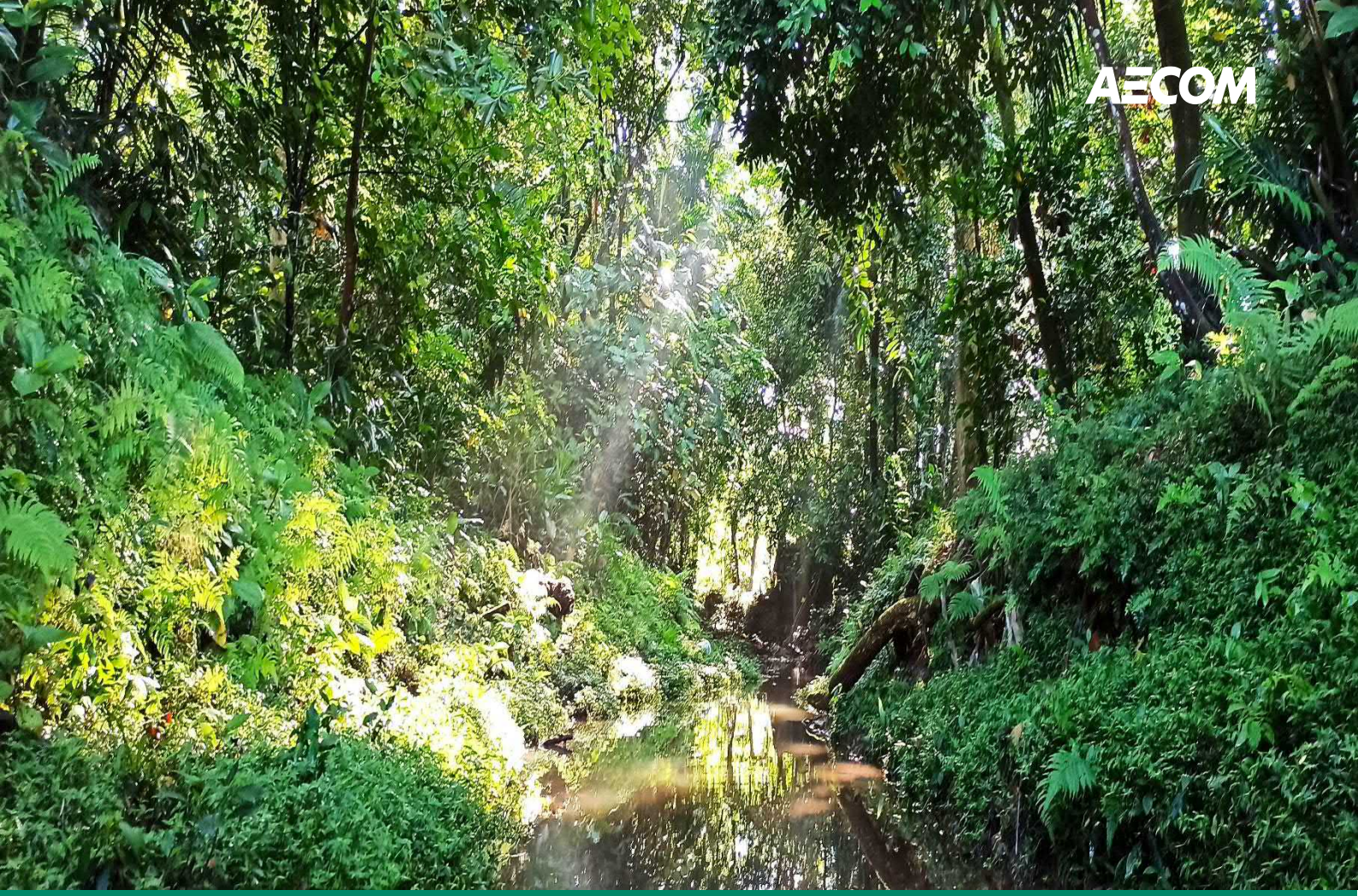


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List of Acronyms

Acronym	Definition
ABC	Active, Beautiful, Clean
ACMV	Air Conditioning and Mechanical Ventilation
AECOM	AECOM Singapore Pte. Ltd.
AHU	Air handling unit
ALS	ALS Technichem (S) Pte. Ltd.
ANZECC	Australian and New Zealand Environment and Conservation Council
ASR	Air sensitive receptor
BIA	Biodiversity Impact Assessment
BTNR	Bukit Timah Nature Reserve
CBD	Central Business District
CCNR	Central Catchment Nature Reserve
CCS	Central Control System
CCTV	Closed-Circuit Television
CFU	Colony Forming Unit
CITES	The Convention on International Trade in Endangered Species of Wild Fauna and Flora
COD	Chemical Oxygen Demand
COPPC	SS 593: Code of Practice for Pollution Control, 2013
CR	Critically Endangered
CS	Conservation Significance
dB	Decibel
DGPS	Differential Global Positioning System
DO	Dissolved Oxygen
DOE	Department of Environment (Malaysia)
EBS	Environmental Baseline Survey
ECM	Earth Control Measures
ECO	Erosion Control Officer
ECP	Erosion Control Plan
EHS	Environmental Health and Safety
EIA	Environmental Impact Assessment
EIS	Environmental Impact Study
EMMP	Environmental Management and Monitoring Programme
EN	Endangered
ERP	Emergency Response Plan
ERSS	Earth Retaining and Stabilising Structures
ERT	Emergency Response Team
EU	European Union
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
HDB	Housing & Development Board, Singapore
HDV	Heavy duty vehicles
HK EIAO TM	Hong Kong Environmental Impact Assessment Ordinance – Technical Memorandum
IAQM	UK Institute of Air Quality Management
IUCN	International Union for Conservation of Nature
JID	Jurong Innovation District
JRL	Jurong Regional Line
JTC	JTC Corporation (formerly Jurong Town Corporation)
KJE	Kranji Expressway
LOEL	Lowest Observed Effect Level
LTA	Land Transport Authority
M&E	Mechanical and Electrical Works
m bgs	Meters Below Ground Surface
MEP	Mechanical/ Electrical/ Plumbing
MND	Ministry of National Development

Acronym	Definition
MPA	Maritime and Port Authority
mRL	Meters Reduced Level
MRT	Mass Rapid Transit
NAAQS	USEPA National Ambient Air Quality Standards
NAS	National Archives of Singapore
NBSAP	National Biodiversity Strategy and Action Plan
NEA	National Environment Agency
NG	Nature Group (s)
NParks	National Parks Board
NSR	Noise sensitive receptor
NTU	Nephelometric Turbidity Units
NUS	National University of Singapore
NUSLHMSG	NUS Libraries Historical Maps of Singapore
PH	Public Holiday
PHILMINAQ	Mitigating Impact from Aquaculture in the Philippines
PIE	Pan Island Expressway
PM	Particulate Matter
PME	Powered mechanical equipment
PRO	Public Relations Officer
PSI	Pollution Standard Index
PSU	Practical Salinity Unit
PUB	Public Utilities Board
QECP	Qualified Erosion Control Professional
RER	Representative ecological receptors
RTO	Resident Technical Officer
SFA	Singapore Food Agency
SI	Soil Investigation
SIDS	Silty Imagery Detection System
SING	Singapore Botanic Gardens' Herbarium
SLA	Singapore Land Authority
SO	Superintending Officer
SOP	Standard Operation Procedure
SRDB	Singapore Red Data Book
SWL	Stabilised Water Level
TAQMMS	Telemetric Air Quality Monitoring and Management System
TDS	Total dissolved solids
TN	Total Nitrogen
TNIA	Traffic Noise Impact Assessment
TOC	Total Organic Carbon
TOL	Temporary Occupation Licence
TOR	Terms of Reference
TP	Total Phosphorus
TSS	Total suspended solids
UHI	Urban Heating Island
UK	United Kingdom
UNECE	United Nations Economic Commission for Europe
URA	Urban Redevelopment Authority
US	United States of America
USEPA	United States Environmental Protection Agency
VU	Vulnerable
WHO	World Health Organisation
WWCA	Western Water Catchment Area

1 Executive Summary

Project Description & Objectives

AECOM Singapore Pte Ltd was appointed by Housing & Development Board (HDB) to carry out the Environmental Impact Study (EIS) for the Southern area in Tengah (hereafter referred to as the "Project"). The Project Site is bounded by Pan Island Expressway (PIE) on the south and Bukit Batok Road on the east. Located at the south of the proposed Tengah Town development (Figure 1-1), the Project Site consists of 60 hectares (ha) which has been safeguarded as mainly "Residential", "Park", "Commercial and Residential", "Health and Medical Care", "Place of Worship" and "Educational Institution" based on the gazetted Master Plan 2019. Currently, the Study Area is mainly covered by vegetated area (about 41 ha), with about 19 ha already cleared for other projects at Tengah, and were accounted for in their respective environmental impact assessments.

With the current proposed developments in Southern Tengah Town, there is a need to: (1) assess its potential impacts on the local biodiversity and environment; (2) to recommend mitigation measures to address the current gaps in connectivity to surrounding green spaces and to safeguard such ecological connectivity in the future development; and (3) to develop an Environmental Monitoring and Management Plan (EMMP).

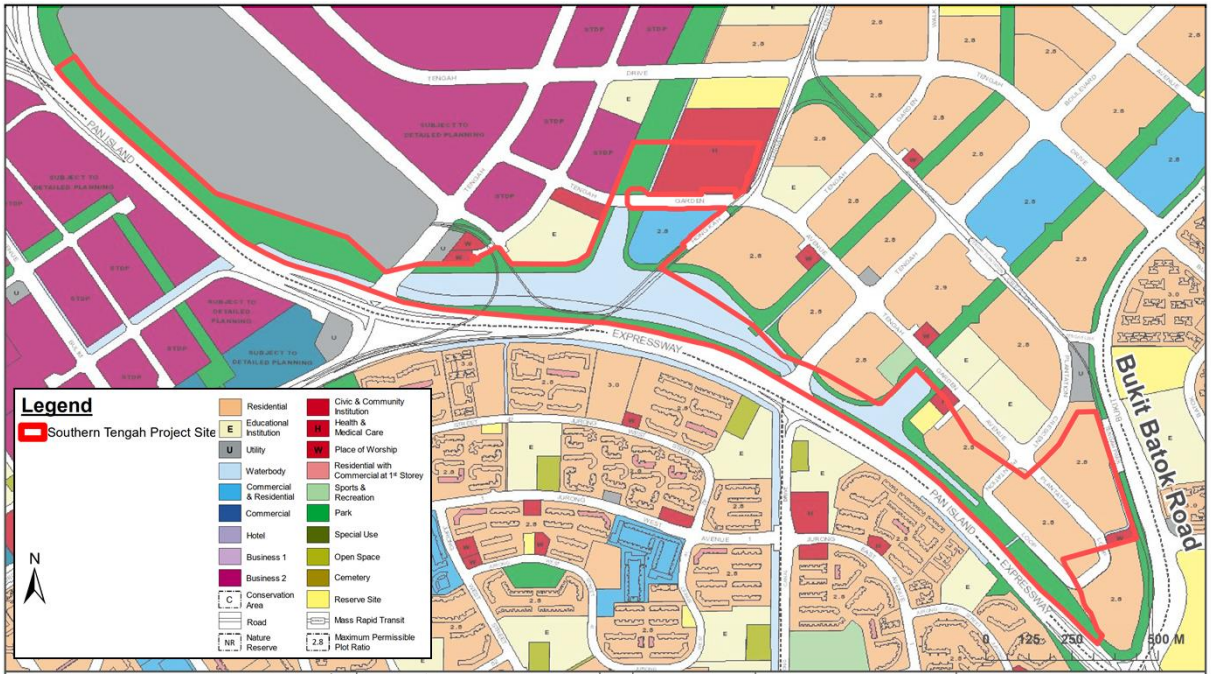


Figure 1-1 Proposed land use of Project Site

Environmental Baseline Findings

Baseline studies on biodiversity, hydrology and water quality, air quality and airborne noise were conducted for the Project Site, and a summary of the findings is provided below. More information can be obtained from Sections 7, 8, 9 and 10 of the report, respectively.

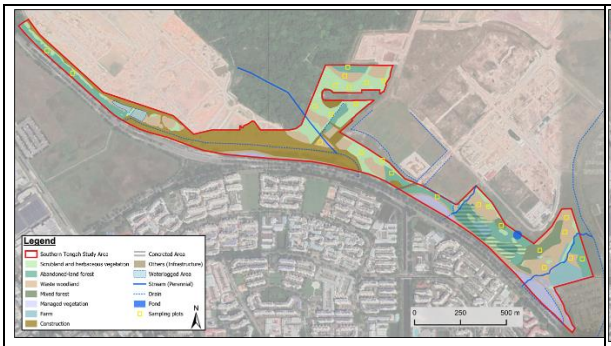


Figure 1-2 Vegetation distribution in the Project Site

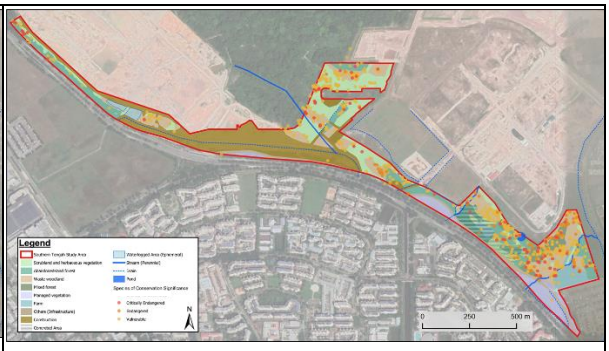


Figure 1-3 Distribution of flora species of conservation significance in the Project Site

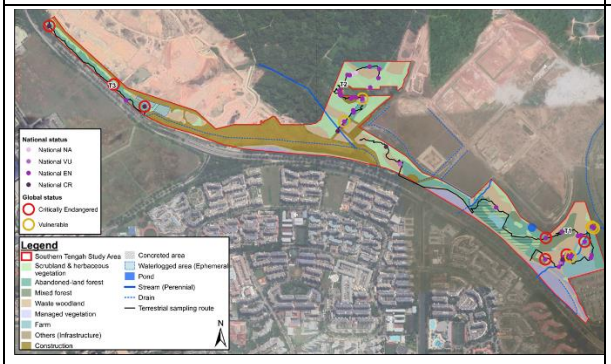


Figure 1-4 Distribution of fauna species of conservation significance in the Project Site

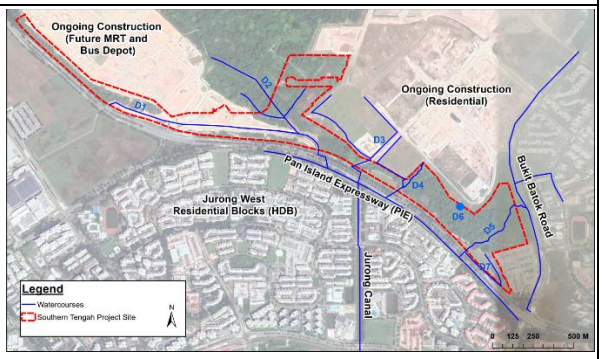


Figure 1-5 Existing waterbodies in the Project Site

- **Vegetation Distribution** (see Figure 1-2) – Southern Tengah comprises of four types of vegetation of which, the largest vegetation type is scrubland and herbaceous vegetation which takes up 12.9 ha (21.43%) of the Project Site. This is followed by waste woodland, occupying 10.59 ha (17.59%) of the Project Site; abandoned-land forest (9.51 ha; 15.8%), and lastly, mixed forest habitat (2.15 ha; 3.25%). The remaining areas are covered by farms (2.20 ha; 3.65%), managed vegetation (4.23 ha; 7.03%) and other non-vegetation area such as construction area and infrastructure which consists of 15.63 ha (25.96%) and 2.38 ha (3.95%) respectively.
- **Biodiversity, Flora** (see Figure 1-3) – A total of 364 species and 5 species groups (i.e., plants that could not be identified to species level with certainty) belonging to 109 families were recorded from the floristic surveys. Thirty-three recorded species were considered as species of conservation significance. Notable recorded species include the Critically Endangered mature specimens of *Ficus stricta*, nationally Endangered *Ardisia elliptica, Dacryodes* cf. *costata* and *Tarenna fragrans*, and Vulnerable *Glochidion zeylanicum* var. *zeylanicum* that has an association to the rare butterfly species – Malay staff sergeant butterfly (*Athyma reta moorei*).
- **Biodiversity, Large Plant Specimens and Other Specimens of Values** – Malayan banyan (*Ficus microcarpa*) makes up the majority of large specimens, while the second-most abundant large specimen species found is the common roadside tree, angsana (*Pterocarpus indicus*). Other specimens of values recorded at Tengah includes an albizia (*Falcataria moluccana*) in the western portion that was observed to have one raptor nest belonging to the changeable hawk eagle (*Nisaetus cirrhatus*). Majority of the keystone species were concentrated over at the eastern portion of Southern Tengah.
- **Biodiversity, Fauna** (see Figure 1-4) – Nineteen species of conservation significance were observed in the central and eastern part of the Project Site. One of the notable records of fauna includes the very rare Malay staff sergeant (*Athyma reta moorei*). Native host plants for this butterfly species of conservation significance were observed in the central and eastern part of the Project Site. Globally Vulnerable and nationally Endangered Asian softshell turtle (*Amyda cartilaginea*) were encountered at the D5 stream (Figure 1-5). To add on, the nationally Endangered and globally Critically Endangered straw-headed bulbul (*Pycnonotus zeylanicus*) was recorded in the eastern part of the Project Site (T1), close to the D5 stream, likely due to their

preference for riverine habitats. As for non-volant mammals, the globally and nationally Critically Endangered Sunda pangolin (*Manis javanica*) was recorded over at the western portion of the Project Site, probably due to forested areas that remains connected to north of the Project Site and construction site via a forested corridor running along the PIE and KJE, thus possibly explaining its presence here.

- **Hydrological Conditions** (see Figure 1-5) – Six (6) water catchment areas within the vicinity of the Project mainly contribute to five (5) perennial drains/ streams (i.e. D1 to D5), one pond (D6) and one dry roadside drain (D7).
- **Water Quality** – Surface water quality of waterbodies canal D1, stream D2, drain D3 and stream D4 were relatively poor as they were potentially impacted by surrounding construction site as sampled during the time of field surveys. The natural stream D5 was less impacted by the surrounding construction site and had relatively better water quality. Although some water quality indicators in the natural stream D5 had exceeded the aquatic life criteria[1], this is commonly observed in natural watercourses in Singapore with its tropical climate and D5 is habitable for aquatic flora and fauna, based on AECOM's previous project experience. This also aligned with biodiversity findings in Section 7, which showed the presence of important aquatic species such as odonates and reptiles in D5.
- **Groundwater Level** – In terms of groundwater level, it ranged between 2.78 m Reduced Level (mRL) and 11.25 mRL, i.e. 0.86 meters below ground surface (m bgs) and 1.87 m bgs. from gauging records in previous study.
- **Air Quality** – 3 representative locations were monitored for 1 week each, and it was observed that there was an exceedance of $PM_{2.5}$ targets as per the Singapore Ambient Air Quality Long Term Targets at all three monitoring stations (A01 – A03) and an exceedance of the PM_{10} targets at A02 station.
- **Airborne Noise** – Baseline monitoring was carried out at thirteen (13) locations within the defined Project Site (i.e. 150 m from the Project Site). Noise monitoring was conducted for one (1) week (inclusive of Weekdays and Weekends) to capture baseline noise levels over time periods of 12 hours (long term), 1 hour and 5 minutes (short term) at each of the locations. Generally, the baseline airborne noise levels exceeded the *NEA Maximum Permissible Noise Levels for Construction Noise Control* criteria, most likely due to the traffic noise from the Bukit Batok Road, PIE, nearby carparks and ongoing construction worksites.

[1] The aquatic life criteria indicate the threshold concentration of contaminants that can be present in surface waterbodies before it is likely to harm on the aquatic flora and fauna within it.

Recommended Areas of Conservation (RAC)

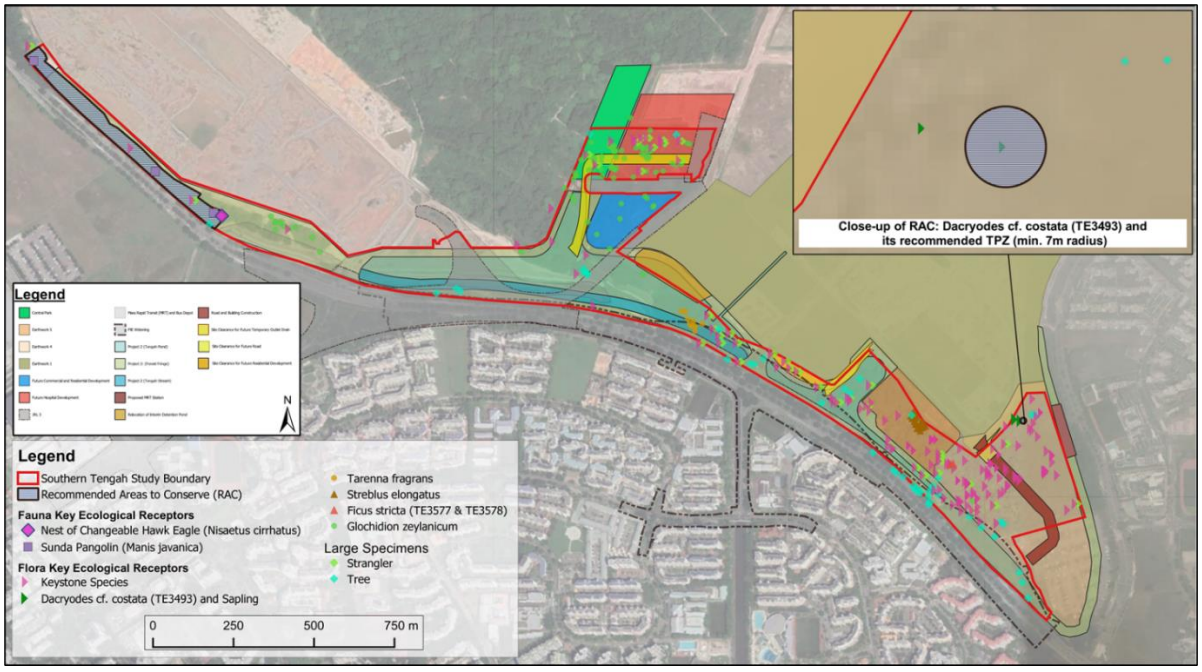


Figure 1-6 Recommended Areas of Conservation (RAC) within the Project Site

Two areas of high conservation value were identified within the Project Site. The singular specimen of *Dacryodes cf. costata* (TE3493), along with its recommended Tree Protection Zone (TPZ), and the linear strip of habitat abutting the PIE on the western section of the Project Site were delineated as a RAC. In total, the RAC occupies 3.22 ha (5.35%) of the Project Site. More details are provided in Sections 7.6 and 7.7.

Impact Assessment Methodology

Sections 7, 8, 9 and 10 of the EIS report discuss the methodologies used for impact identification, prediction and assessment on environmental parameters including biodiversity, hydrology, water quality, groundwater level, air quality and airborne noise during the construction and operational phases of the development.

Key Mitigation Measures

Table 1-1 summarises the key mitigation measures that have been developed for adoption, to minimise the adverse impacts throughout the course of the projects. More details can be found in Sections 7, 8, 9 and 10 of the report.

Table 1-1 Recommended key mitigation measures

Environmental Parameter	Recommended Key Mitigation Measures and Best Management Practices	
	During Construction Phase	During Operational Phase
Flora and Fauna	• Retain delineated RAC within Study Area. • Retain specimen of *Dacryodes* cf. *costata*. • Salvage suitable specimens of plants of conservation significance. • Transplant two specimens of *Ficus stricta*. • Conduct pre-felling inspections and directional wildlife shepherding during pre-construction stage.	• Grade-separated wildlife crossings. • Implement traffic calming measures if necessary. • Unused areas should be replanted by adopting a native planting palette. • Use lighting of lower lux levels at strategic locations to cater for darker areas to minimise disturbance from light at areas where habitat creation is proposed and/or near to the RAC. • Provide adequate vegetated buffer adjacent to the RAC to reduce impacts

Environmental Parameter	Recommended Key Mitigation Measures and Best Management Practices	
	During Construction Phase	During Operational Phase
	• Monthly flora and fauna monitoring on construction site. • Implement compensatory measures of habitat creation along the Forest Fringe and Tengah Pond to compensate for the major loss of terrestrial and aquatic habitat. • Enhance wildlife connectivity within Southern Tengah and other green spaces (i.e., Forest Corridor, Central Park) beyond the Study Area.	from edge effects (i.e., change in species composition). • Elevated or separated footpaths from RAC to reduce trampling of vegetation. Human activities should also avoid major vegetated corridors that is used by fauna species.
Hydrology, Groundwater Level and Surface Water Quality	• For any construction activities that may alter the alignment of or block drains/stream, appropriate measures such as watercourse diversion should be carried out to avoid localised flooding. • Ensure strict compliance with PUB Code of Practice on Surface Water Drainage during the design of roadside drains and diversion drains, as well as during the implementation Earth Control Measures, to ensure no flooding risk and no water quality impact during the construction. • Provide enclosed bins and designated waste disposal facilities, with frequent housekeeping checks conducted. • Schedule frequent waste collection by licensed waste operator/collector. • Implement CCTV and Silt Imagery Detection System (SIDS) to monitor surface runoff discharges from sites as part of ECM required by PUB. • Install piezometers to monitor changes in groundwater levels.	• Ensure strict compliance with PUB Code of Practice on Surface Water Drainage during design of storage system, to reduce peak flow during operational phase to be the same or lower than that of the existing condition. • Incorporate more softscape areas and pervious areas in the design of the development to increase seepage of surface water into the soil and to reduce the peak flow and flooding risks within the development. • Provide sufficient disposal bins surrounding the Project to avoid improper waste disposal. • Raise awareness on waste management via community/stakeholder engagement (e.g. signage boards, warning signs).
Air Quality	• Implement dust control measures e.g. dust screens, etc. • Install hard surfaced haul routes. • Only use cutting, grinding and sawing equipment with dust suppression water spray mechanisms. • Erect hoarding around dusty activities and site boundary min. 1.8m height in line with BCA guideline. • Impose and signpost maximum speed-limit of 25km/hr on paved roads and 15 km/hr on unpaved roads and work areas. • No burning of waste allowed on site. • Revegetate earthworks and exposed areas / soil stockpiles.	<u>No mitigation measures to be proposed</u> as the predicted increase in air quality pollutant levels is likely to be insignificant, due to: • Current large traffic volume along existing roads, and thus, any increase in traffic due to the development will not lead to a significant change in air quality. • Continued implementation of increasingly stringent Euro emission standards on new vehicles.
Airborne Noise	• Implement airborne noise monitoring programme as part of EMMP as pre-emptive measures to assess potential impacts arising from uncontrolled/ unpredicted events.	• Utilize noise attenuators and other Best Available Technology (BAT) and Best Environmental Practice (BEP) to mitigate potential noise from air conditioning and mechanical ventilation (ACMV) systems.

Environmental Parameter	Recommended Key Mitigation Measures and Best Management Practices	
	During Construction Phase	During Operational Phase
		• Utilize low speed postings, speed humps, speed limit signages at drop-off points and parking areas to mitigate noise from increased road traffic.

Environmental Impact Assessment

For habitats, plants and fauna, the unmitigated impact significance during construction phase is **Moderate to Major**, due to loss of vegetation/habitats resulting from the total site clearance carried out for the Project Site. With the complete implementation of mitigation and compensatory measures in Table 1-1, the residual impact significance for habitats, plants and fauna is reduced to **Minor to Major**. Some residual impact significance for the construction phase is expected to remain as **Major** due to the permanent and irreversible loss of vegetation/habitat. For operational phase, with the consideration of mitigation measures in Table 1-1, residual impact significance to plant and fauna receptors are expected to be **Negligible to Moderate**. The detailed impact assessment can be found in Section 7 of the EIS report. With the implementation of these mitigation measures in Table 1-1, the residual impact significance is assessed to be in the range of **Negligible to Minor** for most of the environmental parameters (i.e. hydrology, groundwater level, surface water quality, air quality and airborne noise) in the construction and operational phase. The detailed impact assessment can be found in Sections 8, 9 and 10 of the EIS report.

2 Introduction

AECOM Singapore Pte Ltd has been appointed by Housing & Development Board (HDB), through the Letter of Acceptance dated 29 January 2021, to carry out the Environmental Impact Study (EIS) for the construction and operational phases of proposed residential development in Southern Tengah (hereafter referred to as the "Project").

The Project Site with a total area of 60 hectares (ha) is located in the south of proposed new Tengah Town. It is currently heavily vegetated, mostly covered in exotic-dominated secondary forest and woodlands of abandoned plantations/kampong, which is home for a significant number of floral and faunal species that are of conservation interest. Besides the intrinsic value that greenery has for the present complex ecosystems, large and forested areas such as this one also provides a number of benefits for the surrounding highly urbanized areas (e.g. cooling the air, reduced heat island effects, etc.). Furthermore, it should be noted that the Project Site represents a part of a larger forested patch that is surrounded by Western Water Catchment (0.4km) in the northwest, Jurong Lake Gardens (0.8km) in the South, Bukit Batok Hillside Nature Park (1.1km), Bukit Batok Town Park (1.9km), Bukit Batok Nature Park (2.7km) as well as Bukit Timah Nature Reserve (3.6km) in the west (refer to Figure 3-1). Hence, the Project Site acts as an important wildlife corridor for migrant faunal species that move from one area to the other.

The findings of baseline survey and environmental impact study have been included in this Final EIS Report. This section will serve as a brief introduction of this EIS Report in terms of the scope of EIS works, report structure, study limitations, assumptions and study constraints.

2.1 Scope of Work

Prior to the commission of EIS, HDB undertook an environmental consultation process with the related agencies (i.e. MPA, SFA, NEA, NParks and URA/MND). Agencies recommended that an environmental study should be carried out to develop an Environmental Monitoring and Management Plan (EMMP). The scope of the EIS was then documented in the form of Inception Report Rev 01 [R-1] that was submitted and presented to HDB and relevant agencies on 29 March 2021. This EIS progressed only after acceptance of the Inception Report by HDB and relevant agencies.

The services under this EIS shall include, but are not limited to the following:

- Field survey, data collection and baseline study including topography survey, floral survey, faunal survey, hydrological, groundwater level and water quality survey, noise and dust monitoring;
- Formulation of biodiversity inventory and distribution maps;
- Environmental Impact Study;
- Mitigation measures and EMMP; and
- Preparation of the EIS Report.

Limited information regarding development plan, design elements, construction methodology, and project components was available at the time of writing. Therefore, assumptions, if any, are described in each individual assessment in their respective Sections. Should the construction and operational activities differ from our assumptions or should the build contractor make alterations to these assumptions/approaches, the contractor shall undertake a revised environment impact assessment addressing these changes and obtain requisite approvals from various agencies.

2.2 Report Structure

The structure of the report is as follows:

- **Section 1** – Executive Summary of the Project provides overall findings and a conclusive summary of the EIS;
- **Section 2** – Introduction of the Project provides the detailed scope, report structure, study limitations, assumptions and constraints;

- **Section 3** – Description of the Project provides a general description of the Project components, construction activities and operational activities;
- **Section 4** – Description of the Environment provides a general description of the site setting, land use, historical features, topography, geology, water catchment and climate of the Project;
- **Section 5** – Environment Legislation, Policies, Plans, Standards and Criteria provides the legislative requirements relevant to the Project;
- **Section 6** – Description of Assessment Methodologies provides the overview of the methodology used for the assessment;
- **Section 7** – Biodiversity presents the methodology, baseline environment, sensitive receptors, and potential sources of impacts, minimum controls and evaluation of impacts to biodiversity within the Project Site, along with recommendations for mitigation measures;
- **Section 8** – Hydrology, Groundwater Level and Surface Water Quality presents the methodology, baseline environment, sensitive receptors, potential sources of impacts, minimum controls and evaluation of impacts to hydrology, groundwater level and surface water quality within the Project Site, along with recommendations for mitigation measures;
- **Section 9** – Air Quality presents the methodology, baseline environment, sensitive receptors, potential sources of impacts, minimum controls and evaluation of impacts from the Project to air quality on the ecologically sensitive sites within the Project Site, along with recommendations for mitigation measures;
- **Section 10** – Airborne Noise presents the methodology, baseline environment, sensitive receptors, potential sources of impacts, minimum controls and evaluation of noise impacts on the ecologically sensitive sites within the Project Site, along with recommendations for mitigation measures;
- **Section 11** – Environmental Monitoring and Management Plan (EMMP) details the organisational framework, stakeholder roles and responsibilities, monitoring program requirements and detailed EMMP; and
- **Section 12** – Conclusions provides a conclusive summary of the EIS's outcomes.

2.3 Study Limitations, Assumptions and Constraints

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During this study, there were inherent limitations associated with data acquisition in flora surveys due to the variability of vegetation communities across a site and changes to the detectability and presence of species with time (i.e. cleared land, inaccessible areas due to the nature of arduous terrain that might be present). Therefore, it may be possible that some flora species occurring within the Project Site, or perhaps not visibly present during the survey period, were not recorded. However, the surveys were considered to be comprehensive as survey routes were strategically planned to cover ecologically and geographically representative samples of the Project Site, and all plant species sighted were identified and recorded to the best of the team members’ abilities. Project team members who carried out the survey and identified the species post-survey have prior experience in conducting such flora assessments in Singapore.

As for the fauna surveys conducted, surveys could not detect all species for which the site may be important as fauna are highly mobile, frequently cryptic and vary in presence and abundance within and between seasons. Species returned by the literature review were therefore considered to be potentially present in the site and were considered in the impact assessment. The study period coincided only with the end of the bird migratory season (September to February), when birds leave their northern breeding grounds to reach southern overwintering haunts via the East Asian-Australasian Flyway. Hence, NParks has agreed to exclude migratory bird survey from this Study due to the short duration of this Project during the scoping meeting carried out on 26 February 2021. As such, migratory bird species may be under-represented in the field assessment. Professionals who carried out the fauna surveys are experienced field biologists and familiar with the local fauna.

Due to the above, the statements, conclusions and opinions contained in this report are approximations of the existing environmental conditions within the Project Site, based on available literature, expert observations and opinion at the time of reporting. Reliance on the report after the date of issuance as an accurate representation of current site conditions shall be at the user’s sole risk.

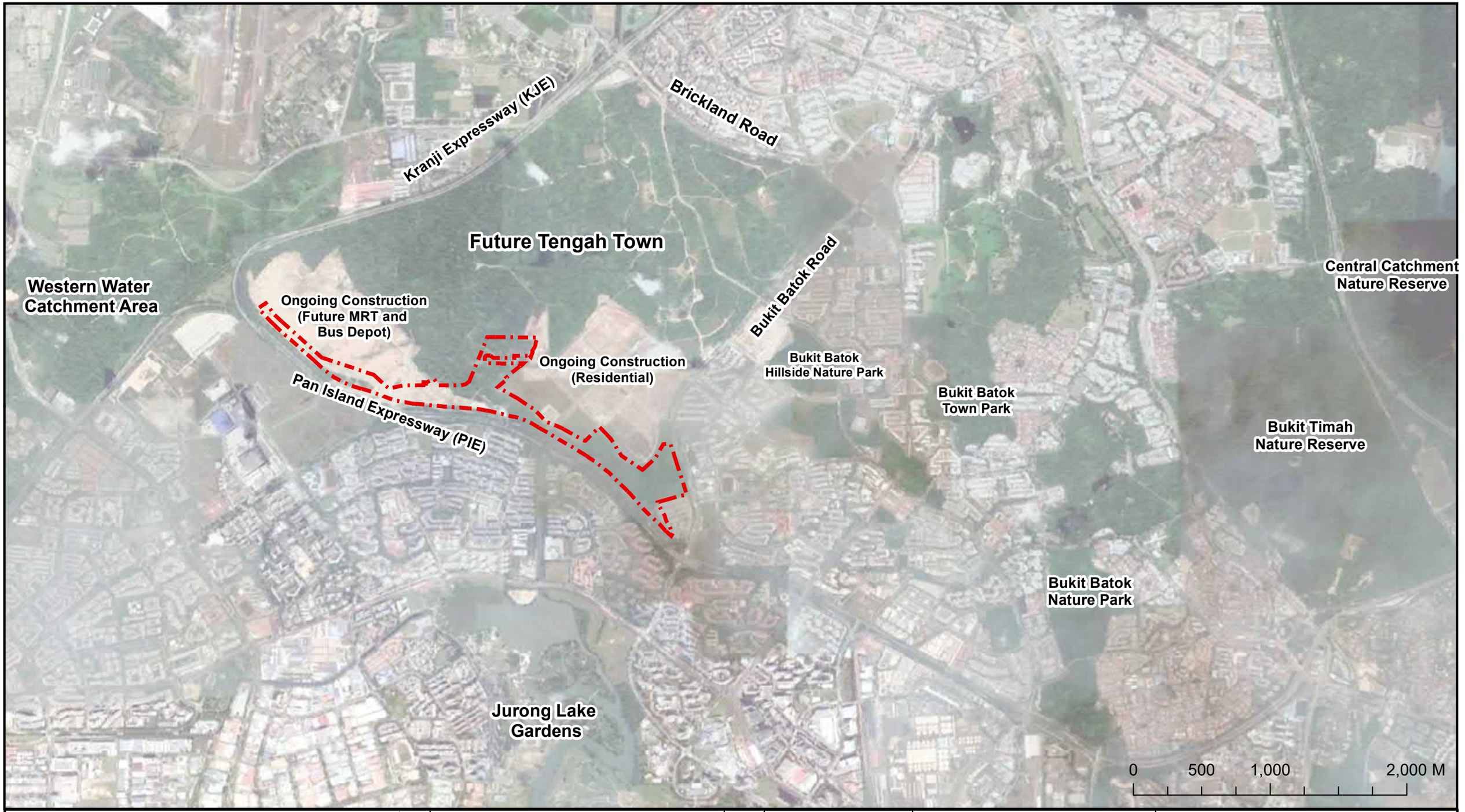
3 Project Overview

This section will provide a background overview of the Project in terms of its location, current land uses, conceptual development plan, proposed construction and operational activities.

3.1 Project Location

Tengah Town is a new township development in the western region of Singapore, which is bounded by Kranji Expressway (KJE), Pan Island Expressway (PIE), Brickland Road and Bukit Batok Road, as shown in Figure 3-1. The Project Site for this EIS is located in the south of the future Tengah Town development and is estimated to be approximately 60 ha. It is bounded by PIE in the south and Bukit Batok Road in the east, as shown in Figure 3-1. The Project Site comprises of the forested area in the west and east, as well as the site for construction of Jurong Region Line (JRL) in the centre.

Tengah is situated between the Central Catchment Nature Reserve (CCNR) and the Western Water Catchment Area (WWCA). Hence, it is regarded as an important habitat for flora and fauna and serves as an ecological corridor or a “stepping stone” for avian fauna community that travels between CCNR, Bukit Timah Nature Reserve (BTNR) and to the WWCA [R-47]. It also facilitates the dispersal of flora and fauna between these locations which are biodiversity hotspots, across fragmented landscape in Singapore. With the current proposed developments in Tengah Town, there is a need to address the current gaps in connectivity to the surrounding green spaces in close proximity (see Figure 3-1).



Legend

Southern Tengah Project Site

N

Rev.	Date	By	Description	Chk'd	App'd
-	OCT 2021	LAL	Final Report	NHT	JAG

Qualified Person Endorsement : NA

HDB Endorsement : NA

Consultant : AECOM

Client: HOUSING & DEVELOPMENT BOARD

Project Title :

CONTRACT L/025/21
SPECIALIST CONSULTANCY SERVICES FOR ENVIRONMENTAL IMPACT STUDY (EIS) ON SOUTHERN TENGAH

Figure Title :

Location of the Project Site

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LAL	NHT	JAG	3-1	-	1 of 1
	Drawn LAL	Date OCT 2021	CAD File Name : NA		A3

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3.2 Project Description

Under statutory land use plan (Master Plan 2019, [M-2]) of Urban Redevelopment Authority (URA), the land parcels of the Project Site are categorised as “Park”, “Waterbody”, “Commercial and Residential”, “Health and Medical Care”, “Residential” and “Reserved Site”, as shown in Figure 3-2. “Waterbody” development, which denotes the areas that are intended for drainage purposes and water areas such as pond dominate the central/south portion of the Project Site, while the “Residential” development is mostly concentrated in the eastern portion of the site, towards Bukit Batok Road. Majority of “Health and Medical Care” parcels are located in the northernmost part of the Project Site, exception being a smaller parcel, located to the east of the future water body. “Commercial and Residential” development parcels are planned to be between “Health and Medical Care” and “Waterbody”, in the centre of the Project Site. “Park” parcels can be found all around the Project Site, mostly surrounding other types of developments.

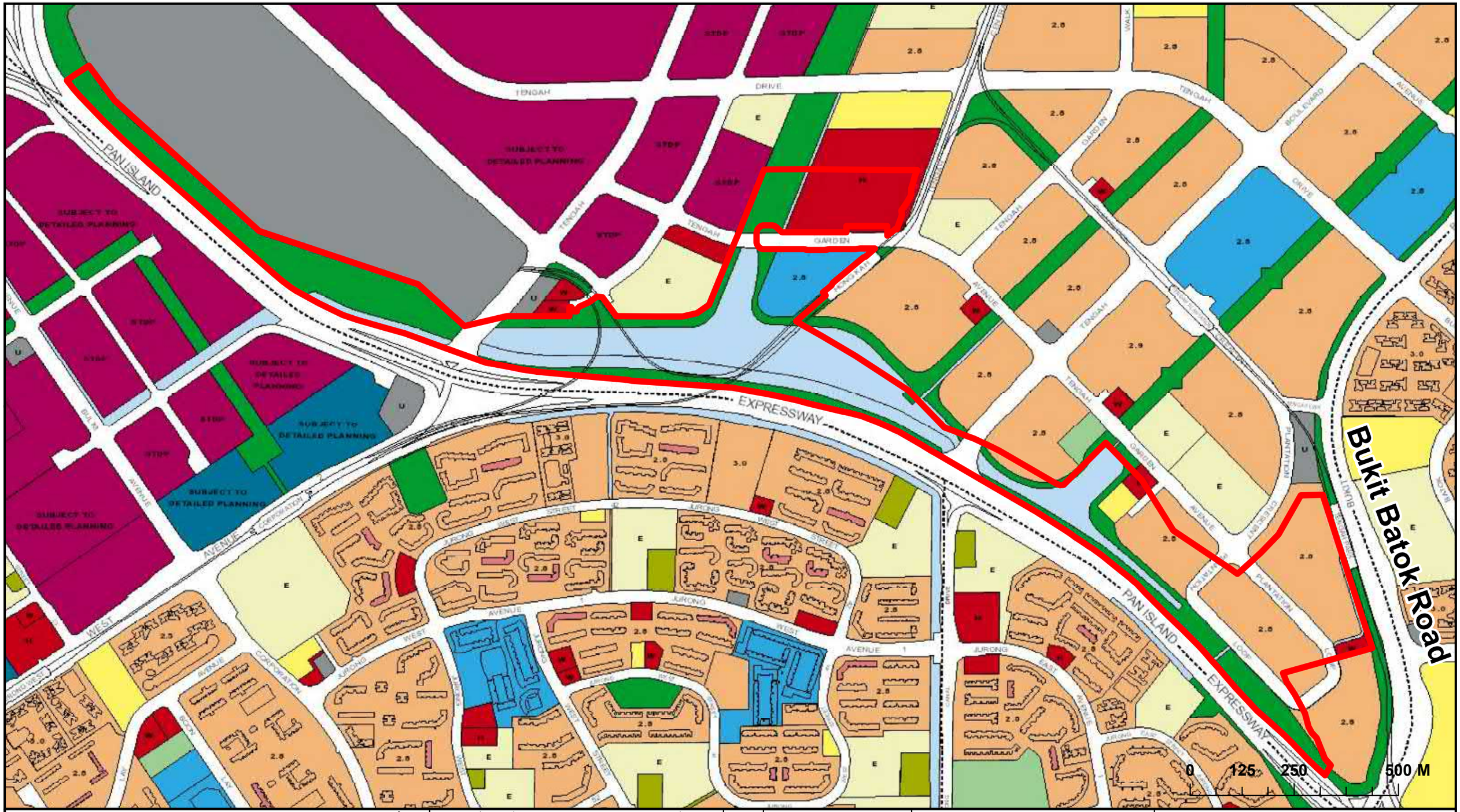
Similar as shown in the conceptual development plan (refer to Figure 3-3), this Project Site has been proposed to be redeveloped into Project 2 in the west and centre (i.e. Tengah Pond, Tengah Stream and Promenade Park), earthwork site in the east for future road and building construction, future residential development in the centre, future hospital development and Central Park in the north. Besides this, there will be some minor construction works associated with future developments including relocation of interim detention pond, site clearance (for future residential development, future temporary outlet drain, and future roads) are also within this Project Site.

To create an endearing town where future residents can experience being “At Home with Nature”, green parks (including future Tengah Pond, Central Park, Forest Corridor, etc.) surrounding the proposed residential areas are planned in the prospective development plan of this Project by HDB as demonstrated in Figure 3-3. In addition to providing a greener residential area, the future Tengah Pond has also been proposed to ensure 0% increase in peak runoff to minimize flood risks as compared to the pre-development condition as designed in AECOM’s early report for Tengah Town Master Plan to HDB [R-48]. This pond will be built with an effective depth of 1.9m with a maximum water level of around 3 mRL [R-48]. In addition to the quantity of water, AECOM’s master plan [R-48] also took consideration of the stormwater quality by using bio-engineering methods, such as rain garden/ bioretention system, wetland in the proposed pond and stream (refer to conceptual designs and examples from Figure 8-13 to Figure 8-18).

Besides the main Project, a few concurrent projects (refer to Figure 3-5) have been identified to be under construction at the same time as the Project. These include road construction to the northeast of the Study Area, JRL construction to the north and in the centre of Study Area, as well as an MRT and Bus Depot to the northwest of the Project.

It should be noted that a large portion of land towards the western portion of the Study Area has been cleared for the on-going construction of the upcoming JRL. Other infrastructure within the Study Area includes small section of Bukit Batok Heavy Vehicle Carpark and defunct Jurong Road that runs parallel to the boundary of Southern Tengah. The mentioned road has been closed off to make way for the construction of JRL and future proposed development such as the PIE Widening works.

The detailed construction activities and timeline of this Project as well as concurrent projects have been described in Section 3.5.



Legend

Southern Tengah Project Site

Residential		Civic & Community Institution	
E	Educational Institution	H	Health & Medical Care
U	Utility	W	Place of Worship
	Waterbody		Residential with Commercial at 1st Storey
	Commercial & Residential		Sports & Recreation
	Commercial		Park
	Hotel		Special Use
	Business 1		Open Space
	Business 2		Cemetery
C	Conservation Area		Reserve Site
	Road		Mass Rapid Transit
NR	Nature Reserve	2.8	Maximum Permissible Plot Ratio

N

Rev.	Date	By	Description	Chk'd	App'd
-	OCT 2021	LAL	Final Report	NHT	JAG

Qualified Person Endorsement : NA

HDB Endorsement : NA

Consultant : AECOM

Client: HOUSING & DEVELOPMENT BOARD

Project Title :

CONTRACT L/025/21 SPECIALIST CONSULTANCY SERVICES FOR ENVIRONMENTAL IMPACT STUDY (EIS) ON SOUTHERN TENGAH

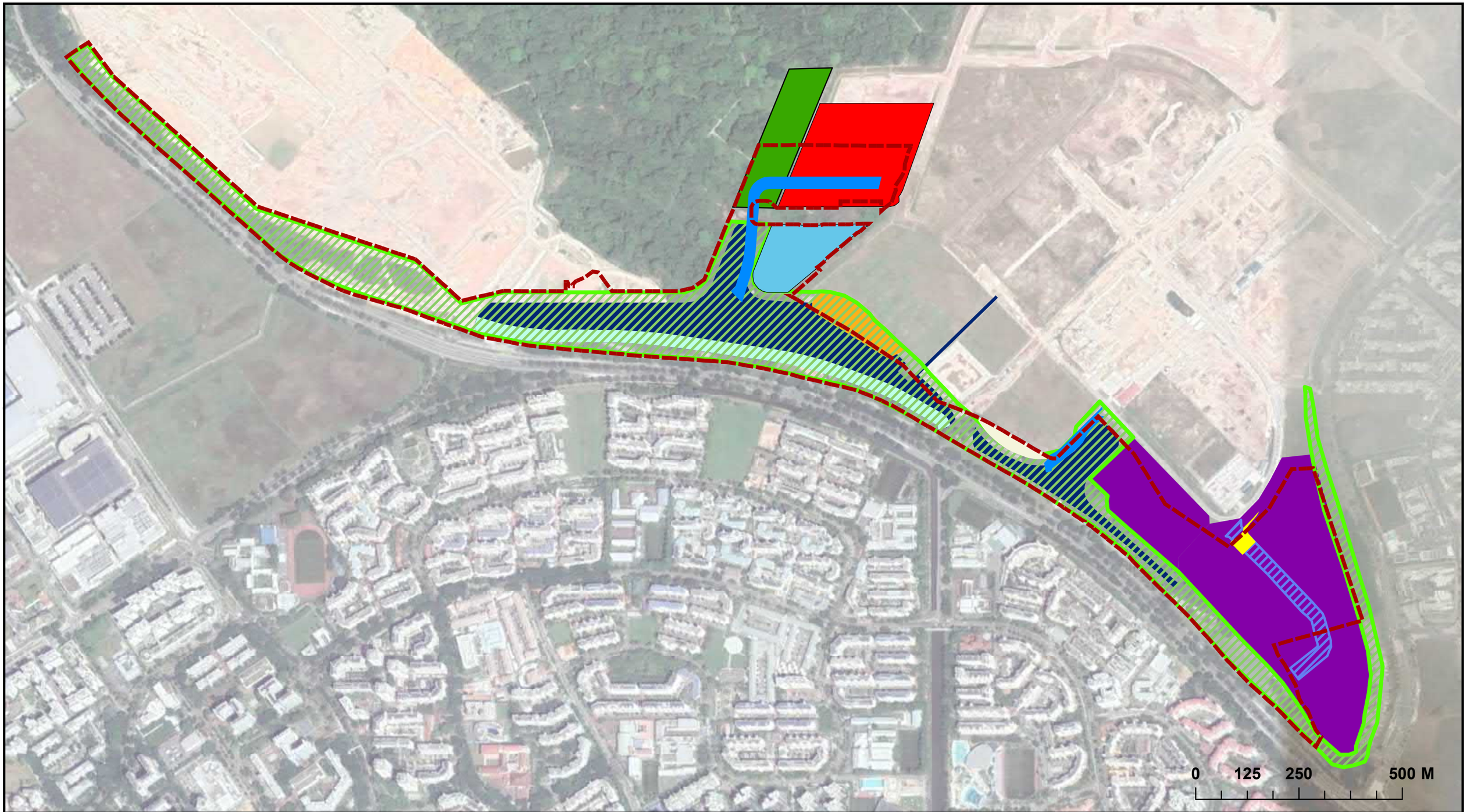
Figure Title :

Proposed land use of the Project Site and its surrounding

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LAL	NHT	JAG	3-2	-	1 of 1
	Drawn LAL	Date OCT 2021	CAD File Name : NA		A3

Note: Source of basemap - URA Master Plan 2019

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Legend

- Southern Tengah Project Site
- Earthworks
- Central Park
- Project 2
- Tengah Stream
- Tengah Pond
- Road and Building Construction
- Future Hospital Development
- Future Commercial & Residential Site
- Site Clearance of Forest Patch for Future Road
- Site Clearance of Forest Patch for Future Temporary Outlet Drain
- Site Clearance of Forest Patch for Future Residential Development
- Relocation of Interim Detention Pond

N

Rev.	Date	By	Description	Chk'd	App'd
-	OCT 2021	LAL	Final Report	NHT	JAG

Qualified Person Endorsement : NA

HDB Endorsement : NA

Consultant : AECOM

Client: HOUSING & DEVELOPMENT BOARD

Project Title :

CONTRACT L/025/21 SPECIALIST CONSULTANCY SERVICES FOR ENVIRONMENTAL IMPACT STUDY (EIS) ON SOUTHERN TENGAH

Figure Title :

Key planned developments within the Project Site

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	Drawn: LAL	Date: OCT 2021

Figure No. : 3-3 | Rev. : - | Sheet : 1 of 1

CAD File Name : NA | A3

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3.3 Proposed Construction Activities

The construction activities involved during the development of the proposed Project will entail civil engineering works such as site clearance (demolition of all buildings/structures, removal of existing trees and vegetation), earthworks cutting/filling within site to achieve desirable platform levels required for the proposed residential development from the drainage and sewerage perspectives; pond construction; construction of roads, drainage works, sewerage works etc; building works such as foundation, superstructure construction, utilities/services laying, etc; and construction of parks and landscaping works. The detailed descriptions of each construction stages are as following sections.

3.3.1 Stage 1 – Advance Works/ Site Clearance

As described in Section 2, the Project Site is mainly forest area (about 41 ha). To prepare the site for actual construction works, it will first require clearance of trees/ vegetation at the construction worksite areas and access roads by using either excavator or other types of vegetation harvester. Site clearance for the forest area in southern Tengah will be completed before any subsequent construction works (i.e. earthworks, infrastructure and building works). However, it should be noted that about 19 ha of the whole Project Site (60 ha) has been cleared for construction works (refer to Figure 3-1). The site clearance activities may cause biodiversity, water, air, and noise impacts.

For this, the construction contractor's certified Environmental Control Officer (ECO) shall prepare an Erosion Control Plan (ECP) and obtain approval from the Public Utilities Board (PUB). The contractor shall also map the trees on site and the trees planned to be felled and obtain National Parks Board (NParks) approval.

At this time, EIS report must be consulted by the Contractor for following requirements and therefore, plan of action:

- An area rich in trees of conservation interest, the contractor should employ a certified arborist to map the trees carefully while applying for tree felling approval. This is to gauge the health, species, size and conservation significance of the tree;
- If there are trees that must be transplanted, this should be done prior to commencing site clearance;
- If the area is rich in wildlife, the contractor shall consult wildlife specialist and prepare a wildlife shepherding plan, obtain NParks' approval and execute it prior to/ along the site clearance process; and
- Based on the wildlife shepherding strategy (refer to Section 3.5.3), it has been decided that the tree felling should be completed from east to west, and the site will be cleared area by area (e.g. around 2 hectares each time).

Site hoarding process and extent should also be governed by the above factors and the approved plans by NParks, PUB and/ or any other relevant agency. The construction site debris, felled trees and spoil will be temporarily stored on site and then collected by licenced third parties for offsite disposal.

3.3.2 Stage 2 – Earthwork

After advance works/ site clearance, earthworks involving soil and geotechnical investigation (SI), demolition of existing structures, road and utilities diversion, site levelling will be carried out.

3.3.2.1 Soil Investigation (SI)

SI will be performed by drilling boreholes to obtain information on the physical properties of soil earthworks and foundations for proposed structures, for repair of distress to earthworks and structures caused by subsurface conditions. The information obtained in SI aids the detailed foundation design of the future infrastructure.

3.3.2.2 Utilities Diversion

One of the pre-construction activities will be utility diversion. Utilities which are shallow and likely to cause impedance to excavation works will be diverted first, so that there is no disruption in usage of utilities to nearby receptors. If required, some of the utilities will be reinstated after the whole construction works are completed and the utilities need to be restored at the same place.

3.3.2.3 Site Levelling

Due to the hilly and undulating Project Site, the construction site of the whole Project Site will be levelled for construction to start, which would involve large machineries such as excavator, grader, concrete truck, roller, concrete vibrator, etc. This may involve cutting and stabilising of slopes in areas. In this case geotechnical engineers will develop Earth Retaining Stabilisation Structures (ERSS) schemes to stabilise the exposed slopes in their engineering design. ECO considers measures to prevent erosion of soil into the nearest drainage network. This may or may not accompany ground improvement works depending on the nature of the soil in the area.

The earthworks as described above may cause potential biodiversity impact due to reduced habitats and indirect impact from air, noise and water, potential surface water impact due to increased surface runoff and contaminants from construction activities, potential noise impact due to operation of machineries, as well as potential air quality impact due to dust emissions from hacking activities. These potential impacts have been assessed in the relevant sections of this Final EIS Report.

3.3.3 Stage 3 – Infrastructure Works

Following the earthworks, infrastructure will be built up as part of the town development in the Project Site, which will involve road works (refer to Figure 3-2), drainage and sewerage works, mechanical and electrical works (M&E), etc. Besides, the temporary worksite structures are set up at construction worksite. Generally, the site features will include areas for site offices, toilets, raw material storage area, equipment storage and workshop area, waste management facilities and storage, hazardous materials storage, internal temporary roads for movement of vehicles and vehicle parking lot. For the Project construction worksite area, it is not yet determined if the worksites will have/not have concrete batching plants.

The construction works required, operation of machineries and increase in site vehicular traffic for the establishment of infrastructure works may cause potential noise nuisance and dust emission to nearby human and ecologically sensitive receptors, as well as potential water quality impact to existing streams or drains. Standard waste management practices shall be implemented on site to handle hazardous (e.g., toxic chemical wastes, oil) and non-hazardous wastes (e.g., general waste, stormwater runoff). These potential impacts have been assessed in the relevant sections of this Final EIS Report.

3.3.4 Stage 4 – Building Works

Once infrastructure works are established, building construction will be carried out through construction of foundation works, superstructure and finishing works, general landscaping works, as well as reinstatement and stabilisation of the Project Site.

3.3.4.1 Foundation Works

Foundation work for substructures including piles and pile caps will be constructed. To begin the foundation piling process, erection of crawler crane and boring rig will be required, in which mobile crane might be used for lifting and transporting actions. After setting up the pile position, a temporary guide casing with an internal diameter same as pile diameter can be installed using crawler crane to the pile centre of the marked position to prevent collapse of the surrounding soil. The temporary casing will also serve as a guide in forming a uniform basis for the following boring works until the designed depth using a bored piling machine, which can be very intensive and generates noise and vibration. Thereafter, the reinforced bars (rebar) will be installed using a crawler crane to enhance the strength of concrete pile, followed by the tremie pipe installation to better support the concreting works. The ready-mix concrete will be transported by a concrete truck and will be poured into the borehole using crawler crane. During circumstances when there is extra pile head after the completion of bored piling, pile head hacking will be conducted using breaker and excavator. Besides, generators will provide the power supply on site for lighting, pumps and temporary ventilation fans operations.

To seal the pile foundation, a pile cap will be necessary. For that, steel waler and struts are required to hold the temporary formworks to proceed with pile cap concreting. The steel will be delivered with a 40-feet trailer where hot works (e.g. welding of steel beams, brackets, etc.) may be required with the usage of welding equipment. Hoisting of waler and struts will be carried out using an excavator with lifting appliance. Upon completion of foundation works, excavator or mini excavator would be necessary for site excavation, at which dump trucks will be commissioned for spoil and slurry removal.

At this stage, the developer or contractor shall ensure proper handling and disposal of construction waste on site to avoid any potential contamination to nearby water resources, soil and groundwater.

3.3.4.2 Superstructure and Finishing Works

Following by the completion of foundation works, superstructures will be constructed for this Project. Firstly, generators will provide the power supply on site for lighting, pumps and temporary ventilation fans operations. Before the installation of superstructures, temporary water pumps might be required to pump water from ground and rain to not affect the quality of concrete. To form the working platform, excavation below surface will be conducted using an excavator, which then following by the formation of lean concrete as the first ground layer for waterproofing purpose. Crane will be used for the spoil removal as well. To construct building until the designed height, temporary formwork is necessary at each level before casting, where air compressor will be used for cleaning. During this process, mobile crane will be used to transport rebar and for the hoisting of false work, scaffolding and the construction of temporary working platforms. A concrete truck will be used to transport ready mix concrete to the site and concrete pump will be used for the superstructure's concreting works.

After the completion of superstructures, it is generally followed by finishing works, such as interior plastering, exterior plastering, waterproofing and tiling, mechanical/ electrical/ plumbing (MEP) rough-in and ceiling installation, painting, lift installation, exterior glass walls, windows and doors installation, as well as setting up building systems (i.e. electrical, plumbing, air-conditioning, etc.). The potential environmental impacts associated with the construction of superstructures and finishing works have been assessed in the relevant sections of this Final EIS Report.



Figure 3-4 An example of superstructure construction works in Singapore (AECOM©)

3.3.4.3 General Landscaping Works

For most of the projects, landscaping works will be conducted to maintain or present the landscape and visual amenity values to users or general public.

Similarly, generators will be used to provide power supply for lighting and running machineries during landscaping works. Excavator and mobile crane might be necessary for excavation and transport of construction materials as well as soil removal. Welding or cutting equipment are commonly used to form landscape structures. The potential environmental impacts associated with the general landscaping works were assessed and incorporated as a whole in the relevant sections of Final EIS Report.

3.3.4.4 Reinstatement and Stabilisation of the Project Site

As the final step towards the completion of construction activities, the developer and/or contractor shall remove all temporary works and ERSS for the reinstatement of working area to its original condition and/or required conditions. A well-reinstated and stabilised land will also enhance the landscape and visual amenity values to create a better living environment for the public and residents of this project development.

The equipment used at this stage is similar to that of the general landscaping works mentioned. Therefore, the potential environmental impacts associated with the reinstatement and stabilisation works under Stage 4 have been assessed in the relevant sections of this Final EIS Report.

3.4 Proposed Operational Activities

Following the reinstatement period, human activity will increase as the development area becomes operational. The Project Site will see an associated increase in human activity such as traffic movement and general activities. During the operational stage, the vehicular traffic volume in the vicinity is predicted to increase when the proposed residential housing and its associated road network starts operating. All the above may cause potential air pollution, noise nuisance, water and biodiversity impacts in the vicinity of the development.

In addition, more impervious surfaces will be expected due to potential change of natural landscape to urbanised area. It might reduce stormwater infiltration into the ground and increase water runoff.

3.5 Project Schedule

3.5.1 Schedule of this Project

As described in Section 3.2, this Project mainly consists of a few proposed developments, including earthworks, road and building construction, future hospital development, future commercial and residential site, Central Park, Project 2 (i.e. Tengah Pond, Tengah Stream, Promenade Park and Forest Fringe), as well as a few minor site clearance projects.

The construction timeline of each proposed development is planned as follows. However, it is noted that site clearance for the whole forest area in the Project Site will be completed before any subsequent construction works (i.e. earthwork, infrastructure and building works).

Table 3-1 Construction timeline of each proposed development in this Project

Development	Description	Timeline
Earthwork (Figure 3-5)	Includes site clearance and earthwork in the eastern side of this Project	In short term to mid-term
Road and building construction (Figure 3-5)	Includes infrastructure works followed by construction of residential buildings in the eastern side of this Project	In mid-term
Relocation of Interim Detention Pond (Figure 3-5)	A temporary holding pond as per Earth Control Measures (ECM) requirements [R-49] at the location of proposed future Tengah Pond	In short term
Site clearance of forest patch for future residential development (Figure 3-5)	Includes site clearance for future residential development	In short term

Development	Description	Timeline
Site clearance of forest patch for future temporary outlet drain (Figure 3-5)	Includes site clearance for future temporary outlet drain in the north and east of this Project Site	In short term
Site clearance of forest patch for future road (Figure 3-5)	Includes site clearance for proposed future road in the east of this Project Site	In short term
Future hospital development (Figure 3-5)	Includes site clearance, earthworks, infrastructure works and building works for future hospital development in the north of this Project Site	In long term
Future commercial and residential site (Figure 3-5)	Includes site clearance, earthworks, infrastructure works and building works for future residential development next to the hospital development in the north of this Project Site	In mid-term
Central Park (section within this Project Site) (Figure 3-5)	Includes site clearance, earthworks, and tree plantation for the proposed central green park area	In mid-term
Project 2 (Figure 3-5)	Includes site clearance, earthworks and tree plantation for the proposed future green areas including Tengah Pond, Tengah Stream, Promenade Park and Forest Fringe	In mid-term

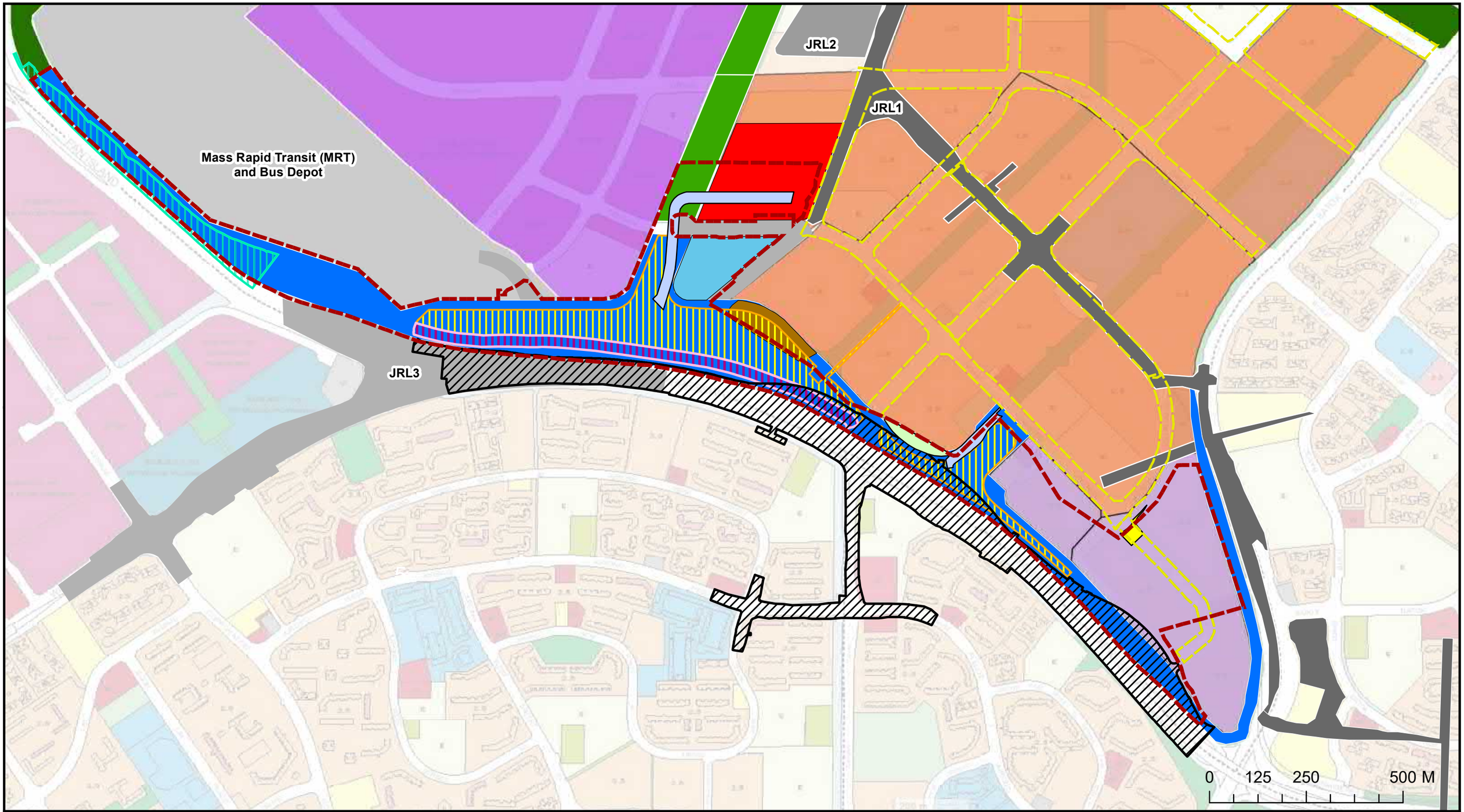
3.5.2 Major Concurrent Developments

A few major concurrent developments in the vicinity of the Project has been identified as below. The timeline of these concurrent developments relevant to this Project is presented in Table 3-2, while the locations of these concurrent developments are presented in Figure 3-5.

Table 3-2 Construction timeline of concurrent developments in this Project

Development	Description	Timeline
Road and building construction (Figure 3-5)	Includes infrastructure works followed by construction of residential buildings to the northern side of this Project Its whole construction period will overlap with the site clearance, earthworks, Project 2, future commercial and residential site, road and building construction, proposed central green park area	In mid-term
Forest Corridor (Figure 3-5)	Includes site clearance, earthworks, and tree plantation for the proposed central green park area Its whole construction period will overlap with site clearance, earthworks, Project 2, future commercial and residential site, road and building construction	In mid-term
Central Park (section outside of this Project Site) (Figure 3-5)	Includes site clearance, earthworks, and tree plantation for the proposed central green park area Its whole construction period will overlap with site clearance, earthworks, Project 2, future commercial and residential site, road and building construction	In mid-term
JRL1 (Figure 3-5)	Includes site clearance, earthworks, infrastructure works and building works for future MRT station	In mid-term

Development	Description	Timeline
	Its whole construction period will overlap with the site clearance, earthworks, Project 2, future commercial and residential site, road and building construction, proposed central green park area	
JRL2 (Figure 3-5)	Includes site clearance, earthworks, infrastructure works and building works for future MRT station Its whole construction period will overlap with the site clearance, earthworks, Project 2, future commercial and residential site, road and building construction, proposed central green park area	In mid-term
JRL3 (Figure 3-5)	Includes site clearance, earthworks, infrastructure works and building works for future MRT station Its whole construction period will overlap with the site clearance, earthworks, Project 2, future commercial and residential site, road and building construction, proposed central green park area	In mid-term
Mass Rapid Transit (MRT) and Bus Depot (Figure 3-5)	Includes earthworks, infrastructure works and building works for future MRT station Its whole construction period will overlap with the site clearance, earthworks, Project 2, future commercial and residential site, road and building construction, proposed central green park area	In mid-term
PIE Widening (Figure 3-5)	Includes site clearance, earthworks, infrastructure works for expansion of existing PIE Its whole construction period will overlap with the site clearance, earthworks, Project 2, future commercial and residential site, road and building construction, proposed central green park area	In mid-term
Nanyang Pipeline (Figure 3-5)	Includes site clearance and pipe jacking for the potable water pipeline construction Its whole construction period will overlap with the site clearance, earthworks, Project 2, future commercial and residential site, road and building construction, proposed central green park area	In mid-term
JID (Figure 3-5)	Includes site clearance, earthworks, infrastructure works and building works for future industrial area Its whole construction period will overlap with proposed central green park area and proposed future hospital of this Project	In long term



Legend

- Southern Tengah Project Site

Concurrent Projects

- Road and Building Construction
- Central Park
- Forest Corridor
- JRL1
- JRL2
- JRL3
- MRT and Bus Depot
- PIE Widening
- Nanyang Pipeline
- JID

This Project

- Earthworks
- Future Hospital Development
- Future Commercial & Residential Site
- Road and Building Construction
- Relocation of Interim Detention Pond
- Site Clearance of Forest Patch for Future Residential Development
- Site Clearance of Forest Patch for Future Temporary Outlet Drain
- Site Clearance of Forest Patch for Future Road
- Project 2
- Tengah Stream
- Tengah Pond

Other Projects

- Earthworks

N

Rev.	Date	By	Description	Chk'd	App'd
-	OCT 2021	LAL	Final Report	NHT	JAG

Qualified Person Endorsement : NA

HDB Endorsement : NA

Consultant : AECOM

Client: HOUSING & DEVELOPMENT BOARD

Project Title :

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SPECIALIST CONSULTANCY SERVICES FOR ENVIRONMENTAL IMPACT STUDY (EIS) ON SOUTHERN TENGAH

Figure Title :

Locations of major concurrent developments

Designed	Checked	Approved	Figure No. :	Rev.	Sheet
LAL	NHT	JAG	3 - 5	-	1 of 1
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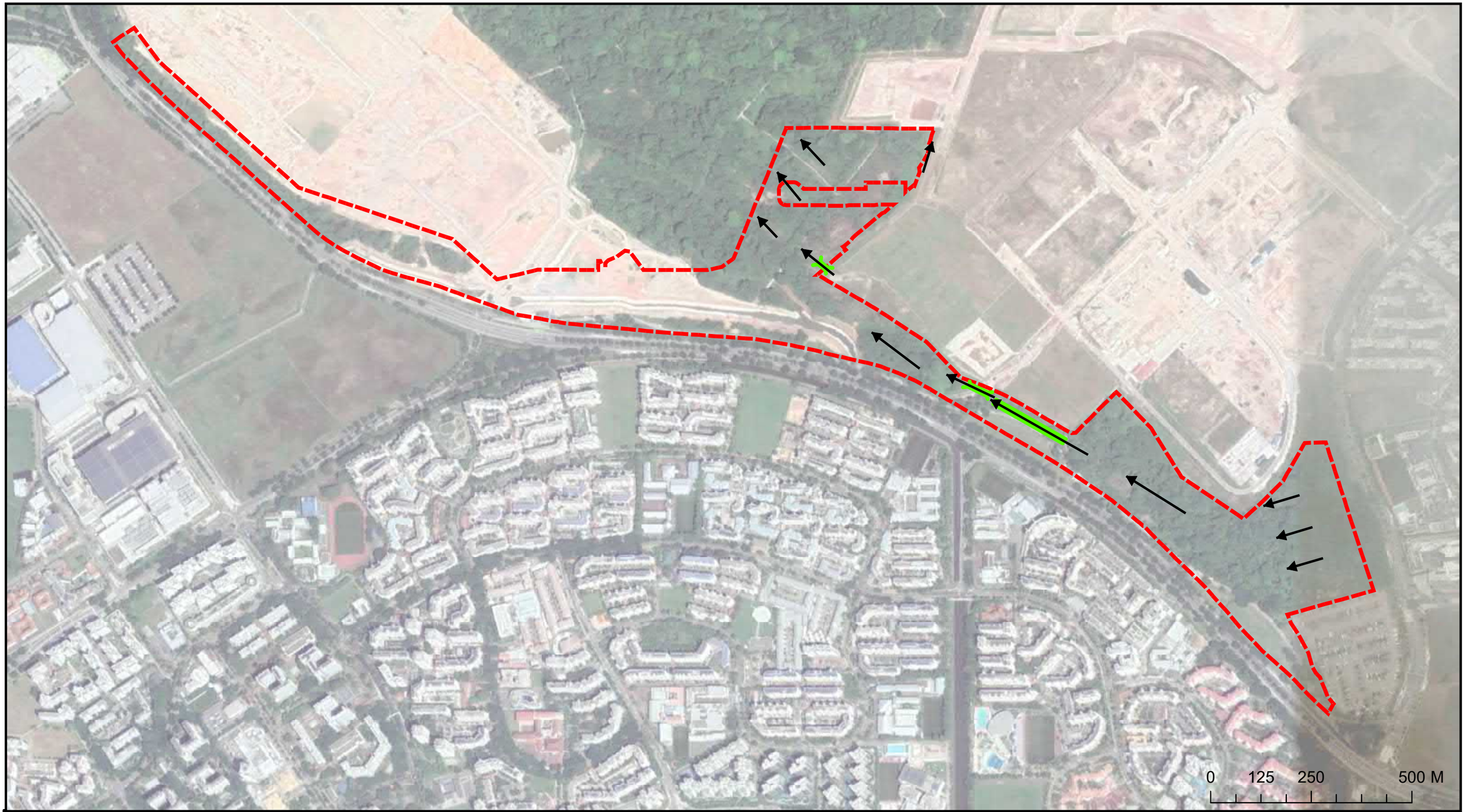
Note: Source of basemap - URA Master Plan 2019

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3.5.3 Overall Wildlife Shepherding Strategy

Due to the various concurrent developments proposed in the vicinity of the Project Site, an overall wildlife shepherding strategy has been planned among various developer agencies as shown in Figure 3-6. Generally, the wildlife shepherding plan is to shepherd the wildlife from east to west (i.e. from this Project Site towards the proposed JID). Two temporary bridges have been proposed, one located at site of JRL3 to support animal crossing from east of the Project Site to the JID area while the other is located near the PIE widening worksite. Besides, one additional wildlife corridor will be provided for wildlife shepherding during construction phase. However, its dimensions are presently still under study.

As the concurrent developments will commence at different time in phases, to facilitate the shepherding movement via directional clearing, it is important to retain patches of forest as much as possible and should only be cleared once the land is required for development.



Legend

- Southern Tengah Project Site
- Indicative Direction of Wildlife Movement
- Wildlife Crossing

N

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-	OCT 2021	LAL	Final Report	NHT	JAG

Qualified Person Endorsement : NA

HDB Endorsement : NA

Consultant : AECOM

Client: HOUSING & DEVELOPMENT BOARD

Project Title :

CONTRACT L/025/21
SPECIALIST CONSULTANCY SERVICES FOR ENVIRONMENTAL IMPACT STUDY (EIS) ON SOUTHERN TENGAH

Figure Title :

Overall wildlife shepherding strategy

Designed	Checked	Approved	Figure No. :	Rev.	Sheet
LAL	NHT	JAG	3 - 6	-	1 of 1
	Drawn LAL	Date OCT 2021	CAD File Name : NA		A3

Note: Source of basemap - Google Earth Map

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4 Description of the Environment

This section will describe the historical land use, current land use, environment and topographical condition, geological characteristics as well as climate conditions of the Project.

4.1 Historical Land Use

As far as possible, a chronological account of the changes in land use of the Project Site is provided below, with inferences drawn from historical resources (maps and aerial photographs) contained within the NUS Libraries Historical Maps of Singapore (NUSLHMSG), unless otherwise mentioned.

Prior to colonisation by the British in 1819, the primeval vegetation of Singapore comprised largely lowland dipterocarp forest, with freshwater swamp forest occurring inland, as well as mangrove forest fringing much of the coast [P-62]. During this period, Tengah was likely covered by lowland dipterocarp forest.

In the 1830s, gambir and pepper were the main cash crops of Singapore's economy, owing to great demands for gambir by the dyeing and tanning industry. Pepper plantations were often cultivated together with gambir for its symbiotic relationship and were widely used as a condiment. Consequently, this led to the clearing of forests in the interiors of the island for gambir and pepper cultivation [W-6].

By the 1840s, Chu Kangs, which refers to farming lands by the riverside, were established mostly in the northern and western regions of Singapore. In 1853, a man named Teng Ah Ting was given concession to farm Tengah, thus establishing the land as Teng Chu Kang – one of the 35 officially recorded Chu Kangs in Singapore. Its etymology was believed to derive from its historical ownership rather than a language origin, even though Tengah does mean "central" or "middle" in Malay [W-7]. During 1855, a survey conducted by the municipal government on district farms in Singapore listed Tengah as a relatively small gambier and pepper farm [O-4].

However, gambir cultivation eventually fell into decline between the 1870s to 1890s, as soil nutrients were leached from the plantations and the infertile soil was unsuited for gambier. This resulted in other forested areas being cleared for new plantations. By 1905, gambir supplies had moved to Johor, Malaysia with high demands, and the lucrativeness of gambir crops in Singapore had died out. Many local farmers began to switch to pineapple and rubber instead as the demand had increased for these crops [W-6].

The earliest map available on NUSLHMSG with the Project Site dates back to 1943 and shows that the majority of the site is used for rubber and coconut plantations. Canals were present around and in the Project Site, draining to the huge freshwater and mangrove swamps south of the Project Site (Figure 4-1A). A road was spreading from west to east and its position roughly corresponded to modern-day old Jurong Road. Settlements such as Hong Kah Village were located north of the road, in the vicinity of the central to the southeast portion of the Project Site. The Hong Kah Village, of which the name as colloquial usage, was used to refer to 'Chinese Christians'. The year where the village was found remains unknown. However, this village was mostly associated to with the Anglican St. Andrew's Mission, which had carried out missionary work in the area since the 1870s [W-34; W-35]. At the eastern portion of the Project Site, members of the Chettiar community developed an estate called the 'Chidambaram Chettiar Estate' [W-34].

By the 1950s, more roads were developed within the Project site. The area became more interconnected with smaller, fair-weather roads constructed and connected to the main road. The swamps reduced in size, with more structured canals and waterbodies leading outwards into the Jurong Straits, indicating the presence of organised water management. The cleared swampland was mostly still used for tree cultivation, such as rubber plantations, with more settlements arraigned in organised fashion (Figure 4-1B).

In the following decades tree cultivation was drastically reduced in favour of more roads and waterbodies. A school was constructed within Project Site, close to Kampong Ulu Jurong and Hong Kah Estate. South of the Project Site, Jurong Town is already in the midst of the development.

During the 1970s and 1980s, tree cultivation mostly disappeared and was replaced by built environment, mostly residential developments and accompanying infrastructure. Freshwater swamps and mangroves in the vicinity of the site were cleared. The major road observed in older maps was replaced by Pan Island Expressway (Figure 4-1C).

During the 1990s, most of the developments in Project Site was removed, first in the west portion of the site, continuing eastward. Based on the Google Earth Historical Satellite Imagery, clearance continued in the early 2000s and by 2008 vegetation again dominated the Project Site (Figure 4-1D).

In summary, the land use of the Project Site, and the whole west side of Singapore had undergone significant changes over the years, from rural swamp into a sprawling town today, with many landmarks, residences and major roads passing through it.

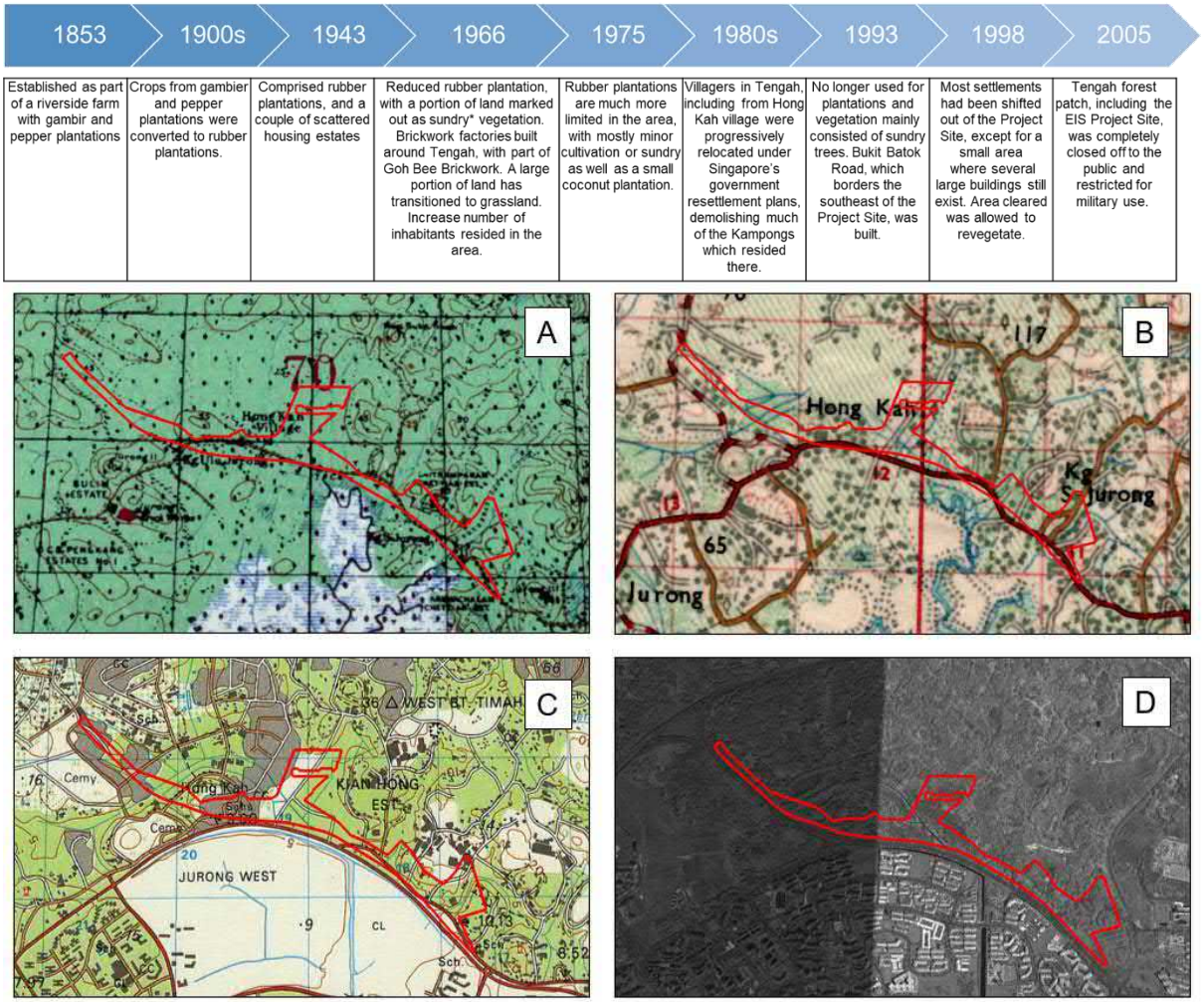


Figure 4-1 General reference map (A), topographical maps (B and C) and satellite imagery (D), of the Project Site, dated 1943 (A), 1958 (B), 1983 (C) and 2008 (D)

*Common term used in old topographical maps to represent abandoned land forest which would largely be abandoned plantations, kampungs or orchards and would mainly compromise of remnant rubber, fruit and ornamental trees [P-61].

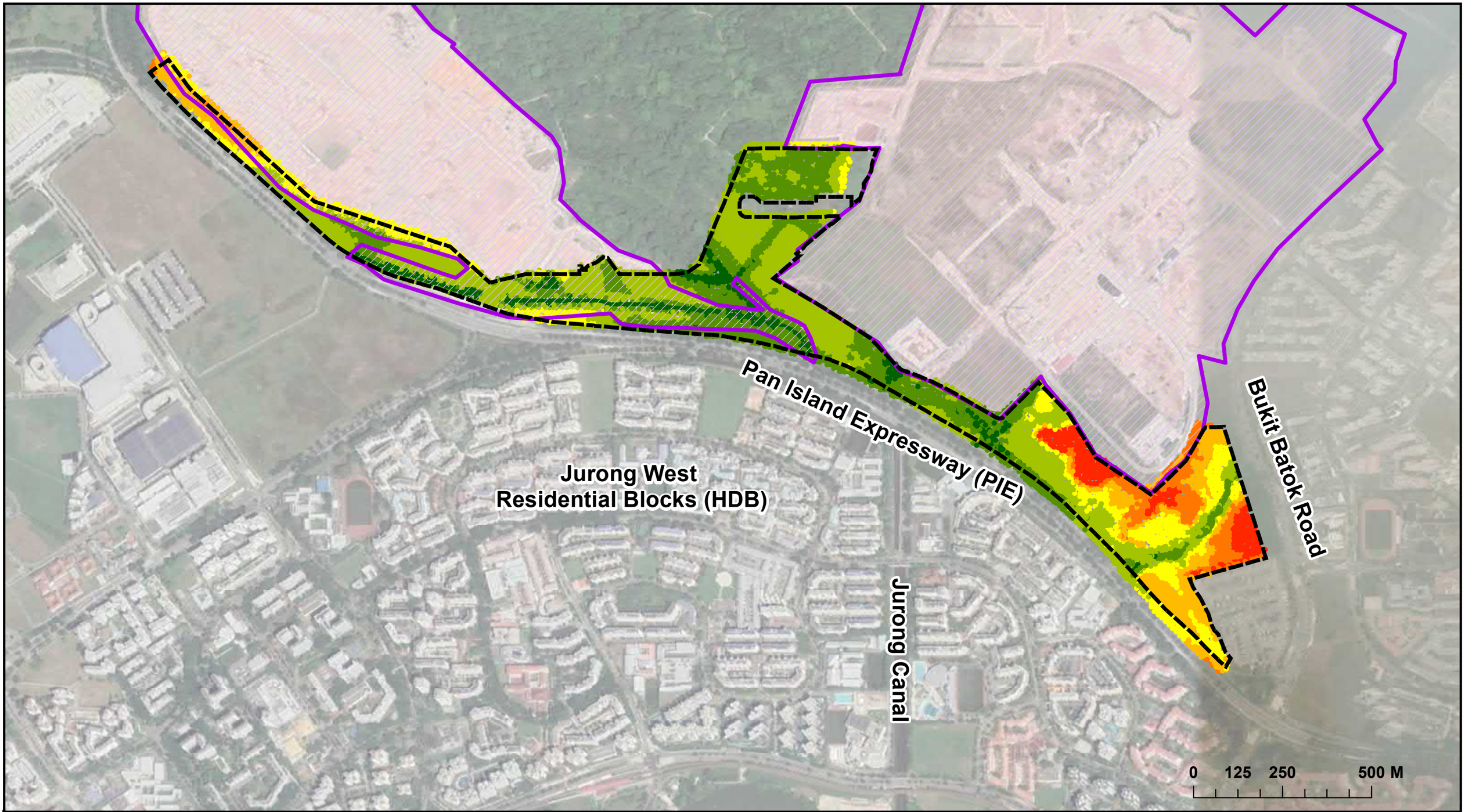
4.2 Current Land Use

The Project Site of Southern Tengah represents a part of a broader township development known as Tengah Town. Proposed housing town will be bounded by KJE, PIE, Brickland Road and Bukit Batok Road and is expected to house approximately 42,000 new homes [W-9]. Tengah is planned to be Singapore's first sustainable town with highly integrated green features and smart technologies aiming to interconnect the community and surrounding nature [W-10]. Based on the proposed Tengah Master Plan developments for Southern Tengah, it can be seen that a large area of the Project Site will be dominated by retention pond while the rest is mostly intended for residential, healthcare and commercial developments.

Currently, forest patches in northern, eastern and westmost portions of the Project Site are still intact while the centre has been cleared as a part of ongoing construction works. Adjacent to the Project Site are two construction sites (i.e. future Bus and Train Depot to the west and residential developments to the east as shown in Figure 3-3). It should be noted that the future Jurong Regional Line (JRL) is intended to pass through the Project Site which will cause additional disturbance within the site.

4.3 Topography of the Project Site

AECOM has engaged a topographic surveyor to determine the different elevations and slopes within the Project Site. Both updated topographic survey data carried out in 2021 and previous topographic contour provided by the Client were reviewed accordingly. As shown in Figure 4-2, it was noted that the general topography of the Project Site is generally hilly and undulating with decreasing elevation from west and east of the Project Site towards the centre. The elevation ranges from 0.07 mRL to 23.32 mRL. The low-lying areas are located at downstream of main canal (D1) and discharge location near Jurong Canal.



Legend

- Southern Tengah Project Site
- Cleared Site

Elevation (mRL)

- <2
- 2-4
- 4-6
- 6-8
- 8-10
- 10-12
- >12

N

Rev.	Date	By	Description	Chk'd	App'd
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Qualified Person Endorsement : NA

HDB Endorsement : NA

Consultant : AECOM

Client: HOUSING & DEVELOPMENT BOARD

Project Title :

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Figure Title :

Topographic survey data of the Project Site (generated based on survey data from this Project)

Designed	Checked	Approved	Figure No. :	Rev.	Sheet
LAL	NHT	JAG	4-2	-	1 of 1
	Drawn LAL	Date OCT 2021	CAD File Name : NA		A3

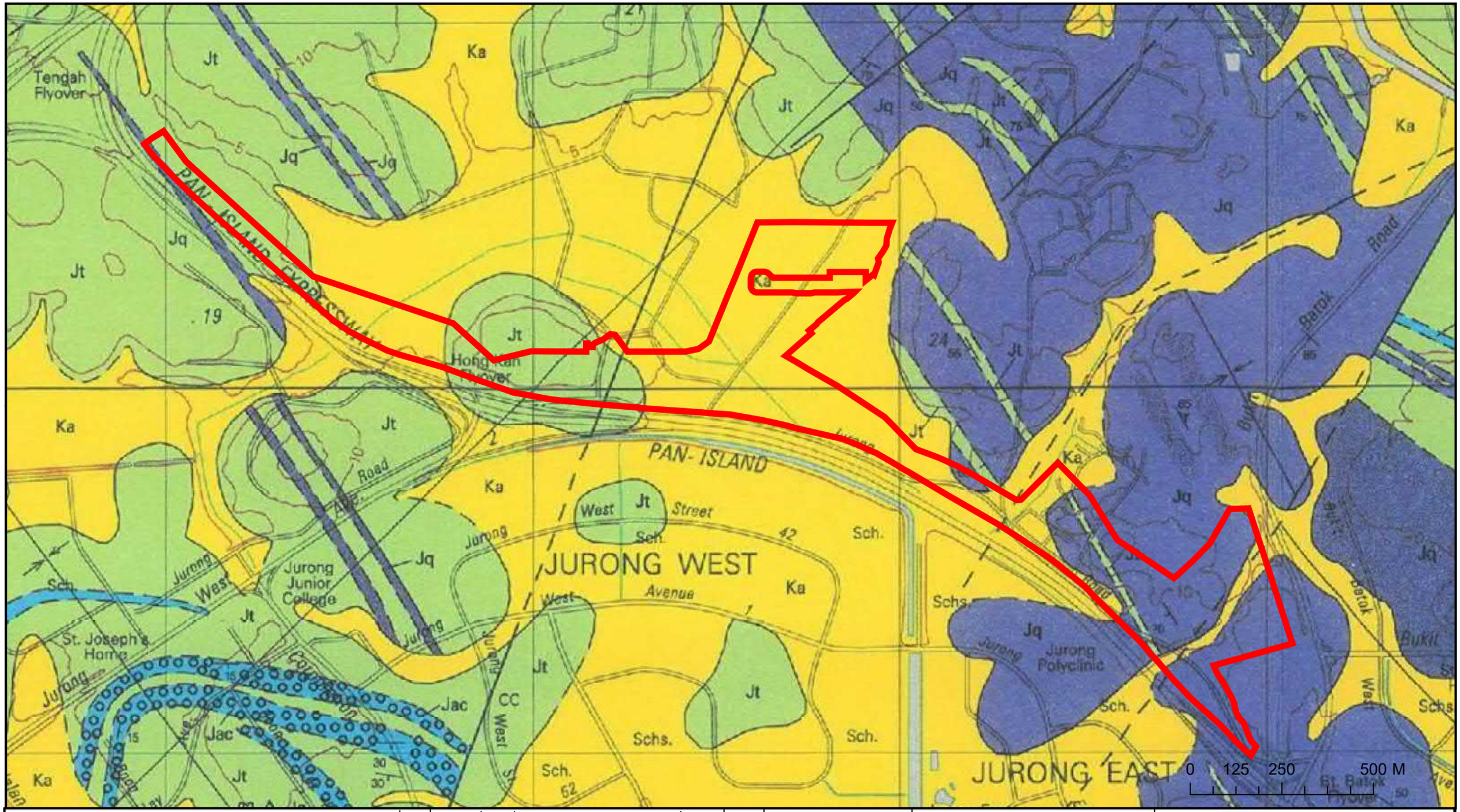
Note: Source of basemap - Google Earth Map

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4.4 Geology

Based on the Geological Map of Singapore (2008) (refer to M-4) and previous soil investigation (SI) reports, the Project Site is primarily underlain by the Alluvial Member (Ka) of the Kallang Formation. This formation is named after the Kallang River Basin and it was formed by deposition of marine clay, beach sand, river sand, peaty mud and corals during rising sea levels. It is the youngest of the existing geological formations of Singapore, with thickness up to 80 m. It is usually located in river valleys, river mouths, river plains, coastal areas and near offshore [O-5]. The Ka member comprises a variable terrestrial sediment ranging from pebble beds through sand, muddy sand, and clay to peat [O-5]. The member is usually unconsolidated but lightly consolidated beds might be found.

The Tengah Facies (Jt) of the Jurong Formation can also be found in the west and central parts of the Project Site. The Jt primarily consists of muddy marine sandstone with occasional grit beds and conglomerate. The member is common at west and southwest Singapore and is usually deeply weathered but appears not to have been strongly lithified at any stage. Eastern portions of the Project Site are underlain by Queenstown Facies (Jq) also of Jurong Formation. As other members of the Jurong Formation, it is common in west and southwest Singapore. The formation usually consists of red to purple mudstone and sandstone with minor conglomerate. Furthermore, minor tuffs can also be found within the member. The characteristic red colouration is thought to come from tropical weathering in Triassic times, although it is possible that the volcanic material present may have also added to the colour.



Legend

Southern Tengah Project Site

Alluvial Member (Ka) : A variable terrestrial sediment ranging from pebble beds through sand, muddy sand, and clay to peat. The member is usually unconsolidated but lightly consolidated beds may be found.

Tengah Facies (Jt) : Muddy marine sandstone with occasional grit beds and conglomerate. The member is usually deeply weathered but appears not to have been strongly lithified at any stage

Queenstown Facies (Jq) : Red to purple mudstone and sandstone with minor conglomerate. Minor tuffs can also be found within the member. The red colouration is thought to come from tropical weathering in Triassic time, but volcanic material present may also have added to the colour.

N

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Client: HOUSING & DEVELOPMENT BOARD

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Figure Title :

Geological map of the Project Site

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SAG	NHT	JAG
	Drawn: SAG	Date: OCT 2021

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CAD File Name : NA | A3

Note: Source of basemap - Geological Maps of Singapore

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4.5 Catchment Area

As Singapore does not have extensive natural aquifers or lakes and has limited land to collected stormwater, it aims to maximize stormwater harvesting. Stormwater is collected through a network of rivers, canals and drains and channelled to seventeen (17) reservoirs, after which it is treated, filtered and disinfected at the water treatment plants. Stormwater is one of Singapore's main sources of drinking water and industrial water. As shown in Figure 4-4, the Project Site is located within the catchment area of Jurong Lake. The stormwater from the Project Site will be drained to the Jurong Canal and eventually end up in the Jurong Lake. This indicates that the stormwater runoff within the Project Site is collected for drinking water purposes in the Jurong Lake. The detailed hydrology baseline information will be further discussed in Section 8.

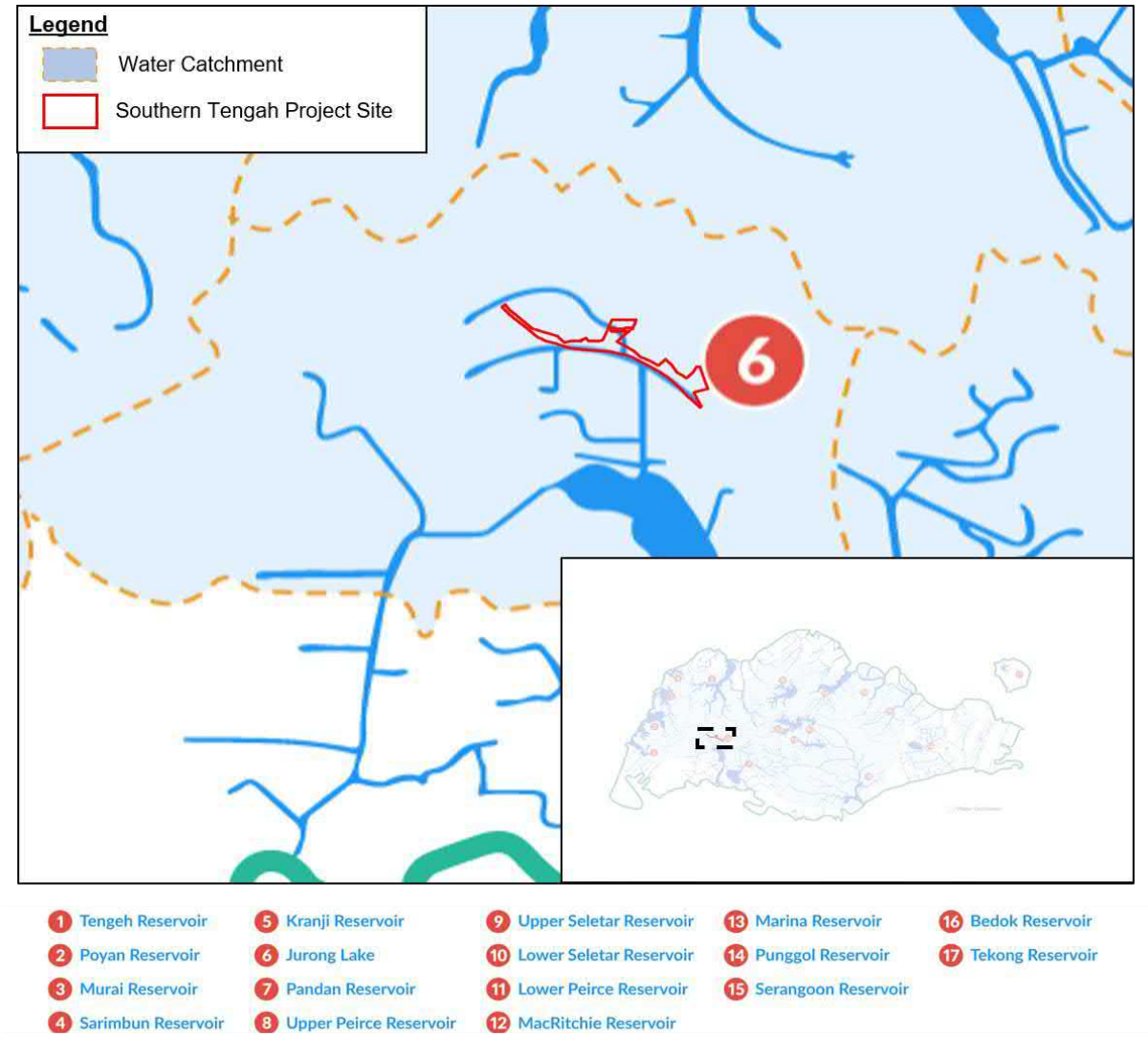


Figure 4-4 Singapore water catchment [W-1]

4.6 Climate

4.6.1 Rainfall

Singapore is situated near the equator and has a typically tropical climate. Singapore's year-to-year rainfall is highly variable. However, on a longer-term basis, the average annual rainfall total has increased at an average rate of 100 mm per decade since 1980 (see Figure 4-5). Rainfall is plentiful in Singapore and it rains an average of 167 days of the year. The 1981-2010 long-term mean annual rainfall total is 2165.9mm [W-11].

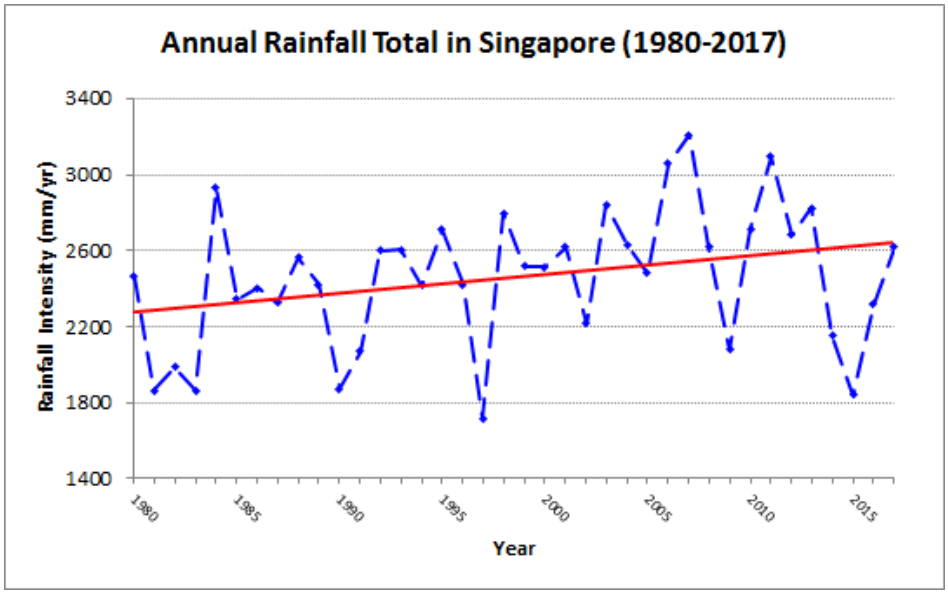


Figure 4-5 Annual rainfall total in Singapore from 1980 to 2017 [W-11]

In terms of spatial distribution, rainfall is higher over the northern and western parts of Singapore and decreases towards the eastern part of the island (Figure 4-6) [W-11]. The figure also shows that the central catchment possibly receives the maximum rainfall in Singapore. The annual average rainfall in the Project Site is anticipated to be approximately 2800-3000 mm.



Figure 4-6 Annual average rainfall spatial distribution (1981-2010) [W-11]

Singapore has two monsoon seasons separated by inter-monsoonal periods, where the Northeast Monsoon occurs from December to early March and the Southwest Monsoon from June to September. It also has abundant rainfall all the year round with relatively higher mean raindays (more than 13 days) and mean rainfall amount (more than 230 mm) from November to January every year (refer to Figure 4-7). The average rainfall in Singapore is approximately 200mm and 150mm during Northeast and Southwest monsoon respectively.

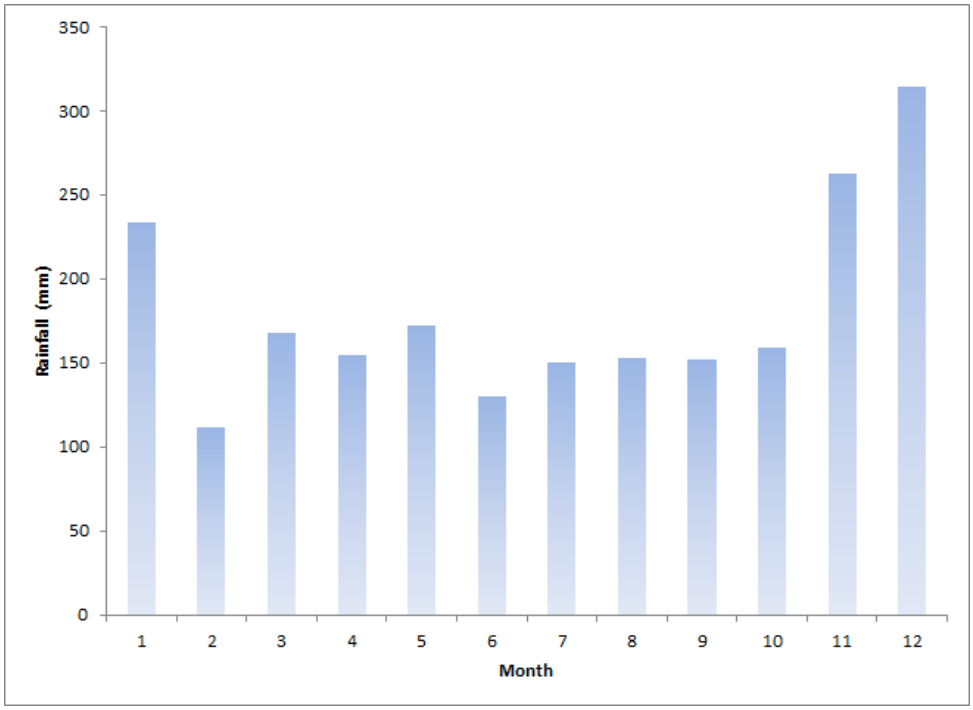


Figure 4-7 Monthly rainfall in Singapore [W-11]

4.6.2 Temperature

Singapore's continuous temperature records since 1948 show that the island has warmed by an average of 0.25°C per decade, with a visible and sudden rapid increase after the mid-1970s (see Figure 4-8). This may have been due to the rapid economic development and urbanization that took place after Singapore's political reformation, as well as due to the influence of anthropogenic climate change effects. Eight of the ten warmest years recorded in Singapore have occurred in the 21st century and all ten occurred after 1997.

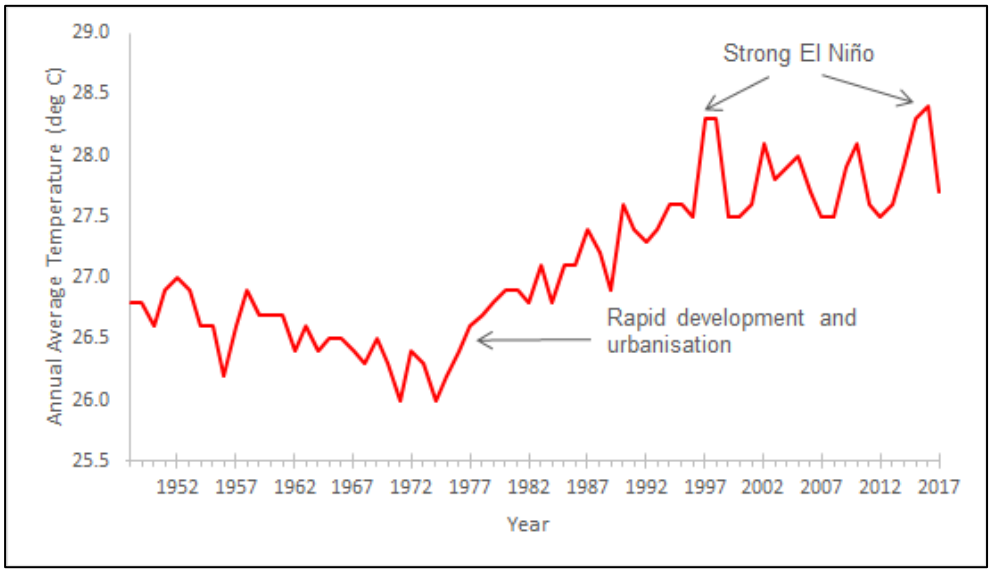


Figure 4-8 Annual mean temperature in Singapore from 1948 to 2017 [W-11]

Generally, Singapore has high and uniform mean temperatures ranging from 24°C to 32.3°C throughout the year (refer to Figure 4-9). Extreme minimum and maximum temperatures are ranging from 20°C to 36°C.

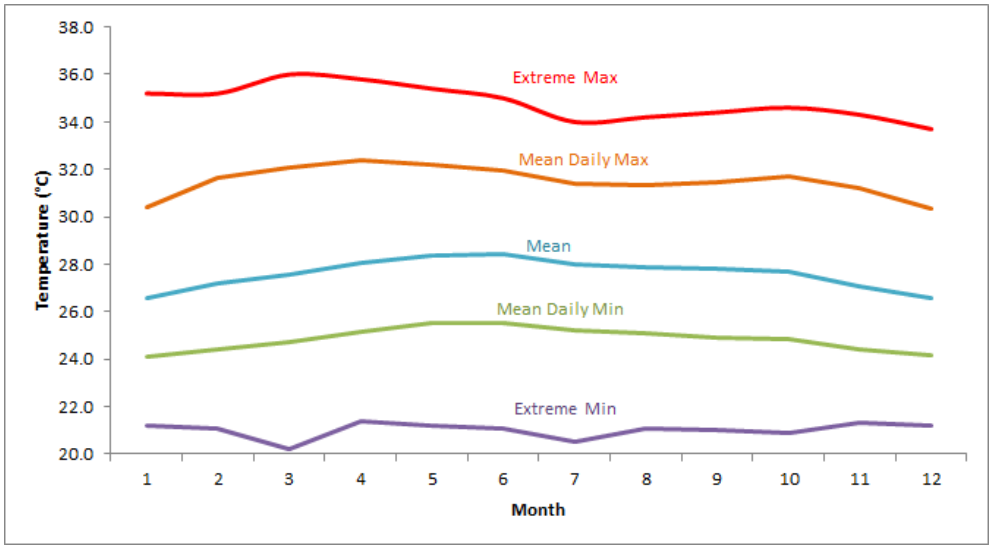


Figure 4-9 Mean monthly temperature variation (1981-2010) [W-11]

Although there is no distinct borderline between 'urban' and 'rural' areas in Singapore, maximum temperature difference of 4.01°C was observed between well planted area, such as Lim Chu Kang area, and the Central Business District (CBD) area [P-58]. This shows the presence of Urban Heating Island (UHI) effect in Singapore. Green areas in cities have been considered as potential measure in mitigating the UHI effect. This finding is also supported by a study conducted by Jusuf et al (2007), which shows different daytime temperature at different type of land use areas in Singapore. As observed in Figure 4-10, the daytime temperature in park areas is considerably lower compared to other type of land use areas [P-24].

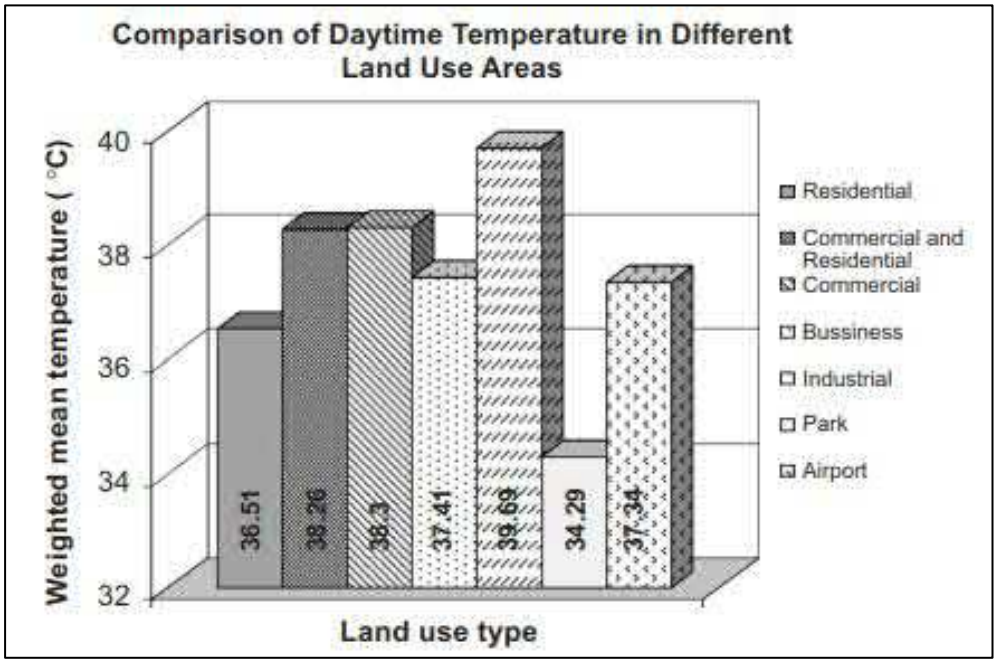


Figure 4-10 Comparison of daytime and night time temperature in different land use areas [P-24]

4.6.3 Relative Humidity

Relative humidity shows a fairly uniform pattern throughout the year and does not vary much from month to month (refer to Figure 4-11). Its daily variation is more marked, varying from more than 90% before sunrise to around 60% in the mid-afternoon on days when there is no rain. While the mean annual relative humidity is 83.9%, the relative humidity frequently reaches 100% during prolonged periods of rain.

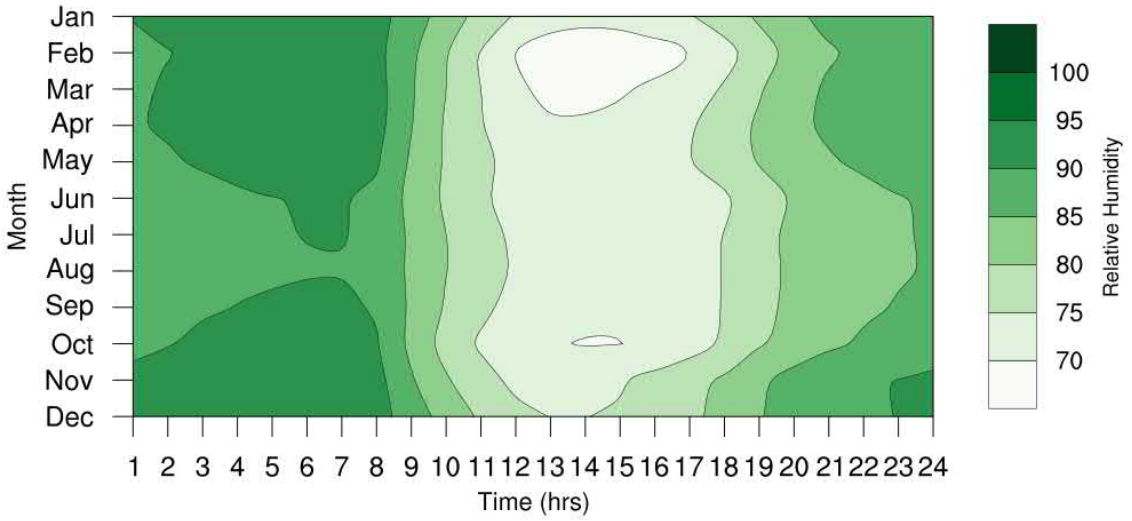


Figure 4-11 Hourly variation of relative humidity for each month (1981-2010) [W-11]

4.6.4 Surface Wind

Winds in Singapore are generally light, with the mean surface wind speed normally less than 2.5 m/s. An exception to this is during the presence of a Northeast Monsoon surge, where mean speeds of 10m/s or more have been observed. Strong winds also occur during thunderstorms. Surface wind gusts are produced from thunderstorm downdrafts and from the passage of Sumatra Squall Lines. As shown in Figure 4-12, the most prominent winds in Singapore are from northeast and the south, occurring during the Northeast and Southwest Monsoon, respectively. The mean monthly wind speed ranges from 1.5 to 3 m/s [W-11].

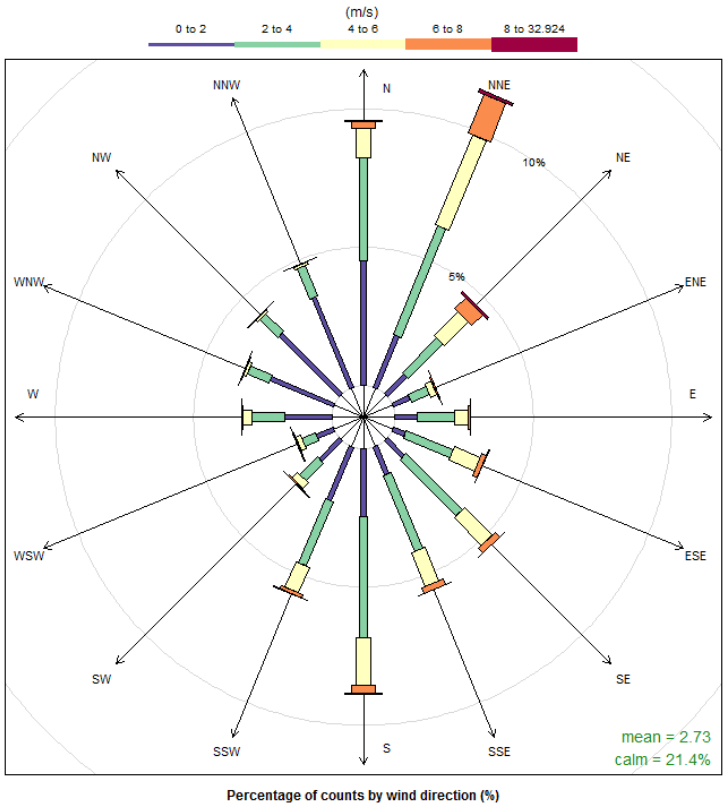


Figure 4-12 Annual wind rose of Singapore [W-11]

5 Relevant Regulatory Framework, International Standards and Guidelines

An indicative list of relevant legislative requirements applicable to the Project is provided in Table 5-1.

Table 5-1 Relevant regulatory framework, international standards and guidelines

Environmental Parameter	Relevant Regulatory Framework, International Standards and Guidelines	Key Points
General	Biodiversity Impact Assessment (BIA) Guidelines, 2020 [R-9]	This document is published by NParks to provide a framework guiding biodiversity impact assessments in Singapore. It recommends methods for conducting baseline survey and impact assessment, and subsequently provide information on developing the biodiversity component of an Environmental Management and Monitoring Plan (EMMP). Section 2 of this BIA Guidelines detailed the baseline study methods recommended for vegetation mapping, habitat mapping, hydrology (including waterbody mapping, water conditions, water quantity and water quality) Section 4 of the BIA Guidelines detailed the impact study methods recommended for air, noise, soil, water related biodiversity impacts. Section 5 of the BIA Guidelines detailed the mitigation measures developing protocols, i.e. avoid, minimise, remedy/repair/restore, and compensate/offset. Section 6 of the BIA Guidelines outlined the requirements for developing an EMMP.
	Environmental Protection and Management Act, 2020 [R-10]	An Act to consolidate the laws relating to environmental pollution control, to provide for the protection and management of the environment and resource conservation, and for purposes connected therewith. For surface water, groundwater and soil, it regulates the discharge of trade effluent, oil chemical, sewage or other pollution onto land and drains. For air quality, it provides standards and regulations on air impurities.
Biodiversity	National Biodiversity Strategy and Action Plan (NBSAP), 2019 [R-2]	This document provides a framework to guide biodiversity conservation efforts in Singapore. It intends to establish both policy frameworks and specific measures to ensure better planning and co-

Environmental Parameter	Relevant Regulatory Framework, International Standards and Guidelines	Key Points
		ordination in the sustainable use, management and conservation of biodiversity. A holistic approach has been adopted where the input of various public sector agencies and nature groups have been taken into consideration in the preparation of the document.
	Wildlife Act, Chapter 351, 2000 [R-3]	• Any person who kills, takes or keeps any wild animal or bird, other than those specified in the Act, without a licence shall be guilty of an offence and shall be liable on conviction to a fine not exceeding $1,000 and to the forfeiture of the wild animal or bird. • No person should take, destroy or has in possession the eggs if any wild bird during the specified time of the year or during the breeding season of the bird.
	Parks and Trees Act, 2006 [R-4]	• An Act to provide for the planting, maintenance and conservation of trees and plants within national parks, nature reserves, tree conservation areas, heritage road green buffers and other specified areas, and for matters connected therewith. • No tree with a girth exceeding one meter (when measured 1-m from the ground) should be cut or damaged without the prior approval of the relevant authorities; and • No tree or plant will be cut or damaged if located within the heritage road green buffer.
	Parks and Trees Act (Parks and Trees Regulations), 2006 [R-5]	Prohibitions and regulations on trees and animals within national park, nature reserve or public park.
	Parks and Trees (Heritage Road Green Buffers) Order, 2006 [R-6]	Lists the areas designated as heritage road green buffers.
	Parks and Trees (Preservation of Trees) Order, 1998 [R-7]	Lists the designated tree conservation areas No cutting or damaging of tree having girth of more than one metre.
	The Singapore Red Data Book (SRDB) [P-14]	Lists the endangered plants and animals in Singapore Published by Singapore's Nature Society Provides the scientific name, common name, status, description, habitat, distribution, threats, scientific interest and potential value, as well as conservation measures for each plant and animal listed.
	The International Union for Conservation of Nature and Natural Resources (IUCN) Red List of Threated Species [P-22]	Provides taxonomic, conservation status and distribution information on plants, fungi and animals that have been globally evaluated.
	The Hong Kong Environmental Impact Assessment Ordinance -	Sets out the principles, procedures, guidelines, requirements and criteria for deciding whether the Project is environmentally acceptable.

Environmental Parameter	Relevant Regulatory Framework, International Standards and Guidelines	Key Points
	Technical Memorandum (HK EIAO TM)[2] [R-8]	
Hydrology and Surface Water Quality	Singapore Sewerage and Drainage Act, 2001 [R-13]	An Act to provide for and regulate the construction, maintenance, improvement, operation and use of sewerage and land drainage systems, and to regulate the discharge of sewage and trade effluent. Regulates the protection, maintenance and provision of stormwater drainage system.
	Singapore Sewerage and Drainage (Surface Water Drainage) Regulations, 2007 [R-15]	Regulates measures to be implemented to protect the stormwater drainage system.
	Singapore Sewerage and Drainage (Trade Effluent) Regulations, 2007 [R-14]	Regulates trade effluent discharge into public sewerage system.
	Singapore Environmental Protection and Management (Trade Effluent) Regulations, 2008 [R-11]	• Regulates the discharge of trade effluent to public watercourse. • Any discharge into a watercourse has to comply with the regulatory standards established in these regulations.
	PUB Erosion & Sediment Control at Construction Sites [R-49]	Provides guidelines for measures to be implemented to protect the stormwater drainage system and manage surface water drainage (e.g. development and implementation of an Earth Control Measures [ECM] plan).
	Singapore Standard 593: 2013 – Code of Practice for Pollution Control (COPPC) [R-12]	• Provides guidelines for the appropriate discharge of any effluent into public sewer or watercourse. • Provides guidelines for the appropriate storage and accidental release of oils & chemicals.
	PUB Circular on Preventing Muddy Water from the Construction Site, October 2015 [R-17]	All new construction sites with site area of 0.2 ha and above, sites with problematic ECM, and sites within sensitive areas are required to implement CCTV including a Silty Imagery Detection System (SIDS) at the public drain to monitor the surface runoff discharges from the sites.
	NEA Allowable Limits for Trade Effluent Discharge to Watercourse or Controlled Watercourse [R-26]	Provides allowable limits for trade effluent discharge to watercourse or controlled watercourse in Singapore.
	Standard Statistical Classification of Surface Freshwater Quality for the Maintenance of Aquatic Life, New York and Geneva UNECE (1994) [R-18]	Provides standards for water quality assessment relating to aquatic life for surface watercourses.

[2] The HK EIAO TM was added as an applicable legislation for biodiversity because: (1) Singapore does not have an established standard for biodiversity assessment yet; (2) Singapore and Hong Kong share similar urban development setting; and (3) HK EIAO TM has previously been used for other environmental impact studies in Singapore.

Environmental Parameter	Relevant Regulatory Framework, International Standards and Guidelines	Key Points
	Australian & New Zealand Guidelines for Freshwater and Marine Water Quality (2000) [R-21]	Provides standards for water quality assessment relating to aquatic life for surface watercourses.
	Canadian Water Quality Guidelines for the Protection of Aquatic Life (2007) [R-22]	Provides standards for water quality assessment relating to aquatic life for surface watercourses.
	Water Quality Standards Handbook USEPA (2017) [R-20]	Provides standards for water quality assessment relating to aquatic life for surface watercourses.
	Mitigating Impact from Aquaculture in the Philippines (PHILMINAQ) [R-23]	Provides standards for water quality assessment relating to aquatic life for surface watercourses.
	National Water Quality Standards for Malaysia (DOE) [R-24]	Provides standards for water quality assessment relating to aquatic life for surface watercourses
	Water Quality Requirements WHO (n.d.) [R-19]	Provides standards for water quality assessment relating to aquatic life for surface watercourses.
Groundwater Level	SS 593:2013 Code of Practice for Pollution Control (COPPC) [R-12]	• Provides guidelines for the control of land pollution and remediation of contaminated sites. • Provides guidelines for the appropriate storage and accidental release of oils & chemicals.
	Environmental Protection and Management (Trade Effluent) Regulations, 2008 [R-11]	• Regulates the discharge of trade effluent into any watercourse or onto land.
	Sewerage and Drainage Act, 2001 [R-13]	• Regulates the construction, maintenance, improvement, operation and use of sewerage and land drainage systems.
	Sewerage and Drainage (Surface Water Drainage) Regulations, 2007 [R-15]	• Regulates measures to be implemented to protect the storm water drainage system and avoid flooding. • Regulates the provision and maintenance of ECM in accordance with the Code of Practice on Surface Water Drainage.
Air Quality	Environmental Protection and Management (Air Impurities) Regulations 2015 [R-27]	Regulates air emissions and impurities in Singapore.
	Singapore Ambient Air Quality Targets (Long Term Targets) [R-28]	Stipulates the recommended limit values for ambient concentrations of NO_2, SO_2, PM_{10}, $PM_{2.5}$, CO and O_3 based on final World Health Organisation (WHO) Limit values.
	Environmental Protection and Management (Off-Road Diesel Engine Emissions) Regulations 2012 [R-29]	Stipulates that all off-road diesel engines (including construction equipment with diesel engines) imported for use in Singapore from July 2012 must comply with the EU Stage II, US Tier II or Japan Tier I off-road diesel engine emission standards.
	UK Institute of Air Quality Management (IAQM) Guidance on the Assessment of Dust from	The document provides guidance for developers, their consultants and environmental health practitioners on how to undertake a construction

Environmental Parameter	Relevant Regulatory Framework, International Standards and Guidelines	Key Points
	Demolition and Construction [R-30]	impact assessment (including demolition and earthworks).
Airborne Noise	SS 593: Code of Practice for Pollution Control (COPPC), 2013 [R-12]	Specifies recommended pollution control requirements and good practices for prevention of impacts to noise.
	SS602:2014 Code of Practice for Noise Control on Construction and Demolition Sites [R-31]	Specifies recommendations and good practices for prevention of noise impacts from construction and demolition activities.
	Environmental Protection and Management (Control of Noise at Construction Sites) Regulations, 2008 [R-32]	• Stipulates a set of maximum allowable noise limits for construction sites for different time periods of the day and for different types of premises affected by construction noise. • Stipulates the correction factor that needs to be applied to the applicable noise criteria based on background noise levels.
	Technical Guideline for Land Transport Noise Impact Assessment from National Environment Agency (NEA) [R-46]	Airborne noise: • Operation: Airborne noise limit (from MRT trains) of LAeq1hr of 67 dB when measured at 1m from the façade of existing residential buildings/noise sensitive premises are set by the National Environment Agency (NEA).
	Guideline on Boundary Noise Limit for Air Conditioning and Mechanical Ventilation Systems in Non-Industrial Buildings by National Environmental Agency (NEA); Code of Practice on Pollution Control by National Environment Agency [R-40]	Airborne Noise: Legislative requirements for boundary noise due to noise emissions from mechanical ventilation systems for non-industrial buildings.
	Biodiversity 2020 (UK) [R-33]	"Theme 3: reduce environmental pressures - integrate consideration of biodiversity within the sectors which have the greatest potential for direct influence and reduce direct pressures." The guide does not provide airborne noise criteria for biodiversity impact assessment but only serves as a reference that sets out biodiversity policies and strategies to conserve biodiversity for AECOM to consider and implement in the EIS study.

6 EIS Approach and Methodology

This section outlines the approach and methodology followed for this EIS.

6.1 Approach

The overall EIS workflow is shown in Figure 6-1 with general approach to the EIS is as follows:

- Scoping of EIS (Section 6.2);
- Data Collection and Analysis (Section 6.3);
- Prediction of Impacts (Section 6.4.1);
- Evaluation of Impacts (Section 6.4.2);
- Recommendations of Mitigation Measures (Section 6.5); and
- Environmental Monitoring and Management Plan (Section 6.5).

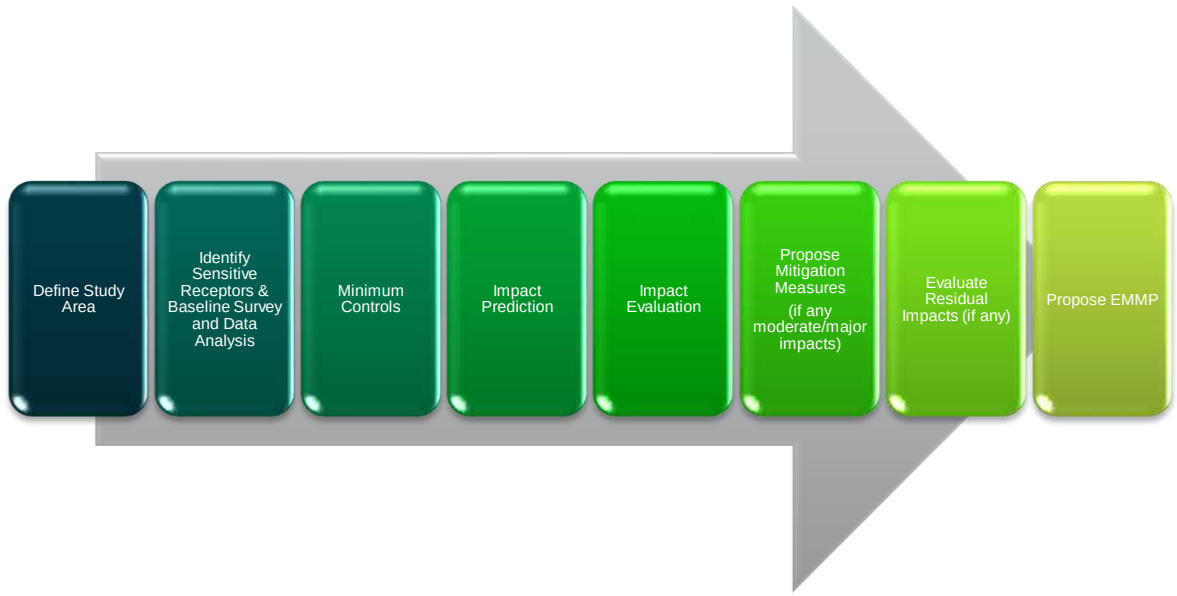


Figure 6-1 Overall EIS workflow

6.2 Scoping of Project

Referring to the Inception Report Rev 01 [R-1] submitted to HDB and technical agencies (NParks, NEA, PUB, LTA, and URA/MND) on 29 March 2021, the environmental impacts resulting from the construction and operational activities of this Project were assessed as following:

- Biodiversity;
- Hydrology, Groundwater Level and Surface Water Quality;
- Air Quality; and
- Airborne Noise.

6.2.1 Identification of Environmental Impact Study Area

The Project Site for this EIS is presented in Figure 3-1 which is an area of total 60 hectare (ha) within the Project boundary delineated via legal agreement with the Client that defines the scope of works of this report. The Study

Area was used to determine any potential environmental impacts to the nearby sensitive receptors due to construction and operational activities from the Project Site. Study Area varies depending on the technical discipline as shown in Table 6-1 and has been described respectively for each impact in the following chapters.

Table 6-1 Study Area for different environmental parameters

Environmental Impacts	Study Area (Construction Phase)	Study Area (Operational Phase)	Justifications
Biodiversity	Ecological sensitive areas within the Project Site		NParks' BIA Guidelines [R-9]
Hydrology, Groundwater Level and Water Quality	Any watercourses with direct impact from the Project.		Construction and operational activities of the Project has potential to impact hydrology and water quality of the watercourses affected by the Project.
Air Quality	50 m (ecological receptors) and 350 m (human receptors) from construction worksite area.	250 m from Project Site.	Construction phase: Based on UK IAQM Guidance [R-30] Operational phase: Based on other project experiences.
Airborne Noise	150 m around the construction worksites.	Immediate boundary of the operational footprint and access roads.	Construction phase: Environmental Protection and Management (Control of Noise at Construction Sites) Regulations, 2008 [R-32] Operational phase: NEA Technical Guideline for Land Traffic Noise Impact Assessment, 2016 [R-46]

6.2.2 Identification and Categorization of Sensitive Receptors

Sensitive receptors are those receptors within or in the vicinity of the Study Area which may potentially be impacted by the Project's construction and operational activities. Environmentally sensitive receptors are sub-categorised into three categories: Priority 1, Priority 2 and Priority 3 (from the most sensitive to the least) as shown in the following table. The identification of sensitive receptors for each environmental parameter were developed based on the findings of the environmental reconnaissance surveys, baseline surveys and review of the proposed Study Area.

Table 6-2 Receptor sensitivity classification

Environmental Parameter	Receptor Sensitivity		
	Priority 1	Priority 2	Priority 3
Biodiversity	Flora, fauna species and habitats of high ecological value (i.e., presence of conservation significant flora, fauna species and habitats; identified keystone species and NParks-designated heritage trees)	Flora, fauna species and habitats of moderate ecological value (i.e., mainly native species of flora, fauna and habitats)	Flora, fauna species and habitats of low ecological value (i.e., mainly exotic or cryptogenic flora, fauna and habitats; managed vegetation which can provide habitat for significant species)

Environmental Parameter	Receptor Sensitivity		
	Priority 1	Priority 2	Priority 3
Hydrology and Surface Water Quality	Surface waterbodies protected and used for drinking supply[3], or supporting ecosystems of biodiversity conservation significance in consultant with Biodiversity specialist after surveys[4]; Natural or artificial waterbodies which are used as a flood mitigation measure for residential development or land of high ecological or industrial value and which malfunction would cause severe, long-term impacts to the surrounding areas	Surface waterbodies used for industrial water supply or for recreational purposes, but not used for drinking water purposes and which do not support ecosystems of biodiversity conservation significance in consultant with Biodiversity specialist after surveys; Natural or artificial waterbodies which are used for as a flood mitigation measure and which malfunction would cause moderate, short-term, localized flooding to the surrounding areas.	Surface waterbodies not used for any purposes and not protected; Natural or artificial waterbodies not used as a flood protection measure or that protect the land of low ecological and industrial value.
Groundwater Level	Sensitive groundwater (i.e. supports ecosystems of biodiversity conservation significance)	Groundwater partially supporting ecosystems of biodiversity conservation significance	Not sensitive groundwater (i.e. does not support any ecosystems of biodiversity conservation significance)
Air Quality (Construction)	For human receptors: • Sensitive receptors[5] (more than 100 receptors) within 50m of the construction area. • Sensitive receptors (1-100 receptors) within 20 m of the construction area. • Office, industrial facilities, or shops (more than 10 receptors) within 20 m of the construction area.	For human receptors: • Sensitive receptors (more than 100 receptors) between 50 m to 100 m of the construction area. • Sensitive receptors (1-100 receptor) between 20 m to 50m of the construction area. • Office, industrial facilities, or shops (more than 10 receptors) within 20 m to 50m of the construction area. • Office, industrial facilities, or shops (1-10 receptors) within 20 m of the construction area.	For human receptors: • Public footpath, playing fields and parks within 20 m from the construction area. • All other buildings within the 350 m study boundary.
	For ecological receptors: Flora, Fauna Species and Habitats of High Ecological Value within 20 m of construction worksite area	For ecological receptors: Flora, Fauna Species and Habitats of High Ecological Value within 20 m to 50m of construction worksite area. Ecological sites having known sensitive	For ecological receptors: Ecological sites having known sensitive communities within 20 m to 50 m of construction worksite area

[3] Waterbody usage will be determined based on the PUB Water Catchment Map [W-1].
[4] The receptor sensitivity of surface waterbodies will be determined based on the biodiversity baseline survey results which will identify whether such surface waterbodies are supporting ecosystems of biodiversity conservation significance.
[5] Sensitive receptors for air impact assessment include residential blocks, hospitals, medical centre, schools and education and residential care home. This is according to classification made in the IAQM's guidance. Hawker centres shall also be checked.

Environmental Parameter	Receptor Sensitivity		
	Priority 1	Priority 2	Priority 3
		communities within 20 m of construction worksite area.	Any other ecological sites within the Study Area of 50 m.
Air Quality (Operational)	Schools and education buildings, hospitals and medical centres, nursing homes, residential buildings, ecological sensitive site	Sport and recreation areas (outdoor)	Commercial, religious, infrastructure, industrial
Airborne Noise[6]	<u>For human receptors:</u> Schools and Education Buildings, Hospitals and Medical Centres, Nursing Homes.	<u>For human receptors:</u> Residential buildings	<u>For human receptors:</u> Other Buildings (Industrial, Commercial, Infrastructure, Sport & Recreation Areas, Religious Buildings, etc.).
	<u>For ecological receptors:</u> Species that use sound for communication, foraging and breeding or are known to have their behaviours disrupted by sound or are of Conservation Significance	<u>For ecological receptors:</u> Species that are less affected by airborne noise but are of Conservation Significance	<u>For ecological receptors:</u> Species that are less affected by airborne noise and are not of Conservation Significance

6.3 Data Collection and Analysis

Collection of pre-construction environmental baseline data within the Project Site was conducted both from primary sources and secondary sources.

6.3.1 Sample collection and Survey Locations

The sample collection and survey locations were selected for baseline data collection based on their proximity to the project and receptor priority. These locations were confirmed during a site reconnaissance survey. Site visits were undertaken as tabulated in the following Table 6-3.

Further information on sample collection and survey locations and parameters is provided in Section 7 (Biodiversity), Section 8 (Hydrology, Groundwater Level and Surface Water Quality), Section 9 (Air Quality), and Section 10 (Airborne Noise).

Table 6-3 Site visits for data collection

Environmental Parameter	Site Visits
Biodiversity	<u>Site reconnaissance survey</u>: • 5 February 2021 • 8 February 2021

[6] The fact is that different species are likely to react differently to disturbance and that will be influenced by various other factors such as how percussive the noise is (e.g. from blasting and piling), how far away the receptor is generally, behaviour of the fauna, and other factors such as whether the species is feeding or breeding/nesting and in particular from the complication of visual disturbance (particularly humans on foot nearby).

Environmental Parameter	Site Visits
	Sampling dates: • 11 March 2021 • 12 March 2021 • 29 March 2021 • 30 March 2021 • 31 March 2021 • 7 April 2021 • 21 April 2021 • 22 April 2021 • 6 May 2021
Hydrology and Surface Water Quality	Site reconnaissance survey: • 5 February 2021 • 18 February 2021 Sampling dates: • 8 March 2021 • 13 April 2021 • 5 May 2021 • 11 May 2021 • 17 May 2021
Groundwater Level	No field work is required for groundwater as per scope of this Study.
Air Quality	Site reconnaissance survey: • 5 February 2021 • 2 March 2021 • 29 April 2021 Sampling dates: • 3 – 10 May 2021
Airborne Noise	Site reconnaissance survey: • 5 February 2021 Sampling dates: • 02 March – 08 March 2021 • 03 March – 09 March 2021 • 01 April – 08 April 2021 • 10 April – 17 April 2021 • 16 April – 23 April 2021 • 19 April – 25 April 2021 • 27 April – 04 May 2021

6.3.2 Secondary Data Collection

Additional secondary data were collected from sources including, but not limited to, the following:

- Review of available environmental surveys previously carried out within or in the vicinity of the Project Site (e.g. tree surveys, ecological surveys, topography surveys, geotechnical interpretative report, environmental site investigation/environmental site assessment/environmental baseline study, etc);
- Review of timelines of concurrent projects in the area including JRL depot, bus depot, Cleantech Park industrial development, Tengah housing estates, etc;
- Proposed site infrastructure installation methodology and layout, including the expected excavation depth and project schedule;

- Forms A/B submitted for the development in Project Site;
- Publicly available data, existing literature, books (e.g. Singapore Red Data Book (SRDB) and online sources);
- Historical, current and planned land uses;
- Online databases, aerial photographs;
- Existing topography;
- Existing biodiversity information for Tengah region;
- Planned development on the watercourses;
- Regional and local drainage maps of the catchment area;
- Weather data (rainfall, wind, evaporation);
- Landscape maps;
- Commercial and recreational activities;
- Previous environmental site assessment/ soil and groundwater investigation reports (s) prepared for the site;
- Geotechnical interpretative report; and
- Geological maps.

Further information on secondary data collection is provided in in Section 7 (Biodiversity), Section 8 (Hydrology, Groundwater Level and Surface Water Quality), Section 9 (Air Quality), and Section 10 (Airborne Noise).

6.4 Assessment Criteria

6.4.1 Prediction of Impacts

Key potential environmental impacts arising from the Project's construction and operational activities were assessed within the Project scope. The methodology for the prediction of impacts is as given in Table 6-4.

Table 6-4 Methodology for prediction of construction impacts

Environmental Parameter	Predictive Methods	Assessment Criteria	EIS Section
Biodiversity	Qualitative assessment to evaluate the impacts of construction activities on key biodiversity sensitive receptors of floral communities, faunal species and habitats within the Project Site and its immediate surrounding (if any).	Assessment criteria broadly takes guidance from Hong Kong Environmental Impact Assessment Ordinance - Technical Memorandum Annex 8, with considerations from literature review and local biodiversity standards.	Section 7
Hydrology and Surface Water Quality	Qualitative and analytical methods were applied to assess hydrological and water quality impacts of the development construction phase. Hydrological impact study helped to understand the impact of construction activities as well as potential land use changes to hydrological conditions of the site, such as the increase in peak flow discharge or changes in stream alignment of the site. Water quality impact study helped to evaluate potential impact of construction	• Environmental Protection and Management (Trade Effluent) Regulations [R-26]; • Water Quality Criteria for Aquatic Life from other countries including United Nations Economic Commission for Europe [R-18], World Health Organization [R-19], United States Environmental Protection Agency [R-20], Philippines [R-23], Australian and New Zealand Environment and Conservation Council (ANZECC) [R-21], Canadian Council of Ministers of	Section 8

Environmental Parameter	Predictive Methods	Assessment Criteria	EIS Section
	activities on the existing waterbodies within/surrounding the site using analytical methods.	the Environment [R-22], and Department of Environment in Malaysia (DOE) [R-24].	
Groundwater Level	Qualitative and analytical assessment to identify and evaluate the potential impact of construction and operation to the existing groundwater level, that may impact the local vegetation and downstream waterbodies within the Project Site.	N.A.	Section 8
Air Quality	Qualitative assessment following dust risk assessment methodology focusing on fugitive particulate emissions (dust) from the construction site.	Assessment broadly follows "Guidance on the Assessment of Dust from Demolition and Construction" which was published by the UK Institute of Air Quality Management (IAQM) in 2014.	Section 9
Airborne Noise	Quantitative assessment was adopted to assess construction impact to the noise sensitive ecological receptors.	Environmental Protection and Management (Control of Noise at Construction Sites) Regulations, 2008	Section 10

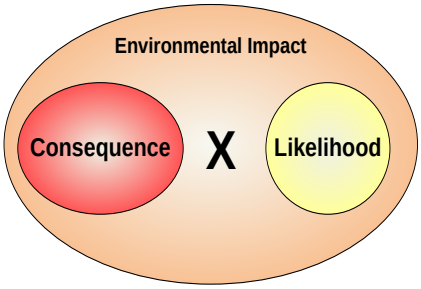
Table 6-5 Methodology for prediction of operational impacts

Environmental Parameter	Predictive Methods	Assessment Criteria	EIS Section
Biodiversity	Qualitative assessment to evaluate the impacts of operational activities on key biodiversity sensitive receptors of floral communities, faunal species and habitats within the Project Site and its immediate surrounding (if any).	Assessment criteria broadly takes guidance from Hong Kong Environmental Impact Assessment Ordinance - Technical Memorandum Annex 8, with considerations from literature review and local biodiversity standards.	Section 7
Hydrology and Surface Water Quality	Qualitative and analytical methods were applied to assess hydrological and water quality impacts of the development operational phase. Hydrological impact study helped to understand the impact of operational activities as well as potential land use changes to hydrological conditions of the site, such as the increase in peak flow discharge or changes in stream alignment of the site. Water quality impact study helped to evaluate potential impact of operational activities on the existing waterbodies within/surrounding the site using analytical methods.	• Environmental Protection and Management (Trade Effluent) Regulations [R-26]; • Water Quality Criteria for Aquatic Life from other countries including United Nations Economic Commission for Europe [R-18], World Health Organization [R-19], United States Environmental Protection Agency [R-20], Philippines [R-23], Australian and New Zealand Environment and Conservation Council (ANZECC) [R-21], Canadian Council of Ministers of the Environment [R-22], and Department of Environment in Malaysia (DOE) [R-24].	Section 8

Environmental Parameter	Predictive Methods	Assessment Criteria	EIS Section
Groundwater Level	Qualitative and analytical assessment to evaluate the groundwater level impacts of construction activities.	N.A.	Section 8
Air Quality	Qualitative assessment was conducted to assess air quality impacts of the development operational phase due to increased traffic in the vicinity of the project.	Compare the change in predicted increase in traffic volume to the Project and access routes in the vicinity of the Project.	Section 9
Airborne Noise	Qualitative assessment was adopted to assess operational noise to the noise sensitive ecological receptors.	• NEA Technical Guideline for Land Traffic Noise Impact Assessment, 2016	Section 10

6.4.2 Evaluation of Impacts

Impacts were evaluated based on their significance, which is a measure of the weight that should be given to each impact in decision making and if it warrants impact management. It was assessed using the following two factors in the Impact Significance Assessment Matrix (refer to Table 6-6) as detailed below and in the following sections:



- **Impact Consequence:** The consequence of an impact is a function of a range of considerations including impact spread, impact duration, impact intensity and nature, legal and guideline compliance;
- **Likelihood of Occurrence:** The likelihood of the impact occurring in life of the project.

6.4.2.1 Impact Consequence

In evaluating the consequence of environmental impacts, the following aspects were taken into consideration:

- **Receptor Sensitivity**: categorises receptors according to their susceptibility to adverse impacts from the Projects construction and operational phases (refer to Table 6-2);
- **Impact Intensity**: defines the magnitude of the impact and the status of the impact in relation to regulations (e.g. discharge limits), standards (e.g. environmental quality criteria) and guidelines. The criteria presented in Table 6-6 were used to categorise the impact intensity.

Table 6-6 Evaluation of impact intensity for construction and operational phases

Environmental Parameters	Impact Intensity			
	Negligible	Low	Medium	High
Biodiversity- Habitats	Potential impacts with no detectable changes to viability/function of habitats	Potential impacts with small temporal and spatial (localised) scale changes that could affect part of the habitat but does not	Potential impacts with moderate duration and/or over a considerable spatial scale changes that could affect part	Potential impacts with extensive duration and large spatial scale that affects the entire habitat, or a significant proportion of it,

Environmental Parameters	Impact Intensity			
	Negligible	Low	Medium	High
		cause the loss of viability/function of the habitat	of the habitat but does not threaten the long-term viability/function of the habitat	and could affect the long-term viability/function of the habitat
Biodiversity – Flora and Fauna	No expected changes to the ecologically sensitive receptors and/or individuals	Short duration and small-scale localised spatial changes that could cause minimal changes to the ecologically sensitive receptors and/or individuals	Moderate duration and medium-scale spatial changes that could cause moderate effects on the ecologically sensitive receptors but would not threaten long-term viability	Extended duration and large-scale spatial changes that could cause substantial effects on the ecologically sensitive receptors and threaten long-term viability
Hydrology	Very minor change to existing hydrology and flow.	Small scale localised changes to existing hydrology or flow.	Medium scale changes to existing hydrology or flow.	Major changes to existing hydrology or flow.
Water Quality	No contamination; or Likely to be well within regulatory limits.	Small scale localised contamination within regulatory limits.	Medium scale contamination just exceed regulatory limits.	Large scale contamination exceed regulatory limits by hazardous levels for the habitat/ conservation species.
Groundwater Level	None of the construction activities identified will cause groundwater impacts on site.	Small scale localised groundwater impacts which is not likely to extend beyond the Projects site.	Medium scale groundwater impacts which is likely to extend beyond the Projects site.	Large scale groundwater impacts which is likely to extend beyond the Projects site.
Air Quality (Construction Phase) [1]	-	For Earthworks: • Total site area <2,500 m^2 • Soil type with large grain size (e.g., sand) • <5 heavy earth moving vehicles active at any one time • Formation of bunds <4 m in height	For Earthworks: • Total site area 2,500 m^3 – 10,000 m^3 • Moderately dusty soil type (e.g., silt) • 5-10 heavy earth moving vehicles active at any one time • Formation of bunds 4 m - 8 m in height	For Earthworks: • Total site area >10,000 m^2 • Potentially dusty soil type (e.g., clay, which will be prone to suspension when dry due to small particle size) • >10 heavy earth moving

Environmental Parameters	Impact Intensity			
	Negligible	Low	Medium	High
		• Total material moved <20,000t • Earthworks during wetter months	• Total material moved 20,000-100,000t	vehicles active at any one time • Formation of bunds >8 m in height • Total material moved >100,000t
	-	For Construction: • Total building volume <25,000 m^3 • Construction material with low potential for dust release (e.g., metal cladding or timber)	For Construction: • Total building volume 25,000-100,000 m^3 • Potentially dusty construction material (e.g., concrete) • On-site concrete batching	For Construction: • Total building volume >100, 000 m^3 • On-site concrete batching • Sandblasting
	-	For Trackout: • <10 HDV (>3.5t) outward movements in any one day • Surface material with low potential for dust release • Unpaved road length <50 m	For Trackout: • 10-50 HDV (>3.5t) outward movements in any one day • Moderately dusty surface material (e.g. high clay content) • Unpaved road length 50-100 m	For Trackout: • >50 HDV (>3.5t) outward movements in any one day • Potentially dusty surface material (e.g. high clay content) • Unpaved road length >100 m
	-	For Demolition: • Total building volume <20,000 m^3 • Construction material with low potential for dust release (e.g. metal cladding or timber) • Demolition activities <10m above ground Demolition during wetter months	For Demolition: • Total building 20,000 – 50,000 m^3 • Potentially dusty construction material Demolition activities 10-20 m above ground level	For Demolition: • Total building >50,000 m^3 • Potentially dusty construction material (e.g. concrete) • On-site crushing and screening Demolition activities >20m above ground level
Air Quality (Operational Phase)	Insignificant increase in air quality levels in the vicinity of stations due to Project operation	Small scale increase in air quality levels in the vicinity of stations due to Project operation	Medium scale increase in air quality levels in the vicinity of stations due to Project operation	Large scale increase in air quality levels in the vicinity of stations due to Project operation
	Human Receptor:	Human Receptor:	Human Receptor:	Human Receptor:

Environmental Parameters	Impact Intensity			
	Negligible	Low	Medium	High
Airborne Noise (Construction Phase)	The predicted noise levels are within the regulatory noise limits.	The exceedance of values compared to regulatory noise limits is within 0-3 dB(A).	The exceedance of values compared to regulatory noise limits is within 3-6 dB(A).	The exceedance of values compared to regulatory noise limits is greater than 6 dB(A).
	Ecological Receptor: The predicted noise levels are within baseline monitoring results.	Ecological Receptor: The exceedance of values compared to baseline monitoring results is within 0-3 dB(A).	Ecological Receptor: The exceedance of values compared to baseline monitoring results is 3-6 dB(A).	Ecological Receptor: The exceedance of values compared to baseline monitoring results is greater than 6 dB(A).
Airborne Noise (Operational Phase)	Insignificant increase in noise levels in the vicinity of stations due to Project operation.	Small scale increase in noise quality levels in the vicinity of stations due to Project operation.	Medium scale increase in noise quality levels in the vicinity of stations due to Project operation.	Large scale increase in noise quality levels in the vicinity of stations due to Project operation.

Notes:
1. This impact intensity criterion is equivalent to the Emission Magnitude as defined in IAQM's Guidance [R-30].
2. Heavy duty vehicles (HDV) defined as vehicles with a gross weight greater than 3.5 tonnes.
3. The Flora & Fauna Specialist will be consulted to identify the species sensitivity to the potential change to their habitat, conservation status and foraging regime.

A consequence category is then derived based on receptor sensitivity and impact intensity, as shown in Table 6-6. The air quality impact assessment uses matrices specific to the Institute of Air Quality Management (IAQM) Guidance on the assessment of dust from demolition and construction [R-30] and these are provided in Section 9.2.

Table 6-7 Impact consequence matrix

Sensitivity / Impact Intensity	Priority 3	Priority 2	Priority 1
Negligible	Imperceptible	Very Low	Very Low
Low	Very Low	Low	Low
Medium	Very Low	Medium	Medium
High	Low	High	High

6.4.2.2 Likelihood

Likelihood is estimated on the basis of experience and/or evidence that such an outcome has previously occurred. Impacts resulting from routine/planned events (normal operations) are classified under High Likelihood.

Table 6-8 Likelihood criteria

Likelihood Criteria	Definition for All Environmental Parameters	Definition for Airborne Noise (Construction)
Unlikely/ Remote	Would be unlikely or not expected to occur during construction and operational activities.	Happening < 5% of the construction timeline at the worksite.
Less Likely/ Rare	Would less likely/ rarely occur during construction and operational activities.	Happening 5 - 15% of the construction timeline at the worksite.
Possible/ Occasional	Would possibly/ occasionally occur during construction and operational activities.	Happening 16 - 25% of the construction timeline at the worksite.
Likely/ Regular	Would likely to occur or would occur on a regular basis during construction and operational activities.	Happening 26 - 50% of the construction timeline at the worksite.
Certain/ Continuous	Would be certain to occur or would occur continuously during construction and operational activities.	Definition for Airborne Noise and Ground-borne Vibration Quantitative Evaluation (Construction)

References:

1. Ecological Impact Assessment (EcIA). EIANZ Guidelines for use in New Zealand: terrestrial and freshwater ecosystems. 2nd Edition. May 2018. [R-34]
2. CIEEM (2018). Guidelines for ecological impact assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal. September 2018. [R-35].

6.4.2.3 Impact Significance

The significance of each impact will be determined by assessing the impact consequence against the likelihood of the impact occurring using the Impact Significance Assessment Matrix. A simple risk-based matrix will be used for summation of consequence and likelihood, a sample of which is shown below.

Table 6-9 Impact significance matrix

Consequence / Likelihood	Imperceptible	Very Low	Low	Medium	High
Unlikely/ Remote	Negligible	Negligible	Negligible	Negligible	Negligible
Less Likely/ Rare	Negligible	Negligible	Minor	Minor	Minor
Possible/ Occasional	Negligible	Minor	Minor	Moderate	Moderate
Likely/ Regular	Negligible	Minor	Moderate	Moderate	Major
Certain/ Continuous	Negligible	Minor	Moderate	Major	Major

Positive impacts are classified under a single category. Impacts assessed as negligible or minor will require no additional management or mitigation measures (on the basis that the magnitude of the impact is sufficiently small, or that the receptor was of low sensitivity and/or that adequate controls were already included in the Project design). Negligible and minor impacts are therefore deemed to be “Insignificant”. Impacts evaluated as moderate or major require the adoption of management or mitigation measures. Major impacts are therefore deemed to be

"Significant" and moderate impact as "Relatively Significant". Major impacts require further management or mitigation measures where possible to minimize or reduce the impact to an acceptable level.

An "acceptable level" is the reduction of a major impact to a moderate one after mitigation. In seeking to mitigate moderate impacts, the emphasis is on demonstrating that the impact has been reduced to a level that is as low as reasonably practicable. It will not always be practical to reduce moderate impacts to minor ones in consideration of the cost-ineffectiveness of such an approach (due to the diminishing return of a reduction of impact versus cost). Residual impact assessment shall be conducted for those parameters where impact from the activity is identified to be significant and additional mitigation measures are recommended. Positive impacts were not assessed for significance. Assessment of residual impact shall follow similar risk approach as outlined above.

6.5 Mitigation, Monitoring and Management

Where the implementation of minimum controls is insufficient to alleviate any significant environmental construction and operational impacts (moderate to major impacts), Project-specific final mitigation measures, in consultation with the HDB and the relevant agencies, will be proposed. Where applicable and practical, engineering control measures will be accompanied by specifications (product brochures), estimated cost and source of supply. In addition, mitigation measures at receptors' end will also be recommended on a case-by-case basis. For example, if the unmitigated construction noise levels are found exceeding the relevant criteria, practical direct mitigation measures such as the use of noise barriers, enclosures, quieter powered mechanical equipment (PME) and construction methods, etc. will be recommended. Effective dust control measures will be recommended to minimize dust emission from the site, where necessary. Mitigation measures will be proposed in accordance with the following hierarchy in line with Biodiversity Impact Assessment (BIA) Guidelines published by NParks in year 2020 [R-9]:

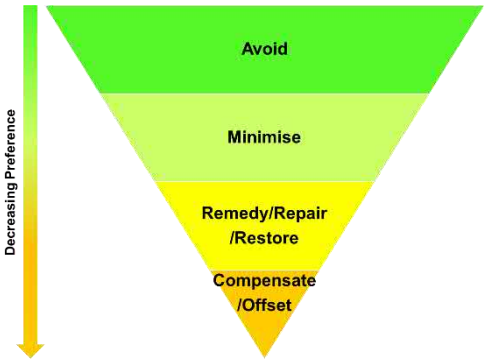


Figure 6-2 Mitigation hierarchy

- **Avoid** – Where changes to the Project design and construction/operational methodology can be made to eliminate or avoid an identified impact (e.g. optimisation or reduction of construction footprint, shift or elimination of construction site in critical areas, etc.). If a full elimination is not possible, the next level of mitigation is to minimize the identified impact;
- **Minimize** – Where changes to the Project design and construction/operational methodology cannot affect impact elimination or avoidance, use of alternative construction methodology or any enhancement measures can be adopted to minimize for identified impacts. For e.g. a wildlife shepherding plan is put in place to allow any animals trapped on the site to escape into the surrounding vegetation;
- **Remedy/Repair/Restore** – Where changes to the Project design and construction/operation cannot affect impact avoidance and impact minimization, restoration methodology can be applied after construction is completed to remedy/repair/restore the ecological habitat as much as possible. For e.g. after construction, appropriate trees and shrubs are replanted in appropriate locations on the impacted site to restore part of the habitat;
- **Compensation/Offset –** Where measures taken to compensate or offset the residual impacts after implementing the first three steps of the mitigation hierarchy, wherever technically and financially feasible, e.g. transplanting of rare shrubs or trees to elsewhere in consultation with government authorities, etc.

Subsequently, A Construction Stage EMMP and Operational stage EMMP will be formulated specifying mitigation measures, monitoring scope, methodology and location, and triggers to report and escalate the irregularities in the baseline conditions at construction/operational stage. The basis of EMMP is provided in Section 11 which also summarises information about identified sensitive receptors, potential impacts evaluated, residual impacts (if any) and frequency of monitoring (if required), as well as close up actions.

7 Biodiversity

7.1 Introduction

The Biodiversity Impact Assessment establishes baseline biodiversity information of the Study Area (same as Project Site as defined in Section 6.2.1) and evaluates the biodiversity impacts of the proposed construction works and operational phase of the Project. Baseline information was first gathered through reviews of past and present biodiversity records, published literature, and in consultation with taxonomic experts. Field surveys were then carried out to verify and supplement the data. Through desktop and field assessments, important habitats, species of flora, and fauna of conservation significance were identified. The information was used to evaluate the extent of the impacts during construction and operational phases. Measures were recommended to mitigate identified impacts.

7.2 Methodology and Assumptions

7.2.1 Biodiversity Baseline Study

The baseline study and impact assessment methodology adopted in this Project were discussed and approved by relevant agencies during the Scoping Meeting and Presentation on 26 February 2021.

7.2.1.1 Desktop Assessment

7.2.1.1.1 Land Use History

Historical and present-day land use of the Study Area was reviewed. Information on land use history was primarily gathered from old maps in the online collection of the National Archives of Singapore (NAS) as well as historical maps on the OneMap and the National University of Singapore (NUS) Libraries portals. A list of faunal species that are likely to occur at the site (termed hereafter as “species of probable occurrence”) was generated using information on past faunal records and existing habitat types and past fauna records up to 2 km from the Study Area. This information is presented in Section 4.1.

7.2.1.1.2 Key References

Past and present floristic as well as faunistic species composition was examined using relevant key references that include books, scientific publications, unpublished literature, and online databases. Sources of databases include The Biodiversity of Singapore by the Lee Kong Chian Natural History Museum [W-26], Flora and Fauna Web by the National Parks Board [W-3] and iNaturalist [W-28]. Other key references include the Singapore Red Data Book [P-14], Singapore Biodiversity Records [W-27], encyclopaedia on Singapore’s biodiversity [P-42] and the database of flora and fauna records compiled by our biodiversity specialists. This report also references the Tengah Environmental Baseline Study for the entire Tengah Town published by AECOM in March 2019 [R-50]. These records were referenced or used for generating species list for the Study Area (see Appendix I).

7.2.1.1.3 Taxonomy and Nomenclature

Taxonomy and nomenclature adopted made reference to relevant key references that include books, scientific publications and online databases.

Key local and/or regional references for the various taxonomic groups are listed in the table below.

Table 7-1 Key references for the nomenclature and taxonomy for each taxonomic group

Taxon	Key References
Plants	Chong et al., 2009 [P-10]; World Checklist of Selected Plant Families [W-31]; Plants of the World Online [W-30]
Aculeate hymenopteran	Ascher et al. (in prep) [P-2]
Odonates	Soh and Ngiam, 2019 [P-49]
Butterflies	Khew, 2015 [P-26]
Freshwater decapod crustaceans	Ng, 1997 [P-41]; Cai et al., 2007 [P-7]

Taxon	Key References
Freshwater fish	Kottelat, 2013 [P-31]; Suzuki et al., 2015 [P-50]; Ho et al., 2016 [P-19]
Herpetofauna	Baker and Lim, 2012 [P-3]
Birds	Gill and Donsker, 2020 [W-5]
Mammals	Baker and Lim, 2012 [P-3]

7.2.1.1.4 Species of Conservation Significance

Threatened species of flora—i.e., listed in Chong et al. 2009 [P-10] as nationally Vulnerable, Endangered, Critically Endangered, or Presumed Extinct (which indicates a rediscovery)—were assessed to determine whether they are of conservation significance. While the national conservation status of threatened species is true of wild populations that originate in an area without direct or indirect human intervention, some populations may be relics that persist from past cultivation or escapees from present-day cultivation that does not belong to native genetic stock. The assessment of whether a threatened species are of conservation significance will be based on, but not limited to, information on the following: (1) land use history, (2) presence of large parent tree(s), (3) commercial availability, (4) data from previous environmental impact assessments, (5) reforestation efforts, (6) natural range, and (7) importance for associated fauna. If the origin of a threatened species population is disputable or difficult to determine, we corroborated findings from field surveys of fauna and/or adopt the more conservative approach by considering them of conservation significance.

Faunal species of conservation significance include both non-threatened species regarded as notable records as well as threatened species. Notable non-threatened species are species deemed to be of conservation interest within the Study Area based on recent local trends observed by specialists from (1) increased rarity of the species, (2) reduced habitat suitability for the species locally, or (3) presence of breeding sites that are uncommon or rare locally. On the other hand, threatened species of fauna are those listed as nationally or globally Vulnerable, Endangered, Critically Endangered, or Extinct. The national conservation statuses reference the Singapore Red Data Book (SRDB; [P-14] and other more updated local checklists, where available, such as Soh et al. 2019 [P-49] for odonates and Jain et al. 2018 [P-23] for butterflies. The global conservation status references the Red List of Threatened Species by the International Union for Conservation of Nature (IUCN, 2021 [P-22]).

7.2.1.2 Field Assessment

7.2.1.2.1 Site Reconnaissance

Site reconnaissance surveys were conducted to obtain an initial understanding of the existing habitats and biodiversity. Field observations were used for planning and execution of the actual surveys. The objectives of the reconnaissance survey are as follows:

- Determine site accessibility and terrain
- Conduct a preliminary assessment to determine the dominant vegetation types
- Identify locations of existing natural permanent waterbodies, such as streams, ponds, and swampy areas (if any)
- Mark out survey sampling routes and potential locations for camera traps

7.2.1.2.2 Flora Field Assessment

The field assessment for flora consists of (1) habitat mapping, (2) general walking floristic surveys, (3) tree mapping and (4) sampling plots.

7.2.1.2.2.1 Habitat Mapping

A preliminary map to highlight possible habitats that could be found within the Study Area was first prepared based on satellite images from Google Earth Pro 7.3.3.7786 (Google Inc. 2020 [O-3]). Preliminary classification of the habitat types, for example, waste woodlands, abandoned-land forest and managed vegetation were mapped out using visual features, such as textures and colours, observed in the satellite images. Adjustments was made to the preliminary maps according to actual observations during ground truthing. Ground truthing was conducted throughout the survey area with the aid of a GPS receiver (Garmin GPSMap® 64s). Photographs of the different

habitat types were also taken. The boundaries of each habitat type were tracked on the GPS receiver and mapped out on Google Earth 7.3.3.7786. The classification of habitat types references NParks [R-2].

7.2.1.2.2.2 General Walking Surveys

All plants observed in the Study Area were identified to species whenever possible. A checklist of all the plant species recorded from the present floristic surveys were compiled. The nomenclature and national conservation status follow that of Chong et al. (2009) [P-10], and/or other published papers with information on the updated assessment of the species nomenclature and/or conservation status. The latter is usually for one or a few individual species. Other information on the plant species was also crosschecked with online databases, namely, the National Parks Board Flora and Fauna Web and Singapore Biodiversity Online.

For plants that could not be immediately identified with certainty in the field, photographs and/or voucher specimens were taken. They were then identified using identification keys, taxonomic descriptions, online plant photo databases, with the help of taxonomic experts, and/or by matching the pressed and dried collected specimens with existing specimens in the Singapore Botanic Gardens' Herbarium (SING).

For very tall unidentifiable trees with leaves that are too high in the canopy to photograph, dried leaves matching these trees were collected from the forest floor and used to aid in species identification.

Species of Conservation Significance

The geographic coordinates of plants of conservation significance were marked using a Global Positioning System (GPS) receiver (Garmin GPSMap® 64s), which records locations with an accuracy of ± 4 m, during floristic surveys. Where there are clusters of plants of conservation significance—i.e., more than one individual occurring within 5 m or less of another individual—the geographic coordinates of the approximate centre of the area were marked using the GPS receiver.

Large Plant Specimens

Similarly, the GPS receiver was used to record locations of all trees of ≥ 3 m girth, as well as bamboo clusters, palm clusters, and strangling *Ficus* species of ≥ 3 m spread. Individuals were identified to species and whenever possible, measure girth (for trees)/estimate spread (for bamboo clusters, palm clusters, and strangling Ficus species), estimate height and tag them with unique serial numbers.

Other Plant Specimens of Value

Locations of other plants that are of value but do not meet the minimum size requirement, as detailed in the above sub-section, were recorded using the GPS receiver. Examples of such include bamboo clusters of < 3 m spread that may be important refugia for rare bamboo bats, amongst others, and keystone species. According to Lok et al., (2013), keystone species is defined as "important plants that other animals in the community depend heavily on" [P-36]. These specimens can fall under the categories mentioned above (i.e., species of conservation and large specimens) and trees and/or strangling species of ≥ 1.0 m girth which was recorded during tree mapping. Geographic locations of all keystone species were recorded using the GPS receiver (Garmin GPSMap® 64s or/and Differential GPS receiver.

7.2.1.2.2.3 Tree Mapping

Mapped specimens were tagged with a unique serial number on site. All trees, including single-stemmed palm (defined in this study as having one obvious and erect stem), strangling *Ficus* species of ≥ 1.0 m girth or spread, and those of species of conservation significance of ≥ 0.3 m girth or spread were mapped and tagged with a unique serial number on site, except for ten exotic tree species. These species were: (1) *Acacia auriculiformis;* (2) *Acacia mangium*; (3) *Areca catechu;* (4) *Carica papaya*; (5) *Cocos nucifera*; (6) *Elaies guineensis*; (7) *Falcataria moluccana*; (8) *Leucaena leucocephala*; (9) *Ptychosperma macarthurii* and (10) *Spathodea campanulata*. As agreed during the Scoping Meeting, these exotic trees with girth of ≥1 m were mapped by topography surveyor instead.

Geographic location girth/spread and height was also recorded. Differential Global Positioning System (DGPS) receivers (CHC® Navigation HCE320 Global Navigation Satellite System [GNSS] data controller with the CHC® Navigation i90 Pro GNSS receiver and Leica DISTO™ D510 rangefinder; Hi-Target Qmini A5 High Precision Handheld data controller with the Hi-Target V-90 GNSS receiver and Leica DISTO™ D510 rangefinder) (see Figure 7-1 and Figure 7-2)—which records locations with accuracy of ± 1 m and less—was used to record geographic locations of the specimens using the SVY21 plane coordinate system. This local datum gives a more accurate

representation of the areas of coverage in Singapore compared to a global datum and is used by the Singapore Land Authority (SLA) [W-2]. Where there were clusters of specimens of the same species occurring within 1–2 m of each other, only one specimen was tagged, and its location marked using the DGPS.



Figure 7-1 (A) CHC® Navigation HCE320 GNSS data controller (Source: Geo-Matching.Com); (B) How it is used in the field

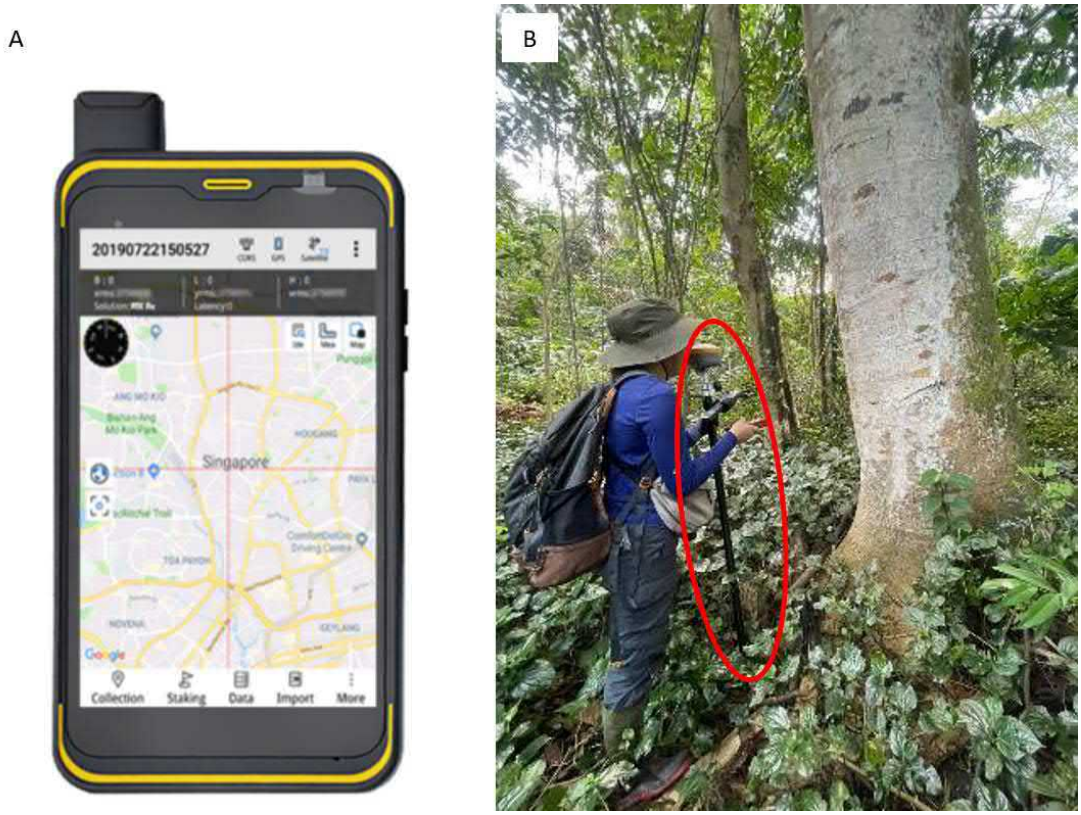


Figure 7-2 (A) Hi-Target Qmini A5 High Precision Handheld data controller (Source: Geo-Matching.com); (B) How it is being used in the field

7.2.1.2.3 Sampling Plots

Twenty-five vegetation plots measuring 10 × 10 m were set up and surveyed in the Study Area. The number of plots in each site was determined based on the sampling density of one plot for every 1.25 ha. Hence, the number of vegetation plots was proportionate relative to the size of the site.

After the number of vegetation plots was determined, the location of each plot was determined via stratified random sampling; points representing the location of the plots were randomly generated within each identified vegetation type in each site. Actual plot locations were adjusted on-site based on accessibility and suitability, i.e., not covered in dense vegetation and/or tree falls that would render the site inaccessible. Individuals within the plots were identified to species and stem diameter was measured at breast height (DBH) of all woody tree and shrub specimens as well as palms of ≥ 0.05 m girth. For *Ficus* stranglers and palm clusters, estimation of the size of spread and measurement of the circumference of each woody aerial root or stem, respectively, of ≥ 0.01 cm DBH, was carried out. All other plant species observed in each plot were also recorded.

7.2.1.2.4 Data Analyses

After conducting field assessments, statistical data analysis was carried out using statistical programming environment R version 3.4.3. [O-2]. Two main classes of data analyses were used: a) Community Data Analyses and b) Forest Regeneration:

7.2.1.2.4.1 Community Data Analyses

A species accumulation curve (SAC) was plotted using data on floristic diversity from the vegetation plots across sites. Species richness was plotted against sample coverage, as opposed to survey effort, to estimate sample completeness/ survey adequacy, i.e., how extensively we have sampled the species in the community. According to Chao and Jost (2012), sample coverage refers to "the proportion of the total number of individuals in a community that belong to the species represented in the sample" [P-8]. The curve was extrapolated to provide an estimation of species richness and sample coverage if the sample size was doubled. Community data analyses were conducted using the "vegan" package 2.5-6 [R-35] and "iNEXT" package 2.0.19 [R-36].

As some species will always remain undetected after sampling all the vegetation plots, thus total species richness had to be estimated via extrapolation. The total number of species was approximated using the chao estimator in "iNEXT" package 2.0.19 (Heish et al., 2019 [R-36]) — by estimating the number of undetected species and adding them to the observed species richness [R-37]; [R-39].

To visualize the differences among vegetation types based on species composition, non-metric multidimensional scaling (NMDS) ordination was used. The Bray–Curtis dissimilarity was used to quantify dissimilarities between the observed communities. Permutational Multivariate Analysis of Variance (PERMANOVA) via bootstrapping with 999 permutations were then tested for statistical significance. The plots were nested within the respective vegetation types. The ordination was also tested to ensure that the assumption of homogeneity of multivariate dispersion holds true.

7.2.1.2.4.2 Forest Regeneration

This analysis was carried out to evaluate and provide an insight into the spontaneous natural regeneration and composition of new stands within the forest patches that were surveyed.

The trees were broadly categorized into two main girth-size classes, e.g., ≥ 0.5 m and < 0.5 m. They were first ranked by abundance and examined to see which species made up the larger and smaller trees respectively. Bars in light blue belong to the ten most abundant species). The ten most abundant species present in the vegetation plots were ranked according to their size-class distribution and examined.

7.2.1.2.5 Faunal Field Assessment

Faunal field surveys were carried out for the following taxa: (1) aculeate hymenopterans, (2) butterflies, (3) odonates (damselflies and dragonflies), (4) herpetofauna (amphibians and reptiles), (5) birds, (6) mammals (including bats). All observations of notable species from the aforementioned taxa were also recorded if seen outside the stated survey times.

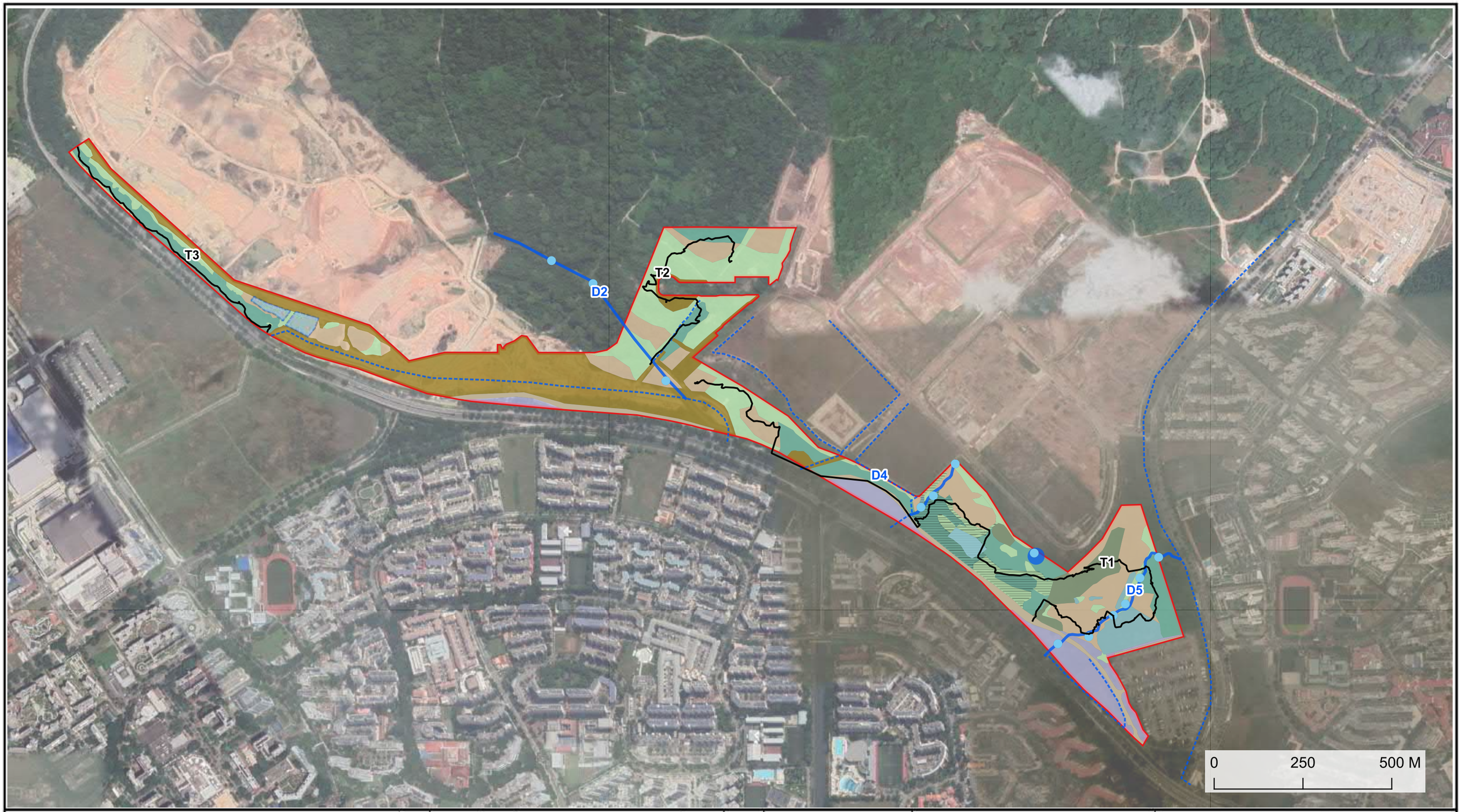
Table 7-2 summarises all the surveys that were carried out for fauna. Each survey was performed by at least two (maximum three) surveyors. All fauna encountered were identified to species, or to the next lowest taxonomic level

possible, and the location of each individual was recorded using a handheld GPS (Garmin GPSMAP 64s). The number of individuals observed was also documented. The locations of sampling units are provided in Figure 7-3.

Table 7-2 Summary of surveys* of fauna

Survey Type	Taxon	Timing (h)	Duration	Sampling Unit	Technique
Diurnal transect surveys	Aculeate hymenopterans	0900–1500	20–30 minutes per transect	200m continuous transects along a sampling route	Visual only; up to 25 m left, right, and front of surveyor
	Butterflies	0900–1500	20–30 minutes per transect	200m continuous transects along a sampling route	Visual only; up to 25 m left, right, and front of surveyor
	Odonates (damselflies and dragonflies)	0900–1500	20–30 minutes per transect	200m continuous transects along a sampling route	Visual only; up to 25 m left, right, and front of surveyor
Diurnal and nocturnal transect surveys	Herpetofauna (amphibians and reptiles)	0700–1000; 2000–2300	20–30 minutes per transect	200m continuous transects along a sampling route	Visual and auditory; up to 50 m left, right, and front of surveyor
	Birds	0700–1000; 2000–2300	20–30 minutes per transect	200m continuous transects along a sampling route	Visual and auditory; up to 50 m left, right, and front of surveyor
	Mammals (non-volant)	0700–1000; 2000–2300	20–30 minutes per transect	200m continuous transects along a sampling route	Visual and auditory; up to 50 m left, right, and front of surveyor
Aquatic point counts	Odonates (damselflies and dragonflies)	0900–1500	5 minutes per point	Sampling points at fresh waterbodies (intervals vary with waterbodies)	Visual only; up to 25 m from sampling point or the extent of waterbodies, whichever is smaller
	Herpetofauna (amphibians and reptiles)	0900–1500; 2000–2300	5 minutes per point	Sampling points at fresh waterbodies (intervals vary with waterbodies)	Visual only; up to 25 m from sampling point or the extent of waterbodies, whichever is smaller
Camera trapping	Mammals (non-volant)	24 hours a day	60 days	One trap per 6.25 ha. Additional traps will be deployed at strategic locations.	Infrared motion sensing
Bioacoustics surveys	Mammals (bats)	2000–2300	20–30 minutes per transect	200-m continuous transects along a sampling route	Auditory only

Survey Type	Taxon	Timing (h)	Duration	Sampling Unit	Technique
Push and scoop netting	Aquatic fauna (fish)	Daytime	-	Sampling points inside waterbodies	-
Minnow trapping	Freshwater aquatic fauna (fish and decapod crustaceans)	Overnight	One day one night	Traps (intervals vary with length of stream)	Baited



Legend

- Southern Tengah Study Area
- Scrubland & herbaceous vegetation
- Abandoned-land forest
- Mixed forest
- Waste woodland
- Managed vegetation
- Farm
- Others (Infrastructure)
- Construction
- Concreted area
- Waterlogged area (Ephemeral)
- Pond
- Stream (Perennial)
- Drain
- Terrestrial sampling route
- Aquatic sampling point

N

Rev.	Date	By	Description	Chk'd	App'd
-	OCT 2021	JT	Final Report	NHT	JAG

Qualified Person Endorsement : NA

HDB Endorsement : NA

Consultant : AECOM

Client: HOUSING & DEVELOPMENT BOARD

Project Title :

CONTRACT L/025/21 SPECIALIST CONSULTANCY SERVICES FOR ENVIRONMENTAL IMPACT STUDIES (EIS) ON SOUTHERN TENGAH

Figure Title :

Location of terrestrial sampling route and aquatic sampling point

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Note: Source of basemap - Google Earth Map

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7.2.1.2.5.1 Aculeate Hymenopterans (Bees and Stinging Wasps, excluding Ants)

Adult bees and stinging wasps, nests, and food plants were visually surveyed along 200-m continuous transects on a sampling route. Surveys were conducted between 0900h and 1500h. Bees and wasps were identified by sight or photography whenever possible. Otherwise, they were captured using handheld insect nets. Individuals were released immediately after identification. When identification in the field was not possible, live specimens were collected and examined *post-hoc* under microscope. The specimens were identified to the lowest taxonomic level possible using relevant references, identification keys, or in consultation with taxonomic experts.

7.2.1.2.5.2 Butterflies

Diurnal transect surveys were carried out for adult butterflies along 200m continuous transects on a sampling route between 0900h and 1500h. Butterfly caterpillars, pupae, eggs, and host plants were recorded when observed. Adult butterflies were identified visually (with binoculars where necessary), photographed, or caught using insect nets, if required. Captured individuals were released immediately after identification.

7.2.1.2.5.3 Odonates (Dragonflies and Damselflies)

Diurnal transect surveys were carried out for adult damselflies and dragonflies along 200m continuous transects on a sampling route, as well as 5-minute point counts at aquatic sampling points between 0900h and 1500h. Owing to difficulties in sampling and identification, aquatic larvae and exuviae were be surveyed. Adult odonates were identified visually (with binoculars where necessary), photographed, or caught using insect nets, if required. Captured individuals were released immediately after identification.

7.2.1.2.5.4 Herpetofauna (Amphibians and Reptiles)

Diurnal (0700h–1000h) and nocturnal (2000h–2300h) surveys were carried out for amphibians and reptiles along 200-m continuous transects on a sampling route, as well as 5-minutes point counts at aquatic sampling points As herpetofauna occupy a wide range of habitat types, both the diurnal and nocturnal surveys also involved active searches for individuals on the ground, below rocks, logs, leaf litter and debris, in the water, and/or on vegetation. Torches and/or headlamps were used to elicit eyeshine during nocturnal surveys. Vocalising fauna was located or identified by call recognition, whenever possible. For species that are capable of quick retreats and escapes, the individuals were captured by hand, or using hooks, tongs, or dip nets for identification. Captured individuals were released immediately after identification.

7.2.1.2.5.5 Birds

Diurnal (0700h–1000h) and nocturnal (2000h–2300h) surveys were carried out for birds along 200-m continuous transects on a sampling route. Birds were identified visually (with binoculars where necessary) and photographed. Torches and/or headlamps were used to elicit eyeshine during nocturnal surveys. Vocalising birds was also be located or identified by call recognition, whenever possible. Bird surveys were not conducted in the migratory season (Sep–Mar) as the project timeline is likely to miss the key migratory period.

7.2.1.2.5.6 Mammals (Non-Volant)

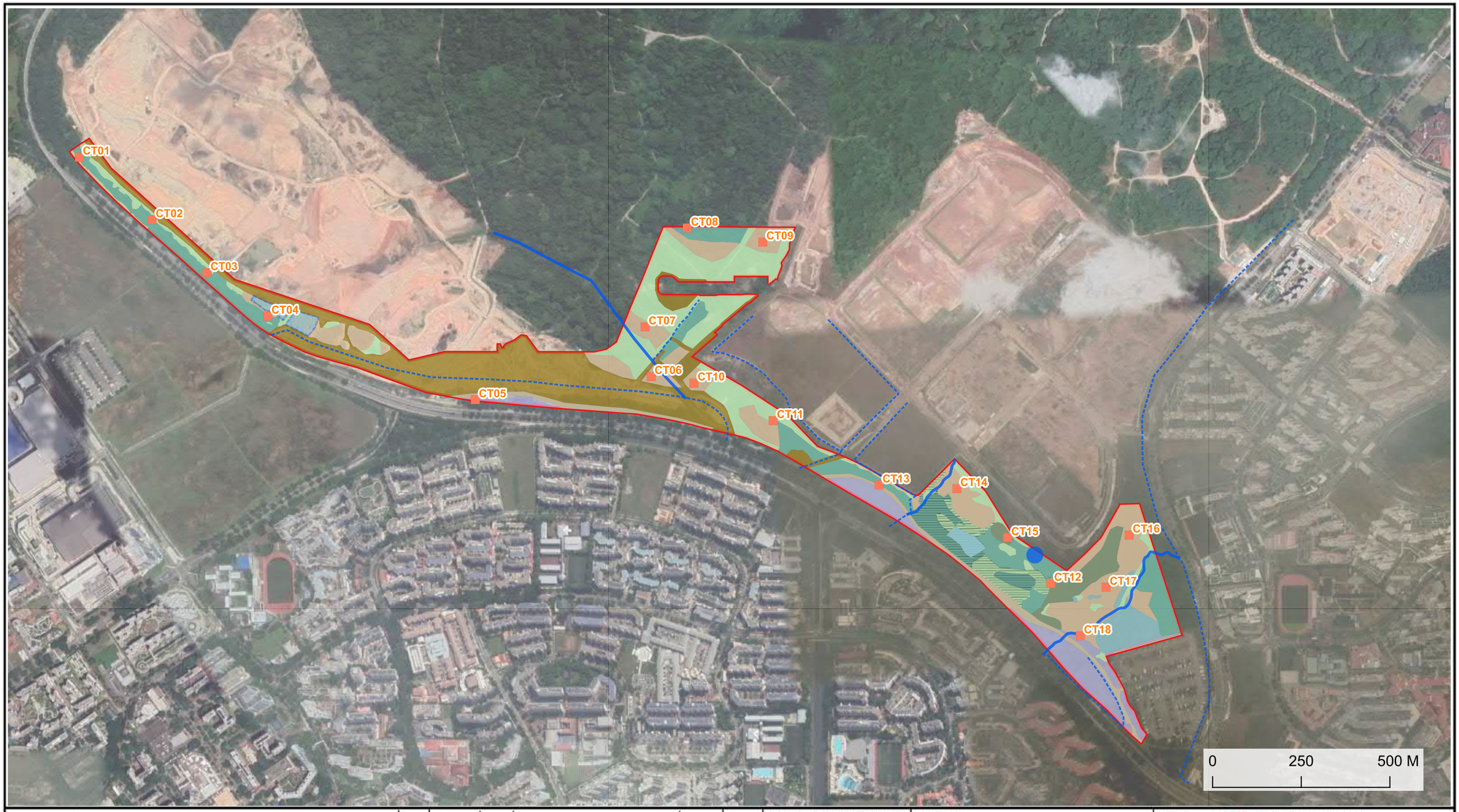
Diurnal (0700h–1000h) and nocturnal (2000h–2300h) surveys were carried out for non-volant mammals along 200-m continuous transects on a sampling route. Both the diurnal and nocturnal surveys also involved searches in burrows and tree holes. Tracks, scats and holts were also be recorded. Mammals was identified visually (with binoculars where necessary) and photographed. Torches and/or headlamps were used to elicit eyeshine during nocturnal surveys. Vocalising mammals, such as the squirrels, were also be located or identified by call recognition, whenever possible.

Camera traps were systematically deployed across the Study Area (see Figure 7-5). One camera trap was deployed within each grid, which amounts to 10 camera traps. In addition, eight camera traps were strategically deployed in suitable locations to increase the detection of target species in the Study Area.

Each camera trap was set up at approximately 20–30 cm above ground (see Figure 7-4). They operated for 24 hours a day and were programmed to record 10-second footage per motion trigger with a 10-second quiet period following each trigger. Each camera trap was deployed for 60 days. The camera trap model that was used was Browning Dark Ops HD Pro X BTC-6HDPX.



Figure 7-4 Example of a camera trap setup



Legend

- Southern Tengah Study Area
- Scrubland & herbaceous vegetation
- Abandoned-land forest
- Mixed forest
- Waste woodland
- Managed vegetation
- Farm
- Others (Infrastructure)
- Construction
- Concreted area
- Waterlogged area (Ephemeral)
- Pond
- Stream (Perennial)
- Drain
- Camera trap

N

Rev.	Date	By	Description	Chk'd	App'd
-	OCT 2021	JT	Final Report	NHT	JAG

Qualified Person Endorsement : NA

HDB Endorsement : NA

Consultant : AECOM

Client: HOUSING & DEVELOPMENT BOARD

Project Title :

CONTRACT L/025/21
SPECIALIST CONSULTANCY SERVICES FOR ENVIRONMENTAL IMPACT STUDIES (EIS) ON SOUTHERN TENGAH

Figure Title :

Location of camera traps

Designed	Checked	Approved	Figure No. :	Rev.	Sheet
JT	NHT	JAG	7-5	-	1 of 1
	Drawn JT	Date OCT 2021	CAD File Name : NA		A3

Note: Source of basemap - Google Earth Map

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7.2.1.2.5.7 Mammals (Bats Only)

Acoustics surveys were carried out for bats along 200-m continuous transects on a sampling route between 2000h and 2300h. The Echo Meter Touch 2 Pro (Wildlife Acoustics, Inc.) will be used to record, stream, and attenuate ultrasonic calls between 18 and 192 kHz at a sampling frequency of 384 kHz to low frequency signals below 20 kHz, a range that is audible to the human ear.

Roost emergence surveys were carried out between 1830h and 2100h for bamboo bats, specifically, at bamboo clusters (if any). Bamboo bats will be identified visually and photographed, and calls will be recorded using the Echo Meter Touch 2 Pro detector. Bamboo slits that are at least 1 cm wide and long and are actively used for entry and exit, as well as the number of bats residing within each internode will be recorded.

7.2.1.2.5.8 Freshwater aquatic fauna (Fish and decapod crustaceans)

Surveys involved diurnal (0900h–1500h) five-minute visual point counts at aquatic sampling points and minnow trapping at waterbodies. It should be noted that the proposed survey routes are tentative. Minnow traps were baited with halal meat (e.g., sausage or liver) and systematically deployed at locations with deeper water (see Figure 7-6). Traps were left overnight, then checked and removed the following morning.



Figure 7-6 A minnow trap deployed during aquatic surveys

7.2.1.2.6 Data Analyses

7.2.1.2.6.1 Species Distribution Maps

Locations of species of conservation significance were presented on maps to shows their distribution within the Study Area. All maps were prepared and generated using the mapping software QGIS 3.4.12.

7.2.1.2.6.2 Camera Trapping

Camera trap location, species identity, and the number of individuals were recorded for each video with a positive capture of fauna. An independent detection constitutes video of one or a group of individuals of the same faunal species occurring within 60 minutes at each camera trap. The number of independent detections were calculated detection rate of each mammal species.

7.2.1.2.6.3 Bat Sound File Analysis

All bat sound files were processed using Kaleidoscope v.4.5.4 (Wildlife Acoustics, Inc.) to separate extraneous noise from files with bat echolocation calls. The signal parameters for recognising a potential bat echolocation call were configured as follows: frequency range of 20–200 kilohertz (kHz), duration of 2–500 milliseconds (ms), maximum inter-syllable gap of 500 ms and a minimum of 2 pulses. These files were visually processed to identify bat species based on call structures [P-45]. They were identified with reference to those in Pottie et al. (2005) [P-45], which provides echolocation signatures for bats in Singapore, and other relevant references [P-11; P-21].

7.2.1.2.6.4 Taxon Sampling Curves

Taxon sampling curves were plotted for the surveys conducted for selected taxa with sufficient occurrences as large sample sizes are required for the estimation of sample coverage to be robust [P-8]. The observed sample of incidence data was used to estimate sample coverage and species richness. Species richness was plotted against sample coverage, as opposed to survey effort, to estimate sample completeness/ survey adequacy, i.e., how extensively we have sampled the species in the community. Sample coverage refers to "the proportion of the total number of species in a community that belongs to the species represented in the sample" [P-8]. The curve was extrapolated to provide an estimation of species richness and sample coverage if sample size was doubled. The associated standard error and 95% confidence interval were also computed. Standard error represents the range of uncertainty of the estimate, while 95% confidence interval is the interval in which there is a 0.95 probability of containing the estimated true species richness. As some species will always remain undetected, total species richness had to be estimated via extrapolation. This was done using the Chao estimator. All statistical analyses were carried out in the statistical programming environment R version 3.4.3 using the "iNEXT" package 2.0.20 [R-36].

7.2.2 Prediction and Evaluation of Biodiversity Impact

The detailed prediction and evaluation methodologies for biodiversity impact have been described in Section 6.4.

7.3 Baseline Findings

The baseline findings presented below are based on data collected from the floristic and faunistic surveys conducted between 1 March 2021 to 10 May 2021. All baseline data were assessed and presented in the sections below.

7.3.1 Habitat Types

The Study Area comprises of four habitat types (see Figure 7-7). The largest habitat is scrubland and herbaceous vegetation, which takes up 12.9 ha (21.43%) of the Study Area. This is followed by waste woodland, occupying 10.59 ha (17.59%) of the Study Area. Following that is abandoned-land forest that takes up approximately 9.51 ha (15.8%) of the total Study Area. Lastly, 3.25% (2.15 ha) is taken up by mixed forest habitat. The remaining habitats are covered by farms (2.20 ha; 3.65%) and managed vegetation (4.23 ha; 7.03%). Other areas like construction area and infrastructure takes up 15.63 ha (25.96%) and 2.38 ha (3.95%) respectively.

Vegetation plot data indicate that species richness is the highest in scrubland and herbaceous vegetation, with 103 species in total, followed by a total of 50 species in abandoned-land forest, 49 species in waste woodland plot, and 30 species recorded for mixed forest (see Table 7-3). However, this could, in part, be explained by the higher number of plots in scrubland and herbaceous vegetation

Table 7-3 Absolute (ha) and relative (%) sizes, number of vegetation plots, and species richness of each habitat type

Habitat Type	Area (ha)	% of Study Area	Number of Vegetation Plots	Species Richness per Vegetation Type		
				*Total	Native	Exotic and Cryptogenic
Abandoned-land forest	9.51	15.80	6	50	30	20

Habitat Type	Area (ha)	% of Study Area	Number of Vegetation Plots	Species Richness per Vegetation Type		
				*Total	Native	Exotic and Cryptogenic
Mixed forest	2.15	3.57	2	30	25	5
Waste woodland	10.59	17.59	7	49	31	18
Scrubland and herbaceous vegetation	12.9	21.43	10	111	46	65
Farms	2.20	3.65	-	-	-	-
Managed Vegetation	4.23	7.03	-	-	-	-
Construction	15.63	25.96	-	-	-	-
Others (Infrastructure)	2.38	3.95	-	-	-	-
Waterlogged area	0.60	1.00	-	-	-	-
Total Spontaneous Vegetation	35.15	58.39	-	-	-	-
Total Area	60.2	100.00	-	-	-	-

Note: *refers to the total number of species recorded across all plots in each vegetation type

0 250 500 m

Legend

- Southern Tengah Study Area
- Scrubland and herbaceous vegetation
- Abandoned-land forest
- Waste woodland
- Mixed forest
- Managed vegetation
- Farm
- Construction
- Concreted Area
- Others (Infrastructure)
- Waterlogged Area
- Stream (Perennial)
- Drain
- Pond
- Sampling plots

N

Rev.	Date	By	Description	Chk'd	App'd
-	OCT 2021	ZA	Final Report	NHT	JAG

Qualified Person Endorsement : NA

HDB Endorsement : NA

Consultant : AECOM

Client: HOUSING & DEVELOPMENT BOARD

Project Title :

CONTRACT L/025/21 SPECIALIST CONSULTANCY SERVICES FOR ENVIRONMENTAL IMPACT STUDIES (EIS) ON SOUTHERN TENGAH

Figure Title :

Map of different habitats identified in Southern Tengah Study Area and locations of sampling plots

Designed	Checked	Approved	Figure No. :	Rev.	Sheet
ZA	NHT	JAG	7-7	-	1 of 1
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7.3.1.1 Mixed Forest

This habitat type was encountered mostly along areas of higher terrain within the eastern portion of the Southern Tengah Study Area. The floristic assemblage of this forest type was similar to that of abandoned-land forest, with typically remnants of rubber plantation owing to the historical land use of the Study Area (refer to Section 7.2.1.1.1). However, a higher presence of native species was observed within this habitat type.

This habitat type stretches from north to south-west of the eastern portion of the Southern Tengah Study Area (see Figure 7-7, Figure 7-8B). At areas of higher terrain, the canopy stratum consists of para rubber (*Hevea brasiliensis*), *Acacia auriculiformis* and native species such as *Syzygium grande*. Within the higher terrain in the north-west of the eastern portion of the Study Area, there were clusters of Tempinis tree (*Streblus* elongatus), including both mature specimens and saplings (refer to Section 7.3.2). It was observed that this species was restricted within that region, not been found elsewhere within Southern Tengah.

Common native climber, *Smilax setosa,* was observed creeping on the forest floor and covering the forest canopy at certain areas of this habitat type. In certain areas at the northern portion of this vegetation type, few individuals of *Adinandra dumosa* were observed (see Figure 7-8A). The understorey consists of common secondary native forest species such as simpoh air (*Dillenia suffruticosa)*, fish-tail palm (*Caryota mitis)*, wild cinnamon (*Cinammomum iners)* and ivy palm (*Arthrophyllum diversifolium)*. Common native secondary forest species, such as *Champereia manillana,* were also commonly sighted in this vegetation type, occupying both the canopy and understorey strata of the forest. Some specimens were flowering and fruiting at the point of encounter.

At the lower terrain, fruit trees that were cultivated in the past such as jackfruit (*Artocarpus heterophyllus*), rambutan (*Nephelium lappaceum*) and Indonesian bay leaf (*Syzygium polyanthum*) were more of a common sight. Vulnerable species such as *Macaranga griffithiana* and *Oxyceros longiflorus* were also found in abundance within this habitat type (see Figure 7-8C).

A noteworthy observation was the presence of large *Dacryodes* cf. *costata* tree with girth measured to be approximately 2.7 m and up to 15 m in height. Saplings of this species were present within 5 m radius of the parent tree. This species is elaborated further in Section 7.3.2.1.

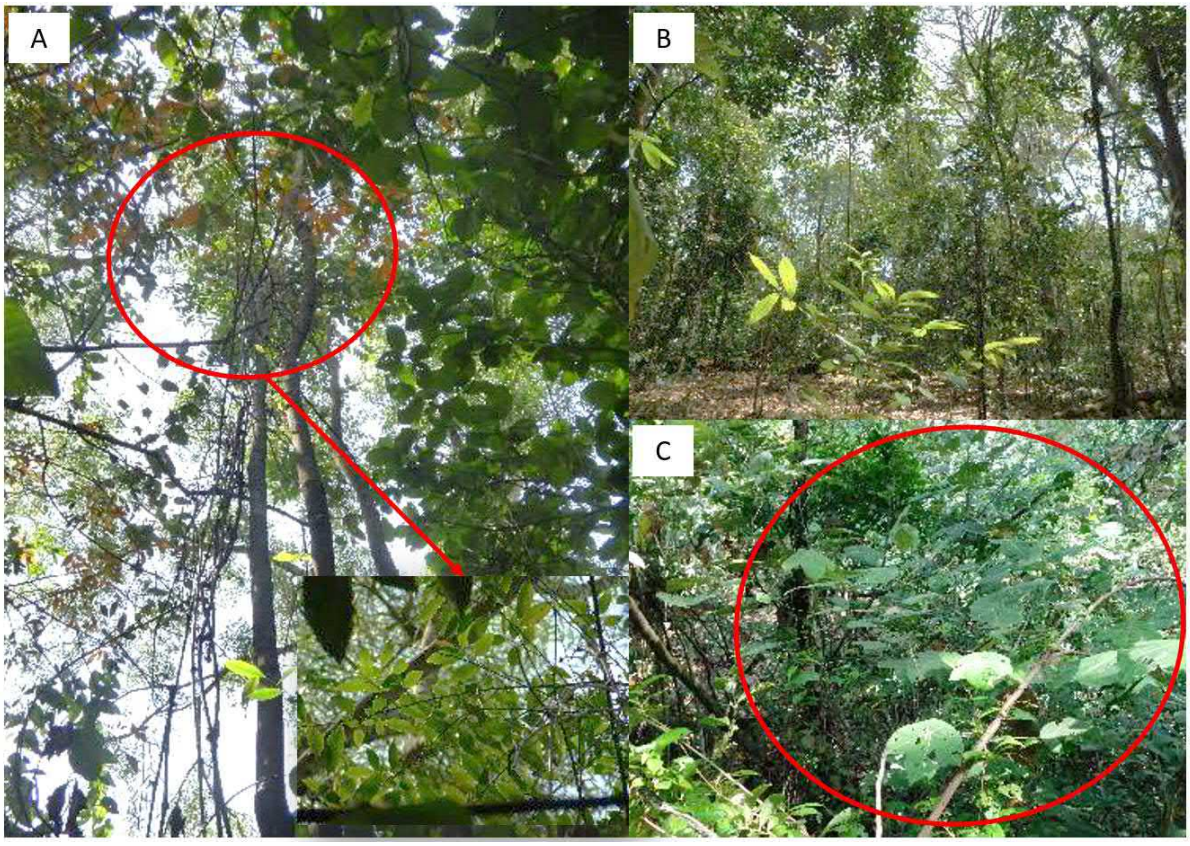


Figure 7-8 (A) Canopy stratum of mixed forest habitat type with specimens of *Adinandra dumosa* indicated by red circle; (B) Overall condition of the habitat type on the south-west of the eastern portion of Study Area; (C) Clusters of *Macaranga griffithiana* found within habitat type

7.3.1.2 Abandoned-land Forest

Abandoned-land forest that was identified within the Study Area is characterised by the presence of remnant mature fruit and crop trees, and/or ornamental plants left intact after the abandonment of previous plantations. For most areas within this habitat type, the canopy consists of para rubber (*Hevea brasiliensis;* see Figure 7-9A*)*, owing to the history of the Study Area which was once dominated by rubber plantation (refer to Section 7.2.1.1.1). Fruit trees that were cultivated in the past, such as jackfruit (*Artocarpus heterophyllus*), rambutan (*Nephelium lappaceum*) and mango (*Mangifera sp.)* have also interspersed within the canopy stratum. The understorey comprises of forest edge species such as simpoh air (*Dillenia suffruticosa*) and wild cinnamon (*Cinnamomum iners*). Vulnerable species, such as *Macaranga griffithiana* and *Oxyceros longiflorus,* were also found in abundance within this habitat type. There was sparse groundcover, mainly covered by layers of leaf litter and groundcovers, such as wild pepper (*Piper sarmentosum),* and saplings of *Syzygium grande* (see Figure 7-9B) and *Syzygium polyanthum* observed. Areas of this habitat type with concrete ground were observed within north-west of the eastern portion of the Study Area, owing to historical land use of the area. Within these areas, trees planted for ornamental purposes, such as *Tabebuia rosea* (see Figure 7-9C) and few large specimens of angsana (*Pterocarpus indicus*) were observed.

Over on the western portion of the Study Area, *T. rosea* dominated the canopy, along with its saplings and *C. iners* saplings recorded mostly in the understorey stratum. The vegetation type was categorised as abandoned-land forest for the following reasons: (1) *T. rosea* was introduced between 1975–1980 as an ornamental tree planted along roads as well as in parks [P-80], making up the sixth highest total number of individuals of a cultivated tree species in Singapore as of 2009 [P-79], (2) topographical maps dating back to 1975 indicate that land-use surrounding Study Area 2 comprised built-up areas (including for residential use) served by several roads, with bordering forested patches characterised as abandoned-land forests (formerly termed “sundry tree cultivation”; refer to Section 7.2.1.1.1). Hence, given Singapore’s greening history and land-use records of the area, the likelihood of *T. rosea* being widely planted as an ornamental in the vicinity is high, providing high

propagule pressure for dispersal into Study Area 2 over time, resulting in its establishment as the dominant species there.



Figure 7-9 (A) Canopy of this vegetation type dominated by para rubber (*Hevea brasiliensis*); (B) Saplings of *Syzygium grande* observed growing from the forest floor; (C) Area with concrete ground covered by leaf litter with *Tabebuia rosea* trees growing over the area, indicated by the red arrow

7.3.1.3 Waste Woodlands

Waste woodland usually comprises of exotic-dominated species that established itself on areas that were recently cleared. This vegetation type usually starts off as a scrubland that is dominated by sun-loving herbs and shrubs and in time, transforms into an exotic-dominated forest [P-60] In Southern Tengah, more native species were recorded than exotics from the sampling plots (see Table 7-3).

Generally, within this habitat type, exotic species such as African tulip (*Spathodea campanulata)* and albizia (*Falcataria moluccana)* with high propagule pressure makes up the canopy stratum. In certain areas, the canopy comprised of *S. campanulata* and *laping budak (Claoxlon indicum)* (see Figure 7-10A). Numerous native species such as sea almond (*Terminalia catappa)*, shrubby simpoh (*Dillenia suffruticosa)*, wild cinnamon (*Cinnamomum iners)* and variegated fig (*Ficus variegata)* can also be observed in the understorey stratum. It is not uncommon for specimens of fruit trees such as rambutan (*Nephelium lappaceum*) and mango (*Mangifera indica*) to be present within this vegetation type due to its close proximity to abandoned-land forest and farm areas.

The floristic composition of waste woodland differs slightly near the forest edges of eastern section of the Southern Tengah Study Area. On the eastern section, *S. campanulata* and acacia tree (*Acacia aurifuliformis)* interspersed with common native species, such as *Mallotus paniculatus,* and poison peach *Trema tomentosa* that are usually found along forest edges. These species make up the canopy stratum of this vegetation type. (see Figure 7-10B).

A cluster of river tarenna (*Tarenna fragrans)*, an Endangered species, was found within a patch of waste woodlands in the south-east of the Study Area. This species was only found in that area of the entire Southern Tengah. A

higher count of the Endangered *Ardisia elliptica* were also recorded within the site. These species are elaborated further in Section 7.3.2.1.



Figure 7-10 (A) Albizia (*Falcataria moluccana*; as indicated by the blue right arrow) and *Claoxylon indicum* (indicated by blue left arrow) takes up the canopy stratum of this habitat type; (B) Canopy of northern part of this habitat type is taken up by *Mallotus paniculatus*, indicated by red circle

7.3.1.4 Scrubland and Herbaceous Vegetation

This habitat type is typically made up of shrubs, climbing/creeping plants, and grasses as a result of any tree fall or recent land clearance which encourages the colonization of sun-loving herbaceous plants, resulting in formation of scrubland vegetation [P-60]. Over at the eastern portion of the Study Area, herbaceous species such as *Asystasia gangetica* subsp. *micrantha,* mile-a-minute weed (*Mikania micrantha*), elephant grass (*Pennisetum purpureum* (see Figure 7-11A), and native grass *Ottochloa nodosa* were recorded within this habitat type. *Dillenia suffruticosa* was also frequently seen in numerous areas that were of close proximity or within other spontaneous vegetation present in the Study Area.

In the northern section of the Study Area, this habitat type comprises of native species, such as resam (*Dicranopteris linearis*), *Melastoma malabathricum,* and *D. suffruticosa* (see Figure 7-11B). Exotics such as saplings of *Acacia mangium* from nearby waste woodland area were seen to have dispersed into the scrubland habitat. It was observed that this habitat type was wetter and often waterlogged after a period of heavy rain. This encourages the presence of grasses that are able tolerate the wet conditions, such as *Fimbristylis sp.*, *Brachiaria mutica,* and *Rhynchospora rubra* that were found in abundance across this habitat type. Other native species that favour such conditions, such as *Ploiarium elegans* and tembusu (*Cyrtophyllum fragrans*), were sparsely distributed across the habitat too.

Presence of the slender pitcher plant *(Nepenthes gracilis;* (see Figure 7-11C); and small clusters of common native bamboo orchids (*Arundina graminifolia:* see Figure 7-11D)) were also recorded within the area, as well as large clusters of native Vulnerable tree species, *Glochidion zeylanicum var. zeylanicum* (see Section 7.3.2.1).



Figure 7-11 (A) Scrubland dominated by elephant grass (Pennisetum purpureum); (B) Scrubland area consisting of *Dillenia suffruticosa* and resam (*Dicranopteris linearis*); (C) Slender pitcher plant (*Nepenthes gracilis*) and (D) bamboo orchid (*Arundina graminifolia*)

7.3.1.5 Managed Vegetation

This habitat type comprise of common roadside trees planted along the old Jurong road that is abutting the Pan-Island Expressway (PIE), such as rain tree (*Samanea saman*; see Figure 7-12A), angsana (*Pterocarpus indicus*) and yellow flame (*Peltophorum pterocarpum*). These large roadside trees were sparsely planted across large patches of turf areas that make up most of this habitat type. Rows of yellow flame (*Peltophorum pterocarpum*; see Figure 7-12B) were planted along the stretch of Bukit Batok Heavy Vehicle Carpark.



Figure 7-12 (A) Turf and raintree (*Samanea saman*) that constitutes this habitat type; (B) Rows of yellow flame (*Peltophorum pterocarpum*) planted beside Bukit Batok Heavy Vehicle Carpark

7.3.1.6 Farms

Numerous parts of the forest patch in the eastern part of Southern Tengah consisted areas with farming practices, with the largest patch observed in close proximity to Bukit Batok Heavy Vehicle Carpark. Some common plants planted are fruit trees and vegetables used for culinary and medicinal purposes (see Figure 7-13A). These farms appeared to be regularly maintained with few makeshift shelters erected within this habitat type (see Figure 7-13B). Although the floristic composition of this habitat type consists of mostly exotic species, species planted within the farm areas attracts different wildlife such as butterflies and bees.



Figure 7-13 (A) Vegetables planted within farm areas; (B) Makeshift shelters that was erected within farm areas

7.3.1.7 Waterbodies

A variety of waterbodies including streams/earth drains, pond and other ephemeral waterways are present within the EIS Study Area as discussed in Section 8. Amongst these waterbodies, two streams, one naturalised earth drain and one pond were identified for aquatic sampling (see Figure 7-14). These waterbodies are perennial in nature and the locations of these waterbodies are shown in Figure 7-7.

Ephemeral waterways can be found in multiple locations across the Study Area, often along the sides of tracks/roads or in channels within the forest (see Figure 7-7, Figure 7-14). These areas are mostly unshaded and poorly vegetation.



Figure 7-14 Waterbodies in the Study Area identified for aquatic sampling. (A) D2 stream, (B) stream located at upstream of D4 concrete drain, (C) D5 stream and (D) D6 pond

7.3.2 Floristic Field Findings

A total of 364 species and 5 species groups (i.e., plants that could not be identified to species with certainty) belonging to 109 families were recorded from the floristic surveys (Appendix D). The species group recorded consist of the following: (1) *Dacryodes* cf. *costata* (2) *Dalbergia* cf. *velutina* (3) *Ixora* sp., (4) *Luffa* sp. and (5) *Nothaphoebe* cf. *umbelliflora.*

Of all species recorded, 146 (39.67 %) are native, 176 (47.83 %) are exotic and 46 (12.5%) are cryptogenic, i.e., of unknown/uncertain origins. The status of three exotic species—*Lemna minor*, *Mucuna pruriens* and *Persicaria attenuate* — are unassessed but is reflected in the total tabulation of flora species below. As for the species group, only status of *Ixora* sp. were excluded in the tabulation in Table 7-4 as its status was undetermined.

The number of native threatened species makes up 14.2% (54 species) of total flora species count. For overall findings, a distinction is not made as to whether these threatened species are from native wild populations, or are cultivated locally and/or are relics from past cultivation. Species belonging to the latter category may therefore not be of conservation significance even though they have been accorded with a threatened conservation status. This is discussed in greater detail in Section 7.2.1.1.4 and Section 7.3.2.1.

Table 7-4 Tabulation of all species recorded in the Study Area alongside their status category

Origin	Status	Number of Species	Percentage (%)
Native		**146**	**39.67**
	Common	92	25.00
	Vulnerable	26	7.07

Origin	Status	Number of Species	Percentage (%)
	Endangered	12	3.26
	Critically Endangered	14	3.80
	Extinct	1	0.27
	Presumed Extinct; Re-discovered	1	0.27
Exotic		**176**	**47.83**
	Casual	34	9.24
	Naturalised	82	22.28
	Unassessed	3	0.82
	Cultivated Only	57	15.49
Cryptogenic		**46**	**12.50**
Total		**368**	**100.00**

7.3.2.1 Species of Conservation Significance

Of the 54 threatened native species, only 33 species were considered as species of conservation significance (Section 7.2.1.1.4**;** Table 7-5**;** Appendix E). Some species were considered of conservation significance even though they are/had been seen cultivated in high numbers in recent years across Singapore, such *as Alsophila latebrosa* and *Planchonella obovata.* For cases such as the latter, a conservative approach was taken during the assessment to consider these species as species of conservation significance.

Overall, a higher concentration of conservation significance was observed to be in the eastern portion of the Study Area (see Figure 7-15). A higher count of specimens of conservation significance (315 clusters/individuals) were recorded in waste woodland habitat within the Study Area (Table 7-6). However, abandoned-land forest had the highest species richness of species of conservation significance (25 species) when compared against all habitat types despite being comparatively smaller in size (Table 7-6). This includes the re-discovery of nationally Presumed Extinct fern, *Asplenium nitidum*, that was found in a small patch of forest in the northern portion of the Study Area. The distribution of all species of conservation significance are reflected in Figure 7-15.

Table 7-5 Breakdown of threatened plant species and those regarded as species of conservation significance

Species Conservation Status*	VU	EN	CR	EX	Total
Non-cultivated Threatened Species	19	8	8	1	36
Cultivated Threatened Species	7	4	6	1	18

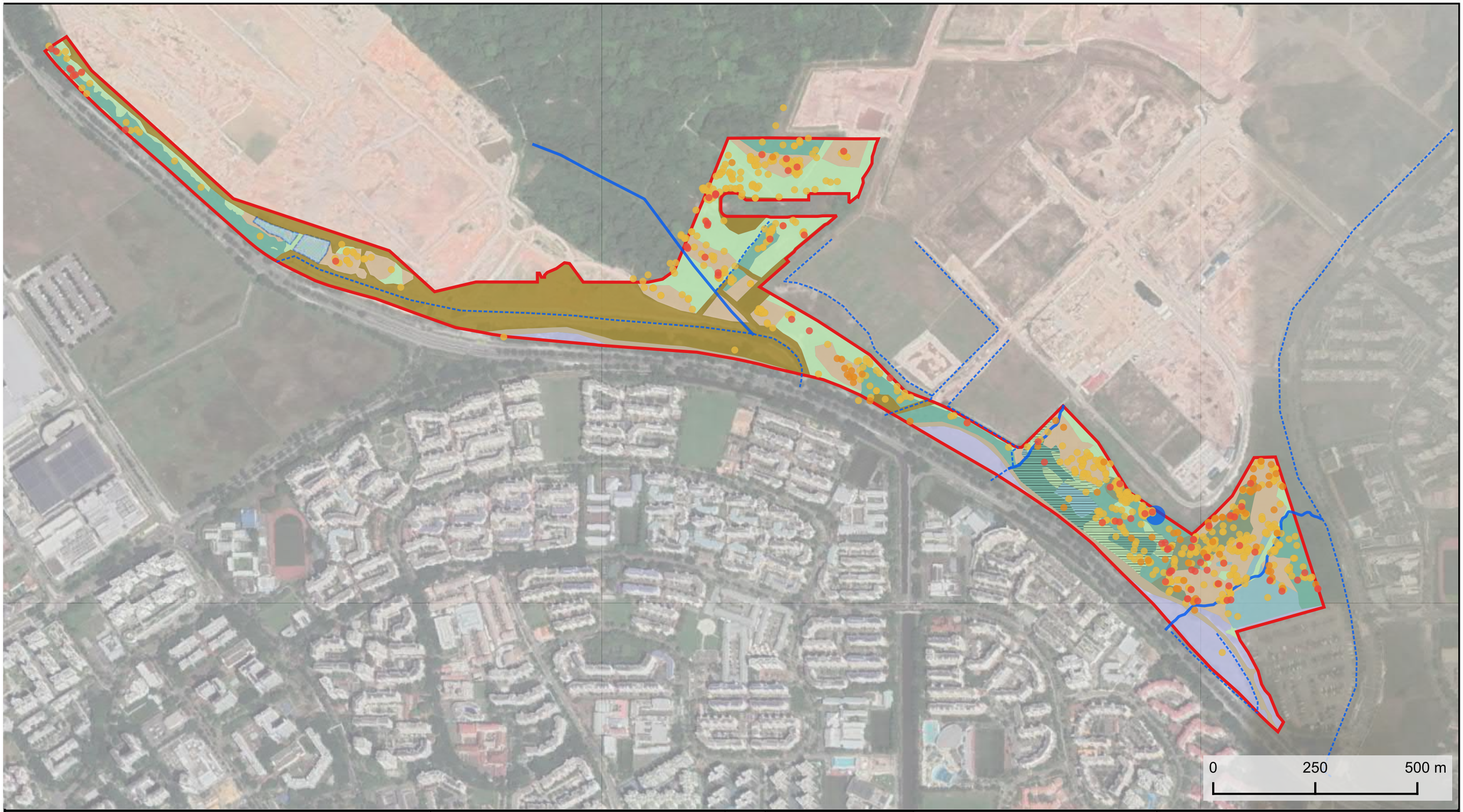
Note: VU – Vulnerable; EN – Endangered; CR – Critically Endangered; EX – Presumed Extinct (non-cultivated threatened species indicate a re-discovery)

Table 7-6 Number of plant specimens and species of conservation significance in each vegetation type In Southern Tengah

Vegetation Type	Number of Individuals and Clusters					Number of Species				
	VU	EN	CR	EX	Total	VU	EN	CR	EX	*Total
Abandoned-land Forest	138	2	18	1	**159**	14	5	5	1	**25**
Waste Woodland	250	37	28	-	**315**	9	4	5	0	**18**

Vegetation Type	Number of Individuals and Clusters					Number of Species				
	VU	EN	CR	EX	Total	VU	EN	CR	EX	*Total
Scrubland and Herbaceous Vegetation	146	8	21	-	**175**	8	2	4	0	**14**
Mixed Forest	104	19	14	-	**137**	7	4	4	0	**15**
Managed vegetation	2	0	0	-	**3**	2	0	0	0	**2**
Farm	15	3	3	-	**21**	4	2	2	0	**8**

*Total species richness is not the sum of species richness per vegetation type as some species occur in more than one vegetation type.



Legend

- Southern Tengah Study Area
- Scrubland and herbaceous vegetation
- Abandoned-land forest
- Waste woodland
- Mixed forest
- Managed vegetation
- Farm
- Others (Infrastructure)
- Construction
- Concreted Area
- Waterlogged Area (Ephemeral)
- Stream (Perennial)
- Drain
- Pond

Species of Conservation Significance

- Critically Endangered
- Endangered
- Vulnerable

N

Rev.	Date	By	Description	Chk'd	App'd
02	OCT 2021	ZA	Final Report	NHT	JAG
-	OCT 2021	ZA	Final Report	NHT	JAG

Qualified Person Endorsement : NA

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Project Title :

CONTRACT L/025/21 SPECIALIST CONSULTANCY SERVICES FOR ENVIRONMENTAL IMPACT STUDIES (EIS) ON SOUTHERN TENGAH

Figure Title :

Location of all plant species of conservation significance within the Study Area

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ZA	NHT	JAG	7-15	02	1 of 1
	Drawn ZA	Date OCT 2021	CAD File Name : NA		A3

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The *Asplenium nitidum* fern specimen was encountered on 7 April 2021 (See Figure 7-16A). It was growing on a fallen log along with other epiphytes, in a small patch of forest that was partially shaded located in the northern portion of the Study Area.

The fern was of good health and some spores were observed on the fronds below (see Figure 7-16B). The frond specimen of the fern was collected to verify the identification with Singapore Herbarium (SING) to verify its identification, which was confirmed by SING.

This species is listed as nationally Extinct in Davison et al. (2008), Chong et al. (2009), and Ho et al. (2019). Three specimens catalogued in the Singapore Herbarium date all the way back to the 19th century, where specimens were collected between 1906 and 1907. Thereafter, no voucher specimens were collected until about a century later, in 2012, where one specimen was collected from Jalan Jelutong at Pulau Ubin. A checklist of vascular plants on Pulau Ubin published by the NParks in 2014 listed this species, but there were no details about its population size in the account. This species may have been under-detected and thus thought to be nationally extinct.

The re-discovery of this species suggests that the population may still be persisting on mainland Singapore. More studies on this species are needed to assess and determine its national conservation status as well as to put in place measures to conserve it as part of our natural heritage.

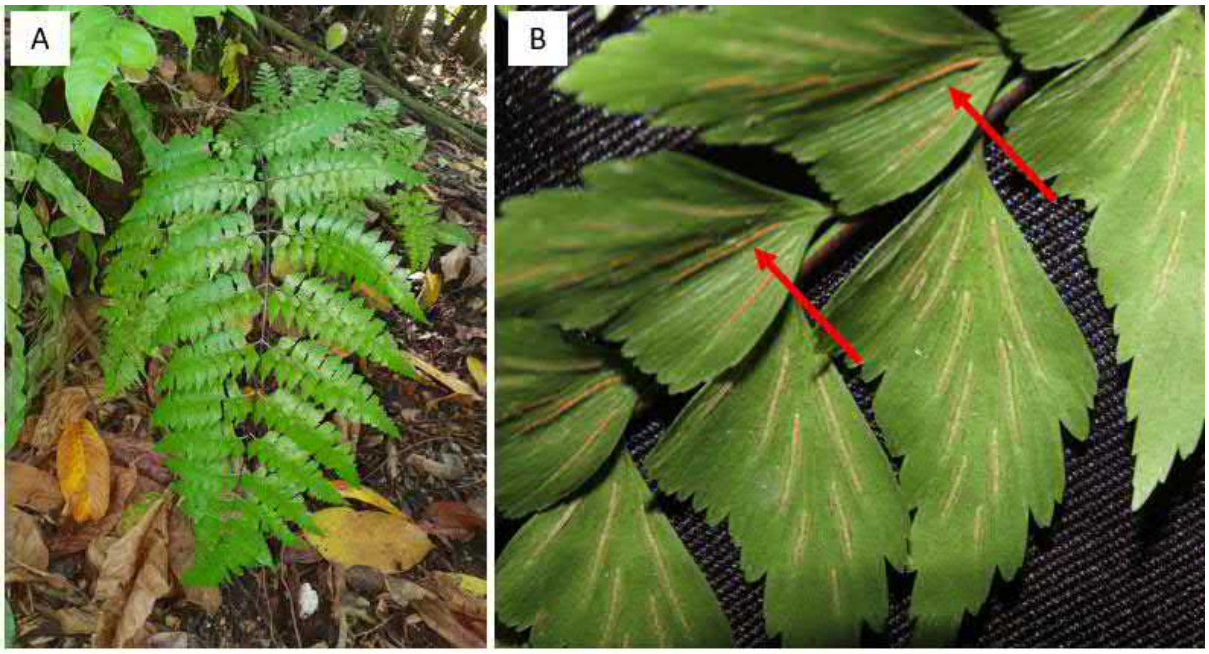


Figure 7-16 (A) Specimen of *Asplenium nitidum* growing on a fallen log; (B) Sporangia of the fern (indicated by the red arrow) found at the underside of the fronds

Altogether, eight species listed as Critically Endangered are considered of conservation significance in this study (Table 7-6). Some of the rarer ones are *Dalbergia* cf. *velutina* (Figure 7-17A), *Fuirena ciliaris* (Figure 7-17B), and *Ficus stricta* (Figure 7-18). Two Critically Endangered species known to be cultivated in some local nurseries according to Chong et al. (2009), but are considered of conservation significance are (1) *Centotheca lappacea* and (2) *Cissus repens*.

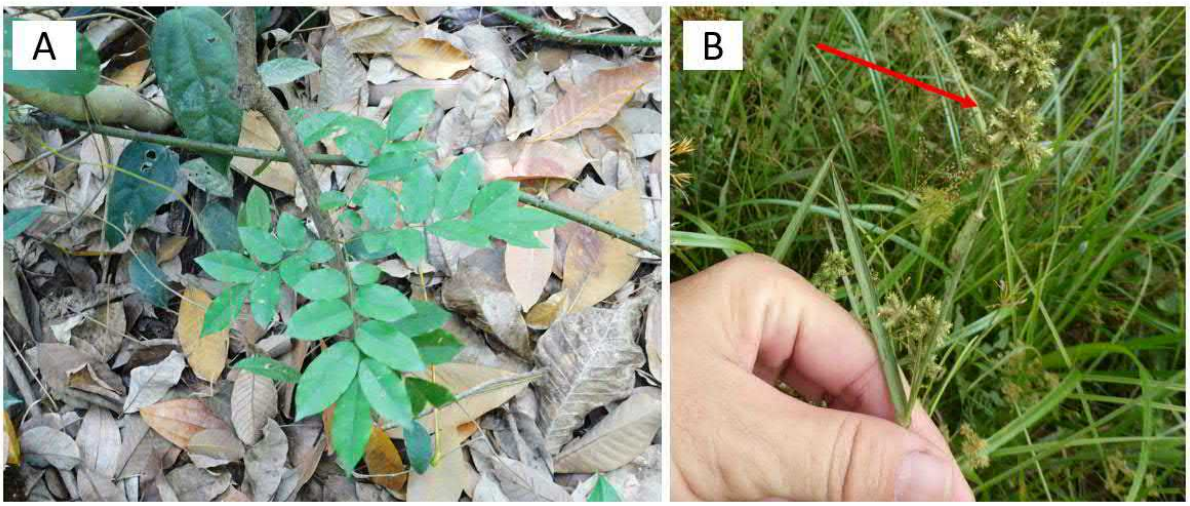


Figure 7-17 Specimens of nationally Critically Endangered species: (A) *Dalbergia* cf. *velutina* and (B) *Fuirena ciliaris*

Ficus stricta was recognised as a notable record in Southern Tengah and considered to be a rare species in Singapore, of which sizable reproductive individuals were recorded in Changi and Pulau Ubin. Previously listed as 'Exotic' in Chong et al. (2010), its status has since then, been revised to 'Critically Endangered' [P-10; P-63]. Specimens were only collected and deposited to SING in 2004. As a result, the species is poorly represented in herbarium collections [P-63]. To date, this species is represented in Singapore by fewer than twenty sizable individuals which pushes the urgency to conserve this species.

Three mature specimens of this species of more than 1 m spread were recorded; two specimens of 1.7 m and 1.9 m spread respectively, were growing over a concreted ground on a scrubland area (Figure 7-18A; Figure 7-25) and one specimen of 2.8 m spread, was located on a hilly terrain of waste woodland patch at the eastern portion of Southern Tengah (see Figure 7-25). The latter was observed to be fruiting during the point of encounter (see Figure 7-18B). This fig seldom fruits, sometimes not for six years [W-22]. Upon one glance, the vegetative specimen could easily be mistaken for another *Ficus* species, *F. benjamina,* which might be the reason to why it has often been overlooked in the past.

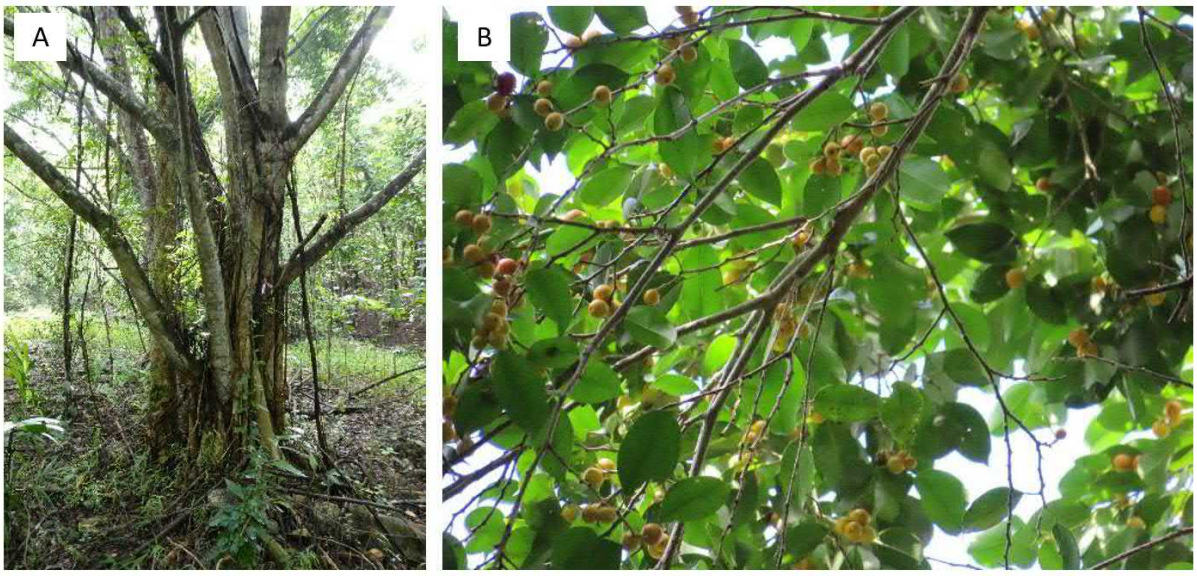


Figure 7-18 Specimen of *Ficus stricta* growing on concrete ground; (B) Fruits observed on one of the specimens recorded in Southern Tengah

Eight out of 12 species recorded as nationally Endangered are considered of conservation significance in this study. A few notable species of interest include *Dacryodes* cf. *costata* (see Figure 7-19B), and *Tarenna fragrans* (see

Figure 7-21). Although *T. fragrans* are known to be cultivated in local nurseries and/or sold commercially, the specimens encountered are almost certainly from native genetic stocks. Considering the growth form of the specimens and the locality of where these specimens were found, they were most likely of local provenance and might have been brought in by birds as they are the main source of pollinator and disperser of the seeds of its berry-like fruits [W-23].

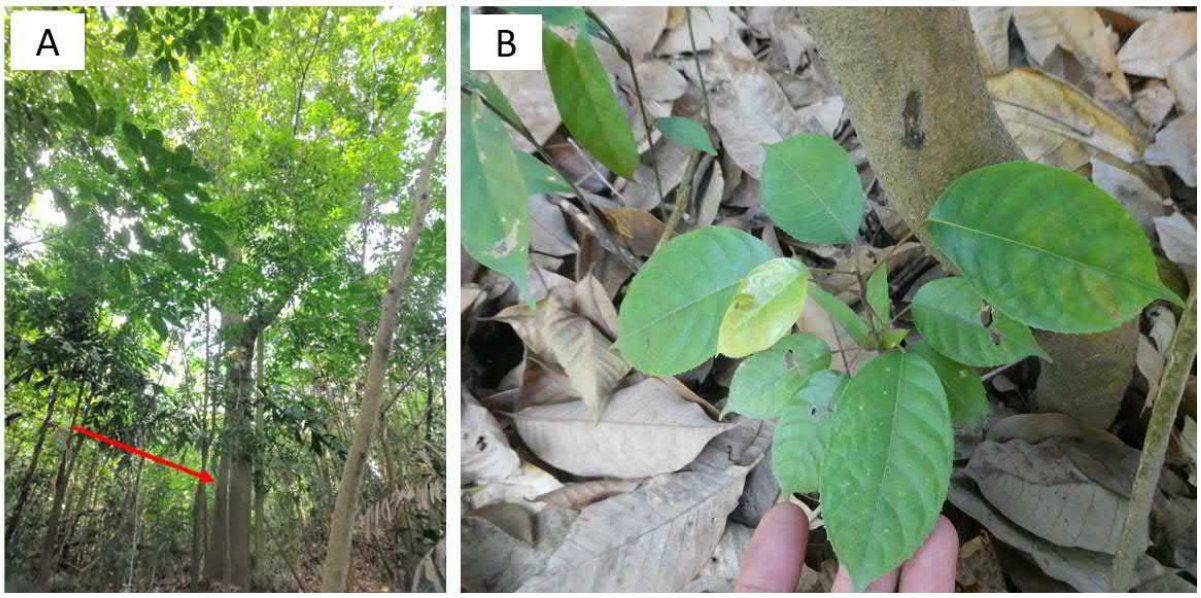


Figure 7-19 (A) Tree specimen of Dacryodes cf. costata (TE3943) and (B) its sapling of less than 0.05m girth recorded in proximity

Two large specimens of *Dacryodes* cf. *costata* (TE3493 and TE4061) were recorded within the Study Area (See Figure 7-25). TE3493 that was measured to be of 2.7 m girth size and a height of 15 m, was located in the mixed forest habitat on the eastern portion of the Study Area (see Figure 7-19A). Saplings of girth measure to be < 0.05 - 0.1 m were also seen within the proximity Figure 7-19B, indicating that this species was actively recruiting. The second specimen (TE4061) was recorded to be of 1.1 m girth and a height of 15 m was located in a patch of abandoned-land forest beside Jurong Road. Records of this species are considered significant and rare as this nationally Endangered species are only found within restricted forest patches in the remaining primary forest in Bukit Timah Nature Reserve (BTNR) and Nee Soon Swamp Forest (NSSF) [P-9].

Specimens of this species had characteristics consistent with those listed in Chong et al. (2019) [P-9], such as strongly flattened leaf stalks at the base (Figure 7-20A) which is distinctly pubescent (i.e., covered by layers of thin hair) (Figure 7-20B). The leaves and trunk also emit a strong mango or turpentine-like fragrant upon being crushed or scraped, typical to the characteristics of a Burseraceae species [P-28]. This specimen was unable to be identified with certainty as it was not flowering or fruiting during the point of encounter.

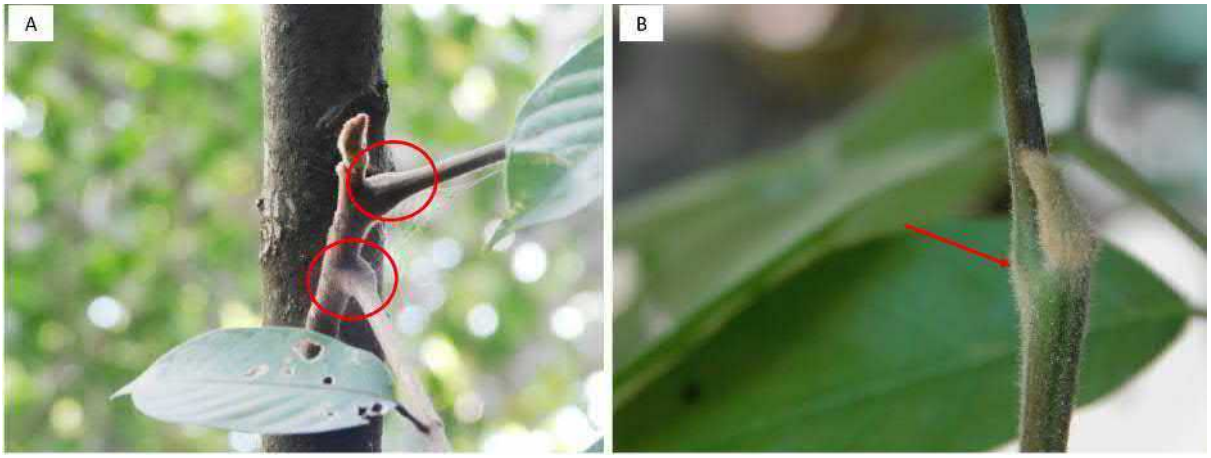


Figure 7-20 (A) Strongly flattened leaf base indicated by the red circles; (B) distinct layer of hairs (pubescent) on the leaf base and leaf stalk, indicated by the red arrow

Clusters of the nationally Endangered *Tarenna fragrans* were encountered in small patch of waste woodland habitat in the southern portion of the Study Area (see Figure 7-25). Besides the area mentioned, no other records of this species were recorded within Southern Tengah. At the point of encounter, some specimens were blooming and fruiting (see Figure 7-21). This species is considered to be one of the attractive-looking native species that can be found in Singapore as it produces inflorescences that changes its colour upon maturity and produces a sweet fragrance [W-21].



Figure 7-21 (A) Inflorescence of one of the specimens of *Tarenna fragrans*; (B) Unriped fruits of a specimen

Nineteen nationally Vulnerable species recorded in the Study Area are considered of conservation significance. Some of these were common encountered throughout the Study Area, such as *Bridelia stipularis, Oxyceros longiflorus and Macaranga griffithiana*. A few notable species that were recorded in large clusters are *Glochidion zeylanicum* var. *zeylanicum* and *Streblus elongatus* (see Figure 7-25).

Clusters of mature specimens of Vulnerable species, *Glochidion zeylanicum* var. *zeylanicum,* with girth sizes that ranges from 0.3 m - 1.5 m, were observed at the northern portion of the Study Area (Figure 7-22; Figure 7-25). Saplings of this tree were also found scattered around within the proximity of the parent tree which indicates active recruitment of this species. The presence of a large population of this species supports the presence of the rare Malay staff sergeant butterfly (*Athyma reta moorei*) observed during the faunal survey given that it is the host plant for this butterfly species (see Section 7.3.3.5). Large clusters of this species were also recorded in the EIS for Tengah Town development. This indicates that the Tengah forest could be a stronghold for this species.



Figure 7-22 Clusters of *Glochidion zeylanicum* var. *zeylanicum*

Clusters of nationally Vulnerable *Streblus elongatus* were encountered in the small patch of mixed forest habitat on a hilly terrain within the Study Area (see Figure 7-25). Approximately thirty-seven trees of this species were tagged, although the actual number of species present was expected to be higher. Specimens with girth sizes that ranged from 0.3 - 1.9 m were recorded in close proximity to each other, owing to the presence of a parent tree within the area.



Figure 7-23 (A) Patch of mixed forest habitat where specimens of *Streblus elongatus* were recorded. Presence of mother tree indicated by the red arrow; (B) A mature specimen of *Streblus elongatus* with a recorded girth of 1.9m and 16m height

Based on the Google Earth Historical Satellite Imagery from the year 2001 to the present date, the mixed forest habitat remained undisturbed despite the land development that had occurred within the areas on the lower terrain (see Figure 7-24A) [O-3]. It is possible that this species could have also been dispersed to the north of the forest

patch in the past. However, the area has since then been cleared for HDB's Phase 1 Earthworks (see Figure 7-24B).

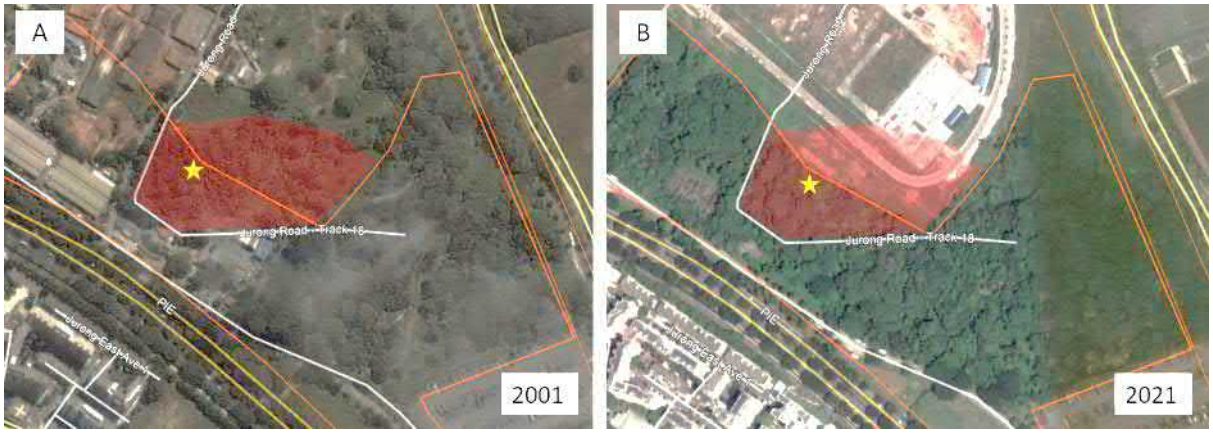


Figure 7-24 (A) Satellite imagery in 2001 shows that the mixed forest habitat remained undisturbed (red region). Location of clusters of *Streblus elongatus* indicate by the yellow star; (B) Northern portion of the forest patch cleared for HDB's Phase 1 Earthworks

S. elongatus holds a historical and cultural value in Singapore. It is also known as 'Tempinis tree' and were recorded to be abundant in many regions of Singapore in the past, especially in the East, as it was harvested for its strong and durable timber properties. This has led to the decrease in its population over the years. It occurs locally in Bukit Timah Nature Reserve, Central Catchment Nature Reserve, Pulau Tekong, Pulau Ubin, and Sentosa Island [W-25].

0 250 500 750 m

Legend

- Southern Tengah Study Area
- Scrubland and herbaceous vegetation
- Abandoned-land forest
- Waste woodland
- Mixed forest
- Managed vegetation
- Farm
- Others (Infrastructure)
- Construction
- Concreted Area
- Waterlogged Area (Ephemeral)
- Stream (Perennial)
- Drain
- Pond

Species of Conservation Significance

- Ficus Stricta (CR)
- Dacryodes cf. costata (EN)
- Tarenna fragrans (EN)
- Glochidion zeylanicum (VU)
- Streblus elongatus (VU)

N

Rev.	Date	By	Description	Chk'd	App'd
02	OCT 2021	ZA	Final Report	NHT	JAG
-	OCT 2021	ZA	Final Report	NHT	JAG

Qualified Person Endorsement : NA

HDB Endorsement : NA

Consultant : AECOM

Client: HOUSING & DEVELOPMENT BOARD

Project Title :

CONTRACT L/025/21 SPECIALIST CONSULTANCY SERVICES FOR ENVIRONMENTAL IMPACT STUDIES (EIS) ON SOUTHERN TENGAH

Figure Title :

Locations of all notable clusters/ individuals of species of conservation significance

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ZA	NHT	JAG	7-25	02	1 of 1
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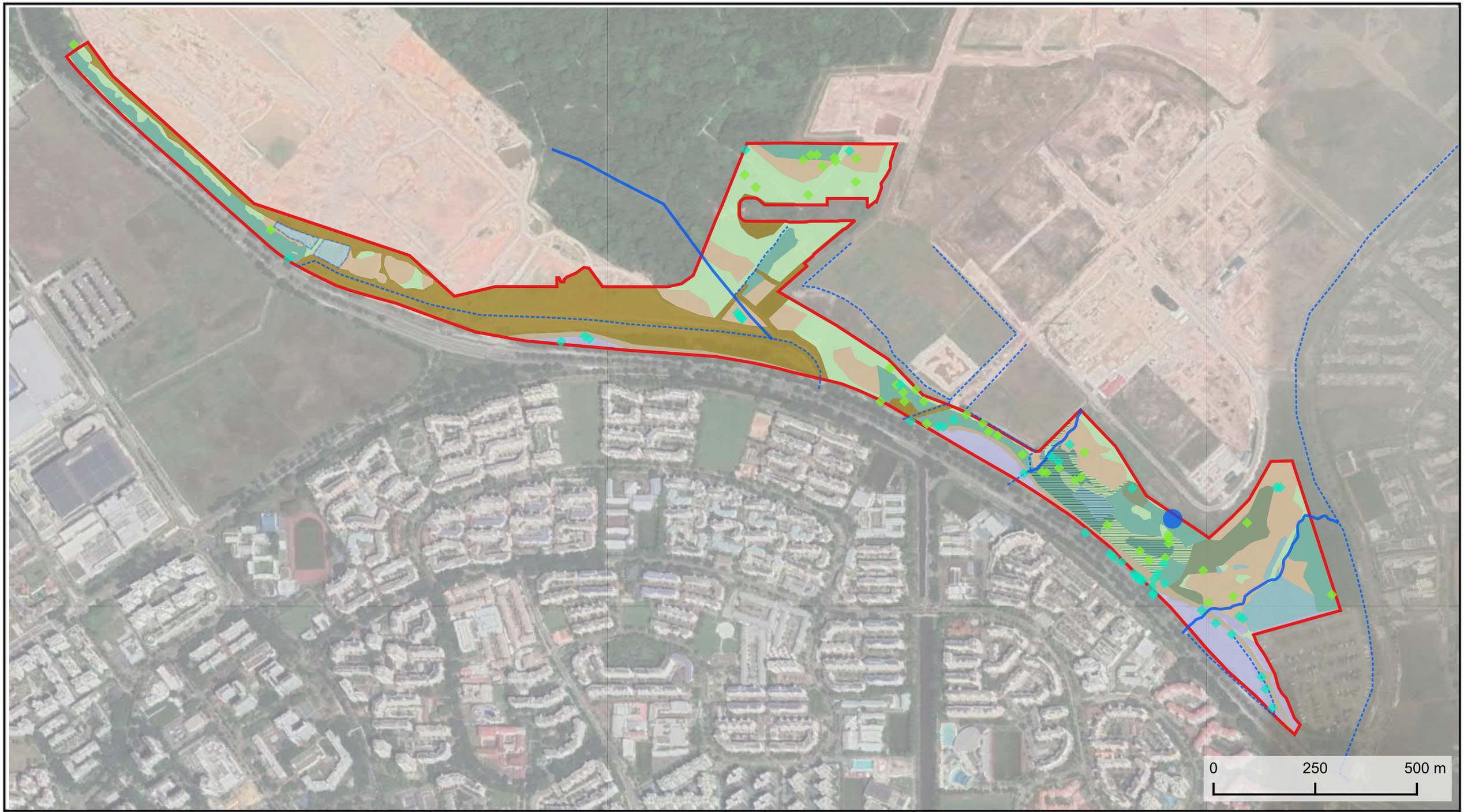
7.3.2.2 Large Plant Specimens

A total of 90 large specimens were encountered in the Study Area (Figure 7-26; Table 7-7; Appendix F). Of these, 46 are trees and 44 are stranglers. They were found distributed mostly around the eastern and northern portion of the Study Area within abandoned-land forest and managed vegetation habitat types. With 40 individuals found, Malayan banyan (*Ficus microcarpa*) makes up the majority of large specimens found. The second most abundant large specimen species found is the common roadside tree, angsana (*Pterocarpus indicus*) with 21 individuals observed. The largest specimen recorded is *Ficus microcarpa* with a spread of 25m and height of 16m.

Large plant specimen is highly valuable as they provide a myriad of environmental and ecological service such as regulating microclimates of the forest, influence hydrological processes and storing large amount of carbon [P-5]. Volant and arboreal fauna species usually depend on large specimens to shelter them against predators.

Table 7-7 Type and species of large specimens recorded, accompanied by their origin, status and count of individuals of each species

Habit	Tree Species	Origin	Status	No. of Specimens
Stranglers	*Ficus benjamina*	Cryptogenic	-	3
	Ficus elastica	Exotic	Casual	1
	Ficus microcarpa	Native	Common	**40**
Trees	*Khaya senegalensis*	Exotic	Casual	12
	Peltophorum pterocarpum	Native	Critically Endangered	2
	Pterocarpus indicus	Exotic	Casual	**21**
	Samanea saman	Exotic	Casual	8
	Syzygium grande	Native	Common	1
	Tabebuia rosea	Exotic	Common	1
	Terminalia catappa	Native	Common	1
	Total			**90**



Legend

- Southern Tengah Study Area
- Scrubland and herbaceous vegetation
- Abandoned-land forest
- Waste woodland
- Mixed forest
- Managed vegetation
- Farm
- Others (Infrastructure)
- Construction
- Concreted Area
- Waterlogged Area (Ephemeral)
- Stream (Perennial)
- Drain
- Pond

Large Specimens

- Stranglers
- Trees

N

Rev.	Date	By	Description	Chk'd	App'd
-	OCT 2021	ZA	Final Report	NHT	JAG

Qualified Person Endorsement : NA

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Project Title :

CONTRACT L/025/21 SPECIALIST CONSULTANCY SERVICES FOR ENVIRONMENTAL IMPACT STUDIES (EIS) ON SOUTHERN TENGAH

Figure Title :

Distribution of large specimens in the Study Area

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	Drawn ZA	Date OCT 2021	CAD File Name : NA		A3

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7.3.2.3 Other Specimens of Value

Other specimens of values recorded at Tengah includes an albizia (*Falcataria moluccana*) in the western portion that was observed to have one raptor nest (see Figure 7-27). Based on recent study executed in that area, it was recorded to be nest for a changeable hawk eagle (*Nisaetus cirrhatus*; refer to Section 7.3.3.10). The tree girth of the albizia tree is 3.3m with a heigh of 25m. Exact location of the tree was taken and reflected in Figure 7-28.



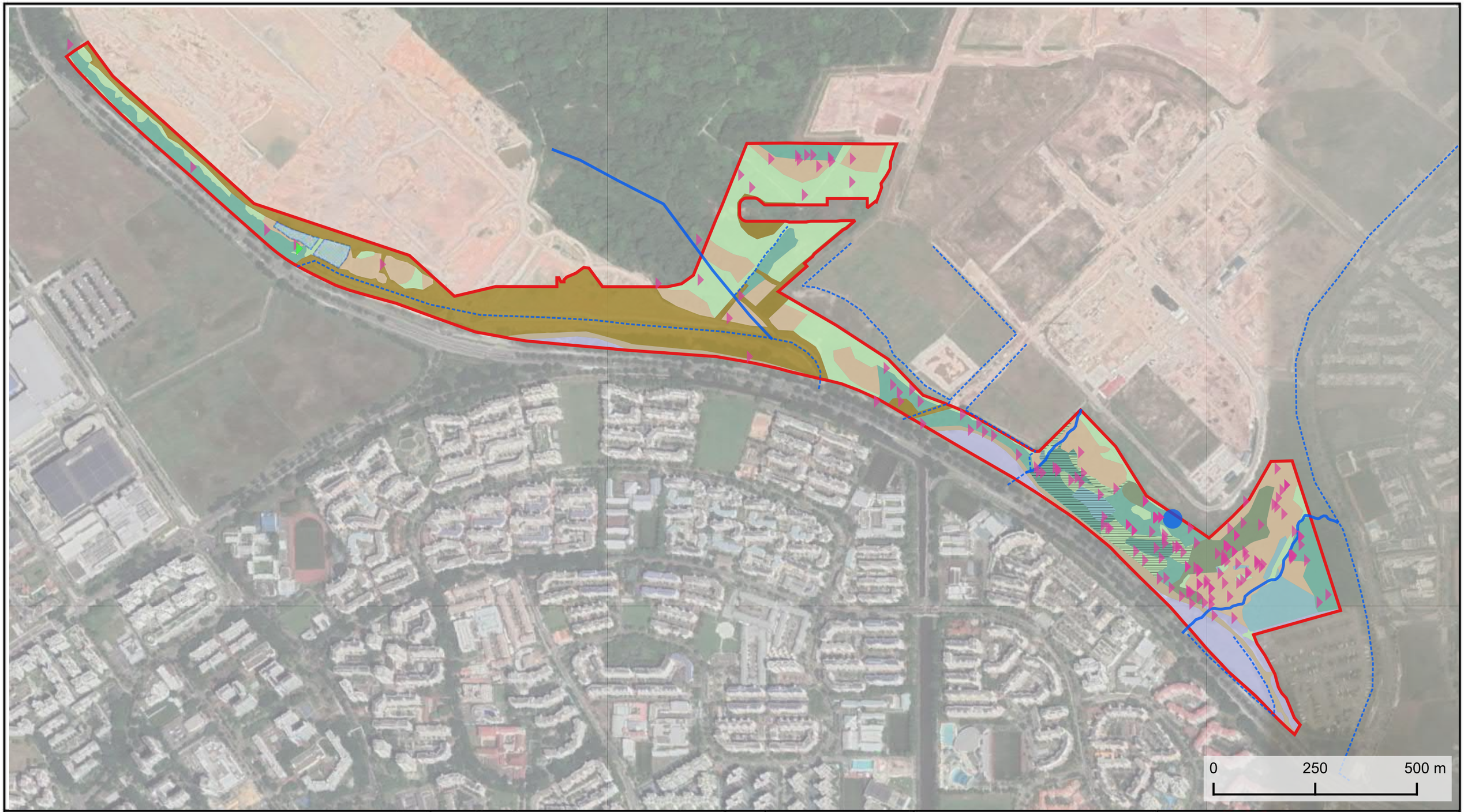
Figure 7-27 Nest of changeable hawk eagle (*Nisaetus cirrhatus*) on a specimen of albizia (*Falcataria moluccana*)

7.3.2.4 Keystone Species

In most tropical rainforest in the South-east Asia region, *Ficus* species or also known as figs, are known to be a keystone species (refer to Section 7.2.1.2.2.2). Monoecious figs (i.e., species that bear both male and female reproductive organs within the same individual), are able to produce fruits all year round. This makes figs an important food source for many frugivores, especially during the time of the year where no other fruits are available [P-39; P-36]. Dioecious figs are also important as they provide food for numerous avian insectivores that feeds on fig wasps. According to Mills et al. (1993), keystone species are essential, and the removal of these species would most likely cause an extirpation of dependant animals such as pollinators and seed dispersers [P-39].

Majority of the keystone species were concentrated over at the eastern portion of Southern Tengah (see Figure 7-28). Approximately 50% of the trees that were captured during the tree mapping survey (excluding the roadside trees), were figs. Ten fig species were recorded during the floristic survey, of which two were considered to be threatened species (see Appendix G). Figure 7-28 reflects the distributions of keystone species within the Study Area, of which shows that there was higher concentration of figs recorded in the eastern portion.

The rapid increase of urban development around and within Tengah Forest would mean that the keystone species would play a vital role in providing food for the fauna community within the region. The continued existence of these keystone species helps to encourage the recruitment and population growth of native frugivores from neighbouring forest reserves and those that are already found in the urban areas [P-36].



Legend

- Southern Tengah Study Area
- Scrubland and herbaceous vegetation
- Abandoned-land forest
- Waste woodland
- Mixed forest
- Managed vegetation
- Farm
- Others (Infrastructure)
- Construction
- Concreted Area
- Waterlogged Area (Ephemeral)
- Stream (Perennial)
- Drain
- Pond
- Keystone species (Ficus spp.)
- Raptor nest

N

Rev.	Date	By	Description	Chk'd	App'd
-	OCT 2021		Final Report	NHT	JAG

Qualified Person Endorsement : NA

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CONTRACT L/025/21 SPECIALIST CONSULTANCY SERVICES FOR ENVIRONMENTAL IMPACT STUDIES (EIS) ON SOUTHERN TENGAH

Figure Title :

Distribution of other specimens of value and keystone species (Ficus spp.) in the Study Area

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7.3.2.5 Tree Mapping

A total of 1,294 specimens belonging to 52 species and 5 species groups were tagged and recorded during tree mapping survey (Appendix H; Section 7.2.1.2.2.3). Fourteen specimens represented by five species group could not be identified with certainty due to reasons such as tall height and obscured view of the tree crown due forest canopy or little foliage, or lack of the presence of reproductive specimens. Altogether, all species belong to 23 families.

As some specimens occur in clusters, i.e., within 1 – 2 m of each other, they were recorded under the same tree tag and only one specimen was tagged. Majority of these trees are found in the eastern portion of Southern Tengah Study Area. Around 60.7% (786) of these trees are native specimens while the remaining percentage of specimens are exotic and/or cryptogenic.

Tebebuia rosea, *Macaranga griffithiana,* para rubber *(Hevea brasiliensis)*, yellow flame (*Peltophorum pterocarpum*) and wild cinnamon (*Cinnamomum iners*) trees make up majority (> 50%) of all the specimens recorded during tree mapping surveys in descending order. Two hundred and ninety specimens belong to ten species of conservation significance, namely, *Dacryodes* cf. *costata*, *Ficus stricta, Ficus vasculosa, Glochidion zeylanicum* var. *zeylanicum, Macaranga griffithiana*, *Melicope lunu-ankenda*, *Melicope* cf. *lunu-ankenda*, *Planchonella obovata, Streblus elongatus* and *Symplocos fasciculata*. Majority of these specimens (160 specimens; 55.6%) were *Macaranga griffithiana* that had a girth range of 0.3 m – 2.8 m.

7.3.2.6 Community Data Results

Species accumulation curves (SAC) were plotted using data on floristic diversity from the vegetation plots (see Figure 7-29). Species richness was plotted against sample coverage, as opposed to survey effort, to estimate sample completeness/ survey adequacy, i.e., how extensively we have sampled the species in the community.

Majority of the plant species recorded in the Study Area were captured via vegetation plot sampling alone (see Figure 7-29). Sample coverage, which refers to the proportion of the total number of species in the community belong to those represented in the vegetation plots [P-8], was 85.2%. Upon extrapolation, i.e., sample sizes were theoretically doubled using the statistical programme, sample coverage increases to 92.2% and species richness increases to 268.46 (the 95% confidence interval is between 216.05 and 366.63). This implies that even with increased survey effort (vegetation plot sampling), a small proportion of plant species in the community, i.e., around 8%, will remain undetected in the vegetation plots.

The Chao estimator was used to predict total number of species in the species pool in each Study Area. Using the ‘ChaoRichness’ function in the iNEXT 2.0.20 package [O-2], total species richness of the entire Study Area was estimated to be 268.46 ± 36.95 (standard error). The 95% confidence interval is between 216.05 and 366.63.

In this study, the total species richness observed during the floristic survey was 366 (see Table 7-3). This proportion of the number of observed species, out of the (higher bound) predicted total number of species (367, to the nearest integer) is 99.7%, which falls within the 95% confidence interval for total species richness estimated using the Chao estimator. The remaining 0.3% is attributed to the fact that species undetected or absent in the vegetation plots were encountered during general floristic surveys. Therefore, comparatively, the combined survey efforts of general floristic surveys and vegetation plot sampling in this present study were adequate in documenting floristic composition of the plant community in the Study Area.

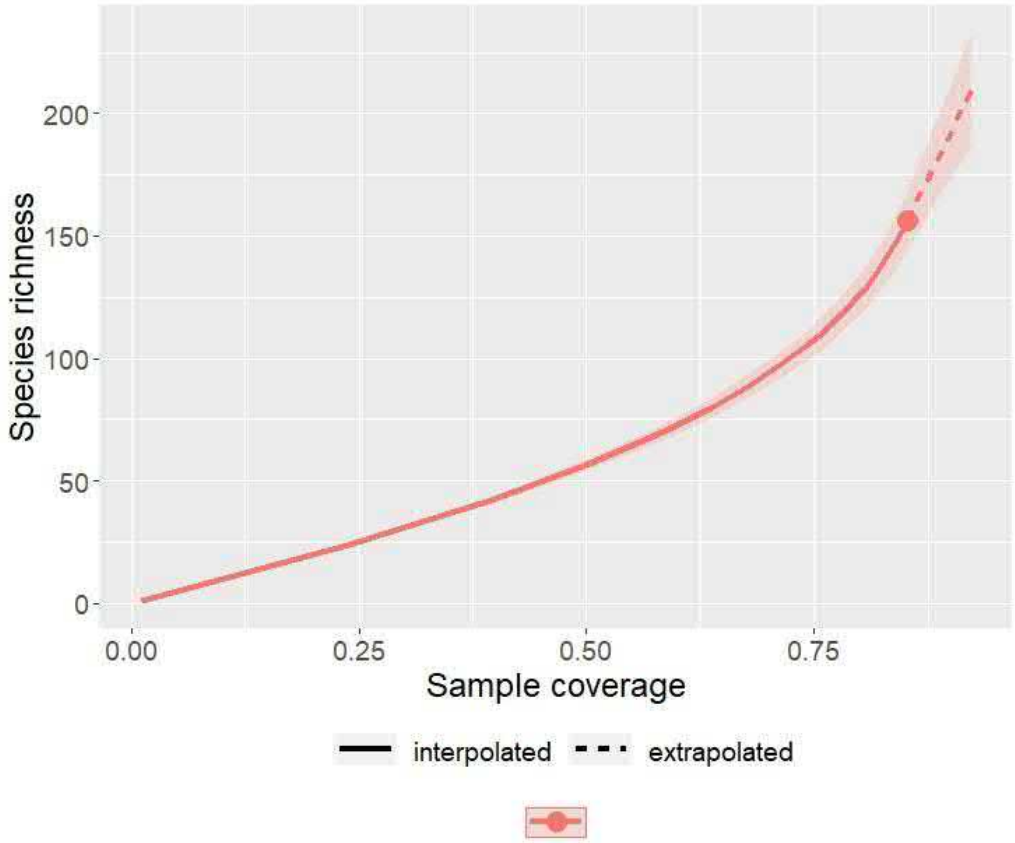


Figure 7-29 Coverage-based sampling curve using data from twenty-five 10 × 10 m vegetation plots

The NMDS ordination shows that vegetation plots representing abandoned-land forest, waste woodland and mixed forest are floristically similar. Scrubland and herbaceous vegetation was the most distinct among the four habitat types, as indicated by the non-overlapping polygons (see Figure 7-30). Results of the PERMANOVA using Bray–Curtis distance as a measure of dissimilarity indicates that floristic community of scrubland and herbaceous vegetation is statistically different from the others (pseudo-*F* = 5.2348, *p*-value = 0.001) (see Table 7-8).

Scrubland and herbaceous vegetation had the highest species richness compared to other habitat types, with a recorded species richness of 111 (see Table 7-3). Within the floristic assemblage of this vegetation type, more than half (65 out of 111; 58.6%) are exotic species. Most species are capable of adapting to wet conditions (See Section 7.3.1). Species of conservation significance such as nationally Vulnerable *Glochidion zeylanicum var. zeylanicum* and *Macaranga griffithiana* were recorded during the executing of sampling plots. It is also a habitat where wild population of Common native species such as slender pitcher plant (*Nepenthes gracilis*) and bamboo orchid (*Arundina graminifolia*) were found. Although the latter are known to be cultivated for ornamental purposes, it is considered to be a rare sight to see their natural population thriving in scrubland or grassland areas due to the rapid rate of urban development in Singapore which led to the destruction of this type of habitat [P-59].

The other three habitat types—mixed forest, abandoned-land forest and waste woodland—have similar floristic composition. In particular, part of the plant composition of waste woodland overlaps with that of abandoned-land forest (See Figure 7-30). This could be because most of the waste-woodland are adjacent or contiguous to the abandoned-land forest. Some of the propagules may be dispersing from the abandoned-land forest.

As for the mixed forest habitat, the NMDS ordination corroborates the observation of this habitat mentioned in Section 7.3.1.1, of which, the plant composition resembles that of the abandoned-land forest. Twenty-five out (83.3%) of 30 species (see Table 7-3) were recorded to be native species. If left undisturbed, the recruitment of native propagules will be able to take place, and potentially establish itself into a native-dominated secondary forest should the native species continue to outcompete the exotic species.

Table 7-8 Results of Permutational Multivariate Analysis of Variance (PERMANOVA) comparing floristic composition among habitat types

Terms	*df*	pseudo-*F*	R^2	*p*-value
Habitat	3	5.2348	0.4279	0.001
Residuals	21	–	0.5721	–

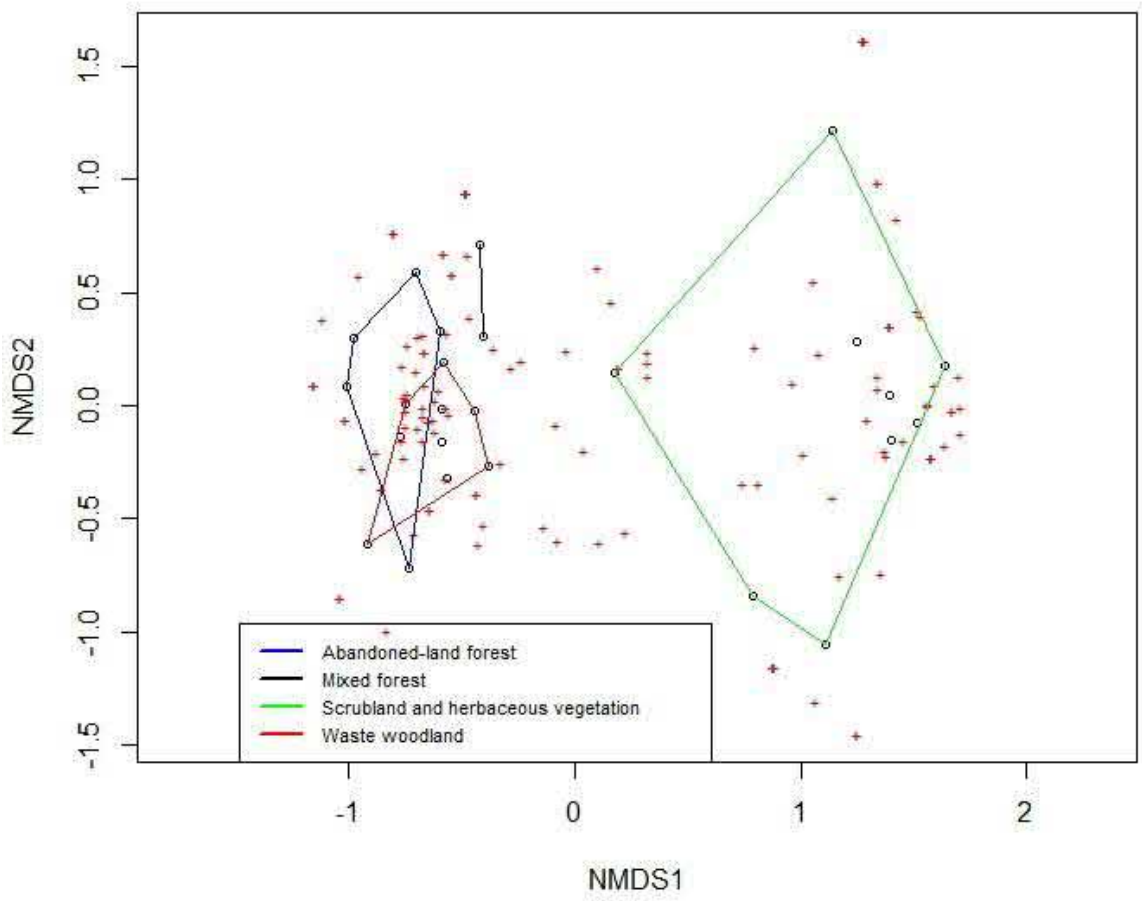


Figure 7-30 NMDS ordination of the 25 10x10 vegetation plots (open circles) based on species composition. Red crosses represent plant species found in the plots. Stress value = 0.16, k = 2.

7.3.2.7 Forest Regeneration

In this analysis, the girth of specimens with multiple stems was taken to be that of its largest stem. In view of this, large strangling figs were excluded in the count analysis as a single strangler has several woody aerial roots of ≥ 0.5 m girth; it would be imprecise to record the girth (spread) of a large strangler that lies partially within a vegetation plot as that of the thickest woody aerial root. Given the large spread of most of the stranglers found in the Study Area, it is more appropriate to document count and spread of stranglers recorded during general floristic surveys, as opposed to vegetation plot sampling. This is discussed in Section 7.3.2 and recorded in Appendix F.

Within the vegetation plots, there were 39 specimens of ≥ 0.5 m girth belonging to 15 species (excluding strangling fig species) and 1454 specimens of < 0.5 m girth belonging to 56 species. The top ten most abundant species in these two-broad girth-size classes, i.e., ≥ 0.5 m girth and < 0.5 m girth, respectively, are listed in descending order in Table 7-9. Both girth-size classes were further divided whereby the diameter distribution for the top ten species for ≥ 0.5 m girth-size class (see Figure 7-31) and the top ten most abundant species for < 0.5 m girth-size class (see Figure 7-33) are shown in Figure 7-32 and Figure 7-34, respectively.

Table 7-9 The top ten most abundant species ranked in descending order for specimens of ≥ 0.5 m and < 0.5 m girth

S/N	Species with Specimens of ≥ 0.5 m Girth	Species with Specimens of < 0.5 m Girth
1.	*Spathodea campanulata*	*Cinnamomum iners*
2.	*Hevea brasiliensis*	*Dillenia suffruticosa*
3.	*Falcataria moluccana*	*Tabebuia rosea*
4.	*Tabebuia rosea*	*Melastoma malabathricum*
5.	*Cinnamomum iners*	*Acacia auriculiformis*
6.	*Terminalia catappa*	*Spathodea campanulata*
7.	*Syzygium polyanthum*	*Syzygium polyanthum*
8.	*Vitex pinnata*	*Macaranga griffithiana*
9.	*Acacia auriculiformis*	*Syzygium grande*
10.	*Acacia mangium*	*Ficus fistulosa*

Six out of ten species listed in Table 7-9 were exotic species, which leaves the remaining four species—*Cinnamomum iners*, *Terminalia catappa*, *Syzygium polyanthum* and *Vitex pinnata*—of native origin. It is observed that the number of specimens of ≥ 0.5 m girth has a low stem count of fewer than eight each. The number of large specimens, i.e. 1.5 m girth or larger, belonged to albizia *(Falcataria moluccana*) and *Tabebuia rosea,* with only three counts of large specimens respectively (see Figure 7-32). Given their overall low stem counts, there is insufficient resolution for the detection of distinct trends. It is important to note that the absence of large trees within the vegetation plots does not imply that they are not present in the Study Area, as they may have been opportunistically missed out with random plot sampling.

However, there are numerous seedings and saplings found in the lower forest strata. Out of the top ten most abundant species of < 0.5 m girth size, seven out of ten species, are native. *C. iners*, though ranked as the species with fifth highest number of large specimens (three counts) (see Table 7-9; Figure 7-33) has mostly trees in the lower range within the large girth-size class, i.e. 0.5 – 0.9 m (see Figure 7-32). It appears to display the highest recruitment of seedlings and saplings with stem counts of 261 were encountered. Majority (189; 72.4%) of the specimens had < 0.05 m girth or smaller (see Figure 7-34. The presence of large *C. iners* could act as potential seed sources in the forest, thus explaining the higher number of seedlings of these species found in the understory. The second highest recruitment and seedling comes from simpoh air *(Dillenia suffruticosa*) with 198 specimens belonging to this species encountered, and approximately 57% of them had 0.05 m girth or smaller (see Figure 7-34**.** This corroborates to the findings described in Section 7.3.1, of which, *D. suffruticosa* was observed in all habitat types, in particular, the largest scrubland and herbaceous vegetation patch located in the north of the Study Area.

Five species from the lower girth-size class (< 0.5 m) exhibit a typical reverse-J distribution pattern (see Figure 7-34), indicating that there is a high recruitment of small trees. These five species are: 1) *Acacia auriculiformis*, 2) *C. iners*, 3) *D. suffruticosa*, 4) *Macaranga griffithiana* and 5) *T. rosea*. Half of these species listed species are native, of which, *M. griffithiana,* is a nationally Vulnerable species.

The high saturation of seedlings belonging to both native and exotic tree species occupying the same forest strata is indicative that there could be inter- and intra-specific competition for space, nutrients, light, and other resources. Should the native seedling species successfully outcompete the exotic seedling species when there are forest canopy openings, e.g., from natural tree falls, the forest may slowly recover into a native secondary forest over a long period of time if left undisturbed. However, if the exotic seedlings persist, seedling competition between the exotic and native species is likely to continue. Native species that are unable to outcompete the exotic counterparts would eventually be shaded out. In such scenarios, the forest would continue to be dominated by exotic species.

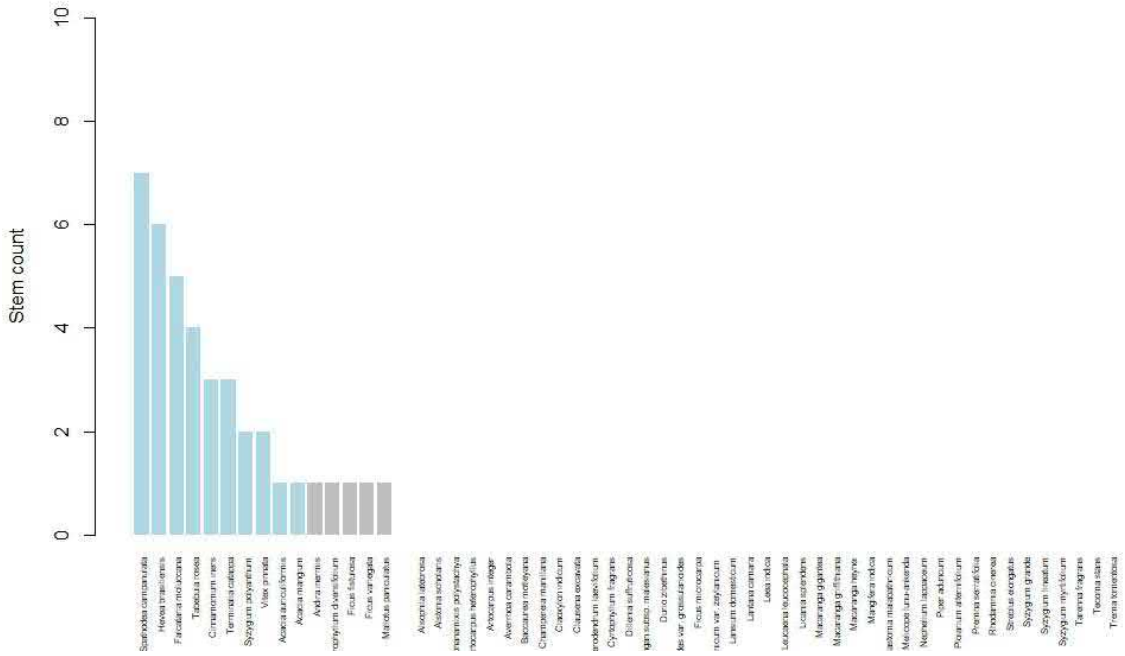


Figure 7-31 Number of specimens with ≥ 0.5 m girth for each species across all vegetation plots. Bars in light blue belong to the ten most abundant species

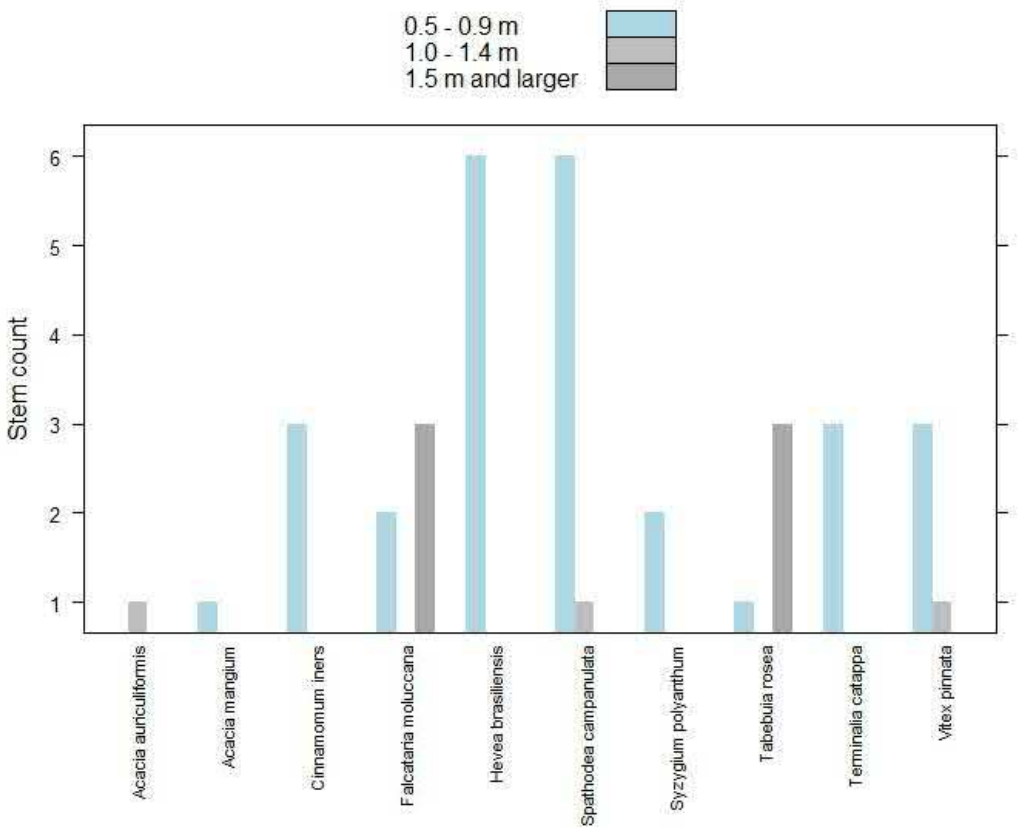


Figure 7-32 Girth-size class distribution of all top ten most abundant species with specimens of ≥ 0.5 m girth.

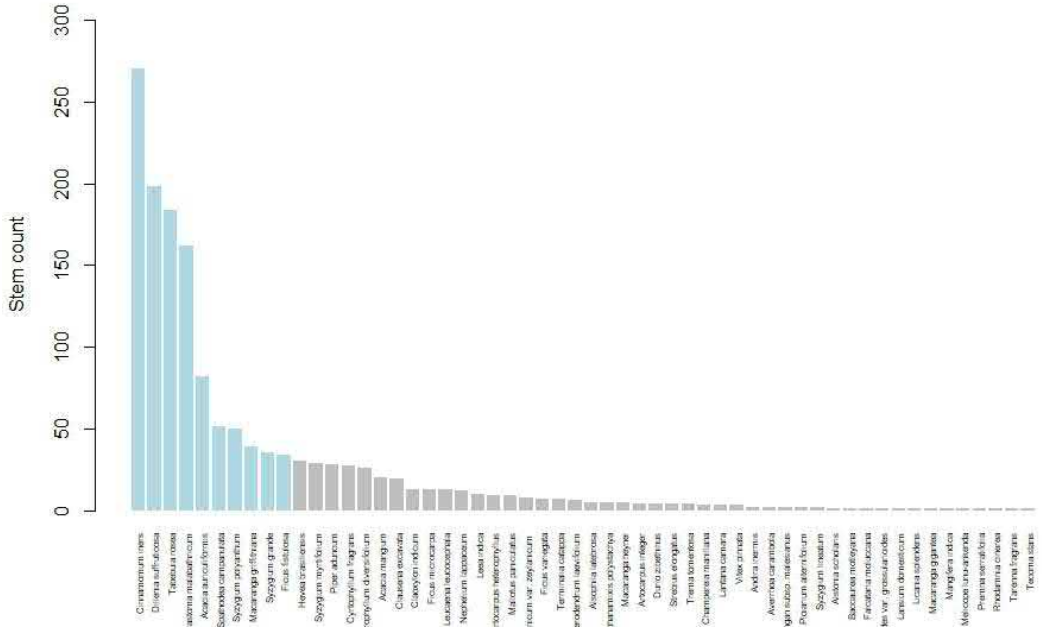


Figure 7-33 Number of specimens with < 0.5 m girth for each species across all vegetation plots. Bars in light blue belong to the ten most abundant species.

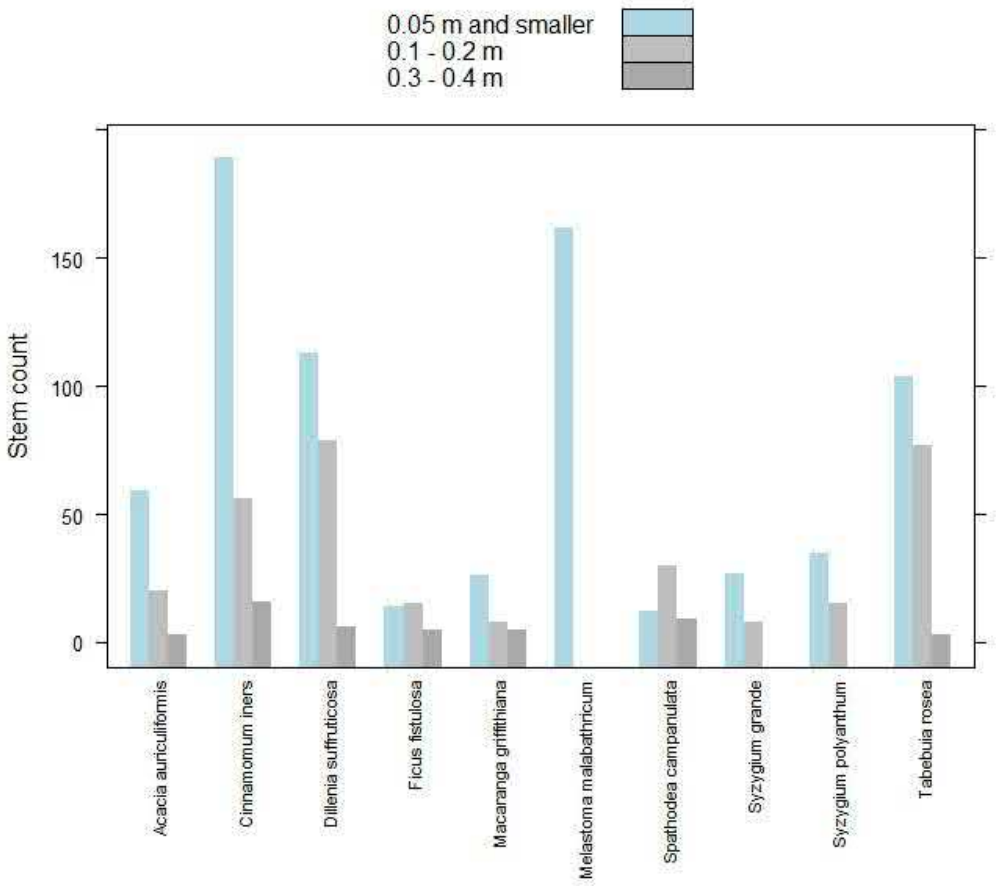


Figure 7-34 Girth-size class distribution of the ten most abundant species with specimens of < 0.5 m girth.

7.3.3 Faunistic Field Findings

7.3.3.1 Overall

The field assessment recorded 247 species with about half of the assemblage (53%) dominated by birds (76 species) and butterflies (55 species) (see Table 7-10). The list of faunal survey data and recorded faunal species is available in Appendix I and Appendix J respectively. The camera trap data is available in Appendix K.

Across the Study Area, aquatic habitats recorded mostly common species although one species of conservation significance, the Asiatic softshell turtle (*Amyda cartilaginea*), was recorded several times in the D5 stream in the eastern part of the Study Area. This same stream have generally good water quality (refer to Section 8.2.1.2.1) and possess conservation value. In addition, large streams and canals in both the central and eastern part of the Study Area provide foraging opportunities for the nationally threatened grey-headed fish eagles (*Haliaeetus ichthyaetus*).

Faunal species of conservation significance were also distributed across the terrestrial habitats in the Study Area. In the western portion, the Sunda pangolin (*Manis javanica*) was recorded on camera traps, and a nest of the changeable hawk-eagle (*Nisaetus cirrhatus*) was also observed. In the central portion, key observations include the Malay staff sergeant (*Athyma moorei moorei*) for which a cluster of its host plant, the Glochidion zeylanicum var. zeylanicum was also observed nearby; lowland dwarf gecko (Hemiphyllodactylus typus) as well as the grey-headed fish eagle (*Haliaeetus ichthyaetus*). In the eastern portion, the straw-headed bulbul (*Pycnonotus zeylanicus*) and Asian softshell turtle (*Cuora amboinensis*) was recorded within or around the D5 stream that flows pass the area.

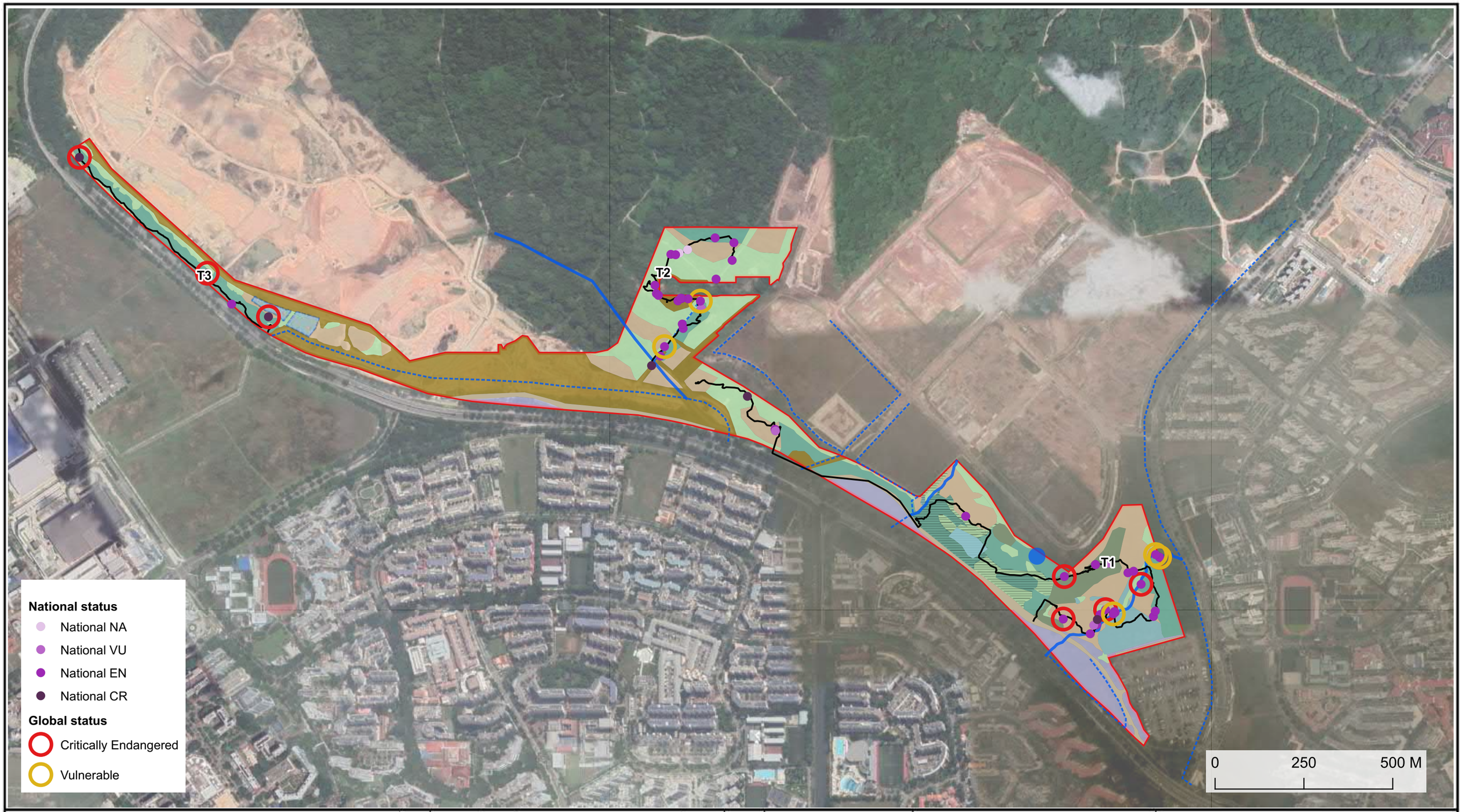
Table 7-10 Number of recorded species for each faunal group

Faunal Group	No. of Recorded Species	
	All Species	CS Species
Aculeate hymenopterans	**28**	**0**
Bees	10	0
Stinging wasps	18	0
Odonates	**28**	**0**
Dragonflies	22	0
Damselflies	6	0
Butterflies	**55**	**2**
Freshwater decapod crustaceans	**3**	**0**
Freshwater fish	**14**	**0**
Herpetofauna	**28**	**3**
Amphibians	11	0
Reptiles	17	3
Birds	**76**	**13**
Mammals	**15**	**1**
Non-volant mammals	11	1
Bats	4	0
Total	**247**	**19**
***Note: CS–conservation significance**		

Nineteen species of the conservation significance were recorded (see Table 7-11; Figure 7-35) of which there was two butterfly species, three reptile species, 13 bird species and one mammal species. Their presence shows the value of the Study Area in supporting species that are threatened or uncommon to rare. There is no distinct pattern in the distribution of species of conservation significance as they were found across the Study Area. The key findings for each faunal group are further discussed in the subsequent sections.

Table 7-11 Number of recorded species for each faunal group

Faunal Group	Scientific Name	Common Name	National Status	Global Status	Location of Record
Butterfly	*Borbo cinnara*	Formosan swift	Endangered	Not Assessed	T1
	Athyma reta moorei	Malay staff sergeant	Not Assessed	Not Assessed	T1, T2
Reptile	*Amyda cartilaginea*	Asian softshell turtle	Endangered	Vulnerable	T1, T2, D5
	Cuora amboinensis	Malayan box terrapin	Not Assessed	Vulnerable; CITES protected (Appendix II)	T2
	Hemiphyllodactylus typus	Lowland dwarf gecko	Vulnerable	Least Concern	T2
Bird	*Accipiter trivirgatus*	Crested goshawk	Critically Endangered	Least Concern	T1
	Cacomantis sepulcralis	Rusty-breasted cuckoo	Vulnerable	Least Concern	T1
	Copsychus saularis	Oriental magpie-robin	Endangered	Least Concern	T2
	Gallus	Red junglefowl	Endangered	Least Concern	T1, T2, T3
	Haliaeetus ichthyaetus	Grey-headed fish eagle	Critically Endangered	Near Threatened	T1, T2
	Loriculus galgulus	Blue-crowned hanging-parrot	Endangered	Least Concern	T1, T2
	Nisaetus cirrhatus	Changeable hawk-eagle	Endangered	Least Concern	T1, T2
	Psittacula longicauda	Long-tailed parakeet	Not Assessed	Vulnerable	T2
	Pycnonotus zeylanicus	Straw-headed bulbul	Endangered	Critically Endangered	T1
	Rallina fasciata	Red-legged crake	Vulnerable	Least Concern	T1
	Vanellus indicus	Red-wattled lapwing	Endangered	Least Concern	T2
	Collocalia affinis	Plume-toed swiftlet	Not Assessed	Not Assessed	T3
	Pitta moluccensis	Blue-winged pitta	Not Assessed	Least Concern	T1, T2
Mammal	Manis javanica	Sunda pangolin	Critically Endangered	Critically Endangered	T3



Legend

- Southern Tengah Study Area
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- Abandoned-land forest
- Mixed forest
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- Managed vegetation
- Farm
- Others (Infrastructure)
- Construction
- Concreted area
- Waterlogged area (Ephemeral)
- Pond
- Stream (Perennial)
- Drain
- Terrestrial sampling route

N

Rev.	Date	By	Description	Chk'd	App'd
-	OCT 2021	JT	Final Report	NHT	JAG

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Consultant : AECOM

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Project Title :

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Figure Title :

Location of faunal species of conservation significance

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7.3.3.2 Taxon Sampling Curves

Along the terrestrial sampling route and aquatic sampling points, the sample coverage for the faunal groups were mostly above 80% (Table 7-12; Figure 7-36; Figure 7-37). This is with the exception of decapod crustaceans at aquatic sampling points which yielded only 66.7%. Species that had insufficient data points were removed from the analysis.

Table 7-12 Result summary of taxon sampling analysis

Faunal group	Sample coverage (%)	Observed Richness	Estimated Richness (± s.e)
Terrestrial sampling route			
Aculeate hymenopterans	83.4	23	31 ± 6.6
Odonates	92.8	23	28.1 ± 4.7
Butterflies	89.5	50	69.2 ± 11.7
Reptiles	84.0	12	32.1 ± 16.6
Birds	94.2	61	80.4 ± 12.3
Aquatic sampling points			
Odonate	86.1	5	21.5 ± 4.5
Fish	83.3	14	21.5 ± 7.7
Decapod crustaceans	66.7	3	4.3 ± 2.6
Amphibian	89.7	8	9.4 ± 2.1
Reptile	84.4	5	5.6 ± 1.1

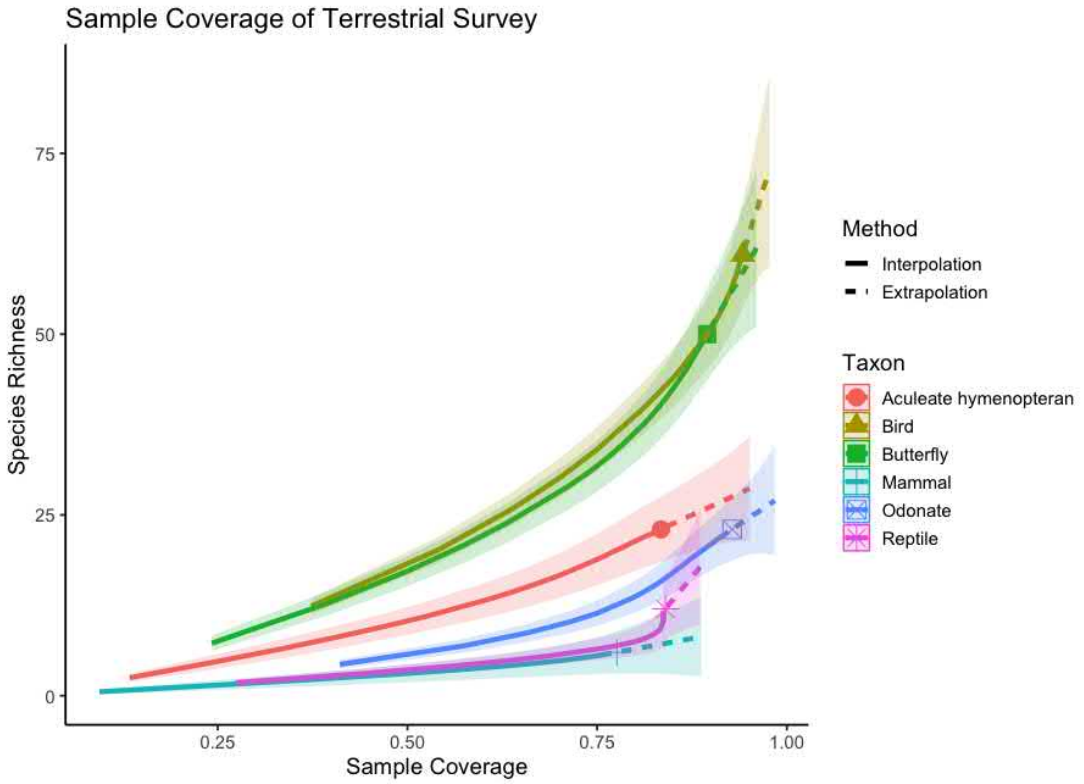


Figure 7-36 Taxon sampling curve for terrestrial sampling route

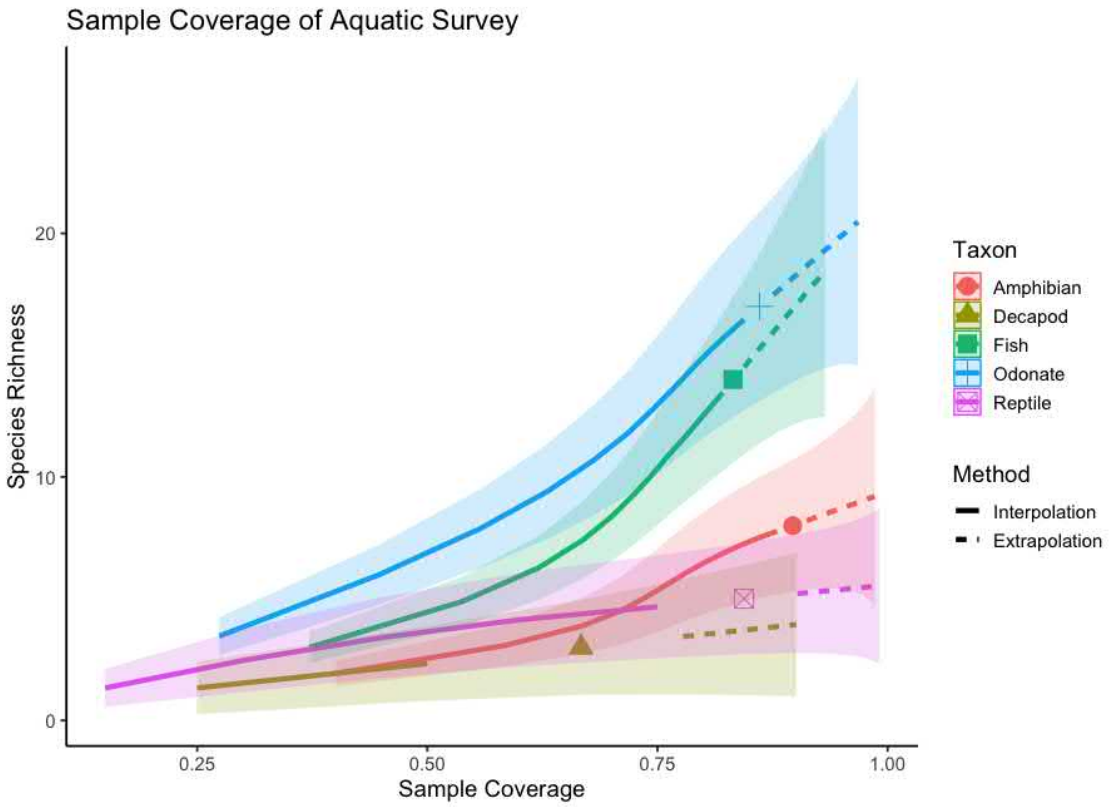


Figure 7-37 Taxon sampling curve for aquatic sampling points

7.3.3.3 Aculeate Hymenopterans

The field assessment recorded a total of 28 species of aculeate hymenopterans, comprising 10 bee species (35.7%) and 18 wasp species (64.3%) (see Table 7-11, Appendix I). None of the aculeate hymenopteran species recorded during the field assessment were of conservation significance.

Nevertheless, the Study Area contains suitable habitats for a variety of aculeate hymenopteran species including forest specialists as well as those adapted to more open-country conditions. During the field assessment, multiple species of aculeate hymenopterans were recorded nesting. *Phimenes flavopictus* was recorded nesting within the mixed forest in the eastern side of the Study Area. While this species can also be found in urban environment, such an observation is a good record since nesting is not frequently observed or recorded in a natural environment (Lee JXQ, pers. comm.). *Ropalidia sumatrae*, *Parischnogaster nigricans* and *Apis cerana* were also recorded nesting in the Study Area (see Figure 7-38).

One other interesting record would be the record of *Polistes tenebris* from the central part of the Study Area (T2). At present, this species is only known from Singapore (Lee JXQ, pers comm. While this species has been recorded from different habitats including urban areas and mangrove, the abundance of this species has always been scarce even in years when aculeate hymenopteran diversity and abundance were considered to be much higher.

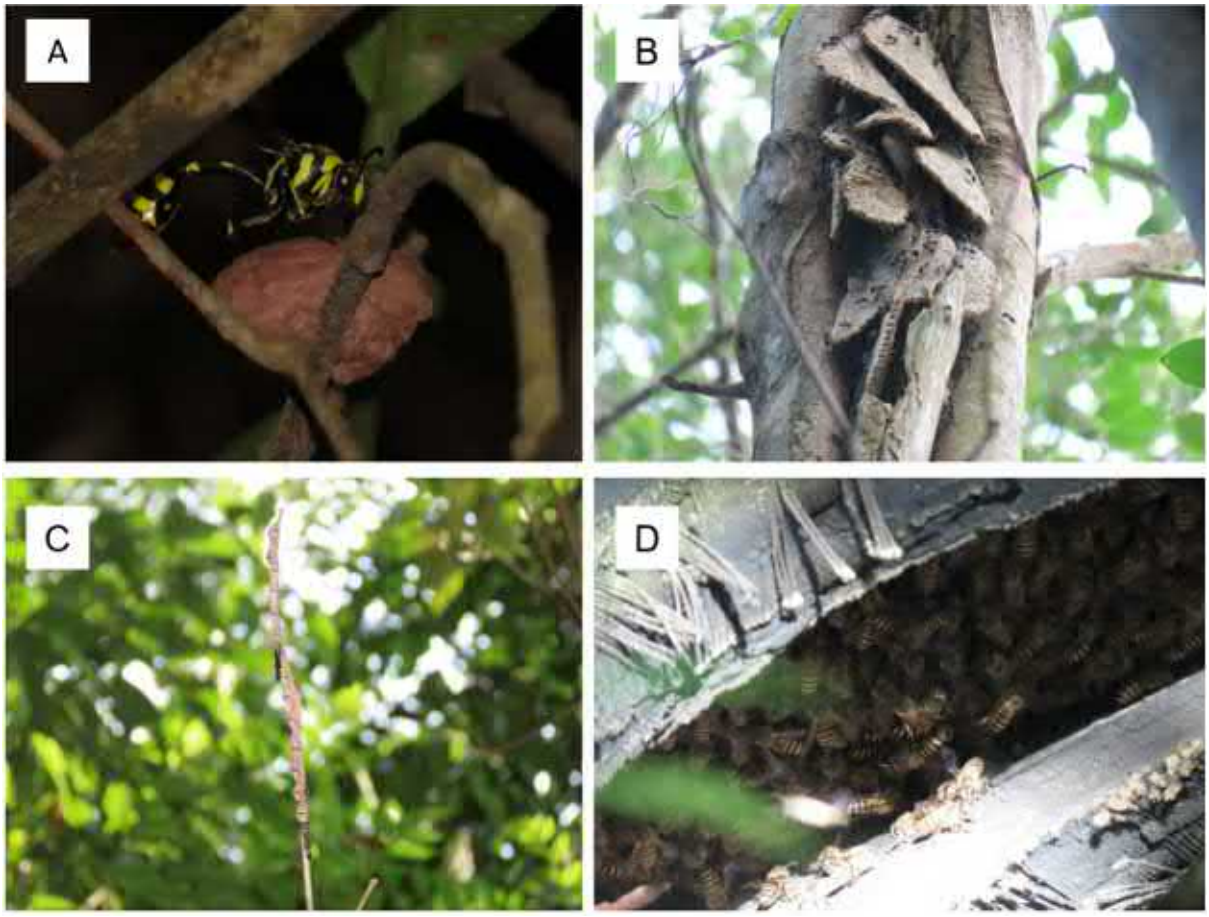


Figure 7-38 Nests of aculeate hymenopterans. (A) *Phimenes flavopictus*, (B) *Ropalidia sumatrae*, (C) *Parischnogaster nigricans*, (D) *Apis cerana*

7.3.3.4 Odonates

The field assessment recorded 28 species of odonates comprising 22 dragonfly species (78.6%) and six damselfly species (21.4%). While none of the species of odonates recorded were noted to be of conservation significance (Table 7-10; Appendix I), the striped grenadier (*Nesoxenia lineata*, Figure 7-39) was recorded during the field assessment in the central part of the Study Area (T2). Although widespread in distribution, this species is uncommon and not expected within the Study Area since it is characteristically found in more waterlogged swampy forests [W-5], a habitat condition that is not typical of the Study Area. Nonetheless, the observation of this species could likely be explained by the presence of some waterlogged areas, especially within the central part Study Area where this species of dragonfly was recorded. The unexpected occurrence of this species in the Study Area also likely arises from the dearth of surveys that have been conducted to quantify the species composition of the forests in Tengah. Recording this uncommon species in the Study Area suggests that these understudied forests can support a composition of species that are usually more typical of higher quality forests in nature reserves and nature park.

Aquatic point counts across all aquatic sampling points recorded a total of 16 species of odonates comprising 12 dragonfly species (75%) and four damselfly species (25%). The blue sprite (*Pseudagrion microcephalum*) was recorded at many of the aquatic sampling points, with 83 individuals recorded over the entire field assessment (42.8% of individuals recorded).



Figure 7-39 Striped grenadier (*Nesoxenia lineata*) recorded within the Study Area.

7.3.3.5 Butterflies

The field assessment recorded 55 butterfly species, of which two are of conservation significance: the nationally Endangered Formosan swift (*Borbo cinnara*) and the Malay staff sergeant (*Athyma reta moorei* ; see Figure 7-40), which is very rare within Singapore. The Formosan swift is a cryptic species that utilises degraded secondary forests and urban parks [P-23]. Its host plants include widespread species such as Buffalo grass (*Paspalum conjugatum*) and the bristly foxtail grass (*Setaria barbata*), as well as the Critically Endangered *Centotheca lappacea*, which was also recorded in the field assessment (refer to Section 7.3.2.1). Since its rediscovery in 2010, the number of Formosan swift sightings have increased, and it is hence listed as moderately common [P-26]. All three encounters of the Formosan swift were near waste woodlands within the Study Area (T1) (see Figure 7-41). The Malay staff sergeant is known to occur in the Central Nature Reserves. Within the Study Area, both encounters were with female individuals (T1 and T2) (see Figure 7-41). The species' host plant, *Glochidion zeylanicum* var. *zeylanicum*, was observed in abundance within the scrubland and herbaceous habitat occupying the northern parts of the Study Area (refer to Section 7.3.2.1). A few saplings were also encountered in the eastern end of the Study Area (T1). Although no caterpillars were observed, the habitat appears suitable for supporting a population of Malay staff sergeants.

Most encountered species are common or moderately common, and are typically found in parks, gardens and urban areas, such as the chocolate pansy (*Junonia hedonia ida*). The moderately rare species encountered are generally associated with forested areas. These include shade-loving species such as the large snow flat (*Tagiades gana gana*), Malayan (*Megisba malaya sikkima*), orange awlet (*Burara harisa consobrina*), and palm king (*Amathusia phidippus phidippus*), while species such as the conjoined swift (*Pelopidas conjunctus conjunctus*), Felder's royal (*Tajuria mantra mantra*), and full stop swift (*Caltoris cormasa*) favour forest edges, as well as adjacent habitats.

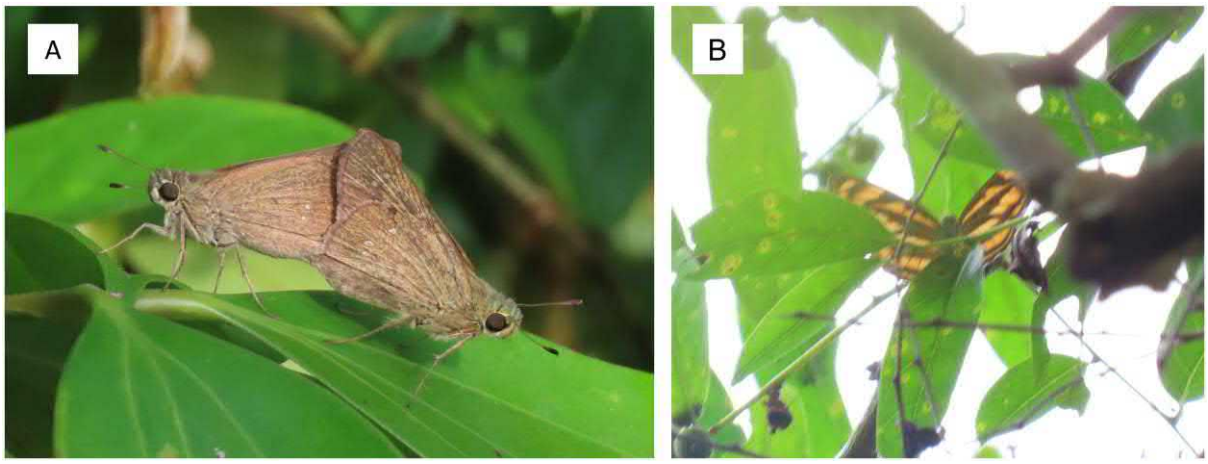
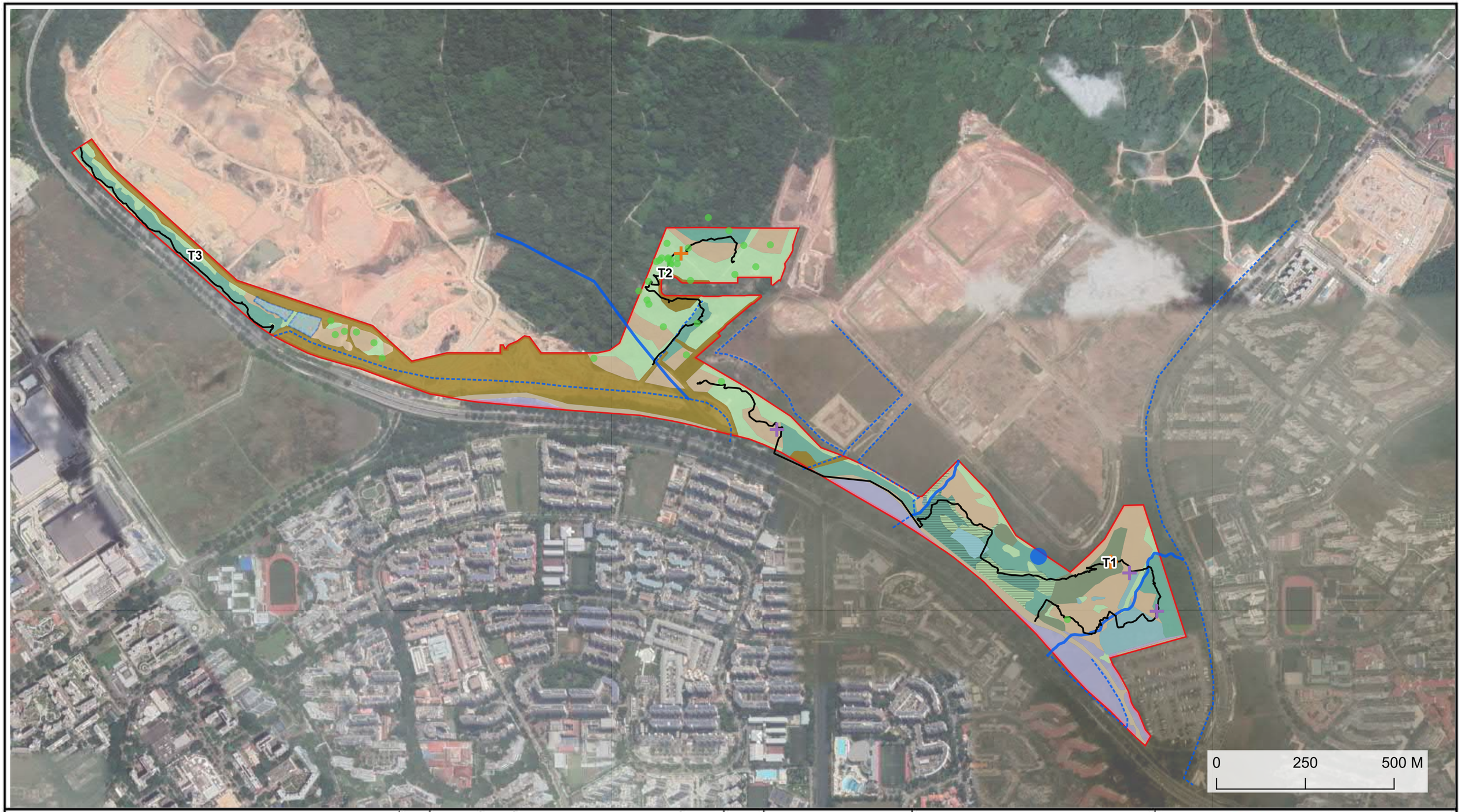


Figure 7-40 Butterflies of conservation significance. (A) A pair of mating Formosan swifts (*Borbo cinnara*) and (B) Malay staff sergeant (*Athyma reta moorei*) on its host plant, *Glochidion zeylanicum* var. *zeylanicum*.



Legend

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- Concreted area
- Waterlogged area (Ephemeral)
- Pond
- Stream (Perennial)
- Drain
- Terrestrial sampling route
- Athyma reta moorei
- Borbo cinnara
- Glochidion zeylanicum

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Figure Title :

Location of butterfly species of conservation significance and its host plants

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7.3.3.6 Freshwater Decapod Crustaceans

Across all aquatic habitats within the Study Area, there was a low diversity and abundance of freshwater decapod crustaceans. Freshwater decapod crustaceans were only recorded in the D2 and D4 streams, from which only three species were recorded. These included the non-native ghost shrimp (*Macrobrachium lanchesteri*) which was caught only in the D4 stream and the non-native Oriental river prawn (*Macrobrachium nipponense*) which was caught in both D2 and D4 streams (see Figure 7-42). Both species are not of conservation significance. In addition, one native *Caridina* sp. Was recorded from the D2 stream but was only identifiable to the genus level since species level identification would require the use of a microscope to examine the shape of the gut and rostrum (Nyanasengeran, pers. Comm). Considering the habitat conditions and locality, the species recorded is likely to be *Caridina. Cf. johnsoni*. *Caridina johnsoni* is found in freshwater habitats such as reservoirs, lakes, rivers and streams [P-41] and locally, *Caridina johnsoni* has been observed in Nee Soon Swamp forest, Pasir Laba, Kranji Marshes, Tengeh Reservoir, Lower Peirce Reservoir (north arm), Sungei Seletar, Seletar Reservoir and Singapore Quarry at BTNR [P-7, P-51, P-52]. Observation of this species in the Study Area signify a new locality for the species.

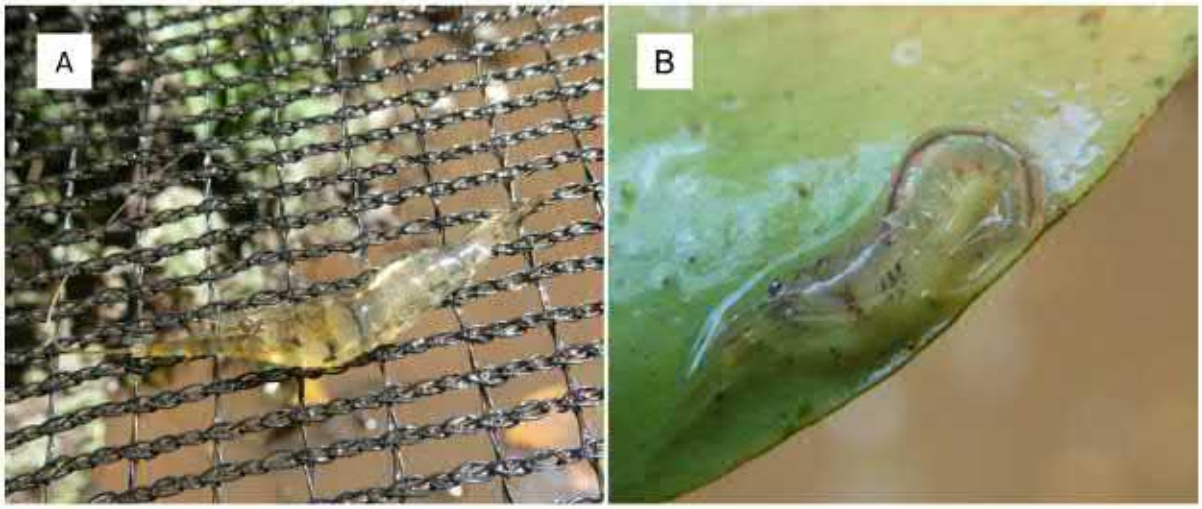


Figure 7-42 Freshwater decapod crustaceans recorded in this study. (A) Non-native Oriental river prawn (*Macrobrachium nipponense*) and (B) native *Caridina. Cf. johnsoni*

7.3.3.7 Freshwater Fish

The field assessment recorded 15 species of freshwater fish across all aquatic sampling points in the Study Area (see Table 7-10; Appendix I). Across all aquatic sampling points, the greatest number of non-native species were recorded in the D4 stream, while more native than non-native species were recorded in the other aquatic sampling points. None of the species recorded were of conservation significance.

The minnow traps obtained two species across all aquatic sampling points: the native croaking gouramy (*Trichopsis vittate*; see Figure 7-43) was caught in the D2 stream and the D6 pond and the non-native guppy (*Poecilia reticulata*) was caught in the D5 stream. As with the freshwater decapod crustaceans, the reason for the low freshwater fish diversity is likely due to the lack of connectivity to waterbodies with higher biodiversity, such as those in CCNR. Many of the non-native species that can be found within the waterbodies in the Study Area are likely to have appeared due to the release of unwanted pets into the concretised canals upstream of the Study Area that feed the streams.

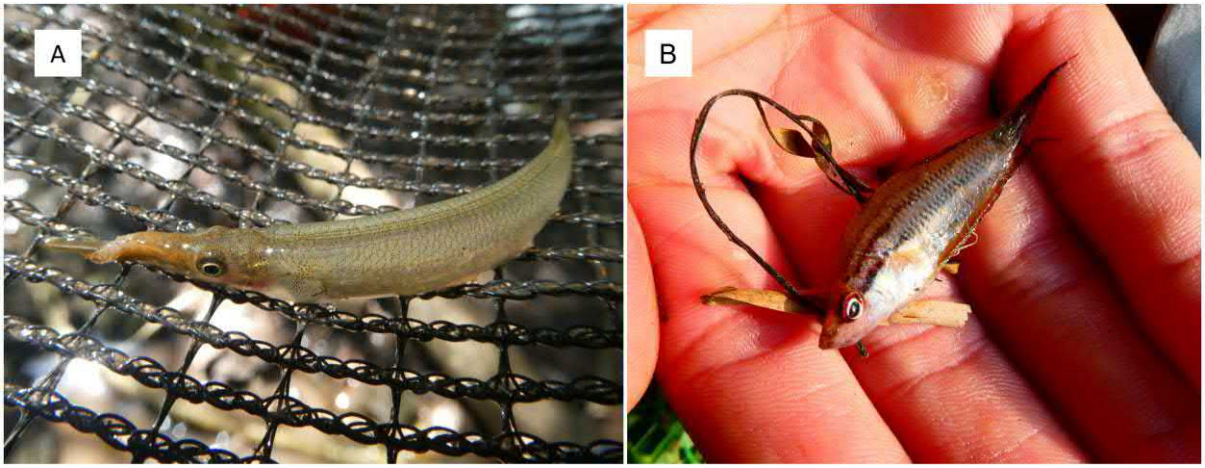


Figure 7-43 (A) Native Sunda pygmy halfbeak (*Dermogenys collettei*) caught in a tray net and (B) native croaking gourami (*Trichopsis vittatta*) caught in a minnow trap during the field assessment

7.3.3.8 Amphibians

The field assessment recorded 11 amphibian species, comprising eight native and three non-native species, none of which have conservation significance (Table 7-10, Appendix I). All recorded species were considered widespread and common, with the exceptions of the restricted and rare (but non-native) East Asian ornate chorus frog (*Microhyla mukhlesuri*) and widespread but uncommon Guenther's frog (*Sylvirana guentheri*).

7.3.3.9 Reptiles

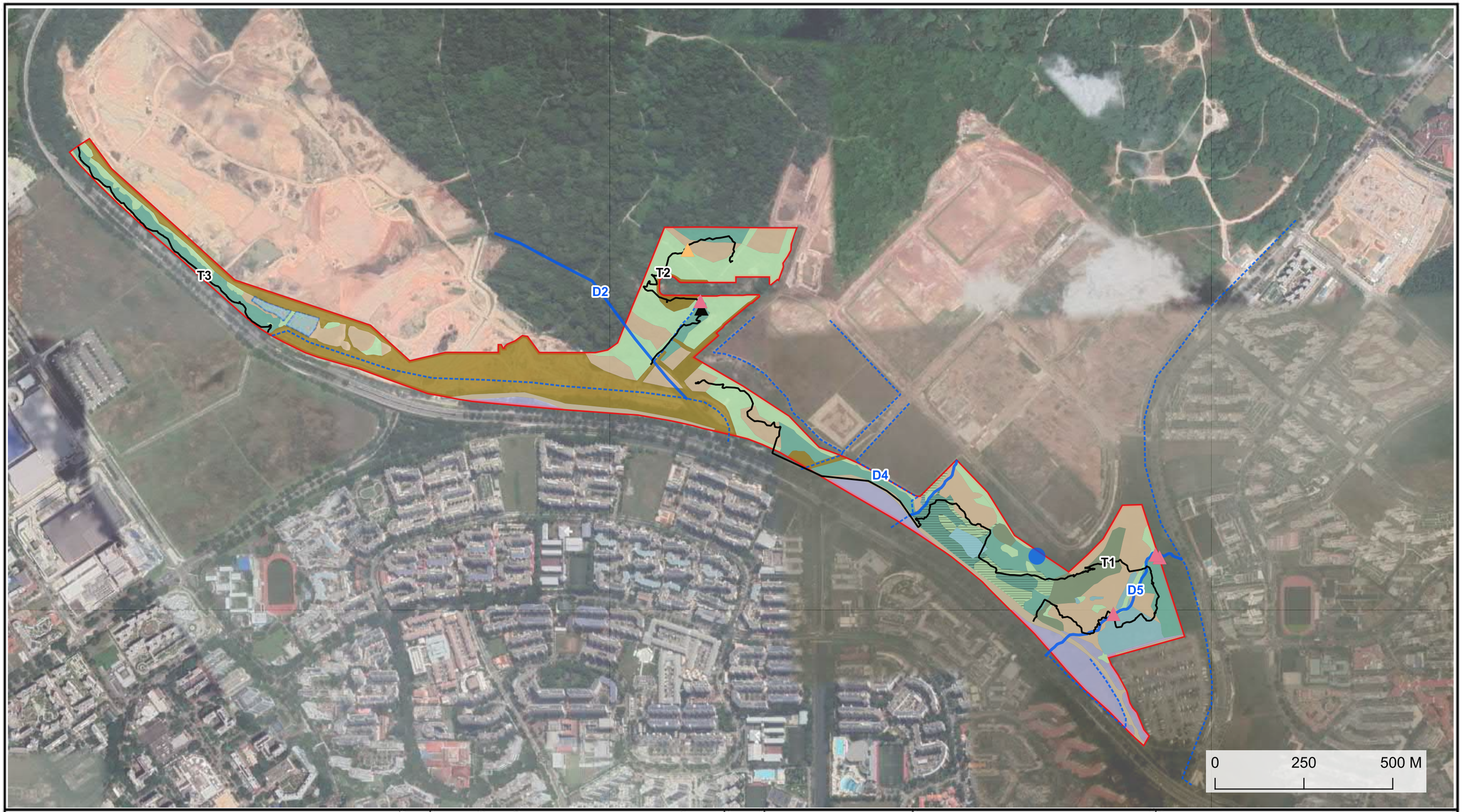
The field assessment recorded 17 reptilian species, comprising four turtles, seven lizards, and six snakes. Three species of conservation significance were identified: the globally Vulnerable Malayan box terrapin (*Cuora amboinensis*), the globally Vulnerable and nationally Endangered Asian softshell turtle (*Amyda cartilaginea*), as well as the nationally Vulnerable lowland dwarf gecko (*Hemiphyllodactylus typus*; see Figure 7-44). The Malayan box terrapin is able to survive in disturbed aquatic habitats, but prefers habitats with soft bottoms and slow currents [P-48]. Globally, the species is in rapid decline due to the international food, pet, and medicinal trade, although the population in Singapore appears stable [P-48]. Similar to the Malayan box terrapin, the Asian softshell turtle has also been recorded from disturbed aquatic habitats. The species also utilises waterbodies with slow-moving waters with soft bottoms, but is likely adaptable to a range of habitat conditions, as there are records of the species from hill streams with rocky substrate [P-1]. Throughout its range, the species is hunted for its meat, resulting in population declines [P-1]. Within Singapore, the Asian softshell turtle is restricted and uncommon [P-3]. The lowland dwarf gecko is a nocturnal and arboreal species [P-25]. Within Singapore, the species has been recorded in forests, parkland, and mangrove forests [P-55].

The Asian softshell turtle (*Amyda cartilaginea*), Malayan box terrapin (*Cuora amboinensis*), and lowland dwarf gecko (*Hemiphyllodactylus typus*) were recorded from the northern parts of the Study Area (T2; see Figure 7-45). As this area is contiguous with forested habitats within the larger landscape, species can move through this landscape in search of suitable habitats. For instance, ephemeral and forest streams run through the area, providing the Asian softshell turtle and Malayan box terrapin with the aquatic habitats that they require for survival. The Asian softshell turtle was also encountered at the D5 stream, located near the eastern boundary of the Study Area. During field assessment, the Asian softshell turtle was recorded at the upstream portion of the D5 stream (D5_06); a subsequent targeted survey for the species yielded two more encounters (D5_03 and D5_06), resulting in a total of four records (see Figure 7-47A). The substrate of the D5 stream is heterogeneous, with soft and sandy substrates preferred by the species interspersed with areas of rocky substrate.

The remainder of observed species are widespread and common, and typical of other urban or parkland habitats in Singapore, such as the changeable lizard (*Calotes versicolor*) and painted bronzeback (*Dendrelaphis pictus*). However, the widespread but uncommon green-crested lizard (*Bronchocela cristatella*) and Indochinese rat snake (*Ptyas korros*) were also observed.



Figure 7-44 Reptiles of conservation significance. (A) Malayan box turtle (*Curoa amboinensis*); (B) Asian softshell turtle (*Amyda cartilaginea);* and (C) Lowland dwarf gecko (*Hemiphyllodactylus typus*).



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- Cuora amboinensis
- Hemiphyllodactylus typus

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Figure Title :

Location of reptilian species of conservation significance

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7.3.3.10 Birds

The field assessment recorded 73 species, of which 61 are resident species (83.6%), 10 introduced (13.7%) and one is an introduced non-resident (1.4%) (Appendix I). One species (*Aerodramus* sp.) was only identifiable to genus level and was thus not classified by its native status.

Thirteen species of conservation significance were recorded in the field assessment (Appendix I). Eleven species are globally or nationally threatened or both. They appear to be mainly distributed across the central and eastern parts of the Study Area (see Figure 7-47).

Three species of conservation significance, the nationally Critically Endangered crested goshawk (*Accipiter trivirgatus*), nationally Endangered changeable hawk-eagle (*Nisaetus cirrhatus*) and nationally Critically Endangered grey-headed fish eagle (*Haliaeetus ichthyaetus*), make use of large trees to hunt and nest [P-53]. One changeable hawk-eagle nest was observed in an Albizia in the western part of the Study Area (T3) (see Section 7.3.2.4) and no individuals were observed in the nest during the field assessment. To add on, a recent EIS that was conducted for the PUB Pipeline project recorded a juvenile changeable hawk-eagle perching close to this nest [R-53]. Other large trees within the Study Area also provide nesting opportunities for all three species. Large trees in the Study Area are also used by all three species for hunting. The crested goshawk was recorded once in the eastern part of the Study Area (T1) perched on a large Albizia tree (see Figure 7-46), while the grey-headed fish eagle was observed multiple times either perched on a large Albizia near the canal or on the railings beside the canal in the central part of the Study Area (T2) (see Figure 7-46), possibly making use of the perch to rest and look out for fish in the canal. Another two species of conservation significance, the nationally Endangered blue-crowned hanging parrot (*Loriculus galgulus*) and the globally Vulnerable long-tailed parakeet (*Psittacula longicauda*), also make use of large trees for nesting. These species nests in cavities in large trees, living or dead. Large trees within the Study Area are thus important for the sustained population of these five nationally threatened species.

The straw-headed bulbul (*Pycnonotus zeylanicus*) is listed as nationally Endangered and globally Critically Endangered and is a CITES-protected species. Its melodious and attractive songs make it highly sought-after for the songbird trade and this has resulted in extirpation throughout much of its range. The species is also threatened by loss of forest habitat throughout much of its range. This rapid deterioration of global population resulted in a revision of its global conservation status in 2018 from Endangered to Critically Endangered [W-4]. In Singapore, while the estimated population size is slightly over 200 birds, possibly making up one-third of the global population [P-39], habitat loss to development continues to remain a primary threat. Even though this species is not fastidious in its nesting habitat requirements, having been observed to nest on trees in wooded areas in urban parks and gardens, they mostly occur in secondary forest and woodlands patches near rivers, suggesting that they prefer these habitats [P-34]. During the field assessment, this species was recorded in the eastern part of the Study Area (T1), close to the D5 stream (see Figure 7-47), likely due to their preference for riparian habitats [P-65].

The nationally Endangered red-wattled lapwing (*Vanellus indicus*) was encountered several times at the central part of the Study Area (T2) beside the construction hoarding where excessive vegetation clearance had occurred (See Figure 7-47). Red-wattled lapwings use shallow scrapes on rocky ground as nests, preferably near waterbodies and obscured by scrubby vegetation [P-64] and it is possible that the individuals encountered during the field assessment were making use of the open cleared habitat for breeding since they were observed on multiple occasions at the same open vegetation located beside the construction hoarding in the central part of the Study Area (ST_T2). While the western part of Singapore is known to be a stronghold of the species [P-64], the population of this species may still be threatened by the rapid loss of habitat as a result of the ongoing and upcoming developments.

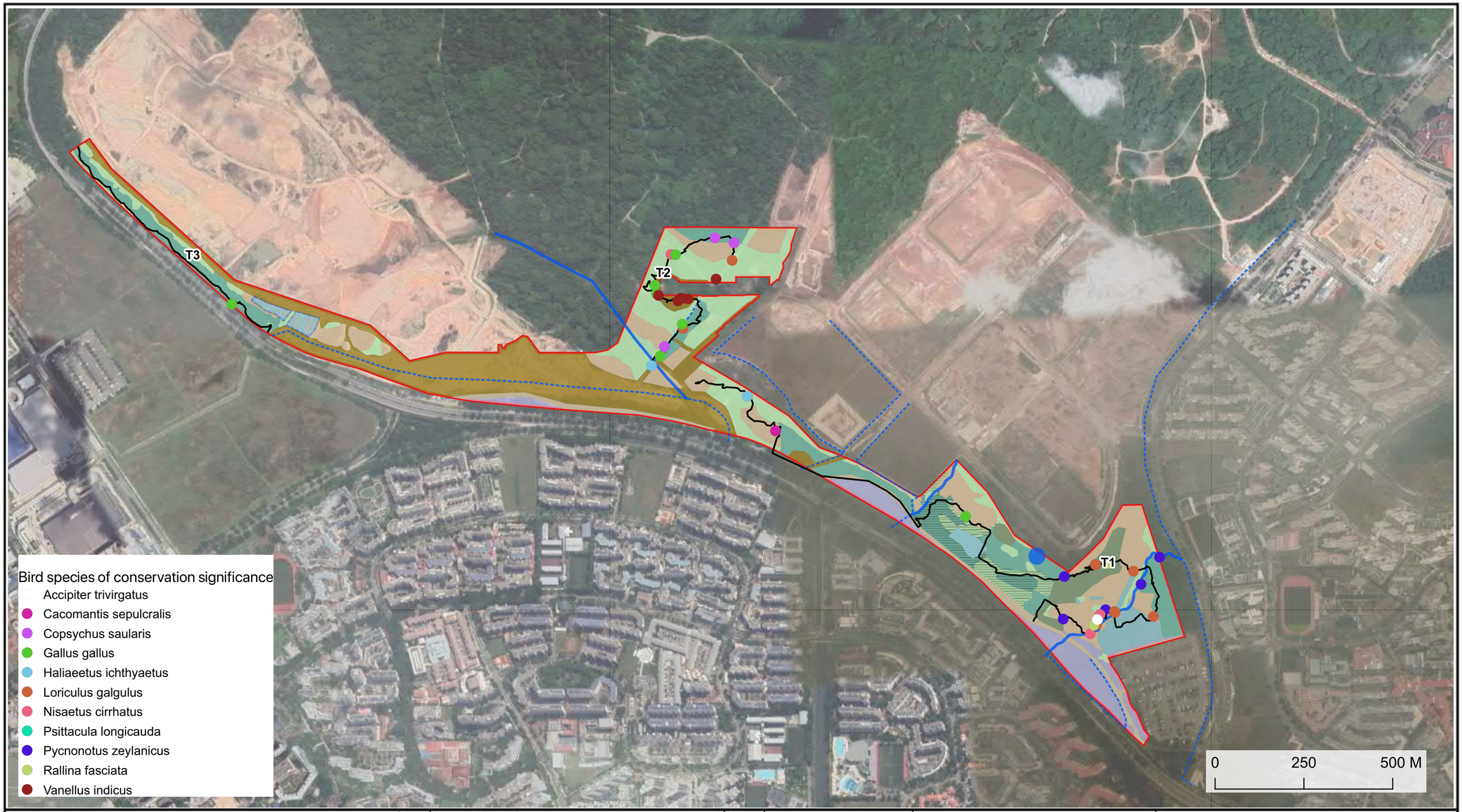
The nationally Vulnerable rusty-breasted cuckoo (*Cacomantis sepulcralis*) was recorded once during the field assessment in the eastern part of the Study Area (T1) (see Figure 7-47). This species is a brood parasite of the Malaysian pied fantail (*Rhipidura javanica*) and can usually be found in wooded secondary forests [P-64]. The host species, the Malaysian pied fantail, was recorded multiple times in the central part of the Study Area (T2) although forest connectivity on the northern edge of the Study Area would allow the rusty-breasted cuckoo to move through the landscape easily. The nationally Endangered Oriental magpie robin (*Copsychus saularis*) and nationally Endangered red junglefowl (*Gallus gallus*) were also recorded during the field assessment. These species make use of forest edges, scrubland and occasionally urban areas for foraging [P-64]. The nationally Vulnerable red legged crake (*Rallina fasciata*) that was recorded in the field assessment was once thought to be rare but has been found to be widespread in secondary scrub [P-64].

The sightings of plume-toed swiftlet (*Collocalia affinis*) at the western part of the Study Area (T3) (see Figure 7-47) are notable records because this species was previously recognized as the nationally Critically Endangered glossy swiftlet (*Collocalia esculenta*). Its scientific name was updated in 2017 [P-47] and thus its conservation status is not reflected in the Singapore Red Data Book [P-14]. As it is, this species is not widespread. Yong et al. (2016) [P-64] noted that they appear to be localized to the Bukit Batok and Bukit Timah areas, where they are likely to be nesting in a drain culvert. The Study Area provides suitable nesting and foraging habitats and recording this species in the Study Area suggest that they could be making use of the Study Area for nesting and feeding.

The record of the blue-winged pitta (*Pitta moluccensis*) is considered to be of notable significance because it is an indication of a breeding population in the Study Area. This species was heard on multiple occasions and seen twice at two different locations of the Study Area (T1 and T2) towards the ending of the migratory season (September to March) (see Figure 7-47). Low et al. (2016) reported that blue-winged pittas have been heard calling at “western Singapore, around the periphery of a military training area” between late April and July since 2008. Currently, the only confirmed local breeding record of this species is from Pulau Ubin [P-37]. Blue-winged pittas nest on the ground among the dense vegetation of the forest understorey. The abandoned-land forest patches in the Study Area provide potentially suitable breeding habitats for this species.



Figure 7-46 Birds of conservation significance. (A) Crested goshawk (*Accipiter trivirgatus*) and (B) grey-headed fish eagle (*Haliaeetus ichthyaetus*).



Legend

- Southern Tengah Study Area
- Scrubland & herbaceous vegetation
- Abandoned-land forest
- Mixed forest
- Waste woodland
- Managed vegetation
- Farm
- Others (Infrastructure)
- Construction
- Concreted area
- Waterlogged area (Ephemeral)
- Pond
- Stream (Perennial)
- Drain
- Terrestrial sampling route

N

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Figure Title :

Location of bird species of conservation significance

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7.3.3.11 Mammals (Non-Volant)

The field assessment recorded 11 non-volant mammal species, with the globally and nationally Critically Endangered Sunda pangolin (*Manis javanica*) being the only species of conservation significance. Singapore is a stronghold for the Sunda pangolin, with the species being able to utilise green areas within nature reserves as well as degraded forests and manmade structures such as roads and drains [P-32]. However, threats to the local population remain, with road-related mortality reducing the population size, and habitat loss, degradation and fragmentation, threatening the genetic diversity of the Singapore's population [P-32]. There were four independent detections of the Sunda pangolin via camera trap, resulting in an average detection rate of 0.021 Sunda pangolin detections per trap night. All occurrences were from the western portion of the Study Area (CT01, CT03 and CT04), where the PUB Pipeline is slated to be (see Figure 7-48). A previously unpublished camera trapping exercise at PUB Pipeline also recorded the Sunda pangolin, but with a higher detection rate of 0.049 Sunda pangolin detections per trap night. Within the larger landscape, hoardings have been established to the north and east of the western edge of the Study Area, preventing the movement of Sunda pangolins further east. However, the western part of the Study Area remains connected to forested areas north of the Study Area and construction site via a forested corridor running along the PIE and KJE, thus possibly explaining its presence here.

All other recorded species were considered widespread and common except the restricted but common slender squirrel (*Sundasciurus tenuis*), a species more often observed within forested habitats, and the common palm civet (*Paradoxurus musangus*) which is considered widespread but uncommon.



Figure 7-48 Sunda pangolin (*Manis javanica*) on camera trap footage

The 18 camera traps yielded 1,432 independent detections, with 10 species of identified non-volant mammals over 1136 trap-nights.

The most commonly recorded non-volant mammalian species was the wild pig (*Sus scrofa*), with 963 independent detections across all camera traps. Common treeshrews (*Tupaia glis*) were also frequently recorded, with 215 independent detections. CT04 recorded the highest non-volant mammal species richness, with six species, and also had the highest detection rate of all camera trap stations. CT04 is located at the western portion of the Study Area.

Table 7-13 Summary of trap-nights and number of independent detections of mammal species at each camera trap

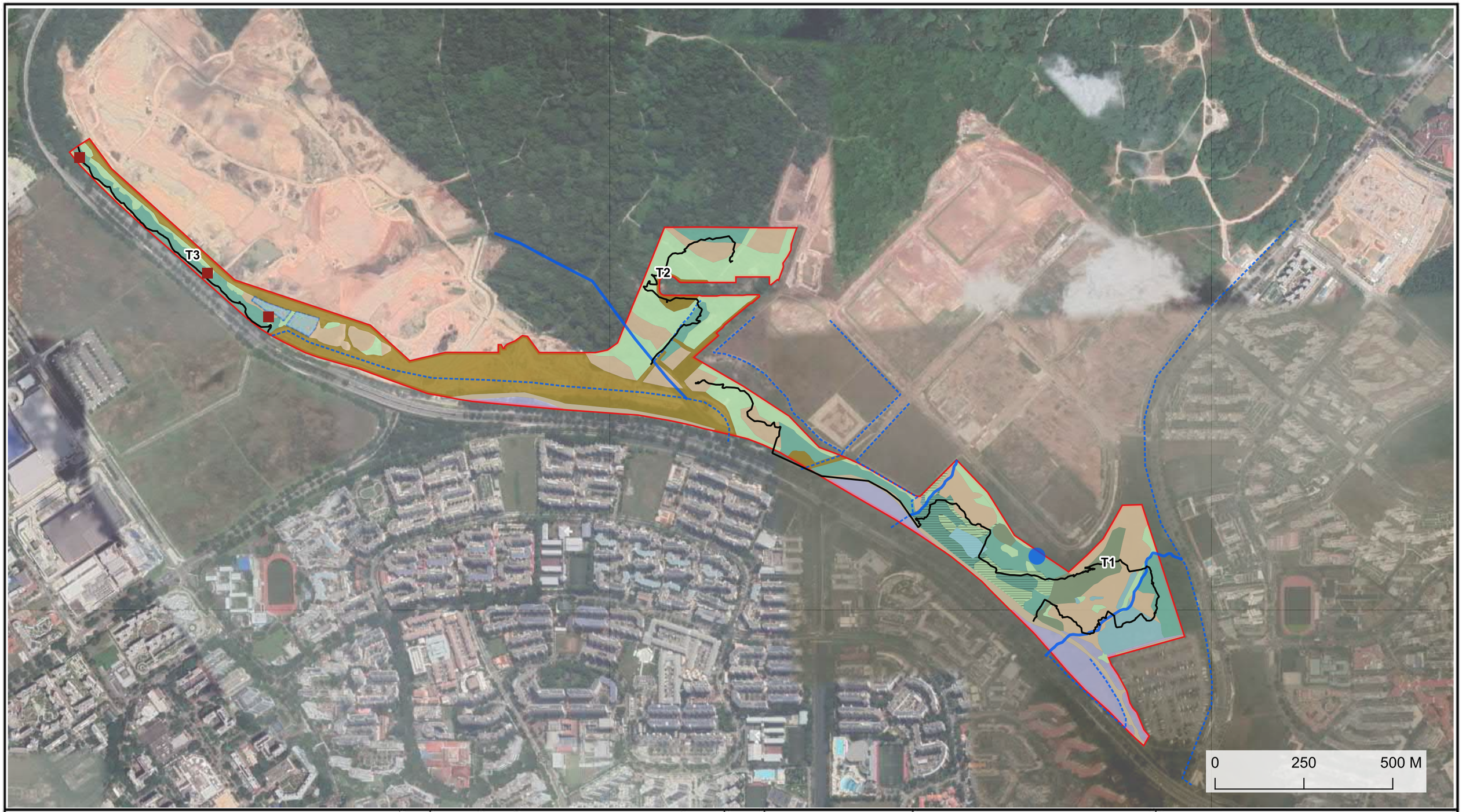
Station	No. of trap nights	No. of species	Detection rate of non-volant mammal species
CT01	67	5	1.54
CT02	67	5	3.4

Station	No. of trap nights	No. of species	Detection rate of non-volant mammal species
CT03	67	5	1.16
CT04	67	6	2.81
CT05	48	3	0.25
CT06	81	5	2.25
CT07	60	5	0.98
CT08	60	3	1.07
CT09	60	3	0.2
CT10	60	3	1.47
CT11	74	4	1.31
CT12	61	3	0.75
CT13	60	3	1.23
CT14	63	1	0.17
CT15	63	5	2.13
CT16	63	1	0.08
CT17	60	4	0.37
CT18	55	3	0.53

Table 7-14 Location of and number of independent detections of mammal species across all camera traps

Scientific Name	Common name	Station	No. of independent detections
Callosciurus notatus	Plantain squirrel	02, 03, 04, 06, 07, 08, 09, 10, 11, 12, 13, 15, and 17	79
Canis lupus familiaris	Feral dog	06, 07, 08, 09, 12, 13, 17, and 18	13
Felis catus	Feral cat	02 and 03	4
Manis javanica	Sunda pangolin	01, 03, and 04	4
Paradoxurus musangus	Common palm civet	01, 02, 03, 04, 06, 07, 11, 15, 17, and 18	33
Rattus tanezumi	Oriental house rat	05	1
Rattus tiomanicus	Malaysian wood rat	01, 02, 03, 04, 05, 06, 07, 15, 17, and 18	113
***Rattus* sp.**	Rat	01, 02, 03, 04, 05, 06, 07, 14, 15, 17, and 18	N.A*
Suncus murinus	House shrew	05	7
Sus scrofa	Wild pig	All stations	963
Tupaia glis	Common treeshrew	01, 02, 03, 04, 06, 07, 10, 11, and 15	215
N.A.	Unidentified squirrel or treeshrew	01, 02, 03, 04, 05, 06, 07, 14, 15, 17, and 18	N.A*
		Total	**1432**

*Independent detection cannot be calculated since it was not identified to species level



Legend

- Southern Tengah Study Area
- Scrubland & herbaceous vegetation
- Abandoned-land forest
- Mixed forest
- Waste woodland
- Managed vegetation
- Farm
- Others (Infrastructure)
- Construction
- Concreted area
- Waterlogged area (Ephemeral)
- Pond
- Stream (Perennial)
- Drain
- Terrestrial sampling route
- Manis javanica

N

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Figure Title :

Location of non-volant mammal species of conservation significance

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7.3.3.12 Mammals (Bats)

Four bat species were recorded during the field assessment: the lesser dog-faced fruit bat (*Cynopterus brachyotis*) was observed during transect surveys, while the Asiatic lesser yellow house bat (*Scotophilus kuhlii*), pouch-bearing tomb bat (*Saccolaimus saccolaimus*), and whiskered myotis (*Myotis muricola*) were recorded acoustically (see Figure 7-50) (Table 7-10; Appendix I). All four species are widespread and common, and are able to thrive in disturbed environments.

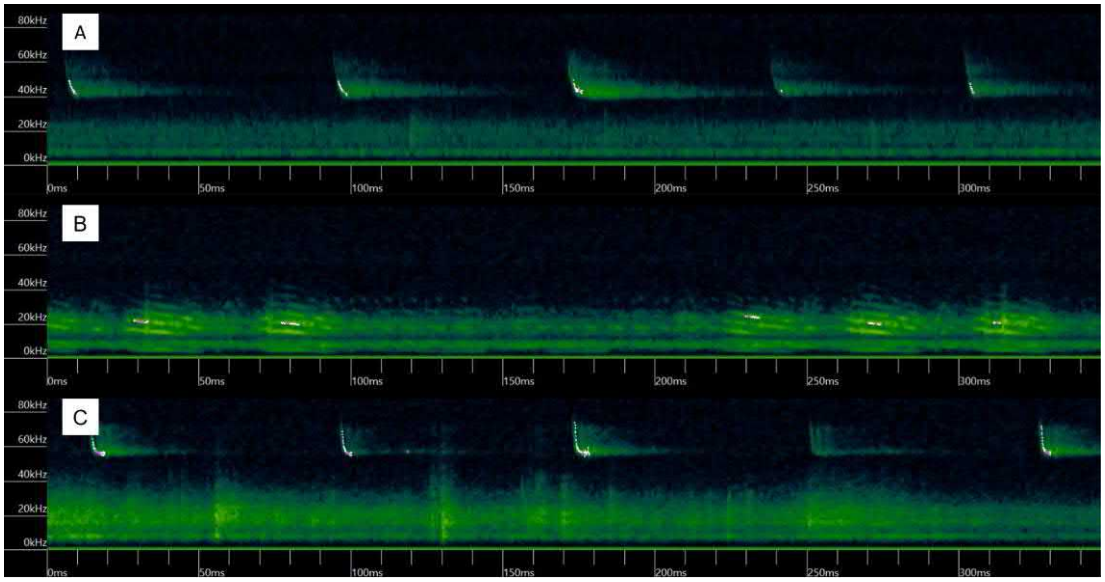
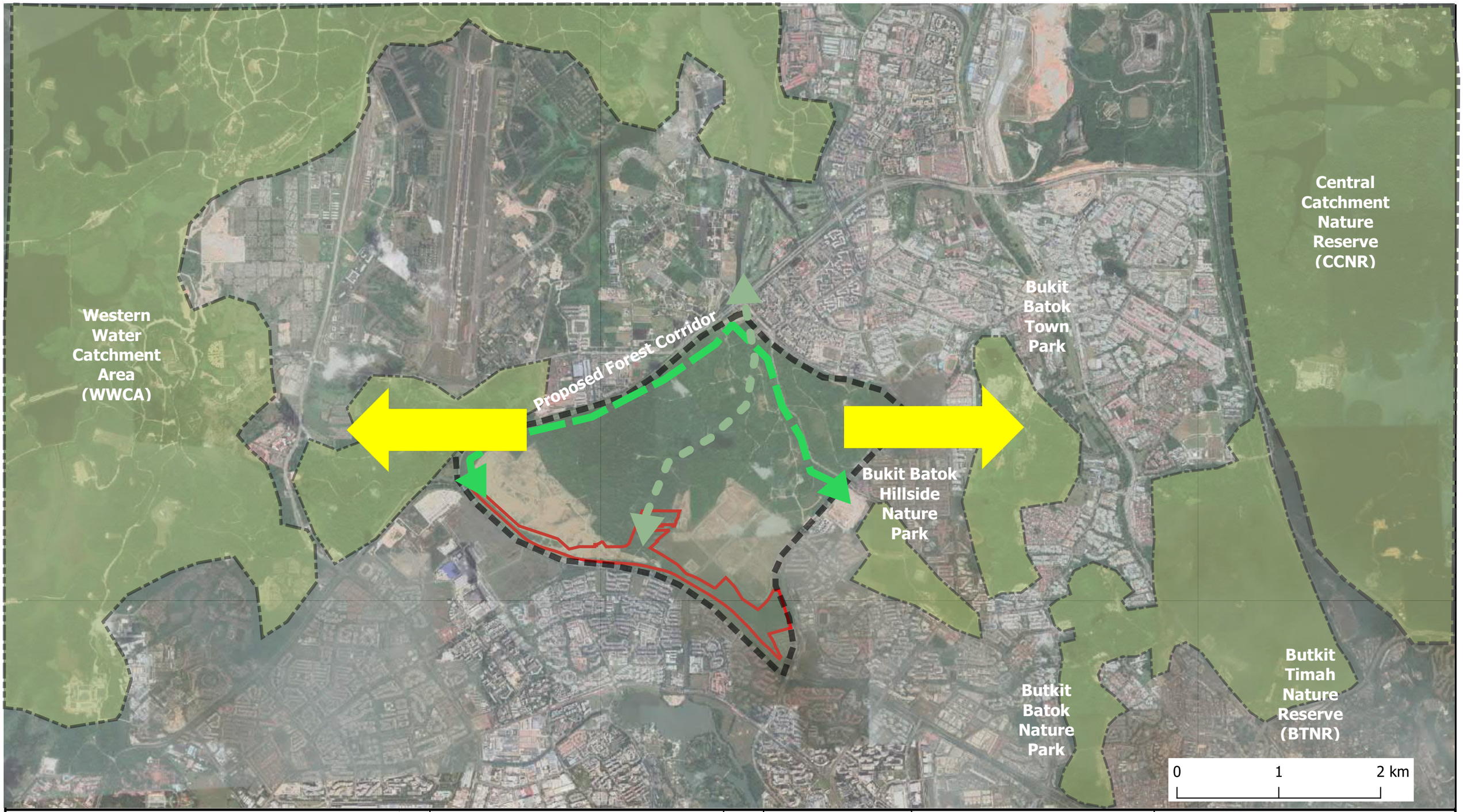


Figure 7-50 Bat recordings obtained during the field assessment. (A) Asiatic lesser yellow house bat (*Scotophilus kuhlii*), (B) Pouch-bearing tomb bat (*Saccolaimus saccolaimus*), and (C) Whiskered myotis (*Myotis muricola*)

7.4 Ecological Significance

Southern Tengah (60.2 ha) is the last few remaining forest patches within the Tengah Forest. It is home to a diversity of flora and fauna and provide as a stepping stone for connectivity between two biodiversity hotspots, the Western Water Catchment Area (WWCA) and the Central Catchment Nature Reserve (CCNR) (see Figure 7-51). Ecological connectivity is important as it maintains a healthy ecosystem through crucial processes such as seed dispersal and genetic exchanges.



Legend

- Boundary of Tengah
- Southern Tengah Study Area

N

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Qualified Person Endorsement : NA

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Figure Title :

Ecological connectivity of the Study Area within Tengah and to other green areas

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7.5 Assessment of Ecological Value

Habitats and species were assessed for their ecological value based on the criteria described in Table 7-15 and Section 7.5.1, respectively [P-13, R-8]. Those of higher ecological value were assigned Priority 1 sensitivity level, while those of moderate or low ecological value were assigned Priority 2 or 3 levels, respectively.

Table 7-15 Criteria used in assessing the ecological value of a habitat

Criterion	Definition	Classification		
		High	Medium	Low
Size	Area occupied by the habitat relative to the study area or length of a stream	≥ 40%	10–40%	≤ 10%
Naturalness	Degree to which the habitat has been modified or disturbed as a result of human activities	Habitat with minimal human disturbance	Moderately disturbed habitat that has been modified to some extent	Highly disturbed habitat that has been modified to a large extent
Abundance of species of conservation significance	Number of plant specimens and sightings of fauna of conservation significance recorded within the habitat relative to the study area	≥ 40%	10–40%	≤ 10%
Abundance of large and other plant specimens of value	Number of large and other plant specimens of value recorded within the habitat relative to the study area	≥ 40%	10–40%	≤ 10%
Ecological linkage	Connectedness to a highly-valued habitat	Highly connected	Moderately connected	Unconnected/ isolated
Difficulty in recreatability	Level of difficulty in re-constructing the habitat through human intervention	Difficult	Moderately difficult	Easy

7.5.1 Habitat Evaluation

Within the Study Area, 10 habitats were assessed. Three habitats–mixed forest, abandoned-land forest and D5 stream, were assigned with a Priority 1 level. Four habitats–waste woodland, scrubland and herbaceous vegetation, D2 stream and D4 stream, were assigned with a Priority 2 level. The remaining three habitats–farm, managed vegetation and D6 pond, were assigned with a Priority 3 level. The assessment of the ecological value of each habitat is described below and summarised in Table 7-16.

Table 7-16 Assessment of ecological value of each vegetation type within the Study Area

Criterion/ Habitats Type within Study Area	Mixed Forest	Abandoned-land Forest	Scrubland and Herbaceous Vegetation	Waste Woodland	Managed Vegetation	Farm
Size	2.8% (1.7 ha)	15.8% (9.5 ha)	22.2% (13.3 ha)	17.1% (10.3 ha)	7.1% (4.2 ha)	4.2% (2.5 ha)
Naturalness	Natural	Naturalised	Naturalised	Naturalised	Man-made	Man-made
Abundance of species of conservation significance	Flora: 17% (137) Fauna: 26% (5)	Flora: 20% (159) Fauna: 37% (7)	Flora: 22% (175) Fauna: 63% (7)	Flora: 39% (315) Fauna: 74% (14)	Flora: 0.4% (3) Fauna: 0%	Flora: 3% (21) Fauna: 0%
Abundance of large specimens and other specimens of value	4% (3)	36% (26)	26% (19)	22% (16)	11% (8)	0% (0)
Ecological linkage	High	High	High	High	Medium	Medium
Difficulty in recreatability	Difficult	Moderately difficult	Easy	Easy	Easy	Easy
Summary of categorisations	Size: low	Size: low	Size: medium	Size: medium	Size: low	Size: low
	Naturalness: high	Naturalness: medium	Naturalness: medium	Naturalness: medium	Naturalness: low	Naturalness: low
	Abundance of species of conservation significance: medium	Abundance of species of conservation significance: medium	Abundance of species of conservation significance: medium	Abundance of species of conservation significance: high	Abundance of species of conservation significance: low	Abundance of species of conservation significance: low
	Abundance of large specimens and other plant specimens of value: low	Abundance of large specimens and other plant specimens of value: medium	Abundance of large specimens and other plant specimens of value: medium	Abundance of large specimens and other plant specimens of value: medium	Abundance of large specimens and other plant specimens of value: medium	Abundance of large specimens and other plant specimens of value: low

Criterion/ Habitats Type within Study Area	Mixed Forest	Abandoned-land Forest	Scrubland and Herbaceous Vegetation	Waste Woodland	Managed Vegetation	Farm
	Ecological linkage: high	Ecological linkage: high	Ecological linkage: high	Ecological linkage: high	Ecological linkage: medium	Ecological linkage: medium
	Difficulty in recreatability: Difficult	Difficulty in recreatability: Moderately difficult	Difficulty in recreatability: Easy	Difficulty in recreatability: Easy	Difficulty in recreatability: Easy	Difficulty in recreatability: Easy
Sensitivity	Priority 1	Priority 1	Priority 2	Priority 2	Priority 3	Priority 3

Table 7-17 Assessment of each waterbody within the Study Area

Criterion/ Habitats Type within Study Area	D5 Stream	D2 Stream	D4 Stream	D6 Pond
Size	574 m	650 m (only 200 m lies within the Study Area)	212 m	10 m by 10 m
Naturalness	Natural	Naturalised	Naturalised	Naturalised
Abundance of species of conservation significance	Flora: N.A Fauna: 100%*	Flora: N.A Fauna: 0%	Flora: N.A Fauna: 0%	Flora: N.A Fauna: 0%
Abundance of large specimens and other specimens of value	N.A	N.A	N.A	N.A
Ecological linkage	High	Low	Low	Low
Difficult in recreatability	Difficult	Easy	Moderately difficult	Easy
Summary of categorisations	Size: low	Size: low	Size: low	Size: low
	Naturalness: natural	Naturalness: naturalised	Naturalness: naturalised	Naturalness: naturalised

Criterion/ Habitats Type within Study Area	D5 Stream	D2 Stream	D4 Stream	D6 Pond
	Abundance of species of conservation significance: high	Abundance of species of conservation significance: low	Abundance of species of conservation significance: low	Abundance of species of conservation significance: low
	Abundance of large specimens and other plant specimens of value: N.A	Abundance of large specimens and other plant specimens of value: N.A	Abundance of large specimens and other plant specimens of value: N.A	Abundance of large specimens and other plant specimens of value: N.A
	Ecological linkage: high	Ecological linkage: low	Ecological linkage: low	Ecological linkage: low
	Difficulty in recreatability: Difficult	Difficulty in recreatability: Easy	Difficulty in recreatability: Moderately difficult	Difficulty in recreatability Easy
Sensitivity	Priority 1	Priority 2	Priority 2	Priority 3

*Only one species of conservation significance was recorded within the waterbodies; and only along D5 stream.

Table 7-18 Assessment of the ecological value for each habitat receptor

Habitat Assessed with High Ecological Value

a) Mixed Forest (MF)

This forest patch occupies 1.7 ha (2.84%) within the Study Area. It is considered a habitat of high naturalness as it is dominated by native flora species (25 native out of 30 recorded species within this habitat) and a medium level of abundance of conservation significance species (taking into account both flora and fauna). This suggests the habitat was subjected to less human disturbance. The forest also contains some large tree specimens and ample clusters of keystone species (*Ficus* spp.) which is an important food source for many frugivores animals. The plant species of conservation significance present within this habitat type includes a patch of mature and saplings of nationally Vulnerable *Streblus elongatus*, and the mature specimen of nationally Endangered *Dacryodes* cf. *costata*. In terms of fauna, the very rare Malay staff sergeant (*Athyma reta moorei*), nationally Endangered straw-headed bulbul (*Pycnonotus zeylanicus*), blue-crowned hanging parrot (*Loriculus galgulus)* and changeable hawk-eagle (*Nisaetus cirrhatus)*.

The Mixed Forest is contiguous to other habitat types of high ecological value in the Study Area. Hence, it serves as an ecological resource for species requiring more natural forest. It is also a source for the natural dispersal of propagules of native species into surrounding habitats. Therefore, this habitat type has a high ecological linkage.

All in all, The MF is assessed to be of high ecological value (Priority 1) due to its high naturalness and ecological linkage, difficulty in recreatability, and medium abundance of species of conservation significance.

b) Abandoned-land Forest (ALF)

Abandoned-land forest is a naturalised habitat in Singapore that is moderately difficult to recreate. It occupies 9.46 ha (15.80%) of the total Study Area. This habitat was mainly dominated by exotic fruit trees and crop plants cultivated in the past. However, it has 159 individuals of plant species of conservation significance which is comprised of 25 species (out of 34 species of conservation significance across the Study Area). The most noteworthy record was the re-discovery of *Asplenium nitidum,* a fern previously considered to be nationally Extinct. An individual was found in a small forest patch in the northern portion of the Study Area. There was also a higher density of large specimens and keystone species (mainly *Ficus microcarpa*) on the eastern portion of this habitat type. Large specimens are highly valuable as they provide a myriad of environmental and ecological services such as making up the forest structure and regulating the microclimate of the forest [P-5]. Volant and arboreal fauna species usually depend on large specimens to shelter them against predators.

The patches of ALF across the Study Area harbour seven individuals of faunal species of conservation significance. The patch of ALF on the top eastern corner adjacent to Bukit Batok Road lies the headwater of a natural freshwater stream where the nationally Endangered Asian softshell turtle (*Amyda cartilaginea*) was recorded. Other species of conservation significance include the nationally Vulnerable and rare lowland dwarf gecko (*Hemiphyllodactylus typus)* and nationally Endangered and globally Critically Endangered straw-headed bulbul (*Pycnonotus zeylanicus*). The western portion of this habitat type is noteworthy for the presence of the nest of a nationally Endangered changeable hawk-eagle (*Nisaetus cirrhatus)* and Critically Endangered Sunda pangolin (*Manis javanica*). In all, the abundance level of species of conservation significance (flora and fauna) in ALF is medium.

The habitat type exists in patches distributed across the Study Area, and is contiguous with other high value habitat types. Therefore, it is of high value in terms of ecological linkage, allowing floral and faunal species to disperse or move across the Study Area. Hence, this habitat type was assessed with a high ecological value (Priority 1).

c) D5 Stream

D5 stream is a meandering stream with natural embankment and a sandy/mud/pebbly stream bed. Although its riparian vegetation was mainly exotic species, they provide a complex vegetation structure along the banks creating a variety of shady and sunny sections along the stream. Over time, the land use changes in the surrounding area have degraded the stream (soil and stream bank erosion and presence of large debris and trash) but it has maintained its natural biophysical character. D5 stream was also assessed with high ecological linkage as it is linked to other waterways beyond the Study Area. Even though this stream has a low abundance of species of conservation significance (i.e., Asian soft-shell turtle (*A. cartilaginea)*), it is assessed to be of high ecological value (Priority 1) due to its high naturalness, and is considered difficult to recreate.

Habitat Assessed with Medium Ecological Value

a) Waste Woodland (WW)

Waste woodland is considered to be a naturalised habitat that is easy to be recreated in Singapore. It occupies 10.26 ha (17.14%) within the Study Area. The WW patches are contiguous to other habitat types, especially the eastern patch where a section of the natural stream (D2) flows through. Furthermore, a large patch is adjacent to a habitat of higher ecological value, mixed forest. Therefore, this habitat type has a high ecological linkage.

There are 18 plant species of conservation significance, which is the second highest tally across all habitat types such as the large cluster of *Glochidion zeylanicum* var. *zeylanicum* in northern portion of this habitat type. In total, there were 315 individuals and clusters of plant species of conservation significance within this habitat type across the Study Area. This is the highest abundance among all habitat types. The proportion of large trees and clusters of specimens of value/keystone species in this habitat type is medium at 22%.

In terms of fauna, 14 individuals of species of conservation significance were recorded which is the highest among the habitat types. This includes the endangered Formosan swift butterfly (*Borbo cinnara*), globally vulnerable Malayan box terrapin (*Cuora amboinensis*) at the northern portion, and nationally Endangered blue-crowned hanging parrot (*Loriculus galgulus)*. Overall, this habitat type has a medium abundance of flora and fauna species of conservation significance.

Even though it's a naturalised, high recreatability habitat, the WW in this Study Area is considered to be of medium ecological value (Priority 2) due to the medium level of species of conservation significance and large trees, specimens of value/keystone species found.

b) Scrubland and Herbaceous Vegetation (SHV)

Scrubland and herbaceous vegetation is a highly disturbed, naturalised habitat that is typically easy to recreate in Singapore. It occupies 13.31 ha (22.24 %), the largest vegetated habitat in the Study Area. This habitat type mostly occupies the forest edges where temperature and light levels are higher, although there may also be small patches scattered within a forest. This habitat type is also contiguous with other habitat types of higher ecological value such as abandoned-land forest and mixed forest within the eastern portion of the Study Area. As such, this habitat type has a high ecological linkage.

Floristically, 46 out of 111 of the species recorded were native of which 14 are of conservation significance. In total, there were 175 (21%) individuals of plant species of conservation significance. This includes the nationally Vulnerable *Glochidion zeylanicum* var. *zeylanicum* mostly concentrated within the northern portion of the scrubland and herbaceous habitat. The northern patch also contains some large trees, specimens of value, and keystone species.

The very rare Malay staff sergeant (*Athyma reta moorei*), was recorded at the northern portion of this habitat type, most likely due to the presence of its host plant *Glochidion zeylanicum* var. *zeylanicum*. Twelve individuals of faunal species of conservation significance were recorded., such as the changeable hawk-eagle (*Nisaetus cirrhatus)*, red-wattled lapwing (*Vanellus indicus*), and red junglefowl (*Gallus gallus*). The abundance of flora and fauna species of conservation significance in this habitat type is considered medium.

Despite it being a naturalised and easily recreatable habitat, this habitat was assessed to be of medium ecological value (Priority 2) on account of its high ecological linkage and medium level of species of conservation significance and large trees, specimens of value/keystone species.

c) D4 and D2 streams

D4 and D2 streams are both naturalised streams that do not contain any species of conservation significance and were of low ecological linkage.

D4 is a small, narrow, meandering shady stream with a natural embankment that is steep due to soil erosion from previous land clearance activities. Although its riparian zone is degraded and narrow, the vegetation structure is complex, thus conferring a level of habitat heterogeneity. Hence, the stream is considered to be moderately difficult to recreate. It is of medium ecological value (Priority 2).

Much wider and more open than D4, D2 is a typical rural stream that was linear with a rather homogenous riparian vegetation dominated by tall lalangs (*Imperata cylindrica*) and elephant grass (*Pennisetum purpureum*). It is easy to recreate and was

assessed to be Priority 2 as less than half of the stream length (200m) of its entire length of 650m would be directly impacted by the proposed development within the Study Area.

Habitat Assessed with Low Ecological Value

a) Farm and Managed Vegetation

These two habitats were essentially naturalised, man-made, and highly disturbed. The farm is of medium ecological linkage as it is located within the abandoned-land forest, waste woodland, and scrubland and herbaceous vegetation. The planted crops provide a food resource for certain fauna species. Additionally, the small ponds created by farmers, presumably for irrigation purposes, provided habitats for common odonates species. The managed vegetation has a medium ecological linkage since it is located in close proximity to other habitats of high ecological value. It also contained large specimens of angsana (*Pterocarpus indicus*) and keystone species.

In terms of biodiversity, 21 (eight species) and three (two species) individuals of plant species of conservation significance were recorded from the farm and managed vegetation respectively. This represents the lowest proportion among all habitat types. No faunal species of conservation significance were recorded here.

Collectively, these two habitat types are of low ecological value (Priority 3).

b) D6 pond

D6 pond is a Priority 3 waterbody because it was assessed low in terms of abundance of species of conservation significance and low ecological linkage as it was not connected to any other ponds or streams. Moreover, it abuts a construction hoarding. Although naturalised, it is easy to recreate since its origin was most likely man-made.

7.5.2 Species Evaluation

All plant and faunal species were first accorded with a tentative ecological value, i.e., high, medium, or low, based on the following basic framework:

- High ecological value: Species of conservation significance (See Section 7.2.1.1.4)
- Medium ecological value: All other native and migratory species
- Low ecological value: Exotic and cryptogenic species

Plant species that were tentatively assigned medium (all other native species) or low (exotic and cryptogenic species) ecological value were then evaluated individually based on the criteria listed in Table 7-19. The evaluation of individual species served to either maintain or raise the pre-assigned ecological value. The following paragraphs detail how each criterion was considered in the further evaluation of plant species.

Cultivation intensity and effects (native species only): The ecological value of all native species previously or presently cultivated and/or with populations of relics or escapees, respectively, present in the secondary forests of Singapore were maintained at the medium level. Otherwise, those that are associated with important fauna were raised to high ecological value.

National distribution (non-cultivated native species only): The ecological value of non-cultivated native plant species with restricted national distribution—i.e., largely found in certain forest patches in Singapore or offshore islands, such as the primary and old growth secondary forests of the CCNR—were raised from the original medium level to high. On the other hand, that of non-cultivated plant species that are nationally widespread—i.e., occur at several secondary forest patches throughout Singapore—were maintained at the medium level.

Association with important fauna (native, exotic, and cryptogenic species): The ecological value of plant species that directly support the growth and survival of important fauna at one or various life cycle stages were raised to high, irrespective of plant species origin, cultivation intensity and effects, as well as national distribution. Examples of such plant species include caterpillar host plants for rare butterfly species and bamboos that are refugia for nationally threatened bamboo bats. The ecological value of plant species without associations with important fauna was maintained at the original level, i.e., medium or low.

There are, however, a few exceptions in which the highest ecological value was automatically assigned to species regardless of the criteria listed below. They are: (1) species endemic to Singapore; (2) keystone fig species (*Ficus* sp.) as they fruit all year round and provide a steady source of food for frugivores [P-36]; and (3) species planted for reforestation and/or previously thought to be extinct and are planted for species reintroduction. Additionally, the exotic rain tree (*Samanea saman*) was also automatically raised from low to medium ecological value given that it often supports the growth of epiphytes that provide habitats for fauna.

Table 7-19 Criteria for assessing the ecological value of plant species

Criterion	Definition
Conservation significance	Listed as nationally threatened, i.e., Vulnerable, Endangered, Critically Endangered, or Extinct, and are considered of conservation significance in this study
Cultivation intensity and effects	Cultivated previously or presently—for various purposes such as reforestation, landscaping, species reintroduction, commercial sale, etc—and populations of relics and/or escapees are present/absent in forests
National distribution	Extent of spread and/or occurrence at one or multiple forest patches in Singapore
Association with important fauna	Directly associated with the survival of important fauna at one or various life cycle stages

7.5.2.1 Plants

The ecological value of 368 plant species was assessed. Of the 368 plant species assessed for their ecological value, 45 are of high value, 104 of medium value, and the remaining 219 of low value. Altogether, 10 species had their ecological value raised after assessment. One species, which is rain tree (*Samanea saman)*, was raised from

low to medium ecological value as this exotic species often supports the growth of various species of epiphytes that create and provide habitats for fauna. For the remaining nine species, seven species were raised from medium to high and two were raised from low to high.

Seven of the species that had their ecological value raised from medium to high comprise fig (*Ficus* spp.) species. Five of these fig species are common native species (i.e., *Ficus caulocarpa, F. fistulosa, F. grossularioides var. grossularioides, F. microcarpa* and *F. variegata*) and were therefore accorded an initial level of medium. The remaining two species are *F. benjamina* and *F. hispida* are cryptogenic and of exotic origin respectively, and thus originally accorded low ecological value. The ecological value of these fig species was raised as they are keystone species important for the health of entire ecosystems; they produce figs year-round that provide a steady source of food for frugivores [P-36].

The remaining two species that were raised from medium to high ecological value are native species. These species are *Adinandra dumosa* and *Ploiarium elegans* that although listed as locally Common, have a restricted distribution nationally where they often occur in pioneer successional secondary in Southern Ridges, and forest reserves in some parts of the BTNR and CCNR, as well as the Western Catchment [P-61].

7.5.2.2 Fauna

The ecological value of 247 faunal species was assessed. Nineteen species were assessed to have high ecological value, 195 species of medium value, and 33 species of low value.

7.6 Areas of Conservation Value

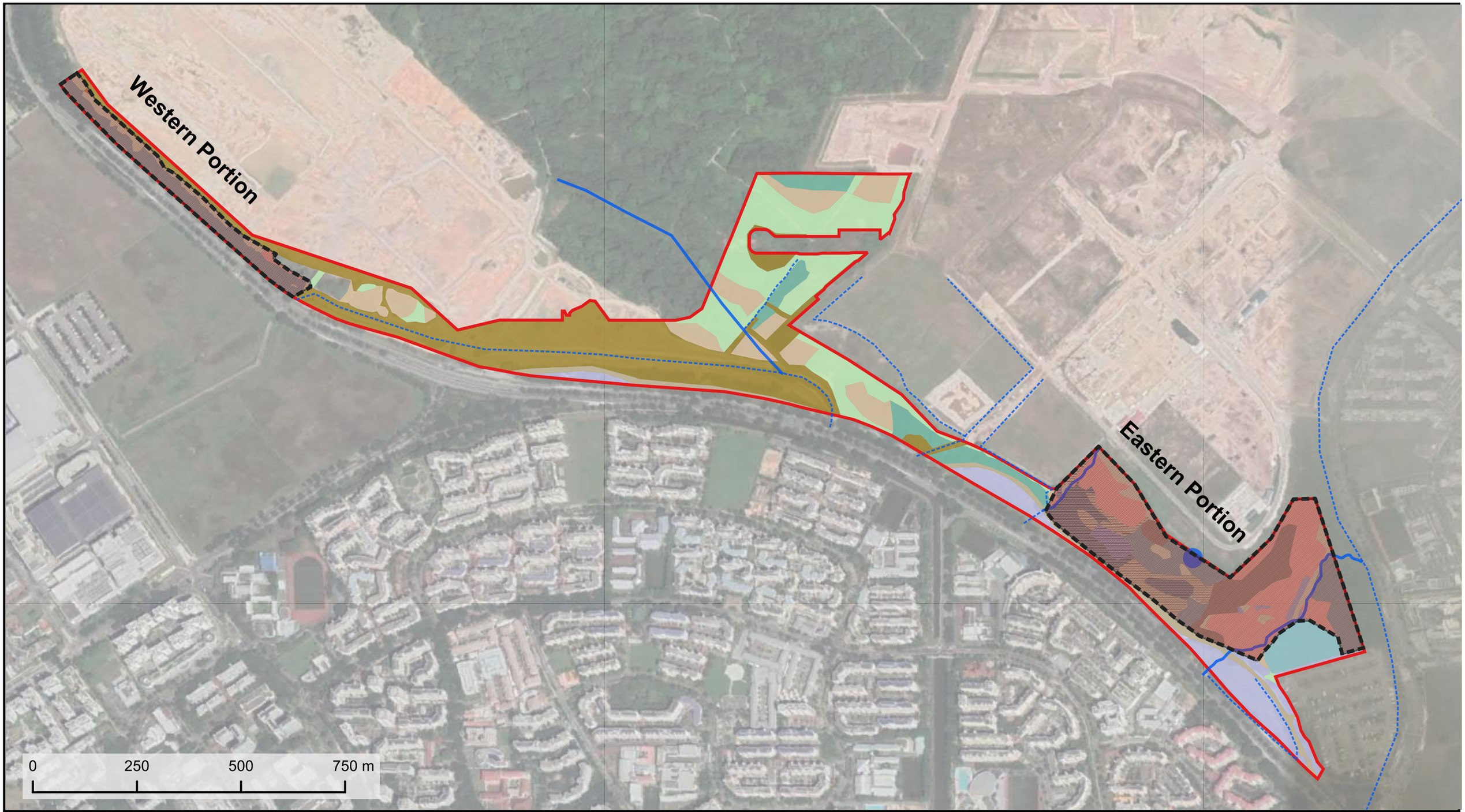
Areas of conservation value (ACV) were initially identified within the Study Area to prioritise conservation efforts. It was determined based on the presence of habitats and species of high ecological value, as well as the contiguity of the habitats.

Two areas of high conservation value were identified within the Study Area. Firstly, the eastern portion comprised habitats of high ecological value, i.e., mixed-forest, abandoned-land forest, and D5 stream, and habitats of medium ecological value, i.e., scrubland and herbaceous vegetation, waste woodland, and D4 stream. In addition, there is a higher concentration of plant species of conservation significance and keystone species here. The area harbours 10 species of *Ficus*, of which three are nationally threatened, viz. *Ficus aurata var. aurata* (Vulnerable), *Ficus stricta* (Critically Endangered), and *Ficus vasculosa* (Endangered). The abundance of faunal species of conservation significance is also considered medium to high here. This includes species such as nationally Vulnerable red-legged crake (*Rallina fasciata*) and Critically Endangered crested goshawk (*Accipiter trivirgatus*). Furthermore, at least two individuals of the nationally Endangered Asian softshell turtle (*Amyda cartilaginea*) inhabit the natural stream (D5 stream) that flows through the area. The globally and nationally threatened straw-headed bulbul (*Pycnonotus zeylanicus*) was also only recorded in the eastern portion of the Study Area, which may be explained by the presence of the D5 stream since this species has a preference for riparian habitats [P-65].

The conservation value of the eastern section is greatly bolstered by the structurally complex natural stream with its meandering channel, substrate complexness (sandy, pebbles, small rocks), sections of slow flow, and rapid riffles, deep and shallow pools. The varying degree of canopy cover results in various shady and sunny spots along the stream. These complexities create different micro-habitats potentially for a rich riverine community. Streams like this are a rare lotic habitat in Singapore. The eastern section occupies 15.60 ha of the total Study Area.

Another area of conservation that was identified is the linear strip of habitat abutting the Pan-Island Expressway (PIE) on the western section of the Study Area. It comprises habitats of high and medium ecological value (i.e., abandoned-land forest, scrubland and herbaceous vegetation and waste woodland) as concluded from Section 7.5.1. Moreover, it adjoins to the larger intact forest north of the Study Area which is the most plausible reason why the globally and nationally Critically Endangered Sunda pangolin (*Manis javanica*) were recorded there. It also contains the biggest specimen of *Ficus microcarpa,* which was measured to be 25m spread & 16m in height. To add on, the presence of the nationally Endangered changeable hawk-eagle's nest ((*Nisaetus cirrhatus*) suggests that the area provides a suitable environment for it to be utilised by threatened species. This area occupies 3.90 ha of the total Study Area.

In total, the area of conservation value amounted to 19.5 ha and represents 55.5% of the vegetated area within the Study Area.



Legend

- Southern Tengah Study Area
- Area of Conservation
- Abandoned-land forest
- Mixed forest
- Scrubland and herbaceous vegetation
- Waste woodland
- Farm
- Construction
- Managed vegetation
- Others (Infrastructure)
- Concreted Area
- Waterlogged Area (Ephemeral)
- Stream (Perennial)
- Drain
- Pond

N

Rev.	Date	By	Description	Chk'd	App'd
-	OCT 2021	ZA	Final Report	NHT	JAG

Qualified Person Endorsement : NA

HDB Endorsement : NA

Consultant : AECOM

Client: HOUSING & DEVELOPMENT BOARD

Project Title :

CONTRACT L/025/21 SPECIALIST CONSULTANCY SERVICES FOR ENVIRONMENTAL IMPACT STUDIES (EIS) ON SOUTHERN TENGAH

Figure Title :

Areas of conservation value within the Study Area indicated by the black dotted line

Designed	Checked	Approved	Figure No. :	Rev.	Sheet
ZA	NHT	JAG	7-52	-	1 of 1
	Drawn ZA	Date OCT 2021	CAD File Name : NA		A3

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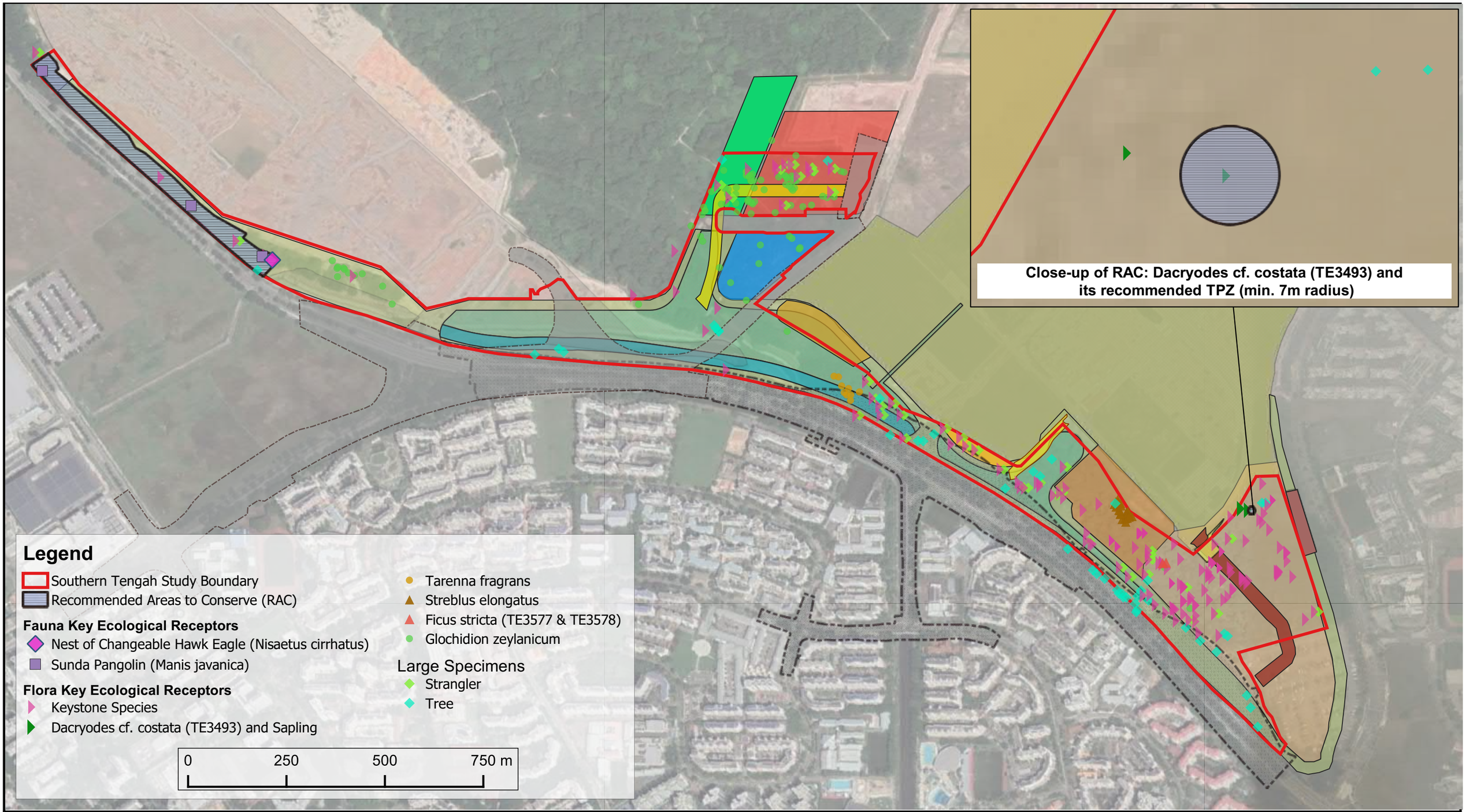
7.7 Recommended Areas of Conservation (RAC)

The feasibility of retaining the two sections delineated as areas of conservation value (ACV) in Section 7.6 was studied in greater detail. One of the challenges of conserving patches of forested areas was ensuring habitat connectivity to other existing forested areas. This is to ensure that the conserved habitats will not remain fragmented and isolated after the commencement of the proposed developments. According to Haddad et. al., 2015, habitat isolation has been proven to reduce the species richness of flora and fauna species within the fragmented patch of forest [P-81]. Generally, this is largely due to various preceding causes such as release from competition or predation, changes in disturbance regimes, and/or abiotic factors. To add on, habitat fragmentation encourages the formation of edge effect, which would alter the microclimatic conditions of the forest [P-82]. Eventually, these conditions such as greater wind speed and air temperature, leading to a change in forest structure and causing the failure of large and old tree specimens [P-81; P-82].

The feasibility of retaining the eastern portion of the area of high conservation value was greatly constrained due to ongoing site clearance, earthworks and other developments that are surrounding the area. Almost all vegetation has been cleared to make way for the developments such as residential developments and ongoing earthworks, infrastructure and building works for the future MRT station (JRL 2) (see Figure 7-53). As a result, habitat connectivity was almost impossible to achieve if the eastern portion were to be retained. Hence, the eastern portion was unable to be retained. However, certain mitigating measures will be implemented for some ecological receptors that lie within the eastern portion of the Study Area to minimise the impacts that are expected from the loss of vegetation within the eastern portion. This includes retaining the rare mature specimen of *Dacryodes cf. costata* (TE3493) (refer to Figure 7-53 and Section 7.3.2.1), along with a recommended Tree Protection Zone (TPZ) with a minimum radius of 7m to ensure that all parts of the tree will be protected during the construction period that will be carried out around the specimen. It is important to note that the radius of the TPZ may be expected to increase if required, subject to further assessments by a certified arborist.

For the western portion of the ACV, its existing connectivity to the larger forested area beyond the Study Area is beneficial to facilitate the movements of shy ground-dwelling mammals such as the nationally and globally Critically Endangered Sunda Pangolin (*Manis javanica*) (refer to Section 7.3.3.11 and 7.6). Although this portion is only approximately 45 m in width and is surrounded by the ongoing earthworks, infrastructure and building works for the Mass Rapid Transit (MRT) and Bus Depot (see Figure 7-53), the dense vegetation as described in Section 7.3.1.2 provided a conducive environment for numerous fauna species to utilise as a place of refuge from the ongoing developments nearby.

Hence, the western portion and the singular specimen of *Dacryodes cf. costata* (TE3493), along with its recommended TPZ, were delineated as a RAC and should be fully retained with no works or disturbances to happen within these areas. In total, the RAC occupies 3.22 ha (5.35%) of the Study Area.



Legend

- Central Park
- Earthwork 5
- Earthwork 4
- Earthwork 1
- Future Commercial and Residential Development
- Future Hospital Development
- JRL 3
- Mass Rapid Transit (MRT) and Bus Depot
- PIE Widening
- Project 2 (Tengah Pond)
- Project 2: (Forest Fringe)
- Project 2 (Tengah Stream)
- Proposed MRT Station
- Relocation of Interim Detention Pond
- Road and Building Construction
- Site Clearance for Future Temporary Outlet Drain
- Site Clearance for Future Road
- Site Clearance for Future Residential Development

N

Rev.	Date	By	Description	Chk'd	App'd
-	OCT 2021	ZA	Final Report	NHT	JAG

Qualified Person Endorsement : NA

HDB Endorsement : NA

Consultant : AECOM

Client: HOUSING & DEVELOPMENT BOARD

Project Title :

CONTRACT L/025/21 SPECIALIST CONSULTANCY SERVICES FOR ENVIRONMENTAL IMPACT STUDIES (EIS) ON SOUTHERN TENGAH

Figure Title :

Recommended Areas of Conservation within the Study Area

Designed	Checked	Approved	Figure No. :	Rev.	Sheet
ZA	NHT	JAG	7-53	-	1 of 1
	Drawn ZA	Date OCT 2021	CAD File Name : NA		A3

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7.8 Identification of Biodiversity Sensitive Receptors

7.8.1 Habitats

All habitats of Priority 1 and 2 sensitivity levels were identified as the sensitive receptors for habitats.

7.8.2 Flora

Following the assessment of ecological value for all plant species in Section 7.5.2, some were selected for the assessment of ecological impacts. The selection was based on the following: (1) common native species with restricted distribution, (2) species with specimens of conservation significance, large specimens, and/or other specimens of value found inside the proposed worksite area, (3) keystone species, which are only the *Ficus* species in this study and (4) species associated with important fauna.

7.8.3 Fauna

All species of fauna of conservation significance in this study were identified as the sensitive receptors for faunal species.

7.9 Potential Impacts on Biodiversity

Potential impacts to biodiversity arising from construction activities are identified in this section (Table 7-20). The construction activities include site clearance, excavation works, and construction of above-ground structures for the development of a residential town as described in Section 3.3.

There are two main categories which impacts fall into, namely, (1) direct, i.e., impacts to habitats and species within the worksites, and (2) indirect, i.e., impacts to habitats and species outside the worksites but within the impact zone. Impact zones for habitat and species receptors are defined as the proposed worksite, as well as 30 m from the proposed worksite. Although some studies have shown that edge effects can affect vegetation up to 150 m from forest boundaries [P-15, P-32, P-44, P-38], the 30-m impact zone is delineated based on the assumption that forest edge effects are the greatest within 30 m from the worksite. As a result, a small area of the demarcated Recommended Areas of Conservation (RAC), as well as adjacent existing habitats that are still intact, lies within the impact zone.

Table 7-20 List of potential ecological impacts during construction and operational phases

Receptor	Impact Type	Description	Impact Category
Habitats	Loss of vegetation	Direct removal of vegetation (with extensive underground root systems that protect against soil erosion) to create space for construction activities	Direct
	Habitat degradation	Improper disposal of construction waste, accidental release of hazardous materials (such as construction slurry, paint, and/or solvents), increase in dust, noise, and light levels, changes in forest hydrology	Indirect
	Change in species composition	Formation of forest edge habitats that favour the growth of certain exotic plants and fauna, and accidental introduction of exotic species from construction materials (such as soil with seeds or bio-degradable erosion blankets with insect eggs)	Indirect
Plant species	Mortality	Direct removal of vegetation or plant specimens to create space for construction activities	Direct
	Impediment to seedling recruitment	Pollution of habitats from improper disposal of construction waste and accidental release of	Indirect

Receptor	Impact Type	Description	Impact Category
		hazardous materials (such as construction slurry, paint, and/or solvents)	
	Competition from exotic plant species	Formation of forest edge habitats that favour the growth of certain exotic plants and accidental introduction of exotic species from construction materials (such as soil with seeds)	Indirect
	Decline in plant health and survival	Changes in microclimatic conditions (i.e., dust, noise, and light, temperature, and humidity) and hydrology	Indirect
Faunal species	Loss of/ reduction in habitats and food sources	Direct removal of vegetation to create space for construction activities	Direct
	Injury or mortality	Collisions with machineries, entrapments in construction materials (such as non-biodegradable erosion control blankets) and structures (such as exposed pits or drains), accidental kills by construction personnel, as well as injury or mortality from the translocation of individuals	Direct
	Loss of ecological connectivity for faunal movement	Habitat fragmentation from the removal of vegetation	Indirect
	Light disturbances	Increase in light levels from construction activities	Indirect
	Human disturbances	Increase in human traffic flow, such as workers and site personnel	Indirect
Operational Phase			
Habitat	Change in plant species composition	Long-term changes in light, temperature, and humidity in habitats surrounding facility structures	Direct
	Habitat degradation	Trampling on vegetation and/or pollution from increased human traffic	Direct
Plant Species	Mortality	Stealing/poaching of plants by humans	Direct
	Competition from exotic plant species	Accidental and/or intentional release/planting of exotic plants by humans	Indirect
Faunal Species	Injury or mortality	Navigation failures into the wrong areas and entrapment in facility structures, as well as collisions with vehicles.	Direct
	Impediment to faunal movement	Habitat fragmentation from the removal of vegetation	Indirect
	Disturbances from light	Disturbances from light generated from development	Indirect
	Disturbances from human presence	Disturbances from human presence (i.e., residential or park users)	Indirect
	Collisions with buildings (birds only)	Distorted perceptions of reflective surfaces on buildings as flyways, greenery, and/or water	Indirect

7.10 Minimum Control Measures

This section lists biodiversity-specific minimum controls commonly implemented in Singapore for similar construction and operational activities. These are assumed to be implemented for the impact assessment. Minimum controls for each potential impact occurring from the construction and operational phases are listed in Table 7-21. These measures should be proposed in tandem with other environmental receptors (e.g., air and noise).

Table 7-21 Description of minimum controls implemented at construction and operational phases

Work Activities	Minimum Controls
Construction phase	
Advance Works	• Set up Tree Protection Zones (TPZs) around trees or other plant specimens to be retained within the worksites, within which no construction works should be carried out. This should be executed by certified arborists and in accordance with the guidelines set up by the NParks. • Conduct inspections of fauna prior to felling or removal of vegetation. This should be done by an ecologist who is able to identify wildlife and/or active nesting structures, such as bird nests, tree hollows and/or burrows. • Execute wildlife response plan, and • Implement soil erosion control measures as soon as vegetation has been removed and soil is exposed (refer to Section 8 on Surface Water Quality).
Earthworks (Excavation, above and below ground construction)	• Implement soil erosion control measures (refer to Section 8 on Surface Water Quality), • Ensure proper storage of machineries likely to leech harmful chemicals and fuel-powered equipment, • Store the aforementioned equipment away from waterbodies and/or sensitive habitats (refer to Section 8 on Surface Water Quality), • Implement dust control measures (refer to Section 9 on Air Quality), and • Ensure noise levels are within approved limits as described in Section 10 under Airborne Noise.
General	• Avoid carrying out works at night to prevent disturbance to nocturnal fauna, • Avoid fogging by implementing preventive measures for mosquito to remove sources of stagnant water or water-bearing receptacles, e.g., – Providing well-maintained pitched roof, clearing discarded items daily, store materials appropriately, level up ground depression/uneven surfaces, ensure effective drainage flow. • Daily checks by Environmental Manager on site.
Operational phase	
General	• Ensure noise levels are within approved limits as described in Section 10 under Airborne Noise • Ensure dust levels are within approved limits as described in Section 9 on Air Quality • Avoid fogging by implementing preventive measures for mosquito to remove sources of stagnant water or water-bearing receptacles, e.g., – Providing well-maintained pitched roof, clearing discarded items daily, store materials appropriately, level up ground depression/uneven surfaces, ensure effective drainage flow.

7.11 Prediction and Evaluation of Biodiversity Impacts

Before the implementation of mitigating measures, direct impacts were assessed for all areas of the Study Area. Since indirect impacts are also expected to the existing adjacent habitats located beyond the Study Areas, for these areas, the impact significance matrix cannot be applied due to a lack of information of ecological receptors. A qualitative assessment was carried out instead.

For the assessment of residual impact, it is assumed that the demarcated RAC will be retained on site (refer to Section 7.7). Hence, the RAC was not assessed for direct impacts, and only areas that fall within the impact zone (refer to Section 7.9), were assessed for indirect impacts. Additionally, all impacts to the Study Area from adjacent development works were separately assessed qualitatively under cumulative impacts in Section 7.12.

Four general levels of qualitative assessments were given based on the following definitions:

1. No/negligible impacts – No impacts from the **proposed development** in Study Area to surrounding forested areas or from the **concurrent developments.**
2. Minimal impacts – Impacts may be incurred from the **proposed development** in Study Area to surrounding forest areas or from **concurrent developments** that may result in short duration and small-scale localised spatial changes, and that could cause minimal changes to species population.

3. Some impacts – Impacts may be incurred from the **proposed development** in Study Area to surrounding forest areas or from **concurrent developments** that may result in moderate duration and medium-scale localised spatial changes that could cause moderate reduction in size of species population but would not threaten species long-term viability.
4. Significant impacts – Impacts incurred from the **proposed development** in Study Area to surrounding forest areas or from **concurrent developments** that may result in extended duration and large-scale localised spatial changes that could cause substantial reduction in size of species population but threaten species long-term viability.

All identified key ecologically sensitive receptors were evaluated based on impact intensity and likelihood which eventually gives the impact significance. The various levels of impact intensity and likelihood for each impact type during construction and operational phases were specifically defined for the ecologically sensitive receptors in Sections 7.11.1 and 7.11.2, respectively.

Two assumptions were made in defining the levels of impact intensity and the likelihood of direct and indirect impacts for habitat receptors were:

1. Habitats within 30 m from the worksites are assumed to experience the greatest extent of edge effects, though some studies have shown that edge effects could be up to 150 m (refer to Section 7.9 for the definition of impact zone).
2. The likelihood of habitat degradation [i.e., improper disposal of construction waste, accidental release of hazardous materials (such as construction slurry, pain, and/or solvents), increase in dust, noise and light levels, changes in forest hydrology; refer to Table 7-20] is presumed to be “less likely” for all habitat receptors, based on the assumption that all minimum controls (refer to Section 7.10) are adequately and properly implemented.

For the assessment of plant receptors, these are considered during species-specific impact evaluations:

1. For tree/strangler or plant species that are not bamboos or of conservation significance (i.e., native common or exotic species), and hence do not have count data, total specimen count was taken from tree mapping data. Note that the area for tree mapping covers the entire study area. For species with zero counts (i.e., were not recorded during tree mapping), it is assumed that the intensity of impacts on mortality will still be **High,** since the entire specimens within the Study Area will be affected by total land clearance.
2. For native common or exotic climbing fig species/species (e.g., *Ficus heteropleur*a and *F. punctata*) associated with important fauna that also does not have count data from floristic surveys, it is assumed that the intensity of impacts of work activities on them will still be **High** since most of these species are expected to be widespread and will be affected by total land clearance.

7.11.1 Construction Phase

7.11.1.1 Habitats

Ten habitat types were assessed for impacts from construction phase. The impact significance of habitat loss for Priority 1 (mixed forest, abandoned-land forest and D5 stream) and Priority 2 (scrubland and herbaceous vegetation, waste woodland, D2 stream and D4 stream) habitat receptors during the construction phase was considered as **Major**. The impact significance of habitat loss for Priority 3 habitats was **Moderate**. The single reason for this assessment is the eventual vegetation clearance of the entire Project Area for development. The definition of levels of impact intensity and likelihood are stated in Table 7-22 and Table 7-23 respectively. The full list of the priority level, impact intensity, impact consequence, impact likelihood, as well as the resulting impact significance for each habitat receptor is provided in Appendix L.

Construction activities from vegetation clearance may result in the degradation of habitat adjacent to the worksite, and change in species composition from edge effects in these habitats. Therefore, **Some** impacts are expected to the surrounding forested areas (i.e., areas outside of the Study Area but within the 30-m impact zone).

Table 7-22 Definitions of each level of impact intensity for habitat receptors during construction

Impact Type	Negligible	Low	Medium	High
Loss of vegetation	The habitat does not overlap with the Study Area	≤ 10% of the habitat overlaps with the Study Area	10–40% of the habitat overlaps with the Study Area	≥ 40% of the habitat overlaps with the Study Area

Table 7-23 Definitions of each level of likelihood for habitat receptors during construction

Likelihood of Occurrence for Each Impact Type	Definition for Habitat Loss
Unlikely/Remote	The habitat does not overlap with the worksites
Less Likely/ Rare	N.A.
Possible/ Occasional	N.A.
Likely/ Regular	N.A.
Almost Certain/ Continuous	The habitat overlaps with the worksites

7.11.1.2 Plants

Fifty-two plant species were assessed for the impacts deriving from construction phase. All plant species, except for three—*Khaya senegalensis*, *Pterocarpus indicus,* and *Tabebuia rosea*—were assessed with **Major** impact significance for the impact of Mortality as these specimens will be removed during land clearance. The three plant receptors mentioned previously were assessed with **Moderate** impact significance due to their low sensitivity level. Despite their low sensitivity level, the species were still included in the impact assessment as they collectively make up 38% of the large specimens recorded within the Study Area (refer to Section 7.8.2 for the criteria used to select biodiversity plant receptors for this impact assessment).

The definition of levels of impact intensity and likelihood are stated in Table 7-24 and Table 7-25 respectively. The full list of priority level, impact intensity, impact consequence, impact likelihood, as well as the resulting impact significance for each plant species receptors, is provided in Appendix L. Assumptions made in defining the levels of impact intensity (see Table 7-24) for plant species receptors are:

1. Similar to habitat receptors, plant species within 30 m from the worksites are assumed to experience the greatest extent of edge effects (refer to Section 7.9 for the definition of the impact zone). The effects of forest edges may be experienced by species more sensitive to microclimatic changes more than 30 m away from the worksites.

Table 7-24 Definitions of each level of impact intensity for plant species receptors during construction

Impact Type	Negligible	Low	Medium	High
Mortality	No plant specimens of this species are within the Study Area	Less than 50% of all plant specimens of this species are within the Study Area	More than or exactly 50% of all plant specimens of this species are within the Study Area	All plant specimens of this species are within the Study Area

Table 7-25 Definitions of each level of likelihood for plant species receptors during construction

Likelihood of Occurrence for Each Impact Type	Definition for Habitat Loss
Unlikely/Remote	No plant specimens of this species are within the worksite.
Less Likely/ Rare	(Salvaging Procedure) Plants are least likely to face with mortality during salvaging/transplanting procedure. Multiple studies/or known information of successful salvaging/transplanting procedures have been observed over the recent years.
Possible/ Occasional	No count data/locations of specimens of this species is available, but specimens could possibly be within the worksites. (Salvaging Procedure) Possible for plant specimens to be faced with mortality during salvaging/transplanting procedure.
Likely/ Regular	N.A.
Almost Certain/ Continuous	Plant specimens of this species are within the worksite.

Assuming that these plant species can also be found within the impact zone that is beyond the Study Area, they will also be affected by indirect impacts:

Impediment to seedling recruitment

Accidental release of hazardous waste (e.g., construction slurry, paint, and/or solvent) may occur and leak out to adjacent habitats that were located within the impact zone, polluting the habitat with possibly inorganic toxic compounds and hence, altering the soil quality. This would make the habitat unfavourable for seedling recruitment. Significant impacts are expected for all species of conservation significance. Reproduction is essential for these species to ensure their survivability, given that their national population is already under threat.

Similarly, plant species with restricted distribution (i.e., tiup-tiup (*Adinandra Dumosa)* and *Ploiarium elegans*) are also expected to face significant impacts. Generally, *A.dumosa* favours environmental conditions that have low soil nutrients, while *P. elegans* are usually found in marshy areas [W-32]. The accidental release of hazardous waste would alter the conditions of the habitat, reducing the succession rate of germination of their saplings and this would threaten species' long-term viability.

As for the remaining native or exotic plant species that were assessed, **Minimal** or **Some** impacts will be expected.

Competition from exotic plant species

Exotic plant species that are regarded to be self-sustaining populations (i.e., naturalised) and those regarded as invasive species, can limit the range of abiotic and biotic conditions and cause additional competition to existing resources such as light, nutrients, and water. Invasive species possess higher values of competitively advantageous traits, which include being able to gain and retain resources and/or to advantageously exploit resources better than native species [P-17]. As such, some impacts are expected for native plant species while remaining exotic species are expected to face **Minimal** or **Some** impacts.

Decline in plant health and survival

The removal of forest patches within the Study Area would cause adverse changes in microclimatic conditions to adjacent habitats that are within the impact zone such as changes to humidity, higher exposure to light, and increase in temperature and wind speed. Different plant species possess different requirements to ensure that they are in optimal health conditions. As for plant species of conservation significance, significant impacts are expected as a decline in their health would threaten their survivability. As for the remaining plant species receptors, they are expected to face **Minimal** or **Some** impact significance.

7.11.1.3 Fauna

Nineteen faunal species (Priority 1) were assessed. During construction, the impact significance from loss of habitats is expected to be **Major** across all species. Impact significance from injury or mortality of faunal species is

expected to be **Moderate-Major**. The assessment is elaborated below. The definition of levels of impact intensity and likelihood are stated in Table 7-26 and Table 7-27, respectively. The full list of priority level, impact intensity, impact consequence, impact likelihood, as well as the resulting impact significance for each faunal species receptor is provided in Appendix L.

Table 7-26 Definitions of each level of impact intensity for faunal species receptors during construction

Impact Type	Negligible	Low	Medium	High
Loss of/ reduction in habitats and food sources	No loss of original habitat	– Loss of <10% of original habitat or; – Retention of >90% of original habitat	– Loss of 10–40% of original habitat or; – Retention of >60% of original habitat	– Loss of >40% of original habitat or; – Retention of <60% of original habitat
Injury or mortality	Negligible susceptibility to roadkills For species translocation, there are many proven cases of success translocation.	Species with low susceptibility to injury/mortality: – Volant species (e.g., odonates, butterflies, birds, and bats) – Low susceptibility to roadkills For species translocation, there are numerous cases of successful translocation known.	Species that are mobile but possibly susceptible to injury/mortality: – Amphibious aquatic species – All amphibians – Mammals: squirrels, shrews – Possibly susceptible to roadkill For species translocation, there are some cases of successful translocation known.	Species with high susceptibility to collisions with vehicles: – All birds, including migratory species – All amphibians – All reptiles – Mammals: Long-tailed macaque (*Macaca fascicularis)*, Sunda pangolin (*Manis javanica)* – Has small population size For species translocation, there are no/few cases of successful translocation.

Table 7-27 Definitions of each level of likelihood for faunal species receptors during construction

Likelihood of Occurrence for Each Impact Type	Loss of/ Reduction in Habitats and Food Sources	Injury or Mortality
Unlikely/Remote	The habitats and locations of food sources does not overlap with the worksites.	No fauna of this species utilize the areas that are within the worksites.
Less Likely/ Rare	N.A.	N.A.
Possible/ Occasional	N.A.	No records of this fauna species is available, but individuals could possibly be within the worksites. Injury or mortality is possible to occur during the process of translocation.

Likelihood of Occurrence for Each Impact Type	Loss of/ Reduction in Habitats and Food Sources	Injury or Mortality
Likely/ Regular	N.A.	Injury or mortality is expected will most likely occur during the process of translocation.
Almost Certain/ Continuous	The habitats and locations of food sources overlap with the worksites.	Fauna species is recorded within the worksite.

Butterflies

As forest species, the loss of/ reduction in habitats and food sources is expected to be **Major** for the two butterflies of conservation significance (i.e., Formosan swift (*Borbo cinnara*), Malay staff sergeant (*Athyma reta moorei*). In particular, their life history is invariably linked to the host plants, such as the Malay staff sergeant to the nationally Vulnerable *Glochidion zeylancium* var. *zeylanicum*. Hence vegetation removal will acutely impact these butterflies. Since they are volant species, impact intensity from injury or mortality is **Low**, hence impact significance is **Moderate.**

Reptiles

The three species of conservation significance (i.e., lowland dwarf gecko (*Hemiphyllodactylus typus*), Malayan box terrapin (*Cuora amboinensis*), Asian softshell turtle (*Amyda cartilaginea*) in the Study Area are greatly dependent on forest habitats and requires connected forest habitats for dispersal. This is especially so for the aquatic Asian softshell turtle (*A. cartilaginea*) which is dependent on the eastern natural stream. In this respect, the construction impacts are expected to be **Major** on the three reptilian species of conservation significance.

Birds

Species of conservation significance that are expected to bear the brunt of the construction are those that are generally ground-dwelling, shy, highly forest-dependent, short distance, or low flying. They are the uncommon Blue-winged pitta, the nationally Vulnerable red-legged crake (*Rallina fasciata*), nationally Endangered red-wattled lapwing (*Vanellus indicus*), and straw-headed bulbul (*Pycnonotus zeylanicus*). **Major** impacts are expected from loss of/reduction in habitats and food sources, as well as, injury or mortality, for these species. For the two nationally Critically Endangered raptors (i.e., crested goshawk (*Accipiter trivirgatus*) and grey-headed fish eagle (*Haliaeetus ichthyaetus*), that are largely inhabitants of primary and secondary forests, the **Major** impacts are expected from the loss of/ reduction in habitats and food sources. Since they are volant species, impact intensity from injury or mortality is **Low**, hence impact significance is **Moderate.**

The rest of the species of conservation significance are expected to experience **Major** impact from loss of/ reduction in habitats and food sources. Otherwise, due to their higher tolerance for human disturbance, amenability to urban habitats, less forest-dependent, or higher dispersal ability, they are expected to experience either **Moderate** or **Minor** impacts from injury/mortality, light disturbances, human disturbances, and loss of ecological connectivity.

Mammals (non-volant)

The globally and nationally Critically Endangered Sunda pangolin (*Manis javanica*) found in the western section of the Study Area is the only mammal of conservation significance. The construction impact is expected to be **Major** for this species across all impact types.

7.11.2 Operational Phase

During the operational phase, all the existing habitat types and waterbodies would have been cleared. Hence, no impacts were assessed for the original habitats, plant, and faunal species. However, a qualitative description of potential impacts is provided below.

7.11.2.1 Habitat

Some indirect impacts may occur to the newly planted vegetation in the form of habitat degradation due to trampling or pollution from increased traffic by humans. The loss of habitats will also result in the loss of ecological connectivity of the Study Area to surrounding green spaces. A change in plant species composition due to long-term changes in light, temperature, and humidity in habitats surrounding built-up areas are also expected to occur,

especially within the habitats within the Forest Fringe. This impact can be significant if no mitigating measures are implemented.

7.11.2.2 Plants

Some indirect impacts may occur to the newly planted individuals in the form of competition from exotic species that are considered to be invasive. For this assessment, 'exotic' species are regarded as those which are invasive or 'self-sustaining' species. These species would most likely establish themselves quickly in bare areas that are not planted back or in areas that are less dense.

According to HDB's Landscape Guide Book [P-20], it is expected that both native and exotic species will be planted in the Study Area for landscaping purposes. The exotics species that will be planted would most likely be those listed as casual species, i.e., species that "do not form self-replacing populations and rely on repeated introductions or limited asexual reproduction for persistence", as seen in most of HDB'S past habitat landscaping projects.

As such, the competition from invasive or 'self-sustaining' exotic species would most likely happen to the newly planted native and casual exotic species, since invasive exotic species possess higher values of competitively advantageous traits to exploit resources better (refer to Section 7.11.1.2).

7.11.2.3 Fauna

In the assessment of operational phase impacts on fauna, it is assumed that all faunal species recorded during the baseline study may return to utilise the Study Area, although realistically, some species may not. The assessment also excludes the Asian softshell turtle (*Amyda cartilaginea*) that was proposed to be relocated to other suitable habitats out of the Study Area, as well as butterflies with known host plants to be cleared during the construction phase. Accordingly, only 16 faunal species will be assessed.

The definition of levels of impact intensity and likelihood are stated in Table 7-28 and Table 7-29 respectively. The full list of priority level, impact intensity, impact consequence, impact likelihood, as well as the resulting impact significance for each faunal species receptor is provided in Appendix L.

Table 7-28 Definitions of each level of impact intensity for faunal species receptors during operation

Impact Type	Negligible	Low	Medium	High
Injury or mortality	Negligible susceptibility to roadkills	Species with low susceptibility to injury/mortality: – Volant species (e.g., odonates, butterflies, birds, and bats) – Low susceptibility to roadkills	Species that are mobile but possibly susceptible to injury/mortality: – Amphibious aquatic species – All amphibians – Mammals: squirrels, shrews – Possibly susceptible to roadkills	Species with high susceptibility to collisions with vehicles: – All birds, including migratory species – All amphibians – All reptiles – Mammals: Long-tailed macaque – Has small population size
Impediment to faunal movement	– Not dependent on connected and forested habitats for dispersal and able to traverse urban infrastructures (i.e., high dispersal ability) or;	– Slightly dependent on connected and forested habitats for dispersal and adaptable to traverse urban infrastructures or; – Low susceptibility to roadkills or; – Has small home range	– Dependent on connected and forested habitats for dispersal (i.e. intermediate dispersal ability) or; – Possibly susceptible to roadkills or; – Has moderate home range	– Highly dependent on connected and forested habitats for dispersal (i.e. low dispersal ability) or; – Susceptible to roadkills or; – Has large home range

Impact Type	Negligible	Low	Medium	High
	– Negligible susceptibility to roadkills;			
Disturbances from light	Species that are not susceptible to changes in light levels: aculeate hymenopterans, aquatic species	Species that are slightly susceptible to changes in light levels: odonates, butterflies	Species that are susceptible to changes in light levels: diurnal birds, reptiles and mammals	Species that are susceptible to changes in light levels: nocturnal and crepuscular fauna
Disturbances from humans	Species that are not sensitive to human presence: commonly observed in urban environments	Species that are slightly sensitive to human presence: occasionally observed in urban environments	Species that are possibly sensitive to human presence: occasionally observed in urban environments	Species that are sensitive to human presence: rarely observed in urban environments
Collisions with buildings (birds only)	Non-migratory birds with low susceptibility to collision	Non-migratory birds with possibly susceptibility to collision	Non-migratory birds that is susceptible to collision	– Migratory birds – Non-migratory birds but with high susceptibility to collision

Table 7-29 Definitions of each level of likelihood for faunal species receptors during operation

Likelihood of Occurrence for Each Impact Type	Injury or Mortality	Impediment to Faunal Movement	Light Disturbances	Human Disturbances	Collisions with Buildings (Birds only)
Unlikely/Remote	No records of this faunal species is available and unlikely to utilize the Study Area No roads are present	Faunal species have a small home range and rarely utilise connecting vegetation to travel between patches Presence of well-connected ecological corridors	No human activities (e.g., trails) within the habitat that the species utilizes Presence of vegetated buffer of > 150m		No records of this faunal species during baseline study is available and unlikely to utilize the Study Area Visual markers extensively implemented in buildings
Less Likely/ Rare	N.A.	N.A.	N.A.		N.A.
Possible/ Occasional	No records of this faunal species is available, but individuals could possibly be within the Study Area	Faunal species have a medium home range and sometimes utilize connecting vegetation to travel between vegetated patches	Some human activities (e.g., trails) within the habitat that the species utilizes Presence of vegetated buffer of at least 30 m		No records of this faunal species during baseline study, but individuals could possibly utilize the Study Area

Likelihood of Occurrence for Each Impact Type	Injury or Mortality	Impediment to Faunal Movement	Light Disturbances	Human Disturbances	Collisions with Buildings (Birds only)
	Some grade-separated wildlife crossings are present	Some vegetated corridors are present			Some visual markers implemented in buildings
Likely/ Regular	N.A.	N.A.	N.A.		N.A.
Almost Certain/ Continuous	Faunal species is recorded within the Study Area No grade-separated wildlife crossings are present	Faunal species have a large home range and often utilize connecting vegetation to travel between vegetated patches No vegetated corridors are present	Complete overlap of human activities (e.g., trails) within the habitat that the species utilize Absence of vegetated buffer, or vegetated buffer is < 30 m		Presence of records of this faunal species during baseline study; individuals likely to utilize the Study Area No visual markers implemented in buildings

During operational phase, disturbances to fauna are expected in the form of noise, light, and human presence from the surrounding residential areas. For diurnal species, higher noise levels from human activities may affect their rhythmic patterns and may reduce the suitability of habitats. Similarly, the higher noise and light levels may reduce the suitability of habitats for nocturnal species resulting in less-than-optimal condition for nocturnal species to move (refer to Section 10.7.2.1 for noise impact assessment towards ecological receptors). Therefore, impact significance from disturbances from light and humans is expected to be **Major**.

The increase in road infrastructures would result in increased injury or mortality for fauna species. For the reptiles and ground-dwelling mammals assessed during the operation phase, they are expected to face **Major** impact significance. As for bird species, they are expected to face **Moderate** impact significance. As for the impact of bird-building collision, it was assumed that some visual markers may be implemented since there are no such precedents in HDBs. Hence, the impact significance was assessed to be **Minor-Moderate**.

Since the total vegetation clearance and the proposed developments would have caused the Study Area to be isolated with no proper wooded corridors, especially during the early period of the operation phase, to facilitate the movements of fauna, the impact significance from impediment to faunal movement is expected to be range from **Minor-Major**.

7.12 Recommended Mitigation Measures

7.12.1 Construction Phase

7.12.1.1 Habitats

Avoid

- Areas that were demarcated as Recommended Areas of Conservation (RAC) in Section 7.7 should be retained. It comprises high and medium ecological value habitats which in turn supports a numerous keystone species, large specimens as well as fauna species of conservation significance. Most importantly, it provides habitat connectivity to the larger forest patches beyond the Study Area.

7.12.1.2 Plants

Avoid

- Retain the single specimen of *Dacryodes* cf. *costata* (TE3943) in the eastern portion of the Study Area. Erect Tree Protection Zones (TPZs) with minimum radius of 7-m as part of the demarcated RAC before the commencement of any work. The feasibility of integrating this specimen into larger green pockets within the proposed residential estate (e.g., small-scaled parks, playground area etc) should be studied in further details and
- Establish TPZs around large trees and keystone species to be retained (if any).

Minimise

- Consider engaging arborists, flora and fauna specialists to clearly mark out the RAC and plants with conservation value before the start of works. This would minimise the working space, eliminate the need of removing specimens of value and plants of conservation significance as much as possible.
- Salvage and/or transplant suitable candidates of conservation significance such as those notable findings that were highlighted in Section 7.3.2.1 (e.g., saplings of *Dacryodes* cf. *costata*, *Streblus elongatus*, *Glochidion zeylanicum, Tarenna fragrans* and *Asplenium nitidum* etc.) This would be ideal for small plant specimens that are of < 0.2 m girth size.
- Transplant two specimens of the nationally Critically Endangered *Ficus stricta* (TE3577 and TE3588) into the proposed green spaces. Ideally, it should be integrated into the greenery of within the Forest Fringe and/or Tengah Pond of Southern Tengah. A certified arborist should be engaged to perform a detailed assessment of these specimens and oversee the transplanting operation and check on the health of the tree before commencement of transplantation and
- Conduct regular inspections to monitor the health of the retained or transplanted specimens.

7.12.1.3 Fauna

Avoid

- Avoid felling trees and clearing vegetation during the peak bird breeding season (March to July), and
- Restrict working hours to between 0800–1800h (recommended). Any level of artificial light above that of moonlight masks the natural rhythms of lunar sky brightness and may disrupt patterns of foraging, mating, as well as the circadian rhythm [P-57]. Artificial lighting at night (ALAN) could disorient birds, bats, and insects, altering their behaviours that cause them to become more vulnerable to predation and other risks [P-4]. For example, ALAN may repel light-adverse bats from lit areas and restrict their use of commuting or feeding space. Direct lighting away from the adjacent forested areas.

Minimise/rehabilitate

The following measures are recommended to minimise impact on species of conservation significance in the event that area of conservation value cannot be retained:

<u>Minimise fauna mortality</u>

- Carry out wildlife shepherding via passive directional vegetation clearance. This entails clearing the site from east to west side towards forested refuge areas (see Figure 3-6) so as to prevent ground-dwelling mammals (especially the Critically Endangered *Sunda pangolin*) from getting trapped in isolated forest patches. This should be planned and overseen by an ecologist.
- Ensure that wildlife corridor with a width of minimally 10-m is provided for wildlife shepherding, especially in areas where the workspace boundaries of concurrent development overlaps with the Southern Tengah Study Area (i.e. site clearance, earthworks, infrastructure works for PIE Widening; refer to Section 7.12.3) Retain ground cover for as long as possible before removal. When ground cover is removed, earth control measures (ECM) are to be in place. Use only fully biodegradable erosion control blankets (ECB) to avoid trapping fossorial fauna, such as snakes.
- Relocation of the endangered Asiatic Softshell turtle (*Amyda cartilaginea*) to suitable habitats out of the Study Area.
- Conduct pre-felling inspections of fauna before felling any trees or removing any vegetation. This should be planned and overseen by an ecologist.

- Ensure no gaps in hoarding that may allow fauna to move from the surrounding forested areas into the worksites, which may result in roadkill accidents.
- Train site personnel on biodiversity awareness and actions to take when encountering wildlife.
- Execute the fauna response and rescue protocol if any fauna is found on-site. and
- Conduct regular site inspections to ensure contractor compliance and to identify potential fauna entrapments.

Minimise disturbances to fauna from light and noise

- Use quieter construction machinery/equipment as opposed to loud and noisy machinery/equipment whenever possible.
- Adopt the following framework if night works cannot be avoided:
    a. Prevent areas from being artificially lit; lighting should be installed only when necessary
    b. Limit the duration of lighting and minimise the overlap with periods with peak nocturnal faunal activities (i.e., after 1800h).
    c. Reduce the trespass of lighting by using minimal number of luminaires, positioning the light sources at low positions relative to the ground, directing and shielding the area to minimise light spills into the adjacent habitats while having the necessary lighting levels for working safely (refer to Appendix M). Accessories such as baffles, hoods or louvres can be used to reduce light spill and direct light only to where it is needed (ILP, 2018)
    d. Use warm colour temperature light sources, preferably at < 2,700 K
    e. Set dark buffers, illuminance limits and zonation
    f. Employ species-specific strategy
    g. Minimise noise levels at night (refer to Section 10).

Conduct fauna monitoring for roadkills

a. Fauna monitoring for roadkills should be conducted at established roads that are located in close proximity to the Study Area during construction phase. This is to determine any potential roadkill hotspots or occurrences that may be due to proposed development works.

Minimise habitat degradation

- Implement dust control measures, such as installing dust screens and water suppression systems.
- Implement acoustic barriers to reduce noise pollution outside worksites.
- Practise due diligence in proper storage and handling of machinery to prevent leaching of oil or harmful materials, such as bentonite slurry, especially into waterbodies.
- Monitor the water quality and aquatic faunal community in retained streams and streams adjacent to the construction areas (if any), and
- Engage a Qualified Erosion Control Professional (QECP) to formulate and implement the ECM plans in accordance with the requirements slated by the PUB, to reduce siltation to retained waterbodies and vegetation (if any).

7.12.2 Operational Phase

During operational phase, measures should focus on minimising edge effects, disturbances to wildlife and human-wildlife conflict. These measures should be integrated in the design phase during township planning.

7.12.2.1 Habitats

Minimise/rehabilitate

- Execute in-fill planting using native species within the RAC, especially within forest gaps or areas with sparse undergrowth, if any. More details are elaborated in Appendix M.
- For the creation of low impact activities within the Recommended Areas of Conservation (RAC) such as pedestrian footpaths, it is advisable to situate footpaths away from the RAC (i.e., along the boundary of RAC which has been cleared for hoarding installation for the ongoing earthworks, infrastructure works and building

works for the Mass Rapid Transit (MRT) and Bus Depot; refer to Appendix M). This will help to minimise habitat degradation within the RAC.

Alternatively, low impact footpaths (e.g., lightweight elevated boardwalks) can be integrated within the RAC if it is necessary. This will be subjected to further detailed studies of the Forest Fringe on the western portion of the Study Area.

- Incorporate at least a 30 m vegetated buffer along small patch of Forest Fringe that is adjacent to the RAC). This is to reduce the effects of changes in species composition due to edge effects that is expected along the edges of the RAC and provide ample and dense vegetation buffer for the RAC in the future.

Compensate

Habitat Creation and Wildlife Connectivity

Compensatory measures on habitat creation are essential to be carried out within the Study Area to mitigate the major loss of vegetation/habitat. The integration of habitat creation, enhancement measures as well as securing wildlife connectivity can be carried out around the within the Forest Fringe and Tengah Pond. This includes incorporating compensatory measures that were recommended in the Tengah Masterplan, such as creation of aquatic habitats and the integration of bioswales within the Study Area. More details on the measures for habitat creations can be found in Appendix M.

It is important to note that the areas where habitat creation is proposed also functions as a corridor for fauna species to move. If the corridor serves both function of connectivity and habitat (refugia), a minimum width of 100m is recommended as it provides sufficient interior habitat conditions. This allows for the movement and/or habitation of sensitive species and also provides sufficient space for cover from predators, domestic animals and human disturbances [P-84; P-85] especially for shy ground-dwelling species, such as the Sunda Pangolin (*Manis javanica*). As such, the feasibility of extending the Forest Fringe over at the eastern portion of the Study Area should be studied further to provide larger space for enhancement planting and habitat creation.

The recommended width will also help in buffering from human disturbance and reduces the likelihood of human-wildlife conflicts for targeted species like pangolins (*M.javanica*), civet cats (*Paradoxurus musanga*) and wild boar (*Sus scrofa*) that may use the areas that were proposed for habitat creation.

For the narrow strip of corridor along the edge of the Tengah Pond, achieving a 100m strip corridor may posed some constraints. Instead, a minimum width of 30 m should be established as this narrow strip of corridor will also function as a minimum buffer for riparian habitat that was proposed below as part of the creation of habitats [P-84].

Aquatic habitats

- Create soft banks, as well as shallow (littoral zones) and deep pools (limnetic zones) along pond banks to enhance habitat complexity. Littoral zones are known to harbour higher number of biodiversity and higher productivity as it is attractive and favourable for multiple fauna community, such as odonates, amphibians and waterbirds [W-32].
- A diversity of aquatic habitats may be incorporated, including wetlands, rain gardens, bioswale along green spaces surrounding the Tengah Pond.

Riparian habitats

- Habitats along the proposed Tengah Pond are envisioned to be significantly forested/shaded. This can be achieved by implementing tiered planting of native species with dense understorey along riparian zone (i.e., stream bank or pond soft-banks) to provide ample shade and attract shade-loving fauna, filter pollutants from urban runoffs and maintain stable stream channel geomorphology.
- Ample space should be catered for the creation of soft banks to incorporate the planting of vegetation of different watercourse level. The soft-banks will also double up as a vegetated corridor for wildlife to travel up to the north, towards the proposed Central Park, or towards the Forest Fringe in the east (refer to Figure 7-54Figure 7-54).

Terrestrial habitat

- Enhance the Forest Fringe with tall trees, denser understory, and shrub layer so that its more conducive for shyer birds like blue-winged pitta and red-legged crake. Additionally, it would provide shade and refuge for arboreal species as well as reduce the surrounding temperature of the habitat, which will be favorable for different fauna communities.

- Empirically, there are approximately 300 trees of 0.3m girth or more in 1 ha of forested land. To match this density, it is likely that more trees (possibly 400 per ha) have to be planted to account for competition loses and natural attrition post planting. Selection of tree species should be of native species as much of possible and there should be a mix of fast-growing and slow-growing trees to eventually achieve a stratified structure in the terrestrial habitat that is often observed in forest settings (i.e., canopy, understorey layer, undergrowth etc)
- In addition to planting of native species, suitable candidates of plant species of conservation significance (e.g., *Glochidion zeylanicum*, *Tarenna fragrans*, *Ficus stricta*, *Streblus elongatus*) that were salvaged/ transplanted during construction phase should be planted within the terrestrial habitat. Keystone species should also be planted within the habitat to provide a source of diet to fauna species that will be utilising the habitat.
- Incorporate ABC features (e.g., bio-swales/ rain gardens) along the perimeter of the Forest Fringe in the south east, as proposed in Tengah Masterplan to provide habitats for odonates and butterfly species.

Gaps in Connectivity

- Three gaps in connectivity have been identified within the Study Area (refer to Figure 7-54). It is essential to bridge the gaps to allow continuous movements of fauna to other areas within the Study Area, and other green spaces within the vicinity of Tengah Town (refer to Appendix M). By doing so, the wildlife connectivity within Forest Fringe and the Central Park can be maintained (refer to Figure 7-54).
- Other wildlife connectivity can also be explored further, such as towards the eastern section of the Study Area, subject to further detailed studies by HDB and Technical Agencies.

Provision for Low-Impact Human Activities Within Newly Created Habitats

- Low impact activities such as footpaths can be incorporated within the Forest Fringe. Ideally, footpaths should be slightly elevated to provide space for habitat creation such as planting low-lying shrubs and undergrowth beside the footpaths and to allow fauna movements to cross underneath these structures (e.g., elevated boardwalks) (refer to 7.13.2.1 and Appendix M for more details).

- Human activities should be designed to avoid the soft-bank features of the Tengah Pond where riparian habitats will be created. This is to minimise disturbances and trampling of vegetation to ensure that habitat is able to thrive (refer to 7.13.2.1 and Appendix M for more details).

- Educational signages should be placed in public spaces around newly created habitats to inform residents on the ecological functions of the habitats and to advise them on the appropriate behaviours to reduce the likelihood of habitat degradation from activities such as littering and trampling of vegetation.

Areas with gaps in connectivity

Proposed wildlife connectivity

Possible wildlife connectivity (subject to detailed studies)

0 250 500 750 m

Legend

- Southern Tengah Study Area
- Recommended Areas to Conserve (RAC)
- Proposed Habitat Creation
- Central Park
- Earthwork 5
- Earthwork 4
- Forest Corridor
- Future Hospital Development
- JRL 3
- PIE Widening
- Site Clearance for Future Temporary Outlet Drain
- Project 2 (Tengah Stream)
- Project 2 (Tengah Pond)
- Project 2 (Forest Fringe)
- Future Commercial and Residential Development
- Site Clearance for Future Residential Development
- Proposed MRT Station
- Relocation of Interim Detention Pond
- Road and Building Construction
- Site Clearance for Future Road

N

Rev.	Date	By	Description	Chk'd	App'd
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Figure Title :

Compensatory measures within the Study Area

Designed	Checked	Approved	Figure No. :	Rev.	Sheet
ZA	NHT	JAG	7-54	-	1 of 1
	Drawn ZA	Date OCT 2021	CAD File Name : NA		A3

Note: Source of basemap - Google Earth Map

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7.12.2.2 Plants

Remedy

- Unused areas should be replanted. Adopt a native planting palette considering the existing and surrounding vegetation.
- Suitable specimens of plant species that were salvaged and that have an association to specific fauna species or pollinators, species with attractive inflorescence, or those which act as a food source for fauna community, are recommended to be planted within the Forest Fringe. Examples of this would be *Glochidion zeylanicum, Tarenna fragrans,* and *Ficus spp*.

7.12.2.3 Fauna

Avoid

- Avoid unnecessary trees maintenance work during bird breeding season.

Minimise

- Provide grade-separated wildlife crossings at locations with identified gaps in connectivity to reduce incidences of roadkill. This can be executed as a culvert undercrossings with an elevated walkway that is located above water level for fauna species to use (refer to 7.13.2.1 and Appendix M for more details).
- Incorporate strategic planting of shrubs/hedge that would lead fauna species away from road junction
- Implement traffic calming measures, such as road narrowing, speed bumps, and road strips, to reduce incidence of roadkills. This can be incorporated with signages that warn drivers of the presence of possible wildlife that may be using the area in close proximity to the road.
- Use lighting of lower lux levels at strategic locations to cater for darker areas at areas where habitat creation is proposed and/or near to the RAC.
- Place educational signages in public spaces around the township to advise residents on appropriate behaviours during wildlife encounters, including no feeding of wild animals and no retaliatory attack/killing. These signs should target fauna usually implicated in human-wildlife conflict, such as the snakes, wild pig, long-tailed macaque.
- Conduct regular monitoring during early operational phase to monitor for edge effects and other biodiversity concerns. Implement additional mitigation measures if required, and
- Provide visual markers/decals on glass façade of buildings to reduce bird collisions. Building design strategies should be incorporated as well during the Design Phase to further reduce the likelihood of bird collisions. This is elaborated further in Appendix M.

7.12.3 Agencies' Response to Mitigation Measures

D5 Stream

AECOM, HDB, and other Technical Agencies had explored the feasibility of retaining the D5 stream that was recognised as part of areas of conservation value (ACV; refer to Section 7.6), along with a proposed 30-m buffer on each side of the stream as riparian habitat. Certain challenges in retaining the stream were identified:

1. The upper portion of the stream could not be retained as it is directly affected by the site clearance, earthworks, infrastructure works and building works for future MRT station. These proposed works and the upcoming residential development within the eastern portion of the Study Area, will cause a disruption to the overall stream capacity and hydrology of the stream (refer to Section 8.8).

2. Rubbish such as plastic bottles and food wrappers, as well as larger debris such as pipes, canvas sheets, and remnants of concrete structures were observed within the stream. Stream rehabilitation efforts would be required to dispose of the rubbish and large debris. The removal of rubbish is likely to require large machineries as some debris was already integrated within the stream banks and bed. This would alter the state of the stream and cause damages to riparian vegetation, as well as cause siltation to occur within the stream. These impacts are likely to be damaging to the stream.

3. Since soil level changes of more than 1m from backfilling are expected around the stream, the riparian vegetation would be destroyed and this would cause major changes to the microclimate of the stream, exposing the stream to higher temperatures.

After considerable deliberations, HDB recognises the difficulty in retaining D5 stream as it is, and will instead focus efforts on compensatory measures via habitat creation within the proposed blue and green features, subject to further study (refer to Section 7.12.2.1 and Appendix M).

Grade-Separated Crossings

The feasibility of grade-separated crossings was initially studied by AECOM, HDB, and relevant Technical Agencies. Initially, the grade-separated crossings were recommended to be implemented underneath major road networks where the Forest Fringe and Tengah Pond can be integrated (see Figure 7-54). This would also function as a corridor for wildlife movements and provide an opportunity for habitat creation to take place.

For this to be executed, this would require additional space for the roads to incline and elevated above the Tengah Pond and Stream, and eventually ramp down towards the existing PIE and Hong Kah Flyover. After considerable deliberations, due to limitations from upcoming developments that have/will be executed along the boundary of the Study Area (e.g., upcoming PIE Widening), grade-separated wildlife crossings in the form of culvert undercrossings will be implemented instead.

Implementation of Adequate Width for Wildlife Crossings

A portion of the temporary workspace for the PIE Widening will overlap with the Study Area within the bottleneck region in the southeast section of the Study Area (refer to Figure 7-54). As the works for the widening will happen concurrently with the development of Southern Tengah, this will affect the overall movements of the proposed wildlife shepherding that was highlighted in Section 3.5.3. To ensure an effective wildlife shepherding, HDB and relevant Technical Agencies has agreed to provide at least 10-m width of wildlife corridor for wildlife shepherding and to work/coordinate closely in ensuring a seamless wildlife corridor during construction phase. This includes coordination in terms of execution of land clearance and shepherding works between the proposed works in Southern Tengah and PIE Widening.

7.13 Residual Impacts

Residual impacts for habitats, flora, and fauna are assessed based on the relevant mitigation and compensatory measures stated in Section 7.12.1 for construction phase and Section 7.12.2 for operational phase.

7.13.1 Construction Phase

7.13.1.1 Habitats

The residual impact significance was evaluated based on the assumption that the Recommended Areas of Conservation (RAC) is fully retained within the Study Area and that all mitigation measures has been agreed to be adopted by HDB. For residual impact assessment, all habitat receptors were assessed for direct impacts (i.e., loss of vegetation). However, only four habitat receptors (i.e., abandoned-land forest, scrubland and herbaceous vegetation, waste woodland and mixed forest) were assessed for indirect impacts as these habitats fall within the impact zone and are expected to face with indirect impacts from the large-scaled proposed works (refer to Section 7.9).

For direct impacts, the definition of levels of impact intensity and likelihood reference to Table 7-22 and Table 7-23 in Section 7.11.1.1 respectively. In addition, definitions were also set for the levels of impact intensity and likelihood for indirect impacts as showed in in Table 7-30 and Table 7-31 respectively.

The full list of the priority level, impact intensity, impact consequence, impact likelihood, as well as the resulting impact significance for each habitat receptor is provided in Appendix L.

Table 7-30 Definitions of each level of impact intensity for indirect impacts for habitat receptors during construction

Impact Type	Negligible	Low	Medium	High
Habitat degradation (Indirect impact)	The habitat does overlap with areas 30 m from the worksites	≤ 10% of the habitat overlaps with areas 30 m from the worksites	10–40% of the habitat overlaps with areas 30 m from the worksites	40% of the habitat overlaps with areas 30 m from the worksites
Change in species composition (Indirect impact)				

Table 7-31 Definitions of each level of likelihood for indirect impacts for habitat receptors during construction

Likelihood of Occurrence for Each Impact Type	Habitat Degradation	Change in Species Composition
Unlikely/Remote	N.A.	No formation of forest edges (i.e., construction activities are fully underground and/or in existing built-up areas outside the forest)
Less likely/ Rare	N.A. (see assumption above)	Formation of scrubland edges in scrubland areas only
Possible/ Occasional	N.A.	Formation of some forest and scrubland edges in a mix of managed vegetation, scrubland and forested areas
Likely/ Regular	N.A.	Formation of new forest edges (i.e., complete clearance within forested areas)
Almost certain/ Continuous	N.A.	N.A.

Ecological impacts evaluated to have **Major to Moderate** impact for Priority 1 and 2 habitat receptors (abandoned-land forest, mixed forest, scrubland and herbaceous vegetation, waste woodland, D2 stream, D4 stream and D5 stream), despite the retention of RAC, which only takes 3.22 ha (5.35%) of the total Study Area. As for both of the indirect impacts listed in Table 7-20 towards the four habitat receptors, only a small percentage (i.e., less than 10%) of the total area of each habitat falls within the impact zone. Hence, ecological impacts were evaluated to have **Minor** impact on these habitat receptors (refer to Appendix L).

As for the surrounding forest areas that falls within the 30-m impact zone but are located outside the Study Area (refer to Section 7.9), **Some** impacts are still expected to the receptor.

7.13.1.2 Plants

All plant species receptors were assessed for residual impacts. The assessment took into account of the mitigation measures for plants, fauna and habitat receptors mentioned in Section 7.12, which has a direct influence on the plant receptors, with the assumption that the Recommended Areas of Conservation (RAC) were retained (refer to Section 7.11). Similar assumptions that were listed in Section 7.11.1.2 were also considered during the of residual impact. Plant receptors that fall within the 30-m impact zone were also assessed for indirect impacts that has been listed in Table 7-20 (refer to Section 7.9).

The definitions of impact intensity and likelihood for these indirect impacts are listed in Table 7-32 and Table 7-33 respectively. The full list of priority level, impact intensity, impact consequence, impact likelihood, as well as resulting impact significance for each plant species receptors, is provided in Appendix L.

Table 7-32 Definitions of each level of impact intensity for all three impact types during construction for plant species receptors

Impact Type	Negligible	Low	Medium	High
Impediment to seedling recruitment	No specimens of this species are within 30 m from the worksites	Less than 50% of all plant specimens of this species are within 30 m from the worksites	More than or exactly 50% of all plant specimens of this species are within 30 m from the worksites	All specimens of this species are within 30 m from the worksites
Competition from exotic species				
Decline in plant health and survival				

Table 7-33 Definitions of each level of likelihood for all three impact types during construction for plant species receptors

Likelihood of Occurrence for Each Impact Type	Impediment to Seedling Recruitment	Competition from Exotic Species	Decline in Plant Health and Survival
Unlikely/Remote	Plants are epiphytes and/or do not grow on soil.	No formation of forest edges (i.e., construction activities are fully underground and/or in existing built-up areas outside the forest).	
Less likely/ Rare	N.A.	Formation of scrubland edges in scrubland areas only.	
Possible/ Occasional	Plants that grow on soil and whose dispersals are not restricted, i.e., they disperse via wind, water, and/or terrestrial fauna.	Formation of some forest and scrubland edges in a mix of urban vegetation, scrubland and forested areas.	
Likely/ Regular	N.A.	Formation of new forest edges (i.e., complete clearance within forested areas).	
Almost certain/ Continuous	Plants that grow on soil whose dispersals are restricted owing to environmental factors and/or growth strategies (e.g., bamboos that propagate via underground rhizomes and ground orchids).	N.A.	

Mortality

For direct impact (i.e., mortality), native plant species with common or cultivated status, exotic and cryptogenic species plant species that were not subjected to any salvaging/transplanting procedures were assessed with **Minor** to **Major** impact significance (refer to Appendix L) as they will still be subjected to be cleared during the construction phase. Thirteen species were assessed with **Major** impact significance, of which, majority were Priority 1 plant receptors and mostly keystone species or species with restricted distribution (i.e., *Adinandra dumosa* and *Ploiarium elegans*). With the retention of RAC, the impact significance of the exotic species, *Tabebuia rosea*, was reduced from **Major** to **Minor** as approximately 180 specimens (76.9%) of the total specimens count will be retained within the RAC.

As for species with conservation significance, eight species were accorded with a **Negligible** impact significance as it is assumed that these species would be less likely be face with any mortality during the process of salvaging. Eighteen species were assessed with **Minor** significance despite being accorded a '**Negligible**' impact intensity. Despite being subjected to salvaging, mortality is still possible during the process of salvaging/transplanting due to

the limited studies/or known information that is available on the successful salvaging and/or transplanting records over the recent years.

Seven tree species of conservation significance were assessed with **Low to Medium** impact intensity and **Moderate** impact significance. The likelihood of mortality is almost certain for these species as less than 50% of the specimens recorded on site had girth sizes of more than 0.2 m girth and are considered to be unsuitable to undergo salvaging process. Some examples of these species would be Tempinis tree (*Streblus elongatus)* and *Macaranga griffithiana*. As a result, the larger specimens would most likely be cleared during the construction phase. On the other hand, the impact significance for three tree species, *Ficus vasculosa*, *Glochidion zeylanicum var. zeylanicum* and *Planchonella obovata*, remained as **Major** as more than 50% or all specimens recorded within the Study Area will not be suitable to undergo salvaging process due its large size.

Indirect Impacts

For the assessment of indirect impacts, only seven species were assessed for the ecological impacts as these were the plant receptors that were situated within the 30-m impact zone. All plant receptors were of Priority 1 sensitivity, except for *Tabebuia rosea.* Four species were assessed with **Minor** impact significance while three species were assessed with **Moderate** impact significance. For the remaining indirect impacts (i.e., competition from exotic species, decline in plant health and survival), all plant receptors were assessed with **Minor** impact significance with the implementation of minimal control measures, such as soil erosion control measures and proper storage of machineries and harmful chemicals.

7.13.1.3 Fauna

Faunal species receptor (highlighted in Section 7.11.1.3) were assessed for residual impacts. The assessment took into account mitigation measures for fauna as well as habitats which directly influence how fauna will response to the measures. For residual impact, indirect impacts such as those listed in Table 7-20, were also assessed with the assumption that the RAC were fully retained. The definitions of impact intensity and likelihood for these indirect impacts are listed in Table 7-34 and Table 7-35 respectively.

The full list of the priority level, impact intensity, impact consequence, impact likelihood, as well as the resulting impact significance for each fauna receptor is provided in Appendix L.

Table 7-34 Definitions of each level of impact intensity for all three indirect impact types during construction for faunal species receptors

Impact Type	Negligible	Low	Medium	High
Loss of ecological connectivity for faunal movement	Not dependent on connected and forested habitats for dispersal and able to traverse urban infrastructures	Slightly dependent on connected and forested habitats for dispersal and adaptable to traverse urban infrastructures if needed	Dependent on connected and forested habitats for dispersal	Highly dependent on connected and forested habitats for dispersal
Light disturbances	Species that are not sensitive to changes in light levels: aculeate hymenopterans, most aquatic and marine species	Species that are slightly sensitive to changes in light levels: odonates, butterflies	Species that are sensitive to changes in light levels: diurnal birds, reptiles and mammals	Species that are extremely sensitive to changes in light levels: nocturnal, crepuscular fauna and nesting/hatching sea turtle species
Human disturbances	Species that are not sensitive to human presence	Species that are slightly sensitive to human presence	Species that are sensitive to human presence	Species that are extremely sensitive to human presence

Table 7-35 Definitions of each level of likelihood for all three indirect impact types during construction for faunal species receptors

Impact type	Unlikely/ Remote	Less likely/Rare	Possible/ Occasional	Likely/Regular	Almost certain/ Continuous
Loss of ecological connectivity for faunal movement	Impact is not expected to happen during the construction phase of the project.	Impact is not likely to happen during the construction phase of the project	Impact could possibly happen or known to occur during the construction phase of the project	Impact is a common occurrence during the construction phase of the project	Impact is a continual or repeated process during the construction phase of the project
Light disturbances					
Human disturbances					

Butterflies

Even with the retention of RAC, majority of the total Study Area will still be subjected to clearance. Hence, the assessment for the loss of/reduction in habitats and food source for the two butterfly species of conservation significance (Formosan swift (*Borbo cinnara*) and Malay staff sergeant (*Athyma reta moorei*) remain as **Major**. The retention of the western portion of the Study Area could reduce the loss of ecological connectivity from **Major** to **Moderate** for the two butterfly species of conservation significance. As for the disturbances from light and human, the impact significance ranges from **Minor** to **Moderate** respectively for both species.

Reptiles

Wildlife shepherding can potentially lower the injury/mortality impact on Malayan box terrapin (*Cuora amboinensis*) from **Major** to **Moderate**. On the other hand, the conventional ground level shepherding method is ineffective for the arboreal lowland dwarf gecko (*Hemiphyllodactylus typus*), so this impact is still expected to be **Major**. The impact of Injury/mortality towards Asian softshell turtle (*Amyda cartilaginea*), can be mitigated with relocation to other suitable habitats. However, it is important to note that since there has not been any documented relocation for this species in the wild, the success rate of the relocation exercise is uncertain. For this reason, assessment of injury/mortality was still accounted for but has been reduced to **Moderate** after the implementation of the mitigation measure.

For the assessment of indirect impacts, only the lowland dwarf gecko (*H. typus*), and Malayan box terrapin (*C. amboinensis*) were assessed as it is assumed that the Asian softshell turtle (*A. cartilaginea*), has been successfully translocated out from the Study Area. Mitigation measures to minimise light disturbance and human disturbances is expected to confer a residual impact of **Moderate** for the two reptilians. The likelihood these two impact types is still **Possible** as night works may be required during the construction phase. As a result, the impact significance was assessed to be **Moderate**.

Vegetation connectivity across Southern Tengah to the other retained or proposed green areas such as Forest Corridor or Central Park outside of the Study Area as recommended under the compensatory measures in Section 7.12.2 could lower the impact from loss of connectivity to **Moderate** for Lowland dwarf gecko (*H. typus*), and Malayan box terrapin (*C. amboinensis*).

Birds

Mitigation measures that involve wildlife shepherding (via directional vegetation clearance), pre-felling fauna inspection to minimise injuring/mortality, and minimisation of light and human disturbance would lower the impact from **Moderate** to **Minor.** However, as for the residual impact for the other impact types (i.e., loss of ecological connectivity for faunal movement and the loss of/reduction in habitats and food sources) would still be **Moderate** and **Major** respectively, given the extensive vegetation clearance and large-scaled construction that is expected from the Project, even with the retention of the RAC.

Mammals (non-volant)

The retention of the western portion of the Study Area as part of the RAC, and other mitigating measures listed in Section 7.12, is expected to reduce the impact significance of injury/mortality towards the critically endangered Sunda pangolin (*Manis javanica*) from **Major** to **Moderate.** This can be achieved by minimising light disturbance and wildlife shepherding. However, the loss of/reduction in habitats and food source remain **Major** as major land clearance is still expected within the Study Area**.**

With the retention of the RAC, it is expected to reduce the impact significance for loss in ecological connectivity and human disturbances to **Minor** as it less likely for the ecological movement to be disrupted or for it to face with human disturbances since the Sunda pangolin (*M. javanica*) were mostly recorded within the RAC. As for the impact of disturbance to light and human, it is expected for the impact significance to be **Moderate.** Since this species is considered to be nocturnal, they are extremely sensitive to changes in light levels. With the implemented mitigating measures, such as limiting the duration of lighting and minimise the overlap with periods with peak nocturnal faunal activities, it would help to alleviate the impact significance. However, the likelihood of light disturbance is still **Possible** as night works are still expected to be executed occasionally during the construction phase.

7.13.2 Operational Phase

7.13.2.1 Habitat

During the operational phase, the four habitat receptors within the Recommended Areas of Conservation (RAC) that were assessed in Section 7.13.1.1 will be faced with two impacts: (1) change in plant species composition, and (2) habitat degradation. The assessment took into account mitigation measures for habitats listed in Section 7.12.2.1 which directly influence how each habitat receptor will response to the measures.

The tables below state the definitions of impact intensity (refer to Table 7-36) and likelihood (refer to Table 7-37) of the respective impact types on the habitat and species receptors, respectively. The full list of the priority level, impact intensity, impact consequence, impact likelihood, as well as the resulting impact significance for each habitat receptor is provided in Appendix L.

Table 7-36 Definitions of each level of impact intensity for all three impact types during operational phase for habitat receptors

Impact Type	Negligible	Low	Medium	High
Habitat degradation	Developed area is not accessible to public.	Developed area is not designed with the intention for the public to use or visit, but may increase human accessibility to the surrounding natural habitats.	Developed area is designed for members of the public to visit (e.g., parks with boardwalks)	Developed area is designed for large groups of people to live in in the long-run (e.g., residential estates)
Change in species composition	Development footprint is temporary and/or operational activities are fully underground	Development footprint is permanent and small relative to the size of the surrounding habitats (i.e., ≤ 10%)	Development footprint is permanent and medium-sized relative to the size of the surrounding habitats (i.e., 10-40%)	Development footprint is permanent and medium-sized relative to the size of the surrounding habitats (i.e., ≥ 40%)

Table 7-37 Definitions of each level of likelihood for all three impact types during operational for habitat receptors

Likelihood	Habitat Degradation	Changes to Species Composition
Unlikely/Remote	Surrounding natural habitats are not accessible to public	Development is largely green (e.g., Thompson Nature Park)

Likelihood	Habitat Degradation	Changes to Species Composition
Less likely/ Rare	Surrounding natural habitats are less accessible and public use is restricted/controlled	Development involves the building of urban infrastructures but will be heavily landscaped
Possible/ Occasional	Surrounding natural habitats are accessible and have some infrastructure for the public to use, such as boardwalks (but people can still stray off track)	Development involves the building or infrastructure that are designed to release heat
Likely/ Regular	Surrounding natural habitats are easily accessible and do not have infrastructure for the public to use, such as boardwalks (but people can still stray off track)	Development involves the building of extensive pavements, structures, and other infrastructures with surfaces that absorb and retain heat (e.g., residential estate)
Almost certain/ Continuous	N.A.	N.A.

The impact significance for habitat degradation is assessed to be **Moderate.** Habitat degradation in the form of trampling of vegetation is expected to be reduced by situating footpaths away from the RAC (refer to Section 7.12.2.1) to cater for human activities and human traffic within the Study Area. However, given that the built-up areas will not be restricted for human access (i.e., Forest Fringe), it is likely that people may still stray off any designated track and into the RAC.

As for the impact of changes in species composition, the impact significance for habitat degradation is assessed to be **Minor.** It is also expected for the proposed developments within the Study Area to be heavily landscaped, such as areas within the Forest Fringe and Tengah Pond that is located near to the RAC. Hence, changes to light, temperature, and humidity in habitats surrounding the proposed development is expected to be lesser. To add on, with the implementation of mitigating measures such in-fill planting using native species, and incorporating at least 30 m vegetated along the patch of Forest Fringe that is adjacent to the RAC, this will help in alleviating the impact significance of the habitat receptors within the RAC.

7.13.2.2 Plants

Assuming that mitigation and compensatory measures mentioned in Section 7.12.2.1 have been adopted, the impacts for operational phase were carried out to seven plant species receptor that are situated within the 30 m impact zone (refer to Section 7.9).

The definitions of impact intensity and likelihood for these indirect impacts for operation phase are listed in Table 7-38 and Table 7-39 respectively. The full list of priority level, impact intensity, impact consequence, impact likelihood, as well as the resulting impact significance for each plant species receptors, is provided in Appendix L.

Table 7-38 Definitions of each level of likelihood for all two impact types during operation for plant species receptors

Impact Type	Negligible	Low	Medium	High
Mortality	No plant specimens of this species could get stolen	Less than 50% of plant specimens of this species could get stolen (i.e., most plant species)	More than or exactly 50% of all plant specimens of this species could get stolen (i.e., orchids)	All plant specimens of this species could get stolen (i.e., pitcher plants)
Competition from exotic species	Species is cryptogenic, or exotic and listed as “Naturalised”	Species is exotic and listed as “Casual” or not assessed	Species is exotic and listed as “Cultivated Only”	Species is native

Table 7-39 Definitions of each level of likelihood for all two impact types during operation for plant species receptors

Likelihood	Mortality	Competition from Exotic Species
Unlikely/Remote	Species not known to have been stolen before	Original vegetation mostly retained with no new landscaping
Less likely/ Rare	N.A.	Some original vegetation retained with some new landscaping using only native species, or original vegetation mostly cleared with new large-scale landscaping using only native species
Possible/ Occasional	Flowering species known to have been stolen before	Some original vegetation retained with some new landscaping using exotic species
Likely/ Regular	N.A.	Original vegetation mostly cleared with new large-scale landscaping using exotic species
Almost certain/ Continuous	"Charismatic species" known to be stolen most of the time (i.e., pitcher plants and orchids)	N.A.

Mortality

Mortality to the selected plant species due to it being stolen/poached by human can be based on certain characteristics that the species possess. Generally, plants with aesthetic values, medicinal properties, market value due to their rarity or can be used as a food (e.g., edible fruits etc.) are mostly likely subjected to be stolen by people. All seven plant receptors do not possess any characteristics with aesthetic value or not known to have medicinal or culinary value. Hence, it is unlikely for all plant receptors to be stolen. All of them were assessed with **Minor** impact significance, with the exception of *Tabebuia rosea*, which were assessed with **Negligible** impact significance due to its sensitivity level (i.e., Priority 3).

Competition from Exotic Species

Plants that will be planted around the Forest Fringe as part of landscaping efforts are assumed be a mix of exotic and native species, as mentioned in Section 7.11.2.2. However, with the implementation of mitigating measures mentioned in Section 7.12.2.2, it is assumed that a higher number of native species will be used for landscaping as part of improving the existing native biodiversity of the site. As such, native plant species are least likely to be outcompeted by exotic plant species. Hence, all seven plant receptors that were native were assessed with **Minor** impact significance. As for *T. rosea,* since it is an exotic species of 'Casual' status, it was assessed with **Low** impact intensity and would least likely be impacted by this ecological impact. Hence, its impact significance was assessed to be **Negligible.**

7.13.2.3 Fauna

In the assessment of operational phase impacts on fauna, it is assumed that all faunal species recorded during the baseline study may return to utilise the Study Area, although realistically, some species may not. The assessment also excluded the Asian softshell turtle (*Amyda cartilaginea*) that was proposed to be relocated to other suitable habitats out of the Study Area. It is assumed that species specific measures such as planting of host plants for butterflies of conservation significance have also been implemented. A further assumption was made whereby 18 (excluding the relocated Asian softshell turtle) faunal species of conservation significance identified in this study have adapted to the new habitats either as inhabitants or using the proposed wildlife corridor mentioned in Section 7.12.2.1 for traversing to other green spaces. Impact significance is thus assessed for these 18 species.

The definitions for impact intensity and likelihood for faunal species at operational phase are presented in Table 7-40 and Table 7-41, respectively. The full list of the priority level, impact intensity, impact consequence, impact likelihood, as well as the resulting impact significance for each habitat receptor is provided in Appendix L.

Table 7-40 Definitions of each level of impact intensity for all four impact types during operation for faunal species receptors

Impact Type	Negligible	Low	Medium	High
Injury or mortality	Operation activities cause no injuries/deaths to the species.	Extent of injuries/ mortality arising from operation activities is low OR Species is able to move away from danger in operation activities relatively easily: – Volant species (e.g., odonates, butterflies, non-ground-dwelling birds, raptors and bats) Low susceptibility to roadkills, poaching and/or collision with buildings	Extent of injuries/ mortality arising from operation activities is medium OR Species is not able to move away from danger in operation activities very easily: – Amphibious aquatic species – All amphibians (frogs, lizards) – Mammals: squirrels, shrews Possibly susceptible to roadkills, poaching and/or collision with buildings	Extent of injuries/mortality arising from operation activities is high – Has small population size – Birds, specifically migratory species OR Species is unable to move away from danger in operation activities easily: – Ground-dwelling birds – Reptiles (snakes) – Mammals: Pangolin, long-tailed macaque, High susceptibility to roadkills, poaching and/or collision with buildings
Impediment to faunal movement	– Not dependent on connected and forested habitats for dispersal and able to traverse urban infrastructures;	– Slightly dependent on connected and forested habitats for dispersal and adaptable to traverse urban infrastructures if needed;	– Dependent on connected and forested habitats for dispersal;	– Highly dependent on connected and forested habitats for dispersal;
Light disturbances	Species that are not sensitive to changes in light levels: aculeate hymenopterans, aquatic and marine species	Species that are slightly sensitive to changes in light levels: odonates, butterflies	Species that are sensitive to changes in light levels: diurnal birds, reptiles and mammals	Species that are highly sensitive to changes in light levels: nocturnal, crepuscular fauna and nesting/hatching sea turtle species
Human disturbances	Species that are not sensitive to human presence	Species that are slightly sensitive to human presence	Species that are possibly sensitive to human presence	Species that are sensitive to human presence

Table 7-41 Definitions of each level of likelihood for all five impact types during operational for faunal species receptors

Impact type	Unlikely/ Remote	Less likely/Rare	Possible/ Occasional	Likely/Regular	Almost certain/ Continuous
Injury or mortality	Impact is not expected to happen during the operation phase of the project	Impact is not likely to happen during the operation phase of the project	Impact could possibly happen or known to occur during the operation phase of the project	Impact is a common occurrence during the operation phase of the project	Impact is a continual or repeated process during the operation phase of the project
Impediment to faunal movement					
Light disturbances					
Human disturbances					

During operational phase, with the implementation of grade-separated crossings such as culvert undercrossings, the impact significance from injury and/or mortality from roadkills can be reduced from **Moderate-Major** to **Minor-Moderate**, depending on whether the species is sensitive to urban disturbance (e.g., blue-winged pitta *Pitta moluccensis),* Sunda pangolin (*Manis javanica*)) or more adaptable to urban environment (e.g., red jungle fowl (*Gallus gallus*), oriental magpie-robin (*Copsychus saularis*)). Similarly, with the presence of some vegetated corridors such as the Forest Fringe and connected vegetation such as the planting of riparian vegetations within the soft-banks of the Tengah Pond (refer to Section 7.12.2 and Appendix M), this would provide fauna species with a safe corridor to travel within the Study Area and transverse to other green spaces, such as the Central Park located beyond the Study Area.

For the impact of collision of building (only assessed for bird species), only four bird species with moderate impact significance before the implementation of mitigation measures were assessed. These species were jungle fowl (*G. gallus*), grey-headed fish eagle (*Haliaeetus ichthyaetus*), blue-winged pitta (*P. moluccensis),* and straw-headed bulbul (*Pycnonotus zeylanicus*). Specifically for the grey-headed fish eagle (*H. ichthyaetus*), due to the extensive development of residential areas on site, there is a higher chance of it colliding with high rise buildings within the development. Hence, the impact significance was raised from **Minor** to **Moderate**. For the remaining three bird species, even with the implementation of mitigating measures mentioned in Section 7.13.2.3 and other design strategies to reduce light glares and reflection as mentioned in Appendix M, the likelihood of collision of building is still possible. Hence, impact significance for bird-building collision remains **Moderate**.

Disturbances to fauna are expected in the form of light and human presence from the surrounding residential areas. Hence, with the presence of at least 30 m vegetated buffer to the core habitats (i.e., RAC) the likelihood of occurrence of light and human disturbances to these species may be reduced to possible. Therefore, impact significance from disturbances from light and humans may be reduced from **Major** to **Minor-Moderate**.

The vegetation and wildlife connectivity across Southern Tengah to the Forest Corridor and Central Park for faunal movement as proposed under the compensatory measure (refer to Section 7.12.2 and Appendix M) could lower the impact of loss of connectivity that would result in the impediment to faunal movement. Species such as ground dwelling mammals like Sunda pangolin (*M. javanica),* forest-dependent species, short distance or low flying species can potentially benefit from this vegetation and wildlife connectivity and enhance the faunal movement. This is especially if the connecting vegetation are landscaped to replicate the vegetation structure of a forest habitat. In this regard, the residual impact from loss of ecological connectivity could be mitigated from **Major** to **Minor-Moderate.**

By implementing a more diverse riparian native planting along the Tengah Pond and creating a more complex riparian/aquatic landscape would further encourage these species that are associated to riparian habitats or waterbodies to utilise the vegetation connectivity. In this regard, the residual impact from impediment to faunal movement could be mitigated from **Major** to **Moderate** for most bird species such as blue-winged pitta (*P. moluccensis*, red-wattled lapwing (*Vanellus indicus*), straw-headed bulbul (*P. zeylanicus*) and the nationally Endangered grey-headed fish eagle (*H. ichthyaetus*).

7.14 Cumulative Impacts from Other Major Concurrent Development

This section assessed the cumulative impacts from major concurrent developments in the vicinity of the Study Areas. Cumulative impacts will be discussed qualitatively and given four general levels of assessment as mentioned in Section 7.9). Subsequently, it is important to note that cumulative impacts are considered after mitigations measures applied. The list and description of concurrent developments can be found in Section 3.5.2.

7.14.1 Construction Phase

At the construction phase, other ongoing developments would include Project 2, site clearance, earthworks, infrastructure works and building works for JRL 1, 2 and 3, Mass Rapid Transit (MRT) and Bus Depot, proposed PIE Widening, future commercial and residential development as well as Nanyang Pipeline (see Figure 3-5).

Since the boundary of Nanyang Pipeline overlaps with the Recommended Area of Conservation (RAC) in western portion of the Study Area, direct impacts such as loss in vegetation, habitat degradation and change in species composition are expected to occur. According to the recent publication of EIS conducted for the pipeline project, the pipeline works will involve the construction of potable water pipeline using pipe jacking along the western portion of the proposed green areas in the west that is adjacent to the PIE. Site clearance of approximately 0.13 ha in total will only be required at areas where three jacking shafts were proposed. It was also ensured that no flora of conservation significance was located along the jacking shafts [R-53]. The site clearance will also be conducted sensitively to prevent any injury and mortality to fauna. Assuming that works are done sensitively with little vegetation clearing, habitat and plant receptors are still expected to face with **minimal to some impact** significance**.**

Cumulatively, all proposed developments mentioned above are likely to generate higher levels of disturbances, in the form of noise, dust and light, to fauna residing within the surrounding forested areas, north and west of the Study Area. Therefore, **some to significant impacts** to fauna are expected.

7.14.2 Operational Phase

At the operational phase, most of the other concurrent developments assessed during construction phase would have been completed. This is with the exception of the Forest Corridor and Central Park located beyond the Study Area. Given that most of the areas would have been cleared and converted into urban infrastructures, leaving only the vegetated corridor along the Forest Fringe and Tengah Pond, only **some impacts** are expected from the additional noise disturbances generated from these construction activities.

7.15 Summary of Key Findings

Southern Tengah comprises four habitat types. The largest vegetation type is scrubland and herbaceous vegetation which takes up 12.9 ha (21.43%) of the Study Area. This is followed by waste woodland (10.59 ha; 17.59%), abandoned-land forest (9.51 ha; 15.8%), and mixed forest (2.15 ha; 3.25%). The remaining areas are covered by farms (2.20 ha; 3.65%) and managed vegetation (4.23 ha; 7.03%). Three streams and one pond were also present in the Study Area.

A total of 364 species and 5 species groups (i.e., plants that could not be identified to species with certainty) belonging to 109 families were recorded from the floristic surveys. Of all species recorded, 146 (39.67 %) are native, 176 (47.83 %) are exotic and 46 (12.5%) are cryptogenic. Thirty-three species were considered as species of conservation significance. This includes the re-discovery of nationally Presumed Extinct fern, *Asplenium nitidum*, that was found in a forest patch in the northern portion of the Study Area. Some rare and notable findings observed in the eastern portion of the Study Area would be Critically Endangered mature specimens of *Ficus stricta,* nationally Endanagered *Dacryodes* cf. *costata* and *Tarenna fragrans.* Clusters of nationally Vulnerable species such as *Glochidion zeylanicum* var. *zeylanicum* that has an association to rare butterfly species, the Malay staff sergeant butterfly (*Athyma reta moorei*) and clusters of *Streblus elongatus* within a small patch of mixed forest habitat were *also* regarded as notable findings.

A total of 90 large specimens were encountered in the Study Area. Of these, 46 are trees and 44 are stranglers. Malayan banyan (*Ficus microcarpa*) makes up the majority of large specimens, while the second most abundant large specimen species found is the common roadside tree, angsana (*Pterocarpus indicus*) with 21 individuals observed.

Other specimens of values recorded includes an albizia (*Falcataria moluccana*) in the western portion with one raptor nest belonging to the changeable hawk eagle (*Nisaetus cirrhatus*). Majority of the keystone species were concentrated over at the eastern portion of the Study Area. Ten fig (*Ficus*) species were recorded during the floristic survey, of which two were considered to be threatened species. Figs an important food source for many frugivores, especially during the time of the year where no other fruits are available.

A total of 1,294 specimens belonging to 52 species and five species groups were tagged and recorded during tree mapping survey. Around 60.7% (786) of these trees are native specimens while the remaining percentage of specimens are exotic and/or cryptogenic.

The faunistic field assessment recorded 247 species with about half of the assemblage (53%) dominated by birds (76 species) and butterflies (55 species). Across the Study Area, aquatic habitats recorded mostly common species although one species of conservation significance, the Asiatic softshell turtle (*Amyda cartilaginea*), was recorded several times in the D5 stream in the eastern part of the Study Area. This same stream generally has good water quality and is of conservation value. In addition, large streams and canals in both the central and eastern part of the Study Area provide foraging opportunities for the nationally threatened grey-headed fish eagles (*Haliaeetus ichthyaetus*).

Faunal species of conservation significance were also distributed across the terrestrial habitats in the Study Area. In the western portion, the Sunda pangolin (*Manis javanica*) was recorded on camera traps, and a nest of the changeable hawk-eagle (*Nisaetus cirrhatus*) was also observed. In the central portion, key observations include the Malay staff sergeant (*Athyma moorei moorei*) for which a cluster of its host plant, the *Glochidion zeylanicum* var. *zeylanicum* was also observed nearby; lowland dwarf gecko (*Hemiphyllodactylus typus*) as well as the grey-headed fish eagle (*Haliaeetus ichthyaetus*). In the eastern portion, the straw-headed bulbul (*Pycnonotus zeylanicus*) and Asian softshell turtle (*Cuora amboinensis*) was recorded within or around the D5 stream that flows pass the area.

Based on the baseline findings, Recommended Areas of Conservation (RAC) were delineated. This includes the retention of *Dacryodes* cf. *costata* (TE3493) specimen along with a minumum TPZ radius of 7m, and the western corridor due to the existing vegetation connectivity to larger forest patches of Tengah forest. In total, the RAC occupies 3.22 ha (5.35%) of the total Study Area.

Impacts to 10 habitat receptors, 53 plant species receptors and 19 faunal species receptors during construction phase were assessed. Impact significance from the loss of vegetation/habitat of Priority 1 and 2 habitat receptors is considered **Major** since total site clearance is expected. Plant species receptors are expected to face **Moderate** to **Major** impact significance from mortality. Similarly, faunal species receptors are expected to face **Moderate** to **Major** impact significance from the loss of/ reduction in habitats and food sources, as well as injury and/or mortality. Due to total land clearance, indirect impacts were assessed qualitatively for the adjacent forest patches instead.

Key mitigation measures recommended during the construction phase include (1) retention of RAC; as well as (2) minimisation, such as transplantation of two specimens of *F. stricta* (TE3577 and TE3578) and salvaging of suitable candidates of plant species of conservation significance, (3) wildlife shepherding (via directional vegetation clearance) as well as pre-felling fauna inspection, (4) the relocation of nationally Endangered Asian softshell turtle *(A. cartilaginea)* and, (5) habitat creation and enhancing wildlife connectivity within the Study Area. With the complete implementation of mitigation and compensatory measures listed in Section 7.9, impact significance expected to be **Negligible** to **Major** for plant and impacts of injury and/or mortality towards faunal species can be reduced to **Minor** to **Major**. However, the residual impact for loss of vegetation/habitat remains as **Major** since it is permanent and irreversible. As for indirect impacts, the residual impact towards 7 plants and 19 fauna receptors were assessed to be **Minor** to **Moderate.**

To compensate for the major loss of terrestrial and aquatic habitats within the Study Area, compensatory measures via habitat creation and enhancing wildlife connectivity should be implemented. A bulk of these habitat creation in the form of riparian and aquatic habitats can be carried out within the Tengah Pond, which has been catered for in the Tengah Master Plan. Terrestrial habitat creation should also be focused within the Forest Fringe. As such, the feasibility of extending the width of the Forest Fringe in the south-eastern portion of the Study Area should be studied in greater details as this would provide ample space for the creation of habitat. It is also essential to maintain the connectivity of these newly created habitats within the Study Area, and also to other green areas, such as Central Park and Forest Corridor that will be established beyond the Southern Tengah Study Area. Grade-separated crossings, in the form of culvert undercrossings should be implemented along road networks where possible to reduce the risk of roadkill of fauna species.

During the operational phase, all the existing habitat types and waterbodies would have been cleared. Hence, no pre-mitigating impact significance were assessed for habitats, plants and fauna. However, upon implementation of mitigation measures listed in Section 7.9, species receptors were assessed for residual impacts with the assumptions that plant species associated to fauna such as *G. zeylanicum* were planted back into the Study Area and that 18 fauna species (excluding the relocated Asian softshell turtle) faunal species of conservation significance identified in this study have adapted to the new habitats either as inhabitants or using the proposed ecological corridor that was recommended in Section 7.12.2.1 for traversing to other green spaces. For plant species receptors, they are expected to face with **Negligible to Minor** impact significance from mortality and competition from exotic species. As for fauna species receptors are expected to face with **Minor to Moderate** impact significance from injury or mortality, light and human disturbances, depending on whether the species is sensitive to urban disturbance.

Table 7-42 Summary of biodiversity impact assessment

Potential Source of Impact	Impact Significance with Minimum Control	Key Mitigation Measures (if any)	Residual Impact Significance with Mitigation Measures (if required)
Construction Phase			
Loss of vegetation	Moderate to **Major**	Compensation: • Extend width of Forest Fringe for terrestrial habitat creation (subjected to detailed study) • Aquatic and Terrestrial Habitat creation within Study Area (e.g., Tengah Pond and Forest Fringe)	Moderate to **Major**
Injury/Mortality of Plant Species	**Major**	Avoidance: • Retain specimen of *Dacryodes* cf. *costata* (TE3493) • Retention of delineated RAC • Establish TPZs around large trees and keystone species to be retained (if any). Minimisation: • Salvaging/transplanting of suitable plant species of conservation significance (e.g., *Ficus stricta* (TE3577 and TE3578), *Glochidion zeylanicum, Streblus elongatus*, *Tarenna fragrans* etc.	Negligible to **Major**
Injury/Mortality of Faunal Species	Moderate to **Major**	Minimisation: • Carry out wildlife shepherding via directional clearing • Relocation of the endangered Asiatic Softshell turtle to suitable habitats • Conduct pre-felling inspections of fauna before felling any trees or removing any vegetation • Creation of grade-separate wildlife crossings (i.e., culverts undercrossing)	Minor to **Major**
Loss of/ reduction in habitats and food sources	**Major**	Compensatory:	**Major**

Potential Source of Impact	Impact Significance with Minimum Control	Key Mitigation Measures (if any)	Residual Impact Significance with Mitigation Measures (if required)
		• Plant in *Ficus spp.*, food sources, butterfly host plants within new habitats	
Operational Phase			
Injury/ mortality of Faunal Species	Moderate to **Major**	Minimisation: • Creation of grade-separate wildlife crossings via culvert undercrossings	Minor to Moderate
Impediment to faunal movement	Minor to **Major**	Compensation: • Presence of well-vegetated corridor such along the Forest Fringe • Creation of soft-banks along the proposed pond feature so as to provide opportunities to create a vegetated corridor	Minor to Moderate
Collision with buildings (birds only)	Minor to **Major**	Minimisation: • Visual markers on buildings	Minor to Moderate
Disturbances from light	**Major**	Minimisation: • Use lighting of lower lux levels at strategic locations to cater for darker areas at areas where habitat creation is proposed and/or near to the RAC	Minor to Moderate
Disturbances from human presence	**Major**	Minimisation: • Presence of buffer of at least 30 m from the core habitats	Minor to Moderate
Competition from exotic species (plant species)	Some impacts (General assessment done for newly planted plant species) (Refer to Section 7.11.2.2)	Minimisation: • Using native planting palette for enhancement planting within proposed development site • Presence of buffer of at least 30 m from the core habitats	Negligible to Minor

8 Hydrology, Groundwater Level and Surface Water Quality

8.1 Introduction

This section includes the assessment of baseline conditions of hydrology, groundwater level and surface water quality within the Study Area (as defined in Section 6.2.1), as well as the evaluation of the potential impacts on them, arising from activities during Projects' construction and operational phases. Based on the analysis of primary (e.g. visual observations during site reconnaissance and surveys, hydrological and surface water quality sampling and analysis, etc.) and secondary data (e.g. publicly-available secondary data and data provided by the Client) baseline conditions have been established and presented. These findings were subsequently used to analyse the changes that might occur due to the impacts associated with construction and operational activities of the Project. Sensitive receptors were identified and classified according to the sensitivity categorization as defined in Section 6.2.2 of this Report. As part of impact prediction, potential sources of impact from the Project that could affect the identified sensitive receptors and the minimum controls put in place to reduce them were also described for impact prediction. Based on the baseline survey, an impact evaluation (refer to Section 8.7) and EMMP development (refer to Section 11) were carried out.

The scope of work of the hydrological, groundwater level and surface water quality impact assessment consisted of:

- Reviewing data provided by the Client and appointed topographic surveyor to understand the topographic and hydrographic characteristics of the Study Area;
- Reviewing data from the Client and desktop research of publicly available data to determine the characteristics of groundwater in the Study Area (i.e. groundwater level).
- Site reconnaissance survey for a better understanding of the Study Area's topography, hydrology, land cover and existing watercourses with their properties (i.e. locations, water flow conditions and bank characteristics);
- Identification of sampling locations for in-situ and ex-situ water quality analysis of existing watercourses located within the Study Area;
- Hydrological and surface water quality impact analysis to assess the potential impacts of the Project during construction and operational phases;
- Groundwater level impact analysis to assess potential impacts on groundwater level changes from the Project during construction and operational phases;
- Propose mitigation measures to mitigate the potential impacts; and
- Propose EMMP to manage and monitor potential impacts of the Project during construction and operational phases.

8.2 Methodology and Assumptions

This section details the methodology used to carry out baseline studies as well as impact assessment on hydrology, groundwater level and surface water quality.

8.2.1 Hydrology, Groundwater Level and Surface Water Quality Baseline Study

Hydrology, groundwater level and surface water quality baseline study was carried out by the combination of desktop research (i.e. review of publicly available secondary data, data provided by the Client, previous studies carried out within the Project Site or its vicinity) and field surveys (including the collection and analysis of primary data such as surface water quality and visual observations during site surveys). Subsequently, this data was collated, analysed and compared to the selected criteria, where applicable (refer to the section 8.4.2.2). Following sub-sections detail the methodologies used for data collection and analysis of the collected baseline data.

8.2.1.1 Data Collection Methodology

8.2.1.1.1 Desktop Research

Desktop research consisted of a review of secondary data (including existing topographic data, vegetation cover, existing land use and development activities, satellite images, etc.) which aided in determining the location of existing watercourses within the Study Area. The topographic survey data provided by the Client and surveyor, as well as catchment map (i.e. the source of water flow to existing reservoirs) from PUB website [W-1] and Tengah Town Master Plan Final Report [R-48] were used to support the findings of the hydrological survey. The information, retrieved during the desktop research, comprised of publicly available data from government and technical agencies, existing available data (e.g. online satellite images), as well as published books, relevant articles, and other online sources.

Besides the publicly available secondary data, as a part of groundwater level baseline study, AECOM also reviewed the following previously carried out studies within the Study Area and its vicinity provided by the Client:

- SI Report for SI Works conducted at Tengah Phase 1 (WI058) for HDB;
- SI Report for SI Works conducted at Tengah Phase 2 & 3 (WI007) for HDB;
- SI Report for SI Works conducted at Tengah Phase 1 & 2 Infra (WI059) for HDB;
- SI Report for SI Works conducted at Tengah Plantation Contract 4 (WI035) for HDB;
- SI Report for Preliminary SI Works conducted at Tengah Park District (WI001) for HDB; and
- SI Report for detailed SI Works conducted at Tengah GA C3 & C7 (WI038) for HDB.

8.2.1.1.2 Field Survey and Sampling Events

The activities performed as part of the field surveys included the following:

- Evaluate the accessibility of the watercourses through existing tracks;
- Verify the information collected from the available topographic surveys and satellite images;
- Identify and map out the location of existing watercourses within the Study Area;
- Determine the flow conditions and bank characteristics of the identified watercourses during dry and wet weathers; and
- Observe water quality indicators in existing watercourses within the Study Area (e.g. physical parameters such as colour, turbidity, odour, etc).

8.2.1.1.2.1 Hydrological Survey Methodology

The hydrological survey was conducted by casual exploration methods to identify and outline existing watercourses and waterbodies within the Study Area. The watercourse conditions, such as stream bank characteristics (e.g. natural bank or artificial bank), and flow velocity were identified based on visual observations and professional experience. A Global Positioning System (GPS) device was used to track the hydrological survey route. The GPS data was then synchronised with the photos taken on-site to identify the exact location of identified watercourses.

8.2.1.1.2.2 Surface Water Quality Sampling Methodology

As mentioned in the sub-section above, watercourses present in the Study Area were identified during hydrological site surveys. Subsequently, sampling locations were selected at identified watercourses to collect surface water samples that would accurately represent the baseline surface water quality.

In order to get comprehensive data that is representative of baseline conditions of surface water quality and to capture the possible changes in water quality parameters over time and different events, identified watercourses were tested during both dry-weather and wet-weather conditions. Dry-weather conditions are defined as conditions after a continuous 48-hour period of no-rain, while wet-weather conditions are defined as a rainfall event having more than 10mm of rainfall, with samples to be collected within three (3) hours after the rain stops. Two (2) dry weather ("normal conditions") and one (1) wet weather samples were collected from majority of water quality stations.

Surface water samples were collected by using designated plastic containers by letting the water flow into the container, without disturbance of the bottom sediment, as much as practically possible. Upon collection, surface water samples were tested in-situ and ex-situ for a range of physical and chemical parameters.

In-situ water quality parameters assessed in this study were all measured using a calibrated multi-parameter digital sensor (YSI ProDSS) with United States Environmental Protection Agency (USEPA) approved testing methods for water quality parameters and included:

- Temperature;
- pH;
- Salinity/Conductivity;
- Turbidity;
- Total Dissolved Solids (TDS); and
- Dissolved oxygen (DO).

The ex-situ parameters analysed are listed as below:

- Total Nitrogen (TN);
- Total Phosphorus (TP);
- Ammonium Nitrogen (NH_4-N);
- Nitrates (NO_3-N);
- Orthophosphate (PO_4).
- Total Suspended Solids (TSS);
- Total Organic Carbon (TOC);
- Enterococcus; and
- Lead (Pb).

8.2.1.2 Baseline Data Analysis and Assessment Methodology

The activities performed as part of the analysis and assessment of baseline data included the following:

- Analysis and manipulation of collected data by using various specialized software programmes;
- Evaluation of the accuracy of collected primary data and comparison and coupling with relevant available secondary data;
- Development of maps and figures for better understanding and comparison of data; and
- Comparison of data to selected criteria.

8.2.1.2.1 Hydrology and Groundwater Level Baseline Data Assessment

The elevation and slope maps of the Study Area were developed based on surveyed topographic survey data using GIS technique. In order to determine the exact locations of each of the identified watercourses, GPS data from surveys was synchronised with the photos taken on site. Catchment analysis was conducted based on surveyed topographic data, publicly available catchment map of Singapore developed by PUB [W-1], previously developed elevation and slope maps as well as findings from Tengah Town Master Plan Final Report [R-48]. Catchment delineation is considered to be very important information in order to identify the main sources of water that feed each of the watercourses within the Study Area and also to understand how the runoff flows within the site.

8.2.1.2.2 Water Quality Baseline Assessment Criteria

The baseline water quality of the watercourses located within the Study Area was determined by comparing the selected parameters against the NEA Trade Effluent Discharge limits for controlled watercourses [R-11]. This comparison could be used to determine whether the existing baseline water quality of the watercourses within the Study Area complies with NEA limits or already exceeds these limits. However, the NEA Trade Effluent Discharge limits does not provide criteria for the preservation and growth of aquatic life locally. To assess whether the surface water quality within the Study Area is suitable for aquatic life, certain parameters were compared to the water quality criteria for aquatic life from other countries and international organisations including United Nations Economic Commission for Europe [R-18], World Health Organization [R-19], USEPA [R-20], Australian & New Zealand [R-21], Canada [R-22], Philippines [R-23], and Malaysia [R-24], which provide guidelines for the protection of aquatic life. The relevant limits and guidelines for water quality parameters were summarised in Table 8-1; however, where no guidelines exist, the monitored results would be considered as the baseline.

Table 8-1 Water quality guidelines and criteria

Parameter	NEA Trade Effluent Discharge Limits[1]	International Water Quality Criteria for Aquatic Life[2]
pH	6 -9	6.5 - 9
Temperature (°C)	45	-
Salinity (ppt)/ Conductivity (µS/cm)	-	-
Dissolved Oxygen, DO (mg/L)	-	> 4.0
Turbidity (NTU)	-	50
Total Dissolved Solids, TDS (mg/L)	1,000	1,000
Total Suspended Solids, TSS (mg/L)	30	50
Total Organic Carbon, TOC (mg/L)	-	-
Total Phosphorous, TP (mg/L)	-	Eutrophic limit: 0.075 mg/L
Orthophosphate, PO_4-P (mg/L)	0.65 (equivalent to 2 as PO_4)	<0.033 (equivalent to <0.1 as PO_4)
Total Nitrogen, TN (mg/L)	-	Eutrophic limit: 1.5 mg/L
Ammonium Nitrogen, NH_4-N (mg/L)	-	0.5
Nitrate, NO_3-N (mg/L)	4.52 (equivalent to 20 as NO_3)	10 (equivalent to 44 as NO_3)
Enterococcus[3]	-	-
Lead, Pb (µg/L)	100	Acute LOEL[4]: 82 Chronic LOEL[4]: 3.2

Note:
1. NEA Trade Effluent Discharge Limits for discharge into a controlled watercourse.

Parameter	NEA Trade Effluent Discharge Limits[1]	International Water Quality Criteria for Aquatic Life[2]

2. The sources of international water quality criteria for aquatic life include United Nations Economic Commission for Europe [R-18], World Health Organization [R-19], United States Environmental Protection Agency [R-20], Australian & New Zealand [R-21], Canada [R-22], Philippines [R-23], and Malaysia [R-24]
3. Singapore's Water Quality Guidelines for Recreational Beaches and Fresh Water Bodies [W-20] requires that the Enterococcus count should be less than or equal to 200 counts per 100 millilitres of water at 95% of the time
4. LOEL – Lowest Observed Effect Level

8.2.2 Prediction and Evaluation of Impact Assessment

The detailed prediction and evaluation methodologies for Project impacts on hydrology, groundwater level, surface water quality has been described in Section 6.4.

Qualitative and analytical methods will be applied to assess the potential impact on hydrology, groundwater level and surface water quality impacts arising from the Project development during construction and operational phases.

Hydrological impact study helps to understand the impact that might occur as a result of the proposed activities during construction and operational phase of the Projects (as described in Section 3.3 and Section 3.4). Furthermore, it helps with the assessment of the potential impacts (direct and indirect) that the land use change planned for the operational phase of the Project might have on the hydrological conditions of the Study Area (e.g. increased peak flow, reduced dry weather flow, reduced seepage into the soil, etc.).

Qualitative and analytical assessment methods will be used to assess the potential impacts that activities planned for the construction and operational phase of the Project might have on groundwater level.

Surface water quality impact study helps to evaluate potential impact(s) of construction and operational activities (as described in Section 3.3 and Section 3.4) on the water quality of the identified present and future watercourses within the Study Area and its surrounding using analytical method.

8.3 Potential Sources of Hydrology, Groundwater Level and Surface Water Quality Impacts

This section discusses the potential environmental impacts arising from the construction and operational phases of the Project.

8.3.1 Construction Phase

Watercourses nearby can be potentially exposed to hydrological flow modification, groundwater level change and surface water contamination due to the activities taking place during the Project's construction phase. The sources that could potentially have adverse impact(s) on the watercourses' quality and quantity as well as groundwater level include, but are not limited to, those listed in Table 8-2.

Table 8-2 Potential hydrology, groundwater level and surface water quality impacts during the construction phase

Activity	Potential Source of Impacts	Potential Environmental Parameter Affected and Associated Impacts
Land clearing, earthworks and excavation activities	• Runoff from exposed soil surface, earth work areas, soil stockpiles; • Stormwater/groundwater pumped out from excavated areas; • Release of grouting and cement materials; and • Runoff from dust suppression sprays.	Hydrology: • Increased stormwater peak flow contributions to the channel can lead to increased water level and subsequent flooding of surrounding areas adjacent to the watercourses due to the land use change from land clearing; • Altered dry weather flow which can lead to impact on downstream aquatic habitats and communities; • Stream realignment that can lead to impact on aquatic habitats; and

Activity	Potential Source of Impacts	Potential Environmental Parameter Affected and Associated Impacts
	• Elevated suspended solids (e.g. silt and sediment) in site runoff due to heavy rain; • Spoil generation, handling and transport; • Heavy rain during construction; • Dewatering of soil during excavation works and sub-soil construction activities; and • Wood waste and debris generation and wood waste degradation.	• Stormwater runoff from exposed and unstable slopes may cause soil erosion. Surface Water Quality: • Elevated levels of suspended solids and organics leading to increased turbidity and sedimentation rates, solid waste, toxic material, etc; and • Increase in the levels of oil, grease, and other chemical substances. Groundwater Level: • Construction activities such as site clearance, re-shaping of topography, excavation and various dewatering activities during construction phase can lead to groundwater drawdown.
Storage and disposal of liquid and solid wastes (i.e. domestic and construction wastes)	• Improper handling, transfer, storage, and disposal of spoil and solid waste (e.g. excavated earth, construction debris). • Improper management of sewage effluents from on-site; and • Inappropriate discharge of domestic sewage and poor maintenance of the portable chemical toilet, storage tanks and septic tanks (e.g. overflow or overload).	Surface Water Quality: • Poorly managed solid waste can lead to elevated levels of suspended solids entering watercourses via runoff or improper handling/disposal. This waste can also block the temporary drains leading to contamination of receiving watercourses; • Improper storage, handling, disposal or leakage of toxic waste generated at temporary work areas can lead to water contamination. • Inappropriate discharge of wastewater to the watercourse will result in contamination in nearby water sources; and • Inappropriate discharge of domestic sewage and poor maintenance of the portable toilet (e.g. overflow or overload) can result in runoff to nearby water sources and potentially contaminate the watercourses located adjacent to the construction sites.
Use and storage of chemical substances, and refuelling activities	• Improper handling, transfer, and storage of chemical substances; • Accidental spill and leaks; and • Fuel and lubricants spillage from maintenance of construction vehicles and mechanical equipment.	Surface Water Quality (Improper management of chemical substances): • Contaminated stormwater due to improper storage/disposal/transport of chemical materials handled and stored on site leading to an increase in the levels of oil, grease and other chemical substances in the nearby watercourses; and • Fuel and lubricants spillage from maintenance of construction vehicles and mechanical equipment can also lead to elevation in levels of oil in the nearby watercourses.

8.3.2 Operational Phase

Watercourses and watercourses can potentially be exposed to contamination due to the activities taking place during the Project's operational phase. Furthermore, permanent land use changes, such as the ones planned for this Project (i.e. increase in urbanised land), might lead to long-term change in groundwater levels. The sources that could potentially impact on nearby surface water quality and quantity and groundwater level include but are not limited to the ones listed in Table 8-3.

Table 8-3 Potential hydrology and water quality impacts during the operational phase

Activity	Potential Source of Impacts	Potential Associated Impacts
Stormwater runoff generation	• Heavy rain and stormwater wash-off pollutants built-up in the new development area and discharge to the surrounding watercourses; • Increase of runoff peak flow draining to the stream or drain during storm events due to the increase in urbanized area; • Reduce the baseflow (sub-surface water discharge) due to the change in land use of the new development	Hydrology: • Increased stormwater peak flow contributions to the channel can lead to increased water level and subsequent flooding of surrounding areas adjacent to the stream/drain; • Stormwater runoff from exposed and unstable slopes may cause soil erosion; and • Reduced baseflow contributing to proposed natural features such as natural pond or stream. Surface Water Quality: • Elevated suspended solids (e.g. silt and sediment) and pollutants (e.g. heavy metals and nutrients from human activities) in site runoff; and • Potential eutrophication for proposed watercourses (i.e. stagnant water in proposed pond) due to runoff from surrounding residential and industrial areas.
Improper management of liquid and solid wastes	• Accidental spill and leaks (e.g. during storm event); • Improper handling, transfer, and storage of solid and liquid wastes (e.g. rubbish collection and sewage disposal);	Surface Water Quality: • Solid wastes generated can lead to elevated levels of suspended solids entering watercourses via runoff or improper handling/disposal. The wastes can also block the watercourse and leading to contamination of receiving watercourses; and • Inappropriate discharge of liquid wastes to the watercourse results in contamination of nearby or downstream watercourses (e.g. potential eutrophication).
Increase of areas with impervious surfaces	• Reduced seepage of surface water into the soil	Groundwater Level: Higher percentage of urbanized land compared to the existing conditions may lead to permanent groundwater level reduction.

8.4 Baseline Hydrology, Groundwater Level and Surface Water Quality

As mentioned in Table 6-3, this report presents the hydrology and surface water quality findings of the field assessments collected till May 2021.

8.4.1 Baseline Monitoring Personnel

The assessment and site surveys were conducted by the following AECOM personnel:

- Dr. Thanh Nguyen (Technical Reviewer of Surface Water Quality);

- Dr. Liang (Surface Water Quality Technical Lead);
- Ms. Jacquelynn Chia (Surface Water Quality Specialist); and
- Mr. Grujica Sarenac (Surface Water Quality Specialist).

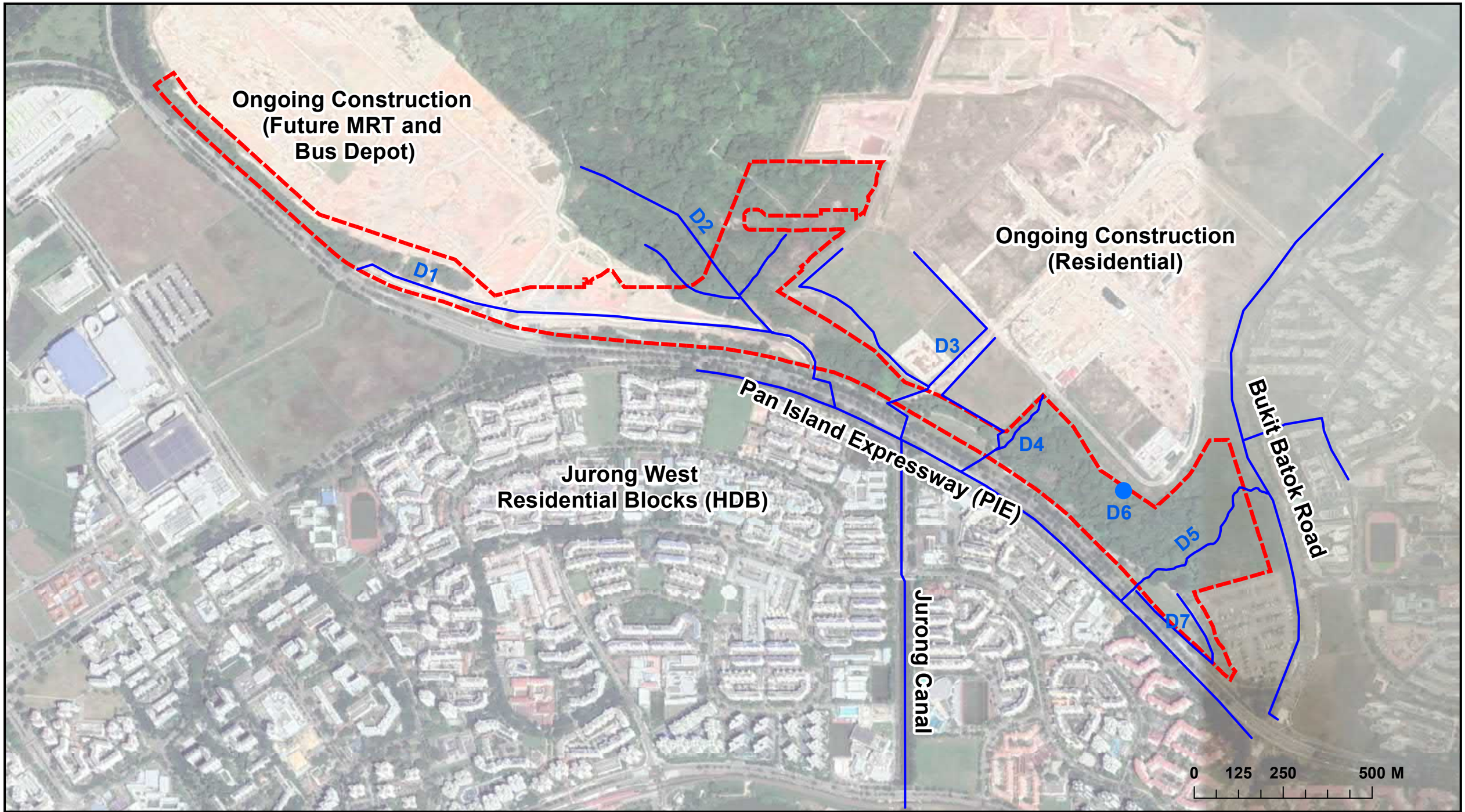
8.4.2 Baseline Findings

8.4.2.1 Hydrological Conditions in the Study Area

During site reconnaissance, concrete canal D1, earth stream D2, concrete drains (i.e. D3 and D7), earth stream D4, pond D6 and natural stream D5 were identified in the Study Area. Their locations are shown in Figure 8-1. The baseline hydrological conditions in the Study Area were analysed based on site observations, recent topography survey carried out during May 2021, as well as the topographic survey data (provided by the Client). Photographic record of each of the drains, canal, pond and natural stream was made during every site survey (refer to Table 8-4). Subsequently, elevation and slope maps of the site were developed based on topographic data using GIS technique. They were then overlaid with hydrological network as shown in Figure 8-2 and Figure 8-3.

As shown in Figure 8-2, the elevation of the Study Area is ranging from 0.07 mRL to 23.32 mRL. Generally, the Study Area has undulating terrain, with elevations increasing from the low-lying central parts towards the eastern and western boundaries of the site. Forested eastern portion of the site has been identified as the area with the highest elevation within the site, with elevations reaching more than 12 m RL. Natural stream D5 carves the low-lying streambed with high river banks in the middle of forested area. The Study Area generally has mild slopes as shown in Figure 8-3, which are observed along the canal D1 and small northern forest patches. The significantly steep slope (up to 55%) can be found in the eastern forested area (i.e. near the pond D6 and stream D5).

Based on the developed elevation map, topographic survey data, and other secondary data (e.g. previously developed regional catchment plan as a part of Tengah Town Master Plan [R-48]), catchment delineation was carried out (refer to the in Figure 8-4). Catchment analysis shows that the water generally flows from north to south within the six (6) identified catchments of the Study Area. The concrete canal D1 collects water from the west (Bulim Area) and north from earth stream D2 towards the centre of the Study Area. The concrete drain D3 and stream D4 are mostly fed by the surface runoff from the nearby construction areas and partly vegetated areas, both located to the north of the Study Area. The natural stream D5 receives surface runoff from the surrounding forested area as well as the larger catchment area that extends across Bukit Batok Road to the east. Pond D6 collects runoff from the forested area of the Study Area. The roadside concrete drain, D7 has a relatively small catchment which receives the surface runoff from the eastern part of the Study Area. All the streams, drains and canal carry flow below PIE via culverts and water eventually flows into Jurong Canal.



Legend

- Watercourses
- Southern Tengah Project Site

N

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-	JUN 2021	LAL	Draft Final Report	NHT	JAG

Qualified Person Endorsement : NA

HDB Endorsement : NA

Consultant : AECOM

Client: HOUSING & DEVELOPMENT BOARD

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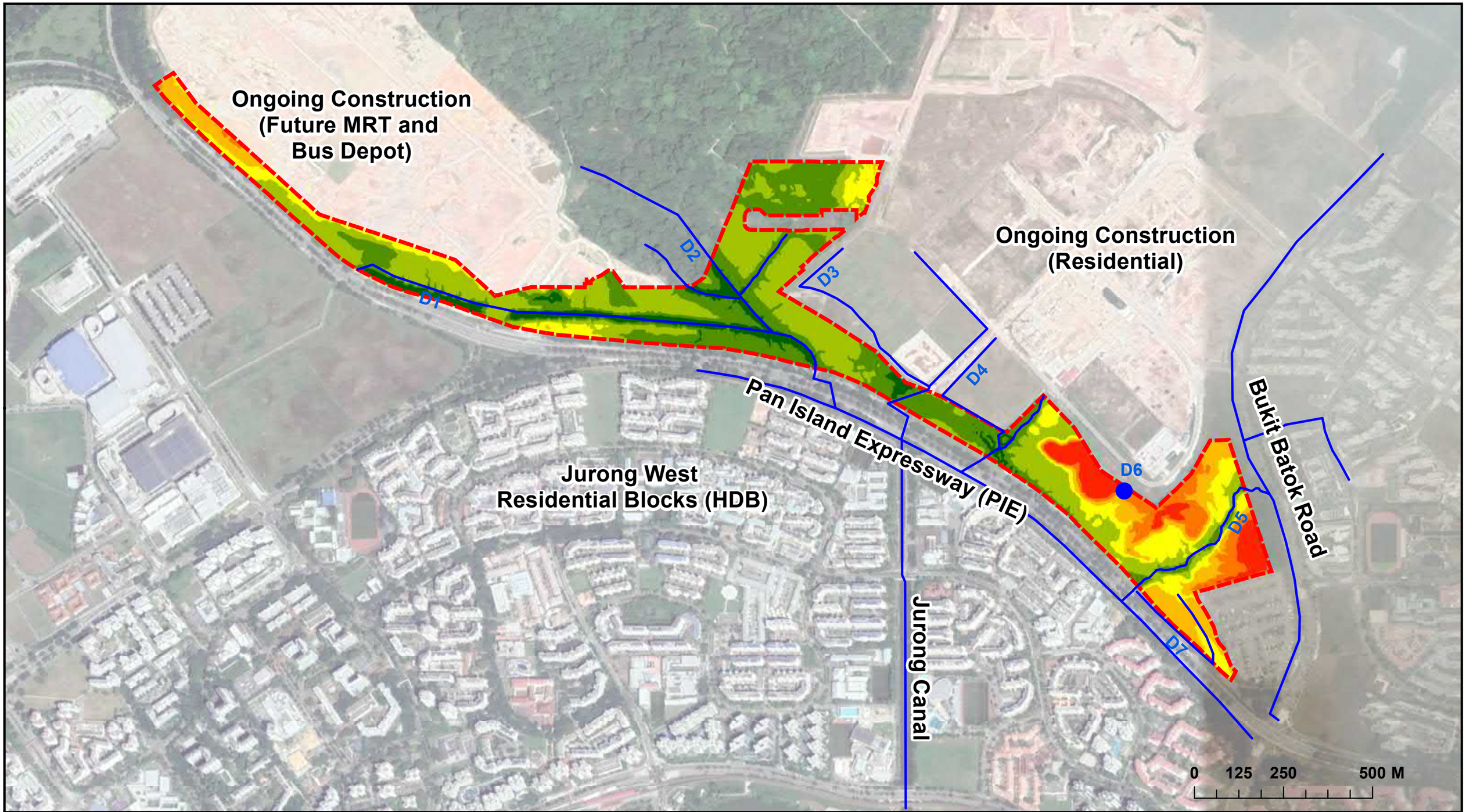
Figure Title :

Study Area for the hydrology and surface water quality impact assessment

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LAL	NHT	JAG	8-1	-	1 of 1
	Drawn LAL	Date JUN 2021	CAD File Name : NA		A3

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Legend

- Watercourses
- Southern Tengah Project Site/ Study Area

Elevation (mRL)

- < 2
- 2-4
- 4-6
- 6-8
- 8-10
- 10-12
- >12

N

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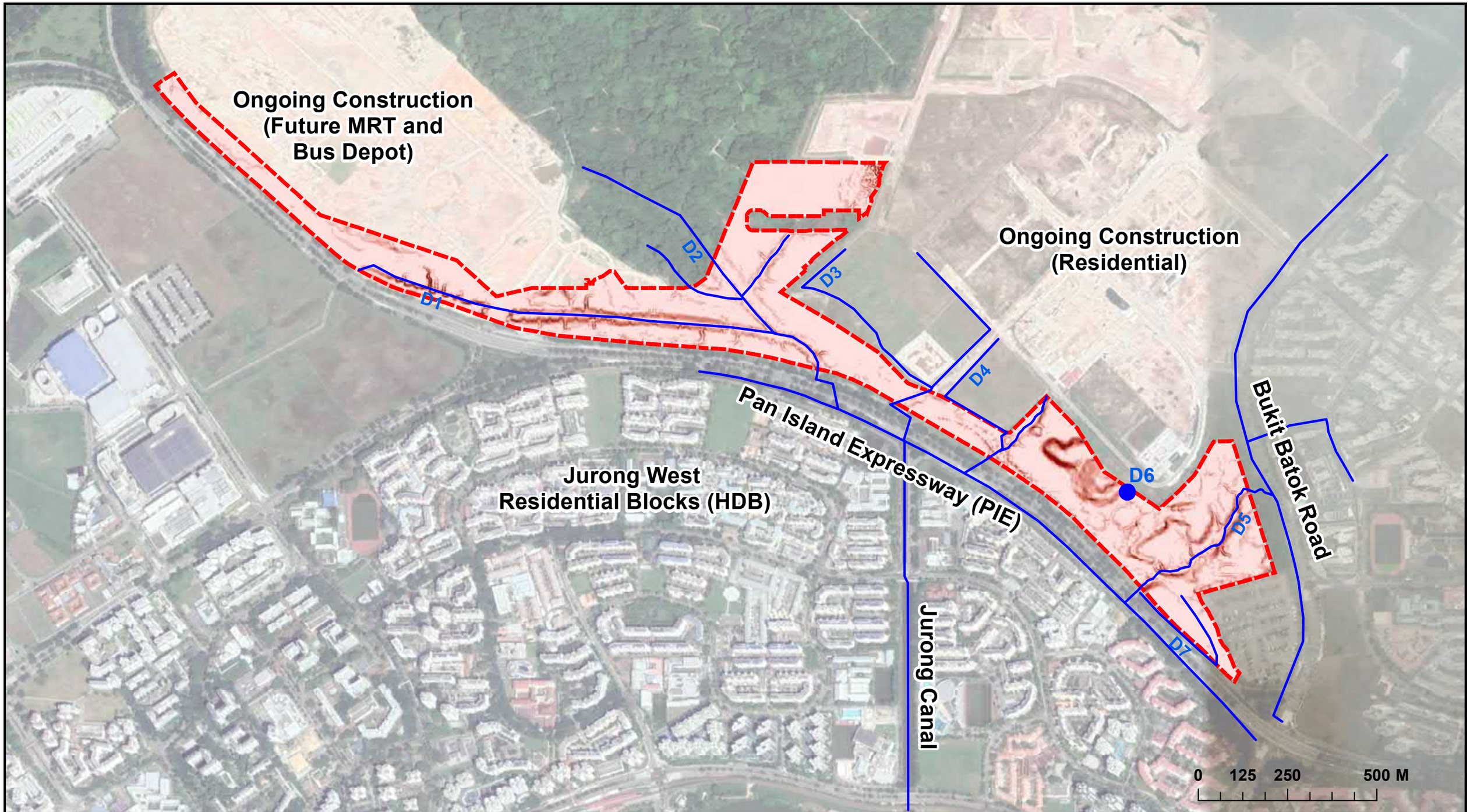
Figure Title :

Elevation Map with Watercourses of the Study Area (generated based on topographic data)

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Legend

- Watercourses
- Southern Tengah Project Site/Study Area

Slope (%)

- < 10
- 10-15
- 15-20
- 20-25
- 25-30
- 30-35
- 35-40
- 40-45
- 45-50
- 50-55

N

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Qualified Person Endorsement : NA

HDB Endorsement : NA

Consultant : AECOM

Client: HOUSING & DEVELOPMENT BOARD

Project Title :

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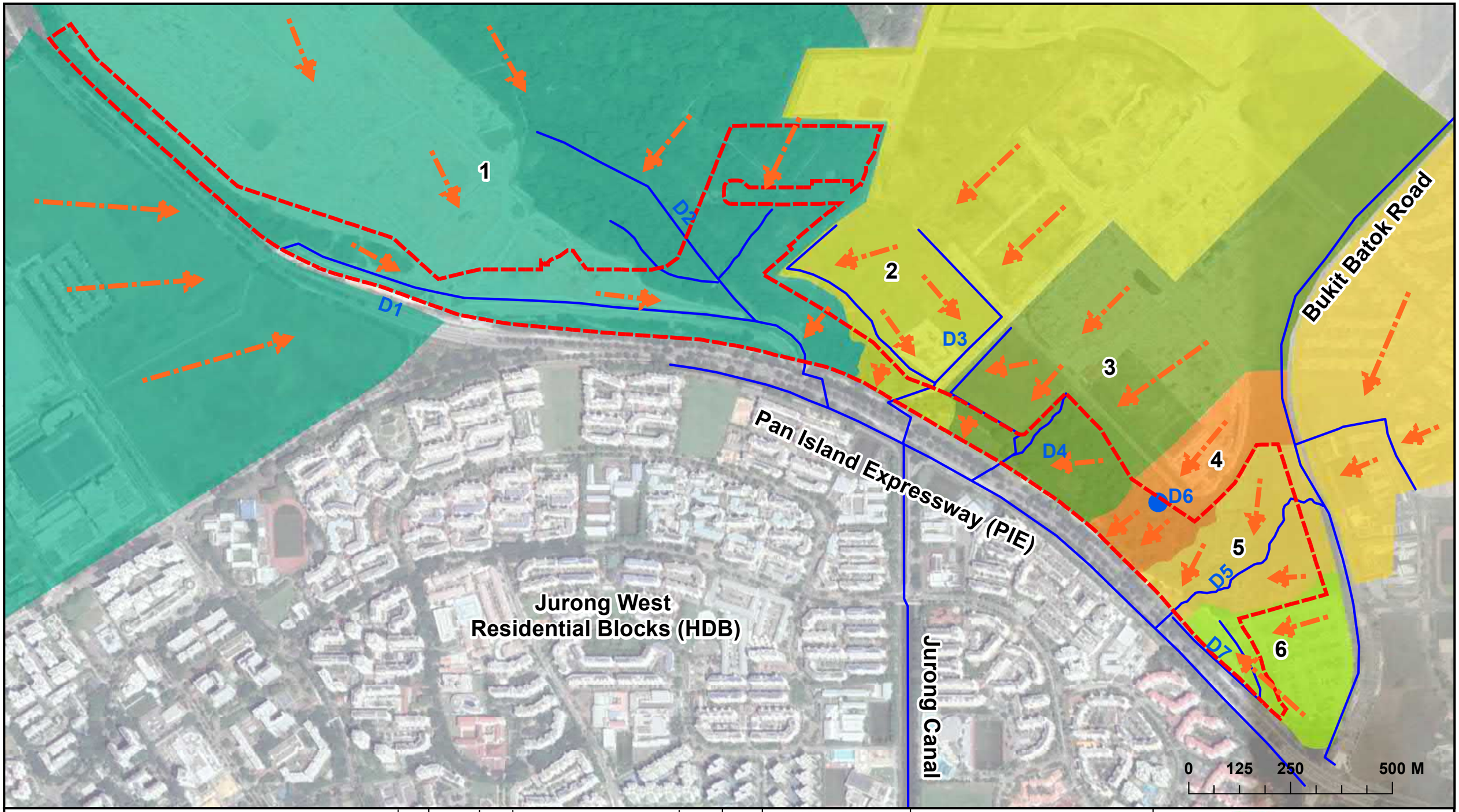
Figure Title :

Slope Map with watercourses of the Study Area (generated based on topographic data)

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Legend

- Water Flow Direction
- Southern Tengah Project Site/ Study Area
- Watercourses

Catchment

- 1
- 2
- 3
- 4
- 5
- 6

N

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-	JUN 2021	LAL	Draft Final Report	NHT	JAG

Qualified Person Endorsement : NA

HDB Endorsement : NA

Consultant : AECOM

Client: HOUSING & DEVELOPMENT BOARD

Project Title :

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Figure Title :

Catchment map with watercourses of the Study Area (generated based on topographic data)

Designed	Checked	Approved	Figure No. :	Rev.	Sheet
LAL	NHT	JAG	8-4	-	1 of 1
	Drawn LAL	Date JUN 2021	CAD File Name : NA		A3

Note: Source of basemap - Google Earth Map

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Table 8-4 Description of watercourses within the Study Area

Watercourses	Bank Characteristics	Water Flow Conditions	Photos
Concrete Canal D1	D1 is a wide concrete canal with artificial banks. Estimated length of the drain is about 1,400 m.	• Originates from runoff from Bulim area to the Study Area, and • Perennial flow towards east **During dry weather condition:** <u>Upstream</u> (Water Quality Station WQ1): • Slow water flow (estimated at 0.3 m/s) • At water quality station WQ1, the depth was approximately 0.25 m with an approximate width of 1.5 m, at time of survey • Water was turbid and had no smell <u>Downstream</u> (Water Quality Station WQ3): • Slow water flow observed of approximately 0.5 m/s • At water quality station WQ3, the depth was approximately 0.25 m with an approximate width of 2.5 m, at time of survey	Water Quality Station WQ1 During Dry Weather  During Wet Weather  Water Quality Station WQ3 During Dry Weather  During Wet Weather 

Watercourses	Bank Characteristics	Water Flow Conditions	Photos	
		• Water was turbid and had no smell **During wet weather condition** Upstream (Water Quality Station WQ1): • Slow water flow (estimated at 0.27 m/s) • At water quality station WQ1, the depth was approximately 1.6 m with an approximate width of 16 m, at time of survey • Water was turbid and had no smell Downstream (Water Quality Station WQ3): • Slow water flow observed of approximately 0.1 m/s • At water quality station WQ3, the depth was approximately 1.4 m with an approximate width of 10 m, at time of survey • Water was turbid and had no smell		
Earth Drain D2			Water Quality Station WQ2	

Watercourses	Bank Characteristics	Water Flow Conditions	Photos	
	Earth banks covered by dense vegetation Estimated stream length is 917 m.	• Originates from the nearby construction site, discharges at concrete canal D1, and • Perennial flow towards south **During dry weather condition:** • Slow water flow observed of approximately 0.2 m/s • At water quality station WQ2, the depth was approximately 0.5 m with an approximate width of 2-3 m, at time of survey • Water was turbid and had no smell **During wet weather condition** • Slow water flow observed of approximately 0.04 m/s • At water quality station WQ2, the depth was approximately 1.3-1.4 m with an approximate width of 8-9 m, at time of survey • Water was turbid and had no smell	During Dry Weather 	During Wet Weather 
Concrete drain D3			Water Quality Station WQ4	

Watercourses	Bank Characteristics	Water Flow Conditions	Photos	
	Concrete roadside drain with artificial banks Estimated drain length is 524 m	• Originates from construction site; and • Perennial flow towards south **During dry weather condition:** • Water flow approximately 1.5 m/s • At water quality station WQ4, the depth was approximately 0.18 m with an approximate width of 0.4 m, at time of survey • Water was turbid and had no smell **During wet weather condition** • Water flow approximately 2.68 m/s • At water quality station WQ4, the depth was approximately 0.35 m width was approximately 3-4 m, at time of survey • Water was turbid and had no smell	During Dry Weather 	During Wet Weather 
Concrete Drain D4	Concrete drain with artificial banks	• Originates from upstream forest area as well as discharge from nearby construction site; and	Water Quality Station WQ5 During Dry Weather	During Wet Weather

Watercourses	Bank Characteristics	Water Flow Conditions	Photos	
	Estimated drain length is 291 m	• Perennial flow towards south **During dry weather condition:** • Slow water flow observed of approximately 0.2 m/s • At water quality station WQ5, the depth was approximately 1-2 cm with an approximate width of 1 m, at time of survey • Water was turbid and had no smell **During wet weather condition** • Slow water flow observed of approximately 0.45 m/s • At water quality station WQ5, the depth was approximately 0.15 m with an approximate width of 1.5 m, at time of survey • Water was turbid and had no smell		
Natural Stream D5	The upstream (WQ9) is an earth	• Originates from urban drains outside of the	Water Quality Station WQ9	
			During Dry Weather	During Wet Weather

<table>
<tr><th>Watercourses</th><th>Bank Characteristics</th><th>Water Flow Conditions</th><th colspan="2">Photos</th></tr>
<tr><td></td><td>stream with dense vegetation.
The downstream (WQ7) is an stream with dense vegetation.

Estimated stream length is 458 m</td><td>Study Area before entering the forest area
• Perennial flow towards south

During dry weather condition:
• <u>Upstream</u> (Water Quality Station WQ9):
• Fast water flow observed of approximately 2 m/s
• At water quality station WQ9, the depth was approximately 3 cm with an approximate width of 0.6 m, at time of survey
• Water was turbid and had no smell
• <u>Downstream</u> (Water Quality Station WQ7):
• Slow water flow observed of approximately 0.5 m/s
• At water quality station WQ7, the depth was approximately 0.15 m with an approximate width of 2-3 m, at time of survey
• Water was turbid and had no smell

During wet weather condition</td><td>  </td><td>  </td></tr>
<tr><td colspan="3"></td><td colspan="2">Water Quality Station WQ7</td></tr>
<tr><td colspan="3"></td><td>During Dry Weather
  </td><td>During Wet Weather
  </td></tr>
</table>

Watercourses	Bank Characteristics	Water Flow Conditions	Photos	
		Upstream (Water Quality Station WQ9): • Fast water flow observed of approximately 2.0-2.5 m/s • At water quality station WQ9, the depth was approximately 0.10-0.12 m with an approximate width of 0.7 m, at time of survey • Water was turbid and had no smell Downstream (Water Quality Station WQ7): • Slow water flow observed of approximately 0.28 m/s • At water quality station WQ7, the depth was approximately 0.3-0.5 m with an approximate width of 3.06 m, at time of survey • Water was turbid and had no smell		
Pond D6	Pond in forested area	• Originates from runoff from forested area and surrounding construction site **During dry weather condition:**	Water Quality Station WQ6	
			During Dry Weather	During Wet Weather

Watercourses	Bank Characteristics	Water Flow Conditions	Photos
		• Stagnant, almost no flow • At water quality station WQ6, the depth was more than 0.7 m, with an approximate diameter of 1 m at time of survey • Water was turbid and had no smell **During wet weather condition** • Stagnant, almost no flow • At water quality station WQ6, the depth of the pond was approximately 1.8m, at time of survey • Water was turbid and had no smell	 
Concrete Drain D7	Concrete drain with artificial banks Estimated stream length is 262 m	• Originates from outside of the Study Area in the east, and • Ephemeral flow **During dry weather condition:** • Almost no flow **During wet weather condition** • Water flow observed of approximately 0.85 m/s • At water quality station WQ8, the depth was approximately 5 cm, with	Water Quality Station WQ8 During Dry Weather  During Wet Weather 

Watercourses	Bank Characteristics	Water Flow Conditions	Photos	
		an approximate width of 0.2 m at time of survey • Observed water was clear		

8.4.2.2 Water Quality Conditions in the Study Area

Surface water samples were collected at nine (9) water quality stations strategically located in the drains, canal, pond and natural stream within the Study Area, as detailed in Figure 8-5 and Table 8-6.

Figure 8-6 shows the exact locations of water quality sampling stations within the Study Area, while the Table 8-6 summarizes the rationale for selection of each of the water quality sampling stations. Two water quality stations were located upstream (i.e. WQ1) and downstream (i.e. WQ3) of the concrete canal D1. The location of WQ1 was selected to capture the water quality of the water inflowing from the Bulim Area into the canal and Study Area. Station WQ3 captures the water quality of the water leaving the Study Area via canal D1 at the southern border of the site, below the PIE through culvert. Location of station WQ2 was selected to capture the quality of water flowing from the earth drain D2 (which receives the water from construction site and vegetated areas to the north and northeast), right before it merges with the canal D1. Strategic positions of these three stations (i.e. WQ1, WQ2 and WQ3) besides providing the information on baseline conditions also allows us to estimate if, and to which extent, water quality from earth drain D2 impact the water quality of concrete canal D1. Water quality stations WQ4 and WQ5 are located downstream of the drains D3 and D4, respectively. These locations were selected to capture the quality of water leaving the Study Area which originates north of the Study Area (currently mostly under construction). Station WQ6 is located in the pond D6 and it was selected to capture its water quality baseline conditions. Although natural stream D5 is reatively short, due to its ecological significance, two sampling stations were positioned on it (i.e. WQ7 on the downstream and WQ9 on the upstream). Station WQ9 was selected to capture the quality of water inflowing to the natural stream from surrounding construction sie to the north and urbanized areas to the east, while the station WQ7 captures the quality of water at the end of the stream, on the southern border of Study Area. Station WQ8 was selected to capture the water quality of drain collecting the water from eastern side of the Study Area.

At all the stations, water samples were collected during both dry and wet weather conditions, the only exception being water quality station WQ8 (in roadside drain D7) which was sampled only during the wet weather conditions due to the ephemeral flow of the water in the drain. As the Study Area is surrounded by a few active construction sites, one (1) dry weather sample has been carried out one (1) day after a heavy storm event to capture the excess discharge from sedimentation ponds of existing construction worksite, if any. A total of twenty-five (25) samples were collected for this study as shown in Table 8-5.

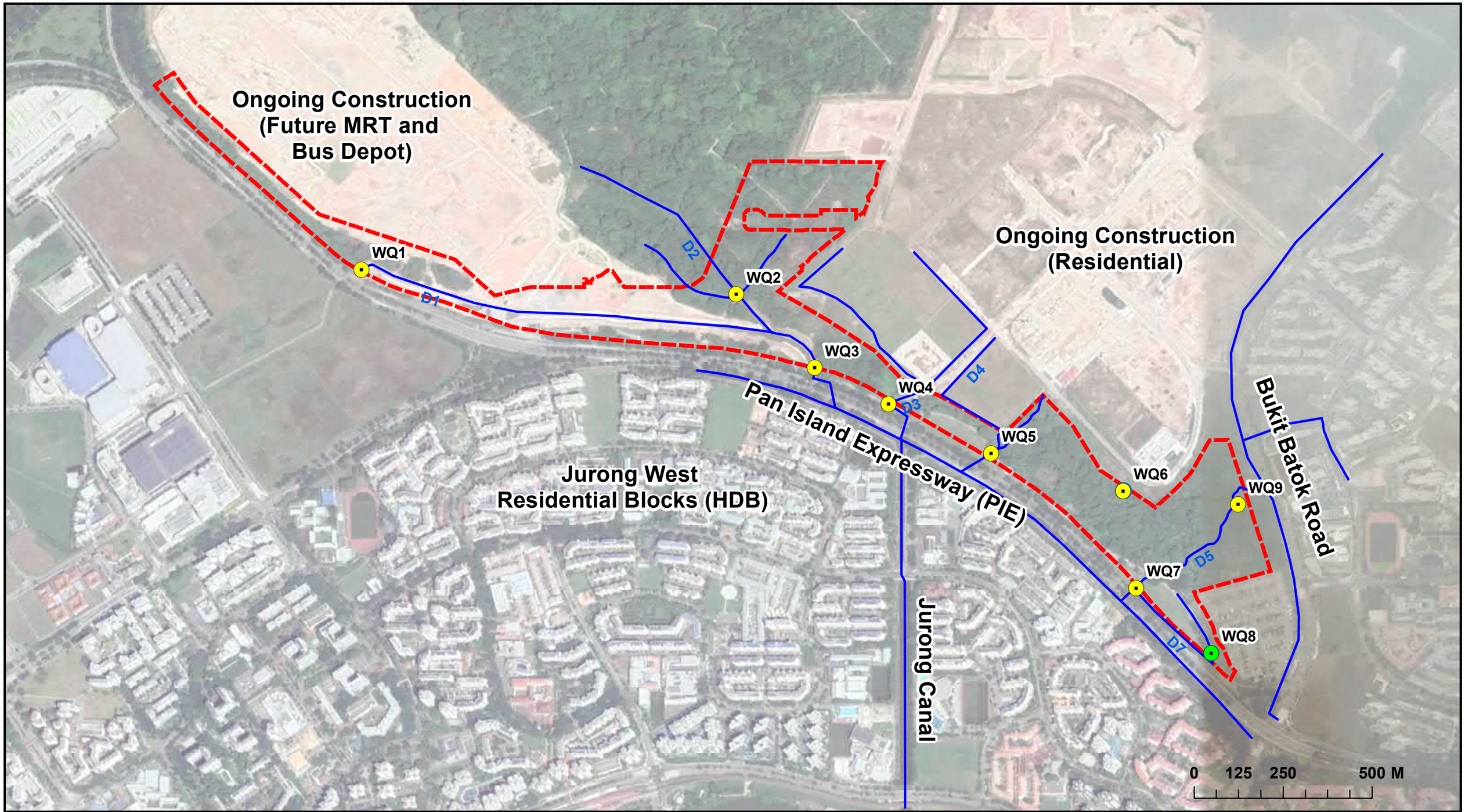
The surface water quality results are summarized and presented in Table 8-7 while the full laboratory result reports are shown in Appendix S. Photos showing the dry and wet weather conditions at each of the stations are presented in Table 8-8. Surface water quality results were assessed against NEA Trade Effluent Discharge limits and multiple international water quality criteria for aquatic life (as listed in Table 8-1). It should be noted that the water quality of any water generated from the Project's activities during both construction and operational phases should comply with the NEA allowable limits for discharge into a controlled watercourse.

Table 8-5 Water quality monitoring schedule

Sampling Event / Sampling Location	Dry Weather			Wet weather	
	8 March 2021	13 April 2021	11 May 2021	5 May 2021	17 May 2021
WQ1 (Concrete canal D1)	Sampled	Sampled	N.S.	S.C.	Sampled
WQ2 (Earth stream D2)	Sampled	Sampled	N.S	Sampled	N.S.
WQ3 (Downstream of earth stream D2)	Sampled	Sampled	N.S	Sampled	N.S.

Sampling Event / Sampling Location	Dry Weather			Wet weather	
	8 March 2021	13 April 2021	11 May 2021	5 May 2021	17 May 2021
WQ4 (Concrete drain D3)	Sampled	Sampled	N.S	Sampled	N.S.
WQ5 (Concrete drain D4)	Sampled	Sampled	N.S.	Sampled	N.S.
WQ6 (Pond D6)	S.C.	Sampled	Sampled	Sampled	N.S.
WQ7 (Downstream of natural stream D5)	Sampled	Sampled	N.S.	Sampled	N.S.
WQ8 (Concrete drain D7)	N.A	N.A	N.A.	Sampled	N.S.
WQ9 (Upstream of natural stream D5)	Sampled	N.S.	Sampled	S.C.	Sampled

Note:
N.A. – Not Applicable: The sampling was not intended for this weather condition due to the flow characteristics of the watercourse (i.e. ephemeral flow)
S.C. – Suboptimum Conditions: The sampling was not carried out due to restricting/ unfavourable conditions such as weather, timing, altered flow, etc.
N.S. - Not Sampled: The sampling was not carried out because the required sample(s) were already collected previously



Legend

Proposed Water Quality Sampling Locations

- Wet
- Dry and Wet
- Watercourses
- Southern Tengah Project Site/ Study Area

N

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Qualified Person Endorsement : NA

HDB Endorsement : NA

Consultant : AECOM

Client: HOUSING & DEVELOPMENT BOARD

Project Title :

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Figure Title :

Proposed water quality sampling locations within/surrounding the Study Area

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	Drawn LAL	Date JUN 2021	CAD File Name : NA		A3

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Table 8-6 Rationale for the selection of proposed water quality sampling locations with photos

S/N	Monitoring Location	Justification	Photo of Monitoring Location
WQ1	Upstream of the concrete canal (D1) discharging water from Bulim Area to the Project Site	To capture the upstream water quality discharged from Bulim Area to the Project Site (i.e. Canal D1).	
WQ2	Earth stream (D2)	To capture the water quality of the earth stream (D2) before discharging water into the concrete canal D1.	
WQ3	Downstream of concrete canal (D1)	To capture the water quality of the canal (D1) downstream, before it leaves the Study Area via culvert, below PIE.	
WQ4	Concrete drain (D3)	To capture the water quality of the drain (D3) which receives discharge from nearby construction site.	
WQ5	Concrete drain (D4)	To capture the water quality of the drain (D4) which is receiving water from upstream natural stream in forest area as well as discharge from nearby construction site	
WQ6	Pond (D6) in the forest	To capture the water quality of the pond (D6) located in the forested part of Study Area, which receives surface runoff from surrounding construction site and forested area.	
WQ7	Natural stream (D5)	To capture the downstream water quality of natural stream (D5) which receives water from urban area to west (across Bukit Batok road) and nearby construction sites and the	

S/N	Monitoring Location	Justification	Photo of Monitoring Location
		forest area of the Study Area.	
WQ8	Concrete drain (D7)	To capture the water quality of the roadside drain discharging from the Study Area. During the site reconnaissance (dry weather conditions), the drain was found to be dry. Water quality samples were taken during wet weather conditions only.	
WQ9	Natural stream (D5)	To capture the upstream of D5 receiving water from urban drains outside of the Study Area before it enters the forest area.	

Table 8-7 Surface water quality results

Parameter		WQ1 (D1)	WQ2 (D2)	WQ3 (D1)	WQ4 (D3)	WQ5 (D4)	WQ6 (D6)	WQ7 (D5)	WQ8 (D7)	WQ9 (D5)	Average	NEA Trade Effluent Discharge Limits[1]	Water Quality Criteria for Aquatic Life from other countries[2]
pH	Dry Average	**9.10**	7.32	7.76	**9.16**	7.62	6.78	7.80	-	8.48	8.00	6 - 9	6.5 - 9
	Wet Average	8.88	**9.34**	8.33	**9.30**	8.75	6.71	8.29	7.83	**9.15**	8.51		
Temperature (˚C)	Dry Average	33.24	26.50	29.39	29.22	27.08	26.72	27.91	-	28.39	28.56	45	-
	Wet Average	27.78	27.72	28.06	27.39	27.39	26.28	27.11	27.50	27.94	27.46		
Salinity (PSU)	Dry Average	0.29	0.46	0.37	0.28	0.31	0.03	0.24	-	0.25	0.28	-	-
	Wet Average	0.08	0.13	0.10	0.06	0.06	0.03	0.08	0.03	0.12	0.08		
Conductivity (µS/cm)	Dry Average	713	936	821	614	660	75	514	-	546	610	-	-
	Wet Average	175	300	237	139	134	65	179	72	276	175		
Total Dissolved Solids, TDS (mg/L)	Dry Average	395.5	595.8	496.9	371.8	415.1	47.0	317.5	-	336.3	108.4	1,000	1,000
	Wet Average	108.0	185.4	145.6	86.0	83.0	41.0	112.0	44.6	169.6	372.0		
Dissolved Oxygen, DO (mg/L)	Dry Average	**10.15**	1.29	**4.76**	**7.90**	**4.96**	0.62	**6.39**	-	**8.31**	**5.55**	-	> 4.0
	Wet Average	**7.94**	**6.23**	**6.30**	**7.96**	**7.73**	2.85	**7.84**	**7.41**	**8.26**	**6.95**		
Turbidity (NTU)	Dry Average	**70.5**	**60.9**	**132.0**	40.6	**118.2**	16.0	12.4	-	38.3	61.1	-	50
	Wet Average	**664.9**	**355.8**	**296.4**	**570.0**	**106.7**	36.5	**102.1**	39.5	**128.6**	**255.6**		
Total Suspended Solids, TSS (mg/L)	Dry Average	**62.8**	36.3	**162.8**	20.7	**107.5**	8.5	2.3	-	6.2	**50.9**	30	50
	Wet Average	**874.0**	**175.0**	**326.0**	**530.0**	**78.0**	34.3	**63.5**	21.4	**57.6**	**240.0**		
Total Organic Carbon, TOC (mg/L)	Dry Average	5.31	12.70	6.47	5.06	6.84	3.78	2.43	-	4.04	5.83	-	-
	Wet Average	5.71	9.12	6.13	3.57	4.81	3.15	4.67	5.05	4.38	5.18		
Total Phosphorous, TP (mg/L)	Dry Average	0.064	**0.085**	**0.095**	**0.076**	**0.096**	0.053	0.055	-	0.069	0.074	-	Eutrophic Limit: 0.075 mg/l
	Wet Average	0.065	0.065	**0.086**	**0.180**	0.058	0.046	**0.100**	0.040	**0.090**	**0.081**		
Orthophosphate as PO_4-P (mg/L)	Dry Average	**0.049**	**0.063**	**0.069**	**0.053**	**0.066**	0.030	**0.039**	-	**0.053**	**0.052**	0.65 (equivalent to 2 as PO_4)	<0.033 (equivalent to <0.1 as PO_4)
	Wet Average	**0.035**	**0.046**	**0.040**	**0.120**	**0.035**	0.026	**0.061**	0.024	**0.065**	**0.050**		
Total Nitrogen, TN (mg/L)	Dry Average	2.78	1.30	1.11	2.15	1.42	1.18	0.99	-	**1.73**	**1.58**	-	Eutrophic Limit: 1.5 mg/l
	Wet Average	1.22	1.26	1.38	1.29	1.08	1.02	1.05	1.34	1.02	1.18		
Ammonium Nitrogen, NH_4-N (mg/L)	Dry Average	0.401	**0.675**	0.375	**1.190**	**0.595**	**0.600**	0.103	-	0.110	0.153	-	0.5
	Wet Average	< 0.010	0.120	0.092	0.250	0.077	**0.550**	0.024	0.039	0.072	**0.506**		
Nitrate as NO_3-N (mg/L)	Dry Average	0.96	0.16	0.49	0.53	0.43	0.02	0.68	-	0.95	0.53	4.52 (equivalent to 20 as NO_3)	10 (equivalent to 44 as NO_3)
	Wet Average	0.34	0.49	0.89	0.6	0.62	0.15	0.61	1.01	0.42	0.57		
Enterococcus[4], (cfu/100ml)	Dry Average	1,600	1,250	850	1,200	7,350	175	<1	-	1,400	1,728	-	-
	Wet Average	35,000	9,000	14,000	13,000	12,000	410	14,000	16,000	15,000	14,268		
Lead, Pb (µg/L)	Dry Average	1.11	0.38	4.18	0.43	3.34	<0.50	<0.50	-	<0.50	1.18	100	Acute LOEL[5]: 82
	Wet Average	10.60	6.81	6.56	6.71	8.86	4.92	6.93	4.95	1.61	6.44		

Note:

1. NEA Trade Effluent Discharge Limits are for controlled watercourses.
2. The sources of water quality criteria for aquatic life include United Nations Economic Commission for Europe [R-18], World Health Organization [R-19], United States Environmental Protection Agency [R-20], Australian & New Zealand [R-21], Canada R-22], Philippines [R-23], and Malaysia [R-24].
3. **Red** values mean data exceeding the NEA limits; **Blue** values mean data exceeding aquatic life criteria; **Purple** values mean data exceeding both NEA limits and aquatic life criteria.
4. Singapore's Water Quality Guidelines for Recreational Beaches and Fresh Water Bodies [W-20] requires that the Enterococcus count should be less than or equal to 200 counts per 100 millilitres of water at 95% of the time
5. LOEL – Lowest Observed Effect Level

Table 8-8 Photographs taken during sampling events at each sampling station

Water Sampling Station	During Dry Weather Conditions	During Wet Weather Conditions
WQ1 (Upstream of concrete canal D1)		
WQ2 (Earth stream D2)		
WQ3 (Downstream of concrete canal D1)		

Water Sampling Station	During Dry Weather Conditions	During Wet Weather Conditions
WQ4 (Concrete drain D3)		
WQ5 (Concrete drain D4)		
WQ6 (Pond D6)		
WQ7 (Downstream of natural stream D5)		

Water Sampling Station	During Dry Weather Conditions	During Wet Weather Conditions
WQ8 (Concrete drain D7)		
WQ9 (Upstream of natural stream D5)		

As shown in Figure 8-6, water temperature across the watercourses during dry and wet weather conditions ranged from 26.28 ˚C to 33.24 ˚C, which is below the NEA limit of 45˚C.

Besides the NEA criteria for trade effluent discharge limits, the water quality of watercourses was also compared to international water quality standards in order to assess their appropriateness to support aquatic life. The average pH of the watercourses sampled within the Study Area did not vary significantly, ranging from 6.78 (at pond D6) to 9.16 (at drain D3) during dry weather conditions, and from 6.71 (at pond D6) to 9.34 (at stream D2) during wet weather conditions. Based on the water quality results (as shown in Table 8-7), pH values of water in drain D3 were observed to be slightly elevated during both dry and wet weather conditions, exceeding the NEA Trade Effluent Discharge limits as well as international water quality criteria for pH with regards to aquatic life. Besides, the pH values in the upstream reaches of canal D1 during dry weather conditions and the pH of earth stream D2 and upstream of natural stream D5 during wet weather conditions were also observed to slightly exceed the NEA trade effluent discharge limits as well as international water quality criteria for aquatic life. The slightly elevated pH at concrete canal D1 and upstream of stream D5 might be due to receiving elevated alkali concentration of water runoff from urban areas. For earth stream D2, it might be due to the flushing of runoff with elevated alkali concentration from nearby construction site into the stream during storm event. The pH of concrete drain D3 during both dry and wet weathers exceeded both NEA limit and aquatic life criteria might be due to the runoff from the vicinity construction sites consisting of high alkali chemical compounds such as concrete residuals.

The conductivity of water is strongly dependent on the number of ions available to participate in the conduction process. This parameter is positively correlated to TDS, a parameter which measures the total amount of organic and inorganic matter present in the waterbody, as well as salinity, which measures the amounts of salts dissolved in water. Due to the mutual dependency between conductivity, TDS and salinity these three parameters are analysed together. The conductivity, TDS and salinity measured in the samples taken from water quality stations during both dry and wet weather conditions were found to have no significant variations. The average conductivity during dry weather conditions was 610 µS/cm, ranging from 75 µS/cm in WQ6 (pond D6) to 936 µS/cm in WQ2 (drain D2). During the wet weather condition, average conductivity was 175 µS/cm and it ranged from 65 µS/cm (pond D6) to 300 µS/cm (drain D2). The average TDS concentration was 108.4 mg/L during dry weather conditions

and 372 mg/L during wet weather conditions, while the average salinity was 0.28 PSU during dry weather and 0.08 during wet weather conditions. Both maximum TDS concentration and salinity were observed at WQ2 (i.e. drain D2) during dry weather conditions (i.e. 595.8 mg/L and 0.46 PSU, respectively). Analysis of these three parameters confirm the prevalence of freshwater in the Study Area, given that the seawater generally has conductivity of around $3.31x10^6$ µS/m [P-56], salinity of around 35 PSU [W-18], and TDS of around 35,000 mg/L [W-19].

The average DO at all water quality stations during dry and wet weathers were 5.55 mg/L and 6.95 mg/L, respectively. Decomposition of organic matter from forest vegetation in low flowing rate of natural streams surrounded by vegetation, can usually result in depletion of DO in the natural streams. These reasons seem valid for low DO levels observed at drain D2 during dry weathers, where the D2 is covered by dense vegetation and originates from forest area. Low DO levels measured at pond D6 during both dry and wet weather conditions might be due to the stagnant water conditions of the pond which was surrounded by dense vegetation and the decomposition of organic matter resulting in depletion of DO.

The average turbidity and TSS concentrations at all the water quality stations during dry weathers were 61.1 NTU and 50.9 mg/L, respectively. During wet weather, the average turbidity and TSS at all the water quality stations were 255.6 NTU and 240.0 mg/L, respectively. The TSS of all sampling points except roadside drain D7 during wet weather and concrete canal D1, earth stream D2 and drain D4 during dry weather exceeded the NEA limits (i.e. 30 mg/L). The turbidity and TSS of concrete drain D1 and drain D4 during dry weather and all sampling points except pond D6 and roadside drain D7 during wet weather exceeded water quality criteria for aquatic life (i.e. 50 NTU and 50 mg/L, respectively). The elevated TSS and turbidity for concrete canal D1, earth stream D2, concrete drain D3 and drain D4 during dry and wet weathers (except for concrete drain D3 during dry weathers) could be due to surface water runoff from the nearby construction sites which most likely contained excess sediments at time of sampling. During wet weather conditions, the water quality stations of pond D6 had elevated TSS (i.e. 34.3 mg/L) while natural stream D5 had higher turbidity (i.e. 102.1 NTU and 128.6 NTU) and TSS (i.e. 63.5 mg/L and 57.6 mg/L). This suggested that the source for elevated turbidity and TSS could be due to either construction site or urban area outside of the Study Area.

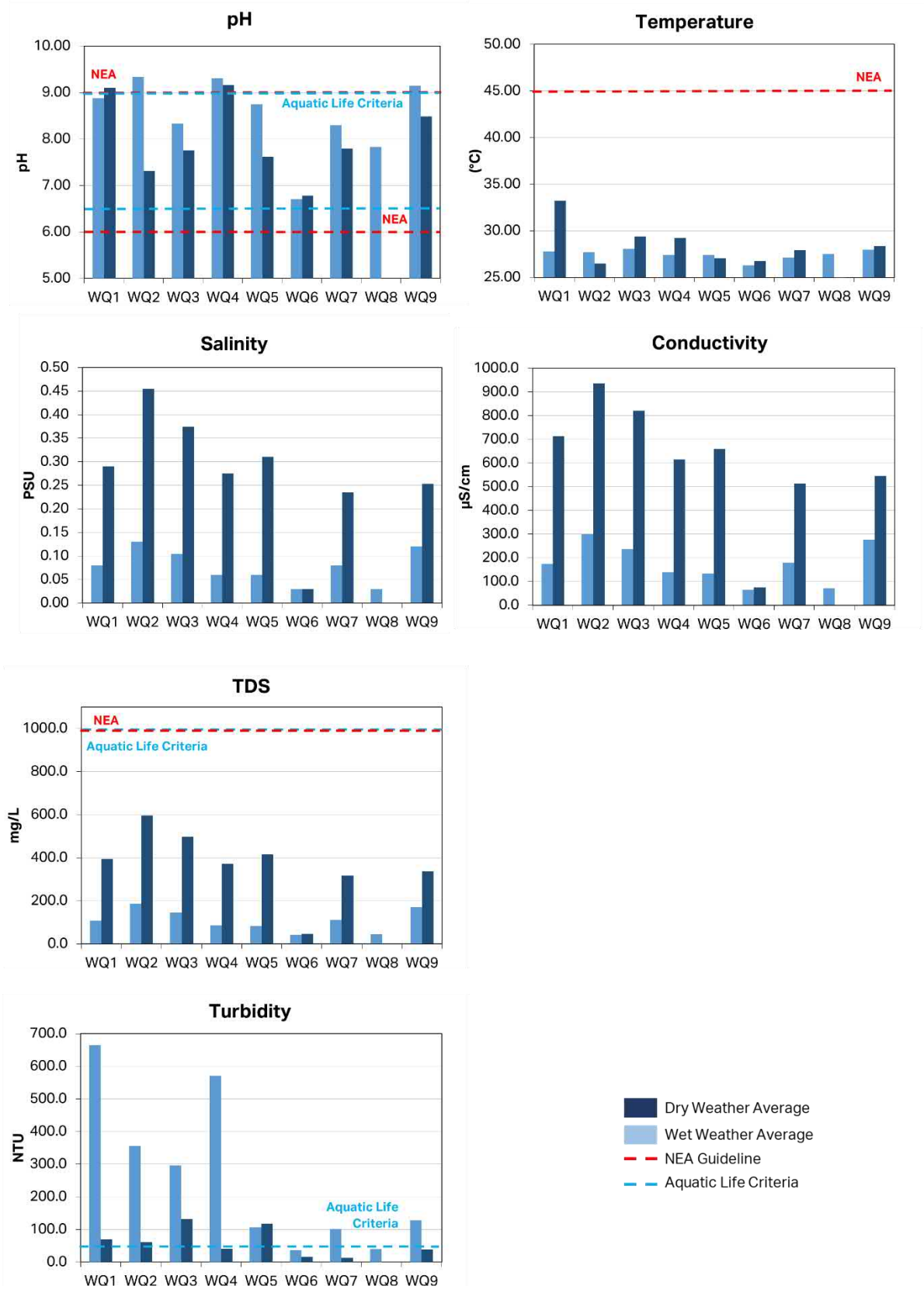


Figure 8-6 Average monitoring results of in-situ parameters for dry and wet weather conditions

The mean TOC of dry-weather samples was 5.83 mg/L, ranging from 2.43 mg/L to 12.7 mg/L, while the mean TOC of wet weather samples was 5.18 mg/L, ranging from 3.15 mg/L to 9.12 mg/L. Since there are no available TOC guidelines with regards to aquatic life, the results were compared to criteria for drinking water from Canada (i.e. maximum allowable TOC is 4 mg/L [R-45]). When compared with this limit, the water runoff coming from

construction sites (i.e. concrete canal D1, earth stream D2, concrete drain D3 and drain D4) during dry weather showed relatively higher TOC than water from urban and forest area (i.e. natural stream D5). This suggested that excess TOC might come along with surface runoff from construction sites.

Total Phosphorus (TP) had an average concentration of 0.074 mg/L, ranging from 0.053 mg/L to 0.096 mg/L during dry weather conditions, and an average concentration of 0.081 mg/L with a range of 0.04 mg/L to 0.18 mg/L during wet weather conditions. Although TP is considered to be one of the essential nutrients for plants and animals, high concentrations in watercourses may have serious adverse effects to water quality and surrounding habitats. Namely, high concentrations of TP can cause excessive growth of algae (process also known as algae bloom) and other aquatic plants. Consequently, this can result in significant decrease of levels of DO in the watercourses, making them unhabitable. This process is also known as eutrophication. By comparing TP concentrations to eutrophication limit (i.e. 0.075 mg/L) it can be observed that during dry weather conditions water in stream D2, drains D3 and D4 as well as downstream of canal D1 all exceed that limit. During wet weather conditions, water in drain D3, downstream of canal D1 and natural stream D5 (both upstream and downstream) exceed the eutrophication limit. This implies that the before mentioned watercourses have certain eutrophication potential and additional increase in concentrations of nutrients might lead to their eutrophication. Slightly higher TP concentrations might be due to the construction activities in the surrounding area (at canal D1, stream D2 and drains D3 and D4), while the elevated TP in natural stream D5 during wet weather conditions might be due to runoff from urbanized and forested areas which usually have higher concentrations of nutrients. The average concentration of PO_4-P (orthophosphate) was 0.052 mg/L, ranging from 0.030 mg/L to 0.069 mg/L during dry weather conditions, and 0.050 mg/L, ranging from 0.024 mg/L to 0.12 mg/L during wet weather conditions. Concentration of orthophosphate exceeded the limit of aquatic life criteria (i.e. 0.033 mg/L) in majority of the watercourses (during both dry and wet weather conditions), exception being pond D6 and roadside drain D7. The source of elevated phosphorus in natural stream D5 might be from urbanized and forested areas, in the form of flushed fertilizers from tree plantations, food wastes, plant decomposition, etc. In downstream of canal D1, earth stream D2, concrete drain D3 and drain D4, higher phosphorus concentration might be due to construction activities at nearby construction areas and from surrounding dense forest (e.g. organic decomposition of dead plants).

Total Nitrogen (TN) had an average concentration of 1.58 mg/L during dry weather conditions, ranging from 0.99 mg/L to 2.78 mg/L and an average concentration of 1.18 mg/L during wet weather conditions, ranging from 1.02 mg/L to 1.38 mg/L. Similarly like TP, elevated concentrations of TN can also lead to eutrophication of watercourses. Compared with the water quality criteria for aquatic life, the detected TN exceeded the eutrophic limit of TN (i.e. 1.5 mg/L) at upstream of canal D1, drain D3 and upstream of stream D5 during dry weather conditions only, indicating a possibility of eutrophication to occur in those watercourses. Ammonium Nitrogen (NH_4-N) had an average concentration of 0.51 mg/L and 0.15 mg/L during dry and wet weather conditions, respectively. During dry weather conditions, water in earth stream D2, as well as drains D3 and D4 exceeded the water quality criteria (i.e. 0.5 mg/L). Pond D6 exceeded the criteria during both dry and wet weather conditions. Excess TN and NH_4-N might come from wastewater originating from urbanized area or construction sites. NO_3-N (Nitrate) had an average concentration of 0.53 mg/L during dry weather conditions, ranging from 0.16 mg/L to 0.96 mg/L, and an average concentration of 0.57 mg/L during wet weather conditions, ranging from 0.15 mg/L to 1.01 mg/L with nitrate at all stations below the NEA guidelines (i.e. 4.52 mg/L) and aquatic life criteria (i.e. 10 mg/L).

Enterococcus counts during dry weather conditions had an average value of 1,728 cfu/100ml (ranging from <1 cfu/100ml to 7,350 cfu/100ml). During wet weather conditions average enterococcus counts were 14,268 cfu/100ml (ranging from 410 cfu/100ml to 35,000 cfu/100ml). By comparing the dry and wet weather results, it was observed that the enterococcus count increased at all of the locations during wet weather, which is probably due to the flushing effect of stormwater runoff originating from surrounding areas. The NEA Recreational Water Quality Guidelines [W-20] requires enterococcus to be below 200 cfu/100ml, indicating possible human or animal faecal pollution in the streams. However, it should be noted that all watercourses are not expected to hold any recreational activities that involved direct human contact.

The average concentration of lead (Pb) at all water quality stations were very low, at 1.18 µg/L and 6.44 µg/L during dry and wet weather conditions, respectively. Based on the results, it can be observed that the Pb concentrations notably increase during wet weather conditions at all sampling stations. This is most likely due to the stormwater runoff which originates from urbanized areas and construction sites around the Study Area. However, all of the detected Pb concentrations were well-below both NEA Trade Effluent Discharge limit (100 µg/L) and adopted aquatic life criteria (82 µg/L).

The collected water quality data shows that the water quality is generally poorer in the watercourses in central and western parts of the Study Area (i.e. canal D1, stream D2, drains D3 and D4) than the water quality of the natural stream D5, pond D6 and drain D7 located in eastern portion of the site. This is most likely due to the fact that the

canal D1, stream D2 and drains D3 and D4 were affected by the surrounding construction site activities (e.g. surface runoff that gets discharged into the Study Area) which aligned with increased concentrations of TSS, nutrients as well as pH characteristic for basic water at the time of survey. Water quality of natural stream D5 and pond D6 have slightly increased concentrations of nutrients (e.g. TN, TP). However, based on AECOM's previous experience, this occurrence is normal in natural waterbodies in Singapore. Drain D7 exhibited good water quality (i.e. within applicable criteria) during wet weather conditions.

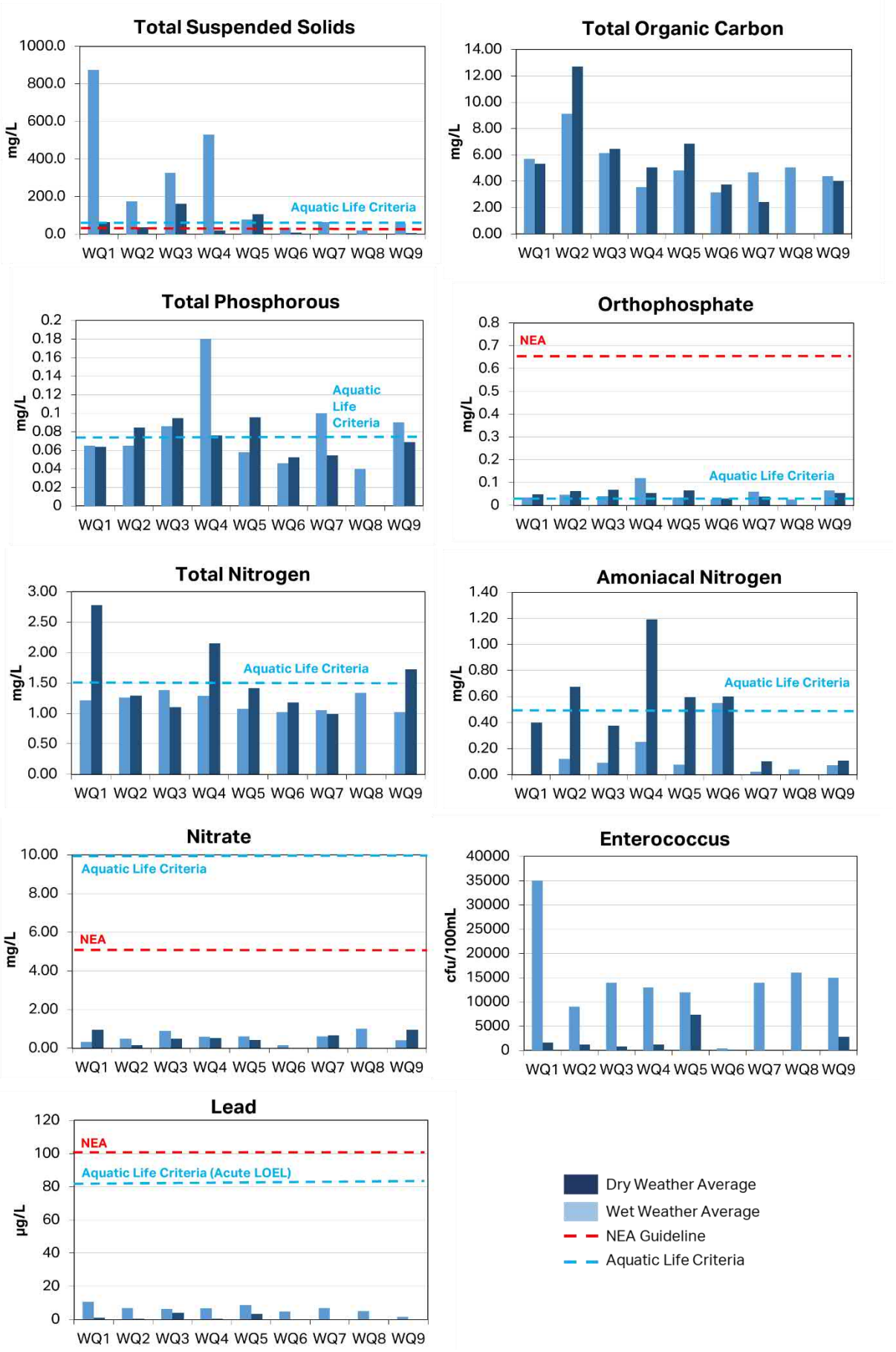


Figure 8-7 Average monitoring results of ex-situ parameters for dry and wet weather conditions

8.4.2.3 Groundwater Level in the Study Area

As no field work is required for groundwater as per scope of this Study, summary of the previous SI reports were provided in the table below:

Table 8-9 Summary of previous SI carried out within and in the vicinity of the Study Area

SI Report	Scope of Work	Field work duration	Soil Investigation Contractor	No. of Boreholes / Monitoring Wells Located within the Southern Tengah Study Area
WI001	• SI drilling of thirty-one (31) boreholes by using rotary wash boring method; • Installation of twelve (12) water standpipes; • Groundwater level monitoring; • Soil sampling, in-situ and ex-situ analysis of the soil physical characteristics; and • Standard Penetration Tests including collection of split spoon samples.	6 June 2019 – 28 June 2019	Ryobi Geotechnique International Pte Ltd	No boreholes nor monitoring wells were placed within the Study Area.
WI007	• SI drilling of eleven (11) boreholes by rotary wash boring method; • Installation of three (3) water standpipes; • Groundwater level monitoring; • Soil sampling, in-situ and ex-situ analysis of the soil physical characteristics; and • Standard Penetration Tests	11 July 2013 – 1 August 2013	KIMARO Geotechnical Engineering Pte Ltd	No boreholes nor monitoring wells were placed within the Study Area.
WI035	• SI drilling of thirty-seven (37) boreholes by using rotary wash boring method; • Installation of six (6) water standpipes; • Groundwater level monitoring; • Soil sampling, in-situ and ex-sit analysis of the soil physical characteristics; and	11 July 2018 – 8 September 2018	Ryobi Geotechnique International Pte Ltd	No boreholes nor monitoring wells were placed within the Study Area.

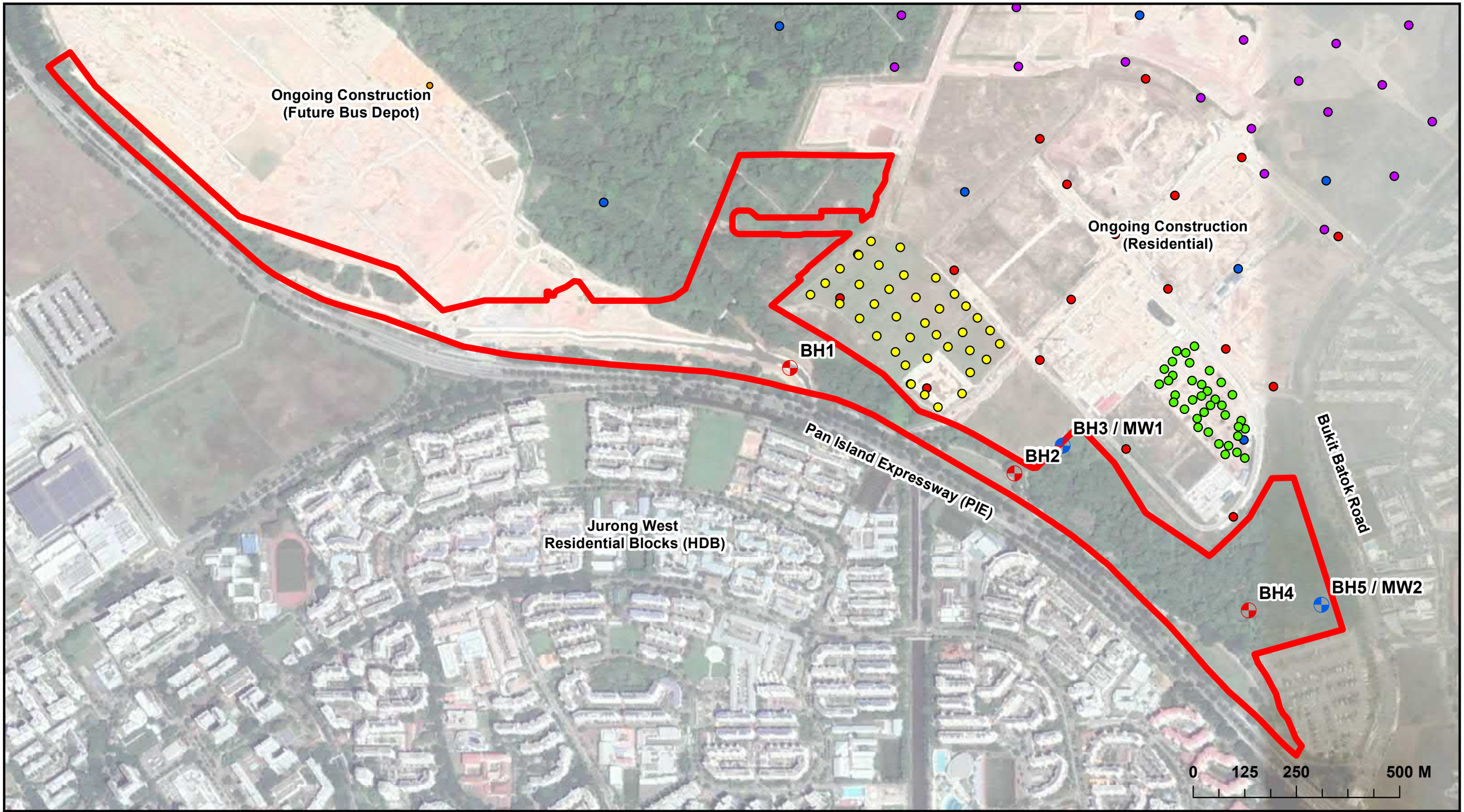
SI Report	Scope of Work	Field work duration	Soil Investigation Contractor	No. of Boreholes / Monitoring Wells Located within the Southern Tengah Study Area
	• Standard Penetration Tests including collection of split spoon samples and Down-hole Seismic Logging Tests.			
WI038	• SI drilling of fourty (40) boreholes by using rotary wash boring method; • Installation of five (5) water standpipes; • Groundwater level monitoring; • Soil sampling, in-situ and ex-sit analysis of the soil physical characteristics; and • Standard Penetration Tests, including collection of split spoon samples.	29 August 2020 – 6 November 2020	Ryobi Geotechnique International Pte Ltd	No boreholes nor monitoring wells were placed within the Study Area.
WI058	• SI drilling of eleven (11) boreholes by rotary drilling method; • Installation of three (3) water standpipes; • Groundwater level monitoring; • Soil sampling, in-situ and ex-situ analysis of the soil physical characteristics; and • Standard Penetration Tests	15 March 2013 – 1 April 2013	KIMARO Geotechnical Engineering Pte Ltd	Boreholes and monitoring wells installed within the Study Area include: • Boreholes: BH1, BH2, BH6; and • Monitoring well: WSP-1 (converted from BH1)
WI059	• SI drilling of nineteen (19) boreholes by rotary drilling method; • Installation of six (6) water standpipes; • Groundwater level monitoring; • Soil sampling, in-situ and ex-situ analysis of the soil physical characteristics; and • Standard Penetration Tests	22 November 2016 – 9 January 2017	TÜV SÜD AL TECHNOLOGIES	Boreholes and monitoring wells installed within the Study Area include: • Boreholes: BH3, BH8; and • Monitoring Wells: WSP-4 (converted from BH8)

As shown in the Table 8-10 above, three (3) boreholes (i.e. BH1, B2 and BH6) from SI Report WI058 and two (2) boreholes (i.e. BH3 and BH8) from SI report WI059 were located within the boundaries of the current Study Area. With regards to monitoring wells, one (1) monitoring well (i.e. WSP-1, converted from BH1) from SI report WI058 and one (1) monitoring well (i.e. WSP-4, converted from BH8) from SI report WI059 were located within current Study Area.

Considering the fact that each of the reports follows its own unique borehole/monitoring well numeration, to avoid confusion, for the purposes of this baseline study, relevant boreholes and monitoring wells (i.e. boreholes and monitoring wells located within Study Area) were renamed as shown in Table 8-10. Locations of boreholes and monitoring wells from previous SI within and outside of the Study Area are shown in Figure 8-8.

Table 8-10 Renamed boreholes and monitoring wells

SI Report	Original borehole/ monitoring well number	Assigned borehole/ monitoring well number	Coordinates	
			Northing	Easting
WI058	• BH1 / WSP-1 (converted from BH1)	• BH3 / MW1	37348.841	16638.734
	• BH2	• BH4	36949.818	17088.490
	• BH6	• BH1	37536.497	15977.948
WI059	• BH3	• BH2	37281.356	16521.745
	• BH8 / WSP-4 (converted from BH8)	• BH5 / MW2	36963.401	17264.311



Legend

- Southern Tengah Study Area
- Borehole
- Borehole Converted to Monitoring Well

Boreholes/ Monitoring Wells outside Study Area

- WI001
- WI007
- WI035
- WI038
- WI058
- WI059

N

Rev.	Date	By	Description	Chk'd	App'd
-	JUN 2021	SAG	Draft Final Report	NHT	JAG

Qualified Person Endorsement : NA

HDB Endorsement : NA

Consultant : AECOM

Client: HOUSING & DEVELOPMENT BOARD

Project Title :

CONTRACT L/025/21
SPECIALIST CONSULTANCY SERVICES FOR ENVIRONMENTAL IMPACT STUDY (EIS) ON SOUTHERN TENGAH

Figure Title :

Location of boreholes and monitoring wells from previous SI

Designed	Checked	Approved	Figure No. :	Rev.	Sheet
SAG	NHT	JAG	8 - 8	-	1 of 1
	Drawn SAG	Date JUN 2021	CAD File Name : NA		A3

Note: Source of basemap - Google Earth Map

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8.4.2.3.1 Stabilized Groundwater Level

Well gauging at MW1 was conducted between 19 March 2013 and 12 April 2013 while well gauging at MW2 was conducted between 10 January and 6 February 2017. The groundwater levels for the two water standpipes were measured 24 and 27 days, respectively. Based on the gauging record, the average stabilized groundwater level (SWL) ranged between 102.78 m RL and 111.25 m RL (i.e. 0.86 m bgs and 1.87 m bgs). The SWL from the two (2) gauging sessions are presented in Table 8-11.

Table 8-11 Groundwater elevation data

Monitoring Well ID	Groundwater Elevation (m RL)								
	0 days	3 days	7 days	10 days	14 days	17 days	21 days	24 days	Average
MW1	102.964	102.884	102.804	102.764	102.734	102.704	102.684	102.664	102.78
Monitoring Well ID	**Groundwater Elevation (m RL)**								
	0 days	3 days	7 days	10 days	14 days	17 days	21 days	27 days	Average
MW2	110.74	110.78	110.86	110.94	111.37	111.80	111.78	111.76	111.25

The stabilized groundwater level trends of MW1 and MW2 is also graphically presented in Figure 8-9 below.

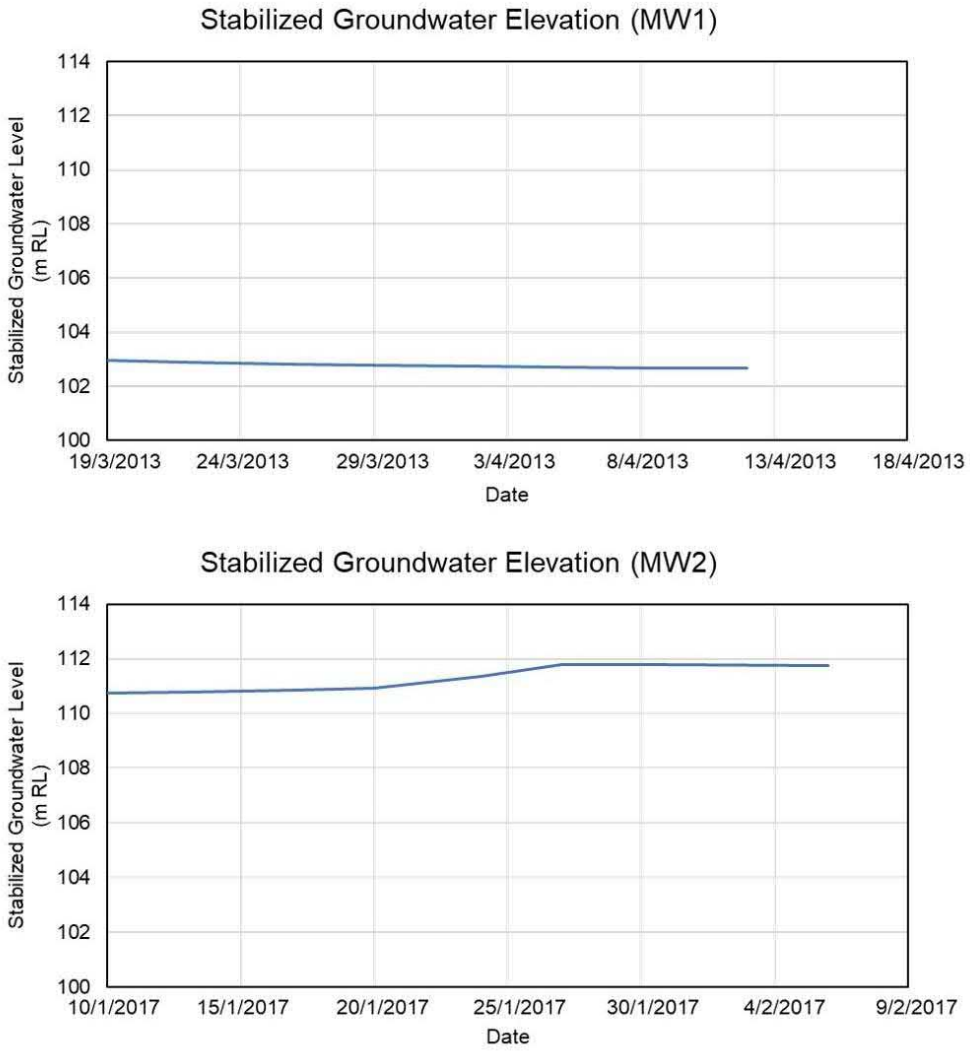


Figure 8-9 Groundwater elevation data obtained from previous SI reports

Based on the topographic gradient and proximity of the nearest surface water body, shallow groundwater likely flows towards the Jurong Canal.

8.5 Identification of Hydrology, Groundwater Level and Surface Water Quality Sensitive Receptors

Receptor screening for surface water was conducted within Study Area and its surroundings for both construction and operational phases. Based on site observations and information provided by the Client, due to the planned changes in watercourses of Study Area (e.g. diversion, construction of new watercourses such as Tengah Pond, etc.) sensitive receptors for surface water will be different for both construction and operational phases. The criteria detailed in Table 6-2 were used to determine the sensitivity of the surface water receptors presented in Table 8-12 and Table 8-13.

During construction phase, concrete canal D1, streams D2 and D5, drains D3, D4 and D7 and Jurong Canal were classified as Priority 1 sensitive receptors (Table 8-12 and Figure 8-10). Pond D6 was classified as the Priority 3 sensitive receptor. With regards to groundwater level, sensitive receptors were classified either as Priority 3 (i.e. groundwater within the Study Area, drain D2 and pond D6) or Priority 2 (i.e. natural stream D5).

During operational phase, based on the proposed developments (Figure 3-2) planned for the Study Area, concrete canal D1, streams D2 and D5, drains D3, D4 and D7 and pond D6 will most likely be removed. Based on the developed master plan, these several smaller watercourses and drains will be replaced by the Tengah Pond which is planned to be located along southern border of the Study Area (as shown in Figure 3-2) and will occupy large portion of the southern and central part of Study Area (Figure 3-2). As the water from Tengah Pond will drain into Jurong Canal and from there further to reservoir, and eventually be used for drinking purposes, both Tengah Pond (including other proposed future watercourses within Study Area) and Jurong Canal are classified as Priority 1 sensitive receptors (Table 8-13 and Figure 8-11).

Table 8-12 Classification of hydrology and surface water quality sensitive receptors identified within the Study Area for construction phase

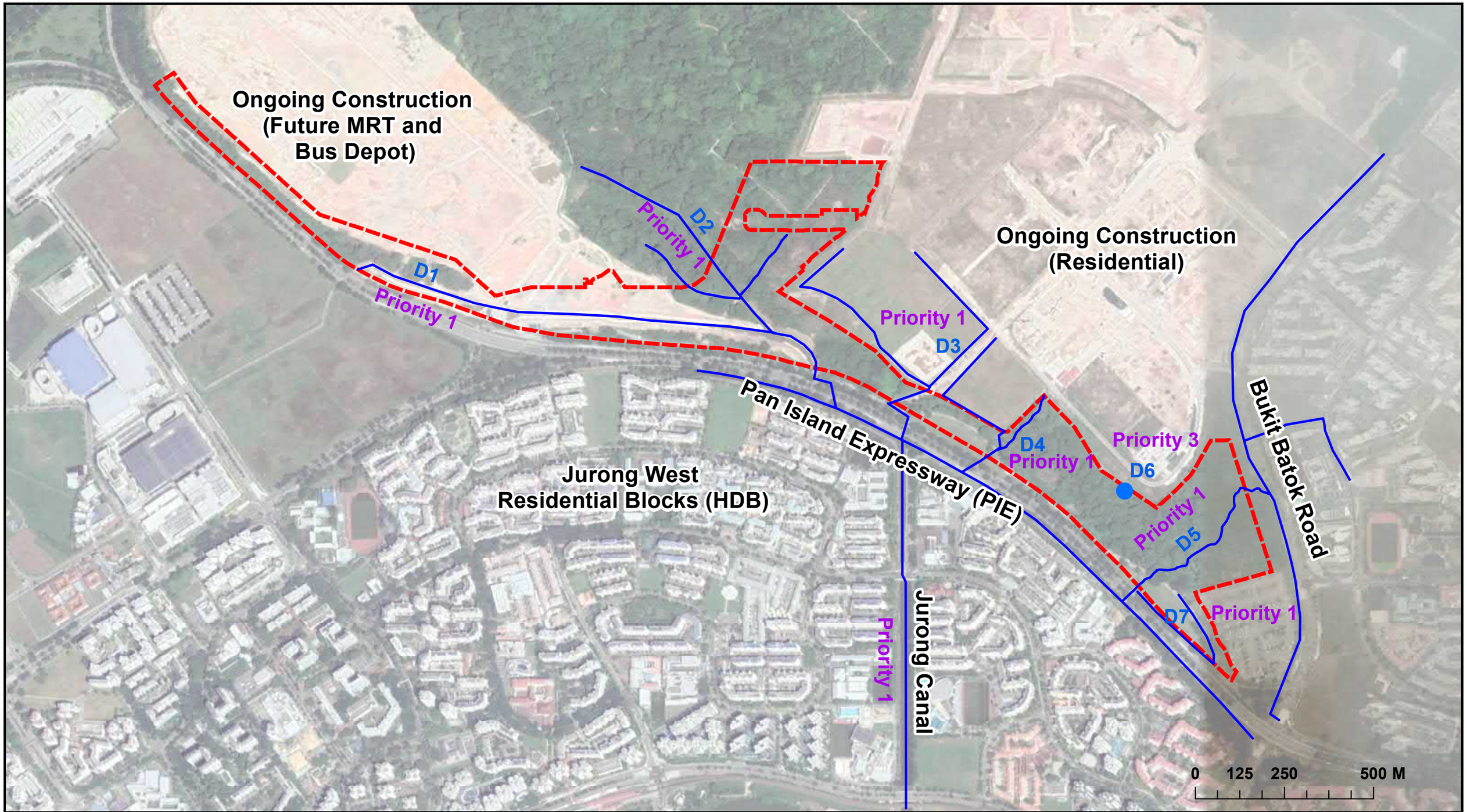
Sensitive Receptor	Description	Water Use	Sensitivity Classification
Concrete canal **D1** **(Figure 8-5)**	The concrete canal is a freshwater public canal receiving water from the Bulim Area at upstream and water flowing from earth stream D2. Observations from the site survey and the biodiversity survey findings did not include presence of aquatic life.	• No presence of aquatic life; • The surface water will eventually discharge to Jurong Lake (refer to Figure 4-4) and be used for drinking supply eventually • Canal can be considered as a flood mitigation measure for the land of low value (e.g. construction site outside of the Study Area).	Priority 1
Earth stream **D2** **(Figure 8-5)**	The earth stream is a freshwater stream that receives surface runoff from nearby construction worksite and forested areas to the north. It discharges to the concrete canal D1. It supports aquatic life of low conservation significance and low ecological linkage (refer to Section 7.3.3).	• It supports ecosystems of low conservation significance and low ecological value; • The surface water will eventually discharge to Jurong Lake (refer to Figure 4-4), and be used for drinking supply eventually; • Stream is not considered to be flood mitigation measure.	Priority 1

Sensitive Receptor	Description	Water Use	Sensitivity Classification
Concrete drain **D3** **(Figure 8-5)**	The concrete drain receives water from the nearby construction worksite. Observations from the site survey and the biodiversity survey findings did not include presence of aquatic life.	• No presence of aquatic life; • The surface water will eventually discharge to Jurong Lake (refer to Figure 4-4) and be used for drinking supply eventually; • It can be considered as a flood mitigation measure for the construction site to the north.	Priority 1
Drain **D4** **(Figure 8-5)**	The drain receives water from a natural stream within the forest area as well as discharge from the nearby construction worksite. Observations from the site walkover did not include presence of aquatic life. However, the natural stream located upstream of concrete drain, D4 support aquatic life of low conservation significance (refer to Section 7.3.3).	• The upper reaches of the drain which are naturalized support ecosystems of low conservation significance and are of low ecological linkage; • The surface water will eventually discharge to Jurong Lake (refer to Figure 4-4) and be used for drinking supply eventually; • It can be considered as a flood mitigation measure for the construction site to the north.	Priority 1
Natural stream **D5** **(Figure 8-5)**	The natural stream is a freshwater stream that receives majority of the flow from urban areas and nearby construction site outside of the Study Area. Biodiversity surveys showed the presence of the globally Vulnerable and nationally Endangered Asian softshell turtle (*Amyda carilaginea*) in the stream.	• The only natural stream in the Study Area, with the presence of fauna species of conservation significance; • The surface water eventually discharges to Jurong Lake (refer to Figure 4-4), and will be used for drinking purposes eventually; • It is not used as a flood mitigation measure.	Priority 1
Pond **D6** **(Figure 8-5)**	It is a freshwater pond located in the forested area. Aquatic life of low conservation significant was found within the pond (refer to Section 7.3.3).	• The surface water is not used for any purposes and not protected	Priority 3
Concrete drain **D7** **(Figure 8-5)**	The concrete drain is a freshwater public drain and collects water from eastern side of the Study Area. Observations from the site survey and biodiversity survey findings did not include presence of aquatic life due to its dry condition during dry days.	• No presence of aquatic life; • The surface water will eventually discharge to Jurong Lake (refer to Figure 4-4) and be used for drinking supply eventually; • It can be regarded as a flood mitigation measure	Priority 1

Sensitive Receptor	Description	Water Use	Sensitivity Classification
Jurong Canal and its downstream **(Figure 8-5)**	The existing concrete drain is a freshwater public drain and collects water from the Study Area.	• The surface water will eventually discharge to Jurong Lake (refer to Figure 4-4) and be used for drinking supply eventually.	Priority 1

Table 8-13 Classification of hydrology and surface water quality sensitive receptors identified for operational phase

Sensitive Receptor	Description	Water Use	Sensitivity Classification
Tengah Pond and surrounding watercourses **(Figure 3-2)**	The proposed retention pond is to collect the water from whole Jurong Catchment including Study Area.	• The surface water will eventually discharge to Jurong Lake (refer to Figure 4-4) and be used for drinking supply eventually; • The proposed Tengah pond is intended to be used as a flood mitigation measure	Priority 1
Jurong Canal Downstream **(Figure 3-2)**	The existing concrete drain is a freshwater public drain and collects water from the Study Area.	• The surface water will eventually discharge to Jurong Lake (refer to Figure 4-4) and be used for drinking supply eventually.	Priority 1



Legend

- Watercourses
- Southern Tengah Project Site

N

Rev.	Date	By	Description	Chk'd	App'd
-	JUN 2021	LAL	Draft Final Report	NHT	JAG

Qualified Person Endorsement : NA

HDB Endorsement : NA

Consultant : AECOM

Client: HOUSING & DEVELOPMENT BOARD

Project Title :

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SPECIALIST CONSULTANCY SERVICES FOR ENVIRONMENTAL IMPACT STUDY (EIS) ON SOUTHERN TENGAH

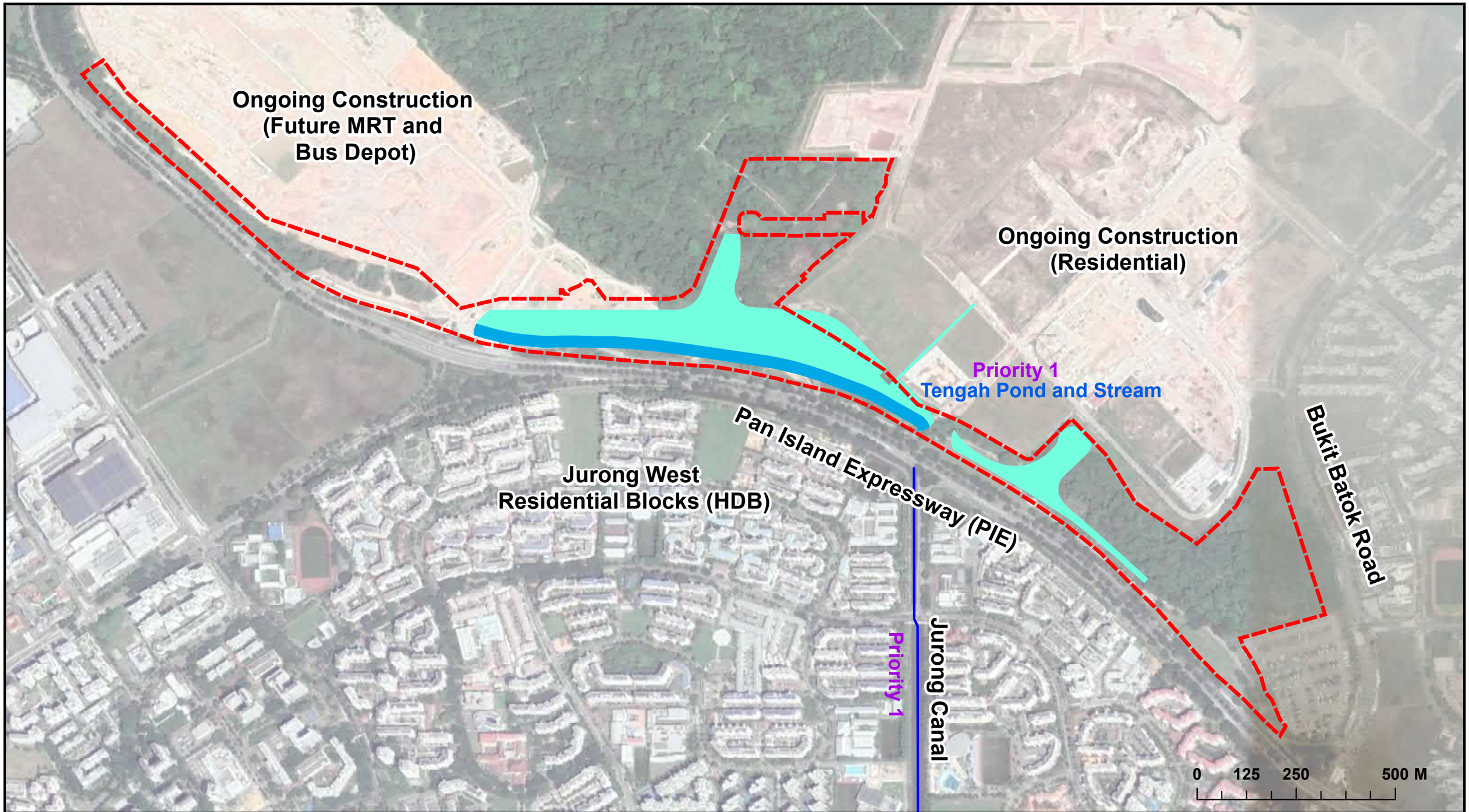
Figure Title :

Identified sensitive receptor in the vicinity of Study Area during construction phase

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	Drawn LAL	Date JUN 2021	CAD File Name : NA		A3

Note: Source of basemap - Google Earth Map

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Legend

- Southern Tengah Project Site
- Tengah Stream
- Tengah Pond
- Jurong Canal Downstream

N

Rev.	Date	By	Description	Chk'd	App'd
-	OCT 2021	LAL	Final Report	NHT	JAG

Qualified Person Endorsement : NA

HDB Endorsement : NA

Consultant : AECOM

Client: HOUSING & DEVELOPMENT BOARD

Project Title :

CONTRACT L/025/21
SPECIALIST CONSULTANCY SERVICES FOR ENVIRONMENTAL IMPACT STUDIES (EIS) AT SOUTHERN TENGAH

Figure Title :

Identified sensitive receptor in the vicinity of Study Area during operational phase

Designed	Checked	Approved	Figure No. :	Rev.	Sheet
LAL	NHT	JAG	8-11	-	1 of 1
	Drawn LAL	Date OCT 2021	CAD File Name : NA		A3

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It is understood that presently groundwater in Singapore is not directly extracted for beneficial use i.e. as a source of potable water, industrial water or irrigation purposes. Summary of sensitive receptors with regards to groundwater level is shown in Table 8-14 and Table 8-15.

Table 8-14 Classification of groundwater sensitive receptors identified within the Study Area for construction phase

Sensitive Receptor	Description	Receptor Sensitivity	Sensitivity Classification
Groundwater within the Project Site	Based on the gauging record, the average stabilized groundwater level (SWL) ranged between 102.78 m RL and 111.25 m RL (i.e. 0.86 m bgs and 1.87 m bgs)	The groundwater within the Project Site is not expected to be directly extracted for beneficial use (i.e. as a source of potable water, industrial water or for irrigational purposes)	Priority 3
Natural Stream D2	Supports scrubland and herbaceous vegetation of medium (Priority 2) ecological value.	Groundwater does not support the stream with biodiversity conservation significance.	Priority 3
Natural Stream D5	Presence of the globally Vulnerable and nationally Endangered Asian softshell turtle (*Amyda carilaginea*).	Groundwater partially supporting the stream with biodiversity conservation significance.	Priority 2
Pond D6	Together with natural stream D5 forms a forested, undeveloped area of the Project Site.	Groundwater partially supporting the waterbody without conservation significance.	Priority 3

Table 8-15 Classification of groundwater sensitive receptors identified within the Study Area for operational phase

Sensitive Receptor	Description	Receptor Sensitivity	Sensitivity Classification
Groundwater within the Project Site	Groundwater level after the development will be dependent on the various aspects such as percentage of impervious land, basement depths (if any), etc.	The groundwater within the Project Site is not expected to be directly extracted for beneficial use (i.e. as a source of potable water, industrial water or for irrigational purposes)	Priority 3
Tengah Pond and other proposed watercourses within the Project Site	Groundwater might be partly supporting the normal functioning of planned watercourses	It is not expected that the proposed future watercourses will support biodiversity of high conservation significance	Priority 2

8.6 Minimum Control Measures

This section proposes minimum controls, or standard practices, commonly implemented in Singapore for similar construction and operational activities, that have been assumed to be implemented for the purposes of impact assessment.

8.6.1 Construction Phase

Table 8-16 has a non-exhaustive list of minimum controls for each potential impact identified in Section 8.3.1 for construction phase.

Table 8-16 Minimum controls during the construction phase applicable to hydrology, groundwater level and surface water quality impact assessment

Potential Source of Impacts	Environmental Parameter Potentially Affected	Minimum Control
Solid & Toxic Waste Generation (During site clearing, earthworks and general construction activities)	Surface Water Quality	• Development of a Standard Operation Procedure (SOP) for safe handling, transfer, storage and disposal of solid waste; • Effective ECM and monitoring implemented as required in the Code of Practice on Surface Water Drainage to ensure that discharge into the stormwater drainage system does not contain TSS in concentrations greater than the prescribed limits under the Sewerage and Drainage (Surface Water Drainage) Regulations; • ECM measures include but are not limited to minimisation of formation of bare soil, coverage of all bare/erodible surfaces, slope stability, concrete cut-off drains, silt fences/traps along the perimeter cut-off drain, turbidity curtains for works adjacent to watercourses, etc.; • Implementation of CCTV including SIDS at the public drain to monitor the surface runoff discharges from the sites as per the Public Utilities Board of Singapore's (PUB) circular on Preventing Muddy Waters from the Construction Sites (October 2015); • Provision of enclosed bins and waste disposal facilities cleared up as often as necessary to prevent build-up. Housekeeping checks will be carried out once a day to ensure all litter is cleared from site; • All wastes will be disposed only in the designated waste disposal facilities and appropriately separated, i.e. by trained workers to properly sort and label the different types of waste (reusable and recyclable waste, toxic and non-toxic waste, wood waste etc.); and • Appropriate disposal of any waste listed in the Environmental Public Health (General Waste Collection) Regulations by licensed waste operator/collector.

Potential Source of Impacts	Environmental Parameter Potentially Affected	Minimum Control
Improper Management of Chemical Substances (Use, storage and disposal of chemical substances; refuelling activities)	Surface Water Quality	• Development of SOP for safe handling, transfer and storage of toxic waste; housekeeping checks once a day to ensure all toxic waste is cleared from site; • Appropriate tests to ascertain the presence/absence of contamination of the excavated earth and sand; • Appropriate storage area (enclosed on at least 3 sides, covered and with adequate ventilation); • Appropriate construction material for toxic waste storage containers with leak detection tests conducted periodically; • Provision of secondary containment for all toxic waste stored in bulk as per the requirements in the COPPC/SS593; • Preparation of an emergency response plan, training of the emergency response team (ERT) to be competent in the response mechanism and provision of response kits for any spillages; • Consignment notification/tracking system and transport emergency response plan for transport of toxic waste; and • Appropriate disposal of toxic waste as per required in the Environmental Public Health (Toxic Industrial Waste) Regulations by licensed waste operator/collector.
Liquid Effluent Generation and Stormwater Runoff Generation (Construction wastewater and stormwater runoff resulting from site clearance, excavation, etc.)	Surface Water Quality	• A full inventory of all anticipated wastewater streams and volumes should be finalised before the onset of the construction works; • No unmanaged discharge of wastewater stream permitted; • Reduce, reuse, and recycle hierarchy principle to be applied to wastewater onsite; • Regular audits on environmental management procedures shall be carried out onsite; • No hazardous liquids to be sent to the detention pond; • Hazardous wastewater, such as oily water, thinners, solvents, or paints, are to be stored and removed for treatment and disposal off-site by an approved Waste Management Contractor. Hazardous liquids to be handled as Hazardous Waste; • Settling ponds will be of impervious material and be designed with sufficient capacity to hold volumes of wastewater produced on-site, as well as allowance for stormwater runoff and potential fire-fighting wastewater; • Temporary storage volumes should be provided for overflow situations. Temporary storage to be of sufficient capacity to capture any additional volumes that may be expected to ensure untreated wastewater is not released to watercourses unless it complies with Singapore NEA Guidelines on trade effluent discharge concentrations; • A responsible person (e.g. ECO) to be assigned to oversee the efficient operation of the detention ponds where 'Good Housekeeping' practices would be adhered to. Also, the area would be carefully managed to avoid spills, leaks, and odour issues, with the settling ponds checked at least daily to ensure proper functionality; • Daily record volume of wastewater, as well as volumes of sludge and other produced wastes; • The settling ponds, as well as wastewater generating areas on-site, to be equipped with spill clean-up kits; • Adequate drainage, cut-off drains sump pit, road kerb, piping, toe wall and/or channelling of construction process

Potential Source of Impacts	Environmental Parameter Potentially Affected	Minimum Control
		wastewater streams (e.g. concrete batching, wash water, etc.) to be assured through detailed design for capture and treatment in the settling ponds. Where applicable (e.g. in the vicinity of liquid storage or refuelling areas), this infrastructure shall include oil-water separators to capture inadvertent spills or leaked oils or greases; • Implement a construction EMMP and ensure full preparation of associated plans and procedures including the following: – EMMP to include SOPs, an Emergency Response Plan (ERP), an inventory of wastewater streams, training of staff as well as an inspection, maintenance and audit schedule; and – Full development of EMMP Wastewater Management Procedures to include dedicated management and monitoring procedures that covers all eventualities related to the proper operation of the detention ponds, or any other wastewater discharge location/equipment. • Regular and dedicated procedures for the inspection and maintenance of wastewater collection, storage, and treatment infrastructure, such as pipes, oil water separators, silt screens, etc.; – Regular and dedicated procedures for the management of stormwater collection, settling, testing and eventual discharge of 'clean' water to watercourses. This should also include associated measures required (e.g. silt curtains) to prevent high sediment concentration stormwater drainage to watercourses; and – A training programme for all on-site workers, including sub-contractors, in relation to their obligations for ensuring proper water quality management. • ECM measures include but are not limited to minimisation of formation of bare soil, coverage of all bare/erodible surfaces, concrete cut-off drains, silt fences/traps along the perimeter cut-off drain, turbidity curtains for works adjacent to watercourses (canals, drains, streams), etc. • Adequate drainage, piping and/or channelling of stormwater runoff to be assured through detailed design for capture and treatment before discharge into surface watercourses • Regular and dedicated procedures for the inspection and maintenance of stormwater collection, storage, and treatment infrastructure, such as pipes, oil water separation, silt screens, etc.; and • Regular and dedicated procedures for the management of stormwater collection, settling, testing and eventual discharge of 'clean' water to surface waters. This should also include associated measures required to prevent high sediment concentration stormwater drainage to surface waters;
Storage and Disposal of Wastes – Domestic and Construction Wastes	Surface Water Quality	• Provision of portable toilets and on-site septic tank; • Regular cleaning of the portable toilets and clearing of sewage waste; • Appropriate location of toilet facilities away from any nearby watercourses; • Inspections and audits to ascertain the hygienic conditions onsite; • Training of workers on the best practices to contribute in environmental protection;

Potential Source of Impacts	Environmental Parameter Potentially Affected	Minimum Control
		• Appropriate disposal of any waste listed in the Environmental Public Health (General Waste Collection) Regulations by licensed waste operator/collector; • Implementation of on-site horticulture waste recycling programme to ensure the collection, storage and transport of felled trees and cleared vegetation to horticultural recycling facilities; • Surface Water Drainage, to be endorsed by a QECP and submitted to PUB; • Implementation of the ECM plan before the start of any construction work; • Effective ECM and monitoring implemented as recommended in the Code of Practice on Surface Water Drainage to ensure that discharge into stormwater drainage system does not contain TSS in concentrations greater than the prescribed limits under the Sewerage and Drainage (Surface Water Drainage) Regulations; • ECM measures include but are not limited to minimisation of formation of bare soil, coverage of all bare/erodible surfaces, concrete cut-off drains, silt fences/traps along the perimeter cut-off drain, turbidity curtains for works adjacent to water bodies (canals, drains, streams), etc. • Implementation of CCTV including a SIDS at the public drain to monitor the surface runoff discharges from the sites as per the PUB circular on Preventing Muddy Waters from the Construction Sites (October 2015); • Runoff within, upstream of, and adjacent to the work site shall be effectively drained away without causing flooding in the vicinity; • Manholes should always be adequately covered and temporarily sealed; • Protection of stockpiles with erosion blanket coverage and proper scheduling of the demolition and earthworks to reduce the quantity of stockpiles to be stored onsite; • Coverage of temporary/open storage of excavated materials; • All vehicles and plant should run via wheel washing process before leaving the site to ensure no earth, mud, debris, etc., is deposited on roads; and the wastewater hence generated should be stored and removed for treatment and disposal off-site by an approved Waste Management Contractor; and • Appropriate permits for discharge to be obtained from relevant authority prior to discharge. No trade effluent other than that of a nature or type approved by NEA Director-General shall be discharged into any watercourse or land.
Temporary Land Use Change	Hydrology and Groundwater Level (limited)	• Runoff within, upstream of, and adjacent to the work site shall be effectively drained away without causing flooding in the vicinity; • Potential increase of peak-flow due to the change in the land use at the worksite can be mitigated by providing detention tanks or ponds within the Study Area. Detention tanks or ponds can capture stormwater during heavy storm events to reduce the peak runoff; • Geotechnical aspect of site's slope stability (such as Earth Retaining and Stabilising structures (ERSS) to be included in detailed design engineering for the construction stage; and

Potential Source of Impacts	Environmental Parameter Potentially Affected	Minimum Control
		• The design engineers for detailed design may need to ensure that Earth Retaining Stabilisation structures (ERSS) are proposed when the site is cleared and excavated. Concurrently the ECO must ensure that these measures are implemented in the construction phase, as cutting of slopes may result in slope instability.
Dewatering of Soil (During excavation works and sub-soil construction activities)	Groundwater Level	• Install piezometers to monitor the changes in groundwater level in compliance with Building Control Regulations 2003 as part of its instrumentation and monitoring plan to be endorsed by Qualified Professionals (QP); • Proper Earth Retaining Stabilising Structures (ERSS) should be selected and designed to limit groundwater settlement; • Schedule the proposed development in phases in order to minimize the volume of dewatering at any one time; and • Use recharge wells as necessary during the excavation (if with basements) to limit the potential groundwater drawdown

8.6.2 Operational Phase

Table 8-17 has a non-exhaustive list of minimum controls for each potential impact identified in Section 8.3.2 for operational phase.

Table 8-17 Minimum controls during the operational phase applicable for hydrology, groundwater level and surface water quality impact assessment

Potential Source of Impact	Environmental Parameter Potentially Affected	Minimum Control
Stormwater runoff generation	Surface Water Quality	• Regular and dedicated procedures for the inspection and maintenance of stormwater collection, storage, and treatment infrastructure, such as pipes, oil water separation, silt screens, etc.; • Regular and dedicated procedures for the management of stormwater collection, settling, testing and eventual discharge of 'clean' water to surface waters. This should also include associated measures required to prevent high sediment concentration stormwater drainage to surface waters;
Permanent land use change (increase in areas with impervious surfaces)	Hydrology and Groundwater Level	• Potential increase of peak-flow due to the change in the land use at the new developments can be mitigated by providing detention tanks within the Study Area. Detention tanks can capture stormwater during heavy storm events to reduce the peak runoff. Stored water can then be discharged back to the system after the storm event. As required by PUB's Code of Practice for Surface Water Drainage, the storage system needs to be in place to reduce the peak flow at the operational phase to be the same or less than that of the existing condition; • Geotechnical aspect of site's slope stability (such as ERSS) to be included in detailed design engineering for the operational stage; • Providing more softscape area should be considered in the design of the development to reduce the runoff coefficient which will help to reduce the peak flow and reduce flood risk at downstream area; and • Provide more pervious areas to increase the seepage of surface water into the soil.

Potential Source of Impact	Environmental Parameter Potentially Affected	Minimum Control
Improper management of liquid and solid wastes	Surface Water Quality	• To prepare sufficient disposal bins surrounding of the Project to avoid improper disposal of waste; • To conduct regular inspection on wastes' storage system of the Project; • To monitor the proposed water features and its surroundings with CCTV surveillance regularly to ensure no contamination occurred; • To develop an emergency response plan and conduct adequate training; and • Raising awareness of various stakeholders with community/stakeholder engagement (e.g. signage boards, warning signs, etc.)

8.7 Prediction and Evaluation of Hydrology, Groundwater Level and Surface Water Quality Impacts

8.7.1 Construction Phase

As described in Sections 8.3, major sources of impacts on hydrology, groundwater level and surface water quality during construction phase are temporary land use changes, dewatering of soil, solid & toxic waste generation, liquid effluent generation, stormwater runoff contamination and improper management of chemical substances. Temporary land use change (due to construction activities) will mostly impact the existing hydrological and hydrogeological conditions (limited) of the site, while the rest of the impact sources will mostly have an impact on surface water quality. Section 8.5 has also identified the sensitive receptors in the vicinity of the Study Area. During construction phase, concrete canal D1, streams D2 and D5, drains D3, D4 and D7 and Jurong Canal were classified as Priority 1 sensitive receptors (Table 8-12 and Figure 8-10). Pond D6 was classified as the Priority 3 sensitive receptor. With regards to groundwater level, sensitive receptors were classified either as Priority 3 (i.e. groundwater within the Study Area, drain D2 and pond D6) or Priority 2 (i.e. natural stream D5).

Following sub-sections present the impact prediction and evaluation on hydrology, groundwater level and surface water quality during construction phase.

8.7.1.1 Hydrology

8.7.1.1.1 Temporary Land Use Change

Land use modification due to land clearing during construction phase may affect existing hydrological conditions of the Study Area. Due to the proposed construction activities which will include site clearance and excavations, the quantity of the vegetation on the ground will reduce, exposing bare soil. Such changes may increase stormwater surface runoff and reduce the time of runoff propagation over the land. Subsequently this could lead to rapid and significant increase of water levels in the existing channels (i.e. stream D2, drain D3, drain D4 and drain D7) and possible flooding of surrounding areas during the heavy storm events. Hence, catchment area and existing hydrological conditions could be affected significantly. It is assessed that the impact intensity on the watercourses would be **Medium** for stream D2, drain D3, drain D4 and drain D7. Since stream D2 and drains D3, D4 and D7 have been categorized as Priority 1 sensitive receptors, impact consequence would be **Medium** (refer to the Table 6-7). Likelihood for this source of impact is determined to be **Regular** and hence the impact significance will be **Moderate** (based on Impact Significance Matrix [Table 6-9]).

Since the existing concrete canal D1 is intended to serve as a temporary diversion during the construction phase, it is assumed that the above-mentioned changes in hydrological conditions were already taken into consideration when designing it. Hence, with the recommended minimum control measures (as described in Table 8-16) it is assessed that the impact intensity will be **Low**. Since the canal D1 is categorized as Priority 1 receptor, and based

on the Impact Consequence Matrix, impact intensity will be **Low**. As the occurrence likelihood is characterized as **Occasional** due to the existing land use would not change substantially, the impact significance will be **Minor**.

Since the land use changes will have a significant impact on pond D6 during construction phase, the impact intensity would be **High**. Pond D6 is categorized as the Priority 3 sensitive receptor, so the impact consequence would be **Low** based on Impact Consequence Matrix (Table 6-7). With the likelihood of flooding impact as **Regular**, the impact significance on pond D6 would be **Moderate** based on Impact Significance Matrix (Table 6-9).

The existing forested area at the eastern part of Study Area will experience significant potential changes such as dry weather flow alteration and stormwater peak flow increase due to the land clearing and excavation activities during construction phase. For natural stream D5, the impact intensity of hydrology change due to construction activities would be **High** because the potential land use change might significantly impact on the high ecological habitat of stream D5. Stream D5 was classified as Priority 1 sensitive receptor, so **High** impact consequence would be expected based on Impact Consequence Matrix (Table 6-7). Even though the minimum controls such as proposed earth retaining stabilisation structures (ERSS) will be included in detailed design for construction phase, the impact significance would be **Major** for stream D5 with the potential impacts that are expected to occur in **Regular** likelihood.

The hydrological impacts to Jurong Canal and its downstream were investigated. With the provision of the detention ponds to capture stormwater to reduce stormwater peak flow within the Study Area during construction phase, the hydrological change impact consequence to Jurong Canal and its downstream would be **Very Low** based on Impact Consequence Matrix (Table 6-7). As the temporary land use change of the Study Area would insignificantly affect the Jurong Canal and its downstream, the occurrence likelihood was considered to be **Occasional** throughout the construction period, the impact significance for Jurong Canal and its downstream would be **Minor**.

Since the downstream culverts will be remained during construction phase (no land use modification on the downstream culverts at the time of construction) and the detention tanks will be installed to reduce peak flow of runoff prior discharging to its downstream, it is expected that there will be no indirect hydrology impact to the downstream culverts.

8.7.1.2 Groundwater Level

8.7.1.2.1 Pre-construction and Construction Activities that Include Soil Dewatering

The watercourses identified within the Study Area receive water from upstream surface runoff and rainfall, and potentially a baseflow contribution from groundwater. The pre-construction activities such as site clearance, excavation and levelling and main construction activities of proposed developments which include deep excavations and dewatering processes, could lead to potential impact on baseline groundwater level conditions. Based on the catchment analysis and hydrological surveys of natural watercourses within the Study Area, it seems that natural watercourses receive considerable large amount of flow from upstream areas.

Based on the footprint of the future HDB development, streams D2 and D5 and pond D6 will be converted into roads and HDB high-rise development which can have deep excavations for the foundation and with the large upstream catchment. After the implementation of minimum control measures (e.g. installing piezometers for continuous monitoring of groundwater levels, use of recharge wells to limit the potential groundwater drawdown, etc.) impact intensity is considered to be **Low** and impact consequence is assessed to be **Very Low** (for Priority 3 sensitive receptors [i.e. groundwater within the Study Area that will not be used for any beneficial purpose, stream D2 and pond D6 which do not support species of conservation significance]) to **Low** (for Priority 2 sensitive receptors [i.e. natural stream D5 which is a habitat for species of conservation significance and is partly fed by the groundwater]). The occurrence of groundwater drawdown is expected to be only temporary and that it will recover to original or near-original condition after the works (i.e. **Occasional**). Therefore, the impact significance of the impact on groundwater level to the identified sensitive receptors is **Minor**.

8.7.1.3 Surface Water Quality

8.7.1.3.1 Solid & Toxic Waste Generation

Activities that are planned for the construction phase of the Project (as described in the Section 3.3) could result in generation of various solid and toxic wastes which could have significant adverse effects on the water quality of the identified watercourses and drains. However, quantity of the waste stored on the site (e.g. chemical waste, construction debris, wood waste etc.) is expected to be limited and it would be periodically removed by the licensed waste management contractors. It is expected that, after implementation of the minimum control measures, the

impact intensity on the water quality in canal D1, stream D2 and drains D3, D4 and D7 would be **Medium**. Since before mentioned receptors are classified as Priority 1 sensitive receptors, impact consequence will be **Medium.** Given the **Regular** likelihood of accidental spills and leaks during the construction activities, impact significance is assessed to be **Moderate**.

Natural stream D5 is located in the eastern, forested portion of the Study Area and it supports one species of high ecological significance (refer to Table 7-1). Any spill or leakage of solid and toxic wastes generated from the construction site would cause **High** impact intensity on the natural stream D5. Based on Impact Consequence Matrix (Table 6-7), the impact consequence would be **High**, given that stream D5 classified as Priority 1 sensitive receptor. As the potential impact would likely to occur on regular basis during construction activities (i.e. **Regular** likelihood), the impact significance would be **Major**.

Pond D6 is also located in the eastern, forested portion of the Study Area and the wastes generated from construction site will pose certain contamination risk on the stagnant water of pond D6. Hence, the impact intensity for pond D6 would be **Medium.** Pond D6 has been characterized as a habitat of low ecological value (refer to the Section 7.3.3) and is not intended to be used for any beneficial purposes during the construction phase (i.e. Priority 3 sensitive receptor). Therefore, the impact consequence would be **Very Low**. As the potential sources of impact (e.g. leaks and spills) may occur on a regular basis during construction activities (i.e. **Regular** likelihood), the impact significance would be **Minor**.

With an effective ECM and water quality monitoring implemented as recommended in the Code of Practice on Surface Water Drainage, it is expected that there will be **Negligible** impact intensity on Jurong Canal and its downstream. Other minimum controls such as implementation of CCTV, including SIDS at public drain and canal to monitor the surface runoff discharges from the site will further lead to **Very Low** impact consequence to Jurong Canal and its downstream. The potential solid and toxic wastes contamination may occur in **Regular** likelihood throughout the construction period, therefore, the impact significance for Jurong Canal and its downstream would be **Minor**.

8.7.1.3.2 Improper Management of Chemical Substances

During maintenance of construction vehicles or mechanical equipment, the chemical substances such as fuel and lubricants may accidentally spill and leak to the surrounding streams or drains. Given the relatively small quantities of such potential spills and assumptions that the appropriate minimum control measures have been applied, impact intensity on the canal D1, stream D2, drains D3, D4 and D7 is considered to be **Medium**. As the improper usage, storage and disposal of chemical substances could happen throughout the construction period with a **Regular** likelihood, the impact significance for the canal D1, stream D2 and drains D3, D4 and D7 (all of which were categorized as Priority 1 sensitive receptors) assessed to be **Moderate**.

Natural stream D5, located in the eastern part of the Study Area provides a habitat for one species of high conservation significance (refer to Table 7-1). Hence, any spill or leakage of chemical substances on site could potentially cause **High** impact intensity on the natural stream D5. Based on Impact Consequence Matrix (Table 6-7), the impact consequence would be **High**, given that stream D5 classified as Priority 1 sensitive receptor. As the potential impact would likely to occur on regular basis during construction activities which in **Regular** likelihood, the impact significance would be **Major**.

Pond D6 is located in the eastern forest of the Study Area. If the chemicals are not properly managed on site, pond D6 might have contamination risk due to its stagnant water conditions of the pond (i.e. **Medium** impact intensity). Since the pond D6 has low ecological significance and is not intended to be used for any beneficial purposes (i.e. Priority 3 sensitive receptor), impact consequence on pond D6 would be **Very Low**. The likelihood of chemical spills occurrence could be regarded as **Regular** during the construction phase, the impact significance would be **Minor**.

Water quality impacts to Jurong Canal and its downstream has been assessed. With a detailed SOP for the management of chemical substance during the construction phase of the Project, impact intensity on the Canal and its downstream is expected to be **Negligible**. Since this sensitive receptor is classified as Priority 1 (i.e. it will eventually be used for drinking purposes) the impact consequence would be **Very Low**. Although improper management of chemical substances may occur **Regularly** throughout the construction period, impact significance on the Jurong Canal and its downstream would be only **Minor.**

8.7.1.3.3 Liquid Effluent and Stormwater Runoff Generation

During construction phase, the liquid effluents generated from the construction activities commonly include extracted groundwater, sanitary discharges, and stormwater runoff from exposed and unstable slopes. The

elevated suspended solids of liquid effluents will lead to increased turbidity and sedimentation rates. It could bring **Medium** impact intensity to the concrete canal D1, stream D2 and drains D3, D4 and D7, located within the Study Area. Since these watercourses and drains are categorized as Priority 1 sensitive receptors, impact consequence would be **Medium**. As the liquid effluent generated from the construction activities could happen throughout the construction period with a **Regular** likelihood, the impact significance for the watercourses (i.e. canal D1, stream D2, drain D3, drain D4 and drain D7) was assessed to be **Moderate**.

Pond D6 is located in the eastern portion of the Study Area. If the runoff from exposed soil surface, earthwork areas and soil stockpiles is not well managed during dry and wet weather conditions, pond D6 might be at contamination risk due to its stagnant water conditions. Impact intensity of such occurrence would be **Medium**. Since the pond D6 has low ecological value (i.e. does not support species of conservation significance) and is not intended for beneficial purposes (i.e. Priority 3 sensitive receptor), the impact consequence would be **Very Low**. With Regular likelihood of this source of impact, impact significance would be **Minor**.

Natural stream D5 is also located in the eastern forested portion of the Study Area and it has high ecological value as it is a habitat for one species of conservation significance (refer toTable 7-1). The runoff generated from excavated areas or land clearing will potentially increase the levels of suspended solids, nutrients, oils and greases, etc. which could negatively affect the current water quality conditions of the stream. Hence, the impact intensity would be **High**. Based on Impact Consequence Matrix (Table 6-7), the impact consequence would also be **High**, given that stream D5 is classified as Priority 1 sensitive receptor. With the possibility of liquid effluents **Regularly** impacting natural stream due to poor waste management practices, impact significance would be **Major**.

Water quality impacts on Jurong Canal and its downstream is expected to have **Negligible** impact intensity and **Very Low** consequence for this Priority 1 sensitive receptor (assuming that adequate drainage and piping of stormwater runoff will capture and effectively treat the runoff before it gets discharged). Although the potential contamination of surface water quality may occur in **Regular** likelihood from different construction activities, it was assessed to have **Minor** impact significance on Jurong Canal and its downstream.

8.7.1.3.4 Storage and Disposal of Domestic Liquid and Construction Solid Wastes

During construction phase, the domestic and construction wastes normally will be generated from construction activities. Surface water contamination may occur due to improper storage, handling, transfer and disposal of the wastes (e.g. chemical waste, construction debris, wood waste etc.). Given the assumptions that the appropriate minimum control measures have been applied, the impact intensity on the canal D1, stream D2, drains D3, D4 and D7 was considered to be **Medium**. As the improper discharge of domestic liquid wastes and improper management on construction solid wastes could happen throughout the construction period with a **Regular** likelihood, the impact significance for the canal D1, stream D2 and drains D3, D4 and D7 (all of which were categorized as Priority 1 sensitive receptors) is assessed to be **Moderate**.

Natural stream D5, located in the eastern part of the Study Area provides a habitat for one species of high conservation significance (refer toTable 7-1). Hence, any improper storage and disposal of liquid and solid wastes could potentially cause **High** impact intensity on the natural stream D5. Based on Impact Consequence Matrix (Table 6-7), the impact consequence would be **High**, given that stream D5 classified as Priority 1 sensitive receptor. As the potential impact would likely to occur on regular basis during construction activities which in **Regular** likelihood, the impact significance would be **Major**.

Pond D6 is located in the eastern forest of the Study Area. If there is inappropriate discharge of domestic liquid waste to the pond D6, it might have contamination risk due to its stagnant water conditions of the pond (i.e. **Medium** impact intensity). Since the pond D6 has low ecological significance and is not intended to be used for any beneficial purposes (i.e. Priority 3 sensitive receptor), impact consequence on pond D6 would be **Very Low**. The likelihood of chemical spills occurrence could be regarded as **Regular** during the construction phase, the impact significance would be **Minor**.

With the implementation of waste management practices during the construction phase of the Project, the impact intensity of improper storage and disposal of domestic liquid and construction solid wastes is expected to be **Negligible** on the Jurong Canal and its downstream. Since this sensitive receptor is classified as Priority 1 (i.e. eventually be used for drinking purposes) the impact consequence would be **Very Low**. Although improper discharge of domestic liquid wastes and improper management on construction solid wastes may occur **Regularly** throughout the construction period, impact significance on the Jurong Canal and its downstream would be only **Minor.**

Table 8-18 Summary of impact evaluation during construction phase

Potential Source of Impact	Sensitive Receptor and its Sensitivity[7]	Impact Intensity	Consequence	Likelihood	Significance
Temporary land use change (Hydrology)	Concrete Canal D1 (Priority 1)	Low	Low	Occasional	Minor
	Earth Stream (Priority 1)	Medium	Medium	Regular	Moderate
	Concrete Drain D3 (Priority 1)	Medium	Medium	Regular	Moderate
	Concrete Drain D4 (Priority 1)	Medium	Medium	Regular	Moderate
	Natural Stream D5 (Priority 1)	High	High	Regular	Major
	Pond D6 (Priority 3)	High	Low	Regular	Moderate
	Concrete Drain D7 (Priority 1)	Medium	Medium	Regular	Moderate
	Jurong Canal and its downstream (Priority 1)	Negligible	Very Low	Occasional	Minor
Pre-construction and construction activities that include soil dewatering (Groundwater Level)	Natural Stream D5 (Priority 2)	Medium	Medium	Occasional	Minor
	Stream D2, Pond D6, groundwater level of the Study Area (Priority 3)	Medium	Very Low	Occasional	Minor
Solid & Toxic Waste Generation (Surface Water Quality)	Concrete Canal D1 (Priority 1)	Medium	Medium	Regular	Moderate
	Earth Stream (Priority 1)	Medium	Medium	Regular	Moderate
	Concrete Drain D3 (Priority 1)	Medium	Medium	Regular	Moderate
	Concrete Drain D4 (Priority 1)	Medium	Medium	Regular	Moderate
	Natural Stream D5 (Priority 1)	High	High	Regular	Major
	Pond D6 (Priority 3)	Medium	Very Low	Regular	Minor
	Concrete Drain D7 (Priority 1)	Medium	Medium	Regular	Moderate
	Jurong Canal and its downstream (Priority 1)	Negligible	Very Low	Regular	Minor
Improper Management of Chemical Substances (Surface Water Quality)	Concrete Canal D1 (Priority 1)	Medium	Medium	Regular	Moderate
	Earth Stream (Priority 1)	Medium	Medium	Regular	Moderate
	Concrete Drain D3 (Priority 1)	Medium	Medium	Regular	Moderate
	Concrete Drain D4 (Priority 1)	Medium	Medium	Regular	Moderate
	Natural Stream D5 (Priority 1)	High	High	Regular	Major
	Pond D6 (Priority 3)	Medium	Very Low	Regular	Minor
	Concrete Drain D7 (Priority 1)	Medium	Medium	Regular	Moderate

[7] Receptor locations are shown in Figure 8-10.

Potential Source of Impact	Sensitive Receptor and its Sensitivity[7]	Impact Intensity	Consequence	Likelihood	Significance
	Jurong Canal and its downstream (Priority 1)	Negligible	Very Low	Regular	Minor
Liquid Effluent and Stormwater Runoff Generation (Surface Water Quality)	Concrete Canal D1 (Priority 1)	Medium	Medium	Regular	Moderate
	Earth Stream (Priority 1)	Medium	Medium	Regular	Moderate
	Concrete Drain D3 (Priority 1)	Medium	Medium	Regular	Moderate
	Concrete Drain D4 (Priority 1)	Medium	Medium	Regular	Moderate
	Natural Stream D5 (Priority 1)	High	High	Regular	Major
	Pond D6 (Priority 3)	Medium	Very Low	Regular	Minor
	Concrete Drain D7 (Priority 1)	Medium	Medium	Regular	Moderate
	Jurong Canal and its downstream (Priority 1)	Negligible	Very Low	Regular	Minor
Storage and Disposal of Domestic Liquid and Construction Solid Wastes (Surface Water Quality)	Concrete Canal D1 (Priority 1)	Medium	Medium	Regular	Moderate
	Earth Stream (Priority 1)	Medium	Medium	Regular	Moderate
	Concrete Drain D3 (Priority 1)	Medium	Medium	Regular	Moderate
	Concrete Drain D4 (Priority 1)	Medium	Medium	Regular	Moderate
	Natural Stream D5 (Priority 1)	High	High	Regular	Major
	Pond D6 (Priority 3)	Medium	Very Low	Regular	Minor
	Concrete Drain D7 (Priority 1)	Medium	Medium	Regular	Moderate
	Jurong Canal and its downstream (Priority 1)	Negligible	Very Low	Regular	Minor

8.7.2 Operational Phase

As described in Section 8.5, during operational phase, both Tengah Pond (including other proposed future watercourses within Study Area) and Jurong Canal are classified as Priority 1 sensitive receptors (Table 8-13 and Figure 8-11).

8.7.2.1 Hydrology

8.7.2.1.1 Altered Stormwater Runoff

Higher percentage of urbanized areas is known to have an impact on the surface water runoff, both in quantity and quality. Hence, it is expected that the proposed future land use which includes the residential developments (mostly in the eastern portion of the site) will have an impact on the hydrology during operational phase of the Project, especially during storm events. Increased runoff flow peak is expected in such events which could consequently lead to elevated water depths in drainage system and potentially cause flooding to the surrounding areas. In order to cater for these changes and avoid possible adverse impacts, the future drainage system of Tengah was developed to cater for the water originating from the Jurong catchment (refer to the Figure 8-12) as shared by PUB. One of the key features which was developed as part of this Master Plan was Tengah Pond (refer to Figure 8-13) which, besides its aesthetical value for the area also acts as a retention pond and as a flooding mitigation measure. It should be noted that based on the hydrological findings from Tengah Town Master Plan, Tengah Pond will be

able to control the stormwater peak flow discharged to downstream waterways. Furthermore, the design of Tengah Pond includes ABC Water Design Features (e.g. rain gardens, wetlands, etc.) (refer to Figure 8-14 and Figure 8-15) which additionally help retaining the excess surface runoff. This implies that the Tengah Pond might have a **Positive** impact to the hydrology of the Study Area, reducing the flood risk to the surrounding areas and stress to other watercourses.

Altered stormwater runoff due to the planned land use changes could also potentially affect the Jurong Canal and its downstream. However, as mentioned in the previous paragraph, introduction of Tengah Pond in Study Area, these impacts are most likely going to be significantly reduced. Tengah Pond will also have a positive impact on the Jurong Canal by retaining the excess peak runoff from its catchment and hence enhancing the flood resilience of Jurong Canal.

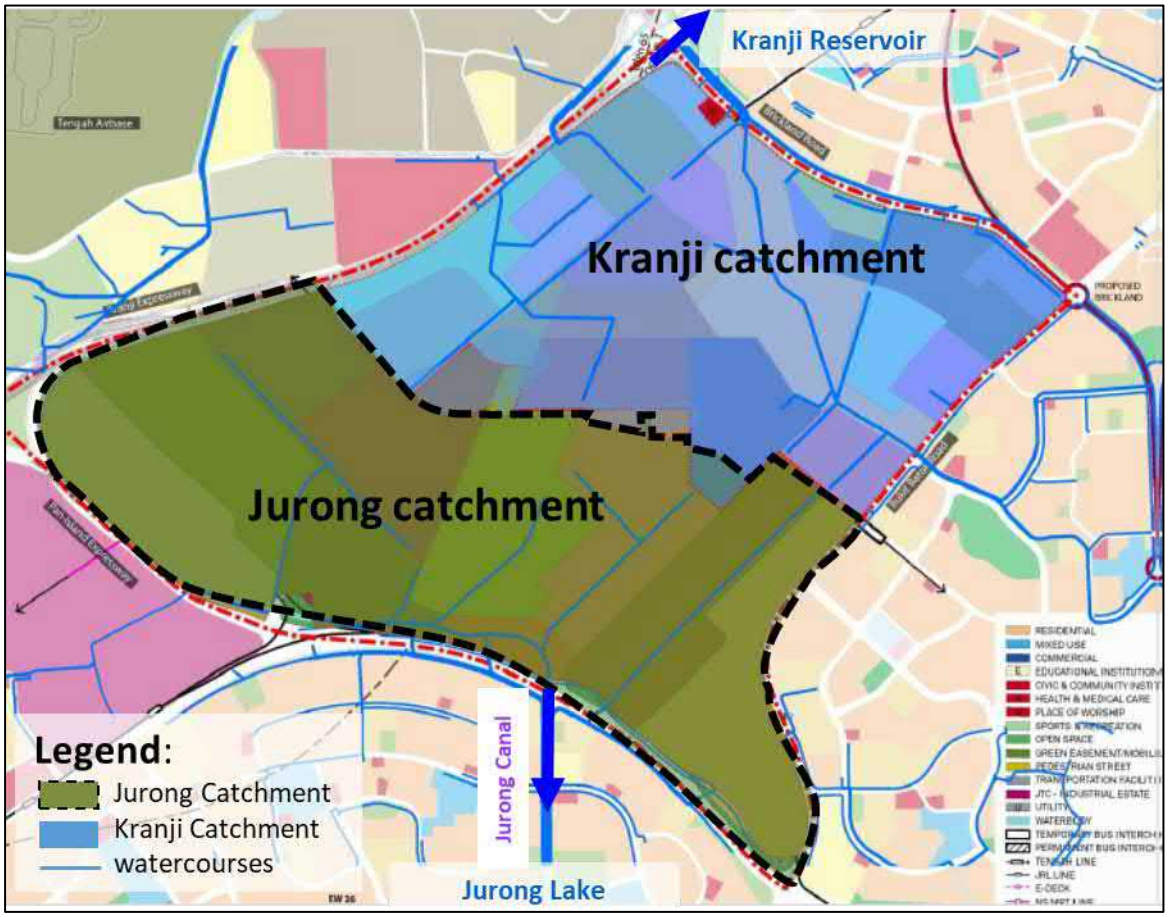


Figure 8-12 Proposed catchment plan (shared by PUB)

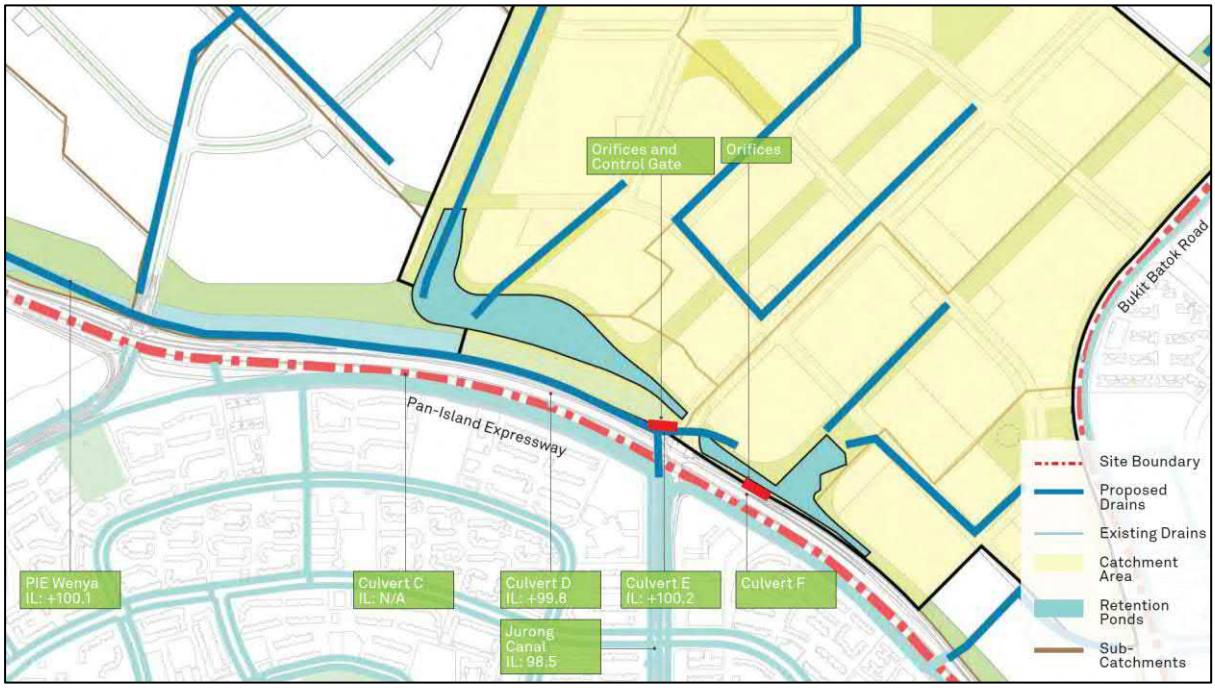


Figure 8-13 Proposed design of Tengah pond (retrieved from Tengah Town Master Plan [R-48])



Figure 8-14 A concept design of proposed rain garden and retention pond in Tengah Town (retrieved from Tengah Town Master Plan [R-48])

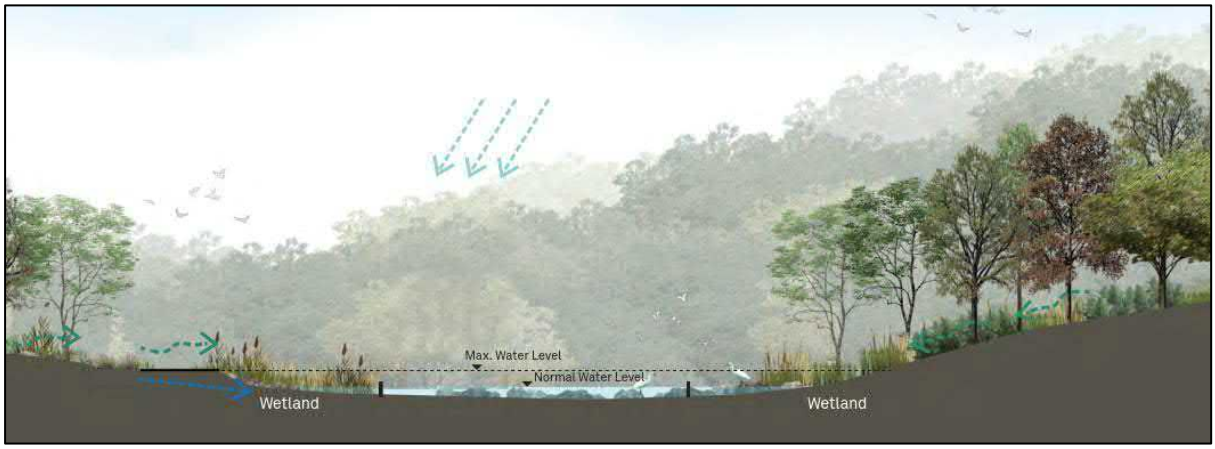


Figure 8-15 A concept design of proposed wetland in Tengah Town (retrieved from Tengah Town Master Plan [R-48])

8.7.2.2 Groundwater Level

8.7.2.2.1 Increase in Impervious Surfaces

The operational stage of the Project will mainly consist of human activities related to their occupancy of the future HDB development. As the future HDB development area will be replaced with impervious surfaces, especially in the eastern portion of the Study Area, reduced infiltration is expected. However, after the construction phase, groundwater level is expected to achieve a steady state and will equilibrate with the surrounding groundwater level. Hence, the likelihood of groundwater level decrease during operational phase is **Unlikely** and impact on groundwater level during operational phase is expected to be **Negligible**. It should be noted that Tengah Pond and other proposed watercourses within Study Area are most likely going to have **Positive** impact on groundwater levels of the Study Area (e.g. stabilize groundwater level).

8.7.2.3 Surface Water Quality

8.7.2.3.1 Stormwater Runoff Contamination

During operational phase, Tengah Pond will occupy large amount of surface water and such size of pond normally has baseflow supporting from the large catchment. With the minimum controls such as regular and dedicated procedures for stormwater management, wastewater and solid waste management practice will be implemented, the surface water at Tengah Pond and surroundings watercourses as well as Jurong Canal downstream might be protected from discharge from surrounding residential and industrial areas. The water quality impact intensity, therefore, on Tengah Pond and surrounding watercourses as well as Jurong Canal downstream would be **Medium**. Based on Impact Consequence Matrix (Table 6-7), the impact consequence would be **Medium**, given that the Tengah Pond and surrounding watercourses as well as Jurong Canal downstream were classified as Priority 1 sensitive receptor. Since the potential surface water quality contamination will be only happened during storm event and will be well mitigated by minimum control, the occurrence likelihood of potential impact would be **Rare**. Thus, the water quality impact significance on both Tengah Pond and Stream as well as Jurong Canal downstream would be **Minor**. With the proposed additional measures to improve the stormwater in the Project Site such introducing greener area, application of ABC Waters Design features around the Tengah Pond and at its sub-catchments (refer to the Figure 8-16), the water quality in the pond and at downstream (i.e. Jurong Canal) will be further filtered and enhanced. Therefore, overall surface water quality impact of the Project during the operation is considered as **Minor Negative** to **Positive** impact.

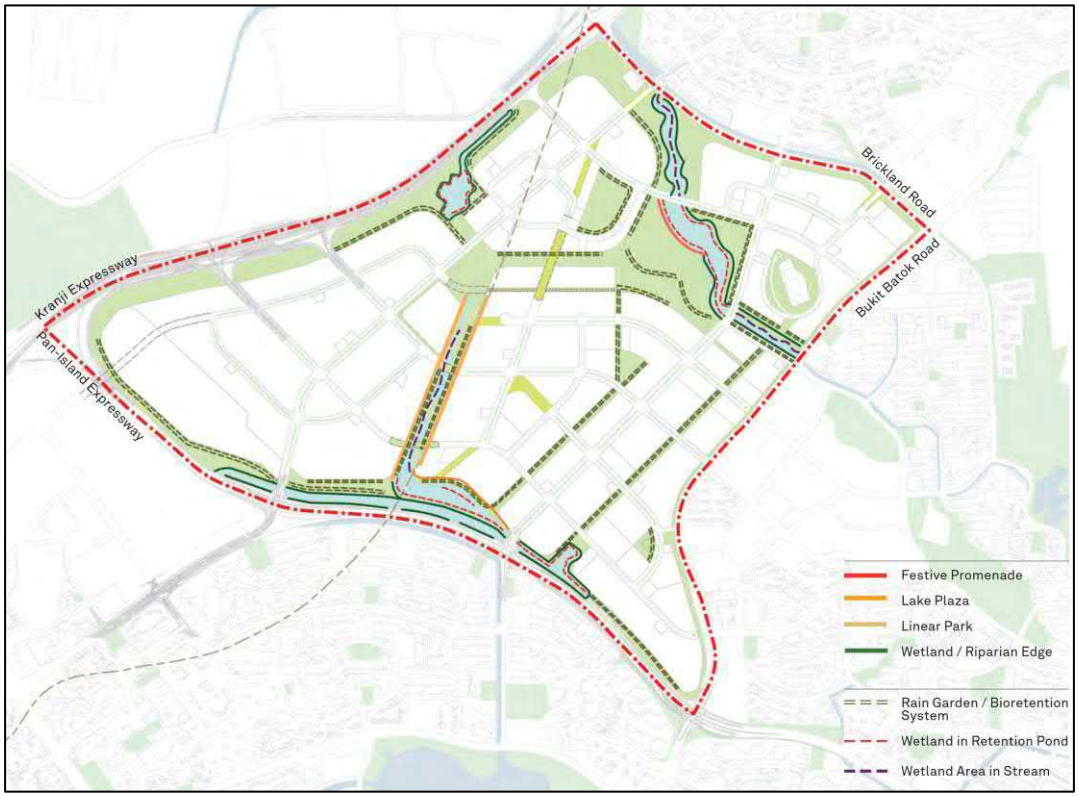


Figure 8-16 ABC Waters Design features plan (retrieved from Tengah Town Master Plan [R-48])



Figure 8-17 An example of rain garden in the USA (retrieved from Tengah Town Master Plan [R-48])



Figure 8-18 An example of wetland in China (retrieved from Tengah Town Master Plan [R-48])

8.7.2.3.2 Improper Management on Liquid and Solid Wastes

Tengah Pond will occupy large amount of surface water and such size of pond normally has low flow rate with almost stagnant water. The surface water at Tengah Pond and surroundings watercourses as well as Jurong Canal downstream might easily be contaminated due to inappropriate disposal and storage of liquid and solid wastes. The impact intensity on Tengah Pond and surrounding watercourses as well as Jurong Canal downstream would be **Medium**. Based on Impact Consequence Matrix (Table 6-7), the impact consequence would be **Medium**, given that the Tengah Pond and surrounding watercourses as well as Jurong Canal downstream were classified as Priority 1 sensitive receptor. With conducting regular inspections on wastes storage system in the Study Area and well-developed emergency response plan to tackle the accidental contamination issue, the occurrence likelihood of potential surface water quality contamination would be **Rare**. Thus, the impact significance on both Tengah Pond and Stream as well as Jurong Canal downstream would be **Minor**.

Table 8-19 Summary of impact evaluation during operational phase

Potential Source of Impact	Receptor Sensitivity[8]	Impact Intensity	Consequence	Likelihood	Significance
Altered Stormwater Runoff (Hydrology)	Priority 1 (Concrete Canal D1)	N/A			
	Priority 1 (Earth Stream D2)				
	Priority 1 (Concrete Drain D3)				
	Priority 1 (Concrete Drain D4)				
	Priority 1 (Natural Stream D5)				
	Priority 3 (Pond D6)				
	Priority 1 (Concrete Drain D7)				
	Priority 1 (Tengah Pond and surrounding watercourses)	Positive impacts were expected; thus the impact assessment matrix was not followed.			Positive
	Priority 1 (Jurong Canal Downstream)	Positive impacts were expected; thus the impact assessment matrix was not followed.			Positive

[8] Receptor locations are shown in Figure 8-11

Potential Source of Impact	Receptor Sensitivity8	Impact Intensity	Consequence	Likelihood	Significance
Stormwater Runoff Contamination (Surface Water Quality)	Priority 1 (Concrete Canal D1)	N/A			
	Priority 1 (Earth Stream D2)				
	Priority 1 (Concrete Drain D3)				
	Priority 1 (Concrete Drain D4)				
	Priority 1 (Natural Stream D5)				
	Priority 3 (Pond D6)				
	Priority 1 (Concrete Drain D7)				
	Priority 1 (Tengah Pond and surrounding watercourses)	Positive impacts were expected; thus the impact assessment matrix was not followed.			Positive
	Priority 1 (Jurong Canal Downstream)	Positive impacts were expected; thus the impact assessment matrix was not followed.			Positive
Improper Management on Liquid and Solid Wastes (Surface Water Quality)	Priority 1 (Concrete Canal D1)	N/A			
	Priority 1 (Earth Stream D2)				
	Priority 1 (Concrete Drain D3)				
	Priority 1 (Concrete Drain D4)				
	Priority 1 (Natural Stream D5)				
	Priority 3 (Pond D6)				
	Priority 1 (Concrete Drain D7)				
	Priority 1 (Tengah Pond and surrounding watercourses)	Medium	Medium	Rare	Minor
	Priority 1 (Jurong Canal Downstream)	Medium	Medium	Rare	Minor
Increase in Impervious Surfaces (Groundwater Level)	Priority 2 (Tengah Pond and other proposed watercourses within Study Area)	Low	Very Low	Unlikely	Negligible
	Priority 3 (Groundwater within the Study Area)	Low	Imperceptible	Unlikely	Negligible

Note:
1. N/A – Not Available as these sensitive receptors will not exist during operational phase.

8.8 Recommended Mitigation Measures

In this section, mitigation measures were proposed to further minimise the adverse impacts on the environment where impact significance were assessed to be Moderate or Major during construction phase. As the impact significance ranged from Negligible Negative to Positive impact during operation, no mitigation measures are proposed for operational phase.

8.8.1 Minimize

The construction activities of the Project were assessed to have Moderate to Major impact significances on the concrete canal D1, stream D2, drain D3, drain D4, pond D6, stream D5 and drain D7 although with implemented minimum controls. If there are any construction activities that may alter the alignment or may block drain/stream, appropriate measure such as diverting the drain/stream to avoid the blockage that may cause localize flooding should be carried out. The design of watercourse diversion should follow PUB's Code of Practice on Surface Water Drainage [R-16] to ensure the design watercourse can cater for sufficient flow capacity during construction phase. The water quality of the watercourses should also be monitored closely during diversion process especially Total Suspended Solids. By applying the recommendations, the hydrology and water quality impact on the watercourses will reduce to Minor during construction stage.

8.9 Residual Impacts

A residual impact assessment has been undertaken assuming the mitigation measures recommended in the previous section are implemented.

With the implementation of the recommended mitigation measures in conjunction with the identified minimum controls, the intensity of the hydrology, water quality and groundwater level residual impact on the watercourses can be reduced to **Very Low** during construction phase. Thereafter, the impact significance is hence reduced to **Minor**. Proposed Tengah Pond in the central area is expected to further stabilize groundwater level, while proposed additional green areas are expected to increase the water infiltration into the soil. Hence, after implementation of proposed mitigation measures, it is expected that the overall development will have a **Positive** impact on the hydrology and groundwater level.

Table 8-20 Summary of residual impacts and its mitigation measures during construction phase

Activity	Receptor Sensitivity	Impacts	Impact Significance (with minimum controls)	Mitigation Measures	Significance of Residual Impact (with mitigation measures)
• **Land clearing, earthworks and excavation activities;** • **Storage and disposal of solid, liquid and toxic wastes;** • **Use and storage of chemical substances, and refuelling activities; and** • **Land use changes due to construction works**	Priority 1 (Concrete Canal D1, Earth Stream D2, Concrete Drain D3, Concrete Drain D4, and Concrete Drain D7)	• Increased stormwater peak flow, increased water level and subsequent flooding of surrounding as the watercourses will be occupied by the construction worksite. • Contaminants from the worksite will direct deteriorate the water quality. • Reduction of baseflow due to land use change.	• Hydrology: Minor to Moderate • Water Quality: Moderate	• If there are any construction activities that may alter the alignment or may block drain/stream, appropriate measure such as diverting the drain/stream to avoid the blockage that may cause localize flooding should be carried out. • Ensure strict compliance with PUB Code of Practice (COP) on Surface Water Drainage during the design of roadside drains and diversion drains, as well as during the implementation Earth Control Measures, to ensure no flooding risk and no water quality impact during the construction.	• Hydrology: Minor • Water Quality: Minor
	Priority 1 (Natural Stream D5)	• Increased stormwater peak flow, increased water level and subsequent flooding of surrounding as the watercourses will be occupied by the construction worksite. • Contaminants from the worksite will directly deteriorate the water quality. • Aquatic habitat disturbance.	• Hydrology: Major • Water Quality: Major		• Hydrology: Minor • Water Quality: Minor

8.10 Cumulative Impacts from Other Major Concurrent Development

This section focuses on assessing cumulative impacts of the construction and operational activities from identified concurrent developments on the watercourses. It should be noted that as the details of construction and operational activities were not available at the time of writing this report, only qualitative cumulative impact assessment was carried out.

8.10.1 Construction Phase

It was assumed that all the concurrent developments would comply with the construction standards and hence their impact on hydrology, groundwater level and surface water quality for the watercourses was not expected to be significant.

8.10.2 Operational Phase

It was assumed that all the concurrent developments would comply with the operation standards and hence the hydrology, groundwater level and surface water quality impact for the watercourses was not expected to be significant and in fact, the overall impact can be considered as Positive as the proposed Project with its activities will help to reduce flooding risk and improve surface water quality for the site itself as well as surrounding sub-catchments.

8.11 Summary of Key Findings

While the hydrological baseline study aimed to identify watercourses existing in the Study Area including their location, water flow conditions and bank characteristics, their surface water quality was also surveyed in this Study.

Based on topographic survey data and hydrological survey findings, overall Study Area has undulating terrain, with decreasing elevations from Study Area boundaries toward the central of the Study Area. The Study Area generally has flat mild slope. Six (6) water catchment areas within the vicinity of the Project mainly contribute to five (5) perennial drains/ streams (i.e. D1 to D5), one pond (D6) and one dry roadside drain (D7). Within the Study Area, canal D1, originating from Bulim Area was running west to east. It is joined midstream by earth stream D2, which flows from northwest to southeast. Concrete drain D3 running from northeast to southwest receives discharge from nearby construction site, while earth stream D4 also running from northeast to southwest receives water from natural stream in forest area as well as discharge from nearby construction site. The natural stream D5 receiving water from urban drains outside of the Study Area flow through the forest area from northeast to southwest inside the Study Area. A stormwater drain D7 with ephemeral flow was identified in the east of the Study Area. An isolated pond D6 within the forested area receives runoff from the forested area and construction site in the north of the Study Area.

In terms of groundwater level, it ranged between 2.78 m Reduced Level (mRL) and 11.25 mRL, i.e. 0.86 meters below ground surface (m bgs) and 1.87 m bgs. from gauging records in previous study.

To capture the water quality of each watercourse contributed by different land use changes, concrete canal D1 and natural stream D5 were sampled both upstream and downstream, while the other smaller streams and drains (i.e. D2, D3, D4, D6 and D7) were only sampled at their downstream, making a total of nine (9) sampling locations in the Study Area. Water samples were tested for both physical and chemical parameters relevant for sustenance of aquatic life including temperature, pH, salinity, conductivity, TDS, DO, turbidity, TSS, TOC, TP, PO_4-P, TN, NO_3-N, NH_4-N, enterococcus, and Pb. Results were compared with both NEA discharge guidelines in Singapore and international criteria for aquatic life. Their in-situ water quality was good for aquatic life in terms of temperature, conductivity, salinity, TDS during dry and wet weather conditions. pH is within reasonable range for most watercourses during both dry and wet weather conditions, except for concrete drain D3, due to construction waste such as cement possibly increases pH. DO is above the criteria at most of the stations, except for earth stream D2 and pond D6, possibly due to dense vegetation and decomposition of organic matter from forest surrounding it. Among the watercourses, the upstream and downstream of concrete canal D1, earth stream (i.e. D2 and D4),concrete drain (i.e. D3) as well as upstream and downstream of stream D5 during dry and/or wet weather had either higher turbidity or TSS than the water quality criteria for aquatic life. This could be due to surface runoff from upstream construction sites which carried excess TSS at time of sampling of upstream and downstream of concrete canal D1, earth stream D2 and concrete drains (i.e. D3 and D4). But for upstream and downstream of stream D5, it could be sourced from either construction site or urban area. Same for TOC, excess TOC might also come along

with surface runoff from construction sites for upstream and downstream of concrete canal D1, earth stream (i.e. D2 and D4) and concrete drain (i.e. D3). The nutrients in terms of nitrogen and phosphorus showed possible eutrophication potential at all watercourses, with contamination sources possibly coming from urbanized and construction areas (e.g. fertilizer from tree plantation, food wastes, etc.), or surrounding dense forest (e.g. organic decomposition from dead plants). Elevated enterococcus counts were observed at upstream and downstream of concrete canal D1, earth stream (i.e. D2 and D4) and concrete drain (i.e. D3) as well as upstream and downstream of stream D5 due to runoff from nearby construction sites or forested area during wet weather. Pb indicate low organic content and low Pb pollution within the Study Area.

From the results of the hydrological and surface water quality assessment, it can be inferred that the watercourses such as upstream and downstream of concrete canal D1, earth stream (i.e. D2 and D4) and concrete drain (i.e. D3), upstream and downstream of stream D5 as well as pond D6 which were generally in perennial flow while the roadside drain D7 was flowing ephemerally across the Study Area. Among all the surveyed watercourses, surface water quality of those in the west and centre of the Study Area (i.e. canal D1, stream D2, drain D3 and stream D4) were heavily impacted by surrounding construction site in terms of TSS, nutrients and pH at the time of field surveys. The natural stream (D5) in the east of the Study Area was less impacted by the surrounding construction site with relatively better water quality. Although nutrients (i.e. nitrogen and phosphorus) in the natural stream (D5) were slightly higher than the aquatic life criteria, such condition is normal in natural watercourses of Singapore as a tropical country and suitable as stream habitats based on AECOM's previous project experience. This also aligned with biodiversity findings in Section 7, which showed the presence of important aquatic species such as odonates and reptiles in the natural stream (D5).

Based on the assessment of the hydrology, groundwater level and surface water quality related impacts on the various sensitive receptors, the findings have been summarised in Table 8-18 and Table 8-19. The hydrology and surface water quality changes were assessed to cause significant **Minor to Major** impacts on all the watercourses (i.e. D1 – D7) during construction and operational phases, with implemented minimum controls. If there is any construction activities that may alter the alignment or may block drain/stream, appropriate measure such as diverting the drain/stream to avoid the blockage that may cause localize flooding should be carried out. The design of watercourse diversion should follow PUB's Code of Practice on Surface Water Drainage to ensure the design watercourse can cater for sufficient flow capacity during construction phase. The water quality of the watercourses should also be monitored closely during diversion process especially Total Suspended Solids. By applying the recommendations, the hydrology and water quality impact on the watercourses will reduce to **Minor** during construction stage. The impact on groundwater level was expected to be **Minor** during construction phase.

During operation phase, the impact significance from the potential sources of contamination on the sensitive watercourse receptors (i.e. the proposed retention pond and upstream, downstream catchment) was assessed to be **Minor Negative to Positive** as the proposed retention pond with its associated well-design drainage system supported by ABC Waters Design features will help to reduce flooding risk and improve water quality condition within the site, surrounding sub-catchments and Jurong Canal downstream. The impact on groundwater level is **Negligible** during operational phase.

For the cumulative impacts from concurrent developments identified in the vicinity of the Project during both construction and operational phases, it was assumed that all the concurrent developments will comply with the construction and operation standards and hence their impact on hydrology, groundwater level and surface water quality for the watercourses was not expected to be significant.

Table 8-21 Summary of hydrology, groundwater level and water quality impact assessment

Potential Source of Impact	Impact Significance with Minimum Control	Key Mitigation Measures (if any)	Residual Impact Significance with Mitigation Measures (if required)
Construction Phase			
Land use change (Hydrology)	Minor to Major	• If there is any construction activities that may alter the alignment or may block drain/stream, appropriate measure such as diverting the drain/stream to avoid the blockage that may	Minor
Pre-construction and Construction Activities that can lead to groundwater drawdown (Groundwater Level)	Minor		Minor
Solid & Toxic Waste Generation (Surface Water Quality)	Minor to Major		Minor

Potential Source of Impact	Impact Significance with Minimum Control	Key Mitigation Measures (if any)	Residual Impact Significance with Mitigation Measures (if required)
Improper Management of Chemical Substances (Surface Water Quality)	Minor to Major	cause localize flooding should be carried out. • Ensure strict compliance with PUB COP on Surface Water Drainage during the design of roadside drains and diversion drains, as well as during the implementation Earth Control Measures, to ensure no flooding risk and no water quality impact during the construction.	Minor
Liquid Effluent and Stormwater Runoff Generation (Surface Water Quality)	Minor to Major		Minor
Storage and Disposal of Domestic Liquid and Construction Solid Wastes (Surface Water Quality)	Minor to Major		Minor
Operational Phase			
Altered Stormwater Runoff (Hydrology)	Positive	-	Positive
Increase in Impervious Surfaces (Groundwater Level)	Negligible		Negligible
Stormwater Runoff Contamination (Surface Water Quality)	Minor Negative to Positive		Minor Negative to Positive
Improper Management on Liquid and Solid Wastes (Surface Water Quality)	Minor		Minor

9 Air Quality

9.1 Introduction

This section presents the air quality impact assessment for the construction and operational phases of the project following the general EIS methodology described in Section 6. Air quality impact tends to impact sensitive receptors such as schools, medical institutions, residential area in the vicinity of the Project Site, therefore the Study Area for air quality is well beyond the Project Site and focused largely on the sensitive receptors defined as its Study Area (see Section 6.2.1). In line with the applicable legislation detailed in Section 5, the key steps for conducting the air quality impact assessment are as follows:

- Review existing baseline monitoring data (if any) and to conduct and evaluate existing air quality in the Study Area;
- Identify and classify sensitivity of the area around the construction worksite or project footprint;
- Understand the proposed activities during construction and operational phases;
- Conduct an impact assessment to qualitatively assess air quality impacts during construction and operation of the Project;
- Evaluate qualitative air quality impacts against nominated assessment criteria;
- Specify mitigation measures to be implemented;
- Determine the overall significance of the residual air quality impacts after implementation of mitigation measures; and
- Recommend a suitable monitoring and management plan.

9.2 Methodology and Assumptions

The sections below outline the methodology used in the air quality impact assessment for both construction and operational phases, including the determination of Study Area and baseline collection methodology.

9.2.1 Study Area and Screening of Air Sensitive Receptors

The Study Area for air quality impact assessment is recommended as 350m and 50m from the construction worksite areas for human and ecological receptors respectively during construction phase in accordance with UK IAQM guidance [R-30] and 250m around the project footprint for operational phase. During the scoping phase for this EIS, an initial screening of receptors in the Study Area was conducted as per Section 6.2.2 and detailed in Section 9.4, in order to determine the areas which are sensitive to potential construction impacts detailed in Section 9.3.

9.2.2 Baseline Air Quality Study

Baseline air quality monitoring includes primary data collection in the form of baseline ambient air quality monitoring in the Study Area. Of the criteria pollutants generally measured as part of ambient air monitoring, such as CO, NO_2, SO_2, PM_{10} and $PM_{2.5}$, this baseline monitoring only focuses on dust levels i.e. PM_{10} and $PM_{2.5}$, since these are the major pollutants that are likely to have the biggest impact on the ambient air quality as a result of the Project. The purpose of the baseline monitoring is to understand what the natural conditions of these air quality parameters are, so that in the event that a repeat monitoring event is to be conducted during the construction and/or operational phases of the Project, this monitoring data can be used as a reference of the existing baseline prior to any disturbance in the Study Area.

Air quality has both short-term and long-term targets which vary from a 1-hr target to an annual target. Owing to the timeframe of the Project, annual monitoring cannot be accommodated in this study; however, a short-term monitoring baseline will be established. With varying seasonal fluctuations, it is understandable that wind flow and direction will vary throughout the year, and hence short-term baselines shall also fluctuate. However, a correlation, be it direct or indicative between the site baseline and NEA's central area monitoring data, will be useful for future monitoring as it provides a reliable context for any future comparisons based on the relation between the two datasets. Hence, secondary data, such as NEA's long-term air quality data, hourly Pollution Standard Index (PSI),

and meteorological data observed in the vicinity of the Study Area have been collected from publicly available sources.

9.2.2.1 Secondary Data Collection (Review of Background Data)

Desktop research consists of a review of secondary data (including existing land use and development activities, satellite images, etc.) which aids in determining the baseline air monitoring location. The information retrieved during the desktop research comprised of publicly available data from government and technical agencies, existing available data, relevant articles, and other online sources.

9.2.2.1.1 NEA Long Term Ambient Air Quality

NEA carries out routine monitoring of ambient air quality through the Telemetric Air Quality Monitoring and Management System (TAQMMS). This system comprises 22 monitoring stations (refer to Figure 9-1) which are located around Singapore and linked into a Central Control System (CCS). The air quality monitoring stations are distributed amongst urban, industrial, suburban, coastal, and roadside locations. General NEA ambient air monitoring results for Singapore over the period 2015 – 2019 have been presented and compared with Singapore Long Term Ambient Air Quality Targets in Section 9.5.2.1.1. Air pollution control in Singapore is governed by legislation listed in Section 5.



Figure 9-1 NEA ambient air quality monitoring stations in Singapore [R-41]

9.2.2.1.2 Hourly Pollution Standards Index (PSI) and 24-hour PM10 and PM2.5 Concentrations

PSI (Pollutant Standards Index) is an index to provide accurate and easily understandable information about daily levels of air quality. The concentration levels of particulate matter (PM_{10}), fine particulate matter ($PM_{2.5}$), sulphur dioxide (SO_2), nitrogen dioxide (NO_2), ozone (O_3), and carbon monoxide (CO) monitored by air monitoring locations located in different parts of Singapore are used to determine the PSI. The PSI value gives an indication of the air quality as shown in Table 9-1. 24-hr $PM_{2.5}$ and PM_{10} PSI readings were available on data.gov.sg for the West Region of Singapore. These data were collected during the same period of primary data collection period and discussed in Section 9.5.2.1.2.

Table 9-1 General air quality descriptor based on PSI value [W-12]

PSI Value	Air Quality Descriptor
0 – 50	Good
51 – 100	Moderate

PSI Value	Air Quality Descriptor
101 -200	Unhealthy
201 – 300	Very unhealthy
Above 300	Hazardous

9.2.2.1.3 Other Parameters (Rainfall, Temperature, Wind Speed)

Rainfall, temperature, and wind speed can significantly affect the distribution of pollutants. Jurong (North) is the nearest monitoring station to the Study Area, located approximately 780m from the Project Site. However, this monitoring location only recorded rainfall data and has stopped operation since December 2018. Hence, only rainfall data up to December 2018 was presented for Jurong (North). Collection of rainfall, temperature and wind speed was conducted for the next nearest weather monitoring location, Jurong (West), located approximately 3.2km from the Project Site. The weather monitoring station recorded rainfall, temperature and wind speed data. These are discussed in Section 9.5.2.1.3.



Figure 9-2 NEA weather monitoring stations in Singapore [W-11]

9.2.2.2 Primary Data Collection (Survey & Sampling)

Air quality monitoring services were provided by Stats Asia Pacific Pte. Ltd. (Stats). A total of three (3) air monitoring locations were proposed (at the Inception stage), based on the following considerations:

- Identification of ASRs (hospitals, schools, childcare facilities, old age homes, residences, flora and habitats of high ecological value) nearest to the construction worksite areas / project footprint boundary;
- Other ASRs away from the construction worksite areas / project footprint were eliminated as these receptors are assumed to be barricaded by the first row of buildings;
- ASRs with areas having ongoing construction were avoided; and
- The closest ASR to the construction worksite areas / project footprint was selected.

Air quality monitoring was conducted at the monitoring locations for one week on 3 – 10 May 2021, to collect air quality samples for the following air quality parameters:

- Particulate matter smaller than 2.5µm, $PM_{2.5}$; and

- Particulate matter smaller than 10 µm, PM_{10}.

Air quality monitoring was conducted for 1 week within the Study Area in order to establish a baseline for existing air quality levels. Following the site survey conducted on 5 February, 2 March, and 29 April 2021, 3 (three) monitoring locations were identified to represent the site and were determined to represent the west, central and east side of the Study Area. This has been proposed and accepted in the inception report. The monitoring location was chosen so that the equipment was more than 1 metre from any buildings or structures, and not shaded by structures or trees. This is necessary to ensure adequate airflow. The indicative air quality monitor was installed at 1.8m from ground level in the breathing zone. Baseline air monitoring locations are provided in Table 9-2 and Figure 9-3.

TSI Environmental DustTrak Monitoring System was used for the purpose of PM_{10} and $PM_{2.5}$ monitoring. Concentrations of PM_{10} and $PM_{2.5}$ are measured by the light scattering laser photometer principle using an Environmental DustTrak Monitoring System coupled with a heated inlet for 5-minute interval data logging over a 7-day continuous sampling period. The photometer uses an ellipsoidal reflector and simple optical components to collect the laser-scattered light and to focus it onto a photodiode array. The mass and particle size are determined by detecting how the particles scatter light. For further details of the Air Quality Monitoring, please refer to Appendix U.

Table 9-2 Baseline air quality monitoring locations

S/N	Monitoring Location	Receptor Type	Justification	Photo of Monitoring Location
A01	Future Industrial Area	Industrial/ Residential (North west)	The ambient air quality in the Study Area is currently primarily dominated by traffic from PIE and Jurong West Avenue 2, emission from industrial facilities in the area and also from nearby construction sites. The monitored result is expected to represent the ambient air quality in the western side of the Study Area including the immediate neighbouring residential receptors such as HDB blocks along Jurong West street 42 as well.	
A02	Tengah Forest	Ecologically Sensitive Receptor (Central East)	The ambient air quality in the Study Area is currently primarily dominated by emission from nearby construction sites in the north (depot) and HDB (south, south east). The monitored result is expected to represent the ambient air quality within the Tengah Forest Identified ecologically sensitive area in the central side of the Tengah Town. It is to be noted due to multiple ongoing construction works within the Tengah Forest, the monitoring results in this location are expected to be influenced by dust emission from the neighbouring construction works.	
A03	HDB Blk 374 Jurong East Avenue 1	Residential (West and south west)	The ambient air quality in the Study Area is currently primarily dominated by traffic from PIE. The monitored result is expected to represent the ambient air quality in the eastern side of the Study Area.	



Legend

- Southern Tengah Study Area
- Baseline Air Quality Monitoring Location

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Figure Title :

Baseline Air Quality Monitoring Locations

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Figure No. : 9-3 | Rev. : A | Sheet : 1 of 1

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9.2.3 Prediction and Evaluation of Impact Assessment

The air quality impact assessment includes evaluation of air quality impacts from construction and operational activities.

9.2.3.1 Construction Phase

Air quality impacts are assessed using the methodology outlined in the document entitled “Guidance on the Assessment of Dust from Demolition and Construction” which was published by the UK IAQM in 2014 for impacts during construction phase. This methodology has been adapted to the general methodology outlined in this EIS.

9.2.3.1.1 Identification of Potential Sources of Air Quality Impacts

It is important to identify potential sources of air quality impact in the vicinity of the Study Area. While conducting the assessment, a typical construction machinery is assumed to be used during the construction equipment and activities. These have been detailed in Section 9.3.1.

9.2.3.1.2 Identification of Sensitive Receptors

Identification of Air Sensitive Receptors (ASRs) in the Study Area was subsequently undertaken. IAQM identifies an entire area around one continuous stretch of construction footprint as a category or sensitive receptor. It does not distinguish between each unit, household or block present in the area as a separate ASR but designates the whole area as same category of sensitivity based on an overall location, number, proximity and scale to the construction activity. This approach thereby adopts a conservative principle to air quality. A further discussion on Receptor Sensitivity is presented in Section 9.4.1.

Sensitive areas identified as Priority 1, Priority 2, and Priority 3 for air quality during the screening process have been examined in the Impact Assessment in this EIS in order to provide a more refined classification for Receptor Sensitivity. Sensitivity of the area has been determined based on the usage, number of receptors, distance from the construction footprint, and the current context of sensitive buildings in Singapore.

9.2.3.1.3 Understanding of Baseline Air Quality

Primary and secondary data were collected to understand the baseline air quality of the Study Area. NEA’s PSI data available from the nearest monitoring station was also reviewed for the Study Area. In addition, baseline air quality data was collected for representative location near the construction footprint. The baseline air quality review and data measured is discussed in Section 9.5.2.

9.2.3.1.4 Impact Intensity Definition

The impact intensity was determined by reviewing the scale of construction activities and classifying them as Low, Medium or High. The IAQM Guidance document provides example definitions for determining impact intensity for earthworks (based on construction footprint, heavy duty vehicles movement, formation of bunds, and material moved), for construction (based on total building volume, on-site concrete batching), for trackout (based on heavy duty vehicle outward movement, surface material, and unpaved road lengths), and for demolition (based on total demolition volume, construction material, on-site crushing of material, and height of demolition activity). The definition of parameters is defined in Table 6-6 in Section 6.4.2. It should be noted that in each case, not all criteria need to be met and that determination of magnitude is also based on the professional judgment of the air quality consultant. If the areas around the construction footprint are rated as High for one activity and Medium or Low for the other activities, the overall impact intensity result is classified as High for that site as those multiple activities may be occurring concurrently.

9.2.3.1.5 Classification of Overall Consequence

The dust impact assessment therefore evaluates the overall consequence prior to the implementation of mitigation. The work site has been assessed by considering both the impact intensity and the Receptor Sensitivity to obtain an overall consequence rating. Since the definition of impact intensity is different for each activity, the overall consequence for each activity is explained in matrices shown in Table 9-3 to Table 9-6. Each activity for the work site has been rated as being High, Medium, Low, or Imperceptible in terms of overall consequence based upon pre-mitigation measures.

Table 9-3 Overall consequence of the air impact analysis (Earthworks)

Receptor Sensitivity / Impact Intensity	Priority 3	Priority 2	Priority 1
Negligible	-	-	-
Low	Imperceptible	Low	Low
Medium	Low	Medium	Medium
High	Low	Medium	High

Table 9-4 Overall consequence of the air impact analysis (Construction)

Receptor Sensitivity / Impact Intensity	Priority 3	Priority 2	Priority 1
Negligible	-	-	-
Low	Imperceptible	Low	Low
Medium	Low	Medium	Medium
High	Low	Medium	High

Table 9-5 Overall consequence of the air impact analysis (Trackout)

Receptor Sensitivity / Impact Intensity	Priority 3	Priority 2	Priority 1
Negligible	-	-	-
Low	Imperceptible	Imperceptible	Low
Medium	Low	Low	Medium
High	Low	Medium	High

Table 9-6 Overall consequence of the air impact analysis (Demolition)

Receptor Sensitivity / Impact Intensity	Priority 3	Priority 2	Priority 1
Negligible	-	-	-
Low	Imperceptible	Low	Medium
Medium	Low	Medium	Medium
High	Medium	High	High

9.2.3.1.6 Establishing Impact Significance

Impact Significance is evaluated by considering both the overall Consequence and the Likelihood of occurrence of significant adverse impacts. The Likelihood of occurrence may be defined as remote, rare, occasional, regular, and continuous as per criteria listed in Table 6-8. Impact Significance has been evaluated in accordance with the matrix presented below in Table 9-7. The IAQM methodology does not differentiate between imperceptible and very low Consequences, due to the nature of air impacts as perceived by humans. In order to align the IAQM methodology with the methodology of this report, imperceptible and very low Consequences were consolidated.

Table 9-7 Impact significance matrix for air quality

Likelihood \ Consequence	Imperceptible / Very Low	Low	Medium	High
Remote	Negligible	Negligible	Negligible	Negligible
Rare	Negligible	Minor	Minor	Minor
Occasional	Minor	Minor	Moderate	Moderate
Regular	Minor	Moderate	Moderate	Major
Continuous	Minor	Moderate	Major	Major

9.2.3.1.7 Mitigation Measures Recommendations

Mitigation measures have been proposed for implementation when the Impact Significance is predicted to be Moderate or Major. Where mitigation measures are required, specific mitigation measures have been proposed based on the level of overall Consequence (High, Medium, and Low) as per the IAQM guidance. This is the most efficient way of prescribing dust mitigation measures so that high Consequence areas have the most comprehensive mitigation measures implemented whilst avoiding unnecessary implementation of complex mitigation measures in low Consequence areas.

9.2.3.1.8 Establishing Residual Impact Significance

Following implementation of mitigation measures prescribed in the EIS at the proposed construction footprint, the residual Impact Significance is evaluated using the matrix outlined in Table 9-7. Ideally, the mitigation measures required should be specified within the conditions given for planning permission and should be stipulated in construction contracts.

9.2.3.2 Operational Phase

This methodology below has been used to assess the air quality impact during operational phase of the Project.

9.2.3.2.1 Identification of Potential Sources of Air Quality Impacts

It is important to identify potential sources of air quality impact in the vicinity of the Study Area. While conducting the assessment, an increase in traffic volume in the vicinity of the Project during operational phase is assumed. These have been detailed in Section 9.3.2.

9.2.3.2.2 Identification of Sensitive Receptors

Identification of Air Sensitive Receptors (ASRs) in the Study Area within 250m around the Project Footprint was subsequently undertaken. A further discussion on Receptor Sensitivity is presented in Section 9.4.2.

Sensitive areas identified as Priority 1, Priority 2, and Priority 3 for air quality during the screening process have been examined in the Impact Assessment in this EIS in order to provide a more refined classification for Receptor Sensitivity. Sensitivity of the area has been determined based on the usage and the current context of sensitive buildings in Singapore.

9.2.3.2.3 Understanding of Baseline Air Quality

Primary and secondary data were collected to understand the baseline air quality of the Study Area. NEA's PSI data available from the nearest monitoring station was also reviewed for the Study Area. In addition, baseline air quality data was collected for representative location near the Project Footprint. The baseline air quality review and data measured is discussed in Section 9.5.2.

9.2.3.2.4 Impact Intensity Definition

The impact intensity was determined by reviewing the scale of increase in air quality levels due to traffic volume increase in the vicinity of the Project Footprint by comparing the baseline and predicted traffic volume. The impact intensity is then classified as Low, Medium or High.

9.2.3.2.5 Classification of Overall Consequence

The air quality impact assessment therefore evaluates the overall consequence prior to the implementation of mitigation. The work site has been assessed by considering both the impact intensity and the Receptor Sensitivity

to obtain an overall consequence rating. The overall consequence has been rated as being High, Medium, Low, or Imperceptible in terms of overall consequence based upon pre-mitigation measures.

9.2.3.2.6 Establishing Impact Significance

Impact Significance is evaluated by considering both the overall Consequence and the Likelihood of occurrence of significant adverse impacts. The Likelihood of occurrence may be defined as unlikely, rare, occasional, regular, and continuous as per criteria listed in Table 6-8. Impact Significance has been evaluated in accordance with the matrix presented in Table 9-7.

9.2.3.2.7 Mitigation Measures Recommendations

Mitigation measures have been proposed for implementation when the Impact Significance is predicted to be Moderate or Major.

9.2.3.2.8 Establishing Residual Impact Significance

Following implementation of mitigation measures prescribed in the EIS at the proposed Project Footprint, the residual Impact Significance is evaluated using the matrix outlined in Table 9-7. Ideally, the mitigation measures required should be specified within the conditions given for planning permission and should be stipulated in construction contracts.

9.3 Potential Sources of Air Quality Impact

Fugitive particulate emissions from construction and operational activities have the potential to result in adverse impacts on air quality and therefore, public and ecosystem health. Particulate emissions may also generate significant nuisance to receptors near the heavy use construction footprint.

9.3.1 Construction Phase

For human receptors, dust emissions could potentially result in adverse impacts on air quality and public health causing respiratory problems on human. For ecological receptors, dust generated during construction works can have adverse effects upon vegetation restricting photosynthesis, respiration and transpiration. Furthermore, it can lead to phytotoxic gaseous pollutants penetrating the plants. The overall effect can be a decline in plant productivity, which may then have indirect effects on the quality of the affected habitats and associated fauna. Table 9-8 listed potential sources of air quality impact during construction phase of the project.

Table 9-8 Potential air quality impacts during the construction stage

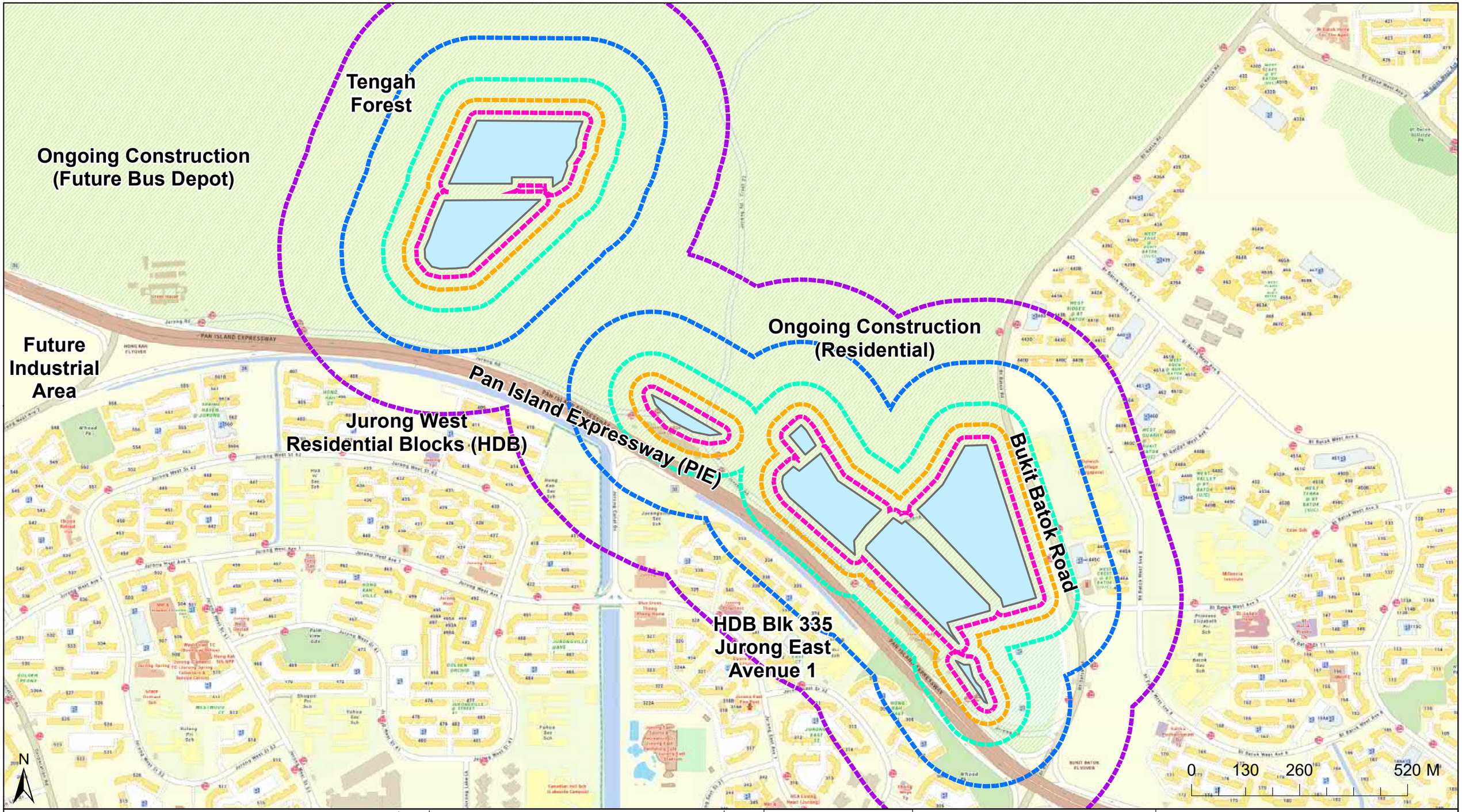
Potential Source of Impacts	Potential Associated Impacts
Dust emissions generated by earthworks processes, including land clearance (e.g. waste wood debris), soil-stripping, ground levelling, excavation, stockpiling of spoil and landscaping.	Dust emissions could potentially result in adverse impacts on air quality and public health and may also generate significant nuisance at receptors, including the biodiversity, located nearby heavy construction worksite areas.
Dust emissions generated by the construction of new structures, including holding areas, site offices and road widening works.	Dust emissions could potentially result in adverse impacts on air quality and public health and may also generate significant nuisance at receptors, including the biodiversity, located nearby heavy construction worksite areas.
Dust emissions generated from potential demolition works, if any.	Dust emissions could potentially result in adverse impacts on air quality and public health and may also generate significant nuisance at receptors, including the biodiversity, located nearby heavy construction worksite areas.
Dust emissions from transport of dust and dirt by dumper trucks for transporting spoil within the site and from the site onto public road network, where it may be deposited and resuspended by vehicles using the network.	Dust emissions could potentially result in adverse impacts on air quality and public health and may also generate significant nuisance at receptors nearby haulage routes.

Potential Source of Impacts	Potential Associated Impacts
Gaseous emissions from vehicle exhaust due to movement of construction vehicles and equipment, including spoil disposal	Exhaust emissions (NO_2, SO_2, CO, PM_{10} and $PM_{2.5}$) could potentially impact the air quality in the vicinity of construction worksites.
Gaseous emissions from off-road diesel engines on-site such as generators, if any	Exhaust emissions (NO_2, SO_2, CO, PM_{10} and $PM_{2.5}$) could potentially impact the air quality in the vicinity of construction worksites.

At this early stage, no detailed plan regarding the footprint and exact location of the proposed buildings is available, however land use plan is available. Therefore, the worst-case emission source for earthworks comprises the whole area planned for development, excluding roads, parks, canals and reserve site. This area has been referred as earthworks footprint for the purpose of air quality impact assessment (refer to Figure 9-4). The earthworks activity includes some extent of soil-cutting, excavation, piling and excavation works, while the construction activity includes the construction of the proposed buildings. Given the area of the earthworks footprint, it is assumed that the spoil amount will be greater than 100,000 tonnes based on at least 0.33m depth excavation works across the earthworks footprint.

The worst-case emission source for construction has been assumed to comprise the whole area planned for development, including roads, parks and canals construction. This area has been referred as construction footprint for the purpose of air quality impact assessment (refer to Figure 9-5). It is also assumed that no concrete batching plant to be located within the construction footprint. It is also assumed that there is no demolition of permanent structure activity as part of the project.

The trucks carrying spoil to and from the construction footprint on access roads are also considered as a potential source of emission (referred to as trackout activity) as shown in Figure 9-6. The number of outward trucks movement has been conservatively assumed to be >50 HDVs per day. The road construction works may not be completed and paved before the construction of other development commences. Hence, length of unpaved roads has been assumed to be >100m in the assessment. Impact prediction and evaluation were detailed in Section 9.7.



Legend

- Earthworks Footprint
- 20m from Source
- 50m from Source
- 100m from Source
- 200m from Source
- 350m from Source
- Ecologically Sensitive Receptors

Sensitive Receptors

- Public Housing
- Commercial Building
- Place of Worship
- Educational Institution
- Hospital / Polyclinic
- Government Institution
- Transport Infrastructure
- Utility
- Industrial Facility
- Unclassified Building (incl. Condominium and Landed Properties)

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Figure Title :

Emission Sources and Sensitive Receptors - Earthworks

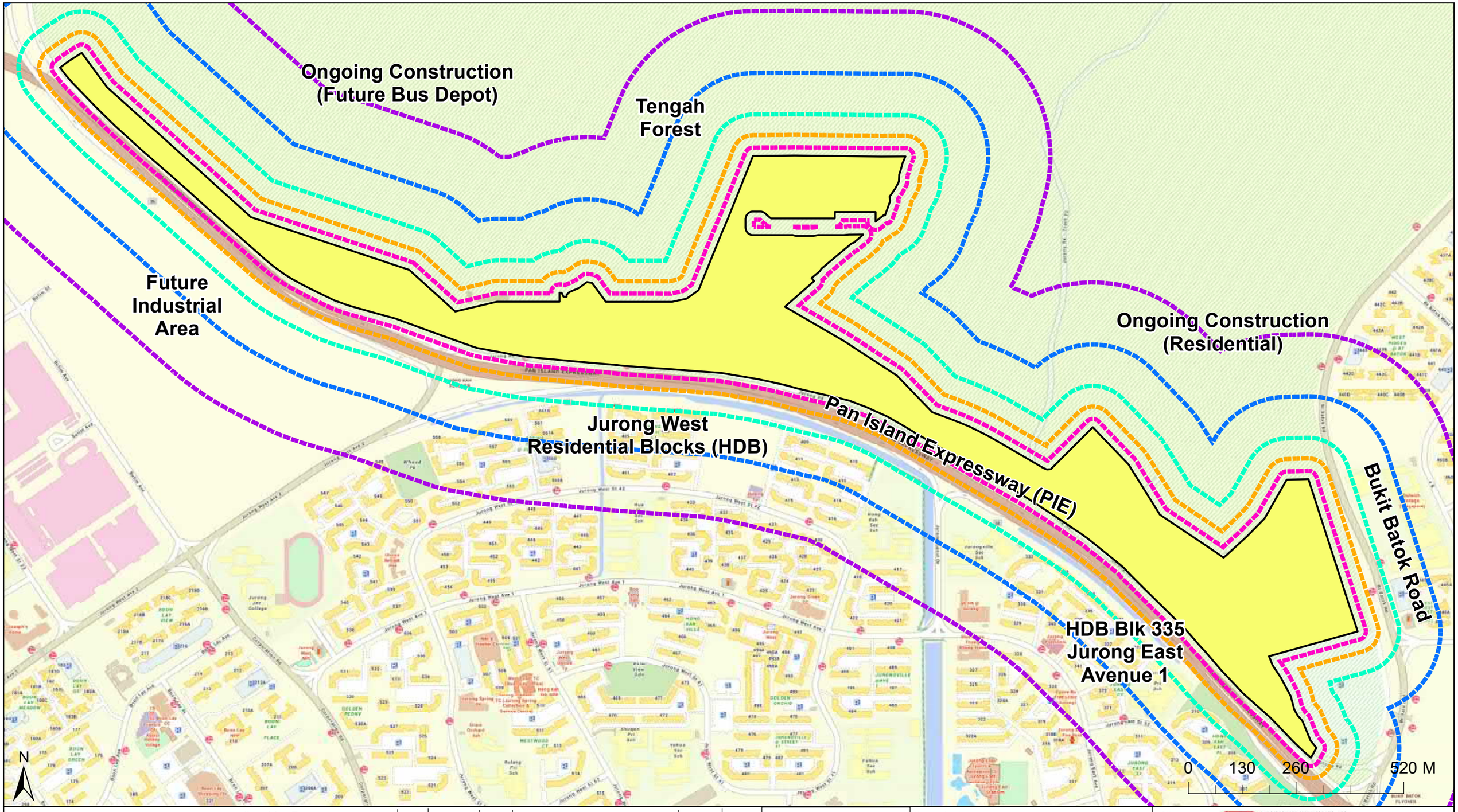
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Legend

- Construction Footprint
- 20m from Source
- 50m from Source
- 100m from Source
- 200m from Source
- 350m from Source
- Ecologically Sensitive Receptors

Sensitive Receptors

- Public Housing
- Commercial Building
- Place of Worship
- Educational Institution
- Hospital / Polyclinic
- Government Institution
- Transport Infrastructure
- Utility
- Industrial Facility
- Unclassified Building (incl. Condominium and Landed Properties)

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Figure Title :

Emission Sources and Sensitive Receptors - Construction

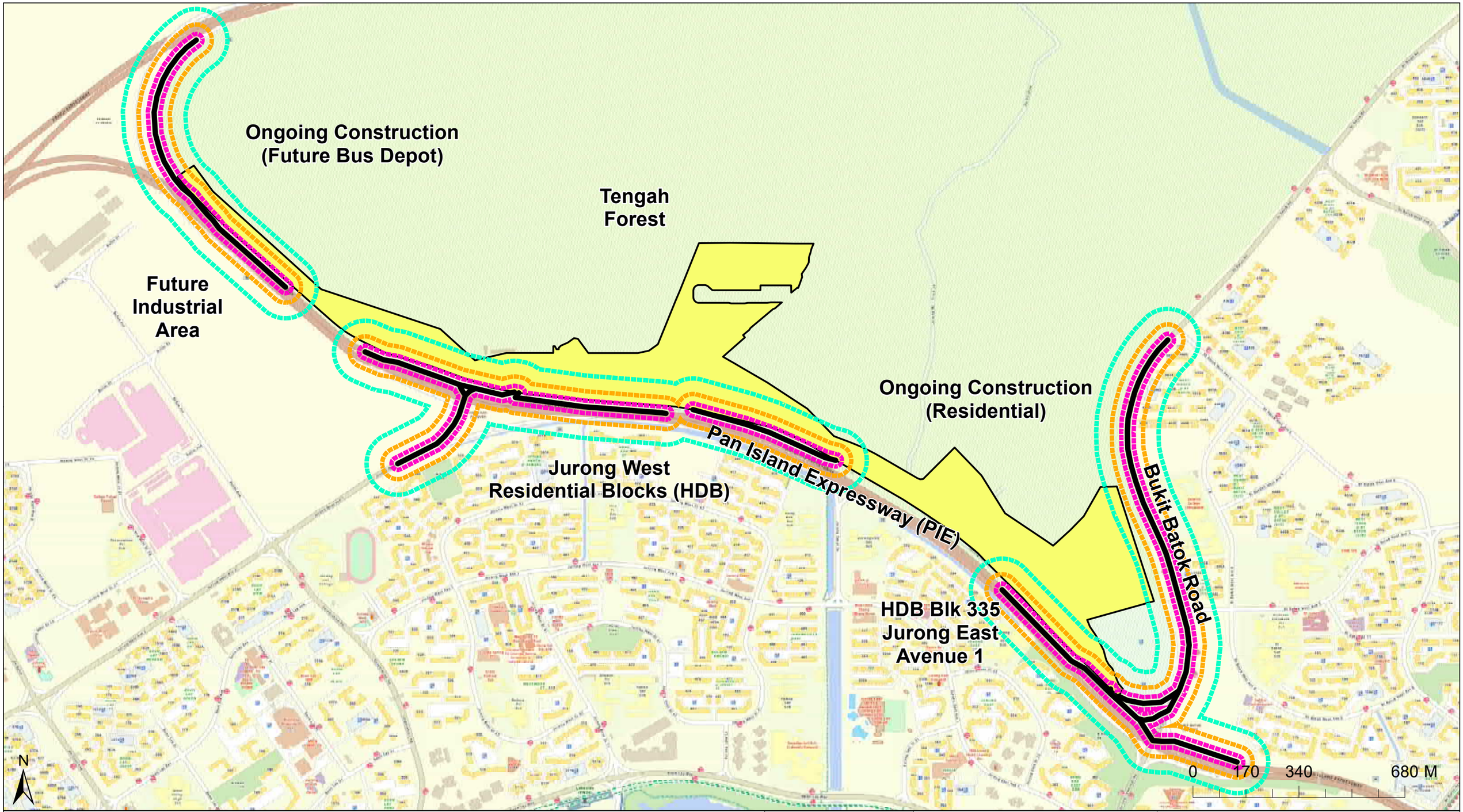
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Legend

- Potential Access Roads
- 20m from Source
- 50m from Source
- 100m from Source
- Construction Footprint
- Ecologically Sensitive Receptors

Sensitive Receptors

- Public Housing
- Commercial Building
- Place of Worship
- Educational Institution
- Hospital / Polyclinic
- Government Institution
- Transport Infrastructure
- Utility
- Industrial Facility
- Unclassified Building (incl. Condominium and Landed Properties)

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Figure Title :

Emission Sources and Sensitive Receptors - Trackout

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9.3.2 Operational Phase

As presented in Table 9-9, potential air quality impact during operational phase of the Project would be vehicular emissions due to increased traffic in the vicinity of the Project. For human receptors, gaseous and particulate emissions from the increased traffic could potentially result in adverse impacts on air quality and public health causing respiratory problems on human. For ecological receptors, the main air pollutants affecting vegetation and ecosystems are nitrogen oxides (NOx), sulphur dioxide (SO_2) and ammonia (NH_3) [R-42]. In the context of this project, the air pollutant of concern will be NOx which are produced from road traffic emission. SO_2 is not relevant for this project as low sulphur content fuel will be used. NH_3 is mainly produced from agricultural activities and therefore, not relevant for the purpose of this project. There is no published evidence for any direct toxic effect of NOx on animals and therefore effects on animals are not included in ecological impact assessment [R-42].

As per the NEA website, since 1 September 2017, all new petrol vehicles have had to meet the Euro 4 emission standard, and since 1 January 2018, all new diesel vehicles have had to meet the Euro 6 emission standard. The new standards will tighten fine particulate emissions from direct-injection petrol engines in addition to the other pollutants. Since 1 January 2018, the emission standard for all three-wheeled (Cat L5e) and large motorcycles with an engine capacity more than 200cc have been tightened to Euro 4 standard, while smaller motorcycles with an engine capacity of 200cc and below will see the Euro 4 emission standard implemented from 1 January 2020. Compared to the Euro 3 emission standard, the tighter Euro 4 emission standard will help reduce emissions of hydrocarbons and nitrogen oxides (NOx), which are precursors to ozone. The emission standards for various vehicle classes have been summarized in Table 9-10.

Table 9-9 Potential air quality impacts during the operational stage

Potential Source of Impacts	Potential Associated Impacts
Gaseous and particulate emissions from vehicle exhaust due to the increased traffic in vicinity of the project due to project operation.	Exhaust emissions (NO_2, SO_2, CO, PM_{10} and $PM_{2.5}$) could potentially impact the air quality in the vicinity of the project.

Table 9-10 Emission standard of various vehicle classes

No	Implementation Date	Vehicle Classes	Emission Standard
1	1 September 2017	New petrol vehicles	Euro 6
2	1 January 2018	New diesel vehicles	Euro 6
3	1 January 2018	Three-wheeled (Cat L5e) and large motorcycles with engine capacity more than 200cc	Euro 4
4	1 January 2020	Smaller motorcycles with engine capacity of 200cc and below	Euro 4

9.4 Identification of Air Sensitive Receptors

9.4.1 Construction Phase

Ecological Receptors

The construction activities at the construction worksite pose a potential risk of dust emissions that may impact upon target habitat areas lying within the zone of influence of the construction site. In line with the IAQM Guidance, a Study Area of 50 m was considered for ecological impacts during construction phase. Table 9-11 below summarizes the sensitivity of each construction phase for earthworks, construction, and trackout. Earthworks footprint, construction footprint and access roads are located within or in close proximity to ecologically sensitive receptors. Based on the distances of emission sources to the identified receptors presented in Figure 9-4 to Figure 9-6, the Sensitivity of the Area was determined to range from Priority 1. In line with the IAQM Guidance, Priority 1 refers to emission source located <20m to the nearest ecologically sensitive receptors.

Table 9-11 Receptor sensitivity for air quality impact assessment – construction phase (ecological receptor)

Distance	Identified Receptors	Sensitivity of the Area
For Earthworks:		
Within 20m	Tengah Forest	Priority 1
Between 20m to 50m	Tengah Forest	
For Construction:		
Within 20m	Tengah Forest	Priority 1
Between 20m to 50m	Tengah Forest	
For Trackout:		
Within 20m	Tengah Forest	Priority 1
Between 20m to 50m	Tengah Forest	

Human Receptors

Study Area of 350 m was considered for human health impacts during construction phase. Based on Table 6-2, in line with the IAQM Guidance, Priority 1 is defined as having sensitive receptors (i.e. residentials, hospitals, schools) within 20m of construction worksite or >100 sensitive receptors within 50m of construction worksite. While Priority 2 is defined as having commercial receptors within 20m of construction worksite, having 1-100 sensitive receptors between 20-50m of construction worksite or having >100 sensitive receptors between 50-100m of construction worksite. All other buildings within the 350m Study Area will be considered as Priority 3.

Therefore, based on the distances of emission sources to the identified receptors presented in Figure 9-4 to Figure 9-6, the Sensitivity of the Area for each construction worksite was determined to be ranging from Priority 1 to Priority 2 as summarized in Table 9-11 for earthworks, construction, and trackout. Due to the extensive list of the identified sensitive receptors for construction phase, this is elaborated and presented in Appendix V.

Table 9-12 Receptor sensitivity for air quality impact assessment – construction phase (human receptors)

Activities	Sensitivity of the Area
Earthworks	Priority 2
Construction	Priority 2
Trackout	Priority 1

9.4.2 Operational Phase

Potential air quality impact during operational phase of the Project would be vehicular emissions due to increased traffic to the proposed development. Potential human and ecological sensitive receptors which might be impacted by the increased traffic (within 250m assessment area) are presented in Table 9-13 below.

Table 9-13 Receptor sensitivity for air quality impact assessment – operational phase

No	Receptor Name	Receptor Type	Sensitivity Classification
1	Tengah Forest	Ecologically Sensitive Site	Priority 1
2	HDB Estate Spring Haven @ Jurong	Residential	Priority 1
3	HDB Estate Hong Kah Ct	Residential	Priority 1
4	HDB Blocks along Jurong West St 42	Residential	Priority 1
5	Hong Kah Secondary School	Educational Institution	Priority 1
6	Jurong Secondary School	Educational Institution	Priority 1
7	Jurong Polyclinic	Medical	Priority 1
8	HDB Blocks along Jurong East Avenue 1	Residential	Priority 1

No	Receptor Name	Receptor Type	Sensitivity Classification
9	Jurong Primary School	Educational Institution	Priority 1
10	HDB Estate Hong Kah East Pl	Residential	Priority 1
11	HDB Estate Jurong East 32	Residential	Priority 1
12	Thong Whye Temple	Place of Worship	Priority 3
13	HDB Estate West Crest @ Bt Batok	Residential	Priority 1
14	Shell Petrol Station Bt Batok West Ave 3	Commercial	Priority 3
15	Dulwich College (Singapore)	Educational Institution	Priority 1
16	HDB Estate West Ridges @ Bt Batok	Residential	Priority 1

9.5 Baseline Air Quality

9.5.1 Baseline Monitoring Personnel

The assessment and site surveys were conducted by the following personnel:

- Ms. Jagriti Dawra, AECOM (EIS Specialist)
- Mr. Hanzel Lalitan, AECOM (Air Quality Consultant)
- Mr. Lam Kah Min Lester, Stats Asia Pacific Pte Ltd
- Mr. Lim Tung Chen Jeffrey, Stats Asia Pacific Pte Ltd
- Mr Tan Boon Wei Ian, Stats Asia Pacific Pte Ltd

Site reconnaissance was conducted on 5 February, 2 March, and 29 April 2021. Subsequently, the primary baseline air quality data collection has been conducted on 3 – 10 May 2021.

9.5.2 Baseline Findings

9.5.2.1 Secondary Data Collection (Review of Background Data)

9.5.2.1.1 NEA Long Term Ambient Air Quality

Table 9-14 provides the general NEA ambient air monitoring results for Singapore over the period 2015 – 2019 and compares them with the Singapore Long Term Ambient Air Quality Targets. The Singapore Long Term Air Quality Targets have been adopted in this report and are generally more stringent than the USEPA National Ambient Air Quality Standards (NAAQS).

It can be observed from Table 9-14 that the NEA monitoring results for background particulate matter less than 10 µm (PM_{10}), particulate matter less than 2.5 µm ($PM_{2.5}$), and ozone (O_3) have consistently exceeded the Singapore Long Term Air Quality Targets over the period 2015 - 2019. Carbon monoxide (CO) and nitrogen dioxide (NO_2) were below the Singapore Ambient Air Quality Long Term Targets between 2015 and 2019. The elevated PM_{10}, and $PM_{2.5}$ concentrations in Singapore are partly attributable to the intermittent haze periods resulting from forest fires in neighbouring countries, although other significant contributors to the background levels may also be domestic emissions from industries, shipping and motor vehicles.

Table 9-14 NEA long term ambient air quality monitoring [R-43]

Pollutants	Averaging Period	2015 results (µg/m³)	2016 results (µg/m³)	2017 results (µg/m³)	2018 results (µg/m³)	2019 results (µg/m³)	Average results 2015 – 2019 (µg/m³)	Singapore Ambient Air Quality Long Term Targets (µg/m³)
PM_{10}	99th %ile of 24-Hour Averages	**186**	**61**	**57**	**59**	**90**	**58.0***	*50*

Pollutants	Averaging Period	2015 results (µg/m³)	2016 results (µg/m³)	2017 results (µg/m³)	2018 results (µg/m³)	2019 results (µg/m³)	Average results 2015 – 2019 (µg/m³)	Singapore Ambient Air Quality Long Term Targets (µg/m³)
$PM_{2.5}$	Annual Mean	**37**	**26**	**25**	**29**	**30**	**27.0***	*20*
	99th %ile of 24-Hour Averages	**145**	**40**	**34**	**32**	**62**	**33.0***	*25*
	Annual Mean	**24**	**15**	**14**	**15**	**16**	**14.5***	*10*
CO	Maximum 1-Hour Average	3,500	2,700	2,300	2,500	2,300	2,700	*30,000*
	Maximum 8-Hour Average	3,300	2,200	1,700	2,000	1,700	2,200	*10,000*
NO_2	Maximum 1-Hour Average	99	123	158	147	156	136.6	*200*
	Annual Mean	22	26	25	26	23	24.4	*40*
SO_2	24-Hour Average	**75**	**61**	**59**	**65**	**57**	**63.4**	*50*
	Annual Mean	12	13	12	9	8	10.8	*15*
O_3	8-Hour Average	**152**	**115**	**191**	**150**	**125**	**146.6**	*100*

Note: Values in Bold exceed the Singapore Ambient Air Quality Long Term Targets

* For PM_{10} and $PM_{2.5}$, the concentrations monitored in 2015, 2016 and 2019 were affected by transboundary smoke haze and thus, have been omitted in the average background calculations.

9.5.2.1.2 Hourly Pollution Standard Index (PSI) and 24-hour PM_{10} and $PM_{2.5}$ Concentrations Readings

According to NEA's website [W-14], PM_{10} and $PM_{2.5}$ data are subsumed into PSI. Hourly historical PSI, 24-hr PM_{10} and $PM_{2.5}$ readings available on data.gov.sg for West Region of Singapore were collected during the same period as primary data collection period for comparison against primary baseline monitoring results.

Figure 9-7 below shows the variation of hourly historical PSI readings in the West Region of Singapore during the primary data collection period, which was on 3 – 10 May 2021. The hourly PSI readings recorded over these days ranged from 25 to 58. The PSI readings during this period are considered Good to Moderate. It is to be noted that these PSI readings cover the entire West Region of Singapore, and hence might not have similar trend to what is monitored on site.

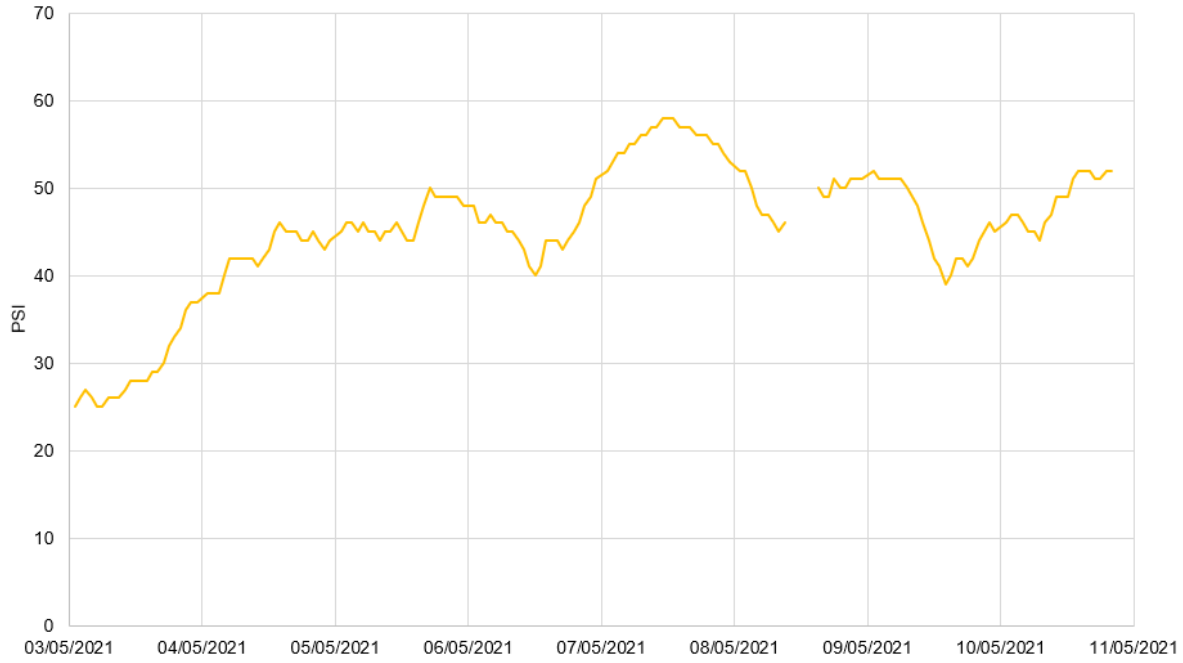


Figure 9-7 Hourly PSI reading of West Singapore [W-15]

A review was also conducted for 24-hr $PM_{2.5}$ and PM_{10} readings available on data.gov.sg for West Singapore during the monitoring period (3 – 10 May 2021). Figure 9-8 and Figure 9-9 show the variation of PM_{10} and $PM_{2.5}$ concentrations recorded by the NEA during the primary baseline data collection period. It is to be noted that these PSI readings cover the entire West Region of Singapore, and hence might not have similar trend to what is monitored on site.

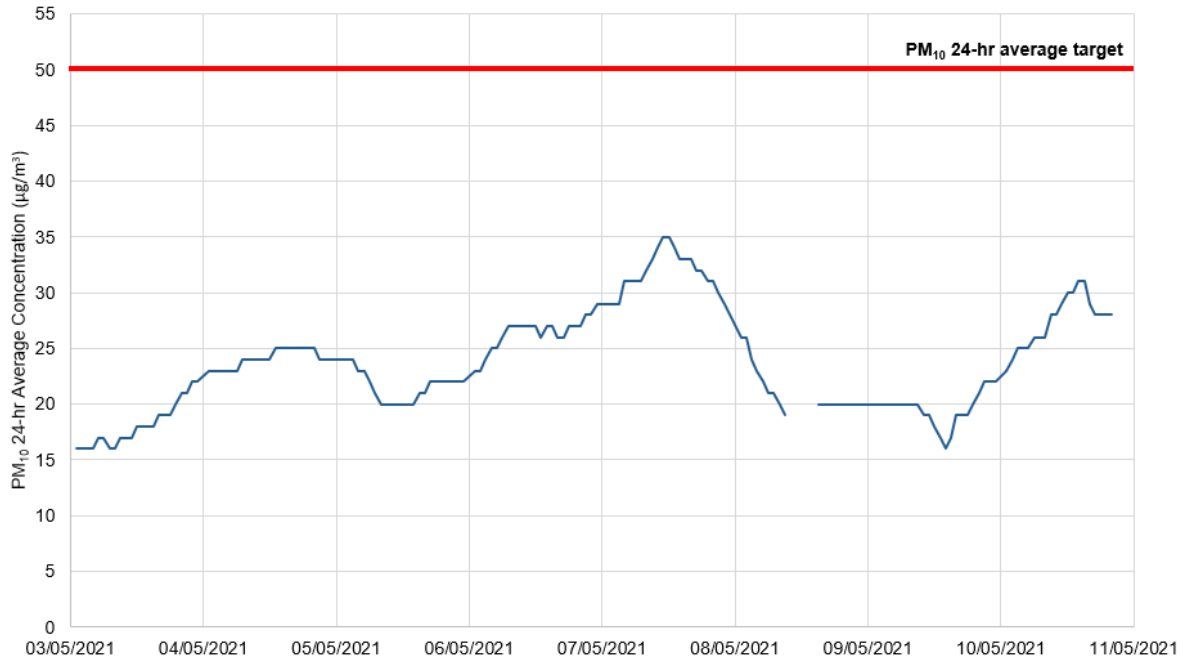


Figure 9-8 24-hr PM_{10} concentrations reading of West Singapore [W-15]

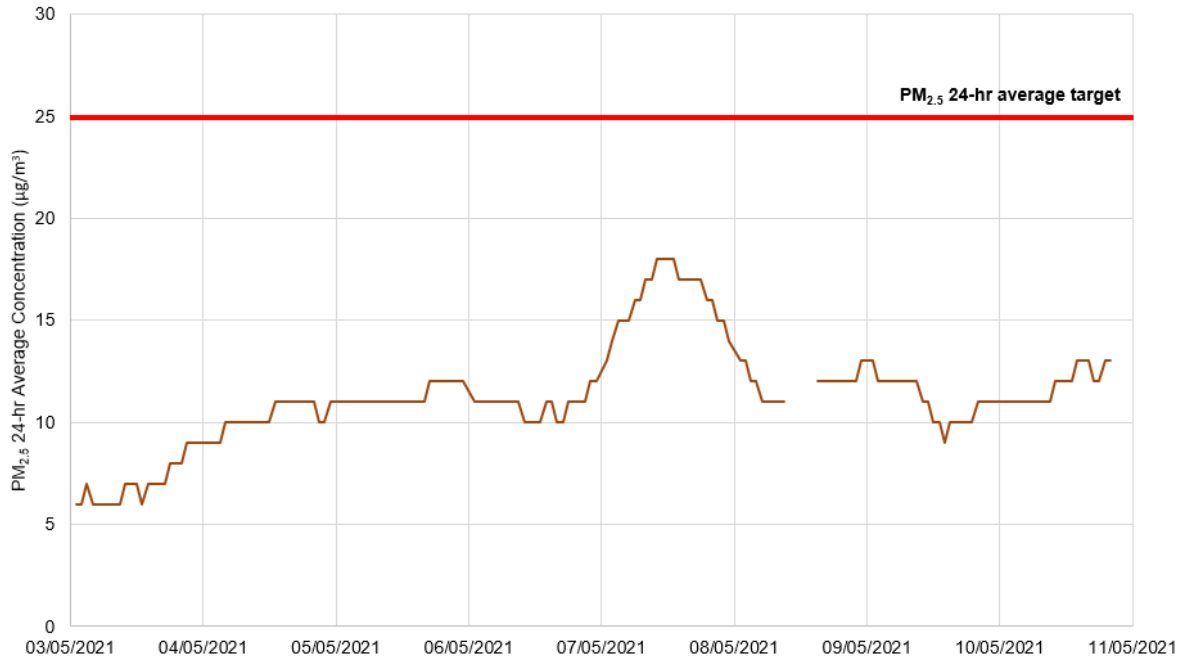


Figure 9-9 24-hr $PM_{2.5}$ concentrations reading of West Singapore [W-15]

9.5.2.1.3 Other Parameters (Rainfall, Temperature, Wind Speed)

Figure 9-10, Figure 9-11, and Figure 9-12 below present the trend of daily total rainfall, mean temperature and mean wind speed observed at Jurong (West) weather monitoring stations, from January 2015 to February 2021.

From Figure 9-10, an average of approximately 7.06mm and 7.42mm of daily rain was observed from Jurong (West) and Jurong (North) monitoring stations, respectively. This calculates to approximately 2,580mm and 2,710mm of rain annually for Jurong (West) and Jurong North (respectively). As discussed in Section 4.6.1, rainfall is higher over the northern and western parts of Singapore. This means the project is expected to receive relatively higher rainfall in the long term compared to the other parts of Singapore. With regards to mean temperature and mean wind speed, the temperature and wind speed at the Project Site is relatively constant with average 27.5°C mean temperature and 7.4 km/h mean wind speed.

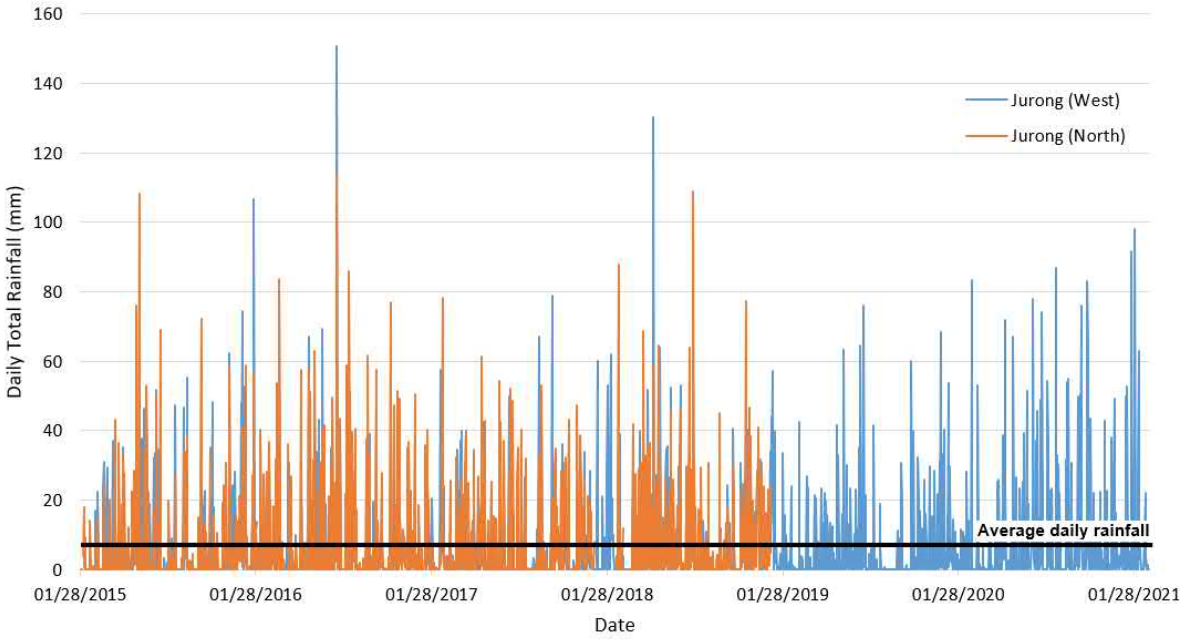


Figure 9-10 Daily rainfall monitored at Jurong (West) monitoring stations [W-13]

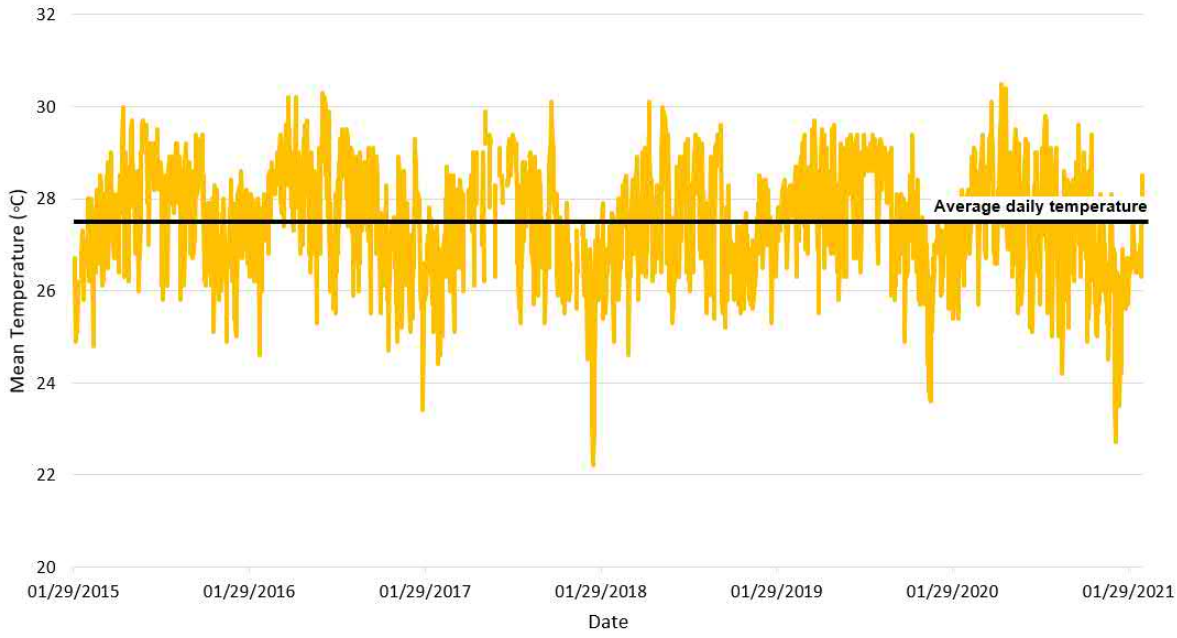


Figure 9-11 Mean temperature monitored at Jurong (West) monitoring station [W-13]

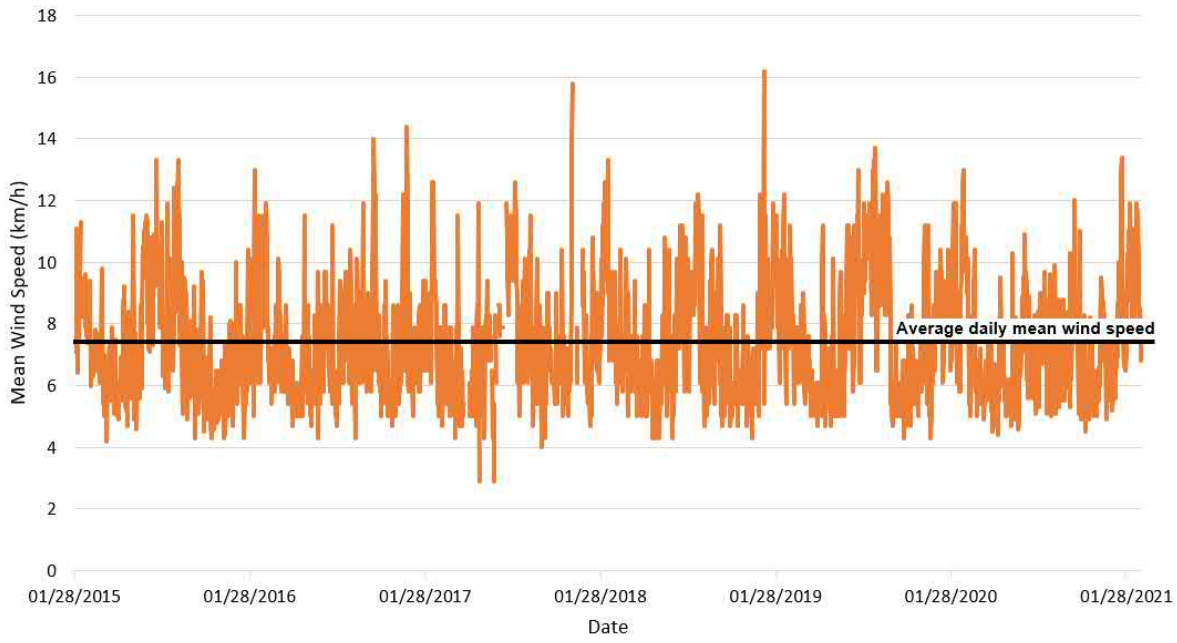


Figure 9-12 Mean wind speed monitored at Jurong (West) monitoring station [W-13]

9.5.2.2 Primary Data Collection (Survey & Sampling)

Seven (7) days of continuous ambient air quality monitoring was conducted at the locations mentioned in Table 9-2 above to determine the pollutant concentrations from existing background pollutant sources. The monitoring results for each pollutant at all monitoring locations are summarized in Table 9-15 below and compared with the Singapore Ambient Air Quality Long Term Targets. Baseline monitoring results are presented graphically in Figure 9-13 to Figure 9-15. Wind direction observed during primary data collection is generally easterly, this is presented in Figure 9-16.

It can be observed from Table 9-15 and Figure 9-13 that the results at A01 generally meet the target for PM_{10} (except Day 4). However, the results exceed the target for $PM_{2.5}$ for most of the days. Monitored data may be influenced by the traffic along PIE (~200 m from A01), Bulim heavy vehicle carpark on the southwest (~100 m from A01), and future bus depot ongoing construction across PIE (~300 m from A01). This is also in line with the wind direction observed in Figure 9-16 where PIE and future bus depot ongoing construction is located east of the A01 monitoring location.

For A02, the results exceed both PM_{10} and $PM_{2.5}$ targets for all days as presented in Figure 9-14. The results may be influenced by activities within LTA construction site. Due to the size of equipment, it is not possible to go further into the forest. A02 is located very close to multiple construction sites (~15 m from A02) and hence, monitored concentration is the highest at this location. A02 is also located ~115 m from the PIE.

As presented in Figure 9-15, the results generally meet the target for PM_{10} (except Day 3 and 4) at A03. However, the results exceed $PM_{2.5}$ target for all days. Monitored data may be influenced by the traffic along PIE (~40 m from A03) and ongoing construction at Jurong Primary School on the southeast (~150 m from A01). This is also in line with the wind direction observed in Figure 9-16 where PIE and Jurong Primary School is located east of the A03 monitoring location.

The monitoring results trend is not in line with the trend of secondary data presented in Section 9.5.2.1.2. The secondary data cover the entire West Region of Singapore, and hence might not have similar trend to what is monitored on site, which may be influenced by heavy traffic along PIE and ongoing construction works in the vicinity of the site.

Table 9-15 Baseline air quality monitoring results

Monitoring Location	Monitoring Date	Daily PM_{10} Concentration, $\mu g/m^3$			Daily $PM_{2.5}$ Concentration, $\mu g/m^3$		
		Min	Max	Average	Min	Max	Average
A01: Future Industrial Area	3-10 May 2021	29.8	**76.4**	39.8	23.1	**68.0**	**33.4**
A02: Tengah Forest	3-10 May 2021	**68.8**	**100.6**	**82.2**	**59.1**	**93.0**	**72.0**
A03: HDB Blk 374 Jurong East Avenue 1	3-10 May 2021	29.4	**85.5**	47.6	**25.8**	**81.2**	**43.1**
Singapore Ambient Air Quality Long Term Targets		*50*			*25*		

Note: Air quality monitoring was conducted during Singapore's Phase 3 reopening after the Circuit Breaker measures during COVID-19 pandemic. Ambient air quality in this area might be higher during normal condition.

Value in **Bold** denotes exceedances against Singapore Ambient Air Quality Long Term Targets.

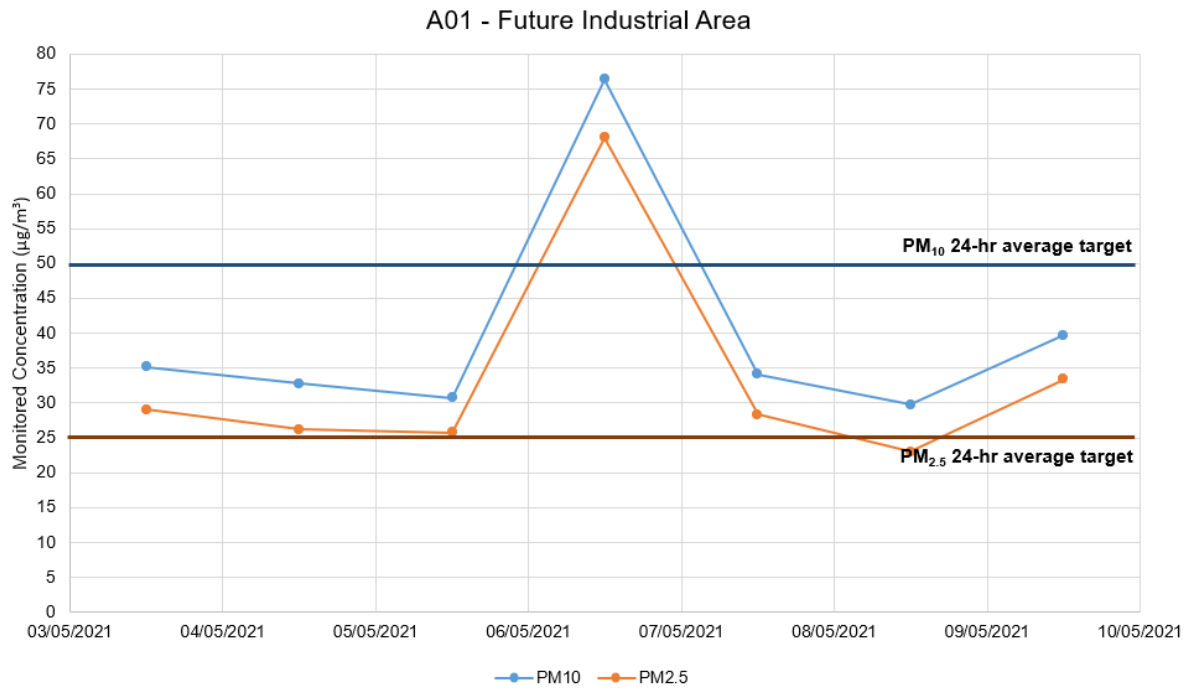


Figure 9-13 Baseline monitoring results at A01

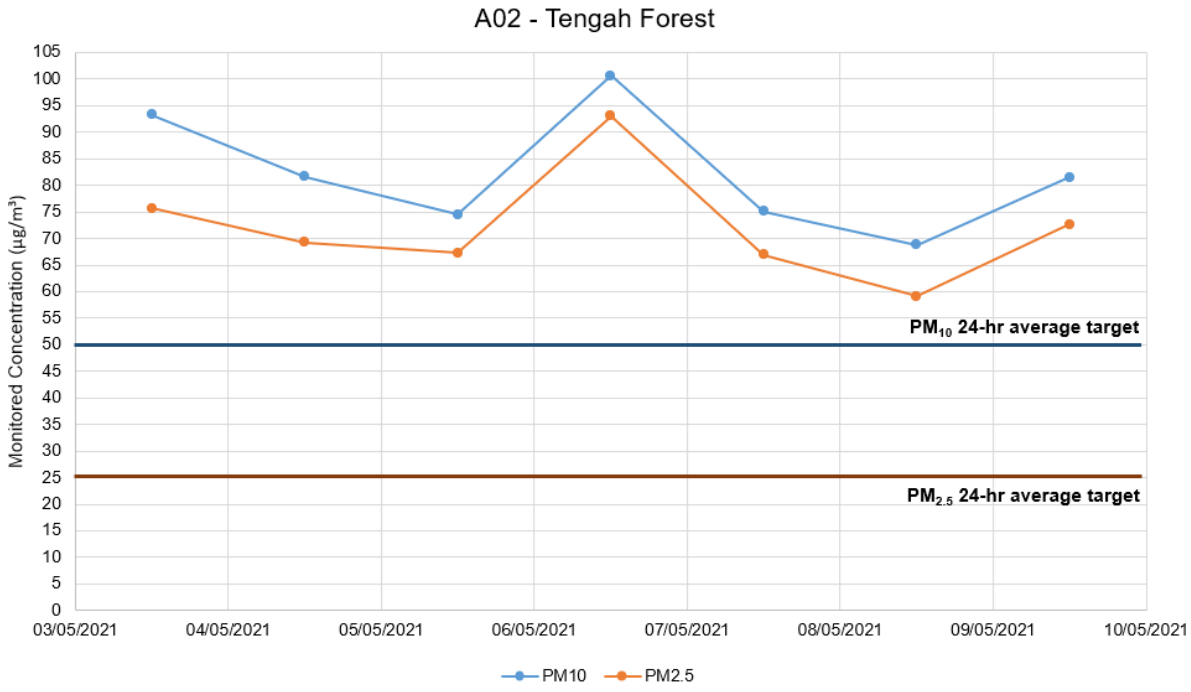


Figure 9-14 Baseline monitoring results at A02

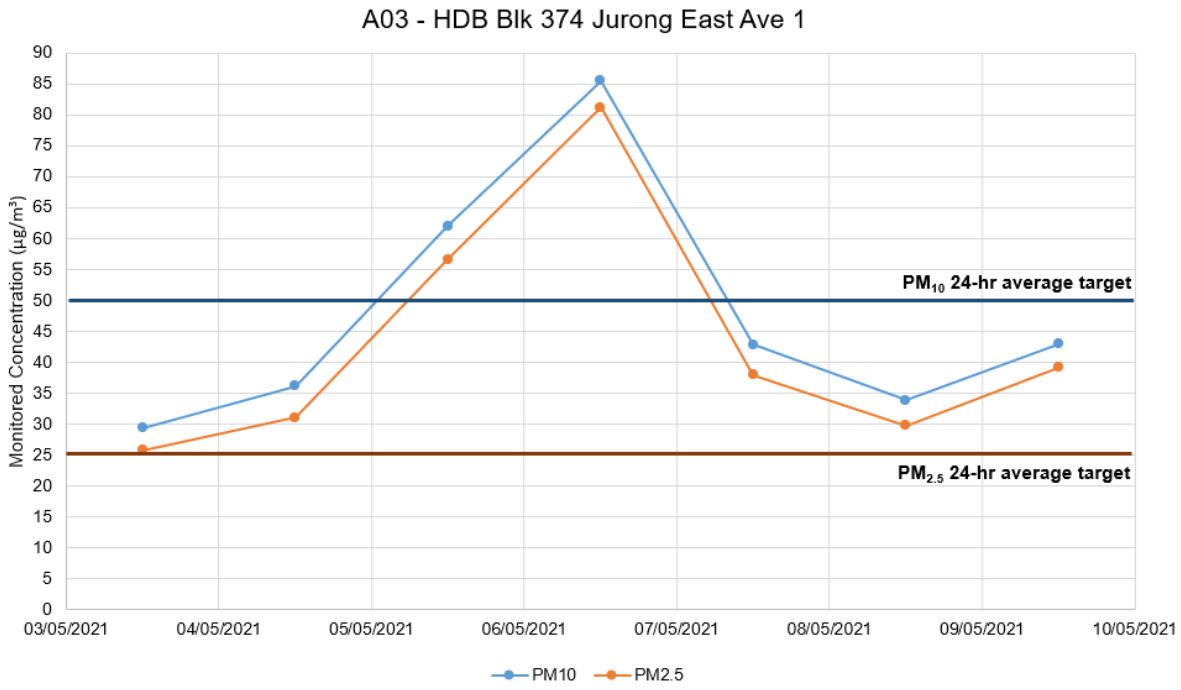


Figure 9-15 Baseline monitoring results at A03

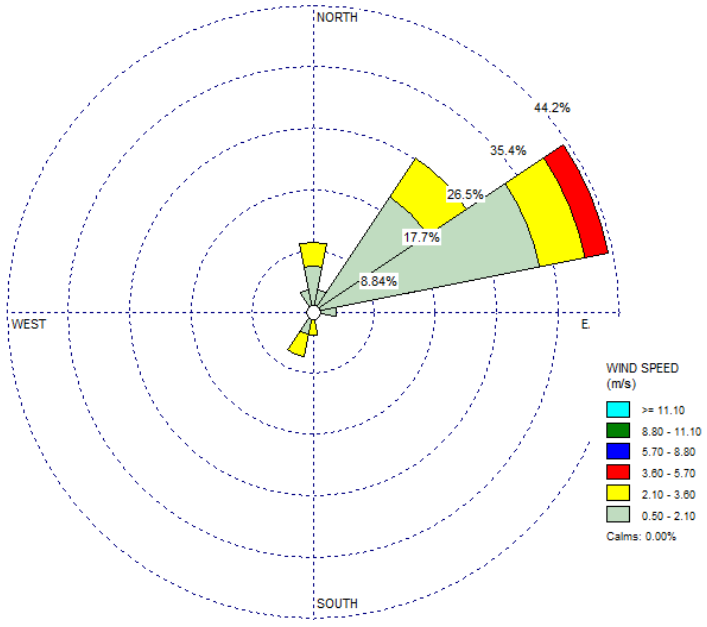


Figure 9-16 Wind direction observed during primary baseline data collection

9.6 Minimum Control Measures

This section proposes minimum controls or standard practices commonly implemented that have been assumed to be implemented for the purposes of impact assessment.

9.6.1 Construction Phase

The following control measures should be observed during the construction stage:

- The construction footprint shall be hoarded on all sides;

- No demolition of permanent structure is expected as part of the project;
- No concrete batching plant to be located on-site; and
- Access road construction or expansion is recommended to be completed first and paved before the construction of other development commences.

9.6.2 Operational Phase

No minimum control has been assumed for the purpose of air quality impact assessment during operational phase.

9.7 Prediction and Evaluation of Air Quality Impacts

9.7.1 Construction Phase

Throughout the study a conservative but credible approach was adopted to assess potential dust impacts. This may lead to an over-estimation of the levels of pollutants that will arise in practice, but this is considered to be appropriate for planning purposes at this stage of the project and is consistent with precautionary principles.

9.7.1.1 Dust Impact Assessment (Earthworks, Construction, Trackout)

The assessment is conducted using the site area, hours of operation, timescale of construction, construction material, excavation quantities, surface material and number of vehicles on site as discussed in Section 9.3.1.

Ecological Receptors

Dust from construction sites deposited on vegetation may create ecological stress within the local plant community. During dry periods dust can coat plant foliage adversely affecting photosynthesis and other biological functions. Rainfall removes the deposited dust from foliage and can rapidly leach chemicals into the soil. Large scale construction sites may give rise to dust deposition over an extended period of time and adversely affect vascular plants. Deposition of concrete dust has the potential to increase the surface alkalinity, which in turn can hydrolyse lipid and wax components, penetrate the cuticle, and denature proteins, finally causing the leaf to wilt [P-18]. Dust may affect photosynthesis, respiration, transpiration and allow the penetration of phytotoxic gaseous pollutants [P-16].

In line with the IAQM Guidance, the Impact Intensity was determined by reviewing the scale of construction activities and classifying them as low, medium or high for each activity type (earthworks, construction, and trackout). The amount of dust deposited, and its effects are also dependent upon weather conditions, during wet weather less dust will be generated and that which has been deposited upon foliage is more likely to be washed off. As discussed in Section 9.5.2.1.3, the project is expected to receive relatively higher rainfall in the long term compared to the other parts of Singapore. Hence, this is expected to help to lessen the intensity of dust generated and deposited upon plant foliage. However, the IAQM methodology does not take into account the rainfall intensity in the study area. Therefore, the air quality assessment is expected to be conservative for the purpose of the project.

The overall Consequence for each activity was classified by considering Impact Intensity with the Receptor Sensitivity. Without any mitigation measures in place, the Likelihood of occurrence of impacts from construction of the project is classified as **Regular** as the activity would occur on a regular basis during construction. The Impact Intensity, overall Consequence and Impact Significance are outlined in Table 9-16.

Based on the assessment, the Impact Significance is predicted to be **Major** for ecological impact. Hence, based on the assessment methodology in Section 9.2.3.1.7, Impact Significance evaluated as Major requires the adoption of management or mitigation measures.

Human Receptors

In line with the IAQM Guidance, the Impact Intensity was determined by reviewing the scale of construction activities and classifying them as low, medium or high for each activity type (earthworks, construction, and trackout). The project was expected to receive relatively higher rainfall in the long term compared to the other parts of Singapore. Hence, this was expected to help to lessen the intensity of dust generated and deposited. However, the IAQM methodology does not take into account the rainfall intensity in the study area. Therefore, the air quality assessment was expected to be conservative for the purpose of the project.

The overall Consequence for each activity was classified by considering Impact Intensity with the Receptor Sensitivity. Without any mitigation measures in place, the Likelihood of occurrence of impacts from construction of the project was classified as **Regular** as the activity would occur on a regular basis during construction. The Impact Intensity, overall Consequence and Impact Significance are outlined in Table 9-16.

Based on the assessment, the Impact Significance was predicted to be **Moderate** to **Major** for human health impact. Hence, based on the assessment methodology in Section 9.2.3.1.7, Impact Significance evaluated as Major and Moderate requires the adoption of management or mitigation measures.

Table 9-16 Impacts of dust risk assessment (before mitigation)

Key Parameter - Earthworks				Impact Assessment						
				Sensitivity of the Area		Overall Consequence / Dust Risk			Impact Significance	
Total Site Area (m^2)	No. of Vehicles moving within the site	Total Material Moved (tonnes)	Impact Intensity	Ecological Receptor	Human Receptor	Ecological Receptor	Human Receptor	Likelihood	Ecological Receptor	Human Receptor
>10,000	~164 (>10)	>100,000	High	Priority 1	Priority 3	High	Low	Regular	**Major**	**Moderate**
Key Parameter - Construction				**Impact Assessment**						
				Sensitivity of the Area		Overall Consequence / Dust Risk			Impact Significance	
Total Building Volume (m^3)	Construction Material	No. of concrete batching plant	Impact Intensity	Ecological Receptor	Human Receptor	Ecological Receptor	Human Receptor	Likelihood	Ecological Receptor	Human Receptor
>100,000	Potentially dusty (e.g. concrete)	0	High	Priority 1	Priority 2	High	Medium	Regular	**Major**	**Moderate**
Key Parameter - Trackout				**Impact Assessment**						
				Sensitivity of the Area		Overall Consequence / Dust Risk			Impact Significance	
No. of outward trucks movement per day	Road surface material	Unpaved Road Length (m)	Impact Intensity	Ecological Receptor	Human Receptor	Ecological Receptor	Human Receptor	Likelihood	Ecological Receptor	Human Receptor
~96 (>50)	Potentially dusty	>100	High	Priority 1	Priority 1	High	High	Regular	**Major**	**Major**

9.7.1.2 Impact from Construction Equipment, Vehicle and Off-Road Diesel Exhaust

Exhaust emissions from construction equipment, machineries and vehicles have the potential to cause air quality impact. Petrol and diesel construction equipment utilized during the construction period will generate pollutants such as PM_{10}, $PM_{2.5}$, CO, SO_2, and NOx. It shall be noted that all construction machines will not operate at the same time and at the same location. The emission will be spread out across the construction duration within the day and also across the Project site. All construction equipment fall under the definition of off-road diesel engine will also comply to Singapore's Environmental Protection and Management (Off-Road Diesel Engine Emissions) Regulations 2012. The impact is usually localised within the construction worksite and only short-term during the operation of the equipment/vehicle only. Therefore, only small-scale increase in air quality levels is expected and the Impact Intensity is considered as **Low**. With likelihood of **Regular**, the overall Impact Significance from equipment exhaust is expected to be **Moderate**. Hence, based on the assessment methodology in Section 9.2.3.1.7, Impact Significance evaluated as Moderate requires the adoption of management or mitigation measures.

9.7.2 Operational Phase

As discussed in Section 9.3.2, emissions from vehicle exhaust due to increased traffic to the proposed project is expected. It is assumed that all new petrol and diesel vehicles will meet Euro 6 emission standard, while all motorcycles will meet Euro 4 standard going forward and slowly completely convert to these or better standards as they get phased out in 10 years from their onset. It can be observed from Table 9-17, NOx reduction from the last three Euro emission standard tier is 55.56% and 25% for diesel and gasoline passenger cars respectively. Similarly, as observed in

Table 9-18, NOx reduction from the last three Euro emission standard tier is approximately 55% and 25% for diesel and gasoline commercial good vehicles respectively across all vehicle categories.

Table 9-17 Euro emission standard for passenger cars [W-16]

Tier	Approval Date	Emission standard for passenger cars, g/km				
		CO	HC	NOx	HC+NOx	PM
Compression Ignition (Diesel)						
Euro 5a	September 2009	0.50	-	0.18	0.23	0.005
Euro 5b	September 2011	0.50	-	0.18	0.23	0.005
Euro 6	September 2014	0.50	-	0.08	0.17	0.005
Positive Ignition (Gasoline)						
Euro 4	January 2005	1.00	0.10	0.08	-	-
Euro 5	September 2009	1.00	0.10	0.06	-	0.005
Euro 6	September 2014	1.00	0.10	0.06	-	0.005

Table 9-18 Euro emission standard for commercial good vehicles [W-16]

Category	Tier	Approval Date	Emission standard for commercial good vehicles, g/km				
			CO	HC	NOx	HC+NOx	PM
Compression Ignition (Diesel)							
N1, Class I ≤ 1305 kg	Euro 5a	September 2009	0.50	-	0.18	0.23	0.005
	Euro 5b	September 2011	0.50	-	0.18	0.23	0.005
	Euro 6	September 2014	0.50	-	0.08	0.17	0.005
	Euro 5a	September 2009	0.63	-	0.235	0.295	0.005
	Euro 5b	September 2011	0.63	-	0.235	0.295	0.005

Category	Tier	Approval Date	Emission standard for commercial good vehicles, g/km				
			CO	HC	NOx	HC+NOx	PM
N1, Class II 1305 – 1760 kg	Euro 6	September 2014	0.63	-	0.105	0.195	0.005
N1, Class III 1760-3500 kg	Euro 5a	September 2009	0.74	-	0.28	0.35	0.005
	Euro 5b	September 2011	0.74	-	0.28	0.35	0.005
	Euro 6	September 2014	0.74	-	0.125	0.215	0.005
N2, 3500 – 12000 kg	Euro 5a	September 2009	0.74	-	0.28	0.35	0.005
	Euro 5b	September 2011	0.74	-	0.28	0.35	0.005
	Euro 6	September 2014	0.74	-	0.125	0.215	0.005
Positive Ignition (Gasoline)							
N1, Class I ≤ 1305 kg	Euro 4	January 2005	1.00	0.10	0.08	-	-
	Euro 5	September 2009	1.00	0.10	0.06	-	0.005
	Euro 6	September 2014	1.00	0.10	0.06	-	0.005
N1, Class II 1305 – 1760 kg	Euro 4	January 2005	1.81	0.13	0.10	-	-
	Euro 5	September 2009	1.81	0.13	0.075	-	0.005
	Euro 6	September 2014	1.81	0.13	0.075	-	0.005
N1, Class III 1760-3500 kg	Euro 4	January 2005	2.27	0.16	0.11	-	-
	Euro 5	September 2009	2.27	0.16	0.082	-	0.005
	Euro 6	September 2014	2.27	0.16	0.082	-	0.005
N2, 3500 – 12000 kg	Euro 5	September 2009	2.27	0.16	0.082	-	0.005
	Euro 6	September 2014	2.27	0.16	0.082	-	0.005

Within the study area, the residential properties are mostly located in the southern portion located within a range of 40 – 400 m from the PIE (40 m being the nearest residential, and 400 m being the farthest residence horizontally within the study area). Note that the northern part of our study area does not have residential buildings, but is dominated by green buffer, and catchment pond etc. Typically, the pollutants of concern in a traffic related pollution tend to be CO, NOx (NO/NO_2), PM_{10} and $PM_{2.5}$. As the vehicles use low sulphur fuel, SO_2 is less of concern these days from vehicular exhaust.

The particulates, viz. PM_{10} and $PM_{2.5}$ (dust) can have direct and indirect impacts on ecological receptors. Dust emissions can have direct adverse effects upon vegetation restricting photosynthesis, respiration and transpiration. It can also lead to phytotoxic gaseous pollutants penetrating the plants. The overall effect can be a decline in plant productivity, which may then have indirect effects on the quality of the affected habitats and associated fauna.

NOx can affect plants directly or indirectly. It may directly enter a plant via the stomata, where it has phytotoxic effects. Lower plants such as lichens and bryophytes (including mosses, landworts and hornwarts) are particularly vulnerable to direct exposure to the gases in this way [W-17]. Since the biodiversity survey was focused on only vascular plants, there is limited information on the locations of these non-vascular species. However, based on empirical observation, rain trees are known to other biomes such as mosses. Numerous specimens of rain trees were recorded within the Study Area (refer to Section 7.3.2.2). Rain trees were also observed along the PIE, which is in close proximity to the Study Area.

Indirectly, NOx can also deposit onto soil and, following transformation to nitrate, enrich the soil, leading to eutrophication. The effects of elevated NOx concentrations on vegetation can be broadly categorised as [R-44]:

- growth effects: particularly increased biomass, changes in root to shoot ratio and growth of more competitive species, but also including growth suppression of some species;

- physiological effects: e.g. CO_2 assimilation and stomatal conductivity; and
- (bio)chemical effects: e.g. changes in enzyme activity and chlorophyll content (probably through the effects of increased nitrogen).

Indirectly in the long run, accumulation of nitrogen oxides (NOx) via acidic rain causes soil and water to become more acidic and hence, reducing the nutritional value of food sources for fauna [P-46]. There is no published evidence for any direct toxic effect of NOx on animals and therefore effects on animals are not included in ecological impact assessment [R-42].

Lichens / mosses are indicator of good air quality and high level of SO_2 emission might impact these plants tremendously. Although this is not seemingly a potential concern in the operation of a residential area. Other development within the residential estates, such as hospitals and community centre, might employ generators which might emit high level of SO_2. In order to avoid this, low sulphur diesel fuel should be used as minimum control in line with NEA's latest regulations.

From CO however, there is no known specific impact on ecological receptors. However, to note that the vegetated/ ecological receptors in the proposed development shall be immediately adjacent to PIE.

As for impacts of pollutants on human, NO_2 increases the risk of respiratory infection and impairs lung functions in asthmatics. CO deprives body tissues of oxygen and causes nausea and impairs vigilance. PM can affect the heart and lungs, especially in people who already have chronic heart or lung disease (e.g. asthma). $PM_{2.5}$ can cause decreased lung function, increased respiratory symptoms and heart attacks. PM_{10} can cause respiratory impairment and aggravate existing respiratory and cardiovascular disease. Short term exposure to PM may also cause irritation of the eyes, nose and throat in healthy individuals [W-36].

It should also be noted that currently there is a significant traffic volume along the PIE on the south, KJE on the west and Bukit Batok Road on the east. However, the proposed project has also planned the construction of future roads. Hence, locally the traffic in the vicinity of the project is likely to increase. The exact numbers in terms of increase /change in volume of traffic was not available. Hence, no detailed assessment could be carried out. However, a high-level qualitative assessment has been conducted.

In 2010, the Health Effects Institute published their authoritative report titled "Traffic-related air pollution: a critical review of the literature on emissions, exposure, and health effects". This report has been used as the basis of WHO Technical Report on Review of evidence on health aspects of air pollution 2013 [R-52]. In this WHO Technical Report, Roorda-Knape et al. (1998), Hitchins et al. (2000), Zhu et al. (2002), and Gilbert et al. (2003) reported a significant decrease of particulates and gases within 150-200 m of a road. However, on the downwind side of a highway, concentrations do not generally reach background levels until at least 300–500 m, though Zhu et al. (2002) found a 60% to 80% decrease of CO from roadside concentrations within 100m. In some studies, this was extended to up to 1500 m for NO_2 (Gilbert et al., 2003; Jerrett et al., 2007). At the moment, the vehicles are using low sulphur content fuel, hence the decrease of SO_2 with distance is not discussed.

The WHO Technical Report concluded that an exposure zone from traffic emissions for particulates (PM_{10}, $PM_{2.5}$) lay within 150-200 m from the road, while for gases like CO and NO_2, this could extend to a range of up to 100 to 500 m respectively from a highway or a major road – the range reflecting the variable influence of background pollution concentrations, meteorological conditions, and season. In some studies, this zone was even extended to up to 1500 m for NO2 (Gilbert et al., 2003; Jerrett et al., 2007).

Thus, based on this WHO Technical Report, it can be argued that the residential properties located with 40 – 400 m from the PIE will also be impacted by the high traffic along PIE. The forested green buffer planned in the north shall be impacted by the PIE as well. AECOM has monitored traffic along highways and smaller roads in several Singapore projects in the past. From our previous experience, the traffic volume in a typical highway can reach up to 14000 veh/hr, while traffic volume within internal roads in HDB estate is considerably minimum and expected to vary between to 1000-2000 veh/hr. The incremental traffic volume within HDB estate is expected to be only 7-14% of the PIE traffic. While there is no denying that the internal roads will also contribute to the impact on the residential area located away from the PIE, their contribution as compared to highway will be proportionately significantly less. Hence, we believe that the airshed in the area will still be dominated by the PIE.

Without any mitigation measures in place, the Likelihood of occurrence of impacts during the operational phase is classified as Regular. Overall it seems that given the two factors above (i.e. the implementation of Euro emission standard on new vehicles and current large traffic volume along existing roads), insignificant increase in air quality

pollutant levels in the vicinity of proposed project is expected during the operational phase. Some green areas will also not be disturbed as part of the project. Hence, the Impact Intensity is considered to be **Negligible**.

As discussed in Section 9.4.2, the Sensitivity of the receptors is classified to be **Priority 1** to **Priority 3**. Thus, as per Table 6-7, the Impact Consequence is calculated to be **Very Low**. Based on the impact significance matrix in Table 9-7, the Impact Significance is predicted to be **Minor** (refer to Table 9-19) from the existing baseline. No mitigation measures are required during operational phase.

Table 9-19 Impacts of air quality impact assessment – operational phase

Impact Intensity	Sensitivity of the Area	Overall Consequence	Likelihood	Impact Significance
Negligible	Priority 1 to Priority 3	Imperceptible to Very Low	Regular	**Minor**

9.8 Recommended Mitigation Measures

9.8.1 Construction Phase

Based on the assessment in Section 9.7.1, the Impact Significance was determined to be **Moderate to Major**. The range of dust mitigation measures to be implemented at the construction sites are outlined in Table 9-20. Upon the implementation of mitigation measures, the Impact Significance was determined to be Minor. This will be detailed in Section 9.9.1.

Table 9-20 Air quality mitigation measures (construction phase)

Mitigation Measures	
GENERAL MITIGATION MEASURES TO BE IMPLEMENTED THROUGH OUT CONSTRUCTION PERIOD	
Communications	
Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.	Mandatory
Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager.	Mandatory
Develop and implement an Air Pollution Control Plan (APCP) (see paragraph below for APCP details).	Mandatory
Site Management	
Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.	Mandatory
Make the complaints log available to the local authority when asked.	Mandatory
Record any exceptional incidents that cause dust and/or air emissions, either on-site or off-site, and the action taken to resolve the situation in the logbook.	Mandatory
Hold liaison meetings with other high-risk construction sites within 500 m of the site boundary, if any, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised.	Optional
Monitoring	
Undertake regular (daily frequency recommended) on-site and off-site inspections and record results. The log should be made available to the NEA or other Government Agencies if required. Inspections should include regular dust soiling checks of surfaces such as street furniture, cars, and windowsills within 100 m of site boundary. Cleaning should be provided if necessary.	Recommended
Carry out regular site inspections to monitor and record compliance with the Air Pollution Control Plan.	Mandatory

Mitigation Measures	
Increase the frequency of site inspections during prolonged dry or windy conditions.	Mandatory
Conduct monitoring for PM_{10} and $PM_{2.5}$ at suitable locations (refer to Section 11.12.1)	Mandatory
Preparing and maintaining the site	
Plan site layout so that machinery and dust causing activities are located away from receptors, where possible.	Mandatory
Erect hoarding around dusty activities and at the site boundary wherever possible. Boundary screens should be at least as high as any stockpiles or dust emission sources on site.	Mandatory
Fully enclose specific activities where there is a known high potential for dust production and the site will be active for an extensive period of time.	Mandatory
Keep site fencing, barriers, and scaffolding clean by cleaning regularly using wet methods (dry methods may give rise to fugitive dust).	Mandatory
Remove materials that have the potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site, stockpiled material should be covered, seeded, fenced or enclosed to prevent fugitive dust formation.	Mandatory
Operating vehicle/machinery and sustainable travel	
Ensure all vehicles and engine powered equipment comply with the legislative requirements of Singapore.	Mandatory
Ensure all vehicles and equipment switch off their engines when stationary – i.e. no idling vehicles or engines. Clear signs shall be erected at site entrance to inform all visitors.	Mandatory
Where practicable, avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment.	Mandatory
Impose and signpost a maximum-speed-limit of 25 km/hr on paved or surfaced haul roads and 15 km/hr on unpaved haul roads and work areas.	Mandatory
Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.	Mandatory
Construction Operations	
Only use cutting, grinding or sawing equipment fitted with, or in conjunction with, suitable dust suppression techniques such as water sprays or local extraction e.g. local exhaust ventilation system.	Mandatory
Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.	Mandatory
Use enclosed chutes and conveyors and covered skips wherever possible.	Mandatory
Minimise drop heights from conveyors, loading shovels, hoppers, and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.	Mandatory
A stringent “Clean as you go” Policy should be implemented on site to ensure no loose dry material is left exposed when not in use. Equipment should be readily available on site to clean any dry spillages, and cleaning should be conducted as soon as reasonably practicable after the event using wet cleaning methods.	Mandatory
Waste Management	
Avoid burning of waste or other materials.	Mandatory
MITIGATION MEASURES FOR EARTHWORKS	
Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable. When a particular work is finished in an area, the soil will need to be reinstated upon completion, before moving on to different areas. This will reduce dust emission. In the	Mandatory

Mitigation Measures	
air assessment it refers to reinstatement as a regrown area, it does not mean replanting same trees. It only refers to vegetation plantation which prevents erosion of soil to form dust.	
Use Hessian, mulches or soil tackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.	Mandatory
Only remove the cover in small areas during work and not all at once.	Mandatory
MITIGATION MEASURES FOR CONSTRUCTION	
Avoid scabbling (roughening of concrete surfaces) if possible.	Mandatory
Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.	Mandatory
Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.	Mandatory
For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.	Mandatory
MITIGATION MEASURES FOR TRACKOUT	
Use water-assisted dust sweeper(s) on the access and affected local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use.	Mandatory
Avoid dry sweeping of large areas.	Mandatory
Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.	Mandatory
Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.	Mandatory
Record all inspections of haul routes and any subsequent action in a site logbook.	Mandatory
Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.	Mandatory
Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).	Mandatory
Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.	Mandatory
Site access gates to be located at least 10 m from receptors where possible.	Mandatory

The APCP shall include the following information as a minimum:

- Summary of all work to be carried out including breakdown of phases and individual activities that may give rise to fugitive dust formation;
- Project title, project location and area, description of the site layout and locations of areas where dust is most likely to be generated such as haulage routes, excavation areas, etc. This description shall also include the location of the water supply or chemical suppressants for applying to the dust generating areas on site;
- List of each dust generating activity, the likely schedule for each activity and the dust control measures to be implemented and frequency for their implementation. The level of detail will depend on the overall Consequence classification identified in this report and should include as a minimum the mitigation measures listed as mandatory in this document;

- Summary of the air monitoring to be undertaken including monitoring location and schedule. The air monitoring results shall be recorded, and trends observed to determine the efficacy of dust control measures over the different construction stages;
- Details and procedures on using the site logbook which is used to record information on incidents such as dust episodes, the sources identified, and the action taken and its efficacy. Any complaints shall also be recorded within the logbook along with the subsequent mitigation implemented and time to close out the complaint. The logbook should also be used to keep track of the daily dust control measures implemented such as wheel washing, site watering, site inspections etc.;
- Details of the Superintending Officer (SO) should be included in this plan for managing dust management at the site. The responsibilities of the SO are listed in Section 11.4.4; and
- The air pollution control plan shall be reviewed at regular intervals during the construction phase to ensure the effectiveness of the procedures in place and to maintain the goal of minimisation of dust and emissions through the use of best practice and procedures.

9.8.2 Operational Phase

No mitigation measures are required during operational phase as only Minor air quality impact significance is expected during project operational phase.

9.9 Residual Impacts

9.9.1 Construction Phase

Residual Impact Assessment assumes that the mitigation measures within Section 9.8.1 are implemented within the construction footprint.

9.9.1.1 Dust Impact Assessment (Earthworks, Construction, Trackout)

The Likelihood of occurrence of a significant adverse impact would be classified as **Rare**, subject to relevant mitigation measures identified being implemented. This Likelihood is combined with Impact Consequence to provide the residual Impact Significance results for the construction footprint. The residual Impact Significance is listed in Table 9-21 below.

Based on the assessment, by implementing the proposed mitigation measures, the Likelihood of the impact is expected to reduce from **Regular** to **Rare**, resulting in **Minor** Impact Significance.

Table 9-21 Impacts of dust risk assessment (after mitigation)

Key Parameter - Earthworks				Impact Assessment						
Total Site Area (m^2)	No. of Vehicles moving within the site	Total Material Moved (tonnes)	Impact Intensity	Sensitivity of the Area		Overall Consequence / Dust Risk		Likelihood	Impact Significance	
				Ecological Receptor	Human Receptor	Ecological Receptor	Human Receptor		Ecological Receptor	Human Receptor
>10,000	~164 (>10)	>100,000	High	Priority 1	Priority 3	High	Low	Rare	**Minor**	**Minor**
Key Parameter - Construction				**Impact Assessment**						
Total Building Volume (m^3)	Construction Material	No. of concrete batching plant	Impact Intensity	Sensitivity of the Area		Overall Consequence / Dust Risk		Likelihood	Impact Significance	
				Ecological Receptor	Human Receptor	Ecological Receptor	Human Receptor		Ecological Receptor	Human Receptor
>100,000	Potentially dusty (e.g. concrete)	0	High	Priority 1	Priority 2	High	Medium	Rare	**Minor**	**Minor**
Key Parameter - Trackout				**Impact Assessment**						
No. of outward trucks movement per day	Road surface material	Unpaved Road Length (m)	Impact Intensity	Sensitivity of the Area		Overall Consequence / Dust Risk		Likelihood	Impact Significance	
				Ecological Receptor	Human Receptor	Ecological Receptor	Human Receptor		Ecological Receptor	Human Receptor
~96 (>50)	Potentially dusty	>100	High	Priority 1	Priority 1	High	High	Rare	**Minor**	**Minor**

9.9.1.2 Impact from Construction Equipment, Vehicle and Off-Road Diesel Exhaust

With the implementation of mitigation measures outlined in Table 9-20, such as ensure all vehicles and engine powered equipment comply with the legislative requirements, switch off vehicles and equipment engines when stationary, avoid the use of diesel- or petrol-powered generators among many others, the Likelihood of the impact is expected to reduce from **Regular** to **Rare**, resulting in **Minor** Impact Significance.

9.9.2 Operational Phase

As discussed in Section 9.7.1.2, the potential impact significance due to increased traffic is considered to be Minor. No mitigation measures are required during operational phase.

9.10 Cumulative Impacts from Other Major Concurrent Development

It is known that construction activities are planned to occur in the vicinity of the Project as highlighted in Section 3.5.2. Hence, cumulative impacts from other relevant major concurrent development in the vicinity of the Project shall be assessed and considered.

9.10.1 Construction Phase

Due to the presence of the HDB, NParks, LTA, JTC and URA concurrent construction site, the construction footprint in this area is expected to be larger. More vehicles moving within the site and more spoil to be moved as part of the excavation stage are also expected. With this concurrent construction activity, the Impact Significance is expected to remain as **Moderate to Major**. The range of dust mitigation measures to be implemented at the construction sites are outlined in Table 9-20. These can be implemented by HDB on the project sites and aid in control of air impact at HDB project sites. However, this report recommends EIA/EIS be conducted for the other concurrent projects and air pollution mitigation measures be recommended to similar if not more stringent levels for the other projects happening in concurrence with the HDB Projects so that cumulative impact can be reduced. It may be best for various concurrent projects to plan especially pollutive phases to stagger in timeline such as earthworks, construction works and number of vehicles on trackouts or the condition of the trackout roads as a joint effort. Upon strict implementation of mitigation measures, the Impact Significance may be reduced to be **Minor to Moderate**.

Table 9-22 Cumulative air quality impact assessment (construction)

Construction Worksite	Impact Intensity	Sensitivity of the Area	Overall Consequence	Likelihood	Impact Significance
Before Mitigation					
Project	High	Priority 1 to Priority 3	Low to High	Regular	**Moderate to Major**
Project + Concurrent Construction	High	Priority 1 to Priority 3	Low to High	Regular	**Moderate to Major**
After Mitigation					
Project	High	Priority 1 to Priority 3	Low to High	Rare	**Minor**
Project + Concurrent Construction	High	Priority 1 to Priority 3	Low to High	Rare	**Minor to Moderate**

9.10.2 Operational Phase

Due to the presence of the HDB, NParks, LTA, JTC and URA concurrent developments, the air quality impact during operational phase is expected to be larger. HDB housing and road construction are expected to result in an increase of traffic volume in the vicinity of the Project site, however, this increase may be marginal compared to the existing high traffic along PIE and Bukit Batok Road. Generators used within HDB estates are also considered insignificant during operational phase. The operation of other park, amenities and utilities projects are also not expected to significantly increase the ambient air quality. Jurong Regional Line MRT operation is using electric trains which will not result in air quality impact.

However, the operation of Bus Depot and additional traffic volume from future roads might add significant amount of traffic volume which may result in medium scale increase in air quality levels in the vicinity. Therefore, with other concurrent projects, the Impact Significance is expected to increase to **Minor** to **Moderate**. This report recommends that EIA/EIS be conducted for the other concurrent projects and air pollution mitigation measures be recommended so that cumulative impact can be reduced. Depending on the implementation of mitigation measures at the concurrent projects in the vicinity, the cumulative impact significance may be reduced.

Table 9-23 Cumulative air quality impact assessment (operation)

Construction Worksite	Impact Intensity	Sensitivity of the Area	Overall Consequence	Likelihood	Impact Significance
Before Mitigation					
Project	Negligible	Priority 1 to Priority 3	Imperceptible to Very Low	Regular	**Minor**
Project + Concurrent Construction	Moderate	Priority 1 to Priority 3	Very Low to Medium	Regular	**Minor to Moderate**

9.11 Summary of Key Findings

Air quality impacts from the construction and operation of the proposed project were assessed on air sensitive receptors (ASRs) in the vicinity of the Project Site. Primary baseline air quality monitoring was conducted at 3 representative locations for 1 week each ranging from 3 – 10 May 2021. All measured pollutant concentrations at A01 and A03 generally meet PM_{10} targets, however, exceed $PM_{2.5}$ targets as per the Singapore Ambient Air Quality Long Term Targets. While monitored results at A02 generally exceed both PM_{10} and $PM_{2.5}$ targets. Analysis of baseline results are detailed in Section 9.5.2.2.

Potential impacts to the neighbouring sensitive receptors during construction phase mainly include emissions from the heavy vehicular exhaust and dust emitted from the earthworks, construction and trackout activities. During the operational phase, emissions from vehicle exhaust due to increased traffic in the vicinity of the proposed development is identified as the predominant air emission source.

Air quality impact assessment for construction phase were undertaken in accordance with the UK IAQM Guidance on the Assessment of Dust from Demolition and Construction. Pursuant to which, 50m and 350m Study Area for ecological and human receptors respectively were considered for earthworks, construction and trackout activities. Dust generated during construction works can have adverse effects upon vegetation restricting photosynthesis, respiration and transpiration. Furthermore, it can lead to phytotoxic gaseous pollutants penetrating the plants. The overall effect can be a decline in plant productivity. For human receptors, the dust and gaseous emissions might cause respiratory problems and diseases in human health.

The results of the assessment show that unmitigated impacts are classified as **Moderate to Major** and have the potential to affect the receptors near the construction footprint unless mitigation measures are put in place (see Section 9.7 for assessment details). This is largely because of the large extent of the construction worksite located very close to the neighbouring sensitive receptors. This report pulls together mitigation measures that can be implemented by the contractor as administrative or management measures, sourcing from best practice measures internationally, which are detailed Section 9.8, which when applied successfully, the significance of impacts is anticipated to be reduced to **Minor** (see Section 9.9 for details). The key control and mitigation measures include but not limited to development of air pollution control plan, dust control measures on site, site hoarding, planning of dust causing activities-location and timing, reinstating land upon completion of works amongst several others.

The construction contractor is recommended to prepare an air quality management plan incorporating a range of monitoring and mitigation measures in line with Section 9.8, Section 11.12.1 and Section 11.12.2.

Cumulative impacts from other major concurrent development in the vicinity of each construction worksite are presented and detailed in Section 9.10. Due to the presence of these concurrent construction sites, the overall construction footprint is expected to be larger. With all these concurrent construction activities, the highest Impact Significance is expected to remain as **Major**. Depending on the implementation of mitigation measures at the concurrent projects in the vicinity, the cumulative impact significance may be reduced to be **Minor to Moderate**.

Table 9-24 Summary of air quality impact assessment

Potential Source of Impact	Impact Significance with Minimum Control	Key Mitigation Measures (if any)	Residual Impact Significance with Mitigation Measures (if required)
Construction Phase			
Dust emissions generated by earthworks processes	Moderate to Major	• Implement dust control measures e.g. dust screens, etc. • Install hard surfaced haul routes. • Only use cutting, grinding and sawing equipment with dust suppression water spray mechanisms. • Erect hoarding around dusty activities and site boundary min. 1.8m height in line with BCA guideline. • Impose and signpost maximum speed-limit of 25km/hr on paved roads and 15 km/hr on unpaved roads and work areas. • No burning of waste allowed on site. • Revegetate earthworks and exposed areas / soil stockpiles.	Minor
Dust and gaseous emissions generated by the construction of new structures, including the use of off-road diesel generators on-site	Moderate to Major		Minor
Dust and gaseous emissions from transport of dust and dirt by dumper trucks	Major		Minor
Operational Phase			
Gaseous and particulate emissions from vehicle exhaust due to the increased traffic	Minor	-	Minor

10 Airborne Noise

10.1 Introduction

This section presents the detailed assessment of airborne noise impacts from the construction and operational phase of the Project, to the identified ecological receptors and human receptors. Noise from construction and operational activities may be perceivable, especially to receptors in proximity and those having a direct line-of-sight to the noise sources. The area of up to 150 m from the boundaries of the Project site, where potential noise impact is experienced, is known as the Airborne Noise Study Area (See section 6.2.1). The key steps for conducting the noise impact assessment are as follows:

- Review existing baseline noise monitoring data and to conduct and assess the current baseline noise level in the Study Area;
- Identify and classify the sensitivity of the receptors surrounding the Project site within the Study Area
- Conduct noise impact assessment to quantitatively assess potential noise impacts during the construction phase;
- Conduct qualitative noise impact assessment to assess potential noise impacts from concurrent phases during construction and the operational phase;
- Recommend minimum control and mitigation measures to be implemented;
- Determine the overall significance of the residual noise impacts after the implementation of the mitigation measures; and
- Recommend a suitable monitoring and management plan.

10.2 Methodology and Assumptions

The sections below outline the methodology used in the noise impact assessment for construction phase and operational phase of the Project.

10.2.1 Baseline Airborne Noise Study

Baseline noise monitoring is used to establish the existing noise levels in the Study Area. Site reconnaissance was conducted on 5 February 2021 for up to 150 m from the Project site. A total of thirteen (13) noise monitoring locations were proposed (at the Inception stage), based on the following considerations:

- Identification of noise sensitive receptors (NSRs) (hospitals, schools, childcare facilities, old age homes, residences, fauna and habitats of high ecological value) within the defined Study Area for airborne noise impact;
- Other NSRs away from the construction worksites will be eliminated as these receptors are assumed to be barricaded by the first row of buildings;
- NSRs with areas having ongoing construction will be avoided;
- NSRs where the owner denied permission during site walkover will be excluded;
- The closest NSR to the construction worksites will be selected; and
- For a high rise residential sensitive receptor, ensure monitoring will be conducted at different floor heights (e.g., mid-level, top level) to capture the terrain variation and its impact on noise levels.

The baseline noise monitoring locations are detailed in Table 10-1 and reflected in Figure 10-1 below. Noise monitoring was conducted for one (1) week (inclusive of Weekdays and Weekends) to capture baseline noise levels over time periods of 12 hours (long term), 1 hour and 5 minutes (short term) at each of the locations. The NEA-approved Norsonic 131 Type 1 Sound Level Meter (SLM) was used to record the noise levels during the time periods. The method and results are detailed in the baseline noise monitoring report in Appendix W and will be further discussed in Section 10.5.

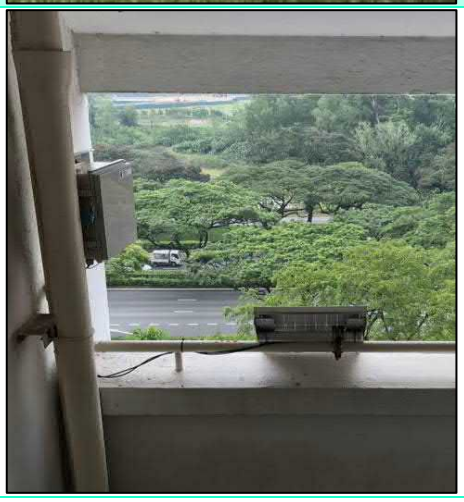
In determining the impact of the construction noise to the noise sensitive receptors (NSRs), the baseline noise levels in the Study Area would be included in the calculation to derive a background noise correction factor to establish the maximum permissible noise level from the construction activities in accordance with the noise

legislation stated in *Environmental Protection and Management (Control of Noise at Construction Sites) Regulations, 2008* [R-32].

While for the determination of operational noise impacts arising from potential operational activities, namely land traffic noise and noise from air conditioning and mechanical ventilation (ACMV) systems, a qualitative study of noise impacts on the NSRs will be conducted in accordance with the *NEA Technical Guideline for Noise Limits for Air Conditioning and Mechanical Ventilation Systems in Non-Industrial Buildings, 2018* [R-40] and *NEA Technical Guideline for Land Traffic Noise Impact Assessment, 2016* [R-46].

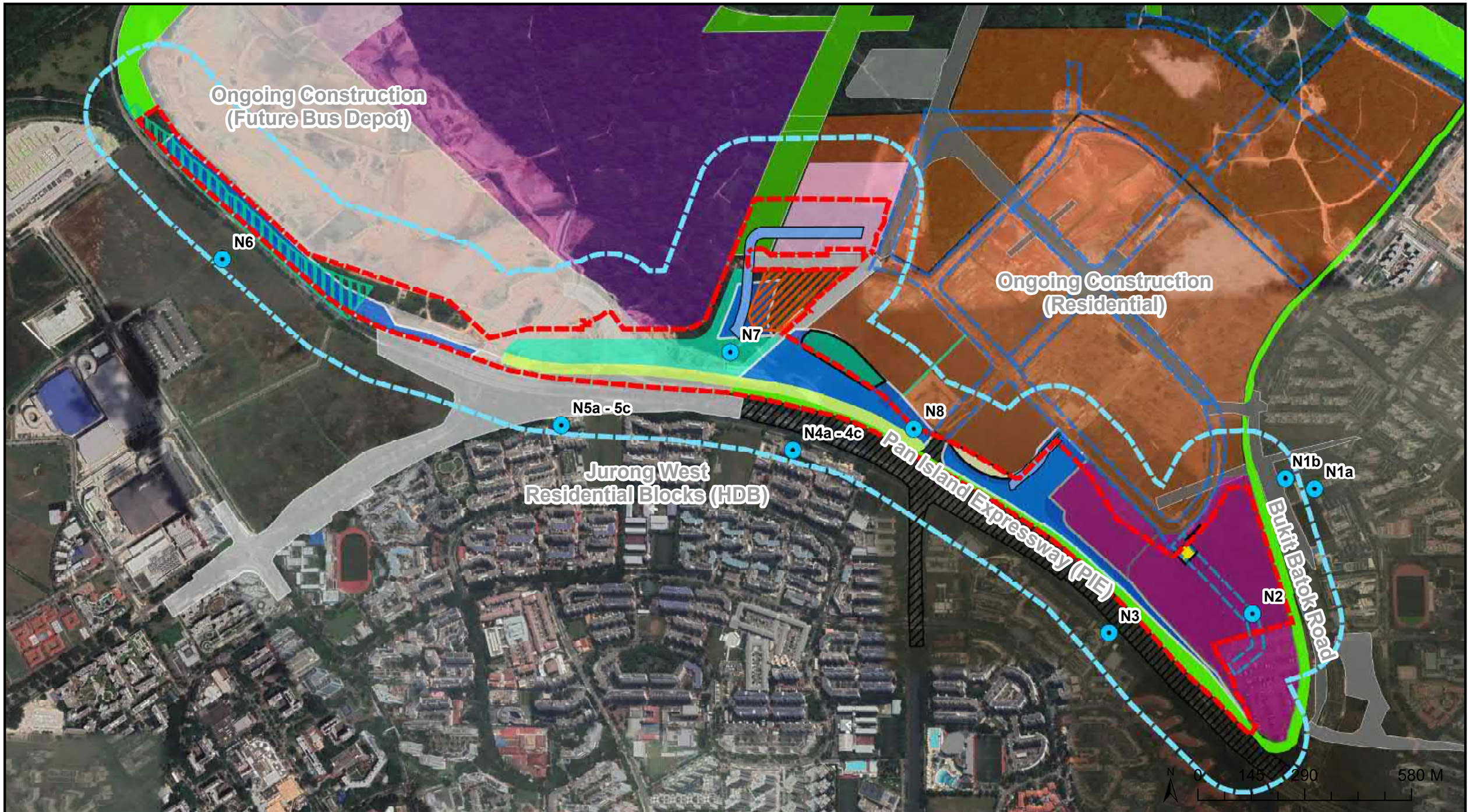
Table 10-1 Baseline noise monitoring locations

S/N	Monitoring Location	Justification	Photo of Monitoring Location
N1a	Dulwich College (rooftop)	Representative baseline noise monitoring location representing the south east of the Study Area. The baseline noise level is expected to be dominated by the operational noise from the school and traffic noise from the Bukit Batok Road.	
N1b	HDB Land Lot (No. MK10-05123K), near Dulwich College (ground level)		
N2	Tengah Forest (Future Residential)	Tengah Forest is an ecologically sensitive site within the central east side of Study Area. The selected location represents the internal environment of the ecologically sensitive site within the Project site.	

S/N	Monitoring Location	Justification	Photo of Monitoring Location
N3a	Block 374 HDB Jurong East	Representative baseline noise monitoring location for Jurong Primary School and residences on the southwest of the Study Area. Jurong Primary School was undergoing construction at the time of site reconnaissance hence the monitoring location shifted to the nearest residential area to this site. The baseline noise level is expected to be dominated by the operation noise from the traffic noise along PIE.	
N4a	Block 409 HDB Jurong West: • N4a (ground level) • N4b (mid-level) • N4c (rooftop)	Representative baseline noise monitoring location for residences on the south west of the Study Area. The baseline noise level is expected to be dominated by traffic noise along PIE.	
N4b			

S/N	Monitoring Location	Justification	Photo of Monitoring Location
N4c	Block 409 HDB Jurong West: • N4a (ground level) • N4b (mid-level) • N4c (rooftop)	Representative baseline noise monitoring location for residences on the south west of the Study Area. The baseline noise level is expected to be dominated by traffic noise along PIE.	
N5a	Block 561B HDB Jurong West: • N5a (ground level) • N5b (mid-level) • N5c (rooftop)	Representative baseline noise monitoring location within the central west of the Study Area. The baseline noise level is expected to be dominated by the traffic noise from the PIE, Hong Kah Flyover, and opposite LTA construction worksite along Jurong Road.	
N5b			
N5c	Block 561B HDB Jurong West: • N5a (ground level) • N5b (mid-level) • N5c (rooftop)	Representative baseline noise monitoring location within the central west of the Study Area. The baseline noise level is expected to be dominated by the traffic noise from the PIE, Hong Kah Flyover, and opposite LTA construction worksite along Jurong Road.	

S/N	Monitoring Location	Justification	Photo of Monitoring Location
N6	Future Industrial Area	Representative baseline noise monitoring location in the western side of the area. Exact location to be determined. The baseline noise level is expected to be dominated by the traffic noise from the PIE and opposite to LTA construction sites.	
N7	Tengah Forest (Future Educational)	Tengah Forest is an ecologically sensitive site within the Study Area. The selected location represents within the Tengah Forest ecologically sensitive site area in the central side of the Study Area. The baseline noise level is expected to be dominated by nearby construction sites of LTA.	
N8	Tengah Forest (Future Park/ Residential)	Tengah Forest is an ecologically sensitive site within the Study Area. The selected location represents the internal environment of the ecologically sensitive sites within the Project site. The baseline noise level is expected to be dominated by nearby HDB construction sites	



Legend

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- Future Hospital Development

This Project

- Earthworks
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- Site Clearance of forest patch for Future Residential Development
- Site Clearance of forest patch for Future Temporary Outlet Drain
- Site Clearance of forest patch for Future Road
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- Tengah Pond
- Tengah Stream

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- JRL2
- JRL3
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- JID
- Nanyang Pipeline
- Future Commercial and Residential Development

Note: Only project sites that fall within the boundary of the Southern Tengah Study Area will be assessed for noise impact assessment (NIA) as agreed with HDB.

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Qualified Person Endorsement : NA

HDB Endorsement : NA

Consultant : AECOM

Client: HOUSING & DEVELOPMENT BOARD

Project Title :

CONTRACT L/025/21
SPECIALIST CONSULTANCY SERVICES FOR ENVIRONMENTAL IMPACT STUDIES (EIS) AT SOUTHERN TENGAH

Figure Title :

Baseline Airborne Noise Monitoring Locations within/ surrouding the Southern Tengah Study Area

Designed	Checked	Approved	Figure No. :	Rev.	Sheet
SAG	NHT	JAG	10-1	-	1 of 1
	Drawn SYT	Date OCT 2021	CAD File Name : NA		A3

Note: Source of basemap - Google Earth Map

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10.2.2 Classification of Noise Sensitive Receptors

The classification of both ecological and human receptors is described as follows and visualised in Figure 10-3 and Figure 10-4 of Section 10.4. Further discussion on the identification of noise sensitive receptors (NSRs) are detailed in Section 10.4.

10.2.2.1 Ecological Receptors

Based on the assessment methodology in Table 6-1, the classification of ecological receptors was deduced based on the auditory sensitivities of the respective fauna species. Fauna species that used sound for communication, foraging and breeding, or as known to have their behaviours disrupted by sound, were assigned Priority 1 status due to their auditory sensitivity. Species that are less affected by airborne noise and/ or of Conservation Significance (CS) will be assigned as Priority 2. While species that are less affected by airborne noise and are not of CS will be assigned as Priority 3.

10.2.2.2 Human Receptors

As an initial step towards baseline noise impact assessment for the construction phase, buildings within the 150 m Study Area from the Project site were analysed. This is in accordance with the *Environmental Protection and Management (Control of Noise at Construction Sites) Regulations, 2008* [R-32]. There are three classifications (namely Priority 1, Priority 2, Priority 3) of human NSRs which relates to the nature of the establishment, be it educational institution, commercial or industrial space and so on, as described in Table 6-1.

While for the operational phase where traffic noise impacts are of concern, human receptors are classified as residential and noise sensitive developments in close proximity to the traffic source as detailed in the *NEA Technical Guideline for Land Traffic Nose Impact Assessment, 2016* [R-46]. These human receptors may be either new residential noise sensitive developments located in close proximity to the existing land traffic noise sources, or existing residential and noise sensitive developments located in close proximity to new transport-related developments inclusive of the expansion of existing transport-related infrastructures.

10.2.3 Assessment Criteria

10.2.3.1 Construction Noise Criteria

10.2.3.1.1 Ecological Receptors

The ecological impacts from airborne noise are species dependent and hence the assessment would be based on species identified during site surveys within the Study Area for airborne noise sensitive receptors to align with the biodiversity study in Section 7. Species which are noise sensitive are those that use noise, for example for their communication or identification of their way, at certain times of the day. Construction and noisy activities during their active times can cause interference with their day-to-day activities. Therefore, at these times, construction noise is curtailed beyond the human noise criteria.

As no guidelines or standards were available to assess construction noise impacts on the ecological receptors, the baseline monitoring results in the vicinity of the Study Area shall be applied to form the assessment criteria for the airborne noise impact assessment on ecological receptors. Unlike human receptors, baseline monitoring results were chosen as a basis of comparison for ecological receptors because fauna species face a direct form of impact, given that the habitats where they reside in are directly impacted by the noises emitted from the introduction of construction activities in the vicinity. Therefore, it is not advisable to adopt similar assessment criteria to human receptors where they operate in different nature.

For the purpose of noise impact assessment on ecological receptors in this EIS, a criterion of no-worse-off than maximum of baseline was adopted and applied on faunal receptors at the Study Area to be aligned with the approach and methodology practiced by Jacobs in Project No. D3332600, 'Specialist Consultancy Services for Environmental Impact Study at Tengah Town'.

Furthermore, akin to the correction factor used to deduce the corrected noise criteria for human receptors discussed in the section below, adjustments will be made to the predicted noise levels for ecological receptors to account for the pre-existing maximum baseline noise levels.

10.2.3.1.2 Human Receptors

In determining the impact of the construction noise to sensitive receptors, the average baseline noise level detailed in Section 10.7 will be included in the calculation to derive a background noise correction factor to establish the maximum permissible noise level from the construction activities in accordance with the noise legislation stated in *Environmental Protection and Management (Control of Noise at Construction Sites) Regulations, 2008* [R-32]. It is to be noted that Airborne noise impacts will occur from above ground construction sites only.

The legislative requirements for environmental noise in Singapore contain three parts which specify the applicable noise criteria for construction sites over different time periods. The corresponding maximum permissible noise criteria are provided in Table 10-2 to Table 10-4 for periods of different duration, these are:

- $L_{Aeq(12\ hour)}$ which refers to equivalent continuous noise level over a period of 12 hours;
- $L_{Aeq(1\ hour)}$ which refers to equivalent continuous noise level over a period of 1 hour within a 24-hr period; and
- $L_{Aeq(5\ min)}$ which refers to equivalent continuous noise level over a period of 5 minutes within a 24-hr period.

Table 10-2 Maximum permissible noise levels for construction works over a period of 12 hours

Types of Affected Buildings	Days of the week	Maximum Permissible $L_{Aeq(12\ hour)}$, dB	
		7am – 7pm	7pm – 7am
(a) Hospitals, schools, institutions of higher learning, homes for the aged or sick etc.	All days	60	50
(b) Residential buildings located less than 150 m from the construction site where the noise is being emitted	All days	75	–
(c) Buildings (other than those in paragraphs (a) and (b))	All days	75	65

Table 10-3 Maximum permissible noise levels for construction works over a period of 1 hour

Types of affected buildings	Days of the week	Maximum Permissible $L_{Aeq\ (1\ hour)}$ (dB)		
		7am – 7pm	7pm – 10pm	10pm – 7am
Residential buildings located less than 150 m from the construction site where the noise is being emitted	Monday to Saturday	–	65	55

Table 10-4 Maximum permissible noise levels for construction works over a period of 5 minutes

Types of affected buildings	Days of the week	Maximum Permissible $L_{Aeq\ (5\ mins)}$ (dB)		
		7am – 7pm	7pm – 10pm	10pm – 7am
(a) Hospitals, schools, institutions of higher learning, homes for the aged or sick etc.	All days	75	55	55
(b) Residential buildings located less than 150 m from the construction site where the noise is being emitted	Monday to Saturday	90	70	55
	Sundays & Public Holidays (PHs)	75	55	55
(c) Buildings (other than those in paragraphs (a) and (b))	All days	90	70	70

As per the legislation, if there are other sources of noise affecting the measurement of noise emitted from the construction site, the maximum permissible noise levels for construction sites should be adjusted by the addition of a correction factor to account for the existing background noise levels in the area. The correction factor corresponds to the difference between the relevant permissible level, and the background noise level and is presented in Table 10-5. The difference in the noise levels are then added to the higher of the two noise levels (background noise/ criteria as appropriate) to give the applicable noise criteria for the specified construction area.

Table 10-5 Construction noise correction factor

Difference between Permissible & Background Noise Levels (dB(A))	Correction Factor to be Added to the Higher of the Two Noise Levels, (dB(A))
Below 2	3
2 to 4	2
4 to 10	1
10 and above	Nil

10.2.3.2 Operational Noise Criteria

10.2.3.2.1 Ecological Receptors

There are currently no guidelines or standards available to assess the noise from operational activities on the ecological receptors. The current guidelines and standards available are used to assess the respective noise impacts to humans only and will be adopted for the ecological receptors for this study for the purpose of establishing the criteria and assessing noise impacts to the identified noise sensitive ecological receptors. The ecological impacts from airborne noise is species dependent, hence the assessment will be based on the species identified by the fauna specialists during site surveys within the Study Area, in sync with the biodiversity section of this report.

The adopted human guidelines and standards for the operational noise impact on ecological receptors are reflected in Section 10.2.3.2.2 below.

10.2.3.2.2 Human Receptors

For airborne noise arising from the operational phase, there exists two (2) aspects of impact for consideration:

1. Operation of air conditioning and mechanical ventilation (ACMV) systems for proposed buildings (non-industrial) within the Project site; and
2. Vehicular noise from road traffic at the Project site.

10.2.3.2.2.1 Air Conditioning and Mechanical Ventilation Boundary Noise Limits

According to the *NEA Technical Guideline on Boundary Noise Limits for Air Conditioning and Mechanical Ventilation Systems in Non-Industrial Buildings, 2018* [R-40], non-industrial buildings refers to any permanent or temporary building or structure used for the purposes of trade, business or commerce and includes any shopping complex, financial institution, office tower, hotel, educational institution, hospital, transport infrastructures, community infrastructure, sport and recreational infrastructure but does not include any factory and residential premises. The noise limits for ACMV systems are outlined in Table 10-6 below.

Table 10-6 NEA boundary noise limits

Type of Affected Premises	Boundary Noise Limits (reckoned as the equivalent continuous noise level over 15 minutes), dB(A)		
	Day 7am – 7pm	Evening 7pm – 11pm	Night 11pm – 7 am
Noise Sensitive Premises e.g. hospital, home for the aged sick, library.	60	55	50
Residential Premises	65	60	55
Others	70	65	60

In accordance with the guideline, noise from sources under consideration are to be measured to determine the impact over a continuous 15-minute period. Adjustments to the measured noise levels are to be applied to account for the effects for duration, tonality, intermittency, and impulsiveness of noise. The adjusted 15-minute noise level measurement should then be assessed in relation to the noise limits as shown in Table 10-6 above.

To deduce the adjusted operational noise criteria, a Noise Consultant should be appointed by HDB/ the contractor appointed by HDB once the non-industrial buildings and associated ACMV systems are laid out to procure an accurate understanding of baseline noise levels for the operational phase where noise levels should be measured at the boundaries of the non-industrial buildings following the methodologies detailed in the guideline. Hence, operational noise impacts arising from ACMV systems have been omitted from in this report.

According to the guideline:

> *"Where a noise source contains certain characteristics such as tonality, impulsiveness, intermittency, irregularity or dominant low frequency content, there is evidence to suggest that it can cause greater annoyance than other noise at the same level and a penalty of 5 dB (A) shall be added for each of the following characteristics, up to a maximum to 10 dB (A)."*

Hence, noise correction factors shall be applied to the baseline noise results to determine the operational noise criteria for the Project. The maximum permissible noise levels for the Project shall be deduced and adjusted by the correction factor reflected in Table 10-7 below to account for the existing noise levels measured at defined boundaries of the non-industrial buildings by the appointed Noise Consultant.

The correction factor corresponds to the difference between maximum permitted level (see Table 10-7) and the baseline noise levels, to the higher of the two (2) noise levels. The adjusted value for the maximum permissible noise limit (i.e. the indicative operational noise criteria), shall be determined through the addition of the correction factor to the baseline noise results.

Table 10-7 ACMV noise correction factor

Difference between 2 noise levels in decibels (A)	Correction factor in decibels (A)
Below 2	3
2 to less than 4	2
4 to less than 10	1
10 and above	Nil.

10.2.3.2.2.2 Land Traffic Noise

The Technical Guideline for Land Traffic Noise Impact Assessment provides guidance to conduct for the following:

- Part 1 – Land traffic Noise Impact Assessment on new residential and noise sensitive developments located in close proximity to existing land traffic noise sources/hotspots (e.g. expressways/major arterial roads/MRT tracks); and
- Part 2 – Land traffic Noise Impact Assessment on existing residential and noise sensitive developments located in close proximity to new transport-related developments (e.g. expressway/major arterial roads/MRT track/bus interchanges/bus depots), inclusive of the expansion of existing transport-related infrastructures.

The noise emissions due to movement of traffic shall be assessed against the *NEA Technical Guideline for Land Traffic Noise Impact Assessment, 2016* [R-46] for the proposed development for operation of transportation network in the Project site. The noise levels of the new residential and noise sensitive development shall comply with the following NEA's noise requirement.

NEA's noise requirements are as follows:

- The noise levels at 1 m from the façade of the new residential/noise sensitive building shall not exceed $L_{Aeq(1hr)}$ 67 dB; and
- The indoor noise level of the new residential/noise sensitive building under natural ventilation shall not exceed $L_{Aeq(1hr)}$ 57 dB.

This Traffic Noise Impact Assessment (TNIA) is typically conducted by a Noise Consultant appointed for the proposed developments for the residential and noise sensitive buildings for the Project and hence have been omitted in this report.

10.2.4 Prediction and Evaluation of Impact Assessment

The airborne noise impact assessment includes the evaluation of construction and operational noise impacts to the respective noise sensitive receptors (NSRs).

10.2.4.1 Construction Phase

The study on construction noise impact to the NSRs will focus on the following three (3) scenarios established based on the construction stages (see Section 3.3) involved in this Project as agreed with HDB. As reflected in Table 10-9, there are several developments within the Project site that will undergo similar construction stages during different periods of time (see Section 3.5), each with its own sets of powered mechanical equipment (PMEs).

Usually in the EIAs only one worst case phase is modelled, however, HDB will be constructing at various different locations at different times, given which AECOM chose to model all major phases of construction as below. In order to streamline noise impact assessment and produce meaningful results for this Project, developments sharing the same construction stages were compared. The highest effective sound power level (SPwL) for each construction stage was then chosen to be representative of the construction stages as shown in Table 10-10 where three (3) scenarios were established. In doing so, a conservative approach has been taken, wherein, the entire area was assumed to undergo single phase at the same time, which may represent the worst potential peak time of construction phase instead of the entire duration as assessed in this report:

- Scenario 1: Site Clearance;
- Scenario 2: Earthworks; and
- Scenario 3: Infrastructure and Building Works.

Scenario 1: Site Clearance referenced the highest effective SPwL of the PMEs adopted for Stage 1: Advance Works/ Site Clearance, and similarly Scenario 2: Earthworks referenced that of the highest effective SPwL of PMEs adopted for Stage 2: Earthworks. For Scenario 3: Infrastructure and Building Works, as most of the two (2) construction stages will occur during overlapping periods of time, construction stages Stage 3: Infrastructure Works and Stage 4: Building Works were hence combined for assessment.

The intent of selecting the three (3) scenarios was such that if noise can be controlled by permanent features during the entire construction period relative to the scenarios, the noise from other less noisy activities will also be mitigated. It should be noted that across all the construction scenarios, only Scenario 1: Site Clearance was considered for night-works with working hours from 8am – 10pm, with other stages having working hours from 7am – 7pm (i.e. no night-works) as per information provided by HDB. As such, only Scenario 1: Site Clearance will be assessed for $L_{Aeq(12\ hours)}$, $L_{Aeq(1\ hour)}$, and $L_{Aeq(5\ mins)}$ for the construction schedules of 7am – 7pm and 7pm – 10pm, while Scenario 2 and Scenario 3 will only be assessed for $L_{Aeq(12\ hours)}$ and $L_{Aeq(5\ mins)}$ for 7am – 7pm, in accordance with the *Environmental Protection and Management (Control of Noise at Construction Sites) Regulations, 2009* [R-32].

For the assessment of the construction phase, the prediction of noise levels generated from the equipment used during construction detailed in Section 10.3 was predicted using SoundPLAN ver. 8.2. Where topography is not available, a flat terrain based on the nearest spot height from the topography survey will be taken within the Study Area. A quantitative assessment of the NSRs (within the 150 m Study Area) will be carried out and compared with the stipulated *Environmental Protection and Management (Control of Noise at Construction Sites) Regulations, 2008* [R-32]. The identified NSRs will be assessed in accordance with the impact evaluation matrix in Section 6.4.2. Noise contours will be provided to the extent where topography is available. Based on the impact evaluation, mitigation to reduce airborne noise impacts will be recommended for the affected NSRs where necessary.

As detailed in the assessment methodology (see Section 6.4.2), noise sensitive receptors were first identified and classified by the nature of the receptors as reflected in Table 6-2. Then, Impact Intensity is determined by the magnitude of noise exceedances predicted as shown in Table 6-6.

The magnitude of noise exceedances was predicted through noise modelling with SoundPLAN ver. 8.2. For ecological receptors, as mentioned in Section 10.2.3.1.1, recorded maximum baseline noise levels was added to predicted noise levels to account for pre-existing baseline conditions. Thereafter, the adjusted predicted noise levels were compared against the maximum baseline noise levels established as the no-worse off than baseline criterion for ecological receptors, aligned with approach and methodology practiced by Jacobs in Project No. D3332600. Noise exceedances derived from this comparison will then be used to deduce Impact Intensity.

While for human receptors, noise levels experienced by the receptors from the identified scenarios were similarly predicted using SoundPLAN ver. 8.2. However, as the current baseline noise levels are already accounted for as part of corrected noise criterion where the maximum permissible noise levels are adjusted according to baseline noise levels, no further addition of baseline noise levels to predicted noise levels was conducted. The predicted noise levels experienced by human receptors were then compared to the corrected noise criteria adjusted using average baseline noise levels recorded near the human receptors where exceedance found would contribute to the deduction of Impact Intensity.

By considering both Impact Intensity and Receptor Sensitivity, Impact Consequence can be obtained as per the matrix in Table 6-7. Thereafter, Likelihood of the impact from the construction activities of this Project were calculated based on the percentage of the duration of the activity over the construction timeline at the worksite (e.g., an activity happening < 5% of the construction timeline at the worksite results in an Unlikely/ Remote Likelihood) as shown in Table 6-8. By relating both Impact Consequence and Likelihood of Occurrence, the Impact Significance of airborne noise impacts were predicted with the consideration of minimum control measures (see Section 10.6). Further analysis and evaluation were then conducted to recommend additional mitigation measures (e.g., noise barriers, etc.) where necessary. At the end a monitoring plan was established and triggers for action determined so that the impacts can be controlled within acceptable limits or as low as reasonably practicable.

10.2.4.2 Operational Phase

Referring to Section 10.2.3.2, it is mandatory for the proposed developments to comply with NEA's guidelines for boundary noise impact assessment for air conditioning and mechanical ventilation (ACMV) systems of non-industrial buildings and Traffic Noise Impact Assessment (TNIA) for existing/ new road networks for the developments within the Project site. Usually conducted by an appointed Noise Consultant during the development stage, AECOM recommends the works for ACMV boundary noise impact assessment and TNIA to be conducted in the later stages of the development in accordance with *NEA Technical Guideline on Boundary Noise Limits for Air Conditioning and Mechanical Ventilation Systems in Non-Industrial Buildings, 2018* [R-40] and *NEA Technical Guideline for Land Traffic Noise Impact Assessment, 2016* [R-46].

10.3 Potential Sources of Airborne Noise Impact and Likelihood of Occurrence

10.3.1 Construction Phase

This section discusses on the equipment and activities which could potentially contribute to noise impacts during the construction phase of the Project. The main sources of noise will originate from the Powered Mechanical Equipment (PMEs) used for the construction stages (see Section 3.3).

Based on the construction programme proposed by HDB, a total of four (4) construction stages starting with Advance Works/ Site Clearance, followed by Earthworks, Infrastructure Works and Building Works as discussed in Section 3.3.

As mentioned in Section 10.2.4.1, the construction phase is modelled as a result of construction activities expected to occur within the Project site. The three (3) scenarios (see Table 10-10) deduced from the construction stages are chosen for assessment based on the worst-case construction stages with the highest overall sound power level as reflected in Table 10-9. The rationale behind deducing these three (3) scenarios is under the assumption that if the construction stages with the highest sound power level can be mitigated for instance with permanent fixtures such as noise barriers or other means proposed in Section 10.8 below, noise impacts from other construction stages/ activities with lower sound power level will also be addressed.

It should be noted that for Infrastructure Works and Building Works for most stages were combined and assessed in Scenario 3: Infrastructure and Building Works with the understanding that the construction timeline of these two activities will occur during the same time period (refer to Section 3.5).

Hence, based on the effective sound power levels generated from construction works in the Project site as summarised in Table 10-9, three (3) worst-case scenarios' sound power levels applied for construction phase noise modelling are reflected in Table 10-10 below. Figure 10-2 reflects the area of assessment within the Project site for each of the three (3) scenarios for Project developments grouped together with their associated construction stages as listed in Table 10-9.

10.3.1.1 Likelihood of Occurrence of Airborne Noise Impacts

The Likelihood of Occurrence of the airborne noise impacts was determined based on the construction timeline and associated activities chosen for assessment reflected in Table 10-7 in accordance with the assessment criteria for the Likelihood of Occurrence matrix in Table 6-8.

Please note that due to the confidentiality of the timeline of the construction stages/ activities, detailed timelines included in the deduction of the Likelihood of Occurrence have been omitted in following sections, Section 10.3.1.1.1, 10.3.1.1.2 and 10.3.1.1.3.

10.3.1.1.1 Scenario 1: Site Clearance

Site Clearance is the sole construction activity considered for assessment for 7am – 7pm and 7pm – 10pm for Weekdays with extended timeline for works as per information provided by HDB. According to the detailed Project construction schedule (omitted due to confidentiality of information) the proposed developments of Scenario 1 within the Project will occur over the short term (see Table 3-1), equating to approximately 0.67% of the total construction timeline.

According to Table 6-8, activities happening for <5 % of the construction timeline will have a Likelihood of Occurrence of **Unlikely/ Remote**, provided in Table 10-8 below. In order to streamline the report, reference to Likelihood for airborne noise impact assessment for Scenario 1 shall apply the term '**Unlikely**' to refer to **Unlikely/ Remote**.

10.3.1.1.2 Scenario 2: Earthworks

Scenario 2: Earthworks is considered for assessment for 7am – 7pm for Weekdays in accordance with the work schedule as per information provided by HDB. According to the detailed Project construction schedule (omitted due to confidentiality of information) the proposed developments of Scenario 2 within the Project site will occur during the midterm (see Table 3-1), equating to approximately 16.0% of the total construction timeline.

As observed in Table 6-8, activities happening for 5 – 15% of the construction timeline will have a Likelihood of Occurrence of **Possible/ Occasional**, reflected in Table 10-8 below. In order to streamline the report, reference to Likelihood for airborne noise impact assessment for Scenario 2 shall apply the term '**Occasional**' to refer to **Possible/ Occasional**.

10.3.1.1.3 Scenario 3: Infrastructure and Building Works

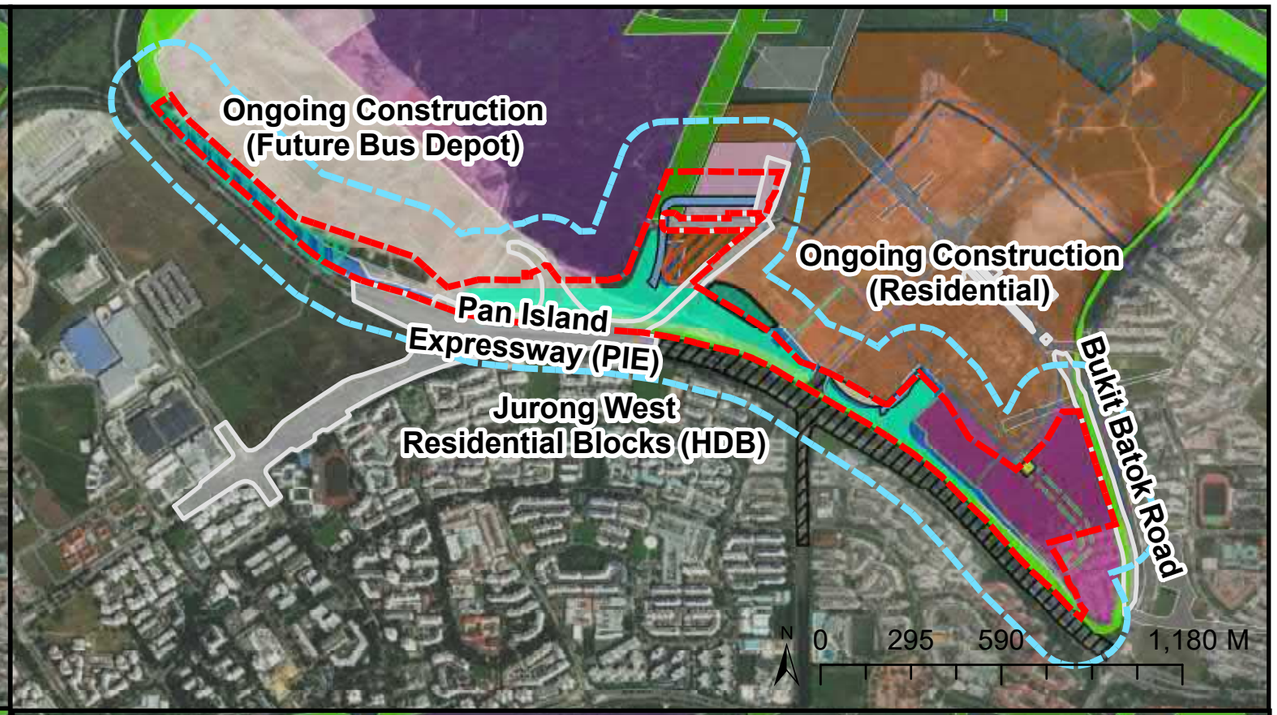
Scenario 3: Infrastructure and Building Works is considered for assessment for 7am – 7pm for Weekdays in accordance with the work schedule as per information provided by HDB. According to the detailed Project construction schedule (omitted due to confidentiality of information) the proposed developments of Scenario 3 within the Project site will occur during the midterm (see Table 3-1), which equates to approximately 28.0% of the total construction timeline.

With reference to Table 6-8, activities happening for 26 – 50% of the construction timeline will have a Likelihood of Occurrence of **Likely/ Regular**, as shown in Table 10-8 below. In order to streamline the report, reference to Likelihood for airborne noise impact assessment for Scenario 3 shall apply the term '**Likely**' to refer to **Likely/ Regular**.

Table 10-8 Likelihood evaluation on construction scenarios for airborne noise impact assessment

Worksites	Construction Activities and Duration	Likelihood
Scenario 1: Site Clearance		
Site Clearance Scenario Area of Assessment (refer to Figure 10-2)	The total construction timeline used in the calculation to derive Likelihood has been omitted from this report due to confidentiality of information.	The Likelihood of Occurrence of the construction stages as part of Site Clearance for $L_{Aeq(12\ hours)}$, $L_{Aeq(1\ hour)}$, and $L_{Aeq(5\ mins)}$ for 7am – 7pm and 7pm – 10pm (Weekdays) – approximately 0.67%. **Likelihood:** Unlikely/ Remote (see Table 6-8)
Scenario 2: Earthworks		
Earthworks Scenario Area of Assessment (refer to Figure 10-2)	The total construction timeline used in the calculation to derive Likelihood has been omitted from this report due to confidentiality of information.	The Likelihood of Occurrence of the construction stages as part of Earthworks for $L_{Aeq(12\ hours)}$ and $L_{Aeq(5\ mins)}$ for 7am – 7pm (Weekdays) – approximately 16.0%. **Likelihood:** Possible/ Occasional (see Table 6-8)
Scenario 3: Infrastructure and Building Works		
Infrastructure and Building Works Scenario Area of Assessment (refer to Figure 10-2)	The total construction timeline used in the calculation to derive Likelihood has been omitted from this report due to confidentiality of information.	The Likelihood of Occurrence of the construction stages as part of Infrastructure and Building Works for $L_{Aeq(12\ hours)}$ and $L_{Aeq(5\ mins)}$ for 7am – 7pm (Weekdays) – approximately 28.0%. **Likelihood:** Likely/ Regular (see Table 6-8)









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- Future Commercial and Residential Development

Scenarios

- Scenario 1: Site Clearance
- Scenario 2: Earthworks
- Scenario 3: Infrastructure and Building Works

Note: Only project sites that fall within the boundary of the Southern Tengah Study Area will be assessed for noise impact assessment (NIA) as agreed with HDB.

Three (3) scenarios were deduced for assessment as described in Section 10.3 of the EIS Final Report.

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Figure Title :

Scenarios for Airborne Noise Impact Assessment

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SAG	NHT	JAG	10-2	-	1 of 1
	Drawn SYT	Date OCT 2021	CAD File Name : NA		A3

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Table 10-9 Effective sound power level (construction phase)

No.	Construction Stages/ Activities	Effective Sound Power Level L_{wA}, dB(A) from overall equipment inventory						
		$L_{Aeq\ (12\ hours)}$		$L_{Aeq\ (1\ hour)}$		$L_{Aeq\ (5\ mins)}$		
		7am – 7pm	7pm – 7am	7pm – 10pm	10pm – 7am	7am – 7pm	7pm – 10pm	10pm – 7am
Stage 1: Advance Works/ Site Clearance								
a	Site Clearance – General	103		104		106	106	
b	Site Clearance of forest patch for Temporary Outlet Drain	107		108		110	110	
Stage 2: Earthworks								
c	Earthworks*	105				108		
Stage 3: Infrastructure Works								
d	Infrastructure Works	111				114		
Stage 4: Building Works								
e	Building Works (Foundation) – General	125				127		
f	Building Works (Foundation) – Future Commercial and Residential Sites^	118				121		
g	Building Works (Superstructure)	99				103		

Note: Only Site Clearance is considered for night-works from 7pm – 10pm following information provided by HDB. As such, grey cells reflect blank inputs from other construction stages that were not considered for night-time construction.

 # Site Clearance is assumed to occur at the same period for all construction stages.

** Earthworks was not assumed for future commercial and residential sites under the assumption that earthworks at both locations will be minimal due to relatively flat terrain.*

^ Powered mechanical equipment (PMEs) of lower sound power levels were adopted for the future commercial and residential sites due to its proximity to the forested areas where noise sensitive ecological receptors are found.

Table 10-10 Effective sound power level – noise model input)

Scenario(s)	Effective Sound Power Level L_{wA}, dB(A) Noise Model input						
	L_{Aeq} (12 hours)		L_{Aeq} (1 hour)		L_{Aeq} (5 mins)		
	7am – 7pm	7pm – 7am	7pm – 10pm	10pm – 7am	7am – 7pm	7pm – 10pm	10pm – 7am
Scenario 1: Site Clearance							
Site Clearance – General	103		105		106	106	
Site Clearance of forest patch and Temporary Outlet Drain	107		108		110	110	
Scenario 2: Earthworks							
Earthworks	105				108		
Scenario 3: Infrastructure and Building Works							
Infrastructure Works	111				114		
Building Works (Foundation) – General	125				127		
Building Works (Foundation) – Future Commercial and Residential Sites	118				121		
Note: Only Site Clearance is considered for night-works from 7pm – 10pm following information provided by HDB. As such, grey cells reflect blank inputs from other construction stages that were not considered for night-time construction.							

10.3.2 Operational Phase

The typical potential noise sources during the operational phase of the Project includes the following:

- Traffic noise due to increase in vehicular volume due to the development of the Project and in the vicinity of the Project site; and
- Air-conditioning and mechanical ventilation (ACMV) noise from services emitted from non-industrial buildings as part of the Project development.

The potential impacts due to the increase in noise levels from the above-mentioned sources includes noise disturbance to humans and in addition, disturbance to ecological receptors (i.e. fauna species) found within the nearby Southern Tengah Forest such as the potential impacts of affecting ecological foraging behaviour, and intra-species and inter-species communication.

Operational noise arising from air conditioning system and mechanical ventilation system are expected to persist through the day, emitting from proposed non-industrial buildings depending on the nature of the eventual establishment.

10.4 Identification of Airborne Noise Sensitive Receptors

This study focused on the noise impacts to the ecological receptors (fauna) and human receptors within the study area during the construction phase and operational phase of the Project. The classification of ecological receptors and human receptors was based on the auditory sensitivity of the respective species as described in Section 10.2.2. The identified noise sensitive receptors (NSRs) for the construction phase and operational phase are further discussed in the following Section 10.4.1 and Section 10.4.2 respectively.

10.4.1 Construction Phase

10.4.1.1 Ecological Receptors

10.4.1.1.1 Receptor Importance

The prioritisation of the ecological receptors within the Southern Tengah Forest Areas follows the approach listed in the below order:

1. The actual presence or likely presence (from records) from faunistic field assessment conducted;
2. The conservation significance or importance of the identified ecological receptors; and
3. The ecological receptor's likelihood to be sensitive to noise impacts.

Based on faunistic field assessment in the vicinity of the Project site, a summary of the receptors of concern in line with the biodiversity section are discussed below. The full list of ecological receptors is reflected in Appendix Y.

Priority 1 and Priority 2 and Priority 3 fauna species have been identified in Table 10-11 for the Southern Tengah Forest Areas and the Project site with the identified species of conservation significance (CS) reflected in Table 10-12. These identified fauna species are of particular concern due to their auditory sensitivities to airborne noise. Priority 3 fauna species that have been identified as animals not likely to be affected by noise are also reflected in Table 10-11 and discussed below. A full detailed list of ecological receptors is reflected in Appendix Y.

10.4.1.1.2 Receptor Sensitivity to Airborne Noise

The following paragraphs discusses the ecological receptors and the rationale for their respective auditory sensitivity.

The priority levels for auditory sensitivity reflected in Table 10-11 were assigned based on the following general framework provided by the biodiversity specialists of this Project:

- Priority 1: Animals that vocalise during important life cycle stages such as courtship, territorial claims and/ or mating;
- Priority 2: Animals that have auditory sensory systems but do not necessarily need to vocalise during important life cycle stages; and
- Priority 3: Animals that are not likely to be affected by noise.

Aculeate hymenopterans such as bees and wasps are capable of detecting airborne sounds despite not having ears. Due to their capability of detecting noise, aculeate hymenopterans are deemed to be highly auditory sensitive [P-66]. Hence, they are classified as Priority 2 sensitive ecological receptor.

Amphibians such as frogs are considered to have highly auditory sensitive as studies have demonstrated that anthropogenic noise is likely to substantially decrease the reproductive success in frogs [P-67]. Hence, amphibians are classified as Priority 1 ecological receptors.

Birds are considered to be highly auditory sensitive as most make use of sound for communication and breeding. Studies have also shown that birds are impacted negatively by anthropogenic noise [P-68]. Hence, birds are classified as Priority 1 ecological receptors.

Lepidoptera such as the butterflies are known to behaviourally respond to low-frequency vibrations and sounds to avoid insect predators and parasites [P-69]. Adult butterflies are known to make use of existing airborne noise in

order to avoid predators [P-70]. Based on the above, lepidopterans are considered highly auditory. Hence, are classified as Priority 2 ecological receptors.

Studies have been conducted on the transmission of noise energy across the air to water boundary. Research shows that the transmission of airborne noise energy to the water medium is low due to the difference in acoustic characteristic impedance of air to water by a ratio of 1:3600 [P-71]. Hence, aquatic species such as decapod crustaceans and fishes that primarily dwell within water bodies are considered to be Priority 3 sensitive ecological receptors [0].

Non-volant mammals such as rodents are known to display stressed behaviour in response to sounds of heavy machinery which could be common occurrence from construction noise [P-77]. Hence, non-volant mammals are deemed to be highly auditory sensitive and classified as Priority 2 ecological receptors.

It is documented that adult odonates appear to be able to hear however sound does not appear to cause significant behavioural change [P-72]. Odonates are consequently regarded as being less auditory sensitive. Hence, they are classified as Priority 3 ecological receptors, dependant on conservation significance.

Reptiles such as lizards are considered to be highly auditory sensitive due to studies showing these species exhibiting stress responses when exposed to anthropogenic noise [P-73]. For snakes, though not equipped with outer-ears and tympanic middle ear, have vestiges for hearing inside their heads and can feel low-frequency airborne sounds [P-74]. Turtles on the other hand, follows the classification of aquatic species such as decapod crustaceans and fish due to their ability to traverse land and water [P-75]. As such, reptiles are classified as Priority 2 sensitive ecological receptors.

Anthropogenic noise is known to impacts bats negatively by disrupting foraging patterns [P-76] and are hence classified as highly auditory sensitive. Hence, they are classified as Priority 1 ecological receptors. However, based on faunistic surveys, bats of conservation significance were not observed for this Project.

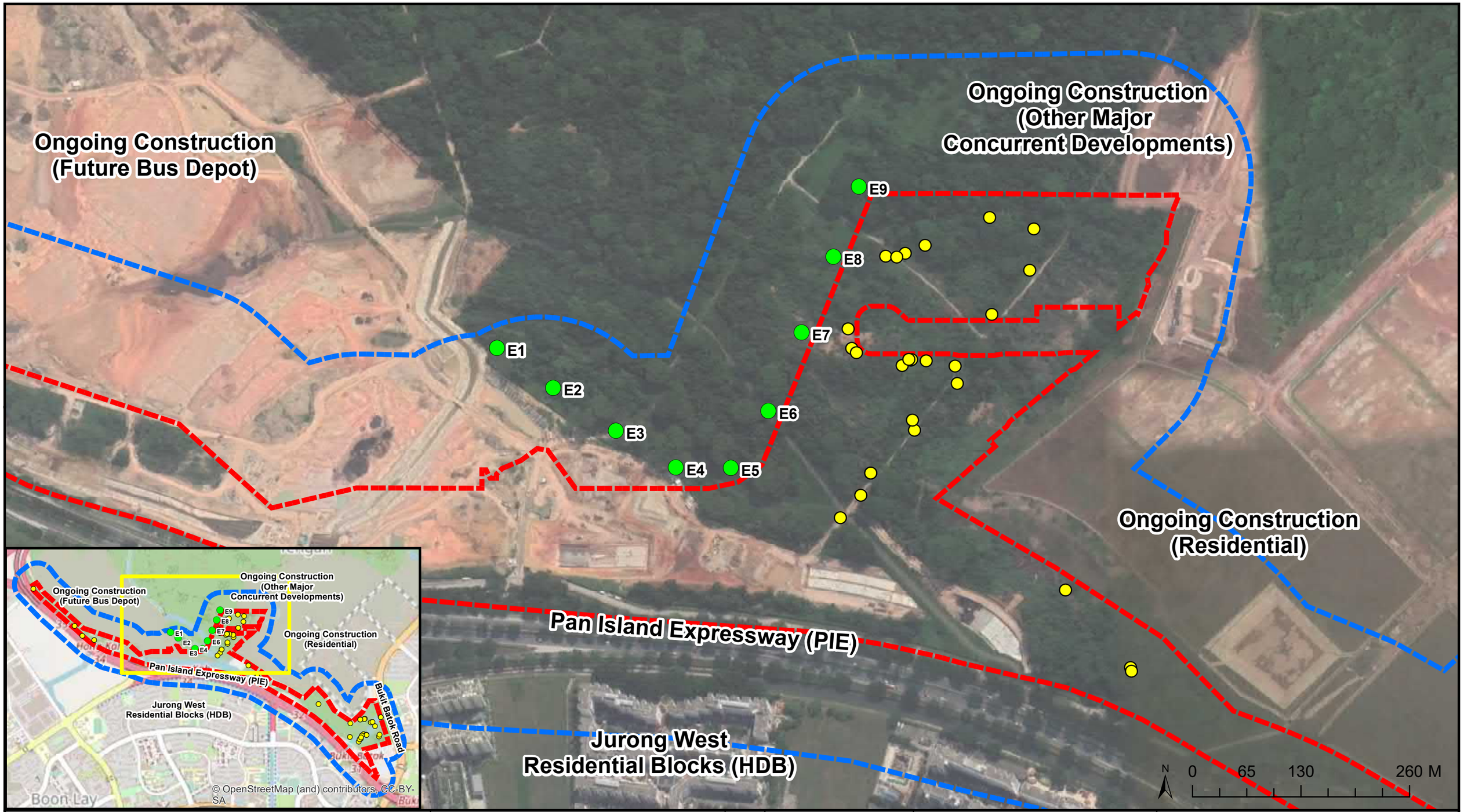
Table 10-11 Ecological receptors and airborne noise auditory sensitivity classification

Receptor Number	Ecological Sensitive Area	Receptors	Auditory Sensitivity Classification
1	Southern Tengah Forest areas	Aculeate Hymenopterans • Bee • Wasp	Priority 2
2		Amphibian • Toad • Frog	Priority 1
3		Birds	Priority 1
4		Butterflies	Priority 2
5		Decapod Crustaceans	Priority 3
6		Fish	Priority 3
7		Non-volant Mammals	Priority 2
8		Odonates • Damselfly • Dragonfly	Priority 3
9		Reptiles • Lizard • Snake • Turtle	Priority 2
10		Volant Mammals (Bats)	Priority 1

Table 10-12 Focal list of ecological receptors of conservation significance

No.	Faunal Group	Common name	Species	Global Status	National Status	Auditory Sensitivity
1	Bird	Blue-crowned hanging-parrot	*Loriculus galgulus*	Least Concern	Endangered	Priority 1
2	Bird	Changeable hawk-eagle	*Nisaetus cirrhatus*	Least Concern	Endangered	Priority 1
3	Bird	Crested goshawk	*Accipiter trivirgatus*	Least Concern	Critically Endangered	Priority 1
4	Bird	Grey-headed fish eagle	*Haliaeetus ichthyaetus*	Near Threatened	Critically Endangered	Priority 1
5	Bird	Long-tailed parakeet	*Psittacula longicauda*	Vulnerable	Not Assessed	Priority 1
6	Bird	Oriental magpie-robin	*Copsychus saularis*	Least Concern	Endangered	Priority 1
7	Bird	Red junglefowl	*Gallus*	Least Concern	Endangered	Priority 1
8	Bird	Red-legged crake	*Rallina fasciata*	Least Concern	Vulnerable	Priority 1
9	Bird	Red-wattled lapwing	*Vanellus indicus*	Least Concern	Endangered	Priority 1
10	Bird	Rusty-breasted cuckoo	*Cacomantis sepulcralis*	Least Concern	Vulnerable	Priority 1
11	Bird	Straw-headed bulbul	*Pycnonotus zeylanicus*	Critically Endangered	Endangered	Priority 1
12	Butterfly	Formosan swift	*Borbo cinnara*	Not Assessed	Endangered	Priority 1
13	Butterfly	Malay staff sergeant	*Athyma reta moorei*	Not Assessed	Not Assessed	Priority 1
14	Mammal	Sunda pangolin	*Manis javanica*	Critically Endangered	Critically Endangered	Priority 1
15	Reptile	Asian softshell turtle	*Amyda cartilaginea*	Vulnerable	Endangered	Priority 2
16	Reptile	Lowland dwarf gecko	*Hemiphyllodactylus typus*	Least Concern	Vulnerable	Priority 1
17	Reptile	Malayan box terrapin	*Cuora amboinensis*	Vulnerable; CITES protected	Not Assessed	Priority 2
18	Other less auditory sensitive fauna species					Priority 3

Note: This table presents the list of fauna species of Conservation Significance (CS).
Other non-CS fauna species of varying auditory sensitivities are provided in Appendix Y.



Legend

- Airborne Noise Impact Assessment - 150 m Study Area
- Southern Tengah Study Area

Noise Sensitive Receptors

Ecological Receptors

- Representative Ecological Receptors
- Fauna Species of Conservative Significance

Note: Representative Ecological Receptors (RERs) were created and positioned near the Project site for the purposes of noise modelling to deduce the potential noise impacts experienced by the ecological receptors.

RERs were not positioned on areas where other concurrent major developments are scheduled to commence before or during the same time as activities assessed in this Project (see Section 3.5).

N

Rev.	Date	By	Description	Chk'd	App'd
-	OCT 2021	SYT	Final Report	NHT	JAG

Qualified Person Endorsement : NA

HDB Endorsement : NA

Consultant : AECOM

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Project Title :

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SPECIALIST CONSULTANCY SERVICES FOR ENVIRONMENTAL IMPACT STUDIES (EIS) AT SOUTHERN TENGAH

Figure Title :

Noise Sensitive Receptors (Ecological)

Designed	Checked	Approved	Figure No. :	Rev.	Sheet
SAG	NHT	JAG	10-3	-	1 of 1
	Drawn SYT	Date OCT 2021	CAD File Name : NA		A3

Note: Source of basemap - Google Earth Map

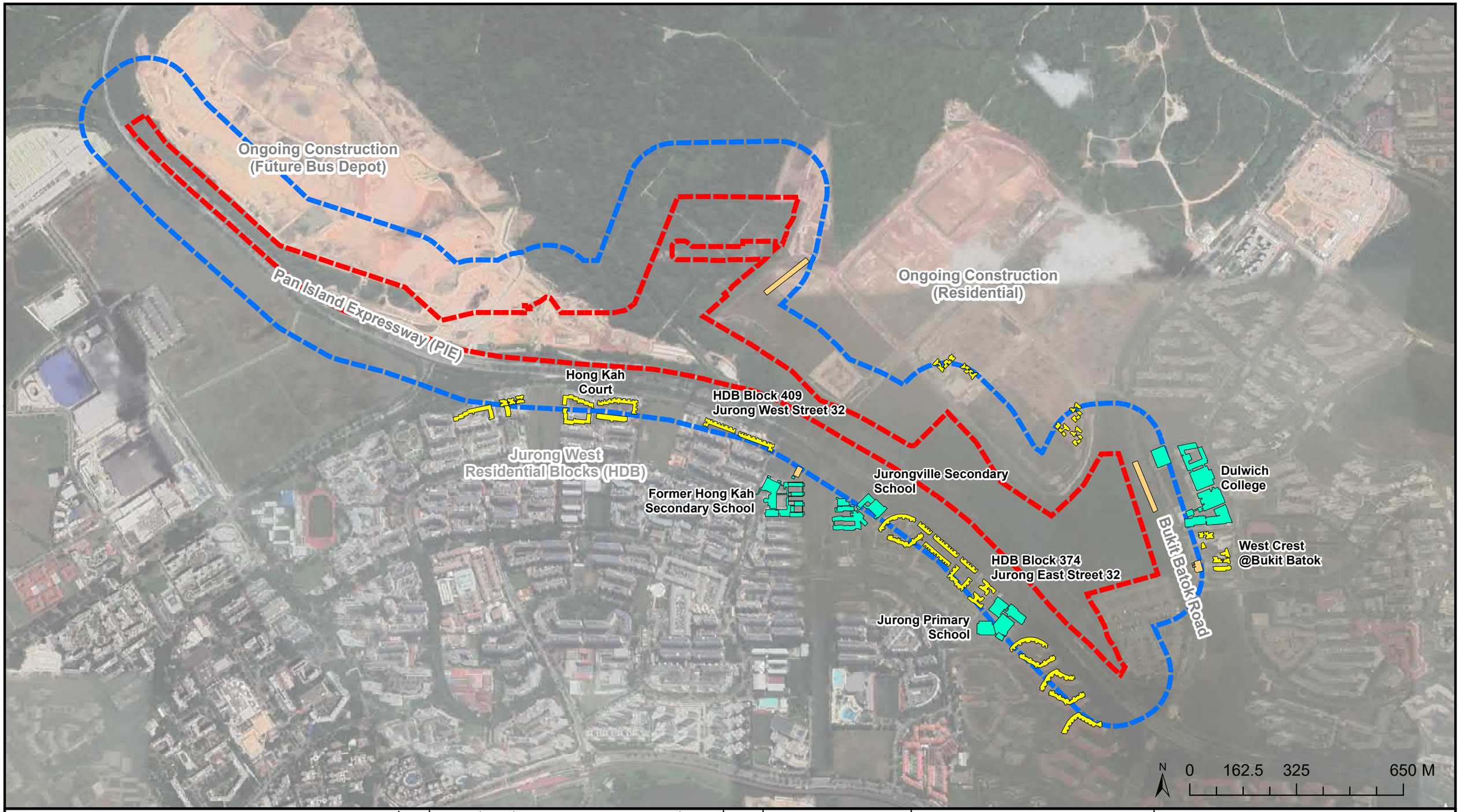
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10.4.1.2 Human Receptors

As the initial step of the construction noise impact assessment, the buildings in the Study Area that may be potentially sensitive to the construction noise from the Project were analysed. According to the Environmental Protection and Management Regulation, the sensitive receptors are buildings within 150 m from the Study Area. As a result, the noise sensitive receptors for the construction phase are presented in Figure 10-4 where the respective receptor sensitivity classifications were based on Table 6-2. The list of noise sensitive human receptors is presented in Table 10-13 below.

Table 10-13 Noise sensitive receptors (human)

No.	Noise Sensitive Receptors	Receptor Sensitivity	Nearest Noise Logger	Receptor Type
1	Dulwich College	1	N1b	Educational Institution
2	Dulwich College Senior School Sports Hall	1	N1b	Educational Institution
3	445A - 445C, 446 West Crest @ Bukit Batok, Bukit Batok West Ave 8	2	N1b	Residential
4	Block 112A, 113A, 113B Tengah Plantation Acres (Future HDB - TOP 2022)	2	N1b	Residential
5	Shell Petrol Station Bukit Batok West Ave 3	3	N1b	Commercial
6	JE 2 Tengah Park MRT (U/C)	3	N1b	Commercial
7	HDB Block 306 Jurong East Street 32	2	N3	Residential
8	HDB Block 310 Jurong East Street 32	2	N3	Residential
9	HDB Block 331 - 336 Jurong East Ave 1	2	N3	Residential
10	HDB Block 307 - 309 Jurong East Street 32	2	N3	Residential
11	HDB Block 373, 374 Jurong East Street 32	2	N3	Residential
12	Jurong Primary School	1	N3	Educational Institution
13	Jurongville Secondary School	1	N3	Educational Institution
14	HDB Block 409, 410 Jurong West Street 42	2	N4	Residential
15	HDB Block 405 - 408 (Hong Kah Court), Jurong West St 42	2	N4	Residential
16	Former Hong Kah Secondary School	3	N4	Commercial
17	HDB Block 559, 561, 561B Jurong West Street 42	2	N5	Residential
18	JS 4 Hong Kah MRT (U/C)	3	N7	Commercial
19	Block 131C, 131D Tengah Plantation Grange (Future HDB - TOP 2022)	2	N8	Residential



Legend

- Airborne Noise Impact Assessment - 150 m Study Area
- Southern Tengah Study Area

Noise Sensitive Receptors
Human Receptors
Receptor Sensitivity

- Priority 1
- Priority 2
- Priority 3

N

Rev.	Date	By	Description	Chk'd	App'd
-	OCT 2021	SYT	Final Report	NHT	JAG

Qualified Person Endorsement : NA

HDB Endorsement : NA

Consultant : AECOM

Client: HOUSING & DEVELOPMENT BOARD

Project Title :

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SPECIALIST CONSULTANCY SERVICES FOR ENVIRONMENTAL IMPACT STUDIES (EIS) AT SOUTHERN TENGAH

Figure Title :

Noise Sensitive Receptors (Human)

Designed	Checked	Approved
SAG	NHT	JAG
	Drawn: SYT	Date: OCT 2021

Figure No. : 10-4 | Rev. : - | Sheet : 1 of 1

CAD File Name : NA | A3

Note: Source of basemap - Google Earth Map

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10.4.2 Operational Phase

10.4.2.1 Ecological Receptors

Ecological receptors considered for assessment of noise impacts arising from the operational phase shall consider similar ecological receptors identified as part of that discussed in Section 10.4.1.1. With necessary and adequate mitigation measures implemented for the construction phase to reduce noise impacts on the ecological receptors, similar fauna species identified surrounding the Project site prior to construction works should continue to inhabit the surrounding Southern Tengah Forest areas.

It is advised that faunistic survey and baseline noise monitoring be conducted upon completion of the construction phase and commencement of the operational phase to determine the new baseline conditions and fauna species that remain in the vicinity of the Project site to determine actual operational noise impacts.

10.4.2.2 Human Receptors

Human receptors for the operational phase should be identified and assessed as part of operational noise impacts arising from noise associated with the ACMV systems of non-industrial buildings, and as part of Traffic Noise Impact Assessment (TNIA). Both elements should be conducted by Noise Consultant(s) engaged by HDB/ contractor engaged by HDB to conduct TNIA on nearby existing residential buildings/ noise sensitive buildings affected by new road networks, and ACMV noise impacts at the boundaries of non-industrial buildings as per the guidelines discussed in Section 10.2.3.2.

Additionally, the developers of the residential developments should assess the noise impacts arising from the Pan Island Expressway (PIE) and Bukit Batok Road if within audible range following the same guidelines to determine the potential noise impacts arising from existing road networks on the future residential developments to facilitate planning of residential development.

10.5 Baseline Airborne Noise

10.5.1 Baseline Monitoring Personnel

The assessment and site surveys were conducted by the following personnel:

- Ms. Jagriti Dawra, AECOM (EIS Specialist)
- Mr. Hanzel Lalitan, AECOM (Air and Noise Consultant)
- Mr. Phyo Naing Zay, AECOM (Noise Consultant)

To understand the ambient noise environment near the Project site, site reconnaissance was conducted on 5 February 2021. Thereafter, baseline airborne noise monitoring was conducted during the dates listed below to obtain the baseline noise levels for the purposes of deducing the noise correction criteria in accordance with the *NEA Maximum Permissible Noise Levels for Construction Noise Control* [W-29].

The baseline monitoring dates are as follows:

- 02 March – 08 March 2021
- 03 March – 09 March 2021
- 01 April – 08 April 2021
- 10 April – 17 April 2021
- 16 April – 23 April 2021
- 19 April – 25 April 2021
- 27 April – 04 May 2021

10.5.2 Baseline Findings

Table 10-14 and Table 10-15 summarizes the $L_{Aeq(12\ hour)}$, $L_{Aeq(1\ hour)}$ and $L_{Aeq(5\ min)}$ baseline results for Weekdays (Monday – Saturday) and Weekend/ Public Holidays (i.e. Sunday/ Public Holidays) respectively. It should be noted that airborne noise impact assessment will not be conducted for Weekend/ Public Holidays as per information provided by HDB on no Weekend works.

Baseline noise monitoring locations at N1a, N1b representing noise levels experienced near Dulwich College (education institution – noise sensitive receptor) recorded high levels of noise levels generally exceeding the NEA construction permissible noise criteria for $L_{Aeq(12\ hours)}$. This is attributed to the proximity of the location to Bukit Batok Road with baseline noise monitoring results being dominated by the traffic noise.

While for baseline noise monitoring results recorded at locations N3, N4a – N4c, N5a – N5c and N6, these locations are found along the Pan Island Expressway (PIE) with some locations near existing construction sites. The baseline noise levels recorded at these locations were found to exceed the NEA permissible noise criteria for evening – night-time hours mainly due to noise dominated by road traffic from the PIE.

While for noise monitoring results at N2, N7 and N8, these locations were generally taken to be representative of ecologically sensitive sites that currently do not have any developments on. Minor exceedances of the recorded baseline noise levels to the NEA permissible noise criteria were found at certain locations during different time periods potentially influenced the nearby existing construction worksites.

Table 10-14 Summary of baseline noise monitoring results – weekdays (construction phase)

Locations		Date of Monitoring	$L_{Aeq(12\ hour)}$, dB		$L_{Aeq(1\ hour)}$, dB						$L_{Aeq(5\ min)}$, dB								
			7am-7pm	7pm-7am	7pm - 10pm			10pm - 7am			10pm - 7am			7am-7pm			7pm-10pm		
			Overall		Min	Max	Ave	Min	Max	Ave	Min	Max	Ave	Min	Max	Ave	Min	Max	Ave
N1a	Dulwich College (rooftop)	10 Apr – 17 Apr 2021	60	55	55	61	57	48	57	53	46	59	52	54	75	58	54	68	57
N1b	HDB Land Lot (No. MK10-05123K) near Dulwich College (ground level)	10 Apr – 17 Apr 2021	68	65	66	68	67	58	68	63	52	70	63	64	75	68	65	69	67
N2	Tengah Forest (Future Residential)	02 Mar – 08 Mar 2021	56	55	53	63	57	51	57	54	50	58	54	50	70	54	51	71	56
N3	Block 374 HDB Jurong East	19 Apr – 25 Apr 2021	71	67	69	70	70	61	70	65	60	72	65	68	73	71	68	72	70
N4a	Block 409 HDB Jurong West (ground level)	16 Apr – 23 Apr 2021	71	67	68	71	69	60	71	65	59	73	65	66	84	70	67	75	69
N4b	Block 409 HDB Jurong West (mid-level)	16 Apr – 23 Apr 2021	75	71	72	75	74	65	75	69	63	77	69	71	83	74	71	76	73
N4c	Block 409 HDB Jurong West (rooftop)	16 Apr – 23 Apr 2021	69	65	66	69	67	58	68	63	56	71	63	65	83	68	65	75	67
N5a	Block 561B HDB Jurong West (ground level)	01 Apr – 08 Apr 2021	67	65	65	70	67	58	70	62	55	72	62	62	75	67	55	75	67
N5b	Block 561B HDB Jurong West (mid-level)	01 Apr – 08 Apr 2021	72	69	69	73	71	63	71	67	61	73	67	67	78	71	69	78	71
N5c	Block 561B HDB Jurong West (rooftop)	01 Apr – 08 Apr 2021	70	67	68	72	70	61	70	65	59	72	66	66	79	70	65	77	69
N6	Future Industrial Area	19 Apr – 25 Apr 2021	75	72	73	75	74	66	75	70	63	77	70	71	81	75	72	77	74
N7	Tengah Forest (Future Educational)	27 Apr – 04 May 2021	58	51	50	62	53	46	53	49	44	59	49	48	79	54	48	72	51
N8	Tengah Forest (Future Park/ Residential)	03 Mar – 09 Mar 2021	61	57	54	72	59	47	59	52	46	60	52	53	83	57	53	82	58

Table 10-15 Summary of baseline noise monitoring results – Sunday/ public holidays (construction phase)

Locations		Date of Monitoring	$L_{Aeq(12\ hour)}$, dB		$L_{Aeq(5\ min)}$, dB							
			7am-7pm	7pm-7am	10pm - 7am			7am-7pm			7pm-10pm	
			Overall		Min	Max	Ave	Min	Max	Ave	Min	Max	Ave
N1a	Dulwich College (rooftop)	10 Apr – 17 Apr 2021	61	55	48	58	53	56	74	59	56	69	57
N1b	HDB Land Lot (No. MK10-05123K) near Dulwich College (ground level)	10 Apr – 17 Apr 2021	67	65	56	70	62	65	69	67	65	68	66
N2	Tengah Forest (Future Residential)	02 Mar – 08 Mar 2021	61	59	51	61	57	50	72	57	52	62	60
N3	Block 374 HDB Jurong East	19 Apr – 25 Apr 2021	69	67	59	71	64	67	70	69	69	71	70
N4a	Block 409 HDB Jurong West (ground level)	16 Apr – 23 Apr 2021	70	68	60	72	66	68	75	69	70	72	71
N4b	Block 409 HDB Jurong West (mid-level)	16 Apr – 23 Apr 2021	74	72	64	76	70	72	77	74	74	76	75
N4c	Block 409 HDB Jurong West (rooftop)	16 Apr – 23 Apr 2021	68	66	58	70	63	66	75	68	68	70	69
N5a	Block 561B HDB Jurong West (ground level)	01 Apr – 08 Apr 2021	68	64	55	68	61	64	74	67	65	68	66
N5b	Block 561B HDB Jurong West (mid-level)	01 Apr – 08 Apr 2021	71	68	60	72	65	68	74	71	70	71	70
N5c	Block 561B HDB Jurong West (rooftop)	01 Apr – 08 Apr 2021	70	66	58	71	66	67	73	70	68	70	69
N6	Future Industrial Area	19 Apr – 25 Apr 2021	73	72	63	76	69	72	77	73	73	75	74
N7	Tengah Forest (Future Educational)	27 Apr – 04 May 2021	52	50	45	55	49	48	60	52	45	76	52
N8	Tengah Forest (Future Park/ Residential)	03 Mar – 09 Mar 2021	61	57	51	60	55	53	76	59	57	60	59

10.5.3 Corrected Construction Noise Criteria

Based on the baseline airborne noise monitoring results and corrected noise criteria performed in accordance to the "adjusted maximum permissible noise level" as explained in Section 10.2.2, the noise criteria for airborne noise impact assessment of the human and ecological receptors are deduced below separately.

10.5.3.1 Ecological Receptors

As mentioned in Section 10.2.3.1, there are currently no guidelines or standards available to assess construction noise impacts on the ecological receptors, thus the recorded maximum baseline noise levels in Table 10-14 and Table 10-15 recorded by the nearest noise logger (N7) reflected in Table 10-16 below would form the assessment criteria for construction noise impact on ecological receptors in this Project. This approach was adopted to be aligned with the approach and methodology practiced by Jacobs in Project No. D3332600, 'Specialist Consultancy Services for Environmental Impact Study at Tengah Town', that if no noise exceedances is predicted when compared to this criterion, the airborne noise impact on fauna in the vicinity will also not experience noise levels exceeding the established criteria.

Table 10-16 Maximum baseline noise levels at N7

$L_{Aeq(12\ hours)}$, dB		$L_{Aeq(1\ hour)}$, dB		$L_{Aeq(5\ mins)}$, dB		
7am-7pm	**7pm-7am**	**7pm-10pm**	**10pm-7am**	**10pm - 7am**	**7am-7pm**	**7pm-10pm**
Weekdays (Monday – Saturday)						
58	51	62	53	59	79	72
Weekend (Sundays/ Public Holidays)						
52	50			55	60	76

10.5.3.2 Human Receptors

For human receptors, the corrected noise criteria was deduced from using the recorded average baseline noise levels for $L_{Aeq(12\ hour)}$, $L_{Aeq(1\ hour)}$ and $L_{Aeq(5\ min)}$ from N1a – N8 to calculate the "adjusted maximum permissible noise level" as per the *Environmental Protection and Management (Control of Noise at Construction Sites) Regulations, 2008* [R-32]. Table 10-17 and Table 10-18 below reflects the corrected noise criteria for Weekdays (Monday – Saturday) and Weekend (Sunday/ Public Holiday) according to *EPM (2008)* [R-32].

Table 10-17 Corrected construction noise criteria – weekdays (human)

No.	Types of Affected Buildings	$L_{Aeq(12\ hour)}$, dB		$L_{Aeq(1\ hour)}$, dB		$L_{Aeq(5\ min)}$, dB		
		7am-7pm	7pm-7am	7pm-10pm	10pm – 7am	7am-7pm	7pm-10pm	10pm-7am
N1a	(a) Noise Sensitive (e.g. educational institution, medical facilities) (Priority 1)	63	56	NA	NA	75	60	57
	(b) Residential (Priority 2)	75	NA	66	57	90	70	57
	(c) Others (e.g. commercial, recreational, etc.) (Priority 3)	75	65	NA	NA	90	70	70
N1b	(a) Noise Sensitive (e.g. educational institution, medical facilities) (Priority 1)	69	65	NA	NA	76	67	64
	(b) Residential (Priority 2)	76	NA	69	64	90	72	64
	(c) Others (e.g. commercial, recreational, etc.) (Priority 3)	76	68	NA	NA	90	72	71
N2	(a) Noise Sensitive (e.g. educational institution, medical facilities) (Priority 1)	61	56	NA	NA	75	59	58
	(b) Residential (Priority 2)	75	NA	66	58	90	70	58
	(c) Others (e.g. commercial, recreational, etc.) (Priority 3)	75	66	NA	NA	90	70	70
N3	(a) Noise Sensitive (e.g. educational institution, medical facilities) (Priority 1)	71	67	NA	NA	76	70	65
	(b) Residential (Priority 2)	76	NA	71	65	90	73	65
	(c) Others (e.g. commercial, recreational, etc.) (Priority 3)	76	69	NA	NA	90	73	71
N4a	(a) Noise Sensitive (e.g. educational institution, medical facilities) (Priority 1)	71	67	NA	NA	76	69	66
	(b) Residential (Priority 2)	77	NA	70	66	90	73	66
	(c) Others (e.g. commercial, recreational, etc.) (Priority 3)	77	70	NA	NA	90	73	71
N5a	(a) Noise Sensitive (e.g. educational institution, medical facilities) (Priority 1)	68	65	NA	NA	76	67	63
	(b) Residential (Priority 2)	76	NA	69	63	90	72	63
	(c) Others (e.g. commercial, recreational, etc.) (Priority 3)	76	68	NA	NA	90	72	71
N5b	(a) Noise Sensitive (e.g. educational institution, medical facilities) (Priority 1)	72	69	NA	NA	77	71	67
	(b) Residential (Priority 2)	77	NA	72	67	90	74	67
	(c) Others (e.g. commercial, recreational, etc.) (Priority 3)	77	71	NA	NA	90	74	72
N5c	(a) Noise Sensitive (e.g. educational institution, medical facilities) (Priority 1)	70	67	NA	NA	76	69	66
	(b) Residential (Priority 2)	76	NA	71	65	90	73	66
	(c) Others (e.g. commercial, recreational, etc.) (Priority 3)	76	69	NA	NA	90	73	72
N6	(a) Noise Sensitive (e.g. educational institution, medical facilities) (Priority 1)	75	72	NA	NA	78	74	70
	(b) Residential (Priority 2)	78	NA	75	70	90	75	70
	(c) Others (e.g. commercial, recreational, etc.) (Priority 3)	78	73	NA	NA	90	75	73
N7	(a) Noise Sensitive (e.g. educational institution, medical facilities) (Priority 1)	63	54	NA	NA	75	57	56
	(b) Residential (Priority 2)	75	NA	65	56	90	70	56
	(c) Others (e.g. commercial, recreational, etc.) (Priority 3)	75	65	NA	NA	90	70	70

No.	Types of Affected Buildings	$L_{Aeq(12\ hour)}$, dB		$L_{Aeq(1\ hour)}$, dB		$L_{Aeq(5\ min)}$, dB		
		7am-7pm	7pm-7am	7pm-10pm	10pm – 7am	7am-7pm	7pm-10pm	10pm-7am
N4b	(a) Noise Sensitive (e.g. educational institution, medical facilities) (Priority 1)	75	71	NA	NA	78	73	69
	(b) Residential (Priority 2)	78	NA	75	69	90	75	69
	(c) Others (e.g. commercial, recreational, etc.) (Priority 3)	78	72	NA	NA	90	75	73
N4c	(a) Noise Sensitive (e.g. educational institution, medical facilities) (Priority 1)	70	65	NA	NA	76	67	64
	(b) Residential (Priority 2)	76	NA	69	64	90	72	64
	(c) Others (e.g. commercial, recreational, etc.) (Priority 3)	76	68	NA	NA	90	72	71

No.	Types of Affected Buildings	$L_{Aeq(12\ hour)}$, dB		$L_{Aeq(1\ hour)}$, dB		$L_{Aeq(5\ min)}$, dB		
		7am-7pm	7pm-7am	7pm- 10pm	10pm – 7am	7am-7pm	7pm-10pm	10pm-7am
N8	(a) Noise Sensitive (e.g. educational institution, medical facilities) (Priority 1)	64	58	NA	NA	75	60	57
	(b) Residential (Priority 2)	75	NA	66	57	90	70	57
	(c) Others (e.g. commercial, recreational, etc.) (Priority 3)	75	66	NA	NA	90	70	70

Table 10-18 Corrected construction noise criteria – Sunday/ public holidays (human)

No.	Types of Affected Buildings	$L_{Aeq(12\ hour),\ dB}$		$L_{Aeq(5\ min),\ dB}$		
		7am-7pm	7pm-7am	7am-7pm	7pm-10pm	10pm-7am
N1a	(a) Noise Sensitive (e.g. educational institution, medical facilities) (Priority 1)	64	56	75	59	57
	(b) Residential (Priority 2)	75	NA	75	59	57
	(c) Others (e.g. commercial, recreational, etc.) (Priority 3)	75	66	90	70	70
N1b	(a) Noise Sensitive (e.g. educational institution, medical facilities) (Priority 1)	68	65	76	66	63
	(b) Residential (Priority 2)	76	NA	76	66	63
	(c) Others (e.g. commercial, recreational, etc.) (Priority 3)	76	68	90	72	71
N2	(a) Noise Sensitive (e.g. educational institution, medical facilities) (Priority 1)	64	60	75	61	60
	(b) Residential (Priority 2)	75	NA	75	61	60
	(c) Others (e.g. commercial, recreational, etc.) (Priority 3)	75	66	90	70	70
N3	(a) Noise Sensitive (e.g. educational institution, medical facilities) (Priority 1)	70	67	76	70	65
N5a	(a) Noise Sensitive (e.g. educational institution, medical facilities) (Priority 1)	69	64	76	66	62
	(b) Residential (Priority 2)	76	NA	76	66	62
	(c) Others (e.g. commercial, recreational, etc.) (Priority 3)	76	68	90	72	71
N5b	(a) Noise Sensitive (e.g. educational institution, medical facilities) (Priority 1)	71	68	77	70	65
	(b) Residential (Priority 2)	77	NA	77	70	76
	(c) Others (e.g. commercial, recreational, etc.) (Priority 3)	77	70	90	73	71
N5c	(a) Noise Sensitive (e.g. educational institution, medical facilities) (Priority 1)	71	66	76	69	66
	(b) Residential (Priority 2)	76	NA	76	69	66
	(c) Others (e.g. commercial, recreational, etc.) (Priority 3)	76	69	90	73	71
N6	(a) Noise Sensitive (e.g. educational institution, medical facilities) (Priority 1)	73	72	78	74	69

No.	Types of Affected Buildings	$L_{Aeq(12\ hour),\ dB}$		$L_{Aeq(5\ min),\ dB}$		
		7am-7pm	7pm-7am	7am-7pm	7pm-10pm	10pm-7am
	(b) Residential (Priority 2)	76	NA	76	70	65
	(c) Others (e.g. commercial, recreational, etc.) (Priority 3)	76	70	90	73	71
N4a	(a) Noise Sensitive (e.g. educational institution, medical facilities) (Priority 1)	71	68	76	61	68
	(b) Residential (Priority 2)	76	NA	76	61	68
	(c) Others (e.g. commercial, recreational, etc.) (Priority 3)	76	70	90	71	73
N4b	(a) Noise Sensitive (e.g. educational institution, medical facilities) (Priority 1)	74	72	78	75	70
	(b) Residential (Priority 2)	78	NA	78	75	70
	(c) Others (e.g. commercial, recreational, etc.) (Priority 3)	78	73	90	76	73
N4c	(a) Noise Sensitive (e.g. educational institution, medical facilities) (Priority 1)	69	66	76	69	64
	(b) Residential (Priority 2)	76	NA	76	69	64
	(c) Others (e.g. commercial, recreational, etc.) (Priority 3)	76	69	90	73	71

No.	Types of Affected Buildings	$L_{Aeq(12\ hour),\ dB}$		$L_{Aeq(5\ min),\ dB}$		
		7am-7pm	7pm-7am	7am-7pm	7pm-10pm	10pm-7am
	(b) Residential (Priority 2)	78	NA	78	74	69
	(c) Others (e.g. commercial, recreational, etc.) (Priority 3)	78	73	90	76	73
N7	(a) Noise Sensitive (e.g. educational institution, medical facilities) (Priority 1)	61	53	75	57	56
	(b) Residential (Priority 2)	75	NA	75	57	56
	(c) Others (e.g. commercial, recreational, etc.) (Priority 3)	75	65	90	70	70
N8	(a) Noise Sensitive (e.g. educational institution, medical facilities) (Priority 1)	65	58	75	61	58
	(b) Residential (Priority 2)	75	NA	75	61	58
	(c) Others (e.g. commercial, recreational, etc.) (Priority 3)	75	66	90	70	70

10.5.4 Corrected Operational Noise Criteria

As discussed in Section 10.2.3.2, HDB/ contractors engaged by HDB should appoint Noise Consultant(s) to conduct traffic noise impact assessment (TNIA) and baseline noise monitoring at defined boundaries of non-industrial buildings for developments within the Project site to determine the baseline findings required to procure a more accurate understanding of noise impacts arising from operational conditions. The corrected operational noise criteria have hence been omitted from this report and shall be determined based on said findings by said appointed Noise Consultant(s) in accordance with the NEA technical guidelines for the two respective elements based on the contractors baseline monitoring at the buildings boundary once the buildings are planned during design phase.

10.6 Minimum Control Measures

This section proposes minimum controls or standard practices commonly implemented that have been assumed to be implemented for the purposes of impact assessment.

10.6.1 Construction Noise

The following control measures should be observed during the construction stage to reduce the noise levels:

- Construction prohibition period should be followed, as per fourth schedule of Environment Protection and Management regulation;
- Prepare a Construction Noise Management Plan, to establish pre-construction baseline monitoring, plan for monitoring during the construction phase, and procedure for complaint handling;
- The contractor shall review the equipment to be used on site and erect localised noise barriers prior to undertaking high noise generating work;
- Machines (such as trucks) that may be in intermittent use shall be shut down between work periods or shall be throttled down to a minimum;
- Only well-maintained construction plants shall be utilized on-site, and plants shall be serviced regularly during the entire construction period;
- The number of PMEs shall be reduced as far as practicable when construction works are carried out at areas close to the noise sensitive receivers:
- Consider use of silencers or mufflers on construction equipment which are properly maintained during the construction programme while facing sensitive receptors;
- Behavioural practices including no shouting, no loud stereos/ radios on site, no dropping of materials from height, no throwing of metal items shall be ensured;
- Construction respite: Restrict high noise generating drilling activities only in continuous blocks, not exceeding 3 hours each, with a minimum respite period of one hour between each block, if possible;
- Periodic noise monitoring by an independent third party, to establish compliance with requirements and to advise on equipment causing concern, and additional potential mitigation measures;
- Plan the layout of the site by considering using materials and other large structural equipment as noise barriers;
- Plant known to emit noise strongly in one direction shall, wherever possible, be orientated so that the noise is directed away from the nearby NSRs;
- Material stockpiles and other structures shall be effectively utilized, wherever practicable, in screening noise from on-site construction activities;
- Acoustic sheds should be provided at the locations of the noise generating activity such as operation of hand-held breaker; and

10.6.2 Operational Noise

As part of pre-emptive measures to control noise emitted from air conditioning and mechanical ventilation (ACMV) systems of non-industrial buildings and increased land traffic noise contributing to operational noise, following

minimum control measures were developed as listed below. This list is non-exhaustive and should be practised as minimum control to reduce noise levels during the operational phase of the Project:

- Use low-noise air-conditioning and mechanical ventilation system equipment;
- Ensure that any exhaust outlet or intake from the mechanical ventilation system is designed to be adequately set back as far as possible from the boundary line of the development;
- Acoustic treatment if any to be designed and implemented;
- Air conditioning (AC) system to be designed with the air handling units (AHUs) placed at appropriate locations as set back from the boundary line of the development as possible;
- Acoustic enclosures for outdoor equipment;
- Road design should be considered as part of land use planning to minimize potential impact of land traffic noise on existing residential buildings;
- Alternative siting/ alignment of roads should be considered during road design to propose road siting/ alignment away from existing noise sensitive development; and
- Screening should be done to identify noise tolerant buildings (e.g. multi-storey car park building) and placing noise tolerant buildings between road traffic and existing residential buildings during road design phase.

10.7 Prediction and Evaluation of Airborne Noise Impacts

This section discusses the predicted noise impacts arising from the construction and operational phase on the ecological and human receptors.

10.7.1 Construction Phase

10.7.1.1 Ecological Receptors

The predicted noise levels for ecological receptors identified within the study area for the Southern Tengah EIS The predicted noise levels for ecological receptors identified within the Study Area for the Southern Tengah EIS Project were deduced based on the representative ecological receptors (RERs) selectively chosen for noise modelling and placed near the Project site as visualized in Figure 10-3 of Section 10.4.1.1. The purpose of establishing RERs is to predict the potential noise levels that the ecological receptors could have experienced during the construction phase of the Project from activities associated with the different scenarios established in this report.

Construction noise predictions for ecological receptors were done at heights 1.5 m (for ground dwelling fauna species) and 10m and 15 m (for arboreal fauna species) based on the average tree height observed by arborists during site survey. The results of the predicted noise levels experienced by the RERs are reflected in Appendix Z with the summarized construction noise impacts shown in Table 10-19 below for all three (3) scenarios. These elevations were deduced to be representative of the average heights of trees observed at the Southern Tengah Forest Areas, deemed located at the northern tip of the Project site given that the previously forested areas within/ surrounding the Project site have been cleared based on desktop studies and observations during site reconnaissance. The noise impact on ground level (1.5 m) would differ from that at a higher elevation of (10 m, 15 m) even at the same location, resulting in the variation of response from the ecological receptors according to the noise levels as well as the auditory sensitivities of the different types of fauna inhabiting or present at the different levels.

It should be noted that as discussed in Section 10.2.3.1.1, pre-existing maximum baseline noise levels recorded at monitoring location N7 (see Table 10-1) nearest to the RERs have been accounted for in the predicted nose levels reflected in Appendix Z to ensure that pre-existing noise conditions are accounted for as part of noise impact assessment.

From the construction noise predictions of the three (3) scenarios found in Appendix Z, it could be observed that the RERs subjected to noise arising from activities of Scenario 2: Earthworks is predicted to not experience any noise exceedances, resulting in **Negligible** impact significance as shown in Table 10-20 below. While construction noise arising from the remaining two (2) scenarios, Scenario 1: Site Clearance and Scenario 3: Infrastructure and

Building Works are predicted to range from **Negligible** to **Low** impact intensity (see Table 6-6) as reflected in the noise result tables in Appendix Z with impact significance ranging from **Negligible** to **Moderate** for the two (2) scenarios observed in Table 10-20 below reflecting the summarized construction noise impacts.

The resulting worst-case noise contours of the two (2) scenarios, Scenario 3: Infrastructure and Building Works with a worst-case impact significance ranging from **Minor** to **Moderate** (see Table 10-20), are represented for elevations of 1.5 m (for ground dwelling fauna species), and 10 m and 15 m (for arboreal fauna species) near the uncleared Southern Tengah Forest areas at the northern tip of the Project site as listed in Table 10-19 below. Other locations surrounding the Project site were not assessed for noise impacts on ecological receptors as they are already being urbanised and under construction/ planned to be urbanized by the time construction commences at the project site. The findings of the impacts on the ecological receptors are further discussed for each of the three (3) scenarios below.

Table 10-19 List of noise contour maps reflecting ecological impacts

Elevation	Construction Schedules	L_{Aeq}	Figure
Scenario 3: Infrastructure and Building Works			
1.5 m	Weekdays (7am – 7pm)	$L_{Aeq(12\ hours)}$	Figure 10-5
	Weekdays (7am – 7pm)	$L_{Aeq(5\ mins)}$	Figure 10-6
10 m	Weekdays (7am – 7pm)	$L_{Aeq(12\ hours)}$	Figure 10-7
	Weekdays (7am – 7pm)	$L_{Aeq(5\ mins)}$	Figure 10-8
15 m	Weekdays (7am – 7pm)	$L_{Aeq(12\ hours)}$	Figure 10-9
	Weekdays (7am – 7pm)	$L_{Aeq(5\ mins)}$	Figure 10-10

Based on the predicted noise levels and maximum noise exceedances observed for the three (3) scenarios (see Appendix Z), construction noise impact assessment for the ecological receptors at different elevations was conducted and summarized in Table 10-20 below. This evaluation was carried out with reference to the assessment methodology in Section 6.4.2.

Table 10-20 Summary of construction noise impacts - ecological impacts

Elevation	Nearest Noise Logger No. for Baseline Monitoring Result	Receptor Priority	Maximum Exceedance Observed, dB(A)	Impact Intensity	Impact Consequence	Likelihood	Impact Significance
Scenario 1: Site Clearance							
Ground Level (1.5 m)	N7* (Tengah Forest – Future Educational)	1	1	Low	Low	Unlikely	Negligible
		2		Low	Low	Unlikely	Negligible
		3		Low	Very Low	Unlikely	Negligible
Higher Elevation (10 m)		1	2	Low	Low	Unlikely	Negligible
		2		Low	Low	Unlikely	Negligible
		3		Low	Very Low	Unlikely	Negligible
Higher Elevation (15 m)		1	2	Low	Low	Unlikely	Negligible
		2		Low	Low	Unlikely	Negligible
		3		Low	Very Low	Unlikely	Negligible
Scenario 2: Earthworks							
Ground Level (1.5 m)	N7* (Tengah Forest – Future Educational)	1	0	Negligible	Very Low	Occasional	Minor
		2		Negligible	Very Low	Occasional	Minor
		3		Negligible	Imperceptible	Occasional	Negligible
Higher Elevation (10 m)		1	0	Negligible	Very Low	Occasional	Minor
		2		Negligible	Very Low	Occasional	Minor
		3		Negligible	Imperceptible	Occasional	Negligible
Higher Elevation (15 m)		1	0	Negligible	Very Low	Occasional	Minor
		2		Negligible	Very Low	Occasional	Minor
		3		Negligible	Imperceptible	Occasional	Negligible

Elevation	Nearest Noise Logger No. for Baseline Monitoring Result	Receptor Priority	Maximum Exceedance Observed, dB(A)	Impact Intensity	Impact Consequence	Likelihood	Impact Significance
Scenario 3: Infrastructure and Building Works							
Ground Level (1.5 m)	N7* (Tengah Forest – Future Educational)	1	0	Negligible	Very Low	Likely	Minor
		2		Negligible	Very Low	Likely	Minor
		3		Negligible	Imperceptible	Likely	Negligible
Higher Elevation (10 m)		1	1	Low	Low	Likely	Moderate
		2		Low	Low	Likely	Moderate
		3		Low	Very Low	Likely	Minor
Higher Elevation (15 m)		1	1	Low	Low	Likely	Moderate
		2		Low	Low	Likely	Moderate
		3		Low	Very Low	Likely	Minor

Note:
** Refer to Table 10-1 for more information on the nearest noise logger where the recorded baseline noise monitoring results are used as the noise criterion as part of no-worse-off than baseline noise impact assessment for ecological receptors in this EIS.*
The colour of the cells corresponds to that of the assessment matrices in Section 6.4.2.
The full list of construction noise results for the individual representative ecological receptors (RERs) can be found in Appendix Z.

10.7.1.1.1 Findings for Ecological Impacts on Ecological Receptors

The uncleared areas of the Southern Tengah Forest found at the northern tip of the Project site is in close proximity (within 150 m) to the Project construction worksite. During the construction phase, ground level receptors are expected to experience low noise exceedances of up to 1 dB(A). Fauna species at ground level are typically ground dwellers comprising of odonates and mammals such as identified rat species reflected in Appendix Y. Noise impact on these species of fauna are not yet clearly known but it is possible that these fauna species will avoid the immediate vicinity of the Project construction worksite. It is also possible that some species will find refuge further up north into the Southern Tengah forest, away from the Project construction worksite.

Preliminary predictions of noise levels at higher elevations representative of ecological receptors at heights of 10 m and 15 m was also performed as described in this section. The fauna species at higher levels from the ground are also expected to experience low noise exceedances with the highest exceedance being 2 dB(A) during the construction phase. It is to be noted that the noise levels predicted are the noise levels observed at the closest boundary of the uncleared areas of the Southern Tengah Forest to the Project construction worksite. It can be expected that fauna species that are highly mobile are able to move deeper within the Southern Tengah Forest, away from the construction noise. Mammals and avian species impacted are likely to be able to find alternative habitats in the surrounding irrespective of construction noise, and largely due to human activities. Hence, bird species will likely move away during the construction period and may or may not return due to the clearance of their habitats.

Butterflies are perturbed by intermitted noise. Therefore, as a minimum control for the Project construction worksite, it is recommended that high intermitted noises be avoided as much as possible while not compromising human safety. Aculeate hymenopterans such as bees and wasps, on the other hand, are highly sensitive to noise impacts as they are capable of detecting air-particle movements associated with airborne sounds and will likely be disoriented by construction noise resulting in potential abandonment of hives.

Reptiles such as lizards, snakes, and turtles were also observed in this area. Lizards are considered to be highly auditory sensitive and will exhibit stress responses when exposed to anthropogenic noise. Snakes, though not equipped with outer-ears and the tympanic middle ear, have vestiges for hearing inside their heads and can feel low-frequency airborne sounds. Turtles, with their ability to traverse both terrestrial and aquatic settings, although able to detect airborne sounds in vibrations of lower frequencies do not have sensitive hearing due to the lack of an outer ear.

While for aquatic fauna species, such as decapod crustaceans and fishes, studies conducted on the transmission of airborne noise energy across the air to water boundary have shown that the transmission of noise energy to the water medium is low due to differences in acoustic characteristics impendences of air and water. Hence, auditory sensitives of the aquatic species cannot be definitively determined as discussed in Section 10.4.1.1. Due to the existence of streams within the Project site, as well as extending from the Southern Tengah Forest areas, it is likely that aquatic species be impacted by construction work due to the presence of human activities and removal of habitats irrespective of the construction noise.

Similarly, amphibians such as frogs are fauna species that are likely to be found near natural watercourses such as streams. It is noted that from the findings of site surveys conducted by the biodiversity team, natural streams are found within the area demarcated as the Project construction worksite and extending from the Southern Tengah Forest areas into the site (see Figure 7-14) in which amphibians may reside. Therefore, it is likely that the noise sensitive amphibians be impacted when construction works commence regardless of construction noise, but due to human activities and removal of habitat.

For the bat species identified in this area (see Appendix Y), no roosting sites were identified within the Project site as per information provided by the flora and fauna specialists. Hence, it is likely that the identified bat species will move away during the construction period to their respective roosting sites away from the Project construction worksite areas.

As mentioned in Section 10.2.4.1 the overall impact significance for the ecological receptors at the Southern Tengah Forest areas were classified according to impact intensity, impact consequence and likelihood of occurrence of impacts from the construction phase. Following reflects the deduction of the overall impact significance of each of the three (3) different scenarios assessed for ecological impacts. Please note that references to the assessment matrices in Section 6.4 have been provided in brackets for ease of reference to the appropriate matrices.

10.7.1.1.1.1 Scenario 1: Site Clearance

According to Table 10-20, the impact intensity for Scenario 1 ecological receptors was assessed as **Low** (refer to Table 6-6), and the corresponding impact consequence for the ecological receptors of varying auditory sensitivities were determined to range from **Very Low to Low** (refer to Table 6-7). In relation to the impact consequence and **Unlikely** likelihood (refer to Table 6-8) of Scenario 1, it was determined that the impact significance of ecological receptors in the uncleared Southern Tengah Forest areas near the Project site would be **Negligible** (refer to Table 6-9) as reflected in Table 10-20 above. Hence, with a **Negligible** impact intensity within acceptable levels, no mitigation measures were proposed for Scenario 1: Site Clearance.

10.7.1.1.1.2 Scenario 2: Earthworks

In relation to Table 10-20, the impact intensity for Scenario 2 was assessed to be **Negligible** (no exceedance, refer to Table 6-6) with the corresponding impact consequence of the ecological receptors of varying auditory sensitivities ranging from **Imperceptible to Negligible** (refer to Table 6-7). When relating the impact consequence to the **Occasional** likelihood (refer to Table 6-8) of Scenario 2, it was determined that the impact significance for ecological receptors in the Southern Tengah Forest areas near the Project site to be **Negligible to Minor** (refer to Table 6-9) as reflected in Table 10-20.

As no noise exceedance was predicted to arise from this scenario, no mitigation measures were proposed for Scenario 2: Earthworks.

10.7.1.1.1.3 Scenario 3: Infrastructure and Building Works

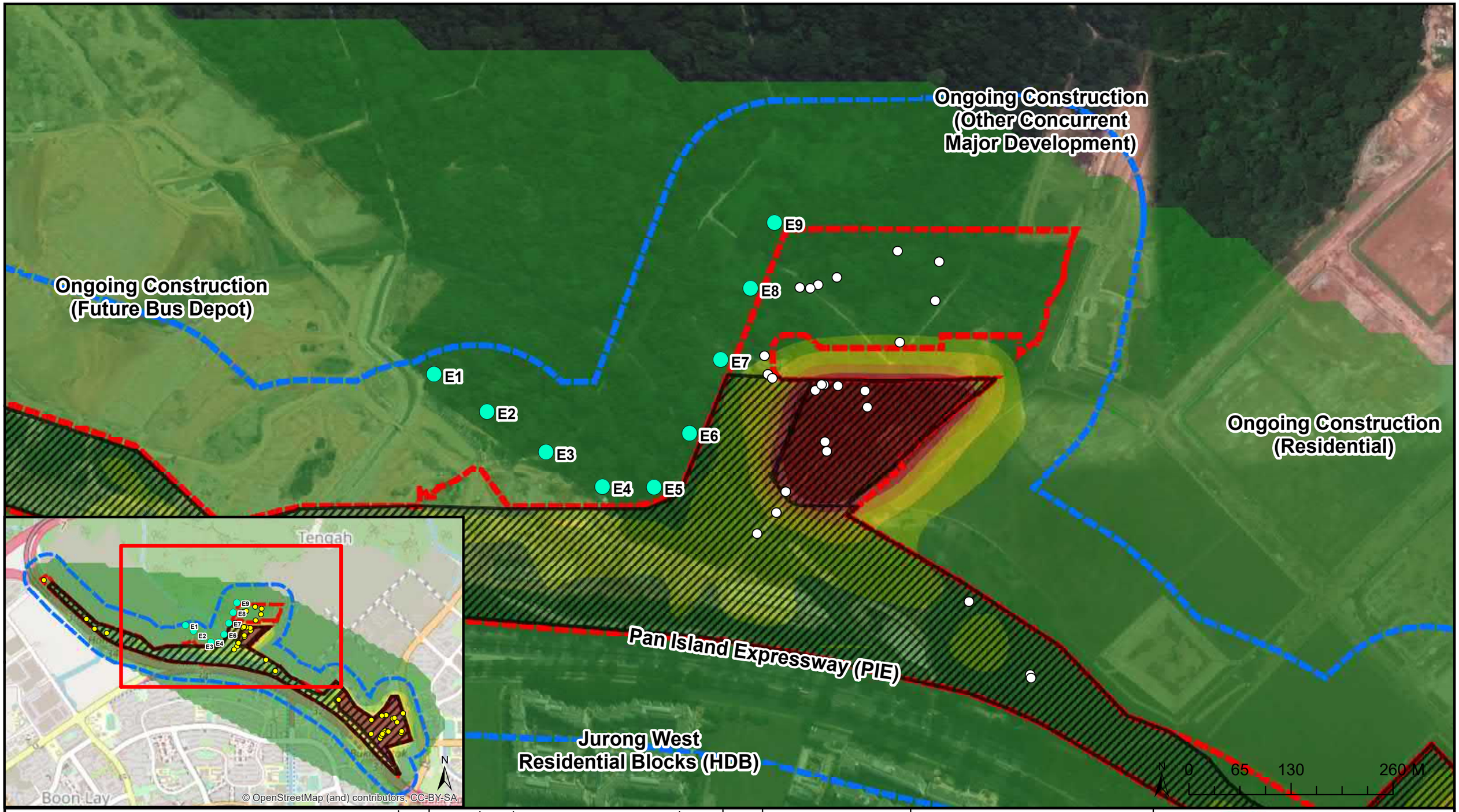
Refer to Table 10-20, the impact intensity for Scenario 3 ecological receptors was assessed to range from **Negligible to Low** (refer to Table 6-6), and the corresponding impact consequence for the ecological receptors of varying auditory sensitivities were determined to range from **Imperceptible to Low** (refer to Table 6-7). In relation to the impact consequence and **Likely** likelihood (refer to Table 6-8) of Scenario 3, it was determined that the impact significance of ecological receptors in the uncleared Southern Tengah Forest areas near the Project site would range from **Minor to Moderate** (refer to Table 6-9) as reflected in Table 10-20 above.

For Scenario 3, it is observed that no noise exceedance was predicted for ground-dwelling fauna found at ground level up to 1.5 m with an impact intensity of **Negligible** (refer to Table 6-6), while arboreal fauna receptors at heights of 10 m and 15 m were found to experience **Low** impact intensity noise exceedance of 1 dB(A) (refer to Table 6-6) due to the greater line of sight from elevated heights into the Project site. Considering the low magnitude of impact intensity predicted, mitigation measures were hence not proposed for Scenario 3: Infrastructure and Building Works are as low as reasonably practical. The overall considerable noise impacts ranging up to **Moderate** is attributed to a **Likely** likelihood rather than significant impact intensity which can be controlled by mitigation measures. In order to reduce likelihood, the only mitigation is to try and ensure the impact phase can be reduced in duration to as much as reasonably practicable.

Table 10-21 Summary of noise impacts to focal ecological receptors of conservation significance

No.	Faunal Group	Common name	Auditory Sensitivity	Greatest Impact Significance		
				Scenario 1: Site Clearance	Scenario 2: Earthworks	Scenario 3: Infrastructure and Building Works
1	Bird	Blue-crowned hanging-parrot	Priority 1	Negligible	Minor	Moderate
2	Bird	Changeable hawk-eagle	Priority 1	Negligible	Minor	Moderate
3	Bird	Crested goshawk	Priority 1	Negligible	Minor	Moderate
4	Bird	Grey-headed fish eagle	Priority 1	Negligible	Minor	Moderate
5	Bird	Long-tailed parakeet	Priority 1	Negligible	Minor	Moderate
6	Bird	Oriental magpie-robin	Priority 1	Negligible	Minor	Moderate
7	Bird	Red junglefowl	Priority 1	Negligible	Minor	Moderate
8	Bird	Red-legged crake	Priority 1	Negligible	Minor	Moderate
9	Bird	Red-wattled lapwing	Priority 1	Negligible	Minor	Moderate
10	Bird	Rusty-breasted cuckoo	Priority 1	Negligible	Minor	Moderate
11	Bird	Straw-headed bulbul	Priority 1	Negligible	Minor	Moderate
12	Butterfly	Formosan swift	Priority 2	Negligible	Minor	Moderate
13	Butterfly	Malay staff sergeant	Priority 2	Negligible	Minor	Moderate
14	Mammal	Sunda pangolin	Priority 2	Negligible	Minor	Moderate
15	Reptile	Asian softshell turtle	Priority 2	Negligible	Minor	Moderate
16	Reptile	Lowland dwarf gecko	Priority 2	Negligible	Minor	Moderate
17	Reptile	Malayan box terrapin	Priority 2	Negligible	Minor	Moderate
18	Other less auditory sensitive fauna species		Priority 3	Negligible	Negligible	Minor

Note: This table presents the list of fauna species of Conservation Significance (CS).
Other non-CS fauna species of varying auditory sensitivities are provided in Appendix Y.



Legend

- Airborne Noise Impact Assessment - 150 m Study Area
- Southern Tengah Study Area
- Scenario 3: Infrastructure and Building Works Area of Assessment

Noise Sensitive Receptors

Ecological Receptors

- Representative Ecological Receptors
- Fauna Species of Conservative Significance

Noise Criteria:
58 dB(A)

Noise level LAeq(12 hours) in dB(A)

	<= 49
49 <	<= 52
52 <	<= 55
55 <	<= 58
58 <	<= 61
61 <	

Note: Representative Ecological Receptors (RERs) were created and positioned near the Project site for the purposes of noise modelling to deduce the potential noise impacts experienced by the ecological receptors in the Southern Tengah Forest areas.

RERs were not positioned on areas where other concurrent major developments are scheduled to commence before or during the same time as activities assessed in this Project (see Section 3.5).

N

Rev.	Date	By	Description	Chk'd	App'd
-	OCT 2021	SYT	Final Report	NHT	JAG

Qualified Person Endorsement : NA

HDB Endorsement : NA

Consultant : AECOM

Client: HOUSING & DEVELOPMENT BOARD

Project Title :

CONTRACT L/025/21
SPECIALIST CONSULTANCY SERVICES FOR ENVIRONMENTAL IMPACT STUDIES (EIS) AT SOUTHERN TENGAH

Figure Title : **Construction Phase - Scenario 3: Infrastructure and Building Works, $L_{Aeq(12\ hours)}$ for Weekdays, 7am - 7pm for Ecological Receptors (Noise Contours at 1.5 m)**

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SAG	NHT	JAG
	Drawn: SYT	Date: OCT 2021

Figure No. :	Rev.	Sheet
10-5	-	1 of 1

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Ongoing Construction (Other Concurrent Major Development)

Ongoing Construction (Future Bus Depot)

Ongoing Construction (Residential)

E1 E2 E3 E4 E5 E6 E7 E8 E9

Pan Island Expressway (PIE)

Jurong West Residential Blocks (HDB)



N 0 65 130 260 M

Legend

- Airborne Noise Impact Assessment - 150 m Study Area
- Southern Tengah Study Area
- Scenario 3: Infrastructure and Building Works Area of Assessment

Noise Sensitive Receptors

Ecological Receptors

- Representative Ecological Receptors
- Fauna Species of Conservative Significance

Noise Criteria:
7am-7pm: 79 dB(A)
7pm-10pm: 72 dB(A)

Noise level LAeq(5 mins) in dB(A)

	<= 63
63 <	<= 66
66 <	<= 69
69 <	<= 72
72 <	<= 75
75 <	

Note: Representative Ecological Receptors (RERs) were created and positioned near the Project site for the purposes of noise modelling to deduce the potential noise impacts experienced by the ecological receptors in the Southern Tengah Forest areas.

RERs were not positioned on areas where other concurrent major developments are scheduled to commence before or during the same time as activities assessed in this Project (see Section 3.5).

N

Rev.	Date	By	Description	Chk'd	App'd
-	OCT 2021	SYT	Final Report	NHT	JAG

Qualified Person Endorsement : NA

HDB Endorsement : NA

Consultant : AECOM

Client: HOUSING & DEVELOPMENT BOARD

Project Title :

CONTRACT L/025/21
SPECIALIST CONSULTANCY SERVICES FOR ENVIRONMENTAL IMPACT STUDIES (EIS) AT SOUTHERN TENGAH

Figure Title : **Construction Phase - Scenario 3: Infrastructure and Building Works, $L_{Aeq(5\ mins)}$ for Weekdays, 7am - 7pm for Ecological Receptors (Noise Contours at 1.5 m)**

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Figure No. :	Rev.	Sheet
10-6	-	1 of 1

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Ongoing Construction (Other Concurrent Major Development)

Ongoing Construction (Future Bus Depot)

Ongoing Construction (Residential)

E1 E2 E3 E4 E5 E6 E7 E8 E9

Pan Island Expressway (PIE)

Jurong West Residential Blocks (HDB)



N 0 65 130 260 M

Legend

- Airborne Noise Impact Assessment - 150 m Study Area
- Southern Tengah Study Area
- Scenario 3: Infrastructure and Building Works Area of Assessment

Noise Sensitive Receptors

Ecological Receptors

- Representative Ecological Receptors
- Fauna Species of Conservative Significance

Noise Criteria: 58 dB(A)

Noise level LAeq(12 hours) in dB(A)

	<= 49
49 <	<= 52
52 <	<= 55
55 <	<= 58
58 <	<= 61
61 <	

Note: Representative Ecological Receptors (RERs) were created and positioned near the Project site for the purposes of noise modelling to deduce the potential noise impacts experienced by the ecological receptors in the Southern Tengah Forest areas.

RERs were not positioned on areas where other concurrent major developments are scheduled to commence before or during the same time as activities assessed in this Project (see Section 3.5).

N

Rev.	Date	By	Description	Chk'd	App'd
-	OCT 2021	SYT	Final Report	NHT	JAG

Qualified Person Endorsement : NA

HDB Endorsement : NA

Consultant : AECOM

Client: HOUSING & DEVELOPMENT BOARD

Project Title :

CONTRACT L/025/21 SPECIALIST CONSULTANCY SERVICES FOR ENVIRONMENTAL IMPACT STUDIES (EIS) AT SOUTHERN TENGAH

Figure Title : **Construction Phase - Scenario 3: Infrastructure and Building Works, $L_{Aeq(12\ hours)}$ for Weekdays, 7am - 7pm for Ecological Receptors (Noise Contours at 10 m)**

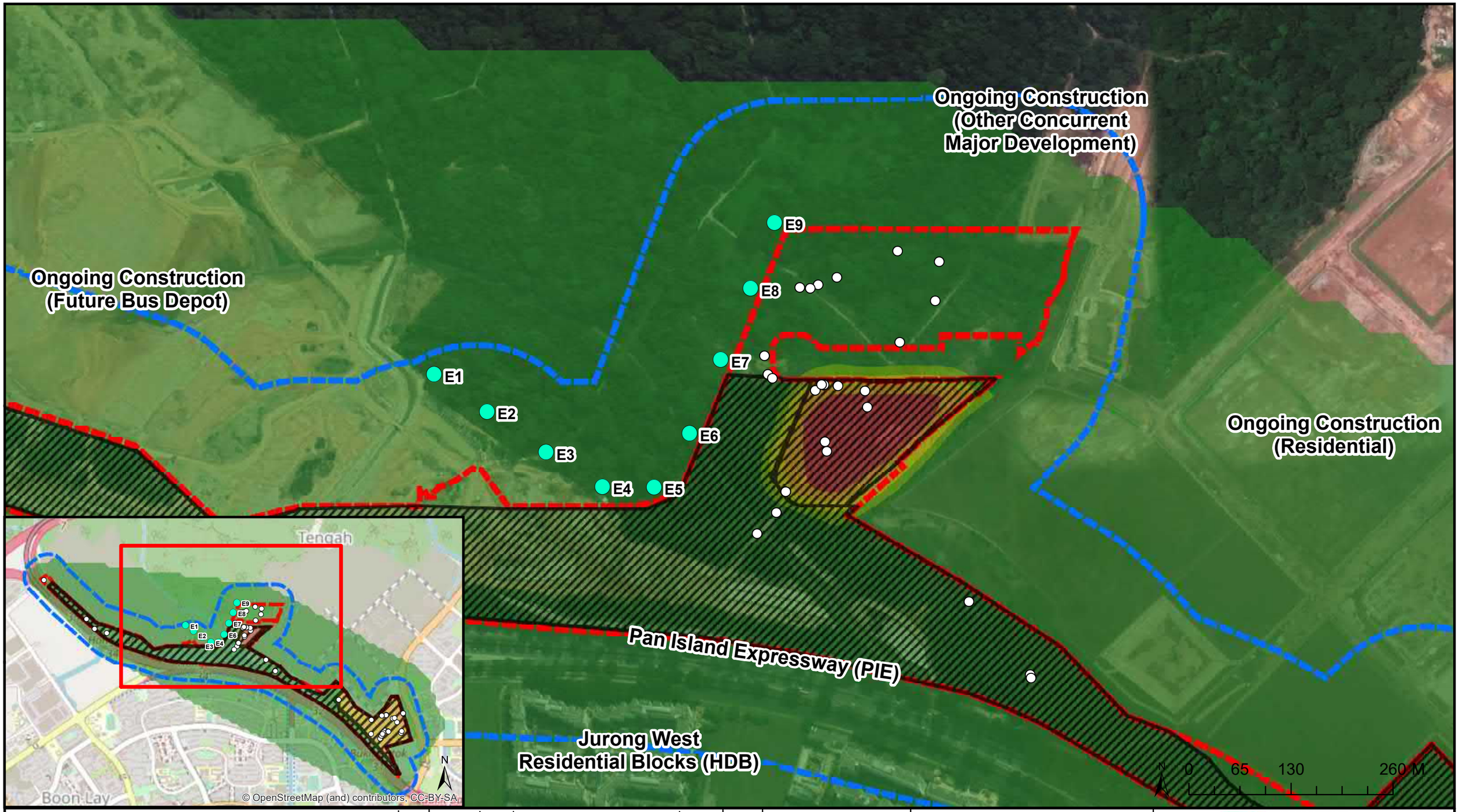
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	Drawn: SYT	Date: OCT 2021

Figure No. : 10-7 | Rev. : - | Sheet : 1 of 1

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Legend

- Airborne Noise Impact Assessment - 150 m Study Area
- Southern Tengah Study Area
- Scenario 3: Infrastructure and Building Works Area of Assessment

Noise Sensitive Receptors

Ecological Receptors

- Representative Ecological Receptors
- Fauna Species of Conservative Significance

Noise Criteria:
7am-7pm: 79 dB(A)
7pm-10pm: 72 dB(A)

Noise level LAeq(5 mins) in dB(A)	
	<= 63
63 <	<= 66
66 <	<= 69
69 <	<= 72
72 <	<= 75
75 <	

Note: Representative Ecological Receptors (RERs) were created and positioned near the Project site for the purposes of noise modelling to deduce the potential noise impacts experienced by the ecological receptors in the Southern Tengah Forest areas.

RERs were not positioned on areas where other concurrent major developments are scheduled to commence before or during the same time as activities assessed in this Project (see Section 3.5).

N

Rev.	Date	By	Description	Chk'd	App'd
-	OCT 2021	SYT	Final Report	NHT	JAG

Qualified Person Endorsement : NA

HDB Endorsement : NA

Consultant : AECOM

Client: HOUSING & DEVELOPMENT BOARD

Project Title :

CONTRACT L/025/21
SPECIALIST CONSULTANCY SERVICES FOR ENVIRONMENTAL IMPACT STUDIES (EIS) AT SOUTHERN TENGAH

Figure Title : **Construction Phase - Scenario 3: Infrastructure and Building Works, $L_{Aeq(5\ mins)}$ for Weekdays, 7am - 7pm for Ecological Receptors (Noise Contours at 10 m)**

Designed	Checked	Approved
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	Drawn: SYT	Date: OCT 2021

Figure No. :	Rev.	Sheet
10-8	-	1 of 1

CAD File Name : NA | A3

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Ongoing Construction (Other Concurrent Major Development)

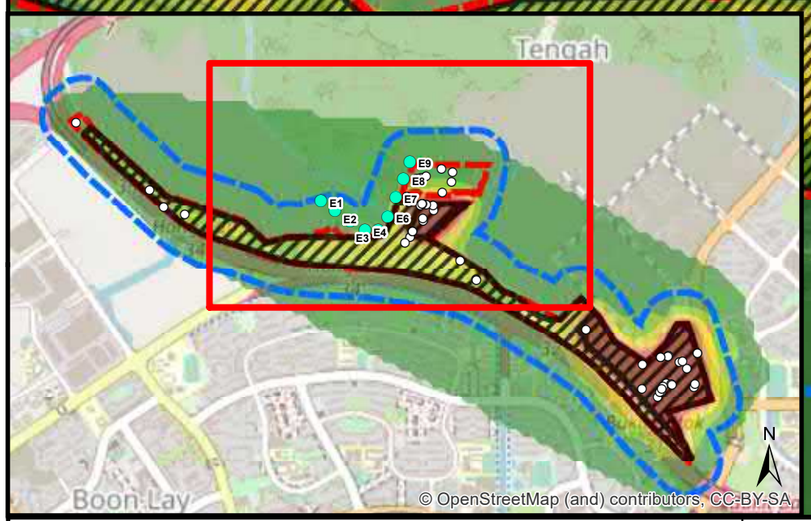
Ongoing Construction (Future Bus Depot)

Ongoing Construction (Residential)

E1 E2 E3 E4 E5 E6 E7 E8 E9

Pan Island Expressway (PIE)

Jurong West Residential Blocks (HDB)



N 0 65 130 260 M

Legend

- Airborne Noise Impact Assessment - 150 m Study Area
- Southern Tengah Study Area
- Scenario 3: Infrastructure and Building Works Area of Assessment

Noise Sensitive Receptors

Ecological Receptors

- Representative Ecological Receptors
- Fauna Species of Conservative Significance

Noise Criteria: 58 dB(A)

Noise level LAeq(12 hours) in dB(A)

	<= 49
49 <	<= 52
52 <	<= 55
55 <	<= 58
58 <	<= 61
61 <	

Note: Representative Ecological Receptors (RERs) were created and positioned near the Project site for the purposes of noise modelling to deduce the potential noise impacts experienced by the ecological receptors in the Southern Tengah Forest areas.

RERs were not positioned on areas where other concurrent major developments are scheduled to commence before or during the same time as activities assessed in this Project (see Section 3.5).

N

Rev.	Date	By	Description	Chk'd	App'd
-	OCT 2021	SYT	Final Report	NHT	JAG

Qualified Person Endorsement : NA

HDB Endorsement : NA

Consultant : AECOM

Client: HOUSING & DEVELOPMENT BOARD

Project Title :

CONTRACT L/025/21 SPECIALIST CONSULTANCY SERVICES FOR ENVIRONMENTAL IMPACT STUDIES (EIS) AT SOUTHERN TENGAH

Figure Title : **Construction Phase - Scenario 3: Infrastructure and Building Works, $L_{Aeq(12\ hours)}$ for Weekdays, 7am - 7pm for Ecological Receptors (Noise Contours at 15 m)**

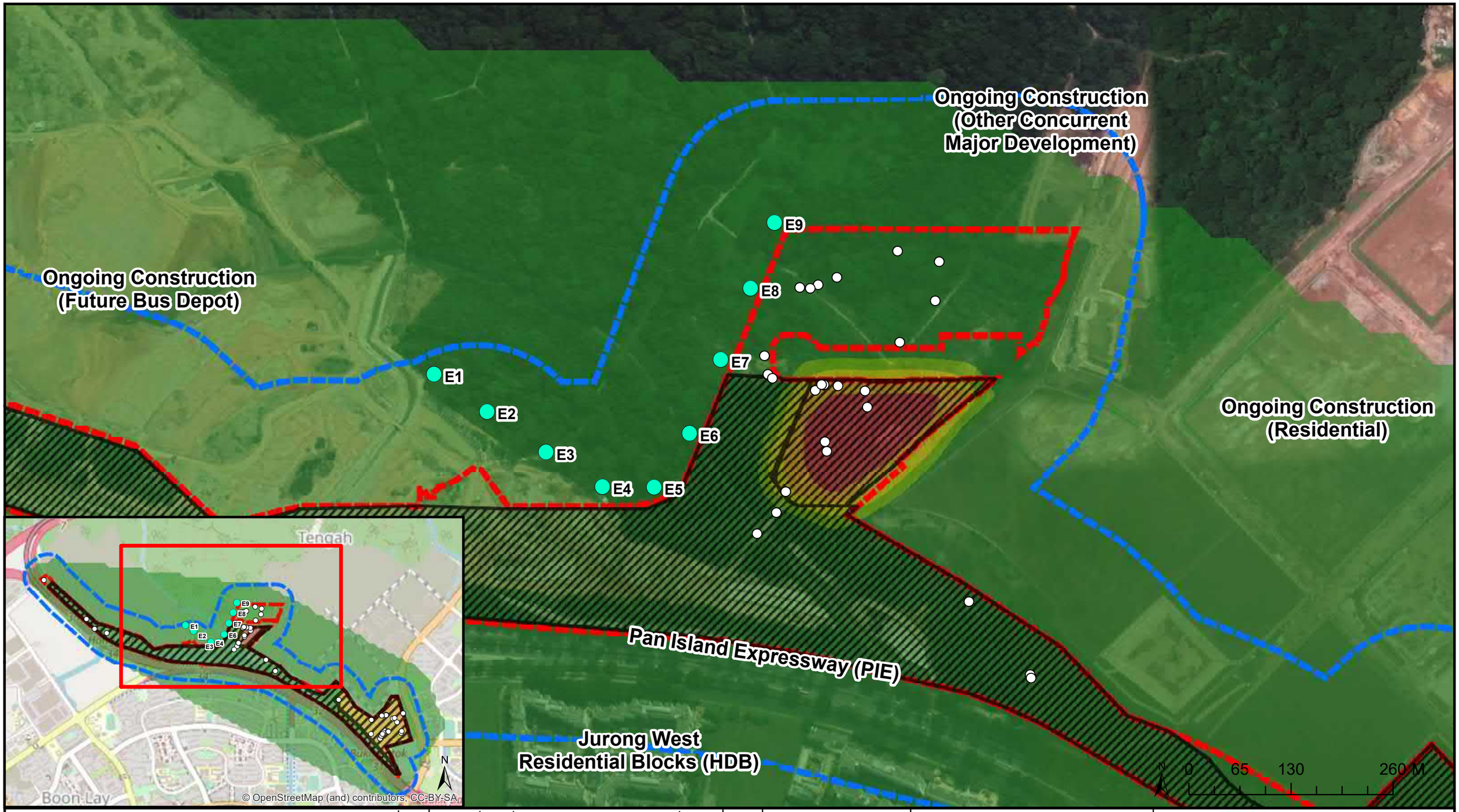
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Legend

- Airborne Noise Impact Assessment - 150 m Study Area
- Southern Tengah Study Area
- Scenario 3: Infrastructure and Building Works Area of Assessment

Noise Sensitive Receptors

Ecological Receptors

- Representative Ecological Receptors
- Fauna Species of Conservative Significance

Noise Criteria:
7am-7pm: 79 dB(A)
7pm-10pm: 72 dB(A)

Noise level LAeq(5 mins) in dB(A)

	<= 63
63 <	<= 66
66 <	<= 69
69 <	<= 72
72 <	<= 75
75 <	

Note: Representative Ecological Receptors (RERs) were created and positioned near the Project site for the purposes of noise modelling to deduce the potential noise impacts experienced by the ecological receptors in the Southern Tengah Forest areas.

RERs were not positioned on areas where other concurrent major developments are scheduled to commence before or during the same time as activities assessed in this Project (see Section 3.5).

N

Rev.	Date	By	Description	Chk'd	App'd
-	OCT 2021	SYT	Final Report	NHT	JAG

Qualified Person Endorsement : NA

HDB Endorsement : NA

Consultant : AECOM

Client: HOUSING & DEVELOPMENT BOARD

Project Title :

CONTRACT L/025/21
SPECIALIST CONSULTANCY SERVICES FOR ENVIRONMENTAL IMPACT STUDIES (EIS) AT SOUTHERN TENGAH

Figure Title : **Construction Phase - Scenario 3: Infrastructure and Building Works, $L_{Aeq(5\ mins)}$ for Weekdays, 7am - 7pm for Ecological Receptors (Noise Contours at 15 m)**

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	Drawn: SYT	Date: OCT 2021

Figure No. :	Rev.	Sheet
10-10	-	1 of 1

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10.7.1.2 Human Receptors

The noise impact assessment results and the respective Impact Significance for the three (3) different scenarios can be found in Appendix Z. Based on the results predicted by the noise models, human receptors are not predicted to experience noise exceedance arising from noise emitted from construction activities in all three (3) scenarios. The resulting **Negligible** impact intensity due to no predicted noise exceedances (refer to Table 6-6) with the corresponding impact consequence for human receptors determined to range from **Imperceptible to Very Low** (refer to Table 6-7).

In relation to the impact consequence and likelihoods of the three (3) different scenarios, it was determined that Scenario 1 with an **Unlikely** likelihood, Scenario 2 with an **Occasional** likelihood and Scenarios 3 with a **Likely** likelihood (refer to Table 10-8), that the impact significance arising from the proposed construction activities will result in an overall impact significance ranging from **Negligible to Minor** (refer to Table 6-9) as reflected in Table 10-22 below. As such, no mitigation measures were required to mitigate noise impacts on human receptors as no noise exceedance were predicted to occur based on the noise modelling results displayed in Appendix Z.

The resulting noise contours representative of the worst-case noisiest scenario, Scenario 3: Infrastructure and Building Works with the highest overall predicted noise levels based on the results in Appendix Z are visualized in Figure 10-11 and Figure 10-12 for $L_{Aeq(12\ hours)}$ and $L_{Aeq(5\ mins)}$ respectively.

Based on the predicted noise levels observed for the three (3) different scenarios reflected in Appendix Z, construction noise impact assessment for human receptors was performed and summarized in 10-21 below. This evaluation was carried out with reference to the assessment methodology outlined in Section 6.4.2.

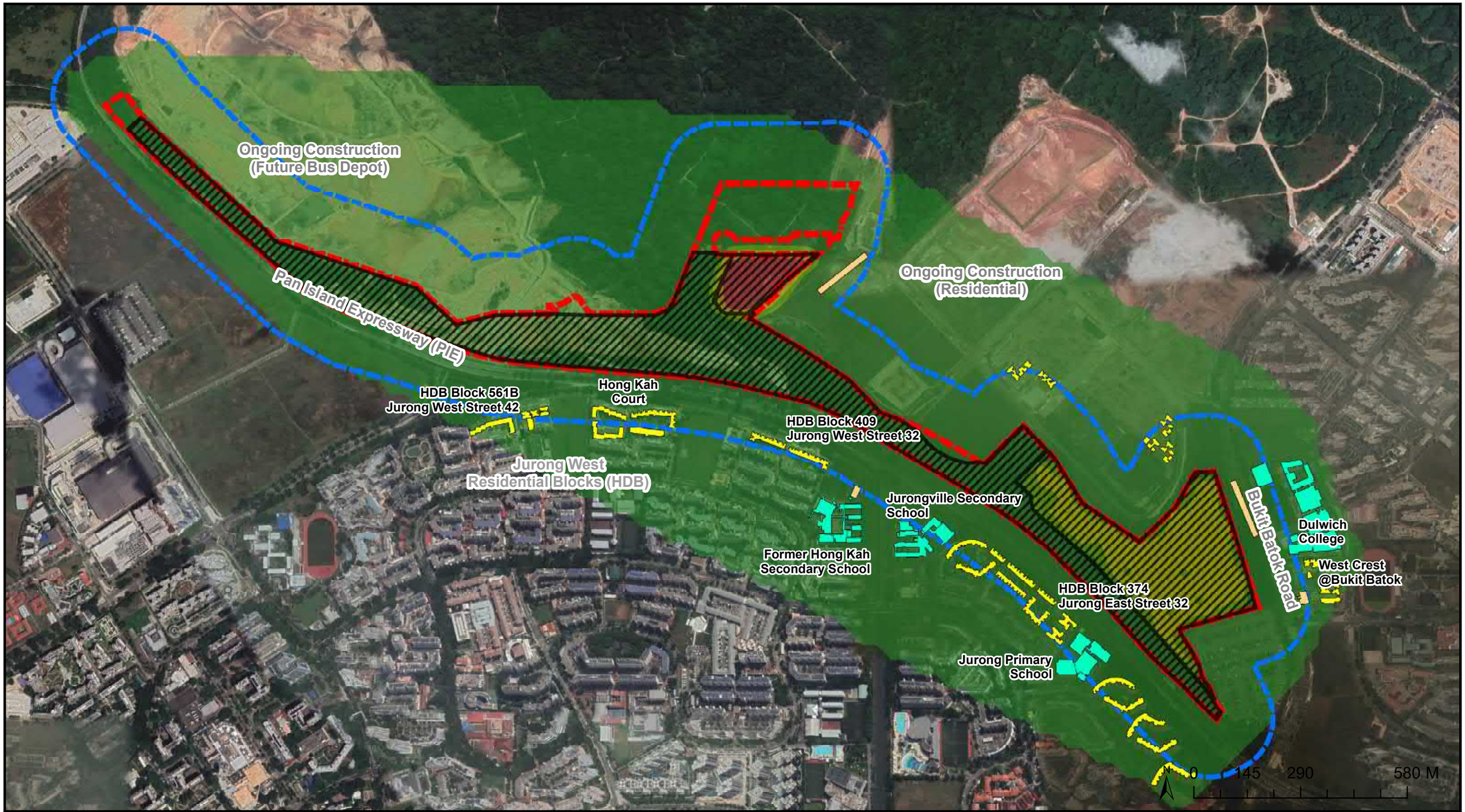
Table 10-22 Summary of Construction Noise Impacts - Human Impacts

Nearest Noise Logger / Scenario	Noise Sensitive Receptors	Maximum Exceedance Observed, dB(A)	Impact Intensity	Impact Consequence	Likelihood	Impact Significance
N1b: HDB Land Lot (No. MK10-05123K), near Dulwich College						
Scenario 1: Site Clearance	(a) Noise Sensitive (Priority 1)	–	Negligible	Very Low	Unlikely	Negligible
	(b) Residential (Priority 2)	–	Negligible	Very Low	Unlikely	Negligible
	(c) Others (Priority 3)	–	Negligible	Imperceptible	Unlikely	Negligible
Scenario 2: Earthworks	(a) Noise Sensitive (Priority 1)	–	Negligible	Very Low	Occasional	Minor
	(b) Residential (Priority 2)	–	Negligible	Very Low	Occasional	Minor
	(c) Others (Priority 3)	–	Negligible	Imperceptible	Occasional	Negligible
Scenario 3: Infrastructure and Building Works	(a) Noise Sensitive (Priority 1)	–	Negligible	Very Low	Likely	Minor
	(b) Residential (Priority 2)	–	Negligible	Very Low	Likely	Minor
	(c) Others (Priority 3)	–	Negligible	Imperceptible	Likely	Negligible
N3: Block 374 HDB Jurong East						
Scenario 1: Site Clearance	(a) Noise Sensitive (Priority 1)	–	Negligible	Very Low	Unlikely	Negligible

Nearest Noise Logger / Scenario	Noise Sensitive Receptors	Maximum Exceedance Observed, dB(A)	Impact Intensity	Impact Consequence	Likelihood	Impact Significance
	(b) Residential (Priority 2)	–	Negligible	Very Low	Unlikely	Negligible
Scenario 2: Earthworks	(a) Noise Sensitive (Priority 1)	–	Negligible	Very Low	Occasional	Minor
	(b) Residential (Priority 2)	–	Negligible	Very Low	Occasional	Minor
Scenario 3: Infrastructure and Building Works	(a) Noise Sensitive (Priority 1)	–	Negligible	Very Low	Likely	Minor
	(b) Residential (Priority 2)	–	Negligible	Very Low	Likely	Minor
N4: Block 409 HDB Jurong West						
Scenario 1: Site Clearance	(a) Noise Sensitive (Priority 1)	–	Negligible	Very Low	Unlikely	Negligible
	(b) Residential (Priority 2)	–	Negligible	Very Low	Unlikely	Negligible
Scenario 2: Earthworks	(a) Noise Sensitive (Priority 1)	–	Negligible	Very Low	Occasional	Minor
	(b) Residential (Priority 2)	–	Negligible	Very Low	Occasional	Minor
Scenario 3: Infrastructure and Building Works	(a) Noise Sensitive (Priority 1)	–	Negligible	Very Low	Likely	Minor
	(b) Residential (Priority 2)	–	Negligible	Very Low	Likely	Minor
N5: Block 561B HDB Jurong West						
Scenario 1: Site Clearance	(b) Residential (Priority 2)	–	Negligible	Very Low	Unlikely	Negligible
Scenario 2: Earthworks	(b) Residential (Priority 2)	–	Negligible	Very Low	Occasional	Minor
Scenario 3: Infrastructure and Building Works	(b) Residential (Priority 2)	–	Negligible	Very Low	Likely	Minor
N7: Tengah Forest (Future Educational)						
Scenario 1: Site Clearance	(c) Others (Priority 3)	–	Negligible	Imperceptible	Unlikely	Negligible
Scenario 2: Earthworks	(c) Others (Priority 3)	–	Negligible	Imperceptible	Occasional	Negligible
Scenario 3: Infrastructure and Building Works	(c) Others (Priority 3)	–	Negligible	Imperceptible	Likely	Negligible
N8: Tengah Forest (Future Park/ Residential)						

Nearest Noise Logger / Scenario	Noise Sensitive Receptors	Maximum Exceedance Observed, dB(A)	Impact Intensity	Impact Consequence	Likelihood	Impact Significance
Scenario 1: Site Clearance	(b) Residential (Priority 2)	–	Negligible	Very Low	Unlikely	Negligible
Scenario 2: Earthworks	(b) Residential (Priority 2)	–	Negligible	Very Low	Occasional	Minor
Scenario 3: Infrastructure and Building Works	(b) Residential (Priority 2)	–	Negligible	Very Low	Likely	Minor

Note:
** Refer to Table 10-1 for more information on the nearest noise logger where the recorded baseline noise monitoring results are used as the noise criterion as part of no-worse-off than baseline noise impact assessment for ecological receptors in this EIS.*
The colour of the cells corresponds to that of the assessment matrices in Section 6.4.2.
The full list of construction noise results for the individual representative ecological receptors (RERs) can be found in Appendix Z.



Legend

- Airborne Noise Impact Assessment - 150 m Study Area
- Southern Tengah Study Area
- Scenario 3: Infrastruture and Building Works Area of Assessment

Noise Sensitive Receptors

Human Receptors

Receptor Sensitivity

- Priority 1
- Priority 2
- Priority 3

Note: * Refer to Section 10.5.3 of the EIS Final Report and Appendix X for the Corrected Construction Noise Criteria for the noise criteria of each individual human receptor.

N

Maximum Permissible Noise Levels:
70 - 76 dB(A)*

Noise level LAeq(12 hours) in dB(A)

	<= 61
61 <	<= 64
64 <	<= 67
67 <	<= 70
70 <	<= 73
73 <	<= 76
76 <	

Rev.	Date	By	Description	Chk'd	App'd
-	OCT 2021	SYT	Final Report	NHT	JAG

Qualified Person Endorsement : NA

HDB Endorsement : NA

Consultant : AECOM

Client: HOUSING & DEVELOPMENT BOARD

Project Title :

CONTRACT L/025/21
SPECIALIST CONSULTANCY SERVICES FOR ENVIRONMENTAL IMPACT STUDIES (EIS) AT SOUTHERN TENGAH

Figure Title :

Construction Phase - Scenario 3: Infrastructure and Building Works, $L_{Aeq(12\ hours)}$ for Weekdays, 7am - 7pm for Human Receptors Noise Contours

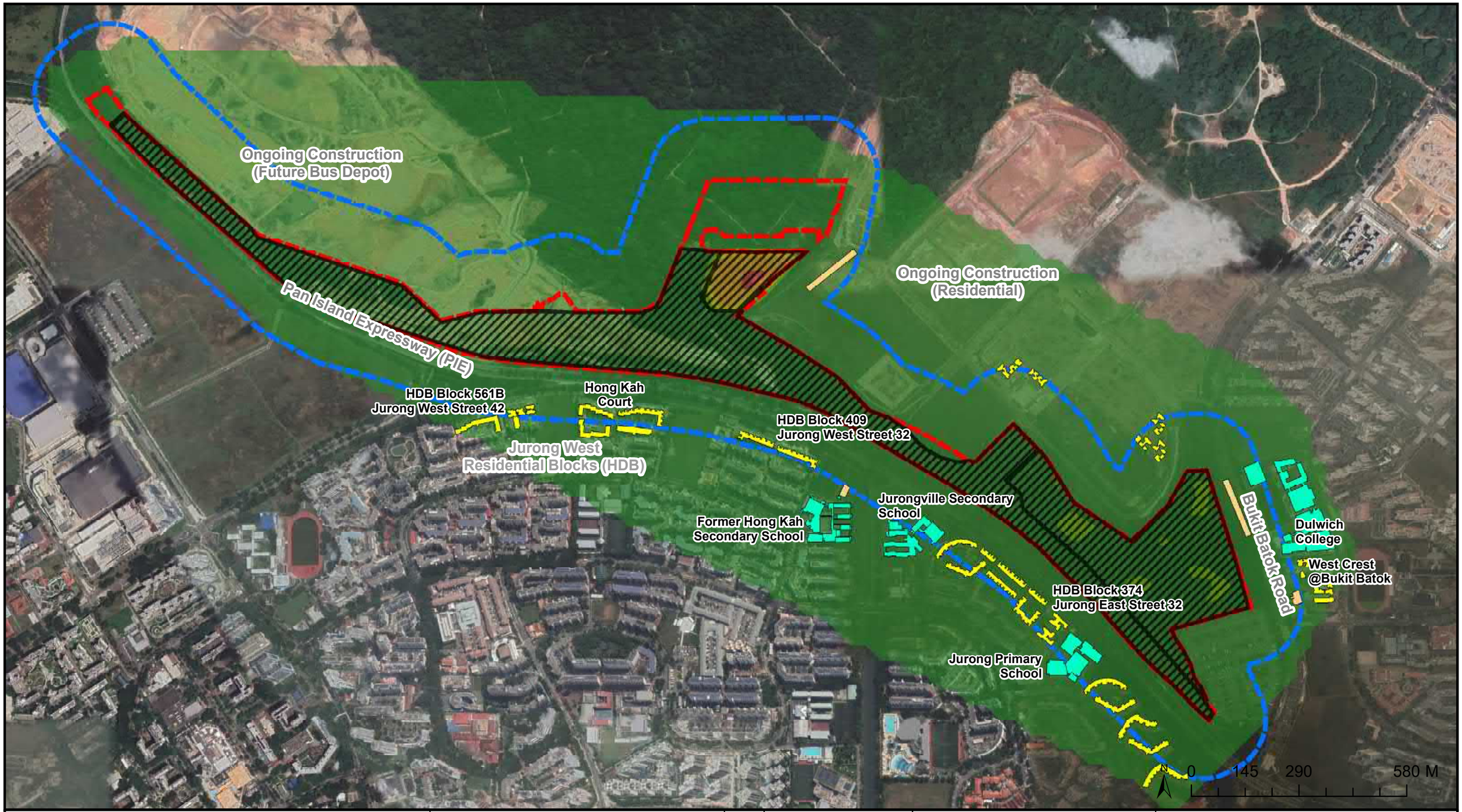
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Figure No. :	Rev.	Sheet
10-11	-	1 of 1

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Legend

- Airborne Noise Impact Assessment - 150 m Study Area
- Southern Tengah Study Area
- Scenario 3: Infrastruture and Building Works Area of Assessment

Noise Sensitive Receptors

Human Receptors

Receptor Sensitivity

- Priority 1
- Priority 2
- Priority 3

Note: * Refer to Section 10.5.3 of the EIS Final Report and Appendix X for the Corrected Construction Noise Criteria for the noise criteria of each individual human receptor.

Noise Criterion:
76 - 90 dB(A)*

Noise level LAeq(5 mins) in dB(A)

	<= 67
67 <	<= 70
70 <	<= 73
73 <	<= 76
76 <	<= 79
79 <	<= 82
82 <	

Rev.	Date	By	Description	Chk'd	App'd
-	OCT 2021	SYT	Final Report	NHT	JAG

Qualified Person Endorsement : NA

HDB Endorsement : NA

Consultant : AECOM

Client: HOUSING & DEVELOPMENT BOARD

Project Title :

CONTRACT L/025/21 SPECIALIST CONSULTANCY SERVICES FOR ENVIRONMENTAL IMPACT STUDIES (EIS) AT SOUTHERN TENGAH

Figure Title :

Construction Phase - Scenario 3: Infrastructure and Building Works, $L_{Aeq(5\ mins)}$ for Weekdays, 7am - 7pm for Human Receptors Noise Contours

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Figure No. : 10-12 | Rev. : - | Sheet : 1 of 1

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10.7.2 Operational Phase

10.7.2.1 Ecological receptors

The Southern Tengah Forest areas at the northern tip of the Project is home to several ecological receptors identified in Section 10.4.1.1. For this study, operational noise impacts on the ecological receptors were qualitatively evaluated based on the auditory sensitivities of the fauna species identified. Within the group of fauna species identified to reside within 150 m from the Project site, Priority 1 (most sensitive) – Priority 3 fauna have been identified.

However, it should be noted that the larger impact on this area regardless of noise is due to the redevelopment of the forested area into urbanized developments, removing the habitats where said identified fauna species reside in and impacting them directly. Whether the fauna species will eventually move northwards to take shelter deeper into the Southern Tengah Forest areas or develop new habitats elsewhere is uncertain at this stage making it difficult to analyse the impact of noise on these fauna species.

For fauna species found to reside further away from the boundary of the Project site, as noise propagation reduces with distance, it is possible that with time in the operational phase, that the fauna species may adapt itself to a continuous noise level (i.e. new baseline). As discussed in Section 10.2.4.2, HDB/ contractor contracted by HDB should appoint a Noise Consultant(s) to assess the impacts arising from the operational phase to procure a more accurate understanding of noise impacts arising from operational conditions based on updated baseline conditions. It is advised that faunistic survey and baseline noise monitoring be conducted upon completion of the construction phase and commencement of the operational phase to determine the new baseline conditions and fauna species that remain in the vicinity of the Project site to determine actual operational noise impacts.

The noise monitoring location N7 (see Table 10-1) is the nearest noise monitoring location to the ecological receptors at the Southern Tengah Forest areas near the northern tip of the Project site. The average baseline noise levels for $L_{Aeq(15\ mins)}$ recorded at N7 ranged from 49 – 51 dB(A). Comparing this to the *NEA Technical Guideline on Boundary Noise Limits for Air Conditioning and Mechanical Ventilation Systems in Non-Industrial Buildings, 2018* [R-40] for the most stringent noise sensitive criteria (60 dB(A) – day, 55 dB(A) – evening, 50 dB(A) – night), current recorded baseline noise levels are relatively lower than the noise limits provided by NEA. As a conservative means, the lower recorded baseline noise levels should be established as the noise criteria to ensure that noise sensitive fauna species will not face significant impacts from noise disturbances. That said, assuming if the regulation will be met by the contractors, fauna species may potentially face **Negligible to Moderate** impacts due detectable disturbances from increased noise levels in the Southern Tengah Forest areas if ACMV systems are designed to be fronting those noise sensitive areas. However, if a more conservative criteria (i.e. no worse off than baseline) was adopted, the operational noise impact significance on the ecological receptors can be qualitatively assessed as **Negligible to Minor**.

The impact intensity if abiding by the conservative criteria would potentially range from **Negligible to Low** (refer to Table 6-6) and the corresponding impact consequence may range from **Imperceptible to Low** (see Table 6-7). The likelihood of noise levels exceeding the criteria would be **Occasional** (see Table 6-8), dependant on human activities and how frequently ACMV systems are engaged. Hence, the overall impact significance can be qualitatively assessed to range from **Negligible to Minor** (see Table 6-9) for ecological receptors found in the Southern Tengah Forest areas.

In accordance with the impact evaluation matrices in Section 6.4.2, the summary of operational noise impacts as assessed qualitatively are presented in Table 10-23 below.

Table 10-23 Summary of operational noise impacts – ecological impacts

Auditory Sensitivity of Ecological Receptors	Impact Intensity	Impact Consequence	Likelihood	Impact Significance
Priority 1	Negligible to Low	Very Low to Low	Occasional	Negligible to Minor
Priority 2	Negligible to Low	Very Low to Low	Occasional	Negligible to Minor
Priority 3	Negligible to Low	Imperceptible to Very Low	Occasional	Negligible

10.7.2.2 Human Receptors

Referring to Section 10.2.4.2, it is mandatory for the proposed developments to comply with NEA's guidelines for boundary noise impact assessment for air conditioning and mechanical ventilation (ACMV) systems of non-industrial buildings and Traffic Noise Impact Assessment (TNIA) for existing/ new road networks for the developments within the Project site. Usually conducted by an appointed Noise Consultant during the development stage, AECOM recommends the works for ACMV boundary noise impact assessment and TNIA to be conducted in the later stages of the development in accordance with *NEA Technical Guideline on Boundary Noise Limits for Air Conditioning and Mechanical Ventilation Systems in Non-Industrial Buildings, 2018* [R-40] and *NEA Technical Guideline for Land Traffic Noise Impact Assessment, 2016* [R-46].

For the ACMV boundary noise impact assessment, the immediate boundary of the identified non-industrial buildings as part of the Project developments should be assessed against the corrected criteria in accordance to the guidelines, especially for boundaries fronting noise sensitive receptors. For TNIA, developers of the residential developments should assess noise impacts from the proposed new road networks and the Pan Island Expressway (PIE) or Bukit Batok Road (if within audible range) on the noise sensitive receptors as outlined by the guideline.

As part of qualitative impact assessment for operational noise impacts on human receptors, judging from the construction noise impacts which are considerably more significant compared to operational noise impacts in terms of magnitude of noise, size of/ area impacted by noise source, operational noise impacts should constitute lesser significance. Based on this, the impact intensity of operational noise on human receptors was qualitatively assessed as **Negligible** (see Table 6-6), with the corresponding impact consequence deduced to range from **Imperceptible to Very Low** (refer to Table 6-7) depending on the sensitivity of the receptor (see Section 10.4). The likelihood of noise levels exceeding the criteria would be **Occasional** (see Table 6-8), dependant on human activities and how frequently ACMV systems are engaged. Hence, the overall impact significance can be qualitatively assessed to range from **Negligible to Minor** (see Table 6-9) for operational noise impacts on human receptors.

It should be noted that as mandated by law, HDB/ contractors contracted by HDB should conduct quantitative operational noise impact assessment duly in the later stages of the Project development.

10.8 Recommended Mitigation Measures

10.8.1 Construction Phase

As assessed in Section 10.7 above, no mitigation measures were proposed for both ecological and human receptors. However, as part of pre-emptive measures to assess potential impacts that may arise from uncontrolled/ unpredicted events, an EMMP with airborne noise monitoring program was proposed to assess the effectiveness of minimum control measures on site during construction phase of the Project, as detailed in Section 11.13.1.

10.8.2 Operational Phase

At this stage, following preliminary mitigation measures have been proposed for consideration as reflected in Table 10-24 below.

Table 10-24 Proposed preliminary mitigation measures - operational phase (human impacts)

Potential Noise Sources	Proposed Mitigation Measures
Air conditioning and mechanical ventilation systems	Noise attenuators and other Best Available Technology (BAT) and Best Environmental Practice (BEP) noise control measures shall be utilized.
Increase road traffic in vicinity of developments	Traffic noise at drop-off points and parking areas shall be mitigated with low-speed postings, speed humps and speed limit signages. The addition of these speed control measures will likely lower noise levels for traffic as the vehicles would be cruising at lower speeds.

Due to the lack of literature regarding the possible impacts of operational noise arising from the operation of ACMV systems and increased traffic noise on the ecological receptors, the approach to mitigate operational noise impacts on human receptors have been adopted to mitigate noise impacts on the ecological receptors. It was assumed that due to the potential noise sources arising from human activities as part of the operational phase (see Table 10-24), it is likely that ecological receptors with higher mobility (e.g. birds, butterflies, bats) will migrate northwards, deeper into the Southern Tengah Forest areas, away from the disturbances brought about by operational noise. The approach to mitigate noise arising from ACMV systems and increased road traffic as per Table 10-24 is recommended to be employed to mitigate operational noise where possible.

Noise monitoring programme for the operational phase have not been proposed as information required regarding ACMV system designs and traffic volumes are unavailable. Usually conducted by an appointed Noise Consultant during the development stage, AECOM recommends the works for ACMV boundary noise impact assessment and TNIA to be conducted in the later stages of the development in accordance with *NEA Technical Guideline on Boundary Noise Limits for Air Conditioning and Mechanical Ventilation Systems in Non-Industrial Buildings, 2018* [R-40] and *NEA Technical Guideline for Land Traffic Noise Impact Assessment, 2016* [R-46].

10.9 Residual Impacts

10.9.1 Construction Phase

10.9.1.1 Ecological Impacts

No residual noise impacts were assessed for ecological receptors of scenarios 1 and 2 in this Project, while for Scenario 3: Infrastructure and Building Works, residual impact significance ranged from **Minor to Moderate**. While no further mitigation measures were proposed in Section 10.8, it has been noted in Section 10.7.1.1.1.3 that noise impacts of Scenario 3 has been reduced to as low as reasonably practical and the considerable impact significance could be influenced by the **Likely** likelihood of occurrence.

10.9.1.2 Human Impacts

Human receptors were not assessed for residual impacts due to no noise exceedances predicted by the noise model as discussed in Section 10.2.4.1.

10.9.2 Operational Phase

10.9.2.1 Ecological Impacts

The residual operational noise impact assessment assumes that the mitigation measures proposed within Section 10.8.2 have been implemented at developments identified as potential sources for operational noise. The impact intensity at the receptors are expected to be reduced with the adoption of Best Available Technology (BAT) and Best Environmental Practice (BEP) noise control measures for ACMV systems, and measures to reduce traffic noise by introducing speed postings, humps and speed limit signages to slow down traffic. Furthermore, it was assumed the ecological receptors with higher mobility would potentially migrate northwards into the Southern Tengah Forest areas to distant themselves from the disturbances arising from operational noise impacts.

Based on the above assumptions, the residual operational noise impacts on the ecological receptors could be deduced to be reduced from an impact significance ranging from **Negligible-Minor to Negligible**.

10.9.2.2 Human Impacts

As discussed in Section 10.2.4.2, it is mandatory that the proposed developments comply with the *NEA Technical Guideline on Boundary Noise Limits for Air Conditioning and Mechanical Ventilation Systems in Non-Industrial Buildings, 2018* [R-40] and *NEA Technical Guideline for Land Traffic Noise Impact Assessment, 2016* [R-46]. This is usually conducted by an appointed Noise Consultant during the development stage. Hence, AECOM recommends that HDB/ contractor contracted by HDB to appoint a Noise Consultant(s) to assess the impacts arising from the operational phase at later stages of the development, to procure a more accurate understanding of noise impacts arising from operational conditions based on updated baseline conditions.

Following the implementation of preliminary proposed mitigation measures in Section 10.8.2, the residual impact significance on human receptors can be qualitatively deduced to be reduced to range from **Negligible-Minor to Negligible**.

10.10 Cumulative Impacts from Other Major Concurrent Development

It is known that several major concurrent project developments, highlighted in Section 3.5 and visualized in Figure 3-5, would be on-going during similar construction schedules. As means of a holistic approach to assess noise impacts experienced by the noise sensitive receptors (NSRs) in the vicinity of said developments, potential noise impacts arising from these concurrent developments ought to be assessed along with the noise impacts arising from construction stages within this Project to deduce the cumulative noise impacts experienced by NSRs. In view of this, cumulative impacts from this Project along with that of other major concurrent developments in the vicinity are addressed for construction and operational noise impacts as follows:

10.10.1 Construction Phase

According to Section 3.5, several major concurrent developments in vicinity of the Project site have been identified with their information and locations discussed and presented Figure 3-5. As observed, the other major concurrent

developments enveloping the Project site will result in an overall larger construction footprint to be considered for noise impacts across the entire construction period. The other major concurrent developments were found to be progressing within the same timeline as proposed developments of this Project. As a result, noise from more powered mechanical equipment (PMEs) as part of the construction phase are also expected.

When considering the other major concurrent developments and their construction activities along with those occurring within this Project, the impact significance are expected to worsen as assessed in Table 10-25 below for the respective scenarios and associated NSRs.

Table 10-25 Cumulative airborne noise impact assessment (construction phase)

Scenarios	Construction Period (refer to Section 3.5)	Other Major Concurrent Developments occurring during same period (refer to Section 3.5)	Auditory Priority/ Sensitivity	Pre-Mitigation without addition of Other Concurrent Major Developments		Pre-Mitigation with addition of Other Major Concurrent Developments				Remarks
				Impact Intensity	Impact Significance	Impact Intensity	Impact Consequence	Likelihood	Impact Significance	
Ecological Receptors										
Scenario 1: Site Clearance	In mid term	• Road and Building Construction • JRL1, JRL3 • JRL2 • Mass Rapid Transit (MRT) and Bus Depot • PIE Widening • Nanyang Pipeline construction using pipe jacking	Priority 1 – Priority 3	Low	Negligible	Low – Medium	Very Low – Medium	Unlikely	Negligible	As discussed in Section 3.5, the other major concurrent development occurring nearest to the ecological receptors assessed in this Project during the occurrence of Scenario 1 is the Mass Rapid Transport (MRT) and Bus Depot. At the time of commencement of Scenario 1, JRL2 is approximately at the earthworks/ building which may entail significant noise contributions resulting in worsened noise conditions and an increased impact intensity ranging from **Low** – **Medium.**
Scenario 2: Earthworks	In mid term	• Road and Building Construction • JRL1, JRL3 • JRL2 • Mass Rapid Transport (MRT) and Bus Depot • PIE Widening • Nanyang Pipeline construction using pipe jacking	Priority 1 – Priority 3	Negligible	Negligible to Minor	Negligible to Low	Imperceptible to Low	Occasional	Negligible to Minor	For Scenario 2, the Mass Rapid Transport (MRT) and Bus Depot would be the predominant concurrent major development contributing to noise disturbances on the ecological receptors identified for assessment in this Project resulting in potentially worsened noise conditions and increased impact intensity ranging from **Negligible to Low**.
Scenario 3: Infrastructure and Building Works	In mid term	• Road and Building Construction • Central Park (section outside of this Project site) • JRL1, JRL3 • JRL2 • Mass Rapid Transport (MRT) and Bus Depot • PIE Widening • Nanyang Pipeline construction using pipe jacking	Priority 1 – Priority 3	Negligible to Low	Minor to Moderate	Low	Very Low – Low	Likely	Minor to Moderate	Referring to in Section 3.5, the other major concurrent development occurring nearest to the ecological receptors assessed in this Project when Scenario 3 occurs would be the Central Park (section outside of this Project site) and Mass Rapid Transport (MRT) and Bus Depot. For noise contributions from the Central Park(section outside of this Project site) site, it is assumed that noise contribution due to activities occurring at the concurrent project site would be minimal from the regreening of the cleared areas with activities such as planting trees/ arboriculture with an overall impact intensity of **Low**. Similarly, as the construction phase of the Mass Rapid Transport (MRT) and Bus Depot is at a late stage, near completion, it is expected that noisier activities such as infrastructure/ building works would have been completed by now, noise contribution from the Mass Rapid Transport (MRT) and Bus Depot site be minimal with an overall impact intensity of **Low**
Human Receptors										
Scenario 1: Site Clearance	In mid term	• Road and Building Construction • JRL1, JRL3 • JRL2 • Mass Rapid Transport (MRT) and Bus Depot • PIE Widening • Nanyang Pipeline construction using pipe jacking	Priority 1 – Priority 3	Negligible	Negligible	Low – Medium	Very Low – Medium	Unlikely	Negligible	Based on information provided in Section 3.5,, the other major concurrent developments that will occur in the vicinity of human receptors assessed in this Project for Scenario 1 and Scenario 2 would include PIE Widening, JRL1, JRL3 works. Due to the close proximity of the JRL1 site to the noise sensitive human receptors such as Dulwich College, and proximity of the PIE Widening and JRL2 worksites to HDB estates along the PIE, it is likely that potential impact intensity be worsened to range from **Low** – **Medium** contributed by noise of the LTA Projects.
Scenario 2: Earthworks	In mid term	• Road and Building Construction • JRL1, JRL3 • JRL2	Priority 1 – Priority 3	Negligible	Negligible to Minor	Low – Medium	Very Low – Medium	Occasional	Minor to Moderate	

Scenarios	Construction Period (refer to Section 3.5)	Other Major Concurrent Developments occurring during same period (refer to Section 3.5)	Auditory Priority/ Sensitivity	Pre-Mitigation without addition of Other Concurrent Major Developments		Pre-Mitigation with addition of Other Major Concurrent Developments				Remarks
				Impact Intensity	Impact Significance	Impact Intensity	Impact Consequence	Likelihood	Impact Significance	
		• Mass Rapid Transport (MRT) and Bus Depot • PIE Widening • Nanyang Pipeline construction using pipe jacking								
Scenario 3: Infrastructure and Building Works	In mid term	• Road and Building Construction • Central Park (section outside of this Project site) • JRL1, JRL3 • JRL2 • Mass Rapid Transport (MRT) and Bus Depot • PIE Widening • Nanyang Pipeline construction using pipe jacking	Priority 1 – Priority 3	Negligible	Negligible to Minor	Negligible to Low	Very Low – Low	Likely	Minor to Moderate	Similar to Scenario 1 and 2, cumulative noise impacts from PIE Widening, JRL2, JRL3 works are likely to contribute to noise impacts on human receptors assessed for Scenario 3. However, it should be noted that these concurrent major developments are at the later stages (nearing completion). Hence the noise contribution is expected to be less significant than for Scenario 1 and 2, with the potential impact intensity worsened to a range of **Very Low** – **Low**.

At this stage, as the project schedule provided by HDB is still tentative as mentioned in Section 3.5, it is highly recommended that the contractor on board for the design and building phases re-assess the construction of the construction developments based on the cumulative impacts assessed for both ecological and human receptors potentially impacted by this, such as sequencing or planning works such that cumulative noise impacts can be mitigated.

10.10.2 Operational Phase

For the operational phase, as other major concurrent developments would have been completed along with the construction of proposed developments within the Project site, other than the proposed future hospital development and Central Park (section within this Project site), and given that most areas where ecological receptors within 150 m from the Project site were identified and assessed would be cleared and urbanized to house infrastructures such as the JID, and cleared for the Central Park (section outside this Project site), it is expected that the additional cumulative operational noise impacts would be insignificant compared to the removal of habitat of the ecological receptors within the 150 m airborne noise study area.

While for human receptors, as mandated by law, proposed developments must comply with NEA's guidelines for boundary noise impacts assessment for air conditioning and mechanical ventilation (ACMV) systems of non-industrial buildings and traffic noise impact assessment (TNIA) for existing/ new road networks for the developments within the Project site. Usually conducted by an appointed Noise Consultant during the development stage, AECOM recommends that the works for ACMV boundary noise impact assessment and TNIA be conducted at later stages of development in accordance with NEA's guidelines as discussed in Section 10.7.2 and hence cumulative impact assessment have been omitted from this report.

10.11 Summary of Key Findings

In this study, noise impact assessment was carried out for both the construction phase and operational phase of the proposed developments within the defined Project site to assess the noise impacts brought about by these two phases on the ecological and human receptors identified in this Project. Following details, the summary of key findings for the two (2) respective phases:

10.11.1 Construction Phase

For the construction phase, noise impact assessment was carried out for three (3) different scenarios: Scenario 1: Site Clearance; Scenario 2: Earthworks; and Scenario 3: Infrastructure and Building Works (see Section 10.2.4.1), deduced based on the construction stages and construction schedules to assess the noise impacts arising from the multiple proposed developments within the Project site. The assessment was divided to assess the impacts on both ecological and human receptors as identified in Section 10.4 as mentioned. The airborne noise study area for the construction phase was defined as 150 m from the Project site. Baseline airborne noise monitoring was carried out at thirteen (13) locations within the defined study area.

For human receptors, the baseline study recorded the average $L_{Aeq(12\ hours)}$, $L_{Aeq(1\ hour)}$ and $L_{Aeq(5\ mins)}$ baseline noise levels and compared it against the construction criteria provided by the NEA guidelines [W-29] to develop a Project-specific criterion for the construction phase of the Project. The Project-specific corrected noise criteria were then used as part of construction noise impact assessment (see Section 10.5.3.2) for human receptors. While, for ecological receptors, the maximum baseline noise monitoring results (see Section 10.5.3.1) were adopted to assess the ecological impacts on the fauna species identified in this Project in line with methods adopted by Jacobs in Project No. D3332600, 'Specialist Consultancy Services for Environmental Impact Study at Tengah Town', accepted by NEA as detailed in Section 10.2.3.

In the assessment of the construction phase, noise levels generated from the powered mechanical equipment (PMEs) were predicted using SoundPLAN ver. 8.2. Topography and terrain elevations plays an important role in noise propagation and has hence been accounted for in the noise model. A quantitative assessment approach was adopted for the noise sensitive receptors (NSRs) (i.e. ecological receptors and human receptors as visualized in Figure 10-3 and Figure 10-4 respectively) and carried out and compared to the stipulated *Environmental Protection and Management (Control of Noise at Construction Sites) Regulations, 2008*. The identified NSRs were then assessed in accordance to the impact evaluation matrices in Section 6.4.2 and noise contours reflecting the extent of noise propagation from source to receptors were also provided. Base on the impact evaluation, mitigation measures to reduce airborne noise impacts on the ecological and human receptors were recommended for the affected NSRs.

Out of the three (3) selected scenarios, Scenario 1: Site Clearance is the only scenario assessed against both daytime (7am – 7pm, $L_{Aeq(12\ hours)}$ and $L_{Aeq(5\ mins)}$) and night-time criteria beyond 7pm and up to 10pm (i.e. 7pm – 10pm, $L_{Aeq(1\ hour)}$, $L_{Aeq(5mins)}$) subject to approval by Agencies. While all other remaining scenarios (i.e. Scenario 2 and Scenario 3) were assessed against daytime criteria (7am – 7pm, $L_{Aeq(12\ hours)}$ and $L_{Aeq(5mins)}$) in-line with information provided by HDB.

The likelihood of occurrence of the potential noise impacts were determined based on the construction timeline of selected construction stages as described in Table 6-8. This resulted in Scenario 1 having a likelihood of **Unlikely**/ **Remote**, Scenario 2 having a likelihood of **Occasional**/ **Rare**, and Scenario 3 having a likelihood of **Likely**/ **Regular** as reflected in Table 10-8.

Following reflects the key findings of the noise impacts of the ecological receptors and human receptors for all three (3) scenarios (where applicable):

10.11.1.1 Ecological Receptors

10.11.1.1.1 Scenario 1: Site Clearance

For Scenario 1, low levels of noise exceedances (up to 2 dB(A), see Table 10-20) were predicted (see Appendix Z) by noise model with a resulting impact intensity of **Low**. With the corresponding impact consequence for ecological receptors of varying auditory priorities determined to range from **Very Low to Low**, the resultant impact significance was determined to be **Negligible** upon relating the impact consequence to an **Unlikely** likelihood. As such, no mitigation measures were proposed for Scenario 1.

When accounting for cumulative impacts of noise arising from other major concurrent developments in the vicinity of the Project site and ecological receptors, the cumulative noise impacts on the ecological receptors were expected to be worsened to an impact intensity ranging from **Low to Medium** with the cumulative impact significance remaining as **Negligible** attributed to an **Unlikely** likelihood.

Although the cumulative impact significance will remain as **Negligible**, the potentially significant noise exceedances cannot be ignored. At this stage, as the project schedule provided by HDB is still tentative as mentioned in Section 3.5, it is highly recommended that the contractor on board for the design and building phases re-assess the construction of the construction developments based on the cumulative impacts assessed for both ecological and human receptors potentially impacted by this, such as sequencing or planning works such that cumulative noise impacts can be mitigated.

10.11.1.1.2 Scenario 2: Earthworks

For Scenario 2, no noise exceedances were predicted (see Appendix Z) with predicted results of the ecological receptors subjected to noise arising from Scenario 2 reflecting an impact intensity of **Negligible**, with the corresponding impact consequence for ecological receptors of varying auditory priorities determined to range from **Imperceptible to Very Low**. The resultant impact significance was determined to range from **Negligible to Minor** upon relating the deduced impact consequence with an **Occasional** likelihood. As such, no mitigation measures were proposed for Scenario 2.

When accounting for cumulative impacts of noise arising from other major concurrent developments near the Project site, the cumulative noise impacts on the ecological receptors were expected to increase to an impact intensity ranging from **Negligible to Low** with the impact significance remaining unchanged ranging from **Negligible to Minor** and staying within acceptable levels.

10.11.1.1.3 Scenario 3: Infrastructure and Building Works

For Scenario 3, low levels of noise exceedances (up to 1 dB(A), see Table 10-20) were predicted (reflected in Appendix Z) by the noise model with a resulting impact intensity ranging from **Negligible to Low**. The corresponding impact consequence was deduced to range from **Imperceptible to Low** and the impact significance was determined to range from **Minor to Moderate** with a **Likely** likelihood.

As discussed in Section 10.7.1.1.1.3, the **Low** impact intensity predicted for arboreal fauna at heights of 10 m and 15 m were due to the direct line of sight to the Project site from these elevated locations, while **Negligible** impact intensity (no exceedance) was predicted for ground dwelling fauna up to heights of 1.5 m. Hence, no mitigation measures were proposed for Scenario 3, considering that impact intensity is already as reasonably low as practical. As such, the residual impact intensity for ecological receptors subjected to noise from Scenario 3 was deduced to range from **Minor to Moderate.**

When accounting for the cumulative noise impacts arising from other major concurrent developments in the vicinity of the ecological receptors in the forested areas of the Southern Tengah Forest at the northern tip of the Project site, contributions of noise from other concurrent major developments can potentially result in a worsened impact intensity of **Low** with the cumulative impact significance remaining unchanged ranging from **Minor to Moderate.** Hence, at this stage, as the project schedule provided by HDB is still tentative as mentioned in Section 3.5, it is highly recommended that the contractor on board for the design and building phases re-assess the construction of the construction developments based on the cumulative impacts assessed for both ecological and human receptors potentially impacted by this, such as sequencing or planning works such that cumulative noise impacts can be mitigated.

10.11.1.2 Human Receptors

For construction noise impacts on human receptors, no noise exceedances were predicted by the noise models for all three (3) scenarios as reflected in Appendix Z and mitigation measures were hence not introduced. Following summarizes the key findings of noise impact assessment on human receptors for the construction phase:

10.11.1.2.1 Scenario 1: Site Clearance

The impact intensity of Scenario 1 was assessed to be **Negligible**, with the corresponding impact consequence for human receptors of a range of auditory priorities varying from **Imperceptible to Very Low**. The resultant impact significance was deduced as **Negligible** for human receptors subjected to construction noise impacts arising from Scenario 1 upon relation of the impact consequence and an **Unlikely** likelihood.

Following the considerations of cumulative noise impacts arising from other major concurrent developments near the Project site and human receptors, the impact significance of noise impacts arising from Scenario 1 along with that of other major concurrent developments will potentially worsen to a cumulative impact intensity of Low – Medium while the cumulative impact significance remains unchanged as **Negligible**. Although the cumulative impact significance will remain as **Negligible**, the potentially significant noise exceedances cannot be ignored. At this stage, as the project schedule provided by HDB is still tentative as mentioned in Section 3.5, it is highly recommended that the contractor on board for the design and building phases re-assess the construction of the construction developments based on the cumulative impacts assessed for both ecological and human receptors potentially impacted by this, such as sequencing or planning works such that cumulative noise impacts can be mitigated.

10.11.1.2.2 Scenario 2: Earthworks

Likewise, for Scenario 2, impact intensity was assessed to be **Negligible** with impact consequence for human receptors of a range of auditory priorities ranging from **Imperceptible to Very Low**. With a likelihood of **Occasional**, the resultant impact significance was determined to range from **Negligible to Minor** for human receptors subjected to construction noise impacts of Scenario 2.

When considering the cumulative noise impacts arising from other major concurrent developments near the Project site, the impact significance of noise impacts arising from Scenario 2 along with that of other major concurrent developments are predicted to potentially increase from ranging from **Negligible to Minor** to a range of **Minor to Moderate** due to the increased cumulative impact intensity of **Low** to **Medium** due to the proximity of other major concurrent developments to the human receptors. Hence, at this stage, as the project schedule provided by HDB is still tentative as mentioned in Section 3.5, it is highly recommended that the contractor on board for the design and building phases re-assess the construction of the construction developments based on the cumulative impacts assessed for both ecological and human receptors potentially impacted by this, such as sequencing or planning works such that cumulative noise impacts can be mitigated.

10.11.1.2.3 Scenario 3: Infrastructure and Building Works

Similarly, for Scenario 3, impact intensity was deduced to be **Negligible**. With impact consequence for human receptors of a range of auditory priorities ranging from **Imperceptible to Very Low** and a likelihood of **Likely**, the overall impact significance was deduced to be ranging from **Negligible to Minor** for human receptors subjected to construction noise impacts arising from Scenario 3.

However, due to the presence of other major concurrent developments near the Project site, the residual impact significance of noise impacts arising from Scenario 3 on the human receptors are expected to worsen from a range of **Negligible to Minor** to ranging from **Minor to Moderate**. At this stage, as the project schedule provided by HDB is still tentative as mentioned in Section 3.5, it is highly recommended that the contractor on board for the design and building phases re-assess the construction of the construction developments based on the cumulative impacts assessed for both ecological and human receptors potentially impacted by this, such as sequencing or planning works such that cumulative noise impacts can be mitigated.

10.11.2 Operational Phase

For the operational phase, operational noise impact assessment focused on the air conditioning and mechanical ventilation (ACMV) systems of non-industrial buildings and increased traffic noise arising from the increase in vehicular volumes from existing/ new road networks. Following details, the key findings of the operational noise impacts on ecological receptors and human receptors from the two (2) identified sources of operational noise:

10.11.2.1 Ecological Receptors

For ecological receptors, fauna species of auditory sensitivities ranging from Priority 1 (most sensitive) – Priority 3 have been identified for the Southern Tengah Forest areas at the northern tip of the Project site as discussed in Section 10.7.2.1. It was noted that the larger impact on this area regardless of impacts from noise is due to the redevelopment of the forested area into urbanized developments where habitats are cleared and impacting the ecological receptors directly. These fauna species may inadvertently be forced to move northwards and deeper into the Southern Tengah Forest areas to take shelter or develop new habitats which is uncertain at this stage. Based on this, it is difficult to analyse operational noise impacts on the ecological receptors.

While for fauna species found to reside further away from the Project boundary, it is possible that with time in the operational phase that these species adapt itself to a continuous noise level (i.e. new baseline) as noise propagation reduces with distance. As discussed in Section 10.2.4.2, HDB/ contractor contracted by HDB should appoint a Noise Consultant(s) to assess impacts arising from the operational phase to procure a more accurate understanding of the updated baseline conditions.

Baseline noise monitoring results at N7, the nearest noise monitoring location to the ecological receptors, was used to assess the potential operational noise impacts on the ecological receptors, indicatively. As observed, the average baseline at N7 for $L_{Aeq(15\ mins)}$ ranged from 41 – 51 dB(A). This was compared against the NEA's ACMV boundary noise limits for the most stringent noise sensitive criteria (see Section 10.7.2.1) and it showed that current baseline noise levels were relatively lower than the noise limits. Assuming that this regulation will be met by the contractors, there will be significant detectable changes in noise levels in the area differing from daytime and night-time. As a conservative means, the lower recorded baseline noise levels should be established as the noise criteria to ensure that noise sensitive fauna species will not face significant impacts from noise disturbances.

That said, assuming if the regulation will be met by the contractors, fauna species may potentially face **Negligible to Moderate** impacts due detectable disturbances from increased noise levels in the surrounding nature areas if ACMV systems are designed to be fronting those noise sensitive areas. However, if a more conservative criteria (i.e. no worse off than baseline) was adopted, the operational noise impact significance on the ecological receptors can be qualitatively assessed as **Negligible to Minor**.

The impact intensity if abiding by the conservative criteria would potentially range from **Negligible to Low** and the corresponding impact consequence may range from **Imperceptible to Low**. The likelihood of noise levels exceeding the criteria would be **Occasional**, dependant on human activities and how frequently ACMV systems are engaged. Hence, the overall impact significance can be qualitatively assessed to range from **Negligible to Minor** for ecological receptors found in forested areas and water bodies in vicinity of the proposed residential development site.

Thereafter, preliminary mitigation measures to reduce operational noise impacts were introduced in Section 10.8.2 and for human receptors and adopted for ecological receptors. With the implementation of said preliminary mitigation measures, the impact significance of operational noise impacts on the ecological receptors were qualitatively assessed to be reduced to range from **Negligible-Minor to Negligible.**

Cumulative impacts were not considered for the operational phase for ecological receptors as it is expected that the additional cumulative operational noise impacts would be insignificant compared to the removal of habitat of the ecological receptors within the 150 m airborne noise study area.

10.11.2.2 Human Receptors

For operational noise impacts on human receptors, it is mandated by law for the proposed developments to comply with NEA's guidelines for boundary noise impacts assessment for ACMV systems of non-industrial buildings and traffic noise impact assessment (TNIA) for existing/ new road networks for the developments within the Project site. Usually conducted by an appointed Noise Consultant during the development stage, AECOM recommends that the works for ACMV boundary noise impact assessment and TNIA be conducted at later stages of development in accordance with NEA's guidelines as discussed in Section 10.7.2. As part of qualitative impact assessment for

operational noise impacts on human receptors, the impact intensity was deduced to be **Negligible** with corresponding impact consequence determined to range from **Imperceptible to Very Low**. The consequent impact significance of operational noise on human receptors was deduced to range from **Negligible to Minor** following an **Occasional** likelihood dependant on human activities and frequency of use of ACMV systems and roads. Thereafter, preliminary mitigation measures to reduce operational noise impacts were introduced in Section 10.8.2 and for human receptors. With the implementation of said preliminary mitigation measures, the impact significance of operational noise impacts on the human receptors were qualitatively assessed to be reduced to range from **Negligible-Minor to Negligible**.

It should be noted that this qualitative assessment is not definitive and as re-emphasized, it is mandatory for proposed developments to comply with NEA's guidelines. HDB/ contractors contracted by HDB should conduct quantitative operational impact assessment (omitted in this report) duly at later stages of the Project development likewise for the cumulative operational noise impacts.

Table 10-26 Summary of airborne noise impact assessment

Scenarios/ Noise Sensitive Receptors	Impact Significance with Minimum Control	Key Mitigation Measures (if any)	Residual Impact Significance	Cumulative Impact Significance with Other Major Concurrent Developments
Construction Phase				
Human Receptors				
Scenario 1: Site Clearance	Negligible	N.A.	N.A.	Negligible
Scenario 2: Earthworks	Negligible to Minor	N.A.	N.A.	Minor to Moderate
Scenario 3: Infrastructure and Building Works	Negligible to Minor	N.A.	Minor to Moderate	Minor to Moderate
Ecological Receptors				
Scenario 1: Site Clearance	Negligible	N.A.	N.A.	Negligible
Scenario 2: Earthworks	Negligible to Minor	N.A.	N.A.	Negligible to Minor
Scenario 3: Infrastructure and Building Works	Minor to Moderate	N.A.	N.A.	Minor to Moderate
Operational Phase				
Human Receptors	Negligible to Minor	Refer to Section 10.8.2	Negligible	N.A.
Ecological Receptors	Negligible to Minor	Refer to Section 10.8.2	Negligible	N.A.

11 Environmental Monitoring and Management Plan

The proposed Environmental Monitoring and Management Plan (EMMP) is prepared for environmental impacts of the construction and operational phases associated with the project, and that were assessed in this EIS study, namely biodiversity, hydrology and water quality, groundwater level, air quality and airborne noise. An additional EMMP section on vectors was also added, as construction activities tends to contribute to their occurrence and breeding, leading to the spread of vector-borne diseases. The EMMP details how the recommended mitigation measures prepared for the impact assessment are to be implemented and specifies recommended monitoring measures to assess the effectiveness of the mitigation measures. This document is also intended to provide a broad framework for the ECO to develop a more contract-specific EMMP, as per their responsibilities in Section 11.4.5. Since the project will evolve over time, the EMMP is an adaptive document meant to be amended where necessary. Copies of the EMMP must be kept on-site for reference at all times.

This section outlines the objectives of the EMMP, the project organisation, describes the roles and responsibilities relevant to implementation of the EMMP, and summarises the EMMP requirements for each discipline.

11.1 EMMP Objectives

The Environmental Monitoring and Management Programme (EMMP) details the implementation and deliverables of the recommended mitigation measures identified from the impact assessment for each technical discipline. The EMMP progressively scrutinizes construction and operational activities as they ensue and applies flexible monitoring and management procedures to protect the project's environmental values throughout the construction and operational phases. The objective of the EMMP is twofold:

a) Environmental monitoring focuses on overseeing that impacts to the project's environmental values from construction and operation are within the anticipated level and tackle unforeseen impacts that may arise; and

b) It also tracks the effectiveness of the recommended mitigation measures to allow amendment or review of the mitigation measures to better address any issues faced during construction and operation of the project.

Environmental management employs a more active approach to ensure that impacts to flora and fauna are directly avoided through documentation, auditing and enforcement.

11.2 Project Organisation during the Construction Phase

The roles and responsibilities of the various parties responsible for implementing the EMMP during the construction phase are outlined below. The proposed project organization and lines of communication with respect to environmental protection works are presented in Figure 11-1.

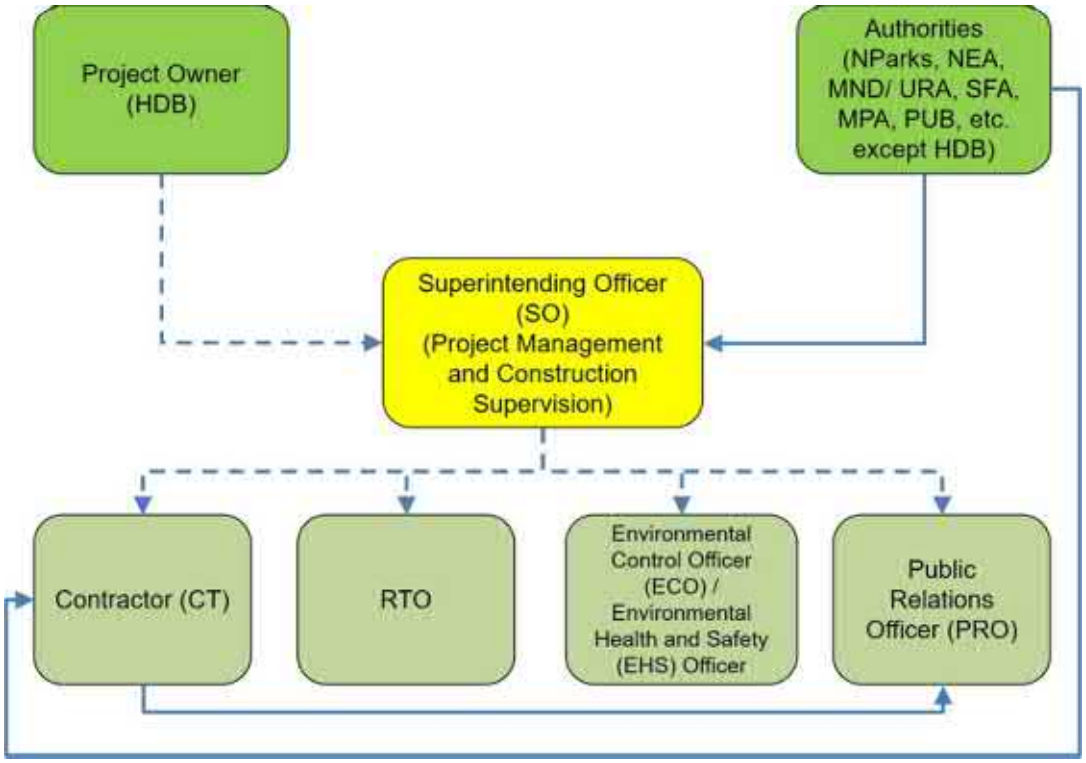


Figure 11-1 Project organization and lines of communication during the construction phase

11.3 Project Organisation during the Operational Phase

The roles and responsibilities of the various parties responsible for implementing the EMMP during the operational phase are outlined below. The proposed project organization and lines of communication with respect to environmental protection works are presented in Figure 11-2.

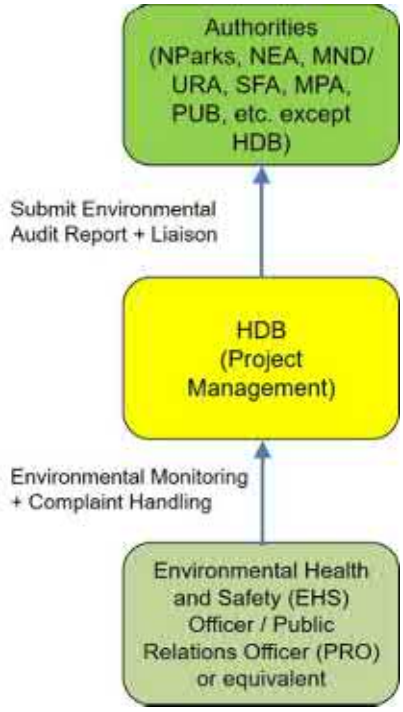


Figure 11-2 Project organization and lines of communication during the operational phase

11.4 Roles and Responsibilities of the EMMP for the Construction Phase

11.4.1 Technical Agencies

Technical agencies constitute but are not limited to NParks, PUB, NEA, LTA and URA. These agencies shall assess and approve the detailed EMMP for the construction and operational phases prior to commencement of works and where required during the course of the project.

11.4.2 Project Owner (HDB) and Resident Technical Officer

HDB, being the project owner oversees the construction phase of the project in accordance with the design. HDB, in conjunction with the Resident Technical Officer (RTO) (Contractor), are required to:

- Ensure resources are available to achieve the requirements of the EMMP;
- Provide leadership in the development and implementation of the EMMP;
- Ensure all environmental incidents and near misses are promptly investigated and reported;
- Resolve any non-compliance issues;
- Record, respond to, and action any complaints from members of the public, if any, with inputs from the Technical agencies, if required; and
- Reporting to the Technical Agencies regarding implementation of the EMMP.

11.4.3 The Contractor

The term “Contractor” refers to all construction contractors and sub-contractors working onsite at any time. In addition to reporting to the SO, the Contractor should:

- Work under the relevant contract scope, specifications, and other tender conditions;
- Ensure that the roles of RTO, Superintending Officer (SO), Environmental, Health and Safety Officer (EHS Officer), Environmental Control Officer (ECO), Certified Arborist, and Fauna Specialist/s are adequately resourced;
- Participate in the required environmental site audits (via the SO) undertaken by the ECO and undertake any corrective actions;
- Provide up-to-date information and advice to the RTO, SO, ECO, Certified Arborist, and Fauna Specialist/s regarding any work activities which may contribute or continuously create adverse environmental conditions, or any changes to the work plan;
- Implement measures to reduce impacts where emission/discharge levels are exceeded;
- Prepare a detailed contract-specific EMMP, incorporating the relevant mitigation measures and monitoring works recommended in this EIS report and seek technical agencies’ approval prior to the commencement of any works. This detailed EMMP shall include, as a minimum, a Standard Operating Procedure (SOP) detailing:
  - Handling and storage of hazardous chemicals;
  - Biodiversity management plan;
  - Individual environmental management plans as detailed in the NEA’s SHE Specifications (air, vector, waste, noise, water pollution management plans);
  - Monitoring plans (including but not limited to noise, air, waste, ecology and water pollution);
  - Existing legislation and environmental best practices to be implemented; and
  - Contingency planning during emergency situations.

Besides, for site and/or vegetation clearance before the commencement of actual construction, the Contractor shall engage a certified Qualified Erosion Control Professional (QECP) to prepare an Erosion Control Plan (ECP) and obtain approval from the Public Utilities Board (PUB).

For tree-felling, the Contractor shall also map the trees on site and the trees planned for removal or retention and NParks' approval, where the Contractor shall consider the following requirements:

- An area rich in trees of conservation interest, the contractor should employ a certified arborist to map the trees carefully while applying for tree felling approval. This is to gauge the health, species, size and conservation significance of the tree;
- If there are trees that must be transplanted, this should be done prior to commencing site clearance;
- If the area is rich in wildlife, the contractor shall consult wildlife specialist and prepare a wildlife shepherding plan, obtain NParks' approval and execute it prior to/ along the site clearance process.

11.4.4 The Superintending Officer (SO)

The Superintending Officer is responsible for overseeing the construction works undertaken by various staff, contractors and sub-contractors. The SO should ensure that the construction works are performed by the contractors and personnel in accordance with the specification, contractual requirements, and EMMP. The SO should also:

- Communicate the requirements of this plan to all staff, contractors and sub-contractors
- Monitor all staff, contractor's and sub-contractor's compliance with contract specifications and regulatory requirements, including the implementation of the environmental mitigation and monitoring measures and ensure their effectiveness, and other aspects of the environmental audit program;
- Coordinate with the project's EHS Officer to monitor and participate in the implementation of the environmental audit program, with assistance from the ECO, and ensure that the requirements in the environmental audit program are correctly followed;
- Implement measures to reduce impacts where emission/discharge levels are exceeded;
- Coordinate with the Project Owner and RTO for submission of environmental audit reports;
- Carry out any complaint investigations as per Section 11.8;
- Resolve any non-compliance issues; and
- Promote environmental awareness and responsibility and lead by example.

11.4.5 The Environmental Control Officer (ECO)

The ECO shall be employed by the Contractor but may not be in any way an associated body of the Contractor, the SO, or the project's SHE team. The ECO is responsible for implementing the elements of the environmental monitoring program that fall within their responsibilities as outlined in the Code of Practice for Environmental Control Officers (Environmental Health Department, 2000). He/she should be a registered Environmental Control Officer (ECO) with NEA and has at least two years' experience in environmental monitoring and auditing works. Resources to implement the environmental monitoring program should be allocated time to fulfil the environmental audit requirements during construction works as specified in the EIS Report. The ECO's duties include:

- Coordinate with the SO to monitor and participate in the implementation of the environmental audit program, with assistance from the EHS Officer;
- Assist the SO with the resolution of near misses/incidents, non-compliance issues, and complaint management; and
- Assist the EHS Officer with reporting of monitoring results to the SO.

11.4.6 The Environmental, Health and Safety Officer (EHS Officer)

The Environmental, Health and Safety Officer is responsible for the overall environmental, health and safety during the construction phase of the project. With respect to the EMMP, their duty is to:

- Carry out monitoring of environmental parameters and conduct laboratory analysis;
- Conduct regular site inspections, report monitoring results, and audit environmental performance as required in the EMMP;
- Coordinate with the SO and ECO regarding equipment, locations, and schedule of monitoring and auditing works;
- Analyse environmental monitoring data and audit findings, review the adequacy of implementation of mitigation measures, identify adverse environmental impacts, and liaise with the SO and ECO;
- Formulate and implement the environmental audit program and carry out regular site audits against the Contractor's site practices, equipment and work methodologies with respect to pollution control and environmental mitigation, and effect proactive actions to pre-empt problems in coordination with the SO and ECO;
- Monitor compliance with conditions in the EMMP, relevant environmental protection, pollution prevention and control regulations and contract specifications; and
- Report the results of the environmental monitoring program, and any required changes to meet the requirements of the EMMP and legal obligations to the SO and ECO in a timely manner.

11.4.7 Arborist and Fauna Specialists

These roles play an important part of the construction process with respect to management of flora and fauna. A Certified Arborist is required to monitor and manage all matters related to the adequate and successful conservation of trees and flora within and adjacent to the contract boundary. Fauna specialists are required for regular fauna monitoring during the construction period and to conduct tree-felling inspections and fauna salvage where required. A detailed list of the responsibilities for each role is provided in Section 11.4 in this Final EIS Report.

11.5 Roles and Responsibilities of the EMMP for the Operational Phase

11.5.1 Technical Agencies

Technical agencies constitute but are not limited to NParks, PUB, NEA, LTA and MND/ URA. These agencies shall assess and approve the detailed EMMP for the construction and operational phases, prior to commencement of works and, where required, during the course of the project.

11.5.2 Housing & Development Board

The Housing & Development Board (HDB) is a statutory board in Singapore under the Ministry of National Development responsible for public housing in Singapore, which is also the project owner for this Project.

11.5.3 Project Owner (HDB)

HDB is responsible for overseeing and managing the environmental monitoring detailed in the EMMP for the operational phase. HDB are required to:

- Ensure resources and appropriate personnel are available to achieve the requirements of the EMMP;
- Provide leadership in the implementation of the EMMP;
- Ensure all environmental incidents and near misses are promptly investigated and reported;
- Resolve any non-compliance issues;

- Record, respond to, and action any complaints from members of the public, if any, with inputs from the Technical agencies, if required; and
- Reporting to the Technical Agencies and HDB regarding implementation of the EMMP.

11.5.4 EHS Officer (or Equivalent)

Appointed by HDB and is responsible for the overall environmental, health and safety during the operational phase of the project. With respect to the EMMP, the EHS Officer is required to:

- Carry out monitoring of environmental parameters and conduct any required laboratory analysis;
- Conduct site inspections, report monitoring results, and coordinate environmental auditing as stipulated in the EMMP;
- Coordinate with HDB regarding equipment, locations, and schedule of monitoring and auditing works;
- Analyse environmental monitoring data and audit findings, review the adequacy of implementation of mitigation measures, identify adverse environmental impacts, and liaise with the HDB;
- Monitor compliance with conditions in the EMMP, relevant environmental protection and control regulations; and
- Report the results of the environmental monitoring program, and any required changes, to meet the requirements of the EMMP to HDB in a timely manner.

11.6 Construction Site Audit

Site surveillance provides a direct means to assess and ensure the project's environmental protection and pollution control measures are in compliance with the contract specifications and the EMMP. The ECO should inspect the construction activities regularly and routinely to ensure that the appropriate environmental protection and pollution control mitigation measures are properly and timely implemented, based on the EMMP's recommendations. With well-defined pollution control and impact mitigation measures outlined, and a well-established efficient remedial action reporting system, the site inspection is an effective "tool" to ensure acceptable environmental performance at the construction site.

The ECO is responsible to formulate environmental site inspections, deficiencies and the remedial action reporting system, and to carry out the site inspections. After consultation with project's EHS Officer and SO, the ECO should prepare a procedure for the site inspections, deficiencies, remedial action, and reporting requirements. This documentation shall be agreed to by the RTO and Contractor representative, and approved by the Project Owner within 21 days of the commencement of the construction contract.

Regular site inspections should be carried out at least once weekly for all the work areas during the construction phase. The inspections should cover the onsite environmental situation, pollution control and mitigation measures. Offsite environmental situations, which may be affected by onsite activities, (directly or indirectly) should also be reviewed.

11.7 Operational Phase Audit

During the operation of the project, annual monitoring (minimum frequency) for all environmental parameters should be conducted to ensure that all implemented measures are meeting their intended purpose, and that any potential changes in project conditions such as funicular maintenance issues, increased traffic, track lighting, etc are not having an adverse impact over and above the impacts identified in this assessment. A log tracking all maintenance procedures of equipment and carrying out of audits should be maintained by the Project Owner and the EHS Officer.

A minimum of annual monitoring periods also enables the Project Owner and EHS Officer to address any potential issues, not originally identified during the current impact assessment, that may arise during the course of the project. In this instance, the Project Owner should consider the impacts and, in consultation with the Technical Agencies and qualified professionals, develop measures to mitigate any identified impacts.

Details of monitoring requirements will be provided in Draft Final EIS report after EIS is completed.

11.8 Complaint Handling

The Public Relation Officer (PRO) is responsible for handling complaints and managing feedback and investigative work. The PRO shall be supported by the Project Owner, ECO, Contractor representatives, and any other relevant party.

During the construction phase, upon receipt of complaints, the PRO should undertake the following procedures:

- Log the complaint and record the date when the complaint is received onto the complaint database and inform the Project Owner, SO, and EHS Officer immediately;
- Investigate the complaint with the ECO to determine its validity and assess whether the source of the problem is due to construction works (the target time for response to the complainant is proposed to be 48 hours);
- If a complaint is valid and due to construction works, liaise with the ECO and EHS Officer on the mitigation measures and seek agreement from SO;
- Review the current situation and the ECO's and SO's implementation of the mitigation measures;
- Engage the ECO to undertake additional monitoring and auditing to verify the complaint if necessary. Ensure that any valid reasons for complaints do not re-occur by revising the work methods, procedures, machines and/or equipment, etc.;
- Submit complaint report (as well as the implementation of mitigation measures and the effectiveness of the mitigation measures as advised by the ECO) to the Project Owner, RTO and the SO; and
- Log a record of the complaint, investigation, follow-up actions and the results in the environmental audit reports.

The ECO, EHS Officer, and SO should provide all the necessary information and assistance to the PRO in order to complete the complaint investigation. Following the investigation, the Contractor should promptly undertake the mitigation measures. The PRO and SO should ensure that the measures have been appropriately implemented. The Contractor, RTO, and SO should also be responsible for the reporting of complaint investigation results and followed up actions to the Project Owner.

During the operational phase, upon receipt of complaints, the PRO should undertake the following procedures:

- Log the complaint and record the date when the complaint is received onto the complaint database and inform the Project Owner and EHS Officer immediately;
- Investigate the complaint with the ECO to determine its validity and assess whether the source of the problem is due to construction works (the target time for response to the complainant is proposed to be 48 hours);
- If a complaint is valid and due to construction works, liaise with the ECO and EHS Officer on the mitigation measures and seek agreement from SO;
- Review the current situation and the ECO's and SO's implementation of the mitigation measures;
- Engage the ECO to undertake additional monitoring and auditing to verify the complaint if necessary. Ensure that any valid reasons for complaints do not re-occur by revising the work methods, procedures, machines and/or equipment, etc.;
- Submit complaint report (as well as the implementation of mitigation measures and the effectiveness of the mitigation measures as advised by the ECO) to the Project Owner, RTO and the SO; and
- Log a record of the complaint, investigation, follow-up actions and the results in the environmental audit reports.

The PRO should work with the Project Owner and EHS Officer to gather all the necessary information and resources necessary to complete a complaint investigation. Following the investigation, the Project Manager and EHS Officer to undertake appropriate mitigation measures. Follow is required by the PRO to ensure that the mitigation measures have been appropriately implemented. Reporting of the complaint investigation results and followed up actions should be provided to SDC and the Authorities.

11.9 Biodiversity Monitoring Programme Requirement

At the construction phase, EMMP for both flora and fauna are essential in minimising and managing construction impacts.

11.9.1 Construction Phase

11.9.1.1 Flora and Arboriculture Monitoring Programme

The flora and arboriculture monitoring aims to assess the impacts of construction to vegetation and habitat, such as tree health, unauthorised and/or excessive vegetation removal, edge effects, habitat degradation from soil erosion, and rubbish dumping. The programme should include the following:

- Assess impact of construction on the physiological health and structural stability of vegetation and trees at proximity to the development;
- Determine whether there has been excessive and unauthorized removal of vegetation and trees beyond the development boundary (See Figure 11-3);
- Monitor and assess potential edge effects (e.g., predictable failures, accelerated growth of climbers on canopy, change in species composition at the edge) within vegetation adjacent to the development. Make recommendations on mitigating measures where necessary;
- Determine occurrence of mechanical damage to the trees beyond the development boundary from nearby construction. These would include damage to the canopy, trunk or roots that may impair the structural stability of the trees;
- Visual inspection for soil erosion locations that resulted from construction activities; and
- Determine if there was unauthorized dumping of rubbish (e.g., food materials), construction debris and materials, oil/chemical leakage that may contaminate soil and water bodies.



Figure 11-3 Monitoring of vegetation and trees along the hoarding line for unauthorised vegetation clearance and forest edge effects.

11.9.1.2 Flora and Arboriculture Management Programme

The flora and arboriculture management programme aim to manage all matters related to the adequate and successful conservation of trees and vegetation within and adjacent to the contract boundary (up to 15 m from the contract boundary). The programme should include the following works:

- Ensure trees (with or without tree protection zones) meant to be protected or transplanted are visibly tagged to avoid accidental removal;
- Conduct monthly inspections at construction sites to ensure tree conditions have not deteriorated; check that integrity of the TPZ has not been compromised; verify no mechanical damage to trees has occurred, and; monitor for edge effects at new forest edge;
- Provide a brief monthly report with recommendations of mitigating measure(s) if any. Reports should include photos of tree and condition of TPZs;
- Assessment to determine the need for additional tree removal due to construction constraints;
- Seek support and/or approval from the SDC for any proposal for tree removal prior to submission to the NParks;
- Liaise with NParks for permission to remove roots where necessary;
- Review method statements from builders for construction at proximity to trees;
- Liaise and coordinate with selected tree works contractor to carry out tree pruning works and carry out inspection to ensure that works is carried out to NParks' standards; and
- Work with architects and structural engineer on design changes and structural solutions at proximity to the trees that will meet NParks' guidelines and help justify the works within the tree protection zone if necessary.

The flora specialists and arborists engaged should meet the following requirements:

- The flora specialist and arborist should have at least 10 years' relevant experience and demonstrate experience in developments of similar forested context, size, and construction complexity;
- The Arboriculture Contractor should meet NParks' safety requirements for work at heights. All arboriculture workers engaged by the Arboriculture Contractor to perform tree climbing and chainsaw work shall possess a valid basic tree climbing certification based upon demonstrated competence in the Workforce Skills Qualifications (WSQ) module conducted by CUGE or an equivalent WSQ-approved training organization; and
- The arboriculture crew deployed by the Arboriculture Contractor for the Contract shall possess the following valid competences:
  - Operation of chainsaw for groundwork (LS-MT-103E-1);
  - Chainsaw safety and maintenance (LS-MT-102E-1);
  - Perform formative pruning of young trees (LS-MT-114E-1);
  - Provide Arboriculture support on site (LS-MT-116E-1);
  - Workplace safety and health – operators (ES-WSH-101G-1);
  - Respond to Emergency (LS-HM-208E-1);
  - Perform advance rigging and climbing techniques (LS-HM-308S-1);
  - Perform aerial tree access and aerial rescue skills (LS-HM-204S-1);
  - Implement and apply appropriate risk and safety management to sector practices (LS- BP-301S-1);
  - Prepare risk assessment report (LS-HM-406S-1); and
  - Operate and work from an elevated work platform (CUGE-ARB-3501).

Additionally, the Contractor should fulfil the following:

- The Contractor and the attending arborist shall complete the 'Verification of Tree Protection Checklist' prior to the start of site clearance (refer to Annex A of Appendix O); and

- The Contractor shall instil discipline and raise awareness amongst all personnel on measures and mitigations to prevent damage to retained and protected trees throughout construction by including reminders on tree conservation guidelines within their daily toolbox briefings to workers and crane/excavator operators.

11.9.1.3 Fauna Monitoring Programme

Fauna monitoring surveys should comprise transect surveys and site inspection surveys conducted together, at within and outside of hoarded areas. The programme should include the conducting of monthly diurnal and nocturnal fauna and site inspection surveys beginning one month prior to construction and ending two months after reinstatement. This includes both faunistic surveys and site inspections.

Faunistic Surveys

Faunistic surveys are recommended to be conducted along the sampling routes and should target the following fauna groups: butterflies, odonates (dragonflies and damselflies), herpetofauna (amphibians and reptiles), birds, mammals (including bats), and fish. Comparison of species presence can be made with the baseline studies, where appropriate, to provide an indication of the changes in fauna diversity.

The methodology for the faunistic surveys should closely follow that implemented for this EIA, so as to ensure that the data collected can be used to compare against the baseline data.

Further details of the surveys should be determined in consultation with NParks and should take into account construction phases, final construction footprint, final development hoarding plan, and baseline studies.

Site Inspections

The following should be inspected for during monthly fauna site inspections (See Figure 11-4):

- Visual inspection of sensitive habitats in the vicinity (e.g., streams, forests) to determine if the construction has damaged or affected them;
- Visual checks that construction works are limited to within agreed boundaries, and that construction slurry, chemicals and fuel are contained;
- Visual checks for animal entrapments on-site, particularly within TPZs, ECM sedimentation tanks, erosion control blankets and among construction materials and equipment;
- Inspection of site hoarding to ensure that integrity is maintained throughout the duration of the construction to prevent entry of ground-dwelling fauna; and
- Reporting and documentation of all findings and recommendations.

Additional Monitoring

- As mentioned in Section 7.12.1.3, additional monitoring for fauna roadkill should be conducted at established road networks that are located near the Study Area should also be carried out to determine any potential roadkill hotspots or occurrences that may be due to development works.



Figure 11-4 Photographs showing monthly fauna monitoring and inspection on-site.

11.9.1.4 Fauna Management Programme

Fauna management will consist of managing fauna within and around all designated work areas. It consists of pre-site clearance inspections and continued biodiversity awareness training for the site team, tree felling inspections, and fauna response plan in event of animal encounters. The objectives of fauna management are as follows:

- Minimize negative impacts to fauna, particularly to species of conservation interest;
- Inspect hoarded areas for any compromises that may allow smaller-sized animals to enter;
- Prevent human-wildlife conflicts;
- Monitor presence of trapped/injured/dead fauna inside hoarded areas;
- Monitor and compare presence of targeted fauna groups within and outside of hoarded areas; and
- During each survey, fill out Fauna Inspection Form (Appendix P).

Pre-site Clearance Inspection

- Pre-site clearance inspection should be adopted together with mitigating measures of directional clearance. Part of pre-site clearance involves pre-felling inspections. This is to minimize fauna injury and mortality during

tree felling and vegetation clearance. Subsequently, site clearance should be executed outside of the key bird breeding season (March to July) where possible. Refer to Figure 11-5 for pre-felling inspection protocol. Refer to Appendix Q for Pre-felling Inspection Form.

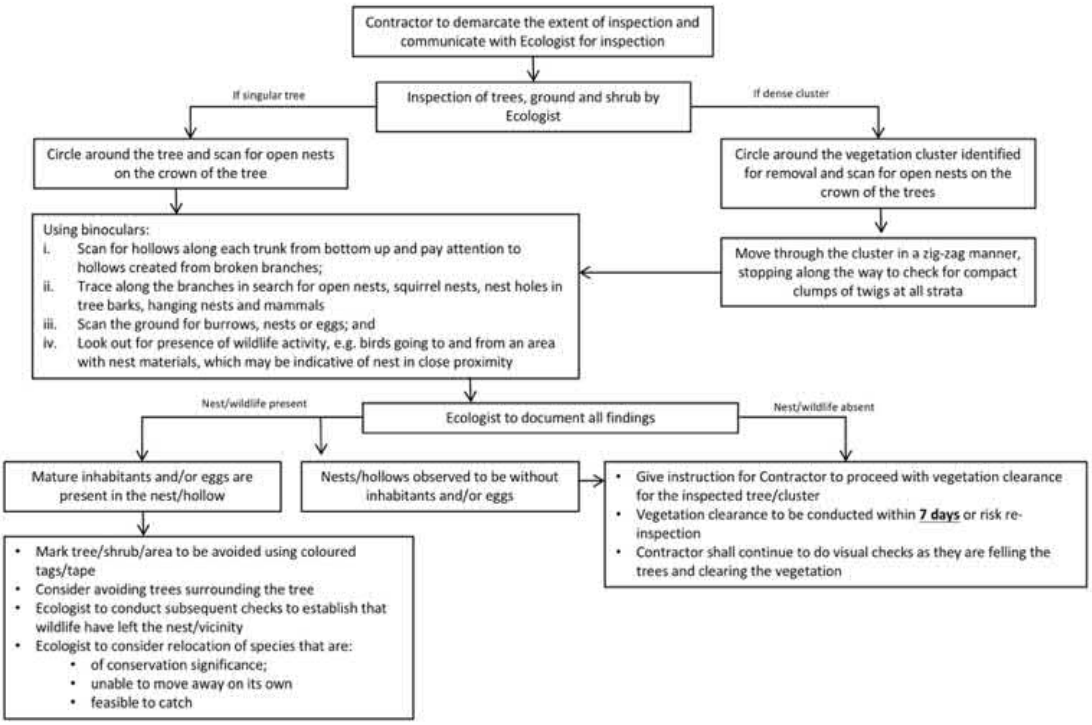


Figure 11-5 Example of pre-felling inspection protocol

Fauna Response and Rescue Plan

The Fauna Response and Rescue Plan (Appendix K) should be enacted when a trapped/injured/dead/dangerous animal is encountered around or within the worksite. The objective of the wildlife response plan is to minimise animal injury and mortality by responding appropriately to the different scenarios in Figure 11-6. This should be emphasized during the toolbox briefings. All wildlife encounters are to be documented within 24 h using the Wildlife Incident Form (Refer to Appendix R).

Where species of conservation significance are affected by the development, relocation works should be planned (e.g., bamboo bats). Where fauna is trapped on-site, options should be explored to remove them from site (e.g., partitioning worksite, use of one-way exit door) (See Figure 11-7).

In scenarios where certain animal groups are encountered around or within the worksite, external specialists may be contacted to handle the animal. These scenarios are shown below:

- For encounters with snakes that require relocation/handling, a snake specialist should be contacted
- For animal carcasses that require disposal, an animal carcass disposal service should be contacted
- For injured animals that require medical attention, a veterinarian should be contacted

Table 11-1 provides a list of preferred contacts for the respective services.

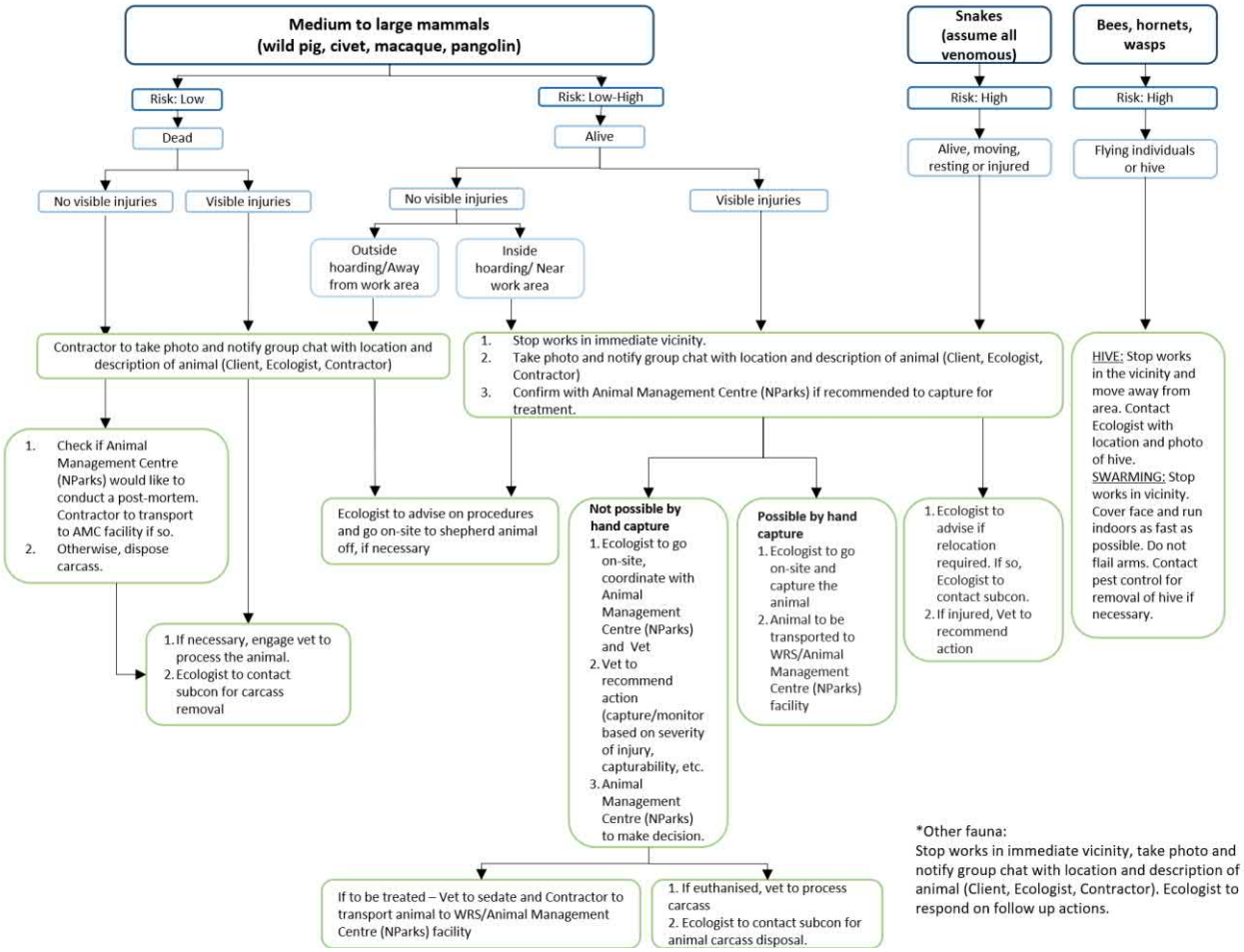


Figure 11-6 A flowchart of the wildlife response plan



Figure 11-7 Example of one-way flap door to allow fauna to exit independently

Table 11-1 List of preferred subcontractors for wildlife response support

Wildlife Response Support	Subcontractor	Contact Person	Contact Number/Email
Snake handling	Mastermark	Gloria	gloria@mastermark.com.sg
Animal carcass disposal	Mastermark	Gloria	gloria@mastermark.com.sg
Veterinary services	Wildlife Asia Veterinary Services	Dr. Serena Oh	9743 3777

Toolbox Briefing on Biodiversity Awareness

The Ecologists will conduct toolbox briefings (when necessary, up to once per quarter) to inform site personnel of their responsibilities towards fauna, how to minimise impacts to wildlife and how to respond to fauna encounters.

11.9.2 Operational Phase

At the operational phase, arboriculture services are normally not under the Contractor. Subsequently, the management of flora and fauna are also not expected of the Contractor. However, flora and fauna monitoring might still be expected of Contractor. More importantly, it is still important to monitor flora and fauna during post-construction through to at least two months into the operational phase. This will allow contractor to review the effectiveness of mitigation measures proposed during design phase and rectify biodiversity problems that arise due to operational works.

11.9.2.1 Flora Monitoring Programme

The flora monitoring aims to assess the impacts of operational works to surrounding vegetation and/or adjacent forest and rectify issues when identified. The programme should include the following:

- Assess impact of operational on the physiological health and structural stability of vegetation and trees at proximity to the development;
- Determine whether there has been excessive and unauthorized removal of vegetation and trees beyond the development boundary;
- Monitor and assess potential edge effects (e.g., predictable failures, accelerated growth of climbers on canopy, change in species composition at the edge) within vegetation adjacent to the development; and
- Determine if there was unauthorized dumping of rubbish (e.g., food materials), construction debris and materials, oil/chemical leakage that may contaminate soil waterbodies, from post-construction water bodies post-construction.

11.9.2.2 Fauna Monitoring Programme

The fauna monitoring aims to assess the impacts of operational works to fauna that might come back after the creation of habitat, or the impacts of operational works to fauna residing within adjacent forest within the Study Area (if any) and rectify issues when identified. Monitoring should closely follow that implemented for this EIS, so as to ensure that the data collected can be used to compare against the baseline data and data from construction monitoring.

The programme should include faunistic surveys. Faunistic surveys are recommended to be conducted along terrestrial sampling routes and aquatic sampling points and should target the following fauna groups: odonates (dragonflies and damselflies), fish, decapods, butterflies, herpetofauna (amphibians and reptiles), birds, and mammals. Comparison of species presence can be made with the baseline studies, where appropriate, to provide an indication of the changes in fauna diversity.

11.10 Hydrology and Water Quality Monitoring Programme Requirement

11.10.1 Construction Phase

In order to ensure that procedures are followed appropriately, the construction phase of the projects should be accompanied by an EMMP.

Water quality monitoring is essential as discharge of excess contaminants, especially pH, nutrients and heavy metals, may lead to severe consequences (e.g. algae blooms).

Discharges via detention ponds will take place during the construction phase, therefore monitoring of detention pond discharge waters was recommended to be undertaken to complement surface water quality to assure compliance with the relevant standards. For all discharge points from construction worksites, it is recommended to monitor water quality following Singapore NEA's Allowable Limits for Trade Effluent Discharge to Sewer/Watercourse/Controlled Watercourse. Meanwhile, the water quality of sensitive natural streams should also be recorded and compared with the water quality criteria for aquatic life as listed in Table 8-1 to make sure the aquatic condition will not be impacted by the construction activities.

Table 11-2 Recommended monitoring program during construction phase (surface water quality)

Test	Parameters	Monitoring Recommendation and Frequency
In-situ	Temperature	• Online real time monitoring for TSS at the discharge point location at all the construction sites throughout the construction period. • Monthly monitoring for temperature, pH, conductivity, TDS and DO at all the discharge point locations at the construction sites throughout the construction period.
	pH	
	Conductivity	
	Total Dissolved Solids (TDS)	
	Turbidity and Total Suspended Solids (TSS)	
	Dissolved Oxygen (DO)	
Ex-situ	Biochemical Oxygen Demand (BOD_5)	• Monthly monitoring for all the ex-situ parameters at the all the discharge point locations at the construction sites during the construction period.
	Chemical Oxygen Demand (COD)	
	Total Nitrogen (TN)	
	Nitrate (NO_3-N)	
	Total Phosphorus (TP)	
	Orthophosphate (PO_4)	
	Oil & Grease (Total)	
	Oil & Grease (Hydrocarbon)	
	Lead (Pb)	
	Zinc (Zn)	
	Mercury (Hg)	
	Enterococcus	

Beside the water quality monitoring, hydrological conditions of drainage system within construction site and at immediate vicinity should also be closely monitored during construction phase. Before draining to public drains or watercourses, surface runoff from the construction site should be drained to the ECM treatment system to be filtered and to reduce peak runoff. The hoarding and perimeter drains should be inspected daily to ensure no surface runoff flowing out from the site untreated and no clogging which would affect the flow capacity of the drains/streams. During heavy storm event, site inspection should be carried out to ensure no flooding. Monthly audit on the site should also be carried out by EMMP consultant.

11.10.2 Operational Phase

The operational phase of the projects should be accompanied by an EMMP to ensure the proposed development will have minor impact on the surrounding watercourses. Water quality monitoring is essential as discharge of excess contaminants, especially pH and suspended solids may lead to severe consequences (e.g. water with less clearance) due to the operational activities. Hence, due to the ecological importance natural stream, D5, it was recommended to monitor their water quality during the first three (3) months of operational period to ensure minor operational impacts on their water quality. For main outlets/drains of the Project site, it is recommended to monitor water quality following Singapore NEA's Allowable Limits for Trade Effluent Discharge to Sewer/Watercourse/Controlled Watercourse. Meanwhile, the water quality of sensitive natural streams should also be recorded and compared with the water quality criteria for aquatic life as listed in Table 8-1 to make sure the aquatic condition will not be impact by the operational activities.

Table 11-3 Recommended monitoring program during operational phase (surface water quality)

Test	Parameters	Monitoring Recommendation and Frequency
In-situ	Temperature	Monthly monitoring for all the in-situ parameters at the main outlets/drains of the project site during the first three (3) months of operation period.
	pH	
	Conductivity	
	Total Dissolved Solids (TDS)	
	Turbidity and Total Suspended Solids (TSS)	
	Dissolved Oxygen (DO)	
Ex-situ	Biochemical Oxygen Demand (BOD_5)	Monthly monitoring for all the ex-situ parameters at the main outlets/drains of the project site during the first three (3) months of operation period.
	Chemical Oxygen Demand (COD)	
	Total Nitrogen (TN)	
	Nitrate (NO_3-N)	
	Total Phosphorus (TP)	
	Orthophosphate (PO_4)	
	Enterococcus	

For the hydrological condition monitoring during operational phase, drainage system within the site and at immediate vicinity should be inspected especially during heavy storm event to ensure no flooding. Monthly audit on the site should be carried out by EMMP consultant during the first three (3) months of operation period.

11.11 Groundwater Level Monitoring Programme Requirement

11.11.1 Construction Phase

A summary of the recommended monitoring of groundwater level during the construction phase is provided in the table below.

Table 11-4 Recommended monitoring program during construction phase (groundwater level)

Location	Parameters	Frequency and Duration
Within the development boundary	Groundwater Level	Continuous monitoring of groundwater level throughout the lifetime of the construction phase as per the instrumentation and monitoring plan developed by QP.

11.11.2 Operational Phase

No monitoring is required for groundwater level during operational phase of the Project.

11.12 Air Quality Monitoring Programme Requirement

11.12.1 Construction Phase

As noted in the mitigation measures (Section 9.8.1), continuous dust monitoring shall be undertaken during the construction phase. Continuous PM_{10} and $PM_{2.5}$ monitoring is recommended due to the potential of High consequence dust impact conducted within the ecological sensitive receptors and also a few human receptors during construction phase. Based on a review of sensitive receptors around the construction worksite areas, a continuous monitoring program as per Table 11-5 is proposed to be conducted during at the start of construction and throughout the project construction.

Table 11-5 Recommended monitoring program during construction phase (air quality)

Location	Parameters	Frequency and Duration	Triggers
Monitoring at the following locations: • Tengah Forest • Dulwich College (Singapore)	PM_{10} and $PM_{2.5}$	Before commencement of construction phase Continuous monitoring of mentioned parameters during construction phase	Investigation and corrective actions to be taken, when 1. Any of the following documentation are found inadequate / missing: Air Pollution Control Plan; Compliance certificate of an Off-Road Diesel engine; or Monitoring Log. 2. If the monitored parameters exceed Singapore long term air quality targets. 3. If complaints are received due to project activities. 4. If visual non-compliance to any of the minimum control or mitigation measures are observed on-site.

11.12.2 Operational Phase

During operational phase, ambient air quality monitoring may not be required.

11.13 Airborne Noise Monitoring Programme Requirement

11.13.1 Construction Phase

As noted in Section 10.8.1, airborne noise monitoring programme can be implemented if required. Based on a review of sensitive receptors around the Project construction site, a continuous monitoring program as per Table 11-6 is proposed to be conducted during Project construction.

Table 11-6 Recommended airborne noise monitoring programme during construction phase

No.	Location	Parameters	Frequency and Duration
1	Northern tip of Project site near Southern Tengah Forest Areas	$L_{Aeq(12\ hours)}$, $L_{Aeq(1\ hour)}$ and $L_{Aeq(5\ mins)}$	For construction phase: pre-construction baseline and continuous monitoring for the entire duration of the construction phase of the aforementioned parameters at all locations.
2	Dulwich College		
3	Jurongville Secondary School		
4	Jurong Primary School		

11.13.2 Operational Phase

No noise monitoring programme were proposed for the operational phase due to the lack of information required regarding the air conditioning and mechanical ventilation (ACMV) system designs and traffic volumes. Usually conducted by an appointed Noise Consultant, AECOM recommends that the works for ACMV boundary noise impact assessment and traffic noise impact assessment be conducted at later stages of the Project development in accordance with the NEA guidelines as discussed in Section 10.8.2.

11.14 Vector Monitoring Programme Requirement

This section provides a vector monitoring programme to minimise the occurrence of potential impacts of vector populations near the Project Site during the construction and operational phase, whose occurrence and growth may be a result of the Project activities. Vectors are defined as any insect, including its egg, larva or pupa, and any rodent, including its young, carrying or causing, or capable of carrying or causing any disease to human beings. As such, they pose a risk to public health and should be controlled and eliminated.

In recent years, virulent vector problems have been mostly attributed to mosquitoes and rats. Mosquitoes are the most widely known disease vector, that can transmit the dengue virus. The common breeding habitats in a construction site that can cause the accumulation of stagnant water would include material storage area, site office, empty containers at workers area, water tanks at construction area and so on. If left uncontrolled, it may lead to mosquito breeding. Hence, as an effective and targeted approach, it is important to reduce/eliminate conditions that creates these suitable breeding habitats in order to control the mosquito population within the study area. Rodent (including rats) infestations are problematic as they can spread diseases through their urine and droppings and chew up wires, pipes and insulation [W-37]. They tend to find new habitats easily and can repopulate quickly at locations with ample food, water and shelter available – which are typically found in hawker centres and vicinity of food waste bins. The removal of potential food sources and areas of harbourages can help prevent the nesting and breeding of rodents, and thus prevents rodent infestations [W-38]. At a construction worksite, there may be poorly maintained food-waste bins, poor refuse management and a lack of housekeeping practices onsite. As such, rodents may thrive in these environments as food, water and shelter are readily available. This section will focus on preventing the creation of such breeding grounds for these two types of vectors.

11.14.1 Construction Phase

This vector monitoring program is dedicated for the construction worksites of this Project only. Areas outside of the Project boundary is not within the Project's authority and minimum control measures shall be carried out by each household or its housing/ school/ building/ public committee and other relevant party according to the stipulated legislations and guidelines. All construction worksites were identified to be the potential sources of vector impact due to accumulation of stagnant water, poor housekeeping and improper waste handing, transfer and storage of waste onsite. Vector-breeding may lead to severe consequences such as the spread of virulent diseases (e.g. dengue fever) both to the workers onsite and to other people near the worksite.

Aligning with NEA's Code of Practice for Vector Control Operator, Technician and Worker [W-41] and NEA's Mosquito and Rodent Control Measures [W-38,W-39], the Contractor shall submit a site-specific Vector Control Plan upon contract award, which encompassing the following elements:

- **Pre-existing Conditions:** To conduct a site assessment and establish vector baseline, which serves to identify high-risk areas for vectors-breeding and eliminate pre-existing vector issues before starting work. Information on the existing dengue clusters and areas with higher Aedes aegypti mosquito population can be reviewed on NEA' websites [W-42, W-43].
- **Vector Control Plan:** To develop plan in case that any person found on site is discovered to be a carrier of vector-borne disease, and when outbreak of dengue or mosquito breeding ground is detected on site.

For the implementation of Vector Control Plan, the Contractor shall provide competent personnel on site as follows:

- **A registered ECO** who undergone relevant trainings (e.g. Joint ITE-NEA Certificate in Pest Management for ECO or equivalent) shall be appointed by the Contractor to assist in investigating vector-borne disease on site as part of the ECO's responsibilities stated in NEA's Code of Practice for Environmental Control Officers (ECO) [W-41].
- **An in-house pest control team** with competent personnel who have undergone relevant trainings (e.g. ITE-NEA Certificate in Control for in-house pest control team or equivalent) shall be formed to carry out vector control and surveillance at least once a week. The in-house pest control team shall be able to identify potential vector-breeding grounds and propose measures to prevent propagation of vectors on site.
- **An external NEA-licensed PCO** shall be engaged to supplement the weekly in-house vector control and surveillance routine.

The in-house pest control team shall develop a vector control program to conduct a daily routine of "Search and Destroy [9]" activities at each construction site.

The recommended monitoring program for vectors is summarised in Table 11-7 below.

Table 11-7 Recommended Vector Monitoring Programme

Location	Parameters	Frequency and Duration
All construction worksites (including storage and resting areas).	Inspection of potential mosquito breeding grounds (stagnant water), rodent burrows and droppings of other vectors (e.g. cockroaches, flies)	• Daily inspection across each construction site, with each site inspected at twice a week; • Weekly inspection by an external NEA-licensed Pest Control Operator.

11.14.2 Operational Phase

Minimum control measures shall be carried out by each household or its housing/ school/ building/ public committee and other relevant party according to the Control of Vectors and Pesticides Act and NEA guidelines [R-54, W-38, W-40].

[9] This refers to the search for and destruction of potential mosquito breeding grounds. This includes clearing of stagnant water, removal of unwanted water-bearing receptacles and eliminating conditions that are prone to water stagnation.

11.15 Proposed EMMP

The framework for the proposed EMMP is detailed below; however, it is important to note that this is not an exhaustive list of potential impacts, monitoring requirements, and triggers. This EMMP is intended to be a living document and should be reviewed thoroughly by the Client/ Project Owner and the Contractor (CT) prior to implementation. Development of the following inputs, that have not been addressed in this report, by the CT is also required, including but not limited to:

- Stakeholder Communications Plan;
- Air Pollution Control Plan;
- Site log for all monitoring activities and complaints;
- Construction Logistics Plan;
- Standard Operating Procedures for processes identified in Table 11-8 and Table 11-9 below;
- Emergency Response Plan;
- Inventory of wastewater streams;
- Training protocols for staff, where appropriate; and
- Maintenance and Audit Schedules.

11.15.1 Construction Phase

The EMMP for construction phase of the project is described in Table 13 8.

Table 11-8 Proposed environmental monitoring and management plan for the construction phase

Environmental Parameter	Environmental Issue	Minimum Control Measures	Mitigation Measures	Monitoring Parameter	Monitoring Locations	Recommended Frequency of Monitoring	Site Responsibility	Triggers[10,11]
Biodiversity	Minimisation of construction impacts to flora/vegetation	• Mark out site boundary where works will be conducted; • Set up Tree Protection Zones (TPZs) around trees or other plant specimens to be retained within the worksites (e.g. *Dacroydes* cf. *costata* (TE3493); and • Tag trees (with or without TPZs) meant to be protected or transplanted to avoid accidental removal.	• The boundary of the Recommended Area of Conservation (RAC) should clearly demarcated; andRecord locations, species and quantity of transplant candidates that are affected by construction.	Flora and Arboriculture	Within development boundary	Prior to site clearance	CT, ECO, Flora Specialist	N.A.
		• Establishment of TPZs; • Inspect the integrity of the TPZ hoarding; • Assess tree physiological health and vigour; • Check for mechanical damage on trees that may impair stability; • Review method statements of construction works in proximity to retained trees; and • Implement soil erosion control measures as soon as vegetation has been removed and soil is exposed.	• Identify excessive or unauthorized tree removal; • Identify trees that require management and maintenance such as tree care and pruning; • Check on the health and condition of the TPZ of (e.g. *Dacroydes* cf. *costata* (TE3493) ; • Determine if there are any unauthorized removal of flora within RAC (if any) or beyond the demarcated worksite; • Identify areas with soil erosion and degradation that have resulted from construction activities; • Determine if there are unauthorized dumping of waste material, construction debris or oil/chemical leakage that may contaminate the soil and waterbodies, and/or be detrimental to the vegetation; and • Identify areas that are responding poorly due to the development impacts.		Within development boundary and 15 m beyond hoarding line	Monthly for duration of construction	CT, ECO, Flora Specialist, Arborist	
	Minimisation of construction impacts to fauna	• Ensure proper storage of machineries likely to leech harmful chemicals and fuel-powered equipment; • Store the aforementioned equipment away from waterbodies and/or sensitive habitats; and • Ensure noise levels are kept within the approved limits.	• Implement wildlife shepherding via directional clearing; and • Conduct pre-felling fauna inspection before executing directional clearance.	Fauna	Within development boundary	Prior to site clearance	CT, ECO, Fauna specialist/Ecologist	
		• Ensure proper storage of machineries likely to leech harmful chemicals and fuel-powered equipment; • Store the aforementioned equipment away from waterbodies and/or sensitive habitats; and Ensure hoardings has been properly erected.	• Check if hoardings are properly installed with no gaps; and check on erosion control blankets (ECB) to check on possible entrapment of fauna		Within development boundary	Monthly for duration of construction	CT, ECO, Fauna specialist/Ecologist	
		Ensure that noise mitigation measures (as detailed in the Airborne Noise EMMP section below) are adhered to.	• Conduct biodiversity survey to monitor construction impacts on fauna activity and presence. • Identify possible roadkill hotspots by conducted monitoring for fauna roadkill at established road networks located close to the construction boundary.		Adjacent to development boundary	Monthly for duration of construction	CT, ECO, Fauna specialist/Ecologist	When fauna is encountered within development boundary
Hydrology and Surface Water Quality	• Solid & Toxic Waste Generation • Liquid Effluent Generation • Improper Management of Chemical Substances • Storage and Disposal of Domestic Liquid and Construction Solid Wastes • Temporary Land Use Change	<u>Solid & Toxic Waste Generation</u> • Effective ECM and monitoring implemented as required in the Code of Practice on Surface Water Drainage to ensure that discharge into the stormwater drainage system does not contain TSS in concentrations greater than the prescribed limits under the Sewerage and Drainage (Surface Water Drainage) Regulations; • Implementation of CCTV including SIDS at the public drain to monitor the surface runoff discharges from the sites as per the Public Utilities Board of Singapore's (PUB) circular on Preventing Muddy Waters from the Construction Sites (October 2015); and • All wastes will be disposed only in the designated waste disposal facilities and appropriately separated, i.e. by trained workers to properly sort and label the different types of waste (reusable and recyclable waste, toxic and non-toxic waste, etc.). <u>Liquid Effluent Generation and Stormwater Runoff</u> • A full inventory of all anticipated wastewater streams and volumes should be finalised before the onset of the construction works; • No unmanaged discharge of wastewater stream permitted;	• If there is any construction activities that may alter the alignment or may block drain/stream, appropriate measure such as diverting the drain/stream to avoid the blockage that may cause localize flooding should be carried out. • Ensure strict compliance with PUB COP on Surface Water Drainage during the design of roadside drains and diversion drains, as well as during the implementation Earth Control Measures, to ensure no flooding risk and no water quality impact during the construction.	All water quality parameters identified in Table 11-2. And any flooding issues should be recorded and inspected.	Before discharge outlets	• Permanent TSS monitor installed at every discharge outlet; • Implementation of CCTV including a SIDS at every discharge outlet to monitor the surface runoff discharges from the sites; • Monthly water quality monitoring for all discharge	CT, ECO	Investigation and corrective actions to be taken, when: • The following documentation are found inadequate/missing: – ECM Plan; – Monitoring Log; – Training Log; – Audit Reports; • If the monitored parameters exceed applicable values of NEA Trade Effluent

[10] Resident Technical Officer (RTO) and Site Officers (SO, WSHO and ECO) check the project site for construction progress and implementation of environmental mitigation measures.
[11] If there is trigger then all the mitigation and management measures should be audited in detail for compliance and corrective action must be taken in liaison with the Project Owner.

Environmental Parameter	Environmental Issue	Minimum Control Measures	Mitigation Measures	Monitoring Parameter	Monitoring Locations	Recommended Frequency of Monitoring	Site Responsibility	Triggers[10,11]
		• Reduce, reuse, and recycle hierarchy principle to be applied to wastewater on-site; • Hazardous wastewater, such as oily water, thinners, solvents, or paints, are to be stored and removed for treatment and disposal off-site by an approved Waste Management Contractor. Hazardous liquids to be handled as Hazardous Waste; • Adequate drainage, cut-off drains sump pit, road kerb, piping, toe wall and/or channelling of construction process wastewater streams (e.g. concrete batching, wash water, etc.) to be assured through detailed design for capture and treatment in the settling ponds. Where applicable (e.g. in the vicinity of liquid storage or refuelling areas), this infrastructure shall include oil-water separators to capture inadvertent spills or leaked oils or greases; • Appropriate disposal of any waste listed in the Environmental Public Health (General Waste Collection) Regulations by licensed waste operator/collector. • Runoff within, upstream of, and adjacent to the work site shall be effectively drained away without causing flooding in the vicinity; • Appropriate permits for discharge to be obtained from relevant authority prior to discharge. No trade effluent other than that of a nature or type approved by NEA Director-General shall be discharged into any watercourse or land. • Regular and dedicated procedures for the management of stormwater collection, settling, testing and eventual discharge of 'clean' water to surface waters. This should also include associated measures required to prevent high sediment concentration stormwater drainage to surface waters; and • Geotechnical aspect of site's slope stability (such as Earth Retaining and Stabilising structures (ERSS) to be included in detailed design engineering for the construction stage. <u>Improper Management of Chemical Substances</u> • Development of SOP for safe handling, transfer and storage of toxic waste; housekeeping checks once a day to ensure all toxic waste is cleared from site; • Appropriate tests to ascertain the presence/absence of contamination of the excavated earth and sand; • Appropriate storage area (enclosed on at least 3 sides, covered and with adequate ventilation); • Appropriate construction material for toxic waste storage containers with leak detection tests conducted periodically; • Provision of secondary containment for all toxic waste stored in bulk as per the requirements in the COPPC/SS593; • Preparation of an emergency response plan, training of the emergency response team (ERT) to be competent in the response mechanism and provision of response kits for any spillages; • Consignment notification/tracking system and transport emergency response plan for transport of toxic waste; • Appropriate disposal of toxic waste as per required in the Environmental Public Health (Toxic Industrial Waste) Regulations by licensed waste operator/collector. <u>Storage and Disposal of Domestic Liquid Wastes</u> • Provision of portable toilets and on-site septic tank; • Regular cleaning of the portable toilets and clearing of sewage waste; • Appropriate location of toilet facilities away from any nearby watercourses; • Inspections and audits to ascertain the hygienic conditions onsite; • Training of workers on the best practices to contribute in environmental protection; and • Appropriate disposal of any waste listed in the Environmental Public Health (General Waste Collection) Regulations by licensed waste operator/collector. <u>Storage and Disposal of Construction Solid Wastes</u> • Surface Water Drainage, to be endorsed by a QECP and submitted to PUB; • Implementation of the ECM plan before the start of any construction work; • Effective ECM and monitoring implemented as recommended in the Code of Practice on Surface Water Drainage to ensure that discharge into stormwater drainage system does not contain TSS in concentrations greater than the			point locations and other public drains during construction phase; • Bi-weekly water quality monitoring for stream D5 during construction period; – Intensity of the laboratory analysis will be increased (e.g. fortnightly, weekly) if in-situ measurements and/or monthly laboratory results indicate deterioration in the water quality. Intensified monitoring will be carried out until in-situ measurements and/or laboratory results indicate 'normality'/consistency with earlier monitored conditions; and – Daily inspection on perimeter drains to ensure no surface runoff flowing out from the site untreated done by the site officer with monthly audit done by EMMP consultant. – Daily inspection on perimeter drains and stream including stream D5 to ensure no surface runoff flowing out from the site untreated		Discharge Limits at discharge point (refer to Table 8-1); • If the monitored parameters exceed applicable values of Water Quality Criteria for Aquatic Life at natural stream (refer to Table 8-1); • If any flooding or clogging issues observed; • If complaints are received due to project activities; and • If visual non-compliance to any of the minimum control or mitigation measures are observed on-site.

Environmental Parameter	Environmental Issue	Minimum Control Measures	Mitigation Measures	Monitoring Parameter	Monitoring Locations	Recommended Frequency of Monitoring	Site Responsibility	Triggers[10,11]
		prescribed limits under the Sewerage and Drainage (Surface Water Drainage) Regulations; • ECM measures include but are not limited to minimisation of formation of bare soil, coverage of all bare/erodible surfaces, concrete cut-off drains, silt fences/traps along the perimeter cut-off drain, turbidity curtains for works adjacent to water bodies (canals, drains, streams), etc. • Implementation of CCTV including a SIDS at the public drain to monitor the surface runoff discharges from the sites as per the PUB circular on Preventing Muddy Waters from the Construction Sites (October 2015); <u>Temporary Land Use Change</u> • Runoff within, upstream of, and adjacent to the work site shall be effectively drained away without causing flooding in the vicinity; • Potential increase of peak-flow due to the change in the land use at the worksite can be mitigated by providing detention tanks or ponds within the Study Area. Detention tanks or ponds can capture stormwater during heavy storm events to reduce the peak runoff; • Geotechnical aspect of site's slope stability (such as Earth Retaining and Stabilising structures (ERSS) to be included in detailed design engineering for the construction stage; and • The design engineers for detailed design may need to ensure that Earth Retaining Stabilisation structures (ERSS) are proposed when the site is cleared and excavated. Concurrently the ECO must ensure that these measures are implemented in the construction phase, as cutting of slopes may result in slope instability.				done by the site officer with bi-weekly audit done by EMMP consultant.		
Groundwater Level	Excavation works, site levelling, foundation works	• Install piezometers to monitor the changes in groundwater level in compliance with Building Control Regulations 2003 as part of its instrumentation and monitoring plan to be endorsed by Qualified Professionals (QP); • Proper Earth Retaining Stabilising Structures (ERSS) should be selected and designed to limit groundwater settlement; • Schedule the proposed development in phases in order to minimize the volume of dewatering at any one time; and • Use recharge wells as necessary during excavation (if with basements) to limit the potential groundwater drawdown.	Divert all the watercourses if necessary	Groundwater Level	Within the development boundary (actual monitoring location to be decided by QP)	Continuous monitoring during construction phase	CT, ECO	Investigation and corrective actions to be taken if there is a significant drawdown of groundwater level
Air Quality	Air quality impact from dust nuisance from the construction activities and gaseous emissions from the construction equipment and vehicles	• The construction footprint shall be hoarded on all sides; • No demolition of permanent structure is expected as part of the project; • No concrete batching plant to be located on-site; and • Access road construction or expansion is recommended to be completed first and paved before the construction of other development commences.	General mitigation measures to be implemented throughout construction period. Communications: • Develop and implement a stakeholder communications plan that includes community engagement before work commences on site. • Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager. • Develop and implement an Air Pollution Control Plan (APCP) Site Management: • Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken. • Make the complaints log available to the local authority when asked. • Record any exceptional incidents# that cause dust and/or air emissions, either on-site or off- site, and the action taken to resolve the situation in the logbook. • Hold liaison meetings with other high-risk construction sites within 500m of the site boundary, if any, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. Monitoring: • Undertake regular (daily frequency recommended) on-site and off-site inspections and record results. The log should be made available to the NEA or other Government Agencies if required. Inspections should include regular dust soiling checks of surfaces such as street furniture, cars and windowsills within 100m of site boundary. Cleaning should be provided if necessary. • Carry out regular site inspections to monitor and record compliance with the Air Pollution Control Plan.	PM_{10}, $PM_{2.5}$	• Tengah Forest • Dulwich College (Singapore)	Before commencement of construction phase; and Continuous monitoring of mentioned parameter during construction period	CT, ECO	Investigation and corrective actions to be taken, when 1. Any of the following documentation are found inadequate / missing: Air Pollution Control Plan; Compliance certificate of an Off-Road Diesel engine; or Monitoring Log. 2. If the monitored parameters exceed Singapore long term air quality targets. 3. If complaints are received due to project activities. 4. If visual non-compliance to any of the minimum control or mitigation measures are observed on-site.

Environmental Parameter	Environmental Issue	Minimum Control Measures	Mitigation Measures	Monitoring Parameter	Monitoring Locations	Recommended Frequency of Monitoring	Site Responsibility	Triggers[10,11]
			• Increase the frequency of site inspections during prolonged dry or windy conditions. • Conduct monitoring for PM_{10} and $PM_{2.5}$ at suitable locations (refer to Section 11.12.1) Preparing and maintaining the site: • Plan site layout so that machinery and dust causing activities are located away from receptors, where possible. • Erect hoarding around dusty activities and at the site boundary wherever possible. Boundary screens should be at least as high as any stockpiles or dust emission sources on site. • Fully enclose specific activities where there is a known high potential for dust production and the site will be active for an extensive period of time. • Keep site fencing, barriers, and scaffolding clean by cleaning regularly using wet methods (dry methods may give rise to fugitive dust). • Remove materials that have the potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site, stockpiled material should be covered, seeded, fenced or enclosed to prevent fugitive dust formation. Operating vehicle/machinery and sustainable travel: • Impose and signpost a maximum-speed-limit of 25 km/hr on paved or surfaced haul roads and 15 km/hr on unpaved haul roads and work areas. • Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials. • Ensure all vehicles and engine powered equipment comply with the legislative requirements of Singapore • Ensure all vehicles and equipment switch off their engines when stationary – i.e. no idling vehicles or engines. Clear signs shall be erected at site entrance to inform all visitors. • Where practicable, avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment Construction: • Only use cutting, grinding or sawing equipment fitted with, or in conjunction with, suitable dust suppression techniques such as water sprays or local extraction e.g. local exhaust ventilation system. • Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate. • Use enclosed chutes and conveyors and covered skips wherever possible. • Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate. • A stringent “Clean as you go” Policy should be implemented on site to ensure no loose dry material is left exposed when not in use. Equipment should be readily available on site to clean and dry spillages, and cleaning should be conducted as soon as reasonably practicable after the event using wet cleaning methods. Waste Management: Avoid burning of waste or other materials					
			MITIGATION MEASURES FOR EARTHWORKS • Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable. • Use Hessian, mulches or soil tackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable. • Only remove the cover in small areas during work and not all at once.					
			MITIGATION MEASURES FOR CONSTRUCTION • Avoid scabbling (roughening of concrete surfaces) if possible. • Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.					

Environmental Parameter	Environmental Issue	Minimum Control Measures	Mitigation Measures	Monitoring Parameter	Monitoring Locations	Recommended Frequency of Monitoring	Site Responsibility	Triggers[10,11]
			• Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery. • For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust. MITIGATION MEASURES FOR TRACKOUT • Use water-assisted dust sweeper(s) on the access and affected local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use. • Avoid dry sweeping of large areas. • Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport. • Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable. • Record all inspections of haul routes and any subsequent action in a site logbook. • Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned. • Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable). • Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits. • Site access gates to be located at least 10m from receptors where possible					
Airborne Noise	Noise from construction machines and equipment, especially rotational and vibratory equipment (e.g., dozers, cranes, excavators, trailers, generators, etc.)	• All machinery and equipment used will be labelled with a weather-proof sticker clearly indicating its noise emission level (at source) under normal operating conditions; • All machinery and equipment used on site will be sound reduced, as far as is practicable; • Stationary noisy equipment will be housed in enclosures on site where necessary; • Machine operators and workers will be trained and briefed on quieter work techniques; • Ad-hoc noise monitoring will be carried out when work progresses during noisy operations; and • Additional noise measures will be implemented when noise monitoring indicates the noise levels are approaching or exceeding permissible noise levels (refer to Section 10.2.3, Table 10-14, Table 10-15, Table 10-17 and Table 10-18).	MITIGATION MEASURES FOR GENERAL CONSTRUCTION NOISE CONTROL: • Control of noise sources at the source from construction site – Analyse construction inventory list and check equipment causing high noise levels. The equipment with lower noise level shall be prioritized; and • Where controlling noise sources at the source is not feasible, acoustic enclosures or sheds are to be introduced to mitigate noise at the source. Typical acoustic enclosure covers the machine as fully as possible (with or without ventilation where applicable) to provide sound insulation. MITIGATION MEASURES FOR CONSTRUCTION NOISE: • No mitigation measures were proposed for construction noise apart from pre-emptive measures detailed in the EMMP as part of airborne noise monitoring plan in Section 11.13.	$L_{Aeq(12\ hours)}$, $L_{Aeq(1hour)}$ and $L_{Aeq(5\ mins)}$	• At the northern tip of the Project site near the Southern Tengah Forest areas • Dulwich College • Jurongville Secondary School; and • Jurong Primary School.	Records on noise levels from construction sites should be properly kept and produced when requested.	CT, ECO	Investigation and corrective actions to be taken, when Any of the following documentation are found inadequate / missing: • Construction Noise Management Plan; • Monitoring Log. 1. If the monitored parameters exceed applicable values of EPM regulations. 2. If complaints are received due to project activities. 3. If visual non-compliance to any of the minimum control or mitigation measures are observed on-site. 4. If there are any cracks / leaks present on the noise barrier erected.

Environmental Parameter	Environmental Issue	Minimum Control Measures	Mitigation Measures	Monitoring Parameter	Monitoring Locations	Recommended Frequency of Monitoring	Site Responsibility	Triggers[10,11]
Vectors	• Accumulation of stagnant water, poor housekeeping and improper handling/ disposal of solid waste (especially food waste)	• Adhere to Control of Vector and Pesticide Act (CVPA) and ensure good housekeeping on-site. • Preparation and implementation of an effective vector control plan and measures as required under NEA's Code of Practice for Environmental Control Officers. (See Section 11.14.1) • Ensure water-bearing receptacles, gaps on grounds and equipment (e.g. openings at concrete barriers), as well as stockpiled areas are covered or sheltered, especially during the northeast monsoon season between November to January. • Scheduled daily housekeeping to ensure clearance of stagnant water and unwanted items are discarded properly. • Site entrance shall be paved to avoid ground depression. • Milled waste can be used to level the ground before laying steel plates. • Provide movable roof over shaft to prevent rainwater ingress. • Pump shall be deployed to clear water at areas where drainage is not possible, as well as for larger recessed surfaces. • Install pitched roof on top and/or seal up bottom of site container office. • After trees clearance, top of tree stumps has to be either remove thoroughly or patched up. • Pipette can be used for larvae-checking at the hard-to-reach parts of a tree. • Food disposal should be clearly allocated and disposed of on a daily basis to discourage rodents from establishing nests on site and to prevent cockroaches/ flies' infestation. • Store food in rodent proof storage containers/ cabinets with at least 60 cm clearance above ground level. • Thermal Fogging shall only be carried out when there is a Dengue outbreak or when high mosquito population is detected at construction worksite. Regular fogging is not encouraged as it may build up the mosquitoes' resistance over time.	Not Applicable.	• Inspection of potential mosquitoes breeding grounds (water ponding) • Inspection of rodent burrows • Inspection of cockroaches and flies' droppings	• Within and/or at boundary of construction worksites, as well as any other temporary and permanent utilities diversion work areas or any other relevant work areas associated with this Project.	• Daily inspection across each construction site, with each site inspected at twice a week • Weekly inspection by an external NEA-licensed PCO.	ECO / SHE personnel, CT	Investigation and corrective actions (i.e. Stop Work Orders) to be taken, when: a. Worksite is found to have vector-breeding habitats. b. There is an occurrence of suspected dengue outbreak cases.

11.15.2 Operational Phase

The EMMP for operational phase of the project is described in Table 13 8.

Table 11-9 Proposed environmental monitoring and management plan for the operational phase

Environmental Parameter	Environmental Issue	Minimum Control Measures	Mitigation Measures	Monitoring Parameter	Monitoring Locations	Recommended Frequency of Monitoring	Site Responsibility	Triggers[12,13]
Biodiversity	Minimisation of operational impacts to flora/vegetation	Not applicable	• Identify of areas that are responding poorly due to operational activities (e.g. newly created habitats within Study Area); and • Ensure that post-construction planting is responding well to development surrounding.	Flora and Arboriculture	Softscape of operational boundary	Monthly for duration of 1 year	CT, ECO, Flora Specialist, Arborist	Not applicable
			• Ensure integrity of Recommended Areas of Conservation (RAC) and adjacent forest patches; and • Identify signs of edge effects on new forest edge of adjacent forest/forest corridor (if any)		Adjacent forest to development boundary (if any)			
	Minimisation of operational impacts to fauna		• Assessment of habitat quality (e.g., water quality, excessive vegetation removal); • Inspection for presence of trapped/injured/dead fauna, potential fauna entrapments and gaps in site hoardings should the development within the Study Area be conducted in phases; • Recording of number of number of occurrences of human-wildlife conflict; and • Conduct biodiversity survey to monitor construction impacts on fauna activity and presence.	Fauna	Adjacent forest to development boundary (if any)		CT, ECO, Ecologist	Not applicable
Hydrology and Surface Water Quality	• Stormwater runoff generation • Permanent land use modification • Improper management on Liquid and Solid Wastes	<u>Stormwater runoff generation</u> • Regular and dedicated procedures for the inspection and maintenance of stormwater collection, storage, and treatment infrastructure, such as pipes, oil water separation, silt screens, etc.; – Regular and dedicated procedures for the management of stormwater collection, settling, testing and eventual discharge of 'clean' water to surface waters. This should also include associated measures required to prevent high sediment concentration stormwater drainage to surface waters; <u>Permanent land use modification</u> • Potential increase of peak-flow due to the change in the land use at the new developments can be mitigated by providing detention tanks within the study area. Detention tanks can capture stormwater during heavy storm events to reduce the peak runoff. Stored water can then be discharged back to the system after the storm event. As required by PUB, the storage system needs to be in place to reduce the peak flow at the operational phase to be the same or less than that of the existing condition. • Geotechnical aspect of site's slope stability (such as ERSS) to be included in detailed design engineering for the operational stage. • Providing more softscape area should be considered in the design of the development to reduce the runoff coefficient which will help to reduce the peak flow and reduce flood risk at downstream area. <u>Improper management on liquid and solid wastes</u> • To prepare sufficient disposal bins surrounding of the Project to avoid wastes generation; • To conduct regular inspection on wastes storage system of the Project;	Not applicable	All parameters identified in Table 11-3. And any flooding issues should be recorded and inspected.	At the main outlets/drains of the project site for the first three (3) month of operational period	Monthly inspection for the water quality and hydrology, especially during heavy storm event for hydrological conditions during first three (3) month of operational period.	EHS Officer	Investigation and corrective actions to be taken, when: • If the monitored parameters of all discharge points exceed applicable values of NEA Trade Effluent Discharge Limits at discharge point (refer to Table 8-1); • If the monitored parameters of natural streams exceed applicable values of Water Quality Criteria for Aquatic Life at natural stream (refer to Table 8-1); • If any flooding issues observed; • If complaints are received due to project activities; and If visual non-compliance to any of the minimum control or mitigation measures are observed on-site.

[12] Resident Technical Officer (RTO) and Site Officers (SO, WSHO and ECO) check the project site for construction progress and implementation of environmental mitigation measures.
[13] If there is trigger then all the mitigation and management measures should be audited in detail for compliance and corrective action must be taken in liaison with the Project Owner.

Environmental Parameter	Environmental Issue	Minimum Control Measures	Mitigation Measures	Monitoring Parameter	Monitoring Locations	Recommended Frequency of Monitoring	Site Responsibility	Triggers[12,13]
		• To monitor the proposed water features and its surroundings with CCTV surveillance regularly to ensure no contamination happen; • To develop an emergency response plan and conduct adequate training; and • Raising awareness of various stakeholders with active community/stakeholder engagement (e.g. signage boards, warning signs, etc.)						
Groundwater Level	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Air Quality	Increased traffic in the vicinity of Project	Not required during operational phase	As Impact Significance is expected to be Minor, no mitigation measures are required	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Airborne Noise	Noise from Air-conditioning and Mechanical Ventilation, Traffic Noise	MINIMUM CONTROLS FOR ACMV NOISE: Minimum Controls below should be applied at the prelim design stage of the development by the appointed M&E consultants. An appointed Noise consultant should validate the noise in accordance with *NEA's Technical Guideline on Boundary Noise Limits for Air Conditioning and Mechanical Ventilation Systems in Non-Industrial Building.* In addition, mitigation measures will be provided by the appointed Noise Consultants during the prelim design stage. • Use low air-conditioning and mechanical ventilation system equipment; • Ensure that any exhaust outlet or intake from the mechanical ventilation system is designed to be adequately set back as far as possible from the boundary line of the development; • Acoustic treatment if any to be designed and implemented; • AC system to be designed with the AHU units placed at appropriate locations as set back from the boundary line of the development as possible; and • Acoustic enclosures for outdoor equipment. MINIMUM CONTROLS FOR TRAFFIC NOISE: Due to the lack of information at this juncture of reporting, assessment, minimum controls, and mitigation will be provided by the appointed Noise Consultant during the prelim design stage and in accordance with Technical Guideline for Land Traffic Noise Impact Assessment	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Vector	• Accumulation of stagnant water, poor housekeeping and improper handling/ disposal of solid waste (especially food waste)	• Adhere to Control of Vector and Pesticide Act (CVPA) and ensure good housekeeping on-site. • Weekly inspections for potential breeding sites should be conducted for areas such as unused containers in open areas and under bushes, open and closed drains, gully traps, tree holes and bifurcations between branches, leaf axils of banana trees, Travellers Palms and other palms, outdoor litter bins etc; • Fortnightly application of sand granular insecticides gully traps, manhole cover handle depressions, lightning conductor pits, stop-cock pits, valve chambers, and sumps; • Immediate application of insecticide should be conducted to destroy breeding habitats identified during inspections and to immediately eliminate the identified potential breeding habitats (i.e. source of stagnant water or waste). Proper recording of these incidents should also be conducted once the breeding habitats or potential breeding grounds have been eliminated; • Thermal Fogging shall only be carried out when there is a Dengue outbreak or when high mosquito population is detected at construction worksite. Regular fogging is not encouraged as it may build up the mosquitoes' resistance over time. Monthly routine pest control checks should be conducted at all locations; • Fortnightly application of sand granular insecticide to sources of stagnant water in schools and boarding	No mitigation measures required to be proposed, as minimum controls for vectors should be practised as advised by NEA.	Not applicable	Not applicable	Not applicable	Each household or its housing/ school/ building/ public committee and other relevant party	Not applicable

Environmental Parameter	Environmental Issue	Minimum Control Measures	Mitigation Measures	Monitoring Parameter	Monitoring Locations	Recommended Frequency of Monitoring	Site Responsibility	Triggers[12,13]
		schools (e.g. toilet bowls, cisterns, and gully traps in toilets), during school vacation.						

12 Conclusions

This section will present the summary of conclusions and recommendations from the assessed potential environmental impacts. The unmitigated impact significance and potential residual impact significance of the assessed environmental aspects are summarised in table below.

Table 12-1 Summary of potential residual impact significance during construction phase

Environmental Parameter	EIS Section	Unmitigated Impact Significance (with minimum controls)	Key Mitigation Measures (if any)	Residual Impact Significance (with mitigation measures if any)
Biodiversity	Section 7	Moderate to Major	• Retain delineated RAC within Study Area • Retain specimen of *Dacryodes* cf. *costata* • Salvage suitable specimens of plants of conservation significance • Transplant two specimens of *Ficus stricta* • Conduct pre-felling inspections and directional wildlife shepherding during pre-construction stage • Monthly flora and fauna monitoring on construction site • Implement compensatory measures of habitat creation along the Forest Fringe and Tengah Pond to compensate for the major loss of terrestrial and aquatic habitat • Enhance wildlife connectivity within Southern Tengah and other green spaces (i.e., Forest Corridor, Central Park) beyond the Study Area	Minor to Major
Hydrology, Surface Water Quality and Groundwater Level	Section 8	Minor to Major	• If there are any construction activities that may alter the alignment or may block drain/stream, appropriate measure such as diverting the drain/stream to avoid the blockage that may cause localize flooding should be carried out. • Ensure strict compliance with PUB COP on Surface Water Drainage during the design of roadside drains and diversion drains, as well as during the implementation Earth Control Measures, to ensure no flooding risk and no water quality impact during the construction.	Minor
Air Quality	Section 9	Moderate to Major	• Implement dust control measures e.g. dust screens, etc. • Install hard surfaced haul routes. • Only use cutting, grinding and sawing equipment with dust suppression water spray mechanisms. • Erect hoarding around dusty activities and site boundary min. 1.8m height in line with BCA guideline. • Impose and signpost maximum speed-limit of 25km/hr on paved roads and 15 km/hr on unpaved roads and work areas. • No burning of waste allowed on site.	Minor

Environmental Parameter	EIS Section	Unmitigated Impact Significance (with minimum controls)	Key Mitigation Measures (if any)	Residual Impact Significance (with mitigation measures if any)
			• Revegetate earthworks and exposed areas / soil stockpiles.	
Airborne Noise	Section 10	**Ecological Receptors**		
		Scenario 1: Site Clearance		
		Negligible	• Implement airborne noise monitoring programme as part of EMMP as pre-emptive measures to assess potential impacts arising from uncontrolled/ unpredicted events.	N.A.
		Scenario 2: Earthworks		
		Negligible to Minor	N.A.	N.A.
		Scenario 3: Infrastructure and Building Works		
		Minor to Moderate	• Implement airborne noise monitoring programme as part of EMMP as pre-emptive measures to assess potential impacts arising from uncontrolled/ unpredicted events.	Minor to Moderate
		Human Receptors		
		Scenario 1: Site Clearance		
		Negligible	N.A.	N.A.
		Scenario 2: Earthworks		
		Negligible to Minor	N.A.	N.A.
		Scenario 3: Infrastructure and Building Works		
		Negligible to Minor	N.A.	N.A.

Table 12-2 Summary of potential residual impact significance during operational phase

Environmental Parameter	EIS Section	Unmitigated Impact Significance (with minimum controls)	Key Mitigation Measures (if any)	Residual Impact Significance (with mitigation measures if any)
Biodiversity	Section 7	N.A. due to total clearance of Study Area	• Grade-separated wildlife crossings via culvert undercrossings • Implement traffic calming measures • Unused areas should be replanted by adopting a native planting palette • Use lighting of lower lux levels at strategic locations to cater for darker areas to minimise disturbance from light at areas where habitat creation is proposed and/or near to the RAC	Negligible to Moderate

Environmental Parameter	EIS Section	Unmitigated Impact Significance (with minimum controls)	Key Mitigation Measures (if any)	Residual Impact Significance (with mitigation measures if any)
			• Provide adequate vegetated buffer adjacent to the RAC to reduce impacts from edge effects (i.e., change in species composition) Elevated or separated footpaths from RAC to reduce trampling of vegetation. Human activities should also avoid major vegetated corridors that is used by fauna species	
Hydrology, Surface Water Quality and Groundwater Level	Section 8	Minor Negative to Positive	N.A.	Minor Negative to Positive
Air Quality	Section 9	Minor	-	Minor
Airborne Noise	Section 10	**Ecological Receptors**		
		Negligible to Minor	• Utilize noise attenuators and other Best Available Technology (BAT) and Best Environmental Practice (BEP) to mitigate potential noise from air conditioning and mechanical ventilation (ACMV) systems; and • Utilize low speed postings, speed humps, speed limit signages at drop-off points and parking areas to mitigate noise from increased road traffic.	Negligible
		Human Receptors		
		Negligible to Minor	• Utilize noise attenuators and other Best Available Technology (BAT) and Best Environmental Practice (BEP) to mitigate potential noise from air conditioning and mechanical ventilation (ACMV) systems; and • Utilize low speed postings, speed humps, speed limit signages at drop-off points and parking areas to mitigate noise from increased road traffic.	Negligible

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Appendix A
AECOM Health and Safety Plan

Delivering a better world

APPENDIX A:

HEALTH AND SAFETY PLAN

SPECIALIST CONSULTANCY SERVICES FOR ENVIRONMENTAL BASELINE STUDIES (EBS) AT SOUTHERN TENGAH AND CHOA CHU KANG N1

Prepared by:

AECOM Singapore Pte Ltd
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Project Number: ***60651709***

HEALTH AND SAFETY PLAN
APPROVAL PAGE

This project Health and Safety Plan (HASP) was prepared for employees performing a specific, limited scope of work. It was prepared based on the best available information regarding the chemical, physical and biological hazards known or suspected to be present on the projects site. While it is not possible to discover, evaluate, and protect in advance against all possible hazards, which may be encountered during the completion of the projects, adherence to the requirements of the HASP will significantly reduce the potential for occupational injury.

By signing below, I acknowledge that I have reviewed and hereby approve this HASP. This HASP has been written for the exclusive use of AECOM, its employees, and subcontractors. The plan is written for specified site conditions, dates and personnel, and must be amended if these conditions change.

Prepared by:



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LIST OF ATTACHMENTS

Attachment A – HASP Receipt and Acceptance Form
Attachment B – Emergency Response Information
Attachment C – COVID-19 Screening Process and Toolbox Meeting Record Form

1.0 Introduction

This Health and Safety Plan (HASP) was developed by AECOM's Environment Business Line (AECOM) for implementing the site survey for Specialist Consultancy Services For Environmental Baseline Studies (EBS) at Southern Tengah and Choa Chu Kang N1. This establishes the health and safety procedures required to minimize potential risk to personnel for the duration of the activity. This is a project and site-specific HASP and should be used concurrently with the AECOM Field SH&E Manual and standard operating procedures (SOPs) and a completed site specific Emergency Response Information Form (Attachment B).

1.1 Policy

AECOM, as a leading global provider of environmental, health and safety services, is committed in protecting the safety and health of our employees and meeting our obligations with respect to the protection of others affected by the implementation of all our operations. We are also committed to protecting and preserving the natural environment in which we operate. The safety of persons and property is of vital importance to the success of this project and accident prevention measures shall be taken toward the avoidance of needless waste and loss. It shall be the policy of this project that all operations be conducted safely as stated in *AECOM SH&E Policy Statement*.

1.2 Scope and Application

The provisions of this HASP apply to all AECOM project staff who may potentially be exposed to safety and/or health hazards related to activities described in Section 3.0 of this document. Unanticipated site-specific conditions or situations may occur during the implementation of this project. Also, AECOM and/or the contractors may elect to perform certain tasks in a manner that is different from what was originally intended due to a change in field conditions. As such, this HASP must be considered a *working document* that is subject to change to meet the needs of this project.

1.3 Regulatory Compliance

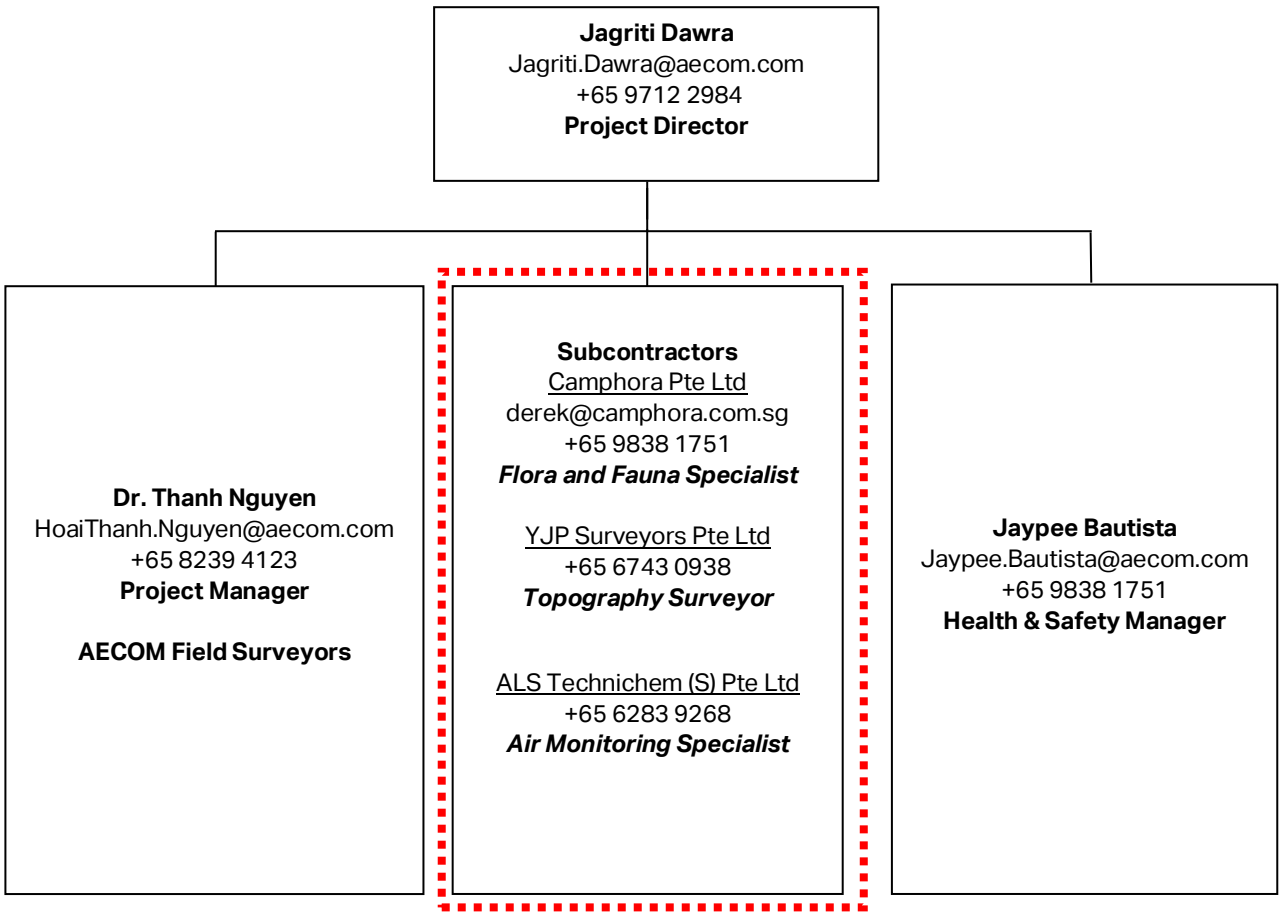
All activities covered by this HASP must be conducted in complete compliance with this HASP and with all applicable environmental, health and safety regulations of Singapore. Additionally, all work will be conducted in accordance with AECOM SH&E Policies and Procedures found in the *AECOM Field SH&E Manual* and Singapore Occupational Safety and Health Administration (OSHA) framework. Personnel covered by this HASP who cannot or will not comply with any of these requirements will be excluded from site activities.

1.4 Management of Change

The procedures in this HASP have been developed based on current knowledge regarding the specific biological and physical hazards, which are known or anticipated for the proposed onsite baseline survey. Site specific requirements and hazards for this project will be taken into consideration and will be included in any update of this HASP. Should additional information become available regarding unique site hazards or operational change, it may be necessary to modify this HASP. All proposed modifications to this HASP must be reviewed and approved by the AECOM Project Manager (PM) and HSSE Focal before such modifications are implemented. The Receipt and Acceptance Sign-off sheet must be submitted to the AECOM PM. The HASP Receipt and Acceptance Sign-off Sheet are included in this HASP as Attachment A.

1.5 Health and Safety Organization

The implementation of health and safety at the site location will be the shared responsibility of the Project Manager (PM), the Project Field Surveyors (FS), the HSSE Focal (HSSEF), and other site-based personnel and contractors implementing the proposed scope of work. The responsibilities of the PM, FS and HSSEF are shown in detail in the *AECOM SH&E Field Manual*. For the implementation of this project, the following Health and Safety Organizational Chart will apply:



1.5.1 Project Manager

The Project Manager (PM) has overall management authority and responsibility for the project, including safety. The PM will provide the FS with work plans, safety personnel, and budgetary resources, which are appropriate to meet the safety needs of the project operations. Helping the PM with the management of the project is the Deputy Project Manager (DPM).

1.5.2 AECOM Field Surveyors

The AECOM Field Surveyor (FS) has the overall responsibility and authority to complete the work according to the provided scope of work. The FS must verify that all tasks are in compliance with the requirements of this HASP, and halt any activity that poses a potential hazard to personnel, property, or the environment.

1.5.3 Subcontractors

Subcontractors (in red box) involved in this project should review and understand the contents of this HASP prior to the start of on-site work. However, as part of the contract with the subcontractors, they are expected to follow their internal health and safety protocols. The subcontractor shall be fully responsible and shall indemnify AECOM for any losses, liabilities and claims as stipulated in Clause 9 and Clause 13 of the signed Subconsultant Engagement. Moreover, the subcontractors are expected to maintain proper and adequate insurances to cover health and safety related emergencies.

1.5.4 Other Field Personnel

All other field personnel covered by this HASP are responsible for following the health and safety procedures specified in this HASP and for performing their work in a safe and responsible manner.

1.6 Stop Work Authority

AECOM Stop Work Procedures (S3AS-106-PR) grants all AECOM employees, including employees of any of its subcontractors the right and responsibility to exercise a 'Stop Work Authority' any time that an employee identifies a discrepancy, deficiency, or potentially dangerous condition or act that is likely to cause an unsafe or unhealthy situation. Any time a 'Stop Work Authority' is issued at the site, work must immediately cease and

all involved employees should review that task and the appropriate JSRA to ensure that any hazards are recognized by all concerned workers. The **Behaviour Based Safety** (BBS) process enables each worker to



2.1 Project Background

AECOM Singapore Pte Ltd was appointed by the Housing and Development Board (HDB) of Singapore, through the Letter of Acceptance dated 29 January 2021, to carry out Specialist Consultancy Services For Environmental Baseline Studies (EBS) at Southern Tengah and Choa Chu Kang N1. The indicative proposed boundary of the study area is shown below in **Figure 1**. The proposed study area of Southern Tengah and Choa Chu Kang N1 are estimated to be 60 ha and 21.7 ha respectively.

As the existing terrain is partially vegetated and undulating, the proposed study area would entail civil engineering works such as site clearance (demolition of all buildings/structures, removal of existing trees and vegetation), earthworks cutting/filling within site to achieve desirable platform levels required for the proposed residential development from the drainage and sewerage perspectives; construction of roads, drainage works, sewerage works etc; and building works such as foundation, superstructure construction, utilities/services laying, etc.



Figure 1 Project Location

2.2 Scope of Work

To assess the nature and existing baseline of study area, HDB would like to conduct an Environmental Impact Study (EIS) for Southern Tengah and EBS for Choa Chu Kang (CCK) N1. The scope of the field work for the project is composed of the following items:

2.2.1 Biodiversity

For Southern Tengah site, the study will include baseline study which comprise of fauna, flora, habitats and areas of conservation interest. The EIS will assess the impacts on flora and fauna communities, habitats and/or ecological processes due to risk of pollution to aquatic habitats, noise and air pollution from construction phase of the project. Area of high conservation value and buffer zones will be identified. Appropriate mitigation measures (if warranted) and recommendations for monitoring programme will be proposed.

For Choa Chu Kang N1 site, the study will only include baseline study which comprise of fauna, flora, habitats and areas of conservation interest.

2.2.2 Hydrology and Water Quality

For Southern Tengah site, the study will map out any permanent streams and/or waterbodies in the study area and investigate the flow conditions (indicative flow velocity, depth and width during dry and wet weathers) of those waterbodies. The dimensions, patterns and profiles of stream channels and other waterbodies will be identified and documented. Catchment delineation will be conducted to identify the water sources and how the water flows within the site. Impacts related to the stream alignment, potential runoff and water pollution will be identified for construction phase. Impacts related to possible construction discharges will be identified. Contaminant concentrations will be compared to relevant water quality criteria. The water quality data to criteria relevant to ecological uses will be compared. The impacts on water quality in the study area will be assessed qualitatively and analytically that results from construction phase of the project.

For Choa Chu Kang site, the study will map out any permanent streams and/or waterbodies in the study area and investigate the flow conditions (indicative flow velocity, depth and width during dry and wet weathers) of those waterbodies. The dimensions, patterns and profiles of stream channels and other waterbodies will be identified and documented. Catchment delineation will be conducted to identify the water sources and how the water flows within the site.

2.2.3 Soil and Groundwater

For Southern Tengah Site, groundwater conditions (i.e. groundwater level) will be assessed through secondary data provided by the Client and/or agencies. No groundwater monitoring wells are assumed to be installed for the EIS. The soil and groundwater impact assessment will be conducted to identify and evaluate the potential impact of construction to the existing soil and groundwater quality (and groundwater system) within the site. Mitigation measures will be proposed to mitigate the identified negative impact(s), if any.

For Choa Chu Kang N1 site, baseline groundwater conditions (i.e. groundwater level) will be assessed through secondary data provided by the Client and/or agencies. No groundwater monitoring wells are assumed to be installed for the EIS.

2.2.4 Air Quality

For Southern Tengah site, the EIS will include a dust baseline survey whose results will be used to evaluate ambient dust (PM_{10} and $PM_{2.5}$) and air quality. The study will assess the impacts from dust generated during the construction phase on the nearest sensitive receptors.

2.2.5 Airborne Noise

For Southern Tengah site, the baseline noise monitoring will be carried out to establish the baseline noise levels. This study will assess the potential impact qualitatively from noise generated during construction phase on the neighbouring sensitive receptors.

2.2.6 Topography Survey

Topographic survey will be conducted to gather data about the elevation of points within the study area and present them as contour lines on a plot. The purpose of a topographic survey is to collect survey data about the natural and man-made features of the land, as well as its elevations. A survey map of terrain and levels within the study area will be provided. The survey area for Southern Tengah Site and CCK N1 Site are approximately 60 ha and 21.7 ha.

3.0 Hazard Assessment

3.1 Physical Hazards

AECOM recognizes that performing certain tasks related to executing the scope of work for the site would expose workers to a variety of physical hazards. As such, AECOM employees have been trained and mentored to carry out assessment activities following AECOM standard operating procedures (SOPs) making SH&E a priority in their operations.

3.1.1 Slip, Trip and Fall Hazards

On any work area, it is expected that the ground may be uneven. The ground surface may be unreliable due to settling. The site should be initially assessed for potential slip, trip and fall hazards. Identify excavations, open pits, holes, and trenches then place appropriate markers at locations with these hazards. Establish and follow an unobstructed walking path identified when working due to the irregular terrain.

3.1.2 Pinch Points

The use of hand tools, mechanical equipment, heavy machinery and more can create pinch points within the working area. Pinch points can be recognized when moving objects are present in the work space in close proximity to employees, and it is reasonable to assume that a part of the employee's body can be caught between the moving objects. Pinch points will be considered when performing a JSRA for the task being performed and recommendations will be made to reduce the potential for body parts to become caught in moving parts, including but not limited to:

- Guarding machinery and equipment to prevent body parts from being caught in the moving objects;
- When tools are used as an extension of the body consideration will be given to how the tool may become a hazard if it is caught within moving parts; and
- The use of PPE, e.g. gloves, boots, etc., to protect exposed body parts.

3.1.3 Manual Lifting

Most materials associated with construction-related activities are moved by hand. The human body is subject to severe damage in the forms of back injury, muscle strains, and hernia if caution is not observed in the handling process. Whenever possible, use at least two people to lift, or roll/lift with your arms as close to the body as possible. Under no circumstances should any one person lift more than 12 kgs unassisted. Using the proper techniques to lift and move heavy pieces of equipment is important to reduce the potential for back injury. Use mechanical devices to move objects that are too heavy to be moved manually. If mechanical devices are not available, ask another person to assist you. Bend at the knees and not the waist when lifting loads. Let your legs do the lifting and do not twist your body while lifting. Be sure the path you are taking while carrying a heavy object is free of obstructions and slip, trip and fall hazards.

3.1.4 Cuts and Lacerations

Field personnel should always look for sharp surfaces such as glass when handling sampling bottles, soil samples or debris. Always wear cut/puncture resistant gloves when hand-clearing cannot be avoided. Never attempt to remove objects caught in an auger stem with the hand and make sure the equipment is turned off.

Machine guards on generators and other mechanical equipment with rotating components are designed to protect hands and arms from being cut, amputated or crushed. Machine areas that are typically guarded include points of operation and moving points or pinch points (any point other than a point of operation at which it is possible for a part of the body to be caught).

3.1.5 Traffic Hazards

Motor vehicle traffic may impact the field team during the implementation of the proposed investigation. The FS must identify the parking location for personnel vehicles and heavy equipment, designated pedestrian walkways, position of designated traffic watcher, traffic control for offsite activities, and coordination with other third party contractors. The FS must verify installation of a barricade around the work area and proper placement of traffic cones, flags and warning signs to warn motorists and pedestrians especially for drilling locations near the access road. All employees onsite should wear an ANSI-approved Class II safety vest.

3.2 Weather Hazards

3.2.1 Heat Stress

Heat stress related problems include **heat rash, fainting, heat cramps, heat exhaustion and heat stroke.** Increased body temperature and physical discomfort also promote irritability and a decreased attention to the performance of hazardous tasks. The surveyors should establish work-rest cycles (short and frequent are more beneficial than long and seldom) and rest in a shaded, cool area.

Most workers exposed to hot environments drink less fluid than needed because of an insufficient thirst. DO NOT DEPEND ON THIRST TO SIGNAL WHEN AND HOW MUCH TO DRINK. **During field work, drink at least 4 - 6 litres (120 - 200 ounces) of fluids for an 8-hour workday.** Sufficient potable water and approved beverages should be made available each day for the field team. The field surveyors should also identify the most effective technique for heat stress monitoring.

3.2.2 Sun Exposure

Field personnel are encouraged to liberally apply sunscreen, with a minimum sun protection factor (SPF) of 30, when working outdoors to avoid sunburn and potential skin cancer, which is associated with excessive sun exposure to unprotected skin. Additionally, employees should consider wearing safety glasses that offer protection from UVA/UVB rays.

3.2.3 Darkness

AECOM discourages field activities to be done at low light conditions, particularly at night. When working in dark areas, ensure that additional artificial lighting must be present to illuminate the work area to ensure that paths and potential site hazards are clearly visible. The field personnel should also recognize the effect of fatigue on workers not accustomed to working at night or extended periods. If night works is required, approval from the PM/DPM, HDB, PUB and SLA must be obtained prior to start of any night works. Moreover, a minimum of two personnel should be completing the work. Lone worker at night time is NOT allowed.

3.2.4 Inclement Weather and Other Natural Disasters

Severe weather can occur with little warning. Employees will be vigilant for the potential of storms, lightning, high winds, and flash flood events. The field personnel will be attentive to daily weather forecasts for the project area each morning. Predicted weather conditions of potential field impact should be considered when performing the work. No field surveys will be conducted during inclement weather, thunder or lightning in the vicinity of the study area.

Be alert to the signs of changing weather, such as darkening skies, a sudden wind shift or drop in temperature. If you are expected to be onsite, plan your evacuation and safety measures in advance. During thunderstorms, when you first see lightning or hear thunder, activate your emergency plan and go inside to the closest building or vehicle. In the event that the national weather service predicts that one of the areas where AECOM is working is in the direct path of a typhoon or cyclone, the PM will immediately contact the field personnel to determine what, if any, precautions are necessary, including the need for evacuation.

This same protocol will be followed in the event that other natural disasters (e.g., floods, landslides, earthquakes, etc.) could impact field personnel. DO NOT IGNORE INSTRUCTIONS TO GET TO SAFETY.

3.3 Biological Hazards

As the site is located in a secondary forest, biological hazards are expected to be present. The AECOM project team shall ensure that the potential for exposure to specific biological hazards are assessed prior to the commencement of work and that the procedures specified by this HASP are integrated into the project planning process and conveyed to AECOM employees conducting the field work. This information shall be communicated in the site kick-off meetings. Possible biological hazards that may be encountered at the site include mosquitoes, wild boars, spiders, bees, and snakes. Where detected, assessment of trees will only be carried out at a distance.

The hazard assessments must also consider the additional hazards posed by vegetative clearing such as the increased risk of coming in contact with plants that may cause irritation, cuts and punctures. Hazards associated with the use of tools and equipment to remove vegetation.

3.3.1 Spiders

Spiders can be found in derelict buildings, sheltered areas, basements, storage areas, well heads, and even on open ground. Spiders can be found year round in sheltered areas and are often present in well heads and valve boxes. Most spider bites produce wounds with localized inflammation and swelling. All spiders are poisonous, but fear of all spiders is unwarranted because most are either too small or possess poison that is too weak to harm humans. Only a few have bites that are dangerous to humans. However, the bite of these few species can cause serious medical problems and possible death under certain circumstances.

3.3.2 Mosquitoes

When a mosquito bites, it injects an enzyme that breaks down blood capillaries and acts as an anticoagulant. The enzymes induce an immune response in the host that results in itching and local inflammation. The tendency to scratch the bite sites can lead to secondary infections. CDC data indicates that mosquito-borne illnesses, including the strains of dengue, Zika, malaria and encephalitis, are a health risk to employees working in outdoor environments. Mosquitoes breed in stagnant water and typically only travel a quarter mile from their breeding site. Whenever possible, stagnant water should be drained to eliminate breeding areas. Project managers and client should be contacted to determine whether water can be drained and the most appropriate method for draining containers, containment areas, and other objects of standing water. Application of mosquito-repellent lotion is advised especially when working outdoors. Employees also need to consider whether they are sensitive to the use of insect repellents. Priority should be given to elimination of breeding areas.

3.3.3 Bees and Hornets

Bees, hornets and wasps may be found in derelict buildings, sheltered areas, and even on open ground. Avoid reaching into areas where visibility is limited. If stung by a wasp or bee or hornet, notify a co-worker or someone who can help should you have an allergic reaction. Stay calm and treat the area with ice or cold water. Seek medical attention if you have any reactions to the sting such as developing a rash, excessive swelling or pain at the site of the bite or sting or any swelling or numbness beyond the site of the bite or sting.

Employees with known allergies to insect stings should consult their personal physician for advice on any immediate medications that they should carry with them. AECOM recommends that employees with known allergies inform their co-workers of the allergy and the location of the medications they might carry for the allergy.

3.3.4 Snakes

Most snake bites happen when the snake is trodden on, either in the dark or in undergrowth. If you find a snake while at work, contact local authorities which will arrange for a suitably qualified snake handler to catch and relocate the snake. DO NOT attempt to catch the snake yourself as this may result in serious injury. Simply track the snake's movements and await the arrival of the snake handler. Attention to the following recommendations might reduce the number of accidents.

- Know your local snakes, the sort of places where they like to live and hide, at what times of year, day/night or in what kinds of weather they are most likely to be active.
- Be especially vigilant about snake bites after rains, during flooding, at harvest time and at night.
- Wear proper shoes or boots and long trousers, especially when walking in the dark or in undergrowth.
- Avoid working in areas where snakes are suspected present or there is a history of their presence. Wear snake chaps if it is necessary to work in or near these areas.
- Avoid snakes as far as possible. Never handle, threaten or attack a snake and never intentionally trap or corner a snake in an enclosed space.
- Avoid or take great care handling dead snakes, or snakes that appear to be dead.
- Avoid having rubble, rubbish, termite mounds or domestic animals close to human dwellings, as all of these attract snakes.
- If you suspect that snake is present in close proximity to your work location, back off and request for help.

- Avoid work alone in remote sites – the buddy can serve as additional eyes for hazard identification and aide in times of emergency
- Prepare an emergency vehicle on standby for working in remote sites especially difficult in transportation (e.g. rent a car)

The hazard assessments must also consider the additional hazards posed by vegetative clearing such as the increased risk of coming in contact with plants that may cause irritation, cuts and punctures. Hazards associated with the use of tools and equipment to remove vegetation.

3.3.5 Wild Boars

There is potential dangerous of wild boar attack in the forested area of Southern Tengah site. Based on local worker near the site, they have noticed wild boar few times in the forest of Southern Tengah. There is a few recommendations when encountered wild boar:

- Be calm and move slowly away from the wild boar.
- Do not approach or attempt to attack the wild boar.
- Keep a safe distance and do not corner or provoke the wild boar.
- If see adults with young piglets, leave them alone to avoid increase the alertness of the adult and they may attempt to defend their youngs.
- Wear proper shoes or boots and long trousers, especially when walking in the dark or in undergrowth.
- Avoid working in areas where wild boars are suspected present or there is a history of their presence.
- Avoid or take great care handling dead wild boar, or wild boar that appear to be dead.
- If you suspect that wild boar is present in close proximity to your work location, back off and request for help.

3.4 Covid

AECOM adopts a screening process to prevent spread of Covid-19 to employees, sub-consultants, subcontractors, and visitors at AECOM project offices and field locations, as detailed in Attachment C. This process will be strictly followed by field staff and visitors within the scope of AECOM-managed activities.

4.0 Personal Protective Equipment

4.1 Basic PPE

PPE will be worn during field work activities to meet the facility's basic PPE requirements and to prevent on-site personnel from being injured by the safety hazards posed by the site and/or the activities being performed. The following tables describe the basic PPE requirements for general site activities and for certain specific tasks/areas.

Basic PPE Item	Requirements for Donning Item
Long sleeved work jacket or shirt; 100% cotton	Required at all times. No torn or sleeveless shirts allowed
Long pants; denim or cotton	Required at all times. No short pants allowed.
Closed shoes/knee-high rubber boots/gaiters	Required at all times.
Hard Hat (ANSI Z89.1, Type 1, Class E)	Required when working in areas or activities with overhead hazards (i.e. operation of rig)
Traffic vests (ANSI 107, Class II)	Required when working in areas with moving vehicles.
Work Gloves	Type required dependent on work performed. Brightly colored gloves are recommended.

4.2 Other Safety Equipment

The following additional safety items should be available at the site:

- Portable, hand-held eyewash bottles
- Fully-stocked First Aid Kit
- Hard barricades or traffic cones to designate work area;
- Multipurpose Dry Chemical (Type A-B-C) Fire (when hot works are implemented). The fire extinguisher should be accessible and placed close to the area were the Hot Work activities are occurring.
- Trekking pole/stick
- Face shield/mask

5.0 Personal & Travel Related Safety & Security

5.1 General Information

This project involves travel to an area of Singapore that may or may not pose security threats to the AECOM field team members that will perform the project work. All field personnel will use the buddy system when working within any controlled work area. Under no circumstances will any employee be present alone in a controlled area. To ensure the personal safety of AECOM staff, the following general precautions need to be considered and implemented:

- Obtain travel, health and security advisories applicable prior to mobilization. This includes notice to proceed from NParks, HDB, URA, SLA, ISD, MINDEF and SPF.
- Schedule onsite works during daylight hours or until nearby establishments are still open.
- Keep a mobile phone with you onsite. Maintain regular contact with someone in the office.
- To avoid being a target, dress conservatively. Do not wear expensive looking jewellery.
- Always try to travel light. You can move more quickly and with ease and will be more likely to have a free hand.
- If you wear glasses, pack an extra pair and pack medicines you need in your carry-on luggage.
- Notify a representative of the site/facility and your supervisor immediately if you become concerned at any time about your personal safety and security while conducting this work.

5.2 Communications

Throughout field surveys, a minimum of two personnel will work together at all times and carry hand phones to keep in contact with non-field personnel. Local telephone facilities or services may be limited at the site. Field teams must have a portable mobile phone to contact other AECOM Project Managers, and if necessary, local emergency responders.

6.0 SITE CONTROL

6.1 Housekeeping

During site activities, work areas will be continuously policed for identification of excess trash and unnecessary debris. Excess debris and trash will be collected and stored in an appropriate container (e.g., plastic trash bags, garbage can, roll-off bin) prior to disposal. At no time will debris or trash be intermingled with waste PPE or contaminated materials.

6.2 Smoking, Eating, or Drinking

Smoking, eating and drinking will not be permitted inside any controlled work area at any time. Field workers will first wash hands and face immediately after leaving controlled work areas (and always prior to eating or drinking). Consumption of alcoholic beverages is prohibited at any AECOM site.

6.3 Personal Hygiene

The following personal hygiene requirements will be observed:

- Water Supply: A water supply meeting the following requirements will be utilized:
  - ❖ Potable Water - An adequate supply of potable water will be available for field personnel consumption. Potable water can be provided in the form of water bottles, canteens, water coolers, or drinking fountains. Where drinking fountains are not available, individual-use cups will be provided as well as adequate disposal containers. Potable water containers will be properly identified in order to distinguish them from non-potable water sources.
  - ❖ Non-Potable Water - Non-potable water may be used for hand washing and cleaning activities. Non-potable water will not be used for drinking purposes. All containers of non-potable water will be marked with a label stating:

Non-Potable Water
Not Intended for Drinking Water Consumption

- Toilet Facilities: The FS shall identify the nearest toilet facilities onsite.

7.0 HEALTH AND SAFETY REQUIREMENTS

7.1 Training Requirements

7.1.1 Site Safety Officer Accreditation

All AECOM personnel performing activities covered by this HASP must have completed the appropriate prescribed internal training requirements.

7.2 SH&E Briefings and Meetings

7.2.1 Field Kick-off Meetings

Prior to the commencement of on-site activities, a field kick-off meeting will be conducted by the FS to review the specific requirements of this HASP. Attendance of the pre-entry meeting is mandatory for all personnel covered by this HASP and must be documented on the HASP Acceptance Form provided in Attachment A. All documentation should be maintained in the project file. The pre-entry briefing must be completed for each new employee before they begin work at the site.

7.3 Medical Surveillance Program

AECOM has a medical surveillance program in place specifically designed to provide pre-placement baseline medical examinations to determine the medical suitability of, and to establish a "medical baseline" for, newly hired employees. The program provides annual examinations to detect medical conditions or changes, which may affect medical suitability for unrestricted work; and also provides interim and post exposure examinations, as necessary, based on types of projects and materials handled.

7.4 Substance Abuse

AECOM understands that the unlawful or improper presence or use of controlled substances or alcohol in the workplace presents a danger to everyone. Employees who refuse to meet the requirements of the AECOM Substance Abuse Policy shall be removed from the project and may be subjected to disciplinary action, up to and including termination.

8.0 Emergency Response

AECOM response actions will be limited to evacuation and medical/first aid as described within this section. As such, this section of the HASP has been written to comply with 29CFR 1910.38 (a). AECOM employees and their subcontractors should be prepared to evacuate the work site in the event of an emergency. When work involves working at a remote location where medical facilities may not exist, it is imperative that the field team understand how to contact transportation companies to assist with transport to the closest medical facility. This information must be determined in advance of mobilizing to a remote location with no medical facilities, reviewed with the field team and verified with the identified transport companies on the day of field mobilization to ensure services are available. AECOM will bring a portable phone to the site to ensure that communications with local emergency responders is maintained, when necessary.

8.1 Emergency Information and References

Prior to working, the field personnel will review with the PM the scope of work and any site-specific information that may be available, including emergency information specific to the site location, emergency contact information and the designated emergency evacuation area. Emergency references of MEDICAL (ambulance), FIRE and POLICE services that can be summoned to the facility during an emergency should be determined as part of the Site Specific Data Form and should be discussed during the daily safety meetings. The field personnel and/or PM must ensure completion of the **Emergency Response Information** form (Attachment B) prior to mobilization.

8.2 Accident Reporting and Investigation

8.2.1 AECOM Reporting Requirements

All work-related H&S incidents, including injuries and illnesses, first aid cases, accidents, property damage incidents, and near-miss incidents must be reported to the PM as soon as possible. The PM should then notify the HSSE Focal to discuss the incident and to determine whether the incident must be reported to LTA (see below) and whether an accident investigation should be conducted and documented. If any person is injured, his/her supervisor, the PM and HSSE Focal must be notified immediately.

If an investigation will be required, it should be conducted as soon as emergency conditions are under control. The purpose of the investigation is not to attribute blame but to determine the pertinent facts so that repeat or similar occurrences can be avoided. An AECOM Accident Investigation Form in the *AECOM Field SH&E Manual* must be completed as soon as possible and submitted to the PM.

8.3 Emergency Contacts

Name	Title	Mobile Phone	E-Mail Address
AECOM Contacts			
Jagriti Dawra	Project Director	+65 9712 2984	Jagriti.Dawra@aecom.com
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Lissiana Markun Lauwa	Project Co-ordinator	+65 6490 3298	Lissiana_Markun LAUWA@hdb.gov.sg

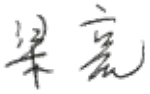
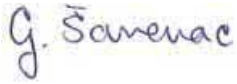
Attachment A

HASP Receipt and Acceptance Form

Health and Safety Plan Receipt and Acceptance Form

for Biodiversity and Hydrology Baseline Studies and Environmental Impact Study for Keppel Club, PSA Club, Bukit Chermin, Berlayer Creek and Former BP Oil Refinery Site

I have received a copy of the Health and Safety Plan (HASP) prepared for the above referenced project. I have read and understood its contents and I agree that I will abide by its requirements.

Name	Signature	Company	Date
Jagriti Dawra		AECOM Singapore Pte Ltd	17-Feb-2021
Jaypee Perez Bautista		AECOM Singapore Pte Ltd	17-Feb-2021
Dr Hoai Thanh Nguyen		AECOM Singapore Pte Ltd	19-Feb-2021
Dr. Liang Liang		AECOM Singapore Pte Ltd	19-Feb-2021
Jacquelynn Chia		AECOM Singapore Pte Ltd	17-Feb-2021
Grujica Sarenac		AECOM Singapore Pte Ltd	19-Feb-2021
Hanzel Lalitan		AECOM Singapore Pte Ltd	19-Feb-2021
Phyo Naing Zay		AECOM Singapore Pte Ltd	19-Feb-2021
Rou Jie Tan		AECOM Singapore Pte Ltd	18-Feb-2021
Yee Chian Choo		AECOM Singapore Pte Ltd	17-Feb-2021

Reva Gupta		AECOM Singapore Pte Ltd	18-Feb-2021
Jafon Ng		AECOM Singapore Pte Ltd	19-Feb-2021

Attachment B

Emergency Response Information

Local Police:

For Southern Tengah site: Jurong West Neighbourhood Police Centre, 700 Corporation Rd, Singapore 649818

Tel: +65 1800 268 9999

For Choa Chu Kang N1 site: Choa Chu Kang Neighbourhood Police Post , 116 Teck Whye Ln, #01-740, Singapore 680116

Tel: +65 1800 762 9999

Local Fire: Bukit Batok Fire Station, 80 Bukit Batok Rd, Singapore 658072

Tel: +65 6314 6931

Closest Hospital/Clinic to Site:

Hospitals and Clinics Near *Southern Tengah site*

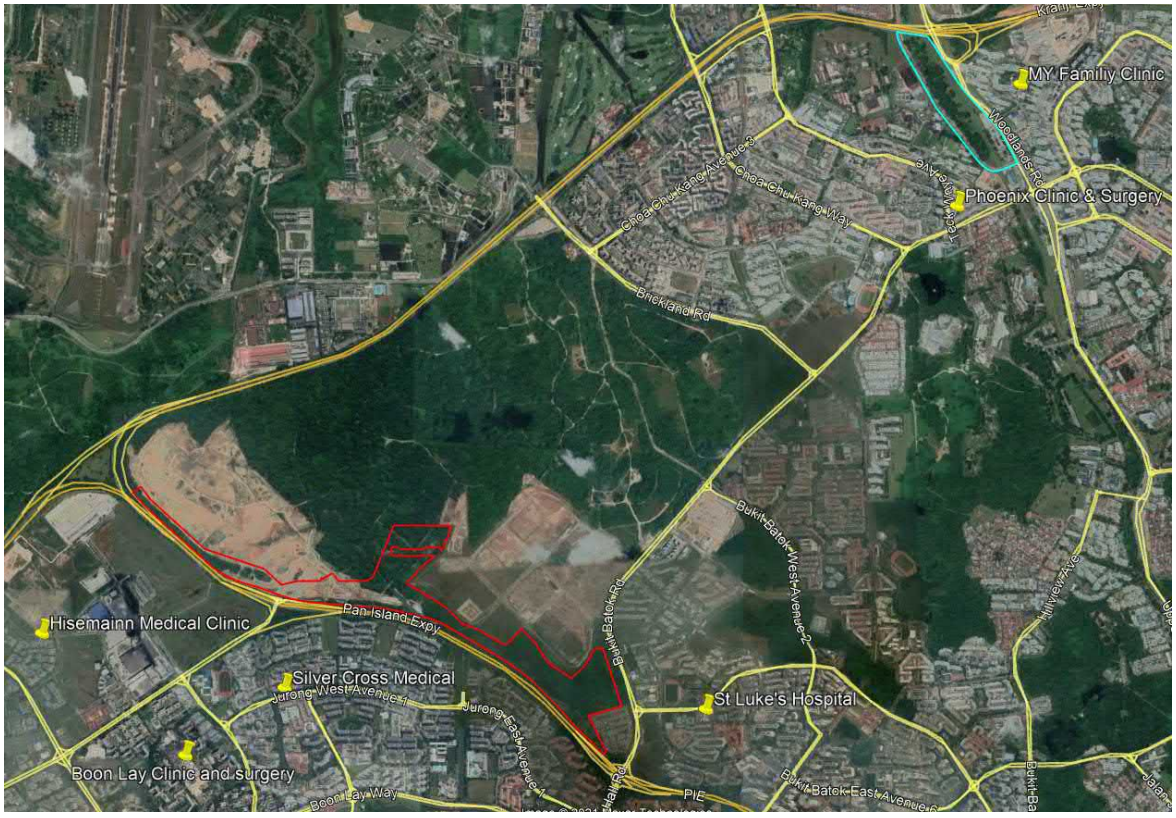
Name of Hospital and Clinic	Distance from Project Site (km)	Address	Contact Number/Hotline	Opening Hours	Coordinates
St Luke's Hospital	~1.76 km	2 Bukit Batok Street 11, Singapore 659674	+65 6563 2281	Mon – Sun: 24 hours	1°20'56.95"N, 103°44'31.10"E
Silver Cross Medical (Jurong West)	~1.8 km	502 Jurong West Ave 1, #01-803, Singapore 640502	+65 6899 2141	Fri – Wed: 8am-10pm; Thurs – 8am-5pm	1°21'1.34"N, 103°43'3.76"E
Boon Lay Clinic and surgery	~1.7 km	221 Boon Lay Pl, #01-240, Singapore 640221	+65 6265 5247	Mon – Thurs: 9am-12.30pm, 2-5pm,7-9pm Fri: 9am-12.30pm, 2-5pm; Sat – Sun: 9am-12.30pm	1°20'47.38"N, 103°42'43.15"E
Hisemainn Medical Clinic	~2.4km	Blk 276 Jurong West Street 25 #01-06, 640276	+65 6795 8990	Mon - Fri:8.30am-3.30pm, 6.30-9.30pm; Sat-Sun: 8.30am-12.30pm	1°21'12.63"N, 103°42'13.47"E

Hospitals and Clinics Near *Choa Chu Kang N1 site*

Name of Hospital and Clinic	Distance from Project Site (km)	Address	Contact Number/Hotline	Opening Hours	Coordinates
St Luke's Hospital	~6.7km	2 Bukit Batok Street 11,	+65 6563 2281	Mon – Sun: 24 hours	1°20'56.95"N, 103°44'31.10"E

		Singapore 659674			
MY FAMILY CLINIC (SENJA)	~1.3km	Senja Rd, #01-04 Senja Grande, Blk 628, Singapore 670628	+65 6314 0638	Mon & Wed: 8am-2pm,6-10pm; Tues, Thurs,Fri: 8am-2pm; Sat-Sun: 8am-12pm	1°23'6.30"N, 103°45'36.33"E
Phoenix Clinic & Surgery	~0.5km (walking distance)	150 Jln Teck Whye, 01-43, Singapore 680150	+65 6767 5345	Mon-Fri: 8.30am-2.30pm,7-9.30pm; Sat: 9-11.30pm; Sun: 7-9.30pm	1°22'41.06"N, 103°45'23.20"E

Location of Nearest Hospital/Clinic:



Attachment C

COVID-19 Screening Process and Toolbox Meeting Record Form

Singapore

Appendix C - COVID-19 Screening Process

To help prevent the spread of Covid-19 to employees, sub-consultants, subcontractors, and visitors at AECOM project offices and field locations, it is recommended that all employees, sub-consultants, subcontractors and visitors undergo a screening process as part of the toolbox meeting prior to start of the project.

The AECOM field staff presiding over the toolbox meeting shall:

1. Check if each employee, sub-consultant, subcontractor and visitor at the project site is wearing a surgical or N95 mask. Note that face shields cannot replace masks but can be worn together with a mask;
2. Measure the temperature of each employee, sub-consultant, subcontractor and visitor at the project site using a thermal scanner. The measurement shall be done twice – one in the morning before the toolbox meeting and one in the afternoon prior to start of work; and
3. Ask each employee, sub-consultant, subcontractor and visitor at the project site to answer the questions listed in the Covid-19 Screening Questionnaire below.

Use the Toolbox Meeting Record (**S3[APAC]-006-FM2, Singapore Office version**) to record the temperature and assess whether each employee, sub-consultant, subcontractor and visitor at the project site is fit for duty.

Covid-19 Screening Questionnaire:

1. Do you have any of the following symptoms: fever, cough, muscle aches, fatigue, difficulty breathing, sore throat or vomiting? **Yes or No.**

If the person answers Yes, ask him not to proceed with work. Contact the person's manager to inform that the person is showing at least one of the signs mentioned above and therefore will not be allowed to work. Recommend the person to seek medical assistance if necessary.

2. Have you been diagnosed with COVID-19? **Yes or No.**

If the person answers Yes, ask whether he has been cleared by the Government of Singapore. Ask for certification of negative result, if applicable.

3. a) Have you been in close contact with a confirmed or probable case of COVID-19? **Yes or No.**

   b) If Yes to 3a) have you followed the required isolation period as required by the Singapore Government? **Yes or No.**

If the person answers No to 3b), contact the person's manager to inform that the person will not be allowed to work at the site. If Yes, ask for certification or clearance, if applicable.

4. a) Have you travelled outside Singapore within the past 14 days? **Yes or No.**

   b) If Yes to 2a) did you follow the quarantine instructions by the Singapore Government? **Yes or No or Not applicable**

The person shall be considered fit-for-duty if:

1. The body temperature is below 37 °C; and

2. The person clears the screening questionnaire.

APAC - Singapore

Toolbox Meeting Record – Covid-19

S3[APAC]-006-FM2

Project Name:			
Meeting Location:			
Meeting Date:		**Time:**	

Presenter(s) / Supervisor Leading Toolbox Talk:			
Name:		**Signature:**	
Name:		**Signature:**	

Upcoming Activity Review (activities due to commence on-site in the following week and expected dates of completion & ideas or suggestions for SHEQ improvement)	**Date**
1.	
2.	
3.	
4.	
5.	

Alert / Fact Sheet / Lessons Learnt / Topic Reviewed
1.
2.
3.
4.

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Comments / Issues raised by attendees and review of outstanding issues	Action By	Due Date
1.		
2.		
3.		
4.		
5.		

ATTENDEES

The information listed above has been adequately explained to me and I understand how and where to get additional support on the topics covered if I require it.

Name	Company	Fit for Duty Check			
		Morning		Afternoon	
		Temperature	Fit-for-duty?	Temperature	Fit-for-duty?
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					

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ATTENDEES **The information listed above has been adequately explained to me and I understand how and where to get additional support on the topics covered if I require it.**					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					

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Appendix B
AECOM Job Safety Risk Assessment

Delivering a better world

APPENDIX B:

JOB SAFETY RISK ASSESSMENT

SPECIALIST CONSULTANCY SERVICES FOR ENVIRONMENTAL BASELINE STUDIES (EBS) AT SOUTHERN TENGAH AND CHOA CHU KANG N1

Prepared by:

AECOM Singapore Pte Ltd

300 Beach Road, #23-00 The Concourse,

Singapore 199555

Project Number: ***60651709***

AECOM

JOB SAFETY RISK ASSESSMENT

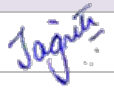
Project:	Specialist Consultancy Services for Environmental Baseline Studies (EBS) at Southern Tengah and Choa Chu Kang N1	**Location:**	Southern Tengah and Choa Chu Kang N1
Work Activity:	Onsite Survey, water quality sampling, biodiversity surveys, topographic survey, air/noise monitoring		
Personnel Protective Equipment (PPE):	Long-sleeved shirt, long trousers, raincoat/poncho (as applicable), mosquito head net, trekking pole, face shield/mask, knee-high rubber boots and insect repellent.		
Development Team:	**Name/Designation:** Jacquelynn Chia / Consultant **Date:** 5 February 2021	**Reviewed by:**	**Name/Designation:** Jaypee Bautista / Health & Safety Manager **Date:** 5 February 2021
JSRA Type:	☒ New ☐ Revised	**Next Review Date:**	5 February 2022

No	Job Steps	Potential Hazard(s)	Existing Risk Control	Initial Risk Evaluation			Additional Risk Control	Residual Risk Evaluation			Responsible Person	Completed by:
				L	S	R		L	S	R		
1.1	Site walkabout / locating of point counts/transects • Inspecting the area / vicinity walk within the site • Conduct flora and fauna surveys	Slips, trips and fall due to uneven surface, slippery ground, soft soil, obstructions (fence/railing) or wayward objects (FB, FC)	- Use alternative routes, if available, for areas blocked by fences/railings - Assess for slippery, uneven surface or obstructions; remove wayward objects; identify safe routes and pathways; follow designated paths as shown in maps (access maps)	3	2	6	- If climbing over a low fence or railing cannot be avoided, always maintain three-point contact - Use trekking poles or stick to assess the ground and to aid balance when walking around uneven/grassy ground - Remove obstructions - Maintain a slow and steady walking pace while working onsite - Ensure anti-slip threads on safety boots are clean and not worn out	1	3	3	AECOM Personnel	
1.2		Exposure to extreme heat	- Take periodic breaks and keep hydrated – drink water or ionic drinks - Stay under the shade whenever possible	3	2	6	- Apply sunscreen as necessary - Use umbrella as necessary	1	2	3	AECOM Personnel	
1.3		Biological hazard - Mosquito bites (and other insect bites – bees, hornets, ants)	- Read AECOM Safety for Life Safety Alert regarding mosquitoes and malaria - Be on an active lookout for beehives and hornet nests	3	2	6	- Use insect repellent (spray or patch) - Wear light coloured clothing with long sleeves and long pants	1	2	2	AECOM Personnel	

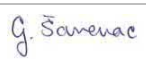
No	Job Steps	Potential Hazard(s)	Existing Risk Control	Initial Risk Evaluation			Additional Risk Control	Residual Risk Evaluation			Responsible Person	Completed by:
				L	S	R		L	S	R		
							- Be aware of peak mosquito hours – avoid works during dusk and dawn - Wear mosquito head nets - Use a poncho/raincoat, if necessary, to cover body parts					
1.4		Biological hazard - Snake bites (CB) / animal bites (wild animals like wild boars)	- Do not approach or provoke wild animals - Leave the area cautiously and slowly	2	3	6	- Avoid walking through dense vegetation / tall grass. Use known tracks or cleared routes (i.e., with no or little vegetation). - If there is a person who is familiar with the site, seek advice on safer or alternative routes. - Always carry a stick or trekking pole which you can use as protection - Use knee-high rubber boots or gaiters, especially when walking on grassy and waterlogged areas - Avoid walking alone in remote sites	1	3	3	AECOM Personnel	
1.5		Intermittent weather	- Stop work during heavy rain or thunderstorm	2	4	8	- Seek shelter; do not hide under trees in case of thunderstorms - Resume work only 30 minutes after a thunderstorm	1	3	3	AECOM Personnel	
2.1	Water Quality Sampling • Grab sampling of water sample using sample container • Use of water quality kit to measure water parameters	Contact with preservatives in sampling bottles (CW)	Wear appropriate PPE, such as nitrile gloves, long sleeve shirts and safety glasses	2	1	2	-				AECOM Personnel	
2.2		Ergonomic hazards – repetitive movements, overreaching, bending, twisting, slouching (O)	- Observe good ergonomic practices such as minimizing twisting, bending and slouching, avoiding overreaching and awkward positions - Sit on a stool, if possible	3	2	6	- Sit on a stool, if possible - Use a trolley to carry buckets to designated waste disposal/storage location or - Avoid overfilling the buckets	1	2	2	AECOM Personnel	

No	Job Steps	Potential Hazard(s)	Existing Risk Control	Initial Risk Evaluation			Additional Risk Control	Residual Risk Evaluation			Responsible Person	Completed by:
				L	S	R		L	S	R		
							(at most, half-filled) if a trolley is not available or usable					
2.3		Slip, trip, fall due soft grounds or slippery surface/uneven grounds while climbing the fence; Getting stuck/trapped in subsiding/very soft ground (FS, FB) Slip, trip and fall into waterbody (FB)	- Observe good housekeeping practices – clean up spills - Maintain slow and steady walking pace while walking on site - Conduct surface water sampling with a buddy as a watchman	2	3	6	- Remove obstructions if observed - Use a trekking pole for additional support - Wear rubber boots / high boots with high traction - Ensure three-point contact while climbing the fence	1	3	3	AECOM Personnel	
3.1	Installation / placement of noise monitoring equipment • Attach microphone to the pole and drive the pole to the ground	Ergonomic – repetitive movement and awkward posture (slouching, twisting, overreaching, kneeling, lifting) when shifting / setting up the equipment	- Keep tools and equipment within arm's reach - Use proper lifting techniques - Use pallet jack/trolley or a two-man lift when lifting heavy equipment - Use proper equipment to extend hand reach instead of overreaching	3	2	6	- Do not sustain awkward positions (e.g. shoulders too high/low, prolonged extension of elbow) - Take frequent breaks to rest muscles and hydrate - Use a stool or knee pad, if possible, to avoid awkward legs	1	2	2	AECOM Personnel	
3.2	• Store battery-powered measurement equipment in the protective box • Secure cable and equipment box • Noise monitoring will run for 1 week before removal • Demobilization – retrieval of equipment from the site	Hand injury (cuts, lacerations, puncture, an abrasions) due to pinch points and sharp edges	- Identify and be aware of possible pinch points and sharp edges during installation of equipment	2	2	4	- Use cut and puncture resistant working gloves	1	1	1	AECOM Personnel	

No	Job Steps	Potential Hazard(s)	Existing Risk Control	Initial Risk Evaluation			Additional Risk Control	Residual Risk Evaluation			Responsible Person	Completed by:
				L	S	R		L	S	R		
4.1	Installation / placement of air monitoring equipment (subcon ALS) • Attach equipment and solar power panel to the ground	Ergonomic – repetitive movement and awkward posture (slouching, twisting, overreaching, kneeling, lifting) when shifting / setting up the equipment	- Keep tools and equipment within arm's reach - Use proper lifting techniques - Use pallet jack/trolley or a two-man lift when lifting heavy equipment - Use proper equipment to extend hand reach instead of overreaching	3	2	6	- Do not sustain awkward positions (e.g. shoulders too high/low, prolonged extension of elbow) - Take frequent breaks to rest muscles and hydrate - Use a stool or knee pad, if possible, to avoid awkward legs	1	2	2	ALS Personnel	
4.2	• Secure cable and equipment box • Barricade the equipment with proper signs indicating the work, contact person details etc • Air monitoring will run for 1 week before removal • Demobilization – retrieval of equipment from the site	Hand injury (cuts, lacerations, puncture, an abrasions) due to pinch points and sharp edges	- Identify and be aware of possible pinch points and sharp edges during installation of equipment	2	2	4	- Use cut and puncture resistant working gloves	1	1	1	ALS Personnel	
5.1	Biodiversity survey	Refer to the General Safety Plan provided in Appendix C and developed by Camphora Pte Ltd for this project									Camphora Personnel	
6.1	Topography Survey	TBD									TBD	

My signature below indicates that all requirements and conditions listed above have been verified, met, and reviewed will all affected personnel prior to start of work.	
Supervisor's Signature:  Jagriti Dawra	Date/Time: 17-Feb-2021

I have read this JSRA, and I understand the hazards and safe work practices associated with the task.			
Signature:  Dr Hoai Thanh Nguyen	Date/Time: 19-Feb-2021	Signature: Jacquelynn Chia	Date/Time: 17-Feb-2021

Signature: 	Dr Liang Liang	Date/Time: 19-Feb-2021	Signature: 	Grujica Sarenac	Date/Time: 19-Feb-2021
Signature 	Phyo Naing Zay	Date/Time: 19-Feb-2021	Signature: 	Hanzel Lalitan	Date/Time: 19-Feb-2021
Signature: 	Rou Jie Tan	Date/Time: 18-Feb-2021	Signature: 	Yee Chian Choo	Date/Time: 17-Feb-2021
Signature: 	Reva Gupta	Date/Time: 18-Feb-2021	Signature:		Date/Time:
Signature:		Date/Time:	Signature:		Date/Time:

Risk Assessment Matrix:

Likelihood / Severity	*Rare (1)*	*Remote (2)*	*Occasional (3)*	*Frequent (4)*	*Almost Certain (5)*
Catastrophic (5)	5	10	15	20	25
Major (4)	4	8	12	16	20
Moderate (3)	3	6	9	12	15
Minor (2)	2	4	6	8	10
Negligible (1)	1	2	3	4	5

Code for Potential Hazards:

Caught Between (CBT)	Contacted By (CB)	Fall to Below (FB)	Overexertion (O)	Struck Against (SA)
Caught In (CI)	Contact With (CW)	Fall – Same Level (FS)	Release To (R)	Struck By (SB)

Appendix C
Camphora Safety Plan (Biodiversity Team)

Delivering a better world

RISK ASSESSMENT FORM

Company:	Camphora Pte Ltd	**Conducted by:**	Derek Yap		Reference
Process:	Conducting Flora, Fauna and Arboriculture	**Names, designations:**	Lead Arborist		Cam-EIA
Location:	Southern Tengah	**Date :**	Jan-21		
First Assessment Date:	N/A	**Project Name :**	EIS Southern Tengah		
Last Review Date:	N/A				

1. Hazard Identification				2. Risk Evaluation				3. Risk Control	
1a.	**1b.**	**1c.**	**1d.**	**2a.**	**2b.**	**2c.**	**2d.**	**3a.**	**3b.**
No.	**Work Activity**	**Hazard**	**Possible Accident / Ill Health & Persons-at-Risk**	**Existing Risk Control (if any)**	**S**	**L**	**Risk Level**	**Additional Risk Control**	**Action Officer, Designation (Follow-up date)**
1	Mobilisation of project team	Unaware of site conditions and site-specific safety rules and regulations	Entering into prohibited areas, injury to persons	1) Ensure approval has been granted by clients/authority; carry approval letter if available; seek advice from clients regarding site access/conditions. 2) Check in to company group chat before work commences and check out after work is done.	2	1	2 (L)	Study topography plans prior to entry.	Designated team leader for the project
2	Working outdoors	Heat, humidity	Heat injuries, heat stroke	Bring plenty of water; take regular breaks; be aware of heat injuries and the symptoms	4	1	4 (M)	Wear light-coloured and breathable clothings and head gear (e.g hats) Look out for team mates	Designated team leader for the project
3	Working outdoors	Lightning, rain, gusty wind	Lightning strike	Stop all work activity. Get out of site as soon as possible or seek shelter when there is lightning. Do not stay under tall trees and avoid open spaces.	5	1	5 (M)	Monitor NEA weather forecast app for lightning risk, rain activity and strong wind. Continue work, only after waiting for at least 30 minutes after the last lightning strike	Designated team leader for the project

4	Working within natural/forested areas/grasslands	Falling branches, dangerous fauna, thorns, toxic plants, hidden obstacles, uneven grounds, potholes, slippery, muddy, rocky surfaces	Stings/bites/scratches, trips/slips/falls, head injury, feet injury, getting lost	1) Work in a group of at least two people; conduct visual assessment of surroundings for hornets/bees/snakes/dead branches/roots/protruding vegetation while walking; stamp feet and make loud noises when walking through thick vegetation 2) Wear long sleeves and pants; wear appropriate close-toed footwear; use clear paths where possible; ensure experienced field personnel are present at all times; bring first aid kit; avoid touching toxic plants 3) Check your bags prior to carrying it, if you leave it on the ground in case of fauna crawling into it 4) Wear gloves to handle bats to prevent bites 5)Familiarise with the emergency response plans	3	1	3 (L)	1) Exit forested site during inclement weather; use GPS to track location; bring spare batteries for GPS; remain contactable by mobile phone. Inform team leads upon entering/exiting site via phone 2) First aid kit to have anti-histamines for bee stings. 3) Use flagging tape to demarcate locations of hidden obstacles to warn other team mates	Designated team leader for the project

5	Night works	Low lighting conditions. Uneven terrain. Dangerous fauna, getting lost	Stings/bites/scratches, trips/slips/falls, bodily injury, getting lost	1) Work in a group of at least 3 people; conduct visual assessment of surroundings for hornets/bees/snakes/dead branches/roots/protruding vegetation while walking; stamp feet and make loud noises when walking through thick vegetation; 2) Wear long sleeves and pants; wear appropriate close-toed footwear; use clear paths where possible; ensure experienced field personnel are present at all time 3) Bring first aid kit; avoid areas where crocodiles have been sighted; ensure sufficient light while working. 4) Familiarise with the emergency response plans	2	1	2 (L)	Use GPS to track location; bring spare batteries for GPS; remain contactable by mobile phone; bring spare batteries for torches/headlamps	Designated team leader for the project
6	Working at the water edges	Falling into water	Injuries due to trips/slips/falls, drowning	1) Work in a group of at least 2 people; wear appropriate close-toed footwear with grip; avoid working near the edge of deep water.	4	1	4 (M)	-	Designated team leader for the project

7	Working in streams Crossing stream or canal	Soft substrate, slippery surface, debris, rocks, dangerous animals	Slips/falls, cuts, scratches, stings/bites Injury due to crossing deep or fast flowing stream, or canal	1) Work in a group of at least two person; look before stepping into stream, avoid slippery rocks; wear appropriate footwear such as booties and covered shoes 2) Bring first aid kit 3) Assess surroundings to find a crossing at narrow, slow moving part of stream. As a guide no deeper than knee depth. Can use a stick to determine the depth and softness of the substrate. Where possible, put plank across to facilitate crossing. If stream cannot be crossed safely, detour to find another safer route.	3	1	3 (L)	Feel the ground as we walk in waters	Designated team leader for the project
8	Working within water bodies	Soft substrate, large boulders, loose fishing lines, dangerous animals, sharp objects	Stings/bites/scratches , trips/slips/falls/cuts	1) Work in a group of at least 2 people; keep to no more than 2m from other personnel when in the water; wear appropriate footwear such as booties; wear long sleeves and pants; 2) Ensure experienced field personnel are present at all times; ensure personnel know how to navigate through muddy/soft ground areas and identify points to avoid and traverse; bring first aid kit.	3	1	3 (L)	Ensure that a third individual is present on-site (who is not in the water) and remains contactable by mobile phone; ensure access to hot water to treat stings/bites by echinoderms, fishes, worms, etc.	Designated team leader for the project
9	Working near steep slopes	Falling from slope	Injury from trips/slips/falls	1) Watch our steps and not stand too close to edge. Avoid walking down steep slopes, and find other ways to go down. 2) Wear proper footwear	2	1	2 (L)	Avoid works during inclement weather to avoid slips/falls.	Designated team leader for the project

10	Plant collection, clearing of path	Use of sharp tools such as parang, secateurs, hammer	Cuts and injuries by improper use of hammer, secateurs and parang	1) Be aware of cutting points and your surroundings; do not be distracted when making cuts. Ensure no one is nearby when using parang and stay away from the person using parang 2) Bring first aid kit	2	1	2 (L)	Wear gloves.	Designated team leader for the project
11	Carrying of heavy equipment from point to point	Improper lifting technique	Health issue such as back pain, strained muscles	Use the correct lifting and putting down technique, always bend the knees to lift the heavy equipment instead of bending the back. More people to help carry if too heavy.	3	1	3 (L)	Use trolley whenever possible. Take turns to carry. If need to carry for a distance, rest in between every once a while before proceeding to walk with the equipment	Designated team leader for the project
13	General field work during Post-circuit breaker period in forested areas	Physical contact with other personnel that can lead to the spread of the coronavirus	COVID-19 infection	1) Comply to the regulations set by authorities. Wear a mask. 2) Work in small teams of no more than 8 people; ensure proper record-keeping of personnel present for each work session; keep at least 1m safe distance from other personnel where possible.	5	1	5 (M)	Good personal hygiene. Support contact tracing by activating the TraceTogether app; check body temperature before starting work and see a doctor and do not go to work if temperature is 37.8^{o}C or above. Do not go to work if unwell, see a doctor	Designated team leader for the project

CAMPHORA PTE LTD RISK ASSESSMENT

Severity	(1)	(2)	(3)	(4)	(5)
Catastrophic (5)	5 (M)	10 (M)	15 (H)	20 (H)	25 (H)
Major (4)	4 (M)	8 (M)	12 (M)	16 (H)	20 (H)
Moderate (3)	3 (L)	6 (M)	9 (M)	12 (M	15 (H)
Minor (2)	2 (L)	4 (M)	6 (M)	8 (M)	10 (M)
Negligible (1)	1 (L)	2 (L)	3 (L)	4 (M)	5 (M)

H= High Risk, M = Medium risk, L = Low Risk

Likelihood		Description
Almost Certain	5	Continual or repeating experience.
Frequent	4	4 Common occurrences.
Occasional	3	Possible or known to occur.
Remote	2	Not likely to occur under normal circumstances.
Rare	1	Not expected to occur but still possible.

Severity		Description
Catastrophic	5	Fatality, fatal diseases or multiple major injuries.
Major	4	Serious injuries or life-threatening occupational disease (includes amputations, major fractures, multiple injuries, occupational cancer, acute poisoning).
Moderate	3	Injury requiring medical treatment or ill-health leading to disability (includes lacerations, burns, sprains, minor fractures, dermatitis, deafness, work-related upper limb disorders).
Minor	2	Injury or ill-health requiring first-aid only (includes minor cuts and bruises, irritation, ill-health with temporary discomfort).
Negligible	1	Not likely to cause injury or ill-health

Risk level	Risk Acceptability	Recommended actions
High Risk	Not acceptable	• High Risk level must be reduced to at least Medium Risk before work commences. • There should not be any interim risk control measures. Risk control measures should not be overly dependent on PPE or appliances. • If practicable, the hazard should be eliminated before work commences. • Management review is required before work commences.
Medium Risk	Tolerable	• A careful evaluation of the hazards should be carried out to ensure that the risk level is reduced to as low as reasonably practicable (ALARP) within a defined time period. • Interim risk control measures, such as administrative controls or PPE, may be implemented while longer term measures are being established. • Management attention is required.
Low Risk	Acceptable	• No additional risk control measures may be needed. • Frequent review and monitoring of hazards are required to ensure that the risk level assigned is accurate and does not increase overtime.

Contact Information		Remarks	Equipment Checklist	
Emergency Contacts			Equipment	Numbers
Ambulance	995		GPS (Garmin 64s)	
Fire	995		Binoculars	
Police	999		Hammer and nails	
Hospital with anti-venom			Long Pruner, Parang	
Alexandra Hospital	6472 2000		Camera Traps	
National University Hospital	6779 5555		Differential GPS	
Tan Tock Seng Hospital	6256 6011			
S'pore General Hospital	6222 3322			

Client Contacts

	Personnel title	Name	IC no.	Contact no.
1	Project Manager (AECOM)	Hoai Thanh Nguyen	-	82394123

Team Contacts

	Personnel title	Name	IC no.	Contact no.
1	Project manager (OIC)	Siti Zaleha	SXXXX919E	81270247
2	Project coordinator (2IC)	Joys Tan	SXXXX850F	90095648

3	Arborist	Derek Yap	SXXXXX806C	98381751	
4	Senior Flora Specialist	Boo Chih Min	SXXXX320A	97834814	

RISK ASSESSMENT FORM

Company:	Camphora Pte Ltd	**Conducted by:**	Derek Yap		Reference
Process:	Carrying out flora, arboriculture and fauna (EMMP)	**Names, designations**	Lead Arborist		Cam-EMMP
Location:	Construction sites	**Date:**	Jan-21		
First Assessment Date	N/A	**Project Name:**	EIS Southern Tengah		
Last Review Date	N/A				

1. Hazard Identification				2. Risk Evaluation				3. Risk Control	
1a.	**1b.**	**1c.**	**1d.**	**2a.**	**2b.**	**2c.**	**2d.**	**3a.**	**3b.**
No.	**Work Activity**	**Hazard**	**Possible Accident / Ill Health & Persons- at-Risk**	**Existing Risk Control (if any)**	**Severity**	**Likelihood**	**Risk Level**	**Additional Risk Control**	**Action Officer, Designation (Follow-up date)**
1	General field work	Heat, humidity	Heat sickness, heat stroke	Bring plenty of water; take regular breaks; be aware of heat injuries and the symptoms	4	1	4 (M)	Wear light-coloured and breathable clothings and head gear (hats). Look out for team mates	Designated team leader for the project
2	General field work	Lightning	Lightning strike	Halt work and move indoors/designated shelter.	5	1	5 (M)	1) Stop work, move to designated shelter and continue work, only after waiting for at least 30 minutes after the last lightning strike. 2) Monitor NEA weather forecast app for lightning risk, rain activity and strong wind. Continue work, only after waiting for at least 30 minutes after the last lightning	Designated team leader for the project

								strike	
3	General field work	Traffic hazards	Hit by a vehicle	When working in or near areas where traffic hazards may be present, personnel shall isolate the work area using cones, flagging, or other methods to ensure a safe work zone; and ANSI-rated high visibility safety vests should be worn when working in high traffic areas.	5	1	5 (M)	Remain highly visible to drivers at all times; watch out for traffic when crossing roads; do not use cell phone while walking and/or crossing roads; if a designated crossing is not available, walk on side of the road facing traffic.	Designated team leader for the project

4	General field work	Construction activities or hazards such as moving vehicles, cranes etc	Head, feet or other injury	Keep a good look out of the construction activities and hazards, such as lifting, excavation works and other construction vehicles moving about in site	5	1	5 (M)	Stop to give way and ensure operators are aware of your presence	Designated team leader for the project
5	General field work	Sharp objects on the ground/falling objects	Head, feet or other injury	Helmets and steel toe boots to be used at all times within the construction site.	5	1	5 (M)	Be aware of your surroundings. Look out for team mates	Designated team leader for the project
6	General field work	Working alone	Sudden onset of medical conditions, accidental work-related injury, attacked by animal or person	Work in a group of at least 2 people, get EMO to accompany; provide reliable means of communication such as mobile devices with backup power sources; keep emergency contact number at all times.	3	1	3 (L)	Ensure in good health before start of work. Ensure ECM or ECO is informed. Report status before and after work	Designated team leader for the project
7	Walking through forested/vegetated areas	Dangerous fauna, toxic plants	Bites, scratches, stings	1) Shuffle feet and make loud noises when walking through thick vegetation; conduct visual assessment of surroundings for hornets/bees/snakes; wear long sleeves, pants and safety shoes; carry a first aid kit 2) Avoid touching toxic plants. Apply insect repellent	3	1	3 (L)	First aid kit to have anti-histamines for bee stings	Designated team leader for the project
8	Walking through forested/vegetated areas	Unobvious obstacles, uneven ground	Injury from trips/slips/falls	Wear long sleeves, pants and safety shoes; conduct visual assessment of surroundings for dead branches/ roots/ protruding vegetation while walking; carry a first aid kit	3	1	3 (L)	NIL	Designated team leader for the project

9	General field work during Post-circuit breaker period in construction sites	Physical contact with other personnel that can lead to the spread of the coronavirus	COVID-19 infection	1)Comply to the regulations set by authorities and contractors. 2) Wear a mask at all times; work in small teams of no more than 4 people; ensure proper record- keeping of personnel present for each work session; keep at least 1m safe distance from other personnel where possible. 3) Restrict each person to one worksite; undergo swab test (and test negative) within first 2 weeks of starting work; undergo swab test once every 2 weeks.	5	1	5 (M)	Good personal hygiene. Attend the BCA COVID course. Record attendance with SafeEntry. Support contact tracing by activating the TraceTogether app; check body temperature before starting work and see a doctor and do not go to work if temperature is 37.8^{o}C or above. Do not go to work if unwell, see a doctor	Designated team leader for the project

CAMPHORA PTE LTD RISK ASSESSMENT

Severity	(1)	(2)	(3)	(4)	(5)
Catastrophic (5)	5 (M)	10 (M)	15 (H)	20 (H)	25 (H)
Major (4)	4 (M)	8 (M)	12 (M)	16 (H)	20 (H)
Moderate (3)	3 (L)	6 (M)	9 (M)	12 (M	15 (H)
Minor (2)	2 (L)	4 (M)	6 (M)	8 (M)	10 (M)
Negligible (1)	1 (L)	2 (L)	3 (L)	4 (M)	5 (M)

H= High Risk, M = Medium risk, L = Low Risk

Likelihood		Description
Almost Certain	5	Continual or repeating experience.
Frequent	4	4 Common occurrences.
Occasional	3	Possible or known to occur.
Remote	2	Not likely to occur under normal circumstances.
Rare	1	Not expected to occur but still possible.

Severity		Description
Catastrophic	5	Fatality, fatal diseases or multiple major injuries.
Major	4	Serious injuries or life-threatening occupational disease (includes amputations, major fractures, multiple injuries, occupational cancer, acute poisoning).
Moderate	3	Injury requiring medical treatment or ill-health leading to disability (includes lacerations, burns, sprains, minor fractures, dermatitis, deafness, work-related upper limb disorders).
Minor	2	Injury or ill-health requiring first-aid only (includes minor cuts and bruises, irritation, ill-health with temporary discomfort).

Negligible	1	Not likely to cause injury or ill-health

Risk level	Risk Acceptability	Recommended actions
High Risk	Not acceptable	• High Risk level must be reduced to at least Medium Risk before work commences. • There should not be any interim risk control measures. Risk control measures should not be overly dependent on PPE or appliances. • If practicable, the hazard should be eliminated before work commences. • Management review is required before work commences.
Medium Risk	Tolerable	• A careful evaluation of the hazards should be carried out to ensure that the risk level is reduced to as low as reasonably practicable (ALARP) within a defined time period. • Interim risk control measures, such as administrative controls or PPE, may be implemented while longer term measures are being established. • Management attention is required.
Low Risk	Acceptable	• No additional risk control measures may be needed. • Frequent review and monitoring of hazards are required to ensure that the risk level assigned is accurate and does not increase overtime.

Contact Information		Remarks	Equipment Checklist	
Emergency Contacts			Equipment	Numbers
Ambulance	995		GPS (Garmin 64s)	
Fire	995		Binoculars	
Police	999		Hammer and nails	
			Long Pruner, Parang	
Hospital with anti-venom			Camera Traps	
Alexandra Hospital	6472 2000		Trimble differential GPS	
National University Hospital	6779 5555			
Tan Tock Seng Hospital	6256 6011			
S'pore General Hospital	6222 3322			

Client Contacts

	Personnel title	Name	IC no.	Contact no.
1	Project Manager (AECOM)	Hoai Thanh Nguyen	-	82394123

Team Contacts

	Personnel title	Name	IC no.	Contact no.
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2	Project coordinator (2IC)	Joys Tan	SXXXX850F	90095648
3	Arborist	Derek Yap	SXXXX806C	98381751
4	Senior Flora Specialist	Boo Chih Min	SXXXX320A	97834814

RISK ASSESSMENT FORM

Company:	Camphora Pte Ltd	**Conducted by:**	Derek Yap		Reference
Process:	Carrying out fauna rescue	**Names, designations:**	Lead Arborist		Cam-EMMP
Location:	Construction sites	**Date:**	Jan-21		
First Assessment Date:	N/A	**Project Name:**	EIS Southern Tengah		
Last Review Date:	N/A				

1. Hazard Identification				2. Risk Evaluation				3. Risk Control	
1a.	1b.	1c.	1d.	2a.	2b.	2c.	2d.	3a.	3b.
No.	**Work Activity**	**Hazard**	**Possible Accident / Ill Health & Persons- at-Risk**	**Existing Risk Control (if any)**	**Severity**	**Likelihood**	**Risk Level**	**Additional Risk Control**	**Action Officer, Designation (Follow-up date)**
1	Passive shepherding in construction site	Heat, humidity	Heat sickness, heat stroke	Staff has been trained and is aware of the symptoms of and appropriate response actions for heat sickness and heat stroke. Drink plenty of water; take regular breaks	4	1	4 (M)	Wear light-coloured and breathable clothings. Look out for team mates	Designated team leader for the project
2	Passive shepherding in construction site	Lightning, rain, wind	Lightning strike, fallen, loose objects due to strong wind	Monitor NEA weather forecast before commencing work. Halt work and move indoors/designated shelter.	5	1	5 (M)	Stop work, move to designated shelter and continue work, only after waiting for at least 30 minutes after the last lightning strike.	Designated team leader for the project
3	Passive shepherding in construction site	Sharp objects on the ground/falling objects Unobvious obstacles, uneven, slippery, muddy ground	Slips, trips and falls. Head, feet or other injury	Be aware of the surroundings. Wear long sleeves, pants and PPE: helmet and steel toe cap safety shoes; carry a first aid kit	5	1	5 (M)	Look out for team mates of any hazards	Designated team leader for the project

4	Walking through forested/vegetated areas	Dangerous fauna, toxic plants	Bites, scratches, stings	Shuffle feet and make loud noises when walking through thick vegetation; conduct visual assessment of surroundings for hornets/bees/snakes; wear long sleeves, pants and safety shoes; carry a first aid kit Avoid touching toxic plants. Apply insect repellent	3	1	3 (L)	First aid kit to have anti-histamines for bee stings	Designated team leader for the project
5	Passive shepherding of fauna. Handling of rescued fauna	Aggressive display by fauna, such as macaque, snake, wild boar; biting, scratching, charging	Injuries from bites, scratches, venom from by venomous snakes	1) Understanding the behavoiur of fauna and not aggravate further. Only trained staff are allowed to handle fauna. 2) Wear gloves, PPE and protective clothings/gears and use appropriate tools. Know the emergency response for snake bites and location of nearest hospitals with anti-venom	3	2	6 (M)	1) Keeping a safe distance from wildlife while shepherding, not handling venomous snakes unnecessarily. 2) Engaging specialists who are experienced in animal handling	Designated team leader for the project
6	General field work during Phase 1 of post-circuit breaker period	Physical contact with other personnel that can lead to the spread of the coronavirus	COVID-19 infection	1) Comply to the regulations set by authorities and contractors. 2) Wear a mask at all times; work in small teams of no more than 4 people; ensure proper record- keeping of personnel present for each work session; keep at least 1m safe distance from other personnel where possible. 3) Restrict each person to one worksite; undergo swab test (and test negative) within first 2 weeks of starting work; undergo swab test once every 2 weeks.	5	1	5 (M)	Good personal hygiene. Attend the BCA COVID course. Record attendance with SafeEntry. Support contact tracing by activating the TraceTogether app; check body temperature before starting work and do not go to work if temperature is 37.8ºC or above. Do not go to work if unwell, see a doctor	Designated team leader for the project

CAMPHORA PTE LTD RISK ASSESSMENT

Severity	(1)	(2)	(3)	(4)	(5)
Catastrophic (5)	5 (M)	10 (M)	15 (H)	20 (H)	25 (H)
Major (4)	4 (M)	8 (M)	12 (M)	16 (H)	20 (H)
Moderate (3)	3 (L)	6 (M)	9 (M)	12 (M	15 (H)
Minor (2)	2 (L)	4 (M)	6 (M)	8 (M)	10 (M)
Negligible (1)	1 (L)	2 (L)	3 (L)	4 (M)	5 (M)

H= High Risk, M = Medium risk, L = Low Risk

Likelihood		Description
Almost Certain	5	Continual or repeating experience.
Frequent	4	4 Common occurrences.
Occasional	3	Possible or known to occur.
Remote	2	Not likely to occur under normal circumstances.
Rare	1	Not expected to occur but still possible.

Severity		Description
Catastrophic	5	Fatality, fatal diseases or multiple major injuries.
Major	4	Serious injuries or life-threatening occupational disease (includes amputations, major fractures, multiple injuries, occupational cancer, acute poisoning).
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Negligible	1	Not likely to cause injury or ill-health

Risk level	Risk Acceptability	Recommended actions
High Risk	Not acceptable	• High Risk level must be reduced to at least Medium Risk before work commences. • There should not be any interim risk control measures. Risk control measures should not be overly dependent on PPE or appliances. • If practicable, the hazard should be eliminated before work commences. • Management review is required before work commences.
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Low Risk	Acceptable	• No additional risk control measures may be needed. • Frequent review and monitoring of hazards are required to ensure that the risk level assigned is accurate and does not increase overtime.

Contact Information		Remarks	Equipment Checklist	
Emergency Contacts			Equipment	Numbers
Ambulance	995		GPS (Garmin 64s)	
Fire	995		Binoculars	
Police	999		Hammer and nails	
			Long Pruner, Parang	
Hospital with anti-venom			Camera Traps	
Alexandra Hospital	6472 2000		Trimble differential GPS	
National University Hospital	6779 5555			
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S'pore General Hospital	6222 3322			

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3	Arborist	Derek Yap	SXXXX806C	98381751
4	Senior Flora Specialist	Boo Chih Min	SXXXX320A	97834814

RISK ASSESSMENT FORM IN VIEW OF COVID-19

Company:	Camphora Pte Ltd	**Conducted by:**	Derek Yap		Reference
Process:	Fieldwork for EIA and EMMP	**Names, designations**	Lead Arborist		Cam-EIA
Location:	Forested and/or Construction sites	**Date:**	Jan-21		
First Assessment Date:	N/A	**Project Name:**	EIS Southern Tengah		
Last Review Date:	N/A				

1. Hazard Identification				2. Risk Evaluation				3. Risk Control	
1a.	1b.	1c.	1d.	2a.	2b.	2c.	2d.	3a.	3b.
No.	Work Activity	Hazard	Possible Accident / Ill Health & Persons-at-Risk	Existing Risk Control (if any)	S	L	Risk Level	Additional Risk Control	Action Officer, Designation (Follow-up date)
1	General field work during Post-circuit breaker period in forested areas	Physical contact with other personnel that can lead to the spread of the coronavirus	COVID-19 infection	Comply to the regulations set by authorities. Wear a mask. Work in small teams of no more than 4 people; ensure proper record-keeping of personnel present for each work session; keep at least 1m safe distance from other personnel where possible.	5	1	5 (M)	Good personal hygiene. Support contact tracing by activating the TraceTogether app; check body temperature before starting work and see a doctor and do not go to work if temperature is 37.8ºC or above. Do not go to work if unwell, see a doctor	Designated team leader for the project
2	General field work during Post-circuit breaker period in construction sites	Physical contact with other personnel that can lead to the spread of the coronavirus	COVID-19 infection	1) Comply to the regulations set by authorities and contractors. Wear a mask at all times; work in small teams of no more than 4 people; ensure proper record- keeping of personnel present for each work session; keep at least 1m safe distance from other personnel where possible. 2) Restrict each person to one worksite; undergo swab test (and test negative) within first 2 weeks of starting work; undergo swab test once every	5	1	5 (M)	Good personal hygiene. . Attend the BCA COVID course. Record attendance with SafeEntry. Support contact tracing by activating the TraceTogether app; check body temperature before starting work and see a doctor and do not go to work if temperature is 37.8ºC or above. Do not go to work if unwell, see a doctor	Designated team leader for the project

				2 weeks.					

CAMPHORA PTE LTD RISK ASSESSMENT

Severity	(1)	(2)	(3)	(4)	(5)
Catastrophic (5)	5 (M)	10 (M)	15 (H)	20 (H)	25 (H)
Major (4)	4 (M)	8 (M)	12 (M)	16 (H)	20 (H)
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4	Senior Flora Specialist	Boo Chih Min	SXXX320A	97834814

Appendix D
Flora Species List

Delivering a better world

Appendix D- Flora Species List

Species	Family	Habit	Origin	Status
Abelmoschus esculentus	Malvaceae	Shrub	Exotic	Cultivated only
Acacia auriculiformis	Fabaceae	Tree	Exotic	Naturalised
Acacia mangium	Fabaceae	Tree	Exotic	Naturalised
Acalypha siamensis	Euphorbiaceae	Shrub	Exotic	Casual
Acalypha wilkesiana	Euphorbiaceae	Herb	Exotic	Cultivated only
Acmella paniculata	Asteraceae	Herb	Exotic	Naturalised
Acrostichum aureum	Pteridaceae	Shrub	Native	Common
Adenanthera pavonina	Fabaceae	Tree	Exotic	Naturalised
Adiantum latifolium	Adiantaceae	Herb	Exotic	Naturalised
Adinandra dumosa	Pentaphylacaceae	Tree	Native	Common
Ageratum conyzoides	Asteraceae	Herb	Exotic	Naturalised
Aglaia argentea	Melastomataceae	Tree	Exotic	Cultivated only
Aglaonema commutatum	Araceae	Herb	Exotic	Casual
Alocasia macrorrhizos	Araceae	Herb	Exotic	Naturalised
Alsophila latebrosa	Cyatheaceae	Tree	Native	Vulnerable
Alstonia scholaris	Apocynaceae	Tree	Exotic	Cultivated only
Alternanthera sessilis	Amaranthaceae	Herb	Cryptogenic	-
Alysicarpus vaginalis	Fabaceae	Herb	Cryptogenic	-
Ammannia baccifera	Lythraceae	Herb	Exotic	Naturalised
Amphineuron opulentum	Thelypteridaceae	Climber	Native	Endangered
Andira inermis	Fabaceae	Tree	Exotic	Casual
Annona muricata	Annonaceae	Tree	Exotic	Cultivated only
Antigonon leptopus	Polygonaceae	Climber	Exotic	Casual
Aphanamixis polystachya	Meliaceae	Tree	Native	Endangered
Aporosa benthamiana	Phyllanthaceae	Tree	Native	Vulnerable
Archidendron jiringa	Fabaceae	Tree	Native	Vulnerable
Ardisia elliptica	Primulaceae	Tree	Native	Endangered
Aristolochia elegans	Aristolochiaceae	Climber	Exotic	Cultivated only
Arthrophyllum diversifolium	Araliaceae	Tree	Native	Common
Artocarpus elasticus	Moraceae	Tree	Native	Common
Artocarpus heterophyllus	Moraceae	Tree	Exotic	Casual
Artocarpus integer	Moraceae	Tree	Exotic	Casual
Arundina graminifolia	Orchidaceae	Herb	Native	Common
Asplenium longissimum	Aspleniaceae	Epiphyte	Native	Common
Asplenium nidus	Aspleniaceae	Epiphyte	Native	Common
Asplenium nitidum	Aspleniaceae	Herb	Native	Presumed Nationally Extinct
Asystasia gangetica ssp. micrantha	Acanthaceae	Herb	Exotic	Naturalised
Averrhoa carambola	Oxalidaceae	Tree	Exotic	Casual
Axonopus compressus	Poaceae	Herb	Exotic	Naturalised
Baccaurea motleyana	Phyllanthaceae	Tree	Native	Critically Endangered
Bidens alba	Asteraceae	Herb	Exotic	Cultivated only
Blechnopsis orientalis	Blechnaceae	Herb	Native	Common
Blechnum finlaysonianum	Blechnaceae	Herb	Native	Vulnerable
Bouea oppositifolia	Anacardiaceae	Tree	Native	Vulnerable
Bougainvillea glabra	Nyctaginaceae	Shrub	Exotic	Cultivated only
Brachiaria mutica	Poaceae	Herb	Exotic	Naturalised
Bridelia stipularis	Phyllanthaceae	Shrub	Native	Vulnerable
Calla palustris	Araceae	Tree	Exotic	Cultivated only

Species	Family	Habit	Origin	Status
Callicarpa longifolia	Lamiaceae	Shrub	Native	Endangered
Calophyllum soulattri	Calophyllacaeae	Tree	Exotic	Cultivated only
Calopogonium mucunoides	Fabaceae	Climber	Exotic	Naturalised
Capsicum annuum	Solanaceae	Shrub	Exotic	Cultivated only
Carallia suffruticosa	Rhizophoraceae	Tree	Exotic	Cultivated only
Carica papaya	Caricaceae	Tree	Exotic	Casual
Caryota mitis	Arecaceae	Tree	Native	Common
Cassia fistula	Fabaceae	Tree	Exotic	Cultivated only
Cassytha filiformis	Lauraceae	Climber	Native	Common
Casuarina equisetifolia	Casuarinaceae	Tree	Native	Common
Catharanthus roseus	Apocynaceae	Shrub	Exotic	Naturalised
Cayratia trifolia	Vitaceae	Climber	Native	Vulnerable
Cecropia pachystachya	Urticaceae	Tree	Exotic	Naturalised
Centotheca lappacea	Poaceae	Herb	Native	Critically Endangered
Centrosema molle	Fabaceae	Climber	Exotic	Naturalised
Chamaesyce thymifolia	Euphorbiaceae	Herb	Cryptogenic	-
Champereia manillana	Opiliaceae	Tree	Native	Common
Chassalia curviflora	Rubiaceae	Shrub	Native	Vulnerable
Cheilocostus speciosus	Costaceae	Shrub	Native	Common
Christella parasitica	Thelypteridaceae	Herb	Cryptogenic	-
Christella subpubescens	Thelypteridaceae	Herb	Native	Common
Chromolaena odorata	Asteraceae	Herb	Exotic	Naturalised
Cinnamomum iners	Lauraceae	Tree	Native	Common
Cissus hastata	Vitaceae	Climber	Cryptogenic	-
Cissus repens	Vitaceae	Climber	Native	Critically Endangered
Citrus hystrix	Rutaceae	Tree	Exotic	Cultivated only
Citrus maxima	Rutaceae	Tree	Exotic	Cultivated only
Citrus x aurantiifolia	Rutaceae	Tree	Exotic	Cultivated only
Claoxylon indicum	Euphorbiaceae	Tree	Native	Common
Clausena excavata	Rutaceae	Shrub	Native	Common
Cleome rutidosperma	Cleomaceae	Herb	Exotic	Naturalised
Clerodendrum laevifolium	Lamiaceae	Tree	Native	Common
Clerodendrum paniculatum	Lamiaceae	Shrub	Exotic	Casual
Clerodendrum villosum	Lamiaceae	Shrub	Native	Vulnerable
Clidemia hirta	Melastomataceae	Shrub	Exotic	Naturalised
Clinacanthus nutans	Acanthaceae	Herb	Exotic	Cultivated only
Cocos nucifera	Arecaceae	Tree	Exotic	Naturalised
Coffea liberica	Rubiaceae	Tree	Exotic	Cultivated only
Colocasia esculenta	Araceae	Herb	Exotic	Casual
Commelina diffusa	Commelinaceae	Herb	Cryptogenic	-
Commersonia bartramia	Malvaceae	Tree	Native	Common
Connarus semidecandrus	Connaraceae	Climber	Native	Critically Endangered
Cordyline fruticosa	Asparagaceae	Shrub	Exotic	Casual
Cratoxylum formosum	Hypericaceae	Tree	Native	Endangered
Crotalaria retusa	Fabaceae	Shrub	Cryptogenic	-
Crytococcum patens	Poaceae	Herb	Native	Critically Endangered
Cucumis maderaspatanus	Cucurbitaceae	Climber	Exotic	Naturalised
Cucumis sativus	Cucurbitaceae	Climber	Exotic	Cultivated only
Cuphea carthagenesis	Lythraceae	Herb	Exotic	Naturalised

Species	Family	Habit	Origin	Status
Curcuma longa	Zingiberaceae	Herb	Exotic	Cultivated only
Cyanthillium cinereum	Asteraceae	Herb	Cryptogenic	-
Cyclosorus interruptus	Thelypteridaceae	Herb	Native	Common
Cyclosorus polycarpus	Thelypteridaceae	Herb	Native	Vulnerable
Cyclosorus triphyllus var. triphyllus	Thelypteridaceae	Herb	Native	Common
Cyperus compactus	Cyperaceae	Herb	Native	Common
Cyperus difformis	Cyperaceae	Herb	Cryptogenic	-
Cyperus iria	Cyperaceae	Herb	Cryptogenic	-
Cyrtophyllum fragrans	Gentianaceae	Tree	Native	Common
Dacryodes cf. costata	Burseraceae	Tree	Native	Endangered
Dactyloctenium aegyptium	Poaceae	Herb	Native	Common
Dalbergia cf. velutina	Fabaceae	Climber	Native	Critically Endangered
Davallia denticulata	Davalliaceae	Epiphyte	Native	Common
Decalobanthus peltatus	Convolvulaceae	Climber	Cryptogenic	-
Dendrobium crumenatum	Orchidaceae	Epiphyte	Native	Common
Dendrophthoe pentandra	Loranthaceae	Epiphyte	Native	Common
Desmanthus virgatus	Fabaceae	Shrub	Exotic	Naturalised
Desmodium heterocarpon	Fabaceae	Shrub	Cryptogenic	-
Desmodium heterophyllum	Fabaceae	Herb	Cryptogenic	-
Desmodium triflorum	Fabaceae	Herb	Cryptogenic	-
Dicranopteris linearis	Gleicheniaceae	Climber	Native	Common
Dieffenbachia seguine var. seguine	Araceae	Herb	Exotic	Casual
Digitaria didactyla	Poaceae	Herb	Exotic	Naturalised
Dillenia suffruticosa	Dilleniaceae	Shrub	Native	Common
Dimocarpus longan ssp. malesianus	Sapindaceae	Tree	Exotic	Casual
Diospyros malabarica	Ebenaceae	Tree	Exotic	Cultivated only
Dipterocarpus grandiflorus	Dipterocarpaceae	Tree	Native	Vulnerable
Dracaena fragrans	Ruscaceae	Shrub	Exotic	Casual
Dracaena surculosa	Ruscaceae	Shrub	Exotic	Cultivated only
Dracaena braunii	Ruscaceae	Shrub	Exotic	Cultivated only
Durio zibethinus	Malvaceae	Tree	Exotic	Casual
Echinochloa colona	Poaceae	Herb	Cryptogenic	-
Eclipta prostrata	Asteraceae	Herb	Exotic	Naturalised
Eichhornia crassipes	Pontederiaceae	Herb	Exotic	Naturalised
Elaeis guineensis	Arecaceae	Tree	Exotic	Cultivated only
Eleocharis geniculata	Cyperaceae	Herb	Cryptogenic	-
Eleusine indica	Poaceae	Herb	Exotic	Naturalised
Eleutheranthera ruderalis	Asteraceae	Herb	Exotic	Naturalised
Emilia sonchifolia	Asteraceae	Herb	Cryptogenic	-
Epipremnum aureum	Araceae	Climber	Exotic	Casual
Epipremnum pinnatum	Araceae	Climber	Native	Critically Endangered
Erycibe tomentosa	Convolvulaceae	Climber	Native	Common
Eryngium foetidum	Apiaceae	Herb	Exotic	Casual
Eurya acuminata	Pentaphylacaceae	Shrub	Native	Common
Falcataria moluccana	Fabaceae	Tree	Exotic	Naturalised
Fibraurea tinctoria	Menispermaceae	Climber	Native	Common
Ficus aurata var. aurata	Moraceae	Tree	Native	Vulnerable

Species	Family	Habit	Origin	Status
Ficus benjamina	Moraceae	Strangler	Cryptogenic	-
Ficus caulocarpa	Moraceae	Strangler	Native	Common
Ficus fistulosa	Moraceae	Tree	Native	Common
Ficus grossularioides var. grossularioides	Moraceae	Tree	Native	Common
Ficus hispida	Moraceae	Tree	Exotic	Naturalised
Ficus microcarpa	Moraceae	Strangler	Native	Common
Ficus stricta	Moraceae	Strangler	Native	Critically Endangered
Ficus variegata	Moraceae	Tree	Native	Common
Ficus vasculosa	Moraceae	Tree	Native	Endangered
Fimbristylis dichotoma	Cyperaceae	Herb	Cryptogenic	-
Fimbristylis littoralis	Cyperaceae	Herb	Cryptogenic	-
Flagellaria indica	Flagellariaceae	Climber	Native	Common
Fuirena ciliaris	Cyperaceae	Herb	Native	Critically Endangered
Garcinia mangostana	Clusiaceae	Tree	Exotic	Casual
Garcinia nigrolineata	Clusiaceae	Tree	Native	Critically Endangered
Glochidion zeylanicum var. zeylanicum	Phyllanthaceae	Tree	Native	Vulnerable
Goniophlebium percussum	Polypodiaceae	Epiphyte	Native	Vulnerable
Gymnopetalum scabrum	Cucurbitaceae	Shrub	Cryptogenic	-
Gynochthodes sublanceolata	Rubiaceae	Climber	Native	Common
Hedyotis auricularia	Rubiaceae	Herb	Native	Common
Heliconia psittacorum	Heliconiaceae	Herb	Exotic	Casual
Hevea brasiliensis	Euphorbiaceae	Tree	Exotic	Naturalised
Hibiscus rosa-sinensis	Malvaceae	Shrub	Exotic	Casual
Hopea odorata	Dipterocarpaceae	Tree	Exotic	Cultivated only
Hoya latifolia	Apocynaceae	Climber	Native	Endangered
Hoya verticillata var. verticillata	Apocynaceae	Climber	Native	Common
Hydnocarpus castanea	Achariaceae	Tree	Exotic	Cultivated only
Hydrilla verticillata	Hydrocharitaceae	Herb	Cryptogenic	-
Hypolytrum nemorum	Cyperaceae	Herb	Native	Common
Hyptis capitata	Lamiaceae	Herb	Exotic	Naturalised
Ilex cymosa	Aquifoliaceae	Tree	Native	Common
Imperata cylindrica	Poaceae	Herb	Cryptogenic	-
Indorouchera griffithiana	Linaceae	Climber	Native	Common
Ipomoea batatas	Convolvulaceae	Herb	Exotic	Casual
Ipomoea cairica	Convolvulaceae	Climber	Exotic	Naturalised
Isachne globosa	Poaceae	Herb	Cryptogenic	-
Ischaemum muticum	Poaceae	Herb	Native	Common
Ischaemum rugosum	Poaceae	Herb	Cryptogenic	-
Ixora sp.	Rubiaceae	Shrub	-	-
Jasminum elongatum	Oleaceae	Shrub	Native	Endangered
Justicia procumbrens	Acanthaceae	Herb	Cryptogenic	-
Khaya senegalensis	Meliaceae	Tree	Exotic	Cultivated only
Kyllinga nemoralis	Cyperaceae	Herb	Cryptogenic	-
Kyllinga polyphylla	Cyperaceae	Herb	Exotic	Naturalised
Lagerstroemia speciosa	Lythraceae	Tree	Exotic	Cultivated only
Lansium domesticum	Meliaceae	Tree	Exotic	Cultivated only

Species	Family	Habit	Origin	Status
Lantana camara	Verbenaceae	Shrub	Exotic	Naturalised
Leea indica	Vitaceae	Tree	Native	Common
Legazpia polygonoides	Linderniaceae	Herb	Cryptogenic	-
Lemna minor	Araceae	Herb	Exotic	Unassessed
Lepisanthes rubiginosa	Sapindaceae	Tree	Native	Common
Leptospermum madidum subsp. sativum	Myrtaceae	Tree	Exotic	Cultivated only
Leucaena leucocephala	Fabaceae	Tree	Exotic	Naturalised
Leuenbergeria bleo	Cactaceae	Shrub	Exotic	Cultivated only
Licania splendens	Chrysobalanaceae	Tree	Native	Common
Licuala grandis	Arecaceae	Tree	Exotic	Cultivated only
Limacia scandens	Menispermaceae	Climber	Native	Vulnerable
Limnocharis flava	Alismataceae	Climber	Exotic	Naturalised
Lindernia antipoda	Linderniaceae	Climber	Cryptogenic	-
Lindernia crustacea	Linderniaceae	Climber	Cryptogenic	-
Lindsaea ensifolia	Dennstaedtiaceae	Climber	Native	Common
Litsea elliptica	Lauraceae	Tree	Native	Common
Litsea firma	Lauraceae	Tree	Native	Vulnerable
Livistona rotundifolia	Arecaceae	Tree	Exotic	Cultivated only
Ludwigia hyssopifolia	Onagraceae	Herb	Cryptogenic	-
Ludwigia octovalvis	Onagraceae	Herb	Cryptogenic	-
Ludwigia peruviana	Onagraceae	Shrub	Exotic	Naturalised
Luffa sp.	Cucurbitaceae	Climber	Exotic	Cultivated only
Lycopodiella cernua	Lycopodiaceae	Herb	Native	Common
Lygodium flexuosum	Schizaeaceae	Climber	Native	Common
Macaranga bancana	Euphorbiaceae	Tree	Native	Common
Macaranga gigantea	Euphorbiaceae	Tree	Native	Common
Macaranga griffithiana	Euphorbiaceae	Tree	Native	Vulnerable
Macaranga heynei	Euphorbiaceae	Tree	Native	Common
Macaranga hypoleuca	Euphorbiaceae	Tree	Native	Common
Macrosolen cochinchinensis	Loranthaceae	Epiphyte	Native	Common
Mallotus paniculatus	Euphorbiaceae	Tree	Native	Common
Mangifera foetida	Anacardiaceae	Tree	Native	Vulnerable
Mangifera indica	Anacardiaceae	Tree	Exotic	Casual
Manihot carthagenensis	Euphorbiaceae	Tree	Exotic	Naturalised
Manihot esculenta	Euphorbiaceae	Herb	Exotic	Naturalised
Melastoma malabathricum	Melastomataceae	Tree	Native	Common
Melicope lunu-ankenda	Rutaceae	Tree	Native	Critically Endangered
Melothria pendula	Cucurbitaceae	Climber	Exotic	Naturalised
Merremia hederacea	Convolvulaceae	Climber	Native	Common
Merremia umbellata	Convolvulaceae	Climber	Cryptogenic	-
Microlepia speluncae	Dennstaedtiaceae	Herb	Native	Common
Microsorum punctatum	Polypodiaceae	Epiphyte	Native	Common
Microsorum scolopendria	Polypodiaceae	Epiphyte	Native	Common
Mikania micrantha	Asteraceae	Climber	Exotic	Naturalised
Mimosa diplotricha	Fabaceae	Shrub	Exotic	Naturalised
Mimosa pigra	Fabaceae	Shrub	Exotic	Naturalised
Mimosa pudica	Fabaceae	Shrub	Exotic	Naturalised
Mirabilis jalapa	Nyctaginaceae	Herb	Exotic	Cultivated only

Species	Family	Habit	Origin	Status
Monochoria vaginalis	Pontederiaceae	Herb	Cryptogenic	-
Morella esculenta	Myricaceae	Tree	Native	Common
Morinda citrifolia	Rubiaceae	Tree	Cryptogenic	-
Morus alba	Moraceae	Tree	Exotic	Cultivated only
Mucuna pruriens	Fabaceae	Climber	Exotic	Unassessed
Muntingia calabura	Malvaceae	Tree	Exotic	Naturalised
Murraya koenigii	Rutaceae	Shrub	Exotic	Casual
Musa acuminata	Musaceae	Shrub	Exotic	Cultivated only
Neolitsea cassia	Lauraceae	Tree	Native	Vulnerable
Nepenthes gracilis	Nepenthaceae	Climber	Native	Common
Nephelium lappaceum	Sapindaceae	Tree	Native	Critically Endangered
Nephrolepis biserrata	Oleandraceae	Herb	Native	Common
Neptunia plena	Fabaceae	Shrub	Exotic	Naturalised
Nothaphoebe cf. umbelliflora	Lauraceae	Tree	Native	Common
Ochna kirkii	Ochnaceae	Shrub	Exotic	Cultivated only
Ottochloa nodosa	Poaceae	Herb	Native	Common
Oxalis barrelieri	Oxalidaceae	Herb	Exotic	Naturalised
Oxyceros longiflorus	Rubiaceae	Climber	Native	Vulnerable
Paederia foetida	Rubiaceae	Climber	Native	Common
Pandanus amaryllifolius	Pandanaceae	Shrub	Exotic	Casual
Paraderris elliptica	Fabaceae	Climber	Cryptogenic	-
Paspalum scrobiculatum	Poaceae	Herb	Cryptogenic	-
Passiflora edulis	Passifloraceae	Herb	Exotic	Cultivated only
Passiflora foetida	Passifloraceae	Herb	Exotic	Naturalised
Passiflora laurifolia	Passifloraceae	Climber	Exotic	Naturalised
Passiflora suberosa	Passifloraceae	Climber	Exotic	Naturalised
Peltophorum pterocarpum	Fabaceae	Tree	Native	Critically Endangered
Pennisetum purpureum	Poaceae	Herb	Exotic	Naturalised
Peperomia pellucida	Piperaceae	Herb	Exotic	Naturalised
Persicaria attenuata	Polygonaceae	Herb	Exotic	Unassessed
Persicaria chinensis var. chinensis	Polygonaceae	Herb	Exotic	Naturalised
Persicaria odorata	Polygonaceae	Shrub	Exotic	Cultivated only
Phanera semibifida var. semibifida	Fabaceae	Climber	Native	Vulnerable
Philodendron erubescens	Araceae	Climber	Exotic	Cultivated only
Phyllanthus amarus	Phyllanthaceae	Herb	Exotic	Naturalised
Phyllanthus urinaria	Phyllanthaceae	Herb	Exotic	Naturalised
Physalis minima	Solanaceae	Herb	Cryptogenic	-
Pilea microphylla	Urticaceae	Shrub	Exotic	Naturalised
Piper aduncum	Piperaceae	Climber	Exotic	Naturalised
Piper betle	Piperaceae	Climber	Exotic	Casual
Piper sarmentosum	Piperaceae	Climber	Native	Common
Pipturus argenteus	Urticaceae	Shrub	Exotic	Naturalised
Pistia stratiotes	Araceae	Herb	Exotic	Naturalised
Pityrogramma calomelanos	Adiantaceae	Herb	Exotic	Naturalised
Planchonella obovata	Sapotaceae	Tree	Native	Vulnerable
Plectranthus monostachyus	Lamiaceae	Herb	Exotic	Naturalised
Ploiarium elegans	Bonnetiaceae	Tree	Native	Common

Species	Family	Habit	Origin	Status
Polyalthia longifolia	Annonaceae	Tree	Exotic	Cultivated only
Polygala paniculata	Polygalaceae	Herb	Exotic	Naturalised
Pometia pinnata	Sapindaceae	Tree	Native	Endangered
Portulaca grandiflora	Portulacaceae	Herb	Exotic	Cultivated only
Praxelis clematidea	Asteraceae	Herb	Exotic	Naturalised
Psidium guajava	Myrtaceae	Tree	Exotic	Casual
Pteris ensiformis 'Victoriae'	Pteridaceae	Herb	Cryptogenic	-
Pteris vittata	Pteridaceae	Herb	Cryptogenic	-
Pterocarpus indicus	Fabaceae	Tree	Exotic	Casual
Ptychosperma macarthurii	Arecaceae	Tree	Exotic	Naturalised
Punica granatum	Lythraceae	Tree	Exotic	Cultivated only
Pyrrosia longifolia	Polypodiaceae	Epiphyte	Native	Common
Pyrrosia piloselloides	Polypodiaceae	Epiphyte	Native	Common
Ravenala madagascariensis	Strelitziaceae	Tree	Exotic	Cultivated only
Rhodamnia cinerea	Myrtaceae	Tree	Native	Common
Rhynchospora rubra	Cyperaceae	Herb	Cryptogenic	-
Ruellia simplex	Acanthaceae	Herb	Exotic	Cultivated only
Sacciolepis indica	Poaceae	Herb	Cryptogenic	-
Samanea saman	Fabaceae	Tree	Exotic	Casual
Sandoricum koetjape	Meliaceae	Tree	Native	Endangered
Sauropus androgynus	Phyllanthaceae	Shrub	Native	Common
Schoutenia accrescens	Malvaceae	Tree	Exotic	Cultivated only
Scleria ciliaris	Cyperaceae	Herb	Native	Common
Scoparia dulcis	Scrophulariaceae	Herb	Exotic	Naturalised
Scurrula ferruginea	Loranthaceae	Epiphyte	Native	Common
Senna alata	Fabaceae	Tree	Exotic	Naturalised
Senna siamea	Fabaceae	Tree	Exotic	Cultivated only
Smilax setosa	Smilacaceae	Climber	Native	Common
Solanum melongena	Solanaceae	Herb	Exotic	Cultivated only
Solanum torvum	Solanaceae	Shrub	Exotic	Naturalised
Spathodea campanulata	Bignoniaceae	Tree	Exotic	Naturalised
Spathoglottis plicata	Orchidaceae	Herb	Native	Common
Spermacoce exilis	Rubiaceae	Herb	Cryptogenic	-
Spermacoce ocymoides	Rubiaceae	Herb	Exotic	Naturalised
Sphagneticola trilobata	Asteraceae	Herb	Exotic	Naturalised
Spigelia anthelmia	Loganiaceae	Herb	Exotic	Naturalised
Sporobolus indicus	Poaceae	Herb	Native	Common
Stachytarpheta jamaicensis	Verbenaceae	Shrub	Exotic	Naturalised
Stenochlaena palustris	Blechnaceae	Climber	Native	Common
Stenotaphrum secundatum	Poaceae	Herb	Exotic	Naturalised
Sterculia cordata	Malvaceae	Tree	Native	Critically Endangered
Streblus elongatus	Moraceae	Tree	Native	Vulnerable
Striga asiatica	Orobanchaceae	Herb	Cryptogenic	-
Strobilanthes crispa	Acanthaceae	Herb	Exotic	Cultivated only
Strobilanthes reptans	Acanthaceae	Herb	Exotic	Naturalised
Struchium sparganophorum	Asteraceae	Herb	Exotic	Naturalised
Symplocos fasciculata	Symplocaceae	Tree	Native	Vulnerable
Synedrella nodiflora	Asteraceae	Herb	Exotic	Naturalised
Syngonium podophyllum	Araceae	Climber	Exotic	Naturalised

Appendix D- Flora Species List

Species	Family	Habit	Origin	Status
Syzygium glaucum	Myrtaceae	Tree	Native	Vulnerable
Syzygium grande	Myrtaceae	Tree	Native	Common
Syzygium jambos	Myrtaceae	Tree	Exotic	Casual
Syzygium lineatum	Myrtaceae	Tree	Native	Common
Syzygium malaccense	Myrtaceae	Tree	Exotic	Casual
Syzygium myrtifolium	Myrtaceae	Tree	Native	Extinct
Syzygium polyanthum	Myrtaceae	Tree	Native	Vulnerable
Syzygium zeylanicum	Myrtaceae	Shrub	Native	Common
Tabebuia rosea	Bignoniaceae	Tree	Exotic	Casual
Taenitis blechnoides	Pteridaceae	Climber	Native	Common
Taenitis interrupta	Pteridaceae	Herb	Native	Common
Tarenna fragrans	Rubiaceae	Shrub	Native	Endangered
Tecoma stans	Bignoniaceae	Tree	Exotic	Cultivated only
Terminalia catappa	Combretaceae	Tree	Native	Common
Tetracera indica	Dilleniaceae	Climber	Native	Common
Theobroma cacao	Malvaceae	Tree	Exotic	Cultivated only
Thunbergia fragrans	Acanthaceae	Climber	Exotic	Naturalised
Thysanolaena latifolia	Poaceae	Shrub	Exotic	Naturalised
Tinospora crispa	Menispermaceae	Climber	Exotic	Casual
Tradescantia spathacea	Commelinaceae	Shrub	Exotic	Cultivated only
Tradescantia zebrina	Commelinaceae	Shrub	Exotic	Cultivated only
Trema cannabina	Cannabaceae	Tree	Native	Common
Trema tomentosa	Cannabaceae	Shrub	Native	Common
Tridax procumbens	Asteraceae	Herb	Exotic	Naturalised
Typha angustifolia	Typhaceae	Herb	Exotic	Naturalised
Utricularia bifida	Lentibulariaceae	Herb	Cryptogenic	-
Utricularia minutissima	Lentibulariaceae	Herb	Cryptogenic	-
Vitex pinnata	Lamiaceae	Tree	Native	Common
Vittaria ensiformis	Vittariaceae	Epiphyte	Native	Common
Wrightia religiosa	Apocynaceae	Shrub	Exotic	Casual
Xanthosoma sagittifolium	Araceae	Shrub	Exotic	Cultivated only
Youngia japonica	Asteraceae	Herb	Exotic	Naturalised
Zingiber officinale	Zingiberaceae	Herb	Exotic	Cultivated only
Zingiber ottensii	Zingiberaceae	Herb	Exotic	Casual
Zoysia japonica	Poaceae	Herb	Exotic	Cultivated only

Appendix E
List and Location of Flora Species of Conservation Significance

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Appendix E-List and Location of Flora Species of Conservation Significance

Species	Family	Origin	Status	Habit	Northing	Easting
Alsophila latebrosa	Cyatheaceae	Native	Vulnerable	Tree	37066.19482	16999.81804
Alsophila latebrosa	Cyatheaceae	Native	Vulnerable	Tree	37067.6303	17027.30646
Alsophila latebrosa	Cyatheaceae	Native	Vulnerable	Tree	37061.77209	17044.77858
Alsophila latebrosa	Cyatheaceae	Native	Vulnerable	Tree	37060.11284	17049.45264
Alsophila latebrosa	Cyatheaceae	Native	Vulnerable	Tree	37040.87016	17092.29809
Alsophila latebrosa	Cyatheaceae	Native	Vulnerable	Tree	37022.40861	17068.81539
Alsophila latebrosa	Cyatheaceae	Native	Vulnerable	Tree	37011.56466	17070.70686
Alsophila latebrosa	Cyatheaceae	Native	Vulnerable	Tree	36968.99558	17100.97573
Alsophila latebrosa	Cyatheaceae	Native	Vulnerable	Tree	36984.25531	17091.85065
Alsophila latebrosa	Cyatheaceae	Native	Vulnerable	Tree	36983.25997	17095.74573
Alsophila latebrosa	Cyatheaceae	Native	Vulnerable	Tree	37047.5053	17065.47774
Alsophila latebrosa	Cyatheaceae	Native	Vulnerable	Tree	37055.57834	17039.43646
Alsophila latebrosa	Cyatheaceae	Native	Vulnerable	Tree	37059.78031	17036.43183
Alsophila latebrosa	Cyatheaceae	Native	Vulnerable	Tree	36972.08886	17124.45782
Alsophila latebrosa	Cyatheaceae	Native	Vulnerable	Tree	36975.06995	17282.7108
Alsophila latebrosa	Cyatheaceae	Native	Vulnerable	Tree	36976.17619	17270.35777
Alsophila latebrosa	Cyatheaceae	Native	Vulnerable	Tree	37052.25452	17202.58585
Alsophila latebrosa	Cyatheaceae	Native	Vulnerable	Tree	37021.52754	16884.52091
Amphineuron opulentum	Thelypteridaceae	Native	Endangered	Climber	37033.24364	17060.58045
Amphineuron opulentum	Thelypteridaceae	Native	Endangered	Climber	36919.68337	16995.5831
Amphineuron opulentum	Thelypteridaceae	Native	Endangered	Climber	36924.65898	17002.14935
Amphineuron opulentum	Thelypteridaceae	Native	Endangered	Climber	36969.00077	16972.88217
Amphineuron opulentum	Thelypteridaceae	Native	Endangered	Climber	37012.014	16984.34668
Amphineuron opulentum	Thelypteridaceae	Native	Endangered	Climber	37026.05518	17029.9757
Amphineuron opulentum	Thelypteridaceae	Native	Endangered	Climber	37036.22842	17021.74074
Amphineuron opulentum	Thelypteridaceae	Native	Endangered	Climber	36896.35188	16999.47727
Amphineuron opulentum	Thelypteridaceae	Native	Endangered	Climber	37142.04181	17194.0202
Amphineuron opulentum	Thelypteridaceae	Native	Endangered	Climber	37203.96433	17181.7809
Amphineuron opulentum	Thelypteridaceae	Native	Endangered	Climber	37219.00409	17142.9417
Amphineuron opulentum	Thelypteridaceae	Native	Endangered	Climber	37123.80119	17087.84989
Amphineuron opulentum	Thelypteridaceae	Native	Endangered	Climber	36971.53544	17184.88769
Amphineuron opulentum	Thelypteridaceae	Native	Endangered	Climber	36990.88603	17186.11264
Amphineuron opulentum	Thelypteridaceae	Native	Endangered	Climber	37005.59268	17181.77296
Amphineuron opulentum	Thelypteridaceae	Native	Endangered	Climber	36991.77086	17180.21436
Amphineuron opulentum	Thelypteridaceae	Native	Endangered	Climber	36975.73712	17189.11684
Amphineuron opulentum	Thelypteridaceae	Native	Endangered	Climber	37084.87166	17201.47427
Amphineuron opulentum	Thelypteridaceae	Native	Endangered	Climber	37199.20473	17215.05607
Amphineuron opulentum	Thelypteridaceae	Native	Endangered	Climber	37196.11158	17155.29384
Amphineuron opulentum	Thelypteridaceae	Native	Endangered	Climber	37124.57484	17097.08689
Amphineuron opulentum	Thelypteridaceae	Native	Endangered	Climber	37207.83604	17142.38481
Amphineuron opulentum	Thelypteridaceae	Native	Endangered	Climber	37069.40317	16964.20573
Amphineuron opulentum	Thelypteridaceae	Native	Endangered	Climber	37020.64118	16927.47839
Amphineuron opulentum	Thelypteridaceae	Native	Endangered	Climber	37014.11971	16867.60469
Amphineuron opulentum	Thelypteridaceae	Native	Endangered	Climber	37185.18376	16760.66314
Amphineuron opulentum	Thelypteridaceae	Native	Endangered	Climber	37017.98908	16886.07881
Amphineuron opulentum	Thelypteridaceae	Native	Endangered	Climber	37297.75528	16615.10206
Amphineuron opulentum	Thelypteridaceae	Native	Endangered	Climber	37360.67196	16659.39765
Amphineuron opulentum	Thelypteridaceae	Native	Endangered	Climber	37409.34076	16204.11733
Angiopteris evecta	Marattiaceae	Native	Vulnerable	Tree	36960.92273	17122.67675

Appendix E-List and Location of Flora Species of Conservation Significance

Species	Family	Origin	Status	Habit	Northing	Easting
Aporosa benthamiana	Phyllanthaceae	Native	Vulnerable	Tree	37002.60383	17265.23953
Aporosa benthamiana	Phyllanthaceae	Native	Vulnerable	Tree	37043.62988	17197.35493
Bridelia stipularis	Phyllanthaceae	Native	Vulnerable	Climber	36927.30567	17178.54245
Bridelia stipularis	Phyllanthaceae	Native	Vulnerable	Climber	37086.43215	16956.75007
Bridelia stipularis	Phyllanthaceae	Native	Vulnerable	Climber	37039.99103	17058.13236
Bridelia stipularis	Phyllanthaceae	Native	Vulnerable	Climber	37022.18832	16949.73624
Bridelia stipularis	Phyllanthaceae	Native	Vulnerable	Climber	37007.81058	17022.96376
Bridelia stipularis	Phyllanthaceae	Native	Vulnerable	Climber	37026.16543	17037.98851
Bridelia stipularis	Phyllanthaceae	Native	Vulnerable	Climber	36950.08792	17084.17034
Bridelia stipularis	Phyllanthaceae	Native	Vulnerable	Climber	37040.75671	17152.72796
Bridelia stipularis	Phyllanthaceae	Native	Vulnerable	Climber	37094.71541	17200.91821
Bridelia stipularis	Phyllanthaceae	Native	Vulnerable	Climber	37243.10729	17196.91775
Bridelia stipularis	Phyllanthaceae	Native	Vulnerable	Climber	37249.52204	17161.97332
Bridelia stipularis	Phyllanthaceae	Native	Vulnerable	Climber	37125.45846	17121.3479
Bridelia stipularis	Phyllanthaceae	Native	Vulnerable	Climber	37131.76214	17098.97909
Bridelia stipularis	Phyllanthaceae	Native	Vulnerable	Climber	36961.14575	17057.01628
Bridelia stipularis	Phyllanthaceae	Native	Vulnerable	Climber	37261.02637	17162.19636
Bridelia stipularis	Phyllanthaceae	Native	Vulnerable	Climber	37131.65045	17126.69002
Bridelia stipularis	Phyllanthaceae	Native	Vulnerable	Climber	37103.45613	17069.37511
Bridelia stipularis	Phyllanthaceae	Native	Vulnerable	Climber	37146.68943	17107.66023
Bridelia stipularis	Phyllanthaceae	Native	Vulnerable	Climber	37040.98912	16875.72988
Bridelia stipularis	Phyllanthaceae	Native	Vulnerable	Climber	37134.75731	16881.52076
Bridelia stipularis	Phyllanthaceae	Native	Vulnerable	Climber	37169.15328	16691.21822
Bridelia stipularis	Phyllanthaceae	Native	Vulnerable	Climber	37216.03505	16783.03348
Bridelia stipularis	Phyllanthaceae	Native	Vulnerable	Climber	37295.32611	16543.32067
Bridelia stipularis	Phyllanthaceae	Native	Vulnerable	Climber	37461.20715	16180.52638
Bridelia stipularis	Phyllanthaceae	Native	Vulnerable	Climber	37409.78684	16175.85
Bridelia stipularis	Phyllanthaceae	Native	Vulnerable	Climber	37723.06088	15841.10746
Bridelia stipularis	Phyllanthaceae	Native	Vulnerable	Climber	37669.10529	15744.06129
Bridelia stipularis	Phyllanthaceae	Native	Vulnerable	Climber	37708.13958	15624.20516
Bridelia stipularis	Phyllanthaceae	Native	Vulnerable	Climber	38010.54831	15973.33125
Bridelia stipularis	Phyllanthaceae	Native	Vulnerable	Climber	37985.114	16021.51805
Bridelia stipularis	Phyllanthaceae	Native	Vulnerable	Climber	37967.76379	15836.44441
Bridelia stipularis	Phyllanthaceae	Native	Vulnerable	Climber	37753.40154	14922.42088
Bridelia stipularis	Phyllanthaceae	Native	Vulnerable	Climber	37433.7796	16219.9214
Bridelia stipularis	Phyllanthaceae	Native	Vulnerable	Climber	38073.54213	14407.393
Bridelia stipularis	Phyllanthaceae	Native	Vulnerable	Climber	37932.18596	14565.4157
Bridelia stipularis	Phyllanthaceae	Native	Vulnerable	Climber	37969.31158	15842.12019
Bridelia stipularis	Phyllanthaceae	Native	Vulnerable	Climber	37962.8985	15836.11032
Bridelia stipularis	Phyllanthaceae	Native	Vulnerable	Climber	38006.34057	16148.05407
Bridelia stipularis	Phyllanthaceae	Native	Vulnerable	Climber	38015.40836	16133.69825
Bridelia stipularis	Phyllanthaceae	Native	Vulnerable	Climber	38052.45459	16053.127
Bridelia stipularis	Phyllanthaceae	Native	Vulnerable	Climber	38247.70673	14236.24011
Bridelia stipularis	Phyllanthaceae	Native	Vulnerable	Climber	38261.30851	14215.9863
Bridelia stipularis	Phyllanthaceae	Native	Vulnerable	Climber	38278.11713	14192.72787
Bridelia stipularis	Phyllanthaceae	Native	Vulnerable	Climber	38204.91334	14251.9296
Bridelia stipularis	Phyllanthaceae	Native	Vulnerable	Climber	37565.516	15306.80312
Bridelia stipularis	Phyllanthaceae	Native	Vulnerable	Climber	37533.53372	15872.81619
Bridelia stipularis	Phyllanthaceae	Native	Vulnerable	Climber	40600.41439	19485.56744

Appendix E-List and Location of Flora Species of Conservation Significance

Species	Family	Origin	Status	Habit	Northing	Easting
Callicarpa longifolia	Lamiaceae	Native	Endangered	Shrub	36959.69948	17296.28744
Cayratia trifolia	Vitaceae	Native	Vulnerable	Climber	37110.10278	16773.01309
Cayratia trifolia	Vitaceae	Native	Vulnerable	Climber	36913.82363	16977.44276
Cayratia trifolia	Vitaceae	Native	Vulnerable	Climber	36950.75539	16985.01192
Cayratia trifolia	Vitaceae	Native	Vulnerable	Climber	36969.00077	16972.88217
Cayratia trifolia	Vitaceae	Native	Vulnerable	Climber	36965.90595	16941.49856
Cayratia trifolia	Vitaceae	Native	Vulnerable	Climber	37029.81491	17025.5243
Cayratia trifolia	Vitaceae	Native	Vulnerable	Climber	37240.45373	17190.90805
Cayratia trifolia	Vitaceae	Native	Vulnerable	Climber	37012.01797	16887.41403
Cayratia trifolia	Vitaceae	Native	Vulnerable	Climber	37013.78699	16891.75437
Cayratia trifolia	Vitaceae	Native	Vulnerable	Climber	37056.69168	16853.80661
Cayratia trifolia	Vitaceae	Native	Vulnerable	Climber	37028.27442	16840.89593
Cayratia trifolia	Vitaceae	Native	Vulnerable	Climber	37020.64428	16852.13579
Cayratia trifolia	Vitaceae	Native	Vulnerable	Climber	37076.70772	16806.50966
Cayratia trifolia	Vitaceae	Native	Vulnerable	Climber	37498.90957	16204.00996
Cayratia trifolia	Vitaceae	Native	Vulnerable	Climber	37717.7584	15660.37442
Cayratia trifolia	Vitaceae	Native	Vulnerable	Climber	37957.1473	15864.71122
Cayratia trifolia	Vitaceae	Native	Vulnerable	Climber	38020.2734	16139.81933
Centotheca lappacea	Poaceae	Native	Critically Endangered	Herb	37054.68847	17109.65972
Centotheca lappacea	Poaceae	Native	Critically Endangered	Herb	37069.40185	16996.70208
Centotheca lappacea	Poaceae	Native	Critically Endangered	Herb	37011.56466	17070.70686
Centotheca lappacea	Poaceae	Native	Critically Endangered	Herb	36918.90888	17007.04583
Centotheca lappacea	Poaceae	Native	Critically Endangered	Herb	36946.77446	16990.79878
Centotheca lappacea	Poaceae	Native	Critically Endangered	Herb	36923.99635	16982.00603
Centotheca lappacea	Poaceae	Native	Critically Endangered	Herb	36924.21749	16982.3399
Centotheca lappacea	Poaceae	Native	Critically Endangered	Herb	36995.20627	16992.24751
Centotheca lappacea	Poaceae	Native	Critically Endangered	Herb	36991.55696	17000.59403
Centotheca lappacea	Poaceae	Native	Critically Endangered	Herb	37013.11855	17014.06086
Centotheca lappacea	Poaceae	Native	Critically Endangered	Herb	37026.05518	17029.9757
Centotheca lappacea	Poaceae	Native	Critically Endangered	Herb	36955.72729	17083.28026
Centotheca lappacea	Poaceae	Native	Critically Endangered	Herb	36920.34345	17078.93856
Centotheca lappacea	Poaceae	Native	Critically Endangered	Herb	37206.95167	17136.59775
Centotheca lappacea	Poaceae	Native	Critically Endangered	Herb	37127.89249	17087.18232
Centotheca lappacea	Poaceae	Native	Critically Endangered	Herb	36921.44838	17088.17559
Centotheca lappacea	Poaceae	Native	Critically Endangered	Herb	36961.14575	17057.01628
Centotheca lappacea	Poaceae	Native	Critically Endangered	Herb	36968.54996	17183.77468
Centotheca lappacea	Poaceae	Native	Critically Endangered	Herb	36948.64177	17301.40629

Appendix E-List and Location of Flora Species of Conservation Significance

Species	Family	Origin	Status	Habit	Northing	Easting
Centotheca lappacea	Poaceae	Native	Critically Endangered	Herb	37124.57484	17097.08689
Centotheca lappacea	Poaceae	Native	Critically Endangered	Herb	37044.8527	16932.82125
Centotheca lappacea	Poaceae	Native	Critically Endangered	Herb	37136.7494	16895.65453
Centotheca lappacea	Poaceae	Native	Critically Endangered	Herb	37046.7366	16934.82453
Centotheca lappacea	Poaceae	Native	Critically Endangered	Herb	37114.3033	16805.06446
Centotheca lappacea	Poaceae	Native	Critically Endangered	Herb	37112.53368	16815.19167
Centotheca lappacea	Poaceae	Native	Critically Endangered	Herb	37309.14205	16615.88156
Centotheca lappacea	Poaceae	Native	Critically Endangered	Herb	37716.53735	15832.09278
Centotheca lappacea	Poaceae	Native	Critically Endangered	Herb	37751.19136	14895.15505
Centotheca lappacea	Poaceae	Native	Critically Endangered	Herb	38072.99065	14379.9047
Centotheca lappacea	Poaceae	Native	Critically Endangered	Herb	38223.15865	14243.91776
Centotheca lappacea	Poaceae	Native	Critically Endangered	Herb	38020.2734	16139.81933
Centotheca lappacea	Poaceae	Native	Critically Endangered	Herb	38265.17893	14210.42208
Centotheca lappacea	Poaceae	Native	Critically endangered	Herb	38271.15059	14198.73709
Centotheca lappacea	Poaceae	Native	Critically endangered	Herb	38204.91334	14251.9296
Centotheca lappacea	Poaceae	Native	Critically endangered	Herb	38219.8412	14247.59011
Centotheca lappacea	Poaceae	Native	Critically endangered	Herb	38214.09001	14272.74102
Centotheca lappacea	Poaceae	Native	Critically endangered	Herb	38207.67742	14257.71674
Centotheca lappacea	Poaceae	Native	Critically endangered	Herb	37465.0689	16253.30939
Chassalia cf curviflora	Rubiaceae	Native	Vulnerable	Shrub	36992.2111	17231.96373
Cissus repens	Vitaceae	Native	Critically endangered	Climber	37258.83217	16631.45988
Clerodendrum villosum	Lamiaceae	Native	Vulnerable	Shrub	37170.9138	16860.15479
Clerodendrum villosum	Lamiaceae	Native	Vulnerable	Shrub	37685.36521	15672.28083
Clerodendrum villosum	Lamiaceae	Native	Vulnerable	Shrub	37667.115	15691.8668
Clerodendrum villosum	Lamiaceae	Native	Vulnerable	Shrub	37781.44054	15929.80714
Connarus semidecandrus	Connaraceae	Native	Critically Endangered	Climber	36988.00776	17269.35664
Cratoxylum formosum	Hypericaceae	Native	Endangered	Tree	37359.02815	16302.16056
Crytococcum patens	Poaceae	Native	Critically endangered	Herb	37110.98736	16773.45828
Crytococcum patens	Poaceae	Native	Critically endangered	Herb	36966.01707	16928.14389
Crytococcum patens	Poaceae	Native	Critically endangered	Herb	36992.66505	16943.16899
Crytococcum patens	Poaceae	Native	Critically endangered	Herb	37103.01523	17034.76425
Crytococcum patens	Poaceae	Native	Critically endangered	Herb	36987.91055	16937.49306
Crytococcum patens	Poaceae	Native	Critically endangered	Herb	36991.89114	16940.27544

Appendix E-List and Location of Flora Species of Conservation Significance

Species	Family	Origin	Status	Habit	Northing	Easting
Crytococcum patens	Poaceae	Native	Critically endangered	Herb	36948.64177	17301.40629
Crytococcum patens	Poaceae	Native	Critically endangered	Herb	36969.98473	17251.66099
Crytococcum patens	Poaceae	Native	Critically endangered	Herb	36942.78479	17213.37651
Crytococcum patens	Poaceae	Native	Critically endangered	Herb	37355.148	16442.1617
Cyclosorus polycarpus	Thelypteridaceae	Native	Vulnerable	Herb	36925.5406	17075.82268
Cyclosorus polycarpus	Thelypteridaceae	Native	Vulnerable	Herb	36946.66016	17082.72344
Cyclosorus polycarpus	Thelypteridaceae	Native	Vulnerable	Herb	36922.22316	17080.38539
Cyclosorus polycarpus	Thelypteridaceae	Native	Vulnerable	Herb	36975.29732	17126.79502
Cyclosorus polycarpus	Thelypteridaceae	Native	Vulnerable	Herb	36942.79346	17082.72329
Cyclosorus polycarpus	Thelypteridaceae	Native	Vulnerable	Herb	37093.71992	17208.81969
Cyclosorus polycarpus	Thelypteridaceae	Native	Vulnerable	Herb	36973.20015	17146.15921
Cyclosorus polycarpus	Thelypteridaceae	Native	Vulnerable	Herb	37975.93905	16006.15982
Dacryodes cf. *costata*	Burseraceae	Native	Endangered	Tree	37185.634	17137.108
Dacryodes cf. *costata*	Burseraceae	Native	Endangered	Tree	37147.76	16679.03
Dalbergia cf. *velutina*	Fabaceae	Native	Critically Endangered	Climber	37050.38326	16991.58202
Ficus aurata var. *aurata*	Moraceae	Native	Vulnerable	Tree	37088.08375	17069.70835
Ficus aurata var. *aurata*	Moraceae	Native	Vulnerable	Tree	37063.86675	17043.88835
Ficus aurata var. *aurata*	Moraceae	Native	Vulnerable	Tree	37060.11284	17049.45264
Ficus aurata var. *aurata*	Moraceae	Native	Vulnerable	Tree	37011.24141	16949.29064
Ficus aurata var. *aurata*	Moraceae	Native	Vulnerable	Tree	37048.6111	17064.36489
Ficus aurata var. *aurata*	Moraceae	Native	Vulnerable	Tree	37212.25534	17193.1327
Ficus aurata var. *aurata*	Moraceae	Native	Vulnerable	Tree	37132.65332	16883.41259
Ficus aurata var. *aurata*	Moraceae	Native	Vulnerable	Tree	37131.99572	16872.84012
Ficus aurata var. *aurata*	Moraceae	Native	Vulnerable	Tree	37172.57337	16845.35344
Ficus aurata var. *aurata*	Moraceae	Native	Vulnerable	Tree	37100.25975	16817.63952
Ficus aurata var. *aurata*	Moraceae	Native	Vulnerable	Tree	37114.74567	16803.39514
Ficus aurata var. *aurata*	Moraceae	Native	Vulnerable	Tree	37131.66089	16870.39175
Ficus stricta	Moraceae	Native	Critically Endangered	Tree	37061.31	16927.087
Ficus stricta	Moraceae	Native	Critically Endangered	Tree	37059.831	16918.875
Ficus stricta	Moraceae	Native	Critically Endangered	Tree	36994.455	17030.028
Ficus vasculosa	Moraceae	Native	Endangered	Tree	36948.19	16959.55
Ficus vasculosa	Moraceae	Native	Endangered	Tree	36949.09	16955.32
Ficus vasculosa	Moraceae	Native	Endangered	Tree	36949.2	16954.66
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37621.21328	16010.48427
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	36950.75539	16985.01192
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37997.45044	15917.20785
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37775.36264	15846.78554
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37876.32084	15777.67989
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37850.66637	15800.82675
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37839.16632	15806.05679

Appendix E-List and Location of Flora Species of Conservation Significance

Species	Family	Origin	Status	Habit	Northing	Easting
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37686.5803	15650.91345
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	38004.79759	16073.37939
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37929.06184	15851.13275
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37954.1617	15866.26913
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37966.32526	15859.70365
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37959.24993	15827.09578
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37696.07738	15911.55197
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37784.97839	15941.93776
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37687.27122	15054.62866
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37730.50721	15031.48269
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37760.47545	14982.18325
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37762.578	14948.57417
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37792.32459	14909.95845
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37753.40154	14922.42088
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37903.41053	15804.50167
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37951.17612	15867.49317
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37965.10858	15867.49379
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37969.5319	15860.5941
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37969.31158	15842.12019
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37962.8985	15836.11032
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	38010.55543	15856.92343
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	38046.59507	16031.53676
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37969.30953	15887.52592
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37930.38822	15862.70682
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37905.83782	15923.13541
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37953.16564	15885.85587
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37922.86079	16048.33582
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37944.53089	16107.31973
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	38006.34057	16148.05407
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	38083.19804	15973.22321
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	38001.427	15911.895

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Species	Family	Origin	Status	Habit	Northing	Easting
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	38007.461	15911.78
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37991.84	15921.313
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37985.278	15922.97
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37985.435	15924.092
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37992.29	16026.42
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37987.7	16030.52
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37985.58	16033.11
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37982.19	16023.22
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37972.74	16014.8
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37935.04	15931.92
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37926.01	16019.28
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37823.62	16041.81
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37830.08	15945.52
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37985.456	15922.773
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37929.29	15927.18
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37936.39	15919.1
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	38001.249	15926.584
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	38007.464	15910.964
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37995.91	16007.75
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37967.98	16028.01
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37966.69	16020.86
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37931.84	15924.54
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37938.23	15915.45
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37946.2	16124.03
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37989.465	15921.646
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37948	16096.42
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37851.53	16015.57
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37921.511	15808.667
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37985.366	15923.065
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37998.09	16031.84
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37997.24	16021.44

Appendix E-List and Location of Flora Species of Conservation Significance

Species	Family	Origin	Status	Habit	Northing	Easting
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37992.36	16010.76
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	38008.57	16140.52
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37771.149	14939.425
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37776.546	14923.158
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37930.91	15886.1
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37932.66	15924.11
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37846.05	16022.06
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37049.454	16923.865
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37913.135	15811.723
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37913.072	15811.615
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37998.287	15921.259
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37991.92	16009.38
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	38000.31	15996.41
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37968.12	15930.58
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37939.72	15917.32
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37926.69	16069.42
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37820.56	16039.45
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37976.56	16007.25
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37908.49	15981.24
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37756.458	14963.628
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37774.304	14936.982
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37934.85	15915.54
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37998.315	15911.259
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37962.62	16024.06
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37910.3	15889.33
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37773.606	14921.395
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37738.93	15873.45
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37985.966	15930.118
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37998.71	16004.37
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37994.36	15989.78
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37963.74	15954.69

Appendix E-List and Location of Flora Species of Conservation Significance

Species	Family	Origin	Status	Habit	Northing	Easting
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	37987.261	15946.953
Goniophlebium percussum	Polypodiaceae	Native	Vulnerable	Epiphyte	36887.83427	17081.71947
Goniophlebium percussum	Polypodiaceae	Native	Vulnerable	Epiphyte	38033.55021	16018.84929
Goniophlebium percussum	Polypodiaceae	Native	Vulnerable	Epiphyte	38023.92741	16071.04318
Hoya latifolia	Apocynacae	Native	Endangered	Climber	38006.35011	15965.76344
Jasminum elongatum	Oleaceae	Native	Endangered	Climber	37063.86675	17043.88835
Jasminum elongatum	Oleaceae	Native	Endangered	Climber	37111.19787	17032.65009
Jasminum elongatum	Oleaceae	Native	Endangered	Climber	37123.91259	17067.37274
Limacia scandens	Menispermaceae	Native	Vulnerable	Climber	37062.98902	16986.57453
Limacia scandens	Menispermaceae	Native	Vulnerable	Climber	37061.44031	17002.71136
Limacia scandens	Menispermaceae	Native	Vulnerable	Climber	38033.55021	16018.84929
Litsea firma	Lauraceae	Native	Vulnerable	Tree	37823.35585	15767.10506
Litsea firma	Lauraceae	Native	Vulnerable	Tree	37816.28022	15741.28577
Lygodium longifolium	Schizaeaceae	Native	Vulnerable	Climber	37076.14891	17002.15551
Lygodium longifolium	Schizaeaceae	Native	Vulnerable	Climber	37116.95798	16784.03097
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37030.47815	17030.75491
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	36880.87109	17104.75601
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37040.08906	17155.39887
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37040.75847	17103.53827
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37076.2594	17020.62948
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37067.85185	17050.0094
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37066.52656	17048.4513
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37066.52656	17048.4513
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37011.56466	17070.70686
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	36925.5406	17075.82268
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	36934.82924	17067.58767
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	36964.24763	16934.15342
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37037.99891	16990.13476
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37050.38264	17006.60602
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37037.77725	17002.59911
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37010.46563	16992.24813
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37026.05518	17029.9757
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	36986.35803	17047.33517
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	36946.66016	17082.72344
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	36950.08792	17084.17034
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	36922.22316	17080.38539
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	36919.45922	17069.59025
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37073.04503	17142.71326
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37101.01869	17188.23153
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37190.69736	17131.03266
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37137.40077	17116.34038
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37055.57834	17039.43646
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37035.01433	16966.76397
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	36980.60722	17102.64553
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	36946.54416	17217.82822
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	36955.94324	17212.93188
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	36967.44394	17190.34068
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37084.87166	17201.47427

Appendix E-List and Location of Flora Species of Conservation Significance

Species	Family	Origin	Status	Habit	Northing	Easting
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37203.07915	17209.93694
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37050.37658	17162.2992
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37218.78	17199.699
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37124.57484	17097.08689
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37149.23321	17093.9718
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37077.13218	17245.98951
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37138.84409	16894.09657
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37140.28062	16895.54339
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37134.75731	16881.52076
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37127.12974	16875.84472
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37171.58124	16857.3726
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37126.46438	16828.32434
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37026.50423	16864.93426
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37085.11044	16830.43712
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37130.2277	16766.89303
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37131.66089	16870.39175
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37064.32127	16856.03271
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37100.92301	16822.0911
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37112.53368	16815.19167
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37243.12662	16774.57666
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37245.44378	16773.13
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37213.7124	16754.32087
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37249.20828	16723.49534
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37373.06499	16409.77743
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37371.29511	16402.321
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37493.05422	16152.70559
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37507.42836	16176.96716
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37491.71818	16187.09375
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37483.54381	16179.41447
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37470.82704	16193.88145
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37547.45217	16100.51357
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37620.11029	16013.04386
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37619.2209	16003.91814
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37597.44264	15953.16952
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37587.59922	15965.96728
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37850.22202	15846.1212
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37823.35585	15767.10506
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37633.38419	15769.09962
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37746.07067	15714.46201
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37702.16977	15647.79809
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37929.06184	15851.13275
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37837.94166	15991.24099
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37815.27146	16042.98919
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37696.07738	15911.55197
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37784.97839	15941.93776
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37757.04837	14966.60267
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37773.858	14921.08642
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37757.82594	14893.59733
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37746.65736	14903.83535

Appendix E-List and Location of Flora Species of Conservation Significance

Species	Family	Origin	Status	Habit	Northing	Easting
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37812.38166	14710.08498
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37900.86704	15810.28856
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37920.43767	15835.88582
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37979.15264	15845.01414
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	38042.95017	15940.3913
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	38041.95088	16032.42686
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37931.27181	15885.07586
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37917.56023	15890.86225
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37905.83782	15923.13541
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	38161.78732	14285.20266
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	38186.55576	14292.88284
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37413.10212	16241.39923
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37428.24441	16288.9202
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37414.42577	16280.46165
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37433.11105	16270.89163
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	36978.06	16937.18
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37107.014	17195.345
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37099.951	17188.093
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37100.097	17189.793
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37097.447	17185.171
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37087.141	17173.194
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37125.653	17164.17
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37044.153	16851.123
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37090.484	16826.296
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37119.375	17164.639
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37119.375	17164.639
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37230.222	16781.686
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37247.801	16769.547
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37257.006	16764.248
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37253.141	16764.008
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37263.635	16757.479
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37245.625	16752.236
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37230.238	16737.317
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37257.509	16725.965
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37256.399	16726.493
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37263.459	16719.681
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37265.47	16725.42
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37263.592	16725.146
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37270.3	16732.273
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37273.871	16743.473
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37275.49	16741.773
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37283.025	16735.642
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37282.713	16711.7
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37628.3	15938.598
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37632.655	15935.879
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37631.496	15934.264
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37631.7	15934.457
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37633.919	15933.282
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37634.822	15932.137

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Species	Family	Origin	Status	Habit	Northing	Easting
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37631.989	15931.894
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	36937.202	17087.276
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	36939.47264	17086.06182
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	36936.597	17087.416
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	36964.90419	17103.86908
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37034.331	16969.821
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37065.51	17109.051
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37067.102	17090.761
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37068	17133.43
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37079.82	17127.49
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37069.24	17120.47
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37067.24	17124.1
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37074.01	17125.13
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37065.07	17119.22
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37069.64	17112.48
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37082.21	17109.27
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37047.27	17100.3
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37042.93	17106.82
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37046.23	17102.28
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37040.74	17106.71
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37040.41	17106.37
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37044.13	17122.97
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37050.43	17127.2
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37045.23	17132.54
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37042.69	17130.09
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37044.13	17132.09
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37043.35	17112.28
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37029.09	17119.85
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37024.78	17120.52
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	36999.39	17096.99
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	36996.01	17095.4
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	36981.74	17085.68
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37044.55	17096.7
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37045.68	17085.84
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37047.09	17048.38
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37039.75	17019.71
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37042.43	17031.91
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37043.44	17033.79
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37045.65	17027.5
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37056.369	17208.005
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37055.863	17207.499
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37056.337	17206.534
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37043.617	17192.281
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37044.415	17193.994
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37039.367	17195.792
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	36979.953	17237.816
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37141.51	16820.61
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37631.193	15931.675
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37627.534	15928.859

Appendix E-List and Location of Flora Species of Conservation Significance

Species	Family	Origin	Status	Habit	Northing	Easting
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37626.832	15929.978
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37627.741	15929.021
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37627.136	15932.769
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37625.019	15935.365
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37626.204	15935.236
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37624.9	15937.143
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37626.822	15938.066
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37623.644	15939.097
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37624.552	15938.079
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37625.839	15939.174
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37625.947	15939.466
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37627.041	15940.052
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37627.991	15940.785
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37624.408	15941.909
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37625.568	15945.33
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37624.385	15946.782
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37625.233	15945.351
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37633.71	15937.32
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37474.615	16077.892
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37710.97	15832.9
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37708.84	15834.3
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37709.28	15836.73
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37719.79	15841.24
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37723.85	15845.01
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37722.82	15840.84
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37722.94	15849.86
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37732.48	15848.25
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37807.46	15754.32
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37808.52	15750.25
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37806.47	15750.24
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37813.46	15740.76
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37785.61	15773.81
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37769.22	15791.4
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37740.57	15796.92
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37754.07	15821.49
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37762.83	15821.4
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37764.32	15816.24
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37660.072	15759.281
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37721.805	15725.198
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37685.786	15672.333
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37685.761	15673.954
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37138.54	16761.69
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37259.33	16688.25
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37241.09	16705.07
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37235.53	16706.74
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37231.54	16727.23
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37222.31	16725.06
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37995.72	15960.89
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37996.9	15967.84

Appendix E-List and Location of Flora Species of Conservation Significance

Species	Family	Origin	Status	Habit	Northing	Easting
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37999.47	15966.22
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37987.64	15997.44
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37969.85	16031.18
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37927.84	15875.7
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37928.93	15873.39
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37744.962	14929.157
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37927.74	15820
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37935.96	15809.61
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37925.83	15800.62
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37925.33	15796.23
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37929.93	15793.49
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37925.31	15801.4
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37930.85	15796.61
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37843.37	15973
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37699.01	15863.85
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37700.89	15862.96
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37705.92	15869.81
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37711.3	15864.1
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37801.83	15956.27
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37813.05	15956.72
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37815.63	15958.74
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37818.32	15956.85
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37826.44	15960.52
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37824.36	15960.85
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37824.52	15963.9
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37829.87	15964.01
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37831.42	15965.9
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	37419.969	16292.205
Melicope cf. *lunu-ankenda*	Rutaceae	Native	Critically Endangered	Tree	37197.73	16792.58
Melicope cf. *lunu-ankenda*	Rutaceae	Native	Critically Endangered	Tree	37906.876	15809.587
Melicope cf. *lunu-ankenda*	Rutaceae	Native	Critically Endangered	Tree	37916.113	15825.936
Melicope cf. *lunu-ankenda*	Rutaceae	Native	Critically Endangered	Tree	37915.363	15826.51
Melicope cf. *lunu-ankenda*	Rutaceae	Native	Critically Endangered	Tree	37912.825	15825.621
Melicope cf. *lunu-ankenda*	Rutaceae	Native	Critically Endangered	Tree	38012.108	15939.202
Melicope lunu-ankenda	Rutaceae	Native	Critically Endangered	Tree	37038.54156	17147.27472
Melicope lunu-ankenda	Rutaceae	Native	Critically Endangered	Tree	37069.40185	16996.70208
Melicope lunu-ankenda	Rutaceae	Native	Critically Endangered	Tree	37150.11698	17114.44899
Melicope lunu-ankenda	Rutaceae	Native	Critically Endangered	Tree	37132.76479	16877.73686
Melicope lunu-ankenda	Rutaceae	Native	Critically Endangered	Tree	37580.63475	16055.55439
Melicope lunu-ankenda	Rutaceae	Native	Critically Endangered	Tree	37608.71954	16012.26433
Melicope lunu-ankenda	Rutaceae	Native	Critically Endangered	Tree	37848.8971	15802.38471

Appendix E-List and Location of Flora Species of Conservation Significance

Species	Family	Origin	Status	Habit	Northing	Easting
Melicope lunu-ankenda	Rutaceae	Native	Critically Endangered	Tree	37843.4787	15807.05859
Melicope lunu-ankenda	Rutaceae	Native	Critically Endangered	Tree	37839.16632	15806.05679
Melicope lunu-ankenda	Rutaceae	Native	Critically Endangered	Tree	37760.87942	15799.93237
Melicope lunu-ankenda	Rutaceae	Native	Critically Endangered	Tree	38002.03883	15999.48368
Melicope lunu-ankenda	Rutaceae	Native	Critically Endangered	Tree	37837.94166	15991.24099
Melicope lunu-ankenda	Rutaceae	Native	Critically Endangered	Tree	37815.27146	16042.98919
Melicope lunu-ankenda	Rutaceae	Native	Critically Endangered	Tree	37973.17721	16003.71135
Melicope lunu-ankenda	Rutaceae	Native	Critically Endangered	Tree	37120.77	16842.97
Melicope lunu-ankenda	Rutaceae	Native	Critically Endangered	Tree	37723.03	15832.16
Melicope lunu-ankenda	Rutaceae	Native	Critically Endangered	Tree	37784.79	15756.52
Melicope lunu-ankenda	Rutaceae	Native	Critically Endangered	Tree	37782.62	15757.68
Melicope lunu-ankenda	Rutaceae	Native	Critically Endangered	Tree	37787.56	15754.85
Melicope lunu-ankenda	Rutaceae	Native	Critically Endangered	Tree	37205.83	16816.25
Melicope lunu-ankenda	Rutaceae	Native	Critically Endangered	Tree	37981.78	16025.43
Melicope lunu-ankenda	Rutaceae	Native	Critically Endangered	Tree	37805.35	15959.21
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37041.63726	17146.27324
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37037.55072	17127.46525
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37054.25284	17111.44032
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37088.19505	17068.15031
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37087.9736	17042.66515
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37076.37137	17002.60068
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	36919.90193	17059.46297
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	36946.77446	16990.79878
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	36970.77041	16962.08721
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	36965.90595	16941.49856
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	36964.69018	16927.92126
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	36988.35341	16923.80454
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37000.29446	16949.73534
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37048.28304	16974.10958
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37048.61404	16991.91581
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37047.17629	16998.59309
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37037.77725	17002.59911
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37031.91737	16987.90873
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37012.014	16984.34668
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	36958.49414	17022.18274
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	36919.45922	17069.59025
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37082.77424	17177.43578
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37101.01869	17188.23153
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37203.191	17164.30852
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37243.10729	17196.91775

Appendix E-List and Location of Flora Species of Conservation Significance

Species	Family	Origin	Status	Habit	Northing	Easting
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37255.60407	17151.95757
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37206.95167	17136.59775
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37189.37101	17117.34408
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37159.29465	17115.89611
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37098.14995	17034.20761
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37098.47924	17094.41491
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37059.77832	17085.62152
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37056.1311	17042.32999
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37017.43354	16951.07151
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	36970.10719	16956.63403
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	36968.11326	17110.21268
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	36959.042	17053.0098
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	36792.62973	17067.13677
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	36949.86153	17215.04612
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	36977.39186	17286.93987
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	36978.3879	17265.01599
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37085.09517	17172.87303
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37156.30207	17209.15605
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37106.32862	17179.77379
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37119.26773	17164.63902
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37212.25534	17193.1327
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37222.65442	17191.90893
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37261.02637	17162.19636
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37122.04553	16757.43314
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37055.25126	16944.39572
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37095.17015	16936.941
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37134.53421	16896.65604
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37140.17899	16887.75316
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37127.12974	16875.84472
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37169.47739	16855.81447
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37172.57337	16845.35344
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37169.47838	16831.77607
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37168.487	16822.98421
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37160.0802	16833.66759
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37143.16674	16807.06885
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	36983.48921	16897.09499
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	36994.21467	16904.88566
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37116.95798	16784.03097
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37115.0775	16800.9468
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37132.54938	16776.2414
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37185.40605	16733.28609
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37106.78159	16868.16495
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37137.08001	16847.46646
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37139.07372	16766.44825
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37147.25499	16797.38689
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37231.73553	16782.03254
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37254.95221	16792.49465
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37245.44378	16773.13
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37259.27192	16777.02568

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Species	Family	Origin	Status	Habit	Northing	Easting
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37265.35218	16769.90345
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37261.36696	16767.00978
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37261.36696	16767.00978
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37206.74569	16765.67204
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37219.35228	16740.85515
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37231.84774	16729.6155
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37249.20828	16723.49534
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37267.5648	16698.23354
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37259.27286	16669.63197
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37232.40157	16706.69002
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37298.74791	16675.75451
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37296.53826	16589.61687
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37314.00766	16621.66879
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37332.47856	16640.2548
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37355.148	16442.1617
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37467.39906	16164.50107
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37512.07095	16194.88486
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37504.87881	16195.10712
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37445.60763	16204.00762
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37483.65329	16219.58971
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37504.98959	16203.00862
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37505.32462	16172.96068
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37625.97104	15940.15002
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37600.42709	15952.39063
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37712.33553	15831.42486
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37790.84515	15802.71594
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37812.85062	15780.12535
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37760.87942	15799.93237
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37657.49146	15759.08473
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37747.28416	15728.26186
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37731.36155	15721.24995
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37667.115	15691.8668
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	38000.49275	15962.75839
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	38013.86244	16063.25254
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37797.58358	15950.28498
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37747.8739	14899.38386
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37433.7796	16219.9214
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37476.1295	16228.04733
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	38066.6861	14414.7377
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	38071.33134	14393.25924
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	38091.12488	14381.79753
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	38175.72038	14273.74065
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37996.6877	14500.50429
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37906.17425	15818.85802
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37988.5513	15849.79997
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	38012.98428	15941.16897
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	38035.76052	15991.02726
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	38127.09551	15992.03294
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	38264.73546	14233.12491

Appendix E-List and Location of Flora Species of Conservation Significance

Species	Family	Origin	Status	Habit	Northing	Easting
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	38212.21029	14271.51675
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37410.55171	16276.67766
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37417.85402	16303.72115
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	37444.27939	16270.11309
Phanera semibifida var. *semibifida*	Fabaceae	Native	Vulnerable	Climber	37006.69795	17193.79221
Phanera semibifida var. *semibifida*	Fabaceae	Native	Vulnerable	Climber	37094.71541	17200.91821
Phanera semibifida var. *semibifida*	Fabaceae	Native	Vulnerable	Climber	37001.94168	17232.40927
Phanera semibifida var. *semibifida*	Fabaceae	Native	Vulnerable	Climber	37023.50334	17244.42933
Phanera semibifida var. *semibifida*	Fabaceae	Native	Vulnerable	Climber	37054.79587	17249.66116
Phanera semibifida var. *semibifida*	Fabaceae	Native	Vulnerable	Climber	37070.16657	17230.52008
Phanera semibifida var. *semibifida*	Fabaceae	Native	Vulnerable	Climber	37084.32093	17211.49024
Phanera semibifida var. *semibifida*	Fabaceae	Native	Vulnerable	Climber	37064.86027	17197.68964
Phanera semibifida var. *semibifida*	Fabaceae	Native	Vulnerable	Climber	37036.77471	17185.11288
Phanera semibifida var. *semibifida*	Fabaceae	Native	Vulnerable	Climber	36995.74968	17227.40102
Phanera semibifida var. *semibifida*	Fabaceae	Native	Vulnerable	Climber	37023.50345	17241.7584
Planchonella obovata	Sapotaceae	Native	Vulnerable	Tree	36944.71	16939.41
Planchonella obovata	Sapotaceae	Native	Vulnerable	Tree	36940.1	16936.54
Planchonella obovata	Sapotaceae	Native	Vulnerable	Tree	37417.92	16205.94
Streblus elongatus	Moraceae	Native	Vulnerable	Tree	37168.59412	16842.34848
Streblus elongatus	Moraceae	Native	Vulnerable	Tree	37181.43	16831.9
Streblus elongatus	Moraceae	Native	Vulnerable	Tree	37179.87	16831.31
Streblus elongatus	Moraceae	Native	Vulnerable	Tree	37172.51	16832.33
Streblus elongatus	Moraceae	Native	Vulnerable	Tree	37167.84	16829.23
Streblus elongatus	Moraceae	Native	Vulnerable	Tree	37199.36	16809.3
Streblus elongatus	Moraceae	Native	Vulnerable	Tree	37204.56	16811.01
Streblus elongatus	Moraceae	Native	Vulnerable	Tree	37208.88	16805.4
Streblus elongatus	Moraceae	Native	Vulnerable	Tree	37206.71	16809.58
Streblus elongatus	Moraceae	Native	Vulnerable	Tree	37204.65	16817.43
Streblus elongatus	Moraceae	Native	Vulnerable	Tree	37172.36	16837.63
Streblus elongatus	Moraceae	Native	Vulnerable	Tree	37177.36	16829.56
Streblus elongatus	Moraceae	Native	Vulnerable	Tree	37175.42	16831.8
Streblus elongatus	Moraceae	Native	Vulnerable	Tree	37165.93	16820.81
Streblus elongatus	Moraceae	Native	Vulnerable	Tree	37168.81	16833.31
Streblus elongatus	Moraceae	Native	Vulnerable	Tree	37203.7	16812.93
Streblus elongatus	Moraceae	Native	Vulnerable	Tree	37205.15	16812.95
Streblus elongatus	Moraceae	Native	Vulnerable	Tree	37206.83	16809.41
Streblus elongatus	Moraceae	Native	Vulnerable	Tree	37187.27	16815.47
Streblus elongatus	Moraceae	Native	Vulnerable	Tree	37205.62	16813.46
Streblus elongatus	Moraceae	Native	Vulnerable	Tree	37173.05	16845.03
Streblus elongatus	Moraceae	Native	Vulnerable	Tree	37172.66	16836.84
Streblus elongatus	Moraceae	Native	Vulnerable	Tree	37175.43	16838.37
Streblus elongatus	Moraceae	Native	Vulnerable	Tree	37171.41	16837.31
Streblus elongatus	Moraceae	Native	Vulnerable	Tree	37202.96	16809.43

Appendix E-List and Location of Flora Species of Conservation Significance

Species	Family	Origin	Status	Habit	Northing	Easting
Streblus elongatus	Moraceae	Native	Vulnerable	Tree	37202.49	16802.06
Streblus elongatus	Moraceae	Native	Vulnerable	Tree	37179.05	16816.5
Streblus elongatus	Moraceae	Native	Vulnerable	Tree	37195.91	16806.32
Streblus elongatus	Moraceae	Native	Vulnerable	Tree	37159.49	16829.77
Streblus elongatus	Moraceae	Native	Vulnerable	Tree	37214.26	16810.17
Streblus elongatus	Moraceae	Native	Vulnerable	Tree	37178.16	16816.29
Streblus elongatus	Moraceae	Native	Vulnerable	Tree	37188.12	16812.91
Streblus elongatus	Moraceae	Native	Vulnerable	Tree	37174.76	16835.09
Streblus elongatus	Moraceae	Native	Vulnerable	Tree	37171.09	16830.51
Streblus elongatus	Moraceae	Native	Vulnerable	Tree	37181.26	16837.04
Streblus elongatus	Moraceae	Native	Vulnerable	Tree	37184.23	16832.04
Streblus elongatus	Moraceae	Native	Vulnerable	Tree	37186.06	16835.02
Streblus elongatus	Moraceae	Native	Vulnerable	Tree	37198.56	16818.38
Symplocos fasciculata	Symplocaceae	Native	Vulnerable	Tree	37129.22818	16871.72711
Symplocos fasciculata	Symplocaceae	Native	Vulnerable	Tree	37142.60788	16868.83415
Symplocos fasciculata	Symplocaceae	Native	Vulnerable	Tree	37136.528	16869.50164
Symplocos fasciculata	Symplocaceae	Native	Vulnerable	Tree	37144.82	16873.11
Symplocos fasciculata	Symplocaceae	Native	Vulnerable	Tree	37144.98	16869.65
Symplocos fasciculata	Symplocaceae	Native	Vulnerable	Tree	37132.06	16871
Symplocos fasciculata	Symplocaceae	Native	Vulnerable	Tree	37152.95	16872.02
Tarenna fragrans	Rubiaceae	Native	Endangered	Shrub	37467.28839	16154.2625
Tarenna fragrans	Rubiaceae	Native	Endangered	Shrub	37467.39906	16164.50107
Tarenna fragrans	Rubiaceae	Native	Endangered	Shrub	37473.14613	16148.47574
Tarenna fragrans	Rubiaceae	Native	Endangered	Shrub	37482.76615	16158.93731
Tarenna fragrans	Rubiaceae	Native	Endangered	Shrub	37489.06933	16142.24427
Tarenna fragrans	Rubiaceae	Native	Endangered	Shrub	37474.46988	16185.20109
Tarenna fragrans	Rubiaceae	Native	Endangered	Shrub	37453.90452	16163.61017
Tarenna fragrans	Rubiaceae	Native	Endangered	Tree	37510.8502	16134.5663
Tarenna fragrans	Rubiaceae	Native	Endangered	Tree	37512.62087	16123.77137

Appendix F
List and Location of Large Specimens

Delivering a better world

Tag ID	Species	Family	Origin	Status	Habit	Girth/ spread (m)	Height (m)	Northing	Easting
TE3410	*Ficus benjamina*	Moraceae	Cryptogenic	-	Strangler	3.5	16	36938.02	17053.45
TE3507	*Ficus benjamina*	Moraceae	Cryptogenic	-	Strangler	10	20	37032.934	16885.166
TE3510	*Ficus benjamina*	Moraceae	Cryptogenic	-	Strangler	3	12	37068.725	16894.331
TE3508	*Ficus elastica*	Moraceae	Exotic	Casual	Strangler	12	20	37026.88	16844.958
TE3404	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	5	15	36922.92	16991.79
TE3443	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	6	13	37001.72	16978.7
TE3509	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	15	20	37049.662	16822.975
TE3527	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	10	12	37113.814	16742.992
TE3601	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	4	16	37119.15	17086.83
TE3647	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	5	13	37292.857	16687.256
TE3657	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	12	15	37286.934	16534.477
TE3662	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	10	16	37333.633	16473.339
TE3664	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	6	14	37343.216	16451.143
TE3668	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	3	12	37363.597	16436.796
TE3675	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	5	16	37385.826	16396.744
TE3683	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	8	10	37362.613	16299.077
TE3689	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	10	20	37499.588	16208.82
TE3829	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	15	18	36942.446	17295.241
TE4000	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	6	7	37081.22	16892.67
TE4001	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	5	8	37090.11	16893.77
TE4041	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	5	10	37223.92	16663.24
TE4042	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	8	10	37230.57	16678.43
TE4078	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	4	15	37243.84	16582.92
TE4084	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	6	18	37254.63	16624.41
TE4088	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	5	10	37242.31	16593.66
TE4091	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	15	20	37417.503	16185.324
TE4148	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	10	15	37975.031	15850.998
TE4201	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	10	20	38011.63	15995.17
TE4203	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	10	20	38023.99	16013.61
TE4205	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	6	20	38024.19	16028.75

Tag ID	Species	Family	Origin	Status	Habit	Girth/ spread (m)	Height (m)	Northing	Easting
TE4210	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	6	15	38017.46	16071.43
TE4213	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	12	20	38008.6	16074.95
TE4214	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	8	20	37996.04	16043.2
TE4238	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	8	15	37925.77	16007.73
TE4305	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	8	15	37944.12	15878.3
TE4321	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	3.1	9	37957.62	16124.48
TE4324	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	5	14	38014.83	16125.8
TE4484	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	25	16	38295.637	14201.34
TE4529	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	3	18	37839.81	14685.763
TE4600	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	20	20	37439.99	16241.05
TE4601	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	12	20	37458.71	16224.9
TE4627	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	15	16	37418.053	16244.232
TE4628	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	10	18	37417.867	16292.669
TE4635	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	5	10	37446.55	16271.957
TE3543	*Khaya senegalensis*	Meliaceae	Exotic	-	Tree	3.2	15	37094.459	16689.674
TE3549	*Khaya senegalensis*	Meliaceae	Exotic	-	Tree	3	20	37043.205	16750.355
TE3550	*Khaya senegalensis*	Meliaceae	Exotic	-	Tree	3	20	37034.249	16759.618
TE3552	*Khaya senegalensis*	Meliaceae	Exotic	-	Tree	3	20	37022.359	16778.462
TE3557	*Khaya senegalensis*	Meliaceae	Exotic	-	Tree	3	20	36995.11	16808.958
TE3558	*Khaya senegalensis*	Meliaceae	Exotic	-	Tree	3.2	20	36986.997	16812.989
TE3559	*Khaya senegalensis*	Meliaceae	Exotic	-	Tree	3.2	20	36985.958	16820.907
TE3560	*Khaya senegalensis*	Meliaceae	Exotic	-	Tree	3.2	20	36977.431	16823.714
TE3561	*Khaya senegalensis*	Meliaceae	Exotic	-	Tree	3	20	36977.127	16830.993
TE3563	*Khaya senegalensis*	Meliaceae	Exotic	-	Tree	3.2	20	36962.147	16852.232
TE3566	*Khaya senegalensis*	Meliaceae	Exotic	-	Tree	3	20	36946.593	16857.168
TE3567	*Khaya senegalensis*	Meliaceae	Exotic	-	Tree	3.2	20	36941.624	16855.254
TE3385	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	3.2	10	36710.47	17131.9
TE3387	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	3	10	36740.06	17122.64

Tag ID	Species	Family	Origin	Status	Habit	Girth/ spread (m)	Height (m)	Northing	Easting
TE3487	*Pterocarpus indicus*	Fabaceae	Exotic	Casual	Tree	4.8	18	37206.113	17168.062
TE3488	*Pterocarpus indicus*	Fabaceae	Exotic	Casual	Tree	3.3	18	37205.867	17159.209
TE3500	*Pterocarpus indicus*	Fabaceae	Exotic	Casual	Tree	4.5	18	36969.989	16884.533
TE3505	*Pterocarpus indicus*	Fabaceae	Exotic	Casual	Tree	3.5	15	36993.596	16866.572
TE3506	*Pterocarpus indicus*	Fabaceae	Exotic	Casual	Tree	3.5	15	37018.221	16882.759
TE3680	*Pterocarpus indicus*	Fabaceae	Exotic	Casual	Tree	4.4	12	37355.316	16339.757
TE3681	*Pterocarpus indicus*	Fabaceae	Exotic	Casual	Tree	4.5	12	37356.394	16326.982
TE3684	*Pterocarpus indicus*	Fabaceae	Exotic	Casual	Tree	5	12	37370.164	16259.7
TE3999	*Pterocarpus indicus*	Fabaceae	Exotic	Casual	Tree	6	18	37622.93	15844.313
TE4048	*Pterocarpus indicus*	Fabaceae	Exotic	Casual	Tree	4.5	18	37270.13	16622.64
TE4049	*Pterocarpus indicus*	Fabaceae	Exotic	Casual	Tree	3.8	18	37281.59	16606.3
TE4051	*Pterocarpus indicus*	Fabaceae	Exotic	Casual	Tree	3.8	12	37311.64	16650.77
TE4111	*Pterocarpus indicus*	Fabaceae	Exotic	Casual	Tree	3.7	20	37240.68	16538.16
TE4153	*Pterocarpus indicus*	Fabaceae	Exotic	Casual	Tree	3	16	38036.517	15852.891
TE4300	*Pterocarpus indicus*	Fabaceae	Exotic	Casual	Tree	5.4	18	37620.639	15844.819
TE4301	*Pterocarpus indicus*	Fabaceae	Exotic	Casual	Tree	4.2	18	37628.749	15837.506
TE4304	*Pterocarpus indicus*	Fabaceae	Exotic	Casual	Tree	4.3	18	37635.726	15833.714
TE4325	*Pterocarpus indicus*	Fabaceae	Exotic	Casual	Tree	3.8	13	38033.69	16108.78
TE4410	*Pterocarpus indicus*	Fabaceae	Exotic	Casual	Tree	4.9	25	37564.95	15399.51
TE4419	*Pterocarpus indicus*	Fabaceae	Exotic	Casual	Tree	4.8	25	37571.22	15469.58
TE4420	*Pterocarpus indicus*	Fabaceae	Exotic	Casual	Tree	4.1	25	37578.83	15457.65
TE3383	*Samanea saman*	Fabaceae	Exotic	Casual	Tree	3.4	8	36664.03	17148.89
TE3400	*Samanea saman*	Fabaceae	Exotic	Casual	Tree	4	9	36845.41	17049.47
TE3402	*Samanea saman*	Fabaceae	Exotic	Casual	Tree	3.8	10	36871.96	17009.95
TE3403	*Samanea saman*	Fabaceae	Exotic	Casual	Tree	4.4	14	36904.18	16975.17
TE3463	*Samanea saman*	Fabaceae	Exotic	Casual	Tree	3.6	12	36889.35	17067.87
TE3464	*Samanea saman*	Fabaceae	Exotic	Casual	Tree	3.4	19	36883.6	17076.11
TE3564	*Samanea saman*	Fabaceae	Exotic	Casual	Tree	3	15	36980.396	16858.159
TE4602	*Samanea saman*	Fabaceae	Exotic	Casual	Tree	3.2	20	37458.37	16234.72
TE4011	*Syzygium grande*	Myrtaceae	Native	Common	Tree	4	16	37204.54	16804.33

Tag ID	Species	Family	Origin	Status	Habit	Girth/ spread (m)	Height (m)	Northing	Easting
TE4342	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	3	14	37769.25	14728.773
TE3677	*Terminalia catappa*	Combretaceae	Native	Common	Tree	3	12	37372.443	16365.754

Appendix G
List and Location of Other Specimens of Value

Delivering a better world

Tag ID	Species	Family	Origin	Status	Habit	Northing	Easting
CS	*Ficus aurata var. aurata*	Moraceae	Native	Vulnerable	Tree	37088.08	17069.708
CS	*Ficus aurata var. aurata*	Moraceae	Native	Vulnerable	Tree	37063.87	17043.888
CS	*Ficus aurata var. aurata*	Moraceae	Native	Vulnerable	Tree	37060.11	17049.453
CS	*Ficus aurata var. aurata*	Moraceae	Native	Vulnerable	Tree	37011.24	16949.291
CS	*Ficus aurata var. aurata*	Moraceae	Native	Vulnerable	Tree	37048.61	17064.365
CS	*Ficus aurata var. aurata*	Moraceae	Native	Vulnerable	Tree	37212.26	17193.133
CS	*Ficus aurata var. aurata*	Moraceae	Native	Vulnerable	Tree	37132.65	16883.413
CS	*Ficus aurata var. aurata*	Moraceae	Native	Vulnerable	Tree	37132	16872.84
CS	*Ficus aurata var. aurata*	Moraceae	Native	Vulnerable	Tree	37172.57	16845.353
CS	*Ficus aurata var. aurata*	Moraceae	Native	Vulnerable	Tree	37100.26	16817.64
CS	*Ficus aurata var. aurata*	Moraceae	Native	Vulnerable	Tree	37114.75	16803.395
CS	*Ficus aurata var. aurata*	Moraceae	Native	Vulnerable	Tree	37131.66	16870.392
TE3510	*Ficus benjamina*	Moraceae	Cryptogenic	-	Strangler	37068.73	16894.331
TE3413	*Ficus benjamina*	Moraceae	Cryptogenic	-	Strangler	36933.03	17008.98
TE3410	*Ficus benjamina*	Moraceae	Cryptogenic	-	Strangler	36938.02	17053.45
TE4003	*Ficus benjamina*	Moraceae	Cryptogenic	-	Strangler	37097.6	16861.99
TE4008	*Ficus benjamina*	Moraceae	Cryptogenic	-	Strangler	37058.49	16926.23
TE4040	*Ficus benjamina*	Moraceae	Cryptogenic	-	Strangler	37218.45	16688.3
TE4081	*Ficus benjamina*	Moraceae	Cryptogenic	-	Strangler	37255.5	16578.14
TE4086	*Ficus benjamina*	Moraceae	Cryptogenic	-	Strangler	37251.89	16630.69
TE3507	*Ficus benjamina*	Moraceae	Cryptogenic	-	Strangler	37032.93	16885.166
TE3508	*Ficus elastica*	Moraceae	Exotic	Casual	Strangler	37026.88	16844.958
TE3781	*Ficus fistulosa*	Moraceae	Native	Common	Tree	37024.11	17121.3
TE3788	*Ficus fistulosa*	Moraceae	Native	Common	Tree	36993.91	17097.41
TE3990	*Ficus fistulosa*	Moraceae	Native	Common	Tree	37717	15751.257
TE3451	*Ficus hispida*	Moraceae	Exotic	Naturalised	Tree	36891.3	17015.54
TE3668	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	37363.6	16436.796
TE4529	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	37839.81	14685.763
TE3494	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	37047.45	16938.93
TE3498	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	37107.04	16956.95
TE4321	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	37957.62	16124.48
TE3522	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	37105.88	16759.469
TE3523	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	37107.03	16754.334
TE3609	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	37171.42	17093
TE3601	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	37119.15	17086.83
TE4078	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	37243.84	16582.92
TE3687	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	37347.52	16415.934
TE3710	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	36971.1	17041.431
TE3965	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	37677.37	15851.78
TE3978	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	37815.42	15747.85
TE4009	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	37057.41	16872.93
TE3404	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	36922.92	16991.79
TE3647	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	37292.86	16687.256
TE3675	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	37385.83	16396.744
TE4001	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	37090.11	16893.77
TE4041	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	37223.92	16663.24
TE4088	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	37242.31	16593.66
TE4324	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	38014.83	16125.8
TE4087	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	37246.45	16630.81
TE4635	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	37446.55	16271.957
TE3443	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	37001.72	16978.7
TE3664	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	37343.22	16451.143
TE4000	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	37081.22	16892.67
TE4084	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	37254.63	16624.41
TE4205	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	38024.19	16028.75

Tag ID	Species	Family	Origin	Status	Habit	Northing	Easting
TE4210	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	38017.46	16071.43
TE3683	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	37362.61	16299.077
TE4042	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	37230.57	16678.43
TE4214	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	37996.04	16043.2
TE4238	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	37925.77	16007.73
TE4305	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	37944.12	15878.3
TE3527	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	37113.81	16742.992
TE3662	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	37333.63	16473.339
TE3689	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	37499.59	16208.82
TE4148	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	37975.03	15850.998
TE4201	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	38011.63	15995.17
TE4327	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	37754.87	14969.438
TE4203	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	38023.99	16013.61
TE4628	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	37417.87	16292.669
TE3657	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	37286.93	16534.477
TE4213	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	38008.6	16074.95
TE4601	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	37458.71	16224.9
TE3509	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	37049.66	16822.975
TE3829	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	36942.45	17295.241
TE4091	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	37417.5	16185.324
TE4627	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	37418.05	16244.232
TE4600	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	37439.99	16241.05
TE4484	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	38295.64	14201.34
TE3577	*Ficus stricta*	Moraceae	Native	Critically Endangered	Tree	37061.31	16927.087
TE3578	*Ficus stricta*	Moraceae	Native	Critically Endangered	Tree	37059.83	16918.875
TE3712	*Ficus stricta*	Moraceae	Native	Critically Endangered	Tree	36994.46	17030.028
TE3405	*Ficus variegata*	Moraceae	Native	Common	Tree	36918.96	17007.93
TE3416	*Ficus variegata*	Moraceae	Native	Common	Tree	36936.82	16978.79
TE3417	*Ficus variegata*	Moraceae	Native	Common	Tree	36920.76	16960.7
TE3418	*Ficus variegata*	Moraceae	Native	Common	Tree	36939.36	16935.5
TE3427	*Ficus variegata*	Moraceae	Native	Common	Tree	36959.69	16910
TE3429	*Ficus variegata*	Moraceae	Native	Common	Tree	36958.26	17008.3
TE3430	*Ficus variegata*	Moraceae	Native	Common	Tree	36957.82	17007.63
TE3431	*Ficus variegata*	Moraceae	Native	Common	Tree	36970.76	16995.28
TE3432	*Ficus variegata*	Moraceae	Native	Common	Tree	36976.51	16997.61
TE3434	*Ficus variegata*	Moraceae	Native	Common	Tree	36968.1	16978.81
TE3435	*Ficus variegata*	Moraceae	Native	Common	Tree	36967.88	16978.47
TE3439	*Ficus variegata*	Moraceae	Native	Common	Tree	36952.18	16952.43
TE3442	*Ficus variegata*	Moraceae	Native	Common	Tree	37002.16	16979.14
TE3444	*Ficus variegata*	Moraceae	Native	Common	Tree	37002.16	16977.47
TE3445	*Ficus variegata*	Moraceae	Native	Common	Tree	37002.94	16980.03
TE3446	*Ficus variegata*	Moraceae	Native	Common	Tree	37008.69	16970.91
TE3461	*Ficus variegata*	Moraceae	Native	Common	Tree	36885.03	17064.33
TE3471	*Ficus variegata*	Moraceae	Native	Common	Tree	37158.89	17169.786
TE3473	*Ficus variegata*	Moraceae	Native	Common	Tree	37140.94	17187.047
TE3482	*Ficus variegata*	Moraceae	Native	Common	Tree	37114.37	17129.851
TE3485	*Ficus variegata*	Moraceae	Native	Common	Tree	37180.48	17173.371
TE3486	*Ficus variegata*	Moraceae	Native	Common	Tree	37199.79	17182.578
TE3489	*Ficus variegata*	Moraceae	Native	Common	Tree	37252.56	17170.294
TE3504	*Ficus variegata*	Moraceae	Native	Common	Tree	36981.78	16880.541
TE3570	*Ficus variegata*	Moraceae	Native	Common	Tree	36983.58	16897.061
TE3598	*Ficus variegata*	Moraceae	Native	Common	Tree	37133.64	16744.805

Tag ID	Species	Family	Origin	Status	Habit	Northing	Easting
TE3603	*Ficus variegata*	Moraceae	Native	Common	Tree	37105.81	17054.42
TE3605	*Ficus variegata*	Moraceae	Native	Common	Tree	37070.06	16971.83
TE3617	*Ficus variegata*	Moraceae	Native	Common	Tree	37164.67	17162.88
TE3628	*Ficus variegata*	Moraceae	Native	Common	Tree	37188.4	16735.587
TE3709	*Ficus variegata*	Moraceae	Native	Common	Tree	36971.36	17076.105
TE3752	*Ficus variegata*	Moraceae	Native	Common	Tree	37010.81	17131.61
TE3753	*Ficus variegata*	Moraceae	Native	Common	Tree	37017.49	17136.01
TE3772	*Ficus variegata*	Moraceae	Native	Common	Tree	37037.94	17094.22
TE3782	*Ficus variegata*	Moraceae	Native	Common	Tree	37024	17119.85
TE3783	*Ficus variegata*	Moraceae	Native	Common	Tree	37017.53	17122.31
TE3785	*Ficus variegata*	Moraceae	Native	Common	Tree	36997.32	17099.21
TE3789	*Ficus variegata*	Moraceae	Native	Common	Tree	36978.32	17085.97
TE3800	*Ficus variegata*	Moraceae	Native	Common	Tree	37018.79	17073.84
TE3805	*Ficus variegata*	Moraceae	Native	Common	Tree	37048.32	17091.31
TE3817	*Ficus variegata*	Moraceae	Native	Common	Tree	37043.37	17023.73
TE3821	*Ficus variegata*	Moraceae	Native	Common	Tree	37038.59	17039.39
TE3822	*Ficus variegata*	Moraceae	Native	Common	Tree	37028.51	17038.6
TE3824	*Ficus variegata*	Moraceae	Native	Common	Tree	37031.27	17041.93
TE3826	*Ficus variegata*	Moraceae	Native	Common	Tree	37024.81	17046.77
TE3828	*Ficus variegata*	Moraceae	Native	Common	Tree	36923.83	17273.643
TE3852	*Ficus variegata*	Moraceae	Native	Common	Tree	37026.82	17243.026
TE3860	*Ficus variegata*	Moraceae	Native	Common	Tree	37065.17	17229.321
TE3861	*Ficus variegata*	Moraceae	Native	Common	Tree	37085.98	17228.476
TE3862	*Ficus variegata*	Moraceae	Native	Common	Tree	37084.5	17228.315
TE3864	*Ficus variegata*	Moraceae	Native	Common	Tree	37097.99	17212.656
TE3877	*Ficus variegata*	Moraceae	Native	Common	Tree	37035.77	17206.958
TE3878	*Ficus variegata*	Moraceae	Native	Common	Tree	37039.7	17204.868
TE3879	*Ficus variegata*	Moraceae	Native	Common	Tree	37038.56	17205.894
TE3880	*Ficus variegata*	Moraceae	Native	Common	Tree	37040.34	17209.7
TE3881	*Ficus variegata*	Moraceae	Native	Common	Tree	37038.2	17207.821
TE3882	*Ficus variegata*	Moraceae	Native	Common	Tree	37037.66	17210.308
TE3883	*Ficus variegata*	Moraceae	Native	Common	Tree	37031.97	17207.113
TE3992	*Ficus variegata*	Moraceae	Native	Common	Tree	37707.98	15647.796
TE3998	*Ficus variegata*	Moraceae	Native	Common	Tree	37622.49	15822.564
TE4010	*Ficus variegata*	Moraceae	Native	Common	Tree	37203.26	16773.97
TE4055	*Ficus variegata*	Moraceae	Native	Common	Tree	37241.29	16694.15
TE4172	*Ficus variegata*	Moraceae	Native	Common	Tree	38014.22	15925.32
TE4202	*Ficus variegata*	Moraceae	Native	Common	Tree	38021.86	15991.26
TE4473	*Ficus variegata*	Moraceae	Native	Common	Tree	37528.05	15872.09
TE4701	*Ficus variegata*	Moraceae	Native	Common	Tree	37803.74	14757.688
TE4710	*Ficus variegata*	Moraceae	Native	Common	Tree	37993.74	14504.082
TE3436	*Ficus vasculosa*	Moraceae	Native	Endangered	Tree	36948.19	16959.55
TE3437	*Ficus vasculosa*	Moraceae	Native	Endangered	Tree	36949.09	16955.32
TE3438	*Ficus vasculosa*	Moraceae	Native	Endangered	Tree	36949.2	16954.66
Raptor nest	*Falcataria moluccana*	Fabaceae	Exotic	Naturalised	Tree	37793.77	14764.838

Appendix H
List and Location of All Tree Specimens

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Appendix H-List and Locations of All Tree Specimens

Tag ID	Species	Family	Origin	Status	Habit	Girth/ spread (m)	Height (m)	Northing	Easting
TE3355	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.1	8	37946.428	15861.896
TE3356	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.4	9	37941.82	15891.43
TE3357	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	2	10	37939.67	15880.14
TE3358	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.1	8	37948.85	15875.39
TE3359	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.8	10	37241.321	17161.35
TE3360	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.4	9	37189.303	16761.017
TE3361	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.6	9	37173.26	16850.07
TE3362	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.9	9	36993.395	17013.929
TE3363	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.6	9	37025.48	17045.66
TE3364	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.8	9	37098.632	17220.392
TE3365	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1	8	38056.874	15863.226
TE3366	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.1	9	36985.824	16889.719
TE3367	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1	8	37122.226	16777.632
TE3368	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.4	9	38099.262	14390.444
TE3369	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.1	8	38107.503	14395.766
TE3370	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1	8	36936.89	17146.26
TE3371	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.6	10	37335.493	16479.062

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Tag ID	Species	Family	Origin	Status	Habit	Girth/ spread (m)	Height (m)	Northing	Easting
TE3372	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.1	10	38032.8	16021.97
TE3373	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1	9	37589.066	16098.145
TE3374	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.3	9	36895.8	17013.67
TE3375	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.4	9	36967.486	17091.715
TE3376	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	2	12	36991.44	16964.78
TE3377	*Samanea saman*	Fabaceae	Exotic	Casual	Tree	2.9	8	36924.53	17059.49
TE3378	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.6	13	36926.75	17057.93
TE3379	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.5	11	36931.57	17146.84
TE3380	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.8	11	37101.95	16961.17
TE3381	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.5	8	37106.175	16824.549
TE3382	*Samanea saman*	Fabaceae	Exotic	Casual	Tree	2.8	8	37148.891	16770.013
TE3383	*Samanea saman*	Fabaceae	Exotic	Casual	Tree	3.4	8	37118.6	17072.81
TE3384	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	2.6	10	37017.27	17138.43
TE3385	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	3.2	10	37138.73	16832.41
TE3386	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	2.8	11	37125.17	16851.29
TE3387	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	3	10	37129.5	16851.86
TE3388	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.4	10	37615.809	15942.134
TE3389	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.4	10	37586.893	15958.328
TE3390	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1	9	37472.939	16075.913

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Tag ID	Species	Family	Origin	Status	Habit	Girth/ spread (m)	Height (m)	Northing	Easting
TE3391	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.2	9	37146.62	16764.76
TE3392	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.3	9	38033.737	15875.759
TE3393	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1	8	38043.016	15892.123
TE3394	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1	6	38025.713	15949.66
TE3395	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.5	8	38038.38	15975.519
TE3396	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	2	8	38014.34	16073.29
TE3397	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.2	9	38018.4	16072.94
TE3398	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1	7	38214.869	14261.136
TE3399	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.2	9	38222.478	14257.803
TE3400	*Samanea saman*	Fabaceae	Exotic	Casual	Tree	4	9	38227.551	14254.357
TE3401	*Samanea saman*	Fabaceae	Exotic	Casual	Tree	2.7	10	38229.179	14247.113
TE3402	*Samanea saman*	Fabaceae	Exotic	Casual	Tree	3.8	10	38232.6	14243.135
TE3403	*Samanea saman*	Fabaceae	Exotic	Casual	Tree	4.4	14	38241.586	14235.544
TE3404	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	5	15	38245.495	14232.79
TE3405	*Ficus variegata*	Moraceae	Native	Common	Tree	1.15	13	38193.083	14278.549
TE3406	*Syzygium lineatum*	Myrtaceae	Native	Common	Tree	1.5	11	38190.111	14283.462
TE3407	*Vitex pinnata*	Lamiaceae	Native	Common	Tree	1.1	9	38183.93	14295.481
TE3408	*Vitex pinnata*	Lamiaceae	Native	Common	Tree	1.3	9	38180.693	14296.922
TE3409	*Nephelium lappaceum*	Sapindaceae	Native	Critically endangered	Tree	1	15	38166.021	14315.512
TE3410	*Ficus benjamina*	Moraceae	Cryptogenic	-	Strangler	3.5	16	38169.267	14314.541

Appendix H-List and Locations of All Tree Specimens

Tag ID	Species	Family	Origin	Status	Habit	Girth/ spread (m)	Height (m)	Northing	Easting
TE3411	*Nephelium lappaceum*	Sapindaceae	Native	Critically endangered	Tree	1.4	10	38175.242	14303.822
TE3412	*Senna siamea*	Fabaceae	Exotic	Cultivated Only	Tree	1.8	13	38122.597	14360.829
TE3413	*Ficus benjamina*	Moraceae	Cryptogenic	-	Strangler	2.8	14	38100.689	14381.557
TE3414	*Terminalia catappa*	Combretaceae	Native	Common	Tree	1.4	16	38095.24	14384.032
TE3415	*Terminalia catappa*	Combretaceae	Native	Common	Tree	2.5	16	38089.159	14391.334
TE3416	*Ficus variegata*	Moraceae	Native	Common	Tree	1	11	38090.827	14391.133
TE3417	*Ficus variegata*	Moraceae	Native	Common	Tree	1	10	38093.807	14404.608
TE3418	*Ficus variegata*	Moraceae	Native	Common	Tree	1.5	10	38088.044	14398.831
TE3419	*Syzygium grande*	Myrtaceae	Native	Common	Tree	1.4	13	38082.358	14403.745
TE3420	*Planchonella obovata*	Sapotaceae	Native	Vulnerable	Tree	1.3	15	37800.802	14727.142
TE3421	*Planchonella obovata*	Sapotaceae	Native	Vulnerable	Tree	1.6	15	37802.368	14727.344
TE3422	*Syzygium grande*	Myrtaceae	Native	Common	Tree	1.7	10	37825.41	14697.587
TE3423	*Syzygium grande*	Myrtaceae	Native	Common	Tree	1.2	12	37828.613	14687.181
TE3424	*Syzygium grande*	Myrtaceae	Native	Common	Tree	2	13	37833.072	14687.038
TE3425	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.1	15	37877.569	14634.266
TE3426	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.2	13	37881.765	14633.708
TE3427	*Ficus variegata*	Moraceae	Native	Common	Tree	1	10	38247.172	14229.98
TE3428	*Samanea saman*	Fabaceae	Exotic	Casual	Tree	2.4	10	38258.477	14220.43
TE3429	*Ficus variegata*	Moraceae	Native	Common	Tree	1	10	38261.599	14214.666
TE3430	*Ficus variegata*	Moraceae	Native	Common	Tree	1	10	38265.111	14212.023
TE3431	*Ficus variegata*	Moraceae	Native	Common	Tree	1.2	10	38284.601	14201.806
TE3432	*Ficus variegata*	Moraceae	Native	Common	Tree	1.3	10	38289.631	14198.617
TE3433	*Terminalia catappa*	Combretaceae	Native	Common	Tree	1	10	38296.353	14195.341
TE3434	*Ficus variegata*	Moraceae	Native	Common	Tree	1.3	15	38301.973	14195.157
TE3435	*Ficus variegata*	Moraceae	Native	Common	Tree	1	10	37837.906	14683.019
TE3436	*Ficus vasculosa*	Moraceae	Native	Endangered	Tree	1.4	14	37837.299	14680.018

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Tag ID	Species	Family	Origin	Status	Habit	Girth/ spread (m)	Height (m)	Northing	Easting
TE3437	*Ficus vasculosa*	Moraceae	Native	Endangered	Tree	1	16	37841.072	14677.147
TE3438	*Ficus vasculosa*	Moraceae	Native	Endangered	Tree	0.5	5	37892.165	14616.826
TE3439	*Ficus variegata*	Moraceae	Native	Common	Tree	1.2	11	37903.982	14603.478
TE3440	*Claoxylon indicum*	Euphorbiaceae	Native	Common	Tree	1	8	38046.393	14441.659
TE3441	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.3	7	38046.686	14438.206
TE3442	*Ficus variegata*	Moraceae	Native	Common	Tree	1.2	16	38057.397	14430.017
TE3443	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	6	13	38060.938	14425.822
TE3444	*Ficus variegata*	Moraceae	Native	Common	Tree	1	15	38068.895	14418.946
TE3445	*Ficus variegata*	Moraceae	Native	Common	Tree	1	15	38076.47	14406.431
TE3446	*Ficus variegata*	Moraceae	Native	Common	Tree	1	14	38079.539	14402.985
TE3447	*Syzygium grande*	Myrtaceae	Native	Common	Tree	2.4	16	38104.286	14377.785
TE3448	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.3	7	38115.784	14367.22
TE3449	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1	9	38136.84	14348.029
TE3450	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1	12	37422.403	16269.893
TE3451	*Ficus hispida*	Moraceae	Exotic	Naturalised	Tree	1.3	10	37767.886	14762.419
TE3452	*Cecropia pachystachya*	Urticaceae	Exotic	Naturalised	Tree	1	12	37809.909	14708.705
TE3453	*Nephelium lappaceum*	Sapindaceae	Native	Critically endangered	Tree	1	13	37812.623	14705.268
TE3454	*Durio zibethinus*	Malvaceae	Exotic	Casual	Tree	1.3	20	37947.694	14556.261
TE3455	*Durio zibethinus*	Malvaceae	Exotic	Casual	Tree	1.1	20	37965.588	14537.943
TE3456	*Citrus* cf. *maxima*	Rutaceae	Exotic	Cultivated Only	Tree	1.1	4	37987.925	14508.277
TE3457	*Averrhoa carambola*	Oxalidaceae	Exotic	Casual	Tree	1.2	6	38000.761	14492.298
TE3458	*Samanea saman*	Fabaceae	Exotic	Casual	Tree	1.4	6	38004.22	14490.36
TE3459	*Samanea saman*	Fabaceae	Exotic	Casual	Tree	1.8	12	38006.617	14486.679
TE3460	*Samanea saman*	Fabaceae	Exotic	Casual	Tree	2.2	19	38007.118	14486.616
TE3461	*Ficus variegata*	Moraceae	Native	Common	Tree	1	9	38021.642	14468.692
TE3462	*Samanea saman*	Fabaceae	Exotic	Casual	Tree	1.65	13	36956.07	17155.73
TE3463	*Samanea saman*	Fabaceae	Exotic	Casual	Tree	3.6	12	36980.38	16964.67

Appendix H-List and Locations of All Tree Specimens

Tag ID	Species	Family	Origin	Status	Habit	Girth/ spread (m)	Height (m)	Northing	Easting
TE3464	*Samanea saman*	Fabaceae	Exotic	Casual	Tree	3.4	19	36868.31	17082.69
TE3465	*Samanea saman*	Fabaceae	Exotic	Casual	Tree	2.8	15	37157.621	17208.216
TE3466	*Claoxylon indicum*	Euphorbiaceae	Native	Common	Tree	1.1	7	37086.3	16952.82
TE3467	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1	9	37095.64	16939.19
TE3468	*Samanea saman*	Fabaceae	Exotic	Casual	Tree	1.1	10	37169.056	16752.05
TE3469	*Samanea saman*	Fabaceae	Exotic	Casual	Tree	2.2	16	36974.517	17118.51
TE3470	*Claoxylon indicum*	Euphorbiaceae	Native	Common	Tree	1.05	15	37467.692	16207.586
TE3471	*Ficus variegata*	Moraceae	Native	Common	Tree	1.05	14	37821.107	14733.797
TE3472	*Syzygium grande*	Myrtaceae	Native	Common	Tree	1.4	12	37185.634	17137.108
TE3473	*Ficus variegata*	Moraceae	Native	Common	Tree	1	11	37147.76	16679.03
TE3474	*Macaranga gigantea*	Euphorbiaceae	Native	Common	Tree	1	14	37083.278	16835.301
TE3475	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.9	10	37325.926	16495.788
TE3476	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.4	8	37100.54	16855.95
TE3477	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.35	8	37552.82	15431.85
TE3478	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.3	8	37554.66	15432.05
TE3479	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.55	7	37554.94	15438.25
TE3481	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.5	5	36906.83	17066.07
TE3482	*Ficus variegata*	Moraceae	Native	Common	Tree	1	12	36908.08	17067.33
TE3483	*Vitex pinnata*	Lamiaceae	Native	Common	Tree	1	13	36975.2	16879.602
TE3484	*Vitex pinnata*	Lamiaceae	Native	Common	Tree	1	13	37096.446	16857.558
TE3485	*Ficus variegata*	Moraceae	Native	Common	Tree	1	14	37122.023	16788.361
TE3486	*Ficus variegata*	Moraceae	Native	Common	Tree	1	15	37117.659	16796.66
TE3487	*Pterocarpus indicus*	Fabaceae	Exotic	Casual	Tree	4.8	18	37355.134	16440.151
TE3488	*Pterocarpus indicus*	Fabaceae	Exotic	Casual	Tree	3.3	18	36920.605	17083.914
TE3489	*Ficus variegata*	Moraceae	Native	Common	Tree	1.3	13	37094.07	16839.55
TE3490	*Aphanamixis polystachya*	Meliaceae	Native	Endangered	Tree	1	13	38031.434	15973.668
TE3491	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.15	12	38041.747	15995.177
TE3492	*Terminalia catappa*	Combretaceae	Native	Common	Tree	1.7	15	38218.313	14273.039

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Tag ID	Species	Family	Origin	Status	Habit	Girth/ spread (m)	Height (m)	Northing	Easting
TE3493	*Dacryodes* cf. *costata*	Burseraceae	Native	Endangered	Tree	2.7	15	37419.421	16288.841
TE3494	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	2.5	9	37677.738	15665.72
TE3495	*Claoxylon indicum*	Euphorbiaceae	Native	Common	Tree	1	12	36938.02	17053.45
TE3496	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.2	8	36933.03	17008.98
TE3497	*Terminalia catappa*	Combretaceae	Native	Common	Tree	1.3	10	37032.934	16885.166
TE3498	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	2	5	37068.725	16894.331
TE3499	*Claoxylon indicum*	Euphorbiaceae	Native	Common	Tree	1	10	37097.6	16861.99
TE3500	*Pterocarpus indicus*	Fabaceae	Exotic	Casual	Tree	4.5	18	37058.49	16926.23
TE3501	*Pterocarpus indicus*	Fabaceae	Exotic	Casual	Tree	2.1	15	37218.45	16688.3
TE3502	*Durio zibethinus*	Malvaceae	Exotic	Casual	Tree	1	10	37255.5	16578.14
TE3503	Artocarpus integer	Moraceae	Exotic	Casual	Tree	1.2	10	37251.89	16630.69
TE3504	*Ficus variegata*	Moraceae	Native	Common	Tree	1.4	18	37026.88	16844.958
TE3505	*Pterocarpus indicus*	Fabaceae	Exotic	Casual	Tree	3.5	15	37024.11	17121.3
TE3506	*Pterocarpus indicus*	Fabaceae	Exotic	Casual	Tree	3.5	15	36993.91	17097.41
TE3507	*Ficus benjamina*	Moraceae	Cryptogenic	-	Strangler	10	20	37717	15751.257
TE3508	*Ficus elastica*	Moraceae	Exotic	Casual	Strangler	12	20	36891.3	17015.54
TE3509	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	15	20	36922.92	16991.79
TE3510	*Ficus benjamina*	Moraceae	Cryptogenic	-	Strangler	3	12	37001.72	16978.7
TE3511	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.3	6	37047.45	16938.93
TE3512	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.3	10	37107.04	16956.95
TE3513	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.3	10	37049.662	16822.975
TE3514	*Mangifera odorata*	Anacardiaceae	Native	Vulnerable	Tree	1.7	12	37105.88	16759.469
TE3515	*Mangifera* cf. *indica*	Anacardiaceae	Exotic	Casual	Tree	1.1	10	37107.032	16754.334
TE3516	*Mangifera* cf. *indica*	Anacardiaceae	Exotic	Casual	Tree	2	12	37113.814	16742.992
TE3517	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.2	10	37119.15	17086.83

Appendix H-List and Locations of All Tree Specimens

Tag ID	Species	Family	Origin	Status	Habit	Girth/ spread (m)	Height (m)	Northing	Easting
TE3518	*Nephelium lappaceum*	Sapindaceae	Native	Critically endangered	Tree	1.7	10	37171.42	17093
TE3519	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.7	15	37292.857	16687.256
TE3520	*Lepisanthes rubiginosa*	Sapindaceae	Native	Common	Tree	1.8	15	37286.934	16534.477
TE3521	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.8	15	37333.633	16473.339
TE3522	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	2	10	37343.216	16451.143
TE3523	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	2	10	37363.597	16436.796
TE3524	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.5	10	37385.826	16396.744
TE3525	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.3	10	37362.613	16299.077
TE3526	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.3	10	37347.515	16415.934
TE3527	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	10	12	37499.588	16208.82
TE3528	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2	10	36971.1	17041.431
TE3529	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.2	12	36942.446	17295.241
TE3530	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.9	12	37677.37	15851.78
TE3531	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.3	12	37815.42	15747.85
TE3532	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2	12	37081.22	16892.67
TE3533	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.8	12	37090.11	16893.77
TE3534	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1	12	37057.41	16872.93
TE3535	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.9	12	37223.92	16663.24
TE3536	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.8	12	37230.57	16678.43
TE3537	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.5	12	37243.84	16582.92
TE3538	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.3	12	37254.63	16624.41
TE3539	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.4	12	37246.45	16630.81
TE3540	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.2	15	37242.31	16593.66
TE3541	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.4	15	37417.503	16185.324
TE3542	*Khaya senegalensis*	Meliaceae	Exotic	Cultivated Only	Tree	2.6	15	37975.031	15850.998
TE3543	*Khaya senegalensis*	Meliaceae	Exotic	Cultivated Only	Tree	3.2	15	38011.63	15995.17

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Tag ID	Species	Family	Origin	Status	Habit	Girth/ spread (m)	Height (m)	Northing	Easting
TE3544	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.7	10	38023.99	16013.61
TE3545	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.9	10	38024.19	16028.75
TE3546	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.3	9	38017.46	16071.43
TE3547	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.4	12	38008.6	16074.95
TE3548	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.7	12	37996.04	16043.2
TE3549	*Khaya senegalensis*	Meliaceae	Exotic	Cultivated Only	Tree	3	20	37925.77	16007.73
TE3550	*Khaya senegalensis*	Meliaceae	Exotic	Cultivated Only	Tree	3	20	37944.12	15878.3
TE3551	*Khaya senegalensis*	Meliaceae	Exotic	Cultivated Only	Tree	2.8	20	37957.62	16124.48
TE3552	*Khaya senegalensis*	Meliaceae	Exotic	Cultivated Only	Tree	3	20	38014.83	16125.8
TE3553	*Khaya senegalensis*	Meliaceae	Exotic	Cultivated Only	Tree	2.8	20	37754.869	14969.438
TE3554	*Khaya senegalensis*	Meliaceae	Exotic	Cultivated Only	Tree	2.8	20	38295.637	14201.34
TE3555	*Khaya senegalensis*	Meliaceae	Exotic	Cultivated Only	Tree	2.8	20	37839.81	14685.763
TE3556	*Khaya senegalensis*	Meliaceae	Exotic	Cultivated Only	Tree	2.5	20	37439.99	16241.05
TE3557	*Khaya senegalensis*	Meliaceae	Exotic	Cultivated Only	Tree	3	20	37458.71	16224.9
TE3558	*Khaya senegalensis*	Meliaceae	Exotic	Cultivated Only	Tree	3.2	20	37418.053	16244.232
TE3559	*Khaya senegalensis*	Meliaceae	Exotic	Cultivated Only	Tree	3.2	20	37417.867	16292.669
TE3560	*Khaya senegalensis*	Meliaceae	Exotic	Cultivated Only	Tree	3.2	20	37446.55	16271.957
TE3561	*Khaya senegalensis*	Meliaceae	Exotic	Cultivated Only	Tree	3	20	37061.31	16927.087
TE3562	*Khaya senegalensis*	Meliaceae	Exotic	Cultivated Only	Tree	2.5	20	37059.831	16918.875
TE3563	*Khaya senegalensis*	Meliaceae	Exotic	Cultivated Only	Tree	3.2	20	36994.455	17030.028
TE3564	*Samanea saman*	Fabaceae	Exotic	Casual	Tree	3	15	36918.96	17007.93
TE3565	*Khaya senegalensis*	Meliaceae	Exotic	Cultivated Only	Tree	1.8	15	36936.82	16978.79
TE3566	*Khaya senegalensis*	Meliaceae	Exotic	Cultivated Only	Tree	3	20	36920.76	16960.7
TE3567	*Khaya senegalensis*	Meliaceae	Exotic	Cultivated Only	Tree	3.2	20	36939.36	16935.5
TE3568	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.05	14	36959.69	16910
TE3569	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1	14	36958.26	17008.3
TE3570	*Ficus variegata*	Moraceae	Native	Common	Tree	1	15	36957.82	17007.63
TE3571	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.25	16	36970.76	16995.28

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Tag ID	Species	Family	Origin	Status	Habit	Girth/ spread (m)	Height (m)	Northing	Easting
TE3572	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1	10	36976.51	16997.61
TE3573	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.6	18	36968.1	16978.81
TE3574	*Syzygium grande*	Myrtaceae	Native	Common	Tree	2.8	16	36967.88	16978.47
TE3575	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1	10	36952.18	16952.43
TE3576	*Syzygium grande*	Myrtaceae	Native	Common	Tree	1.6	14	37002.16	16979.14
TE3577	*Ficus stricta*	Moraceae	Native	Critically Endangered	Tree	1.7	8	37002.16	16977.47
TE3578	*Ficus stricta*	Moraceae	Native	Critically Endangered	Tree	1.9	8	37002.94	16980.03
TE3579	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.6	9	37008.69	16970.91
TE3580	*Dimocarpus longan subsp. malesianus*	Sapindaceae	Exotic	Casual	Tree	1.6	10	36885.03	17064.33
TE3581	*Terminalia catappa*	Combretaceae	Native	Common	Tree	1.2	15	37158.893	17169.786
TE3582	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.3	7	37140.939	17187.047
TE3583	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1	6	37114.366	17129.851
TE3584	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1	12	37180.481	17173.371
TE3585	*Durio zibethinus*	Malvaceae	Exotic	Casual	Tree	1	12	37199.791	17182.578
TE3586	*Nephelium lappaceum*	Sapindaceae	Native	Critically endangered	Tree	1.1	14	37252.561	17170.294
TE3587	*Mangifera odorata*	Anacardiaceae	Native	Vulnerable	Tree	1.1	14	36981.775	16880.541
TE3588	Artocarpus integer	Moraceae	Exotic	Casual	Tree	1.7	15	36983.583	16897.061
TE3589	*Durio zibethinus*	Malvaceae	Exotic	Casual	Tree	1	20	37133.636	16744.805
TE3590	*Durio zibethinus*	Malvaceae	Exotic	Casual	Tree	1	20	37105.81	17054.42
TE3591	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.3	14	37070.06	16971.83
TE3592	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.45	16	37164.67	17162.88
TE3593	*Vitex pinnata*	Lamiaceae	Native	Common	Tree	1.2	10	37188.4	16735.587
TE3594	*Syzygium grande*	Myrtaceae	Native	Common	Tree	1	25	36971.355	17076.105
TE3595	*Mangifera indica*	Anacardiaceae	Exotic	Casual	Tree	1.2	11	37010.81	17131.61
TE3596	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1	10	37017.49	17136.01

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Tag ID	Species	Family	Origin	Status	Habit	Girth/ spread (m)	Height (m)	Northing	Easting
TE3597	*Vitex pinnata*	Lamiaceae	Native	Common	Tree	1.7	10	37037.94	17094.22
TE3598	*Ficus variegata*	Moraceae	Native	Common	Tree	1	14	37024	17119.85
TE3599	*Syzygium grande*	Myrtaceae	Native	Common	Tree	1.5	14	37017.53	17122.31
TE3600	*Vitex pinnata*	Lamiaceae	Native	Common	Tree	1	15	36997.32	17099.21
TE3601	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	4	16	36978.32	17085.97
TE3602	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1	8	37018.79	17073.84
TE3603	*Ficus variegata*	Moraceae	Native	Common	Tree	1.1	13	37048.32	17091.31
TE3604	*Terminalia catappa*	Combretaceae	Native	Common	Tree	1.2	12	37043.37	17023.73
TE3605	*Ficus variegata*	Moraceae	Native	Common	Tree	1.6	13	37038.59	17039.39
TE3606	*Terminalia catappa*	Combretaceae	Native	Common	Tree	1.25	14	37028.51	17038.6
TE3607	*Vitex pinnata*	Lamiaceae	Native	Common	Tree	1	9	37031.27	17041.93
TE3608	*Vitex pinnata*	Lamiaceae	Native	Common	Tree	1	7	37024.81	17046.77
TE3609	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	1.2	9	36923.829	17273.643
TE3610	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.3	14	37026.818	17243.026
TE3611	*Terminalia catappa*	Combretaceae	Native	Common	Tree	1	8	37065.169	17229.321
TE3612	*Mangifera* cf. *indica*	Anacardiaceae	Exotic	Casual	Tree	1.1	12	37085.981	17228.476
TE3613	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1	13	37084.5	17228.315
TE3614	*Terminalia catappa*	Combretaceae	Native	Common	Tree	2.4	14	37097.99	17212.656
TE3615	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1	10	37035.766	17206.958
TE3616	*Terminalia catappa*	Combretaceae	Native	Common	Tree	2.1	15	37039.7	17204.868
TE3617	*Ficus variegata*	Moraceae	Native	Common	Tree	1	14	37038.555	17205.894
TE3618	*Vitex pinnata*	Lamiaceae	Native	Common	Tree	1	13	37040.337	17209.7
TE3619	*Vitex pinnata*	Lamiaceae	Native	Common	Tree	1.1	14	37038.202	17207.821
TE3620	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.35	5	37037.661	17210.308
TE3621	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.6	7	37031.967	17207.113
TE3622	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.1	14	37707.978	15647.796
TE3623	*Terminalia catappa*	Combretaceae	Native	Common	Tree	2	15	37622.485	15822.564

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Tag ID	Species	Family	Origin	Status	Habit	Girth/ spread (m)	Height (m)	Northing	Easting
TE3624	*Nephelium lappaceum*	Sapindaceae	Native	Critically endangered	Tree	1.2	10	37203.26	16773.97
TE3625	*Claoxylon indicum*	Euphorbiaceae	Native	Common	Tree	1.15	10	37241.29	16694.15
TE3626	*Vitex pinnata*	Lamiaceae	Native	Common	Tree	1.3	15	38014.221	15925.32
TE3627	*Archidendron jiringa*	Fabaceae	Native	Vulnerable	Tree	0.8	9	38021.86	15991.26
TE3628	*Ficus variegata*	Moraceae	Native	Common	Tree	1.6	17	37528.05	15872.09
TE3629	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.35	8	37803.742	14757.688
TE3630	*Vitex pinnata*	Lamiaceae	Native	Common	Tree	1.1	11	37993.743	14504.082
TE3631	*Vitex pinnata*	Lamiaceae	Native	Common	Tree	1.8	11	36948.19	16959.55
TE3632	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.3	5	36949.09	16955.32
TE3633	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.3	8	36949.2	16954.66
TE3634	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.3	8	37049.454	16923.865
TE3635	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.3	8	37913.135	15811.723
TE3636	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.3	6	37913.072	15811.615
TE3637	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.4	8	37921.511	15808.667
TE3638	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.3	9	38001.249	15926.584
TE3639	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.5	11	37998.287	15921.259
TE3640	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.4	9	37998.315	15911.259
TE3641	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.3	9	38001.427	15911.895
TE3642	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.3	3	38007.461	15911.78
TE3643	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.45	8	38007.464	15910.964
TE3644	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.5	6	37989.465	15921.646
TE3645	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.3	7	37991.84	15921.313
TE3646	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.3	6	37985.456	15922.773
TE3647	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	5	13	37985.366	15923.065
TE3648	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.5	12	37985.278	15922.97
TE3649	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.3	3	37985.435	15924.092
TE3650	*Terminalia catappa*	Combretaceae	Native	Common	Tree	2.8	13	37985.966	15930.118

Appendix H-List and Locations of All Tree Specimens

Tag ID	Species	Family	Origin	Status	Habit	Girth/ spread (m)	Height (m)	Northing	Easting
TE3651	*Vitex pinnata*	Lamiaceae	Native	Common	Tree	1.3	12	37987.261	15946.953
TE3652	*Mangifera indica*	Anacardiaceae	Exotic	Casual	Tree	1.2	6	37998.09	16031.84
TE3653	*Terminalia catappa*	Combretaceae	Native	Common	Tree	1.5	14	37997.24	16021.44
TE3654	*Terminalia catappa*	Combretaceae	Native	Common	Tree	1.4	14	37992.29	16026.42
TE3655	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.1	6	37987.7	16030.52
TE3656	*Mangifera indica*	Anacardiaceae	Exotic	Casual	Tree	1.7	12	37985.58	16033.11
TE3657	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	12	15	37982.19	16023.22
TE3658	*Terminalia catappa*	Combretaceae	Native	Common	Tree	1.6	13	37992.36	16010.76
TE3659	*Mangifera indica*	Anacardiaceae	Exotic	Casual	Tree	1.7	8	37991.92	16009.38
TE3660	*Dimocarpus longan subsp. malesianus*	Sapindaceae	Exotic	Casual	Tree	2.2	12	37995.91	16007.75
TE3661	*Averrhoa carambola*	Oxalidaceae	Exotic	Casual	Tree	1.4	5	37998.71	16004.37
TE3662	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	10	16	38000.31	15996.41
TE3663	*Terminalia catappa*	Combretaceae	Native	Common	Tree	1.9	15	37994.36	15989.78
TE3664	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	6	14	37967.98	16028.01
TE3665	*Nephelium lappaceum*	Sapindaceae	Native	Critically endangered	Tree	1.1	9	37966.69	16020.86
TE3666	*Durio zibethinus*	Malvaceae	Exotic	Casual	Tree	1.5	16	37962.62	16024.06
TE3667	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.2	6	37972.74	16014.8
TE3668	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	3	12	37976.56	16007.25
TE3669	*Terminalia catappa*	Combretaceae	Native	Common	Tree	2.3	16	37968.12	15930.58
TE3670	*Terminalia catappa*	Combretaceae	Native	Common	Tree	2.1	12	37963.74	15954.69
TE3671	*Terminalia catappa*	Combretaceae	Native	Common	Tree	2.1	12	37908.49	15981.24
TE3672	*Mangifera indica*	Anacardiaceae	Exotic	Casual	Tree	1.4	10	37930.91	15886.1
TE3673	*Nephelium lappaceum*	Sapindaceae	Native	Critically endangered	Tree	1.2	10	37910.3	15889.33
TE3674	*Nephelium lappaceum*	Sapindaceae	Native	Critically endangered	Tree	1.1	10	37935.04	15931.92

Tag ID	Species	Family	Origin	Status	Habit	Girth/ spread (m)	Height (m)	Northing	Easting
TE3675	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	5	16	37929.29	15927.18
TE3676	*Mangifera indica*	Anacardiaceae	Exotic	Casual	Tree	1.4	10	37931.84	15924.54
TE3677	*Terminalia catappa*	Combretaceae	Native	Common	Tree	3	12	37932.66	15924.11
TE3678	*Mangifera indica*	Anacardiaceae	Exotic	Casual	Tree	1.1-1.2	10	37936.39	15919.1
TE3679	*Mangifera indica*	Anacardiaceae	Exotic	Casual	Tree	1.8	10	37939.72	15917.32
TE3679A	*Terminalia catappa*	Combretaceae	Native	Common	Tree	2.6	13	37934.85	15915.54
TE3680	*Pterocarpus indicus*	Fabaceae	Exotic	Casual	Tree	4.4	12	37938.23	15915.45
TE3680A	*Syzygium grande*	Myrtaceae	Native	Common	Tree	2	13	37926.69	16069.42
TE3681	*Pterocarpus indicus*	Fabaceae	Exotic	Casual	Tree	4.5	12	37948	16096.42
TE3681A	*Terminalia catappa*	Combretaceae	Native	Common	Tree	1.8	13	37946.2	16124.03
TE3682	*Mangifera indica*	Anacardiaceae	Exotic	Casual	Tree	1.9	10	38008.57	16140.52
TE3683	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	8	10	37926.01	16019.28
TE3684	*Pterocarpus indicus*	Fabaceae	Exotic	Casual	Tree	5	12	37756.458	14963.628
TE3685	*Terminalia catappa*	Combretaceae	Native	Common	Tree	2.4	11	37774.304	14936.982
TE3686	*Terminalia catappa*	Combretaceae	Native	Common	Tree	1.5	11	37771.149	14939.425
TE3687	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	2	11	37773.606	14921.395
TE3688	*Samanea saman*	Fabaceae	Exotic	Casual	Tree	1.3	13	37776.546	14923.158
TE3689	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	10	20	37851.53	16015.57
TE3690	*Terminalia catappa*	Combretaceae	Native	Common	Tree	2	15	37846.05	16022.06
TE3691	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.05	10	37820.56	16039.45
TE3692	Casuarina equisetifolia	Casuarinaceae	Native	Common	Tree	1.9	20	37823.62	16041.81
TE3693	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	1	8	37830.08	15945.52
TE3694	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.45	8	37738.93	15873.45
TE3695	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.5	8	36967.51	16916.67
TE3696	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.5	8	36975.29	16923.2

Appendix H-List and Locations of All Tree Specimens

Tag ID	Species	Family	Origin	Status	Habit	Girth/ spread (m)	Height (m)	Northing	Easting
TE3697	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.4	8	37219.977	17148.144
TE3698	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.3	8	37122.979	16771.059
TE3699	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.35	8	37126.987	16766.529
TE3700	*Syzygium polyanthum*	Myrtaceae	Native	Vulnerable	Tree	1	10	36975.11	16893.772
TE3701	*Durio zibethinus*	Malvaceae	Exotic	Casual	Tree	1.7	14	36984.548	16895.823
TE3702	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.4	7	36990.032	16902.917
TE3703	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.5	10	36990.313	16905.925
TE3704	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.7	10	36990.294	16903.216
TE3705	*Claoxylon indicum*	Euphorbiaceae	Native	Common	Tree	1	10	36999.996	16906.132
TE3706	*Macaranga hypoleuca*	Euphorbiaceae	Native	Common	Tree	1	14	37096.665	16827.957
TE3707	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.35	6	37111.873	16803.232
TE3708	*Cecropia pachystachya*	Urticaceae	Exotic	Naturalised	Tree	0.6	10	37112.183	16803.364
TE3709	*Ficus variegata*	Moraceae	Native	Common	Tree	1.1	15	37178.04	17097.37
TE3710	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	1.5	16	37207.09	17117.39
TE3711	*Terminalia catappa*	Combretaceae	Native	Common	Tree	1.4	18	37176.02	17135.8
TE3712	*Ficus stricta*	Moraceae	Native	Critically Endangered	Tree	2.8	13	36942.674	17213.377
TE3713	*Artocarpus heterophyllus*	Moraceae	Exotic	Casual	Tree	1.1	9	37356.027	16433.428
TE3714	*Vitex pinnata*	Lamiaceae	Native	Common	Tree	1	13	37034.162	16966.815
TE3715	*Vitex pinnata*	Lamiaceae	Native	Common	Tree	1	12	37019.712	16991.587
TE3716	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1	14	37030.997	16990.137
TE3717	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.4	10	37032.273	17002.795
TE3718	*Mangifera* cf. *foetida*	Anacardiaceae	Native	Vulnerable	Tree	1.5	15	37032.9	17002.232
TE3719	*Vitex pinnata*	Lamiaceae	Native	Common	Tree	1.6	13	37029.662	17009.346
TE3720	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.1	16	37030.254	17008.81
TE3721	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.5	15	37034.065	17010.287
TE3722	*Rhodamnia cinerea*	Myrtaceae	Native	Common	Tree	1.6	12	37035.511	17000.588
TE3723	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.1	10	37041.832	16999.782

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Tag ID	Species	Family	Origin	Status	Habit	Girth/ spread (m)	Height (m)	Northing	Easting
TE3724	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1	12	37056.498	16995.452
TE3725	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1	14	37066.993	17004.13
TE3725A	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.1	14	37064.8	16997.211
TE3726	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.4	14	37071.552	17006.88
TE3727	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1	15	37067.374	16987.88
TE3728	*Vitex pinnata*	Lamiaceae	Native	Common	Tree	1.2	15	37060.621	16973.552
TE3729	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.1	15	37060.416	16972.385
TE3730	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.1	15	37041.121	16974.384
TE3731	*Syzygium grande*	Myrtaceae	Native	Common	Tree	1.8	20	37041.545	16978.386
TE3732	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.6	16	37075.957	17006.248
TE3733	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.5	16	37084.352	17008.105
TE3734	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1	12	37084.198	17087.859
TE3735	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.5	16	37091.572	17106.087
TE3736	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.1	12	37061.212	17072.171
TE3737	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1	10	37058.973	17051.422
TE3738	*Nephelium lappaceum*	Sapindaceae	Native	Critically endangered	Tree	1.4	12	37019.73	17138.46
TE3739	*Nephelium lappaceum*	Sapindaceae	Native	Critically endangered	Tree	1.1	12	37027.99	17138.09
TE3740	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.2	16	37021.96	17139.54
TE3741	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.1	16	37047.83	17099.22
TE3742	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.9	20	37033.47	17099.03
TE3743	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1	12	37022.06	17104.1
TE3744	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.1	14	37035.28	17096.87
TE3745	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1	12	37045.96	17057.04
TE3746	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.5	10	37067.78	17017.48
TE3747	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.6	10	37062.69	17013.77
TE3748	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1	10	37063.84	17017.55
TE3749	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1	14	37054.25	17020.99

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Tag ID	Species	Family	Origin	Status	Habit	Girth/ spread (m)	Height (m)	Northing	Easting
TE3750	*Syzygium grande*	Myrtaceae	Native	Common	Tree	1.6	20	37044.75	17008.63
TE3751	*Syzygium grande*	Myrtaceae	Native	Common	Tree	1.8	20	36979.356	17298.179
TE3752	*Ficus variegata*	Moraceae	Native	Common	Tree	1.3	21	36980.666	17295.74
TE3753	*Ficus variegata*	Moraceae	Native	Common	Tree	1.5	21	36973.84	17293.214
TE3754	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.3	15	36980.692	17280.554
TE3755	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.1	15	36979.621	17289.724
TE3756	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.15	17	36987.386	17285.152
TE3757	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.5	20	36978.297	17278.601
TE3758	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.5	12	36979.349	17279.53
TE3759	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.9	9	36978.825	17278.71
TE3760	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.7	10	36990.077	17273.238
TE3761	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.5	10	36993.253	17270.834
TE3762	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.45	12	36994.377	17264.587
TE3763	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.3	10	37000.906	17264.104
TE3764	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.3	8	36998.349	17280.206
TE3765	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.7	9	37002.669	17278.108
TE3766	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.05	20	37006.214	17274.019
TE3767	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.6	10	37014.325	17266.193
TE3768	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.35	10	37012.528	17262.321
TE3769	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.3	9	37036.982	17267.026
TE3770	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.75	12	37031.634	17276.258
TE3771	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.5	11	37035.465	17263.977
TE3772	*Ficus variegata*	Moraceae	Native	Common	Tree	1.47	22	37054.049	17265.591
TE3773	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.55	10	37062.809	17261.137
TE3774	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.4	10	37065.405	17260.047
TE3775	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.5	9	37071.469	17257.686
TE3776	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.3	7	37055.207	17250.643
TE3777	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.5	7	37066.291	17204.671

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Tag ID	Species	Family	Origin	Status	Habit	Girth/ spread (m)	Height (m)	Northing	Easting
TE3778	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.6	9	37030.713	17192.666
TE3779	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.3	10	37041.775	17198.597
TE3780	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.5	11	36993.663	17227.306
TE3781	*Ficus fistulosa*	Moraceae	Native	Common	Tree	1	12	37120.25	16898.33
TE3782	*Ficus variegata*	Moraceae	Native	Common	Tree	1	18	37129.64	16901.55
TE3783	*Ficus variegata*	Moraceae	Native	Common	Tree	1.45	20	37144.41	16900.24
TE3784	*Macaranga gigantea*	Euphorbiaceae	Native	Common	Tree	1.05	20	37140.84	16903.2
TE3785	*Ficus variegata*	Moraceae	Native	Common	Tree	2	24	37131.51	16890.1
TE3786	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.35	7	37134.95	16878.63
TE3787	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.35	10	37145.22	16876.97
TE3788	*Ficus fistulosa*	Moraceae	Native	Common	Tree	1	12	37131.18	16877.38
TE3789	*Ficus variegata*	Moraceae	Native	Common	Tree	1	20	37119.09	16880.09
TE3790	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.7	12	37119.53	16881.37
TE3800	*Ficus variegata*	Moraceae	Native	Common	Tree	1.5	24	37118.53	16895.31
TE3801	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.05	20	37114.93	16891.96
TE3802	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.02	12	37114.08	16897.52
TE3803	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.4	18	37117.85	16898.76
TE3804	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.8	11	37150.95	16865.56
TE3805	*Ficus variegata*	Moraceae	Native	Common	Tree	1.1	24	37163.08	16857.41
TE3806	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.3	9	37167.02	16856.73
TE3807	*Syzygium grande*	Myrtaceae	Native	Common	Tree	2.5	18	37691.578	15671.39
TE3808	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.4	18	38055.51	15857.132
TE3809	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.3	8	38036.04	16041.86
TE3810	*Syzygium lineatum*	Myrtaceae	Native	Common	Tree	1	20	37463.95	16242.68
TE3811	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.1	18	37463.028	16258.283
TE3812	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1	12	37466.451	16257.008
TE3813	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1	7	37803.844	14766.759
TE3814	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.3	12	37116.33	16677.23

Tag ID	Species	Family	Origin	Status	Habit	Girth/ spread (m)	Height (m)	Northing	Easting
TE3815	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1	15	37096.808	16683.939
TE3816	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.5	12	37094.459	16689.674
TE3817	*Ficus variegata*	Moraceae	Native	Common	Tree	1	20	37043.205	16750.355
TE3818	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.35	12	37034.249	16759.618
TE3819	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.3	7	37023.626	16772.768
TE3820	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	1.3	21	37022.359	16778.462
TE3821	*Ficus variegata*	Moraceae	Native	Common	Tree	1	20	37015.906	16781.417
TE3822	*Ficus variegata*	Moraceae	Native	Common	Tree	1	18	37015.549	16789.528
TE3823	*Terminalia catappa*	Combretaceae	Native	Common	Tree	1	20	37006.738	16800.887
TE3824	*Ficus variegata*	Moraceae	Native	Common	Tree	1.3	21	36996.585	16803.037
TE3825	*Artocarpus heterophyllus*	Moraceae	Exotic	Casual	Tree	1.2	18	36995.11	16808.958
TE3826	*Ficus variegata*	Moraceae	Native	Common	Tree	1	18	36986.997	16812.989
TE3827	*Terminalia catappa*	Combretaceae	Native	Common	Tree	1.4	14	36985.958	16820.907
TE3828	*Ficus variegata*	Moraceae	Native	Common	Tree	1.6	18	36977.431	16823.714
TE3829	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	15	18	36977.127	16830.993
TE3830	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.2	15	36966.153	16841.554
TE3831	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.25	18	36962.147	16852.232
TE3832	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.2	15	36949.942	16860.943
TE3833	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	2	18	36946.593	16857.168
TE3834	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1	15	36941.624	16855.254
TE3835	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.5	18	37140.8	16628.6
TE3836	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1	13	37139.42	16625.25
TE3837	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.1	13	37140.69	16622.43
TE3838	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1	13	37190.54	16571.51
TE3839	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1	13	37204.03	16577.84
TE3840	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.05	15	37201.71	16569.71
TE3841	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1	15	37209.21	16569.07
TE3842	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.2	18	37123.806	16768.672

Tag ID	Species	Family	Origin	Status	Habit	Girth/ spread (m)	Height (m)	Northing	Easting
TE3843	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.3	12	37110.288	17190.184
TE3844	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1	15	37012.1	17107.17
TE3845	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1	15	36978.06	16937.18
TE3846	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1	15	37107.014	17195.345
TE3847	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.2	18	37099.951	17188.093
TE3848	*Mangifera indica*	Anacardiaceae	Exotic	Casual	Tree	1.3	18	37100.097	17189.793
TE3849	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.7	18	37097.447	17185.171
TE3850	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	2	20	37087.141	17173.194
TE3851	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1	8	37125.653	17164.17
TE3852	*Ficus variegata*	Moraceae	Native	Common	Tree	2	20	37044.153	16851.123
TE3853	*Syzygium polyanthum*	Myrtaceae	Native	Vulnerable	Tree	1.45	9	37090.484	16826.296
TE3854	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.2	15	37119.375	17164.639
TE3855	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1	153	37119.375	17164.639
TE3856	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1	15	37230.222	16781.686
TE3857	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.4	15	37247.801	16769.547
TE3858	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1	12	37257.006	16764.248
TE3859	*Terminalia catappa*	Combretaceae	Native	Common	Tree	1.9	20	37253.141	16764.008
TE3860	*Ficus variegata*	Moraceae	Native	Common	Tree	1.6	15	37263.635	16757.479
TE3861	*Ficus variegata*	Moraceae	Native	Common	Tree	1.1	20	37245.625	16752.236
TE3862	*Ficus variegata*	Moraceae	Native	Common	Tree	1	20	37230.238	16737.317
TE3863	*Terminalia catappa*	Combretaceae	Native	Common	Tree	1	13	37257.509	16725.965
TE3864	*Ficus variegata*	Moraceae	Native	Common	Tree	1.6	20	37256.399	16726.493
TE3865	*Artocarpus heterophyllus*	Moraceae	Exotic	Casual	Tree	1	14	37263.459	16719.681
TE3866	*Terminalia catappa*	Combretaceae	Native	Common	Tree	1.25	18	37265.47	16725.42
TE3867	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.5	7	37263.592	16725.146
TE3868	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.5	7	37270.3	16732.273
TE3869	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.35	7	37273.871	16743.473
TE3870	*Terminalia catappa*	Combretaceae	Native	Common	Tree	1.3	18	37275.49	16741.773

Tag ID	Species	Family	Origin	Status	Habit	Girth/ spread (m)	Height (m)	Northing	Easting
TE3871	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.1	15	37283.025	16735.642
TE3872	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.5	9	37282.713	16711.7
TE3873	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.8	11	37628.3	15938.598
TE3874	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.85	12	37632.655	15935.879
TE3875	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1	15	37631.496	15934.264
TE3876	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.1	13	37631.7	15934.457
TE3877	*Ficus variegata*	Moraceae	Native	Common	Tree	1.3	20	37633.919	15933.282
TE3878	*Ficus variegata*	Moraceae	Native	Common	Tree	1	18	37634.822	15932.137
TE3879	*Ficus variegata*	Moraceae	Native	Common	Tree	1.4	20	37631.989	15931.894
TE3880	*Ficus variegata*	Moraceae	Native	Common	Tree	1.4	20	36937.202	17087.276
TE3881	*Ficus variegata*	Moraceae	Native	Common	Tree	1	18	36939.4726	17086.06182
TE3882	*Ficus variegata*	Moraceae	Native	Common	Tree	1	18	36936.597	17087.416
TE3883	*Ficus variegata*	Moraceae	Native	Common	Tree	1.05	20	36964.9042	17103.86908
TE3884	*Terminalia catappa*	Combretaceae	Native	Common	Tree	2.3	14	37034.331	16969.821
TE3885	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1	11	37065.51	17109.051
TE3886	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.4	9	37067.102	17090.761
TE3887	*Terminalia catappa*	Combretaceae	Native	Common	Tree	1	12	37068	17133.43
TE3888	*Terminalia catappa*	Combretaceae	Native	Common	Tree	1.8	14	37079.82	17127.49
TE3889	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.4	15	37069.24	17120.47
TE3890	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.3	16	37067.24	17124.1
TE3891	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.9	16	37074.01	17125.13
TE3892	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	2.5	16	37065.07	17119.22
TE3893	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1	16	37069.64	17112.48
TE3894	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.1	16	37082.21	17109.27
TE3895	*Symplocos fasciculata*	Symplocaceae	Native	Vulnerable	Tree	0.3	3.5	37047.27	17100.3
TE3896	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1	10	37042.93	17106.82
TE3897	*Symplocos fasciculata*	Symplocaceae	Native	Vulnerable	Tree	0.4	6	37046.23	17102.28
TE3898	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.2	15	37040.74	17106.71

Appendix H-List and Locations of All Tree Specimens

Tag ID	Species	Family	Origin	Status	Habit	Girth/ spread (m)	Height (m)	Northing	Easting
TE3899	*Symplocos fasciculata*	Symplocaceae	Native	Vulnerable	Tree	0.3	5	37040.41	17106.37
TE3900	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1	14	37044.13	17122.97
TE3901	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1	13	37050.43	17127.2
TE3902	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.7	16	37045.23	17132.54
TE3903	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.6	12	37042.69	17130.09
TE3904	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.1	12	37044.13	17132.09
TE3905	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.2	10	37043.35	17112.28
TE3906	*Symplocos fasciculata*	Symplocaceae	Native	Vulnerable	Tree	0.6	6	37029.09	17119.85
TE3907	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.6	15	37024.78	17120.52
TE3908	*Nephelium lappaceum*	Sapindaceae	Native	Critically endangered	Tree	1	12	36999.39	17096.99
TE3909	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1	15	36996.01	17095.4
TE3910	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.1	14	36981.74	17085.68
TE3911	*Artocarpus elasticus*	Moraceae	Native	Common	Tree	1.2	10	37044.55	17096.7
TE3912	*Streblus elongatus*	Moraceae	Native	Vulnerable	Tree	0.5	15	37045.68	17085.84
TE3913	*Streblus elongatus*	Moraceae	Native	Vulnerable	Tree	0.4	13	37047.09	17048.38
TE3914	*Streblus elongatus*	Moraceae	Native	Vulnerable	Tree	0.5	13	37039.75	17019.71
TE3915	*Streblus elongatus*	Moraceae	Native	Vulnerable	Tree	0.7	14	37042.43	17031.91
TE3916	*Streblus elongatus*	Moraceae	Native	Vulnerable	Tree	0.5	14	37043.44	17033.79
TE3917	*Syzygium grande*	Myrtaceae	Native	Common	Tree	2.2	15	37045.65	17027.5
TE3918	*Streblus elongatus*	Moraceae	Native	Vulnerable	Tree	1.1	14	37056.369	17208.005
TE3919	*Streblus elongatus*	Moraceae	Native	Vulnerable	Tree	1.2	14	37055.863	17207.499
TE3920	*Streblus elongatus*	Moraceae	Native	Vulnerable	Tree	1.3	13	37056.337	17206.534
TE3921	*Streblus elongatus*	Moraceae	Native	Vulnerable	Tree	0.3	9	37043.617	17192.281
TE3922	*Streblus elongatus*	Moraceae	Native	Vulnerable	Tree	0.4	11	37044.415	17193.994
TE3923	*Streblus elongatus*	Moraceae	Native	Vulnerable	Tree	0.3	11	37039.367	17195.792
TE3924	*Rhodamnia cinerea*	Myrtaceae	Native	Common	Tree	1.7	13	36979.953	17237.816
TE3925	*Streblus elongatus*	Moraceae	Native	Vulnerable	Tree	0.4	14	37141.51	16820.61
TE3926	*Streblus elongatus*	Moraceae	Native	Vulnerable	Tree	0.3	11	37631.193	15931.675

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Tag ID	Species	Family	Origin	Status	Habit	Girth/ spread (m)	Height (m)	Northing	Easting
TE3927	*Streblus elongatus*	Moraceae	Native	Vulnerable	Tree	0.7	13	37627.534	15928.859
TE3928	*Streblus elongatus*	Moraceae	Native	Vulnerable	Tree	0.4	9	37626.832	15929.978
TE3929	*Streblus elongatus*	Moraceae	Native	Vulnerable	Tree	0.3	10	37627.741	15929.021
TE3930	*Streblus elongatus*	Moraceae	Native	Vulnerable	Tree	0.4	12	37627.136	15932.769
TE3931	*Streblus elongatus*	Moraceae	Native	Vulnerable	Tree	0.5	12	37625.019	15935.365
TE3932	*Streblus elongatus*	Moraceae	Native	Vulnerable	Tree	0.6	12	37626.204	15935.236
TE3933	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.5	13	37624.9	15937.143
TE3934	*Mangifera* cf. *indica*	Anacardiaceae	Exotic	Casual	Tree	1.2	8	37626.822	15938.066
TE3935	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1	10	37623.644	15939.097
TE3936	*Terminalia catappa*	Combretaceae	Native	Common	Tree	2.4	12	37624.552	15938.079
TE3937	*Melicope lunu-ankenda*	Rutaceae	Native	Critically Endangered	Tree	0.3	8	37625.839	15939.174
TE3938	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.4	8	37625.947	15939.466
TE3939	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1	8	37627.041	15940.052
TE3940	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.5	8	37627.991	15940.785
TE3941	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.3	8	37624.408	15941.909
TE3942	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	1.1	8	37625.568	15945.33
TE3943	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.3	8	37624.385	15946.782
TE3944	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.45	8	37625.233	15945.351
TE3945	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.3	6	37633.71	15937.32
TE3946	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.3	6	37474.615	16077.892
TE3947	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.4	8	37710.97	15832.9
TE3948	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.5	8	37708.84	15834.3
TE3949	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.4	8	37709.28	15836.73
TE3950	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.5	8	37719.79	15841.24
TE3951	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.45	8	37723.85	15845.01
TE3952	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.35	8	37722.82	15840.84
TE3953	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.5	8	37722.94	15849.86
TE3954	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.4	8	37732.48	15848.25

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Tag ID	Species	Family	Origin	Status	Habit	Girth/ spread (m)	Height (m)	Northing	Easting
TE3955	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.4	8	37807.46	15754.32
TE3956	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.4	8	37808.52	15750.25
TE3957	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.3	8	37806.47	15750.24
TE3958	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.5	8	37813.46	15740.76
TE3959	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.7	8	37785.61	15773.81
TE3960	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1	15	37769.22	15791.4
TE3961	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.2	8	37740.57	15796.92
TE3962	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.7	12	37754.07	15821.49
TE3963	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.2	10	37762.83	15821.4
TE3964	*Pterocarpus indicus*	Fabaceae	Exotic	Casual	Tree	1.7	8	37764.32	15816.24
TE3965	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	7 (Spread)	14	37660.072	15759.281
TE3966	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.3	6	37721.805	15725.198
TE3967	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.3	8	37685.786	15672.333
TE3968	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.3	6	37685.761	15673.954
TE3969	*Melicope lunu-ankenda*	Rutaceae	Native	Critically Endangered	Tree	0.7	7	37138.54	16761.69
TE3970	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.35	9	37259.33	16688.25
TE3971	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.3	8	37241.09	16705.07
TE3972	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.4	7	37235.53	16706.74
TE3973	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.4	8	37231.54	16727.23
TE3974	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.35	6	37222.31	16725.06
TE3975	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.3	7	37995.72	15960.89
TE3976	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.7	7	37996.9	15967.84
TE3977	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.4	5	37999.47	15966.22
TE3978	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	15 (Spread)	28	37987.64	15997.44
TE3979	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.3	4	37969.85	16031.18
TE3980	*Melicope lunu-ankenda*	Rutaceae	Native	Critically Endangered	Tree	0.7	11	37927.84	15875.7

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Tag ID	Species	Family	Origin	Status	Habit	Girth/ spread (m)	Height (m)	Northing	Easting
TE3981	*Melicope lunu-ankenda*	Rutaceae	Native	Critically Endangered	Tree	1.6	12	37928.93	15873.39
TE3982	*Melicope lunu-ankenda*	Rutaceae	Native	Critically Endangered	Tree	0.7	11	37744.962	14929.157
TE3983	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.4	8	37927.74	15820
TE3984	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.35	9	37935.96	15809.61
TE3985	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	2.8	9	37925.83	15800.62
TE3986	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.3	10	37925.33	15796.23
TE3987	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.35	6	37929.93	15793.49
TE3988	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.35	9	37925.31	15801.4
TE3989	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	1	8	37930.85	15796.61
TE3990	*Ficus fistulosa*	Moraceae	Native	Common	Tree	1	10	37843.37	15973
TE3991	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.55	8	37699.01	15863.85
TE3992	*Ficus variegata*	Moraceae	Native	Common	Tree	1.5	11	37700.89	15862.96
TE3993	*Eurya acuminata*	Pentaphylacaceae	Native	Common	Tree	0.5	7	37705.92	15869.81
TE3994	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.8	15	37711.3	15864.1
TE3995	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.3	4	37801.83	15956.27
TE3996	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.3	4	37813.05	15956.72
TE3997	*Vitex pinnata*	Lamiaceae	Native	Common	Tree	1	13	37815.63	15958.74
TE3998	*Ficus variegata*	Moraceae	Native	Common	Tree	1.35	11	37818.32	15956.85
TE3999	*Pterocarpus indicus*	Fabaceae	Exotic	Casual	Tree	6	18	37826.44	15960.52
TE4000	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	6	7	37824.36	15960.85
TE4001	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	5	8	37824.52	15963.9
TE4002	*Terminalia catappa*	Combretaceae	Native	Common	Tree	1.1	5	37829.87	15964.01
TE4003	*Ficus benjamina*	Moraceae	Cryptogenic	-	Strangler	2.4	16	37831.42	15965.9
TE4004	*Dimocarpus longan subsp. malesianus*	Sapindaceae	Exotic	Casual	Tree	1.65	12	37419.969	16292.205

Appendix H-List and Locations of All Tree Specimens

Tag ID	Species	Family	Origin	Status	Habit	Girth/ spread (m)	Height (m)	Northing	Easting
TE4005	*Nephelium lappaceum*	Sapindaceae	Native	Critically endangered	Tree	1.4	10	36968.851	17110.652
TE4006	*Durio zibethinus*	Malvaceae	Exotic	Casual	Tree	1	13	37034.057	16977.59
TE4007	*Terminalia catappa*	Combretaceae	Native	Common	Tree	1.1	15	37083.856	16784.204
TE4008	*Ficus benjamina*	Moraceae	Cryptogenic	-	Strangler	1.65	9	37086.968	16780.308
TE4009	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	2	9	37200.3	17119.15
TE4010	*Ficus variegata*	Moraceae	Native	Common	Tree	1.7	15	37142.09	16808.39
TE4011	*Syzygium grande*	Myrtaceae	Native	Common	Tree	4	16	37133.792	16765.11
TE4012	*Streblus elongatus*	Moraceae	Native	Vulnerable	Tree	0.3	8	37285.154	16591.66
TE4013	*Streblus elongatus*	Moraceae	Native	Vulnerable	Tree	0.4	6	37326.575	16501.038
TE4014	*Streblus elongatus*	Moraceae	Native	Vulnerable	Tree	0.5	9	37300.31	16517.936
TE4015	*Streblus elongatus*	Moraceae	Native	Vulnerable	Tree	0.4	9	37365.186	16394.113
TE4016	*Streblus elongatus*	Moraceae	Native	Vulnerable	Tree	0.6	10	37384.296	16391.196
TE4017	*Streblus elongatus*	Moraceae	Native	Vulnerable	Tree	0.4	7	37368.135	16365.2
TE4018	*Streblus elongatus*	Moraceae	Native	Vulnerable	Tree	0.35	7	37365.514	16361.229
TE4019	*Streblus elongatus*	Moraceae	Native	Vulnerable	Tree	0.35	6	37359.722	16318.281
TE4020	*Streblus elongatus*	Moraceae	Native	Vulnerable	Tree	0.5	10	37014.789	17255.897
TE4021	*Melicope* cf. *lunu-ankenda*	Rutaceae	Native	Critically Endangered	Tree	1.4	14	38047.286	15841.193
TE4022	*Vitex pinnata*	Lamiaceae	Native	Common	Tree	1.6	11	37572.24	15483.07
TE4023	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1	8	38264.735	14233.125
TE4024	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.4	3	37423.723	16267.902
TE4025	*Vitex pinnata*	Lamiaceae	Native	Common	Tree	1.2	10	37075.953	16790.237
TE4026	*Vitex pinnata*	Lamiaceae	Native	Common	Tree	1.5	10	37105.062	16794.371
TE4027	*Syzygium grande*	Myrtaceae	Native	Common	Tree	1.3	16	38012.108	15939.202
TE4028	*Streblus elongatus*	Moraceae	Native	Vulnerable	Tree	0.6	10	37197.73	16792.58
TE4029	*Streblus elongatus*	Moraceae	Native	Vulnerable	Tree	0.5	9	37906.876	15809.587
TE4030	*Streblus elongatus*	Moraceae	Native	Vulnerable	Tree	0.45	10	37916.113	15825.936

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Tag ID	Species	Family	Origin	Status	Habit	Girth/ spread (m)	Height (m)	Northing	Easting
TE4031	*Streblus elongatus*	Moraceae	Native	Vulnerable	Tree	0.65	14	37915.363	15826.51
TE4032	*Streblus elongatus*	Moraceae	Native	Vulnerable	Tree	0.55	13	37912.825	15825.621
TE4033	*Syzygium grande*	Myrtaceae	Native	Common	Tree	2.1	16	37120.77	16842.97
TE4034	*Streblus elongatus*	Moraceae	Native	Vulnerable	Tree	0.3	9	37723.03	15832.16
TE4035	*Streblus elongatus*	Moraceae	Native	Vulnerable	Tree	0.35	10	37784.79	15756.52
TE4036	*Melicope lunu-ankenda*	Rutaceae	Native	Critically Endangered	Tree	0.4	9	37782.62	15757.68
TE4037	*Streblus elongatus*	Moraceae	Native	Vulnerable	Tree	0.45	12	37787.56	15754.85
TE4038	*Streblus elongatus*	Moraceae	Native	Vulnerable	Tree	1.9	16	37205.83	16816.25
TE4039	*Terminalia catappa*	Combretaceae	Native	Common	Tree	1.8	13	37981.78	16025.43
TE4040	*Ficus benjamina*	Moraceae	Cryptogenic	-	Strangler	1.1	11	37805.35	15959.21
TE4041	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	5	10	36933.64	17065.71
TE4042	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	8	10	36928.71	17058.46
TE4043	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.3	13	36899.85	17011.91
TE4044	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.7	10	37113.18	16777.908
TE4045	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.8	10	37105.201	16790.303
TE4046	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.8	15	37164.84	16752.397
TE4047	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.4	13	37350.542	16442.894
TE4048	*Pterocarpus indicus*	Fabaceae	Exotic	Casual	Tree	4.5	18	37378.748	16397.946
TE4049	*Pterocarpus indicus*	Fabaceae	Exotic	Casual	Tree	3.8	18	37380.005	16397.824
TE4050	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1	10	37057.741	16971.045
TE4051	*Pterocarpus indicus*	Fabaceae	Exotic	Casual	Tree	3.8	12	37050.064	16969.338
TE4052	*Samanea saman*	Fabaceae	Exotic	Casual	Tree	1.6	18	37158.07	16862.88
TE4053	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.5	10	37095.5	16841.35
TE4054	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.4	10	38051.23	15880.539
TE4055	*Ficus variegata*	Moraceae	Native	Common	Tree	1.2	13	38041.078	15878.004
TE4056	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.3	9	38034.518	15981.738

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Tag ID	Species	Family	Origin	Status	Habit	Girth/ spread (m)	Height (m)	Northing	Easting
TE4057	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.5	10	38035.888	15989.183
TE4058	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.4	9	38046.354	16009.613
TE4059	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1	10	38046.837	16011.955
TE4060	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1	10	38045.934	16017.994
TE4061	*Dacryodes* cf. *costata*	Burseraceae	Native	Endangered	Tree	1.1	15	38044.045	16026.082
TE4062	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1	11	38035.76	16007.59
TE4063	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1	12	38037.32	16044.37
TE4064	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.4	12	38092.042	14396.153
TE4065	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.1	12	38090.856	14408.549
TE4066	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1	10	38260.865	14241.026
TE4067	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.2	12	37447.377	16265.666
TE4068	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.4	12	36603.24	17229.37
TE4069	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.7	12	36617.66	17222.92
TE4070	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2	15	36626.97	17204.83
TE4071	*Samanea saman*	Fabaceae	Exotic	Casual	Tree	2.2	15	36634.16	17205.6
TE4072	*Samanea saman*	Fabaceae	Exotic	Casual	Tree	2.6	15	36642.83	17199.8
TE4073	*Samanea saman*	Fabaceae	Exotic	Casual	Tree	2.3	15	36650.78	17201.15
TE4074	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.4	10	36658.23	17196.91
TE4075	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.3	15	36677.82	17193.55
TE4076	*Samanea saman*	Fabaceae	Exotic	Casual	Tree	2	18	36680.44	17186.65
TE4077	*Samanea saman*	Fabaceae	Exotic	Casual	Tree	2.4	15	36687.4	17183.27
TE4078	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	4	15	36699.72	17188.03
TE4079	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.4	13	36699.02	17180.75
TE4080	*Terminalia catappa*	Combretaceae	Native	Common	Tree	1.2	15	36713.71	17184.66
TE4081	*Ficus benjamina*	Moraceae	Cryptogenic	-	Strangler	2.1	15	36718.17	17178.54
TE4082	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1	15	36741.25	17157.4
TE4083	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.4	15	36745.67	17161.55

Tag ID	Species	Family	Origin	Status	Habit	Girth/ spread (m)	Height (m)	Northing	Easting
TE4084	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	6	18	36716.53	17154.61
TE4085	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1	15	36711.08	17158.47
TE4086	*Ficus benjamina*	Moraceae	Cryptogenic	-	Strangler	1.3	15	36700.83	17158.18
TE4087	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	2	15	36693.42	17160.07
TE4088	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	5	10	36693.6	17171.28
TE4089	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2	15	36687.24	17172.84
TE4090	*Terminalia catappa*	Combretaceae	Native	Common	Tree	1.2	10	36646	17183
TE4091	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	15	20	36632.22	17196.36
TE4092	*Terminalia catappa*	Combretaceae	Native	Common	Tree	1.8	20	36615.54	17205.82
TE4093	*Claoxylon indicum*	Euphorbiaceae	Native	Common	Tree	1	15	36612.73	17195.29
TE4094	*Samanea saman*	Fabaceae	Exotic	Casual	Tree	1.3	15	36690.2	17140.91
TE4095	*Samanea saman*	Fabaceae	Exotic	Casual	Tree	1.8	15	36710.47	17131.9
TE4096	*Terminalia catappa*	Combretaceae	Native	Common	Tree	1	13	36731.94	17113.18
TE4097	*Terminalia catappa*	Combretaceae	Native	Common	Tree	1	13	36740.06	17122.64
TE4098	*Samanea saman*	Fabaceae	Exotic	Casual	Tree	2	13	36772.41	17107.37
TE4099	*Samanea saman*	Fabaceae	Exotic	Casual	Tree	2.5	18	36756.06	17128.42
TE4100	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.05	15	36778.29	17124.93
TE4101	*Hopea odorata*	Dipterocarpacea e	Exotic	Cultivated Only	Tree	1	13	36771.61	17136.57
TE4102	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.1	15	36773.9	17122.05
TE4103	*Khaya senegalensis*	Meliaceae	Exotic	Cultivated Only	Tree	2.7	20	36792.44	17122.05
TE4104	*Khaya senegalensis*	Meliaceae	Exotic	Cultivated Only	Tree	1.55	15	36791.94	17108.47
TE4105	*Khaya senegalensis*	Meliaceae	Exotic	Cultivated Only	Tree	1.4	15	36810.48	17110.37
TE4106	*Samanea saman*	Fabaceae	Exotic	Casual	Tree	2.2	13	36833.69	17094.15
TE4107	*Khaya senegalensis*	Meliaceae	Exotic	Cultivated Only	Tree	2.8	22	36824.14	17086.88
TE4108	*Khaya senegalensis*	Meliaceae	Exotic	Cultivated Only	Tree	2.1	20	36825.46	17088.96

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Tag ID	Species	Family	Origin	Status	Habit	Girth/ spread (m)	Height (m)	Northing	Easting
TE4109	*Khaya senegalensis*	Meliaceae	Exotic	Cultivated Only	Tree	2.2	20	36844	17061.93
TE4110	*Khaya senegalensis*	Meliaceae	Exotic	Cultivated Only	Tree	1.9	18	37417.371	16164.667
TE4111	*Pterocarpus indicus*	Fabaceae	Exotic	Casual	Tree	3.7	20	37347.23	16328.58
TE4112	*Samanea saman*	Fabaceae	Exotic	Casual	Tree	1.7	14	37350.37	16305.03
TE4113	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.9	10	37354.32	16285.12
TE4114	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.7	12	37368.23	16233.32
TE4115	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.45	12	37377.05	16239.37
TE4116	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.1	12	37375.24	16212.17
TE4117	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.9	13	37396.47	16182.92
TE4118	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.2	10	37398.8	16175.65
TE4119	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.6	13	37403.93	16162.98
TE4120	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.4	13	37415.61	16142.36
TE4121	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.3	12	37420.54	16127.75
TE4122	*Planchonella obovata*	Sapotaceae	Native	Vulnerable	Tree	0.5	10	37435.22	16093.34
TE4123	*Terminalia catappa*	Combretaceae	Native	Common	Tree	1.2	15	37437.1	16086.35
TE4124	*Terminalia catappa*	Combretaceae	Native	Common	Tree	1.1	15	37442.89	16073.37
TE4125	*Terminalia catappa*	Combretaceae	Native	Common	Tree	1.55	9	37446.22	16062.94
TE4126	*Terminalia catappa*	Combretaceae	Native	Common	Tree	1.7	13	37458.41	16034.58
TE4127	*Vitex pinnata*	Lamiaceae	Native	Common	Tree	1.1	11	37467.59	16008.5
TE4128	*Vitex pinnata*	Lamiaceae	Native	Common	Tree	1	13	37461.44	16007.29
TE4129	*Terminalia catappa*	Combretaceae	Native	Common	Tree	1.6	13	37470.99	16008.45
TE4130	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.6	12	37560.35	15381.18

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Tag ID	Species	Family	Origin	Status	Habit	Girth/ spread (m)	Height (m)	Northing	Easting
TE4131	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.7	13	37566.74	15419.44
TE4132	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.7	13	37561.13	15444.73
TE4133	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.8	13	37567.03	15470.41
TE4134	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.9	13	37553.95	15470.45
TE4135	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.8	13	37551.99	15494.76
TE4136	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	2.2	13	37554.23	15515.07
TE4137	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1	10	37555.04	15527.44
TE4138	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.25	10	37558.33	15328.98
TE4139	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.15	10	37553.71	15368.41
TE4140	*Melicope* cf. *lunu-ankenda*	Rutaceae	Native	Critically Endangered	Tree	0.3	6	37553.09	15374.61
TE4141	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.6	8	37553.85	15413.06
TE4142	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.6	8	37559.65	15414.53
TE4143	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.5	8	37548.83	15450.79
TE4144	*Melicope* cf. *lunu-ankenda*	Rutaceae	Native	Critically Endangered	Tree	0.3	8	37546.92	15457.57
TE4145	*Melicope* cf. *lunu-ankenda*	Rutaceae	Native	Critically Endangered	Tree	0.45	8	37548.57	15470.16
TE4146	*Melicope* cf. *lunu-ankenda*	Rutaceae	Native	Critically Endangered	Tree	0.35	8	37547.41	15476.82
TE4147	*Adenanthera pavonina*	Fabaceae	Exotic	Naturalised	Tree	1.1	12	37548.41	15489.39
TE4148	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	10	15	37541.38	15508.71

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Tag ID	Species	Family	Origin	Status	Habit	Girth/ spread (m)	Height (m)	Northing	Easting
TE4149	*Samanea saman*	Fabaceae	Exotic	Casual	Tree	1.4	14	37541.86	15514.99
TE4150	*Samanea saman*	Fabaceae	Exotic	Casual	Tree	1.4	7	37541.12	15527.83
TE4151	*Samanea saman*	Fabaceae	Exotic	Casual	Tree	1.9	16	37541.89	15534.11
TE4152	*Pterocarpus indicus*	Fabaceae	Exotic	Casual	Tree	2	16	37541.89	15546.86
TE4153	*Pterocarpus indicus*	Fabaceae	Exotic	Casual	Tree	3	16	37534.36	15553.26
TE4154	*Pterocarpus indicus*	Fabaceae	Exotic	Casual	Tree	1.9	15	37534.53	15559.68
TE4155	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.1	13	37534.59	15611.04
TE4156	*Mangifera indica*	Anacardiaceae	Exotic	Casual	Tree	2.2	15	37527.85	15667.97
TE4157	*Artocarpus heterophyllus*	Moraceae	Exotic	Casual	Tree	1	12	37528.48	15693.62
TE4158	*Nephelium lappaceum*	Sapindaceae	Native	Critically endangered	Tree	1.4	10	37529.78	15705.89
TE4159	*Nephelium lappaceum*	Sapindaceae	Native	Critically endangered	Tree	1.2	7	37529.82	15712.22
TE4160	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.1	12	37521.97	15719.11
TE4161	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.5	10	37527.35	15737.84
TE4162	*Pterocarpus indicus*	Fabaceae	Exotic	Casual	Tree	2.3	15	37521.79	15770.08
TE4163	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.1	10	37514.85	15782.59
TE4164	*Vitex pinnata*	Lamiaceae	Native	Common	Tree	1	9	37515.07	15795.46
TE4165	*Syzygium polyanthum*	Myrtaceae	Native	Vulnerable	Tree	1.4	14	37521.98	15808.38
TE4166	*Syzygium polyanthum*	Myrtaceae	Native	Vulnerable	Tree	1.3	14	37516.45	15814.69
TE4167	*Vitex pinnata*	Lamiaceae	Native	Common	Tree	1.3	12	37515.91	15821.15
TE4168	*Melicope* cf. *lunu-ankenda*	Rutaceae	Native	Critically Endangered	Tree	1	12	37510.26	15833.77
TE4169	*Vitex pinnata*	Lamiaceae	Native	Common	Tree	1	12	37510.37	15859.22
TE4170	*Vitex pinnata*	Lamiaceae	Native	Common	Tree	1	11	37502.86	15865.75
TE4171	*Vitex pinnata*	Lamiaceae	Native	Common	Tree	1	10	37502.7	15884.84
TE4172	*Ficus variegata*	Moraceae	Native	Common	Tree	1	12	37498.1	15890.79
TE4173	*Vitex pinnata*	Lamiaceae	Native	Common	Tree	1.1	12	37497.56	15897.54
TE4174	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.4	8	37490.37	15923.16

Tag ID	Species	Family	Origin	Status	Habit	Girth/ spread (m)	Height (m)	Northing	Easting
TE4175	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.6	9	37484	15935.91
TE4176	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.8	9	37484.46	15942.29
TE4177	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.3	7	37485.12	15948.44
TE4178	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.3	7	37477.1	15954.88
TE4179	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.4	8	37485.23	15954.74
TE4180	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.45	8	37475.51	15996.81
TE4181	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.3	6	37476.46	15973.61
TE4182	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.35	7	37476.97	15967.58
TE4183	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.5	7	36944.71	16939.41
TE4184	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.3	6	36940.1	16936.54
TE4185	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.3	6	37417.92	16205.94
TE4186	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	1.2	11	37206.113	17168.062
TE4187	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	1.5	10	37205.867	17159.209
TE4188	*Durio zibethinus*	Malvaceae	Exotic	Casual	Tree	1.05	14	36969.989	16884.533
TE4189	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.8	10	36975.277	16889.061
TE4190	*Nephelium lappaceum*	Sapindaceae	Native	Critically endangered	Tree	1.3	12	36993.596	16866.572
TE4191	*Nephelium lappaceum*	Sapindaceae	Native	Critically endangered	Tree	1	12	37018.221	16882.759
TE4192	*Nephelium lappaceum*	Sapindaceae	Native	Critically endangered	Tree	1.7	14	37355.316	16339.757
TE4193	*Durio zibethinus*	Malvaceae	Exotic	Casual	Tree	1	12	37356.394	16326.982

Tag ID	Species	Family	Origin	Status	Habit	Girth/ spread (m)	Height (m)	Northing	Easting
TE4194	*Nephelium lappaceum*	Sapindaceae	Native	Critically endangered	Tree	1.1	11	37370.164	16259.7
TE4195	*Nephelium lappaceum*	Sapindaceae	Native	Critically endangered	Tree	1.1	9	37464.655	16079.661
TE4196	*Nephelium lappaceum*	Sapindaceae	Native	Critically endangered	Tree	1	10	37622.93	15844.313
TE4197	*Syzygium malaccense*	Myrtaceae	Exotic	Casual	Tree	1.4	12	37270.13	16622.64
TE4198	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.3	8	37281.59	16606.3
TE4199	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.5	8	37311.64	16650.77
TE4200	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.3	9	37240.68	16538.16
TE4201	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	10	20	38038.164	15839.106
TE4202	*Ficus variegata*	Moraceae	Native	Common	Tree	2	20	38036.517	15852.891
TE4203	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	10	20	38035.005	15854.748
TE4204	*Nephelium lappaceum*	Sapindaceae	Native	Critically endangered	Tree	1	18	38059.661	15925.793
TE4205	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	6	20	37620.639	15844.819
TE4206	*Baccaurea motleyana*	Phyllanthaceae	Native	Critically Endangered	Tree	1	14	37628.749	15837.506
TE4207	*Vitex pinnata*	Lamiaceae	Native	Common	Tree	1.1	15	37629.931	15835.867
TE4208	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.2	16	37631.791	15836.807
TE4209	*Nephelium lappaceum*	Sapindaceae	Native	Critically endangered	Tree	1	20	37635.726	15833.714
TE4210	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	6	15	38033.69	16108.78
TE4211	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	2.2	13	37564.95	15399.51
TE4212	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.4	13	37571.22	15469.58
TE4213	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	12	20	37578.83	15457.65
TE4214	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	8	20	38274.025	14218.769

Appendix H-List and Locations of All Tree Specimens

Tag ID	Species	Family	Origin	Status	Habit	Girth/ spread (m)	Height (m)	Northing	Easting
TE4215	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.5	11	37419.016	16305.741
TE4216	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.5	13	37422.448	16307.107
TE4217	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.3	13	37025.349	16995.281
TE4218	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.3	11	37179.08	16828.78
TE4219	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.3	9	36658.11	17177.59
TE4220	*Melicope lunu-ankenda*	Rutaceae	Native	Critically Endangered	Tree	0.6	10	36642.61	17163.3
TE4221	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.3	6	36664.03	17148.89
TE4222	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.5	8	36845.41	17049.47
TE4223	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.6	8	36890.72	17036.38
TE4224	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.4	8	36871.96	17009.95
TE4225	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	1.2	10	36904.18	16975.17
TE4226	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.6	12	36928.3	16904.35
TE4227	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	1.2	12	36886.72	17084.48
TE4228	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.3	8	36887.47	17084.14
TE4229	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	1	6	36884.53	17073.07
TE4230	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.4	12	36879.47	17073.13
TE4231	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.4	10	36889.35	17067.87
TE4232	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.8	10	36883.6	17076.11

Appendix H-List and Locations of All Tree Specimens

Tag ID	Species	Family	Origin	Status	Habit	Girth/ spread (m)	Height (m)	Northing	Easting
TE4233	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.3	8	36886.22	17079.96
TE4234	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.7	9	36980.38	17181.42
TE4235	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.6	9	36987.87	17179.83
TE4236	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	1.3	8	36980.396	16858.159
TE4237	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.7	10	37486.176	16212.272
TE4238	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	8	15	37288.41	16656.36
TE4239	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.6	6	37212.79	16579.75
TE4240	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.5	8	37216.17	16580.35
TE4241	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.3	8	37216.17	16580.35
TE4242	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2	16	37233.08	16585.65
TE4243	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.1	16	37244.38	16578.94
TE4244	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.2	8	37478.334	16215.123
TE4245	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.2	11	37480.862	16216.413
TE4246	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.8	16	37485.175	16218.614
TE4247	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.6	16	37483.792	16209.241
TE4248	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.5	14	37171.97	16593.75
TE4249	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.1	16	37346.22	16356.67
TE4250	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.3	16	37986.922	15857.676
TE4251	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.8	12	37985.49	15856.723
TE4252	Durio zibethinus	Malvaceae	Exotic	Casual	Tree	1.1	13	37992.017	15862.148
TE4253	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.1	16	37458.37	16234.72
TE4254	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.3	17	36938.83	17056.31
TE4255	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.9	17	37173.05	16845.03
TE4256	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.6	17	37172.36	16837.63
TE4257	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.9	15	37172.66	16836.84

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Tag ID	Species	Family	Origin	Status	Habit	Girth/ spread (m)	Height (m)	Northing	Easting
TE4258	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.1	15	37174.76	16835.09
TE4259	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.2	12	37175.43	16838.37
TE4260	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.8	15	37181.26	16837.04
TE4261	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.5	12	37184.23	16832.04
TE4262	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.6	15	37186.06	16835.02
TE4263	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.4	16	37181.43	16831.9
TE4264	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.1	15	37177.36	16829.56
TE4265	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.8	14	37179.87	16831.31
TE4266	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.3	15	37175.42	16831.8
TE4267	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.1	14	37172.51	16832.33
TE4268	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.7	14	37171.09	16830.51
TE4269	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.8	16	37165.93	16820.81
TE4270	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.6	12	37167.84	16829.23
TE4271	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.2	16	37168.81	16833.31
TE4272	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.4	12	37171.41	16837.31
TE4273	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2	15	37159.49	16829.77
TE4274	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.5	15	37199.36	16809.3
TE4275	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.9	14	37203.7	16812.93
TE4276	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.3	16	37202.96	16809.43
TE4277	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.5	5	37205.15	16812.95
TE4278	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.8	7	37214.26	16810.17
TE4279	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.9	15	37206.83	16809.41
TE4280	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.1	15	37208.88	16805.4
TE4281	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.1	13	37206.71	16809.58
TE4282	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.8	14	37202.49	16802.06
TE4283	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.1	14	37178.16	16816.29
TE4284	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.5	14	37179.05	16816.5
TE4285	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2	14	37187.27	16815.47

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Tag ID	Species	Family	Origin	Status	Habit	Girth/ spread (m)	Height (m)	Northing	Easting
TE4286	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.8	15	37188.12	16812.91
TE4287	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.7	15	37195.91	16806.32
TE4288	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.4	14	37204.56	16811.01
TE4289	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.7	8	37204.65	16817.43
TE4290	Artocarpus integer	Moraceae	Exotic	Casual	Tree	1.4	14	37205.62	16813.46
TE4291	Artocarpus integer	Moraceae	Exotic	Casual	Tree	1.2	14	37198.56	16818.38
TE4292	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1	14	37144.82	16873.11
TE4293	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.25	14	37144.98	16869.65
TE4294	*Nephelium lappaceum*	Sapindaceae	Native	Critically endangered	Tree	1.25	16	37132.06	16871
TE4295	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.5	16	37152.95	16872.02
TE4296	*Nephelium lappaceum*	Sapindaceae	Native	Critically endangered	Tree	1.8	16	37566.14	15342.86
TE4297	*Vitex pinnata*	Lamiaceae	Native	Common	Tree	1.1	16	37566.19	15349.25
TE4298	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.5	16	37565.62	15349.04
TE4299	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.5	13	37564.94	15354.86
TE4300	*Pterocarpus indicus*	Fabaceae	Exotic	Casual	Tree	5.4	18	36952.12	16932.97
TE4301	*Pterocarpus indicus*	Fabaceae	Exotic	Casual	Tree	4.2	18	36956.49	16921
TE4302	*Pterocarpus indicus*	Fabaceae	Exotic	Casual	Tree	2.3	18	36947.1	16922.31
TE4303	*Pterocarpus indicus*	Fabaceae	Exotic	Casual	Tree	2.7	18	36957.42	16913.54
TE4304	*Pterocarpus indicus*	Fabaceae	Exotic	Casual	Tree	4.3	18	37006.14	16950.32
TE4305	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	8	15	37152.138	17175.058
TE4306	*Vitex pinnata*	Lamiaceae	Native	Common	Tree	1.5	10	37001.691	16911.808
TE4307	*Adenanthera pavonina*	Fabaceae	Exotic	Naturalised	Tree	1.2	10	37002.861	16906.332
TE4308	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.55	9	37154.064	16790.655
TE4308A	*Adenanthera pavonina*	Fabaceae	Exotic	Naturalised	Tree	1.2	8	37144.656	16736.695
TE4309	*Adenanthera pavonina*	Fabaceae	Exotic	Naturalised	Tree	1.2	12	37363.181	16333.132
TE4309A	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.4	8	37058.473	16998.243

Tag ID	Species	Family	Origin	Status	Habit	Girth/ spread (m)	Height (m)	Northing	Easting
TE4309B	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.3	5	37058.985	17046.723
TE4310	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.8	8	37061.29	17029.994
TE4311	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.3	5	37049.29	17078.38
TE4312	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.35	6	37177.19	16838.74
TE4313	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.4	6	37204.54	16804.33
TE4314	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.55	6	37160.97	16797.32
TE4315	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.35	6	37205.88	16810.62
TE4316	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.6	7	37539.11	15902.48
TE4317	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.75	6	37508.11	15859.19
TE4318	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.4	5	36918.73	17037.03
TE4319	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.6	6	37041.21	17043.3
TE4320	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.45	6	38043.666	16039.119
TE4321	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	3.1	9	36934.529	17097.121
TE4321A	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.4	7	37014.338	17246.683
TE4322	*Vitex pinnata*	Lamiaceae	Native	Common	Tree	1	10	38021.681	15950.49
TE4323	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.5	9	38019.546	15945.41
TE4324	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	5	14	37062.819	16805.034
TE4325	*Pterocarpus indicus*	Fabaceae	Exotic	Casual	Tree	3.8	13	37056.28	16785.116
TE4326	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.3	6	37107.352	16778.563

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Tag ID	Species	Family	Origin	Status	Habit	Girth/ spread (m)	Height (m)	Northing	Easting
TE4327	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	2.2	9	37110.983	16752.676
TE4328	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.7	10	37111.218	16751.661
TE4329	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.7	10	37112.148	16750.384
TE4330	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.5	9	37117.219	16741.339
TE4331	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.9	8	37138.965	16739.275
TE4332	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.5	6	37123.252	16730.499
TE4333	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	1.7	7	37119.432	16724.553
TE4333A	*Terminalia catappa*	Combretaceae	Native	Common	Tree	1.2	12	37116.956	16702.33
TE4334	*Terminalia catappa*	Combretaceae	Native	Common	Tree	1	14	37118.846	16698.134
TE4335	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.3	8	37120.743	16695.425
TE4336	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.2	13	37127.812	16688.1
TE4337	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2	13	37128.589	16683.697
TE4338	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.8	13	37124.241	16681.91
TE4339	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.9	16	37124.428	16683.363
TE4340	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.35	7	37120.142	16687.978
TE4341	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2	15	37109.011	16677.375
TE4342	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	3	14	37103.615	16684.382
TE4343	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.4	13	37093.24	16720.645
TE4344	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.7	16	37089.671	16732.38
TE4345	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2	16	37094.343	16733.245
TE4346	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.2	16	37081.312	16740.623
TE4347	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.4	15	37078.967	16738.634
TE4348	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.1	8	37316.031	16692.31
TE4349	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.2	10	37365.993	16659.16
TE4350	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.4	16	37247.82	16644.1

Tag ID	Species	Family	Origin	Status	Habit	Girth/ spread (m)	Height (m)	Northing	Easting
TE4351	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.2	16	37240.76	16655.73
TE4352	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.45	15	37241.62	16644.5
TE4353	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.7	16	37270.13	16648.14
TE4354	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2	15	37270.13	16641.76
TE4355	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.7	12	37288.03	16643.74
TE4356	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2	16	37149.35	16681.11
TE4357	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.8	12	37146.18	16686.81
TE4358	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.6	14	37155.09	16662.82
TE4359	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.2	15	37168.3	16656.46
TE4360	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.2	10	37173.72	16652.66
TE4361	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.5	11	37177.98	16643.15
TE4362	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.1	15	37190.67	16620.41
TE4363	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.2	8	37206.93	16617.94
TE4364	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1	6	37212.59	16605.8
TE4365	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.9	14	37203.52	16604.94
TE4366	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.8	16	37209.95	16603.63
TE4367	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.7	15	37222.51	16586.72
TE4368	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.1	15	37226.41	16573.29
TE4369	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.7	15	37235.24	16587.28
TE4370	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.5	15	37266.9	16604.95
TE4371	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.3	15	37267.16	16612.02
TE4372	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.2	14	37253.84	16642.21
TE4373	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.6	19	37222.58	16612.27
TE4374	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.6	16	37115.86	16668.56
TE4375	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.45	14	37132.57	16659.55
TE4376	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.6	16	38219.513	14248.763
TE4377	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.55	16	38225.299	14242.836
TE4378	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.9	18	38228.457	14235.57

Appendix H-List and Locations of All Tree Specimens

Tag ID	Species	Family	Origin	Status	Habit	Girth/ spread (m)	Height (m)	Northing	Easting
TE4379	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.7	16	38235.381	14236.041
TE4380	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.4	16	38236.326	14227.624
TE4381	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.25	15	38242.538	14230.492
TE4382	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2	18	38209.376	14260.57
TE4383	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.4	10	38201.837	14256.038
TE4384	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.2	5	38192.213	14254.973
TE4385	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.5	16	38185.556	14264.814
TE4386	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.4	16	38194.122	14272.21
TE4387	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.6	16	38177.321	14290.13
TE4388	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.6	14	38172.923	14278.122
TE4389	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2	15	38178.582	14271.42
TE4390	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.8	15	38166.8	14296.221
TE4391	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2	14	38172.823	14297.056
TE4392	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.1	15	38158.297	14297.25
TE4393	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2	15	38151.946	14313.147
TE4394	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.3	13	38161.15	14313.507
TE4395	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.6	12	38186.309	14279.965
TE4396	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2	16	38174.979	14284.775
TE4397	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.7	16	38142.983	14317.182
TE4398	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.7	16	38138.126	14319.883
TE4399	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.8	16	38148.707	14324.071
TE4402	*Syzygium glaucum*	Myrtaceae	Native	Vulnerable	Tree	0.4	6	38146.77	14329.771
TE4403	*Syzygium glaucum*	Myrtaceae	Native	Vulnerable	Tree	0.5	9	38139.006	14325.953
TE4404	*Syzygium glaucum*	Myrtaceae	Native	Vulnerable	Tree	0.5	9	38125.165	14334.065
TE4405	*Syzygium glaucum*	Myrtaceae	Native	Vulnerable	Tree	0.55	10	38110.737	14361.655
TE4408	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.05	10	38102.7	14361.33
TE4409	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1	11	38099.927	14353.026
TE4410	*Pterocarpus indicus*	Fabaceae	Exotic	Casual	Tree	4.9	25	38089.805	14365.317

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Tag ID	Species	Family	Origin	Status	Habit	Girth/ spread (m)	Height (m)	Northing	Easting
TE4411	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.6	13	38103.753	14366.582
TE4412	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1	14	38097.563	14372.244
TE4413	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.9	13	37767.028	14753.252
TE4414	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.5	18	37759.809	14751.438
TE4415	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.8	15	37766.919	14745.972
TE4416	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.2	14	37766.144	14735.284
TE4417	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1	14	37772.141	14745.543
TE4418	*Mangifera indica*	Anacardiaceae	Exotic	Casual	Tree	1.6	18	37775.754	14741.581
TE4419	*Pterocarpus indicus*	Fabaceae	Exotic	Casual	Tree	4.8	25	37772.278	14735.564
TE4420	*Pterocarpus indicus*	Fabaceae	Exotic	Casual	Tree	4.1	25	37769.25	14728.773
TE4421	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.6	25	37780.085	14735.704
TE4424	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.1	14	37781.965	14728.136
TE4425	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.4	15	37775.173	14732.97
TE4426	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.1	10	37789.984	14722.592
TE4427	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.3	10	37794.451	14721.129
TE4428	*Diospyros malabarica*	Ebenaceae	Exotic	Cultivated Only	Tree	1.3	12	37795.582	14709.702
TE4429	*Diospyros malabarica*	Ebenaceae	Exotic	Cultivated Only	Tree	1.3	12	37800.478	14713.767
TE4430	*Diospyros malabarica*	Ebenaceae	Exotic	Cultivated Only	Tree	1	12	37796.459	14705.877
TE4431	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.8	12	37791.558	14705.453
TE4432	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.2	12	37801.588	14709.695

Tag ID	Species	Family	Origin	Status	Habit	Girth/ spread (m)	Height (m)	Northing	Easting
TE4433	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.2	7	37810.898	14701.294
TE4434	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1	12	37814.095	14698.049
TE4435	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.1	12	37804.195	14692.586
TE4436	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.2	10	37809.723	14690.439
TE4437	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.6	13	37815.777	14686.145
TE4438	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.3	11	37818.154	14693.006
TE4439	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1	9	37820.796	14678.975
TE4440	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.1	10	37825.073	14674.826
TE4441	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.1	10	37833.585	14674.449
TE4442	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.3	12	37845.315	14671.035
TE4443	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	2.4	15	37829.158	14668.62
TE4444	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.1	11	37822.327	14666.027
TE4445	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.3	14	37828.124	14661.606
TE4446	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.2	12	37835.685	14663.126
TE4447	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	2	14	37842.331	14669.363
TE4448	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.9	14	37835.541	14651.188
TE4449	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	2	14	37841.332	14644.889

Tag ID	Species	Family	Origin	Status	Habit	Girth/ spread (m)	Height (m)	Northing	Easting
TE4450	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1	10	37847.217	14639.131
TE4451	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.35	13	37850.334	14647.227
TE4452	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.1	13	37855.588	14651.825
TE4453	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.4	13	37861.412	14643.741
TE4454	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.1	12	37853.77	14641.72
TE4455	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.4	12	37857.729	14628.206
TE4456	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.6	14	37861.076	14634.791
TE4457	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.5	15	37867.966	14637.442
TE4458	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.5	14	37876.955	14625.966
TE4459	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.5	12	37882.07	14621.266
TE4460	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.1	12	37876.053	14619.794
TE4461	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.8	14	37864.026	14622.394
TE4462	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.3	11	37871.392	14615.314
TE4463	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.2	12	37880.08	14615.217
TE4464	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.6	13	37885.302	14606.478
TE4465	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.1	10	37889.862	14602.502
TE4466	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.2	11	37890.584	14590.94

Appendix H-List and Locations of All Tree Specimens

Tag ID	Species	Family	Origin	Status	Habit	Girth/ spread (m)	Height (m)	Northing	Easting
TE4467	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1	10	37904.952	14589.112
TE4468	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.2	11	37904.387	14589.094
TE4469	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	2.4	15	37897.645	14597.106
TE4470	*Peltophorum pterocarpum*	Fabaceae	Native	Critically endangered	Tree	1.2	12	37896.277	14598.345
TE4471	*Syzygium grande*	Myrtaceae	Native	Common	Tree	2.4	18	37905	14585.717
TE4472	*Vitex pinnata*	Lamiaceae	Native	Common	Tree	1.2	10	37901.7	14575.923
TE4473	*Ficus variegata*	Moraceae	Native	Common	Tree	1.6	14	37565.82	15381.02
TE4474	*Syzygium grande*	Myrtaceae	Native	Common	Tree	1.8	16	38272.716	14196.854
TE4475	*Nephelium lappaceum*	Sapindaceae	Native	Critically endangered	Tree	1.2	12	38260.004	14206.433
TE4476	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.6	10	38257.634	14209.118
TE4477	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.4	10	38252.615	14216.649
TE4478	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.6	12	38247.579	14218.818
TE4479	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.1	8	38245.461	14212.831
TE4480	*Mangifera indica*	Anacardiaceae	Exotic	Casual	Tree	1.7	15	38239.02	14219.005
TE4481	*Pterocarpus indicus*	Fabaceae	Exotic	Casual	Tree	2.3	22	38230.216	14226.238
TE4482	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.1	9	38230.4	14225.968
TE4483	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.1	10	38223.333	14226.181
TE4484	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	25	16	38215.581	14236.859
TE4485	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.1	10	38201.434	14245.133
TE4486	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1	10	38213.766	14254.297
TE4487	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.8	18	37926.682	14553.589
TE4488	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.7	15	37907.894	14571.564
TE4489	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.3	12	37852.77	14653.56
TE4490	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.9	16	37848.62	14652.551
TE4491	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.8	18	37843.867	14656.391

Tag ID	Species	Family	Origin	Status	Habit	Girth/ spread (m)	Height (m)	Northing	Easting
TE4492	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.8	18	37864.813	14628.505
TE4493	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.5	15	37870.586	14623.083
TE4494	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.3	15	37903.032	14609.578
TE4495	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.5	15	37905.262	14608.409
TE4496	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.3	15	37867.739	14616.153
TE4497	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.3	14	37910.884	14585.689
TE4498	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.7	14	37917.418	14582.444
TE4499	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.1	16	37917.262	14570.607
TE4500	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.45	8	37911.315	14567.698
TE4501	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.4	8	37916.241	14562.538
TE4502	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.55	8	37919.604	14567.179
TE4503	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.65	8	37922.661	14571.711
TE4504	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.3	8	37921.298	14561.552
TE4505	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.4	6	37924.911	14559.912
TE4506	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.45	6	37924.357	14556.403
TE4507	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.4	8	37926.547	14563.157
TE4508	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.45	8	37930.021	14561.701
TE4509	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.55	8	37931.513	14555.846
TE4510	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.65	9	37933.263	14560.285
TE4511	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.3	7	37932.775	14552.781
TE4512	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.4	9	37939.032	14551.249
TE4513	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.35	7	37928.96	14548.181
TE4514	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.45	8	37938.055	14538.62
TE4515	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.5	8	37944.928	14542.51
TE4516	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.3	9	37946.527	14542.559

Tag ID	Species	Family	Origin	Status	Habit	Girth/ spread (m)	Height (m)	Northing	Easting
TE4517	*Melicope lunu-ankenda*	Rutaceae	Native	Critically Endangered	Tree	0.6	12	37948.563	14539.942
TE4518	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.7	9	37951.721	14534.891
TE4519	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.45	9	37949.517	14525.971
TE4520	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.3	6	37949.506	14523.706
TE4521	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.5	8	37958.647	14531.513
TE4522	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.7	8	37959.207	14520.441
TE4523	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.3	8	37958.649	14517.229
TE4524	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.3	8	37964.884	14520.385
TE4525	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.4	6	37969.097	14523.378
TE4526	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.3	6	37972.953	14511.225
TE4527	*Glochidion zeylanicum var. zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	0.9	6	37962.237	14521.271
TE4528	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.9	16	37966.223	14509.9
TE4529	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	3	18	37968.564	14501.545
TE4530	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1	9	37973.438	14503.262
TE4531	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1	12	37981.364	14504.744
TE4532	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.4	9	37979.453	14495.056
TE4533	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2	16	37975.686	14487.617
TE4534	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.4	8	37984.792	14493.738
TE4535	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.8	12	37983.302	14487.627
TE4536	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.6	16	37980.234	14481.299
TE4537	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.4	16	37990.85	14482.485
TE4538	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	2	14	38002.603	14476.825
TE4539	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.5	12	38007.425	14475.995
TE4540	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.3	12	37994.706	14470.49
TE4541	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.6	14	38002.271	14462.09
TE4542	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.2	8	38008.016	14470.715

Tag ID	Species	Family	Origin	Status	Habit	Girth/ spread (m)	Height (m)	Northing	Easting
TE4543	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.8	16	38014.963	14464.63
TE4544	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.3	15	38010.943	14451.966
TE4545	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.1	15	38019.309	14461.29
TE4546	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.6	16	38023.819	14454.677
TE4547	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.7	16	38027.007	14450.929
TE4548	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.1	14	38033.425	14445.486
TE4549	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.6	16	38028.025	14435.751
TE4550	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.6	16	38037.73	14424.172
TE4551	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.8	16	38043.513	14422.294
TE4552	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.5	16	38050.36	14421.696
TE4553	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.4	16	38068.497	14399.65
TE4554	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.5	16	38064.621	14405.666
TE4555	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.5	16	38049.823	14407.889
TE4556	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.8	16	38062.41	14398.264
TE4557	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.6	16	38066.516	14393.321
TE4558	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.8	16	38071.155	14386.303
TE4559	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.3	16	38076.153	14394.848
TE4560	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.6	16	38080.775	14390.206
TE4561	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.8	16	38076.169	14379.623
TE4562	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2	16	38094.833	14377.726
TE4563	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.2	16	38086.28	14383.822
TE4564	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.6	15	37932.491	14575.03
TE4565	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2	15	36939.23	17008.42
TE4566	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.7	16	36927.71	16985.14
TE4567	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.8	15	36982.37	16996.84
TE4568	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.2	16	37194.669	17147.737
TE4569	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2	16	37104.346	16941.838
TE4570	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.8	14	37076.01	16827

Tag ID	Species	Family	Origin	Status	Habit	Girth/ spread (m)	Height (m)	Northing	Easting
TE4571	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.6	16	37097.03	17018.62
TE4572	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1	14	37081.73	16980.23
TE4573	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.8	16	37189.91	17101.36
TE4574	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.8	16	37222.35	17119.57
TE4575	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.4	16	37165.16	17152.54
TE4576	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.2	16	37152.651	16743.699
TE4577	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.4	16	37260.586	16546.568
TE4578	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2	16	37314.629	16627.664
TE4579	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.2	16	37351.583	16656.452
TE4580	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.7	15	37306.291	16540.749
TE4581	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.8	16	37345.683	16457.406
TE4582	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2	16	37378.943	16413.661
TE4583	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.6	16	37356.872	16399.077
TE4584	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.6	10	37360.25	16397.336
TE4585	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.8	16	37372.443	16365.754
TE4586	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.2	16	37369.062	16349.45
TE4587	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.2	16	37366.795	16327.046
TE4588	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.8	16	37354.359	16391.698
TE4589	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.3	16	37354.502	16401.506
TE4590	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.8	16	37520.227	16190.951
TE4591	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.2	15	36992.395	17038.669
TE4592	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.2	15	37024.95	17039.06
TE4593	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2	15	36913.68	17271.414
TE4594	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.8	15	37046.81	17244.387
TE4595	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.7	18	37087.089	17239.436
TE4596	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.9	15	37081.144	17219.867
TE4597	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.8	13	37054.994	17198.719
TE4598	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.7	14	37010.827	17218.729

Appendix H-List and Locations of All Tree Specimens

Tag ID	Species	Family	Origin	Status	Habit	Girth/ spread (m)	Height (m)	Northing	Easting
TE4599	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.3	15	37105.33	16931.37
TE4600	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	20	20	37118.78	16910.6
TE4601	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	12	20	37123.33	16831.84
TE4602	*Samanea saman*	Fabaceae	Exotic	Casual	Tree	3.2	20	37106.91	16871.8
TE4603	*Terminalia catappa*	Combretaceae	Native	Common	Tree	2.3	14	37105.22	16889.64
TE4604	*Terminalia catappa*	Combretaceae	Native	Common	Tree	2	15	37211.91	16707.45
TE4605	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1	18	37260.08	16583.7
TE4606	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	2	12	37192.39	16637.64
TE4607	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.15	12	37446.023	16209.145
TE4608	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	2	10	37484.355	16221.951
TE4609	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.8	14	37484.974	16221.7
TE4610	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.7	12	37421.68	16209.6
TE4611	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.2	12	37433.25	16183.83
TE4612	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.8	18	37460.51	16182.76
TE4613	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.2	16	37522.29	16186.72
TE4614	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.4	16	37493.39	16183.25
TE4615	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.7	18	37792.856	14839.106
TE4616	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	2.6	18	37767.786	14822.49
TE4617	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.4	12	37476.44	16239.88
TE4618	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.8	14	37465.38	16242.31
TE4619	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1	12	36912	17037.92
TE4620	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.6	14	36913.37	17045.29
TE4621	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.8	12	37101.364	17107.244
TE4622	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.25	12	37100.778	17091.967
TE4623	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1	15	37134.798	16797.716
TE4624	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.05	9	37159.901	16770.358
TE4625	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.6	13	37131.31	17124.34

Appendix H-List and Locations of All Tree Specimens

Tag ID	Species	Family	Origin	Status	Habit	Girth/ spread (m)	Height (m)	Northing	Easting
TE4626	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.5	15	37127.92	17054.52
TE4627	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	15	16	37158.3	17088.79
TE4628	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	10	18	37159.627	17106.437
TE4629	*Macaranga griffithiana*	Euphorbiaceae	Native	Vulnerable	Tree	0.45	9	37152.55	17107.104
TE4630	*Pterocarpus indicus*	Fabaceae	Exotic	Casual	Tree	2.1	15	37168.426	16751.763
TE4631	*Pterocarpus indicus*	Fabaceae	Exotic	Casual	Tree	1.9	12	37248.721	16796.057
TE4632	*Durio zibethinus*	Malvaceae	Exotic	Casual	Tree	1.3	15	37248.581	16798.986
TE4633	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1	7	37283.619	16589.037
TE4634	*Mangifera indica*	Anacardiaceae	Exotic	Casual	Tree	1	10	36991.426	16993.764
TE4635	*Ficus microcarpa*	Moraceae	Native	Common	Strangler	5	10	37009.364	16977.723
TE4636	*Nephelium lappaceum*	Sapindaceae	Native	Critically endangered	Tree	1	10	37027.054	16976.338
TE4637	*Vitex pinnata*	Lamiaceae	Native	Common	Tree	2.3	16	37040.51	16998.579
TE4638	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.4	12	37653.876	15713.903
TE4639	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	2.1	16	37183.81	16784.35
TE4700	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.4	14	37131.6	16759.38
TE4701	*Ficus variegata*	Moraceae	Native	Common	Tree	1.1	14	37154.29	16796.2
TE4702	*Hevea brasiliensis*	Euphorbiaceae	Exotic	Naturalised	Tree	1.1	12	37514	16200.74
TE4703	*Claoxylon indicum*	Euphorbiaceae	Native	Common	Tree	1.2	10	37503.6	16189.24
TE4704	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	2	12	38020.556	15951.422
TE4705	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1	10	38012.834	15938.357
TE4706	*Tabebuia rosea*	Bignoniaceae	Exotic	Casual	Tree	1.2	12	38013.024	15942.951
TE4707	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.1	14	38007.99	15947.552
TE4708	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.5	12	38008.577	15931.631
TE4709	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.2	12	38008.515	15923.304
TE4710	*Ficus variegata*	Moraceae	Native	Common	Tree	1.25	13	38028.25	16034.7
TE4711	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1	10	38083.728	14405.89

Appendix H-List and Locations of All Tree Specimens

Tag ID	Species	Family	Origin	Status	Habit	Girth/ spread (m)	Height (m)	Northing	Easting
TE4712	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.8	14	37935.04	15897.47
TE4713	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1	14	38008.86	16142.36
TE4714	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.8	14	37533.58	15871.68
TE4715	*Cinnamomum iners*	Lauraceae	Native	Common	Tree	1.6	10	37431.384	16265.044

Appendix I
List of Probable and Recorded Faunal Species

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Appendix I - List of Probable and Recorded Faunal Species

Faunal Group	No. of Probable Species		No. of Recorded Species		No. of Recorded Species Not on Probable List	
	All Species	CS Species	All Species	CS Species	All Species	CS Species
Aculeate hymenopterans	**79**	**0**	**28**	**0**	**0**	**0**
Bees	47	0	10	0	0	0
Stinging wasps	30	0	18	0	0	0
Odonates	**56**	**0**	**28**	**0**	**1**	**0**
Dragonflies	45	0	22	0	1	0
Damselflies	11	0	6	0	0	0
Butterflies	**201**	**23**	**55**	**2**	**1**	**0**
Freshwater decapod crustaceans	**6**	**0**	**3**	**0**	**0**	**0**
Freshwater fish	**25**	**0**	**14**	**0**	**0**	**0**
Herpetofauna	**50**	**8**	**28**	**3**	**0**	**0**
Amphibians	13	0	11	0	0	0
Reptiles	37	8	17	3	0	0
Birds	**175**	**25**	**76**	**13**	**0**	**0**
Mammals	**26**	**5**	**15**	**1**	**0**	**0**
Non-volant mammals	16	2	11	1	0	0
Bats	10	3	4	0	1	0
Total	**618**	**61**	**247**	**19**	**2**	**0**

No.	Type	Family	Scientific Name	Common Name	Global Status (IUCN/CITES)	National Status (Ascher et al. (in prep); JXQ Lee, pers comm)	Species of Conservation Significance	Native Status (The Biodiversity of Singapore, 2020; JXQ Lee, pers comm)	Probable Species	Recorded Species	Remarks
1	Bee	Apidae	*Amegilla andrewsi*	N.A	Not Assessed	Least Concern	No	Native	Yes	Yes	-
2	Bee	Apidae	*Amegilla korotonensis*	N.A	Not Assessed	Least Concern	No	Native	Yes	No	-
3	Bee	Apidae	*Apis andreniformis*	N.A	Not Assessed	Least Concern	No	Native	Yes	No	-
4	Bee	Apidae	*Apis cerana*	Eastern honey bee	Not Assessed	Least Concern	No	Native	Yes	Yes	-
5	Bee	Apidae	*Apis dorsata*	N.A	Not Assessed	Least Concern	No	Native	Yes	No	-
6	Bee	Apidae	*Apis florea*	N.A	Not Assessed	Non-native	No	Non-native	Yes	No	-
7	Bee	Apidae	*Braunsapis clarihirta*	N.A	Not Assessed	Least Concern	No	Native	Yes	No	-
8	Bee	Apidae	*Braunsapis cupulifera**	N.A	Not Assessed	Least Concern	No	Native	Yes	No	-
9	Bee	Apidae	*Braunsapis hewitti**	N.A	Not Assessed	Least Concern	No	Native	Yes	No	-
10	Bee	Apidae	*Braunsapis puangensis*	N.A	Not Assessed	Least Concern	No	Native	Yes	No	-
11	Bee	Apidae	*Ceratina collusor*	N.A	Not Assessed	Least Concern	No	Native	Yes	No	-
12	Bee	Apidae	*Ceratina dentipes*	N.A	Not Assessed	Least Concern	No	Native	Yes	No	-
13	Bee	Apidae	*Ceratina lieftincki*	N.A	Not Assessed	Not Assessed	No	Native	Yes	No	-
14	Bee	Apidae	*Ceratina nigrolateralis*	N.A	Not Assessed	Not Assessed	No	Native	Yes	No	-
15	Bee	Apidae	*Ceratina perforatrix*	N.A	Not Assessed	Least Concern	No	Native	Yes	No	-
16	Bee	Apidae	*Ceratina smaragdula*	N.A	Not Assessed	Not Assessed	No	Native	Yes	No	-
17	Bee	Apidae	*Ceratina* sp.	N.A	N.A	N.A	N.A	N.A	N.A	Yes	-
18	Bee	Apidae	*Ceratina unimaculata*	N.A	Not Assessed	Least Concern	No	Native	Yes	No	-
19	Bee	Apidae	*Tetragonula valdezi*	N.A	Not Assessed	Least Concern	No	Native	Yes	No	-
20	Bee	Apidae	*Thyreus ceylonicus*	N.A	Not Assessed	Least Concern	No	Native	Yes	No	-
21	Bee	Apidae	*Thyreus himalayensis*	N.A	Not Assessed	Least Concern	No	Native	Yes	Yes	-
22	Bee	Apidae	*Xylocopa aestuans*	White-cheeked carpenter bee	Not Assessed	Not Assessed	No	Native	Yes	No	*Xylocopa* sp. recorded may be *X. aestuans*
23	Bee	Apidae	*Xylocopa caerulea*	N.A	Not Assessed	Least Concern	No	Native	Yes	No	
24	Bee	Apidae	*Xylocopa flavonigrescens*	N.A	Not Assessed	Least Concern	No	Native	Yes	No	*Xylocopa* sp. recorded may be *X. flavonigrescens*
25	Bee	Apidae	*Xylocopa latipes*	Broad-handed carpenter bee	Not Assessed	Least Concern	No	Native	Yes	Yes	-
26	Bee	Apidae	*Xylocopa myops*	N.A	Not Assessed	Data Deficient	No	Native	Yes	No	-
27	Bee	Colletidae	*Hylaeus penangensis*	N.A	Not Assessed	Least Concern	No	Native	Yes	No	-
28	Bee	Halictidae	*Lasioglossum adonidiae*	N.A	Not Assessed	Least Concern	No	Native	Yes	No	-
29	Bee	Halictidae	*Lasioglossum albescens*	N.A	Not Assessed	Least Concern	No	Native	Yes	No	-

No.	Type	Family	Scientific Name	Common Name	Global Status (IUCN/CITES)	National Status (Ascher et al. (in prep); JXQ Lee, pers comm)	Species of Conservation Significance	Native Status (The Biodiversity of Singapore, 2020; JXQ Lee, pers comm)	Probable Species	Recorded Species	Remarks
30	Bee	Halictidae	*Lasioglossum deliense*	N.A	Not Assessed	Least Concern	No	Native	Yes	No	-
31	Bee	Halictidae	*Lasioglossum singapurellum*	N.A	Not Assessed	Least Concern	No	Native	Yes	No	-
32	Bee	Halictidae	*Lasioglossum vagans*	N.A	Not Assessed	Least Concern	No	Native	Yes	No	-
33	Bee	Halictidae	*Lipotriches ceratina*	N.A	Not Assessed	Least Concern	No	Native	Yes	Yes	-
34	Bee	Halictidae	*Nomia iridiscens*	Pearly-banded bee	Not Assessed	Least Concern	No	Native	Yes	Yes	-
35	Bee	Halictidae	*Nomia strigata*	Pearly-banded bee	Not Assessed	Least Concern	No	Native	Yes	Yes	-
36	Bee	Halictidae	*Patellapis murbanus*	N.A	Not Assessed	Least Concern	No	Native	Yes	No	-
37	Bee	Halictidae	*Pseudapis siamensis*	N.A	Not Assessed	Least Concern	No	Native	Yes	No	-
38	Bee	Megachilidae	*Euaspis polynesia*	N.A	Not Assessed	Least Concern	No	Native	Yes	No	-
39	Bee	Megachilidae	*Megachile conjuncta*	N.A	Not Assessed	Least Concern	No	Native	Yes	No	-
40	Bee	Megachilidae	*Megachile disjuncta*	N.A	Not Assessed	Non-native	No	Non-native	Yes	No	-
41	Bee	Megachilidae	*Megachile fulvipennis*	N.A	Not Assessed	Least Concern	No	Native	Yes	No	-
42	Bee	Megachilidae	*Megachile stulta*	N.A	Not Assessed	Least Concern	No	Native	Yes	No	-
43	Bee	Megachilidae	*Megachile tricincta*	N.A	Not Assessed	Least Concern	No	Native	Yes	No	-
44	Bee	Megachilidae	*Megachile umbripennis*	N.A	Not Assessed	Non-native	No	Non-native	Yes	No	-
45	Bee	Megachilidae	*Coelioxys confusus*	N.A	Not Assessed	Least Concern	No	Native	Yes	Yes	-
46	Bee	Megachilidae	*Heriades othonis*	N.A	Not Assessed	Least Concern	No	Native	Yes	No	-
47	Bee	Megachilidae	*Megachile laticeps*	N.A	Not Assessed	Least Concern	No	Native	Yes	Yes	-
48	Bee	Megachilidae	*Megachile subrixator*	N.A	Not Assessed	Least Concern	No	Native	Yes	No	-
49	Wasp	Ampulicidae	*Ampulex compressa*	Emerald cockroach wasp/Jewel wasp	Not Assessed	Least Concern	No	Native	Yes	No	-
50	Wasp	Crabronidae	*Liris subtessellatus*	N.A	Not Assessed	Least Concern	No	Native	Yes	Yes	-
51	Wasp	Crabronidae	*Tachytes cf. modestus*	N.A	Not Assessed	Least Concern	No	Native	Yes	No	-
52	Wasp	Crabronidae	*Trypoxylon sp.*	N.A	N.A	N.A	No	N.A	Yes	Yes	-
53	Wasp	Pompilidae	*Auplopus sp. (blue)*	N.A	N.A	Least Concern	No	Native	Yes	No	-
54	Wasp	Pompilidae	*Auplopus sp. (grey)*	N.A	N.A	Least Concern	No	Native	Yes	Yes	-
55	Wasp	Pompilidae	*Tachypompilus analis*	N.A	Not Assessed	Least Concern	No	Native	Yes	No	-
56	Wasp	Scoliidae	*Campsomeriella collaris*	N.A	Not Assessed	Least Concern	No	Native	Yes	No	-
57	Wasp	Scoliidae	*Phalerimeris phalerata*	N.A	Not Assessed	Least Concern	No	Native	Yes	No	-
58	Wasp	Sphecidae	*Chalybion bengalense*	N.A	Not Assessed	Least Concern	No	Native	Yes	Yes	-
59	Wasp	Sphecidae	*Hemichalybion sp.*	NA	Not Assessed	Least Concern	No	Native	Yes	No	-
60	Wasp	Sphecidae	*Isodontia diodon*	N.A	Not Assessed	Least Concern	No	Native	Yes	No	-
61	Wasp	Sphecidae	*Sceliphron javanum*	N.A	Not Assessed	Least Concern	No	Native	Yes	No	-
62	Wasp	Sphecidae	*Sceliphron madraspatanum*	N.A	Not Assessed	Least Concern	No	Native	Yes	No	-
63	Wasp	Sphecidae	*Sphex diabolicus*	N.A	Not Assessed	Least Concern	No	Native	Yes	No	-
64	Wasp	Sphecidae	*Sphex sericeus*	N.A	Not Assessed	Least Concern	No	Native	Yes	No	-
65	Wasp	Sphecidae	*Sphex subtruncatus*	N.A	Not Assessed	Least Concern	No	Native	Yes	No	-

No.	Type	Family	Scientific Name	Common Name	Global Status (IUCN/CITES)	National Status (Ascher et al. (in prep); JXQ Lee, pers comm)	Species of Conservation Significance	Native Status (The Biodiversity of Singapore, 2020; JXQ Lee, pers comm)	Probable Species	Recorded Species	Remarks
66	Wasp	Vespidae	*Allorhynchium argentatum*	N.A	Not Assessed	Least Concern	No	Native	Yes	Yes	-
67	Wasp	Vespidae	*Antepipona sp. nr. bipustulata*	N.A	N.A	Least Concern	No	Native	Yes	Yes	-
68	Wasp	Vespidae	*Delta campaniforme*	N.A	Not Assessed	Least Concern	No	Native	Yes	No	-
69	Wasp	Vespidae	*Delta esuriens*	N.A	Not Assessed	Least Concern	No	Native	Yes	No	-
70	Wasp	Vespidae	*Delta pyriforme*	N.A	Not Assessed	Least Concern	No	Native	Yes	Yes	-
71	Wasp	Vespidae	*Elimus sp.*	N.A	N.A	Not Assessed	No	Native	Yes	No	-
72	Wasp	Vespidae	*Eumenes sp.*	N.A	Not Assessed	Not Assessed	No	N.A	Yes	Yes	-
73	Wasp	Vespidae	*Eustenogaster hauxwelli*	N.A	Not Assessed	Near Threatened	No	Native	Yes	No	-
74	Wasp	Vespidae	*Eustenogaster micans*	N.A	Not Assessed	Near Threatened	No	Native	Yes	No	-
75	Wasp	Vespidae	*Liostenogaster nitidipennis*	N.A	Not Assessed	Near Threatened	No	Native	Yes	No	-
76	Wasp	Vespidae	*Liostenogaster varipicta*	N.A	Not Assessed	Near Threatened	No	Native	Yes	Yes	-
77	Wasp	Vespidae	*Paraleptomenes miniatus*	N.A	Not Assessed	Least Concern	No	Native	Yes	No	-
78	Wasp	Vespidae	*Parapolybia varia*	Lesser paper wasp	Not Assessed	Near Threatened	No	Native	Yes	No	-
79	Wasp	Vespidae	*Parischnogaster mellyi*	N.A	Not Assessed	Least Concern	No	Native	Yes	Yes	-
80	Wasp	Vespidae	*Parischnogaster nigricans*	N.A	Not Assessed	Least Concern	No	Native	Yes	Yes	-
81	Wasp	Vespidae	*Phimenes flavopictus*	N.A	Not Assessed	Least Concern	No	Native	Yes	Yes	-
82	Wasp	Vespidae	*Polistes sagittarius*	Banded paper wasp	Not Assessed	Least Concern	No	Native	Yes	No	-
83	Wasp	Vespidae	*Polistes stigma*	N.A	Not Assessed	Least Concern	No	Native	Yes	No	-
84	Wasp	Vespidae	*Polistes tenebris*	N.A	Not Assessed	Data Deficient	No	Native	Yes	Yes	-
85	Wasp	Vespidae	*Provespa anomala*	Night hornet	Not Assessed	Least Concern	No	Native	Yes	No	-
86	Wasp	Vespidae	*Rhynchium haemorrhoidale*	N.A	Not Assessed	Least Concern	No	Native	Yes	Yes	-
87	Wasp	Vespidae	*Ropalidia erythrospila*	N.A	Not Assessed	Least Concern	No	Native	Yes	No	-
88	Wasp	Vespidae	*Ropalidia jacobsoni*	N.A	Not Assessed	Least Concern	No	Native	Yes	Yes	-
89	Wasp	Vespidae	*Ropalidia sp. (flavopicta group)*	N.A	Not Assessed	Data Deficient	No	Native	Yes	No	-
90	Wasp	Vespidae	*Ropalidia stigma*	N.A	Not Assessed	Least Concern	No	Native	Yes	Yes	-
91	Wasp	Vespidae	*Ropalidia sumatrae*	N.A	Not Assessed	Least Concern	No	Native	Yes	Yes	-
92	Wasp	Vespidae	*Ropalidia timida*	N.A	Not Assessed	Least Concern	No	Native	Yes	No	-
93	Wasp	Vespidae	*Stenodyneriellus guttulatus*	N.A	Not Assessed	Least Concern	No	Native	Yes	Yes	-
94	Wasp	Vespidae	*Subancistrocerus sichelii*	N.A	Not Assessed	Least Concern	No	Native	Yes	No	-
95	Wasp	Vespidae	*Subancistrocerus sp.*	N.A	Not Assessed	Data Deficient	No	Native	Yes	No	-
96	Wasp	Vespidae	*Vespa affinis*	Lesser banded hornet	Not Assessed	Not Assessed	No	Native	Yes	No	-
97	Wasp	Vespidae	*Vespa analis*	Yellow vented hornet	Not Assessed	Not Assessed	No	Native	Yes	No	-
98	Wasp	Vespidae	*Vespa tropica*	Greater banded hornet	Not Assessed	Not Assessed	No	Native	Yes	No	-

Appendix I - List of Probable and Recorded Faunal Species

No.	Type	Family	Scientific Name	Common Name	Global Status (IUCN/CITES)	National Status (Soh et al., 2019)	Species of Conservation Significance	Distribution/Rarity (Soh et al. 2019)	Probable Species	Recorded Species
1	Damselfly	Coenagrionidae	*Agriocnemis femina*	Variable wisp	Least Concern	Least Concern	No	Widespread and Common	Yes	Yes
2	Damselfly	Coenagrionidae	*Agriocnemis nana*	Dwarf wisp	Least Concern	Endangered	Yes	Restricted and Very Rare	Yes	No
3	Damselfly	Coenagrionidae	*Agriocnemis rubescens*	Variable sprite	Least Concern	Least Concern	No	Widespread but Uncommon	Yes	No
4	Damselfly	Coenagrionidae	*Archibasis viola*	Violet sprite	Least Concern	Least Concern	No	Widespread and Common	Yes	No
5	Damselfly	Coenagrionidae	*Ceriagrion cerinorubellum*	Ornate coraltail	Least Concern	Least Concern	No	Widespread and Common	Yes	Yes
6	Damselfly	Coenagrionidae	*Ischnura senegalensis*	Common bluetail	Least Concern	Least Concern	No	Widespread and Common	Yes	Yes
7	Damselfly	Coenagrionidae	*Pseudagrion microcephalum*	Blue sprite	Least Concern	Least Concern	No	Widespread and Common	Yes	Yes
8	Damselfly	Coenagrionidae	*Teinobasis ruficollis*	Red-tailed sprite	Not Assessed	Near Threatened	No	Widespread but Rare	Yes	Yes
9	Damselfly	Platycnemididae	*Copera marginipes*	Yellow featherlegs	Least Concern	Least Concern	No	Widespread and Common	Yes	Yes
10	Damselfly	Platycnemididae	*Copera vittata*	Variable featherlegs	Least Concern	Vulnerable	Yes	Restricted and Rare	Yes	No
11	Damselfly	Platycnemididae	*Onychargia atrocyana*	Shorttail	Least Concern	Least Concern	No	Widespread but Uncommon	Yes	No
12	Dragonfly	Aeshnidae	*Anax guttatus*	Emperor	Least Concern	Least Concern	No	Widespread but Uncommon	Yes	No
13	Dragonfly	Aeshnidae	*Anax sp.*	N.A	N.A	N.A	N.A	N.A	N.A	Yes
14	Dragonfly	Aeshnidae	*Gynacantha dohrni*	Spear-tail duskhawker	Not Assessed	Least Concern	No	Widespread but Uncommon	Yes	No
15	Dragonfly	Aeshnidae	*Gynacantha subinterrupta*	Dingy duskhawker	Least Concern	Least Concern	No	Widespread but Uncommon	Yes	Yes
16	Dragonfly	Gomphidae	*Ictinogomphus decoratus*	Common flangetail	Least Concern	Least Concern	No	Widespread and Common	Yes	Yes
17	Dragonfly	Libellulidae	*Acisoma panorpoides*	Trumpet tail	Least Concern	Least Concern	No	Widespread and Common	Yes	Yes
18	Dragonfly	Libellulidae	*Aethriamanta aethra*	Blue adjudant	Least Concern	Least Concern	No	Widespread but Uncommon	Yes	No
19	Dragonfly	Libellulidae	*Aethriamanta brevipennis*	Scarlet adjudant	Least Concern	Least Concern	No	Widespread but Uncommon	Yes	No
20	Dragonfly	Libellulidae	*Aethriamanta gracilis*	Pond adjudant	Least Concern	Least Concern	No	Widespread and Common	Yes	No
21	Dragonfly	Libellulidae	*Agrionoptera insignis*	Grenadier	Least Concern	Least Concern	No	Widespread and Common	Yes	Yes
22	Dragonfly	Libellulidae	*Brachydiplax chalybea*	Blue dasher	Least Concern	Least Concern	No	Widespread and Common	Yes	Yes
23	Dragonfly	Libellulidae	*Brachythemis contaminata*	Common amberwing	Least Concern	Least Concern	No	Widespread and Common	Yes	No
24	Dragonfly	Libellulidae	*Camacinia gigantea*	Sultan	Least Concern	Least Concern	No	Widespread but Uncommon	Yes	No
25	Dragonfly	Libellulidae	*Cratilla lineata*	Lined forest skimmer	Least Concern	Near Threatened	Yes	Widespread but Rare	Yes	No
26	Dragonfly	Libellulidae	*Cratilla metallica*	Dark-tipped forest skimmer	Least Concern	Least Concern	No	Widespread and Common	Yes	No
27	Dragonfly	Libellulidae	*Crocothemis servilia*	Common scarlet	Least Concern	Least Concern	No	Widespread and Common	Yes	Yes
28	Dragonfly	Libellulidae	*Diplacodes nebulosa*	Black-tipped percher	Least Concern	Least Concern	No	Widespread but Uncommon	Yes	No
29	Dragonfly	Libellulidae	*Diplacodes trivialis*	Blue percher	Least Concern	Least Concern	No	Widespread and Common	Yes	Yes
30	Dragonfly	Libellulidae	*Hydrobasileus croceus*	Water monarch	Least Concern	Least Concern	No	Widespread and Common	Yes	No
31	Dragonfly	Libellulidae	*Lathrecista asiatica*	Scarlet grenadier	Least Concern	Least Concern	No	Widespread and Common	Yes	Yes
32	Dragonfly	Libellulidae	*Macrodiplax cora*	Coastal glider	Least Concern	Least Concern	No	Widespread and Common	Yes	No
33	Dragonfly	Libellulidae	*Nannophya pygmaea*	Scarlet pygmy	Least Concern	Least Concern	No	Widespread and Common	Yes	No
34	Dragonfly	Libellulidae	*Nesoxenia lineata*	Striped grenadier	Least Concern	Least Concern	No	Widespread but Uncommon	No	Yes
35	Dragonfly	Libellulidae	*Neurothemis fluctuans*	Common parasol	Least Concern	Least Concern	No	Widespread and Common	Yes	Yes
36	Dragonfly	Libellulidae	*Orchithemis pulcherrima*	Variable sentinel	Least Concern	Least Concern	No	Widespread and Common	Yes	No
37	Dragonfly	Libellulidae	*Orthetrum chrysis*	Spine-tufted skimmer	Least Concern	Least Concern	No	Widespread and Common	Yes	Yes
38	Dragonfly	Libellulidae	*Orthetrum glaucum*	Common blue skimmer	Least Concern	Least Concern	No	Widespread and Common	Yes	Yes
39	Dragonfly	Libellulidae	*Orthetrum luzonicum*	Slender blue skimmer	Least Concern	Least Concern	No	Widespread and Common	Yes	No
40	Dragonfly	Libellulidae	*Orthetrum sabina*	Variegated green skimmer	Least Concern	Least Concern	No	Widespread and Common	Yes	Yes

No.	Type	Family	Scientific Name	Common Name	Global Status (IUCN/CITES)	National Status (Soh et al., 2019)	Species of Conservation Significance	Distribution/Rarity (Soh et al. 2019)	Probable Species	Recorded Species
41	Dragonfly	Libellulidae	*Orthetrum testaceum*	Scarlet skimmer	Least Concern	Least Concern	No	Widespread and Common	Yes	Yes
42	Dragonfly	Libellulidae	*Pantala flavescens*	Wandering glider	Least Concern	Least Concern	No	Widespread and Common	Yes	Yes
43	Dragonfly	Libellulidae	*Potamarcha congener*	Common chaser	Least Concern	Least Concern	No	Widespread and Common	Yes	Yes
44	Dragonfly	Libellulidae	*Pseudothemis jorina*	Banded skimmer	Least Concern	Least Concern	No	Widespread but Uncommon	Yes	No
45	Dragonfly	Libellulidae	*Rhodothemis rufa*	Common redbolt	Least Concern	Least Concern	No	Widespread and Common	Yes	Yes
46	Dragonfly	Libellulidae	*Rhyothemis obsolescens*	Bronze flutterer	Least Concern	Least Concern	No	Widespread but Uncommon	Yes	No
47	Dragonfly	Libellulidae	*Rhyothemis phyllis*	Yellow-barred flutterer	Least Concern	Least Concern	No	Widespread and Common	Yes	Yes
48	Dragonfly	Libellulidae	*Rhyothemis triangularis*	Sapphire flutterer	Least Concern	Least Concern	No	Widespread but Uncommon	Yes	No
49	Dragonfly	Libellulidae	*Tholymis tillarga*	White-barred duskhawk	Least Concern	Least Concern	No	Widespread and Common	Yes	Yes
50	Dragonfly	Libellulidae	*Tramea transmarina*	Saddlebag glider	Least Concern	Least Concern	No	Widespread and Common	Yes	No
51	Dragonfly	Libellulidae	*Trithemis aurora*	Crimson dropwing	Least Concern	Least Concern	No	Widespread and Common	Yes	No
52	Dragonfly	Libellulidae	*Trithemis festiva*	Indigo dropwing	Least Concern	Least Concern	No	Widespread and Common	Yes	No
53	Dragonfly	Libellulidae	*Trithemis pallidinervis*	Dancing dropwing	Least Concern	Least Concern	No	Widespread but Uncommon	Yes	No
54	Dragonfly	Libellulidae	*Tyriobapta torrida*	Treehugger	Least Concern	Least Concern	No	Widespread and Common	Yes	No
55	Dragonfly	Libellulidae	*Urothemis signata*	Scarlet basker	Not Assessed	Least Concern	No	Widespread and Common	Yes	Yes
56	Dragonfly	Libellulidae	*Zyxomma petiolatum*	Slender duskdarter	Least Concern	Least Concern	No	Widespread and Common	Yes	Yes
57	Dragonfly	Macromiidae	*Epophthalmia vittigera*	Pond cruiser	Least Concern	Least Concern	No	Widespread and Common	Yes	No
58	Dragonfly	Synthemistidae	*Idionyx yolanda*	Shadowdancer	Not Assessed	Least Concern	No	Widespread but Uncommon	Yes	No

Appendix I - List of Probable and Recorded Faunal Species

No.	Family	Scientific Name	Common Name	Global Status (IUCN/CITES)	National Status (Davison et al., 2008; Jain et al, 2018)	Species of Conservation Significance	Distribution/ Abundance /Rarity (Khew, 2015)	Probable Species	Recorded Species
1	Hesperiidae	*Ampittia dioscorides camertes*	Bush hopper	Not Assessed	Not Assessed	No	Moderately common	Yes	No
2	Hesperiidae	*Ancistroides nigrita maura*	Chocolate demon	Not Assessed	Not Assessed	No	Common	Yes	Yes
3	Hesperiidae	*Astictopterus jama jama*	Forest hopper	Not Assessed	Nationally Extinct (Rediscovered)	Yes	Moderately rare	Yes	No
4	Hesperiidae	*Baoris farri farri*	Bamboo paintbrush swift	Not Assessed	Not Assessed	No	Moderately rare	Yes	No
5	Hesperiidae	*Baoris oceia*	Paintbrush swift	Not Assessed	Not Assessed	No	Moderately rare	Yes	No
6	Hesperiidae	*Borbo cinnara*	Formosan swift	Not Assessed	Endangered	Yes	Moderately common	Yes	Yes
7	Hesperiidae	*Burara harisa consobrina*	Orange awlet	Not Assessed	Not Assessed	No	Moderately rare	Yes	Yes
8	Hesperiidae	*Caltoris cormasa*	Full stop swift	Not Assessed	Not Assessed	No	Moderately rare	Yes	Yes
9	Hesperiidae	*Caltoris malaya*	Malayan swift	Not Assessed	Nationally Extinct (Rediscovered)	Yes	Moderately rare	Yes	No
10	Hesperiidae	*Caltoris philippina philippina*	Philippine swift	Not Assessed	Not Assessed	No	Rare	Yes	No
11	Hesperiidae	*Cephrenes acalle niasicus*	Plain palm dart	Not Assessed	Nationally Extinct (Rediscovered)	Yes	Moderately rare	Yes	No
12	Hesperiidae	*Cephrenes trichopepla*	Yellow palm dart	Not Assessed	Not assessed	No	Common	Yes	No
13	Hesperiidae	*Erionota hiraca apicalis*	White tipped skipper	Not Assessed	Not Assessed	No	Moderately rare	Yes	No
14	Hesperiidae	*Erionota sp.*	Skipper	N.A	N.A	N.A	N.A	N.A	Yes
15	Hesperiidae	*Erionota thrax thrax*	Banana skipper	Not Assessed	Not Assessed	No	Moderately common	Yes	No
16	Hesperiidae	*Erionota torus*	Torus skipper	Not Assessed	Not Assessed	No	Moderately rare	Yes	No
17	Hesperiidae	*Halpe ormenes vilasina*	Dark banded ace	Not Assessed	Not Assessed	No	Rare	Yes	No
18	Hesperiidae	*Hasora badra badra*	Common awl	Not Assessed	Not Assessed	No	Moderately common	Yes	No
19	Hesperiidae	*Hasora taminatus malayana*	White banded awl	Not Assessed	Not Assessed	No	Rare	Yes	No
20	Hesperiidae	*Hidari irava*	Coconut skipper	Not Assessed	Not Assessed	No	Common	Yes	No
21	Hesperiidae	*Iambrix salsala salsala*	Chestnut bob	Not Assessed	Not Assessed	No	Common	Yes	Yes
22	Hesperiidae	*Iambrix stellifer*	Starry bob	Not Assessed	Not Assessed	No	Moderately rare	Yes	No
23	Hesperiidae	*Matapa aria*	Common redeye	Not Assessed	Not Assessed	No	Moderately rare	Yes	No
24	Hesperiidae	*Mooreana trichoneura trichoneura*	Yellow flat	Not Assessed	Not assessed	No	Rare	Yes	No
25	Hesperiidae	*Notocrypta paralysos varians*	Banded demon	Not Assessed	Not Assessed	No	Moderately common	Yes	No
26	Hesperiidae	*Odontoptilum angulatum angulatum*	Chestnut angle	Not Assessed	Not Assessed	No	Moderately rare	Yes	No
27	Hesperiidae	*Oriens gola pseudolus*	Common dartlet	Not Assessed	Not Assessed	No	Moderately common	Yes	Yes
28	Hesperiidae	*Pelopidas agna agna*	Bengal swift	Not Assessed	Endangered	Yes	Moderately common	Yes	No
29	Hesperiidae	*Pelopidas assamensis*	Great swift	Not Assessed	Not Assessed	No	Moderately rare	Yes	No
30	Hesperiidae	*Pelopidas conjunctus conjunctus*	Conjoined swift	Not Assessed	Not assessed	No	Moderately rare	Yes	Yes
31	Hesperiidae	*Pelopidas mathias mathias*	Small branded swift	Not Assessed	Not Assessed	No	Common	Yes	Yes
32	Hesperiidae	*Pemara pugnans*	Pugnacious lancer	Not Assessed	Not Assessed	No	Very rare	Yes	No
33	Hesperiidae	*Plastingia naga*	Chequered lancer	Not Assessed	Not Assessed	No	Moderately common	Yes	No
34	Hesperiidae	*Polytremis lubricans lubricans*	Contiguous swift	Not Assessed	Not Assessed	No	Common	Yes	Yes
35	Hesperiidae	*Potanthus ganda*	N.A	Not Assessed	Not Assessed	No	N.A	Yes	No
36	Hesperiidae	*Potanthus omaha omaha*	Lesser dart	Not Assessed	Not Assessed	No	Common	Yes	Yes
37	Hesperiidae	*Potanthus serina*	Large dart	Not Assessed	Not assessed	No	Moderately common	Yes	No

No.	Family	Scientific Name	Common Name	Global Status (IUCN/CITES)	National Status (Davison et al., 2008; Jain et al, 2018)	Species of Conservation Significance	Distribution/ Abundance /Rarity (Khew, 2015)	Probable Species	Recorded Species
38	Hesperiidae	*Potanthus trachala tytleri*	Detached dart	Not Assessed	Nationally Extinct (Rediscovered)	Yes	Moderately rare	Yes	No
39	Hesperiidae	*Pyroneura latoia latoia*	Yellow vein lancer	Not Assessed	Not Assessed	No	Moderately common	Yes	No
40	Hesperiidae	*Suastus gremius gremius*	Palm bob	Not Assessed	Not Assessed	No	Common	Yes	No
41	Hesperiidae	*Tagiades gana gana*	Large snow flat	Not Assessed	Not Assessed	No	Moderately rare	Yes	Yes
42	Hesperiidae	*Tagiades japetus atticus*	Common snow flat	Not Assessed	Not Assessed	No	Moderately common	Yes	No
43	Hesperiidae	*Taractrocera archias quinta*	Yellow grass dart	Not Assessed	Not Assessed	No	Moderately common	Yes	No
44	Hesperiidae	*Taractrocera ardonia lamia*	Spotted grass dart	Not Assessed	Not Assessed	No	Moderately rare	Yes	No
45	Hesperiidae	*Telicota augias augias*	Pale palm dart	Not Assessed	Not Assessed	No	Moderately common	Yes	No
46	Hesperiidae	*Telicota besta bina*	Besta palm dart	Not Assessed	Not Assessed	No	Moderately common	Yes	No
47	Hesperiidae	*Telicota colon stinga*	Common palm dart	Not Assessed	Nationally Extinct (Rediscovered)	Yes	Moderately common	Yes	No
48	Hesperiidae	*Telicota linna*	Linna palm dart	Not Assessed	Not assessed	No	Moderately rare	Yes	No
49	Hesperiidae	*Udaspes folus*	Grass demon	Not Assessed	Not Assessed	No	Moderately common	Yes	No
50	Hesperiidae	*Unkana ambasa batara*	Hoary palmer	Not Assessed	Not Assessed	No	Moderately rare	Yes	No
51	Hesperiidae	*Zographetus doxus*	Spotted flitter	Not Assessed	Not Assessed	No	Rare	Yes	No
52	Lycaenidae	*Acytolepis puspa lambi*	Common hedge blue	Not Assessed	Not Assessed	No	Moderately common	Yes	No
53	Lycaenidae	*Allotinus unicolor unicolor*	Lesser darkwing	Not Assessed	Not Assessed	No	Moderately common	Yes	No
54	Lycaenidae	*Anthene emolus goberus*	Ciliate blue	Not Assessed	Not Assessed	No	Common	Yes	No
55	Lycaenidae	*Anthene lycaenina miya*	Pointed ciliate blue	Not Assessed	Not Assessed	No	Moderately rare	Yes	No
56	Lycaenidae	*Arhopala amphimuta amphimuta*	N.A	Not Assessed	Nationally Extinct (Rediscovered)	Yes	Moderately common	Yes	No
57	Lycaenidae	*Arhopala antimuta antimuta*	Small tailless oakblue	Not Assessed	Nationally Extinct	Yes	Rare	Yes	No
58	Lycaenidae	*Arhopala centaurus nakula*	Centaur oakblue	Not Assessed	Not Assessed	No	Moderately common	Yes	Yes
59	Lycaenidae	*Arhopala major major*	N.A	Not Assessed	Data Deficient	No	Common	Yes	No
60	Lycaenidae	*Arhopala silhetensis adorea*	Sylhet oakblue	Not Assessed	Nationally Extinct (Rediscovered)	Yes	Rare	Yes	No
61	Lycaenidae	*Catochrysops panormus exiguus*	Silver forget-me-not	Not Assessed	Not Assessed	No	Moderately rare	Yes	No
62	Lycaenidae	*Catochrysops strabo strabo*	Forget-me-not	Not Assessed	Not Assessed	No	Moderately rare	Yes	No
63	Lycaenidae	*Catopyrops ancyra*	Ancyra blue	Not Assessed	Vulnerable	Yes	Moderately rare	Yes	No
64	Lycaenidae	*Cheritra freja frigga*	Common imperial	Least Concern	Not Assessed	No	Moderately rare	Yes	No
65	Lycaenidae	*Chilades pandava pandava*	Cycad blue	Not Assessed	Not Assessed	No	Common	Yes	No
66	Lycaenidae	*Curetis saronis sumatrana*	Sumatran sunbeam	Not Assessed	Not Assessed	No	Moderately common	Yes	No
67	Lycaenidae	*Deudorix epijarbas cinnabarus*	Cornelian	Not Assessed	Not Assessed	No	Rare	Yes	No
68	Lycaenidae	*Eooxylides tharis distanti*	Branded imperial	Not Assessed	Not Assessed	No	Common	Yes	No
69	Lycaenidae	*Euchrysops cnejus cnejus*	Gram blue	Not Assessed	Not Assessed	No	Moderately common	Yes	Yes
70	Lycaenidae	*Everes lacturnus rileyi*	Indian cupid	Not Assessed	Not Assessed	No	Rare	Yes	No
71	Lycaenidae	*Flos apidanus saturatus*	Plain plushblue	Not Assessed	Not Assessed	No	Moderately common	Yes	No
72	Lycaenidae	*Horaga syrinx maenala*	Ambon onyx	Not Assessed	Not Assessed	No	Moderately common	Yes	No
73	Lycaenidae	*Hypolycaena erylus teatus*	Common tit	Not Assessed	Not Assessed	No	Common	Yes	No
74	Lycaenidae	*Hypolycaena thecloides thecloides*	Dark tit	Not Assessed	Not Assessed	No	Moderately rare	Yes	No

No.	Family	Scientific Name	Common Name	Global Status (IUCN/CITES)	National Status (Davison et al., 2008; Jain et al, 2018)	Species of Conservation Significance	Distribution/ Abundance /Rarity (Khew, 2015)	Probable Species	Recorded Species
75	Lycaenidae	*Ionolyce helicon merguiana*	Pointed line blue	Not Assessed	Not Assessed	No	Common	Yes	No
76	Lycaenidae	*Iraota rochana boswelliana*	Scarce silverstreak	Not Assessed	Not Assessed	No	Moderately common	Yes	No
77	Lycaenidae	*Jacoona anasuja anasuja*	Great imperial	Not Assessed	Data Deficient	No	Rare	Yes	No
78	Lycaenidae	*Jamides alecto ageladas*	Metallic caerulean	Not Assessed	Nationally Extinct (Rediscovered)	Yes	Moderately rare	Yes	No
79	Lycaenidae	*Jamides bochus nabonassar*	Dark caerulean	Not Assessed	Not Assessed	No	Moderately rare	Yes	No
80	Lycaenidae	*Jamides celeno aelianus*	Common caerulean	Not Assessed	Not Assessed	No	Common	Yes	Yes
81	Lycaenidae	*Lampides boeticus*	Pea blue	Not Assessed	Not Assessed	No	Common	Yes	Yes
82	Lycaenidae	*Liphyra brassolis abbreviata*	Moth butterfly	Not Assessed	Nationally Extinct (Rediscovered)	Yes	Very rare	Yes	No
83	Lycaenidae	*Logania marmorata damis*	Pale mottle	Not Assessed	Not Assessed	No	Moderately common	Yes	No
84	Lycaenidae	*Loxura atymnus fuconius*	Yamfly	Not Assessed	Not Assessed	No	Moderately common	Yes	No
85	Lycaenidae	*Megisba malaya sikkima*	Malayan	Not Assessed	Not Assessed	No	Moderately rare	Yes	Yes
86	Lycaenidae	*Miletus biggsii biggsii*	Bigg's brownwing	Not Assessed	Not Assessed	No	Moderately common	Yes	No
87	Lycaenidae	*Miletus gopara gopara*	N.A	Not Assessed	Nationally Extinct	Yes	Very rare	Yes	No
88	Lycaenidae	*Miletus symethus petronius*	brownie	Not Assessed	Not Assessed	No	Moderately common	Yes	No
89	Lycaenidae	*Nacaduba berenice icena*	Rounded sixline blue	Not Assessed	Not Assessed	No	Common	Yes	No
90	Lycaenidae	*Nacaduba beroe neon*	Opaque sixline blue	Not Assessed	Not Assessed	No	Common	Yes	No
91	Lycaenidae	*Nacaduba biocellata*	Two spotted line blue	Not Assessed	Not Assessed	No	Moderately rare	Yes	No
92	Lycaenidae	*Nacaduba calauria malayica*	Dark malayan sixline blue	Not Assessed	Not Assessed	No	Moderately rare	Yes	No
93	Lycaenidae	*Nacaduba hermus*	Pale fourline blue	Not Assessed	Not Assessed	No	N.A	Yes	No
94	Lycaenidae	*Nacaduba kurava nemana*	Transparent sixline blue	Not Assessed	Nationally Extinct (Rediscovered)	Yes	Moderately common	Yes	No
95	Lycaenidae	*Nacaduba pactolus odon*	Large fourline blue	Not Assessed	Nationally Extinct (Rediscovered)	Yes	Moderately rare	Yes	No
96	Lycaenidae	*Petrelaea dana*	Dingy line blue	Not Assessed	Not Assessed	No	Moderately rare	Yes	No
97	Lycaenidae	*Poritia sumatrae sumatrae*	Sumatran gem	Not Assessed	Not Assessed	No	Moderately rare	Yes	No
98	Lycaenidae	*Prosotas aluta nanda*	Barred line blue	Not Assessed	Not assessed	No	Rare	Yes	No
99	Lycaenidae	*Prosotas dubiosa lumpura*	Tailless line blue	Not Assessed	Not Assessed	No	Common	Yes	Yes
100	Lycaenidae	*Prosotas nora superdates*	Common line blue	Not Assessed	Not Assessed	No	Moderately common	Yes	No
101	Lycaenidae	*Rachana jalindra burbona*	Banded royal	Not Assessed	Critically Endangered	Yes	Very rare	Yes	No
102	Lycaenidae	*Rapala dieneces dieneces*	Scarlet flash	Not Assessed	Not Assessed	No	Moderately rare	Yes	No
103	Lycaenidae	*Rapala iarbus iarbus*	Common red flash	Not Assessed	Not Assessed	No	Moderately common	Yes	No
104	Lycaenidae	*Rapala manea chozeba*	Slate flash	Not Assessed	Not Assessed	No	Moderately rare	Yes	No
105	Lycaenidae	*Rapala pheretima sequeira*	Copper flash	Not Assessed	Not Assessed	No	Moderately common	Yes	No
106	Lycaenidae	*Rapala suffusa barthema*	Suffused flash	Not Assessed	Not Assessed	No	Moderately common	Yes	No
107	Lycaenidae	*Rapala varuna orseis*	Indigo flash	Not Assessed	Not Assessed	No	Moderately rare	Yes	No
108	Lycaenidae	*Remelana jangala travana*	Chocolate royal	Not Assessed	Not Assessed	No	Moderately rare	Yes	No
109	Lycaenidae	*Semanga superba deliciosa*	N.A	Not Assessed	Not Assessed	No	Moderately rare	Yes	No
110	Lycaenidae	*Spalgis epius epius*	Apefly	Not Assessed	Not Assessed	No	Moderately common	Yes	No
111	Lycaenidae	*Spindasis lohita senama*	Long banded silverline	Not Assessed	Not Assessed	No	Moderately common	Yes	No

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112	Lycaenidae	*Spindasis syama terana*	Club silverline	Not Assessed	Not Assessed	No	Moderately common	Yes	No
113	Lycaenidae	*Surendra vivarna amisena*	Acacia blue	Not Assessed	Not Assessed	No	Moderately common	Yes	No
114	Lycaenidae	*Tajuria cippus maxentius*	Peacock royal	Not Assessed	Not Assessed	No	Moderately common	Yes	No
115	Lycaenidae	*Tajuria dominus dominus*	N.A	Not Assessed	Not Assessed	No	Very rare	Yes	No
116	Lycaenidae	*Tajuria mantra mantra*	Felder's royal	Not Assessed	Not Assessed	No	Moderately rare	Yes	Yes
117	Lycaenidae	*Zeltus amasa maximinianus*	Fluffy tit	Not Assessed	Not Assessed	No	Moderately common	Yes	No
118	Lycaenidae	*Zizeeria maha serica*	Pale grass blue	Not Assessed	Not Assessed	No	Common	Yes	No
119	Lycaenidae	*Zizina otis lampa*	Lesser grass blue	Not Assessed	Not Assessed	No	Common	Yes	No
120	Lycaenidae	*Zizula hylax pygmaea*	Pygmy grass blue	Not Assessed	Not Assessed	No	Common	Yes	Yes
121	Nymphalidae	*Acraea terpsicore*	Tawny coster	Not Assessed	Not assessed	No	Common	Yes	Yes
122	Nymphalidae	*Amathusia phidippus phidippus*	Palm king	Not Assessed	Not Assessed	No	Moderately rare	Yes	Yes
123	Nymphalidae	*Athyma nefte subrata*	Colour sergeant	Not Assessed	Not Assessed	No	Common	Yes	No
124	Nymphalidae	*Athyma reta moorei*	Malay staff sergeant	Not Assessed	Not Assessed	Yes	Very rare	Yes	Yes
125	Nymphalidae	*Cethosia cyane*	Leopard lacewing	Not Assessed	Not assessed	No	Common	Yes	No
126	Nymphalidae	*Cethosia sp.*	Lacewing	N.A	N.A	N.A	N.A	N.A	Yes
127	Nymphalidae	*Cupha erymanthis lotis*	Rustic	Not Assessed	Not Assessed	No	Moderately common	Yes	No
128	Nymphalidae	*Danaus chrysippus chrysippus*	Plain tiger	Not Assessed	Not Assessed	No	Common	Yes	Yes
129	Nymphalidae	*Danaus genutia genutia*	Common tiger	Not Assessed	Not Assessed	No	Moderately common	Yes	No
130	Nymphalidae	*Danaus melanippus hegesippus*	Black veined tiger	Not Assessed	Not Assessed	No	Moderately common	Yes	No
131	Nymphalidae	*Discophora sondaica despoliata*	Common duffer	Not Assessed	Critically Endangered	Yes	Rare	Yes	No
132	Nymphalidae	*Doleschallia bisaltide bisaltide*	Autumn leaf	Not Assessed	Not assessed	No	Common	Yes	Yes
133	Nymphalidae	*Doleschallia bisaltide pratipa*	Autumn leaf	Not Assessed	Not assessed	No	Very rare	Yes	No
134	Nymphalidae	*Elymnias hypermnestra agina*	Common palmfly	Not Assessed	Not Assessed	No	Common	Yes	Yes
135	Nymphalidae	*Elymnias panthera panthera*	Tawny palmfly	Not Assessed	Not Assessed	No	Moderately common	Yes	Yes
136	Nymphalidae	*Euploea eyndhovii gardineri*	Striped black crow	Not Assessed	Not Assessed	No	Rare	Yes	No
137	Nymphalidae	*Euploea midamus singapura*	Blue spotted crow	Not Assessed	Not Assessed	No	Moderately common	Yes	No
138	Nymphalidae	*Euploea mulciber mulciber*	Striped blue crow	Not Assessed	Not Assessed	No	Common	Yes	No
139	Nymphalidae	*Euploea radamanthus radamanthus*	Magpie crow	Not Assessed	Not Assessed	No	Moderately common	Yes	No
140	Nymphalidae	*Euthalia aconthea gurda*	Baron	Not Assessed	Not Assessed	No	Common	Yes	No
141	Nymphalidae	*Euthalia adonia pinwilli*	Green baron	Not Assessed	Not Assessed	No	Moderately common	Yes	No
142	Nymphalidae	*Euthalia monina monina*	Malay baron	Not Assessed	Not Assessed	No	Common	Yes	No
143	Nymphalidae	*Faunis canens arcesilas*	Common faun	Not Assessed	Not Assessed	No	Common	Yes	No
144	Nymphalidae	*Hypolimnas anomala anomala*	Malayan eggfly	Not Assessed	Not Assessed	No	Common	Yes	Yes
145	Nymphalidae	*Hypolimnas bolina bolina*	Great eggfly	Not Assessed	Not Assessed	No	Moderately common	Yes	Yes
146	Nymphalidae	*Hypolimnas bolina jacintha*	Jacintha eggfly	Not Assessed	Not Assessed	No	Common	Yes	No
147	Nymphalidae	*Ideopsis vulgaris macrina*	Blue glassy tiger	Not Assessed	Not Assessed	No	Common	Yes	Yes
148	Nymphalidae	*Junonia almana javana*	Peacock pansy	Least Concern	Not Assessed	No	Common	Yes	Yes

No.	Family	Scientific Name	Common Name	Global Status (IUCN/CITES)	National Status (Davison et al., 2008; Jain et al, 2018)	Species of Conservation Significance	Distribution/ Abundance /Rarity (Khew, 2015)	Probable Species	Recorded Species
149	Nymphalidae	*Junonia atlites atlites*	Grey pansy	Not Assessed	Not Assessed	No	Moderately common	Yes	Yes
150	Nymphalidae	*Junonia hedonia ida*	Chocolate pansy	Not Assessed	Not Assessed	No	Common	Yes	Yes
151	Nymphalidae	*Junonia orithya wallacei*	Blue pansy	Not Assessed	Not Assessed	No	Common	Yes	Yes
152	Nymphalidae	*Lasippa tiga siaka*	Malayan lascar	Not Assessed	Not Assessed	No	Common	Yes	Yes
153	Nymphalidae	*Lebadea martha parkeri*	Knight	Not Assessed	Not Assessed	No	Moderately common	Yes	No
154	Nymphalidae	*Lethe europa malaya*	Bamboo tree brown	Not Assessed	Not Assessed	No	Moderately rare	Yes	No
155	Nymphalidae	*Melanitis leda leda*	Common evening brown	Not Assessed	Not Assessed	No	Moderately rare	Yes	No
156	Nymphalidae	*Moduza procris milonia*	Commander	Not Assessed	Not Assessed	No	Moderately common	Yes	No
157	Nymphalidae	*Mycalesis mineus macromalayana*	Dark brand bush brown	Not Assessed	Not Assessed	No	Common	Yes	Yes
158	Nymphalidae	*Mycalesis orseis nautilus*	Purple bush brown	Not Assessed	Not Assessed	No	Rare	Yes	No
159	Nymphalidae	*Mycalesis perseoides perseoides*	Burmese bush brown	Not Assessed	Data Deficient	No	Common	Yes	Yes
160	Nymphalidae	*Mycalesis perseus cepheus*	Dingy bush brown	Not Assessed	Not Assessed	No	Moderately common	Yes	Yes
161	Nymphalidae	*Mycalesis visala phamis*	Long brand bush brown	Not Assessed	Not Assessed	No	Moderately common	Yes	Yes
162	Nymphalidae	*Neptis hylas papaja*	Common sailor	Not Assessed	Not Assessed	No	Moderately common	Yes	Yes
163	Nymphalidae	*Neptis leucoporos cresina*	Burmese sailor	Not Assessed	Not Assessed	No	Common	Yes	No
164	Nymphalidae	*Orsotriaena medus cinerea*	Dark grass brown	Not Assessed	Not Assessed	No	Common	Yes	No
165	Nymphalidae	*Pandita sinope sinope*	Colonel	Not Assessed	Not Assessed	No	Moderately rare	Yes	No
166	Nymphalidae	*Pantoporia hordonia hordonia*	Common lascar	Not Assessed	Not Assessed	No	Common	Yes	Yes
167	Nymphalidae	*Pantoporia paraka paraka*	Perak lascar	Not Assessed	Not Assessed	No	Moderately common	Yes	No
168	Nymphalidae	*Parantica agleoides agleoides*	Dark glassy tiger	Not Assessed	Not Assessed	No	Common	Yes	Yes
169	Nymphalidae	*Phaedyma columella singa*	Short banded sailor	Not Assessed	Not Assessed	No	Common	Yes	Yes
170	Nymphalidae	*Phalanta phalantha phalantha*	Leopard	Not Assessed	Not Assessed	No	Common	Yes	No
171	Nymphalidae	*Polyura hebe plautus*	Plain nawab	Not Assessed	Not Assessed	No	Common	Yes	No
172	Nymphalidae	*Polyura schreiber tisamenus*	Blue nawab	Not Assessed	Not Assessed	No	Moderately rare	Yes	No
173	Nymphalidae	*Symbrenthia hippoclus selangorana*	Malayan jester	Not Assessed	Not assessed	No	migrant)	Yes	No
174	Nymphalidae	*Tanaecia iapis puseda*	Horsfield's baron	Not Assessed	Not Assessed	No	Common	Yes	No
175	Nymphalidae	*Tanaecia pelea pelea*	Malay viscount	Not Assessed	Not Assessed	No	Common	Yes	No
176	Nymphalidae	*Vindula dejone erotella*	Cruiser	Not Assessed	Not Assessed	No	Common	Yes	No
177	Nymphalidae	*Ypthima baldus newboldi*	Common five-ring	Not Assessed	Not Assessed	No	Common	Yes	No
178	Nymphalidae	*Ypthima horsfieldii humei*	Malayan five-ring	Not Assessed	Not Assessed	No	Common	Yes	No
179	Nymphalidae	*Ypthima huebneri*	Common four-ring	Not Assessed	Not Assessed	No	Moderately common	Yes	No
180	Nymphalidae	*Ypthima pandocus corticaria*	Common three-ring	Not Assessed	Not Assessed	No	Common	Yes	No
181	Papilionidae	*Chilasa clytia clytia*	Common mime	Not Assessed	Not Assessed	No	Common	Yes	No
182	Papilionidae	*Graphium agamemnon agamemnon*	Tailed jay	Not Assessed	Not Assessed	No	Common	Yes	Yes
183	Papilionidae	*Graphium sarpedon luctatius*	Common bluebottle	Not Assessed	Not Assessed	No	Common	Yes	Yes
184	Papilionidae	*Pachliopta aristolochiae asteris*	Common rose	Not Assessed	Vulnerable	Yes	Moderately common	Yes	No
185	Papilionidae	*Papilio demoleus malayanus*	Lime butterfly	Not Assessed	Not Assessed	No	Common	Yes	No

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186	Papilionidae	*Papilio demolion demolion*	Banded swallowtail	Not Assessed	Not Assessed	No	Moderately common	Yes	No
187	Papilionidae	*Papilio memnon agenor*	Great mormon	Not Assessed	Not Assessed	No	Moderately common	Yes	No
188	Papilionidae	*Papilio polytes romulus*	Common mormon	Not Assessed	Not Assessed	No	Common	Yes	Yes
189	Papilionidae	*Troides amphrysus ruficollis*	Malayan birdwing	CITES protected	Nationally Extinct (Rediscovered)	Yes	migrant)	Yes	No
190	Papilionidae	*Troides helena cerberus*	Common birdwing	CITES protected	Vulnerable	Yes	Moderately common	Yes	No
191	Pieridae	*Appias libythea olferna*	Striped albatross	Not Assessed	Not Assessed	No	Common	Yes	Yes
192	Pieridae	*Catopsilia pomona pomona*	Lemon emigrant	Not Assessed	Not Assessed	No	Common	Yes	Yes
193	Pieridae	*Catopsilia pyranthe pyranthe*	Mottled emigrant	Not Assessed	Not Assessed	No	Common	Yes	Yes
194	Pieridae	*Catopsilia scylla cornelia*	Orange emigrant	Not Assessed	Not Assessed	No	Common	Yes	Yes
195	Pieridae	*Delias hyparete metarete*	Painted jezebel	Not Assessed	Not Assessed	No	Common	Yes	Yes
196	Pieridae	*Eurema andersonii andersonii*	Anderson's grass yellow	Not Assessed	Not Assessed	No	Moderately common	Yes	No
197	Pieridae	*Eurema blanda snelleni*	Three spot grass yellow	Not Assessed	Not Assessed	No	Common	Yes	Yes
198	Pieridae	*Eurema hecabe contubernalis*	Common grass yellow	Not Assessed	Not Assessed	No	Common	Yes	Yes
199	Pieridae	*Leptosia nina malayana*	Psyche	Not Assessed	Not Assessed	No	Common	Yes	Yes
200	Pieridae	*Pieris canidia canidia*	Cabbage white	Not Assessed	Not Assessed	No	Moderately rare	Yes	No
201	Riodinidae	*Abisara saturata kausambioides*	Malayan plum judy	Not Assessed	Not Assessed	No	Moderately common	Yes	No
202	Riodinidae	*Laxita thuisto thuisto*	Lesser harlequin	Not Assessed	Not Assessed	No	Rare	Yes	No
203	Riodinidae	*Taxila haquinus haquinus*	Harlequin	Not Assessed	Endangered	Yes	Moderately rare	Yes	No

Appendix I - List of Probable and Recorded Faunal Species

No.	Family	Scientific Name	Common Name	Global Status (IUCN/CITES)	National Status (Davison et al., 2008)	Species of Conservation Significance	Native Status (Baker & Lim, 2012)	Probable Species	Recorded Species
1	Atyidae	*Caridina johnsoni*	Johnson's shrimp	Least Concern	Not Assessed	No	Native	Yes	Yes
2	Atyidae	*Caridina* sp.	N.A	N.A	N.A	N.A	N.A	N.A	Yes*
3	Gecarcinucidae	*Parathelphusa maculata*	Maculate freshwater crab	Least Concern	Not Assessed	No	Native	Yes	No
4	Palaemonidae	*Macrobrachium lanchesteri*	Ghost shrimp	Least Concern	Not Assessed	No	Non-native	Yes	Yes
5	Palaemonidae	*Macrobrachium malayanum*	Freshwater prawn	Least Concern	Not Assessed	No	Native	Yes	No
6	Palaemonidae	*Macrobrachium nipponense*	Oriental river prawn	Least Concern	Not Assessed	No	Non-native	No	Yes
7	Sesarmidae	*Geosesarma peraccae*	Peracca's land crab	Not Assessed	Vulnerable	Yes	Native	Yes	No

*Likely to be *Caridina* cf. *johnsoni*

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1	Anabantidae	*Anabas testudineus*	Oriental Climbing Perch	Least Concern	Not Assessed	No	Native	Yes	Yes
2	Aplocheilidae	*Aplocheilus armatus*	Whitespot	Least Concern	Not Assessed	No	Native	Yes	Yes
3	Channidae	*Channa lucius*	Forest Snakehead	Least Concern	Not Assessed	No	Native	Yes	No
4	Channidae	*Channa striata*	Paddyfield Snakehead	Least Concern	Not Assessed	No	Native	Yes	Yes
5	Clariidae	*Clarias cf. batrachus*	Common Walking Catfish	Not Assessed	Not Assessed	No	Native	Yes	No
6	Cyprinidae	*Barbodes rhombeus*	Indochinese Spotted Barb	Least Concern	Not Assessed	No	Non-native	Yes	Yes
7	Cyprinidae	*Brachydanio albolineata*	Pearl Danio	Least Concern	Not Assessed	No	Non-native	Yes	No
8	Cyprinidae	*Brachydanio rerio*	Zebra Danio	Least Concern	Not Assessed	No	Non-native	Yes	No
9	Cyprinidae	*Osteochilus vittatus*	Bonylip Barb	Least Concern	Not Assessed	No	Non-native	Yes	No
10	Cyprinidae	*Puntigrus partipentazona*	Malayan tiger barb	Least Concern	Not Assessed	No	Non-native	Yes	Yes
11	Eleotrididae	*Oxyeleotris marmorata*	Marbled Gudgeon	Least Concern	Not Assessed	No	Non-native	Yes	Yes
12	Gobiidae	*Goby sp.*	N.A	N.A	N.A	N.A	N.A	Yes	Yes
13	Gobiidae	*Rhinogobius giurinus*	Barcheek goby	Least Concern	Not Assessed	No	Non-native	Yes	Yes
14	Gobiidae	*Rhinogobius similis*	Oriental river-goby	Not Assessed	Not Assessed	No	Non-native	Yes	Yes
15	Osphronemidae	*Betta imbellis*	Crescent Betta	Least Concern	Not Assessed	No	Native	Yes	No
16	Osphronemidae	*Betta pugnax*	Malayan Forest Betta	Least Concern	Not Assessed	No	Native	Yes	No
17	Osphronemidae	*Trichopodus trichopterus*	Threespot Gouramy	Least Concern	Not Assessed	No	Native	Yes	Yes
18	Osphronemidae	*Trichopsis vittata*	Croaking Gouramy	Least Concern	Not Assessed	No	Native	Yes	Yes
19	Poeciliidae	*Gambusia affinis*	Mosquitofish	Least Concern	Not Assessed	No	Non-native	Yes	No
20	Poeciliidae	*Poecilia reticulata*	Guppy	Not Assessed	Not Assessed	No	Non-native	Yes	Yes
21	Poeciliidae	*Poecilia sphenops*	Common Molly	Least Concern	Not Assessed	No	Non-native	Yes	No
22	Poeciliidae	*Xiphophorus maculatus*	Southern Platy	Data Deficient	Not Assessed	No	Non-native	Yes	No
23	Synbranchidae	*Monopterus albus*	Asian Swamp-eel	Least Concern	Not Assessed	No	Native	Yes	Yes
24	Zenarchopteridae	*Dermogenys collettei*	Sunda Pygmy Halfbeak	Not Assessed	Not Assessed	No	Native	Yes	Yes

Appendix I - List of Probable and Recorded Faunal Species

No.	Type	Family	Scientific Name	Common Name	Global Status (IUCN/CITES)	National Status (Davison et al., 2008)	Species of Conservation Signficance	Distribution/ Abundance/ Rarity (Baker & Lim, 2012)	Native Status (Baker & Lim, 2012)	Probable Species	Recorded Species
1	Toad	Bufonidae	*Duttaphrynus melanostictus*	Asian toad	Least Concern	Not Assessed	No	Widespread and Common	Native	Yes	Yes
2	Frog	Dicroglossidae	*Fejervarya cancrivora*	Crab-eating frog	Least Concern	Not Assessed	No	Widespread and Common	Native	Yes	Yes
3	Frog	Dicroglossidae	*Fejervarya limnocharis*	Field frog	Least Concern	Not Assessed	No	Widespread and Common	Native	Yes	Yes
4	Frog	Dicroglossidae	*Limnonectes blythii*	Malayan giant frog	Near Threatened	Not Assessed	No	Widespread and Common	Native	Yes	Yes
5	Frog	Eleutherodactylidae	*Eleutherodactylus planirostris*	Greenhouse frog	Least Concern	Not Assessed	No	Widespread and Common	Non-native	Yes	No
6	Frog	Microhylidae	*Kaloula pulchra*	Banded bull frog	Least Concern	Not Assessed	No	Widespread and Common	Non-native	Yes	Yes
7	Frog	Microhylidae	*Microhyla butleri*	Painted chorus frog	Least Concern	Not Assessed	No	Widespread and Common	Native	Yes	Yes
8	Frog	Microhylidae	*Microhyla heymonsi*	Dark-sided chorus frog	Least Concern	Not Assessed	No	Widespread and Common	Native	Yes	Yes
9	Frog	Microhylidae	*Microhyla mukhlesuri*	East Asian ornate chorus frog	Least Concern	Not Assessed	No	Restricted and Rare	Non-native	Yes	Yes
10	Frog	Ranidae	*Hylarana erythraea*	Green paddy frog	Least Concern	Not Assessed	No	Widespread and Common	Native	Yes	Yes
11	Frog	Ranidae	*Lithobates catesbeianus*	American bullfrog	Least Concern	Not Assessed	No	Widespread and Common	Non-native	Yes	No
12	Frog	Ranidae	*Sylvirana guentheri*	Guenther's frog	Least Concern	Not Assessed	No	Widespread but Uncommon	Non-native	Yes	Yes
13	Frog	Rhacophoridae	*Polypedates leucomystax*	Four-lined tree frog	Least Concern	Not Assessed	No	Widespread and Common	Native	Yes	Yes

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1	Lizard	Agamidae	*Bronchocela cristatella*	Green crested lizard	Not Assessed	Not Assessed	No	Widespread but Uncommon	Native	Yes	Yes
2	Lizard	Agamidae	*Calotes versicolor*	Changeable lizard	Not Assessed	Not Assessed	No	Widespread and Common	Non-native	Yes	Yes
3	Lizard	Agamidae	*Draco sumatranus*	Sumatran flying dragon	Not Assessed	Not Assessed	No	Widespread and Common	Native	Yes	No
4	Lizard	Gekkonidae	*Gehyra mutilata*	Four-clawed gecko	Not Assessed	Not Assessed	No	Widespread and Common	Native	Yes	No
5	Lizard	Gekkonidae	*Gekko monarchus*	Spotted house gecko	Not Assessed	Not Assessed	No	Widespread and Common	Native	Yes	Yes
6	Lizard	Gekkonidae	*Hemidactylus brookii*	Brooke's house gecko	Not Assessed	Not Assessed	No	Restricted and Rare	Non-native	Yes	No
7	Lizard	Gekkonidae	*Hemidactylus frenatus*	Spiny-tailed house gecko	Least Concern	Not Assessed	No	Widespread and Common	Native	Yes	Yes
8	Lizard	Gekkonidae	*Hemidactylus platyurus*	Flat-tailed gecko	Not Assessed	Not Assessed	No	Widespread and Common	Native	Yes	No
9	Lizard	Gekkonidae	*Hemiphyllodactylus typus*	Lowland dwarf gecko	Least Concern	Vulnerable	Yes	Restricted and Rare	Native	Yes	Yes
10	Lizard	Scincidae	*Eutropis multifasciata*	Many-lined sun skink	Not Assessed	Not Assessed	No	Widespread and Common	Native	Yes	Yes
11	Lizard	Scincidae	*Lygosoma bowringii*	Garden supple skink	Not Assessed	Not Assessed	No	Widespread and Common	Native	Yes	No
12	Lizard	Varanidae	*Varanus nebulosus*	Clouded monitor	Not Assessed	Not Assessed	No	Restricted but Common	Native	Yes	No
13	Lizard	Varanidae	*Varanus salvator*	Malayan water monitor	Least Concern	Not Assessed	No	Widespread and Common	Native	Yes	Yes
14	Snake	Colubridae	*Ahaetulla prasina*	Oriental whip snake	Least Concern	Not Assessed	No	Widespread and Common	Native	Yes	Yes
15	Snake	Colubridae	*Chrysopelea paradisi*	Paradise gliding snake	Least Concern	Not Assessed	No	Widespread and Common	Native	Yes	No
16	Snake	Colubridae	*Coelognathus flavolineatus*	Common Malayan racer	Least Concern	Endangered	Yes	Widespread but Rare	Native	Yes	No
17	Snake	Colubridae	*Dendrelaphis caudolineatus*	Striped bronzeback	Least Concern	Not Assessed	No	Widespread and Common	Native	Yes	Yes
18	Snake	Colubridae	*Dendrelaphis pictus*	Painted bronzeback	Least Concern	Not Assessed	No	Widespread and Common	Native	Yes	Yes
19	Snake	Colubridae	*Lycodon capucinus*	House wolf snake	Least Concern	Not Assessed	No	Widespread and Common	Native	Yes	Yes
20	Snake	Colubridae	*Oligodon octolineatus*	Striped kukri snake	Least Concern	Not Assessed	No	Widespread and Common	Native	Yes	No
21	Snake	Colubridae	*Ptyas korros*	Indochinese rat snake	Least Concern	Not Assessed	No	Widespread but Uncommon	Native	Yes	Yes
22	Snake	Colubridae	*Sibynophis melanocephalus*	Black-headed collared snake	Least Concern	Endangered	Yes	Widespread but Uncommon	Native	Yes	No
23	Snake	Colubridae	*Xenochrophis vittatus*	Striped keelback	Least Concern	Not Assessed	No	Widespread and Common	Non-native	Yes	No
24	Snake	Elapidae	*Calliophis intestinalis*	Banded Malayan coral snake	Least Concern	Not Assessed	No	Widespread but Rare	Native	Yes	No
25	Snake	Elapidae	*Naja sumatrana*	Equatorial spitting cobra	Least Concern	Not Assessed	No	Widespread and Common	Native	Yes	No
26	Snake	Elapidae	*Ophiophagus hannah*	King cobra	Vulnerable	Endangered	Yes	Restricted and Rare	Native	Yes	No
27	Snake	Homalopsidae	*Homalopsis buccata*	Puff-faced water snake	Least Concern	Vulnerable	Yes	Widespread but Uncommon	Native	Yes	No
28	Snake	Pareidae	*Pareas margaritophorus*	White-spotted slug snake	Least Concern	Not Assessed	No	Widespread and Common	Non-native	Yes	No
29	Snake	Pythonidae	*Malayopython reticulatus*	Reticulated python	Least Concern	Not Assessed	No	Widespread and Common	Native	Yes	Yes
30	Snake	Typhlopidae	*Argyrophis muelleri*	White-bellied blind snake	Least Concern	Critically Endangered	Yes	Widespread but Rare	Native	Yes	No
31	Snake	Typhlopidae	*Indotyphlops braminus*	Brahminy blind snake	Least Concern	Not Assessed	No	Widespread and Common	Native	Yes	No

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32	Snake	Xenopeltidae	*Xenopeltis unicolor*	Iridescent earth snake	Least Concern	Not Assessed	No	Widespread but Uncommon	Native	Yes	No
33	Turtle	Emydidae	*Trachemys decussata*	Cuban slider	Not Assessed	Not Assessed	No	NA	NA	Yes	No
34	Turtle	Emydidae	*Trachemys scripta*	Red-eared slider	Least Concern	Not Assessed	No	Widespread and Common	Non-native	Yes	Yes
35	Turtle	Geomydidae	*Cuora amboinensis*	Malayan box terrapin	Vulnerable; CITES protected (Appendix II)	Not Assessed	Yes	Restricted but Common	Native	Yes	Yes
36	Turtle	Geomydidae	*Heosemys grandis*	Giant Asian pond turtle	Vulnerable; CITES protected (Appendix II)	Not Assessed	No	NA	Non-native	Yes	Yes
37	Turtle	Trionychidae	*Amyda cartilaginea*	Asian softshell turtle	Vulnerable	Endangered	Yes	Restricted and Uncommon	Native	Yes	Yes

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1	Acanthizidae	*Gerygone sulphurea*	Golden-bellied gerygone	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes
2	Accipitridae	*Accipiter gularis*	Japanese sparrowhawk	Least Concern	Not Assessed	No	Common	Winter visitor	Yes	No
3	Accipitridae	*Accipiter soloensis*	Chinese sparrowhawk	Least Concern	Not Assessed	No	Uncommon	Winter visitor	Yes	No
4	Accipitridae	*Accipiter trivirgatus*	Crested goshawk	Least Concern	Critically Endangered	Yes	Uncommon	Resident breeder	Yes	Yes
5	Accipitridae	*Aviceda leuphotes*	Black baza	Least Concern	Not Assessed	No	Common	Winter visitor	Yes	No
6	Accipitridae	*Buteo buteo*	Common buzzard	Least Concern	Not Assessed	No	Uncommon	Winter visitor	Yes	No
7	Accipitridae	*Elanus caeruleus*	Black-winged kite	Least Concern	Not Assessed	No	Uncommon	Resident breeder	Yes	No
8	Accipitridae	*Haliaeetus ichthyaetus*	Grey-headed fish eagle	Threatened	Critically Endangered	Yes	Uncommon	Resident breeder	Yes	Yes
9	Accipitridae	*Haliaeetus leucogaster*	White-bellied sea eagle	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes
10	Accipitridae	*Haliastur indus*	Brahminy kite	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes
11	Accipitridae	*Lophotriorchis kienerii*	Rufous-bellied hawk-eagle	Least Concern	Not Assessed	No	Rare	Winter visitor	Yes	No
12	Accipitridae	*Milvus migrans*	Black kite	Least Concern	Not Assessed	No	Rare	Winter visitor	Yes	No
13	Accipitridae	*Nisaetus cirrhatus*	Changeable hawk-eagle	Least Concern	Endangered	Yes	Uncommon	Resident breeder	Yes	Yes
14	Accipitridae	*Pernis ptilorhynchus*	Crested honey-buzzard	Least Concern	Not Assessed	No	Common	Winter visitor	Yes	Yes
15	Accipitridae	*Spilornis cheela*	Crested serpent eagle	Least Concern	Critically Endangered	Yes	Rare	proven	Yes	No
16	Acrocephalidae	*Acrocephalus orientalis*	Oriental reed warbler	Least Concern	Not Assessed	No	Common	Winter visitor	Yes	Yes
17	Aegithinidae	*Aegithina tiphia*	Common iora	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes
18	Alcedinidae	*Alcedo atthis*	Common kingfisher	Least Concern	Not Assessed	No	Common	Winter visitor	Yes	No
19	Alcedinidae	*Alcedo meninting*	Blue-eared kingfisher	Least Concern	Critically Endangered	Yes	Rare	Resident breeder	Yes	No
20	Alcedinidae	*Ceyx erithaca*	Oriental dwarf kingfisher	Least Concern	Not Assessed	No	Uncommon	Winter visitor	Yes	No
21	Alcedinidae	*Halcyon smyrnensis*	White-throated kingfisher	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes
22	Alcedinidae	*Pelargopsis capensis*	Stork-billed kingfisher	Least Concern	Not Assessed	No	Uncommon	Resident breeder	Yes	Yes
23	Alcedinidae	*Todiramphus chloris*	Collared kingfisher	Least Concern	Not Assessed	No	Abundant	Introduced resident breeder	Yes	Yes
24	Apodidae	*Aerodramus fuciphagus*	Edible-nest swiftlet	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	No
25	Apodidae	*Aerodramus maximus*	Black-nest swiftlet	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	No
26	Apodidae	*Aerodramus sp.*	N.A	N.A	N.A	N.A	N.A	N.A	N.A	Yes
27	Apodidae	*Apus pacificus*	Pacific swift	Least Concern	Not Assessed	No	Uncommon	Winter visitor	Yes	No
28	Apodidae	*Collocalia affinis*	Plume-toed swiftlet	Not Assessed	Not Assessed	Yes	Uncommon	Resident breeder	Yes	Yes
29	Ardeidae	*Ardea cinerea*	Grey heron	Least Concern	Vulnerable	Yes	Uncommon	Resident breeder	Yes	No
30	Ardeidae	*Ardea intermedia*	Intermediate egret	Least Concern	Not Assessed	No	Uncommon	Winter visitor	Yes	Yes
31	Ardeidae	*Ardea purpurea*	Purple heron	Least Concern	Endangered	Yes	Uncommon	Resident breeder	Yes	No
32	Ardeidae	*Ardeola bacchus*	Chinese pond heron	Least Concern	Not Assessed	No	Common	Winter visitor	Yes	No
33	Ardeidae	*Ardeola sp.*	Pond heron	N.A	N.A	N.A	N.A	N.A	N.A	Yes
34	Ardeidae	*Ardeola speciosa*	Javan pond heron	Least Concern	Not Assessed	No	Uncommon	Winter visitor	Yes	No
35	Ardeidae	*Bubulcus coromandus*	Eastern cattle egret	Least Concern	Not Assessed	No	Common	Winter visitor	Yes	No
36	Ardeidae	*Butorides striata*	Striated heron	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	No
37	Ardeidae	*Egretta garzetta*	Little egret	Least Concern	Not Assessed	No	Common	Winter visitor	Yes	No
38	Ardeidae	*Gorsachius melanolophus*	Malayan night heron	Least Concern	Not Assessed	No	Rare	Winter visitor	Yes	Yes
39	Ardeidae	*Ixobrychus cinnamomeus*	Cinnamon bittern	Least Concern	Not Assessed	No	Uncommon	Resident breeder	Yes	No
40	Ardeidae	*Ixobrychus eurhythmus*	Von Schrenck's bittern	Least Concern	Not Assessed	No	Uncommon	Winter visitor	Yes	No

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41	Ardeidae	*Ixobrychus sinensis*	Yellow bittern	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	No
42	Ardeidae	*Nycticorax nycticorax*	Black-crowned night heron	Least Concern	Critically Endangered	Yes	Uncommon	Resident breeder	Yes	No
43	Bucerotidae	*Anthracoceros albirostris*	Oriental pied hornbill	Least Concern	Critically Endangered	Yes	Uncommon	Resident breeder	Yes	No
44	Cacatuidae	*Cacatua goffiniana*	Tanimbar corella	Threatened	Not Assessed	No	Common	Introduced resident breeder	Yes	No
45	Cacatuidae	*Cacatua sulphurea*	Yellow-crested cockatoo	Endangered	Not Assessed	No	Uncommon	Introduced resident breeder	Yes	No
46	Campephagidae	*Lalage nigra*	Pied triller	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes
47	Campephagidae	*Pericrocotus divaricatus*	Ashy minivet	Least Concern	Not Assessed	No	Common	Winter visitor	Yes	Yes
48	Caprimulgidae	*Caprimulgus affinis*	Savanna nightjar	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes
49	Caprimulgidae	*Caprimulgus macrurus*	Large-tailed nightjar	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes
50	Charadriidae	*Vanellus indicus*	Red-wattled lapwing	Least Concern	Endangered	Yes	Uncommon	Resident breeder	Yes	Yes
51	Ciconiidae	*Mycteria cinerea*	Milky stork	Least Concern	Not Assessed	No	N.A	Introduced	Yes	No
52	Cisticolidae	*Cisticola juncidis*	Zitting cisticola	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	No
53	Cisticolidae	*Orthotomus atrogularis*	Dark-necked tailorbird	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes
54	Cisticolidae	*Orthotomus ruficeps*	Ashy tailorbird	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes
55	Cisticolidae	*Orthotomus sericeus*	Rufous-tailed tailorbird	Least Concern	Not Assessed	No	Uncommon	Resident breeder	Yes	No
56	Cisticolidae	*Orthotomus sutorius*	Common tailorbird	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes
57	Cisticolidae	*Prinia flaviventris*	Yellow-bellied prinia	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes
58	Columbidae	*Chalcophaps indica*	Common emerald dove	Least Concern	Not Assessed	No	Uncommon	Resident breeder	Yes	Yes
59	Columbidae	*Columba livia*	Rock dove	Least Concern	Not Assessed	No	Abundant	Introduced resident breeder	Yes	No
60	Columbidae	*Ducula bicolor*	Pied imperial pigeon	Least Concern	Not Assessed	No	Uncommon	Resident breeder	Yes	Yes
61	Columbidae	*Geopelia striata*	Zebra dove	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes
62	Columbidae	*Ptilinopus jambu*	Jambu fruit dove	Threatened	Not Assessed	No	Uncommon	Non-breeding visitor	Yes	No
63	Columbidae	*Spilopelia chinensis*	Spotted dove	Least Concern	Not Assessed	No	Abundant	Introduced resident breeder	Yes	Yes
64	Columbidae	*Treron vernans*	Pink-necked green pigeon	Least Concern	Not Assessed	No	Abundant	Resident breeder	Yes	Yes
65	Coraciidae	*Eurystomus orientalis*	Oriental dollarbird	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes
66	Corvidae	*Corvus macrorhynchos*	Large-billed crow	Least Concern	Not Assessed	No	Uncommon	Resident breeder	Yes	No
67	Corvidae	*Corvus splendens*	House crow	Least Concern	Not Assessed	No	Common	Introduced resident breeder	Yes	Yes
68	Cuculidae	*Cacomantis merulinus*	Plaintive cuckoo	Least Concern	Not Assessed	No	Uncommon	Resident breeder	Yes	Yes
69	Cuculidae	*Cacomantis sepulcralis*	Rusty-breasted cuckoo	Least Concern	Vulnerable	Yes	Uncommon	Resident breeder	Yes	Yes
70	Cuculidae	*Cacomantis sonneratii*	Banded bay cuckoo	Least Concern	Not Assessed	No	Uncommon	Resident breeder	Yes	No
71	Cuculidae	*Centropus bengalensis*	Lesser coucal	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	No
72	Cuculidae	*Centropus sinensis*	Greater coucal	Least Concern	Not Assessed	No	Uncommon	Resident breeder	Yes	No
73	Cuculidae	*Chrysococcyx minutillus*	Little bronze-cuckoo	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes
74	Cuculidae	*xanthorhynchus*	Violet cuckoo	Least Concern	Endangered	Yes	Uncommon	Resident breeder	Yes	No
75	Cuculidae	*Clamator coromandus*	Chestnut-winged cuckoo	Least Concern	Not Assessed	No	Uncommon	Winter visitor	Yes	No
76	Cuculidae	*Cuculus micropterus*	Indian cuckoo	Least Concern	Not Assessed	No	Uncommon	Winter visitor	Yes	No
77	Cuculidae	*Eudynamys scolopaceus*	Asian koel	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes
78	Cuculidae	*Hierococcyx fugax*	Malaysian hawk-cuckoo	Least Concern	Not Assessed	No	Uncommon	Non-breeding visitor	Yes	No
79	Cuculidae	*Hierococcyx sparverioides*	Large hawk-cuckoo	Least Concern	Not Assessed	No	Rare	Winter visitor	Yes	No
80	Cuculidae	*Phaenicophaeus sumatranus*	Chestnut-bellied malkoha	Threatened	Not Assessed	No	Uncommon	Resident breeder	Yes	No

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81	Dicaeidae	*Dicaeum cruentatum*	Scarlet-backed flowerpecker	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes
82	Dicaeidae	*Dicaeum trigonostigma*	Orange-bellied flowerpecker	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	No
83	Dicruridae	*Dicrurus annectans*	Crow-billed drongo	Least Concern	Not Assessed	No	Uncommon	Winter visitor	Yes	No
84	Dicruridae	*Dicrurus paradiseus*	Greater racket-tailed drongo	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes
85	Estrildidae	*Lonchura atricapilla*	Chestnut munia	Least Concern	Not Assessed	No	Uncommon	Resident breeder	Yes	No
86	Estrildidae	*Lonchura cucullata*	Bronze mannikin	Least Concern	Not Assessed	No	N.A	Introduced	Yes	No
87	Estrildidae	*Lonchura ferruginosa*	White-capped munia	Least Concern	Not Assessed	No	Rare	Introduced resident breeder	Yes	No
88	Estrildidae	*Lonchura leucogastroides*	Javan munia	Least Concern	Not Assessed	No	Uncommon	Introduced resident breeder	Yes	No
89	Estrildidae	*Lonchura maja*	White-headed munia	Least Concern	Not Assessed	No	Uncommon	Resident breeder	Yes	No
90	Estrildidae	*Lonchura punctulata*	Scaly-breasted munia	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	No
91	Falconidae	*Falco tinnunculus*	Common kestrel	Least Concern	Not Assessed	No	Uncommon	Winter visitor	Yes	No
92	Hemiprocnidae	*Hemiprocne longipennis*	Grey-rumped treeswift	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	No
93	Hirundinidae	*Cecropis daurica*	Red-rumped swallow	Least Concern	Not Assessed	No	Uncommon	Winter visitor	Yes	No
94	Hirundinidae	*Hirundo rustica*	Barn swallow	Least Concern	Not Assessed	No	Abundant	Winter visitor	Yes	No
95	Hirundinidae	*Hirundo tahitica*	Pacific swallow	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	No
96	Laniidae	*Lanius cristatus*	Brown shrike	Least Concern	Not Assessed	No	Common	Winter visitor	Yes	Yes
97	Laniidae	*Lanius schach*	Long-tailed shrike	Least Concern	Not Assessed	No	Uncommon	Resident breeder	Yes	No
98	Laniidae	*Lanius tigrinus*	Tiger shrike	Least Concern	Not Assessed	No	Common	Winter visitor	Yes	No
99	Leiothrichidae	*Garrulax leucolophus*	White-crested laughingthrush	Least Concern	Not Assessed	No	Common	Introduced resident breeder	Yes	Yes
100	Megalaimidae	*Psilopogon haemacephalus*	Coppersmith barbet	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes
101	Megalaimidae	*Psilopogon lineatus*	Lineated barbet	Least Concern	Not Assessed	No	Uncommon	Introduced resident breeder	Yes	Yes
102	Meropidae	*Merops philippinus*	Blue-tailed bee-eater	Least Concern	Not Assessed	No	Common	Winter visitor	Yes	Yes
103	Meropidae	*Merops viridis*	Blue-throated bee-eater	Least Concern	Not Assessed	No	Common	Migrant breeder	Yes	Yes
104	Monarchidae	*Terpsiphone incei*	Amur paradise flycatcher	Least Concern	Not Assessed	No	Common	Winter visitor	Yes	No
105	Motacillidae	*Anthus rufulus*	Paddyfield pipit	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	No
106	Motacillidae	*Dendronanthus indicus*	Forest wagtail	Least Concern	Not Assessed	No	Uncommon	Winter visitor	Yes	Yes
107	Motacillidae	*Motacilla cinerea*	Grey wagtail	Least Concern	Not Assessed	No	Uncommon	Winter visitor	Yes	No
108	Motacillidae	*Motacilla tschutschensis*	Eastern yellow wagtail	Least Concern	Not Assessed	No	Common	Winter visitor	Yes	No
109	Muscicapidae	*Copsychus malabaricus*	White-rumped shama	Least Concern	Critically Endangered	Yes	Uncommon	Resident breeder	Yes	No
110	Muscicapidae	*Copsychus saularis*	Oriental magpie-robin	Least Concern	Endangered	Yes	Uncommon	Resident breeder	Yes	Yes
111	Muscicapidae	*Cyornis brunneatus*	Brown-chested jungle flycatcher	Vulnerable	Not Assessed	Yes	Uncommon	Winter visitor	Yes	No
112	Muscicapidae	*Ficedula mugimaki*	Mugimaki flycatcher	Least Concern	Not Assessed	No	Uncommon	Passage migrant	Yes	No
113	Muscicapidae	*Ficedula zanthopygia*	Yellow-rumped flycatcher	Least Concern	Not Assessed	No	Uncommon	Passage migrant	Yes	No
114	Muscicapidae	*Larvivora cyane*	Siberian blue robin	Least Concern	Not Assessed	No	Common	Winter visitor	Yes	Yes
115	Muscicapidae	*Muscicapa dauurica*	Asian brown flycatcher	Least Concern	Not Assessed	No	Common	Winter visitor	Yes	No
116	Muscicapidae	*Muscicapa sibirica*	Dark-sided flycatcher	Least Concern	Not Assessed	No	Uncommon	Winter visitor	Yes	No
117	Muscicapidae	*Muscicapa williamsoni*	Brown-streaked flycatcher	Least Concern	Not Assessed	No	Rare	Winter visitor	Yes	No
118	N.A	*Eos bornea*	Red lory	Least Concern	NA	No	N.A	Introduced	Yes	Yes
119	Nectariniidae	*Aethopyga siparaja*	Crimson sunbird	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	No
120	Nectariniidae	*Anthreptes malacensis*	Brown-throated sunbird	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes

No.	Family	Scientific Name	Common Name	Global Status (IUCN/CITES)	National Status (Davison et al., 2008)	Species of Conservation Significance	Distribution/ Abundance/ Rarity (NSS, 2020; Singapore Birds Project, 2020)	Primary Native Status (NSS, 2020; Singapre Birds Project, 2020)	Probable Species	Recorded Species
121	Nectariniidae	*Arachnothera longirostra*	Little spiderhunter	Least Concern	Not Assessed	No	Uncommon	Resident breeder	Yes	No
122	Nectariniidae	*Cinnyris jugularis*	Olive-backed sunbird	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes
123	Nectariniidae	*Leptocoma brasiliana*	Van Hasselt's sunbird	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	No
124	Oriolidae	*Oriolus chinensis*	Black-naped oriole	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes
125	Pandionidae	*Pandion haliaetus*	Western osprey	Least Concern	Not Assessed	No	Common	Non-breeding visitor	Yes	No
126	Passeridae	*Passer montanus*	Eurasian tree sparrow	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	No
127	Pellorneidae	*Malacocincla abbotti*	Abbott's babbler	Least Concern	Not Assessed	No	Uncommon	Resident breeder	Yes	No
128	Phasianidae	*Excalfactoria chinensis*	King quail	Least Concern	Not Assessed	No	Uncommon	Resident breeder	Yes	No
129	Phasianidae	*Gallus gallus*	Red junglefowl	Least Concern	Endangered	Yes	Uncommon	Resident breeder	Yes	Yes
130	Phasianidae	*Gallus gallus (domestic)*	Domestic chicken	Not Assessed	Not Assessed	No	N.A	Introduced	Yes	No
131	Phylloscopidae	*Phylloscopus borealis*	Arctic warbler	Least Concern	Not Assessed	No	Common	Winter visitor	Yes	No
132	Phylloscopidae	*Phylloscopus coronatus*	Eastern crowned warbler	Least Concern	Not Assessed	No	Uncommon	Winter visitor	Yes	No
133	Phylloscopidae	*Phylloscopus inornatus*	Yellow-browed warbler	Least Concern	Not Assessed	No	Rare	Winter visitor	Yes	No
134	Picidae	*Chrysophlegma miniaceum*	Banded woodpecker	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes
135	Picidae	*Dinopium javanense*	Common flameback	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes
136	Picidae	*Micropternus brachyurus*	Rufous woodpecker	Least Concern	Not Assessed	No	Uncommon	Resident breeder	Yes	Yes
137	Picidae	*Picus vittatus*	Laced woodpecker	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes
138	Picidae	*Yungipicus moluccensis*	Sunda pygmy woodpecker	Least Concern	Not Assessed	No	Abundant	Resident breeder	Yes	Yes
139	Pittidae	*Pitta moluccensis*	Blue-winged pitta	Least Concern	Not Assessed	Yes	Uncommon	Migrant breeder	Yes	Yes
140	Pittidae	*Pitta sordida*	Hooded pitta	Least Concern	Not Assessed	No	Uncommon	Winter visitor	Yes	No
141	Ploceidae	*Ploceus philippinus*	Baya weaver	Least Concern	Not Assessed	No	Uncommon	Resident breeder	Yes	No
142	Psittaculidae	*Loriculus galgulus*	Blue-crowned hanging-parrot	Least Concern	Endangered	Yes	Uncommon	Resident breeder	Yes	Yes
143	Psittaculidae	*Psittacula alexandri*	Red-breasted parakeet	Threatened	Not Assessed	No	Common	Introduced resident breeder	Yes	Yes
144	Psittaculidae	*Psittacula krameri*	Rose-ringed parakeet	Least Concern	Not Assessed	No	Uncommon	Introduced resident breeder	Yes	Yes
145	Psittaculidae	*Psittacula longicauda*	Long-tailed parakeet	Vulnerable	Not Assessed	Yes	Common	Resident breeder	Yes	Yes
146	Psittaculidae	*Psittinus cyanurus*	Blue-rumped parrot	Threatened	Critically Endangered	No	Uncommon	proven	Yes	No
147	Psittaculidae	*Trichoglossus haematodus*	Coconut lorikeet	Least Concern	Not Assessed	No	Uncommon	Introduced resident breeder	Yes	Yes
148	Pycnonotidae	*Pycnonotus aurigaster*	Sooty-headed bulbul	Least Concern	Not Assessed	No	Uncommon	Introduced resident breeder	Yes	No
149	Pycnonotidae	*Pycnonotus goiavier*	Yellow-vented bulbul	Least Concern	Not Assessed	No	Abundant	Introduced resident breeder	Yes	Yes
150	Pycnonotidae	*Pycnonotus jocosus*	Red-whiskered bulbul	Least Concern	Not Assessed	No	Uncommon	Introduced resident breeder	Yes	No
151	Pycnonotidae	*Pycnonotus plumosus*	Olive-winged bulbul	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes
152	Pycnonotidae	*Pycnonotus zeylanicus*	Straw-headed bulbul	Endangered	Endangered	Yes	Uncommon	Resident breeder	Yes	Yes
153	Rallidae	*Amaurornis phoenicurus*	White-breasted waterhen	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes
154	Rallidae	*Lewinia striata*	Slaty-breasted rail	Least Concern	Not Assessed	No	Uncommon	Resident breeder	Yes	No
155	Rallidae	*Rallina eurizonoides*	Slaty-legged crake	Least Concern	Not Assessed	No	Rare	Winter visitor	Yes	No
156	Rallidae	*Rallina fasciata*	Red-legged crake	Least Concern	Vulnerable	Yes	Uncommon	Resident breeder	Yes	Yes
157	Rallidae	*Zapornia fusca*	Ruddy-breasted crake	Least Concern	Not Assessed	No	Uncommon	Resident breeder	Yes	No
158	Rhipiduridae	*Rhipidura javanica*	Malaysian pied fantail	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes
159	Scolopacidae	*Actitis hypoleucos*	Common sandpiper	Least Concern	Not Assessed	No	Common	Winter visitor	Yes	No
160	Scolopacidae	*Gallinago gallinago*	Common snipe	Least Concern	Not Assessed	No	Common	Winter visitor	Yes	No

No.	Family	Scientific Name	Common Name	Global Status (IUCN/CITES)	National Status (Davison et al., 2008)	Species of Conservation Significance	Distribution/ Abundance/ Rarity (NSS, 2020; Singapore Birds Project, 2020)	Primary Native Status (NSS, 2020; Singapre Birds Project, 2020)	Probable Species	Recorded Species
161	Scolopacidae	*Gallinago stenura*	Pin-tailed snipe	Least Concern	Not Assessed	No	Common	Winter visitor	Yes	No
162	Scolopacidae	*Rostratula benghalensis*	Greater painted-snipe	Least Concern	Critically Endangered	Yes	Rare	Resident breeder	Yes	No
163	Strigidae	*Ketupa ketupu*	Buffy fish owl	Least Concern	Critically Endangered	Yes	Uncommon	Resident breeder	Yes	No
164	Strigidae	*Otus lempiji*	Sunda scops owl	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes
165	Strigidae	*Strix seloputo*	Spotted wood owl	Least Concern	Critically Endangered	Yes	Uncommon	Resident breeder	Yes	No
166	Sturnidae	*Acridotheres javanicus*	Javan myna	Least Concern	Not Assessed	No	Abundant	Introduced resident breeder	Yes	Yes
167	Sturnidae	*Acridotheres tristis*	Common myna	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	No
168	Sturnidae	*Agropsar sturninus*	Daurian starling	Least Concern	Not Assessed	No	Common	Winter visitor	Yes	No
169	Sturnidae	*Aplonis panayensis*	Asian glossy starling	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes
170	Sturnidae	*Gracula religiosa*	Common hill myna	Least Concern	Not Assessed	No	Uncommon	Resident breeder	Yes	No
171	Timaliidae	*Mixornis gularis*	Pin-striped tit-babbler	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes
172	Turdidae	*Geokichla citrina*	Orange-headed thrush	Least Concern	Not Assessed	No	Uncommon	Winter visitor	Yes	No
173	Turdidae	*Geokichla sibirica*	Siberian thrush	Least Concern	Not Assessed	No	Rare	Passage migrant	Yes	No
174	Turdidae	*Turdus obscurus*	Eyebrowed thrush	Least Concern	Not Assessed	No	Uncommon	Passage migrant	Yes	No
175	Turnicidae	*Turnix suscitator*	Barred buttonquail	Least Concern	Not Assessed	No	Uncommon	Resident breeder	Yes	Yes
176	Tytonidae	*Tyto javanica*	Eastern barn owl	Least Concern	Not Assessed	No	Uncommon	Resident breeder	Yes	No
177	Zosteropidae	*Zosterops simplex*	Swinhoe's white-eye	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes

Appendix I - List of Probable and Recorded Faunal Species

No.	Family	Scientific Name	Common Name	Global Status (IUCN, 2012)	National Status (Davison et al. 2008)	Species of Conservation Significance	Distribution/Rarity (Baker & Lim, 2012)	Native Status (Baker & Lim, 2012)	Probable Species	Recorded Species
1	Canidae	*Canis lupus familiaris*	Feral dog	Not Assessed	Not Assessed	No	N.A	Non-native	Yes	Yes
2	Cercopithecidae	*Macaca fascicularis*	Long-tailed macaque	Vulnerable	Not Assessed	Yes	Widespread and Common	Native	Yes	No
3	Felidae	*Felis catus*	Feral cat	Not Assessed	Not Assessed	No	N.A	Non-native	Yes	Yes
4	Manidae	*Manis javanica*	Sunda pangolin	Critically Endangered	Critically Endangered	Yes	Widespread but Rare	Native	Yes	Yes
5	Muridae	*Mus castaneus*	House mouse	Least Concern	Not Assessed	No	Widespread and Common	Native	Yes	No
6	Muridae	*Rattus annandalei*	Annandale's rat	Least Concern	Not Assessed	No	Restricted but Common	Native	Yes	No
7	Muridae	*Rattus exulans*	Polynesian rat	Least Concern	Not Assessed	No	Widespread but Uncommon	Native	Yes	No
8	Muridae	*Rattus norvegicus*	Brown rat	Least Concern	Not Assessed	No	Widespread and Common	Non-native	Yes	No
9	Muridae	*Rattus tanezumi*	Oriental house rat	Least Concern	Not Assessed	No	Widespread and Common	Native	Yes	Yes
10	Muridae	*Rattus tiomanicus*	Malaysian wood rat	Least Concern	Not Assessed	No	Widespread and Common	Native	Yes	Yes
11	Sciuridae	*Callosciurus notatus*	Plantain squirrel	Least Concern	Not Assessed	No	Widespread and Common	Native	Yes	Yes
12	Sciuridae	*Sundasciurus tenuis*	Slender squirrel	Least Concern	Not Assessed	No	Restricted but Common	Native	Yes	Yes
13	Soricidae	*Suncus murinus*	House shrew	Least Concern	Not Assessed	No	Widespread and Common	Native	Yes	Yes
14	Suidae	*Sus scrofa*	Wild pig	Least Concern	Not Assessed	No	Widespread and Common	Native	Yes	Yes
15	Tupaiidae	*Tupaia glis*	Common treeshrew	Least Concern	Not Assessed	No	Widespread and Common	Native	Yes	Yes
16	Viverridae	*Paradoxurus musangus*	Common palm civet	Least Concern	Not Assessed	No	Widespread but Uncommon	Native	Yes	Yes

Appendix I - List of Probable and Recorded Faunal Species

No.	Family	Scientific Name	Common Name	Global Status (IUCN, 2012)	National Status (Davison et al. 2008)	Species of Conservation Significance	Distribution/Rarity (Baker & Lim, 2012)	Native Status (Baker & Lim, 2012)	Probable Species	Recorded Species
1	Emballonuridae	*Saccolaimus saccolaimus*	Pouch-bearing bat	Least Concern	Not Assessed	No	Widespread and Common	Native	Yes	Yes
2	Emballonuridae	*Taphozous melanopogon*	Black-bearded tomb bat	Least Concern	Endangered	Yes	Widespread but Rare	Native	Yes	No
3	Pteropodidae	*Cynopterus brachyotis*	Lesser dog-faced fruit bat	Least Concern	Not Assessed	No	Widespread and Common	Native	Yes	Yes
4	Pteropodidae	*Eonycteris spelaea*	Cave nectar bat	Least Concern	Not Assessed	No	Widespread but Uncommon	Native	Yes	No
5	Pteropodidae	*Pteropus vampyrus*	Large flying fox	Near Threatened	Not Assessed	No	N.A	Visitor	Yes	No
6	Vespertilionidae	*Myotis muricola*	Whiskered myotis	Least Concern	Not Assessed	No	Widespread and Common	Native	Yes	Yes
7	Vespertilionidae	*Pipistrellus javanicus*	Javan pipistrelle	Least Concern	Not Assessed	No	Widespread but Uncommon	Native	Yes	No
8	Vespertilionidae	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	Least Concern	Not Assessed	No	Widespread and Common	Native	Yes	Yes
9	Vespertilionidae	*Tylonycteris fulvida*	Lesser bamboo bat	Least Concern	Critically Endangered	Yes	Restricted and Rare	Native	Yes	No
10	Vespertilionidae	*Tylonycteris malayana*	Greater bamboo bat	Least Concern	Not Assessed	Yes	Widespread and Common	Native	Yes	No

Appendix J
Faunal Survey Data

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Appendix J - Faunal Survey Data

Date	Route	Aquatic Point	Latitude	Longitude	Time	Taxon	Scientific name	Common name	Qty	Observation type	Photo no.	Survey method	Remarks
18-Feb-21	N.A	N.A	1.353	103.731	1034	Butterfly	*Arhopala centaurus nakula*	Centaur oakblue	1	Seen	-	Incidental	-
22-Feb-21	N.A	N.A	1.350	103.735	1006	Butterfly	*Lasippa tiga siaka*	Malayan lascar	1	Seen	XT372	Incidental	-
22-Feb-21	N.A	N.A	1.351	103.736	1010	Butterfly	*Ideopsis vulgaris macrina*	Blue glassy tiger	1	Seen	XT375	Incidental	-
22-Feb-21	N.A	N.A	1.351	103.736	1018	Bird	*Dicrurus paradiseus*	Greater racket-tailed drongo	1	Seen	-	Incidental	-
22-Feb-21	N.A	N.A	1.351	103.735	1219	Bird	*Garrulax leucolophus*	White-crested laughingthrush	1	Seen	-	Incidental	-
22-Feb-21	N.A	N.A	1.351	103.735	1229	Odonate	*Tholymis tillarga*	White-barred duskhawk	1	Seen	XT01	Incidental	-
3-Mar-21	T2	N.A	1.357	103.723	920	Butterfly	*Mycalesis perseoides perseoides*	Burmese bush brown	1	Seen	CT7082	Targeted	-
3-Mar-21	T2	N.A	1.357	103.723	920	Butterfly	*Catopsilia pyranthe pyranthe*	Mottled emigrant	2	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.357	103.723	920	Odonate	*Neurothemis fluctuans*	Common parasol	3	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.357	103.723	920	Butterfly	*Leptosia nina malayana*	Psyche	1	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.357	103.723	922	Butterfly	*Eurema sp.*	-	1	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.357	103.723	922	Butterfly	*Parantica agleoides agleoides*	Dark glassy tiger	2	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.357	103.723	922	Aculeate hymenopteran	*Ropalidia sumatrae*	NA	1	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.357	103.723	923	Odonate	*Rhyothemis phyllis*	Yellow-barred flutterer	1	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.357	103.723	925	Aculeate hymenopteran	*Apis cerana*	Eastern honey bee	1	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.357	103.724	925	Odonate	*Rhyothemis phyllis*	Yellow-barred flutterer	1	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.357	103.724	927	Butterfly	*Potanthus omaha omaha*	Lesser dart	1	Seen	CT7083	Targeted	-
3-Mar-21	T2	N.A	1.357	103.724	927	Butterfly	*Ideopsis vulgaris macrina*	Blue glassy tiger	1	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.357	103.724	927	Butterfly	*Catopsilia pyranthe pyranthe*	Mottled emigrant	1	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.357	103.724	927	Odonate	*Neurothemis fluctuans*	Common parasol	2	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.357	103.724	928	Butterfly	*Appias libythea olferna*	Striped albatross	2	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.357	103.724	929	Butterfly	*Eurema sp.*	-	1	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.357	103.724	930	Butterfly	*Leptosia nina malayana*	Psyche	1	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.357	103.724	930	Odonate	*Neurothemis fluctuans*	Common parasol	1	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.357	103.724	930	Butterfly	*Delias hyparete metarete*	Painted jezebel	1	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.357	103.724	930	Butterfly	*Eurema hecabe contubernalis*	Common grass yellow	1	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.358	103.724	932	Odonate	*Tholymis tillarga*	White-barred duskhawk	1	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.358	103.724	933	Odonate	*Neurothemis fluctuans*	Common parasol	1	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.358	103.724	933	Odonate	*Neurothemis fluctuans*	Common parasol	3	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.358	103.724	933	Odonate	*Orthetrum chrysis*	Spine-tufted skimmer	1	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.358	103.724	934	Odonate	*Pseudagrion microcephalum*	Blue sprite	2	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.358	103.724	935	Butterfly	*Ideopsis vulgaris macrina*	Blue glassy tiger	1	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.358	103.724	935	Odonate	*Orthetrum testaceum*	Scarlet skimmer	1	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.358	103.724	936	Butterfly	*Ideopsis vulgaris macrina*	Blue glassy tiger	1	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.358	103.725	937	Aculeate hymenopteran	*Lipotriches ceratina*	NA	1	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.358	103.725	937	Butterfly	*Ideopsis vulgaris macrina*	Blue glassy tiger	3	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.358	103.725	938	Odonate	*Potamarcha congener*	Common chaser	1	Seen	J2404	Targeted	-
3-Mar-21	T2	N.A	1.358	103.725	940	Odonate	*Rhyothemis phyllis*	Yellow-barred flutterer	1	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.358	103.725	940	Butterfly	*Delias hyparete metarete*	Painted jezebel	1	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.358	103.725	940	Odonate	*Neurothemis fluctuans*	Common parasol	2	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.358	103.725	941	Odonate	*Neurothemis fluctuans*	Common parasol	4	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.358	103.725	941	Butterfly	*Delias hyparete metarete*	Painted jezebel	1	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.358	103.725	943	Odonate	*Orthetrum chrysis*	Spine-tufted skimmer	1	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.358	103.725	943	Butterfly	*Parantica agleoides agleoides*	Dark glassy tiger	1	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.358	103.725	943	Odonate	*Neurothemis fluctuans*	Common parasol	1	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.358	103.725	943	Butterfly	*Eurema hecabe contubernalis*	Common grass yellow	1	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.358	103.725	944	Butterfly	*Eurema hecabe contubernalis*	Common grass yellow	1	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.358	103.725	947	Butterfly	*Delias hyparete metarete*	Painted jezebel	1	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.358	103.725	949	Odonate	*Gynacantha sp.*	-	1	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.359	103.725	954	Odonate	*Diplacodes trivialis*	Blue percher	1	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.359	103.725	956	Odonate	*Orthetrum testaceum*	Scarlet skimmer	1	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.359	103.725	956	Odonate	*Potamarcha congener*	Common chaser	1	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.359	103.725	957	Odonate	*Potamarcha congener*	Common chaser	1	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.359	103.725	958	Aculeate hymenopteran	*Nomia strigata*	Pearly-banded bee	1	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.359	103.724	1001	Odonate	*Potamarcha congener*	Common chaser	1	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.359	103.724	1002	Aculeate hymenopteran	*Xylocopa latipes*	Broad-handed carpenter bee	1	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.359	103.724	1004	Aculeate hymenopteran	*Ropalidia jacobsoni*	NA	4	Seen	CT7092	Targeted	-
3-Mar-21	T2	N.A	1.359	103.724	1005	Odonate	*Neurothemis fluctuans*	Common parasol	2	Seen	-	Targeted	-

Date	Route	Aquatic Point	Latitude	Longitude	Time	Taxon	Scientific name	Common name	Qty	Observation type	Photo no.	Survey method	Remarks
3-Mar-21	T2	N.A	1.359	103.724	1007	Odonate	*Lathrecista asiatica*	Scarlet grenadier	1	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.359	103.724	1009	Aculeate hymenopteran	*Parischnogaster nigricans*	NA	2	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.359	103.724	1014	Odonate	*Neurothemis fluctuans*	Common parasol	3	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.359	103.724	1014	Odonate	*Potamarcha congener*	Common chaser	1	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.359	103.724	1015	Butterfly	*Eurema sp.*	-	1	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.359	103.724	1016	Butterfly	*Eurema sp.*	-	1	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.359	103.724	1016	Odonate	*Neurothemis fluctuans*	Common parasol	1	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.360	103.724	1018	Butterfly	*Graphium sarpedon luctatius*	Common bluebottle	1	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.360	103.724	1018	Aculeate hymenopteran	*Ropalidia sumatrae*	NA	1	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.360	103.724	1018	Butterfly	*Eurema hecabe contubernalis*	Common grass yellow	1	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.360	103.725	1019	Butterfly	*Junonia almana javana*	Peacock pansy	1	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.360	103.725	1022	Odonate	*Nesoxenia lineata*	Striped grenadier	1	Seen	CT7094	Targeted	-
3-Mar-21	T2	N.A	1.360	103.725	1025	Butterfly	*Mycalesis perseoides perseoides*	Burmese bush brown	1	Seen	CT7097	Targeted	-
3-Mar-21	T2	N.A	1.360	103.725	1031	Butterfly	*Athyma reta moorei*	Malay staff sergeant	1	Seen	CT7101, CT7102-CT7104	Targeted	CT7102-CT7104 Glochidion, Athyma sp. Host plant
3-Mar-21	T2	N.A	1.360	103.725	1044	Butterfly	*Delias hyparete metarete*	Painted jezebel	1	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.360	103.725	1044	Odonate	*Gynacantha sp.*	-	1	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.360	103.725	1046	Odonate	*Tholymis tillarga*	White-barred duskhawk	1	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.360	103.725	1053	Butterfly	*Parantica agleoides agleoides*	Dark glassy tiger	1	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.360	103.725	1054	Odonate	*Lathrecista asiatica*	Scarlet grenadier	1	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.360	103.725	1054	Odonate	*Neurothemis fluctuans*	Common parasol	3	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.360	103.725	1055	Aculeate hymenopteran	*Parischnogaster nigricans*	NA	1	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.360	103.725	1056	Odonate	*Tholymis tillarga*	White-barred duskhawk	1	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.360	103.725	1057	Butterfly	*Iambrix salsala salsala*	Chestnut bob	1	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.360	103.725	1059	Odonate	*Diplacodes trivialis*	Blue percher	1	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.360	103.725	1101	Mammal (Bat)	*Unidentified bat*	-	5	Seen	J2418	Incidental	Possible fruit bat. Roosting under bird nest fern on tree, Acacia
3-Mar-21	T2	N.A	1.360	103.725	1102	Butterfly	*Appias libythea olferna*	Striped albatross	1	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.360	103.725	1102	Butterfly	*Eurema sp.*	-	1	Seen	-	Targeted	-
3-Mar-21	T2	N.A	1.359	103.724	1110	Butterfly	*Jamides celeno aelianus*	Common caerulean	1	Seen	-	Incidental	-
3-Mar-21	T2	N.A	1.359	103.723	1110	Butterfly	*Athyma sp.*	-	1	Seen	-	Incidental	-
9-Mar-21	T1	N.A	1.351	103.734	916	Butterfly	*Mycalesis sp.*	-	1	Seen	CT7210	Targeted	-
9-Mar-21	T1	N.A	1.351	103.734	917	Odonate	*Agrionoptera insignis*	Grenadier	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.351	103.734	919	Odonate	*Tholymis tillarga*	White-barred duskhawk	3	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.351	103.734	924	Odonate	*Tholymis tillarga*	White-barred duskhawk	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.351	103.734	927	Odonate	*Agrionoptera insignis*	Grenadier	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.351	103.734	927	Butterfly	*Junonia hedonia ida*	Chocolate pansy	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.351	103.734	931	Butterfly	*Papilio polytes romulus*	Common mormon	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.351	103.734	931	Odonate	*Tholymis tillarga*	White-barred duskhawk	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.350	103.734	935	Aculeate hymenopteran	*Auplopus sp.*	NA	1	Seen	-	Targeted	Grey
9-Mar-21	T1	N.A	1.350	103.734	937	Odonate	*Agrionoptera insignis*	Grenadier	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.350	103.734	943	Butterfly	*Eurema blanda snelleni*	Three spot grass yellow	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.350	103.734	944	Odonate	*Gynacantha sp.*	-	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.350	103.734	944	Odonate	*Neurothemis fluctuans*	Common parasol	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.350	103.734	946	Butterfly	*Ideopsis vulgaris macrina*	Blue glassy tiger	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.350	103.734	946	Butterfly	*Delias hyparete metarete*	Painted jezebel	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.350	103.735	948	Aculeate hymenopteran	*Apis cerana*	Eastern honey bee	1	Other signs	CT7213	Targeted	Beehive in old tire
9-Mar-21	T1	N.A	1.350	103.735	951	Aculeate hymenopteran	*Apis cerana*	Eastern honey bee	1	Other signs	CT7214	Targeted	Beehive in dead palm
9-Mar-21	T1	N.A	1.350	103.735	951	Butterfly	*Delias hyparete metarete*	Painted jezebel	2	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.350	103.735	954	Butterfly	*Delias hyparete metarete*	Painted jezebel	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.350	103.735	957	Aculeate hymenopteran	*Ropalidia stigma*	NA	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.350	103.735	957	Butterfly	*Eurema sp.*	-	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.350	103.735	1000	Butterfly	*Oriens gola pseudolus*	Common dartlet	1	Seen	CT7218	Targeted	-
9-Mar-21	T1	N.A	1.350	103.735	1011	Butterfly	*Doleschallia bisaltide bisaltide*	Autumn leaf	1	Seen	CT7223	Targeted	-
9-Mar-21	T1	N.A	1.350	103.735	1013	Butterfly	*Eurema sp.*	-	1	Seen	-	Targeted	-

Date	Route	Aquatic Point	Latitude	Longitude	Time	Taxon	Scientific name	Common name	Qty	Observation type	Photo no.	Survey method	Remarks
9-Mar-21	T1	N.A	1.350	103.735	1016	Odonate	*Lathrecista asiatica*	Scarlet grenadier	2	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.350	103.735	1016	Butterfly	*Eurema sp.*	-	2	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.351	103.735	1020	Butterfly	*Mycalesis sp.*	-	1	Seen	CT7225	Targeted	-
9-Mar-21	T1	N.A	1.351	103.735	1020	Odonate	*Neurothemis fluctuans*	Common parasol	1	Seen	-	Targeted	-
9-Mar-21	ST	N.A	1.350	103.735	1023	Odonate	*Copera sp.*	-	1	Seen	-	Incidental	Just at the end of the stream, on the grass along Old Jurong Road. Furry legs. Grey abdomen and thorax.
9-Mar-21	T1	N.A	1.351	103.735	1027	Butterfly	*Tagiades gana gana*	Large snow flat	1	Seen	CT7233	Targeted	-
9-Mar-21	T1	N.A	1.351	103.736	1028	Butterfly	*Eurema sp.*	-	2	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.351	103.736	1030	Aculeate hymenopteran	*Antepipona sp. nr. bipustulata*	NA	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.351	103.736	1030	Butterfly	*Junonia hedonia ida*	Chocolate pansy	2	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.351	103.736	1030	Butterfly	*Zizula hylax pygmaea*	Pygmy grass blue	2	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.351	103.736	1030	Odonate	*Ischnura senegalensis*	Common bluetail	1	Seen	-	Targeted	Feeding
9-Mar-21	T1	N.A	1.351	103.736	1032	Aculeate hymenopteran	*Antepipona sp. nr. bipustulata*	NA	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.351	103.736	1032	Odonate	*Neurothemis fluctuans*	Common parasol	2	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.351	103.736	1034	Butterfly	*Ideopsis vulgaris macrina*	Blue glassy tiger	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.351	103.736	1034	Butterfly	*Junonia hedonia ida*	Chocolate pansy	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.351	103.736	1035	Butterfly	*Iambrix salsala salsala*	Chestnut bob	2	Seen	CT7234	Targeted	Mating
9-Mar-21	T1	N.A	1.351	103.736	1035	Odonate	*Agrionoptera insignis*	Grenadier	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.351	103.736	1036	Butterfly	*Junonia hedonia ida*	Chocolate pansy	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.351	103.736	1036	Odonate	*Tholymis tillarga*	White-barred duskhawk	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.351	103.736	1039	Odonate	*Pseudagrion microcephalum*	Blue sprite	11	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.351	103.736	1040	Odonate	*Lathrecista asiatica*	Scarlet grenadier	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.351	103.736	1042	Odonate	*Pseudagrion microcephalum*	Blue sprite	4	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.351	103.736	1046	Odonate	*Pseudagrion microcephalum*	Blue sprite	3	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.351	103.736	1048	Butterfly	*Papilio polytes romulus*	Common mormon	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.351	103.736	1049	Aculeate hymenopteran	*Ceratina sp.*	-	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.351	103.736	1051	Butterfly	*Leptosia nina malayana*	Psyche	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.351	103.736	1051	Butterfly	*Junonia hedonia ida*	Chocolate pansy	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.351	103.736	1051	Butterfly	*Ideopsis vulgaris macrina*	Blue glassy tiger	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.350	103.736	1052	Odonate	*Orthetrum testaceum*	Scarlet skimmer	2	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.350	103.736	1052	Odonate	*Neurothemis fluctuans*	Common parasol	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.350	103.736	1052	Odonate	*Orthetrum chrysis*	Spine-tufted skimmer	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.350	103.736	1052	Butterfly	*Prosotas dubiosa lumpura*	Tailless line blue	10	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.350	103.736	1054	Butterfly	*Leptosia nina malayana*	Psyche	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.350	103.736	1054	Butterfly	*Appias libythea olferna*	Striped albatross	2	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.350	103.736	1055	Butterfly	*Acraea terpsicore*	Tawny coster	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.350	103.736	1057	Butterfly	*Papilio polytes romulus*	Common mormon	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.350	103.736	1057	Butterfly	*Graphium sarpedon luctatius*	Common bluebottle	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.350	103.736	1057	Odonate	*Ischnura senegalensis*	Common bluetail	2	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.351	103.736	1059	Aculeate hymenopteran	*Thyreus sp.*	-	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.351	103.736	1059	Aculeate hymenopteran	*Coelioxys confusus*	NA	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.351	103.736	1059	Aculeate hymenopteran	*Rhynchium haemorrhoidale*	NA	2	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.350	103.736	1100	Odonate	*Potamarcha congener*	Common chaser	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.350	103.736	1101	Butterfly	*Parantica agleoides agleoides*	Dark glassy tiger	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.350	103.736	1101	Butterfly	*Ideopsis vulgaris macrina*	Blue glassy tiger	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.350	103.736	1102	Butterfly	*Cethosia sp.*	-	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.350	103.736	1104	Aculeate hymenopteran	*Ropalidia sumatrae*	NA	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.350	103.736	1108	Aculeate hymenopteran	*Ceratina sp.*	-	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.350	103.736	1108	Aculeate hymenopteran	*Megachile laticeps*	NA	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.350	103.736	1108	Butterfly	*Appias libythea olferna*	Striped albatross	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.350	103.736	1112	Butterfly	*Appias libythea olferna*	Striped albatross	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.350	103.736	1112	Butterfly	*Prosotas dubiosa lumpura*	Tailless line blue	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.350	103.736	1113	Butterfly	*Acraea terpsicore*	Tawny coster	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.350	103.736	1113	Butterfly	*Eurema sp.*	-	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.350	103.736	1113	Butterfly	*Tagiades gana gana*	Large snow flat	1	Seen	CT7244	Targeted	-

Date	Route	Aquatic Point	Latitude	Longitude	Time	Taxon	Scientific name	Common name	Qty	Observation type	Photo no.	Survey method	Remarks
9-Mar-21	T1	N.A	1.350	103.736	1114	Butterfly	*Papilio polytes romulus*	Common mormon	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.350	103.736	1115	Butterfly	*Prosotas dubiosa lumpura*	Tailless line blue	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.350	103.736	1115	Butterfly	*Junonia hedonia ida*	Chocolate pansy	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.350	103.736	1115	Butterfly	*Elymnias hypermnestra agina*	Common palmfly	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.350	103.736	1115	Butterfly	*Appias libythea olferna*	Striped albatross	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.350	103.736	1117	Odonate	*Neurothemis fluctuans*	Common parasol	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.350	103.736	1117	Butterfly	*Lasippa tiga siaka*	Malayan lascar	1	Seen	CT7248	Targeted	-
9-Mar-21	T1	N.A	1.351	103.736	1119	Butterfly	*Appias libythea olferna*	Striped albatross	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.351	103.736	1119	Butterfly	*Junonia almana javana*	Peacock pansy	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.351	103.736	1120	Butterfly	*Eurema sp.*	-	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.351	103.736	1121	Aculeate hymenopteran	*Ropalidia sumatrae*	NA	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.351	103.736	1123	Odonate	*Orthetrum testaceum*	Scarlet skimmer	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.351	103.736	1123	Odonate	*Ischnura senegalensis*	Common bluetail	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.351	103.736	1123	Odonate	*Potamarcha congener*	Common chaser	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.351	103.736	1123	Odonate	*Ceriagrion cerinorubellum*	Ornate coraltail	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.351	103.736	1123	Butterfly	*Eurema blanda snelleni*	Three spot grass yellow	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.351	103.736	1123	Butterfly	*Prosotas dubiosa lumpura*	Tailless line blue	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.351	103.736	1128	Odonate	*Agrionoptera insignis*	Grenadier	2	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.351	103.736	1128	Butterfly	*Mycalesis sp.*	-	2	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.351	103.736	1128	Aculeate hymenopteran	*Ropalidia stigma*	NA	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.351	103.736	1128	Odonate	*Orthetrum testaceum*	Scarlet skimmer	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.351	103.736	1128	Aculeate hymenopteran	*Amegilla andrewsi*	Andrew's blue-banded digger bee	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.351	103.736	1128	Odonate	*Neurothemis fluctuans*	Common parasol	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.350	103.737	1129	Aculeate hymenopteran	*Ropalidia sumatrae*	NA	3	Seen	-	Targeted	Feeding on caterpillar remnants
9-Mar-21	T1	N.A	1.351	103.737	1133	Butterfly	*Graphium sarpedon luctatius*	Common bluebottle	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.351	103.737	1133	Butterfly	*Appias libythea olferna*	Striped albatross	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.351	103.737	1135	Butterfly	*Eurema sp.*	-	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.351	103.737	1135	Odonate	*Neurothemis fluctuans*	Common parasol	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.351	103.737	1136	Butterfly	*Eurema blanda snelleni*	Three spot grass yellow	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.351	103.737	1136	Aculeate hymenopteran	*Ropalidia sumatrae*	NA	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.351	103.737	1137	Butterfly	*Papilio polytes romulus*	Common mormon	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.351	103.737	1137	Odonate	*Tholymis tillarga*	White-barred duskhawk	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.351	103.737	1137	Butterfly	*Papilio polytes romulus*	Common mormon	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.351	103.737	1138	Odonate	*Agrionoptera insignis*	Grenadier	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.351	103.737	1143	Butterfly	*Burara harisa consobrina*	Orange awlet	1	Seen	CT7255	Targeted	-
9-Mar-21	T1	N.A	1.351	103.737	1143	Butterfly	*Lasippa tiga siaka*	Malayan lascar	1	Seen	CT7258	Targeted	-
9-Mar-21	T1	N.A	1.352	103.737	1144	Butterfly	*Eurema sp.*	-	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.736	1151	Butterfly	*Eurema blanda snelleni*	Three spot grass yellow	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.736	1154	Odonate	*Orthetrum chrysis*	Spine-tufted skimmer	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.736	1156	Odonate	*Pseudagrion microcephalum*	Blue sprite	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.736	1156	Odonate	*Pseudagrion microcephalum*	Blue sprite	5	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.736	1156	Butterfly	*Lasippa tiga siaka*	Malayan lascar	1	Seen	CT7262	Targeted	-
9-Mar-21	T1	N.A	1.352	103.736	1201	Odonate	*Agrionoptera insignis*	Grenadier	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.736	1202	Butterfly	*Mycalesis sp.*	-	1	Seen	CT7263	Targeted	-
9-Mar-21	T1	N.A	1.352	103.736	1202	Odonate	*Neurothemis fluctuans*	Common parasol	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.736	1202	Butterfly	*Elymnias hypermnestra agina*	Common palmfly	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.736	1202	Butterfly	*Eurema sp.*	-	3	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.736	1202	Butterfly	*Junonia hedonia ida*	Chocolate pansy	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.736	1203	Butterfly	*Eurema hecabe contubernalis*	Common grass yellow	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.736	1206	Butterfly	*Borbo cinnara*	Formosan swift	1	Seen	CT7265	Targeted	-
9-Mar-21	T1	N.A	1.352	103.736	1206	Odonate	*Neurothemis fluctuans*	Common parasol	2	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.736	1206	Butterfly	*Eurema blanda snelleni*	Three spot grass yellow	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.736	1206	Butterfly	*Prosotas dubiosa lumpura*	Tailless line blue	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.736	1206	Aculeate hymenopteran	*Apis cerana*	Eastern honey bee	3	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.736	1207	Odonate	*Neurothemis fluctuans*	Common parasol	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.736	1207	Aculeate hymenopteran	*Nomia strigata*	Pearly-banded bee	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.736	1208	Odonate	*Agrionoptera insignis*	Grenadier	1	Seen	-	Targeted	-

Date	Route	Aquatic Point	Latitude	Longitude	Time	Taxon	Scientific name	Common name	Qty	Observation type	Photo no.	Survey method	Remarks
9-Mar-21	T1	N.A	1.352	103.736	1210	Butterfly	*Hypolimnas anomala anomala*	Malayan eggfly	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.736	1210	Odonate	*Agrionoptera insignis*	Grenadier	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.736	1211	Butterfly	*Eurema blanda snelleni*	Three spot grass yellow	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.736	1211	Butterfly	*Eurema sp.*	-	5	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.736	1213	Butterfly	*Tajuria mantra mantra*	Felder's royal	1	Seen	CT7266	Targeted	-
9-Mar-21	T1	N.A	1.352	103.736	1215	Butterfly	*Junonia hedonia ida*	Chocolate pansy	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.736	1215	Odonate	*Neurothemis fluctuans*	Common parasol	4	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.736	1217	Odonate	*Neurothemis fluctuans*	Common parasol	3	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.735	1218	Butterfly	*Eurema sp.*	-	2	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.735	1219	Butterfly	*Athyma reta moorei*	Malay staff sergeant	1	Seen	CT7269, CT7271	Targeted	-
9-Mar-21	T1	N.A	1.352	103.735	1221	Butterfly	*Eurema sp.*	-	2	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.735	1222	Odonate	*Agrionoptera insignis*	Grenadier	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.735	1222	Odonate	*Neurothemis fluctuans*	Common parasol	2	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.735	1222	Odonate	*Lathrecista asiatica*	Scarlet grenadier	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.735	1223	Odonate	*Tholymis tillarga*	White-barred duskhawk	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.735	1224	Odonate	*Agrionoptera insignis*	Grenadier	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.735	1224	Odonate	*Neurothemis fluctuans*	Common parasol	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.735	1224	Butterfly	*Junonia hedonia ida*	Chocolate pansy	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.735	1225	Butterfly	*Eurema hecabe contubernalis*	Common grass yellow	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.735	1226	Odonate	*Lathrecista asiatica*	Scarlet grenadier	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.735	1227	Butterfly	*Eurema hecabe contubernalis*	Common grass yellow	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.735	1228	Odonate	*Agrionoptera insignis*	Grenadier	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.735	1230	Odonate	*Neurothemis fluctuans*	Common parasol	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.735	1232	Butterfly	*Hypolimnas anomala anomala*	Malayan eggfly	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.734	1235	Butterfly	*Eurema sp.*	-	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.734	1238	Butterfly	*Megisba malaya sikkima*	Malayan	1	Seen	CT7277	Targeted	-
9-Mar-21	T1	N.A	1.352	103.734	1238	Butterfly	*Mycalesis sp.*	-	1	Seen	CT7279	Targeted	-
9-Mar-21	T1	N.A	1.352	103.734	1238	Butterfly	*Eurema sp.*	-	2	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.734	1238	Butterfly	*Prosotas dubiosa lumpura*	Tailless line blue	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.734	1239	Butterfly	*Prosotas dubiosa lumpura*	Tailless line blue	2	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.734	1242	Butterfly	*Junonia hedonia ida*	Chocolate pansy	3	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.734	1242	Odonate	*Neurothemis fluctuans*	Common parasol	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.734	1242	Butterfly	*Eurema sp.*	-	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.734	1244	Butterfly	*Papilio polytes romulus*	Common mormon	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.734	1246	Butterfly	*Jamides sp.*	-	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.733	1249	Butterfly	*Eurema sp.*	-	6	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.733	1249	Butterfly	*Catopsilia scylla cornelia*	Orange emigrant	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.733	1249	Butterfly	*Junonia hedonia ida*	Chocolate pansy	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.733	1250	Butterfly	*Hypolimnas anomala anomala*	Malayan eggfly	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.733	1250	Odonate	*Orthetrum testaceum*	Scarlet skimmer	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.733	1250	Odonate	*Orthetrum chrysis*	Spine-tufted skimmer	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.733	1251	Odonate	*Neurothemis fluctuans*	Common parasol	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.733	1253	Butterfly	*Prosotas dubiosa lumpura*	Tailless line blue	2	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.733	1253	Odonate	*Tholymis tillarga*	White-barred duskhawk	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.733	1253	Butterfly	*Junonia hedonia ida*	Chocolate pansy	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.733	1253	Odonate	*Neurothemis fluctuans*	Common parasol	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.733	1253	Butterfly	*Hypolimnas anomala anomala*	Malayan eggfly	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.733	1255	Butterfly	*Papilio polytes romulus*	Common mormon	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.733	1255	Butterfly	*Eurema sp.*	-	2	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.733	1255	Odonate	*Lathrecista asiatica*	Scarlet grenadier	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.733	1257	Butterfly	*Doleschallia bisaltide bisaltide*	Autumn leaf	1	Seen	CT7284-CT7285	Targeted	-
9-Mar-21	T1	N.A	1.352	103.733	1258	Butterfly	*Junonia hedonia ida*	Chocolate pansy	2	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.733	1258	Aculeate hymenopteran	*Chalybion bengalense*	NA	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.733	1258	Odonate	*Neurothemis fluctuans*	Common parasol	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.733	1258	Butterfly	*Papilio polytes romulus*	Common mormon	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.733	1300	Butterfly	*Arhopala centaurus nakula*	Centaur oakblue	1	Seen	-	Targeted	-

Date	Route	Aquatic Point	Latitude	Longitude	Time	Taxon	Scientific name	Common name	Qty	Observation type	Photo no.	Survey method	Remarks
9-Mar-21	T1	N.A	1.352	103.733	1301	Butterfly	*Junonia hedonia ida*	Chocolate pansy	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.733	1301	Odonate	*Neurothemis fluctuans*	Common parasol	3	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.733	1301	Odonate	*Lathrecista asiatica*	Scarlet grenadier	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.733	1301	Butterfly	*Eurema sp.*	-	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.733	1302	Butterfly	*Delias hyparete metarete*	Painted jezebel	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.733	1302	Odonate	*Agrionoptera insignis*	Grenadier	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.733	1302	Butterfly	*Leptosia nina malayana*	Psyche	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.733	1303	Butterfly	*Lasippa tiga siaka*	Malayan lascar	1	Seen	CT7290	Targeted	-
9-Mar-21	T1	N.A	1.352	103.733	1304	Odonate	*Tholymis tillarga*	White-barred duskhawk	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.733	1305	Odonate	*Lathrecista asiatica*	Scarlet grenadier	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.733	1306	Butterfly	*Junonia hedonia ida*	Chocolate pansy	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.733	1306	Odonate	*Copera marginipes*	Yellow featherlegs	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.733	1309	Butterfly	*Junonia hedonia ida*	Chocolate pansy	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.733	1310	Odonate	*Neurothemis fluctuans*	Common parasol	5	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.733	1310	Odonate	*Lathrecista asiatica*	Scarlet grenadier	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.733	1318	Butterfly	*Papilio polytes romulus*	Common mormon	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.733	1318	Butterfly	*Eurema sp.*	-	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.733	1319	Odonate	*Neurothemis fluctuans*	Common parasol	2	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.733	1319	Butterfly	*Eurema sp.*	-	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.733	1319	Butterfly	*Junonia hedonia ida*	Chocolate pansy	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.733	1319	Butterfly	*Leptosia nina malayana*	Psyche	1	Seen	-	Targeted	-
9-Mar-21	T1	N.A	1.352	103.733	1321	Odonate	*Neurothemis fluctuans*	Common parasol	2	Seen	-	Targeted	-
9-Mar-21	T2	N.A	1.358	103.724	2007	Amphibian	*Limnonectes blythii*	Malayan giant frog	1	Seen	-	Targeted	-
9-Mar-21	T2	N.A	1.358	103.724	2008	Mammal (Bat)	*Unidentified Pteropodidae*	-	2	Seen	-	Targeted	-
9-Mar-21	T2	N.A	1.358	103.724	2008	Amphibian	*Polypedates leucomystax*	Four-lined tree frog	1	Heard	-	Targeted	-
9-Mar-21	T2	N.A	1.358	103.724	2008	Reptile	*Unidentified Gekkonidae*	-	1	Heard	-	Targeted	-
9-Mar-21	T2	N.A	1.358	103.724	2009	Mammal (Bat)	*Unidentified Pteropodidae*	-	1	Seen	-	Targeted	-
9-Mar-21	T2	N.A	1.358	103.725	2010	Mammal (Bat)	*Unidentified Pteropodidae*	-	2	Seen	-	Targeted	-
9-Mar-21	T2	N.A	1.358	103.725	2011	Reptile	*Ahaetulla prasina*	Oriental whip snake	1	Seen	-	Targeted	-
9-Mar-21	T2	N.A	1.358	103.725	2012	Amphibian	*Microhyla heymonsi*	Dark-sided chorus frog	1	Heard	-	Targeted	-
9-Mar-21	T2	N.A	1.358	103.725	2013	Reptile	*Hemidactylus frenatus*	Spiny-tailed house gecko	1	Seen	-	Targeted	-
9-Mar-21	T2	N.A	1.358	103.725	2013	Mammal (Bat)	*Unidentified Pteropodidae*	-	2	Seen	-	Targeted	-
9-Mar-21	T2	N.A	1.358	103.725	2019	Reptile	*Hemiphyllodactylus typus*	Lowland dwarf gecko	1	Seen	-	Targeted	-
9-Mar-21	T2	N.A	1.359	103.725	2025	Bird	*Caprimulgus affinis*	Savanna nightjar	1	Heard	-	Targeted	-
9-Mar-21	T2	N.A	1.359	103.725	2025	Amphibian	*Fejervarya limnocharis*	Field frog	1	Seen	-	Targeted	-
9-Mar-21	T2	N.A	1.359	103.725	2026	Reptile	*Hemidactylus frenatus*	Spiny-tailed house gecko	1	Seen	-	Targeted	-
9-Mar-21	T2	N.A	1.359	103.725	2027	Amphibian	*Polypedates leucomystax*	Four-lined tree frog	1	Heard	-	Targeted	-
9-Mar-21	T2	N.A	1.359	103.725	2028	Amphibian	*Fejervarya sp.*	-	3	Seen	-	Targeted	-
9-Mar-21	T2	N.A	1.359	103.725	2029	Amphibian	*Polypedates leucomystax*	Four-lined tree frog	1	Seen	-	Targeted	-
9-Mar-21	T2	N.A	1.359	103.724	2031	Bird	*Caprimulgus macrurus*	Large-tailed nightjar	1	Heard	-	Targeted	-
9-Mar-21	T2	N.A	1.359	103.724	2031	Amphibian	*Fejervarya limnocharis*	Field frog	1	Seen	-	Targeted	-
9-Mar-21	T2	N.A	1.359	103.724	2031	Bird	*Caprimulgus macrurus*	Large-tailed nightjar	1	Seen	-	Targeted	-
9-Mar-21	T2	N.A	1.359	103.724	2031	Mammal (Bat)	*Unidentified Pteropodidae*	-	1	Seen	-	Targeted	-
9-Mar-21	T2	N.A	1.359	103.724	2033	Mammal (Bat)	*Unidentified Pteropodidae*	-	1	Seen	-	Targeted	-
9-Mar-21	T2	N.A	1.359	103.724	2034	Amphibian	*Microhyla mukhlesuri*	East Asian ornate chorus frog	4	Heard	-	Targeted	-
9-Mar-21	T2	N.A	1.359	103.724	2034	Amphibian	*Polypedates leucomystax*	Four-lined tree frog	1	Heard	-	Targeted	-
9-Mar-21	T2	N.A	1.359	103.724	2036	Amphibian	*Fejervarya sp.*	-	1	Seen	-	Targeted	-
9-Mar-21	T2	N.A	1.359	103.724	2036	Amphibian	*Microhyla sp.*	-	20	Seen	-	Targeted	Tadpoles
9-Mar-21	T2	N.A	1.360	103.724	2037	Bird	*Caprimulgus macrurus*	Large-tailed nightjar	2	Heard	-	Targeted	-
9-Mar-21	T2	N.A	1.360	103.724	2038	Bird	*Treron vernans*	Pink-necked green pigeon	1	Nest	JT2442	Targeted	In nest
9-Mar-21	T2	N.A	1.360	103.724	2040	Bird	*Nisaetus cirrhatus*	Changeable hawk-eagle	1	Heard	-	Targeted	-
9-Mar-21	T2	N.A	1.360	103.724	2040	Bird	*Caprimulgus macrurus*	Large-tailed nightjar	1	Seen	-	Targeted	-
9-Mar-21	T2	N.A	1.360	103.725	2041	Bird	*Caprimulgus macrurus*	Large-tailed nightjar	2	Seen	-	Targeted	-
9-Mar-21	T2	N.A	1.360	103.725	2041	Amphibian	*Polypedates leucomystax*	Four-lined tree frog	1	Heard	-	Targeted	-
9-Mar-21	T2	N.A	1.360	103.725	2042	Reptile	*Calotes versicolor*	Changeable lizard	1	Seen	-	Targeted	-
9-Mar-21	T2	N.A	1.360	103.725	2049	Amphibian	*Microhyla mukhlesuri*	East Asian ornate chorus frog	1	Seen	-	Targeted	-
9-Mar-21	T2	N.A	1.360	103.725	2050	Amphibian	*Microhyla mukhlesuri*	East Asian ornate chorus frog	1	Seen	-	Targeted	-
9-Mar-21	T2	N.A	1.360	103.725	2051	Amphibian	*Microhyla heymonsi*	Dark-sided chorus frog	3	Heard	-	Targeted	-

Date	Route	Aquatic Point	Latitude	Longitude	Time	Taxon	Scientific name	Common name	Qty	Observation type	Photo no.	Survey method	Remarks
9-Mar-21	T2	N.A	1.360	103.726	2054	Amphibian	*Microhyla mukhlesuri*	East Asian ornate chorus frog	4	Heard	-	Targeted	-
9-Mar-21	T2	N.A	1.360	103.726	2054	Amphibian	*Fejervarya limnocharis*	Field frog	20	Heard	-	Targeted	-
9-Mar-21	T2	N.A	1.360	103.726	2054	Mammal	*Sus scrofa*	Wild pig	11	Seen	-	Targeted	10 piglets 1 adult
9-Mar-21	T2	N.A	1.360	103.726	2059	Amphibian	*Sylvirana guentheri*	Guenther's frog	1	Heard	-	Targeted	-
9-Mar-21	T2	N.A	1.360	103.726	2100	Amphibian	*Microhyla mukhlesuri*	East Asian ornate chorus frog	1	Heard	-	Targeted	-
9-Mar-21	T2	N.A	1.360	103.726	2102	Bird	*Caprimulgus affinis*	Savanna nightjar	1	Heard	-	Targeted	-
9-Mar-21	T2	N.A	1.360	103.726	2103	Reptile	*Heosemys grandis*	Giant asian pond turtle	1	Seen	JT2444-2446	Targeted	-
9-Mar-21	T2	N.A	1.360	103.726	2103	Amphibian	*Fejervarya cancrivora*	Crab-eating frog	2	Heard	-	Targeted	-
9-Mar-21	T2	N.A	1.360	103.726	2103	Amphibian	*Microhyla mukhlesuri*	East Asian ornate chorus frog	4	Heard	-	Targeted	-
9-Mar-21	T2	N.A	1.360	103.726	2106	Bird	*Caprimulgus affinis*	Savanna nightjar	3	Heard	-	Targeted	-
9-Mar-21	T2	N.A	1.360	103.726	2106	Amphibian	*Microhyla butleri*	Painted chorus frog	4	Heard	-	Targeted	-
9-Mar-21	T2	N.A	1.359	103.725	2108	Bird	*Vanellus indicus*	Red-wattled lapwing	1	Heard	-	Incidental	-
9-Mar-21	T2	N.A	1.359	103.725	2117	Mammal	*Paradoxurus musangus*	Common palm civet	1	Seen	-	Incidental	-
9-Mar-21	T3	N.A	1.357	103.715	2143	Reptile	*Malayopython reticulatus*	Reticulated python	1	Seen	-	Incidental	In drain
9-Mar-21	T3	N.A	1.358	103.714	2150	Amphibian	*Microhyla mukhlesuri*	East Asian ornate chorus frog	1	Seen	-	Targeted	-
9-Mar-21	T3	N.A	1.358	103.713	2157	Bird	*Oriolus chinensis*	Black-naped oriole	1	Seen	JT2453	Targeted	-
9-Mar-21	T3	N.A	1.359	103.713	2201	Reptile	*Calotes versicolor*	Changeable lizard	1	Seen	-	Targeted	-
9-Mar-21	T3	N.A	1.359	103.713	2205	Mammal (Bat)	*Unidentified Pteropodidae*	-	1	Seen	-	Targeted	-
9-Mar-21	T3	N.A	1.359	103.713	2207	Reptile	*Dendrelaphis pictus*	Painted bronzeback	1	Seen	JT2455	Targeted	-
9-Mar-21	T3	N.A	1.359	103.713	2210	Bird	*Oriolus chinensis*	Black-naped oriole	1	Seen	-	Targeted	-
9-Mar-21	T3	N.A	1.359	103.713	2211	Mammal	*Paradoxurus musangus*	Common palm civet	1	Seen	-	Targeted	-
9-Mar-21	T3	N.A	1.360	103.712	2214	Amphibian	*Microhyla mukhlesuri*	East Asian ornate chorus frog	1	Seen	-	Targeted	-
9-Mar-21	T3	N.A	1.362	103.709	2251	Reptile	*Unidentified Gekkonidae*	-	1	Heard	-	Targeted	-
9-Mar-21	T2	N.A	N.A	N.A	0804	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_200428.wa
9-Mar-21	T2	N.A	N.A	N.A	0804	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_200434.wa
9-Mar-21	T2	N.A	N.A	N.A	0804	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_200444.wa
9-Mar-21	T2	N.A	N.A	N.A	0804	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_200454.wa
9-Mar-21	T2	N.A	N.A	N.A	0805	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_200502.wa
9-Mar-21	T2	N.A	N.A	N.A	0805	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_200512.wa
9-Mar-21	T2	N.A	N.A	N.A	0805	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_200520.wa
9-Mar-21	T2	N.A	N.A	N.A	0805	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_200531.wa
9-Mar-21	T2	N.A	N.A	N.A	0805	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_200538.wa
9-Mar-21	T2	N.A	N.A	N.A	0805	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_200553.wa
9-Mar-21	T2	N.A	N.A	N.A	0806	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_200609.wa
9-Mar-21	T2	N.A	N.A	N.A	0806	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_200624.wa
9-Mar-21	T2	N.A	N.A	N.A	0807	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_200702.wa
9-Mar-21	T2	N.A	N.A	N.A	0807	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_200706.wa
9-Mar-21	T2	N.A	N.A	N.A	0807	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210309_200706.wa
9-Mar-21	T2	N.A	N.A	N.A	0807	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210309_200729.wa
9-Mar-21	T2	N.A	N.A	N.A	0807	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210309_200733.wa
9-Mar-21	T2	N.A	N.A	N.A	0807	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_200738.wa
9-Mar-21	T2	N.A	N.A	N.A	0807	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_200754.wa
9-Mar-21	T2	N.A	N.A	N.A	0808	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_200809.wa
9-Mar-21	T2	N.A	N.A	N.A	0808	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_200824.wa
9-Mar-21	T2	N.A	N.A	N.A	0809	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_200900.wa
9-Mar-21	T2	N.A	N.A	N.A	0809	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_200905.wa
9-Mar-21	T2	N.A	N.A	N.A	0809	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_200923.wa
9-Mar-21	T2	N.A	N.A	N.A	0809	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_200936.wa
9-Mar-21	T2	N.A	N.A	N.A	0809	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_200951.wa
9-Mar-21	T2	N.A	N.A	N.A	0809	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_200958.wa
9-Mar-21	T2	N.A	N.A	N.A	0810	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_201003.wa
9-Mar-21	T2	N.A	N.A	N.A	0810	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_201010.wa
9-Mar-21	T2	N.A	N.A	N.A	0810	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_201018.wa
9-Mar-21	T2	N.A	N.A	N.A	0810	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_201032.wa
9-Mar-21	T2	N.A	N.A	N.A	0810	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_201039.wa
9-Mar-21	T2	N.A	N.A	N.A	0810	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_201053.wa
9-Mar-21	T2	N.A	N.A	N.A	0811	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_201105.wa

Date	Route	Aquatic Point	Latitude	Longitude	Time	Taxon	Scientific name	Common name	Qty	Observation type	Photo no.	Survey method	Remarks
9-Mar-21	T2	N.A	N.A	N.A	0811	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_201127.wa
9-Mar-21	T2	N.A	N.A	N.A	0814	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_201434.wa
9-Mar-21	T2	N.A	N.A	N.A	0815	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_201530.wa
9-Mar-21	T2	N.A	N.A	N.A	0816	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_201618.wa
9-Mar-21	T2	N.A	N.A	N.A	0824	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_202406.wa
9-Mar-21	T2	N.A	N.A	N.A	0824	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_202430.wa
9-Mar-21	T2	N.A	N.A	N.A	0826	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210309_202617.wa
9-Mar-21	T2	N.A	N.A	N.A	0826	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_202617.wa
9-Mar-21	T2	N.A	N.A	N.A	0826	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_202635.wa
9-Mar-21	T2	N.A	N.A	N.A	0826	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210309_202635.wa
9-Mar-21	T2	N.A	N.A	N.A	0827	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_202714.wa
9-Mar-21	T2	N.A	N.A	N.A	0827	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_202722.wa
9-Mar-21	T2	N.A	N.A	N.A	0827	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_202737.wa
9-Mar-21	T2	N.A	N.A	N.A	0827	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_202753.wa
9-Mar-21	T2	N.A	N.A	N.A	0827	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_202757.wa
9-Mar-21	T2	N.A	N.A	N.A	0828	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_202810.wa
9-Mar-21	T2	N.A	N.A	N.A	0828	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_202823.wa
9-Mar-21	T2	N.A	N.A	N.A	0828	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_202839.wa
9-Mar-21	T2	N.A	N.A	N.A	0828	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210309_202839.wa
9-Mar-21	T2	N.A	N.A	N.A	0828	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_202854.wa
9-Mar-21	T2	N.A	N.A	N.A	0829	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_202904.wa
9-Mar-21	T2	N.A	N.A	N.A	0829	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210309_202904.wa
9-Mar-21	T2	N.A	N.A	N.A	0829	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_202913.wa
9-Mar-21	T2	N.A	N.A	N.A	0829	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210309_202913.wa
9-Mar-21	T2	N.A	N.A	N.A	0829	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210309_202934.wa
9-Mar-21	T2	N.A	N.A	N.A	0829	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210309_202945.wa
9-Mar-21	T2	N.A	N.A	N.A	0829	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_202955.wa
9-Mar-21	T2	N.A	N.A	N.A	0830	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_203000.wa
9-Mar-21	T2	N.A	N.A	N.A	0830	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210309_203000.wa
9-Mar-21	T2	N.A	N.A	N.A	0830	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_203046.wa
9-Mar-21	T2	N.A	N.A	N.A	0831	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_203112.wa
9-Mar-21	T2	N.A	N.A	N.A	0831	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_203128.wa
9-Mar-21	T2	N.A	N.A	N.A	0831	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_203143.wa
9-Mar-21	T2	N.A	N.A	N.A	0832	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_203205.wa
9-Mar-21	T2	N.A	N.A	N.A	0832	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_203219.wa
9-Mar-21	T2	N.A	N.A	N.A	0832	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_203234.wa
9-Mar-21	T2	N.A	N.A	N.A	0832	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_203245.wa
9-Mar-21	T2	N.A	N.A	N.A	0833	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_203312.wa
9-Mar-21	T2	N.A	N.A	N.A	0833	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210309_203312.wa
9-Mar-21	T2	N.A	N.A	N.A	0833	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210309_203319.wa
9-Mar-21	T2	N.A	N.A	N.A	0833	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210309_203319.wa
9-Mar-21	T2	N.A	N.A	N.A	0833	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_203327.wa
9-Mar-21	T2	N.A	N.A	N.A	0834	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_203434.wa
9-Mar-21	T2	N.A	N.A	N.A	0835	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_203504.wa
9-Mar-21	T2	N.A	N.A	N.A	0836	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_203624.wa
9-Mar-21	T2	N.A	N.A	N.A	0836	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_203645.wa
9-Mar-21	T2	N.A	N.A	N.A	0837	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_203740.wa
9-Mar-21	T2	N.A	N.A	N.A	0839	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_203911.wa
9-Mar-21	T2	N.A	N.A	N.A	0839	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_203922.wa
9-Mar-21	T2	N.A	N.A	N.A	0839	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_203937.wa
9-Mar-21	T2	N.A	N.A	N.A	0840	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_204003.wa
9-Mar-21	T2	N.A	N.A	N.A	0841	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_204142.wa
9-Mar-21	T2	N.A	N.A	N.A	0841	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_204157.wa
9-Mar-21	T2	N.A	N.A	N.A	0842	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_204226.wa
9-Mar-21	T2	N.A	N.A	N.A	0842	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_204241.wa
9-Mar-21	T2	N.A	N.A	N.A	0842	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210309_204246.wa
9-Mar-21	T2	N.A	N.A	N.A	0842	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_204246.wa
9-Mar-21	T2	N.A	N.A	N.A	0843	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_204304.wa

Date	Route	Aquatic Point	Latitude	Longitude	Time	Taxon	Scientific name	Common name	Qty	Observation type	Photo no.	Survey method	Remarks
9-Mar-21	T2	N.A	N.A	N.A	0843	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_204329.wa
9-Mar-21	T2	N.A	N.A	N.A	0843	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210309_204340.wa
9-Mar-21	T2	N.A	N.A	N.A	0843	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_204340.wa
9-Mar-21	T2	N.A	N.A	N.A	0843	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_204355.wa
9-Mar-21	T2	N.A	N.A	N.A	0843	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210309_204355.wa
9-Mar-21	T2	N.A	N.A	N.A	0844	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_204417.wa
9-Mar-21	T2	N.A	N.A	N.A	0844	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_204432.wa
9-Mar-21	T2	N.A	N.A	N.A	0844	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_204447.wa
9-Mar-21	T2	N.A	N.A	N.A	0845	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_204502.wa
9-Mar-21	T2	N.A	N.A	N.A	0845	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_204518.wa
9-Mar-21	T2	N.A	N.A	N.A	0845	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_204527.wa
9-Mar-21	T2	N.A	N.A	N.A	0846	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_204615.wa
9-Mar-21	T2	N.A	N.A	N.A	0846	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_204630.wa
9-Mar-21	T2	N.A	N.A	N.A	0846	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_204636.wa
9-Mar-21	T2	N.A	N.A	N.A	0848	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_204835.wa
9-Mar-21	T2	N.A	N.A	N.A	0851	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210309_205154.wa
9-Mar-21	T2	N.A	N.A	N.A	0852	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210309_205206.wa
9-Mar-21	T2	N.A	N.A	N.A	0855	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_205525.wa
9-Mar-21	T2	N.A	N.A	N.A	0905	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_210551.wa
9-Mar-21	T2	N.A	N.A	N.A	0905	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_210555.wa
9-Mar-21	T3	N.A	N.A	N.A	0951	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_215131.wa
9-Mar-21	T3	N.A	N.A	N.A	0951	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_215139.wa
9-Mar-21	T3	N.A	N.A	N.A	0956	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_215659.wa
9-Mar-21	T3	N.A	N.A	N.A	1005	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_220534.wa
9-Mar-21	T3	N.A	N.A	N.A	1015	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_221550.wa
9-Mar-21	T3	N.A	N.A	N.A	1018	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_221847.wa
9-Mar-21	T3	N.A	N.A	N.A	1018	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_221852.wa
9-Mar-21	T3	N.A	N.A	N.A	1038	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_223808.wa
9-Mar-21	T3	N.A	N.A	N.A	1044	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210309_224407.wa
11-Mar-21	T1	N.A	1.351	103.734	713	Bird	*Oriolus chinensis*	Black-naped oriole	2	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.351	103.734	713	Bird	*Acridotheres javanicus*	Javan myna	1	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.351	103.734	716	Bird	*Halcyon smyrnensis*	White-throated kingfisher	1	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.351	103.734	716	Bird	*Acridotheres javanicus*	Javan myna	2	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.351	103.734	716	Bird	*Cinnyris jugularis*	Olive-backed sunbird	1	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.351	103.734	716	Bird	*Oriolus chinensis*	Black-naped oriole	2	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.351	103.734	718	Bird	*Aplonis panayensis*	Asian glossy starling	3	Seen	-	Targeted	-
11-Mar-21	T1	N.A	1.351	103.734	718	Bird	*Psittacula alexandri*	Red-breasted parakeet	1	Seen	-	Targeted	-
11-Mar-21	T1	N.A	1.351	103.734	718	Bird	*Cinnyris jugularis*	Olive-backed sunbird	1	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.351	103.734	718	Bird	*Picus vittatus*	Laced woodpecker	1	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.350	103.734	721	Bird	*Todiramphus chloris*	Collared kingfisher	1	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.350	103.734	721	Bird	*Pycnonotus zeylanicus*	Straw-headed bulbul	1	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.350	103.734	721	Bird	*Aplonis panayensis*	Asian glossy starling	3	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.350	103.734	721	Bird	*Eudynamys scolopaceus*	Asian koel	1	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.350	103.734	721	Bird	*Acridotheres javanicus*	Javan myna	5	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.350	103.734	721	Bird	*Aplonis panayensis*	Asian glossy starling	16	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.350	103.735	728	Bird	*Oriolus chinensis*	Black-naped oriole	1	Seen	-	Targeted	-
11-Mar-21	T1	N.A	1.350	103.735	728	Bird	*Psittacula alexandri*	Red-breasted parakeet	2	Seen	-	Targeted	-
11-Mar-21	T1	N.A	1.350	103.735	728	Amphibian	*Kaloula pulchra*	Banded bull frog	1	Seen	-	Targeted	In tree hole
11-Mar-21	T1	N.A	1.350	103.735	732	Bird	*Nisaetus cirrhatus*	Changeable hawk-eagle	1	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.350	103.735	732	Bird	*Psittacula alexandri*	Red-breasted parakeet	1	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.350	103.735	738	Bird	*Acridotheres javanicus*	Javan myna	10	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.350	103.735	738	Bird	*Oriolus chinensis*	Black-naped oriole	5	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.350	103.735	739	Mammal	*Callosciurus notatus*	Plantain squirrel	1	Seen	-	Targeted	-
11-Mar-21	T1	N.A	1.350	103.735	739	Bird	*Loriculus galgulus*	Blue-crowned hanging-parrot	1	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.350	103.735	739	Bird	*Psittacula alexandri*	Red-breasted parakeet	2	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.350	103.735	739	Bird	*Aegithina tiphia*	Common iora	1	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.350	103.735	739	Bird	*Aplonis panayensis*	Asian glossy starling	5	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.350	103.735	739	Bird	*Anthreptes malacensis*	Brown-throated sunbird	1	Heard	-	Targeted	-

Date	Route	Aquatic Point	Latitude	Longitude	Time	Taxon	Scientific name	Common name	Qty	Observation type	Photo no.	Survey method	Remarks
11-Mar-21	T1	N.A	1.350	103.735	739	Bird	*Dinopium javanense*	Common flameback	1	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.350	103.735	739	Bird	*Eudynamys scolopaceus*	Asian koel	1	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.351	103.735	745	Bird	*Oriolus chinensis*	Black-naped oriole	2	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.351	103.735	745	Bird	*Chrysophlegma miniaceum*	Banded woodpecker	1	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.351	103.735	745	Bird	*Pycnonotus zeylanicus*	Straw-headed bulbul	1	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.351	103.735	745	Bird	*Psittacula alexandri*	Red-breasted parakeet	2	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.351	103.736	750	Bird	*Garrulax leucolophus*	White-crested laughingthrush	3	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.351	103.736	750	Bird	*Lanius cristatus*	Brown shrike	1	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.351	103.736	750	Bird	*Aegithina tiphia*	Common iora	4	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.351	103.736	750	Bird	*Loriculus galgulus*	Blue-crowned hanging-parrot	1	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.351	103.736	756	Bird	*Psilopogon lineatus*	Lineated barbet	1	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.351	103.736	756	Bird	*Dinopium javanense*	Common flameback	1	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.351	103.736	756	Bird	*Aegithina tiphia*	Common iora	1	Seen	-	Targeted	-
11-Mar-21	T1	N.A	1.351	103.736	756	Bird	*Psittacula alexandri*	Red-breasted parakeet	2	Seen	-	Targeted	-
11-Mar-21	T1	N.A	1.351	103.736	756	Bird	*Unidentified Apodidae*	-	2	Seen	-	Targeted	-
11-Mar-21	T1	N.A	1.351	103.736	756	Bird	*Oriolus chinensis*	Black-naped oriole	2	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.351	103.736	756	Bird	*Eos bornea*	Red lory	2	Seen	-	Targeted	-
11-Mar-21	T1	N.A	1.351	103.736	756	Bird	*Aplonis panayensis*	Asian glossy starling	1	Seen	-	Targeted	-
11-Mar-21	T1	N.A	1.350	103.736	800	Bird	*Aegithina tiphia*	Common iora	1	Seen	-	Targeted	-
11-Mar-21	T1	N.A	1.350	103.736	800	Bird	*Treron vernans*	Pink-necked green pigeon	2	Seen	-	Targeted	-
11-Mar-21	T1	N.A	1.350	103.736	800	Bird	*Amaurornis phoenicurus*	White-breasted waterhen	1	Seen	-	Targeted	-
11-Mar-21	T1	N.A	1.350	103.736	800	Bird	*Aegithina tiphia*	Common iora	1	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.350	103.736	800	Bird	*Aplonis panayensis*	Asian glossy starling	30	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.350	103.736	800	Bird	*Anthreptes malacensis*	Brown-throated sunbird	1	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.351	103.736	806	Bird	*Psittacula alexandri*	Red-breasted parakeet	5	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.351	103.736	806	Bird	*Todiramphus chloris*	Collared kingfisher	1	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.351	103.736	806	Bird	*Dicaeum cruentatum*	Scarlet-backed flowerpecker	1	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.351	103.736	806	Bird	*Garrulax leucolophus*	White-crested laughingthrush	2	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.351	103.736	806	Bird	*Psittacula alexandri*	Red-breasted parakeet	2	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.351	103.737	811	Bird	*Loriculus galgulus*	Blue-crowned hanging-parrot	1	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.351	103.737	811	Bird	*Corvus splendens*	House crow	1	Seen	-	Targeted	-
11-Mar-21	T1	N.A	1.351	103.737	811	Bird	*Treron vernans*	Pink-necked green pigeon	2	Seen	-	Targeted	-
11-Mar-21	T1	N.A	1.351	103.737	811	Bird	*Psittacula alexandri*	Red-breasted parakeet	1	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.351	103.737	811	Bird	*Oriolus chinensis*	Black-naped oriole	3	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.351	103.737	816	Bird	*Todiramphus chloris*	Collared kingfisher	1	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.351	103.737	816	Bird	*Chrysophlegma miniaceum*	Banded woodpecker	1	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.351	103.737	816	Bird	*Amaurornis phoenicurus*	White-breasted waterhen	1	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.351	103.737	816	Bird	*Psilopogon lineatus*	Lineated barbet	3	Seen	2463	Targeted	-
11-Mar-21	T1	N.A	1.351	103.737	816	Bird	*Aegithina tiphia*	Common iora	1	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.352	103.736	822	Bird	*Mixornis gularis*	Pin-striped tit-babbler	3	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.351	103.736	825	Bird	*Dicrurus paradiseus*	Greater racket-tailed drongo	1	Heard	-	Incidental	-
11-Mar-21	T1	N.A	1.351	103.736	825	Bird	*Pycnonotus goiavier*	Yellow-vented bulbul	1	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.351	103.736	825	Bird	*Pycnonotus zeylanicus*	Straw-headed bulbul	1	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.352	103.736	845	Bird	*Orthotomus atrogularis*	Dark-necked tailorbird	1	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.352	103.736	857	Bird	*Aegithina tiphia*	Common iora	1	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.352	103.736	857	Bird	*Dinopium javanense*	Common flameback	1	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.352	103.736	857	Bird	*Todiramphus chloris*	Collared kingfisher	2	Seen	-	Targeted	-
11-Mar-21	T1	N.A	1.352	103.736	857	Bird	*Yungipicus moluccensis*	Sunda pygmy woodpecker	1	Seen	-	Targeted	-
11-Mar-21	T1	N.A	1.352	103.736	857	Bird	*Loriculus galgulus*	Blue-crowned hanging-parrot	1	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.352	103.736	901	Reptile	*Varanus salvator*	Malayan water monitor	1	Seen	2483	Targeted	In tree hole
11-Mar-21	T1	N.A	1.352	103.736	901	Bird	*Eudynamys scolopaceus*	Asian koel	1	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.352	103.736	901	Bird	*Psittacula krameri*	Rose-ringed parakeet	1	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.352	103.735	904	Bird	*Oriolus chinensis*	Black-naped oriole	1	Seen	-	Targeted	-
11-Mar-21	T1	N.A	1.352	103.734	910	Bird	*Pycnonotus zeylanicus*	Straw-headed bulbul	1	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.351	103.734	914	Bird	*Eudynamys scolopaceus*	Asian koel	1	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.351	103.734	914	Bird	*Cinnyris jugularis*	Olive-backed sunbird	1	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.351	103.734	914	Bird	*Pycnonotus goiavier*	Yellow-vented bulbul	1	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.351	103.734	914	Bird	*Oriolus chinensis*	Black-naped oriole	1	Heard	-	Targeted	-

Date	Route	Aquatic Point	Latitude	Longitude	Time	Taxon	Scientific name	Common name	Qty	Observation type	Photo no.	Survey method	Remarks
11-Mar-21	T1	N.A	1.351	103.734	914	Bird	*Aplonis panayensis*	Asian glossy starling	3	Seen	-	Targeted	-
11-Mar-21	T1	N.A	1.351	103.734	914	Bird	*Acridotheres javanicus*	Javan myna	5	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.351	103.734	914	Bird	*Garrulax leucolophus*	White-crested laughingthrush	3	Seen	-	Targeted	-
11-Mar-21	T1	N.A	1.351	103.734	914	Bird	*Trichoglossus haematodus*	Coconut lorikeet	2	Seen	-	Targeted	-
11-Mar-21	T1	N.A	1.352	103.733	914	Bird	*Todiramphus chloris*	Collared kingfisher	2	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.352	103.733	924	Bird	*Mixornis gularis*	Pin-striped tit-babbler	1	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.352	103.733	924	Bird	*Merops sp.*	-	3	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.352	103.733	924	Bird	*Oriolus chinensis*	Black-naped oriole	1	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.352	103.733	924	Bird	*Psittacula alexandri*	Red-breasted parakeet	1	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.352	103.732	928	Bird	*Orthotomus atrogularis*	Dark-necked tailorbird	1	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.352	103.732	928	Bird	*Pericrocotus divaricatus*	Ashy minivet	3	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.352	103.732	928	Bird	*Treron vernans*	Pink-necked green pigeon	1	Seen	-	Targeted	-
11-Mar-21	T1	N.A	1.352	103.732	928	Mammal	*Callosciurus notatus*	Plantain squirrel	1	Seen	-	Targeted	-
11-Mar-21	T1	N.A	1.353	103.732	932	Bird	*Psilopogon lineatus*	Lineated barbet	1	Seen	-	Targeted	-
11-Mar-21	T1	N.A	1.353	103.732	932	Bird	*Todiramphus chloris*	Collared kingfisher	1	Heard	-	Targeted	-
11-Mar-21	T1	N.A	1.353	103.732	932	Bird	*Aegithina tiphia*	Common iora	1	Heard	-	Targeted	-
11-Mar-21	T3	N.A	1.358	103.714	1120	Butterfly	*Junonia hedonia ida*	Chocolate pansy	2	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.358	103.714	1120	Odonate	*Neurothemis fluctuans*	Common parasol	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.358	103.714	1120	Butterfly	*Appias libythea olferna*	Striped albatross	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.358	103.714	1125	Odonate	*Neurothemis fluctuans*	Common parasol	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.358	103.714	1129	Odonate	*Tholymis tillarga*	White-barred duskhawk	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.358	103.713	1132	Odonate	*Neurothemis fluctuans*	Common parasol	5	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.358	103.713	1132	Odonate	*Potamarcha congener*	Common chaser	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.358	103.713	1132	Butterfly	*Iambrix salsala salsala*	Chestnut bob	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.359	103.713	1134	Odonate	*Neurothemis fluctuans*	Common parasol	2	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.359	103.713	1134	Odonate	*Orthetrum testaceum*	Scarlet skimmer	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.359	103.713	1135	Butterfly	*Junonia hedonia ida*	Chocolate pansy	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.359	103.713	1135	Butterfly	*Junonia atlites atlites*	Grey pansy	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.359	103.713	1135	Odonate	*Potamarcha congener*	Common chaser	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.359	103.713	1136	Butterfly	*Appias libythea olferna*	Striped albatross	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.359	103.713	1139	Odonate	*Orthetrum sabina*	Variegated green skimmer	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.359	103.713	1139	Butterfly	*Junonia hedonia ida*	Chocolate pansy	2	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.359	103.713	1139	Odonate	*Neurothemis fluctuans*	Common parasol	2	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.359	103.713	1139	Aculeate hymenopteran	*Eumenes sp.*	NA	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.359	103.713	1141	Butterfly	*Junonia hedonia ida*	Chocolate pansy	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.359	103.713	1141	Butterfly	*Eurema sp.*	-	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.359	103.713	1141	Odonate	*Neurothemis fluctuans*	Common parasol	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.359	103.713	1144	Butterfly	*Iambrix salsala salsala*	Chestnut bob	1	Seen	CT7353	Targeted	-
11-Mar-21	T3	N.A	1.359	103.713	1144	Odonate	*Neurothemis fluctuans*	Common parasol	2	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.359	103.713	1144	Odonate	*Tholymis tillarga*	White-barred duskhawk	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.359	103.713	1147	Odonate	*Neurothemis fluctuans*	Common parasol	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.359	103.713	1148	Butterfly	*Papilio polytes romulus*	Common mormon	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.359	103.712	1152	Butterfly	*Papilio polytes romulus*	Common mormon	1	Seen	-	Targeted	Laying eggs on cinnamon
11-Mar-21	T3	N.A	1.359	103.712	1153	Odonate	*Neurothemis fluctuans*	Common parasol	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.359	103.712	1158	Butterfly	*Junonia hedonia ida*	Chocolate pansy	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.359	103.712	1158	Butterfly	*Appias libythea olferna*	Striped albatross	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.359	103.712	1158	Butterfly	*Hypolimnas anomala anomala*	Malayan eggfly	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.360	103.712	1200	Butterfly	*Papilio polytes romulus*	Common mormon	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.360	103.712	1200	Odonate	*Neurothemis fluctuans*	Common parasol	5	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.360	103.712	1200	Odonate	*Tholymis tillarga*	White-barred duskhawk	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.360	103.712	1204	Butterfly	*Junonia hedonia ida*	Chocolate pansy	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.360	103.712	1204	Butterfly	*Arhopala centaurus nakula*	Centaur oakblue	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.360	103.712	1208	Odonate	*Neurothemis fluctuans*	Common parasol	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.360	103.712	1208	Aculeate hymenopteran	*Trypoxylon sp.*	-	3	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.360	103.711	1212	Butterfly	*Papilio polytes romulus*	Common mormon	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.360	103.711	1218	Butterfly	*Jamides sp.*	-	2	Seen	CT7366	Targeted	-
11-Mar-21	T3	N.A	1.360	103.711	1219	Odonate	*Lathrecista asiatica*	Scarlet grenadier	1	Seen	-	Targeted	-

Date	Route	Aquatic Point	Latitude	Longitude	Time	Taxon	Scientific name	Common name	Qty	Observation type	Photo no.	Survey method	Remarks
11-Mar-21	T3	N.A	1.360	103.711	1219	Butterfly	*Papilio polytes romulus*	Common mormon	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.360	103.711	1219	Odonate	*Neurothemis fluctuans*	Common parasol	2	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.360	103.711	1220	Butterfly	*Elymnias hypermnestra agina*	Common palmfly	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.360	103.711	1220	Butterfly	*Appias libythea olferna*	Striped albatross	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.360	103.711	1220	Butterfly	*Arhopala centaurus nakula*	Centaur oakblue	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.360	103.711	1220	Butterfly	*Eurema sp.*	-	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.360	103.711	1223	Odonate	*Neurothemis fluctuans*	Common parasol	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.360	103.711	1223	Butterfly	*Mycalesis sp.*	-	1	Seen	CT7368-CT736	Targeted	-
11-Mar-21	T3	N.A	1.360	103.711	1223	Butterfly	*Junonia hedonia ida*	Chocolate pansy	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.360	103.711	1226	Butterfly	*Hypolimnas anomala anomala*	Malayan eggfly	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.361	103.711	1227	Butterfly	*Papilio polytes romulus*	Common mormon	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.361	103.711	1227	Butterfly	*Junonia hedonia ida*	Chocolate pansy	2	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.361	103.711	1230	Aculeate hymenopteran	*Ropalidia stigma*	NA	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.361	103.711	1231	Butterfly	*Hypolimnas anomala anomala*	Malayan eggfly	1	Seen	CT7373	Targeted	Caught by spider
11-Mar-21	T3	N.A	1.361	103.711	1232	Butterfly	*Mycalesis perseoides perseoides*	Burmese bush brown	1	Seen	CT7378-CT737	Targeted	-
11-Mar-21	T3	N.A	1.361	103.711	1233	Butterfly	*Mycalesis sp.*	-	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.361	103.711	1234	Odonate	*Neurothemis fluctuans*	Common parasol	4	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.361	103.711	1234	Odonate	*Lathrecista asiatica*	Scarlet grenadier	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.361	103.711	1234	Butterfly	*Arhopala centaurus nakula*	Centaur oakblue	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.361	103.711	1234	Butterfly	*Delias hyparete metarete*	Painted jezebel	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.361	103.711	1238	Odonate	*Lathrecista asiatica*	Scarlet grenadier	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.361	103.711	1238	Aculeate hymenopteran	*Stenodyneriellus guttulatus*	NA	2	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.361	103.711	1238	Butterfly	*Arhopala centaurus nakula*	Centaur oakblue	2	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.361	103.711	1238	Butterfly	*Junonia hedonia ida*	Chocolate pansy	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.361	103.711	1240	Butterfly	*Jamides sp.*	-	2	Seen	CT7386	Targeted	-
11-Mar-21	T3	N.A	1.361	103.711	1240	Butterfly	*Graphium sarpedon luctatius*	Common bluebottle	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.361	103.711	1240	Butterfly	*Papilio polytes romulus*	Common mormon	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.361	103.711	1246	Butterfly	*Arhopala sp.*	-	1	Seen	CT7389	Targeted	-
11-Mar-21	T3	N.A	1.361	103.711	1246	Butterfly	*Arhopala sp.*	-	1	Seen	CT7393	Targeted	-
11-Mar-21	T3	N.A	1.361	103.710	1248	Butterfly	*Zizula hylax pygmaea*	Pygmy grass blue	2	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.361	103.710	1248	Odonate	*Neurothemis fluctuans*	Common parasol	2	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.361	103.710	1250	Butterfly	*Mycalesis sp.*	-	1	Seen	CT7395	Targeted	-
11-Mar-21	T3	N.A	1.362	103.710	1254	Odonate	*Neurothemis fluctuans*	Common parasol	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.362	103.710	1254	Butterfly	*Papilio polytes romulus*	Common mormon	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.362	103.710	1256	Butterfly	*Junonia hedonia ida*	Chocolate pansy	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.362	103.710	1256	Butterfly	*Prosotas dubiosa lumpura*	Tailless line blue	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.362	103.710	1257	Odonate	*Tholymis tillarga*	White-barred duskhawk	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.362	103.710	1257	Butterfly	*Eurema sp.*	-	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.362	103.710	1257	Odonate	*Neurothemis fluctuans*	Common parasol	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.362	103.709	1301	Butterfly	*Arhopala centaurus nakula*	Centaur oakblue	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.362	103.709	1301	Aculeate hymenopteran	*Xylocopa sp.*	-	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.362	103.709	1303	Butterfly	*Junonia hedonia ida*	Chocolate pansy	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.362	103.709	1303	Odonate	*Neurothemis fluctuans*	Common parasol	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.363	103.709	1307	Butterfly	*Papilio polytes romulus*	Common mormon	1	Seen	-	Targeted	-
11-Mar-21	T3	N.A	1.362	103.710	1317	Odonate	*Pantala flavescens*	Wandering glider	1	Seen	-	Incidental	-
11-Mar-21	T3	N.A	1.362	103.711	1319	Butterfly	*Lampides boeticus*	Pea blue	1	Seen	-	Incidental	-
11-Mar-21	T3	N.A	1.362	103.711	1321	Butterfly	*Junonia orithya wallacei*	Blue pansy	1	Seen	-	Incidental	-
11-Mar-21	T3	N.A	1.362	103.711	1323	Odonate	*Crocothemis servilia*	Common scarlet	1	Seen	-	Incidental	-
11-Mar-21	D2	N.A	1.359	103.725	2104	Reptile	*Amyda cartilaginea*	Asian softshell turtle	1	Seen	2486-2487	Incidental	In ephemeral waterbody along trail
11-Mar-21	D2	N.A	1.360	103.724	2104	Bird	*Caprimulgus affinis*	Savanna nightjar	1	Heard	-	Incidental	-
11-Mar-21	T1	D5_01	1.350	103.734	0704-0709	Amphibian	*Sylvirana guentheri*	Guenther's frog	1	Heard	-	Targeted	-
11-Mar-21	T1	D5_01	1.350	103.734	0704-0709	Reptile	*Trachemys scripta*	Red-eared slider	1	Seen	-	Targeted	-
11-Mar-21	T1	D5_02	1.350	103.735	0732-0737	Amphibian	*Sylvirana guentheri*	Guenther's frog	2	Heard	-	Incidental	-
11-Mar-21	T1	D5_03	1.351	103.736	0754-0759	Odonate	*Pseudagrion microcephalum*	Blue sprite	1	Seen	2461	Incidental	-
11-Mar-21	T1	D5_05	1.352	103.737	0825-0830	Bird	*Pycnonotus zeylanicus*	Straw-headed bulbul	1	Heard	-	Incidental	-
11-Mar-21	T1	D5_05	1.352	103.737	0825-0830	Bird	*Lanius cristatus*	Brown shrike	1	Heard	-	Incidental	-
11-Mar-21	T1	D5_04	1.351	103.736	0835-0840	Amphibian	*Sylvirana guentheri*	Guenther's frog	1	Seen	-	Incidental	-

Date	Route	Aquatic Point	Latitude	Longitude	Time	Taxon	Scientific name	Common name	Qty	Observation type	Photo no.	Survey method	Remarks
11-Mar-21	T1	D5_04	1.351	103.736	0835-0840	Amphibian	*Sylvirana guentheri*	Guenther's frog	1	Heard	-	Incidental	-
11-Mar-21	T1	D5_04	1.351	103.736	0835-0840	Bird	*Trichoglossus haematodus*	Coconut lorikeet	2	Heard	-	Incidental	-
11-Mar-21	T1	D5_04	1.351	103.736	0835-0840	Odonate	*Pseudagrion microcephalum*	Blue sprite	1	Seen	2469-2478	Incidental	-
11-Mar-21	T1	D5_01	1.350	103.734	0848-0903	Mammal	*Sus scrofa*	Wild pig	1	Seen	-	Incidental	-
11-Mar-21	T1	D5_01	1.350	103.734	0848-0903	Bird	*Picus vittatus*	Laced woodpecker	1	Seen	-	Incidental	-
11-Mar-21	D5	D5_01	1.350	103.734	2000-2005	Fish	*Channa striata*	Common snakehead/aruan	100	Seen	-	Targeted	Juvenile
11-Mar-21	D5	D5_01	1.350	103.734	2000-2005	Amphibian	*Sylvirana guentheri*	Guenther's frog	3	Heard	-	Targeted	-
11-Mar-21	D5	D5_01	1.350	103.734	2000-2005	Amphibian	*Limnonectes blythii*	Malayan giant frog	1	Seen	-	Targeted	-
11-Mar-21	D5	D5_01	1.350	103.734	2000-2005	Fish	*Channa striata*	Common snakehead/aruan	1	Seen	-	Targeted	Adult
11-Mar-21	D5	D5_01	1.350	103.734	2000-2005	Reptile	*Dendrelaphis pictus*	Painted bronzeback	1	Seen	-	Targeted	-
11-Mar-21	D5	D5_01	1.350	103.734	2000-2005	Reptile	*Calotes versicolor*	Changeable lizard	1	Seen	-	Targeted	-
11-Mar-21	D2	D2_02	1.359	103.722	2033-2038	Amphibian	*Sylvirana guentheri*	Guenther's frog	1	Heard	-	Targeted	-
11-Mar-21	D2	D2_02	1.359	103.722	2033-2038	Amphibian	*Hylarana erythraea*	Green paddy frog	2	Heard	-	Targeted	-
11-Mar-21	D2	D2_02	1.359	103.722	2033-2038	Fish	*Unidentified Gobiidae*	-	1	Seen	2488	Targeted	-
11-Mar-21	D2	D2_03	1.360	103.721	2045-2050	Amphibian	*Microhyla butleri*	Painted chorus frog	1	Heard	-	Targeted	-
11-Mar-21	D2	D2_03	1.360	103.721	2045-2050	Amphibian	*Sylvirana guentheri*	Guenther's frog	1	Heard	-	Targeted	-
12-Mar-21	ST	N.A	1.359	103.725	1058	Bird	*Vanellus indicus*	Red-wattled lapwing	1	Seen	-	Incidental	Possibly nesting beside hoarding
12-Mar-21	D2	D2_01	1.357	103.724	1042-1047	Odonate	*Ictinogomphus decoratus*	Common flangetail	1	Seen	-	Targeted	-
12-Mar-21	D2	D2_01	1.357	103.724	1042-1047	Fish	*Dermogenys collettei*	Sunda pygmy halfbeak	12	Seen	-	Targeted	-
12-Mar-21	D2	D2_01	1.357	103.724	1042-1047	Odonate	*Neurothemis fluctuans*	Common parasol	1	Seen	-	Targeted	-
12-Mar-21	D2	D2_01	1.357	103.724	1042-1047	Fish	*Channa striata*	Common snakehead/aruan	1	Seen	-	Targeted	-
12-Mar-21	D2	D2_01	1.357	103.724	1042-1047	Odonate	*Agriocnemis femina*	Variable wisp	4	Seen	-	Targeted	-
12-Mar-21	D2	D2_01	1.357	103.724	1042-1047	Odonate	*Pseudagrion microcephalum*	Blue sprite	1	Seen	-	Targeted	-
12-Mar-21	D2	D2_02	1.359	103.722	1113-1118	Odonate	*Brachydiplax chalybea*	Blue dasher	5	Seen	-	Targeted	-
12-Mar-21	D2	D2_02	1.359	103.722	1113-1118	Odonate	*Neurothemis fluctuans*	Common parasol	2	Seen	-	Targeted	-
12-Mar-21	D2	D2_02	1.359	103.722	1113-1118	Fish	*Dermogenys collettei*	Sunda pygmy halfbeak	4	Seen	-	Targeted	-
12-Mar-21	D2	D2_02	1.359	103.722	1113-1118	Odonate	*Crocothemis servilia*	Common scarlet	1	Seen	-	Targeted	-
12-Mar-21	D2	D2_02	1.359	103.722	1113-1118	Fish	*Aplocheilus armatus*	Whitespot	1	Seen	-	Targeted	-
12-Mar-21	D2	D2_02	1.359	103.722	1113-1118	Odonate	*Rhodothemis rufa*	Common redbolt	1	Seen	-	Targeted	-
12-Mar-21	D2	D2_03	1.360	103.721	1128-1133	Odonate	*Brachydiplax chalybea*	Blue dasher	8	Seen	-	Targeted	-
12-Mar-21	D2	D2_03	1.360	103.721	1128-1133	Odonate	*Neurothemis fluctuans*	Common parasol	7	Seen	-	Targeted	-
12-Mar-21	D2	D2_03	1.360	103.721	1128-1133	Fish	*Dermogenys collettei*	Sunda pygmy halfbeak	4	Seen	-	Targeted	-
12-Mar-21	D2	D2_03	1.360	103.721	1128-1133	Odonate	*Ictinogomphus decoratus*	Common flangetail	2	Seen	-	Targeted	-
12-Mar-21	D2	D2_03	1.360	103.721	1128-1133	Odonate	*Rhodothemis rufa*	Common redbolt	1	Seen	-	Targeted	-
12-Mar-21	D2	D2_03	1.360	103.721	1128-1133	Odonate	*Ceriagrion cerinorubellum*	Ornate coraltail	1	Seen	-	Targeted	-
12-Mar-21	D2	D2_03	1.360	103.721	1128-1133	Odonate	*Copera marginipes*	Yellow featherlegs	1	Seen	-	Targeted	-
15-Mar-21	T2	N.A	1.357	103.724	701	Bird	*Psilopogon lineatus*	Lineated barbet	1	Heard	-	Targeted	-
15-Mar-21	T2	N.A	1.357	103.724	701	Bird	*Acridotheres javanicus*	Javan myna	5	Seen	-	Targeted	-
15-Mar-21	T2	N.A	1.357	103.724	701	Bird	*Aplonis panayensis*	Asian glossy starling	10	Seen	-	Targeted	-
15-Mar-21	T2	N.A	1.357	103.724	701	Bird	*Picus vittatus*	Laced woodpecker	1	Heard	-	Targeted	-
15-Mar-21	T2	N.A	1.357	103.724	701	Bird	*Eurystomus orientalis*	Oriental dollarbird	1	Heard	-	Targeted	-
15-Mar-21	T2	N.A	1.357	103.724	701	Bird	*Gallus gallus*	Red junglefowl	1	Heard	-	Targeted	-
15-Mar-21	T2	N.A	1.357	103.724	701	Bird	*Oriolus chinensis*	Black-naped oriole	1	Heard	-	Targeted	-
15-Mar-21	T2	N.A	1.357	103.724	701	Bird	*Pycnonotus goiavier*	Yellow-vented bulbul	3	Heard	-	Targeted	-
15-Mar-21	T2	N.A	1.357	103.724	704	Bird	*Acridotheres javanicus*	Javan myna	2	Seen	-	Targeted	-
15-Mar-21	T2	N.A	1.357	103.724	704	Bird	*Aplonis panayensis*	Asian glossy starling	14	Seen	-	Targeted	-
15-Mar-21	T2	N.A	1.358	103.724	705	Bird	*Treron vernans*	Pink-necked green pigeon	1	Seen	-	Targeted	-
15-Mar-21	T2	N.A	1.358	103.724	705	Bird	*Aegithina tiphia*	Common iora	1	Seen	-	Targeted	-
15-Mar-21	T2	N.A	1.358	103.724	705	Bird	*Treron vernans*	Pink-necked green pigeon	2	Seen	-	Targeted	-
15-Mar-21	T2	N.A	1.358	103.724	705	Bird	*Aplonis panayensis*	Asian glossy starling	10	Seen	-	Targeted	-
15-Mar-21	T2	N.A	1.358	103.725	707	Bird	*Oriolus chinensis*	Black-naped oriole	1	Heard	-	Targeted	-
15-Mar-21	T2	N.A	1.358	103.725	707	Bird	*Pycnonotus goiavier*	Yellow-vented bulbul	3	Heard	-	Targeted	-
15-Mar-21	T2	N.A	1.358	103.725	709	Bird	*Picus vittatus*	Laced woodpecker	1	Heard	-	Targeted	-
15-Mar-21	T2	N.A	1.358	103.725	711	Bird	*Garrulax leucolophus*	White-crested laughingthrush	3	Heard	-	Targeted	-
15-Mar-21	T2	N.A	1.358	103.725	712	Bird	*Aplonis panayensis*	Asian glossy starling	23	Seen	-	Targeted	-
15-Mar-21	T2	N.A	1.358	103.725	712	Bird	*Eurystomus orientalis*	Oriental dollarbird	1	Seen	-	Targeted	-
15-Mar-21	T2	N.A	1.359	103.725	712	Bird	*Todiramphus chloris*	Collared kingfisher	1	Heard	-	Targeted	-

Date	Route	Aquatic Point	Latitude	Longitude	Time	Taxon	Scientific name	Common name	Qty	Observation type	Photo no.	Survey method	Remarks
15-Mar-21	T2	N.A	1.359	103.725	712	Bird	*Treron vernans*	Pink-necked green pigeon	1	Seen	-	Targeted	-
15-Mar-21	T2	N.A	1.359	103.725	712	Bird	*Oriolus chinensis*	Black-naped oriole	1	Heard	-	Targeted	-
15-Mar-21	T2	N.A	1.359	103.725	714	Bird	*Vanellus indicus*	Red-wattled lapwing	1	Seen	-	Targeted	-
15-Mar-21	T2	N.A	1.359	103.725	714	Bird	*Psittacula alexandri*	Red-breasted parakeet	1	Seen	-	Targeted	-
15-Mar-21	T2	N.A	1.359	103.725	715	Bird	*Vanellus indicus*	Red-wattled lapwing	1	Seen	-	Targeted	-
15-Mar-21	T2	N.A	1.359	103.725	716	Bird	*Aplonis panayensis*	Asian glossy starling	10	Seen	-	Targeted	-
15-Mar-21	T2	N.A	1.359	103.725	716	Bird	*Corvus splendens*	House crow	2	Seen	-	Targeted	-
15-Mar-21	T2	N.A	1.359	103.725	716	Bird	*Acridotheres javanicus*	Javan myna	10	Seen	-	Targeted	-
15-Mar-21	T2	N.A	1.359	103.725	716	Bird	*Psilopogon lineatus*	Lineated barbet	1	Heard	-	Targeted	-
15-Mar-21	T2	N.A	1.359	103.724	718	Bird	*Gallus gallus*	Red junglefowl	1	Heard	-	Targeted	-
15-Mar-21	T2	N.A	1.359	103.724	718	Bird	*Spilopelia chinensis*	Spotted dove	1	Heard	-	Targeted	-
15-Mar-21	T2	N.A	1.359	103.724	718	Bird	*Dicrurus paradiseus*	Greater racket-tailed drongo	1	Heard	-	Targeted	-
15-Mar-21	T2	N.A	1.359	103.724	718	Bird	*Picus vittatus*	Laced woodpecker	1	Seen	-	Targeted	-
15-Mar-21	T2	N.A	1.359	103.724	720	Bird	*Treron vernans*	Pink-necked green pigeon	1	Heard	-	Targeted	-
15-Mar-21	T2	N.A	1.359	103.724	720	Bird	*Psilopogon haemacephalus*	Coppersmith barbet	1	Heard	-	Targeted	-
15-Mar-21	T2	N.A	1.359	103.724	720	Bird	*Psittacula alexandri*	Red-breasted parakeet	1	Heard	-	Targeted	-
15-Mar-21	T2	N.A	1.359	103.724	720	Bird	*Amaurornis phoenicurus*	White-breasted waterhen	1	Heard	-	Targeted	-
15-Mar-21	T2	N.A	1.359	103.724	720	Bird	*Oriolus chinensis*	Black-naped oriole	1	Heard	-	Targeted	-
15-Mar-21	T2	N.A	1.359	103.724	721	Bird	*Treron vernans*	Pink-necked green pigeon	5	Seen	-	Targeted	-
15-Mar-21	T2	N.A	1.359	103.724	721	Bird	*Lalage nigra*	Pied triller	1	Heard	-	Targeted	-
15-Mar-21	T2	N.A	1.359	103.724	721	Bird	*Aerodramus sp.*	-	5	Seen	-	Targeted	-
15-Mar-21	T2	N.A	1.359	103.724	722	Bird	*Garrulax leucolophus*	White-crested laughingthrush	5	Heard	-	Targeted	-
15-Mar-21	T2	N.A	1.359	103.724	722	Bird	*Psittacula krameri*	Rose-ringed parakeet	1	Seen	-	Targeted	-
15-Mar-21	T2	N.A	1.359	103.724	724	Bird	*Aplonis panayensis*	Asian glossy starling	15	Seen	-	Targeted	-
15-Mar-21	T2	N.A	1.359	103.724	724	Bird	*Pycnonotus goiavier*	Yellow-vented bulbul	3	Heard	-	Targeted	-
15-Mar-21	T2	N.A	1.359	103.724	726	Amphibian	*Microhyla sp.*	-	1000	Seen	-	Targeted	-
15-Mar-21	T2	N.A	1.359	103.724	726	Amphibian	*Microhyla mukhlesuri*	East Asian ornate chorus frog	1	Heard	-	Targeted	-
15-Mar-21	T2	N.A	1.359	103.724	727	Bird	*Treron vernans*	Pink-necked green pigeon	5	Seen	-	Targeted	-
15-Mar-21	T2	N.A	1.359	103.724	727	Bird	*Cinnyris jugularis*	Olive-backed sunbird	1	Heard	-	Targeted	-
15-Mar-21	T2	N.A	1.359	103.724	727	Bird	*Oriolus chinensis*	Black-naped oriole	1	Seen	-	Targeted	-
15-Mar-21	T2	N.A	1.360	103.724	728	Bird	*Aplonis panayensis*	Asian glossy starling	10	Seen	-	Targeted	-
15-Mar-21	T2	N.A	1.360	103.724	729	Bird	*Cinnyris jugularis*	Olive-backed sunbird	1	Heard	-	Targeted	-
15-Mar-21	T2	N.A	1.360	103.724	729	Bird	*Eurystomus orientalis*	Oriental dollarbird	1	Heard	-	Targeted	-
15-Mar-21	T2	N.A	1.360	103.724	729	Bird	*Dicrurus paradiseus*	Greater racket-tailed drongo	1	Heard	-	Targeted	-
15-Mar-21	T2	N.A	1.360	103.724	731	Bird	*Gallus gallus*	Red junglefowl	1	Heard	-	Targeted	-
15-Mar-21	T2	N.A	1.360	103.725	732	Bird	*Pericrocotus divaricatus*	Ashy minivet	2	Heard	-	Targeted	-
15-Mar-21	T2	N.A	1.360	103.725	734	Bird	*Dinopium javanense*	Common flameback	1	Heard	-	Targeted	-
15-Mar-21	T2	N.A	1.360	103.725	736	Bird	*Oriolus chinensis*	Black-naped oriole	1	Heard	-	Targeted	-
15-Mar-21	T2	N.A	1.360	103.725	736	Bird	*Cinnyris jugularis*	Olive-backed sunbird	1	Heard	-	Targeted	-
15-Mar-21	T2	N.A	1.360	103.725	736	Bird	*Mixornis gularis*	Pin-striped tit-babbler	2	Heard	-	Targeted	-
15-Mar-21	T2	N.A	1.360	103.725	736	Bird	*Pycnonotus goiavier*	Yellow-vented bulbul	1	Heard	-	Targeted	-
15-Mar-21	T2	N.A	1.360	103.726	736	Bird	*Garrulax leucolophus*	White-crested laughingthrush	5	Heard	-	Targeted	-
15-Mar-21	T2	N.A	1.360	103.726	736	Bird	*Psittacula alexandri*	Red-breasted parakeet	1	Heard	-	Targeted	-
15-Mar-21	T2	N.A	1.360	103.726	736	Bird	*Psilopogon lineatus*	Lineated barbet	2	Heard	-	Targeted	-
15-Mar-21	T2	N.A	1.360	103.726	736	Bird	*Aegithina tiphia*	Common iora	2	Heard	-	Targeted	-
15-Mar-21	T2	N.A	1.360	103.726	742	Bird	*Dicaeum cruentatum*	Scarlet-backed flowerpecker	1	Heard	-	Targeted	-
15-Mar-21	T2	N.A	1.360	103.726	742	Bird	*Caprimulgus affinis*	Savanna nightjar	1	Seen	-	Targeted	-
15-Mar-21	T2	N.A	1.360	103.726	742	Mammal	*Sundasciurus tenuis*	Slender squirrel	1	Seen	-	Targeted	-
15-Mar-21	T2	N.A	1.360	103.726	744	Mammal	*Sus scrofa*	Wild pig	2	Seen	-	Targeted	-
15-Mar-21	T2	N.A	1.360	103.726	744	Bird	*Orthotomus ruficeps*	Ashy tailorbird	1	Heard	-	Targeted	-
15-Mar-21	T2	N.A	1.360	103.726	746	Bird	*Treron vernans*	Pink-necked green pigeon	1	Heard	-	Targeted	-
15-Mar-21	T2	N.A	1.360	103.726	746	Bird	*Acrocephalus orientalis*	Oriental reed warbler	1	Heard	-	Targeted	-
15-Mar-21	T2	N.A	1.360	103.726	746	Bird	*Copsychus saularis*	Oriental magpie-robin	1	Heard	-	Targeted	-
15-Mar-21	T2	N.A	1.360	103.726	746	Bird	*Rhipidura javanica*	Malaysian pied fantail	1	Heard	-	Targeted	-
15-Mar-21	T2	N.A	1.360	103.726	746	Bird	*Aegithina tiphia*	Common iora	1	Heard	-	Targeted	-
15-Mar-21	T2	N.A	1.360	103.726	746	Bird	*Oriolus chinensis*	Black-naped oriole	1	Heard	-	Targeted	-
15-Mar-21	T2	N.A	1.360	103.726	746	Bird	*Geopelia striata*	Zebra dove	1	Heard	-	Targeted	-
15-Mar-21	T2	N.A	1.360	103.726	746	Bird	*Merops sp.*	-	1	Heard	-	Targeted	-

Date	Route	Aquatic Point	Latitude	Longitude	Time	Taxon	Scientific name	Common name	Qty	Observation type	Photo no.	Survey method	Remarks
15-Mar-21	T2	N.A	1.360	103.726	750	Amphibian	*Sylvirana guentheri*	Guenther's frog	1	Heard	-	Targeted	-
15-Mar-21	T2	N.A	1.360	103.726	750	Bird	*Rhipidura javanica*	Malaysian pied fantail	1	Heard	-	Targeted	-
15-Mar-21	T2	N.A	1.360	103.726	750	Bird	*Pycnonotus goiavier*	Yellow-vented bulbul	2	Seen	-	Targeted	-
15-Mar-21	T2	N.A	1.360	103.726	750	Bird	*Todiramphus chloris*	Collared kingfisher	1	Heard	-	Targeted	-
15-Mar-21	T2	N.A	1.360	103.726	750	Bird	*Psilopogon lineatus*	Lineated barbet	1	Heard	-	Targeted	-
15-Mar-21	T2	N.A	1.360	103.726	752	Bird	*Rhipidura javanica*	Malaysian pied fantail	1	Heard	-	Targeted	-
15-Mar-21	T2	N.A	1.359	103.726	753	Bird	*Merops philippinus*	Blue-tailed bee-eater	1	Seen	-	Incidental	-
15-Mar-21	T2	N.A	1.359	103.724	758	Bird	*Haliastur indus*	Brahminy kite	1	Seen	-	Incidental	-
15-Mar-21	T2	N.A	1.358	103.725	804	Bird	*Loriculus galgulus*	Blue-crowned hanging-parrot	1	Heard	-	Incidental	-
15-Mar-21	T2	N.A	1.357	103.724	806	Bird	*Chrysophlegma miniaceum*	Banded woodpecker	1	Heard	-	Incidental	-
15-Mar-21	T2	N.A	1.357	103.724	808	Bird	*Prinia flaviventris*	Yellow-bellied prinia	1	Seen	-	Incidental	-
15-Mar-21	T2	N.A	1.356	103.723	812	Bird	*Ducula bicolor*	Pied imperial pigeon	1	Seen	-	Incidental	-
15-Mar-21	T3	N.A	1.358	103.714	830	Bird	*Oriolus chinensis*	Black-naped oriole	1	Heard	-	Targeted	-
15-Mar-21	T3	N.A	1.358	103.714	830	Bird	*Acridotheres javanicus*	Javan myna	2	Heard	-	Targeted	-
15-Mar-21	T3	N.A	1.358	103.714	832	Bird	*Aplonis panayensis*	Asian glossy starling	5	Seen	-	Targeted	-
15-Mar-21	T3	N.A	1.358	103.714	832	Bird	*Halcyon smyrnensis*	White-throated kingfisher	1	Heard	-	Targeted	-
15-Mar-21	T3	N.A	1.358	103.714	833	Bird	*Dinopium javanense*	Common flameback	1	Heard	-	Targeted	-
15-Mar-21	T3	N.A	1.358	103.714	833	Bird	*Dicaeum cruentatum*	Scarlet-backed flowerpecker	1	Heard	-	Targeted	-
15-Mar-21	T3	N.A	1.359	103.713	837	Bird	*Cinnyris jugularis*	Olive-backed sunbird	1	Heard	-	Targeted	-
15-Mar-21	T3	N.A	1.359	103.713	837	Bird	*Corvus splendens*	House crow	1	Seen	-	Targeted	-
15-Mar-21	T3	N.A	1.359	103.713	837	Bird	*Psittacula alexandri*	Red-breasted parakeet	2	Heard	-	Targeted	-
15-Mar-21	T3	N.A	1.359	103.713	838	Bird	*Zosterops simplex*	Swinhoe's white-eye	2	Heard	-	Targeted	-
15-Mar-21	T3	N.A	1.360	103.712	844	Bird	*Cinnyris jugularis*	Olive-backed sunbird	1	Heard	-	Targeted	-
15-Mar-21	T3	N.A	1.360	103.712	847	Bird	*Aplonis panayensis*	Asian glossy starling	4	Heard	-	Targeted	-
15-Mar-21	T3	N.A	1.360	103.711	849	Bird	*Acridotheres javanicus*	Javan myna	1	Seen	-	Targeted	-
15-Mar-21	T3	N.A	1.361	103.711	850	Bird	*Cinnyris jugularis*	Olive-backed sunbird	1	Heard	-	Targeted	-
15-Mar-21	T3	N.A	1.361	103.710	855	Bird	*Dicaeum cruentatum*	Scarlet-backed flowerpecker	1	Heard	-	Targeted	-
15-Mar-21	T3	N.A	1.361	103.710	855	Bird	*Acridotheres javanicus*	Javan myna	5	Heard	-	Targeted	-
15-Mar-21	T3	N.A	1.361	103.710	855	Bird	*Aplonis panayensis*	Asian glossy starling	5	Heard	-	Targeted	-
15-Mar-21	T3	N.A	1.362	103.710	857	Bird	*Oriolus chinensis*	Black-naped oriole	1	Seen	-	Targeted	-
15-Mar-21	T3	N.A	1.362	103.709	900	Bird	*Aplonis panayensis*	Asian glossy starling	20	Seen	-	Targeted	-
15-Mar-21	T3	N.A	1.363	103.709	903	Bird	*Aegithina tiphia*	Common iora	1	Heard	-	Targeted	-
15-Mar-21	T3	N.A	1.363	103.709	910	Bird	*Psilopogon lineatus*	Lineated barbet	1	Heard	-	Incidental	-
15-Mar-21	T3	N.A	1.362	103.710	912	Reptile	*Ahaetulla prasina*	Oriental whip snake	1	Seen	-	Incidental	-
15-Mar-21	T3	N.A	1.363	103.709	916	Mammal	*Sus scrofa*	Wild pig	1	Scat	-	Incidental	-
15-Mar-21	T3	N.A	1.361	103.711	916	Mammal	*Sus scrofa*	Wild pig	1	Scat	-	Incidental	-
15-Mar-21	T1	N.A	1.351	103.734	2018	Reptile	*Bronchocela cristatella*	Green crested lizard	1	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.351	103.734	2019	Amphibian	*Polypedates leucomystax*	Four-lined tree frog	1	Heard	-	Targeted	-
15-Mar-21	T1	N.A	1.351	103.734	2020	Mammal (Bat)	*Unidentified Pteropodidae*	-	1	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.350	103.734	2024	Mammal (Bat)	*Unidentified Pteropodidae*	-	2	Seen	-	Targeted	Feeding on Piper aduncum
15-Mar-21	T1	N.A	1.350	103.735	2026	Amphibian	*Fejervarya limnocharis*	Field frog	1	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.350	103.735	2028	Amphibian	*Kaloula pulchra*	Banded bull frog	1	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.350	103.735	2029	Amphibian	*Sylvirana guentheri*	Guenther's frog	1	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.350	103.735	2030	Amphibian	*Limnonectes blythii*	Malayan giant frog	1	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.350	103.735	2030	Mammal (Bat)	*Cynopterus sp.*	-	1	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.350	103.735	2031	Amphibian	*Microhyla mukhlesuri*	East Asian ornate chorus frog	2	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.350	103.735	2034	Amphibian	*Microhyla heymonsi*	Dark-sided chorus frog	1	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.350	103.735	2035	Bird	*Rallina fasciata*	Red-legged crake	1	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.350	103.735	2036	Amphibian	*Sylvirana guentheri*	Guenther's frog	2	Heard	-	Targeted	-
15-Mar-21	T1	N.A	1.350	103.735	2037	Amphibian	*Polypedates leucomystax*	Four-lined tree frog	1	Heard	-	Targeted	-
15-Mar-21	T1	N.A	1.350	103.735	2037	Reptile	*Unidentified Gekkonidae*	-	1	Heard	-	Targeted	-
15-Mar-21	T1	N.A	1.350	103.735	2038	Reptile	*Bronchocela cristatella*	Green crested lizard	1	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.351	103.735	2039	Amphibian	*Sylvirana guentheri*	Guenther's frog	1	Heard	-	Targeted	-
15-Mar-21	T1	N.A	1.351	103.735	2039	Reptile	*Unidentified Gekkonidae*	-	1	Heard	-	Targeted	-
15-Mar-21	T1	N.A	1.351	103.736	2044	Amphibian	*Microhyla heymonsi*	Dark-sided chorus frog	1	Heard	-	Targeted	-
15-Mar-21	T1	N.A	1.351	103.736	2044	Amphibian	*Polypedates leucomystax*	Four-lined tree frog	1	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.351	103.736	2044	Mammal	*Paradoxurus musangus*	Common palm civet	1	Seen	-	Targeted	-

Date	Route	Aquatic Point	Latitude	Longitude	Time	Taxon	Scientific name	Common name	Qty	Observation type	Photo no.	Survey method	Remarks
15-Mar-21	T1	N.A	1.351	103.736	2044	Amphibian	*Duttaphrynus melanostictus*	Asian toad	1	Heard	-	Targeted	-
15-Mar-21	T1	N.A	1.351	103.736	2044	Amphibian	*Sylvirana guentheri*	Guenther's frog	2	Heard	-	Targeted	-
15-Mar-21	T1	N.A	1.351	103.736	2045	Amphibian	*Fejervarya limnocharis*	Field frog	1	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.351	103.736	2046	Amphibian	*Sylvirana guentheri*	Guenther's frog	2	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.351	103.736	2047	Amphibian	*Fejervarya sp.*	-	1	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.351	103.736	2047	Amphibian	*Microhyla heymonsi*	Dark-sided chorus frog	1	Heard	-	Targeted	-
15-Mar-21	T1	N.A	1.351	103.736	2048	Amphibian	*Duttaphrynus melanostictus*	Asian toad	1	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.350	103.736	2051	Amphibian	*Polypedates leucomystax*	Four-lined tree frog	1	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.350	103.736	2051	Amphibian	*Duttaphrynus melanostictus*	Asian toad	1	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.350	103.736	2052	Amphibian	*Microhyla mukhlesuri*	East Asian ornate chorus frog	1	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.350	103.736	2052	Amphibian	*Fejervarya sp.*	-	1	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.350	103.736	2055	Reptile	*Dendrelaphis pictus*	Painted bronzeback	1	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.350	103.736	2056	Amphibian	*Polypedates leucomystax*	Four-lined tree frog	1	Heard	-	Targeted	-
15-Mar-21	T1	N.A	1.350	103.736	2057	Bird	*Caprimulgus sp.*	-	1	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.350	103.736	2057	Amphibian	*Kaloula pulchra*	Banded bull frog	1	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.350	103.736	2057	Amphibian	*Microhyla mukhlesuri*	East Asian ornate chorus frog	10	Heard	-	Targeted	-
15-Mar-21	T1	N.A	1.351	103.736	2101	Amphibian	*Microhyla mukhlesuri*	East Asian ornate chorus frog	100	Seen	-	Targeted	Tadpoles
15-Mar-21	T1	N.A	1.351	103.736	2103	Mammal (Bat)	*Cynopterus sp.*	-	1	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.351	103.736	2103	Butterfly	*Erionota sp.*	-	1	Seen	CT7453	Incidental	On banana leaf
15-Mar-21	T1	N.A	1.351	103.736	2103	Amphibian	*Microhyla butleri*	Painted chorus frog	20	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.351	103.736	2104	Amphibian	*Sylvirana guentheri*	Guenther's frog	1	Heard	-	Targeted	-
15-Mar-21	T1	N.A	1.351	103.736	2105	Amphibian	*Polypedates leucomystax*	Four-lined tree frog	1	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.350	103.736	2107	Odonate	*Gynacantha sp.*	-	1	Seen	CT7457	Incidental	-
15-Mar-21	T1	N.A	1.350	103.736	2108	Mammal	*Canis lupus familiaris*	Feral dog	6	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.350	103.737	2109	Reptile	*Dendrelaphis pictus*	Painted bronzeback	1	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.351	103.737	2112	Amphibian	*Sylvirana guentheri*	Guenther's frog	1	Heard	-	Targeted	-
15-Mar-21	T1	N.A	1.351	103.737	2112	Amphibian	*Microhyla butleri*	Painted chorus frog	10	Heard	-	Targeted	-
15-Mar-21	T1	N.A	1.351	103.737	2112	Amphibian	*Polypedates leucomystax*	Four-lined tree frog	1	Heard	-	Targeted	-
15-Mar-21	T1	N.A	1.351	103.737	2112	Amphibian	*Microhyla mukhlesuri*	East Asian ornate chorus frog	1	Heard	-	Targeted	-
15-Mar-21	T1	N.A	1.351	103.737	2112	Amphibian	*Fejervarya cancrivora*	Crab-eating frog	3	Heard	-	Targeted	-
15-Mar-21	T1	N.A	1.351	103.737	2112	Amphibian	*Fejervarya sp.*	-	1	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.351	103.737	2115	Reptile	*Hemidactylus frenatus*	Spiny-tailed house gecko	1	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.351	103.737	2117	Mammal (Bat)	*Unidentified Pteropodidae*	-	1	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.351	103.737	2120	Amphibian	*Microhyla mukhlesuri*	East Asian ornate chorus frog	1	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.351	103.737	2120	Amphibian	*Microhyla sp.*	-	1	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.351	103.737	2121	Amphibian	*Microhyla mukhlesuri*	East Asian ornate chorus frog	1	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.351	103.737	2123	Mammal (Bat)	*Cynopterus brachyotis*	Lesser dog-faced fruit bat	1	Seen	CT7462	Targeted	Feeding on figs
15-Mar-21	T1	N.A	1.352	103.737	2125	Reptile	*Ahaetulla prasina*	Oriental whip snake	1	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.352	103.736	2126	Amphibian	*Sylvirana guentheri*	Guenther's frog	3	Heard	-	Targeted	-
15-Mar-21	T1	N.A	1.352	103.736	2128	Amphibian	*Limnonectes blythii*	Malayan giant frog	1	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.352	103.736	2131	Mammal (Bat)	*Cynopterus sp.*	-	3	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.352	103.736	2133	Amphibian	*Polypedates leucomystax*	Four-lined tree frog	2	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.352	103.735	2142	Amphibian	*Microhyla mukhlesuri*	East Asian ornate chorus frog	1	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.352	103.735	2147	Amphibian	*Microhyla mukhlesuri*	East Asian ornate chorus frog	1	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.352	103.735	2147	Mammal (Bat)	*Unidentified Pteropodidae*	-	1	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.351	103.734	2150	Amphibian	*Microhyla mukhlesuri*	East Asian ornate chorus frog	1	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.352	103.733	2157	Reptile	*Bronchocela cristatella*	Green crested lizard	1	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.352	103.733	2158	Mammal (Bat)	*Unidentified Pteropodidae*	-	1	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.352	103.732	2159	Mammal (Bat)	*Unidentified Pteropodidae*	-	1	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.353	103.732	2204	Amphibian	*Microhyla mukhlesuri*	East Asian ornate chorus frog	1	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.353	103.732	2204	Reptile	*Unidentified Gekkonidae*	-	1	Heard	-	Targeted	-
15-Mar-21	T1	N.A	1.353	103.732	2206	Bird	*Otus lempiji*	Sunda scops owl	1	Heard	-	Targeted	-
15-Mar-21	T1	N.A	1.353	103.732	2208	Amphibian	*Duttaphrynus melanostictus*	Asian toad	1	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.353	103.732	2209	Amphibian	*Sylvirana guentheri*	Guenther's frog	3	Heard	-	Targeted	-
15-Mar-21	T1	N.A	1.353	103.732	2211	Amphibian	*Microhyla heymonsi*	Dark-sided chorus frog	1	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.353	103.731	2214	Bird	*Oriolus chinensis*	Black-naped oriole	1	Seen	CT7464	Targeted	In nest
15-Mar-21	T1	N.A	1.353	103.731	2216	Mammal	*Rattus tiomanicus*	Malaysian wood rat	1	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.353	103.731	2216	Reptile	*Gekko monarchus*	Spotted house gecko	1	Seen	-	Targeted	-

Date	Route	Aquatic Point	Latitude	Longitude	Time	Taxon	Scientific name	Common name	Qty	Observation type	Photo no.	Survey method	Remarks
15-Mar-21	T1	N.A	1.353	103.731	2216	Bird	*Caprimulgus macrurus*	Large-tailed nightjar	1	Heard	-	Targeted	-
15-Mar-21	T1	N.A	1.353	103.731	2218	Amphibian	*Polypedates leucomystax*	Four-lined tree frog	1	Heard	-	Targeted	-
15-Mar-21	T1	N.A	1.353	103.731	2221	Mammal (Bat)	*Cynopterus sp.*	-	1	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.353	103.731	2223	Amphibian	*Kaloula pulchra*	Banded bull frog	1	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.353	103.730	2230	Amphibian	*Kaloula pulchra*	Banded bull frog	1	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.353	103.730	2230	Amphibian	*Fejervarya sp.*	-	2	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.353	103.730	2230	Amphibian	*Microhyla mukhlesuri*	East Asian ornate chorus frog	5	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.353	103.730	2230	Reptile	*Lycodon capucinus*	House wolf snake	1	Seen	-	Targeted	In treehole beside road
15-Mar-21	T1	N.A	1.354	103.730	2233	Mammal (Bat)	*Unidentified Pteropodidae*	-	1	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.354	103.730	2233	Amphibian	*Sylvirana guentheri*	Guenther's frog	1	Heard	-	Targeted	-
15-Mar-21	T1	N.A	1.354	103.730	2234	Reptile	*Dendrelaphis pictus*	Painted bronzeback	2	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.354	103.730	2236	Reptile	*Bronchocela cristatella*	Green crested lizard	1	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.354	103.729	2242	Mammal (Bat)	*Unidentified Pteropodidae*	-	2	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.354	103.729	2242	Amphibian	*Fejervarya cancrivora*	Crab-eating frog	1	Heard	-	Targeted	-
15-Mar-21	T1	N.A	1.354	103.729	2242	Reptile	*Dendrelaphis pictus*	Painted bronzeback	1	Seen	-	Targeted	-
15-Mar-21	T1	N.A	1.354	103.729	2242	Amphibian	*Microhyla mukhlesuri*	East Asian ornate chorus frog	30	Heard	-	Targeted	-
15-Mar-21	T1	N.A	1.354	103.729	2251	Amphibian	*Microhyla mukhlesuri*	East Asian ornate chorus frog	1	Seen	-	Targeted	-
15-Mar-21	T1	N.A	N.A	N.A	0936	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210315_213651.wa
15-Mar-21	T1	N.A	N.A	N.A	0936	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210315_213657.wa
15-Mar-21	T1	N.A	N.A	N.A	0937	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210315_213703.wa
15-Mar-21	T1	N.A	N.A	N.A	0936	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210315_213646.wa
15-Mar-21	T1	N.A	N.A	N.A	0936	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210315_213642.wa
15-Mar-21	T1	N.A	N.A	N.A	0937	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210315_213709.wa
15-Mar-21	T1	N.A	N.A	N.A	0941	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210315_214132.wa
15-Mar-21	T1	N.A	N.A	N.A	0948	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210315_214827.wa
15-Mar-21	T1	N.A	N.A	N.A	0948	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210315_214851.wa
15-Mar-21	T1	N.A	N.A	N.A	0949	Mammal (Bat)	*Myotis muricola*	Whiskered myotis	1	Acoustic	-	Targeted	20210315_214917.wa
15-Mar-21	T1	N.A	N.A	N.A	0953	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210315_215323.wa
15-Mar-21	T1	N.A	N.A	N.A	0953	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210315_215305.wa
15-Mar-21	T1	N.A	N.A	N.A	0953	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210315_215315.wa
15-Mar-21	T1	N.A	N.A	N.A	0954	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210315_215420.wa
15-Mar-21	T1	N.A	N.A	N.A	0954	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210315_215404.wa
15-Mar-21	T1	N.A	N.A	N.A	0954	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210315_215428.wa
15-Mar-21	T1	N.A	N.A	N.A	0955	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210315_215546.wa
15-Mar-21	T1	N.A	N.A	N.A	0955	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210315_215556.wa
15-Mar-21	T1	N.A	N.A	N.A	0956	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210315_215608.wa
15-Mar-21	T1	N.A	N.A	N.A	0955	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210315_215520.wa
15-Mar-21	T1	N.A	N.A	N.A	1000	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210315_220055.wa
15-Mar-21	T1	N.A	N.A	N.A	1002	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210315_220254.wa
15-Mar-21	T1	N.A	N.A	N.A	1003	Mammal (Bat)	*Myotis muricola*	Whiskered myotis	1	Acoustic	-	Targeted	20210315_220340.wa
15-Mar-21	T1	N.A	N.A	N.A	1004	Mammal (Bat)	*Myotis muricola*	Whiskered myotis	1	Acoustic	-	Targeted	20210315_220415.wa
15-Mar-21	T1	N.A	N.A	N.A	1004	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210315_220449.wa
15-Mar-21	T1	N.A	N.A	N.A	1006	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210315_220657.wa
15-Mar-21	T1	N.A	N.A	N.A	1013	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210315_221310.wa
15-Mar-21	T1	N.A	N.A	N.A	1013	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210315_221303.wa
15-Mar-21	T1	N.A	N.A	N.A	1013	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210315_221352.wa
15-Mar-21	T1	N.A	N.A	N.A	1018	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210315_221843.wa
15-Mar-21	T1	N.A	N.A	N.A	1018	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210315_221850.wa
15-Mar-21	T1	N.A	N.A	N.A	1020	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210315_222028.wa
15-Mar-21	T1	N.A	N.A	N.A	1020	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210315_222034.wa
15-Mar-21	T1	N.A	N.A	N.A	1021	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210315_222153.wa
15-Mar-21	T1	N.A	N.A	N.A	1028	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210315_222830.wa
15-Mar-21	T1	N.A	N.A	N.A	1032	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210315_223255.wa
15-Mar-21	T1	N.A	N.A	N.A	1052	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210315_225212.wa
15-Mar-21	T1	N.A	N.A	N.A	1004	Mammal (Bat)	*Myotis muricola*	Whiskered myotis	1	Acoustic	-	Targeted	20210315_220449.wa
22-Mar-21	T1	N.A	1.353	103.731	943	Aculeate hymenopteran	*Stenodyneriellus guttulatus*	NA	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.353	103.730	945	Odonate	*Neurothemis fluctuans*	Common parasol	4	Seen	-	Targeted	-

Date	Route	Aquatic Point	Latitude	Longitude	Time	Taxon	Scientific name	Common name	Qty	Observation type	Photo no.	Survey method	Remarks
22-Mar-21	T1	N.A	1.353	103.730	945	Butterfly	*Mycalesis perseoides perseoides*	Burmese bush brown	1	Seen	CT7692	Targeted	-
22-Mar-21	T1	N.A	1.353	103.730	945	Odonate	*Agrionoptera insignis*	Grenadier	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.353	103.730	946	Aculeate hymenopteran	*Rhynchium haemorrhoidale*	NA	3	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.353	103.730	946	Aculeate hymenopteran	*Parischnogaster mellyi*	NA	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.353	103.730	948	Butterfly	*Elymnias panthera panthera*	Tawny palmfly	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.353	103.730	948	Butterfly	*Junonia hedonia ida*	Chocolate pansy	2	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.353	103.730	948	Butterfly	*Neptis hylas papaja*	Common sailor	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.353	103.730	948	Odonate	*Orthetrum testaceum*	Scarlet skimmer	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.353	103.730	948	Butterfly	*Mycalesis sp.*	-	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.353	103.730	950	Butterfly	*Junonia hedonia ida*	Chocolate pansy	4	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.353	103.730	950	Butterfly	*Delias hyparete metarete*	Painted jezebel	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.353	103.730	950	Butterfly	*Delias hyparete metarete*	Painted jezebel	2	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.353	103.730	953	Butterfly	*Mycalesis perseoides perseoides*	Burmese bush brown	1	Seen	CT7693	Targeted	-
22-Mar-21	T1	N.A	1.353	103.730	953	Butterfly	*Mycalesis sp.*	-	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.353	103.730	953	Butterfly	*Mycalesis mineus macromalayana*	Dark brand bush brown	1	Seen	CT7694	Targeted	-
22-Mar-21	T1	N.A	1.353	103.730	953	Butterfly	*Junonia hedonia ida*	Chocolate pansy	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.353	103.730	953	Aculeate hymenopteran	*Unidentified Pompilidae*	-	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.353	103.730	953	Butterfly	*Catopsilia scylla cornelia*	Orange emigrant	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.353	103.730	954	Odonate	*Neurothemis fluctuans*	Common parasol	4	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.353	103.730	955	Butterfly	*Eurema sp.*	-	2	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.354	103.730	957	Butterfly	*Mycalesis visala phamis*	Long brand bush brown	1	Seen	CT7695	Targeted	-
22-Mar-21	T1	N.A	1.354	103.730	957	Butterfly	*Mycalesis visala phamis*	Long brand bush brown	1	Seen	CT7696	Targeted	-
22-Mar-21	T1	N.A	1.354	103.730	957	Butterfly	*Junonia hedonia ida*	Chocolate pansy	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.354	103.730	957	Butterfly	*Delias hyparete metarete*	Painted jezebel	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.354	103.730	958	Butterfly	*Neptis hylas papaja*	Common sailor	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.354	103.730	959	Odonate	*Lathrecista asiatica*	Scarlet grenadier	2	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.354	103.730	959	Odonate	*Neurothemis fluctuans*	Common parasol	3	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.354	103.730	959	Odonate	*Potamarcha congener*	Common chaser	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.354	103.730	959	Butterfly	*Delias hyparete metarete*	Painted jezebel	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.354	103.729	1002	Butterfly	*Delias hyparete metarete*	Painted jezebel	2	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.354	103.729	1002	Butterfly	*Elymnias hypermnestra agina*	Common palmfly	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.354	103.729	1003	Butterfly	*Eurema sp.*	-	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.354	103.729	1004	Butterfly	*Junonia hedonia ida*	Chocolate pansy	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.354	103.729	1004	Butterfly	*Mycalesis sp.*	-	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.354	103.729	1005	Butterfly	*Mycalesis mineus macromalayana*	Dark brand bush brown	1	Seen	CT7698	Targeted	-
22-Mar-21	T1	N.A	1.354	103.729	1007	Butterfly	*Potanthus omaha omaha*	Lesser dart	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.354	103.729	1008	Butterfly	*Mycalesis mineus macromalayana*	Dark brand bush brown	1	Seen	CT7700	Targeted	-
22-Mar-21	T1	N.A	1.354	103.729	1008	Butterfly	*Mycalesis mineus macromalayana*	Dark brand bush brown	1	Seen	CT7702	Targeted	-
22-Mar-21	T1	N.A	1.354	103.729	1008	Butterfly	*Mycalesis sp.*	-	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.354	103.729	1009	Odonate	*Lathrecista asiatica*	Scarlet grenadier	2	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.354	103.729	1009	Odonate	*Neurothemis fluctuans*	Common parasol	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.354	103.729	1009	Butterfly	*Delias hyparete metarete*	Painted jezebel	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.354	103.729	1009	Butterfly	*Appias libythea olferna*	Striped albatross	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.354	103.729	1009	Aculeate hymenopteran	*Xylocopa latipes*	Broad-handed carpenter bee	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.354	103.729	1010	Butterfly	*Junonia hedonia ida*	Chocolate pansy	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.354	103.729	1011	Odonate	*Agrionoptera insignis*	Grenadier	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.354	103.729	1012	Odonate	*Tholymis tillarga*	White-barred duskhawk	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.354	103.729	1012	Butterfly	*Polytremis lubricans lubricans*	Contiguous swift	1	Seen	CT7708	Targeted	-
22-Mar-21	T1	N.A	1.354	103.729	1012	Butterfly	*Potanthus omaha omaha*	Lesser dart	2	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.354	103.728	1014	Odonate	*Lathrecista asiatica*	Scarlet grenadier	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.354	103.728	1014	Butterfly	*Junonia hedonia ida*	Chocolate pansy	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.354	103.728	1015	Butterfly	*Delias hyparete metarete*	Painted jezebel	2	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.354	103.728	1016	Butterfly	*Iambrix salsala salsala*	Chestnut bob	2	Seen	CT7709	Targeted	-
22-Mar-21	T1	N.A	1.354	103.728	1016	Odonate	*Tholymis tillarga*	White-barred duskhawk	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.354	103.728	1016	Odonate	*Ischnura senegalensis*	Common bluetail	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.354	103.728	1017	Odonate	*Lathrecista asiatica*	Scarlet grenadier	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.354	103.728	1019	Butterfly	*Mycalesis perseoides perseoides*	Burmese bush brown	1	Seen	CT7715	Targeted	-
22-Mar-21	T1	N.A	1.354	103.728	1019	Butterfly	*Mycalesis visala phamis*	Long brand bush brown	1	Seen	CT7716	Targeted	-

Date	Route	Aquatic Point	Latitude	Longitude	Time	Taxon	Scientific name	Common name	Qty	Observation type	Photo no.	Survey method	Remarks
22-Mar-21	T1	N.A	1.354	103.728	1019	Butterfly	*Mycalesis sp.*	-	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.354	103.728	1020	Odonate	*Lathrecista asiatica*	Scarlet grenadier	2	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.354	103.728	1020	Butterfly	*Eurema sp.*	-	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.354	103.728	1021	Butterfly	*Catopsilia scylla cornelia*	Orange emigrant	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.354	103.728	1021	Butterfly	*Junonia hedonia ida*	Chocolate pansy	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.354	103.728	1022	Butterfly	*Catopsilia pomona pomona*	Lemon emigrant	2	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.354	103.727	1024	Butterfly	*Delias hyparete metarete*	Painted jezebel	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.354	103.727	1024	Butterfly	*Junonia hedonia ida*	Chocolate pansy	3	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.354	103.727	1025	Butterfly	*Eurema sp.*	-	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.354	103.727	1026	Butterfly	*Zizula hylax pygmaea*	Pygmy grass blue	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.354	103.727	1026	Butterfly	*Mycalesis sp.*	-	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.354	103.727	1026	Butterfly	*Mycalesis perseus cepheus*	Dingy bush brown	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.355	103.727	1033	Aculeate hymenopteran	*Delta pyriforme*	NA	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.355	103.727	1033	Butterfly	*Junonia hedonia ida*	Chocolate pansy	3	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.355	103.727	1033	Butterfly	*Delias hyparete metarete*	Painted jezebel	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.355	103.727	1033	Butterfly	*Eurema sp.*	-	2	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.355	103.727	1037	Odonate	*Gynacantha sp.*	-	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.355	103.727	1039	Butterfly	*Potanthus omaha omaha*	Lesser dart	1	Seen	CT7718	Targeted	-
22-Mar-21	T1	N.A	1.355	103.727	1039	Butterfly	*Junonia hedonia ida*	Chocolate pansy	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.355	103.727	1039	Odonate	*Tholymis tillarga*	White-barred duskhawk	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.355	103.727	1040	Butterfly	*Parantica agleoides agleoides*	Dark glassy tiger	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.355	103.727	1040	Aculeate hymenopteran	*Stenodyneriellus guttulatus*	NA	4	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.355	103.727	1040	Butterfly	*Delias hyparete metarete*	Painted jezebel	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.355	103.727	1043	Butterfly	*Eurema sp.*	-	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.355	103.727	1047	Butterfly	*Eurema sp.*	-	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.355	103.727	1047	Odonate	*Tholymis tillarga*	White-barred duskhawk	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.355	103.727	1047	Odonate	*Orthetrum chrysis*	Spine-tufted skimmer	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.355	103.727	1049	Butterfly	*Eurema sp.*	-	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.355	103.726	1053	Butterfly	*Eurema sp.*	-	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.356	103.726	1053	Butterfly	*Eurema sp.*	-	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.356	103.726	1053	Odonate	*Agrionoptera insignis*	Grenadier	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.356	103.726	1053	Odonate	*Orthetrum chrysis*	Spine-tufted skimmer	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.356	103.726	1055	Butterfly	*Acraea terpsicore*	Tawny coster	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.356	103.726	1055	Odonate	*Ictinogomphus decoratus*	Common flangetail	1	Seen	CT7722	Targeted	Feeding on wasp
22-Mar-21	T1	N.A	1.356	103.726	1059	Butterfly	*Eurema sp.*	-	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.356	103.726	1101	Aculeate hymenopteran	*Ropalidia sumatrae*	NA	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.356	103.726	1101	Aculeate hymenopteran	*Eumenes sp.*	NA	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.356	103.726	1102	Butterfly	*Pelopidas mathias mathias*	Small branded swift	1	Seen	CT7723	Targeted	-
22-Mar-21	T1	N.A	1.356	103.726	1102	Bird	*Haliaeetus ichthyaetus*	Grey-headed fish eagle	1	Seen	-	Incidental	-
22-Mar-21	T1	N.A	1.356	103.726	1104	Aculeate hymenopteran	*Ropalidia jacobsoni*	NA	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.356	103.726	1104	Aculeate hymenopteran	*Xylocopa latipes*	Broad-handed carpenter bee	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.356	103.725	1109	Odonate	*Neurothemis fluctuans*	Common parasol	7	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.356	103.725	1110	Odonate	*Orthetrum chrysis*	Spine-tufted skimmer	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.356	103.725	1114	Butterfly	*Parantica agleoides agleoides*	Dark glassy tiger	1	Seen	-	Targeted	-
22-Mar-21	T1	N.A	1.352	103.731	1138	Bird	*Ardeola sp.*	-	1	Seen	-	Incidental	-
22-Mar-21	T1	N.A	1.350	103.734	1142	Butterfly	*Doleschallia bisaltide bisaltide*	Autumn leaf	1	Seen	CT7730	Incidental	-
24-Mar-21	T2	N.A	1.359	103.725	900	Bird	*Vanellus indicus*	Red-wattled lapwing	3	Seen	-	Incidental	-
24-Mar-21	T2	N.A	1.360	103.726	912	Butterfly	*Parantica agleoides agleoides*	Dark glassy tiger	1	Seen	-	Targeted	-
24-Mar-21	T2	N.A	1.360	103.725	916	Aculeate hymenopteran	*Liostenogaster varipicta*	NA	1	Seen	-	Targeted	-
24-Mar-21	T2	N.A	1.360	103.725	920	Reptile	*Cuora amboinensis*	Malayan box terrapin	1	Seen	-	Incidental	-
24-Mar-21	T2	N.A	1.360	103.725	925	Butterfly	*Eurema sp.*	-	1	Seen	-	Targeted	-
24-Mar-21	T2	N.A	1.360	103.724	926	Butterfly	*Eurema sp.*	-	1	Seen	-	Targeted	-
24-Mar-21	T2	N.A	1.360	103.724	926	Butterfly	*Euchrysops cnejus cnejus*	Gram blue	1	Seen	-	Targeted	-
24-Mar-21	T2	N.A	1.360	103.724	929	Butterfly	*Eurema hecabe contubernalis*	Common grass yellow	1	Seen	-	Targeted	-
24-Mar-21	T2	N.A	1.360	103.724	929	Bird	*Pitta moluccensis*	Blue-winged pitta	1	Heard	-	Incidental	-
24-Mar-21	T2	N.A	1.360	103.724	930	Aculeate hymenopteran	*Ropalidia sumatrae*	NA	1	Seen	-	Targeted	-
24-Mar-21	T2	N.A	1.359	103.724	933	Aculeate hymenopteran	*Stenodyneriellus guttulatus*	NA	1	Seen	-	Targeted	-
24-Mar-21	T2	N.A	1.359	103.724	935	Butterfly	*Eurema hecabe contubernalis*	Common grass yellow	2	Seen	-	Targeted	-

Date	Route	Aquatic Point	Latitude	Longitude	Time	Taxon	Scientific name	Common name	Qty	Observation type	Photo no.	Survey method	Remarks
24-Mar-21	T2	N.A	1.359	103.724	937	Aculeate hymenopteran	*Polistes tenebris*	NA	1	Seen	-	Targeted	Collected
24-Mar-21	T2	N.A	1.359	103.724	942	Aculeate hymenopteran	*Xylocopa latipes*	Broad-handed carpenter bee	1	Seen	-	Targeted	Feeding on Dillenia
24-Mar-21	T2	N.A	1.359	103.724	945	Bird	*Vanellus indicus*	Red-wattled lapwing	1	Seen	-	Incidental	-
24-Mar-21	T2	N.A	1.358	103.725	954	Aculeate hymenopteran	*Stenodyneriellus guttulatus*	NA	2	Seen	-	Targeted	-
24-Mar-21	T2	N.A	1.358	103.725	959	Butterfly	*Parantica agleoides agleoides*	Dark glassy tiger	2	Seen	-	Targeted	-
24-Mar-21	T2	N.A	1.358	103.725	1000	Butterfly	*Junonia hedonia ida*	Chocolate pansy	1	Seen	-	Targeted	-
24-Mar-21	T2	N.A	1.358	103.725	1000	Butterfly	*Eurema sp.*	-	1	Seen	-	Targeted	-
24-Mar-21	T2	N.A	1.358	103.725	1000	Aculeate hymenopteran	*Nomia iridiscens*	-	1	Seen	-	Targeted	Collected
26-Mar-21	T2	N.A	1.359	103.725	656	Bird	*Vanellus indicus*	Red-wattled lapwing	2	Seen	-	Incidental	-
26-Mar-21	T2	N.A	1.359	103.725	702	Mammal	*Sus scrofa*	Wild pig	2	Seen	-	Incidental	-
26-Mar-21	T2	N.A	1.360	103.726	706	Amphibian	*Sylvirana guentheri*	Guenther's frog	1	Heard	-	Targeted	-
26-Mar-21	T2	N.A	1.360	103.724	722	Mammal	*Sus scrofa*	Wild pig	4	Seen	-	Targeted	-
26-Mar-21	T2	N.A	1.359	103.724	729	Amphibian	*Microhyla heymonsi*	Dark-sided chorus frog	100	Seen	-	Targeted	Tadpoles
26-Mar-21	T2	N.A	1.359	103.724	729	Amphibian	*Microhyla sp.*	-	1000	Seen	-	Targeted	Tadpoles
26-Mar-21	T2	N.A	1.359	103.724	734	Bird	*Pitta moluccensis*	Blue-winged pitta	1	Seen	-	Targeted	-
26-Mar-21	T2	N.A	1.359	103.724	738	Amphibian	*Fejervarya limnocharis*	Field frog	100	Seen	-	Targeted	Tadpoles
26-Mar-21	T2	N.A	1.359	103.724	738	Amphibian	*Microhyla sp.*	-	50	Seen	-	Targeted	Tadpoles
26-Mar-21	T2	N.A	1.359	103.725	745	Amphibian	*Fejervarya limnocharis*	Field frog	100	Seen	-	Targeted	Tadpoles
26-Mar-21	T2	N.A	1.359	103.725	745	Amphibian	*Microhyla sp.*	-	50	Seen	-	Targeted	Tadpoles
26-Mar-21	T3	N.A	1.359	103.712	857	Reptile	*Dendrelaphis pictus*	Painted bronzeback	1	Seen	-	Targeted	-
29-Mar-21	D5	D5_01	1.350	103.734	1946	Fish	*Poecilia reticulata*	Guppy	200	Seen	-	Targeted	-
29-Mar-21	D5	D5_02	1.350	103.735	2005	Fish	*Poecilia reticulata*	Guppy	27	Seen	-	Targeted	-
29-Mar-21	D5	D5_03	1.351	103.736	2018	Fish	*Poecilia reticulata*	Guppy	10	Seen	-	Targeted	Fish trap deployed
29-Mar-21	D5	D5_03	1.351	103.736	2018	Amphibian	*Limnonectes blythii*	Malayan giant frog	1	Seen	-	Targeted	-
29-Mar-21	D4	D4_02	1.354	103.731	2036	Amphibian	*Limnonectes blythii*	Malayan giant frog	1	Seen	-	Targeted	-
29-Mar-21	D4	D4_02	1.354	103.731	2036	Amphibian	*Kaloula pulchra*	Banded bull frog	1	Seen	-	Targeted	-
29-Mar-21	D4	D4_02	1.354	103.731	2036	Fish	*Poecilia reticulata*	Guppy	15	Seen	-	Targeted	-
29-Mar-21	D4	D4_02	1.354	103.731	2036	Fish	*Dermogenys collettei*	Sunda pygmy halfbeak	26	Seen	-	Targeted	-
29-Mar-21	D5	D5_04	1.351	103.736	2044	Fish	*Poecilia reticulata*	Guppy	27	Seen	-	Targeted	-
29-Mar-21	D5	D5_05	1.351	103.736	2055	Fish	*Poecilia reticulata*	Guppy	70	Seen	-	Targeted	Fish trap deployed
29-Mar-21	D5	D5_06	1.352	103.737	2107	Fish	*Monopterus albus*	Sunda swamp-eel	1	Seen	-	Targeted	Fish trap deployed
29-Mar-21	D5	D5_06	1.352	103.737	2107	Fish	*Poecilia reticulata*	Guppy	17	Seen	-	Targeted	-
29-Mar-21	D5	D5_06	1.352	103.737	2107	Amphibian	*Sylvirana guentheri*	Guenther's frog	1	Heard	-	Targeted	-
29-Mar-21	D5	D5_06	1.352	103.736	2125	Amphibian	*Limnonectes blythii*	Malayan giant frog	1	Seen	-	Targeted	-
29-Mar-21	D6	D6_Pond	1.352	103.734	2140	Fish	*Aplocheilus armatus*	Whitespot	6	Seen	-	Targeted	-
29-Mar-21	D6	D6_Pond	1.352	103.734	2140	Amphibian	*Sylvirana guentheri*	Guenther's frog	1	Heard	-	Targeted	-
29-Mar-21	D6	D6_Pond	1.352	103.734	2140	Fish	*Anabas testudineus*	Oriental climbing perch	1	Seen	-	Targeted	-
29-Mar-21	D6	D6_Pond	1.352	103.734	2140	Fish	*Trichopsis vittata*	Croaking gouramy	2	Seen	-	Targeted	-
29-Mar-21	T1	N.A	1.353	103.730	2206	Reptile	*Dendrelaphis pictus*	Painted bronzeback	1	Seen	-	Targeted	-
29-Mar-21	T1	N.A	1.353	103.730	2210	Fish	*Trichopodus trichopterus*	Threespot gouramy	1	Seen	-	Targeted	-
29-Mar-21	D4	D4_01	1.353	103.731	2213	Fish	*Monopterus albus*	Sunda swamp-eel	2	Seen	-	Targeted	-
29-Mar-21	D4	D4_01	1.353	103.731	2213	Fish	*Dermogenys collettei*	Sunda pygmy halfbeak	35	Seen	-	Targeted	-
29-Mar-21	D4	D4_01	1.353	103.731	2213	Fish	*Barbodes rhombeus*	Indochinese spotted barb	1	Seen	-	Targeted	-
29-Mar-21	D4	D4_01	1.353	103.731	2213	Fish	*Poecilia reticulata*	Guppy	5	Seen	-	Targeted	-
29-Mar-21	D4	D4_01	1.353	103.731	2213	Fish	*Oxyeleotris marmorata*	Marbled gudgeon	1	Seen	-	Targeted	-
29-Mar-21	T1	N.A	1.353	103.731	2232	Fish	*Rhinogobius similis*	Oriental river-goby	4	Seen	-	Targeted	Fish trap deployed
29-Mar-21	T1	N.A	1.353	103.731	2232	Decapod	*Macrobrachium lanchesteri*	Riceland shrimp	20	Seen	-	Targeted	-
29-Mar-21	T1	N.A	1.353	103.731	2235	Amphibian	*Limnonectes blythii*	Malayan giant frog	1	Seen	-	Targeted	-
29-Mar-21	T1	N.A	1.353	103.731	2237	Fish	*Trichopodus trichopterus*	Threespot gouramy	35	Seen	-	Targeted	-
29-Mar-21	T1	N.A	1.354	103.731	2242	Bird	*Caprimulgus affinis*	Savanna nightjar	2	Seen	-	Targeted	-
29-Mar-21	D4	D4_03	1.354	103.732	2248	Reptile	*Dendrelaphis pictus*	Painted bronzeback	1	Seen	-	Targeted	-
29-Mar-21	D4	D4_03	1.354	103.732	2248	Fish	*Dermogenys collettei*	Sunda pygmy halfbeak	3	Seen	-	Targeted	-
29-Mar-21	D4	D4_03	1.354	103.732	2248	Fish	*Poecilia reticulata*	Guppy	7	Seen	-	Targeted	-
29-Mar-21	D4	D4_03	1.354	103.732	2248	Fish	*Rhinogobius similis*	Oriental river-goby	2	Seen	-	Targeted	-
30-Mar-21	N.A	N.A	1.359	103.724	1018	Bird	*Turnix suscitator*	Barred buttonquail	1	Seen	-	Incidental	-
30-Mar-21	D6	D6_Pond	1.352	103.734	1037	Fish	*Trichopsis vittata*	Croaking gouramy	1	Caught	-	Targeted	Fish trap
30-Mar-21	D4	D4_03	1.354	103.732	1146	Odonate	*Copera marginipes*	Yellow featherlegs	1	Seen	RS040-46	Incidental	-
30-Mar-21	D5	D5_06	1.352	103.737	1007-10012	Fish	*Poecilia reticulata*	Guppy	19	Caught	-	Targeted	Tray net

Date	Route	Aquatic Point	Latitude	Longitude	Time	Taxon	Scientific name	Common name	Qty	Observation type	Photo no.	Survey method	Remarks
30-Mar-21	D6	D6_Pond	1.352	103.734	1037-1042	Fish	*Aplocheilus armatus*	Whitespot	1	Caught	-	Targeted	Tray net
30-Mar-21	D4	D4_01	1.353	103.731	1110-1115	Fish	*Dermogenys collettei*	Sunda pygmy halfbeak	11	Caught	RS028-31	Targeted	Tray net
30-Mar-21	D4	D4_01	1.353	103.731	1110-1115	Fish	*Poecilia reticulata*	Guppy	3	Caught	-	Targeted	Tray net
30-Mar-21	D4	D4_01	1.353	103.731	1110-1115	Decapod	*Macrobrachium nipponense*	Oriental river prawn	1	Caught	RS032-35	Targeted	Tray net
30-Mar-21	D4	D4_02	1.354	103.731	1123-1128	Fish	*Barbodes rhombeus*	Indochinese spotted barb	1	Caught	RS036-38	Targeted	Tray net
30-Mar-21	D4	D4_03	1.354	103.732	1138-1143	Fish	*Dermogenys collettei*	Sunda pygmy halfbeak	1	Caught	-	Targeted	Tray net
30-Mar-21	D5	D5_01	1.350	103.734	850-855	Fish	*Poecilia reticulata*	Guppy	78	Caught	RS024-27	Targeted	Tray net
30-Mar-21	D5	D5_02	1.350	103.735	914-919	Fish	*Poecilia reticulata*	Guppy	2	Caught	-	Targeted	Tray net
30-Mar-21	D5	D5_03	1.351	103.736	923-928	Fish	*Poecilia reticulata*	Guppy	50	Caught	-	Targeted	Tray net
30-Mar-21	D5	D5_04	1.351	103.736	938-943	Fish	*Poecilia reticulata*	Guppy	39	Caught	-	Targeted	Tray net
30-Mar-21	D5	D5_05	1.352	103.737	953-958	Fish	*Poecilia reticulata*	Guppy	43	Caught	-	Targeted	Tray net
31-Mar-21	D5	D5_02	1.350	103.735	929	Odonate	*Pseudagrion microcephalum*	Blue sprite	1	Seen	-	Incidental	-
31-Mar-21	D5	D5_06	1.352	103.737	1037	Odonate	*Ischnura senegalensis*	Common bluetail	1	Seen	-	Incidental	-
31-Mar-21	T1	N.A	1.353	103.730	2144	Reptile	*Ahaetulla prasina*	Oriental whip snake	1	Seen	-	Targeted	-
31-Mar-21	T1	N.A	1.354	103.730	2147	Amphibian	*Microhyla mukhlesuri*	East Asian ornate chorus frog	3	Heard	-	Targeted	-
31-Mar-21	T1	N.A	1.354	103.730	2147	Reptile	*Calotes versicolor*	Changeable lizard	1	Seen	-	Targeted	-
31-Mar-21	T1	N.A	1.354	103.729	2150	Mammal (Bat)	*Unidentified Pteropodidae*	-	1	Seen	-	Targeted	-
31-Mar-21	T1	N.A	1.354	103.729	2153	Amphibian	*Duttaphrynus melanostictus*	Asian toad	1	Seen	-	Targeted	-
31-Mar-21	T1	N.A	1.354	103.729	2154	Amphibian	*Microhyla mukhlesuri*	East Asian ornate chorus frog	2	Heard	-	Targeted	-
31-Mar-21	T1	N.A	1.354	103.729	2154	Reptile	*Calotes versicolor*	Changeable lizard	1	Seen	-	Targeted	-
31-Mar-21	T1	N.A	1.354	103.729	2155	Amphibian	*Duttaphrynus melanostictus*	Asian toad	1	Seen	-	Targeted	-
31-Mar-21	T1	N.A	1.354	103.729	2155	Amphibian	*Microhyla mukhlesuri*	East Asian ornate chorus frog	1	Heard	-	Targeted	-
31-Mar-21	T1	N.A	1.354	103.728	2156	Amphibian	*Microhyla mukhlesuri*	East Asian ornate chorus frog	10	Heard	-	Targeted	-
31-Mar-21	T1	N.A	1.354	103.728	2156	Amphibian	*Fejervarya limnocharis*	Field frog	50	Heard	-	Targeted	-
31-Mar-21	T1	N.A	1.354	103.728	2202	Mammal	*Paradoxurus musangus*	Common palm civet	1	Seen	-	Targeted	-
31-Mar-21	T1	N.A	1.355	103.727	2204	Amphibian	*Microhyla mukhlesuri*	East Asian ornate chorus frog	2	Heard	-	Targeted	-
31-Mar-21	T1	N.A	1.355	103.727	2205	Mammal (Bat)	*Cynopterus brachyotis*	Lesser dog-faced fruit bat	1	Seen	-	Targeted	-
31-Mar-21	T1	N.A	1.355	103.727	2205	Amphibian	*Sylvirana guentheri*	Guenther's frog	1	Heard	-	Targeted	-
31-Mar-21	T1	N.A	1.355	103.727	2207	Amphibian	*Sylvirana guentheri*	Guenther's frog	2	Heard	-	Targeted	-
31-Mar-21	T1	N.A	1.355	103.727	2207	Amphibian	*Microhyla mukhlesuri*	East Asian ornate chorus frog	3	Heard	-	Targeted	-
31-Mar-21	T1	N.A	1.355	103.727	2207	Amphibian	*Fejervarya limnocharis*	Field frog	50	Heard	-	Targeted	-
31-Mar-21	T1	N.A	1.355	103.727	2210	Amphibian	*Duttaphrynus melanostictus*	Asian toad	1	Seen	-	Targeted	-
31-Mar-21	T1	N.A	1.356	103.726	2217	Amphibian	*Limnonectes blythii*	Malayan giant frog	1	Seen	-	Targeted	-
31-Mar-21	T1	N.A	1.356	103.726	2218	Amphibian	*Microhyla heymonsi*	Dark-sided chorus frog	1	Heard	-	Targeted	-
31-Mar-21	T1	N.A	1.356	103.726	2221	Amphibian	*Microhyla heymonsi*	Dark-sided chorus frog	2	Heard	-	Targeted	-
31-Mar-21	T1	N.A	1.356	103.726	2221	Reptile	*Dendrelaphis pictus*	Painted bronzeback	1	Seen	-	Targeted	-
31-Mar-21	T1	N.A	1.356	103.726	2221	Bird	*Caprimulgus macrurus*	Large-tailed nightjar	1	Seen	-	Targeted	-
31-Mar-21	T1	N.A	1.356	103.726	2225	Amphibian	*Polypedates leucomystax*	Four-lined tree frog	1	Heard	-	Targeted	-
31-Mar-21	T1	N.A	1.356	103.726	2225	Reptile	*Hemidactylus frenatus*	Spiny-tailed house gecko	2	Seen	-	Targeted	-
31-Mar-21	T1	N.A	1.356	103.726	2225	Amphibian	*Microhyla mukhlesuri*	East Asian ornate chorus frog	2	Heard	-	Targeted	-
31-Mar-21	T1	N.A	1.356	103.726	2226	Amphibian	*Polypedates leucomystax*	Four-lined tree frog	1	Heard	-	Targeted	-
31-Mar-21	T1	N.A	1.356	103.726	2230	Mammal (Bat)	*Unidentified Pteropodidae*	-	1	Seen	-	Targeted	-
31-Mar-21	T1	N.A	1.356	103.725	2232	Amphibian	*Polypedates leucomystax*	Four-lined tree frog	1	Heard	-	Targeted	-
31-Mar-21	T1	N.A	1.356	103.725	2232	Amphibian	*Microhyla mukhlesuri*	East Asian ornate chorus frog	10	Heard	-	Targeted	-
31-Mar-21	T1	N.A	1.356	103.725	2236	Amphibian	*Limnonectes blythii*	Malayan giant frog	1	Seen	-	Targeted	-
31-Mar-21	D5	D5_05	1.352	103.737	1011-1016	Odonate	*Pseudagrion microcephalum*	Blue sprite	5	Seen	-	Targeted	-
31-Mar-21	D5	D5_06	1.352	103.737	1023-1028	Odonate	*Pseudagrion microcephalum*	Blue sprite	8	Seen	-	Targeted	-
31-Mar-21	D6	D6_Pond	1.352	103.734	1057-1102	Odonate	*Agrionoptera insignis*	Grenadier	1	Seen	-	Targeted	-
31-Mar-21	D6	D6_Pond	1.352	103.734	1057-1102	Odonate	*Brachydiplax chalybea*	Blue dasher	2	Seen	-	Targeted	-
31-Mar-21	D6	D6_Pond	1.352	103.734	1057-1102	Odonate	*Pseudagrion microcephalum*	Blue sprite	1	Seen	-	Targeted	-
31-Mar-21	D4	D4_01	1.353	103.731	1120-1125	Odonate	*Orthetrum chrysis*	Spine-tufted skimmer	3	Seen	-	Targeted	-
31-Mar-21	D4	D4_01	1.353	103.731	1120-1125	Odonate	*Copera marginipes*	Yellow featherlegs	1	Seen	-	Targeted	-
31-Mar-21	D4	D4_02	1.354	103.731	1134-1139	Odonate	*Orthetrum chrysis*	Spine-tufted skimmer	1	Seen	-	Targeted	-
31-Mar-21	D4	D4_02	1.354	103.731	1134-1139	Odonate	*Copera marginipes*	Yellow featherlegs	2	Seen	-	Targeted	-
31-Mar-21	D4	D4_03	1.354	103.732	1144-1149	Odonate	*Orthetrum chrysis*	Spine-tufted skimmer	2	Seen	-	Targeted	-
31-Mar-21	D4	D4_03	1.354	103.732	1144-1149	Odonate	*Copera marginipes*	Yellow featherlegs	1	Seen	-	Targeted	-
31-Mar-21	D5	D5_01	1.350	103.734	909-914	Odonate	*Neurothemis fluctuans*	Common parasol	1	Seen	-	Targeted	-
31-Mar-21	D5	D5_01	1.350	103.734	909-914	Odonate	*Pseudagrion microcephalum*	Blue sprite	12	Seen	-	Targeted	-

Date	Route	Aquatic Point	Latitude	Longitude	Time	Taxon	Scientific name	Common name	Qty	Observation type	Photo no.	Survey method	Remarks
31-Mar-21	D5	D5_01	1.350	103.734	909-914	Odonate	*Crocothemis servilia*	Common scarlet	1	Seen	-	Targeted	-
31-Mar-21	D5	D5_03	1.351	103.736	939-944	Odonate	*Pseudagrion microcephalum*	Blue sprite	2	Seen	-	Targeted	-
31-Mar-21	D5	D5_04	1.351	103.736	939-944	Odonate	*Pseudagrion microcephalum*	Blue sprite	1	Seen	-	Targeted	-
31-Mar-21	D5	D5_04	1.351	103.736	951-956	Odonate	*Neurothemis fluctuans*	Common parasol	3	Seen	-	Targeted	-
31-Mar-21	D5	D5_04	1.351	103.736	951-956	Odonate	*Pseudagrion microcephalum*	Blue sprite	7	Seen	-	Targeted	-
31-Mar-21	D5	D5_04	1.351	103.736	951-956	Odonate	*Pseudagrion microcephalum*	Blue sprite	1	Seen	-	Targeted	-
31-Mar-21	D5	D5_04	1.351	103.736	951-956	Odonate	*Lathrecista asiatica*	Scarlet grenadier	1	Seen	-	Targeted	-
31-Mar-21	T1	N.A	N.A	N.A	0943	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210331_214354.wa
31-Mar-21	T1	N.A	N.A	N.A	0944	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210331_214424.wa
31-Mar-21	T1	N.A	N.A	N.A	0944	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210331_214410.wa
31-Mar-21	T1	N.A	N.A	N.A	0944	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210331_214449.wa
31-Mar-21	T1	N.A	N.A	N.A	0945	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210331_214508.wa
31-Mar-21	T1	N.A	N.A	N.A	0945	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210331_214523.wa
31-Mar-21	T1	N.A	N.A	N.A	0945	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210331_214546.wa
31-Mar-21	T1	N.A	N.A	N.A	0945	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210331_214531.wa
31-Mar-21	T1	N.A	N.A	N.A	0945	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210331_214549.wa
31-Mar-21	T1	N.A	N.A	N.A	0946	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210331_214649.wa
31-Mar-21	T1	N.A	N.A	N.A	0946	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210331_214634.wa
31-Mar-21	T1	N.A	N.A	N.A	0947	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210331_214753.wa
31-Mar-21	T1	N.A	N.A	N.A	0947	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210331_214738.wa
31-Mar-21	T1	N.A	N.A	N.A	0947	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210331_214759.wa
31-Mar-21	T1	N.A	N.A	N.A	0948	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210331_214855.wa
31-Mar-21	T1	N.A	N.A	N.A	0948	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210331_214840.wa
31-Mar-21	T1	N.A	N.A	N.A	0949	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210331_214910.wa
31-Mar-21	T1	N.A	N.A	N.A	0949	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210331_214925.wa
31-Mar-21	T1	N.A	N.A	N.A	0950	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210331_215012.wa
31-Mar-21	T1	N.A	N.A	N.A	0949	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210331_214940.wa
31-Mar-21	T1	N.A	N.A	N.A	0949	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210331_214956.wa
31-Mar-21	T1	N.A	N.A	N.A	0950	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210331_215018.wa
31-Mar-21	T1	N.A	N.A	N.A	0952	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210331_215225.wa
31-Mar-21	T1	N.A	N.A	N.A	0951	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210331_215158.wa
31-Mar-21	T1	N.A	N.A	N.A	0952	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210331_215233.wa
31-Mar-21	T1	N.A	N.A	N.A	0952	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210331_215256.wa
31-Mar-21	T1	N.A	N.A	N.A	0953	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210331_215319.wa
31-Mar-21	T1	N.A	N.A	N.A	0953	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210331_215351.wa
31-Mar-21	T1	N.A	N.A	N.A	0954	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210331_215404.wa
31-Mar-21	T1	N.A	N.A	N.A	0954	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210331_215410.wa
31-Mar-21	T1	N.A	N.A	N.A	0955	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210331_215546.wa
31-Mar-21	T1	N.A	N.A	N.A	0956	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210331_215610.wa
31-Mar-21	T1	N.A	N.A	N.A	0958	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210331_215834.wa
31-Mar-21	T1	N.A	N.A	N.A	1001	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210331_220140.wa
31-Mar-21	T1	N.A	N.A	N.A	1003	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210331_220341.wa
31-Mar-21	T1	N.A	N.A	N.A	1007	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210331_220703.wa
31-Mar-21	T1	N.A	N.A	N.A	1008	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210331_220816.wa
31-Mar-21	T1	N.A	N.A	N.A	1009	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210331_220913.wa
31-Mar-21	T1	N.A	N.A	N.A	1009	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210331_220925.wa
31-Mar-21	T1	N.A	N.A	N.A	1010	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210331_221002.wa
31-Mar-21	T1	N.A	N.A	N.A	1010	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210331_221014.wa
31-Mar-21	T1	N.A	N.A	N.A	1009	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210331_220945.wa
31-Mar-21	T1	N.A	N.A	N.A	1010	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210331_221019.wa
31-Mar-21	T1	N.A	N.A	N.A	1010	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210331_221028.wa
31-Mar-21	T1	N.A	N.A	N.A	1022	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210331_222203.wa
31-Mar-21	T1	N.A	N.A	N.A	1024	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210331_222407.wa
31-Mar-21	T1	N.A	N.A	N.A	1027	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210331_222731.wa
31-Mar-21	T1	N.A	N.A	N.A	1027	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210331_222746.wa
31-Mar-21	T1	N.A	N.A	N.A	1027	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210331_222759.wa
31-Mar-21	T1	N.A	N.A	N.A	1029	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210331_222913.wa
31-Mar-21	T1	N.A	N.A	N.A	1029	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210331_222943.wa

Date	Route	Aquatic Point	Latitude	Longitude	Time	Taxon	Scientific name	Common name	Qty	Observation type	Photo no.	Survey method	Remarks
31-Mar-21	T1	N.A	N.A	N.A	1036	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210331_223602.wa
31-Mar-21	T1	N.A	N.A	N.A	1008	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210331_220853.wa
31-Mar-21	T1	N.A	N.A	N.A	1009	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210331_220925.wa
1-Apr-21	T1	N.A	1.356	103.725	2002	Amphibian	*Microhyla heymonsi*	Dark-sided chorus frog	1	Seen	-	Targeted	-
1-Apr-21	T1	N.A	1.356	103.725	2008	Amphibian	*Polypedates leucomystax*	Four-lined tree frog	2	Heard	-	Targeted	-
1-Apr-21	T1	N.A	1.356	103.725	2008	Amphibian	*Microhyla mukhlesuri*	East Asian ornate chorus frog	2	Heard	-	Targeted	-
1-Apr-21	T1	N.A	1.356	103.726	2011	Amphibian	*Polypedates leucomystax*	Four-lined tree frog	2	Heard	-	Targeted	-
1-Apr-21	T1	N.A	1.356	103.726	2014	Amphibian	*Polypedates leucomystax*	Four-lined tree frog	1	Heard	-	Targeted	-
1-Apr-21	T1	N.A	1.356	103.726	2016	Mammal (Bat)	*Unidentified Pteropodidae*	-	2	Seen	-	Targeted	-
1-Apr-21	T1	N.A	1.356	103.726	2016	Reptile	*Dendrelaphis pictus*	Painted bronzeback	1	Seen	-	Targeted	-
1-Apr-21	T1	N.A	1.356	103.726	2016	Amphibian	*Microhyla mukhlesuri*	East Asian ornate chorus frog	1	Heard	-	Targeted	-
1-Apr-21	T1	N.A	1.356	103.726	2021	Amphibian	*Microhyla heymonsi*	Dark-sided chorus frog	1	Seen	-	Targeted	-
1-Apr-21	T1	N.A	1.356	103.726	2021	Amphibian	*Microhyla butleri*	Painted chorus frog	2	Seen	-	Targeted	-
1-Apr-21	T1	N.A	1.356	103.726	2021	Amphibian	*Microhyla mukhlesuri*	East Asian ornate chorus frog	2	Seen	-	Targeted	-
1-Apr-21	T1	N.A	1.355	103.727	2024	Amphibian	*Microhyla mukhlesuri*	East Asian ornate chorus frog	1	Seen	-	Targeted	-
1-Apr-21	T1	N.A	1.355	103.727	2030	Amphibian	*Polypedates leucomystax*	Four-lined tree frog	2	Heard	-	Targeted	-
1-Apr-21	T1	N.A	1.355	103.727	2030	Amphibian	*Microhyla mukhlesuri*	East Asian ornate chorus frog	5	Heard	-	Targeted	-
1-Apr-21	T1	N.A	1.355	103.727	2030	Amphibian	*Sylvirana guentheri*	Guenther's frog	4	Heard	-	Targeted	-
1-Apr-21	T1	N.A	1.355	103.727	2032	Amphibian	*Microhyla heymonsi*	Dark-sided chorus frog	4	Heard	-	Targeted	-
1-Apr-21	T1	N.A	1.355	103.727	2034	Mammal (Bat)	*Unidentified Pteropodidae*	-	1	Seen	-	Targeted	-
1-Apr-21	T1	N.A	1.355	103.727	2035	Amphibian	*Microhyla sp.*	-	1000	Seen	-	Targeted	Tadpoles
1-Apr-21	T1	N.A	1.355	103.727	2035	Amphibian	*Microhyla heymonsi*	Dark-sided chorus frog	2	Heard	-	Targeted	-
1-Apr-21	T1	N.A	1.353	103.730	2036	Reptile	*Bronchocela cristatella*	Green crested lizard	1	Seen	-	Targeted	-
1-Apr-21	T1	N.A	1.354	103.728	2038	Amphibian	*Microhyla mukhlesuri*	East Asian ornate chorus frog	2	Heard	-	Targeted	-
1-Apr-21	T1	N.A	1.354	103.728	2038	Amphibian	*Sylvirana guentheri*	Guenther's frog	2	Heard	-	Targeted	-
1-Apr-21	T1	N.A	1.354	103.728	2038	Amphibian	*Polypedates leucomystax*	Four-lined tree frog	1	Heard	-	Targeted	-
1-Apr-21	T1	N.A	1.354	103.728	2038	Amphibian	*Microhyla butleri*	Painted chorus frog	3	Heard	-	Targeted	-
1-Apr-21	T1	N.A	1.354	103.728	2038	Amphibian	*Microhyla mukhlesuri*	East Asian ornate chorus frog	25	Heard	-	Targeted	-
1-Apr-21	T1	N.A	1.354	103.729	2044	Amphibian	*Sylvirana guentheri*	Guenther's frog	1	Heard	-	Targeted	-
1-Apr-21	T1	N.A	1.354	103.730	2047	Reptile	*Calotes versicolor*	Changeable lizard	1	Seen	-	Targeted	-
1-Apr-21	T1	N.A	1.353	103.731	2058	Amphibian	*Microhyla mukhlesuri*	East Asian ornate chorus frog	1	Heard	-	Targeted	-
1-Apr-21	T1	N.A	1.353	103.731	2100	Reptile	*Calotes versicolor*	Changeable lizard	1	Seen	-	Targeted	-
1-Apr-21	T1	N.A	1.353	103.731	2101	Butterfly	*Phaedyma columella singa*	Short banded sailor	1	Seen	-	Incidental	-
1-Apr-21	T1	N.A	1.353	103.731	2102	Bird	*Caprimulgus macrurus*	Large-tailed nightjar	1	Heard	-	Targeted	-
1-Apr-21	T1	N.A	1.353	103.731	2103	Mammal (Bat)	*Unidentified Pteropodidae*	-	1	Seen	-	Targeted	-
1-Apr-21	T1	N.A	1.353	103.732	2109	Amphibian	*Kaloula pulchra*	Banded bull frog	1	Seen	-	Targeted	-
1-Apr-21	T1	N.A	1.353	103.732	2118	Mammal (Bat)	*Unidentified Pteropodidae*	-	1	Seen	-	Targeted	-
1-Apr-21	T1	N.A	1.352	103.732	2121	Amphibian	*Kaloula pulchra*	Banded bull frog	1	Seen	-	Targeted	-
1-Apr-21	T1	N.A	1.352	103.732	2122	Mammal (Bat)	*Unidentified Pteropodidae*	-	1	Seen	-	Targeted	-
1-Apr-21	T1	N.A	1.352	103.732	2126	Bird	*Todiramphus chloris*	Collared kingfisher	1	Seen	-	Targeted	-
1-Apr-21	T1	N.A	1.352	103.732	2128	Reptile	*Dendrelaphis pictus*	Painted bronzeback	1	Seen	-	Targeted	-
1-Apr-21	T1	N.A	1.352	103.733	2136	Amphibian	*Sylvirana guentheri*	Guenther's frog	2	Heard	-	Targeted	-
1-Apr-21	T1	N.A	1.352	103.733	2136	Amphibian	*Polypedates leucomystax*	Four-lined tree frog	2	Heard	-	Targeted	-
1-Apr-21	T1	N.A	1.352	103.733	2136	Amphibian	*Microhyla mukhlesuri*	East Asian ornate chorus frog	10	Heard	-	Targeted	-
1-Apr-21	T1	N.A	1.351	103.734	2142	Bird	*Otus lempiji*	Sunda scops owl	1	Heard	-	Targeted	-
1-Apr-21	T1	N.A	1.351	103.734	2142	Amphibian	*Polypedates leucomystax*	Four-lined tree frog	1	Heard	-	Targeted	-
1-Apr-21	T1	N.A	1.352	103.734	2146	Amphibian	*Microhyla heymonsi*	Dark-sided chorus frog	3	Heard	-	Targeted	-
1-Apr-21	T1	N.A	1.352	103.734	2146	Mammal (Bat)	*Unidentified Pteropodidae*	-	1	Seen	-	Targeted	-
1-Apr-21	T1	N.A	1.352	103.735	2155	Amphibian	*Duttaphrynus melanostictus*	Asian toad	1	Heard	-	Targeted	-
1-Apr-21	T1	N.A	1.352	103.735	2155	Amphibian	*Microhyla mukhlesuri*	East Asian ornate chorus frog	1	Seen	-	Targeted	-
1-Apr-21	T1	N.A	1.352	103.735	2158	Reptile	*Bronchocela cristatella*	Green crested lizard	1	Seen	-	Targeted	-
1-Apr-21	T1	N.A	1.352	103.735	2205	Bird	*Rallina fasciata*	Red-legged crake	1	Seen	-	Targeted	-
1-Apr-21	T1	N.A	1.352	103.735	2205	Mammal (Bat)	*Unidentified Pteropodidae*	-	1	Seen	-	Targeted	-
1-Apr-21	T1	N.A	1.352	103.736	2207	Reptile	*Dendrelaphis pictus*	Painted bronzeback	1	Seen	-	Targeted	-
1-Apr-21	T1	N.A	1.352	103.736	2207	Amphibian	*Microhyla mukhlesuri*	East Asian ornate chorus frog	1	Heard	-	Targeted	-
1-Apr-21	T1	N.A	1.352	103.736	2210	Reptile	*Bronchocela cristatella*	Green crested lizard	1	Seen	-	Targeted	-
1-Apr-21	T1	N.A	1.352	103.736	2211	Mammal (Bat)	*Unidentified Pteropodidae*	-	1	Seen	-	Targeted	-
1-Apr-21	T1	N.A	1.352	103.736	2215	Amphibian	*Polypedates leucomystax*	Four-lined tree frog	30	Seen	-	Targeted	Tadpoles

Date	Route	Aquatic Point	Latitude	Longitude	Time	Taxon	Scientific name	Common name	Qty	Observation type	Photo no.	Survey method	Remarks
1-Apr-21	T1	N.A	1.352	103.736	2215	Reptile	*Unidentified Gekkonidae*	-	1	Heard	-	Targeted	-
1-Apr-21	T1	N.A	1.352	103.736	2217	Amphibian	*Microhyla mukhlesuri*	East Asian ornate chorus frog	5	Seen	-	Targeted	-
1-Apr-21	T1	N.A	1.352	103.736	2220	Bird	*Otus lempiji*	Sunda scops owl	1	Heard	-	Targeted	-
1-Apr-21	T1	N.A	1.352	103.736	2223	Amphibian	*Sylvirana guentheri*	Guenther's frog	1	Heard	-	Targeted	-
1-Apr-21	T1	N.A	1.351	103.737	2225	Mammal (Bat)	*Unidentified Pteropodidae*	-	1	Seen	-	Targeted	-
1-Apr-21	T1	N.A	1.351	103.737	2228	Mammal	*Canis lupus familiaris*	Feral dog	3	Heard	-	Targeted	-
1-Apr-21	T1	N.A	1.351	103.736	2232	Amphibian	*Sylvirana guentheri*	Guenther's frog	4	Heard	-	Targeted	-
1-Apr-21	T1	N.A	1.351	103.736	2232	Amphibian	*Microhyla mukhlesuri*	East Asian ornate chorus frog	20	Heard	-	Targeted	-
1-Apr-21	T1	N.A	1.351	103.736	2232	Amphibian	*Polypedates leucomystax*	Four-lined tree frog	3	Heard	-	Targeted	-
1-Apr-21	T1	N.A	1.351	103.736	2232	Amphibian	*Microhyla heymonsi*	Dark-sided chorus frog	5	Heard	-	Targeted	-
1-Apr-21	T1	N.A	1.351	103.736	2232	Mammal	*Rattus sp.*	-	1	Seen	-	Targeted	-
1-Apr-21	T1	N.A	1.351	103.736	2232	Bird	*Caprimulgus macrurus*	Large-tailed nightjar	1	Seen	-	Targeted	-
1-Apr-21	T1	N.A	1.350	103.736	2242	Amphibian	*Microhyla mukhlesuri*	East Asian ornate chorus frog	1	Heard	-	Targeted	-
1-Apr-21	T1	N.A	1.350	103.736	2242	Amphibian	*Sylvirana guentheri*	Guenther's frog	3	Heard	-	Targeted	-
1-Apr-21	T1	N.A	1.350	103.736	2242	Mammal	*Paradoxurus musangus*	Common palm civet	1	Seen	-	Targeted	-
1-Apr-21	T1	N.A	1.350	103.736	2242	Amphibian	*Polypedates leucomystax*	Four-lined tree frog	1	Heard	-	Targeted	-
1-Apr-21	T1	N.A	1.350	103.736	2242	Bird	*Otus lempiji*	Sunda scops owl	1	Heard	-	Targeted	-
1-Apr-21	T1	N.A	1.350	103.736	2242	Amphibian	*Microhyla heymonsi*	Dark-sided chorus frog	20	Seen	J16	Targeted	Tadpoles
1-Apr-21	T1	N.A	1.350	103.736	2242	Amphibian	*Microhyla mukhlesuri*	East Asian ornate chorus frog	2	Heard	-	Targeted	-
1-Apr-21	T1	N.A	1.350	103.736	2242	Amphibian	*Limnonectes blythii*	Malayan giant frog	3	Seen	J19	Targeted	-
1-Apr-21	T1	N.A	1.350	103.736	2242	Amphibian	*Fejervarya cancrivora*	Crab-eating frog	1	Heard	-	Targeted	-
1-Apr-21	T1	N.A	1.350	103.736	2242	Amphibian	*Duttaphrynus melanostictus*	Asian toad	1	Heard	-	Targeted	-
1-Apr-21	T1	N.A	1.350	103.736	2247	Reptile	*Hemidactylus frenatus*	Spiny-tailed house gecko	1	Seen	-	Targeted	-
1-Apr-21	T1	N.A	1.350	103.736	2247	Mammal	*Rattus sp.*	-	1	Seen	-	Targeted	-
1-Apr-21	T1	N.A	1.350	103.735	2253	Reptile	*Dendrelaphis caudolineatus*	Striped bronzeback	1	Seen	J19-21	Targeted	-
1-Apr-21	T1	N.A	1.350	103.735	2253	Mammal	*Paradoxurus musangus*	Common palm civet	1	Seen	-	Targeted	-
1-Apr-21	T1	N.A	1.350	103.735	2256	Amphibian	*Sylvirana guentheri*	Guenther's frog	1	Heard	-	Targeted	-
1-Apr-21	T1	N.A	1.351	103.735	2302	Mammal (Bat)	*Unidentified Pteropodidae*	-	1	Seen	-	Targeted	-
1-Apr-21	T1	N.A	1.351	103.734	2307	Amphibian	*Polypedates leucomystax*	Four-lined tree frog	1	Heard	-	Targeted	-
1-Apr-21	T1	N.A	1.351	103.734	2307	Amphibian	*Microhyla mukhlesuri*	East Asian ornate chorus frog	2	Heard	-	Targeted	-
1-Apr-21	T1	N.A	1.351	103.734	2309	Reptile	*Dendrelaphis pictus*	Painted bronzeback	1	Seen	-	Targeted	-
1-Apr-21	T1	N.A	N.A	N.A	0806	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_200622.wa
1-Apr-21	T1	N.A	N.A	N.A	0806	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_200626.wa
1-Apr-21	T1	N.A	N.A	N.A	0806	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_200650.wa
1-Apr-21	T1	N.A	N.A	N.A	0807	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_200700.wa
1-Apr-21	T1	N.A	N.A	N.A	0806	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_200635.wa
1-Apr-21	T1	N.A	N.A	N.A	0807	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_200740.wa
1-Apr-21	T1	N.A	N.A	N.A	0807	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_200756.wa
1-Apr-21	T1	N.A	N.A	N.A	0807	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_200711.wa
1-Apr-21	T1	N.A	N.A	N.A	0807	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_200725.wa
1-Apr-21	T1	N.A	N.A	N.A	0808	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_200802.wa
1-Apr-21	T1	N.A	N.A	N.A	0808	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_200848.wa
1-Apr-21	T1	N.A	N.A	N.A	0809	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_200914.wa
1-Apr-21	T1	N.A	N.A	N.A	0809	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_200930.wa
1-Apr-21	T1	N.A	N.A	N.A	0809	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_200945.wa
1-Apr-21	T1	N.A	N.A	N.A	0809	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_200957.wa
1-Apr-21	T1	N.A	N.A	N.A	0812	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_201219.wa
1-Apr-21	T1	N.A	N.A	N.A	0813	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_201313.wa
1-Apr-21	T1	N.A	N.A	N.A	0813	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_201342.wa
1-Apr-21	T1	N.A	N.A	N.A	0814	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_201404.wa
1-Apr-21	T1	N.A	N.A	N.A	0814	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_201417.wa
1-Apr-21	T1	N.A	N.A	N.A	0814	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_201450.wa
1-Apr-21	T1	N.A	N.A	N.A	0814	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_201439.wa
1-Apr-21	T1	N.A	N.A	N.A	0814	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_201424.wa
1-Apr-21	T1	N.A	N.A	N.A	0815	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_201529.wa
1-Apr-21	T1	N.A	N.A	N.A	0816	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_201603.wa
1-Apr-21	T1	N.A	N.A	N.A	0815	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_201553.wa
1-Apr-21	T1	N.A	N.A	N.A	0815	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_201538.wa

Date	Route	Aquatic Point	Latitude	Longitude	Time	Taxon	Scientific name	Common name	Qty	Observation type	Photo no.	Survey method	Remarks
1-Apr-21	T1	N.A	N.A	N.A	0816	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_201656.wa
1-Apr-21	T1	N.A	N.A	N.A	0816	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_201645.wa
1-Apr-21	T1	N.A	N.A	N.A	0816	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_201626.wa
1-Apr-21	T1	N.A	N.A	N.A	0817	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_201711.wa
1-Apr-21	T1	N.A	N.A	N.A	0818	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_201802.wa
1-Apr-21	T1	N.A	N.A	N.A	0818	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_201817.wa
1-Apr-21	T1	N.A	N.A	N.A	0828	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_202809.wa
1-Apr-21	T1	N.A	N.A	N.A	0828	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_202816.wa
1-Apr-21	T1	N.A	N.A	N.A	0828	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_202858.wa
1-Apr-21	T1	N.A	N.A	N.A	0831	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_203137.wa
1-Apr-21	T1	N.A	N.A	N.A	0831	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210401_203115.wa
1-Apr-21	T1	N.A	N.A	N.A	0831	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_203144.wa
1-Apr-21	T1	N.A	N.A	N.A	0833	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_203343.wa
1-Apr-21	T1	N.A	N.A	N.A	0833	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_203313.wa
1-Apr-21	T1	N.A	N.A	N.A	0833	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_203350.wa
1-Apr-21	T1	N.A	N.A	N.A	0833	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_203328.wa
1-Apr-21	T1	N.A	N.A	N.A	0833	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_203356.wa
1-Apr-21	T1	N.A	N.A	N.A	0834	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_203411.wa
1-Apr-21	T1	N.A	N.A	N.A	0836	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_203605.wa
1-Apr-21	T1	N.A	N.A	N.A	0836	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_203627.wa
1-Apr-21	T1	N.A	N.A	N.A	0837	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_203700.wa
1-Apr-21	T1	N.A	N.A	N.A	0837	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_203757.wa
1-Apr-21	T1	N.A	N.A	N.A	0839	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_203936.wa
1-Apr-21	T1	N.A	N.A	N.A	0840	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_204058.wa
1-Apr-21	T1	N.A	N.A	N.A	0842	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_204245.wa
1-Apr-21	T1	N.A	N.A	N.A	0843	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_204345.wa
1-Apr-21	T1	N.A	N.A	N.A	0847	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_204733.wa
1-Apr-21	T1	N.A	N.A	N.A	0847	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_204722.wa
1-Apr-21	T1	N.A	N.A	N.A	0847	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_204746.wa
1-Apr-21	T1	N.A	N.A	N.A	0848	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_204801.wa
1-Apr-21	T1	N.A	N.A	N.A	0848	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_204832.wa
1-Apr-21	T1	N.A	N.A	N.A	0853	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_205303.wa
1-Apr-21	T1	N.A	N.A	N.A	0855	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_205537.wa
1-Apr-21	T1	N.A	N.A	N.A	0858	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210401_205858.wa
1-Apr-21	T1	N.A	N.A	N.A	0859	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210401_205917.wa
1-Apr-21	T1	N.A	N.A	N.A	0902	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210401_210219.wa
1-Apr-21	T1	N.A	N.A	N.A	0902	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210401_210230.wa
1-Apr-21	T1	N.A	N.A	N.A	0904	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_210427.wa
1-Apr-21	T1	N.A	N.A	N.A	0905	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210401_210531.wa
1-Apr-21	T1	N.A	N.A	N.A	0905	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210401_210545.wa
1-Apr-21	T1	N.A	N.A	N.A	0905	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210401_210521.wa
1-Apr-21	T1	N.A	N.A	N.A	0905	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210401_210550.wa
1-Apr-21	T1	N.A	N.A	N.A	0905	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210401_210555.wa
1-Apr-21	T1	N.A	N.A	N.A	0906	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210401_210621.wa
1-Apr-21	T1	N.A	N.A	N.A	0912	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_211201.wa
1-Apr-21	T1	N.A	N.A	N.A	0914	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210401_211423.wa
1-Apr-21	T1	N.A	N.A	N.A	0914	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210401_211446.wa
1-Apr-21	T1	N.A	N.A	N.A	0931	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210401_213141.wa
1-Apr-21	T1	N.A	N.A	N.A	0934	Mammal (Bat)	*Myotis muricola*	Whiskered myotis	1	Acoustic	-	Targeted	20210401_213415.wa
1-Apr-21	T1	N.A	N.A	N.A	0935	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210401_213507.wa
1-Apr-21	T1	N.A	N.A	N.A	0934	Mammal (Bat)	*Myotis muricola*	Whiskered myotis	1	Acoustic	-	Targeted	20210401_213426.wa
1-Apr-21	T1	N.A	N.A	N.A	0935	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210401_213535.wa
1-Apr-21	T1	N.A	N.A	N.A	0935	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210401_213545.wa
1-Apr-21	T1	N.A	N.A	N.A	0935	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210401_213553.wa
1-Apr-21	T1	N.A	N.A	N.A	0938	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210401_213805.wa
1-Apr-21	T1	N.A	N.A	N.A	0940	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_214032.wa
1-Apr-21	T1	N.A	N.A	N.A	0941	Mammal (Bat)	*Myotis muricola*	Whiskered myotis	1	Acoustic	-	Targeted	20210401_214129.wa
1-Apr-21	T1	N.A	N.A	N.A	0941	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_214146.wa

Date	Route	Aquatic Point	Latitude	Longitude	Time	Taxon	Scientific name	Common name	Qty	Observation type	Photo no.	Survey method	Remarks
1-Apr-21	T1	N.A	N.A	N.A	0942	Mammal (Bat)	*Myotis muricola*	Whiskered myotis	1	Acoustic	-	Targeted	20210401_214211.wa
1-Apr-21	T1	N.A	N.A	N.A	0948	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210401_214850.wa
1-Apr-21	T1	N.A	N.A	N.A	1011	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_221148.wa
1-Apr-21	T1	N.A	N.A	N.A	1010	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210401_221027.wa
1-Apr-21	T1	N.A	N.A	N.A	1016	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_221611.wa
1-Apr-21	T1	N.A	N.A	N.A	1021	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210401_222121.wa
1-Apr-21	T1	N.A	N.A	N.A	1022	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210401_222209.wa
1-Apr-21	T1	N.A	N.A	N.A	1021	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210401_222154.wa
1-Apr-21	T1	N.A	N.A	N.A	1022	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210401_222219.wa
1-Apr-21	T1	N.A	N.A	N.A	1038	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_223809.wa
1-Apr-21	T1	N.A	N.A	N.A	1038	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_223814.wa
1-Apr-21	T1	N.A	N.A	N.A	1038	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_223844.wa
1-Apr-21	T1	N.A	N.A	N.A	1041	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_224138.wa
1-Apr-21	T1	N.A	N.A	N.A	1042	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_224216.wa
1-Apr-21	T1	N.A	N.A	N.A	1044	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_224448.wa
1-Apr-21	T1	N.A	N.A	N.A	1044	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_224459.wa
1-Apr-21	T1	N.A	N.A	N.A	1045	Mammal (Bat)	*Myotis muricola*	Whiskered myotis	1	Acoustic	-	Targeted	20210401_224541.wa
1-Apr-21	T1	N.A	N.A	N.A	1050	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_225050.wa
1-Apr-21	T1	N.A	N.A	N.A	1107	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210401_230712.wa
1-Apr-21	T1	N.A	N.A	N.A	1108	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210401_230814.wa
1-Apr-21	T1	N.A	N.A	N.A	1109	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210401_230942.wa
1-Apr-21	T1	N.A	N.A	N.A	1110	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_231013.wa
1-Apr-21	T1	N.A	N.A	N.A	1111	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210401_231147.wa
1-Apr-21	T1	N.A	N.A	N.A	1111	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210401_231155.wa
1-Apr-21	T1	N.A	N.A	N.A	1112	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210401_231201.wa
1-Apr-21	T1	N.A	N.A	N.A	0829	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_202926.wa
1-Apr-21	T1	N.A	N.A	N.A	0840	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_204027.wa
1-Apr-21	T1	N.A	N.A	N.A	0912	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210401_211201.wa
1-Apr-21	T1	N.A	N.A	N.A	0938	Mammal (Bat)	*Myotis muricola*	Whiskered myotis	1	Acoustic	-	Targeted	20210401_213805.wa
1-Apr-21	T1	N.A	N.A	N.A	0940	Mammal (Bat)	*Myotis muricola*	Whiskered myotis	1	Acoustic	-	Targeted	20210401_214032.wa
1-Apr-21	T1	N.A	N.A	N.A	0941	Mammal (Bat)	*Myotis muricola*	Whiskered myotis	1	Acoustic	-	Targeted	20210401_214146.wa
1-Apr-21	T1	N.A	N.A	N.A	1045	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_224541.wa
1-Apr-21	T1	N.A	N.A	N.A	1112	Mammal (Bat)	*Saccolaimus saccolaimus*	Pouch-bearing bat	1	Acoustic	-	Targeted	20210401_231210.wa
1-Apr-21	T1	N.A	N.A	N.A	0831	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210401_203115.wa
2-Apr-21	T1	N.A	1.356	103.725	904	Odonate	*Lathrecista asiatica*	Scarlet grenadier	1	Seen	-	Targeted	-
2-Apr-21	T1	N.A	1.356	103.725	904	Odonate	*Ceriagrion cerinorubellum*	Ornate coraltail	1	Seen	-	Targeted	-
2-Apr-21	T1	N.A	1.356	103.725	904	Odonate	*Neurothemis fluctuans*	Common parasol	2	Seen	-	Targeted	-
2-Apr-21	T1	N.A	1.356	103.725	907	Odonate	*Neurothemis fluctuans*	Common parasol	3	Seen	-	Targeted	-
2-Apr-21	T1	N.A	1.356	103.726	908	Odonate	*Acisoma panorpoides*	Trumpet tail	1	Seen	-	Targeted	-
2-Apr-21	T1	N.A	1.356	103.726	914	Odonate	*Neurothemis fluctuans*	Common parasol	1	Seen	-	Targeted	-
2-Apr-21	T1	N.A	1.356	103.726	918	Odonate	*Neurothemis fluctuans*	Common parasol	1	Seen	-	Targeted	-
2-Apr-21	T1	N.A	1.356	103.726	923	Odonate	*Agrionoptera insignis*	Grenadier	1	Seen	-	Targeted	-
2-Apr-21	T1	N.A	1.355	103.727	930	Odonate	*Gynacantha sp.*	-	1	Seen	-	Targeted	-
2-Apr-21	T1	N.A	1.355	103.727	933	Odonate	*Teinobasis ruficollis*	Red-tailed sprite	1	Seen	-	Targeted	-
2-Apr-21	T1	N.A	1.355	103.727	942	Odonate	*Neurothemis fluctuans*	Common parasol	1	Seen	-	Targeted	-
2-Apr-21	T1	N.A	1.354	103.728	953	Odonate	*Lathrecista asiatica*	Scarlet grenadier	1	Seen	-	Targeted	-
2-Apr-21	T1	N.A	1.354	103.729	955	Odonate	*Agrionoptera insignis*	Grenadier	2	Seen	-	Targeted	-
2-Apr-21	T1	N.A	1.354	103.729	958	Odonate	*Pantala flavescens*	Wandering glider	11	Seen	-	Targeted	-
2-Apr-21	T1	N.A	1.354	103.730	1003	Odonate	*Lathrecista asiatica*	Scarlet grenadier	2	Seen	-	Targeted	-
2-Apr-21	T1	N.A	1.354	103.730	1003	Odonate	*Orthetrum glaucum*	Common blue skimmer	1	Seen	-	Targeted	-
2-Apr-21	T1	N.A	1.354	103.730	1008	Odonate	*Agrionoptera insignis*	Grenadier	1	Seen	-	Targeted	-
5-Apr-21	T1	N.A	1.357	103.725	1139	Butterfly	*Parantica agleoides agleoides*	Dark glassy tiger	1	Seen	-	Targeted	-
5-Apr-21	T1	N.A	1.356	103.726	1142	Butterfly	*Acraea terpsicore*	Tawny coster	1	Seen	-	Targeted	-
5-Apr-21	T1	N.A	1.356	103.726	1146	Aculeate hymenopteran	*Xylocopa sp.*	-	1	Seen	-	Targeted	X. flavonigrescens or X. aestuans
5-Apr-21	T1	N.A	1.356	103.726	1151	Butterfly	*Acraea terpsicore*	Tawny coster	3	Seen	-	Targeted	-
5-Apr-21	T1	N.A	1.356	103.726	1155	Aculeate hymenopteran	*Xylocopa latipes*	Broad-handed carpenter bee	1	Seen	-	Targeted	-
5-Apr-21	T1	N.A	1.356	103.726	1155	Aculeate hymenopteran	*Antepipona sp. nr. bipustulata*	NA	2	Seen	-	Targeted	-

Date	Route	Aquatic Point	Latitude	Longitude	Time	Taxon	Scientific name	Common name	Qty	Observation type	Photo no.	Survey method	Remarks
5-Apr-21	T1	N.A	1.356	103.726	1155	Aculeate hymenopteran	*Parischnogaster nigricans*	NA	1	Seen	-	Targeted	-
5-Apr-21	T1	N.A	1.356	103.726	1157	Butterfly	*Eurema sp.*	-	1	Seen	-	Targeted	-
5-Apr-21	T1	N.A	1.356	103.726	1157	Butterfly	*Junonia hedonia ida*	Chocolate pansy	1	Seen	-	Targeted	-
5-Apr-21	T1	N.A	1.356	103.726	1200	Butterfly	*Parantica agleoides agleoides*	Dark glassy tiger	1	Seen	-	Targeted	-
5-Apr-21	T1	N.A	1.356	103.726	1201	Butterfly	*Eurema sp.*	-	3	Seen	-	Targeted	-
5-Apr-21	T1	N.A	1.355	103.727	1202	Butterfly	*Eurema sp.*	-	2	Seen	-	Targeted	-
5-Apr-21	T1	N.A	1.355	103.727	1206	Aculeate hymenopteran	*Stenodyneriellus guttulatus*	NA	4	Seen	-	Targeted	-
5-Apr-21	T1	N.A	1.355	103.727	1208	Butterfly	*Parantica agleoides agleoides*	Dark glassy tiger	2	Seen	-	Targeted	-
5-Apr-21	T1	N.A	1.355	103.727	1208	Butterfly	*Borbo cinnara*	Formosan swift	1	Seen	CT7950	Targeted	-
5-Apr-21	T1	N.A	1.355	103.727	1208	Butterfly	*Prosotas dubiosa lumpura*	Tailless line blue	1	Seen	-	Targeted	-
5-Apr-21	T1	N.A	1.355	103.727	1210	Butterfly	*Papilio polytes romulus*	Common mormon	1	Seen	-	Targeted	-
5-Apr-21	T1	N.A	1.355	103.727	1210	Aculeate hymenopteran	*Xylocopa latipes*	Broad-handed carpenter bee	1	Seen	-	Targeted	-
5-Apr-21	T1	N.A	1.355	103.727	1215	Butterfly	*Graphium sarpedon luctatius*	Common bluebottle	1	Seen	-	Targeted	-
5-Apr-21	T1	N.A	1.355	103.727	1215	Butterfly	*Junonia hedonia ida*	Chocolate pansy	1	Seen	-	Targeted	-
5-Apr-21	T1	N.A	1.355	103.727	1215	Odonate	*Zyxomma petiolatum*	Slender duskdarter	1	Seen	-	Incidental	-
5-Apr-21	T1	N.A	1.355	103.727	1217	Odonate	*Copera marginipes*	Yellow featherlegs	1	Seen	-	Incidental	-
5-Apr-21	T1	N.A	1.355	103.727	1219	Butterfly	*Junonia hedonia ida*	Chocolate pansy	1	Seen	-	Targeted	-
5-Apr-21	T1	N.A	1.355	103.727	1220	Butterfly	*Prosotas dubiosa lumpura*	Tailless line blue	2	Seen	-	Targeted	-
5-Apr-21	T1	N.A	1.355	103.727	1220	Butterfly	*Eurema sp.*	-	3	Seen	-	Targeted	-
5-Apr-21	T1	N.A	1.355	103.727	1222	Aculeate hymenopteran	*Amegilla andrewsi*	Andrew's blue-banded digger bee	1	Seen	-	Targeted	-
5-Apr-21	T1	N.A	1.355	103.727	1224	Aculeate hymenopteran	*Delta pyriforme*	NA	1	Seen	-	Targeted	-
5-Apr-21	T1	N.A	1.355	103.727	1225	Butterfly	*Junonia hedonia ida*	Chocolate pansy	1	Seen	-	Targeted	-
5-Apr-21	T1	N.A	1.354	103.728	1228	Butterfly	*Eurema sp.*	-	1	Seen	-	Targeted	-
5-Apr-21	T1	N.A	1.354	103.728	1228	Butterfly	*Junonia hedonia ida*	Chocolate pansy	3	Seen	-	Targeted	-
5-Apr-21	T1	N.A	1.354	103.728	1228	Butterfly	*Eurema sp.*	-	1	Seen	-	Targeted	-
5-Apr-21	T1	N.A	1.354	103.728	1228	Butterfly	*Mycalesis perseoides perseoides*	Burmese bush brown	1	Seen	-	Targeted	-
5-Apr-21	T1	N.A	1.354	103.728	1230	Butterfly	*Appias libythea olferna*	Striped albatross	2	Seen	-	Targeted	-
5-Apr-21	T1	N.A	1.354	103.728	1230	Butterfly	*Elymnias hypermnestra agina*	Common palmfly	1	Seen	-	Targeted	-
5-Apr-21	T1	N.A	1.354	103.728	1230	Butterfly	*Mycalesis sp.*	-	1	Seen	-	Targeted	-
5-Apr-21	T1	N.A	1.354	103.728	1231	Aculeate hymenopteran	*Xylocopa latipes*	Broad-handed carpenter bee	1	Seen	-	Targeted	-
5-Apr-21	T1	N.A	1.354	103.728	1231	Butterfly	*Mycalesis sp.*	-	2	Seen	-	Targeted	-
5-Apr-21	T1	N.A	1.354	103.729	1233	Butterfly	*Mycalesis mineus macromalayana*	Dark brand bush brown	1	Seen	-	Targeted	-
5-Apr-21	T1	N.A	1.354	103.729	1233	Butterfly	*Mycalesis sp.*	-	1	Seen	-	Targeted	-
5-Apr-21	T1	N.A	1.354	103.729	1235	Butterfly	*Junonia hedonia ida*	Chocolate pansy	1	Seen	-	Targeted	-
5-Apr-21	T1	N.A	1.354	103.730	1238	Butterfly	*Junonia hedonia ida*	Chocolate pansy	1	Seen	-	Targeted	-
5-Apr-21	T1	N.A	1.354	103.730	1238	Butterfly	*Eurema sp.*	-	1	Seen	-	Targeted	-
5-Apr-21	T1	N.A	1.354	103.730	1240	Butterfly	*Eurema sp.*	-	1	Seen	-	Targeted	-
5-Apr-21	T1	N.A	1.354	103.730	1240	Butterfly	*Prosotas dubiosa lumpura*	Tailless line blue	1	Seen	-	Targeted	-
5-Apr-21	T1	N.A	1.354	103.730	1240	Butterfly	*Elymnias panthera panthera*	Tawny palmfly	1	Seen	-	Targeted	-
5-Apr-21	T1	N.A	1.354	103.730	1241	Butterfly	*Potanthus omaha omaha*	Lesser dart	1	Seen	-	Targeted	-
5-Apr-21	T1	N.A	1.354	103.730	1241	Butterfly	*Junonia hedonia ida*	Chocolate pansy	1	Seen	-	Targeted	-
5-Apr-21	T1	N.A	1.353	103.730	1243	Aculeate hymenopteran	*Chalybion sp.*	-	1	Seen	-	Targeted	-
5-Apr-21	T1	N.A	1.353	103.730	1244	Butterfly	*Prosotas dubiosa lumpura*	Tailless line blue	1	Seen	-	Targeted	-
5-Apr-21	T1	N.A	1.353	103.730	1246	Butterfly	*Junonia hedonia ida*	Chocolate pansy	1	Seen	-	Targeted	-
5-Apr-21	T1	N.A	1.353	103.730	1246	Butterfly	*Mycalesis perseoides perseoides*	Burmese bush brown	1	Seen	-	Targeted	-
5-Apr-21	T1	N.A	1.353	103.731	1247	Butterfly	*Junonia hedonia ida*	Chocolate pansy	1	Seen	-	Targeted	-
5-Apr-21	T1	N.A	1.353	103.731	1251	Butterfly	*Megisba malaya sikkima*	Malayan	1	Seen	-	Targeted	-
5-Apr-21	T1	N.A	1.349	103.736	1310	Bird	*Ardea intermedia*	Intermediate egret	1	Seen	RS076-077	Incidental	-
6-Apr-21	T1	N.A	1.356	103.725	719	Bird	*Acridotheres javanicus*	Javan myna	1	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.356	103.725	719	Bird	*Todiramphus chloris*	Collared kingfisher	1	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.356	103.725	719	Bird	*Pycnonotus goiavier*	Yellow-vented bulbul	1	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.356	103.725	719	Bird	*Caprimulgus macrurus*	Large-tailed nightjar	1	Seen	-	Targeted	-
6-Apr-21	T1	N.A	1.356	103.725	719	Bird	*Dicaeum cruentatum*	Scarlet-backed flowerpecker	1	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.356	103.725	719	Bird	*Pericrocotus divaricatus*	Ashy minivet	3	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.356	103.725	719	Bird	*Oriolus chinensis*	Black-naped oriole	1	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.356	103.725	722	Bird	*Treron vernans*	Pink-necked green pigeon	3	Seen	-	Targeted	-
6-Apr-21	T1	N.A	1.356	103.725	722	Bird	*Psittacula alexandri*	Red-breasted parakeet	1	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.356	103.726	722	Bird	*Cinnyris jugularis*	Olive-backed sunbird	1	Heard	-	Targeted	-

Date	Route	Aquatic Point	Latitude	Longitude	Time	Taxon	Scientific name	Common name	Qty	Observation type	Photo no.	Survey method	Remarks
6-Apr-21	T1	N.A	1.356	103.726	722	Bird	*Treron vernans*	Pink-necked green pigeon	1	Seen	-	Targeted	-
6-Apr-21	T1	N.A	1.356	103.726	722	Bird	*Acridotheres javanicus*	Javan myna	2	Seen	-	Targeted	-
6-Apr-21	T1	N.A	1.356	103.726	722	Bird	*Zosterops simplex*	Swinhoe's white-eye	1	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.356	103.726	725	Bird	*Pycnonotus goiavier*	Yellow-vented bulbul	3	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.356	103.726	725	Bird	*Aegithina tiphia*	Common iora	1	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.356	103.726	725	Bird	*Aplonis panayensis*	Asian glossy starling	5	Seen	-	Targeted	-
6-Apr-21	T1	N.A	1.356	103.726	725	Bird	*Treron vernans*	Pink-necked green pigeon	9	Seen	-	Targeted	-
6-Apr-21	T1	N.A	1.356	103.726	725	Bird	*Acridotheres javanicus*	Javan myna	1	Seen	-	Targeted	-
6-Apr-21	T1	N.A	1.356	103.726	725	Bird	*Picus vittatus*	Laced woodpecker	2	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.356	103.726	725	Bird	*Dinopium javanense*	Common flameback	1	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.355	103.726	730	Bird	*Pycnonotus goiavier*	Yellow-vented bulbul	1	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.355	103.726	730	Bird	*Oriolus chinensis*	Black-naped oriole	2	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.355	103.727	731	Bird	*Picus vittatus*	Laced woodpecker	1	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.355	103.727	731	Bird	*Psittacula alexandri*	Red-breasted parakeet	1	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.355	103.727	733	Bird	*Psilopogon lineatus*	Lineated barbet	1	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.355	103.727	733	Bird	*Dinopium javanense*	Common flameback	1	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.355	103.727	733	Bird	*Cacomantis sepulcralis*	Rusty-breasted cuckoo	1	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.355	103.727	733	Bird	*Todiramphus chloris*	Collared kingfisher	1	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.355	103.727	735	Bird	*Orthotomus sutorius*	Common tailorbird	1	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.354	103.727	736	Bird	*Todiramphus chloris*	Collared kingfisher	1	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.354	103.727	736	Bird	*Treron vernans*	Pink-necked green pigeon	1	Seen	-	Targeted	-
6-Apr-21	T1	N.A	1.354	103.727	736	Bird	*Acridotheres javanicus*	Javan myna	2	Seen	-	Targeted	-
6-Apr-21	T1	N.A	1.354	103.727	736	Bird	*Garrulax leucolophus*	White-crested laughingthrush	3	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.354	103.728	739	Bird	*Pernis ptilorhynchus*	Crested honey-buzzard	1	Seen	-	Targeted	-
6-Apr-21	T1	N.A	1.354	103.728	739	Bird	*Oriolus chinensis*	Black-naped oriole	1	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.354	103.729	741	Bird	*Acridotheres javanicus*	Javan myna	1	Seen	-	Targeted	-
6-Apr-21	T1	N.A	1.354	103.729	742	Bird	*Oriolus chinensis*	Black-naped oriole	3	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.354	103.729	742	Bird	*Aplonis panayensis*	Asian glossy starling	5	Seen	-	Targeted	-
6-Apr-21	T1	N.A	1.354	103.729	742	Bird	*Treron vernans*	Pink-necked green pigeon	6	Seen	-	Targeted	-
6-Apr-21	T1	N.A	1.353	103.731	750	Bird	*Oriolus chinensis*	Black-naped oriole	1	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.353	103.731	750	Bird	*Pycnonotus goiavier*	Yellow-vented bulbul	1	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.353	103.731	750	Bird	*Garrulax leucolophus*	White-crested laughingthrush	3	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.353	103.731	750	Bird	*Aplonis panayensis*	Asian glossy starling	1	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.353	103.731	750	Bird	*Dicrurus paradiseus*	Greater racket-tailed drongo	1	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.353	103.731	753	Bird	*Psittacula alexandri*	Red-breasted parakeet	1	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.353	103.731	753	Bird	*Dinopium javanense*	Common flameback	1	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.353	103.731	753	Bird	*Treron vernans*	Pink-necked green pigeon	2	Seen	-	Targeted	-
6-Apr-21	T1	N.A	1.353	103.731	753	Bird	*Psittacula alexandri*	Red-breasted parakeet	1	Seen	-	Targeted	-
6-Apr-21	T1	N.A	1.353	103.731	753	Bird	*Aplonis panayensis*	Asian glossy starling	1	Seen	-	Targeted	-
6-Apr-21	T1	N.A	1.353	103.731	753	Bird	*Aegithina tiphia*	Common iora	1	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.353	103.731	753	Bird	*Todiramphus chloris*	Collared kingfisher	2	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.353	103.732	758	Bird	*Gallus gallus*	Red junglefowl	1	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.353	103.732	758	Bird	*Acridotheres javanicus*	Javan myna	5	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.353	103.732	802	Bird	*Eudynamys scolopaceus*	Asian koel	1	Seen	-	Targeted	-
6-Apr-21	T1	N.A	1.353	103.732	802	Bird	*Psittacula alexandri*	Red-breasted parakeet	1	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.353	103.732	802	Bird	*Treron vernans*	Pink-necked green pigeon	1	Seen	-	Targeted	-
6-Apr-21	T1	N.A	1.352	103.732	804	Bird	*Oriolus chinensis*	Black-naped oriole	1	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.352	103.732	804	Bird	*Pycnonotus goiavier*	Yellow-vented bulbul	1	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.352	103.732	806	Mammal	*Sus scrofa*	Wild pig	1	Seen	-	Targeted	-
6-Apr-21	T1	N.A	1.352	103.732	806	Bird	*Todiramphus chloris*	Collared kingfisher	2	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.352	103.733	807	Amphibian	*Sylvirana guentheri*	Guenther's frog	1	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.352	103.733	809	Bird	*Zosterops simplex*	Swinhoe's white-eye	3	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.352	103.733	809	Bird	*Oriolus chinensis*	Black-naped oriole	3	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.352	103.733	809	Bird	*Aegithina tiphia*	Common iora	2	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.352	103.733	809	Bird	*Psittacula alexandri*	Red-breasted parakeet	2	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.352	103.733	809	Bird	*Dicaeum cruentatum*	Scarlet-backed flowerpecker	1	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.352	103.733	809	Mammal	*Sus scrofa*	Wild pig	1	Scat	-	Targeted	-
6-Apr-21	T1	N.A	1.352	103.733	809	Bird	*Psittacula alexandri*	Red-breasted parakeet	1	Heard	-	Targeted	-

Date	Route	Aquatic Point	Latitude	Longitude	Time	Taxon	Scientific name	Common name	Qty	Observation type	Photo no.	Survey method	Remarks
6-Apr-21	T1	N.A	1.352	103.734	813	Bird	*Acridotheres javanicus*	Javan myna	1	Seen	-	Targeted	-
6-Apr-21	T1	N.A	1.352	103.734	813	Bird	*Psilopogon lineatus*	Lineated barbet	1	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.352	103.735	815	Bird	*Gerygone sulphurea*	Golden-bellied gerygone	1	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.352	103.735	818	Bird	*Treron vernans*	Pink-necked green pigeon	2	Seen	-	Targeted	-
6-Apr-21	T1	N.A	1.352	103.735	818	Bird	*Pycnonotus goiavier*	Yellow-vented bulbul	3	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.352	103.735	818	Bird	*Oriolus chinensis*	Black-naped oriole	1	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.352	103.735	818	Bird	*Nisaetus cirrhatus*	Changeable hawk-eagle	1	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.352	103.735	818	Bird	*Loriculus galgulus*	Blue-crowned hanging-parrot	1	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.352	103.735	818	Bird	*Psittacula alexandri*	Red-breasted parakeet	1	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.352	103.735	818	Bird	*Acridotheres javanicus*	Javan myna	5	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.352	103.736	822	Bird	*Aegithina tiphia*	Common iora	1	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.352	103.736	822	Bird	*Aplonis panayensis*	Asian glossy starling	5	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.352	103.736	822	Reptile	*Calotes versicolor*	Changeable lizard	1	Seen	-	Targeted	-
6-Apr-21	T1	N.A	1.352	103.736	822	Bird	*Dicrurus paradiseus*	Greater racket-tailed drongo	1	Seen	JT0026	Targeted	On nest
6-Apr-21	T1	N.A	1.352	103.736	822	Bird	*Lalage nigra*	Pied triller	1	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.352	103.736	822	Bird	*Yungipicus moluccensis*	Sunda pygmy woodpecker	1	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.352	103.736	822	Bird	*Todiramphus chloris*	Collared kingfisher	1	Seen	-	Targeted	-
6-Apr-21	T1	N.A	1.352	103.736	826	Reptile	*Eutropis multifasciata*	Many-lined sun skink	1	Seen	-	Targeted	-
6-Apr-21	T1	N.A	1.352	103.736	829	Bird	*Pericrocotus divaricatus*	Ashy minivet	3	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.352	103.736	829	Bird	*Pitta moluccensis*	Blue-winged pitta	2	Heard	JT0029	Targeted	-
6-Apr-21	T1	N.A	1.351	103.737	834	Bird	*Aegithina tiphia*	Common iora	2	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.351	103.737	834	Bird	*Psittacula alexandri*	Red-breasted parakeet	5	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.351	103.737	834	Bird	*Psittacula krameri*	Rose-ringed parakeet	3	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.351	103.737	834	Bird	*Dicaeum cruentatum*	Scarlet-backed flowerpecker	1	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.351	103.737	834	Mammal	*Canis lupus familiaris*	Feral dog	3	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.351	103.736	840	Amphibian	*Sylvirana guentheri*	Guenther's frog	1	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.351	103.736	840	Bird	*Lalage nigra*	Pied triller	1	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.351	103.736	840	Reptile	*Calotes versicolor*	Changeable lizard	1	Seen	-	Targeted	-
6-Apr-21	T1	N.A	1.351	103.736	840	Bird	*Psittacula alexandri*	Red-breasted parakeet	3	Seen	-	Targeted	-
6-Apr-21	T1	N.A	1.350	103.736	843	Bird	*Aplonis panayensis*	Asian glossy starling	10	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.350	103.736	843	Bird	*Picus vittatus*	Laced woodpecker	1	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.350	103.736	843	Bird	*Treron vernans*	Pink-necked green pigeon	3	Seen	-	Targeted	-
6-Apr-21	T1	N.A	1.350	103.736	843	Bird	*Lalage nigra*	Pied triller	1	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.351	103.736	846	Amphibian	*Sylvirana guentheri*	Guenther's frog	1	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.351	103.736	846	Bird	*Loriculus galgulus*	Blue-crowned hanging-parrot	1	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.351	103.736	846	Bird	*Dendronanthus indicus*	Forest wagtail	1	Seen	-	Targeted	-
6-Apr-21	T1	N.A	1.351	103.736	846	Bird	*Lalage nigra*	Pied triller	1	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.351	103.736	846	Bird	*Dinopium javanense*	Common flameback	1	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.351	103.736	846	Bird	*Eurystomus orientalis*	Oriental dollarbird	1	Seen	-	Targeted	-
6-Apr-21	T1	N.A	1.351	103.735	851	Bird	*Nisaetus cirrhatus*	Changeable hawk-eagle	1	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.351	103.735	851	Bird	*Dicrurus paradiseus*	Greater racket-tailed drongo	1	Seen	-	Targeted	-
6-Apr-21	T1	N.A	1.350	103.735	855	Bird	*Anthreptes malacensis*	Brown-throated sunbird	1	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.350	103.735	855	Bird	*Cinnyris jugularis*	Olive-backed sunbird	1	Seen	-	Targeted	-
6-Apr-21	T1	N.A	1.350	103.735	855	Bird	*Orthotomus sutorius*	Common tailorbird	1	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.351	103.734	901	Bird	*Halcyon smyrnensis*	White-throated kingfisher	1	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.351	103.734	901	Bird	*Oriolus chinensis*	Black-naped oriole	1	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.351	103.734	901	Bird	*Psittacula alexandri*	Red-breasted parakeet	1	Heard	-	Targeted	-
6-Apr-21	T1	N.A	1.351	103.734	901	Bird	*Unidentified Apodidae*	-	10	Seen	-	Targeted	-
6-Apr-21	T2	N.A	1.359	103.725	931	Odonate	*Orthetrum sabina*	Variegated green skimmer	1	Seen	-	Incidental	-
6-Apr-21	T2	N.A	1.359	103.725	931	Odonate	*Crocothemis servilia*	Common scarlet	1	Seen	-	Incidental	-
6-Apr-21	T2	N.A	1.359	103.725	931	Odonate	*Lathrecista asiatica*	Scarlet grenadier	1	Seen	-	Incidental	-
6-Apr-21	T2	N.A	1.359	103.726	932	Butterfly	*Danaus chrysippus chrysippus*	Plain tiger	1	Seen	-	Incidental	-
6-Apr-21	T2	N.A	1.359	103.724	949	Odonate	*Neurothemis fluctuans*	Common parasol	1	Seen	-	Targeted	-
6-Apr-21	T2	N.A	1.359	103.724	955	Odonate	*Tholymis tillarga*	White-barred duskhawk	2	Seen	-	Targeted	-
6-Apr-21	T2	N.A	1.359	103.724	955	Odonate	*Orthetrum sabina*	Variegated green skimmer	2	Seen	-	Targeted	-
6-Apr-21	T2	N.A	1.359	103.724	1001	Odonate	*Neurothemis fluctuans*	Common parasol	1	Seen	-	Targeted	-
6-Apr-21	T2	N.A	1.359	103.724	1001	Odonate	*Orthetrum sabina*	Variegated green skimmer	3	Seen	-	Targeted	-
6-Apr-21	T2	N.A	1.359	103.725	1004	Odonate	*Lathrecista asiatica*	Scarlet grenadier	1	Seen	-	Targeted	-

Date	Route	Aquatic Point	Latitude	Longitude	Time	Taxon	Scientific name	Common name	Qty	Observation type	Photo no.	Survey method	Remarks
6-Apr-21	T2	N.A	1.359	103.725	1004	Odonate	*Neurothemis fluctuans*	Common parasol	1	Seen	-	Targeted	-
6-Apr-21	T2	N.A	1.359	103.725	1004	Odonate	*Rhodothemis rufa*	Common redbolt	1	Seen	-	Targeted	-
6-Apr-21	T2	N.A	1.359	103.725	1008	Odonate	*Lathrecista asiatica*	Scarlet grenadier	1	Seen	-	Targeted	-
6-Apr-21	T2	N.A	1.359	103.725	1012	Odonate	*Neurothemis fluctuans*	Common parasol	1	Seen	RS88	Targeted	-
6-Apr-21	T2	N.A	1.359	103.725	1012	Odonate	*Copera marginipes*	Yellow featherlegs	1	Seen	-	Targeted	-
6-Apr-21	T2	N.A	1.359	103.725	1012	Odonate	*Orthetrum testaceum*	Scarlet skimmer	1	Seen	-	Targeted	-
6-Apr-21	T2	N.A	1.359	103.725	1012	Odonate	*Orthetrum chrysis*	Spine-tufted skimmer	1	Seen	RS89	Targeted	-
6-Apr-21	T2	N.A	1.358	103.725	1019	Odonate	*Orthetrum chrysis*	Spine-tufted skimmer	2	Seen	-	Targeted	-
6-Apr-21	T2	N.A	1.358	103.725	1019	Odonate	*Lathrecista asiatica*	Scarlet grenadier	1	Seen	-	Targeted	-
6-Apr-21	T2	N.A	1.358	103.725	1031	Odonate	*Neurothemis fluctuans*	Common parasol	4	Seen	-	Targeted	-
6-Apr-21	T2	N.A	1.358	103.725	1031	Odonate	*Orthetrum chrysis*	Spine-tufted skimmer	3	Seen	-	Targeted	-
6-Apr-21	T2	N.A	1.357	103.724	1041	Odonate	*Agriocnemis femina*	Variable wisp	1	Seen	-	Incidental	-
6-Apr-21	T2	N.A	1.357	103.724	1926	Bird	*Haliaeetus leucogaster*	White-bellied sea eagle	1	Seen	-	Incidental	-
6-Apr-21	T2	N.A	1.360	103.726	1943	Amphibian	*Polypedates leucomystax*	Four-lined tree frog	1	Heard	-	Targeted	-
6-Apr-21	T2	N.A	1.360	103.726	1943	Amphibian	*Sylvirana guentheri*	Guenther's frog	1	Heard	-	Targeted	-
6-Apr-21	T2	N.A	1.360	103.726	1943	Amphibian	*Microhyla heymonsi*	Dark-sided chorus frog	2	Heard	-	Targeted	-
6-Apr-21	T2	N.A	1.360	103.726	1946	Amphibian	*Fejervarya cancrivora*	Crab-eating frog	1	Seen	-	Targeted	-
6-Apr-21	T2	N.A	1.360	103.725	1954	Amphibian	*Fejervarya cancrivora*	Crab-eating frog	1	Seen	-	Targeted	-
6-Apr-21	T2	N.A	1.360	103.725	1955	Bird	*Otus lempiji*	Sunda scops owl	1	Heard	-	Targeted	-
6-Apr-21	T2	N.A	1.360	103.725	1956	Amphibian	*Microhyla heymonsi*	Dark-sided chorus frog	5	Heard	-	Targeted	-
6-Apr-21	T2	N.A	1.360	103.725	1956	Amphibian	*Polypedates leucomystax*	Four-lined tree frog	1	Heard	-	Targeted	-
6-Apr-21	T2	N.A	1.360	103.725	1958	Amphibian	*Sylvirana guentheri*	Guenther's frog	1	Heard	-	Targeted	-
6-Apr-21	T2	N.A	1.360	103.725	2000	Amphibian	*Polypedates leucomystax*	Four-lined tree frog	3	Heard	-	Targeted	-
6-Apr-21	T2	N.A	1.360	103.725	2000	Amphibian	*Microhyla heymonsi*	Dark-sided chorus frog	10	Heard	-	Targeted	-
6-Apr-21	T2	N.A	1.360	103.725	2000	Bird	*Caprimulgus macrurus*	Large-tailed nightjar	3	Seen	-	Targeted	-
6-Apr-21	T2	N.A	1.360	103.725	2005	Reptile	*Dendrelaphis pictus*	Painted bronzeback	1	Seen	-	Targeted	-
6-Apr-21	T2	N.A	1.360	103.724	2007	Amphibian	*Microhyla mukhlesuri*	East Asian ornate chorus frog	10	Heard	-	Targeted	-
6-Apr-21	T2	N.A	1.360	103.724	2007	Amphibian	*Polypedates leucomystax*	Four-lined tree frog	1	Heard	-	Targeted	-
6-Apr-21	T2	N.A	1.360	103.724	2008	Mammal (Bat)	*Cynopterus brachyotis*	Lesser dog-faced fruit bat	4	Seen	-	Targeted	-
6-Apr-21	T2	N.A	1.360	103.724	2008	Amphibian	*Sylvirana guentheri*	Guenther's frog	2	Heard	-	Targeted	-
6-Apr-21	T2	N.A	1.360	103.724	2009	Reptile	*Unidentified Gekkonidae*	-	1	Heard	-	Targeted	-
6-Apr-21	T2	N.A	1.359	103.724	2011	Amphibian	*Microhyla mukhlesuri*	East Asian ornate chorus frog	10	Heard	-	Targeted	-
6-Apr-21	T2	N.A	1.359	103.724	2012	Mammal (Bat)	*Cynopterus brachyotis*	Lesser dog-faced fruit bat	1	Seen	-	Targeted	-
6-Apr-21	T2	N.A	1.359	103.724	2012	Amphibian	*Duttaphrynus melanostictus*	Asian toad	1	Heard	-	Targeted	-
6-Apr-21	T2	N.A	1.359	103.724	2014	Bird	*Caprimulgus macrurus*	Large-tailed nightjar	3	Seen	-	Targeted	-
6-Apr-21	T2	N.A	1.359	103.724	2015	Reptile	*Hemidactylus frenatus*	Spiny-tailed house gecko	1	Seen	-	Targeted	-
6-Apr-21	T2	N.A	1.359	103.724	2015	Amphibian	*Polypedates leucomystax*	Four-lined tree frog	1	Heard	-	Targeted	-
6-Apr-21	T2	N.A	1.359	103.724	2015	Amphibian	*Microhyla heymonsi*	Dark-sided chorus frog	2	Heard	-	Targeted	-
6-Apr-21	T2	N.A	1.359	103.724	2016	Amphibian	*Fejervarya cancrivora*	Crab-eating frog	1	Heard	-	Targeted	-
6-Apr-21	T2	N.A	1.359	103.724	2017	Amphibian	*Fejervarya limnocharis*	Field frog	1	Seen	-	Targeted	-
6-Apr-21	T2	N.A	1.359	103.724	2017	Amphibian	*Microhyla butleri*	Painted chorus frog	2	Heard	-	Targeted	-
6-Apr-21	T2	N.A	1.359	103.724	2017	Amphibian	*Microhyla heymonsi*	Dark-sided chorus frog	10	Heard	-	Targeted	-
6-Apr-21	T2	N.A	1.359	103.724	2017	Amphibian	*Fejervarya cancrivora*	Crab-eating frog	1	Seen	-	Targeted	-
6-Apr-21	T2	N.A	1.359	103.725	2019	Amphibian	*Polypedates leucomystax*	Four-lined tree frog	1	Heard	-	Targeted	-
6-Apr-21	T2	N.A	1.359	103.725	2022	Reptile	*Dendrelaphis pictus*	Painted bronzeback	1	Seen	-	Targeted	-
6-Apr-21	T2	N.A	1.358	103.725	2037	Amphibian	*Fejervarya limnocharis*	Field frog	1	Seen	-	Targeted	-
6-Apr-21	T2	N.A	1.357	103.724	2038	Mammal (Bat)	*Cynopterus brachyotis*	Lesser dog-faced fruit bat	1	Seen	-	Targeted	-
6-Apr-21	T2	N.A	1.357	103.724	2039	Amphibian	*Fejervarya limnocharis*	Field frog	10	Seen	-	Targeted	Tadpoles
6-Apr-21	T2	N.A	1.357	103.724	2039	Amphibian	*Microhyla heymonsi*	Dark-sided chorus frog	10	Heard	-	Targeted	-
6-Apr-21	T2	N.A	1.357	103.724	2041	Fish	*Monopterus albus*	Sunda swamp-eel	1	Seen	-	Targeted	-
6-Apr-21	T3	N.A	1.361	103.711	2123	Reptile	*Dendrelaphis pictus*	Painted bronzeback	1	Seen	-	Incidental	-
6-Apr-21	T3	N.A	1.362	103.709	2131	Reptile	*Hemidactylus frenatus*	Spiny-tailed house gecko	1	Seen	-	Targeted	-
6-Apr-21	T3	N.A	1.363	103.709	2137	Reptile	*Unidentified Gekkonidae*	-	1	Heard	-	Targeted	-
6-Apr-21	T3	N.A	1.361	103.711	2151	Mammal (Bat)	*Cynopterus brachyotis*	Lesser dog-faced fruit bat	1	Seen	-	Targeted	-
6-Apr-21	T3	N.A	1.361	103.711	2151	Amphibian	*Microhyla sp.*	-	20	Seen	-	Targeted	Tadpoles
6-Apr-21	T3	N.A	1.360	103.712	2156	Reptile	*Ahaetulla prasina*	Oriental whip snake	2	Seen	RS95-103	Targeted	-
6-Apr-21	T3	N.A	1.360	103.712	2204	Mammal (Bat)	*Cynopterus brachyotis*	Lesser dog-faced fruit bat	1	Seen	-	Targeted	-
6-Apr-21	T3	N.A	1.360	103.712	2205	Reptile	*Unidentified Gekkonidae*	-	1	Heard	-	Targeted	-

Date	Route	Aquatic Point	Latitude	Longitude	Time	Taxon	Scientific name	Common name	Qty	Observation type	Photo no.	Survey method	Remarks
6-Apr-21	T3	N.A	1.360	103.712	2208	Amphibian	*Sylvirana guentheri*	Guenther's frog	3	Heard	-	Targeted	-
6-Apr-21	T3	N.A	1.360	103.712	2208	Amphibian	*Microhyla heymonsi*	Dark-sided chorus frog	20	Heard	-	Targeted	-
6-Apr-21	T3	N.A	1.360	103.712	2208	Amphibian	*Microhyla mukhlesuri*	East Asian ornate chorus frog	10	Heard	-	Targeted	-
6-Apr-21	T3	N.A	1.360	103.712	2208	Amphibian	*Fejervarya limnocharis*	Field frog	50	Seen	-	Targeted	Tadpoles
6-Apr-21	T3	N.A	1.359	103.713	2208	Reptile	*Dendrelaphis pictus*	Painted bronzeback	1	Seen	RS111-104	Targeted	-
6-Apr-21	T2	N.A	N.A	N.A	0743	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_194343.wa
6-Apr-21	T2	N.A	N.A	N.A	0743	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_194358.wa
6-Apr-21	T2	N.A	N.A	N.A	0744	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_194414.wa
6-Apr-21	T2	N.A	N.A	N.A	0744	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_194429.wa
6-Apr-21	T2	N.A	N.A	N.A	0744	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_194445.wa
6-Apr-21	T2	N.A	N.A	N.A	0744	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_194453.wa
6-Apr-21	T2	N.A	N.A	N.A	0744	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_194459.wa
6-Apr-21	T2	N.A	N.A	N.A	0745	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_194510.wa
6-Apr-21	T2	N.A	N.A	N.A	0745	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_194526.wa
6-Apr-21	T2	N.A	N.A	N.A	0746	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_194615.wa
6-Apr-21	T2	N.A	N.A	N.A	0746	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_194623.wa
6-Apr-21	T2	N.A	N.A	N.A	0754	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_195404.wa
6-Apr-21	T2	N.A	N.A	N.A	0801	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_200144.wa
6-Apr-21	T2	N.A	N.A	N.A	0802	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_200244.wa
6-Apr-21	T2	N.A	N.A	N.A	0803	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_200305.wa
6-Apr-21	T2	N.A	N.A	N.A	0803	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_200324.wa
6-Apr-21	T2	N.A	N.A	N.A	0803	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_200340.wa
6-Apr-21	T2	N.A	N.A	N.A	0803	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_200354.wa
6-Apr-21	T2	N.A	N.A	N.A	0804	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_200408.wa
6-Apr-21	T2	N.A	N.A	N.A	0804	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_200414.wa
6-Apr-21	T2	N.A	N.A	N.A	0804	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_200420.wa
6-Apr-21	T2	N.A	N.A	N.A	0804	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_200424.wa
6-Apr-21	T2	N.A	N.A	N.A	0804	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_200442.wa
6-Apr-21	T2	N.A	N.A	N.A	0804	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_200457.wa
6-Apr-21	T2	N.A	N.A	N.A	0805	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_200512.wa
6-Apr-21	T2	N.A	N.A	N.A	0805	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_200541.wa
6-Apr-21	T2	N.A	N.A	N.A	0805	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_200550.wa
6-Apr-21	T2	N.A	N.A	N.A	0806	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_200606.wa
6-Apr-21	T2	N.A	N.A	N.A	0806	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_200616.wa
6-Apr-21	T2	N.A	N.A	N.A	0806	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_200621.wa
6-Apr-21	T2	N.A	N.A	N.A	0806	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_200637.wa
6-Apr-21	T2	N.A	N.A	N.A	0806	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_200650.wa
6-Apr-21	T2	N.A	N.A	N.A	0807	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_200703.wa
6-Apr-21	T2	N.A	N.A	N.A	0807	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_200710.wa
6-Apr-21	T2	N.A	N.A	N.A	0807	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_200716.wa
6-Apr-21	T2	N.A	N.A	N.A	0807	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_200721.wa
6-Apr-21	T2	N.A	N.A	N.A	0807	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_200752.wa
6-Apr-21	T2	N.A	N.A	N.A	0808	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_200846.wa
6-Apr-21	T2	N.A	N.A	N.A	0811	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_201110.wa
6-Apr-21	T2	N.A	N.A	N.A	0811	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_201125.wa
6-Apr-21	T2	N.A	N.A	N.A	0811	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_201130.wa
6-Apr-21	T2	N.A	N.A	N.A	0811	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_201144.wa
6-Apr-21	T2	N.A	N.A	N.A	0811	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_201154.wa
6-Apr-21	T2	N.A	N.A	N.A	0812	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_201207.wa
6-Apr-21	T2	N.A	N.A	N.A	0812	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_201256.wa
6-Apr-21	T2	N.A	N.A	N.A	0813	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_201312.wa
6-Apr-21	T2	N.A	N.A	N.A	0813	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_201343.wa
6-Apr-21	T2	N.A	N.A	N.A	0814	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_201407.wa
6-Apr-21	T2	N.A	N.A	N.A	0814	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_201426.wa
6-Apr-21	T2	N.A	N.A	N.A	0814	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_201433.wa
6-Apr-21	T2	N.A	N.A	N.A	0814	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_201449.wa
6-Apr-21	T2	N.A	N.A	N.A	0815	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_201512.wa
6-Apr-21	T2	N.A	N.A	N.A	0815	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_201526.wa

Date	Route	Aquatic Point	Latitude	Longitude	Time	Taxon	Scientific name	Common name	Qty	Observation type	Photo no.	Survey method	Remarks
6-Apr-21	T2	N.A	N.A	N.A	0815	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_201531.wa
6-Apr-21	T2	N.A	N.A	N.A	0815	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_201547.wa
6-Apr-21	T2	N.A	N.A	N.A	0816	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_201623.wa
6-Apr-21	T2	N.A	N.A	N.A	0816	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_201633.wa
6-Apr-21	T2	N.A	N.A	N.A	0816	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_201645.wa
6-Apr-21	T2	N.A	N.A	N.A	0817	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_201706.wa
6-Apr-21	T2	N.A	N.A	N.A	0817	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_201746.wa
6-Apr-21	T2	N.A	N.A	N.A	0817	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_201755.wa
6-Apr-21	T2	N.A	N.A	N.A	0818	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_201802.wa
6-Apr-21	T2	N.A	N.A	N.A	0818	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_201830.wa
6-Apr-21	T2	N.A	N.A	N.A	0818	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_201847.wa
6-Apr-21	T2	N.A	N.A	N.A	0818	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_201852.wa
6-Apr-21	T2	N.A	N.A	N.A	0819	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_201908.wa
6-Apr-21	T2	N.A	N.A	N.A	0819	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_201920.wa
6-Apr-21	T2	N.A	N.A	N.A	0819	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_201936.wa
6-Apr-21	T2	N.A	N.A	N.A	0819	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_201951.wa
6-Apr-21	T2	N.A	N.A	N.A	0820	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_202009.wa
6-Apr-21	T2	N.A	N.A	N.A	0820	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_202025.wa
6-Apr-21	T2	N.A	N.A	N.A	0820	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_202030.wa
6-Apr-21	T2	N.A	N.A	N.A	0820	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_202036.wa
6-Apr-21	T2	N.A	N.A	N.A	0820	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_202051.wa
6-Apr-21	T2	N.A	N.A	N.A	0821	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_202103.wa
6-Apr-21	T2	N.A	N.A	N.A	0821	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_202123.wa
6-Apr-21	T2	N.A	N.A	N.A	0821	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_202135.wa
6-Apr-21	T2	N.A	N.A	N.A	0821	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_202150.wa
6-Apr-21	T2	N.A	N.A	N.A	0822	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_202205.wa
6-Apr-21	T2	N.A	N.A	N.A	0822	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_202214.wa
6-Apr-21	T2	N.A	N.A	N.A	0822	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_202221.wa
6-Apr-21	T2	N.A	N.A	N.A	0822	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_202229.wa
6-Apr-21	T2	N.A	N.A	N.A	0822	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_202236.wa
6-Apr-21	T2	N.A	N.A	N.A	0822	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_202247.wa
6-Apr-21	T2	N.A	N.A	N.A	0823	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_202320.wa
6-Apr-21	T2	N.A	N.A	N.A	0823	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_202325.wa
6-Apr-21	T2	N.A	N.A	N.A	0823	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_202333.wa
6-Apr-21	T2	N.A	N.A	N.A	0823	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_202344.wa
6-Apr-21	T2	N.A	N.A	N.A	0823	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_202356.wa
6-Apr-21	T2	N.A	N.A	N.A	0824	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_202403.wa
6-Apr-21	T2	N.A	N.A	N.A	0824	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_202424.wa
6-Apr-21	T2	N.A	N.A	N.A	0824	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_202436.wa
6-Apr-21	T2	N.A	N.A	N.A	0824	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_202452.wa
6-Apr-21	T2	N.A	N.A	N.A	0826	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_202647.wa
6-Apr-21	T2	N.A	N.A	N.A	0826	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_202659.wa
6-Apr-21	T2	N.A	N.A	N.A	0827	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_202707.wa
6-Apr-21	T2	N.A	N.A	N.A	0827	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_202721.wa
6-Apr-21	T2	N.A	N.A	N.A	0827	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_202729.wa
6-Apr-21	T2	N.A	N.A	N.A	0827	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_202739.wa
6-Apr-21	T2	N.A	N.A	N.A	0827	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_202750.wa
6-Apr-21	T2	N.A	N.A	N.A	0828	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_202840.wa
6-Apr-21	T2	N.A	N.A	N.A	0832	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_203202.wa
6-Apr-21	T2	N.A	N.A	N.A	0832	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_203234.wa
6-Apr-21	T2	N.A	N.A	N.A	0835	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_203515.wa
6-Apr-21	T2	N.A	N.A	N.A	0835	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_203546.wa
6-Apr-21	T2	N.A	N.A	N.A	0836	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_203602.wa
6-Apr-21	T2	N.A	N.A	N.A	0836	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_203613.wa
6-Apr-21	T2	N.A	N.A	N.A	0836	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_203624.wa
6-Apr-21	T2	N.A	N.A	N.A	0836	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_203633.wa
6-Apr-21	T2	N.A	N.A	N.A	0836	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_203643.wa
6-Apr-21	T2	N.A	N.A	N.A	0836	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_203656.wa

Date	Route	Aquatic Point	Latitude	Longitude	Time	Taxon	Scientific name	Common name	Qty	Observation type	Photo no.	Survey method	Remarks
6-Apr-21	T2	N.A	N.A	N.A	0837	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_203715.wa
6-Apr-21	T2	N.A	N.A	N.A	0837	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_203736.wa
6-Apr-21	T2	N.A	N.A	N.A	0838	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_203827.wa
6-Apr-21	T2	N.A	N.A	N.A	0838	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_203837.wa
6-Apr-21	T2	N.A	N.A	N.A	0838	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_203846.wa
6-Apr-21	T2	N.A	N.A	N.A	0839	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_203900.wa
6-Apr-21	T2	N.A	N.A	N.A	0839	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_203912.wa
6-Apr-21	T2	N.A	N.A	N.A	0839	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_203928.wa
6-Apr-21	T2	N.A	N.A	N.A	0839	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_203944.wa
6-Apr-21	T2	N.A	N.A	N.A	0840	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_204000.wa
6-Apr-21	T2	N.A	N.A	N.A	0840	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_204015.wa
6-Apr-21	T2	N.A	N.A	N.A	0840	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_204026.wa
6-Apr-21	T2	N.A	N.A	N.A	0840	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_204041.wa
6-Apr-21	T2	N.A	N.A	N.A	0840	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_204047.wa
6-Apr-21	T2	N.A	N.A	N.A	0840	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_204052.wa
6-Apr-21	T2	N.A	N.A	N.A	0841	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_204102.wa
6-Apr-21	T2	N.A	N.A	N.A	0841	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_204112.wa
6-Apr-21	T2	N.A	N.A	N.A	0841	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_204120.wa
6-Apr-21	T2	N.A	N.A	N.A	0841	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_204125.wa
6-Apr-21	T2	N.A	N.A	N.A	0841	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_204140.wa
6-Apr-21	T2	N.A	N.A	N.A	0841	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_204145.wa
6-Apr-21	T2	N.A	N.A	N.A	0842	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_204200.wa
6-Apr-21	T3	N.A	N.A	N.A	0937	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210406_213702.wa
7-Apr-21	D4	N.A	1.353	103.731	921	Odonate	*Copera marginipes*	Yellow featherlegs	1	Seen	-	Incidental	-
7-Apr-21	D4	N.A	1.354	103.731	934	Odonate	*Copera marginipes*	Yellow featherlegs	1	Seen	-	Incidental	-
7-Apr-21	D4	N.A	1.351	103.734	1008	Odonate	*Lathrecista asiatica*	Scarlet grenadier	1	Seen	-	Incidental	-
7-Apr-21	D4	N.A	1.351	103.734	1008	Odonate	*Agrionoptera insignis*	Grenadier	1	Seen	-	Incidental	-
7-Apr-21	D4	D4_02	1.354	103.731	0923-0928	Odonate	*Copera marginipes*	Yellow featherlegs	2	Seen	-	Targeted	-
7-Apr-21	D4	D4_03	1.354	103.732	0939-0944	Odonate	*Copera marginipes*	Yellow featherlegs	2	Seen	JT0030	Targeted	Mating pair
7-Apr-21	D4	D4_03	1.354	103.732	0939-0944	Odonate	*Tholymis tillarga*	White-barred duskhawk	1	Seen	-	Targeted	-
7-Apr-21	D6	D6_Pond	1.352	103.734	1015-1020	Odonate	*Brachydiplax chalybea*	Blue dasher	3	Seen	-	Targeted	-
7-Apr-21	D6	D6_Pond	1.352	103.734	1015-1020	Odonate	*Pseudagrion microcephalum*	Blue sprite	1	Seen	-	Targeted	-
7-Apr-21	D6	D6_Pond	1.352	103.734	1015-1020	Odonate	*Lathrecista asiatica*	Scarlet grenadier	2	Seen	-	Targeted	-
7-Apr-21	D6	D6_Pond	1.352	103.734	1015-1020	Odonate	*Neurothemis fluctuans*	Common parasol	1	Seen	-	Targeted	-
7-Apr-21	D5	D5_06	1.352	103.737	1043-1048	Odonate	*Pseudagrion microcephalum*	Blue sprite	7	Seen	-	Targeted	-
7-Apr-21	D5	D5_06	1.352	103.737	1043-1048	Bird	*Pitta moluccensis*	Blue-winged pitta	1	Seen	-	Incidental	-
7-Apr-21	D5	D5_05	1.351	103.736	1108-1113	Odonate	*Pseudagrion microcephalum*	Blue sprite	10	Seen	-	Targeted	2 mating pairs
7-Apr-21	D5	D5_04	1.351	103.736	1126-1131	Odonate	*Pseudagrion microcephalum*	Blue sprite	12	Seen	-	Targeted	-
7-Apr-21	D5	D5_03	1.351	103.736	1137-1142	Odonate	*Pseudagrion microcephalum*	Blue sprite	7	Seen	-	Targeted	-
7-Apr-21	D5	D5_02	1.350	103.735	1152-1157	Odonate	*Pseudagrion microcephalum*	Blue sprite	7	Seen	-	Targeted	-
7-Apr-21	D5	D5_01	1.350	103.734	1206-1211	Odonate	*Crocothemis servilia*	Common scarlet	15	Seen	-	Targeted	-
7-Apr-21	D5	D5_01	1.350	103.734	1206-1211	Odonate	*Neurothemis fluctuans*	Common parasol	3	Seen	-	Targeted	-
7-Apr-21	D5	D5_01	1.350	103.734	1206-1211	Odonate	*Brachydiplax chalybea*	Blue dasher	8	Seen	-	Targeted	-
7-Apr-21	D5	D5_01	1.350	103.734	1206-1211	Odonate	*Pseudagrion microcephalum*	Blue sprite	1	Seen	-	Targeted	-
7-Apr-21	D5	D5_01	1.350	103.734	1206-1211	Odonate	*Anax sp.*	-	1	Seen	-	Targeted	-
7-Apr-21	D5	D5_01	1.350	103.734	1206-1211	Odonate	*Rhyothemis phyllis*	Yellow-barred flutterer	1	Seen	-	Targeted	-
13-Apr-21	T3	N.A	1.362	103.710	738	Bird	*Dicaeum cruentatum*	Scarlet-backed flowerpecker	1	Heard	-	Targeted	-
13-Apr-21	T3	N.A	1.362	103.710	739	Bird	*Aplonis panayensis*	Asian glossy starling	1	Heard	-	Targeted	-
13-Apr-21	T3	N.A	1.362	103.710	739	Bird	*Acridotheres javanicus*	Javan myna	1	Heard	-	Targeted	-
13-Apr-21	T3	N.A	1.362	103.710	741	Bird	*Treron vernans*	Pink-necked green pigeon	1	Seen	-	Targeted	-
13-Apr-21	T3	N.A	1.362	103.710	741	Bird	*Dicaeum cruentatum*	Scarlet-backed flowerpecker	1	Seen	-	Targeted	-
13-Apr-21	T3	N.A	1.361	103.710	746	Bird	*Acridotheres javanicus*	Javan myna	3	Seen	-	Targeted	-
13-Apr-21	T3	N.A	1.361	103.710	746	Bird	*Dicaeum cruentatum*	Scarlet-backed flowerpecker	1	Heard	-	Targeted	-
13-Apr-21	T3	N.A	1.361	103.710	746	Bird	*Oriolus chinensis*	Black-naped oriole	1	Seen	-	Targeted	-
13-Apr-21	T3	N.A	1.361	103.710	746	Bird	*Aerodramus sp.*	-	1	Seen	-	Targeted	-
13-Apr-21	T3	N.A	1.361	103.710	750	Bird	*Todiramphus chloris*	Collared kingfisher	1	Heard	-	Targeted	-
13-Apr-21	T3	N.A	1.361	103.711	753	Bird	*Todiramphus chloris*	Collared kingfisher	1	Heard	-	Targeted	-
13-Apr-21	T3	N.A	1.361	103.711	753	Bird	*Oriolus chinensis*	Black-naped oriole	1	Heard	-	Targeted	-

Date	Route	Aquatic Point	Latitude	Longitude	Time	Taxon	Scientific name	Common name	Qty	Observation type	Photo no.	Survey method	Remarks
13-Apr-21	T3	N.A	1.361	103.711	753	Bird	*Dicaeum cruentatum*	Scarlet-backed flowerpecker	1	Heard	-	Targeted	-
13-Apr-21	T3	N.A	1.360	103.711	758	Bird	*Aplonis panayensis*	Asian glossy starling	1	Heard	-	Targeted	-
13-Apr-21	T3	N.A	1.360	103.712	801	Mammal	*Callosciurus notatus*	Plantain squirrel	1	Seen	-	Incidental	-
13-Apr-21	T3	N.A	1.360	103.712	801	Bird	*Acridotheres javanicus*	Javan myna	1	Heard	-	Targeted	-
13-Apr-21	T3	N.A	1.360	103.712	801	Bird	*Cinnyris jugularis*	Olive-backed sunbird	1	Heard	-	Targeted	-
13-Apr-21	T3	N.A	1.360	103.712	801	Bird	*Treron vernans*	Pink-necked green pigeon	1	Seen	-	Targeted	-
13-Apr-21	T3	N.A	1.360	103.712	801	Bird	*Dicaeum cruentatum*	Scarlet-backed flowerpecker	1	Heard	-	Targeted	-
13-Apr-21	T3	N.A	1.360	103.712	804	Bird	*Oriolus chinensis*	Black-naped oriole	1	Heard	-	Targeted	-
13-Apr-21	T3	N.A	1.360	103.712	805	Bird	*Dicaeum cruentatum*	Scarlet-backed flowerpecker	1	Heard	-	Targeted	-
13-Apr-21	T3	N.A	1.359	103.712	811	Bird	*Aplonis panayensis*	Asian glossy starling	1	Heard	-	Targeted	-
13-Apr-21	T3	N.A	1.359	103.713	813	Bird	*Acridotheres javanicus*	Javan myna	1	Heard	-	Targeted	-
13-Apr-21	T3	N.A	1.359	103.713	815	Bird	*Dicaeum cruentatum*	Scarlet-backed flowerpecker	1	Heard	-	Targeted	-
13-Apr-21	T3	N.A	1.359	103.713	817	Butterfly	*Hypolimnas bolina bolina*	Great eggfly	1	Seen	-	Targeted	Inci
13-Apr-21	T3	N.A	1.359	103.713	822	Bird	*Treron vernans*	Pink-necked green pigeon	2	Seen	-	Targeted	-
13-Apr-21	T3	N.A	1.359	103.713	822	Bird	*Aerodramus sp.*	-	1	Heard	-	Targeted	-
13-Apr-21	T3	N.A	1.358	103.713	823	Bird	*Gallus gallus*	Red junglefowl	1	Heard	-	Targeted	-
13-Apr-21	T3	N.A	1.358	103.713	825	Mammal	*Sus scrofa*	Wild pig	1	Scat	-	Targeted	-
13-Apr-21	T3	N.A	1.358	103.713	825	Bird	*Treron vernans*	Pink-necked green pigeon	1	Seen	-	Incidental	-
13-Apr-21	T3	N.A	1.358	103.714	827	Bird	*Garrulax leucolophus*	White-crested laughingthrush	1	Heard	-	Targeted	-
13-Apr-21	T3	N.A	1.358	103.714	831	Bird	*Acridotheres javanicus*	Javan myna	1	Heard	-	Targeted	-
13-Apr-21	T3	N.A	1.358	103.714	832	Bird	*Corvus splendens*	House crow	4	Seen	-	Targeted	-
13-Apr-21	T3	N.A	1.358	103.714	832	Bird	*Pycnonotus goiavier*	Yellow-vented bulbul	1	Seen	-	Targeted	-
13-Apr-21	T2	N.A	1.359	103.725	2012	Fish	*Anabas testudineus*	Oriental climbing perch	1	Seen	-	Incidental	Juvenile, in puddle near to hoarding
13-Apr-21	T2	N.A	1.359	103.725	2012	Fish	*Rhinogobius similis*	Oriental river-goby	2	Seen	-	Incidental	In puddle near hoarding
14-Apr-21	D2	D2_01	1.357	103.724	856	Fish	*Trichopsis vittata*	Croaking gouramy	2	Caught	SG478-SG482	Trapping	Fish trap
14-Apr-21	T2	N.A	1.360	103.724	906	Bird	Pelargopsis capensis	Stork-billed kingfisher	1	Seen	SG483	Incidental	-
15-Apr-21	T2	N.A	1.357	103.724	821	Bird	*Haliaeetus ichthyaetus*	Grey-headed fish eagle	1	Seen	VS578, 604	Incidental	Perching on canal, possibly foraging. Present even at end of survey
15-Apr-21	T2	N.A	1.359	103.724	827	Bird	*Pernis ptilorhynchus*	Crested honey-buzzard	1	Seen	-	Incidental	-
15-Apr-21	T2	N.A	1.359	103.724	828	Bird	*Chrysococcyx minutillus*	Little bronze-cuckoo	1	Heard	-	Incidental	-
15-Apr-21	T2	N.A	1.360	103.726	834	Bird	*Acridotheres javanicus*	Javan myna	1	Seen	-	Targeted	-
15-Apr-21	T2	N.A	1.360	103.726	834	Bird	*Pycnonotus goiavier*	Yellow-vented bulbul	1	Heard	-	Targeted	-
15-Apr-21	T2	N.A	1.360	103.726	834	Bird	*Orthotomus sutorius*	Common tailorbird	1	Heard	-	Targeted	-
15-Apr-21	T2	N.A	1.360	103.726	834	Bird	*Aegithina tiphia*	Common iora	2	Heard	-	Targeted	-
15-Apr-21	T2	N.A	1.360	103.726	834	Bird	*Aplonis panayensis*	Asian glossy starling	16	Seen	-	Targeted	-
15-Apr-21	T2	N.A	1.360	103.726	835	Bird	*Dicaeum cruentatum*	Scarlet-backed flowerpecker	1	Seen	-	Targeted	-
15-Apr-21	T2	N.A	1.360	103.726	835	Bird	*Treron vernans*	Pink-necked green pigeon	10	Seen	-	Targeted	-
15-Apr-21	T2	N.A	1.360	103.726	836	Bird	*Acridotheres javanicus*	Javan myna	3	Seen	-	Targeted	-
15-Apr-21	T2	N.A	1.360	103.726	836	Bird	*Todiramphus chloris*	Collared kingfisher	1	Heard	-	Targeted	-
15-Apr-21	T2	N.A	1.360	103.726	836	Bird	*Loriculus galgulus*	Blue-crowned hanging-parrot	1	Heard	-	Targeted	-
15-Apr-21	T2	N.A	1.360	103.726	837	Bird	*Psilopogon haemacephalus*	Coppersmith barbet	1	Heard	-	Targeted	-
15-Apr-21	T2	N.A	1.360	103.726	837	Bird	*Prinia flaviventris*	Yellow-bellied prinia	1	Heard	-	Targeted	-
15-Apr-21	T2	N.A	1.360	103.726	838	Bird	*Orthotomus atrogularis*	Dark-necked tailorbird	1	Heard	-	Targeted	-
15-Apr-21	T2	N.A	1.360	103.726	839	Bird	*Anthreptes malacensis*	Brown-throated sunbird	1	Heard	-	Targeted	-
15-Apr-21	T2	N.A	1.360	103.726	839	Bird	*Pycnonotus goiavier*	Yellow-vented bulbul	1	Heard	-	Targeted	-
15-Apr-21	T2	N.A	1.360	103.726	839	Bird	*Orthotomus atrogularis*	Dark-necked tailorbird	1	Heard	-	Targeted	-
15-Apr-21	T2	N.A	1.360	103.725	844	Bird	*Copsychus saularis*	Oriental magpie-robin	1	Heard	-	Targeted	-
15-Apr-21	T2	N.A	1.360	103.725	845	Bird	*Acridotheres javanicus*	Javan myna	1	Heard	-	Targeted	-
15-Apr-21	T2	N.A	1.360	103.725	846	Bird	*Oriolus chinensis*	Black-naped oriole	2	Heard	-	Targeted	-
15-Apr-21	T2	N.A	1.360	103.725	847	Bird	*Pycnonotus goiavier*	Yellow-vented bulbul	1	Heard	-	Targeted	-
15-Apr-21	T2	N.A	1.360	103.725	847	Bird	*Aegithina tiphia*	Common iora	1	Heard	-	Targeted	-
15-Apr-21	T2	N.A	1.360	103.725	847	Bird	*Anthreptes malacensis*	Brown-throated sunbird	1	Heard	-	Targeted	-
15-Apr-21	T2	N.A	1.360	103.725	848	Bird	*Psittacula alexandri*	Red-breasted parakeet	1	Heard	-	Targeted	-

Date	Route	Aquatic Point	Latitude	Longitude	Time	Taxon	Scientific name	Common name	Qty	Observation type	Photo no.	Survey method	Remarks
15-Apr-21	T2	N.A	1.360	103.725	848	Bird	*Oriolus chinensis*	Black-naped oriole	2	Heard	-	Targeted	-
15-Apr-21	T2	N.A	1.360	103.725	850	Bird	*Spilopelia chinensis*	Spotted dove	1	Heard	-	Targeted	-
15-Apr-21	T2	N.A	1.360	103.725	852	Bird	*Psilopogon lineatus*	Lineated barbet	1	Heard	-	Targeted	-
15-Apr-21	T2	N.A	1.360	103.725	853	Bird	*Rhipidura javanica*	Malaysian pied fantail	1	Heard	-	Targeted	-
15-Apr-21	T2	N.A	1.360	103.725	853	Bird	*Chrysococcyx minutillus*	Little bronze-cuckoo	1	Heard	-	Targeted	-
15-Apr-21	T2	N.A	1.360	103.725	854	Bird	*Aplonis panayensis*	Asian glossy starling	1	Heard	-	Targeted	-
15-Apr-21	T2	N.A	1.360	103.725	854	Bird	*Pycnonotus goiavier*	Yellow-vented bulbul	1	Heard	-	Targeted	-
15-Apr-21	T2	N.A	1.360	103.725	854	Bird	*Aerodramus sp.*	-	*2*	Seen	-	Targeted	-
15-Apr-21	T2	N.A	1.360	103.724	855	Bird	*Psittacula alexandri*	Red-breasted parakeet	1	Heard	-	Targeted	-
15-Apr-21	T2	N.A	1.360	103.724	855	Bird	*Treron vernans*	Pink-necked green pigeon	1	Heard	-	Targeted	-
15-Apr-21	T2	N.A	1.360	103.724	856	Bird	*Aegithina tiphia*	Common iora	1	Heard	-	Targeted	-
15-Apr-21	T2	N.A	1.360	103.724	856	Bird	*Orthotomus sutorius*	Common tailorbird	1	Heard	-	Targeted	-
15-Apr-21	T2	N.A	1.360	103.724	857	Bird	*Orthotomus atrogularis*	Dark-necked tailorbird	1	Heard	-	Targeted	-
15-Apr-21	T2	N.A	1.359	103.724	858	Bird	*Picus vittatus*	Laced woodpecker	1	Heard	-	Targeted	-
15-Apr-21	T2	N.A	1.359	103.724	900	Bird	*Cinnyris jugularis*	Olive-backed sunbird	1	Heard	-	Targeted	-
15-Apr-21	T2	N.A	1.359	103.724	901	Bird	*Acridotheres javanicus*	Javan myna	2	Seen	-	Targeted	-
15-Apr-21	T2	N.A	1.359	103.724	902	Bird	*Pycnonotus plumosus*	Olive-winged bulbul	1	Heard	-	Targeted	-
15-Apr-21	T2	N.A	1.359	103.724	902	Bird	*Gallus gallus*	Red junglefowl	1	Heard	-	Targeted	-
15-Apr-21	T2	N.A	1.359	103.724	902	Bird	*Mixornis gularis*	Pin-striped tit-babbler	1	Heard	-	Targeted	-
15-Apr-21	T2	N.A	1.359	103.724	902	Bird	*Treron vernans*	Pink-necked green pigeon	13	Seen	-	Targeted	-
15-Apr-21	T2	N.A	1.359	103.724	902	Bird	*Anthreptes malacensis*	Brown-throated sunbird	1	Heard	-	Targeted	-
15-Apr-21	T2	N.A	1.359	103.724	902	Bird	*Todiramphus chloris*	Collared kingfisher	1	Heard	-	Targeted	-
15-Apr-21	T2	N.A	1.359	103.724	903	Bird	*Oriolus chinensis*	Black-naped oriole	3	Seen	-	Targeted	-
15-Apr-21	T2	N.A	1.359	103.724	903	Bird	*Acridotheres javanicus*	Javan myna	6	Seen	-	Targeted	-
15-Apr-21	T2	N.A	1.359	103.724	904	Bird	*Psittacula alexandri*	Red-breasted parakeet	1	Heard	-	Targeted	-
15-Apr-21	T2	N.A	1.359	103.724	904	Bird	*Dicaeum cruentatum*	Scarlet-backed flowerpecker	1	Heard	-	Targeted	-
15-Apr-21	T2	N.A	1.359	103.724	905	Bird	*Treron vernans*	Pink-necked green pigeon	4	Seen	-	Targeted	-
15-Apr-21	T2	N.A	1.359	103.724	905	Bird	*Psilopogon lineatus*	Lineated barbet	1	Heard	-	Targeted	-
15-Apr-21	T2	N.A	1.359	103.724	905	Bird	*Pycnonotus goiavier*	Yellow-vented bulbul	2	Seen	-	Targeted	-
15-Apr-21	T2	N.A	1.359	103.724	907	Bird	*Psittacula krameri*	Rose-ringed parakeet	1	Seen	-	Targeted	-
15-Apr-21	T2	N.A	1.359	103.724	907	Bird	*Aerodramus sp.*	-	8	Seen	-	Targeted	-
15-Apr-21	T2	N.A	1.359	103.724	907	Bird	*Halcyon smyrnensis*	White-throated kingfisher	1	Heard	-	Targeted	-
15-Apr-21	T2	N.A	1.359	103.724	908	Bird	*Merops viridis*	Blue-throated bee-eater	1	Seen	-	Targeted	-
15-Apr-21	T2	N.A	1.359	103.724	908	Bird	*Psilopogon lineatus*	Lineated barbet	1	Seen	-	Targeted	-
15-Apr-21	T2	N.A	1.359	103.724	909	Bird	*Dicaeum cruentatum*	Scarlet-backed flowerpecker	3	Heard	-	Targeted	-
15-Apr-21	T2	N.A	1.359	103.724	909	Bird	*Orthotomus atrogularis*	Dark-necked tailorbird	1	Heard	-	Targeted	-
15-Apr-21	T2	N.A	1.359	103.724	909	Bird	*Treron vernans*	Pink-necked green pigeon	5	Seen	-	Targeted	-
15-Apr-21	T2	N.A	1.359	103.724	909	Bird	*Cacomantis merulinus*	Plaintive cuckoo	1	Heard	-	Targeted	-
15-Apr-21	T2	N.A	1.359	103.724	909	Bird	*Psittacula alexandri*	Red-breasted parakeet	1	Seen	-	Targeted	-
15-Apr-21	T2	N.A	1.359	103.724	911	Bird	*Cinnyris jugularis*	Olive-backed sunbird	1	Heard	-	Targeted	-
15-Apr-21	T2	N.A	1.359	103.724	911	Bird	*Treron vernans*	Pink-necked green pigeon	2	Seen	-	Targeted	-
15-Apr-21	T2	N.A	1.358	103.725	920	Bird	*Todiramphus chloris*	Collared kingfisher	1	Heard	-	Targeted	-
15-Apr-21	T2	N.A	1.358	103.725	925	Bird	*Merops viridis*	Blue-throated bee-eater	2	Seen	-	Targeted	-
15-Apr-21	T2	N.A	1.358	103.725	925	Bird	*Dicaeum cruentatum*	Scarlet-backed flowerpecker	1	Seen	-	Targeted	-
15-Apr-21	T2	N.A	1.358	103.725	925	Bird	*Psittacula alexandri*	Red-breasted parakeet	1	Heard	-	Targeted	-
15-Apr-21	T2	N.A	1.358	103.725	925	Bird	*Aegithina tiphia*	Common iora	1	Heard	-	Targeted	-
15-Apr-21	T2	N.A	1.358	103.725	926	Bird	*Gallus gallus*	Red junglefowl	1	Heard	-	Targeted	-
15-Apr-21	T2	N.A	1.358	103.725	926	Bird	*Corvus splendens*	House crow	1	Seen	-	Targeted	-
15-Apr-21	T2	N.A	1.358	103.725	926	Bird	*Oriolus chinensis*	Black-naped oriole	3	Seen	-	Targeted	-
15-Apr-21	T2	N.A	1.357	103.724	928	Bird	*Psittacula longicauda*	Long-tailed parakeet	1	Seen	-	Targeted	-
15-Apr-21	T2	N.A	1.357	103.724	928	Bird	*Aplonis panayensis*	Asian glossy starling	6	Seen	-	Targeted	-
15-Apr-21	T2	N.A	1.357	103.724	930	Bird	*Copsychus saularis*	Oriental magpie-robin	1	Heard	-	Targeted	-
15-Apr-21	T2	N.A	1.357	103.724	930	Bird	*Pycnonotus plumosus*	Olive-winged bulbul	1	Heard	-	Targeted	-
15-Apr-21	T2	N.A	1.357	103.724	932	Bird	*Eurystomus orientalis*	Oriental dollarbird	1	Seen	-	Targeted	-
15-Apr-21	T3	N.A	1.358	103.713	1001	Bird	*Collocalia affinis*	Plume-toed swiftlet	2	Seen	-	Incidental	-
15-Apr-21	T3	N.A	1.360	103.711	1007	Bird	*Collocalia affinis*	Plume-toed swiftlet	3	Seen	-	Incidental	-
15-Apr-21	T3	N.A	1.363	103.709	1018	Aculeate hymenopteran	*Ropalidia sumatrae*	NA	1	Nest	CT8257	Incidental	-
15-Apr-21	T3	N.A	1.363	103.709	1021	Butterfly	*Delias hyparete metarete*	Painted jezebel	1	Seen	-	Targeted	-

Date	Route	Aquatic Point	Latitude	Longitude	Time	Taxon	Scientific name	Common name	Qty	Observation type	Photo no.	Survey method	Remarks
15-Apr-21	T3	N.A	1.362	103.709	1026	Butterfly	*Iambrix salsala salsala*	Chestnut bob	1	Seen	-	Targeted	Feeding on Bidens pilosa
15-Apr-21	T3	N.A	1.362	103.709	1026	Odonate	*Neurothemis fluctuans*	Common parasol	1	Seen	-	Targeted	-
15-Apr-21	T3	N.A	1.362	103.709	1028	Aculeate hymenopteran	*Ropalidia sumatrae*	NA	2	Seen	-	Targeted	-
15-Apr-21	T3	N.A	1.362	103.709	1028	Butterfly	*Delias hyparete metarete*	Painted jezebel	1	Seen	-	Targeted	-
15-Apr-21	T3	N.A	1.362	103.710	1033	Butterfly	*Junonia hedonia ida*	Chocolate pansy	1	Seen	-	Targeted	-
15-Apr-21	T3	N.A	1.362	103.710	1034	Aculeate hymenopteran	*Xylocopa latipes*	Broad-handed carpenter bee	1	Seen	-	Targeted	-
15-Apr-21	T3	N.A	1.362	103.710	1035	Aculeate hymenopteran	*Ropalidia sumatrae*	NA	1	Seen	-	Targeted	-
15-Apr-21	T3	N.A	1.362	103.710	1035	Aculeate hymenopteran	*Xylocopa latipes*	Broad-handed carpenter bee	2	Seen	-	Targeted	-
15-Apr-21	T3	N.A	1.362	103.710	1035	Butterfly	*Delias hyparete metarete*	Painted jezebel	1	Seen	-	Targeted	-
15-Apr-21	T3	N.A	1.362	103.710	1040	Butterfly	*Delias hyparete metarete*	Painted jezebel	1	Seen	-	Targeted	-
15-Apr-21	T3	N.A	1.361	103.710	1046	Butterfly	*Delias hyparete metarete*	Painted jezebel	1	Seen	-	Targeted	-
15-Apr-21	T3	N.A	1.361	103.710	1046	Butterfly	*Junonia hedonia ida*	Chocolate pansy	1	Seen	-	Targeted	-
15-Apr-21	T3	N.A	1.361	103.710	1049	Odonate	*Orthetrum chrysis*	Spine-tufted skimmer	2	Seen	-	Targeted	-
15-Apr-21	T3	N.A	1.361	103.710	1049	Butterfly	*Delias hyparete metarete*	Painted jezebel	1	Seen	-	Targeted	-
15-Apr-21	T3	N.A	1.361	103.711	1055	Butterfly	*Junonia hedonia ida*	Chocolate pansy	1	Seen	-	Targeted	-
15-Apr-21	T3	N.A	1.361	103.711	1059	Butterfly	*Junonia hedonia ida*	Chocolate pansy	1	Seen	-	Targeted	-
15-Apr-21	T3	N.A	1.361	103.711	1059	Butterfly	*Prosotas dubiosa lumpura*	Tailless line blue	1	Seen	-	Targeted	-
15-Apr-21	T3	N.A	1.361	103.711	1101	Butterfly	*Delias hyparete metarete*	Painted jezebel	1	Seen	-	Targeted	-
15-Apr-21	T3	N.A	1.361	103.711	1101	Aculeate hymenopteran	*Ropalidia stigma*	NA	1	Seen	-	Targeted	-
15-Apr-21	T3	N.A	1.361	103.711	1102	Butterfly	*Potanthus omaha omaha*	Lesser dart	1	Seen	CT8263	Targeted	-
15-Apr-21	T3	N.A	1.361	103.711	1103	Butterfly	*Leptosia nina malayana*	Psyche	1	Seen	-	Targeted	-
15-Apr-21	T3	N.A	1.360	103.711	1104	Odonate	*Neurothemis fluctuans*	Common parasol	1	Seen	-	Targeted	-
15-Apr-21	T3	N.A	1.360	103.711	1105	Aculeate hymenopteran	*Parischnogaster nigricans*	NA	2	Seen	CT8265	Targeted	-
15-Apr-21	T3	N.A	1.360	103.711	1110	Reptile	*Hemidactylus frenatus*	Spiny-tailed house gecko	1	Seen	CT8267	Incidental	-
15-Apr-21	T3	N.A	1.360	103.711	1111	Butterfly	*Junonia hedonia ida*	Chocolate pansy	2	Seen	-	Targeted	-
15-Apr-21	T3	N.A	1.360	103.711	1111	Butterfly	*Prosotas dubiosa lumpura*	Tailless line blue	5	Seen	-	Targeted	-
15-Apr-21	T3	N.A	1.359	103.712	1127	Odonate	*Gynacantha subinterrupta*	Dingy duskhawker	1	Seen	CT8273	Targeted	-
15-Apr-21	T3	N.A	1.359	103.713	1134	Butterfly	*Mycalesis sp.*	-	1	Seen	-	Targeted	-
15-Apr-21	T3	N.A	1.358	103.713	1137	Odonate	*Neurothemis fluctuans*	Common parasol	1	Seen	-	Targeted	-
15-Apr-21	T3	N.A	1.358	103.713	1137	Odonate	*Potamarcha congener*	Common chaser	1	Seen	-	Targeted	-
15-Apr-21	T3	N.A	1.358	103.713	1138	Aculeate hymenopteran	*Parischnogaster mellyi*	NA	1	Seen	-	Targeted	-
15-Apr-21	T3	N.A	1.358	103.713	1140	Butterfly	*Leptosia nina malayana*	Psyche	1	Seen	-	Targeted	-
15-Apr-21	T3	N.A	1.358	103.714	1142	Odonate	*Tholymis tillarga*	White-barred duskhawk	1	Seen	-	Targeted	-
19-Apr-21	T1	N.A	1.352	103.731	844	Bird	*Micropternus brachyurus*	Rufous woodpecker	1	Seen	-	Targeted	-
19-Apr-21	T1	N.A	1.353	103.731	845	Aculeate hymenopteran	*Liostenogaster varipicta*	NA	1	Seen	-	Targeted	-
19-Apr-21	T1	N.A	1.353	103.732	902	Odonate	*Neurothemis fluctuans*	Common parasol	3	Seen	-	Targeted	-
19-Apr-21	T1	N.A	1.353	103.732	902	Odonate	*Agrionoptera insignis*	Grenadier	1	Seen	-	Targeted	-
19-Apr-21	T1	N.A	1.352	103.733	910	Butterfly	*Eurema hecabe contubernalis*	Common grass yellow	1	Seen	-	Targeted	-
19-Apr-21	T1	N.A	1.352	103.733	912	Odonate	*Lathrecista asiatica*	Scarlet grenadier	1	Seen	CT8353	Targeted	-
19-Apr-21	T1	N.A	1.352	103.733	913	Odonate	*Neurothemis fluctuans*	Common parasol	3	Seen	-	Targeted	-
19-Apr-21	T1	N.A	1.352	103.733	915	Butterfly	*Eurema sp.*	-	1	Seen	-	Targeted	-
19-Apr-21	T1	N.A	1.352	103.733	917	Butterfly	*Eurema sp.*	-	2	Seen	-	Targeted	-
19-Apr-21	T1	N.A	1.352	103.733	919	Butterfly	*Junonia hedonia ida*	Chocolate pansy	1	Seen	-	Targeted	-
19-Apr-21	T1	N.A	1.352	103.733	919	Butterfly	*Iambrix salsala salsala*	Chestnut bob	2	Seen	-	Targeted	-
19-Apr-21	T1	N.A	1.352	103.733	919	Butterfly	*Prosotas dubiosa lumpura*	Tailless line blue	3	Seen	-	Targeted	-
19-Apr-21	T1	N.A	1.352	103.733	922	Butterfly	*Junonia hedonia ida*	Chocolate pansy	1	Seen	-	Targeted	-
19-Apr-21	T1	N.A	1.352	103.733	923	Butterfly	*Jamides celeno aelianus*	Common caerulean	1	Seen	CT8359	Targeted	-
19-Apr-21	T1	N.A	1.352	103.733	925	Odonate	*Neurothemis fluctuans*	Common parasol	3	Seen	-	Targeted	-
19-Apr-21	T1	N.A	1.352	103.733	925	Odonate	*Agrionoptera insignis*	Grenadier	2	Seen	-	Targeted	-
19-Apr-21	T1	N.A	1.352	103.733	925	Aculeate hymenopteran	*Apis cerana*	Eastern honey bee	1	Seen	-	Targeted	-
19-Apr-21	T1	N.A	1.352	103.733	926	Aculeate hymenopteran	*Liris subtessellatus*	NA	1	Seen	-	Targeted	-
19-Apr-21	T1	N.A	1.352	103.733	927	Butterfly	*Iambrix salsala salsala*	Chestnut bob	2	Seen	-	Targeted	-
19-Apr-21	T1	N.A	1.352	103.733	927	Butterfly	*Eurema sp.*	-	1	Seen	-	Targeted	-
19-Apr-21	T1	N.A	1.352	103.733	930	Butterfly	*Jamides celeno aelianus*	Common caerulean	1	Seen	-	Targeted	-
19-Apr-21	T1	N.A	1.352	103.733	930	Butterfly	*Eurema blanda snelleni*	Three spot grass yellow	1	Seen	-	Targeted	-
19-Apr-21	T1	N.A	1.352	103.733	930	Odonate	*Neurothemis fluctuans*	Common parasol	2	Seen	-	Targeted	-
19-Apr-21	T1	N.A	1.351	103.734	933	Odonate	*Agrionoptera insignis*	Grenadier	1	Seen	-	Targeted	-

Date	Route	Aquatic Point	Latitude	Longitude	Time	Taxon	Scientific name	Common name	Qty	Observation type	Photo no.	Survey method	Remarks
19-Apr-21	T1	N.A	1.351	103.734	934	Butterfly	*Delias hyparete metarete*	Painted jezebel	1	Seen	-	Targeted	-
19-Apr-21	T1	N.A	1.352	103.734	937	Butterfly	*Amathusia phidippus phidippus*	Palm king	1	Seen	-	Targeted	-
19-Apr-21	T1	N.A	1.352	103.735	942	Aculeate hymenopteran	*Phimenes flavopictus*	NA	1	Seen	CT8361	Targeted	Building a nest
19-Apr-21	T1	N.A	1.352	103.735	948	Butterfly	*Eurema sp.*	-	2	Seen	-	Targeted	-
19-Apr-21	T1	N.A	1.352	103.735	948	Butterfly	*Eurema hecabe contubernalis*	Common grass yellow	1	Seen	-	Targeted	-
19-Apr-21	T1	N.A	1.352	103.735	950	Odonate	*Neurothemis fluctuans*	Common parasol	1	Seen	-	Targeted	-
19-Apr-21	T1	N.A	1.352	103.735	950	Odonate	*Lathrecista asiatica*	Scarlet grenadier	1	Seen	CT8368	Targeted	-
19-Apr-21	T1	N.A	1.352	103.735	954	Butterfly	*Mycalesis perseoides perseoides*	Burmese bush brown	1	Seen	-	Targeted	-
19-Apr-21	T1	N.A	1.352	103.735	956	Butterfly	*Pantoporia hordonia hordonia*	Common lascar	1	Seen	-	Targeted	-
19-Apr-21	T1	N.A	1.352	103.735	956	Odonate	*Agrionoptera insignis*	Grenadier	2	Seen	-	Targeted	-
19-Apr-21	T1	N.A	1.352	103.735	959	Odonate	*Agrionoptera insignis*	Grenadier	1	Seen	-	Targeted	-
19-Apr-21	T1	N.A	1.352	103.736	1000	Odonate	*Agrionoptera insignis*	Grenadier	1	Seen	-	Targeted	-
19-Apr-21	T1	N.A	1.352	103.736	1000	Butterfly	*Eurema sp.*	-	1	Seen	-	Targeted	-
19-Apr-21	T1	N.A	1.352	103.736	1000	Aculeate hymenopteran	*Ropalidia sumatrae*	NA	1	Seen	-	Targeted	-
19-Apr-21	T1	N.A	1.352	103.736	1000	Butterfly	*Potanthus omaha omaha*	Lesser dart	1	Seen	-	Targeted	-
19-Apr-21	T1	N.A	1.352	103.736	1003	Butterfly	*Eurema blanda snelleni*	Three spot grass yellow	2	Seen	-	Targeted	-
19-Apr-21	T1	N.A	1.352	103.736	1003	Butterfly	*Papilio polytes romulus*	Common mormon	2	Seen	-	Targeted	-
21-Apr-21	T1	N.A	1.353	103.731	1950	Reptile	*Bronchocela cristatella*	Green crested lizard	1	Seen	-	Incidental	Juvenile
21-Apr-21	T1	N.A	1.352	103.736	2216	Reptile	*Ahaetulla prasina*	Oriental whip snake	1	Seen	-	Incidental	-
21-Apr-21	T1	D4_03	1.354	103.732	2004-2009	Fish	*Channa striata*	Common snakehead/aruan	2	Seen	RS03	Targeted	-
21-Apr-21	T1	D4_03	1.354	103.732	2004-2009	Amphibian	*Limnonectes blythii*	Malayan giant frog	1	Seen	-	Targeted	-
21-Apr-21	T1	D4_03	1.354	103.732	2004-2009	Fish	*Dermogenys collettei*	Sunda pygmy halfbeak	28	Seen	-	Targeted	-
21-Apr-21	T1	D4_03	1.354	103.732	2004-2009	Fish	*Poecilia reticulata*	Guppy	4	Seen	-	Targeted	-
21-Apr-21	T1	D4_02	1.354	103.731	2014-2019	Fish	*Poecilia reticulata*	Guppy	6	Seen	-	Targeted	Deployed fish trap
21-Apr-21	T1	D4_02	1.354	103.731	2014-2019	Fish	*Dermogenys collettei*	Sunda pygmy halfbeak	13	Seen	-	Targeted	-
21-Apr-21	T1	D4_02	1.354	103.731	2014-2019	Fish	*Rhinogobius giurinus*	Barcheek goby	2	Seen	-	Targeted	-
21-Apr-21	T1	D4_02	1.354	103.731	2014-2019	Fish	*Barbodes rhombeus*	Indochinese spotted barb	6	Seen	-	Targeted	-
21-Apr-21	T1	D4_02	1.354	103.731	2014-2019	Decapod	*Macrobrachium nipponense*	Oriental river prawn	1	Seen	-	Targeted	-
21-Apr-21	T1	D4_01	1.353	103.731	2025-2030	Fish	*Barbodes rhombeus*	Indochinese spotted barb	3	Seen	-	Targeted	-
21-Apr-21	T1	D4_01	1.353	103.731	2025-2030	Fish	*Dermogenys collettei*	Sunda pygmy halfbeak	74	Seen	-	Targeted	-
21-Apr-21	T1	D4_01	1.353	103.731	2025-2030	Amphibian	*Kaloula pulchra*	Banded bull frog	1	Seen	-	Targeted	-
21-Apr-21	T1	D6_Pond	1.352	103.734	2050-2055	Amphibian	*Polypedates leucomystax*	Four-lined tree frog	1	Heard	-	Targeted	Fish trap deployed
21-Apr-21	T1	D6_Pond	1.352	103.734	2050-2055	Fish	*Aplocheilus armatus*	Whitespot	3	Seen	-	Targeted	-
21-Apr-21	T1	D6_Pond	1.352	103.734	2050-2055	Amphibian	*Limnonectes blythii*	Malayan giant frog	1	Seen	-	Targeted	-
21-Apr-21	T1	D5_06	1.352	103.737	2120-2125	Fish	*Channa striata*	Common snakehead/aruan	2	Seen	-	Targeted	-
21-Apr-21	T1	D5_06	1.352	103.737	2120-2125	Reptile	*Amyda cartilaginea*	Asian softshell turtle	2	Seen	-	Targeted	-
21-Apr-21	T1	D5_06	1.352	103.737	2120-2125	Fish	*Poecilia reticulata*	Guppy	12	Seen	-	Targeted	-
21-Apr-21	T1	D5_06	1.352	103.737	2120-2125	Amphibian	*Sylvirana guentheri*	Guenther's frog	1	Heard	-	Targeted	-
21-Apr-21	T1	D5_05	1.352	103.737	2134-2139	Reptile	*Trachemys scripta*	Red-eared slider	1	Seen	-	Targeted	Fish trap deployed
21-Apr-21	T1	D5_05	1.352	103.737	2134-2139	Fish	*Poecilia reticulata*	Guppy	300	Seen	-	Targeted	-
21-Apr-21	T1	D5_05	1.352	103.737	2134-2139	Amphibian	*Microhyla mukhlesuri*	East Asian ornate chorus frog	1	Seen	-	Targeted	-
21-Apr-21	T1	D5_05	1.352	103.737	2134-2139	Fish	*Channa striata*	Common snakehead/aruan	1	Seen	-	Targeted	-
21-Apr-21	T1	D5_04	1.351	103.736	2147-2152	Amphibian	*Sylvirana guentheri*	Guenther's frog	1	Heard	-	Targeted	-
21-Apr-21	T1	D5_04	1.351	103.736	2147-2152	Fish	*Poecilia reticulata*	Guppy	100	Seen	-	Targeted	-
21-Apr-21	T1	D5_03	1.351	103.736	2156-2201	Amphibian	*Sylvirana guentheri*	Guenther's frog	2	Heard	-	Targeted	-
21-Apr-21	T1	D5_03	1.351	103.736	2156-2201	Fish	*Poecilia reticulata*	Guppy	100	Seen	-	Targeted	-
21-Apr-21	T1	D5_03	1.351	103.736	2156-2201	Amphibian	*Microhyla heymonsi*	Dark-sided chorus frog	1	Heard	-	Targeted	-
21-Apr-21	T1	D5_03	1.351	103.736	2156-2201	Fish	*Channa striata*	Common snakehead/aruan	1	Seen	-	Targeted	-
21-Apr-21	T1	D5_02	1.350	103.735	2207-2212	Amphibian	*Limnonectes blythii*	Malayan giant frog	3	Seen	-	Targeted	-
21-Apr-21	T1	D5_02	1.350	103.735	2207-2212	Fish	*Channa striata*	Common snakehead/aruan	1	Seen	-	Targeted	-
21-Apr-21	T1	D5_02	1.350	103.735	2207-2212	Reptile	*Unidentified Trionychidae*	-	1	Seen	-	Targeted	-
21-Apr-21	T1	D5_02	1.350	103.735	2207-2212	Fish	*Poecilia reticulata*	Guppy	43	Seen	-	Targeted	-
21-Apr-21	T1	D5_01	1.350	103.734	2219-2224	Amphibian	*Sylvirana guentheri*	Guenther's frog	1	Heard	-	Targeted	-
21-Apr-21	T1	D5_01	1.350	103.734	2219-2224	Amphibian	*Polypedates leucomystax*	Four-lined tree frog	1	Heard	-	Targeted	-
21-Apr-21	T1	D5_01	1.350	103.734	2219-2224	Fish	*Poecilia reticulata*	Guppy	72	Seen	-	Targeted	-
21-Apr-21	T1	D5_01	1.350	103.734	2219-2224	Fish	*Channa striata*	Common snakehead/aruan	1	Seen	-	Targeted	-
22-Apr-21	T1	N.A	1.352	103.736	1007	Bird	*Pitta moluccensis*	Blue-winged pitta	2	Heard	-	Incidental	-
22-Apr-21	D5	D5_05	1.352	103.737	1031	Fish	*Poecilia reticulata*	Guppy	6	Caught	-	Targeted	Fish trap

Date	Route	Aquatic Point	Latitude	Longitude	Time	Taxon	Scientific name	Common name	Qty	Observation type	Photo no.	Survey method	Remarks
22-Apr-21	D2	N.A	1.358	103.725	2021	Reptile	*Ptyas korros*	Indochinese rat snake	1	Seen	Yes	Incidental	-
22-Apr-21	D5	D5_06	1.352	103.737	1014-1019	Fish	*Poecilia reticulata*	Guppy	78	Caught	-	Targeted	-
22-Apr-21	D5	D5_05	1.352	103.737	1031-1036	Fish	*Poecilia reticulata*	Guppy	25	Caught	-	Targeted	-
22-Apr-21	D5	D5_04	1.351	103.736	1042-1047	Fish	*Poecilia reticulata*	Guppy	27	Caught	-	Targeted	-
22-Apr-21	D5	D5_03	1.351	103.736	1053-1058	Fish	*Poecilia reticulata*	Guppy	74	Caught	-	Targeted	-
22-Apr-21	D5	D5_01	1.350	103.734	1113-1118	Fish	*Poecilia reticulata*	Guppy	47	Caught	-	Targeted	-
22-Apr-21	D2	D2_01	1.357	103.724	1945-1950	Reptile	*Calotes versicolor*	Changeable lizard	1	Seen	-	Targeted	-
22-Apr-21	D2	D2_01	1.357	103.724	1945-1950	Amphibian	*Sylvirana guentheri*	Guenther's frog	2	Heard	-	Targeted	-
22-Apr-21	D2	D2_01	1.357	103.724	1945-1950	Amphibian	*Hylarana erythraea*	Green paddy frog	3	Heard	-	Targeted	-
22-Apr-21	D2	D2_01	1.357	103.724	1945-1950	Fish	*Dermogenys collettei*	Sunda pygmy halfbeak	1	Seen	-	Targeted	-
22-Apr-21	D4	D4_03	1.354	103.732	910-915	Fish	*Dermogenys collettei*	Sunda pygmy halfbeak	3	Caught	-	Targeted	-
22-Apr-21	D4	D4_01	1.353	103.731	921-926	Fish	*Dermogenys collettei*	Sunda pygmy halfbeak	2	Caught	-	Targeted	-
22-Apr-21	D4	D4_02	1.354	103.731	931-936	Fish	*Dermogenys collettei*	Sunda pygmy halfbeak	18	Caught	-	Targeted	-
22-Apr-21	D4	D4_02	1.354	103.731	931-936	Fish	*Poecilia reticulata*	Guppy	3	Caught	-	Targeted	-
22-Apr-21	D4	D4_02	1.354	103.731	931-936	Decapod	*Macrobrachium nipponense*	Oriental river prawn	3	Caught	-	Targeted	-
28-Apr-21	T1	N.A	N.A	N.A	0848	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210428_204800.wa
28-Apr-21	T1	N.A	N.A	N.A	0848	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210428_204826.wa
28-Apr-21	T1	N.A	N.A	N.A	0848	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210428_204832.wa
28-Apr-21	T1	N.A	N.A	N.A	0848	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210428_204840.wa
28-Apr-21	T1	N.A	N.A	N.A	0849	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210428_204912.wa
28-Apr-21	T1	N.A	N.A	N.A	0849	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210428_204922.wa
28-Apr-21	T1	N.A	N.A	N.A	0849	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210428_204940.wa
28-Apr-21	T1	N.A	N.A	N.A	0903	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210428_210317.wa
28-Apr-21	T1	N.A	N.A	N.A	0902	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210428_210247.wa
28-Apr-21	T1	N.A	N.A	N.A	0903	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210428_210306.wa
28-Apr-21	T1	N.A	N.A	N.A	0903	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210428_210329.wa
28-Apr-21	T1	N.A	N.A	N.A	0906	Mammal (Bat)	*Myotis muricola*	Whiskered myotis	1	Acoustic	-	Targeted	20210428_210628.wa
28-Apr-21	T1	N.A	N.A	N.A	0906	Mammal (Bat)	*Myotis muricola*	Whiskered myotis	1	Acoustic	-	Targeted	20210428_210648.wa
28-Apr-21	T1	N.A	N.A	N.A	0908	Mammal (Bat)	*Myotis muricola*	Whiskered myotis	1	Acoustic	-	Targeted	20210428_210814.wa
28-Apr-21	T1	N.A	N.A	N.A	0908	Mammal (Bat)	*Myotis muricola*	Whiskered myotis	1	Acoustic	-	Targeted	20210428_210808.wa
28-Apr-21	T1	N.A	N.A	N.A	0908	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210428_210822.wa
28-Apr-21	T1	N.A	N.A	N.A	0909	Mammal (Bat)	*Myotis muricola*	Whiskered myotis	1	Acoustic	-	Targeted	20210428_210949.wa
28-Apr-21	T1	N.A	N.A	N.A	0909	Mammal (Bat)	*Myotis muricola*	Whiskered myotis	1	Acoustic	-	Targeted	20210428_210953.wa
28-Apr-21	T1	N.A	N.A	N.A	0910	Mammal (Bat)	*Myotis muricola*	Whiskered myotis	1	Acoustic	-	Targeted	20210428_211028.wa
28-Apr-21	T1	N.A	N.A	N.A	0910	Mammal (Bat)	*Myotis muricola*	Whiskered myotis	1	Acoustic	-	Targeted	20210428_211011.wa
28-Apr-21	T1	N.A	N.A	N.A	0911	Mammal (Bat)	*Myotis muricola*	Whiskered myotis	1	Acoustic	-	Targeted	20210428_211110.wa
28-Apr-21	T1	N.A	N.A	N.A	0912	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210428_211248.wa
28-Apr-21	T1	N.A	N.A	N.A	0909	Mammal (Bat)	*Myotis muricola*	Whiskered myotis	1	Acoustic	-	Targeted	20210428_210904.wa
28-Apr-21	T1	N.A	N.A	N.A	0911	Mammal (Bat)	*Myotis muricola*	Whiskered myotis	1	Acoustic	-	Targeted	20210428_211144.wa
28-Apr-21	T1	N.A	N.A	N.A	0909	Mammal (Bat)	*Myotis muricola*	Whiskered myotis	1	Acoustic	-	Targeted	20210428_210935.wa
28-Apr-21	T1	N.A	N.A	N.A	0912	Mammal (Bat)	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	1	Acoustic	-	Targeted	20210428_211253.wa
28-Apr-21	T1	N.A	N.A	N.A	0913	Mammal (Bat)	*Myotis muricola*	Whiskered myotis	1	Acoustic	-	Targeted	20210428_211332.wa
29-Apr-21	D2	D2_01	1.357	103.724	914	Odonate	*Copera marginipes*	Yellow featherlegs	1	Seen	-	Incidental	-
29-Apr-21	D2	D2_03	1.359	103.722	1012-1017	Fish	*Dermogenys collettei*	Sunda pygmy halfbeak	3	Seen	-	Targeted	-
29-Apr-21	D2	D2_03	1.359	103.722	1012-1017	Decapod	*Macrobrachium lanchesteri*	Riceland shrimp	12	Seen	-	Targeted	-
29-Apr-21	D2	D2_03	1.359	103.722	1012-1017	Freshwater shrimp	*Caridina sp.*	-	15	Seen	RS031	Targeted	cf. Johnsoni
29-Apr-21	D2	D2_03	1.359	103.722	1012-1017	Fish	*Trichopsis vittata*	Croaking gouramy	2	Seen	-	Targeted	-
29-Apr-21	D2	D2_01	1.357	103.724	904-909	Fish	*Dermogenys collettei*	Sunda pygmy halfbeak	44	Seen	-	Targeted	-
29-Apr-21	D2	D2_01	1.357	103.724	904-909	Odonate	*Neurothemis fluctuans*	Common parasol	1	Seen	-	Targeted	-
29-Apr-21	D2	D2_01	1.357	103.724	904-909	Odonate	*Brachydiplax chalybea*	Blue dasher	2	Seen	-	Targeted	-
29-Apr-21	D2	D2_01	1.357	103.724	904-909	Fish	*Puntigrus partipentazona*	Malayan tiger barb	1	Seen	RS024-RS025	Targeted	-
29-Apr-21	D2	D2_01	1.357	103.724	904-909	Fish	*Poecilia reticulata*	Guppy	3	Seen	-	Targeted	-
29-Apr-21	D2	D2_01	1.357	103.724	904-909	Fish	*Trichopsis vittata*	Croaking gouramy	1	Seen	-	Targeted	-
29-Apr-21	D2	D2_02	1.357	103.724	953-958	Fish	*Dermogenys collettei*	Sunda pygmy halfbeak	29	Seen	-	Targeted	-
29-Apr-21	D2	D2_02	1.357	103.724	953-958	Odonate	*Brachydiplax chalybea*	Blue dasher	4	Seen	-	Targeted	-
29-Apr-21	D2	D2_02	1.357	103.724	953-958	Odonate	*Neurothemis fluctuans*	Common parasol	2	Seen	-	Targeted	-
29-Apr-21	D2	D2_02	1.357	103.724	953-958	Odonate	*Rhyothemis phyllis*	Yellow-barred flutterer	2	Seen	-	Targeted	-

Date	Route	Aquatic Point	Latitude	Longitude	Time	Taxon	Scientific name	Common name	Qty	Observation type	Photo no.	Survey method	Remarks
29-Apr-21	D2	D2_02	1.357	103.724	953-958	Odonate	*Orthetrum chrysis*	Spine-tufted skimmer	4	Seen	-	Targeted	-
29-Apr-21	D2	D2_02	1.357	103.724	953-958	Odonate	*Crocothemis servilia*	Common scarlet	1	Seen	-	Targeted	-
29-Apr-21	D2	D2_02	1.357	103.724	953-958	Odonate	*Rhodothemis rufa*	Common redbolt	1	Seen	-	Targeted	-
29-Apr-21	D2	D2_02	1.357	103.724	953-958	Odonate	*Urothemis signata*	Scarlet basker	1	Seen	-	Targeted	-
30-Apr-21	T1	N.A	1.352	103.736	848	Butterfly	*Eurema blanda snelleni*	Three spot grass yellow	1	Seen	-	Targeted	Feeding on bidens sp.
30-Apr-21	T1	N.A	1.352	103.736	851	Butterfly	*Eurema blanda snelleni*	Three spot grass yellow	3	Seen	-	Targeted	Feeding on bidens sp.
30-Apr-21	T1	N.A	1.352	103.736	852	Butterfly	*Eurema sp.*	-	4	Seen	-	Targeted	-
30-Apr-21	T1	N.A	1.351	103.737	905	Butterfly	*Lasippa tiga siaka*	Malayan lascar	1	Seen	CT8585	Targeted	-
30-Apr-21	T1	N.A	1.351	103.737	906	Odonate	*Agrionoptera insignis*	Grenadier	1	Seen	-	Targeted	-
30-Apr-21	T1	N.A	1.351	103.737	906	Butterfly	*Junonia hedonia ida*	Chocolate pansy	2	Seen	-	Targeted	-
30-Apr-21	T1	N.A	1.351	103.737	906	Butterfly	*Eurema sp.*	-	1	Seen	-	Targeted	-
30-Apr-21	T1	N.A	1.351	103.737	906	Butterfly	*Papilio polytes romulus*	Common mormon	1	Seen	-	Targeted	-
30-Apr-21	T1	N.A	1.351	103.737	907	Odonate	*Neurothemis fluctuans*	Common parasol	3	Seen	-	Targeted	-
30-Apr-21	T1	N.A	1.351	103.737	912	Butterfly	*Eurema sp.*	-	1	Seen	-	Targeted	-
30-Apr-21	T1	N.A	1.351	103.737	912	Butterfly	*Lampides boeticus*	Pea blue	1	Seen	CT8587	Targeted	-
30-Apr-21	T1	N.A	1.351	103.737	912	Aculeate hymenopteran	*Ceratina sp.*	-	1	Seen	-	Targeted	-
30-Apr-21	T1	N.A	1.351	103.737	913	Aculeate hymenopteran	*Xylocopa sp.*	-	1	Seen	-	Targeted	*X. flavonigrescens or X. aestuans*
30-Apr-21	T1	N.A	1.351	103.737	915	Butterfly	*Graphium agamemnon agamemnon*	Tailed jay	1	Seen	CT8592	Targeted	-
30-Apr-21	T1	N.A	1.351	103.737	916	Aculeate hymenopteran	*Allorhynchium argentatum*	NA	1	Seen	-	Targeted	-
30-Apr-21	T1	N.A	1.351	103.737	916	Butterfly	*Borbo cinnara*	Formosan swift	2	Seen	CT8594	Targeted	-
30-Apr-21	T1	N.A	1.351	103.737	916	Butterfly	*Pelopidas conjunctus conjunctus*	Conjoined swift	1	Seen	CT8590	Targeted	-
30-Apr-21	T1	N.A	1.351	103.737	922	Butterfly	*Appias libythea olferna*	Striped albatross	1	Seen	-	Targeted	-
30-Apr-21	T1	N.A	1.351	103.737	923	Odonate	*Agrionoptera insignis*	Grenadier	1	Seen	-	Targeted	-
30-Apr-21	T1	N.A	1.351	103.736	926	Odonate	*Neurothemis fluctuans*	Common parasol	2	Seen	-	Targeted	-
30-Apr-21	T1	N.A	1.351	103.736	926	Odonate	*Agrionoptera insignis*	Grenadier	4	Seen	CT8600-01	Targeted	-
30-Apr-21	T1	N.A	1.351	103.736	931	Aculeate hymenopteran	*Unidentified Crabronidae*	-	1	Seen	-	Targeted	-
30-Apr-21	T1	N.A	1.351	103.736	933	Aculeate hymenopteran	*Lipotriches ceratina*	NA	1	Seen	-	Targeted	-
30-Apr-21	T1	N.A	1.351	103.736	935	Butterfly	*Eurema hecabe contubernalis*	Common grass yellow	1	Seen	-	Targeted	-
30-Apr-21	T1	N.A	1.351	103.736	937	Odonate	*Brachydiplax chalybea*	Blue dasher	1	Seen	-	Targeted	-
30-Apr-21	T1	N.A	1.351	103.736	937	Odonate	*Agrionoptera insignis*	Grenadier	1	Seen	-	Targeted	-
30-Apr-21	T1	N.A	1.351	103.736	941	Butterfly	*Ideopsis vulgaris macrina*	Blue glassy tiger	1	Seen	-	Targeted	-
30-Apr-21	T1	N.A	1.350	103.736	941	Odonate	*Agrionoptera insignis*	Grenadier	1	Seen	-	Targeted	-
30-Apr-21	T1	N.A	1.350	103.736	941	Aculeate hymenopteran	*Parischnogaster mellyi*	NA	1	Seen	-	Targeted	-
30-Apr-21	T1	N.A	1.350	103.736	942	Odonate	*Neurothemis fluctuans*	Common parasol	2	Seen	-	Targeted	-
30-Apr-21	T1	N.A	1.350	103.736	942	Butterfly	*Caltoris cormasa*	Full stop swift	2	Seen	CT8611, 8614	Targeted	-
30-Apr-21	T1	N.A	1.350	103.736	945	Aculeate hymenopteran	*Eumenes sp.*	NA	1	Seen	-	Targeted	-
30-Apr-21	T1	N.A	1.350	103.736	945	Aculeate hymenopteran	*Trypoxylon sp.*	-	1	Seen	-	Targeted	Collected
30-Apr-21	T1	N.A	1.350	103.736	945	Odonate	*Lathrecista asiatica*	Scarlet grenadier	1	Seen	-	Targeted	-
30-Apr-21	T1	N.A	1.350	103.736	948	Odonate	*Neurothemis fluctuans*	Common parasol	1	Seen	-	Targeted	-
30-Apr-21	T1	N.A	1.350	103.736	948	Butterfly	*Eurema sp.*	-	3	Seen	-	Targeted	-
30-Apr-21	T1	N.A	1.350	103.736	948	Butterfly	*Papilio polytes romulus*	Common mormon	1	Seen	-	Targeted	-
30-Apr-21	T1	N.A	1.350	103.736	948	Butterfly	*Oriens gola pseudolus*	Common dartlet	1	Seen	CT8618	Targeted	-
30-Apr-21	T1	N.A	1.350	103.736	948	Butterfly	*Potanthus omaha omaha*	Lesser dart	1	Seen	-	Targeted	-
30-Apr-21	T1	N.A	1.350	103.736	951	Butterfly	*Elymnias hypermnestra agina*	Common palmfly	1	Seen	-	Targeted	-
30-Apr-21	T1	N.A	1.350	103.736	952	Odonate	*Orthetrum chrysis*	Spine-tufted skimmer	1	Seen	-	Targeted	-
30-Apr-21	T1	N.A	1.350	103.736	953	Butterfly	*Eurema sp.*	-	2	Seen	-	Targeted	-
30-Apr-21	T1	N.A	1.350	103.736	956	Aculeate hymenopteran	*Parischnogaster mellyi*	NA	2	Seen	-	Targeted	-
30-Apr-21	T1	N.A	1.350	103.736	956	Aculeate hymenopteran	*Parischnogaster nigricans*	NA	1	Seen	-	Targeted	-
30-Apr-21	T1	N.A	1.350	103.736	956	Butterfly	*Papilio polytes romulus*	Common mormon	3	Seen	-	Targeted	Feeding on Asystasia gangetica
30-Apr-21	T1	N.A	1.350	103.736	1000	Butterfly	*Oriens gola pseudolus*	Common dartlet	1	Seen	CT8620	Targeted	-
30-Apr-21	T1	N.A	1.350	103.736	1003	Odonate	*Orthetrum chrysis*	Spine-tufted skimmer	1	Seen	-	Targeted	-
30-Apr-21	T1	N.A	1.350	103.736	1003	Aculeate hymenopteran	*Thyreus himalayensis*	NA	1	Seen	-	Targeted	-
30-Apr-21	T1	N.A	1.350	103.736	1004	Butterfly	*Prosotas dubiosa lumpura*	Tailless line blue	2	Seen	CT8621	Targeted	-
30-Apr-21	T1	N.A	1.350	103.736	1004	Aculeate hymenopteran	*Apis cerana*	Eastern honey bee	1	Seen	-	Targeted	-
30-Apr-21	T1	N.A	1.350	103.736	1004	Butterfly	*Ancistroides nigrita maura*	Chocolate demon	1	Seen	CT8625	Targeted	Feeding on hibiscus
30-Apr-21	T1	N.A	1.351	103.736	1004	Butterfly	*Eurema sp.*	-	1	Seen	-	Targeted	-

Date	Route	Aquatic Point	Latitude	Longitude	Time	Taxon	Scientific name	Common name	Qty	Observation type	Photo no.	Survey method	Remarks
30-Apr-21	T1	N.A	1.351	103.736	1011	Butterfly	*Elymnias hypermnestra agina*	Common palmfly	1	Seen	-	Targeted	-
30-Apr-21	T1	N.A	1.351	103.736	1011	Butterfly	*Junonia hedonia ida*	Chocolate pansy	1	Seen	-	Targeted	-
30-Apr-21	T1	N.A	1.351	103.736	1013	Odonate	*Neurothemis fluctuans*	Common parasol	1	Seen	-	Targeted	-
30-Apr-21	T1	N.A	1.351	103.736	1013	Aculeate hymenopteran	*Eumenes sp.*	NA	1	Seen	-	Targeted	-
30-Apr-21	T1	N.A	1.351	103.735	1016	Butterfly	*Eurema sp.*	-	1	Seen	-	Targeted	-
30-Apr-21	T1	N.A	1.350	103.735	1017	Bird	*Accipiter trivirgatus*	Crested goshawk	1	Seen	CT8640	Incidental	Perched on albizia, chased by crows
30-Apr-21	T1	N.A	1.350	103.735	1019	Butterfly	*Junonia hedonia ida*	Chocolate pansy	1	Seen	-	Targeted	-
30-Apr-21	T1	N.A	1.350	103.735	1021	Butterfly	*Prosotas dubiosa lumpura*	Tailless line blue	2	Seen	-	Targeted	-
30-Apr-21	T1	N.A	1.350	103.735	1021	Odonate	*Neurothemis fluctuans*	Common parasol	1	Seen	-	Targeted	-
30-Apr-21	T1	N.A	1.350	103.735	1024	Butterfly	*Delias hyparete metarete*	Painted jezebel	1	Seen	-	Targeted	-
30-Apr-21	T1	N.A	1.350	103.735	1026	Aculeate hymenopteran	*Ropalidia sumatrae*	NA	1	Seen	-	Targeted	-
30-Apr-21	T1	N.A	1.351	103.734	1034	Odonate	*Gynacantha subinterrupta*	Dingy duskhawker	1	Seen	CT8642	Targeted	-
30-Apr-21	T1	N.A	1.351	103.734	1035	Butterfly	*Eurema sp.*	-	1	Seen	-	Targeted	-
30-Apr-21	T1	N.A	1.351	103.734	1040	Butterfly	*Mycalesis visala phamis*	Long brand bush brown	2	Seen	-	Targeted	-
30-Apr-21	T1	N.A	1.350	103.734	1040	Butterfly	*Catopsilia scylla cornelia*	Orange emigrant	1	Seen	-	Incidental	-
30-Apr-21	T1	N.A	1.350	103.734	1040	Butterfly	*Eurema sp.*	-	3	Seen	-	Incidental	-
30-Apr-21	T1	N.A	1.350	103.734	1040	Butterfly	*Megisba malaya sikkima*	Malayan	2	Seen	-	Incidental	-
30-Apr-21	T1	N.A	1.350	103.734	1040	Aculeate hymenopteran	*Antepipona sp. nr. Bipustulata*	NA	1	Seen	-	Incidental	-
30-Apr-21	T1	N.A	1.351	103.736	931	Butterfly	*Pelopidas conjunctus conjunctus*	Conjoined swift	1	Seen	RS7408	Targeted	-
6-May-21	D2	D2_02	1.357	103.724	2020-2025	Fish	*Dermogenys collettei*	Sunda pygmy halfbeak	80	Seen	-	Targeted	-
6-May-21	D2	D2_03	1.359	103.722	2032-2037	Fish	*Dermogenys collettei*	Sunda pygmy halfbeak	5	Seen	-	Targeted	-
25-May-21	D5	D5_02	1.351	103.736	2012	Reptile	*Amyda cartilaginea*	Asian softshell turtle	1	Seen	-	Incidental	-
25-May-21		D5_06	1.352	103.737	2045	Reptile	*Amyda cartilaginea*	Asian softshell turtle	1	Seen	-	Incidental	-

Appendix K
Camera Trap Data

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Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
8/3/2021	CT02	22/2/2021 17:38	22/2/2021	17:38:50	IMG_0003.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	22/2/2021 17:40	22/2/2021	17:40:12	IMG_0004.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	22/2/2021 17:41	22/2/2021	17:41:34	IMG_0005.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	22/2/2021 17:58	22/2/2021	17:58:20	IMG_0006.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	22/2/2021 20:19	22/2/2021	20:19:42	IMG_0008.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	22/2/2021 20:33	22/2/2021	20:33:08	IMG_0009.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	22/2/2021 20:37	22/2/2021	20:37:48	IMG_0010.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	22/2/2021 20:59	22/2/2021	20:59:02	IMG_0011.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	22/2/2021 21:09	22/2/2021	21:09:22	IMG_0012.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	23/2/2021 7:30	22/2/2021	7:30:28	IMG_0013.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	23/2/2021 7:31	22/2/2021	7:31:46	IMG_0014.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	23/2/2021 10:44	23/2/2021	10:44:08	IMG_0015.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	23/2/2021 10:45	23/2/2021	10:45:24	IMG_0016.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	23/2/2021 10:50	23/2/2021	10:50:34	IMG_0017.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	23/2/2021 10:52	23/2/2021	10:52:32	IMG_0018.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	23/2/2021 10:55	23/2/2021	10:55:48	IMG_0019.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	23/2/2021 14:43	23/2/2021	14:43:12	IMG_0020.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	23/2/2021 15:49	23/2/2021	15:49:20	IMG_0021.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	23/2/2021 16:47	23/2/2021	16:47:44	IMG_0022.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	23/2/2021 16:49	23/2/2021	16:49:10	IMG_0023.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	23/2/2021 20:27	23/2/2021	20:27:32	IMG_0024.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	23/2/2021 20:29	23/2/2021	20:29:18	IMG_0025.MP4	*Sus scrofa*	2	-
8/3/2021	CT02	23/2/2021 20:35	23/2/2021	20:35:38	IMG_0026.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	23/2/2021 20:39	23/2/2021	20:39:38	IMG_0027.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	23/2/2021 20:40	23/2/2021	20:40:58	IMG_0028.MP4	*Sus scrofa*	2	-
8/3/2021	CT02	23/2/2021 20:43	23/2/2021	20:43:32	IMG_0029.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	23/2/2021 21:35	23/2/2021	21:35:00	IMG_0030.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	24/2/2021 7:56	23/2/2021	7:56:04	IMG_0031.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	24/2/2021 11:58	24/2/2021	11:58:16	IMG_0032.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	24/2/2021 14:55	24/2/2021	14:55:24	IMG_0033.MP4	Unidentified squirrel or treeshrew	1	-
8/3/2021	CT02	24/2/2021 15:03	24/2/2021	15:03:52	IMG_0034.MP4	Unidentified squirrel or treeshrew	1	-
8/3/2021	CT02	24/2/2021 17:14	24/2/2021	17:14:44	IMG_0035.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	24/2/2021 19:31	24/2/2021	19:31:04	IMG_0036.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	24/2/2021 19:32	24/2/2021	19:32:20	IMG_0037.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	24/2/2021 19:39	24/2/2021	19:39:42	IMG_0038.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	24/2/2021 19:40	24/2/2021	19:40:58	IMG_0039.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	24/2/2021 19:56	24/2/2021	19:56:20	IMG_0040.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	25/2/2021 6:05	24/2/2021	6:05:58	IMG_0041.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	25/2/2021 6:39	24/2/2021	6:39:08	IMG_0042.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	25/2/2021 11:36	25/2/2021	11:36:28	IMG_0043.MP4	*Gallus gallus*	2	-
8/3/2021	CT02	25/2/2021 12:40	25/2/2021	12:40:04	IMG_0044.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	25/2/2021 12:41	25/2/2021	12:41:24	IMG_0045.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	25/2/2021 12:46	25/2/2021	12:46:36	IMG_0046.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	25/2/2021 12:47	25/2/2021	12:47:58	IMG_0047.MP4	*Sus scrofa*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
8/3/2021	CT02	25/2/2021 16:08	25/2/2021	16:08:52	IMG_0048.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	25/2/2021 20:38	25/2/2021	20:38:58	IMG_0049.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	25/2/2021 20:40	25/2/2021	20:40:28	IMG_0050.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	25/2/2021 20:41	25/2/2021	20:41:52	IMG_0051.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	25/2/2021 20:47	25/2/2021	20:47:20	IMG_0052.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	25/2/2021 20:48	25/2/2021	20:48:42	IMG_0053.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	25/2/2021 20:56	25/2/2021	20:56:54	IMG_0054.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	25/2/2021 20:59	25/2/2021	20:59:06	IMG_0055.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	25/2/2021 21:00	25/2/2021	21:00:32	IMG_0056.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	25/2/2021 21:07	25/2/2021	21:07:14	IMG_0057.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	25/2/2021 23:58	25/2/2021	23:58:48	IMG_0058.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	26/2/2021 1:26	25/2/2021	1:26:00	IMG_0059.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	26/2/2021 1:27	25/2/2021	1:27:40	IMG_0060.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	26/2/2021 1:29	25/2/2021	1:29:02	IMG_0061.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	26/2/2021 1:30	25/2/2021	1:30:20	IMG_0062.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	26/2/2021 1:32	25/2/2021	1:32:08	IMG_0063.MP4	*Sus scrofa*	2	-
8/3/2021	CT02	26/2/2021 1:35	25/2/2021	1:35:10	IMG_0064.MP4	*Sus scrofa*	2	-
8/3/2021	CT02	26/2/2021 1:37	25/2/2021	1:37:16	IMG_0065.MP4	*Sus scrofa*	2	-
8/3/2021	CT02	26/2/2021 5:57	25/2/2021	5:57:30	IMG_0066.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	26/2/2021 8:15	26/2/2021	8:15:08	IMG_0067.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	26/2/2021 8:16	26/2/2021	8:16:26	IMG_0068.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	26/2/2021 8:17	26/2/2021	8:17:40	IMG_0069.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	26/2/2021 19:03	26/2/2021	19:03:14	IMG_0070.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	26/2/2021 22:33	26/2/2021	22:33:48	IMG_0071.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	26/2/2021 22:35	26/2/2021	22:35:06	IMG_0072.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	26/2/2021 22:36	26/2/2021	22:36:24	IMG_0073.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	27/2/2021 0:30	26/2/2021	0:30:16	IMG_0074.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	27/2/2021 6:38	26/2/2021	6:38:06	IMG_0076.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	27/2/2021 7:44	26/2/2021	7:44:46	IMG_0077.MP4	*Garrulax leucolophus*	1	-
8/3/2021	CT02	27/2/2021 19:54	27/2/2021	19:54:36	IMG_0078.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	27/2/2021 19:55	27/2/2021	19:55:52	IMG_0079.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	27/2/2021 20:02	27/2/2021	20:02:20	IMG_0080.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	27/2/2021 20:05	27/2/2021	20:05:04	IMG_0082.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	27/2/2021 20:22	27/2/2021	20:22:48	IMG_0083.MP4	*Sus scrofa*	2	-
8/3/2021	CT02	27/2/2021 20:28	27/2/2021	20:28:14	IMG_0084.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	27/2/2021 23:04	27/2/2021	23:04:50	IMG_0085.MP4	*Rattus tiomanicus*	1	-
8/3/2021	CT02	28/2/2021 9:21	28/2/2021	9:21:46	IMG_0087.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	28/2/2021 9:36	28/2/2021	9:36:10	IMG_0088.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	28/2/2021 9:37	28/2/2021	9:37:46	IMG_0089.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	28/2/2021 9:39	28/2/2021	9:39:12	IMG_0090.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	28/2/2021 9:40	28/2/2021	9:40:28	IMG_0091.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	28/2/2021 9:44	28/2/2021	9:44:10	IMG_0092.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	28/2/2021 14:37	28/2/2021	14:37:20	IMG_0093.MP4	*Callosciurus notatus*	1	-
8/3/2021	CT02	28/2/2021 17:42	28/2/2021	17:42:58	IMG_0094.MP4	*Gallus gallus*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
8/3/2021	CT02	28/2/2021 19:21	28/2/2021	19:21:26	IMG_0095.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	28/2/2021 19:23	28/2/2021	19:23:12	IMG_0096.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	28/2/2021 19:25	28/2/2021	19:25:26	IMG_0097.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	28/2/2021 19:26	28/2/2021	19:26:58	IMG_0098.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	28/2/2021 19:28	28/2/2021	19:28:14	IMG_0099.MP4	*Sus scrofa*	2	-
8/3/2021	CT02	1/3/2021 7:45	28/2/2021	7:45:06	IMG_0100.MP4	*Gallus gallus*	2	-
8/3/2021	CT02	1/3/2021 8:36	1/3/2021	8:36:08	IMG_0101.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	1/3/2021 13:13	1/3/2021	13:13:34	IMG_0102.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	1/3/2021 13:15	1/3/2021	13:15:30	IMG_0103.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	1/3/2021 13:17	1/3/2021	13:17:58	IMG_0104.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	1/3/2021 13:19	1/3/2021	13:19:18	IMG_0105.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	1/3/2021 13:21	1/3/2021	13:21:08	IMG_0106.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	1/3/2021 13:22	1/3/2021	13:22:48	IMG_0107.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	1/3/2021 13:25	1/3/2021	13:25:20	IMG_0108.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	1/3/2021 13:26	1/3/2021	13:26:38	IMG_0109.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	1/3/2021 13:38	1/3/2021	13:38:14	IMG_0110.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	1/3/2021 13:43	1/3/2021	13:43:28	IMG_0111.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	1/3/2021 13:55	1/3/2021	13:55:36	IMG_0112.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	1/3/2021 14:55	1/3/2021	14:55:40	IMG_0113.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	1/3/2021 16:05	1/3/2021	16:05:48	IMG_0114.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	1/3/2021 16:07	1/3/2021	16:07:08	IMG_0115.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	1/3/2021 16:08	1/3/2021	16:08:46	IMG_0116.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	1/3/2021 18:48	1/3/2021	18:48:16	IMG_0117.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	1/3/2021 19:53	1/3/2021	19:53:26	IMG_0118.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	1/3/2021 22:13	1/3/2021	22:13:00	IMG_0119.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	2/3/2021 4:37	1/3/2021	4:37:06	IMG_0121.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	2/3/2021 5:54	1/3/2021	5:54:36	IMG_0122.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	2/3/2021 6:11	1/3/2021	6:11:20	IMG_0123.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	2/3/2021 6:37	1/3/2021	6:37:26	IMG_0124.MP4	*Sus scrofa*	2	-
8/3/2021	CT02	2/3/2021 6:45	1/3/2021	6:45:10	IMG_0125.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	2/3/2021 6:46	1/3/2021	6:46:40	IMG_0126.MP4	*Sus scrofa*	2	-
8/3/2021	CT02	2/3/2021 6:48	1/3/2021	6:48:12	IMG_0127.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	2/3/2021 7:42	1/3/2021	7:42:44	IMG_0128.MP4	*Gallus gallus*	2	-
8/3/2021	CT02	2/3/2021 8:01	2/3/2021	8:01:18	IMG_0129.MP4	*Sus scrofa*	2	-
8/3/2021	CT02	2/3/2021 8:06	2/3/2021	8:06:08	IMG_0130.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	2/3/2021 8:07	2/3/2021	8:07:26	IMG_0131.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	2/3/2021 14:21	2/3/2021	14:21:28	IMG_0132.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	2/3/2021 14:48	2/3/2021	14:48:44	IMG_0133.MP4	*Sus scrofa*	2	-
8/3/2021	CT02	2/3/2021 20:43	2/3/2021	20:43:16	IMG_0134.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	2/3/2021 20:46	2/3/2021	20:46:58	IMG_0135.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	3/3/2021 1:27	2/3/2021	1:27:30	IMG_0136.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	3/3/2021 1:57	2/3/2021	1:57:54	IMG_0137.MP4	*Rattus sp.*	1	-
8/3/2021	CT02	3/3/2021 7:09	2/3/2021	7:09:54	IMG_0139.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	3/3/2021 7:50	2/3/2021	7:50:52	IMG_0140.MP4	*Gallus gallus*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
8/3/2021	CT02	3/3/2021 11:22	3/3/2021	11:22:46	IMG_0141.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	3/3/2021 12:22	3/3/2021	12:22:30	IMG_0142.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	3/3/2021 12:32	3/3/2021	12:32:10	IMG_0143.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	3/3/2021 12:43	3/3/2021	12:43:04	IMG_0144.MP4	*Sus scrofa*	2	-
8/3/2021	CT02	3/3/2021 12:45	3/3/2021	12:45:06	IMG_0145.MP4	*Sus scrofa*	2	-
8/3/2021	CT02	3/3/2021 12:46	3/3/2021	12:46:24	IMG_0146.MP4	*Sus scrofa*	2	-
8/3/2021	CT02	3/3/2021 13:03	3/3/2021	13:03:34	IMG_0147.MP4	*Sus scrofa*	2	-
8/3/2021	CT02	3/3/2021 13:04	3/3/2021	13:04:52	IMG_0148.MP4	*Sus scrofa*	2	-
8/3/2021	CT02	3/3/2021 13:06	3/3/2021	13:06:08	IMG_0149.MP4	*Sus scrofa*	2	-
8/3/2021	CT02	3/3/2021 13:08	3/3/2021	13:08:54	IMG_0150.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	3/3/2021 15:23	3/3/2021	15:23:00	IMG_0151.MP4	*Gallus gallus*	1	-
8/3/2021	CT02	3/3/2021 16:42	3/3/2021	16:42:32	IMG_0152.MP4	*Gallus gallus*	1	-
8/3/2021	CT02	3/3/2021 17:32	3/3/2021	17:32:36	IMG_0153.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	3/3/2021 17:34	3/3/2021	17:34:30	IMG_0154.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	3/3/2021 18:38	3/3/2021	18:38:30	IMG_0155.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	3/3/2021 18:58	3/3/2021	18:58:32	IMG_0156.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	3/3/2021 19:04	3/3/2021	19:04:36	IMG_0157.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	4/3/2021 1:03	3/3/2021	1:03:04	IMG_0158.MP4	*Sus scrofa*	2	-
8/3/2021	CT02	4/3/2021 1:04	3/3/2021	1:04:34	IMG_0159.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	4/3/2021 1:05	3/3/2021	1:05:56	IMG_0160.MP4	*Sus scrofa*	2	-
8/3/2021	CT02	4/3/2021 1:07	3/3/2021	1:07:14	IMG_0161.MP4	*Sus scrofa*	2	-
8/3/2021	CT02	4/3/2021 1:09	3/3/2021	1:09:10	IMG_0162.MP4	*Sus scrofa*	2	-
8/3/2021	CT02	4/3/2021 1:10	3/3/2021	1:10:28	IMG_0163.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	4/3/2021 1:14	3/3/2021	1:14:44	IMG_0165.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	4/3/2021 1:21	3/3/2021	1:21:38	IMG_0166.MP4	*Sus scrofa*	2	-
8/3/2021	CT02	4/3/2021 1:24	3/3/2021	1:24:06	IMG_0167.MP4	*Sus scrofa*	2	-
8/3/2021	CT02	4/3/2021 1:25	3/3/2021	1:25:22	IMG_0168.MP4	*Sus scrofa*	2	-
8/3/2021	CT02	4/3/2021 1:26	3/3/2021	1:26:42	IMG_0169.MP4	*Sus scrofa*	2	-
8/3/2021	CT02	4/3/2021 1:27	3/3/2021	1:27:56	IMG_0170.MP4	*Sus scrofa*	2	-
8/3/2021	CT02	4/3/2021 1:29	3/3/2021	1:29:42	IMG_0171.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	4/3/2021 4:10	3/3/2021	4:10:40	IMG_0172.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	4/3/2021 4:20	3/3/2021	4:20:52	IMG_0173.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	4/3/2021 4:22	3/3/2021	4:22:08	IMG_0174.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	4/3/2021 4:40	3/3/2021	4:40:50	IMG_0175.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	4/3/2021 5:27	3/3/2021	5:27:10	IMG_0177.MP4	*Sus scrofa*	2	-
8/3/2021	CT02	4/3/2021 6:53	3/3/2021	6:53:30	IMG_0178.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	4/3/2021 6:54	3/3/2021	6:54:46	IMG_0179.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	4/3/2021 7:00	3/3/2021	7:00:54	IMG_0180.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	4/3/2021 8:36	4/3/2021	8:36:40	IMG_0181.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	4/3/2021 12:34	4/3/2021	12:34:38	IMG_0182.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	4/3/2021 12:43	4/3/2021	12:43:18	IMG_0183.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	4/3/2021 12:44	4/3/2021	12:44:36	IMG_0184.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	4/3/2021 12:50	4/3/2021	12:50:28	IMG_0186.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	4/3/2021 12:51	4/3/2021	12:51:54	IMG_0187.MP4	*Sus scrofa*	2	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
8/3/2021	CT02	4/3/2021 12:53	4/3/2021	12:53:26	IMG_0188.MP4	*Sus scrofa*	2	-
8/3/2021	CT02	4/3/2021 12:56	4/3/2021	12:56:26	IMG_0189.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	4/3/2021 13:06	4/3/2021	13:06:16	IMG_0190.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	4/3/2021 13:08	4/3/2021	13:08:42	IMG_0191.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	4/3/2021 13:10	4/3/2021	13:10:52	IMG_0192.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	4/3/2021 13:12	4/3/2021	13:12:14	IMG_0193.MP4	*Sus scrofa*	2	-
8/3/2021	CT02	4/3/2021 13:14	4/3/2021	13:14:00	IMG_0194.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	4/3/2021 13:33	4/3/2021	13:33:04	IMG_0195.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	4/3/2021 13:47	4/3/2021	13:47:18	IMG_0196.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	5/3/2021 1:58	4/3/2021	1:58:46	IMG_0197.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	5/3/2021 7:30	4/3/2021	7:30:18	IMG_0199.MP4	Unidentified squirrel or treeshrew	2	-
8/3/2021	CT02	5/3/2021 8:02	5/3/2021	8:02:46	IMG_0200.MP4	*Gallus gallus*	2	-
8/3/2021	CT02	5/3/2021 8:29	5/3/2021	8:29:46	IMG_0201.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	5/3/2021 8:39	5/3/2021	8:39:22	IMG_0202.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	5/3/2021 8:46	5/3/2021	8:46:02	IMG_0203.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	5/3/2021 8:48	5/3/2021	8:48:08	IMG_0204.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	5/3/2021 8:53	5/3/2021	8:53:24	IMG_0205.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	5/3/2021 8:54	5/3/2021	8:54:42	IMG_0206.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	5/3/2021 9:11	5/3/2021	9:11:20	IMG_0207.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	5/3/2021 11:23	5/3/2021	11:23:42	IMG_0209.MP4	*Callosciurus notatus*	1	-
8/3/2021	CT02	5/3/2021 13:28	5/3/2021	13:28:06	IMG_0210.MP4	*Callosciurus notatus*	1	-
8/3/2021	CT02	5/3/2021 13:31	5/3/2021	13:31:24	IMG_0211.MP4	Unidentified squirrel or treeshrew	1	-
8/3/2021	CT02	5/3/2021 18:09	5/3/2021	18:09:58	IMG_0212.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	5/3/2021 20:41	5/3/2021	20:41:32	IMG_0213.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	5/3/2021 20:44	5/3/2021	20:44:32	IMG_0214.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	5/3/2021 20:46	5/3/2021	20:46:06	IMG_0215.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	5/3/2021 21:14	5/3/2021	21:14:32	IMG_0216.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	6/3/2021 5:06	5/3/2021	5:06:42	IMG_0217.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	6/3/2021 5:53	5/3/2021	5:53:52	IMG_0218.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	6/3/2021 7:16	5/3/2021	7:16:08	IMG_0219.MP4	*Gallus gallus*	2	-
8/3/2021	CT02	6/3/2021 8:22	6/3/2021	8:22:52	IMG_0220.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	6/3/2021 8:24	6/3/2021	8:24:18	IMG_0221.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	6/3/2021 8:25	6/3/2021	8:25:36	IMG_0222.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	6/3/2021 11:13	6/3/2021	11:13:20	IMG_0223.MP4	*Amaurornis phoenicurus*	1	-
8/3/2021	CT02	6/3/2021 15:01	6/3/2021	15:01:56	IMG_0224.MP4	*Gallus gallus*	1	-
8/3/2021	CT02	6/3/2021 17:52	6/3/2021	17:52:20	IMG_0225.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	6/3/2021 19:35	6/3/2021	19:35:20	IMG_0226.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	7/3/2021 5:39	6/3/2021	5:39:44	IMG_0227.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	7/3/2021 7:21	6/3/2021	7:21:46	IMG_0228.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	7/3/2021 11:35	7/3/2021	11:35:24	IMG_0229.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	7/3/2021 11:37	7/3/2021	11:37:42	IMG_0230.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	7/3/2021 11:39	7/3/2021	11:39:12	IMG_0231.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	7/3/2021 11:40	7/3/2021	11:40:28	IMG_0232.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	7/3/2021 12:00	7/3/2021	12:00:44	IMG_0233.MP4	*Sus scrofa*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
8/3/2021	CT02	7/3/2021 12:02	7/3/2021	12:02:00	IMG_0234.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	7/3/2021 12:14	7/3/2021	12:14:26	IMG_0235.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	7/3/2021 12:17	7/3/2021	12:17:10	IMG_0236.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	7/3/2021 12:26	7/3/2021	12:26:14	IMG_0237.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	7/3/2021 12:29	7/3/2021	12:29:34	IMG_0238.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	7/3/2021 18:22	7/3/2021	18:22:34	IMG_0239.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	7/3/2021 19:37	7/3/2021	19:37:04	IMG_0240.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	7/3/2021 20:28	7/3/2021	20:28:44	IMG_0241.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	7/3/2021 20:48	7/3/2021	20:48:52	IMG_0242.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	7/3/2021 22:05	7/3/2021	22:05:02	IMG_0243.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	7/3/2021 23:58	7/3/2021	23:58:16	IMG_0245.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	8/3/2021 0:06	7/3/2021	0:06:28	IMG_0246.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	8/3/2021 0:16	7/3/2021	0:16:42	IMG_0247.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	8/3/2021 0:19	7/3/2021	0:19:50	IMG_0248.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	8/3/2021 0:25	7/3/2021	0:25:54	IMG_0249.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	8/3/2021 9:01	8/3/2021	9:01:44	IMG_0250.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	8/3/2021 10:48	8/3/2021	10:48:56	IMG_0251.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	8/3/2021 10:52	8/3/2021	10:52:10	IMG_0252.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	8/3/2021 10:54	8/3/2021	10:54:44	IMG_0253.MP4	*Sus scrofa*	1	-
8/3/2021	CT02	8/3/2021 10:56	8/3/2021	10:56:46	IMG_0254.MP4	*Sus scrofa*	1	-
8/3/2021	CT03	23/2/2021 6:31	22/2/2021	6:31:34	IMG_0010.MP4	*Sus scrofa*	1	-
8/3/2021	CT03	23/2/2021 8:02	23/2/2021	8:02:06	IMG_0011.MP4	*Sus scrofa*	2	-
8/3/2021	CT03	23/2/2021 18:52	23/2/2021	18:52:42	IMG_0013.MP4	*Sus scrofa*	1	-
8/3/2021	CT03	24/2/2021 22:32	24/2/2021	22:32:06	IMG_0014.MP4	*Sus scrofa*	1	-
8/3/2021	CT03	25/2/2021 2:28	24/2/2021	2:28:44	IMG_0015.MP4	*Sus scrofa*	2	-
8/3/2021	CT03	25/2/2021 2:35	24/2/2021	2:35:36	IMG_0016.MP4	*Sus scrofa*	1	-
8/3/2021	CT03	25/2/2021 2:48	24/2/2021	2:48:38	IMG_0017.MP4	*Sus scrofa*	1	-
8/3/2021	CT03	25/2/2021 2:54	24/2/2021	2:54:12	IMG_0018.MP4	*Sus scrofa*	1	-
8/3/2021	CT03	25/2/2021 3:12	24/2/2021	3:12:26	IMG_0019.MP4	*Sus scrofa*	1	-
8/3/2021	CT03	25/2/2021 3:24	24/2/2021	3:24:32	IMG_0020.MP4	*Sus scrofa*	1	-
8/3/2021	CT03	25/2/2021 3:41	24/2/2021	3:41:02	IMG_0021.MP4	*Sus scrofa*	1	-
8/3/2021	CT03	25/2/2021 5:33	24/2/2021	5:33:38	IMG_0022.MP4	*Sus scrofa*	1	-
8/3/2021	CT03	25/2/2021 11:24	25/2/2021	11:24:52	IMG_0023.MP4	*Gallus gallus*	1	-
8/3/2021	CT03	25/2/2021 18:26	25/2/2021	18:26:50	IMG_0024.MP4	*Sus scrofa*	1	-
8/3/2021	CT03	25/2/2021 23:58	25/2/2021	23:58:18	IMG_0025.MP4	*Manis javanica*	1	-
8/3/2021	CT03	26/2/2021 18:29	26/2/2021	18:29:56	IMG_0027.MP4	*Sus scrofa*	1	-
8/3/2021	CT03	28/2/2021 11:04	28/2/2021	11:04:30	IMG_0028.MP4	*Amaurornis phoenicurus*	1	-
8/3/2021	CT03	28/2/2021 11:40	28/2/2021	11:40:32	IMG_0029.MP4	*Amaurornis phoenicurus*	1	-
8/3/2021	CT03	1/3/2021 8:43	1/3/2021	8:43:14	IMG_0030.MP4	*Amaurornis phoenicurus*	1	-
8/3/2021	CT03	2/3/2021 4:00	1/3/2021	4:00:20	IMG_0031.MP4	*Sus scrofa*	1	-
8/3/2021	CT03	2/3/2021 7:33	1/3/2021	7:33:22	IMG_0032.MP4	*Sus scrofa*	1	-
8/3/2021	CT03	2/3/2021 7:37	1/3/2021	7:37:22	IMG_0033.MP4	*Sus scrofa*	1	-
8/3/2021	CT03	3/3/2021 20:17	3/3/2021	20:17:34	IMG_0034.MP4	*Sus scrofa*	1	-
8/3/2021	CT03	3/3/2021 20:17	3/3/2021	20:17:34	IMG_0034.MP4	*Rattus tiomanicus*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
8/3/2021	CT04	22/2/2021 14:36	22/2/2021	14:36:48	IMG_0004.MP4	*Tupaia glis*	1	-
8/3/2021	CT04	23/2/2021 18:16	23/2/2021	18:16:36	IMG_0005.MP4	*Garrulax leucolophus*	1	-
8/3/2021	CT04	23/2/2021 18:24	23/2/2021	18:24:30	IMG_0006.MP4	*Tupaia glis*	1	-
8/3/2021	CT04	23/2/2021 18:55	23/2/2021	18:55:26	IMG_0007.MP4	*Tupaia glis*	1	-
8/3/2021	CT04	23/2/2021 19:01	23/2/2021	19:01:00	IMG_0008.MP4	*Tupaia glis*	1	-
8/3/2021	CT04	24/2/2021 6:49	23/2/2021	6:49:14	IMG_0010.MP4	*Sus scrofa*	1	-
8/3/2021	CT04	24/2/2021 7:27	23/2/2021	7:27:48	IMG_0011.MP4	*Callosciurus notatus*	1	-
8/3/2021	CT04	24/2/2021 10:49	24/2/2021	10:49:02	IMG_0012.MP4	*Callosciurus notatus*	1	-
8/3/2021	CT04	24/2/2021 13:35	24/2/2021	13:35:20	IMG_0013.MP4	*Callosciurus notatus*	1	-
8/3/2021	CT04	24/2/2021 13:42	24/2/2021	13:42:32	IMG_0014.MP4	*Callosciurus notatus*	1	-
8/3/2021	CT04	24/2/2021 14:22	24/2/2021	14:22:26	IMG_0015.MP4	*Tupaia glis*	1	-
8/3/2021	CT04	24/2/2021 15:07	24/2/2021	15:07:18	IMG_0016.MP4	*Tupaia glis*	1	-
8/3/2021	CT04	24/2/2021 16:47	24/2/2021	16:47:10	IMG_0017.MP4	*Sus scrofa*	1	-
8/3/2021	CT04	24/2/2021 17:27	24/2/2021	17:27:48	IMG_0018.MP4	*Sus scrofa*	1	-
8/3/2021	CT04	24/2/2021 17:29	24/2/2021	17:29:20	IMG_0019.MP4	*Sus scrofa*	1	-
8/3/2021	CT04	24/2/2021 19:53	24/2/2021	19:53:32	IMG_0020.MP4	*Sus scrofa*	1	-
8/3/2021	CT04	24/2/2021 19:55	24/2/2021	19:55:08	IMG_0021.MP4	*Sus scrofa*	1	-
8/3/2021	CT04	25/2/2021 7:07	24/2/2021	7:07:08	IMG_0022.MP4	*Tupaia glis*	1	-
8/3/2021	CT04	25/2/2021 8:08	25/2/2021	8:08:16	IMG_0023.MP4	*Sus scrofa*	1	-
8/3/2021	CT04	25/2/2021 9:23	25/2/2021	9:23:54	IMG_0024.MP4	*Sus scrofa*	1	-
8/3/2021	CT04	25/2/2021 17:46	25/2/2021	17:46:26	IMG_0025.MP4	*Callosciurus notatus*	1	-
8/3/2021	CT04	25/2/2021 17:52	25/2/2021	17:52:14	IMG_0026.MP4	*Sus scrofa*	1	-
8/3/2021	CT04	25/2/2021 17:55	25/2/2021	17:55:54	IMG_0027.MP4	*Sus scrofa*	1	-
8/3/2021	CT04	26/2/2021 3:09	25/2/2021	3:09:52	IMG_0028.MP4	*Rattus sp.*	1	-
8/3/2021	CT04	26/2/2021 4:37	25/2/2021	4:37:22	IMG_0029.MP4	*Sus scrofa*	1	-
8/3/2021	CT04	26/2/2021 4:39	25/2/2021	4:39:20	IMG_0030.MP4	*Sus scrofa*	1	-
8/3/2021	CT04	26/2/2021 7:22	25/2/2021	7:22:10	IMG_0031.MP4	*Sus scrofa*	1	-
8/3/2021	CT04	26/2/2021 17:53	26/2/2021	17:53:54	IMG_0033.MP4	*Tupaia glis*	1	-
8/3/2021	CT04	26/2/2021 17:53	26/2/2021	17:53:54	IMG_0033.MP4	*Callosciurus notatus*	1	-
8/3/2021	CT04	26/2/2021 18:29	26/2/2021	18:29:00	IMG_0034.MP4	*Callosciurus notatus*	1	-
8/3/2021	CT04	26/2/2021 18:52	26/2/2021	18:52:56	IMG_0035.MP4	*Sus scrofa*	1	-
8/3/2021	CT04	26/2/2021 19:59	26/2/2021	19:59:06	IMG_0036.MP4	*Rattus sp.*	1	-
8/3/2021	CT04	26/2/2021 23:37	26/2/2021	23:37:38	IMG_0037.MP4	*Sus scrofa*	1	-
8/3/2021	CT04	27/2/2021 8:37	27/2/2021	8:37:40	IMG_0038.MP4	*Sus scrofa*	1	-
8/3/2021	CT04	27/2/2021 23:05	27/2/2021	23:05:34	IMG_0039.MP4	*Sus scrofa*	1	-
8/3/2021	CT04	28/2/2021 6:31	27/2/2021	6:31:22	IMG_0040.MP4	*Rattus sp.*	1	-
8/3/2021	CT04	28/2/2021 13:29	28/2/2021	13:29:14	IMG_0041.MP4	*Copsychus saularis*	1	-
8/3/2021	CT04	28/2/2021 19:11	28/2/2021	19:11:36	IMG_0042.MP4	*Tupaia glis*	1	-
8/3/2021	CT04	28/2/2021 19:27	28/2/2021	19:27:18	IMG_0043.MP4	*Tupaia glis*	1	-
8/3/2021	CT04	1/3/2021 9:33	1/3/2021	9:33:24	IMG_0044.MP4	*Sus scrofa*	1	-
8/3/2021	CT04	1/3/2021 11:47	1/3/2021	11:47:08	IMG_0045.MP4	*Callosciurus notatus*	1	-
8/3/2021	CT04	1/3/2021 13:47	1/3/2021	13:47:12	IMG_0046.MP4	*Sus scrofa*	2	-
8/3/2021	CT04	1/3/2021 15:08	1/3/2021	15:08:02	IMG_0047.MP4	*Sus scrofa*	1	-
8/3/2021	CT04	1/3/2021 18:52	1/3/2021	18:52:34	IMG_0049.MP4	*Sus scrofa*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
8/3/2021	CT04	2/3/2021 4:00	1/3/2021	4:00:04	IMG_0050.MP4	*Sus scrofa*	1	-
8/3/2021	CT04	2/3/2021 13:47	2/3/2021	13:47:24	IMG_0051.MP4	*Sus scrofa*	1	-
8/3/2021	CT04	2/3/2021 14:15	2/3/2021	14:15:38	IMG_0052.MP4	*Callosciurus notatus*	2	-
8/3/2021	CT04	3/3/2021 4:55	2/3/2021	4:55:12	IMG_0053.MP4	*Sus scrofa*	1	-
8/3/2021	CT04	3/3/2021 4:58	2/3/2021	4:58:58	IMG_0054.MP4	*Sus scrofa*	2	-
8/3/2021	CT04	3/3/2021 11:12	3/3/2021	11:12:50	IMG_0055.MP4	*Sus scrofa*	1	-
8/3/2021	CT04	3/3/2021 13:38	3/3/2021	13:38:10	IMG_0056.MP4	*Tupaia glis*	1	-
8/3/2021	CT04	3/3/2021 15:10	3/3/2021	15:10:34	IMG_0057.MP4	*Sus scrofa*	1	-
8/3/2021	CT04	3/3/2021 17:29	3/3/2021	17:29:38	IMG_0058.MP4	*Tupaia glis*	1	-
8/3/2021	CT04	3/3/2021 17:56	3/3/2021	17:56:44	IMG_0059.MP4	*Sus scrofa*	1	-
8/3/2021	CT04	3/3/2021 22:03	3/3/2021	22:03:12	IMG_0060.MP4	*Rattus sp.*	1	-
8/3/2021	CT04	4/3/2021 6:56	3/3/2021	6:56:36	IMG_0061.MP4	*Sus scrofa*	1	-
8/3/2021	CT04	4/3/2021 7:17	3/3/2021	7:17:54	IMG_0062.MP4	*Sus scrofa*	1	-
8/3/2021	CT04	4/3/2021 12:48	4/3/2021	12:48:24	IMG_0063.MP4	*Sus scrofa*	1	-
8/3/2021	CT04	4/3/2021 12:50	4/3/2021	12:50:34	IMG_0064.MP4	*Sus scrofa*	1	-
8/3/2021	CT04	4/3/2021 19:21	4/3/2021	19:21:38	IMG_0065.MP4	Unidentified squirrel or treeshrew	1	-
8/3/2021	CT04	4/3/2021 20:07	4/3/2021	20:07:34	IMG_0066.MP4	Unidentified sp.	1	Possibly wild pig (Sus scrofa) or feral dog (Canis lupus familiaris)
8/3/2021	CT04	5/3/2021 6:30	4/3/2021	6:30:24	IMG_0067.MP4	*Sus scrofa*	1	-
8/3/2021	CT04	5/3/2021 6:31	4/3/2021	6:31:36	IMG_0068.MP4	*Sus scrofa*	1	-
8/3/2021	CT04	5/3/2021 6:36	4/3/2021	6:36:44	IMG_0070.MP4	*Sus scrofa*	1	-
8/3/2021	CT04	5/3/2021 6:41	4/3/2021	6:41:08	IMG_0071.MP4	*Sus scrofa*	1	-
8/3/2021	CT04	5/3/2021 6:42	4/3/2021	6:42:20	IMG_0072.MP4	*Sus scrofa*	1	-
8/3/2021	CT04	5/3/2021 12:52	5/3/2021	12:52:46	IMG_0073.MP4	*Tupaia glis*	1	-
8/3/2021	CT04	5/3/2021 14:17	5/3/2021	14:17:30	IMG_0074.MP4	*Callosciurus notatus*	1	-
8/3/2021	CT04	5/3/2021 14:17	5/3/2021	14:17:30	IMG_0074.MP4	*Tupaia glis*	1	-
8/3/2021	CT04	5/3/2021 14:18	5/3/2021	14:18:52	IMG_0075.MP4	*Callosciurus notatus*	1	-
8/3/2021	CT04	5/3/2021 14:57	5/3/2021	14:57:06	IMG_0076.MP4	*Sus scrofa*	1	-
8/3/2021	CT04	5/3/2021 18:59	5/3/2021	18:59:16	IMG_0077.MP4	*Tupaia glis*	1	-
8/3/2021	CT04	6/3/2021 16:25	6/3/2021	16:25:04	IMG_0078.MP4	*Tupaia glis*	1	-
8/3/2021	CT04	6/3/2021 17:35	6/3/2021	17:35:38	IMG_0079.MP4	*Sus scrofa*	1	-
8/3/2021	CT04	7/3/2021 12:54	7/3/2021	12:54:32	IMG_0080.MP4	*Tupaia glis*	1	-
8/3/2021	CT04	7/3/2021 16:43	7/3/2021	16:43:02	IMG_0081.MP4	Unidentified squirrel or treeshrew	1	-
8/3/2021	CT04	7/3/2021 17:49	7/3/2021	17:49:30	IMG_0082.MP4	*Sus scrofa*	1	-
8/3/2021	CT04	8/3/2021 3:09	7/3/2021	3:09:06	IMG_0084.MP4	*Rattus sp.*	1	-
8/3/2021	CT04	8/3/2021 3:20	7/3/2021	3:20:40	IMG_0085.MP4	*Rattus sp.*	1	-
9/3/2021	CT01	22/2/2021 18:47	22/2/2021	18:47:24	IMG_0006.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	23/2/2021 4:24	22/2/2021	4:24:52	IMG_0007.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	23/2/2021 7:09	22/2/2021	7:09:50	IMG_0008.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	23/2/2021 7:54	22/2/2021	7:54:16	IMG_0009.MP4	*Sus scrofa*	2	-
9/3/2021	CT01	23/2/2021 11:38	23/2/2021	11:38:40	IMG_0010.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	23/2/2021 15:38	23/2/2021	15:38:12	IMG_0011.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	23/2/2021 21:48	23/2/2021	21:48:36	IMG_0012.MP4	*Sus scrofa*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
9/3/2021	CT01	23/2/2021 21:53	23/2/2021	21:53:50	IMG_0013.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	24/2/2021 2:07	23/2/2021	2:07:36	IMG_0014.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	24/2/2021 12:40	24/2/2021	12:40:56	IMG_0016.MP4	*Sus scrofa*	3	-
9/3/2021	CT01	24/2/2021 13:00	24/2/2021	13:00:20	IMG_0017.MP4	*Sus scrofa*	2	-
9/3/2021	CT01	24/2/2021 17:29	24/2/2021	17:29:18	IMG_0018.MP4	*Sus scrofa*	2	-
9/3/2021	CT01	24/2/2021 18:48	24/2/2021	18:48:54	IMG_0019.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	24/2/2021 19:42	24/2/2021	19:42:32	IMG_0020.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	24/2/2021 19:42	24/2/2021	19:42:54	IMG_0021.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	25/2/2021 6:16	24/2/2021	6:16:48	IMG_0022.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	25/2/2021 9:29	25/2/2021	9:29:16	IMG_0023.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	25/2/2021 11:36	25/2/2021	11:36:28	IMG_0024.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	25/2/2021 13:11	25/2/2021	13:11:22	IMG_0025.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	25/2/2021 14:52	25/2/2021	14:52:04	IMG_0026.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	25/2/2021 21:15	25/2/2021	21:15:30	IMG_0027.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	26/2/2021 7:33	25/2/2021	7:33:46	IMG_0028.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	26/2/2021 15:45	26/2/2021	15:45:48	IMG_0029.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	26/2/2021 17:54	26/2/2021	17:54:06	IMG_0030.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	26/2/2021 18:39	26/2/2021	18:39:34	IMG_0031.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	27/2/2021 7:40	26/2/2021	7:40:14	IMG_0032.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	27/2/2021 7:43	26/2/2021	7:43:42	IMG_0034.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	27/2/2021 7:45	26/2/2021	7:45:38	IMG_0035.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	27/2/2021 15:01	27/2/2021	15:01:32	IMG_0036.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	27/2/2021 19:36	27/2/2021	19:36:38	IMG_0037.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	1/3/2021 7:21	28/2/2021	7:21:16	IMG_0039.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	1/3/2021 7:29	28/2/2021	7:29:08	IMG_0040.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	1/3/2021 7:38	28/2/2021	7:38:36	IMG_0041.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	1/3/2021 8:54	1/3/2021	8:54:00	IMG_0044.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	1/3/2021 10:39	1/3/2021	10:39:38	IMG_0045.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	2/3/2021 12:51	2/3/2021	12:51:12	IMG_0046.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	2/3/2021 14:23	2/3/2021	14:23:14	IMG_0047.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	2/3/2021 15:05	2/3/2021	15:05:08	IMG_0048.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	2/3/2021 16:13	2/3/2021	16:13:20	IMG_0049.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	3/3/2021 1:15	2/3/2021	1:15:08	IMG_0050.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	3/3/2021 6:37	2/3/2021	6:37:16	IMG_0051.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	3/3/2021 6:56	2/3/2021	6:56:30	IMG_0052.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	3/3/2021 8:24	3/3/2021	8:24:42	IMG_0053.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	3/3/2021 8:35	3/3/2021	8:35:52	IMG_0054.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	3/3/2021 9:12	3/3/2021	9:12:46	IMG_0055.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	3/3/2021 12:44	3/3/2021	12:44:26	IMG_0056.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	3/3/2021 13:28	3/3/2021	13:28:44	IMG_0057.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	3/3/2021 13:31	3/3/2021	13:31:24	IMG_0058.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	3/3/2021 16:07	3/3/2021	16:07:08	IMG_0059.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	3/3/2021 16:30	3/3/2021	16:30:04	IMG_0060.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	4/3/2021 1:19	3/3/2021	1:19:18	IMG_0061.MP4	*Sus scrofa*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
9/3/2021	CT01	4/3/2021 4:54	3/3/2021	4:54:44	IMG_0062.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	4/3/2021 7:55	3/3/2021	7:55:34	IMG_0063.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	4/3/2021 8:10	4/3/2021	8:10:20	IMG_0064.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	4/3/2021 8:21	4/3/2021	8:21:26	IMG_0065.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	4/3/2021 8:23	4/3/2021	8:23:00	IMG_0066.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	4/3/2021 8:49	4/3/2021	8:49:30	IMG_0067.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	4/3/2021 9:16	4/3/2021	9:16:36	IMG_0068.MP4	*Sus scrofa*	2	-
9/3/2021	CT01	4/3/2021 9:17	4/3/2021	9:17:48	IMG_0069.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	4/3/2021 12:10	4/3/2021	12:10:54	IMG_0070.MP4	*Sus scrofa*	2	-
9/3/2021	CT01	4/3/2021 13:18	4/3/2021	13:18:18	IMG_0071.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	4/3/2021 13:20	4/3/2021	13:20:58	IMG_0072.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	4/3/2021 16:42	4/3/2021	16:42:00	IMG_0073.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	5/3/2021 6:35	4/3/2021	6:35:28	IMG_0074.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	5/3/2021 8:04	5/3/2021	8:04:18	IMG_0075.MP4	*Sus scrofa*	2	-
9/3/2021	CT01	5/3/2021 8:49	5/3/2021	8:49:02	IMG_0076.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	5/3/2021 9:05	5/3/2021	9:05:10	IMG_0077.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	5/3/2021 9:08	5/3/2021	9:08:28	IMG_0078.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	5/3/2021 9:10	5/3/2021	9:10:24	IMG_0079.MP4	*Sus scrofa*	2	-
9/3/2021	CT01	5/3/2021 9:36	5/3/2021	9:36:04	IMG_0080.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	5/3/2021 13:11	5/3/2021	13:11:44	IMG_0081.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	5/3/2021 14:41	5/3/2021	14:41:48	IMG_0082.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	5/3/2021 19:16	5/3/2021	19:16:18	IMG_0083.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	5/3/2021 20:18	5/3/2021	20:18:00	IMG_0084.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	5/3/2021 23:26	5/3/2021	23:26:06	IMG_0085.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	6/3/2021 5:45	5/3/2021	5:45:34	IMG_0086.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	6/3/2021 10:57	6/3/2021	10:57:40	IMG_0087.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	7/3/2021 9:09	7/3/2021	9:09:36	IMG_0088.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	7/3/2021 19:32	7/3/2021	19:32:50	IMG_0089.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	7/3/2021 19:33	7/3/2021	19:33:16	IMG_0090.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	8/3/2021 7:53	7/3/2021	7:53:38	IMG_0091.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	8/3/2021 8:09	8/3/2021	8:09:40	IMG_0092.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	8/3/2021 9:49	8/3/2021	9:49:58	IMG_0093.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	8/3/2021 15:03	8/3/2021	15:03:46	IMG_0100.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	8/3/2021 20:35	8/3/2021	20:35:18	IMG_0101.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	9/3/2021 2:07	8/3/2021	2:07:54	IMG_0102.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	9/3/2021 7:45	8/3/2021	7:45:06	IMG_0103.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	9/3/2021 12:02	9/3/2021	12:02:20	IMG_0104.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	9/3/2021 14:17	9/3/2021	14:17:28	IMG_0105.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	9/3/2021 15:53	9/3/2021	15:53:14	IMG_0106.MP4	*Sus scrofa*	1	-
9/3/2021	CT01	9/3/2021 20:59	9/3/2021	20:59:28	IMG_0107.MP4	*Sus scrofa*	2	-
9/3/2021	CT01	9/3/2021 20:59	9/3/2021	20:59:52	IMG_0108.MP4	*Sus scrofa*	1	-
11/3/2021	CT06	2/3/2021 22:49	2/3/2021	22:49:12	IMG_0066.AVI	*Sus scrofa*	1	-
11/3/2021	CT06	4/3/2021 21:22	4/3/2021	21:22:02	IMG_0135.AVI	*Sus scrofa*	1	-
11/3/2021	CT06	10/3/2021 7:19	9/3/2021	7:19:20	IMG_0159.AVI	*Sus scrofa*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
11/3/2021	CT07	2/3/2021 9:54	2/3/2021	9:54:16	IMG_0004.AVI	*Gallus gallus*	1	-
11/3/2021	CT07	3/3/2021 11:31	3/3/2021	11:31:32	IMG_0007.AVI	*Sus scrofa*	1	-
11/3/2021	CT07	3/3/2021 16:43	3/3/2021	16:43:46	IMG_0011.AVI	*Gallus gallus*	2	-
11/3/2021	CT07	3/3/2021 16:45	3/3/2021	16:45:02	IMG_0012.AVI	*Gallus gallus*	2	-
11/3/2021	CT07	4/3/2021 7:57	3/3/2021	7:57:52	IMG_0013.AVI	*Gallus gallus*	2	-
11/3/2021	CT07	4/3/2021 19:18	4/3/2021	19:18:48	IMG_0014.AVI	*Sus scrofa*	1	-
11/3/2021	CT07	7/3/2021 18:53	7/3/2021	18:53:24	IMG_0017.AVI	*Sus scrofa*	1	-
11/3/2021	CT07	7/3/2021 19:05	7/3/2021	19:05:54	IMG_0018.AVI	*Sus scrofa*	1	-
11/3/2021	CT07	7/3/2021 19:06	7/3/2021	19:06:16	IMG_0019.AVI	*Sus scrofa*	1	-
11/3/2021	CT07	8/3/2021 7:44	7/3/2021	7:44:40	IMG_0020.AVI	*Sus scrofa*	1	-
11/3/2021	CT07	8/3/2021 7:45	7/3/2021	7:45:34	IMG_0021.AVI	*Gallus gallus*	1	-
11/3/2021	CT07	8/3/2021 7:45	7/3/2021	7:45:56	IMG_0022.AVI	*Gallus gallus*	1	-
11/3/2021	CT07	8/3/2021 8:05	8/3/2021	8:05:42	IMG_0023.AVI	*Gallus gallus*	1	-
11/3/2021	CT07	8/3/2021 8:10	8/3/2021	8:10:16	IMG_0024.AVI	*Chalcophaps indica*	1	-
11/3/2021	CT07	8/3/2021 8:10	8/3/2021	8:10:16	IMG_0024.AVI	*Gallus gallus*	1	-
11/3/2021	CT07	8/3/2021 9:44	8/3/2021	9:44:52	IMG_0025.AVI	*Gallus gallus*	1	-
11/3/2021	CT07	9/3/2021 6:53	8/3/2021	6:53:58	IMG_0028.AVI	*Sus scrofa*	1	-
11/3/2021	CT07	9/3/2021 6:54	8/3/2021	6:54:50	IMG_0029.AVI	*Sus scrofa*	1	-
11/3/2021	CT07	9/3/2021 6:55	8/3/2021	6:55:16	IMG_0030.AVI	*Sus scrofa*	2	-
11/3/2021	CT07	9/3/2021 7:01	8/3/2021	7:01:50	IMG_0032.AVI	*Sus scrofa*	1	-
11/3/2021	CT07	9/3/2021 7:05	8/3/2021	7:05:04	IMG_0033.AVI	*Sus scrofa*	1	-
11/3/2021	CT07	9/3/2021 7:15	8/3/2021	7:15:06	IMG_0034.AVI	*Sus scrofa*	2	-
11/3/2021	CT07	9/3/2021 7:15	8/3/2021	7:15:50	IMG_0035.AVI	*Sus scrofa*	2	-
11/3/2021	CT07	9/3/2021 7:16	8/3/2021	7:16:28	IMG_0036.AVI	*Sus scrofa*	1	-
11/3/2021	CT07	9/3/2021 7:17	8/3/2021	7:17:04	IMG_0037.AVI	*Sus scrofa*	2	-
11/3/2021	CT07	9/3/2021 7:22	8/3/2021	7:22:30	IMG_0038.AVI	*Sus scrofa*	2	-
11/3/2021	CT07	9/3/2021 7:32	8/3/2021	7:32:10	IMG_0039.AVI	*Sus scrofa*	1	-
11/3/2021	CT07	9/3/2021 12:12	9/3/2021	12:12:12	IMG_0040.AVI	*Gallus gallus*	1	-
11/3/2021	CT07	11/3/2021 10:16	11/3/2021	10:16:42	IMG_0044.AVI	*Gallus gallus*	1	-
11/3/2021	CT08	1/3/2021 17:32	1/3/2021	17:32:24	IMG_0008.AVI	*Gallus gallus*	1	-
11/3/2021	CT08	2/3/2021 8:21	2/3/2021	8:21:44	IMG_0009.AVI	*Sus scrofa*	1	-
11/3/2021	CT08	2/3/2021 8:22	2/3/2021	8:22:14	IMG_0010.AVI	*Sus scrofa*	1	-
11/3/2021	CT08	3/3/2021 0:39	2/3/2021	0:39:56	IMG_0011.AVI	*Sus scrofa*	1	-
11/3/2021	CT08	3/3/2021 0:40	2/3/2021	0:40:18	IMG_0012.AVI	*Sus scrofa*	1	-
11/3/2021	CT08	3/3/2021 0:40	2/3/2021	0:40:38	IMG_0013.AVI	*Sus scrofa*	1	-
11/3/2021	CT08	3/3/2021 0:41	2/3/2021	0:41:00	IMG_0014.AVI	*Sus scrofa*	1	-
11/3/2021	CT08	3/3/2021 6:38	2/3/2021	6:38:18	IMG_0015.AVI	*Sus scrofa*	2	-
11/3/2021	CT08	3/3/2021 6:38	2/3/2021	6:38:40	IMG_0016.AVI	*Sus scrofa*	1	-
11/3/2021	CT08	3/3/2021 6:39	2/3/2021	6:39:02	IMG_0017.AVI	*Sus scrofa*	2	-
11/3/2021	CT08	3/3/2021 6:39	2/3/2021	6:39:22	IMG_0018.AVI	*Sus scrofa*	2	-
11/3/2021	CT08	3/3/2021 6:40	2/3/2021	6:40:02	IMG_0019.AVI	*Sus scrofa*	1	-
11/3/2021	CT08	3/3/2021 6:40	2/3/2021	6:40:22	IMG_0020.AVI	*Sus scrofa*	1	-
11/3/2021	CT08	3/3/2021 6:40	2/3/2021	6:40:46	IMG_0021.AVI	*Sus scrofa*	1	-
11/3/2021	CT08	3/3/2021 6:41	2/3/2021	6:41:16	IMG_0022.AVI	*Sus scrofa*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
11/3/2021	CT08	3/3/2021 6:41	2/3/2021	6:41:42	IMG_0023.AVI	*Sus scrofa*	1	-
11/3/2021	CT08	3/3/2021 6:42	2/3/2021	6:42:04	IMG_0024.AVI	*Sus scrofa*	2	-
11/3/2021	CT08	3/3/2021 6:42	2/3/2021	6:42:26	IMG_0025.AVI	*Sus scrofa*	1	-
11/3/2021	CT08	3/3/2021 6:42	2/3/2021	6:42:52	IMG_0026.AVI	*Sus scrofa*	2	-
11/3/2021	CT08	3/3/2021 6:43	2/3/2021	6:43:14	IMG_0027.AVI	*Sus scrofa*	2	-
11/3/2021	CT08	3/3/2021 6:43	2/3/2021	6:43:36	IMG_0028.AVI	*Sus scrofa*	2	-
11/3/2021	CT08	3/3/2021 6:43	2/3/2021	6:43:58	IMG_0029.AVI	*Sus scrofa*	2	-
11/3/2021	CT08	3/3/2021 11:46	3/3/2021	11:46:56	IMG_0030.AVI	*Sus scrofa*	2	-
11/3/2021	CT08	3/3/2021 11:48	3/3/2021	11:48:28	IMG_0031.AVI	*Sus scrofa*	1	-
11/3/2021	CT08	3/3/2021 11:49	3/3/2021	11:49:52	IMG_0032.AVI	*Sus scrofa*	2	-
11/3/2021	CT08	4/3/2021 12:39	4/3/2021	12:39:46	IMG_0033.AVI	*Canis lupus familiaris*	3	-
11/3/2021	CT08	5/3/2021 2:57	4/3/2021	2:57:54	IMG_0034.AVI	*Sus scrofa*	1	-
11/3/2021	CT08	5/3/2021 11:24	5/3/2021	11:24:10	IMG_0035.AVI	*Gallus gallus*	1	-
11/3/2021	CT08	5/3/2021 14:05	5/3/2021	14:05:54	IMG_0036.AVI	*Sus scrofa*	1	-
11/3/2021	CT08	6/3/2021 6:37	5/3/2021	6:37:48	IMG_0037.AVI	*Sus scrofa*	1	-
11/3/2021	CT08	6/3/2021 6:38	5/3/2021	6:38:14	IMG_0038.AVI	*Sus scrofa*	1	-
11/3/2021	CT08	6/3/2021 6:39	5/3/2021	6:39:16	IMG_0039.AVI	*Sus scrofa*	2	-
11/3/2021	CT08	6/3/2021 6:39	5/3/2021	6:39:36	IMG_0040.AVI	*Sus scrofa*	1	-
11/3/2021	CT08	7/3/2021 7:21	6/3/2021	7:21:54	IMG_0041.AVI	*Gallus gallus*	1	-
11/3/2021	CT08	7/3/2021 19:44	7/3/2021	19:44:28	IMG_0042.AVI	*Sus scrofa*	1	-
11/3/2021	CT08	8/3/2021 8:23	8/3/2021	8:23:20	IMG_0043.AVI	*Gallus gallus*	1	-
11/3/2021	CT08	8/3/2021 8:41	8/3/2021	8:41:56	IMG_0044.AVI	*Gallus gallus*	3	-
11/3/2021	CT08	8/3/2021 17:21	8/3/2021	17:21:58	IMG_0045.AVI	*Sus scrofa*	2	-
11/3/2021	CT08	8/3/2021 17:59	8/3/2021	17:59:36	IMG_0046.AVI	*Sus scrofa*	1	-
11/3/2021	CT08	8/3/2021 18:00	8/3/2021	18:00:20	IMG_0047.AVI	*Sus scrofa*	1	-
11/3/2021	CT08	8/3/2021 18:15	8/3/2021	18:15:56	IMG_0048.AVI	*Sus scrofa*	2	-
11/3/2021	CT08	9/3/2021 10:01	9/3/2021	10:01:42	IMG_0049.AVI	*Sus scrofa*	1	-
11/3/2021	CT08	9/3/2021 14:55	9/3/2021	14:55:20	IMG_0050.AVI	*Sus scrofa*	1	-
11/3/2021	CT08	9/3/2021 19:54	9/3/2021	19:54:24	IMG_0051.AVI	*Sus scrofa*	1	-
11/3/2021	CT08	9/3/2021 19:57	9/3/2021	19:57:08	IMG_0052.AVI	*Sus scrofa*	1	-
11/3/2021	CT08	10/3/2021 9:07	10/3/2021	9:07:48	IMG_0053.AVI	*Sus scrofa*	1	-
11/3/2021	CT09	2/3/2021 23:51	2/3/2021	23:51:48	IMG_0008.AVI	*Sus scrofa*	1	-
11/3/2021	CT09	2/3/2021 23:52	2/3/2021	23:52:18	IMG_0009.AVI	*Sus scrofa*	1	-
11/3/2021	CT09	2/3/2021 23:53	2/3/2021	23:53:16	IMG_0010.AVI	*Sus scrofa*	1	-
11/3/2021	CT09	2/3/2021 23:53	2/3/2021	23:53:52	IMG_0011.AVI	*Sus scrofa*	1	-
11/3/2021	CT09	2/3/2021 23:54	2/3/2021	23:54:14	IMG_0012.AVI	*Sus scrofa*	1	-
11/3/2021	CT09	4/3/2021 13:05	4/3/2021	13:05:34	IMG_0013.AVI	*Canis lupus familiaris*	3	-
11/3/2021	CT09	4/3/2021 13:06	4/3/2021	13:06:50	IMG_0014.AVI	*Canis lupus familiaris*	1	-
11/3/2021	CT09	4/3/2021 18:39	4/3/2021	18:39:40	IMG_0018.AVI	*Canis lupus familiaris*	2	-
11/3/2021	CT09	4/3/2021 18:40	4/3/2021	18:40:02	IMG_0019.AVI	*Canis lupus familiaris*	1	-
11/3/2021	CT09	6/3/2021 19:37	6/3/2021	19:37:20	IMG_0022.AVI	*Sus scrofa*	1	-
11/3/2021	CT09	6/3/2021 19:37	6/3/2021	19:37:42	IMG_0023.AVI	*Sus scrofa*	1	-
11/3/2021	CT09	6/3/2021 19:38	6/3/2021	19:38:04	IMG_0024.AVI	*Sus scrofa*	1	-
11/3/2021	CT09	6/3/2021 19:38	6/3/2021	19:38:26	IMG_0025.AVI	*Sus scrofa*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
11/3/2021	CT09	6/3/2021 19:38	6/3/2021	19:38:48	IMG_0026.AVI	*Sus scrofa*	1	-
11/3/2021	CT09	8/3/2021 19:35	8/3/2021	19:35:10	IMG_0027.AVI	*Caprimulgus macrurus*	1	-
11/3/2021	CT09	10/3/2021 2:35	9/3/2021	2:35:48	IMG_0028.AVI	*Sus scrofa*	1	-
11/3/2021	CT09	10/3/2021 7:13	9/3/2021	7:13:08	IMG_0029.AVI	*Sus scrofa*	1	-
11/3/2021	CT09	10/3/2021 7:14	9/3/2021	7:14:06	IMG_0030.AVI	*Sus scrofa*	1	-
11/3/2021	CT09	10/3/2021 7:14	9/3/2021	7:14:42	IMG_0031.AVI	*Sus scrofa*	1	-
11/3/2021	CT09	10/3/2021 7:15	9/3/2021	7:15:04	IMG_0032.AVI	*Sus scrofa*	1	-
11/3/2021	CT09	10/3/2021 7:15	9/3/2021	7:15:32	IMG_0033.AVI	*Sus scrofa*	1	-
11/3/2021	CT09	10/3/2021 7:16	9/3/2021	7:16:16	IMG_0034.AVI	*Sus scrofa*	1	-
11/3/2021	CT09	10/3/2021 7:17	9/3/2021	7:17:26	IMG_0035.AVI	*Sus scrofa*	1	-
11/3/2021	CT09	10/3/2021 7:17	9/3/2021	7:17:56	IMG_0036.AVI	*Sus scrofa*	1	-
11/3/2021	CT09	10/3/2021 7:18	9/3/2021	7:18:26	IMG_0037.AVI	*Sus scrofa*	1	-
11/3/2021	CT09	10/3/2021 7:20	9/3/2021	7:20:08	IMG_0038.AVI	*Sus scrofa*	1	-
11/3/2021	CT09	10/3/2021 7:20	9/3/2021	7:20:32	IMG_0039.AVI	*Sus scrofa*	1	-
11/3/2021	CT09	10/3/2021 7:21	9/3/2021	7:21:10	IMG_0040.AVI	*Sus scrofa*	1	-
11/3/2021	CT09	10/3/2021 16:04	10/3/2021	16:04:56	IMG_0042.AVI	*Sus scrofa*	2	-
11/3/2021	CT09	10/3/2021 18:17	10/3/2021	18:17:16	IMG_0043.AVI	*Sus scrofa*	1	-
11/3/2021	CT09	10/3/2021 18:17	10/3/2021	18:17:44	IMG_0044.AVI	*Sus scrofa*	1	-
11/3/2021	CT09	10/3/2021 18:44	10/3/2021	18:44:44	IMG_0045.AVI	*Sus scrofa*	1	-
11/3/2021	CT09	10/3/2021 18:45	10/3/2021	18:45:08	IMG_0046.AVI	*Sus scrofa*	1	-
11/3/2021	CT09	10/3/2021 18:45	10/3/2021	18:45:32	IMG_0047.AVI	*Sus scrofa*	1	-
11/3/2021	CT09	10/3/2021 18:46	10/3/2021	18:46:02	IMG_0048.AVI	*Sus scrofa*	1	-
11/3/2021	CT09	10/3/2021 18:46	10/3/2021	18:46:26	IMG_0049.AVI	*Sus scrofa*	1	-
11/3/2021	CT09	10/3/2021 22:30	10/3/2021	22:30:00	IMG_0050.AVI	*Sus scrofa*	1	-
12/3/2021	CT10	15/3/2021 17:25	15/3/2021	5:25:07 PM	IMG_0016.AVI	*Callosciurus notatus*	1	-
12/3/2021	CT10	15/3/2021 17:25	15/3/2021	5:25:07 PM	IMG_0017.AVI	*Callosciurus notatus*	1	-
12/3/2021	CT10	15/3/2021 17:25	15/3/2021	5:25:09 PM	IMG_0028.AVI	*Sus scrofa*	1	-
12/3/2021	CT10	15/3/2021 17:25	15/3/2021	5:25:10 PM	IMG_0014.AVI	*Callosciurus notatus*	1	-
12/3/2021	CT10	15/3/2021 17:25	15/3/2021	5:25:11 PM	IMG_0015.AVI	*Sus scrofa*	1	-
12/3/2021	CT10	15/3/2021 17:25	15/3/2021	5:25:12 PM	IMG_0029.AVI	*Sus scrofa*	1	-
12/3/2021	CT10	15/3/2021 17:25	15/3/2021	5:25:13 PM	IMG_0011.AVI	*Sus scrofa*	1	-
12/3/2021	CT10	15/3/2021 17:25	15/3/2021	5:25:15 PM	IMG_0038.AVI	*Sus scrofa*	1	-
12/3/2021	CT10	15/3/2021 17:25	15/3/2021	5:25:15 PM	IMG_0039.AVI	*Sus scrofa*	1	-
12/3/2021	CT10	15/3/2021 17:25	15/3/2021	5:25:17 PM	IMG_0010.AVI	*Sus scrofa*	1	-
12/3/2021	CT10	15/3/2021 17:25	15/3/2021	5:25:19 PM	IMG_0012.AVI	*Sus scrofa*	1	-
12/3/2021	CT10	15/3/2021 17:25	15/3/2021	5:25:20 PM	IMG_0007.AVI	*Sus scrofa*	1	-
12/3/2021	CT10	15/3/2021 17:25	15/3/2021	5:25:21 PM	IMG_0022.AVI	*Callosciurus notatus*	1	-
12/3/2021	CT10	15/3/2021 17:25	15/3/2021	5:25:22 PM	IMG_0036.AVI	*Sus scrofa*	1	-
12/3/2021	CT10	15/3/2021 17:25	15/3/2021	5:25:23 PM	IMG_0023.AVI	*Gallus gallus*	1	-
12/3/2021	CT10	15/3/2021 17:25	15/3/2021	5:25:23 PM	IMG_0037.AVI	*Sus scrofa*	1	-
12/3/2021	CT10	15/3/2021 17:25	15/3/2021	5:25:26 PM	IMG_0020.AVI	*Sus scrofa*	1	-
12/3/2021	CT10	15/3/2021 17:25	15/3/2021	5:25:26 PM	IMG_0021.AVI	*Sus scrofa*	1	-
12/3/2021	CT10	15/3/2021 17:25	15/3/2021	5:25:27 PM	IMG_0034.AVI	*Sus scrofa*	1	-
12/3/2021	CT10	15/3/2021 17:25	15/3/2021	5:25:28 PM	IMG_0008.AVI	*Sus scrofa*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
12/3/2021	CT10	15/3/2021 17:25	15/3/2021	5:25:29 PM	IMG_0030.AVI	*Amaurornis phoenicurus*	1	-
12/3/2021	CT10	15/3/2021 17:25	15/3/2021	5:25:29 PM	IMG_0030.AVI	*Sus scrofa*	1	-
12/3/2021	CT10	15/3/2021 17:25	15/3/2021	5:25:30 PM	IMG_0018.AVI	*Sus scrofa*	1	-
12/3/2021	CT10	15/3/2021 17:25	15/3/2021	5:25:30 PM	IMG_0024.AVI	*Sus scrofa*	7	-
12/3/2021	CT10	15/3/2021 17:25	15/3/2021	5:25:31 PM	IMG_0019.AVI	*Sus scrofa*	1	-
12/3/2021	CT10	15/3/2021 17:25	15/3/2021	5:25:31 PM	IMG_0025.AVI	*Sus scrofa*	3	-
12/3/2021	CT10	15/3/2021 17:25	15/3/2021	5:25:32 PM	IMG_0031.AVI	*Callosciurus notatus*	1	-
12/3/2021	CT10	15/3/2021 17:25	15/3/2021	5:25:33 PM	IMG_0027.AVI	*Sus scrofa*	5	-
12/3/2021	CT10	15/3/2021 17:25	15/3/2021	5:25:33 PM	IMG_0033.AVI	Unidentified Strigidae	1	-
12/3/2021	CT10	15/3/2021 17:25	15/3/2021	5:25:34 PM	IMG_0032.AVI	*Sus scrofa*	8	-
12/3/2021	CT10	15/3/2021 17:25	15/3/2021	5:25:35 PM	IMG_0041.AVI	*Picus vittatus*	1	-
12/3/2021	CT10	15/3/2021 17:25	15/3/2021	5:25:35 PM	IMG_0026.AVI	*Sus scrofa*	5	-
12/3/2021	CT10	15/3/2021 17:25	15/3/2021	5:25:36 PM	IMG_0040.AVI	*Sus scrofa*	1	-
12/3/2021	CT13	1/3/2021 20:19	1/3/2021	8:19:56 PM	IMG_0003.MP4	*Sus scrofa*	1	-
12/3/2021	CT13	2/3/2021 11:36	2/3/2021	11:36:12 AM	IMG_0004.MP4	*Varanus salvator*	1	-
12/3/2021	CT13	2/3/2021 13:50	2/3/2021	1:50:04 PM	IMG_0006.MP4	*Junonia hedonia ida*	1	-
12/3/2021	CT13	4/3/2021 19:46	4/3/2021	7:46:06 PM	IMG_0018.MP4	*Sus scrofa*	1	-
12/3/2021	CT13	11/3/2021 20:12	11/3/2021	8:12:30 PM	IMG_0233.MP4	*Sus scrofa*	1	-
12/3/2021	CT14	2/3/2021 8:56	2/3/2021	8:56:56 AM	IMG_0007.MP4	*Sus scrofa*	1	-
12/3/2021	CT14	4/3/2021 11:31	4/3/2021	11:31:58 AM	IMG_0008.MP4	*Sus scrofa*	1	-
12/3/2021	CT14	5/3/2021 20:52	5/3/2021	8:52:38 PM	IMG_0010.MP4	*Sus scrofa*	1	-
12/3/2021	CT14	5/3/2021 20:54	5/3/2021	8:54:26 PM	IMG_0011.MP4	*Sus scrofa*	1	-
12/3/2021	CT14	5/3/2021 20:54	5/3/2021	8:54:54 PM	IMG_0012.MP4	*Sus scrofa*	2	-
12/3/2021	CT14	5/3/2021 22:25	5/3/2021	10:25:56 PM	IMG_0013.MP4	*Sus scrofa*	1	-
12/3/2021	CT14	10/3/2021 12:19	10/3/2021	12:19:08 PM	IMG_0014.MP4	*Gallus gallus*	6	-
12/3/2021	CT14	10/3/2021 15:39	10/3/2021	3:39:36 PM	IMG_0015.MP4	*Sus scrofa*	1	-
12/3/2021	CT14	10/3/2021 16:31	10/3/2021	4:31:50 PM	IMG_0016.MP4	*Gallus gallus*	2	-
12/3/2021	CT15	26/2/2021 19:09	26/2/2021	7:09:04 PM	IMG_0007.MP4	*Gallus gallus*	1	-
12/3/2021	CT15	27/2/2021 8:59	27/2/2021	8:59:10 AM	IMG_0009.MP4	*Chalcophaps indica*	1	-
12/3/2021	CT15	28/2/2021 10:05	28/2/2021	10:05:36 AM	IMG_0010.MP4	*Chalcophaps indica*	1	-
12/3/2021	CT15	28/2/2021 15:34	28/2/2021	3:34:22 PM	IMG_0011.MP4	*Chalcophaps indica*	1	-
12/3/2021	CT15	1/3/2021 6:39	28/2/2021	6:39:08 AM	IMG_0013.MP4	*Rattus tiomanicus*	1	-
12/3/2021	CT15	1/3/2021 8:10	1/3/2021	8:10:22 AM	IMG_0014.MP4	*Chalcophaps indica*	1	-
12/3/2021	CT15	1/3/2021 10:00	1/3/2021	10:00:22 AM	IMG_0015.MP4	*Chalcophaps indica*	1	-
12/3/2021	CT15	1/3/2021 12:44	1/3/2021	12:44:34 PM	IMG_0016.MP4	*Chalcophaps indica*	1	-
12/3/2021	CT15	1/3/2021 15:57	1/3/2021	3:57:56 PM	IMG_0017.MP4	*Gallus gallus*	4	-
12/3/2021	CT15	1/3/2021 19:01	1/3/2021	7:01:50 PM	IMG_0018.MP4	*Sus scrofa*	1	-
12/3/2021	CT15	1/3/2021 19:02	1/3/2021	7:02:12 PM	IMG_0019.MP4	*Sus scrofa*	1	-
12/3/2021	CT15	2/3/2021 9:02	2/3/2021	9:02:20 AM	IMG_0021.MP4	*Chalcophaps indica*	1	-
12/3/2021	CT15	3/3/2021 0:08	2/3/2021	12:08:06 AM	IMG_0022.MP4	*Rattus tiomanicus*	1	-
12/3/2021	CT15	3/3/2021 4:36	2/3/2021	4:36:10 AM	IMG_0023.MP4	*Rattus tiomanicus*	1	-
12/3/2021	CT15	3/3/2021 4:41	2/3/2021	4:41:42 AM	IMG_0024.MP4	*Rattus tiomanicus*	1	-
12/3/2021	CT15	3/3/2021 9:56	3/3/2021	9:56:32 AM	IMG_0027.MP4	*Chalcophaps indica*	2	-
12/3/2021	CT15	3/3/2021 11:01	3/3/2021	11:01:14 AM	IMG_0028.MP4	*Chalcophaps indica*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
12/3/2021	CT15	3/3/2021 23:08	3/3/2021	11:08:02 PM	IMG_0030.MP4	*Rattus tiomanicus*	1	-
12/3/2021	CT15	4/3/2021 5:50	3/3/2021	5:50:34 AM	IMG_0031.MP4	*Paradoxurus musangus*	1	-
12/3/2021	CT15	4/3/2021 7:35	3/3/2021	7:35:36 AM	IMG_0032.MP4	*Chalcophaps indica*	1	-
12/3/2021	CT15	4/3/2021 8:06	4/3/2021	8:06:14 AM	IMG_0033.MP4	*Picus vittatus*	1	-
12/3/2021	CT15	4/3/2021 9:21	4/3/2021	9:21:42 AM	IMG_0034.MP4	*Chalcophaps indica*	1	-
12/3/2021	CT15	4/3/2021 9:48	4/3/2021	9:48:00 AM	IMG_0035.MP4	*Chalcophaps indica*	1	-
12/3/2021	CT15	5/3/2021 8:35	5/3/2021	8:35:02 AM	IMG_0036.MP4	*Sus scrofa*	1	-
12/3/2021	CT15	5/3/2021 8:45	5/3/2021	8:45:48 AM	IMG_0037.MP4	*Sus scrofa*	1	-
12/3/2021	CT15	6/3/2021 5:33	5/3/2021	5:33:52 AM	IMG_0038.MP4	*Rattus tiomanicus*	1	-
12/3/2021	CT15	6/3/2021 7:43	5/3/2021	7:43:32 AM	IMG_0039.MP4	*Chalcophaps indica*	1	-
12/3/2021	CT15	6/3/2021 8:37	6/3/2021	8:37:22 AM	IMG_0040.MP4	*Sus scrofa*	1	-
12/3/2021	CT15	7/3/2021 7:35	6/3/2021	7:35:06 AM	IMG_0041.MP4	*Chalcophaps indica*	1	-
12/3/2021	CT15	7/3/2021 10:12	7/3/2021	10:12:14 AM	IMG_0042.MP4	*Chalcophaps indica*	1	-
12/3/2021	CT15	7/3/2021 16:50	7/3/2021	4:50:00 PM	IMG_0043.MP4	*Sus scrofa*	1	-
12/3/2021	CT15	7/3/2021 16:53	7/3/2021	4:53:30 PM	IMG_0044.MP4	*Sus scrofa*	1	-
12/3/2021	CT15	7/3/2021 16:53	7/3/2021	4:53:52 PM	IMG_0045.MP4	*Sus scrofa*	1	-
12/3/2021	CT15	7/3/2021 16:54	7/3/2021	4:54:14 PM	IMG_0046.MP4	*Sus scrofa*	1	-
12/3/2021	CT15	7/3/2021 17:15	7/3/2021	5:15:48 PM	IMG_0047.MP4	*Sus scrofa*	1	-
12/3/2021	CT15	7/3/2021 18:56	7/3/2021	6:56:30 PM	IMG_0048.MP4	*Picus vittatus*	1	-
12/3/2021	CT15	7/3/2021 21:58	7/3/2021	9:58:34 PM	IMG_0049.MP4	*Rattus tiomanicus*	1	-
12/3/2021	CT15	8/3/2021 4:16	7/3/2021	4:16:44 AM	IMG_0050.MP4	*Rattus tiomanicus*	1	-
12/3/2021	CT15	8/3/2021 6:50	7/3/2021	6:50:40 AM	IMG_0051.MP4	*Sus scrofa*	1	-
12/3/2021	CT15	8/3/2021 9:28	8/3/2021	9:28:00 AM	IMG_0052.MP4	*Chalcophaps indica*	1	-
12/3/2021	CT15	8/3/2021 10:49	8/3/2021	10:49:52 AM	IMG_0053.MP4	*Chalcophaps indica*	1	-
12/3/2021	CT15	8/3/2021 12:42	8/3/2021	12:42:08 PM	IMG_0054.MP4	*Sus scrofa*	1	-
12/3/2021	CT15	8/3/2021 13:12	8/3/2021	1:12:08 PM	IMG_0055.MP4	*Chalcophaps indica*	1	-
12/3/2021	CT15	9/3/2021 7:27	8/3/2021	7:27:30 AM	IMG_0056.MP4	*Chalcophaps indica*	1	-
12/3/2021	CT15	9/3/2021 8:40	9/3/2021	8:40:10 AM	IMG_0057.MP4	*Chalcophaps indica*	1	-
12/3/2021	CT15	9/3/2021 9:02	9/3/2021	9:02:24 AM	IMG_0058.MP4	*Chalcophaps indica*	1	-
12/3/2021	CT15	9/3/2021 13:12	9/3/2021	1:12:50 PM	IMG_0059.MP4	*Sus scrofa*	1	-
12/3/2021	CT15	10/3/2021 2:49	9/3/2021	2:49:46 AM	IMG_0060.MP4	*Rattus tiomanicus*	1	-
12/3/2021	CT15	10/3/2021 4:53	9/3/2021	4:53:02 AM	IMG_0061.MP4	*Rattus tiomanicus*	1	-
12/3/2021	CT15	10/3/2021 7:43	9/3/2021	7:43:06 AM	IMG_0062.MP4	*Chalcophaps indica*	1	-
12/3/2021	CT15	10/3/2021 8:40	10/3/2021	8:40:12 AM	IMG_0063.MP4	*Gallus gallus*	1	-
12/3/2021	CT15	10/3/2021 8:40	10/3/2021	8:40:12 AM	IMG_0063.MP4	*Sus scrofa*	1	-
12/3/2021	CT15	10/3/2021 22:01	10/3/2021	10:01:04 PM	IMG_0064.MP4	*Otus lempiji*	1	-
12/3/2021	CT15	11/3/2021 1:25	10/3/2021	1:25:56 AM	IMG_0065.MP4	*Rattus tiomanicus*	1	-
12/3/2021	CT15	11/3/2021 19:04	11/3/2021	7:04:20 PM	IMG_0067.MP4	*Sus scrofa*	1	-
12/3/2021	CT15	12/3/2021 1:44	11/3/2021	1:44:38 AM	IMG_0068.MP4	*Rattus tiomanicus*	1	-
12/3/2021	CT15	12/3/2021 9:50	12/3/2021	9:50:52 AM	IMG_0069.MP4	*Chalcophaps indica*	1	-
12/3/2021	CT16	28/2/2021 0:46	27/2/2021	12:46:22 AM	IMG_0009.MP4	*Sus scrofa*	1	-
12/3/2021	CT16	28/2/2021 15:30	28/2/2021	3:30:42 PM	IMG_0010.MP4	*Sus scrofa*	1	-
12/3/2021	CT16	4/3/2021 5:24	3/3/2021	5:24:08 AM	IMG_0011.MP4	Unidentified squirrel or treeshrew	1	-
12/3/2021	CT16	9/3/2021 9:06	9/3/2021	9:06:38 AM	IMG_0012.MP4	*Sus scrofa*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
12/3/2021	CT16	11/3/2021 21:25	11/3/2021	9:25:36 PM	IMG_0013.MP4	*Sus scrofa*	1	-
12/3/2021	CT16	12/3/2021 8:53	12/3/2021	8:53:36 AM	IMG_0015.MP4	*Sus scrofa*	1	-
12/3/2021	CT17	27/2/2021 8:48	27/2/2021	8:48:52 AM	IMG_0008.MP4	*Garrulax leucolophus*	5	-
12/3/2021	CT17	27/2/2021 8:49	27/2/2021	8:49:18 AM	IMG_0009.MP4	*Garrulax leucolophus*	2	-
12/3/2021	CT17	28/2/2021 23:29	28/2/2021	11:29:30 PM	IMG_0011.MP4	*Rattus sp.*	1	-
12/3/2021	CT17	1/3/2021 1:27	28/2/2021	1:27:52 AM	IMG_0012.MP4	*Rattus tiomanicus*	1	-
12/3/2021	CT17	1/3/2021 1:28	28/2/2021	1:28:34 AM	IMG_0013.MP4	*Rattus tiomanicus*	1	-
12/3/2021	CT17	2/3/2021 0:42	1/3/2021	12:42:04 AM	IMG_0014.MP4	*Rattus tiomanicus*	1	-
12/3/2021	CT17	2/3/2021 6:54	1/3/2021	6:54:08 AM	IMG_0015.MP4	*Rattus tiomanicus*	1	-
12/3/2021	CT17	2/3/2021 20:04	2/3/2021	8:04:14 PM	IMG_0018.MP4	*Rattus tiomanicus*	1	-
12/3/2021	CT17	3/3/2021 6:51	2/3/2021	6:51:20 AM	IMG_0019.MP4	*Rattus sp.*	1	-
12/3/2021	CT17	3/3/2021 8:44	3/3/2021	8:44:18 AM	IMG_0020.MP4	*Gallus gallus*	1	-
12/3/2021	CT17	4/3/2021 6:50	3/3/2021	6:50:08 AM	IMG_0021.MP4	*Sus scrofa*	1	-
12/3/2021	CT17	4/3/2021 6:52	3/3/2021	6:52:52 AM	IMG_0022.MP4	*Gorsachius melanolophus*	1	-
12/3/2021	CT17	4/3/2021 10:08	4/3/2021	10:08:14 AM	IMG_0023.MP4	*Acridotheres javanicus*	1	-
12/3/2021	CT17	5/3/2021 6:44	4/3/2021	6:44:18 AM	IMG_0024.MP4	*Rattus sp.*	1	-
12/3/2021	CT17	5/3/2021 6:44	4/3/2021	6:44:54 AM	IMG_0025.MP4	*Rattus tiomanicus*	1	-
12/3/2021	CT17	7/3/2021 4:11	6/3/2021	4:11:20 AM	IMG_0026.MP4	*Rattus tiomanicus*	1	-
12/3/2021	CT17	8/3/2021 2:06	7/3/2021	2:06:28 AM	IMG_0028.MP4	*Rattus sp.*	1	-
12/3/2021	CT17	10/3/2021 1:59	9/3/2021	1:59:36 AM	IMG_0031.MP4	*Paradoxurus musangus*	1	-
12/3/2021	CT17	10/3/2021 2:00	9/3/2021	2:00:02 AM	IMG_0032.MP4	*Paradoxurus musangus*	1	-
12/3/2021	CT17	11/3/2021 21:25	11/3/2021	9:25:50 PM	IMG_0035.MP4	*Paradoxurus musangus*	1	-
25/3/2021	CT11	12/3/2021 16:03	12/3/2021	4:03:14 PM	IMG_0003.AVI	*Sus scrofa*	1	-
25/3/2021	CT11	13/3/2021 16:31	13/3/2021	4:31:48 PM	IMG_0004.AVI	*Sus scrofa*	1	-
25/3/2021	CT11	13/3/2021 16:42	13/3/2021	4:42:10 PM	IMG_0005.AVI	*Sus scrofa*	1	-
25/3/2021	CT11	13/3/2021 17:31	13/3/2021	5:31:08 PM	IMG_0006.AVI	*Sus scrofa*	1	-
25/3/2021	CT11	14/3/2021 7:11	13/3/2021	7:11:40 AM	IMG_0007.AVI	*Sus scrofa*	1	-
25/3/2021	CT11	14/3/2021 14:01	14/3/2021	2:01:40 PM	IMG_0008.AVI	*Sus scrofa*	1	-
25/3/2021	CT11	14/3/2021 18:34	14/3/2021	6:34:26 PM	IMG_0009.AVI	*Sus scrofa*	1	-
25/3/2021	CT11	14/3/2021 18:36	14/3/2021	6:36:58 PM	IMG_0010.AVI	*Sus scrofa*	1	-
25/3/2021	CT11	15/3/2021 14:43	15/3/2021	2:43:36 PM	IMG_0011.AVI	*Callosciurus notatus*	1	-
25/3/2021	CT11	15/3/2021 14:43	15/3/2021	2:43:36 PM	IMG_0011.AVI	*Garrulax leucolophus*	1	-
25/3/2021	CT11	15/3/2021 18:30	15/3/2021	6:30:28 PM	IMG_0012.AVI	*Sus scrofa*	1	-
25/3/2021	CT11	15/3/2021 20:47	15/3/2021	8:47:48 PM	IMG_0013.AVI	*Sus scrofa*	3	-
25/3/2021	CT11	16/3/2021 7:38	15/3/2021	7:38:32 AM	IMG_0014.AVI	*Sus scrofa*	1	-
25/3/2021	CT11	16/3/2021 16:50	16/3/2021	4:50:26 PM	IMG_0015.AVI	*Sus scrofa*	1	-
25/3/2021	CT11	16/3/2021 18:33	16/3/2021	6:33:50 PM	IMG_0016.AVI	*Sus scrofa*	1	-
25/3/2021	CT11	17/3/2021 11:41	17/3/2021	11:41:30 AM	IMG_0017.AVI	*Sus scrofa*	2	-
25/3/2021	CT11	18/3/2021 13:51	18/3/2021	1:51:14 PM	IMG_0018.AVI	*Sus scrofa*	1	-
25/3/2021	CT11	19/3/2021 18:34	19/3/2021	6:34:16 PM	IMG_0020.AVI	*Sus scrofa*	1	-
25/3/2021	CT11	19/3/2021 18:41	19/3/2021	6:41:20 PM	IMG_0021.AVI	*Amaurornis phoenicurus*	1	-
25/3/2021	CT11	19/3/2021 18:41	19/3/2021	6:41:20 PM	IMG_0021.AVI	*Sus scrofa*	1	-
25/3/2021	CT11	20/3/2021 14:56	20/3/2021	2:56:06 PM	IMG_0022.AVI	Unidentified squirrel or treeshrew	1	-
25/3/2021	CT11	21/3/2021 7:00	20/3/2021	7:00:50 AM	IMG_0023.AVI	Unidentified squirrel or treeshrew	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
25/3/2021	CT11	21/3/2021 7:50	20/3/2021	7:50:34 AM	IMG_0024.AVI	*Sus scrofa*	1	-
25/3/2021	CT11	21/3/2021 14:29	21/3/2021	2:29:06 PM	IMG_0025.AVI	*Sus scrofa*	1	-
25/3/2021	CT11	22/3/2021 12:17	22/3/2021	12:17:20 PM	IMG_0026.AVI	*Sus scrofa*	1	-
25/3/2021	CT11	23/3/2021 15:30	23/3/2021	3:30:34 PM	IMG_0027.AVI	*Sus scrofa*	1	-
25/3/2021	CT11	24/3/2021 16:10	24/3/2021	4:10:10 PM	IMG_0028.AVI	*Sus scrofa*	1	-
25/3/2021	CT12	2/3/2021 14:33	2/3/2021	2:33:10 PM	IMG_0025.AVI	*Acridotheres javanicus*	1	-
25/3/2021	CT12	2/3/2021 14:34	2/3/2021	2:34:48 PM	IMG_0026.AVI	*Acridotheres javanicus*	1	-
25/3/2021	CT12	3/3/2021 11:58	3/3/2021	11:58:56 AM	IMG_0040.AVI	*Varanus salvator*	1	-
25/3/2021	CT12	3/3/2021 17:06	3/3/2021	5:06:44 PM	IMG_0049.AVI	*Acridotheres javanicus*	1	-
25/3/2021	CT12	3/3/2021 19:02	3/3/2021	7:02:20 PM	IMG_0050.AVI	*Acridotheres javanicus*	2	-
25/3/2021	CT12	4/3/2021 13:14	4/3/2021	1:14:56 PM	IMG_0064.AVI	*Acridotheres javanicus*	1	-
25/3/2021	CT12	4/3/2021 15:23	4/3/2021	3:23:14 PM	IMG_0075.AVI	*Acridotheres javanicus*	1	-
25/3/2021	CT12	4/3/2021 15:23	4/3/2021	3:23:58 PM	IMG_0076.AVI	*Acridotheres javanicus*	1	-
25/3/2021	CT12	4/3/2021 15:44	4/3/2021	3:44:12 PM	IMG_0077.AVI	*Butorides striata*	1	-
25/3/2021	CT12	4/3/2021 17:48	4/3/2021	5:48:08 PM	IMG_0093.AVI	*Acridotheres javanicus*	1	-
25/3/2021	CT12	4/3/2021 18:09	4/3/2021	6:09:42 PM	IMG_0094.AVI	*Acridotheres javanicus*	2	-
25/3/2021	CT12	4/3/2021 19:13	4/3/2021	7:13:56 PM	IMG_0095.AVI	*Butorides striata*	1	-
25/3/2021	CT12	5/3/2021 12:02	5/3/2021	12:02:42 PM	IMG_0120.AVI	*Acridotheres javanicus*	1	-
25/3/2021	CT12	5/3/2021 12:03	5/3/2021	12:03:10 PM	IMG_0121.AVI	*Acridotheres javanicus*	1	-
25/3/2021	CT12	5/3/2021 16:22	5/3/2021	4:22:40 PM	IMG_0168.AVI	*Acridotheres javanicus*	1	-
25/3/2021	CT12	6/3/2021 10:00	6/3/2021	10:00:48 AM	IMG_0203.AVI	*Acridotheres javanicus*	1	-
25/3/2021	CT12	6/3/2021 11:50	6/3/2021	11:50:02 AM	IMG_0326.AVI	*Acridotheres javanicus*	1	-
25/3/2021	CT12	6/3/2021 11:51	6/3/2021	11:51:02 AM	IMG_0327.AVI	*Acridotheres javanicus*	1	-
25/3/2021	CT12	6/3/2021 11:51	6/3/2021	11:51:44 AM	IMG_0328.AVI	*Acridotheres javanicus*	2	-
30/3/2021	CT12	26/3/2021 16:23	26/3/2021	4:23:00 PM	IMG_0001.AVI	*Garrulax leucolophus*	4	-
30/3/2021	CT12	27/3/2021 7:48	26/3/2021	7:48:44 AM	IMG_0004.AVI	*Garrulax leucolophus*	2	-
30/3/2021	CT12	28/3/2021 7:11	27/3/2021	7:11:04 AM	IMG_0005.AVI	*Sus scrofa*	1	-
30/3/2021	CT12	28/3/2021 19:09	28/3/2021	7:09:36 PM	IMG_0006.AVI	*Gallus gallus*	1	-
30/3/2021	CT12	28/3/2021 19:13	28/3/2021	7:13:30 PM	IMG_0007.AVI	*Gallus gallus*	1	-
30/3/2021	CT12	28/3/2021 19:13	28/3/2021	7:13:52 PM	IMG_0008.AVI	*Gallus gallus*	1	-
30/3/2021	CT12	29/3/2021 8:54	29/3/2021	8:54:54 AM	IMG_0009.AVI	*Sus scrofa*	1	-
30/3/2021	CT12	29/3/2021 15:45	29/3/2021	3:45:12 PM	IMG_0010.AVI	*Garrulax leucolophus*	2	-
30/3/2021	CT12	29/3/2021 17:23	29/3/2021	5:23:54 PM	IMG_0011.AVI	*Sus scrofa*	1	-
30/3/2021	CT12	29/3/2021 17:24	29/3/2021	5:24:16 PM	IMG_0012.AVI	*Sus scrofa*	1	-
30/3/2021	CT12	29/3/2021 17:24	29/3/2021	5:24:36 PM	IMG_0013.AVI	*Sus scrofa*	1	-
30/3/2021	CT12	30/3/2021 8:40	30/3/2021	8:40:00 AM	IMG_0014.AVI	*Gallus gallus*	1	-
9/4/2021	CT01	13/3/2021 5:11	12/3/2021	5:11:28	IMG_0016.MP4	*Sus scrofa*	1	-
9/4/2021	CT01	16/3/2021 6:15	15/3/2021	6:15:00	IMG_0017.MP4	*Rattus tiomanicus*	1	-
9/4/2021	CT01	17/3/2021 18:08	17/3/2021	18:08:10	IMG_0018.MP4	*Garrulax leucolophus*	1	-
9/4/2021	CT01	17/3/2021 21:32	17/3/2021	21:32:30	IMG_0020.MP4	*Sus scrofa*	1	-
9/4/2021	CT01	17/3/2021 21:32	17/3/2021	21:32:52	IMG_0021.MP4	*Sus scrofa*	1	-
9/4/2021	CT01	17/3/2021 21:33	17/3/2021	21:33:16	IMG_0022.MP4	*Sus scrofa*	1	-
9/4/2021	CT01	17/3/2021 21:33	17/3/2021	21:33:38	IMG_0023.MP4	*Sus scrofa*	1	-
9/4/2021	CT01	18/3/2021 6:53	17/3/2021	6:53:22	IMG_0024.MP4	*Rattus sp.*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
9/4/2021	CT01	18/3/2021 10:53	18/3/2021	10:53:04	IMG_0025.MP4	*Sus scrofa*	1	-
9/4/2021	CT01	19/3/2021 12:11	19/3/2021	12:11:54	IMG_0027.MP4	*Tupaia glis*	1	-
9/4/2021	CT01	20/3/2021 20:25	20/3/2021	20:25:08	IMG_0028.MP4	*Sus scrofa*	1	-
9/4/2021	CT01	21/3/2021 11:36	21/3/2021	11:36:22	IMG_0029.MP4	*Gallus gallus*	2	-
9/4/2021	CT01	22/3/2021 3:26	21/3/2021	3:26:10	IMG_0030.MP4	*Sus scrofa*	1	-
9/4/2021	CT01	24/3/2021 23:45	24/3/2021	23:45:34	IMG_0032.MP4	*Paradoxurus musangus*	1	-
9/4/2021	CT01	25/3/2021 4:53	24/3/2021	4:53:44	IMG_0033.MP4	*Rattus sp.*	1	-
9/4/2021	CT01	27/3/2021 6:50	26/3/2021	6:50:00	IMG_0034.MP4	*Tupaia glis*	1	-
9/4/2021	CT01	27/3/2021 6:50	26/3/2021	6:50:32	IMG_0035.MP4	*Tupaia glis*	1	-
9/4/2021	CT01	27/3/2021 22:11	27/3/2021	22:11:04	IMG_0036.MP4	*Rattus tiomanicus*	1	-
9/4/2021	CT01	28/3/2021 3:44	27/3/2021	3:44:32	IMG_0037.MP4	*Rattus sp.*	1	-
9/4/2021	CT01	28/3/2021 20:56	28/3/2021	20:56:30	IMG_0038.MP4	*Sus scrofa*	1	-
9/4/2021	CT01	29/3/2021 21:34	29/3/2021	21:34:44	IMG_0039.MP4	*Rattus tiomanicus*	1	-
9/4/2021	CT01	29/3/2021 23:31	29/3/2021	23:31:42	IMG_0040.MP4	*Rattus tiomanicus*	1	-
9/4/2021	CT01	31/3/2021 4:10	30/3/2021	4:10:24	IMG_0042.MP4	*Paradoxurus musangus*	1	-
9/4/2021	CT01	2/4/2021 19:09	2/4/2021	19:09:30	IMG_0044.MP4	*Amaurornis phoenicurus*	1	-
9/4/2021	CT01	4/4/2021 21:58	4/4/2021	21:58:00	IMG_0045.MP4	*Sus scrofa*	1	-
9/4/2021	CT01	5/4/2021 16:57	5/4/2021	16:57:22	IMG_0046.MP4	*Sus scrofa*	3	-
9/4/2021	CT01	7/4/2021 1:34	6/4/2021	1:34:36	IMG_0047.MP4	*Sus scrofa*	1	-
9/4/2021	CT01	7/4/2021 1:34	6/4/2021	1:34:58	IMG_0048.MP4	*Sus scrofa*	1	-
9/4/2021	CT01	7/4/2021 3:11	6/4/2021	3:11:38	IMG_0049.MP4	*Paradoxurus musangus*	1	-
9/4/2021	CT01	7/4/2021 17:09	7/4/2021	17:09:32	IMG_0050.MP4	*Gallus gallus*	1	-
9/4/2021	CT01	8/4/2021 3:22	7/4/2021	3:22:08	IMG_0051.MP4	*Rattus sp.*	1	-
9/4/2021	CT01	8/4/2021 16:57	8/4/2021	16:57:28	IMG_0052.MP4	*Varanus salvator*	1	-
9/4/2021	CT02	9/3/2021 2:49	8/3/2021	2:49:44	IMG_0003.MP4	*Rattus tiomanicus*	1	-
9/4/2021	CT02	9/3/2021 6:48	8/3/2021	6:48:52	IMG_0004.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	9/3/2021 7:38	8/3/2021	7:38:46	IMG_0005.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	9/3/2021 13:16	9/3/2021	13:16:04	IMG_0006.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	9/3/2021 13:17	9/3/2021	13:17:02	IMG_0007.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	9/3/2021 13:31	9/3/2021	13:31:06	IMG_0008.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	9/3/2021 13:31	9/3/2021	13:31:54	IMG_0009.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	9/3/2021 13:32	9/3/2021	13:32:20	IMG_0010.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	9/3/2021 13:36	9/3/2021	13:36:30	IMG_0011.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	9/3/2021 19:44	9/3/2021	19:44:58	IMG_0013.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	9/3/2021 19:45	9/3/2021	19:45:38	IMG_0014.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	9/3/2021 19:46	9/3/2021	19:46:06	IMG_0015.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	9/3/2021 19:46	9/3/2021	19:46:48	IMG_0016.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	9/3/2021 19:48	9/3/2021	19:48:10	IMG_0017.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	9/3/2021 19:48	9/3/2021	19:48:36	IMG_0018.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	9/3/2021 19:50	9/3/2021	19:50:02	IMG_0019.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	9/3/2021 19:50	9/3/2021	19:50:40	IMG_0020.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	9/3/2021 20:13	9/3/2021	20:13:22	IMG_0022.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	9/3/2021 20:13	9/3/2021	20:13:54	IMG_0023.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	10/3/2021 4:27	9/3/2021	4:27:10	IMG_0024.MP4	*Sus scrofa*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
9/4/2021	CT02	10/3/2021 6:35	9/3/2021	6:35:50	IMG_0025.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	10/3/2021 6:36	9/3/2021	6:36:16	IMG_0026.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	10/3/2021 6:37	9/3/2021	6:37:36	IMG_0027.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	10/3/2021 6:50	9/3/2021	6:50:52	IMG_0028.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	10/3/2021 7:04	9/3/2021	7:04:38	IMG_0029.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	10/3/2021 7:16	9/3/2021	7:16:40	IMG_0030.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	10/3/2021 7:17	9/3/2021	7:17:02	IMG_0031.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	10/3/2021 7:17	9/3/2021	7:17:26	IMG_0032.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	10/3/2021 7:17	9/3/2021	7:17:48	IMG_0033.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	10/3/2021 7:23	9/3/2021	7:23:12	IMG_0034.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	10/3/2021 7:23	9/3/2021	7:23:36	IMG_0035.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	10/3/2021 7:23	9/3/2021	7:23:58	IMG_0036.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	10/3/2021 7:24	9/3/2021	7:24:22	IMG_0037.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	10/3/2021 7:31	9/3/2021	7:31:42	IMG_0038.MP4	*Gallus gallus*	3	-
9/4/2021	CT02	10/3/2021 11:15	10/3/2021	11:15:20	IMG_0039.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	10/3/2021 18:02	10/3/2021	18:02:58	IMG_0040.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	10/3/2021 18:03	10/3/2021	18:03:24	IMG_0041.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	10/3/2021 18:03	10/3/2021	18:03:48	IMG_0042.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	10/3/2021 18:04	10/3/2021	18:04:14	IMG_0043.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	10/3/2021 18:04	10/3/2021	18:04:38	IMG_0044.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	10/3/2021 18:05	10/3/2021	18:05:02	IMG_0045.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	10/3/2021 18:06	10/3/2021	18:06:30	IMG_0046.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	10/3/2021 18:06	10/3/2021	18:06:52	IMG_0047.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	10/3/2021 18:07	10/3/2021	18:07:48	IMG_0048.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	10/3/2021 18:12	10/3/2021	18:12:02	IMG_0049.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	10/3/2021 18:12	10/3/2021	18:12:24	IMG_0050.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	11/3/2021 3:15	10/3/2021	3:15:50	IMG_0051.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	11/3/2021 3:16	10/3/2021	3:16:26	IMG_0052.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	11/3/2021 3:22	10/3/2021	3:22:00	IMG_0053.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	11/3/2021 7:25	10/3/2021	7:25:38	IMG_0055.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	11/3/2021 7:27	10/3/2021	7:27:48	IMG_0056.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	11/3/2021 7:28	10/3/2021	7:28:20	IMG_0057.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	11/3/2021 17:58	11/3/2021	17:58:06	IMG_0059.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	11/3/2021 17:58	11/3/2021	17:58:30	IMG_0060.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	11/3/2021 17:58	11/3/2021	17:58:52	IMG_0061.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	11/3/2021 18:05	11/3/2021	18:05:10	IMG_0062.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	11/3/2021 18:05	11/3/2021	18:05:32	IMG_0063.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	11/3/2021 18:05	11/3/2021	18:05:58	IMG_0064.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	11/3/2021 18:24	11/3/2021	18:24:36	IMG_0065.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	11/3/2021 18:25	11/3/2021	18:25:18	IMG_0066.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	11/3/2021 20:27	11/3/2021	20:27:50	IMG_0067.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	11/3/2021 20:28	11/3/2021	20:28:26	IMG_0068.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	11/3/2021 20:30	11/3/2021	20:30:14	IMG_0069.MP4	*Sus scrofa*	2	-
9/4/2021	CT02	11/3/2021 20:35	11/3/2021	20:35:40	IMG_0071.MP4	*Sus scrofa*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
9/4/2021	CT02	11/3/2021 20:36	11/3/2021	20:36:02	IMG_0072.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	11/3/2021 20:38	11/3/2021	20:38:12	IMG_0074.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	11/3/2021 20:38	11/3/2021	20:38:46	IMG_0075.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	12/3/2021 0:09	11/3/2021	0:09:12	IMG_0076.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	12/3/2021 0:09	11/3/2021	0:09:34	IMG_0077.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	12/3/2021 0:15	11/3/2021	0:15:56	IMG_0078.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	12/3/2021 6:01	11/3/2021	6:01:22	IMG_0079.MP4	*Sus scrofa*	2	-
9/4/2021	CT02	12/3/2021 7:56	11/3/2021	7:56:38	IMG_0080.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	12/3/2021 7:59	11/3/2021	7:59:46	IMG_0081.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	12/3/2021 8:00	12/3/2021	8:00:10	IMG_0082.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	12/3/2021 9:47	12/3/2021	9:47:50	IMG_0083.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	12/3/2021 9:49	12/3/2021	9:49:30	IMG_0084.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	12/3/2021 9:49	12/3/2021	9:49:52	IMG_0085.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	12/3/2021 9:50	12/3/2021	9:50:20	IMG_0086.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	12/3/2021 9:52	12/3/2021	9:52:20	IMG_0087.MP4	*Sus scrofa*	2	-
9/4/2021	CT02	12/3/2021 9:56	12/3/2021	9:56:40	IMG_0088.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	12/3/2021 9:57	12/3/2021	9:57:04	IMG_0089.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	12/3/2021 16:12	12/3/2021	16:12:40	IMG_0090.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	12/3/2021 21:03	12/3/2021	21:03:28	IMG_0092.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	12/3/2021 21:03	12/3/2021	21:03:52	IMG_0093.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	12/3/2021 21:16	12/3/2021	21:16:26	IMG_0095.MP4	*Rattus tiomanicus*	1	-
9/4/2021	CT02	12/3/2021 21:34	12/3/2021	21:34:10	IMG_0096.MP4	*Rattus sp.*	1	-
9/4/2021	CT02	13/3/2021 2:30	12/3/2021	2:30:10	IMG_0097.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	13/3/2021 2:30	12/3/2021	2:30:34	IMG_0098.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	13/3/2021 2:31	12/3/2021	2:31:04	IMG_0099.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	13/3/2021 2:31	12/3/2021	2:31:26	IMG_0100.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	13/3/2021 2:31	12/3/2021	2:31:50	IMG_0101.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	13/3/2021 2:32	12/3/2021	2:32:14	IMG_0102.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	13/3/2021 2:36	12/3/2021	2:36:00	IMG_0103.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	13/3/2021 2:36	12/3/2021	2:36:24	IMG_0104.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	13/3/2021 6:30	12/3/2021	6:30:16	IMG_0105.MP4	*Sus scrofa*	2	-
9/4/2021	CT02	13/3/2021 7:00	12/3/2021	7:00:06	IMG_0106.MP4	*Tupaia glis*	1	-
9/4/2021	CT02	13/3/2021 7:05	12/3/2021	7:05:58	IMG_0107.MP4	*Gallus gallus*	1	-
9/4/2021	CT02	13/3/2021 7:05	12/3/2021	7:05:58	IMG_0107.MP4	*Tupaia glis*	1	-
9/4/2021	CT02	13/3/2021 7:13	12/3/2021	7:13:06	IMG_0108.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	13/3/2021 7:35	12/3/2021	7:35:12	IMG_0109.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	13/3/2021 9:46	13/3/2021	9:46:08	IMG_0110.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	13/3/2021 9:47	13/3/2021	9:47:26	IMG_0111.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	13/3/2021 12:30	13/3/2021	12:30:00	IMG_0112.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	13/3/2021 12:30	13/3/2021	12:30:26	IMG_0113.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	13/3/2021 19:55	13/3/2021	19:55:40	IMG_0115.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	13/3/2021 19:56	13/3/2021	19:56:42	IMG_0116.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	13/3/2021 20:10	13/3/2021	20:10:18	IMG_0118.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	13/3/2021 20:10	13/3/2021	20:10:42	IMG_0119.MP4	*Sus scrofa*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
9/4/2021	CT02	13/3/2021 20:11	13/3/2021	20:11:04	IMG_0120.MP4	*Sus scrofa*	2	-
9/4/2021	CT02	13/3/2021 20:11	13/3/2021	20:11:54	IMG_0121.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	13/3/2021 20:12	13/3/2021	20:12:18	IMG_0122.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	14/3/2021 7:05	13/3/2021	7:05:02	IMG_0123.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	14/3/2021 7:19	13/3/2021	7:19:30	IMG_0124.MP4	*Gallus gallus*	3	-
9/4/2021	CT02	14/3/2021 7:19	13/3/2021	7:19:30	IMG_0124.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	14/3/2021 7:20	13/3/2021	7:20:12	IMG_0125.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	14/3/2021 12:49	14/3/2021	12:49:12	IMG_0126.MP4	*Callosciurus notatus*	1	-
9/4/2021	CT02	14/3/2021 17:35	14/3/2021	17:35:52	IMG_0127.MP4	Unidentified sp.	1	-
9/4/2021	CT02	14/3/2021 22:11	14/3/2021	22:11:06	IMG_0128.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	14/3/2021 22:11	14/3/2021	22:11:38	IMG_0129.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	14/3/2021 23:44	14/3/2021	23:44:32	IMG_0131.MP4	*Rattus sp.*	1	-
9/4/2021	CT02	15/3/2021 8:15	15/3/2021	8:15:22	IMG_0133.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	15/3/2021 19:09	15/3/2021	19:09:54	IMG_0134.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	15/3/2021 19:10	15/3/2021	19:10:20	IMG_0135.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	15/3/2021 19:10	15/3/2021	19:10:42	IMG_0136.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	15/3/2021 19:13	15/3/2021	19:13:46	IMG_0137.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	15/3/2021 19:14	15/3/2021	19:14:08	IMG_0138.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	15/3/2021 23:32	15/3/2021	23:32:16	IMG_0139.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	16/3/2021 6:55	15/3/2021	6:55:12	IMG_0140.MP4	*Tupaia glis*	1	-
9/4/2021	CT02	16/3/2021 7:26	15/3/2021	7:26:18	IMG_0141.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	16/3/2021 7:32	15/3/2021	7:32:48	IMG_0142.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	16/3/2021 7:34	15/3/2021	7:34:00	IMG_0143.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	16/3/2021 8:04	16/3/2021	8:04:38	IMG_0144.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	16/3/2021 15:51	16/3/2021	15:51:20	IMG_0145.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	16/3/2021 15:54	16/3/2021	15:54:28	IMG_0146.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	16/3/2021 15:57	16/3/2021	15:57:52	IMG_0147.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	16/3/2021 20:23	16/3/2021	20:23:24	IMG_0148.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	16/3/2021 20:41	16/3/2021	20:41:46	IMG_0149.MP4	*Rattus sp.*	1	-
9/4/2021	CT02	16/3/2021 21:47	16/3/2021	21:47:06	IMG_0150.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	17/3/2021 7:45	16/3/2021	7:45:36	IMG_0151.MP4	*Tupaia glis*	1	-
9/4/2021	CT02	17/3/2021 8:30	17/3/2021	8:30:54	IMG_0152.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	17/3/2021 8:53	17/3/2021	8:53:30	IMG_0153.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	17/3/2021 8:56	17/3/2021	8:56:44	IMG_0154.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	17/3/2021 8:57	17/3/2021	8:57:10	IMG_0155.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	17/3/2021 10:17	17/3/2021	10:17:00	IMG_0156.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	17/3/2021 10:17	17/3/2021	10:17:22	IMG_0157.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	17/3/2021 10:17	17/3/2021	10:17:50	IMG_0158.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	17/3/2021 10:18	17/3/2021	10:18:12	IMG_0159.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	17/3/2021 19:02	17/3/2021	19:02:52	IMG_0160.MP4	*Sus scrofa*	2	-
9/4/2021	CT02	17/3/2021 19:22	17/3/2021	19:22:52	IMG_0161.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	18/3/2021 8:49	18/3/2021	8:49:54	IMG_0162.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	18/3/2021 13:32	18/3/2021	13:32:04	IMG_0163.MP4	*Tupaia glis*	1	-
9/4/2021	CT02	19/3/2021 0:11	18/3/2021	0:11:52	IMG_0164.MP4	*Sus scrofa*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
9/4/2021	CT02	19/3/2021 1:07	18/3/2021	1:07:00	IMG_0166.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	19/3/2021 1:07	18/3/2021	1:07:24	IMG_0167.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	19/3/2021 2:13	18/3/2021	2:13:06	IMG_0168.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	19/3/2021 6:58	18/3/2021	6:58:22	IMG_0169.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	19/3/2021 9:39	19/3/2021	9:39:50	IMG_0170.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	19/3/2021 11:42	19/3/2021	11:42:34	IMG_0171.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	19/3/2021 16:42	19/3/2021	16:42:28	IMG_0172.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	19/3/2021 16:43	19/3/2021	16:43:08	IMG_0173.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	19/3/2021 16:45	19/3/2021	16:45:10	IMG_0174.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	19/3/2021 17:11	19/3/2021	17:11:10	IMG_0175.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	19/3/2021 17:13	19/3/2021	17:13:16	IMG_0176.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	19/3/2021 17:13	19/3/2021	17:13:38	IMG_0177.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	19/3/2021 17:14	19/3/2021	17:14:04	IMG_0178.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	19/3/2021 17:14	19/3/2021	17:14:44	IMG_0179.MP4	*Sus scrofa*	2	-
9/4/2021	CT02	19/3/2021 17:15	19/3/2021	17:15:10	IMG_0180.MP4	*Sus scrofa*	2	-
9/4/2021	CT02	19/3/2021 17:15	19/3/2021	17:15:34	IMG_0181.MP4	*Sus scrofa*	2	-
9/4/2021	CT02	19/3/2021 19:10	19/3/2021	19:10:20	IMG_0182.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	19/3/2021 21:07	19/3/2021	21:07:04	IMG_0183.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	19/3/2021 21:07	19/3/2021	21:07:28	IMG_0184.MP4	*Sus scrofa*	2	-
9/4/2021	CT02	20/3/2021 0:43	19/3/2021	0:43:38	IMG_0185.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	20/3/2021 4:48	19/3/2021	4:48:02	IMG_0186.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	20/3/2021 7:04	19/3/2021	7:04:12	IMG_0187.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	20/3/2021 7:04	19/3/2021	7:04:52	IMG_0188.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	20/3/2021 7:46	19/3/2021	7:46:00	IMG_0189.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	20/3/2021 8:34	20/3/2021	8:34:16	IMG_0190.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	20/3/2021 13:36	20/3/2021	13:36:52	IMG_0191.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	20/3/2021 13:38	20/3/2021	13:38:34	IMG_0192.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	20/3/2021 13:38	20/3/2021	13:38:58	IMG_0193.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	20/3/2021 17:10	20/3/2021	17:10:14	IMG_0194.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	20/3/2021 17:10	20/3/2021	17:10:38	IMG_0195.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	20/3/2021 17:55	20/3/2021	17:55:06	IMG_0196.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	20/3/2021 19:29	20/3/2021	19:29:18	IMG_0197.MP4	*Rattus sp.*	1	-
9/4/2021	CT02	20/3/2021 20:05	20/3/2021	20:05:32	IMG_0198.MP4	*Sus scrofa*	2	-
9/4/2021	CT02	20/3/2021 21:35	20/3/2021	21:35:36	IMG_0199.MP4	*Rattus tiomanicus*	1	-
9/4/2021	CT02	20/3/2021 22:16	20/3/2021	22:16:26	IMG_0200.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	21/3/2021 0:12	20/3/2021	0:12:04	IMG_0202.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	21/3/2021 0:13	20/3/2021	0:13:00	IMG_0203.MP4	*Sus scrofa*	2	-
9/4/2021	CT02	21/3/2021 7:38	20/3/2021	7:38:36	IMG_0204.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	21/3/2021 14:50	21/3/2021	14:50:52	IMG_0205.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	21/3/2021 16:15	21/3/2021	16:15:14	IMG_0206.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	21/3/2021 20:13	21/3/2021	20:13:46	IMG_0207.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	21/3/2021 20:14	21/3/2021	20:14:10	IMG_0208.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	22/3/2021 3:12	21/3/2021	3:12:42	IMG_0209.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	22/3/2021 3:13	21/3/2021	3:13:10	IMG_0210.MP4	*Sus scrofa*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
9/4/2021	CT02	22/3/2021 3:14	21/3/2021	3:14:06	IMG_0211.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	22/3/2021 8:06	22/3/2021	8:06:12	IMG_0212.MP4	*Gallus gallus*	2	-
9/4/2021	CT02	22/3/2021 9:27	22/3/2021	9:27:34	IMG_0213.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	22/3/2021 12:53	22/3/2021	12:53:46	IMG_0214.MP4	*Gallus gallus*	1	-
9/4/2021	CT02	22/3/2021 13:47	22/3/2021	13:47:18	IMG_0215.MP4	*Gallus gallus*	1	-
9/4/2021	CT02	22/3/2021 18:57	22/3/2021	18:57:06	IMG_0216.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	23/3/2021 3:40	22/3/2021	3:40:42	IMG_0217.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	23/3/2021 3:41	22/3/2021	3:41:06	IMG_0218.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	23/3/2021 13:17	23/3/2021	13:17:16	IMG_0219.MP4	*Tupaia glis*	1	-
9/4/2021	CT02	23/3/2021 15:22	23/3/2021	15:22:06	IMG_0220.MP4	*Gallus gallus*	1	-
9/4/2021	CT02	23/3/2021 20:17	23/3/2021	20:17:20	IMG_0221.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	23/3/2021 20:17	23/3/2021	20:17:44	IMG_0222.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	24/3/2021 5:29	23/3/2021	5:29:18	IMG_0224.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	24/3/2021 5:57	23/3/2021	5:57:42	IMG_0227.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	24/3/2021 9:25	24/3/2021	9:25:54	IMG_0228.MP4	*Gallus gallus*	1	-
9/4/2021	CT02	24/3/2021 10:44	24/3/2021	10:44:42	IMG_0229.MP4	*Sus scrofa*	2	-
9/4/2021	CT02	24/3/2021 10:46	24/3/2021	10:46:26	IMG_0230.MP4	*Sus scrofa*	3	-
9/4/2021	CT02	24/3/2021 10:46	24/3/2021	10:46:48	IMG_0231.MP4	*Sus scrofa*	3	-
9/4/2021	CT02	24/3/2021 10:47	24/3/2021	10:47:12	IMG_0232.MP4	*Sus scrofa*	3	-
9/4/2021	CT02	24/3/2021 10:47	24/3/2021	10:47:40	IMG_0233.MP4	*Sus scrofa*	2	-
9/4/2021	CT02	24/3/2021 21:40	24/3/2021	21:40:00	IMG_0234.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	24/3/2021 21:40	24/3/2021	21:40:30	IMG_0235.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	24/3/2021 21:41	24/3/2021	21:41:46	IMG_0236.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	25/3/2021 0:04	24/3/2021	0:04:22	IMG_0237.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	25/3/2021 14:10	25/3/2021	14:10:48	IMG_0238.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	25/3/2021 19:05	25/3/2021	19:05:56	IMG_0239.MP4	*Sus scrofa*	2	-
9/4/2021	CT02	25/3/2021 19:18	25/3/2021	19:18:04	IMG_0240.MP4	*Tupaia glis*	1	-
9/4/2021	CT02	25/3/2021 19:19	25/3/2021	19:19:18	IMG_0241.MP4	*Tupaia glis*	1	-
9/4/2021	CT02	26/3/2021 10:34	26/3/2021	10:34:46	IMG_0242.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	26/3/2021 11:02	26/3/2021	11:02:08	IMG_0243.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	26/3/2021 11:03	26/3/2021	11:03:18	IMG_0244.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	26/3/2021 12:41	26/3/2021	12:41:58	IMG_0245.MP4	*Tupaia glis*	1	-
9/4/2021	CT02	26/3/2021 13:10	26/3/2021	13:10:16	IMG_0246.MP4	*Sus scrofa*	2	-
9/4/2021	CT02	26/3/2021 13:13	26/3/2021	13:13:50	IMG_0247.MP4	*Sus scrofa*	2	-
9/4/2021	CT02	26/3/2021 13:14	26/3/2021	13:14:12	IMG_0248.MP4	*Sus scrofa*	2	-
9/4/2021	CT02	26/3/2021 13:14	26/3/2021	13:14:44	IMG_0249.MP4	*Sus scrofa*	2	-
9/4/2021	CT02	26/3/2021 13:15	26/3/2021	13:15:54	IMG_0250.MP4	*Sus scrofa*	2	-
9/4/2021	CT02	26/3/2021 13:16	26/3/2021	13:16:42	IMG_0251.MP4	*Sus scrofa*	2	-
9/4/2021	CT02	26/3/2021 14:48	26/3/2021	14:48:04	IMG_0252.MP4	*Gallus gallus*	1	-
9/4/2021	CT02	26/3/2021 19:00	26/3/2021	19:00:32	IMG_0253.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	26/3/2021 19:29	26/3/2021	19:29:08	IMG_0254.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	26/3/2021 19:31	26/3/2021	19:31:32	IMG_0255.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	27/3/2021 1:12	26/3/2021	1:12:58	IMG_0256.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	27/3/2021 1:13	26/3/2021	1:13:34	IMG_0257.MP4	*Sus scrofa*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
9/4/2021	CT02	27/3/2021 1:14	26/3/2021	1:14:14	IMG_0258.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	27/3/2021 1:15	26/3/2021	1:15:06	IMG_0259.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	27/3/2021 1:15	26/3/2021	1:15:30	IMG_0260.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	27/3/2021 14:06	27/3/2021	14:06:32	IMG_0261.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	27/3/2021 14:08	27/3/2021	14:08:16	IMG_0262.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	27/3/2021 15:41	27/3/2021	15:41:34	IMG_0263.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	27/3/2021 20:38	27/3/2021	20:38:06	IMG_0264.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	27/3/2021 22:41	27/3/2021	22:41:00	IMG_0265.MP4	*Otus lempiji*	1	Eating
9/4/2021	CT02	27/3/2021 22:56	27/3/2021	22:56:36	IMG_0267.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	27/3/2021 22:57	27/3/2021	22:57:00	IMG_0268.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	27/3/2021 22:57	27/3/2021	22:57:22	IMG_0269.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	27/3/2021 23:07	27/3/2021	23:07:08	IMG_0270.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	27/3/2021 23:54	27/3/2021	23:54:48	IMG_0272.MP4	*Rattus tiomanicus*	1	-
9/4/2021	CT02	28/3/2021 1:52	27/3/2021	1:52:00	IMG_0273.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	28/3/2021 17:29	28/3/2021	17:29:38	IMG_0275.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	28/3/2021 18:35	28/3/2021	18:35:28	IMG_0276.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	29/3/2021 6:56	28/3/2021	6:56:00	IMG_0277.MP4	*Tupaia glis*	1	-
9/4/2021	CT02	29/3/2021 7:32	28/3/2021	7:32:10	IMG_0278.MP4	Unidentified squirrel or treeshrew	1	-
9/4/2021	CT02	29/3/2021 9:46	29/3/2021	9:46:52	IMG_0279.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	29/3/2021 14:09	29/3/2021	14:09:00	IMG_0280.MP4	*Sus scrofa*	5	-
9/4/2021	CT02	29/3/2021 20:40	29/3/2021	20:40:38	IMG_0281.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	29/3/2021 20:42	29/3/2021	20:42:16	IMG_0282.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	29/3/2021 20:54	29/3/2021	20:54:20	IMG_0283.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	29/3/2021 20:54	29/3/2021	20:54:46	IMG_0284.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	29/3/2021 20:55	29/3/2021	20:55:10	IMG_0285.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	29/3/2021 21:00	29/3/2021	21:00:56	IMG_0287.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	29/3/2021 21:01	29/3/2021	21:01:20	IMG_0288.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	29/3/2021 21:04	29/3/2021	21:04:56	IMG_0289.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	29/3/2021 21:05	29/3/2021	21:05:20	IMG_0290.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	29/3/2021 21:20	29/3/2021	21:20:40	IMG_0291.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	29/3/2021 21:21	29/3/2021	21:21:02	IMG_0292.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	29/3/2021 21:21	29/3/2021	21:21:40	IMG_0293.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	30/3/2021 10:50	30/3/2021	10:50:20	IMG_0294.MP4	*Tupaia glis*	1	-
9/4/2021	CT02	30/3/2021 18:43	30/3/2021	18:43:50	IMG_0295.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	31/3/2021 2:33	30/3/2021	2:33:08	IMG_0296.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	31/3/2021 2:33	30/3/2021	2:33:34	IMG_0297.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	31/3/2021 2:34	30/3/2021	2:34:02	IMG_0298.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	31/3/2021 2:37	30/3/2021	2:37:16	IMG_0300.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	31/3/2021 2:37	30/3/2021	2:37:38	IMG_0301.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	31/3/2021 2:38	30/3/2021	2:38:02	IMG_0302.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	31/3/2021 2:38	30/3/2021	2:38:28	IMG_0303.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	31/3/2021 2:38	30/3/2021	2:38:56	IMG_0304.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	31/3/2021 7:31	30/3/2021	7:31:30	IMG_0305.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	31/3/2021 12:35	31/3/2021	12:35:04	IMG_0306.MP4	*Sus scrofa*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
9/4/2021	CT02	31/3/2021 12:36	31/3/2021	12:36:16	IMG_0307.MP4	*Sus scrofa*	5	-
9/4/2021	CT02	31/3/2021 12:38	31/3/2021	12:38:12	IMG_0308.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	31/3/2021 13:52	31/3/2021	13:52:24	IMG_0309.MP4	*Sus scrofa*	2	-
9/4/2021	CT02	31/3/2021 13:52	31/3/2021	13:52:56	IMG_0310.MP4	*Sus scrofa*	4	-
9/4/2021	CT02	31/3/2021 13:53	31/3/2021	13:53:36	IMG_0311.MP4	*Sus scrofa*	6	-
9/4/2021	CT02	31/3/2021 13:54	31/3/2021	13:54:22	IMG_0312.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	31/3/2021 18:18	31/3/2021	18:18:46	IMG_0313.MP4	*Gallus gallus*	1	-
9/4/2021	CT02	31/3/2021 18:21	31/3/2021	18:21:20	IMG_0314.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	31/3/2021 18:21	31/3/2021	18:21:42	IMG_0315.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	31/3/2021 19:23	31/3/2021	19:23:26	IMG_0316.MP4	Unidentified squirrel or treeshrew	1	-
9/4/2021	CT02	31/3/2021 19:25	31/3/2021	19:25:36	IMG_0317.MP4	*Rattus sp.*	1	-
9/4/2021	CT02	31/3/2021 22:40	31/3/2021	22:40:04	IMG_0318.MP4	*Rattus sp.*	1	-
9/4/2021	CT02	31/3/2021 23:17	31/3/2021	23:17:30	IMG_0319.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	31/3/2021 23:18	31/3/2021	23:18:08	IMG_0320.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	31/3/2021 23:18	31/3/2021	23:18:38	IMG_0321.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	1/4/2021 21:54	1/4/2021	21:54:44	IMG_0322.MP4	*Rattus sp.*	1	-
9/4/2021	CT02	1/4/2021 22:23	1/4/2021	22:23:38	IMG_0323.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	1/4/2021 22:24	1/4/2021	22:24:18	IMG_0324.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	1/4/2021 22:26	1/4/2021	22:26:00	IMG_0325.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	2/4/2021 15:45	2/4/2021	15:45:40	IMG_0326.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	2/4/2021 15:46	2/4/2021	15:46:38	IMG_0327.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	3/4/2021 11:31	3/4/2021	11:31:28	IMG_0328.MP4	*Sus scrofa*	5	-
9/4/2021	CT02	3/4/2021 11:32	3/4/2021	11:32:08	IMG_0329.MP4	*Sus scrofa*	6	-
9/4/2021	CT02	3/4/2021 11:32	3/4/2021	11:32:30	IMG_0330.MP4	*Sus scrofa*	8	-
9/4/2021	CT02	3/4/2021 11:33	3/4/2021	11:33:28	IMG_0331.MP4	*Sus scrofa*	4	-
9/4/2021	CT02	3/4/2021 11:33	3/4/2021	11:33:50	IMG_0332.MP4	*Sus scrofa*	4	-
9/4/2021	CT02	3/4/2021 11:34	3/4/2021	11:34:24	IMG_0333.MP4	*Sus scrofa*	3	-
9/4/2021	CT02	3/4/2021 11:35	3/4/2021	11:35:32	IMG_0334.MP4	*Sus scrofa*	4	-
9/4/2021	CT02	3/4/2021 11:36	3/4/2021	11:36:00	IMG_0335.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	3/4/2021 11:36	3/4/2021	11:36:22	IMG_0336.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	3/4/2021 11:37	3/4/2021	11:37:02	IMG_0337.MP4	*Sus scrofa*	2	-
9/4/2021	CT02	3/4/2021 11:38	3/4/2021	11:38:22	IMG_0338.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	3/4/2021 11:39	3/4/2021	11:39:38	IMG_0339.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	3/4/2021 14:32	3/4/2021	14:32:28	IMG_0340.MP4	*Sus scrofa*	6	-
9/4/2021	CT02	4/4/2021 3:36	3/4/2021	3:36:30	IMG_0341.MP4	*Felis catus*	1	-
9/4/2021	CT02	4/4/2021 4:51	3/4/2021	4:51:58	IMG_0342.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	4/4/2021 4:52	3/4/2021	4:52:36	IMG_0343.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	4/4/2021 4:53	3/4/2021	4:53:44	IMG_0344.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	4/4/2021 4:54	3/4/2021	4:54:06	IMG_0345.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	4/4/2021 7:29	3/4/2021	7:29:38	IMG_0346.MP4	*Gallus gallus*	2	-
9/4/2021	CT02	4/4/2021 11:30	4/4/2021	11:30:28	IMG_0347.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	4/4/2021 11:31	4/4/2021	11:31:06	IMG_0348.MP4	*Sus scrofa*	8	-
9/4/2021	CT02	4/4/2021 14:18	4/4/2021	14:18:30	IMG_0349.MP4	*Sus scrofa*	2	-
9/4/2021	CT02	4/4/2021 14:20	4/4/2021	14:20:48	IMG_0350.MP4	*Sus scrofa*	2	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
9/4/2021	CT02	4/4/2021 17:16	4/4/2021	17:16:18	IMG_0351.MP4	*Gallus gallus*	2	-
9/4/2021	CT02	4/4/2021 17:16	4/4/2021	17:16:42	IMG_0352.MP4	*Gallus gallus*	1	-
9/4/2021	CT02	4/4/2021 18:46	4/4/2021	18:46:42	IMG_0353.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	5/4/2021 1:56	4/4/2021	1:56:12	IMG_0354.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	5/4/2021 1:57	4/4/2021	1:57:14	IMG_0355.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	5/4/2021 5:49	4/4/2021	5:49:06	IMG_0357.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	5/4/2021 5:49	4/4/2021	5:49:40	IMG_0358.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	5/4/2021 5:50	4/4/2021	5:50:56	IMG_0359.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	5/4/2021 5:53	4/4/2021	5:53:54	IMG_0360.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	5/4/2021 11:07	5/4/2021	11:07:34	IMG_0362.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	5/4/2021 11:10	5/4/2021	11:10:20	IMG_0363.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	5/4/2021 11:23	5/4/2021	11:23:38	IMG_0364.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	5/4/2021 11:52	5/4/2021	11:52:00	IMG_0365.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	5/4/2021 13:14	5/4/2021	13:14:12	IMG_0366.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	5/4/2021 13:14	5/4/2021	13:14:38	IMG_0367.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	5/4/2021 13:17	5/4/2021	13:17:14	IMG_0368.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	5/4/2021 13:17	5/4/2021	13:17:48	IMG_0369.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	5/4/2021 13:18	5/4/2021	13:18:12	IMG_0370.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	5/4/2021 13:20	5/4/2021	13:20:32	IMG_0371.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	5/4/2021 13:21	5/4/2021	13:21:00	IMG_0372.MP4	*Sus scrofa*	6	-
9/4/2021	CT02	5/4/2021 13:21	5/4/2021	13:21:24	IMG_0373.MP4	*Sus scrofa*	7	-
9/4/2021	CT02	5/4/2021 14:21	5/4/2021	14:21:10	IMG_0374.MP4	*Sus scrofa*	4	-
9/4/2021	CT02	5/4/2021 17:22	5/4/2021	17:22:14	IMG_0375.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	6/4/2021 0:51	5/4/2021	0:51:12	IMG_0376.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	6/4/2021 9:23	6/4/2021	9:23:12	IMG_0379.MP4	*Sus scrofa*	2	-
9/4/2021	CT02	6/4/2021 10:37	6/4/2021	10:37:40	IMG_0380.MP4	*Sus scrofa*	2	-
9/4/2021	CT02	6/4/2021 18:55	6/4/2021	18:55:46	IMG_0381.MP4	*Tupaia glis*	1	-
9/4/2021	CT02	6/4/2021 19:30	6/4/2021	19:30:00	IMG_0382.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	6/4/2021 19:32	6/4/2021	19:32:46	IMG_0383.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	6/4/2021 23:00	6/4/2021	23:00:42	IMG_0384.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	7/4/2021 0:52	6/4/2021	0:52:30	IMG_0385.MP4	*Felis catus*	1	-
9/4/2021	CT02	7/4/2021 5:41	6/4/2021	5:41:00	IMG_0386.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	7/4/2021 6:56	6/4/2021	6:56:22	IMG_0387.MP4	*Tupaia glis*	1	-
9/4/2021	CT02	7/4/2021 8:08	7/4/2021	8:08:20	IMG_0388.MP4	*Callosciurus notatus*	1	-
9/4/2021	CT02	7/4/2021 12:42	7/4/2021	12:42:58	IMG_0389.MP4	*Sus scrofa*	5	-
9/4/2021	CT02	7/4/2021 12:44	7/4/2021	12:44:04	IMG_0390.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	7/4/2021 12:44	7/4/2021	12:44:28	IMG_0391.MP4	*Sus scrofa*	2	-
9/4/2021	CT02	7/4/2021 12:44	7/4/2021	12:44:54	IMG_0392.MP4	*Sus scrofa*	2	-
9/4/2021	CT02	7/4/2021 12:45	7/4/2021	12:45:34	IMG_0393.MP4	*Sus scrofa*	3	-
9/4/2021	CT02	7/4/2021 12:46	7/4/2021	12:46:04	IMG_0394.MP4	*Sus scrofa*	4	-
9/4/2021	CT02	7/4/2021 12:46	7/4/2021	12:46:42	IMG_0395.MP4	*Sus scrofa*	4	-
9/4/2021	CT02	7/4/2021 12:49	7/4/2021	12:49:10	IMG_0396.MP4	*Sus scrofa*	4	-
9/4/2021	CT02	7/4/2021 13:57	7/4/2021	13:57:14	IMG_0397.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	7/4/2021 13:57	7/4/2021	13:57:42	IMG_0398.MP4	*Sus scrofa*	4	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
9/4/2021	CT02	8/4/2021 1:18	7/4/2021	1:18:48	IMG_0399.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	8/4/2021 1:19	7/4/2021	1:19:18	IMG_0400.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	8/4/2021 1:24	7/4/2021	1:24:36	IMG_0401.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	8/4/2021 10:26	8/4/2021	10:26:00	IMG_0403.MP4	*Sus scrofa*	1	-
9/4/2021	CT02	8/4/2021 16:02	8/4/2021	16:02:52	IMG_0404.MP4	*Sus scrofa*	3	-
9/4/2021	CT02	8/4/2021 16:18	8/4/2021	16:18:46	IMG_0405.MP4	*Sus scrofa*	2	-
9/4/2021	CT02	8/4/2021 17:54	8/4/2021	17:54:12	IMG_0406.MP4	*Sus scrofa*	4	-
9/4/2021	CT02	9/4/2021 10:39	9/4/2021	10:39:32	IMG_0407.MP4	*Sus scrofa*	1	-
9/4/2021	CT03	8/3/2021 21:06	8/3/2021	21:06:12	IMG_0013.MP4	*Rattus sp.*	1	-
9/4/2021	CT03	8/3/2021 22:13	8/3/2021	22:13:42	IMG_0014.MP4	*Sus scrofa*	1	-
9/4/2021	CT03	8/3/2021 22:14	8/3/2021	22:14:58	IMG_0015.MP4	*Sus scrofa*	1	-
9/4/2021	CT03	9/3/2021 5:16	8/3/2021	5:16:16	IMG_0016.MP4	*Sus scrofa*	1	-
9/4/2021	CT03	9/3/2021 5:16	8/3/2021	5:16:46	IMG_0017.MP4	*Sus scrofa*	1	-
9/4/2021	CT03	10/3/2021 9:29	10/3/2021	9:29:32	IMG_0018.MP4	*Garrulax leucolophus*	1	-
9/4/2021	CT03	10/3/2021 9:30	10/3/2021	9:30:32	IMG_0019.MP4	*Tupaia glis*	1	-
9/4/2021	CT03	10/3/2021 9:32	10/3/2021	9:32:52	IMG_0020.MP4	*Tupaia glis*	1	-
9/4/2021	CT03	10/3/2021 20:42	10/3/2021	20:42:22	IMG_0021.MP4	*Rattus sp.*	1	-
9/4/2021	CT03	12/3/2021 7:22	11/3/2021	7:22:36	IMG_0023.MP4	*Sus scrofa*	1	-
9/4/2021	CT03	12/3/2021 7:24	11/3/2021	7:24:02	IMG_0024.MP4	*Sus scrofa*	1	-
9/4/2021	CT03	12/3/2021 7:24	11/3/2021	7:24:32	IMG_0025.MP4	*Sus scrofa*	1	-
9/4/2021	CT03	12/3/2021 8:46	12/3/2021	8:46:00	IMG_0026.MP4	*Callosciurus notatus*	1	-
9/4/2021	CT03	12/3/2021 12:04	12/3/2021	12:04:06	IMG_0027.MP4	*Spilopelia chinensis*	1	-
9/4/2021	CT03	12/3/2021 20:59	12/3/2021	20:59:08	IMG_0028.MP4	*Rattus sp.*	1	-
9/4/2021	CT03	13/3/2021 12:21	13/3/2021	12:21:20	IMG_0029.MP4	*Amaurornis phoenicurus*	1	-
9/4/2021	CT03	13/3/2021 12:33	13/3/2021	12:33:04	IMG_0030.MP4	*Amaurornis phoenicurus*	1	-
9/4/2021	CT03	13/3/2021 12:34	13/3/2021	12:34:10	IMG_0031.MP4	*Amaurornis phoenicurus*	1	-
9/4/2021	CT03	13/3/2021 19:48	13/3/2021	19:48:58	IMG_0032.MP4	*Rattus sp.*	1	-
9/4/2021	CT03	13/3/2021 21:13	13/3/2021	21:13:12	IMG_0033.MP4	*Rattus tiomanicus*	1	-
9/4/2021	CT03	14/3/2021 6:37	13/3/2021	6:37:08	IMG_0034.MP4	*Sus scrofa*	1	-
9/4/2021	CT03	14/3/2021 6:37	13/3/2021	6:37:44	IMG_0035.MP4	*Sus scrofa*	1	-
9/4/2021	CT03	15/3/2021 3:00	14/3/2021	3:00:22	IMG_0036.MP4	*Rattus sp.*	1	-
9/4/2021	CT03	15/3/2021 3:51	14/3/2021	3:51:58	IMG_0037.MP4	*Rattus sp.*	1	-
9/4/2021	CT03	15/3/2021 22:10	15/3/2021	22:10:06	IMG_0038.MP4	*Rattus tiomanicus*	1	-
9/4/2021	CT03	15/3/2021 22:59	15/3/2021	22:59:08	IMG_0039.MP4	*Rattus tiomanicus*	1	-
9/4/2021	CT03	17/3/2021 3:29	16/3/2021	3:29:58	IMG_0040.MP4	*Rattus tiomanicus*	1	-
9/4/2021	CT03	17/3/2021 13:14	17/3/2021	13:14:40	IMG_0041.MP4	*Tupaia glis*	1	-
9/4/2021	CT03	17/3/2021 20:36	17/3/2021	20:36:30	IMG_0042.MP4	*Rattus tiomanicus*	1	-
9/4/2021	CT03	18/3/2021 11:06	18/3/2021	11:06:46	IMG_0043.MP4	*Tupaia glis*	1	-
9/4/2021	CT03	19/3/2021 2:14	18/3/2021	2:14:42	IMG_0044.MP4	*Rattus sp.*	1	-
9/4/2021	CT03	19/3/2021 5:52	18/3/2021	5:52:12	IMG_0045.MP4	*Sus scrofa*	1	-
9/4/2021	CT03	19/3/2021 5:54	18/3/2021	5:54:06	IMG_0047.MP4	*Sus scrofa*	1	-
9/4/2021	CT03	19/3/2021 5:54	18/3/2021	5:54:28	IMG_0048.MP4	*Sus scrofa*	1	-
9/4/2021	CT03	19/3/2021 21:40	19/3/2021	21:40:58	IMG_0049.MP4	*Rattus tiomanicus*	1	-
9/4/2021	CT03	20/3/2021 11:32	20/3/2021	11:32:56	IMG_0050.MP4	*Tupaia glis*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
9/4/2021	CT03	20/3/2021 11:35	20/3/2021	11:35:26	IMG_0051.MP4	*Varanus salvator*	1	-
9/4/2021	CT03	20/3/2021 14:28	20/3/2021	14:28:34	IMG_0052.MP4	*Gallus gallus*	1	-
9/4/2021	CT03	20/3/2021 14:28	20/3/2021	14:28:58	IMG_0053.MP4	*Gallus gallus*	1	-
9/4/2021	CT03	20/3/2021 14:29	20/3/2021	14:29:20	IMG_0054.MP4	*Gallus gallus*	1	-
9/4/2021	CT03	20/3/2021 14:29	20/3/2021	14:29:52	IMG_0055.MP4	*Gallus gallus*	1	-
9/4/2021	CT03	20/3/2021 16:26	20/3/2021	16:26:50	IMG_0056.MP4	*Tupaia glis*	1	-
9/4/2021	CT03	21/3/2021 3:08	20/3/2021	3:08:28	IMG_0057.MP4	*Rattus sp.*	1	-
9/4/2021	CT03	21/3/2021 14:17	21/3/2021	14:17:28	IMG_0058.MP4	*Tupaia glis*	1	-
9/4/2021	CT03	21/3/2021 19:43	21/3/2021	19:43:38	IMG_0059.MP4	*Rattus tiomanicus*	1	-
9/4/2021	CT03	21/3/2021 20:07	21/3/2021	20:07:40	IMG_0060.MP4	*Rattus tiomanicus*	1	-
9/4/2021	CT03	21/3/2021 22:00	21/3/2021	22:00:04	IMG_0061.MP4	*Rattus tiomanicus*	2	-
9/4/2021	CT03	21/3/2021 22:32	21/3/2021	22:32:12	IMG_0062.MP4	*Sus scrofa*	1	-
9/4/2021	CT03	21/3/2021 22:32	21/3/2021	22:32:50	IMG_0063.MP4	*Sus scrofa*	1	-
9/4/2021	CT03	22/3/2021 19:39	22/3/2021	19:39:38	IMG_0064.MP4	*Rattus sp.*	1	-
9/4/2021	CT03	23/3/2021 3:43	22/3/2021	3:43:26	IMG_0065.MP4	*Sus scrofa*	1	-
9/4/2021	CT03	23/3/2021 4:00	22/3/2021	4:00:36	IMG_0066.MP4	*Sus scrofa*	1	-
9/4/2021	CT03	23/3/2021 4:04	22/3/2021	4:04:52	IMG_0067.MP4	*Sus scrofa*	1	-
9/4/2021	CT03	23/3/2021 6:38	22/3/2021	6:38:32	IMG_0068.MP4	*Sus scrofa*	1	-
9/4/2021	CT03	23/3/2021 9:09	23/3/2021	9:09:54	IMG_0069.MP4	*Gallus gallus*	1	-
9/4/2021	CT03	23/3/2021 14:58	23/3/2021	14:58:58	IMG_0070.MP4	*Gallus gallus*	1	-
9/4/2021	CT03	23/3/2021 20:11	23/3/2021	20:11:48	IMG_0071.MP4	*Rattus tiomanicus*	1	-
9/4/2021	CT03	24/3/2021 0:53	23/3/2021	0:53:24	IMG_0072.MP4	*Rattus sp.*	1	-
9/4/2021	CT03	24/3/2021 7:42	23/3/2021	7:42:52	IMG_0073.MP4	*Sus scrofa*	1	-
9/4/2021	CT03	24/3/2021 8:41	24/3/2021	8:41:02	IMG_0074.MP4	*Gallus gallus*	1	-
9/4/2021	CT03	24/3/2021 9:14	24/3/2021	9:14:44	IMG_0075.MP4	*Gallus gallus*	1	-
9/4/2021	CT03	24/3/2021 22:39	24/3/2021	22:39:00	IMG_0076.MP4	*Rattus sp.*	1	-
9/4/2021	CT03	24/3/2021 23:42	24/3/2021	23:42:06	IMG_0077.MP4	*Rattus sp.*	1	-
9/4/2021	CT03	25/3/2021 0:03	24/3/2021	0:03:58	IMG_0078.MP4	*Rattus sp.*	1	-
9/4/2021	CT03	25/3/2021 7:54	24/3/2021	7:54:02	IMG_0079.MP4	*Gallus gallus*	1	-
9/4/2021	CT03	25/3/2021 8:56	25/3/2021	8:56:10	IMG_0080.MP4	*Gallus gallus*	1	-
9/4/2021	CT03	25/3/2021 19:55	25/3/2021	19:55:26	IMG_0081.MP4	*Rattus tiomanicus*	1	-
9/4/2021	CT03	25/3/2021 22:17	25/3/2021	22:17:38	IMG_0082.MP4	*Rattus sp.*	1	-
9/4/2021	CT03	26/3/2021 14:46	26/3/2021	14:46:54	IMG_0083.MP4	*Tupaia glis*	1	-
9/4/2021	CT03	26/3/2021 19:43	26/3/2021	19:43:56	IMG_0084.MP4	*Rattus sp.*	1	-
9/4/2021	CT03	26/3/2021 19:50	26/3/2021	19:50:16	IMG_0085.MP4	*Rattus sp.*	1	-
9/4/2021	CT03	26/3/2021 21:59	26/3/2021	21:59:06	IMG_0086.MP4	*Rattus tiomanicus*	1	-
9/4/2021	CT03	27/3/2021 0:19	26/3/2021	0:19:48	IMG_0087.MP4	*Sus scrofa*	1	-
9/4/2021	CT03	27/3/2021 0:28	26/3/2021	0:28:38	IMG_0088.MP4	*Sus scrofa*	1	-
9/4/2021	CT03	27/3/2021 0:29	26/3/2021	0:29:00	IMG_0089.MP4	*Sus scrofa*	1	-
9/4/2021	CT03	27/3/2021 0:29	26/3/2021	0:29:24	IMG_0090.MP4	*Sus scrofa*	1	-
9/4/2021	CT03	27/3/2021 11:04	27/3/2021	11:04:32	IMG_0091.MP4	*Varanus salvator*	1	-
9/4/2021	CT03	27/3/2021 12:45	27/3/2021	12:45:12	IMG_0092.MP4	*Gallus gallus*	1	-
9/4/2021	CT03	28/3/2021 0:01	27/3/2021	0:01:22	IMG_0095.MP4	*Rattus sp.*	1	-
9/4/2021	CT03	28/3/2021 5:29	27/3/2021	5:29:26	IMG_0096.MP4	*Rattus tiomanicus*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
9/4/2021	CT03	28/3/2021 10:58	28/3/2021	10:58:08	IMG_0097.MP4	*Sus scrofa*	2	-
9/4/2021	CT03	28/3/2021 10:58	28/3/2021	10:58:30	IMG_0098.MP4	*Sus scrofa*	2	-
9/4/2021	CT03	28/3/2021 20:49	28/3/2021	20:49:56	IMG_0100.MP4	*Rattus tiomanicus*	1	-
9/4/2021	CT03	28/3/2021 21:19	28/3/2021	21:19:44	IMG_0101.MP4	*Rattus sp.*	1	-
9/4/2021	CT03	29/3/2021 1:05	28/3/2021	1:05:32	IMG_0102.MP4	*Rattus sp.*	1	-
9/4/2021	CT03	30/3/2021 6:28	29/3/2021	6:28:42	IMG_0103.MP4	*Felis catus*	1	-
9/4/2021	CT03	30/3/2021 23:16	30/3/2021	23:16:44	IMG_0104.MP4	*Paradoxurus musangus*	1	-
9/4/2021	CT03	31/3/2021 11:34	31/3/2021	11:34:24	IMG_0105.MP4	*Sus scrofa*	2	-
9/4/2021	CT03	31/3/2021 11:34	31/3/2021	11:34:50	IMG_0106.MP4	*Sus scrofa*	3	-
9/4/2021	CT03	31/3/2021 11:35	31/3/2021	11:35:12	IMG_0107.MP4	*Sus scrofa*	4	-
9/4/2021	CT03	31/3/2021 11:36	31/3/2021	11:36:26	IMG_0108.MP4	*Sus scrofa*	2	-
9/4/2021	CT03	31/3/2021 11:37	31/3/2021	11:37:10	IMG_0109.MP4	*Sus scrofa*	3	-
9/4/2021	CT03	31/3/2021 11:37	31/3/2021	11:37:34	IMG_0110.MP4	*Sus scrofa*	1	-
9/4/2021	CT03	31/3/2021 11:45	31/3/2021	11:45:16	IMG_0111.MP4	*Sus scrofa*	3	-
9/4/2021	CT03	31/3/2021 11:46	31/3/2021	11:46:52	IMG_0112.MP4	*Sus scrofa*	4	-
9/4/2021	CT03	31/3/2021 11:47	31/3/2021	11:47:44	IMG_0113.MP4	*Sus scrofa*	4	-
9/4/2021	CT03	31/3/2021 16:22	31/3/2021	16:22:06	IMG_0118.MP4	*Tupaia glis*	1	-
9/4/2021	CT03	1/4/2021 7:35	31/3/2021	7:35:40	IMG_0119.MP4	*Tupaia glis*	1	-
9/4/2021	CT03	1/4/2021 8:17	1/4/2021	8:17:46	IMG_0120.MP4	*Tupaia glis*	1	-
9/4/2021	CT03	2/4/2021 21:15	2/4/2021	21:15:56	IMG_0121.MP4	*Rattus sp.*	1	-
9/4/2021	CT03	3/4/2021 11:28	3/4/2021	11:28:48	IMG_0122.MP4	*Gallus gallus*	2	-
9/4/2021	CT03	3/4/2021 17:53	3/4/2021	17:53:22	IMG_0123.MP4	*Gallus gallus*	2	-
9/4/2021	CT03	4/4/2021 3:12	3/4/2021	3:12:28	IMG_0124.MP4	*Felis catus*	1	-
9/4/2021	CT03	4/4/2021 10:53	4/4/2021	10:53:08	IMG_0125.MP4	*Sus scrofa*	2	-
9/4/2021	CT03	5/4/2021 9:34	5/4/2021	9:34:10	IMG_0126.MP4	*Tupaia glis*	1	-
9/4/2021	CT03	5/4/2021 10:49	5/4/2021	10:49:20	IMG_0127.MP4	*Tupaia glis*	1	-
9/4/2021	CT03	5/4/2021 13:22	5/4/2021	13:22:18	IMG_0128.MP4	*Tupaia glis*	2	-
9/4/2021	CT03	5/4/2021 13:28	5/4/2021	13:28:44	IMG_0129.MP4	*Tupaia glis*	2	-
9/4/2021	CT03	5/4/2021 19:43	5/4/2021	19:43:42	IMG_0130.MP4	*Rattus sp.*	1	-
9/4/2021	CT03	5/4/2021 23:00	5/4/2021	23:00:26	IMG_0131.MP4	*Rattus sp.*	1	-
9/4/2021	CT03	6/4/2021 7:35	5/4/2021	7:35:38	IMG_0132.MP4	*Tupaia glis*	1	-
9/4/2021	CT03	6/4/2021 14:09	6/4/2021	14:09:08	IMG_0133.MP4	*Tupaia glis*	1	-
9/4/2021	CT03	7/4/2021 7:47	6/4/2021	7:47:56	IMG_0134.MP4	*Gallus gallus*	1	-
9/4/2021	CT03	7/4/2021 8:15	7/4/2021	8:15:16	IMG_0135.MP4	*Gallus gallus*	1	-
9/4/2021	CT03	8/4/2021 5:43	7/4/2021	5:43:22	IMG_0136.MP4	*Sus scrofa*	1	-
9/4/2021	CT03	8/4/2021 5:43	7/4/2021	5:43:46	IMG_0137.MP4	*Sus scrofa*	1	-
9/4/2021	CT03	8/4/2021 5:45	7/4/2021	5:45:30	IMG_0138.MP4	*Sus scrofa*	1	-
9/4/2021	CT03	8/4/2021 5:45	7/4/2021	5:45:52	IMG_0139.MP4	*Sus scrofa*	1	-
9/4/2021	CT03	8/4/2021 5:56	7/4/2021	5:56:14	IMG_0140.MP4	*Sus scrofa*	1	-
9/4/2021	CT03	8/4/2021 5:56	7/4/2021	5:56:36	IMG_0141.MP4	*Sus scrofa*	1	-
9/4/2021	CT03	8/4/2021 7:13	7/4/2021	7:13:42	IMG_0143.MP4	*Callosciurus notatus*	2	-
9/4/2021	CT03	8/4/2021 7:23	7/4/2021	7:23:00	IMG_0144.MP4	*Tupaia glis*	1	-
9/4/2021	CT03	8/4/2021 8:30	8/4/2021	8:30:12	IMG_0145.MP4	*Tupaia glis*	1	-
9/4/2021	CT03	8/4/2021 13:15	8/4/2021	13:15:00	IMG_0146.MP4	*Sus scrofa*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
9/4/2021	CT03	8/4/2021 13:48	8/4/2021	13:48:14	IMG_0147.MP4	*Sus scrofa*	1	-
9/4/2021	CT03	8/4/2021 13:48	8/4/2021	13:48:40	IMG_0148.MP4	*Sus scrofa*	1	-
9/4/2021	CT03	8/4/2021 13:49	8/4/2021	13:49:46	IMG_0149.MP4	*Sus scrofa*	7	-
9/4/2021	CT03	8/4/2021 13:52	8/4/2021	13:52:48	IMG_0150.MP4	*Sus scrofa*	1	-
9/4/2021	CT03	9/4/2021 3:11	8/4/2021	3:11:16	IMG_0152.MP4	*Sus scrofa*	1	-
9/4/2021	CT03	9/4/2021 3:42	8/4/2021	3:42:26	IMG_0153.MP4	*Sus scrofa*	1	-
9/4/2021	CT03	9/4/2021 3:42	8/4/2021	3:42:48	IMG_0154.MP4	*Sus scrofa*	1	-
9/4/2021	CT04	8/3/2021 12:07	8/3/2021	12:07:22	IMG_0006.MP4	*Copsychus saularis*	1	-
9/4/2021	CT04	8/3/2021 15:54	8/3/2021	15:54:44	IMG_0007.MP4	*Tupaia glis*	2	-
9/4/2021	CT04	9/3/2021 9:46	9/3/2021	9:46:26	IMG_0008.MP4	*Tupaia glis*	1	-
9/4/2021	CT04	9/3/2021 10:21	9/3/2021	10:21:54	IMG_0009.MP4	*Callosciurus notatus*	1	-
9/4/2021	CT04	9/3/2021 15:45	9/3/2021	15:45:06	IMG_0010.MP4	*Sus scrofa*	1	-
9/4/2021	CT04	10/3/2021 2:35	9/3/2021	2:35:22	IMG_0011.MP4	*Sus scrofa*	1	-
9/4/2021	CT04	10/3/2021 4:40	9/3/2021	4:40:12	IMG_0012.MP4	*Rattus sp.*	1	-
9/4/2021	CT04	11/3/2021 20:23	11/3/2021	20:23:10	IMG_0013.MP4	*Sus scrofa*	1	-
9/4/2021	CT04	12/3/2021 11:51	12/3/2021	11:51:50	IMG_0014.MP4	*Varanus salvator*	1	-
9/4/2021	CT04	13/3/2021 0:46	12/3/2021	0:46:54	IMG_0015.MP4	*Rattus tiomanicus*	1	-
9/4/2021	CT04	13/3/2021 7:21	12/3/2021	7:21:58	IMG_0016.MP4	Unidentified squirrel or treeshrew	1	-
9/4/2021	CT04	13/3/2021 8:42	13/3/2021	8:42:00	IMG_0017.MP4	*Tupaia glis*	1	-
9/4/2021	CT04	13/3/2021 23:42	13/3/2021	23:42:56	IMG_0018.MP4	*Sus scrofa*	1	-
9/4/2021	CT04	14/3/2021 1:59	13/3/2021	1:59:56	IMG_0019.MP4	*Rattus tiomanicus*	1	-
9/4/2021	CT04	14/3/2021 14:33	14/3/2021	14:33:14	IMG_0020.MP4	*Garrulax leucolophus*	2	-
9/4/2021	CT04	14/3/2021 15:37	14/3/2021	15:37:14	IMG_0021.MP4	*Tupaia glis*	1	-
9/4/2021	CT04	14/3/2021 19:18	14/3/2021	19:18:30	IMG_0022.MP4	*Tupaia glis*	1	-
9/4/2021	CT04	15/3/2021 11:41	15/3/2021	11:41:18	IMG_0023.MP4	*Callosciurus notatus*	1	-
9/4/2021	CT04	15/3/2021 13:45	15/3/2021	13:45:36	IMG_0025.MP4	*Callosciurus notatus*	1	-
9/4/2021	CT04	15/3/2021 14:01	15/3/2021	14:01:24	IMG_0026.MP4	*Callosciurus notatus*	1	-
9/4/2021	CT04	15/3/2021 14:09	15/3/2021	14:09:38	IMG_0027.MP4	*Callosciurus notatus*	2	-
9/4/2021	CT04	15/3/2021 15:03	15/3/2021	15:03:32	IMG_0028.MP4	Unidentified squirrel or treeshrew	1	-
9/4/2021	CT04	15/3/2021 21:45	15/3/2021	21:45:54	IMG_0029.MP4	*Sus scrofa*	1	-
9/4/2021	CT04	16/3/2021 0:32	15/3/2021	0:32:24	IMG_0030.MP4	*Rattus sp.*	1	-
9/4/2021	CT04	16/3/2021 10:24	16/3/2021	10:24:16	IMG_0032.MP4	*Tupaia glis*	1	-
9/4/2021	CT04	16/3/2021 19:14	16/3/2021	19:14:38	IMG_0033.MP4	*Tupaia glis*	1	-
9/4/2021	CT04	16/3/2021 23:00	16/3/2021	23:00:00	IMG_0034.MP4	*Sus scrofa*	1	-
9/4/2021	CT04	17/3/2021 14:31	17/3/2021	14:31:28	IMG_0035.MP4	*Garrulax leucolophus*	1	-
9/4/2021	CT04	17/3/2021 16:01	17/3/2021	16:01:26	IMG_0036.MP4	*Garrulax leucolophus*	2	-
9/4/2021	CT04	18/3/2021 3:15	17/3/2021	3:15:58	IMG_0037.MP4	*Sus scrofa*	1	-
9/4/2021	CT04	18/3/2021 8:11	18/3/2021	8:11:18	IMG_0038.MP4	*Sus scrofa*	1	-
9/4/2021	CT04	18/3/2021 11:21	18/3/2021	11:21:20	IMG_0039.MP4	*Amaurornis phoenicurus*	1	-
9/4/2021	CT04	18/3/2021 22:39	18/3/2021	22:39:08	IMG_0040.MP4	*Sus scrofa*	1	-
9/4/2021	CT04	19/3/2021 13:43	19/3/2021	13:43:02	IMG_0041.MP4	*Tupaia glis*	1	-
9/4/2021	CT04	20/3/2021 14:40	20/3/2021	14:40:42	IMG_0042.MP4	*Sus scrofa*	1	-
9/4/2021	CT04	20/3/2021 18:27	20/3/2021	18:27:34	IMG_0043.MP4	*Sus scrofa*	1	-
9/4/2021	CT04	20/3/2021 21:17	20/3/2021	21:17:34	IMG_0044.MP4	*Sus scrofa*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
9/4/2021	CT04	21/3/2021 7:37	20/3/2021	7:37:44	IMG_0045.MP4	*Sus scrofa*	1	-
9/4/2021	CT04	21/3/2021 11:32	21/3/2021	11:32:12	IMG_0046.MP4	*Sus scrofa*	1	-
9/4/2021	CT04	21/3/2021 11:34	21/3/2021	11:34:54	IMG_0047.MP4	*Sus scrofa*	1	-
9/4/2021	CT04	21/3/2021 11:37	21/3/2021	11:37:00	IMG_0048.MP4	*Sus scrofa*	1	-
9/4/2021	CT04	21/3/2021 18:30	21/3/2021	18:30:40	IMG_0049.MP4	*Tupaia glis*	1	-
9/4/2021	CT04	23/3/2021 15:44	23/3/2021	15:44:16	IMG_0050.MP4	*Sus scrofa*	1	-
9/4/2021	CT04	24/3/2021 1:33	23/3/2021	1:33:32	IMG_0051.MP4	*Manis javanica*	1	-
9/4/2021	CT04	24/3/2021 6:01	23/3/2021	6:01:48	IMG_0052.MP4	*Rattus sp.*	1	-
9/4/2021	CT04	24/3/2021 13:58	24/3/2021	13:58:42	IMG_0053.MP4	*Amaurornis phoenicurus*	1	-
9/4/2021	CT04	24/3/2021 16:28	24/3/2021	16:28:00	IMG_0054.MP4	*Sus scrofa*	1	-
9/4/2021	CT04	25/3/2021 21:47	25/3/2021	21:47:52	IMG_0055.MP4	*Sus scrofa*	1	-
9/4/2021	CT04	26/3/2021 3:27	25/3/2021	3:27:10	IMG_0056.MP4	*Sus scrofa*	1	-
9/4/2021	CT04	26/3/2021 6:52	25/3/2021	6:52:08	IMG_0057.MP4	*Tupaia glis*	1	-
9/4/2021	CT04	26/3/2021 16:10	26/3/2021	16:10:08	IMG_0058.MP4	*Callosciurus notatus*	1	-
9/4/2021	CT04	27/3/2021 6:55	26/3/2021	6:55:22	IMG_0059.MP4	*Tupaia glis*	1	-
9/4/2021	CT04	27/3/2021 16:11	27/3/2021	16:11:36	IMG_0060.MP4	*Sus scrofa*	1	-
9/4/2021	CT04	27/3/2021 19:15	27/3/2021	19:15:22	IMG_0061.MP4	*Tupaia glis*	1	-
9/4/2021	CT04	27/3/2021 23:16	27/3/2021	23:16:10	IMG_0062.MP4	*Sus scrofa*	1	-
9/4/2021	CT04	28/3/2021 14:16	28/3/2021	14:16:40	IMG_0063.MP4	*Sus scrofa*	1	-
9/4/2021	CT04	28/3/2021 14:17	28/3/2021	14:17:04	IMG_0064.MP4	*Sus scrofa*	1	-
9/4/2021	CT04	28/3/2021 16:32	28/3/2021	16:32:48	IMG_0065.MP4	*Tupaia glis*	1	-
9/4/2021	CT04	28/3/2021 17:44	28/3/2021	17:44:50	IMG_0066.MP4	*Sus scrofa*	1	-
9/4/2021	CT04	28/3/2021 21:52	28/3/2021	21:52:16	IMG_0067.MP4	*Rattus sp.*	1	-
9/4/2021	CT04	29/3/2021 17:57	29/3/2021	17:57:38	IMG_0068.MP4	*Sus scrofa*	2	-
9/4/2021	CT04	29/3/2021 18:00	29/3/2021	18:00:14	IMG_0069.MP4	*Sus scrofa*	2	-
9/4/2021	CT04	29/3/2021 18:03	29/3/2021	18:03:10	IMG_0070.MP4	*Sus scrofa*	2	-
9/4/2021	CT04	29/3/2021 22:05	29/3/2021	22:05:20	IMG_0071.MP4	*Rattus tiomanicus*	1	-
9/4/2021	CT04	30/3/2021 13:33	30/3/2021	13:33:18	IMG_0072.MP4	*Copsychus saularis*	1	-
9/4/2021	CT04	31/3/2021 9:28	31/3/2021	9:28:52	IMG_0073.MP4	*Tupaia glis*	1	-
9/4/2021	CT04	31/3/2021 11:11	31/3/2021	11:11:10	IMG_0074.MP4	*Tupaia glis*	1	-
9/4/2021	CT04	31/3/2021 11:12	31/3/2021	11:12:50	IMG_0075.MP4	*Tupaia glis*	1	-
9/4/2021	CT04	31/3/2021 14:02	31/3/2021	14:02:34	IMG_0076.MP4	*Callosciurus notatus*	1	-
9/4/2021	CT04	31/3/2021 19:17	31/3/2021	19:17:38	IMG_0077.MP4	*Tupaia glis*	1	-
9/4/2021	CT04	31/3/2021 19:20	31/3/2021	19:20:06	IMG_0078.MP4	Unidentified squirrel or treeshrew	1	-
9/4/2021	CT04	31/3/2021 22:46	31/3/2021	22:46:26	IMG_0079.MP4	*Rattus tiomanicus*	1	-
9/4/2021	CT04	1/4/2021 5:18	31/3/2021	5:18:30	IMG_0080.MP4	*Rattus tiomanicus*	1	-
9/4/2021	CT04	1/4/2021 10:26	1/4/2021	10:26:10	IMG_0082.MP4	*Tupaia glis*	1	-
9/4/2021	CT04	1/4/2021 10:59	1/4/2021	10:59:26	IMG_0083.MP4	*Sus scrofa*	1	-
9/4/2021	CT04	1/4/2021 17:17	1/4/2021	17:17:24	IMG_0084.MP4	*Callosciurus notatus*	1	-
9/4/2021	CT04	2/4/2021 8:49	2/4/2021	8:49:06	IMG_0086.MP4	*Tupaia glis*	1	-
9/4/2021	CT04	2/4/2021 13:37	2/4/2021	13:37:14	IMG_0087.MP4	*Callosciurus notatus*	1	-
9/4/2021	CT04	2/4/2021 14:47	2/4/2021	14:47:56	IMG_0088.MP4	*Sus scrofa*	3	-
9/4/2021	CT04	2/4/2021 15:34	2/4/2021	15:34:24	IMG_0089.MP4	*Sus scrofa*	2	-
9/4/2021	CT04	2/4/2021 17:33	2/4/2021	17:33:54	IMG_0090.MP4	*Sus scrofa*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
9/4/2021	CT04	2/4/2021 18:50	2/4/2021	18:50:26	IMG_0091.MP4	*Sus scrofa*	1	-
9/4/2021	CT04	3/4/2021 8:31	3/4/2021	8:31:02	IMG_0093.MP4	*Tupaia glis*	1	-
9/4/2021	CT04	3/4/2021 9:34	3/4/2021	9:34:56	IMG_0094.MP4	*Tupaia glis*	1	-
9/4/2021	CT04	3/4/2021 15:19	3/4/2021	15:19:32	IMG_0095.MP4	*Sus scrofa*	1	-
9/4/2021	CT04	3/4/2021 19:35	3/4/2021	19:35:24	IMG_0096.MP4	*Sus scrofa*	1	-
9/4/2021	CT04	4/4/2021 8:26	4/4/2021	8:26:46	IMG_0097.MP4	*Sus scrofa*	1	-
9/4/2021	CT04	4/4/2021 10:41	4/4/2021	10:41:46	IMG_0098.MP4	*Sus scrofa*	1	-
9/4/2021	CT04	4/4/2021 13:38	4/4/2021	13:38:42	IMG_0099.MP4	*Amaurornis phoenicurus*	1	-
9/4/2021	CT04	4/4/2021 14:13	4/4/2021	14:13:38	IMG_0100.MP4	*Tupaia glis*	1	-
9/4/2021	CT04	4/4/2021 15:07	4/4/2021	15:07:00	IMG_0101.MP4	*Tupaia glis*	1	-
9/4/2021	CT04	4/4/2021 15:08	4/4/2021	15:08:32	IMG_0102.MP4	*Tupaia glis*	1	-
9/4/2021	CT04	5/4/2021 6:13	4/4/2021	6:13:26	IMG_0103.MP4	*Sus scrofa*	1	-
9/4/2021	CT04	5/4/2021 7:32	4/4/2021	7:32:48	IMG_0104.MP4	*Tupaia glis*	1	-
9/4/2021	CT04	5/4/2021 7:37	4/4/2021	7:37:38	IMG_0105.MP4	*Sus scrofa*	1	-
9/4/2021	CT04	5/4/2021 15:42	5/4/2021	15:42:32	IMG_0106.MP4	*Tupaia glis*	1	-
9/4/2021	CT04	5/4/2021 16:22	5/4/2021	16:22:04	IMG_0107.MP4	*Amaurornis phoenicurus*	1	-
9/4/2021	CT04	6/4/2021 5:28	5/4/2021	5:28:30	IMG_0108.MP4	*Rattus sp.*	1	-
9/4/2021	CT04	6/4/2021 8:40	6/4/2021	8:40:00	IMG_0109.MP4	*Tupaia glis*	1	-
9/4/2021	CT04	6/4/2021 12:15	6/4/2021	12:15:20	IMG_0111.MP4	*Amaurornis phoenicurus*	1	-
9/4/2021	CT04	6/4/2021 12:28	6/4/2021	12:28:18	IMG_0112.MP4	*Callosciurus notatus*	1	-
9/4/2021	CT04	6/4/2021 16:27	6/4/2021	16:27:28	IMG_0113.MP4	*Tupaia glis*	1	-
9/4/2021	CT04	6/4/2021 19:08	6/4/2021	19:08:14	IMG_0114.MP4	*Tupaia glis*	1	-
9/4/2021	CT04	7/4/2021 1:14	6/4/2021	1:14:24	IMG_0115.MP4	*Rattus tiomanicus*	1	-
9/4/2021	CT04	7/4/2021 1:15	6/4/2021	1:15:30	IMG_0116.MP4	*Rattus tiomanicus*	1	-
9/4/2021	CT04	7/4/2021 7:39	6/4/2021	7:39:40	IMG_0117.MP4	*Tupaia glis*	1	-
9/4/2021	CT04	7/4/2021 8:35	7/4/2021	8:35:16	IMG_0118.MP4	*Tupaia glis*	1	-
9/4/2021	CT04	7/4/2021 10:58	7/4/2021	10:58:54	IMG_0119.MP4	*Gallus gallus*	1	-
9/4/2021	CT04	7/4/2021 11:18	7/4/2021	11:18:46	IMG_0120.MP4	*Sus scrofa*	1	-
9/4/2021	CT04	7/4/2021 11:25	7/4/2021	11:25:54	IMG_0121.MP4	*Sus scrofa*	1	-
9/4/2021	CT04	7/4/2021 12:44	7/4/2021	12:44:10	IMG_0122.MP4	*Tupaia glis*	1	-
9/4/2021	CT04	7/4/2021 19:01	7/4/2021	19:01:20	IMG_0123.MP4	*Tupaia glis*	1	-
9/4/2021	CT04	7/4/2021 23:51	7/4/2021	23:51:28	IMG_0124.MP4	*Sus scrofa*	1	-
9/4/2021	CT04	8/4/2021 8:08	8/4/2021	8:08:32	IMG_0125.MP4	*Tupaia glis*	1	-
9/4/2021	CT04	8/4/2021 10:38	8/4/2021	10:38:44	IMG_0126.MP4	*Garrulax leucolophus*	2	-
9/4/2021	CT04	8/4/2021 10:39	8/4/2021	10:39:08	IMG_0127.MP4	*Garrulax leucolophus*	2	-
9/4/2021	CT04	8/4/2021 10:43	8/4/2021	10:43:02	IMG_0128.MP4	*Tupaia glis*	2	-
9/4/2021	CT04	8/4/2021 10:43	8/4/2021	10:43:58	IMG_0129.MP4	*Callosciurus notatus*	1	-
9/4/2021	CT04	8/4/2021 10:44	8/4/2021	10:44:48	IMG_0130.MP4	*Callosciurus notatus*	1	-
9/4/2021	CT04	8/4/2021 11:14	8/4/2021	11:14:20	IMG_0131.MP4	*Tupaia glis*	1	-
9/4/2021	CT04	8/4/2021 11:50	8/4/2021	11:50:28	IMG_0132.MP4	*Callosciurus notatus*	1	-
9/4/2021	CT04	8/4/2021 12:12	8/4/2021	12:12:30	IMG_0133.MP4	*Sus scrofa*	1	-
9/4/2021	CT04	9/4/2021 4:50	8/4/2021	4:50:10	IMG_0134.MP4	*Paradoxurus musangus*	1	-
9/4/2021	CT04	9/4/2021 4:50	8/4/2021	4:50:34	IMG_0135.MP4	*Paradoxurus musangus*	1	-
9/4/2021	CT04	9/4/2021 8:46	9/4/2021	8:46:16	IMG_0136.MP4	*Tupaia glis*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
9/4/2021	CT04	9/4/2021 8:50	9/4/2021	8:50:48	IMG_0137.MP4	*Tupaia glis*	1	-
9/4/2021	CT05	1/3/2021 15:38	1/3/2021	15:38:44	IMG_0097.AVI	*Amaurornis phoenicurus*	1	-
9/4/2021	CT05	1/3/2021 17:10	1/3/2021	17:10:32	IMG_0126.AVI	*Acridotheres javanicus*	1	-
9/4/2021	CT05	2/3/2021 12:38	2/3/2021	12:38:20	IMG_0182.AVI	*Acridotheres javanicus*	1	-
9/4/2021	CT05	2/3/2021 13:07	2/3/2021	13:07:06	IMG_0187.AVI	*Acridotheres javanicus*	1	-
9/4/2021	CT05	2/3/2021 16:02	2/3/2021	16:02:02	IMG_0237.AVI	*Acridotheres javanicus*	1	-
9/4/2021	CT05	2/3/2021 16:28	2/3/2021	16:28:50	IMG_0245.AVI	*Amaurornis phoenicurus*	1	-
9/4/2021	CT05	2/3/2021 18:48	2/3/2021	18:48:52	IMG_0283.AVI	*Amaurornis phoenicurus*	1	-
9/4/2021	CT05	3/3/2021 9:12	3/3/2021	9:12:12	IMG_0300.AVI	*Amaurornis phoenicurus*	1	-
9/4/2021	CT06	11/3/2021 16:27	11/3/2021	16:27:58	IMG_0005.AVI	*Garrulax leucolophus*	1	-
9/4/2021	CT06	11/3/2021 17:55	11/3/2021	17:55:02	IMG_0006.AVI	*Gallus gallus*	1	-
9/4/2021	CT06	12/3/2021 6:52	11/3/2021	6:52:52	IMG_0007.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	12/3/2021 7:13	11/3/2021	7:13:34	IMG_0008.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	12/3/2021 16:13	12/3/2021	16:13:26	IMG_0010.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	12/3/2021 17:44	12/3/2021	17:44:14	IMG_0011.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	12/3/2021 18:18	12/3/2021	18:18:44	IMG_0012.AVI	*Tupaia glis*	1	-
9/4/2021	CT06	12/3/2021 18:32	12/3/2021	18:32:10	IMG_0013.AVI	*Tupaia glis*	1	-
9/4/2021	CT06	12/3/2021 19:19	12/3/2021	19:19:02	IMG_0014.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	13/3/2021 18:58	13/3/2021	18:58:04	IMG_0015.AVI	*Tupaia glis*	1	-
9/4/2021	CT06	14/3/2021 7:14	13/3/2021	7:14:48	IMG_0016.AVI	*Tupaia glis*	1	-
9/4/2021	CT06	14/3/2021 12:14	14/3/2021	12:14:50	IMG_0019.AVI	*Copsychus saularis*	1	-
9/4/2021	CT06	14/3/2021 13:45	14/3/2021	13:45:10	IMG_0020.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	14/3/2021 14:35	14/3/2021	14:35:30	IMG_0021.AVI	*Tupaia glis*	1	-
9/4/2021	CT06	14/3/2021 15:12	14/3/2021	15:12:32	IMG_0022.AVI	*Callosciurus notatus*	1	-
9/4/2021	CT06	14/3/2021 18:42	14/3/2021	18:42:16	IMG_0023.AVI	*Tupaia glis*	1	-
9/4/2021	CT06	14/3/2021 18:42	14/3/2021	18:42:36	IMG_0024.AVI	*Tupaia glis*	1	-
9/4/2021	CT06	14/3/2021 19:18	14/3/2021	19:18:52	IMG_0025.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	14/3/2021 19:21	14/3/2021	19:21:56	IMG_0026.AVI	*Rallina fasciata*	1	-
9/4/2021	CT06	15/3/2021 5:23	14/3/2021	5:23:24	IMG_0027.AVI	*Rattus sp.*	1	-
9/4/2021	CT06	15/3/2021 7:05	14/3/2021	7:05:26	IMG_0028.AVI	Unidentified squirrel or treeshrew	1	-
9/4/2021	CT06	15/3/2021 14:35	15/3/2021	14:35:30	IMG_0030.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	15/3/2021 14:37	15/3/2021	14:37:46	IMG_0031.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	16/3/2021 10:57	16/3/2021	10:57:00	IMG_0032.AVI	*Picus vittatus*	1	-
9/4/2021	CT06	16/3/2021 12:02	16/3/2021	12:02:10	IMG_0033.AVI	*Callosciurus notatus*	1	-
9/4/2021	CT06	16/3/2021 13:25	16/3/2021	13:25:10	IMG_0034.AVI	*Chalcophaps indica*	1	-
9/4/2021	CT06	16/3/2021 23:51	16/3/2021	23:51:30	IMG_0037.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	17/3/2021 3:02	16/3/2021	3:02:24	IMG_0038.AVI	*Rattus sp.*	1	-
9/4/2021	CT06	17/3/2021 12:35	17/3/2021	12:35:14	IMG_0039.AVI	*Callosciurus notatus*	1	-
9/4/2021	CT06	17/3/2021 19:26	17/3/2021	19:26:12	IMG_0040.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	18/3/2021 5:30	17/3/2021	5:30:54	IMG_0041.AVI	*Rattus sp.*	1	-
9/4/2021	CT06	18/3/2021 7:09	17/3/2021	7:09:14	IMG_0042.AVI	*Tupaia glis*	1	-
9/4/2021	CT06	19/3/2021 7:45	18/3/2021	7:45:46	IMG_0045.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	19/3/2021 13:00	19/3/2021	13:00:42	IMG_0046.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	19/3/2021 13:01	19/3/2021	13:01:04	IMG_0047.AVI	*Acridotheres javanicus*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
9/4/2021	CT06	19/3/2021 13:01	19/3/2021	13:01:04	IMG_0047.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	19/3/2021 16:07	19/3/2021	16:07:06	IMG_0048.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	19/3/2021 19:19	19/3/2021	19:19:32	IMG_0049.AVI	*Pitta moluccensis*	1	-
9/4/2021	CT06	19/3/2021 19:20	19/3/2021	19:20:20	IMG_0050.AVI	*Pitta moluccensis*	1	-
9/4/2021	CT06	19/3/2021 21:08	19/3/2021	21:08:28	IMG_0051.AVI	*Rattus sp.*	1	-
9/4/2021	CT06	20/3/2021 7:00	19/3/2021	7:00:22	IMG_0053.AVI	*Tupaia glis*	1	-
9/4/2021	CT06	20/3/2021 7:18	19/3/2021	7:18:36	IMG_0054.AVI	*Tupaia glis*	1	-
9/4/2021	CT06	20/3/2021 21:44	20/3/2021	21:44:40	IMG_0055.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	21/3/2021 7:03	20/3/2021	7:03:22	IMG_0056.AVI	*Rallina fasciata*	1	-
9/4/2021	CT06	21/3/2021 13:56	21/3/2021	13:56:04	IMG_0057.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	21/3/2021 14:16	21/3/2021	14:16:06	IMG_0058.AVI	*Picus vittatus*	1	-
9/4/2021	CT06	21/3/2021 14:17	21/3/2021	14:17:44	IMG_0059.AVI	*Copsychus saularis*	1	-
9/4/2021	CT06	21/3/2021 14:17	21/3/2021	14:17:44	IMG_0059.AVI	*Picus vittatus*	1	-
9/4/2021	CT06	21/3/2021 18:07	21/3/2021	18:07:16	IMG_0060.AVI	*Tupaia glis*	1	-
9/4/2021	CT06	21/3/2021 19:16	21/3/2021	19:16:10	IMG_0061.AVI	*Tupaia glis*	1	-
9/4/2021	CT06	21/3/2021 20:50	21/3/2021	20:50:06	IMG_0062.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	22/3/2021 10:17	22/3/2021	10:17:18	IMG_0063.AVI	*Tupaia glis*	1	-
9/4/2021	CT06	22/3/2021 12:20	22/3/2021	12:20:44	IMG_0064.AVI	*Garrulax leucolophus*	3	-
9/4/2021	CT06	22/3/2021 12:21	22/3/2021	12:21:58	IMG_0065.AVI	*Garrulax leucolophus*	3	-
9/4/2021	CT06	22/3/2021 12:23	22/3/2021	12:23:06	IMG_0066.AVI	*Garrulax leucolophus*	3	-
9/4/2021	CT06	22/3/2021 16:05	22/3/2021	16:05:24	IMG_0067.AVI	*Callosciurus notatus*	1	-
9/4/2021	CT06	22/3/2021 16:38	22/3/2021	16:38:16	IMG_0068.AVI	*Garrulax leucolophus*	1	-
9/4/2021	CT06	22/3/2021 16:38	22/3/2021	16:38:40	IMG_0069.AVI	*Tupaia glis*	1	-
9/4/2021	CT06	22/3/2021 16:41	22/3/2021	16:41:00	IMG_0070.AVI	*Garrulax leucolophus*	2	-
9/4/2021	CT06	22/3/2021 16:41	22/3/2021	16:41:00	IMG_0070.AVI	*Tupaia glis*	1	-
9/4/2021	CT06	22/3/2021 16:45	22/3/2021	16:45:30	IMG_0071.AVI	*Garrulax leucolophus*	1	-
9/4/2021	CT06	22/3/2021 16:58	22/3/2021	16:58:10	IMG_0072.AVI	*Rhipidura javanica*	1	-
9/4/2021	CT06	22/3/2021 19:06	22/3/2021	19:06:00	IMG_0073.AVI	*Amaurornis phoenicurus*	1	-
9/4/2021	CT06	22/3/2021 19:11	22/3/2021	19:11:22	IMG_0074.AVI	*Tupaia glis*	1	-
9/4/2021	CT06	22/3/2021 19:17	22/3/2021	19:17:34	IMG_0075.AVI	*Tupaia glis*	1	-
9/4/2021	CT06	22/3/2021 20:22	22/3/2021	20:22:04	IMG_0076.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	22/3/2021 20:22	22/3/2021	20:22:38	IMG_0077.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	22/3/2021 22:16	22/3/2021	22:16:08	IMG_0078.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	22/3/2021 22:16	22/3/2021	22:16:46	IMG_0079.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	22/3/2021 22:17	22/3/2021	22:17:08	IMG_0080.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	23/3/2021 6:09	22/3/2021	6:09:26	IMG_0081.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	23/3/2021 6:23	22/3/2021	6:23:36	IMG_0082.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	23/3/2021 9:40	23/3/2021	9:40:40	IMG_0083.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	23/3/2021 11:35	23/3/2021	11:35:58	IMG_0084.AVI	*Garrulax leucolophus*	2	-
9/4/2021	CT06	23/3/2021 11:36	23/3/2021	11:36:58	IMG_0085.AVI	*Garrulax leucolophus*	1	-
9/4/2021	CT06	23/3/2021 19:16	23/3/2021	19:16:30	IMG_0086.AVI	*Tupaia glis*	1	-
9/4/2021	CT06	23/3/2021 23:12	23/3/2021	23:12:38	IMG_0087.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	23/3/2021 23:14	23/3/2021	23:14:22	IMG_0088.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	24/3/2021 0:46	23/3/2021	0:46:40	IMG_0089.AVI	*Sus scrofa*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
9/4/2021	CT06	24/3/2021 1:37	23/3/2021	1:37:46	IMG_0090.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	24/3/2021 6:59	23/3/2021	6:59:08	IMG_0091.AVI	*Tupaia glis*	1	-
9/4/2021	CT06	24/3/2021 7:08	23/3/2021	7:08:52	IMG_0092.AVI	*Tupaia glis*	1	-
9/4/2021	CT06	24/3/2021 8:21	24/3/2021	8:21:42	IMG_0093.AVI	*Garrulax leucolophus*	1	-
9/4/2021	CT06	24/3/2021 11:52	24/3/2021	11:52:18	IMG_0095.AVI	*Garrulax leucolophus*	2	Juvinile begging
9/4/2021	CT06	24/3/2021 11:52	24/3/2021	11:52:44	IMG_0096.AVI	*Garrulax leucolophus*	1	-
9/4/2021	CT06	24/3/2021 16:07	24/3/2021	16:07:54	IMG_0097.AVI	*Garrulax leucolophus*	1	-
9/4/2021	CT06	25/3/2021 7:14	24/3/2021	7:14:40	IMG_0098.AVI	*Tupaia glis*	1	-
9/4/2021	CT06	25/3/2021 7:16	24/3/2021	7:16:14	IMG_0099.AVI	*Callosciurus notatus*	1	-
9/4/2021	CT06	25/3/2021 7:16	24/3/2021	7:16:14	IMG_0099.AVI	*Tupaia glis*	1	-
9/4/2021	CT06	25/3/2021 8:05	25/3/2021	8:05:58	IMG_0100.AVI	*Tupaia glis*	1	-
9/4/2021	CT06	25/3/2021 8:52	25/3/2021	8:52:36	IMG_0101.AVI	*Garrulax leucolophus*	1	-
9/4/2021	CT06	25/3/2021 15:16	25/3/2021	15:16:28	IMG_0102.AVI	*Canis lupus familiaris*	4	-
9/4/2021	CT06	26/3/2021 10:48	26/3/2021	10:48:18	IMG_0103.AVI	*Tupaia glis*	1	-
9/4/2021	CT06	26/3/2021 11:20	26/3/2021	11:20:12	IMG_0104.AVI	*Tupaia glis*	1	-
9/4/2021	CT06	26/3/2021 11:44	26/3/2021	11:44:12	IMG_0105.AVI	*Acridotheres javanicus*	1	-
9/4/2021	CT06	26/3/2021 12:16	26/3/2021	12:16:18	IMG_0107.AVI	*Garrulax leucolophus*	3	-
9/4/2021	CT06	26/3/2021 12:17	26/3/2021	12:17:20	IMG_0108.AVI	*Garrulax leucolophus*	3	-
9/4/2021	CT06	26/3/2021 12:18	26/3/2021	12:18:50	IMG_0109.AVI	*Garrulax leucolophus*	2	-
9/4/2021	CT06	26/3/2021 12:59	26/3/2021	12:59:08	IMG_0110.AVI	*Garrulax leucolophus*	1	-
9/4/2021	CT06	26/3/2021 13:00	26/3/2021	13:00:14	IMG_0111.AVI	*Garrulax leucolophus*	2	-
9/4/2021	CT06	26/3/2021 13:03	26/3/2021	13:03:14	IMG_0112.AVI	*Garrulax leucolophus*	2	-
9/4/2021	CT06	26/3/2021 16:55	26/3/2021	16:55:08	IMG_0113.AVI	*Callosciurus notatus*	1	-
9/4/2021	CT06	26/3/2021 19:07	26/3/2021	19:07:50	IMG_0114.AVI	*Amaurornis phoenicurus*	1	-
9/4/2021	CT06	26/3/2021 19:08	26/3/2021	19:08:14	IMG_0115.AVI	*Amaurornis phoenicurus*	1	-
9/4/2021	CT06	26/3/2021 19:23	26/3/2021	19:23:28	IMG_0116.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	26/3/2021 19:23	26/3/2021	19:23:28	IMG_0116.AVI	Unidentified squirrel or treeshrew	1	-
9/4/2021	CT06	27/3/2021 6:55	26/3/2021	6:55:08	IMG_0117.AVI	*Tupaia glis*	1	-
9/4/2021	CT06	27/3/2021 8:22	27/3/2021	8:22:34	IMG_0118.AVI	*Chalcophaps indica*	1	-
9/4/2021	CT06	27/3/2021 15:03	27/3/2021	15:03:08	IMG_0120.AVI	*Amaurornis phoenicurus*	1	-
9/4/2021	CT06	27/3/2021 19:11	27/3/2021	19:11:02	IMG_0121.AVI	*Tupaia glis*	1	-
9/4/2021	CT06	27/3/2021 23:52	27/3/2021	23:52:54	IMG_0122.AVI	*Rattus sp.*	1	-
9/4/2021	CT06	28/3/2021 6:11	27/3/2021	6:11:06	IMG_0123.AVI	*Rattus sp.*	1	-
9/4/2021	CT06	28/3/2021 8:10	28/3/2021	8:10:20	IMG_0124.AVI	*Garrulax leucolophus*	2	-
9/4/2021	CT06	28/3/2021 8:29	28/3/2021	8:29:06	IMG_0125.AVI	*Tupaia glis*	1	-
9/4/2021	CT06	28/3/2021 8:42	28/3/2021	8:42:44	IMG_0126.AVI	*Amaurornis phoenicurus*	1	-
9/4/2021	CT06	28/3/2021 10:31	28/3/2021	10:31:56	IMG_0127.AVI	*Garrulax leucolophus*	2	-
9/4/2021	CT06	28/3/2021 10:32	28/3/2021	10:32:20	IMG_0128.AVI	*Garrulax leucolophus*	1	-
9/4/2021	CT06	28/3/2021 10:32	28/3/2021	10:32:48	IMG_0129.AVI	*Garrulax leucolophus*	1	-
9/4/2021	CT06	28/3/2021 22:59	28/3/2021	22:59:34	IMG_0131.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	28/3/2021 22:59	28/3/2021	22:59:58	IMG_0132.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	28/3/2021 23:00	28/3/2021	23:00:20	IMG_0133.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	28/3/2021 23:00	28/3/2021	23:00:42	IMG_0134.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	29/3/2021 7:46	28/3/2021	7:46:08	IMG_0135.AVI	*Tupaia glis*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
9/4/2021	CT06	29/3/2021 7:46	28/3/2021	7:46:30	IMG_0136.AVI	*Tupaia glis*	1	-
9/4/2021	CT06	29/3/2021 7:47	28/3/2021	7:47:04	IMG_0137.AVI	*Tupaia glis*	2	-
9/4/2021	CT06	29/3/2021 10:23	29/3/2021	10:23:04	IMG_0138.AVI	*Garrulax leucolophus*	2	-
9/4/2021	CT06	29/3/2021 10:23	29/3/2021	10:23:42	IMG_0139.AVI	*Garrulax leucolophus*	2	-
9/4/2021	CT06	29/3/2021 10:23	29/3/2021	10:23:42	IMG_0139.AVI	*Tupaia glis*	1	-
9/4/2021	CT06	29/3/2021 10:24	29/3/2021	10:24:04	IMG_0140.AVI	*Garrulax leucolophus*	1	-
9/4/2021	CT06	29/3/2021 10:24	29/3/2021	10:24:04	IMG_0140.AVI	*Tupaia glis*	1	-
9/4/2021	CT06	29/3/2021 10:25	29/3/2021	10:25:30	IMG_0141.AVI	*Tupaia glis*	1	-
9/4/2021	CT06	29/3/2021 13:22	29/3/2021	13:22:10	IMG_0142.AVI	*Amaurornis phoenicurus*	1	-
9/4/2021	CT06	29/3/2021 14:19	29/3/2021	14:19:18	IMG_0143.AVI	*Tupaia glis*	1	-
9/4/2021	CT06	29/3/2021 14:38	29/3/2021	14:38:28	IMG_0145.AVI	*Tupaia glis*	1	-
9/4/2021	CT06	29/3/2021 19:21	29/3/2021	19:21:00	IMG_0146.AVI	*Pitta moluccensis*	1	-
9/4/2021	CT06	30/3/2021 7:01	29/3/2021	7:01:38	IMG_0148.AVI	*Tupaia glis*	1	-
9/4/2021	CT06	30/3/2021 7:34	29/3/2021	7:34:04	IMG_0149.AVI	*Garrulax leucolophus*	1	-
9/4/2021	CT06	30/3/2021 7:49	29/3/2021	7:49:38	IMG_0150.AVI	*Garrulax leucolophus*	1	-
9/4/2021	CT06	30/3/2021 7:57	29/3/2021	7:57:04	IMG_0151.AVI	*Tupaia glis*	1	-
9/4/2021	CT06	30/3/2021 15:51	30/3/2021	15:51:02	IMG_0152.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	30/3/2021 15:59	30/3/2021	15:59:22	IMG_0153.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	30/3/2021 20:59	30/3/2021	20:59:58	IMG_0154.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	31/3/2021 12:31	31/3/2021	12:31:40	IMG_0156.AVI	*Garrulax leucolophus*	1	-
9/4/2021	CT06	31/3/2021 12:32	31/3/2021	12:32:06	IMG_0157.AVI	*Garrulax leucolophus*	1	-
9/4/2021	CT06	31/3/2021 17:30	31/3/2021	17:30:12	IMG_0158.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	31/3/2021 17:39	31/3/2021	17:39:56	IMG_0159.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	31/3/2021 17:41	31/3/2021	17:41:48	IMG_0160.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	31/3/2021 19:25	31/3/2021	19:25:12	IMG_0161.AVI	*Sus scrofa*	2	-
9/4/2021	CT06	31/3/2021 19:25	31/3/2021	19:25:58	IMG_0162.AVI	*Sus scrofa*	2	-
9/4/2021	CT06	1/4/2021 7:29	31/3/2021	7:29:20	IMG_0163.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	1/4/2021 8:47	1/4/2021	8:47:28	IMG_0164.AVI	*Tupaia glis*	1	-
9/4/2021	CT06	1/4/2021 12:23	1/4/2021	12:23:12	IMG_0165.AVI	*Tupaia glis*	1	-
9/4/2021	CT06	1/4/2021 14:50	1/4/2021	14:50:04	IMG_0167.AVI	*Garrulax leucolophus*	2	-
9/4/2021	CT06	1/4/2021 14:59	1/4/2021	14:59:12	IMG_0168.AVI	*Garrulax leucolophus*	1	-
9/4/2021	CT06	1/4/2021 14:59	1/4/2021	14:59:12	IMG_0168.AVI	*Tupaia glis*	1	-
9/4/2021	CT06	1/4/2021 15:18	1/4/2021	15:18:04	IMG_0169.AVI	*Garrulax leucolophus*	2	-
9/4/2021	CT06	1/4/2021 18:55	1/4/2021	18:55:44	IMG_0170.AVI	*Tupaia glis*	1	-
9/4/2021	CT06	1/4/2021 19:20	1/4/2021	19:20:00	IMG_0171.AVI	*Tupaia glis*	1	-
9/4/2021	CT06	1/4/2021 19:20	1/4/2021	19:20:36	IMG_0172.AVI	*Tupaia glis*	1	-
9/4/2021	CT06	2/4/2021 7:44	1/4/2021	7:44:18	IMG_0173.AVI	*Tupaia glis*	1	-
9/4/2021	CT06	2/4/2021 9:13	2/4/2021	9:13:18	IMG_0174.AVI	*Callosciurus notatus*	1	-
9/4/2021	CT06	2/4/2021 9:36	2/4/2021	9:36:54	IMG_0175.AVI	*Garrulax leucolophus*	1	-
9/4/2021	CT06	2/4/2021 10:35	2/4/2021	10:35:10	IMG_0176.AVI	*Garrulax leucolophus*	2	-
9/4/2021	CT06	2/4/2021 14:29	2/4/2021	14:29:52	IMG_0177.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	2/4/2021 14:30	2/4/2021	14:30:18	IMG_0178.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	2/4/2021 14:30	2/4/2021	14:30:38	IMG_0179.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	2/4/2021 14:31	2/4/2021	14:31:02	IMG_0180.AVI	*Sus scrofa*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
9/4/2021	CT06	2/4/2021 14:32	2/4/2021	14:32:14	IMG_0181.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	2/4/2021 14:32	2/4/2021	14:32:34	IMG_0182.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	2/4/2021 14:32	2/4/2021	14:32:58	IMG_0183.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	2/4/2021 14:33	2/4/2021	14:33:18	IMG_0184.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	2/4/2021 14:33	2/4/2021	14:33:54	IMG_0185.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	2/4/2021 14:35	2/4/2021	14:35:54	IMG_0186.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	2/4/2021 14:36	2/4/2021	14:36:48	IMG_0187.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	2/4/2021 14:37	2/4/2021	14:37:10	IMG_0188.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	2/4/2021 14:37	2/4/2021	14:37:34	IMG_0189.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	2/4/2021 14:44	2/4/2021	14:44:22	IMG_0190.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	2/4/2021 14:44	2/4/2021	14:44:46	IMG_0191.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	2/4/2021 14:45	2/4/2021	14:45:08	IMG_0192.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	2/4/2021 14:52	2/4/2021	14:52:12	IMG_0193.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	2/4/2021 16:48	2/4/2021	16:48:48	IMG_0194.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	2/4/2021 16:49	2/4/2021	16:49:12	IMG_0195.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	2/4/2021 16:49	2/4/2021	16:49:36	IMG_0196.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	2/4/2021 16:49	2/4/2021	16:49:58	IMG_0197.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	2/4/2021 16:50	2/4/2021	16:50:26	IMG_0198.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	2/4/2021 16:50	2/4/2021	16:50:48	IMG_0199.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	2/4/2021 16:51	2/4/2021	16:51:10	IMG_0200.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	2/4/2021 16:51	2/4/2021	16:51:30	IMG_0201.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	2/4/2021 16:54	2/4/2021	16:54:22	IMG_0202.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	2/4/2021 17:06	2/4/2021	17:06:04	IMG_0203.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	2/4/2021 17:36	2/4/2021	17:36:04	IMG_0205.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	2/4/2021 18:45	2/4/2021	18:45:30	IMG_0206.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	2/4/2021 22:29	2/4/2021	22:29:26	IMG_0207.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	2/4/2021 22:29	2/4/2021	22:29:46	IMG_0208.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	3/4/2021 9:22	3/4/2021	9:22:16	IMG_0209.AVI	*Tupaia glis*	1	-
9/4/2021	CT06	3/4/2021 9:51	3/4/2021	9:51:30	IMG_0210.AVI	*Sus scrofa*	3	-
9/4/2021	CT06	3/4/2021 9:51	3/4/2021	9:51:50	IMG_0211.AVI	*Sus scrofa*	2	-
9/4/2021	CT06	3/4/2021 9:52	3/4/2021	9:52:32	IMG_0212.AVI	*Sus scrofa*	2	-
9/4/2021	CT06	3/4/2021 9:57	3/4/2021	9:57:04	IMG_0213.AVI	*Amaurornis phoenicurus*	1	-
9/4/2021	CT06	3/4/2021 17:50	3/4/2021	17:50:44	IMG_0214.AVI	*Amaurornis phoenicurus*	1	-
9/4/2021	CT06	3/4/2021 18:55	3/4/2021	18:55:52	IMG_0215.AVI	*Amaurornis phoenicurus*	2	-
9/4/2021	CT06	3/4/2021 18:57	3/4/2021	18:57:10	IMG_0216.AVI	*Amaurornis phoenicurus*	1	-
9/4/2021	CT06	3/4/2021 18:57	3/4/2021	18:57:10	IMG_0216.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	3/4/2021 19:01	3/4/2021	19:01:06	IMG_0217.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	3/4/2021 19:10	3/4/2021	19:10:32	IMG_0218.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	3/4/2021 19:10	3/4/2021	19:10:52	IMG_0219.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	3/4/2021 19:11	3/4/2021	19:11:14	IMG_0220.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	3/4/2021 19:11	3/4/2021	19:11:36	IMG_0221.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	3/4/2021 19:11	3/4/2021	19:11:56	IMG_0222.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	3/4/2021 19:12	3/4/2021	19:12:18	IMG_0223.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	3/4/2021 19:36	3/4/2021	19:36:24	IMG_0224.AVI	*Sus scrofa*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
9/4/2021	CT06	3/4/2021 19:36	3/4/2021	19:36:46	IMG_0225.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	3/4/2021 19:37	3/4/2021	19:37:06	IMG_0226.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	3/4/2021 19:37	3/4/2021	19:37:28	IMG_0227.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	3/4/2021 19:51	3/4/2021	19:51:24	IMG_0228.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	4/4/2021 5:54	3/4/2021	5:54:34	IMG_0229.AVI	*Rattus sp.*	1	-
9/4/2021	CT06	4/4/2021 7:23	3/4/2021	7:23:24	IMG_0230.AVI	*Gallus gallus*	1	-
9/4/2021	CT06	4/4/2021 7:25	3/4/2021	7:25:46	IMG_0231.AVI	*Amaurornis phoenicurus*	1	-
9/4/2021	CT06	4/4/2021 7:25	3/4/2021	7:25:46	IMG_0231.AVI	*Tupaia glis*	1	-
9/4/2021	CT06	4/4/2021 7:26	3/4/2021	7:26:12	IMG_0232.AVI	*Tupaia glis*	1	-
9/4/2021	CT06	4/4/2021 7:48	3/4/2021	7:48:58	IMG_0233.AVI	*Gallus gallus_hybrid_domestica*	1	-
9/4/2021	CT06	4/4/2021 7:49	3/4/2021	7:49:22	IMG_0234.AVI	*Gallus gallus_hybrid_domestica*	1	-
9/4/2021	CT06	4/4/2021 7:49	3/4/2021	7:49:44	IMG_0235.AVI	*Gallus gallus_hybrid_domestica*	1	-
9/4/2021	CT06	4/4/2021 7:51	3/4/2021	7:51:30	IMG_0236.AVI	*Gallus gallus_hybrid_domestica*	1	-
9/4/2021	CT06	4/4/2021 7:52	3/4/2021	7:52:08	IMG_0237.AVI	*Gallus gallus_hybrid_domestica*	1	-
9/4/2021	CT06	4/4/2021 7:54	3/4/2021	7:54:30	IMG_0238.AVI	*Tupaia glis*	1	-
9/4/2021	CT06	4/4/2021 8:19	4/4/2021	8:19:58	IMG_0239.AVI	*Tupaia glis*	1	-
9/4/2021	CT06	4/4/2021 8:22	4/4/2021	8:22:22	IMG_0240.AVI	*Gallus gallus_hybrid_domestica*	1	-
9/4/2021	CT06	4/4/2021 8:23	4/4/2021	8:23:52	IMG_0241.AVI	*Gallus gallus_hybrid_domestica*	1	-
9/4/2021	CT06	4/4/2021 8:24	4/4/2021	8:24:18	IMG_0242.AVI	*Gallus gallus_hybrid_domestica*	1	-
9/4/2021	CT06	4/4/2021 8:24	4/4/2021	8:24:40	IMG_0243.AVI	*Gallus gallus_hybrid_domestica*	1	-
9/4/2021	CT06	4/4/2021 8:25	4/4/2021	8:25:10	IMG_0244.AVI	*Gallus gallus_hybrid_domestica*	1	-
9/4/2021	CT06	4/4/2021 8:43	4/4/2021	8:43:42	IMG_0245.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	4/4/2021 10:34	4/4/2021	10:34:18	IMG_0246.AVI	*Gallus gallus_hybrid_domestica*	1	-
9/4/2021	CT06	4/4/2021 11:14	4/4/2021	11:14:06	IMG_0247.AVI	*Garrulax leucolophus*	1	-
9/4/2021	CT06	4/4/2021 11:44	4/4/2021	11:44:16	IMG_0248.AVI	*Garrulax leucolophus*	1	-
9/4/2021	CT06	4/4/2021 16:04	4/4/2021	16:04:48	IMG_0249.AVI	*Copsychus saularis*	1	-
9/4/2021	CT06	4/4/2021 19:12	4/4/2021	19:12:12	IMG_0250.AVI	*Pitta moluccensis*	1	-
9/4/2021	CT06	4/4/2021 19:12	4/4/2021	19:12:12	IMG_0250.AVI	*Tupaia glis*	1	-
9/4/2021	CT06	4/4/2021 19:15	4/4/2021	19:15:30	IMG_0251.AVI	*Tupaia glis*	1	-
9/4/2021	CT06	4/4/2021 20:02	4/4/2021	20:02:12	IMG_0253.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	4/4/2021 20:02	4/4/2021	20:02:34	IMG_0254.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	4/4/2021 20:02	4/4/2021	20:02:54	IMG_0255.AVI	*Sus scrofa*	2	-
9/4/2021	CT06	4/4/2021 20:03	4/4/2021	20:03:14	IMG_0256.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	4/4/2021 20:03	4/4/2021	20:03:38	IMG_0257.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	5/4/2021 7:12	4/4/2021	7:12:12	IMG_0258.AVI	*Tupaia glis*	1	-
9/4/2021	CT06	5/4/2021 8:48	5/4/2021	8:48:04	IMG_0259.AVI	*Tupaia glis*	1	-
9/4/2021	CT06	5/4/2021 8:48	5/4/2021	8:48:04	IMG_0259.AVI	Unidentified bird	1	-
9/4/2021	CT06	5/4/2021 9:25	5/4/2021	9:25:22	IMG_0260.AVI	*Tupaia glis*	1	-
9/4/2021	CT06	5/4/2021 10:13	5/4/2021	10:13:14	IMG_0261.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	5/4/2021 10:13	5/4/2021	10:13:36	IMG_0262.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	5/4/2021 10:23	5/4/2021	10:23:32	IMG_0263.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	5/4/2021 10:23	5/4/2021	10:23:54	IMG_0264.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	5/4/2021 11:45	5/4/2021	11:45:28	IMG_0265.AVI	*Tupaia glis*	1	-
9/4/2021	CT06	5/4/2021 13:14	5/4/2021	13:14:10	IMG_0266.AVI	*Sus scrofa*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
9/4/2021	CT06	5/4/2021 13:14	5/4/2021	13:14:30	IMG_0267.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	5/4/2021 13:14	5/4/2021	13:14:54	IMG_0268.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	5/4/2021 13:18	5/4/2021	13:18:42	IMG_0269.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	5/4/2021 16:49	5/4/2021	16:49:58	IMG_0270.AVI	*Tupaia glis*	1	-
9/4/2021	CT06	5/4/2021 18:15	5/4/2021	18:15:48	IMG_0271.AVI	*Sus scrofa*	1	-
9/4/2021	CT06	5/4/2021 18:48	5/4/2021	18:48:26	IMG_0272.AVI	*Tupaia glis*	1	-
9/4/2021	CT07	11/3/2021 16:56	11/3/2021	16:56:36	IMG_0005.AVI	*Tupaia glis*	1	-
9/4/2021	CT07	12/3/2021 16:17	12/3/2021	16:17:10	IMG_0006.AVI	*Amaurornis phoenicurus*	1	-
9/4/2021	CT07	12/3/2021 18:55	12/3/2021	18:55:38	IMG_0007.AVI	*Tupaia glis*	1	-
9/4/2021	CT07	12/3/2021 19:10	12/3/2021	19:10:14	IMG_0008.AVI	*Tupaia glis*	1	-
9/4/2021	CT07	13/3/2021 8:16	13/3/2021	8:16:40	IMG_0009.AVI	*Tupaia glis*	1	-
9/4/2021	CT07	13/3/2021 10:56	13/3/2021	10:56:22	IMG_0010.AVI	*Tupaia glis*	1	-
9/4/2021	CT07	13/3/2021 14:15	13/3/2021	14:15:34	IMG_0011.AVI	*Tupaia glis*	1	-
9/4/2021	CT07	13/3/2021 17:25	13/3/2021	17:25:36	IMG_0012.AVI	*Tupaia glis*	1	-
9/4/2021	CT07	14/3/2021 7:24	13/3/2021	7:24:56	IMG_0013.AVI	*Amaurornis phoenicurus*	1	-
9/4/2021	CT07	15/3/2021 16:41	15/3/2021	16:41:40	IMG_0018.AVI	*Tupaia glis*	1	-
9/4/2021	CT07	15/3/2021 16:43	15/3/2021	16:43:30	IMG_0019.AVI	*Amaurornis phoenicurus*	1	-
9/4/2021	CT07	15/3/2021 16:43	15/3/2021	16:43:30	IMG_0019.AVI	*Tupaia glis*	1	-
9/4/2021	CT07	15/3/2021 19:06	15/3/2021	19:06:12	IMG_0021.AVI	*Tupaia glis*	1	-
9/4/2021	CT07	15/3/2021 19:10	15/3/2021	19:10:14	IMG_0022.AVI	*Tupaia glis*	1	-
9/4/2021	CT07	15/3/2021 19:22	15/3/2021	19:22:08	IMG_0023.AVI	*Tupaia glis*	1	-
9/4/2021	CT07	16/3/2021 14:03	16/3/2021	14:03:30	IMG_0025.AVI	*Tupaia glis*	1	-
9/4/2021	CT07	16/3/2021 14:43	16/3/2021	14:43:16	IMG_0026.AVI	*Amaurornis phoenicurus*	1	-
9/4/2021	CT07	16/3/2021 14:53	16/3/2021	14:53:26	IMG_0027.AVI	*Tupaia glis*	1	-
9/4/2021	CT07	16/3/2021 22:59	16/3/2021	22:59:42	IMG_0028.AVI	*Paradoxurus musangus*	1	-
9/4/2021	CT07	17/3/2021 19:04	17/3/2021	19:04:32	IMG_0034.AVI	*Tupaia glis*	1	-
9/4/2021	CT07	17/3/2021 19:22	17/3/2021	19:22:10	IMG_0035.AVI	*Tupaia glis*	1	-
9/4/2021	CT07	18/3/2021 9:56	18/3/2021	9:56:50	IMG_0036.AVI	*Amaurornis phoenicurus*	1	-
9/4/2021	CT07	18/3/2021 18:22	18/3/2021	18:22:42	IMG_0039.AVI	*Amaurornis phoenicurus*	1	-
9/4/2021	CT07	18/3/2021 18:39	18/3/2021	18:39:08	IMG_0040.AVI	*Tupaia glis*	1	-
9/4/2021	CT07	18/3/2021 18:39	18/3/2021	18:39:30	IMG_0041.AVI	*Tupaia glis*	1	-
9/4/2021	CT07	18/3/2021 18:39	18/3/2021	18:39:50	IMG_0042.AVI	*Tupaia glis*	1	-
9/4/2021	CT07	19/3/2021 8:48	19/3/2021	8:48:32	IMG_0043.AVI	*Sus scrofa*	2	-
9/4/2021	CT07	19/3/2021 8:48	19/3/2021	8:48:54	IMG_0044.AVI	*Sus scrofa*	5	-
9/4/2021	CT07	19/3/2021 8:49	19/3/2021	8:49:22	IMG_0045.AVI	*Sus scrofa*	3	-
9/4/2021	CT07	19/3/2021 18:43	19/3/2021	18:43:10	IMG_0047.AVI	*Amaurornis phoenicurus*	1	-
9/4/2021	CT07	19/3/2021 18:43	19/3/2021	18:43:10	IMG_0047.AVI	*Tupaia glis*	2	-
9/4/2021	CT07	20/3/2021 16:48	20/3/2021	16:48:42	IMG_0051.AVI	*Picus vittatus*	1	-
9/4/2021	CT07	20/3/2021 18:13	20/3/2021	18:13:58	IMG_0052.AVI	*Acridotheres javanicus*	1	-
9/4/2021	CT07	20/3/2021 19:00	20/3/2021	19:00:10	IMG_0053.AVI	*Amaurornis phoenicurus*	1	-
9/4/2021	CT07	20/3/2021 19:10	20/3/2021	19:10:16	IMG_0054.AVI	*Tupaia glis*	1	-
9/4/2021	CT07	21/3/2021 18:54	21/3/2021	18:54:36	IMG_0057.AVI	*Tupaia glis*	1	-
9/4/2021	CT07	22/3/2021 7:05	21/3/2021	7:05:10	IMG_0058.AVI	*Amaurornis phoenicurus*	1	-
9/4/2021	CT07	22/3/2021 10:36	22/3/2021	10:36:02	IMG_0059.AVI	*Varanus sp.*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
9/4/2021	CT07	22/3/2021 10:36	22/3/2021	10:36:26	IMG_0060.AVI	*Varanus sp.*	1	-
9/4/2021	CT07	23/3/2021 18:52	23/3/2021	18:52:40	IMG_0061.AVI	*Amaurornis phoenicurus*	1	-
9/4/2021	CT07	23/3/2021 19:13	23/3/2021	19:13:52	IMG_0062.AVI	*Amaurornis phoenicurus*	1	-
9/4/2021	CT07	23/3/2021 19:14	23/3/2021	19:14:50	IMG_0063.AVI	*Amaurornis phoenicurus*	1	-
9/4/2021	CT07	23/3/2021 19:19	23/3/2021	19:19:26	IMG_0064.AVI	*Amaurornis phoenicurus*	1	-
9/4/2021	CT07	24/3/2021 6:43	23/3/2021	6:43:12	IMG_0065.AVI	*Rattus tiomanicus*	1	-
9/4/2021	CT07	24/3/2021 7:01	23/3/2021	7:01:30	IMG_0066.AVI	*Tupaia glis*	1	-
9/4/2021	CT07	24/3/2021 7:15	23/3/2021	7:15:14	IMG_0067.AVI	*Tupaia glis*	1	-
9/4/2021	CT07	24/3/2021 7:35	23/3/2021	7:35:02	IMG_0068.AVI	*Amaurornis phoenicurus*	1	-
9/4/2021	CT07	24/3/2021 10:12	24/3/2021	10:12:04	IMG_0070.AVI	*Amaurornis phoenicurus*	1	-
9/4/2021	CT07	24/3/2021 12:29	24/3/2021	12:29:28	IMG_0071.AVI	*Amaurornis phoenicurus*	1	-
9/4/2021	CT07	24/3/2021 18:19	24/3/2021	18:19:40	IMG_0076.AVI	*Amaurornis phoenicurus*	1	-
9/4/2021	CT07	24/3/2021 18:53	24/3/2021	18:53:24	IMG_0077.AVI	*Tupaia glis*	1	-
9/4/2021	CT07	25/3/2021 8:34	25/3/2021	8:34:30	IMG_0079.AVI	*Sus scrofa*	2	-
9/4/2021	CT07	25/3/2021 8:35	25/3/2021	8:35:14	IMG_0080.AVI	*Sus scrofa*	3	-
9/4/2021	CT07	25/3/2021 8:35	25/3/2021	8:35:44	IMG_0081.AVI	*Sus scrofa*	3	-
9/4/2021	CT07	25/3/2021 13:14	25/3/2021	13:14:20	IMG_0082.AVI	*Garrulax leucolophus*	2	-
9/4/2021	CT07	25/3/2021 13:15	25/3/2021	13:15:02	IMG_0083.AVI	*Garrulax leucolophus*	1	-
9/4/2021	CT07	25/3/2021 13:16	25/3/2021	13:16:04	IMG_0084.AVI	*Garrulax leucolophus*	1	-
9/4/2021	CT07	25/3/2021 13:17	25/3/2021	13:17:34	IMG_0085.AVI	*Callosciurus notatus*	1	-
9/4/2021	CT07	25/3/2021 13:17	25/3/2021	13:17:34	IMG_0085.AVI	*Garrulax leucolophus*	1	-
9/4/2021	CT07	25/3/2021 13:18	25/3/2021	13:18:22	IMG_0086.AVI	*Garrulax leucolophus*	1	-
9/4/2021	CT07	25/3/2021 13:18	25/3/2021	13:18:22	IMG_0086.AVI	*Tupaia glis*	1	-
9/4/2021	CT07	25/3/2021 13:19	25/3/2021	13:19:34	IMG_0087.AVI	*Garrulax leucolophus*	1	-
9/4/2021	CT07	25/3/2021 13:20	25/3/2021	13:20:26	IMG_0088.AVI	*Garrulax leucolophus*	1	-
9/4/2021	CT07	25/3/2021 13:21	25/3/2021	13:21:40	IMG_0089.AVI	*Garrulax leucolophus*	1	-
9/4/2021	CT07	25/3/2021 13:21	25/3/2021	13:21:40	IMG_0089.AVI	*Picus vittatus*	1	-
9/4/2021	CT07	25/3/2021 13:22	25/3/2021	13:22:22	IMG_0090.AVI	*Garrulax leucolophus*	3	-
9/4/2021	CT07	25/3/2021 13:22	25/3/2021	13:22:22	IMG_0090.AVI	Unidentified bird	1	-
9/4/2021	CT07	25/3/2021 13:22	25/3/2021	13:22:48	IMG_0091.AVI	*Garrulax leucolophus*	2	-
9/4/2021	CT07	26/3/2021 6:48	25/3/2021	6:48:26	IMG_0093.AVI	*Rattus tiomanicus*	1	-
9/4/2021	CT07	26/3/2021 7:01	25/3/2021	7:01:22	IMG_0094.AVI	*Tupaia glis*	1	-
9/4/2021	CT07	26/3/2021 7:02	25/3/2021	7:02:08	IMG_0095.AVI	*Amaurornis phoenicurus*	1	-
9/4/2021	CT07	26/3/2021 7:02	25/3/2021	7:02:08	IMG_0095.AVI	*Tupaia glis*	1	-
9/4/2021	CT07	28/3/2021 8:20	28/3/2021	8:20:16	IMG_0102.AVI	*Tupaia glis*	1	-
9/4/2021	CT07	29/3/2021 7:00	28/3/2021	7:00:32	IMG_0103.AVI	*Amaurornis phoenicurus*	1	-
9/4/2021	CT07	29/3/2021 7:02	28/3/2021	7:02:16	IMG_0104.AVI	*Amaurornis phoenicurus*	1	-
9/4/2021	CT07	29/3/2021 8:58	29/3/2021	8:58:46	IMG_0105.AVI	*Gallus gallus*	2	-
9/4/2021	CT07	30/3/2021 8:13	30/3/2021	8:13:00	IMG_0106.AVI	*Amaurornis phoenicurus*	1	-
9/4/2021	CT07	30/3/2021 8:13	30/3/2021	8:13:00	IMG_0106.AVI	*Gallus gallus*	1	-
9/4/2021	CT07	30/3/2021 8:13	30/3/2021	8:13:24	IMG_0107.AVI	*Amaurornis phoenicurus*	1	-
9/4/2021	CT07	30/3/2021 8:13	30/3/2021	8:13:24	IMG_0107.AVI	*Gallus gallus*	2	-
9/4/2021	CT07	30/3/2021 8:13	30/3/2021	8:13:58	IMG_0108.AVI	*Gallus gallus*	2	-
9/4/2021	CT07	30/3/2021 8:14	30/3/2021	8:14:18	IMG_0109.AVI	*Gallus gallus*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
9/4/2021	CT07	31/3/2021 19:26	31/3/2021	19:26:32	IMG_0115.AVI	*Tupaia glis*	1	-
9/4/2021	CT07	2/4/2021 23:59	2/4/2021	23:59:46	IMG_0118.AVI	*Paradoxurus musangus*	1	-
9/4/2021	CT07	3/4/2021 18:51	3/4/2021	18:51:12	IMG_0119.AVI	*Sus scrofa*	1	-
9/4/2021	CT07	3/4/2021 18:57	3/4/2021	18:57:32	IMG_0120.AVI	*Tupaia glis*	1	-
9/4/2021	CT07	3/4/2021 19:08	3/4/2021	19:08:32	IMG_0121.AVI	*Amaurornis phoenicurus*	1	-
9/4/2021	CT07	4/4/2021 9:50	4/4/2021	9:50:54	IMG_0122.AVI	*Gallus gallus*	1	-
9/4/2021	CT07	4/4/2021 10:16	4/4/2021	10:16:18	IMG_0123.AVI	*Gallus gallus*	1	-
9/4/2021	CT07	4/4/2021 10:16	4/4/2021	10:16:42	IMG_0124.AVI	*Gallus gallus*	2	-
9/4/2021	CT07	4/4/2021 10:31	4/4/2021	10:31:10	IMG_0125.AVI	*Gallus gallus*	2	-
9/4/2021	CT07	4/4/2021 10:32	4/4/2021	10:32:24	IMG_0126.AVI	*Gallus gallus*	1	-
9/4/2021	CT07	5/4/2021 10:22	5/4/2021	10:22:42	IMG_0127.AVI	*Gallus gallus*	1	-
9/4/2021	CT07	5/4/2021 18:20	5/4/2021	18:20:24	IMG_0128.AVI	*Gallus gallus*	2	-
9/4/2021	CT07	5/4/2021 18:20	5/4/2021	18:20:50	IMG_0129.AVI	*Gallus gallus*	1	-
9/4/2021	CT07	5/4/2021 18:47	5/4/2021	18:47:08	IMG_0130.AVI	*Tupaia glis*	1	-
9/4/2021	CT07	5/4/2021 18:47	5/4/2021	18:47:32	IMG_0131.AVI	*Gallus gallus*	1	-
9/4/2021	CT07	5/4/2021 18:47	5/4/2021	18:47:32	IMG_0131.AVI	*Tupaia glis*	1	-
9/4/2021	CT07	5/4/2021 18:48	5/4/2021	18:48:00	IMG_0132.AVI	*Gallus gallus*	1	-
9/4/2021	CT07	5/4/2021 18:48	5/4/2021	18:48:30	IMG_0133.AVI	*Gallus gallus*	1	-
9/4/2021	CT07	5/4/2021 18:48	5/4/2021	18:48:52	IMG_0134.AVI	*Gallus gallus*	1	-
9/4/2021	CT07	7/4/2021 12:19	7/4/2021	12:19:38	IMG_0135.AVI	*Gallus gallus*	1	-
9/4/2021	CT07	7/4/2021 17:59	7/4/2021	17:59:02	IMG_0136.AVI	*Amaurornis phoenicurus*	1	-
9/4/2021	CT07	7/4/2021 18:49	7/4/2021	18:49:46	IMG_0137.AVI	*Amaurornis phoenicurus*	2	-
9/4/2021	CT07	7/4/2021 19:10	7/4/2021	19:10:20	IMG_0138.AVI	*Tupaia glis*	1	-
9/4/2021	CT07	8/4/2021 12:35	8/4/2021	12:35:40	IMG_0141.AVI	*Copsychus saularis*	1	-
9/4/2021	CT07	8/4/2021 12:36	8/4/2021	12:36:06	IMG_0142.AVI	*Copsychus saularis*	1	-
9/4/2021	CT07	8/4/2021 12:36	8/4/2021	12:36:38	IMG_0143.AVI	*Copsychus saularis*	1	-
9/4/2021	CT07	8/4/2021 20:57	8/4/2021	20:57:52	IMG_0150.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	11/3/2021 17:47	11/3/2021	17:47:52	IMG_0009.AVI	*Sus scrofa*	2	-
9/4/2021	CT08	12/3/2021 7:10	11/3/2021	7:10:40	IMG_0010.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	12/3/2021 7:18	11/3/2021	7:18:18	IMG_0012.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	12/3/2021 7:43	11/3/2021	7:43:42	IMG_0013.AVI	Unidentified sp.	1	-
9/4/2021	CT08	12/3/2021 7:44	11/3/2021	7:44:58	IMG_0014.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	12/3/2021 8:26	12/3/2021	8:26:04	IMG_0015.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	12/3/2021 12:02	12/3/2021	12:02:46	IMG_0016.AVI	*Garrulax leucolophus*	1	-
9/4/2021	CT08	12/3/2021 12:03	12/3/2021	12:03:10	IMG_0017.AVI	*Garrulax leucolophus*	2	-
9/4/2021	CT08	12/3/2021 17:37	12/3/2021	17:37:38	IMG_0018.AVI	*Sus scrofa*	4	-
9/4/2021	CT08	13/3/2021 17:31	13/3/2021	17:31:32	IMG_0019.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	14/3/2021 15:46	14/3/2021	15:46:40	IMG_0020.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	15/3/2021 5:05	14/3/2021	5:05:24	IMG_0021.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	16/3/2021 12:07	16/3/2021	12:07:08	IMG_0022.AVI	*Callosciurus notatus*	1	-
9/4/2021	CT08	16/3/2021 13:29	16/3/2021	13:29:56	IMG_0023.AVI	*Garrulax leucolophus*	2	-
9/4/2021	CT08	16/3/2021 13:29	16/3/2021	13:29:56	IMG_0023.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	16/3/2021 13:30	16/3/2021	13:30:24	IMG_0024.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	16/3/2021 13:31	16/3/2021	13:31:36	IMG_0025.AVI	*Sus scrofa*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
9/4/2021	CT08	16/3/2021 18:59	16/3/2021	18:59:30	IMG_0026.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	18/3/2021 16:21	18/3/2021	16:21:30	IMG_0027.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	19/3/2021 7:34	18/3/2021	7:34:16	IMG_0029.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	20/3/2021 9:56	20/3/2021	9:56:02	IMG_0030.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	20/3/2021 9:56	20/3/2021	9:56:22	IMG_0031.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	20/3/2021 9:56	20/3/2021	9:56:44	IMG_0032.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	20/3/2021 9:57	20/3/2021	9:57:04	IMG_0033.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	20/3/2021 9:57	20/3/2021	9:57:26	IMG_0034.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	20/3/2021 9:57	20/3/2021	9:57:52	IMG_0035.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	20/3/2021 9:58	20/3/2021	9:58:14	IMG_0036.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	20/3/2021 9:58	20/3/2021	9:58:34	IMG_0037.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	20/3/2021 9:58	20/3/2021	9:58:56	IMG_0038.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	20/3/2021 9:59	20/3/2021	9:59:24	IMG_0039.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	20/3/2021 9:59	20/3/2021	9:59:48	IMG_0040.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	20/3/2021 10:00	20/3/2021	10:00:12	IMG_0041.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	20/3/2021 10:00	20/3/2021	10:00:40	IMG_0042.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	20/3/2021 10:01	20/3/2021	10:01:04	IMG_0043.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	20/3/2021 10:01	20/3/2021	10:01:28	IMG_0044.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	20/3/2021 10:01	20/3/2021	10:01:50	IMG_0045.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	20/3/2021 10:02	20/3/2021	10:02:52	IMG_0046.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	20/3/2021 10:03	20/3/2021	10:03:16	IMG_0047.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	20/3/2021 10:03	20/3/2021	10:03:44	IMG_0048.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	22/3/2021 22:10	22/3/2021	22:10:06	IMG_0051.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	22/3/2021 22:10	22/3/2021	22:10:28	IMG_0052.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	23/3/2021 5:33	22/3/2021	5:33:12	IMG_0053.AVI	*Sus scrofa*	2	-
9/4/2021	CT08	23/3/2021 5:34	22/3/2021	5:34:40	IMG_0054.AVI	*Sus scrofa*	2	-
9/4/2021	CT08	23/3/2021 5:35	22/3/2021	5:35:10	IMG_0055.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	23/3/2021 5:35	22/3/2021	5:35:34	IMG_0056.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	23/3/2021 5:35	22/3/2021	5:35:58	IMG_0057.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	23/3/2021 5:36	22/3/2021	5:36:22	IMG_0058.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	23/3/2021 5:36	22/3/2021	5:36:58	IMG_0059.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	23/3/2021 5:37	22/3/2021	5:37:20	IMG_0060.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	23/3/2021 5:37	22/3/2021	5:37:54	IMG_0061.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	23/3/2021 5:38	22/3/2021	5:38:22	IMG_0062.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	23/3/2021 5:38	22/3/2021	5:38:44	IMG_0063.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	23/3/2021 9:40	23/3/2021	9:40:50	IMG_0064.AVI	*Gallus gallus*	1	-
9/4/2021	CT08	25/3/2021 16:28	25/3/2021	16:28:06	IMG_0065.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	27/3/2021 4:24	26/3/2021	4:24:44	IMG_0067.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	27/3/2021 19:56	27/3/2021	19:56:54	IMG_0068.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	27/3/2021 19:57	27/3/2021	19:57:14	IMG_0069.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	28/3/2021 7:00	27/3/2021	7:00:18	IMG_0070.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	28/3/2021 7:00	27/3/2021	7:00:18	IMG_0070.AVI	Unidentified squirrel or treeshrew	2	-
9/4/2021	CT08	28/3/2021 7:00	27/3/2021	7:00:38	IMG_0071.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	28/3/2021 9:57	28/3/2021	9:57:14	IMG_0072.AVI	*Callosciurus notatus*	3	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
9/4/2021	CT08	28/3/2021 9:57	28/3/2021	9:57:54	IMG_0073.AVI	*Callosciurus notatus*	3	-
9/4/2021	CT08	28/3/2021 13:26	28/3/2021	13:26:24	IMG_0074.AVI	*Garrulax leucolophus*	1	-
9/4/2021	CT08	28/3/2021 14:44	28/3/2021	14:44:08	IMG_0075.AVI	*Callosciurus notatus*	2	-
9/4/2021	CT08	28/3/2021 14:44	28/3/2021	14:44:08	IMG_0075.AVI	Unidentified squirrel or treeshrew	2	-
9/4/2021	CT08	28/3/2021 14:44	28/3/2021	14:44:42	IMG_0076.AVI	*Callosciurus notatus*	1	-
9/4/2021	CT08	28/3/2021 15:14	28/3/2021	15:14:12	IMG_0077.AVI	*Callosciurus notatus*	2	-
9/4/2021	CT08	31/3/2021 17:37	31/3/2021	17:37:54	IMG_0081.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	31/3/2021 17:38	31/3/2021	17:38:42	IMG_0082.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	31/3/2021 17:39	31/3/2021	17:39:26	IMG_0083.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	31/3/2021 17:50	31/3/2021	17:50:08	IMG_0084.AVI	*Gallus gallus*	1	-
9/4/2021	CT08	1/4/2021 19:55	1/4/2021	19:55:54	IMG_0085.AVI	*Sus scrofa*	2	-
9/4/2021	CT08	1/4/2021 19:56	1/4/2021	19:56:30	IMG_0086.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	1/4/2021 20:36	1/4/2021	20:36:20	IMG_0087.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	1/4/2021 20:36	1/4/2021	20:36:42	IMG_0088.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	1/4/2021 20:38	1/4/2021	20:38:54	IMG_0089.AVI	*Sus scrofa*	6	-
9/4/2021	CT08	1/4/2021 20:39	1/4/2021	20:39:16	IMG_0090.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	2/4/2021 0:37	1/4/2021	0:37:48	IMG_0091.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	2/4/2021 0:38	1/4/2021	0:38:12	IMG_0092.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	2/4/2021 0:38	1/4/2021	0:38:34	IMG_0093.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	2/4/2021 0:38	1/4/2021	0:38:56	IMG_0094.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	2/4/2021 0:39	1/4/2021	0:39:18	IMG_0095.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	2/4/2021 9:42	2/4/2021	9:42:36	IMG_0096.AVI	*Canis lupus familiaris*	4	-
9/4/2021	CT08	3/4/2021 12:28	3/4/2021	12:28:22	IMG_0098.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	3/4/2021 12:28	3/4/2021	12:28:42	IMG_0099.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	3/4/2021 12:29	3/4/2021	12:29:04	IMG_0100.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	3/4/2021 16:34	3/4/2021	16:34:18	IMG_0101.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	3/4/2021 16:34	3/4/2021	16:34:50	IMG_0102.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	3/4/2021 16:35	3/4/2021	16:35:56	IMG_0103.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	3/4/2021 16:37	3/4/2021	16:37:20	IMG_0104.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	3/4/2021 16:37	3/4/2021	16:37:44	IMG_0105.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	4/4/2021 12:36	4/4/2021	12:36:02	IMG_0106.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	4/4/2021 13:01	4/4/2021	13:01:12	IMG_0107.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	4/4/2021 13:01	4/4/2021	13:01:34	IMG_0108.AVI	*Sus scrofa*	2	-
9/4/2021	CT08	4/4/2021 16:58	4/4/2021	16:58:06	IMG_0109.AVI	*Gallus gallus*	1	-
9/4/2021	CT08	4/4/2021 17:46	4/4/2021	17:46:56	IMG_0110.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	4/4/2021 17:47	4/4/2021	17:47:18	IMG_0111.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	4/4/2021 17:47	4/4/2021	17:47:50	IMG_0112.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	5/4/2021 6:55	4/4/2021	6:55:48	IMG_0113.AVI	*Sus scrofa*	1	-
9/4/2021	CT08	6/4/2021 9:41	6/4/2021	9:41:34	IMG_0115.AVI	*Sus scrofa*	2	-
9/4/2021	CT08	8/4/2021 13:35	8/4/2021	13:35:28	IMG_0122.AVI	*Oriolus chinensis*	2	-
9/4/2021	CT09	12/3/2021 8:13	12/3/2021	8:13:14	IMG_0004.AVI	*Sus scrofa*	1	-
9/4/2021	CT09	26/3/2021 8:05	26/3/2021	8:05:40	IMG_0007.AVI	*Callosciurus notatus*	1	-
9/4/2021	CT09	26/3/2021 8:49	26/3/2021	8:49:38	IMG_0008.AVI	*Callosciurus notatus*	1	-
9/4/2021	CT09	26/3/2021 8:54	26/3/2021	8:54:42	IMG_0010.AVI	*Callosciurus notatus*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
9/4/2021	CT09	26/3/2021 16:53	26/3/2021	16:53:32	IMG_0011.AVI	*Sus scrofa*	1	-
9/4/2021	CT09	26/3/2021 16:54	26/3/2021	16:54:00	IMG_0012.AVI	*Sus scrofa*	3	-
9/4/2021	CT09	26/3/2021 16:54	26/3/2021	16:54:22	IMG_0013.AVI	*Sus scrofa*	1	-
9/4/2021	CT09	26/3/2021 16:54	26/3/2021	16:54:44	IMG_0014.AVI	*Sus scrofa*	1	-
9/4/2021	CT09	26/3/2021 16:55	26/3/2021	16:55:06	IMG_0015.AVI	*Sus scrofa*	1	-
9/4/2021	CT09	26/3/2021 16:55	26/3/2021	16:55:26	IMG_0016.AVI	*Sus scrofa*	1	-
9/4/2021	CT09	31/3/2021 13:40	31/3/2021	13:40:14	IMG_0017.AVI	Unidentified reptile	1	Snake or skink
9/4/2021	CT10	12/3/2021 16:37	12/3/2021	16:37:58	IMG_0006.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	12/3/2021 16:38	12/3/2021	16:38:20	IMG_0007.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	12/3/2021 21:27	12/3/2021	21:27:12	IMG_0008.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	14/3/2021 9:34	14/3/2021	9:34:48	IMG_0010.AVI	*Callosciurus notatus*	1	-
9/4/2021	CT10	15/3/2021 16:26	15/3/2021	16:26:00	IMG_0012.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	16/3/2021 12:33	16/3/2021	12:33:26	IMG_0013.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	16/3/2021 13:03	16/3/2021	13:03:30	IMG_0014.AVI	*Acridotheres javanicus*	1	-
9/4/2021	CT10	17/3/2021 7:26	16/3/2021	7:26:04	IMG_0015.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	17/3/2021 7:32	16/3/2021	7:32:20	IMG_0016.AVI	*Gallus gallus*	1	-
9/4/2021	CT10	17/3/2021 7:32	16/3/2021	7:32:42	IMG_0017.AVI	*Gallus gallus*	1	-
9/4/2021	CT10	17/3/2021 7:32	16/3/2021	7:32:42	IMG_0017.AVI	*Tupaia glis*	1	-
9/4/2021	CT10	17/3/2021 7:33	16/3/2021	7:33:10	IMG_0018.AVI	*Gallus gallus*	1	-
9/4/2021	CT10	17/3/2021 7:33	16/3/2021	7:33:10	IMG_0018.AVI	*Tupaia glis*	1	-
9/4/2021	CT10	17/3/2021 7:37	16/3/2021	7:37:38	IMG_0019.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	17/3/2021 7:52	16/3/2021	7:52:34	IMG_0020.AVI	*Callosciurus notatus*	1	Carry nesting material
9/4/2021	CT10	17/3/2021 11:22	17/3/2021	11:22:32	IMG_0021.AVI	*Sus scrofa*	2	-
9/4/2021	CT10	17/3/2021 18:22	17/3/2021	18:22:14	IMG_0022.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	19/3/2021 10:36	19/3/2021	10:36:10	IMG_0023.AVI	*Callosciurus notatus*	1	-
9/4/2021	CT10	19/3/2021 11:42	19/3/2021	11:42:10	IMG_0024.AVI	*Callosciurus notatus*	1	-
9/4/2021	CT10	21/3/2021 6:58	20/3/2021	6:58:04	IMG_0025.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	21/3/2021 6:58	20/3/2021	6:58:26	IMG_0026.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	21/3/2021 14:39	21/3/2021	14:39:14	IMG_0027.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	21/3/2021 15:20	21/3/2021	15:20:02	IMG_0028.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	21/3/2021 23:36	21/3/2021	23:36:00	IMG_0029.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	21/3/2021 23:36	21/3/2021	23:36:22	IMG_0030.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	24/3/2021 8:35	24/3/2021	8:35:48	IMG_0032.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	24/3/2021 17:13	24/3/2021	17:13:20	IMG_0033.AVI	*Garrulax leucolophus*	2	-
9/4/2021	CT10	24/3/2021 17:13	24/3/2021	17:13:20	IMG_0033.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	25/3/2021 8:39	25/3/2021	8:39:12	IMG_0034.AVI	*Amaurornis phoenicurus*	3	Fighting
9/4/2021	CT10	25/3/2021 12:41	25/3/2021	12:41:28	IMG_0035.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	25/3/2021 22:49	25/3/2021	22:49:28	IMG_0036.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	27/3/2021 13:24	27/3/2021	13:24:58	IMG_0037.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	27/3/2021 23:47	27/3/2021	23:47:00	IMG_0038.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	28/3/2021 11:10	28/3/2021	11:10:44	IMG_0039.AVI	*Callosciurus notatus*	1	-
9/4/2021	CT10	28/3/2021 18:56	28/3/2021	18:56:36	IMG_0040.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	29/3/2021 10:40	29/3/2021	10:40:34	IMG_0041.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	29/3/2021 12:56	29/3/2021	12:56:02	IMG_0042.AVI	*Sus scrofa*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
9/4/2021	CT10	30/3/2021 7:26	29/3/2021	7:26:20	IMG_0043.AVI	*Picus vittatus*	1	-
9/4/2021	CT10	30/3/2021 10:15	30/3/2021	10:15:34	IMG_0044.AVI	*Amaurornis phoenicurus*	1	-
9/4/2021	CT10	30/3/2021 10:15	30/3/2021	10:15:34	IMG_0044.AVI	*Callosciurus notatus*	1	-
9/4/2021	CT10	30/3/2021 10:55	30/3/2021	10:55:28	IMG_0045.AVI	*Sus scrofa*	2	-
9/4/2021	CT10	30/3/2021 10:56	30/3/2021	10:56:28	IMG_0046.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	30/3/2021 13:22	30/3/2021	13:22:00	IMG_0047.AVI	*Sus scrofa*	3	-
9/4/2021	CT10	30/3/2021 13:22	30/3/2021	13:22:32	IMG_0048.AVI	*Sus scrofa*	3	-
9/4/2021	CT10	30/3/2021 13:22	30/3/2021	13:22:54	IMG_0049.AVI	*Sus scrofa*	3	-
9/4/2021	CT10	30/3/2021 13:23	30/3/2021	13:23:14	IMG_0050.AVI	*Sus scrofa*	3	-
9/4/2021	CT10	30/3/2021 13:23	30/3/2021	13:23:36	IMG_0051.AVI	*Sus scrofa*	2	-
9/4/2021	CT10	30/3/2021 13:23	30/3/2021	13:23:58	IMG_0052.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	30/3/2021 13:30	30/3/2021	13:30:10	IMG_0053.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	30/3/2021 18:47	30/3/2021	18:47:10	IMG_0054.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	31/3/2021 1:37	30/3/2021	1:37:32	IMG_0055.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	31/3/2021 13:09	31/3/2021	13:09:42	IMG_0056.AVI	*Amaurornis phoenicurus*	1	-
9/4/2021	CT10	31/3/2021 21:24	31/3/2021	21:24:20	IMG_0057.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	1/4/2021 9:29	1/4/2021	9:29:30	IMG_0063.AVI	*Callosciurus notatus*	1	-
9/4/2021	CT10	2/4/2021 18:35	2/4/2021	18:35:28	IMG_0065.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	2/4/2021 21:04	2/4/2021	21:04:36	IMG_0066.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	3/4/2021 8:48	3/4/2021	8:48:30	IMG_0067.AVI	*Gallus gallus*	1	-
9/4/2021	CT10	3/4/2021 13:00	3/4/2021	13:00:02	IMG_0068.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	3/4/2021 13:00	3/4/2021	13:00:22	IMG_0069.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	4/4/2021 9:16	4/4/2021	9:16:00	IMG_0070.AVI	*Amaurornis phoenicurus*	1	-
9/4/2021	CT10	4/4/2021 9:16	4/4/2021	9:16:00	IMG_0070.AVI	*Garrulax leucolophus*	1	-
9/4/2021	CT10	4/4/2021 9:47	4/4/2021	9:47:06	IMG_0071.AVI	*Garrulax leucolophus*	1	-
9/4/2021	CT10	5/4/2021 7:40	4/4/2021	7:40:24	IMG_0072.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	5/4/2021 9:54	5/4/2021	9:54:18	IMG_0073.AVI	Unidentified sp.	1	-
9/4/2021	CT10	6/4/2021 18:52	6/4/2021	18:52:46	IMG_0074.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	6/4/2021 18:53	6/4/2021	18:53:54	IMG_0075.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	6/4/2021 18:54	6/4/2021	18:54:28	IMG_0076.AVI	*Amaurornis phoenicurus*	1	-
9/4/2021	CT10	6/4/2021 18:54	6/4/2021	18:54:28	IMG_0076.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	6/4/2021 18:59	6/4/2021	18:59:06	IMG_0077.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	6/4/2021 18:59	6/4/2021	18:59:54	IMG_0078.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	6/4/2021 19:33	6/4/2021	19:33:10	IMG_0079.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	8/4/2021 6:47	7/4/2021	6:47:14	IMG_0081.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	8/4/2021 6:47	7/4/2021	6:47:52	IMG_0082.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	8/4/2021 6:48	7/4/2021	6:48:24	IMG_0083.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	8/4/2021 6:49	7/4/2021	6:49:02	IMG_0084.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	8/4/2021 6:49	7/4/2021	6:49:24	IMG_0085.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	8/4/2021 6:49	7/4/2021	6:49:50	IMG_0086.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	8/4/2021 6:50	7/4/2021	6:50:12	IMG_0087.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	8/4/2021 6:50	7/4/2021	6:50:48	IMG_0088.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	8/4/2021 6:51	7/4/2021	6:51:10	IMG_0089.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	8/4/2021 6:51	7/4/2021	6:51:36	IMG_0090.AVI	*Sus scrofa*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
9/4/2021	CT10	8/4/2021 7:01	7/4/2021	7:01:42	IMG_0091.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	8/4/2021 7:02	7/4/2021	7:02:04	IMG_0092.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	8/4/2021 7:02	7/4/2021	7:02:26	IMG_0093.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	8/4/2021 7:02	7/4/2021	7:02:56	IMG_0094.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	8/4/2021 7:03	7/4/2021	7:03:18	IMG_0095.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	8/4/2021 7:03	7/4/2021	7:03:50	IMG_0096.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	8/4/2021 7:04	7/4/2021	7:04:16	IMG_0097.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	8/4/2021 7:04	7/4/2021	7:04:40	IMG_0098.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	8/4/2021 7:05	7/4/2021	7:05:06	IMG_0099.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	8/4/2021 7:05	7/4/2021	7:05:28	IMG_0100.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	8/4/2021 7:05	7/4/2021	7:05:48	IMG_0101.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	8/4/2021 7:06	7/4/2021	7:06:28	IMG_0102.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	8/4/2021 7:07	7/4/2021	7:07:02	IMG_0103.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	8/4/2021 7:07	7/4/2021	7:07:28	IMG_0104.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	8/4/2021 10:27	8/4/2021	10:27:14	IMG_0105.AVI	*Callosciurus notatus*	1	-
9/4/2021	CT10	8/4/2021 21:42	8/4/2021	21:42:40	IMG_0108.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	8/4/2021 21:45	8/4/2021	21:45:46	IMG_0109.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	8/4/2021 21:46	8/4/2021	21:46:08	IMG_0110.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	8/4/2021 21:46	8/4/2021	21:46:30	IMG_0111.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	8/4/2021 21:53	8/4/2021	21:53:12	IMG_0112.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	8/4/2021 21:53	8/4/2021	21:53:34	IMG_0113.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	8/4/2021 21:56	8/4/2021	21:56:02	IMG_0115.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	8/4/2021 21:56	8/4/2021	21:56:26	IMG_0116.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	8/4/2021 21:56	8/4/2021	21:56:46	IMG_0117.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	8/4/2021 21:57	8/4/2021	21:57:08	IMG_0118.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	9/4/2021 0:44	8/4/2021	0:44:20	IMG_0119.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	9/4/2021 0:44	8/4/2021	0:44:54	IMG_0120.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	9/4/2021 0:45	8/4/2021	0:45:18	IMG_0121.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	9/4/2021 0:45	8/4/2021	0:45:40	IMG_0122.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	9/4/2021 0:46	8/4/2021	0:46:10	IMG_0123.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	9/4/2021 0:46	8/4/2021	0:46:32	IMG_0124.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	9/4/2021 0:46	8/4/2021	0:46:54	IMG_0125.AVI	*Sus scrofa*	1	-
9/4/2021	CT10	9/4/2021 0:47	8/4/2021	0:47:18	IMG_0126.AVI	*Sus scrofa*	1	-
9/4/2021	CT11	25/3/2021 23:41	25/3/2021	23:41:14	IMG_0004.AVI	*Sus scrofa*	1	-
9/4/2021	CT11	26/3/2021 15:23	26/3/2021	15:23:24	IMG_0005.AVI	*Garrulax leucolophus*	2	-
9/4/2021	CT11	26/3/2021 20:46	26/3/2021	20:46:40	IMG_0006.AVI	*Sus scrofa*	1	-
9/4/2021	CT11	28/3/2021 9:24	28/3/2021	9:24:32	IMG_0007.AVI	*Sus scrofa*	1	-
9/4/2021	CT11	28/3/2021 9:24	28/3/2021	9:24:54	IMG_0008.AVI	*Sus scrofa*	1	-
9/4/2021	CT11	29/3/2021 0:26	28/3/2021	0:26:32	IMG_0010.AVI	*Sus scrofa*	1	-
9/4/2021	CT11	29/3/2021 0:27	28/3/2021	0:27:10	IMG_0011.AVI	*Sus scrofa*	1	-
9/4/2021	CT11	29/3/2021 0:28	28/3/2021	0:28:08	IMG_0012.AVI	*Sus scrofa*	1	-
9/4/2021	CT11	29/3/2021 11:13	29/3/2021	11:13:08	IMG_0013.AVI	*Sus scrofa*	1	-
9/4/2021	CT11	29/3/2021 18:33	29/3/2021	18:33:56	IMG_0014.AVI	*Sus scrofa*	4	-
9/4/2021	CT11	29/3/2021 18:34	29/3/2021	18:34:18	IMG_0015.AVI	*Sus scrofa*	2	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
9/4/2021	CT11	31/3/2021 7:08	30/3/2021	7:08:56	IMG_0016.AVI	*Sus scrofa*	1	-
9/4/2021	CT11	31/3/2021 7:58	30/3/2021	7:58:14	IMG_0017.AVI	*Sus scrofa*	1	-
9/4/2021	CT11	31/3/2021 14:35	31/3/2021	14:35:28	IMG_0018.AVI	*Sus scrofa*	5	-
9/4/2021	CT11	31/3/2021 14:35	31/3/2021	14:35:50	IMG_0019.AVI	*Sus scrofa*	5	-
9/4/2021	CT11	31/3/2021 17:35	31/3/2021	17:35:16	IMG_0020.AVI	*Sus scrofa*	1	-
9/4/2021	CT11	31/3/2021 17:35	31/3/2021	17:35:36	IMG_0021.AVI	*Sus scrofa*	3	-
9/4/2021	CT11	31/3/2021 18:04	31/3/2021	18:04:52	IMG_0022.AVI	*Sus scrofa*	1	-
9/4/2021	CT11	31/3/2021 21:54	31/3/2021	21:54:02	IMG_0023.AVI	*Sus scrofa*	2	-
9/4/2021	CT11	1/4/2021 6:59	31/3/2021	6:59:16	IMG_0027.AVI	*Paradoxurus musangus*	1	-
9/4/2021	CT11	1/4/2021 13:38	1/4/2021	13:38:38	IMG_0028.AVI	*Tupaia glis*	1	-
9/4/2021	CT11	1/4/2021 21:05	1/4/2021	21:05:28	IMG_0029.AVI	*Sus scrofa*	1	-
9/4/2021	CT11	2/4/2021 6:53	1/4/2021	6:53:56	IMG_0030.AVI	*Paradoxurus musangus*	1	-
9/4/2021	CT11	2/4/2021 6:54	1/4/2021	6:54:32	IMG_0031.AVI	*Paradoxurus musangus*	1	-
9/4/2021	CT11	2/4/2021 12:15	2/4/2021	12:15:40	IMG_0032.AVI	*Sus scrofa*	1	-
9/4/2021	CT11	2/4/2021 16:17	2/4/2021	16:17:56	IMG_0033.AVI	*Dicrurus paradiseus*	1	-
9/4/2021	CT11	2/4/2021 17:06	2/4/2021	17:06:38	IMG_0034.AVI	*Garrulax leucolophus*	2	-
9/4/2021	CT11	2/4/2021 17:41	2/4/2021	17:41:48	IMG_0035.AVI	*Gallus gallus*	1	-
9/4/2021	CT11	3/4/2021 18:34	3/4/2021	18:34:40	IMG_0036.AVI	*Sus scrofa*	1	-
9/4/2021	CT11	4/4/2021 18:31	4/4/2021	18:31:48	IMG_0037.AVI	*Amaurornis phoenicurus*	1	-
9/4/2021	CT11	5/4/2021 17:29	5/4/2021	17:29:42	IMG_0038.AVI	*Amaurornis phoenicurus*	1	-
9/4/2021	CT11	7/4/2021 7:13	6/4/2021	7:13:06	IMG_0040.AVI	*Paradoxurus musangus*	1	-
9/4/2021	CT13	1/3/2021 20:19	1/3/2021	20:19:56	IMG_0003.MP4	*Sus scrofa*	1	-
9/4/2021	CT13	2/3/2021 11:36	2/3/2021	11:36:12	IMG_0004.MP4	*Varanus salvator*	1	-
9/4/2021	CT13	4/3/2021 19:46	4/3/2021	19:46:06	IMG_0018.MP4	*Sus scrofa*	1	-
9/4/2021	CT13	6/3/2021 18:59	6/3/2021	18:59:32	IMG_0024.MP4	*Sus scrofa*	1	-
9/4/2021	CT13	11/3/2021 20:12	11/3/2021	20:12:30	IMG_0233.MP4	*Sus scrofa*	1	-
9/4/2021	CT13	13/3/2021 23:40	13/3/2021	23:40:26	IMG_0259.MP4	*Sus scrofa*	1	-
9/4/2021	CT13	14/3/2021 21:34	14/3/2021	21:34:52	IMG_0267.MP4	*Sus scrofa*	1	-
9/4/2021	CT13	15/3/2021 22:05	15/3/2021	22:05:58	IMG_0278.MP4	*Sus scrofa*	1	-
9/4/2021	CT13	16/3/2021 1:28	15/3/2021	1:28:40	IMG_0281.MP4	*Sus scrofa*	1	-
9/4/2021	CT13	16/3/2021 1:30	15/3/2021	1:30:22	IMG_0282.MP4	*Sus scrofa*	1	-
9/4/2021	CT13	16/3/2021 20:40	16/3/2021	20:40:02	IMG_0292.MP4	*Sus scrofa*	1	-
9/4/2021	CT13	16/3/2021 21:50	16/3/2021	21:50:34	IMG_0293.MP4	*Canis lupus familiaris*	2	-
9/4/2021	CT13	17/3/2021 8:23	17/3/2021	8:23:34	IMG_0296.MP4	*Acridotheres javanicus*	1	-
9/4/2021	CT13	17/3/2021 8:23	17/3/2021	8:23:34	IMG_0296.MP4	Unidentified squirrel or treeshrew	1	-
9/4/2021	CT13	17/3/2021 9:23	17/3/2021	9:23:08	IMG_0297.MP4	*Callosciurus notatus*	1	-
9/4/2021	CT13	18/3/2021 17:57	18/3/2021	17:57:18	IMG_0305.MP4	*Canis lupus familiaris*	1	-
9/4/2021	CT13	18/3/2021 20:07	18/3/2021	20:07:26	IMG_0306.MP4	*Sus scrofa*	1	-
9/4/2021	CT13	20/3/2021 0:19	19/3/2021	0:19:52	IMG_0317.MP4	*Sus scrofa*	1	-
9/4/2021	CT13	20/3/2021 6:31	19/3/2021	6:31:58	IMG_0318.MP4	*Sus scrofa*	1	-
9/4/2021	CT13	21/3/2021 13:01	21/3/2021	13:01:42	IMG_0332.MP4	*Acridotheres javanicus*	4	-
9/4/2021	CT13	21/3/2021 13:02	21/3/2021	13:02:06	IMG_0333.MP4	*Acridotheres javanicus*	4	-
9/4/2021	CT13	21/3/2021 13:02	21/3/2021	13:02:30	IMG_0334.MP4	*Acridotheres javanicus*	2	-
9/4/2021	CT13	21/3/2021 13:04	21/3/2021	13:04:18	IMG_0335.MP4	*Acridotheres javanicus*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
9/4/2021	CT13	21/3/2021 19:54	21/3/2021	19:54:56	IMG_0340.MP4	*Sus scrofa*	1	-
9/4/2021	CT13	21/3/2021 23:47	21/3/2021	23:47:48	IMG_0341.MP4	*Sus scrofa*	1	-
9/4/2021	CT13	22/3/2021 21:36	22/3/2021	21:36:08	IMG_0357.MP4	*Sus scrofa*	1	-
9/4/2021	CT13	23/3/2021 11:50	23/3/2021	11:50:36	IMG_0363.MP4	*Acridotheres javanicus*	2	-
9/4/2021	CT13	23/3/2021 21:54	23/3/2021	21:54:22	IMG_0373.MP4	*Canis lupus familiaris*	2	-
9/4/2021	CT13	24/3/2021 19:12	24/3/2021	19:12:42	IMG_0380.MP4	*Sus scrofa*	1	-
9/4/2021	CT18	24/5/2021 19:24	24/5/2021	19:24:14	IMG_0114.MP4	*Rattus tiomanicus*	1	-
9/4/2021	CT18	24/5/2021 19:24	24/5/2021	19:24:16	IMG_0121.MP4	*Rattus sp.*	1	-
9/4/2021	CT18	24/5/2021 19:24	24/5/2021	19:24:16	IMG_0120.MP4	*Rattus sp.*	1	-
9/4/2021	CT18	24/5/2021 19:24	24/5/2021	19:24:18	IMG_0128.MP4	*Rattus sp.*	1	-
9/4/2021	CT18	24/5/2021 19:24	24/5/2021	19:24:18	IMG_0129.MP4	*Rattus sp.*	1	-
9/4/2021	CT18	24/5/2021 19:24	24/5/2021	19:24:14	IMG_0115.MP4	*Rattus sp.*	1	-
9/4/2021	CT18	24/5/2021 19:24	24/5/2021	19:24:22	IMG_0143.MP4	*Sus scrofa*	1	-
9/4/2021	CT18	24/5/2021 19:24	24/5/2021	19:24:22	IMG_0144.MP4	*Sus scrofa*	1	-
9/4/2021	CT18	24/5/2021 19:24	24/5/2021	19:24:22	IMG_0145.MP4	*Sus scrofa*	1	-
9/4/2021	CT18	24/5/2021 19:24	24/5/2021	19:24:20	IMG_0134.MP4	*Sus scrofa*	1	-
9/4/2021	CT18	24/5/2021 19:24	24/5/2021	19:24:20	IMG_0136.MP4	*Sus scrofa*	1	-
9/4/2021	CT18	24/5/2021 19:24	24/5/2021	19:24:20	IMG_0137.MP4	*Sus scrofa*	1	-
9/4/2021	CT18	24/5/2021 19:24	24/5/2021	19:24:18	IMG_0127.MP4	*Sus scrofa*	1	-
9/4/2021	CT18	24/5/2021 19:24	24/5/2021	19:24:18	IMG_0132.MP4	*Sus scrofa*	1	-
9/4/2021	CT18	24/5/2021 19:24	24/5/2021	19:24:18	IMG_0126.MP4	*Sus scrofa*	1	-
9/4/2021	CT18	24/5/2021 19:24	24/5/2021	19:24:18	IMG_0130.MP4	*Sus scrofa*	1	-
9/4/2021	CT18	24/5/2021 19:24	24/5/2021	19:24:16	IMG_0124.MP4	*Sus scrofa*	1	-
9/4/2021	CT18	24/5/2021 19:24	24/5/2021	19:24:10	IMG_0093.MP4	*Sus scrofa*	1	-
9/4/2021	CT18	24/5/2021 19:24	24/5/2021	19:24:18	IMG_0125.MP4	*Sus scrofa*	1	-
9/4/2021	CT18	24/5/2021 19:24	24/5/2021	19:24:18	IMG_0131.MP4	*Sus scrofa*	1	-
9/4/2021	CT18	24/5/2021 19:24	24/5/2021	19:24:20	IMG_0139.MP4	*Sus scrofa*	1	-
9/4/2021	CT18	24/5/2021 19:24	24/5/2021	19:24:20	IMG_0138.MP4	*Sus scrofa*	1	-
16/4/2021	CT12	30/3/2021 18:24	30/3/2021	18:24:24	IMG_0002.AVI	*Sus scrofa*	1	-
16/4/2021	CT12	31/3/2021 7:24	30/3/2021	7:24:20	IMG_0004.AVI	*Garrulax leucolophus*	4	-
16/4/2021	CT12	31/3/2021 7:40	30/3/2021	7:40:08	IMG_0005.AVI	*Gallus gallus*	1	-
16/4/2021	CT12	1/4/2021 19:03	1/4/2021	19:03:16	IMG_0006.AVI	*Sus scrofa*	1	-
16/4/2021	CT12	1/4/2021 19:20	1/4/2021	19:20:52	IMG_0007.AVI	*Sus scrofa*	1	-
16/4/2021	CT12	2/4/2021 8:43	2/4/2021	8:43:06	IMG_0008.AVI	*Sus scrofa*	1	-
16/4/2021	CT12	2/4/2021 12:06	2/4/2021	12:06:58	IMG_0009.AVI	*Gallus gallus*	1	-
16/4/2021	CT12	2/4/2021 15:52	2/4/2021	15:52:16	IMG_0010.AVI	*Sus scrofa*	1	-
16/4/2021	CT12	2/4/2021 21:34	2/4/2021	21:34:56	IMG_0011.AVI	*Otus lempiji*	1	-
16/4/2021	CT12	5/4/2021 6:55	4/4/2021	6:55:10	IMG_0012.AVI	*Sus scrofa*	1	-
16/4/2021	CT12	5/4/2021 20:45	5/4/2021	20:45:22	IMG_0014.AVI	*Sus scrofa*	1	-
16/4/2021	CT12	7/4/2021 7:36	6/4/2021	7:36:12	IMG_0015.AVI	*Sus scrofa*	1	-
16/4/2021	CT12	7/4/2021 20:14	7/4/2021	20:14:32	IMG_0016.AVI	*Sus scrofa*	1	-
16/4/2021	CT12	7/4/2021 20:14	7/4/2021	20:14:58	IMG_0017.AVI	*Sus scrofa*	1	-
16/4/2021	CT12	7/4/2021 20:15	7/4/2021	20:15:22	IMG_0018.AVI	*Sus scrofa*	1	-
16/4/2021	CT12	7/4/2021 20:15	7/4/2021	20:15:44	IMG_0019.AVI	*Sus scrofa*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
16/4/2021	CT12	8/4/2021 3:07	7/4/2021	3:07:32	IMG_0020.AVI	*Sus scrofa*	1	-
16/4/2021	CT12	8/4/2021 3:07	7/4/2021	3:07:54	IMG_0021.AVI	*Sus scrofa*	1	-
16/4/2021	CT12	10/4/2021 19:42	10/4/2021	19:42:04	IMG_0022.AVI	*Sus scrofa*	1	-
16/4/2021	CT12	14/4/2021 18:49	14/4/2021	18:49:32	IMG_0024.AVI	*Sus scrofa*	1	-
16/4/2021	CT12	15/4/2021 7:19	14/4/2021	7:19:56	IMG_0025.AVI	*Sus scrofa*	1	-
16/4/2021	CT12	15/4/2021 9:30	15/4/2021	9:30:28	IMG_0026.AVI	*Garrulax leucolophus*	1	-
16/4/2021	CT12	15/4/2021 9:48	15/4/2021	9:48:32	IMG_0027.AVI	*Sus scrofa*	1	-
16/4/2021	CT14	18/3/2021 19:39	18/3/2021	19:39:02	IMG_0005.MP4	*Sus scrofa*	1	-
16/4/2021	CT14	18/3/2021 19:39	18/3/2021	19:39:24	IMG_0006.MP4	*Sus scrofa*	1	-
16/4/2021	CT14	19/3/2021 10:02	19/3/2021	10:02:06	IMG_0007.MP4	*Gallus gallus*	1	-
16/4/2021	CT14	21/3/2021 11:22	21/3/2021	11:22:52	IMG_0009.MP4	*Acridotheres javanicus*	1	-
16/4/2021	CT14	23/3/2021 11:29	23/3/2021	11:29:42	IMG_0010.MP4	*Acridotheres javanicus*	1	-
16/4/2021	CT14	26/3/2021 21:17	26/3/2021	21:17:48	IMG_0011.MP4	*Sus scrofa*	1	-
16/4/2021	CT14	27/3/2021 12:49	27/3/2021	12:49:48	IMG_0012.MP4	*Gallus gallus*	1	-
16/4/2021	CT14	28/3/2021 0:31	27/3/2021	0:31:34	IMG_0013.MP4	*Sus scrofa*	1	-
16/4/2021	CT14	28/3/2021 17:11	28/3/2021	17:11:56	IMG_0014.MP4	*Sus scrofa*	1	-
16/4/2021	CT14	2/4/2021 0:04	1/4/2021	0:04:02	IMG_0017.MP4	*Sus scrofa*	1	-
16/4/2021	CT14	4/4/2021 21:56	4/4/2021	21:56:10	IMG_0018.MP4	*Rattus sp.*	1	-
16/4/2021	CT14	5/4/2021 15:23	5/4/2021	15:23:48	IMG_0019.MP4	*Sus scrofa*	1	-
16/4/2021	CT15	12/3/2021 12:06	12/3/2021	12:06:26	IMG_0002.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	12/3/2021 18:12	12/3/2021	18:12:34	IMG_0003.MP4	*Sus scrofa*	1	-
16/4/2021	CT15	13/3/2021 8:37	13/3/2021	8:37:12	IMG_0004.MP4	*Sus scrofa*	1	-
16/4/2021	CT15	14/3/2021 8:34	14/3/2021	8:34:12	IMG_0006.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	14/3/2021 8:34	14/3/2021	8:34:34	IMG_0007.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	14/3/2021 13:23	14/3/2021	13:23:56	IMG_0008.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	15/3/2021 7:02	14/3/2021	7:02:44	IMG_0012.MP4	*Sus scrofa*	1	-
16/4/2021	CT15	15/3/2021 9:04	15/3/2021	9:04:00	IMG_0013.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	15/3/2021 10:27	15/3/2021	10:27:32	IMG_0014.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	15/3/2021 14:59	15/3/2021	14:59:12	IMG_0015.MP4	*Tupaia glis*	1	-
16/4/2021	CT15	16/3/2021 10:52	16/3/2021	10:52:28	IMG_0016.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	16/3/2021 11:23	16/3/2021	11:23:16	IMG_0017.MP4	*Sus scrofa*	1	-
16/4/2021	CT15	16/3/2021 11:26	16/3/2021	11:26:36	IMG_0018.MP4	*Sus scrofa*	1	-
16/4/2021	CT15	16/3/2021 16:38	16/3/2021	16:38:40	IMG_0020.MP4	*Sus scrofa*	1	-
16/4/2021	CT15	16/3/2021 23:59	16/3/2021	23:59:22	IMG_0021.MP4	*Rattus tiomanicus*	1	-
16/4/2021	CT15	17/3/2021 7:17	16/3/2021	7:17:54	IMG_0022.MP4	*Gallus gallus*	1	-
16/4/2021	CT15	17/3/2021 8:08	17/3/2021	8:08:38	IMG_0023.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	17/3/2021 10:14	17/3/2021	10:14:22	IMG_0024.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	17/3/2021 16:52	17/3/2021	16:52:14	IMG_0025.MP4	*Sus scrofa*	1	-
16/4/2021	CT15	17/3/2021 20:43	17/3/2021	20:43:04	IMG_0026.MP4	*Rattus tiomanicus*	1	-
16/4/2021	CT15	18/3/2021 0:07	17/3/2021	0:07:56	IMG_0027.MP4	*Rattus tiomanicus*	1	-
16/4/2021	CT15	18/3/2021 1:21	17/3/2021	1:21:06	IMG_0028.MP4	*Rattus tiomanicus*	1	-
16/4/2021	CT15	18/3/2021 1:42	17/3/2021	1:42:50	IMG_0029.MP4	*Sus scrofa*	1	-
16/4/2021	CT15	18/3/2021 1:43	17/3/2021	1:43:24	IMG_0030.MP4	*Sus scrofa*	1	-
16/4/2021	CT15	18/3/2021 3:10	17/3/2021	3:10:10	IMG_0031.MP4	*Rattus tiomanicus*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
16/4/2021	CT15	18/3/2021 3:20	17/3/2021	3:20:40	IMG_0032.MP4	*Rattus tiomanicus*	1	-
16/4/2021	CT15	18/3/2021 8:13	18/3/2021	8:13:28	IMG_0033.MP4	*Picus vittatus*	1	-
16/4/2021	CT15	18/3/2021 8:21	18/3/2021	8:21:56	IMG_0034.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	18/3/2021 10:24	18/3/2021	10:24:38	IMG_0035.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	18/3/2021 21:24	18/3/2021	21:24:52	IMG_0036.MP4	*Rattus tiomanicus*	1	-
16/4/2021	CT15	19/3/2021 7:48	18/3/2021	7:48:32	IMG_0037.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	19/3/2021 8:32	19/3/2021	8:32:40	IMG_0038.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	19/3/2021 9:03	19/3/2021	9:03:52	IMG_0039.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	19/3/2021 23:03	19/3/2021	23:03:08	IMG_0040.MP4	*Rattus tiomanicus*	1	-
16/4/2021	CT15	20/3/2021 8:39	20/3/2021	8:39:22	IMG_0041.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	20/3/2021 10:59	20/3/2021	10:59:14	IMG_0042.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	21/3/2021 5:50	20/3/2021	5:50:40	IMG_0043.MP4	*Rattus tiomanicus*	1	LTNJ background call
16/4/2021	CT15	21/3/2021 7:20	20/3/2021	7:20:42	IMG_0044.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	21/3/2021 10:29	21/3/2021	10:29:20	IMG_0045.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	21/3/2021 19:35	21/3/2021	19:35:48	IMG_0046.MP4	*Rattus tiomanicus*	1	-
16/4/2021	CT15	22/3/2021 7:15	21/3/2021	7:15:36	IMG_0047.MP4	*Gallus gallus*	1	-
16/4/2021	CT15	22/3/2021 7:15	21/3/2021	7:15:36	IMG_0047.MP4	*Sus scrofa*	1	-
16/4/2021	CT15	22/3/2021 7:39	21/3/2021	7:39:42	IMG_0048.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	22/3/2021 11:58	22/3/2021	11:58:40	IMG_0049.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	22/3/2021 22:02	22/3/2021	22:02:40	IMG_0051.MP4	*Rattus tiomanicus*	1	-
16/4/2021	CT15	23/3/2021 7:49	22/3/2021	7:49:36	IMG_0052.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	23/3/2021 10:33	23/3/2021	10:33:40	IMG_0053.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	23/3/2021 10:34	23/3/2021	10:34:12	IMG_0054.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	24/3/2021 3:57	23/3/2021	3:57:38	IMG_0055.MP4	*Rattus tiomanicus*	1	-
16/4/2021	CT15	24/3/2021 4:21	23/3/2021	4:21:20	IMG_0056.MP4	*Rattus tiomanicus*	1	-
16/4/2021	CT15	24/3/2021 7:08	23/3/2021	7:08:28	IMG_0057.MP4	*Sus scrofa*	1	-
16/4/2021	CT15	24/3/2021 7:42	23/3/2021	7:42:54	IMG_0058.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	24/3/2021 7:44	23/3/2021	7:44:24	IMG_0059.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	24/3/2021 8:42	24/3/2021	8:42:42	IMG_0060.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	25/3/2021 7:22	24/3/2021	7:22:20	IMG_0066.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	25/3/2021 7:38	24/3/2021	7:38:30	IMG_0067.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	25/3/2021 9:42	25/3/2021	9:42:38	IMG_0068.MP4	*Gallus gallus*	1	-
16/4/2021	CT15	25/3/2021 17:31	25/3/2021	17:31:32	IMG_0069.MP4	*Sus scrofa*	1	-
16/4/2021	CT15	25/3/2021 18:56	25/3/2021	18:56:26	IMG_0070.MP4	*Gallus gallus*	1	-
16/4/2021	CT15	25/3/2021 19:27	25/3/2021	19:27:50	IMG_0071.MP4	*Sus scrofa*	1	-
16/4/2021	CT15	26/3/2021 9:47	26/3/2021	9:47:16	IMG_0072.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	27/3/2021 7:25	26/3/2021	7:25:02	IMG_0073.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	27/3/2021 10:32	27/3/2021	10:32:46	IMG_0074.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	28/3/2021 7:21	27/3/2021	7:21:32	IMG_0075.MP4	*Sus scrofa*	1	-
16/4/2021	CT15	28/3/2021 7:49	27/3/2021	7:49:32	IMG_0076.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	28/3/2021 8:16	28/3/2021	8:16:06	IMG_0077.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	28/3/2021 8:40	28/3/2021	8:40:46	IMG_0078.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	28/3/2021 13:28	28/3/2021	13:28:14	IMG_0080.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	28/3/2021 15:54	28/3/2021	15:54:20	IMG_0081.MP4	*Chalcophaps indica*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
16/4/2021	CT15	29/3/2021 3:49	28/3/2021	3:49:56	IMG_0082.MP4	*Rattus tiomanicus*	1	-
16/4/2021	CT15	29/3/2021 7:11	28/3/2021	7:11:30	IMG_0083.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	29/3/2021 7:31	28/3/2021	7:31:46	IMG_0084.MP4	*Gallus gallus*	1	-
16/4/2021	CT15	29/3/2021 10:18	29/3/2021	10:18:38	IMG_0087.MP4	*Sus scrofa*	1	-
16/4/2021	CT15	29/3/2021 11:59	29/3/2021	11:59:24	IMG_0088.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	29/3/2021 19:26	29/3/2021	19:26:18	IMG_0089.MP4	*Sus scrofa*	1	-
16/4/2021	CT15	29/3/2021 19:58	29/3/2021	19:58:56	IMG_0090.MP4	*Rattus tiomanicus*	1	-
16/4/2021	CT15	30/3/2021 7:30	29/3/2021	7:30:06	IMG_0091.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	30/3/2021 7:38	29/3/2021	7:38:26	IMG_0092.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	30/3/2021 8:38	30/3/2021	8:38:50	IMG_0093.MP4	*Gallus gallus*	1	-
16/4/2021	CT15	30/3/2021 11:41	30/3/2021	11:41:14	IMG_0094.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	30/3/2021 14:48	30/3/2021	14:48:06	IMG_0096.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	30/3/2021 18:33	30/3/2021	18:33:28	IMG_0097.MP4	*Sus scrofa*	1	-
16/4/2021	CT15	30/3/2021 18:34	30/3/2021	18:34:26	IMG_0098.MP4	*Sus scrofa*	1	-
16/4/2021	CT15	31/3/2021 18:22	31/3/2021	18:22:18	IMG_0100.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	31/3/2021 20:49	31/3/2021	20:49:16	IMG_0101.MP4	*Sus scrofa*	1	-
16/4/2021	CT15	1/4/2021 9:25	1/4/2021	9:25:40	IMG_0102.MP4	*Sus scrofa*	1	-
16/4/2021	CT15	1/4/2021 9:53	1/4/2021	9:53:12	IMG_0103.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	1/4/2021 10:39	1/4/2021	10:39:02	IMG_0105.MP4	*Sus scrofa*	1	-
16/4/2021	CT15	1/4/2021 11:52	1/4/2021	11:52:12	IMG_0106.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	1/4/2021 22:02	1/4/2021	22:02:58	IMG_0107.MP4	*Sus scrofa*	1	-
16/4/2021	CT15	2/4/2021 5:44	1/4/2021	5:44:10	IMG_0108.MP4	*Rattus tiomanicus*	1	-
16/4/2021	CT15	2/4/2021 8:30	2/4/2021	8:30:14	IMG_0109.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	2/4/2021 10:05	2/4/2021	10:05:02	IMG_0110.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	2/4/2021 13:56	2/4/2021	13:56:08	IMG_0111.MP4	*Sus scrofa*	1	-
16/4/2021	CT15	2/4/2021 13:56	2/4/2021	13:56:38	IMG_0112.MP4	*Sus scrofa*	1	-
16/4/2021	CT15	2/4/2021 16:39	2/4/2021	16:39:46	IMG_0114.MP4	*Callosciurus notatus*	1	-
16/4/2021	CT15	2/4/2021 17:57	2/4/2021	17:57:20	IMG_0115.MP4	*Picus vittatus*	1	-
16/4/2021	CT15	2/4/2021 18:47	2/4/2021	18:47:10	IMG_0116.MP4	*Sus scrofa*	1	-
16/4/2021	CT15	2/4/2021 20:07	2/4/2021	20:07:14	IMG_0117.MP4	*Sus scrofa*	1	-
16/4/2021	CT15	2/4/2021 20:30	2/4/2021	20:30:44	IMG_0118.MP4	*Sus scrofa*	1	-
16/4/2021	CT15	3/4/2021 0:52	2/4/2021	0:52:16	IMG_0119.MP4	*Rattus tiomanicus*	1	-
16/4/2021	CT15	3/4/2021 4:48	2/4/2021	4:48:18	IMG_0120.MP4	*Sus scrofa*	1	-
16/4/2021	CT15	3/4/2021 4:48	2/4/2021	4:48:42	IMG_0121.MP4	*Sus scrofa*	1	-
16/4/2021	CT15	3/4/2021 7:38	2/4/2021	7:38:02	IMG_0122.MP4	*Sus scrofa*	1	-
16/4/2021	CT15	3/4/2021 9:25	3/4/2021	9:25:42	IMG_0123.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	3/4/2021 10:29	3/4/2021	10:29:58	IMG_0124.MP4	*Sus scrofa*	2	-
16/4/2021	CT15	3/4/2021 12:59	3/4/2021	12:59:26	IMG_0125.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	3/4/2021 19:36	3/4/2021	19:36:18	IMG_0126.MP4	*Sus scrofa*	1	-
16/4/2021	CT15	4/4/2021 8:19	4/4/2021	8:19:40	IMG_0127.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	4/4/2021 10:17	4/4/2021	10:17:52	IMG_0128.MP4	*Gallus gallus*	1	-
16/4/2021	CT15	4/4/2021 17:30	4/4/2021	17:30:08	IMG_0129.MP4	*Sus scrofa*	1	-
16/4/2021	CT15	4/4/2021 20:37	4/4/2021	20:37:36	IMG_0130.MP4	*Rattus tiomanicus*	1	-
16/4/2021	CT15	5/4/2021 3:22	4/4/2021	3:22:00	IMG_0131.MP4	*Rattus tiomanicus*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
16/4/2021	CT15	5/4/2021 5:34	4/4/2021	5:34:02	IMG_0132.MP4	*Sus scrofa*	1	-
16/4/2021	CT15	5/4/2021 8:59	5/4/2021	8:59:30	IMG_0134.MP4	*Gallus gallus*	1	-
16/4/2021	CT15	5/4/2021 13:06	5/4/2021	13:06:16	IMG_0135.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	5/4/2021 14:58	5/4/2021	14:58:58	IMG_0136.MP4	*Sus scrofa*	1	-
16/4/2021	CT15	5/4/2021 20:32	5/4/2021	20:32:46	IMG_0137.MP4	*Sus scrofa*	1	-
16/4/2021	CT15	5/4/2021 22:24	5/4/2021	22:24:32	IMG_0138.MP4	*Rattus tiomanicus*	1	-
16/4/2021	CT15	6/4/2021 6:58	5/4/2021	6:58:50	IMG_0139.MP4	*Tupaia glis*	1	-
16/4/2021	CT15	6/4/2021 7:33	5/4/2021	7:33:02	IMG_0140.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	6/4/2021 8:29	6/4/2021	8:29:48	IMG_0141.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	6/4/2021 12:53	6/4/2021	12:53:00	IMG_0142.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	6/4/2021 15:01	6/4/2021	15:01:48	IMG_0144.MP4	*Sus scrofa*	1	-
16/4/2021	CT15	6/4/2021 17:07	6/4/2021	17:07:36	IMG_0145.MP4	*Gallus gallus*	1	-
16/4/2021	CT15	6/4/2021 18:11	6/4/2021	18:11:36	IMG_0146.MP4	*Sus scrofa*	1	-
16/4/2021	CT15	6/4/2021 18:19	6/4/2021	18:19:32	IMG_0147.MP4	*Sus scrofa*	1	-
16/4/2021	CT15	6/4/2021 19:58	6/4/2021	19:58:36	IMG_0148.MP4	*Rattus tiomanicus*	1	-
16/4/2021	CT15	6/4/2021 22:04	6/4/2021	22:04:10	IMG_0149.MP4	*Rattus tiomanicus*	1	-
16/4/2021	CT15	7/4/2021 2:21	6/4/2021	2:21:48	IMG_0150.MP4	*Rattus tiomanicus*	1	-
16/4/2021	CT15	7/4/2021 2:22	6/4/2021	2:22:14	IMG_0151.MP4	*Rattus tiomanicus*	1	-
16/4/2021	CT15	7/4/2021 9:23	7/4/2021	9:23:58	IMG_0152.MP4	*Gallus gallus*	1	-
16/4/2021	CT15	7/4/2021 9:45	7/4/2021	9:45:52	IMG_0153.MP4	*Sus scrofa*	1	-
16/4/2021	CT15	7/4/2021 11:25	7/4/2021	11:25:32	IMG_0154.MP4	*Gallus gallus*	1	-
16/4/2021	CT15	7/4/2021 13:42	7/4/2021	13:42:50	IMG_0155.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	7/4/2021 21:19	7/4/2021	21:19:36	IMG_0156.MP4	*Rattus tiomanicus*	1	-
16/4/2021	CT15	8/4/2021 7:49	7/4/2021	7:49:54	IMG_0157.MP4	*Gallus gallus*	1	-
16/4/2021	CT15	8/4/2021 8:04	8/4/2021	8:04:04	IMG_0158.MP4	*Sus scrofa*	1	-
16/4/2021	CT15	8/4/2021 9:32	8/4/2021	9:32:00	IMG_0159.MP4	*Gallus gallus*	1	-
16/4/2021	CT15	8/4/2021 13:00	8/4/2021	13:00:26	IMG_0161.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	8/4/2021 16:00	8/4/2021	16:00:02	IMG_0162.MP4	*Gallus gallus*	1	-
16/4/2021	CT15	8/4/2021 16:03	8/4/2021	16:03:40	IMG_0163.MP4	*Gallus gallus*	1	-
16/4/2021	CT15	8/4/2021 21:43	8/4/2021	21:43:28	IMG_0164.MP4	*Rattus tiomanicus*	1	-
16/4/2021	CT15	8/4/2021 22:32	8/4/2021	22:32:28	IMG_0165.MP4	*Rattus tiomanicus*	1	-
16/4/2021	CT15	9/4/2021 5:38	8/4/2021	5:38:50	IMG_0166.MP4	*Rattus tiomanicus*	1	-
16/4/2021	CT15	9/4/2021 12:09	9/4/2021	12:09:48	IMG_0167.MP4	*Gallus gallus*	1	-
16/4/2021	CT15	9/4/2021 19:44	9/4/2021	19:44:34	IMG_0168.MP4	*Sus scrofa*	1	-
16/4/2021	CT15	10/4/2021 7:19	9/4/2021	7:19:28	IMG_0169.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	10/4/2021 7:30	9/4/2021	7:30:54	IMG_0170.MP4	*Gallus gallus*	2	-
16/4/2021	CT15	10/4/2021 14:38	10/4/2021	14:38:48	IMG_0172.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	10/4/2021 14:59	10/4/2021	14:59:52	IMG_0173.MP4	*Garrulax leucolophus*	2	-
16/4/2021	CT15	10/4/2021 19:00	10/4/2021	19:00:16	IMG_0174.MP4	*Sus scrofa*	1	-
16/4/2021	CT15	10/4/2021 19:55	10/4/2021	19:55:08	IMG_0175.MP4	*Paradoxurus musangus*	1	-
16/4/2021	CT15	11/4/2021 0:31	10/4/2021	0:31:40	IMG_0176.MP4	*Rattus tiomanicus*	1	-
16/4/2021	CT15	11/4/2021 7:06	10/4/2021	7:06:20	IMG_0177.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	11/4/2021 8:06	11/4/2021	8:06:58	IMG_0178.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	11/4/2021 11:24	11/4/2021	11:24:22	IMG_0179.MP4	*Chalcophaps indica*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
16/4/2021	CT15	11/4/2021 14:39	11/4/2021	14:39:34	IMG_0180.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	11/4/2021 19:17	11/4/2021	19:17:00	IMG_0181.MP4	*Sus scrofa*	1	-
16/4/2021	CT15	11/4/2021 19:46	11/4/2021	19:46:46	IMG_0182.MP4	*Paradoxurus musangus*	1	-
16/4/2021	CT15	11/4/2021 22:28	11/4/2021	22:28:50	IMG_0183.MP4	*Sus scrofa*	1	-
16/4/2021	CT15	11/4/2021 22:30	11/4/2021	22:30:42	IMG_0184.MP4	*Sus scrofa*	1	-
16/4/2021	CT15	12/4/2021 4:03	11/4/2021	4:03:38	IMG_0186.MP4	*Rattus tiomanicus*	1	-
16/4/2021	CT15	12/4/2021 6:48	11/4/2021	6:48:04	IMG_0187.MP4	Unidentified Strigidae	1	-
16/4/2021	CT15	12/4/2021 8:21	12/4/2021	8:21:20	IMG_0188.MP4	*Gallus gallus*	1	-
16/4/2021	CT15	13/4/2021 2:06	12/4/2021	2:06:40	IMG_0189.MP4	*Sus scrofa*	1	-
16/4/2021	CT15	13/4/2021 6:00	12/4/2021	6:00:34	IMG_0190.MP4	*Rattus tiomanicus*	1	-
16/4/2021	CT15	13/4/2021 7:06	12/4/2021	7:06:58	IMG_0191.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	13/4/2021 12:24	13/4/2021	12:24:10	IMG_0192.MP4	*Picus vittatus*	1	-
16/4/2021	CT15	13/4/2021 13:05	13/4/2021	13:05:08	IMG_0193.MP4	*Gallus gallus*	1	-
16/4/2021	CT15	13/4/2021 20:07	13/4/2021	20:07:16	IMG_0194.MP4	*Rattus tiomanicus*	1	-
16/4/2021	CT15	15/4/2021 7:07	14/4/2021	7:07:02	IMG_0195.MP4	*Sus scrofa*	1	-
16/4/2021	CT15	15/4/2021 7:51	14/4/2021	7:51:32	IMG_0196.MP4	*Sus scrofa*	1	-
16/4/2021	CT15	15/4/2021 12:46	15/4/2021	12:46:06	IMG_0197.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	15/4/2021 17:04	15/4/2021	17:04:20	IMG_0198.MP4	*Chalcophaps indica*	1	-
16/4/2021	CT15	15/4/2021 20:15	15/4/2021	20:15:44	IMG_0199.MP4	*Rattus tiomanicus*	1	Biting something
16/4/2021	CT15	15/4/2021 21:58	15/4/2021	21:58:26	IMG_0200.MP4	*Sus scrofa*	1	-
16/4/2021	CT15	16/4/2021 6:24	15/4/2021	6:24:22	IMG_0201.MP4	*Sus scrofa*	1	-
16/4/2021	CT17	17/3/2021 22:34	17/3/2021	22:34:42	IMG_0011.MP4	*Rattus tiomanicus*	1	-
16/4/2021	CT17	20/3/2021 21:37	20/3/2021	21:37:58	IMG_0012.MP4	*Rattus tiomanicus*	1	-
16/4/2021	CT17	20/3/2021 21:39	20/3/2021	21:39:44	IMG_0013.MP4	*Rattus sp.*	1	-
16/4/2021	CT17	21/3/2021 8:39	21/3/2021	8:39:56	IMG_0014.MP4	*Garrulax leucolophus*	1	-
16/4/2021	CT17	21/3/2021 8:40	21/3/2021	8:40:26	IMG_0015.MP4	*Garrulax leucolophus*	1	-
27/4/2021	CT01	12/4/2021 4:21	11/4/2021	4:21:52	IMG_0004.MP4	*Sus scrofa*	1	-
27/4/2021	CT01	12/4/2021 5:17	11/4/2021	5:17:16	IMG_0005.MP4	*Sus scrofa*	1	-
27/4/2021	CT01	12/4/2021 8:58	12/4/2021	8:58:44	IMG_0006.MP4	*Garrulax Leucolophus*	1	-
27/4/2021	CT01	13/4/2021 7:52	12/4/2021	7:52:28	IMG_0008.MP4	*Gallus gallus*	1	-
27/4/2021	CT01	13/4/2021 18:52	13/4/2021	18:52:26	IMG_0009.MP4	*Sus scrofa*	1	-
27/4/2021	CT01	13/4/2021 20:32	13/4/2021	20:32:24	IMG_0010.MP4	*Sus scrofa*	1	-
27/4/2021	CT01	14/4/2021 7:04	13/4/2021	7:04:30	IMG_0011.MP4	*Tupaia glis*	1	-
27/4/2021	CT01	14/4/2021 7:32	13/4/2021	7:32:10	IMG_0012.MP4	*Tupaia glis*	1	-
27/4/2021	CT01	14/4/2021 11:54	14/4/2021	11:54:04	IMG_0014.MP4	*Tupaia glis*	1	-
27/4/2021	CT01	14/4/2021 19:12	14/4/2021	19:12:40	IMG_0015.MP4	Unidentified squirrel or treeshrew	1	-
27/4/2021	CT01	15/4/2021 3:45	14/4/2021	3:45:10	IMG_0016.MP4	*Paradoxurus musangus*	1	-
27/4/2021	CT01	15/4/2021 7:16	14/4/2021	7:16:08	IMG_0017.MP4	*Tupaia glis*	1	-
27/4/2021	CT01	15/4/2021 16:58	15/4/2021	16:58:50	IMG_0020.MP4	*Sus scrofa*	1	-
27/4/2021	CT01	16/4/2021 6:17	15/4/2021	6:17:34	IMG_0021.MP4	*Sus scrofa*	1	-
27/4/2021	CT01	16/4/2021 9:35	16/4/2021	9:35:28	IMG_0022.MP4	*Tupaia glis*	1	-
27/4/2021	CT01	16/4/2021 9:43	16/4/2021	9:43:30	IMG_0023.MP4	*Tupaia glis*	1	-
27/4/2021	CT01	16/4/2021 20:10	16/4/2021	20:10:26	IMG_0024.MP4	*Sus scrofa*	1	-
27/4/2021	CT01	18/4/2021 13:42	18/4/2021	13:42:12	IMG_0025.MP4	*Garrulax Leucolophus*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
27/4/2021	CT01	18/4/2021 21:11	18/4/2021	21:11:22	IMG_0026.MP4	*Sus scrofa*	1	-
27/4/2021	CT01	19/4/2021 7:19	18/4/2021	7:19:08	IMG_0027.MP4	*Sus scrofa*	1	-
27/4/2021	CT01	19/4/2021 9:03	19/4/2021	9:03:24	IMG_0028.MP4	*Tupaia glis*	1	-
27/4/2021	CT01	19/4/2021 18:57	19/4/2021	18:57:08	IMG_0029.MP4	*Tupaia glis*	1	-
27/4/2021	CT01	19/4/2021 22:32	19/4/2021	22:32:06	IMG_0030.MP4	*Rattus tiomanicus*	1	-
27/4/2021	CT01	20/4/2021 6:54	19/4/2021	6:54:38	IMG_0031.MP4	*Tupaia glis*	1	-
27/4/2021	CT01	20/4/2021 7:02	19/4/2021	7:02:30	IMG_0032.MP4	*Tupaia glis*	2	-
27/4/2021	CT01	20/4/2021 8:18	20/4/2021	8:18:22	IMG_0033.MP4	*Tupaia glis*	1	-
27/4/2021	CT01	20/4/2021 18:44	20/4/2021	18:44:48	IMG_0034.MP4	*Tupaia glis*	1	-
27/4/2021	CT01	21/4/2021 4:47	20/4/2021	4:47:32	IMG_0035.MP4	*Paradoxurus musangus*	1	-
27/4/2021	CT01	21/4/2021 5:37	20/4/2021	5:37:02	IMG_0036.MP4	*Rattus tiomanicus*	1	-
27/4/2021	CT01	21/4/2021 9:11	21/4/2021	9:11:52	IMG_0037.MP4	Unidentified squirrel or treeshrew	1	-
27/4/2021	CT01	22/4/2021 20:13	22/4/2021	20:13:10	IMG_0039.MP4	*Rattus tiomanicus*	1	-
27/4/2021	CT01	23/4/2021 3:05	22/4/2021	3:05:06	IMG_0040.MP4	*Manis javanica*	1	-
27/4/2021	CT01	25/4/2021 1:27	24/4/2021	1:27:22	IMG_0041.MP4	*Rattus tiomanicus*	1	-
27/4/2021	CT01	26/4/2021 3:34	25/4/2021	3:34:16	IMG_0046.MP4	*Rattus tiomanicus*	1	-
27/4/2021	CT02	9/4/2021 14:39	9/4/2021	14:39:46	IMG_0001.MP4	*Sus scrofa*	2	-
27/4/2021	CT02	9/4/2021 21:13	9/4/2021	21:13:58	IMG_0002.MP4	*Rattus sp.*	1	-
27/4/2021	CT02	10/4/2021 0:38	9/4/2021	0:38:52	IMG_0003.MP4	*Rattus tiomanicus*	1	-
27/4/2021	CT02	11/4/2021 4:19	10/4/2021	4:19:58	IMG_0006.MP4	*Sus scrofa*	1	-
27/4/2021	CT02	11/4/2021 4:20	10/4/2021	4:20:36	IMG_0007.MP4	*Sus scrofa*	1	-
27/4/2021	CT02	11/4/2021 4:22	10/4/2021	4:22:28	IMG_0009.MP4	*Sus scrofa*	1	-
27/4/2021	CT02	11/4/2021 4:22	10/4/2021	4:22:52	IMG_0010.MP4	*Sus scrofa*	1	-
27/4/2021	CT02	11/4/2021 4:25	10/4/2021	4:25:20	IMG_0011.MP4	*Sus scrofa*	1	-
27/4/2021	CT02	11/4/2021 4:26	10/4/2021	4:26:06	IMG_0012.MP4	*Sus scrofa*	1	-
27/4/2021	CT02	11/4/2021 22:00	11/4/2021	22:00:02	IMG_0014.MP4	*Rattus sp.*	1	-
27/4/2021	CT02	12/4/2021 7:25	11/4/2021	7:25:54	IMG_0016.MP4	*Sus scrofa*	1	-
27/4/2021	CT02	13/4/2021 7:10	12/4/2021	7:10:32	IMG_0017.MP4	*Sus scrofa*	1	-
27/4/2021	CT02	14/4/2021 15:46	14/4/2021	15:46:56	IMG_0019.MP4	*Sus scrofa*	1	-
27/4/2021	CT02	15/4/2021 2:00	14/4/2021	2:00:46	IMG_0020.MP4	*Sus scrofa*	1	-
27/4/2021	CT02	15/4/2021 5:34	14/4/2021	5:34:46	IMG_0021.MP4	*Sus scrofa*	1	-
27/4/2021	CT02	15/4/2021 7:33	14/4/2021	7:33:34	IMG_0022.MP4	*Sus scrofa*	2	-
27/4/2021	CT02	15/4/2021 7:34	14/4/2021	7:34:40	IMG_0023.MP4	*Sus scrofa*	1	-
27/4/2021	CT02	15/4/2021 16:46	15/4/2021	16:46:28	IMG_0028.MP4	*Sus scrofa*	3	-
27/4/2021	CT02	17/4/2021 1:06	16/4/2021	1:06:02	IMG_0029.MP4	*Sus scrofa*	1	-
27/4/2021	CT02	17/4/2021 21:23	17/4/2021	21:23:32	IMG_0030.MP4	*Paradoxurus musangus*	1	-
27/4/2021	CT02	18/4/2021 1:57	17/4/2021	1:57:56	IMG_0031.MP4	*Rattus sp.*	1	-
27/4/2021	CT02	18/4/2021 2:51	17/4/2021	2:51:44	IMG_0032.MP4	*Rattus sp.*	1	-
27/4/2021	CT02	18/4/2021 5:57	17/4/2021	5:57:50	IMG_0033.MP4	*Sus scrofa*	1	-
27/4/2021	CT02	18/4/2021 5:58	17/4/2021	5:58:14	IMG_0034.MP4	*Sus scrofa*	1	-
27/4/2021	CT02	18/4/2021 6:00	17/4/2021	6:00:02	IMG_0035.MP4	*Sus scrofa*	1	-
27/4/2021	CT02	19/4/2021 18:42	19/4/2021	18:42:52	IMG_0038.MP4	*Sus scrofa*	1	-
27/4/2021	CT02	20/4/2021 6:41	19/4/2021	6:41:46	IMG_0039.MP4	*Sus scrofa*	1	-
27/4/2021	CT02	21/4/2021 6:55	20/4/2021	6:55:22	IMG_0040.MP4	*Rattus sp.*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
27/4/2021	CT02	21/4/2021 7:02	20/4/2021	7:02:48	IMG_0041.MP4	*Gallus gallus*	1	-
27/4/2021	CT02	21/4/2021 7:02	20/4/2021	7:02:48	IMG_0041.MP4	*Sus scrofa*	1	-
27/4/2021	CT02	21/4/2021 9:18	21/4/2021	9:18:50	IMG_0042.MP4	*Garrulax leucolophus*	1	-
27/4/2021	CT02	21/4/2021 9:19	21/4/2021	9:19:28	IMG_0043.MP4	*Garrulax leucolophus*	2	-
27/4/2021	CT02	21/4/2021 17:03	21/4/2021	17:03:10	IMG_0044.MP4	*Tupaia glis*	1	-
27/4/2021	CT02	23/4/2021 8:15	23/4/2021	8:15:04	IMG_0045.MP4	*Sus scrofa*	1	-
27/4/2021	CT02	23/4/2021 18:40	23/4/2021	18:40:38	IMG_0046.MP4	*Sus scrofa*	2	-
27/4/2021	CT02	23/4/2021 19:09	23/4/2021	19:09:44	IMG_0047.MP4	*Sus scrofa*	3	-
27/4/2021	CT02	24/4/2021 18:33	24/4/2021	18:33:58	IMG_0048.MP4	*Sus scrofa*	1	-
27/4/2021	CT02	24/4/2021 19:10	24/4/2021	19:10:40	IMG_0049.MP4	Unidentified squirrel or treeshrew	1	-
27/4/2021	CT02	24/4/2021 22:40	24/4/2021	22:40:28	IMG_0050.MP4	*Rattus tiomanicus*	1	-
27/4/2021	CT02	25/4/2021 2:44	24/4/2021	2:44:26	IMG_0051.MP4	*Paradoxurus musangus*	1	-
27/4/2021	CT02	25/4/2021 20:03	25/4/2021	20:03:00	IMG_0052.MP4	*Sus scrofa*	1	-
27/4/2021	CT02	26/4/2021 14:44	26/4/2021	14:44:30	IMG_0053.MP4	*Sus scrofa*	1	-
27/4/2021	CT02	26/4/2021 21:41	26/4/2021	21:41:04	IMG_0054.MP4	*Rattus sp.*	1	-
27/4/2021	CT02	27/4/2021 6:33	26/4/2021	6:33:36	IMG_0055.MP4	*Sus scrofa*	1	-
27/4/2021	CT03	10/4/2021 16:35	10/4/2021	16:35:30	IMG_0004.MP4	*Sus scrofa*	1	-
27/4/2021	CT03	11/4/2021 16:37	11/4/2021	16:37:36	IMG_0005.MP4	*Sus scrofa*	1	-
27/4/2021	CT03	11/4/2021 16:38	11/4/2021	16:38:12	IMG_0006.MP4	*Sus scrofa*	3	-
27/4/2021	CT03	11/4/2021 16:39	11/4/2021	16:39:12	IMG_0007.MP4	*Sus scrofa*	3	-
27/4/2021	CT03	11/4/2021 17:01	11/4/2021	17:01:52	IMG_0008.MP4	*Sus scrofa*	1	-
27/4/2021	CT03	11/4/2021 17:05	11/4/2021	17:05:04	IMG_0009.MP4	*Sus scrofa*	2	-
27/4/2021	CT03	11/4/2021 17:08	11/4/2021	17:08:38	IMG_0010.MP4	*Sus scrofa*	2	-
27/4/2021	CT03	13/4/2021 19:33	13/4/2021	19:33:36	IMG_0011.MP4	*Paradoxurus musangus*	1	-
27/4/2021	CT03	14/4/2021 20:21	14/4/2021	20:21:44	IMG_0012.MP4	*Sus scrofa*	1	-
27/4/2021	CT03	15/4/2021 7:30	14/4/2021	7:30:34	IMG_0013.MP4	*Tupaia glis*	1	-
27/4/2021	CT03	15/4/2021 9:33	15/4/2021	9:33:08	IMG_0014.MP4	*Sus scrofa*	2	-
27/4/2021	CT03	15/4/2021 9:34	15/4/2021	9:34:20	IMG_0015.MP4	*Sus scrofa*	1	-
27/4/2021	CT03	15/4/2021 9:36	15/4/2021	9:36:00	IMG_0017.MP4	*Sus scrofa*	1	-
27/4/2021	CT03	15/4/2021 9:38	15/4/2021	9:38:26	IMG_0018.MP4	*Sus scrofa*	2	-
27/4/2021	CT03	16/4/2021 7:50	15/4/2021	7:50:00	IMG_0019.MP4	*Tupaia glis*	1	-
27/4/2021	CT03	17/4/2021 17:03	17/4/2021	17:03:52	IMG_0020.MP4	*Tupaia glis*	1	-
27/4/2021	CT03	18/4/2021 13:42	18/4/2021	13:42:14	IMG_0021.MP4	*Tupaia glis*	1	-
27/4/2021	CT03	19/4/2021 14:33	19/4/2021	14:33:00	IMG_0022.MP4	*Sus scrofa*	1	-
27/4/2021	CT03	19/4/2021 14:35	19/4/2021	14:35:06	IMG_0023.MP4	*Sus scrofa*	1	-
27/4/2021	CT03	19/4/2021 20:15	19/4/2021	20:15:12	IMG_0024.MP4	*Rattus sp.*	1	-
27/4/2021	CT03	20/4/2021 7:51	19/4/2021	7:51:06	IMG_0025.MP4	*Gallus gallus*	3	-
27/4/2021	CT03	22/4/2021 2:51	21/4/2021	2:51:32	IMG_0028.MP4	*Rattus sp.*	1	-
27/4/2021	CT03	23/4/2021 17:55	23/4/2021	17:55:04	IMG_0029.MP4	*Sus scrofa*	4	-
27/4/2021	CT03	23/4/2021 17:55	23/4/2021	17:55:32	IMG_0030.MP4	*Sus scrofa*	1	-
27/4/2021	CT03	23/4/2021 17:56	23/4/2021	17:56:26	IMG_0031.MP4	*Sus scrofa*	2	-
27/4/2021	CT03	25/4/2021 7:18	24/4/2021	7:18:04	IMG_0032.MP4	*Tupaia glis*	1	-
27/4/2021	CT03	25/4/2021 7:25	24/4/2021	7:25:08	IMG_0033.MP4	*Tupaia glis*	1	-
27/4/2021	CT03	25/4/2021 7:26	24/4/2021	7:26:12	IMG_0034.MP4	*Tupaia glis*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
27/4/2021	CT03	26/4/2021 14:30	26/4/2021	14:30:34	IMG_0036.MP4	*Tupaia glis*	1	-
27/4/2021	CT03	26/4/2021 16:02	26/4/2021	16:02:36	IMG_0037.MP4	*Tupaia glis*	1	-
27/4/2021	CT03	26/4/2021 17:46	26/4/2021	17:46:08	IMG_0038.MP4	*Sus scrofa*	2	-
27/4/2021	CT03	26/4/2021 17:46	26/4/2021	17:46:58	IMG_0039.MP4	*Sus scrofa*	5	-
27/4/2021	CT03	27/4/2021 9:41	27/4/2021	9:41:10	IMG_0040.MP4	*Tupaia glis*	2	-
27/4/2021	CT04	9/4/2021 12:54	9/4/2021	12:54:14	IMG_0006.MP4	*Sus scrofa*	1	-
27/4/2021	CT04	9/4/2021 14:39	9/4/2021	14:39:44	IMG_0007.MP4	*Callosciurus notatus*	1	-
27/4/2021	CT04	9/4/2021 14:40	9/4/2021	14:40:06	IMG_0008.MP4	*Callosciurus notatus*	1	-
27/4/2021	CT04	9/4/2021 14:47	9/4/2021	14:47:02	IMG_0009.MP4	*Callosciurus notatus*	1	-
27/4/2021	CT04	9/4/2021 14:53	9/4/2021	14:53:06	IMG_0010.MP4	*Callosciurus notatus*	2	-
27/4/2021	CT04	9/4/2021 15:04	9/4/2021	15:04:12	IMG_0011.MP4	*Callosciurus notatus*	1	-
27/4/2021	CT04	9/4/2021 15:04	9/4/2021	15:04:34	IMG_0012.MP4	*Callosciurus notatus*	1	-
27/4/2021	CT04	9/4/2021 20:20	9/4/2021	20:20:36	IMG_0013.MP4	*Paradoxurus musangus*	1	-
27/4/2021	CT04	10/4/2021 11:47	10/4/2021	11:47:08	IMG_0014.MP4	*Sus scrofa*	1	-
27/4/2021	CT04	10/4/2021 12:25	10/4/2021	12:25:52	IMG_0016.MP4	*Tupaia glis*	1	-
27/4/2021	CT04	10/4/2021 13:46	10/4/2021	13:46:34	IMG_0018.MP4	*Sus scrofa*	1	-
27/4/2021	CT04	10/4/2021 16:40	10/4/2021	16:40:38	IMG_0019.MP4	*Tupaia glis*	1	-
27/4/2021	CT04	10/4/2021 18:16	10/4/2021	18:16:26	IMG_0020.MP4	*Tupaia glis*	1	-
27/4/2021	CT04	10/4/2021 18:16	10/4/2021	18:16:48	IMG_0021.MP4	*Tupaia glis*	1	-
27/4/2021	CT04	10/4/2021 18:51	10/4/2021	18:51:00	IMG_0022.MP4	*Sus scrofa*	1	-
27/4/2021	CT04	10/4/2021 18:51	10/4/2021	18:51:24	IMG_0023.MP4	*Sus scrofa*	6	-
27/4/2021	CT04	10/4/2021 18:51	10/4/2021	18:51:56	IMG_0024.MP4	*Sus scrofa*	1	-
27/4/2021	CT04	11/4/2021 3:03	10/4/2021	3:03:24	IMG_0025.MP4	*Rattus tiomanicus*	1	-
27/4/2021	CT04	11/4/2021 20:53	11/4/2021	20:53:58	IMG_0026.MP4	*Paradoxurus musangus*	1	-
27/4/2021	CT04	12/4/2021 3:32	11/4/2021	3:32:34	IMG_0027.MP4	*Paradoxurus musangus*	1	-
27/4/2021	CT04	12/4/2021 3:33	11/4/2021	3:33:36	IMG_0028.MP4	*Paradoxurus musangus*	1	-
27/4/2021	CT04	12/4/2021 3:35	11/4/2021	3:35:38	IMG_0029.MP4	*Paradoxurus musangus*	1	-
27/4/2021	CT04	12/4/2021 3:36	11/4/2021	3:36:36	IMG_0030.MP4	*Paradoxurus musangus*	1	-
27/4/2021	CT04	12/4/2021 9:16	12/4/2021	9:16:50	IMG_0031.MP4	*Sus scrofa*	1	-
27/4/2021	CT04	12/4/2021 15:56	12/4/2021	15:56:52	IMG_0032.MP4	*Tupaia glis*	1	-
27/4/2021	CT04	12/4/2021 22:11	12/4/2021	22:11:14	IMG_0033.MP4	*Rattus tiomanicus*	1	-
27/4/2021	CT04	12/4/2021 22:12	12/4/2021	22:12:24	IMG_0034.MP4	*Rattus sp.*	1	-
27/4/2021	CT04	13/4/2021 11:11	13/4/2021	11:11:32	IMG_0035.MP4	*Tupaia glis*	1	-
27/4/2021	CT04	13/4/2021 11:12	13/4/2021	11:12:42	IMG_0036.MP4	*Callosciurus notatus*	1	-
27/4/2021	CT04	13/4/2021 11:37	13/4/2021	11:37:28	IMG_0037.MP4	*Tupaia glis*	1	-
27/4/2021	CT04	13/4/2021 11:42	13/4/2021	11:42:40	IMG_0038.MP4	*Tupaia glis*	1	-
27/4/2021	CT04	13/4/2021 12:47	13/4/2021	12:47:14	IMG_0039.MP4	*Tupaia glis*	1	-
27/4/2021	CT04	13/4/2021 13:31	13/4/2021	13:31:46	IMG_0040.MP4	*Copsychus saularis*	1	-
27/4/2021	CT04	13/4/2021 13:34	13/4/2021	13:34:08	IMG_0041.MP4	*Callosciurus notatus*	1	-
27/4/2021	CT04	13/4/2021 13:35	13/4/2021	13:35:38	IMG_0042.MP4	*Callosciurus notatus*	1	-
27/4/2021	CT04	13/4/2021 19:32	13/4/2021	19:32:36	IMG_0043.MP4	*Sus scrofa*	1	-
27/4/2021	CT04	13/4/2021 19:58	13/4/2021	19:58:42	IMG_0044.MP4	*Sus scrofa*	1	-
27/4/2021	CT04	13/4/2021 20:17	13/4/2021	20:17:40	IMG_0045.MP4	*Paradoxurus musangus*	1	-
27/4/2021	CT04	14/4/2021 4:22	13/4/2021	4:22:34	IMG_0046.MP4	*Sus scrofa*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
27/4/2021	CT04	14/4/2021 6:23	13/4/2021	6:23:26	IMG_0047.MP4	*Sus scrofa*	1	-
27/4/2021	CT04	14/4/2021 6:24	13/4/2021	6:24:56	IMG_0048.MP4	*Sus scrofa*	1	-
27/4/2021	CT04	14/4/2021 6:26	13/4/2021	6:26:02	IMG_0049.MP4	*Sus scrofa*	1	-
27/4/2021	CT04	14/4/2021 6:28	13/4/2021	6:28:26	IMG_0050.MP4	*Sus scrofa*	1	-
27/4/2021	CT04	14/4/2021 11:48	14/4/2021	11:48:38	IMG_0051.MP4	*Tupaia glis*	1	-
27/4/2021	CT04	15/4/2021 2:44	14/4/2021	2:44:12	IMG_0052.MP4	*Rattus sp.*	1	-
27/4/2021	CT04	15/4/2021 18:32	15/4/2021	18:32:40	IMG_0053.MP4	*Tupaia glis*	1	-
27/4/2021	CT04	15/4/2021 18:33	15/4/2021	18:33:02	IMG_0054.MP4	*Tupaia glis*	1	-
27/4/2021	CT04	15/4/2021 21:22	15/4/2021	21:22:02	IMG_0055.MP4	*Sus scrofa*	1	-
27/4/2021	CT04	16/4/2021 5:43	15/4/2021	5:43:36	IMG_0056.MP4	*Sus scrofa*	1	-
27/4/2021	CT04	16/4/2021 11:05	16/4/2021	11:05:34	IMG_0057.MP4	*Tupaia glis*	1	-
27/4/2021	CT04	16/4/2021 21:24	16/4/2021	21:24:08	IMG_0058.MP4	*Rattus tiomanicus*	1	-
27/4/2021	CT04	17/4/2021 0:40	16/4/2021	0:40:06	IMG_0059.MP4	*Rattus tiomanicus*	1	-
27/4/2021	CT04	17/4/2021 1:52	16/4/2021	1:52:32	IMG_0060.MP4	*Rattus sp.*	1	-
27/4/2021	CT04	17/4/2021 3:24	16/4/2021	3:24:50	IMG_0061.MP4	*Manis javanica*	1	-
27/4/2021	CT04	17/4/2021 4:52	16/4/2021	4:52:20	IMG_0062.MP4	*Paradoxurus musangus*	1	-
27/4/2021	CT04	17/4/2021 6:42	16/4/2021	6:42:14	IMG_0063.MP4	*Rattus sp.*	1	-
27/4/2021	CT04	17/4/2021 18:45	17/4/2021	18:45:20	IMG_0064.MP4	*Sus scrofa*	1	-
27/4/2021	CT04	17/4/2021 18:45	17/4/2021	18:45:52	IMG_0065.MP4	*Sus scrofa*	1	-
27/4/2021	CT04	18/4/2021 10:22	18/4/2021	10:22:54	IMG_0066.MP4	*Sus scrofa*	1	-
27/4/2021	CT04	18/4/2021 11:59	18/4/2021	11:59:28	IMG_0067.MP4	*Sus scrofa*	1	-
27/4/2021	CT04	18/4/2021 20:18	18/4/2021	20:18:38	IMG_0068.MP4	*Rattus tiomanicus*	1	-
27/4/2021	CT04	18/4/2021 21:21	18/4/2021	21:21:48	IMG_0069.MP4	*Rattus tiomanicus*	1	-
27/4/2021	CT04	19/4/2021 0:35	18/4/2021	0:35:04	IMG_0070.MP4	*Rattus sp.*	1	-
27/4/2021	CT04	19/4/2021 13:23	19/4/2021	13:23:38	IMG_0071.MP4	*Sus scrofa*	1	-
27/4/2021	CT04	20/4/2021 10:26	20/4/2021	10:26:24	IMG_0073.MP4	*Tupaia glis*	1	-
27/4/2021	CT04	20/4/2021 10:26	20/4/2021	10:26:54	IMG_0074.MP4	*Tupaia glis*	1	-
27/4/2021	CT04	20/4/2021 19:50	20/4/2021	19:50:48	IMG_0078.MP4	*Callosciurus notatus*	1	-
27/4/2021	CT04	21/4/2021 19:16	21/4/2021	19:16:02	IMG_0079.MP4	*Paradoxurus musangus*	1	-
27/4/2021	CT04	22/4/2021 4:37	21/4/2021	4:37:58	IMG_0080.MP4	*Rattus tiomanicus*	1	-
27/4/2021	CT04	22/4/2021 13:06	22/4/2021	13:06:04	IMG_0081.MP4	*Tupaia glis*	1	-
27/4/2021	CT04	22/4/2021 19:01	22/4/2021	19:01:56	IMG_0082.MP4	*Tupaia glis*	1	-
27/4/2021	CT04	22/4/2021 19:04	22/4/2021	19:04:10	IMG_0083.MP4	*Tupaia glis*	1	-
27/4/2021	CT04	23/4/2021 9:22	23/4/2021	9:22:44	IMG_0084.MP4	*Tupaia glis*	1	-
27/4/2021	CT04	24/4/2021 5:34	23/4/2021	5:34:04	IMG_0086.MP4	*Sus scrofa*	1	-
27/4/2021	CT04	24/4/2021 5:37	23/4/2021	5:37:38	IMG_0087.MP4	*Sus scrofa*	1	-
27/4/2021	CT04	24/4/2021 18:51	24/4/2021	18:51:52	IMG_0088.MP4	*Tupaia glis*	1	-
27/4/2021	CT04	25/4/2021 15:12	25/4/2021	15:12:12	IMG_0089.MP4	*Callosciurus notatus*	1	-
27/4/2021	CT04	25/4/2021 17:17	25/4/2021	17:17:32	IMG_0090.MP4	*Tupaia glis*	1	-
27/4/2021	CT04	26/4/2021 4:14	25/4/2021	4:14:04	IMG_0091.MP4	*Rattus tiomanicus*	1	-
27/4/2021	CT04	26/4/2021 5:55	25/4/2021	5:55:40	IMG_0092.MP4	*Paradoxurus musangus*	1	-
27/4/2021	CT04	26/4/2021 6:52	25/4/2021	6:52:32	IMG_0093.MP4	*Tupaia glis*	1	-
27/4/2021	CT04	26/4/2021 7:30	25/4/2021	7:30:32	IMG_0094.MP4	*Tupaia glis*	1	-
27/4/2021	CT04	26/4/2021 16:54	26/4/2021	16:54:40	IMG_0095.MP4	*Sus scrofa*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
30/4/2021	CT05	9/4/2021 13:27	9/4/2021	13:27:50	IMG_0004.AVI	*Calotes versicolor*	1	-
30/4/2021	CT05	9/4/2021 14:23	9/4/2021	14:23:18	IMG_0005.AVI	*Calotes versicolor*	1	-
30/4/2021	CT05	10/4/2021 5:02	9/4/2021	5:02:04	IMG_0006.AVI	*Rattus sp.*	1	-
30/4/2021	CT05	10/4/2021 16:49	10/4/2021	16:49:56	IMG_0007.AVI	*Calotes versicolor*	1	-
30/4/2021	CT05	10/4/2021 18:31	10/4/2021	18:31:14	IMG_0008.AVI	*Acridotheres javanicus*	1	-
30/4/2021	CT05	13/4/2021 9:33	13/4/2021	9:33:14	IMG_0010.AVI	*Calotes versicolor*	1	-
30/4/2021	CT05	13/4/2021 11:16	13/4/2021	11:16:20	IMG_0011.AVI	*Acridotheres javanicus*	1	-
30/4/2021	CT05	13/4/2021 11:17	13/4/2021	11:17:00	IMG_0012.AVI	*Acridotheres javanicus*	1	-
30/4/2021	CT05	13/4/2021 18:05	13/4/2021	18:05:40	IMG_0013.AVI	*Acridotheres javanicus*	2	-
30/4/2021	CT05	13/4/2021 18:09	13/4/2021	18:09:54	IMG_0014.AVI	*Acridotheres javanicus*	1	-
30/4/2021	CT05	14/4/2021 9:01	14/4/2021	9:01:48	IMG_0016.AVI	*Acridotheres javanicus*	1	-
30/4/2021	CT05	15/4/2021 21:32	15/4/2021	21:32:54	IMG_0028.AVI	*Suncus murinus*	1	-
30/4/2021	CT05	16/4/2021 8:57	16/4/2021	8:57:56	IMG_0029.AVI	*Calotes versicolor*	1	-
30/4/2021	CT05	19/4/2021 15:51	19/4/2021	15:51:14	IMG_0058.AVI	*Acridotheres javanicus*	1	-
30/4/2021	CT05	19/4/2021 15:52	19/4/2021	15:52:22	IMG_0059.AVI	*Acridotheres javanicus*	1	-
30/4/2021	CT05	19/4/2021 15:52	19/4/2021	15:52:54	IMG_0060.AVI	*Acridotheres javanicus*	1	-
30/4/2021	CT05	19/4/2021 17:14	19/4/2021	17:14:50	IMG_0069.AVI	*Acridotheres javanicus*	1	-
30/4/2021	CT05	19/4/2021 18:51	19/4/2021	18:51:40	IMG_0086.AVI	*Acridotheres javanicus*	1	-
30/4/2021	CT05	19/4/2021 18:52	19/4/2021	18:52:36	IMG_0087.AVI	*Acridotheres javanicus*	1	-
30/4/2021	CT05	19/4/2021 18:54	19/4/2021	18:54:16	IMG_0088.AVI	*Acridotheres javanicus*	1	-
30/4/2021	CT05	20/4/2021 0:19	19/4/2021	0:19:56	IMG_0089.AVI	*Rattus sp.*	1	-
30/4/2021	CT05	20/4/2021 7:29	19/4/2021	7:29:04	IMG_0091.AVI	*Acridotheres javanicus*	1	-
30/4/2021	CT05	20/4/2021 7:39	19/4/2021	7:39:48	IMG_0092.AVI	*Acridotheres javanicus*	1	-
30/4/2021	CT05	20/4/2021 10:40	20/4/2021	10:40:32	IMG_0105.AVI	*Acridotheres javanicus*	1	-
30/4/2021	CT05	21/4/2021 2:23	20/4/2021	2:23:12	IMG_0156.AVI	*Sus scrofa*	1	-
30/4/2021	CT05	21/4/2021 3:32	20/4/2021	3:32:10	IMG_0157.AVI	*Suncus murinus*	1	-
30/4/2021	CT05	22/4/2021 17:03	22/4/2021	17:03:42	IMG_0205.AVI	*Acridotheres javanicus*	1	-
30/4/2021	CT05	23/4/2021 7:46	22/4/2021	7:46:00	IMG_0206.AVI	*Acridotheres javanicus*	1	-
30/4/2021	CT05	23/4/2021 16:49	23/4/2021	16:49:36	IMG_0217.AVI	*Acridotheres javanicus*	1	-
30/4/2021	CT05	23/4/2021 16:54	23/4/2021	16:54:28	IMG_0218.AVI	*Acridotheres javanicus*	1	-
30/4/2021	CT05	24/4/2021 4:24	23/4/2021	4:24:28	IMG_0219.AVI	*Suncus murinus*	1	-
30/4/2021	CT05	25/4/2021 9:09	25/4/2021	9:09:34	IMG_0220.AVI	*Calotes versicolor*	1	-
30/4/2021	CT05	27/4/2021 6:57	26/4/2021	6:57:14	IMG_0223.AVI	*Rattus sp.*	1	-
30/4/2021	CT05	27/4/2021 10:52	27/4/2021	10:52:58	IMG_0224.AVI	*Calotes versicolor*	1	-
30/4/2021	CT05	27/4/2021 14:02	27/4/2021	14:02:44	IMG_0226.AVI	*Acridotheres javanicus*	1	-
30/4/2021	CT05	27/4/2021 19:27	27/4/2021	19:27:10	IMG_0233.AVI	*Rattus tiomanicus*	1	-
30/4/2021	CT05	29/4/2021 4:08	28/4/2021	4:08:28	IMG_0236.AVI	*Rattus sp.*	1	-
30/4/2021	CT05	30/4/2021 9:39	30/4/2021	9:39:56	IMG_0237.AVI	*Calotes versicolor*	1	-
30/4/2021	CT05	30/4/2021 9:41	30/4/2021	9:41:38	IMG_0238.AVI	*Calotes versicolor*	1	-
30/4/2021	CT05	30/4/2021 10:07	30/4/2021	10:07:58	IMG_0239.AVI	*Calotes versicolor*	1	-
30/4/2021	CT06	9/4/2021 10:34	9/4/2021	10:34:34	IMG_0004.AVI	*Acridotheres javanicus*	2	-
30/4/2021	CT06	9/4/2021 10:35	9/4/2021	10:35:16	IMG_0005.AVI	*Acridotheres javanicus*	1	-
30/4/2021	CT06	9/4/2021 11:32	9/4/2021	11:32:32	IMG_0006.AVI	*Gallus gallus*	1	-
30/4/2021	CT06	9/4/2021 14:12	9/4/2021	14:12:34	IMG_0007.AVI	*Varanus sp.*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
30/4/2021	CT06	9/4/2021 17:19	9/4/2021	17:19:14	IMG_0009.AVI	*Gallus gallus*	3	Domestic
30/4/2021	CT06	9/4/2021 17:19	9/4/2021	17:19:44	IMG_0010.AVI	*Gallus gallus*	3	Domestic
30/4/2021	CT06	9/4/2021 17:21	9/4/2021	17:21:16	IMG_0011.AVI	*Gallus gallus*	3	Domestic
30/4/2021	CT06	9/4/2021 17:21	9/4/2021	17:21:44	IMG_0012.AVI	*Gallus gallus*	1	Domestic
30/4/2021	CT06	9/4/2021 17:22	9/4/2021	17:22:38	IMG_0013.AVI	*Gallus gallus*	1	-
30/4/2021	CT06	9/4/2021 17:23	9/4/2021	17:23:24	IMG_0014.AVI	*Gallus gallus*	1	-
30/4/2021	CT06	9/4/2021 17:23	9/4/2021	17:23:48	IMG_0015.AVI	*Gallus gallus*	1	-
30/4/2021	CT06	9/4/2021 17:24	9/4/2021	17:24:18	IMG_0016.AVI	*Gallus gallus*	1	-
30/4/2021	CT06	9/4/2021 17:24	9/4/2021	17:24:56	IMG_0017.AVI	Unidentified bird	1	Maybe Picus vittatus
30/4/2021	CT06	9/4/2021 17:24	9/4/2021	17:24:56	IMG_0017.AVI	*Gallus gallus*	1	-
30/4/2021	CT06	9/4/2021 17:33	9/4/2021	17:33:28	IMG_0018.AVI	*Gallus gallus*	1	-
30/4/2021	CT06	9/4/2021 17:33	9/4/2021	17:33:28	IMG_0018.AVI	Unidentified bird	1	-
30/4/2021	CT06	9/4/2021 18:17	9/4/2021	18:17:14	IMG_0019.AVI	*Amaurornis phoenicurus*	1	-
30/4/2021	CT06	9/4/2021 18:18	9/4/2021	18:18:56	IMG_0020.AVI	*Tupaia glis*	1	-
30/4/2021	CT06	9/4/2021 18:19	9/4/2021	18:19:20	IMG_0021.AVI	*Tupaia glis*	1	-
30/4/2021	CT06	9/4/2021 19:16	9/4/2021	19:16:22	IMG_0022.AVI	*Rallina fasciata*	2	-
30/4/2021	CT06	9/4/2021 21:03	9/4/2021	21:03:14	IMG_0023.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	9/4/2021 21:04	9/4/2021	21:04:30	IMG_0024.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	9/4/2021 21:04	9/4/2021	21:04:50	IMG_0025.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	9/4/2021 21:05	9/4/2021	21:05:12	IMG_0026.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	9/4/2021 21:05	9/4/2021	21:05:34	IMG_0027.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	9/4/2021 21:08	9/4/2021	21:08:56	IMG_0028.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	9/4/2021 21:09	9/4/2021	21:09:34	IMG_0029.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	9/4/2021 21:09	9/4/2021	21:09:56	IMG_0030.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	9/4/2021 21:10	9/4/2021	21:10:16	IMG_0031.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	9/4/2021 21:13	9/4/2021	21:13:36	IMG_0032.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	9/4/2021 23:30	9/4/2021	23:30:48	IMG_0034.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	10/4/2021 7:00	9/4/2021	7:00:38	IMG_0036.AVI	*Rallina fasciata*	1	-
30/4/2021	CT06	10/4/2021 7:50	9/4/2021	7:50:32	IMG_0037.AVI	Unidentified bird	1	-
30/4/2021	CT06	10/4/2021 18:56	10/4/2021	18:56:06	IMG_0044.AVI	*Pitta moluccensis*	1	-
30/4/2021	CT06	10/4/2021 19:10	10/4/2021	19:10:56	IMG_0045.AVI	*Tupaia glis*	1	-
30/4/2021	CT06	10/4/2021 19:11	10/4/2021	19:11:32	IMG_0046.AVI	*Tupaia glis*	1	-
30/4/2021	CT06	10/4/2021 21:29	10/4/2021	21:29:32	IMG_0047.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	10/4/2021 21:31	10/4/2021	21:31:52	IMG_0048.AVI	*Sus scrofa*	2	-
30/4/2021	CT06	10/4/2021 21:38	10/4/2021	21:38:16	IMG_0049.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	10/4/2021 21:38	10/4/2021	21:38:40	IMG_0050.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	10/4/2021 21:39	10/4/2021	21:39:00	IMG_0051.AVI	*Sus scrofa*	2	-
30/4/2021	CT06	10/4/2021 21:39	10/4/2021	21:39:22	IMG_0052.AVI	*Sus scrofa*	2	-
30/4/2021	CT06	10/4/2021 21:39	10/4/2021	21:39:44	IMG_0053.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	10/4/2021 21:41	10/4/2021	21:41:22	IMG_0055.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	10/4/2021 21:41	10/4/2021	21:41:44	IMG_0056.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	10/4/2021 21:46	10/4/2021	21:46:44	IMG_0057.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	10/4/2021 21:47	10/4/2021	21:47:06	IMG_0058.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	10/4/2021 21:47	10/4/2021	21:47:44	IMG_0059.AVI	*Sus scrofa*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
30/4/2021	CT06	10/4/2021 21:48	10/4/2021	21:48:06	IMG_0060.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	10/4/2021 21:48	10/4/2021	21:48:28	IMG_0061.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	10/4/2021 21:48	10/4/2021	21:48:50	IMG_0062.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	10/4/2021 21:49	10/4/2021	21:49:12	IMG_0063.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	10/4/2021 21:49	10/4/2021	21:49:34	IMG_0064.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	10/4/2021 21:49	10/4/2021	21:49:58	IMG_0065.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	11/4/2021 9:11	11/4/2021	9:11:02	IMG_0069.AVI	Unidentified squirrel or treeshrew	1	-
30/4/2021	CT06	11/4/2021 11:04	11/4/2021	11:04:12	IMG_0076.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	11/4/2021 11:04	11/4/2021	11:04:34	IMG_0077.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	11/4/2021 11:06	11/4/2021	11:06:04	IMG_0078.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	11/4/2021 11:13	11/4/2021	11:13:10	IMG_0079.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	11/4/2021 11:13	11/4/2021	11:13:32	IMG_0080.AVI	*Sus scrofa*	2	-
30/4/2021	CT06	11/4/2021 11:13	11/4/2021	11:13:54	IMG_0081.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	11/4/2021 11:14	11/4/2021	11:14:16	IMG_0082.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	11/4/2021 11:14	11/4/2021	11:14:38	IMG_0083.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	11/4/2021 12:06	11/4/2021	12:06:56	IMG_0084.AVI	*Copsychus saularis*	1	-
30/4/2021	CT06	11/4/2021 12:21	11/4/2021	12:21:30	IMG_0085.AVI	*Tupaia glis*	1	-
30/4/2021	CT06	11/4/2021 13:24	11/4/2021	13:24:06	IMG_0087.AVI	*Callosciurus notatus*	1	-
30/4/2021	CT06	11/4/2021 16:59	11/4/2021	16:59:50	IMG_0092.AVI	*Gallus gallus*	1	-
30/4/2021	CT06	11/4/2021 17:49	11/4/2021	17:49:54	IMG_0093.AVI	Unidentified sp.	1	-
30/4/2021	CT06	11/4/2021 17:50	11/4/2021	17:50:22	IMG_0094.AVI	Unidentified sp.	1	-
30/4/2021	CT06	11/4/2021 17:50	11/4/2021	17:50:46	IMG_0095.AVI	Unidentified sp.	1	-
30/4/2021	CT06	11/4/2021 19:04	11/4/2021	19:04:04	IMG_0096.AVI	*Gallus gallus*	1	-
30/4/2021	CT06	11/4/2021 19:05	11/4/2021	19:05:58	IMG_0097.AVI	*Tupaia glis*	1	-
30/4/2021	CT06	11/4/2021 19:41	11/4/2021	19:41:10	IMG_0098.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	11/4/2021 19:41	11/4/2021	19:41:32	IMG_0099.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	11/4/2021 19:41	11/4/2021	19:41:58	IMG_0100.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	11/4/2021 19:42	11/4/2021	19:42:18	IMG_0101.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	11/4/2021 19:42	11/4/2021	19:42:48	IMG_0102.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	11/4/2021 19:43	11/4/2021	19:43:10	IMG_0103.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	11/4/2021 19:43	11/4/2021	19:43:36	IMG_0104.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	11/4/2021 19:43	11/4/2021	19:43:58	IMG_0105.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	11/4/2021 19:44	11/4/2021	19:44:34	IMG_0106.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	11/4/2021 19:44	11/4/2021	19:44:56	IMG_0107.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	11/4/2021 19:45	11/4/2021	19:45:18	IMG_0108.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	11/4/2021 19:45	11/4/2021	19:45:40	IMG_0109.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	11/4/2021 19:46	11/4/2021	19:46:00	IMG_0110.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	11/4/2021 19:47	11/4/2021	19:47:22	IMG_0111.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	12/4/2021 9:10	12/4/2021	9:10:50	IMG_0113.AVI	*Garrulax leucolophus*	1	-
30/4/2021	CT06	12/4/2021 9:27	12/4/2021	9:27:38	IMG_0114.AVI	*Amaurornis phoenicurus*	1	-
30/4/2021	CT06	12/4/2021 10:32	12/4/2021	10:32:02	IMG_0116.AVI	*Amaurornis phoenicurus*	1	-
30/4/2021	CT06	12/4/2021 10:40	12/4/2021	10:40:26	IMG_0117.AVI	*Gallus gallus*	1	-
30/4/2021	CT06	12/4/2021 12:13	12/4/2021	12:13:12	IMG_0118.AVI	*Gallus gallus*	1	-
30/4/2021	CT06	12/4/2021 12:31	12/4/2021	12:31:14	IMG_0119.AVI	*Varanus sp.*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
30/4/2021	CT06	12/4/2021 14:03	12/4/2021	14:03:46	IMG_0122.AVI	*Copsychus saularis*	1	-
30/4/2021	CT06	12/4/2021 15:22	12/4/2021	15:22:40	IMG_0123.AVI	*Varanus sp.*	1	-
30/4/2021	CT06	12/4/2021 18:27	12/4/2021	18:27:36	IMG_0125.AVI	*Tupaia glis*	1	-
30/4/2021	CT06	12/4/2021 18:27	12/4/2021	18:27:58	IMG_0126.AVI	*Tupaia glis*	1	-
30/4/2021	CT06	12/4/2021 18:29	12/4/2021	18:29:04	IMG_0127.AVI	*Tupaia glis*	1	-
30/4/2021	CT06	12/4/2021 18:54	12/4/2021	18:54:42	IMG_0128.AVI	*Tupaia glis*	1	-
30/4/2021	CT06	12/4/2021 19:00	12/4/2021	19:00:20	IMG_0129.AVI	*Tupaia glis*	1	-
30/4/2021	CT06	12/4/2021 19:06	12/4/2021	19:06:16	IMG_0130.AVI	*Tupaia glis*	1	-
30/4/2021	CT06	13/4/2021 7:31	12/4/2021	7:31:46	IMG_0131.AVI	*Garrulax leucolophus*	1	-
30/4/2021	CT06	13/4/2021 7:32	12/4/2021	7:32:14	IMG_0132.AVI	*Garrulax leucolophus*	1	-
30/4/2021	CT06	13/4/2021 7:55	12/4/2021	7:55:16	IMG_0133.AVI	*Gallus gallus*	1	-
30/4/2021	CT06	13/4/2021 19:23	13/4/2021	19:23:16	IMG_0134.AVI	*Sus scrofa*	2	-
30/4/2021	CT06	13/4/2021 19:23	13/4/2021	19:23:42	IMG_0135.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	13/4/2021 20:43	13/4/2021	20:43:20	IMG_0136.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	13/4/2021 20:43	13/4/2021	20:43:42	IMG_0137.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	13/4/2021 20:44	13/4/2021	20:44:10	IMG_0138.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	14/4/2021 7:25	13/4/2021	7:25:16	IMG_0139.AVI	*Gallus gallus*	1	-
30/4/2021	CT06	14/4/2021 8:45	14/4/2021	8:45:32	IMG_0140.AVI	*Garrulax leucolophus*	1	-
30/4/2021	CT06	14/4/2021 9:18	14/4/2021	9:18:36	IMG_0141.AVI	*Gallus gallus*	1	-
30/4/2021	CT06	14/4/2021 11:46	14/4/2021	11:46:58	IMG_0142.AVI	*Gallus gallus*	1	-
30/4/2021	CT06	14/4/2021 12:07	14/4/2021	12:07:22	IMG_0143.AVI	*Sus scrofa*	2	-
30/4/2021	CT06	14/4/2021 12:07	14/4/2021	12:07:42	IMG_0144.AVI	*Sus scrofa*	2	-
30/4/2021	CT06	14/4/2021 12:08	14/4/2021	12:08:32	IMG_0145.AVI	*Gallus gallus*	1	-
30/4/2021	CT06	14/4/2021 12:08	14/4/2021	12:08:32	IMG_0145.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	14/4/2021 19:31	14/4/2021	19:31:08	IMG_0146.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	14/4/2021 19:31	14/4/2021	19:31:44	IMG_0147.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	15/4/2021 7:34	14/4/2021	7:34:58	IMG_0148.AVI	*Gallus gallus*	1	-
30/4/2021	CT06	15/4/2021 7:34	14/4/2021	7:34:58	IMG_0148.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	15/4/2021 7:35	14/4/2021	7:35:18	IMG_0149.AVI	*Gallus gallus*	1	-
30/4/2021	CT06	15/4/2021 7:35	14/4/2021	7:35:18	IMG_0149.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	15/4/2021 7:35	14/4/2021	7:35:18	IMG_0149.AVI	Unidentified bird	1	-
30/4/2021	CT06	15/4/2021 7:47	14/4/2021	7:47:34	IMG_0150.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	15/4/2021 7:59	14/4/2021	7:59:46	IMG_0151.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	15/4/2021 8:00	15/4/2021	8:00:06	IMG_0152.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	15/4/2021 8:00	15/4/2021	8:00:28	IMG_0153.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	15/4/2021 8:00	15/4/2021	8:00:48	IMG_0154.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	15/4/2021 8:01	15/4/2021	8:01:08	IMG_0155.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	15/4/2021 8:05	15/4/2021	8:05:46	IMG_0156.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	15/4/2021 8:06	15/4/2021	8:06:06	IMG_0157.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	15/4/2021 8:06	15/4/2021	8:06:28	IMG_0158.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	15/4/2021 8:06	15/4/2021	8:06:48	IMG_0159.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	15/4/2021 8:07	15/4/2021	8:07:08	IMG_0160.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	15/4/2021 8:07	15/4/2021	8:07:30	IMG_0161.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	15/4/2021 8:08	15/4/2021	8:08:08	IMG_0162.AVI	*Sus scrofa*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
30/4/2021	CT06	15/4/2021 8:08	15/4/2021	8:08:28	IMG_0163.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	15/4/2021 8:08	15/4/2021	8:08:48	IMG_0164.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	15/4/2021 8:09	15/4/2021	8:09:08	IMG_0165.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	15/4/2021 8:09	15/4/2021	8:09:32	IMG_0166.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	15/4/2021 8:09	15/4/2021	8:09:52	IMG_0167.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	15/4/2021 8:10	15/4/2021	8:10:32	IMG_0168.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	15/4/2021 8:11	15/4/2021	8:11:10	IMG_0169.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	15/4/2021 8:11	15/4/2021	8:11:32	IMG_0170.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	15/4/2021 8:11	15/4/2021	8:11:52	IMG_0171.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	15/4/2021 8:16	15/4/2021	8:16:46	IMG_0172.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	15/4/2021 8:17	15/4/2021	8:17:36	IMG_0173.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	15/4/2021 8:17	15/4/2021	8:17:58	IMG_0174.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	15/4/2021 8:18	15/4/2021	8:18:18	IMG_0175.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	15/4/2021 8:18	15/4/2021	8:18:40	IMG_0176.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	15/4/2021 8:19	15/4/2021	8:19:02	IMG_0177.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	15/4/2021 8:19	15/4/2021	8:19:22	IMG_0178.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	15/4/2021 8:20	15/4/2021	8:20:34	IMG_0179.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	15/4/2021 8:21	15/4/2021	8:21:32	IMG_0180.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	15/4/2021 13:34	15/4/2021	13:34:24	IMG_0182.AVI	*Chalcophaps indica*	1	-
30/4/2021	CT06	15/4/2021 15:01	15/4/2021	15:01:32	IMG_0183.AVI	*Garrulax leucolophus*	1	-
30/4/2021	CT06	15/4/2021 16:05	15/4/2021	16:05:44	IMG_0184.AVI	*Amaurornis phoenicurus*	2	-
30/4/2021	CT06	15/4/2021 16:05	15/4/2021	16:05:44	IMG_0184.AVI	*Garrulax leucolophus*	1	-
30/4/2021	CT06	15/4/2021 16:08	15/4/2021	16:08:48	IMG_0185.AVI	*Garrulax leucolophus*	2	-
30/4/2021	CT06	15/4/2021 16:51	15/4/2021	16:51:28	IMG_0186.AVI	*Amaurornis phoenicurus*	1	-
30/4/2021	CT06	15/4/2021 19:08	15/4/2021	19:08:12	IMG_0187.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	15/4/2021 19:08	15/4/2021	19:08:34	IMG_0188.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	15/4/2021 19:08	15/4/2021	19:08:56	IMG_0189.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	15/4/2021 19:19	15/4/2021	19:19:56	IMG_0190.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	15/4/2021 19:37	15/4/2021	19:37:32	IMG_0191.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	15/4/2021 21:36	15/4/2021	21:36:34	IMG_0192.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	15/4/2021 21:36	15/4/2021	21:36:56	IMG_0193.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	15/4/2021 21:38	15/4/2021	21:38:54	IMG_0194.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	15/4/2021 21:39	15/4/2021	21:39:16	IMG_0195.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	15/4/2021 21:39	15/4/2021	21:39:38	IMG_0196.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	15/4/2021 21:40	15/4/2021	21:40:10	IMG_0197.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	16/4/2021 1:11	15/4/2021	1:11:40	IMG_0198.AVI	*Rattus sp.*	1	-
30/4/2021	CT06	16/4/2021 7:22	15/4/2021	7:22:52	IMG_0199.AVI	*Tupaia glis*	1	-
30/4/2021	CT06	16/4/2021 7:23	15/4/2021	7:23:36	IMG_0200.AVI	*Tupaia glis*	1	-
30/4/2021	CT06	16/4/2021 7:24	15/4/2021	7:24:50	IMG_0201.AVI	*Gallus gallus*	1	-
30/4/2021	CT06	16/4/2021 16:54	16/4/2021	16:54:26	IMG_0202.AVI	*Garrulax leucolophus*	1	-
30/4/2021	CT06	16/4/2021 19:11	16/4/2021	19:11:32	IMG_0203.AVI	*Tupaia glis*	1	-
30/4/2021	CT06	16/4/2021 22:25	16/4/2021	22:25:06	IMG_0204.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	16/4/2021 22:25	16/4/2021	22:25:28	IMG_0205.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	16/4/2021 22:25	16/4/2021	22:25:50	IMG_0206.AVI	*Sus scrofa*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
30/4/2021	CT06	16/4/2021 22:26	16/4/2021	22:26:12	IMG_0207.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	16/4/2021 22:26	16/4/2021	22:26:34	IMG_0208.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	16/4/2021 22:26	16/4/2021	22:26:56	IMG_0209.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	16/4/2021 22:27	16/4/2021	22:27:16	IMG_0210.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	16/4/2021 22:27	16/4/2021	22:27:44	IMG_0211.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	16/4/2021 23:23	16/4/2021	23:23:50	IMG_0212.AVI	*Paradoxurus musangus*	1	-
30/4/2021	CT06	17/4/2021 1:25	16/4/2021	1:25:24	IMG_0213.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	17/4/2021 1:26	16/4/2021	1:26:32	IMG_0214.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	17/4/2021 1:27	16/4/2021	1:27:54	IMG_0215.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	17/4/2021 15:17	17/4/2021	15:17:40	IMG_0216.AVI	*Gallus gallus*	1	-
30/4/2021	CT06	17/4/2021 15:21	17/4/2021	15:21:14	IMG_0217.AVI	*Gallus gallus*	1	-
30/4/2021	CT06	17/4/2021 15:21	17/4/2021	15:21:14	IMG_0217.AVI	*Garrulax leucolophus*	1	-
30/4/2021	CT06	17/4/2021 16:05	17/4/2021	16:05:28	IMG_0219.AVI	*Gallus gallus*	1	-
30/4/2021	CT06	17/4/2021 16:05	17/4/2021	16:05:28	IMG_0219.AVI	*Tupaia glis*	1	-
30/4/2021	CT06	17/4/2021 17:01	17/4/2021	17:01:04	IMG_0220.AVI	*Garrulax leucolophus*	2	-
30/4/2021	CT06	18/4/2021 7:19	17/4/2021	7:19:06	IMG_0221.AVI	*Amaurornis phoenicurus*	1	-
30/4/2021	CT06	18/4/2021 7:27	17/4/2021	7:27:22	IMG_0222.AVI	*Amaurornis phoenicurus*	1	-
30/4/2021	CT06	18/4/2021 11:41	18/4/2021	11:41:30	IMG_0223.AVI	*Garrulax leucolophus*	1	-
30/4/2021	CT06	18/4/2021 11:42	18/4/2021	11:42:02	IMG_0224.AVI	*Garrulax leucolophus*	3	-
30/4/2021	CT06	18/4/2021 11:43	18/4/2021	11:43:02	IMG_0225.AVI	*Garrulax leucolophus*	3	-
30/4/2021	CT06	18/4/2021 12:02	18/4/2021	12:02:56	IMG_0226.AVI	*Garrulax leucolophus*	2	-
30/4/2021	CT06	18/4/2021 14:30	18/4/2021	14:30:46	IMG_0227.AVI	*Garrulax leucolophus*	1	-
30/4/2021	CT06	18/4/2021 14:30	18/4/2021	14:30:46	IMG_0227.AVI	*Tupaia glis*	1	-
30/4/2021	CT06	18/4/2021 14:31	18/4/2021	14:31:18	IMG_0228.AVI	*Garrulax leucolophus*	1	-
30/4/2021	CT06	18/4/2021 14:31	18/4/2021	14:31:18	IMG_0228.AVI	*Tupaia glis*	1	-
30/4/2021	CT06	18/4/2021 14:32	18/4/2021	14:32:44	IMG_0229.AVI	*Tupaia glis*	1	-
30/4/2021	CT06	18/4/2021 14:33	18/4/2021	14:33:34	IMG_0230.AVI	*Tupaia glis*	1	-
30/4/2021	CT06	18/4/2021 14:34	18/4/2021	14:34:10	IMG_0231.AVI	*Garrulax leucolophus*	2	-
30/4/2021	CT06	18/4/2021 14:34	18/4/2021	14:34:10	IMG_0231.AVI	*Tupaia glis*	1	-
30/4/2021	CT06	18/4/2021 14:36	18/4/2021	14:36:36	IMG_0232.AVI	*Tupaia glis*	2	-
30/4/2021	CT06	18/4/2021 16:22	18/4/2021	16:22:34	IMG_0233.AVI	*Gallus gallus*	1	-
30/4/2021	CT06	18/4/2021 19:05	18/4/2021	19:05:56	IMG_0235.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	18/4/2021 19:28	18/4/2021	19:28:42	IMG_0236.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	18/4/2021 19:29	18/4/2021	19:29:06	IMG_0237.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	18/4/2021 21:36	18/4/2021	21:36:22	IMG_0238.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	18/4/2021 21:37	18/4/2021	21:37:02	IMG_0239.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	18/4/2021 22:17	18/4/2021	22:17:54	IMG_0240.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	18/4/2021 22:18	18/4/2021	22:18:16	IMG_0241.AVI	*Sus scrofa*	2	-
30/4/2021	CT06	18/4/2021 22:18	18/4/2021	22:18:38	IMG_0242.AVI	*Sus scrofa*	4	-
30/4/2021	CT06	18/4/2021 22:18	18/4/2021	22:18:58	IMG_0243.AVI	*Sus scrofa*	4	-
30/4/2021	CT06	18/4/2021 22:19	18/4/2021	22:19:20	IMG_0244.AVI	*Sus scrofa*	3	-
30/4/2021	CT06	18/4/2021 22:19	18/4/2021	22:19:44	IMG_0245.AVI	*Sus scrofa*	4	-
30/4/2021	CT06	18/4/2021 22:21	18/4/2021	22:21:06	IMG_0246.AVI	*Sus scrofa*	4	-
30/4/2021	CT06	18/4/2021 22:21	18/4/2021	22:21:30	IMG_0247.AVI	*Sus scrofa*	4	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
30/4/2021	CT06	18/4/2021 22:21	18/4/2021	22:21:52	IMG_0248.AVI	*Sus scrofa*	3	-
30/4/2021	CT06	19/4/2021 4:54	18/4/2021	4:54:32	IMG_0249.AVI	*Rattus tiomanicus*	1	-
30/4/2021	CT06	19/4/2021 4:55	18/4/2021	4:55:50	IMG_0250.AVI	*Rattus sp.*	1	-
30/4/2021	CT06	19/4/2021 5:26	18/4/2021	5:26:10	IMG_0251.AVI	*Rattus sp.*	1	-
30/4/2021	CT06	19/4/2021 5:27	18/4/2021	5:27:56	IMG_0252.AVI	*Rattus tiomanicus*	1	-
30/4/2021	CT06	19/4/2021 8:04	19/4/2021	8:04:28	IMG_0253.AVI	*Amaurornis phoenicurus*	1	-
30/4/2021	CT06	19/4/2021 8:08	19/4/2021	8:08:32	IMG_0254.AVI	*Garrulax leucolophus*	1	-
30/4/2021	CT06	19/4/2021 8:18	19/4/2021	8:18:22	IMG_0256.AVI	*Garrulax leucolophus*	1	-
30/4/2021	CT06	19/4/2021 14:05	19/4/2021	14:05:28	IMG_0257.AVI	*Amaurornis phoenicurus*	1	-
30/4/2021	CT06	19/4/2021 19:36	19/4/2021	19:36:14	IMG_0258.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	19/4/2021 21:01	19/4/2021	21:01:20	IMG_0259.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	19/4/2021 21:09	19/4/2021	21:09:20	IMG_0260.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	19/4/2021 21:10	19/4/2021	21:10:48	IMG_0261.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	19/4/2021 21:11	19/4/2021	21:11:10	IMG_0262.AVI	*Sus scrofa*	2	-
30/4/2021	CT06	19/4/2021 21:11	19/4/2021	21:11:30	IMG_0263.AVI	*Sus scrofa*	2	-
30/4/2021	CT06	19/4/2021 21:11	19/4/2021	21:11:52	IMG_0264.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	19/4/2021 21:12	19/4/2021	21:12:14	IMG_0265.AVI	*Sus scrofa*	2	-
30/4/2021	CT06	19/4/2021 21:14	19/4/2021	21:14:28	IMG_0266.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	19/4/2021 21:14	19/4/2021	21:14:50	IMG_0267.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	19/4/2021 22:48	19/4/2021	22:48:34	IMG_0268.AVI	*Sus scrofa*	2	-
30/4/2021	CT06	19/4/2021 22:48	19/4/2021	22:48:56	IMG_0269.AVI	*Sus scrofa*	2	-
30/4/2021	CT06	19/4/2021 22:49	19/4/2021	22:49:18	IMG_0270.AVI	*Sus scrofa*	3	-
30/4/2021	CT06	19/4/2021 22:49	19/4/2021	22:49:40	IMG_0271.AVI	*Sus scrofa*	2	-
30/4/2021	CT06	19/4/2021 22:50	19/4/2021	22:50:00	IMG_0272.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	19/4/2021 22:52	19/4/2021	22:52:00	IMG_0273.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	19/4/2021 23:03	19/4/2021	23:03:06	IMG_0274.AVI	*Rattus sp.*	1	-
30/4/2021	CT06	20/4/2021 6:52	19/4/2021	6:52:30	IMG_0275.AVI	*Rallina fasciata*	1	-
30/4/2021	CT06	20/4/2021 7:22	19/4/2021	7:22:42	IMG_0276.AVI	*Amaurornis phoenicurus*	1	-
30/4/2021	CT06	20/4/2021 7:53	19/4/2021	7:53:34	IMG_0277.AVI	*Tupaia glis*	1	-
30/4/2021	CT06	20/4/2021 16:04	20/4/2021	16:04:34	IMG_0278.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	21/4/2021 7:13	20/4/2021	7:13:06	IMG_0279.AVI	*Gallus gallus*	3	Domestic
30/4/2021	CT06	21/4/2021 7:13	20/4/2021	7:13:06	IMG_0279.AVI	*Picus vittatus*	1	Maybe Picus vittatus
30/4/2021	CT06	21/4/2021 7:14	20/4/2021	7:14:18	IMG_0280.AVI	*Gallus gallus*	3	Domestic
30/4/2021	CT06	21/4/2021 7:14	20/4/2021	7:14:58	IMG_0281.AVI	*Gallus gallus*	3	Domestic
30/4/2021	CT06	21/4/2021 7:14	20/4/2021	7:14:58	IMG_0281.AVI	Unidentified bird	1	-
30/4/2021	CT06	21/4/2021 7:15	20/4/2021	7:15:24	IMG_0282.AVI	*Gallus gallus*	3	Domestic
30/4/2021	CT06	21/4/2021 7:15	20/4/2021	7:15:24	IMG_0282.AVI	Unidentified bird	1	-
30/4/2021	CT06	21/4/2021 7:16	20/4/2021	7:16:42	IMG_0283.AVI	*Gallus gallus*	3	Domestic
30/4/2021	CT06	21/4/2021 7:16	20/4/2021	7:16:42	IMG_0283.AVI	Unidentified bird	1	-
30/4/2021	CT06	21/4/2021 7:20	20/4/2021	7:20:26	IMG_0284.AVI	*Gallus gallus*	3	Domestic
30/4/2021	CT06	21/4/2021 7:20	20/4/2021	7:20:54	IMG_0285.AVI	*Gallus gallus*	3	Domestic
30/4/2021	CT06	21/4/2021 7:21	20/4/2021	7:21:18	IMG_0286.AVI	*Gallus gallus*	3	Domestic
30/4/2021	CT06	21/4/2021 8:10	21/4/2021	8:10:26	IMG_0287.AVI	*Garrulax leucolophus*	1	-
30/4/2021	CT06	21/4/2021 12:41	21/4/2021	12:41:34	IMG_0288.AVI	*Garrulax leucolophus*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
30/4/2021	CT06	21/4/2021 16:58	21/4/2021	16:58:16	IMG_0289.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	21/4/2021 20:22	21/4/2021	20:22:52	IMG_0290.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	22/4/2021 6:51	21/4/2021	6:51:30	IMG_0291.AVI	*Gallus gallus*	1	-
30/4/2021	CT06	22/4/2021 6:52	21/4/2021	6:52:02	IMG_0292.AVI	*Gallus gallus*	1	-
30/4/2021	CT06	22/4/2021 6:53	21/4/2021	6:53:20	IMG_0293.AVI	*Gallus gallus*	1	-
30/4/2021	CT06	22/4/2021 7:13	21/4/2021	7:13:00	IMG_0294.AVI	*Garrulax leucolophus*	3	-
30/4/2021	CT06	22/4/2021 7:27	21/4/2021	7:27:26	IMG_0295.AVI	*Rallina fasciata*	1	-
30/4/2021	CT06	22/4/2021 7:53	21/4/2021	7:53:42	IMG_0296.AVI	*Gallus gallus*	1	-
30/4/2021	CT06	22/4/2021 8:03	22/4/2021	8:03:26	IMG_0297.AVI	*Amaurornis phoenicurus*	1	-
30/4/2021	CT06	22/4/2021 16:30	22/4/2021	16:30:08	IMG_0298.AVI	*Gallus gallus*	3	Domestic
30/4/2021	CT06	22/4/2021 16:34	22/4/2021	16:34:38	IMG_0299.AVI	*Gallus gallus*	3	Domestic
30/4/2021	CT06	22/4/2021 16:35	22/4/2021	16:35:02	IMG_0300.AVI	*Gallus gallus*	3	Domestic
30/4/2021	CT06	22/4/2021 16:35	22/4/2021	16:35:38	IMG_0301.AVI	*Gallus gallus*	3	Domestic
30/4/2021	CT06	22/4/2021 16:36	22/4/2021	16:36:10	IMG_0302.AVI	*Gallus gallus*	3	Domestic
30/4/2021	CT06	22/4/2021 18:25	22/4/2021	18:25:04	IMG_0303.AVI	*Tupaia glis*	1	-
30/4/2021	CT06	22/4/2021 18:56	22/4/2021	18:56:34	IMG_0304.AVI	*Sus scrofa*	2	-
30/4/2021	CT06	22/4/2021 18:57	22/4/2021	18:57:36	IMG_0305.AVI	*Sus scrofa*	3	-
30/4/2021	CT06	22/4/2021 19:09	22/4/2021	19:09:52	IMG_0306.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	22/4/2021 20:09	22/4/2021	20:09:40	IMG_0307.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	23/4/2021 6:56	22/4/2021	6:56:44	IMG_0308.AVI	*Tupaia glis*	1	-
30/4/2021	CT06	23/4/2021 7:26	22/4/2021	7:26:36	IMG_0309.AVI	*Amaurornis phoenicurus*	1	-
30/4/2021	CT06	23/4/2021 7:37	22/4/2021	7:37:50	IMG_0310.AVI	*Amaurornis phoenicurus*	1	-
30/4/2021	CT06	23/4/2021 7:44	22/4/2021	7:44:24	IMG_0311.AVI	*Garrulax leucolophus*	1	-
30/4/2021	CT06	23/4/2021 7:47	22/4/2021	7:47:50	IMG_0312.AVI	*Tupaia glis*	1	-
30/4/2021	CT06	23/4/2021 7:52	22/4/2021	7:52:42	IMG_0313.AVI	*Tupaia glis*	1	-
30/4/2021	CT06	23/4/2021 7:53	22/4/2021	7:53:28	IMG_0314.AVI	*Tupaia glis*	1	-
30/4/2021	CT06	23/4/2021 8:11	23/4/2021	8:11:18	IMG_0315.AVI	*Gallus gallus*	3	Domestic
30/4/2021	CT06	23/4/2021 8:11	23/4/2021	8:11:40	IMG_0316.AVI	*Gallus gallus*	3	Domestic
30/4/2021	CT06	23/4/2021 8:18	23/4/2021	8:18:20	IMG_0317.AVI	*Gallus gallus*	3	Domestic
30/4/2021	CT06	23/4/2021 8:18	23/4/2021	8:18:42	IMG_0318.AVI	*Gallus gallus*	3	Domestic
30/4/2021	CT06	23/4/2021 8:19	23/4/2021	8:19:04	IMG_0319.AVI	*Gallus gallus*	3	Domestic
30/4/2021	CT06	23/4/2021 8:19	23/4/2021	8:19:40	IMG_0320.AVI	*Gallus gallus*	3	Domestic
30/4/2021	CT06	23/4/2021 14:09	23/4/2021	14:09:40	IMG_0321.AVI	*Gallus gallus*	1	-
30/4/2021	CT06	24/4/2021 6:59	23/4/2021	6:59:34	IMG_0322.AVI	*Rallina fasciata*	2	-
30/4/2021	CT06	24/4/2021 8:55	24/4/2021	8:55:12	IMG_0323.AVI	*Amaurornis phoenicurus*	1	-
30/4/2021	CT06	24/4/2021 19:07	24/4/2021	19:07:20	IMG_0324.AVI	*Tupaia glis*	1	-
30/4/2021	CT06	24/4/2021 23:08	24/4/2021	23:08:58	IMG_0325.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	24/4/2021 23:09	24/4/2021	23:09:20	IMG_0326.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	24/4/2021 23:10	24/4/2021	23:10:14	IMG_0327.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	24/4/2021 23:10	24/4/2021	23:10:36	IMG_0328.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	24/4/2021 23:11	24/4/2021	23:11:02	IMG_0329.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	24/4/2021 23:11	24/4/2021	23:11:22	IMG_0330.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	24/4/2021 23:11	24/4/2021	23:11:44	IMG_0331.AVI	*Sus scrofa*	2	-
30/4/2021	CT06	24/4/2021 23:12	24/4/2021	23:12:06	IMG_0332.AVI	*Sus scrofa*	3	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
30/4/2021	CT06	25/4/2021 8:52	25/4/2021	8:52:52	IMG_0333.AVI	*Tupaia glis*	1	-
30/4/2021	CT06	25/4/2021 11:53	25/4/2021	11:53:44	IMG_0334.AVI	*Garrulax leucolophus*	1	-
30/4/2021	CT06	25/4/2021 11:54	25/4/2021	11:54:14	IMG_0335.AVI	*Garrulax leucolophus*	2	-
30/4/2021	CT06	25/4/2021 11:54	25/4/2021	11:54:38	IMG_0336.AVI	*Garrulax leucolophus*	1	-
30/4/2021	CT06	25/4/2021 11:59	25/4/2021	11:59:50	IMG_0337.AVI	Unidentified squirrel or treeshrew	1	-
30/4/2021	CT06	25/4/2021 13:10	25/4/2021	13:10:36	IMG_0338.AVI	*Acridotheres javanicus*	2	-
30/4/2021	CT06	25/4/2021 13:10	25/4/2021	13:10:36	IMG_0338.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	25/4/2021 13:11	25/4/2021	13:11:00	IMG_0339.AVI	*Acridotheres javanicus*	1	-
30/4/2021	CT06	25/4/2021 13:11	25/4/2021	13:11:00	IMG_0339.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	25/4/2021 13:11	25/4/2021	13:11:32	IMG_0340.AVI	*Acridotheres javanicus*	1	-
30/4/2021	CT06	25/4/2021 13:11	25/4/2021	13:11:32	IMG_0340.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	25/4/2021 13:12	25/4/2021	13:12:46	IMG_0341.AVI	*Acridotheres javanicus*	2	-
30/4/2021	CT06	25/4/2021 13:12	25/4/2021	13:12:46	IMG_0341.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	25/4/2021 19:26	25/4/2021	19:26:32	IMG_0342.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	25/4/2021 19:27	25/4/2021	19:27:52	IMG_0343.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	25/4/2021 19:28	25/4/2021	19:28:34	IMG_0344.AVI	*Sus scrofa*	1	-
30/4/2021	CT06	25/4/2021 19:29	25/4/2021	19:29:28	IMG_0345.AVI	*Sus scrofa*	1	-
30/4/2021	CT07	10/4/2021 1:47	9/4/2021	1:47:28	IMG_0006.AVI	*Paradoxurus musangus*	1	-
30/4/2021	CT07	10/4/2021 19:40	10/4/2021	19:40:42	IMG_0007.AVI	*Tupaia glis*	1	-
30/4/2021	CT07	10/4/2021 20:00	10/4/2021	20:00:46	IMG_0008.AVI	*Otus lempiji*	1	-
30/4/2021	CT07	12/4/2021 14:36	12/4/2021	14:36:44	IMG_0010.AVI	*Sus scrofa*	1	-
30/4/2021	CT07	12/4/2021 14:37	12/4/2021	14:37:06	IMG_0011.AVI	*Sus scrofa*	1	-
30/4/2021	CT07	12/4/2021 14:37	12/4/2021	14:37:28	IMG_0012.AVI	*Sus scrofa*	1	-
30/4/2021	CT07	12/4/2021 14:37	12/4/2021	14:37:54	IMG_0013.AVI	*Sus scrofa*	1	-
30/4/2021	CT07	12/4/2021 14:38	12/4/2021	14:38:16	IMG_0014.AVI	*Sus scrofa*	1	-
30/4/2021	CT07	12/4/2021 14:38	12/4/2021	14:38:52	IMG_0015.AVI	*Sus scrofa*	1	-
30/4/2021	CT07	12/4/2021 14:39	12/4/2021	14:39:22	IMG_0016.AVI	*Sus scrofa*	1	-
30/4/2021	CT07	12/4/2021 14:39	12/4/2021	14:39:52	IMG_0017.AVI	*Sus scrofa*	1	-
30/4/2021	CT07	12/4/2021 14:40	12/4/2021	14:40:16	IMG_0018.AVI	*Sus scrofa*	1	-
30/4/2021	CT07	12/4/2021 14:45	12/4/2021	14:45:58	IMG_0019.AVI	*Sus scrofa*	1	-
30/4/2021	CT07	12/4/2021 14:46	12/4/2021	14:46:24	IMG_0020.AVI	*Sus scrofa*	1	-
30/4/2021	CT07	12/4/2021 14:46	12/4/2021	14:46:50	IMG_0021.AVI	*Sus scrofa*	1	-
30/4/2021	CT07	12/4/2021 14:47	12/4/2021	14:47:14	IMG_0022.AVI	*Sus scrofa*	1	-
30/4/2021	CT07	12/4/2021 14:49	12/4/2021	14:49:06	IMG_0023.AVI	*Sus scrofa*	1	-
30/4/2021	CT07	12/4/2021 14:49	12/4/2021	14:49:50	IMG_0024.AVI	*Sus scrofa*	1	-
30/4/2021	CT07	12/4/2021 14:50	12/4/2021	14:50:10	IMG_0025.AVI	*Sus scrofa*	1	-
30/4/2021	CT07	12/4/2021 14:50	12/4/2021	14:50:38	IMG_0026.AVI	*Sus scrofa*	1	-
30/4/2021	CT07	12/4/2021 14:52	12/4/2021	14:52:20	IMG_0027.AVI	*Sus scrofa*	2	-
30/4/2021	CT07	12/4/2021 14:52	12/4/2021	14:52:40	IMG_0028.AVI	*Sus scrofa*	2	-
30/4/2021	CT07	12/4/2021 14:53	12/4/2021	14:53:04	IMG_0029.AVI	*Sus scrofa*	2	-
30/4/2021	CT07	12/4/2021 14:53	12/4/2021	14:53:30	IMG_0030.AVI	*Sus scrofa*	1	-
30/4/2021	CT07	12/4/2021 14:53	12/4/2021	14:53:54	IMG_0031.AVI	*Sus scrofa*	1	-
30/4/2021	CT07	12/4/2021 14:54	12/4/2021	14:54:16	IMG_0032.AVI	*Sus scrofa*	1	-
30/4/2021	CT07	12/4/2021 14:55	12/4/2021	14:55:54	IMG_0033.AVI	*Sus scrofa*	4	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
30/4/2021	CT07	12/4/2021 19:10	12/4/2021	19:10:24	IMG_0034.AVI	*Paradoxurus musangus*	1	-
30/4/2021	CT07	13/4/2021 2:39	12/4/2021	2:39:36	IMG_0035.AVI	*Sus scrofa*	1	-
30/4/2021	CT07	13/4/2021 8:55	13/4/2021	8:55:38	IMG_0036.AVI	*Canis lupus familiaris*	3	-
30/4/2021	CT07	13/4/2021 15:43	13/4/2021	15:43:16	IMG_0037.AVI	*Sus scrofa*	1	-
30/4/2021	CT07	13/4/2021 15:43	13/4/2021	15:43:52	IMG_0038.AVI	*Sus scrofa*	1	-
30/4/2021	CT07	13/4/2021 15:44	13/4/2021	15:44:38	IMG_0039.AVI	*Sus scrofa*	1	-
30/4/2021	CT07	14/4/2021 18:21	14/4/2021	18:21:58	IMG_0040.AVI	*Amaurornis phoenicurus*	1	-
30/4/2021	CT07	14/4/2021 18:21	14/4/2021	18:21:58	IMG_0040.AVI	*Gallus gallus*	1	-
30/4/2021	CT07	14/4/2021 18:28	14/4/2021	18:28:22	IMG_0041.AVI	*Gallus gallus*	1	-
30/4/2021	CT07	15/4/2021 9:14	15/4/2021	9:14:16	IMG_0042.AVI	*Gallus gallus*	1	-
30/4/2021	CT07	15/4/2021 9:14	15/4/2021	9:14:40	IMG_0043.AVI	*Gallus gallus*	1	-
30/4/2021	CT07	15/4/2021 9:15	15/4/2021	9:15:08	IMG_0044.AVI	*Gallus gallus*	1	-
30/4/2021	CT07	15/4/2021 9:15	15/4/2021	9:15:32	IMG_0045.AVI	*Gallus gallus*	1	-
30/4/2021	CT07	15/4/2021 18:49	15/4/2021	18:49:36	IMG_0046.AVI	*Amaurornis phoenicurus*	1	-
30/4/2021	CT07	15/4/2021 18:49	15/4/2021	18:49:36	IMG_0046.AVI	*Tupaia glis*	1	-
30/4/2021	CT07	16/4/2021 8:32	16/4/2021	8:32:04	IMG_0047.AVI	*Amaurornis phoenicurus*	1	-
30/4/2021	CT07	16/4/2021 8:50	16/4/2021	8:50:28	IMG_0048.AVI	*Gallus gallus*	2	-
30/4/2021	CT07	16/4/2021 8:56	16/4/2021	8:56:40	IMG_0049.AVI	*Amaurornis phoenicurus*	1	-
30/4/2021	CT07	17/4/2021 5:27	16/4/2021	5:27:50	IMG_0050.AVI	*Paradoxurus musangus*	1	-
30/4/2021	CT07	18/4/2021 6:14	17/4/2021	6:14:50	IMG_0052.AVI	*Sus scrofa*	1	-
30/4/2021	CT07	18/4/2021 6:15	17/4/2021	6:15:12	IMG_0053.AVI	*Sus scrofa*	1	-
30/4/2021	CT07	18/4/2021 6:15	17/4/2021	6:15:32	IMG_0054.AVI	*Sus scrofa*	1	-
30/4/2021	CT07	18/4/2021 6:15	17/4/2021	6:15:54	IMG_0055.AVI	*Sus scrofa*	1	-
30/4/2021	CT07	18/4/2021 6:19	17/4/2021	6:19:34	IMG_0057.AVI	*Sus scrofa*	1	-
30/4/2021	CT07	18/4/2021 6:22	17/4/2021	6:22:50	IMG_0060.AVI	*Sus scrofa*	2	-
30/4/2021	CT07	18/4/2021 6:23	17/4/2021	6:23:12	IMG_0061.AVI	*Sus scrofa*	2	-
30/4/2021	CT07	18/4/2021 9:18	18/4/2021	9:18:56	IMG_0062.AVI	*Gallus gallus*	2	-
30/4/2021	CT07	19/4/2021 9:04	19/4/2021	9:04:06	IMG_0063.AVI	*Gallus gallus*	1	-
30/4/2021	CT07	19/4/2021 9:37	19/4/2021	9:37:26	IMG_0064.AVI	*Gallus gallus*	1	-
30/4/2021	CT07	19/4/2021 12:58	19/4/2021	12:58:06	IMG_0067.AVI	*Gallus gallus*	1	-
30/4/2021	CT07	19/4/2021 13:28	19/4/2021	13:28:36	IMG_0068.AVI	*Amaurornis phoenicurus*	1	-
30/4/2021	CT07	19/4/2021 13:50	19/4/2021	13:50:14	IMG_0069.AVI	*Sus scrofa*	4	-
30/4/2021	CT07	19/4/2021 13:53	19/4/2021	13:53:04	IMG_0070.AVI	*Amaurornis phoenicurus*	1	-
30/4/2021	CT07	19/4/2021 13:54	19/4/2021	13:54:02	IMG_0071.AVI	*Amaurornis phoenicurus*	1	-
30/4/2021	CT07	20/4/2021 1:22	19/4/2021	1:22:56	IMG_0072.AVI	*Otus lempiji*	1	-
30/4/2021	CT07	20/4/2021 5:51	19/4/2021	5:51:06	IMG_0075.AVI	*Sus scrofa*	1	-
30/4/2021	CT07	21/4/2021 8:13	21/4/2021	8:13:04	IMG_0077.AVI	*Amaurornis phoenicurus*	1	-
30/4/2021	CT07	21/4/2021 9:47	21/4/2021	9:47:40	IMG_0078.AVI	*Gallus gallus*	1	-
30/4/2021	CT07	21/4/2021 9:48	21/4/2021	9:48:14	IMG_0079.AVI	*Gallus gallus*	1	-
30/4/2021	CT07	21/4/2021 17:41	21/4/2021	17:41:36	IMG_0085.AVI	*Sus scrofa*	1	-
30/4/2021	CT07	21/4/2021 17:43	21/4/2021	17:43:26	IMG_0086.AVI	*Sus scrofa*	1	-
30/4/2021	CT07	21/4/2021 18:06	21/4/2021	18:06:16	IMG_0087.AVI	*Amaurornis phoenicurus*	1	-
30/4/2021	CT07	21/4/2021 19:54	21/4/2021	19:54:54	IMG_0088.AVI	*Sus scrofa*	1	-
30/4/2021	CT07	22/4/2021 5:47	21/4/2021	5:47:00	IMG_0089.AVI	*Rattus tiomanicus*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
30/4/2021	CT07	23/4/2021 7:14	22/4/2021	7:14:40	IMG_0090.AVI	*Tupaia glis*	1	-
30/4/2021	CT07	23/4/2021 7:26	22/4/2021	7:26:20	IMG_0091.AVI	*Tupaia glis*	1	-
30/4/2021	CT07	23/4/2021 9:42	23/4/2021	9:42:42	IMG_0092.AVI	*Sus scrofa*	3	-
30/4/2021	CT07	23/4/2021 19:14	23/4/2021	19:14:30	IMG_0093.AVI	*Caprimulgus macrurus*	1	-
30/4/2021	CT07	25/4/2021 6:08	24/4/2021	6:08:56	IMG_0095.AVI	*Rattus sp.*	1	-
30/4/2021	CT07	25/4/2021 6:55	24/4/2021	6:55:42	IMG_0096.AVI	*Amaurornis phoenicurus*	1	-
30/4/2021	CT07	25/4/2021 19:04	25/4/2021	19:04:02	IMG_0097.AVI	*Tupaia glis*	1	-
30/4/2021	CT07	25/4/2021 19:26	25/4/2021	19:26:26	IMG_0098.AVI	*Caprimulgus macrurus*	1	-
30/4/2021	CT07	26/4/2021 6:27	25/4/2021	6:27:54	IMG_0099.AVI	*Rattus sp.*	1	-
30/4/2021	CT07	26/4/2021 18:09	26/4/2021	18:09:00	IMG_0100.AVI	*Acridotheres javanicus*	4	-
30/4/2021	CT07	26/4/2021 18:50	26/4/2021	18:50:18	IMG_0101.AVI	*Tupaia glis*	1	-
30/4/2021	CT07	26/4/2021 18:55	26/4/2021	18:55:28	IMG_0102.AVI	*Tupaia glis*	1	-
30/4/2021	CT07	26/4/2021 20:03	26/4/2021	20:03:54	IMG_0103.AVI	*Rattus sp.*	1	-
30/4/2021	CT07	27/4/2021 18:51	27/4/2021	18:51:20	IMG_0104.AVI	*Amaurornis phoenicurus*	1	-
30/4/2021	CT07	27/4/2021 18:51	27/4/2021	18:51:20	IMG_0104.AVI	*Tupaia glis*	1	-
30/4/2021	CT07	28/4/2021 5:23	27/4/2021	5:23:32	IMG_0105.AVI	*Rattus tiomanicus*	1	-
30/4/2021	CT07	28/4/2021 7:06	27/4/2021	7:06:28	IMG_0106.AVI	*Tupaia glis*	1	-
30/4/2021	CT07	28/4/2021 13:13	28/4/2021	13:13:26	IMG_0107.AVI	*Pycnonotus goiavier*	1	-
30/4/2021	CT07	29/4/2021 4:10	28/4/2021	4:10:10	IMG_0108.AVI	*Rattus sp.*	1	-
30/4/2021	CT07	29/4/2021 4:17	28/4/2021	4:17:12	IMG_0109.AVI	*Rattus sp.*	1	-
30/4/2021	CT07	29/4/2021 6:10	28/4/2021	6:10:44	IMG_0111.AVI	*Rattus sp.*	1	-
30/4/2021	CT07	30/4/2021 6:17	29/4/2021	6:17:28	IMG_0112.AVI	*Rattus sp.*	1	-
30/4/2021	CT08	11/4/2021 15:23	11/4/2021	15:23:36	IMG_0006.AVI	*Sus scrofa*	1	-
30/4/2021	CT08	11/4/2021 15:24	11/4/2021	15:24:12	IMG_0007.AVI	*Sus scrofa*	1	-
30/4/2021	CT08	11/4/2021 15:25	11/4/2021	15:25:54	IMG_0008.AVI	*Sus scrofa*	1	-
30/4/2021	CT08	11/4/2021 15:26	11/4/2021	15:26:28	IMG_0009.AVI	*Sus scrofa*	1	-
30/4/2021	CT08	11/4/2021 15:26	11/4/2021	15:26:52	IMG_0010.AVI	*Sus scrofa*	2	-
30/4/2021	CT08	11/4/2021 15:27	11/4/2021	15:27:14	IMG_0011.AVI	*Sus scrofa*	2	-
30/4/2021	CT08	11/4/2021 15:27	11/4/2021	15:27:36	IMG_0012.AVI	*Sus scrofa*	2	-
30/4/2021	CT08	11/4/2021 15:27	11/4/2021	15:27:58	IMG_0013.AVI	*Sus scrofa*	2	-
30/4/2021	CT08	11/4/2021 15:28	11/4/2021	15:28:34	IMG_0014.AVI	*Sus scrofa*	2	-
30/4/2021	CT08	11/4/2021 15:29	11/4/2021	15:29:00	IMG_0015.AVI	*Sus scrofa*	2	-
30/4/2021	CT08	11/4/2021 15:29	11/4/2021	15:29:22	IMG_0016.AVI	*Sus scrofa*	2	-
30/4/2021	CT08	11/4/2021 15:29	11/4/2021	15:29:44	IMG_0017.AVI	*Sus scrofa*	2	-
30/4/2021	CT08	11/4/2021 15:30	11/4/2021	15:30:16	IMG_0018.AVI	*Sus scrofa*	2	-
30/4/2021	CT08	11/4/2021 15:30	11/4/2021	15:30:54	IMG_0019.AVI	*Sus scrofa*	2	-
30/4/2021	CT08	11/4/2021 15:31	11/4/2021	15:31:18	IMG_0020.AVI	*Sus scrofa*	2	-
30/4/2021	CT08	11/4/2021 15:37	11/4/2021	15:37:14	IMG_0021.AVI	*Sus scrofa*	1	-
30/4/2021	CT08	11/4/2021 15:37	11/4/2021	15:37:34	IMG_0022.AVI	*Sus scrofa*	1	-
30/4/2021	CT08	11/4/2021 15:37	11/4/2021	15:37:56	IMG_0023.AVI	*Sus scrofa*	1	-
30/4/2021	CT08	11/4/2021 15:38	11/4/2021	15:38:20	IMG_0024.AVI	*Sus scrofa*	1	-
30/4/2021	CT08	11/4/2021 15:46	11/4/2021	15:46:34	IMG_0025.AVI	*Sus scrofa*	1	-
30/4/2021	CT08	11/4/2021 18:49	11/4/2021	18:49:42	IMG_0026.AVI	*Sus scrofa*	1	-
30/4/2021	CT08	11/4/2021 18:54	11/4/2021	18:54:40	IMG_0027.AVI	*Sus scrofa*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
30/4/2021	CT08	12/4/2021 4:16	11/4/2021	4:16:26	IMG_0028.AVI	*Sus scrofa*	1	-
30/4/2021	CT08	12/4/2021 4:16	11/4/2021	4:16:46	IMG_0029.AVI	*Sus scrofa*	1	-
30/4/2021	CT08	12/4/2021 11:57	12/4/2021	11:57:54	IMG_0030.AVI	*Sus scrofa*	1	-
30/4/2021	CT08	12/4/2021 17:27	12/4/2021	17:27:48	IMG_0031.AVI	*Sus scrofa*	1	-
30/4/2021	CT08	12/4/2021 17:28	12/4/2021	17:28:12	IMG_0032.AVI	*Sus scrofa*	1	-
30/4/2021	CT08	14/4/2021 19:01	14/4/2021	19:01:32	IMG_0033.AVI	*Sus scrofa*	1	-
30/4/2021	CT08	15/4/2021 7:38	14/4/2021	7:38:16	IMG_0034.AVI	*Sus scrofa*	2	-
30/4/2021	CT08	15/4/2021 7:38	14/4/2021	7:38:38	IMG_0035.AVI	*Sus scrofa*	2	-
30/4/2021	CT08	15/4/2021 7:43	14/4/2021	7:43:40	IMG_0036.AVI	*Sus scrofa*	2	-
30/4/2021	CT08	15/4/2021 7:44	14/4/2021	7:44:00	IMG_0037.AVI	*Sus scrofa*	5	-
30/4/2021	CT08	15/4/2021 7:44	14/4/2021	7:44:24	IMG_0038.AVI	*Sus scrofa*	4	-
30/4/2021	CT08	15/4/2021 7:44	14/4/2021	7:44:46	IMG_0039.AVI	*Sus scrofa*	1	-
30/4/2021	CT08	15/4/2021 17:48	15/4/2021	17:48:04	IMG_0040.AVI	*Sus scrofa*	1	-
30/4/2021	CT08	15/4/2021 17:48	15/4/2021	17:48:24	IMG_0041.AVI	*Sus scrofa*	1	-
30/4/2021	CT08	15/4/2021 18:23	15/4/2021	18:23:24	IMG_0042.AVI	*Gallus gallus*	2	-
30/4/2021	CT08	16/4/2021 8:34	16/4/2021	8:34:34	IMG_0043.AVI	*Gallus gallus*	1	-
30/4/2021	CT08	17/4/2021 9:48	17/4/2021	9:48:30	IMG_0044.AVI	*Sus scrofa*	2	-
30/4/2021	CT08	17/4/2021 9:48	17/4/2021	9:48:50	IMG_0045.AVI	*Sus scrofa*	2	-
30/4/2021	CT08	18/4/2021 17:12	18/4/2021	17:12:40	IMG_0047.AVI	*Sus scrofa*	2	-
30/4/2021	CT08	18/4/2021 19:40	18/4/2021	19:40:58	IMG_0048.AVI	*Sus scrofa*	1	-
30/4/2021	CT08	18/4/2021 19:41	18/4/2021	19:41:34	IMG_0049.AVI	*Sus scrofa*	1	-
30/4/2021	CT08	18/4/2021 19:42	18/4/2021	19:42:36	IMG_0050.AVI	*Sus scrofa*	2	-
30/4/2021	CT08	18/4/2021 19:43	18/4/2021	19:43:06	IMG_0051.AVI	*Sus scrofa*	2	-
30/4/2021	CT08	19/4/2021 1:34	18/4/2021	1:34:34	IMG_0053.AVI	*Sus scrofa*	1	-
30/4/2021	CT08	19/4/2021 1:37	18/4/2021	1:37:18	IMG_0054.AVI	*Sus scrofa*	1	-
30/4/2021	CT08	20/4/2021 6:35	19/4/2021	6:35:48	IMG_0056.AVI	*Sus scrofa*	1	-
30/4/2021	CT08	20/4/2021 6:36	19/4/2021	6:36:36	IMG_0058.AVI	*Sus scrofa*	1	-
30/4/2021	CT08	20/4/2021 6:36	19/4/2021	6:36:56	IMG_0059.AVI	*Sus scrofa*	1	-
30/4/2021	CT08	20/4/2021 6:38	19/4/2021	6:38:32	IMG_0060.AVI	*Sus scrofa*	1	-
30/4/2021	CT08	20/4/2021 6:38	19/4/2021	6:38:54	IMG_0061.AVI	*Sus scrofa*	1	-
30/4/2021	CT08	21/4/2021 7:49	20/4/2021	7:49:04	IMG_0062.AVI	*Gallus gallus*	2	-
30/4/2021	CT08	21/4/2021 7:51	20/4/2021	7:51:04	IMG_0063.AVI	*Gallus gallus*	1	-
30/4/2021	CT08	21/4/2021 8:16	21/4/2021	8:16:14	IMG_0064.AVI	*Sus scrofa*	1	-
30/4/2021	CT08	21/4/2021 8:16	21/4/2021	8:16:36	IMG_0065.AVI	*Sus scrofa*	1	-
30/4/2021	CT08	21/4/2021 8:16	21/4/2021	8:16:58	IMG_0066.AVI	*Sus scrofa*	1	-
30/4/2021	CT08	21/4/2021 16:09	21/4/2021	16:09:54	IMG_0067.AVI	*Sus scrofa*	1	-
30/4/2021	CT08	23/4/2021 12:47	23/4/2021	12:47:32	IMG_0068.AVI	*Sus scrofa*	3	-
30/4/2021	CT08	23/4/2021 12:47	23/4/2021	12:47:58	IMG_0069.AVI	*Sus scrofa*	2	-
30/4/2021	CT08	27/4/2021 7:44	26/4/2021	7:44:16	IMG_0071.AVI	*Garrulax leucolophus*	3	-
30/4/2021	CT08	27/4/2021 9:00	27/4/2021	9:00:34	IMG_0072.AVI	*Sus scrofa*	1	-
30/4/2021	CT08	27/4/2021 15:54	27/4/2021	15:54:56	IMG_0073.AVI	*Sus scrofa*	1	-
30/4/2021	CT08	29/4/2021 7:59	28/4/2021	7:59:40	IMG_0075.AVI	*Sus scrofa*	1	-
30/4/2021	CT08	29/4/2021 8:00	29/4/2021	8:00:02	IMG_0076.AVI	*Sus scrofa*	1	-
30/4/2021	CT08	29/4/2021 13:32	29/4/2021	13:32:10	IMG_0082.AVI	*Callosciurus notatus*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
30/4/2021	CT10	9/4/2021 17:46	9/4/2021	17:46:10	IMG_0005.AVI	*Amaurornis phoenicurus*	1	-
30/4/2021	CT10	9/4/2021 17:46	9/4/2021	17:46:10	IMG_0005.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	9/4/2021 17:46	9/4/2021	17:46:34	IMG_0006.AVI	*Amaurornis phoenicurus*	1	-
30/4/2021	CT10	9/4/2021 17:46	9/4/2021	17:46:34	IMG_0006.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	10/4/2021 6:29	9/4/2021	6:29:04	IMG_0007.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	10/4/2021 6:54	9/4/2021	6:54:34	IMG_0008.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	10/4/2021 7:13	9/4/2021	7:13:02	IMG_0009.AVI	*Sus scrofa*	2	-
30/4/2021	CT10	10/4/2021 7:13	9/4/2021	7:13:32	IMG_0010.AVI	*Sus scrofa*	2	-
30/4/2021	CT10	10/4/2021 17:05	10/4/2021	17:05:44	IMG_0011.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	10/4/2021 17:06	10/4/2021	17:06:08	IMG_0012.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	10/4/2021 17:06	10/4/2021	17:06:32	IMG_0013.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	10/4/2021 17:09	10/4/2021	17:09:36	IMG_0014.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	11/4/2021 6:48	10/4/2021	6:48:22	IMG_0015.AVI	*Caprimulgus macrurus*	1	-
30/4/2021	CT10	11/4/2021 8:06	11/4/2021	8:06:44	IMG_0016.AVI	*Tupaia glis*	1	-
30/4/2021	CT10	11/4/2021 9:55	11/4/2021	9:55:00	IMG_0017.AVI	*Callosciurus notatus*	1	-
30/4/2021	CT10	11/4/2021 12:05	11/4/2021	12:05:40	IMG_0018.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	11/4/2021 12:06	11/4/2021	12:06:24	IMG_0019.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	11/4/2021 12:07	11/4/2021	12:07:22	IMG_0020.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	11/4/2021 12:09	11/4/2021	12:09:14	IMG_0021.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	11/4/2021 12:09	11/4/2021	12:09:50	IMG_0022.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	11/4/2021 12:09	11/4/2021	12:09:50	IMG_0022.AVI	*Varanus salvator*	1	-
30/4/2021	CT10	11/4/2021 12:10	11/4/2021	12:10:12	IMG_0023.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	11/4/2021 12:10	11/4/2021	12:10:12	IMG_0023.AVI	*Varanus salvator*	1	-
30/4/2021	CT10	11/4/2021 12:10	11/4/2021	12:10:34	IMG_0024.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	11/4/2021 12:10	11/4/2021	12:10:58	IMG_0025.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	11/4/2021 12:11	11/4/2021	12:11:24	IMG_0026.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	11/4/2021 12:11	11/4/2021	12:11:24	IMG_0026.AVI	*Varanus salvator*	1	-
30/4/2021	CT10	11/4/2021 12:13	11/4/2021	12:13:12	IMG_0027.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	11/4/2021 12:13	11/4/2021	12:13:48	IMG_0028.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	11/4/2021 12:14	11/4/2021	12:14:10	IMG_0029.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	11/4/2021 12:15	11/4/2021	12:15:50	IMG_0030.AVI	*Garrulax leucolophus*	2	-
30/4/2021	CT10	11/4/2021 12:15	11/4/2021	12:15:50	IMG_0030.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	11/4/2021 12:17	11/4/2021	12:17:00	IMG_0031.AVI	*Garrulax leucolophus*	2	-
30/4/2021	CT10	11/4/2021 12:17	11/4/2021	12:17:00	IMG_0031.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	11/4/2021 12:19	11/4/2021	12:19:14	IMG_0032.AVI	*Garrulax leucolophus*	2	-
30/4/2021	CT10	11/4/2021 12:19	11/4/2021	12:19:14	IMG_0032.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	11/4/2021 12:19	11/4/2021	12:19:38	IMG_0033.AVI	*Garrulax leucolophus*	1	-
30/4/2021	CT10	11/4/2021 12:19	11/4/2021	12:19:38	IMG_0033.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	11/4/2021 12:20	11/4/2021	12:20:06	IMG_0034.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	11/4/2021 12:21	11/4/2021	12:21:52	IMG_0035.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	11/4/2021 12:22	11/4/2021	12:22:14	IMG_0036.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	11/4/2021 14:31	11/4/2021	14:31:14	IMG_0037.AVI	*Sus scrofa*	2	-
30/4/2021	CT10	11/4/2021 14:33	11/4/2021	14:33:32	IMG_0038.AVI	*Sus scrofa*	2	-
30/4/2021	CT10	11/4/2021 14:35	11/4/2021	14:35:46	IMG_0039.AVI	*Amaurornis phoenicurus*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
30/4/2021	CT10	11/4/2021 14:35	11/4/2021	14:35:46	IMG_0039.AVI	*Sus scrofa*	2	-
30/4/2021	CT10	11/4/2021 14:36	11/4/2021	14:36:10	IMG_0040.AVI	*Amaurornis phoenicurus*	1	-
30/4/2021	CT10	11/4/2021 14:36	11/4/2021	14:36:10	IMG_0040.AVI	*Sus scrofa*	2	-
30/4/2021	CT10	11/4/2021 14:36	11/4/2021	14:36:34	IMG_0041.AVI	*Sus scrofa*	2	-
30/4/2021	CT10	11/4/2021 14:37	11/4/2021	14:37:40	IMG_0042.AVI	*Amaurornis phoenicurus*	1	-
30/4/2021	CT10	11/4/2021 14:37	11/4/2021	14:37:40	IMG_0042.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	11/4/2021 18:41	11/4/2021	18:41:06	IMG_0043.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	11/4/2021 18:41	11/4/2021	18:41:26	IMG_0044.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	12/4/2021 6:49	11/4/2021	6:49:32	IMG_0045.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	12/4/2021 12:41	12/4/2021	12:41:28	IMG_0046.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	12/4/2021 12:41	12/4/2021	12:41:50	IMG_0047.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	12/4/2021 13:34	12/4/2021	13:34:26	IMG_0048.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	12/4/2021 13:47	12/4/2021	13:47:24	IMG_0049.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	12/4/2021 13:48	12/4/2021	13:48:52	IMG_0050.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	12/4/2021 13:50	12/4/2021	13:50:36	IMG_0051.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	12/4/2021 16:32	12/4/2021	16:32:22	IMG_0052.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	12/4/2021 16:45	12/4/2021	16:45:20	IMG_0053.AVI	*Sus scrofa*	2	-
30/4/2021	CT10	12/4/2021 16:47	12/4/2021	16:47:28	IMG_0054.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	13/4/2021 6:47	12/4/2021	6:47:32	IMG_0055.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	13/4/2021 6:47	12/4/2021	6:47:54	IMG_0056.AVI	*Pitta moluccensis*	1	-
30/4/2021	CT10	13/4/2021 6:47	12/4/2021	6:47:54	IMG_0056.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	13/4/2021 6:48	12/4/2021	6:48:20	IMG_0057.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	13/4/2021 6:48	12/4/2021	6:48:58	IMG_0058.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	13/4/2021 6:49	12/4/2021	6:49:20	IMG_0059.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	13/4/2021 6:50	12/4/2021	6:50:10	IMG_0060.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	13/4/2021 6:50	12/4/2021	6:50:34	IMG_0061.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	13/4/2021 6:50	12/4/2021	6:50:56	IMG_0062.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	14/4/2021 4:51	13/4/2021	4:51:44	IMG_0063.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	14/4/2021 6:18	13/4/2021	6:18:40	IMG_0064.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	14/4/2021 6:19	13/4/2021	6:19:10	IMG_0065.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	14/4/2021 10:54	14/4/2021	10:54:40	IMG_0066.AVI	*Callosciurus notatus*	1	-
30/4/2021	CT10	14/4/2021 11:02	14/4/2021	11:02:38	IMG_0067.AVI	*Callosciurus notatus*	1	-
30/4/2021	CT10	14/4/2021 12:49	14/4/2021	12:49:58	IMG_0068.AVI	*Callosciurus notatus*	1	-
30/4/2021	CT10	14/4/2021 15:09	14/4/2021	15:09:02	IMG_0069.AVI	*Gallus gallus*	1	-
30/4/2021	CT10	14/4/2021 16:02	14/4/2021	16:02:22	IMG_0070.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	14/4/2021 16:54	14/4/2021	16:54:58	IMG_0071.AVI	*Sus scrofa*	2	-
30/4/2021	CT10	14/4/2021 16:55	14/4/2021	16:55:24	IMG_0072.AVI	*Sus scrofa*	2	-
30/4/2021	CT10	14/4/2021 16:56	14/4/2021	16:56:44	IMG_0073.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	14/4/2021 16:58	14/4/2021	16:58:24	IMG_0074.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	14/4/2021 16:58	14/4/2021	16:58:48	IMG_0075.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	14/4/2021 16:59	14/4/2021	16:59:10	IMG_0076.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	14/4/2021 17:03	14/4/2021	17:03:24	IMG_0077.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	14/4/2021 17:34	14/4/2021	17:34:30	IMG_0078.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	14/4/2021 17:37	14/4/2021	17:37:02	IMG_0079.AVI	*Amaurornis phoenicurus*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
30/4/2021	CT10	14/4/2021 17:37	14/4/2021	17:37:02	IMG_0079.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	14/4/2021 17:37	14/4/2021	17:37:22	IMG_0080.AVI	*Amaurornis phoenicurus*	1	-
30/4/2021	CT10	14/4/2021 17:37	14/4/2021	17:37:22	IMG_0080.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	14/4/2021 17:38	14/4/2021	17:38:30	IMG_0081.AVI	*Amaurornis phoenicurus*	1	-
30/4/2021	CT10	14/4/2021 17:38	14/4/2021	17:38:30	IMG_0081.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	14/4/2021 17:38	14/4/2021	17:38:52	IMG_0082.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	14/4/2021 17:39	14/4/2021	17:39:16	IMG_0083.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	14/4/2021 17:39	14/4/2021	17:39:42	IMG_0084.AVI	*Amaurornis phoenicurus*	1	-
30/4/2021	CT10	14/4/2021 17:39	14/4/2021	17:39:42	IMG_0084.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	14/4/2021 17:40	14/4/2021	17:40:04	IMG_0085.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	14/4/2021 17:40	14/4/2021	17:40:26	IMG_0086.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	14/4/2021 17:40	14/4/2021	17:40:48	IMG_0087.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	14/4/2021 17:42	14/4/2021	17:42:02	IMG_0088.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	15/4/2021 20:09	15/4/2021	20:09:50	IMG_0089.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	15/4/2021 20:10	15/4/2021	20:10:12	IMG_0090.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	16/4/2021 9:10	16/4/2021	9:10:58	IMG_0091.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	16/4/2021 12:34	16/4/2021	12:34:08	IMG_0092.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	16/4/2021 12:36	16/4/2021	12:36:04	IMG_0093.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	16/4/2021 12:42	16/4/2021	12:42:02	IMG_0094.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	16/4/2021 18:37	16/4/2021	18:37:52	IMG_0095.AVI	*Sus scrofa*	2	-
30/4/2021	CT10	16/4/2021 18:38	16/4/2021	18:38:14	IMG_0096.AVI	*Sus scrofa*	2	-
30/4/2021	CT10	16/4/2021 18:38	16/4/2021	18:38:44	IMG_0097.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	16/4/2021 18:39	16/4/2021	18:39:48	IMG_0098.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	16/4/2021 18:52	16/4/2021	18:52:54	IMG_0099.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	16/4/2021 18:53	16/4/2021	18:53:18	IMG_0100.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	17/4/2021 2:12	16/4/2021	2:12:32	IMG_0101.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	17/4/2021 2:12	16/4/2021	2:12:52	IMG_0102.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	17/4/2021 2:13	16/4/2021	2:13:14	IMG_0103.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	17/4/2021 8:36	17/4/2021	8:36:10	IMG_0104.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	18/4/2021 1:41	17/4/2021	1:41:50	IMG_0105.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	18/4/2021 15:11	18/4/2021	15:11:00	IMG_0106.AVI	*Sus scrofa*	2	-
30/4/2021	CT10	18/4/2021 18:45	18/4/2021	18:45:04	IMG_0107.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	19/4/2021 12:22	19/4/2021	12:22:54	IMG_0109.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	19/4/2021 16:21	19/4/2021	16:21:22	IMG_0110.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	21/4/2021 9:15	21/4/2021	9:15:42	IMG_0112.AVI	*Callosciurus notatus*	1	-
30/4/2021	CT10	21/4/2021 15:29	21/4/2021	15:29:28	IMG_0113.AVI	*Sus scrofa*	2	-
30/4/2021	CT10	21/4/2021 15:30	21/4/2021	15:30:24	IMG_0114.AVI	*Amaurornis phoenicurus*	1	-
30/4/2021	CT10	21/4/2021 15:30	21/4/2021	15:30:24	IMG_0114.AVI	*Sus scrofa*	3	-
30/4/2021	CT10	22/4/2021 18:27	22/4/2021	18:27:30	IMG_0115.AVI	*Amaurornis phoenicurus*	1	-
30/4/2021	CT10	22/4/2021 18:27	22/4/2021	18:27:30	IMG_0115.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	22/4/2021 18:27	22/4/2021	18:27:50	IMG_0116.AVI	*Amaurornis phoenicurus*	1	-
30/4/2021	CT10	22/4/2021 18:27	22/4/2021	18:27:50	IMG_0116.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	22/4/2021 23:13	22/4/2021	23:13:42	IMG_0117.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	23/4/2021 5:13	22/4/2021	5:13:26	IMG_0118.AVI	*Sus scrofa*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
30/4/2021	CT10	23/4/2021 5:14	22/4/2021	5:14:08	IMG_0119.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	23/4/2021 11:08	23/4/2021	11:08:02	IMG_0120.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	23/4/2021 11:08	23/4/2021	11:08:24	IMG_0121.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	25/4/2021 12:35	25/4/2021	12:35:22	IMG_0123.AVI	*Gallus gallus*	1	-
30/4/2021	CT10	25/4/2021 21:24	25/4/2021	21:24:44	IMG_0124.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	26/4/2021 8:06	26/4/2021	8:06:12	IMG_0125.AVI	*Gallus gallus*	1	-
30/4/2021	CT10	26/4/2021 10:11	26/4/2021	10:11:12	IMG_0126.AVI	*Gallus gallus*	1	-
30/4/2021	CT10	26/4/2021 12:37	26/4/2021	12:37:16	IMG_0127.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	26/4/2021 15:22	26/4/2021	15:22:20	IMG_0128.AVI	*Copsychus saularis*	1	-
30/4/2021	CT10	26/4/2021 15:39	26/4/2021	15:39:04	IMG_0129.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	27/4/2021 6:23	26/4/2021	6:23:42	IMG_0130.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	27/4/2021 6:25	26/4/2021	6:25:36	IMG_0131.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	27/4/2021 6:26	26/4/2021	6:26:12	IMG_0132.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	27/4/2021 6:27	26/4/2021	6:27:06	IMG_0133.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	27/4/2021 6:28	26/4/2021	6:28:14	IMG_0134.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	27/4/2021 6:28	26/4/2021	6:28:44	IMG_0135.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	27/4/2021 13:19	27/4/2021	13:19:06	IMG_0136.AVI	*Callosciurus notatus*	1	-
30/4/2021	CT10	27/4/2021 23:10	27/4/2021	23:10:10	IMG_0137.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	28/4/2021 10:19	28/4/2021	10:19:34	IMG_0138.AVI	*Amaurornis phoenicurus*	1	-
30/4/2021	CT10	28/4/2021 10:19	28/4/2021	10:19:34	IMG_0138.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	28/4/2021 17:39	28/4/2021	17:39:14	IMG_0139.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	28/4/2021 18:33	28/4/2021	18:33:44	IMG_0140.AVI	*Callosciurus notatus*	1	-
30/4/2021	CT10	28/4/2021 21:21	28/4/2021	21:21:42	IMG_0141.AVI	*Sus scrofa*	3	-
30/4/2021	CT10	28/4/2021 21:22	28/4/2021	21:22:08	IMG_0142.AVI	*Sus scrofa*	5	-
30/4/2021	CT10	29/4/2021 17:55	29/4/2021	17:55:38	IMG_0143.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	29/4/2021 19:11	29/4/2021	19:11:36	IMG_0144.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	29/4/2021 19:12	29/4/2021	19:12:02	IMG_0145.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	29/4/2021 19:12	29/4/2021	19:12:22	IMG_0146.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	29/4/2021 19:12	29/4/2021	19:12:44	IMG_0147.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	29/4/2021 19:13	29/4/2021	19:13:58	IMG_0148.AVI	*Sus scrofa*	1	-
30/4/2021	CT10	29/4/2021 19:18	29/4/2021	19:18:48	IMG_0150.AVI	*Sus scrofa*	1	-
30/4/2021	CT11	9/4/2021 21:33	9/4/2021	21:33:30	IMG_0002.AVI	*Sus scrofa*	1	-
30/4/2021	CT11	10/4/2021 13:47	10/4/2021	13:47:54	IMG_0003.AVI	*Acridotheres javanicus*	1	-
30/4/2021	CT11	10/4/2021 13:47	10/4/2021	13:47:54	IMG_0003.AVI	Unidentified squirrel or treeshrew	1	-
30/4/2021	CT11	10/4/2021 14:56	10/4/2021	14:56:14	IMG_0005.AVI	*Acridotheres javanicus*	2	-
30/4/2021	CT11	10/4/2021 14:56	10/4/2021	14:56:14	IMG_0005.AVI	Unidentified squirrel or treeshrew	1	-
30/4/2021	CT11	10/4/2021 21:15	10/4/2021	21:15:20	IMG_0006.AVI	*Sus scrofa*	1	-
30/4/2021	CT11	11/4/2021 13:08	11/4/2021	13:08:04	IMG_0009.AVI	*Gallus gallus*	1	-
30/4/2021	CT11	11/4/2021 13:30	11/4/2021	13:30:50	IMG_0010.AVI	*Acridotheres javanicus*	1	-
30/4/2021	CT11	14/4/2021 15:41	14/4/2021	15:41:04	IMG_0011.AVI	*Sus scrofa*	1	-
30/4/2021	CT11	15/4/2021 7:11	14/4/2021	7:11:56	IMG_0012.AVI	*Gallus gallus*	1	-
30/4/2021	CT11	15/4/2021 10:01	15/4/2021	10:01:50	IMG_0013.AVI	*Gallus gallus*	2	-
30/4/2021	CT11	15/4/2021 12:21	15/4/2021	12:21:56	IMG_0014.AVI	*Callosciurus notatus*	2	-
30/4/2021	CT11	16/4/2021 0:07	15/4/2021	0:07:24	IMG_0015.AVI	*Sus scrofa*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
30/4/2021	CT11	16/4/2021 5:28	15/4/2021	5:28:44	IMG_0016.AVI	*Sus scrofa*	1	-
30/4/2021	CT11	16/4/2021 7:22	15/4/2021	7:22:14	IMG_0017.AVI	*Amaurornis phoenicurus*	1	-
30/4/2021	CT11	16/4/2021 15:11	16/4/2021	15:11:30	IMG_0018.AVI	*Sus scrofa*	1	-
30/4/2021	CT11	16/4/2021 15:11	16/4/2021	15:11:52	IMG_0019.AVI	*Sus scrofa*	1	-
30/4/2021	CT11	16/4/2021 15:13	16/4/2021	15:13:08	IMG_0020.AVI	*Sus scrofa*	2	-
30/4/2021	CT11	16/4/2021 15:13	16/4/2021	15:13:30	IMG_0021.AVI	*Sus scrofa*	3	-
30/4/2021	CT11	16/4/2021 15:14	16/4/2021	15:14:02	IMG_0022.AVI	*Sus scrofa*	1	-
30/4/2021	CT11	16/4/2021 18:51	16/4/2021	18:51:38	IMG_0023.AVI	*Sus scrofa*	2	-
30/4/2021	CT11	17/4/2021 23:29	17/4/2021	23:29:22	IMG_0024.AVI	*Sus scrofa*	1	-
30/4/2021	CT11	18/4/2021 7:39	17/4/2021	7:39:14	IMG_0025.AVI	*Amaurornis phoenicurus*	1	-
30/4/2021	CT11	18/4/2021 10:12	18/4/2021	10:12:00	IMG_0026.AVI	*Sus scrofa*	1	-
30/4/2021	CT11	18/4/2021 12:15	18/4/2021	12:15:12	IMG_0027.AVI	*Sus scrofa*	1	-
30/4/2021	CT11	18/4/2021 14:38	18/4/2021	14:38:52	IMG_0028.AVI	*Sus scrofa*	1	-
30/4/2021	CT11	19/4/2021 2:11	18/4/2021	2:11:32	IMG_0029.AVI	*Sus scrofa*	1	-
30/4/2021	CT11	19/4/2021 7:14	18/4/2021	7:14:24	IMG_0030.AVI	*Sus scrofa*	1	-
30/4/2021	CT11	19/4/2021 13:32	19/4/2021	13:32:34	IMG_0032.AVI	*Chalcophaps indica*	1	-
30/4/2021	CT11	19/4/2021 14:35	19/4/2021	14:35:52	IMG_0033.AVI	*Sus scrofa*	1	-
30/4/2021	CT11	19/4/2021 14:42	19/4/2021	14:42:40	IMG_0034.AVI	*Gallus gallus*	1	-
30/4/2021	CT11	19/4/2021 15:41	19/4/2021	15:41:50	IMG_0035.AVI	*Sus scrofa*	2	-
30/4/2021	CT11	20/4/2021 0:31	19/4/2021	0:31:22	IMG_0036.AVI	*Sus scrofa*	4	-
30/4/2021	CT11	20/4/2021 0:31	19/4/2021	0:31:44	IMG_0037.AVI	*Sus scrofa*	3	-
30/4/2021	CT11	20/4/2021 4:31	19/4/2021	4:31:44	IMG_0039.AVI	*Sus scrofa*	1	-
30/4/2021	CT11	20/4/2021 6:47	19/4/2021	6:47:06	IMG_0040.AVI	*Sus scrofa*	1	-
30/4/2021	CT11	20/4/2021 10:07	20/4/2021	10:07:30	IMG_0041.AVI	*Sus scrofa*	1	-
30/4/2021	CT11	20/4/2021 12:19	20/4/2021	12:19:48	IMG_0042.AVI	*Garrulax leucolophus*	1	-
30/4/2021	CT11	20/4/2021 14:02	20/4/2021	14:02:34	IMG_0043.AVI	*Garrulax leucolophus*	1	-
30/4/2021	CT11	20/4/2021 16:37	20/4/2021	16:37:50	IMG_0045.AVI	*Sus scrofa*	1	-
30/4/2021	CT11	21/4/2021 7:07	20/4/2021	7:07:52	IMG_0046.AVI	*Pitta moluccensis*	1	-
30/4/2021	CT11	21/4/2021 11:27	21/4/2021	11:27:34	IMG_0047.AVI	*Sus scrofa*	1	-
30/4/2021	CT11	21/4/2021 13:05	21/4/2021	13:05:02	IMG_0048.AVI	*Sus scrofa*	2	-
30/4/2021	CT11	21/4/2021 23:40	21/4/2021	23:40:16	IMG_0050.AVI	*Sus scrofa*	1	-
30/4/2021	CT11	22/4/2021 7:13	21/4/2021	7:13:34	IMG_0051.AVI	*Sus scrofa*	1	-
30/4/2021	CT11	22/4/2021 9:01	22/4/2021	9:01:22	IMG_0052.AVI	*Sus scrofa*	1	-
30/4/2021	CT11	23/4/2021 5:26	22/4/2021	5:26:14	IMG_0053.AVI	*Sus scrofa*	1	-
30/4/2021	CT11	23/4/2021 8:30	23/4/2021	8:30:24	IMG_0054.AVI	*Sus scrofa*	1	-
30/4/2021	CT11	23/4/2021 8:32	23/4/2021	8:32:58	IMG_0055.AVI	*Gallus gallus*	1	-
30/4/2021	CT11	23/4/2021 9:20	23/4/2021	9:20:08	IMG_0056.AVI	*Sus scrofa*	1	-
30/4/2021	CT11	23/4/2021 12:36	23/4/2021	12:36:46	IMG_0057.AVI	*Garrulax leucolophus*	2	-
30/4/2021	CT11	23/4/2021 17:51	23/4/2021	17:51:48	IMG_0058.AVI	*Amaurornis phoenicurus*	1	-
30/4/2021	CT11	24/4/2021 18:47	24/4/2021	18:47:32	IMG_0059.AVI	*Sus scrofa*	1	-
30/4/2021	CT11	25/4/2021 8:45	25/4/2021	8:45:12	IMG_0060.AVI	*Sus scrofa*	1	-
30/4/2021	CT11	25/4/2021 12:12	25/4/2021	12:12:08	IMG_0061.AVI	*Sus scrofa*	1	-
30/4/2021	CT11	25/4/2021 12:16	25/4/2021	12:16:42	IMG_0062.AVI	*Sus scrofa*	1	-
30/4/2021	CT11	25/4/2021 12:36	25/4/2021	12:36:08	IMG_0063.AVI	*Copsychus saularis*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
30/4/2021	CT11	25/4/2021 12:49	25/4/2021	12:49:52	IMG_0064.AVI	*Copsychus saularis*	1	-
30/4/2021	CT11	25/4/2021 13:12	25/4/2021	13:12:36	IMG_0065.AVI	*Copsychus saularis*	1	-
30/4/2021	CT11	25/4/2021 14:07	25/4/2021	14:07:02	IMG_0066.AVI	*Gallus gallus*	1	-
30/4/2021	CT11	25/4/2021 15:15	25/4/2021	15:15:50	IMG_0068.AVI	*Callosciurus notatus*	1	-
30/4/2021	CT11	25/4/2021 15:21	25/4/2021	15:21:36	IMG_0069.AVI	*Sus scrofa*	1	-
30/4/2021	CT11	25/4/2021 16:05	25/4/2021	16:05:08	IMG_0070.AVI	*Copsychus saularis*	1	-
30/4/2021	CT11	25/4/2021 21:06	25/4/2021	21:06:48	IMG_0072.AVI	*Paradoxurus musangus*	1	-
30/4/2021	CT11	26/4/2021 7:15	25/4/2021	7:15:46	IMG_0073.AVI	*Sus scrofa*	1	-
30/4/2021	CT11	26/4/2021 12:50	26/4/2021	12:50:06	IMG_0074.AVI	*Sus scrofa*	1	-
30/4/2021	CT11	27/4/2021 0:02	26/4/2021	0:02:02	IMG_0075.AVI	*Sus scrofa*	1	-
30/4/2021	CT11	27/4/2021 1:46	26/4/2021	1:46:52	IMG_0076.AVI	*Sus scrofa*	1	-
30/4/2021	CT11	28/4/2021 8:18	28/4/2021	8:18:14	IMG_0077.AVI	*Sus scrofa*	1	-
30/4/2021	CT11	28/4/2021 8:21	28/4/2021	8:21:10	IMG_0078.AVI	*Sus scrofa*	1	-
30/4/2021	CT11	28/4/2021 17:50	28/4/2021	17:50:48	IMG_0079.AVI	*Amaurornis phoenicurus*	1	-
30/4/2021	CT11	29/4/2021 13:58	29/4/2021	13:58:56	IMG_0080.AVI	*Callosciurus notatus*	1	-
30/4/2021	CT11	29/4/2021 16:03	29/4/2021	16:03:32	IMG_0081.AVI	*Callosciurus notatus*	1	-
30/4/2021	CT12	16/4/2021 15:15	16/4/2021	15:15:30	IMG_0003.AVI	*Gallus gallus*	1	-
30/4/2021	CT12	16/4/2021 15:22	16/4/2021	15:22:24	IMG_0004.AVI	*Gallus gallus*	1	-
30/4/2021	CT12	17/4/2021 4:30	16/4/2021	4:30:02	IMG_0005.AVI	*Sus scrofa*	2	-
30/4/2021	CT12	18/4/2021 6:57	17/4/2021	6:57:02	IMG_0007.AVI	*Sus scrofa*	1	-
30/4/2021	CT12	18/4/2021 9:05	18/4/2021	9:05:58	IMG_0008.AVI	Unidentified bird	1	-
30/4/2021	CT12	18/4/2021 18:18	18/4/2021	18:18:00	IMG_0010.AVI	*Sus scrofa*	1	-
30/4/2021	CT12	20/4/2021 19:12	20/4/2021	19:12:46	IMG_0011.AVI	*Sus scrofa*	1	-
30/4/2021	CT12	21/4/2021 10:01	21/4/2021	10:01:28	IMG_0012.AVI	*Gallus gallus*	1	-
30/4/2021	CT12	21/4/2021 18:49	21/4/2021	18:49:50	IMG_0014.AVI	*Sus scrofa*	1	-
30/4/2021	CT12	22/4/2021 7:05	21/4/2021	7:05:00	IMG_0015.AVI	*Sus scrofa*	1	-
30/4/2021	CT12	23/4/2021 7:23	22/4/2021	7:23:12	IMG_0016.AVI	*Sus scrofa*	1	-
30/4/2021	CT12	23/4/2021 19:06	23/4/2021	19:06:18	IMG_0017.AVI	*Sus scrofa*	1	-
30/4/2021	CT12	24/4/2021 5:55	23/4/2021	5:55:10	IMG_0018.AVI	*Sus scrofa*	1	-
30/4/2021	CT12	24/4/2021 7:05	23/4/2021	7:05:32	IMG_0019.AVI	*Sus scrofa*	1	-
30/4/2021	CT12	25/4/2021 4:17	24/4/2021	4:17:06	IMG_0021.AVI	*Sus scrofa*	1	-
30/4/2021	CT12	25/4/2021 9:18	25/4/2021	9:18:50	IMG_0022.AVI	*Gallus gallus*	1	-
30/4/2021	CT12	26/4/2021 7:29	25/4/2021	7:29:56	IMG_0023.AVI	*Callosciurus notatus*	1	-
30/4/2021	CT12	26/4/2021 21:55	26/4/2021	21:55:46	IMG_0024.AVI	*Sus scrofa*	1	-
30/4/2021	CT12	26/4/2021 21:56	26/4/2021	21:56:14	IMG_0025.AVI	*Sus scrofa*	1	-
30/4/2021	CT12	26/4/2021 21:56	26/4/2021	21:56:38	IMG_0026.AVI	*Sus scrofa*	1	-
30/4/2021	CT12	26/4/2021 21:56	26/4/2021	21:56:58	IMG_0027.AVI	*Sus scrofa*	1	-
30/4/2021	CT12	26/4/2021 21:57	26/4/2021	21:57:22	IMG_0028.AVI	*Sus scrofa*	1	-
30/4/2021	CT12	26/4/2021 21:57	26/4/2021	21:57:44	IMG_0029.AVI	*Sus scrofa*	1	-
30/4/2021	CT12	28/4/2021 7:51	27/4/2021	7:51:24	IMG_0030.AVI	*Sus scrofa*	1	-
30/4/2021	CT12	28/4/2021 15:59	28/4/2021	15:59:58	IMG_0031.AVI	*Callosciurus notatus*	1	-
30/4/2021	CT12	30/4/2021 7:41	29/4/2021	7:41:34	IMG_0032.AVI	*Garrulax leucolophus*	1	-
30/4/2021	CT13	10/4/2021 2:22	9/4/2021	2:22:22	IMG_0014.MP4	*Sus scrofa*	1	-
30/4/2021	CT13	10/4/2021 20:56	10/4/2021	20:56:50	IMG_0035.MP4	*Sus scrofa*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
30/4/2021	CT13	10/4/2021 21:44	10/4/2021	21:44:22	IMG_0036.MP4	*Sus scrofa*	1	-
30/4/2021	CT13	15/4/2021 20:34	15/4/2021	20:34:58	IMG_0093.MP4	*Sus scrofa*	5	1 mother 4 piglets
30/4/2021	CT13	16/4/2021 1:09	15/4/2021	1:09:16	IMG_0096.MP4	*Sus scrofa*	1	-
30/4/2021	CT13	16/4/2021 1:09	15/4/2021	1:09:48	IMG_0097.MP4	*Sus scrofa*	1	-
30/4/2021	CT13	16/4/2021 19:39	16/4/2021	19:39:50	IMG_0105.MP4	*Sus scrofa*	1	-
30/4/2021	CT13	16/4/2021 20:03	16/4/2021	20:03:40	IMG_0106.MP4	*Sus scrofa*	1	-
30/4/2021	CT13	16/4/2021 20:05	16/4/2021	20:05:56	IMG_0107.MP4	*Sus scrofa*	1	-
30/4/2021	CT13	18/4/2021 0:34	17/4/2021	0:34:42	IMG_0127.MP4	*Sus scrofa*	1	-
30/4/2021	CT13	18/4/2021 21:06	18/4/2021	21:06:48	IMG_0137.MP4	*Sus scrofa*	6	1 mother 5 piglets
30/4/2021	CT13	19/4/2021 13:49	19/4/2021	13:49:36	IMG_0143.MP4	*Todiramphus chloris*	1	-
30/4/2021	CT13	19/4/2021 22:48	19/4/2021	22:48:06	IMG_0158.MP4	*Sus scrofa*	5	1 mother 4 piglets
30/4/2021	CT13	19/4/2021 23:04	19/4/2021	23:04:24	IMG_0159.MP4	*Sus scrofa*	1	-
30/4/2021	CT13	20/4/2021 3:48	19/4/2021	3:48:36	IMG_0160.MP4	*Sus scrofa*	1	-
30/4/2021	CT13	21/4/2021 4:43	20/4/2021	4:43:14	IMG_0173.MP4	*Sus scrofa*	1	-
30/4/2021	CT13	21/4/2021 21:38	21/4/2021	21:38:54	IMG_0182.MP4	*Sus scrofa*	1	-
30/4/2021	CT13	24/4/2021 21:26	24/4/2021	21:26:16	IMG_0207.MP4	*Sus scrofa*	1	-
30/4/2021	CT13	24/4/2021 21:31	24/4/2021	21:31:20	IMG_0208.MP4	*Sus scrofa*	2	-
30/4/2021	CT13	25/4/2021 1:11	24/4/2021	1:11:48	IMG_0209.MP4	*Sus scrofa*	1	-
30/4/2021	CT13	27/4/2021 19:56	27/4/2021	19:56:24	IMG_0267.MP4	*Sus scrofa*	1	-
30/4/2021	CT13	30/4/2021 4:30	29/4/2021	4:30:44	IMG_0313.MP4	*Sus scrofa*	1	-
30/4/2021	CT14	18/4/2021 12:32	18/4/2021	12:32:20	IMG_0003.MP4	*Gallus gallus*	1	-
30/4/2021	CT14	19/4/2021 15:29	19/4/2021	15:29:34	IMG_0004.MP4	Unidentified sp.	1	-
30/4/2021	CT14	20/4/2021 20:49	20/4/2021	20:49:50	IMG_0005.MP4	*Rattus sp.*	1	-
30/4/2021	CT14	22/4/2021 3:51	21/4/2021	3:51:50	IMG_0006.MP4	*Rattus sp.*	1	-
30/4/2021	CT14	26/4/2021 10:35	26/4/2021	10:35:26	IMG_0007.MP4	*Acridotheres javanicus*	1	-
30/4/2021	CT14	29/4/2021 21:59	29/4/2021	21:59:34	IMG_0010.MP4	*Rattus sp.*	1	-
30/4/2021	CT15	16/4/2021 12:37	16/4/2021	12:37:30	IMG_0001.JPG	*Chalcophaps indica*	1	-
30/4/2021	CT15	16/4/2021 20:07	16/4/2021	20:07:36	IMG_0002.JPG	Unidentified sp.	1	Likely Rattus sp.
30/4/2021	CT15	16/4/2021 20:53	16/4/2021	20:53:32	IMG_0003.JPG	*Rattus sp.*	1	-
30/4/2021	CT15	16/4/2021 23:27	16/4/2021	23:27:00	IMG_0005.JPG	*Sus scrofa*	1	-
30/4/2021	CT15	17/4/2021 5:10	16/4/2021	5:10:50	IMG_0006.JPG	*Rattus tiomanicus*	1	-
30/4/2021	CT15	17/4/2021 5:11	16/4/2021	5:11:32	IMG_0007.JPG	*Rattus tiomanicus*	1	-
30/4/2021	CT15	17/4/2021 5:20	16/4/2021	5:20:58	IMG_0008.JPG	*Rattus tiomanicus*	1	-
30/4/2021	CT15	17/4/2021 7:16	16/4/2021	7:16:02	IMG_0009.JPG	*Chalcophaps indica*	1	-
30/4/2021	CT15	17/4/2021 8:12	17/4/2021	8:12:04	IMG_0010.JPG	*Chalcophaps indica*	1	-
30/4/2021	CT15	17/4/2021 19:37	17/4/2021	19:37:04	IMG_0011.JPG	*Sus scrofa*	1	-
30/4/2021	CT15	17/4/2021 19:37	17/4/2021	19:37:16	IMG_0012.JPG	*Sus scrofa*	1	-
30/4/2021	CT15	17/4/2021 23:01	17/4/2021	23:01:44	IMG_0013.JPG	Unidentified sp.	1	Likely Rattus sp.
30/4/2021	CT15	18/4/2021 1:04	17/4/2021	1:04:10	IMG_0014.JPG	*Rattus tiomanicus*	1	-
30/4/2021	CT15	18/4/2021 7:09	17/4/2021	7:09:44	IMG_0015.JPG	*Sus scrofa*	1	-
30/4/2021	CT15	18/4/2021 7:10	17/4/2021	7:10:26	IMG_0016.JPG	*Sus scrofa*	1	-
30/4/2021	CT15	18/4/2021 7:37	17/4/2021	7:37:48	IMG_0017.JPG	*Sus scrofa*	1	-
30/4/2021	CT15	18/4/2021 10:48	18/4/2021	10:48:38	IMG_0018.JPG	*Chalcophaps indica*	1	-
30/4/2021	CT15	18/4/2021 12:47	18/4/2021	12:47:52	IMG_0019.JPG	*Gallus gallus*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
30/4/2021	CT15	18/4/2021 12:48	18/4/2021	12:48:18	IMG_0020.JPG	*Gallus gallus*	1	-
30/4/2021	CT15	18/4/2021 15:56	18/4/2021	15:56:12	IMG_0021.JPG	*Chalcophaps indica*	1	-
30/4/2021	CT15	18/4/2021 17:38	18/4/2021	17:38:48	IMG_0022.JPG	*Gallus gallus*	1	-
30/4/2021	CT15	18/4/2021 18:15	18/4/2021	18:15:02	IMG_0023.JPG	*Sus scrofa*	1	-
30/4/2021	CT15	19/4/2021 5:41	18/4/2021	5:41:12	IMG_0024.JPG	*Sus scrofa*	1	-
30/4/2021	CT15	19/4/2021 7:17	18/4/2021	7:17:12	IMG_0025.JPG	*Sus scrofa*	1	-
30/4/2021	CT15	19/4/2021 8:17	19/4/2021	8:17:10	IMG_0026.JPG	*Picus vittatus*	1	-
30/4/2021	CT15	19/4/2021 11:27	19/4/2021	11:27:54	IMG_0027.JPG	*Garrulax leucolophus*	1	-
30/4/2021	CT15	19/4/2021 12:10	19/4/2021	12:10:34	IMG_0028.JPG	*Chalcophaps indica*	1	-
30/4/2021	CT15	19/4/2021 14:06	19/4/2021	14:06:14	IMG_0029.JPG	*Chalcophaps indica*	1	-
30/4/2021	CT15	19/4/2021 18:11	19/4/2021	18:11:48	IMG_0030.JPG	*Sus scrofa*	1	-
30/4/2021	CT15	19/4/2021 19:45	19/4/2021	19:45:18	IMG_0031.JPG	*Rattus tiomanicus*	1	-
30/4/2021	CT15	19/4/2021 19:47	19/4/2021	19:47:38	IMG_0032.JPG	*Rattus tiomanicus*	1	-
30/4/2021	CT15	19/4/2021 19:50	19/4/2021	19:50:30	IMG_0033.JPG	*Rattus tiomanicus*	1	-
30/4/2021	CT15	19/4/2021 20:17	19/4/2021	20:17:46	IMG_0034.JPG	*Rattus sp.*	1	-
30/4/2021	CT15	19/4/2021 20:22	19/4/2021	20:22:04	IMG_0035.JPG	*Rattus sp.*	1	-
30/4/2021	CT15	19/4/2021 20:23	19/4/2021	20:23:46	IMG_0036.JPG	*Rattus tiomanicus*	2	-
30/4/2021	CT15	19/4/2021 20:24	19/4/2021	20:24:00	IMG_0037.JPG	*Rattus tiomanicus*	2	-
30/4/2021	CT15	19/4/2021 20:24	19/4/2021	20:24:54	IMG_0039.JPG	*Rattus tiomanicus*	2	-
30/4/2021	CT15	19/4/2021 20:41	19/4/2021	20:41:26	IMG_0040.JPG	*Rattus sp.*	1	-
30/4/2021	CT15	19/4/2021 20:41	19/4/2021	20:41:40	IMG_0041.JPG	*Rattus sp.*	1	-
30/4/2021	CT15	19/4/2021 20:41	19/4/2021	20:41:54	IMG_0042.JPG	*Rattus sp.*	1	-
30/4/2021	CT15	19/4/2021 20:42	19/4/2021	20:42:54	IMG_0043.JPG	*Rattus sp.*	1	-
30/4/2021	CT15	19/4/2021 20:45	19/4/2021	20:45:18	IMG_0044.JPG	*Rattus sp.*	1	-
30/4/2021	CT15	19/4/2021 20:48	19/4/2021	20:48:42	IMG_0046.JPG	*Rattus tiomanicus*	1	-
30/4/2021	CT15	19/4/2021 20:52	19/4/2021	20:52:20	IMG_0047.JPG	*Rattus tiomanicus*	1	-
30/4/2021	CT15	19/4/2021 21:05	19/4/2021	21:05:32	IMG_0048.JPG	*Rattus sp.*	1	-
30/4/2021	CT15	19/4/2021 21:08	19/4/2021	21:08:50	IMG_0049.JPG	*Rattus tiomanicus*	1	-
30/4/2021	CT15	19/4/2021 21:09	19/4/2021	21:09:08	IMG_0050.JPG	*Rattus sp.*	1	-
30/4/2021	CT15	19/4/2021 21:09	19/4/2021	21:09:40	IMG_0051.JPG	*Rattus sp.*	1	-
30/4/2021	CT15	19/4/2021 21:20	19/4/2021	21:20:02	IMG_0052.JPG	*Rattus sp.*	1	-
30/4/2021	CT15	19/4/2021 21:34	19/4/2021	21:34:36	IMG_0053.JPG	*Rattus sp.*	1	-
30/4/2021	CT15	20/4/2021 2:44	19/4/2021	2:44:32	IMG_0056.JPG	*Rattus tiomanicus*	1	-
30/4/2021	CT15	20/4/2021 4:18	19/4/2021	4:18:38	IMG_0057.JPG	*Rattus tiomanicus*	1	-
30/4/2021	CT15	20/4/2021 4:19	19/4/2021	4:19:50	IMG_0058.JPG	*Sus scrofa*	1	-
30/4/2021	CT15	20/4/2021 6:43	19/4/2021	6:43:24	IMG_0059.JPG	*Sus scrofa*	1	-
30/4/2021	CT15	20/4/2021 8:47	20/4/2021	8:47:42	IMG_0060.JPG	*Chalcophaps indica*	1	-
30/4/2021	CT15	20/4/2021 11:00	20/4/2021	11:00:50	IMG_0062.JPG	*Chalcophaps indica*	1	-
30/4/2021	CT15	20/4/2021 11:41	20/4/2021	11:41:02	IMG_0064.JPG	*Chalcophaps indica*	1	-
30/4/2021	CT15	20/4/2021 12:38	20/4/2021	12:38:36	IMG_0065.JPG	*Sus scrofa*	1	-
30/4/2021	CT15	20/4/2021 12:39	20/4/2021	12:39:10	IMG_0066.JPG	*Sus scrofa*	1	-
30/4/2021	CT15	20/4/2021 12:43	20/4/2021	12:43:12	IMG_0067.JPG	*Sus scrofa*	1	-
30/4/2021	CT15	20/4/2021 14:16	20/4/2021	14:16:14	IMG_0069.JPG	*Chalcophaps indica*	1	-
30/4/2021	CT15	20/4/2021 21:30	20/4/2021	21:30:44	IMG_0071.JPG	*Rattus sp.*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
30/4/2021	CT15	20/4/2021 22:32	20/4/2021	22:32:26	IMG_0072.JPG	*Rattus sp.*	1	-
30/4/2021	CT15	21/4/2021 6:00	20/4/2021	6:00:36	IMG_0074.JPG	*Rattus sp.*	1	-
30/4/2021	CT15	21/4/2021 6:03	20/4/2021	6:03:00	IMG_0078.JPG	*Sus scrofa*	1	-
30/4/2021	CT15	21/4/2021 6:03	20/4/2021	6:03:12	IMG_0079.JPG	*Sus scrofa*	1	-
30/4/2021	CT15	21/4/2021 6:03	20/4/2021	6:03:30	IMG_0080.JPG	*Sus scrofa*	1	-
30/4/2021	CT15	21/4/2021 7:22	20/4/2021	7:22:10	IMG_0081.JPG	*Chalcophaps indica*	1	-
30/4/2021	CT15	21/4/2021 7:43	20/4/2021	7:43:18	IMG_0083.JPG	*Chalcophaps indica*	1	-
30/4/2021	CT15	21/4/2021 7:49	20/4/2021	7:49:54	IMG_0084.JPG	*Chalcophaps indica*	1	-
30/4/2021	CT15	21/4/2021 8:14	21/4/2021	8:14:10	IMG_0085.JPG	*Chalcophaps indica*	1	-
30/4/2021	CT15	21/4/2021 8:37	21/4/2021	8:37:54	IMG_0086.JPG	*Chalcophaps indica*	1	-
30/4/2021	CT15	21/4/2021 8:42	21/4/2021	8:42:40	IMG_0087.JPG	*Chalcophaps indica*	1	-
30/4/2021	CT15	21/4/2021 16:20	21/4/2021	16:20:46	IMG_0088.JPG	*Gallus gallus*	1	-
30/4/2021	CT15	21/4/2021 17:18	21/4/2021	17:18:22	IMG_0089.JPG	*Sus scrofa*	1	-
30/4/2021	CT15	21/4/2021 21:25	21/4/2021	21:25:30	IMG_0090.JPG	*Rattus tiomanicus*	1	-
30/4/2021	CT15	21/4/2021 22:43	21/4/2021	22:43:22	IMG_0091.JPG	*Rattus sp.*	1	-
30/4/2021	CT15	21/4/2021 22:50	21/4/2021	22:50:08	IMG_0092.JPG	*Rattus sp.*	1	-
30/4/2021	CT15	22/4/2021 1:30	21/4/2021	1:30:02	IMG_0093.JPG	*Sus scrofa*	1	-
30/4/2021	CT15	22/4/2021 5:12	21/4/2021	5:12:22	IMG_0094.JPG	*Sus scrofa*	1	-
30/4/2021	CT15	22/4/2021 7:14	21/4/2021	7:14:38	IMG_0096.JPG	*Chalcophaps indica*	1	-
30/4/2021	CT15	22/4/2021 7:16	21/4/2021	7:16:06	IMG_0097.JPG	*Chalcophaps indica*	1	-
30/4/2021	CT15	22/4/2021 7:30	21/4/2021	7:30:02	IMG_0098.JPG	*Picus vittatus*	1	-
30/4/2021	CT15	22/4/2021 10:03	22/4/2021	10:03:34	IMG_0102.JPG	*Chalcophaps indica*	1	-
30/4/2021	CT15	22/4/2021 14:12	22/4/2021	14:12:26	IMG_0103.JPG	*Chalcophaps indica*	1	-
30/4/2021	CT15	22/4/2021 15:35	22/4/2021	15:35:44	IMG_0104.JPG	*Chalcophaps indica*	1	-
30/4/2021	CT15	22/4/2021 22:39	22/4/2021	22:39:12	IMG_0105.JPG	*Rattus tiomanicus*	1	-
30/4/2021	CT15	22/4/2021 22:40	22/4/2021	22:40:28	IMG_0106.JPG	*Rattus sp.*	1	-
30/4/2021	CT15	23/4/2021 6:32	22/4/2021	6:32:04	IMG_0107.JPG	*Sus scrofa*	1	-
30/4/2021	CT15	23/4/2021 7:20	22/4/2021	7:20:56	IMG_0108.JPG	*Picus vittatus*	1	-
30/4/2021	CT15	23/4/2021 8:17	23/4/2021	8:17:48	IMG_0109.JPG	*Chalcophaps indica*	1	-
30/4/2021	CT15	23/4/2021 9:15	23/4/2021	9:15:36	IMG_0110.JPG	*Chalcophaps indica*	1	-
30/4/2021	CT15	23/4/2021 11:44	23/4/2021	11:44:34	IMG_0111.JPG	*Chalcophaps indica*	1	-
30/4/2021	CT15	23/4/2021 14:17	23/4/2021	14:17:58	IMG_0112.JPG	*Chalcophaps indica*	1	-
30/4/2021	CT15	24/4/2021 3:06	23/4/2021	3:06:08	IMG_0113.JPG	*Rattus sp.*	1	-
30/4/2021	CT15	24/4/2021 13:10	24/4/2021	13:10:34	IMG_0116.JPG	*Chalcophaps indica*	1	-
30/4/2021	CT15	25/4/2021 7:22	24/4/2021	7:22:56	IMG_0118.JPG	*Chalcophaps indica*	1	-
30/4/2021	CT15	25/4/2021 8:38	25/4/2021	8:38:32	IMG_0120.JPG	*Chalcophaps indica*	1	-
30/4/2021	CT15	25/4/2021 8:41	25/4/2021	8:41:16	IMG_0121.JPG	*Sus scrofa*	1	-
30/4/2021	CT15	25/4/2021 11:25	25/4/2021	11:25:04	IMG_0124.JPG	*Chalcophaps indica*	1	-
30/4/2021	CT15	25/4/2021 22:03	25/4/2021	22:03:26	IMG_0126.JPG	*Rattus tiomanicus*	1	-
30/4/2021	CT15	26/4/2021 8:52	26/4/2021	8:52:58	IMG_0127.JPG	*Chalcophaps indica*	1	-
30/4/2021	CT15	26/4/2021 9:12	26/4/2021	9:12:06	IMG_0128.JPG	*Sus scrofa*	1	-
30/4/2021	CT15	26/4/2021 11:47	26/4/2021	11:47:52	IMG_0129.JPG	*Chalcophaps indica*	1	-
30/4/2021	CT15	26/4/2021 14:25	26/4/2021	14:25:28	IMG_0130.JPG	*Chalcophaps indica*	1	-
30/4/2021	CT15	27/4/2021 0:24	26/4/2021	0:24:22	IMG_0131.JPG	*Sus scrofa*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
30/4/2021	CT15	27/4/2021 1:16	26/4/2021	1:16:04	IMG_0132.JPG	*Sus scrofa*	1	-
30/4/2021	CT15	27/4/2021 5:51	26/4/2021	5:51:46	IMG_0133.JPG	*Rattus sp.*	1	-
30/4/2021	CT15	27/4/2021 6:22	26/4/2021	6:22:16	IMG_0134.JPG	*Sus scrofa*	1	-
30/4/2021	CT15	27/4/2021 7:17	26/4/2021	7:17:44	IMG_0135.JPG	*Chalcophaps indica*	1	-
30/4/2021	CT15	27/4/2021 7:36	26/4/2021	7:36:48	IMG_0136.JPG	*Sus scrofa*	1	-
30/4/2021	CT15	27/4/2021 7:49	26/4/2021	7:49:52	IMG_0137.JPG	*Picus vittatus*	1	-
30/4/2021	CT15	27/4/2021 7:50	26/4/2021	7:50:12	IMG_0138.JPG	*Chalcophaps indica*	1	-
30/4/2021	CT15	27/4/2021 10:08	27/4/2021	10:08:24	IMG_0141.JPG	*Chalcophaps indica*	1	-
30/4/2021	CT15	27/4/2021 10:35	27/4/2021	10:35:34	IMG_0142.JPG	*Garrulax leucolophus*	1	-
30/4/2021	CT15	27/4/2021 12:40	27/4/2021	12:40:44	IMG_0143.JPG	*Chalcophaps indica*	1	-
30/4/2021	CT15	27/4/2021 14:00	27/4/2021	14:00:46	IMG_0145.JPG	*Gallus gallus*	1	-
30/4/2021	CT15	27/4/2021 17:52	27/4/2021	17:52:28	IMG_0146.JPG	*Sus scrofa*	1	-
30/4/2021	CT15	27/4/2021 21:23	27/4/2021	21:23:46	IMG_0147.JPG	*Sus scrofa*	1	-
30/4/2021	CT15	27/4/2021 23:09	27/4/2021	23:09:18	IMG_0148.JPG	*Rattus sp.*	1	-
30/4/2021	CT15	28/4/2021 7:34	27/4/2021	7:34:08	IMG_0150.JPG	*Chalcophaps indica*	1	-
30/4/2021	CT15	28/4/2021 9:31	28/4/2021	9:31:14	IMG_0151.JPG	*Chalcophaps indica*	1	-
30/4/2021	CT15	28/4/2021 12:01	28/4/2021	12:01:10	IMG_0152.JPG	*Chalcophaps indica*	1	-
30/4/2021	CT15	28/4/2021 13:01	28/4/2021	13:01:42	IMG_0153.JPG	*Chalcophaps indica*	1	-
30/4/2021	CT15	28/4/2021 17:07	28/4/2021	17:07:10	IMG_0154.JPG	*Sus scrofa*	1	-
30/4/2021	CT15	28/4/2021 17:07	28/4/2021	17:07:24	IMG_0155.JPG	*Sus scrofa*	1	-
30/4/2021	CT15	28/4/2021 21:21	28/4/2021	21:21:24	IMG_0156.JPG	*Rattus sp.*	1	-
30/4/2021	CT15	28/4/2021 23:05	28/4/2021	23:05:12	IMG_0157.JPG	*Rattus tiomanicus*	1	-
30/4/2021	CT15	29/4/2021 5:13	28/4/2021	5:13:30	IMG_0158.JPG	*Sus scrofa*	1	-
30/4/2021	CT15	29/4/2021 7:13	28/4/2021	7:13:56	IMG_0159.JPG	*Chalcophaps indica*	1	-
30/4/2021	CT15	29/4/2021 7:21	28/4/2021	7:21:58	IMG_0160.JPG	*Chalcophaps indica*	1	-
30/4/2021	CT15	29/4/2021 7:43	28/4/2021	7:43:06	IMG_0162.JPG	*Chalcophaps indica*	1	-
30/4/2021	CT15	29/4/2021 12:27	29/4/2021	12:27:46	IMG_0163.JPG	*Chalcophaps indica*	1	-
30/4/2021	CT15	29/4/2021 12:37	29/4/2021	12:37:52	IMG_0164.JPG	*Chalcophaps indica*	1	-
30/4/2021	CT15	29/4/2021 12:39	29/4/2021	12:39:22	IMG_0165.JPG	*Chalcophaps indica*	1	-
30/4/2021	CT15	30/4/2021 2:45	29/4/2021	2:45:58	IMG_0166.JPG	*Sus scrofa*	1	-
30/4/2021	CT15	30/4/2021 2:46	29/4/2021	2:46:12	IMG_0167.JPG	*Sus scrofa*	1	-
30/4/2021	CT15	30/4/2021 5:45	29/4/2021	5:45:56	IMG_0169.JPG	*Rattus tiomanicus*	1	-
30/4/2021	CT15	30/4/2021 6:10	29/4/2021	6:10:14	IMG_0170.JPG	*Sus scrofa*	1	-
30/4/2021	CT15	30/4/2021 7:24	29/4/2021	7:24:14	IMG_0171.JPG	*Sus scrofa*	1	-
30/4/2021	CT15	30/4/2021 8:18	30/4/2021	8:18:22	IMG_0172.JPG	*Chalcophaps indica*	1	-
30/4/2021	CT15	30/4/2021 9:12	30/4/2021	9:12:00	IMG_0173.JPG	*Chalcophaps indica*	1	-
30/4/2021	CT15	30/4/2021 10:19	30/4/2021	10:19:16	IMG_0174.JPG	*Chalcophaps indica*	1	-
30/4/2021	CT17	16/4/2021 17:14	16/4/2021	17:14:54	IMG_0005.MP4	*Garrulax leucolophus*	2	-
30/4/2021	CT17	17/4/2021 6:07	16/4/2021	6:07:10	IMG_0006.MP4	*Sus scrofa*	1	-
30/4/2021	CT17	17/4/2021 6:17	16/4/2021	6:17:30	IMG_0007.MP4	*Sus scrofa*	1	-
30/4/2021	CT17	17/4/2021 6:17	16/4/2021	6:17:52	IMG_0008.MP4	*Sus scrofa*	1	-
30/4/2021	CT17	18/4/2021 7:51	17/4/2021	7:51:36	IMG_0009.MP4	*Garrulax leucolophus*	1	-
30/4/2021	CT17	20/4/2021 6:50	19/4/2021	6:50:26	IMG_0010.MP4	*Sus scrofa*	1	-
30/4/2021	CT17	20/4/2021 6:50	19/4/2021	6:50:26	IMG_0010.MP4	*Rallina fasciata*	2	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
30/4/2021	CT17	20/4/2021 6:51	19/4/2021	6:51:46	IMG_0011.MP4	*Sus scrofa*	1	-
30/4/2021	CT17	20/4/2021 6:52	19/4/2021	6:52:08	IMG_0012.MP4	*Sus scrofa*	1	-
30/4/2021	CT17	20/4/2021 6:52	19/4/2021	6:52:32	IMG_0013.MP4	*Sus scrofa*	1	-
30/4/2021	CT17	20/4/2021 8:15	20/4/2021	8:15:24	IMG_0014.MP4	*Geokichla sibirica*	1	Oriental magpie-robin?
30/4/2021	CT17	21/4/2021 8:45	21/4/2021	8:45:52	IMG_0015.MP4	*Garrulax leucolophus*	2	-
30/4/2021	CT17	21/4/2021 8:46	21/4/2021	8:46:22	IMG_0016.MP4	*Garrulax leucolophus*	2	-
30/4/2021	CT17	21/4/2021 8:47	21/4/2021	8:47:02	IMG_0017.MP4	*Garrulax leucolophus*	2	-
30/4/2021	CT17	21/4/2021 8:48	21/4/2021	8:48:20	IMG_0018.MP4	*Garrulax leucolophus*	2	-
30/4/2021	CT17	21/4/2021 8:48	21/4/2021	8:48:48	IMG_0019.MP4	*Garrulax leucolophus*	1	-
30/4/2021	CT17	22/4/2021 9:59	22/4/2021	9:59:02	IMG_0021.MP4	*Callosciurus notatus*	1	-
30/4/2021	CT17	25/4/2021 8:04	25/4/2021	8:04:02	IMG_0022.MP4	*Garrulax leucolophus*	1	-
30/4/2021	CT17	25/4/2021 8:04	25/4/2021	8:04:02	IMG_0022.MP4	Unidentified bird	1	-
30/4/2021	CT17	27/4/2021 20:57	27/4/2021	20:57:38	IMG_0024.MP4	*Sus scrofa*	1	-
30/4/2021	CT17	27/4/2021 20:58	27/4/2021	20:58:00	IMG_0025.MP4	*Sus scrofa*	1	-
30/4/2021	CT18	1/1/2020 8:13	1/1/2020	8:13:38	IMG_0001.MP4	*Sus scrofa*	1	-
30/4/2021	CT18	3/1/2020 5:55	2/1/2020	5:55:56	IMG_0002.MP4	*Rattus sp.*	1	-
25/5/2021	CT05	1/5/2021 13:27	1/5/2021	13:27:38	IMG_0004.AVI	*Acridotheres javanicus*	1	-
25/5/2021	CT05	3/5/2021 14:00	3/5/2021	14:00:36	IMG_0009.AVI	*Acridotheres javanicus*	1	-
25/5/2021	CT05	9/5/2021 12:49	9/5/2021	12:49:40	IMG_0015.AVI	*Acridotheres javanicus*	1	-
25/5/2021	CT05	9/5/2021 13:14	9/5/2021	13:14:38	IMG_0016.AVI	*Acridotheres javanicus*	1	-
25/5/2021	CT05	10/5/2021 11:07	10/5/2021	11:07:04	IMG_0022.AVI	*Acridotheres javanicus*	1	-
25/5/2021	CT05	11/5/2021 11:47	11/5/2021	11:47:04	IMG_0028.AVI	*Acridotheres javanicus*	1	-
25/5/2021	CT05	11/5/2021 17:39	11/5/2021	17:39:32	IMG_0030.AVI	*Acridotheres javanicus*	1	-
25/5/2021	CT05	12/5/2021 10:09	12/5/2021	10:09:50	IMG_0034.AVI	*Acridotheres javanicus*	1	-
25/5/2021	CT05	12/5/2021 18:53	12/5/2021	18:53:58	IMG_0036.AVI	*Acridotheres javanicus*	1	-
25/5/2021	CT05	11/5/2021 18:21	11/5/2021	18:21:52	IMG_0032.AVI	*Acridotheres javanicus*	2	-
25/5/2021	CT05	1/5/2021 14:08	1/5/2021	14:08:12	IMG_0005.AVI	*Calotes versicolor*	1	-
25/5/2021	CT05	18/5/2021 10:55	18/5/2021	10:55:04	IMG_0047.AVI	*Calotes versicolor*	1	-
25/5/2021	CT05	11/5/2021 10:35	11/5/2021	10:35:50	IMG_0026.AVI	*Cinnyris jugularis*	1	-
25/5/2021	CT05	9/5/2021 16:20	9/5/2021	16:20:14	IMG_0018.AVI	*Copsychus saularis*	1	-
25/5/2021	CT05	9/5/2021 16:20	9/5/2021	16:20:36	IMG_0019.AVI	*Copsychus saularis*	1	-
25/5/2021	CT05	13/5/2021 9:54	13/5/2021	9:54:02	IMG_0037.AVI	*Copsychus saularis*	1	-
25/5/2021	CT05	15/5/2021 22:10	15/5/2021	22:10:28	IMG_0040.AVI	*Suncus murinus*	1	-
25/5/2021	CT05	16/5/2021 3:15	15/5/2021	3:15:06	IMG_0041.AVI	*Suncus murinus*	1	-
25/5/2021	CT05	20/5/2021 19:58	20/5/2021	19:58:34	IMG_0049.AVI	*Rattus tanezumi*	1	-
25/5/2021	CT05	20/5/2021 20:28	20/5/2021	20:28:54	IMG_0050.AVI	*Suncus murinus*	1	-
25/5/2021	CT05	21/5/2021 1:35	20/5/2021	1:35:04	IMG_0051.AVI	*Suncus murinus*	1	-
25/5/2021	CT05	21/5/2021 1:51	20/5/2021	1:51:18	IMG_0052.AVI	*Suncus murinus*	1	-
25/5/2021	CT05	23/5/2021 3:18	22/5/2021	3:18:48	IMG_0053.AVI	*Sus scrofa*	1	-
25/5/2021	CT05	25/5/2021 0:55	24/5/2021	0:55:18	IMG_0056.AVI	*Sus scrofa*	1	-
25/5/2021	CT05	26/5/2021 18:35	26/5/2021	18:35:28	IMG_0041.AVI	Unidentified frog	1	-
25/5/2021	CT05	16/5/2021 5:45	15/5/2021	5:45:42	IMG_0042.AVI	Unidentified frog	1	-
25/5/2021	CT06	1/5/2021 13:02	1/5/2021	13:02:32	IMG_0028.AVI	*Acridotheres javanicus*	1	-
25/5/2021	CT06	1/5/2021 16:32	1/5/2021	16:32:50	IMG_0030.AVI	*Amaurornis phoenicurus*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
25/5/2021	CT06	5/5/2021 11:10	5/5/2021	11:10:34	IMG_0058.AVI	*Amaurornis phoenicurus*	1	-
25/5/2021	CT06	2/5/2021 16:47	2/5/2021	16:47:18	IMG_0041.AVI	*Callosciurus notatus*	1	-
25/5/2021	CT06	2/5/2021 16:47	2/5/2021	16:47:40	IMG_0042.AVI	*Callosciurus notatus*	1	-
25/5/2021	CT06	11/5/2021 11:19	11/5/2021	11:19:46	IMG_0104.AVI	*Callosciurus notatus*	1	-
25/5/2021	CT06	12/5/2021 9:55	12/5/2021	9:55:22	IMG_0109.AVI	*Callosciurus notatus*	1	-
25/5/2021	CT06	12/5/2021 18:57	12/5/2021	18:57:06	IMG_0113.AVI	*Callosciurus notatus*	1	-
25/5/2021	CT06	20/5/2021 15:41	20/5/2021	15:41:28	IMG_0170.AVI	*Callosciurus notatus*	1	-
25/5/2021	CT06	21/5/2021 6:47	20/5/2021	6:47:40	IMG_0172.AVI	*Callosciurus notatus*	1	-
25/5/2021	CT06	22/5/2021 16:16	22/5/2021	16:16:16	IMG_0183.AVI	*Callosciurus notatus*	1	-
25/5/2021	CT06	23/5/2021 18:30	23/5/2021	18:30:54	IMG_0202.AVI	*Callosciurus notatus*	1	-
25/5/2021	CT06	24/5/2021 16:34	24/5/2021	16:34:56	IMG_0206.AVI	*Callosciurus notatus*	1	-
25/5/2021	CT06	24/5/2021 16:36	24/5/2021	16:36:26	IMG_0207.AVI	*Callosciurus notatus*	1	-
25/5/2021	CT06	24/5/2021 16:36	24/5/2021	16:36:48	IMG_0208.AVI	*Callosciurus notatus*	1	-
25/5/2021	CT06	24/5/2021 16:37	24/5/2021	16:37:18	IMG_0209.AVI	*Callosciurus notatus*	1	-
25/5/2021	CT06	24/5/2021 17:13	24/5/2021	17:13:28	IMG_0210.AVI	*Callosciurus notatus*	1	-
25/5/2021	CT06	9/5/2021 11:54	9/5/2021	11:54:00	IMG_0087.AVI	*Copsychus saularis*	1	-
25/5/2021	CT06	3/5/2021 7:30	2/5/2021	7:30:34	IMG_0045.AVI	*Gallus gallus*	1	-
25/5/2021	CT06	5/5/2021 9:38	5/5/2021	9:38:30	IMG_0054.AVI	*Gallus gallus*	1	Hybrid
25/5/2021	CT06	5/5/2021 9:38	5/5/2021	9:38:52	IMG_0055.AVI	*Gallus gallus*	1	Hybrid
25/5/2021	CT06	5/5/2021 12:31	5/5/2021	12:31:34	IMG_0060.AVI	*Gallus gallus*	1	-
25/5/2021	CT06	5/5/2021 12:31	5/5/2021	12:31:56	IMG_0061.AVI	*Gallus gallus*	1	-
25/5/2021	CT06	13/5/2021 8:45	13/5/2021	8:45:06	IMG_0128.AVI	*Gallus gallus*	1	Hybrid
25/5/2021	CT06	21/5/2021 17:25	21/5/2021	17:25:10	IMG_0178.AVI	*Gallus gallus*	1	-
25/5/2021	CT06	22/5/2021 18:11	22/5/2021	18:11:50	IMG_0184.AVI	*Gallus gallus*	1	-
25/5/2021	CT06	22/5/2021 18:13	22/5/2021	18:13:14	IMG_0185.AVI	*Gallus gallus*	1	-
25/5/2021	CT06	23/5/2021 7:19	22/5/2021	7:19:14	IMG_0195.AVI	*Gallus gallus*	1	-
25/5/2021	CT06	23/5/2021 18:08	23/5/2021	18:08:28	IMG_0201.AVI	*Gallus gallus*	1	-
25/5/2021	CT06	3/5/2021 7:31	2/5/2021	7:31:28	IMG_0046.AVI	*Gallus gallus*	2	Hybrid
25/5/2021	CT06	8/5/2021 7:29	7/5/2021	7:29:20	IMG_0082.AVI	*Gallus gallus*	2	-
25/5/2021	CT06	8/5/2021 7:29	7/5/2021	7:29:42	IMG_0083.AVI	*Gallus gallus*	2	-
25/5/2021	CT06	11/5/2021 18:09	11/5/2021	18:09:26	IMG_0105.AVI	*Gallus gallus*	2	Hybrid
25/5/2021	CT06	21/5/2021 8:15	21/5/2021	8:15:22	IMG_0173.AVI	*Gallus gallus*	2	-
25/5/2021	CT06	21/5/2021 15:41	21/5/2021	15:41:14	IMG_0175.AVI	*Gallus gallus*	2	-
25/5/2021	CT06	23/5/2021 7:16	22/5/2021	7:16:22	IMG_0191.AVI	*Gallus gallus*	2	Hybrid
25/5/2021	CT06	23/5/2021 7:16	22/5/2021	7:16:56	IMG_0192.AVI	*Gallus gallus*	2	Hybrid
25/5/2021	CT06	23/5/2021 7:17	22/5/2021	7:17:18	IMG_0193.AVI	*Gallus gallus*	2	Hybrid
25/5/2021	CT06	23/5/2021 7:18	22/5/2021	7:18:28	IMG_0194.AVI	*Gallus gallus*	2	Hybrid
25/5/2021	CT06	2/5/2021 14:05	2/5/2021	14:05:56	IMG_0036.AVI	*Gallus gallus*	3	-
25/5/2021	CT06	2/5/2021 14:06	2/5/2021	14:06:22	IMG_0037.AVI	*Gallus gallus*	3	-
25/5/2021	CT06	3/5/2021 7:31	2/5/2021	7:31:58	IMG_0047.AVI	*Gallus gallus*	3	Hybrid
25/5/2021	CT06	16/5/2021 8:08	16/5/2021	8:08:22	IMG_0149.AVI	*Gallus gallus*	3	-
25/5/2021	CT06	21/5/2021 15:40	21/5/2021	15:40:48	IMG_0174.AVI	*Gallus gallus*	3	-
25/5/2021	CT06	21/5/2021 17:24	21/5/2021	17:24:30	IMG_0176.AVI	*Gallus gallus*	3	-
25/5/2021	CT06	21/5/2021 17:24	21/5/2021	17:24:50	IMG_0177.AVI	*Gallus gallus*	3	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
25/5/2021	CT06	2/5/2021 15:45	2/5/2021	15:45:50	IMG_0039.AVI	*Gallus gallus*	4	Hybrid
25/5/2021	CT06	2/5/2021 15:46	2/5/2021	15:46:10	IMG_0040.AVI	*Gallus gallus*	4	Hybrid
25/5/2021	CT06	5/5/2021 12:30	5/5/2021	12:30:22	IMG_0059.AVI	*Gallus gallus*	6	-
25/5/2021	CT06	1/5/2021 7:09	30/4/2021	7:09:48	IMG_0020.AVI	*Garrulax leucolophus*	1	-
25/5/2021	CT06	2/5/2021 10:19	2/5/2021	10:19:38	IMG_0035.AVI	*Garrulax leucolophus*	1	-
25/5/2021	CT06	8/5/2021 9:45	8/5/2021	9:45:42	IMG_0085.AVI	*Garrulax leucolophus*	1	-
25/5/2021	CT06	10/5/2021 11:13	10/5/2021	11:13:38	IMG_0092.AVI	*Garrulax leucolophus*	1	-
25/5/2021	CT06	10/5/2021 15:12	10/5/2021	15:12:28	IMG_0095.AVI	*Garrulax leucolophus*	1	-
25/5/2021	CT06	28/5/2021 12:28	28/5/2021	12:28:50	IMG_0109.AVI	*Garrulax leucolophus*	1	-
25/5/2021	CT06	12/5/2021 9:57	12/5/2021	9:57:52	IMG_0110.AVI	*Garrulax leucolophus*	1	-
25/5/2021	CT06	12/5/2021 15:34	12/5/2021	15:34:38	IMG_0111.AVI	*Garrulax leucolophus*	1	-
25/5/2021	CT06	28/5/2021 15:13	28/5/2021	15:13:36	IMG_0155.AVI	*Garrulax leucolophus*	1	-
25/5/2021	CT06	28/5/2021 15:36	28/5/2021	15:36:15	IMG_0179.AVI	*Garrulax leucolophus*	1	-
25/5/2021	CT06	28/5/2021 11:37	28/5/2021	11:37:46	IMG_0032.AVI	*Garrulax leucolophus*	2	-
25/5/2021	CT06	8/5/2021 9:45	8/5/2021	9:45:14	IMG_0084.AVI	*Garrulax leucolophus*	2	-
25/5/2021	CT06	10/5/2021 11:18	10/5/2021	11:18:46	IMG_0093.AVI	*Garrulax leucolophus*	2	-
25/5/2021	CT06	18/5/2021 17:21	18/5/2021	17:21:34	IMG_0162.AVI	*Garrulax leucolophus*	2	-
25/5/2021	CT06	20/5/2021 10:22	20/5/2021	10:22:40	IMG_0168.AVI	*Garrulax leucolophus*	2	-
25/5/2021	CT06	22/5/2021 8:20	22/5/2021	8:20:02	IMG_0180.AVI	*Garrulax leucolophus*	2	-
25/5/2021	CT06	22/5/2021 8:26	22/5/2021	8:26:58	IMG_0181.AVI	*Garrulax leucolophus*	2	-
25/5/2021	CT06	22/5/2021 10:14	22/5/2021	10:14:40	IMG_0182.AVI	*Garrulax leucolophus*	2	-
25/5/2021	CT06	1/5/2021 16:38	1/5/2021	16:38:02	IMG_0031.AVI	*Garrulax leucolophus*	3	-
25/5/2021	CT06	10/5/2021 13:48	10/5/2021	13:48:24	IMG_0094.AVI	*Garrulax leucolophus*	3	-
25/5/2021	CT06	15/5/2021 7:32	14/5/2021	7:32:02	IMG_0146.AVI	*Garrulax leucolophus*	3	-
25/5/2021	CT06	17/5/2021 8:19	17/5/2021	8:19:44	IMG_0155.AVI	*Picus vittatus*	1	-
25/5/2021	CT06	17/5/2021 8:27	17/5/2021	8:27:08	IMG_0156.AVI	*Picus vittatus*	1	-
25/5/2021	CT06	17/5/2021 8:27	17/5/2021	8:27:46	IMG_0157.AVI	*Picus vittatus*	1	-
25/5/2021	CT06	20/5/2021 10:45	20/5/2021	10:45:48	IMG_0169.AVI	*Picus vittatus*	1	-
25/5/2021	CT06	22/5/2021 8:14	22/5/2021	8:14:46	IMG_0179.AVI	*Picus vittatus*	1	-
25/5/2021	CT06	1/5/2021 18:59	1/5/2021	18:59:24	IMG_0033.AVI	*Rallina fasciata*	1	-
25/5/2021	CT06	8/5/2021 18:41	8/5/2021	18:41:02	IMG_0086.AVI	*Rallina fasciata*	2	-
25/5/2021	CT06	6/5/2021 23:21	6/5/2021	23:21:50	IMG_0076.AVI	*Rattus tiomanicus*	1	-
25/5/2021	CT06	7/5/2021 22:58	7/5/2021	22:58:34	IMG_0079.AVI	*Rattus tiomanicus*	1	-
25/5/2021	CT06	8/5/2021 1:31	7/5/2021	1:31:24	IMG_0080.AVI	*Rattus sp.*	1	-
25/5/2021	CT06	12/5/2021 20:58	12/5/2021	20:58:10	IMG_0114.AVI	*Rattus sp.*	1	-
25/5/2021	CT06	17/5/2021 22:14	17/5/2021	22:14:06	IMG_0159.AVI	*Rattus tiomanicus*	1	-
25/5/2021	CT06	18/5/2021 20:16	18/5/2021	20:16:16	IMG_0164.AVI	*Rattus sp.*	1	-
25/5/2021	CT06	19/5/2021 21:58	19/5/2021	21:58:20	IMG_0167.AVI	*Rattus tiomanicus*	1	-
25/5/2021	CT06	30/4/2021 13:59	30/4/2021	13:59:28	IMG_0007.AVI	*Sus scrofa*	1	-
25/5/2021	CT06	30/4/2021 13:59	30/4/2021	13:59:50	IMG_0008.AVI	*Sus scrofa*	1	-
25/5/2021	CT06	30/4/2021 14:00	30/4/2021	14:00:12	IMG_0009.AVI	*Sus scrofa*	1	-
25/5/2021	CT06	30/4/2021 22:11	30/4/2021	22:11:58	IMG_0013.AVI	*Sus scrofa*	1	-
25/5/2021	CT06	28/5/2021 11:33	28/5/2021	11:33:23	IMG_0028.AVI	*Sus scrofa*	1	-
25/5/2021	CT06	3/5/2021 19:37	3/5/2021	19:37:18	IMG_0048.AVI	*Sus scrofa*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
25/5/2021	CT06	4/5/2021 13:55	4/5/2021	13:55:46	IMG_0050.AVI	*Sus scrofa*	1	-
25/5/2021	CT06	4/5/2021 21:09	4/5/2021	21:09:12	IMG_0051.AVI	*Sus scrofa*	1	-
25/5/2021	CT06	5/5/2021 20:37	5/5/2021	20:37:20	IMG_0064.AVI	*Sus scrofa*	1	-
25/5/2021	CT06	5/5/2021 20:37	5/5/2021	20:37:40	IMG_0065.AVI	*Sus scrofa*	1	-
25/5/2021	CT06	6/5/2021 19:33	6/5/2021	19:33:08	IMG_0067.AVI	*Sus scrofa*	1	-
25/5/2021	CT06	6/5/2021 19:33	6/5/2021	19:33:28	IMG_0068.AVI	*Sus scrofa*	1	-
25/5/2021	CT06	6/5/2021 19:33	6/5/2021	19:33:50	IMG_0069.AVI	*Sus scrofa*	1	-
25/5/2021	CT06	6/5/2021 19:34	6/5/2021	19:34:12	IMG_0070.AVI	*Sus scrofa*	1	-
25/5/2021	CT06	6/5/2021 19:34	6/5/2021	19:34:34	IMG_0071.AVI	*Sus scrofa*	1	-
25/5/2021	CT06	6/5/2021 19:35	6/5/2021	19:35:02	IMG_0072.AVI	*Sus scrofa*	1	-
25/5/2021	CT06	6/5/2021 19:35	6/5/2021	19:35:24	IMG_0073.AVI	*Sus scrofa*	1	-
25/5/2021	CT06	6/5/2021 19:35	6/5/2021	19:35:48	IMG_0074.AVI	*Sus scrofa*	1	-
25/5/2021	CT06	6/5/2021 19:36	6/5/2021	19:36:10	IMG_0075.AVI	*Sus scrofa*	1	-
25/5/2021	CT06	10/5/2021 19:45	10/5/2021	19:45:22	IMG_0098.AVI	*Sus scrofa*	1	-
25/5/2021	CT06	10/5/2021 19:45	10/5/2021	19:45:42	IMG_0099.AVI	*Sus scrofa*	1	-
25/5/2021	CT06	10/5/2021 19:46	10/5/2021	19:46:46	IMG_0102.AVI	*Sus scrofa*	1	-
25/5/2021	CT06	13/5/2021 8:06	13/5/2021	8:06:48	IMG_0116.AVI	*Sus scrofa*	1	-
25/5/2021	CT06	13/5/2021 8:07	13/5/2021	8:07:08	IMG_0117.AVI	*Sus scrofa*	1	-
25/5/2021	CT06	13/5/2021 8:07	13/5/2021	8:07:30	IMG_0118.AVI	*Sus scrofa*	1	-
25/5/2021	CT06	13/5/2021 8:17	13/5/2021	8:17:10	IMG_0119.AVI	*Sus scrofa*	1	-
25/5/2021	CT06	13/5/2021 8:17	13/5/2021	8:17:28	IMG_0120.AVI	*Sus scrofa*	1	-
25/5/2021	CT06	13/5/2021 8:17	13/5/2021	8:17:50	IMG_0121.AVI	*Sus scrofa*	1	-
25/5/2021	CT06	13/5/2021 8:19	13/5/2021	8:19:08	IMG_0122.AVI	*Sus scrofa*	1	-
25/5/2021	CT06	13/5/2021 8:19	13/5/2021	8:19:28	IMG_0123.AVI	*Sus scrofa*	1	-
25/5/2021	CT06	13/5/2021 8:19	13/5/2021	8:19:48	IMG_0124.AVI	*Sus scrofa*	1	-
25/5/2021	CT06	13/5/2021 8:20	13/5/2021	8:20:08	IMG_0125.AVI	*Sus scrofa*	1	-
25/5/2021	CT06	13/5/2021 8:20	13/5/2021	8:20:30	IMG_0126.AVI	*Sus scrofa*	1	-
25/5/2021	CT06	13/5/2021 8:20	13/5/2021	8:20:50	IMG_0127.AVI	*Sus scrofa*	1	-
25/5/2021	CT06	13/5/2021 8:50	13/5/2021	8:50:16	IMG_0129.AVI	*Sus scrofa*	1	-
25/5/2021	CT06	13/5/2021 8:51	13/5/2021	8:51:02	IMG_0130.AVI	*Sus scrofa*	1	-
25/5/2021	CT06	13/5/2021 8:52	13/5/2021	8:52:04	IMG_0131.AVI	*Sus scrofa*	1	-
25/5/2021	CT06	13/5/2021 8:52	13/5/2021	8:52:54	IMG_0132.AVI	*Sus scrofa*	1	-
25/5/2021	CT06	13/5/2021 9:02	13/5/2021	9:02:00	IMG_0133.AVI	*Sus scrofa*	1	-
25/5/2021	CT06	13/5/2021 23:27	13/5/2021	23:27:08	IMG_0140.AVI	*Sus scrofa*	1	-
25/5/2021	CT06	14/5/2021 6:00	13/5/2021	6:00:18	IMG_0141.AVI	*Sus scrofa*	1	-
25/5/2021	CT06	14/5/2021 6:00	13/5/2021	6:00:38	IMG_0142.AVI	*Sus scrofa*	1	-
25/5/2021	CT06	16/5/2021 14:44	16/5/2021	14:44:46	IMG_0151.AVI	*Sus scrofa*	1	-
25/5/2021	CT06	17/5/2021 19:03	17/5/2021	19:03:34	IMG_0158.AVI	*Sus scrofa*	1	-
25/5/2021	CT06	18/5/2021 0:16	17/5/2021	0:16:22	IMG_0160.AVI	*Sus scrofa*	1	-
25/5/2021	CT06	20/5/2021 20:01	20/5/2021	20:01:50	IMG_0171.AVI	*Sus scrofa*	1	-
25/5/2021	CT06	23/5/2021 8:11	23/5/2021	8:11:02	IMG_0196.AVI	*Sus scrofa*	1	-
25/5/2021	CT06	23/5/2021 8:11	23/5/2021	8:11:22	IMG_0197.AVI	*Sus scrofa*	1	-
25/5/2021	CT06	23/5/2021 8:11	23/5/2021	8:11:44	IMG_0198.AVI	*Sus scrofa*	1	-
25/5/2021	CT06	23/5/2021 8:12	23/5/2021	8:12:10	IMG_0199.AVI	*Sus scrofa*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
25/5/2021	CT06	30/4/2021 22:16	30/4/2021	22:16:18	IMG_0014.AVI	*Sus scrofa*	2	-
25/5/2021	CT06	4/5/2021 21:11	4/5/2021	21:11:30	IMG_0052.AVI	*Sus scrofa*	2	-
25/5/2021	CT06	10/5/2021 19:44	10/5/2021	19:44:20	IMG_0096.AVI	*Sus scrofa*	2	-
25/5/2021	CT06	10/5/2021 19:44	10/5/2021	19:44:40	IMG_0097.AVI	*Sus scrofa*	2	-
25/5/2021	CT06	10/5/2021 19:46	10/5/2021	19:46:04	IMG_0100.AVI	*Sus scrofa*	2	-
25/5/2021	CT06	10/5/2021 19:46	10/5/2021	19:46:24	IMG_0101.AVI	*Sus scrofa*	2	-
25/5/2021	CT06	30/4/2021 23:43	30/4/2021	23:43:52	IMG_0015.AVI	*Sus scrofa*	3	-
25/5/2021	CT06	30/4/2021 23:44	30/4/2021	23:44:14	IMG_0016.AVI	*Sus scrofa*	3	-
25/5/2021	CT06	30/4/2021 23:44	30/4/2021	23:44:36	IMG_0017.AVI	*Sus scrofa*	3	-
25/5/2021	CT06	30/4/2021 23:45	30/4/2021	23:45:02	IMG_0018.AVI	*Sus scrofa*	3	-
25/5/2021	CT06	30/4/2021 19:00	30/4/2021	19:00:50	IMG_0010.AVI	*Tupaia glis*	1	-
25/5/2021	CT06	30/4/2021 19:01	30/4/2021	19:01:22	IMG_0011.AVI	*Tupaia glis*	1	-
25/5/2021	CT06	30/4/2021 19:07	30/4/2021	19:07:48	IMG_0012.AVI	*Tupaia glis*	1	-
25/5/2021	CT06	28/5/2021 11:35	28/5/2021	11:35:49	IMG_0030.AVI	*Tupaia glis*	1	-
25/5/2021	CT06	1/5/2021 16:38	1/5/2021	16:38:28	IMG_0032.AVI	*Tupaia glis*	1	-
25/5/2021	CT06	2/5/2021 6:52	1/5/2021	6:52:00	IMG_0034.AVI	*Tupaia glis*	1	-
25/5/2021	CT06	2/5/2021 14:11	2/5/2021	14:11:38	IMG_0038.AVI	*Tupaia glis*	1	-
25/5/2021	CT06	2/5/2021 19:04	2/5/2021	19:04:18	IMG_0043.AVI	*Tupaia glis*	1	-
25/5/2021	CT06	2/5/2021 19:04	2/5/2021	19:04:42	IMG_0044.AVI	*Tupaia glis*	1	-
25/5/2021	CT06	5/5/2021 7:11	4/5/2021	7:11:58	IMG_0053.AVI	*Tupaia glis*	1	-
25/5/2021	CT06	5/5/2021 18:59	5/5/2021	18:59:18	IMG_0063.AVI	*Tupaia glis*	1	-
25/5/2021	CT06	7/5/2021 18:52	7/5/2021	18:52:28	IMG_0077.AVI	*Tupaia glis*	1	-
25/5/2021	CT06	7/5/2021 18:53	7/5/2021	18:53:26	IMG_0078.AVI	*Tupaia glis*	1	-
25/5/2021	CT06	12/5/2021 9:16	12/5/2021	9:16:14	IMG_0107.AVI	*Tupaia glis*	1	-
25/5/2021	CT06	12/5/2021 9:16	12/5/2021	9:16:40	IMG_0108.AVI	*Tupaia glis*	1	-
25/5/2021	CT06	12/5/2021 18:41	12/5/2021	18:41:04	IMG_0112.AVI	*Tupaia glis*	1	-
25/5/2021	CT06	15/5/2021 6:56	14/5/2021	6:56:06	IMG_0144.AVI	*Tupaia glis*	1	-
25/5/2021	CT06	17/5/2021 7:56	16/5/2021	7:56:40	IMG_0154.AVI	*Tupaia glis*	1	-
25/5/2021	CT06	18/5/2021 7:01	17/5/2021	7:01:06	IMG_0161.AVI	*Tupaia glis*	1	-
25/5/2021	CT06	18/5/2021 19:07	18/5/2021	19:07:24	IMG_0163.AVI	*Tupaia glis*	1	-
25/5/2021	CT06	22/5/2021 19:08	22/5/2021	19:08:24	IMG_0186.AVI	*Tupaia glis*	1	-
25/5/2021	CT06	23/5/2021 6:53	22/5/2021	6:53:00	IMG_0188.AVI	*Tupaia glis*	1	-
25/5/2021	CT06	23/5/2021 6:57	22/5/2021	6:57:14	IMG_0189.AVI	*Tupaia glis*	1	-
25/5/2021	CT06	23/5/2021 6:57	22/5/2021	6:57:48	IMG_0190.AVI	*Tupaia glis*	1	-
25/5/2021	CT06	24/5/2021 8:55	24/5/2021	8:55:56	IMG_0204.AVI	*Tupaia glis*	1	-
25/5/2021	CT06	24/5/2021 9:00	24/5/2021	9:00:36	IMG_0205.AVI	*Tupaia glis*	1	-
25/5/2021	CT06	22/5/2021 19:08	22/5/2021	19:08:46	IMG_0187.AVI	*Tupaia glis*	2	-
25/5/2021	CT06	28/5/2021 12:30	28/5/2021	12:30:15	IMG_0111.AVI	Unidentified bird	1	-
25/5/2021	CT06	9/5/2021 18:52	9/5/2021	18:52:54	IMG_0090.AVI	*Tupaia glis*	1	-
25/5/2021	CT06	13/5/2021 9:38	13/5/2021	9:38:26	IMG_0135.AVI	Unidentified squirrel or treeshrew	1	-
25/5/2021	CT06	13/5/2021 9:38	13/5/2021	9:38:46	IMG_0136.AVI	Unidentified squirrel or treeshrew	1	-
25/5/2021	CT06	13/5/2021 9:39	13/5/2021	9:39:12	IMG_0137.AVI	Unidentified squirrel or treeshrew	1	-
25/5/2021	CT06	13/5/2021 9:39	13/5/2021	9:39:38	IMG_0138.AVI	Unidentified squirrel or treeshrew	1	-
25/5/2021	CT06	13/5/2021 9:40	13/5/2021	9:40:00	IMG_0139.AVI	Unidentified squirrel or treeshrew	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
25/5/2021	CT06	15/5/2021 7:02	14/5/2021	7:02:06	IMG_0145.AVI	*Tupaia glis*	1	-
25/5/2021	CT06	15/5/2021 18:59	15/5/2021	18:59:48	IMG_0148.AVI	*Tupaia glis*	1	-
25/5/2021	CT06	16/5/2021 10:54	16/5/2021	10:54:22	IMG_0150.AVI	*Tupaia glis*	1	-
25/5/2021	CT06	28/5/2021 15:37	28/5/2021	15:37:07	IMG_0180.AVI	Unidentified squirrel or treeshrew	1	-
25/5/2021	CT11	12/5/2021 13:44	12/5/2021	13:44:08	IMG_0033.AVI	*Gallus gallus*	1	-
25/5/2021	CT11	15/5/2021 9:48	15/5/2021	9:48:04	IMG_0053.AVI	*Gallus gallus*	1	-
25/5/2021	CT11	15/5/2021 9:49	15/5/2021	9:49:38	IMG_0054.AVI	*Gallus gallus*	1	-
25/5/2021	CT11	10/5/2021 14:56	10/5/2021	14:56:02	IMG_0022.AVI	*Garrulax leucolophus*	1	-
25/5/2021	CT11	22/5/2021 10:07	22/5/2021	10:07:54	IMG_0089.AVI	*Garrulax leucolophus*	1	-
25/5/2021	CT11	10/5/2021 14:53	10/5/2021	14:53:32	IMG_0021.AVI	*Garrulax leucolophus*	2	-
25/5/2021	CT11	14/5/2021 18:42	14/5/2021	18:42:16	IMG_0048.AVI	*Ketupa ketupu*	1	-
25/5/2021	CT11	14/5/2021 18:43	14/5/2021	18:43:26	IMG_0050.AVI	*Ketupa ketupu*	1	-
25/5/2021	CT11	17/5/2021 12:05	17/5/2021	12:05:24	IMG_0058.AVI	*Ketupa ketupu*	1	-
25/5/2021	CT11	17/5/2021 12:16	17/5/2021	12:16:14	IMG_0070.AVI	*Ketupa ketupu*	1	-
25/5/2021	CT11	20/5/2021 11:08	20/5/2021	11:08:30	IMG_0078.AVI	*Ketupa ketupu*	1	-
25/5/2021	CT11	17/5/2021 12:07	17/5/2021	12:07:38	IMG_0059.AVI	*Ketupa ketupu*	2	-
25/5/2021	CT11	17/5/2021 12:08	17/5/2021	12:08:00	IMG_0060.AVI	*Ketupa ketupu*	2	-
25/5/2021	CT11	17/5/2021 12:08	17/5/2021	12:08:22	IMG_0061.AVI	*Ketupa ketupu*	2	-
25/5/2021	CT11	17/5/2021 12:08	17/5/2021	12:08:46	IMG_0062.AVI	*Ketupa ketupu*	2	-
25/5/2021	CT11	17/5/2021 12:09	17/5/2021	12:09:10	IMG_0063.AVI	*Ketupa ketupu*	2	-
25/5/2021	CT11	17/5/2021 12:10	17/5/2021	12:10:04	IMG_0064.AVI	*Ketupa ketupu*	2	-
25/5/2021	CT11	17/5/2021 12:10	17/5/2021	12:10:44	IMG_0065.AVI	*Ketupa ketupu*	2	-
25/5/2021	CT11	17/5/2021 12:12	17/5/2021	12:12:26	IMG_0066.AVI	*Ketupa ketupu*	2	-
25/5/2021	CT11	17/5/2021 12:12	17/5/2021	12:12:48	IMG_0067.AVI	*Ketupa ketupu*	2	-
25/5/2021	CT11	17/5/2021 12:14	17/5/2021	12:14:40	IMG_0068.AVI	*Ketupa ketupu*	2	-
25/5/2021	CT11	17/5/2021 12:15	17/5/2021	12:15:12	IMG_0069.AVI	*Ketupa ketupu*	2	-
25/5/2021	CT11	30/4/2021 19:46	30/4/2021	19:46:58	IMG_0003.AVI	*Sus scrofa*	1	-
25/5/2021	CT11	30/4/2021 19:47	30/4/2021	19:47:24	IMG_0004.AVI	*Sus scrofa*	1	-
25/5/2021	CT11	1/5/2021 8:17	1/5/2021	8:17:32	IMG_0005.AVI	*Sus scrofa*	1	-
25/5/2021	CT11	1/5/2021 8:18	1/5/2021	8:18:22	IMG_0006.AVI	*Sus scrofa*	1	-
25/5/2021	CT11	1/5/2021 12:50	1/5/2021	12:50:26	IMG_0012.AVI	*Sus scrofa*	1	-
25/5/2021	CT11	1/5/2021 12:50	1/5/2021	12:50:48	IMG_0013.AVI	*Sus scrofa*	1	-
25/5/2021	CT11	3/5/2021 6:55	2/5/2021	6:55:42	IMG_0015.AVI	*Sus scrofa*	1	-
25/5/2021	CT11	3/5/2021 20:40	3/5/2021	20:40:00	IMG_0018.AVI	*Sus scrofa*	1	-
25/5/2021	CT11	9/5/2021 22:03	9/5/2021	22:03:16	IMG_0020.AVI	*Sus scrofa*	1	-
25/5/2021	CT11	12/5/2021 16:44	12/5/2021	16:44:40	IMG_0034.AVI	*Sus scrofa*	1	-
25/5/2021	CT11	12/5/2021 16:45	12/5/2021	16:45:02	IMG_0035.AVI	*Sus scrofa*	1	-
25/5/2021	CT11	13/5/2021 8:30	13/5/2021	8:30:30	IMG_0040.AVI	*Sus scrofa*	1	-
25/5/2021	CT11	13/5/2021 8:37	13/5/2021	8:37:26	IMG_0043.AVI	*Sus scrofa*	1	-
25/5/2021	CT11	14/5/2021 20:56	14/5/2021	20:56:24	IMG_0052.AVI	*Sus scrofa*	1	-
25/5/2021	CT11	15/5/2021 16:13	15/5/2021	16:13:14	IMG_0055.AVI	*Sus scrofa*	1	-
25/5/2021	CT11	19/5/2021 6:04	18/5/2021	6:04:48	IMG_0073.AVI	*Sus scrofa*	1	-
25/5/2021	CT11	19/5/2021 23:52	19/5/2021	23:52:28	IMG_0074.AVI	*Sus scrofa*	1	-
25/5/2021	CT11	20/5/2021 13:14	20/5/2021	13:14:04	IMG_0079.AVI	*Sus scrofa*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
25/5/2021	CT11	20/5/2021 13:15	20/5/2021	13:15:10	IMG_0080.AVI	*Sus scrofa*	1	-
25/5/2021	CT11	20/5/2021 19:32	20/5/2021	19:32:58	IMG_0082.AVI	*Sus scrofa*	1	-
25/5/2021	CT11	21/5/2021 17:12	21/5/2021	17:12:08	IMG_0086.AVI	*Sus scrofa*	1	-
25/5/2021	CT11	21/5/2021 17:12	21/5/2021	17:12:30	IMG_0087.AVI	*Sus scrofa*	1	-
25/5/2021	CT11	22/5/2021 18:20	22/5/2021	18:20:48	IMG_0090.AVI	*Sus scrofa*	1	-
25/5/2021	CT11	22/5/2021 18:21	22/5/2021	18:21:08	IMG_0091.AVI	*Sus scrofa*	1	-
25/5/2021	CT11	30/4/2021 19:46	30/4/2021	19:46:36	IMG_0002.AVI	*Sus scrofa*	2	-
25/5/2021	CT11	12/5/2021 8:29	12/5/2021	8:29:04	IMG_0030.AVI	*Sus scrofa*	2	-
25/5/2021	CT11	13/5/2021 8:30	13/5/2021	8:30:08	IMG_0039.AVI	*Sus scrofa*	2	-
25/5/2021	CT11	13/5/2021 12:47	13/5/2021	12:47:18	IMG_0044.AVI	*Sus scrofa*	2	-
25/5/2021	CT11	1/5/2021 18:11	1/5/2021	18:11:44	IMG_0014.AVI	*Sus scrofa*	4	-
25/5/2021	CT11	1/5/2021 8:29	1/5/2021	8:29:36	IMG_0011.AVI	*Sus scrofa*	6	-
25/5/2021	CT11	3/5/2021 16:46	3/5/2021	16:46:02	IMG_0017.AVI	*Tupaia glis*	1	-
25/5/2021	CT11	13/5/2021 8:08	13/5/2021	8:08:24	IMG_0037.AVI	Unidentified sp.	1	-
25/5/2021	CT11	21/5/2021 15:20	21/5/2021	15:20:00	IMG_0083.AVI	Unidentified sp.	1	-
25/5/2021	CT12	10/5/2021 11:33	10/5/2021	11:33:20	IMG_0040.AVI	*Canis lupus familiaris*	1	-
25/5/2021	CT12	11/5/2021 9:14	11/5/2021	9:14:40	IMG_0042.AVI	*Gallus gallus*	1	-
25/5/2021	CT12	9/5/2021 12:26	9/5/2021	12:26:16	IMG_0037.AVI	*Garrulax leucolophus*	1	-
25/5/2021	CT12	9/5/2021 13:47	9/5/2021	13:47:08	IMG_0039.AVI	*Garrulax leucolophus*	1	-
25/5/2021	CT12	12/5/2021 11:08	12/5/2021	11:08:18	IMG_0043.AVI	*Garrulax leucolophus*	1	-
25/5/2021	CT12	13/5/2021 11:08	13/5/2021	11:08:50	IMG_0046.AVI	*Garrulax leucolophus*	1	-
25/5/2021	CT12	15/5/2021 16:18	15/5/2021	16:18:18	IMG_0053.AVI	*Garrulax leucolophus*	1	-
25/5/2021	CT12	16/5/2021 8:50	16/5/2021	8:50:14	IMG_0054.AVI	*Garrulax leucolophus*	1	-
25/5/2021	CT12	1/5/2021 17:30	1/5/2021	17:30:24	IMG_0017.AVI	*Sus scrofa*	1	-
25/5/2021	CT12	1/5/2021 18:38	1/5/2021	18:38:56	IMG_0021.AVI	*Sus scrofa*	1	-
25/5/2021	CT12	2/5/2021 18:41	2/5/2021	18:41:12	IMG_0024.AVI	*Sus scrofa*	1	-
25/5/2021	CT12	2/5/2021 18:41	2/5/2021	18:41:32	IMG_0025.AVI	*Sus scrofa*	1	-
25/5/2021	CT12	4/5/2021 4:41	3/5/2021	4:41:14	IMG_0026.AVI	*Sus scrofa*	1	-
25/5/2021	CT12	4/5/2021 8:26	4/5/2021	8:26:42	IMG_0027.AVI	*Sus scrofa*	1	-
25/5/2021	CT12	5/5/2021 14:56	5/5/2021	14:56:14	IMG_0031.AVI	*Sus scrofa*	1	-
25/5/2021	CT12	6/5/2021 15:51	6/5/2021	15:51:24	IMG_0033.AVI	*Sus scrofa*	1	-
25/5/2021	CT12	7/5/2021 6:49	6/5/2021	6:49:18	IMG_0034.AVI	*Sus scrofa*	1	-
25/5/2021	CT12	7/5/2021 6:49	6/5/2021	6:49:42	IMG_0035.AVI	*Sus scrofa*	1	-
25/5/2021	CT12	13/5/2021 17:37	13/5/2021	17:37:26	IMG_0048.AVI	*Sus scrofa*	1	-
25/5/2021	CT12	14/5/2021 7:54	13/5/2021	7:54:32	IMG_0049.AVI	*Sus scrofa*	1	-
25/5/2021	CT12	14/5/2021 15:05	14/5/2021	15:05:58	IMG_0050.AVI	*Sus scrofa*	1	-
25/5/2021	CT12	14/5/2021 16:43	14/5/2021	16:43:16	IMG_0051.AVI	*Sus scrofa*	1	-
25/5/2021	CT12	17/5/2021 16:10	17/5/2021	16:10:20	IMG_0061.AVI	*Sus scrofa*	1	-
25/5/2021	CT12	18/5/2021 21:37	18/5/2021	21:37:34	IMG_0062.AVI	*Sus scrofa*	1	-
25/5/2021	CT12	18/5/2021 21:37	18/5/2021	21:37:56	IMG_0063.AVI	*Sus scrofa*	1	-
25/5/2021	CT12	17/5/2021 16:09	17/5/2021	16:09:52	IMG_0060.AVI	*Sus scrofa*	2	-
25/5/2021	CT12	17/5/2021 16:09	17/5/2021	16:09:06	IMG_0058.AVI	*Sus scrofa*	5	-
25/5/2021	CT12	17/5/2021 16:09	17/5/2021	16:09:32	IMG_0059.AVI	*Sus scrofa*	5	-
25/5/2021	CT12	1/5/2021 6:26	30/4/2021	6:26:24	IMG_0012.AVI	Unidentified frog	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
25/5/2021	CT12	16/5/2021 14:14	16/5/2021	14:14:08	IMG_0056.AVI	Unidentified bird	1	-
25/5/2021	CT13	11/5/2021 9:16	11/5/2021	9:16:44	IMG_0175.MP4	*Callosciurus notatus*	1	-
25/5/2021	CT13	10/5/2021 11:24	10/5/2021	11:24:10	IMG_0169.MP4	*Canis lupus familiaris*	2	-
25/5/2021	CT13	30/4/2021 23:50	30/4/2021	23:50:10	IMG_0009.MP4	*Sus scrofa*	1	-
25/5/2021	CT13	1/5/2021 20:07	1/5/2021	20:07:42	IMG_0019.MP4	*Sus scrofa*	1	-
25/5/2021	CT13	3/5/2021 2:28	2/5/2021	2:28:50	IMG_0031.MP4	*Sus scrofa*	1	-
25/5/2021	CT13	5/5/2021 20:38	5/5/2021	20:38:58	IMG_0081.MP4	*Sus scrofa*	1	-
25/5/2021	CT13	5/5/2021 21:44	5/5/2021	21:44:12	IMG_0082.MP4	*Sus scrofa*	1	-
25/5/2021	CT13	6/5/2021 0:07	5/5/2021	0:07:36	IMG_0083.MP4	*Sus scrofa*	1	-
25/5/2021	CT13	7/5/2021 23:29	7/5/2021	23:29:40	IMG_0128.MP4	*Sus scrofa*	1	-
25/5/2021	CT13	7/5/2021 23:38	7/5/2021	23:38:38	IMG_0129.MP4	*Sus scrofa*	1	-
25/5/2021	CT13	11/5/2021 18:44	11/5/2021	18:44:44	IMG_0180.MP4	*Sus scrofa*	1	-
25/5/2021	CT13	11/5/2021 18:45	11/5/2021	18:45:36	IMG_0181.MP4	*Sus scrofa*	1	-
25/5/2021	CT13	12/5/2021 3:04	11/5/2021	3:04:46	IMG_0186.MP4	*Sus scrofa*	1	-
25/5/2021	CT13	12/5/2021 18:23	12/5/2021	18:23:34	IMG_0197.MP4	*Sus scrofa*	1	-
25/5/2021	CT13	13/5/2021 8:00	13/5/2021	8:00:06	IMG_0204.MP4	*Sus scrofa*	1	-
25/5/2021	CT13	13/5/2021 20:03	13/5/2021	20:03:22	IMG_0216.MP4	*Sus scrofa*	1	-
25/5/2021	CT13	13/5/2021 20:16	13/5/2021	20:16:28	IMG_0218.MP4	*Sus scrofa*	1	-
25/5/2021	CT13	13/5/2021 22:11	13/5/2021	22:11:56	IMG_0221.MP4	*Sus scrofa*	1	-
25/5/2021	CT13	14/5/2021 2:07	13/5/2021	2:07:38	IMG_0222.MP4	*Sus scrofa*	1	-
25/5/2021	CT13	14/5/2021 19:18	14/5/2021	19:18:14	IMG_0236.MP4	*Sus scrofa*	1	-
25/5/2021	CT13	14/5/2021 20:46	14/5/2021	20:46:08	IMG_0238.MP4	*Sus scrofa*	1	-
25/5/2021	CT13	14/5/2021 21:13	14/5/2021	21:13:50	IMG_0239.MP4	*Sus scrofa*	1	-
25/5/2021	CT13	14/5/2021 21:22	14/5/2021	21:22:20	IMG_0240.MP4	*Sus scrofa*	1	-
25/5/2021	CT13	15/5/2021 19:45	15/5/2021	19:45:02	IMG_0245.MP4	*Sus scrofa*	1	-
25/5/2021	CT13	15/5/2021 20:36	15/5/2021	20:36:48	IMG_0246.MP4	*Sus scrofa*	1	-
25/5/2021	CT13	15/5/2021 21:21	15/5/2021	21:21:06	IMG_0247.MP4	*Sus scrofa*	1	-
25/5/2021	CT13	15/5/2021 21:50	15/5/2021	21:50:02	IMG_0249.MP4	*Sus scrofa*	1	-
25/5/2021	CT13	15/5/2021 21:50	15/5/2021	21:50:26	IMG_0250.MP4	*Sus scrofa*	1	-
25/5/2021	CT13	17/5/2021 15:08	17/5/2021	15:08:00	IMG_0284.MP4	*Sus scrofa*	1	-
25/5/2021	CT13	17/5/2021 20:23	17/5/2021	20:23:30	IMG_0286.MP4	*Sus scrofa*	1	-
25/5/2021	CT13	17/5/2021 20:23	17/5/2021	20:23:54	IMG_0287.MP4	*Sus scrofa*	1	-
25/5/2021	CT13	18/5/2021 19:37	18/5/2021	19:37:00	IMG_0299.MP4	*Sus scrofa*	1	-
25/5/2021	CT13	19/5/2021 13:51	19/5/2021	13:51:54	IMG_0308.MP4	*Sus scrofa*	1	-
25/5/2021	CT13	20/5/2021 1:41	19/5/2021	1:41:14	IMG_0312.MP4	*Sus scrofa*	1	-
25/5/2021	CT13	20/5/2021 2:32	19/5/2021	2:32:00	IMG_0313.MP4	*Sus scrofa*	1	-
25/5/2021	CT13	20/5/2021 2:54	19/5/2021	2:54:18	IMG_0314.MP4	*Sus scrofa*	1	-
25/5/2021	CT13	20/5/2021 19:43	20/5/2021	19:43:38	IMG_0324.MP4	*Sus scrofa*	1	-
25/5/2021	CT13	20/5/2021 19:44	20/5/2021	19:44:00	IMG_0325.MP4	*Sus scrofa*	1	-
25/5/2021	CT13	21/5/2021 4:01	20/5/2021	4:01:40	IMG_0329.MP4	*Sus scrofa*	1	-
25/5/2021	CT13	21/5/2021 21:35	21/5/2021	21:35:56	IMG_0344.MP4	*Sus scrofa*	1	-
25/5/2021	CT13	22/5/2021 2:15	21/5/2021	2:15:18	IMG_0345.MP4	*Sus scrofa*	1	-
25/5/2021	CT13	22/5/2021 3:21	21/5/2021	3:21:16	IMG_0346.MP4	*Sus scrofa*	1	-
25/5/2021	CT13	22/5/2021 22:25	22/5/2021	22:25:14	IMG_0356.MP4	*Sus scrofa*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
25/5/2021	CT13	23/5/2021 3:56	22/5/2021	3:56:34	IMG_0357.MP4	*Sus scrofa*	1	-
25/5/2021	CT13	24/5/2021 19:31	24/5/2021	19:31:06	IMG_0388.MP4	*Sus scrofa*	1	-
25/5/2021	CT13	4/5/2021 20:36	4/5/2021	20:36:50	IMG_0068.MP4	*Sus scrofa*	2	-
25/5/2021	CT13	4/5/2021 20:55	4/5/2021	20:55:48	IMG_0070.MP4	*Sus scrofa*	2	-
25/5/2021	CT13	7/5/2021 22:33	7/5/2021	22:33:02	IMG_0127.MP4	*Sus scrofa*	2	-
25/5/2021	CT13	16/5/2021 1:33	15/5/2021	1:33:44	IMG_0251.MP4	*Sus scrofa*	2	-
25/5/2021	CT13	24/5/2021 3:49	23/5/2021	3:49:52	IMG_0376.MP4	*Sus scrofa*	2	-
25/5/2021	CT13	24/5/2021 4:05	23/5/2021	4:05:54	IMG_0377.MP4	*Sus scrofa*	2	-
25/5/2021	CT13	24/5/2021 21:21	24/5/2021	21:21:18	IMG_0390.MP4	*Sus scrofa*	2	-
25/5/2021	CT13	4/5/2021 20:35	4/5/2021	20:35:16	IMG_0066.MP4	*Sus scrofa*	3	-
25/5/2021	CT13	4/5/2021 21:24	4/5/2021	21:24:42	IMG_0071.MP4	*Sus scrofa*	3	-
25/5/2021	CT13	7/5/2021 22:19	7/5/2021	22:19:36	IMG_0125.MP4	*Sus scrofa*	3	-
25/5/2021	CT13	7/5/2021 22:31	7/5/2021	22:31:44	IMG_0126.MP4	*Sus scrofa*	3	-
25/5/2021	CT13	20/5/2021 19:44	20/5/2021	19:44:38	IMG_0326.MP4	*Sus scrofa*	3	-
25/5/2021	CT13	4/5/2021 20:21	4/5/2021	20:21:40	IMG_0065.MP4	*Sus scrofa*	4	-
25/5/2021	CT13	4/5/2021 20:41	4/5/2021	20:41:54	IMG_0069.MP4	*Sus scrofa*	4	-
25/5/2021	CT13	11/5/2021 18:44	11/5/2021	18:44:12	IMG_0179.MP4	*Sus scrofa*	4	-
25/5/2021	CT13	11/5/2021 18:46	11/5/2021	18:46:58	IMG_0182.MP4	*Sus scrofa*	4	-
25/5/2021	CT13	12/5/2021 2:45	11/5/2021	2:45:10	IMG_0185.MP4	*Sus scrofa*	4	-
25/5/2021	CT13	20/5/2021 19:42	20/5/2021	19:42:56	IMG_0323.MP4	*Sus scrofa*	4	-
25/5/2021	CT13	4/5/2021 20:36	4/5/2021	20:36:26	IMG_0067.MP4	*Sus scrofa*	5	-
25/5/2021	CT13	7/5/2021 22:19	7/5/2021	22:19:12	IMG_0124.MP4	*Sus scrofa*	5	-
25/5/2021	CT13	12/5/2021 20:04	12/5/2021	20:04:54	IMG_0201.MP4	*Sus scrofa*	5	-
25/5/2021	CT13	13/5/2021 20:15	13/5/2021	20:15:54	IMG_0217.MP4	*Sus scrofa*	5	-
25/5/2021	CT13	13/5/2021 20:17	13/5/2021	20:17:18	IMG_0219.MP4	*Sus scrofa*	5	-
25/5/2021	CT13	16/5/2021 7:26	15/5/2021	7:26:50	IMG_0252.MP4	*Sus scrofa*	5	-
25/5/2021	CT13	9/5/2021 22:29	9/5/2021	22:29:50	IMG_0156.MP4	*Sus scrofa*	6	-
25/5/2021	CT13	24/5/2021 21:20	24/5/2021	21:20:36	IMG_0389.MP4	*Sus scrofa*	7	-
25/5/2021	CT13	16/5/2021 7:27	15/5/2021	7:27:20	IMG_0253.MP4	*Sus scrofa*	8	-
25/5/2021	CT17	15/5/2021 12:52	15/5/2021	12:52:30	IMG_0017.MP4	*Canis lupus familiaris*	1	-
25/5/2021	CT17	15/5/2021 13:08	15/5/2021	13:08:06	IMG_0018.MP4	*Canis lupus familiaris*	1	-
25/5/2021	CT17	30/4/2021 16:01	30/4/2021	16:01:08	IMG_0006.MP4	*Gallus gallus*	1	-
25/5/2021	CT17	30/4/2021 16:01	30/4/2021	16:01:50	IMG_0007.MP4	*Gallus gallus*	1	-
25/5/2021	CT17	30/4/2021 16:19	30/4/2021	16:19:32	IMG_0008.MP4	*Gallus gallus*	1	-
25/5/2021	CT17	22/5/2021 8:38	22/5/2021	8:38:20	IMG_0024.MP4	*Gallus gallus*	1	-
25/5/2021	CT17	30/4/2021 16:00	30/4/2021	16:00:36	IMG_0005.MP4	*Gallus gallus*	2	-
25/5/2021	CT17	6/5/2021 15:49	6/5/2021	15:49:16	IMG_0011.MP4	*Gallus gallus*	3	-
25/5/2021	CT17	30/4/2021 18:56	30/4/2021	18:56:16	IMG_0009.MP4	*Picus vittatus*	1	-
25/5/2021	CT17	6/5/2021 12:49	6/5/2021	12:49:10	IMG_0010.MP4	*Picus vittatus*	1	-
25/5/2021	CT17	10/5/2021 19:54	10/5/2021	19:54:10	IMG_0013.MP4	*Sus scrofa*	1	-
25/5/2021	CT17	10/5/2021 19:54	10/5/2021	19:54:40	IMG_0014.MP4	*Sus scrofa*	1	-
25/5/2021	CT17	11/5/2021 0:49	10/5/2021	0:49:12	IMG_0015.MP4	*Sus scrofa*	1	-
25/5/2021	CT17	11/5/2021 22:52	11/5/2021	22:52:38	IMG_0016.MP4	*Sus scrofa*	1	-
25/5/2021	CT17	18/5/2021 10:24	18/5/2021	10:24:50	IMG_0019.MP4	*Sus scrofa*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
25/5/2021	CT17	19/5/2021 8:16	19/5/2021	8:16:30	IMG_0020.MP4	*Sus scrofa*	1	-
25/5/2021	CT17	22/5/2021 0:10	21/5/2021	0:10:56	IMG_0022.MP4	*Sus scrofa*	1	-
25/5/2021	CT17	22/5/2021 0:11	21/5/2021	0:11:20	IMG_0023.MP4	*Sus scrofa*	1	-
25/5/2021	CT18	9/5/2021 10:54	9/5/2021	10:54:38	IMG_0016.MP4	*Canis lupus familiaris*	1	-
25/5/2021	CT18	13/5/2021 8:22	13/5/2021	8:22:38	IMG_0021.MP4	*Garrulax leucolophus*	2	-
25/5/2021	CT18	20/5/2021 22:36	20/5/2021	22:36:48	IMG_0038.MP4	*Paradoxurus musangus*	1	-
25/5/2021	CT18	7/5/2021 0:49	6/5/2021	0:49:58	IMG_0010.MP4	*Rattus tiomanicus*	1	-
25/5/2021	CT18	7/5/2021 2:23	6/5/2021	2:23:48	IMG_0011.MP4	*Rattus sp.*	1	-
25/5/2021	CT18	12/5/2021 21:25	12/5/2021	21:25:36	IMG_0020.MP4	*Rattus sp.*	1	-
25/5/2021	CT18	19/5/2021 21:53	19/5/2021	21:53:22	IMG_0032.MP4	*Rattus sp.*	1	-
25/5/2021	CT18	30/4/2021 19:41	30/4/2021	19:41:42	IMG_0006.MP4	*Sus scrofa*	1	-
25/5/2021	CT18	2/5/2021 1:08	1/5/2021	1:08:00	IMG_0007.MP4	*Sus scrofa*	1	-
25/5/2021	CT18	2/5/2021 19:43	2/5/2021	19:43:28	IMG_0008.MP4	*Sus scrofa*	1	-
25/5/2021	CT18	2/5/2021 19:43	2/5/2021	19:43:54	IMG_0009.MP4	*Sus scrofa*	1	-
25/5/2021	CT18	8/5/2021 19:54	8/5/2021	19:54:24	IMG_0012.MP4	*Sus scrofa*	1	-
25/5/2021	CT18	9/5/2021 0:19	8/5/2021	0:19:30	IMG_0015.MP4	*Sus scrofa*	1	-
25/5/2021	CT18	9/5/2021 20:47	9/5/2021	20:47:54	IMG_0017.MP4	*Sus scrofa*	1	-
25/5/2021	CT18	11/5/2021 20:12	11/5/2021	20:12:40	IMG_0018.MP4	*Sus scrofa*	1	-
25/5/2021	CT18	11/5/2021 20:13	11/5/2021	20:13:10	IMG_0019.MP4	*Sus scrofa*	1	-
25/5/2021	CT18	13/5/2021 21:02	13/5/2021	21:02:06	IMG_0022.MP4	*Sus scrofa*	1	-
25/5/2021	CT18	14/5/2021 21:07	14/5/2021	21:07:16	IMG_0024.MP4	*Sus scrofa*	1	-
25/5/2021	CT18	17/5/2021 21:33	17/5/2021	21:33:40	IMG_0026.MP4	*Sus scrofa*	1	-
25/5/2021	CT18	17/5/2021 21:34	17/5/2021	21:34:14	IMG_0027.MP4	*Sus scrofa*	1	-
25/5/2021	CT18	18/5/2021 6:02	17/5/2021	6:02:52	IMG_0028.MP4	*Sus scrofa*	1	-
25/5/2021	CT18	18/5/2021 17:19	18/5/2021	17:19:44	IMG_0029.MP4	*Sus scrofa*	1	-
25/5/2021	CT18	18/5/2021 21:23	18/5/2021	21:23:32	IMG_0030.MP4	*Sus scrofa*	1	-
25/5/2021	CT18	19/5/2021 19:58	19/5/2021	19:58:18	IMG_0031.MP4	*Sus scrofa*	1	-
25/5/2021	CT18	19/5/2021 23:22	19/5/2021	23:22:36	IMG_0033.MP4	*Sus scrofa*	1	-
25/5/2021	CT18	19/5/2021 23:25	19/5/2021	23:25:00	IMG_0035.MP4	*Sus scrofa*	1	-
25/5/2021	CT18	20/5/2021 22:39	20/5/2021	22:39:00	IMG_0039.MP4	*Sus scrofa*	1	-
25/5/2021	CT18	20/5/2021 22:40	20/5/2021	22:40:10	IMG_0040.MP4	*Sus scrofa*	1	-
25/5/2021	CT18	21/5/2021 3:52	20/5/2021	3:52:32	IMG_0041.MP4	*Sus scrofa*	1	-
25/5/2021	CT18	21/5/2021 18:26	21/5/2021	18:26:22	IMG_0043.MP4	*Sus scrofa*	1	-
25/5/2021	CT18	21/5/2021 18:27	21/5/2021	18:27:34	IMG_0044.MP4	*Sus scrofa*	1	-
25/5/2021	CT18	21/5/2021 19:34	21/5/2021	19:34:32	IMG_0045.MP4	*Sus scrofa*	1	-
25/5/2021	CT18	22/5/2021 6:01	21/5/2021	6:01:38	IMG_0046.MP4	*Sus scrofa*	1	-
25/5/2021	CT18	23/5/2021 7:01	22/5/2021	7:01:28	IMG_0047.MP4	*Sus scrofa*	1	-
25/5/2021	CT18	23/5/2021 21:26	23/5/2021	21:26:26	IMG_0048.MP4	*Sus scrofa*	1	-
25/5/2021	CT18	23/5/2021 21:26	23/5/2021	21:26:50	IMG_0049.MP4	*Sus scrofa*	1	-
25/5/2021	CT18	23/5/2021 21:27	23/5/2021	21:27:46	IMG_0051.MP4	*Sus scrofa*	1	-
25/5/2021	CT18	23/5/2021 21:28	23/5/2021	21:28:08	IMG_0052.MP4	*Sus scrofa*	1	-
25/5/2021	CT18	24/5/2021 0:48	23/5/2021	0:48:34	IMG_0053.MP4	*Sus scrofa*	1	-
25/5/2021	CT18	24/5/2021 0:49	23/5/2021	0:49:20	IMG_0054.MP4	*Sus scrofa*	1	-
25/5/2021	CT18	24/5/2021 0:49	23/5/2021	0:49:52	IMG_0055.MP4	*Sus scrofa*	1	-

Sampling Date	Station	File Modify Date	Date	Time	File Name	Scientific Name	Qty	Remarks
25/5/2021	CT18	24/5/2021 19:56	24/5/2021	19:56:46	IMG_0056.MP4	*Sus scrofa*	1	-

Appendix L
Impact Assessment on Habitat, Plants and Fauna Receptors

Delivering a better world

Phase	Habitat	Impact type	Sensitivity (S)	Impact intensity (I)	Consequence (C = S × I)	Likelihood (L)	Impact significance (C × L)	Summary of impact significance	Residual impact intensity	Residual consequence	Residual likelihood	Residual impact significance	Sumamry of residual impact significance
Construction	Abandoned-land forest	Loss of vegetation/habitat	High	High	High	Almost Certain	Major	Moderate–Major	High	High	Almost Certain	Major	Moderate–Major
Construction	D2 Stream	Loss of vegetation/habitat	Medium	Medium	Medium	Almost Certain	Major		Medium	Medium	Almost Certain	Major	
Construction	D4 Stream	Loss of vegetation/habitat	Medium	High	High	Almost Certain	Major		High	High	Almost Certain	Major	
Construction	D5 Stream	Loss of vegetation/habitat	High	High	High	Almost Certain	Major		High	High	Almost Certain	Major	
Construction	D6 Pond	Loss of vegetation/habitat	Low	High	Low	Almost Certain	Moderate		High	Low	Almost Certain	Moderate	
Construction	Farm	Loss of vegetation/habitat	Low	High	Low	Almost Certain	Moderate		High	Low	Almost Certain	Moderate	
Construction	Mixed forest	Loss of vegetation/habitat	High	High	High	Almost Certain	Major		High	High	Almost Certain	Major	
Construction	Scrubland and herbaceous vegetation	Loss of vegetation/habitat	Medium	High	High	Almost Certain	Major		High	High	Almost Certain	Major	
Construction	Waste woodland	Loss of vegetation/habitat	Medium	High	High	Almost Certain	Major		High	High	Almost Certain	Major	
Construction	Abandoned-land forest	Habitat degradation	High	N.A (Assumed that habitat has been completely cleared)					Low	Low	Less likely	Minor	Minor
Construction	D2 Stream	Habitat degradation	Medium						N.A (Assumed that habitat has been completely cleared)				
Construction	D4 Stream	Habitat degradation	Medium										
Construction	D5 Stream	Habitat degradation	High										
Construction	D6 Pond	Habitat degradation	Low										
Construction	Farm	Habitat degradation	Low										
Construction	Mixed forest	Habitat degradation	High						Low	Low	Less likely	Minor	
Construction	Scrubland and herbaceous vegetation	Habitat degradation	Medium						Low	Low	Less likely	Minor	
Construction	Waste woodland	Habitat degradation	Medium						Low	Low	Less likely	Minor	
Construction	Abandoned-land forest	Change in species composition	High						Low	Low	Possible/ Occasional	Minor	Minor
Construction	D2 Stream	Change in species composition	Medium						N.A (Assumed that habitat has been completely cleared)				
Construction	D4 Stream	Change in species composition	Medium										
Construction	D5 Stream	Change in species composition	High										
Construction	D6 Pond	Change in species composition	Low										
Construction	Farm	Change in species composition	Low										
Construction	Mixed forest	Change in species composition	High						Low	Low	Possible/ Occasional	Minor	
Construction	Scrubland and herbaceous vegetation	Change in species composition	Medium						Low	Low	Possible/ Occasional	Minor	
Construction	Waste woodland	Change in species composition	Medium						Low	Low	Possible/ Occasional	Minor	
Operation	Abandoned-land forest	Habitat degradation	High	N.A (Assumed that habitat has been completely cleared and new habitats are created)					High	High	Possible/ Occasional	Moderate	Moderate
Operation	D2 Stream	Habitat degradation	Medium						N.A (Assumed that habitat has been completely cleared)				
Operation	D4 Stream	Habitat degradation	Medium										
Operation	D5 Stream	Habitat degradation	High										
Operation	D6 Pond	Habitat degradation	Low										
Operation	Farm	Habitat degradation	Low										
Operation	Mixed forest	Habitat degradation	High						High	High	Possible/ Occasional	Moderate	
Operation	Scrubland and herbaceous vegetation	Habitat degradation	Medium						High	High	Possible/ Occasional	Moderate	
Operation	Waste woodland	Habitat degradation	Medium						High	High	Possible/ Occasional	Moderate	
Operation	Abandoned-land forest	Change in species composition	High						High	High	Less likely	Minor	Minor
Operation	D2 Stream	Change in species composition	Medium						High	High	Less likely	Minor	
Operation	D4 Stream	Change in species composition	Medium						High	High	Less likely	Minor	
Operation	D5 Stream	Change in species composition	High						High	High	Less likely	Minor	
Operation	D6 Pond	Change in species composition	Low						High	High	Less likely	Minor	
Operation	Farm	Change in species composition	Low						High	High	Less likely	Minor	
Operation	Mixed forest	Change in species composition	High						High	High	Less likely	Minor	
Operation	Scrubland and herbaceous vegetation	Change in species composition	Medium						High	High	Less likely	Minor	
Operation	Waste woodland	Change in species composition	Medium						High	High	Less likely	Minor	

Species	Family	Origin	Status	Habit	Impact type	Sensitivity (S)	Impact intensity (I)	Consequence (C = S × I)	Likelihood (L)	Impact significance (C × L)	Summary of impact significance	Residual impact intensity	Residual consequence	Residual likelihood	Residual impact significance	Sumamry of residual impact significance
Bridelia stipularis	Phyllanthaceae	Native	Vulnerable	Climber	Mortality	Priority 1	High	High	Almost certain	Major		Negligible	Very Low	Less Likely	Negligible	
Adinandra dumosa	Pentaphylacaceae	Native	Common	Tree	Mortality	Priority 1	High	High	Almost certain	Major		High	High	Almost certain	Major	
Cayratia trifolia	Vitaceae	Native	Vulnerable	Climber	Mortality	Priority 1	High	High	Almost certain	Major		Negligible	Very Low	Possible	Minor	
Crytococcum patens	Poaceae	Native	Critically Endangered	Herb	Mortality	Priority 1	High	High	Almost certain	Major		Negligible	Very Low	Possible	Minor	
Ficus stricta	Moraceae	Native	Critically Endangered	Tree	Mortality	Priority 1	High	High	Almost certain	Major		Low	Low	Possible	Minor	
Ficus vasculosa	Moraceae	Native	Endangered	Tree	Mortality	Priority 1	High	High	Almost certain	Major		High	High	Almost certain	Major	
Goniophlebium percussum	Polypodiaceae	Native	Vulnerable	Epiphyte	Mortality	Priority 1	High	High	Almost certain	Major		Negligible	Very Low	Possible	Minor	
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	Mortality	Priority 1	High	High	Almost certain	Major		Low	Low	Almost certain	Moderate	
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	Mortality	Priority 1	High	High	Almost certain	Major		Negligible	Very Low	Possible	Minor	
Planchonella obovata	Sapotaceae	Native	Vulnerable	Tree	Mortality	Priority 1	High	High	Almost certain	Major		High	High	Almost certain	Major	
Streblus elongatus	Moraceae	Native	Vulnerable	Tree	Mortality	Priority 1	High	High	Almost certain	Major		Low	Low	Almost certain	Moderate	
Adiantum nitidum	Adiantaceae	Native	Extinct; Recently Re-discovered	Epiphyte	Mortality	Priority 1	High	High	Almost certain	Major		Negligible	Very Low	Possible	Minor	
Alsophila latebrosa	Cyatheaceae	Native	Vulnerable	Tree	Mortality	Priority 1	High	High	Almost certain	Major		Low	Low	Almost certain	Moderate	
Amphineuron opulentum	Thelypteridaceae	Native	Endangered	Herb	Mortality	Priority 1	High	High	Almost certain	Major		Negligible	Very Low	Possible	Minor	
Aporosa benthamiana	Phyllanthaceae	Native	Vulnerable	Tree	Mortality	Priority 1	High	High	Almost certain	Major		Negligible	Very Low	Possible	Minor	
Blechnum finlaysonianum	Blechnaceae	Native	Vulnerable	Herb	Mortality	Priority 1	High	High	Almost certain	Major		Negligible	Very Low	Possible	Minor	
Callicarpa longifolia	Lamiaceae	Native	Endangered	Shrub	Mortality	Priority 1	High	High	Almost certain	Major		Negligible	Very Low	Less Likely	Negligible	
Centotheca lappacea	Poaceae	Native	Critically Endangered	Herb	Mortality	Priority 1	High	High	Almost certain	Major		Negligible	Very Low	Less Likely	Negligible	
Chassalia curviflora	Rubiaceae	Native	Vulnerable	Shrub	Mortality	Priority 1	High	High	Almost certain	Major		Negligible	Very Low	Less Likely	Negligible	
Cissus repens	Vitaceae	Native	Critically Endangered	Climber	Mortality	Priority 1	High	High	Almost certain	Major		Negligible	Very Low	Less Likely	Negligible	
Ficus benjamina	Moraceae	Cryptogenic	-	Tree	Mortality	Priority 1	High	High	Almost certain	Major		High	High	Almost certain	Major	
Ficus caulocarpa	Moraceae	Native	Common	Tree	Mortality	Priority 1	High	High	Almost certain	Major		High	High	Almost certain	Major	
Ficus fistulosa	Moraceae	Native	Common	Tree	Mortality	Priority 1	High	High	Almost certain	Major		High	High	Almost certain	Major	
Ficus grossularioides var. grossularioides	Moraceae	Native	Common	Shrub	Mortality	Priority 1	High	High	Possible	Moderate		High	High	Possible	Moderate	
Ficus hispida	Moraceae	Exotic	Naturalised	Tree	Mortality	Priority 1	High	High	Almost certain	Major		High	High	Almost certain	Major	
Ficus microcarpa	Moraceae	Native	Common	Tree	Mortality	Priority 1	High	High	Almost certain	Major		High	High	Almost certain	Major	
Clerodendrum villosum	Lamiaceae	Native	Vulnerable	Shrub	Mortality	Priority 1	High	High	Almost certain	Major	Moderate – Major	Negligible	Very Low	Possible	Minor	Negligible – Major
Ficus variegata	Moraceae	Native	Common	Tree	Mortality	Priority 1	High	High	Almost certain	Major		High	High	Almost certain	Major	
Connarus semidecandrus	Connaraceae	Native	Critically Endangered	Climber	Mortality	Priority 1	High	High	Almost certain	Major		Negligible	Very Low	Possible	Minor	
Cratoxylum formosum	Hypericaceae	Native	Endangered	Tree	Mortality	Priority 1	High	High	Almost certain	Major		Negligible	Very Low	Less Likely	Negligible	
Dalbergia cf. *velutina*	Fabaceae	Native	Critically Endangered	Climber	Mortality	Priority 1	High	High	Almost certain	Major		Negligible	Very Low	Possible	Minor	
Dacryodes cf. costata	Burseraceae	Native	Endangered	Tree	Mortality	Priority 1	High	High	Almost certain	Major		Low	Low	Almost certain	Moderate	
Cyclosorus polycarpus	Thelypteridaceae	Native	Vulnerable	Herb	Mortality	Priority 1	High	High	Almost certain	Major		Negligible	Very Low	Possible	Minor	
Ficus aurata var. aurata	Moraceae	Native	Vulnerable	Shrub	Mortality	Priority 1	High	High	Almost certain	Major		Negligible	Very Low	Possible	Minor	
Peltophorum pterocarpum	Fabaceae	Native	Critically Endangered (Cultivated)	Tree	Mortality	Priority 2	High	High	Almost certain	Major		High	High	Possible	Major	
Fuirena ciliaris	Cyperaceae	Native	Critically Endangered	Herb	Mortality	Priority 1	High	High	Almost certain	Major		Negligible	Very Low	Possible	Minor	
Glochidion zeylanicum var. *zeylanicum*	Phyllanthaceae	Native	Vulnerable	Tree	Mortality	Priority 1	High	High	Almost certain	Major		Medium	Medium	Almost certain	Major	
Hoya latifolia	Apocynaceae	Native	Endangered	Climber	Mortality	Priority 1	High	High	Almost certain	Major		Negligible	Very Low	Less Likely	Negligible	
Jasminum elongatum	Oleaceae	Native	Endangered	Climber	Mortality	Priority 1	High	High	Almost certain	Major		Negligible	Very Low	Possible	Minor	
Limacia scandens	Menispermaceae	Native	Vulnerable	Climber	Mortality	Priority 1	High	High	Almost certain	Major		Negligible	Very Low	Possible	Minor	
Ploiarium elegans	Bonnetiaceae	Native	Common	Tree	Mortality	Priority 1	High	High	Almost certain	Major		High	High	Almost certain	Major	
Litsea firma	Lauraceae	Native	Vulnerable	Tree	Mortality	Priority 1	High	High	Almost certain	Major		Negligible	Very Low	Possible	Minor	
Melicope lunu-ankenda	Rutaceae	Native	Critically Endangered	Tree	Mortality	Priority 1	High	High	Almost certain	Major		Low	Low	Almost certain	Moderate	
Samanea saman	Fabaceae	Exotic	Casual	Tree	Mortality	Priority 2	High	High	Almost certain	Major		High	High	Almost certain	Major	
Syzygium grande	Myrtaceae	Native	Common	Tree	Mortality	Priority 2	High	High	Almost certain	Major		High	High	Almost certain	Major	
Terminalia catappa	Combretaceae	Native	Common	Tree	Mortality	Priority 2	High	High	Almost certain	Major		High	High	Almost certain	Major	
Phanera semibifida var. *semibifida*	Fabaceae	Native	Vulnerable	Climber	Mortality	Priority 1	High	High	Almost certain	Major		Negligible	High	Possible	Minor	
Symplocos fasciculata	Symplocaceae	Native	Vulnerable	Tree	Mortality	Priority 1	High	High	Almost certain	Major		Negligible	Very Low	Possible	Minor	
Khaya senegalensis	Meliaceae	Exotic	Cultivated only	Tree	Mortality	Priority 3	High	Low	Almost certain	Moderate		High	High	Almost certain	Moderate	
Pterocarpus indicus	Fabaceae	Exotic	Casual	Tree	Mortality	Priority 3	High	Low	Almost certain	Moderate		High	Low	Almost certain	Moderate	
Tarenna fragrans	Rubiaceae	Native	Endangered	Tree	Mortality	Priority 1	High	High	Almost certain	Major		Negligible	Very Low	Less Likely	Negligible	
Tabebuia rosea	Bignoniaceae	Exotic	Casual	Tree	Mortality	Priority 3	High	Low	Almost certain	Moderate		Low	Very Low	Almost certain	Minor	
Bridelia stipularis	Phyllanthaceae	Native	Vulnerable	Climber	Impediment to seedling recruitment	Priority 1						Low	Low	Possible	Minor	
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	Impediment to seedling recruitment	Priority 1						Low	Low	Almost certain	Moderate	
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	Impediment to seedling recruitment	Priority 1						Low	Low	Possible	Minor	
Centotheca lappacea	Poaceae	Native	Critically Endangered	Herb	Impediment to seedling recruitment	Priority 1						Low	Low	Possible	Minor	
Ficus microcarpa	Moraceae	Native	Common	Tree	Impediment to seedling recruitment	Priority 1						Low	Low	Possible	Moderate	
Ficus variegata	Moraceae	Native	Common	Tree	Impediment to seedling recruitment	Priority 1						Low	Low	Possible	Moderate	
Tabebuia rosea	Bignoniaceae	Exotic	Casual	Tree	Impediment to seedling recruitment	Priority 3						Medium	Very Low	Almost certain	Minor	
Bridelia stipularis	Phyllanthaceae	Native	Vulnerable	Climber	Competition from exotic species	Priority 1						Low	Low	Possible	Minor	
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	Competition from exotic species	Priority 1						Low	Low	Possible	Minor	
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	Competition from exotic species	Priority 1						Low	Low	Possible	Minor	

N.A (Total land clearance of the Study Area)

Species	Family	Origin	Status	Habit	Impact type	Sensitivity (S)	Impact intensity (I)	Consequence (C = S × I)	Likelihood (L)	Impact significance (C × L)	Summary of impact significance	Residual impact intensity	Residual consequence	Residual likelihood	Residual impact significance	Sumamry of residual impact significance
Centotheca lappacea	Poaceae	Native	Critically Endangered	Herb	Competition from exotic species	Priority 1	N.A (Total land clearance of the Study Area)					Low	Low	Possible	Minor	Minor
Ficus microcarpa	Moraceae	Native	Common	Tree	Competition from exotic species	Priority 1						Low	Low	Possible	Minor	
Ficus variegata	Moraceae	Native	Common	Tree	Competition from exotic species	Priority 1						Low	Low	Possible	Minor	
Tabebuia rosea	Bignoniaceae	Exotic	Casual	Tree	Competition from exotic species	Priority 3						Medium	Very Low	Possible	Minor	
Bridelia stipularis	Phyllanthaceae	Native	Vulnerable	Climber	Decline in plant health and survival	Priority 1	N.A (Total land clearance of the Study Area)					Low	Low	Possible	Minor	Minor
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	Decline in plant health and survival	Priority 1						Low	Low	Possible	Minor	
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	Decline in plant health and survival	Priority 1						Low	Low	Possible	Minor	
Centotheca lappacea	Poaceae	Native	Critically Endangered	Herb	Decline in plant health and survival	Priority 1						Low	Low	Possible	Minor	
Ficus microcarpa	Moraceae	Native	Common	Tree	Decline in plant health and survival	Priority 1						Low	Low	Possible	Minor	
Ficus variegata	Moraceae	Native	Common	Tree	Decline in plant health and survival	Priority 1						Low	Low	Possible	Minor	
Tabebuia rosea	Bignoniaceae	Exotic	Casual	Tree	Decline in plant health and survival	Priority 3						Medium	Very Low	Possible	Minor	
Bridelia stipularis	Phyllanthaceae	Native	Vulnerable	Climber	Competition from exotic species	Priority 1	N.A (Total land clearance of the Study Area)					High	High	Less Likely	Minor	Negligible - Minor
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	Competition from exotic species	Priority 1						High	High	Less Likely	Minor	
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	Competition from exotic species	Priority 1						High	High	Less Likely	Minor	
Centotheca lappacea	Poaceae	Native	Critically Endangered	Herb	Competition from exotic species	Priority 1						High	High	Less Likely	Minor	
Ficus microcarpa	Moraceae	Native	Common	Tree	Competition from exotic species	Priority 1						High	High	Less Likely	Minor	
Ficus variegata	Moraceae	Native	Common	Tree	Competition from exotic species	Priority 1						High	High	Less Likely	Minor	
Tabebuia rosea	Bignoniaceae	Exotic	Casual	Tree	Competition from exotic species	Priority 3						Low	Very Low	Less Likely	Negligible	
Bridelia stipularis	Phyllanthaceae	Native	Vulnerable	Climber	Mortality	Priority 1	N.A (Total land clearance of the Study Area)					Low	Low	Unlikely	Negligible	Negligible
Macaranga griffithiana	Euphorbiaceae	Native	Vulnerable	Tree	Mortality	Priority 1						Low	Low	Unlikely	Negligible	
Oxyceros longiflorus	Rubiaceae	Native	Vulnerable	Climber	Mortality	Priority 1						Low	Low	Unlikely	Negligible	
Centotheca lappacea	Poaceae	Native	Critically Endangered	Herb	Mortality	Priority 1						Low	Low	Unlikely	Negligible	
Ficus microcarpa	Moraceae	Native	Common	Tree	Mortality	Priority 1						Low	Low	Unlikely	Negligible	
Ficus variegata	Moraceae	Native	Common	Tree	Mortality	Priority 1						Low	Low	Unlikely	Negligible	
Tabebuia rosea	Bignoniaceae	Exotic	Casual	Tree	Mortality	Priority 3						Low	Very Low	Unlikely	Negligible	

Phase	Faunal group	Species	Common name	Global status	National status	Impact type	Sensitivity (S)	Impact intensity (I)	Consequence (C = S × I)	Likelihood (L)	Impact significance (C × L)	Summary of impact significance	Residual impact intensity	Residual consequence	Residual likelihood	Residual impact significance	Summary of residual impact significance
Construction	Bird	*Accipiter trivirgatus*	Crested goshawk	Least Concern	Critically Endangered	Injury or mortality	High (Priority 1)	Low	Low	Almost certain	Moderate	Moderate – Major	Low	Low	Possible	Minor	Minor-Major
Construction	Bird	Cacomantis sepulcralis	Rusty-breasted cuckoo	Least Concern	Vulnerable	Injury or mortality	High (Priority 1)	Low	Low	Almost certain	Moderate		Low	Low	Possible	Minor	
Construction	Bird	Collocalia affinis	Plume-toed swiftlet	Not Assessed	Not Assessed	Injury or mortality	High (Priority 1)	Low	Low	Almost certain	Moderate		Low	Low	Possible	Minor	
Construction	Bird	Copsychus saularis	Oriental magpie-robin	Least Concern	Endangered	Injury or mortality	High (Priority 1)	Low	Low	Almost certain	Moderate		Low	Low	Possible	Minor	
Construction	Bird	*Gallus gallus*	Red junglefowl	Least Concern	Endangered	Injury or mortality	High (Priority 1)	Low	Low	Almost certain	Moderate		Low	Low	Possible	Minor	
Construction	Bird	*Haliaeetus ichthyaetus*	Grey-headed fish eagle	Near threatened	Critically Endangered	Injury or mortality	High (Priority 1)	Low	Low	Almost certain	Moderate		Low	Low	Possible	Minor	
Construction	Bird	*Loriculus galgulus*	Blue-crowned hanging-parrot	Least Concern	Endangered	Injury or mortality	High (Priority 1)	Low	Low	Almost certain	Moderate		Low	Low	Possible	Minor	
Construction	Bird	*Nisaetus cirrhatus*	Changeable hawk-eagle	Least Concern	Endangered	Injury or mortality	High (Priority 1)	Low	Low	Almost certain	Moderate		Low	Low	Possible	Minor	
Construction	Bird	Pitta moluccensis	Blue-winged pitta	Least Concern	Not Assessed	Injury or mortality	High (Priority 1)	Low	Low	Almost certain	Moderate		Low	Low	Possible	Minor	
Construction	Bird	Psittacula longicauda	Long-tailed parakeet	Vulnerable	Not Assessed	Injury or mortality	High (Priority 1)	Low	Low	Almost certain	Moderate		Low	Low	Possible	Minor	
Construction	Bird	Pycnonotus zeylanicus	Straw-headed bulbul	Critically endangered	Endangered	Injury or mortality	High (Priority 1)	Low	Low	Almost certain	Moderate		Low	Low	Possible	Minor	
Construction	Bird	*Rallina fasciata*	Red-legged crake	Least Concern	Vulnerable	Injury or mortality	High (Priority 1)	Low	Low	Almost certain	Moderate		Low	Low	Possible	Minor	
Construction	Bird	Vanellus indicus	Red-wattled lapwing	Least Concern	Endangered	Injury or mortality	High (Priority 1)	Low	Low	Almost certain	Moderate		Low	Low	Possible	Minor	
Construction	Butterfly	*Athyma reta moorei*	Malay staff sergeant	Not Assessed	Not Assessed	Injury or mortality	High (Priority 1)	Low	Low	Continuous	Moderate		Low	Low	Possible	Minor	
Construction	Butterfly	*Borbo cinnara*	Formosan swift	Not Assessed	Endangered	Injury or mortality	High (Priority 1)	Low	Low	Continuous	Moderate		Low	Low	Possible	Minor	
Construction	Mammal	Manis javanica	Sunda pangolin	Critically endangered	Critically Endangered	Injury or mortality	High (Priority 1)	High	High	Continuous	Major		High	High	Possible	Moderate	
Construction	Reptile	*Amyda cartilaginea*	Asian softshell turtle	Vulnerable	Endangered	Injury or mortality	High (Priority 1)	High	High	Continuous	Major		High	High	Possible	Moderate	
Construction	Reptile	*Cuora amboinensis*	Malayan box terrapin	Vulnerable	Not Assessed	Injury or mortality	High (Priority 1)	High	High	Continuous	Major		Medium	High	Possible	Moderate	
Construction	Reptile	*Hemiphyllodactylus typus*	Lowland dwarf gecko	Least Concern	Vulnerable	Injury or mortality	High (Priority 1)	High	High	Continuous	Major		High	High	Almost certain	Major	
Construction	Bird	*Accipiter trivirgatus*	Crested goshawk	Least Concern	Critically Endangered	Loss of/ reduction in habitats and food sources	High (Priority 1)	High	High	Continuous	Major	Major	High	High	Continuous	Major	Major
Construction	Bird	Cacomantis sepulcralis	Rusty-breasted cuckoo	Least Concern	Vulnerable	Loss of/ reduction in habitats and food sources	High (Priority 1)	High	High	Continuous	Major		High	High	Continuous	Major	
Construction	Bird	Collocalia affinis	Plume-toed swiftlet	Not Assessed	Not Assessed	Loss of/ reduction in habitats and food sources	High (Priority 1)	High	High	Continuous	Major		High	High	Continuous	Major	
Construction	Bird	Copsychus saularis	Oriental magpie-robin	Least Concern	Endangered	Loss of/ reduction in habitats and food sources	High (Priority 1)	High	High	Continuous	Major		High	High	Continuous	Major	
Construction	Bird	*Gallus gallus*	Red junglefowl	Least Concern	Endangered	Loss of/ reduction in habitats and food sources	High (Priority 1)	High	High	Continuous	Major		High	High	Continuous	Major	
Construction	Bird	*Haliaeetus ichthyaetus*	Grey-headed fish eagle	Near threatened	Critically Endangered	Loss of/ reduction in habitats and food sources	High (Priority 1)	High	High	Continuous	Major		High	High	Continuous	Major	
Construction	Bird	*Loriculus galgulus*	Blue-crowned hanging-parrot	Least Concern	Endangered	Loss of/ reduction in habitats and food sources	High (Priority 1)	High	High	Continuous	Major		High	High	Continuous	Major	
Construction	Bird	*Nisaetus cirrhatus*	Changeable hawk-eagle	Least Concern	Endangered	Loss of/ reduction in habitats and food sources	High (Priority 1)	High	High	Continuous	Major		High	High	Continuous	Major	
Construction	Bird	Pitta moluccensis	Blue-winged pitta	Least Concern	Not Assessed	Loss of/ reduction in habitats and food sources	High (Priority 1)	High	High	Continuous	Major		High	High	Continuous	Major	
Construction	Bird	Psittacula longicauda	Long-tailed parakeet	Vulnerable	Not Assessed	Loss of/ reduction in habitats and food sources	High (Priority 1)	High	High	Continuous	Major		High	High	Continuous	Major	
Construction	Bird	Pycnonotus zeylanicus	Straw-headed bulbul	Critically endangered	Endangered	Loss of/ reduction in habitats and food sources	High (Priority 1)	High	High	Continuous	Major		High	High	Continuous	Major	
Construction	Bird	*Rallina fasciata*	Red-legged crake	Least Concern	Vulnerable	Loss of/ reduction in habitats and food sources	High (Priority 1)	High	High	Continuous	Major		High	High	Continuous	Major	
Construction	Bird	Vanellus indicus	Red-wattled lapwing	Least Concern	Endangered	Loss of/ reduction in habitats and food sources	High (Priority 1)	High	High	Continuous	Major		High	High	Continuous	Major	
Construction	Butterfly	*Athyma reta moorei*	Malay staff sergeant	Not Assessed	Not Assessed	Loss of/ reduction in habitats and food sources	High (Priority 1)	High	High	Continuous	Major		High	High	Continuous	Major	
Construction	Butterfly	*Borbo cinnara*	Formosan swift	Not Assessed	Endangered	Loss of/ reduction in habitats and food sources	High (Priority 1)	High	High	Continuous	Major		High	High	Continuous	Major	
Construction	Mammal	Manis javanica	Sunda pangolin	Critically endangered	Critically Endangered	Loss of/ reduction in habitats and food sources	High (Priority 1)	High	High	Continuous	Major		High	High	Continuous	Major	
Construction	Reptile	*Amyda cartilaginea*	Asian softshell turtle	Vulnerable	Endangered	Loss of/ reduction in habitats and food sources	High (Priority 1)	High	High	Continuous	Major		High	High	Continuous	Major	
Construction	Reptile	*Cuora amboinensis*	Malayan box terrapin	Vulnerable	Not Assessed	Loss of/ reduction in habitats and food sources	High (Priority 1)	High	High	Continuous	Major		High	High	Continuous	Major	
Construction	Reptile	*Hemiphyllodactylus typus*	Lowland dwarf gecko	Least Concern	Vulnerable	Loss of/ reduction in habitats and food sources	High (Priority 1)	High	High	Continuous	Major		High	High	Continuous	Major	
Construction	Bird	*Accipiter trivirgatus*	Crested goshawk	Least Concern	Critically Endangered	Disturbance from light	High (Priority 1)	N.A (Assuming total land clearance of the Study Area)					Medium	Medium	Less likely	Minor	Minor – Moderate
Construction	Bird	Cacomantis sepulcralis	Rusty-breasted cuckoo	Least Concern	Vulnerable	Disturbance from light	High (Priority 1)						Medium	Medium	Less likely	Minor	
Construction	Bird	Collocalia affinis	Plume-toed swiftlet	Not Assessed	Not Assessed	Disturbance from light	High (Priority 1)						Medium	Medium	Less likely	Minor	
Construction	Bird	Copsychus saularis	Oriental magpie-robin	Least Concern	Endangered	Disturbance from light	High (Priority 1)						Medium	Medium	Less likely	Minor	
Construction	Bird	*Gallus gallus*	Red junglefowl	Least Concern	Endangered	Disturbance from light	High (Priority 1)						Medium	Medium	Less likely	Minor	
Construction	Bird	*Haliaeetus ichthyaetus*	Grey-headed fish eagle	Near threatened	Critically Endangered	Disturbance from light	High (Priority 1)						Medium	Medium	Less likely	Minor	
Construction	Bird	*Loriculus galgulus*	Blue-crowned hanging-parrot	Least Concern	Endangered	Disturbance from light	High (Priority 1)						Medium	Medium	Less likely	Minor	
Construction	Bird	*Nisaetus cirrhatus*	Changeable hawk-eagle	Least Concern	Endangered	Disturbance from light	High (Priority 1)						Medium	Medium	Less likely	Minor	
Construction	Bird	Pitta moluccensis	Blue-winged pitta	Least Concern	Not Assessed	Disturbance from light	High (Priority 1)						Medium	Medium	Less likely	Minor	
Construction	Bird	Psittacula longicauda	Long-tailed parakeet	Vulnerable	Not Assessed	Disturbance from light	High (Priority 1)						Medium	Medium	Less likely	Minor	
Construction	Bird	Pycnonotus zeylanicus	Straw-headed bulbul	Critically endangered	Endangered	Disturbance from light	High (Priority 1)						Medium	Medium	Less likely	Minor	
Construction	Bird	*Rallina fasciata*	Red-legged crake	Least Concern	Vulnerable	Disturbance from light	High (Priority 1)						Medium	Medium	Less likely	Minor	
Construction	Bird	Vanellus indicus	Red-wattled lapwing	Least Concern	Endangered	Disturbance from light	High (Priority 1)						Medium	Medium	Less likely	Minor	
Construction	Butterfly	*Athyma reta moorei*	Malay staff sergeant	Not Assessed	Not Assessed	Disturbance from light	High (Priority 1)						Low	Low	Possible	Minor	
Construction	Butterfly	*Borbo cinnara*	Formosan swift	Not Assessed	Endangered	Disturbance from light	High (Priority 1)						Low	Low	Possible	Minor	
Construction	Mammal	Manis javanica	Sunda pangolin	Critically endangered	Critically Endangered	Disturbance from light	High (Priority 1)						High	High	Possible	Moderate	
Construction	Reptile	*Amyda cartilaginea*	Asian softshell turtle	Vulnerable	Endangered	Disturbance from light	High (Priority 1)						N.A (Assuming that species has been translocated)				
Construction	Reptile	*Cuora amboinensis*	Malayan box terrapin	Vulnerable	Not Assessed	Disturbance from light	High (Priority 1)						Medium	Medium	Possible	Moderate	
Construction	Reptile	*Hemiphyllodactylus typus*	Lowland dwarf gecko	Least Concern	Vulnerable	Disturbance from light	High (Priority 1)						Medium	Medium	Possible	Moderate	
Construction	Bird	*Accipiter trivirgatus*	Crested goshawk	Least Concern	Critically Endangered	Human disturbances	High (Priority 1)	N.A (Assuming total land clearance of the Study Area)					Medium	Medium	Less likely	Minor	Minor – Moderate
Construction	Bird	Cacomantis sepulcralis	Rusty-breasted cuckoo	Least Concern	Vulnerable	Human disturbances	High (Priority 1)						Medium	Medium	Less likely	Minor	
Construction	Bird	Collocalia affinis	Plume-toed swiftlet	Not Assessed	Not Assessed	Human disturbances	High (Priority 1)						Medium	Medium	Less likely	Minor	
Construction	Bird	Copsychus saularis	Oriental magpie-robin	Least Concern	Endangered	Human disturbances	High (Priority 1)						Medium	Medium	Less likely	Minor	
Construction	Bird	*Gallus gallus*	Red junglefowl	Least Concern	Endangered	Human disturbances	High (Priority 1)						Medium	Medium	Less likely	Minor	
Construction	Bird	*Haliaeetus ichthyaetus*	Grey-headed fish eagle	Near threatened	Critically Endangered	Human disturbances	High (Priority 1)						Medium	Medium	Less likely	Minor	
Construction	Bird	*Loriculus galgulus*	Blue-crowned hanging-parrot	Least Concern	Endangered	Human disturbances	High (Priority 1)						Medium	Medium	Less likely	Minor	
Construction	Bird	*Nisaetus cirrhatus*	Changeable hawk-eagle	Least Concern	Endangered	Human disturbances	High (Priority 1)						Medium	Medium	Less likely	Minor	
Construction	Bird	Pitta moluccensis	Blue-winged pitta	Least Concern	Not Assessed	Human disturbances	High (Priority 1)						Medium	Medium	Less likely	Minor	
Construction	Bird	Psittacula longicauda	Long-tailed parakeet	Vulnerable	Not Assessed	Human disturbances	High (Priority 1)						Medium	Medium	Less likely	Minor	
Construction	Bird	Pycnonotus zeylanicus	Straw-headed bulbul	Critically endangered	Endangered	Human disturbances	High (Priority 1)						Medium	Medium	Less likely	Minor	
Construction	Bird	*Rallina fasciata*	Red-legged crake	Least Concern	Vulnerable	Human disturbances	High (Priority 1)						Medium	Medium	Less likely	Minor	
Construction	Bird	Vanellus indicus	Red-wattled lapwing	Least Concern	Endangered	Human disturbances	High (Priority 1)						Medium	Medium	Less likely	Minor	
Construction	Butterfly	*Athyma reta moorei*	Malay staff sergeant	Not Assessed	Not Assessed	Human disturbances	High (Priority 1)						Medium	Medium	Regular	Moderate	
Construction	Butterfly	*Borbo cinnara*	Formosan swift	Not Assessed	Endangered	Human disturbances	High (Priority 1)						Medium	Medium	Regular	Moderate	
Construction	Mammal	Manis javanica	Sunda pangolin	Critically endangered	Critically Endangered	Human disturbances	High (Priority 1)						High	High	Possible	Moderate	
Construction	Reptile	*Amyda cartilaginea*	Asian softshell turtle	Vulnerable	Endangered	Human disturbances	High (Priority 1)						N.A				
Construction	Reptile	*Cuora amboinensis*	Malayan box terrapin	Vulnerable	Not Assessed	Human disturbances	High (Priority 1)						Medium	Medium	Possible	Moderate	
Construction	Reptile	*Hemiphyllodactylus typus*	Lowland dwarf gecko	Least Concern	Vulnerable	Human disturbances	High (Priority 1)						Medium	Medium	Possible	Moderate	
Construction	Bird	*Accipiter trivirgatus*	Crested goshawk	Least Concern	Critically Endangered	Loss of ecological connectivity for faunal movement	High (Priority 1)						Low	Low	Likely	Moderate	
Construction	Bird	Cacomantis sepulcralis	Rusty-breasted cuckoo	Least Concern	Vulnerable	Loss of ecological connectivity for faunal movement	High (Priority 1)						Medium	Medium	Likely	Moderate	
Construction	Bird	Collocalia affinis	Plume-toed swiftlet	Not Assessed	Not Assessed	Loss of ecological connectivity for faunal movement	High (Priority 1)						Low	Low	Likely	Moderate	
Construction	Bird	Copsychus saularis	Oriental magpie-robin	Least Concern	Endangered	Loss of ecological connectivity for faunal movement	High (Priority 1)						Medium	Medium	Likely	Moderate	
Construction	Bird	*Gallus gallus*	Red junglefowl	Least Concern	Endangered	Loss of ecological connectivity for faunal movement	High (Priority 1)						Low	Low	Likely	Moderate	
Construction	Bird	*Haliaeetus ichthyaetus*	Grey-headed fish eagle	Near threatened	Critically Endangered	Loss of ecological connectivity for faunal movement	High (Priority 1)						Low	Low	Likely	Moderate	

Phase	Faunal group	Species	Common name	Global status	National status	Impact type	Sensitivity (S)	Impact intensity (I)	Consequence (C = S × I)	Likelihood (L)	Impact significance (C × L)	Summary of impact significance	Residual impact intensity	Residual consequence	Residual likelihood	Residual impact significance	Summary of residual impact significance
Construction	Bird	*Loriculus galgulus*	Blue-crowned hanging-parrot	Least Concern	Endangered	Loss of ecological connectivity for faunal movement	High (Priority 1)	N.A (Assuming total land clearance of the Study Area)					Low	Low	Likely	Moderate	Minor – Moderate
Construction	Bird	*Nisaetus cirrhatus*	Changeable hawk-eagle	Least Concern	Endangered	Loss of ecological connectivity for faunal movement	High (Priority 1)						Low	Low	Likely	Moderate	
Construction	Bird	Pitta moluccensis	Blue-winged pitta	Least Concern	Not Assessed	Loss of ecological connectivity for faunal movement	High (Priority 1)						Medium	Medium	Likely	Moderate	
Construction	Bird	Psittacula longicauda	Long-tailed parakeet	Vulnerable	Not Assessed	Loss of ecological connectivity for faunal movement	High (Priority 1)						Low	Low	Likely	Moderate	
Construction	Bird	Pycnonotus zeylanicus	Straw-headed bulbul	Critically endangered	Endangered	Loss of ecological connectivity for faunal movement	High (Priority 1)						Medium	Medium	Likely	Moderate	
Construction	Bird	*Rallina fasciata*	Red-legged crake	Least Concern	Vulnerable	Loss of ecological connectivity for faunal movement	High (Priority 1)						Low	Low	Likely	Moderate	
Construction	Bird	Vanellus indicus	Red-wattled lapwing	Least Concern	Endangered	Loss of ecological connectivity for faunal movement	High (Priority 1)						Low	Low	Likely	Moderate	
Construction	Butterfly	*Athyma reta moorei*	Malay staff sergeant	Not Assessed	Not Assessed	Loss of ecological connectivity for faunal movement	High (Priority 1)						Medium	Medium	Likely	Moderate	
Construction	Butterfly	*Borbo cinnara*	Formosan swift	Not Assessed	Endangered	Loss of ecological connectivity for faunal movement	High (Priority 1)						Low	Low	Likely	Moderate	
Construction	Mammal	Manis javanica	Sunda pangolin	Critically endangered	Critically Endangered	Loss of ecological connectivity for faunal movement	High (Priority 1)						High	High	Less likely	Minor	
Construction	Reptile	*Amyda cartilaginea*	Asian softshell turtle	Vulnerable	Endangered	Loss of ecological connectivity for faunal movement	High (Priority 1)						N.A				
Construction	Reptile	*Cuora amboinensis*	Malayan box terrapin	Vulnerable	Not Assessed	Loss of ecological connectivity for faunal movement	High (Priority 1)						Medium	Medium	Possible	Moderate	
Construction	Reptile	*Hemiphyllodactylus typus*	Lowland dwarf gecko	Least Concern	Vulnerable	Loss of ecological connectivity for faunal movement	High (Priority 1)						Medium	Medium	Possible	Moderate	
Operational	Bird	*Accipiter trivirgatus*	Crested goshawk	Least Concern	Critically Endangered	Collisions with buildings (birds only)	High (Priority 1)	Low	Low	Possible	Minor	Minor – Moderate	N.A (impact is minor)				Moderate
Operational	Bird	Cacomantis sepulcralis	Rusty-breasted cuckoo	Least Concern	Vulnerable	Collisions with buildings (birds only)	High (Priority 1)	Low	Low	Possible	Minor		N.A (impact is minor)				
Operational	Bird	Collocalia affinis	Plume-toed swiftlet	Not Assessed	Not Assessed	Collisions with buildings (birds only)	High (Priority 1)	Low	Low	Possible	Minor		N.A (impact is minor)				
Operational	Bird	Copsychus saularis	Oriental magpie-robin	Least Concern	Endangered	Collisions with buildings (birds only)	High (Priority 1)	Low	Low	Possible	Minor		N.A (impact is minor)				
Operational	Bird	*Gallus gallus*	Red junglefowl	Least Concern	Endangered	Collisions with buildings (birds only)	High (Priority 1)	Low	Low	Possible	Minor		High	High	Possible	Moderate	
Operational	Bird	*Haliaeetus ichthyaetus*	Grey-headed fish eagle	Near threatened	Critically Endangered	Collisions with buildings (birds only)	High (Priority 1)	Medium	Medium	Possible	Moderate		Medium	Medium	Possible	Moderate	
Operational	Bird	*Loriculus galgulus*	Blue-crowned hanging-parrot	Least Concern	Endangered	Collisions with buildings (birds only)	High (Priority 1)	Low	Low	Possible	Minor		N.A (impact is minor)				
Operational	Bird	*Nisaetus cirrhatus*	Changeable hawk-eagle	Least Concern	Endangered	Collisions with buildings (birds only)	High (Priority 1)	Low	Low	Possible	Minor		N.A (impact is minor)				
Operational	Bird	Pitta moluccensis	Blue-winged pitta	Least Concern	Not Assessed	Collisions with buildings (birds only)	High (Priority 1)	High	High	Continuous	Major		High	High	Possible	Moderate	
Operational	Bird	Psittacula longicauda	Long-tailed parakeet	Vulnerable	Not Assessed	Collisions with buildings (birds only)	High (Priority 1)	Low	Low	Possible	Minor		N.A (impact is minor)				
Operational	Bird	Pycnonotus zeylanicus	Straw-headed bulbul	Critically endangered	Endangered	Collisions with buildings (birds only)	High (Priority 1)	Medium	Medium	Possible	Moderate		Medium	Medium	Possible	Moderate	
Operational	Bird	*Rallina fasciata*	Red-legged crake	Least Concern	Vulnerable	Collisions with buildings (birds only)	High (Priority 1)	Low	Low	Possible	Minor		N.A (impact is minor)				
Operational	Bird	Vanellus indicus	Red-wattled lapwing	Least Concern	Endangered	Collisions with buildings (birds only)	High (Priority 1)	Medium	Medium	Possible	Moderate		Medium	Medium	Possible	Moderate	
Operational	Bird	*Accipiter trivirgatus*	Crested goshawk	Least Concern	Critically Endangered	Disturbances from human presence	High (Priority 1)	Medium	Medium	Continuous	Major	Major	Medium	Medium	Possible	Moderate	Minor-Moderate
Operational	Bird	Cacomantis sepulcralis	Rusty-breasted cuckoo	Least Concern	Vulnerable	Disturbances from human presence	High (Priority 1)	Medium	Medium	Continuous	Major		Medium	Medium	Possible	Moderate	
Operational	Bird	Collocalia affinis	Plume-toed swiftlet	Not Assessed	Not Assessed	Disturbances from human presence	High (Priority 1)	Medium	Medium	Continuous	Major		Medium	Medium	Possible	Moderate	
Operational	Bird	Copsychus saularis	Oriental magpie-robin	Least Concern	Endangered	Disturbances from human presence	High (Priority 1)	Medium	Medium	Continuous	Major		Medium	Medium	Possible	Moderate	
Operational	Bird	*Gallus gallus*	Red junglefowl	Least Concern	Endangered	Disturbances from human presence	High (Priority 1)	High	High	Continuous	Major		High	High	Possible	Moderate	
Operational	Bird	*Haliaeetus ichthyaetus*	Grey-headed fish eagle	Near threatened	Critically Endangered	Disturbances from human presence	High (Priority 1)	Medium	Medium	Continuous	Major		Medium	Medium	Possible	Moderate	
Operational	Bird	*Loriculus galgulus*	Blue-crowned hanging-parrot	Least Concern	Endangered	Disturbances from human presence	High (Priority 1)	Medium	Medium	Continuous	Major		Medium	Medium	Possible	Moderate	
Operational	Bird	*Nisaetus cirrhatus*	Changeable hawk-eagle	Least Concern	Endangered	Disturbances from human presence	High (Priority 1)	Medium	Medium	Continuous	Major		Medium	Medium	Possible	Moderate	
Operational	Bird	Pitta moluccensis	Blue-winged pitta	Least Concern	Not Assessed	Disturbances from human presence	High (Priority 1)	Medium	Medium	Continuous	Major		Medium	Medium	Possible	Moderate	
Operational	Bird	Psittacula longicauda	Long-tailed parakeet	Vulnerable	Not Assessed	Disturbances from human presence	High (Priority 1)	Medium	Medium	Continuous	Major		Medium	Medium	Possible	Moderate	
Operational	Bird	Pycnonotus zeylanicus	Straw-headed bulbul	Critically endangered	Endangered	Disturbances from human presence	High (Priority 1)	Medium	Medium	Continuous	Major		Medium	Medium	Possible	Moderate	
Operational	Bird	*Rallina fasciata*	Red-legged crake	Least Concern	Vulnerable	Disturbances from human presence	High (Priority 1)	Medium	Medium	Continuous	Major		Medium	Medium	Possible	Moderate	
Operational	Bird	Vanellus indicus	Red-wattled lapwing	Least Concern	Endangered	Disturbances from human presence	High (Priority 1)	Medium	Medium	Continuous	Major		Medium	Medium	Possible	Moderate	
Operational	Mammal	Manis javanica	Sunda pangolin	Critically endangered	Critically Endangered	Disturbances from human presence	High (Priority 1)	Medium	Medium	Continuous	Major		Medium	Medium	Possible	Moderate	
Operational	Reptile	*Cuora amboinensis*	Malayan box terrapin	Vulnerable	Not Assessed	Disturbances from human presence	High (Priority 1)	High	High	Continuous	Major		High	High	Possible	Moderate	
Operational	Reptile	*Hemiphyllodactylus typus*	Lowland dwarf gecko	Least Concern	Vulnerable	Disturbances from human presence	High (Priority 1)	Medium	Medium	Continuous	Major		Medium	Medium	Possible	Moderate	
Operational	Butterfly	*Athyma reta moorei*	Malay staff sergeant	Not Assessed	Not Assessed	Disturbances from human presence	High (Priority 1)	N.A (Assumed that the species did not return back to Study Area due to absence of its host plants)					Medium	Medium	Possible	Moderate	
Operational	Butterfly	*Borbo cinnara*	Formosan swift	Not Assessed	Endangered	Disturbances from human presence	High (Priority 1)						Low	Low	Possible	Minor	
Operational	Bird	*Accipiter trivirgatus*	Crested goshawk	Least Concern	Critically Endangered	Disturbances from light	High (Priority 1)	Medium	Medium	Continuous	Major	Major	Medium	Medium	Possible	Moderate	Minor - Moderate
Operational	Bird	Cacomantis sepulcralis	Rusty-breasted cuckoo	Least Concern	Vulnerable	Disturbances from light	High (Priority 1)	Medium	Medium	Continuous	Major		Medium	Medium	Possible	Moderate	
Operational	Bird	Collocalia affinis	Plume-toed swiftlet	Not Assessed	Not Assessed	Disturbances from light	High (Priority 1)	Medium	Medium	Continuous	Major		Medium	Medium	Possible	Moderate	
Operational	Bird	Copsychus saularis	Oriental magpie-robin	Least Concern	Endangered	Disturbances from light	High (Priority 1)	Medium	Medium	Continuous	Major		Medium	Medium	Possible	Moderate	
Operational	Bird	*Gallus gallus*	Red junglefowl	Least Concern	Endangered	Disturbances from light	High (Priority 1)	Medium	Medium	Continuous	Major		Medium	Medium	Possible	Moderate	
Operational	Bird	*Haliaeetus ichthyaetus*	Grey-headed fish eagle	Near threatened	Critically Endangered	Disturbances from light	High (Priority 1)	Medium	Medium	Continuous	Major		Medium	Medium	Possible	Moderate	
Operational	Bird	*Loriculus galgulus*	Blue-crowned hanging-parrot	Least Concern	Endangered	Disturbances from light	High (Priority 1)	Medium	Medium	Continuous	Major		Medium	Medium	Possible	Moderate	
Operational	Bird	*Nisaetus cirrhatus*	Changeable hawk-eagle	Least Concern	Endangered	Disturbances from light	High (Priority 1)	Medium	Medium	Continuous	Major		Medium	Medium	Possible	Moderate	
Operational	Bird	Pitta moluccensis	Blue-winged pitta	Least Concern	Not Assessed	Disturbances from light	High (Priority 1)	Medium	Medium	Continuous	Major		Medium	Medium	Possible	Moderate	
Operational	Bird	Psittacula longicauda	Long-tailed parakeet	Vulnerable	Not Assessed	Disturbances from light	High (Priority 1)	Medium	Medium	Continuous	Major		Medium	Medium	Possible	Moderate	
Operational	Bird	Pycnonotus zeylanicus	Straw-headed bulbul	Critically endangered	Endangered	Disturbances from light	High (Priority 1)	Medium	Medium	Continuous	Major		Medium	Medium	Possible	Moderate	
Operational	Bird	*Rallina fasciata*	Red-legged crake	Least Concern	Vulnerable	Disturbances from light	High (Priority 1)	Medium	Medium	Continuous	Major		Medium	Medium	Possible	Moderate	
Operational	Bird	Vanellus indicus	Red-wattled lapwing	Least Concern	Endangered	Disturbances from light	High (Priority 1)	Medium	Medium	Continuous	Major		Medium	Medium	Possible	Moderate	
Operational	Mammal	Manis javanica	Sunda pangolin	Critically endangered	Critically Endangered	Disturbances from light	High (Priority 1)	High	High	Continuous	Major		High	High	Possible	Moderate	
Operational	Reptile	*Cuora amboinensis*	Malayan box terrapin	Vulnerable	Not Assessed	Disturbances from light	High (Priority 1)	Medium	Medium	Continuous	Major		Medium	Medium	Possible	Moderate	
Operational	Reptile	*Hemiphyllodactylus typus*	Lowland dwarf gecko	Least Concern	Vulnerable	Disturbances from light	High (Priority 1)	High	High	Continuous	Major		High	High	Possible	Moderate	
Operational	Butterfly	*Athyma reta moorei*	Malay staff sergeant	Not Assessed	Not Assessed	Disturbances from light	High (Priority 1)	N.A (Assumed that the species did not return back to Study Area due to absence of its host plants)					Low	Low	Possible	Minor	
Operational	Butterfly	*Borbo cinnara*	Formosan swift	Not Assessed	Endangered	Disturbances from light	High (Priority 1)						Low	Low	Possible	Minor	
Operational	Bird	*Accipiter trivirgatus*	Crested goshawk	Least Concern	Critically Endangered	Impediment to faunal movement	High (Priority 1)	High	High	Continuous	Major	Minor – Major	High	High	Possible	Moderate	Minor - Moderate
Operational	Bird	Cacomantis sepulcralis	Rusty-breasted cuckoo	Least Concern	Vulnerable	Impediment to faunal movement	High (Priority 1)	High	High	Continuous	Major		High	High	Possible	Moderate	
Operational	Bird	Collocalia affinis	Plume-toed swiftlet	Not Assessed	Not Assessed	Impediment to faunal movement	High (Priority 1)	High	High	Continuous	Major		High	High	Less likely	Minor	
Operational	Bird	Copsychus saularis	Oriental magpie-robin	Least Concern	Endangered	Impediment to faunal movement	High (Priority 1)	Negligible	Very low	Possible	Minor		N.A (impact is minor)				
Operational	Bird	*Gallus gallus*	Red junglefowl	Least Concern	Endangered	Impediment to faunal movement	High (Priority 1)	Negligible	Very low	Possible	Minor		N.A (impact is minor)				
Operational	Bird	*Haliaeetus ichthyaetus*	Grey-headed fish eagle	Near threatened	Critically Endangered	Impediment to faunal movement	High (Priority 1)	High	High	Continuous	Major		High	High	Less likely	Minor	
Operational	Bird	*Loriculus galgulus*	Blue-crowned hanging-parrot	Least Concern	Endangered	Impediment to faunal movement	High (Priority 1)	Negligible	Very low	Possible	Minor		N.A (impact is minor)				
Operational	Bird	*Nisaetus cirrhatus*	Changeable hawk-eagle	Least Concern	Endangered	Impediment to faunal movement	High (Priority 1)	High	High	Continuous	Major		High	High	Less likely	Minor	
Operational	Bird	Pitta moluccensis	Blue-winged pitta	Least Concern	Not Assessed	Impediment to faunal movement	High (Priority 1)	High	High	Continuous	Major		High	High	Possible	Moderate	
Operational	Bird	Psittacula longicauda	Long-tailed parakeet	Vulnerable	Not Assessed	Impediment to faunal movement	High (Priority 1)	Negligible	Very low	Possible	Minor		Negligible	Very low	Possible	Minor	
Operational	Bird	Pycnonotus zeylanicus	Straw-headed bulbul	Critically endangered	Endangered	Impediment to faunal movement	High (Priority 1)	High	High	Continuous	Major		High	High	Possible	Moderate	
Operational	Bird	*Rallina fasciata*	Red-legged crake	Least Concern	Vulnerable	Impediment to faunal movement	High (Priority 1)	High	High	Continuous	Major		High	High	Less likely	Minor	
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Operational	Reptile	*Cuora amboinensis*	Malayan box terrapin	Vulnerable	Not Assessed	Impediment to faunal movement	High (Priority 1)	High	High	Continuous	Major		High	High	Possible	Moderate	
Operational	Reptile	*Hemiphyllodactylus typus*	Lowland dwarf gecko	Least Concern	Vulnerable	Impediment to faunal movement	High (Priority 1)	High	High	Continuous	Major		High	High	Possible	Moderate	

Phase	Faunal group	Species	Common name	Global status	National status	Impact type	Sensitivity (S)	Impact intensity (I)	Consequence (C = S × I)	Likelihood (L)	Impact significance (C × L)	Summary of impact significance	Residual impact intensity	Residual consequence	Residual likelihood	Residual impact significance	Summary of residual impact significance
Operational	Butterfly	*Athyma reta moorei*	Malay staff sergeant	Not Assessed	Not Assessed	Impediment to faunal movement	High (Priority 1)	N.A (Assumed that the species did not return back to Study Area due to absence of its host plants)					Medium	Medium	Less likely	Minor	
Operational	Butterfly	*Borbo cinnara*	Formosan swift	Not Assessed	Endangered	Impediment to faunal movement	High (Priority 1)						Low	Low	Less likely	Minor	
Operational	Bird	*Accipiter trivirgatus*	Crested goshawk	Least Concern	Critically Endangered	Injury or mortality	High (Priority 1)	Low	Low	Continuous	Moderate	Moderate – Major	Low	Low	Possible	Minor	Minor – Moderate
Operational	Bird	Cacomantis sepulcralis	Rusty-breasted cuckoo	Least Concern	Vulnerable	Injury or mortality	High (Priority 1)	Low	Low	Continuous	Moderate		Low	Low	Possible	Minor	
Operational	Bird	Collocalia affinis	Plume-toed swiftlet	Not Assessed	Not Assessed	Injury or mortality	High (Priority 1)	Low	Low	Continuous	Moderate		Low	Low	Possible	Minor	
Operational	Bird	Copsychus saularis	Oriental magpie-robin	Least Concern	Endangered	Injury or mortality	High (Priority 1)	Low	Low	Continuous	Moderate		Low	Low	Possible	Minor	
Operational	Bird	*Gallus gallus*	Red junglefowl	Least Concern	Endangered	Injury or mortality	High (Priority 1)	Low	Low	Continuous	Moderate		Low	Low	Possible	Minor	
Operational	Bird	*Haliaeetus ichthyaetus*	Grey-headed fish eagle	Near threatened	Critically Endangered	Injury or mortality	High (Priority 1)	Low	Low	Continuous	Moderate		Low	Low	Possible	Minor	
Operational	Bird	*Loriculus galgulus*	Blue-crowned hanging-parrot	Least Concern	Endangered	Injury or mortality	High (Priority 1)	Low	Low	Continuous	Moderate		Low	Low	Possible	Minor	
Operational	Bird	*Nisaetus cirrhatus*	Changeable hawk-eagle	Least Concern	Endangered	Injury or mortality	High (Priority 1)	Low	Low	Continuous	Moderate		Low	Low	Possible	Minor	
Operational	Bird	Pitta moluccensis	Blue-winged pitta	Least Concern	Not Assessed	Injury or mortality	High (Priority 1)	Low	Low	Continuous	Moderate		Low	Low	Possible	Minor	
Operational	Bird	Psittacula longicauda	Long-tailed parakeet	Vulnerable	Not Assessed	Injury or mortality	High (Priority 1)	Low	Low	Continuous	Moderate		Low	Low	Possible	Minor	
Operational	Bird	Pycnonotus zeylanicus	Straw-headed bulbul	Critically endangered	Endangered	Injury or mortality	High (Priority 1)	Low	Low	Continuous	Moderate		Low	Low	Possible	Minor	
Operational	Bird	*Rallina fasciata*	Red-legged crake	Least Concern	Vulnerable	Injury or mortality	High (Priority 1)	Low	Low	Continuous	Moderate		Low	Low	Possible	Minor	
Operational	Bird	Vanellus indicus	Red-wattled lapwing	Least Concern	Endangered	Injury or mortality	High (Priority 1)	Low	Low	Continuous	Moderate		Low	Low	Possible	Minor	
Operational	Mammal	Manis javanica	Sunda pangolin	Critically endangered	Critically Endangered	Injury or mortality	High (Priority 1)	High	High	Continuous	Major		High	High	Possible	Moderate	
Operational	Reptile	*Amyda cartilaginea*	Asian softshell turtle	Vulnerable	Endangered	Injury or mortality	High (Priority 1)	High	High	Continuous	Major		High	High	Possible	Moderate	
Operational	Reptile	*Cuora amboinensis*	Malayan box terrapin	Vulnerable	Not Assessed	Injury or mortality	High (Priority 1)	High	High	Continuous	Major		High	High	Possible	Moderate	
Operational	Reptile	*Hemiphyllodactylus typus*	Lowland dwarf gecko	Least Concern	Vulnerable	Injury or mortality	High (Priority 1)	High	High	Continuous	Major		High	High	Possible	Moderate	
Operational	Butterfly	*Athyma reta moorei*	Malay staff sergeant	Not Assessed	Not Assessed	Injury or mortality	High (Priority 1)	N.A (Assumed that the species did not return back to Study Area due to absence of its host plants)					Low	Low	Less likely	Minor	
Operational	Butterfly	*Borbo cinnara*	Formosan swift	Not Assessed	Endangered	Injury or mortality	High (Priority 1)						Low	Low	Less likely	Minor	

Appendix M
Design Strategies for Habitat Creation and Biodiversity

Delivering a better world

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1. Summary of Mitigation Strategies for Biodiversity

This document addresses general design strategies for biodiversity that can be adopted and integrated into the Southern Tengah development. It is meant to supplement the mitigation measures outlined in the baseline impact assessment mentioned in the Southern Tengah EIS Final Report in **Section 7.11**. This document serves as a simplified guideline for designers and planners.

A summary of mitigation strategies for biodiversity in the order the mitigation hierarchy, i.e., avoidance, minimisation, remedy/repair and compensation are shown in **Figure 1-1**.



Figure 1-1. Summary of mitigating strategies for biodiversity within Southern Tengah.

2. Avoidance

2.1. Protect Recommended Areas of Conservation (RAC)

Impact: **Loss of habitat & ecological connectivity**	The development results in the loss of extensive area of habitat and ecological connectivity within the EIS Study Area. The EIS Study Area (60.2 ha) provides habitats for many flora and fauna species of conservation significance. It also serves an important ecological connectivity as it facilitates the dispersal of flora and fauna towards the south of Tengah Forest, and to other green spaces in vicinity such as the Western Water Catchment Area and Bukit Timah Nature Reserve, which are biodiversity hotspots across the fragmented landscape in Singapore.
Solution: **Retain Recommended Areas of Conservation**	Recommended Areas of Conservation (RAC) was identified in **Section 7.5** of the EIS Report (**Figure 2-1**). The development should be intentionally designed/re-designed to avoid or minimize works within the RAC to prevent the loss of vegetation which will disrupt the vegetation connectivity towards other areas of Tengah Town.

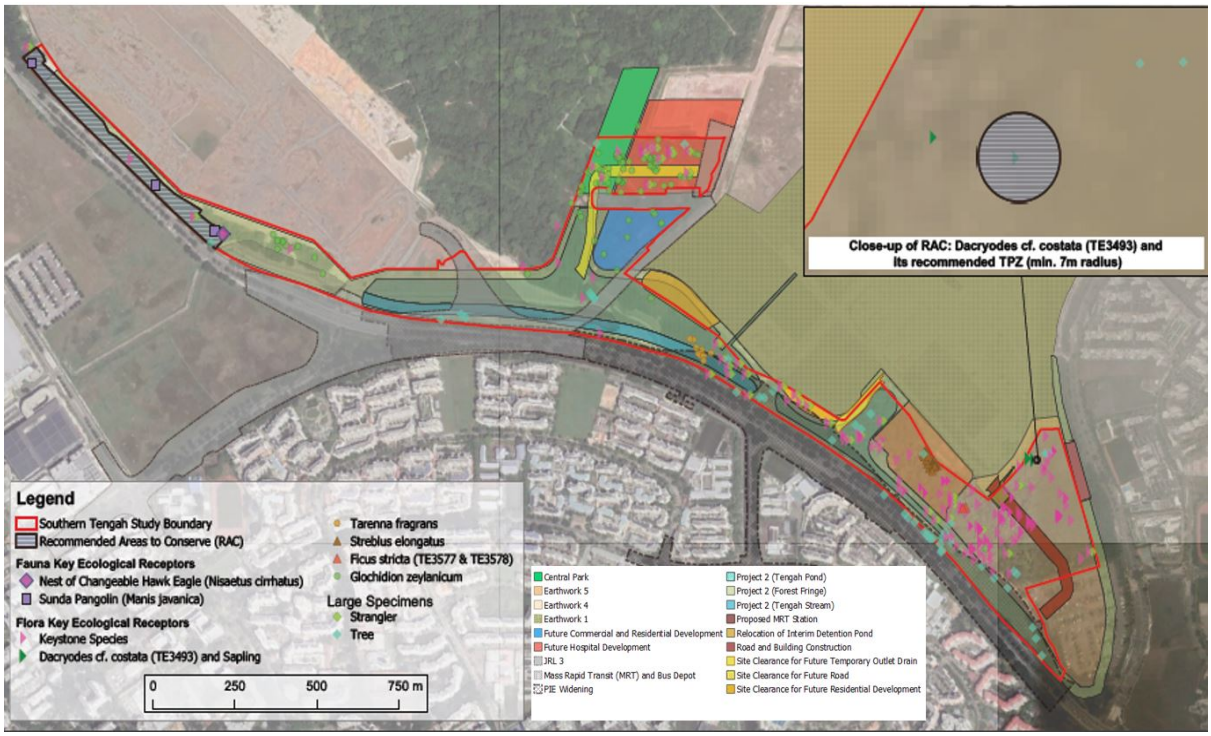


Figure 2-1. Recommended Areas of Conservation (shaded in grey) in the Study Area.

3. Minimisation

The proposed development of residential estates and other amenities will expose fauna receptors to different kinds of impacts and disturbances, as mentioned in **Section 7.9** in the Southern Tengah EIS Final Report. As such, mitigation measures should be implemented to reduce the impacts such as light and human disturbances, as well as to reduce the likelihood of injury/mortality to bird species from colliding with high-rise residential buildings.

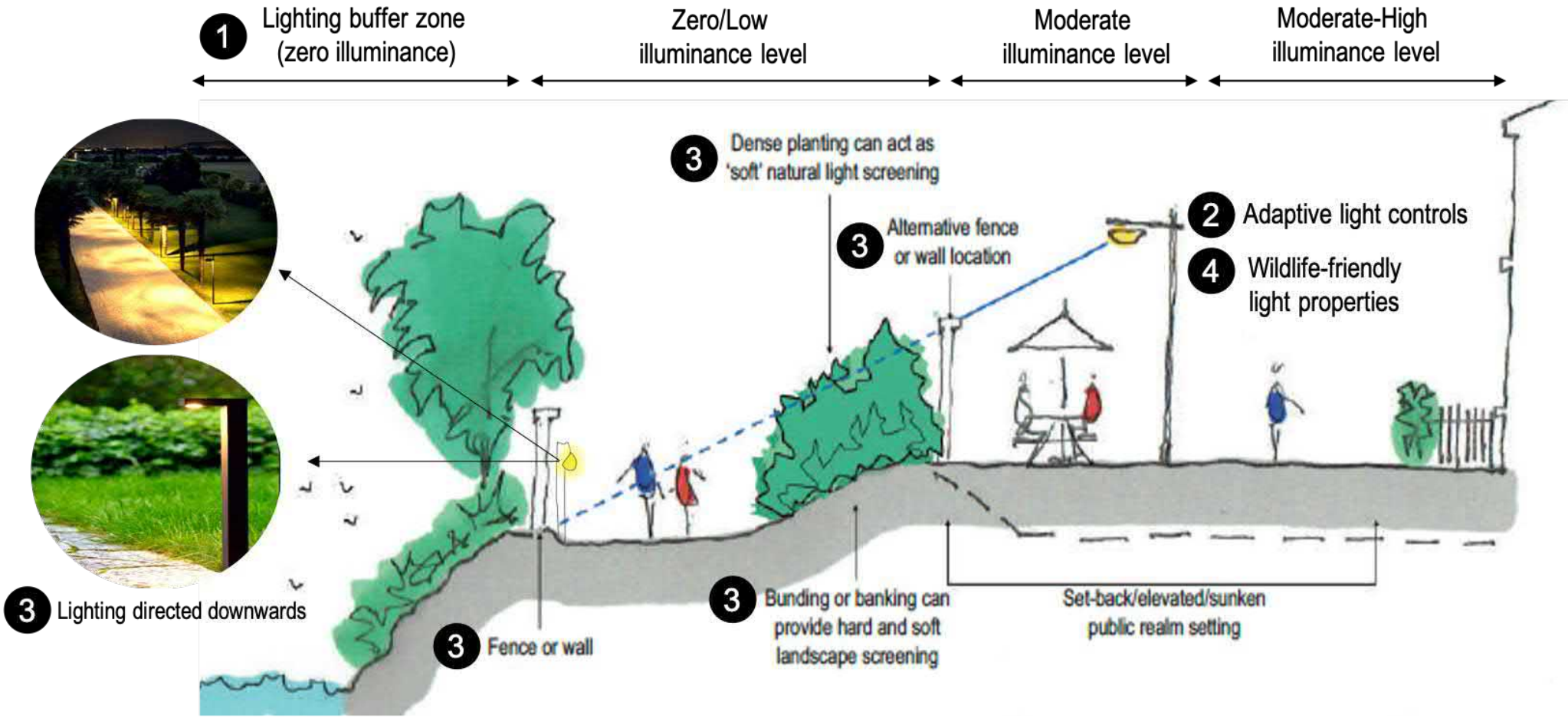
As the site is designed to integrate blue and green features (i.e., Tengah Pond and Forest Fringe) within the proximity to residential areas, the occurrence of human-wildlife conflict is expected. As such, it is important for humans and wildlife to coexist within the same space harmoniously. To allow for this coexistence relationship to thrive, there are several design strategies that can be implemented.

3.1. Reduce Light Disturbances by Incorporating Artificial Light Management Plan

Impact: Increased ecological light disturbance / pollution	The development would result in increased ecological light pollution, which includes chronic or periodically increased illumination, unexpected changes in illumination, and direct glare experienced by flora and fauna (Longcore and Rich, 2004). Ecological light pollution has demonstrable effects on the behavioural and population ecology of organisms in natural settings. A source of ecological light pollution is sky glow, which is the brightness of the night sky caused by the reflected light scattered from particles in the atmosphere. Sky glow comprises both natural and artificial sky glow. As sky glow increases so does the potential for adverse impacts on wildlife which may affect foraging, reproduction, migration, and communication of wildlife.
Solution: Design Artificial Light Management Plan	The artificial light management plan aims to minimize ecological light pollution by: 1) Establish "lighting buffer zones" with no artificial illumination and vary illuminance limits from the "lighting buffer zones" to the urban areas (**Figure 3-1)**. • Direct permanent artificial lightings away from the proposed RAC and areas where terrestrial/riparian habitats will be created (**refer to Section 5.1**). • Higher levels of illuminance can be tolerated with increasing distance from these areas. • If a lighting buffer zone is not possible, minimise illumination in the transition zone between these protected areas and the urban areas. 2) Use adaptive light controls to manage light timing, intensity and colour (**Figure 3-1)**. • Example: smart controlled LED lights • Minimise the use lights during hours just before dawn and after dusk when crepuscular and nocturnal animals are the most active.

	3) Minimise light spills, i.e., the light that falls outside the area intended to be lit, through (**Figure 3-1**): • Optimise the placement of lights by lighting only the object or area intended, and keeping lights close to the ground, directed and shielded. • Configure the location, orientation and height of buildings and structures (e.g., street lights). • Screen through soft landscaping or hard structures (walls, fences and bunding). Fencing can be overplanted with climbers to soften its appearance and provide a vegetated feature for fauna, but should never be relied on as the sole means of attenuating light spill. 4) Use wildlife-friendly light properties or features (**Figure 3-1**): • Use low-glare lighting and lights with reduced or filtered blue, violet and ultra-violet wavelengths. • Use non-reflective, dark-coloured surfaces to reduce contribution to sky glow.

Artificial Light Management Strategies



3.2. Reduce Bird-Building Collision Using Design Strategies

Impact: **Bird-building collision**	Bird-building collisions occurs frequently when birds fail to perceive the glass as a barrier due to reflection of sky or trees or flyway on the glass surface.
Solution: **Bird-friendly designs**	Bird-building collisions can be reduced by integrating bird-friendly designs such as (Sheppard & Phillips, 2015): 1) Reduce the area of glass façade used in the building 2) Increase the visibility of glass (including mirrored and non-mirrored reflective glass, and transparent glass) or dampen reflections to reduce the appearance of clear passage to sky or vegetation through: ○ Using film coating, decals or dense patterns on glass: ▪ A pattern density of 10 cm by 10cm or less; ▪ Visual markers to be at least 5 mm in diameter; ▪ Visual markers should be high contrast; and ▪ Targeting exterior surface as it is the most effective for deterring bird collisions. ○ Physical barriers: Interior or exterior shades, grilles, sunshades, screens, blinds and netting: ▪ To break up reflections on glass façade. ▪ Confer the freedom of choosing to only use it during periods where bird collisions are expected to be most frequent, such as during the migratory seasons. ○ Placement of windows: angled glass, recessed windows and balconies: ▪ The height to width ratio of the balcony is recommended to be 1:1 to block out the harshest sunlight during the brighter half of the day. ▪ Louvres should be added to provide more shade. ▪ Railings should be made from metal grilles or other opaque materials. 3) Avoid interior or exterior vegetation near windows as birds may confuse this with exterior vegetation and fly towards them. If they are close to natural vegetation, the façade should have shades or netting installed near the glass to prevent birds from crashing into it. 4) Buildings should not have courtyards or corridors that are enclosed by glass as these may confuse birds to fly through. These strategies are illustrated in corresponding labels in **Figure 3-2**.

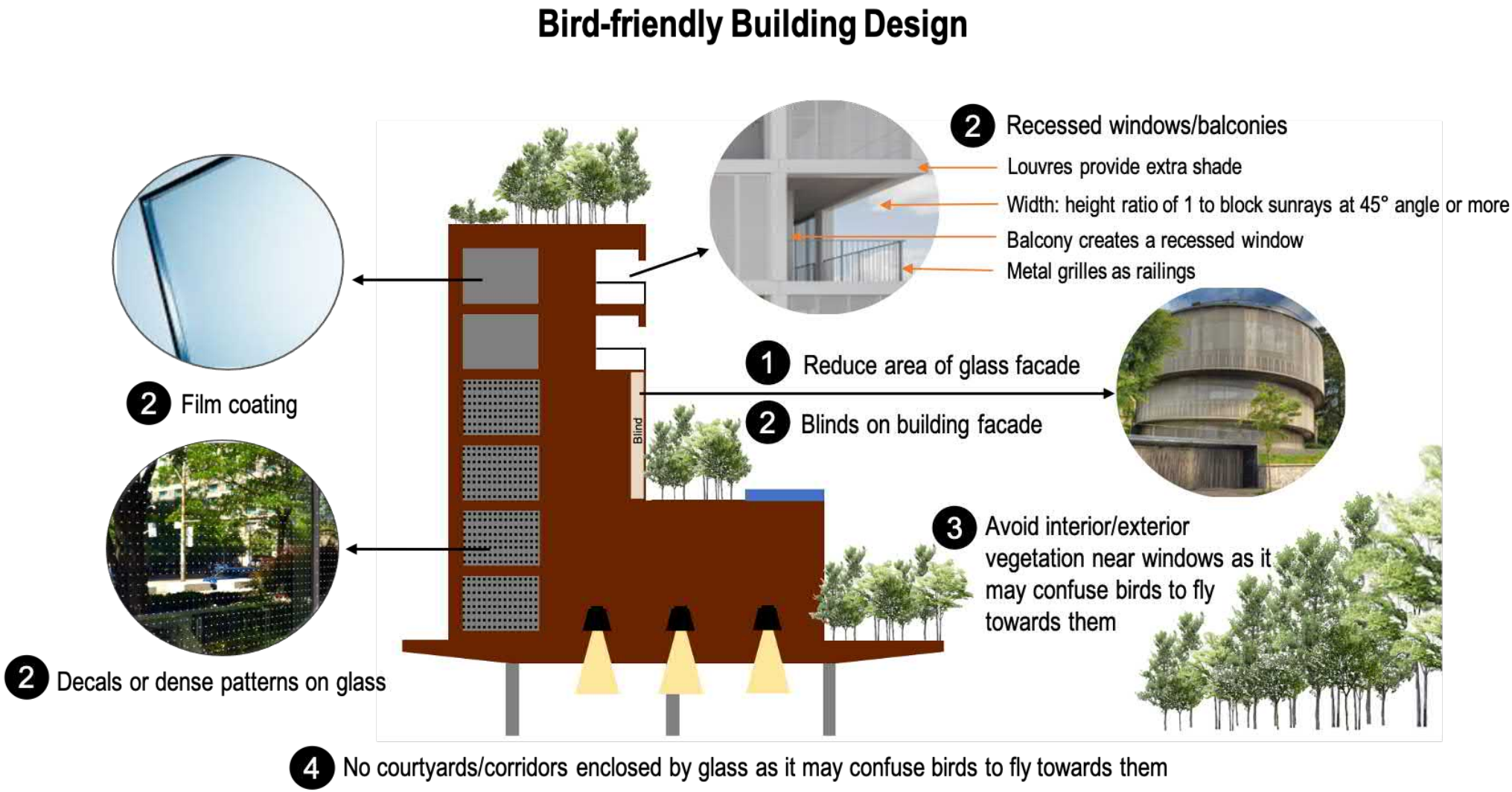


Figure 3-2: Summary of bird-friendly building design to prevent bird strikes. The numbers in the icons corresponds to the strategies listed above.

3.3. Reduce Human-Wildlife Conflict (i.e., macaques) Using Design Strategies

Impact: **Human-wildlife conflict**	The long-tailed macaques (*Macaca fascicularis*) are edge species and are highly adaptable in urban environments. The chance of human-macaque encounters, and therefore, human-macaque conflict in the proposed development is high. Minimising human-macaque conflict requires site-specific recommendations. However, the general guidelines below can be considered:
Solution: **Building Design**	1) The landscaping and infrastructure should keep in mind the capabilities and behaviour of the macaques. For instance: • Macaques are primarily arboreal and have a mean leaping distance of 2.2 m (Cannon & Leighton, 1994) and a maximum leaping distance of 5 m (Cant, 1988). Thus, there should be a 6m buffer between the building façade and the tree line as well as any potential climbing structures (e.g., lamppost). • To prevent scaling, the walls and pillars should be smooth and any projections that could potentially be used as handholds should be spaced greater than 1.5 m apart (i.e., larger than the arm span of an adult male long-tailed macaque) (Jones-Engel et al., 2011). • There should also be a canti-levered section of the building to prevent them from scaling to the higher residential levels of the building. • Addition of invisible grills to balconies will prevent macaques from entering and if these grills are spaced less than 10 cm apart (vertically), they will also prevent birds from entering the residential areas. • Macaques are avid swimmers and would enter outdoor swimming pools accessible to them. Thus, the swimming pools should be placed indoors or at a height that is beyond reach to them. 2) Proper waste-management techniques are extremely crucial within the residential districts. Key features include: • Macaque-proof bins, i.e., inaccessible to macaques either through being enclosed, with secured ropes or ties, or complex opening/closing mechanisms (Jones-Engel et al., 2011) • Waste management centres should be enclosed and inaccessible to macaques, including vents. 3) Education Reducing human-macaque conflict also involves behavioural change on the public's part. It is important to educate the public to not feed the macaques, and indicate proper behaviours to avoid conflict with macaques (e.g., Dos and Don'ts; Jones-Engel et al., 2011). Educational signages are cost-effective methods that can be implemented. 4) Others (Jones-Engel et al., 2011) • Enclosed carparks; owners can cover cars if concerned with damage

	• Walkways/bridges: wide enough for people to pass a macaque at >1m • Gardens: enclosed; motion-triggered water spurts These strategies are illustrated in corresponding labels in **Figure 3-3**.

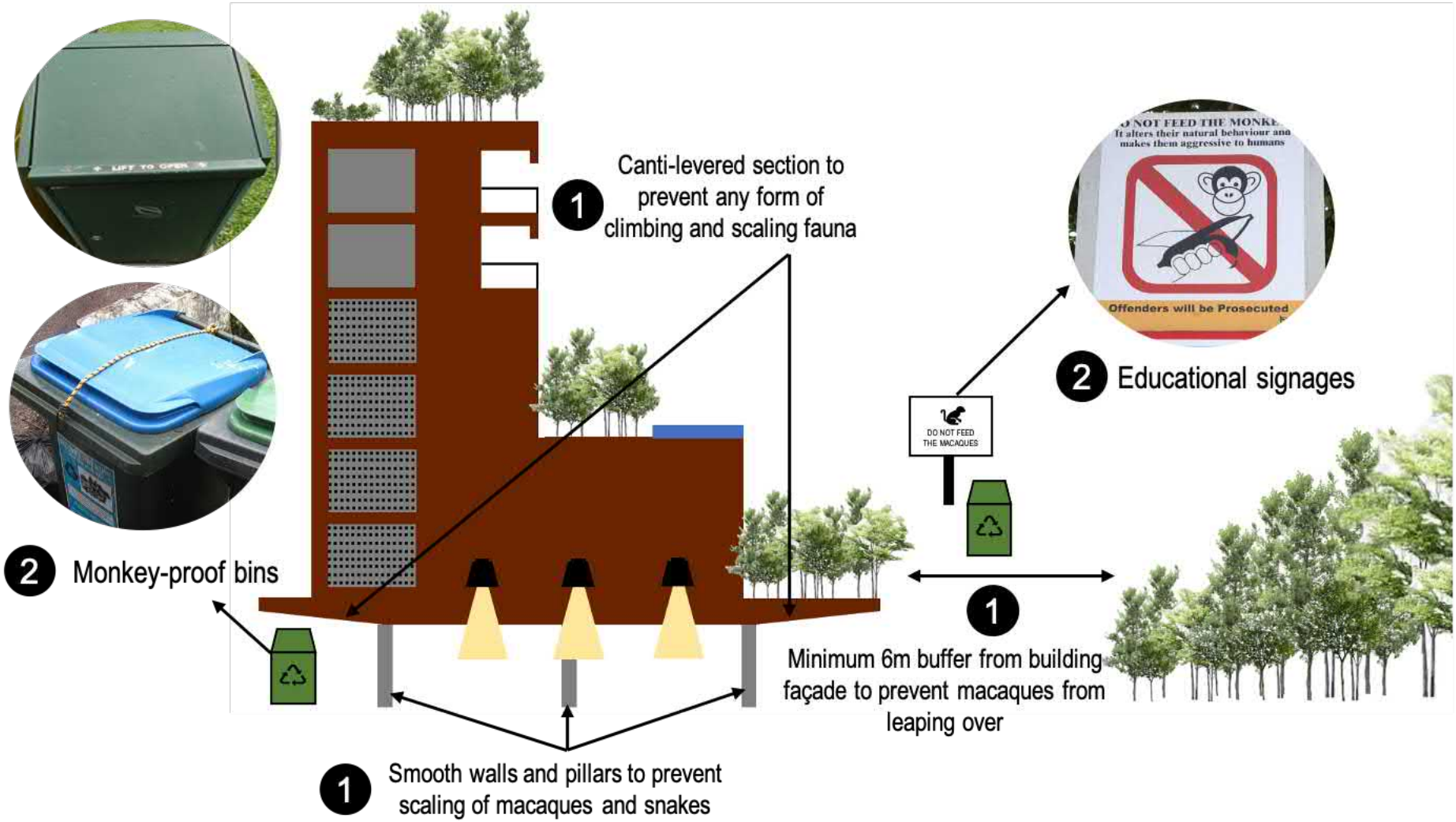


Figure 3-3. Building and landscape strategies to minimise human-macaque conflict. The numbers in the icons corresponds to the strategies listed above.

4. Remedy/Repair/Restore

4.1. In-fill Planting Within Vegetated Areas

Impact: **Habitat degradation**	With the existing and upcoming construction works surrounding the RAC, the forested areas will bound to be affected by edge effects which would expose the forest to greater wind speed and air temperature, leading to a change in forest structure and causing the failure of tree specimens (Magnago et. al, 2015). Degraded habitats with lack of structural complexity will not be able to effectively serve its ecological role. To add on, a degraded habitat will have large gaps that may allow for invasive exotic plant species to thrive. Yet not all invasive exotic species provide an important ecological function. Exotic plant species can also outcompete the native species, resulting in reduced ecosystem services of the forest.
Solution: **Infill planting within vegetation areas**	Context-specific in-fill planting at degraded habitats creates resources and increases structural complexity that benefit wildlife and improve ecosystem services (Toivanen, 2007; Pimentel & Kounang, 1998). Native plants should be used in in-fill planting, in exchange for exotic species which do not provide an ecological function (e.g., rampant, invasive species like oil palm (*Elaeis guineensis*), *Cecropia* sp.) should be gradually phased out. This would also help to increase the native biodiversity within the RAC in the western portion of the Study Area since it is now currently dominated by the exotic species, *Tabebuia rosea*, and its saplings. To facilitate the establishment of plantings, shrubs can be planted alongside trees, which is especially helpful for the recruitment of native birds and ground-dwelling mammals (Eyre et al., 2010). In-fill planting makes use of the existing forest framework, to jump start succession into a more native-dominated forest. It is a common reforestation strategy and is not difficult to implement. The framework emergent and canopy trees as well as native understory trees will be identified and retained. The other trees with low retention values will be phased out and, in its place, native species that is suitable to the site will be planted **(Figure 4.1)**. This allows the existing biodiversity to be maintained while increase the chances of successful regeneration of the forest.

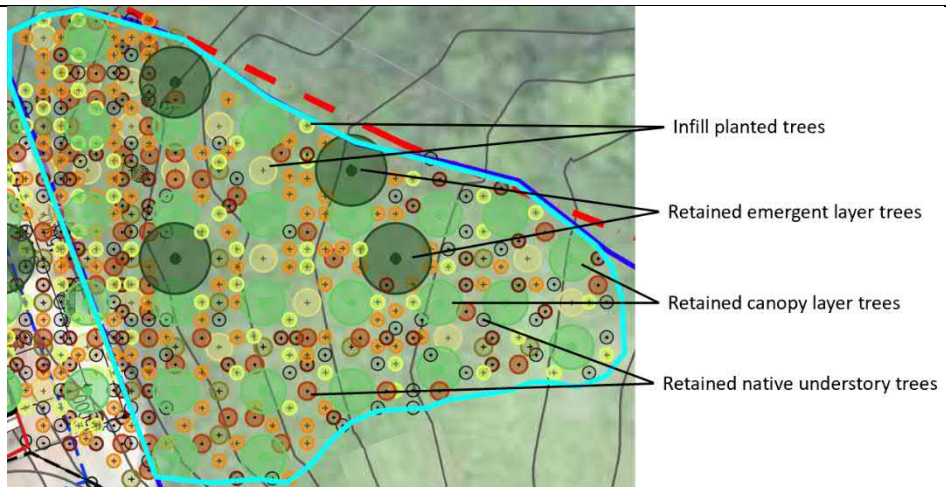


Figure 4-1: Example of infill planting plan

4.2. Provide Vegetated Buffer beside Recommended Areas of Conservation (RAC)

Impact: Forest edge effects	Habitat loss exposes the forest edges of RAC to changes in microclimate conditions, i.e., forest edge effects, which are detrimental if unmanaged. New forest edges are exposed to altered light, wind, humidity and sound levels that may result in: i) reduced habitat suitability for native flora and fauna, which may die or move away from the edges; and ii) colonization of exotic flora and fauna, leading to undesirable changes of species composition.
Solution: Creation of vegetated buffer around RAC	A 30-m wide vegetated buffer is recommended to be created around the RAC, mainly around the western portion. This would help to reduce changes in microclimatic conditions within the conserved areas (Murcia, 1995; Beacon Environmental Ltd, 2012; Dillaha et al.,1986). This can be executed within the patch of Forest Fringe before the delineated RAC indicated in **Figure 4-2.**

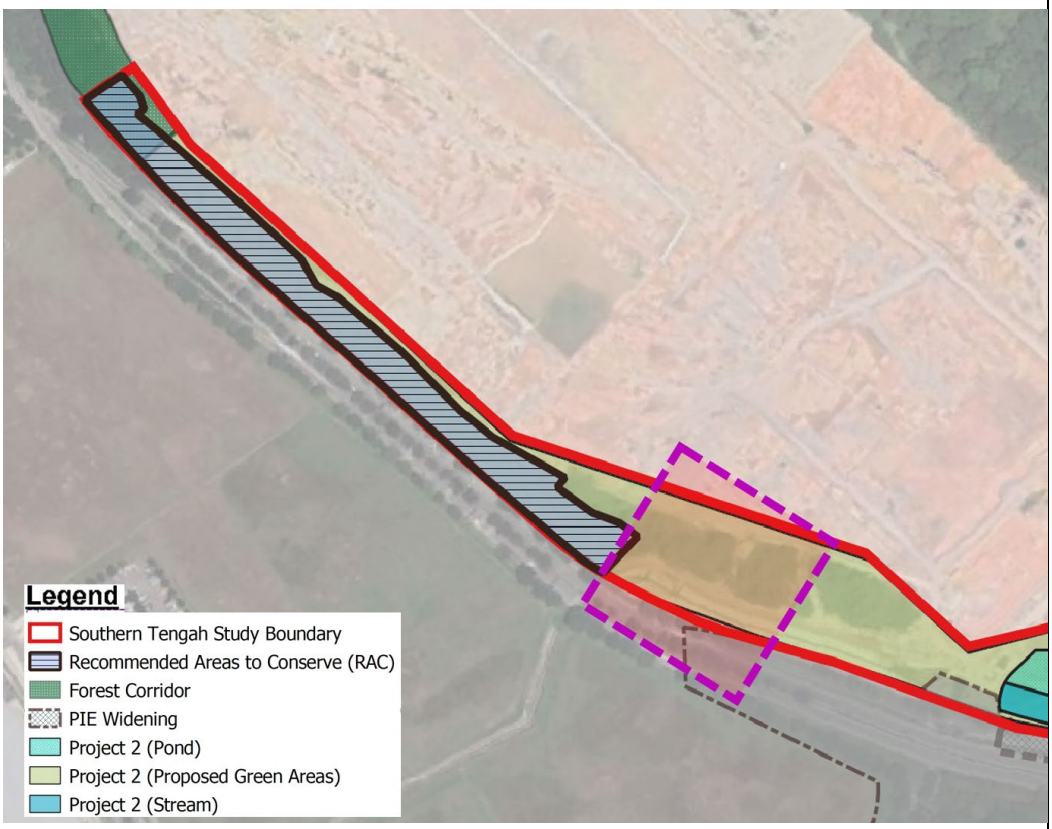


Figure 4-2. Proposed area within the Forest Fringe (indicated by the purple rectangle) where vegetated buffer can be implemented to protect the RAC.

Vegetation density is important for an effective forest buffer (DaWalle, 2010).

- Vegetated buffers should be planted to emulate the density and vegetation structure (i.e., trees and shrubs making up the canopy and understory) of the natural forest over time.
- Given that the height of trees in the site can be up to 30 m, the 30-m strip also serves as a buffer in the scenario of a tree fall. The planted vegetation

will be deliberately tiered with shrubs at the outer edge followed by tree species of different mature height. This produces a graded canopy line that is shape-optimised to buffer against wind and rain to reduce tree failure at the forest edges **(Figure 4-3).**

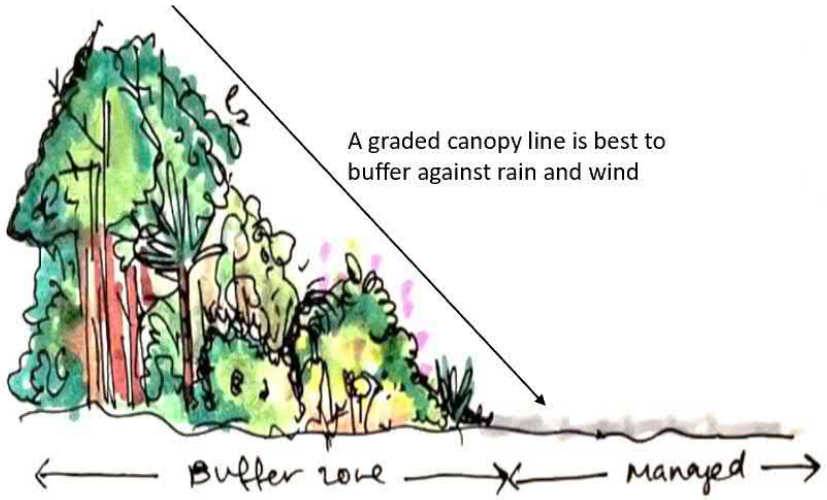


Figure 4-3. Example of buffer zone between forest and development.

5. Compensation

5.1. Habitat Creation within Forest Fringe and Tengah Pond

The extensive habitat loss is inevitable in the process of development. Hence, habitat creation is crucial to be executed within the Study Area to compensate for the habitat loss. This also provides opportunities to create habitats of higher ecological value to increase the biodiversity within the Study Area. These strategies may help to offset some of the negative impacts resulting from the development. Inputs from the Tengah Masterplan has also been adopted in the habitat creation strategies presented below.

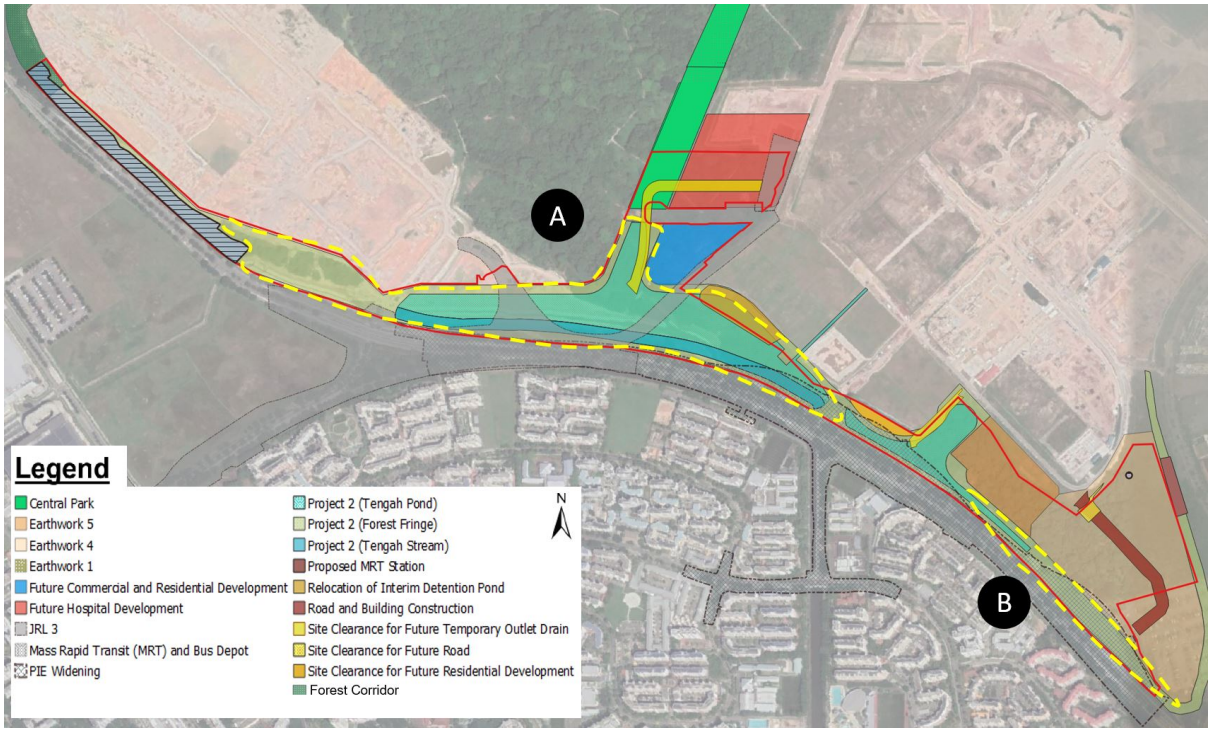
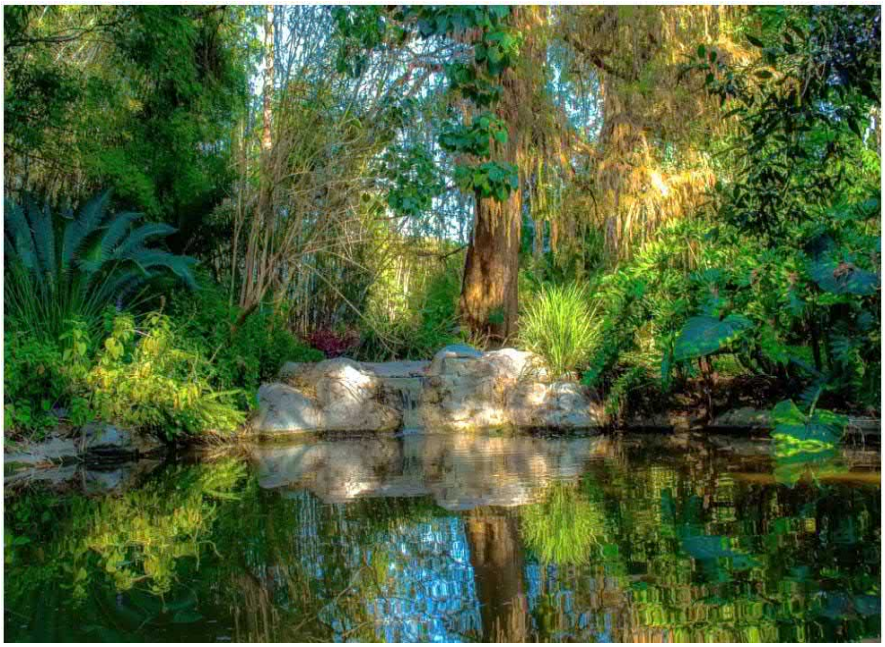


Figure 5-1. Areas where habitat creation will be focused at: (A) Tengah Pond and (B) Forest Fringe.

5.2. (A) Creation of aquatic and riparian habitats at Tengah Pond

The proposed Forest Pond holds the potential for the creation of different aquatic micro-habitats. The overall concept of the Tengah Pond is envisioned to be significantly shaded over time. In order to achieve this, the creation the riparian habitats should be executed within the soft-bank of the Tengah Pond which would provide space to allow the planting of trees and plants of different watercourse level. Some of the habitat features listed below are important features that should be included in the design of the Forest Pond to encourage usage by fauna species.

Habitat features	Description
Riparian features and overhanging vegetation	Provide overhanging vegetation along the banks of the Forest Pond to cater to different species which favour different shade conditions. Logs, rocks and branches can also be provided as resting and perching sites for odonates, fish and birds (Ngiam et al., 2017; **Figure 5-2**). In addition, aquatic and riparian edge vegetation helps to absorb nutrient run-off within the Tengah Pond. A list of native suitable to be planted as riparian vegetation can be found in Appendix N.  **Figure 5-2. Example of shaded conditions of the edge of a pond with overhanging vegetation and feature to provide as perching sites (source: www.authorityaquarium.com/fish-pond-shade).**
Shallow and deep conditions (Littoral and Limnetic Zones)	Shallow water conditions, or also known as littoral zones are known to have higher productivity and biodiversity. It is usually preferred by some frogs, reptiles and waterbirds, and also encourages lifecycle of different fauna communities, such as fishes and dragonflies. It is recommended for this zone to be 0.3m to 0.5m in depth as this will encourage the aquatic wildlife that specializes in the shallow waters and the deep waters to utilize these areas **(Figure 5-3).** As for the deeper waters (limnetic zone), it is are favoured by numerous aquatic species like freshwater fishes.

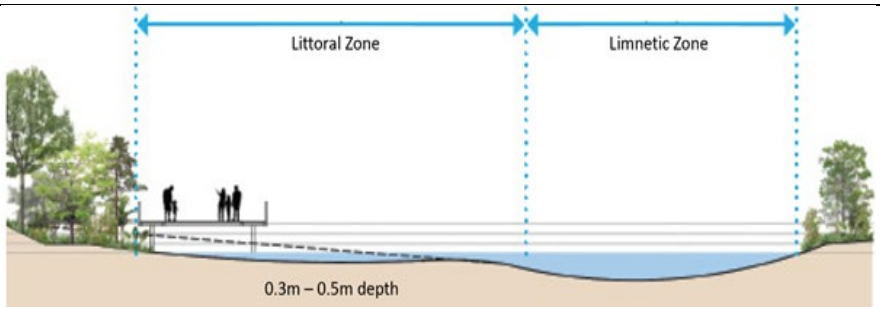


Figure 5-3. Example of stream with littoral zone and limnetic zone (adapted from Ramboll Studio Dreiseitl drawings).

By creating a gradual sloping soft-banks along Tengah Pond, this will also reduce soil erosion and macrophyte growth in the littoral zone and improve bank stability over time **(Figure 5-4A)**.

It is important that any human activities (e.g., footpaths, observation decks etc) should be created away or above the riparian habitats to minimise the disturbances to these sensitive habitats **(Figure 5-4B)**. At the same time, this would reduce habitat degradation and trampling of vegetation. Any form of artificial lightings should also be directed away from these habitats as suggested in **Section 3.1**.

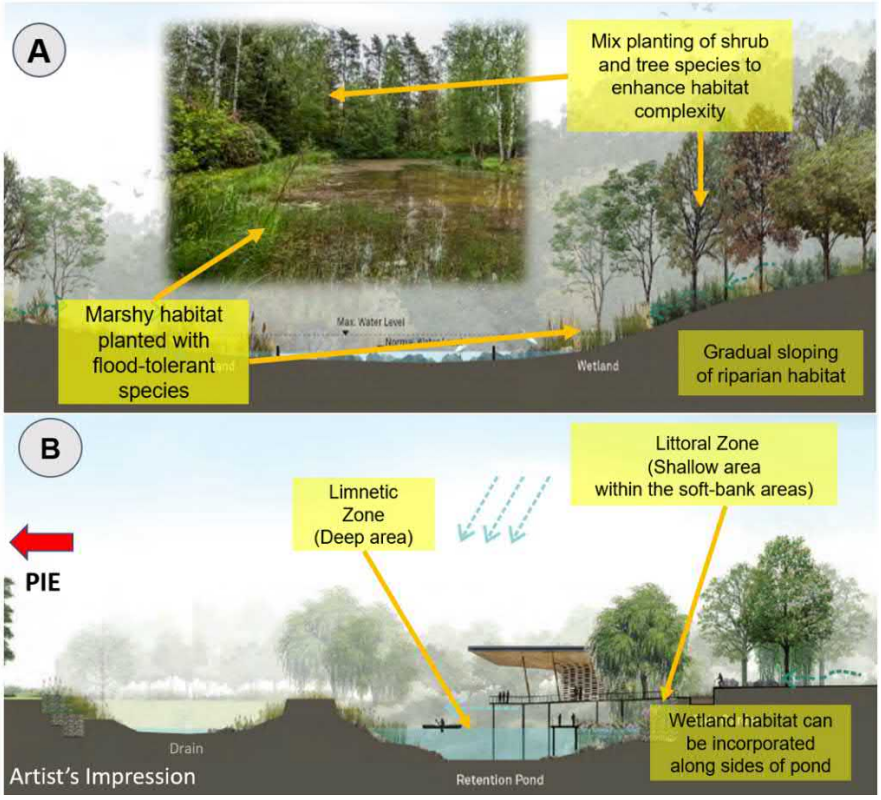


Figure 5-4. Artist impression of (A) riparian, and (B) aquatic habitat creation along the soft-bank of the Tengah Pond.

Macrophytes with phyto-remediative qualities	This feature would help to absorb and reduce the amount of nutrients in the pond. This would help to reduce duckweed biomass and increase light penetration to the pond bottom, thereby creating more conducive conditions for the introduction of submerged macrophytes that can provide refugia for odonate larvae as well as bioremediate the pond. Additionally, emergent macrophytes and larger-leafed floating macrophytes can be planted to create perching and oviposition sites for odonates.
Wetland habitats	Wetland habitats can be incorporated to certain regions of the Tengah Pond banks **(Figure 5-4B)** and can also extend out as a form of 'floating' wetland features **(Figure 5-5).** The benefit of this 'floating' habitat is that it will not be affected by the rise and fall of the water level in the Pond (i.e., plants will not dry out if the pond water level were to decrease during dry seasons).  **Figure 5-5. Example of floating wetland feature at Pang Sua Pond, Singapore (source: http://www.dreiseitl.com).** It can also function as a phyto-remediative feature and attract a diverse number of fauna species such as grey heron (Ardea cinerea), egrets, black-crowned night heron (*Nycticorax nycticorax*), as well as rails and crakes.

5.3. (B) Creation of Terrestrial Habitats

Creation of terrestrial habitats can be done along the extended width of the forest fringe. Different strategies can be implemented to increase floristic diversity and structural complexity within the Forest Fringe. The creation of habitats within the Forest Fringe on the eastern portion of the Study Area targets species that are more adaptable to urban environments since this area will be in proximity to the proposed residential estates and amenities.

Habitat features	**Description**
Mixture of open and forested vegetation	Provides different themes of habitats with a wide diversity of plant species adapted to open and/or shaded, helps to increase biodiversity within the Forest Fringe for fauna that are suitable in different habitats. This is can achieved by planting different shrubs /undercover species/ butterfly-attracting plants and food sources for birds (e.g., keystone species) to attract fauna communities and to create diverse terrestrial habitats. Plant species that are adapted well in waterlogged areas can be planted along the edge of the bioretention system (e.g., bioswales, raingardens) that has been proposed in the Tengah Masterplan.
Planting of native vegetation	Planting of native bird- and butterfly-attracting species (e.g., *Glochidion zeylanicum*, *Bridelia tomentosa*, *Dillenia suffruticosa*, *Melastoma malabathrium*, *Ardisia elliptica* and *Leea rubra*) and keystone species (e.g., *Ficus* species) to attract frugivorous species. Suitable candidates of species of conservation significance (e.g., *G. zeylanicum*, *Tarenna fragrans*) that are salvaged from forested areas in Tengah South can be planted into the forest fringe area. Refer to **Appendix N** for recommended native planting palette.
Tiered planting:	Planting different layers of vegetation with different maturity from shrub to trees (i.e., undergrowth layer, understorey layer, canopy layer and emergent layer) helps to buffer for disturbances, and provides both avian and ground-dwelling species a place of refuge **(Figure 5-6).**

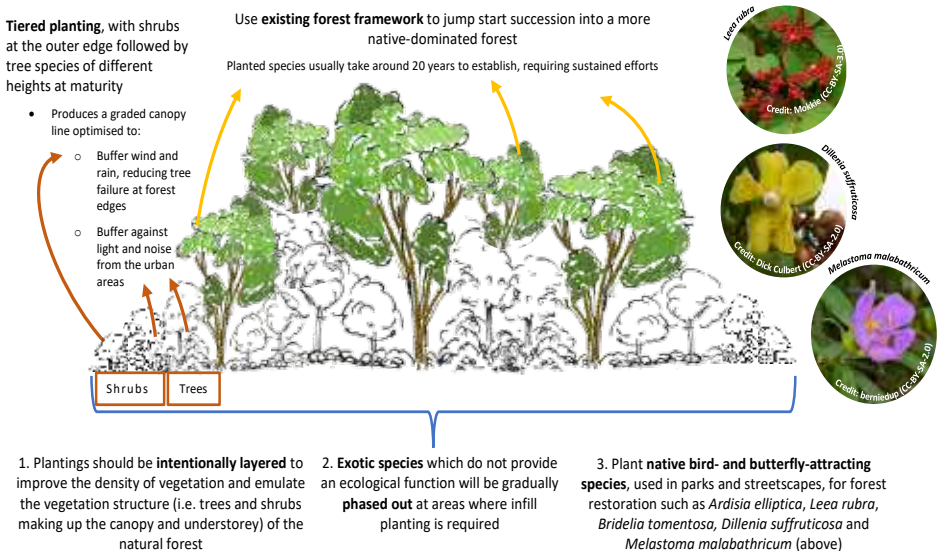


Figure 5-6. General guidelines to tiered planting and other planting strategies.

Elevated walkways

It is expected that footpaths/walkways will be incorporated within the Forest Fringe. As such, footpaths are recommended to be elevated to:

- minimise trampling of vegetation that has been planted for habitat creation,
- provide space beside or below elevated walkways for planting to take place **(Figure 5-7B)**, and
- allow fauna movements below elevated walkways to reduce the risk of injury/mortality especially for ground-dwelling species **(Figure 5-7A).**



Figure 5-7. (A) Conceptual drawing of elevated footpaths at a park in Canada that would allow fauna movements below the structure, and (B) Example of walkway that provides space for habitat creation along both sides of the walkway.

If bioswales/raingardens are incorporated along the boundary of the Forest Fringes, elevated boardwalks can also be incorporate above it to facilitate the transition of pedestrian movements from the residential estate to the Forest Fringe without damaging or trampling the habitat **(Figure 5-8).**



Figure 5-8. Example of boardwalks above bioswales in Oregon, USA.

5.4. Creation of Wildlife Connectivity Within the Study Area and to Surrounding Green Spaces

Three locations with gaps in connectivity from road development/future developments were identified within the Study Area **(Figure 5-9)**. As a result, this would cause disruption in wildlife movements that is expected to come from the west of the Study Area since vegetation connectivity has been established.



Figure 5-9. Three gaps in connectivity that were identified within the Study Area.

To address the gaps in connectivity, particularly in Location 1 and 3, grade-separated wildlife crossings in the form of culvert undercrossing will be incorporate to reduce roadkills, particularly for ground-dwelling fauna like Sunda pangolin (*Manis javanica*). It allows ground-dwelling fauna to safely use the terrestrial passage underneath the roads. Fences along the road and strategic planting of vegetation around the wildlife crossing may be considered to guide the fauna towards utilizing the crossing instead of the roads.

Key considerations in culvert design:

- The minimum size of the passageway should be large enough to accommodate ground-dwelling fauna, such as common palm civet (*Paradoxurus musangus*), mainland leopard cat (*Prionailurus bengalensis*) and Sunda pangolin (*Manis javanica*).
- Provide vegetation that slopes downwards on both sides of the culvert. The vegetation should not be too dense and allow light to pass through **(Figure 5-10)**.
- An elevated walkway as seen in **Figure 5-10** is recommended to be incorporated within the culvert. Ideally, this walkway should be designed above the maximum water level of the Tengah Pond so as to allow fauna species to use the culverts during wet weather.
- Texture of the culvert should be a rough concrete finish to allow grip for the pangolin.
- The entry and exit of the culvert should be gentle to allow animals to climb easily. If it is steep, steps could be provided in the form of concrete steps or small rocks.

- If the culvert stretches across a relatively long section of road of > 6 m, consider providing a light shaft. Animals may not use it if it is too dark.

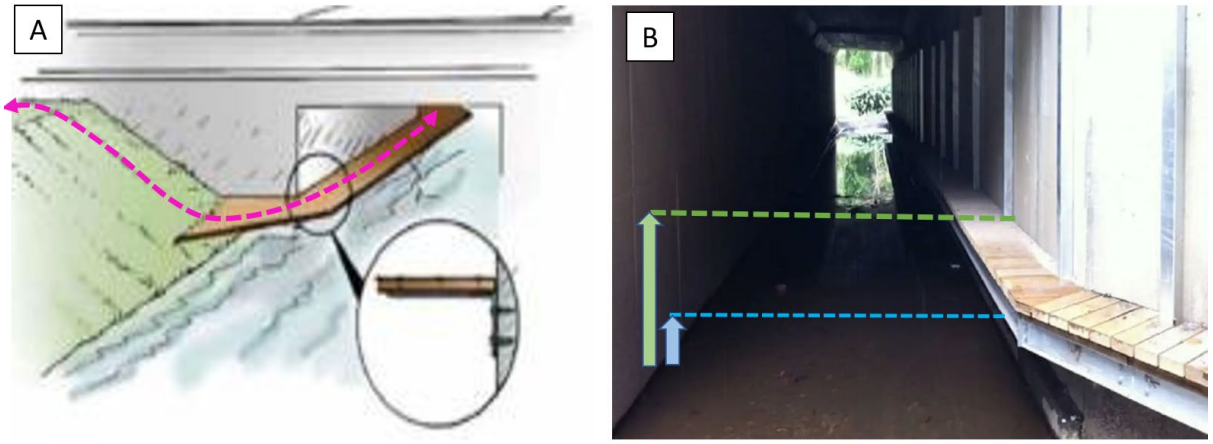


Figure 5-10. Example of culvert undercrossing underneath road networks: (A) Incorporate vegetation that gradually slopes down to the side of the culvert; (B) Design elevated walkways that is higher (indicated in green) than the maximum water level in the culvert (indicated in blue).

Ideally, a wildlife connectivity is proposed to be established during post-construction stage that will facilitate the movements of fauna from the Forest Corridor (in the west), to the Study Area and towards the Central Park (in the north) that would be connected to other green areas located beyond Southern Tengah. As for the gap in connectivity identified in Location 2 (**Figure 5-11**), the feasibility of implementing wildlife crossing over at the location is currently being studied by HDB. However, it is important to recognize the importance of implementing a grade-separated wildlife crossing there as it functions as the integral part of the overall movements of wildlife towards Central Park and eventually to other forest patches in Tengah (**Figure 5-11**).

Another possible wildlife connectivity can also be considered as shown by the pink arrow in (**Figure 5-11**) that will help in facilitating fauna movements towards the eastern part of the Study Area. This will be subjected to further detailed studies with HDB and other Technical Agencies (e.g., NParks, LTA etc) that are involved in the development of Southern Tengah and other concurrent or upcoming projects within Southern Tengah.

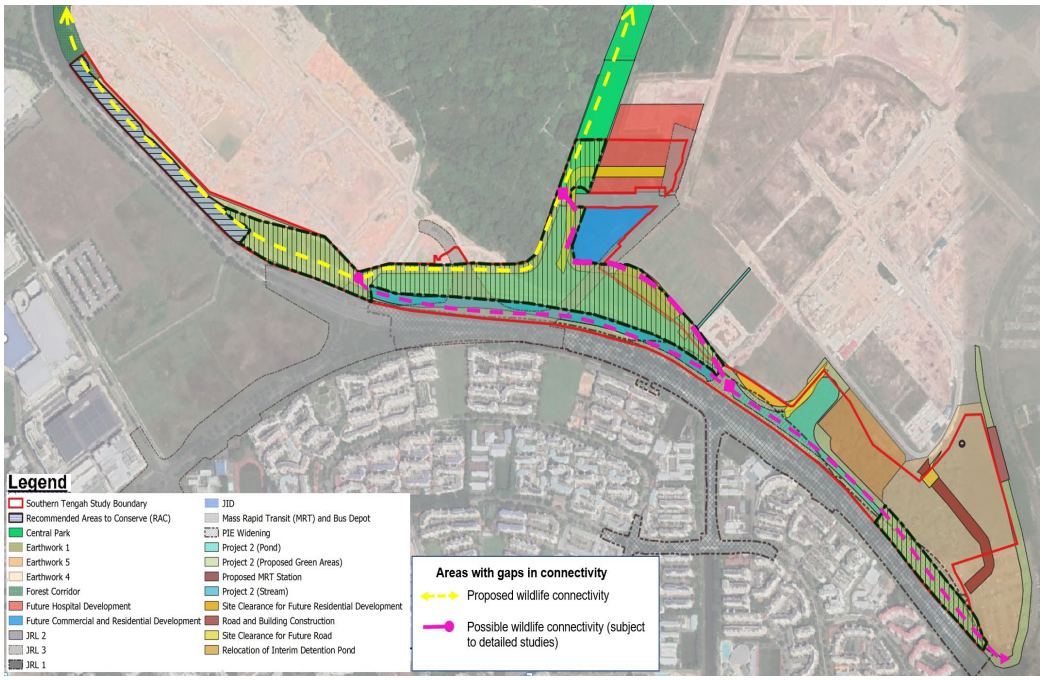


Figure 5-11. Movements of the wildlife connectivity within the Study Area to other green spaces in vicinity (yellow arrow). Possible wildlife connectivity (indicated by the pink arrows) can also be explored towards the eastern portion of the Study Area.

5.5. Creation of Artificial Refugia for Pollinators

Artificial refugia for pollinators (**Figure 5-12**) are proposed on the rooftops and could complement the skyrise greenery. These pollinator houses will be introduced to attract solitary bees and wasps to take refuge, and to serve as an educational element for residents and visitors. The figure below shows examples of pollinator houses that can be constructed. However, it is important to consider the factors below to avoid doing more harm than good, especially when environmental factors result in unsuccessful brooding (Krombein, 1967).

- Use natural materials such as bamboo or wooden tubes to construct the pollinator houses
- Avoid using plastic materials as they are difficult for the pollinators to cling onto, causing them to tire out while nesting
- Ensure that the design allows water to drain so as to prevent flooding from rainfall and excessive humidity, fungal growth and brooding failure
- Locate the pollinator houses in partial shade to prevent overheating
- Use tubes of varying sizes to attract more species

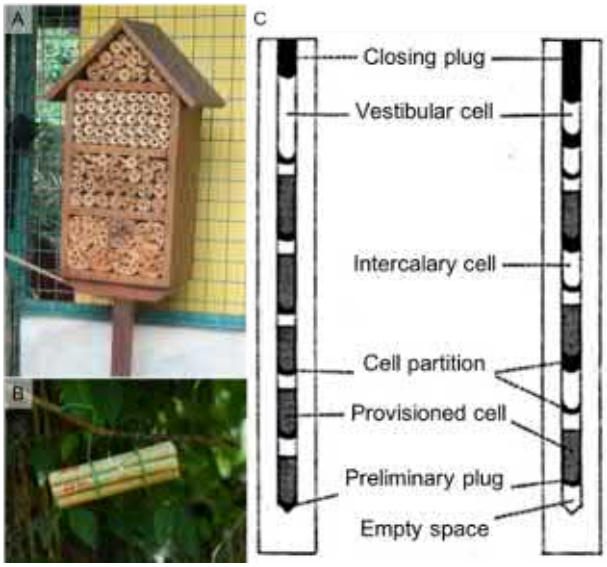


Figure 5-12. Examples of pollinator houses. (A) A specially constructed house with tubes of varying sizes; (B) A simple trap bundle that may also serve as a pollinator house (Barthelemy, 2012); (C) Nest architecture of solitary bees and wasps (Krombein, 1967)

5.6. Creation of Habitats through Designing Skyrise Greenery

Roof gardens, green roofs, green terraces and green walls have the ecological potential to be functional habitats for biodiversity. Through appropriate planting and landscaping, skyrise greenery can provide food and shelter for fauna, particularly flying taxa such as birds, butterflies, bats and odonates. Skyrise greenery also serves as ecological stepping stones, enhancing ecological connectivity in the broader urban landscape (Mayrand & Clergeau, 2018). Moreover, the inclusion of skyrise greenery will soften the facade of the buildings, allowing them to blend seamlessly into the surrounding forest backdrop. Roof gardens, green terraces and green walls are proposed in the design plan and can follow the design principles for biodiversity-attracting skyrise greenery as shown in **Figure 5-13** (Centre for Urban Greenery and Ecology, 2017).

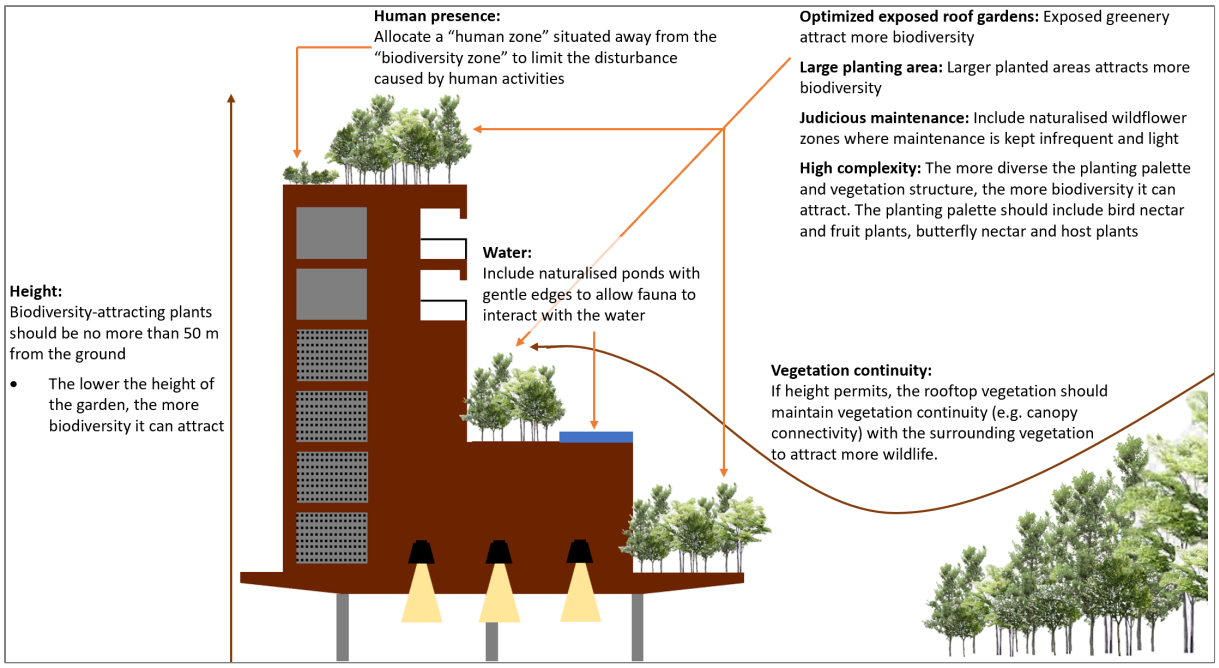


Figure 5-13. Summary of design principles for skyrise greenery

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Appendix N
List of Native Plant Species for Enhancement Planting

Delivering a better world

Scientific Name	Native Status	Common Name	Habit	Forest Enhancement (Species to be plantedfor infill planting in closed-canopy habitat, to increase species diversity)	Forest Creation (Fast growing pioneer species for areas in open canopy)	Riparian habitat	Aquatic habitat	Attracts butterflies/host plant	Market availability	Remarks
Adinandra dumosa	Native	Tiup-tiup	Tree	Yes	Yes	-	-	Yes	Limited	Host plant for *Tanaecia pelea pelea*
Agrostistachys borneensis	Native	Jenjulong	Tree	Yes	-	-	-	-	No	-
Alsophila latebrosa	Native	Tree Fern	Tree	Yes	-	Yes	-	-	Yes	Look into the possibility of salvaging from affected areas of the EIS Study Area
Alstonia angustiloba	Native	Common Pulai	Tree	Yes	-	-	-	Yes	Yes	Attracts *Delias hyparete metarete*
Angiopteris evecta	Native	Elephant Fern	Herb	Yes	-	-	-	-	Yes	Look into the possibility of salvaging from affected areas of the EIS Study Area
Aporosa frutescens	Native	Rukum Utan	Tree	Yes	-	-	-	-	No	-
Aralidium pinnatifidum	Native	False Ivy-Palm	Tree	Yes	-	-	-	-	Yes	-
Archidendron clypearia	Native	Monkey-pod	Tree	Yes	-	-	-	Yes	Limited	Host plant for *Pantoporia hordonia hordonia*
Archidendron jiringa	Native	Jering	Tree	Yes	-	-	-	Yes	No or limited	Look into the possibility of salvaging from other forests; Host plant for *Eurema sari sodalis* and *Surendra vivarna amisena*
Ardisia elliptica	Native	Sea-shore Ardisia	Tree	Yes	-	-	-	Yes	Yes	Host plant for *Abisara saturata kausambioides* and *Taxila haquinus* . Look into the possibility of salvaging from affected areas of the EIS Study Area
Arthrophyllum diversifolium	Native	Ivy Palm	Tree	Yes	Yes	-	-	Yes	No	Host plant for *Burara harisa consobrina*
Arundina graminifolia	Native	Bamboo Orchid	Herb	-	-	-	-	-	Yes	Look into the possibility of salvaging from affected areas of the EIS Study Area
Asplenium nidus	Native	Bird's Nest Fern	Epiphyte	-	-	-	-	-	Yes	-
Baccaurea motleyana	Native	Rambai	Tree	Yes	-	-	-	-	Limited	Look into the possibility of salvaging from affected areas of the EIS Study Area
Bhesa paniculata	Native	Malayan spindle tree	Tree	Yes	-	Yes	-	Yes	No	Host plant for *Euthalia monina monina*
Bhesa robusta	Native	Red-flowered malayan spindle tree	Tree	Yes	-	-	-	-	No	-
Bouea oppositifolia	Native	Plum Mango	Tree	Yes	-	-	-	-	Limited	-

Scientific Name	Native Status	Common Name	Habit	Forest Enhancement (Species to be plantedfor infill planting in closed-canopy habitat, to increase species diversity)	Forest Creation (Fast growing pioneer species for areas in open canopy)	Riparian habitat	Aquatic habitat	Attracts butterflies/host plant	Market availability	Remarks
Bridelia tomentosa	Native	Pop-gun Seed	Tree	Yes	Yes	-	-	Yes	No or limited	Look into the possibility of harvesting/salvaging existing specimen in EIS Study Area; Host plant for *Semanga superba deliciosa*
Buchanania arborescens	Native	Sparrows' Mango	Tree	Yes	-	-	-	-	Yes	-
Calophyllum inophyllum	Native	Penaga Laut	Tree	-	-	-	-	-	Yes	Look into the possibility of salvaging from affected areas of the EIS Study Area
Calophyllum soulattri	Native	Nicobar Canoe Tree	Tree	Yes	-	-	-	-	Yes	-
Carallia brachiata	Native	Freshwater Mangrove	Tree	Yes	-	-	-	-	Yes	-
Caryota mitis	Native	Fshtail Palm	Tree	Yes	Yes	-	-	Yes	Yes	Host plant for *Elymnias hypermnestra agina,* Faunis canens arcesilas, *Plastingia naga* and *Elymnias panthera*
Cayratia trifolia	Native	Three leaf wild vine	Climber	Yes	-	-	-	-	Limited	-
Cerbera manghas	Native	Sea Mango	Tree	-	-	-	-	-	Yes	Those available in market is of red leaf variety
Chassalia curviflora	Native	-	Shrub	Yes	-	-	-	-	No or limited	Look into the possibility of salvaging from affected areas of the EIS Study Area
Cheilocostus speciosus	Native	Crepe Ginger	Herb	-	-	-	-	Yes	Yes	Host plant for *Udaspes folus*
Cinnamomum iners	Native	Wild Cinnamon	Tree	Yes	-	-	-	Yes	Yes	Host plant for *Cheritra freja frigga* , *Chilasa clytia clytia* and *Graphium sarpedon luctatius* . Look into the possibility of salvaging from affected areas of the EIS Study Area.
Claoxylon indicum	Native	Laping Budak	Tree	Yes	Yes	-	-	-	No	-
Clausena excavata	Native	False Curry	Shrub	Yes	Yes	-	-	Yes	No	Host plant for *Papilio demoleus malayanus* and *Papilio polytes romulus* . Look into the possibility of salvaging from affected areas of the EIS Study Area

Scientific Name	Native Status	Common Name	Habit	Forest Enhancement (Species to be plantedfor infill planting in closed-canopy habitat, to increase species diversity)	Forest Creation (Fast growing pioneer species for areas in open canopy)	Riparian habitat	Aquatic habitat	Attracts butterflies/host plant	Market availability	Remarks
Cleistanthus sumatranus	Native	-	Tree	Yes	-	-	-	Yes	Yes	Host plant for *Eetion ella*
Clerodendrum laevifolium	Native	Swaddling Flower	Tree	Yes	Yes	-	-	Yes	Limited	Host plant for *Zeltus amasa maximinianus*
Clerodendrum villosum	Native	-	Shrub	Yes	-	-	-	-	No	Need collect & pregrow
Cratoxylum cochinchinense	Native	Yellow Cow Wood	Tree	Yes	-	Yes	-	Yes	Yes	Host plant for *Eurema hecabe contubernalis* , *Lexias pardalis dirteana* and *Phaedyma columella singa*
Cratoxylum formosum	Native	Mempat	Tree	Yes	-	Yes	-	Yes	Yes	Host plant for *Eurema hecabe contubernalis* and *Lexias pardalis dirteana* ; Attracts *Delias hyparete metarete*
Cratoxylum maingayi	Native	Pink Mempat	Tree	Yes	-	-	-	-	Limited	-
Cyathula prostrata	Native	Hookweed	Shrub	-	Yes	-	-	Yes	Yes	Host plant for *Pseudocoladenia dan dhyana*
Cyperus compactus	Native	-	Herb	Yes	-	Yes	Yes	-	Pregrow	-
Cyrtophyllum fragrans	Native	Tembusu	Tree	Yes	-	-	-	Yes	Yes	Attracts Delias hyparete metarete
Cyrtostachys renda	Native	Lipstick Palm	Shrub	Yes	-	-	-	Yes	Yes	Host plant for *Cephrenes trichopepla*
Derris trifoliata	Native	Common Derris	Climber	-	-	-	-	Yes	Limited	Host plant for *Curetis saronis sumatrana, Jamides bochus nabonassar, Nacaduba pavana singapura, Hasora badra badra, Hasora taminatus malayana, Hypolycaena erylus teatus and Phaedyma columella singa*
Dianella ensifolia	Native	Campanula Orchid	Herb	Yes	-	-	-	-	Yes	-
Dillenia indica	Native	Elephant Apple	Tree	Yes	-	Yes	-	-	Limited	-
Dillenia reticulata	Native	Stilted Simpoh	Tree	Yes	-	Yes	-	-	Limited	-
Dillenia suffruticosa	Native	Simpoh Air	Shrub	Yes	Yes	Yes	-	-	Yes	Look into the possibility of salvaging from affected areas of the EIS Study Area
Diospyros buxifolia	Native	-	Tree	Yes	-	-	-	-	Yes	-

Scientific Name	Native Status	Common Name	Habit	Forest Enhancement (Species to be plantedfor infill planting in closed-canopy habitat, to increase species diversity)	Forest Creation (Fast growing pioneer species for areas in open canopy)	Riparian habitat	Aquatic habitat	Attracts butterflies/host plant	Market availability	Remarks
Dracaena porteri	Native	Jarum jarum	Shrub	Yes	-	-	-	-	Limited	-
Drynaria quercifolia	Native	Oak-leaf Fern	Epiphyte	-	-	-	-	-	Limited	-
Dyera costulata	Native	Jelutong	Tree	Yes	-	-	-	-	Limited	-
Elaeocarpus mastersii	Native	Small-leaf Oil Fruit	Tree	Yes	Yes	-	-	-	Yes	-
Elaeocarpus petiolatus	Native	-	Tree	Yes	-	-	-	-	No or limited	-
Eleocharis dulcis	Native	Chinese water chestnut	Hydrophyte	-	-	Yes	Yes	-	Yes or pregrow	-
Eurycoma longifolia	Native	Tongkat Ali	Tree	Yes	-	-	-	-	Yes	-
Fagraea auriculata	Native	Pelir Musang	Climber	-	-	-	-	-	Yes	-
Ficus aurata	Native	Yellow Hairy Fig	Tree	Yes	-	-	-	-	No	-
Ficus caulocarpa	Native	Stem-Fruited Fig	Strangler	Yes	-	-	-	-	No	Look into the possibility of harvesting/salvaging existing specimen in EIS Study Area
Ficus deltoidea	Native	Rusty-leafed Bush Fig	Epiphyte	-	-	-	-	-	Yes	-
Ficus fistulosa	Native	Common Yellow Stem Fig	Tree	Yes	Yes	Yes	-	-	Yes	-
Ficus grossularioides	Native	White-leafed Fig	Tree	-	Yes	-	-	Yes	No	Look into the possibility of harvesting/salvaging existing specimen in EIS Study Area; Host plant for *Euploea mulciber muciber*
Ficus heteropleura	Native	Sandy-leaved fig	Climber	Yes	-	-	-	Yes	No	Host plant for *Euploea mulciber muciber*
Ficus microcarpa	Native	Malayan Banyan	Strangler	Yes	-	Yes	-	Yes	Yes	Host plant for *Iraota rochana boswelliana* and *Euploea mulciber mulciber*
Ficus variegata	Native	Common Red Stem Fig	Tree	Yes	Yes	Yes	-	-	Limited	Look into the possibility of harvesting/salvaging existing specimen in EIS Study Area

Scientific Name	Native Status	Common Name	Habit	Forest Enhancement (Species to be plantedfor infill planting in closed-canopy habitat, to increase species diversity)	Forest Creation (Fast growing pioneer species for areas in open canopy)	Riparian habitat	Aquatic habitat	Attracts butterflies/host plant	Market availability	Remarks
Flacourtia rukam	Native	Batoko Plum	Tree	Yes	-	-	-	Yes	No	Host plant for *Cupha erymanthis lotis* , *Phalanta phalantha phalantha* and V*agrans sinha sinha*
Garcinia atroviridis	Native	Asam Gelugor	Tree	Yes	-	-	-	-	Yes	-
Garcinia hombroniana	Native	Seashore Mangosteen	Tree	Yes	-	-	-	-	Yes	-
Gardenia tubifera	Native	Water Gardenia	Tree	Yes	-	-	-	-	Yes	-
Glochidion superbum	Native	Great-leaved Pin flower Tree	Tree	Yes	-	-	-	Yes	No	Host plant for *Athyma nefte subrata*
Glochidion zeylanicum var. zeylanicum	Native	-	Tree	Yes	-	-	-	Yes	No	Look into the possibility of salvaging from affected areas of the EIS Study Area; Host plant for *Athyma reta moorei*
Glycosmis chlorosperma	Native	-	Shrub	Yes	-	-	-	Yes	No	Host plant for *Neopithecops zalmora zalmora*
Gnetum gnemon	Native	Melinjo	Tree	Yes	-	-	-	-	Yes	-
Guioa pleuropteris	Native	-	Tree	Yes	-	-	-	Yes	No	Host plant for *Hypolycaena erylus teatus*
Hopea mengarawan	Native	Merawan Penak	Tree	Yes	-	-	-	-	No	-
Horsfieldia irya	Native	Pianggu	Tree	Yes	-	Yes	-	-	Limited	-
Horsfieldia superba	Native	Pendarah	Tree	Yes	-	-	-	-	Limited	-
Hoya spp.	Native	-	Climber	-	-	-	-	-	Yes	-
Hydrocotyle sibthorpioides	Native	Lawn Marshpennywort	Hydrophyte	-	-	Yes	Yes	-	No	-
Iguanura wallichiana	Native	-	Shrub	Yes	-	-	-	-	Limited	-
Ilex cymosa	Native	Marsh Holly	Tree	Yes	-	-	-	Yes	Yes	Host plant for *Athyma asura idita*
Ixora congesta	Native	Malayan Ixora, Jarum-Jarum, Khem Deang	Shurb	Yes	-	-	-	Yes	Yes	Host plant for *Lebadea martha parkeri*
Koompassia malaccensis	Native	Kempas	Tree	Yes	-	-	-	-	Yes	-
Kopsia singapurensis	Native	Singapore Kopsia	Tree	Yes	-	Yes	-	-	Limited	-

Scientific Name	Native Status	Common Name	Habit	Forest Enhancement (Species to be plantedfor infill planting in closed-canopy habitat, to increase species diversity)	Forest Creation (Fast growing pioneer species for areas in open canopy)	Riparian habitat	Aquatic habitat	Attracts butterflies/host plant	Market availability	Remarks
Leea angulata	Native	Memali	Tree	Yes	-	-	-	-	Limited	Look into the possibility of salvaging/propagating from existing affected population in EIS Study Area
Leea indica	Native	Bandicoot Berry	Shrub	Yes	-	-	-	Yes	Yes	Attracts *Iambrix salsala salsala* , *Cethosia hypsea hypsina* , *Neopithecops zalmora zalmora* , *Pyroneura latoia latoia* , *Eurema sari sodalis* , *Tagiades japetus atticus* , *Euploea crameri bremeri* , *Ideopsis vulgaris macrina* , *Spindasis lohita senama* , *Eurema hecabe contubernalis* , *Parantica agleoides agleoides* , *Eurema simulatrix tecmessa* , *Gandaca harina distanti* , *Eurema blanda snelleni* , *Symbrenthia hippoclus* , *Iambrix stellifer* , *Ypthima huebneri*
Leea rubra	Native	Red Leea	Shrub	-	-	-	-	Yes	Yes	Attracts *Danaus melanippus hegesippus* , *Spindasis lohita senama* , *Spindasis syama terana* , *Nacaduba pavana singapura* , *Tajuria cippus maxentius* , *Ideopsis vulgaris macrina* , *Eurema hecabe contubernalis* , *Chilasa clytia clytia* , *Phalanta phalantha phalantha* , *Hypolimnas anomala anomala* , *Hypolycaena erylus teatus* , *Graphium sarpedon luctatius* , *Danaus genutia genutia* and *Mycalesis mineus macromalayana*
Lepisanthes rubiginosa	Native	-	Tree	Yes	-	-	-	-	No or limited	-
Licuala spinosa	Native	Mangrove Fan Palm	Shrub	Yes	-	-	-	Yes	Yes	Host plant for *Elymnias panthera panthera* and *Salanoemia tavoyana*
Litsea elliptica	Native	Medang	Tree	Yes	-	-	-	-	No	-
Macaranga bancana	Native	Common Mahang	Tree	-	Yes	-	-	Yes	Limited	Host plant for *Euhalia monina monina* and *Arhopala amphimuta amphimuta*
Macaranga gigantea	Native	Giant Mahang	Tree	Yes	Yes	-	-	Yes	Limited	Host plant for *Arhopala major major*
Macaranga griffithiana	Native	Mahang Bulan	Tree	Yes	Yes	Yes	-	-	No	Look into the possibility of harvesting/salvaging existing specimen in EIS Study Area
Macaranga heynei	Native	Blue Mahang	Tree	-	Yes	-	-	-	No or limited	-

Scientific Name	Native Status	Common Name	Habit	Forest Enhancement (Species to be plantedfor infill planting in closed-canopy habitat, to increase species diversity)	Forest Creation (Fast growing pioneer species for areas in open canopy)	Riparian habitat	Aquatic habitat	Attracts butterflies/host plant	Market availability	Remarks
Mallotus paniculatus	Native	Turn-in-the-wind	Tree	Yes	Yes	-	-	Yes	Limited	Host plant for *Semanga superba deliciosa* , *Mooreana trichoneura trichoneura* , *Rapala pheretima sequeira* and *Megisba malaya sikkima*
Mangifera caesia	Native	Binjai	Tree	Yes	-	-	-	-	Yes	-
Maranthes corymbosa	Native	Merbatu	Tree	Yes	-	-	-	-	No or limited	-
Melaleuca cajaputi	Native	Cajaput Tree	Tree	-	-	Yes	-	-	Yes	-
Melastoma malabathricum	Native	Singapore Rhododendron	Shrub	Yes	Yes	Yes	-	Yes	Yes	Host plant for *Rapala iarbus iarbus* , *Spindasis lohita senama* , *Tanaecia iapis puseda* and *Semanga superba deliciosa*
Memecylon caeruleum	Native	Blue Strawberry Flowers	Tree	Yes	-	-	-	-	Yes	-
Memecylon pauciflorum	Native	Cherry Shrub	Tree	Yes	-	-	-	-	Yes	-
Morinda citrifolia	WOUO	Noni	Tree	-	Yes	-	-	Yes	Yes	Attracts *Catopsilia pomona pomona* , *Curetis saronis sumatrana* and *Suastus gremius gremius*
Neobalanocarpus heimii	Native	Cengal	Tree	Yes	-	-	-	-	Yes	-
Neolitsea zeylanica	Native	-	Tree	Yes	-	-	-	-	Yes	-
Nepenthes gracilis	Native	Slender Pitcher Plant	Climber	-	Yes	Yes	-	Yes	Yes	Look into the possibility of harvesting/salvaging existing specimen in EIS Study Area; Host plant for *Virachola kessuma deliochus*
Nymphoides indica	Native	Water Snowflake	Hydrophyte	-	-	Yes	Yes	-	Yes	-
Oxyceros longiflorus	Native	-	Climber	Yes	-	-	-	-	Limited	Look into the possibility of harvesting/salvaging existing specimen in EIS Study Area.
Palaquium obovatum	Native	White Gutta	Tree	Yes	-	-	-	Yes	Yes	Host plant for *Tanaecia pelea pelea*
Pandanus atrocarpus	Native	-	Tree	-	-	Yes	-	-	No	-
Pandanus houlletii	Native	Pandan Hutan	Shrub	Yes	-	-	-	-	No	-
Pandanus parvus	Native	-	Shrub	-	-	-	-	-	No	-
Parkia speciosa	Native	Petai	Tree	Yes	-	-	-	Yes	Yes	Host plant for *Polyura hebe plautus* , *Pantoporia hordona hordonia* and *Surendra vivarana amisena*

Scientific Name	Native Status	Common Name	Habit	Forest Enhancement (Species to be plantedfor infill planting in closed-canopy habitat, to increase species diversity)	Forest Creation (Fast growing pioneer species for areas in open canopy)	Riparian habitat	Aquatic habitat	Attracts butterflies/host plant	Market availability	Remarks
Peltophorum pterocarpum	Native	Yellow Flame	Tree	-	-	-	-	-	Yes	-
Peronema canescens	Native	False Elder	Tree	Yes	-	-	-	-	Limited	-
Phymatosorus scolopendria	Native	Monarch Fern	Epiphyte	-	-	-	-	-	Limited	-
Piper sarmentosum	Native	Wild Pepper	Climber	-	-	-	-	Yes	Yes	Attracts *Pyroneura latoia latoia*
Pittosporum ferrugineum	Native	Belalang Puak	Shrub	Yes	-	-	-	-	No or limited	-
Ploiarium alternifolium	Native	Cicada Tree	Shrub	-	-	Yes	Yes	-	Yes	-
Podocarpus polystachyus	Native	Sea Teak	Tree	-	-	-	-	-	Yes	-
Pometia pinnata	Native	Fijian Longan	Tree	-	-	Yes	-	-	Yes	-
Pongamia pinnata	Native	Seashore Mempari	Tree	-	-	-	-	Yes	Yes	Host plant for *Curetis santana malayica* , *Jamides bochus nabonassar* and *Hasora chromus chromus*
Pouteria obovata	Native	Sea Gutta	Tree	Yes	-	-	-	Yes	Yes	Host plant for *Tanaecia pelea pelea*
Premna serratifolia	Native	Buas-Buas	Climber	Yes	-	-	-	Yes	No or limited	Attracts *Graphium evemon eventus* , *Papilio polytes romulus* , *Euploea crameri bremeri* , *Papilio demoleus malayanus* , *Appias libythea olferna* , *Euploea phaenareta castelnaui* , *Euploea mulciber mulciber* , *Junonia almana javana* , *Junonia orithya wallacei* , *Junonia hedonia ida* , *Iambrix salsala salsala* , *Ypthima horsfieldii humei* , *Graphium agamemnon agamemnon* , *Pachliopta aristolochiae asteris*
Pteleocarpa lamponga	Native	Tembusu Tikus	Tree	Yes	-	-	-	-	Yes	-
Pternandra coerulescens	Native	Cursed Shade	Tree	Yes	-	-	-	-	No	-
Rapanea porteriana	Native	-	Shrub	-	-	-	-	-	No or limited	-
Rhodamnia cinerea	Native	Silverback	Tree	Yes	-	Yes	-	-	Limited	-

Scientific Name	Native Status	Common Name	Habit	Forest Enhancement (Species to be plantedfor infill planting in closed-canopy habitat, to increase species diversity)	Forest Creation (Fast growing pioneer species for areas in open canopy)	Riparian habitat	Aquatic habitat	Attracts butterflies/host plant	Market availability	Remarks
Rhodomyrtus tomentosa	Native	Rose Myrtle	Shrub	-	-	-	-	-	Yes	-
Rothmannia macrophylla	Native	Angel's trumpet	Shrub	Yes	-	-	-	-	Limited	-
Sandoricum koetjape	Native	Santol	Tree	Yes	-	-	-	-	Yes	-
Scaphium macropodum	Native	Kembang Semangkuk Jantung	Tree	Yes	-	Yes	-	-	Yes	-
Shorea leprosula	Native	Meranti Tembaga	Tree	Yes	-	-	-	-	Yes	-
Stenochlaena palustris	Native	Climbing Fern	Epiphyte	Yes	Yes	Yes	-	-	Yes	-
Sterculia cordata	Native	Kelumpang	Tree	Yes	-	-	-	-	Yes	-
Sterculia macrophylla	Native	Broad-leaved Sterculia	Tree	Yes	-	Yes	-	-	No or limited	-
Sterculia parviflora	Native	Kelumpang Burung	Tree	Yes	-	-	-	-	Yes	-
Sterculia rubiginosa	Native	Rusty Sterculia	Tree	Yes	-	Yes	-	-	Yes	-
Streblus elongatus	Native	Tempinis Tree	Tree	Yes	-	-	-	-	Yes	-
Syzygium borneense	Native	-	Tree	Yes	-	-	-	-	No	-
Syzygium glaucum	Native	Eugenia glauca	Tree	Yes	-	-	-	Yes	Yes	Host plant for *Flos apidanus saturatus* and *Arhopala athada athada*
Syzygium grande	Native	Sea Apple	Tree	Yes	Yes	-	-	Yes	Yes	Host plant for *Arhopala centaurus nakula* and *Flos apidanus saturatus.* Look into the possibility of salvaging from affected areas of the EIS Study Area
Syzygium lineatum	Native	Common Kelat	Tree	Yes	yes	Yes	-	-	Yes	-
Syzygium myrtifolium	Native	-	Tree	Yes	-	-	-	-	Yes	-
Syzygium polyanthum	Native	Indonesian Bay Leaf	Tree	Yes	-	-	-	-	Yes	-
Syzygium syzygioides	Native	Kelat Hitam	Tree	Yes	-	-	-	-	No or limited	-
Syzygium zeylanicum	Native	Kelat Nasi Nasi	Tree	Yes	Yes	-	-	Yes	Yes	Host plant for *Anthene emolus goberus* and *Rapala pheretima sequeira*
Tabernaemontana corymbosa	Native	Great Rosebay	Tree	Yes	-	-	-	-	No	-
Tarenna fragrans	Native	River Tarenna	Tree	Yes	-	Yes	-	-	Yes	Look into the possibility of harvesting/salvaging existing specimen in EIS Study Area

Scientific Name	Native Status	Common Name	Habit	Forest Enhancement (Species to be plantedfor infill planting in closed-canopy habitat, to increase species diversity)	Forest Creation (Fast growing pioneer species for areas in open canopy)	Riparian habitat	Aquatic habitat	Attracts butterflies/host plant	Market availability	Remarks
Tarenna odorata	Native	-	Shrub	-	-	-	-	-	No	-
Terminalia catappa	Native	Sea Almond	Tree	-	-	-	-	Yes	Yes	Host plant for *Arhopala centaurus nakula* , *Flos apidanus saturatus* and *Spindasis lohita senama*
Thottea grandiflora	Native	Bunga Semubut	Shrub	Yes	-	-	-	-	Limited	-
Thunbergia laurifolia	Native	Laurel-leaved Thunbergia	Climber	-	-	-	-	-	Yes	-
Timonius wallichianus	Native	Silver Timon	Tree	Yes	-	Yes	-	Yes	No	Host plant for *Moduza procris milonia*
Tristaniopsis merguensis	Native	Hill Tristania	Tree	Yes	-	Yes	-	-	Yes	-
Tristaniopsis obovata	Native	Sea Tristania	Tree	Yes	-	-	-	-	Yes	-
Tristaniopsis whiteana	Native	River Tristiana	Tree	Yes	-	Yes	-	-	Yes	-
Tristellateia australasiae	Native	Shower of Gold Climber	Climber	-	-	-	-	-	Yes	-
Tylophora flexuosa	Native	-	Climber	-	-	-	-	Yes	No	Host plant for *Parantica agleoides agleoides* and *Ideopsis vulgaris macrina* .
Ventilago malaccensis	Native	-	Climber	Yes	-	-	-	Yes	No	Host plant for *Eurema andersonii andersonii* and *Gandaca hari distnti* .
Vernonia arborea	Native	Tree Vernonia	Tree	-	-	-	-	-	Yes	-
Vitex pinnata	Native	Leban	Tree	Yes	Yes	-	-	-	Yes	-

Appendix O
Methods Statement for Tree Protection and Conservation Guidleines

Delivering a better world

METHOD STATEMENT FOR TREE PROTECTION AND CONSERVATION GUIDELINES

By

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Lead Arborist

Camphora Pte Ltd

ISA certified

SG-0117A

CONTENT REQUIREMENTS

This document outlines specific measures to protect trees during construction or other site disturbance. The content and scope of the document will vary based on the site, type of construction, tree species, tree location and other factors.

TREE PROTECTION AND CONSERVATION GUIDELINES

This section outlines the general provisions for tree protection before, during and after construction. Additional measures may be added by the attending arborist on a case-by-case basis.

PRE-DEMOLITION/PILING/CONSTRUCTION

1. Pre-Construction Meeting

   The attending arborist shall attend a pre-construction meeting with the project contractor or construction supervisor to explain the tree protection and monitoring requirements as outlined in this document.

   In addition, the project contractor or construction supervisor shall complete the 'VERIFICATION OF TREE PROTECTION CHECKLIST' as attached in Annex A before the onset of the construction.

1.1 Tree Protection Zone

Prior to any site clearing (demolition works), piling works, grading, trenching or other soil disturbance, a tree protection zone (TPZ) must be installed as follows:

i. Type

The barriers should be temporary, made of a hard material, 1.8-m tall and firmly installed into the ground.

ii. Ground protection

Mulching material (can be compost or woodchips) at 100-mm thick to be laid within the TPZ. If woodchips are used, termicide treatment is necessary to prevent the introduction of harmful termites.

Apply complete fertilizer (N:P:K 15:15:15) upon or together with the application of mulch.

iii. Signage

A readily-visible and waterproof sign shall be installed on all sides of the fencing around each individual protected tree. The size of each sign must be a minimum of 300mm wide and must contain the wording below:

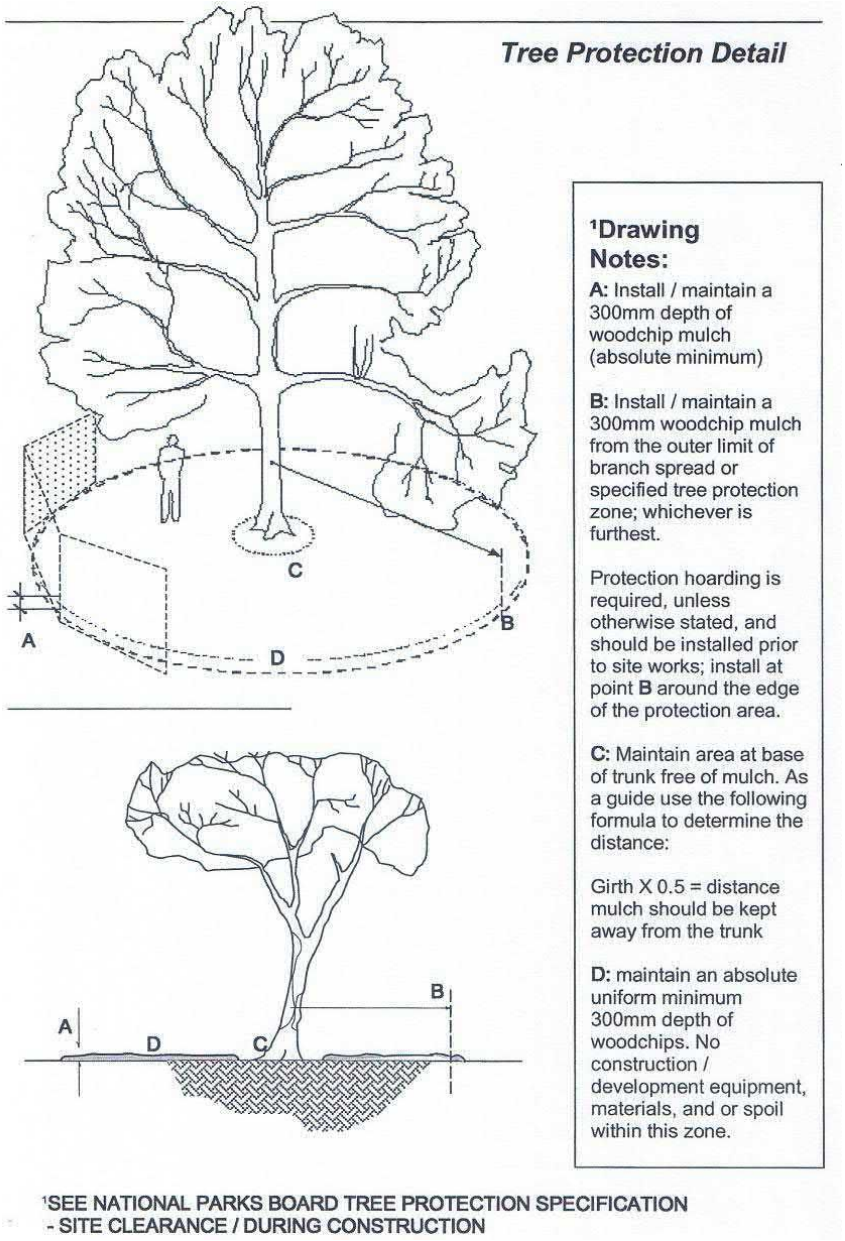
KEEP OUT!
TREE PROTECTION ZONE

Entry prohibited. This fence shall remain in place throughout the entire construction period.

iv. Fencing installation

Installation must be approved by the attending arborists and/or the approved authority prior to construction.

A diagrammatic representation of a proper Tree protection zone is presented below.



1.2 Tree pruning and removal

Various trees may need to be pruned away from structures or proposed construction activity. ***Construction or contractor personnel shall not attempt pruning or removal.*** Consultation and written approval with attending arborist must be obtained prior to pruning.

Removal of trees adjacent to trees that are to be retained requires planning and skilled arboriculture workers. Trees should not be removed by pushing with excavators/heavy

machinery or with lumberjack (one cut) methods. Directional felling methods (notch and back-cut) should be deployed during removal of trees.

Removal of trees that extend into branches or roots of protected trees shall not be attempted by the demolition or construction crew, or by grading or other heavy equipment. Before removing tree stumps, the project manager shall seek the advice from the attending arborist determine if roots are entangled with trees that are to remain. If so, these stumps shall have their roots severed before extracting them.

1.3 Site Clearance

To avoid lumber jack felling of trees that may severely damage the canopy of conserved trees, it is recommended that qualified (see Point 4.3 Tree Conservation Guidelines) Arboriculture contractors be engage to fell trees adjacent to protected trees to ensure that the trees (when cut) fall away from the protected trees and their associated TPZs.

Contractors carry out tree felling works near assigned TPZs of conserved trees should

i. Employ directional felling through the use of notch and back cuts

ii. Deploy cranes to tension trunks in the direction of the drop

iii. Carry out pruning of canopy branches to remove entangling branches

iv. If trees to be removed are taller than neighbouring trees to be retained, removal of branches should be carried out in a controlled manner using ropes and cranes to avoid damaging canopy of the lower trees.

v. To avoid pruning of conserved trees at the proximity unless consultation and approval from attending arborist has been obtained.

vi. No tree should be removed by pushing with an excavator or heavy machinery.

DURING DEMOLITION/PILING/CONSTRUCTION

2. Tree Protection Zone Restrictions

- No ground disturbance, grading, trenching or other construction activities shall occur within the TPZ except as specified and/or approved by the attending arborist or authority.
- No construction material, debris, machinery (e.g. generators) or other construction waste shall be stored within the TPZ. Weight and presence of these materials increases

soil compaction and reduces the area exposed for water infiltration and gaseous exchange.



Figure 1: Construction material and heavy machinery are prohibited within the TPZ

- Excavation works within the TPZ are strictly prohibited. Unless otherwise specified by the attending arborist, all work done within the TPZ shall be completed with manual trenching with hand tools or other hand held power tools that will not cause any root/tree damage.

  If roots need to be cut, it shall be done using proper equipment (e.g. pruning saw, chain saw) under the supervision of the attending arborist.



Figure 2: Trial trench by skilled workers using hand tools exposing root architecture

- Nailing, tying or pasting of materials on trees is prohibited. The tree shall not be used

as an anchor for supporting structures during the construction.



Figure 3: Using tree as anchor may damage its bark.



Figure 4: No nails shall be driven into the tree as it promotes infiltration of pests/diseases

- Phytotoxic materials such as fuels, oils, cement, chemicals, and paint shall be kept away and stored/mixed at least 2.5m from the tree protection zone. Such chemicals can significantly change the cation exchange capacity and pH of the soil, rendering nutrient uptake inefficient and creating an environment too toxic for the roots to grow.

  Construction slug especially from piling works should not be deposited within the TPZ. Such sludge is usually high in clay content and when layered over and within the TPZ could significantly alter the water infiltration and gaseous exchange rates of the root absorption area of the tree.

Canvass sheets/Eco-mat must be laid on the existing soil near the tree in view of soil protection during the demolition, drilling or other construction activities pertaining to concrete structures.



Figure 5: Construction cement deposited at tree base.



Figure 6: Tree showing signs of decline overtime.

- Lowering the grade around trees can have an immediate and long-term effect on trees. Typically, most roots are within the top 1m of soil, and most of the fine roots active in water and nutrient absorption are in the top 300mm.

  A) Grade changes within the TPZ are not permitted.

  B) Grade changes outside the TPZ shall not significantly alter drainage.

  C) Grade changes under specifically approved circumstances shall not allow more than

200mm of fill soil or allow more than 150mm of existing soil to be removed from natural grade, unless mitigated.

D) Grade fills over 200mm or impervious overlay shall incorporate an approved permanent aeration system, permeable material, or other approved mitigation.

E) Grade cuts exceeding 150mm shall incorporate retaining walls or an appropriate transition equivalent.

No removal of the TPZ will be permitted under any circumstances.



Figure 7: Inappropriate installation/maintenance of TPZ during construction.

2.2 Proximity of Heavy machinery/vehicles

Heavy vehicles and machinery (e.g. excavators, piling cranes, 10 wheelers) movement should be limited near TPZs. Temporary access/passageways should be planned to avoid conserved trees.

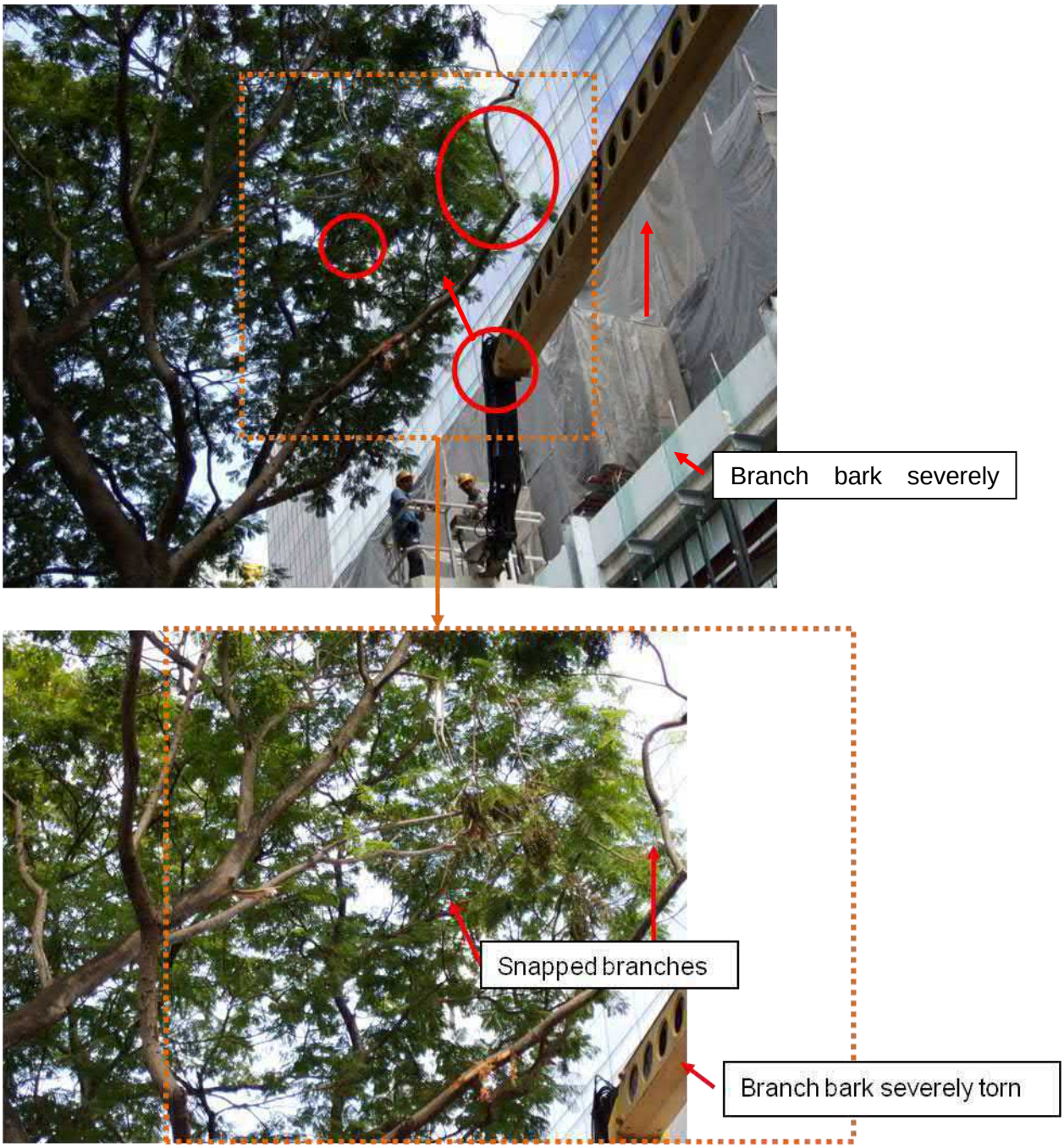


Figure 8: Tree branches were severed due to the negligence of the crane operator.

2.3 Drainage Considerations

In the event that water ponding conditions develop in the course of construction due to change in grade/platform levels, construction events or any other unforeseeable factors, the contractor is required to improve drainage around or within the TPZ in consultation with the attending arborist.

2.4 Trenching, Excavation and Equipment use

Trenching, excavation or boring within the TPZ shall be limited to activities approved by the architect and/or attending Arborist. Explore alternatives for trenching outside the root zone. Avoid exposing roots during hot, dry weather. Backfill trenches as soon as possible with soil and soak with water the same day. Small roots can die in 10 to 15 minutes and large roots may not survive an hour of exposure. If the trench must be left open all roots must be kept moist by wrapping them in peat moss and burlap.

i. Root Severance

No roots greater than 0.2m in diameter shall be cut without approval of the attending Arborist. Tunneling under roots is the approved alternative. Prior to excavation for foundation/footing/walls, or grading or trenching within the TPZ, roots shall be severed cleanly outside the TPZ to the depth of the planned excavation. When roots must be cut, they shall be cut cleanly with a sharp saw to sound wood and flush with the trench site.



Figure 9: Tunneling under roots.

ii. Excavation

Any approved excavation, demolition, or extraction of material shall be performed with equipment that is placed outside the TPZ. Hand digging, hydraulic, or pneumatic excavation (e.g. air spading) are permitted methods for excavation within the TPZ.



Figure 10: Root exploratory works using an air spade. Air spading avoids damage of structural and even feeder roots of the tree.

iii. Heavy Equipment

Use of backhoes, Ditch-Witches, steal tread tractors or other heavy vehicles within the TPZ is prohibited unless approved by the attending Arborist. If allowed, a protective root buffer is required.

2.5 Tree Care

In the course of construction, the following measures may be necessary to reduce the effects of construction stress on protected trees. Quantum, duration and extent to be advised by attending arborist.

(A) Fertilization

A1 Vertical trenches and Nutrient Sinks

Create vertical trenching and nutrient sinks. These nutrient sinks should go down to at least 300mm deep and should be filled with high grade compost and 12% Humic acid (dilution 1:100). These sinks will act to reduce construction stress by conditioning the soil, increasing soil microbiological activity and increasing organic matter At least 24 numbers of vertical trenches / nutrient sinks are required for trees greater than 2m in girth. Vertical trenches for trees under 2m in girth will be

determined empirically by the attending arborist and will take into account site conditions, tree species and its pre construction vigor. Top up nutrient sinks every 3 months.

A2 Soil Injection of Biostimulants

Mandatory if TPZ has been infringed into, soil compaction has occurred, tree condition has observed to have declined (indicators: reduction in Live crown ratios, twig die back at canopy and change in leaf colour/size/density)

- **Purpose :** To de-compact soil using a hydraulic pressurized delivery of biostimulants that both hydrates and aerates at the same time. Aim to reduce compaction to less than 400psi in the first 500mm of the soil.
- Mixed bio stimulants – serves 2 functions
  Decompaction
- Humic acid – as soil conditioner and chelating agent (Nutrients are mobilized in forms that the plants can accept), facilitate release of nutrients and reduces leaching. Also improves water holding capacities of soil.
- Liquid gypsum / Dolomite – soil conditioner, improve soil structure and facilitate release of nutrients in clay soils typical of local conditions.

  To feed and increase soil microbiology to increase tree vigor post damage. Soil microbiology helps nutrient uptake and encourages healthy root growth critical to prevent construction stress.

- Mollases – High CE for immediate uptake,
- Fish Kelp – Protein source. Organic fertilisers
- Slow release fertilizers (Osmocote)

(B) Watering

- Water supplement during periods of drought.
- Watering duration and extent depends on site conditions and species.
- Watering is carried out until first signs of inundation are observed (i.e. water infiltration observe to slow down significantly).

(C) Myconate treatment

- To trigger and stimulate growth of existing mycorrhizae.

(D) Pesticide treatment

- To control pest (e.g. termites, borers, caterpillars etc) when it occurs.
- Fungicide or bacteriocide as required or as determined by attending arborist to control microbe pathogens.

(E) Additonal pruning

To be carried out in consultation with the attending Arborist. Trees are living things and may require some form of pruning during the course of the development.

- Crown cleansing- Prune to remove dead branches that may have developed through time.
- Crown lifting- Prune to lift crown to avoid new amenities.
- Crown thinning- Prune to reduce canopy branches and loading.

Structural pruning (including crown reduction) to remove branches that may obstruct new amenities and/or movement of critically necessary equipment may require the planning and standing supervision of the attending arborist.

2.6 Engaging Arboriculture Contractors

All arboriculture works should be carried out by skilled and trained arboriculture teams. As such, it is preferred that only Arboriculture contractors which have at least 8 years working experience and must show previous work experience in developments of similar size or complexity. Arboriculture contractors should meet NParks safety requirements for work at height, LTA's requirements for temporary works along roadsides (where necessary) and have a certified arborist to supervise the pruning/felling/planting works.

All arboriculture workers engaged in tree climbing and chainsaw work shall possess a valid basic tree climbing certification base upon demonstrated competence in the WSQ module conducted by CUGE or an equivalent WSQ approved training organization.

Each Arboriculture crew shall possess the following VALID competences,
Operation of chainsaw for ground work (LS-MT-103E-1)
Chainsaw safety and maintenance (LS-MT-102E-1)
Perform formative pruning of young trees (LS-MT-114E-1)
Provide Arboriculture support on site (LS-MT-116E-1)
Workplace safety and health – operators (ES-WSH-101G-1)
Respond to Emergency (LS-HM-208E-1)
Perform advance rigging and climbing techniques (LS-HM-308S-1)
Perform aerial tree access and aerial rescue skills (Ls-HM-204S-1)
Implement and apply appropriate risk and safety management to sector practices (LS-BP-301S-1)
Prepare risk assessment report (LS-HM-406S-1)
Operate and work from an elevated work platform (CUGE-ARB-3501)

POST-CONSTRUCTION

3. Soft Landscaping

Ground works, site preparation and implementation of all landscaping near protected trees must be undertaken carefully.

TPZ barriers can only be removed at this juncture for the purpose. However, when working near trees, cultivation of soils in these areas must be cautiously handled using hand tools. Planting of shrubs shall be at a distance of at least 300mm away from existing root collar.

Avoid changes to ground levels or unnecessary compaction of soils within proximity to existing trees during the course.



Figure 10: New plantings at a minimum distance of 300mm (all round) from root collar

ANNEX A

VERIFICATION OF TREE PROTECTION CHECKLIST

Note: The project contractor or construction supervisor shall verify in writing that all **preconstruction** tree preservation conditions have been met as follows:

Submitted by: _____

Company/Project: _____

Date/Time: _____

S/N	Action	Checked (✔)	Remarks
1	Installation of tree fencing around identified trees within/near site (hard material at 1.8m tall)		
2	Tree protection zone (TPZ) dimensions meets specifications (from NParks and/or attending arborist)		
3	Warning signs prominently displayed on all sides of the fencing, including designated tree number		
4	Removal of construction material (ie machinery, debris, tools etc) within TPZ		
5	Mulching of high grade compost of 100mm thick around identified trees		
6	Completion of tree pruning (if necessary) under the supervision/written approval with the attending arborist		
7	Establishment of a tree maintenance schedule according to arborist recommendations (to be submitted to attending arborist)		

Verified by (attending arborist): _____

Date/Time: _____

Appendix P
Fauna Inspection Form

Delivering a better world

CAMPHORA FAUNA INSPECTIONS

Inspection Round:
Date of Inspection:
Start & End Time:
Project Title:

Main Contractor:
Conducted by:
Weather Conditions:

Fortnightly fauna inspections across all zones on site include: (a) inspection of hoarding integrity and possibility of wildlife entry into site, (b) inspection of erosion control blankets for wildlife entrapment, and (c)inspection within and around TPZs on site for wildlife presence.
Ad-hoc fauna inspections will be conducted when the need arises, e.g. when vegetation needs to be removed on site.

S/N	Activity	Zone/s Inspected	Findings	Coordinates (Lat, Lon)	Remarks / Photo/s	Actions (to be) taken

Appendix Q
Pre-felling Inspection Form

Delivering a better world

CAMPHORA PRE-FELLING FAUNA INSPECTION FORM			Personnel:				**Assessment criteria** **FELL:** Ready to fell. No findings or old nests; highly mobile fauna **S-EM:** Fell with supervision by Environmental Manager. Possibly active nest, presence of bird's nest fern, staghorn fern, thick vegetation, tree holes or cavities, ground burrows, logs and debris piles **S-ECO:** Fell with supervision by Ecologist. During bird breeding season. Possibly active nest, presence of bird's nest fern, staghorn fern, thick vegetation, tree holes or cavities **DO NOT FELL:** Sedentary fauna, active nest or burrow; bee or wasp nest
Inspection date:	Valid until:		Weather:				
Site:	Bird breeding season (Mar-Jul)?: Y / N		Time in:	Time out:			

Tree no.	Fauna		Nests		Thick vegetation		Tree holes/cavities		Ground burrows		Logs and debris piles		Assessment	Remarks
	Details (species, behavior, height)	Photo no.	Details (nest type; epiphytic fern; species, eggs or young present)	Photo no.	Details (climbers, oil palm, nibong palm, etc.)	Photo no.	Details (species, eggs/young present, height)	Photo no.	Details (species, eggs/young present)	Photo no.	Details	Photo no.		

CAMPHORA PRE-FELLING FAUNA INSPECTION FORM		Personnel:		**Assessment criteria** **FELL:** Ready to fell. No findings or old nests; highly mobile fauna **S-EM:** Fell with supervision by Environmental Manager. Possibly active nest, presence of bird's nest fern, staghorn fern, thick vegetation, tree holes or cavities, ground burrows, logs and debris piles **S-ECO:** Fell with supervision by Ecologist. During bird breeding season. Possibly active nest, presence of bird's nest fern, staghorn fern, thick vegetation, tree holes or cavities **DO NOT FELL:** Sedentary fauna, active nest or burrow; bee or wasp nest
Inspection date:	Valid until:	Weather:		
Site:	Bird breeding season (Mar-Jul)?: Y / N	Time in:	Time out:	

Tree no.	Fauna		Nests		Thick vegetation		Tree holes/cavities		Ground burrows		Logs and debris piles		Assessment	Remarks
	Details (species, behavior, height)	Photo no.	Details (nest type; epiphytic fern; species, eggs or young present)	Photo no.	Details (climbers, oil palm, nibong palm, etc.)	Photo no.	Details (species, eggs/young present, height)	Photo no.	Details (species, eggs/young present)	Photo no.	Details	Photo no.		

Appendix R
Wildlife Incident Form

Delivering a better world

WILDLIFE INCIDENT FORM

Date (YYYY/MM/DD):	Time:
Description of Location:	GPS Coordinates:
Wildlife Observed:	Animal Condition: ☐ Alive ☐ Killed ☐ Dead ☐ Injured Animal Activity: ☐ Moving ☐ Resting ☐ Trapped
Photographs Taken: ☐ Yes ☐ No	NParks Notified: ☐ Yes ☐ No Name of NParks Staff Notified: _____
Describe Incident (e.g., activities being carried out; what animal was doing; personnel involved):	
Actions Taken:	
Reported by: _____ Contact #: _____	Reported to: _____ Contact #: _____
Remarks:	

Appendix S
Baseline Surface Water Quality Report

Delivering a better world

TEST REPORT

Our Reference No.	:	**R211236**	Date Received	:	08/03/2021
Project Code / Ref.	:	Tengah	Date Commenced	:	08/03/2021
			Date Reported	:	17/03/2021
Customer Ref. No.	:	60651709			
Customer Name	:	AECOM Singapore Pte Ltd			
Customer Address	:	300 Beach Road #03-00 The Concourse Singapore 199555			
Attention To	:	Ms Liang Liang			
Sample Description	:	6 Water Samples			
RESULTS:		Refer to Page 2			

Tan Thuan Piang
Technical Manager

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Website: www.mls.sg

R211236

RESULTS

Test Parameter	Unit	Test Method	Sampling Date: 08/03/2021						LOR
			Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	
			WQ2	WQ3	WQ4	WQ5	WQ7	WQ9	
Total Nitrogen as TN	mg/L	APHA 4500-P (J)	1.55	1.10	2.01	1.47	1.07	1.62	0.01
Total Phosphorus as TP	mg/L	APHA 4500-P (J)	0.074	0.089	0.068	0.081	0.053	0.073	0.01
Ammonia as NH_4-N	mg/L	APHA 4500-NH_3 (H)	0.32	0.21	0.79	0.35	0.075	0.11	0.01
Nitrate as NO_3-N	mg/L	APHA 4500-NO_3 (I)	0.17	0.37	0.54	0.43	0.60	0.95	0.005
Orthophosphates as PO_4-P	mg/L	APHA 4500-P (G)	0.062	0.075	0.049	0.057	0.042	0.059	0.005
Total Suspended Solids as TSS	mg/L	APHA 2540D	40.5	90.5	26.0	215	4.60	5.40	1
Total Organic Carbon,TOC	mg/L	APHA 5310B	14.9	5.97	5.35	6.76	2.83	3.01	1
Enterococcus	cfu/100mL	APHA 9230C	1,200	700	1,700	13,700	<1	<1	1
Lead as Pb	µg/L	APHA 3125B	0.76	0.67	0.86	6.68	<0.5	<0.5	0.5

Note:

1. APHA is a standard method for Determination of Water and Waste Water (APHA 23rd Edition, 2017)
2. "<" = Less than. The data reported is less than Detection Limit of the test.

TEST REPORT

Our Reference No.	:	**R211921**	Date Received	:	13/04/2021
Project Code / Ref.	:	CCK & Tengah	Date Commenced	:	13/04/2021
			Date Reported	:	27/04/2021
Customer Ref. No.	:	60651709			
Customer Name	:	AECOM Singapore Pte Ltd			
Customer Address	:	300 Beach Road #03-00 The Concourse Singapore 199555			
Attention To	:	Ms Liang Liang			
Sample Description	:	13 Water Samples			
RESULTS:		Refer to Page 2 to 3			

Tan Thuan Piang
Technical Manager

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Website: www.mls.sg

R211921

RESULTS

Test Parameter	Unit	Test Method	Sampling Date: 13/04/2021			LOR
			Sample 1	Sample 2	Sample 3	
			CCK WQ1	CCK WQ2	CCK WQ3	
Total Nitrogen as TN	mg/L	APHA 4500-P (J)	1.50	2.17	3.50	0.01
Total Phosphorus as TP	mg/L	APHA 4500-P (J)	0.037	0.047	0.045	0.01
Ammonia as NH_4-N	mg/L	APHA 4500-NH_3 (H)	0.098	0.15	0.30	0.01
Nitrate as NO_3-N	mg/L	APHA 4500-NO_3 (I)	1.27	2.14	2.04	0.005
Orthophosphates as PO_4-P	mg/L	APHA 4500-P (G)	0.020	0.014	0.028	0.005
Total Suspended Solids as TSS	mg/L	APHA 2540D	40.0	70.0	45.7	1
Total Organic Carbon,TOC	mg/L	APHA 5310B	2.85	4.15	6.63	1
Enterococcus	cfu/100mL	APHA 9230C	7,000	14,000	16,000	1
Lead as Pb	µg/L	APHA 3125B	<0.5	<0.5	<0.5	0.5

Test Parameter	Unit	Test Method	Sampling Date: 13/04/2021			LOR
			Sample 4	Sample 5	Sample 6	
			CCK WQ4	CCK WQ5	CCK WQ6	
Total Nitrogen as TN	mg/L	APHA 4500-P (J)	2.20	0.67	2.29	0.01
Total Phosphorus as TP	mg/L	APHA 4500-P (J)	0.043	0.071	0.025	0.01
Ammonia as NH_4-N	mg/L	APHA 4500-NH_3 (H)	0.099	0.053	0.17	0.01
Nitrate as NO_3-N	mg/L	APHA 4500-NO_3 (I)	1.96	0.35	1.92	0.005
Orthophosphates as PO_4-P	mg/L	APHA 4500-P (G)	0.034	0.057	0.018	0.005
Total Suspended Solids as TSS	mg/L	APHA 2540D	37.0	<10	<10	1
Total Organic Carbon,TOC	mg/L	APHA 5310B	6.46	4.23	7.15	1
Enterococcus	cfu/100mL	APHA 9230C	14,000	6,800	8,100	1
Lead as Pb	µg/L	APHA 3125B	0.69	<0.5	<0.5	0.5

Note:

1. APHA is a standard method for Determination of Water and Waste Water (APHA 23rd Edition, 2017)
2. "<" = Less than, The data reported is less than Detection Limit of the test.

R211921

RESULTS

Test Parameter	Unit	Test Method	Sampling Date: 13/04/2021				LOR
			Sample 7	Sample 8	Sample 9	Sample 10	
			Tengah WQ1	Tengah WQ2	Tengah WQ3	Tengah WQ4	
Total Nitrogen as TN	mg/L	APHA 4500-P (J)	4.26	1.04	1.11	2.29	0.01
Total Phosphorus as TP	mg/L	APHA 4500-P (J)	0.059	0.095	0.10	0.084	0.01
Ammonia as NH_4-N	mg/L	APHA 4500-NH_3 (H)	0.79	1.03	0.54	1.59	0.01
Nitrate as NO_3-N	mg/L	APHA 4500-NO_3 (I)	1.25	0.15	0.61	0.52	0.005
Orthophosphates as PO_4-P	mg/L	APHA 4500-P (G)	0.046	0.063	0.062	0.057	0.005
Total Suspended Solids as TSS	mg/L	APHA 2540D	54.3	32.0	235	15.3	1
Total Organic Carbon,TOC	mg/L	APHA 5310B	6.45	10.5	6.97	4.76	1
Enterococcus	cfu/100mL	APHA 9230C	1,800	1,300	1,000	700	1
Lead as Pb	µg/L	APHA 3125B	1.42	<0.5	7.69	<0.5	0.5

Test Parameter	Unit	Test Method	Sampling Date: 13/04/2021				LOR
			Sample 11	Sample 12	Sample 13		
			Tengah WQ5	Tengah WQ6	Tengah WQ7		
Total Nitrogen as TN	mg/L	APHA 4500-P (J)	1.36	1.23	0.91		0.01
Total Phosphorus as TP	mg/L	APHA 4500-P (J)	0.11	0.072	0.056		0.01
Ammonia as NH_4-N	mg/L	APHA 4500-NH_3 (H)	0.84	0.59	0.13		0.01
Nitrate as NO_3-N	mg/L	APHA 4500-NO_3 (I)	0.42	0.010	0.75		0.005
Orthophosphates as PO_4-P	mg/L	APHA 4500-P (G)	0.075	0.033	0.035		0.005
Total Suspended Solids as TSS	mg/L	APHA 2540D	<10	12.7	<10		1
Total Organic Carbon,TOC	mg/L	APHA 5310B	6.91	3.92	2.02		1
Enterococcus	cfu/100mL	APHA 9230C	1,000	100	<1		1
Lead as Pb	µg/L	APHA 3125B	<0.5	<0.5	<0.5		0.5

Note:

1. APHA is a standard method for Determination of Water and Waste Water (APHA 23rd Edition, 2017)
2. "<" = Less than. The data reported is less than Detection Limit of the test.

TEST REPORT

Our Reference No.	:	**R212381**	Date Received	:	05/05/2021
Project Code / Ref.	:	Tengah	Date Commenced	:	05/05/2021
			Date Reported	:	14/05/2021
Customer Ref. No.	:	60651709			
Customer Name	:	AECOM Singapore Pte Ltd			
Customer Address	:	300 Beach Road #03-00 The Concourse Singapore 199555			
Attention To	:	Ms Liang Liang			
Sample Description	:	7 Water Samples			
RESULTS:		Refer to Page 2			

Tan Thuan Piang
Technical Manager

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Website: www.mls.sg

R212381

RESULTS

Test Parameter	Unit	Test Method	Sample 1	Sample 2	Sample 3	Sample 4	LOR
			WQ2	WQ3	WQ4	WQ5	
Conductivity			295	226	140	135	-
Total Nitrogen as TN	mg/L	APHA 4500-P (J)	1.26	1.38	1.29	1.08	0.01
Total Phosphorus as TP	mg/L	APHA 4500-P (J)	0.065	0.086	0.18	0.058	0.01
Ammonia as NH_4-N	mg/L	APHA 4500-NH_3 (H)	0.12	0.092	0.25	0.077	0.01
Nitrate as NO_3-N	mg/L	APHA 4500-NO_3 (I)	0.49	0.89	0.60	0.62	0.005
Orthophosphates as PO_4-P	mg/L	APHA 4500-P (G)	0.046	0.040	0.12	0.035	0.005
Total Suspended Solids as TSS	mg/L	APHA 2540D	175	326	530	78.0	1
Total Dissolved Solids as TDS	mg/L	APHA 2540C	189	151	90.0	87.0	10
Salinity	ppt	APHA 2520B	<0.2	<0.2	<0.2	<0.2	0.2
Total Organic Carbon,TOC	mg/L	APHA 5310B	9.12	6.13	3.57	4.81	1
Enterococcus	cfu/100mL	APHA 9230C	9,000	14,000	13,000	12,000	1
Lead as Pb	µg/L	APHA 3125B	6.81	6.56	6.71	8.86	0.5

Test Parameter	Unit	Test Method	Sample 5	Sample 6	Sample 7		LOR
			WQ6	WQ7	WQ8		
Conductivity			62.6	175	79.0		-
Total Nitrogen as TN	mg/L	APHA 4500-P (J)	1.02	1.05	1.34		0.01
Total Phosphorus as TP	mg/L	APHA 4500-P (J)	0.046	0.10	0.040		0.01
Ammonia as NH_4-N	mg/L	APHA 4500-NH_3 (H)	0.55	0.024	0.039		0.01
Nitrate as NO_3-N	mg/L	APHA 4500-NO_3 (I)	0.15	0.61	1.01		0.005
Orthophosphates as PO_4-P	mg/L	APHA 4500-P (G)	0.026	0.061	0.024		0.005
Total Suspended Solids as TSS	mg/L	APHA 2540D	34.3	63.5	21.4		1
Total Dissolved Solids as TDS	mg/L	APHA 2540C	40.0	112	51.0		10
Salinity	ppt	APHA 2520B	<0.2	<0.2	<0.2		0.2
Total Organic Carbon,TOC	mg/L	APHA 5310B	3.15	4.67	5.05		1
Enterococcus	cfu/100mL	APHA 9230C	410	14,000	16,000		1
Lead as Pb	µg/L	APHA 3125B	4.92	6.93	4.95		0.5

Note:

1. APHA is a standard method for Determination of Water and Waste Water (APHA 23rd Edition, 2017)
2. "<" = Less than. The data reported is less than Detection Limit of the test.

TEST REPORT

Our Reference No.	:	**R212476**	Date Received	: 11/05/2021
Project Code / Ref.	:	Tengah	Date Commenced	: 11/05/2021
			Date Reported	: 20/05/2021
Customer Ref. No.	:	60651709		
Customer Name	:	AECOM Singapore Pte Ltd		
Customer Address	:	300 Beach Road #03-00 The Concourse Singapore 199555		
Attention To	:	Ms Liang Liang		
Sample Description	:	2 Water Samples		
RESULTS:		Refer to Page 2		

Tan Thuan Piang
Technical Manager

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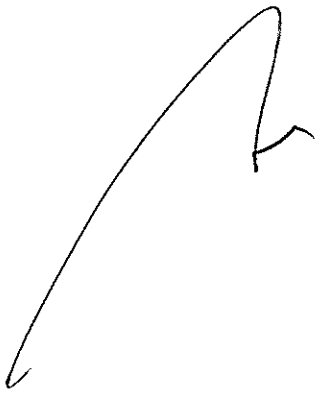
R212476

RESULTS

Test Parameter	Unit	Test Method	Sampling Date: 11/05/2021		LOR
			Sample 1	Sample 2	
			WQ9	WQ6	
Total Nitrogen as TN	mg/L	APHA 4500-P (J)	1.83	1.13	0.01
Total Phosphorus as TP	mg/L	APHA 4500-P (J)	0.065	0.033	0.01
Ammonia as NH_4-N	mg/L	APHA 4500-NH_3 (H)	0.11	0.61	0.01
Nitrate as NO_3-N	mg/L	APHA 4500-NO_3 (I)	0.95	0.021	0.005
Orthophosphates as PO_4-P	mg/L	APHA 4500-P (G)	0.047	0.026	0.005
Total Suspended Solids as TSS	mg/L	APHA 2540D	7.00	4.20	1
Total Organic Carbon,TOC	mg/L	APHA 5310B	5.07	3.63	1
Enterococcus	cfu/100mL	APHA 9230C	250	2,800	1
Lead as Pb	µg/L	APHA 3125B	<0.5	<0.5	0.5

Note:

1. APHA is a standard method for Determination of Water and Waste Water (APHA 23rd Edition, 2017)
2. "<" = Less than. The data reported is less than Detection Limit of the test.



MLS

TEST REPORT

Our Reference No.	:	**R212566**	Date Received	: 17/05/2021
Project Code / Ref.	:	Tengah	Date Commenced	: 17/05/2021
			Date Reported	: 25/05/2021
Customer Ref. No.	:	60651709		
Customer Name	:	AECOM Singapore Pte Ltd		
Customer Address	:	300 Beach Road #03-00 The Concourse Singapore 199555		
Attention To	:	Ms Liang Liang		
Sample Description	:	2 Water Samples		
RESULTS:		Refer to Page 2		

Tan Thuan Piang
Technical Manager

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R212566

RESULTS

Test Parameter	Unit	Test Method	Sampling Date: 17/05/2021		LOR
			Sample 1	Sample 2	
			WQ1	WQ9	
Total Nitrogen as TN	mg/L	APHA 4500-P (J)	1.22	1.02	0.01
Total Phosphorus as TP	mg/L	APHA 4500-P (J)	0.065	0.090	0.01
Ammonia as NH_4-N	mg/L	APHA 4500-NH_3 (H)	<0.01	0.072	0.01
Nitrate as NO_3-N	mg/L	APHA 4500-NO_3 (I)	0.34	0.42	0.005
Orthophosphates as PO_4-P	mg/L	APHA 4500-P (G)	0.035	0.065	0.005
Total Suspended Solids as TSS	mg/L	APHA 2540D	874	57.6	1
Total Organic Carbon,TOC	mg/L	APHA 5310B	5.71	4.38	1
Enterococcus	cfu/100mL	APHA 9230C	35,000	15,000	1
Lead as Pb	µg/L	APHA 3125B	10.6	1.61	0.5

Note:

1. APHA is a standard method for Determination of Water and Waste Water (APHA 23rd Edition, 2017)
2. "<" = Less than. The data reported is less than Detection Limit of the test.



Appendix T
Previous Soil Investigation Reports

Delivering a better world

KIMARO GEOTECHNICAL ENGINEERING PTE LTD

PROJECT TITLE: TERM CONTRACT NO.32 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS

JOB DESCRIBTION: SOIL INVESTIGATION WORKS FOR TENGAH PHASE 1

Contract No. : D/364/11

Work Instruction No. : WI-058

Location : Bukit Batok Road

SOIL INVESTIGATION REPORT

Owner : **Housing & Development Board**

Consultant : **TEP Consultants Pte Ltd**

Main Contractor : **KIMARO Geotechnical Engineering Pte Ltd**

Document Number	SI/HDB/12/108/ WI 058/01	Revision Number	0
Issue Number	1	Report Date	24th April 2013
Prepared By	Min Sea Sar	Reviewed By	Er. Cheang Yew Kee

KIMARO GEOTECHNICAL ENGINEERING PTE. LTD.

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Co.Reg.No.200809676R www.kimaro.com.sg

KIMARO

CERTIFICATION BY PROFESSIONAL ENGINEER FOR SITE INVESTIGATION REPORT

Project Title	: Term Contract No. 32 for Site Investigation Works for a Period of 30 Months.
Work Instruction No.	: WI-058
Sub-Project	: Soil Investigation Works for Tengah Phase 1
Boreholes	: BH-1 to BH-11
Location	: Bukit Batok Road

1. I, Er. Cheang Yew Kee, the Professional Engineer, PE Registration No. 3297 certify that Soil Investigation Works for Tengah Phase 1 comprising all field and laboratory data tests and results therein has been carried out by me or under my supervision or direction, and I have verified the accuracy of the information given in the site investigation report, and to the best of my knowledge and belief, all have been prepared in compliance in all respects with the provision of the Building Control Act and Regulations, relevant Codes of Practice and Standards.

2. I, further certify that I have the appropriate qualifications and experience, and I am familiar with the purpose of the investigation for which this Site Investigation Report is prepared in reference to Project Ref.

3. Total number of pages in the Site Investigation Report is 137 pages.

PROFESSIONAL ENGINEER CIVIL CHEANG YEW KEE 3297 SINGAPORE

Date: 24th April 2013

Professional Engineer for Site Investigation

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1.0 INTRODUCTION

Housing & Development Board (HDB) has engaged KIMARO Geotechnical Engineering Pte Ltd to conduct Soil Investigation Works for Tengah Phase 1.

The soil investigation is carried out in accordance with British Standard Code of Practice for Site Investigation (BS 5930:1999). This report presents the facts of Soil Investigation Works for Tengah Phase 1, Singapore. The investigation was performed by KIMARO Geotechnical Engineering Pte Ltd and laboratory tests were conducted by Lab Services Pte Ltd (SAC-SINGLAS accredited laboratory) which will be responsible for the results of testing and interpretation. The particulars of this project are as follows:

Name of Project	: Soil Investigation Works for Tengah Phase 1
Location	: Bukit Batok Road
Owner	: Housing and Development Board
Consultant	: TEP Consultants Pte Ltd
Main Contractor	: KIMARO Geotechnical Engineering Pte Ltd

1.1 Purpose of Works

The main purpose of the soil investigation is to explore subsurface soil condition at the site and to obtain the geotechnical information that required for the design and construction works.

The operation work was strictly performed by under the fully supervision of Senior Geologists and well experienced Geotechnical Engineers from KIMARO Geotechnical Engineering Pte Ltd. This factual report presents the results of field works, laboratory testing, geotechnical and geological interpretation.

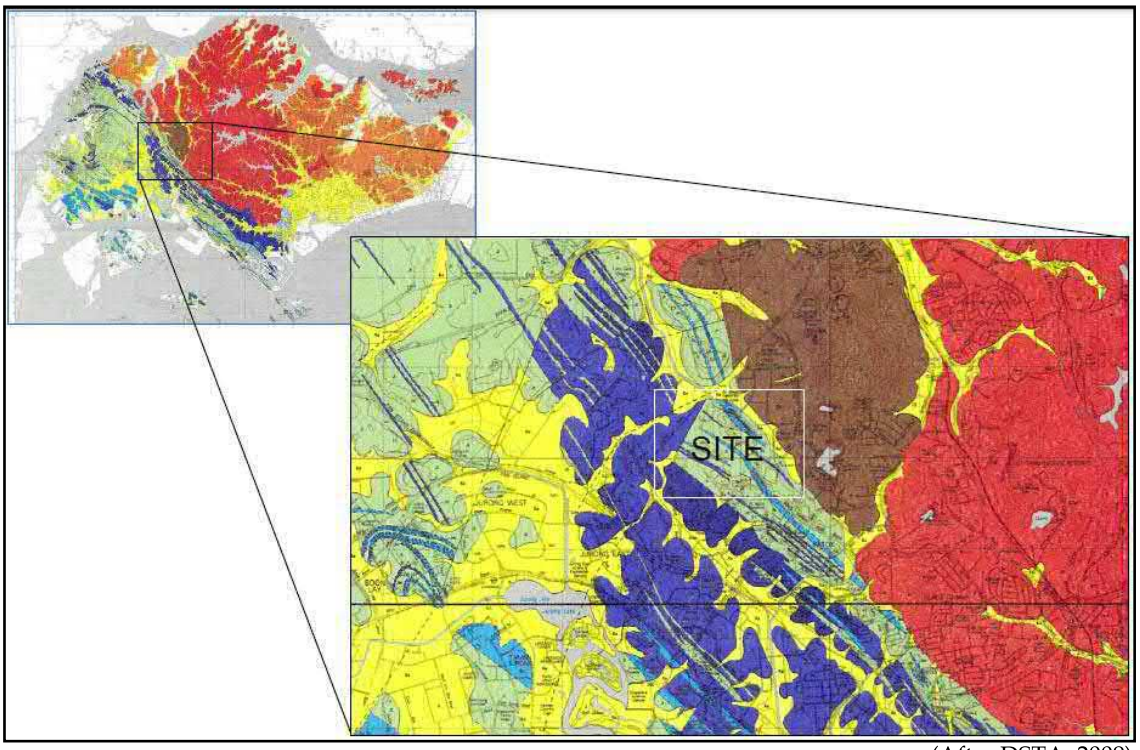
2.0 SITE CONDITIONS

2.1 Site Location and Accessibilities

The proposed site investigation area is generally situated at south western part of Singapore Island. The site area is surrounded by Bukit Batok Road, Pan Island Expressway, Kranji Expressway and Brickland road. General condition of site location and boreholes location plans are shown in **Appendix-A**.

2.2 General Geology

A review of the geology of Singapore by PWD (1976) and DSTA (2009) indicates that the site area lies within the **Kallang Formation** and **Jurong Formation**. The area is mostly distributed with Peaty/Organic CLAY, Sandy SILT/CLAY, Silty SAND, SANDSTONE and SILTSTONE. The following geological map (Fig 1.1) shows the geological setting of site area.



(After DSTA, 2009)

Fig 1.1 Geological Setting for Soil Investigation works at Tengah Phase 1

3.0 SCOPE OF WORK

The scope of the soil investigation work of this project can be summarized as follows:

- Drilling a total numbers of **eleven (11)** exploratory boreholes associated with disturbed and undisturbed soil sampling, and in-situ testing at various depths.
- Conducting laboratory tests for engineering properties of soil layers.
- Submission of Soil Investigation factual report.

3.1 Field Investigation

3. 1.1 General

The fieldworks were performed after seeking the approval of necessary documents from relevant organization and authority of Singapore. The field investigation work was conducted from 15 March 2013 and 1 April 2013.

3.1.2 Setting Out

The proposed boreholes location indicated in the plan were proposed by HDB and were set out by registered surveyor. The coordinates are referenced to the Singapore Department of Survey Grid System (SVY21) and elevations are referenced to the PWD Datum.

To ensure the clearance of underground services beneath the surface, the approval and relevant documents were taken from Singapore Power Grid and other relevant organization.

Coordinate and Reduced Level of each borehole are presented in **Appendix-A**.

3.1.3 Ground Water Level Measurement

The ground water levels were measured by site geologists/engineer twice a day, during the soil investigation works. The summaries of water levels were shown in the bore logs, **Appendix-C**. In order to record the fluctuation of water level for 4 weeks when borehole was terminated, the water standpipes were installed at the depth of 6.00m in BH-1, BH-7 and BH-8. The readings and installation records of water standpipe WSP-1 to WSP-3 are presented in **Appendix-B**.

3.1.4 Drilling Work

The site investigation was performed by rotary drilling method. A metal cutting tool was attached to the drilling rod to produce 100 mm diameter boreholes and jointed casings were used to prevent the collapsing of the borehole wall. Circulated mud water was pumped through the hollow rods into the hole to wash out the cutting soils to the ground surface by pressure and bentonite was used with the water to stabilize the hole when borehole is destabilizing.

Field investigation works described in this report were carried out as per specification and instruction of the client and consultants. Termination criteria for all boreholes were drilling up to the depth of (where achieving) three times consecutive SPT N value 100. All boreholes were backfilled with cement-bentonite grout upon the completion of drillings. Detailed boring logs along with terms and symbols used are shown in **Appendix-C**.

3.1.5 Undisturbed Sampling

Undisturbed samples (UD) were extracted from the boreholes at the depth of relevant interval. Each sample was taken using a 7.5 cm diameter by 100cm long 'Shelby' type sample tube driven by means of hydraulic push. After collection, the samples were sealed with wax at both ends of the tube and send to the laboratory for analysis and testing at the end of the day.

3.1.6 Standard Penetration Test

Standard Penetration Tests were generally carried out at every 3.0m intervals or as per specified. The test was performed in accordance with the British Standard, BS 5930: 1999. Split-Barrel sample tube with a 5.1-cm external diameter was used for determination of penetration resistance (SPT).

The test consists of driving the sample tube into the soil by impact of 63.5 kg hammer falling from a height of 76 cm. The number of blows required to penetrate each of three 15-cm intervals into the soil is recorded by the Field Engineer/ Site Geologist. The N-value is defined, as the total number of blows required to achieve the final 30-cm of penetration. A small portion of the sample was taken and keeps inside a small plastic container for reference and logging.

3.2 Laboratory Testing

Laboratory soil test are carried out in accordance with BS 1377:1990. The soil testing program proposed by contractor and confirmed by Consultants and Client are carried out in order to access the soil variability and to obtain the soil parameters. The summary and results of testing are presented in **Appendix-D**.

3.2.1 Moisture Content

To measure moisture content, a specimen is taken from an undisturbed sample, weighed and placed in a tin, where it is oven dried at 105-110° for 18-24 hours. The soil is weighed after the drying and the weight of water content is calculated simply by subtracting the two values. The moisture content is then defined as the percentage of the weight of water over weight of dry soil.

3.2.2 Bulk and Dry Density

The bulk density is the measured weight of a solid cylindrical soil specimen taken from an undisturbed sample divided by its volume. The dry density was calculated from bulk density and moisture content.

3.2.3 Atterberg Limits

The liquid limit of a specimen is derived using the Cone Penetrometer method as to BS 1377. The plastic limit is defined as the moisture content of a specimen at the point where it can be satisfactorily rolled into a 3 mm diameter thread with cracking. The soils plasticity index is then derived by subtracting the plastic limit from the liquid limit.

3.2.4 Grain Size Distribution

The grain size analysis was carried out utilizing Sieve & Hydrometer Analysis method. The sieve process involves passing an oven dried, representative portion of each sample through a series of square mesh sieves, which become progressively finer down to 60 mm mesh. Each fraction thus collected is then weighed. The weight of individual fraction is then divided by the total sample weight to determine the particle size distribution for the specimen. From this process different fractions are separated, weighed and divided by the total sample weight to arrive at a particle size distribution

value. Hydrometer analysis was carried out to determine the finer particles to distinguish between silt and clay.

3.2.5 Triaxial Testing (Unconsolidated Undrained)

Unconsolidated Undrained Triaxial test was conducted to determine the undrained shear strength of the soil. The soil specimen is subjected to a constant confining pressure. Axial load is increased by applying a constant rate of strain until specimen fail. This test is generally performed as a set of three single tests. However, if the sample is not enough, the test is conducted using two or single (multi-stage) specimen. The three cell pressures correspond to 0.5 σ_v' , σ_v' ,$\sigma_v'2$ where $\sigma_v'$is effective overburden pressure. For a multi-stage test, the shearing was stopped when the peak deviator stress was imminent, and the consolidation and shearing stages were repeated for the next cell pressure.

3.2.6 Triaxial Testing (Consolidated Undrained)

The consolidated- undrained test (CU) is the most common type of triaxial test to determine the effective shear strength parameters of soil including the measurement of pore pressure. The saturated soil specimen is first consolidated by all- around fluid pressure. After consolidation, increase the cell pressure and adjust the back pressure to give a difference equal to the required effective consolidation pressure, start the consolidation stage by opening the back pressure valves, record reading of the volume change indicator at suitable intervals of time and allow consolidation to continue until there is no further volume change, record the pore pressure. The specimen is ready for un-drained compression test.

3.2.7 Triaxial Testing (Consolidated Drained)

The consolidated drained (CD) test refers to a test condition where the soil specimen is consolidated by all around fluid pressure, and then sheared under drained condition. The soil specimen is consolidated to a stress state representative of what is likely to be encountered in the field of the design. The soil is generally consolidated under an isotropic confining pressure, and the deviator stress is applied slowly in order to prevent the development of excess pore-water pressure in the soil.

3.2.8 1-D Consolidation (Oedometer Test)

One dimensional compression and swelling characteristic of soft soil layers are measured in the laboratory performing oedometer test. A cylindrical specimen of soil enclosed in a metal ring is subjected to a series of increasing load, while changes in thickness are recorded against time. In the oedometer, lateral movement of the soil is prevented by containing the soil in a stiff metal ring so that only vertical (one-dimensional) soil movements are possible. Drainage is only permitted from the horizontal faces so that the water in the pores is also constrained to flow vertically. The parameters that are required to estimate settlement and the rate of settlement of the foundation on the soft soil are determined from the result of oedometer tests.

3.2.9 Direct Shear Test

Direct shear box test is performed to determine the shear strength of soil. A specimen is placed in a square or circular shear box which has two split rings to hold the sample and the contact between the two rings is horizontally around the mid-height of the sample. Porous plates are used to allow free drainage. A vertical force (N) is applied to the specimen through a loading plate and shear stress is gradually applied on a horizontal plane by causing the two halves of the box to move relative to each other, the shear force (T) being measured together with the corresponding shear displacement.

4.0 SUBSURFACE INVESTIGATION

4.1 Soil and Rock Classification

The soil classification is based on the geological classification and British classification system. The consistencies of clay/silt and relative densities of sand have been classified according the following criteria:

Table 4.1 Classifications of Clay / Silt from Shear Strength (After BS5930: 1999)

Undrained Shear Strength	Consistency
<20	Very soft
20-40	Soft
40-75	Firm
75-150	Stiff
150-300	Very Stiff
>300	Hard

Table 4.2 Classification of Clay / Silt From SPT Results

(After Terzaghi and Peck, 1963)

Approximate Relation of Consistency to SPT N-Value (blows/300mm of penetration)	Consistency
<2	Very Soft
2-4	Soft
4-8	Firm
8 -15	Stiff
15 - 30	Very Stiff
> 30	Hard

Table 4.3 Classification of Sand from SPT Results (After BS 5930: 1999)

Approximate Relation of Relative Density to SPT N-Value (blows/300mm of penetration)	Consistency
<4	Very Loose
4-10	Loose
10-30	Medium Dense
30-50	Dense
>50	Very Dense

Table 4.4 Classification of Rock Quality (After ASTM D6032-02)

RQD (Rock Quality Designation)	Classification of Rock Quality
<25%	Very Poor
25 – 50%	Poor
50 – 75%	Fair
75 – 90%	Good
90 – 100%	Excellent

Table 4.5 Weathering Grade of Bukit Timah Granite & Gombak Norite (After Civil Design Criteria, 2002)

Description	Grade	Basis for Assessment
Residual	VI	Original rock structure completely degraded to a soil, with none of the original fabric remains. Can be crumbled by hand.
Completely Weathered	V	Original rock structure preserved can be crumbled by hand. Slakes in water. Completely discolored.
Highly Weathered	IV	Core can be broken by hand. Does not slake in water .Completely discolored.
Moderately Weathered	III	Core cannot be broken by hand. Easily broken by hammer. Make a dull or slight ringing sound when struck with hammer. Stained throughout.
Slightly Weathered	II	Core cannot be broken by hammer-rings when struck. Fresh rock colors generally retained but stained near joint surfaces.
Fresh Rock	I	Intact strength, unaffected by weathering. Not broken easily by hammer-rings when struck. No visible discoloration.

Table 4.6 Weathering Grade of Jurong Formation
(After Civil Design Criteria, 2002)

Description	Grade	Basis for Assessment
Residual	VI	Rock completely degraded to a soil, in which none of the original fabric remains. Can be crumbled by hand.
Completely Weathered	V	Rock weathered down to soil-like material, but bedding intact. Material slakes in water.
Highly Weathered	IV	Core can be broken by hand or consists of gravel size pieces. Generally highly to very highly fractured, but majority of sample consists of lithorelics. (RQD generally = 0; but RQD should not be used as major guide for assessment). For siltstone, shale, sandstone, quartzite and conglomerate, the slake test can be used to differentiate between Grade V (slake) and Grade IV (does not slake).
Moderately Weathered	III	Considerably weakened and discoloured, but larger pieces cannot be broken by hand (RQD is generally >0, but RQD should not be used as major criteria for assessment).
Slightly Weathered	II	Slightly weakened, slightly discoloration, partially along joints.
Fresh Rock	I	Intact strength, unaffected by weathering.

Table 4.7 Weathering Classification of Old Alluvium
(After Civil Design Criteria, 2002)

Class	Classifier	Characteristics	Indicative N Value
E	Residual	No bedding remains	<10
D	Destructed	Greatly weakened, often mottled, bedding disturbed	10 to 30
C	Distinctly Weathered	Further weakened	30 to 50
B	Partially Weathered	Slightly reduced strength	>50 (cannot usually be penetrated by CPTs with 20ton load capacity)
A	Unweathered	Original strength	

4.2 Borehole Logging

A site record was prepared for every bore holes done on site to record the soil description and the SPT 'N' value. This site record will be used for the proper borehole logs latter.

The proper borehole logs were generally summarized all the field data and the laboratory tests results as well as give a general indication of the soil conditions at each location. Each borehole log shows:

- Soil and Rock description
- Stratum changes
- SPT results
- Laboratory testing results
- General information such as sample reference, sample recovery

4.3 Termination Criteria

All boreholes are terminated where SPT (N) value 100 were achieved three times consecutively and/or after coring through into the rock. The length of core running was instructed by engineer in-charge.

5.0 SUBSOIL CONDITIONS

This section briefly describes the subsoil conditions encountered for this project. The boring logs with detailed soil conditions and interpolated soil profiles are presented in **Appendix-C**.

With the subsoil data collected from site investigation, the following subsurface layers are classified for engineering works:

SOIL LAYERS / ROCK STRATA

There are found to be six types of soil layers and rock strata in this investigation area as follow:

1. **Fill**
2. **Sandy CLAY**
3. **Peaty/Organic CLAY**
4. **Sandy SILT/ Silty SAND**
5. **SANDSTONE**
6. **SILTSTONE**

1. Fill

The Fill layer can be seen in all boreholes and consists of Silty SAND, Sandy SILT/CLAY with some hard cores materials and gravels. The thickness of the layer is ranging from 0.30m to 7.50m below ground level.

2. Sandy CLAY

The Sandy CLAY layer was found in BH-1, BH-6 and BH-9. The color of soil can be found as light grey, dark brown with SPT N value of 2 to 10.

3. Peaty/Organic CLAY

This soil layer was found in BH-1, BH-6 and BH-9. The consistency of dark brown to brown, black soil is very soft to firm with SPT N value of 0 to 5.

4. Sandy SILT/ Silty SAND

This soil layers were seen in all boreholes. The color of soil can be found as light to dark grey, greenish grey, reddish/puplish brown with SPT N value of 8 to 100.

5. SANDSTONE

The Sandstone was found in BH-3, BH-6 and BH-9. The sandstone can be seen as grey, reddish/yellowish brown with fine grained texture and highly weathered. The field strength of sedimentary rock is moderately strong. Rock mass quality is very poor to poor in BH-3, BH-6 and very poor to good in BH-9.

6. SILTSTONE

The Siltstone was found in BH-7 and BH-10. The siltstone can be seen as purplish red, reddish brown with moderately to highly weathered. The field strength is moderately strong to strong. Rock mass quality is poor to fair. Siltstone boulder was encountered in BH-10 at 27.0m.

6.0 GEOLOGICAL FORMATIONS

The subsurface strata underlying the site consist of fill and 2 types of strata:

1) **FILL**
2) **KALLANG FORMATION**
3) **JURONG FORMATION**

The surficial **FILL** layer can be seen across the site with the thickness of 030 to 7.50m. Sandy CLAY, Peaty CLAY, Organic CLAY and Sandy SILT of **KALLANG FORMATION** are underlain by **JURONG FORMATION** which can be seen as Sandy SILT, Silty SAND, SANDSTONE and SILTSTONE. The classification of rock mass quality (Table 4.4) were used as reference from ASTM D6032-02 and the detailed rock mass qualities of each borehole were presented in **Appendix-G**.

In order to understand the subsurface soil condition, interpolated soil profiles were presented in **Appendix-C** and photos of core boxes were presented in **Appendix-E.**

CLIENT/ OWNER: Housing & Development Board
PROJECT : Term Contract No. 32 for Site Investigation Works for a Period of 30 Months
SUB-PROJECT : Site Investigation Works at Tengah Phase 1
WI :WI058

KIMARO GEOTECHNICAL ENGINEERING PTE LTD

SUMMARY OF FIELD INVESTIGATION WORKS

BOREHOLE NO.	FIELD WORKS		COORDINATES			TERMINATION DEPTH OF BOREHOLE (m)	DEPTH OF DRILLING IN SOIL (m)	DEPTH OF CORING IN ROCK (m)	INSITU TEST/ SAMPLES					LABORATORY TESTING											
														INDEX/ CLASSIFICATION TESTS				STRENGTH & COMPRESSIBILITY				ROCK TESTING		CHEMICAL TESTING	
	DATE OF COMMENCEMENT	DATE OF COMPLETION	NORTHING	EASTING	REDUCE LEVEL (m)				SPT	DS	UD	MZ	WSP	BULK DENSITY	MOISTURE %	PSD		TRIAXIAL TEST			1-D CON	UCT	POINT LOAD	Organic Content	pH VALUE & SULPHATE CONTENT
																MA	HYDRO	UU	CU	CD					
BH-1	15/3/2013	18/3/2013	37348.841	16638.734	103.164	30.21	30.21	-	10	8	2	-	1	2	2	2	2	-	1	-	1	-	-	-	-
BH-2	20/3/2013	25/3/2013	36949.818	17088.490	105.876	27.21	27.21	-	9	5	2	-	-	2	2	2	2	1	-	-		-	-		-
BH-3	19/3/2013	21/3/2013	37361.532	17077.671	107.926	19.00	14.00	5.00	5	4	2	-	-	1	2	2	2		1	-	-	1	2	-	-
BH-4	19/3/2013	19/3/2013	37776.461	17063.956	115.743	18.38	18.38	-	6	5	2	-	-	2	2	2	2		-	1	-	-	-		-
BH-5	16/3/2013	19/3/2013	37989.612	17276.822	114.584	18.42	18.42	-	6	3	1	-	-	1	1	1	1		-	-		-	-		-
BH-6	20/3/2013	28/3/2013	37536.497	15977.948	102.053	21.00	16.00	5.00	6	5	1	-	-	1	1	1	1		1	-	1	-	2	-	-
BH-7	15/3/2013	18/3/2013	37962.538	16402.272	108.661	17.40	12.40	5.00	5	3	-	-	1	-	-	-	-		-	-	-	1	2	-	-
BH-8	16/3/2013	20/3/2013	38389.719	16825.506	118.610	24.20	24.20	-	8	6	1	-	1	1	1	1	1		1		-	-	-	-	-
BH-9	27/3/2013	2/4/2013	37936.536	15527.819	103.477	42.00	39.00	3.00	13	9	1	-	-	1	1	1	1		1			-	3		-
BH-10	22/3/2013	28/3/2013	38363.282	15953.591	111.190	33.35	33.35	-	11	7	2	-	-	2	2	2	2	1	1	-	-	-	-	-	-
BH-11	21/3/2013	26/3/2013	38788.516	16376.983	119.324	30.22	30.22	-	10	8	2	-	-	2	2	2	2	-	1		-	-	-	-	-
TOTAL						**281.39**	**263.39**	**18.00**	**89**	**63**	**16**	**0**	**3**	**15**	**16**	**16**	**16**	**2**	**7**	**1**	**2**	**2**	**9**	**0**	**0**

EXPLANATION

SPT Standard Penetration Test
DS Disturb Sample
UD Undisturb Sample
PS Piston Sample
PSD Particle Size Distribution

UU Unconsolidated Undrained (Triaxial Test)
CU Consolidated Undrained (Triaxial Test)
CD Unconsolidated Drained (Triaxial Test)
UCT Unconfined (Unaxial) Compression Test
WSP Water Standpipe

SG Particle Density
MA Mechanical Analysis (Sieve Analysis)
Hydro Hydrometer Test
1-DCo 1-Dimensional Consolidation Test (Odeometer)

REFERENCES

ASTM D6032, 2002. Standard Test Method for Determining Rock Quality Designation (RQD) of Rock Core. ASTM International, United States.

BS 5930, 1999. Code of practice for site investigations. British Standard Institution, London.

DSTA, 2009. Geology of Singapore. 2nd Edi, Defence Science & Technology Agency, Singapore.

LTA, 2006. Civil design criteria for road and rail transit systems revision A5, Rail & Engineering Group, Land Transport Authority, Singapore.

PWD, 1976. Geology of Singapore. Public Work Department, Singapore.

Disclaimer:

We have bestowed this factual report with the care and skill normally exercised, under similar circumstances by experienced geotechnical engineers. This factual report is prepared based on the information available from the borehole logs and laboratory test results at the time. The interpolated soil profile or geological cross-section between adjacent boreholes is only representative and may not be the actual profile as subsurface conditions can vary both laterally and vertically. No other warranty, expressed or implied is made as to the recommendations included in this report. The recommendations given in this report shall only be used as a guide. The design engineer is expected to exercise his/her own judgment in the use of this report. Laboratory tests were conducted by the SAC-SINGLAS accredited laboratory which shall be fully responsible for the interpretation, analysis and results of the laboratory tests. This report cannot be transferred to or used by another party without permission from KIMARO Geotechnical Engineering Pte Ltd.

APPENDIX A

SITE AND BOREHOLES LOCATION PLAN



Fig 1.2 Site Location Plan for Soil Investigation Works for Tengah Phase 1

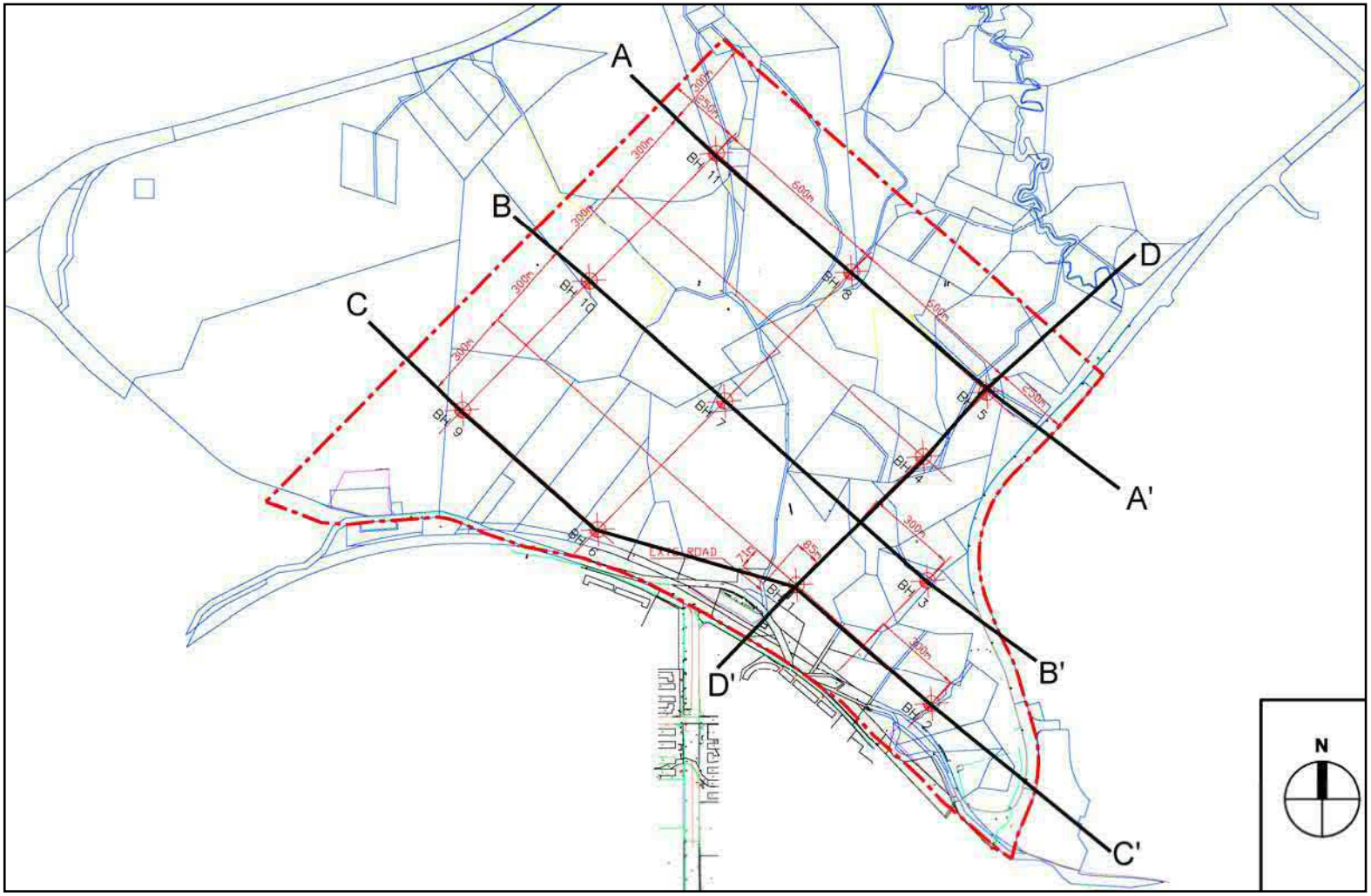


Fig 1.3 Boreholes Location and Cross-section Profile Lines (A-A′, B-B′, C-C′, D-D′) for Tengah Phase 1

Wisescan Engineering Services Pte Ltd

14 Little Road #02-01 Tropical Industrial Building Singapore 536987
Tel: (65) 6841 0880 Fax: (65) 6841 0770

Setting out Coordinates approved by SI contractor

Project Title :Soil Investigation Works for Tengah Phase 1

Location :Jurong Road / Bukit Batok Rd

BH No	Setting out Coordinates			Remarks
	Northing	Easting	Reduced Level (m)	
BH1	37348.841	16638.734	103.164	Spike
BH2	36949.818	17088.490	105.876	Spike
BH3	37361.532	17077.671	107.926	Spike
BH4	37776.461	17063.956	115.743	Spike
BH5	37989.612	17276.822	114.584	Spike
BH6	37536.497	15977.948	102.053	Spike
BH7	37962.538	16402.272	108.661	Spike
BH8	38369.719	16825.506	118.610	Spike
BH9	37936.536	15527.819	103.477	Spike
BH10	38363.282	15953.591	111.190	Spike
BH11	38788.516	16376.983	119.324	Spike

Remarks :Setting out borehole survey on 13th, 14th, 16th, 18th,19th, 20th, 21st & 23rd Mar 2013

Submitted by Surveyor

Name / Signature:

Stamp:

REGISTERED SURVEYOR
23/4/13
Chua Keng Guan
SINGAPORE

Checked by SI Contractor:
Kimaro Geotechnical Eng Pte Ltd

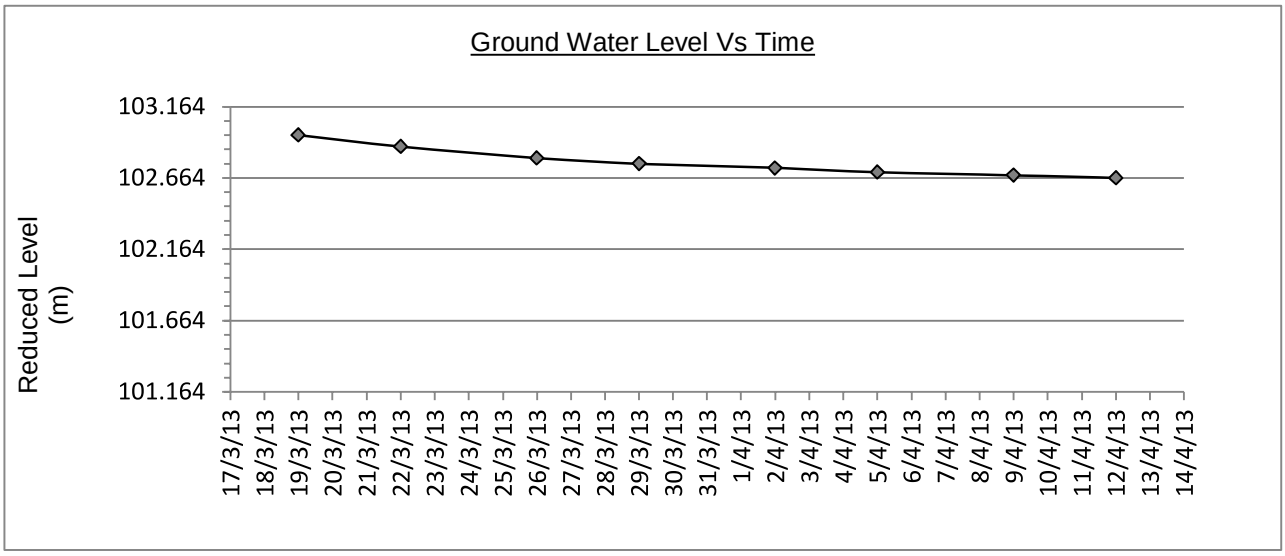
Name / Signature:

APPENDIX B

WATER STANDPIPE INSTALLATION & MONITORING

WATER STANDPIPE MONITORING READINGS

PROJECT :	SI Works at Tengah Phase 1	Date	25/4/2013
BOREHOLE :	BH-1	Recorded by	Zaw Min Tun
CLIENT:	HOUSING & DEVELOPMENT BOARD	Check by	Min Sea Sar
WI NUMBER:	WI-058, TC-32	RL (m)	103.164
CONSULATANT:	TEP Consultants Pte Ltd	Northing	37348.841
MAIN-CON:	KIMARO Geotechnical Engineering Pte Ltd	Easting	16638.734
INSTRUMENT NO./NAME :	WSP-1	Pipe Top Level	103.464

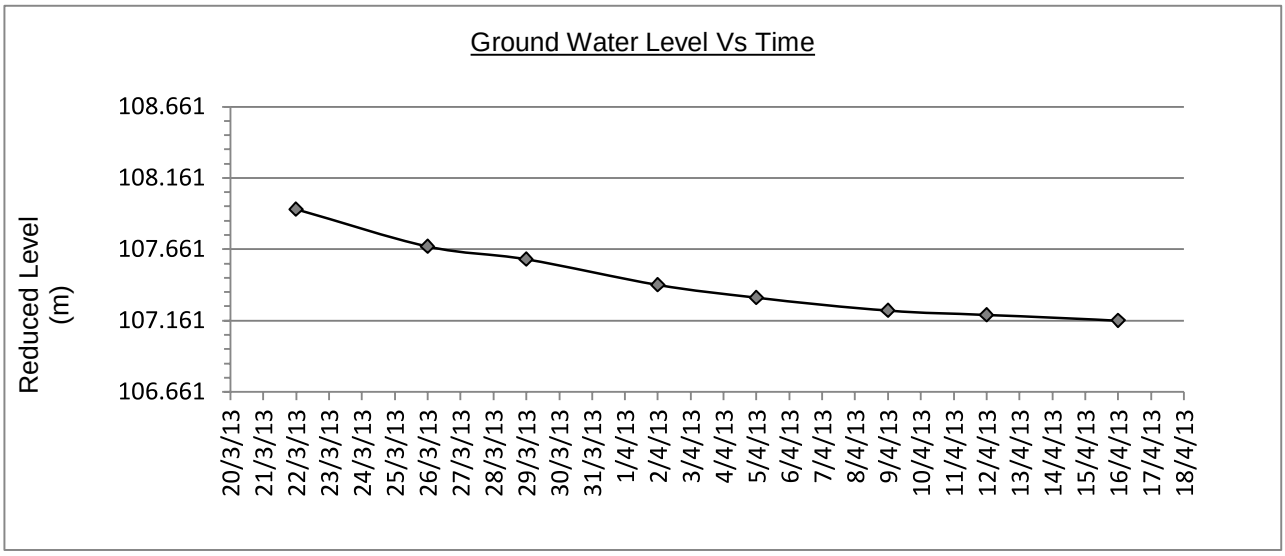


No	Date Monitored *(D/M/Y)*	Elapsed Time *(Days)*	Ground Level *(RL m)*	Pipe Top Level *(RL m)*	Measured Reading *(m)*	Current WL *(RL m)*	Current Change of GWT *(m)*	Cumulative of GWT Change *(m)*	Remarks
1	19/3/13	0	103.164	103.464	0.50	102.964			Initial
2	22/3/13	3	103.164	103.464	0.58	102.884	0.08	0.08	
3	26/3/13	7	103.164	103.464	0.66	102.804	0.08	0.16	
4	29/3/13	10	103.164	103.464	0.70	102.764	0.04	0.20	
5	2/4/13	14	103.164	103.464	0.73	102.734	0.03	0.23	
6	5/4/13	17	103.164	103.464	0.76	102.704	0.03	0.26	
7	9/4/13	21	103.164	103.464	0.78	102.684	0.02	0.28	
8	12/4/13	24	103.164	103.464	0.80	102.664	0.02	0.30	Final

Remark; WSP was installed the depth of 6.00m BGL.

WATER STANDPIPE MONITORING READINGS

PROJECT :	SI Works at Tengah Phase 1	Date	25/4/2013
BOREHOLE :	BH-7	Recorded by	Zaw Min Tun
CLIENT:	HOUSING & DEVELOPMENT BOARD	Check by	Min Sea Sar
WI NUMBER:	WI-058, TC-32	RL (m)	108.661
CONSULATANT:	TEP Consultants Pte Ltd	Northing	37962.538
MAIN-CON:	KIMARO Geotechnical Engineering Pte Ltd	Easting	16402.272
INSTRUMENT NO./NAME :	WSP-2	Pipe Top Level	108.961

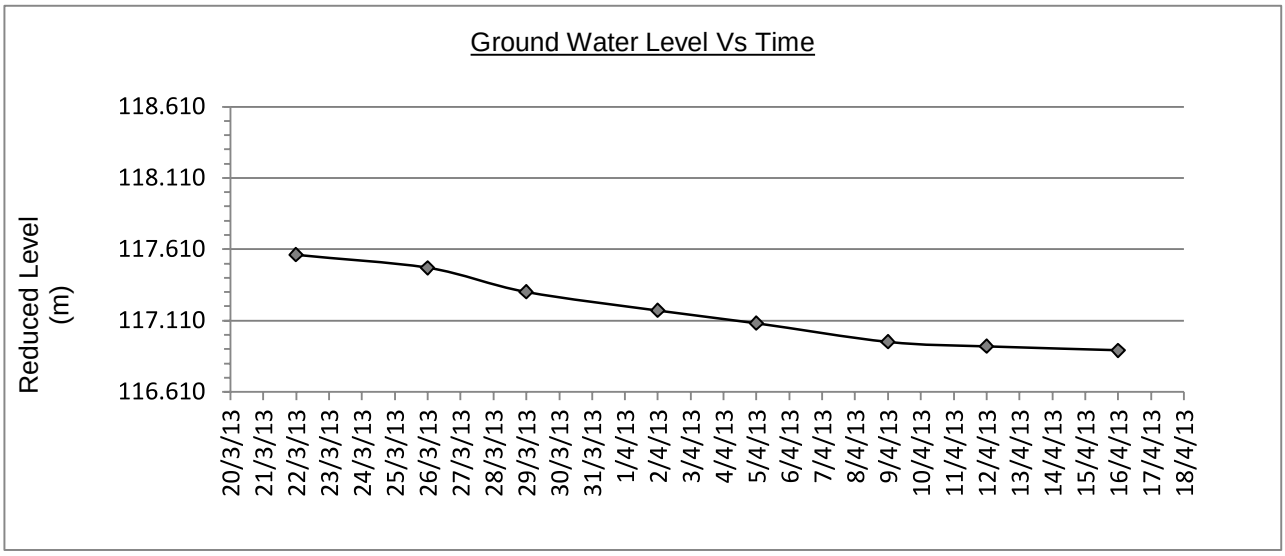


No	Date Monitored *(D/M/Y)*	Elapsed Time *(Days)*	Ground Level *(RL m)*	Pipe Top Level *(RL m)*	Measured Reading *(m)*	Current WL *(RL m)*	Current Change of GWT *(m)*	Cumulative of GWT Change *(m)*	Remarks
1	22/3/13	0	108.661	108.961	1.02	107.941			Initial
2	26/3/13	4	108.661	108.961	1.28	107.681	0.26	0.26	
3	29/3/13	7	108.661	108.961	1.37	107.591	0.09	0.35	
4	2/4/13	11	108.661	108.961	1.55	107.411	0.18	0.53	
5	5/4/13	14	108.661	108.961	1.64	107.321	0.09	0.62	
6	9/4/13	18	108.661	108.961	1.73	107.231	0.09	0.71	
7	12/4/13	21	108.661	108.961	1.76	107.201	0.03	0.74	
8	16/4/13	25	108.661	108.961	1.80	107.161	0.04	0.78	Final

Remark; WSP was installed the depth of 6.00m BGL.

WATER STANDPIPE MONITORING READINGS

PROJECT :	SI Works at Tengah Phase 1	Date	25/4/2013
BOREHOLE :	BH-8	Recorded by	Zaw Min Tun
CLIENT:	HOUSING & DEVELOPMENT BOARD	Check by	Min Sea Sar
WI NUMBER:	WI-058, TC-32	RL (m)	118.61
CONSULATANT:	TEP Consultants Pte Ltd	Northing	38389.719
MAIN-CON:	KIMARO Geotechnical Engineering Pte Ltd	Easting	16825.506
INSTRUMENT NO./NAME :	WSP-3	Pipe Top Level	118.91



No	Date Monitored *(D/M/Y)*	Elapsed Time *(Days)*	Ground Level *(RL m)*	Pipe Top Level *(RL m)*	Measured Reading *(m)*	Current WL *(RL m)*	Current Change of GWT *(m)*	Cumulative of GWT Change *(m)*	Remarks
1	22/3/13	0	118.610	118.910	1.34	117.570			Initial
2	26/3/13	4	118.610	118.910	1.43	117.480	0.09	0.09	
3	29/3/13	7	118.610	118.910	1.60	117.310	0.17	0.26	
4	2/4/13	11	118.610	118.910	1.73	117.180	0.13	0.39	
5	5/4/13	14	118.610	118.910	1.82	117.090	0.09	0.48	
6	9/4/13	18	118.610	118.910	1.95	116.960	0.13	0.61	
7	12/4/13	21	118.610	118.910	1.98	116.930	0.03	0.64	
8	16/4/13	25	118.610	118.910	2.01	116.900	0.03	0.67	Final

Remark; WSP was installed the depth of 6.00m BGL.

APPENDIX C

INTERPOLATED SOIL PROFILE AND BORE LOGS

GEOLOGICAL CLASSIFICATION

FILL

KALLANG FORMATION

F1 : FLUVIAL SAND
F2 : FLUVIAL CLAY
E : ESTUARINE
M : MARINE CLAY

OLD ALLUVIUM

O A
O B
O C
O D
O E

JURONG FORMATION

S I
S II
S III
S IV
S V
S VI

BUKIT TIMAH GRANITE

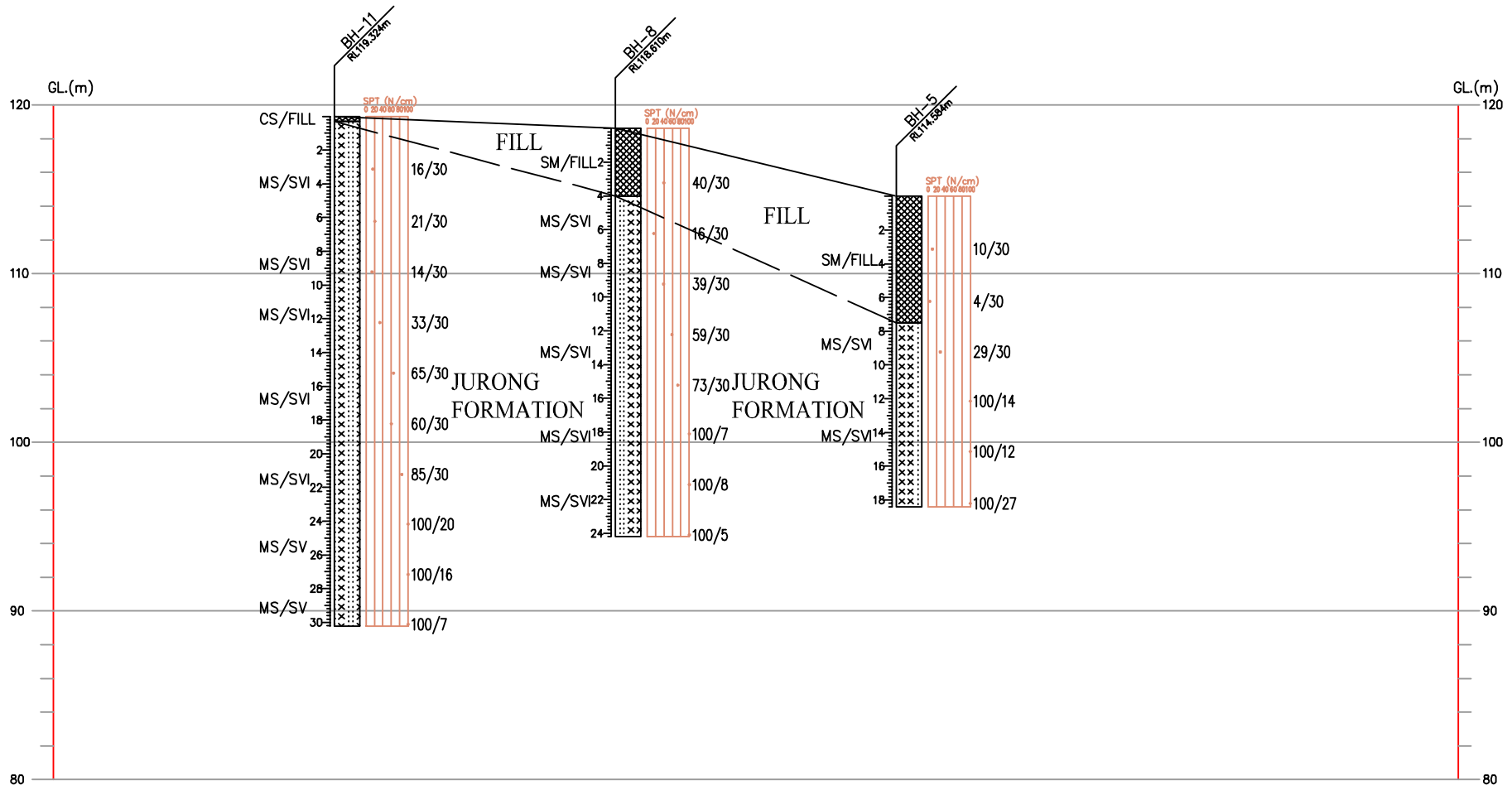
G I
G II
G III
G IV
G V
G VI

ENGINEERING CLASSIFICATION

AS : ASPHALT, TAR
BF : BACKFILL
BE : BEDROCK
BR : BRICK
BO : BOULDER
C : CLAY / MARINE CLAY
CM : SILTY CLAY
CO : ORGANIC CLAY
CS : SANDY CLAY
CG : GRAVELY CLAY
CPt : PEATY CLAY
CNG : CONGLOMERATE
CON : CONCRETE
GM : SILTY GRAVEL
G : GRAVEL
GS : SANDY GRAVEL
GPt : PEATY GRAVEL
GC : CLAYEY GRAVEL
GR : GRANITE
GO : ORGANIC GRAVEL
LI : LIMESTONE
M : SILT
MPt : PEATY SILT
MG : GRAVELLY SILT

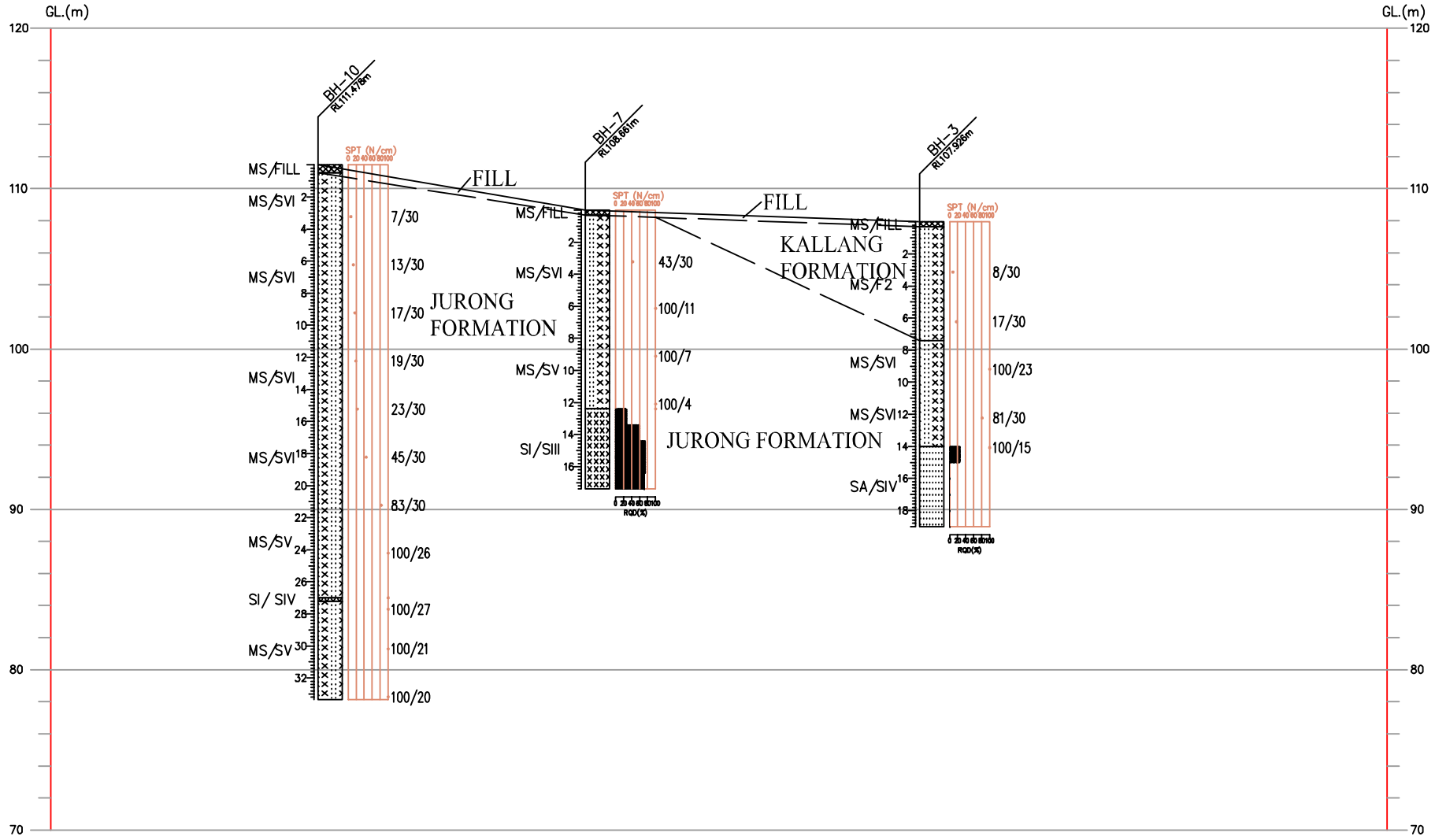
MU : MUDSTONE
MS : SANDY SILT
MC : CLAYEY SILT
MO : ORGANIC SILT
Pt : PEAT
PtS : SANDY PEAT
PtG : GRAVELLY PEAT
PtM : SILTY PEAT
PtC : CLAYEY PEAT
S : SAND
SG : GRAVELLY SAND
SO : ORGANIC SAND
SM : SILTY SAND
SC : CLAYEY SAND
SPt : PEATY SAND
SA : SANDSTONE
SI : SILTSTONE
SH : SHALE
SCH : SCHIST
TB : TIMBER

SOIL INVESTIGATION WORKS FOR TENGAH PHASE 1
GEOLOGICAL CROSS SECTION ALONG A - A'



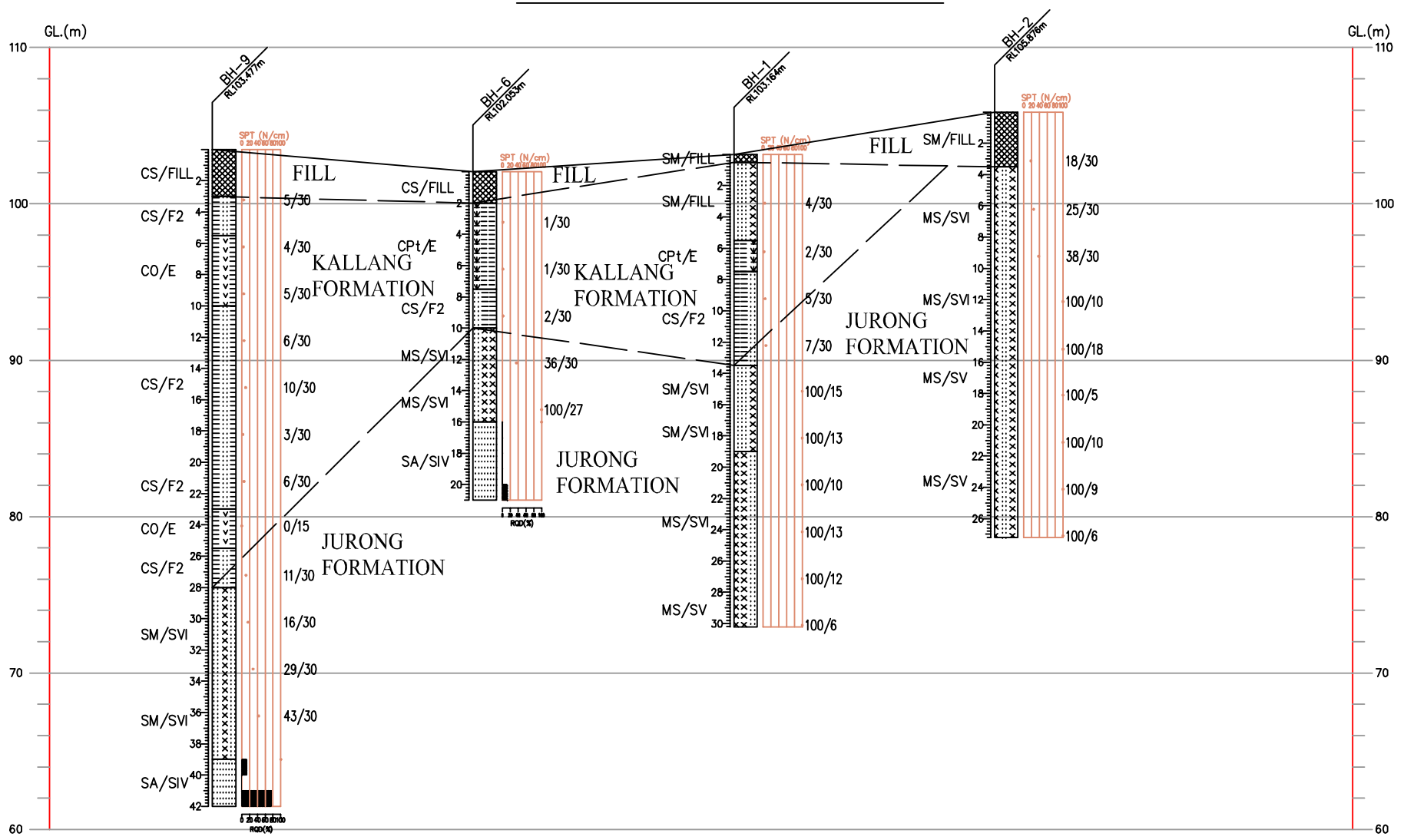
Note: Soil layers and rock strata in the profile are interpolated based on the available subsoil information from the recent soil investigation. The results may vary from the actual subsurface conditions between the boreholes.	Job No.	108	Client: HOUSING AND DEVELOPMENT BOARD (HDB)	Drawn by:	Checked by:	Date: 20/04/2013
Project: Soil Investigation Works for Tengah Phase 1 EXCEL FILE REF: TC32-WO058(2012) AutoCAD FILE REF: TC32-WO058(2012)-CROSS_SECTION	Scale	As shown	Location: Bukit Batok Road Consultant: TEP Consultants Pte Ltd	KIMARO GEOTECHNICAL ENGINEERING PTE LTD		

SOIL INVESTIGATION WORKS FOR TENGAH PHASE 1
GEOLOGICAL CROSS SECTION ALONG B - B'



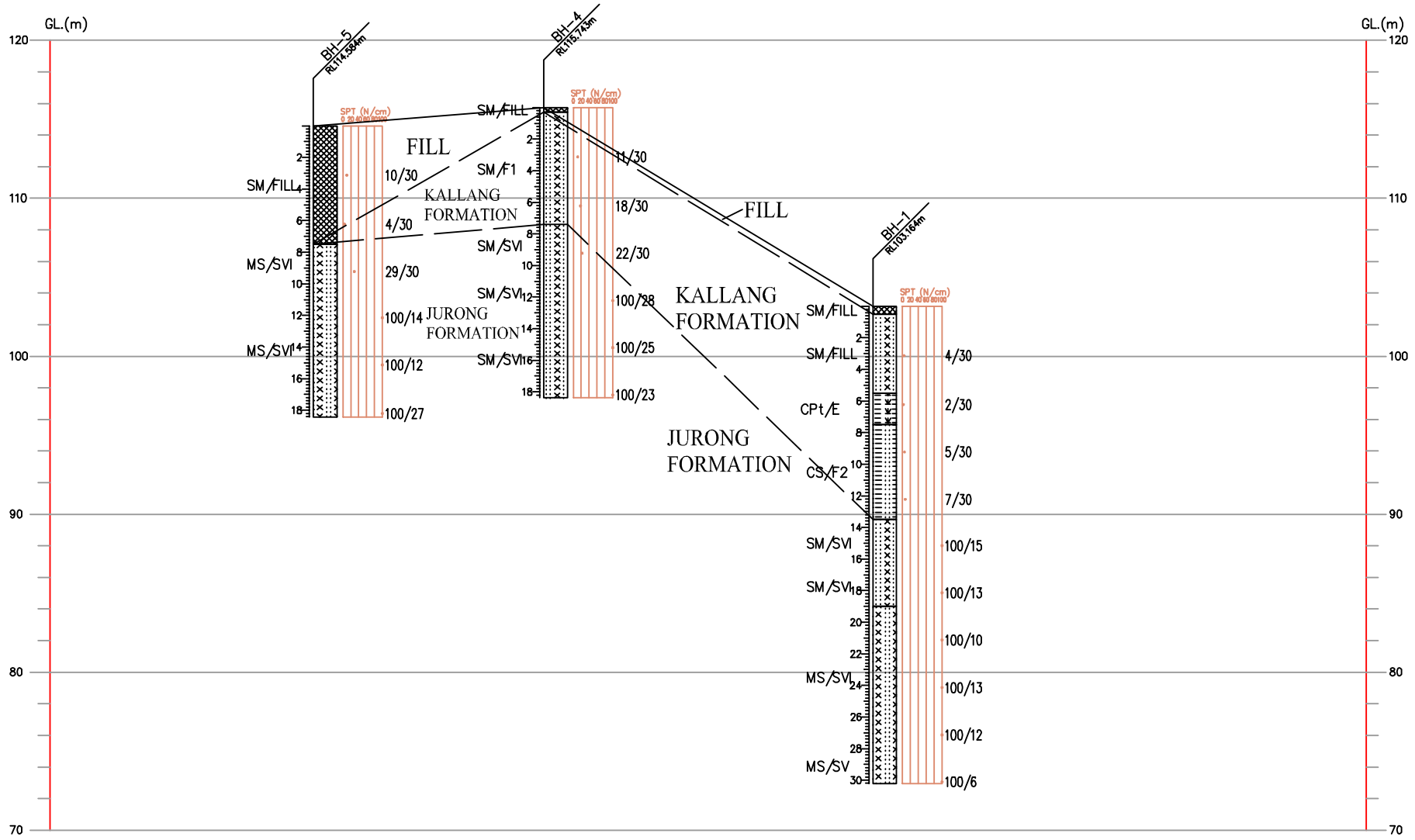
Note: Soil layers and rock strata in the profile are interpolated based on the available subsoil information from the recent soil investigation. The results may vary from the actual subsurface conditions between the boreholes.	Job No.	108	Client: HOUSING AND DEVELOPMENT BOARD (HDB)	Drawn by:	Checked by:	Date: 20/04/2013
Project: Soil Investigation Works for Tengah Phase 1 EXCEL FILE REF: TC32-WO058(2012) AutoCAD FILE REF: TC32-WO058(2012)-CROSS_SECTION	Scale	As shown	Location: Bukit Batok Road Consultant: TEP Consultants Pte Ltd	KIMARO GEOTECHNICAL ENGINEERING PTE LTD		

SOIL INVESTIGATION WORKS FOR TENGAH PHASE 1
GEOLOGICAL CROSS SECTION ALONG C - C'



Note: Soil layers and rock strata in the profile are interpolated based on the available subsoil information from the recent soil investigation. The results may vary from the actual subsurface conditions between the boreholes.	Job No.	108	Client: HOUSING AND DEVELOPMENT BOARD (HDB)	Drawn by:	Checked by:	Date: 20/04/2013
Project: Soil Investigation Works for Tengah Phase 1	Scale	As shown	Location: Bukit Batok Road Consultant: TEP Consultants Pte Ltd	KIM ARO GEOTECHNICAL ENGINEERING PTE LTD		
EXCEL FILE REF: TC32-WO058(2012) AutoCAD FILE REF: TC32-WO058(2012)-CROSS_SECTION						

SOIL INVESTIGATION WORKS FOR TENGAH PHASE 1
GEOLOGICAL CROSS SECTION ALONG D - D'



Note: Soil layers and rock strata in the profile are interpolated based on the available subsoil information from the recent soil investigation. The results may vary from the actual subsurface conditions between the boreholes.	Job No.	108	Client: HOUSING AND DEVELOPMENT BOARD (HDB)	Drawn by:	Checked by:	Date: 20/04/2013
Project: Soil Investigation Works for Tengah Phase 1 EXCEL FILE REF: TC32-WO058(2012) AutoCAD FILE REF: TC32-WO058(2012)-CROSS_SECTION	Scale	As shown	Location: Bukit Batok Road Consultant: TEP Consultants Pte Ltd	KIM ARO GEOTECHNICAL ENGINEERING PTE LTD		

PRELIMINARY FIELD LOG

KIMARO GEOTECHNICAL ENGINEERING PTE LTD

CLIENT: HOUSING AND DEVELOPMENT BOARD (HDB)

CONSULTANT: TEP Consultants Pte Ltd

PROJECT: Soil Investigation works at Tengah Phase 1

LOCATION: Jurong Road – Track 22

PROJECT NO: JB108/TC32-WI058/2011

BOREHOLE NO: BH 1

WATER LEVEL: 0.70m BGL (Highest)
1.05m BGL (Average)

DRILLING DATE STARTED: 15/03/2013

BOREHOLE DIA: 100 mm

DRILLING DATE COMPLETED: 18/03/2013

CORE DIA: 50 mm

REDUCED LEVEL: 103.164m
NORTHING: 37348.841
EASTING: 16638.734

PREPARED BY: Aung / Zaw Min Tun

DRILLING METHOD: RO

Description	Graphic Log	Depth (m) (Thickness)	Reduced Level (m)	Scale	SPT (N-Value) 0 20 40 60 80 100	Blows/cm	Samples & Tests: Legend	Type & No.	Depth (m)	Rock: TCR(%)	Rock: RQD(%)	Geological Classification	Grain Size Analysis G/SA/S/C	Unified Soil Classification	Shear Strength: C (kN/m²)	Shear Strength: φ (°)	Bulk Density (Mg/m³)	Water Content (%)	Atterberg Limit (%): LL	Atterberg Limit (%): PL
Trial Pit 0.5x1.0x1.0m. Hand Auger 1.0m–3.0m. Loose. brownish gray, Silty SAND with hard core (FILL)		(0.50) 0.50	102.66					D1				FILL		SM						
Loose, reddish brown, fine grained Silty SAND (FILL)		(5.00)		1 2 3 4 5	•	4/30 (1/2/2)		UD1 SPT1 D2 UD2	2.00–2.90 2.90–3.35 4.00–4.90											
		5.50	97.66									FILL		SM						
Soft, dark brown, Peaty CLAY with decay roots (KALLANG FORMATION)		(2.00)		6 7	•	2/30 (1/1/1)		SPT2 D3	6.00–6.45											
		7.50	95.66									E		CPt						
Firm, light gray, slightly Sandy CLAY (KALLANG FORMATION)		(6.00)		8 9 10 11 12 13	•	5/30 (1/2/3)		SPT3 D4	9.00–9.45											
		13.50	89.66		•	7/30 (2/3/4)		SPT4	12.00–12.45			F2		CS						
Very dense, purplish brown, fine grained Silty SAND (JURONG FORMATION)		(3.00)		14 15 16	•	100/15 (25/ 100)		SPT5 D5	15.00–15.30											
		16.50	86.66									SVI		SM						
Very dense, light gray, fine grained Silty SAND (JURONG FORMATION)		(2.50)		17 18	•	100/13 (25/ 100)		SPT6 D6	18.00–18.28											
Hard, reddish brown, Sandy SILT (JURONG FORMATION)		19.00	84.16	19								SVI		SM						
		(1.00) 20.00	83.16	20								SVI		MS						

RQD/TCR(%)

TO BE CONTINUED

REMARKS: WSP was installed at 6.00m BGL.

LEGEND:

- ▼ –Pressuremeter Test (PMT)
- ◕ –Vane Shear Test (V)
- ⊗ –Permeability Test (PBT)
- ▤ –Packer Test (PKT)
- ⊠ –Standard Penetration Test (P)
- ▨ –Undisturbed Sample (UD)
- –Open Drive Thickwall Sample (OD)
- ▧ –Mazier Sample (MZ)
- –Denison Sample (DS)
- □ –Attempted (UD), (OD), (PS), (MZ) & (DS)
- ■ –Piston Sample (PS)
- ◧ –Core Run (CR)

NOTE: –The information provided in this preliminary Field Log which are subjected to prior review of official Report are based on the results of field investigation and visual soil description, some interpretations may differ from lavoratory results and final SI Report.
–Kimaro shall not be responsible or made liable for any application or misinterpretation of the above preliminary Field Log which are subjected to prior review, and issuance of an official SI Report.

PRELIMINARY FIELD LOG

KIMARO GEOTECHNICAL ENGINEERING PTE LTD

CLIENT: HOUSING AND DEVELOPMENT BOARD (HDB)

CONSULTANT: TEP Consultants Pte Ltd

PROJECT: Soil Investigation works at Tengah Phase 1

LOCATION: Jurong Road – Track 22

PROJECT NO: JB108/TC32-WI058/2011

BOREHOLE NO: BH 1

WATER LEVEL: 0.70m BGL (Highest)
1.05m BGL (Average)

DRILLING DATE STARTED: 15/03/2013

BOREHOLE DIA: 100 mm

DRILLING DATE COMPLETED: 18/03/2013

CORE DIA: 50 mm

REDUCED LEVEL: 103.164m
NORTHING: 37348.841
EASTING: 16638.734

PREPARED BY: Aung / Zaw Min Tun

DRILLING METHOD: RO

Description	Graphic Log	Depth (m) (Thickness)	Reduced Level (m)	Scale	SPT (N-Value) 0 20 40 60 80 100	Blows/cm	Samples & Tests: Legend	Type & No.	Depth (m)	Rock: TCR(%)	Rock: RQD(%)	Geological Classification	Grain Size Analysis G/SA/S/C	Unified Soil Classification	Shear Strength: C (kN/m²)	Shear Strength: φ (°)	Bulk Density (Mg/m³)	Water Content (%)	Atterberg Limit (%): LL	Atterberg Limit (%): PL
Hard, reddish brown, Sandy SILT (JURONG FORMATION)		(8.00)		21		100/10 (25/100)		SPT7 D7	21.00–21.25											
				22																
				23																
				24		100/13 (25/100)		SPT8	24.00–24.28											
				25																
				26																
				27		100/12 (25/100)		SPT9	27.00–27.27											
		28.00	75.16	28								SVI		MS						
Hard, reddish brown, Sandy SILT with rock fragment (JURONG FORMATION)		(2.21)		29																
		30.21	72.95	30		100/6 (25/100)		SPT10 D8	30.00–30.21			SV		MS						
Borehole was terminated at 30.21m BGL as instructed by the engineer in charge.				31																
				32																
				33																
				34																
				35																
				36																
				37																
				38																
				39																
				40																

RQD/TCR(%)

Ground Water Level (Measured from Ground Level)

Date (dd/mm/yyyy)	Time (hh:mm)	Borehole Depth (m)	Casing Depth (m)	Water Level (m)
15/03/2013	18:30	19.00	6.00	0.70
16/03/2013	08:30	19.00	6.00	1.00
16/03/2013	18:30	28.00	6.00	1.20
18/03/2013	08:30	28.00	6.00	1.30

REMARKS:

LEGEND:

- –Pressuremeter Test (PMT)
- –Vane Shear Test (V)
- –Permeability Test (PBT)
- –Packer Test (PKT)
- –Standard Penetration Test (P)
- –Undisturbed Sample (UD)
- –Open Drive Thickwall Sample (OD)
- –Mazier Sample (MZ)
- –Denison Sample (DS)
- –Attempted (UD), (OD), (PS), (MZ) & (DS)
- –Piston Sample (PS)
- –Core Run (CR)

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PRELIMINARY FIELD LOG

KIMARO GEOTECHNICAL ENGINEERING PTE LTD

CLIENT: HOUSING AND DEVELOPMENT BOARD (HDB)

CONSULTANT: TEP Consultants Pte Ltd

PROJECT: Soil Investigation works at Tengah Phase 1

LOCATION: Jurong Road – Track 22

PROJECT NO: JB108/TC32-WI058/2011

BOREHOLE NO: BH-2

WATER LEVEL: 0.70m BGL (Highest)
1.20m BGL (Average)

DRILLING DATE STARTED: 21/03/2013

BOREHOLE DIA: 100 mm

DRILLING DATE COMPLETED: 25/03/2013

CORE DIA: 50 mm

REDUCED LEVEL: 105.876
NORTHING: 36949.818
EASTING: 17088.49

PREPARED BY: MSS/ Zaw Min Tun

DRILLING METHOD: RO

Description	Graphic Log	Depth (m) (Thickness)	Reduced Level (m)	Scale	SPT (N-Value) 0 20 40 60 80 100	Blows/cm	Samples & Tests: Legend	Type & No.	Depth (m)	Rock: TCR(%)	Rock: RQD(%)	Geological Classification	Grain Size Analysis G/SA/S/C	Unified Soil Classification	Shear Strength: C (kN/m²)	Shear Strength: φ (°)	Bulk Density (Mg/m³)	Water Content (%)	Atterberg Limit (%): LL	Atterberg Limit (%): PL
Trial Pit 0.5x1.0x1.0m. Hand Auger 1.0m–3.0m. Loose, brown, slightly Silty SAND (FILL)		(3.50)		1																
				2				UD1	2.00–2.90											
				3	•	18/30 (5/8/ 10)		SPT1 D1	2.90–3.35			FILL		SM						
		3.50	102.38																	
Very stiff to hard, reddish brown, Sandy SILT (JURONG FORMATION)				4				UD2	4.00–4.90											
				5																
				6	•	25/30 (7/11/ 14)		SPT2 D2	6.00–6.45											
		(6.50)		7																
				8																
				9	•	38/30 (10/17/ 21)		SPT3	9.00–9.45											
		10.00	95.88	10								SVI		MS						
Hard, reddish brown, Sandy SILT (JURONG FORMATION)				11																
				12	•	100/10 (25/ 100)		SPT4 D3	12.00–12.25											
		(4.00)		13																
		14.00	91.88	14								SVI		MS						
Hard, reddish brown, Sandy SILT with some rock fragments (JURONG FORMATION)				15																
				16	•	100/18 (25/78/ 22)		SPT5 D4	15.00–15.33											
		(6.00)		17																
				18	•	100/5 (25/ 100)		SPT6	18.00–18.20											
				19																
		20.00	85.88	20								SV		MS						

RQD/TCR(%)

TO BE CONTINUED

REMARKS:

LEGEND:

- –Pressuremeter Test (PMT)
- –Vane Shear Test (V)
- –Permeability Test (PBT)
- –Packer Test (PKT)
- –Standard Penetration Test (P)
- –Undisturbed Sample (UD)
- –Open Drive Thickwall Sample (OD)
- –Mazier Sample (MZ)
- –Denison Sample (DS)
- –Attempted (UD), (OD), (PS), (MZ) & (DS)
- –Piston Sample (PS)
- –Core Run (CR)

NOTE: –The information provided in this preliminary Field Log which are subjected to prior review of official Report are based on the results of field investigation and visual soil description, some interpretations may differ from lavoratory results and final SI Report.
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PRELIMINARY FIELD LOG

KIMARO GEOTECHNICAL ENGINEERING PTE LTD

CLIENT: HOUSING AND DEVELOPMENT BOARD (HDB)

CONSULTANT: TEP Consultants Pte Ltd

PROJECT: Soil Investigation works at Tengah Phase 1

LOCATION: Jurong Road – Track 22

PROJECT NO: JB108/TC32-WI058/2011

BOREHOLE NO: BH-2

WATER LEVEL: 0.70m BGL (Highest)
1.20m BGL (Average)

DRILLING DATE STARTED: 21/03/2013

BOREHOLE DIA: 100 mm

DRILLING DATE COMPLETED: 25/03/2013

CORE DIA: 50 mm

REDUCED LEVEL: 105.876
NORTHING: 36949.818
EASTING: 17088.49

PREPARED BY: MSS/ Zaw Min Tun

DRILLING METHOD: RO

Description	Graphic Log	Depth (m) (Thickness)	Reduced Level (m)	Scale	SPT (N-Value) 0 20 40 60 80 100	Blows/cm	Samples & Tests: Legend	Type & No.	Depth (m)	Rock: TCR(%)	Rock: RQD(%)	Geological Classification	Grain Size Analysis G/SA/S/C	Unified Soil Classification	Shear Strength: C (kN/m²)	Shear Strength: φ (°)	Bulk Density (Mg/m³)	Water Content (%)	Atterberg Limit (%): LL	Atterberg Limit (%): PL
Hard, reddish brown, slightly Sandy SILT with some rock fragments (JURONG FORMATION)	XXX	(7.21)		21		100/10 (25/ 100)		SPT7 D5	21.00–21.25											
				22																
				23																
				24		100/9 (25/ 100)		SPT8	24.00–24.24											
				25																
				26																
		27.21	78.67	27		100/6 (25/ 100)		SPT9	27.00–27.21			SV		MS						
Borehole was terminated at 27.21m with the instruction from engineer in charge.				28																
				29																
				30																
				31																
				32																
				33																
				34																
				35																
				36																
				37																
				38																
				39																
				40																

RQD/TCR(%)

Ground Water Level (Measured from Ground Level)

Date (dd/mm/yyyy)	Time (hh:mm)	Borehole Depth (m)	Casing Depth (m)	Water Level (m)
21/03/2013	18:30	13.50	6.00	0.70
22/03/2013	08:30	13.50	6.00	1.00
22/03/2013	18:30	19.50	6.00	1.10
23/03/2013	08:30	19.50	6.00	1.30
23/03/2013	18:30	25.50	6.00	1.50
25/03/2013	08:30	25.50	6.00	1.60

REMARKS:

LEGEND:

- –Pressuremeter Test (PMT)
- –Vane Shear Test (V)
- –Permeability Test (PBT)
- –Packer Test (PKT)
- –Standard Penetration Test (P)
- –Undisturbed Sample (UD)
- –Open Drive Thickwall Sample (OD)
- –Mazier Sample (MZ)
- –Denison Sample (DS)
- –Attempted (UD), (OD), (PS), (MZ) & (DS)
- –Piston Sample (PS)
- –Core Run (CR)

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PRELIMINARY FIELD LOG

KIMARO GEOTECHNICAL ENGINEERING PTE LTD

CLIENT: HOUSING AND DEVELOPMENT BOARD (HDB)

CONSULTANT: TEP Consultants Pte Ltd

PROJECT: Soil Investigation works at Tengah Phase 1

LOCATION: Jurong Road – Track 22

PROJECT NO: JB108/TC32-WI058/2011

BOREHOLE NO: BH-3

WATER LEVEL: 0.70m BGL (Highest)
0.85m BGL (Average)

DRILLING DATE STARTED: 20/03/2013

BOREHOLE DIA: 100 mm

DRILLING DATE COMPLETED: 21/03/2013

CORE DIA: 50 mm

REDUCED LEVEL: 107.926
NORTHING: 37361.532
EASTING: 17077.671

PREPARED BY: MSS/ Zaw Min Tun

DRILLING METHOD: RO

Description	Graphic Log	Depth (m) (Thickness)	Reduced Level (m)	Scale	SPT (N-Value) 0 20 40 60 80 100	Blows/cm	Legend	Samples & Tests Type & No.	Depth (m)	Rock TCR(%)	Rock RQD(%)	Geological Classification	Grain Size Analysis G/SA/S/C	Unified Soil Classification	Shear Strength C (kN/m²)	Shear Strength φ (°)	Bulk Density (Mg/m³)	Water Content (%)	Atterberg Limit (%) LL	Atterberg Limit (%) PL
Trial Pit 0.5x1.0x1.0m. Hand Auger 1.0m–3.0m. Firm, reddish brown, Sandy SILT (FILL)		0.30	107.63					D1				FILL		MS						
Firm, reddish yellow, Sandy SILT (KALLANG FORMATION)		(7.20)		1 2 3 4 5 6 7		8/30 (2/3/5)		UD1 SPT1 D2 UD2 SPT2	2.00–2.90 2.90–3.35 4.00–4.90 6.00–6.45											
Hard, purplish brown, slightly Sandy SILT (JURONG FORMATION)		(2.50)		8 9		100/23 (25/63/37)		SPT3 D3	9.00–9.38			F2		MS						
Hard, purplish brown, Sandy SILT (JURONG FORMATION)		(4.00)		10 11 12 13		81/30 (17/36/45)		SPT4 D4	12.00–12.45			SVI		MS						
Moderately strong, reddish brown, highly weathered, fine-grained, SANDSTONE (JURONG FORMATION)		(5.00)		14 15 16 17				SPT5 CR1 CR2 CR3 CR4	14.00Rebound 14.00–15.00 15.00–16.00 16.00–17.00 17.00–18.00	 100 100 100 100	 26 0 0 0	SVI		MS						
Borehole was terminated at 19.00m with the instruction from engineer in charge.		19.00	88.93	18 19 20				CR5	18.00–19.00	100	0	SIV		SA						

RQD/TCR(%)

TO BE CONTINUED

REMARKS:

LEGEND:

- ▼ –Pressuremeter Test (PMT)
- ◕ –Vane Shear Test (V)
- ⊗ –Permeability Test (PBT)
- ▤ –Packer Test (PKT)
- ⊠ –Standard Penetration Test (P)
- ▨ –Undisturbed Sample (UD)
- –Open Drive Thickwall Sample (OD)
- ▧ –Mazier Sample (MZ)
- –Denison Sample (DS)
- □ –Attempted (UD), (OD), (PS), (MZ) & (DS)
- ■ –Piston Sample (PS)
- ◧ –Core Run (CR)

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PRELIMINARY FIELD LOG

KIMARO GEOTECHNICAL ENGINEERING PTE LTD

CLIENT: HOUSING AND DEVELOPMENT BOARD (HDB)

CONSULTANT: TEP Consultants Pte Ltd

PROJECT: Soil Investigation works at Tengah Phase 1

LOCATION: Jurong Road – Track 22

PROJECT NO: JB108/TC32-WI058/2011

BOREHOLE NO: BH-3

WATER LEVEL: 0.70m BGL (Highest)
0.85m BGL (Average)

DRILLING DATE STARTED: 20/03/2013

BOREHOLE DIA: 100 mm

DRILLING DATE COMPLETED: 21/03/2013

CORE DIA: 50 mm

REDUCED LEVEL: 107.926
NORTHING: 37361.532
EASTING: 17077.671

PREPARED BY: MSS/ Zaw Min Tun

DRILLING METHOD: RO

Description	Graphic Log	Depth (m) (Thickness)	Reduced Level (m)	Scale	SPT (N-Value) 0 20 40 60 80 100	Blows/cm	Samples & Tests: Legend	Type & No.	Depth (m)	Rock: TCR(%)	RQD(%)	Geological Classification	Grain Size Analysis G/SA/S/C	Unified Soil Classification	Shear Strength: C (kN/m²)	φ (°)	Bulk Density (Mg/m³)	Water Content (%)	Atterberg Limit (%): LL	PL
				21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40																

Ground Water Level (Measured from Ground Level)

Date (dd/mm/yyyy)	Time (hh:mm)	Borehole Depth (m)	Casing Depth (m)	Water Level (m)
20/03/2013	18:30	14.00	14.00	0.70
21/03/2013	08:30	14.00	14.00	1.00

RQD/TCR(%)

REMARKS:

LEGEND:

- –Pressuremeter Test (PMT)
- –Vane Shear Test (V)
- –Permeability Test (PBT)
- –Packer Test (PKT)
- –Standard Penetration Test (P)
- –Undisturbed Sample (UD)
- –Open Drive Thickwall Sample (OD)
- –Mazier Sample (MZ)
- –Denison Sample (DS)
- –Attempted (UD), (OD), (PS), (MZ) & (DS)
- –Piston Sample (PS)
- –Core Run (CR)

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PRELIMINARY FIELD LOG

SHEET NO: 1 OF 2

KIMARO GEOTECHNICAL ENGINEERING PTE LTD

CLIENT: HOUSING AND DEVELOPMENT BOARD (HDB)

CONSULTANT: TEP Consultants Pte Ltd

PROJECT: Soil Investigation works at Tengah Phase 1

LOCATION: Jurong Road – Track 22

PROJECT NO: JB108/TC32-WI058/2011

BOREHOLE NO: BH-4

WATER LEVEL: 1.20m BGL

DRILLING DATE STARTED: 19/03/2013

BOREHOLE DIA: 100 mm

DRILLING DATE COMPLETED: 19/03/2013

CORE DIA: 50 mm

REDUCED LEVEL: 115.743

NORTHING: 37776.461

EASTING: 17063.956

PREPARED BY: MSS / Zaw Min Tun

DRILLING METHOD: RO

Description	Graphic Log	Depth (m) (Thickness)	Reduced Level (m)	Scale	SPT (N-Value) 0 20 40 60 80 100	Blows/cm	Samples & Tests: Legend	Type & No.	Depth (m)	Rock: TCR(%)	Rock: RQD(%)	Geological Classification	Grain Size Analysis G/SA/S/C	Unified Soil Classification	Shear Strength: C (kN/m²)	Shear Strength: φ (°)	Bulk Density (Mg/m³)	Water Content (%)	Atterberg Limit (%): LL	Atterberg Limit (%): PL
Trial Pit 0.5x1.0x1.0m. Hand Auger 1.0m-3.0m. Loose, yellowish brown, Silty SAND (FILL)		0.30	115.44					D1				FILL		SM						
Medium dense, light yellow mottled purple, Silty SAND (KALLANG FORMATION)		(7.20)						UD1	2.00-2.90											
						11/30 (3/5/6)		SPT1 D2	2.90-3.35											
								UD2	4.00-4.90											
						18/30 (7/8/ 10)		SPT2	6.00-6.45											
		7.50	108.24									F1		SM						
Medium dense, purplish brown, Silty SAND (JURONG FORMATION)		(2.50)																		
		10.00	105.74			22/30 (9/10/ 12)		SPT3 D3	9.00-9.45			SVI		SM						
Very dense, purplish brown, Silty SAND (JURONG FORMATION)		(3.50)																		
						100/28 (25/51/ 49)		SPT4 D4	12.00-12.43											
		13.50	102.24									SVI		SM						
Very dense, reddish yellow, Silty SAND (JURONG FORMATION)		(4.88)																		
						100/25 (25/58/ 42)		SPT5 D5	15.00-15.40											
		18.38	97.36									SVI		SM						
						100/23 (25/60/ 40)		SPT6	18.00-18.38											
Borehole was terminated at 18.38m with the instruction from engineer in charge.																				

RQD/TCR(%)

TO BE CONTINUED

REMARKS:

LEGEND:

- -Pressuremeter Test (PMT)
- -Vane Shear Test (V)
- -Permeability Test (PBT)
- -Packer Test (PKT)
- -Standard Penetration Test (P)
- -Undisturbed Sample (UD)
- -Open Drive Thickwall Sample (OD)
- -Mazier Sample (MZ)
- -Denison Sample (DS)
- -Attempted (UD), (OD), (PS), (MZ) & (DS)
- -Piston Sample (PS)
- -Core Run (CR)

NOTE: -The information provided in this preliminary Field Log which are subjected to prior review of official Report are based on the results of field investigation and visual soil description, some interpretations may differ from lavoratory results and final SI Report.
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PRELIMINARY FIELD LOG

KIMARO GEOTECHNICAL ENGINEERING PTE LTD

CLIENT: HOUSING AND DEVELOPMENT BOARD (HDB)

CONSULTANT: TEP Consultants Pte Ltd

PROJECT: Soil Investigation works at Tengah Phase 1

LOCATION: Jurong Road – Track 22

PROJECT NO: JB108/TC32-WI058/2011

BOREHOLE NO: BH-4

WATER LEVEL: 1.20m BGL

DRILLING DATE STARTED: 19/03/2013

BOREHOLE DIA: 100 mm

DRILLING DATE COMPLETED: 19/03/2013

CORE DIA: 50 mm

REDUCED LEVEL: 115.743

NORTHING: 37776.461

EASTING: 17063.956

PREPARED BY: MSS / Zaw Min Tun

DRILLING METHOD: RO

Description	Graphic Log	Depth (m) (Thickness)	Reduced Level (m)	Scale	SPT (N-Value) 0 20 40 60 80 100	Blows/cm	Samples & Tests: Legend	Type & No.	Depth (m)	Rock: TCR(%)	RQD(%)	Geological Classification	Grain Size Analysis G/SA/S/C	Unified Soil Classification	Shear Strength: C (kN/m²)	φ (°)	Bulk Density (Mg/m³)	Water Content (%)	Atterberg Limit (%): LL	PL
				21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40																

Ground Water Level (Measured from Ground Level)

Date (dd/mm/yyyy)	Time (hh:mm)	Borehole Depth (m)	Casing Depth (m)	Water Level (m)
19/03/2013	18:30	18.38	3.00	1.20

RQD/TCR(%)

REMARKS:

LEGEND:

- –Pressuremeter Test (PMT)
- –Vane Shear Test (V)
- –Permeability Test (PBT)
- –Packer Test (PKT)
- –Standard Penetration Test (P)
- –Undisturbed Sample (UD)
- –Open Drive Thickwall Sample (OD)
- –Mazier Sample (MZ)
- –Denison Sample (DS)
- –Attempted (UD), (OD), (PS), (MZ) & (DS)
- –Piston Sample (PS)
- –Core Run (CR)

NOTE: –The information provided in this preliminary Field Log which are subjected to prior review of official Report are based on the results of field investigation and visual soil description, some interpretations may differ from lavoratory results and final SI Report.
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PRELIMINARY FIELD LOG

KIMARO GEOTECHNICAL ENGINEERING PTE LTD

CLIENT: HOUSING AND DEVELOPMENT BOARD (HDB)

CONSULTANT: TEP Consultants Pte Ltd

PROJECT: Soil Investigation works at Tengah Phase 1

LOCATION: Jurong Road – Track 22

PROJECT NO: JB108/TC32-WI058/2011

BOREHOLE NO: BH-5

WATER LEVEL: 1.40m BGL

DRILLING DATE STARTED: 18/03/2013

BOREHOLE DIA: 100 mm

DRILLING DATE COMPLETED: 19/03/2013

CORE DIA: 50 mm

REDUCED LEVEL: 114.584

NORTHING: 37989.612

EASTING: 17276.822

PREPARED BY: MSS / Zaw Min Tun

DRILLING METHOD: RO

Description	Graphic Log	Depth (m) (Thickness)	Reduced Level (m)	Scale	SPT (N-Value) 0 20 40 60 80 100	Blows/cm	Samples & Tests: Legend	Type & No.	Depth (m)	Rock: TCR(%)	Rock: RQD(%)	Geological Classification	Grain Size Analysis G/SA/S/C	Unified Soil Classification	Shear Strength: C (kN/m²)	Shear Strength: φ (°)	Bulk Density (Mg/m³)	Water Content (%)	Atterberg Limit (%): LL	Atterberg Limit (%): PL
Trial Pit 0.5x1.0x1.0m. Hand Auger 1.0m–3.0m. Loose, yellowish brown, Silty SAND with some gravels (FILL)		(7.50)		1				UD1	2.00–2.90											
				2																
				3	•	10/30 (4/5/5)		SPT1 D1	2.90–3.35											
				4				UD2	4.00–4.00											
				5																
				6																
				7	•	4/30 (1/2/2)		SPT2	6.00–6.45											
		7.50	107.08									FILL		SM						
Very stiff, reddish yellow, white, Sandy SILT (JURONG FORMATION)		(2.50)		8																
				9	•	29/30 (9/13/16)		SPT3 D2	9.00–9.45											
		10.00	104.58	10								SVI		MS						
Hard, reddish brown, Sandy SILT (JURONG FORMATION)		(8.42)		11																
				12	•	100/14 (25/100)		SPT4 D3	12.00–12.29											
				13																
				14																
				15	•	100/12 (25/100)		SPT5	15.00–15.27											
				16																
				17																
				18																
		18.42	96.16		•	100/27 (25/55/45)		SPT6	18.00–18.42			SVI		MS						
Borehole was terminated at 18.42m with the instruction from engineer in charge.				19																
				20																

RQD/TCR(%)

TO BE CONTINUED

REMARKS: UD2 was attempted, no recovery due to loose soil.

LEGEND:

- ▼ –Pressuremeter Test (PMT)
- ◕ –Vane Shear Test (V)
- ⊗ –Permeability Test (PBT)
- ▤ –Packer Test (PKT)
- ☒ –Standard Penetration Test (P)
- ▨ –Undisturbed Sample (UD)
- –Open Drive Thickwall Sample (OD)
- ▧ –Mazier Sample (MZ)
- –Denison Sample (DS)
- □ –Attempted (UD), (OD), (PS), (MZ) & (DS)
- ■ –Piston Sample (PS)
- ◧ –Core Run (CR)

NOTE: –The information provided in this preliminary Field Log which are subjected to prior review of official Report are based on the results of field investigation and visual soil description, some interpretations may differ from lavoratory results and final SI Report.
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PRELIMINARY FIELD LOG

KIMARO GEOTECHNICAL ENGINEERING PTE LTD

CLIENT: HOUSING AND DEVELOPMENT BOARD (HDB)

CONSULTANT: TEP Consultants Pte Ltd

PROJECT: Soil Investigation works at Tengah Phase 1

LOCATION: Jurong Road – Track 22

PROJECT NO: JB108/TC32-WI058/2011

BOREHOLE NO: BH-5

WATER LEVEL: 1.40m BGL

DRILLING DATE STARTED: 18/03/2013

BOREHOLE DIA: 100 mm

DRILLING DATE COMPLETED: 19/03/2013

CORE DIA: 50 mm

REDUCED LEVEL: 114.584

NORTHING: 37989.612

EASTING: 17276.822

PREPARED BY: MSS / Zaw Min Tun

DRILLING METHOD: RO

Description	Graphic Log	Depth (m) (Thickness)	Reduced Level (m)	Scale	SPT (N-Value) 0 20 40 60 80 100	Blows/cm	Samples & Tests: Legend	Type & No.	Depth (m)	Rock: TCR(%)	RQD(%)	Geological Classification	Grain Size Analysis G/SA/S/C	Unified Soil Classification	Shear Strength: C (kN/m²)	φ (°)	Bulk Density (Mg/m³)	Water Content (%)	Atterberg Limit (%): LL	PL
				21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40																

Ground Water Level (Measured from Ground Level)

Date (dd/mm/yyyy)	Time (hh:mm)	Borehole Depth (m)	Casing Depth (m)	Water Level (m)
19/03/2013	18:30	10.00	6.00	1.40

RQD/TCR(%)

REMARKS:

LEGEND:

- –Pressuremeter Test (PMT)
- –Vane Shear Test (V)
- –Permeability Test (PBT)
- –Packer Test (PKT)
- –Standard Penetration Test (P)
- –Undisturbed Sample (UD)
- –Open Drive Thickwall Sample (OD)
- –Mazier Sample (MZ)
- –Denison Sample (DS)
- –Attempted (UD), (OD), (PS), (MZ) & (DS)
- –Piston Sample (PS)
- –Core Run (CR)

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PRELIMINARY FIELD LOG

KIMARO GEOTECHNICAL ENGINEERING PTE LTD

CLIENT: HOUSING AND DEVELOPMENT BOARD (HDB)

CONSULTANT: TEP Consultants Pte Ltd

PROJECT: Soil Investigation works at Tengah Phase 1

LOCATION: Jurong Road – Track 22

PROJECT NO: JB108/TC32-WI058/2011

BOREHOLE NO: BH-6

WATER LEVEL: 1.40m BGL (Highest)
2.13m BGL (Average)

DRILLING DATE STARTED: 25/03/2013

BOREHOLE DIA: 100 mm

DRILLING DATE COMPLETED: 28/03/2013

CORE DIA: 50 mm

REDUCED LEVEL: 102.053
NORTHING: 37536.497
EASTING: 15977.948

PREPARED BY: MSS/ Zaw Min Tun

DRILLING METHOD: RO

Description	Graphic Log	Depth (m) (Thickness)	Reduced Level (m)	Scale	SPT (N-Value) 0 20 40 60 80 100	Blows/cm	Legend	Type & No.	Depth (m)	TCR(%)	RQD(%)	Geological Classification	Grain Size Analysis G/SA/S/C	Unified Soil Classification	Shear Strength C (kN/m²)	Shear Strength φ (°)	Bulk Density (Mg/m³)	Water Content (%)	Atterberg Limit (%) LL	Atterberg Limit (%) PL
Trial Pit 0.5x1.0x1.0m. Hand Auger 1.0m–3.0m. Firm, yellowish brown, Sandy CLAY (FILL)		(2.00)		1				D1												
		2.00	100.05	2				UD1	2.00–2.00			FILL		CS						
Very soft, black, Peaty CLAY with some woods (KALLANG FORMATION)				3		1/30 (1/0/1)		SPT1	3.00–3.45											
				4				UD2	4.00–4.90											
		(5.50)		5																
				6		1/30 (0/0/1)		SPT2 D2	6.00–6.45											
		7.50	94.55	7								E		CPt						
Soft, yellowish grey, slightly Sandy CLAY (KALLANG FORMATION)		(2.50)		8																
				9		2/30 (1/0/2)		SPT3 D3	9.00–9.45											
		10.00	92.05	10								F2		CS						
Hard, greenish grey, slightly Sandy SILT (JURONG FORMATION)				11																
		(3.50)		12		36/30 (12/15/ 21)		SPT4 D4	12.00–12.45											
		13.50	88.55	13								SVI		MS						
Hard, greenish grey, slightly Sandy SILT (JURONG FORMATION)				14																
		(2.50)		15		100/27 (25/55/ 45)		SPT5 D5	15.00–15.42											
		16.00	86.05	16				SPT6	16.00Rebound			SVI		MS						
Moderately strong, purplish grey, highly weathered, SANDSTONE (JURONG FORMATION)				17				CR1	16.00–17.00	100	0									
		(4.00)		18				CR2	17.00–18.00	100	0									
				19				CR3	18.00–19.00	100	0									
		20.00	82.05	20	RQD/TCR(%)			CR4	19.00–20.00	100	0	SIV		SA						

TO BE CONTINUED

REMARKS: UD1 was attempted, no recovery due to soft soil.

LEGEND:

- ▼ –Pressuremeter Test (PMT)
- ◒ –Vane Shear Test (V)
- ⊗ –Permeability Test (PBT)
- ▤ –Packer Test (PKT)
- ⊠ –Standard Penetration Test (P)
- ▨ –Undisturbed Sample (UD)
- –Open Drive Thickwall Sample (OD)
- ▧ –Mazier Sample (MZ)
- –Denison Sample (DS)
- □ –Attempted (UD), (OD), (PS), (MZ) & (DS)
- ■ –Piston Sample (PS)
- ▮ –Core Run (CR)

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PRELIMINARY FIELD LOG

KIMARO GEOTECHNICAL ENGINEERING PTE LTD

CLIENT: HOUSING AND DEVELOPMENT BOARD (HDB)

CONSULTANT: TEP Consultants Pte Ltd

PROJECT: Soil Investigation works at Tengah Phase 1

LOCATION: Jurong Road – Track 22

PROJECT NO: JB108/TC32-WI058/2011

BOREHOLE NO: BH-6

WATER LEVEL: 1.40m BGL (Highest)
2.13m BGL (Average)

DRILLING DATE STARTED: 25/03/2013

BOREHOLE DIA: 100 mm

DRILLING DATE COMPLETED: 28/03/2013

CORE DIA: 50 mm

REDUCED LEVEL: 102.053
NORTHING: 37536.497
EASTING: 15977.948

PREPARED BY: MSS/ Zaw Min Tun

DRILLING METHOD: RO

Description	Graphic Log	Depth (m) (Thickness)	Reduced Level (m)	Scale	SPT (N-Value) 0 20 40 60 80 100	Blows/cm	Samples & Tests: Legend	Type & No.	Depth (m)	Rock: TCR(%)	Rock: RQD(%)	Geological Classification	Grain Size Analysis G/SA/S/C	Unified Soil Classification	Shear Strength: C (kN/m²)	Shear Strength: φ (°)	Bulk Density (Mg/m³)	Water Content (%)	Atterberg Limit (%): LL	Atterberg Limit (%): PL
Moderately strong, purplish grey, highly weathered, SANDSTONE (JURONG FORMATION)		(1.00) 21.00	81.05	21				CR5	20.00-21.00	100	12	SIV		SA						
Borehole was terminated at 21.00m with the instruction from engineer in charge.				22																
				23																
				24																
				25																
				26																
				27																
				28																
				29																
				30																
				31																
				32																
				33																
				34																
				35																
				36																
				37																
				38																
				39																
				40																

RQD/TCR(%)

Ground Water Level (Measured from Ground Level)

Date (dd/mm/yyyy)	Time (hh:mm)	Borehole Depth (m)	Casing Depth (m)	Water Level (m)
25/03/2013	18:30	13.50	9.00	1.40
26/03/2013	08:30	13.50	9.00	1.70
26/03/2013	18:30	17.00	16.00	2.10
27/03/2013	08:30	17.00	16.00	2.40
27/03/2013	18:30	20.00	16.00	2.50
28/03/2013	08:30	20.00	16.00	2.70

REMARKS:

LEGEND:

- –Pressuremeter Test (PMT)
- –Vane Shear Test (V)
- –Permeability Test (PBT)
- –Packer Test (PKT)
- –Standard Penetration Test (P)
- –Undisturbed Sample (UD)
- –Open Drive Thickwall Sample (OD)
- –Mazier Sample (MZ)
- –Denison Sample (DS)
- –Attempted (UD), (OD), (PS), (MZ) & (DS)
- –Piston Sample (PS)
- –Core Run (CR)

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PRELIMINARY FIELD LOG

KIMARO GEOTECHNICAL ENGINEERING PTE LTD

CLIENT: HOUSING AND DEVELOPMENT BOARD (HDB)

CONSULTANT: TEP Consultants Pte Ltd

PROJECT: Soil Investigation works at Tengah Phase 1

LOCATION: Jurong Road – Track 22

PROJECT NO: JB108/TC32-WI058/2011

BOREHOLE NO: BH 7

WATER LEVEL: 0.60m BGL (Highest)
1.00m BGL (Average)

DRILLING DATE STARTED: 15/03/2013

BOREHOLE DIA: 100 mm

DRILLING DATE COMPLETED: 18/03/2013

CORE DIA: 50 mm

REDUCED LEVEL: 108.661m
NORTHING: 37962.538
EASTING: 16402.272

PREPARED BY: Aung / Zaw Min Tun

DRILLING METHOD: RO

Description	Graphic Log	Depth (m) (Thickness)	Reduced Level (m)	Scale	SPT (N-Value) 0 20 40 60 80 100	Blows/cm	Samples & Tests: Legend	Type & No.	Depth (m)	Rock: TCR(%)	Rock: RQD(%)	Geological Classification	Grain Size Analysis G/SA/S/C	Unified Soil Classification	Shear Strength: C (kN/m²)	Shear Strength: φ (°)	Bulk Density (Mg/m³)	Water Content (%)	Atterberg Limit (%): LL	Atterberg Limit (%): PL
Trial Pit 0.5x1.0x1.0m. Hand Auger 1.0m–3.0m. Firm, reddish brown, Sandy SILT (FILL)		(0.30)	108.36					D1				FILL		MS						
		0.30		1																
Hard, purplish brown, Sandy SILT (JURONG FORMATION)				2				UD1	2.00–2.00											
				3		43/30 (13/18/25)		SPT1	3.00–3.45											
								D2												
		(7.20)		4				UD2	4.00–4.00											
				5																
				6		100/11 (25/100)		SPT2	6.00–6.26											
		7.50	101.16	7								SVI		MS						
Hard, reddish brown, Sandy SILT with rock fragment (JURONG FORMATION)				8																
				9		100/7 (25/100/0)		SPT3	9.00–9.22											
								D3												
		(4.90)		10																
				11																
				12		100/4 (25/100)		SPT4	12.00–12.19											
		12.40	94.26					SPT5	Rebound			SV		MS						
Strong, reddish brown, moderately weathered SILTSTONE (JURONG FORMATION)				13				CR1	12.40–13.40	100	28									
				14				CR2	13.40–14.40	100	60									
		(5..00)		15				CR3	14.40–15.40	100	75									
				16				CR4	15.40–16.40	100	74									
				17				CR5	16.40–17.40	100	72									
		17.40	89.26									SIII		STSO						
Borehole was terminated at 17.40m BGL as instructed by the engineer in charge.				18																
				19																
				20																

RQD/TCR(%)

TO BE CONTINUED

REMARKS: WSP was installed at 6.00m BGL. UD1&UD2 were attempted, no recovery due to hard soil.

LEGEND:

- –Pressuremeter Test (PMT)
- –Vane Shear Test (V)
- –Permeability Test (PBT)
- –Packer Test (PKT)
- –Standard Penetration Test (P)
- –Undisturbed Sample (UD)
- –Open Drive Thickwall Sample (OD)
- –Mazier Sample (MZ)
- –Denison Sample (DS)
- –Attempted (UD), (OD), (PS), (MZ) & (DS)
- –Piston Sample (PS)
- –Core Run (CR)

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PRELIMINARY FIELD LOG

KIMARO GEOTECHNICAL ENGINEERING PTE LTD

CLIENT: HOUSING AND DEVELOPMENT BOARD (HDB)

CONSULTANT: TEP Consultants Pte Ltd

PROJECT: Soil Investigation works at Tengah Phase 1

LOCATION: Jurong Road – Track 22

PROJECT NO: JB108/TC32-WI058/2011

BOREHOLE NO: BH 7

WATER LEVEL: 0.60m BGL (Highest)
1.00m BGL (Average)

DRILLING DATE STARTED: 15/03/2013

BOREHOLE DIA: 100 mm

DRILLING DATE COMPLETED: 18/03/2013

CORE DIA: 50 mm

REDUCED LEVEL: 108.661m
NORTHING: 37962.538
EASTING: 16402.272

PREPARED BY: Aung / Zaw Min Tun

DRILLING METHOD: RO

Description	Graphic Log	Depth (m) (Thickness)	Reduced Level (m)	Scale	SPT (N-Value) 0 20 40 60 80 100	Blows/cm	Samples & Tests: Legend	Type & No.	Depth (m)	Rock: TCR(%)	RQD(%)	Geological Classification	Grain Size Analysis G/SA/S/C	Unified Soil Classification	Shear Strength: C (kN/m²)	φ (°)	Bulk Density (Mg/m³)	Water Content (%)	Atterberg Limit (%): LL	PL
				21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40																

RQD/TCR(%)

Ground Water Level (Measured from Ground Level)

Date (dd/mm/yyyy)	Time (hh:mm)	Borehole Depth (m)	Casing Depth (m)	Water Level (m)
15/03/2013	18:30	7.50	3.00	0.60
16/03/2013	08:30	7.50	3.00	1.00
16/03/2013	18:30	12.40	12.40	1.10
18/03/2013	08:30	12.40	12.40	1.30

REMARKS:

LEGEND:

- –Pressuremeter Test (PMT)
- –Vane Shear Test (V)
- –Permeability Test (PBT)
- –Packer Test (PKT)
- –Standard Penetration Test (P)
- –Undisturbed Sample (UD)
- –Open Drive Thickwall Sample (OD)
- –Mazier Sample (MZ)
- –Denison Sample (DS)
- –Attempted (UD), (OD), (PS), (MZ) & (DS)
- –Piston Sample (PS)
- –Core Run (CR)

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PRELIMINARY FIELD LOG

KIMARO GEOTECHNICAL ENGINEERING PTE LTD

CLIENT: HOUSING AND DEVELOPMENT BOARD (HDB)

CONSULTANT: TEP Consultants Pte Ltd

PROJECT: Soil Investigation works at Tengah Phase 1

LOCATION: Jurong Road – Track 22

PROJECT NO: JB108/TC32-WI058/2011

BOREHOLE NO: BH-8

WATER LEVEL: 1.40m BGL (Highest)
1.73m BGL (Average)

DRILLING DATE STARTED: 18/03/2013

BOREHOLE DIA: 100 mm

DRILLING DATE COMPLETED: 20/03/2013

CORE DIA: 50 mm

REDUCED LEVEL: 118.61
NORTHING: 38389.719
EASTING: 16825.506

PREPARED BY: MSS/ Zaw Min Tun

DRILLING METHOD: RO

Description	Graphic Log	Depth (m) (Thickness)	Reduced Level (m)	Scale	SPT (N-Value) 0 20 40 60 80 100	Blows/cm	Samples & Tests: Legend	Type & No.	Depth (m)	Rock: TCR(%)	Rock: RQD(%)	Geological Classification	Grain Size Analysis G/SA/S/C	Unified Soil Classification	Shear Strength: C (kN/m²)	Shear Strength: φ (°)	Bulk Density (Mg/m³)	Water Content (%)	Atterberg Limit (%): LL	Atterberg Limit (%): PL
Trial Pit 0.5x1.0x1.0m. Hand Auger 1.0m–3.0m. Dense, reddish brown, Silty SAND with gravels (FILL)		(4.00)		1 2 3 4		40/30 (12/19/ 21)		UD1 SPT1 D1	2.00–2.00 3.00–3.45			FILL		SM						
		4.00	114.61																	
Very stiff, reddish brown mottled white, Silty SAND (JURONG FORMATION)		(3.00)		5 6 7		16/30 (4/6/ 10)		UD2 SPT2 D2	4.00–4.90 6.00–6.45			SVI		MS						
		7.00	111.61																	
Hard, reddish brown mottled white, Silty SAND (JURONG FORMATION)		(3.00)		8 9 10		39/30 (11/17/ 22)		SPT3 D3	9.00–9.45			SVI		MS						
		10.00	108.61																	
Hard, purplish brown, slightly Sandy SILT (JURONG FORMATION)		(6.50)		11 12 13 14 15 16		59/30 (17/26/ 33) 73/30 (19/32/ 41)		SPT4 D4 SPT5	12.00–12.45 15.00–15.45			SVI		MS						
		16.50	102.11																	
Hard, reddish brown, slightly Sandy SILT (JURONG FORMATION)		(3.50)		17 18 19 20		100/7 (25/ 100)		SPT6 D5	18.00–18.22			SVI		MS						
		20.00	98.61																	

RQD/TCR(%)

TO BE CONTINUED

REMARKS: UD1 was attempted, no recovery due to hard soil.

LEGEND:

- ▼ –Pressuremeter Test (PMT)
- ◕ –Vane Shear Test (V)
- ⊗ –Permeability Test (PBT)
- ▤ –Packer Test (PKT)
- ⊠ –Standard Penetration Test (P)
- ▨ –Undisturbed Sample (UD)
- –Open Drive Thickwall Sample (OD)
- ▧ –Mazier Sample (MZ)
- –Denison Sample (DS)
- □ –Attempted (UD), (OD), (PS), (MZ) & (DS)
- ■ –Piston Sample (PS)
- ◧ –Core Run (CR)

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PRELIMINARY FIELD LOG

KIMARO GEOTECHNICAL ENGINEERING PTE LTD

CLIENT: HOUSING AND DEVELOPMENT BOARD (HDB)

CONSULTANT: TEP Consultants Pte Ltd

PROJECT: Soil Investigation works at Tengah Phase 1

LOCATION: Jurong Road – Track 22

PROJECT NO: JB108/TC32-WI058/2011

BOREHOLE NO: BH-8

WATER LEVEL: 1.40m BGL (Highest)
1.73m BGL (Average)

DRILLING DATE STARTED: 18/03/2013

BOREHOLE DIA: 100 mm

DRILLING DATE COMPLETED: 20/03/2013

CORE DIA: 50 mm

REDUCED LEVEL: 118.61
NORTHING: 38389.719
EASTING: 16825.506

PREPARED BY: MSS/ Zaw Min Tun

DRILLING METHOD: RO

Description	Graphic Log	Depth (m) (Thickness)	Reduced Level (m)	Scale	SPT (N-Value) 0 20 40 60 80 100	Blows/cm	Samples & Tests: Legend	Type & No.	Depth (m)	Rock: TCR(%)	Rock: RQD(%)	Geological Classification	Grain Size Analysis G/SA/S/C	Unified Soil Classification	Shear Strength: C (kN/m²)	Shear Strength: φ (°)	Bulk Density (Mg/m³)	Water Content (%)	Atterberg Limit (%): LL	Atterberg Limit (%): PL
Hard, reddish and purplish brown, slightly Sandy SILT (JURONG FORMATION)	XXX	(4.20)		21	•	100/8 (25/ 100)	☒	SPT7 D6	21.00–21.23											
		24.20	94.41	24	•	100/5 (25/ 100)	☒	SPT8	24.00–24.20			SVI		MS						
Borehole was terminated at 24.20m with the instruction from engineer in charge.				25																
				26																
				27																
				28																
				29																
				30																
				31																
				32																
				33																
				34																
				35																
				36																
				37																
				38																
				39																
				40																

RQD/TCR(%)

Ground Water Level (Measured from Ground Level)

Date (dd/mm/yyyy)	Time (hh:mm)	Borehole Depth (m)	Casing Depth (m)	Water Level (m)
18/03/2013	18:30	13.50	6.00	1.40
19/03/2013	08:30	13.50	6.00	1.80
19/03/2013	18:30	19.50	6.00	2.00

REMARKS:

LEGEND:

- ▼ –Pressuremeter Test (PMT)
- ◕ –Vane Shear Test (V)
- ⊗ –Permeability Test (PBT)
- ▤ –Packer Test (PKT)
- ☒ –Standard Penetration Test (P)
- ▨ –Undisturbed Sample (UD)
- –Open Drive Thickwall Sample (OD)
- ▧ –Mazier Sample (MZ)
- –Denison Sample (DS)
- □ –Attempted (UD), (OD), (PS), (MZ) & (DS)
- ■ –Piston Sample (PS)
- ◨ –Core Run (CR)

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PRELIMINARY FIELD LOG

KIMARO GEOTECHNICAL ENGINEERING PTE LTD

CLIENT: HOUSING AND DEVELOPMENT BOARD (HDB)

CONSULTANT: TEP Consultants Pte Ltd

PROJECT: Soil Investigation works at Tengah Phase 1

LOCATION: Jurong Road – Track 22

PROJECT NO: JB108/TC32-WI058/2011

BOREHOLE NO: BH-9

WATER LEVEL: 0.50m BGL (Highest)
0.67m BGL (Average)

DRILLING DATE STARTED: 27/03/2013

BOREHOLE DIA: 100 mm

DRILLING DATE COMPLETED: 02/04/2013

CORE DIA: 50 mm

REDUCED LEVEL: 103.477
NORTHING: 37936.536
EASTING: 15527.819

PREPARED BY: MSS/ Zaw Min Tun

DRILLING METHOD: RO

Description	Graphic Log	Depth (m) (Thickness)	Reduced Level (m)	Scale	SPT (N-Value) 0 20 40 60 80 100	Blows/cm	Samples & Tests: Legend	Type & No.	Depth (m)	Rock: TCR(%)	Rock: RQD(%)	Geological Classification	Grain Size Analysis G/SA/S/C	Unified Soil Classification	Shear Strength: C (kN/m²)	Shear Strength: φ (°)	Bulk Density (Mg/m³)	Water Content (%)	Atterberg Limit (%): LL	Atterberg Limit (%): PL
Trial Pit 0.5x1.0x1.0m. Hand Auger 1.0m–3.0m. Soft, brown, Sandy CLAY (FILL)		(3.00)		1				D1												
				2				UD1	2.00–2.00											
		3.00	100.48	3								FILL		CS						
Firm, dark brown, Sandy CLAY (KALLANG FORMATION)		(2.50)		4	•	5/30 (2/2/3)		SPT1 D2	3.00–3.45											
				5				UD2	4.00–4.90											
		5.50	97.98									F2		CS						
Firm, brown, Organic CLAY (KALLANG FORMATION)		(4.50)		6	•	4/30 (1/2/2)		SPT2 D3	6.00–6.45											
				7																
				8																
				9																
		10.00	93.48	10	•	5/30 (2/2/3)		SPT3	9.00–9.45			E		CO						
Firm, grey, Sandy CLAY (KALLANG FORMATION)		(10.00)		11																
				12	•	6/30 (2/3/3)		SPT4 D4	12.00–12.45											
				13																
				14																
				15	•	10/30 (3/3/7)		SPT5	15.00–15.45											
				16																
				17																
				18	•	3/30 (1/1/2)		SPT6	18.00–18.45											
		20.00	83.48	19								F2		CS						
				20																

RQD/TCR(%)

TO BE CONTINUED

REMARKS: UD1 was attempted, no recovery due to obstruction.

LEGEND:

- ▼ –Pressuremeter Test (PMT)
- ◕ –Vane Shear Test (V)
- ⊗ –Permeability Test (PBT)
- ▤ –Packer Test (PKT)
- ⊠ –Standard Penetration Test (P)
- ▨ –Undisturbed Sample (UD)
- –Open Drive Thickwall Sample (OD)
- ▧ –Mazier Sample (MZ)
- –Denison Sample (DS)
- □ –Attempted (UD), (OD), (PS), (MZ) & (DS)
- ■ –Piston Sample (PS)
- ◧ –Core Run (CR)

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PRELIMINARY FIELD LOG

KIMARO GEOTECHNICAL ENGINEERING PTE LTD

CLIENT: HOUSING AND DEVELOPMENT BOARD (HDB)

CONSULTANT: TEP Consultants Pte Ltd

PROJECT: Soil Investigation works at Tengah Phase 1

LOCATION: Jurong Road – Track 22

PROJECT NO: JB108/TC32-WI058/2011

BOREHOLE NO: BH-9

WATER LEVEL: 0.50m BGL (Highest)
0.67m BGL (Average)

DRILLING DATE STARTED: 27/03/2013

BOREHOLE DIA: 100 mm

DRILLING DATE COMPLETED: 02/04/2013

CORE DIA: 50 mm

REDUCED LEVEL: 103.477
NORTHING: 37936.536
EASTING: 15527.819

PREPARED BY: MSS/ Zaw Min Tun

DRILLING METHOD: RO

Description	Graphic Log	Depth (m) (Thickness)	Reduced Level (m)	Scale	SPT (N-Value) 0 20 40 60 80 100	Blows/cm	Samples & Tests: Legend	Type & No.	Depth (m)	Rock: TCR(%)	Rock: RQD(%)	Geological Classification	Grain Size Analysis G/SA/S/C	Unified Soil Classification	Shear Strength: C (kN/m²)	Shear Strength: φ (°)	Bulk Density (Mg/m³)	Water Content (%)	Atterberg Limit (%): LL	Atterberg Limit (%): PL
Firm, light to dark grey, Sandy CLAY (KALLANG FORMATION)		(3.00)		21–22	•	6/30 (3/3/3)		SPT7 D5	21.00–21.45											
		23.00	80.48	23								F2		CS						
Very soft, dark brown, Organic CLAY with woods (KALLANG FORMATION)		(2.50)		24–25	•	0/30		SPT8 D6	24.00–24.45											
		25.50	77.98	25								E		CO						
Stiff, grey, Sandy CLAY (KALLANG FORMATION)		(2.50)		26–27	•	11/30 (3/5/6)		SPT9 D7	27.00–27.45											
		28.00	75.48	28								F2		CS						
Medium dense, grey, Silty SAND (JURONG FORMATION)		(6.00)		29–31	•	16/30 (5/7/9)		SPT10 D8	30.00–30.45											
		34.00	69.48	34		29/30 (7/13/16)		SPT11	33.00–33.45			SVI		SM						
Dense, brown, slightly Silty SAND (JURONG FORMATION)		(5.00)		35–38	•	43/30 (8/17/26)		SPT12 D9	36.00–36.45											
Moderately strong, grey, highly weathered, fine-coarse grained, SANDSTONE (JURONG FORMATION)		39.00	64.46	39				SPT13	39.00Rebound			SVI		SM						
		(1.00) 40.00	63.48	40	RQD/TCR(%)			CR1	39.00–40.00	100	13	SIV		SA						

TO BE CONTINUED

REMARKS:

LEGEND:

- ▼ –Pressuremeter Test (PMT)
- ◕ –Vane Shear Test (V)
- ⊗ –Permeability Test (PBT)
- ▤ –Packer Test (PKT)
- ⊠ –Standard Penetration Test (P)
- ▨ –Undisturbed Sample (UD)
- –Open Drive Thickwall Sample (OD)
- ▧ –Mazier Sample (MZ)
- –Denison Sample (DS)
- □ –Attempted (UD), (OD), (PS), (MZ) & (DS)
- ■ –Piston Sample (PS)
- ◧ –Core Run (CR)

NOTE: –The information provided in this preliminary Field Log which are subjected to prior review of official Report are based on the results of field investigation and visual soil description, some interpretations may differ from lavoratory results and final SI Report.
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PRELIMINARY FIELD LOG

KIMARO GEOTECHNICAL ENGINEERING PTE LTD

CLIENT: HOUSING AND DEVELOPMENT BOARD (HDB)

CONSULTANT: TEP Consultants Pte Ltd

PROJECT: Soil Investigation works at Tengah Phase 1

LOCATION: Jurong Road – Track 22

PROJECT NO: JB108/TC32-WI058/2011

BOREHOLE NO: BH-9

WATER LEVEL: 0.50m BGL (Highest)
0.67m BGL (Average)

DRILLING DATE STARTED: 27/03/2013

BOREHOLE DIA: 100 mm

DRILLING DATE COMPLETED: 02/04/2013

CORE DIA: 50 mm

REDUCED LEVEL: 103.477
NORTHING: 37936.536
EASTING: 15527.819

PREPARED BY: MSS/ Zaw Min Tun

DRILLING METHOD: RO

Description	Graphic Log	Depth (m) (Thickness)	Reduced Level (m)	Scale	SPT (N-Value) 0 20 40 60 80 100	Blows/cm	Samples & Tests: Legend	Type & No.	Depth (m)	Rock: TCR(%)	Rock: RQD(%)	Geological Classification	Grain Size Analysis G/SA/S/C	Unified Soil Classification	Shear Strength: C (kN/m²)	Shear Strength: φ (°)	Bulk Density (Mg/m³)	Water Content (%)	Atterberg Limit (%): LL	Atterberg Limit (%): PL
Moderately strong, grey, highly weathered, fine-coarse grained, SANDSTONE (JURONG FORMATION)		(2.00)		41				CR2	40.00-41.00	100	0									
		42.00	61.48	42				CR3	41.00-42.00	100	76	SIV		SA						
Borehole was terminated at 42.00m due to water loss and core barrel was jammed.				43																
				44																
				45																
				46																
				47																
				48																
				49																
				50																
				51																
				52																
				53																
				54																
				55																
				56																
				57																
				58																
				59																
				60																

RQD/TCR(%)

Ground Water Level (Measured from Ground Level)

Date (dd/mm/yyyy)	Time (hh:mm)	Borehole Depth (m)	Casing Depth (m)	Water Level (m)
27/03/2013	18:30	19.00	12.00	0.50
28/03/2013	08:30	19.00	12.00	0.60
28/03/2013	18:30	37.00	15.00	0.60
01/04/2013	08:30	37.00	15.00	0.80
01/04/2013	18:30	41.00	39.50	0.70
02/04/2013	08:30	41.00	39.50	0.80

REMARKS:

LEGEND:

- Pressuremeter Test (PMT)
- Vane Shear Test (V)
- Permeability Test (PBT)
- Packer Test (PKT)
- Standard Penetration Test (P)
- Undisturbed Sample (UD)
- Open Drive Thickwall Sample (OD)
- Mazier Sample (MZ)
- Denison Sample (DS)
- Attempted (UD), (OD), (PS), (MZ) & (DS)
- Piston Sample (PS)
- Core Run (CR)

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PRELIMINARY FIELD LOG

SHEET NO: 1 OF 2

KIMARO GEOTECHNICAL ENGINEERING PTE LTD

CLIENT: HOUSING AND DEVELOPMENT BOARD (HDB)

CONSULTANT: TEP Consultants Pte Ltd

PROJECT: Soil Investigation works at Tengah Phase 1

LOCATION: Jurong Road – Track 22

PROJECT NO: JB108/TC32-WI058/2011

BOREHOLE NO: BH-10

WATER LEVEL: 0.80m BGL (Highest)
1.28m BGL (Average)

DRILLING DATE STARTED: 26/03/2013

BOREHOLE DIA: 100 mm

DRILLING DATE COMPLETED: 28/03/2013

CORE DIA: 50 mm

REDUCED LEVEL: 111.478
NORTHING: 42726.998
EASTING: 34320.004

PREPARED BY: MSS/ Zaw Min Tun

DRILLING METHOD: RO

Description	Graphic Log	Depth (m) (Thickness)	Reduced Level (m)	Scale	SPT (N-Value) 0 20 40 60 80 100	Blows/cm	Samples & Tests: Legend	Type & No.	Depth (m)	Rock: TCR(%)	Rock: RQD(%)	Geological Classification	Grain Size Analysis G/SA/S/C	Unified Soil Classification	Shear Strength: C (kN/m²)	Shear Strength: φ (°)	Bulk Density (Mg/m³)	Water Content (%)	Atterberg Limit (%): LL	Atterberg Limit (%): PL
Trial Pit 0.5x1.0x1.0m. Hand Auger 1.0m-3.0m. Firm, yellowish brown, Sandy SILT (FILL)		(0.50) 0.50	110.98					D1				FILL		MS						
Firm, reddish yellow mottled white, Sandy SILT (JURONG FORMATION)		(3.50)						UD1	2.00-2.90											
						7/30 (2/3/4)		SPT1 D2	3.00-3.45											
		4.00	107.48									SVI		MS						
Stiff to very stiff, light yellow spotted white, Sandy SILT (JURONG FORMATION)								UD2	4.00-4.90											
		(6.00)				13/30 (3/5/8)		SPT2 D3	6.00-6.45											
						17/30 (9/8/9)		SPT3	9.00-9.45											
		10.00	101.48									SVI		MS						
Very stiff, light yellow spotted white, Sandy SILT (JURONG FORMATION)																				
		(6.50)				19/30 (5/8/ 11)		SPT4 D4	12.00-12.45											
						23/30 (7/10/ 13)		SPT5	15.00-15.45											
		16.50	94.98									SVI		MS						
Hard, whitish grey, Sandy SILT (JURONG FORMATION)																				
		(3.50)				45/30 (11/18/ 27)		SPT6 D5	18.00-18.45											
		20.00	91.48									SVI		MS						

RQD/TCR(%)

TO BE CONTINUED

REMARKS:

LEGEND:

- Pressuremeter Test (PMT)
- Vane Shear Test (V)
- Permeability Test (PBT)
- Packer Test (PKT)
- Standard Penetration Test (P)
- Undisturbed Sample (UD)
- Open Drive Thickwall Sample (OD)
- Mazier Sample (MZ)
- Denison Sample (DS)
- Attempted (UD), (OD), (PS), (MZ) & (DS)
- Piston Sample (PS)
- Core Run (CR)

NOTE: -The information provided in this preliminary Field Log which are subjected to prior review of official Report are based on the results of field investigation and visual soil description, some interpretations may differ from lavoratory results and final SI Report.
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PRELIMINARY FIELD LOG

KIMARO GEOTECHNICAL ENGINEERING PTE LTD

CLIENT: HOUSING AND DEVELOPMENT BOARD (HDB)

CONSULTANT: TEP Consultants Pte Ltd

PROJECT: Soil Investigation works at Tengah Phase 1

LOCATION: Jurong Road – Track 22

PROJECT NO: JB108/TC32-WI058/2011

BOREHOLE NO: BH-10

WATER LEVEL: 0.80m BGL (Highest)
1.28m BGL (Average)

DRILLING DATE STARTED: 26/03/2013

BOREHOLE DIA: 100 mm

DRILLING DATE COMPLETED: 28/03/2013

CORE DIA: 50 mm

REDUCED LEVEL: 111.478
NORTHING: 42726.998
EASTING: 34320.004

PREPARED BY: MSS/ Zaw Min Tun

DRILLING METHOD: RO

Description	Graphic Log	Depth (m) (Thickness)	Reduced Level (m)	Scale	SPT (N-Value) 0 20 40 60 80 100	Blows/cm	Samples & Tests: Legend	Type & No.	Depth (m)	Rock: TCR(%)	Rock: RQD(%)	Geological Classification	Grain Size Analysis G/SA/S/C	Unified Soil Classification	Shear Strength: C (kN/m²)	Shear Strength: φ (°)	Bulk Density (Mg/m³)	Water Content (%)	Atterberg Limit (%): LL	Atterberg Limit (%): PL
Hard, dark grey, Sandy SILT with some rock fragments (JURONG FORMATION)	XXX	(7.00)		21–24	•	83/30 (17/36/47)		SPT7	21.00–21.45											
					•	100/26 (25/58/42)		SPT8 D6	24.00–24.41											
		27.00	84.48	27	•			SPT9	27.00Rebound			SV		MS						
Moderately strong, dark grey, highly weathered, boulders SILTSTONE (JURONG FORMATION)	XXX	27.20	84.28		•	100/27 (25/56/44)		SPT10 D7	27.50–27.92			SIV		SI						
Hard, dark grey, Sandy SILT with some rock fragments (JURONG FORMATION)	XXX	(6.15)		28–33	•	100/21 (25/69/31)		SPT10	30.00–30.36											
	XXX	33.35	78.13		•	100/20 (25/71/29)		SPT11	33.00–33.35			SV		MS						
Borehole was terminated at 33.35m with the instruction from engineer in charge.				34–40																

RQD/TCR(%)

Ground Water Level (Measured from Ground Level)

Date (dd/mm/yyyy)	Time (hh:mm)	Borehole Depth (m)	Casing Depth (m)	Water Level (m)
26/03/2013	18:30	19.00	9.00	0.80
27/03/2013	08:30	19.00	9.00	1.10
27/03/2013	18:30	27.00	27.00	1.50
28/03/2013	08:30	27.00	27.00	1.70

REMARKS:

LEGEND:

- –Pressuremeter Test (PMT)
- –Vane Shear Test (V)
- –Permeability Test (PBT)
- –Packer Test (PKT)
- –Standard Penetration Test (P)
- –Undisturbed Sample (UD)
- –Open Drive Thickwall Sample (OD)
- –Mazier Sample (MZ)
- –Denison Sample (DS)
- –Attempted (UD), (OD), (PS), (MZ) & (DS)
- –Piston Sample (PS)
- –Core Run (CR)

NOTE: –The information provided in this preliminary Field Log which are subjected to prior review of official Report are based on the results of field investigation and visual soil description, some interpretations may differ from lavoratory results and final SI Report.
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PRELIMINARY FIELD LOG

KIMARO GEOTECHNICAL ENGINEERING PTE LTD

CLIENT: HOUSING AND DEVELOPMENT BOARD (HDB)

CONSULTANT: TEP Consultants Pte Ltd

PROJECT: Soil Investigation works at Tengah Phase 1

LOCATION: Jurong Road – Track 22

PROJECT NO: JB108/TC32-WI058/2011

BOREHOLE NO: BH–11

WATER LEVEL: 1.20m BGL (Highest)
1.98m BGL (Average)

DRILLING DATE STARTED: 22/03/2013

BOREHOLE DIA: 100 mm

DRILLING DATE COMPLETED: 26/03/2013

CORE DIA: 50 mm

REDUCED LEVEL: 119.324
NORTHING: 38788.516
EASTING: 16376.983

PREPARED BY: MSS/ Zaw Min Tun

DRILLING METHOD: RO

Description	Graphic Log	Depth (m) (Thickness)	Reduced Level (m)	Scale	SPT (N–Value) 0 20 40 60 80 100	Blows/cm	Samples & Tests: Legend	Type & No.	Depth (m)	Rock: TCR(%)	Rock: RQD(%)	Geological Classification	Grain Size Analysis G/SA/S/C	Unified Soil Classification	Shear Strength: C (kN/m²)	Shear Strength: φ (°)	Bulk Density (Mg/m³)	Water Content (%)	Atterberg Limit (%): LL	Atterberg Limit (%): PL
Trial Pit 0.5x1.0x1.0m. Hand Auger 1.0m–3.0m. Stiff, brown, Sandy CLAY (FILL)		0.30	119.02					D1				FILL		CS						
Very stiff, reddish brown mottled white, Sandy SILT (JURONG FORMATION)		(7.20)		1 2 3 4 5 6 7				UD1	2.00–2.90											
					•	16/30 (4/6/ 10)		SPT1 D2	2.90–3.35											
								UD2	4.00–4.90											
					•	21/30 (4/8/ 13)		SPT2	6.00–6.45											
		7.50	111.82	8								SVI		MS						
Stiff, purplish brown, Sandy SILT (JURONG FORMATION)		(2.50)		9																
					•	14/30 (2/6/8)		SPT3 D3	9.00–9.45											
		10.00	109.32	10								SVI		MS						
Very stiff, purplish brown, Sandy SILT (JURONG FORMATION)		(3.50)		11 12 13																
					•	33/30 (8/14/ 19)		SPT4 D4	12.00–12.45											
		13.50	105.82	14								SVI		MS						
Hard, purplish brown, Sandy SILT (JURONG FORMATION)		(6.50)		15 16 17 18 19																
					•	65/30 (16/27/ 38)		SPT5 D5	15.00–15.45											
					•	60/30 (14/24/ 36)		SPT6	18.00–18.45											
		20.00	99.32	20								SVI		MS						

RQD/TCR(%)

TO BE CONTINUED

REMARKS:

LEGEND:

- –Pressuremeter Test (PMT)
- –Vane Shear Test (V)
- –Permeability Test (PBT)
- –Packer Test (PKT)
- –Standard Penetration Test (P)
- –Undisturbed Sample (UD)
- –Open Drive Thickwall Sample (OD)
- –Mazier Sample (MZ)
- –Denison Sample (DS)
- –Attempted (UD), (OD), (PS), (MZ) & (DS)
- –Piston Sample (PS)
- –Core Run (CR)

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PRELIMINARY FIELD LOG

KIMARO GEOTECHNICAL ENGINEERING PTE LTD

CLIENT: HOUSING AND DEVELOPMENT BOARD (HDB)

CONSULTANT: TEP Consultants Pte Ltd

PROJECT: Soil Investigation works at Tengah Phase 1

LOCATION: Jurong Road – Track 22

PROJECT NO: JB108/TC32-WI058/2011

BOREHOLE NO: BH–11

WATER LEVEL: 1.20m BGL (Highest)
1.98m BGL (Average)

DRILLING DATE STARTED: 22/03/2013

BOREHOLE DIA: 100 mm

DRILLING DATE COMPLETED: 26/03/2013

CORE DIA: 50 mm

REDUCED LEVEL: 119.324
NORTHING: 38788.516
EASTING: 16376.983

PREPARED BY: MSS/ Zaw Min Tun

DRILLING METHOD: RO

Description	Graphic Log	Depth (m) (Thickness)	Reduced Level (m)	Scale	SPT (N-Value) 0 20 40 60 80 100	Blows/cm	Samples & Tests: Legend	Type & No.	Depth (m)	Rock: TCR(%)	Rock: RQD(%)	Geological Classification	Grain Size Analysis G/SA/S/C	Unified Soil Classification	Shear Strength: C (kN/m²)	Shear Strength: φ (°)	Bulk Density (Mg/m³)	Water Content (%)	Atterberg Limit (%): LL	Atterberg Limit (%): PL
Hard, reddish brown, slightly Sandy SILT (JURONG FORMATION)	XXX	(3.00)		21	•	85/30 (19/36/49)		SPT7 D6	21.00–21.45											
	XXX	23.00	96.32	22								SVI		MS						
Hard, reddish brown, slightly Sandy SILT with some rock fragments (JURONG FORMATION)	XXX	(5.00)		23																
	XXX	28.00	91.32	24	•	100/20 (25/61/39)		SPT8 D7	24.00–24.35											
Hard, reddish brown, slightly Sandy SILT (JURONG FORMATION)	XXX	(2.22)		25																
	XXX	30.22	89.10	26																
Borehole was terminated at 30.22m with the instruction from engineer in charge.				27	•	100/16 (25/82/18)		SPT9	27.00–27.31			SV		MS						
				28																
				29																
				30	•	100/7 (25/100)		SPT10 D8	30.00–30.22			SV		MS						
				31																
				32																
				33																
				34																
				35																
				36																
				37																
				38																
				39																
				40																

RQD/TCR(%)

Ground Water Level (Measured from Ground Level)

Date (dd/mm/yyyy)	Time (hh:mm)	Borehole Depth (m)	Casing Depth (m)	Water Level (m)
22/03/2013	18:30	13.50	6.00	1.20
23/03/2013	08:30	13.50	6.00	1.50
23/03/2013	18:30	22.50	12.00	1.80
25/03/2013	08:30	22.50	12.00	2.30
25/03/2013	18:30	28.50	12.00	2.40
26/03/2013	08:30	28.50	12.00	2.70

REMARKS:

LEGEND:

- ▼ –Pressuremeter Test (PMT)
- ◕ –Vane Shear Test (V)
- ⊗ –Permeability Test (PBT)
- ▤ –Packer Test (PKT)
- ⊠ –Standard Penetration Test (P)
- ▨ –Undisturbed Sample (UD)
- –Open Drive Thickwall Sample (OD)
- ▧ –Mazier Sample (MZ)
- –Denison Sample (DS)
- □ –Attempted (UD), (OD), (PS), (MZ) & (DS)
- ■ –Piston Sample (PS)
- ◧ –Core Run (CR)

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APPENDIX D

SUMMARY AND RESULTS OF LABORATORY SOIL TESTING

SUMMARY

PROJECT	Site Investigation Works at Tengah Phase 1
WORKS INSTRUCTION	WI058
JOB NUMBER	1304/10360

BOREHOLE NUMBER		BH-1		BH-2	
SAMPLE NUMBER		UD-1	UD-2	UD-1	UD-2
DEPTH (m)	from	2.00	4.00	2.00	4.00
	to	2.90	4.90	2.90	4.90
MOISTURE CONTENT (%)		28	23	32	27
DENSITY (Mg/m^3)	Bulk Density	1.99	2.01	1.93	2.01
	Dry Density	1.55	1.63	1.46	1.58
PARTICLE SIZE DISTRIBUTION (%)	Clay	14	19	52	35
	Silt	29	29	41	54
	Sand	34	50	2	11
	Gravel	23	2	5	0
TRIAXIAL COMPRESSION	Type of Test *1	-	-	-	UU
	Cohesion, C (kN/m^2)	-	-	-	47
	Phi Angle, PHI (degree)	-	-	-	0
TRIAXIAL COMPRESSION	Type of Test *2	-	CU	-	-
	Cohesion, Effective, C' (kN/m^2)	-	16	-	-
	Phi Angle, Effective, PHI' (degree)	-	30	-	-
CONSOLIDATION	Type of Test *4	-	O	-	-
	Pre-Consolidated Pressure, Pc (kN/m^2)	-	51	-	-
	Compression Index, Cc	-	0.120	-	-

Lab Services Private Limited

LEGEND * ~

*1 ~ UU - *Unconsolidated Undrained Triaxial Compression*
*2 ~ CU - *Consolidated Undrained Triaxial Compression*
*4 ~ O - *One Dimensional Consolidation*

TESTING OFFICER - C. Raja

APPROVED / CHECKED -

Samuel Teng
(AUTHORISED SIGNATORY)

Lab Services Private Limited

ACCREDITED LABORATORY
SAC-SINGLAS
Cert. No: LA-2001-0226-B

This Laboratory Is Accredited Under The Singapore Accreditation Council - Singapore Laboratory Accreditation Scheme (SAC-SINGLAS) & Has Met The Requirements Of ISO / IEC 17025:2005.

The Results Reported Herein Have Been Performed In Accordance With The Laboratory's Terms Of Accreditation Under The Singapore Accreditation Council - Singapore Laboratory Accreditation Scheme (SAC-SINGLAS).

SUMMARY

PROJECT	Site Investigation Works at Tengah Phase 1
WORKS INSTRUCTION	WI058
JOB NUMBER	1304/10360

BOREHOLE NUMBER		BH-3	
SAMPLE NUMBER		UD-1	UD-2
DEPTH (m)	from	2.00	4.00
	to	2.90	4.90
MOISTURE CONTENT (%)		21	24
DENSITY (Mg/m^3)	Bulk Density		2.03
	Dry Density	-	1.64
PARTICLE SIZE DISTRIBUTION (%)	Clay	13	24
	Silt	13	38
	Sand	12	34
	Gravel	62	4
TRIAXIAL COMPRESSION	Type of Test *2	-	CU
	Cohesion, Effective, C' (kN/m^2)	-	11
	Phi Angle, Effective, PHI' (degree)	-	34
			Lab Services Private Limited

LEGEND * ~

*2 ~ CU - *Consolidated Undrained Triaxial Compression*

TESTING OFFICER - C. Raja

APPROVED / CHECKED -

Samuel Teng
(AUTHORISED SIGNATORY)
Lab Services Private Limited

ACCREDITED LABORATORY SAC-SINGLAS Cert. No: LA-2001022B-E

This Laboratory Is Accredited Under The Singapore Accreditation Council - Singapore Laboratory Accreditation Scheme (SAC-SINGLAS) & Has Met The Requirements Of ISO / IEC 17025:2005.

The Results Reported Herein Have Been Performed In Accordance With The Laboratory's Terms Of Accreditation Under The Singapore Accreditation Council - Singapore Laboratory Accreditation Scheme (SAC-SINGLAS).

SUMMARY

PROJECT	Site Investigation Works at Tengah Phase 1
WORKS INSTRUCTION	WI058
JOB NUMBER	1304/10360

BOREHOLE NUMBER			BH-4		BH-5
SAMPLE NUMBER			UD-1	UD-2	UD-1
DEPTH (m)		from	2.00	4.00	2.00
		to	2.90	4.90	2.60
MOISTURE CONTENT (%)			26	25	29
DENSITY (Mg/m^3)	Bulk Density		1.97	1.99	1.94
	Dry Density		1.56	1.59	1.50
PARTICLE SIZE DISTRIBUTION (%)	Clay		13	20	28
	Silt		31	33	29
	Sand		56	47	29
	Gravel		0	0	14
TRIAXIAL COMPRESSION	Type of Test *2		CD	-	-
	Cohesion, Effective, C' (kN/m^2)		32	-	-
	Phi Angle, Effective, PHI' (degree)		26	-	-

Lab Services Private Limited

LEGEND * ~

*2 ~ CU - *Consolidated Undrained Triaxial Compression*
CD - *Consolidated Drained Triaxial Compression*

TESTING OFFICER - C. Raja

APPROVED / CHECKED -

Samuel Teng
(AUTHORISED SIGNATORY)

Lab Services Private Limited

ACCREDITED LABORATORY SAC-SINGLAS Cert. No. LA-2001-0226-B

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The Results Reported Herein Have Been Performed In Accordance With The Laboratory's Terms Of Accreditation Under The Singapore Accreditation Council - Singapore Laboratory Accreditation Scheme (SAC-SINGLAS).

SUMMARY

PROJECT	Site Investigation Works at Tengah Phase 1
WORKS INSTRUCTION	WI058
JOB NUMBER	1304/10360

BOREHOLE NUMBER			BH-6	BH-8	BH-9
SAMPLE NUMBER			UD-2	UD-2	UD-2
DEPTH (m)		from	4.00	4.00	4.00
		to	4.90	4.90	4.90
MOISTURE CONTENT (%)			243	29	123
DENSITY (Mg/m^3)	Bulk Density		1.14	1.96	1.31
	Dry Density		0.33	1.52	0.59
PARTICLE SIZE DISTRIBUTION (%)	Clay		32	33	41
	Silt		68	55	53
	Sand		0	12	6
	Gravel		0	0	0
TRIAXIAL COMPRESSION	Type of Test *2		CU	CU	CU
	Cohesion, Effective, C' (kN/m^2)		22	17	12
	Phi Angle, Effective, PHI' (degree)		33	29	21
CONSOLIDATION	Type of Test *4		O	-	-
	Pre-Consolidated Pressure, Pc (kN/m^2)		92	-	-
	Compression Index, Cc		5.352	-	-

Lab Services Private Limited

LEGEND * ~

*2 ~ CU - *Consolidated Undrained Triaxial Compression*
*4 ~ O - *One Dimensional Consolidation*

TESTING OFFICER - C. Raja

APPROVED / CHECKED -

Samuel Teng
(AUTHORISED SIGNATORY)

Lab Services Private Limited

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SUMMARY

PROJECT	Site Investigation Works at Tengah Phase 1
WORKS INSTRUCTION	WI058
JOB NUMBER	1304/10360

BOREHOLE NUMBER		BH-10		BH-11	
SAMPLE NUMBER		UD-1	UD-2	UD-1	UD-2
DEPTH (m)	from	2.00	4.00	2.00	4.00
	to	2.90	4.90	2.90	4.90
MOISTURE CONTENT (%)		32	20	28	27
DENSITY (Mg/m^3)	Bulk Density	1.89	2.02	2.02	2.04
	Dry Density	1.43	1.68	1.58	1.61
PARTICLE SIZE DISTRIBUTION (%)	Clay	29	13	37	23
	Silt	31	23	63	76
	Sand	39	63	0	1
	Gravel	1	1	0	0
TRIAXIAL COMPRESSION	Type of Test *1	-	UU	-	-
	Cohesion, C (kN/m^2)	-	164	-	-
	Phi Angle, PHI (degree)	-	0	-	-
TRIAXIAL COMPRESSION	Type of Test *2	CU	-	CU	-
	Cohesion, Effective, C' (kN/m^2)	19	-	20	-
	Phi Angle, Effective, PHI' (degree)	29	-	29	-

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LEGEND * ~

*1 ~ UU - *Unconsolidated Undrained Triaxial Compression*
*2 ~ CU - *Consolidated Undrained Triaxial Compression*

TESTING OFFICER - C. Raja

APPROVED / CHECKED -

Samuel Teng
(AUTHORISED SIGNATORY)

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SUMMARY

PROJECT	Site Investigation Works at Tengah Phase 1
WORKS INSTRUCTION	WI058
JOB NUMBER	1304/10360

BOREHOLE NUMBER		BH-3	BH-7
SAMPLE TYPE		Rock Core	Rock Core
SAMPLE NUMBER		CR-1	CR-3
DEPTH (m)	from	14.00	14.40
	to	15.00	15.40
BULK DENSITY (Mg/m^3)		2.43	2.48
UNCONFINED COMPRESSIVE STRENGTH (MPa)		29.35	9.65

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BOREHOLE NUMBER		BH-3	BH-3	BH-6	BH-6
SAMPLE TYPE		Rock Core	Rock Core	Rock Core	Rock Core
SAMPLE NUMBER		CR-3	CR-5	CR-1	CR-2
DEPTH (m)	from	16.00	18.00	16.00	17.00
	to	17.00	19.00	17.00	18.00
POINT LOAD STRENGTH INDEX (MN/m^2)	Type of Test *3	D	D	D	D
	Corrected, $Is_{(50)}$	1.81	1.55	1.05	9.80

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BOREHOLE NUMBER		BH-7	BH-7	BH-9	BH-9
SAMPLE TYPE		Rock Core	Rock Core	Rock Core	Rock Core
SAMPLE NUMBER		CR1	CR-5	CR-1	CR-2
DEPTH (m)	from	12.40	16.40	39.00	40.00
	to	13.40	17.40	40.00	41.00
POINT LOAD STRENGTH INDEX (MN/m^2)	Type of Test *3	D	D	D	D
	Corrected, $Is_{(50)}$	3.47	1.98	1.54	4.90

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BOREHOLE NUMBER		BH-9
SAMPLE TYPE		Rock Core
SAMPLE NUMBER		CR3
DEPTH (m)	from	41.00
	to	42.00
POINT LOAD STRENGTH INDEX (MN/m^2)	Type of Test *3	D
	Corrected, $Is_{(50)}$	6.36

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LEGEND * ~

*3 ~ D - *Diametral*

TESTING OFFICER - C. Raja

APPROVED / CHECKED -

Samuel Teng
(AUTHORISED SIGNATORY)

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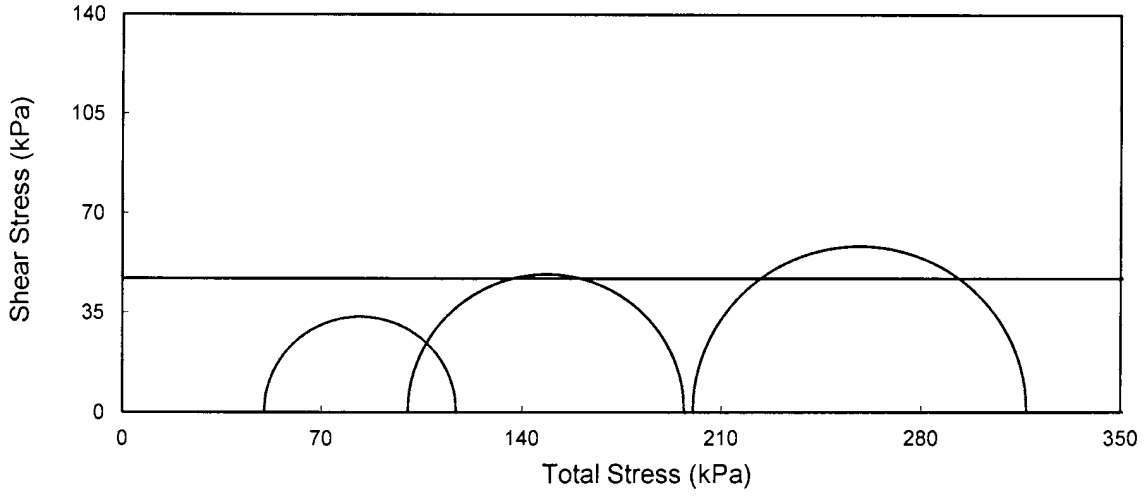
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UNCONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION

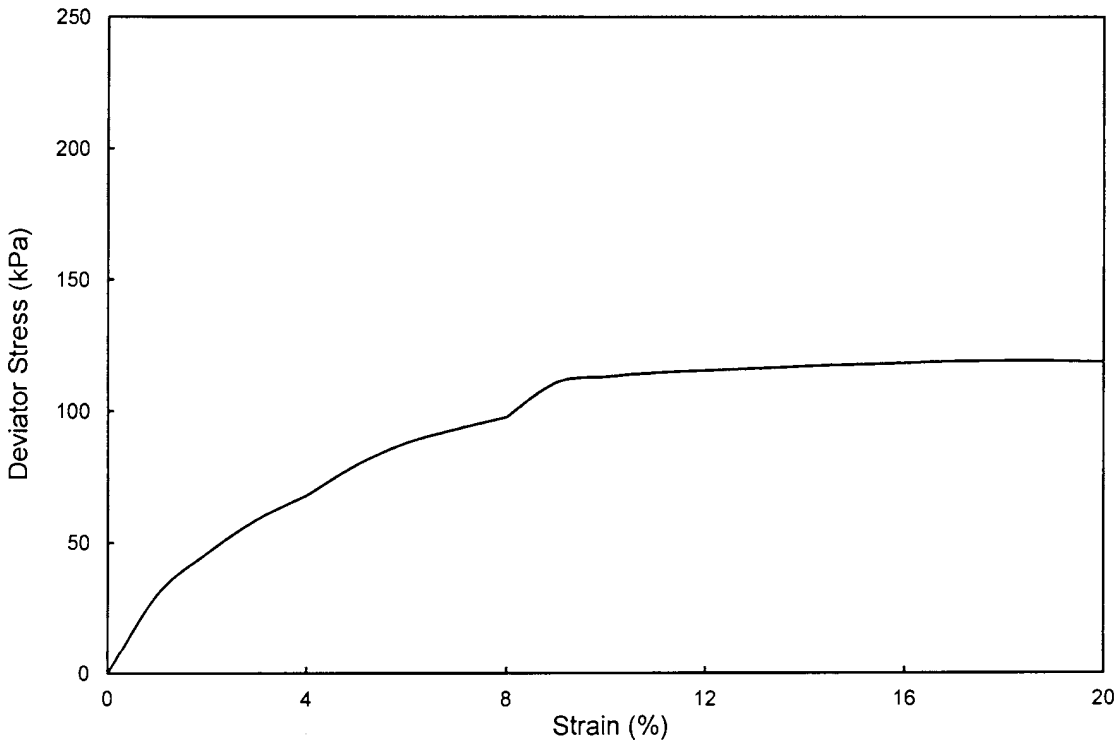
[TEST METHOD - BS 1377:1990:Part 7:Test 9]

PROJECT -	Site Investigation Works at Tengah Phase 1	BOREHOLE -	BH-2
WORKS INSTRUCTION -	WI058	SAMPLE -	UD-2
VISUAL DESCRIPTION -	Reddish brown & light grey slightly sandy CLAY	DEPTH (m) -	4.00 - 4.90
		JOB NUMBER -	1304/10360



COHESION (kN/m^2) - 47

PHI ANGLE (degree) - 0



HEIGHT (mm) 76

DIAMETER (mm) 38



STAGE	CELL PRESSURE (kN/m^2)	CORRECTED MAXIMUM DEVIATOR STRESS (kN/m^2)	UNDRAINED SHEAR STRENGTH, Cu (kN/m^2)	MAXIMUM STRAIN AT FAILURE (%)	MOISTURE CONTENT (%)	BULK / DRY DENSITY (Mg/m^3)	
1.	50	67	34	4	27	2.01	1.58
2.	100	97	49	8			
3.	200	117	59	18			

SAMPLE TYPE - Undisturbed

SHEARING RATE (mm/min) - 1.14

TESTING OFFICER - Y. Simon P.

APPROVED / CHECKED - (Authorised Signatory - Samuel Teng)

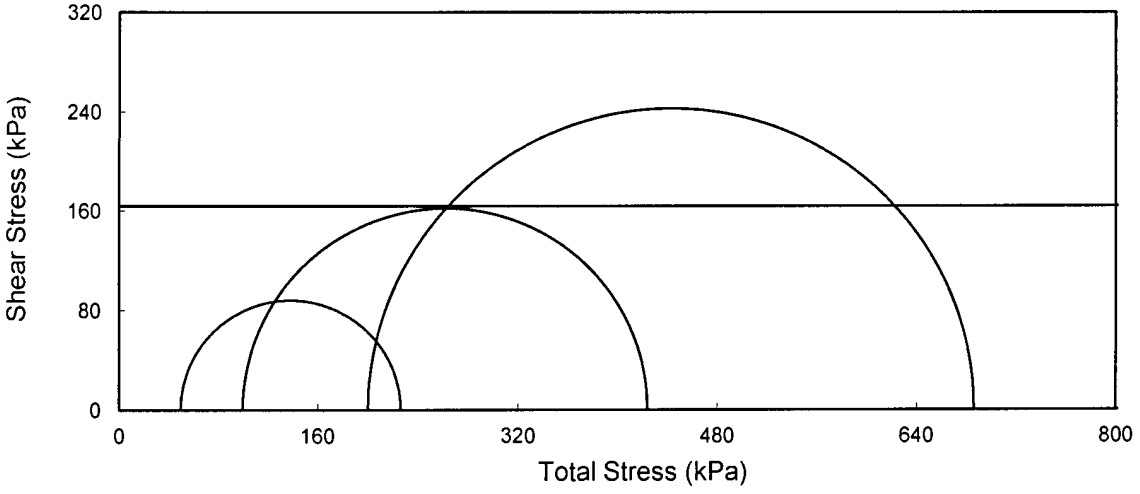
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UNCONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION

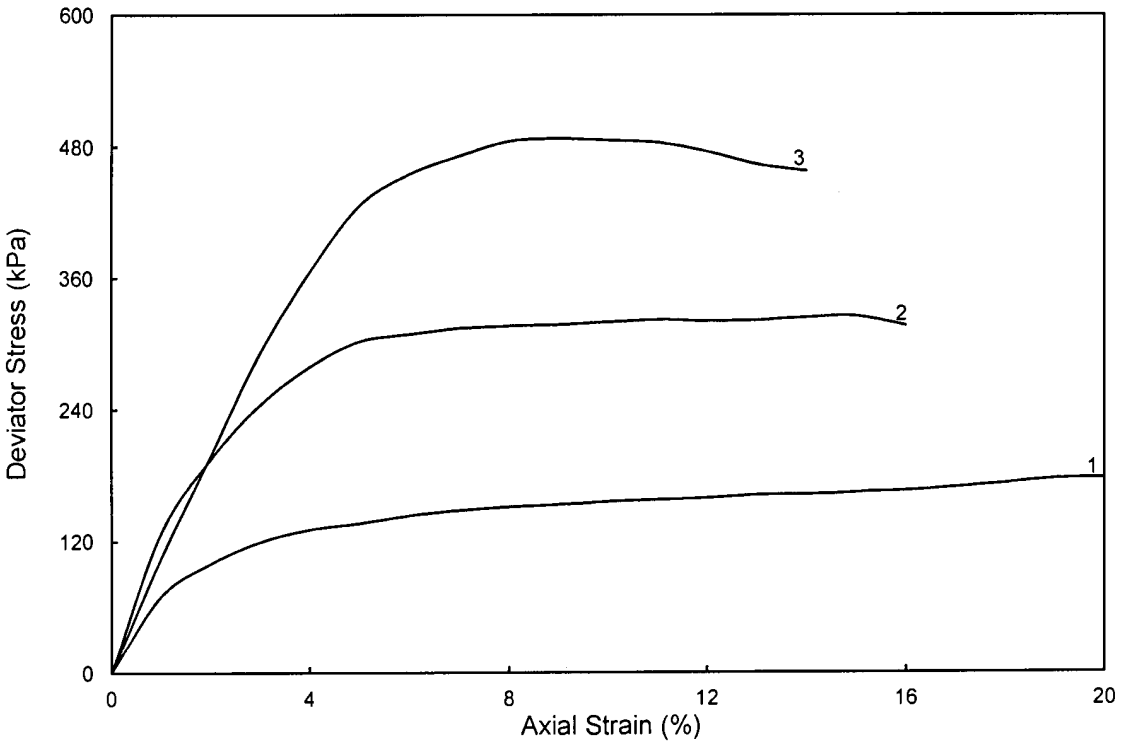
[TEST METHOD - BS 1377:1990:Part 7:Test 8]

PROJECT -	Site Investigation Works at Tengah Phase 1	BOREHOLE -	BH-10
WORKS INSTRUCTION -	WI058	SAMPLE -	UD-2
VISUAL DESCRIPTION -	Yellow & very pale brown slightly gravelly, sandy SILT	DEPTH (m) -	4.00 - 4.90
		JOB NUMBER -	1304/10360



COHESION (kN/m^2)
- 164

PHI ANGLE (degree)
- 0



HEIGHT (mm)
76

DIAMETER (mm)
38


STAGE 1


STAGE 2


STAGE 3

STAGE	CELL PRESSURE (kN/m^2)	CORRECTED MAXIMUM DEVIATOR STRESS (kN/m^2)	UNDRAINED SHEAR STRENGTH, Cu (kN/m^2)	MAXIMUM STRAIN AT FAILURE (%)	MOISTURE CONTENT (%)	BULK / DRY DENSITY (Mg/m^3)	
1.	50	176	88	20	22	1.99	1.63
2.	100	324	162	15	20	2.03	1.69
3.	200	486	243	9	18	2.04	1.73

SAMPLE TYPE - Undisturbed

SHEARING RATE (mm/min) - 1.52

TESTING OFFICER - Y. Simon P.	APPROVED / CHECKED - (Authorised Signatory - Samuel Teng)	ACCREDITED LABORATORY SAC-SINGLAS Cert. No: LA-2001-0226-B

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CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION

[TEST METHOD - BS 1377:1990:Part 8:Test 7]

PROJECT -	Site Investigation Works at Tengah Phase 1	BOREHOLE -	BH-1
WORKS INSTRUCTION -	WI058	SAMPLE -	UD-2
VISUAL DESCRIPTION -	Reddish brown slightly gravelly, sandy SILT	DEPTH (m) -	4.00 - 4.90
		JOB NUMBER -	1304/10360

SINGLE-STAGE TEST

STAGE -	1	2	3
INITIAL CONDITIONS -			
SAMPLE HEIGHT (mm)	76	76	76
SAMPLE DIAMETER (mm)	38	38	38
MOISTURE CONTENT (%)	24	22	24
BULK DENSITY (Mg/m3)	1.99	2.00	2.03
DRY DENSITY (Mg/m3)	1.60	1.64	1.64
PARTICLE DENSITY (Assumed)	2.70	2.70	2.70
VOID RATIO e_o	0.69	0.65	0.65
DEGREE OF SATURATION S_o (%)	93.9	91.4	99.7
FINAL B VALUE AFTER SATURATION	0.98	0.98	0.98
SHEAR STAGE -			
INITIAL CELL PRESSURE σ_3 (kN/m2)	350	400	500
INITIAL PORE PRESSURE u (kN/m2)	300	300	300
INITIAL EFFECTIVE PRESSURE (kN/m2)	50	100	200
STRAIN RATE (mm/min)	0.05	0.05	0.05
FAILURE AT MAXIMUM DEVIATOR STRESS CONDITION :-			
STRAIN (%)	20.58	21.32	21.44
CORRECTED DEVIATOR STRESS σ'_1-σ'_3 (kN/m2)	220.9	312.8	334.3
EFFECTIVE MINOR STRESS σ'_3 (kN/m2)	75.1	131.1	141.8
EFFECTIVE MAJOR STRESS σ'_1 (kN/m2)	296.0	443.9	476.1
A VALUE A_f	-0.114	-0.099	0.174
STRESS RATIO σ'_1/σ'_3	3.940	3.385	3.357
FAILURE AT MAXIMUM STRESS RATIO CONDITION :-			
STRAIN (%)	5.54	4.45	16.49
CORRECTED DEVIATOR STRESS σ'_1-σ'_3 (kN/m2)	141.1	209.0	328.0
EFFECTIVE MINOR STRESS σ'_3 (kN/m2)	41.9	74.8	133.0
EFFECTIVE MAJOR STRESS σ'_1 (kN/m2)	183.0	283.8	461.0
A VALUE A_f	0.057	0.121	0.204
STRESS RATIO σ'_1/σ'_3	4.363	3.795	3.466
FINAL CONDITION-			
MOISTURE CONTENT (%)	24	24	23
BULK DENSITY (Mg/m3)	2.03	2.08	2.12
DRY DENSITY (Mg/m3)	1.64	1.68	1.72
VOID RATIO e_f	0.65	0.61	0.57
DEGREE OF SATURATION S_f (%)	99.7	100.0	100.0

FAILURE MODE


Specimen 1


Specimen 2


Specimen 3

TESTING OFFICER - Y. Simon Ponraj	APPROVED / CHECKED - (Authorised Signatory - Samuel Teng)	ACCREDITED LABORATORY SAC-SINGLAS Cert No: LA-2001-0226-B

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CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION

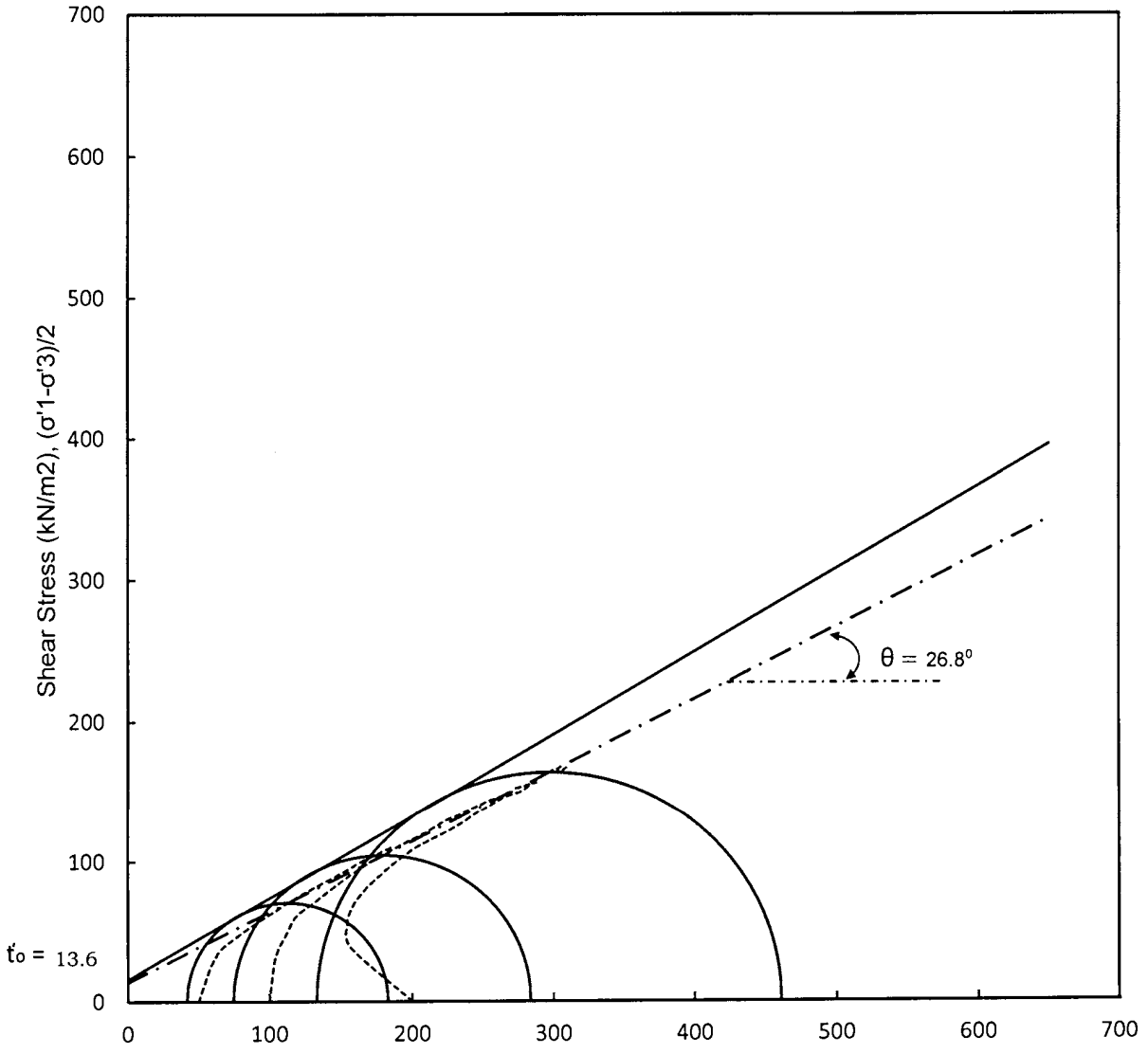
[TEST METHOD - BS 1377:1990:Part 8:Test 7]

PROJECT -	Site Investigation Works at Tengah Phase 1	BOREHOLE -	BH-1
WORKS INSTRUCTION -	WI058	SAMPLE -	UD-2
VISUAL DESCRIPTION -	Reddish brown slightly gravelly, sandy SILT	DEPTH (m) -	4.00 - 4.90
		JOB NUMBER -	1304/10360

SHEAR STAGE - MAXIMUM STRESS RATIO

c' (kN/m^2) - 16

ϕ' (degree) - 30



TESTING OFFICER - Y. Simon Ponraj	APPROVED / CHECKED - (Authorised Signatory - Samuel Teng)	ACCREDITED LABORATORY SAC-SINGLAS Cert. No: LA-2001-0226-B

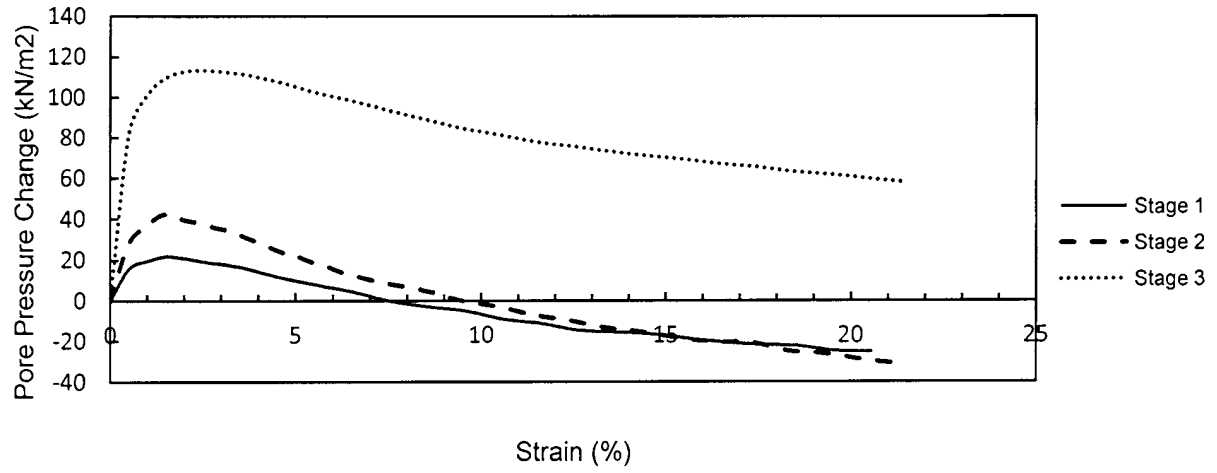
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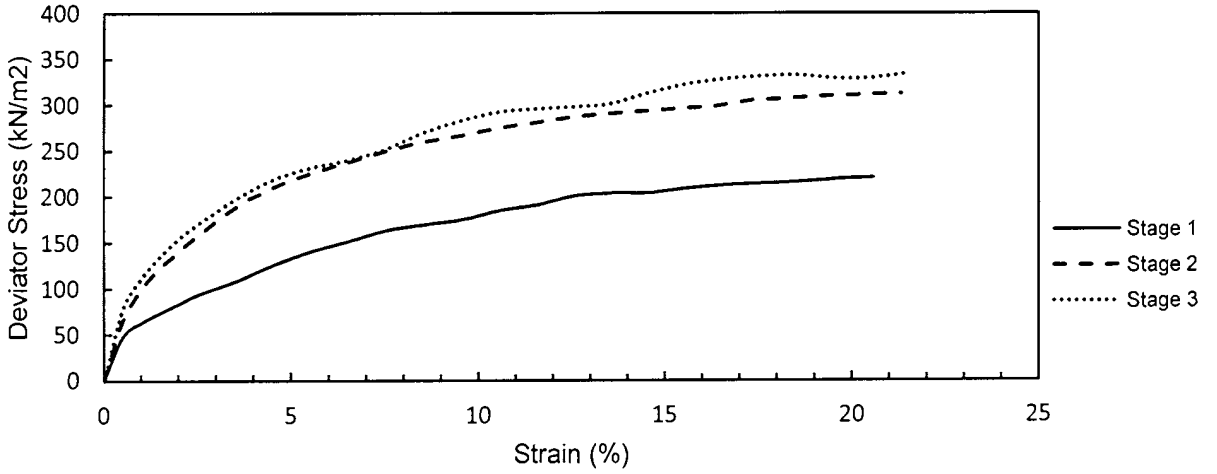
CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION

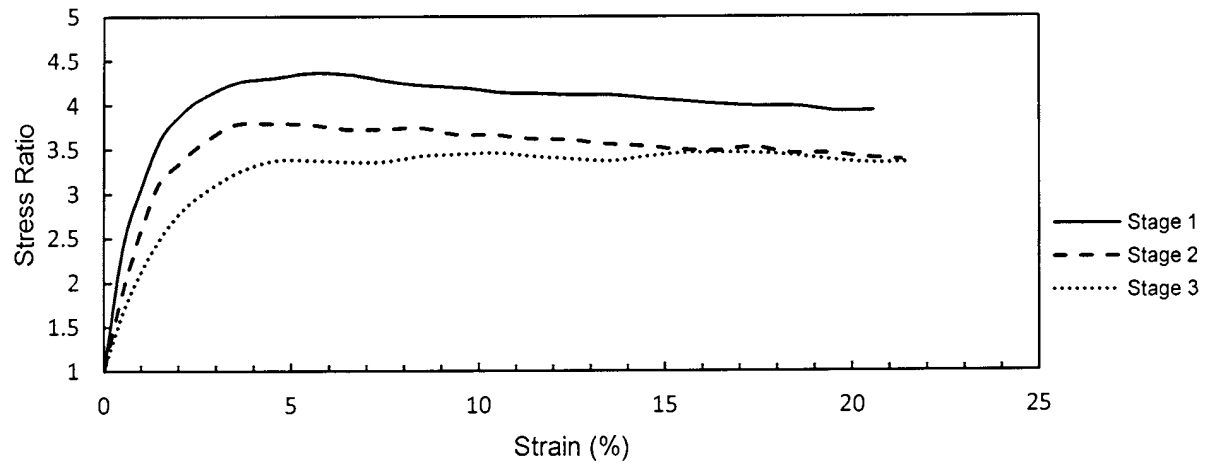
[TEST METHOD - BS 1377:1990:Part 8:Test 7]

PROJECT -	Site Investigation Works at Tengah Phase 1	BOREHOLE -	BH-1
WORKS INSTRUCTION -	WI058	SAMPLE -	UD-2
VISUAL DESCRIPTION -	Reddish brown slightly gravelly, sandy SILT	DEPTH (m) -	4.00 - 4.90
		JOB NUMBER -	1304/10360

SHEAR STAGE







TESTING OFFICER - Y. Simon Ponraj	APPROVED / CHECKED - (Authorised Signatory - Samuel Teng)	ACCREDITED LABORATORY SAC-SINGLAS Cert. No: LA-2001/0226-B

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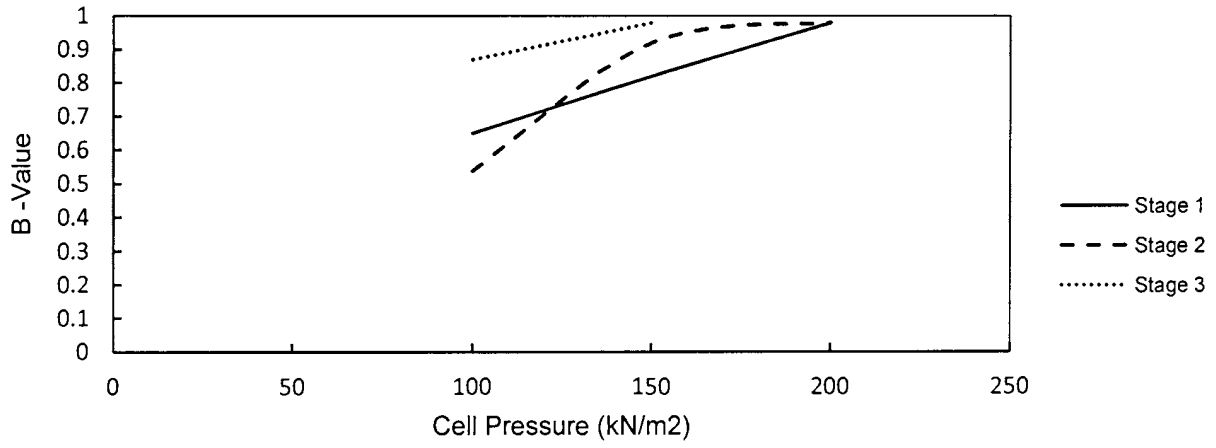
CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION

[TEST METHOD - BS 1377:1990:Part 8:Test 7]

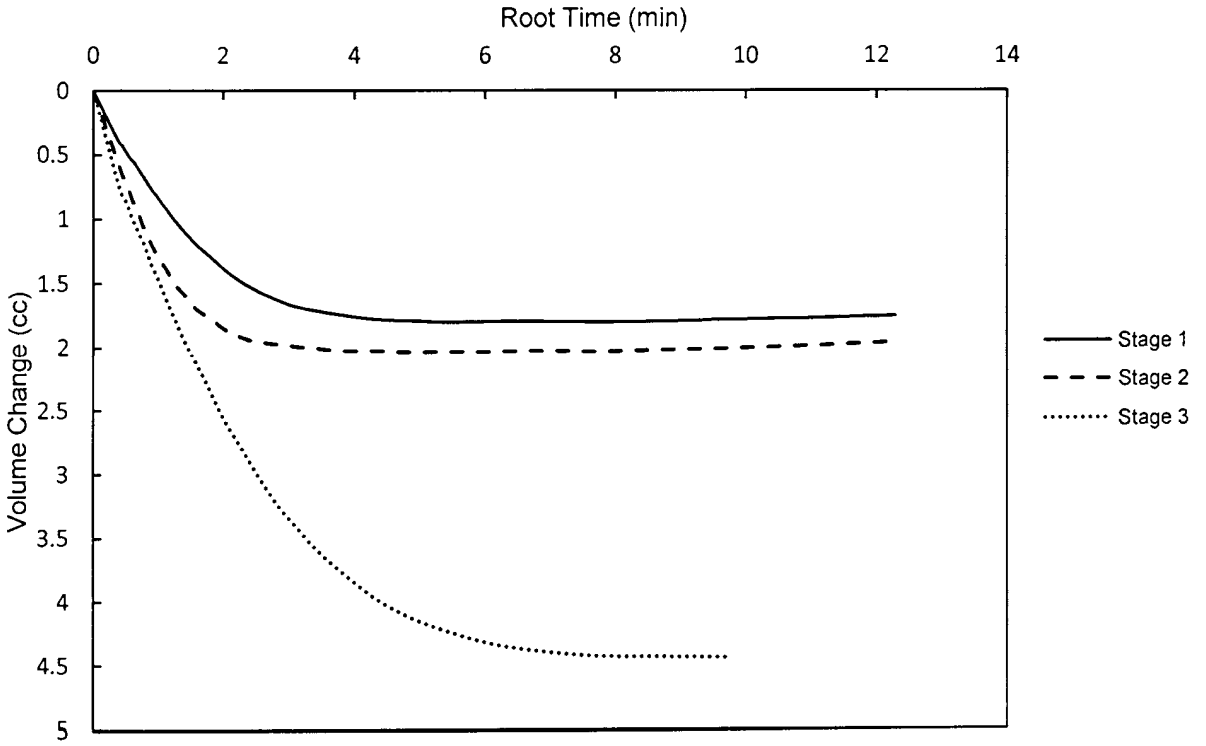
PROJECT -	Site Investigation Works at Tengah Phase 1	BOREHOLE -	BH-1
WORKS INSTRUCTION -	WI058	SAMPLE -	UD-2
VISUAL DESCRIPTION -	Reddish brown slightly gravelly, sandy SILT	DEPTH (m) -	4.00 - 4.90
		JOB NUMBER -	1304/10360

SATURATION / CONSOLIDATION STAGE

SATURATION : BY INCREMENTS OF CELL PRESSURE AND BACK PRESSURE METHOD



CONSOLIDATION : DRAINAGE - TOP AND SIDE DRAIN



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CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION

[TEST METHOD - BS 1377:1990:Part 8:Test 7]

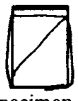
PROJECT -	Site Investigation Works at Tengah Phase 1	BOREHOLE -	BH-3
WORKS INSTRUCTION -	WI058	SAMPLE -	UD-2
VISUAL DESCRIPTION -	Reddish brown & very light grey slightly gravelly, slightly sandy SILT	DEPTH (m) -	4.00 - 4.90
		JOB NUMBER -	1304/10360

SINGLE-STAGE TEST

STAGE -	1	2	3
INITIAL CONDITIONS -			
SAMPLE HEIGHT (mm)	76	76	76
SAMPLE DIAMETER (mm)	38	38	38
MOISTURE CONTENT (%)	24	25	24
BULK DENSITY (Mg/m3)	2.02	2.02	2.04
DRY DENSITY (Mg/m3)	1.63	1.62	1.65
PARTICLE DENSITY (Assumed)	2.70	2.70	2.70
VOID RATIO e_o	0.66	0.67	0.64
DEGREE OF SATURATION S_o (%)	98.2	100.0	100.0
FINAL B VALUE AFTER SATURATION	0.96	0.98	0.98
SHEAR STAGE -			
INITIAL CELL PRESSURE σ_3 (kN/m2)	350	400	500
INITIAL PORE PRESSURE u (kN/m2)	300	300	300
INITIAL EFFECTIVE PRESSURE (kN/m2)	50	100	200
STRAIN RATE (mm/min)	0.03	0.03	0.03
FAILURE AT MAXIMUM DEVIATOR STRESS CONDITION :-			
STRAIN (%)	17.52	21.43	12.52
CORRECTED DEVIATOR STRESS σ'_1-σ'_3 (kN/m2)	188.1	290.1	400.1
EFFECTIVE MINOR STRESS σ'_3 (kN/m2)	67.2	122.5	158.1
EFFECTIVE MAJOR STRESS σ'_1 (kN/m2)	255.3	412.6	558.2
A VALUE A_f	-0.091	-0.078	0.105
STRESS RATIO σ'_1/σ'_3	3.800	3.367	3.530
FAILURE AT MAXIMUM STRESS RATIO CONDITION :-			
STRAIN (%)	2.53	4.50	5.52
CORRECTED DEVIATOR STRESS σ'_1-σ'_3 (kN/m2)	133.1	235.6	378.5
EFFECTIVE MINOR STRESS σ'_3 (kN/m2)	37.4	70.7	130.0
EFFECTIVE MAJOR STRESS σ'_1 (kN/m2)	170.5	306.3	508.5
A VALUE A_f	0.095	0.125	0.185
STRESS RATIO σ'_1/σ'_3	4.563	4.335	3.913
FINAL CONDITION-			
MOISTURE CONTENT (%)	26	27	25
BULK DENSITY (Mg/m3)	2.08	2.11	2.15
DRY DENSITY (Mg/m3)	1.65	1.66	1.72
VOID RATIO e_f	0.64	0.63	0.57
DEGREE OF SATURATION S_f (%)	100.0	100.0	100.0

FAILURE MODE


Specimen 1


Specimen 2


Specimen 3

TESTING OFFICER - Y. Simon Ponraj

APPROVED / CHECKED - (Authorised Signatory - Samuel Teng)

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ACCREDITED LABORATORY SAC-SINGLAS Cert. No: LA-2001-0226-B

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION

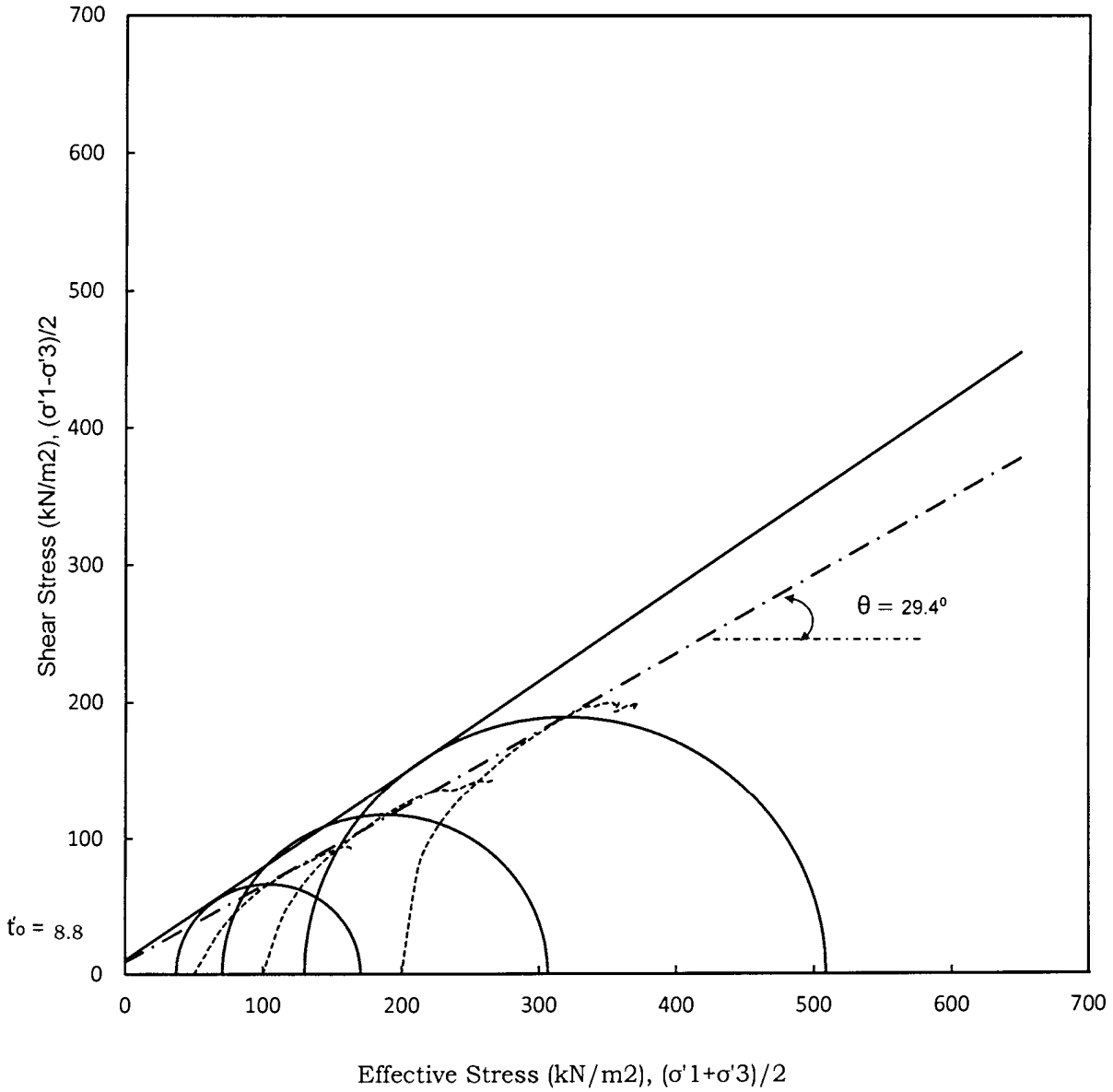
[TEST METHOD - BS 1377:1990:Part 8:Test 7]

PROJECT -	Site Investigation Works at Tengah Phase 1	BOREHOLE -	BH-3
WORKS INSTRUCTION -	WI058	SAMPLE -	UD-2
VISUAL DESCRIPTION -	Reddish brown & very light grey slightly gravelly, slightly sandy SILT	DEPTH (m) -	4.00 - 4.90
		JOB NUMBER -	1304/10360

SHEAR STAGE - MAXIMUM STRESS RATIO

c' (kN/m^2) - 11

ϕ' (degree) - 34



TESTING OFFICER - Y. Simon Ponraj	APPROVED / CHECKED - (Authorised Signatory - Samuel Teng)	ACCREDITED LABORATORY SAC-SINGLAS Cert. No: LA-2001-0226-B

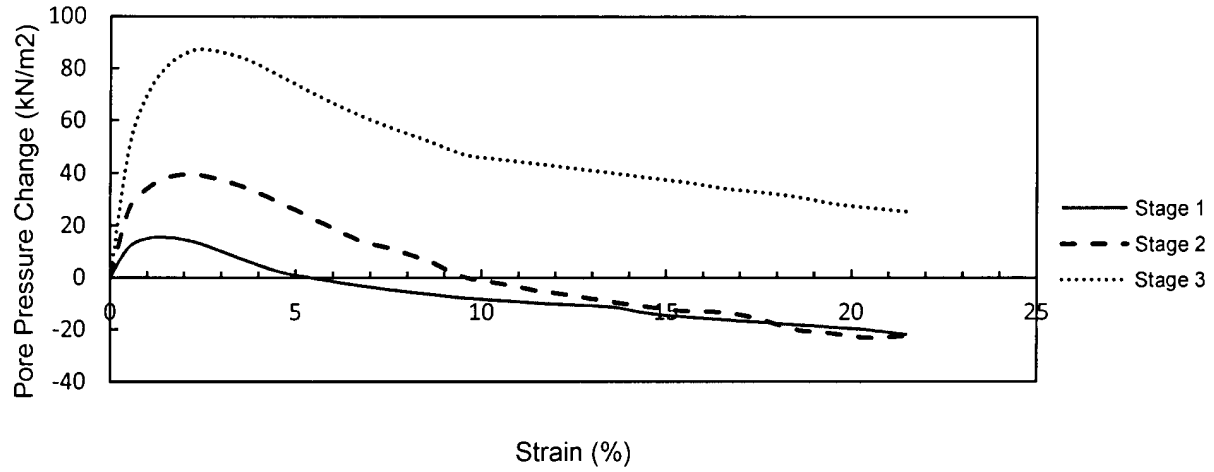
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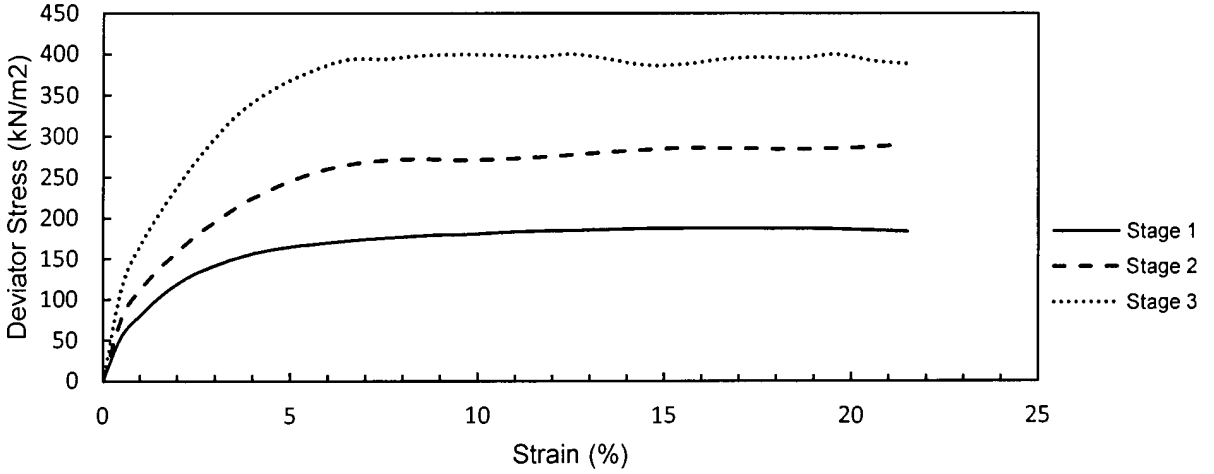
CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION

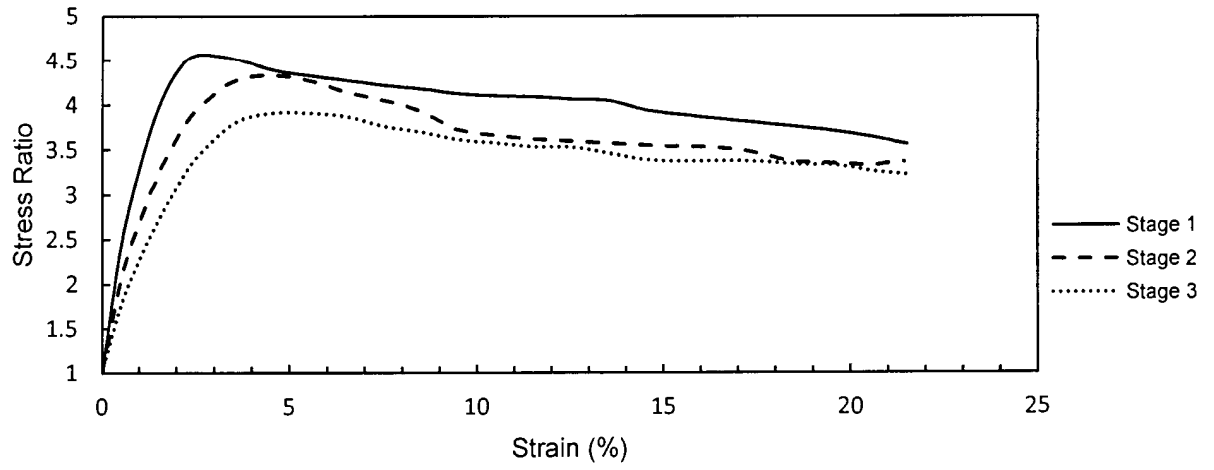
[TEST METHOD - BS 1377:1990:Part 8:Test 7]

PROJECT -	Site Investigation Works at Tengah Phase 1	BOREHOLE -	BH-3
WORKS INSTRUCTION -	WI058	SAMPLE -	UD-2
VISUAL DESCRIPTION -	Reddish brown & very light grey slightly gravelly, slightly sandy SILT	DEPTH (m) -	4.00 - 4.90
		JOB NUMBER -	1304/10360

SHEAR STAGE







TESTING OFFICER - Y. Simon Ponraj	APPROVED / CHECKED - (Authorised Signatory - Samuel Teng)	ACCREDITED LABORATORY SAC-SINGLAS Cert. No: LA-2001/0226-B

The test results reported herein have been performed in accordance with the laboratory's terms of accreditation under SAC-SINGLAS

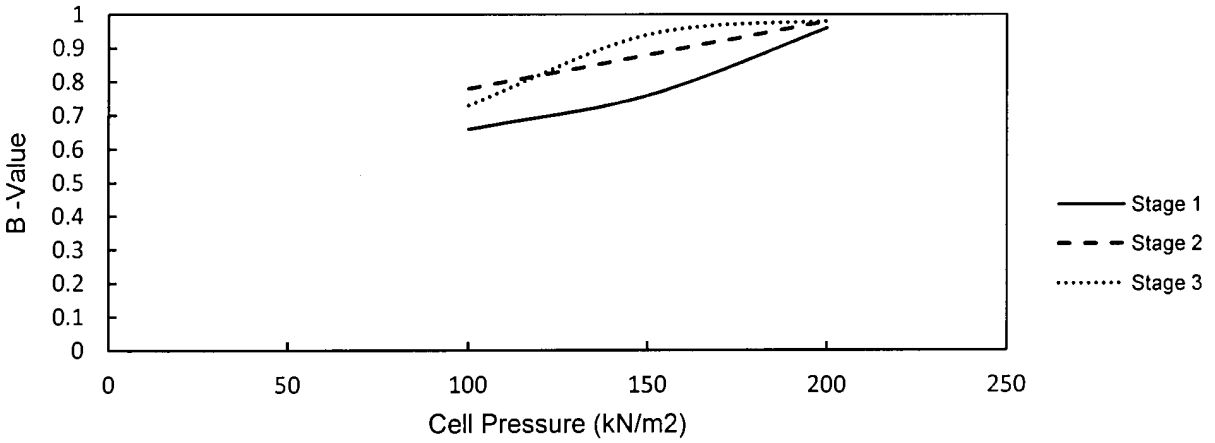
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[TEST METHOD - BS 1377:1990:Part 8:Test 7]

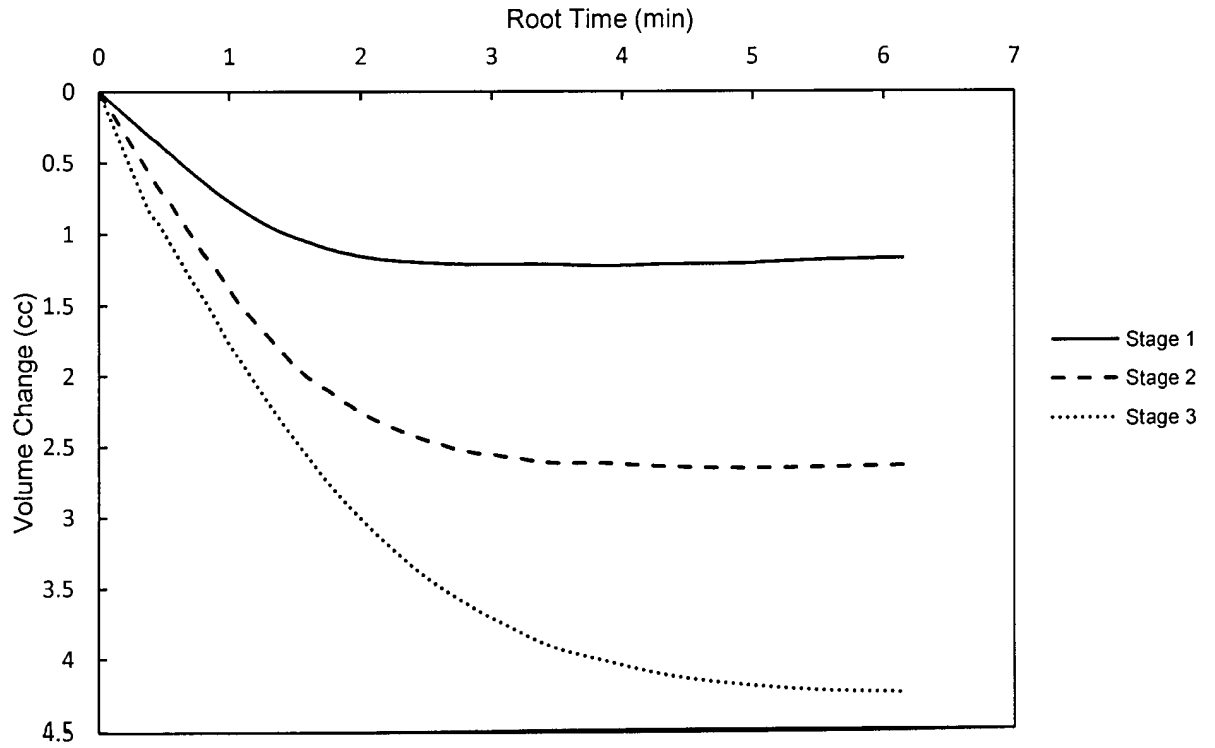
PROJECT -	Site Investigation Works at Tengah Phase 1	BOREHOLE -	BH-3
WORKS INSTRUCTION -	WI058	SAMPLE -	UD-2
VISUAL DESCRIPTION -	Reddish brown & very light grey slightly gravelly, slightly sandy SILT	DEPTH (m) -	4.00 - 4.90
		JOB NUMBER -	1304/10360

SATURATION / CONSOLIDATION STAGE

SATURATION : BY INCREMENTS OF CELL PRESSURE AND BACK PRESSURE METHOD



CONSOLIDATION : DRAINAGE - TOP AND SIDE DRAIN



TESTING OFFICER - Y. Simon Ponraj	APPROVED / CHECKED - (Authorised Signatory - Samuel Teng)	ACCREDITED LABORATORY SAC-SINGLAS Cert. No: LA-2001/022C-B

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CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION

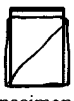
[TEST METHOD - BS 1377:1990:Part 8:Test 7]

PROJECT -	Site Investigation Works at Tengah Phase 1	BOREHOLE -	BH-6
WORKS INSTRUCTION -	WI058	SAMPLE -	UD-2
VISUAL DESCRIPTION -	Very dark grey organic SILT with decayed vegetation	DEPTH (m) -	4.00 - 4.90
		JOB NUMBER -	1304/10360

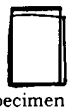
SINGLE-STAGE TEST

STAGE -	1	2	3
INITIAL CONDITIONS -			
SAMPLE HEIGHT (mm)	76	76	76
SAMPLE DIAMETER (mm)	38	38	38
MOISTURE CONTENT (%)	265	241	222
BULK DENSITY (Mg/m3)	1.10	1.16	1.17
DRY DENSITY (Mg/m3)	0.30	0.34	0.36
PARTICLE DENSITY (Assumed)	2.70	2.70	2.70
VOID RATIO e_o	8.00	6.94	6.50
DEGREE OF SATURATION S_o (%)	89.4	93.8	92.2
FINAL B VALUE AFTER SATURATION	0.98	0.98	0.98
SHEAR STAGE -			
INITIAL CELL PRESSURE σ_3 (kN/m2)	350	400	500
INITIAL PORE PRESSURE u (kN/m2)	300	300	300
INITIAL EFFECTIVE PRESSURE (kN/m2)	50	100	200
STRAIN RATE (mm/min)	0.01	0.01	0.01
FAILURE AT MAXIMUM DEVIATOR STRESS CONDITION :-			
STRAIN (%)	9.48	9.57	14.46
CORRECTED DEVIATOR STRESS σ'_1-σ'_3 (kN/m2)	103.4	112.6	179.7
EFFECTIVE MINOR STRESS σ'_3 (kN/m2)	4.7	19.8	42.2
EFFECTIVE MAJOR STRESS σ'_1 (kN/m2)	108.1	132.4	221.9
A VALUE A_f	0.438	0.712	0.878
STRESS RATIO σ'_1/σ'_3	23.010	6.688	5.263
FAILURE AT MAXIMUM STRESS RATIO CONDITION :-			
STRAIN (%)	11.48	12.56	15.45
CORRECTED DEVIATOR STRESS σ'_1-σ'_3 (kN/m2)	101.8	110.8	177.3
EFFECTIVE MINOR STRESS σ'_3 (kN/m2)	3.3	17.0	40.6
EFFECTIVE MAJOR STRESS σ'_1 (kN/m2)	105.1	127.8	217.9
A VALUE A_f	0.459	0.749	0.899
STRESS RATIO σ'_1/σ'_3	31.846	7.512	5.360
FINAL CONDITION-			
MOISTURE CONTENT (%)	245	186	151
BULK DENSITY (Mg/m3)	1.16	1.22	1.28
DRY DENSITY (Mg/m3)	0.34	0.43	0.51
VOID RATIO e_f	7.03	5.33	4.29
DEGREE OF SATURATION S_f (%)	94.1	94.2	95.0

FAILURE MODE


Specimen 1


Specimen 2


Specimen 3

TESTING OFFICER - Y. Simon Ponraj	APPROVED / CHECKED - (Authorised Signatory - Samuel Teng)	ACCREDITED LABORATORY SAC-SINGLAS Cert. No: LA-2001/0228-B

The test results reported herein have been performed in accordance with the laboratory's terms of accreditation under SAC-SINGLAS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION

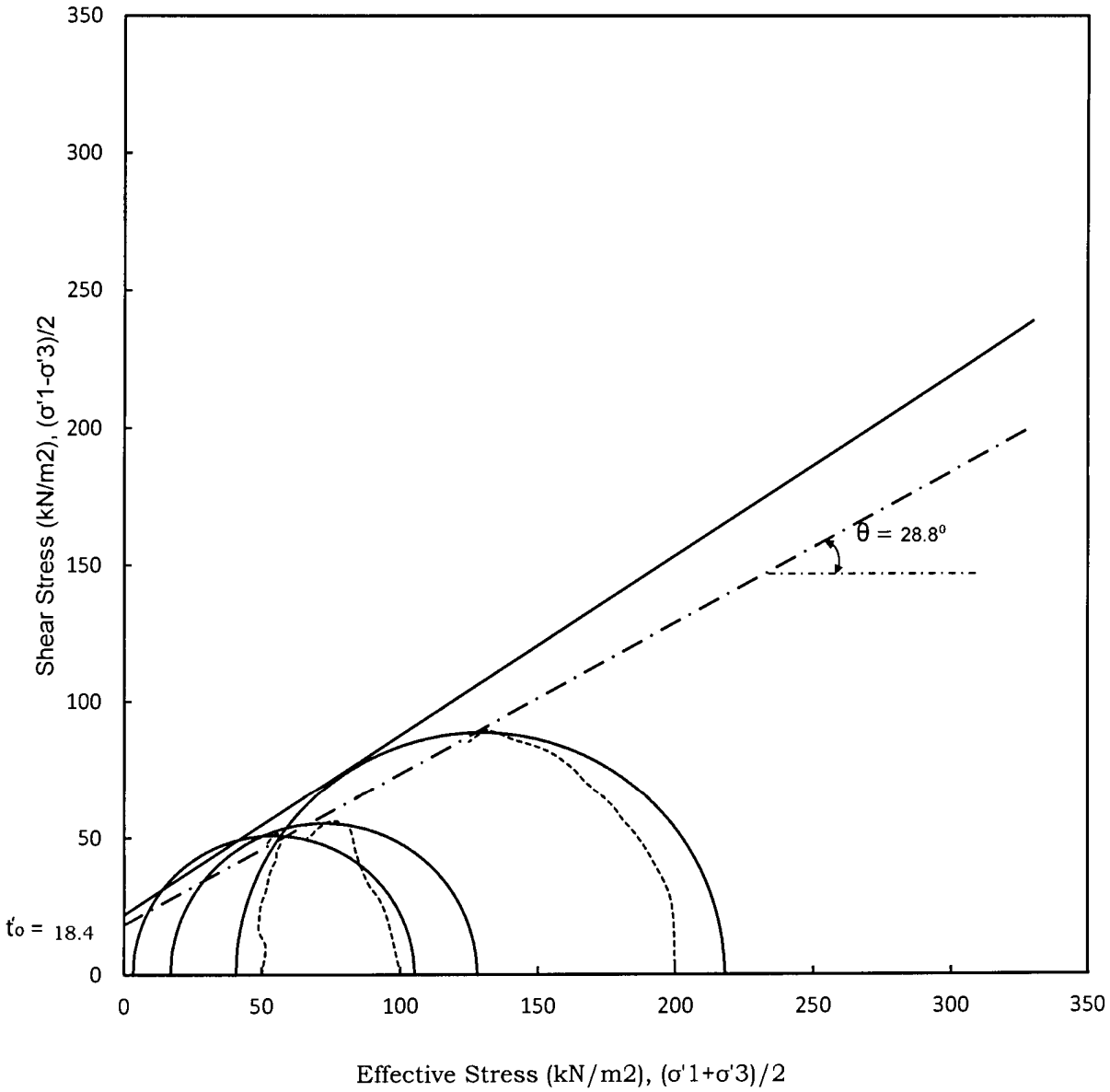
[TEST METHOD - BS 1377:1990:Part 8:Test 7]

PROJECT -	Site Investigation Works at Tengah Phase 1	BOREHOLE -	BH-6
WORKS INSTRUCTION -	WI058	SAMPLE -	UD-2
VISUAL DESCRIPTION -	Very dark grey organic SILT with decayed vegetation	DEPTH (m) -	4.00 - 4.90
		JOB NUMBER -	1304/10360

SHEAR STAGE - MAXIMUM STRESS RATIO

c' (kN/m^2) - 22

ϕ' (degree) - 33



TESTING OFFICER - Y. Simon Ponraj

APPROVED / CHECKED - (Authorised Signatory - Samuel Teng)

The test results reported herein have been performed in accordance with the laboratory's terms of accreditation under SAC-SINGLAS

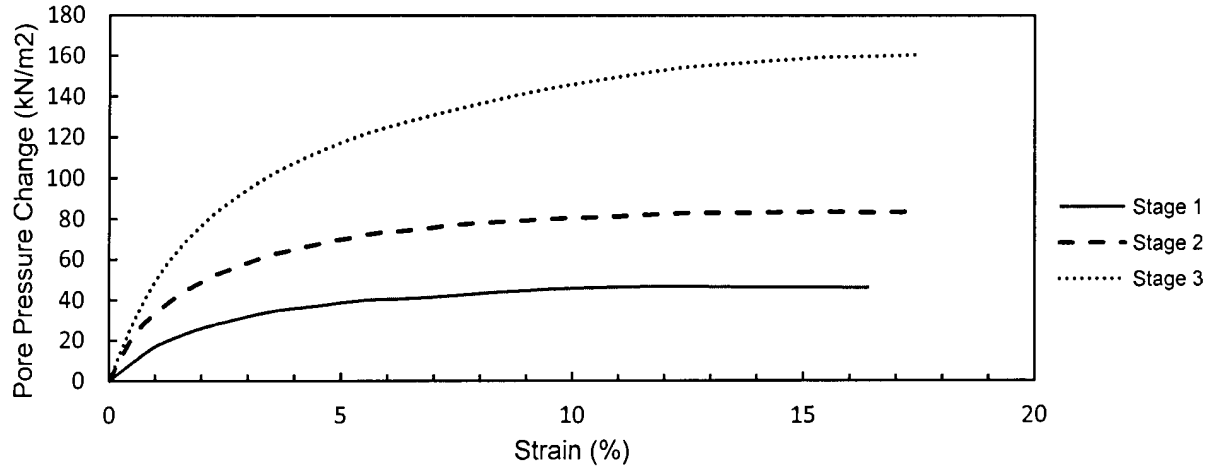
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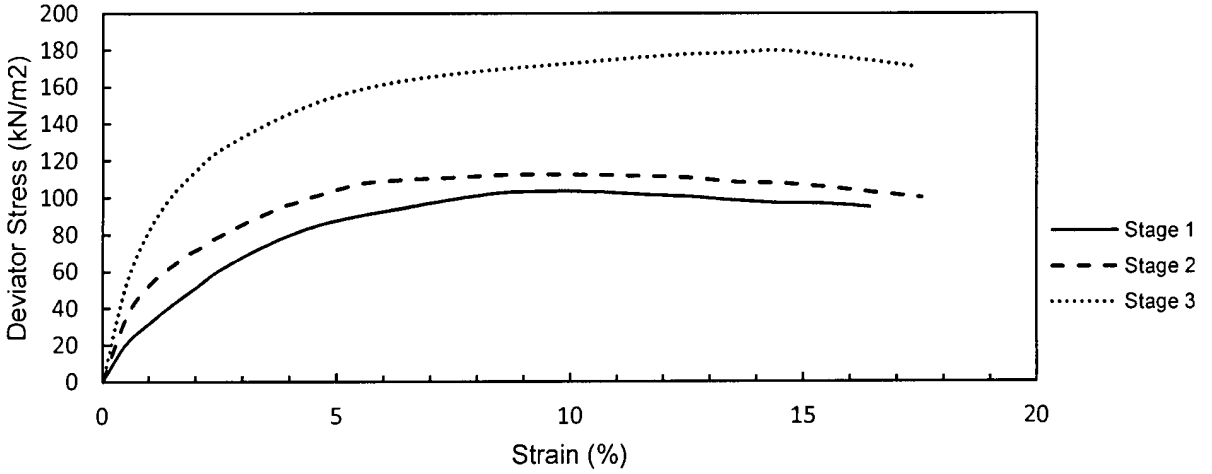
CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION

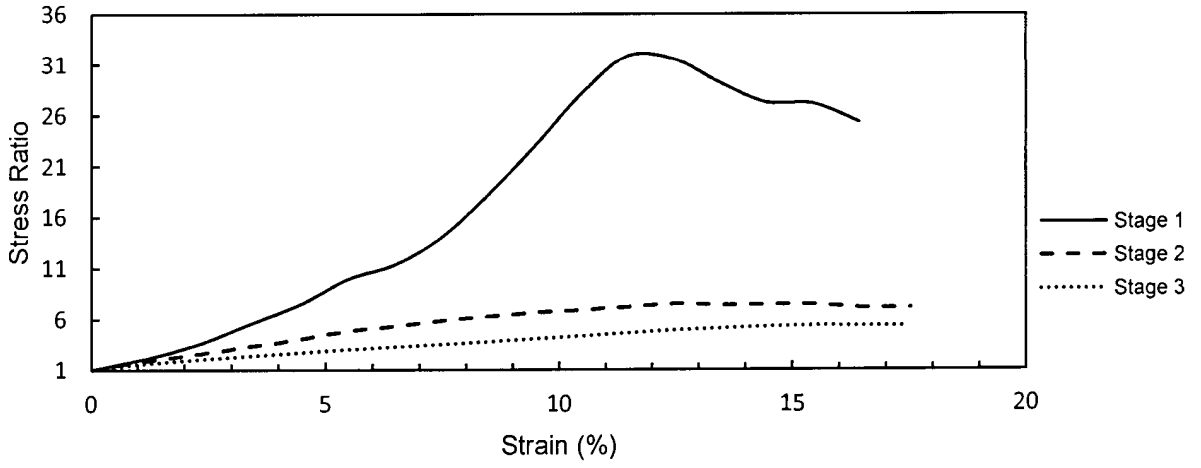
[TEST METHOD - BS 1377:1990:Part 8:Test 7]

PROJECT -	Site Investigation Works at Tengah Phase 1	BOREHOLE -	BH-6
WORKS INSTRUCTION -	WI058	SAMPLE -	UD-2
VISUAL DESCRIPTION -	Very dark grey organic SILT with decayed vegetation	DEPTH (m) -	4.00 - 4.90
		JOB NUMBER -	1304/10360

SHEAR STAGE







	TESTING OFFICER - Y. Simon Ponraj	APPROVED / CHECKED - (Authorised Signatory - Samuel Teng)

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ACCREDITED LABORATORY SAC-SINGLAS Corp. No: LA-2001-0222-S

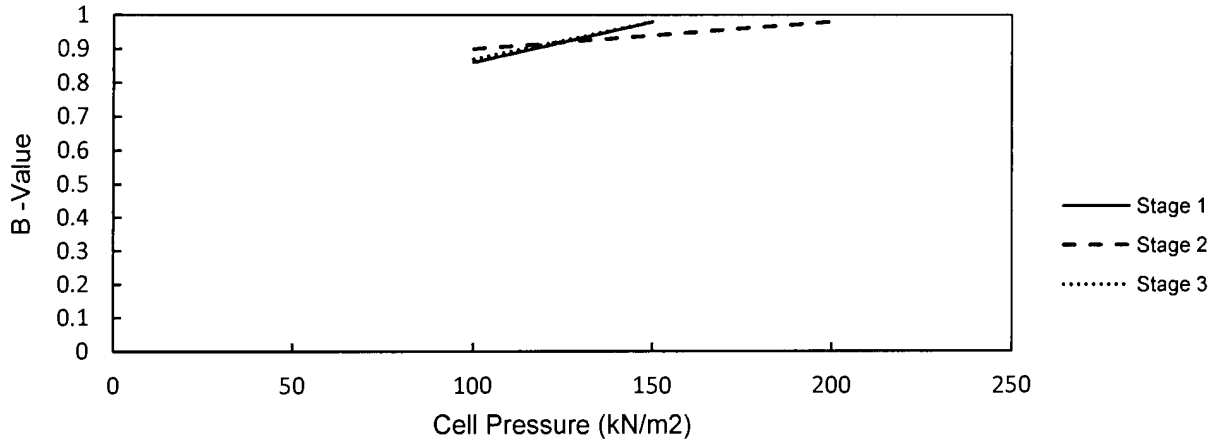
CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION

[TEST METHOD - BS 1377:1990:Part 8:Test 7]

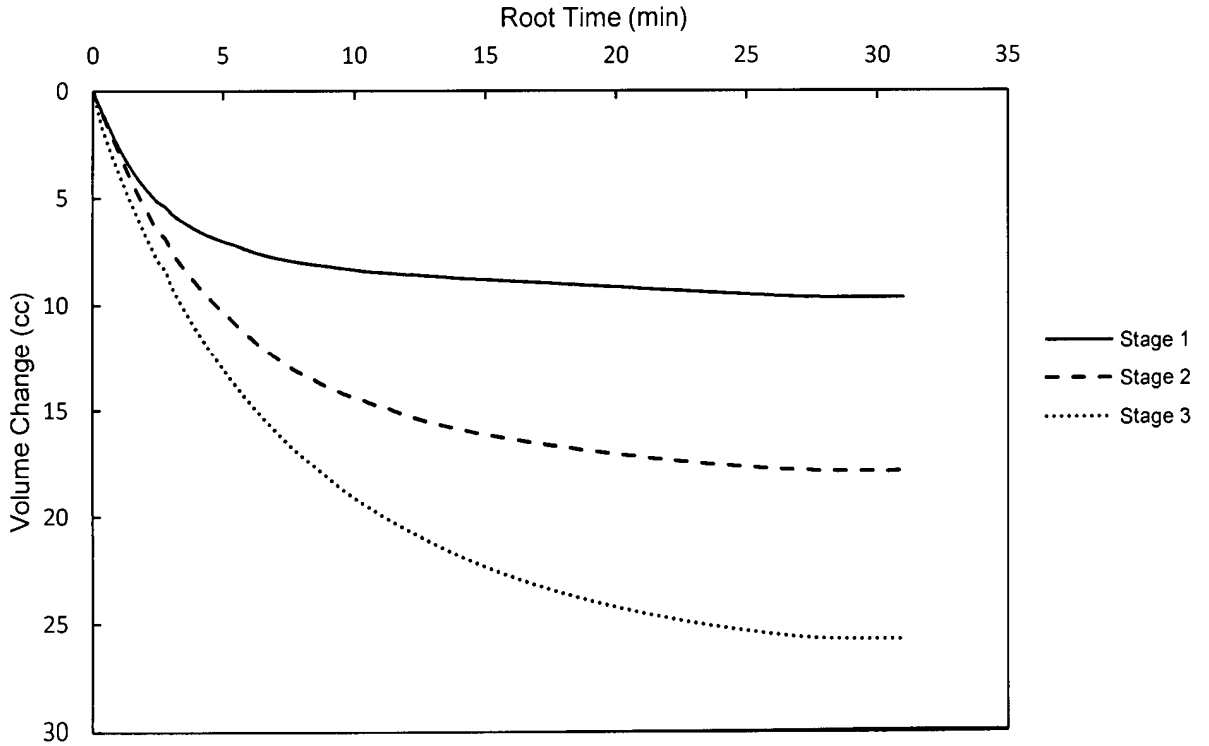
PROJECT -	Site Investigation Works at Tengah Phase 1	BOREHOLE -	BH-6
WORKS INSTRUCTION -	WI058	SAMPLE -	UD-2
VISUAL DESCRIPTION -	Very dark grey organic SILT with decayed vegetation	DEPTH (m) -	4.00 - 4.90
		JOB NUMBER -	1304/10360

SATURATION / CONSOLIDATION STAGE

SATURATION : BY INCREMENTS OF CELL PRESSURE AND BACK PRESSURE METHOD



CONSOLIDATION : DRAINAGE - TOP AND SIDE DRAIN



TESTING OFFICER - Y. Simon Ponraj	APPROVED / CHECKED - (Authorised Signatory - Samuel Teng)	ACCREDITED LABORATORY SAC-SINGLAS Cert. No: LA-2001-0226-B

The test results reported herein have been performed in accordance with the laboratory's terms of accreditation under SAC-SINGLAS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION

[TEST METHOD - BS 1377:1990:Part 8:Test 7]

PROJECT -	Site Investigation Works at Tengah Phase 1	BOREHOLE -	BH-8
WORKS INSTRUCTION -	WI058	SAMPLE -	UD-2
VISUAL DESCRIPTION -	Reddish brown & light reddish brown slightly sandy SILT	DEPTH (m) -	4.00 - 4.90
		JOB NUMBER -	1304/10360

SINGLE-STAGE TEST

STAGE -	1	2	3
INITIAL CONDITIONS -			
SAMPLE HEIGHT (mm)	76	76	76
SAMPLE DIAMETER (mm)	38	38	38
MOISTURE CONTENT (%)	30	30	28
BULK DENSITY (Mg/m3)	1.95	1.96	1.98
DRY DENSITY (Mg/m3)	1.50	1.51	1.55
PARTICLE DENSITY (Assumed)	2.70	2.70	2.70
VOID RATIO e_o	0.80	0.79	0.74
DEGREE OF SATURATION S_o (%)	100.0	100.0	100.0
FINAL B VALUE AFTER SATURATION	0.96	0.98	0.98
SHEAR STAGE -			
INITIAL CELL PRESSURE σ_3 (kN/m2)	350	400	500
INITIAL PORE PRESSURE u (kN/m2)	300	300	300
INITIAL EFFECTIVE PRESSURE (kN/m2)	50	100	200
STRAIN RATE (mm/min)	0.03	0.03	0.03
FAILURE AT MAXIMUM DEVIATOR STRESS CONDITION :-			
STRAIN (%)	13.48	5.46	6.49
CORRECTED DEVIATOR STRESS σ'_1-σ'_3 (kN/m2)	190.0	168.3	270.1
EFFECTIVE MINOR STRESS σ'_3 (kN/m2)	66.8	72.3	117.8
EFFECTIVE MAJOR STRESS σ'_1 (kN/m2)	256.8	240.6	387.9
A VALUE A_f	-0.089	0.165	0.304
STRESS RATIO σ'_1/σ'_3	3.843	3.329	3.293
FAILURE AT MAXIMUM STRESS RATIO CONDITION :-			
STRAIN (%)	3.44	3.47	4.48
CORRECTED DEVIATOR STRESS σ'_1-σ'_3 (kN/m2)	139.0	159.1	261.9
EFFECTIVE MINOR STRESS σ'_3 (kN/m2)	38.1	64.2	108.5
EFFECTIVE MAJOR STRESS σ'_1 (kN/m2)	177.1	223.3	370.4
A VALUE A_f	0.086	0.225	0.349
STRESS RATIO σ'_1/σ'_3	4.653	3.476	3.415
FINAL CONDITION-			
MOISTURE CONTENT (%)	31	32	30
BULK DENSITY (Mg/m3)	2.01	2.05	2.10
DRY DENSITY (Mg/m3)	1.53	1.55	1.62
VOID RATIO e_f	0.76	0.74	0.67
DEGREE OF SATURATION S_f (%)	100.0	100.0	100.0

FAILURE MODE


Specimen 1


Specimen 2


Specimen 3

TESTING OFFICER - Y. Simon Ponraj

APPROVED / CHECKED - (Authorised Signatory - Samuel Teng)

The test results reported herein have been performed in accordance with the laboratory's terms of accreditation under SAC-SINGLAS

ACCREDITED LABORATORY SAC-SINGLAS Cert No: LA-2001/022-B

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION

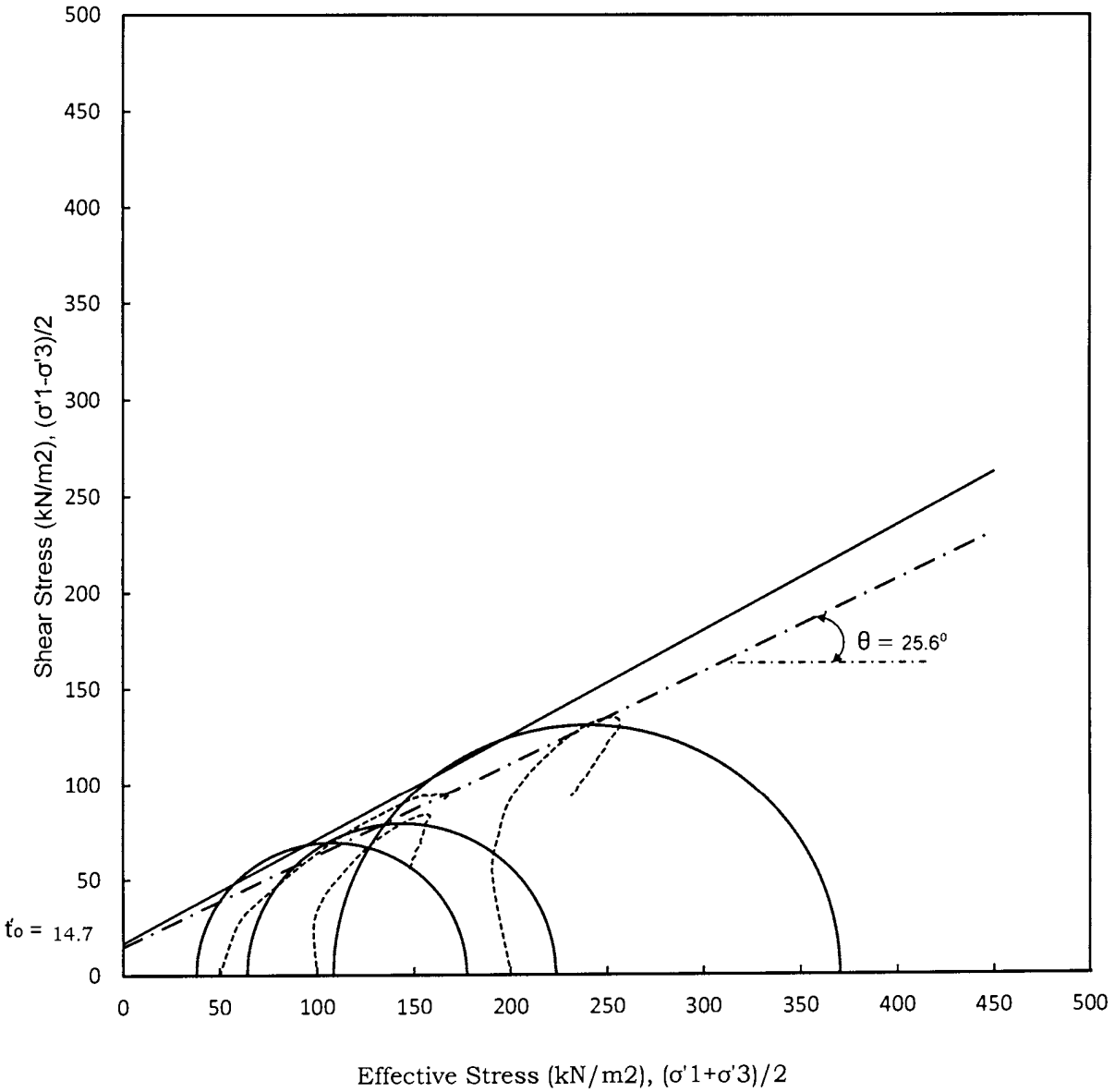
[TEST METHOD - BS 1377:1990:Part 8:Test 7]

PROJECT -	Site Investigation Works at Tengah Phase 1	BOREHOLE -	BH-8
WORKS INSTRUCTION -	WI058	SAMPLE -	UD-2
VISUAL DESCRIPTION -	Reddish brown & light reddish brown slightly sandy SILT	DEPTH (m) -	4.00 - 4.90
		JOB NUMBER -	1304/10360

SHEAR STAGE - MAXIMUM STRESS RATIO

c' (kN/m^2) - 17

ϕ' (degree) - 29



TESTING OFFICER - Y. Simon Ponraj

APPROVED / CHECKED - (Authorised Signatory - Samuel Teng)

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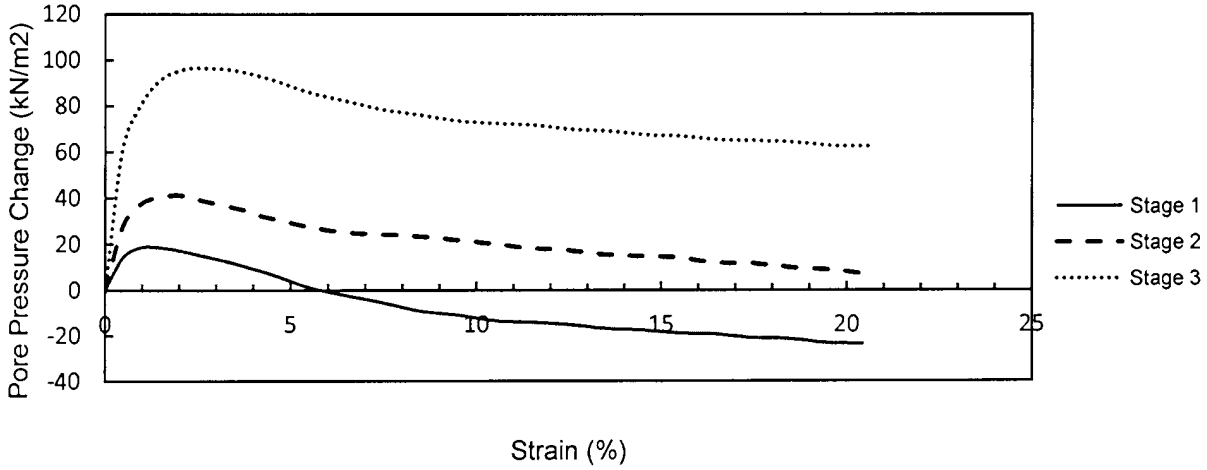
ACCREDITED LABORATORY SAC-SINGLAS Cert. No: LA-2001-0226-B

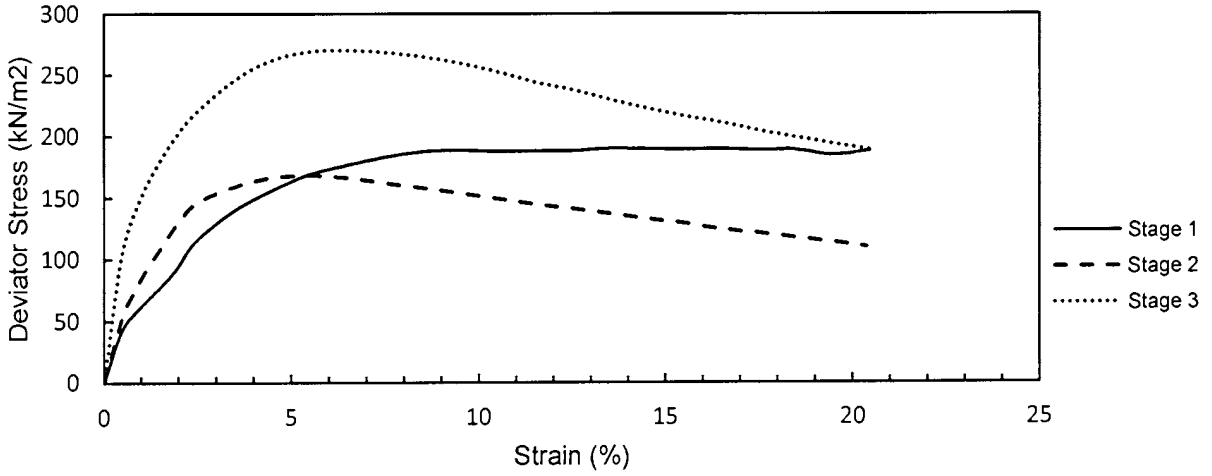
CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION

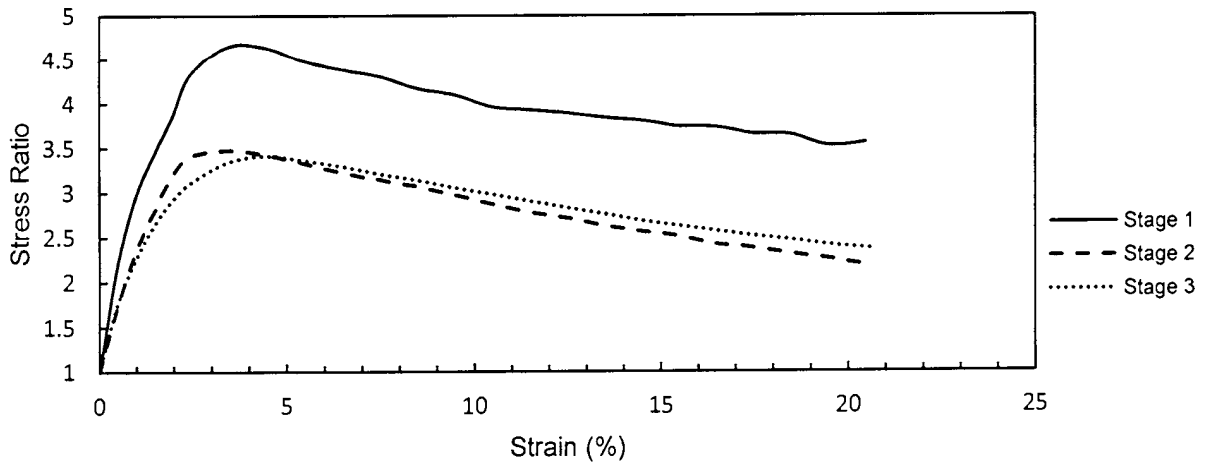
[TEST METHOD - BS 1377:1990:Part 8:Test 7]

PROJECT -	Site Investigation Works at Tengah Phase 1	BOREHOLE -	BH-8
WORKS INSTRUCTION -	WI058	SAMPLE -	UD-2
VISUAL DESCRIPTION -	Reddish brown & light reddish brown slightly sandy SILT	DEPTH (m) -	4.00 - 4.90
		JOB NUMBER -	1304/10360

SHEAR STAGE







TESTING OFFICER - Y. Simon Ponraj	APPROVED / CHECKED - (Authorised Signatory - Samuel Teng)	ACCREDITED LABORATORY SAC-SINGLAS Cert. No: LA-2001/0226-3

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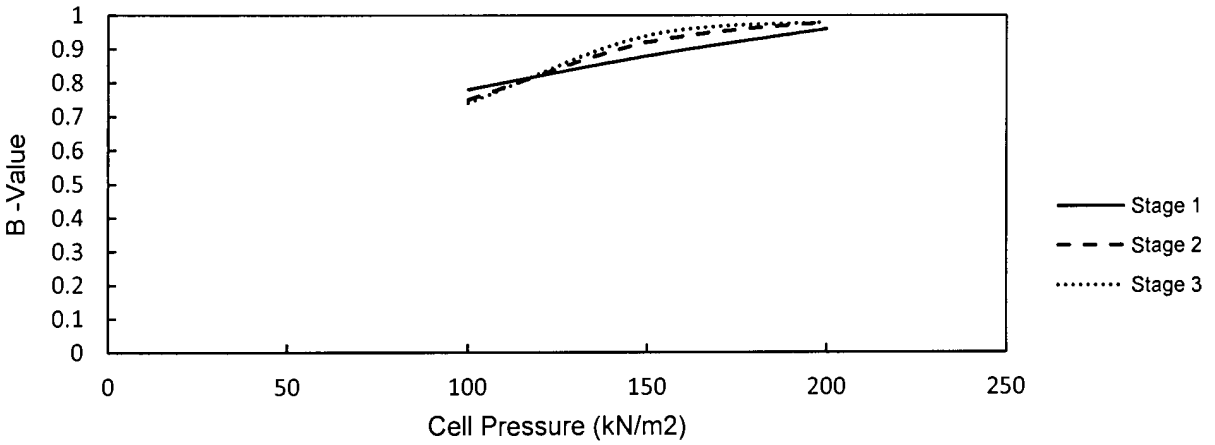
CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION

[TEST METHOD - BS 1377:1990:Part 8:Test 7]

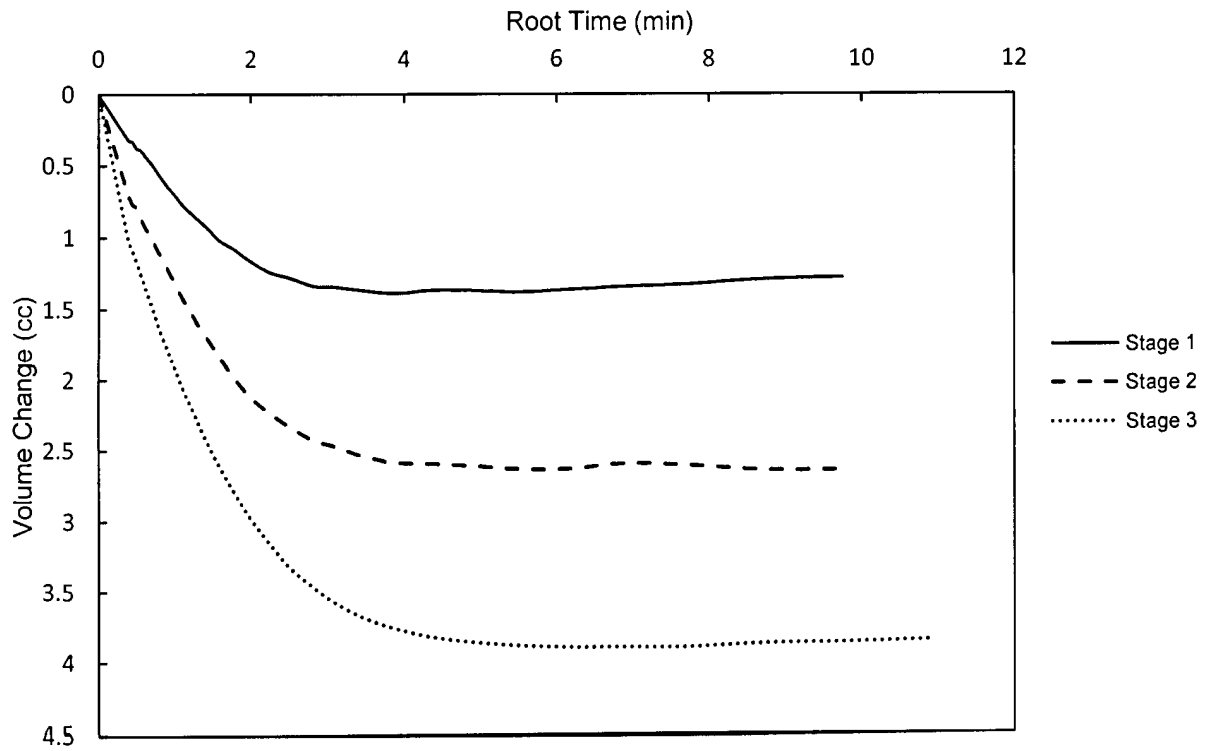
PROJECT -	Site Investigation Works at Tengah Phase 1	BOREHOLE -	BH-8
WORKS INSTRUCTION -	WI058	SAMPLE -	UD-2
VISUAL DESCRIPTION -	Reddish brown & light reddish brown slightly sandy SILT	DEPTH (m) -	4.00 - 4.90
		JOB NUMBER -	1304/10360

SATURATION / CONSOLIDATION STAGE

SATURATION : BY INCREMENTS OF CELL PRESSURE AND BACK PRESSURE METHOD



CONSOLIDATION : DRAINAGE - TOP AND SIDE DRAIN



TESTING OFFICER - Y. Simon Ponraj	APPROVED / CHECKED - (Authorised Signatory - Samuel Teng)	ACCREDITED LABORATORY SAC-SINGLAS Cert. No: LA-2001-0226-B

The test results reported herein have been performed in accordance with the laboratory's terms of accreditation under SAC-SINGLAS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION

[TEST METHOD - BS 1377:1990:Part 8:Test 7]

PROJECT -	Site Investigation Works at Tengah Phase 1	BOREHOLE -	BH-9
WORKS INSTRUCTION -	WI058	SAMPLE -	UD-2
VISUAL DESCRIPTION -	Very dark grey slightly sandy organic SILT with decayed vegetation	DEPTH (m) -	4.00 - 4.90
		JOB NUMBER -	1304/10360

SINGLE-STAGE TEST

STAGE -	1	2	3
INITIAL CONDITIONS -			
SAMPLE HEIGHT (mm)	76	76	76
SAMPLE DIAMETER (mm)	38	38	38
MOISTURE CONTENT (%)	136	125	109
BULK DENSITY (Mg/m3)	1.27	1.31	1.36
DRY DENSITY (Mg/m3)	0.54	0.58	0.65
PARTICLE DENSITY (Assumed)	2.70	2.70	2.70
VOID RATIO e_o	4.00	3.66	3.15
DEGREE OF SATURATION S_o (%)	91.8	92.2	93.4
FINAL B VALUE AFTER SATURATION	0.98	0.98	0.98
SHEAR STAGE -			
INITIAL CELL PRESSURE σ_3 (kN/m2)	350	400	500
INITIAL PORE PRESSURE u (kN/m2)	300	300	300
INITIAL EFFECTIVE PRESSURE (kN/m2)	50	100	200
STRAIN RATE (mm/min)	0.01	0.01	0.01
FAILURE AT MAXIMUM DEVIATOR STRESS CONDITION :-			
STRAIN (%)	16.52	7.59	9.49
CORRECTED DEVIATOR STRESS σ'_1-σ'_3 (kN/m2)	65.3	72.3	106.0
EFFECTIVE MINOR STRESS σ'_3 (kN/m2)	13.9	39.7	72.7
EFFECTIVE MAJOR STRESS σ'_1 (kN/m2)	79.2	112.0	178.7
A VALUE A_f	0.553	0.833	1.201
STRESS RATIO σ'_1/σ'_3	5.695	2.819	2.458
FAILURE AT MAXIMUM STRESS RATIO CONDITION :-			
STRAIN (%)	17.51	10.61	12.48
CORRECTED DEVIATOR STRESS σ'_1-σ'_3 (kN/m2)	65.0	70.1	102.4
EFFECTIVE MINOR STRESS σ'_3 (kN/m2)	13.7	35.0	66.7
EFFECTIVE MAJOR STRESS σ'_1 (kN/m2)	78.7	105.1	169.1
A VALUE A_f	0.558	0.927	1.302
STRESS RATIO σ'_1/σ'_3	5.743	3.003	2.535
FINAL CONDITION-			
MOISTURE CONTENT (%)	113	95	75
BULK DENSITY (Mg/m3)	1.30	1.39	1.46
DRY DENSITY (Mg/m3)	0.61	0.71	0.83
VOID RATIO e_f	3.42	2.79	2.24
DEGREE OF SATURATION S_f (%)	89.2	91.9	90.4

FAILURE MODE


Specimen 1


Specimen 2


Specimen 3

TESTING OFFICER - Y. Simon Ponraj

APPROVED / CHECKED - (Authorised Signatory - Samuel Teng)

The test results reported herein have been performed in accordance with the laboratory's terms of accreditation under SAC-SINGLAS

ACCREDITED LABORATORY SAC-SINGLAS Corp. No: LA-2001-0226-B

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION

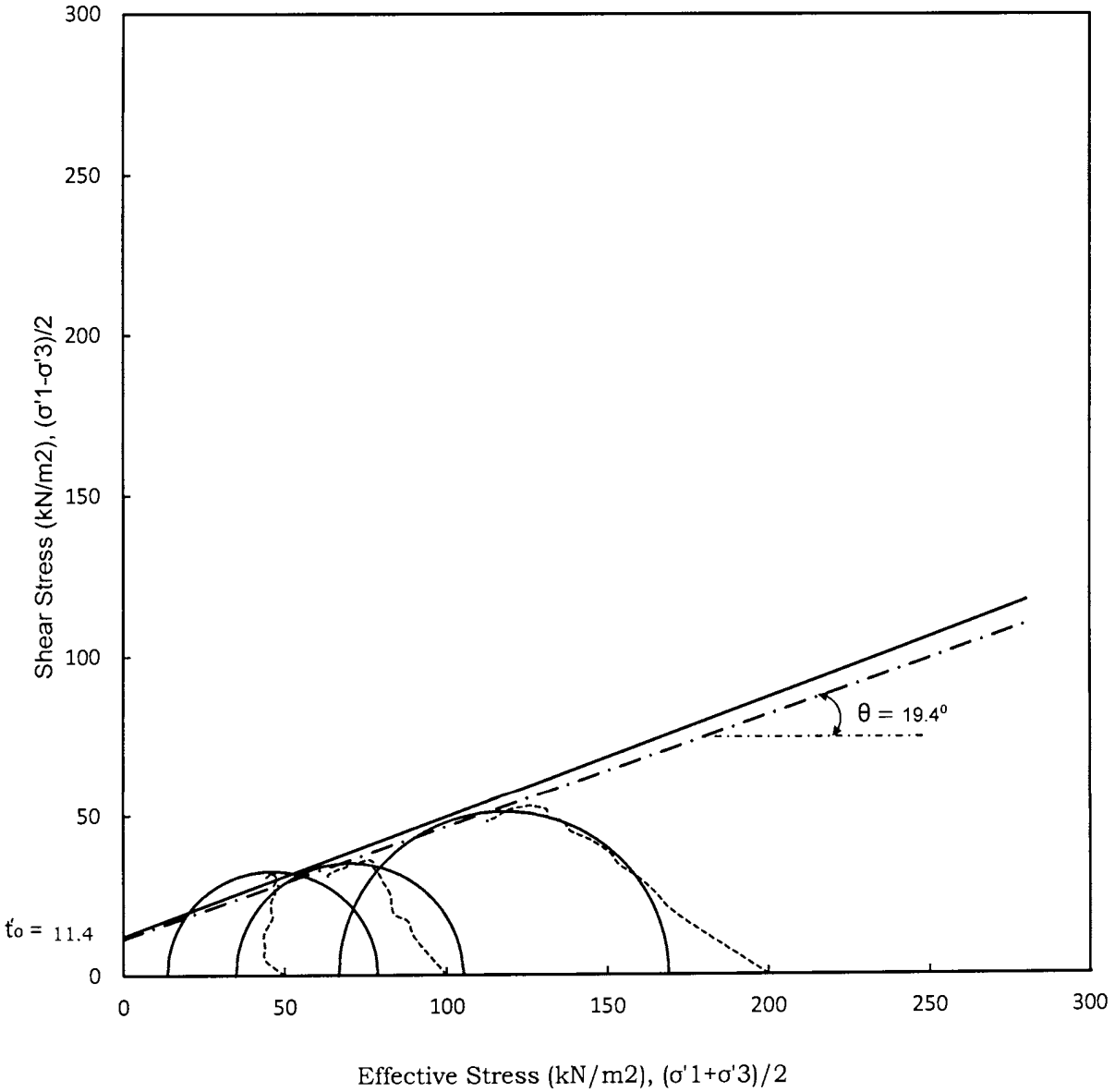
[TEST METHOD - BS 1377:1990:Part 8:Test 7]

PROJECT -	Site Investigation Works at Tengah Phase 1	BOREHOLE -	BH-9
WORKS INSTRUCTION -	WI058	SAMPLE -	UD-2
VISUAL DESCRIPTION -	Very dark grey slightly sandy organic SILT with decayed vegetation	DEPTH (m) -	4.00 - 4.90
		JOB NUMBER -	1304/10360

SHEAR STAGE - MAXIMUM STRESS RATIO

c' (kN/m^2) - 12

ϕ' (degree) - 21



TESTING OFFICER - Y. Simon Ponraj	APPROVED / CHECKED - (Authorised Signatory - Samuel Teng)	ACCREDITED LABORATORY SAC-SINGLAS Cert. No: LA-2001/022-3-9

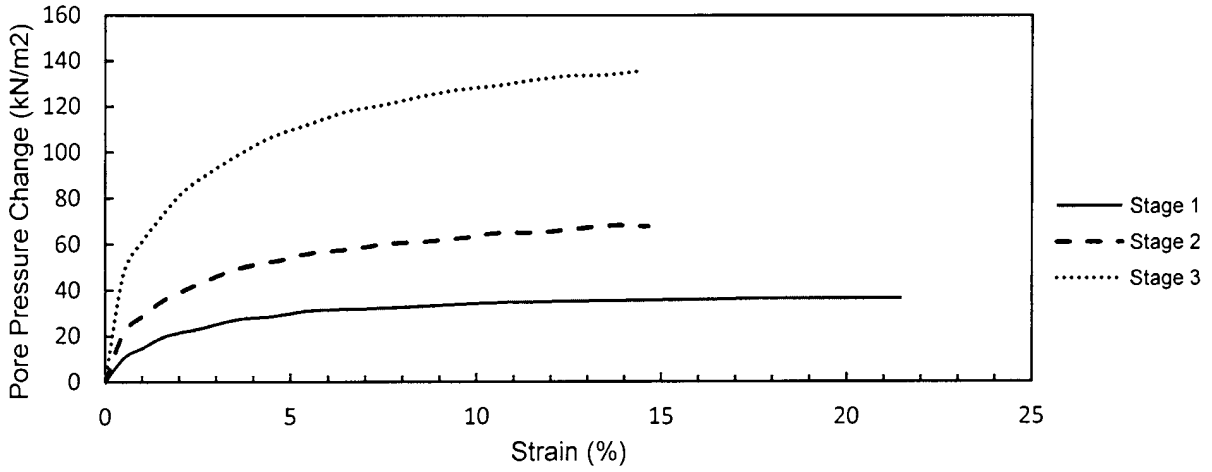
The test results reported herein have been performed in accordance with the laboratory's terms of accreditation under SAC-SINGLAS

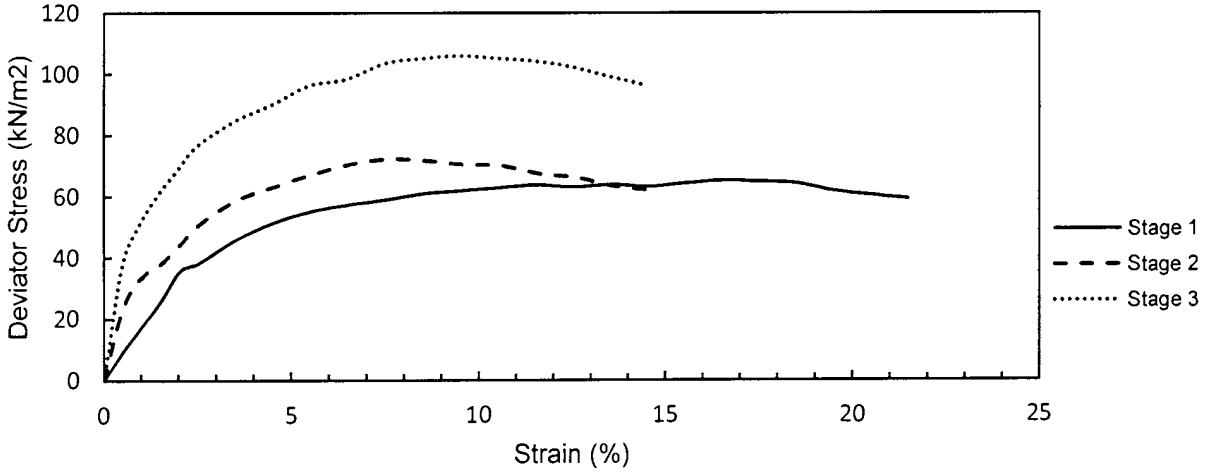
CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION

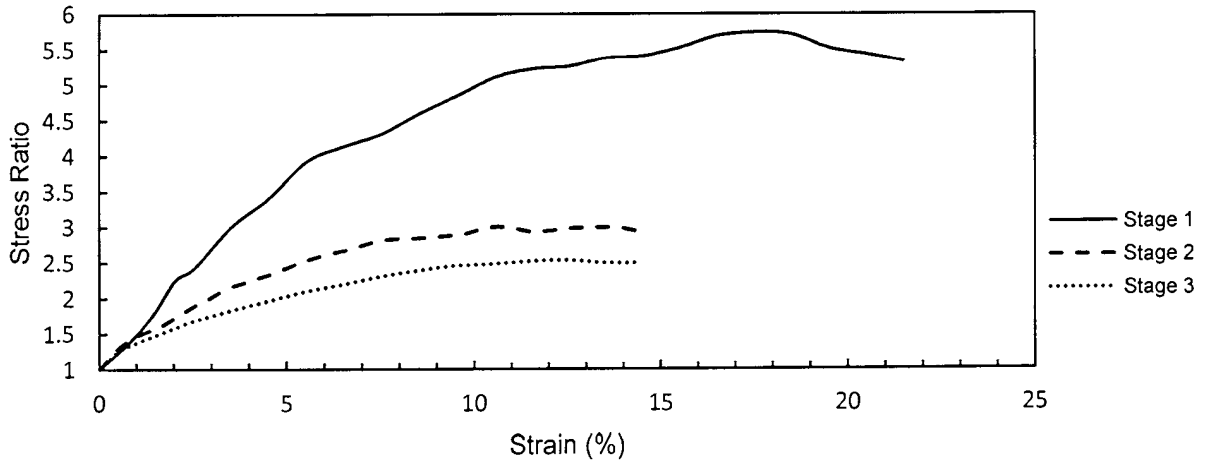
[TEST METHOD - BS 1377:1990:Part 8:Test 7]

PROJECT -	Site Investigation Works at Tengah Phase 1	BOREHOLE -	BH-9
WORKS INSTRUCTION -	WI058	SAMPLE -	UD-2
VISUAL DESCRIPTION -	Very dark grey slightly sandy organic SILT with decayed vegetation	DEPTH (m) -	4.00 - 4.90
		JOB NUMBER -	1304/10360

SHEAR STAGE







TESTING OFFICER - Y. Simon Ponraj	APPROVED / CHECKED - (Authorised Signatory - Samuel Teng)	ACCREDITED LABORATORY SAC-SINGLAS Corr. No: LA-2001/0226-B

The test results reported herein have been performed in accordance with the laboratory's terms of accreditation under SAC-SINGLAS

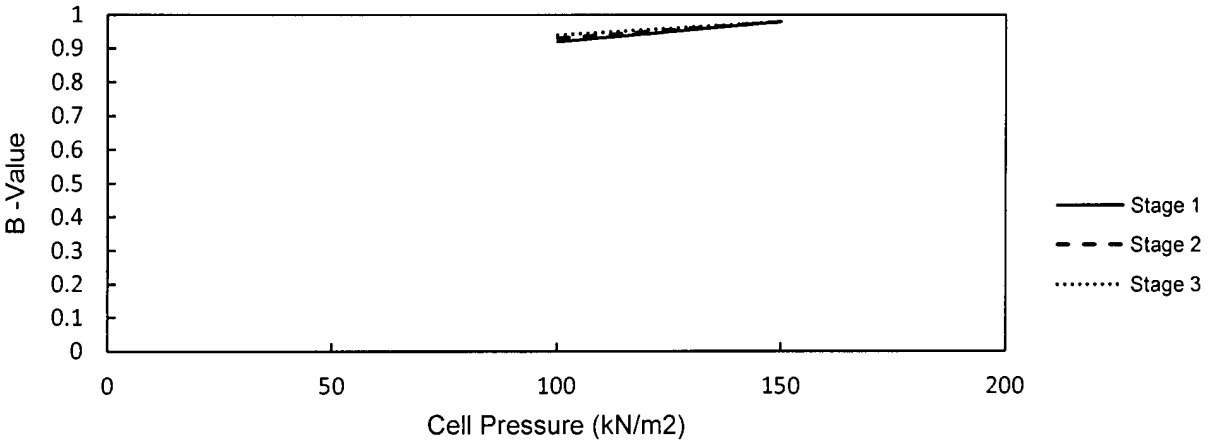
CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION

[TEST METHOD - BS 1377:1990:Part 8:Test 7]

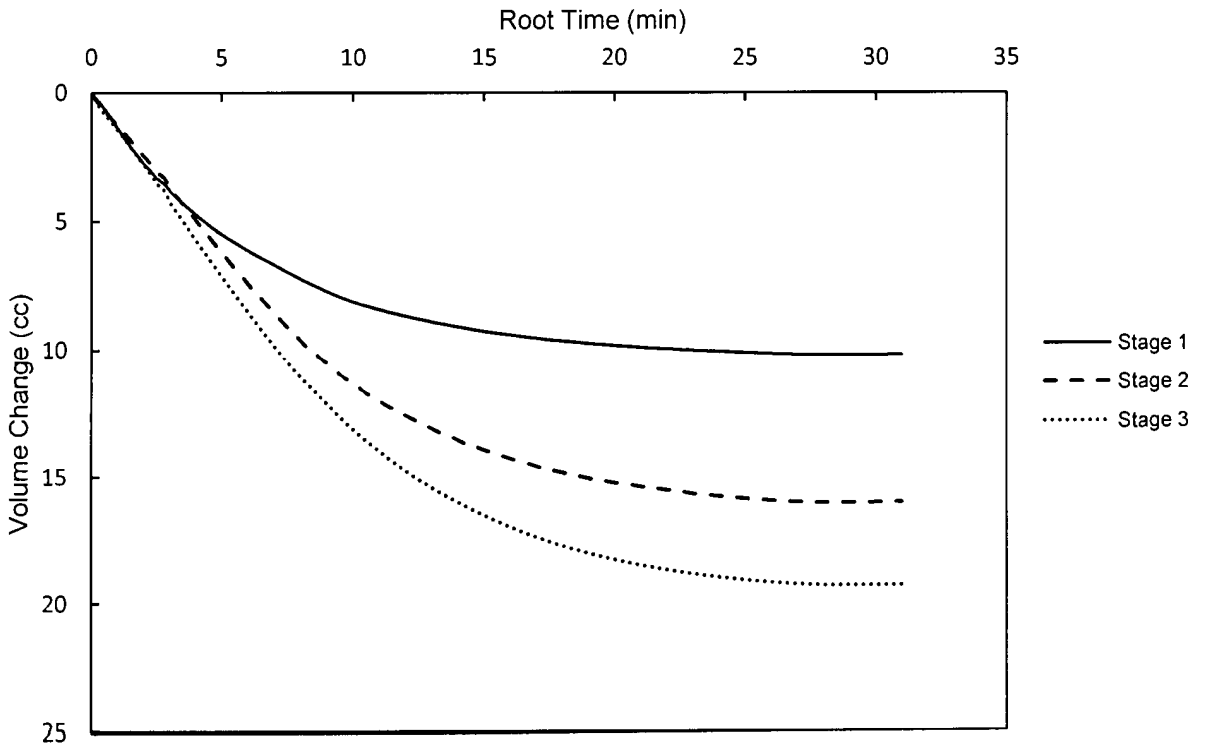
PROJECT -	Site Investigation Works at Tengah Phase 1	BOREHOLE -	BH-9
WORKS INSTRUCTION -	WI058	SAMPLE -	UD-2
VISUAL DESCRIPTION -	Very dark grey slightly sandy organic SILT with decayed vegetation	DEPTH (m) -	4.00 - 4.90
		JOB NUMBER -	1304/10360

SATURATION / CONSOLIDATION STAGE

SATURATION : BY INCREMENTS OF CELL PRESSURE AND BACK PRESSURE METHOD



CONSOLIDATION : DRAINAGE - TOP AND SIDE DRAIN



TESTING OFFICER - Y. Simon Ponraj	APPROVED / CHECKED - (Authorised Signatory - Samuel Teng)	ACCREDITED LABORATORY SAC-SINGLAS Cert. No: LA-2001/0226-B

The test results reported herein have been performed in accordance with the laboratory's terms of accreditation under SAC-SINGLAS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION

[TEST METHOD - BS 1377:1990:Part 8:Test 7]

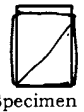
PROJECT -	Site Investigation Works at Tengah Phase 1	BOREHOLE -	BH-10
WORKS INSTRUCTION -	WI058	SAMPLE -	UD-1
VISUAL DESCRIPTION -	Yellow & very light grey slightly gravelly, sandy SILT	DEPTH (m) -	2.00 - 2.90
		JOB NUMBER -	1304/10360

SINGLE-STAGE TEST

STAGE -	1	2	3
INITIAL CONDITIONS -			
SAMPLE HEIGHT (mm)	76	76	76
SAMPLE DIAMETER (mm)	38	38	38
MOISTURE CONTENT (%)	32	32	33
BULK DENSITY (Mg/m3)	1.88	1.90	1.90
DRY DENSITY (Mg/m3)	1.42	1.44	1.43
PARTICLE DENSITY (Assumed)	2.70	2.70	2.70
VOID RATIO e_o	0.90	0.88	0.89
DEGREE OF SATURATION S_o (%)	96.0	98.2	100.0
FINAL B VALUE AFTER SATURATION	0.98	0.96	0.98
SHEAR STAGE -			
INITIAL CELL PRESSURE σ_3 (kN/m2)	350	400	500
INITIAL PORE PRESSURE u (kN/m2)	300	300	300
INITIAL EFFECTIVE PRESSURE (kN/m2)	50	100	200
STRAIN RATE (mm/min)	0.05	0.05	0.05
FAILURE AT MAXIMUM DEVIATOR STRESS CONDITION :-			
STRAIN (%)	14.50	17.40	17.56
CORRECTED DEVIATOR STRESS σ'_1-σ'_3 (kN/m2)	198.7	210.0	254.1
EFFECTIVE MINOR STRESS σ'_3 (kN/m2)	68.5	90.3	121.4
EFFECTIVE MAJOR STRESS σ'_1 (kN/m2)	267.2	300.3	375.5
A VALUE A_f	-0.093	0.046	0.309
STRESS RATIO σ'_1/σ'_3	3.900	3.327	3.093
FAILURE AT MAXIMUM STRESS RATIO CONDITION :-			
STRAIN (%)	3.47	6.47	5.54
CORRECTED DEVIATOR STRESS σ'_1-σ'_3 (kN/m2)	129.5	175.6	231.0
EFFECTIVE MINOR STRESS σ'_3 (kN/m2)	32.5	61.1	94.6
EFFECTIVE MAJOR STRESS σ'_1 (kN/m2)	162.0	236.7	325.6
A VALUE A_f	0.135	0.222	0.456
STRESS RATIO σ'_1/σ'_3	4.983	3.874	3.441
FINAL CONDITION-			
MOISTURE CONTENT (%)	33	34	34
BULK DENSITY (Mg/m3)	1.93	1.97	2.02
DRY DENSITY (Mg/m3)	1.45	1.47	1.51
VOID RATIO e_f	0.86	0.84	0.79
DEGREE OF SATURATION S_f (%)	100.0	100.0	100.0

FAILURE MODE


Specimen 1


Specimen 2


Specimen 3

TESTING OFFICER - Y. Simon Ponraj

APPROVED / CHECKED - (Authorised Signatory - Samuel Teng)

The test results reported herein have been performed in accordance with the laboratory's terms of accreditation under SAC-SINGLAS

ACCREDITED LABORATORY SAC-SINGLAS Cert No: LA-2001/0226-B

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION

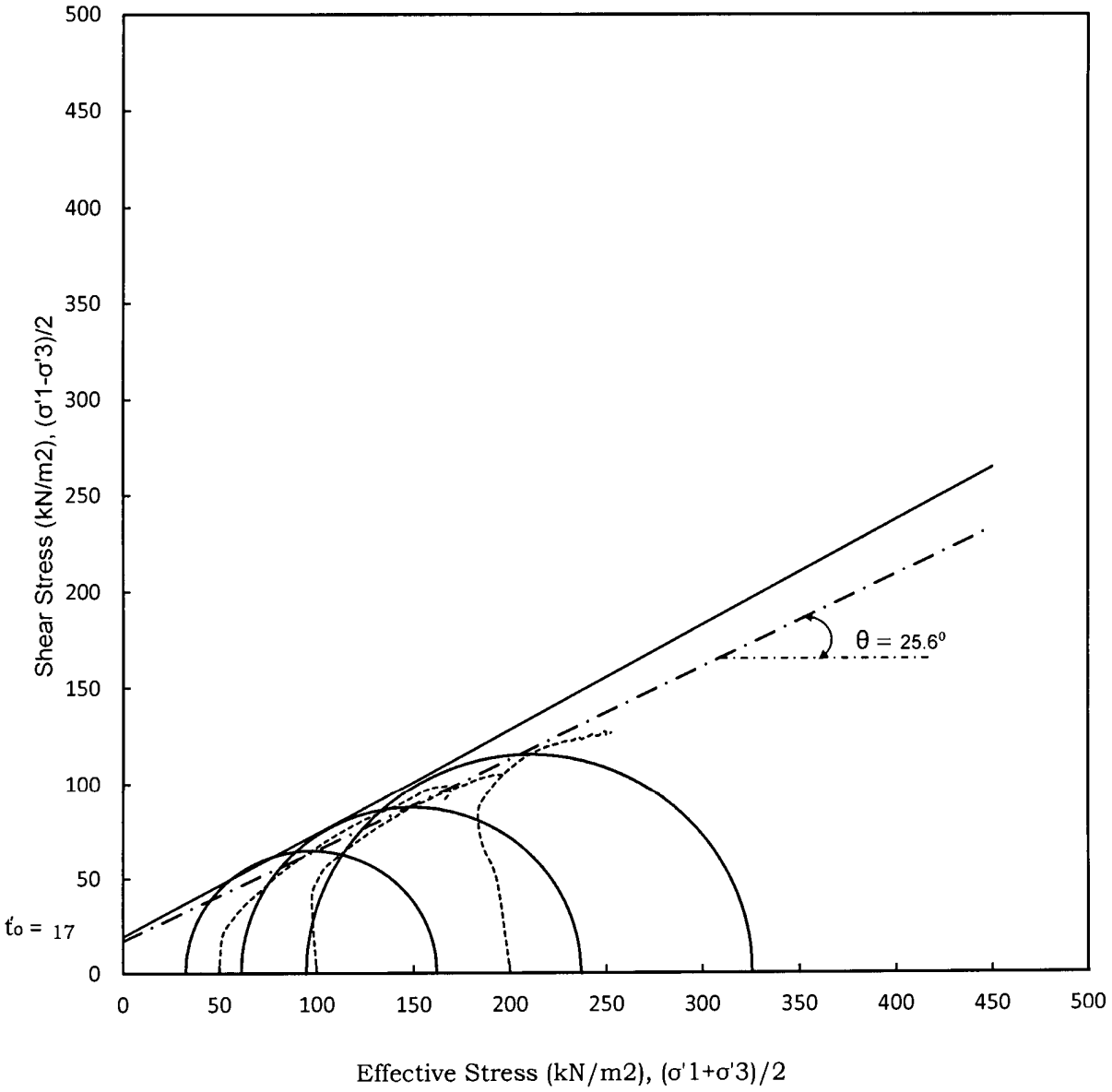
[TEST METHOD - BS 1377:1990:Part 8:Test 7]

PROJECT -	Site Investigation Works at Tengah Phase 1	BOREHOLE -	BH-10
WORKS INSTRUCTION -	WI058	SAMPLE -	UD-1
VISUAL DESCRIPTION -	Yellow & very light grey slightly gravelly, sandy SILT	DEPTH (m) -	2.00 - 2.90
		JOB NUMBER -	1304/10360

SHEAR STAGE - MAXIMUM STRESS RATIO

c' (kN/m^2) - 19

ϕ' (degree) - 29



TESTING OFFICER - Y. Simon Ponraj

APPROVED / CHECKED - (Authorised Signatory - Samuel Teng)

The test results reported herein have been performed in accordance with the laboratory's terms of accreditation under SAC-SINGLAS

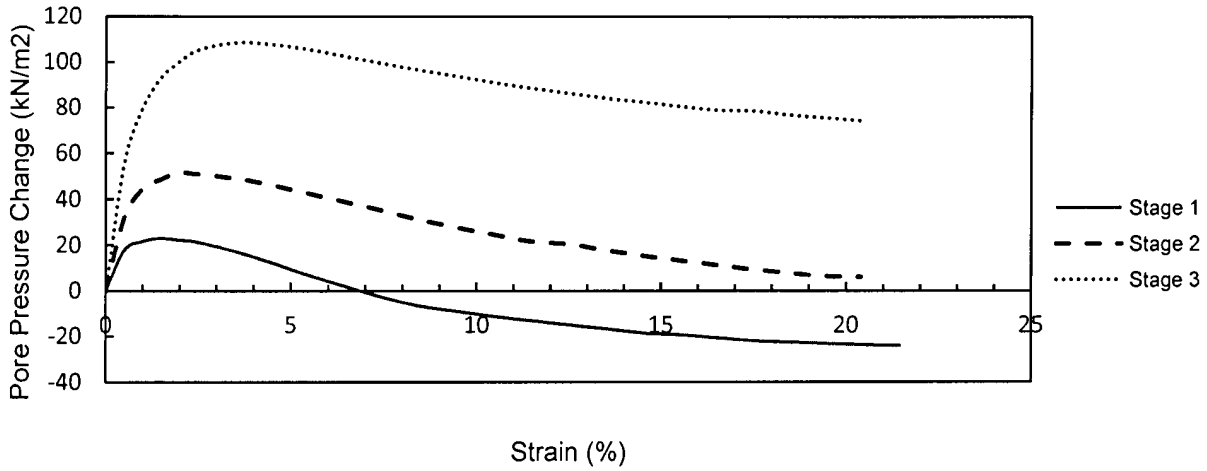
ACCREDITED LABORATORY SAC-SINGLAS Cert. No: LA-2001/0226-B

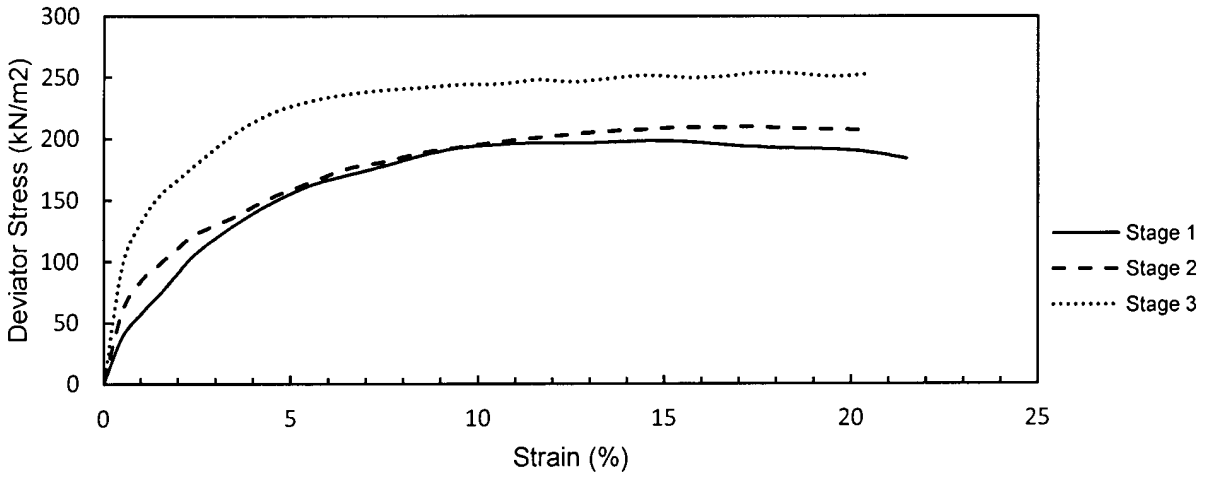
CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION

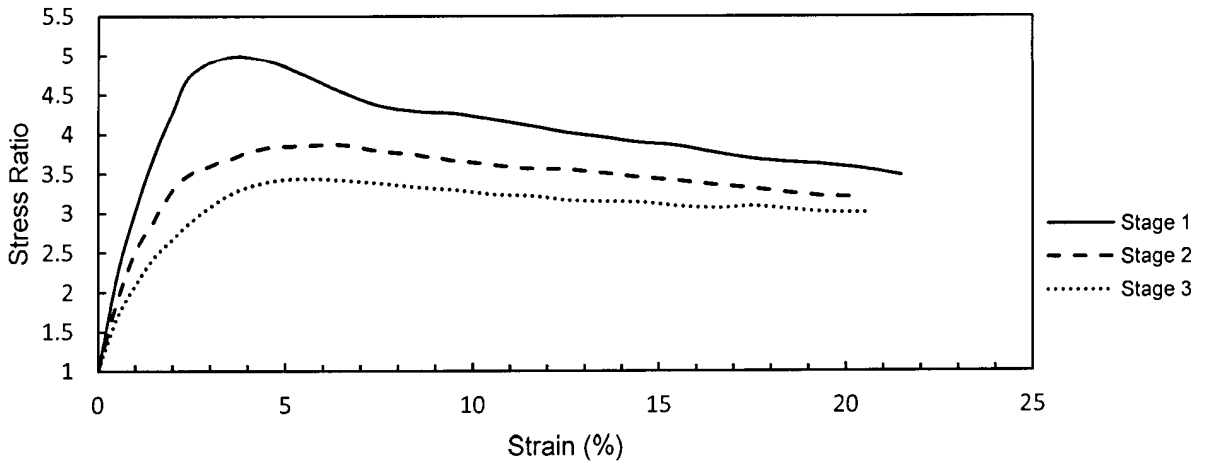
[TEST METHOD - BS 1377:1990:Part 8:Test 7]

PROJECT -	Site Investigation Works at Tengah Phase 1	BOREHOLE -	BH-10
WORKS INSTRUCTION -	WI058	SAMPLE -	UD-1
VISUAL DESCRIPTION -	Yellow & very light grey slightly gravelly, sandy SILT	DEPTH (m) -	2.00 - 2.90
		JOB NUMBER -	1304/10360

SHEAR STAGE







TESTING OFFICER - Y. Simon Ponraj	APPROVED / CHECKED - (Authorised Signatory - Samuel Teng)	ACCREDITED LABORATORY SAC-SINGLAS Cert. No: LA-2001-0226-S

The test results reported herein have been performed in accordance with the laboratory's terms of accreditation under SAC-SINGLAS

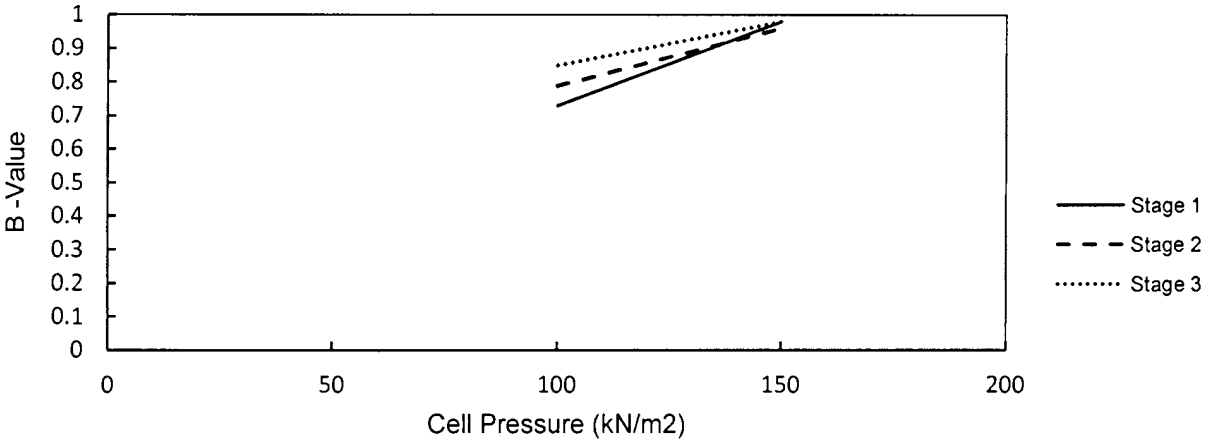
CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION

[TEST METHOD - BS 1377:1990:Part 8:Test 7]

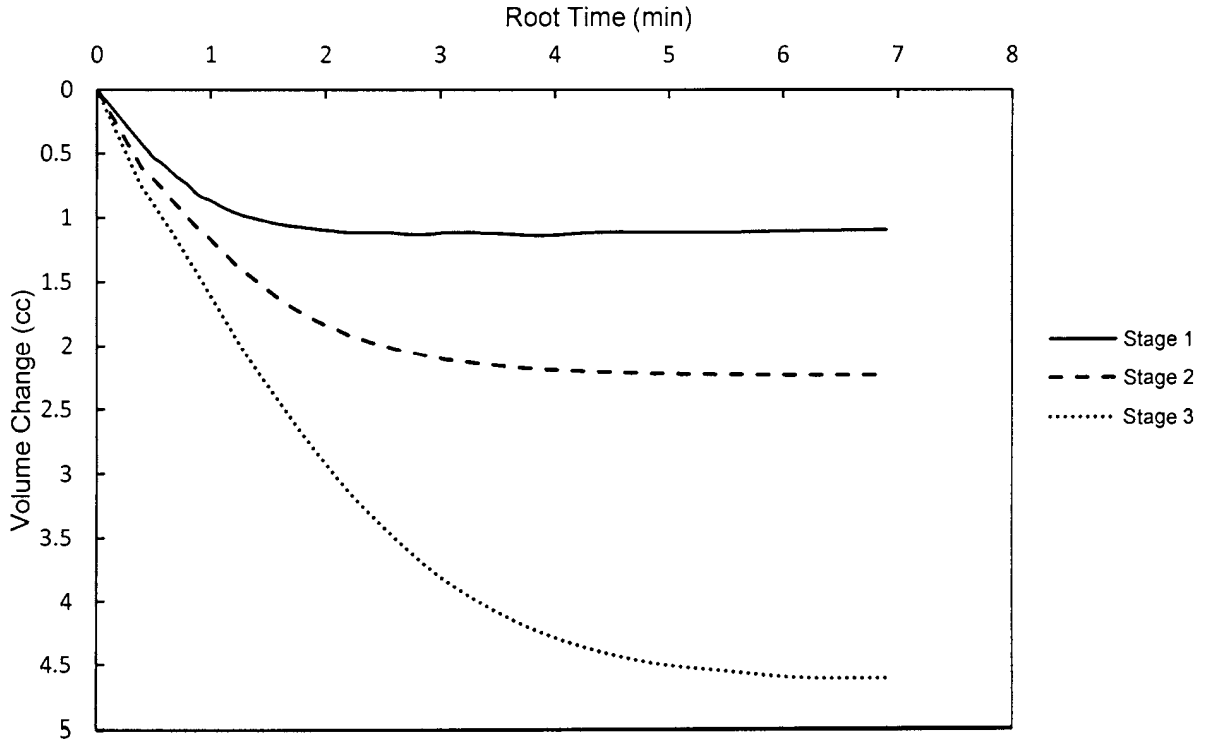
PROJECT -	Site Investigation Works at Tengah Phase 1	BOREHOLE -	BH-10
WORKS INSTRUCTION -	WI058	SAMPLE -	UD-1
VISUAL DESCRIPTION -	Yellow & very light grey slightly gravelly, sandy SILT	DEPTH (m) -	2.00 - 2.90
		JOB NUMBER -	1304/10360

SATURATION / CONSOLIDATION STAGE

SATURATION : BY INCREMENTS OF CELL PRESSURE AND BACK PRESSURE METHOD



CONSOLIDATION : DRAINAGE - TOP AND SIDE DRAIN



TESTING OFFICER - Y. Simon Ponraj	APPROVED / CHECKED - (Authorised Signatory - Samuel Teng)	ACCREDITED LABORATORY SAC-SINGLAS Cert. No: LA-2001-0226-B

The test results reported herein have been performed in accordance with the laboratory's terms of accreditation under SAC-SINGLAS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION

[TEST METHOD - BS 1377:1990:Part 8:Test 7]

PROJECT -	Site Investigation Works at Tengah Phase 1	BOREHOLE -	BH-11
WORKS INSTRUCTION -	WI058	SAMPLE -	UD-1
VISUAL DESCRIPTION -	Reddish brown & very light grey SILT	DEPTH (m) -	2.00 - 2.90
		JOB NUMBER -	1304/10360

SINGLE-STAGE TEST

STAGE -	1	2	3
INITIAL CONDITIONS -			
SAMPLE HEIGHT (mm)	76	76	76
SAMPLE DIAMETER (mm)	38	38	38
MOISTURE CONTENT (%)	28	28	27
BULK DENSITY (Mg/m3)	2.00	2.02	2.04
DRY DENSITY (Mg/m3)	1.56	1.58	1.61
PARTICLE DENSITY (Assumed)	2.70	2.70	2.70
VOID RATIO e_o	0.73	0.71	0.68
DEGREE OF SATURATION S_o (%)	100.0	100.0	100.0
FINAL B VALUE AFTER SATURATION	0.98	0.98	0.98
SHEAR STAGE -			
INITIAL CELL PRESSURE σ_3 (kN/m2)	350	400	500
INITIAL PORE PRESSURE u (kN/m2)	300	300	300
INITIAL EFFECTIVE PRESSURE (kN/m2)	50	100	200
STRAIN RATE (mm/min)	0.03	0.03	0.03
FAILURE AT MAXIMUM DEVIATOR STRESS CONDITION :-			
STRAIN (%)	12.57	20.43	4.54
CORRECTED DEVIATOR STRESS σ'_1-σ'_3 (kN/m2)	166.7	244.6	298.5
EFFECTIVE MINOR STRESS σ'_3 (kN/m2)	58.9	119.5	125.6
EFFECTIVE MAJOR STRESS σ'_1 (kN/m2)	225.6	364.1	424.1
A VALUE A_f	-0.053	-0.080	0.249
STRESS RATIO σ'_1/σ'_3	3.829	3.048	3.377
FAILURE AT MAXIMUM STRESS RATIO CONDITION :-			
STRAIN (%)	3.54	4.48	3.54
CORRECTED DEVIATOR STRESS σ'_1-σ'_3 (kN/m2)	138.1	191.5	283.5
EFFECTIVE MINOR STRESS σ'_3 (kN/m2)	38.5	66.4	116.6
EFFECTIVE MAJOR STRESS σ'_1 (kN/m2)	176.6	257.9	400.1
A VALUE A_f	0.083	0.176	0.294
STRESS RATIO σ'_1/σ'_3	4.586	3.885	3.430
FINAL CONDITION-			
MOISTURE CONTENT (%)	30	30	28
BULK DENSITY (Mg/m3)	2.08	2.11	2.18
DRY DENSITY (Mg/m3)	1.60	1.62	1.70
VOID RATIO e_f	0.69	0.66	0.59
DEGREE OF SATURATION S_f (%)	100.0	100.0	100.0

FAILURE MODE


Specimen 1


Specimen 2


Specimen 3

TESTING OFFICER - Y. Simon Ponraj	APPROVED / CHECKED - (Authorised Signatory - Samuel Teng)	ACCREDITED LABORATORY SAC-SINGLAS Cert. No: LA-2001/0226-B

The test results reported herein have been performed in accordance with the laboratory's terms of accreditation under SAC-SINGLAS

CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION

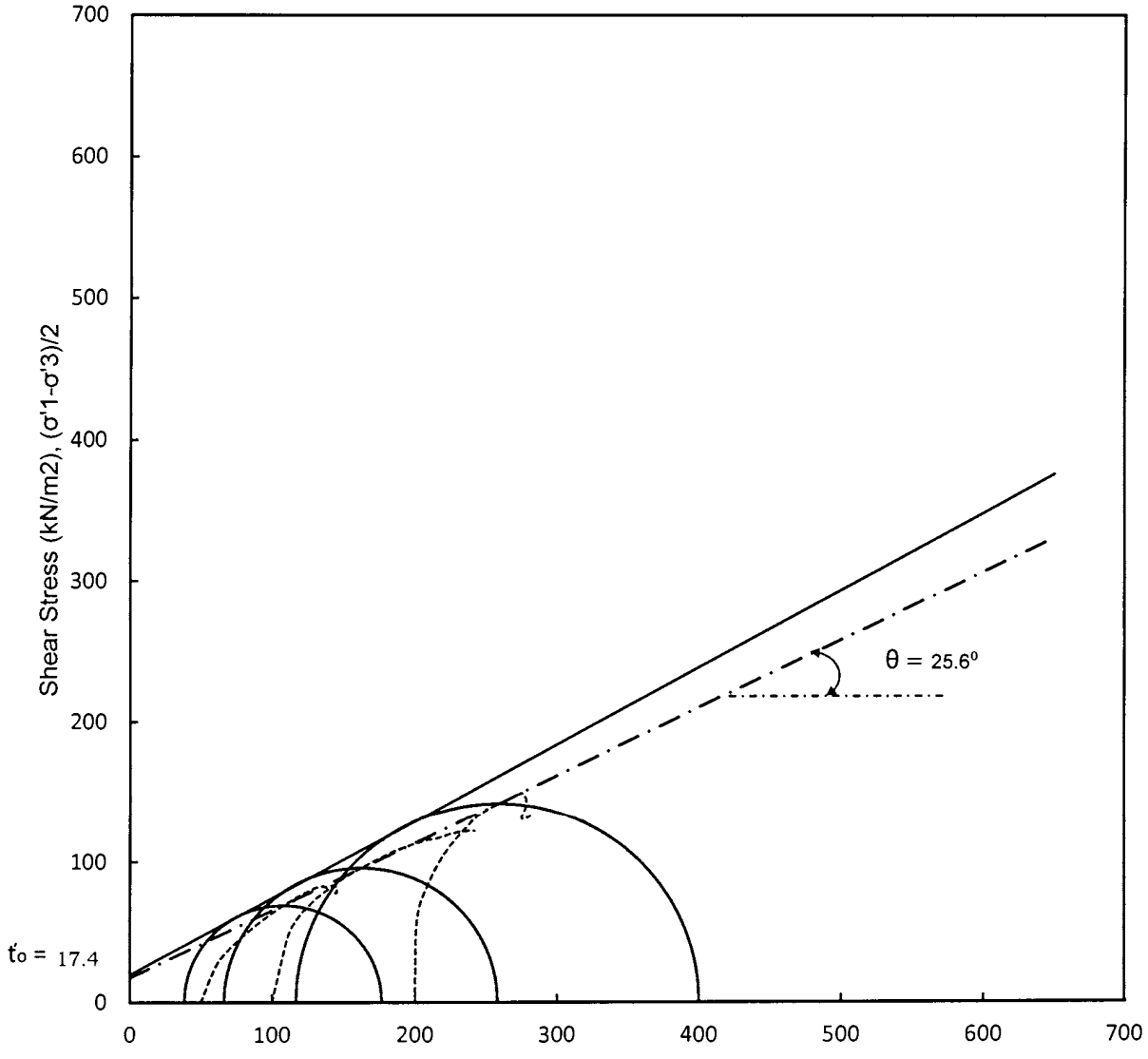
[TEST METHOD - BS 1377:1990:Part 8:Test 7]

PROJECT -	Site Investigation Works at Tengah Phase 1	BOREHOLE -	BH-11
WORKS INSTRUCTION -	WI058	SAMPLE -	UD-1
VISUAL DESCRIPTION -	Reddish brown & very light grey SILT	DEPTH (m) -	2.00 - 2.90
		JOB NUMBER -	1304/10360

SHEAR STAGE - MAXIMUM STRESS RATIO

c' (kN/m^2) - 20

ϕ' (degree) - 29



TESTING OFFICER - Y. Simon Ponraj	APPROVED / CHECKED - (Authorised Signatory - Samuel Teng)	ACCREDITED LABORATORY SAC-SINGLAS Cert. No: LA-2001-022-6-5

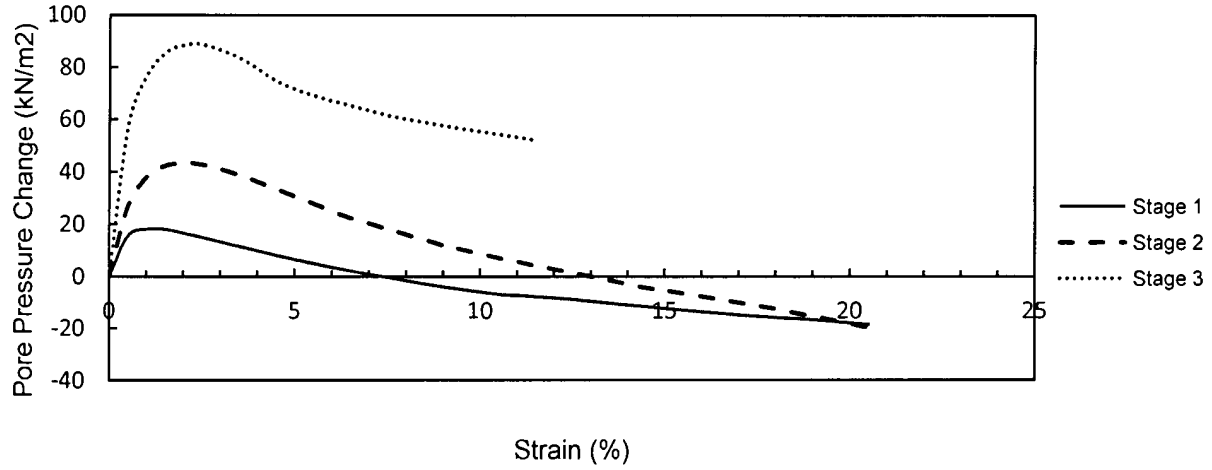
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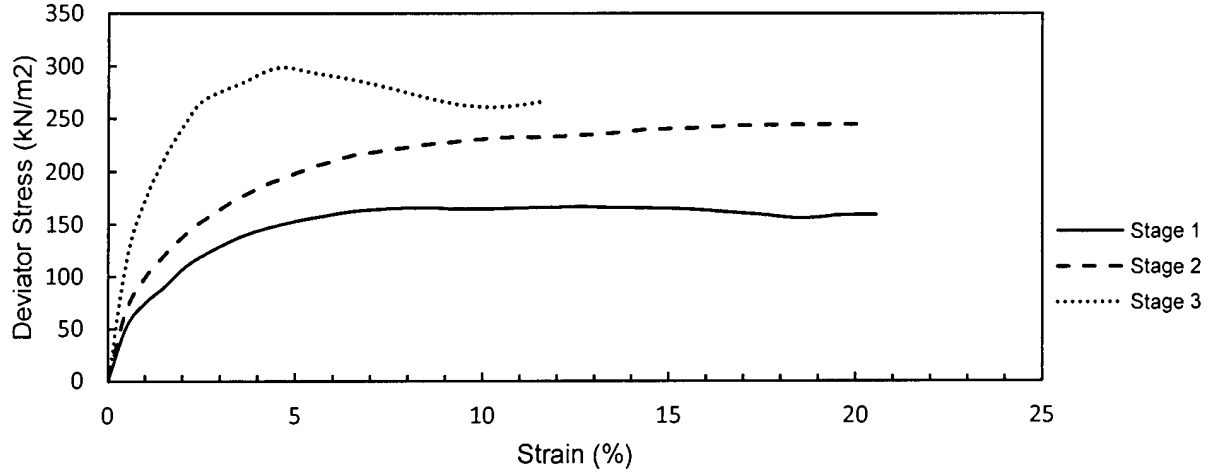
CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION

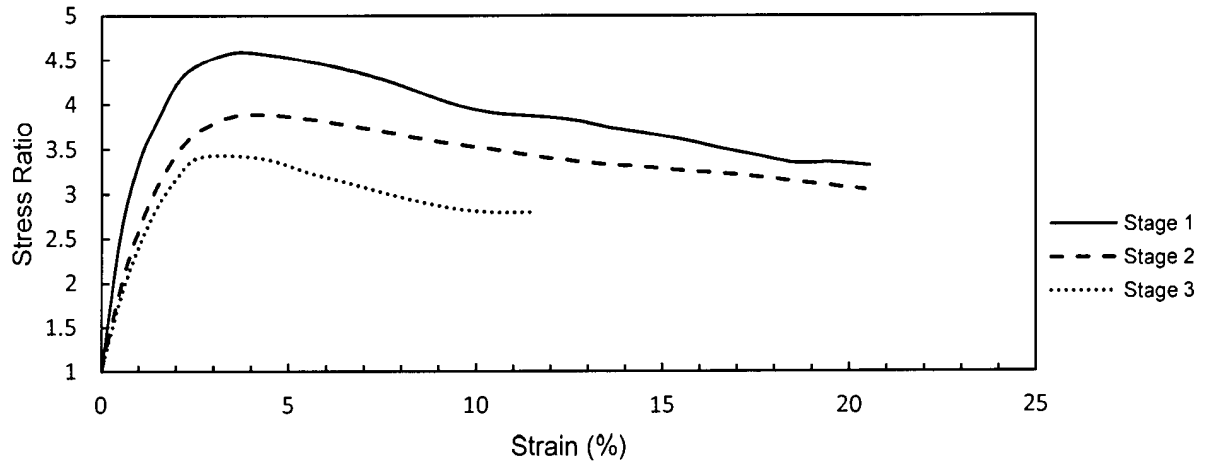
[TEST METHOD - BS 1377:1990:Part 8:Test 7]

PROJECT -	Site Investigation Works at Tengah Phase 1	BOREHOLE -	BH-11
WORKS INSTRUCTION -	WI058	SAMPLE -	UD-1
VISUAL DESCRIPTION -	Reddish brown & very light grey SILT	DEPTH (m) -	2.00 - 2.90
		JOB NUMBER -	1304/10360

SHEAR STAGE







TESTING OFFICER - Y. Simon Ponraj	APPROVED / CHECKED - (Authorised Signatory - Samuel Teng)	ACCREDITED LABORATORY SAC-SINGLAS Cert. No: LA-2001-0226-S

The test results reported herein have been performed in accordance with the laboratory's terms of accreditation under SAC-SINGLAS

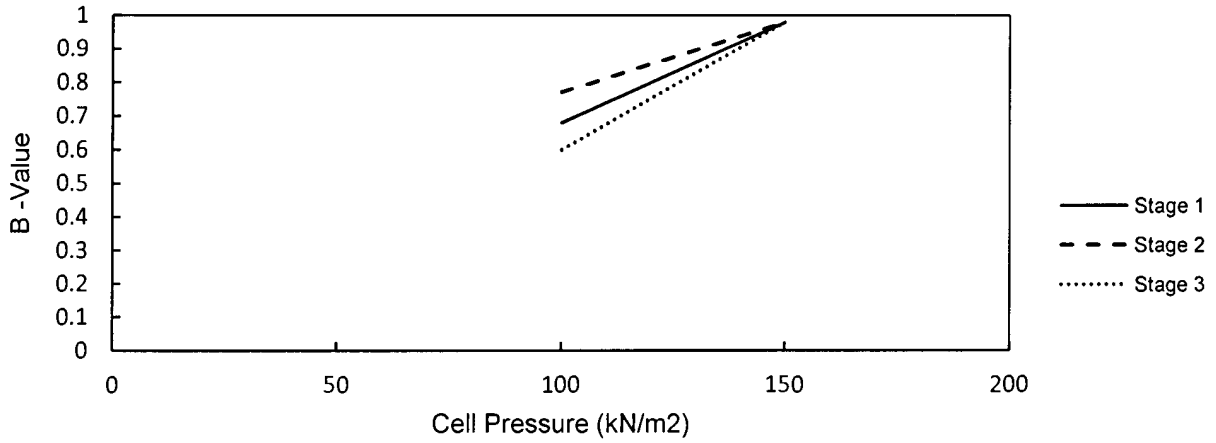
CONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION

[TEST METHOD - BS 1377:1990:Part 8:Test 7]

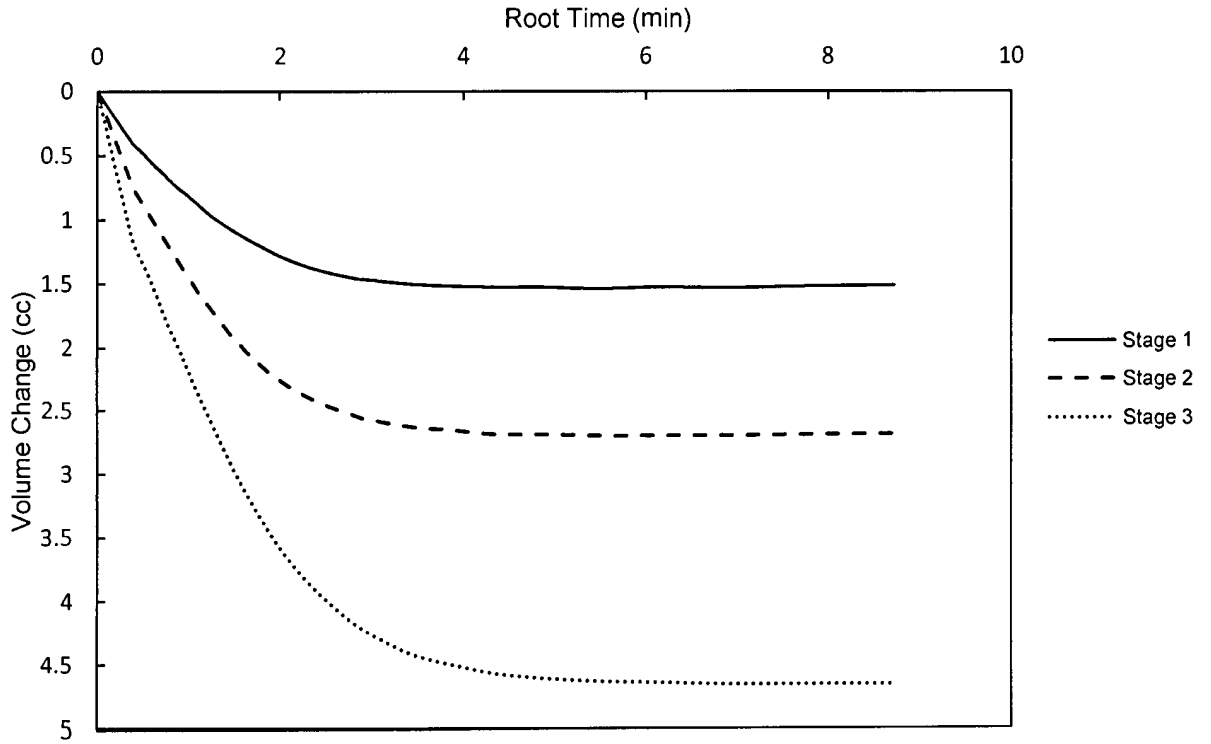
PROJECT -	Site Investigation Works at Tengah Phase 1	BOREHOLE -	BH-11
WORKS INSTRUCTION -	WI058	SAMPLE -	UD-1
VISUAL DESCRIPTION -	Reddish brown & very light grey SILT	DEPTH (m) -	2.00 - 2.90
		JOB NUMBER -	1304/10360

SATURATION / CONSOLIDATION STAGE

SATURATION : BY INCREMENTS OF CELL PRESSURE AND BACK PRESSURE METHOD



CONSOLIDATION : DRAINAGE - TOP AND SIDE DRAIN



TESTING OFFICER - Y. Simon Ponraj	APPROVED / CHECKED - (Authorised Signatory - Samuel Teng)	ACCREDITED LABORATORY SAC-SINGLAS Cert. No: LA-2001-0226-S

The test results reported herein have been performed in accordance with the laboratory's terms of accreditation under SAC-SINGLAS

CONSOLIDATED DRAINED TRIAXIAL COMPRESSION

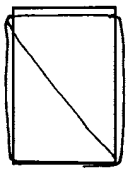
[TEST METHOD - BS 1377:1990:Part 8:Test 8]

PROJECT -	Site Investigation Works at Tengah Phase 1	BOREHOLE -	BH-4
WORKS INSTRUCTION -	WI058	SAMPLE -	UD-1
VISUAL DESCRIPTION -	Brownish yellow & yellow sandy SILT	DEPTH (m) -	2.00 - 2.90
		JOB NUMBER -	1304/10360

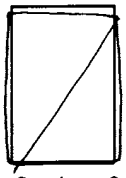
SINGLE-STAGE TEST

STAGE -	1	2	3
INITIAL -			
SAMPLE HEIGHT (mm)	76	76	76
SAMPLE DIAMETER (mm)	38	38	38
MOISTURE CONTENT (%)	27	25	26
BULK DENSITY (Mg/m3)	1.93	1.99	1.99
DRY DENSITY (Mg/m3)	1.52	1.59	1.58
PARTICLE DENSITY (Assumed)	2.70	2.70	2.70
VOID RATIO e_o	0.78	0.70	0.71
DEGREE OF SATURATION S_o (%)	93.5	96.4	98.9
FINAL B VALUE AFTER SATURATION	0.98	0.98	0.98
SHEAR STAGE -			
INITIAL CELL PRESSURE σ_3 (kN/m2)	350	400	500
INITIAL PORE PRESSURE u (kN/m2)	300	300	300
INITIAL EFFECTIVE PRESSURE (kN/m2)	50	100	200
STRAIN RATE (mm/min)	0.006	0.006	0.006
MAXIMUM DEVIATOR STRESS -			
STRAIN (%)	6.45	8.40	4.50
CORRECTED DEVIATOR STRESS σ'_1-σ'_3 (kN/m2)	165.6	292.4	409.2
CORRECTED SHEAR STRESS $(\sigma'_1-\sigma'_3)/2$ (kN/m2)	82.8	146.2	204.6
EFFECTIVE MINOR STRESS σ'_3 (kN/m2)	50.0	100.0	200.0
EFFECTIVE MAJOR STRESS σ'_1 (kN/m2)	215.6	392.4	609.2
FINAL -			
MOISTURE CONTENT (%)	27	25	25
BULK DENSITY (Mg/m3)	1.98	2.06	2.07
DRY DENSITY (Mg/m3)	1.56	1.65	1.66
VOID RATIO e_f	0.73	0.64	0.63
DEGREE OF SATURATION S_f (%)	100.0	100.0	100.0

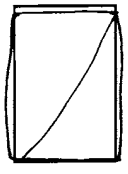
FAILURE MODE -



Specimen 1



Specimen 2



Specimen 3

TESTING OFFICER - Y. Simon Ponraj

APPROVED / CHECKED - (Authorised Signatory - Samuel Teng)

The test results reported herein have been performed in accordance with the laboratory's terms of accreditation under SAC-SINGLAS

ACCREDITED LABORATORY SAC-SINGLAS CHE NO: LA-2001-0226-S

CONSOLIDATED DRAINED TRIAXIAL COMPRESSION

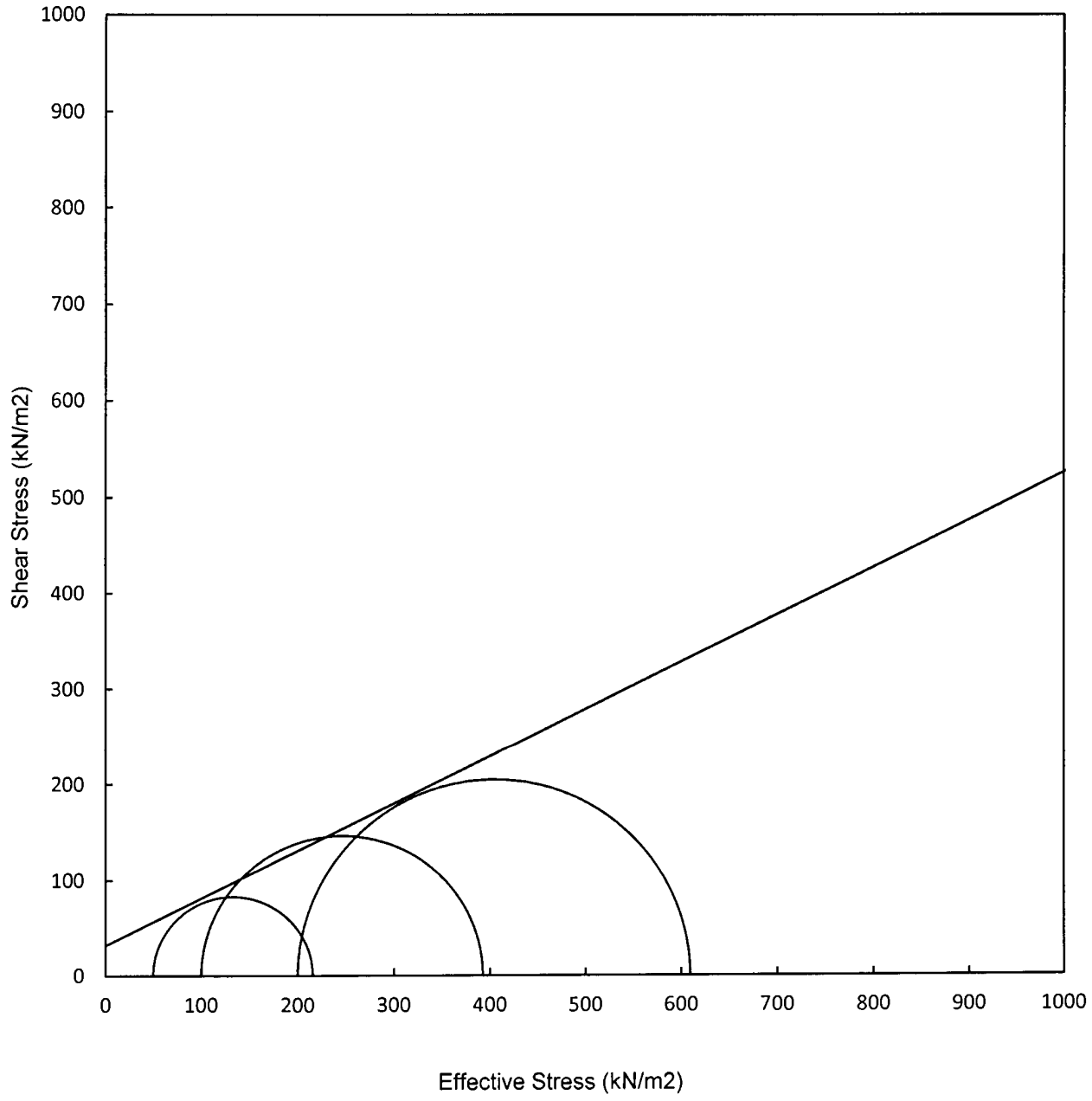
[TEST METHOD - BS 1377:1990:Part 8:Test 8]

PROJECT -	Site Investigation Works at Tengah Phase 1	BOREHOLE -	BH-4
WORKS INSTRUCTION -	WI058	SAMPLE -	UD-1
VISUAL DESCRIPTION -	Brownish yellow & yellow sandy SILT	DEPTH (m) -	2.00 - 2.90
		JOB NUMBER -	1304/10360

SHEAR STAGE - MAXIMUM DEVIATOR STRESS

c' (kN/m2) - 32

ϕ' (degree) - 26



TESTING OFFICER - Y. Simon Ponraj	APPROVED / CHECKED - (Authorised Signatory - Samuel Teng)	ACCREDITED LABORATORY SAC-SINGLAS Cert. No: LA-2001-022C-B

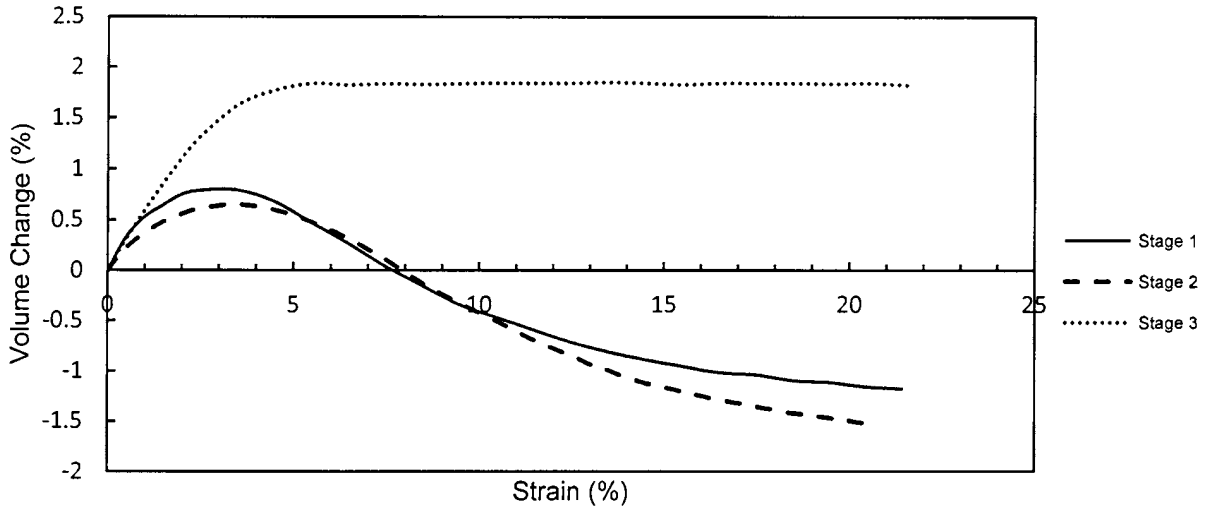
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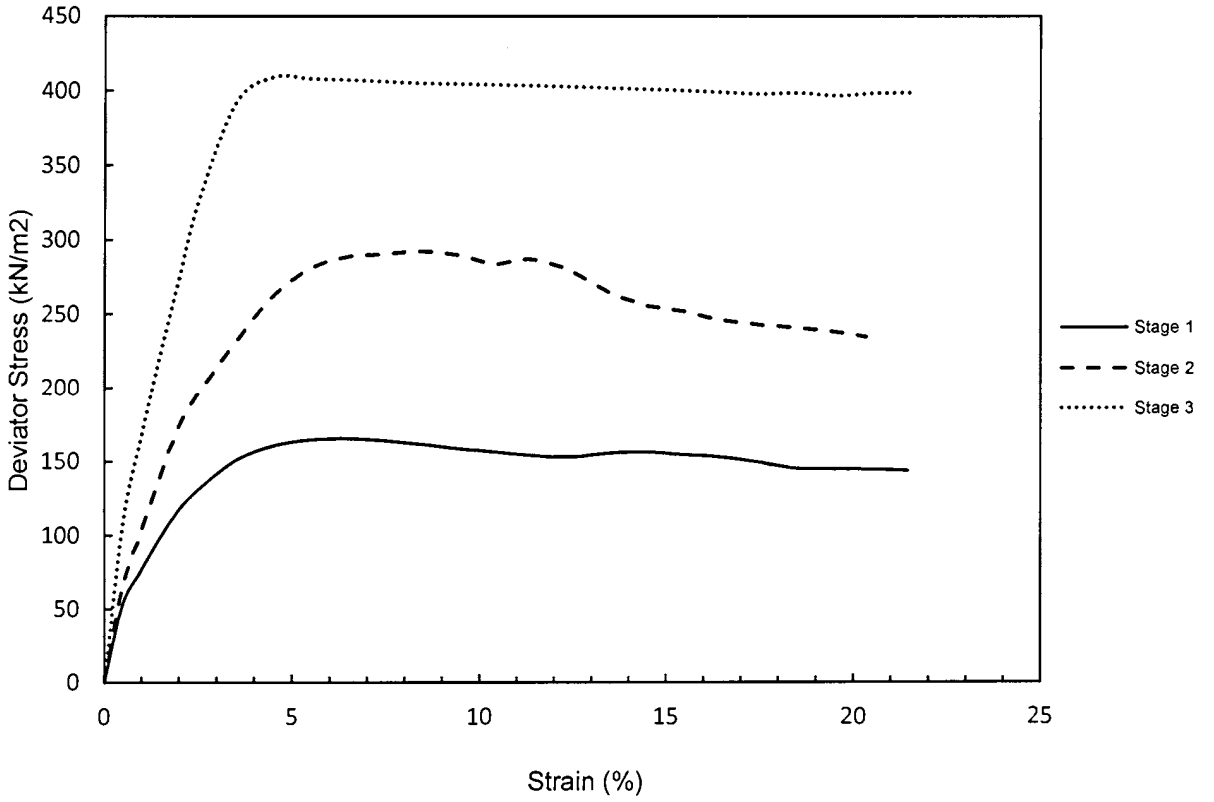
CONSOLIDATED DRAINED TRIAXIAL COMPRESSION

[TEST METHOD - BS 1377:1990:Part 8:Test 8]

PROJECT -	Site Investigation Works at Tengah Phase 1	BOREHOLE -	BH-4
WORKS INSTRUCTION -	WI058	SAMPLE -	UD-1
VISUAL DESCRIPTION -	Brownish yellow & yellow sandy SILT	DEPTH (m) -	2.00 - 2.90
		JOB NUMBER -	1304/10360

SHEAR STAGE





TESTING OFFICER - Y. Simon Ponraj	APPROVED / CHECKED - (Authorised Signatory - Samuel Teng)	ACCREDITED LABORATORY SAC-SINGLAS Cert. No: LA-2001-0226-B

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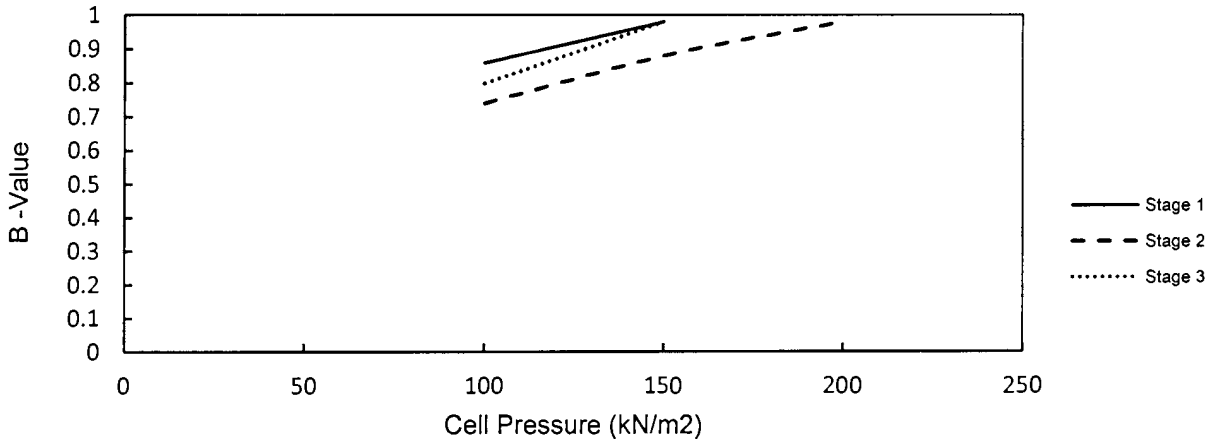
CONSOLIDATED DRAINED TRIAXIAL COMPRESSION

[TEST METHOD - BS 1377:1990:Part 8:Test 8]

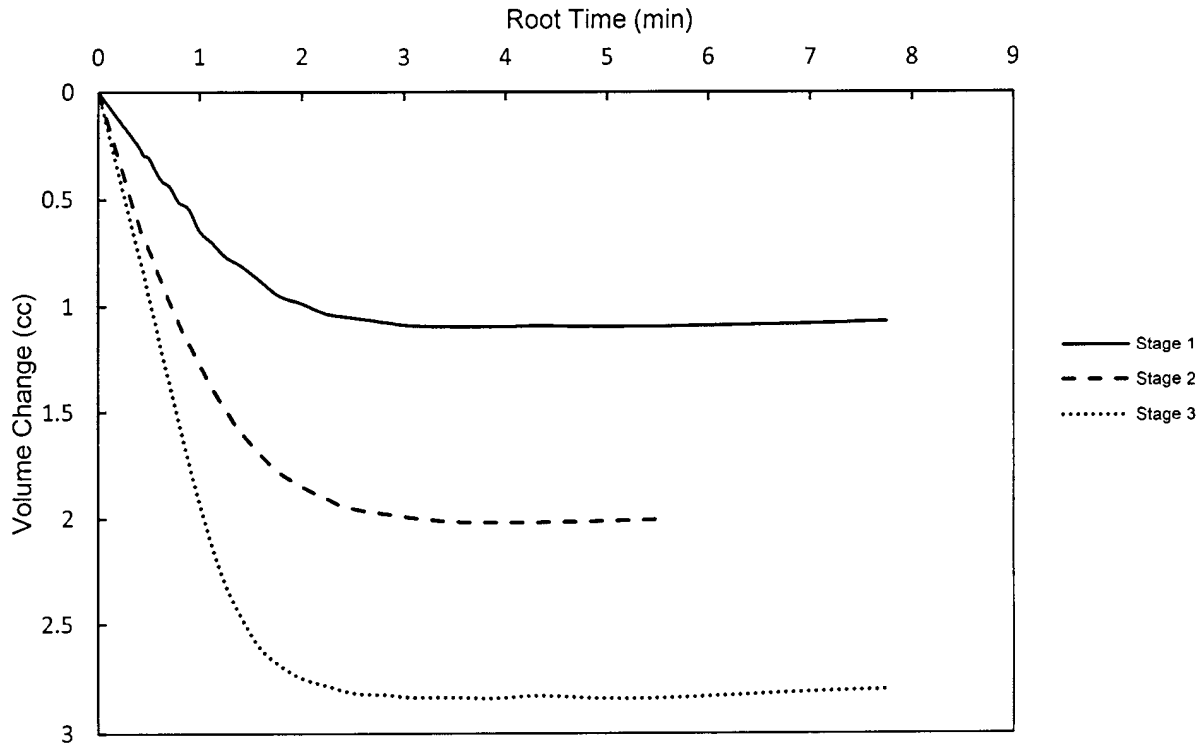
PROJECT -	Site Investigation Works at Tengah Phase 1	BOREHOLE -	BH-4
WORKS INSTRUCTION -	WI058	SAMPLE -	UD-1
VISUAL DESCRIPTION -	Brownish yellow & yellow sandy SILT	DEPTH (m) -	2.00 - 2.90
		JOB NUMBER -	1304/10360

SATURATION / CONSOLIDATION STAGE

SATURATION : BY INCREMENTS OF CELL PRESSURE AND BACK PRESSURE METHOD



CONSOLIDATION : DRAINAGE - TOP AND SIDE DRAIN



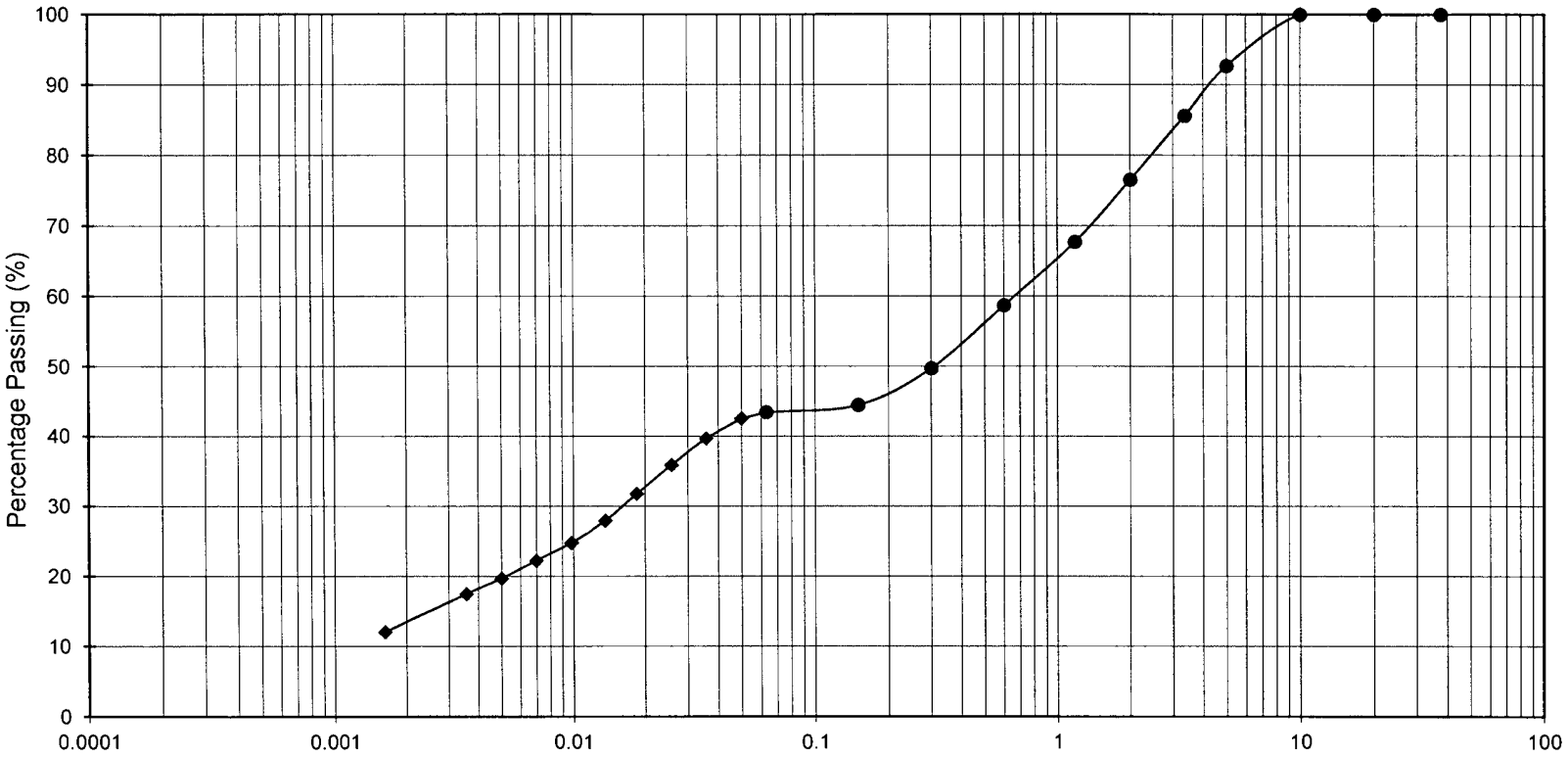
TESTING OFFICER - Y. Simon Ponraj	APPROVED / CHECKED - (Authorised Signatory - Samuel Teng)	ACCREDITED LABORATORY SAC-SINGLAS Cert. No: LA-2001/0228-B

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PARTICLE SIZE DISTRIBUTION - HYDROMETER SEDIMENTATION & SIEVE ANALYSIS

[TEST METHOD - BS 1377:1990:Part 2:Test 9.3 / 9.5]

PROJECT -	Site Investigation Works at Tengah Phase 1	BOREHOLE -	BH-1
WORKS INSTRUCTION -	WI058	SAMPLE -	UD-1
VISUAL DESCRIPTION -	Pale red & light reddish brown slightly gravelly, slightly sandy SILT	DEPTH (m) -	2.00 - 2.90
		JOB NUMBER -	1304/10360



	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	
CLAY	SILT			SAND			GRAVEL			COBBLE

CLAY -	14 %
SILT -	29 %
SAND -	34 %
GRAVEL -	23 %

LEGEND -

● SIEVE ANALYSIS

◆ HYDROMETER SEDIMENTATION

TESTING OFFICER - C. Rajasekaran

APPROVED / CHECKED -

(Authorised Signatory - Samuel Teng)

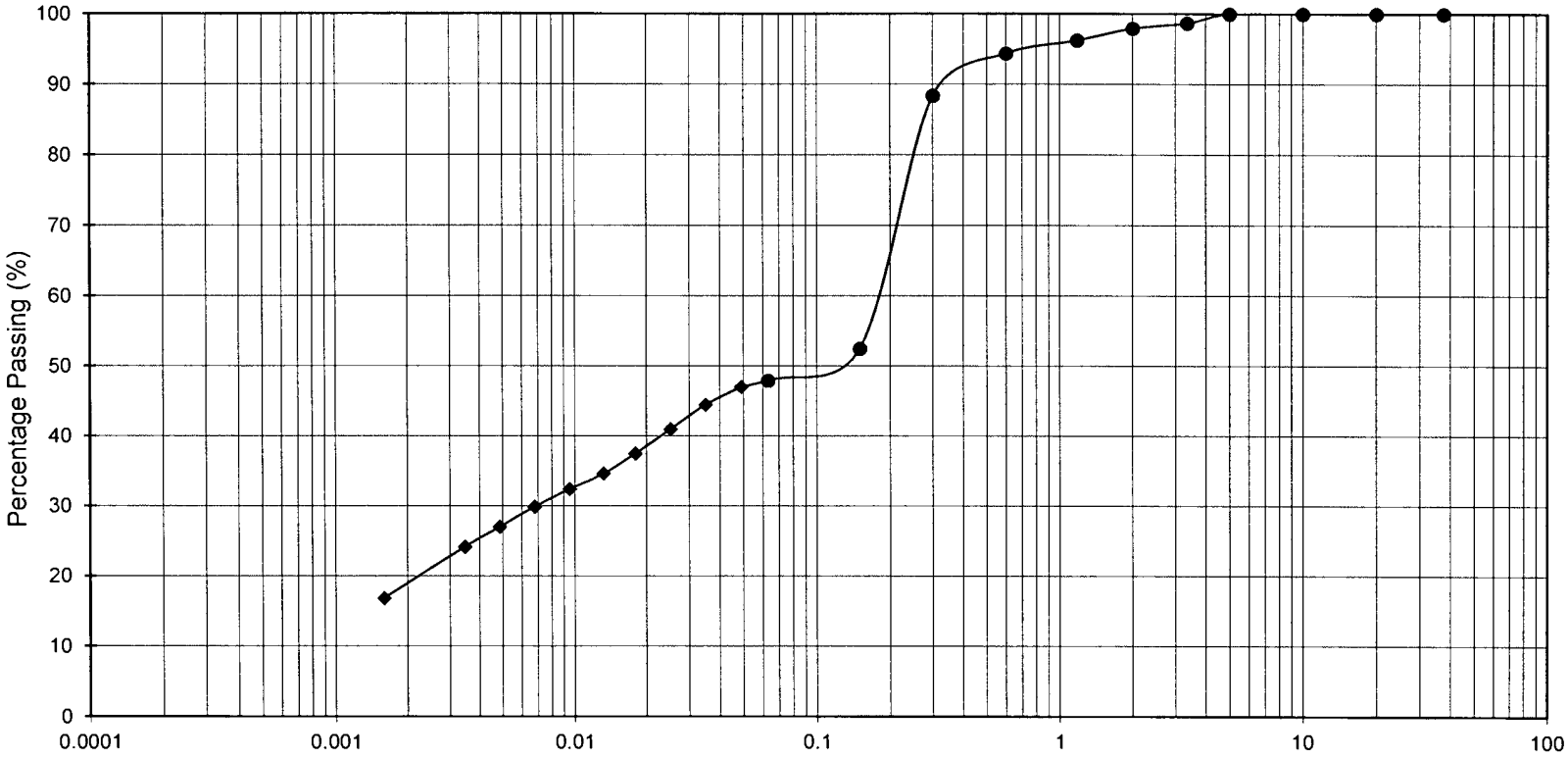
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ACCREDITED LABORATORY SAC-SINGLAS Cert. No: LA-2001/0226-B

PARTICLE SIZE DISTRIBUTION - HYDROMETER SEDIMENTATION & SIEVE ANALYSIS

[TEST METHOD - BS 1377:1990:Part 2:Test 9.3 / 9.5]

PROJECT -	Site Investigation Works at Tengah Phase 1	BOREHOLE -	BH-1
WORKS INSTRUCTION -	WI058	SAMPLE -	UD-2
VISUAL DESCRIPTION -	Reddish brown slightly gravelly, sandy SILT	DEPTH (m) -	4.00 - 4.90
		JOB NUMBER -	1304/10360



CLAY -	19 %		
SILT -	29 %		
SAND -	50 %		
GRAVEL -	2 %		

LEGEND -

● SIEVE ANALYSIS

◆ HYDROMETER SEDIMENTATION

	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	
CLAY	SILT			SAND			GRAVEL			COBBLE

TESTING OFFICER - C. Rajasekaran

APPROVED / CHECKED -

(Authorised Signatory - Samuel Teng)

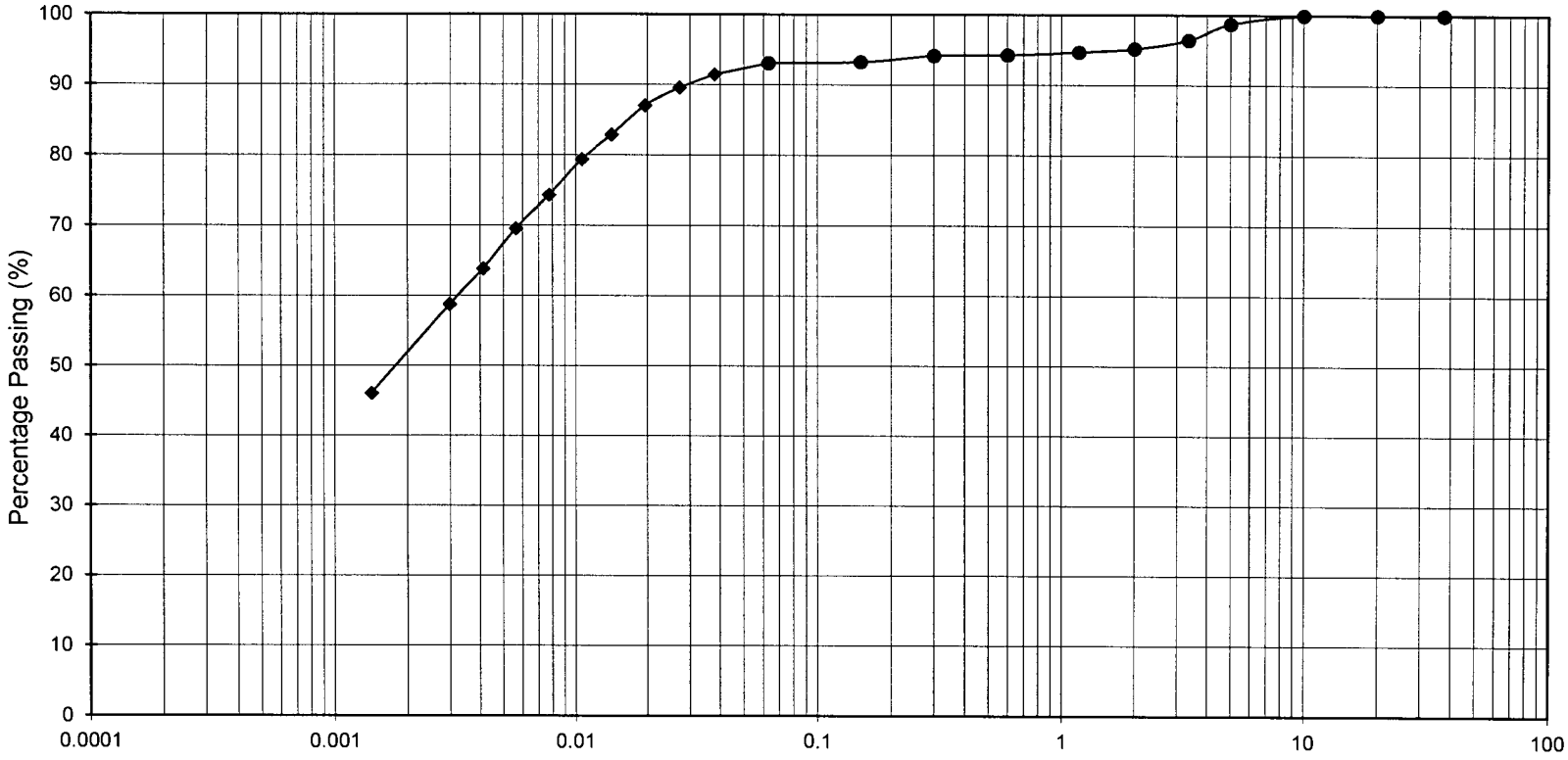
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ACCREDITED LABORATORY SAC-SINGLAS Cert. No: LA-2001-0226-B

PARTICLE SIZE DISTRIBUTION - HYDROMETER SEDIMENTATION & SIEVE ANALYSIS

[TEST METHOD - BS 1377:1990:Part 2:Test 9.3 / 9.5]

PROJECT -	Site Investigation Works at Tengah Phase 1	BOREHOLE -	BH-2
WORKS INSTRUCTION -	WI058	SAMPLE -	UD-1
VISUAL DESCRIPTION -	Reddish yellow & reddish brown slightly sandy, slightly gravelly CLAY	DEPTH (m) -	2.00 - 2.90
		JOB NUMBER -	1304/10360



	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	
CLAY	SILT			SAND			GRAVEL			COBBLE

CLAY -	52 %
SILT -	41 %
SAND -	2 %
GRAVEL -	5 %

LEGEND -

● SIEVE ANALYSIS

◆ HYDROMETER SEDIMENTATION

TESTING OFFICER - C. Rajasekaran

APPROVED / CHECKED -

(Authorised Signatory - Samuel Teng)

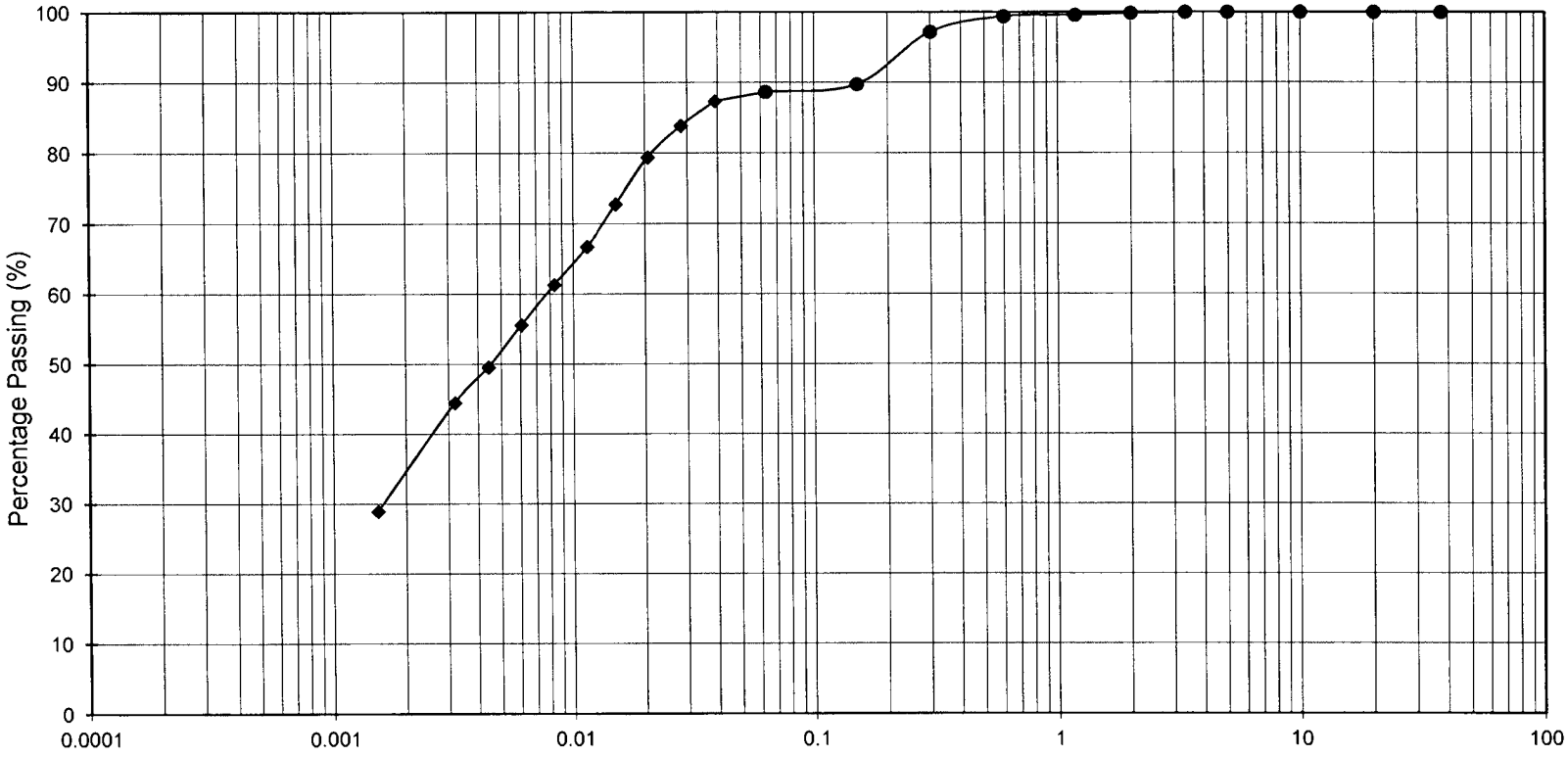
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ACCREDITED LABORATORY SAC-SINGLAS Cert No: LA-2001-022B-B

PARTICLE SIZE DISTRIBUTION - HYDROMETER SEDIMENTATION & SIEVE ANALYSIS

[TEST METHOD - BS 1377:1990:Part 2:Test 9.3 / 9.5]

PROJECT -	Site Investigation Works at Tengah Phase 1	BOREHOLE -	BH-2
WORKS INSTRUCTION -	WI058	SAMPLE -	UD-2
VISUAL DESCRIPTION -	Reddish brown & light grey slightly sandy CLAY	DEPTH (m) -	4.00 - 4.90
		JOB NUMBER -	1304/10360



CLAY -	35 %
SILT -	54 %
SAND -	11 %
GRAVEL -	0 %

LEGEND -
- ● SIEVE ANALYSIS
- ◆ HYDROMETER SEDIMENTATION

	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	
CLAY	SILT			SAND			GRAVEL			COBBLE

TESTING OFFICER - C. Rajasekaran

APPROVED / CHECKED - (Authorised Signatory - Samuel Teng)

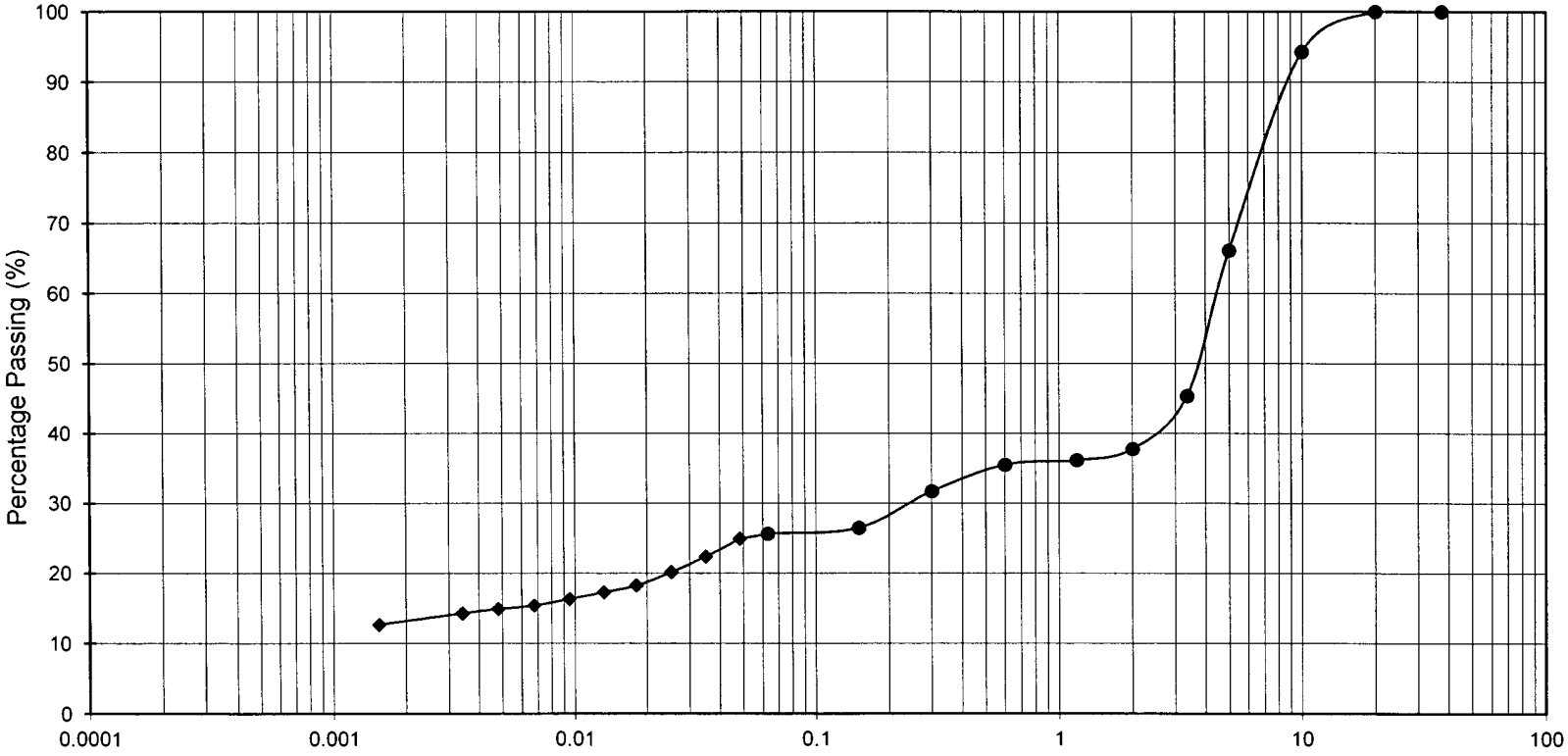
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ACCREDITED LABORATORY SAC-SINGLAS Cert No: LA-2001-0226-B

PARTICLE SIZE DISTRIBUTION - HYDROMETER SEDIMENTATION & SIEVE ANALYSIS

[TEST METHOD - BS 1377:1990:Part 2:Test 9.3 / 9.5]

PROJECT -	Site Investigation Works at Tengah Phase 1	BOREHOLE -	BH-3
WORKS INSTRUCTION -	WI058	SAMPLE -	UD-1
VISUAL DESCRIPTION -	Reddish yellow & brownish yellow sandy, silty, fine to medium GRAVEL	DEPTH (m) -	2.00 - 2.90
		JOB NUMBER -	1304/10360



CLAY -	13 %
SILT -	13 %
SAND -	12 %
GRAVEL -	62 %

LEGEND -
- ● SIEVE ANALYSIS
- ◆ HYDROMETER SEDIMENTATION

	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	
CLAY	SILT			SAND			GRAVEL			COBBLE

TESTING OFFICER - C. Rajasekaran

APPROVED / CHECKED - (Authorised Signatory - Samuel Teng)

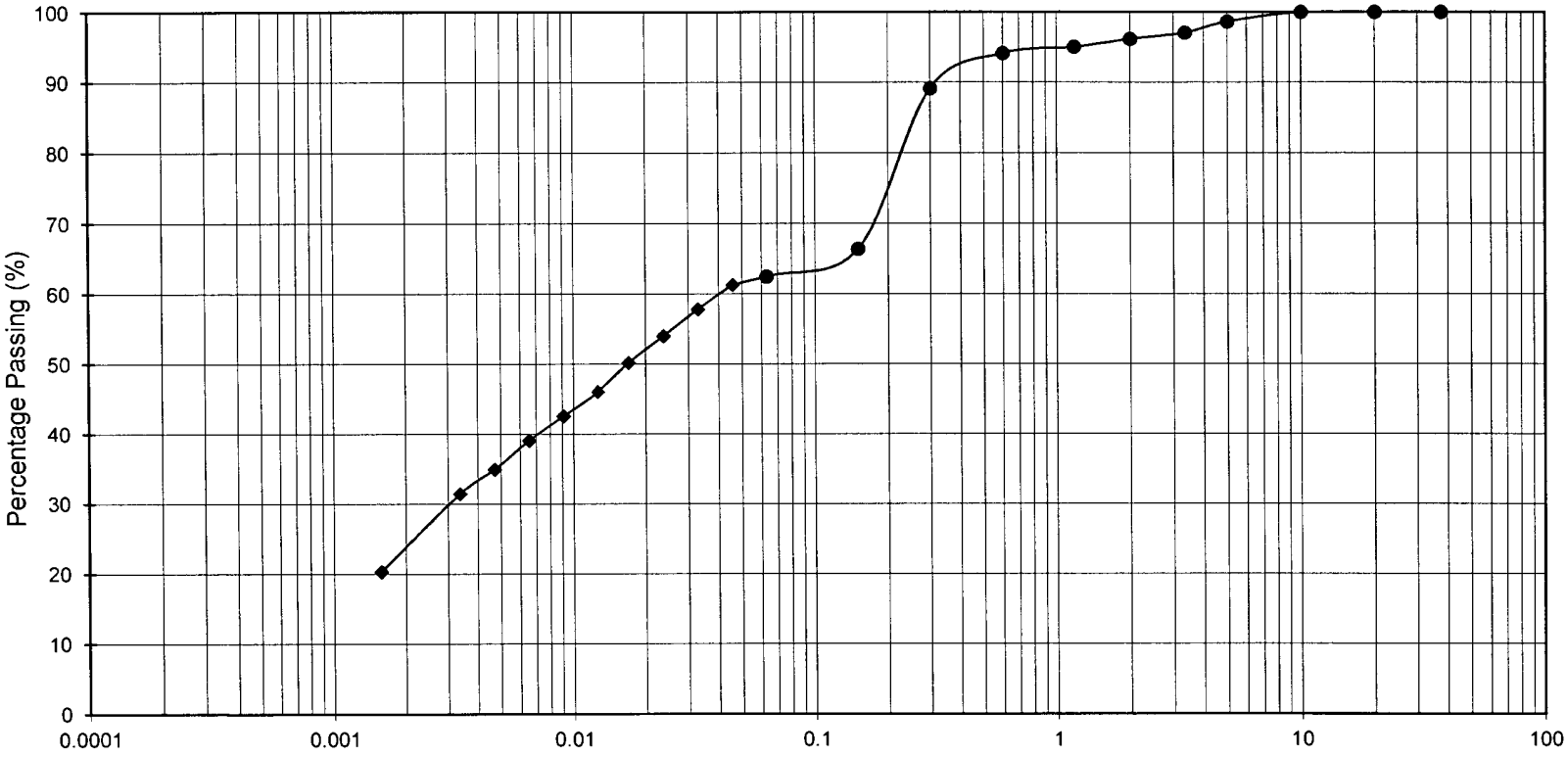
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ACCREDITED LABORATORY SAC-SINGLAS Cert. No. LA-2001/0226-B

PARTICLE SIZE DISTRIBUTION - HYDROMETER SEDIMENTATION & SIEVE ANALYSIS

[TEST METHOD - BS 1377:1990:Part 2:Test 9.3 / 9.5]

PROJECT -	Site Investigation Works at Tengah Phase 1	BOREHOLE -	BH-3
WORKS INSTRUCTION -	WI058	SAMPLE -	UD-2
VISUAL DESCRIPTION -	Reddish brown & very light grey slightly gravelly, slightly sandy SILT	DEPTH (m) -	4.00 - 4.90
		JOB NUMBER -	1304/10360



CLAY -	24 %
SILT -	38 %
SAND -	34 %
GRAVEL -	4 %

LEGEND -
- ● SIEVE ANALYSIS
- ◆ HYDROMETER SEDIMENTATION

	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	
CLAY	SILT			SAND			GRAVEL			COBBLE

TESTING OFFICER - C. Rajasekaran

APPROVED / CHECKED -

(Authorised Signatory - Samuel Teng)

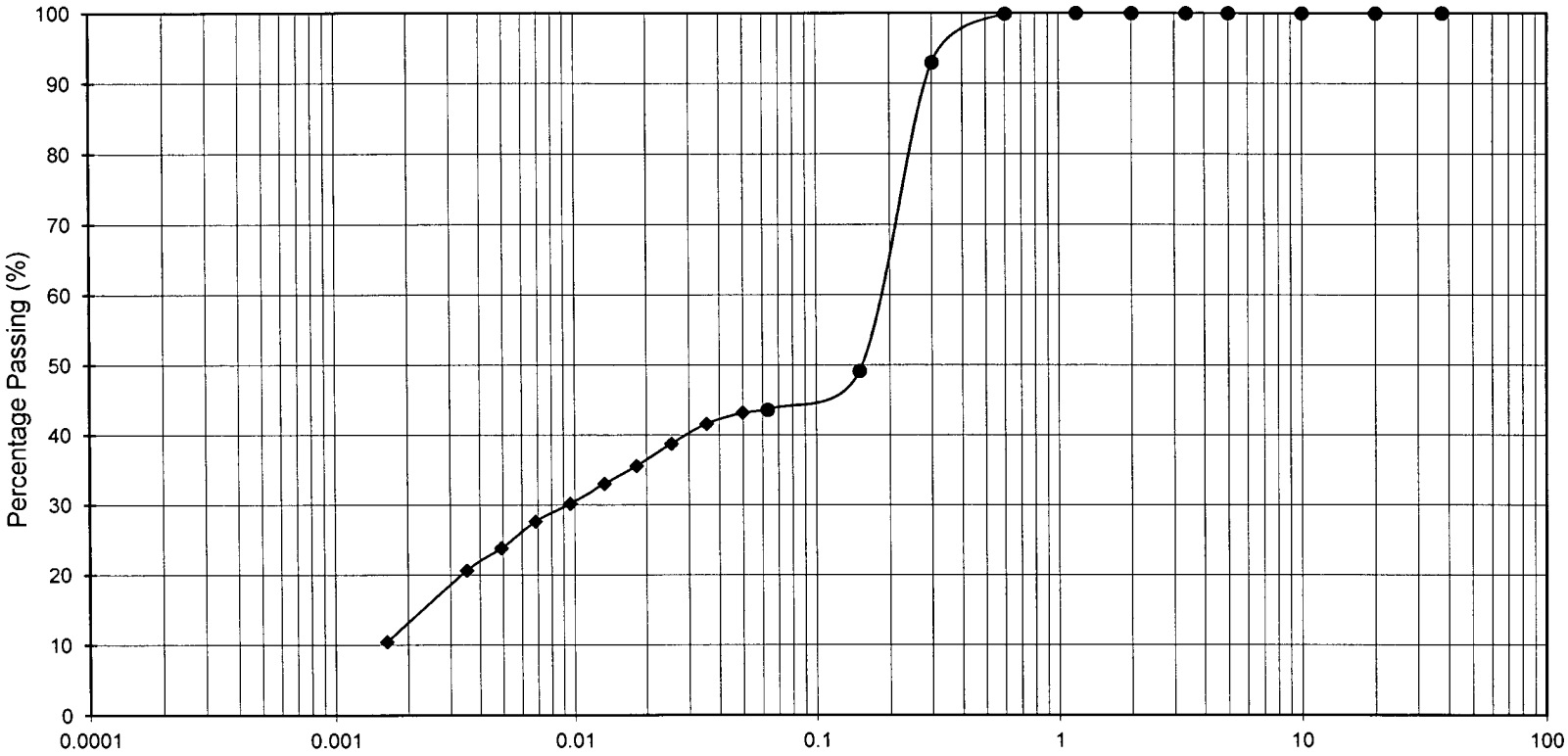
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ACCREDITED LABORATORY SAC-SINGLAS Cert. No: LA-2001-0226-B

PARTICLE SIZE DISTRIBUTION - HYDROMETER SEDIMENTATION & SIEVE ANALYSIS

[TEST METHOD - BS 1377:1990:Part 2:Test 9.3 / 9.5]

PROJECT -	Site Investigation Works at Tengah Phase 1	BOREHOLE -	BH-4
WORKS INSTRUCTION -	WI058	SAMPLE -	UD-1
VISUAL DESCRIPTION -	Brownish yellow & yellow sandy SILT	DEPTH (m) -	2.00 - 2.90
		JOB NUMBER -	1304/10360



CLAY -	13 %
SILT -	31 %
SAND -	56 %
GRAVEL -	0 %

LEGEND -
- ● SIEVE ANALYSIS
- ◆ HYDROMETER SEDIMENTATION

	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	
CLAY	SILT			SAND			GRAVEL			COBBLE

TESTING OFFICER - C. Rajasekaran

APPROVED / CHECKED - (Authorised Signatory - Samuel Teng)

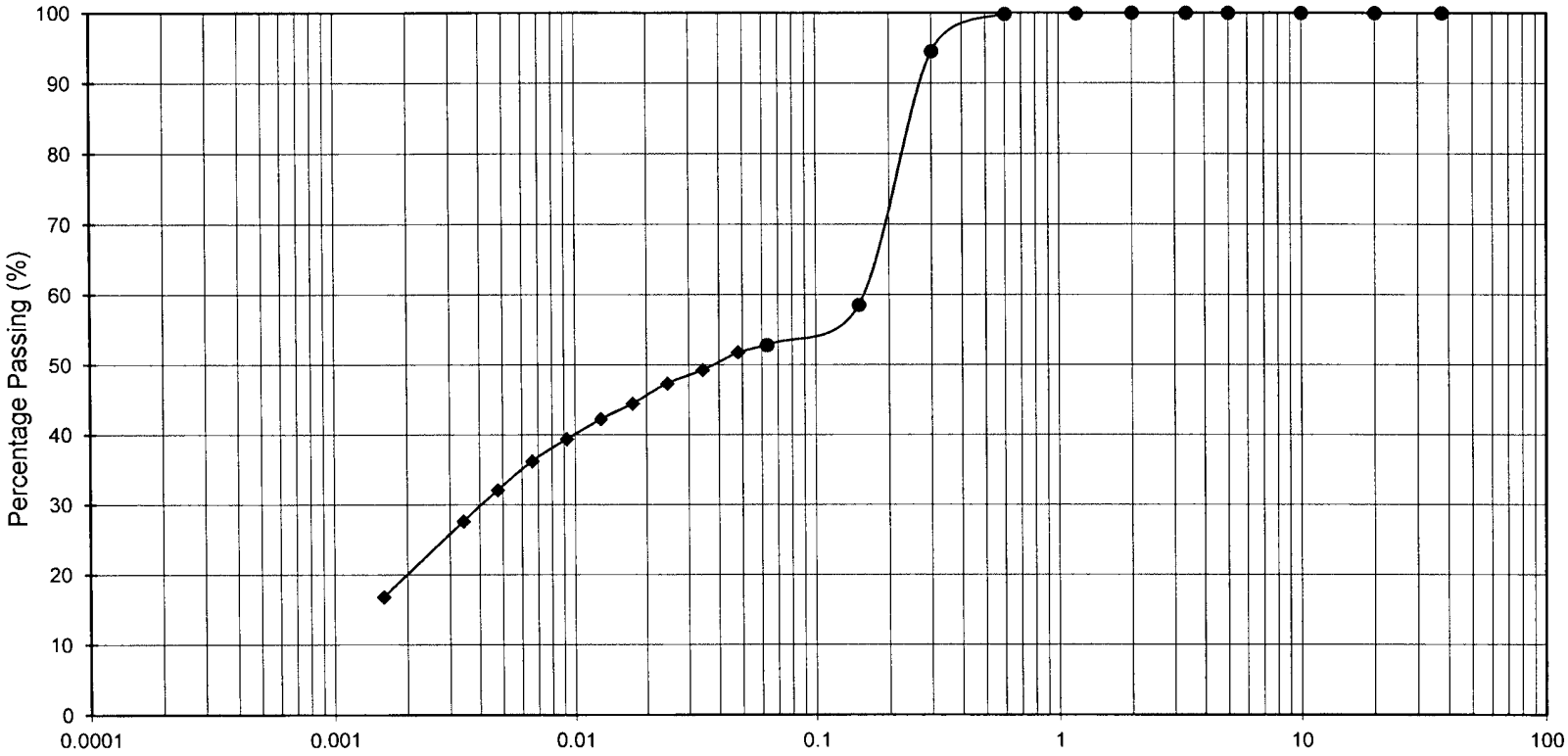
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ACCREDITED LABORATORY SAC-SINGLAS Cert. No: LA-2001-0226-B

PARTICLE SIZE DISTRIBUTION - HYDROMETER SEDIMENTATION & SIEVE ANALYSIS

[TEST METHOD - BS 1377:1990:Part 2:Test 9.3 / 9.5]

PROJECT -	Site Investigation Works at Tengah Phase 1	BOREHOLE -	BH-4
WORKS INSTRUCTION -	WI058	SAMPLE -	UD-2
VISUAL DESCRIPTION -	Light reddish brown & light grey sandy SILT	DEPTH (m) -	4.00 - 4.90
		JOB NUMBER -	1304/10360



	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	
CLAY	SILT			SAND			GRAVEL			COBBLE

CLAY -	20 %
SILT -	33 %
SAND -	47 %
GRAVEL -	0 %

LEGEND -

● SIEVE ANALYSIS

◆ HYDROMETER SEDIMENTATION

TESTING OFFICER - C. Rajasekaran

APPROVED / CHECKED -

(Authorised Signatory - Samuel Teng)

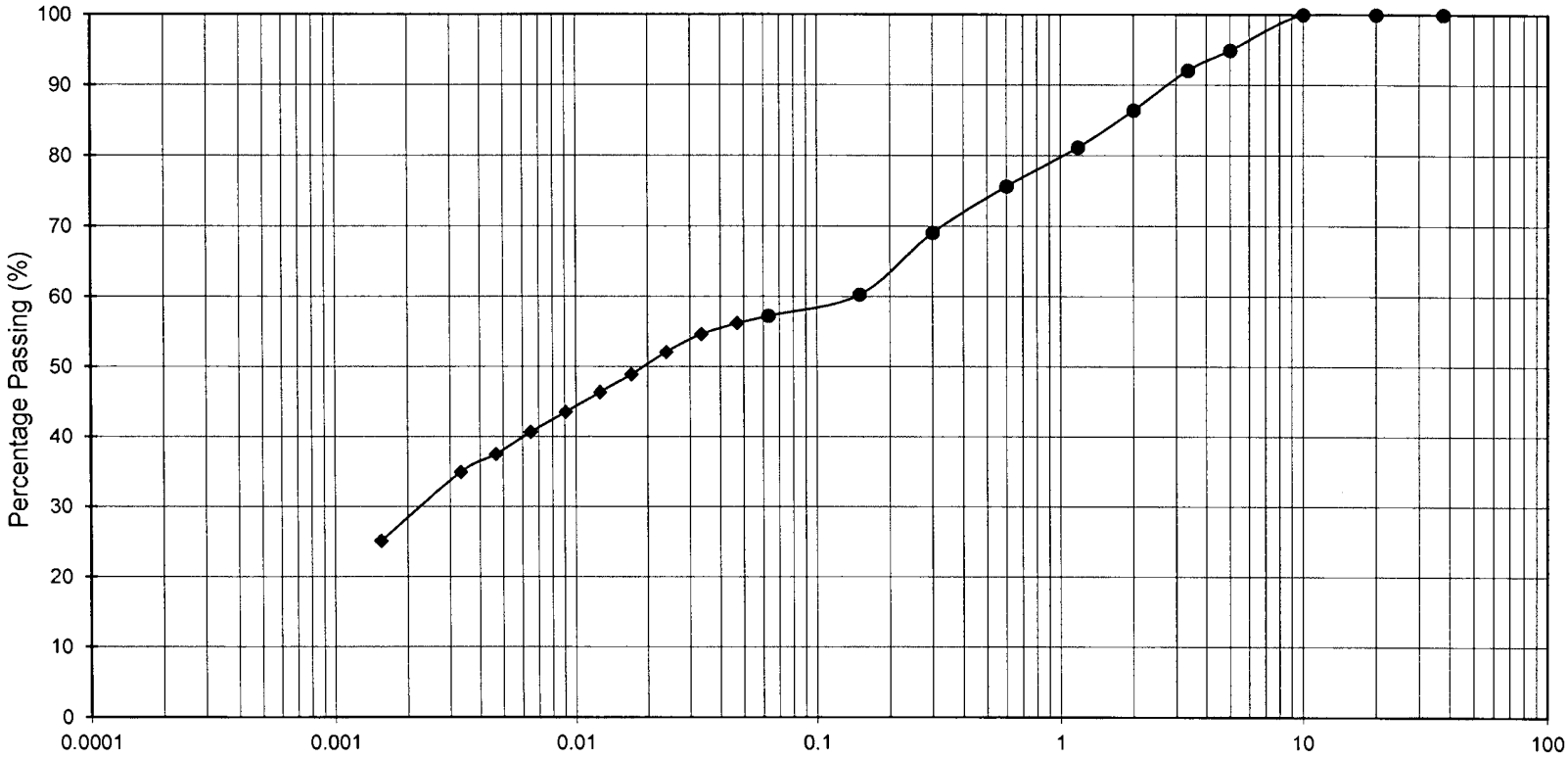
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ACCREDITED LABORATORY SAC-SINGLAS Cert. No. LA-2001-0226-B

PARTICLE SIZE DISTRIBUTION - HYDROMETER SEDIMENTATION & SIEVE ANALYSIS

[TEST METHOD - BS 1377:1990:Part 2:Test 9.3 / 9.5]

PROJECT -	Site Investigation Works at Tengah Phase 1	BOREHOLE -	BH-5
WORKS INSTRUCTION -	WI058	SAMPLE -	UD-1
VISUAL DESCRIPTION -	Reddish yellow & light grey slightly gravelly, slightly sandy SILT	DEPTH (m) -	2.00 - 2.60
		JOB NUMBER -	1304/10360



CLAY -	28 %
SILT -	29 %
SAND -	29 %
GRAVEL -	14 %

LEGEND -
- ● SIEVE ANALYSIS
- ◆ HYDROMETER SEDIMENTATION

	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	
CLAY	SILT			SAND			GRAVEL			COBBLE

TESTING OFFICER - C. Rajasekaran

APPROVED / CHECKED -

(Authorised Signatory - Samuel Teng)

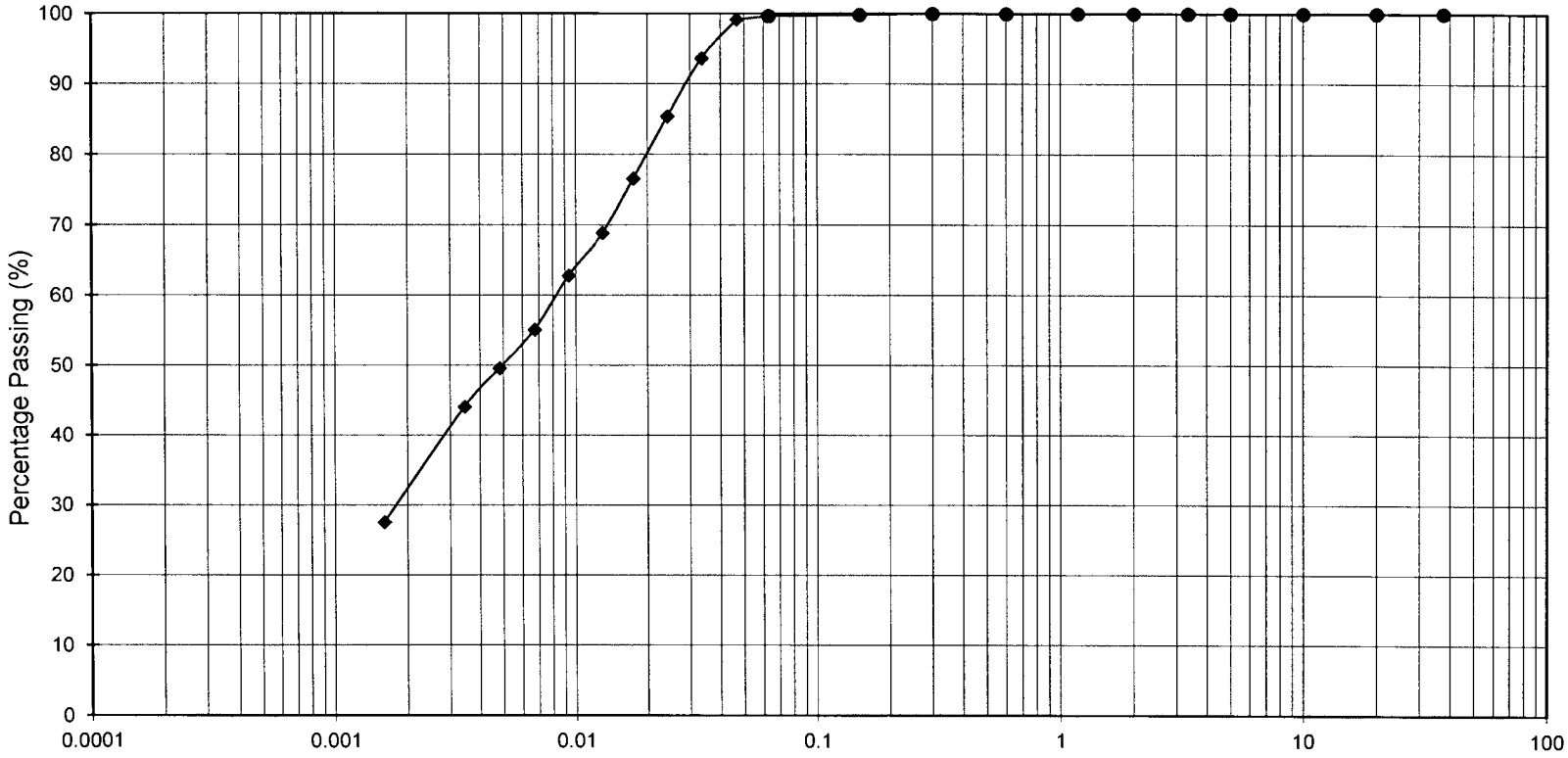
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ACCREDITED LABORATORY SAC-SINGLAS Cert. No: LA-2001-0226-B

PARTICLE SIZE DISTRIBUTION - HYDROMETER SEDIMENTATION & SIEVE ANALYSIS

[TEST METHOD - BS 1377:1990:Part 2:Test 9.3 / 9.5]

PROJECT -	Site Investigation Works at Tengah Phase 1	BOREHOLE -	BH-6
WORKS INSTRUCTION -	WI058	SAMPLE -	UD-2
VISUAL DESCRIPTION -	Very dark grey organic SILT with decayed vegetation	DEPTH (m) -	4.00 - 4.90
		JOB NUMBER -	1304/10360



	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	
CLAY	SILT			SAND			GRAVEL			COBBLE

CLAY -	32 %
SILT -	68 %
SAND -	0 %
GRAVEL -	0 %

LEGEND -

● SIEVE ANALYSIS

◆ HYDROMETER SEDIMENTATION

TESTING OFFICER - C. Rajasekaran

APPROVED / CHECKED -

(Authorised Signatory - Samuel Teng)

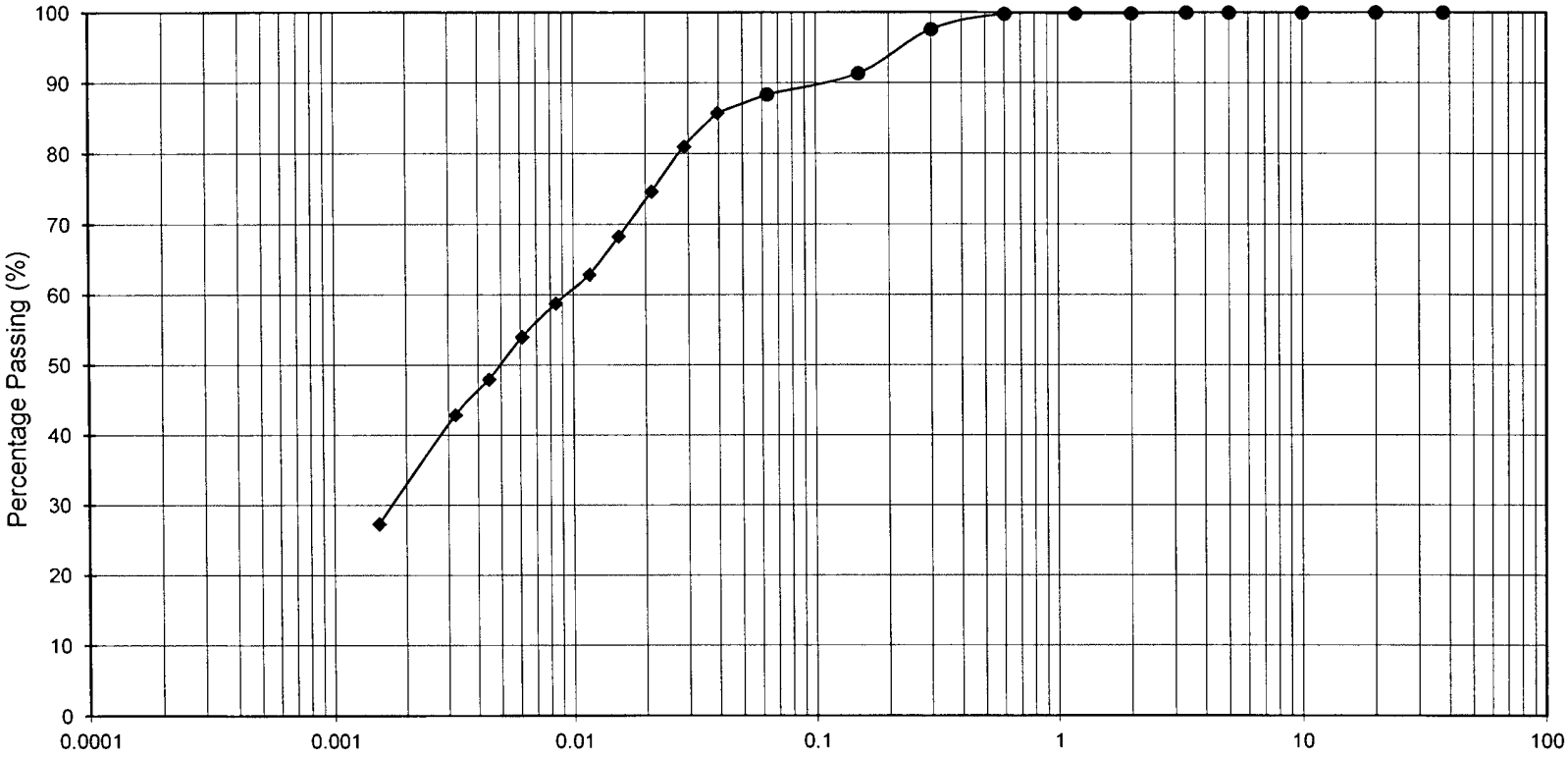
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ACCREDITED LABORATORY SAC-SINGLAS Cert. No: LA-2001-0228-B

PARTICLE SIZE DISTRIBUTION - HYDROMETER SEDIMENTATION & SIEVE ANALYSIS

[TEST METHOD - BS 1377:1990:Part 2:Test 9.3 / 9.5]

PROJECT -	Site Investigation Works at Tengah Phase 1	BOREHOLE -	BH-8
WORKS INSTRUCTION -	WI058	SAMPLE -	UD-2
VISUAL DESCRIPTION -	Reddish brown & light reddish brown slightly sandy SILT	DEPTH (m) -	4.00 - 4.90
		JOB NUMBER -	1304/10360



	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	
CLAY	SILT			SAND			GRAVEL			COBBLE

CLAY -	33 %
SILT -	55 %
SAND -	12 %
GRAVEL -	0 %

LEGEND -

● SIEVE ANALYSIS

◆ HYDROMETER SEDIMENTATION

TESTING OFFICER - C. Rajasekaran

APPROVED / CHECKED -

(Authorised Signatory - Samuel Teng)

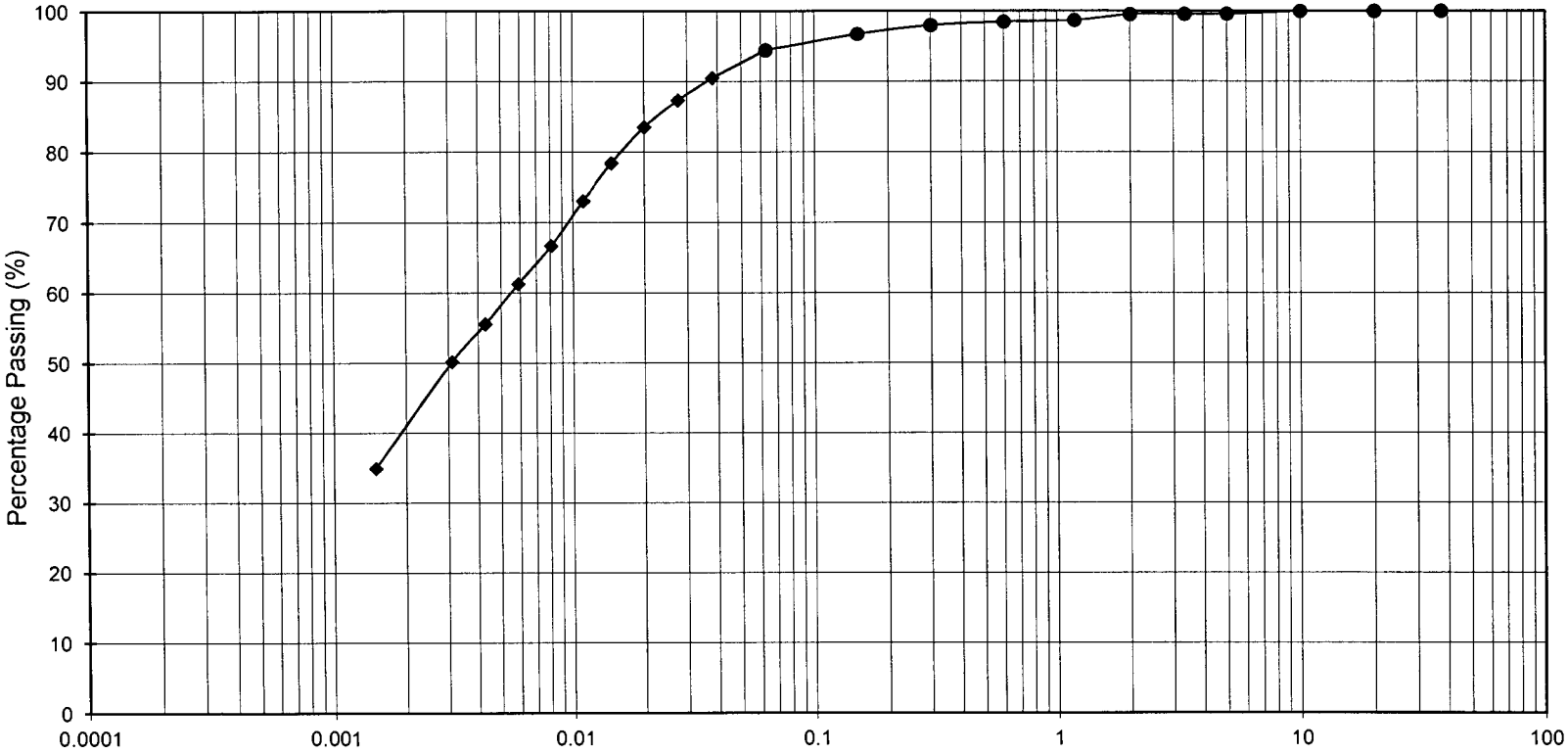
The test results reported herein have been performed in accordance with the laboratory's terms of accreditation under SAC-SINGLAS

ACCREDITED LABORATORY SAC-SINGLAS Cert. No: LA-2007-02/26-E

PARTICLE SIZE DISTRIBUTION - HYDROMETER SEDIMENTATION & SIEVE ANALYSIS

[TEST METHOD - BS 1377:1990:Part 2:Test 9.3 / 9.5]

PROJECT -	Site Investigation Works at Tengah Phase 1	BOREHOLE -	BH-9
WORKS INSTRUCTION -	WI058	SAMPLE -	UD-2
VISUAL DESCRIPTION -	Very dark grey slightly sandy organic SILT with decayed vegetation	DEPTH (m) -	4.00 - 4.90
		JOB NUMBER -	1304/10360



	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	
CLAY	SILT			SAND			GRAVEL			COBBLE

CLAY -	41 %
SILT -	53 %
SAND -	6 %
GRAVEL -	0 %

LEGEND -

● SIEVE ANALYSIS

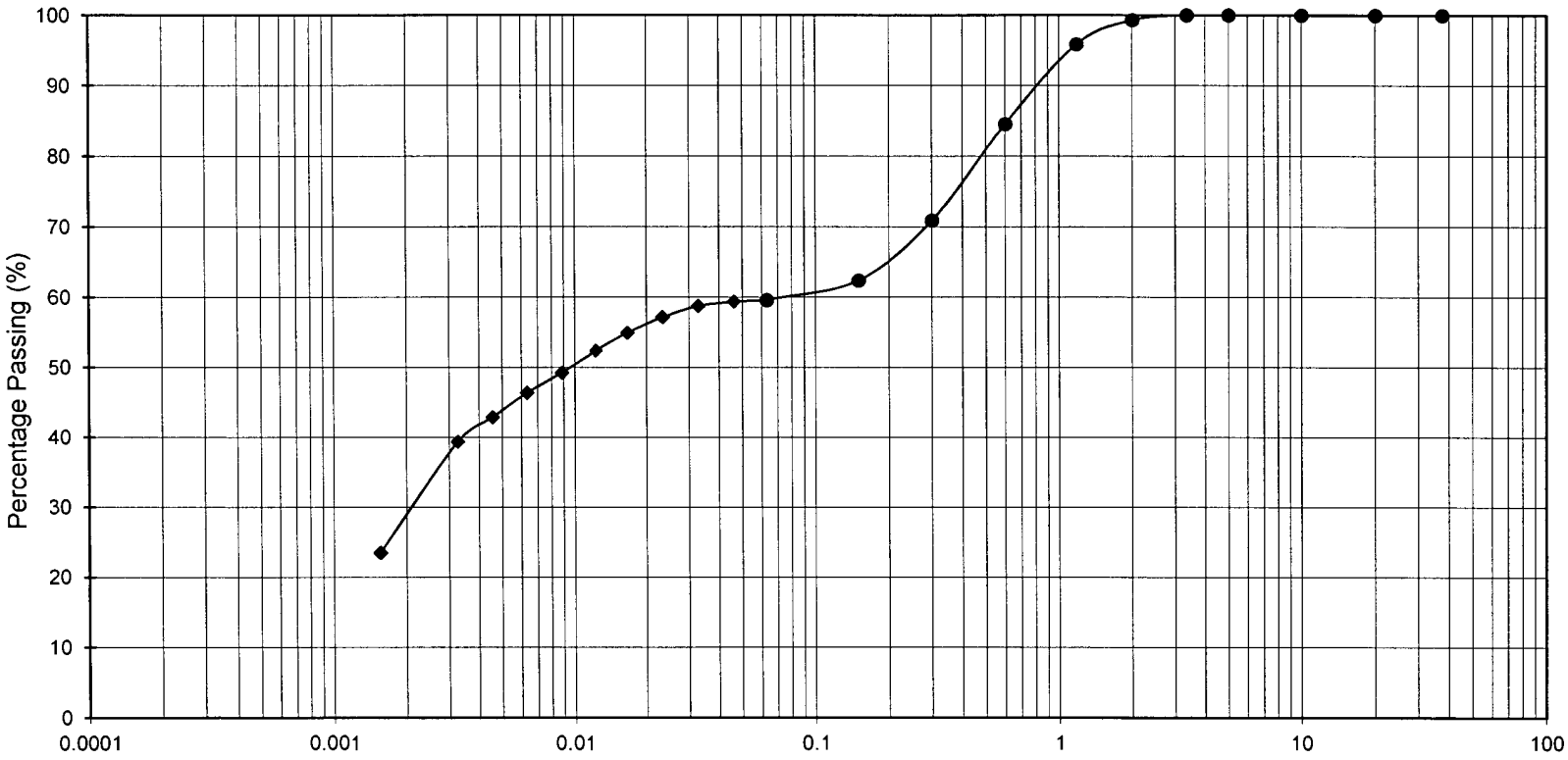
◆ HYDROMETER SEDIMENTATION

	TESTING OFFICER - C. Rajasekaran	APPROVED / CHECKED - (Authorised Signatory - Samuel Teng)
	The test results reported herein have been performed in accordance with the laboratory's terms of accreditation under SAC-SINGLAS	ACCREDITED LABORATORY SAC-SINGLAS Cert. No. LA-2001-02/26-B

PARTICLE SIZE DISTRIBUTION - HYDROMETER SEDIMENTATION & SIEVE ANALYSIS

[TEST METHOD - BS 1377:1990:Part 2:Test 9.3 / 9.5]

PROJECT -	Site Investigation Works at Tengah Phase 1	BOREHOLE -	BH-10
WORKS INSTRUCTION -	WI058	SAMPLE -	UD-1
VISUAL DESCRIPTION -	Yellow & very light grey slightly gravelly, sandy SILT	DEPTH (m) -	2.00 - 2.90
		JOB NUMBER -	1304/10360



CLAY -	29 %
SILT -	31 %
SAND -	39 %
GRAVEL -	1 %

LEGEND -
- ● SIEVE ANALYSIS
- ◆ HYDROMETER SEDIMENTATION

	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	
CLAY	SILT			SAND			GRAVEL			COBBLE

TESTING OFFICER - C. Rajasekaran

APPROVED / CHECKED - (Authorised Signatory - Samuel Teng)

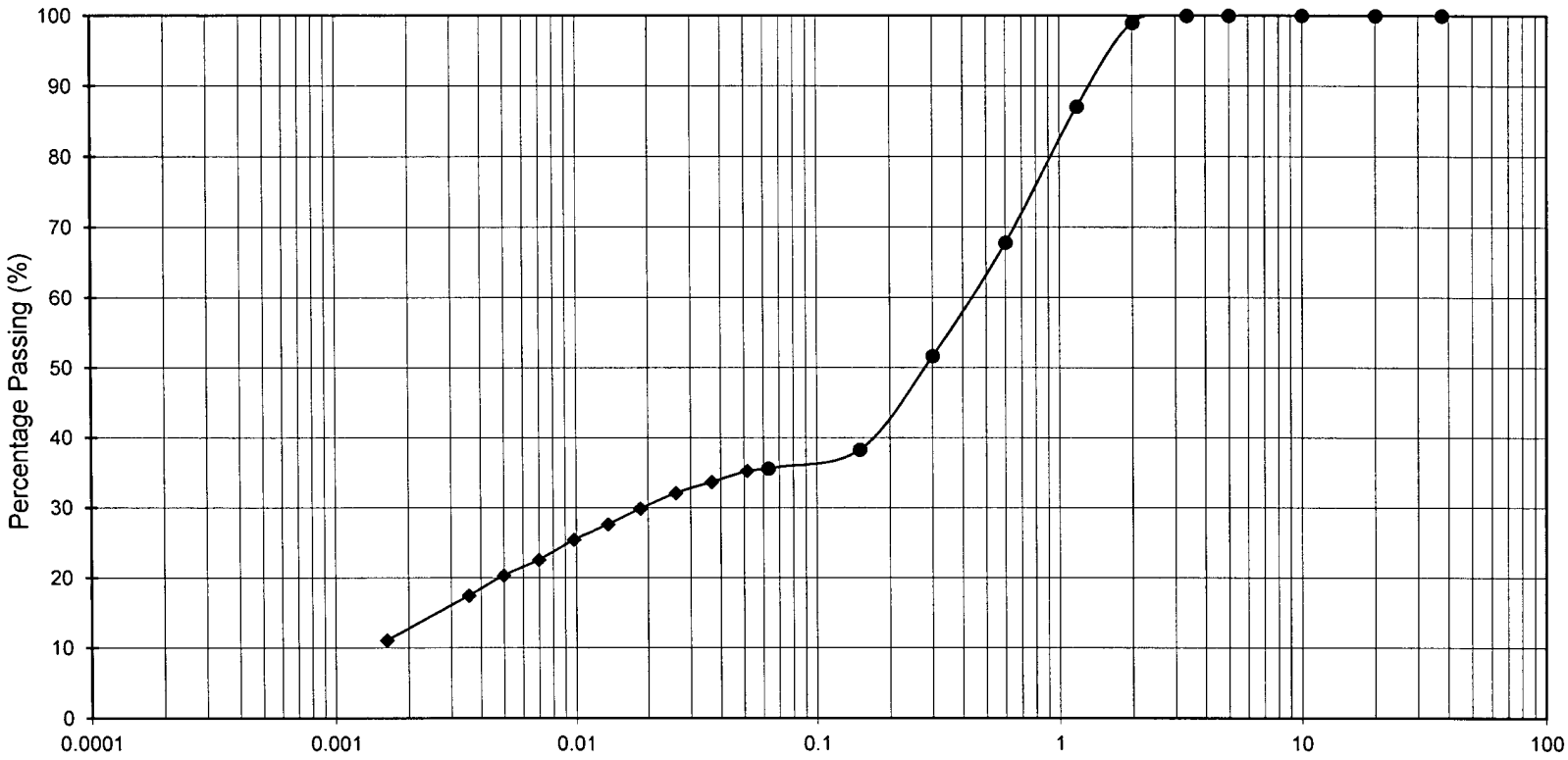
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ACCREDITED LABORATORY SAC-SINGLAS Cert No: LA-2001-0226-B

PARTICLE SIZE DISTRIBUTION - HYDROMETER SEDIMENTATION & SIEVE ANALYSIS

[TEST METHOD - BS 1377:1990:Part 2:Test 9.3 / 9.5]

PROJECT -	Site Investigation Works at Tengah Phase 1	BOREHOLE -	BH-10
WORKS INSTRUCTION -	WI058	SAMPLE -	UD-2
VISUAL DESCRIPTION -	Yellow & very pale brown slightly gravelly, sandy SILT	DEPTH (m) -	4.00 - 4.90
		JOB NUMBER -	1304/10360



CLAY -	13 %
SILT -	23 %
SAND -	63 %
GRAVEL -	1 %

LEGEND -
- ● SIEVE ANALYSIS
- ◆ HYDROMETER SEDIMENTATION

	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	
CLAY	SILT			SAND			GRAVEL			COBBLE

TESTING OFFICER - C. Rajasekaran

APPROVED / CHECKED - (Authorised Signatory - Samuel Teng)

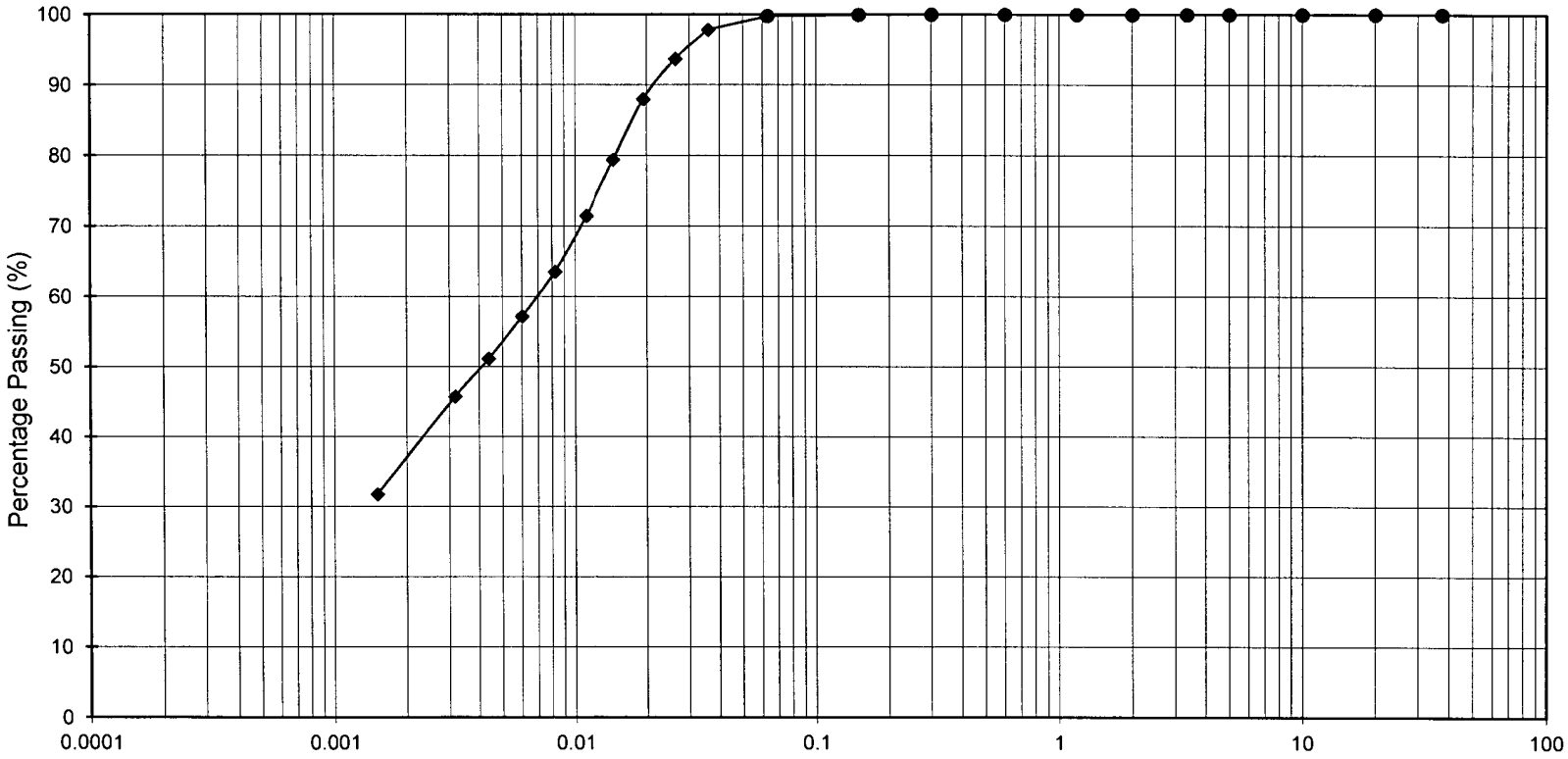
The test results reported herein have been performed in accordance with the laboratory's terms of accreditation under SAC-SINGLAS

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PARTICLE SIZE DISTRIBUTION - HYDROMETER SEDIMENTATION & SIEVE ANALYSIS

[TEST METHOD - BS 1377:1990:Part 2:Test 9.3 / 9.5]

PROJECT -	Site Investigation Works at Tengah Phase 1	BOREHOLE -	BH-11
WORKS INSTRUCTION -	WI058	SAMPLE -	UD-1
VISUAL DESCRIPTION -	Reddish brown & very light grey SILT	DEPTH (m) -	2.00 - 2.90
		JOB NUMBER -	1304/10360



	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	
CLAY	SILT			SAND			GRAVEL			COBBLE

CLAY -	37 %
SILT -	63 %
SAND -	0 %
GRAVEL -	0 %

LEGEND -

● SIEVE ANALYSIS

◆ HYDROMETER SEDIMENTATION

TESTING OFFICER - C. Rajasekaran

APPROVED / CHECKED -

(Authorised Signatory - Samuel Teng)

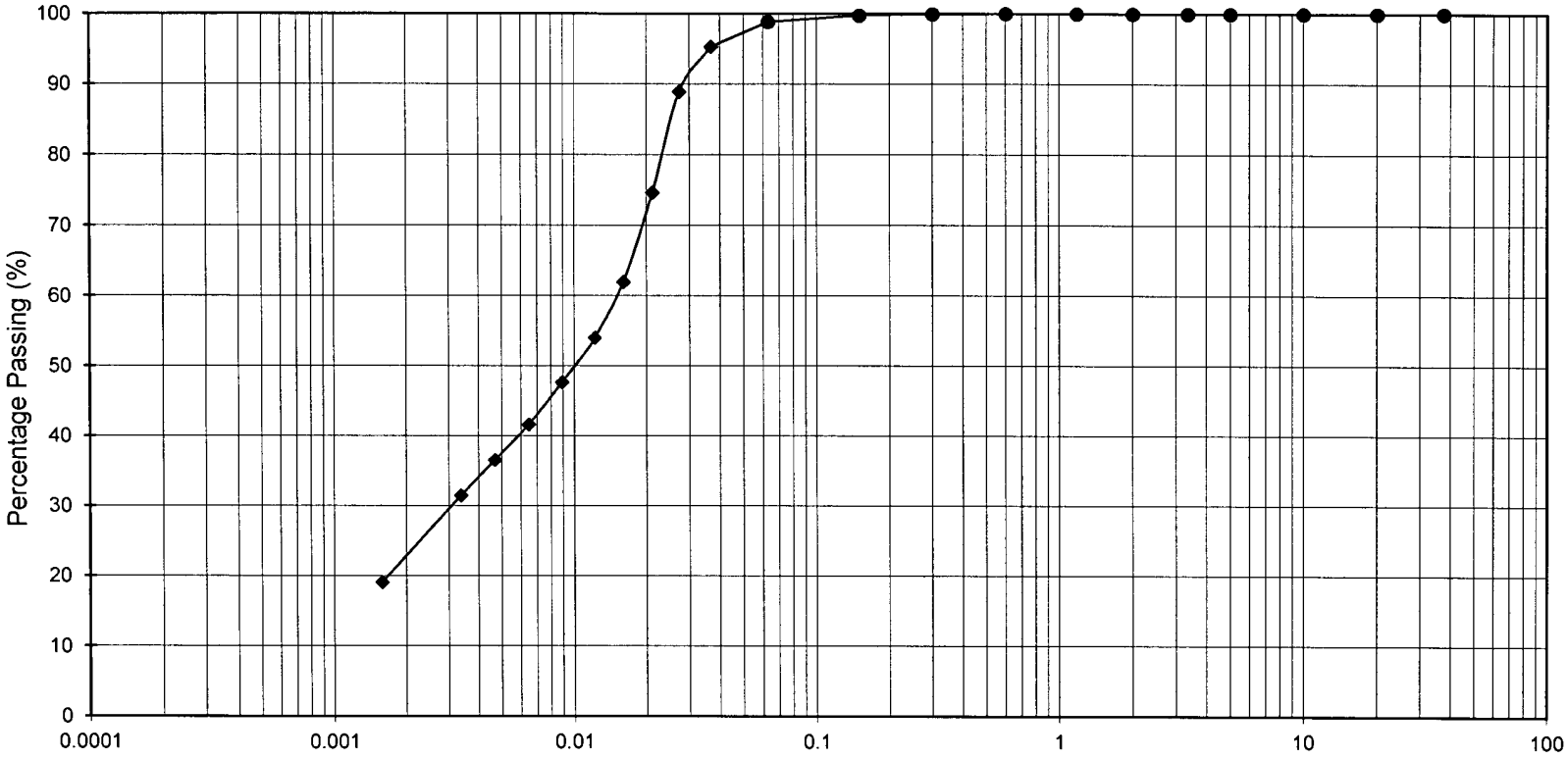
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ACCREDITED LABORATORY SAC-SINGLAS Cert. No: LA-2001-0226-B

PARTICLE SIZE DISTRIBUTION - HYDROMETER SEDIMENTATION & SIEVE ANALYSIS

[TEST METHOD - BS 1377:1990:Part 2:Test 9.3 / 9.5]

PROJECT -	Site Investigation Works at Tengah Phase 1	BOREHOLE -	BH-11
WORKS INSTRUCTION -	WI058	SAMPLE -	UD-2
VISUAL DESCRIPTION -	Pale red & very light grey slightly sandy SILT	DEPTH (m) -	4.00 - 4.90
		JOB NUMBER -	1304/10360



	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	
CLAY	SILT			SAND			GRAVEL			COBBLE

CLAY -	23 %
SILT -	76 %
SAND -	1 %
GRAVEL -	0 %

LEGEND -

● SIEVE ANALYSIS

◆ HYDROMETER SEDIMENTATION

TESTING OFFICER - C. Rajasekaran

APPROVED / CHECKED - (Authorised Signatory - Samuel Teng)

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MOISTURE CONTENT / DENSITY

[TEST METHOD - BS 1377:1990:Part 2:Test 3.2 / 7.2]

PROJECT	Site Investigation Works at Tengah Phase 1
WORKS INSTRUCTION	WI058
JOB NUMBER	1304/10360

BOREHOLE NUMBER	SAMPLE NUMBER	DEPTH (m)	MOISTURE CONTENT (%)	BULK DENSITY (Mg/m^3)	DRY DENSITY (Mg/m^3)
BH-1	UD-1	2.00 – 2.90	28	1.99	1.55
	UD-2	4.00 – 4.90	23	2.01	1.63
BH-2	UD-1	2.00 – 2.90	32	1.93	1.46
	UD-2	4.00 – 4.90	27	2.01	1.58
BH-3	UD-1	2.00 – 2.90	21	(A)	-
	UD-2	4.00 – 4.90	24	2.03	1.64
BH-4	UD-1	2.00 – 2.90	26	1.97	1.56
	UD-2	4.00 – 4.90	25	1.99	1.59
BH-5	UD-1	2.00 – 2.60	29	1.94	1.50
BH-6	UD-2	4.00 – 4.90	243	1.14	0.33

REMARK - (A) - Unable to perform test; sample cannot be trimmed down to size.

TESTING OFFICER - Simon

APPROVED / CHECKED -

Samuel Teng

(AUTHORISED SIGNATORY)

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MOISTURE CONTENT / DENSITY

[TEST METHOD - BS 1377:1990:Part 2:Test 3.2 / 7.2]

PROJECT	Site Investigation Works at Tengah Phase 1
WORKS INSTRUCTION	WI058
JOB NUMBER	1304/10360

BOREHOLE NUMBER	SAMPLE NUMBER	DEPTH (m)	MOISTURE CONTENT (%)	BULK DENSITY (Mg/m^3)	DRY DENSITY (Mg/m^3)
BH-8	UD-2	4.00 – 4.90	29	1.96	1.52
BH-9	UD-2	4.00 – 4.90	123	1.31	0.59
BH-10	UD-1	2.00 – 2.90	32	1.89	1.43
	UD-2	4.00 – 4.90	20	2.02	1.68
BH-11	UD-1	2.00 – 2.90	28	2.02	1.58
	UD-2	4.00 – 4.90	27	2.04	1.61

TESTING OFFICER - Simon

APPROVED / CHECKED -

Samuel Teng

(AUTHORISED SIGNATORY)

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MOISTURE CONTENT / DENSITY

[TEST METHOD - BS 1377:1990:Part 2:Test 3.2 / 7.2]

PROJECT	Site Investigation Works at Tengah Phase 1
WORKS INSTRUCTION	WI058
JOB NUMBER	1304/10360

BOREHOLE NUMBER	SAMPLE NUMBER	DEPTH (m)	VISUAL DESCRIPTION
BH-1	UD-1	2.00 – 2.90	Pale red & light reddish brown slightly gravelly, slightly sandy SILT
	UD-2	4.00 – 4.90	Reddish brown slightly gravelly, sandy SILT
BH-2	UD-1	2.00 – 2.90	Reddish yellow & reddish brown slightly sandy, slightly gravelly CLAY
	UD-2	4.00 – 4.90	Reddish brown & light grey slightly sandy CLAY
BH-3	UD-1	2.00 – 2.90	Reddish yellow & brownish yellow sandy, silty, fine to medium GRAVEL
	UD-2	4.00 – 4.90	Reddish brown & very light grey slightly gravelly, slightly sandy SILT
BH-4	UD-1	2.00 – 2.90	Brownish yellow & yellow sandy SILT
	UD-2	4.00 – 4.90	Light reddish brown & light grey sandy SILT
BH-5	UD-1	2.00 – 2.60	Reddish yellow & light grey slightly gravelly, slightly sandy SILT
BH-6	UD-2	4.00 – 4.90	Very dark grey organic SILT with decayed vegetation

TESTING OFFICER - Simon

APPROVED / CHECKED -

Samuel Teng
(AUTHORISED SIGNATORY)

Lab Services Private Limited

ACCREDITED LABORATORY SAC-SINGLAS Cert No: LA-2001-0226-B

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MOISTURE CONTENT / DENSITY

[TEST METHOD - BS 1377:1990:Part 2:Test 3.2 / 7.2]

PROJECT	Site Investigation Works at Tengah Phase 1
WORKS INSTRUCTION	WI058
JOB NUMBER	1304/10360

BOREHOLE NUMBER	SAMPLE NUMBER	DEPTH (m)	VISUAL DESCRIPTION
BH-8	UD-2	4.00 – 4.90	Reddish brown & light reddish brown slightly sandy SILT
BH-9	UD-2	4.00 – 4.90	Very dark grey slightly sandy organic SILT with decayed vegetation
BH-10	UD-1	2.00 – 2.90	Yellow & very light grey slightly gravelly, sandy SILT
	UD-2	4.00 – 4.90	Yellow & very pale brown slightly gravelly, sandy SILT
BH-11	UD-1	2.00 – 2.90	Reddish brown & very light grey SILT
	UD-2	4.00 – 4.90	Pale red & very light grey slightly sandy SILT

TESTING OFFICER - Simon

APPROVED / CHECKED -

Samuel Teng

(AUTHORISED SIGNATORY)

Lab Services Private Limited

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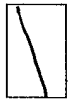
The Results Reported Herein Have Been Performed In Accordance With The Laboratory's Terms Of Accreditation Under The Singapore Accreditation Council - Singapore Laboratory Accreditation Scheme (SAC-SINGLAS).

UNCONFINED COMPRESSIVE STRENGTH - ROCK CORE

[TEST METHOD - ASTM D2938:1995]

PROJECT - Site Investigation Works at Tengah Phase 1 | WORKS INSTRUCTION - WI058 | JOB NUMBER - 1304/10360

STRESS RATE (MPa/s) - 0.5

BOREHOLE	SAMPLE	DEPTH (m)	HEIGHT (mm)	DIAMETER (mm)	WEIGHT (g)	MOISTURE CONTENT AT TIME OF TEST (%)	BULK DENSITY (Mg/m^3)	MAXIMUM COMPRESSION FORCE (kN)	UNCONFINED COMPRESSIVE STRENGTH (MPa)	FAILURE CONDITION
BH-3	CR-1	14.00 - 15.00	109.0	52.0	562.9	1.2	2.43	62.33	29.35	
BH-7	CR-3	14.40 - 15.40	109.0	52.0	574.9	1.9	2.48	20.49	9.65	

TESTING OFFICER - C. Rajasekaran

APPROVED / CHECKED - (Authorised Signatory - Samuel Teng)

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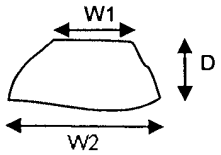
POINT LOAD STRENGTH INDEX

[TEST METHOD - ASTM D5731 - 08]

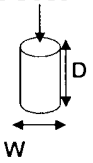
PROJECT - Site Investigation Works at Tengah Phase 1 | WORKS INSTRUCTION - WI-021 | JOB NUMBER - 1304/10360

BOREHOLE NUMBER	SAMPLE NUMBER	DEPTH (m)	TEST TYPE	MOISTURE CONTENT AT TIME OF TEST (%)	DISTANCE D (mm)	WIDTH W (mm)	EQUIVALENT CORE DIAMETER De (mm)	FAILURE LOAD P (kN)	POINT LOAD STRENGTH INDEX Is, UNCORRECTED = P/De^2 (MN/m2)	CORRECTION FACTOR F	POINT LOAD STRENGTH INDEX $Is_{(50)}$, CORRECTED = F X Is (MN/m2)
BH-3	CR-3	16.00 - 17.00	Diametral	1.0	52.0	60.0	52.0	4.78	1.77	1.02	1.81
BH-3	CR-5	18.00 - 19.00	Diametral	1.2	52.0	60.0	52.0	4.10	1.52	1.02	1.55
BH-6	CR-1	16.00 - 17.00	Diametral	0.5	52.0	60.0	52.0	2.79	1.03	1.02	1.05
BH-6	CR-2	17.00 - 18.00	Diametral	0.3	52.0	60.0	52.0	25.99	9.61	1.02	9.80
BH-6	CR-3	18.00 - 19.00	Diametral	0.5	52.0	90.0	52.0	18.86	6.97	1.02	7.11
BH-7	CR-1	12.40 - 13.40	Diametral	1.5	52.0	110.0	52.0	9.19	3.40	1.02	3.47
BH-7	CR-5	16.40 - 17.40	Diametral	1.4	52.0	140.0	52.0	5.25	1.94	1.02	1.98
BH-9	CR-1	39.00 - 40.00	Diametral	3.7	52.0	85.0	52.0	4.09	1.51	1.02	1.54
BH-9	CR-2	40.00 - 41.00	Diametral	2.7	52.0	135.0	52.0	12.97	4.80	1.02	4.90
BH-9	CR-3	41.00 - 42.00	Diametral	1.5	52.0	125.0	52.0	16.87	6.24	1.02	6.36

Irregular Lump, W = (W1+W2)/2



Axial Test



Diametral Test

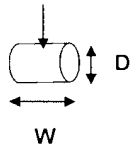


TABLE 1 EXTRACTED FROM ASTM D5878-08, ROCK MASS RATING SYSTEM (RMR) FOR RANGE OF PARAMETERS FOR GEOMECHANICS CLASSIFICATION

Strength of intact rock material	Point Load Index	>10 MPa	4 - 10 MPa	2 - 4 MPa	1 - 2 MPa	< 1 MPa
	Uniaxial Compressive strength	> 250 MPa	100 - 250 MPa	50 - 100 MPa	25 - 50 MPa	5 - 25 MPa
	Designation	Very High	High	Medium high	Moderate	Low

Note: The point load strength test is used as an index test for strength classification of rock materials and should not be used for design or analytical purposes.

TESTING OFFICER - C. Rajasekaran

APPROVED / CHECKED - (Authorised Signatory - Samuel Teng)

The test results reported herein have been performed in accordance with the laboratory's terms of accreditation under SAC-SINGLAS

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ONE DIMENSIONAL CONSOLIDATION

[TEST METHOD - BS 1377:1990:Part 5:Test 3]

PROJECT -	Site Investigation Works at Tengah Phase 1	BOREHOLE -	BH-1
WORKS INSTRUCTION -	WI058	SAMPLE -	UD-2
VISUAL DESCRIPTION -	Reddish brown slightly gravelly, sandy SILT	DEPTH (m) -	4.00 - 4.90
		JOB NUMBER -	1304/10360

INITIAL -	
SAMPLE HEIGHT (mm)	19
SAMPLE DIAMETER (mm)	50
MOISTURE CONTENT (%)	26
BULK DENSITY (Mg/m3)	2.01
DRY DENSITY (Mg/m3)	1.60
DEGREE OF SATURATION (%)	100.00
VOID RATIO	0.69
LABORATORY TEMPERATURE - AVERAGE (degree Celsius)	25.0
PARTICLE DENSITY / SPECIFIC GRAVITY	2.70
FINAL -	
MOISTURE CONTENT (%)	24
BULK DENSITY (Mg/m3)	2.16
DRY DENSITY (Mg/m3)	1.74

STAGE	APPLIED PRESSURE (kN/m^2)	HEIGHT CHANGE (mm)	VOID RATIO	Cv [CORRECTED FOR 20°C] (m^2/yr)	Mv (m^2/MN)
1	12.5	0.241	0.669	17.804	1.015
2	25.0	0.397	0.655	20.508	0.665
3	50.0	0.661	0.631	24.345	0.568
4	100.0	0.945	0.606	30.073	0.310
5	200.0	1.347	0.570	12.738	0.223
6	400.0	1.774	0.532	17.872	0.121
7	100.0	1.667	0.542		
8	12.5	1.441	0.562		

DATA BASED ON END OF LOAD INCREMENT

TIME FITTING METHOD - Square Root

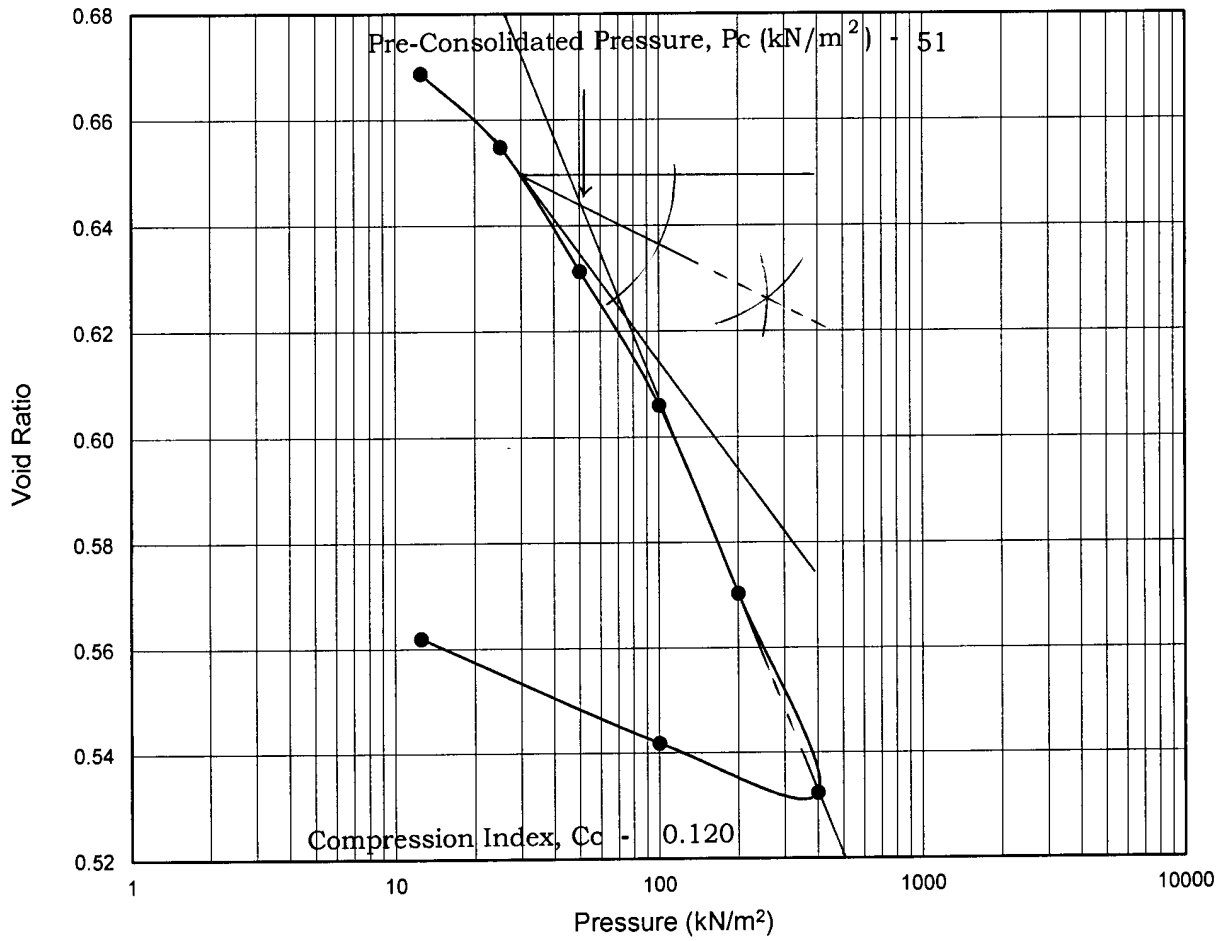
TESTING OFFICER - Sim Liang Heng	APPROVED / CHECKED - (Authorised Signatory - Samuel Teng)	ACCREDITED LABORATORY SAC-SINGLAS Cert. No: LA-2001-0226-B

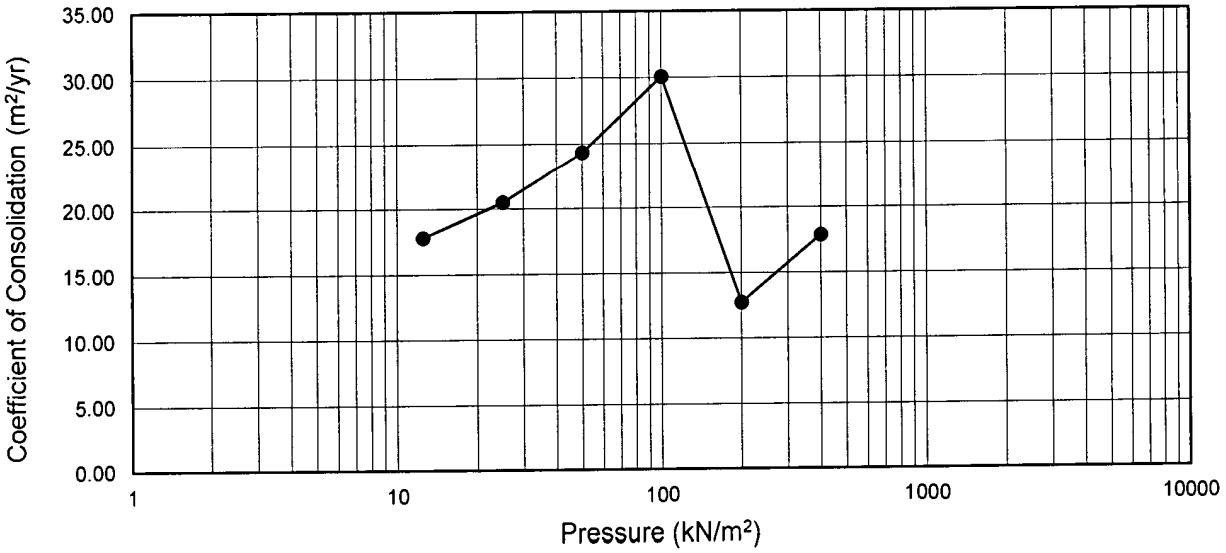
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ONE DIMENSIONAL CONSOLIDATION

[TEST METHOD - BS 1377:1990:Part 5:Test 3]

PROJECT -	Site Investigation Works at Tengah Phase 1	BOREHOLE -	BH-1
WORKS INSTRUCTION -	WI058	SAMPLE -	UD-2
VISUAL DESCRIPTION -	Reddish brown slightly gravelly, sandy SILT	DEPTH (m) -	4.00 - 4.90
		JOB NUMBER -	1304/10360





TESTING OFFICER - Sim Liang Heng	APPROVED / CHECKED - (Authorised Signatory - Samuel Teng)	ACCREDITED LABORATORY SAC-SINGLAS Cert. No: LA-2001-0226-B

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ONE DIMENSIONAL CONSOLIDATION

[TEST METHOD - BS 1377:1990:Part 5:Test 3]

PROJECT -	Site Investigation Works at Tengah Phase 1	BOREHOLE -	BH-6
WORKS INSTRUCTION -	WI058	SAMPLE -	UD-2
VISUAL DESCRIPTION -	Very dark grey organic SILT with decayed vegetation	DEPTH (m) -	4.00 - 4.90
		JOB NUMBER -	1304/10360

INITIAL -	
SAMPLE HEIGHT (mm)	19
SAMPLE DIAMETER (mm)	50
MOISTURE CONTENT (%)	223
BULK DENSITY (Mg/m3)	1.21
DRY DENSITY (Mg/m3)	0.38
DEGREE OF SATURATION (%)	97.89
VOID RATIO	5.93
LABORATORY TEMPERATURE - AVERAGE (degree Celsius)	25.0
PARTICLE DENSITY / SPECIFIC GRAVITY	2.60
FINAL -	
MOISTURE CONTENT (%)	141
BULK DENSITY (Mg/m3)	1.47
DRY DENSITY (Mg/m3)	0.61

STAGE	APPLIED PRESSURE (kN/m^2)	HEIGHT CHANGE (mm)	VOID RATIO	Cv [CORRECTED FOR 20°C] (m^2/yr)	Mv (m^2/MN)
1	12.5	0.565	5.721	5.224	2.379
2	25.0	0.770	5.646	7.994	0.890
3	50.0	1.129	5.515	7.398	0.788
4	100.0	1.812	5.266	6.673	0.764
5	200.0	6.231	3.655	1.067	2.571
6	400.0	8.721	2.747	0.477	0.975
7	100.0	8.321	2.893		
8	12.5	7.630	3.145		

DATA BASED ON END OF LOAD INCREMENT

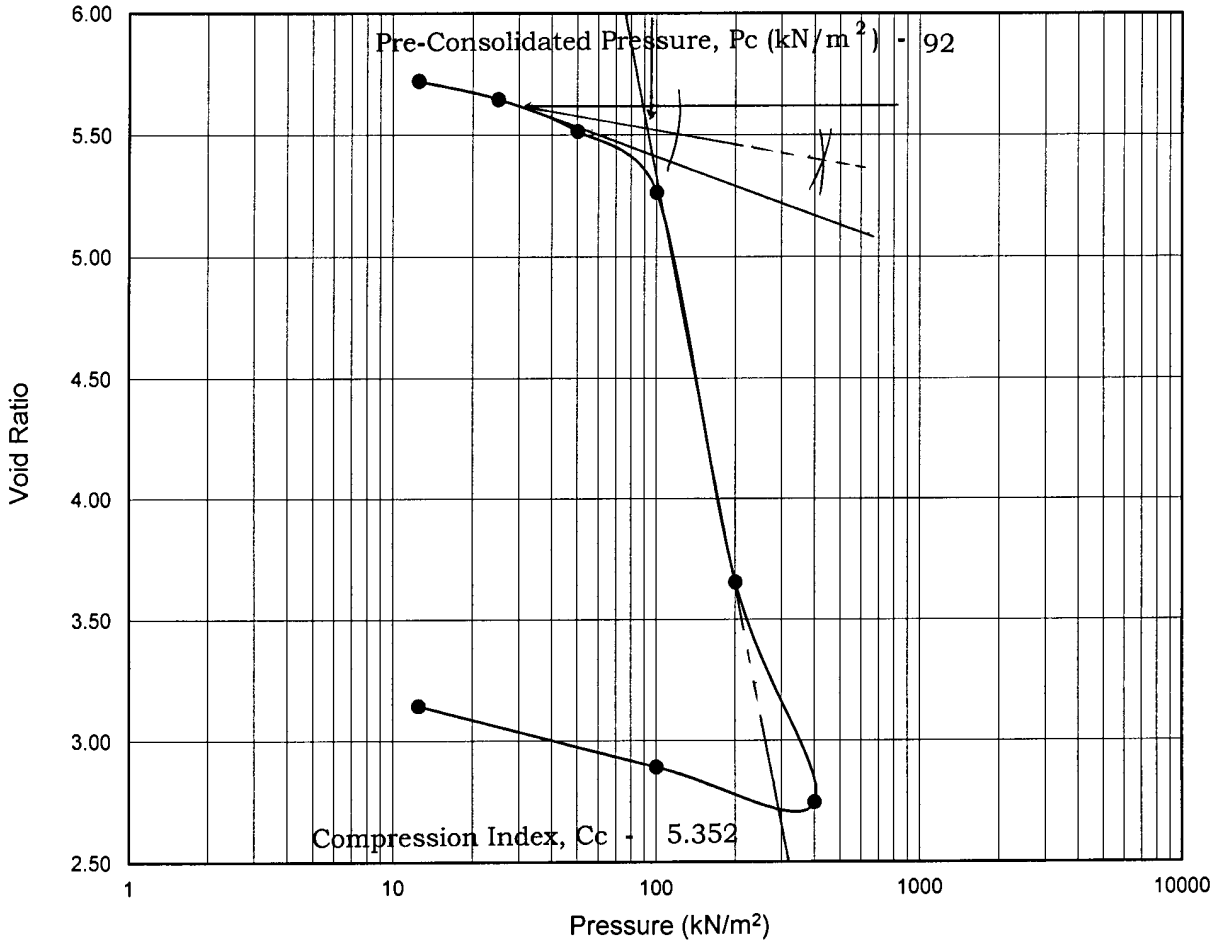
TIME FITTING METHOD - Square Root

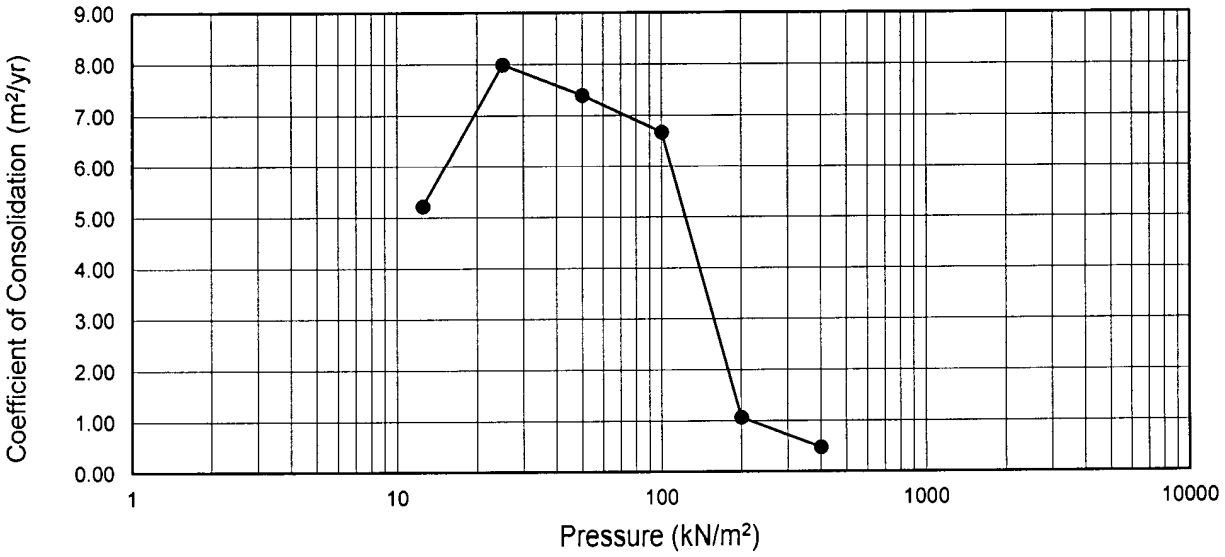
TESTING OFFICER - Sim Liang Heng	APPROVED / CHECKED - (Authorised Signatory - Samuel Teng)	ACCREDITED LABORATORY SAC-SINGLAS Cert. No: LA-2001-0226-B
The test results reported herein have been performed in accordance with the laboratory's terms of accreditation under SAC-SINGLAS		

ONE DIMENSIONAL CONSOLIDATION

[TEST METHOD - BS 1377:1990:Part 5:Test 3]

PROJECT -	Site Investigation Works at Tengah Phase 1	BOREHOLE -	BH-6
WORKS INSTRUCTION -	WI058	SAMPLE -	UD-2
VISUAL DESCRIPTION -	Very dark grey organic SILT with decayed vegetation	DEPTH (m) -	4.00 - 4.90
		JOB NUMBER -	1304/10360





TESTING OFFICER - Sim Liang Heng	APPROVED / CHECKED - (Authorised Signatory - Samuel Teng)	ACCREDITED LABORATORY SAC-SINGLAS Cert. No: LA-2001-022C-E

The test results reported herein have been performed in accordance with the laboratory's terms of accreditation under SAC-SINGLAS

APPENDIX E

CORE SAMPLES PHOTOGRAPH

CLIENT : HOUSING AND DEVELOPMENT BOARD (HDB)
CONTRACT : TERM CONTRACT NO 32 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS
PROJECT : SOIL INVESTIGATION WORKS FOR TENGAH PHASE 1
WORK ORDER :WI058



FIG: CORE RUNNING SAMPLES FROM CR1 TO CR5 (BH-3)



FIG: CORE RUNNING SAMPLES FROM CR1 TO CR5 (BH-6)

CLIENT : HOUSING AND DEVELOPMENT BOARD (HDB)
CONTRACT : TERM CONTRACT NO 32 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS
PROJECT : SOIL INVESTIGATION WORKS FOR TENGAH PHASE 1
WORK ORDER :WI058



FIG: CORE RUNNING SAMPLES FROM CR1 TO CR5 (BH-7)



FIG: CORE RUNNING SAMPLES FROM CR1 TO CR6 (BH-9)

APPENDIX F

SPT SAMPLES PHOTOGRAPH



BH-1	SPT 1-10



BH-2	SPT 1-9



BH-3	SPT 1-4



BH-4	SPT 1-6



BH-5	SPT 1-6



BH-6	SPT 1-5



BH-7	SPT 1-4



BH-8	SPT 1-8



BH-9	SPT 1-12



BH-10	SPT 1-12



BH-11	SPT 1-10

APPENDIX G

ROCK MASS QUALITY

Project	**Soil Investigation Works for Tengah Phase 1**
Work Instruction	**WI058**
Client	**Housing & Development Board**
Main-con	**Kimaro Geotechnical Engineering Pte Ltd**

TABLE SHOWING ROCK QUALITY				
BOREHOLE NO.	**DEPTH**		**RQD (%)**	**ROCK MASS QUALITY**
	From	***To***		
BH-3	**14.00**	**19.00**	**0-26**	**Very Poor to Poor**
BH-6	**16.00**	**21.00**	**0-12**	**Very Poor**
BH-7	**12.40**	**17.40**	**28-75**	**Poor to Fair**
BH-9	**39.00**	**42.00**	**0-76**	**Very Poor to Good**

KIMARO

CERTIFICATION BY PROFESSIONAL ENGINEER FOR SITE INVESTIGATION REPORT

Project Title	: Term Contract No. 32 for Site Investigation Works for a Period of 30 Months.
Work Instruction No.	: WI-058
Sub-Project	: Soil Investigation Works for Tengah Phase 1
Boreholes	: BH-1 to BH-11
Location	: Bukit Batok Road

1. I, Er. Cheang Yew Kee, the Professional Engineer, PE Registration No. 3297 certify that Soil Investigation Works for Tengah Phase 1 comprising all field and laboratory data tests and results therein has been carried out by me or under my supervision or direction, and I have verified the accuracy of the information given in the site investigation report, and to the best of my knowledge and belief, all have been prepared in compliance in all respects with the provision of the Building Control Act and Regulations, relevant Codes of Practice and Standards.

2. I, further certify that I have the appropriate qualifications and experience, and I am familiar with the purpose of the investigation for which this Site Investigation Report is prepared in reference to Project Ref.

3. Total number of pages in the Site Investigation Report is 137 pages.

PROFESSIONAL ENGINEER
CIVIL
CHEANG YEW KEE
3297
SINGAPORE

Date: 24th April 2013

Professional Engineer for Site Investigation

Test Report No. 7362011662
dated 9 February 2017

AL Technologies

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[D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS

Location: Tengah Phase 1 & 2 Infra (WI 059)

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CONSULTANT

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Document Record:

Rev	Date	Report Status	Prepared By	Checked By	Professional Engineer
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Certification by PE for SI Report

1. I, ZHENG ZHIJIAN the Professional Engineer, PE Registration No. 4385 Certify that the Soil Investigation Report,

   [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS

   Location: Tengah Phase 1 & 2 Infra (WI 059)

   Comprising all field and laboratory data, tests and results there in has been carried out by me or under my supervision or direction, and I have verified the accuracy of the information given in the investigation report, and to the best of my knowledge and belief, all have been prepared in compliance in all respects with the provisions of the Building Control Act and Regulations, relevant Codes of Practice and Standards.

2. I further certify that I have appropriate qualifications and experience and I am familiar with the purpose of the investigation for which this Soil Investigation Report is prepared in reference to project Ref No: 7362011662.

3. Total number of pages in the Soil Investigation Report is 19 (Excluding Appendices).



Professional Engineer for Soil Investigation
Signature and Stamp

09.02.2017
Date

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Test Report No. 7362011662
dated 9 February 2017

AL Technologies

Report by
M/s TÜV SÜD AL TECHNOLOGIES PTE LTD

For the Client
M/s HOUSING & DEVELOPMENT BOARD

And for the Consultant
M/s SURBANA JURONG PTE LTD

Concerning
[D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS

Location: Tengah Phase 1 & 2 Infra (WI 059)

Executive Summary

TÜV SÜD AL TECHNOLOGIES PTE LTD has prepared this report on **[D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS** references 7362011662 for M/s **HOUSING & DEVELOPMENT BOARD** and M/s **SURBANA JURONG PTE LTD**. The soil investigation works were carried out at **TENGAH PHASE 1 & 2 INFRA (WI 059)** from 22 November 2016 to 9 January 2017.

The objective of conducting Soil Investigation (SI) is to acquire information of the underlying ground condition and its engineering properties for the planning and designing of foundation works.

The SI works included field exploration using boring machine, standard penetration tests (SPT) with sampling, undisturbed sampling, rock coring, water standpipe installation and laboratory testing.

Report Prepared by

Thaw Zin
Engineer

Report Reviewed by

James Goh
Vice President, (Building & Geo Technology)

Status of Report	Issue Number	Date of Issue
Final	04	9th February 2017

1. INTRODUCTION

This report presents results of the [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 at Tengah Phase 1 & 2 Infra (WI 059). The objective of the soil investigation is to obtain and understand the underlying ground conditions at the project site. The soil investigation was carried out between from 22 November 2016 to 9 January 2017.

2. SCOPE OF WORK

Soil investigation works include drilling, site testing (SPT test), undisturbed sampling, field permeability testing and laboratory testing. Site works were completed by drilling, counting SPT blows count, collecting soil samples and rock coring. Laboratory tests included physical properties tests and strength tests.

In situ testing of SPT was performed at 3.0m intervals over the depth of drilled advised by project specifications. SPT samples were collected by split barrel sampler for soil type verification at each SPT samples. In addition, UD samples were also collected for laboratory testing and rock coring were conducted to know the characteristics rock. Total nineteen soil investigation boreholes were carried out and boreholes terminations depths were shown in Table 2.1. The boreholes setting out survey report with registered surveyor endorsement is attached in **Appendix F**.

Table 2.1 Termination depths of Boreholes

BH No.	Northing (m)	Easting (m)	Reduced Level (m)	Terminated Depths (m BGL)
BH1	37705.530	16099.857	102.733	19.00
BH2	37487.486	16310.438	101.707	18.10
BH3	37281.356	16521.745	101.956	15.14
BH4	37772.748	16376.627	110.124	15.19
BH5	37555.416	16583.491	112.227	15.27
BH6	37339.781	16792.194	105.367	21.06
BH7	37175.464	17052.110	110.484	12.10
BH8	36963.401	17264.311	112.898	12.11
BH9	37702.130	16659.493	110.208	21.28
BH10	38090.709	16583.897	107.530	15.11
BH11	37980.295	16649.678	107.696	12.19

BH No.	Northing (m)	Easting (m)	Reduced Level (m)	Terminated Depths (m BGL)
BH12	37859.378	16766.306	107.865	18.14
BH13	37727.090	16894.075	109.542	24.08
BH14	37581.844	17034.118	115.762	15.10
BH15	37491.000	17149.679	112.046	18.25
BH16	37953.235	16910.434	107.618	15.26
BH17	38236.055	16839.630	123.568	21.39
BH18	38045.212	17073.038	113.242	15.10
BH19	37854.346	17306.422	114.804	15.11

3. METHOD OF STATEMENT

3.1 Site Investigation

Field works included wash boring, SPT and SPT Sampling, UD Sampling, rock coring and drilling with HW 100mmϕ casing with tungsten shoe, using 'Wash Boring' method.

3.1.1 Drilling

Hydraulic feed rotary boring machine was used for the drilling work. A cutting tool was attached at the lower end of the drilling rod. Drilling was carried out by continuous rotating the drilling rod and pumping circulated mud water through hollow rods into the bottom of the borehole and the cutting washed out to the ground surface.

3.1.2 Standard Penetration Test

SPT test was done in accordance with BS 1377: 1990: Part 9. SPT samples were collected for the soil type identification.

The spilt barrel sampler, drive rod, and drive assembly were prepared before performing of SPT test. Once the borehole reached the required test depth, the borehole was cleaned by flushing with water/mud before starting the test. The test was performed by using a split barrel type sampler with a 50.8 mm external and 34.9 mm internal diameter. The test was conducted in six stages, where each stage consisted of driving the sampler 75 mm into the soil by the use of a free fall 63.5 kg hammer (or monkey). Recorded the initial penetration under dead-weight and if penetration is over 450 mm, record the N value as zero. If less than 450 mm, continue seating drive and test drive.

The hammer (63.5 kg mass) was dropping free fall on to a drive head from a height of 760 mm and recorded the number of blows to achieve 150 mm penetration or 25 blows whichever is first reached as seating drive. The number of blows required for each 75mm penetration was noted and the final N-value is reported as the total number of blows required to achieve the last 300 mm of penetration, the initial 150 mm of penetration being to seat the sampler and by-pass any disturbance. If, however, 100 blows were reached before a penetration of 300 mm was achieved, the test was stopped and the penetration achieved recorded.

3.1.3 Undisturbed Sampling

Undisturbed samples were collected by 75 mm thin-wall sampler. Borehole was flushed with water to remove the remnants left at the bottom of the borehole. The depth of borehole was measured. The sampling tube was lowered to the bottom of the hole and jacked into the soil. After sampling tube was jacking into the soil of required depth, sampler tube was taken out from the borehole, cleans the tube and sealed with wax at the ends of the sampling tube. Then, properly label the sample identification. This sampling technique is suitable for clayey and silty soil with SPT N <30.

3.1.4 Rock Coring

When hard rock encounters and normal drilling is not possible and rock coring work is carried out instead. The rock was cored to determine the insitu general rock quality. The coring was conducted by using impregnated diamond bit and NMLC triple tube core barrel, which produces a nominal core and hole diameter of 76 mm respectively.

After taking out coring tool from borehole, the rock samples were removed carefully from core barrel. The coring was properly placed in a standard labelled-timber or iron core box and total core recovery, solid core recovery, RQD, colour, fracture condition and weathering grade were recorded before sending to TÜV SÜD AL TECHNOLOGIES office. The rock core photographs are illustrated in **Plate A.**

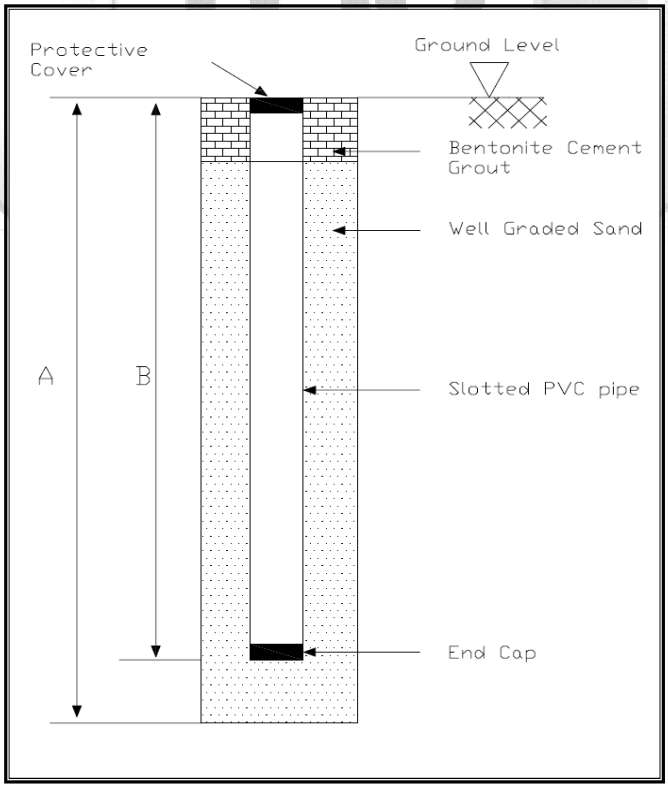
3.1.5 Water Standpipe Installation

Water Standpipe was installed at BH1, BH4, BH6, BH8, BH17 and BH19 to monitor the natural ground water level after completion of site works. The tip of standpipe was installed at depth of 12.00m below the existing ground surface as designated by the project specification.

Upon completion of the borehole, the hole was backfilled with sand to 0.5 m below the designated depth of observation well. The well assembly consisted of: (i) a 0.6 m length of 50 mm diameter solid PVC pipe with a bottom cap, (ii) a 50 mm diameter solid PVC riser pipe with a top cap.

The annular space between the well casing and the borehole was backfilled with filter pack material comprising clean, well graded sand to a minimum of 0.6 m above the top of the screen. A 0.6 m thick bentonite seal was placed above the filter pack materials. The annular space above the seal was then backfilled with a bentonite cement grout. The well was then flushed thoroughly with clean water.

Water Standpipe monitoring results are presenting in **Appendix D**.



Keys	Dimensions (m)	Descriptions
A	Varies	Boring Depth
B	12.00	Installation Depth

3.1.6 Soil Classification

The descriptions of soils are made on the recovered samples from boreholes and excavation pits. Systematic basis for recognition and description of soils are as follows;

(1) Field strength/compactness (please refer to Table (3.2 & 3.3)), discontinuities, bedding;
(2) Matrix colour, secondary colour (weathered colour), particle shape, particle size, grading. (Table 13-columns 7 & 8, BS 5930, 1999);
(3) Principal soil type and modifiers (BS 5930, 1999);
(4) Stratum names (Geological Formation) (LTA, 2003; PWD, 1976; DSTA, 2009).

Table 3.1 Classification of Clay/Silt from SPT Results

Approximate Relation of Consistency to SPT	
N-Value (blows/300mm of penetration)	Consistency
< 2	Very Soft
2 to 4	Soft
4 to 8	Firm
8 to 15	Stiff
15 to 30	Very Stiff
> 30	Hard

(Refer to Table 2.3 of B. M. Das, 1990)

Table 3.2 Classification of Field Strength/Compactness for Coarse soils from SPT Results

N-Value (blows/300mm of penetration)	Density/Compactness
0 to 4	Very Loose
4 to 10	Loose
10 to 30	Medium Dense
30 to 50	Dense
> 50	Very Dense

(Refer to column 2 of Table 13 of BS 5930, 1999)

Table 3.3 Description of Soil and Rock Types in Singapore*

REFERENCE	SOIL & ROCK TYPE	GENERAL DESCRIPTION	GEOLOGICAL FORMATION (PWD, 1976)
B	BEACH (Littoral)	Sandy, sometimes silty, with gravels, coral and shells.	KALLANG Littoral, possibly also part of all other members & TEKONG.
E	ESTUARINE (Transitional)	Peats, Peaty and Organic Clays, Organic Sands.	KALLANG Transitional, possibly part of Alluvial and Marine.
F	FLUVIAL (Alluvial)	Sands, silty Sands, Silt and Clays.	KALLANG Alluvial, possibly part of all other members and TEKONG.
F1		Predominantly granular soils including silty Sands, clayey Sands and sandy Silts.	KALLANG Beds of Alluvial Member
F2		Cohesive soils including silty Clays, sandy Clays, and clayey Silts.	KALLANG Beds of Alluvial Member
M	MARINE	Very soft to soft blue or grey Clay	KALLANG Marine Member
O	OLD ALLUVIUM	Very weak to weak beds of Sandstone and Mudstone.	OLD ALLUVIUM
FC	FORT CANNING BOULDER BED	A colluvial deposit of boulders in a soil matrix. The matrix is typically hard silty clay, but can be granular. The material is largely derived from the rocks and weathered rocks of the Jurong Formation.	Not shown in PWD (1976)
S	Sedimentaries (Rocks & associated soils)	Sandstones, siltstones, mudstones, conglomerates and limestones. The rock has been subjected to a varying degree of metamorphism.	JURONG Tengah, Rimau, Ayer Chawan and Queenstown Facies (plus the Pandan Limestone which was not identified in PWD (1976))
G	GRANITE (Rock & associated Residual and Weathered Soils)	Granitic rocks including granodiorite, adamellite and granite.	BUKIT TIMAH GRANITE

* LTA, 2003: Site Investigation Works Handbook; Appendix 1, Table 1.

3.2 Laboratory Testing

The laboratory tests were performed physical properties for bulk and dry density, moisture content, atterberg's limits, particle density, and particle size distribution tests to know index properties of soil. Unconsolidated Undrained Triaxial Compression Tests and Consolidated Undrained Triaxial Compression Tests were carried out to get soil shear strength, stress and strain behaviours (mechanical properties) of soil.

Laboratory tests were done in accordance with testing procedure from British Standard (BS 1377) for soil and ASTM (American Society for Testing and Materials) for rock. The test standards were summarized in the table below. The details laboratory test results are showing in **Appendix C**.

Table 3.4 Laboratory Tests and Standards

No.	Test	Test Standard
1	Bulk and Dry Density	BS 1377 : Part 2 : 1990
2	Moisture Content	BS 1377 : Part 2 : 1990
3	Atterberg's Limits Test	BS 1377 : Part 2 : 1990
4	Particle Density Test	BS 1377 : Part 2 ; 1990
5	Particle Size Distribution	BS 1377 : Part 2 : 1990
6	Unconsolidated Undrained Triaxial Compression Test (UU)	BS 1377 : Part 7 : 1990
7	Consolidated Undrained Triaxial Compression Test (CU)	BS 1377 : Part 8 : 1990

3.2.1 Bulk and Dry Density

The bulk density is the measured weight of a solid cylindrical soil specimen taken from an undisturbed sample divided by its volume and a solid cube soil specimen taken from disturbed sample divided by its volume. The dry density was calculated from bulk density and moisture content.

3.2.2 Moisture Content

Moisture content determination was performed on numerous samples in order to provide an identification of the relevant strength of the samples and for correlation of the sample type. The moisture content is determined by oven drying selected moist/wet soil material for at least 24 hours to a constant dry mass at a temperature of 105 °C. The loss in weight of the sample due to drying represents the weight of the moisture of the soil. The moisture content of the soil is

presented as percentage of the dry weight of the soil. This test is performed in accordance with **BS 1377:1990 Part 2: #3.**

3.2.3 Atterberg Limits Test

The Atterberg limits refer to arbitrarily defined boundaries between the liquid and plastic states (ie, liquid limit, W_L) and between the plastic and brittle states (i.e., plastic limit, W_P), of fine grained soils. They are expressed in percentage water content. The range of water contents over which a soil behaves plastically is termed the Plastic Index and corresponds to the numerical difference between the liquid and plastic limit (i.e., W_L-W_P).

Tests to determine the Atterberg limits can be performed on soil samples of cohesive material. The soil is dried and then ground into separate grains using a mortar. The soil grains larger than 425 μm size are removed by sieving. The soil is then thoroughly mixed with different quantities of distilled water. The liquid and plastic limits of the soil are then determined in accordance with **BS 1377:1990 Part 2 #4 and #5.**

3.2.4 Particle Density Test

The particle density of a specimen is determined in accordance to 1377:1990 Part 2 #8 using the small pyknometer method which is the definitive method for soils consisting of clay, silt and sand-sized particles. The particle density is defined as the ratio of the mass of soil to the water needed to displace the soil particles.

3.2.5 Particle Size Distribution Test

The particle size distribution has been carried out utilizing both sieve and hydrometer analysis. The sieve analysis was carried out by wet sieving method in which the material was first washed through a 2 mm test sieve nested in a 63 μm test sieve. The soils retained in the sieves were then dried in an oven. The dried soils were then sieved by dry sieving by passing the soils through a series of square mesh sieves, which become progressively finer down to 63 μm mesh. Each fraction thus collected was then weighed and the percentage retained on each sieve was calculated by dividing individual weights by the total sample weight.

The soils passing through 63 μm mesh was analyzed by sedimentation using hydrometer method. The hydrometer method involves measuring the rate of settlement of fine particles suspended in a solution. Utilizing the principle of Stokes' law, particle size can be directly related to its rate of settlement in a fluid such as water. From this process, the particle diameter and percentage finer is calculated.

3.2.6 Unconsolidated Undrained Triaxial Compression Test (UU)

Triaxial compression test was conducted to evaluate the shear strength of soil samples (38 mm diameter x 76 mm length). This test was performed under unconsolidated undrained (UU) condition, at a loading rate of 1.52 mm per minute. It is based on the test method approached by **BS 1377: 1990 Part 7: Test 9.**

3.2.7 Consolidated Undrained Triaxial Compression Test (CU)

A consolidated-undrained triaxial test comprises three stages: saturation, consolidation (or back-pressuring), and shear. During these three stages the effective stresses are monitored by measurements of pore pressure and total stress. Saturation of the sample is achieved by applying cell pressure increments until adequate pore pressure response is obtained. A ratio of pore pressure increment to confining pressure increment in excess of 0.95 is considered to be an acceptable degree of saturation. The sample volume or water content is not altered during the saturation stage so that the residual effective stress is observed for comparison with that of an ideal sample (Skempton and Sowa, 1963). This test is performed in general accordance with **BS 1377: Part 8: 1990 #7**.

4. BORING LOGS

Boring logs, presented in **Appendix B**, give a general indication of the soil conditions at each borehole location. The borehole logs show:

- Soil description
- Stratum changes
- SPT results
- Laboratory test results
- General information such as borehole coordinate, sample reference, etc.

5. DESCRIPTION OF SOIL STRATA

Based on the recent soil investigation results, Jurong Formation is mainly covered as major formation in this project area and also Kallang Formation is partially encountered at some borehole location. The uppermost soil layer is mostly covered by fill. A brief description of the soil types encountered at site is presented below:

5.1 FILL

Fill is manmade deposit of natural earth material. The layer is generally encountered at all borehole location with various thickness and composed with firm to stiff and medium dense; yellowish brown, reddish brown, brownish grey, yellowish grey, brownish yellow mottled with white, blackish brown; Sandy CLAY, Sandy SILT, Clayey SAND and Silty SAND with gravel.

5.2 Kallang Formation

This formation is named after Kallang River Basin where it is most extensive such as along the coastline and extends into the headwater of the rivers draining Singapore. The Kallang Formation is informally included with four members as Marine Member (M), Alluvial Member (F), Transitional or Estuarine Member (E) and Littoral or Beach Member (B). (Referred to LTA, 2003: Site Investigation Works Handbook; Appendix 1, Table 1)

In this project area, Transitional Member is partially encountered at BH1, BH2 and BH3 with different thickness. The soils are mainly composed with very soft; black, dark grey, brownish grey mottled with black; Slightly fine grained sandy CLAY with silt and Peaty CLAY. Organic components and decayed wood fragments are comprised with soil.

5.3 Jurong Formation

The Jurong Formation covers the western and southern coastal areas of Singapore. This formation consists of sedimentary rocks formed during Triassic and lower to middle Jurassic.

The DSTA (2009) recognized within the Jurong Formation seven facies: Queenstown Facies (Jq), Jong Facies (Jj), Ayer Chawan Facies (Jac), Pandan Facies (Jp), Rimau Facies (Jr), St. John Facies (Jsp), and the Tengah Facies (Jt). The Queenstown Facies is characterised by

thinly bedded red and purple mudstone with some red to purple shale, the Jong Facies by dark grey to black well-cemented sub-rounded to rounded clasts conglomerates, the Ayer Chawan Facies by generally reddish coloured of a well-bedded tuffaceous muddy siltstones and sandstones, the Pandan Facies by dark grey to black laminated fine grained arenaceous limestone, the Rimau Facies by well-cemented but loosely packed conglomerates and sandstones with minor beds of carbonaceous matter, the St. John Facies by pale grey muddy sandstone and the Tengah Facies by muddy fine to medium grained deeply weathered poorly lithified sandstones. The facies occur at different horizons and interdigitate.

Although a general spatial and temporal relationship can be recognized for each facies member, no one facies can be assumed to form a continuous unit. Similar sediments could have been deposited at different times and as discrete bodies, because closely similar environmental settings could have occurred periodically throughout the time of deposition of the Jurong Formation. Extensive areas in the Jurong Formation have been affected by dynamic metamorphism resulting from tectonic activity. The grade of metamorphism is low, and it is still possible to determine the facies that has been affected.

Residual and Completely Weathered Soil Layer

The sedimentary residual soils are generally derived from weathering of its sedimentary parent rocks consisting of mudstone, sandstone, shale, conglomerates and siltstone which had been subjected to considerable tectonic activity in the geological past, thereby results in extensive folding and faulting. The sedimentary residual soils generally tend to exhibit an increasing degree of compaction with depth due to a corresponding decrease in the degree of decomposition.

According to the result of soil investigation results, the investigated area probably lies in Tengah Facies (Jt). The soil material is mainly composed with stiff to hard and very dense; SILT, Sandy SILT, Sandy CLAY, Silty GRAVEL and Silty SAND. The soil colour varies with dark grey, brownish grey, grey, reddish brown mottled with white, red mottled with grey, brown mottled with white, yellowish grey, greyish brown, yellowish brown, greenish grey and so on.

Rock Layer

The rock layer encountered in this project area is medium strong; yellowish brown; thin to medium bedded; fine grained; highly weathered; highly fractured; very close spaced jointed; smooth planar; open aperture' SILTSTONE.

For further details, soil description and their properties, please refer to the boring logs, laboratory test results and subsurface soil profiles.

Table 5.1 Weathering classification for Jurong Formation (LTA, 2003)

Grade	Basis for Assessment
I	Intact strength, unaffected by weathering
II	Slightly weakened, slight discoloration, particularly along joints.
III	Considerably weakened & discoloured, but larger pieces cannot be broken by hand. RQD is generally >0, but RQD should not be used as the major criterion for assessment.
IV	Core can be broken by hand or consists of gravel size pieces. Generally, highly to very highly fractured, but majority of sample consists of lithorelics. RQD is generally 0 but RQD should not be used as the major guide for assessment. For siltstone, shale, sandstone, quartzite and conglomerate, the slake test can be used to differentiate between Grade V (slakes) and Grade IV (does not slake).
V	Rock weathered down to soil-like material, bedding intact. Material slakes in water.
VI	Rock degraded to a soil in which none of the original bedding remains.

Report Prepared by

Thaw Zin
Engineer

Report Reviewed by

James Goh
Vice President, (Building & Geo Technology)

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February 2017

FIGURES

Figure 1 Location Map of the Project Area

Figure 2 Borehole Location Plan of the Project Area

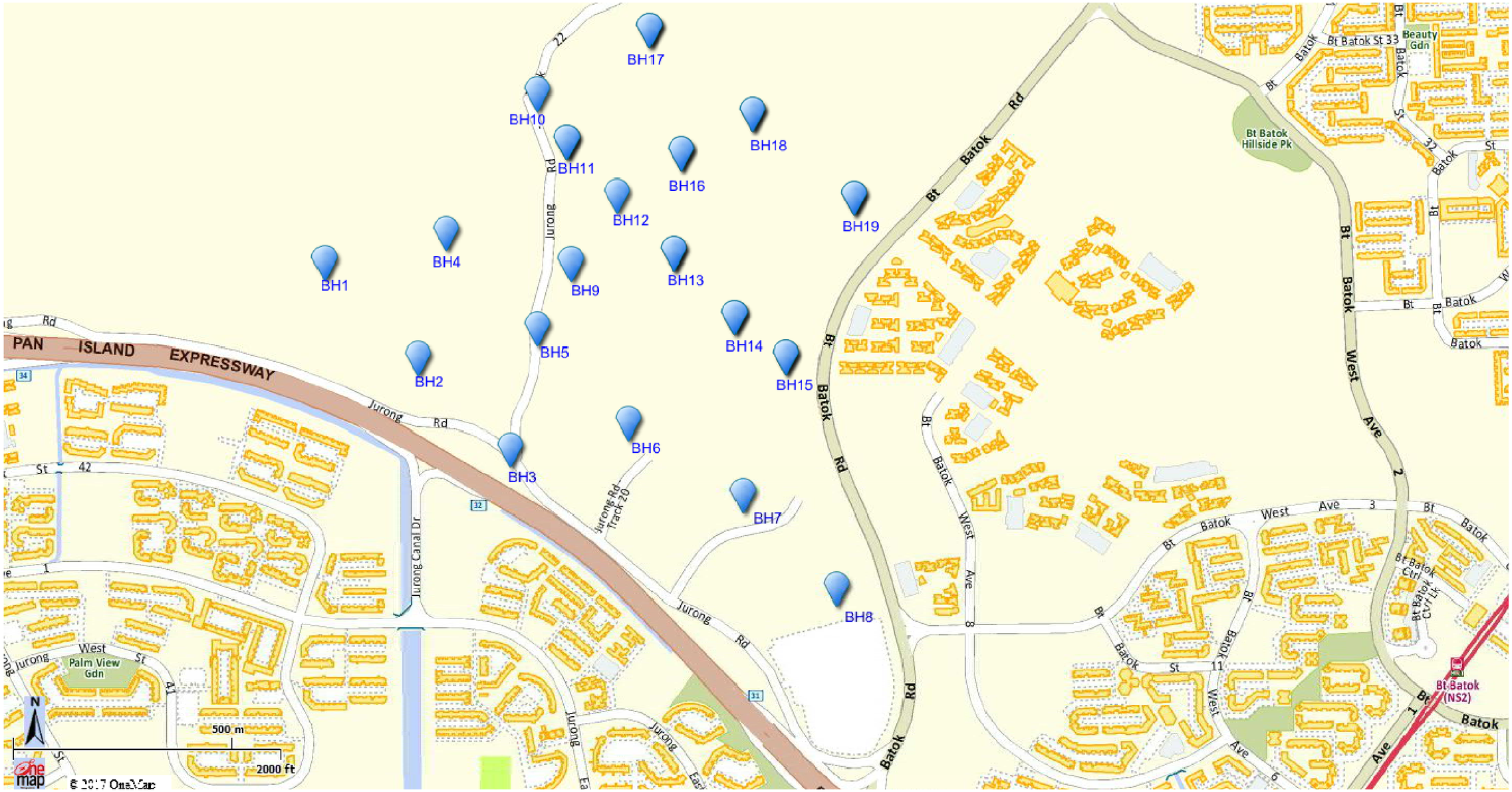


Figure 1 Location Map of the Project Area

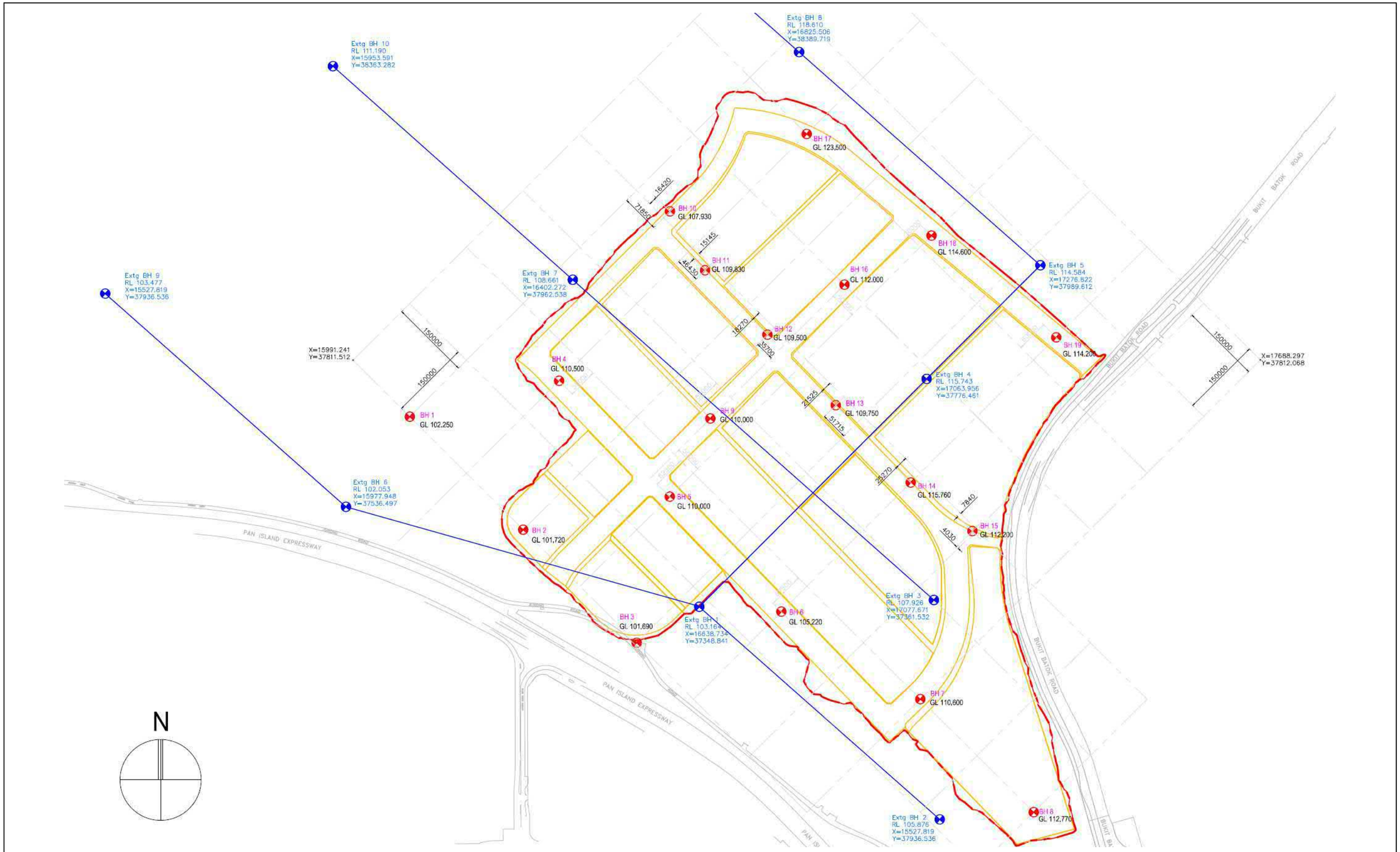


Figure 2 Borehole Location Plan of the Project Area

PLATES

Plate A Core Box and SPT Sample Photographs



Plate A1: Standard Penetration Test Sample Photograph BH1



Plate A2: Standard Penetration Test Sample Photograph BH2



Plate A3: Standard Penetration Test Sample Photograph BH3



Plate A4: Standard Penetration Test Sample Photograph BH4



Plate A5: Standard Penetration Test Sample Photograph BH5



Plate A6: Standard Penetration Test Sample Photograph BH6



Plate A7: Standard Penetration Test Sample Photograph BH7



Plate A8: Standard Penetration Test Sample Photograph BH8



Plate A9: Standard Penetration Test Sample Photograph BH9



Plate A10: Standard Penetration Test Sample Photograph BH10



Plate A11: Standard Penetration Test Sample Photograph BH11



Plate A12: Standard Penetration Test Sample Photograph BH12



Plate A13: Standard Penetration Test Sample Photograph BH13



Plate A14: Standard Penetration Test Sample Photograph BH14



Plate A15: Standard Penetration Test Sample Photograph BH15



Plate A16: Standard Penetration Test Sample Photograph BH16



Plate A17: Standard Penetration Test Sample Photograph BH17



Plate A18: Standard Penetration Test Sample Photograph BH18



Plate A19: Standard Penetration Test Sample Photograph BH19



Plate A20: Core Box Photograph BH1

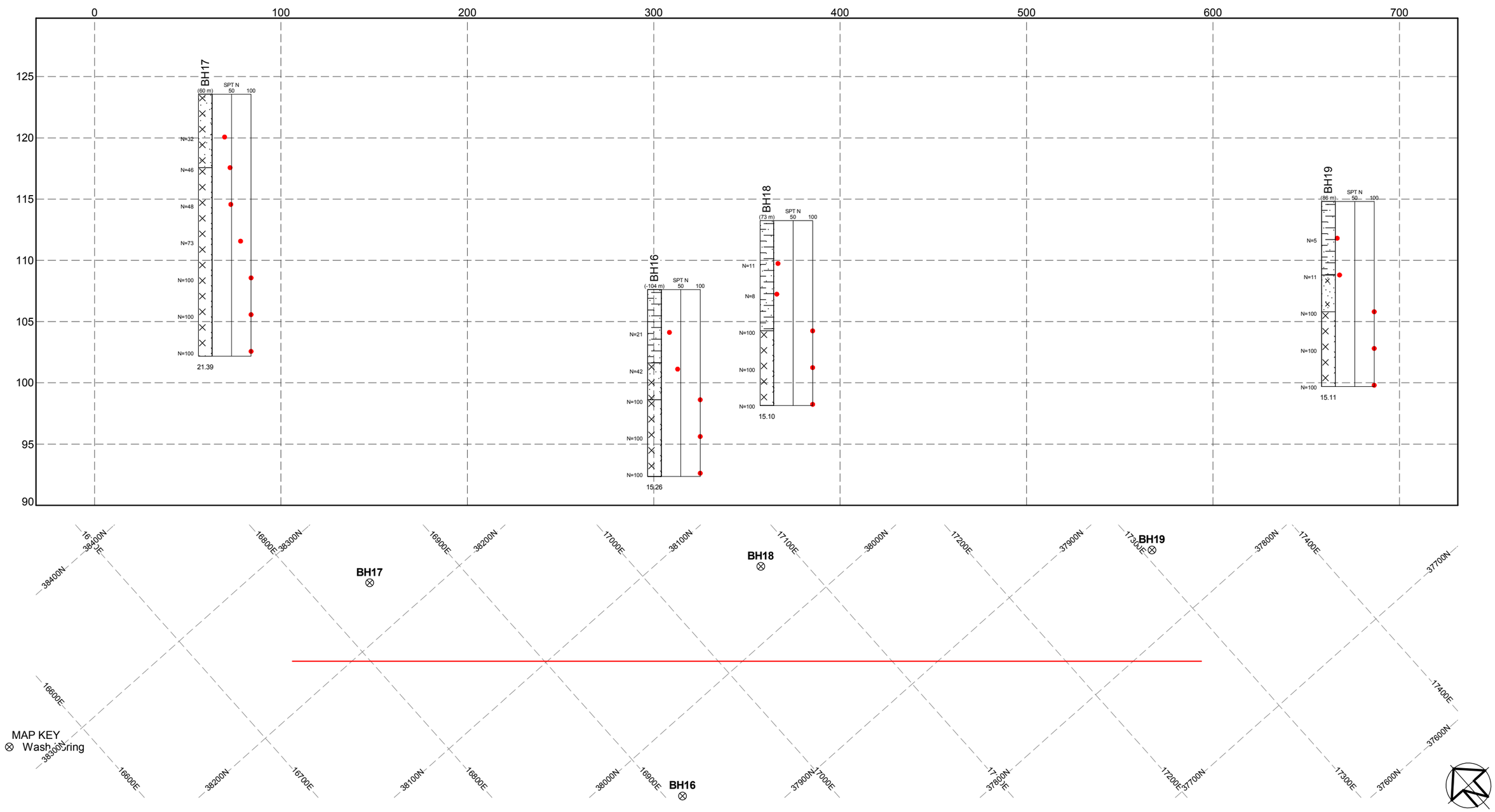


Plate A21: Core Box Photograph BH13

APPENDICES

Appendix A

Subsurface Soil Profiles

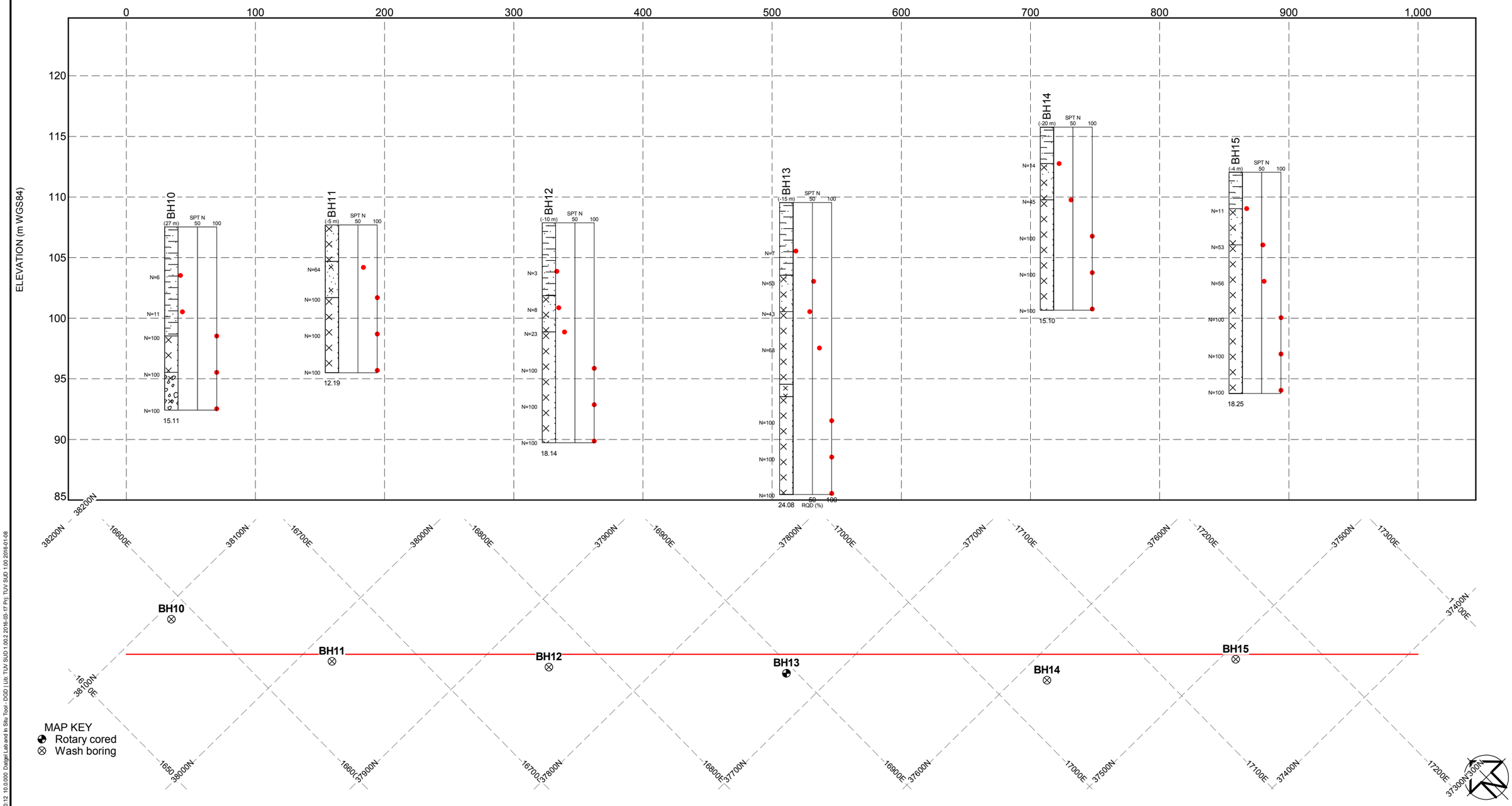


MATERIAL GRAPHIC

- Sandy CLAY
- Silty SAND
- Sandy SILT
- SILT

TÜV SÜD AI. Technologies	TITLE: HOUSING & DEVELOPMENT BOARD E.Engr Wang Yifan SI Works at Tengah Phase 1 & 2 Infra (WI 059) [D/250/14] TERM CONTRACT NO. 35 Subsurface Section	DRAWN: Thaw Zin	DATE: 02/02/2017
		CHECKED: James	DATE: 02/02/2017
		SCALE: H 1:2090 V 1:318	A3
		PROJECT No: 73620111662	FIGURE No: CS1

TUV SUD 1.00.2.LIB.GLB Fence FENCE A3L 73620111662_WI 059.GPJ <<DrawingFile>> 02/02/2017 10:10 10.0.000 Datgel Lab and In Situ Tool - DGD | Lib: TUV SUD 1.00.2 2016-03-17 Prj: TUV SUD 1.00 2016-01-08

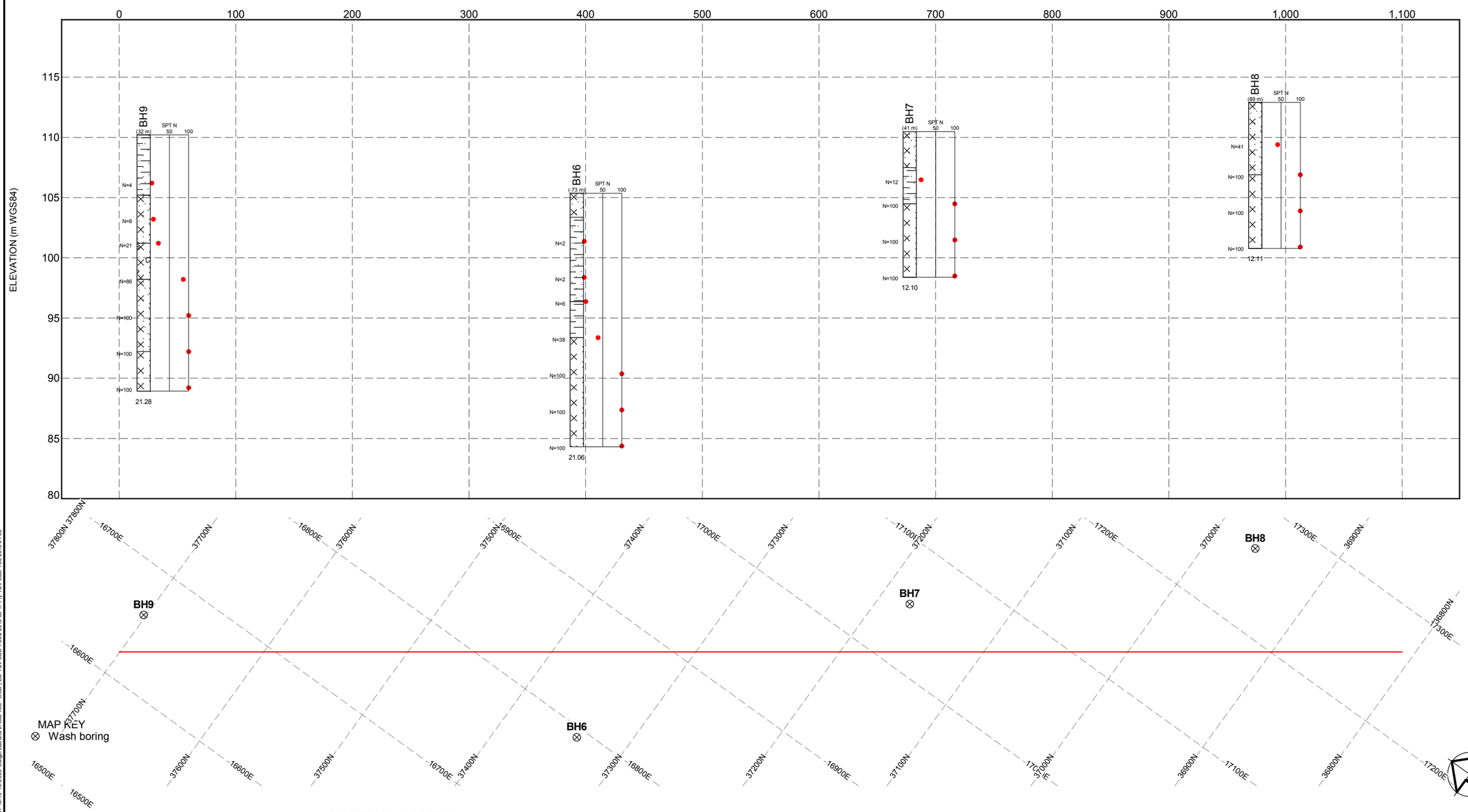


MATERIAL GRAPHIC

- Sandy CLAY
- Sandy SILT
- SILT
- Silty SAND
- Silty GRAVEL
- SILTSTONE

TITLE: HOUSING & DEVELOPMENT BOARD E.Engr Wang Yifan SI Works at Tengah Phase 1 & 2 Infra (WI 059) [D/250/14] TERM CONTRACT NO. 35 Subsurface Section	DRAWN: Thaw Zin	DATE: 02/02/2017	
	CHECKED: James	DATE: 02/02/2017	
	SCALE: H 1:2985 V 1:318		A3
	PROJECT No: 73620111662	FIGURE No: CS2	

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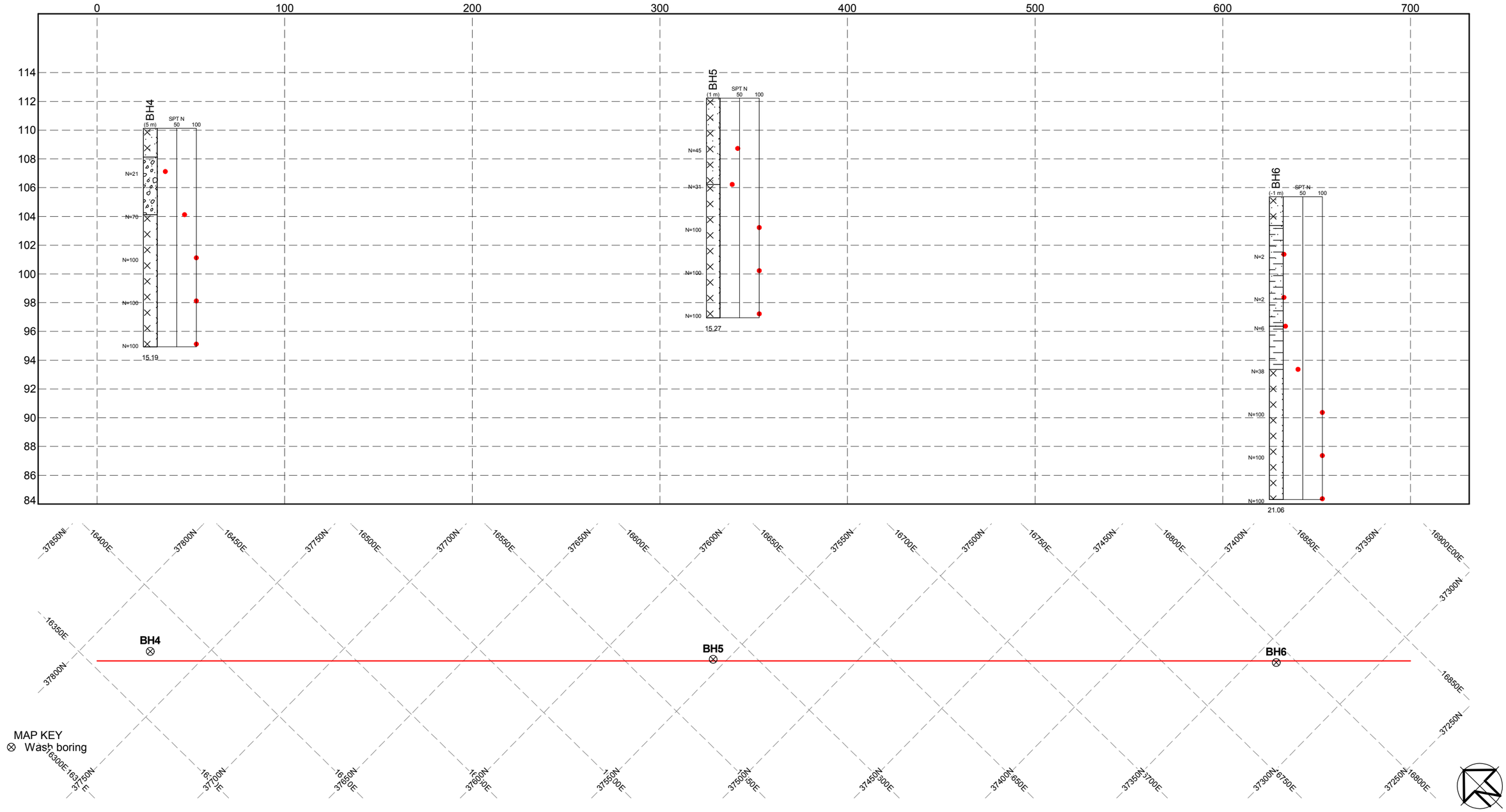


MATERIAL GRAPHIC

- Sandy SILT
- SILT
- Sandy CLAY
- Gravelly SILT
- CLAY

TITLE: HOUSING & DEVELOPMENT BOARD E.Engr Wang Yifan SI Works at Tengah Phase 1 & 2 Infra (WI 059) [D/250/14] TERM CONTRACT NO. 35 Subsurface Section	DRAWN: Thaw Zin	DATE: 02/02/2017	
	CHECKED: James	DATE: 02/02/2017	
	SCALE: H 1:3284 V 1:318		A3
	PROJECT No: 73620111662	FIGURE No: CS3	

TUV SUD 1.00.2 LIB GLB Fence FENCE A3L 73620111662_WI 059.GPJ <<DrawingFile>> 02/02/2017 10:19 10.0.000 Datgel Lab and In Situ Tool - DGD | Lib: TUV SUD 1.00.2 2016-03-17 Prj: TUV SUD 1.00 2016-01-08

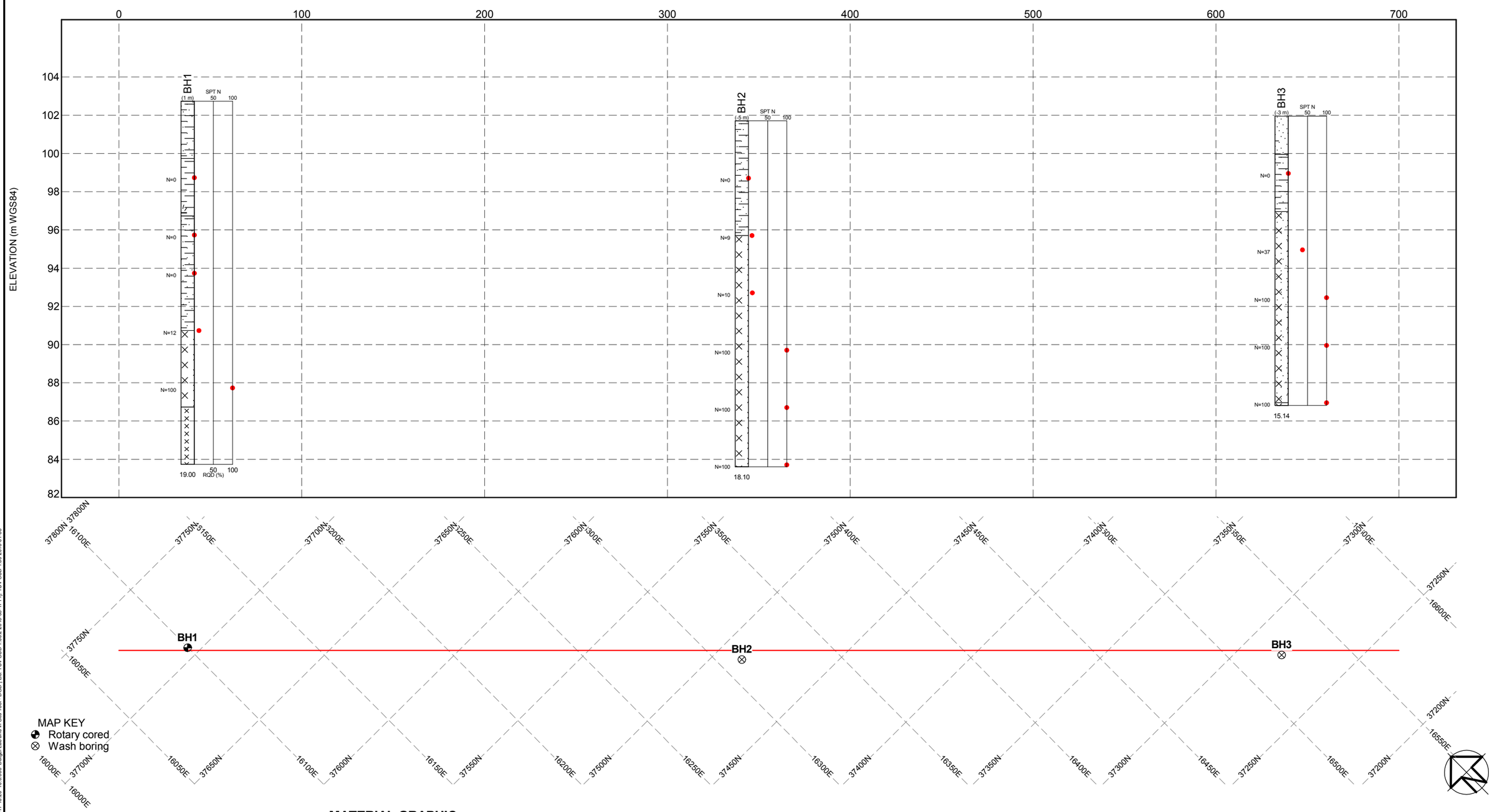


MATERIAL GRAPHIC

- Sandy SILT
- Sandy CLAY
- Sandy GRAVEL
- CLAY
- SILT

TÜV SÜD AI. Technologies	TITLE: HOUSING & DEVELOPMENT BOARD E.Engr Wang Yifan SI Works at Tengah Phase 1 & 2 Infra (WI 059) [D/250/14] TERM CONTRACT NO. 35 Subsurface Section	DRAWN: Thaw Zin	DATE: 02/02/2017
		CHECKED: James	DATE: 02/02/2017
		SCALE: H 1:2090 V 1:273	A3
		PROJECT No: 73620111662	FIGURE No: CS4

TUV SUD 1.00.2 LIB: GLB Fence FENCE A3L 73620111662_WI 059.GPJ <<DrawingFile>> 02/02/2017 10:17 10.0.000 Datgel Lab and In Situ Tool - DGD | Ldb: TUV SUD 1.00.2 2016-03-17 Prj: TUV SUD 1.00 2016-01-08

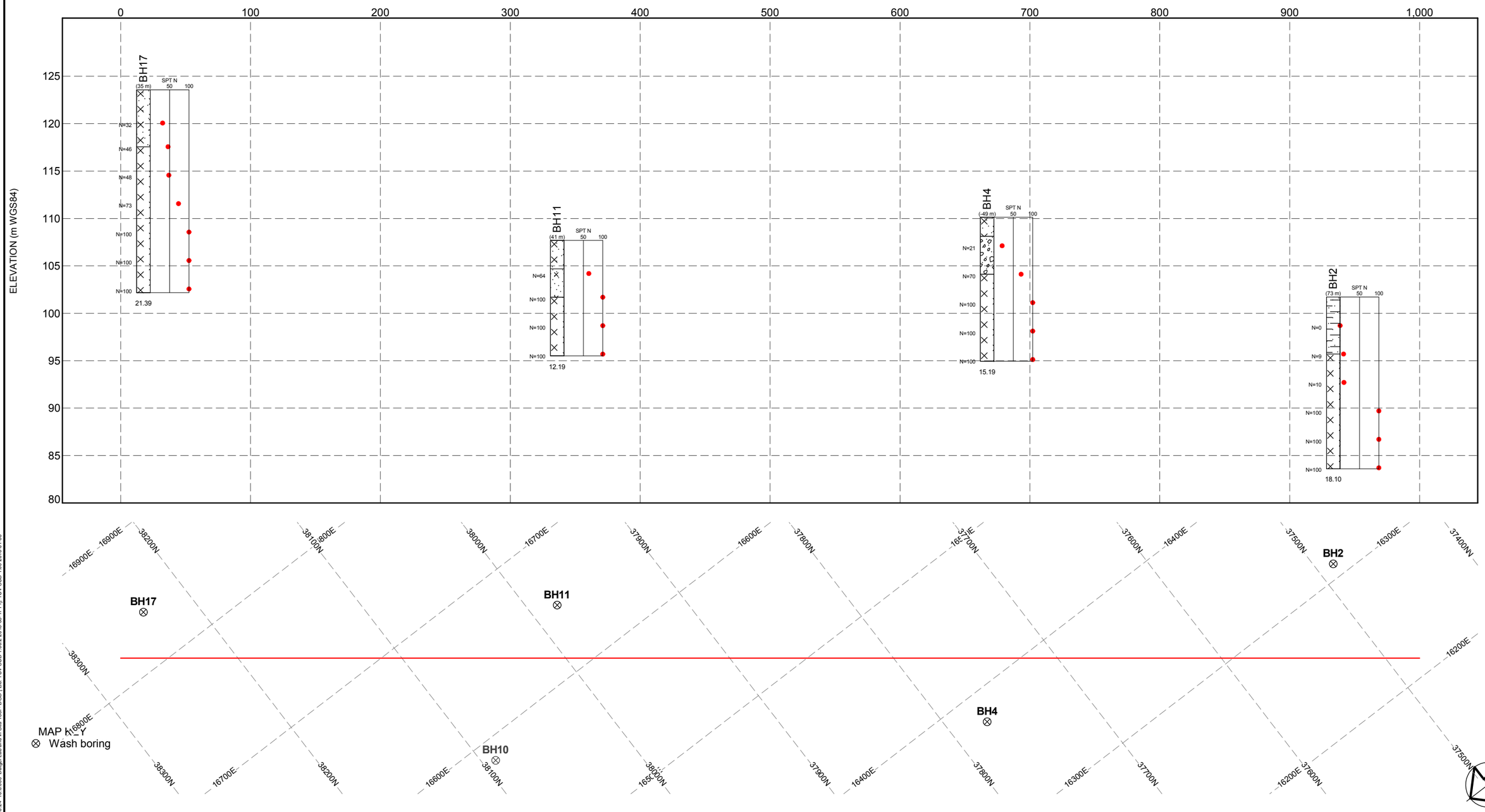


MATERIAL GRAPHIC

- Sandy CLAY
- Organic CLAY
- SILT
- SILTSTONE
- Clayey SAND
- Sandy SILT

TITLE: HOUSING & DEVELOPMENT BOARD E.Engr Wang Yifan SI Works at Tengah Phase 1 & 2 Infra (WI 059) [D/250/14] TERM CONTRACT NO. 35 Subsurface Section	DRAWN: Thaw Zin	DATE: 02/02/2017	
	CHECKED: James	DATE: 02/02/2017	
	SCALE: H 1:2090 V 1:200		A3
	PROJECT No: 73620111662	FIGURE No: CS5	

TUV SUD 1.00.2 LIB GLB Fence FENCE A3L 736201662_WI 059.GPJ <<DrawingFile>> 02/02/2017 10:20 10.0.000 Datgel Lab and In Situ Tool - DGD | Lib: TUV SUD 1.002 2016-03-17 Prj: TUV SUD 1.00 2016-01-08

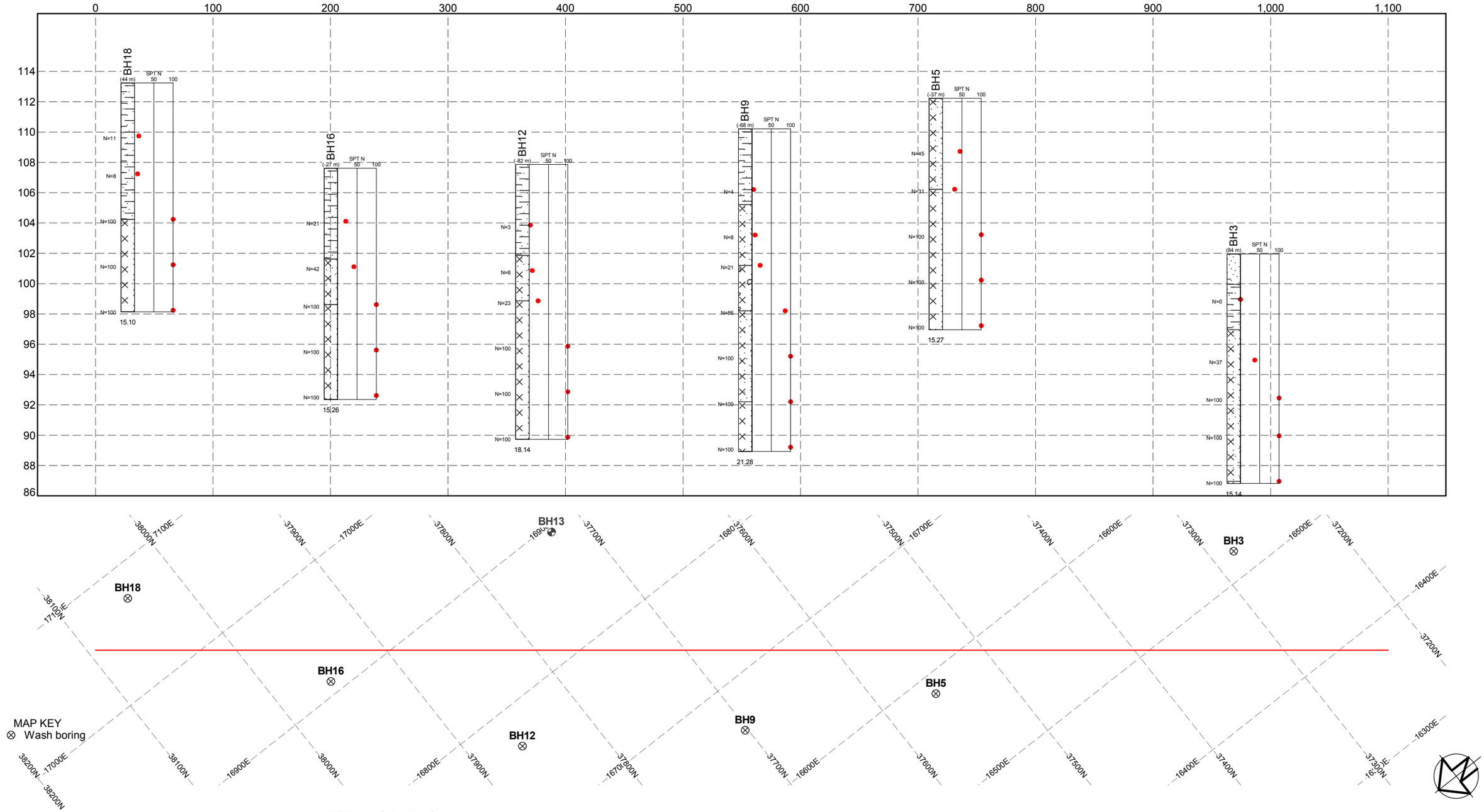


MATERIAL GRAPHIC

- Sandy CLAY
- Sandy GRAVEL
- SILT
- Silty SAND
- Sandy SILT

TITLE: HOUSING & DEVELOPMENT BOARD E.Engr Wang Yifan SI Works at Tengah Phase 1 & 2 Infra (WI 059) [D/250/14] TERM CONTRACT NO. 35 Subsurface Section	DRAWN: Thaw Zin	DATE: 02/02/2017	
	CHECKED: James	DATE: 02/02/2017	
	SCALE: H 1:2985 V 1:409		A3
	PROJECT No: 73620111662	FIGURE No: CS6	

TUV SUD 1.00.2.LIB.GLB Fence FENCE A3L 73620111662_WI 059.GPJ <<DrawingFile>> 02/02/2017 10:24 10.0.000 Datgel Lab and In Situ Tool - DGD | Lib: TUV SUD 1.00.2 2016-03-17 Prj: TUV SUD 1.00 2016-01-08



MATERIAL GRAPHIC

- Clayey SAND
- SILT
- Sandy CLAY
- Gravelly SILT
- Sandy SILT

TITLE: HOUSING & DEVELOPMENT BOARD E.Engr Wang Yifan SI Works at Tengah Phase 1 & 2 Infra (WI 059) [D/250/14] TERM CONTRACT NO. 35 Subsurface Section	DRAWN: Thaw Zin	DATE: 02/02/2017	
	CHECKED: James	DATE: 02/02/2017	
	SCALE: H 1:3284 V 1:255		A3
	PROJECT No: 73620111662	FIGURE No: CS7	

TUV SUD 1.00.2.LIB.GLB Fence FENCE A3L 73620111662_WI 059.GPJ <<DrawingFile>> 02/02/2017 10:27 10.0.000 Datgel Lab and In Situ Tool - DGD | Utz TUV SUD 1.00.2 2016-03-17 Prj TUV SUD 1.00 2016-01-08

APPENDICES

Appendix B

Boring Logs Records

PROJECT: [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS
CLIENT: HOUSING & DEVELOPMENT BOARD
PROJECT NO: 73620111662
LOCATION: SI Works at Tengah Phase 1 & 2 Infra (WI 059)
DRILLING DATE STARTED: 15/12/2016
DRILLING DATE COMPLETED: 15/12/2016
LOGGED BY: Ramesh.R
CHECKED BY: Thaw Zin
DRILLING RIG: TOHO D2K
BOREHOLE DIA: 100mm
CORE DIA: 76 mm
DRILLING METHOD: Rotary cored
DRILLED BY: TAL/G.Jayavel

BORING LOG: BH1

NORTHING: 37705.5 m
EASTING: 16099.9 m
REDUCED LEVEL: 102.73 m
GWL: m dated

Scale	Reduced Level (m)	Depth (m) (Thickness)	Graphic Log	Legend	Type & No.	Description	SPT N blows/300mm	TCR (%)	RQD (%)	Geological Classification	British Soil Classification	Grain Size Analysis G/SA/S/C	Shear Strength C (kPa)	Shear Strength ϕ (°)
1						Firm; yellowish bown; fine to coarse grained sandy CLAY. FILL, Trial Pit (1.0x0.7x1.0)m and Hand Auger up to 3.00m BGL. Sandy CLAY								
2		(3.00)								FILL	CS			
3	99.73	3.00			3.00									
4					UD1	Very soft; brownish black; Slightly gravelly slightly fine to coarse grained sandy Peaty CLAY with silt and decomposed plant remain. Transitional Member (KALLANG FORMATION)						17/25/27/31		
5		(3.00)			4.00 P1 4.45	Peaty CLAY	0/300			E	CPt			
6	96.73	6.00			6.00									
7					UD2	Very soft; dark grey; Slightly fine grained sandy CLAY with silt. Transitional Member (KALLANG FORMATION)						0/19/14/67		
8					7.00 P2 7.45	Sandy CLAY	0/300							
9		(6.00)			9.00 P3 9.45		0/300			E	CS			
10														
11														
12	90.73	12.00			12.00 P4 12.45	Stiff; dark grey; SILT with clay. Residual Soil (JURONG FORMATION) SILT	12/300							
13														
14		(3.00)								S(V)	M			
15	87.73	15.00			15.00									
16	86.73	(1.00) 16.00			P5 15.33	Hard; brownish grey; SILT with highly weatered siltstone. Completely Weathered (JURONG FORMATION) SILT	100/230			S(V)	M			
17					16.00 CR1	Medium strong; yellowish brown; thin to medium bedded; fine grained; SILTSTONE; highly weathered; highly fractured; very close spaced jointed; smooth planar; open aperture. Water Standpipe installed up to 12.00m BGL. JURONG FORMATION SILTSTONE		100	0					
18		(3.00)			17.00 CR2			100	0	S(IV)	SI			
19	83.73	19.00			18.00 CR3			100	0					
20					19.00	Hole Terminated at 19.00 m								

Ground Water Level (Measured from Ground Level)

Date (dd/mm/yyyy)	Time (hh:mm)	Borehole Depth (m)	Casing Depth (m)	Water Level (m)
15/12/2016	17:30	19.00	15.00	1.00

- Sample
- Pressuremeter Test (PRM)
- Core Run
- Vane Shear Test (VST)
- Permeability / Packer Test (PKT)
- SPT N Value
- Attempt TW/P/MZ/U
- P - Piston Sample
- TW - Thin Wall Push
- M - Mazier
- U - Thick Wall Open Drive
- C - Core Run
- SPTLS - SPT Liner
- W - Water
- PZS - Cassagrande Piezometer
- WSP - Water Standpipe

REMARKS:

DATA QUALITY RATING

TUV SUD 1.00.2 LIB.GLB Log IS SG BOREHOLE 2 73620111662_WI 059.GPJ <<DrawingFile>> 02/02/2017 09:56 10.0.000 Datgel Lab and In Situ Tool - DGD | Lib: TUV SUD 1.00.2 2016-03-17 Prj: TUV SUD 1.00 2016-01-08

PROJECT: [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS
CLIENT: HOUSING & DEVELOPMENT BOARD
PROJECT NO: 73620111662
LOCATION: SI Works at Tengah Phase 1 & 2 Infra (WI 059)
DRILLING DATE STARTED: 12/12/2016
DRILLING DATE COMPLETED: 13/12/2016
LOGGED BY: Ramesh.R
CHECKED BY: Thaw Zin

DRILLING RIG: TOHO D2K
BOREHOLE DIA: 100mm
CORE DIA:
DRILLING METHOD: Wash boring
DRILLED BY: TAL/G.Jayavel

BORING LOG: BH2

NORTHING: 37487.5 m
EASTING: 16310.4 m
REDUCED LEVEL: 101.71 m
GWL: m dated

Scale	Reduced Level (m)	Depth (m) (Thickness)	Graphic Log	Legend	Type & No.	Description	SPT N blows/300mm	TCR (%)	RQD (%)	Geological Classification	British Soil Classification	Grain Size Analysis G/SA/S/C	Shear Strength C (kPa)	Shear Strength ϕ (°)
1		(2.00)				Firm; yellowish bown; fine to coarse grained sandy CLAY. FILL, Trial Pit (1.0x0.7x1.0)m and Hand Auger up to 3.00m BGL. Sandy CLAY				FILL	CS			
2	99.71	2.00			2.00									
3					UD1	Very soft; dark grey; Slightly fine grianed sandy CLAY with silt. Transitional Member (KALLANG FORMATION) Sandy CLAY	0/300					0/8/22/70		
4		(4.00)			3.00 P1 3.45					E	CS	0/10/36/54	29 (UU)	
5					4.00 UD2 5.00									
6	95.71	6.00			6.00									
7					P2 6.45	Stiff; dark grey; SILT with clay. Residual Soil (JURONG FORMATION) SILT	9/300							
8														
9		(6.00)			9.00 P3 9.45		10/300			S(VI)	M			
10														
11														
12	89.71	12.00			12.00									
13					P4 12.42	Hard; grey; SILT. Completely Weathered (JURONG FORMATION) SILT	100/270							
14														
15		(6.00)			15.00 P5 15.32		100/200			S(V)	M			
16														
17														
18	83.71	18.00			18.00									
	83.61	18.10 (0.10)			P6 18.10	Hard; grey; SILT with highly weatered siltstone. Completely Weathered (JURONG FORMATION) SILT Hole Terminated at 18.10 m	100/60			S(V)	M			
19														
20														

SPT N blows / 300 mm (20 40 60 80)
Undrained Shear Strength kPa (20 40 60 80)
Rock
Shear Strength
PL WC LL (20 40 60 80)
Bulk Density Mg/m³ (1.5 1.8 2.1 2.4)

Ground Water Level (Measured from Ground Level)				
Date (dd/mm/yyyy)	Time (hh:mm)	Borehole Depth (m)	Casing Depth (m)	Water Level (m)
12/12/2016	17:30	15.00	3.00	1.30
13/12/2016	08:30	15.00	3.00	1.00
13/12/2016	17:30	18.00	4.00	1.20

- Sample
- Pressuremeter Test (PRM)
- Core Run
- Vane Shear Test (VST)
- Permeability / Packer Test (PKT)
- SPT N Value
- Attempt TW/P/MZ/U
- P - Piston Sample
- TW - Thin Wall Push
- M - Mazier
- U - Thick Wall Open Drive
- C - Core Run
- SPTLS - SPT Liner
- W - Water
- PZS - Cassagrande Piezometer
- WSP - Water Standpipe

REMARKS:

DATA QUALITY RATING

TUV SUD Al Technologies

TUV SUD 1.00.2 LIB.GLB Log IS SG BOREHOLE 2 73620111662_WI 059.GPJ <<DrawingFile>> 02/02/2017 09:56 10.0.000 Datgel Lab and In Situ Tool - DGD | Lib: TUV SUD 1.00.2 2016-03-17 Prj: TUV SUD 1.00 2016-01-08

PROJECT: [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS
CLIENT: HOUSING & DEVELOPMENT BOARD
PROJECT NO: 73620111662
LOCATION: SI Works at Tengah Phase 1 & 2 Infra (WI 059)
DRILLING DATE STARTED: 21/11/2016
DRILLING DATE COMPLETED: 22/11/2016
LOGGED BY: Ramesh.R
CHECKED BY: Thaw Zin

DRILLING RIG: TOHO D2K
BOREHOLE DIA: 100mm
CORE DIA:
DRILLING METHOD: Wash boring
DRILLED BY: TAL/N.Murugesan

BORING LOG: BH3

NORTHING: 37281.4 m
EASTING: 16521.7 m
REDUCED LEVEL: 101.96 m
GWL: m dated

Scale	Reduced Level (m)	Depth (m) (Thickness)	Graphic Log	Legend	Type & No.	Description	SPT N blows/300mm	TCR (%)	RQD (%)	Geological Classification	British Soil Classification	Grain Size Analysis G/SA/S/C	Shear Strength C (kPa)	Shear Strength ϕ (°)
1		(2.00)				Medium dense; brownish grey; Clayey fine to coarse grained SAND. FILL, Trial Pit (1.0x0.7x1.0)m and Hand Auger up to 3.00m BGL. Clayey SAND				FILL	SC			
2	99.96	2.00												
3					3.00 P1	Very soft; brownish grey mottled with black; fine grained sandy CLAY with organic. Transitional Member (KALLANG FORMATION) Sandy CLAY	0/300							
4		(3.00)			3.45					E	CS			
5	96.96	5.00												
6					6.00 UD1	Hard; reddish brown mottled with white; Slightly gravelly slightly fine to coarse grained sandy SILT with clay. Residual Soil (JURONG FORMATION) Sandy SILT						7/15/41/37	94 (UU)	
7		(4.00)			7.00 P2		37/300			S(VI)	MS			
8					7.45									
9	92.96	9.00			9.00 UD2							1/37/46/16		
10					9.50 P3	Hard; red mottled with grey; fine grained sandy SILT with clay and traces of gravel. Completely Weathered (JURONG FORMATION) Sandy SILT	100/260							
11					9.81									
12		(6.00)			12.00 P4		100/110			S(V)	MS			
13					12.23									
14														
15	86.96 86.82	15.00 15.14 (0.14)			15.00 P5 15.14	Hard; yellowish to reddish brown; SILT. Completely Weathered (JURONG FORMATION) SILT Hole Terminated at 15.14 m	100/90			S(V)	M			
16														
17														
18														
19														
20														

SPT N blows / 300 mm (20 40 60 80)
Undrained Shear Strength kPa (20 40 60 80)
Shear Strength: PL WC LL (20 40 60 80); Bulk Density Mg/m³ (1.5 1.8 2.1 2.4)

Ground Water Level (Measured from Ground Level)				
Date (dd/mm/yyyy)	Time (hh:mm)	Borehole Depth (m)	Casing Depth (m)	Water Level (m)
21/11/2016	17:30	9.00	6.00	1.20
22/11/2016	08:30	9.00	6.00	1.50
22/11/2016	17:30	15.00	6.00	1.30

- Sample
- Pressuremeter Test (PRM)
- Core Run
- Vane Shear Test (VST)
- Permeability / Packer Test (PKT)
- SPT N Value
- Attempt TW/P/MZ/U
- P - Piston Sample
- TW - Thin Wall Push
- M - Mazier
- U - Thick Wall Open Drive
- C - Core Run
- SPTLS - SPT Liner
- W - Water
- PZS - Cassagrande Piezometer
- WSP - Water Standpipe

REMARKS:

DATA QUALITY RATING

TÜV SÜD AL Technologies

TUV SUD 1.00.2 LIB.GLB Log IS SG BOREHOLE 2 73620111662_WI 059.GPJ <<DrawingFile>> 02/02/2017 09:56 10.0.000 Datgel Lab and In Situ Tool - DGD | Lib: TUV SUD 1.00.2 2016-03-17 Prj: TUV SUD 1.00 2016-01-08

PROJECT: [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS
CLIENT: HOUSING & DEVELOPMENT BOARD
PROJECT NO: 73620111662
LOCATION: SI Works at Tengah Phase 1 & 2 Infra (WI 059)
DRILLING DATE STARTED: 09/12/2016
DRILLING DATE COMPLETED: 09/12/2016
LOGGED BY: Ramesh.R
CHECKED BY: Thaw Zin

DRILLING RIG: TOHO D2K
BOREHOLE DIA: 100mm
CORE DIA:
DRILLING METHOD: Wash boring
DRILLED BY: TAL/G.Jayavel

BORING LOG: BH4

NORTHING: 37772.7 m
EASTING: 16376.6 m
REDUCED LEVEL: 110.12 m
GWL: m dated

Scale	Reduced Level (m)	Depth (m) (Thickness)	Graphic Log	Legend	Type & No.	Description	SPT N blows/300mm	Rock TCR (%)	Rock RQD (%)	Geological Classification	British Soil Classification	Grain Size Analysis G/SA/S/C	Shear Strength C (kPa)	Shear Strength ϕ (°)
1		(2.00)				Stiff; brownish yellow; SILT. FILL, Trial Pit (1.0x0.7x1.0)m and Hand Auger up to 3.00m BGL. Sandy SILT				FILL	MS			
2	108.12	2.00			2.00									
3					UD1 2.50	Medium dense; red; Silty very fine to coarse grained sandy GRAVEL with clay. Residual Soil (JURONG FORMATION)						51/30/15/4		
					3.00 P1 3.45	Sandy GRAVEL	21/300							
4		(4.00)								S(VI)	GS			
5														
6	104.12	6.00			6.00									
7					P2 6.45	Hard; brown; SILT. Residual Soil (JURONG FORMATION) SILT	70/300							
8														
9		(6.00)			9.00 P3 9.40		100/300			S(VI)	M			
10														
11														
12	98.12	12.00			12.00 P4 12.30	Hard; grey; SILT with rock fragments. Completely Weathered (JURONG FORMATION) SILT	100/230							
13														
14		(3.00)								S(V)	M			
15	95.12	15.00			15.00									
	~~94.93~~	(0.19)			P5 15.19	Hard; brown; SILT with completely weatered rock. Water Standpipe installed up to 12.00m BGL. Completely Weathered (JURONG FORMATION) SILT	100/130			S(V)	M			
	15.19					Hole Terminated at 15.19 m								
16														
17														
18														
19														
20														

SPT N blows / 300 mm (20 40 60 80)
Undrained Shear Strength kPa (20 40 60 80)

Shear Strength: PL WC LL (20 40 60 80)
Bulk Density Mg/m³ (1.5 1.8 2.1 2.4)

Ground Water Level (Measured from Ground Level)				
Date (dd/mm/yyyy)	Time (hh:mm)	Borehole Depth (m)	Casing Depth (m)	Water Level (m)
09/12/2016	17:30	15.00	3.00	1.90

- Sample
- Pressuremeter Test (PRM)
- Core Run
- Vane Shear Test (VST)
- Permeability / Packer Test (PKT)
- SPT N Value
- Attempt TW/P/MZ/U
- P - Piston Sample
- TW - Thin Wall Push
- M - Mazier
- U - Thick Wall Open Drive
- C - Core Run
- SPTLS - SPT Liner
- W - Water
- PZS - Cassagrande Piezometer
- WSP - Water Standpipe

REMARKS:

DATA QUALITY RATING

TUV SUD Al Technologies

TUV SUD 1.00.2 LIB.GLB Log IS SG BOREHOLE 2 7362011662_WI 059.GPJ <<DrawingFile>> 02/02/2017 09:56 10.0.000 Datgel Lab and In Situ Tool - DGD | Lib: TUV SUD 1.00.2 2016-03-17 Prj: TUV SUD 1.00 2016-01-08

PROJECT: [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS
CLIENT: HOUSING & DEVELOPMENT BOARD
PROJECT NO: 73620111662
LOCATION: SI Works at Tengah Phase 1 & 2 Infra (WI 059)
DRILLING DATE STARTED: 21/12/2016
DRILLING DATE COMPLETED: 22/12/2016
LOGGED BY: Ramesh.R
CHECKED BY: Thaw Zin
DRILLING RIG: TOHO D2K
BOREHOLE DIA: 100mm
CORE DIA:
DRILLING METHOD: Wash boring
DRILLED BY: TAL/G.Jayavel

BORING LOG: BH5

NORTHING: 37555.4 m
EASTING: 16583.5 m
REDUCED LEVEL: 112.23 m
GWL: m dated

Scale	Reduced Level (m)	Depth (m) (Thickness)	Graphic Log	Legend	Type & No.	Description	SPT N blows/300mm	TCR (%)	RQD (%)	Geological Classification	British Soil Classification	Grain Size Analysis G/SA/S/C	Shear Strength C (kPa)	Shear Strength ϕ (°)
1		(2.00)				Stiff; brownish grey; SILT. FILL, Trial Pit (1.0x0.7x1.0)m and Hand Auger up to 3.00m BGL. Sandy SILT				FILL	MS			
2	110.23	2.00												
3					3.00 UD1	Hard; brown mottled with white; Slightly gravelly fine to coarse grained sandy SILT with clay. Residual Soil (JURONG FORMATION) Sandy SILT						9/40/26/25		
4		(4.00)			3.50 P1 3.95		45/300			S(VI)	MS			
5														
6	106.23	6.00			6.00 P2 6.45	Hard; yellowish grey; SILT with traces of fine grained sand. Residual Soil (JURONG FORMATION) SILT	31/300							
7														
8		(3.00)								S(VI)	M			
9	103.23	9.00			9.00 P3 9.15	Hard; greyish brown; SILT with rock fragments. Completely Weathered (JURONG FORMATION) SILT	100/100							
10														
11		(3.00)								S(V)	M			
12	100.23	12.00			12.00 P4 12.27	Hard; yellowish brown; SILT with rock fragments. Completely Weathered (JURONG FORMATION) SILT	100/150							
13														
14		(3.27)								S(V)	M			
15	96.96	15.27			15.00 P5 15.27	Hole Terminated at 15.27 m	100/170							
16														
17														
18														
19														
20														

SPT N blows / 300 mm (20 40 60 80)
Undrained Shear Strength kPa (20 40 60 80)

Rock: TCR (%), RQD (%)

Shear Strength: PL WC LL (20 40 60 80); Bulk Density Mg/m³ (1.5 1.8 2.1 2.4)

Ground Water Level (Measured from Ground Level)				
Date (dd/mm/yyyy)	Time (hh:mm)	Borehole Depth (m)	Casing Depth (m)	Water Level (m)
21/12/2016	17:30	10.00	3.00	1.60
22/12/2016	08:30	10.00	3.00	2.00
22/12/2016	17:30	15.00	3.00	1.00

- Sample
- Pressuremeter Test (PRM)
- Core Run
- Vane Shear Test (VST)
- Permeability / Packer Test (PKT)
- SPT N Value
- Attempt TW/P/MZ/U
- P - Piston Sample
- TW - Thin Wall Push
- M - Mazier
- U - Thick Wall Open Drive
- C - Core Run
- SPTLS - SPT Liner
- W - Water
- PZS - Cassagrande Piezometer
- WSP - Water Standpipe

REMARKS:

DATA QUALITY RATING

TUV SUD 1.00.2 LIB.GLB Log IS SG BOREHOLE 2 73620111662_WI 059.GPJ <<DrawingFile>> 02/02/2017 09:56 10.0.000 Datgel Lab and In Situ Tool - DGD | Lib: TUV SUD 1.00.2 2016-03-17 Prj: TUV SUD 1.00 2016-01-08

PROJECT: [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS
CLIENT: HOUSING & DEVELOPMENT BOARD
PROJECT NO: 73620111662
LOCATION: SI Works at Tengah Phase 1 & 2 Infra (WI 059)
DRILLING DATE STARTED: 21/12/2016
DRILLING DATE COMPLETED: 22/12/2016
LOGGED BY: Ramesh.R
CHECKED BY: Thaw Zin
DRILLING RIG: TOHO D2K
BOREHOLE DIA: 100mm
CORE DIA:
DRILLING METHOD: Wash boring
DRILLED BY: TAL/J.Alex

BORING LOG: BH6

NORTHING: 37339.8 m
EASTING: 16792.2 m
REDUCED LEVEL: 105.37 m
GWL: m dated

Scale	Reduced Level (m)	Depth (m) (Thickness)	Graphic Log	Legend	Type & No.	Description	SPT N blows/300mm	TCR (%)	RQD (%)	Geological Classification	British Soil Classification	Grain Size Analysis G/SA/S/C	Shear Strength C (kPa)	Shear Strength ϕ (°)
1		(2.00)				Stiff; brownish yellow; SILT. FILL, Trial Pit (1.0x0.7x1.0)m and Hand Auger up to 3.00m BGL. Sandy SILT				FILL	MS			
2	103.37	2.00												
3					3.00 UD1	Soft; greenish grey; Slightly fine grianed sandy CLAY with silt and trraces of gravel. Residual Soil (JURONG FORMATION) Sandy CLAY						1/20/27/52		
4		(4.00)			4.00 P1 4.45		2/300			S(VI)	CS			
5														
6	99.37	6.00			6.00									
7					UD2	Soft; greenish grey; Slightly fine grianed sandy CLAY with silt. Residual Soil (JURONG FORMATION) Sandy CLAY						0/16/38/46	33 (UU)	
8		(3.00)			7.00 P2 7.45		2/300			S(VI)	CS			
9	96.37	9.00			9.00									
10					P3 9.45	Firm; yellow; CLAY. Residual Soil (JURONG FORMATION) CLAY	6/300							
11		(3.00)								S(VI)	C			
12	93.37	12.00			12.00									
13					P4 12.45	Hard; grey; SILT. Residual Soil (JURONG FORMATION) SILT	38/300							
14		(3.00)								S(VI)	M			
15	90.37	15.00			15.00									
16					P5 15.37	Hard; grey; SILT. Completely Weathered (JURONG FORMATION) SILT	100/260							
17		(3.00)								S(V)	M			
18	87.37	18.00			18.00									
19					P6 18.09	Hard; grey; SILT with fine to medium grained sand. Completely Weathered (JURONG FORMATION) SILT	100/60							
20		(3.00)								S(V)	M			

SPT N blows / 300 mm (20 40 60 80)
Undrained Shear Strength kPa (20 40 60 80)
Rock: TCR (%), RQD (%)
Shear Strength: PL WC LL (20 40 60 80); Bulk Density Mg/m³ (1.5 1.8 2.1 2.4)

- Sample
- Pressuremeter Test (PRM)
- Core Run
- Vane Shear Test (VST)
- Permeability / Packer Test (PKT)
- SPT N Value
- Attempt TW/P/MZ/U
- P - Piston Sample
- TW - Thin Wall Push
- M - Mazier
- U - Thick Wall Open Drive
- C - Core Run
- SPTLS - SPT Liner
- W - Water
- PZS - Cassagrande Piezometer
- WSP - Water Standpipe

REMARKS:

DATA QUALITY RATING

TUV SUD 1.00.2 LIB.GLB Log IS SG BOREHOLE 2 7362011662_WI 059.GPJ <<DrawingFile>> 02/02/2017 09:56 10.0.000 Datgel Lab and In Situ Tool - DGD | Lib: TUV SUD 1.00.2 2016-03-17 Prj: TUV SUD 1.00 2016-01-08

PROJECT: [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS
CLIENT: HOUSING & DEVELOPMENT BOARD
PROJECT NO: 73620111662
LOCATION: SI Works at Tengah Phase 1 & 2 Infra (WI 059)
DRILLING DATE STARTED: 21/12/2016
DRILLING DATE COMPLETED: 22/12/2016
LOGGED BY: Ramesh.R
CHECKED BY: Thaw Zin

DRILLING RIG: TOHO D2K
BOREHOLE DIA: 100mm
CORE DIA:
DRILLING METHOD: Wash boring
DRILLED BY: TAL/J.Alex

BORING LOG: BH6

NORTHING: 37339.8 m
EASTING: 16792.2 m
REDUCED LEVEL: 105.37 m
GWL: m dated

Scale	Reduced Level (m)	Depth (m) (Thickness)	Graphic Log	Legend	Type & No.	Description	SPT N blows/300mm	TCR (%)	RQD (%)	Geological Classification	British Soil Classification	Grain Size Analysis G/SA/S/C	Shear Strength C (kPa)	Shear Strength (°)
21	84.37	21.00			21.00	Hard; grey; SILT with fine to medium grained sand. Completely Weathered (JURONG FORMATION) *(continued)*				S(V)	M			
	84.31	21.06 (0.06)			P7 21.06	Hard; grey; SILT. Water Standpipe installed up to 12.00m BGL. Completely Weathered (JURONG FORMATION) SILT Hole Terminated at 21.06 m	100/40			S(V)	M			
22														
23														
24														
25														
26														
27														
28														
29														
30														
31														
32														
33														
34														
35														
36														
37														
38														
39														
40														

SPT N blows / 300 mm (20 40 60 80)
Undrained Shear Strength kPa (20 40 60 80)
Shear Strength (PL WC LL) (20 40 60 80)
Bulk Density Mg/m³ (1.5 1.8 2.1 2.4)

Ground Water Level (Measured from Ground Level)

Date (dd/mm/yyyy)	Time (hh:mm)	Borehole Depth (m)	Casing Depth (m)	Water Level (m)
21/12/2016	17:30	15.00	3.00	2.00
22/12/2016	08:30	15.00	3.00	1.70
22/12/2016	17:30	21.00	3.00	1.50

- Sample
- Pressuremeter Test (PRM)
- Core Run
- Vane Shear Test (VST)
- Permeability / Packer Test (PKT)
- SPT N Value
- Attempt TW/P/MZ/U
- P - Piston Sample
- TW - Thin Wall Push
- M - Mazier
- U - Thick Wall Open Drive
- C - Core Run
- SPTLS - SPT Liner
- W - Water
- PZS - Cassagrande Piezometer
- WSP - Water Standpipe

REMARKS:

DATA QUALITY RATING

TÜV SÜD AL Technologies

TUV SUD 1.00.2 LIB.GLB Log IS SG BOREHOLE 2 7362011662_WI 059.GPJ <<DrawingFile>> 02/02/2017 09:56 10.0.000 Datgel Lab and In Situ Tool - DGD | Lib: TUV SUD 1.00.2 2016-03-17 Prj: TUV SUD 1.00 2016-01-08

PROJECT: [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS
CLIENT: HOUSING & DEVELOPMENT BOARD
PROJECT NO: 73620111662
LOCATION: SI Works at Tengah Phase 1 & 2 Infra (WI 059)
DRILLING DATE STARTED: 04/01/2017
DRILLING DATE COMPLETED: 04/01/2017
LOGGED BY: Ramesh.R
CHECKED BY: Thaw Zin

DRILLING RIG: TOHO D2K
BOREHOLE DIA: 100mm
CORE DIA:
DRILLING METHOD: Wash boring
DRILLED BY: TAL/J.Alex

BORING LOG: BH7

NORTHING: 37175.5 m
EASTING: 17052.1 m
REDUCED LEVEL: 110.48 m
GWL: m dated

Scale	Reduced Level (m)	Depth (m) (Thickness)	Graphic Log	Legend	Type & No.	Description	SPT N blows/300mm	Rock TCR (%)	Rock RQD (%)	Geological Classification	British Soil Classification	Grain Size Analysis G/SA/S/C	Shear Strength C (kPa)	Shear Strength (°)
1						Stiff; brownish yellow; SILT. FILL, Trial Pit (1.0x0.7x1.0)m and Hand Auger up to 3.00m BGL. Sandy SILT								
2		(3.00)								FILL	MS			
3	107.48	3.00			3.00									
4					UD1	Stiff; reddish brown; Slightly fine grained sandy CLAY with silt and traces of gravel. Residual Soil (JURONG FORMATION) Sandy CLAY						2/22/37/39		
5		(3.00)			4.00 P1 4.45		12/300			S(VI)	CS			
6	104.48	6.00			6.00 P2 6.41	Hard; grey spotted with whtie; SILT. Residual Soil (JURONG FORMATION) SILT	100/300							
7														
8		(3.00)								S(VI)	M			
9	101.48	9.00			9.00 P3 9.22	Hard; grey spotted with whtie; SILT. Completely Weathered (JURONG FORMATION) SILT	100/130							
10														
11		(3.10)								S(V)	M			
12	98.38	12.10			12.00 P4 12.10	Hole Terminated at 12.10 m	100/50							
13														
14														
15														
16														
17														
18														
19														
20														

SPT N blows / 300 mm (20 40 60 80)
Undrained Shear Strength kPa (20 40 60 80)
PL WC LL (20 40 60 80)
Bulk Density Mg/m³ (1.5 1.8 2.1 2.4)

Ground Water Level (Measured from Ground Level)				
Date (dd/mm/yyyy)	Time (hh:mm)	Borehole Depth (m)	Casing Depth (m)	Water Level (m)
21/12/2016	17:30	15.00	3.00	2.00
22/12/2016	08:30	15.00	3.00	1.70
22/12/2016	17:30	21.00	3.00	1.50

- Sample
- Pressuremeter Test (PRM)
- Core Run
- Vane Shear Test (VST)
- Permeability / Packer Test (PKT)
- SPT N Value
- Attempt TW/P/MZ/U
- P - Piston Sample
- TW - Thin Wall Push
- M - Mazier
- U - Thick Wall Open Drive
- C - Core Run
- SPTLS - SPT Liner
- W - Water
- PZS - Cassagrande Piezometer
- WSP - Water Standpipe

REMARKS:

DATA QUALITY RATING

TUV SUD 1.00.2 LIB.GLB Log IS SG BOREHOLE 2 7362011662_WI 059.GPJ <<DrawingFile>> 02/02/2017 09:57 10.0.000 Datgel Lab and In Situ Tool - DGD | Lib: TUV SUD 1.00.2 2016-03-17 Prj: TUV SUD 1.00 2016-01-08

PROJECT: [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS
CLIENT: HOUSING & DEVELOPMENT BOARD
PROJECT NO: 73620111662
LOCATION: SI Works at Tengah Phase 1 & 2 Infra (WI 059)
DRILLING DATE STARTED: 06/01/2017
DRILLING DATE COMPLETED: 06/01/2017
LOGGED BY: Ramesh.R
CHECKED BY: Thaw Zin

DRILLING RIG: TOHO D2K
BOREHOLE DIA: 100mm
CORE DIA:
DRILLING METHOD: Wash boring
DRILLED BY: TAL/G.Jayavel

BORING LOG: BH8

NORTHING: 36963.4 m
EASTING: 17264.3 m
REDUCED LEVEL: 112.90 m
GWL: m dated

Scale	Reduced Level (m)	Depth (m) (Thickness)	Graphic Log	Legend	Type & No.	Description	SPT N blows / 300 mm (20 40 60 80)	Undrained Shear Strength kPa (20 40 60 80)	SPT N blows/300mm	Rock TCR (%)	Rock RQD (%)	Geological Classification	British Soil Classification	Grain Size Analysis G/SA/S/C	Shear Strength C (kPa)	Shear Strength (°)	PL WC LL (20 40 60 80) / Bulk Density Mg/m³ (1.5 1.8 2.1 2.4)
1						Firm; reddish brown; Slightly fine grained sandy SILT with clay. FILL, Trial Pit (1.0x0.7x1.0)m and Hand Auger up to 3.00m BGL. Sandy SILT											
2																	
3		(6.00)			3.00 UD1							FILL	MS	0/11/68/21			
4					3.50 P1 3.95				41/300								
5																	
6	106.90	6.00			6.00 P2 6.27	Hard; brownish; SILT. Water Standpipe installed up to 12.00m BGL. Residual Soil (JURONG FORMATION) Sandy SILT			100/170								
7																	
8																	
9		(6.11)			9.00 P3 9.25				100/160			S(VI)	MS				
10																	
11																	
12	100.79	12.11			12.00 P4 12.11	Hole Terminated at 12.11 m			100/70								
13																	
14																	
15																	
16																	
17																	
18																	
19																	
20																	

Ground Water Level (Measured from Ground Level)				
Date (dd/mm/yyyy)	Time (hh:mm)	Borehole Depth (m)	Casing Depth (m)	Water Level (m)
06/01/2017	17:30	12.00	3.00	1.80

- Sample
- Pressuremeter Test (PRM)
- Core Run
- Vane Shear Test (VST)
- Permeability / Packer Test (PKT)
- SPT N Value
- Attempt TW/P/MZ/U
- P - Piston Sample
- TW - Thin Wall Push
- M - Mazier
- U - Thick Wall Open Drive
- C - Core Run
- SPTLS - SPT Liner
- W - Water
- PZS - Cassagrande Piezometer
- WSP - Water Standpipe

REMARKS:

DATA QUALITY RATING

TÜV SÜD AL Technologies

TUV SUD 1.00.2 LIB.GLB Log IS SG BOREHOLE 2 73620111662_WI 059.GPJ <<DrawingFile>> 02/02/2017 09:57 10.0.000 Datgel Lab and In Situ Tool - DGD | Lib: TUV SUD 1.00.2 2016-03-17 Prj: TUV SUD 1.00 2016-01-08

PROJECT: [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS
CLIENT: HOUSING & DEVELOPMENT BOARD
PROJECT NO: 73620111662
LOCATION: SI Works at Tengah Phase 1 & 2 Infra (WI 059)
DRILLING DATE STARTED: 23/11/2016
DRILLING DATE COMPLETED: 25/11/2016
LOGGED BY: Ramesh.R
CHECKED BY: Thaw Zin

DRILLING RIG: TOHO D2K
BOREHOLE DIA: 100mm
CORE DIA:
DRILLING METHOD: Wash boring
DRILLED BY: TAL/N.Murugesan

BORING LOG: BH9

NORTHING: 37702.1 m
EASTING: 16659.5 m
REDUCED LEVEL: 110.21 m
GWL: m dated

Scale	Reduced Level (m)	Depth (m) (Thickness)	Graphic Log	Legend	Type & No.	Description	SPT N blows/300mm	Rock TCR (%)	Rock RQD (%)	Geological Classification	British Soil Classification	Grain Size Analysis G/SA/S/C	Shear Strength C (kPa)	Shear Strength ϕ (°)
1						Firm; reddish brown mottled with yellow; Slightly gravelly fine to coarse grained sandy CLAY with silt. FILL, Trial Pit (1.0x0.7x1.0)m and Hand Auger up to 3.00m BGL. Sandy CLAY								
2														
3		(5.00)			3.00 UD1					FILL	CS	9/47/22/22		
4					4.00 P1 4.45		4/300							
5	105.21	5.00												
6					6.00 UD2	Stiff; red mottled with yellow; Very fine grained sandy SILT with clay. Residual Soil (JURONG FORMATION) Sandy SILT						0/67/21/12	5 (CU)	33
7		(4.00)			7.00 P2 7.45		8/300			S(VI)	MS			
8														
9	101.21	9.00			9.00 P3 9.45	Very stiff; yellow; Gravelly SILT. Residual Soil (JURONG FORMATION) Gravelly SILT	21/300							
10														
11		(3.00)								S(VI)	MG			
12	98.21	12.00			12.00 P4 12.45	Hard; yellow; fine grianed sandy SILT. Residual Soil (JURONG FORMATION) Sandy SILT	86/300							
13														
14		(3.00)								S(VI)	MS			
15	95.21	15.00			15.00 P5 15.34	Hard; yellow; fine grianed sandy SILT. Completely Weathered (JURONG FORMATION) SILT	100/220							
16														
17		(3.00)								S(V)	M			
18	92.21	18.00			18.00 P6 18.20	Hard; yellowish grey; SILT with traces of fine grained sand. Completely Weathered (JURONG FORMATION) SILT	100/130							
19										S(V)	M			
20		(3.28)												

SPT N blows / 300 mm (20 40 60 80)
Undrained Shear Strength kPa (20 40 60 80)
PL WC LL (20 40 60 80)
Bulk Density Mg/m³ (1.5 1.8 2.1 2.4)

- Sample
- Pressuremeter Test (PRM)
- Core Run
- Vane Shear Test (VST)
- Permeability / Packer Test (PKT)
- SPT N Value
- Attempt TW/P/MZ/U
- P - Piston Sample
- TW - Thin Wall Push
- M - Mazier
- U - Thick Wall Open Drive
- C - Core Run
- SPTLS - SPT Liner
- W - Water
- PZS - Cassagrande Piezometer
- WSP - Water Standpipe

REMARKS:

DATA QUALITY RATING

TUV SUD 1.00.2 LIB.GLB Log IS SG BOREHOLE 2 73620111662_WI 059.GPJ <<DrawingFile>> 02/02/2017 09:57 10.0.000 Datgel Lab and In Situ Tool - DGD | Lib: TUV SUD 1.00.2 2016-03-17 Prj: TUV SUD 1.00 2016-01-08

PROJECT: [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS
CLIENT: HOUSING & DEVELOPMENT BOARD
PROJECT NO: 73620111662
LOCATION: SI Works at Tengah Phase 1 & 2 Infra (WI 059)
DRILLING DATE STARTED: 23/11/2016
DRILLING DATE COMPLETED: 25/11/2016
LOGGED BY: Ramesh.R
CHECKED BY: Thaw Zin

DRILLING RIG: TOHO D2K
BOREHOLE DIA: 100mm
CORE DIA:
DRILLING METHOD: Wash boring
DRILLED BY: TAL/N.Murugesan

BORING LOG: BH9

NORTHING: 37702.1 m
EASTING: 16659.5 m
REDUCED LEVEL: 110.21 m
GWL: m dated

Scale	Reduced Level (m)	Depth (m) (Thickness)	Graphic Log	Legend	Type & No.	Description	SPT N blows/300mm	Rock TCR (%)	Rock RQD (%)	Geological Classification	British Soil Classification	Grain Size Analysis G/SA/S/C	Shear Strength C (kPa)	Shear Strength (°)
21	88.93	21.28	× × × ×		21.00 P7	Hard; yellowish grey; SILT with traces of fine grained sand. Completely Weathered (JURONG FORMATION) *(continued)*	100/160			S(V)	M			
22					21.28	Hole Terminated at 21.28 m								
23														
24														
25														
26														
27														
28														
29														
30														
31														
32														
33														
34														
35														
36														
37														
38														
39														
40														

SPT N blows / 300 mm (20 40 60 80)
Undrained Shear Strength kPa (20 40 60 80)
Shear Strength (PL WC LL) (20 40 60 80)
Bulk Density Mg/m³ (1.5 1.8 2.1 2.4)

Ground Water Level (Measured from Ground Level)				
Date (dd/mm/yyyy)	Time (hh:mm)	Borehole Depth (m)	Casing Depth (m)	Water Level (m)
23/11/2016	17:30	9.00	6.00	1.00
25/11/2016	08:30	9.00	6.00	1.50
25/11/2016	17:30	21.00	6.00	1.20

- Sample
- Pressuremeter Test (PRM)
- Core Run
- Vane Shear Test (VST)
- Permeability / Packer Test (PKT)
- SPT N Value
- Attempt TW/P/MZ/U
- P - Piston Sample
- TW - Thin Wall Push
- M - Mazier
- U - Thick Wall Open Drive
- C - Core Run
- SPTLS - SPT Liner
- W - Water
- PZS - Cassagrande Piezometer
- WSP - Water Standpipe

REMARKS:

DATA QUALITY RATING

TÜV SÜD AL Technologies

TUV SUD 1.00.2 LIB.GLB Log IS SG BOREHOLE 2 7362011662_WI 059.GPJ <<DrawingFile>> 02/02/2017 09:57 10.0.000 Datgel Lab and In Situ Tool - DGD | Lib: TUV SUD 1.00.2 2016-03-17 Prj: TUV SUD 1.00 2016-01-08

PROJECT: [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS
CLIENT: HOUSING & DEVELOPMENT BOARD
PROJECT NO: 73620111662
LOCATION: SI Works at Tengah Phase 1 & 2 Infra (WI 059)
DRILLING DATE STARTED: 28/12/2016
DRILLING DATE COMPLETED: 28/12/2016
LOGGED BY: Ramesh.R
CHECKED BY: Thaw Zin

DRILLING RIG: TOHO D2K
BOREHOLE DIA: 100mm
CORE DIA:
DRILLING METHOD: Wash boring
DRILLED BY: TAL/G.Jayavel

BORING LOG: BH10

NORTHING: 38090.7 m
EASTING: 16583.9 m
REDUCED LEVEL: 107.53 m
GWL: m dated

Scale	Reduced Level (m)	Depth (m) (Thickness)	Graphic Log	Legend	Type & No.	Description	SPT N blows/300mm	Rock TCR (%)	Rock RQD (%)	Geological Classification	British Soil Classification	Grain Size Analysis G/SA/S/C	Shear Strength C (kPa)	Shear Strength (°)
1						Firm; brownish yellow; fine to coarse grained sandy CLAY with gravel. FILL, Trial Pit (1.0x0.7x1.0)m and Hand Auger up to 3.00m BGL. Sandy CLAY								
2		(3.00)								FILL	CS			
3	104.53	3.00			3.00									
4					UD1	Firm; light greenish grey; Slightly fine to medium grained sandy CLAY with silt. Residual Soil (JURONG FORMATION) Sandy CLAY						0/11/33/56		
5		(3.00)			4.00 P1 4.45		6/300			S(VI)	CS			
6	101.53	6.00			6.00									
7					UD2	Stiff; light greenish grey; Slightly fine to medium grained sandy CLAY with silt. Residual Soil (JURONG FORMATION) Sandy CLAY						0/24/37/39	3 (CU)	33
8		(3.00)			7.00 P2 7.45		11/300			S(VI)	CS			
9	98.53	9.00			9.00									
10					P3 9.04	Hard; grey; SILT. Completely Weathered (JURONG FORMATION) SILT	100/40							
11		(3.00)								S(V)	M			
12	95.53	12.00			12.00									
13					P4 12.34	Very dense; grey; Slightly silty GRVAEL. Completely Weathered (JURONG FORMATION) Silty GRAVEL	100/190							
14		(3.11)								S(V)	GM			
15	92.42	15.11			15.00 P5 15.11		100/70							
16						Hole Terminated at 15.11 m								
17														
18														
19														
20														

SPT N blows / 300 mm (20 40 60 80)
Undrained Shear Strength kPa (20 40 60 80)

Shear Strength: PL WC LL (20 40 60 80)
Bulk Density Mg/m³ (1.5 1.8 2.1 2.4)

Ground Water Level (Measured from Ground Level)				
Date (dd/mm/yyyy)	Time (hh:mm)	Borehole Depth (m)	Casing Depth (m)	Water Level (m)
28/12/2016	17:30	15.00	3.00	1.20

- Sample
- Pressuremeter Test (PRM)
- Core Run
- Vane Shear Test (VST)
- Permeability / Packer Test (PKT)
- SPT N Value
- Attempt TW/P/MZ/U
- P - Piston Sample
- TW - Thin Wall Push
- M - Mazier
- U - Thick Wall Open Drive
- C - Core Run
- SPTLS - SPT Liner
- W - Water
- PZS - Cassagrande Piezometer
- WSP - Water Standpipe

REMARKS:

DATA QUALITY RATING

TÜV SÜD AL Technologies

TUV SUD 1.00.2 LIB.GLB Log IS SG BOREHOLE 2 73620111662_WI 059.GPJ <<DrawingFile>> 02/02/2017 09:57 1:0.000 Datgel Lab and In Situ Tool - DGD | Lib: TUV SUD 1.00.2 2016-03-17 Prj: TUV SUD 1.00 2016-01-08

PROJECT: [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS
CLIENT: HOUSING & DEVELOPMENT BOARD
PROJECT NO: 73620111662
LOCATION: SI Works at Tengah Phase 1 & 2 Infra (WI 059)
DRILLING DATE STARTED: 23/12/2016
DRILLING DATE COMPLETED: 23/12/2016
LOGGED BY: Ramesh.R
CHECKED BY: Thaw Zin

DRILLING RIG: TOHO D2K
BOREHOLE DIA: 100mm
CORE DIA:
DRILLING METHOD: Wash boring
DRILLED BY: TAL/G.Jayavel

BORING LOG: BH11

NORTHING: 37980.3 m
EASTING: 16649.7 m
REDUCED LEVEL: 107.70 m
GWL: m dated

Scale	Reduced Level (m)	Depth (m) (Thickness)	Graphic Log	Legend	Type & No.	Description	SPT N blows/300mm	Rock TCR (%)	Rock RQD (%)	Geological Classification	British Soil Classification	Grain Size Analysis G/SA/S/C	Shear Strength C (kPa)	Shear Strength (°)
1						Firm; yellowish grey; fine to coarse grained sandy SILT with gravel. FILL, Trial Pit (1.0x0.7x1.0)m and Hand Auger up to 3.00m BGL. Sandy SILT								
2		(3.00)								FILL	MS			
3	104.70	3.00			3.00 UD1									
4					3.50 P1 3.95	Very dense; light grey; Very silty fine to medium grained SAND with clay. Residual Soil (JURONG FORMATION) Silty SAND	64/300					0/69/21/10		
5		(3.00)								S(VI)	SM			
6	101.70	6.00			6.00 P2 6.31	Hard; light grey; SILT. Completely Weathered (JURONG FORMATION) SILT	100/160							
7														
8		(3.00)								S(V)	M			
9	98.70	9.00			9.00 P3 9.27	Hard; whitish grey mottled with brown; SILT. Completely Weathered (JURONG FORMATION) SILT	100/120							
10														
11		(3.00)								S(V)	M			
12	95.70 95.51	12.00 (0.19) 12.19			12.00 P4 12.19	Hard; yellowish grey; SILT. Completely Weathered (JURONG FORMATION) SILT Hole Terminated at 12.19 m	100/140			S(V)	M			
13														
14														
15														
16														
17														
18														
19														
20														

SPT N blows / 300 mm (20 40 60 80)
Undrained Shear Strength kPa (20 40 60 80)

Shear Strength: PL WC LL (20 40 60 80)
Bulk Density Mg/m³ (1.5 1.8 2.1 2.4)

Ground Water Level (Measured from Ground Level)				
Date (dd/mm/yyyy)	Time (hh:mm)	Borehole Depth (m)	Casing Depth (m)	Water Level (m)
23/12/2016	17:30	15.00	3.00	1.20

- Sample
- Pressuremeter Test (PRM)
- Core Run
- Vane Shear Test (VST)
- Permeability / Packer Test (PKT)
- SPT N Value
- Attempt TW/P/MZ/U
- P - Piston Sample
- TW - Thin Wall Push
- M - Mazier
- U - Thick Wall Open Drive
- C - Core Run
- SPTLS - SPT Liner
- W - Water
- PZS - Cassagrande Piezometer
- WSP - Water Standpipe

REMARKS:

DATA QUALITY RATING

TÜV SÜD AL Technologies

TUV SUD 1.00.2 LIB.GLB Log IS SG BOREHOLE 2 73620111662_WI 059.GPJ <<DrawingFile>> 02/02/2017 09:57 10.0.000 Datgel Lab and In Situ Tool - DGD | Lib: TUV SUD 1.00.2 2016-03-17 Prj: TUV SUD 1.00 2016-01-08

PROJECT: [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS
CLIENT: HOUSING & DEVELOPMENT BOARD
PROJECT NO: 73620111662
LOCATION: SI Works at Tengah Phase 1 & 2 Infra (WI 059)
DRILLING DATE STARTED: 13/12/2016
DRILLING DATE COMPLETED: 14/12/2016
LOGGED BY: Ramesh.R
CHECKED BY: Thaw Zin
DRILLING RIG: TOHO D2K
BOREHOLE DIA: 100mm
CORE DIA:
DRILLING METHOD: Wash boring
DRILLED BY: TAL/N.Murugesan

BORING LOG: BH12

NORTHING: 37859.4 m
EASTING: 16766.3 m
REDUCED LEVEL: 107.87 m
GWL: m dated

Scale	Reduced Level (m)	Depth (m) (Thickness)	Graphic Log	Legend	Type & No.	Description	SPT N blows / 300 mm (20 40 60 80) / Undrained Shear Strength kPa (20 40 60 80)	SPT N blows/300mm	Rock TCR (%)	Rock RQD (%)	Geological Classification	British Soil Classification	Grain Size Analysis G/SA/S/C	Shear Strength C (kPa)	Shear Strength (°)	PL WC LL (20 40 60 80) / Bulk Density Mg/m³ (1.5 1.8 2.1 2.4)
1						Firm; yellowish grey; fine to coarse grained sandy CLAY with gravel. FILL, Trial Pit (1.0x0.7x1.0)m and Hand Auger up to 3.00m BGL. Sandy CLAY									
2		(3.00)									FILL	CS				
3	104.87	3.00			3.00											
4					UD1	Soft; grey; Slightly fine to medium grained sandy CLAY with silt. Residual Soil (JURONG FORMATION) Sandy CLAY							0/13/39/48			
5		(3.00)			4.00 P1 4.45			3/300			S(VI)	CS				
6	101.87	6.00			6.00											
7					UD2	Stiff; red; Slightly gravelly slightly fine to coarse grained sandy SILT with clay. Residual Soil (JURONG FORMATION) Sandy SILT							12/22/33/33	87 (UU)		
8		(3.00)			7.00 P2 7.45			8/300			S(VI)	MS				
9	98.87	9.00			9.00											
10					P3 9.45	Very stiff; yellow; SILT. Residual Soil (JURONG FORMATION) SILT		23/300								
11		(3.00)									S(VI)	M				
12	95.87	12.00			12.00											
13					P4 12.30	Hard; reddish brown; SILT with completely weathered rock. Completely Weathered (JURONG FORMATION) SILT		100/180								
14																
15		(6.14)			15.00 P5 15.16			100/90			S(VI)	M				
16																
17																
18	89.73	18.14			18.00 P6 18.14			100/70								
19						Hole Terminated at 18.14 m										
20																

Ground Water Level (Measured from Ground Level)				
Date (dd/mm/yyyy)	Time (hh:mm)	Borehole Depth (m)	Casing Depth (m)	Water Level (m)
13/12/2016	17:30	9.00	3.00	1.50
14/12/2016	08:30	9.00	3.00	2.00
14/12/2016	17:30	18.00	3.00	1.70

- Sample
- Pressuremeter Test (PRM)
- Core Run
- Vane Shear Test (VST)
- Permeability / Packer Test (PKT)
- SPT N Value
- Attempt TW/P/MZ/U
- P - Piston Sample
- TW - Thin Wall Push
- M - Mazier
- U - Thick Wall Open Drive
- C - Core Run
- SPTLS - SPT Liner
- W - Water
- PZS - Cassagrande Piezometer
- WSP - Water Standpipe

REMARKS:

DATA QUALITY RATING

TUV SUD Al Technologies

TUV SUD 1.00.2 LIB.GLB Log IS SG BOREHOLE 2 73620111662_WI 059.GPJ <<DrawingFile>> 02/02/2017 09:57 10.0.000 Datgel Lab and In Situ Tool - DGD | Lib: TUV SUD 1.00.2 2016-03-17 Prj: TUV SUD 1.00 2016-01-08

PROJECT: [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS
CLIENT: HOUSING & DEVELOPMENT BOARD
PROJECT NO: 73620111662
LOCATION: SI Works at Tengah Phase 1 & 2 Infra (WI 059)
DRILLING DATE STARTED: 28/11/2016
DRILLING DATE COMPLETED: 02/12/2016
LOGGED BY: Ramesh.R
CHECKED BY: Thaw Zin
DRILLING RIG: TOHO D2K
BOREHOLE DIA: 100mm
CORE DIA: 76 mm
DRILLING METHOD: Rotary cored
DRILLED BY: TAL/N.Murugesan

BORING LOG: BH13

NORTHING: 37727.1 m
EASTING: 16894.1 m
REDUCED LEVEL: 109.54 m
GWL: m dated

Scale	Reduced Level (m)	Depth (m) (Thickness)	Graphic Log	Legend	Type & No.	Description	SPT N blows/300mm	Rock TCR (%)	Rock RQD (%)	Geological Classification	British Soil Classification	Grain Size Analysis G/SA/S/C	Shear Strength C (kPa)	Shear Strength ϕ (°)
1						Firm; yellowish grey; fine to coarse grained sandy CLAY with gravel. FILL, Trial Pit (1.0x0.7x1.0)m and Hand Auger up to 3.00m BGL. Sandy CLAY								
2		(3.00)								FILL	CS			
3	106.54	3.00			3.00									
4					UD1	Firm; reddish brown; mottled with grey; Slightly gravelly slightly fine to coarse grained sandy CLAY with silt. Residual Soil (JURONG FORMATION) Sandy CLAY						12/15/34/39		
5		(3.00)			4.00 P1 4.45		7/300			S(VI)	CS			
6	103.54	6.00			6.00									
7					UD2 6.50 P2 6.95	Hard; yellow mottled with grey; Slightly fine grained sandy SILT with clay. Residual Soil (JURONG FORMATION) Sandy SILT	53/300					0/25/56/19	131 (UU)	
8		(3.00)								S(VI)	MS			
9	100.54	9.00			9.00									
10					P3 9.45	Hard; yellow; SILT. Residual Soil (JURONG FORMATION) SILT	43/300							
11		(3.00)								S(VI)	M			
12	97.54	12.00			12.00									
13					P4 12.45	Hard; grey; SILT. Residual Soil (JURONG FORMATION) SILT	68/300							
14		(3.00)								S(VI)	M			
15	94.54	15.00			15.00									
16	93.54	(1.00) 16.00			CR1	Medium strong; greyish brown and yellow; thin to medium bedded; fine grained; SILTSTONE; highly weathered; highly fractured; very close spaced jointed; rough planar; open aperture. JURONG FORMATION SILTSTONE		100	0	S(IV)	SI			
17					16.00	Hard; brown; SILT. Completely Weathered (JURONG FORMATION) SILT								
18					18.00 P5 18.16		100/90			S(V)	M			
19														
20														

SPT N blows / 300 mm (20 40 60 80)
Undrained Shear Strength kPa (20 40 60 80)
PL WC LL (20 40 60 80)
Bulk Density Mg/m³ (1.5 1.8 2.1 2.4)

- Sample
- Pressuremeter Test (PRM)
- Core Run
- Vane Shear Test (VST)
- Permeability / Packer Test (PKT)
- SPT N Value
- Attempt TW/P/MZ/U
- P - Piston Sample
- TW - Thin Wall Push
- M - Mazier
- U - Thick Wall Open Drive
- C - Core Run
- SPTLS - SPT Liner
- W - Water
- PZS - Cassagrande Piezometer
- WSP - Water Standpipe

REMARKS:

DATA QUALITY RATING

TÜV SÜD AL Technologies

TUV SUD 1.00.2 LIB.GLB Log IS SG BOREHOLE 2 73620111662_WI 059.GPJ <<DrawingFile>> 02/02/2017 09:57 10.0.000 Datgel Lab and In Situ Tool - DGD | Lib: TUV SUD 1.00.2 2016-03-17 Prj: TUV SUD 1.00 2016-01-08

PROJECT: [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS
CLIENT: HOUSING & DEVELOPMENT BOARD
PROJECT NO: 73620111662
LOCATION: SI Works at Tengah Phase 1 & 2 Infra (WI 059)
DRILLING DATE STARTED: 28/11/2016
DRILLING DATE COMPLETED: 02/12/2016
LOGGED BY: Ramesh.R
CHECKED BY: Thaw Zin

DRILLING RIG: TOHO D2K
BOREHOLE DIA: 100mm
CORE DIA: 76 mm
DRILLING METHOD: Rotary cored
DRILLED BY: TAL/N.Murugesan

BORING LOG: BH13

NORTHING: 37727.1 m
EASTING: 16894.1 m
REDUCED LEVEL: 109.54 m
GWL: m dated

Scale	Reduced Level (m)	Depth (m) (Thickness)	Graphic Log	Legend	Type & No.	Description	SPT N blows/300mm	Rock TCR (%)	Rock RQD (%)	Geological Classification	British Soil Classification	Grain Size Analysis G/SA/S/C	Shear Strength C (kPa)	Shear Strength (°)
21		(8.08)			21.00 P6 21.14	Hard; brown; SILT. Completely Weathered (JURONG FORMATION) *(continued)*	100/80			S(V)	M			
24	85.46	24.08			24.00 P7 24.08	SILT	100/50							
						Hole Terminated at 24.08 m								

SPT N blows / 300 mm (20 40 60 80)
Undrained Shear Strength kPa (20 40 60 80)
PL WC LL (20 40 60 80)
Bulk Density Mg/m³ (1.5 1.8 2.1 2.4)

Ground Water Level (Measured from Ground Level)

Date (dd/mm/yyyy)	Time (hh:mm)	Borehole Depth (m)	Casing Depth (m)	Water Level (m)
28/11/2016	17:30	15.00	6.00	2.00
02/12/2016	08:30	15.00	6.00	2.50
02/12/2016	17:30	24.00	15.00	1.50

- Sample
- Pressuremeter Test (PRM)
- Core Run
- Vane Shear Test (VST)
- Permeability / Packer Test (PKT)
- SPT N Value
- Attempt TW/P/MZ/U
- P - Piston Sample
- TW - Thin Wall Push
- M - Mazier
- U - Thick Wall Open Drive
- C - Core Run
- SPTLS - SPT Liner
- W - Water
- PZS - Cassagrande Piezometer
- WSP - Water Standpipe

REMARKS:

DATA QUALITY RATING

TUV SUD 1.00.2 LIB.GLB Log IS SG BOREHOLE 2 7362011662_WI 059.GPJ <<DrawingFile>> 02/02/2017 09:57 10.0.000 Datgel Lab and In Situ Tool - DGD | Lib: TUV SUD 1.00.2 2016-03-17 Prj: TUV SUD 1.00 2016-01-08

PROJECT: [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS
CLIENT: HOUSING & DEVELOPMENT BOARD
PROJECT NO: 73620111662
LOCATION: SI Works at Tengah Phase 1 & 2 Infra (WI 059)
DRILLING DATE STARTED: 28/11/2016
DRILLING DATE COMPLETED: 28/11/2016
LOGGED BY: Ramesh.R
CHECKED BY: Thaw Zin

DRILLING RIG: TOHO D2K
BOREHOLE DIA: 100mm
CORE DIA:
DRILLING METHOD: Wash boring
DRILLED BY: TAL/G.Jayavel

BORING LOG: BH14

NORTHING: 37581.8 m
EASTING: 17034.1 m
REDUCED LEVEL: 115.76 m
GWL: m dated

Scale	Reduced Level (m)	Depth (m) (Thickness)	Graphic Log	Legend	Type & No.	Description	SPT N blows/300mm	TCR (%)	RQD (%)	Geological Classification	British Soil Classification	Grain Size Analysis G/SA/S/C	Shear Strength C (kPa)	Shear Strength ϕ (°)
1						Firm; reddish brown; Slightly gravelly slightly fine to coarse grained sandy CLAY with silt. FILL, Trial Pit (1.0x0.7x1.0)m and Hand Auger up to 3.00m BGL. Sandy CLAY								
2		(3.00)								FILL	CS			
3	112.76	3.00			2.00 UD1							8/15/34/43	43 (UU)	
4					3.00 P1 3.45	Stiff; reddish brown; Slightly gravelly slightly fine to coarse grained sandy SILT with clay. Residual Soil (JURONG FORMATION) Sandy SILT	14/300							
5		(3.00)			4.00 UD2 4.50					S(VI)	MS	23/25/27/25		
6	109.76	6.00			6.00 P2 6.45	Hard; greyish brown; SILT. Residual Soil (JURONG FORMATION) SILT	45/300							
7														
8														
9		(6.00)			9.00 P3 9.30		100/180			S(VI)	M			
10														
11														
12	103.76	12.00			12.00 P4 12.23	Hard; grey; SILT with rock fragments. Completely Weathered (JURONG FORMATION) SILT	100/140							
13														
14		(3.00)								S(V)	M			
15	100.76	15.00			15.00									
	100.66	15.10			P5 15.10	Hard; greyish brown mottled with yellow; SILT. Completely Weathered (JURONG FORMATION) SILT	100/60			S(V)	M			
		(0.10)				Hole Terminated at 15.10 m								
16														
17														
18														
19														
20														

SPT N blows / 300 mm (20 40 60 80)
Undrained Shear Strength kPa (20 40 60 80)

Shear Strength: PL WC LL (20 40 60 80)
Bulk Density Mg/m³ (1.5 1.8 2.1 2.4)

Ground Water Level (Measured from Ground Level)				
Date (dd/mm/yyyy)	Time (hh:mm)	Borehole Depth (m)	Casing Depth (m)	Water Level (m)
28/11/2016	17:30	15.00	3.00	1.80

- Sample
- Pressuremeter Test (PRM)
- Core Run
- Vane Shear Test (VST)
- Permeability / Packer Test (PKT)
- SPT N Value
- Attempt TW/P/MZ/U
- P - Piston Sample
- TW - Thin Wall Push
- M - Mazier
- U - Thick Wall Open Drive
- C - Core Run
- SPTLS - SPT Liner
- W - Water
- PZS - Cassagrande Piezometer
- WSP - Water Standpipe

REMARKS:

DATA QUALITY RATING

TÜV SÜD AL Technologies

TUV SUD 1.00.2 LIB.GLB Log IS SG BOREHOLE 2 73620111662_WI 059.GPJ <<DrawingFile>> 02/02/2017 09:57 10.0.000 Datgel Lab and In Situ Tool - DGD | Lib: TUV SUD 1.00.2 2016-03-17 Prj: TUV SUD 1.00 2016-01-08

PROJECT: [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS
CLIENT: HOUSING & DEVELOPMENT BOARD
PROJECT NO: 73620111662
LOCATION: SI Works at Tengah Phase 1 & 2 Infra (WI 059)
DRILLING DATE STARTED: 30/11/2016
DRILLING DATE COMPLETED: 02/12/2016
LOGGED BY: Ramesh.R
CHECKED BY: Thaw Zin
DRILLING RIG: TOHO D2K
BOREHOLE DIA: 100mm
CORE DIA:
DRILLING METHOD: Wash boring
DRILLED BY: TAL/G.Jayavel

BORING LOG: BH15

NORTHING: 37491.0 m
EASTING: 17149.7 m
REDUCED LEVEL: 112.05 m
GWL: m dated

Scale	Reduced Level (m)	Depth (m) (Thickness)	Graphic Log	Legend	Type & No.	Description	SPT N blows/300mm	Rock TCR (%)	Rock RQD (%)	Geological Classification	British Soil Classification	Grain Size Analysis G/SA/S/C	Shear Strength C (kPa)	Shear Strength ϕ (°)
1						Firm; yellowish grey; Slightly fine to medium grained sandy CLAY with silt. FILL, Trial Pit (1.0x0.7x1.0)m and Hand Auger up to 3.00m BGL. Sandy CLAY								
2		(3.00)								FILL	CS			
3	109.05	3.00			2.00 UD1							0/12/35/53		
4					3.00 P1 3.45	Stiff; red mottled with white; Slightly fine grained sandy SILT with clay. . Residual Soil (JURONG FORMATION) Sandy SILT	11/300							
5		(3.00)			4.00 UD2 5.00					S(VI)	MS	0/16/52/32	52 (UU)	
6	106.05	6.00			6.00 P2 6.45	Hard; brown; SILT. Residual Soil (JURONG FORMATION) SILT	53/300							
7														
8		(3.00)								S(VI)	M			
9	103.05	9.00			9.00 P3 9.45	Hard; brown; SILT with rock fragments. Completely Weathered (JURONG FORMATION) SILT	56/300							
10														
11		(3.00)								S(V)	M			
12	100.05	12.00			12.00 P4 12.37	Hard; reddish brown; SILT with rock fragments. Completely Weathered (JURONG FORMATION) SILT	100/220							
13														
14														
15		(6.00)			15.00 P5 15.34		100/190			S(V)	M			
16														
17														
18	94.05	18.00 (0.25)			18.00									
	93.80	18.25			P6 18.25	Hard; grey; SILT. Completely Weathered (JURONG FORMATION) SILT Hole Terminated at 18.25 m	100/160			S(V)	M			
19														
20														

Shear Strength: PL WC LL (20 40 60 80); Bulk Density Mg/m³ (1.5 1.8 2.1 2.4)

SPT N blows / 300 mm (20 40 60 80); Undrained Shear Strength kPa (20 40 60 80)

Ground Water Level (Measured from Ground Level)				
Date (dd/mm/yyyy)	Time (hh:mm)	Borehole Depth (m)	Casing Depth (m)	Water Level (m)
30/11/2016	17:30	10.00	3.00	1.50
02/12/2016	17:30	18.00	3.00	1.30
02/12/2016	18:30	10.00	3.00	2.50

- Sample
- Pressuremeter Test (PRM)
- Core Run
- Vane Shear Test (VST)
- Permeability / Packer Test (PKT)
- SPT N Value
- Attempt TW/P/MZ/U
- P - Piston Sample
- TW - Thin Wall Push
- M - Mazier
- U - Thick Wall Open Drive
- C - Core Run
- SPTLS - SPT Liner
- W - Water
- PZS - Cassagrande Piezometer
- WSP - Water Standpipe

REMARKS:

DATA QUALITY RATING

TUV SUD 1.00.2 LIB.GLB Log IS SG BOREHOLE 2 73620111662_WI 059.GPJ <<DrawingFile>> 02/02/2017 09:57 10.0.000 Datgel Lab and In Situ Tool - DGD | Lib: TUV SUD 1.00.2 2016-03-17 Prj: TUV SUD 1.00 2016-01-08

PROJECT: [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS
CLIENT: HOUSING & DEVELOPMENT BOARD
PROJECT NO: 73620111662
LOCATION: SI Works at Tengah Phase 1 & 2 Infra (WI 059)
DRILLING DATE STARTED: 13/12/2016
DRILLING DATE COMPLETED: 13/12/2016
LOGGED BY: Ramesh.R
CHECKED BY: Thaw Zin
DRILLING RIG: TOHO D2K
BOREHOLE DIA: 100mm
CORE DIA:
DRILLING METHOD: Wash boring
DRILLED BY: TAL/N.Murugesan

BORING LOG: BH16

NORTHING: 37953.2 m
EASTING: 16910.4 m
REDUCED LEVEL: 107.62 m
GWL: m dated

Scale	Reduced Level (m)	Depth (m) (Thickness)	Graphic Log	Legend	Type & No.	Description	SPT N blows/300mm	Rock TCR (%)	Rock RQD (%)	Geological Classification	British Soil Classification	Grain Size Analysis G/SA/S/C	Shear Strength C (kPa)	Shear Strength (°)
1						Firm; yellowish grey; fine to coarse grained sandy CLAY with gravel. FILL, Trial Pit (1.0x0.7x1.0)m and Hand Auger up to 3.00m BGL. Sandy CLAY								
2		(3.00)								FILL	CS			
3	104.62	3.00			3.00									
4					UD1 3.50 P1 3.95	Very stiff; red mottled with grey; Slightly gravelly slightly fine to coarse grained sandy CLAY with silt. Residual Soil (JURONG FORMATION) Sandy CLAY	21/300					5/20/35/40		
5		(3.00)								S(VI)	CS			
6	101.62	6.00			6.00									
7					UD2 6.50 P2 6.95	Hard; reddish brown; Slightly gravelly slightly fine to coarse grained sandy CLAY with silt. Residual Soil (JURONG FORMATION) Sandy SILT	42/300					4/16/50/30	7 (CU)	33
8		(3.00)								S(VI)	MS			
9	98.62	9.00			9.00									
10					P3 9.38	Hard; reddish grey; SILT. Completely Weathered (JURONG FORMATION) SILT	100/260							
11														
12		(6.26)			12.00 P4 12.32		100/210			S(V)	M			
13														
14														
15	92.36	15.26			15.00 P5 15.26		100/170							
16						Hole Terminated at 15.26 m								
17														
18														
19														
20														

SPT N blows / 300 mm (20 40 60 80)
Undrained Shear Strength kPa (20 40 60 80)
Shear Strength: PL WC LL (20 40 60 80); Bulk Density Mg/m³ (1.5 1.8 2.1 2.4)

Ground Water Level (Measured from Ground Level)				
Date (dd/mm/yyyy)	Time (hh:mm)	Borehole Depth (m)	Casing Depth (m)	Water Level (m)
13/12/2016	17:30	15.00	3.00	1.50

- Sample
- Pressuremeter Test (PRM)
- Core Run
- Vane Shear Test (VST)
- Permeability / Packer Test (PKT)
- SPT N Value
- Attempt TW/P/MZ/U
- P - Piston Sample
- TW - Thin Wall Push
- M - Mazier
- U - Thick Wall Open Drive
- C - Core Run
- SPTLS - SPT Liner
- W - Water
- PZS - Cassagrande Piezometer
- WSP - Water Standpipe

REMARKS:

DATA QUALITY RATING

TÜV SÜD AL Technologies

TUV SUD 1.00.2 LIB.GLB Log IS SG BOREHOLE 2 7362011662_WI 059.GPJ <<DrawingFile>> 02/02/2017 09:57 10.0.000 Datgel Lab and In Situ Tool - DGD | Lib: TUV SUD 1.00.2 2016-03-17 Prj: TUV SUD 1.00 2016-01-08

PROJECT: [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS
CLIENT: HOUSING & DEVELOPMENT BOARD
PROJECT NO: 73620111662
LOCATION: SI Works at Tengah Phase 1 & 2 Infra (WI 059)
DRILLING DATE STARTED: 29/12/2016
DRILLING DATE COMPLETED: 30/12/2016
LOGGED BY: Ramesh.R
CHECKED BY: Thaw Zin
DRILLING RIG: TOHO D2K
BOREHOLE DIA: 100mm
CORE DIA:
DRILLING METHOD: Wash boring
DRILLED BY: TAL/G.Jayavel

BORING LOG: BH17

NORTHING: 38236.1 m
EASTING: 16839.6 m
REDUCED LEVEL: 123.57 m
GWL: m dated

Scale	Reduced Level (m)	Depth (m) (Thickness)	Graphic Log	Legend	Type & No.	Description	SPT N blows/300mm	Rock TCR (%)	Rock RQD (%)	Geological Classification	British Soil Classification	Grain Size Analysis G/SA/S/C	Shear Strength C (kPa)	Shear Strength (°)
1						Firm; yellowish grey; fine to coarse grained sandy SILT with gravel. FILL, Trial Pit (1.0x0.7x1.0)m and Hand Auger up to 3.00m BGL. Sandy SILT								
2		(3.00)								FILL	MS			
3	120.57	3.00			3.00 UD1									
4					3.50 P1 3.95	Hard; reddish brown mottled with grey; Slightly gravelly slightly fien to coarse grained sandy SILT with clay. Residual Soil (JURONG FORMATION) Sandy SILT	32/300					6/13/44/37		
5		(3.00)								S(VI)	MS			
6	117.57	6.00			6.00 P2 6.45	Hard; greyish brown; SILT. Residual Soil (JURONG FORMATION) SILT	46/300							
7														
8														
9					9.00 P3 9.45		48/300							
10														
11		(9.00)								S(VI)	M			
12					12.00 P4 12.45		73/300							
13														
14														
15	108.57	15.00			15.00 P5 15.40	Hard; greyish brown; SILT. Water Standpipe installed up to 12.00m BGL. Completely Weathered (JURONG FORMATION) SILT	100/250							
16														
17														
18		(6.39)			18.00 P6 18.29		100/180			S(V)	M			
19														
20														

SPT N blows / 300 mm (20 40 60 80)
Undrained Shear Strength kPa (20 40 60 80)
PL WC LL (20 40 60 80)
Bulk Density Mg/m³ (1.5 1.8 2.1 2.4)

- Sample
- Pressuremeter Test (PRM)
- Core Run
- Vane Shear Test (VST)
- Permeability / Packer Test (PKT)
- SPT N Value
- Attempt TW/P/MZ/U
- P - Piston Sample
- TW - Thin Wall Push
- M - Mazier
- U - Thick Wall Open Drive
- C - Core Run
- SPTLS - SPT Liner
- W - Water
- PZS - Cassagrande Piezometer
- WSP - Water Standpipe

REMARKS:

DATA QUALITY RATING

TUV SUD 1.00.2 LIB.GLB Log IS SG BOREHOLE 2 7362011662_WI 059.GPJ <<DrawingFile>> 02/02/2017 09:57 10.0.000 Datgel Lab and In Situ Tool - DGD | Lib: TUV SUD 1.00.2 2016-03-17 Prj: TUV SUD 1.00 2016-01-08

PROJECT: [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS
CLIENT: HOUSING & DEVELOPMENT BOARD
PROJECT NO: 73620111662
LOCATION: SI Works at Tengah Phase 1 & 2 Infra (WI 059)
DRILLING DATE STARTED: 29/12/2016
DRILLING DATE COMPLETED: 30/12/2016
LOGGED BY: Ramesh.R
CHECKED BY: Thaw Zin

DRILLING RIG: TOHO D2K
BOREHOLE DIA: 100mm
CORE DIA:
DRILLING METHOD: Wash boring
DRILLED BY: TAL/G.Jayavel

BORING LOG: BH17

NORTHING: 38236.1 m
EASTING: 16839.6 m
REDUCED LEVEL: 123.57 m
GWL: m dated

Scale	Reduced Level (m)	Depth (m) (Thickness)	Graphic Log	Legend	Type & No.	Description	SPT N blows/300mm	Rock TCR (%)	Rock RQD (%)	Geological Classification	British Soil Classification	Grain Size Analysis G/SA/S/C	Shear Strength C (kPa)	Shear Strength (°)
21	102.18	21.39			21.00 P7 21.39	Hard; greyish brown; SILT. Water Standpipe installed up to 12.00m BGL. Completely Weathered (JURONG FORMATION) *(continued)*	100/240			S(V)	M			
22						Hole Terminated at 21.39 m								
23														
24														
25														
26														
27														
28														
29														
30														
31														
32														
33														
34														
35														
36														
37														
38														
39														
40														

SPT N blows / 300 mm (20 40 60 80)
Undrained Shear Strength kPa (20 40 60 80)
Shear Strength (20 40 60 80)
PL WC LL
Bulk Density Mg/m³ (1.5 1.8 2.1 2.4)

Ground Water Level (Measured from Ground Level)

Date (dd/mm/yyyy)	Time (hh:mm)	Borehole Depth (m)	Casing Depth (m)	Water Level (m)
29/12/2016	17:30	10.00	3.00	1.50
30/12/2016	08:30	10.00	3.00	2.50
30/12/2016	17:30	21.00	3.00	2.00

- Sample
- Pressuremeter Test (PRM)
- Core Run
- Vane Shear Test (VST)
- Permeability / Packer Test (PKT)
- SPT N Value
- Attempt TW/P/MZ/U
- P - Piston Sample
- TW - Thin Wall Push
- M - Mazier
- U - Thick Wall Open Drive
- C - Core Run
- SPTLS - SPT Liner
- W - Water
- PZS - Cassagrande Piezometer
- WSP - Water Standpipe

REMARKS:

DATA QUALITY RATING

TUV SUD 1.00.2 LIB.GLB Log IS SG BOREHOLE 2 7362011662_WI 059.GPJ <<DrawingFile>> 02/02/2017 09:57 10.0.000 Datgel Lab and In Situ Tool - DGD | Lib: TUV SUD 1.00.2 2016-03-17 Prj: TUV SUD 1.00 2016-01-08

PROJECT: [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS
CLIENT: HOUSING & DEVELOPMENT BOARD
PROJECT NO: 73620111662
LOCATION: SI Works at Tengah Phase 1 & 2 Infra (WI 059)
DRILLING DATE STARTED: 27/12/2016
DRILLING DATE COMPLETED: 27/12/2016
LOGGED BY: Ramesh.R
CHECKED BY: Thaw Zin

DRILLING RIG: TOHO D2K
BOREHOLE DIA: 100mm
CORE DIA:
DRILLING METHOD: Wash boring
DRILLED BY: TAL/J.Alex

BORING LOG: BH18

NORTHING: 38045.2 m
EASTING: 17073.0 m
REDUCED LEVEL: 113.24 m
GWL: m dated

Scale	Reduced Level (m)	Depth (m) (Thickness)	Graphic Log	Legend	Type & No.	Description	SPT N blows/300mm	Rock TCR (%)	Rock RQD (%)	Geological Classification	British Soil Classification	Grain Size Analysis G/SA/S/C	Shear Strength C (kPa)	Shear Strength ϕ (°)
1						Stiff; brownish yellow mottled with white; fine to medium grained sandy CLAY. FILL, Trial Pit (1.0x0.7x1.0)m and Hand Auger up to 3.00m BGL. Sandy CLAY								
2														
3					3.00 P1									
4					3.45		11/300							
5		(9.00)								FILL	CS			
6					6.00 P2		8/300							
7					6.45									
8														
9	104.24	9.00			9.00 P3		100/250							
10					9.38	Hard; greyish brown; SILT with clay. Residual Soil (JURONG FORMATION) SILT								
11		(3.00)								S(VI)	M			
12	101.24	12.00			12.00 P4		100/60							
13					12.11	Hard; yellwish brown; SILT. Completely Weathered (JURONG FORMATION) SILT								
14		(3.10)								S(V)	M			
15	98.14	15.10			15.00 P5		100/50							
16					15.10	Hole Terminated at 15.10 m								
17														
18														
19														
20														

SPT N blows / 300 mm (20 40 60 80)
Undrained Shear Strength kPa (20 40 60 80)
Shear Strength PL WC LL (20 40 60 80)
Bulk Density Mg/m³ (1.5 1.8 2.1 2.4)

Ground Water Level (Measured from Ground Level)				
Date (dd/mm/yyyy)	Time (hh:mm)	Borehole Depth (m)	Casing Depth (m)	Water Level (m)
27/12/2016	17:30	15.00	3.00	1.20

- Sample
- Pressuremeter Test (PRM)
- Core Run
- Vane Shear Test (VST)
- Permeability / Packer Test (PKT)
- SPT N Value
- Attempt TW/P/MZ/U
- P - Piston Sample
- TW - Thin Wall Push
- M - Mazier
- U - Thick Wall Open Drive
- C - Core Run
- SPTLS - SPT Liner
- W - Water
- PZS - Cassagrande Piezometer
- WSP - Water Standpipe

REMARKS:

DATA QUALITY RATING

TÜV SÜD Al Technologies

TUV SUD 1.00.2 LIB.GLB Log IS SG BOREHOLE 2 73620111662_WI 059.GPJ <<DrawingFile>> 02/02/2017 09:57 1:0.000 Datgel Lab and In Situ Tool - DGD | Lib: TUV SUD 1.00.2 2016-03-17 Prj: TUV SUD 1.00 2016-01-08

PROJECT: [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS
CLIENT: HOUSING & DEVELOPMENT BOARD
PROJECT NO: 73620111662
LOCATION: SI Works at Tengah Phase 1 & 2 Infra (WI 059)
DRILLING DATE STARTED: 28/12/2016
DRILLING DATE COMPLETED: 28/12/2016
LOGGED BY: Ramesh.R
CHECKED BY: Thaw Zin
DRILLING RIG: TOHO D2K
BOREHOLE DIA: 100mm
CORE DIA:
DRILLING METHOD: Wash boring
DRILLED BY: TAL/J.Alex

BORING LOG: BH19

NORTHING: 37854.3 m
EASTING: 17306.4 m
REDUCED LEVEL: 114.80 m
GWL: m dated

Scale	Reduced Level (m)	Depth (m) (Thickness)	Graphic Log	Legend	Type & No.	Description	SPT N blows/300mm	Rock TCR (%)	Rock RQD (%)	Geological Classification	British Soil Classification	Grain Size Analysis G/SA/S/C	Shear Strength C (kPa)	Shear Strength (°)
1						Fiirm; brown; fine to medium grianed sandy CLAY with wood fragments. FILL, Trial Pit (1.0x0.7x1.0)m and Hand Auger up to 3.00m BGL. Sandy CLAY							
2														
3		(6.00)			3.00 P1 3.45		5/300			FILL	CS			
4														
5														
6	108.80	6.00			6.00									
7					P2 6.45	Medium dense; blackish brown; Slightly silty fine to coarse grained SAND with gravel. FILL Silty SAND	11/300							
8		(3.00)								FILL	SM			
9	105.80	9.00			9.00									
10					P3 9.26	Hard; greyish yellow; SILT with clay. Residual Soil (JURONG FORMATION) SILT	100/200							
11		(3.00)								S(VI)	M			
12	102.80	12.00			12.00									
13					P4 12.11	Hard; yellowish grey; SILT with clay. Water Standpipe installed up to 12.00m BGL. Completely Weathered (JURONG FORMATION) SILT	100/60							
14		(3.11)								S(V)	M			
15	99.69	15.11			15.00 P5 15.11	Hole Terminated at 15.11 m	100/60							
16														
17														
18														
19														
20														

SPT N blows / 300 mm (20 40 60 80)
Undrained Shear Strength kPa (20 40 60 80)
Shear Strength PL WC LL (20 40 60 80)
Bulk Density Mg/m³ (1.5 1.8 2.1 2.4)

Ground Water Level (Measured from Ground Level)				
Date (dd/mm/yyyy)	Time (hh:mm)	Borehole Depth (m)	Casing Depth (m)	Water Level (m)
28/12/2016	17:30	15.00	3.00	0.80

- Sample
- Pressuremeter Test (PRM)
- Core Run
- Vane Shear Test (VST)
- Permeability / Packer Test (PKT)
- SPT N Value
- Attempt TW/P/MZ/U
- P - Piston Sample
- TW - Thin Wall Push
- M - Mazier
- U - Thick Wall Open Drive
- C - Core Run
- SPTLS - SPT Liner
- W - Water
- PZS - Cassagrande Piezometer
- WSP - Water Standpipe

REMARKS:

DATA QUALITY RATING

TÜV SÜD AL Technologies

TUV SUD 1.00.2 LIB.GLB Log IS SG BOREHOLE 2 73620111662_WI 059.GPJ <<DrawingFile>> 02/02/2017 09:57 1.00.000 Datgel Lab and In Situ Tool - DGD | Lib: TUV SUD 1.00.2 2016-03-17 Prj: TUV SUD 1.00 2016-01-08

APPENDICES

Appendix C

Laboratory Tests Results

Test Report No. 7362011662
dated 19-Jan-2017

AL Technologies

SUMMARY OF TEST RESULTS

PROJECT :	**D/250/14] TERM CONTRACT NO.35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS**							
LOCATION :	**Soil Investigation Works at Tengah Phase 1 & 2 Infra (WI059)**							
BOREHOLE NO.			BH1	BH1				
SAMPLE REF.			UD1	UD2				
DEPTH (m)		From	3.00	6.00				
		To	4.00	7.00				
Natural Moisture Content			145	52				
Density	Bulk Density	Mg/m3	1.28	1.76				
	Dry Density	Mg/m3	0.52	1.16				
Atterberg Limits	Liquid Limit	%	*	66				
	Plastic Limit	%	*	31				
	Plasticity Index	%	*	35				
Particle Size Analysis	Gravel	%	17	0				
	Sand	%	25	19				
	Silt	%	27	14				
	Clay	%	31	67				
Particle Density of Soil		Mg/m^3	2.28	2.64				
Triaxial Compression	Type of Test*1							
	Cohesion (c / c')	kPa						
	Phi Angle (φ / φ')	Degree						
Consolidation	Initial Void Ratio							
	Preconsolidation Pre:	kN/m^2						
	Compression Index							
Chemical Test Soil	Acid Soluble Sulphate Content	%		0.21				
	Organic Content	%						
	Water Soluble Sulpate Content	%						
	Chloride Content	%						
	pH Value			6.3				
Chemical Test Water	Ph Value							
	Total Sulphate Content	%						
	Chloride Content	%						

Legend :

*1	UU	- Unconsolidated Undrained	*2	D	-	Diameteral
	CU	- Consolidated Undrained		A	-	Axial
	CD	- Consolidated Drained		I	-	Irregular
	QU	- Quick Undrained				
	SUU	- Saturated UU w/pore water pressure				
	UC	- Unconfined Compression				
	MUU	- Multistage Unconsolidated Undrained				
	MCU	- Multistage Consolidated Undrained				
	MCD	- Multistage Consolidation Drained				

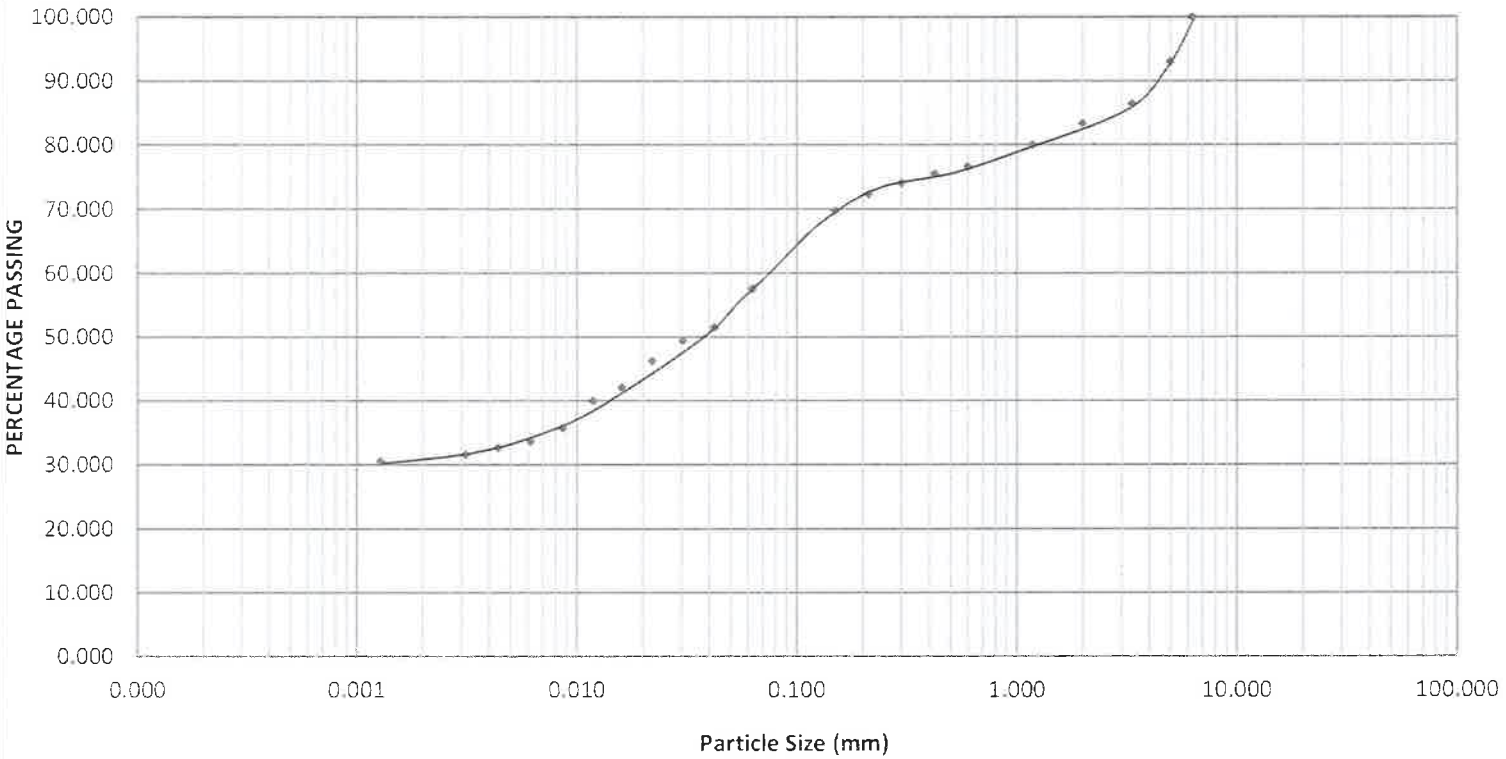
* Test cancel as sample is PEAT

TÜV SÜD AL Technologies Pte Ltd

Test Report No. 7362011662
dated 17/01/2017

AL Technologies

B.S. 1377 PART 2: 1990 PARTICLE SIZE ANALYSIS TEST



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	C
	SILT			SAND			GRAVEL			

Material Description:

Black slightly gravelly slightly sandy PEATY CLAY with silt

Gravel	:	17 %
Sand	:	25 %
Silt	:	27 %
Clay	:	31 %

Detailed Particle Size Distribution

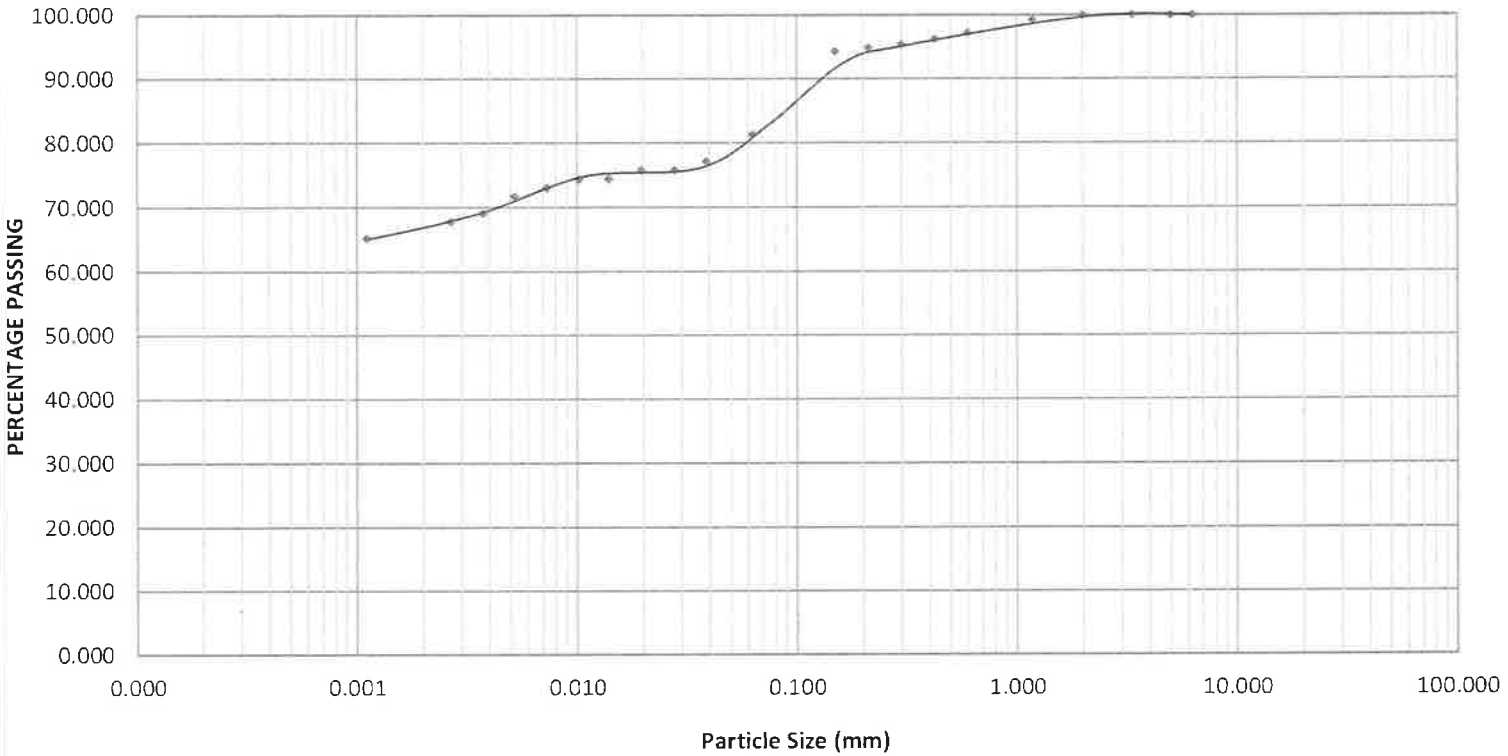
Grading (mm)	% Passing BS Sieve
6.3	100.00
5	92.99
3.35	86.39
2	83.29
1.18	79.96
0.6	76.58
0.425	75.47
0.3	74.04
0.212	72.32
0.15	69.77
0.063	57.53
0.042	51.53
0.030	49.43
0.022	46.27
0.016	42.07
0.012	39.96
0.009	35.76
0.006	33.65
0.004	32.60
0.003	31.55
0.001	30.50

Project : [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS	Borehole No.:	BH1	Location: Soil Investigation Works at Tengah Phase 1 & 2 Infra (WI059)
	Sample Ref: .	UD1	Depth: 3.00-4.00m

Test Report No. 7362011662
dated 17/01/2017

AL Technologies

B.S. 1377 PART 2: 1990 PARTICLE SIZE ANALYSIS TEST



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	C
	SILT			SAND			GRAVEL			

Material Description:

Dark grey slightly sandy CLAY with silt

Gravel	:	0 %
Sand	:	19 %
Silt	:	14 %
Clay	:	67 %

Detailed Particle Size Distribution

Grading (mm)	% Passing BS Sieve
3.35	100.00
2.00	99.88
1.18	99.24
0.600	97.14
0.425	96.18
0.300	95.37
0.212	94.82
0.150	94.23
0.063	81.26
0.039	77.04
0.028	75.71
0.020	75.71
0.014	74.38
0.010	74.38
0.007	73.05
0.005	71.72
0.004	69.07
0.003	67.74
0.001	65.08

AL Technologies

Project : [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS

Borehole No.: BH1

Sample Ref: . UD2

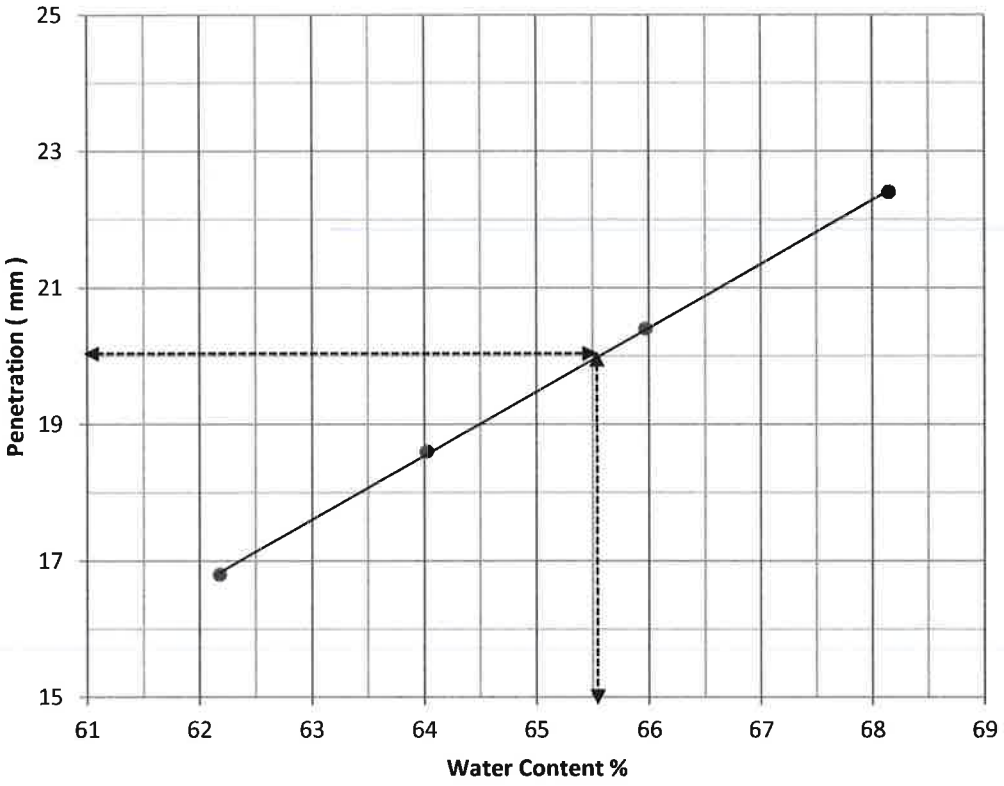
Location: Soil Investigation Works at Tengah Phase 1 & 2 Infra (WI059)

Depth: 6.00-7.00m

Test Report No. 7362011662
dated 18-Jan-17

AL Technologies

BS 1377 PART 2: 1990 ATTERBERG LIMIT (CONE PENETROMETER) TEST



HISTORY OF SAMPLE Wet Sieving Percentage of passing 0.425 mm Sieve 96 %

		LIQUID LIMIT %				PLASTIC LIMIT %	
Wet Weight + Tare	(g)	25.15	24.85	25.62	24.76	25.30	25.45
Dry Weight + Tare	(g)	18.64	18.32	18.68	18.00	22.90	22.87
Tare Weight	(g)	8.17	8.12	8.16	8.08	15.20	14.56
Water Content	%	62.18	64.02	65.97	68.15	31.17	31.05
Penetration	mm	16.8	18.6	20.4	22.4		

Liquid Limit	%	66
Plastic Limit	%	31
Plastic Index	%	35

Sample Reference: BH1 Sample No: UD2 Depth: 6.00-7.00m
Material Description: Dark grey slightly sandy CLAY with silt
Location: Soil Investigation Works at Tengah Phase 1 & 2 Infra (WI059)
Project: [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS

TÜV SÜD AL Technologies Pte Ltd

Test Report No. 7362011662
dated 12-Jan-2017

AL Technologies

SUMMARY OF TEST RESULTS

PROJECT :	D/250/14] TERM CONTRACT NO.35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS							
LOCATION :	Soil Investigation Works at Tengah Phase 1 & 2 Infra (WI059)							
BOREHOLE NO.			BH2	BH2				
SAMPLE REF.			UD1	UD2				
DEPTH (m)		From	2.00	4.00				
		To	3.00	5.00				
Natural Moisture Content			48	32				
Density	Bulk Density	Mg/m3	1.80	1.84				
	Dry Density	Mg/m3	1.22	1.39				
Atterberg Limits	Liquid Limit	%	55	54				
	Plastic Limit	%	27	26				
	Plasticity Index	%	28	28				
Particle Size Analysis	Gravel	%	0	0				
	Sand	%	8	10				
	Silt	%	22	36				
	Clay	%	70	54				
Particle Density of Soil		Mg/m^3	2.63	2.66				
Triaxial Compression	Type of Test*1			UU				
	Cohesion (c / c')	kPa		29				
	Phi Angle (φ / φ')	Degree		0				
Consolidation	Initial Void Ratio							
	Preconsolidation Pre:	kN/m^2						
	Compression Index							
Chemical Test Soil	Acid Soluble Sulphate Content	%						
	Organic Content	%						
	Water Soluble Sulpate Content	%						
	Chloride Content	%						
	pH Value							
Chemical Test Water	Ph Value							
	Total Sulphate Content	%						
	Chloride Content	%						

Legend :

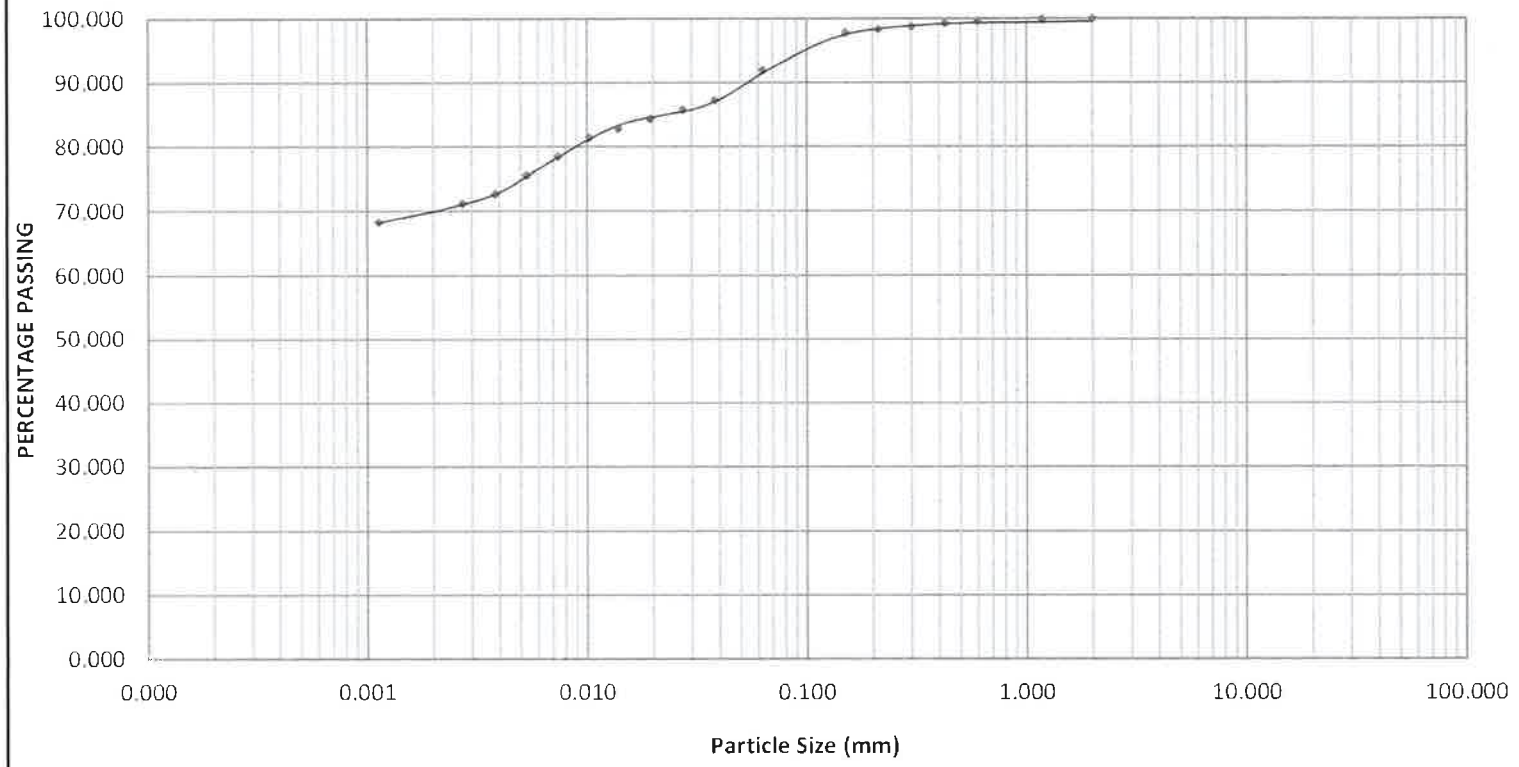
*1	UU	- Unconsolidated Undrained	*2	D	-	Diameteral
	CU	- Consolidated Undrained		A	-	Axial
	CD	- Consolidated Drained		I	-	Irregular
	QU	- Quick Undrained				
	SUU	- Saturated UU w/pore water pressure				
	UC	- Unconfined Compression				
	MUU	- Multistage Unconsolidated Undrained				
	MCU	- Multistage Consolidated Undrained				
	MCD	- Multistage Consolidation Drained				

AL Technologies Pte Ltd Co. Reg. No. 199905120H

Test Report No. 7362011662
dated 10-Jan-17

AL Technologies

B.S. 1377 PART 2: 1990 PARTICLE SIZE ANALYSIS TEST



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	C
	SILT			SAND			GRAVEL			

Material Description:

Dark grey slightly sandy CLAY with silt

Gravel	:	0 %
Sand	:	8 %
Silt	:	22 %
Clay	:	70 %

Detailed Particle Size Distribution

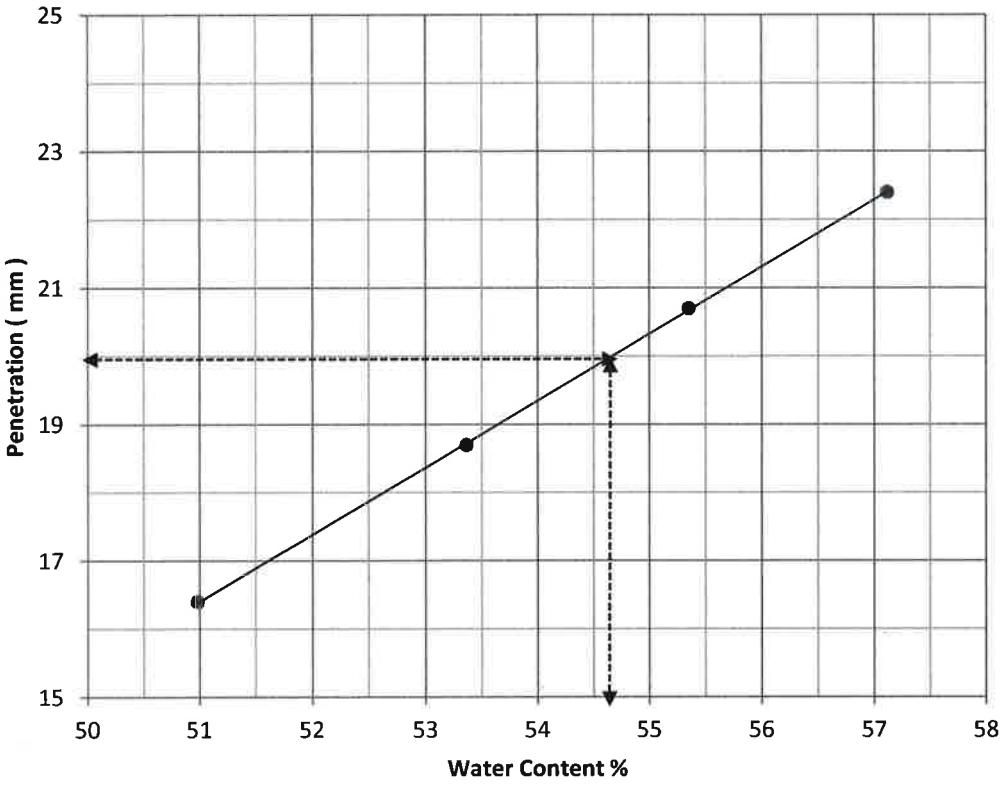
Grading (mm)	% Passing BS Sieve
2	100.00
1.18	99.91
0.600	99.60
0.425	99.26
0.300	98.75
0.212	98.30
0.150	97.77
0.063	91.91
0.038	87.21
0.027	85.75
0.019	84.30
0.014	82.85
0.010	81.39
0.007	78.49
0.005	75.58
0.004	72.67
0.003	71.22
0.001	68.31

Project : [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS	Borehole No.: BH2	Location: Soil Investigation Works at Tengah Phase 1 & 2 Infra (WI059)
	Sample Ref: . UD1	Depth: 2.00-3.00m

Test Report No. 7362011662
dated 10-Jan-17

AL Technologies

BS 1377 PART 2: 1990 ATTERBERG LIMIT (CONE PENETROMETER) TEST



HISTORY OF SAMPLE Wet Sieving Percentage of passing 0.425 mm Sieve 99 %

		LIQUID LIMIT %				PLASTIC LIMIT %	
Wet Weight + Tare	(g)	25.79	25.67	25.12	25.01	27.55	25.44
Dry Weight + Tare	(g)	19.84	19.57	19.12	18.95	24.63	23.03
Tare Weight	(g)	8.17	8.14	8.28	8.34	13.87	14.11
Water Content	%	50.99	53.37	55.35	57.12	27.14	27.02
Penetration	mm	16.4	18.7	20.7	22.4		

Liquid Limit	%	55
Plastic Limit	%	27
Plastic Index	%	28

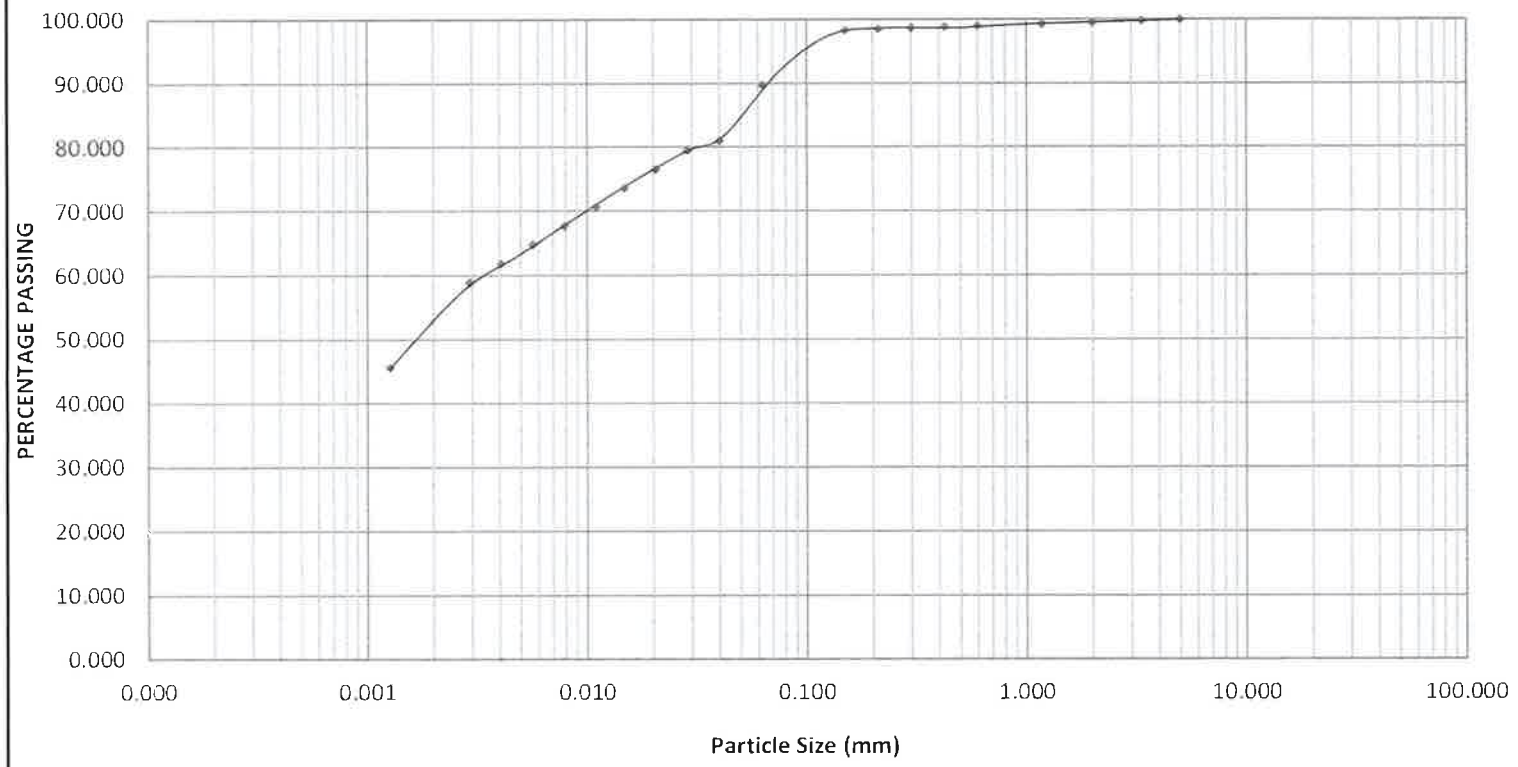
Sample Reference: BH2 Sample No: UD1 Depth: 2.00-3.00m
Material Description: Dark grey slightly sandy CLAY with silt
Location: Soil Investigation Works at Tengah Phase 1 & 2 Infra (WI059)
Project: [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS

TÜV SÜD AL Technologies Pte Ltd

Test Report No. 7362011662
dated 10-Jan-17

AL Technologies

B.S. 1377 PART 2: 1990 PARTICLE SIZE ANALYSIS TEST



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	C
	SILT			SAND			GRAVEL			

Material Description:

Grey slightly sandy CLAY with silt

Gravel	:	0 %
Sand	:	10 %
Silt	:	36 %
Clay	:	54 %

Detailed Particle Size Distribution

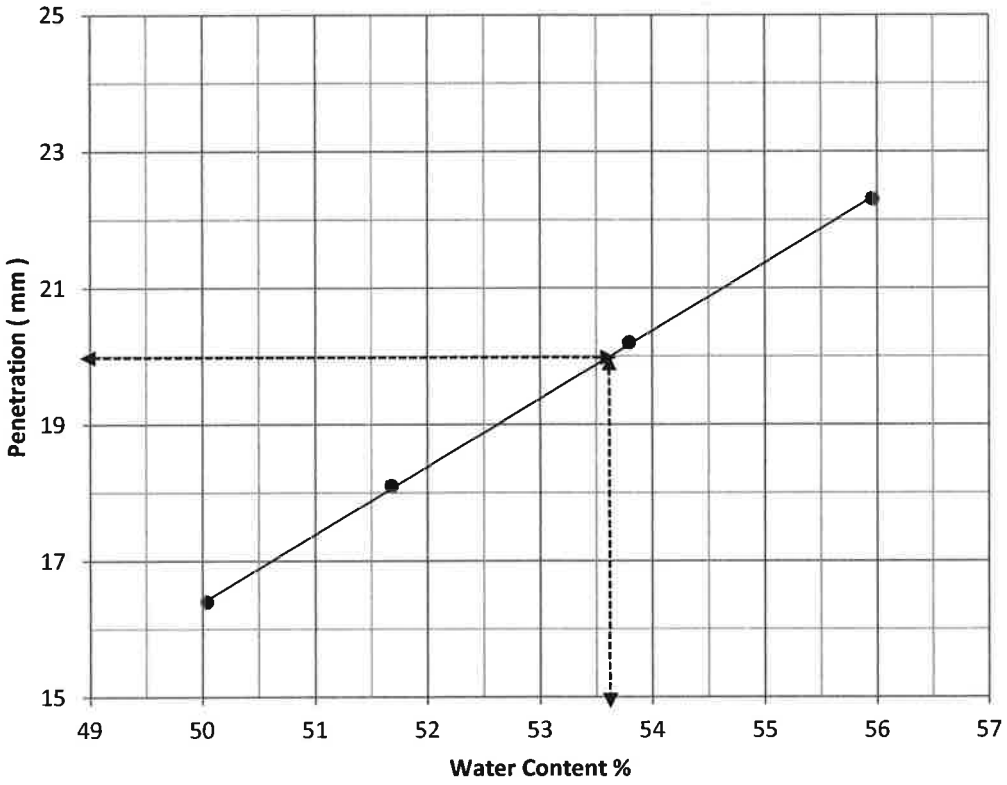
Grading (mm)	% Passing BS Sieve
5.0	100.00
3.4	99.80
2.0	99.52
1.18	99.29
0.600	98.99
0.425	98.85
0.300	98.64
0.212	98.48
0.150	98.28
0.063	89.72
0.040	80.94
0.029	79.46
0.021	76.52
0.015	73.58
0.011	70.63
0.008	67.69
0.006	64.75
0.004	61.81
0.003	58.86
0.001	45.62

Project : [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS	Borehole No.:	BH2	Location: Soil Investigation Works at Tengah Phase 1 & 2 Infra (WI059)
	Sample Ref: .	UD2	Depth: 4.00-5.00m

Test Report No. 7362011662
dated 10-Jan-17

AL Technologies

BS 1377 PART 2: 1990 ATTERBERG LIMIT (CONE PENETROMETER) TEST



HISTORY OF SAMPLE Wet Sieving Percentage of passing 0.425 mm Sieve 99 %

		LIQUID LIMIT %				PLASTIC LIMIT %	
Wet Weight + Tare	(g)	25.52	24.67	24.86	24.47	25.23	25.20
Dry Weight + Tare	(g)	19.71	18.99	19.05	18.60	23.15	22.92
Tare Weight	(g)	8.10	8.00	8.25	8.11	15.20	14.20
Water Content	%	50.04	51.68	53.80	55.96	26.16	26.15
Penetration	mm	16.4	18.1	20.2	22.3		

Liquid Limit	%	54
Plastic Limit	%	26
Plastic Index	%	28

Sample Reference: BH2 Sample No: UD2 Depth: 4.00-5.00m
Material Description: Grey slightly sandy CLAY with silt
Location: Soil Investigation Works at Tengah Phase 1 & 2 Infra (WI059)
Project: [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS

TÜV SÜD AL Technologies Pte Ltd

Total Stress Triaxial Compression

Unconsolidated Undrained

Sample details

Sketch showing specimen location in original Sample

Depth 4.00-5.00m
Description: Soft grey slightly sandy CLAY with silt

	Specimen 1	Specimen 2	Specimen 3
Type			
Height H_0 (mm)	76	76	76
Diameter D_0 (mm)	38	38	38
Weight W_0 (gr)	156.6	157	162.3
Bulk Density ρ (Mg/m3)	1.82	1.82	1.88
Particle Density ρ_s	2.65 (assumed)	2.65 (assumed)	2.65 (assumed)

Initial Conditions

	Specimen 1	Specimen 2	Specimen 3
Cell Pressure $\sigma 3$ (kPa)	40.00	80.00	160.00
Machine Speed d_r(mm/min)	1.520	1.520	1.520
No. of Membranes	1	1	1
Total Thickness (mm)	0.02	0.02	0.02
Strain Channel	13	16	20
Load Channel	10	15	18
Moisture Content w_0%	31	33	36
Dry Density ρ_{d0} (Mg/m3)	1.38	1.37	1.38
Voids Ratio e_0	0.92	0.94	0.92
Deg of Saturation S_0%	90.91	93.76	100.00

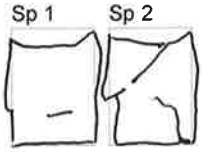
Final Condition

	Specimen 1	Specimen 2	Specimen 3
Max Deviator Stress (kPa)	46.39	60.01	67.89
Membrane Correction σ_{mb} (kPa)	0.20	0.16	0.16
Corr Stress $(\sigma_1 - \sigma_3)_c$ (kPa)	46.19	59.85	67.73
Strain at Failure ε_f%	20.29	13.86	14.45
Shear Strength c_u (kPa)	23.09	29.92	33.87
Moisture Content w_f%	32	33	35
Dry Density ρ_{df} (Mg/m3)	1.38	1.37	1.40
Voids Ratio e_f	0.92	0.93	0.89
Deg of Saturation S_f%	91.15	92.94	100.00

Notes:

Failure Sketch

Sp 1 Sp 2



Sp 3



Surface Inclination

[Test Method : BS1377 : Part 7 : 1990 : 8/9*
(* delete as appropriate)

Test name UUBH2/UD2 (SS, MS)
Date of Test: 29/12/16

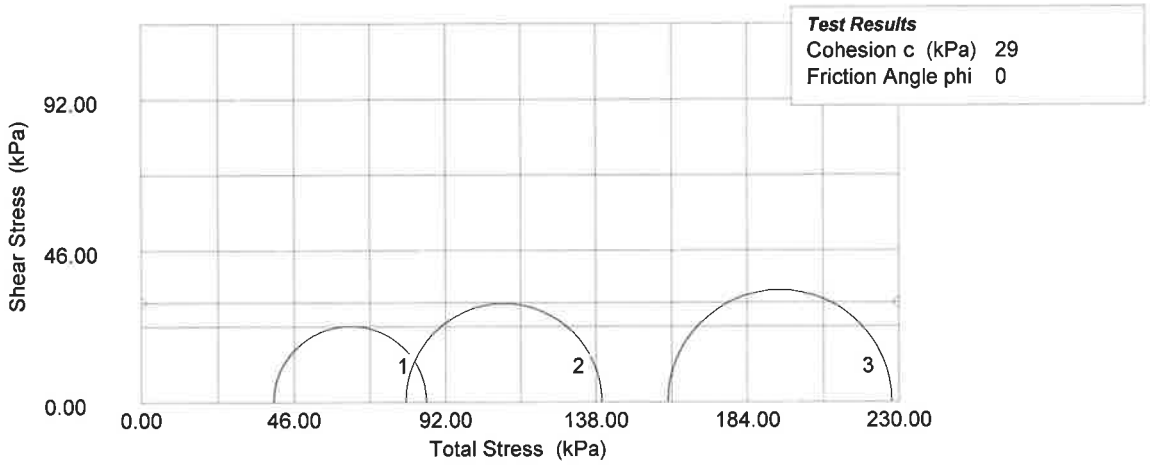
Site Reference: TENGAH PHASE 1&2 INFFRA
Jobfile: C:\WINCLISP\2016\WI-059.JOB

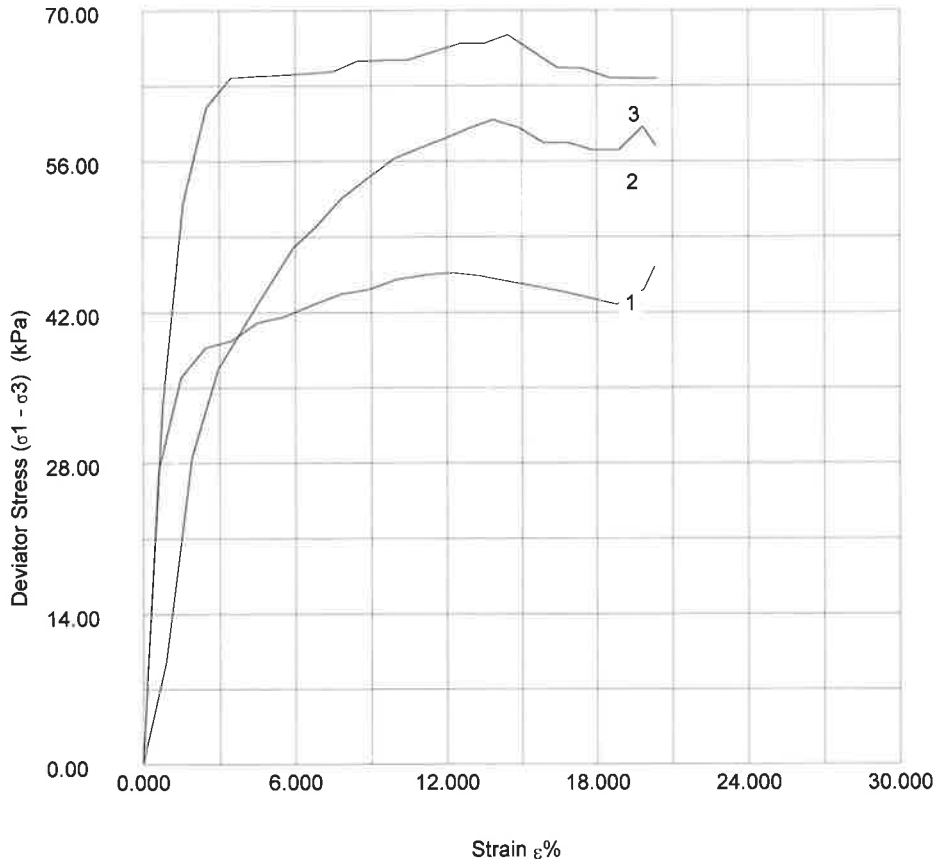
Sample: UD2
Borehole: BH2

Operator: *Checked:* *Approved:*

Total Stress Triaxial Compression

Unconsolidated Undrained





[Test Method : BS1377 : Part 7 : 1990 : 8/9* (* delete as appropriate)		Test name Date of Test:	UUBH2/UD2 (SS, MS) 29/12/16
Site Reference: Jobfile:	TENGAH PHASE 1&2 INFFRA C:\WINCLISP\2016\WI-059.JOB	Sample: Borehole:	UD2 BH2
Operator:	*Checked:*		*Approved:*

TÜV SÜD AL Technologies Pte Ltd * Co. Reg. No.: 198905126W

Test Report No. 7362011662
dated 9-Jan-2017

TÜV SÜD
AL Technologies

SUMMARY OF TEST RESULTS

PROJECT :	D/250/14] TERM CONTRACT NO.35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS							
LOCATION :	Soil Investigation Works at Tengah Phase 1 & 2 Infra (WI059)							
BOREHOLE NO.			BH3	BH3				
SAMPLE REF.			UD1	UD2				
DEPTH (m)		From	6.00	9.00				
		To	7.00	9.50				
Natural Moisture Content			27	30				
Density	Bulk Density	Mg/m3	1.88	1.85				
	Dry Density	Mg/m3	1.48	1.42				
Atterberg Limits	Liquid Limit	%	49	37				
	Plastic Limit	%	29	26				
	Plasticity Index	%	20	11				
Particle Size Analysis	Gravel	%	7	1				
	Sand	%	15	37				
	Silt	%	41	46				
	Clay	%	37	16				
Particle Density of Soil		Mg/m^3	2.63	2.64				
Triaxial Compression	Type of Test*1		UU					
	Cohesion (c / c')	kPa	94					
	Phi Angle (φ / φ')	Degree	0					
Consolidation	Initial Void Ratio							
	Preconsolidation Pre:	kN/m^2						
	Compression Index							
Chemical Test Soil	Acid Soluble Sulphate Content	%						
	Organic Content	%						
	Water Soluble Sulpate Content	%						
	Chloride Content	%						
	pH Value							
Chemical Test Water	Ph Value							
	Total Sulphate Content	%						
	Chloride Content	%						

Legend :

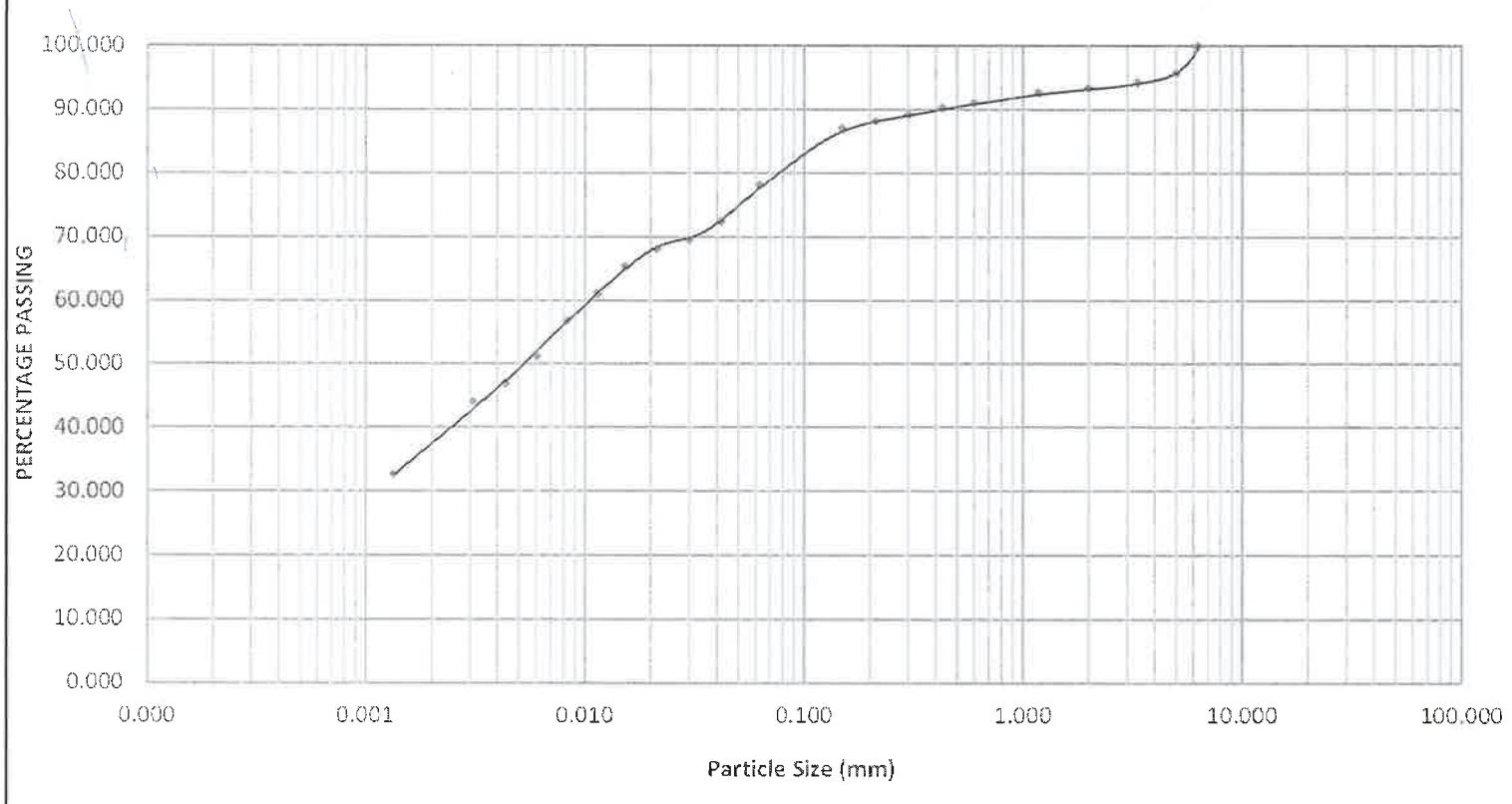
*1	UU	- Unconsolidated Undrained	*2	D	-	Diameteral
	CU	- Consolidated Undrained		A	-	Axial
	CD	- Consolidated Drained		I	-	Irregular
	QU	- Quick Undrained				
	SUU	- Saturated UU w/pore water pressure				
	UC	- Unconfined Compression				
	MUU	- Multistage Unconsolidated Undrained				
	MCU	- Multistage Consolidated Undrained				
	MCD	- Multistage Consolidation Drained				

TÜV SÜD AL Technologies Pte Ltd

Test Report No. 7362011662
dated 6-Jan-17

TÜV SÜD AL Technologies

B.S. 1377 PART 2: 1990 PARTICLE SIZE ANALYSIS TEST



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	C
	SILT			SAND			GRAVEL			

Material Description:

Reddish brown slightly gravelly slightly sandy SILT with clay

Gravel	:	7 %
Sand	:	15 %
Silt	:	41 %
Clay	:	37 %

Detailed Particle Size Distribution

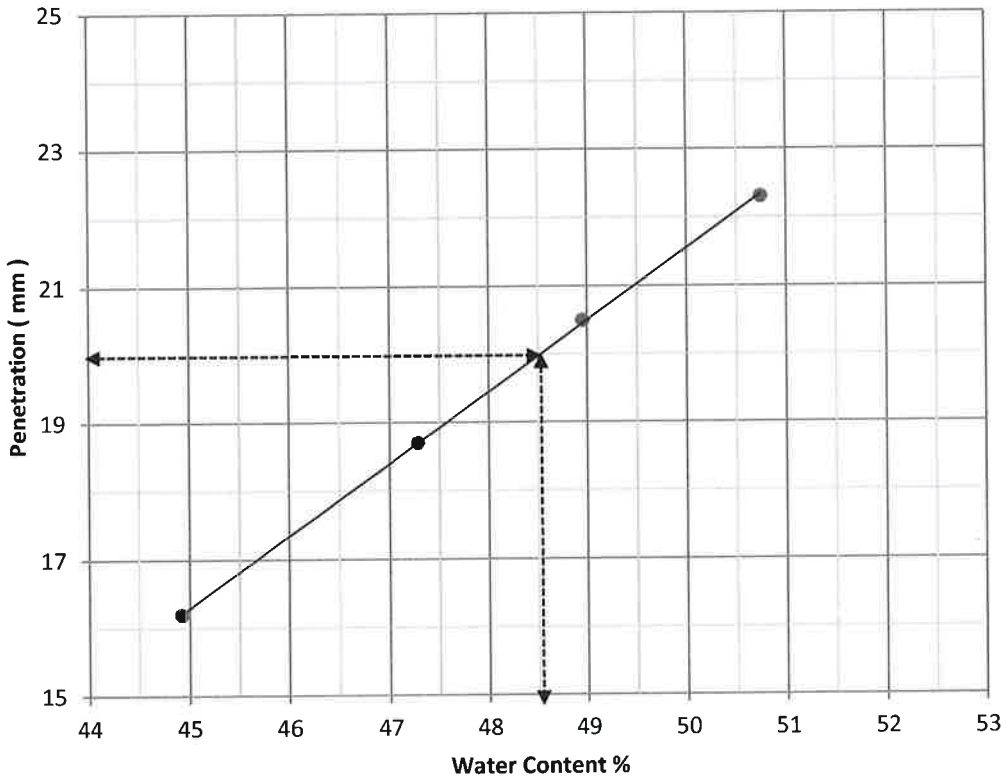
Grading (mm)	% Passing BS Sieve
6.300	100.00
5.000	95.72
3.350	94.23
2.000	93.35
1.180	92.61
0.600	91.03
0.425	90.24
0.300	89.19
0.212	88.17
0.150	87.03
0.063	78.14
0.042	72.45
0.030	69.61
0.021	68.19
0.015	65.34
0.011	61.08
0.008	56.82
0.006	51.14
0.004	46.88
0.003	44.04
0.001	32.67

Project : [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS	Borehole No.: BH3	Location: Tengah Phase 1 & 2 Infra (WI059)
	Sample Ref: . UD1	Depth: 6.00-7.00m

Test Report No. 7362011662
dated 5-Jan-17

AL Technologies

BS 1377 PART 2: 1990 ATTERBERG LIMIT (CONE PENETROMETER) TEST



HISTORY OF SAMPLE Wet Sieving Percentage of passing 0.425 mm Sieve 90 %

		LIQUID LIMIT %				PLASTIC LIMIT %	
Wet Weight + Tare	(g)	23.77	23.90	23.10	23.33	25.20	25.29
Dry Weight + Tare	(g)	18.90	18.84	18.19	18.23	22.75	22.75
Tare Weight	(g)	8.06	8.14	8.16	8.18	14.18	13.88
Water Content	%	44.93	47.29	48.95	50.75	28.59	28.64
Penetration	mm	16.2	18.7	20.5	22.3		

Liquid Limit	%	49
Plastic Limit	%	29
Plastic Index	%	20

Sample Reference: BH3 Sample No: UD1 Depth: 6.00-7.00m
Material Description: Reddish brown slightly gravelly slightly sandy SILT with clay
Location: Tengah Phase 1 & 2 Infra (WI059)
Project: [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS

TÜV SÜD AL Technologies Pte Ltd

Total Stress Triaxial Compression

Unconsolidated Undrained

Sample details

Sketch showing specimen location in original Sample

Depth: 6.00-7.00m
Description: Firm to stiff reddish brown slightly gravelly slightly sandy SILT with clay

	Specimen 1	Specimen 2	Specimen 3
Type			
Height H_0 (mm)	76	76	76
Diameter D_0 (mm)	38	38	38
Weight W_0 (gr)	161.7	161.8	162.5
Bulk Density ρ (Mg/m3)	1.88	1.88	1.89
Particle Density ρ_s	2.65 (assumed)	2.65 (assumed)	2.65 (assumed)

Initial Conditions

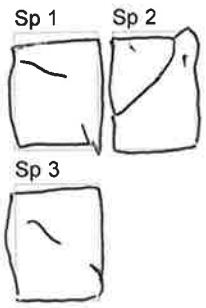
	Specimen 1	Specimen 2	Specimen 3
Cell Pressure $\sigma 3$ (kPa)	60.00	120.00	240.00
Machine Speed d_r(mm/min)	1.520	1.520	1.520
No. of Membranes	1	1	1
Total Thickness (mm)	0.2	0.2	0.2
Strain Channel	20	16	13
Load Channel	18	15	10
Moisture Content w_0%	26	26	29
Dry Density ρ_{d0} (Mg/m3)	1.49	1.49	1.47
Voids Ratio e_0	0.78	0.78	0.81
Deg of Saturation S_0%	88.59	89.03	93.78

Final Condition

	Specimen 1	Specimen 2	Specimen 3
Max Deviator Stress (kPa)	150.95	181.87	234.88
Membrane Correction σ_{mb} (kPa)	1.40	2.00	0.90
Corr Stress $(\sigma_1 - \sigma_3)_c$ (kPa)	149.55	179.87	233.98
Strain at Failure ε_f%	12.21	20.05	7.18
Shear Strength c_u (kPa)	74.77	89.94	116.99
Moisture Content w_f%	26	26	28
Dry Density ρ_{df} (Mg/m3)	1.49	1.49	1.47
Voids Ratio e_f	0.78	0.78	0.80
Deg of Saturation S_f%	88.03	88.75	93.39

Notes:

Failure Sketch



Surface Inclination

[Test Method : BS1377 : Part 7 : 1990 : 8/9*
(* delete as appropriate)

Test name: UU-3-1 (SS, MS)
Date of Test: 15/12/16

Site Reference: TENGAH PHASE 1&2 INFFRA
Jobfile: C:\WINCLISP\2016\WI-059.JOB

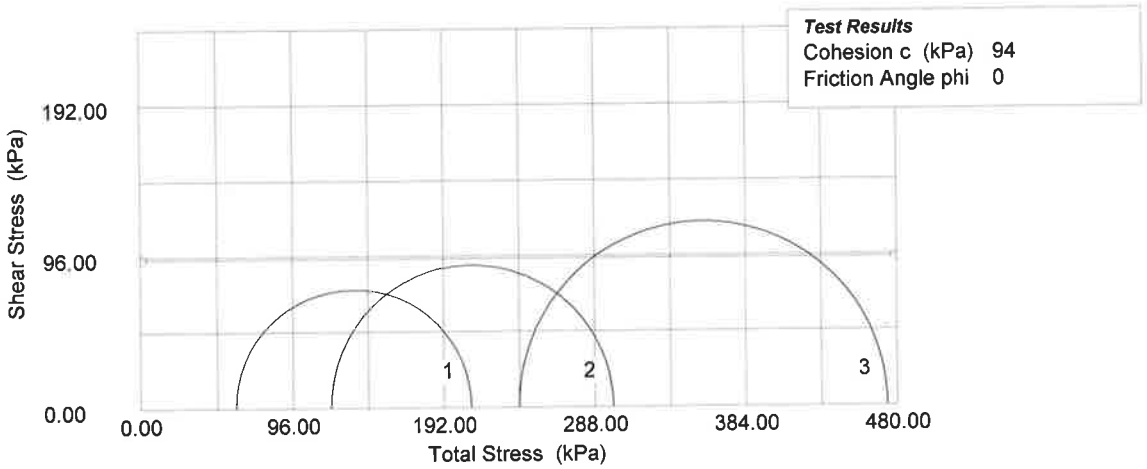
Sample: UD1
Borehole: BH3

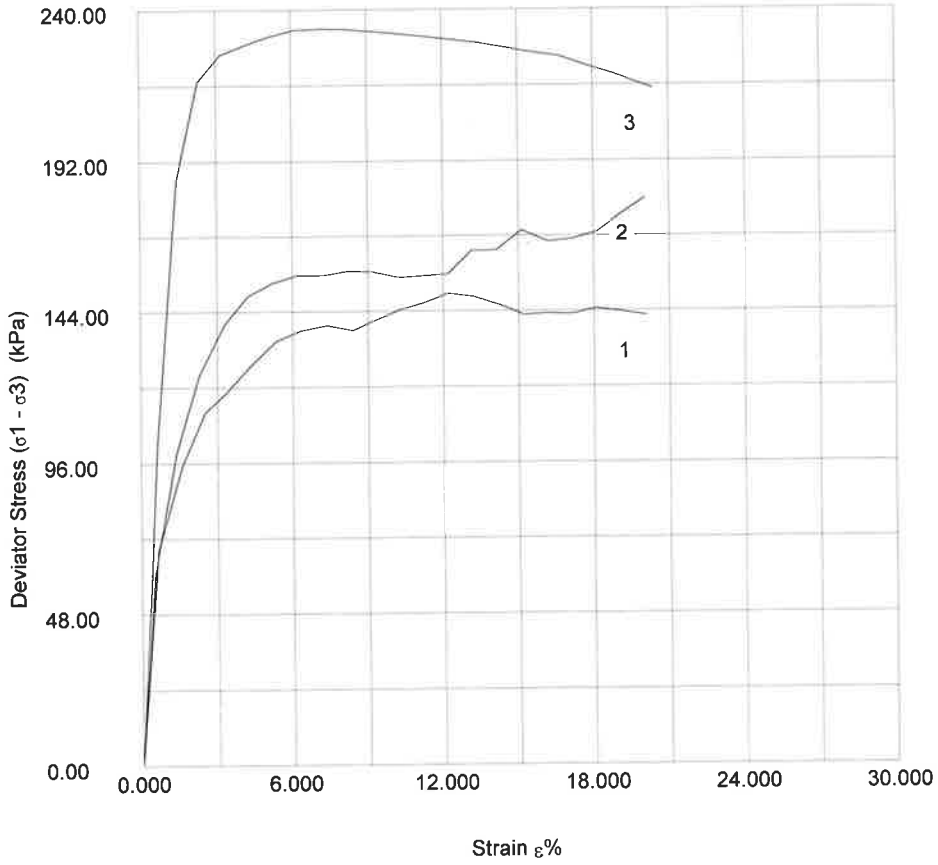
Operator: *Checked:* *Approved:*

TÜV SÜD AL Technologies Pte Ltd * Co. Reg. No. 199903512W

Total Stress Triaxial Compression

Unconsolidated Undrained





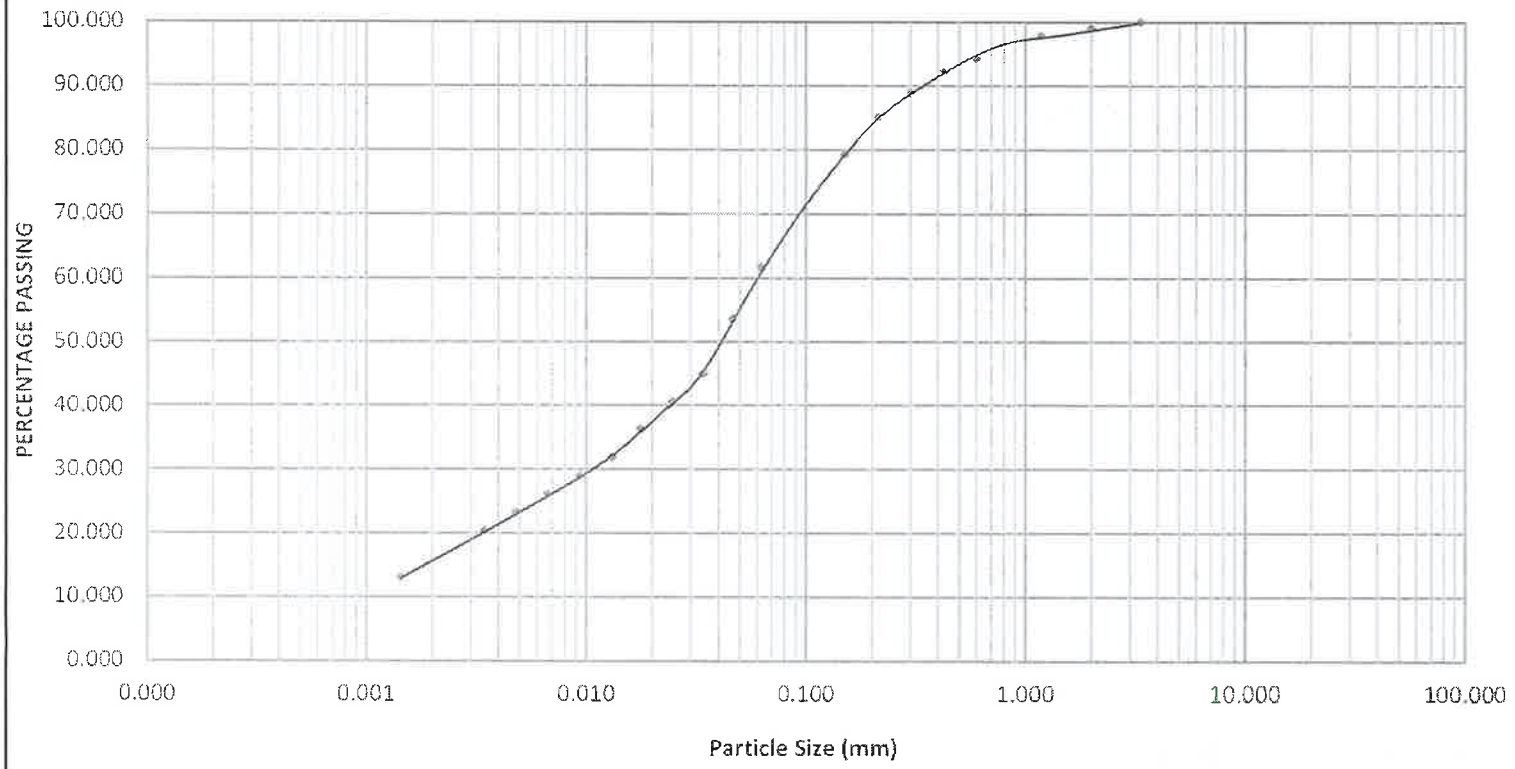
[Test Method : BS1377 : Part 7 : 1990 : 8/9* (* delete as appropriate)		Test name	UU-3-1 (SS, M8)
		Date of Test:	15/12/16
Site Reference:	TENGAH PHASE 1&2 INFFRA	Sample:	UD1
Jobfile:	C:\WINCLISP\2016\WI-059.JOB	Borehole:	BH3
Operator:	*Checked:*		*Approved:*

TÜV SÜD AL Technologies Pte Ltd * Co. Reg. No.: 199505120W

Test Report No. 7362011662
dated 6-Jan-17

AL Technologies

B.S. 1377 PART 2: 1990 PARTICLE SIZE ANALYSIS TEST



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	C
	SILT			SAND			GRAVEL			

Material Description:

Red mottled grey sandy SILT with clay and traces of gravel

Gravel	:	1 %
Sand	:	37 %
Silt	:	46 %
Clay	:	16 %

Detailed Particle Size Distribution

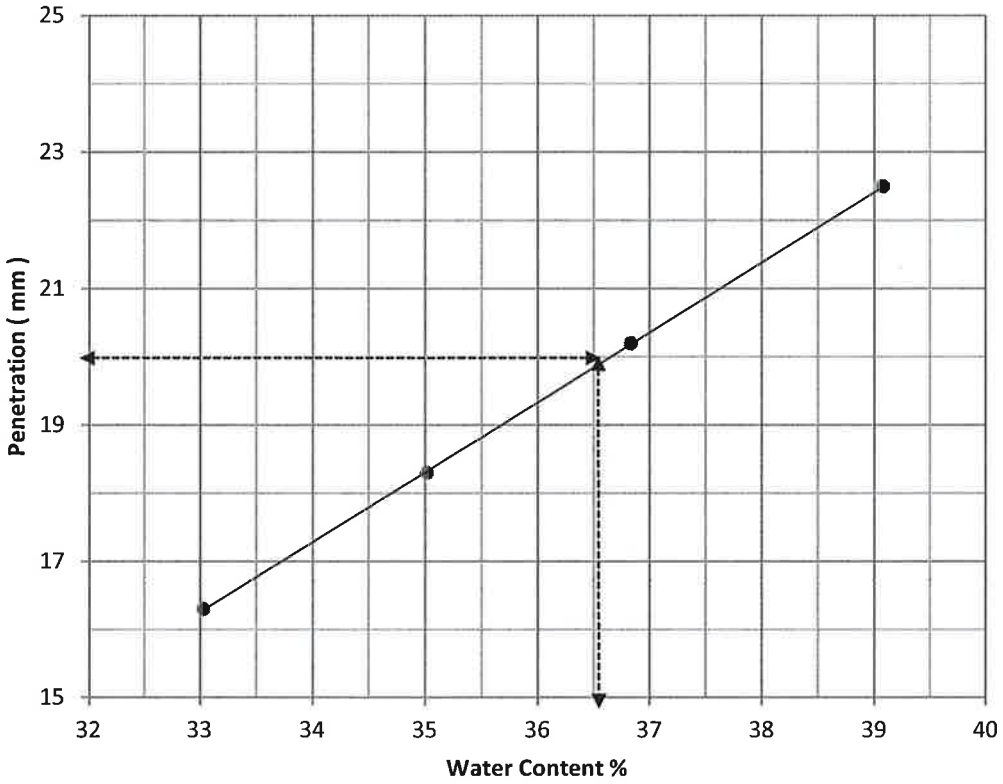
Grading (mm)	% Passing BS Sieve
3.350	100.00
2.000	99.08
1.180	97.82
0.600	94.21
0.425	92.22
0.300	88.94
0.212	85.02
0.150	79.32
0.063	61.66
0.046	53.61
0.034	44.92
0.025	40.57
0.018	36.22
0.013	31.88
0.009	28.98
0.007	26.08
0.005	23.18
0.003	20.29
0.001	13.04

Project : [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS	Borehole No.:	BH3	Location: Tengah Phase 1 & 2 Infra (WI059)
	Sample Ref: .	UD2	Depth: 9.00-9.50m

Test Report No. 7362011662
dated 5-Jan-17

AL Technologies

BS 1377 PART 2: 1990 ATTERBERG LIMIT (CONE PENETROMETER) TEST



HISTORY OF SAMPLE Wet Sieving Percentage of passing 0.425 mm Sieve 92 %

		LIQUID LIMIT %				PLASTIC LIMIT %	
Wet Weight + Tare	(g)	24.38	24.69	24.66	24.43	25.23	24.98
Dry Weight + Tare	(g)	20.37	20.40	20.21	19.83	23.19	23.06
Tare Weight	(g)	8.23	8.15	8.13	8.06	15.16	15.56
Water Content	%	33.03	35.02	36.84	39.08	25.40	25.60
Penetration	mm	16.3	18.3	20.2	22.5		
Liquid Limit	%	37					
Plastic Limit	%	26					
Plastic Index	%	11					

Sample Reference: BH3 Sample No: UD2 Depth: 9.00-9.50m
Material Description: Red mottled grey sandy SILT with clay and traces of gravel
Location: Tengah Phase 1 & 2 Infra (WI059)
Project: [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS

TÜV SÜD AL Technologies Pte Ltd

Test Report No. 7362011662
dated 12-Jan-2017

AL Technologies

SUMMARY OF TEST RESULTS

PROJECT :	D/250/14] TERM CONTRACT NO.35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS							
LOCATION :	Soil Investigation Works at Tengah Phase 1 & 2 Infra (WI059)							
BOREHOLE NO.			BH4					
SAMPLE REF.			UD1					
DEPTH (m)		From	2.00					
		To	2.50					
Natural Moisture Content		%	12					
Density	Bulk Density	Mg/m3	1.94					
	Dry Density	Mg/m3	1.73					
Atterberg Limits	Liquid Limit	%	38					
	Plastic Limit	%	25					
	Plasticity Index	%	13					
Particle Size Analysis	Gravel	%	51					
	Sand	%	30					
	Silt	%	15					
	Clay	%	4					
Particle Density of Soil		Mg/m^3	2.65					
Triaxial Compression	Type of Test*1							
	Cohesion (c / c')	kPa						
	Phi Angle (φ / φ')	Degree						
Consolidation	Initial Void Ratio							
	Preconsolidation Pre:	kN/m^2						
	Compression Index							
Chemical Test Soil	Acid Soluble Sulphate Content	%						
	Organic Content	%						
	Water Soluble Sulpate Content	%						
	Chloride Content	%						
	pH Value							
Chemical Test Water	Ph Value							
	Total Sulphate Content	%						
	Chloride Content	%						

Legend :

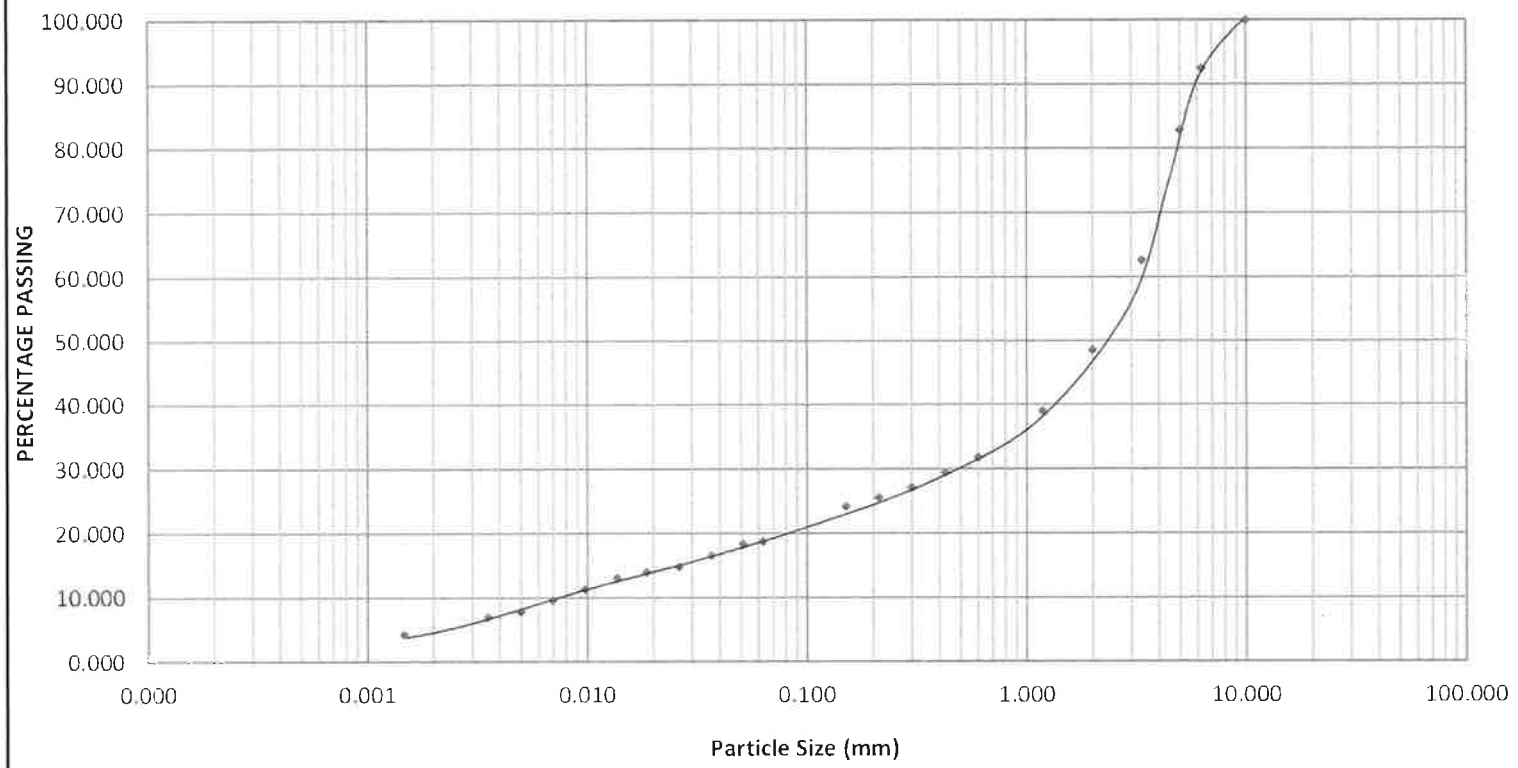
*1	UU	- Unconsolidated Undrained	*2	D	-	Diameteral
	CU	- Consolidated Undrained		A	-	Axial
	CD	- Consolidated Drained		I	-	Irregular
	QU	- Quick Undrained				
	SUU	- Saturated UU w/pore water pressure				
	UC	- Unconfined Compression				
	MUU	- Multistage Unconsolidated Undrained				
	MCU	- Multistage Consolidated Undrained				
	MCD	- Multistage Consolidation Drained				

AL Technologies Pte Ltd Co. Reg. No. 199503712W

Test Report No. 7362011662
dated 10-Jan-17

AL Technologies

B.S. 1377 PART 2: 1990 PARTICLE SIZE ANALYSIS TEST



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	C
	SILT			SAND			GRAVEL			

Material Description:

Red silty very sandy GRAVEL with clay

Gravel	:	51 %
Sand	:	30 %
Silt	:	15 %
Clay	:	4 %

Detailed Particle Size Distribution

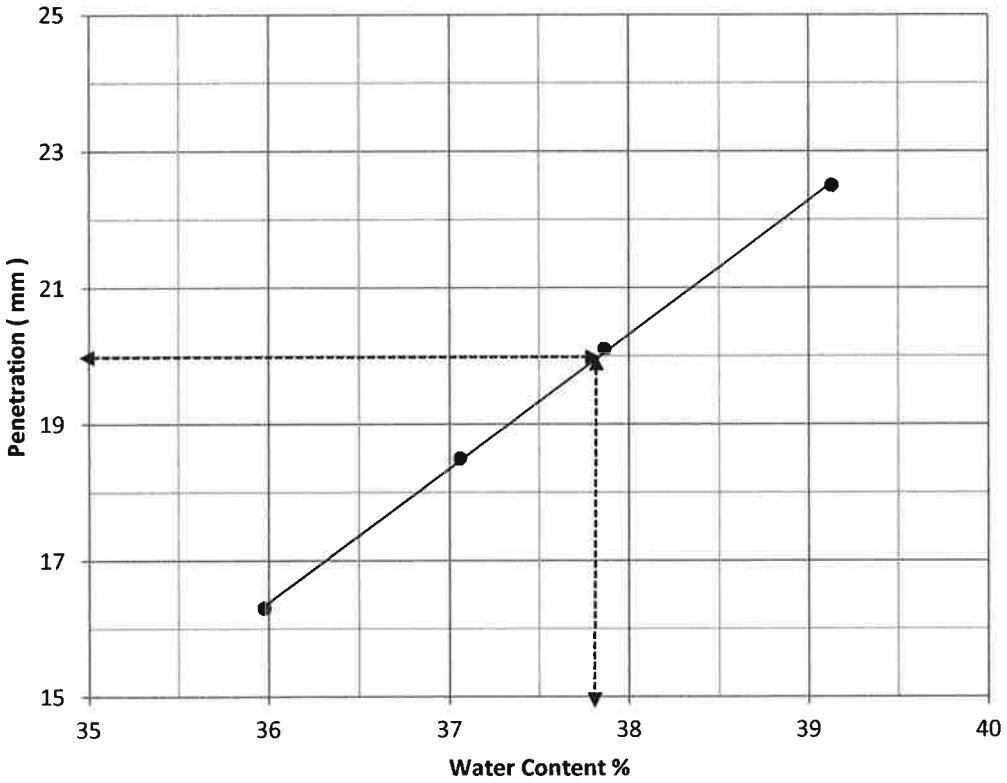
Grading (mm)	% Passing BS Sieve
10.0	100.00
6.3	92.43
5.0	82.83
3.4	62.59
2.0	48.57
1.18	38.99
0.600	31.81
0.425	29.37
0.300	27.17
0.212	25.59
0.150	24.21
0.063	18.73
0.051	18.31
0.037	16.56
0.026	14.82
0.019	13.95
0.014	13.08
0.010	11.33
0.007	9.59
0.005	7.85
0.004	6.97
0.001	4.36

Project : [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS	Borehole No.: BH4	Location: Soil Investigation Works at Tengah Phase 1 & 2 Infra (WI059)	
	Sample Ref: . UD1	Depth: 2.00-2.50m	

Test Report No. 7362011662
dated 10-Jan-17

AL Technologies

BS 1377 PART 2: 1990 ATTERBERG LIMIT (CONE PENETROMETER) TEST



HISTORY OF SAMPLE Wet Sieving Percentage of passing 0.425 mm Sieve 29 %

		LIQUID LIMIT %				PLASTIC LIMIT %	
Wet Weight + Tare	(g)	25.01	25.30	24.83	24.68	25.23	25.27
Dry Weight + Tare	(g)	20.52	20.66	20.29	20.00	23.00	23.22
Tare Weight	(g)	8.04	8.14	8.30	8.04	14.20	15.20
Water Content	%	35.98	37.06	37.86	39.13	25.34	25.56
Penetration	mm	16.3	18.5	20.1	22.5		

Liquid Limit	%	38
Plastic Limit	%	25
Plastic Index	%	13

Sample Reference: BH4 Sample No: UD1 Depth: 2.00-2.50m
Material Description: Red silty very sandy GRAVEL with clay
Location: Soil Investigation Works at Tengah Phase 1 & 2 Infra (WI059)
Project: [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS

TÜV SÜD AL Technologies Pte Ltd

Test Report No. 7362011662
dated 19-Jan-2017

AL Technologies

SUMMARY OF TEST RESULTS

PROJECT :	**D/250/14] TERM CONTRACT NO.35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS**							
LOCATION :	**Soil Investigation Works at Tengah Phase 1 & 2 Infra (WI059)**							
BOREHOLE NO.			BH5					
SAMPLE REF.			UD1					
DEPTH (m)		From	3.00					
		To	3..50					
Natural Moisture Content		%	15					
Density	Bulk Density	Mg/m3	1.82					
	Dry Density	Mg/m3	1.58					
Atterberg Limits	Liquid Limit	%	52					
	Plastic Limit	%	30					
	Plasticity Index	%	22					
Particle Size Analysis	Gravel	%	9					
	Sand	%	40					
	Silt	%	26					
	Clay	%	25					
Particle Density of Soil		Mg/m^3	2.64					
Triaxial Compression	Type of Test*1							
	Cohesion (c / c')	kPa						
	Phi Angle (φ / φ')	Degree						
Consolidation	Initial Void Ratio							
	Preconsolidation Pre:	kN/m^2						
	Compression Index							
Chemical Test Soil	Acid Soluble Sulphate Content	%						
	Organic Content	%						
	Water Soluble Sulpate Content	%						
	Chloride Content	%						
	pH Value							
Chemical Test Water	Ph Value							
	Total Sulphate Content	%						
	Chloride Content	%						

Legend :

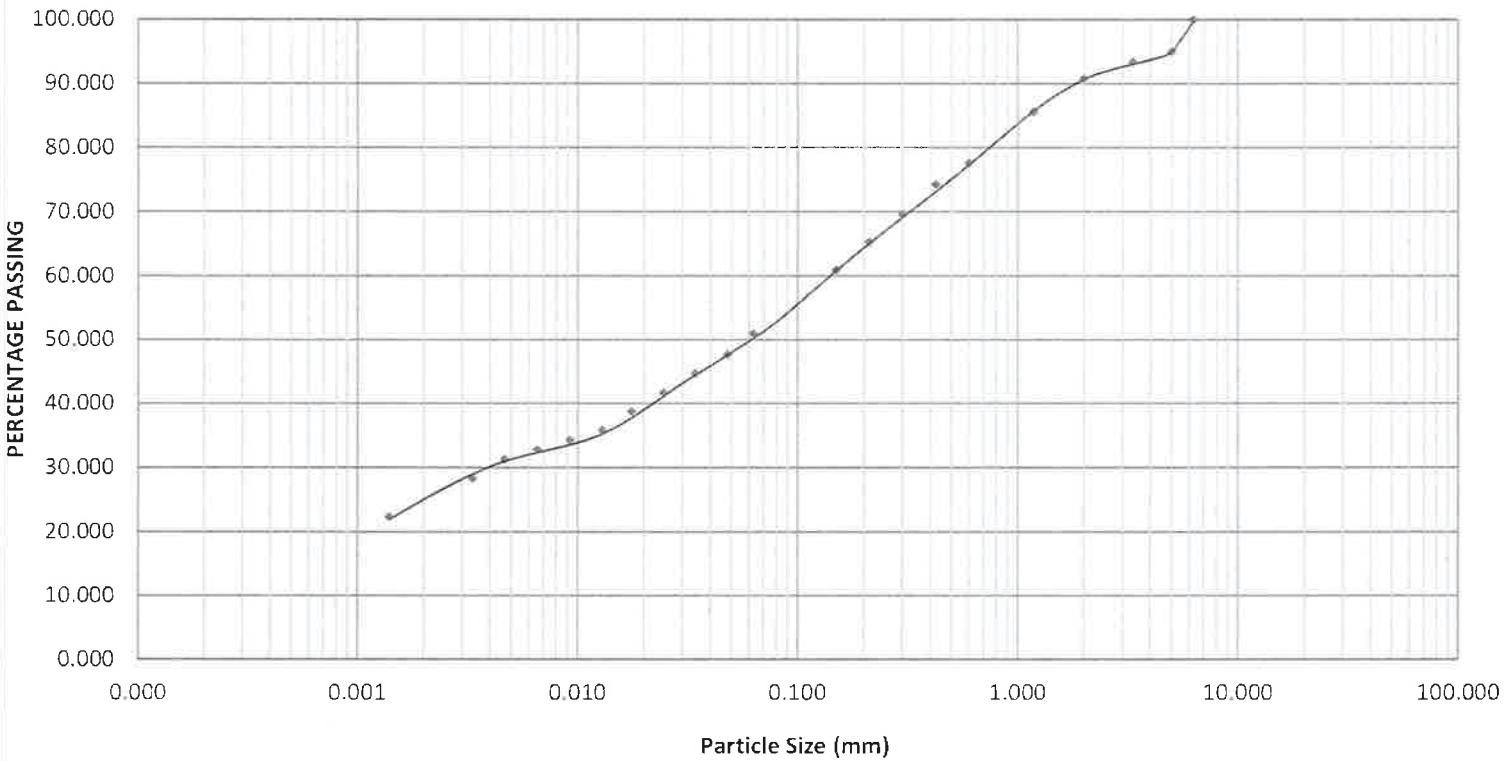
*1	UU	- Unconsolidated Undrained	*2	D	-	Diameteral
	CU	- Consolidated Undrained		A	-	Axial
	CD	- Consolidated Drained		I	-	Irregular
	QU	- Quick Undrained				
	SUU	- Saturated UU w/pore water pressure				
	UC	- Unconfined Compression				
	MUU	- Multistage Unconsolidated Undrained				
	MCU	- Multistage Consolidated Undrained				
	MCD	- Multistage Consolidation Drained				

TÜV SÜD AL Technologies Pte Ltd

Test Report No. 7362011662
dated 17/01/2017

AL Technologies

B.S. 1377 PART 2: 1990 PARTICLE SIZE ANALYSIS TEST



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	C
	SILT			SAND			GRAVEL			

Material Description:

Brown mottled white slightly gravelly sandy SILT with clay

Gravel	:	9 %
Sand	:	40 %
Silt	:	26 %
Clay	:	25 %

Detailed Particle Size Distribution

Grading (mm)	% Passing BS Sieve
6.3	100.00
5.0	94.97
3.35	93.34
2.00	90.76
1.18	85.55
0.600	77.54
0.425	74.22
0.300	69.60
0.212	65.23
0.150	60.87
0.063	50.93
0.048	47.66
0.034	44.68
0.025	41.70
0.018	38.72
0.013	35.74
0.009	34.25
0.007	32.76
0.005	31.28
0.003	28.30
0.001	22.34

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Project : [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS

Borehole No.: BH5

Sample Ref: . UD1

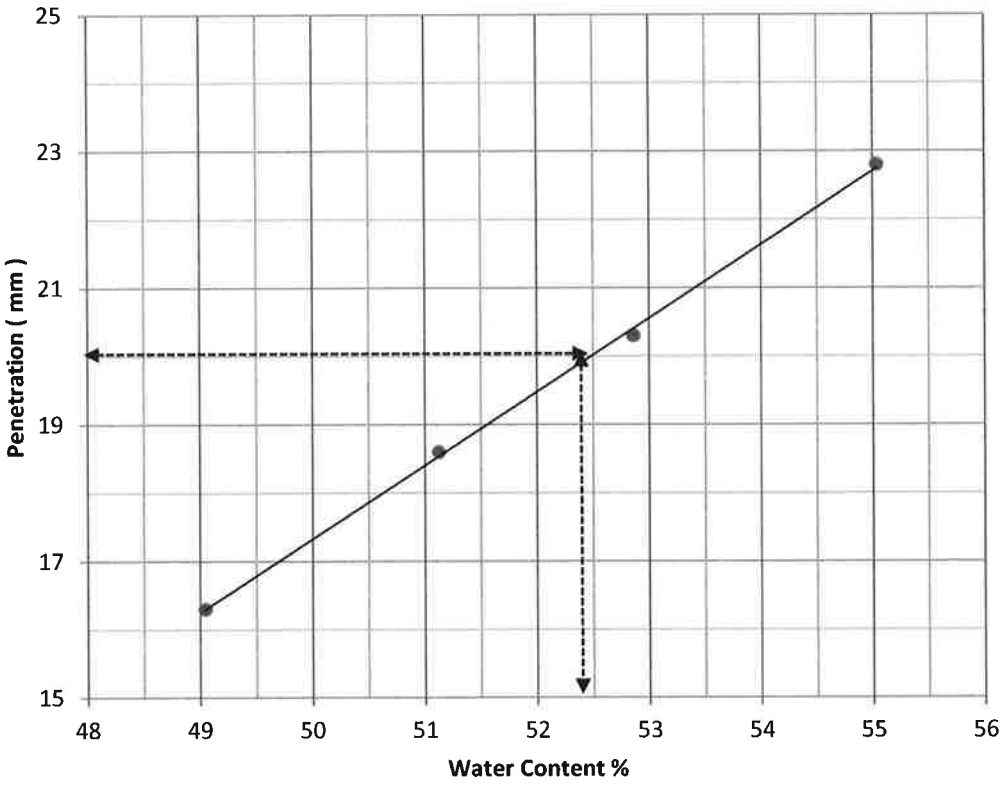
Location: Soil Investigation Works at Tengah Phase 1 & 2 Infra (WI059)

Depth: 3.00-3.50m

Test Report No. 7362011662
dated 18-Jan-17

AL Technologies

BS 1377 PART 2: 1990 ATTERBERG LIMIT (CONE PENETROMETER) TEST



HISTORY OF SAMPLE Wet Sieving Percentage of passing 0.425 mm Sieve 74 %

			LIQUID LIMIT %			PLASTIC LIMIT %	
Wet Weight + Tare	(g)	24.58	24.98	25.18	24.83	25.12	25.30
Dry Weight + Tare	(g)	19.19	19.30	19.27	18.93	22.60	22.75
Tare Weight	(g)	8.20	8.19	8.09	8.21	14.10	14.16
Water Content	%	49.04	51.13	52.86	55.04	29.65	29.69
Penetration	mm	16.3	18.6	20.3	22.8		

Liquid Limit	%	52
Plastic Limit	%	30
Plastic Index	%	22

Sample Reference: BH5 Sample No: UD1 Depth: 3.00-3.50m
Material Description: Brown mottled white slightly gravelly sandy SILT with clay
Location: Soil Investigation Works at Tengah Phase 1 & 2 Infra (WI059)
Project: [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS

TÜV SÜD AL Technologies Pte Ltd

Test Report No. 7362011662
dated 19-Jan-2017

AL Technologies

SUMMARY OF TEST RESULTS

PROJECT :	D/250/14] TERM CONTRACT NO.35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS							
LOCATION :	Soil Investigation Works at Tengah Phase 1 & 2 Infra (WI059)							
BOREHOLE NO.			BH6	BH6				
SAMPLE REF.			UD1	UD2				
DEPTH (m)		From	3.00	6.00				
		To	4.00	7.00				
Natural Moisture Content		%	40	38				
Density	Bulk Density	Mg/m3	1.82	1.86				
	Dry Density	Mg/m3	1.30	1.35				
Atterberg Limits	Liquid Limit	%	53	47				
	Plastic Limit	%	25	22				
	Plasticity Index	%	28	25				
Particle Size Analysis	Gravel	%	1	0				
	Sand	%	20	16				
	Silt	%	27	38				
	Clay	%	52	46				
Particle Density of Soil		Mg/m^3	2.65	2.65				
Triaxial Compression	Type of Test*1			UU				
	Cohesion (c / c')	kPa		33				
	Phi Angle (φ / φ')	Degree		0				
Consolidation	Initial Void Ratio							
	Preconsolidation Pre:	kN/m^2						
	Compression Index							
Chemical Test Soil	Acid Soluble Sulphate Content	%						
	Organic Content	%						
	Water Soluble Sulpate Content	%						
	Chloride Content	%						
	pH Value							
Chemical Test Water	Ph Value		6.8					
	Total Sulphate Content	%	0.010					
	Chloride Content	%						

Legend :

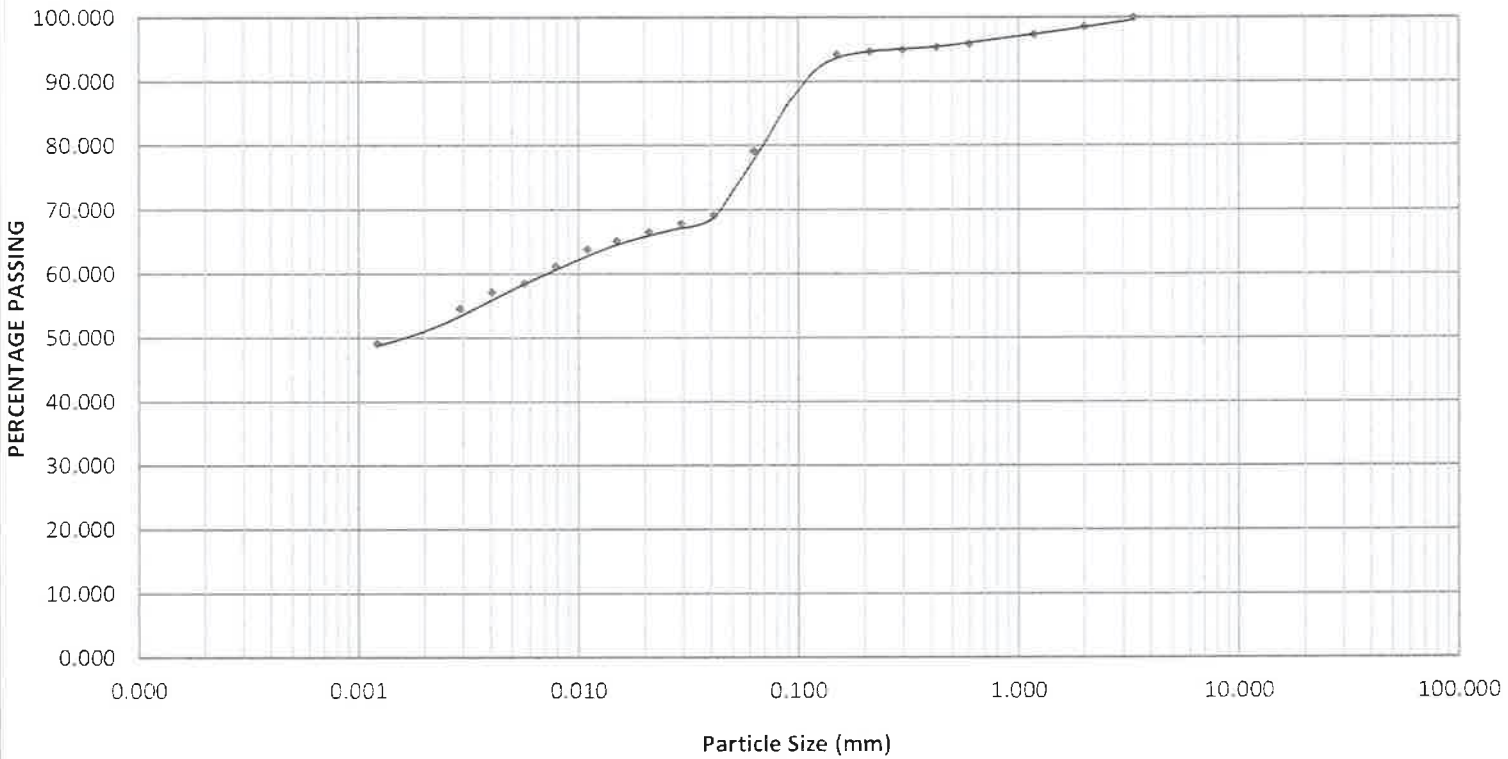
*1	UU	- Unconsolidated Undrained	*2	D	-	Diameteral
	CU	- Consolidated Undrained		A	-	Axial
	CD	- Consolidated Drained		I	-	Irregular
	QU	- Quick Undrained				
	SUU	- Saturated UU w/pore water pressure				
	UC	- Unconfined Compression				
	MUU	- Multistage Unconsolidated Undrained				
	MCU	- Multistage Consolidated Undrained				
	MCD	- Multistage Consolidation Drained				

TÜV SÜD AL Technologies Pte. Ltd. Co. Regn. No. 199503128M

Test Report No. 7362011662
dated 17/01/2017

AL Technologies

B.S. 1377 PART 2: 1990 PARTICLE SIZE ANALYSIS TEST



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	C
	SILT			SAND			GRAVEL			

Material Description:

Greenish grey slightly sandy CLAY with silt and traces of gravel

Gravel	:	1 %
Sand	:	20 %
Silt	:	27 %
Clay	:	52 %

Detailed Particle Size Distribution

Grading (mm)	% Passing BS Sieve
3.35	100.00
2.0	98.51
1.180	97.27
0.600	95.81
0.425	95.32
0.300	94.94
0.212	94.64
0.150	94.18
0.063	79.09
0.041	69.08
0.029	67.75
0.021	66.42
0.015	65.09
0.011	63.76
0.008	61.11
0.006	58.45
0.004	57.12
0.003	54.47
0.001	49.15

AL Technologies

Project : [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS

Borehole No.: BH6

Sample Ref: . UD1

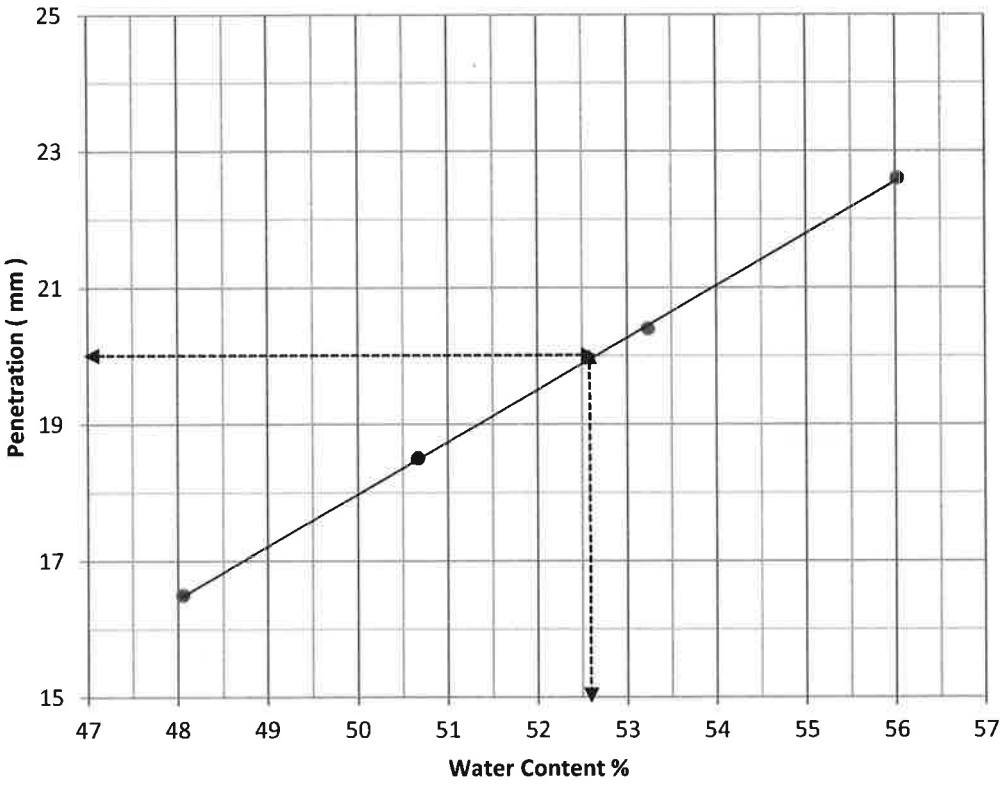
Location: Soil Investigation Works at Tengah Phase 1 & 2 Infra (WI059)

Depth: 3.00-4.00m

Test Report No. 7362011662
dated 18-Jan-17

AL Technologies

BS 1377 PART 2: 1990 ATTERBERG LIMIT (CONE PENETROMETER) TEST



HISTORY OF SAMPLE Wet Sieving Percentage of passing 0.425 mm Sieve 95 %

			LIQUID LIMIT %			PLASTIC LIMIT %	
Wet Weight + Tare	(g)	24.94	24.88	25.67	24.42	25.40	25.48
Dry Weight + Tare	(g)	19.51	19.24	19.59	18.51	23.15	23.40
Tare Weight	(g)	8.21	8.11	8.17	7.96	14.14	15.14
Water Content	%	48.05	50.67	53.24	56.02	24.97	25.18
Penetration	mm	16.5	18.5	20.4	22.6		

Liquid Limit	%	53
Plastic Limit	%	25
Plastic Index	%	28

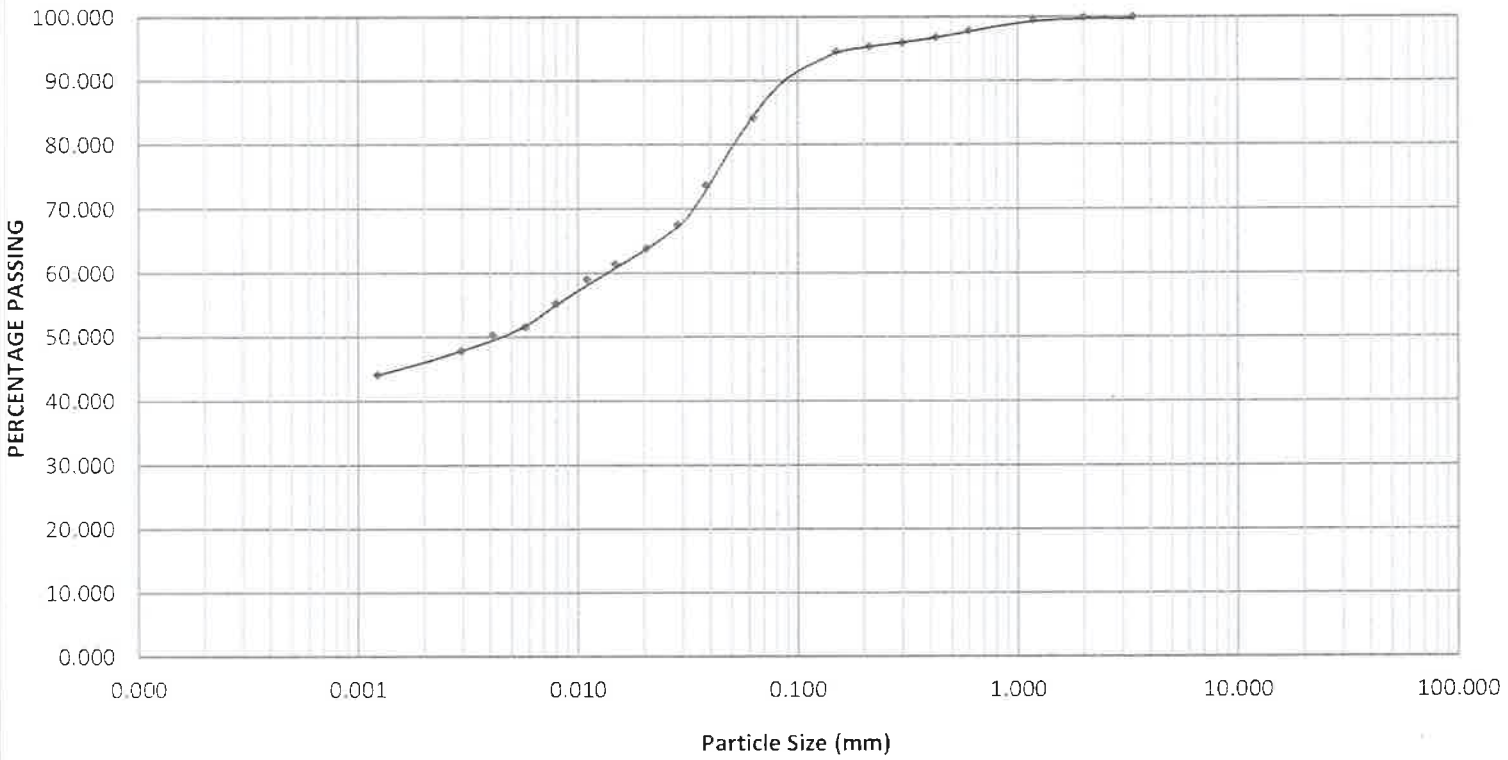
Sample Reference: BH6 Sample No: UD1 Depth: 3.00-4.00m
Material Description: Greenish grey slightly sandy CLAY with silt and traces of gravel
Location: Soil Investigation Works at Tengah Phase 1 & 2 Infra (WI059)
Project: [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS

TÜV SÜD AL Technologies Pte Ltd

Test Report No. 7362011662
dated 17/01/2017

AL Technologies

B.S. 1377 PART 2: 1990 PARTICLE SIZE ANALYSIS TEST



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	C
	SILT			SAND			GRAVEL			

Material Description:

Greenish grey slightly sandy CLAY with silt

Gravel	:	0 %
Sand	:	16 %
Silt	:	38 %
Clay	:	46 %

Detailed Particle Size Distribution

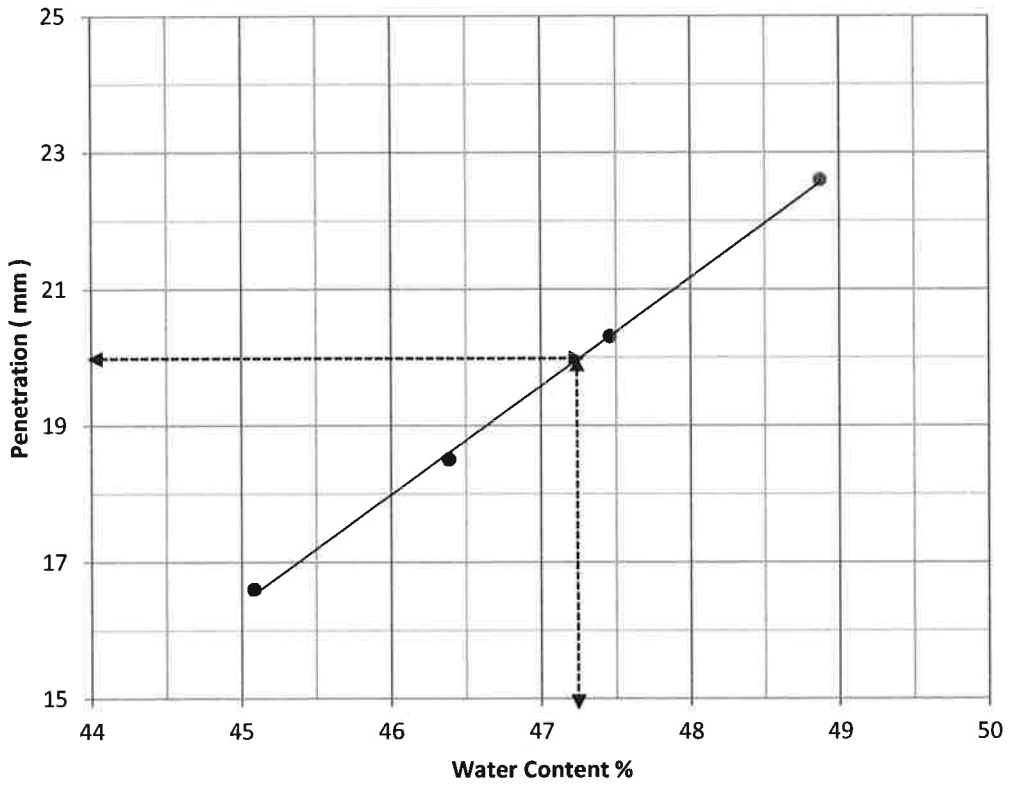
Grading (mm)	% Passing BS Sieve
3.35	100.00
2.00	99.86
1.18	99.48
0.600	97.77
0.425	96.78
0.300	95.92
0.212	95.37
0.150	94.54
0.063	84.12
0.038	73.64
0.028	67.50
0.021	63.82
0.015	61.37
0.011	58.91
0.008	55.23
0.006	51.55
0.004	50.32
0.003	47.87
0.001	44.18

Project : [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS	Borehole No.: BH6	Location: Soil Investigation Works at Tengah Phase 1 & 2 Infra (WI059)
	Sample Ref: . UD2	Depth: 6.00-7.00m

Test Report No. 7362011662
dated 18-Jan-17

AL Technologies

BS 1377 PART 2: 1990 ATTERBERG LIMIT (CONE PENETROMETER) TEST



HISTORY OF SAMPLE Wet Sieving Percentage of passing 0.425 mm Sieve 97 %

		LIQUID LIMIT %				PLASTIC LIMIT %	
Wet Weight + Tare	(g)	25.97	25.76	26.06	25.95	25.42	25.12
Dry Weight + Tare	(g)	20.42	20.24	20.27	20.10	23.56	23.15
Tare Weight	(g)	8.11	8.34	8.07	8.13	15.20	14.20
Water Content	%	45.09	46.39	47.46	48.87	22.25	22.01
Penetration	mm	16.6	18.5	20.3	22.6		

Liquid Limit	%	47
Plastic Limit	%	22
Plastic Index	%	25

Sample Reference: BH6 Sample No: UD2 Depth: 6.00-7.00m
Material Description: Greenish grey slightly sandy CLAY with silt
Location: Soil Investigation Works at Tengah Phase 1 & 2 Infra (WI059)
Project: [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS

TÜV SÜD AL Technologies Pte Ltd

Total Stress Triaxial Compression

Unconsolidated Undrained

Sample details

Sketch showing specimen location in original Sample

Depth 6.00-7.00m
Description: Soft greenish grey slightly sandy CLAY with silt

	Specimen 1	Specimen 2	Specimen 3
Type			
Height H_0 (mm)	76	76	76
Diameter D_0 (mm)	38	38	38
Weight W_0 (gr)	170.2	155.4	155.3
Bulk Density ρ (Mg/m3)	1.97	1.80	1.80
Particle Density ρ_s	2.65 (assumed)	2.65 (assumed)	2.65 (assumed)

Initial Conditions

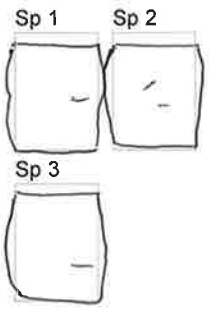
	Specimen 1	Specimen 2	Specimen 3
Cell Pressure $\sigma 3$ (kPa)	60.00	120.00	240.00
Machine Speed d_r(mm/min)	1.520	1.520	1.520
No. of Membranes	1	1	1
Total Thickness (mm)	0.2	0.2	0.2
Strain Channel	13	16	20
Load Channel	10	15	18
Moisture Content w_0%	36	36	39
Dry Density ρ_{d0} (Mg/m3)	1.46	1.32	1.30
Voids Ratio e_0	0.82	1.00	1.04
Deg of Saturation S_0%	100.00	95.59	98.43

Final Condition

	Specimen 1	Specimen 2	Specimen 3
Max Deviator Stress (kPa)	57.63	69.36	75.05
Membrane Correction σ_{mb} (kPa)	1.20	1.48	1.30
Corr Stress $(\sigma_1 - \sigma_3)_c$ (kPa)	56.43	67.88	73.75
Strain at Failure ε_f%	10.46	12.59	11.34
Shear Strength c_u (kPa)	28.22	33.94	36.87
Moisture Content w_f%	35	36	38
Dry Density ρ_{df} (Mg/m3)	1.46	1.33	1.30
Voids Ratio e_f	0.81	1.00	1.03
Deg of Saturation S_f%	100.00	95.27	98.01

Notes:

Failure Sketch



Surface Inclination

[Test Method : BS1377 : Part 7 : 1990 : 8/9*
(* delete as appropriate)

Test name UU6-2 (SS, M8)
Date of Test: 07/01/17

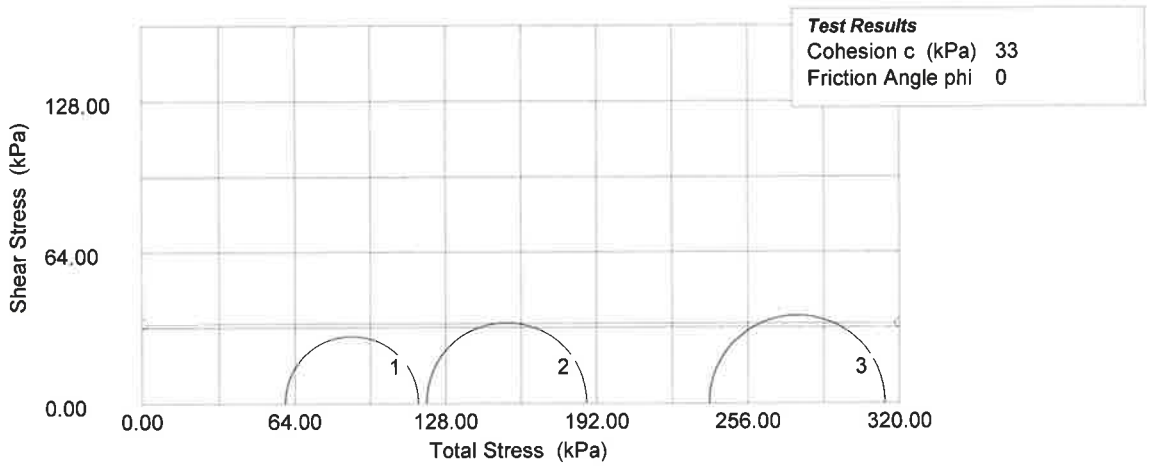
Site Reference: TENGAH PHASE 1&2 INFFRA
Jobfile: C:\WINCLISP\2016\WI-059.JOB

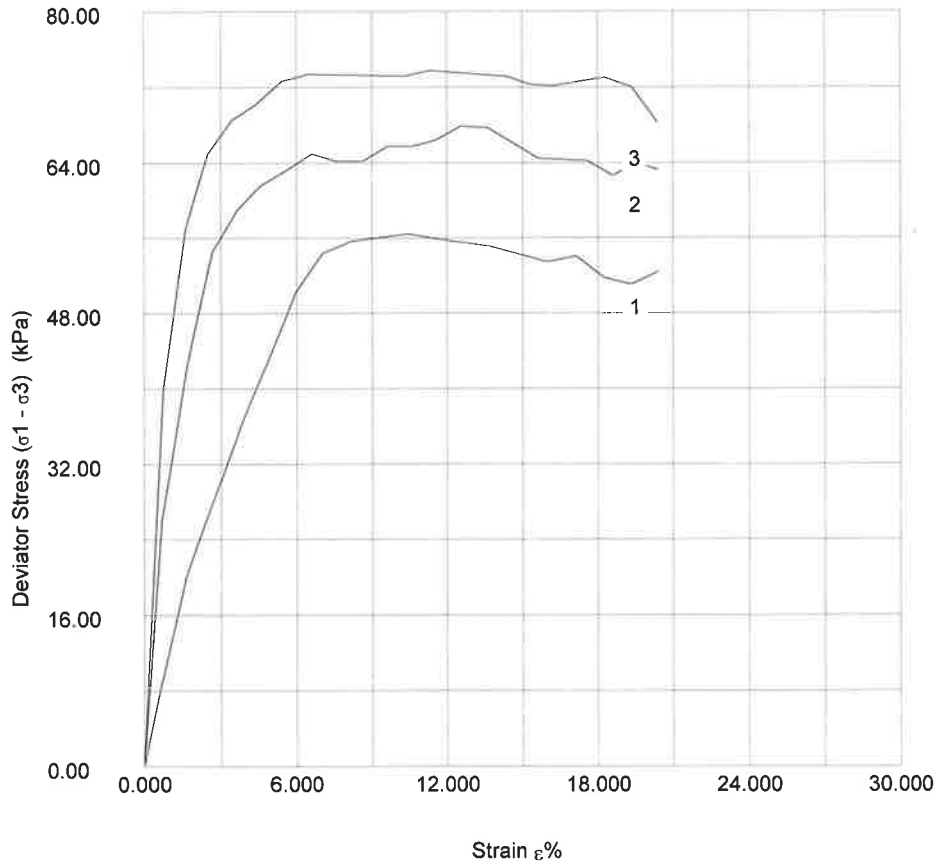
Sample: UD-2
Borehole: BH-6

Operator: *Checked:* *Approved:*

Total Stress Triaxial Compression

Unconsolidated Undrained





[Test Method : BS1377 : Part 7 : 1990 : 8/9 (* delete as appropriate)		Test name Date of Test:	UU6-2 (SS, M8) 07/01/17
Site Reference: Jobfile:	TENGAH PHASE 1&2 INFFRA C:\WINCLISP\2016\WI-059.JOB	Sample: Borehole:	UD-2 BH-6
Operator:	*Checked:*		*Approved:*

Test Report No. 7362011662
dated 24-Jan-2017

TÜV SÜD
AL Technologies

SUMMARY OF TEST RESULTS

PROJECT :	D/250/14] TERM CONTRACT NO.35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS							
LOCATION :	Soil Investigation Works at Tengah Phase 1 & 2 Infra (WI059)							
BOREHOLE NO.			BH7					
SAMPLE REF.			UD1					
DEPTH (m)		From	3.00					
		To	4.00					
Natural Moisture Content			42					
Density	Bulk Density	Mg/m3	1.81					
	Dry Density	Mg/m3	1.27					
Atterberg Limits	Liquid Limit	%	51					
	Plastic Limit	%	19					
	Plasticity Index	%	32					
Particle Size Analysis	Gravel	%	2					
	Sand	%	22					
	Silt	%	37					
	Clay	%	39					
Particle Density of Soil		Mg/m^3	2.64					
Triaxial Compression	Type of Test*1		UU					
	Cohesion (c / c')	kPa	**					
	Phi Angle (φ / φ')	Degree	**					
Consolidation	Initial Void Ratio							
	Preconsolidation Pre:	kN/m^2						
	Compression Index							
Chemical Test Soil	Acid Soluble Sulphate Content	%	0.04					
	Organic Content	%						
	Water Soluble Sulpate Content	%						
	Chloride Content	%						
	pH Value		6.4					
Chemical Test Water	Ph Value							
	Total Sulphate Content	%						
	Chloride Content	%						

Legend :

*1	UU	- Unconsolidated Undrained	*2	D	-	Diameteral
	CU	- Consolidated Undrained		A	-	Axial
	CD	- Consolidated Drained		I	-	Irregular
	QU	- Quick Undrained				
	SUU	- Saturated UU w/pore water pressure				
	UC	- Unconfined Compression				
	MUU	- Multistage Unconsolidated Undrained				
	MCU	- Multistage Consolidated Undrained				
	MCD	- Multistage Consolidation Drained				

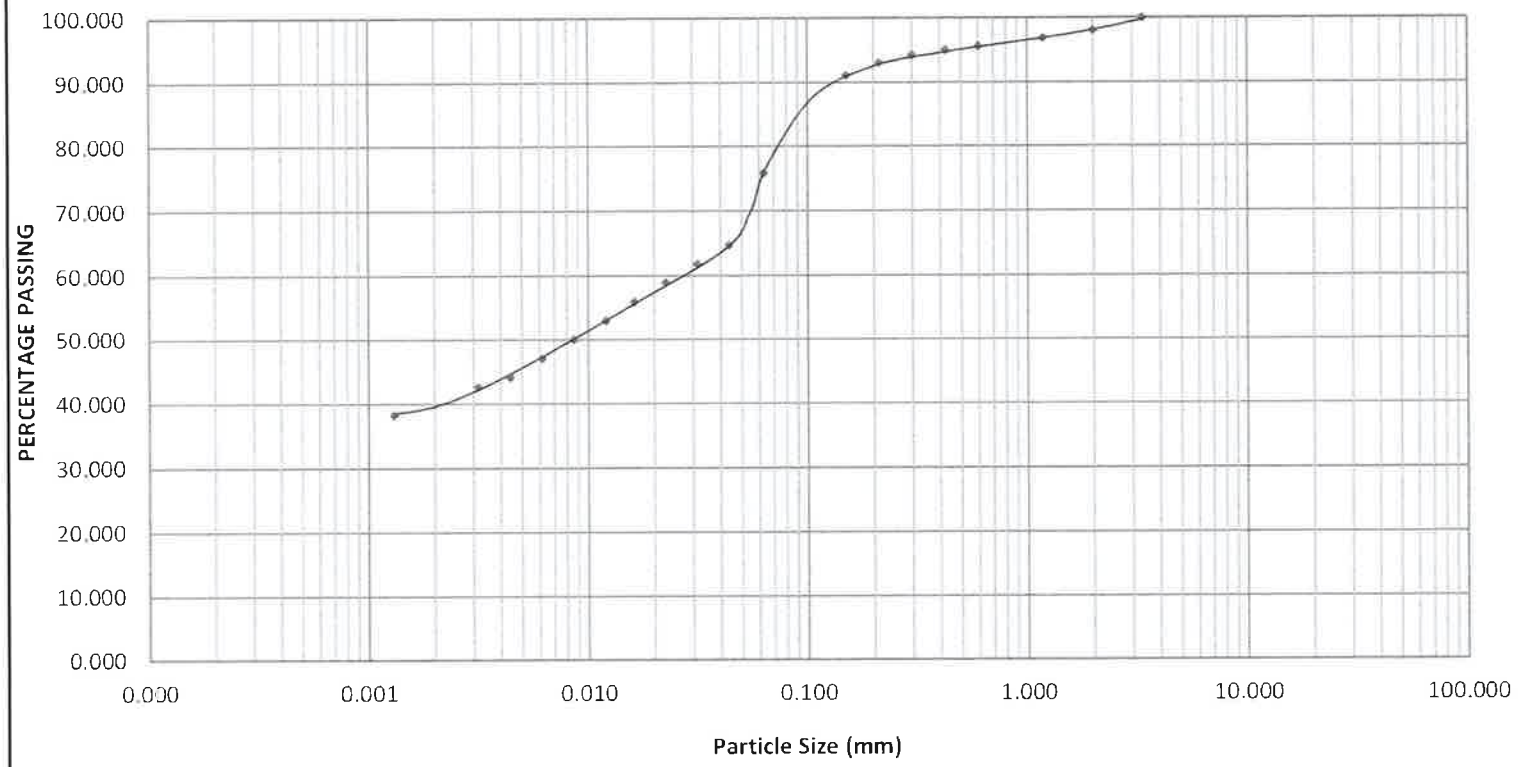
** Test cancel as sample is inadequate for testing

AL Technologies Co. Reg. No. 198805122

Test Report No. 7362011662
dated 19-Jan-17

AL Technologies

B.S. 1377 PART 2: 1990 PARTICLE SIZE ANALYSIS TEST



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	C
	SILT			SAND			GRAVEL			

Material Description:

Reddish brown slightly sandy CLAY with silt and traces of gravel

Gravel	:	2 %
Sand	:	22 %
Silt	:	37 %
Clay	:	39 %

Detailed Particle Size Distribution

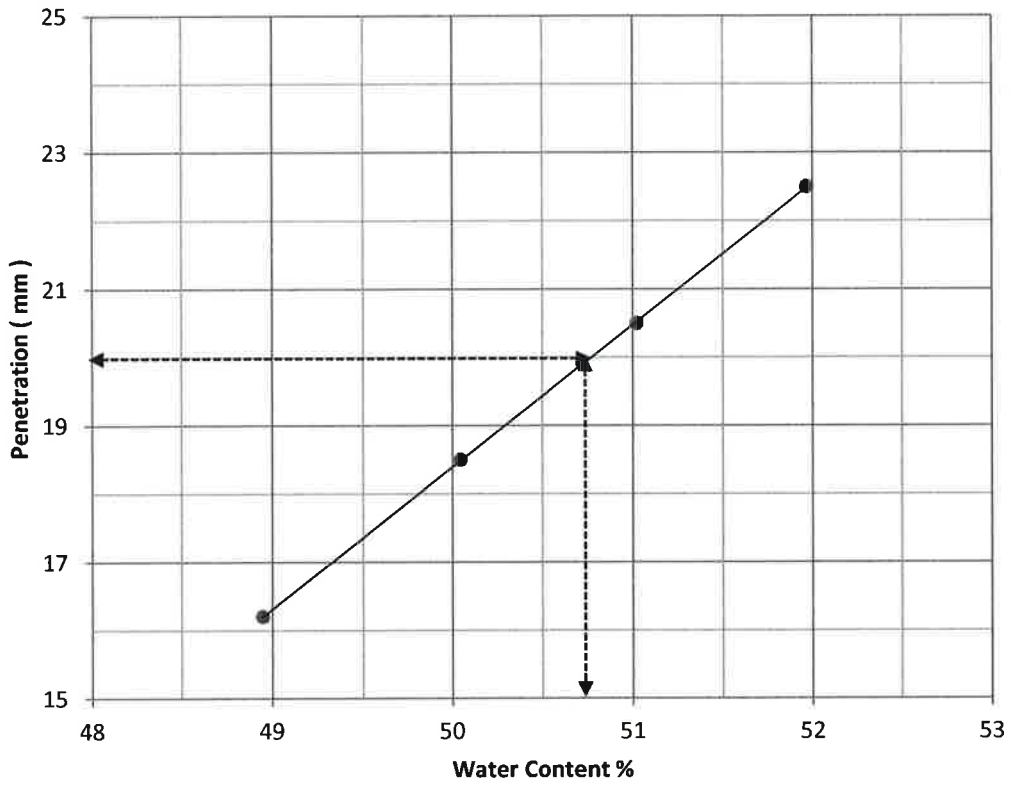
Grading (mm)	% Passing BS Sieve
3.35	100.00
2.0	98.00
1.18	96.81
0.6	95.56
0.425	95.00
0.3	94.24
0.212	93.05
0.15	91.07
0.063	75.84
0.044	64.76
0.032	61.82
0.023	58.87
0.016	55.93
0.012	52.99
0.009	50.04
0.006	47.10
0.004	44.15
0.003	42.68
0.001	38.27

Project : [D/250/14] TERM CONTRACT NO.35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30MONTHS	Borehole No.:	BH7	Location: Tengah Phase 1 & 2 Infra (WI059)
	Sample Ref: .	UD1	Depth: 3.00-4.00m

Test Report No. 7362011662
dated 19-Jan-17

AL Technologies

BS 1377 PART 2: 1990 ATTERBERG LIMIT (CONE PENETROMETER) TEST



HISTORY OF SAMPLE Wet Sieving Percentage of passing 0.425 mm Sieve 95 %

		LIQUID LIMIT %				PLASTIC LIMIT %	
Wet Weight + Tare	(g)	23.95	24.83	23.61	24.66	25.50	25.20
Dry Weight + Tare	(g)	18.84	19.34	18.37	18.98	24.00	23.67
Tare Weight	(g)	8.40	8.37	8.10	8.05	16.16	15.71
Water Content	%	48.95	50.05	51.02	51.97	19.13	19.22
Penetration	mm	16.2	18.5	20.5	22.5		

Liquid Limit	%	51
Plastic Limit	%	19
Plastic Index	%	32

Sample Reference: BH7 Sample No: UD1 Depth: 3.00-4.00m
Material Description: Reddish brown slightly slightly sandy CLAY with silt and traces of gravel
Location: Tengah Phase 1 & 2 Infra (WI059)
Project: [D/250/14] TERM CONTRACT NO.35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS

TÜV SÜD AL Technologies Pte Ltd

Test Report No. 7362011662
dated 24-Jan-2017

AL Technologies

SUMMARY OF TEST RESULTS

PROJECT :	**D/250/14] TERM CONTRACT NO.35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS**							
LOCATION :	**Soil Investigation Works at Tengah Phase 1 & 2 Infra (WI059)**							
BOREHOLE NO.			BH8					
SAMPLE REF.			UD1					
DEPTH (m)		From	3.00					
		To	3.50					
Natural Moisture Content		%	32					
Density	Bulk Density	Mg/m3	1.77					
	Dry Density	Mg/m3	1.34					
Atterberg Limits	Liquid Limit	%	38					
	Plastic Limit	%	26					
	Plasticity Index	%	12					
Particle Size Analysis	Gravel	%	0					
	Sand	%	11					
	Silt	%	68					
	Clay	%	21					
Particle Density of Soil		Mg/m^3	2.64					
Triaxial Compression	Type of Test*1							
	Cohesion (c / c')	kPa						
	Phi Angle (φ / φ')	Degree						
Consolidation	Initial Void Ratio							
	Preconsolidation Pre:	kN/m^2						
	Compression Index							
Chemical Test Soil	Acid Soluble Sulphate Content	%	0.03					
	Organic Content	%						
	Water Soluble Sulpate Content	%						
	Chloride Content	%						
	pH Value		6.8					
Chemical Test Water	Ph Value							
	Total Sulphate Content	%						
	Chloride Content	%						

Legend :

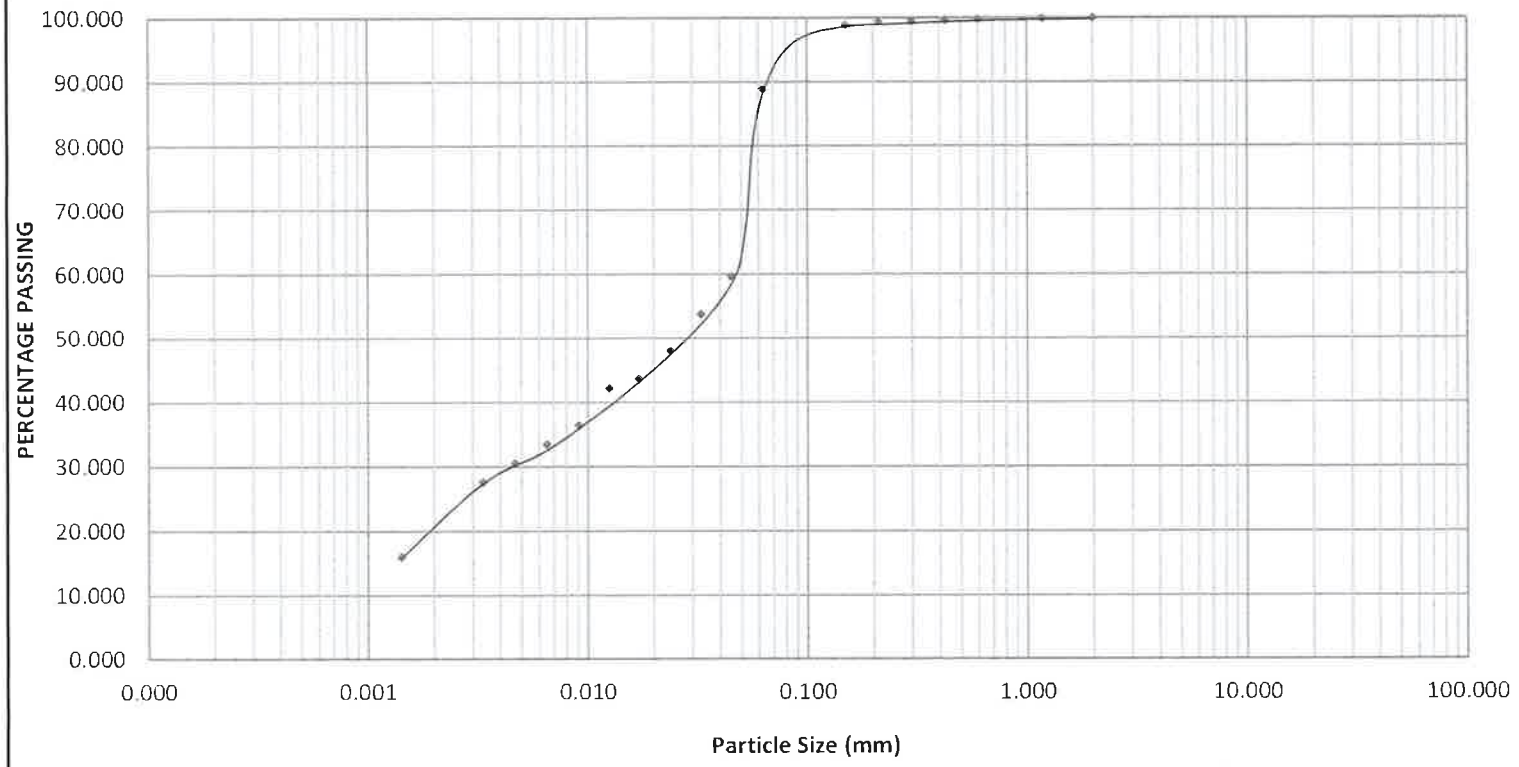
*1	UU	- Unconsolidated Undrained	*2	D	- Diameteral
	CU	- Consolidated Undrained		A	- Axial
	CD	- Consolidated Drained		I	- Irregular
	QU	- Quick Undrained			
	SUU	- Saturated UU w/pore water pressure			
	UC	- Unconfined Compression			
	MUU	- Multistage Unconsolidated Undrained			
	MCU	- Multistage Consolidated Undrained			
	MCD	- Multistage Consolidation Drained			

AL Technologies Pte Ltd * TUV SUD * Co. Reg. No. 199905178W

Test Report No. 7362011662
dated 19-Jan-17

AL Technologies

B.S. 1377 PART 2: 1990 PARTICLE SIZE ANALYSIS TEST



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	C
	SILT			SAND			GRAVEL			

Material Description:

Reddish brown slightly sandy SILT with clay

Gravel	:	0 %
Sand	:	11 %
Silt	:	68 %
Clay	:	21 %

Detailed Particle Size Distribution

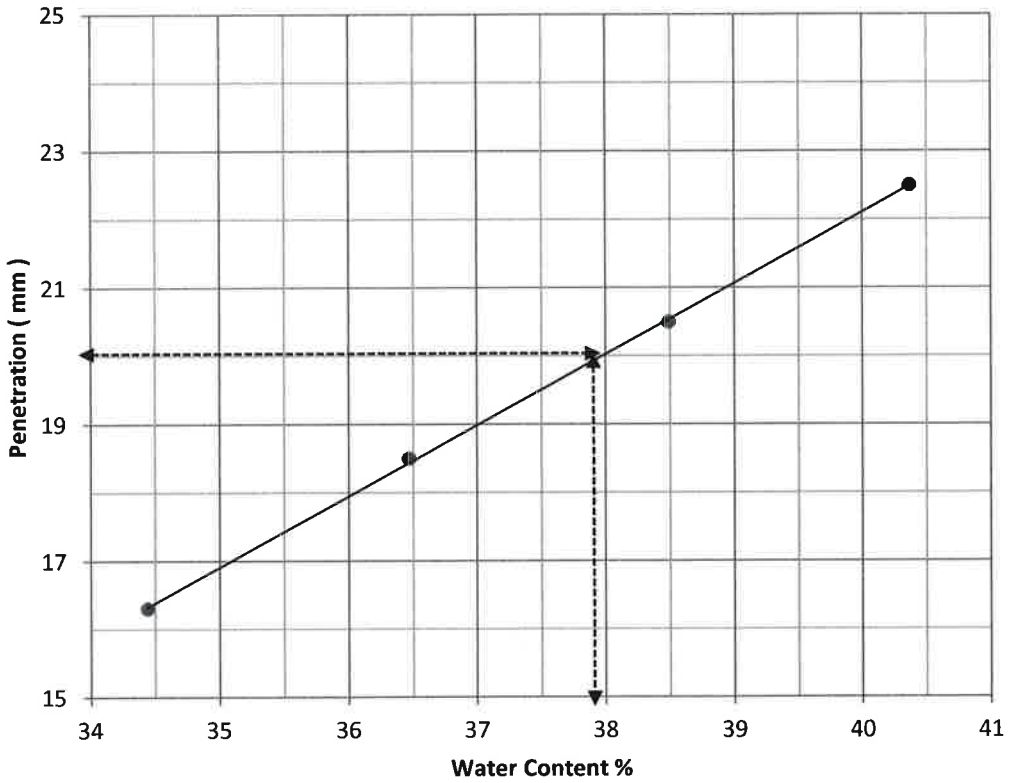
Grading (mm)	% Passing BS Sieve
2	100.00
1.18	99.91
0.6	99.75
0.425	99.66
0.3	99.51
0.212	99.29
0.15	98.84
0.063	88.86
0.045	59.63
0.033	53.82
0.024	48.00
0.017	43.64
0.013	42.18
0.009	36.36
0.007	33.45
0.005	30.54
0.003	27.64
0.001	16.00

Project : [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS	Borehole No.: BH8	Location: Tengah Phase 1 & 2 Infra (WI059)
	Sample Ref: . UD1	Depth: 3.00-3.50m

Test Report No. 7362011662
dated 19-Jan-17

AL Technologies

BS 1377 PART 2: 1990 ATTERBERG LIMIT (CONE PENETROMETER) TEST



HISTORY OF SAMPLE Wet Sieving Percentage of passing 0.425 mm Sieve 100 %

		LIQUID LIMIT %				PLASTIC LIMIT %	
Wet Weight + Tare	(g)	25.57	25.37	24.98	24.85	25.57	25.30
Dry Weight + Tare	(g)	21.11	20.76	20.28	20.05	23.21	23.10
Tare Weight	(g)	8.16	8.12	8.07	8.16	14.04	14.50
Water Content	%	34.44	36.47	38.49	40.37	25.74	25.58
Penetration	mm	16.3	18.5	20.5	22.5		

Liquid Limit	%	38
Plastic Limit	%	26
Plastic Index	%	12

Sample Reference: BH8 Sample No: UD1 Depth: 3.00-3.50m
Material Description: Reddish brown slightly sandy SILT with clay
Location: Tengah Phase 1 & 2 Infra (WI059)
Project: [D/250/14] TERM CONTRACT NO.35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS

TÜV SÜD AL Technologies Pte Ltd

Test Report No. 7362011662
dated 9-Jan-2017

AL Technologies

SUMMARY OF TEST RESULTS

PROJECT :	D/250/14] TERM CONTRACT NO.35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS							
LOCATION :	Soil Investigation Works at Tengah Phase 1 & 2 Infra (WI059)							
BOREHOLE NO.			BH9	BH9				
SAMPLE REF.			UD1	UD2				
DEPTH (m)		From	3.00	6.00				
		To	4.00	7.00				
Natural Moisture Content		%	33	26				
Density	Bulk Density	Mg/m3	1.82	1.85				
	Dry Density	Mg/m3	1.37	1.47				
Atterberg Limits	Liquid Limit	%	38	44				
	Plastic Limit	%	18	27				
	Plasticity Index	%	20	17				
Particle Size Analysis	Gravel	%	9	0				
	Sand	%	47	67				
	Silt	%	22	21				
	Clay	%	22	12				
Particle Density of Soil		Mg/m^3	2.64	2.64				
Triaxial Compression	Type of Test*1			CU				
	Cohesion (c / c')	kPa		5				
	Phi Angle (φ / φ')	Degree		33				
Consolidation	Initial Void Ratio							
	Preconsolidation Pre:	kN/m^2						
	Compression Index							
Chemical Test Soil	Acid Soluble Sulphate Content	%						
	Organic Content	%						
	Water Soluble Sulpate Content	%						
	Chloride Content	%						
	pH Value							
Chemical Test Water	Ph Value							
	Total Sulphate Content	%						
	Chloride Content	%						

Legend :

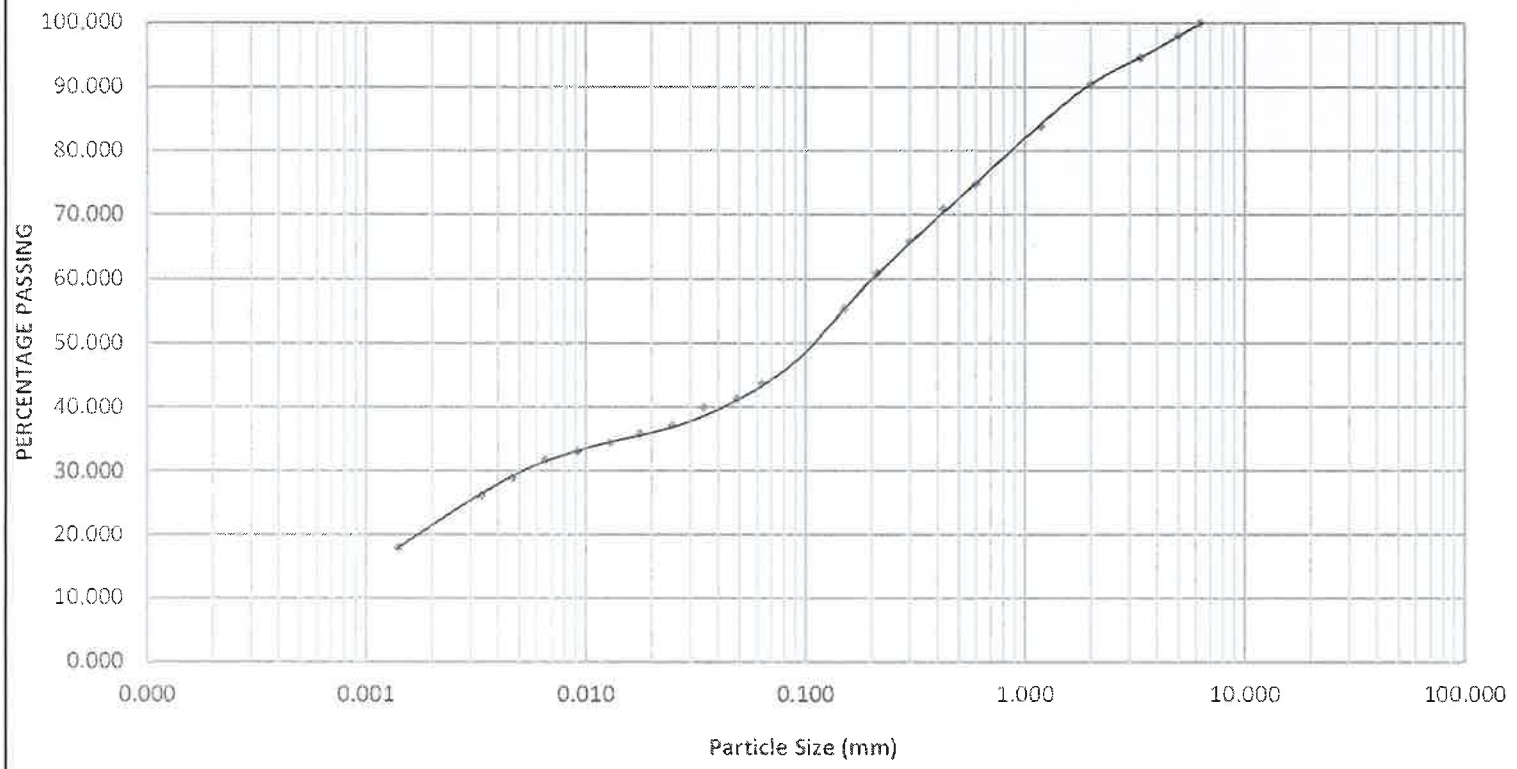
*1	UU	- Unconsolidated Undrained	*2	D	-	Diameteral
	CU	- Consolidated Undrained		A	-	Axial
	CD	- Consolidated Drained		I	-	Irregular
	QU	- Quick Undrained				
	SUU	- Saturated UU w/pore water pressure				
	UC	- Unconfined Compression				
	MUU	- Multistage Unconsolidated Undrained				
	MCU	- Multistage Consolidated Undrained				
	MCD	- Multistage Consolidation Drained				

TÜV SUD AL Technologies Pte Ltd

Test Report No. 7362011662
dated 6-Jan-17

AL Technologies

B.S. 1377 PART 2: 1990 PARTICLE SIZE ANALYSIS TEST



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	C
	SILT			SAND			GRAVEL			

Material Description:

Reddish brown mottled yellow slightly gravelly sandy CLAY with silt

Gravel	:	9 %
Sand	:	47 %
Silt	:	22 %
Clay	:	22 %

Detailed Particle Size Distribution

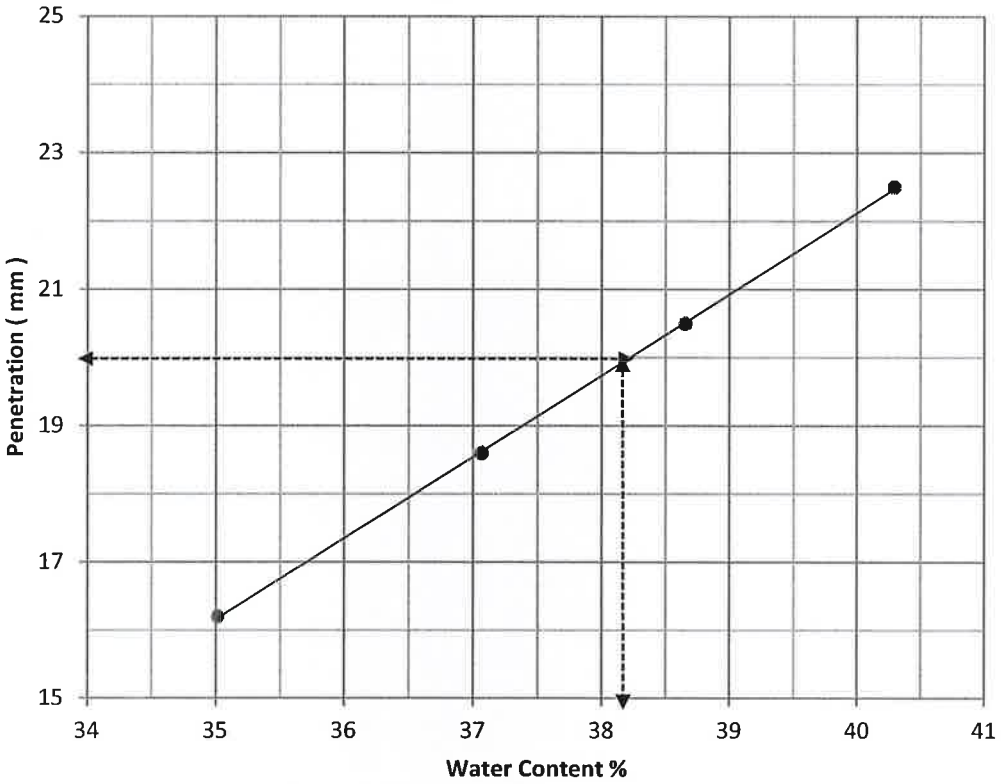
Grading (mm)	% Passing BS Sieve
6.3	100.00
5.0	98.03
3.4	94.70
2.0	90.39
1.18	83.93
0.600	74.87
0.425	70.85
0.300	65.84
0.212	60.84
0.150	55.40
0.063	43.64
0.049	41.36
0.035	39.98
0.025	37.22
0.018	35.84
0.013	34.46
0.009	33.09
0.007	31.71
0.005	28.95
0.003	26.19
0.001	17.92

Project : [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS	Borehole No.:	BH9	Location: Tengah Phase 1 & 2 Infra (WI059)
	Sample Ref: .	UD1	Depth: 3.00-4.00m

Test Report No. 7362011662
dated 5-Jan-17

AL Technologies

BS 1377 PART 2: 1990 ATTERBERG LIMIT (CONE PENETROMETER) TEST



HISTORY OF SAMPLE Wet Sieving Percentage of passing 0.425 mm Sieve 71 %

		LIQUID LIMIT %				PLASTIC LIMIT %	
Wet Weight + Tare	(g)	24.72	25.00	25.57	25.29	25.23	24.96
Dry Weight + Tare	(g)	20.42	20.50	20.68	20.37	23.68	23.53
Tare Weight	(g)	8.14	8.36	8.03	8.16	15.25	15.63
Water Content	%	35.02	37.07	38.66	40.29	18.39	18.10
Penetration	mm	16.2	18.6	20.5	22.5		

Liquid Limit	%	38
Plastic Limit	%	18
Plastic Index	%	20

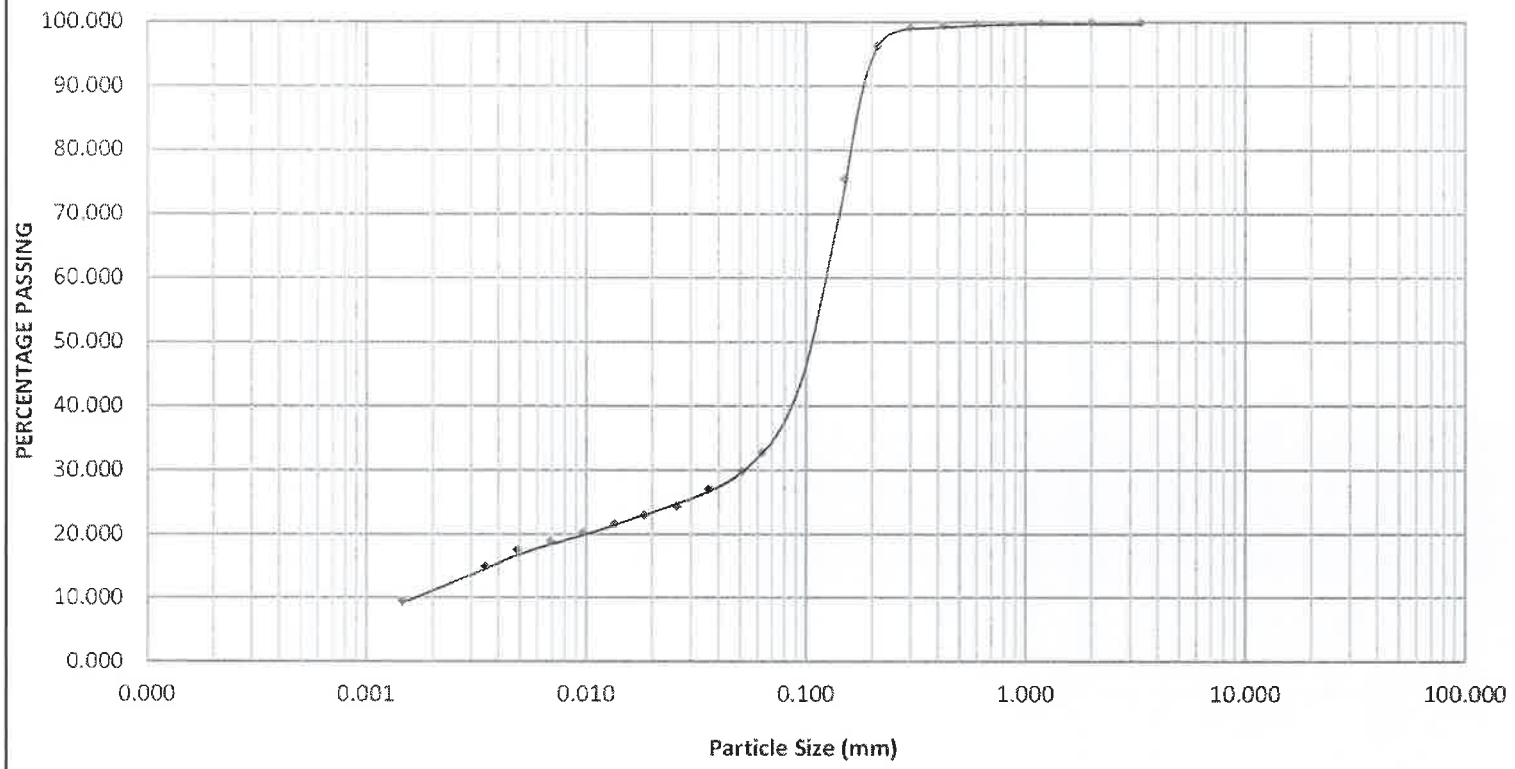
Sample Reference: BH9 Sample No: UD1 Depth: 3.00-4.00m
Material Description: Reddish brown mottled yellow slightly gravelly sandy CLAY with silt
Location: Tengah Phase 1 & 2 Infra (WI059)
Project: [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS

TÜV SÜD AL Technologies Pte Ltd

Test Report No. 7362011662
dated 6-Jan-17

TÜV SÜD AL Technologies

B.S. 1377 PART 2: 1990 PARTICLE SIZE ANALYSIS TEST



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	C
	SILT			SAND			GRAVEL			

Material Description:

Red mottled yellow very sandy SILT with clay

Gravel	:	0 %
Sand	:	67 %
Silt	:	21 %
Clay	:	12 %

Detailed Particle Size Distribution

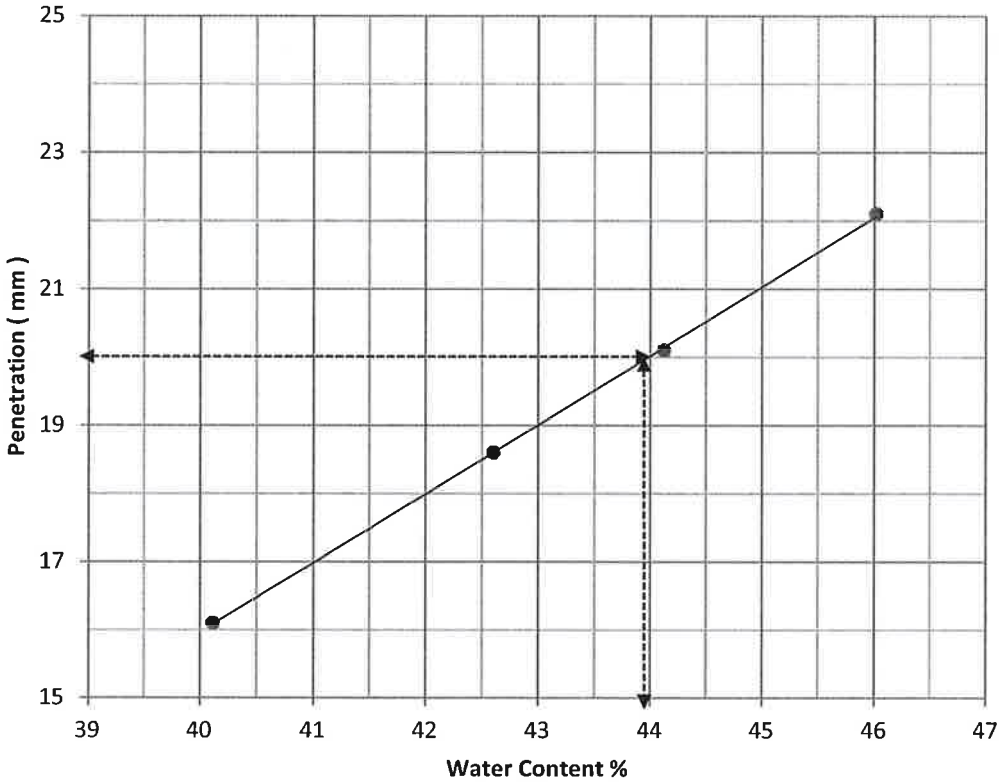
Grading (mm)	% Passing BS Sieve
3.4	100.00
2.0	99.95
1.2	99.92
0.6	99.65
0.425	99.44
0.3	99.19
0.212	96.14
0.15	75.50
0.063	32.70
0.051	29.77
0.036	27.06
0.026	24.35
0.019	23.00
0.014	21.65
0.010	20.30
0.007	18.94
0.005	17.59
0.003	14.88
0.001	9.47

Project : [D/250/14] TERM CONTRACT NO.35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30MONTHS	Borehole No.:	BH9	Location: Tengah Phase 1 & 2 Infra (WI059)
	Sample Ref: .	UD2	Depth: 6.00-7.00m

Test Report No. 7362011662
dated 5-Jan-17

AL Technologies

BS 1377 PART 2: 1990 ATTERBERG LIMIT (CONE PENETROMETER) TEST



HISTORY OF SAMPLE Wet Sieving Percentage of passing 0.425 mm Sieve 99 %

		LIQUID LIMIT %				PLASTIC LIMIT %	
Wet Weight + Tare	(g)	25.07	25.85	24.64	24.16	25.23	25.40
Dry Weight + Tare	(g)	20.24	20.55	19.57	19.13	23.10	23.00
Tare Weight	(g)	8.20	8.11	8.08	8.20	15.15	14.00
Water Content	%	40.12	42.60	44.13	46.02	26.79	26.67
Penetration	mm	16.1	18.6	20.1	22.1		
Liquid Limit	%	44					
Plastic Limit	%	27					
Plastic Index	%	17					

Sample Reference: BH9 Sample No: UD2 Depth: 6.00-7.00m
Material Description: Red mottled yellow very sandy SILT with clay
Location: Tengah Phase 1 & 2 Infra (WI059)
Project: [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS

TÜV SÜD AL Technologies Pte Ltd

Effective Stress Triaxial Compression

Consolidated Undrained

Sample details

Sketch showing specimen location in original Sample

Depth 6.00-7.00m
Description: Red mottled yellow very sandy SILT wtih clay

	Specimen 1	Specimen 2	Specimen 3
Type			
Height H_0 (mm)	76	76	76
Diameter D_0 (mm)	38	38	38
Weight W_0 (gr)	157.6	160.5	159.4
Bulk Density ρ (Mg/m3)	1.83	1.86	1.85
Particle Density ρ_s	2.65 (assumed)	2.65 (assumed)	2.65 (assumed)

Initial Conditions

	Specimen 1	Specimen 2	Specimen 3
Cell Pressure σ_3 (kPa)	360.00	420.00	540.00
Pore Pressure u (kPa)	300.00	300.00	300.00
Machine Speed d_r(mm/min)	0.060	0.060	0.060
No. of Membranes	1	1	1
Total Thickness (mm)	0.2	0.2	0.2
Strain Channel	8	16	20
Load Channel	7	15	18
Pore P. Channel	9	17	21
Volume Channel	14	31	22
Moisture Content w_0%	25	26	26
Dry Density ρ_{d0} (Mg/m3)	1.46	1.47	1.46
Voids Ratio e_0	0.82	0.80	0.81
Deg of Saturation S_0%	82.48	87.71	86.08
Final B Value	0.96	1.00	0.96

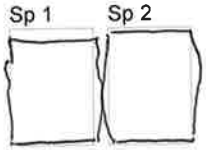
Final Conditions

	Specimen 1	Specimen 2	Specimen 3
Moisture Content w_f%	26	27	26
Dry Density ρ_d (Mg/m3)	1.47	1.58	1.56
Voids Ratio e_f	0.80	0.68	0.70
Deg of Saturation S_f%	84.96	100.00	98.19
Failure Criteria	Mx Dev Stress	Mx Dev Stress	Mx Dev Stress
Axial Strain ε_f%	17.5	14.2	11.3
Corr Dev Stress $(\sigma_1 - \sigma_3)f$ (kPa)	130.3	220.1	335.3
Minor Stress σ_{3f} (kPa)	47.0	83.0	130.5
Major Stress σ_{1f} (kPa)	177.3	303.1	465.8
Stress Ratio $(\sigma_1/\sigma_3)_f$	3.8	3.7	3.6

Notes:

Failure Sketch

Sp 1 Sp 2



Sp 3



Surface Inclination

Test Method : BS1377 : Part 8 : 1990 : 8/9*
(* delete as appropriate)

Test name CUBH9/UD2 (SS, MS)
Date of Test: 22/12/16

Site Reference: TENGAH PHASE 1&2 INFFRA
Jobfile: C:\WINCLISP\2016\WI-059.JOB

Sample: UD-2
Borehole: BH-9

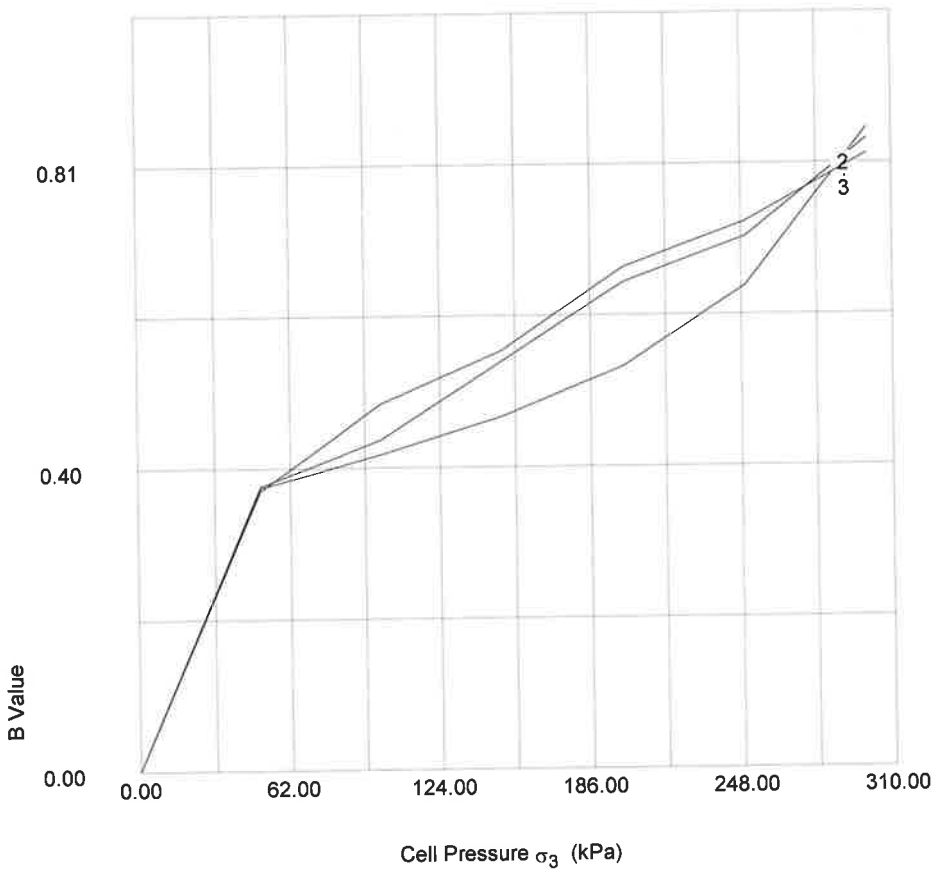
Operator: *Checked:* *Approved:*

TÜV SÜD AL Technologies Pte Ltd Co. Reg. No. 199905215M

Effective Stress Triaxial Compression

Consolidated Undrained

Saturation Stage Data	Specimen 1	Specimen 2	Specimen 3
Test Method:	Cell P. only	Cell P. And Back P.	Cell P. And Back P.
Final Cell Pressure σ_{3f} (kPa)	300.00	300.00	300.00
Final Pore Pressure u_f (kPa)	285.00	288.40	288.00
Final B Value	0.96	1.00	0.96



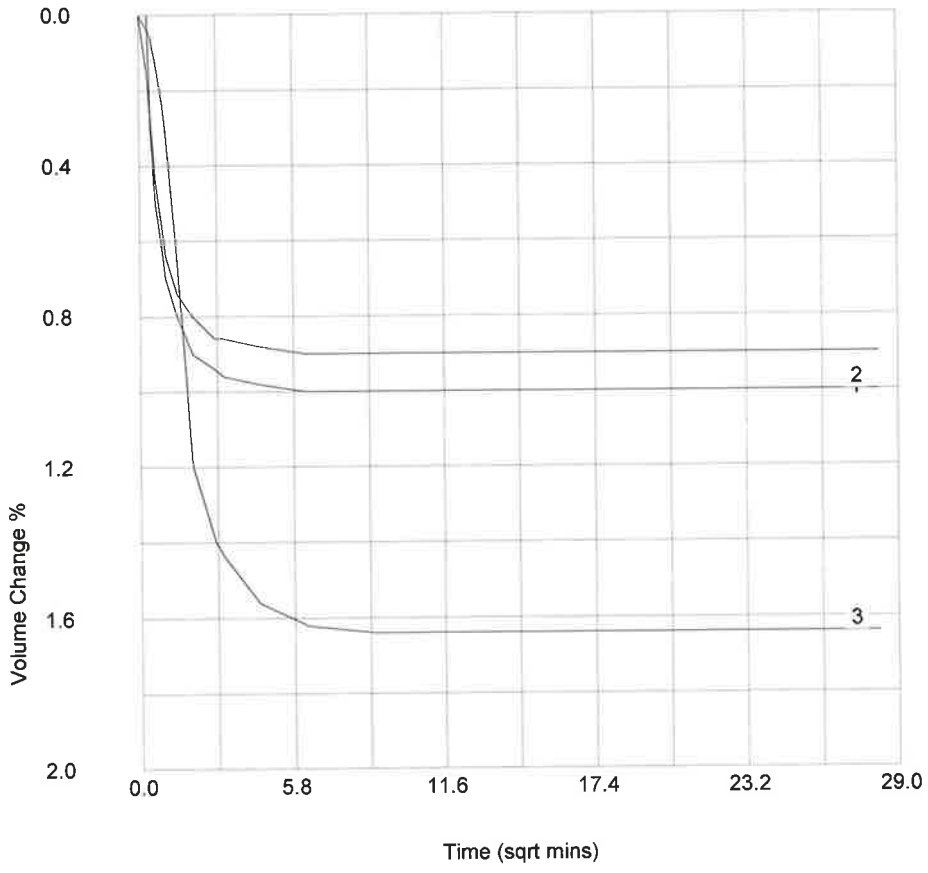
Test Method : BS1377 : Part 8 : 1990 : 8/9* (* delete as appropriate)		Test name	CUBH9/UD2 (SS, MS)
		Date of Test:	22/12/16
Site Reference:	TENGAH PHASE 1&2 INFFRA	Sample:	UD-2
Jobfile:	C:\WINCLISP\2016\WI-059.JOB	Borehole:	BH-9
Operator:	*Checked:*		*Approved:*

Effective Stress Triaxial Compression

Consolidated Undrained

Consolidation Initial Conditions	Specimen 1	Specimen 2	Specimen 3
Cell Pressure σ_3 (kPa)	360.00	420.00	540.00
Pore Pressure u_i (kPa)	352.00	405.00	530.00
Back Pressure u_b (kPa)	300.00	300.00	300.00
Drainage Method	Radial, One End	Radial, One End	Radial, One End

Consolidation Final Results	Specimen 1	Specimen 2	Specimen 3
Deg of Consolidation U%	97.1	99.0	95.7
Volumetric Strain ε_v%	1.0	7.0	6.2
Corr Length L_c (mm)	75.7	74.2	74.4
Corr Area A_c (mm)2	1126.2	1081.5	1087.3
Corr Volume V_c (cc)	85.3	80.3	80.9
t_{100} (min)	4.00	4.80	15.40
Coef. of Consolidation c_v (m2/year)	7.446	6.205	1.934
Coef. of Compressibility m_v (m2/MN)	0.207	0.112	0.086
Testing Time (min) t_f	7.2	8.64	27.72
Est Strain at Failure ε_f	10.0	10.0	10.0
Machine Speed d_r (mm/min)	1.05188	0.85922	0.26851



Test Method : BS1377 : Part 8 : 1990 : 8/9*
(* delete as appropriate)

Test name CUBH9/UD2 (SS, MS)
Date of Test: 22/12/16

Site Reference: TENGAH PHASE 1&2 INFFRA
Jobfile: C:\WINCLISP\2016\WI-059.JOB

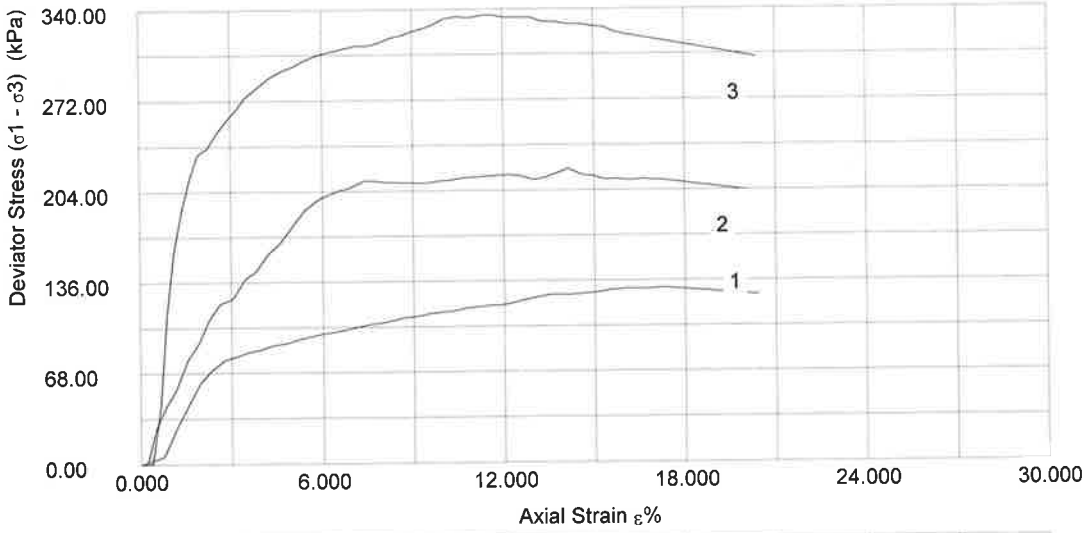
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Borehole: BH-9

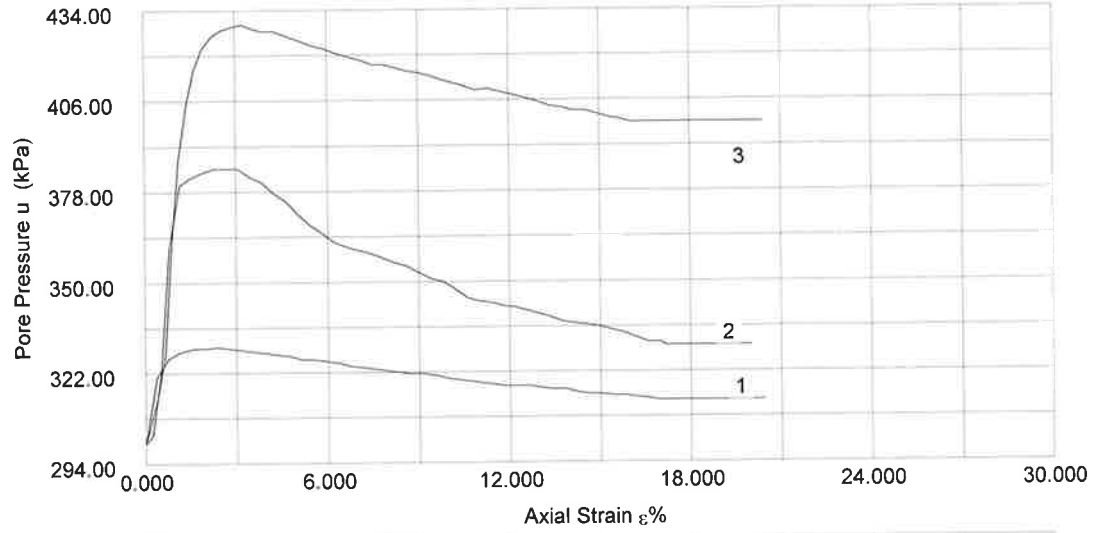
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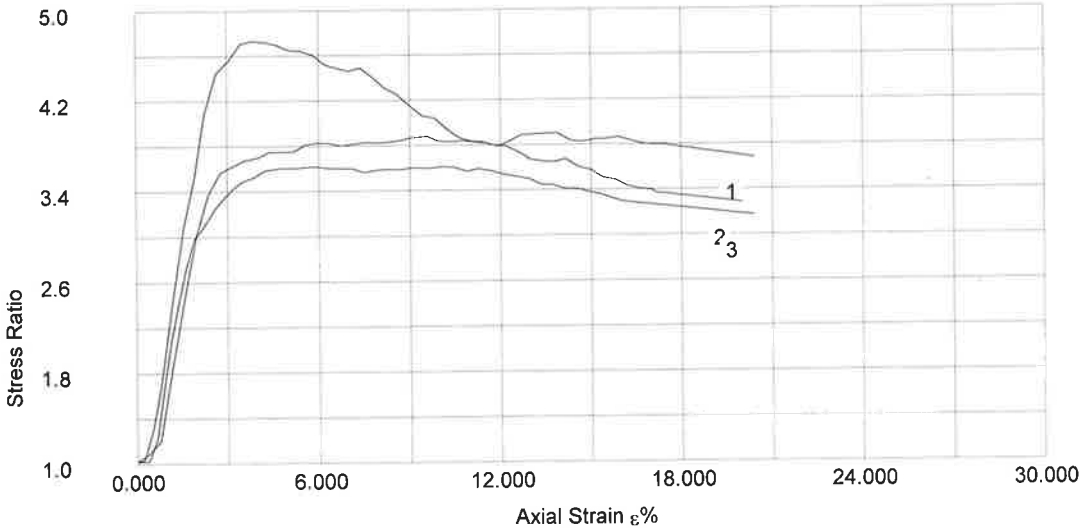
TÜV SÜD AL Technologies Pte Ltd * Co. Reg. No. 199905125W

Effective Stress Triaxial Compression

Consolidated Undrained





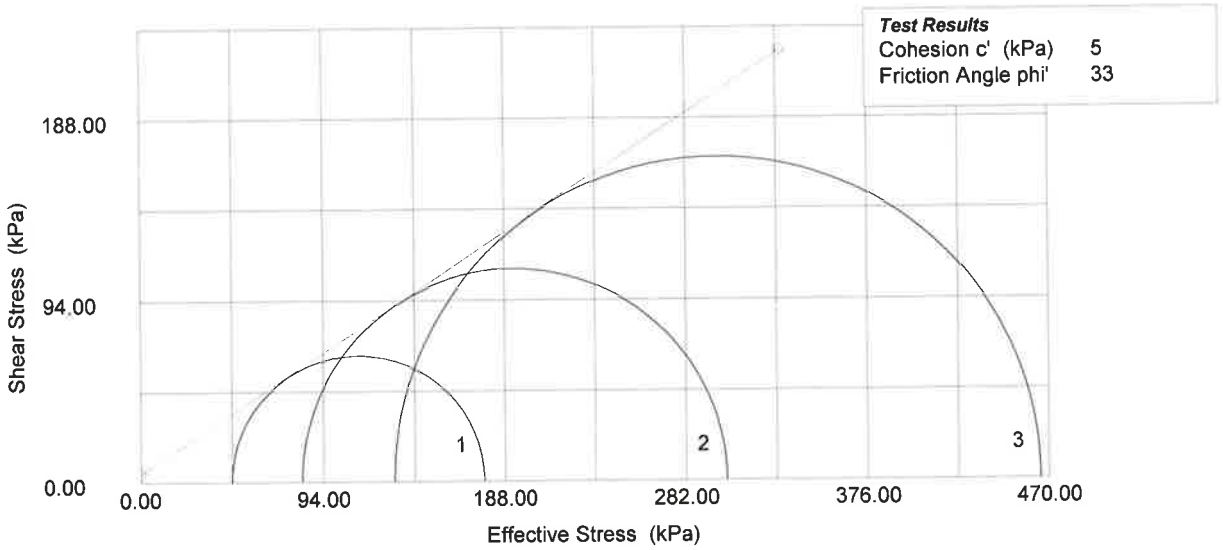


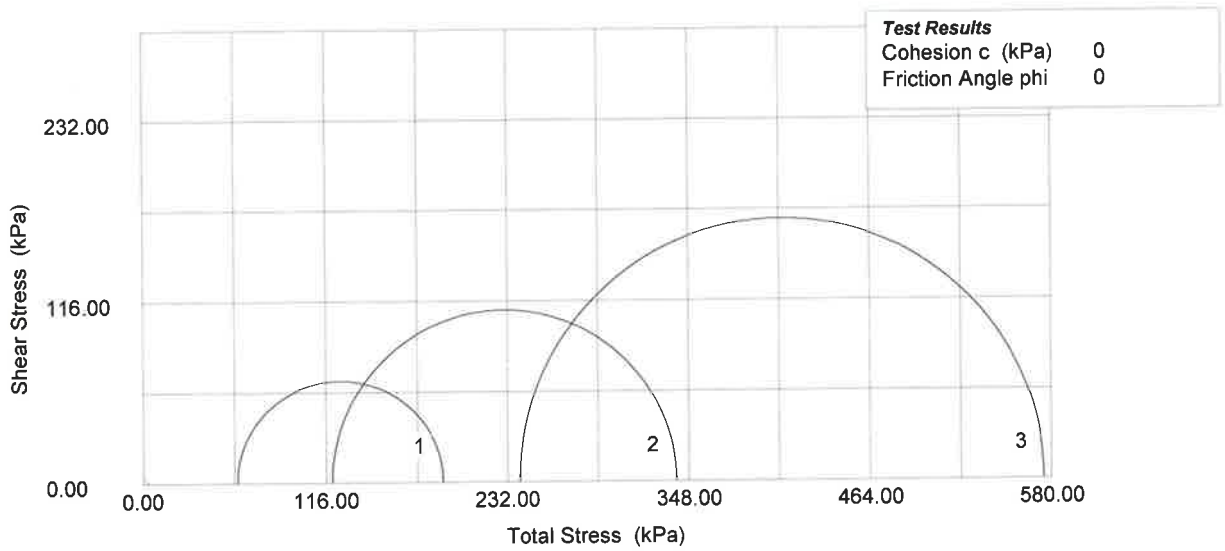
Test Method : BS1377 : Part 8 : 1990 : 8/9* (* delete as appropriate)		Test name	CUBH9/UD2 (SS, MS)
		Date of Test:	22/12/16
Site Reference:	TENGAH PHASE 1&2 INFFRA	Sample:	UD-2
Jobfile:	C:\WINCLISP\2016\WI-059.JOB	Borehole:	BH-9
Operator:	Checked:		Approved:

TÜV SÜD AL Technology Pte Ltd Co. Reg. No. 198505121W

Effective Stress Triaxial Compression

Consolidated Undrained



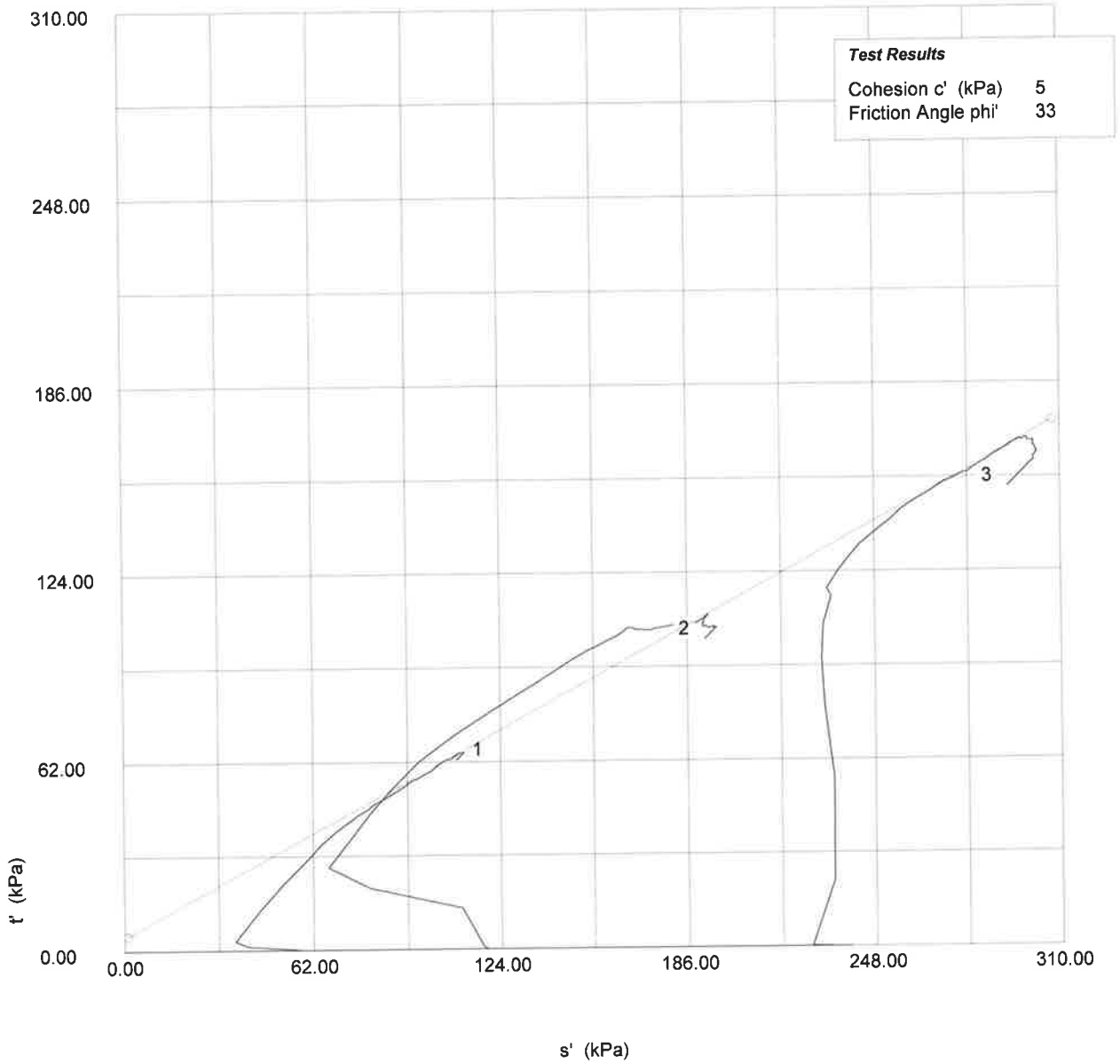


Test Method : BS1377 : Part 8 : 1990 : 8/9 ✓ (* delete as appropriate)		Test name	CUBH9/UD2 (SS, M8)
		Date of Test:	22/12/16
Site Reference:	TENGAH PHASE 1&2 INFFRA	Sample:	UD-2
Jobfile:	C:\WINCLISP\2016\WI-059.JOB	Borehole:	BH-9
Operator:	*Checked:*		*Approved:*

TÜV SÜD AL Technologies Pte Ltd * Co. Reg. No. 199605123W

Effective Stress Triaxial Compression

Consolidated Undrained



Test Method : BS1377 : Part 8 : 1990 : 8/9* (* delete as appropriate)		Test name	CUBH9/UD2 (SS, MS)
		Date of Test:	22/12/16
Site Reference:	TENGAH PHASE 1&2 INFFRA	Sample:	UD-2
Jobfile:	C:\WINCLISP\2016\WI-059.JOB	Borehole:	BH-9
Operator:	*Checked:*		*Approved:*

Test Report No. 7362011662
dated 19-Jan-2017

AL Technologies

SUMMARY OF TEST RESULTS

PROJECT :	**D/250/14] TERM CONTRACT NO.35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS**							
LOCATION :	**Soil Investigation Works at Tengah Phase 1 & 2 Infra (WI059)**							
BOREHOLE NO.			BH10	BH10				
SAMPLE REF.			UD1	UD2				
DEPTH (m)		From	3.00	6.00				
		To	4.00	7.00				
Natural Moisture Content		%	46	26				
Density	Bulk Density	Mg/m3	1.84	1.94				
	Dry Density	Mg/m3	1.26	1.54				
Atterberg Limits	Liquid Limit	%	57	39				
	Plastic Limit	%	27	19				
	Plasticity Index	%	30	20				
Particle Size Analysis	Gravel	%	0	0				
	Sand	%	11	24				
	Silt	%	33	37				
	Clay	%	56	39				
Particle Density of Soil		Mg/m^3	2.65	2.63				
Triaxial Compression	Type of Test*1			CU				
	Cohesion (c / c')	kPa		3				
	Phi Angle (φ / φ')	Degree		33				
Consolidation	Initial Void Ratio							
	Preconsolidation Pre:	kN/m^2						
	Compression Index							
Chemical Test Soil	Acid Soluble Sulphate Content	%						
	Organic Content	%						
	Water Soluble Sulpate Content	%						
	Chloride Content	%						
	pH Value							
Chemical Test Water	Ph Value							
	Total Sulphate Content	%						
	Chloride Content	%						

Legend :

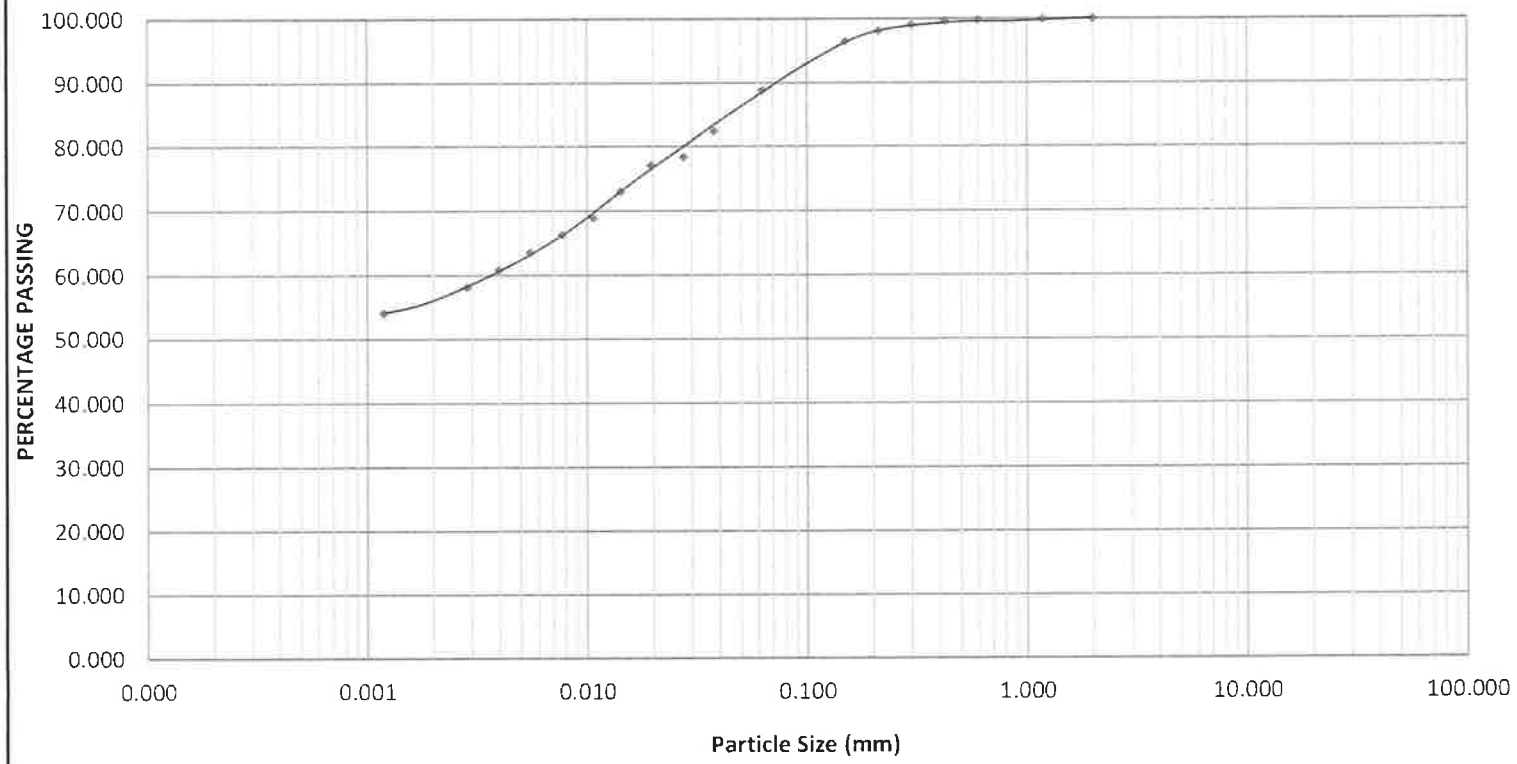
*1	UU	- Unconsolidated Undrained	*2	D	- Diameteral
	CU	- Consolidated Undrained		A	- Axial
	CD	- Consolidated Drained		I	- Irregular
	QU	- Quick Undrained			
	SUU	- Saturated UU w/pore water pressure			
	UC	- Unconfined Compression			
	MUU	- Multistage Unconsolidated Undrained			
	MCU	- Multistage Consolidated Undrained			
	MCD	- Multistage Consolidation Drained			

TÜV SÜD AL Technologies Pte. Ltd. Co. Reg. No. 199903220R

Test Report No. 7362011662
dated 17/01/2017

AL Technologies

B.S. 1377 PART 2: 1990 PARTICLE SIZE ANALYSIS TEST



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	C
	SILT			SAND			GRAVEL			

Material Description:

Light greenish grey slightly sandy CLAY with silt

Gravel	:	0 %
Sand	:	11 %
Silt	:	33 %
Clay	:	56 %

Detailed Particle Size Distribution

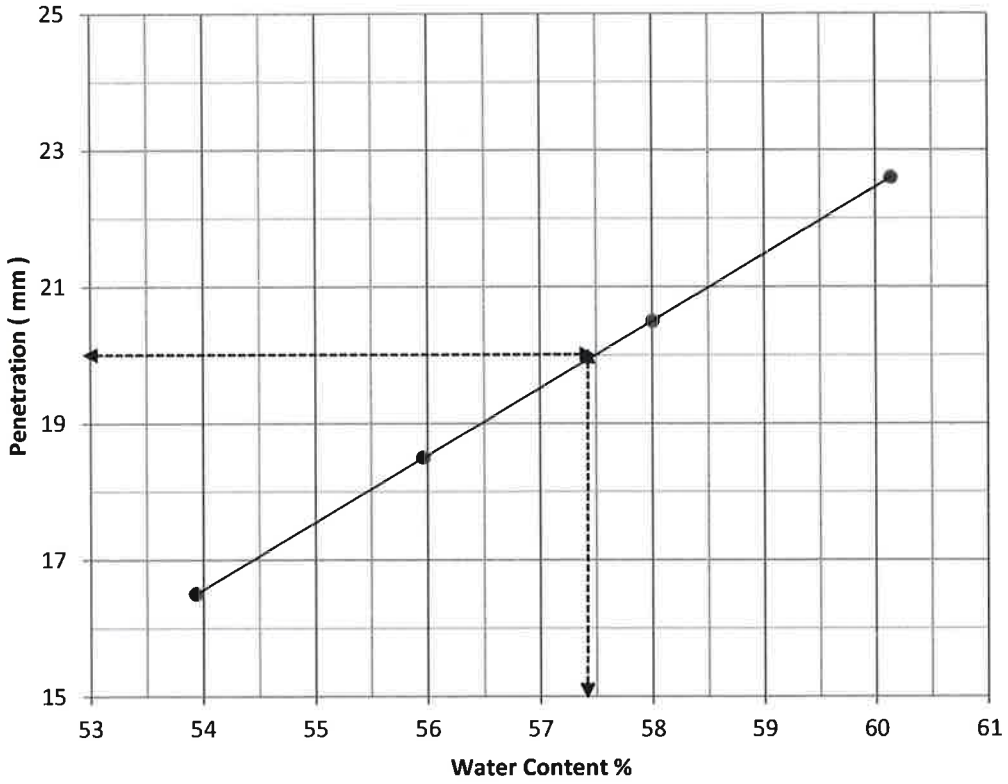
Grading (mm)	% Passing BS Sieve
2	100.00
1.18	99.87
0.6	99.73
0.425	99.58
0.3	99.04
0.212	98.00
0.15	96.38
0.063	88.78
0.038	82.38
0.028	78.33
0.020	76.98
0.014	72.93
0.011	68.88
0.008	66.18
0.006	63.48
0.004	60.77
0.003	58.07
0.001	54.02

Project : [D/250/14] TERM CONTRACT NO.35 FOR SITE INVESTIGATION WORKS FOR PERIOD OF 30 MONTHS	Borehole No.: BH10	Location: Soil Investigation Works at Tengah Phase 1 & 2 Infra (WI059)
	Sample Ref: . UD1	Depth: 3.00-4.00m

Test Report No. 7362011662
dated 18-Jan-17

AL Technologies

BS 1377 PART 2: 1990 ATTERBERG LIMIT (CONE PENETROMETER) TEST



HISTORY OF SAMPLE Wet Sieving Percentage of passing 0.425 mm Sieve 100 %

		LIQUID LIMIT %				PLASTIC LIMIT %	
Wet Weight + Tare	(g)	25.33	24.79	25.20	24.19	25.24	25.56
Dry Weight + Tare	(g)	19.30	18.83	18.93	18.20	23.10	23.14
Tare Weight	(g)	8.12	8.18	8.12	8.24	15.20	14.20
Water Content	%	53.94	55.96	58.00	60.14	27.09	27.07
Penetration	mm	16.5	18.5	20.5	22.6		

Liquid Limit	%	57
Plastic Limit	%	27
Plastic Index	%	30

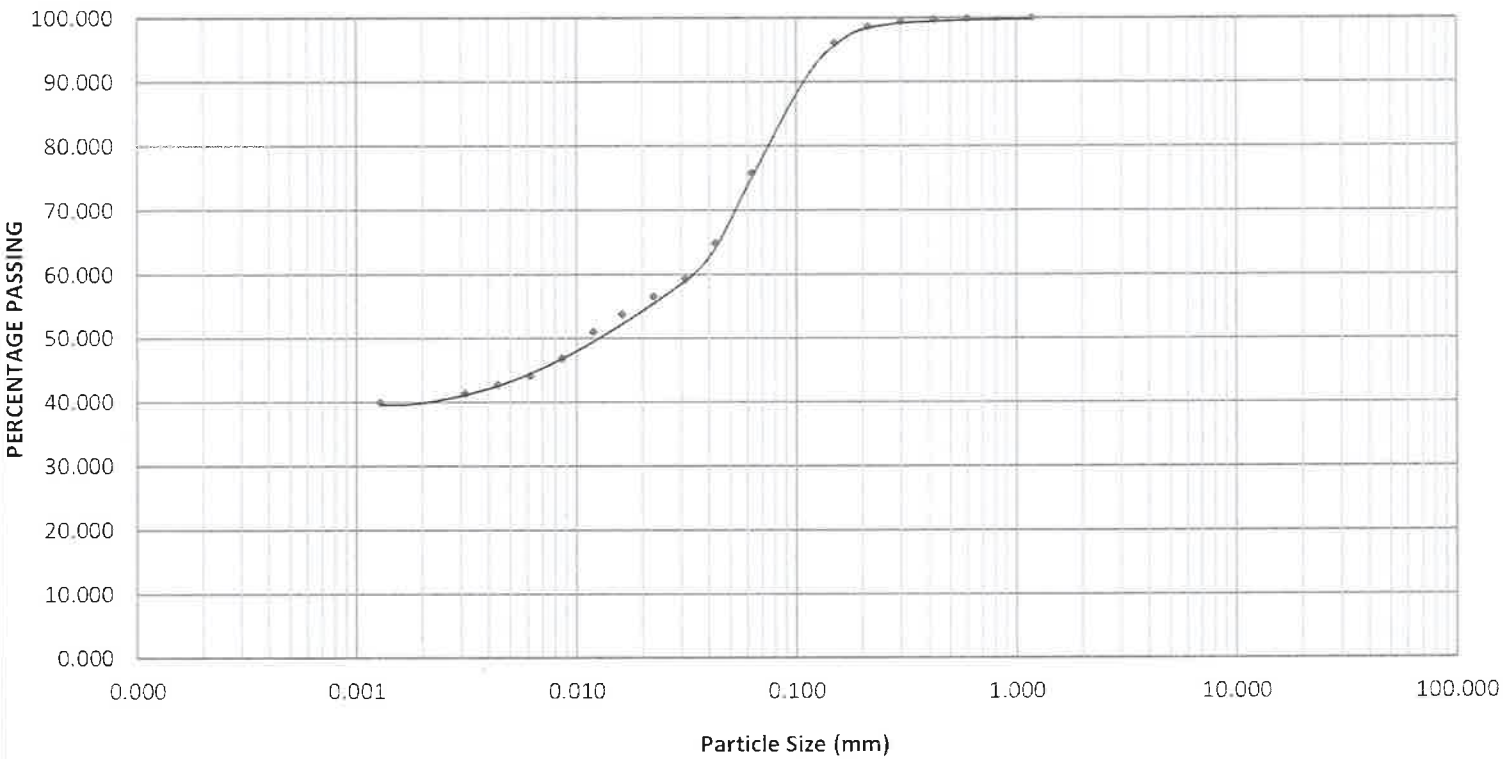
Sample Reference: BH10 Sample No: UD1 Depth: 3.00-4.00m
Material Description: Light greenish grey slightly sandy CLAY with silt
Location: Soil Investigation Works at Tengah Phase 1 & 2 Infra (WI059)
Project: [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS

TÜV SÜD AL Technologies Pte Ltd

Test Report No. 7362011662
dated 17/01/2017

AL Technologies

B.S. 1377 PART 2: 1990 PARTICLE SIZE ANALYSIS TEST



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	C
	SILT			SAND			GRAVEL			

Material Description:

Light greenish grey slightly sandy CLAY with silt

Gravel	:	0 %
Sand	:	24 %
Silt	:	37 %
Clay	:	39 %

Detailed Particle Size Distribution

Grading (mm)	% Passing BS Sieve
1.18	100.00
0.6	99.88
0.425	99.76
0.3	99.42
0.212	98.58
0.15	95.95
0.063	75.72
0.043	64.75
0.031	59.24
0.023	56.48
0.016	53.73
0.012	50.97
0.009	46.84
0.006	44.08
0.004	42.71
0.003	41.33
0.001	39.95

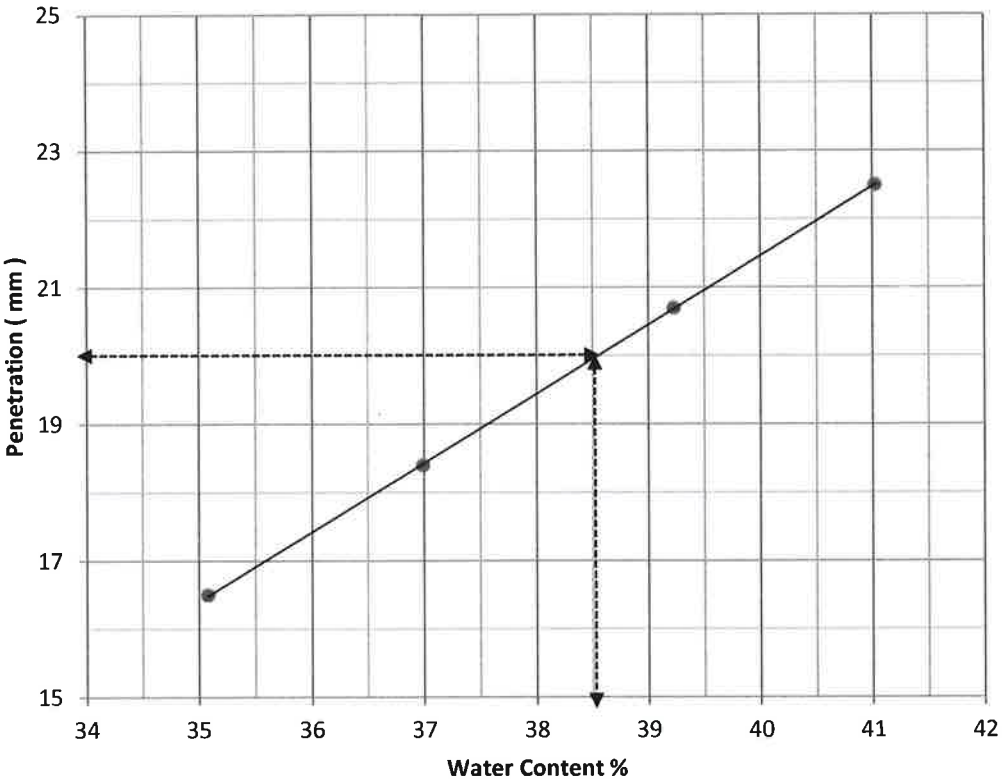
AL Technologies

Project : [D/250/14] TERM CONTRACT NO.35 FOR SITE INVESTIGATION WORKS FOR PERIOD OF 30 MONTHS	Borehole No.: BH10	Location: Soil Investigation Works at Tengah Phase 1 & 2 Infra (WI059)
	Sample Ref: . UD2	Depth: 6.00-7.00m

Test Report No. 7362011662
dated 18-Jan-17

AL Technologies

BS 1377 PART 2: 1990 ATTERBERG LIMIT (CONE PENETROMETER) TEST



HISTORY OF SAMPLE Wet Sieving Percentage of passing 0.425 mm Sieve 100 %

		LIQUID LIMIT %				PLASTIC LIMIT %	
Wet Weight + Tare	(g)	24.72	24.57	24.10	24.95	25.50	25.20
Dry Weight + Tare	(g)	20.43	20.12	19.62	20.08	24.00	23.67
Tare Weight	(g)	8.20	8.09	8.20	8.21	16.16	15.71
Water Content	%	35.08	36.99	39.23	41.03	19.13	19.22
Penetration	mm	16.5	18.4	20.7	22.5		

Liquid Limit	%	39
Plastic Limit	%	19
Plastic Index	%	20

Sample Reference: BH10 Sample No: UD2 Depth: 6.00-7.00m
Material Description: Light greenish grey slightly sandy CLAY with silt
Location: Soil Investigation Works at Tengah Phase 1 & 2 Infra (WI059)
Project: [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS

TÜV SÜD AL Technologies Pte Ltd

Effective Stress Triaxial Compression

Consolidated Undrained

Sample details

Sketch showing specimen location in original Sample

Depth 6.00-7.00m
Description: Light greenish grey slightly sandy CLAY with silt

	Specimen 1	Specimen 2	Specimen 3
Type			
Height H_0 (mm)	76	76	76
Diameter D_0 (mm)	38	38	38
Weight W_0 (gr)	164.3	166.7	170.9
Bulk Density ρ (Mg/m3)	1.91	1.93	1.98
Particle Density ρ_s	2.65 (assumed)	2.65 (assumed)	2.65 (assumed)

Initial Conditions

	Specimen 1	Specimen 2	Specimen 3
Cell Pressure σ_3 (kPa)	260.00	320.00	440.00
Pore Pressure u (kPa)	200.00	200.00	200.00
Machine Speed d_r(mm/min)	0.060	0.060	0.060
No. of Membranes	1	1	1
Total Thickness (mm)	0.2	0.2	0.2
Strain Channel	8	24	28
Load Channel	7	23	27
Pore P. Channel	9	25	29
Volume Channel	14	26	30
Moisture Content w_0%	27	24	28
Dry Density ρ_{d0} (Mg/m3)	1.51	1.56	1.55
Voids Ratio e_0	0.76	0.70	0.71
Deg of Saturation S_0%	92.71	91.60	100.00
Final B Value	0.96	0.95	0.96

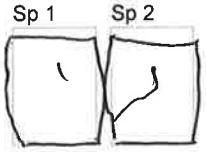
Final Conditions

	Specimen 1	Specimen 2	Specimen 3
Moisture Content w_f%	28	25	28
Dry Density ρ_d (Mg/m3)	1.70	1.96	2.22
Voids Ratio e_f	0.56	0.35	0.19
Deg of Saturation S_f%	100.00	100.00	100.00
Failure Criteria	Mx Dev Stress	Mx Dev Stress	Mx Dev Stress
Axial Strain ε_f%	4.8	12.2	6.9
Corr Dev Stress $(\sigma_1 - \sigma_3)f$ (kPa)	34.4	48.8	131.9
Minor Stress σ_{3f} (kPa)	9.0	15.0	48.9
Major Stress σ_{1f} (kPa)	43.4	63.8	180.8
Stress Ratio $(\sigma_1/\sigma_3)_f$	4.8	4.3	3.7

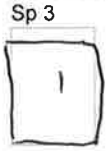
Notes:

Failure Sketch

Sp 1 Sp 2



Sp 3



Surface Inclination

Test Method : BS1377 : Part 8 : 1990 : 8/~~9~~
(* delete as appropriate)

Test name CUBH10/UD2 (SS, MS)
Date of Test: 6/1/2016

Site Reference: TENGAH PHASE 1&2 INFFRA
Jobfile: C:\WINCLISP\2016\WI-059.JOB

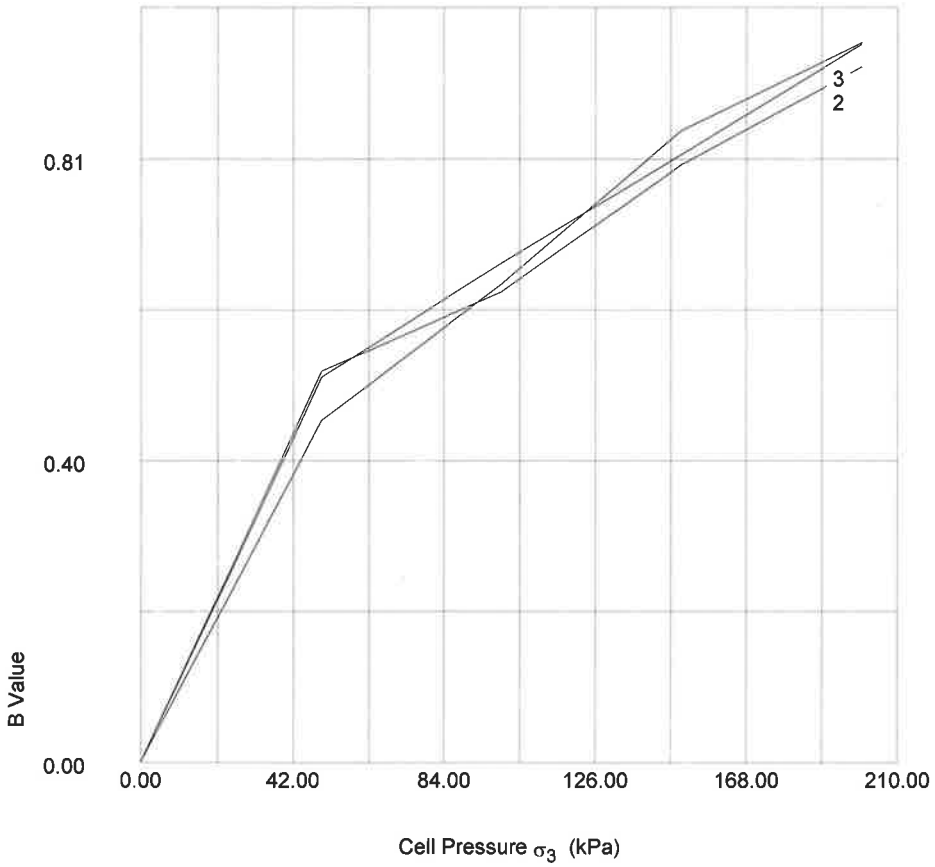
Sample: UD2
Borehole: BH10

Operator: *Checked:* *Approved:*

Effective Stress Triaxial Compression

Consolidated Undrained

Saturation Stage Data	Specimen 1	Specimen 2	Specimen 3
Test Method:	Cell P. only	Cell P. And Back P.	Cell P. And Back P.
Final Cell Pressure σ_{3f} (kPa)	200.00	200.00	200.00
Final Pore Pressure u_f (kPa)	185.00	198.00	195.00
Final B Value	0.96	0.95	0.96



Test Method : BS1377 : Part 8 : 1990 : 8/9* (* delete as appropriate)		Test name	CUBH10/UD2 (SS, MS)*
		Date of Test:	6/1/2016
Site Reference:	TENGAH PHASE 1&2 INFFRA	Sample:	UD2
Jobfile:	C:\WINCLISP\2016\WI-059.JOB	Borehole:	BH10
Operator:	*Checked:*		*Approved:*

Effective Stress Triaxial Compression

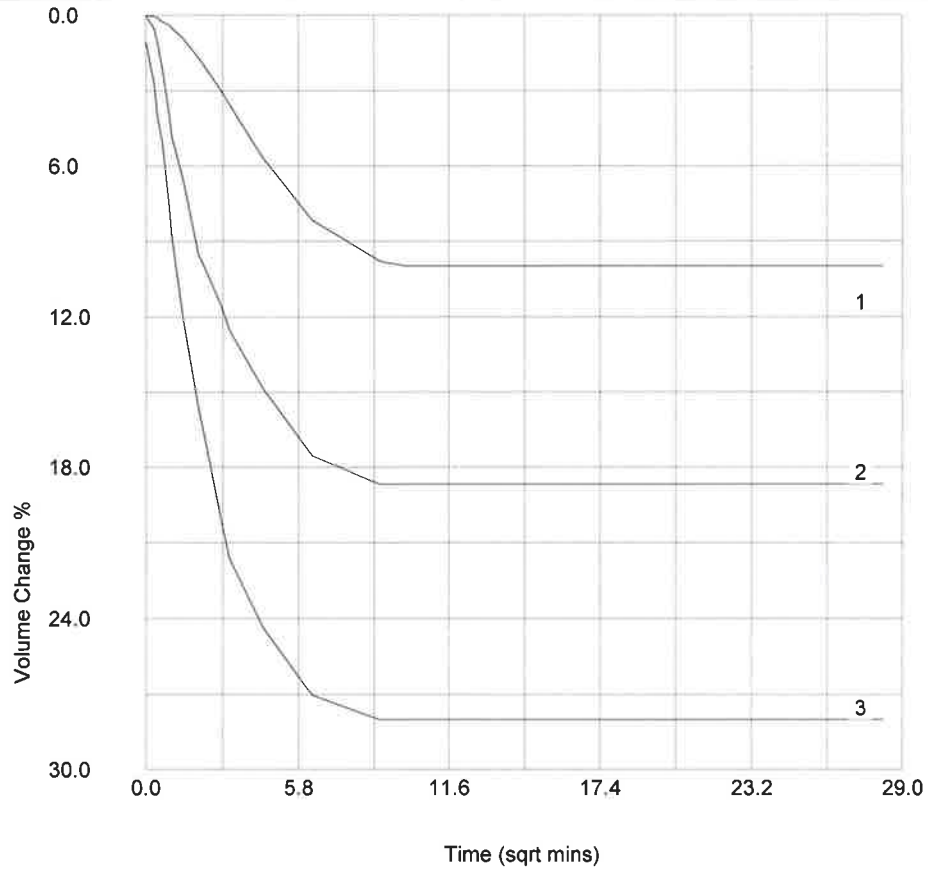
Consolidated Undrained

Consolidation Initial Conditions

	Specimen 1	Specimen 2	Specimen 3
Cell Pressure σ_3 (kPa)	260.00	320.00	440.00
Pore Pressure u_i (kPa)	233.00	310.00	419.80
Back Pressure u_b (kPa)	200.00	200.00	200.00
Drainage Method	Radial, One End	Radial, One End	Radial, One End

Consolidation Final Results

	Specimen 1	Specimen 2	Specimen 3
Deg of Consolidation U%	100.0	100.0	99.5
Volumetric Strain ε_v%	11.6	21.7	32.5
Corr Length L_c (mm)	73.1	70.5	67.8
Corr Area A_c (mm)2	1046.4	970.3	888.3
Corr Volume V_c (cc)	76.5	68.4	60.2
t_{100} (min)	60.50	44.10	37.30
Coef. of Consolidation c_v (m2/year)	0.492	0.675	0.798
Coef. of Compressibility m_v (m2/MN)	3.516	1.970	1.486
Testing Time (min) t_f	108.9	79.38	67.14
Est Strain at Failure ε_f	10.0	10.0	10.0
Machine Speed d_r (mm/min)	0.06709	0.08883	0.10093



Test Method : BS1377 : Part 8 : 1990 : 8/~~9~~*
(* delete as appropriate)

Test name CUBH10/UD2 (SS, ~~MS~~)
Date of Test: 6/1/2016

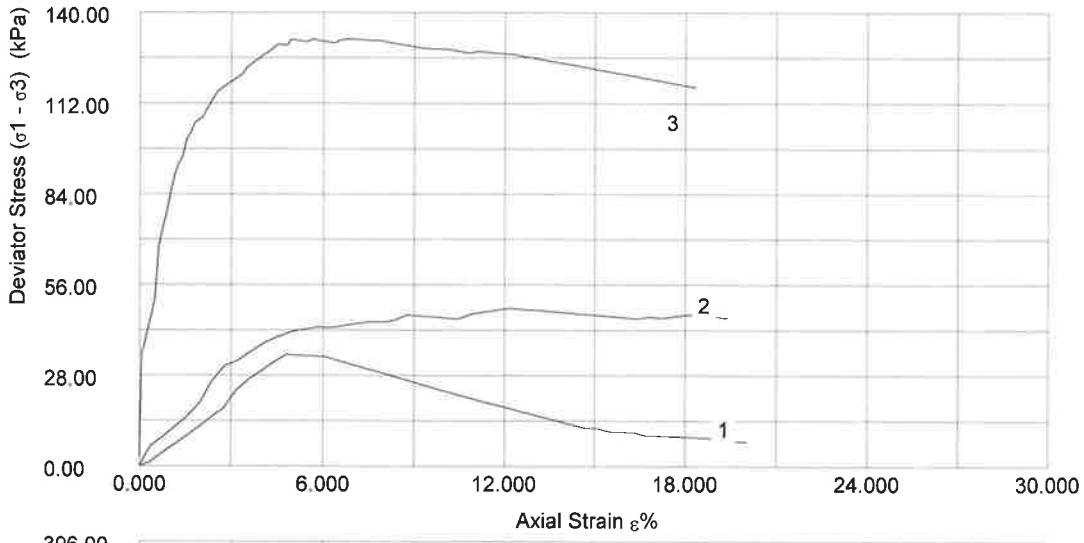
Site Reference: TENGAH PHASE 1&2 INFFRA
Jobfile: C:\WINCLISP\2016\WI-059.JOB

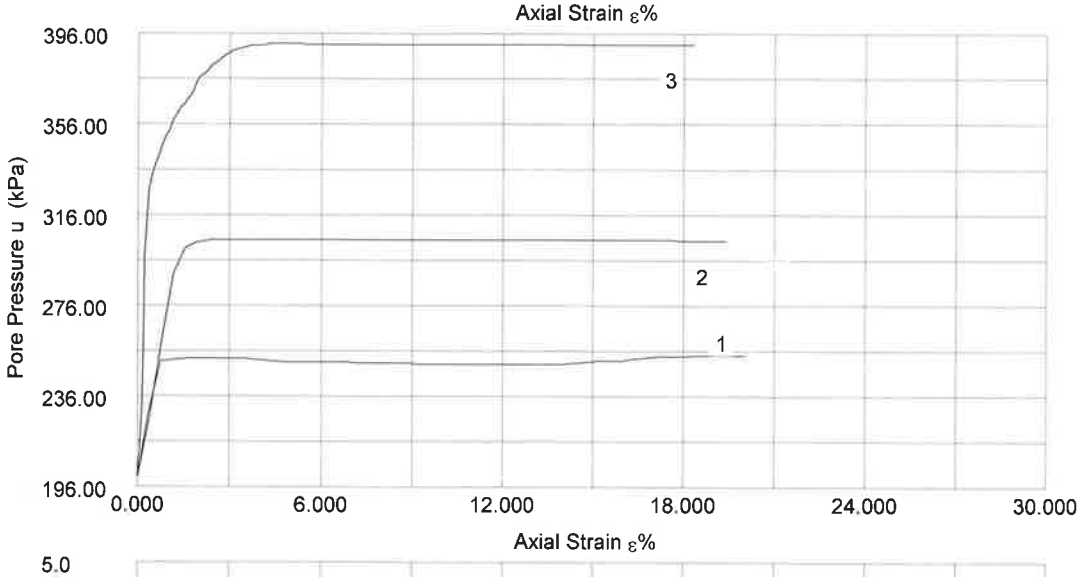
Sample: UD2
Borehole: BH10

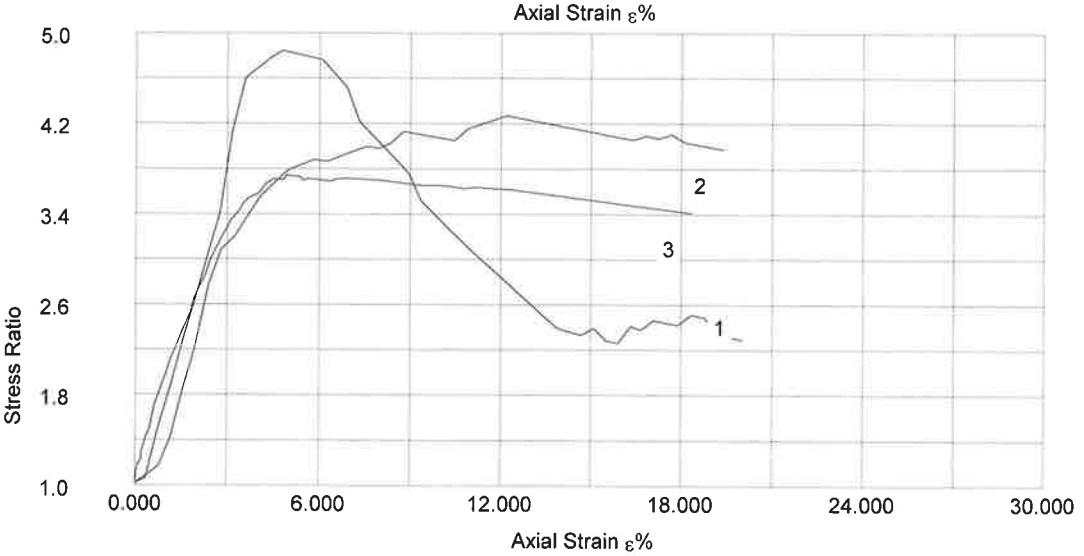
Operator: *Checked:* *Approved:*

Effective Stress Triaxial Compression

Consolidated Undrained



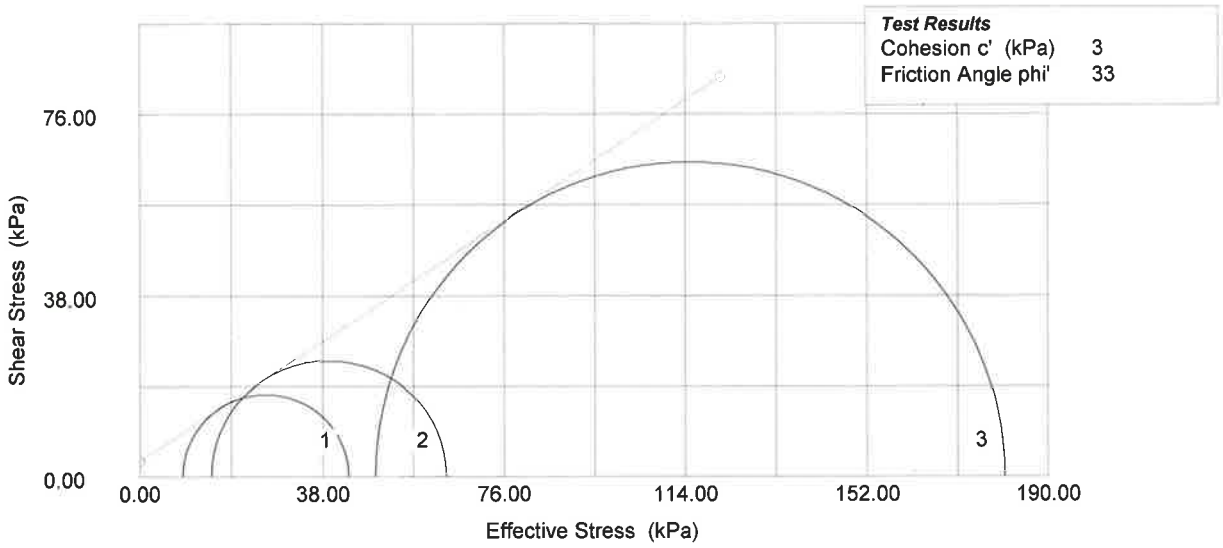


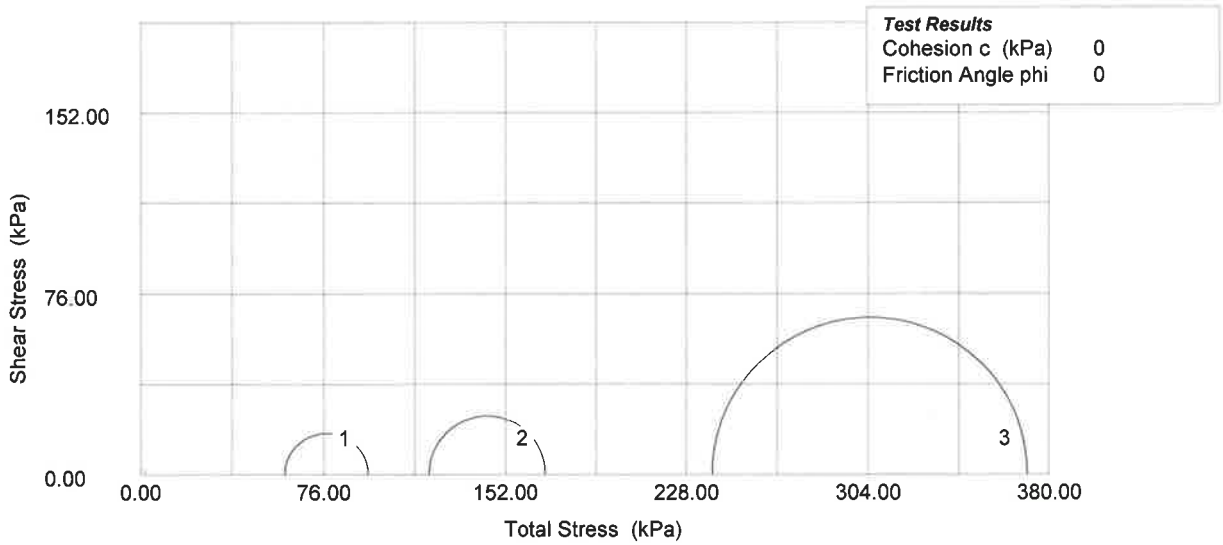


Test Method : BS1377 : Part 8 : 1990 : 8/~~8~~ (* delete as appropriate)		Test name	CUBH10/UD2 (SS, MS)
		Date of Test:	6/1/2016
Site Reference:	TENGAH PHASE 1&2 INFFRA	Sample:	UD2
Jobfile:	C:\WINCLISP\2016\WI-059.JOB	Borehole:	BH10
Operator:	*Checked:*		*Approved:*

Effective Stress Triaxial Compression

Consolidated Undrained

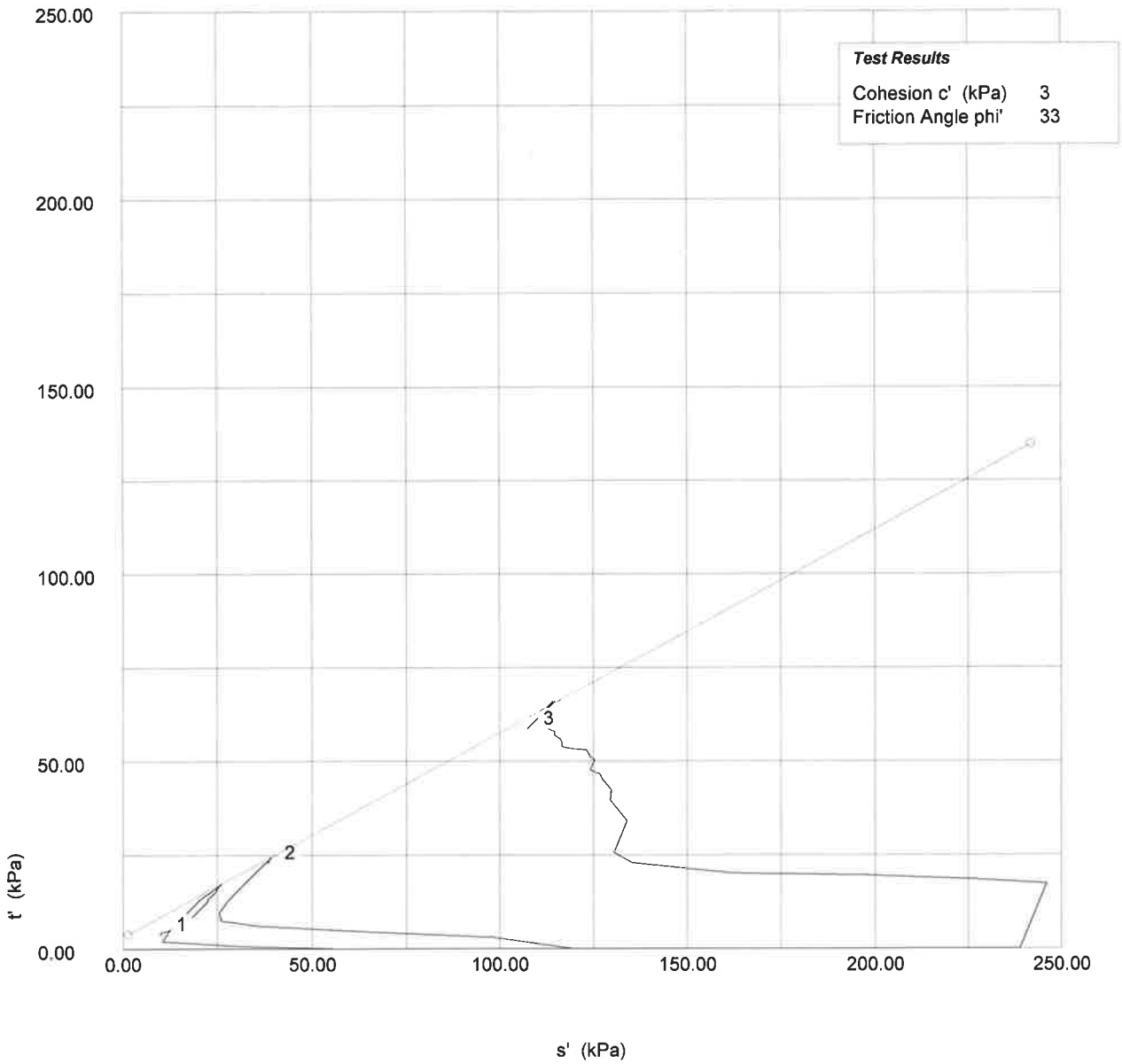




Test Method : BS1377 : Part 8 : 1990 : 8/9* (* delete as appropriate)		Test name	CUBH10/UD2 (SS, MS)
		Date of Test:	6/1/2016
Site Reference:	TENGAH PHASE 1&2 INFFRA	Sample:	UD2
Jobfile:	C:\WINCLISP\2016\WI-059.JOB	Borehole:	BH10
Operator:	*Checked:*		*Approved:*

Effective Stress Triaxial Compression

Consolidated Undrained



Test Method : BS1377 : Part 8 : 1990 : 8/9 (* delete as appropriate)		Test name	CUBH10/UD2 (SS, MS)
		Date of Test:	6/1/2016
Site Reference:	TENGAH PHASE 1&2 INFFRA	Sample:	UD2
Jobfile:	C:\WINCLISP\2016\WI-059.JOB	Borehole:	BH10
Operator:	Checked:		Approved:

Test Report No. 7362011662
dated 19-Jan-2017

AL Technologies

SUMMARY OF TEST RESULTS

PROJECT :	**D/250/14] TERM CONTRACT NO.35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS**							
LOCATION :	**Soil Investigation Works at Tengah Phase 1 & 2 Infra (WI059)**							
BOREHOLE NO.			BH11					
SAMPLE REF.			UD1					
DEPTH (m)		From	3.00					
		To	3.50					
Natural Moisture Content		%	17					
Density	Bulk Density	Mg/m3	1.83					
	Dry Density	Mg/m3	1.56					
Atterberg Limits	Liquid Limit	%	42					
	Plastic Limit	%	28					
	Plasticity Index	%	14					
Particle Size Analysis	Gravel	%	0					
	Sand	%	69					
	Silt	%	21					
	Clay	%	10					
Particle Density of Soil		Mg/m^3	2.63					
Triaxial Compression	Type of Test*1							
	Cohesion (c / c')	kPa						
	Phi Angle (φ / φ')	Degree						
Consolidation	Initial Void Ratio							
	Preconsolidation Pre:	kN/m^2						
	Compression Index							
Chemical Test Soil	Acid Soluble Sulphate Content	%						
	Organic Content	%						
	Water Soluble Sulpate Content	%						
	Chloride Content	%						
	pH Value							
Chemical Test Water	Ph Value							
	Total Sulphate Content	%						
	Chloride Content	%						

Legend :

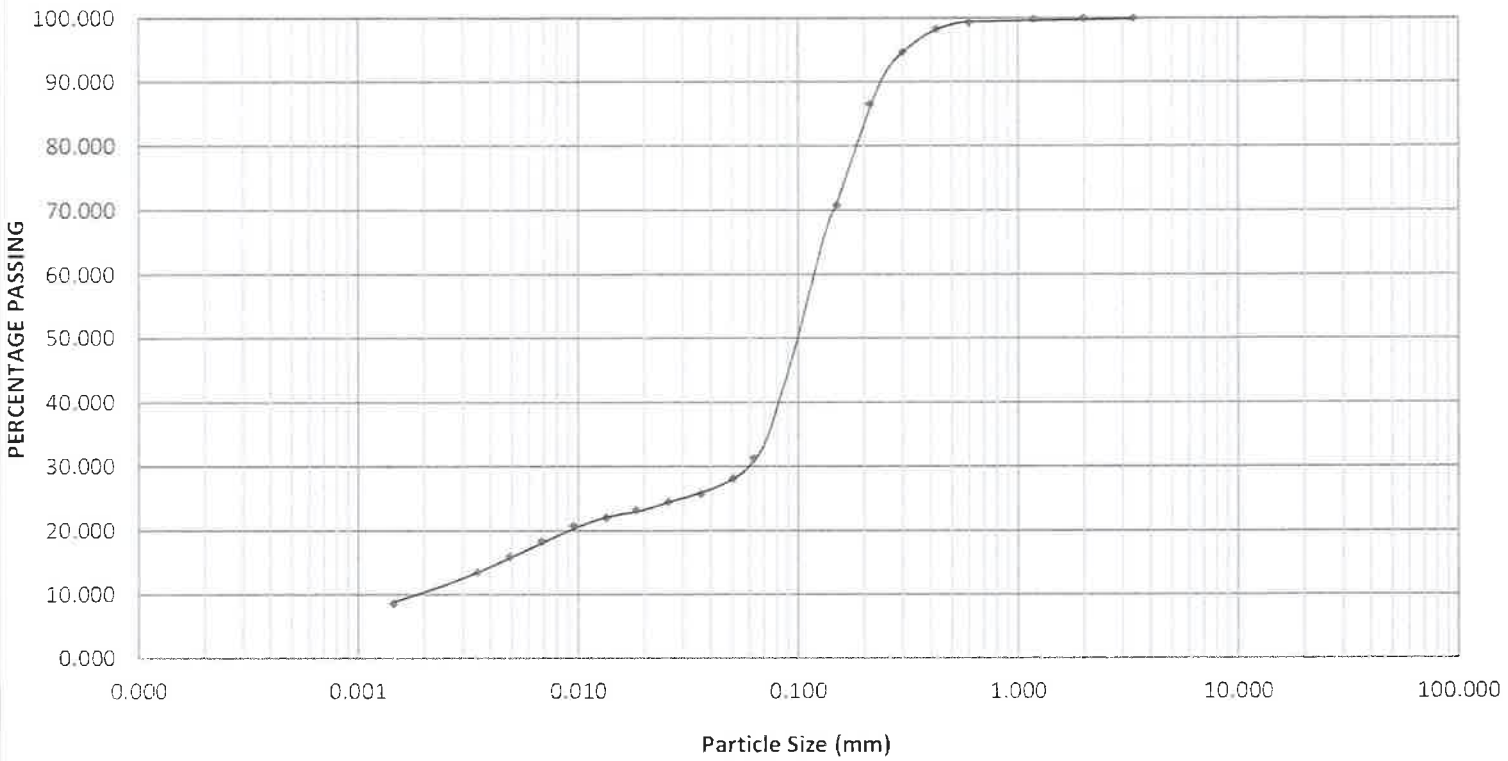
*1	UU	- Unconsolidated Undrained	*2	D	-	Diameteral
	CU	- Consolidated Undrained		A	-	Axial
	CD	- Consolidated Drained		I	-	Irregular
	QU	- Quick Undrained				
	SUU	- Saturated UU w/pore water pressure				
	UC	- Unconfined Compression				
	MUU	- Multistage Unconsolidated Undrained				
	MCU	- Multistage Consolidated Undrained				
	MCD	- Multistage Consolidation Drained				

TÜV SÜD AL Technologies Pte. Ltd.

Test Report No. 7362011662
dated 17/01/2017

AL Technologies

B.S. 1377 PART 2: 1990 PARTICLE SIZE ANALYSIS TEST



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	C
	SILT			SAND			GRAVEL			

Material Description:

Light grey very silty SAND with clay

Gravel	:	0 %
Sand	:	69 %
Silt	:	21 %
Clay	:	10 %

Detailed Particle Size Distribution

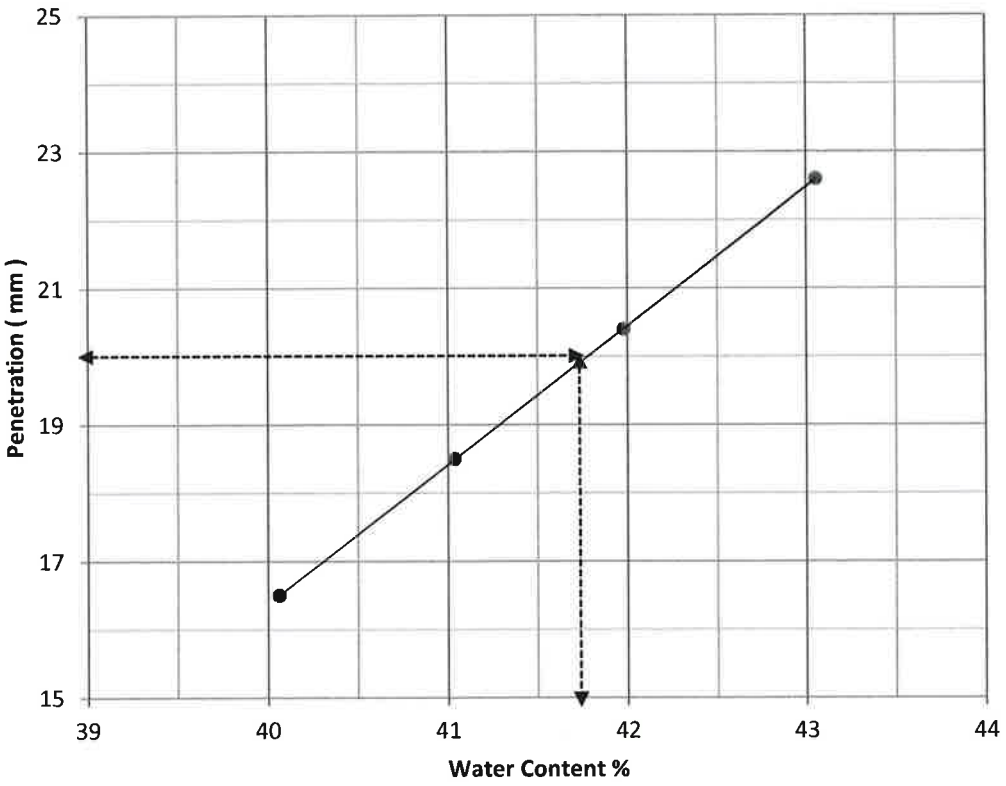
Grading (mm)	% Passing BS Sieve
3.35	100.00
2	99.94
1.18	99.83
0.6	99.29
0.425	98.25
0.3	94.68
0.212	86.48
0.15	70.80
0.063	31.25
0.051	28.09
0.036	25.65
0.026	24.43
0.018	23.21
0.013	21.98
0.010	20.76
0.007	18.32
0.005	15.88
0.003	13.43
0.001	8.55

Project : [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS	Borehole No.:	BH11	Location: Soil Investigation Works at Tengah Phase 1 & 2 Infra (WI059)
	Sample Ref: .	UD1	Depth: 3.00-3.50m

Test Report No. 7362011662
dated 18-Jan-17

AL Technologies

BS 1377 PART 2: 1990 ATTERBERG LIMIT (CONE PENETROMETER) TEST



HISTORY OF SAMPLE Wet Sieving Percentage of passing 0.425 mm Sieve 98 %

			LIQUID LIMIT %			PLASTIC LIMIT %	
Wet Weight + Tare	(g)	25.96	24.21	24.71	25.64	25.30	25.45
Dry Weight + Tare	(g)	20.84	19.54	19.79	20.37	23.10	23.00
Tare Weight	(g)	8.06	8.16	8.07	8.13	15.20	14.20
Water Content	%	40.06	41.04	41.98	43.06	27.85	27.84
Penetration	mm	16.5	18.5	20.4	22.6		

Liquid Limit	%	42
Plastic Limit	%	28
Plastic Index	%	14

Sample Reference: BH11 Sample No: UD1 Depth: 3.00-3.50m
Material Description: Light grey very silty SAND with clay
Location: Soil Investigation Works at Tengah Phase 1 & 2 Infra (WI059)
Project: [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS

TÜV SÜD AL Technologies Pte Ltd

Test Report No. 7362011662

dated 12-Jan-2017

AL Technologies

SUMMARY OF TEST RESULTS

PROJECT :	D/250/14] TERM CONTRACT NO.35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS							
LOCATION :	Soil Investigation Works at Tengah Phase 1 & 2 Infra (WI059)							
BOREHOLE NO.			BH12	BH12				
SAMPLE REF.			UD1	UD2				
DEPTH (m)		From	3.00	6.00				
		To	4.00	7.00				
Natural Moisture Content		%	42	30				
Density	Bulk Density	Mg/m3	1.91	1.99				
	Dry Density	Mg/m3	1.35	1.53				
Atterberg Limits	Liquid Limit	%	53	41				
	Plastic Limit	%	25	27				
	Plasticity Index	%	28	14				
Particle Size Analysis	Gravel	%	0	12				
	Sand	%	13	22				
	Silt	%	39	33				
	Clay	%	48	33				
Particle Density of Soil		Mg/m^3	2.65	2.64				
Triaxial Compression	Type of Test*1			UU				
	Cohesion (c / c')	kPa		87				
	Phi Angle (φ / φ')	Degree		0				
Consolidation	Initial Void Ratio							
	Preconsolidation Pre:	kN/m^2						
	Compression Index							
Chemical Analysis	Sulphate Content	%						
	Chloride Content	%						
	pH Value							
Permeability	Coefficient at 20°C							
Unconfined Compression	Unconfined Comp. strength	MPa						
Point Load	Type of Test*2							

Legend :

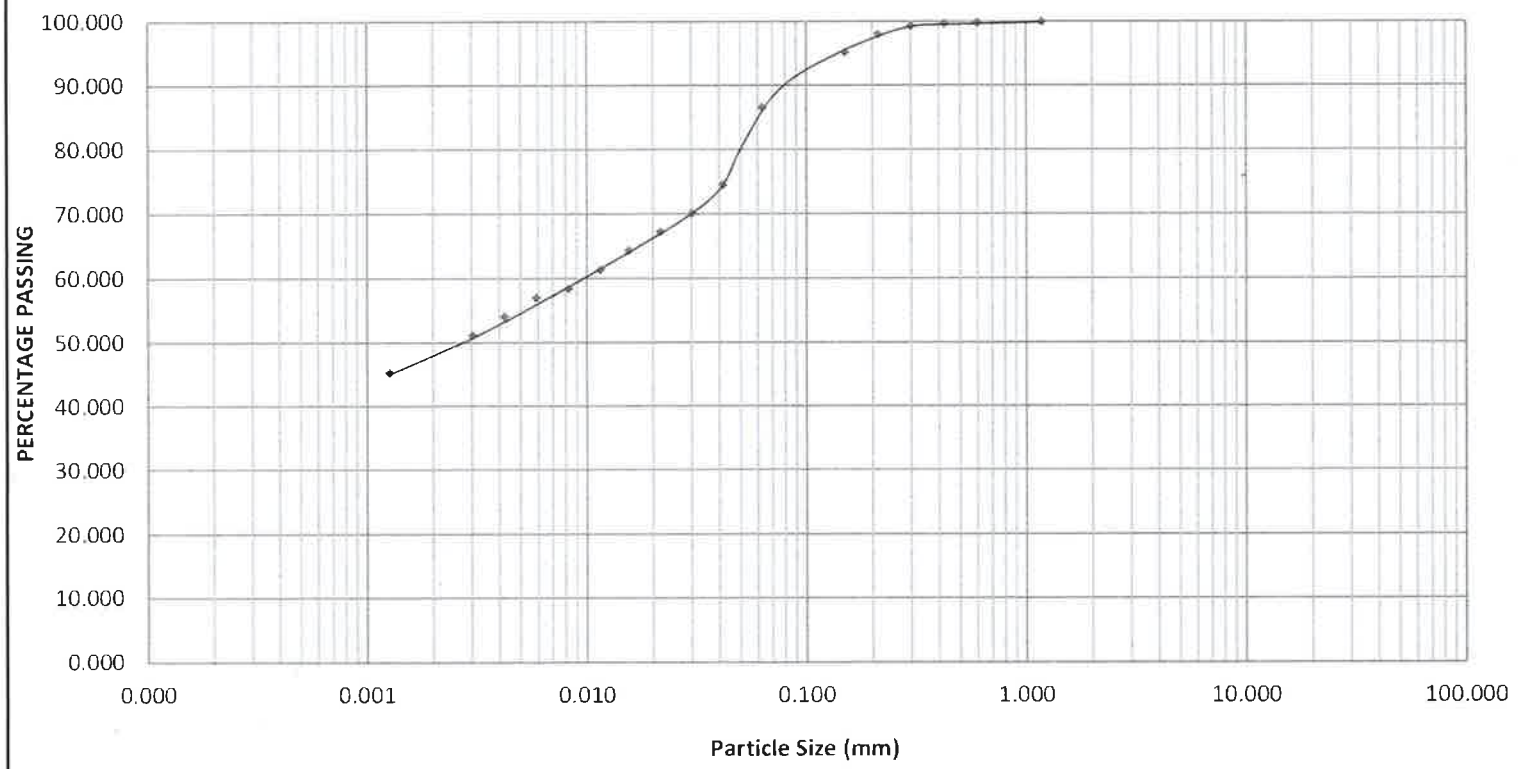
*1	UU	- Unconsolidated Undrained	*2	D	-	Diameteral
	CU	- Consolidated Undrained		A	-	Axial
	CD	- Consolidated Drained		I	-	Irregular
	QU	- Quick Undrained				
	SUU	- Saturated UU w/pore water pressure				
	UC	- Unconfined Compression				
	MUU	- Multistage Unconsolidated Undrained				
	MCU	- Multistage Consolidated Undrained				
	MCD	- Multistage Consolidation Drained				

AL Technologies Pte Ltd Co. Reg. No. 198305123W

Test Report No. 7362011662
dated 10-Jan-17

AL Technologies

B.S. 1377 PART 2: 1990 PARTICLE SIZE ANALYSIS TEST



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	C
	SILT			SAND			GRAVEL			

Material Description:

Grey slightly sandy CLAY with silt

Gravel	:	0 %
Sand	:	13 %
Silt	:	39 %
Clay	:	48 %

Detailed Particle Size Distribution

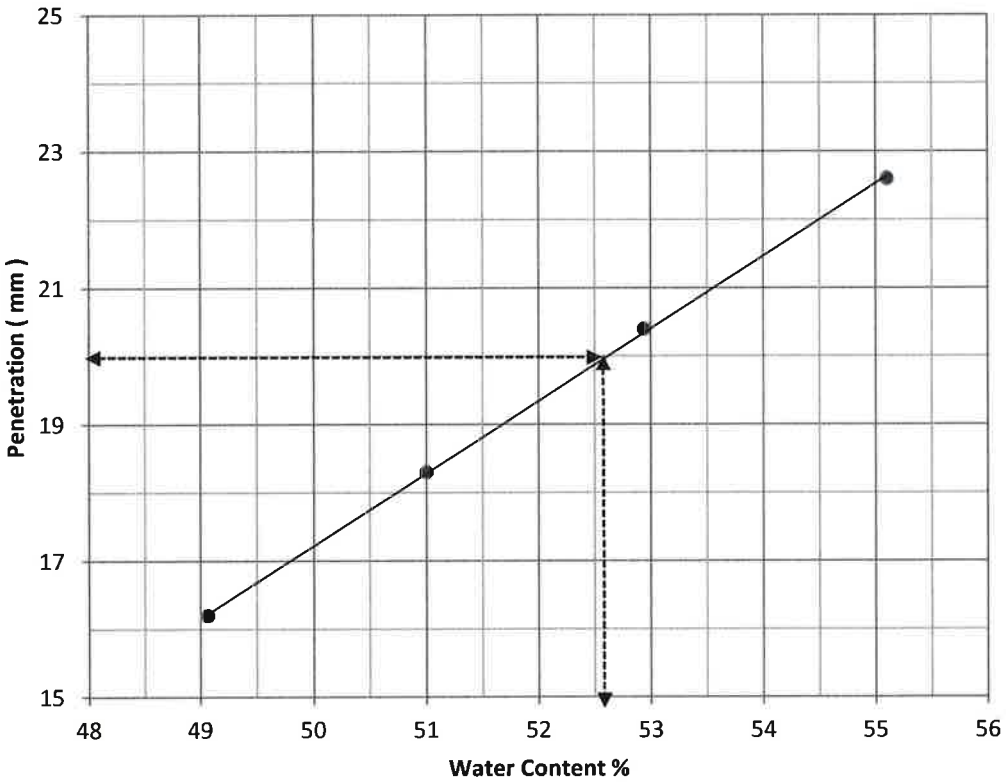
Grading (mm)	% Passing BS Sieve
1.180	100.00
0.600	99.82
0.425	99.71
0.300	99.25
0.212	97.96
0.150	95.16
0.063	86.50
0.042	74.49
0.030	70.11
0.022	67.19
0.016	64.27
0.012	61.34
0.008	58.42
0.006	56.96
0.004	54.04
0.003	51.12
0.001	45.28

Project : [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS	Borehole No.: BH12	Location: Soil Investigation Works at Tengah Phase 1 & 2 Infra (WI059)
	Sample Ref: . UD1	Depth: 3.00-4.00m

Test Report No. 7362011662
dated 10-Jan-17

AL Technologies

BS 1377 PART 2: 1990 ATTERBERG LIMIT (CONE PENETROMETER) TEST



HISTORY OF SAMPLE Wet Sieving Percentage of passing 0.425 mm Sieve 100 %

		LIQUID LIMIT %				PLASTIC LIMIT %	
Wet Weight + Tare	(g)	24.88	25.38	24.18	25.55	25.23	25.05
Dry Weight + Tare	(g)	19.35	19.54	18.60	19.34	23.00	22.80
Tare Weight	(g)	8.08	8.09	8.06	8.07	14.13	13.87
Water Content	%	49.07	51.00	52.94	55.10	25.14	25.20
Penetration	mm	16.2	18.3	20.4	22.6		

Liquid Limit	%	53
Plastic Limit	%	25
Plastic Index	%	28

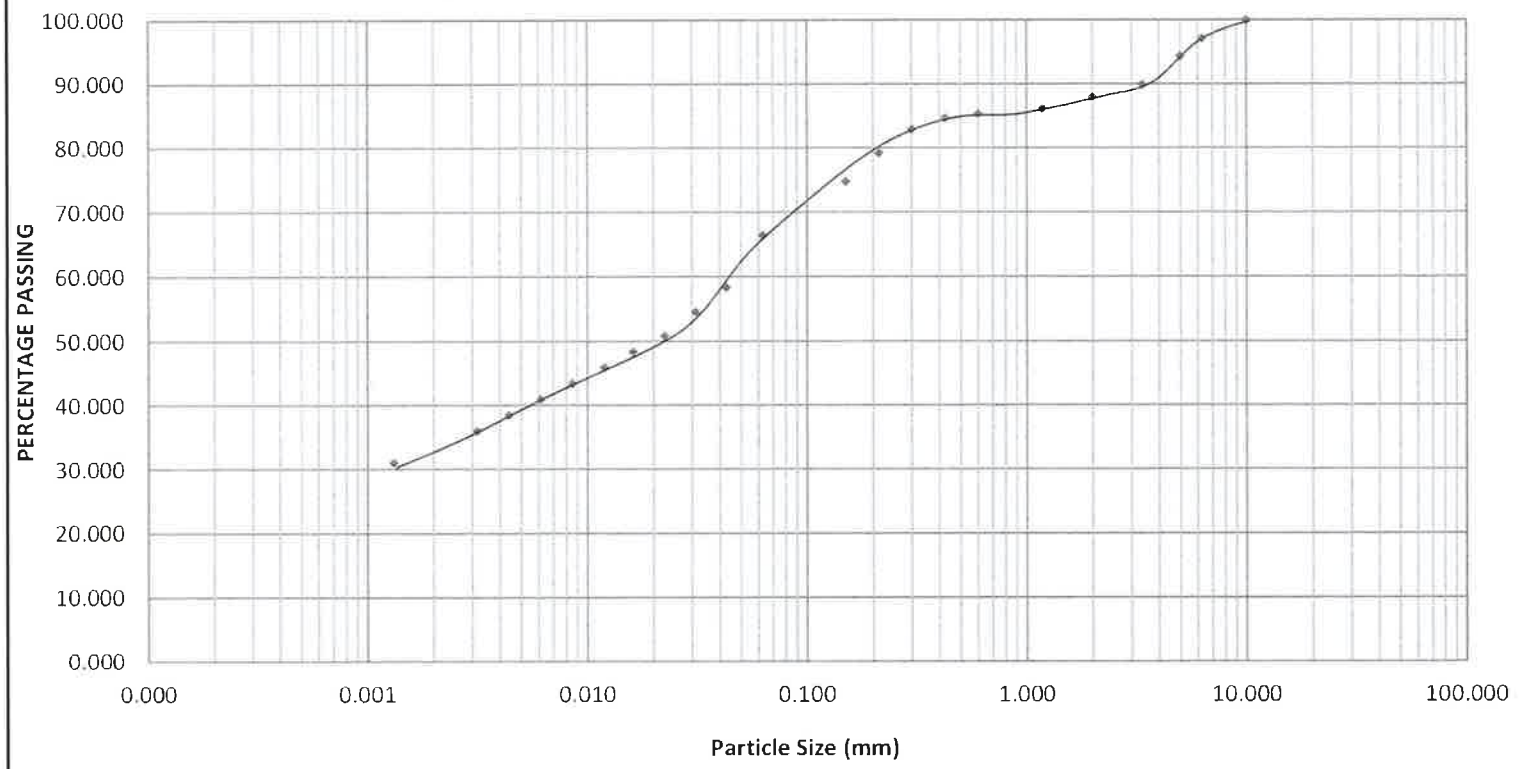
Sample Reference: BH12 Sample No: UD1 Depth: 3.00-4.00m
Material Description: Grey slightly sandy CLAY with silt
Location: Soil Investigation Works at Tengah Phase 1 & 2 Infra (WI059)
Project: [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS

TÜV SÜD AL Technologies Pte Ltd

Test Report No. 7362011662
dated 10-Jan-17

AL Technologies

B.S. 1377 PART 2: 1990 PARTICLE SIZE ANALYSIS TEST



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	C
	SILT			SAND			GRAVEL			

Material Description:

Red slightly gravelly slightly sandy SILT with clay

Gravel	:	12 %
Sand	:	22 %
Silt	:	33 %
Clay	:	33 %

Detailed Particle Size Distribution

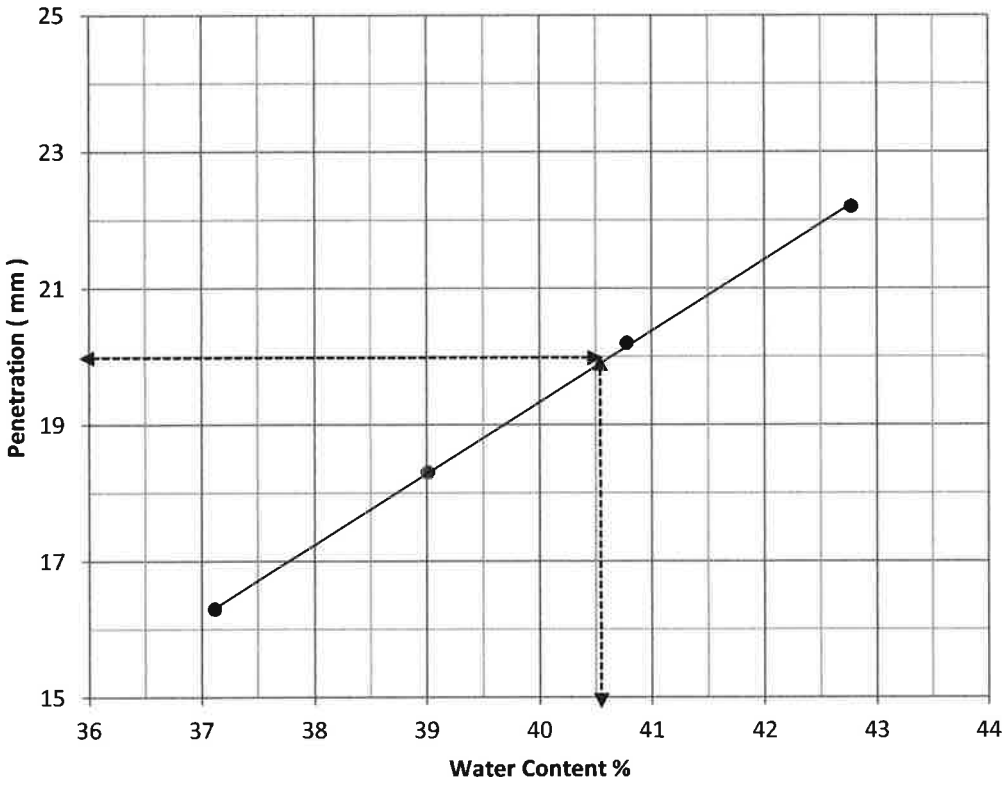
Grading (mm)	% Passing BS Sieve
10.0	100.00
6.3	97.11
5.0	94.28
3.4	89.88
2.0	87.90
1.18	86.12
0.600	85.29
0.425	84.67
0.300	82.91
0.212	79.17
0.150	74.78
0.063	66.38
0.043	58.32
0.031	54.59
0.023	50.87
0.016	48.39
0.012	45.91
0.009	43.43
0.006	40.95
0.004	38.46
0.003	35.98
0.001	31.02

Project : [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS	Borehole No.: BH12	Location: Soil Investigation Works at Tengah Phase 1 & 2 Infra (WI059)	
	Sample Ref: . UD2	Depth: 6.00-7.00m	

Test Report No. 7362011662
dated 10-Jan-17

AL Technologies

BS 1377 PART 2: 1990 ATTERBERG LIMIT (CONE PENETROMETER) TEST



HISTORY OF SAMPLE Wet Sieving Percentage of passing 0.425 mm Sieve 85 %

		LIQUID LIMIT %				PLASTIC LIMIT %	
Wet Weight + Tare	(g)	25.37	24.11	24.35	25.26	25.56	25.44
Dry Weight + Tare	(g)	20.70	19.62	19.64	20.11	23.25	23.00
Tare Weight	(g)	8.12	8.11	8.09	8.07	14.81	14.11
Water Content	%	37.12	39.01	40.78	42.77	27.37	27.45
Penetration	mm	16.3	18.3	20.2	22.2		

Liquid Limit	%	41
Plastic Limit	%	27
Plastic Index	%	14

Sample Reference: BH12 Sample No: UD2 Depth: 6.00-7.00m
Material Description: Red slightly gravelly slightly sandy SILT with clay
Location: Soil Investigation Works at Tengah Phase 1 & 2 Infra (WI059)
Project: [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS

TÜV SÜD AL Technologies Pte Ltd

Total Stress Triaxial Compression

Unconsolidated Undrained

Sample details

Sketch showing specimen location in original Sample

Depth 6.00-7.00m
Description: Firm to stiff red slightly gravelly slightly sandy SILT with clay

	Specimen 1	Specimen 2	Specimen 3
Type			
Height H_0 (mm)	76	76	76
Diameter D_0 (mm)	38	38	38
Weight W_0 (gr)	166.7	168.4	179.5
Bulk Density ρ (Mg/m3)	1.93	1.95	2.08
Particle Density ρ_s	2.65 (assumed)	2.65 (assumed)	2.65 (assumed)

Initial Conditions

	Specimen 1	Specimen 2	Specimen 3
Cell Pressure $\sigma 3$ (kPa)	65.00	130.00	260.00
Machine Speed d_r(mm/min)	1.520	1.520	1.520
No. of Membranes	1	1	1
Total Thickness (mm)	0.02	0.02	0.02
Strain Channel	13	16	20
Load Channel	10	15	18
Moisture Content w_0%	27	22	20
Dry Density ρ_{d0} (Mg/m3)	1.52	1.60	1.74
Voids Ratio e_0	0.74	0.66	0.52
Deg of Saturation S_0%	97.29	89.69	100.00

Final Condition

	Specimen 1	Specimen 2	Specimen 3
Max Deviator Stress (kPa)	119.97	166.23	237.68
Membrane Correction σ_{mb} (kPa)	0.20	0.14	0.20
Corr Stress $(\sigma_1 - \sigma_3)_c$ (kPa)	119.77	166.09	237.48
Strain at Failure ε_f%	20.43	12.32	20.25
Shear Strength c_u (kPa)	59.88	83.04	118.74
Moisture Content w_f%	27	22	20
Dry Density ρ_{df} (Mg/m3)	1.52	1.60	1.74
Voids Ratio e_f	0.74	0.66	0.52
Deg of Saturation S_f%	96.47	89.21	99.77

Notes:

Failure Sketch



Surface Inclination

[Test Method : BS1377 : Part 7 : 1990 : 8/9*
(* delete as appropriate)

Test name UU12/2 (SS, MS)
Date of Test: 29/12/16

Site Reference: TENGAH PHASE 1&2 INFFRA
Jobfile: C:\WINCLISP\2016\WI-059.JOB

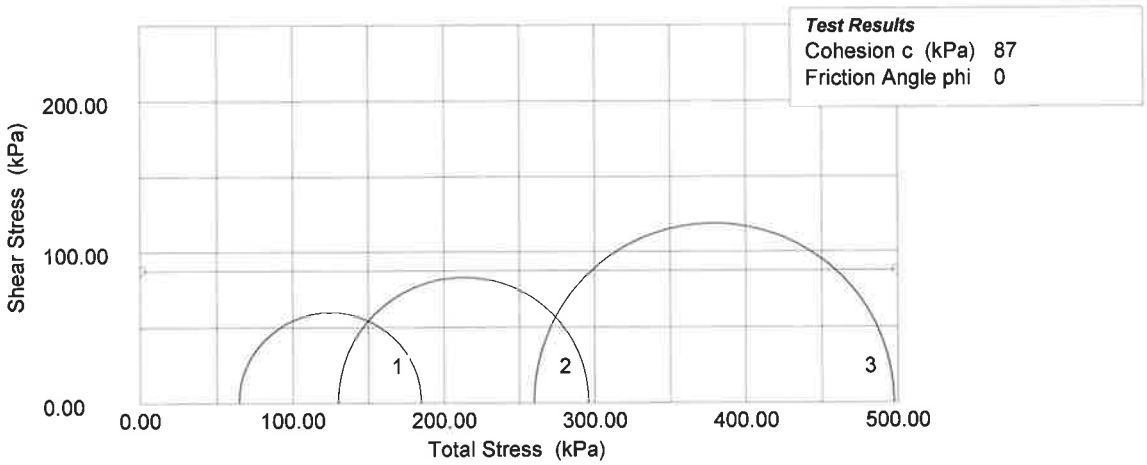
Sample: UD-2
Borehole: BH-12

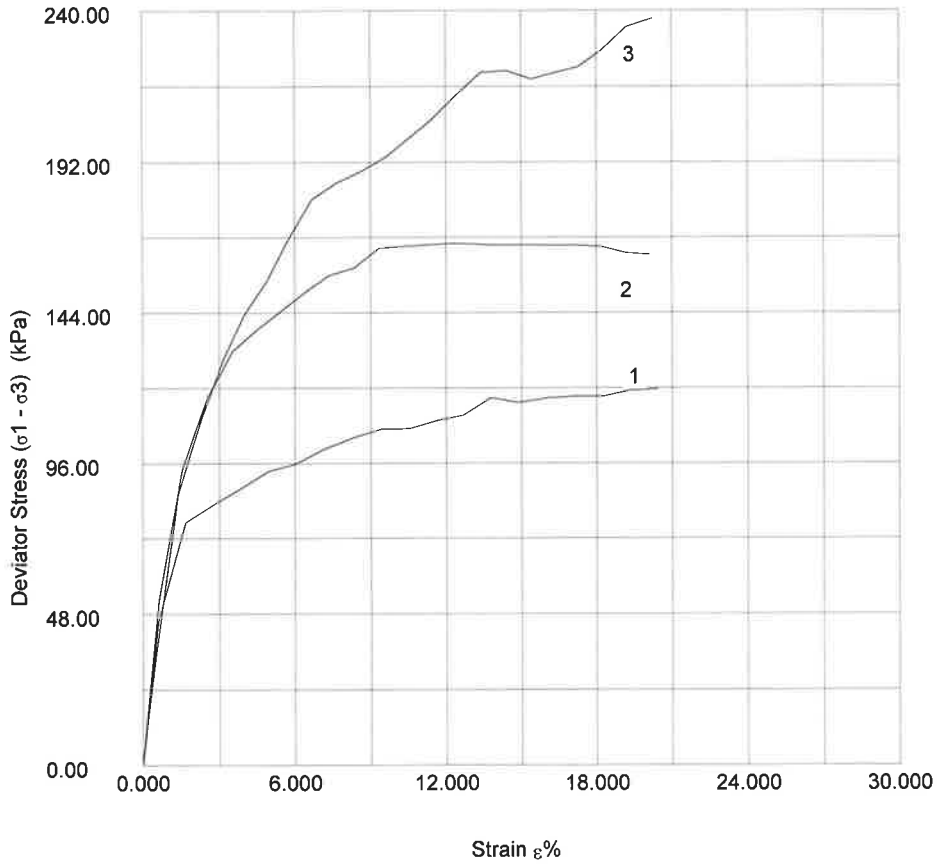
Operator: *Checked:* *Approved:*

TÜV SÜD AL Technology Co. Reg. No. 198906125W

Total Stress Triaxial Compression

Unconsolidated Undrained





[Test Method : BS1377 : Part 7 : 1990 : 8/9* (* delete as appropriate)		Test name Date of Test:	UU12/2 (SS, MS) 29/12/16
Site Reference: Jobfile:	TENGAH PHASE 1&2 INFFRA C:\WINCLISP\2016\WI-059.JOB	Sample: Borehole:	UD-2 BH-12
Operator:	*Checked:*		*Approved:*

TÜV SÜD AL Technology Co. Reg. No: 198905128W Pte Ltd

Test Report No. 7362011662
dated 9-Jan-2017

AL Technologies

SUMMARY OF TEST RESULTS

PROJECT :	D/250/14] TERM CONTRACT NO.35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS							
LOCATION :	Soil Investigation Works at Tengah Phase 1 & 2 Infra (WI059)							
BOREHOLE NO.			BH13	BH13				
SAMPLE REF.			UD1	UD2				
DEPTH (m)		From	3.00	6.00				
		To	4.00	6.50				
Natural Moisture Content		%	32	22				
Density	Bulk Density	Mg/m3	1.88	1.94				
	Dry Density	Mg/m3	1.42	1.59				
Atterberg Limits	Liquid Limit	%	56	41				
	Plastic Limit	%	26	26				
	Plasticity Index	%	30	15				
Particle Size Analysis	Gravel	%	12	0				
	Sand	%	15	25				
	Silt	%	34	56				
	Clay	%	39	19				
Particle Density of Soil		Mg/m^3	2.63	2.64				
Triaxial Compression	Type of Test*1			UU				
	Cohesion (c / c')	kPa		131				
	Phi Angle (φ / φ')	Degree		0				
Consolidation	Initial Void Ratio							
	Preconsolidation Pre:	kN/m^2						
	Compression Index							
Chemical Analysis	Sulphate Content	%						
	Chloride Content	%						
	pH Value							
Permeability	Coefficient at 20°C							
Unconfined Compression	Unconfined Comp. strength	MPa						
Point Load	Type of Test*2							

Legend :

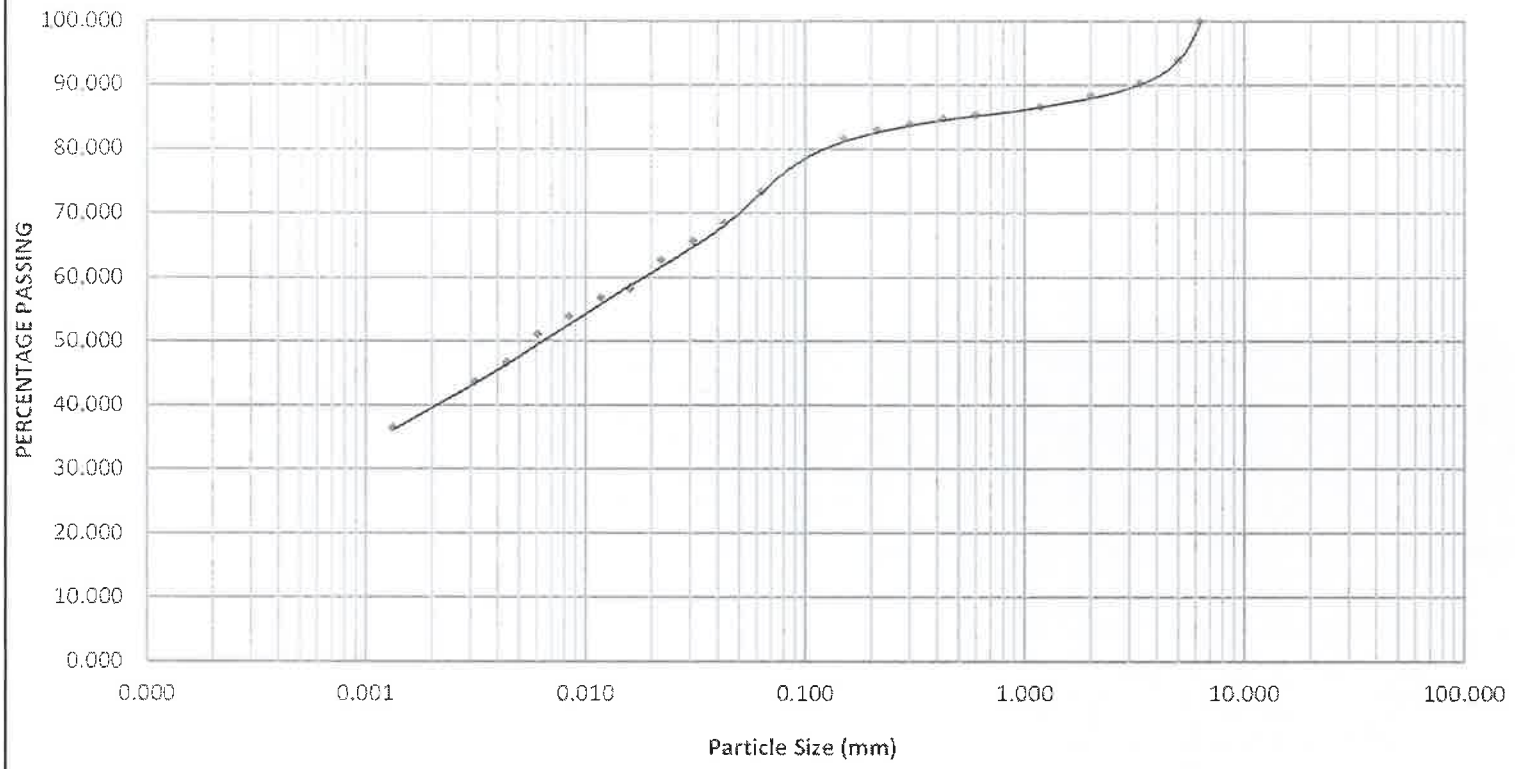
*1	UU	- Unconsolidated Undrained	*2	D	-	Diameteral
	CU	- Consolidated Undrained		A	-	Axial
	CD	- Consolidated Drained		I	-	Irregular
	QU	- Quick Undrained				
	SUU	- Saturated UU w/pore water pressure				
	UC	- Unconfined Compression				
	MUU	- Multistage Unconsolidated Undrained				
	MCU	- Multistage Consolidated Undrained				
	MCD	- Multistage Consolidation Drained				

AL Technologies Pte Ltd * TÜV SÜD * Co. Reg. No. 199806129W

Test Report No. 7362011662
dated 6-Jan-17

AL Technologies

B.S. 1377 PART 2: 1990 PARTICLE SIZE ANALYSIS TEST



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	C
	SILT			SAND			GRAVEL			

Material Description:

Reddish brown mottled grey slightly gravelly slightly sandy CLAY with silt

Gravel	:	12 %
Sand	:	15 %
Silt	:	34 %
Clay	:	39 %

Detailed Particle Size Distribution

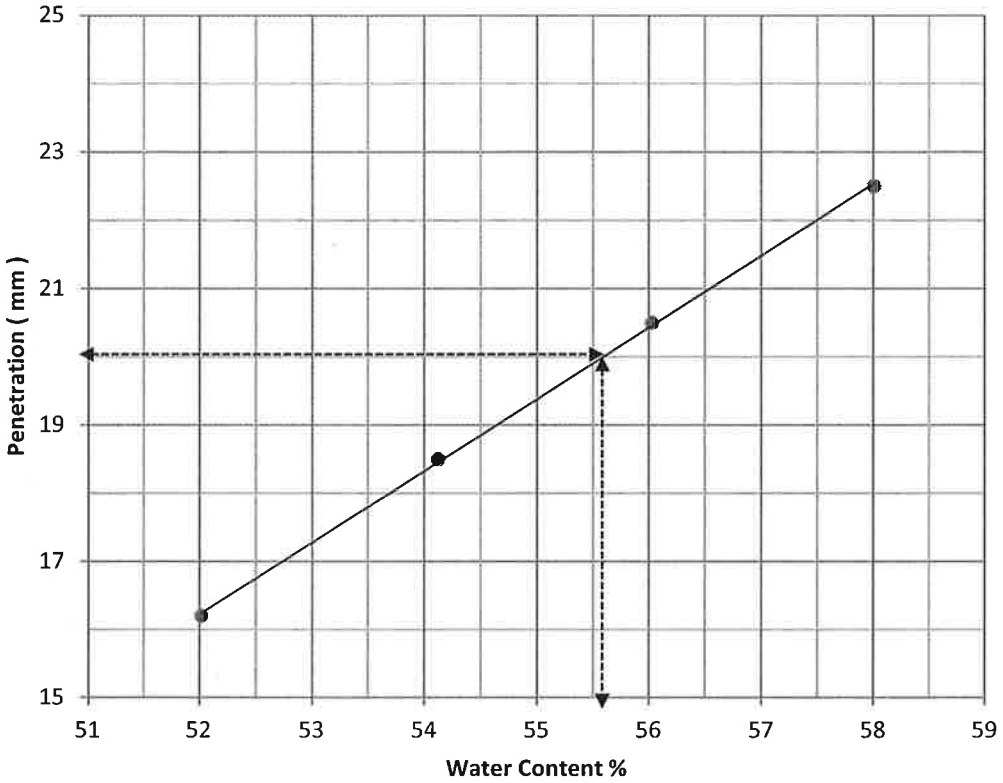
Grading (mm)	% Passing BS Sieve
6.3	100.00
5	93.91
3.35	90.23
2	88.30
1.18	86.57
0.6	85.34
0.425	84.79
0.3	83.96
0.212	82.96
0.15	81.69
0.063	73.47
0.043	68.57
0.031	65.65
0.022	62.74
0.016	58.36
0.012	56.90
0.008	53.98
0.006	51.06
0.004	46.69
0.003	43.77
0.001	36.47

Project : [D/250/14] TERM CONTRACT NO.35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30MONTHS	Borehole No.:	BH13	Location: Tengah Phase 1 & 2 Infra (WI059)
	Sample Ref: .	UD1	Depth: 3.00-4.00m

Test Report No. 7362011662
dated 5-Jan-17

AL Technologies

BS 1377 PART 2: 1990 ATTERBERG LIMIT (CONE PENETROMETER) TEST



HISTORY OF SAMPLE Wet Sieving Percentage of passing 0.425 mm Sieve 85 %

			LIQUID LIMIT %			PLASTIC LIMIT %	
Wet Weight + Tare	(g)	25.78	24.25	24.65	25.04	25.63	25.45
Dry Weight + Tare	(g)	19.72	18.61	18.70	18.81	23.54	23.40
Tare Weight	(g)	8.07	8.19	8.08	8.07	15.50	15.50
Water Content	%	52.02	54.13	56.03	58.01	25.95	25.95
Penetration	mm	16.2	18.5	20.5	22.5		
Liquid Limit	%	56					
Plastic Limit	%	26					
Plastic Index	%	30					

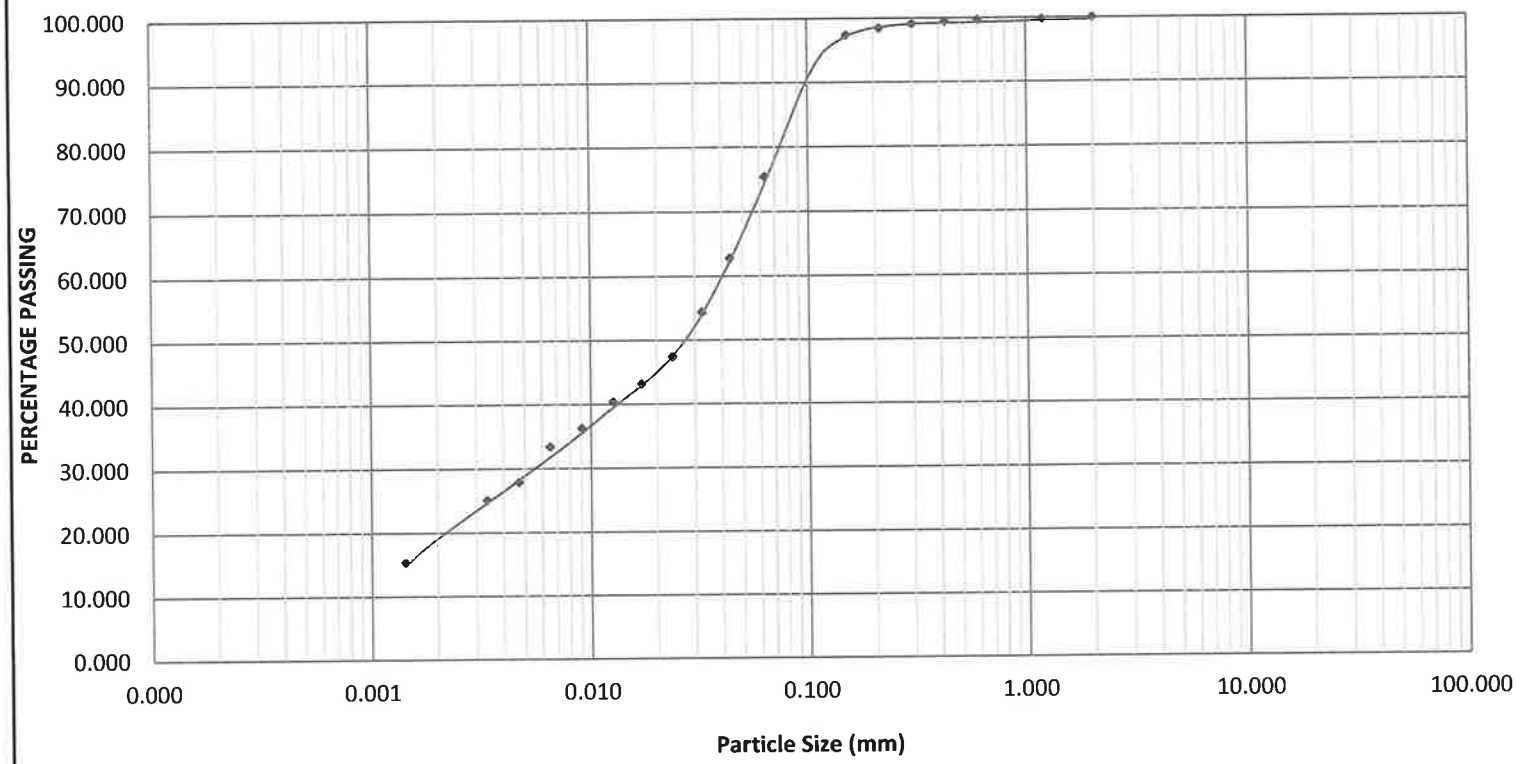
Sample Reference: BH13 Sample No: UD1 Depth: 3.00-4.00m
Material Description: Reddish brown mottled grey slightly gravelly slightly sandy CLAY with silt
Location: Tengah Phase 1 & 2 Infra (WI059)
Project: [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS

TÜV SÜD AL Technologies Pte Ltd

Test Report No. 7362011662
dated 6-Jan-17

AL Technologies

B.S. 1377 PART 2: 1990 PARTICLE SIZE ANALYSIS TEST



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	C
	SILT			SAND			GRAVEL			

Material Description:

Yellow mottled grey slightly sandy SILT with clay

Gravel	:	0 %
Sand	:	25 %
Silt	:	56 %
Clay	:	19 %

Detailed Particle Size Distribution

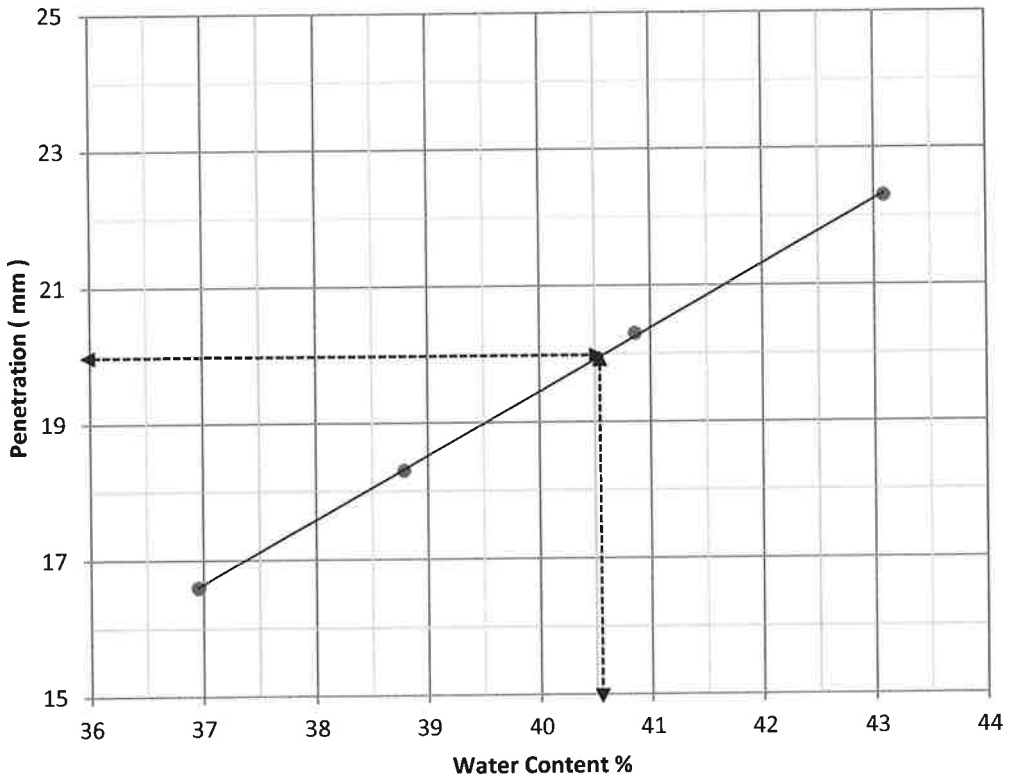
Grading (mm)	% Passing BS Sieve
2.00	100.00
1.18	99.79
0.6	99.67
0.425	99.48
0.3	99.10
0.212	98.49
0.15	97.38
0.063	75.39
0.044	62.80
0.032	54.43
0.024	47.45
0.017	43.26
0.013	40.47
0.009	36.29
0.006	33.49
0.005	27.91
0.003	25.12
0.001	15.35

Project : [D/250/14] TERM CONTRACT NO.35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30MONTHS	Borehole No.: BH13	Location: Tengah Phase 1 & 2 Infra (WI059)
	Sample Ref: . UD2	Depth: 6.00-6.50m

Test Report No. 7362011662
dated 5-Jan-17

AL Technologies

BS 1377 PART 2: 1990 ATTERBERG LIMIT (CONE PENETROMETER) TEST



HISTORY OF SAMPLE Wet Sieving Percentage of passing 0.425 mm Sieve 99 %

			LIQUID LIMIT %			PLASTIC LIMIT %	
Wet Weight + Tare	(g)	25.00	25.84	25.54	23.13	25.63	25.12
Dry Weight + Tare	(g)	20.41	20.91	20.51	18.61	23.50	22.95
Tare Weight	(g)	7.99	8.20	8.20	8.12	15.20	14.50
Water Content	%	36.96	38.79	40.86	43.09	25.66	25.68
Penetration	mm	16.6	18.3	20.3	22.3		

Liquid Limit	%	41
Plastic Limit	%	26
Plastic Index	%	15

Sample Reference: BH13 Sample No: UD2 Depth: 6.00-6.50m
Material Description: Yellow mottled grey slightly sandy SILT with clay
Location: Tengah Phase 1 & 2 Infra (WI059)
Project: [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS

TÜV SÜD AL Technologies Pte Ltd

Total Stress Triaxial Compression

Unconsolidated Undrained

Sample details

Sketch showing specimen location in original Sample

Depth 6.00-6.50m
Description: Stiff yellow mottled grey slightly sandy SILT with clay

	Specimen 1	Specimen 2	Specimen 3
Type			
Height H_0 (mm)	76	76	76
Diameter D_0 (mm)	38	38	38
Weight W_0 (gr)	165.5	164.8	172
Bulk Density ρ (Mg/m3)	1.92	1.91	2.00
Particle Density ρ_s	2.65 (assumed)	2.65 (assumed)	2.65 (assumed)

Initial Conditions

	Specimen 1	Specimen 2	Specimen 3
Cell Pressure $\sigma 3$ (kPa)	60.00	120.00	240.00
Machine Speed d_r(mm/min)	1.520	1.520	1.520
No. of Membranes	1	1	1
Total Thickness (mm)	0.2	0.2	0.2
Strain Channel	20	16	13
Load Channel	18	15	10
Moisture Content w_0%	22	23	21
Dry Density ρ_{d0} (Mg/m3)	1.58	1.56	1.65
Voids Ratio e_0	0.68	0.70	0.61
Deg of Saturation S_0%	84.79	85.50	91.80

Final Condition

	Specimen 1	Specimen 2	Specimen 3
Max Deviator Stress (kPa)	216.40	262.16	311.59
Membrane Correction σ_{mb} (kPa)	2.00	2.00	1.90
Corr Stress $(\sigma_1 - \sigma_3)_c$ (kPa)	214.40	260.16	309.69
Strain at Failure ε_f%	20.32	20.29	18.11
Shear Strength c_u (kPa)	107.20	130.08	154.84
Moisture Content w_f%	21	22	20
Dry Density ρ_{df} (Mg/m3)	1.58	1.57	1.66
Voids Ratio e_f	0.67	0.69	0.59
Deg of Saturation S_f%	83.49	84.24	89.43

Notes:

Failure Sketch



Surface Inclination

[Test Method : BS1377 : Part 7 : 1990 : 8/9*
(* delete as appropriate)

Test name UU-13-2 (SS, MS)
Date of Test: 15/12/16

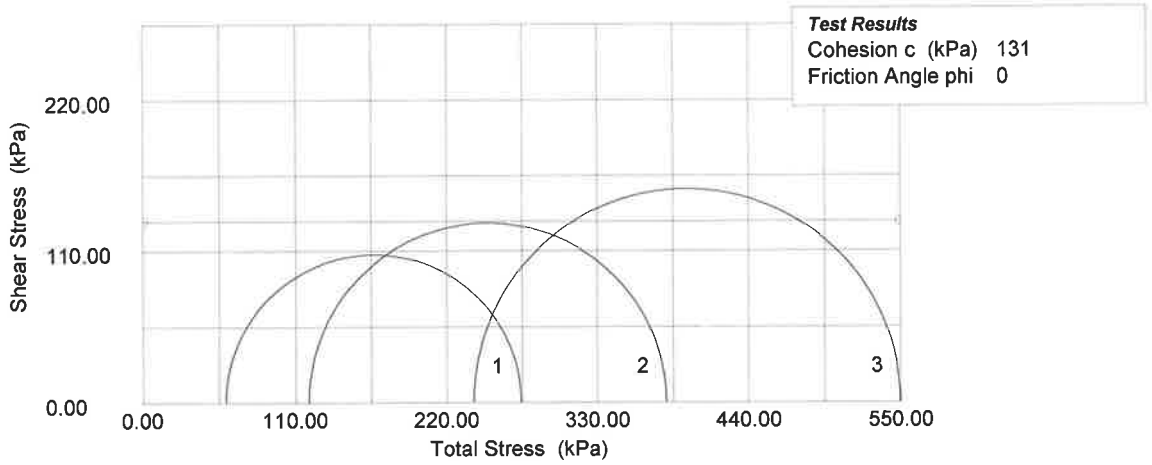
Site Reference: TENGAH PHASE 1&2 INFFRA
Jobfile: C:\WINCLISP\2016\WI-059.JOB

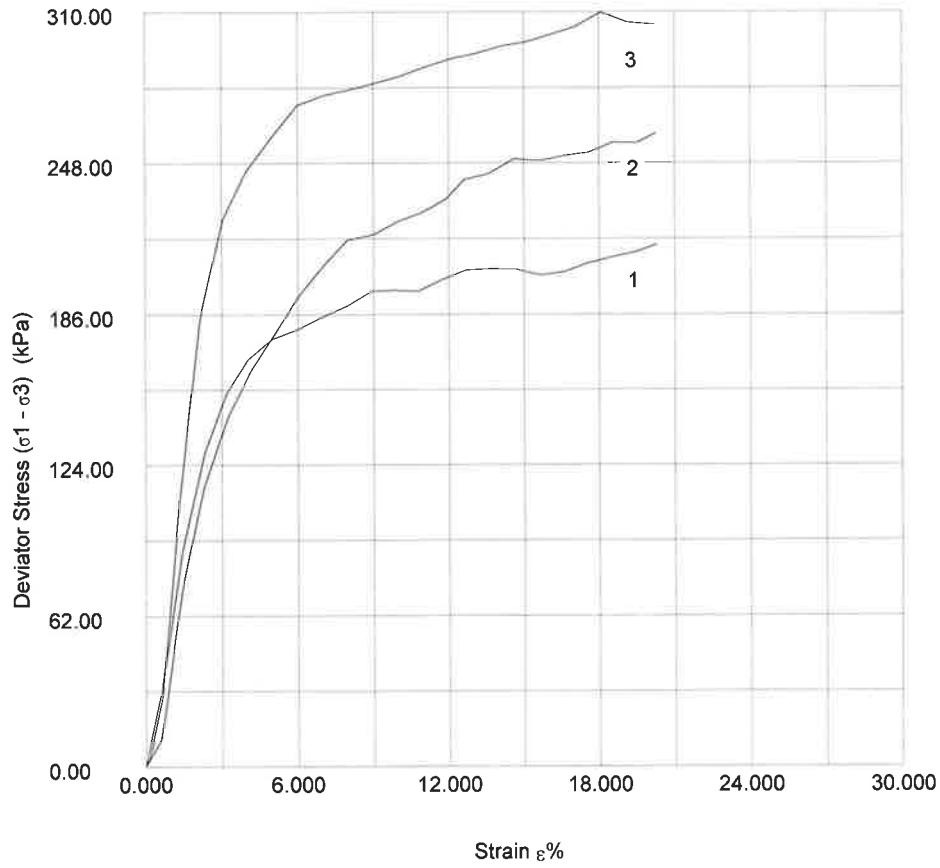
Sample: UD2
Borehole: BH13

Operator: *Checked:* *Approved:*

Total Stress Triaxial Compression

Unconsolidated Undrained





[Test Method : BS1377 : Part 7 : 1990 : 8/9* (* delete as appropriate)		Test name Date of Test:	UU-13-2 (SS, MS) 15/12/16
Site Reference: Jobfile:	TENGAH PHASE 1&2 INFFRA C:\WINCLISP\2016\WI-059.JOB	Sample: Borehole:	UD2 BH13
Operator:	*Checked:*		*Approved:*

Test Report No. 7362011662
dated 9-Jan-2017

AL Technologies

SUMMARY OF TEST RESULTS

PROJECT :	D/250/14] TERM CONTRACT NO.35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS							
LOCATION :	Soil Investigation Works at Tengah Phase 1 & 2 Infra (WI059)							
BOREHOLE NO.			BH14	BH14				
SAMPLE REF.			UD1	UD2				
DEPTH (m)		From	2.00	4.00				
		To	3.00	4.50				
Natural Moisture Content		%	27	28				
Density	Bulk Density	Mg/m3	1.88	1.84				
	Dry Density	Mg/m3	1.48	1.44				
Atterberg Limits	Liquid Limit	%	46	42				
	Plastic Limit	%	22	26				
	Plasticity Index	%	24	16				
Particle Size Analysis	Gravel	%	8	23				
	Sand	%	15	25				
	Silt	%	34	27				
	Clay	%	43	25				
Particle Density of Soil		Mg/m^3	2.63	2.64				
Triaxial Compression	Type of Test*1		UU					
	Cohesion (c / c')	kPa	43					
	Phi Angle (φ / φ')	Degree	0					
Consolidation	Initial Void Ratio							
	Preconsolidation Pre:	kN/m^2						
	Compression Index							
Chemical Analysis, Water	Sulphate Content	%						
	Chloride Content	%						
	pH Value							
Permeability	Coefficient at 20°C							
Unconfined Compression	Unconfined Comp. strength	MPa						
Point Load	Type of Test*2							

Legend :

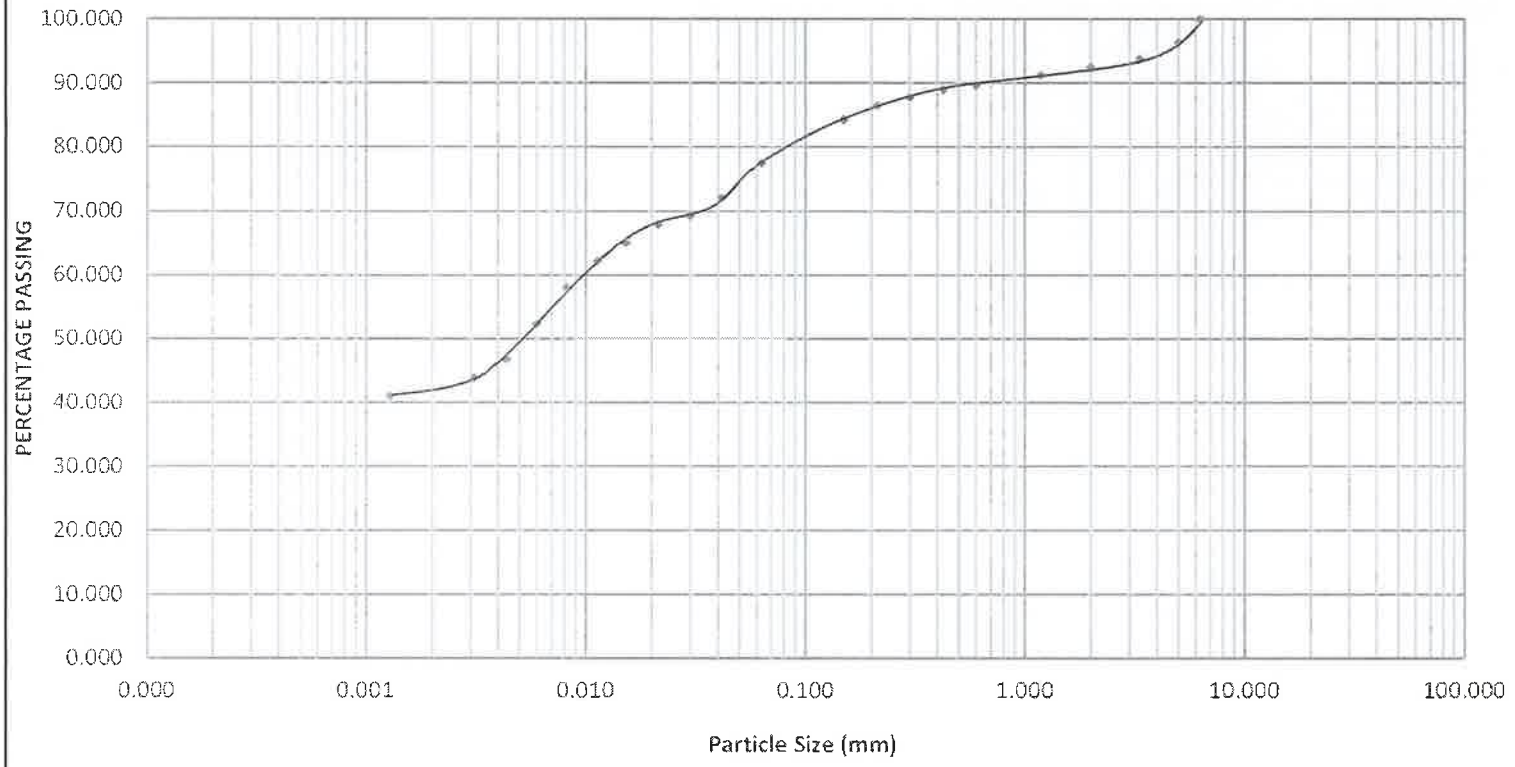
*1	UU	- Unconsolidated Undrained	*2	D	- Diameteral
	CU	- Consolidated Undrained		A	- Axial
	CD	- Consolidated Drained		I	- Irregular
	QU	- Quick Undrained			
	SUU	- Saturated UU w/pore water pressure			
	UC	- Unconfined Compression			
	MUU	- Multistage Unconsolidated Undrained			
	MCU	- Multistage Consolidated Undrained			
	MCD	- Multistage Consolidation Drained			

AL Technologies Pte Ltd * TÜV SÜD * Co. Reg. No. 199905129W

Test Report No. 7362011662
dated 6-Jan-17

AL Technologies

B.S. 1377 PART 2: 1990 PARTICLE SIZE ANALYSIS TEST



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	C
	SILT			SAND			GRAVEL			

Material Description:

Reddish brown slightly gravelly slightly sandy CLAY with silt

Gravel	:	8 %
Sand	:	15 %
Silt	:	34 %
Clay	:	43 %

Detailed Particle Size Distribution

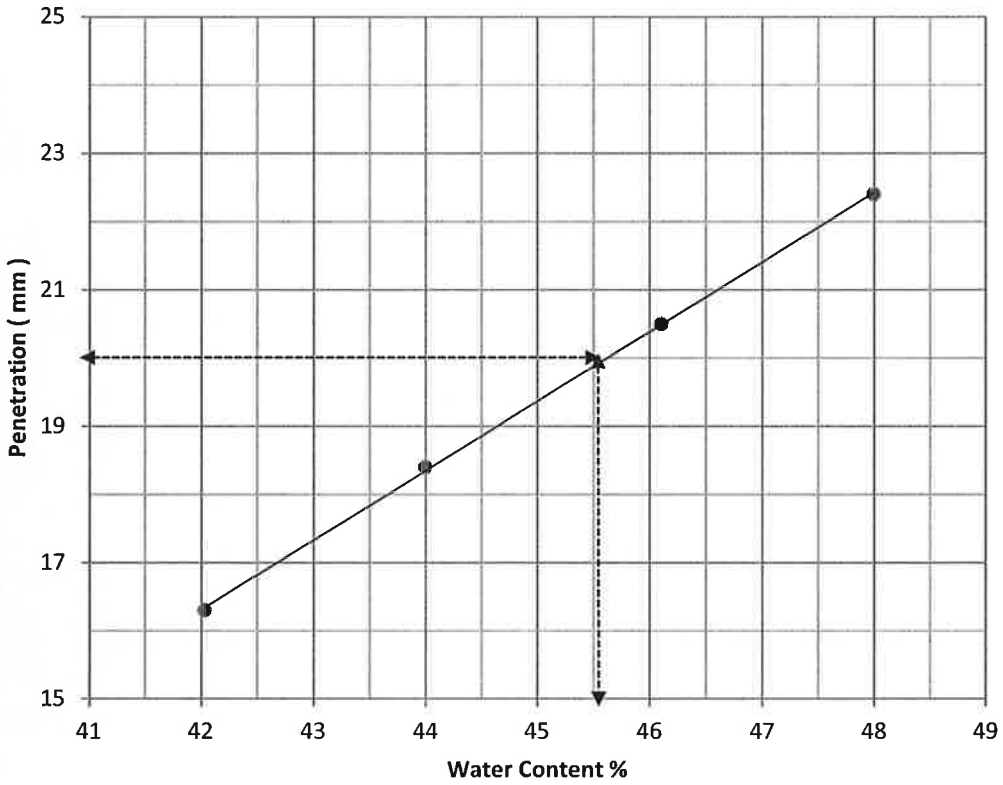
Grading (mm)	% Passing BS Sieve
6.3	100.00
5	96.25
3.35	93.73
2	92.37
1.18	91.23
0.600	89.64
0.425	88.94
0.300	87.72
0.212	86.46
0.150	84.27
0.063	77.42
0.042	72.13
0.030	69.30
0.021	67.89
0.015	65.06
0.011	62.23
0.008	57.99
0.006	52.33
0.004	46.67
0.003	43.84
0.001	41.01

Project : [D/250/14] TERM CONTRACT NO.35 FOR SITE INVESTIGATION WORKS FOR PERIOD OF 30 MONTHS	Borehole No.:	BH14	Location: Tengah Phase 1 & 2 Infra (WI059)
	Sample Ref: .	UD1	Depth: 2.00-3.00m

Test Report No. 7362011662
dated 5-Jan-17

AL Technologies

BS 1377 PART 2: 1990 ATTERBERG LIMIT (CONE PENETROMETER) TEST



HISTORY OF SAMPLE Wet Sieving Percentage of passing 0.425 mm Sieve 89 %

		LIQUID LIMIT %				PLASTIC LIMIT %	
Wet Weight + Tare	(g)	25.78	24.92	24.94	24.43	25.56	25.30
Dry Weight + Tare	(g)	20.64	19.79	19.62	19.16	23.45	23.26
Tare Weight	(g)	8.41	8.13	8.08	8.18	13.87	14.11
Water Content	%	42.03	44.00	46.10	48.00	22.03	22.30
Penetration	mm	16.3	18.4	20.5	22.4		
Liquid Limit	%	46					
Plastic Limit	%	22					
Plastic Index	%	24					

Sample Reference: BH14 Sample No: UD1 Depth: 2.00-3.00m
Material Description: Reddish brown slightly gravelly slightly sandy CLAY with silt
Location: Tengah Phase 1 & 2 Infra (WI059)
Project: [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS

TÜV SÜD AL Technologies Pte Ltd

Total Stress Triaxial Compression

Unconsolidated Undrained

Sample details

Sketch showing specimen location in original Sample

Depth 2.00-3.00m

Description: Soft to firm reddish brown slightly gravelly slightly sandy CLAY with silt

	Specimen 1	Specimen 2	Specimen 3
Type			
Height H_0 (mm)	76	76	76
Diameter D_0 (mm)	38	38	38
Weight W_0 (gr)	157.2	163.2	167
Bulk Density ρ (Mg/m3)	1.82	1.89	1.94
Particle Density ρ_s	2.65 (assumed)	2.65 (assumed)	2.65 (assumed)

Initial Conditions

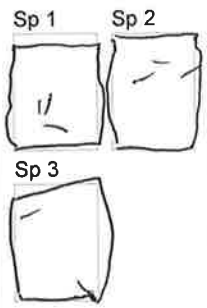
	Specimen 1	Specimen 2	Specimen 3
Cell Pressure $\sigma 3$ (kPa)	25.00	50.00	100.00
Machine Speed d_r(mm/min)	1.520	1.520	1.520
No. of Membranes	1	1	1
Total Thickness (mm)	0.2	0.2	0.2
Strain Channel	20	16	13
Load Channel	18	15	10
Moisture Content w_0%	28	29	23
Dry Density ρ_{d0} (Mg/m3)	1.43	1.46	1.58
Voids Ratio e_0	0.86	0.81	0.68
Deg of Saturation S_0%	85.98	95.93	88.32

Final Condition

	Specimen 1	Specimen 2	Specimen 3
Max Deviator Stress (kPa)	72.73	88.73	99.79
Membrane Correction σ_{mb} (kPa)	1.90	2.00	1.48
Corr Stress $(\sigma_1 - \sigma_3)_c$ (kPa)	70.83	86.73	98.31
Strain at Failure ε_f%	18.33	20.13	12.61
Shear Strength c_u (kPa)	35.42	43.37	49.16
Moisture Content w_f%	27	29	22
Dry Density ρ_{df} (Mg/m3)	1.43	1.47	1.59
Voids Ratio e_f	0.85	0.80	0.67
Deg of Saturation S_f%	85.44	95.02	87.53

Notes:

Failure Sketch



Surface Inclination

[Test Method : BS1377 : Part 7 : 1990 : 8/~~9~~
(* delete as appropriate)

Test name UU-14-1 (SS, ~~M8~~)
Date of Test: 15/12/16

Site Reference: TENGAH PHASE 1&2 INFFRA
Jobfile: C:\WINCLISP\2016\WI-059.JOB

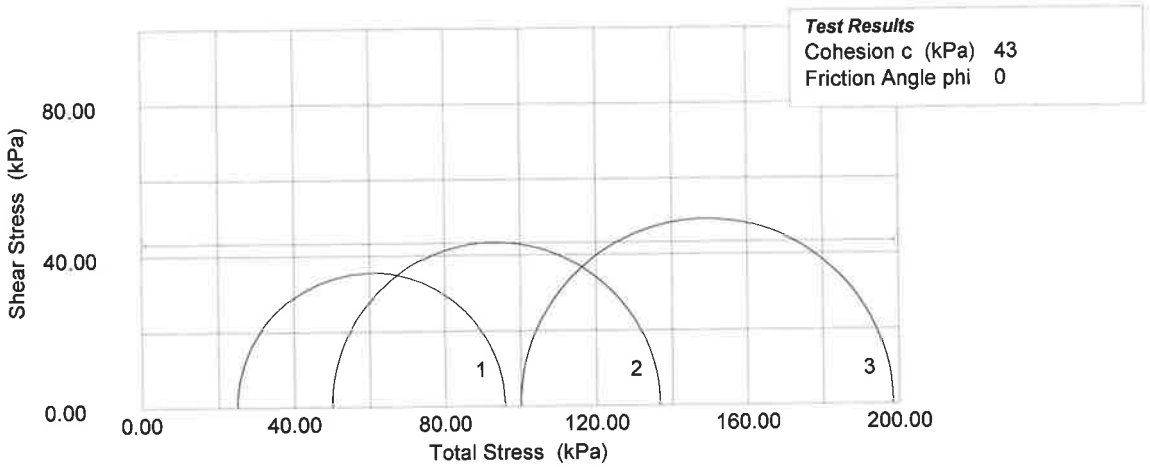
Sample: UD1
Borehole: BH14

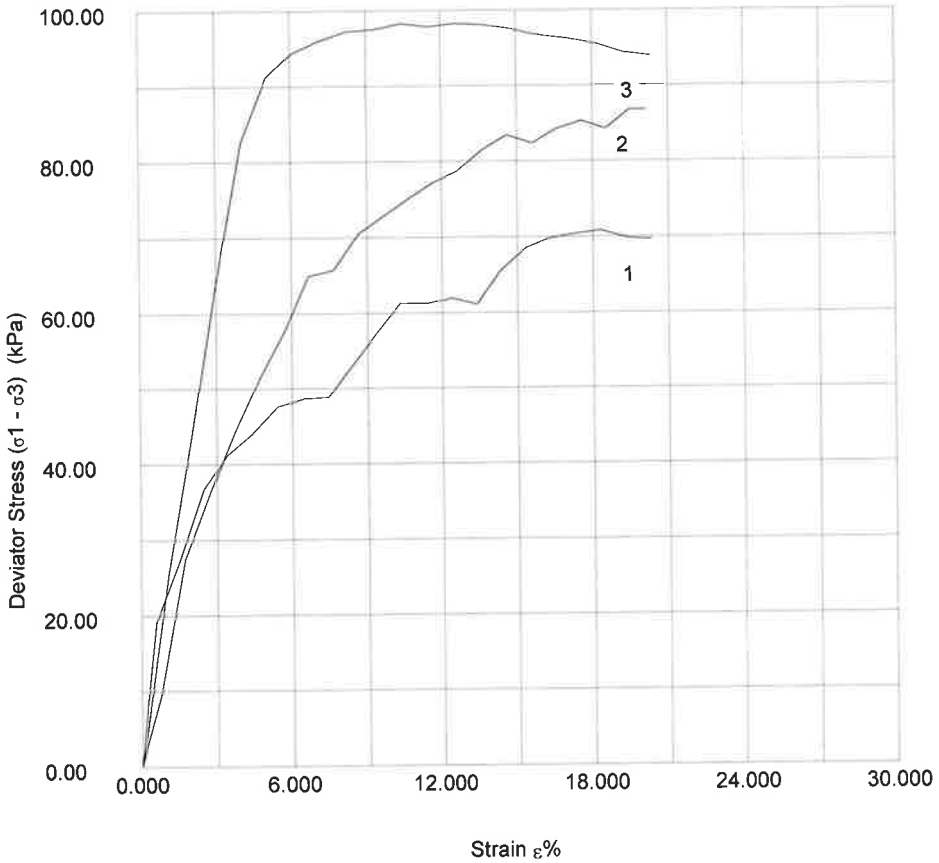
Operator: *Checked:* *Approved:*

TÜV SÜD AL Technologies Pte Ltd * Co. Reg. No. 199905126H

Total Stress Triaxial Compression

Unconsolidated Undrained





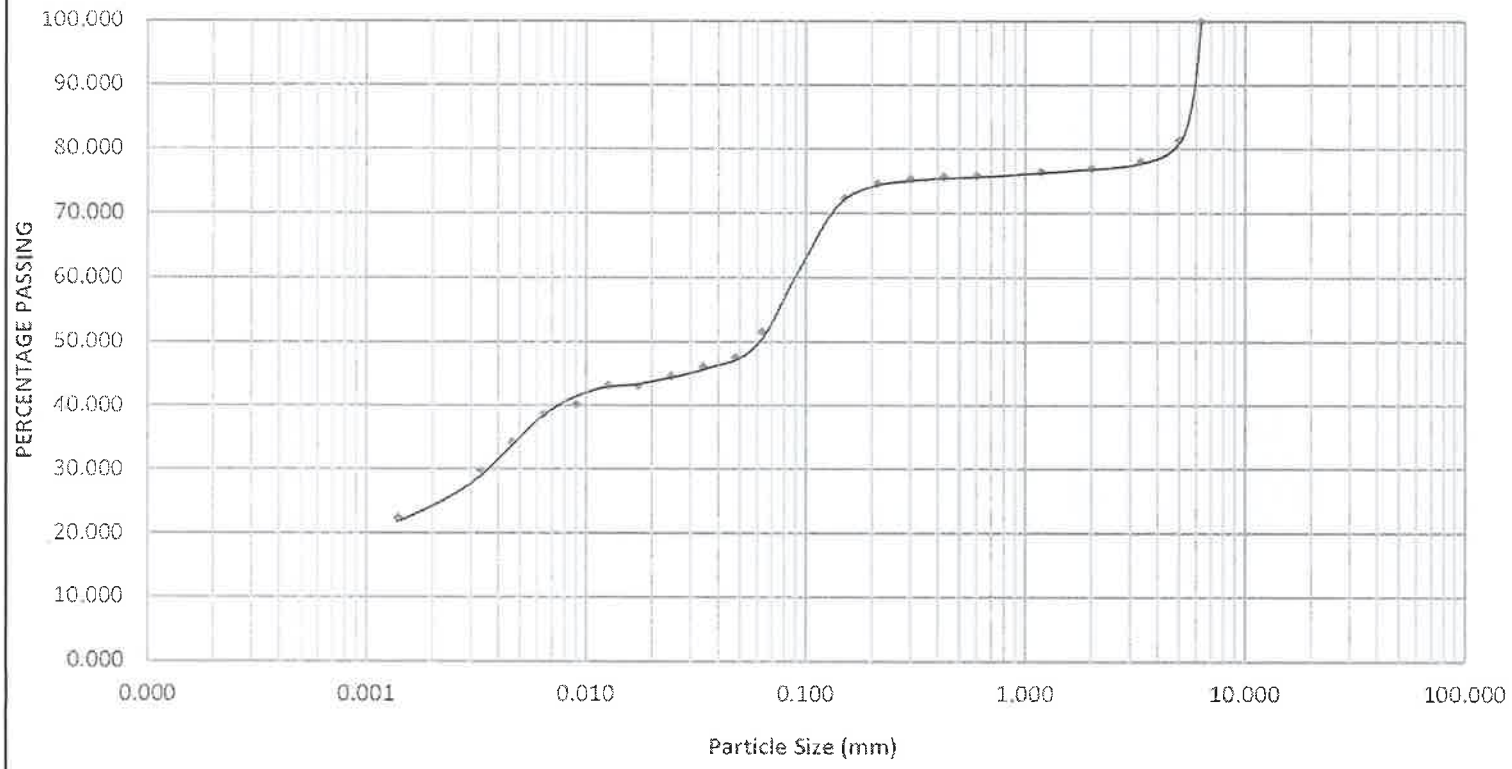
[Test Method : BS1377 : Part 7 : 1990 : 8/9* (* delete as appropriate)		Test name Date of Test:	UU-14-1 (SS, MS) 15/12/16
Site Reference: Jobfile: *Operator:*	TENGAH PHASE 1&2 INFFRA C:\WINCLISP\2016\WI-059.JOB *Checked:*	Sample: Borehole: *Approved:*	UD1 BH14

TÜV SÜD AL Technologies Pte Ltd Co. Reg. No. 199905126W

Test Report No. 7362011662
dated 6-Jan-17

AL Technologies

B.S. 1377 PART 2: 1990 PARTICLE SIZE ANALYSIS TEST



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	C
	SILT			SAND			GRAVEL			

Material Description:

Reddish brown slightly gravelly slightly sandy SILT with clay

Gravel	:	23 %
Sand	:	25 %
Silt	:	27 %
Clay	:	25 %

Detailed Particle Size Distribution

Grading (mm)	% Passing BS Sieve
6.3	100.00
5.0	81.39
3.35	78.04
2.0	77.00
1.18	76.41
0.6	75.84
0.425	75.63
0.3	75.41
0.212	74.67
0.15	72.36
0.063	51.60
0.048	47.58
0.034	46.09
0.024	44.60
0.017	43.12
0.013	43.12
0.009	40.14
0.006	38.66
0.005	34.20
0.003	29.74
0.001	22.30

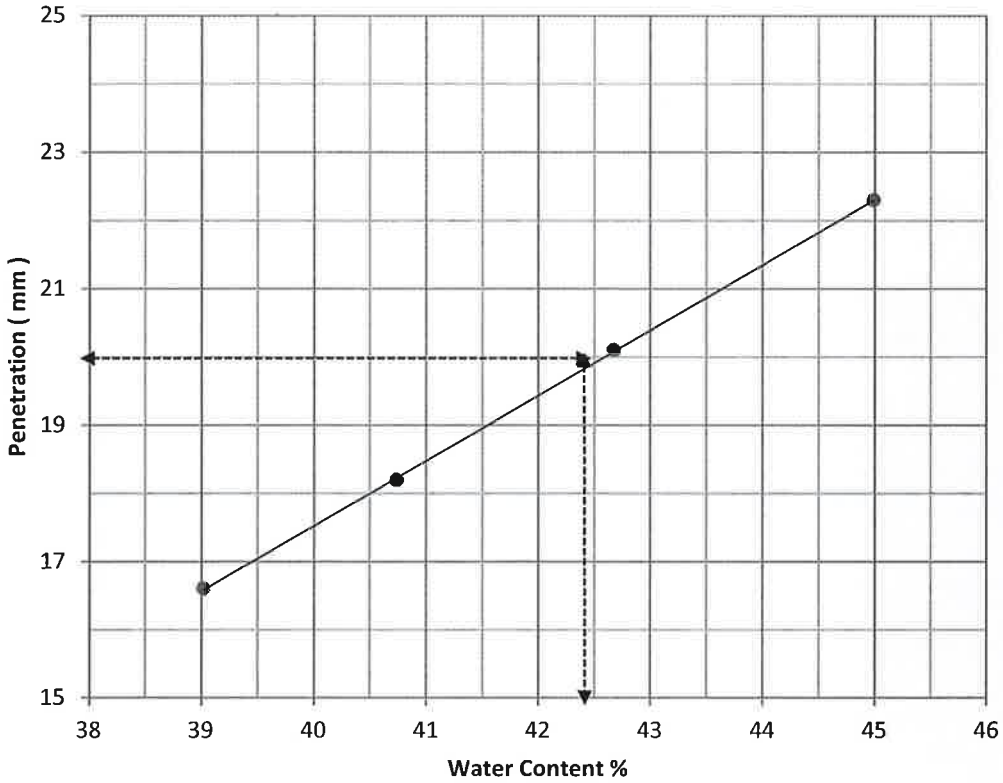
Project : [D/250/14] TERM CONTRACT NO.35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30MONTHS	Borehole No.:	BH14	Location: Tengah Phase 1 & 2 Infra (WI059)
	Sample Ref: .	UD2	Depth: 4.00-4.50m

TÜV SÜD AL Technologies Pte Ltd

Test Report No. 7362011662
dated 5-Jan-17

AL Technologies

BS 1377 PART 2: 1990 ATTERBERG LIMIT (CONE PENETROMETER) TEST



HISTORY OF SAMPLE Wet Sieving Percentage of passing 0.425 mm Sieve 76 %

		LIQUID LIMIT %				PLASTIC LIMIT %	
Wet Weight + Tare	(g)	24.80	24.85	24.35	24.14	25.23	25.60
Dry Weight + Tare	(g)	20.11	20.01	19.60	19.20	23.00	23.45
Tare Weight	(g)	8.09	8.13	8.47	8.22	14.50	15.20
Water Content	%	39.02	40.74	42.68	44.99	26.24	26.06
Penetration	mm	16.6	18.2	20.1	22.3		
Liquid Limit	%	42					
Plastic Limit	%	26					
Plastic Index	%	16					

Sample Reference: BH14 Sample No: UD2 Depth: 4.00-4.50m
Material Description: Reddish brown slightly gravelly slightly sandy SILT with clay
Location: Tengah Phase 1 & 2 Infra (WI059)
Project: [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS

TÜV SÜD AL Technologies Pte Ltd

Test Report No. 7362011662

dated 9-Jan-2017

At Technologies

SUMMARY OF TEST RESULTS

PROJECT :	D/250/14] TERM CONTRACT NO.35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS							
LOCATION :	Soil Investigation Works at Tengah Phase 1 & 2 Infra (WI059)							
BOREHOLE NO.			BH15	BH15				
SAMPLE REF.			UD1	UD2				
DEPTH (m)		From	2.00	4.00				
		To	3.00	5.00				
Natural Moisture Content		%	37	35				
Density	Bulk Density	Mg/m3	1.74	1.78				
	Dry Density	Mg/m3	0.00	0.00				
Atterberg Limits	Liquid Limit	%	55	57				
	Plastic Limit	%	26	30				
	Plasticity Index	%	29	27				
Particle Size Analysis	Gravel	%	0	0				
	Sand	%	12	16				
	Silt	%	35	52				
	Clay	%	53	32				
Particle Density of Soil		Mg/m^3	2.64	2.63				
Triaxial Compression	Type of Test*1			UU				
	Cohesion (c / c')	kPa		52				
	Phi Angle (φ / φ')	Degree		0				
Consolidation	Initial Void Ratio							
	Preconsolidation Pre:	kN/m^2						
	Compression Index							
Chemical Analysis	Sulphate Content	%						
	Chloride Content	%						
	pH Value							
Permeability	Coefficient at 20°C							
Unconfined Compression	Unconfined Comp. strength	MPa						
Point Load	Type of Test*2							

Legend :

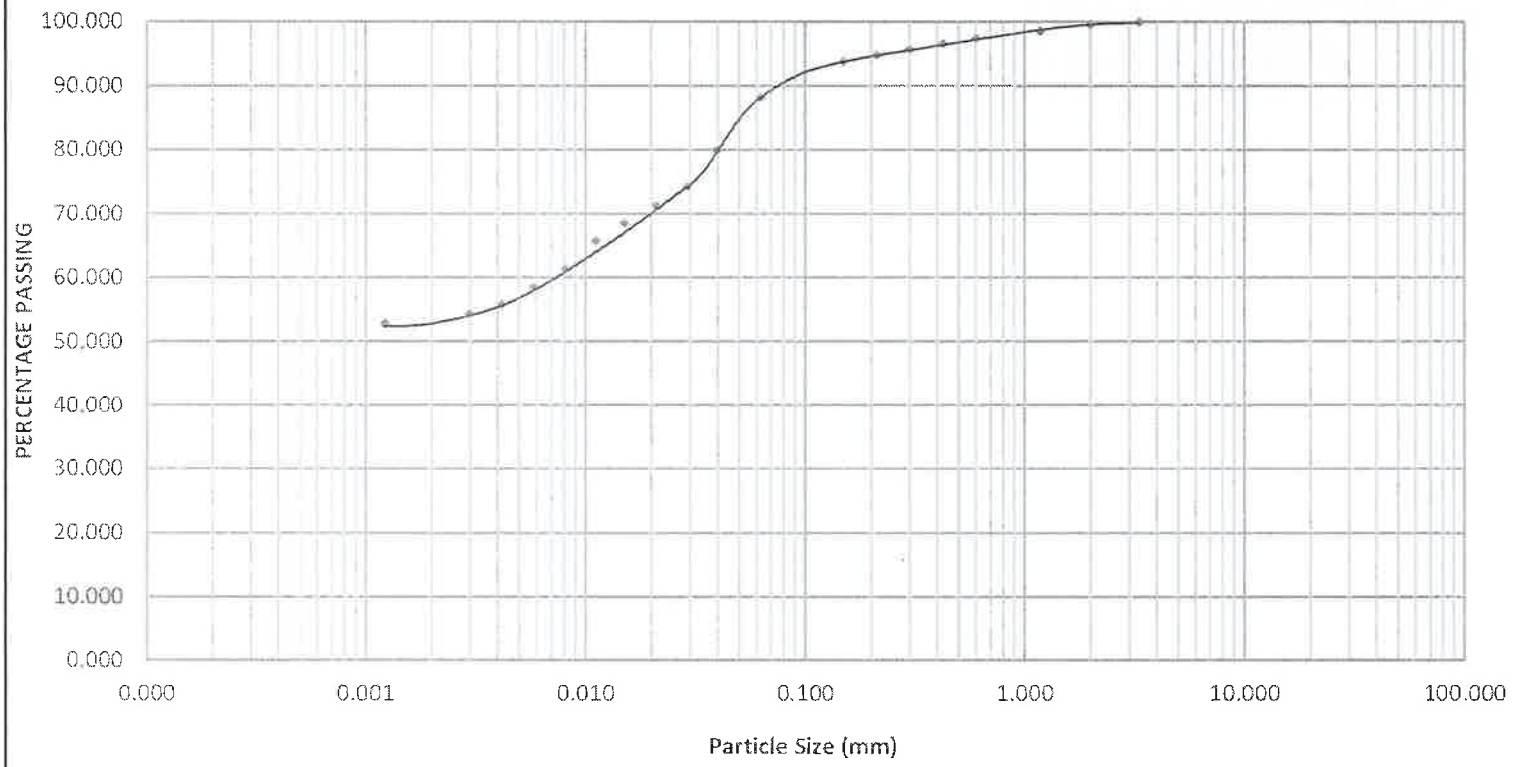
*1	UU	- Unconsolidated Undrained	*2	D	-	Diameteral
	CU	- Consolidated Undrained		A	-	Axial
	CD	- Consolidated Drained		I	-	Irregular
	QU	- Quick Undrained				
	SUU	- Saturated UU w/pore water pressure				
	UC	- Unconfined Compression				
	MUU	- Multistage Unconsolidated Undrained				
	MCU	- Multistage Consolidated Undrained				
	MCD	- Multistage Consolidation Drained				

TÜV SÜD AL Technologies Pte Ltd

Test Report No. 7362011662
dated 6-Jan-17

TÜV SÜD AL Technologies

B.S. 1377 PART 2: 1990 PARTICLE SIZE ANALYSIS TEST



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	C
	SILT			SAND			GRAVEL			

Material Description:

Red mottled slightly sandy CLAY with silt

Gravel	:	0 %
Sand	:	12 %
Silt	:	35 %
Clay	:	53 %

Detailed Particle Size Distribution

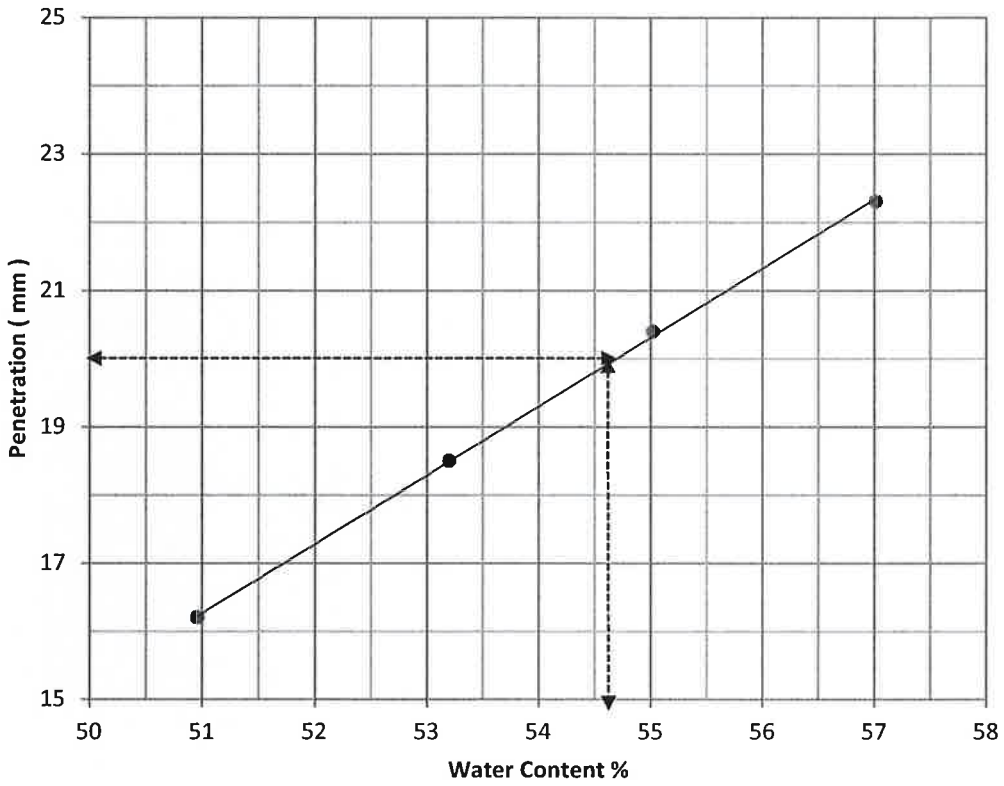
Grading (mm)	% Passing BS Sieve
3.35	100.00
2.0	99.57
1.18	98.54
0.6	97.41
0.425	96.61
0.3	95.68
0.212	94.79
0.15	93.80
0.063	88.22
0.040	79.92
0.029	74.21
0.021	71.36
0.015	68.50
0.011	65.65
0.008	61.37
0.006	58.51
0.004	55.66
0.003	54.23
0.001	52.80

Project : [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS	Borehole No.:	BH15	Location: Tengah Phase 1 & 2 Infra (WI059)
	Sample Ref: .	UD1	Depth: 2.00-3.00m

Test Report No. 7362011662
dated 5-Jan-17

AL Technologies

BS 1377 PART 2: 1990 ATTERBERG LIMIT (CONE PENETROMETER) TEST



HISTORY OF SAMPLE Wet Sieving Percentage of passing 0.425 mm Sieve 97 %

		LIQUID LIMIT %				PLASTIC LIMIT %	
Wet Weight + Tare	(g)	24.60	24.80	24.88	24.02	25.30	25.61
Dry Weight + Tare	(g)	19.03	18.99	18.96	18.37	23.00	23.18
Tare Weight	(g)	8.10	8.07	8.20	8.46	14.14	13.80
Water Content	%	50.96	53.21	55.02	57.01	25.96	25.91
Penetration	mm	16.2	18.5	20.4	22.3		
Liquid Limit	%	55					
Plastic Limit	%	26					
Plastic Index	%	29					

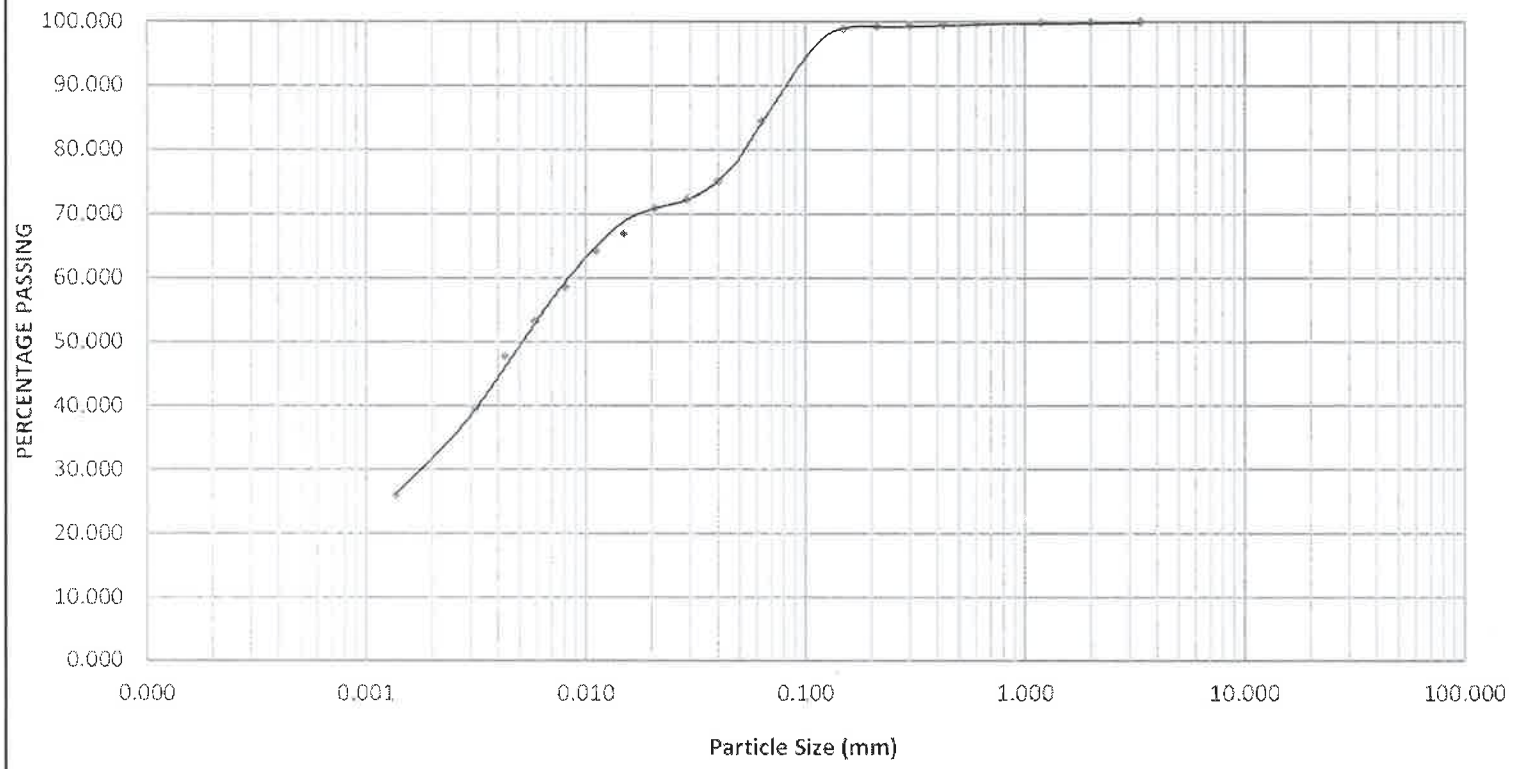
Sample Reference: BH15 Sample No: UD1 Depth: 2.00-3.00m
Material Description: Red mottled slightly sandy CLAY with silt
Location: Tengah Phase 1 & 2 Infra (WI059)
Project: [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS

TÜV SÜD AL Technologies Pte Ltd

Test Report No. 7362011662
dated 6-Jan-17

AL Technologies

B.S. 1377 PART 2: 1990 PARTICLE SIZE ANALYSIS TEST



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	C
	SILT			SAND			GRAVEL			

Material Description:

Red mottled slightly sandy SILT with clay

Gravel	:	0 %
Sand	:	16 %
Silt	:	52 %
Clay	:	32 %

Detailed Particle Size Distribution

Grading (mm)	% Passing BS Sieve
3.35	100.00
2.0	99.98
1.18	99.88
0.60	99.75
0.425	99.54
0.300	99.44
0.212	99.24
0.150	98.84
0.063	84.39
0.040	75.04
0.029	72.31
0.021	70.94
0.015	66.85
0.011	64.12
0.008	58.67
0.006	53.21
0.004	47.75
0.003	39.56
0.001	25.92

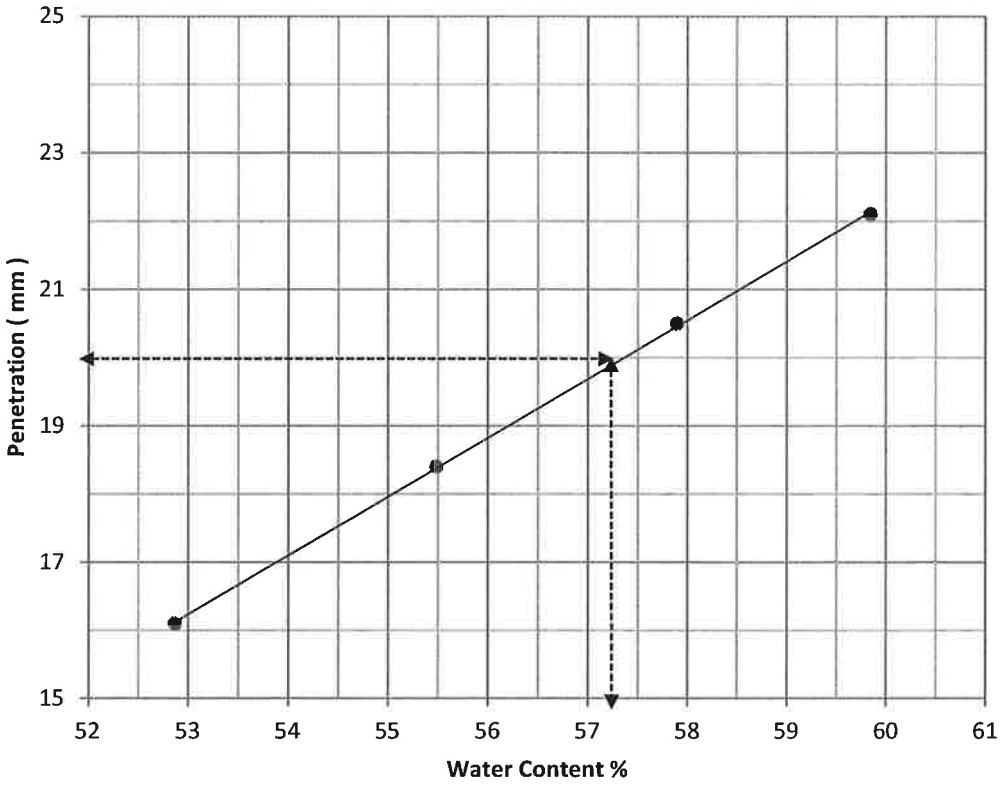
Project : [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS	Borehole No.:	BH15	Location: Tengah Phase 1 & 2 Infra (WI059)
	Sample Ref: .	UD2	Depth: 4.00-5.00m

0 4

Test Report No. 7362011662
dated 5-Jan-17

AL Technologies

BS 1377 PART 2: 1990 ATTERBERG LIMIT (CONE PENETROMETER) TEST



HISTORY OF SAMPLE Wet Sieving Percentage of passing 0.425 mm Sieve 100 %

		LIQUID LIMIT %				PLASTIC LIMIT %	
Wet Weight + Tare	(g)	24.71	25.20	24.59	24.71	25.35	23.45
Dry Weight + Tare	(g)	18.99	19.08	18.54	18.60	23.22	21.60
Tare Weight	(g)	8.17	8.05	8.09	8.39	16.23	15.50
Water Content	%	52.87	55.49	57.89	59.84	30.47	30.33
Penetration	mm	16.1	18.4	20.5	22.1		

Liquid Limit	%	57
Plastic Limit	%	30
Plastic Index	%	27

Sample Reference: BH15 Sample No: UD2 Depth: 4.00-5.00m
Material Description: Red mottled slightly sandy SILT with clay
Location: Tengah Phase 1 & 2 Infra (WI059)
Project: [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS

TÜV SÜD AL Technologies Pte Ltd

Total Stress Triaxial Compression

Unconsolidated Undrained

Sample details

Sketch showing specimen location in original Sample

Depth: 4.00-5.00m
Description: Firm red mottled slightly sandy SILT with clay

	Specimen 1	Specimen 2	Specimen 3
Type			
Height H_0 (mm)	76	76	76
Diameter D_0 (mm)	38	38	38
Weight W_0 (gr)	152.3	149.3	158.4
Bulk Density ρ (Mg/m3)	1.77	1.73	1.84
Particle Density ρ_s	2.65 (assumed)	2.65 (assumed)	2.65 (assumed)

Initial Conditions

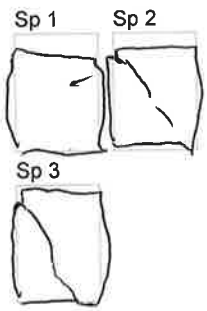
	Specimen 1	Specimen 2	Specimen 3
Cell Pressure $\sigma 3$ (kPa)	40.00	80.00	160.00
Machine Speed d_r(mm/min)	1.520	1.520	1.520
No. of Membranes	1	1	1
Total Thickness (mm)	0.2	0.2	0.2
Strain Channel	20	16	13
Load Channel	18	15	10
Moisture Content w_0%	34	34	34
Dry Density ρ_{d0} (Mg/m3)	1.32	1.29	1.38
Voids Ratio e_0	1.01	1.06	0.93
Deg of Saturation S_0%	88.86	86.29	96.05

Final Condition

	Specimen 1	Specimen 2	Specimen 3
Max Deviator Stress (kPa)	93.49	107.65	113.93
Membrane Correction σ_{mb} (kPa)	1.40	1.20	1.40
Corr Stress $(\sigma_1 - \sigma_3)_c$ (kPa)	92.09	106.45	112.53
Strain at Failure ε_f%	12.37	9.57	12.25
Shear Strength c_u (kPa)	46.05	53.22	56.27
Moisture Content w_f%	33	34	33
Dry Density ρ_{df} (Mg/m3)	1.32	1.30	1.38
Voids Ratio e_f	1.00	1.05	0.92
Deg of Saturation S_f%	88.40	85.49	95.47

Notes:

Failure Sketch



Surface Inclination

[Test Method : BS1377 : Part 7 : 1990 : 8/9*
(* delete as appropriate)

Test name: UU-15-2 (SS, MS)
Date of Test: 15/12/16

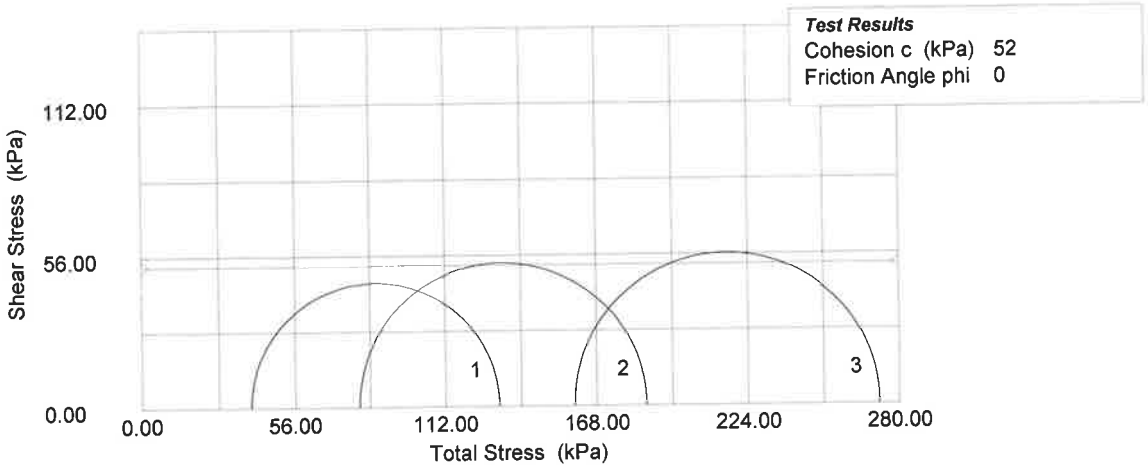
Site Reference: TENGAH PHASE 1&2 INFFRA
Jobfile: C:\WINCLISP\2016\WI-059.JOB

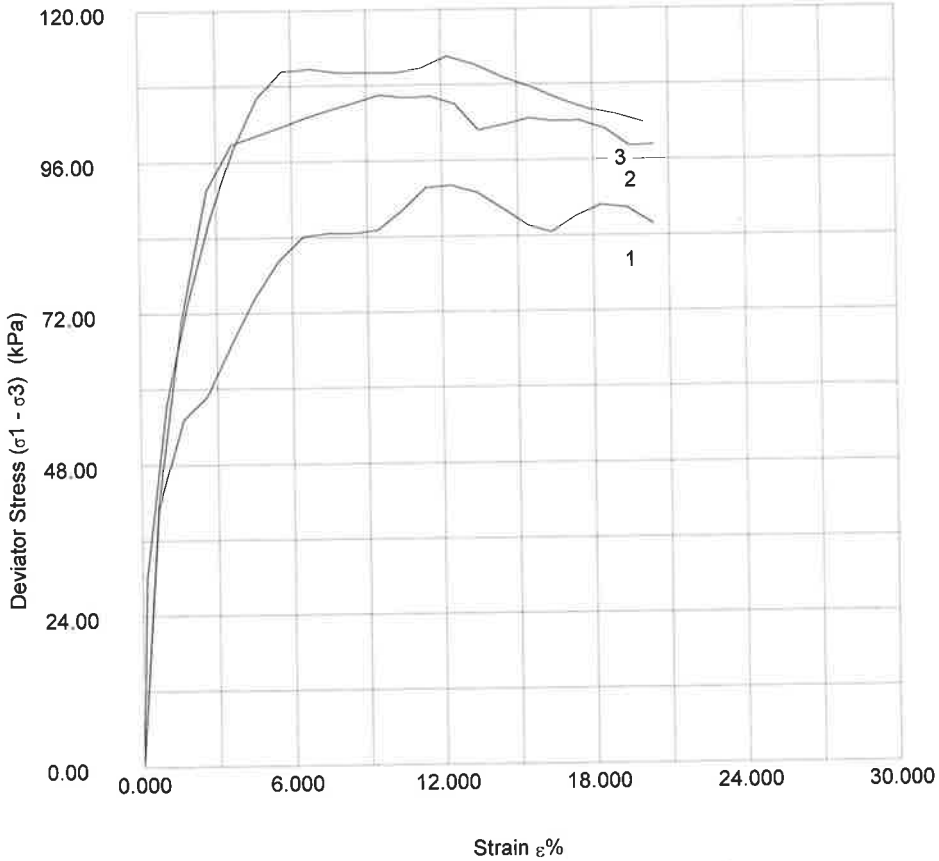
Sample: UD2
Borehole: BH15

Operator: *Checked:* *Approved:*

Total Stress Triaxial Compression

Unconsolidated Undrained





[Test Method : BS1377 : Part 7 : 1990 : 8/9]
(* delete as appropriate)

Test name UU-15-2 (SS, M8)
Date of Test: 15/12/16

Site Reference: TENGAH PHASE 1&2 INFFRA
Jobfile: C:\WINCLISP\2016\WI-059.JOB

Sample: UD2
Borehole: BH15

Operator: Checked: Approved:

TÜV SÜD AL Technologies Pte Ltd Co. Reg. No. 198805712W

Test Report No. 7362011662
dated 12-Jan-2017

TÜV SÜD
AL Technologies

SUMMARY OF TEST RESULTS

PROJECT :	**D/250/14] TERM CONTRACT NO.35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS**							
LOCATION :	**Soil Investigation Works at Tengah Phase 1 & 2 Infra (WI059)**							
BOREHOLE NO.			BH16	BH16				
SAMPLE REF.			UD1	UD2				
DEPTH (m)		From	3.00	6.00				
		To	3.50	6.50				
Natural Moisture Content		%	30	29				
Density	Bulk Density	Mg/m3	1.92	1.96				
	Dry Density	Mg/m3	1.48	1.52				
Atterberg Limits	Liquid Limit	%	44	45				
	Plastic Limit	%	22	28				
	Plasticity Index	%	22	17				
Particle Size Analysis	Gravel	%	5	4				
	Sand	%	20	16				
	Silt	%	35	50				
	Clay	%	40	30				
Particle Density of Soil		Mg/m^3	2.64	2.64				
Triaxial Compression	Type of Test*1			CU				
	Cohesion (c / c')	kPa		7				
	Phi Angle (φ / φ')	Degree		33				
Consolidation	Initial Void Ratio							
	Preconsolidation Pre:	kN/m^2						
	Compression Index							
Chemical Analysis, Water	Sulphate Content	%						
	Chloride Content	%						
	pH Value							
Permeability	Coefficient at 20°C							
Unconfined Compression	Unconfined Comp. strength	MPa						
Point Load	Type of Test*2							

Legend :

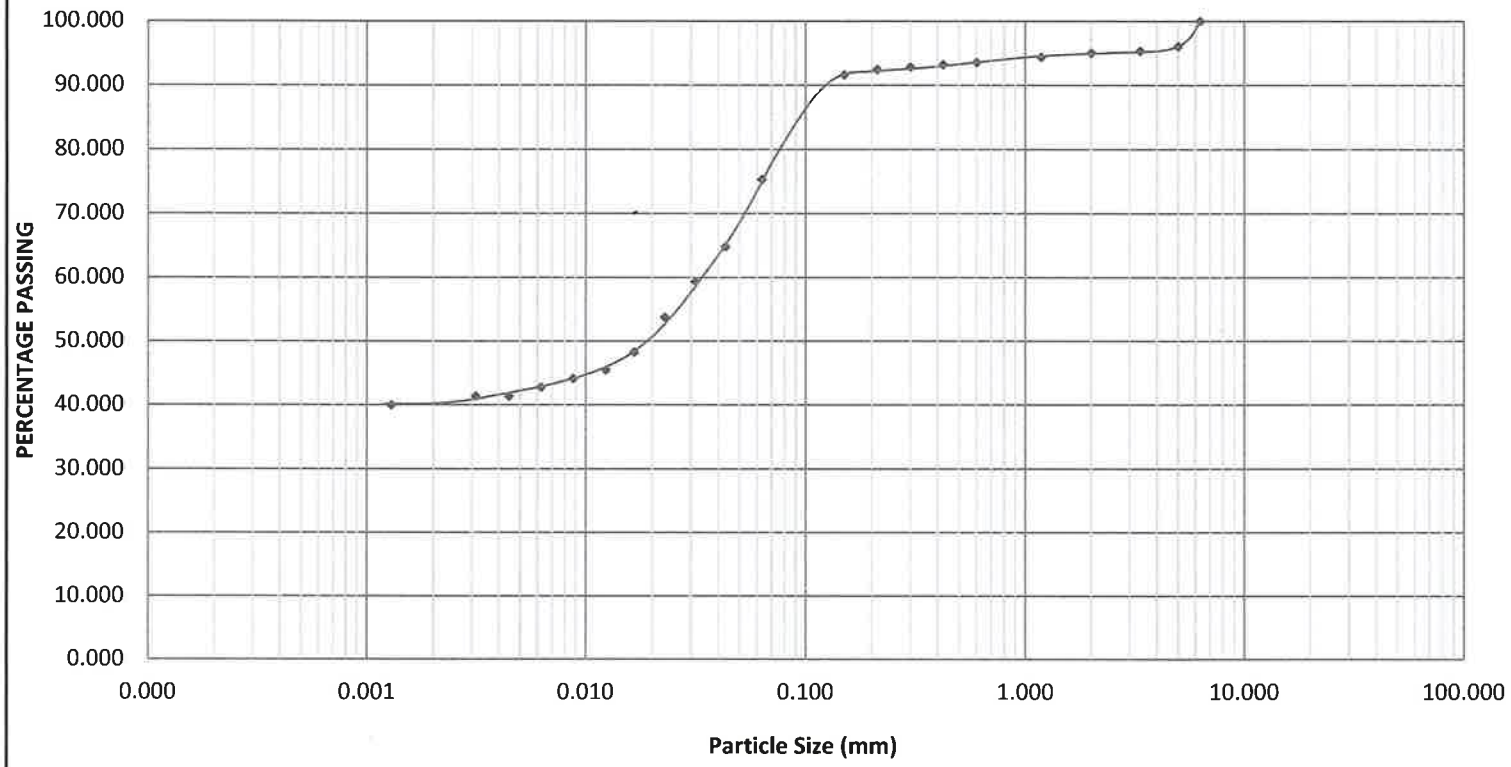
*1	UU	- Unconsolidated Undrained	*2	D	- Diameteral
	CU	- Consolidated Undrained		A	- Axial
	CD	- Consolidated Drained		I	- Irregular
	QU	- Quick Undrained			
	SUU	- Saturated UU w/pore water pressure			
	UC	- Unconfined Compression			
	MUU	- Multistage Unconsolidated Undrained			
	MCU	- Multistage Consolidated Undrained			
	MCD	- Multistage Consolidation Drained			

TÜV SÜD AL Technologies Pte Ltd * Co. Reg. No.: 199905125W

Test Report No. 7362011662
dated 10-Jan-17

AL Technologies

B.S. 1377 PART 2: 1990 PARTICLE SIZE ANALYSIS TEST



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	C
	SILT			SAND			GRAVEL			

Material Description:

Red mottled grey slightly gravelly slightly sandy CLAY with silt

Gravel	:	5 %
Sand	:	20 %
Silt	:	35 %
Clay	:	40 %

Detailed Particle Size Distribution

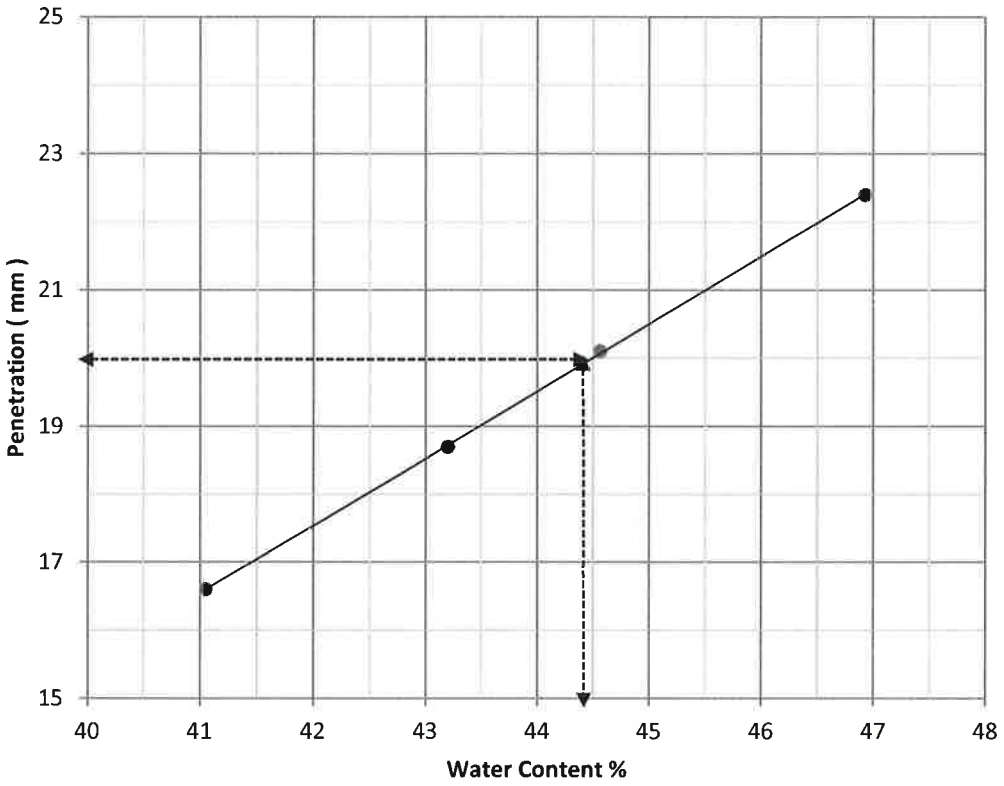
Grading (mm)	% Passing BS Sieve
6.3	100.00
5	96.05
3.35	95.33
2	95.04
1.18	94.38
0.6	93.59
0.425	93.25
0.3	92.87
0.212	92.49
0.15	91.64
0.063	75.35
0.043	64.83
0.031	59.31
0.023	53.79
0.017	48.28
0.012	45.52
0.009	44.14
0.006	42.76
0.004	41.38
0.003	41.38
0.001	40.00

Project : [D/250/14] TERM CONTRACT NO.35 FOR SITE INVESTIGATION WORKS FOR PERIOD OF 30 MONTHS	Borehole No.:	BH16	Location: Soil Investigation Works at Tengah Phase 1 & 2 Infra (WI059)
	Sample Ref: .	UD1	Depth: 3.00-3.50m

Test Report No. 7362011662
dated 10-Jan-17

AL Technologies

BS 1377 PART 2: 1990 ATTERBERG LIMIT (CONE PENETROMETER) TEST



HISTORY OF SAMPLE Wet Sieving Percentage of passing 0.425 mm Sieve 93 %

		LIQUID LIMIT %				PLASTIC LIMIT %	
Wet Weight + Tare	(g)	26.02	25.17	26.22	25.35	25.23	24.98
Dry Weight + Tare	(g)	20.81	20.02	20.77	19.85	23.42	23.07
Tare Weight	(g)	8.12	8.10	8.54	8.13	15.23	14.50
Water Content	%	41.06	43.20	44.56	46.93	22.10	22.29
Penetration	mm	16.6	18.7	20.1	22.4		

Liquid Limit	%	44
Plastic Limit	%	22
Plastic Index	%	22

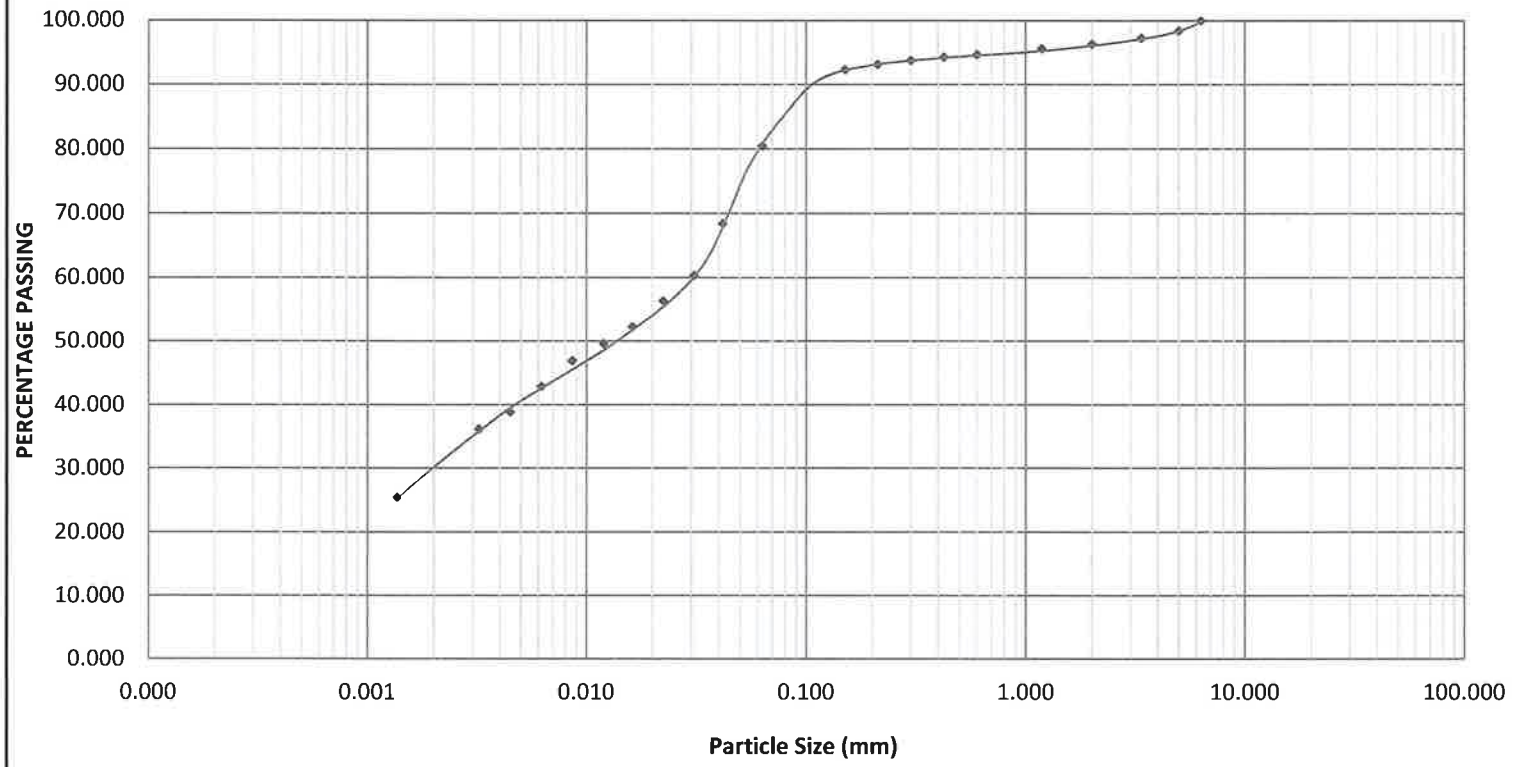
Sample Reference: BH16 Sample No: UD1 Depth: 3.00-3.50m
Material Description: Red mottled grey slightly gravelly slightly sandy CLAY with silt
Location: Soil Investigation Works at Tengah Phase 1 & 2 Infra (WI059)
Project: [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS

TÜV SÜD AL Technologies Pte Ltd

Test Report No. 7362011662
dated 10-Jan-17

AL Technologies

B.S. 1377 PART 2: 1990 PARTICLE SIZE ANALYSIS TEST



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	C
	SILT			SAND			GRAVEL			

Material Description:

Reddish brown slightly gravelly slightly sandy SILT with clay

Gravel	:	4 %
Sand	:	16 %
Silt	:	50 %
Clay	:	30 %

Detailed Particle Size Distribution

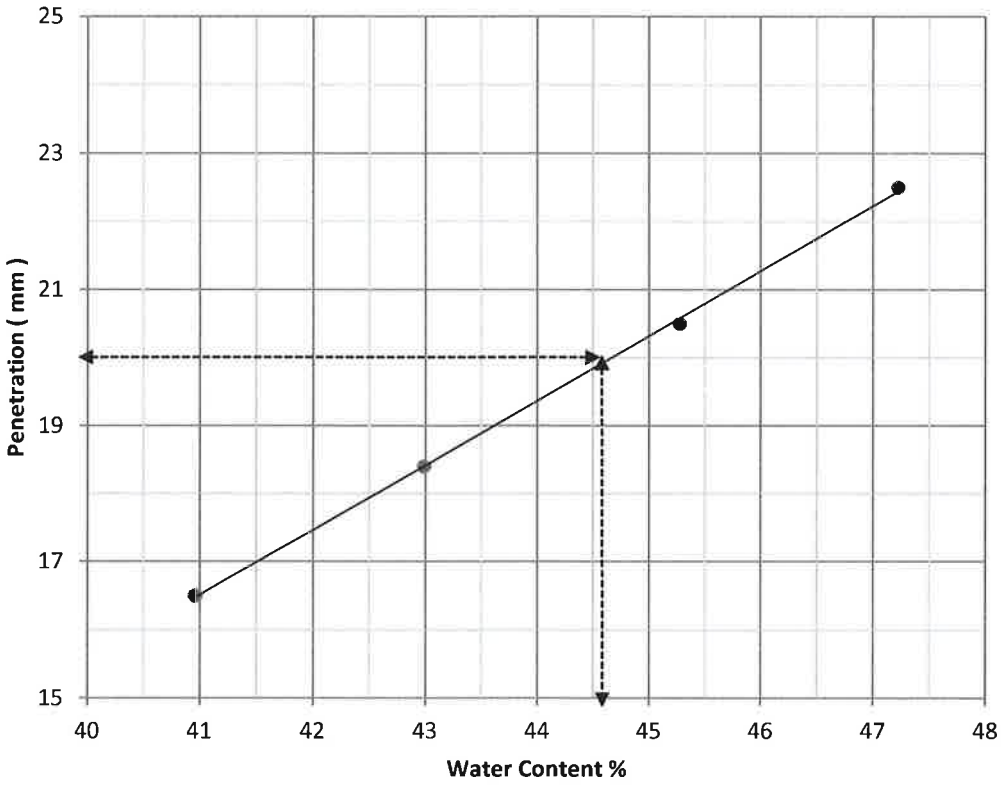
Grading (mm)	% Passing BS Sieve
6.300	100.00
5.000	98.43
3.350	97.28
2.000	96.31
1.180	95.61
0.600	94.67
0.425	94.27
0.300	93.81
0.212	93.14
0.150	92.35
0.063	80.48
0.042	68.38
0.031	60.34
0.022	56.32
0.016	52.29
0.012	49.61
0.009	46.93
0.006	42.91
0.004	38.88
0.003	36.20
0.001	25.48

Project : [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS	Borehole No.:	BH16	Location: Soil Investigation Works at Tengah Phase 1 & 2 Infra (WI059)
	Sample Ref: .	UD2	Depth: 6.00-6.50m

Test Report No. 7362011662
dated 10-Jan-17

AL Technologies

BS 1377 PART 2: 1990 ATTERBERG LIMIT (CONE PENETROMETER) TEST



HISTORY OF SAMPLE Wet Sieving Percentage of passing 0.425 mm Sieve 94 %

			LIQUID LIMIT %			PLASTIC LIMIT %	
Wet Weight + Tare	(g)	25.94	25.37	24.85	25.16	25.56	25.20
Dry Weight + Tare	(g)	20.75	20.22	19.72	19.71	23.44	23.00
Tare Weight	(g)	8.08	8.24	8.39	8.17	16.00	15.20
Water Content	%	40.96	42.99	45.28	47.23	28.49	28.21
Penetration	mm	16.5	18.4	20.5	22.5		

Liquid Limit	%	45
Plastic Limit	%	28
Plastic Index	%	17

Sample Reference: BH16 Sample No: UD2 Depth: 6.00-6.50m
Material Description: Reddish brown slightly gravelly slightly sandy SILT with clay
Location: Soil Investigation Works at Tengah Phase 1 & 2 Infra (WI059)
Project: [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS

SÜD AL Technologies Pte Ltd Co. Reg. No: 199905125W

TÜV SÜD AL Technologies Pte Ltd

Effective Stress Triaxial Compression

Consolidated Undrained

Sample details

Sketch showing specimen location in original Sample

Depth	6.00-6.50m		
Description:	Reddish brown slightly gravelly slightly sandy SILT with cla y		
	Specimen 1	Specimen 2	Specimen 3
Type			
Height H_0 (mm)	76	76	76
Diameter D_0 (mm)	38	38	38
Weight W_0 (gr)	172.9	168.2	166.7
Bulk Density ρ (Mg/m3)	2.01	1.95	1.93
Particle Density ρ_s	2.65 (assumed)	2.65 (assumed)	2.65 (assumed)

Initial Conditions

	Specimen 1	Specimen 2	Specimen 3
Cell Pressure σ_3 (kPa)	310.00	370.00	490.00
Pore Pressure u (kPa)	250.00	250.00	250.00
Machine Speed d_r(mm/min)	0.060	0.060	0.060
No. of Membranes	1	1	1
Total Thickness (mm)	0.2	0.2	0.2
Strain Channel	13	16	20
Load Channel	10	15	18
Pore P. Channel	11	17	21
Volume Channel	12	31	22
Moisture Content w_0%	30	28	28
Dry Density ρ_{d0} (Mg/m3)	1.54	1.52	1.51
Voids Ratio e_0	0.72	0.74	0.75
Deg of Saturation S_0%	100.00	100.00	97.98
Final B Value	1.00	0.97	0.96

Final Conditions

	Specimen 1	Specimen 2	Specimen 3
Moisture Content w_f%	30	29	28
Dry Density ρ_d (Mg/m3)	1.56	1.57	1.66
Voids Ratio e_f	0.70	0.68	0.59
Deg of Saturation S_f%	100.00	100.00	100.00
Failure Criteria	Mx Dev Stress	Mx Dev Stress	Mx Dev Stress
Axial Strain ε_f%	9.6	9.4	9.4
Corr Dev Stress $(\sigma_1 - \sigma_3)f$ (kPa)	136.2	245.5	492.3
Minor Stress σ_{3f} (kPa)	46.5	92.5	199.0
Major Stress σ_{1f} (kPa)	182.7	338.0	691.3
Stress Ratio $(\sigma_1/\sigma_3)_f$	3.9	3.7	3.5

Notes:

Failure Sketch



Surface Inclination

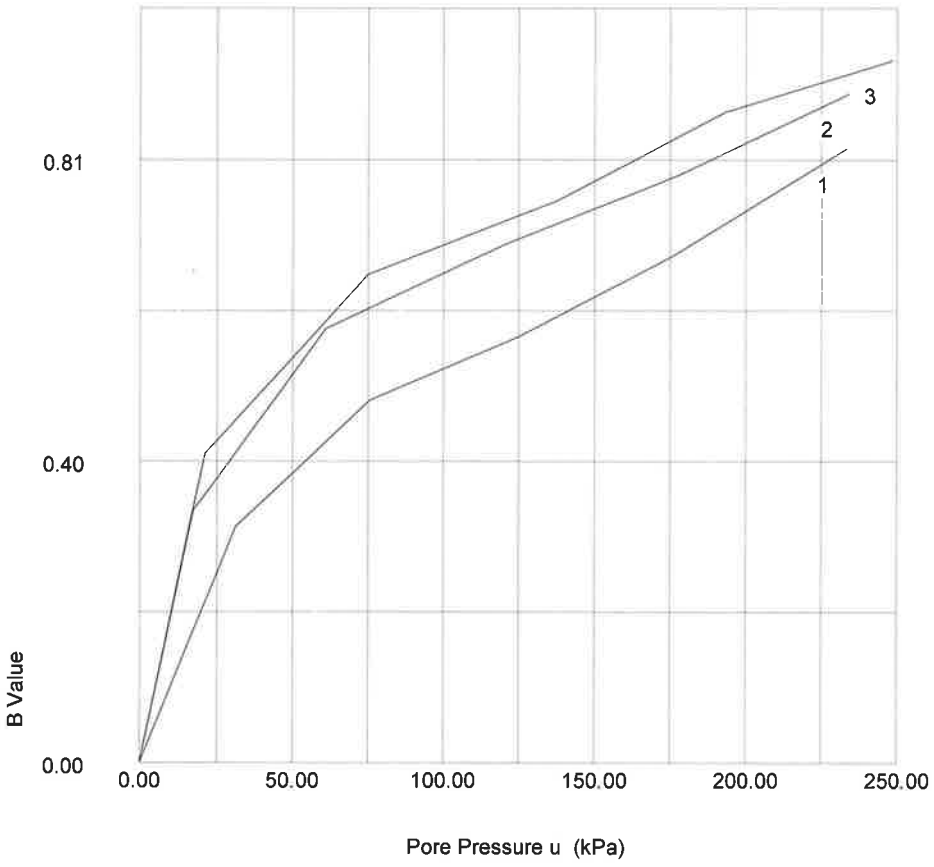
Test Method : BS1377 : Part 8 : 1990 : 8/9* (* delete as appropriate)		Test name	CU16/2 (SS, MS)
		Date of Test:	27/12/16
Site Reference:	TENGAH PHASE 1&2 INFFRA	Sample:	UD2
Jobfile:	C:\WINCLISP\2016\WI-059.JOB	Borehole:	BH16
Operator:	*Checked:*		*Approved:*

SUD Technologies (S) Pte Ltd Co. Reg. No: 198905125W

Effective Stress Triaxial Compression

Consolidated Undrained

Saturation Stage Data	Specimen 1	Specimen 2	Specimen 3
Test Method:	Cell P. And Back P.	Cell P. And Back P.	Cell P. And Back P.
Final Cell Pressure σ_{3f} (kPa)	250.00	250.00	250.00
Final Pore Pressure u_f (kPa)	242.00	238.00	249.50
Final B Value	1.00	0.97	0.96



Test Method : BS1377 : Part 8 : 1990 : 8/9* (* delete as appropriate)		Test name Date of Test:	CU16/2 (SS, MS) 27/12/16
Site Reference: Jobfile:	TENGAH PHASE 1&2 INFFRA C:\WINCLISP\2016\WI-059.JOB	Sample: Borehole:	UD2 BH16
Operator:	*Checked:*		*Approved:*

TÜV SÜD AL Technologies Co. Reg. No: 199905126W

Effective Stress Triaxial Compression

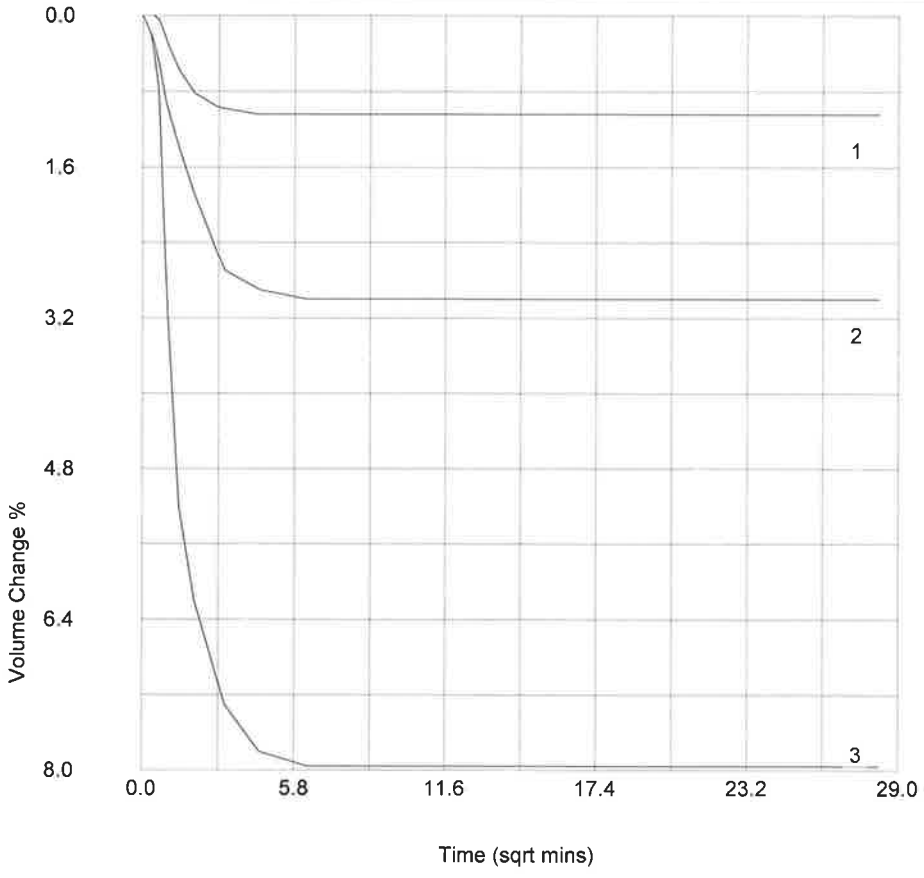
Consolidated Undrained

Consolidation Initial Conditions

	Specimen 1	Specimen 2	Specimen 3
Cell Pressure σ_3 (kPa)	310.00	370.00	490.00
Pore Pressure u_i (kPa)	300.00	355.00	485.00
Back Pressure u_b (kPa)	250.00	250.00	250.00
Drainage Method	Radial, One End	Radial, One End	Radial, One End

Consolidation Final Results

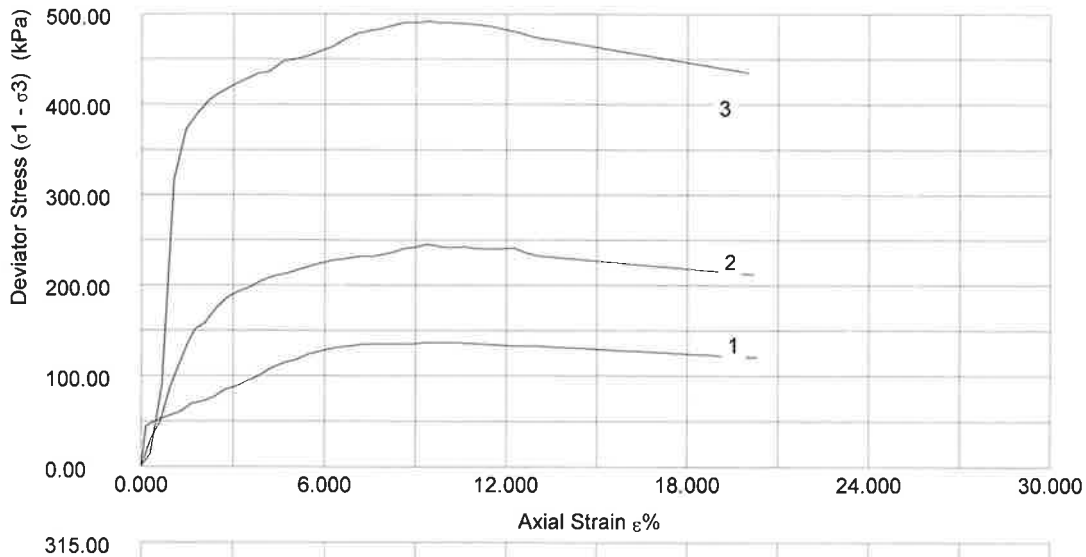
	Specimen 1	Specimen 2	Specimen 3
Deg of Consolidation U%	100.0	98.1	100.0
Volumetric Strain ε_v%	1.2	3.5	9.2
Corr Length L_c (mm)	75.7	75.1	73.7
Corr Area A_c (mm)2	1125.0	1107.8	1064.3
Corr Volume V_c (cc)	85.2	83.2	78.4
t_{100} (min)	6.70	12.50	8.70
Coef. of Consolidation c_v (m2/year)	4.445	2.383	3.423
Coef. of Compressibility m_v (m2/MN)	0.241	0.338	0.393
Testing Time (min) t_f	12.06	22.5	15.66
Est Strain at Failure ε_f	10.0	10.0	10.0
Machine Speed d_r (mm/min)	0.62765	0.33386	0.47037

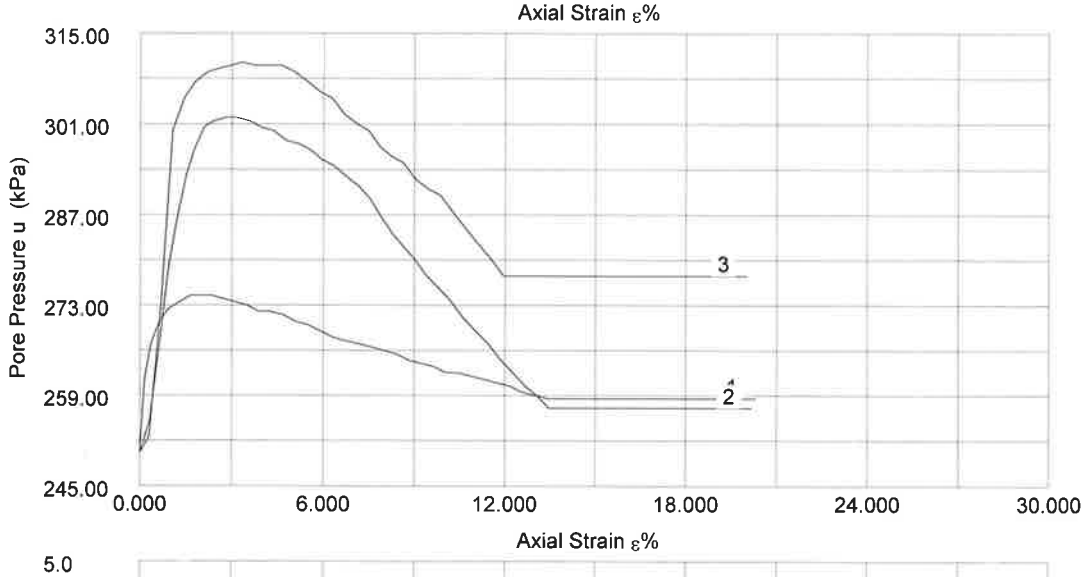


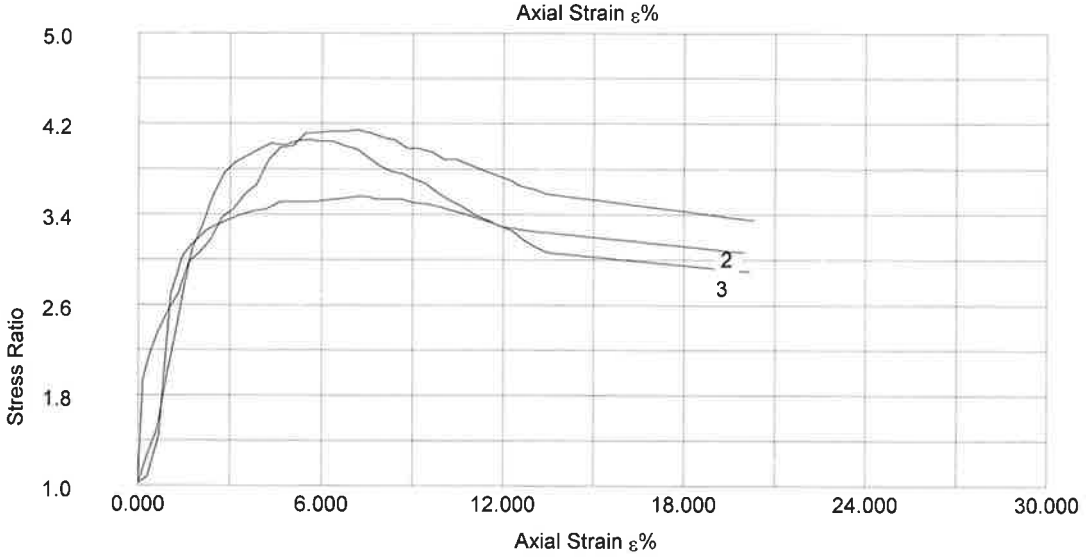
Test Method : BS1377 : Part 8 : 1990 : 8/9* (* delete as appropriate)		Test name	CU16/2 (SS, MS)
		Date of Test:	27/12/16
Site Reference:	TENGAH PHASE 1&2 INFFRA	Sample:	UD2
Jobfile:	C:\WINCLISP\2016\WI-059.JOB	Borehole:	BH16
Operator:	*Checked:*		*Approved:*

Effective Stress Triaxial Compression

Consolidated Undrained





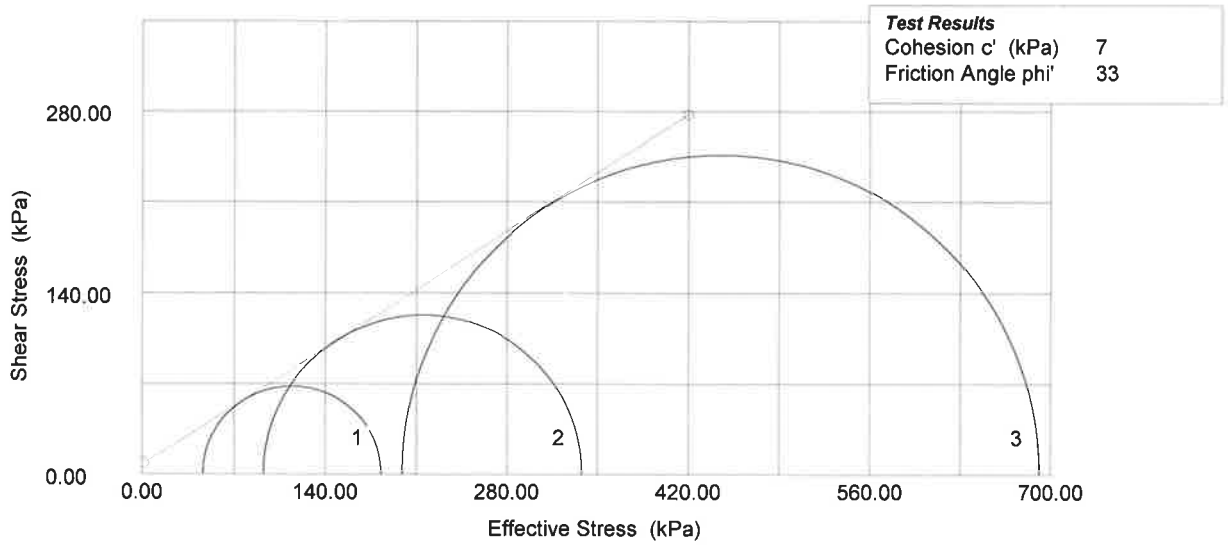


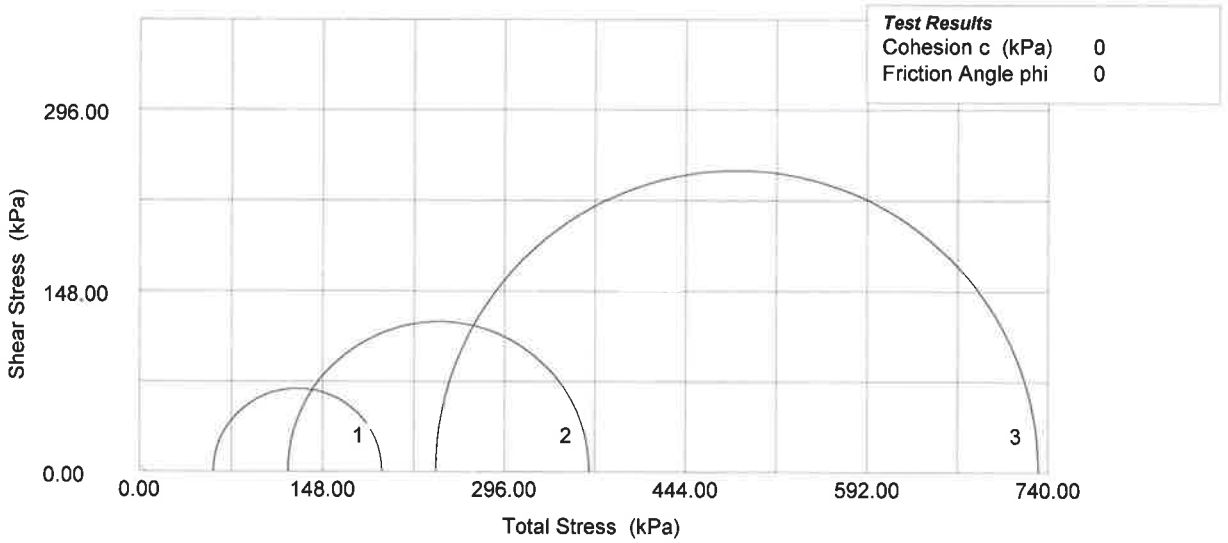
Test Method : BS1377 : Part 8 : 1990 : 8/9* (* delete as appropriate)		Test name	CU16/2 (SS, MS)
		Date of Test:	27/12/16
Site Reference:	TENGAH PHASE 1&2 INFFRA	Sample:	UD2
Jobfile:	C:\WINCLISP\2016\WI-059.JOB	Borehole:	BH16
Operator:	Checked:		Approved:

TÜV SÜD AL Technology Co. Reg. No. 198905126W

Effective Stress Triaxial Compression

Consolidated Undrained



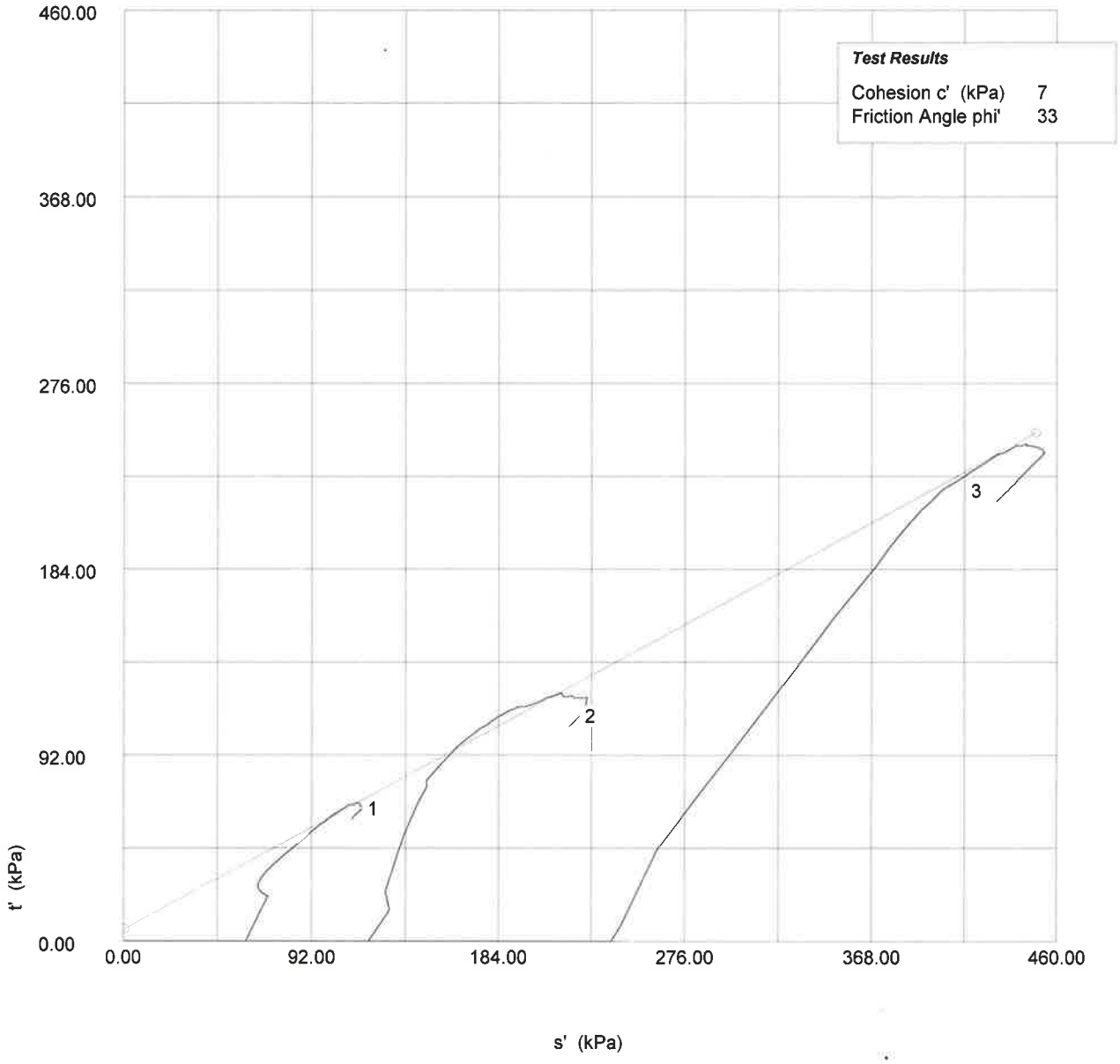


Test Method : BS1377 : Part 8 : 1990 : 8/9* (* delete as appropriate)		Test name	CU16/2 (SS, MS)
		Date of Test:	27/12/16
Site Reference:	TENGAH PHASE 1&2 INFFRA	Sample:	UD2
Jobfile:	C:\WINCLISP\2016\WI-059.JOB	Borehole:	BH16
Operator:	Checked:		Approved:

SÜD AL Technologies Co. Reg. No: 198905126W

Effective Stress Triaxial Compression

Consolidated Undrained



Test Method : BS1377 : Part 8 : 1990 : 8/9* (* delete as appropriate)		Test name	CU16/2 (SS, MS)
		Date of Test:	27/12/16
Site Reference:	TENGAH PHASE 1&2 INFFRA	Sample:	UD2
Jobfile:	C:\WINCLISP\2016\WI-059.JOB	Borehole:	BH16
Operator:	*Checked:*		*Approved:*

TÜV SÜD AL Technologies Pte Ltd * Co. Reg. No: 198905126W

Test Report No. 7362011662
dated 24-Jan-2017

AL Technologies

SUMMARY OF TEST RESULTS

PROJECT :	**D/250/14] TERM CONTRACT NO.35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS**							
LOCATION :	**Soil Investigation Works at Tengah Phase 1 & 2 Infra (WI059)**							
BOREHOLE NO.			BH17					
SAMPLE REF.			UD1					
DEPTH (m)		From	3.00					
		To	3.50					
Natural Moisture Content		%	26					
Density	Bulk Density	Mg/m3	1.83					
	Dry Density	Mg/m3	1.45					
Atterberg Limits	Liquid Limit	%	55					
	Plastic Limit	%	30					
	Plasticity Index	%	25					
Particle Size Analysis	Gravel	%	6					
	Sand	%	13					
	Silt	%	44					
	Clay	%	37					
Particle Density of Soil		Mg/m^3	2.63					
Triaxial Compression	Type of Test*1		UU					
	Cohesion (c / c')	kPa	**					
	Phi Angle (φ / φ')	Degree	**					
Consolidation	Initial Void Ratio							
	Preconsolidation Pre:	kN/m^2						
	Compression Index							
Chemical Test Soil	Acid Soluble Sulphate Content	%						
	Organic Content	%						
	Water Soluble Sulpate Content	%						
	Chloride Content	%						
	pH Value							
Chemical Test Water	Ph Value		6.5					
	Total Sulphate Content	%	0.12					
	Chloride Content	%						

Legend :

*1	UU	- Unconsolidated Undrained	*2	D	-	Diameteral
	CU	- Consolidated Undrained		A	-	Axial
	CD	- Consolidated Drained		I	-	Irregular
	QU	- Quick Undrained				
	SUU	- Saturated UU w/pore water pressure				
	UC	- Unconfined Compression				
	MUU	- Multistage Unconsolidated Undrained				
	MCU	- Multistage Consolidated Undrained				
	MCD	- Multistage Consolidation Drained				

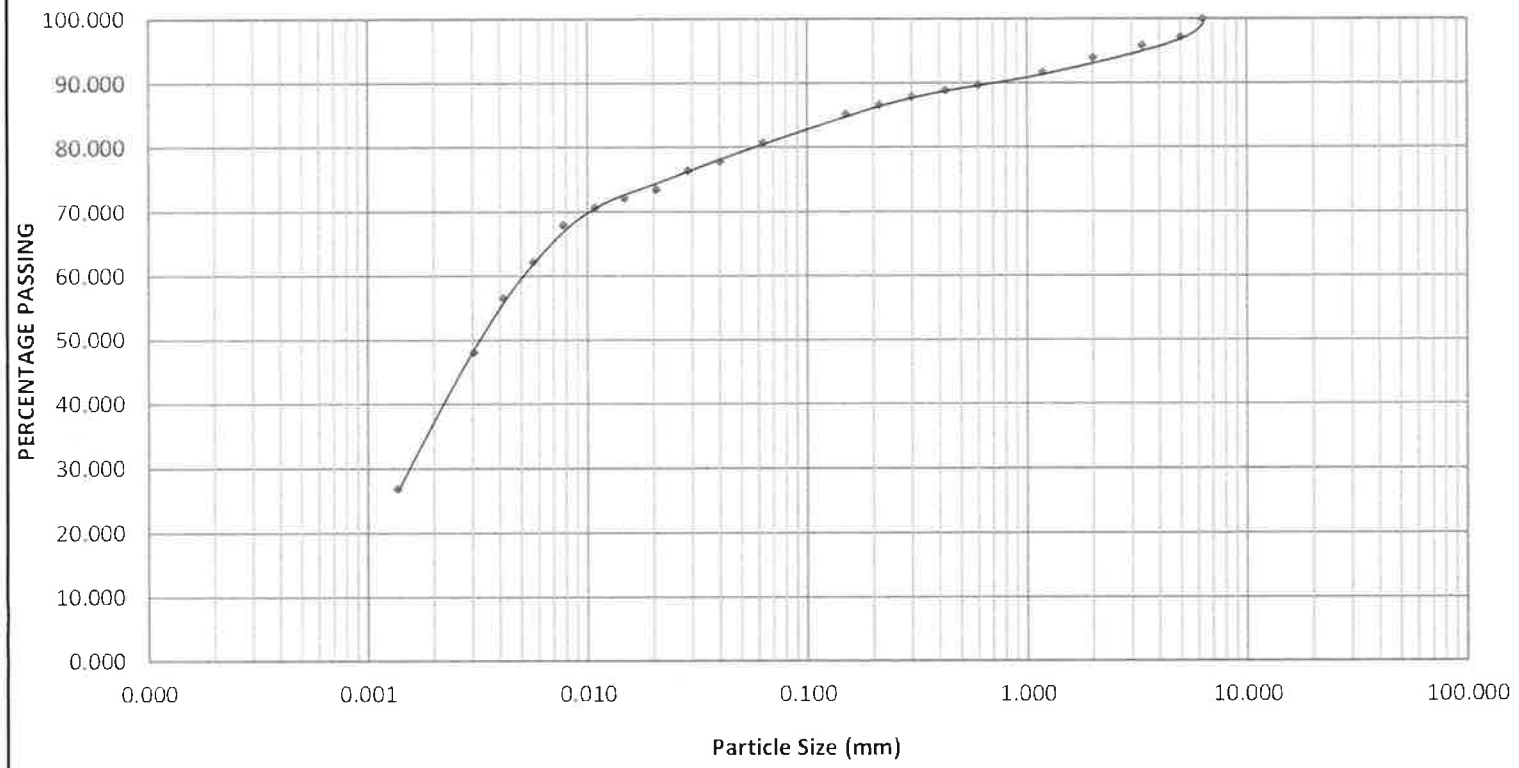
** Test cancel as sample is inadequate for testing

AL Technologies Pte Ltd * TÜV SÜD * Co. Reg. No. 199905125W

Test Report No. 7362011662
dated 19-Jan-17

AL Technologies

B.S. 1377 PART 2: 1990 PARTICLE SIZE ANALYSIS TEST



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	C
	SILT			SAND			GRAVEL			

Material Description:

Reddish brown mottled grey slightly gravelly slightly sandy SILT with clay

Gravel	:	6 %
Sand	:	13 %
Silt	:	44 %
Clay	:	37 %

Detailed Particle Size Distribution

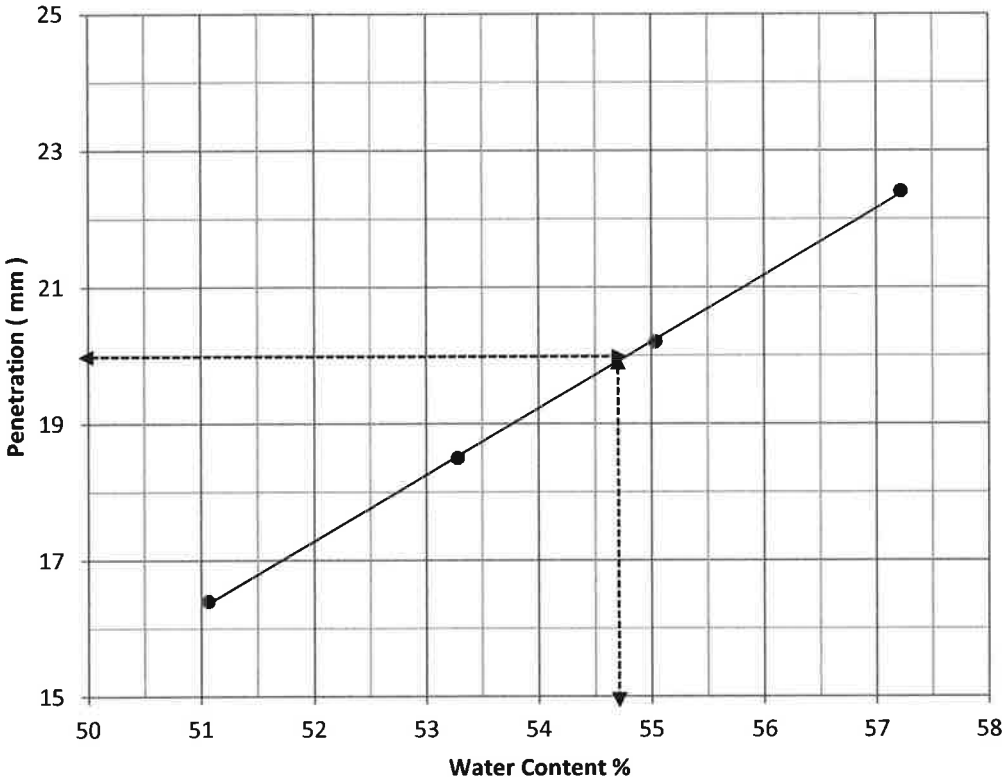
Grading (mm)	% Passing BS Sieve
6.3	100.00
5	97.11
3.35	95.81
2	93.90
1.18	91.68
0.600	89.66
0.425	88.87
0.300	87.84
0.212	86.61
0.150	85.15
0.063	80.66
0.040	77.81
0.029	76.40
0.021	73.57
0.015	72.15
0.011	70.74
0.008	67.91
0.006	62.25
0.004	56.59
0.003	48.10
0.001	26.88

Project : [D/250/14] TERM CONTRACT NO.35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30MONTHS	Borehole No.: BH17	Location: Tengah Phase 1 & 2 Infra (WI059)	
	Sample Ref: . UD1	Depth: 3.00-3.50m	

Test Report No. 7362011662
dated 19-Jan-17

AL Technologies

BS 1377 PART 2: 1990 ATTERBERG LIMIT (CONE PENETROMETER) TEST



HISTORY OF SAMPLE Wet Sieving Percentage of passing 0.425 mm Sieve 89 %

		LIQUID LIMIT %				PLASTIC LIMIT %	
Wet Weight + Tare	(g)	24.40	24.41	23.68	25.34	25.66	25.74
Dry Weight + Tare	(g)	18.90	18.73	18.16	19.08	23.00	23.32
Tare Weight	(g)	8.13	8.07	8.13	8.14	14.10	15.20
Water Content	%	51.07	53.28	55.03	57.22	29.89	29.80
Penetration	mm	16.4	18.5	20.2	22.4		

Liquid Limit	%	55
Plastic Limit	%	30
Plastic Index	%	25

Sample Reference: BH17 Sample No: UD1 Depth: 3.00-3.50m
Material Description: Reddish brown mottled grey slightly gravelly slightly sandy SILT with clay
Location: Tengah Phase 1 & 2 Infra (WI059)
Project: [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS

TÜV SÜD AL Technologies Pte Ltd

Test Report No. 7362011662
dated 24-Jan-2017

TÜV SÜD
At Technologies

SUMMARY OF TEST RESULTS

PROJECT :	D/250/14] TERM CONTRACT NO.35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS							
LOCATION :	Soil Investigation Works at Tengah Phase 1 & 2 Infra (WI059)							
BOREHOLE NO.			BH19					
SAMPLE REF.			WSP6					
DEPTH (m)		From	–					
		To	–					
Natural Moisture Content		%						
Density	Bulk Density	Mg/m3						
	Dry Density	Mg/m3						
Atterberg Limits	Liquid Limit	%						
	Plastic Limit	%						
	Plasticity Index	%						
Particle Size Analysis	Gravel	%						
	Sand	%						
	Silt	%						
	Clay	%						
Particle Density of Soil		Mg/m^3						
Triaxial Compression	Type of Test*1							
	Cohesion (c / c')	kPa						
	Phi Angle (φ / φ')	Degree						
Consolidation	Initial Void Ratio							
	Preconsolidation Pre:	kN/m^2						
	Compression Index							
Chemical Test Soil	Acid Soluble Sulphate Content	%						
	Organic Content	%						
	Water Soluble Sulpate Content	%						
	Chloride Content	%						
	pH Value							
Chemical Test Water	Ph Value		6.1					
	Total Sulphate Content	%	0.10					
	Chloride Content	%						

Legend :

*1	UU	- Unconsolidated Undrained	*2	D	-	Diameteral
	CU	- Consolidated Undrained		A	-	Axial
	CD	- Consolidated Drained		I	-	Irregular
	QU	- Quick Undrained				
	SUU	- Saturated UU w/pore water pressure				
	UC	- Unconfined Compression				
	MUU	- Multistage Unconsolidated Undrained				
	MCU	- Multistage Consolidated Undrained				
	MCD	- Multistage Consolidation Drained				

TÜV SÜD Technologies Pte Ltd Co. Reg. No: 199805126W

APPENDICES

Appendix D

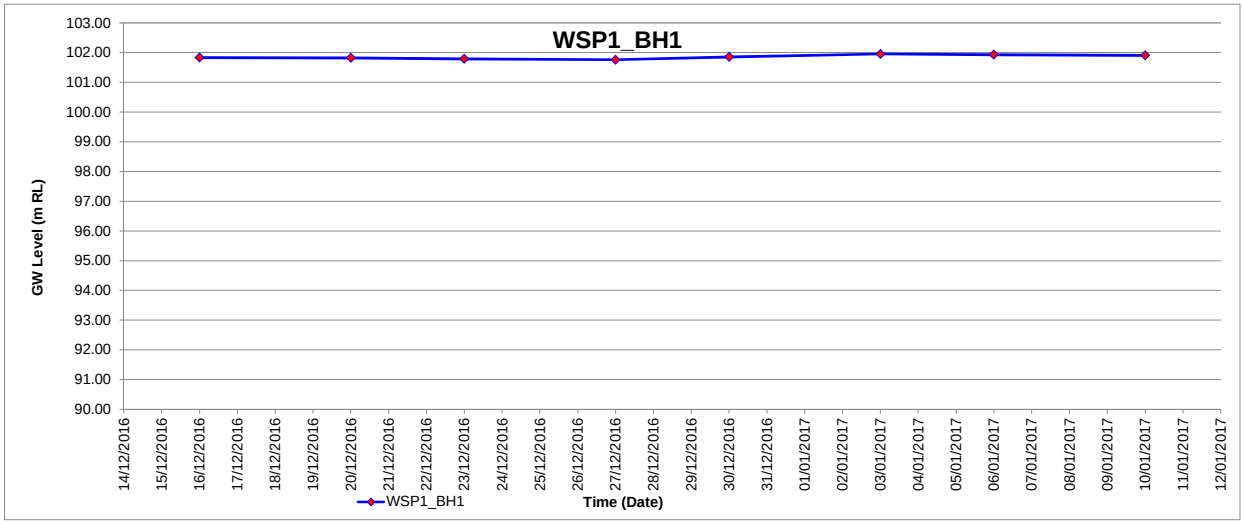
Water Standpipe Monitoring Results

TÜV SÜD AL TECHNOLOGIES PTE LTD

Water Standpipe Readings

Project	[D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS
Client	HOUSING & DEVELOPMENT BOARD
Prepared by	TÜV SÜD AL TECHNOLOGIES PTE LTD
Instrument ID	WSP1_BH1
Installation Date	15/12/2016
Initial Reading on	16/12/2016
Location	Tengah Phase 1 & 2 Infra (WI 059)

Water Stand Pipe	
Instrument ID	WSP1_BH1
Top of Instrument	0.16
Depth of Installation (m)	12.00
Date of Installation	15/12/2016
Ground Level	102.73
Installation Depth (m RL)	**90.73**



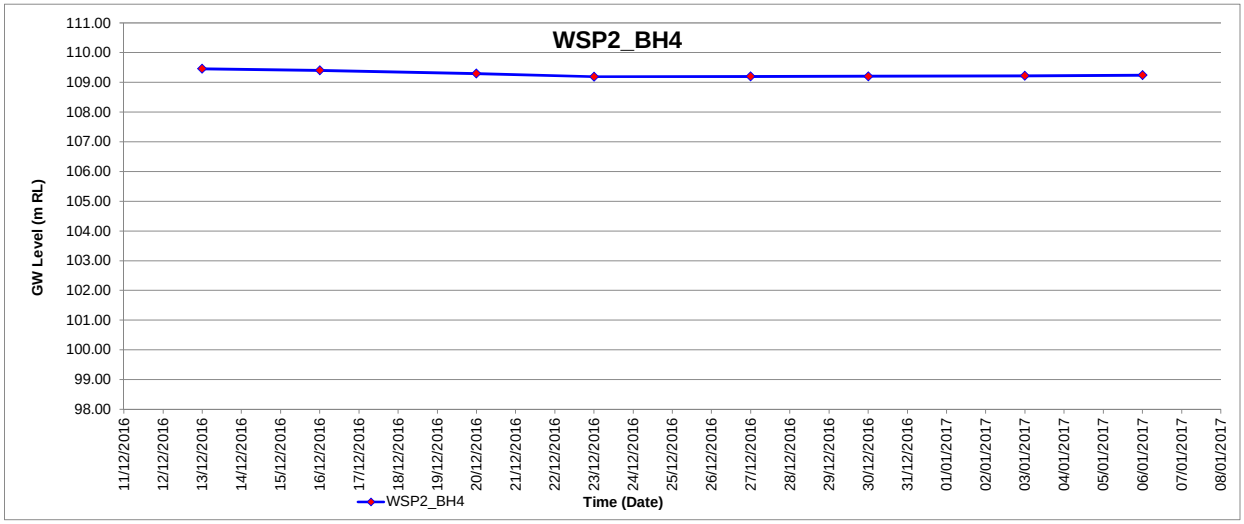
Date	WSP1_BH1		Change in Water Level (m)	Remarks
	Measured water level (m BGL)	GW Level (m RL)		
16/12/2016	1.06	101.84	0.00	Initial
20/12/2016	1.07	101.82	-0.01	
23/12/2016	1.10	101.79	-0.04	
27/12/2016	1.13	101.76	-0.07	
30/12/2016	1.04	101.86	0.02	
03/01/2017	0.94	101.95	0.12	
06/01/2017	0.96	101.93	0.10	
10/01/2017	0.98	101.91	0.08	

TÜV SÜD AL TECHNOLOGIES PTE LTD

Water Standpipe Readings

Project	[D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS
Client	HOUSING & DEVELOPMENT BOARD
Prepared by	TÜV SÜD AL TECHNOLOGIES PTE LTD
Instrument ID	WSP2_BH4
Installation Date	12/12/2016
Initial Reading on	13/12/2016
Location	Tengah Phase 1 & 2 Infra (WI 059)

Water Stand Pipe	
Instrument ID	WSP2_BH4
Top of Instrument	0.19
Depth of Installation (m)	12.00
Date of Installation	12/12/2016
Ground Level	110.12
Installation Depth (m RL)	**98.12**



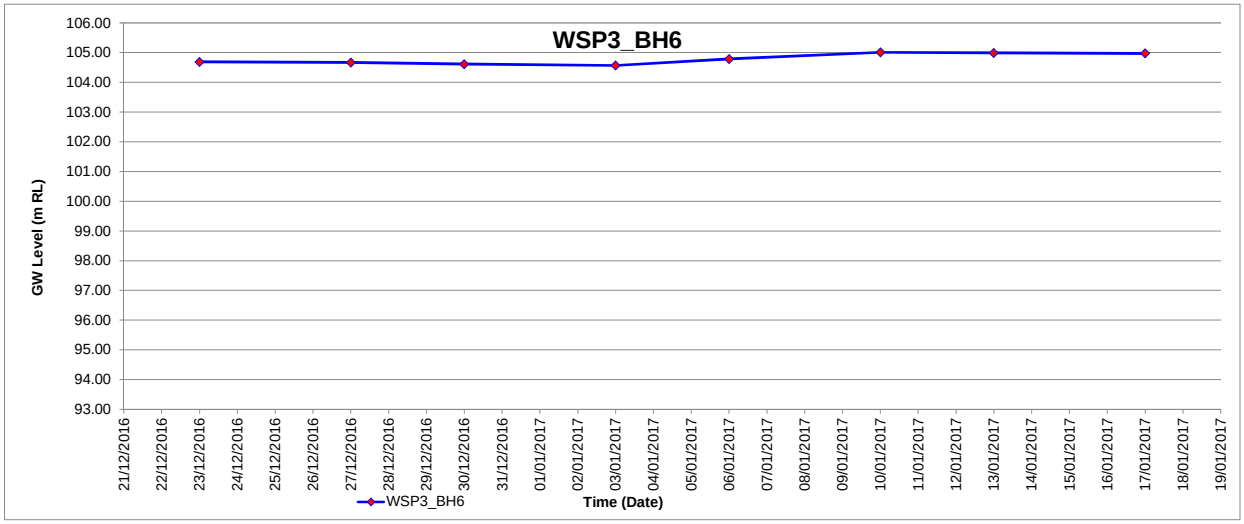
Date	WSP2_BH4		Change in Water Level (m)	Remarks
	Measured water level (m BGL)	GW Level (m RL)		
13/12/2016	0.86	109.46	0.00	Initial
16/12/2016	0.91	109.40	-0.05	
20/12/2016	1.02	109.30	-0.16	
23/12/2016	1.12	109.19	-0.26	
27/12/2016	1.12	109.20	-0.26	
30/12/2016	1.11	109.20	-0.25	
03/01/2017	1.09	109.22	-0.23	
06/01/2017	1.07	109.24	-0.21	

TÜV SÜD AL TECHNOLOGIES PTE LTD

Water Standpipe Readings

Project	[D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS
Client	HOUSING & DEVELOPMENT BOARD
Prepared by	TÜV SÜD AL TECHNOLOGIES PTE LTD
Instrument ID	WSP3_BH6
Installation Date	22/12/2016
Initial Reading on	23/12/2016
Location	Tengah Phase 1 & 2 Infra (WI 059)

Water Stand Pipe	
Instrument ID	WSP3_BH6
Top of Instrument	0.20
Depth of Installation (m)	12.00
Date of Installation	22/12/2016
Ground Level	105.37
Installation Depth (m RL)	**93.37**



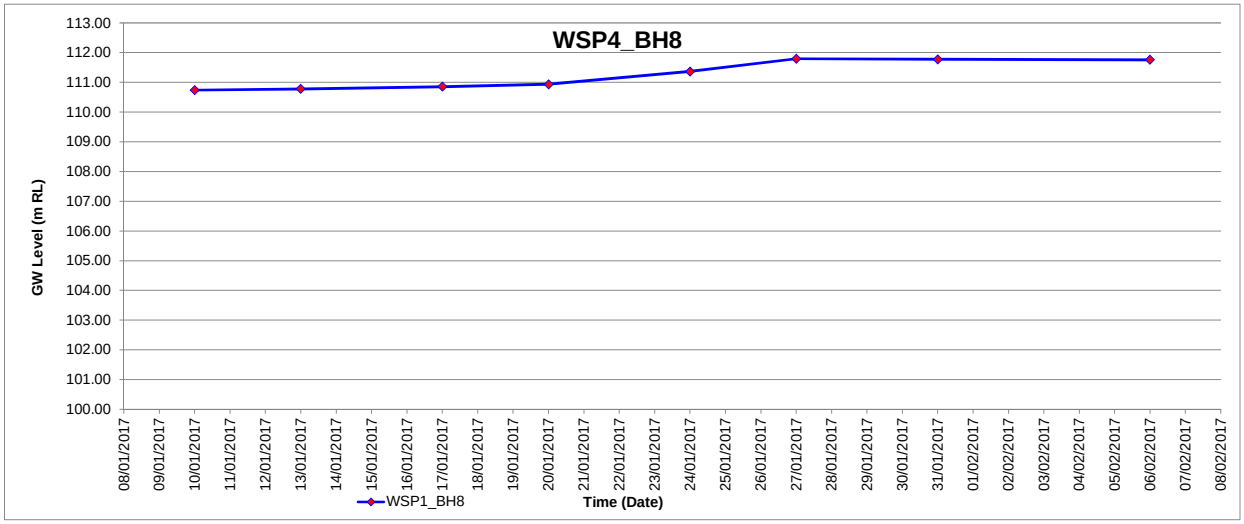
Date	WSP3_BH6		Change in Water Level (m)	Remarks
	Measured water level (m BGL)	GW Level (m RL)		
23/12/2016	0.88	104.69	0.00	Initial
27/12/2016	0.90	104.67	-0.03	
30/12/2016	0.95	104.62	-0.08	
03/01/2017	1.00	104.57	-0.13	
06/01/2017	0.78	104.79	0.09	
10/01/2017	0.56	105.01	0.31	
13/01/2017	0.58	104.99	0.30	
17/01/2017	0.59	104.98	0.28	

TÜV SÜD AL TECHNOLOGIES PTE LTD

Water Standpipe Readings

Project	[D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS
Client	HOUSING & DEVELOPMENT BOARD
Prepared by	TÜV SÜD AL TECHNOLOGIES PTE LTD
Instrument ID	WSP1_BH8
Installation Date	09/01/2017
Initial Reading on	10/01/2017
Location	Tengah Phase 1 & 2 Infra (WI 059)

Water Stand Pipe	
Instrument ID	WSP1_BH8
Top of Instrument	0.22
Depth of Installation (m)	12.00
Date of Installation	09/01/2017
Ground Level	112.90
Installation Depth (m RL)	**100.90**



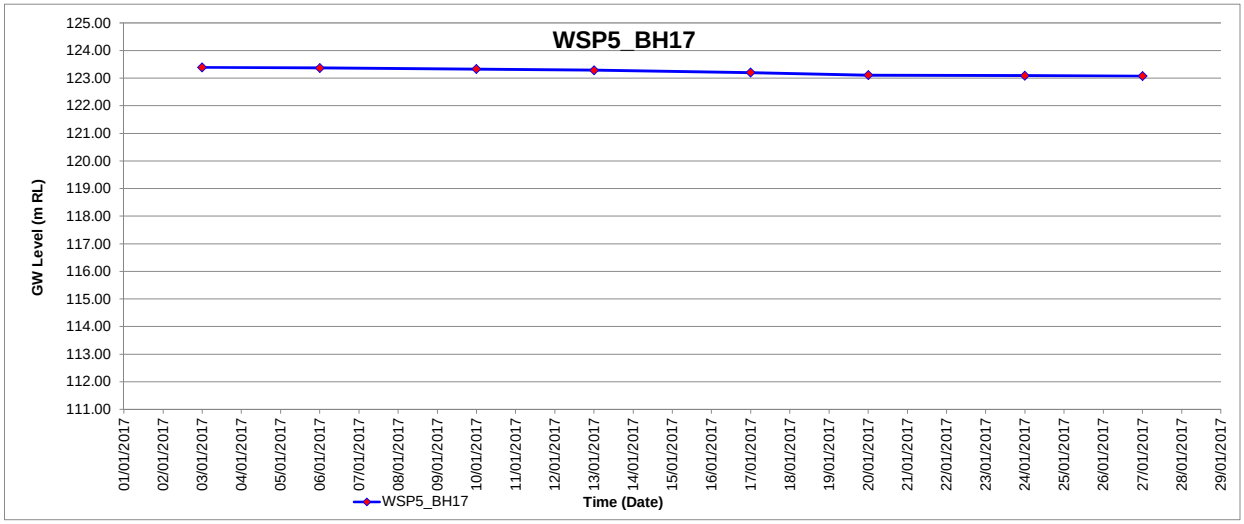
Date	WSP1_BH8		Change in Water Level (m)	Remarks
	Measured water level (m BGL)	GW Level (m RL)		
10/01/2017	2.38	110.74	0.00	Initial
13/01/2017	2.34	110.78	0.04	
17/01/2017	2.26	110.86	0.12	
20/01/2017	2.18	110.94	0.20	
24/01/2017	1.75	111.37	0.63	
27/01/2017	1.32	111.80	1.06	
31/01/2017	1.34	111.78	1.04	
06/02/2017	1.36	111.76	1.02	

TÜV SÜD AL TECHNOLOGIES PTE LTD

Water Standpipe Readings

Project	[D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS
Client	HOUSING & DEVELOPMENT BOARD
Prepared by	TÜV SÜD AL TECHNOLOGIES PTE LTD
Instrument ID	WSP5_BH17
Installation Date	30/12/2016
Initial Reading on	03/01/2017
Location	Tengah Phase 1 & 2 Infra (WI 059)

Water Stand Pipe	
Instrument ID	WSP5_BH17
Top of Instrument	0.23
Depth of Installation (m)	12.00
Date of Installation	30/12/2016
Ground Level	123.57
Installation Depth (m RL)	**111.48**



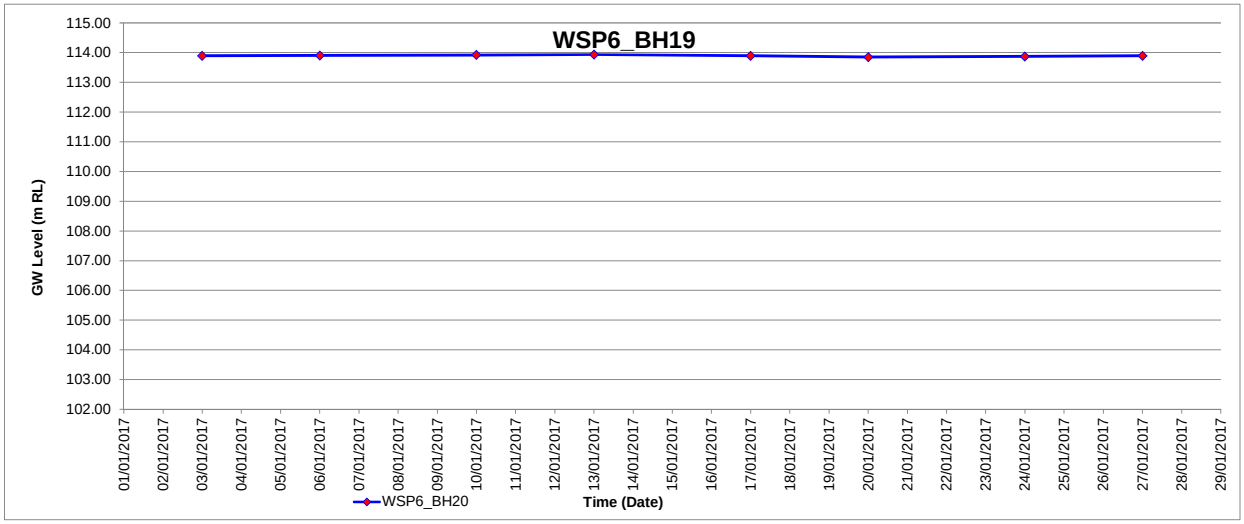
Date	WSP5_BH17		Change in Water Level (m)	Remarks
	Measured water level (m BGL)	GW Level (m RL)		
03/01/2017	0.41	123.39	0.00	Initial
06/01/2017	0.43	123.37	-0.02	
10/01/2017	0.47	123.33	-0.06	
13/01/2017	0.51	123.29	-0.10	
17/01/2017	0.60	123.20	-0.19	
20/01/2017	0.69	123.11	-0.28	
24/01/2017	0.71	123.09	-0.30	
27/01/2017	0.72	123.08	-0.31	

TÜV SÜD AL TECHNOLOGIES PTE LTD

Water Standpipe Readings

Project	[D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS
Client	HOUSING & DEVELOPMENT BOARD
Prepared by	TÜV SÜD AL TECHNOLOGIES PTE LTD
Instrument ID	WSP6_BH20
Installation Date	28/12/2016
Initial Reading on	03/01/2017
Location	Tengah Phase 1 & 2 Infra (WI 059)

Water Stand Pipe	
Instrument ID	WSP6_BH20
Top of Instrument	0.36
Depth of Installation (m)	12.00
Date of Installation	28/12/2016
Ground Level	114.80
Installation Depth (m RL)	**102.80**



Date	WSP6_BH20		Change in Water Level (m)	Remarks
	Measured water level (m BGL)	GW Level (m RL)		
03/01/2017	1.27	113.90	0.00	Initial
06/01/2017	1.26	113.90	0.01	
10/01/2017	1.25	113.92	0.02	
13/01/2017	1.23	113.93	0.04	
17/01/2017	1.27	113.89	0.00	
20/01/2017	1.31	113.85	-0.04	
24/01/2017	1.29	113.87	-0.02	
27/01/2017	1.27	113.89	0.00	

APPENDICES

Appendix E

Summary of Field and Laboratory Tests

TABLE 1

SUMMARY OF BOREHOLE DRILLING, FIELD SAMPLING, FIELD TESTING & INSTRUMENT INSTALLATION

Project No : 7362011662

Project : [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS
Soil Investigation Works at Tengah Phase 1 & 2 Infra (WI 059)

BH No.	Soil Drilling (m)	Rock Coring (m)	Terminated Depth (m)	Field Sampling							Field Testing					Instrument Installation			
				D (no.)	UD (no.)	OD (no.)	PS (no.)	MZ (no.)	DS (no.)	WS (no.)	SPT (no.)	V (no.)	PMT (no.)	PBT (no.)	PKT (no.)	WSP (m)	CP (m)	PP (m)	I (m)
BH1	16.00	3.00	19.00	-	2	-	-	-	-	-	5	-	-	-	-	12	-	-	-
	10.00	-		-	2	-	-	-	-	-	3	-	-	-	-	-	-	-	-
	6.00	3.00		-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-
BH2	18.10	-	18.10	-	2	-	-	-	-	-	6	-	-	-	-	-	-	-	-
	10.00	-		-	2	-	-	-	-	-	3	-	-	-	-	-	-	-	-
	8.10	-		-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-
BH3	15.14	-	15.14	-	2	-	-	-	-	-	5	-	-	-	-	-	-	-	-
	10.00	-		-	2	-	-	-	-	-	3	-	-	-	-	-	-	-	-
	5.14	-		-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-
BH4	15.19	-	15.19	-	1	-	-	-	-	-	5	-	-	-	-	12	-	-	-
	10.00	-		-	1	-	-	-	-	-	3	-	-	-	-	-	-	-	-
	5.19	-		-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-
BH5	15.27	-	15.27	-	1	-	-	-	-	-	5	-	-	-	-	-	-	-	-
	10.00	-		-	1	-	-	-	-	-	3	-	-	-	-	-	-	-	-
	5.27	-		-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-
BH6	21.06	-	21.06	-	2	-	-	-	-	-	7	-	-	-	-	12	-	-	-
	10.00	-		-	2	-	-	-	-	-	3	-	-	-	-	-	-	-	-
	10.00	-		-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-
	1.06	-		-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
BH7	12.10	-	12.10	-	1	-	-	-	-	-	4	-	-	-	-	-	-	-	-
	10.00	-		-	1	-	-	-	-	-	3	-	-	-	-	-	-	-	-
	2.10	-		-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
BH8	12.11	-	12.11	-	1	-	-	-	-	-	4	-	-	-	-	12	-	-	-
	10.00	-		-	1	-	-	-	-	-	3	-	-	-	-	-	-	-	-
	2.11	-		-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
BH9	21.28	-	21.28	-	2	-	-	-	-	-	7	-	-	-	-	-	-	-	-
	10.00	-		-	2	-	-	-	-	-	3	-	-	-	-	-	-	-	-
	10.00	-		-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-

KEY:

D - Disturbed Sample
UD - Undisturbed Sample (Thin Wall)
OD - Undisturbed Sample (Thick Wall)
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V - Field Vane Shear Test
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CP - Casagrande Piezometer
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TABLE 1

SUMMARY OF BOREHOLE DRILLING, FIELD SAMPLING, FIELD TESTING & INSTRUMENT INSTALLATION

Project No : 7362011662

Project : [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS
Soil Investigation Works at Tengah Phase 1 & 2 Infra (WI 059)

BH No.	Soil Drilling (m)	Rock Coring (m)	Terminated Depth (m)	Field Sampling							Field Testing					Instrument Installation			
				D (no.)	UD (no.)	OD (no.)	PS (no.)	MZ (no.)	DS (no.)	WS (no.)	SPT (no.)	V (no.)	PMT (no.)	PBT (no.)	PKT (no.)	WSP (m)	CP (m)	PP (m)	I (m)
	1.28	-		-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
BH10	15.11	-	15.11	-	2	-	-	-	-	-	5	-	-	-	-	-	-	-	-
	10.00	-		-	2	-	-	-	-	-	3	-	-	-	-	-	-	-	-
	5.11	-		-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-
BH11	12.19	-	12.19	-	1	-	-	-	-	-	4	-	-	-	-	-	-	-	-
	10.00	-		-	1	-	-	-	-	-	3	-	-	-	-	-	-	-	-
	2.19	-		-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
BH12	18.14	-	18.14	-	2	-	-	-	-	-	6	-	-	-	-	-	-	-	-
	10.00	-		-	2	-	-	-	-	-	3	-	-	-	-	-	-	-	-
	8.14	-		-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-
BH13	23.08	1.00	24.08	-	2	-	-	-	-	-	7	-	-	-	-	-	-	-	-
	10.00	-		-	2	-	-	-	-	-	3	-	-	-	-	-	-	-	-
	9.00	1.00		-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-
	4.08	-		-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-
BH14	15.10	-	15.10	-	2	-	-	-	-	-	5	-	-	-	-	-	-	-	-
	10.00	-		-	2	-	-	-	-	-	3	-	-	-	-	-	-	-	-
	5.10	-		-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-
BH15	18.25	-	18.25	-	2	-	-	-	-	-	6	-	-	-	-	-	-	-	-
	10.00	-		-	2	-	-	-	-	-	3	-	-	-	-	-	-	-	-
	8.25	-		-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-
BH16	15.26	-	15.26	-	2	-	-	-	-	-	5	-	-	-	-	-	-	-	-
	10.00	-		-	2	-	-	-	-	-	3	-	-	-	-	-	-	-	-
	5.26	-		-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-
BH17	21.39	-	21.39	-	1	-	-	-	-	-	7	-	-	-	-	12	-	-	-
	10.00	-		-	1	-	-	-	-	-	3	-	-	-	-	-	-	-	-
	10.00	-		-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-
	1.39	-		-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
BH18	15.10	-	15.10	-	-	-	-	-	-	-	5	-	-	-	-	-	-	-	-

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BH No.	Soil Drilling (m)	Rock Coring (m)	Terminated Depth (m)	Field Sampling							Field Testing					Instrument Installation			
				D (no.)	UD (no.)	OD (no.)	PS (no.)	MZ (no.)	DS (no.)	WS (no.)	SPT (no.)	V (no.)	PMT (no.)	PBT (no.)	PKT (no.)	WSP (m)	CP (m)	PP (m)	I (m)
	10.00	-		-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-
	5.10	-		-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-
BH19	15.11	-	15.11	-	-	-	-	-	-	-	5	-	-	-	-	12	-	-	-
	10.00	-		-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-
	5.11	-		-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-

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TABLE 2

TOTAL QUANTITIES OF LABORATORY TESTS PERFORMED

Project No : 7362011662

Project : [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS
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Borehole Number	Depth Range (m)	Index Property Test						Mechanical Property Test									Other Test							
								Triaxial Compression Test					Direct Shear Box	One-Dimension Oedometer Test	Rock Test		Chemical Test For Soil				Chemical Test For Water			
		Natural Water Content (No.)	Dry Density (No.)	Atterberg Limits (Set.)	Specific Gravity (No.)	Hydrometer Test (No.)	Sieve Analysis (No.)	UU (Set.)	CIU (Set.)	CID (Set.)	MCIU (Set.)	MCID (Set.)	(No.)	(No.)	Unconf. Comp. Test (No.)	Point Load Test (No.)	Organic Content (Set.)	Sulphate as SO3 (Set.)	Chloride as Cl- (Set.)	pH value (Set.)	Organic Content (Set.)	Sulphate as SO3 (Set.)	Chloride as Cl- (Set.)	pH value (Set.)
BH1	0- 19	2	2	1	2	2	2	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-
	0- 10	2	2	1	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	10- 19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH2	0- 18.1	2	2	2	2	2	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	0- 10	2	2	2	2	2	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	10- 18.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH3	0- 15.14	2	2	2	2	2	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	0- 10	2	2	2	2	2	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	10- 15.14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH4	0- 15.19	1	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	0- 10	1	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	10- 15.19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH5	0- 15.27	1	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	0- 10	1	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	10- 15.27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Borehole Number	Depth Range (m)	Index Property Test						Mechanical Property Test									Other Test							
								Triaxial Compression Test					Direct Shear Box	One-Dimension Oedometer Test	Rock Test		Chemical Test For Soil				Chemical Test For Water			
		Natural Water Content (No.)	Dry Density (No.)	Atterberg Limits (Set.)	Specific Gravity (No.)	Hydrometer Test (No.)	Sieve Analysis (No.)	UU (Set.)	CIU (Set.)	CID (Set.)	MCIU (Set.)	MCID (Set.)	(No.)	(No.)	Unconf. Comp. Test (No.)	Point Load Test (No.)	Organic Content (Set.)	Sulphate as SO3 (Set.)	Chloride as Cl- (Set.)	pH value (Set.)	Organic Content (Set.)	Sulphate as SO3 (Set.)	Chloride as Cl- (Set.)	pH value (Set.)
BH6	0- 21.06	2	2	2	2	2	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1
	0- 10	2	2	2	2	2	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	10- 20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	20- 21.06	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH7	0- 12.1	1	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-
	0- 10	1	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	10- 12.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH8	0- 12.11	1	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-
	0- 10	1	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	10- 12.11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH9	0- 21.28	2	2	2	2	2	2	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	0- 10	2	2	2	2	2	2	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	10- 20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	20- 21.28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Project : [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS
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Borehole Number	Depth Range (m)	Index Property Test						Mechanical Property Test									Other Test							
		Natural Water Content (No.)	Dry Density (No.)	Atterberg Limits (Set.)	Specific Gravity (No.)	Hydrometer Test (No.)	Sieve Analysis (No.)	Triaxial Compression Test					Direct Shear Box (No.)	One-Dimension Oedometer Test (No.)	Rock Test		Chemical Test For Soil				Chemical Test For Water			
								UU (Set.)	CIU (Set.)	CID (Set.)	MCIU (Set.)	MCID (Set.)			Unconf. Comp. Test (No.)	Point Load Test (No.)	Organic Content (Set.)	Sulphate as SO3 (Set.)	Chloride as Cl- (Set.)	pH value (Set.)	Organic Content (Set.)	Sulphate as SO3 (Set.)	Chloride as Cl- (Set.)	pH value (Set.)
BH10	0- 15.11	2	2	2	2	2	2	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	0- 10	2	2	2	2	2	2	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	10- 15.11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH11	0- 12.19	1	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	0- 10	1	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	10- 12.19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH12	0- 18.14	2	2	2	2	2	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	0- 10	2	2	2	2	2	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	10- 18.14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH13	0- 24.08	2	2	2	2	2	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	0- 10	2	2	2	2	2	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	10- 20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	20- 24.08	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

TABLE 2

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Project : [D/250/14] TERM CONTRACT NO. 35 FOR SITE INVESTIGATION WORKS FOR A PERIOD OF 30 MONTHS
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Borehole Number	Depth Range (m)	Index Property Test						Mechanical Property Test									Other Test							
								Triaxial Compression Test					Direct Shear Box	One-Dimension Oedometer Test	Rock Test		Chemical Test For Soil				Chemical Test For Water			
		Natural Water Content (No.)	Dry Density (No.)	Atterberg Limits (Set.)	Specific Gravity (No.)	Hydrometer Test (No.)	Sieve Analysis (No.)	UU (Set.)	CIU (Set.)	CID (Set.)	MCIU (Set.)	MCID (Set.)	(No.)	(No.)	Unconf. Comp. Test (No.)	Point Load Test (No.)	Organic Content (Set.)	Sulphate as SO3 (Set.)	Chloride as Cl- (Set.)	pH value (Set.)	Organic Content (Set.)	Sulphate as SO3 (Set.)	Chloride as Cl- (Set.)	pH value (Set.)
BH14	0- 15.1	2	2	2	2	2	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	0- 10	2	2	2	2	2	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	10- 15.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH15	0- 18.25	2	2	2	2	2	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	0- 10	2	2	2	2	2	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	10- 18.25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH16	0- 15.26	2	2	2	2	2	2	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	0- 10	2	2	2	2	2	2	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	10- 15.26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH17	0- 21.39	1	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1
	0- 10	1	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	10- 20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	20- 21.39	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH18	0- 15.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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		Natural Water Content (No.)	Dry Density (No.)	Atterberg Limits (Set.)	Specific Gravity (No.)	Hydrometer Test (No.)	Sieve Analysis (No.)	UU (Set.)	CIU (Set.)	CID (Set.)	MCIU (Set.)	MCID (Set.)	(No.)	(No.)	Unconf. Comp. Test (No.)	Point Load Test (No.)	Organic Content (Set.)	Sulphate as SO3 (Set.)	Chloride as Cl- (Set.)	pH value (Set.)	Organic Content (Set.)	Sulphate as SO3 (Set.)	Chloride as Cl- (Set.)	pH value (Set.)
	0- 10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	10- 15.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH19	0- 15.11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1
	0- 10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	10- 15.11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL		28	28	27	28	28	28	7	3	-	-	-	-	-	-	-	-	3	-	3	-	3	-	3

APPENDICES

Appendix F

Boreholes Setting Out Survey Report

Ace Land Survey

Company Registered No. 53078203X
GST Registered No. M90368802T
No. 2 Kallang Pudding Road
#05-02 Mactech Building
Singapore 349 307
Tel: 6744 2380 Fax: 6744 2476 Email: survey@aceland.com.sg

bizSAFE STAR

Company	: TÜV SÜD AL Technologies	Date	: 14th December 2016
Attn.	: Mr. Nel Cortes	Ref No.	: TÜV044-16
Fax No.	: (65) 6748 2393	Job No.	: F649-2016

Project : Soil Investigation Work at Tengah Estate Phase 1 & 2 infra

Subject : Setting Out Borehole Coordinates

BH NO.	NORTHING	EASTING	RL	REMARKS/ SURVEY DATE
BH1	37705.481	16097.342	-	Unmark
BH1A	37705.530	16099.857	102.733	09-12-2016 / Offset 2.5m
BH2	37493.419	16309.544	-	Unmark
BH2A	37487.486	16310.438	101.707	09-12-2016 / Offset 6.0m
BH3	37281.356	16521.745	101.956	20-10-2016
BH4	37772.748	16376.627	110.124	09-12-2016
BH5	37555.416	16583.491	112.227	20-10-2016
BH6	37339.781	16792.194	105.367	18-11-2016
BH7	37175.464	17052.110	110.484	14-12-2016
BH8	36963.401	17264.311	112.898	09-12-2016
BH9	37702.130	16659.493	110.208	24-10-2016
BH10	38090.709	16583.897	107.530	20-10-2016
BH11	37980.295	16649.678	107.696	01-11-2016
BH12	37859.378	16766.306	107.865	26-10-2016
BH13	37727.090	16894.075	109.542	01-11-2016
BH14	37581.844	17034.118	115.762	18-11-2016
BH15	37491.000	17149.679	112.046	07-11-2016
BH16	37953.235	16910.434	107.618	26-10-2016
BH17	38236.055	16839.630	123.568	18-11-2016
BH18	38045.212	17073.038	113.242	26-10-2016
BH19	37854.346	17306.422	114.804	07-11-2016

Registered Surveyor

LEE TONG SOON
MSISV Singapore
LSB Reg. No.: 104

Appendix U
Ambient Air Quality Baseline Monitoring Report

Delivering a better world

STATS
Specialist Testing and Technical Services

Website: www.statsasiapac.com
Address: 71 Toh Guan Road East, #02-01/02/06, #03-02, #05-03
TCH Techcentre, Singapore 608598

Co Reg No. 201716604R I GST No. 201716604R
Tel: (65) 6252 6688 I Fax: (65) 6252 6166

TEST REPORT

(This report is issued subject to the terms & conditions set out below)

Your Ref: PO No. 2985 **Our Ref: ENV214905** **Date: 12/05/2021**

Subject **:**

AMBIENT AIR QUAITY (PM2.5 & PM10) MONITORING AT SOUTH TENGAH

Test Date **:** *3rd May to 10h May 2021*

Test Site **:** *South Tengah*

Tested for **:** ***AECOM SINGAPORE PTE LTD***
300 Beach Road
#23-00 The Concourse
Singapore 199555
(Attention : Mr Hanzel Lalitan)

Project Officers **:** *1) Lim Tung Chen Jeffrey*

2) Tan Boon Wei Ian

Prepared By **:**

LAM KAH MIN LESTER
SENIOR MANAGER
ENVIRONMENTAL DEPARTMENT

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1.0 Introduction

STATS Asia Pacific Pte Ltd was engaged by AECOM Singapore Pte Ltd to conduct a baseline ambient air quality monitoring for Particulate Matter 10 (PM_{10}) and Particulate Matter 2.5 ($PM_{2.5}$) within the proximity of South Tengah over a duration of one week at the following three identified locations :_

- Location 1 is situated on SLA land between Bulim Heavy Vehicle Car Park & Pan Island Expressway;
- Location 2 is situated at an LTA construction site near Tengah Forest;
- Location 3 is situated at HDB Block 374, Jurong East Avenue 1.

2.0 Objective

The objective of the study is to determine the baseline levels of ambient air at the mentioned premise.

Ambient air pollutants were compared to the Singapore Ambient Air Quality Targets recommended by National Environment Agency (NEA). The targets are benchmarked against World Health Organization Air Quality Guidelines (WHO AQGs) backed by scientific findings and health studies. It is proposed that NEA should work towards achieving the WHO AQGs for all air pollutants in the long term.

Refer to Appendix I for Singapore Ambient Air Quality Targets.

3.0 Scope of Works

Unattended 7 days continuous measurements were carried out for each of the identified locations from 3rd May 2021 to 10th May 2021. The monitoring instruments were placed within weather proof enclosures mounted on tripods with its sensor at approximately 1.5 metres from ground level. The following parameters and time samples were recorded during the measurement exercise :

- Particulate Matter 10 (PM_{10}) was data logged for every 5 minutes period over one week;
- Particulate Matter 2.5 ($PM_{2.5}$) was data logged for every 5 minutes period over one week;

Site photos of the monitoring setups can be found in Appendix II.

4.0 Methodology

All equipment used for the monitoring study were calibrated and in good working order. Calibration certificates of the equipment can be found in Appendix III, IV and V.

Particulate Matter 2.5 ($PM_{2.5}$) and **Particulate Matter 10 (PM_{10})** were measured using TSI DustTrak DRX Aerosol Monitor Model 8534 and 8533, which uses light scattering laser photometer sensor to determine the airborne particulates present in the air. It provides real time aerosol mass reading simultaneously for size segregated mass fraction concentrations corresponding to PM 1, PM 2.5, Respirable, PM 10 and Total PM size fractions.

The equipment was placed inside a weatherproof enclosure with only the suction tube of the meter exposed to outdoor ambient air. The measurements were datalogged at 5 minutes interval over an entire 24 hours monitoring duration.

5.0 Test Results

The 24 hours average test results for ambient air were summarized in the table below.

Location ID	Equipment	Test Date	Time (hrs)	Particulate Matter 2.5 (µg/m³)	Particulate Matter 10 (µg/m³)
Location 1	TSI DustTrak DRX Aerosol Monitor Model 8534 (S/No. 8534192806)	03/05/21 - 04/05/21	1109 - 1109	**29.02**	35.20
		04/05/21 - 05/05/21	1109 - 1109	**26.25**	32.76
		05/05/21 - 06/05/21	1109 - 1109	**25.75**	30.73
		06/05/21 - 07/05/21	1109 - 1109	**68.01**	**76.37**
		07/05/21 - 08/05/21	1109 - 1109	**28.38**	34.10
		08/05/21 - 09/05/21	1109 - 1109	23.05	29.79
		09/05/21 - 10/05/21	1109 - 1109	**33.42**	39.73
Location 2	TSI DustTrak DRX Aerosol Monitor Model 8533 (S/No. 8533104509)	03/05/21 - 04/05/21	1149 - 1149	**75.68**	**93.23**
		04/05/21 - 05/05/21	1149 - 1149	**69.31**	**81.58**
		05/05/21 - 06/05/21	1149 - 1149	**67.29**	**74.51**
		06/05/21 - 07/05/21	1149 - 1149	**93.00**	**100.61**
		07/05/21 - 08/05/21	1149 - 1149	**66.91**	**75.07**
		08/05/21 - 09/05/21	1149 - 1149	**59.12**	**68.78**
		09/05/21 - 10/05/21	1149 - 1149	**72.68**	**81.50**
Location 3	TSI DustTrak DRX Aerosol Monitor Model 8534 (S/No. 8534171002)	03/05/21 - 04/05/21	1210 - 1210	**25.84**	29.37
		04/05/21 - 05/05/21	1210 - 1210	**31.11**	36.24
		05/05/21 - 06/05/21	1210 - 1210	**56.67**	**62.07**
		06/05/21 - 07/05/21	1210 - 1210	**81.22**	**85.51**
		07/05/21 - 08/05/21	1210 - 1210	**38.03**	42.87
		08/05/21 - 09/05/21	1210 - 1210	**29.84**	33.95
		09/05/21 - 10/05/21	1210 - 1210	**39.22**	42.98
*** Air Quality Targets**				**25**	**50**

Note : 1) Results for particulate matter 2.5 and particulate matter 10 were average derived from 24 hours of 5 minutes interval logging.

2) "*" denotes the targets obtained from NEA's Singapore Ambient Air Quality Targets.

6.0 Appendices

Appendix I - Singapore Ambient Air Quality Targets

Annex I: Singapore Ambient Air Quality Targets

Pollutant	Singapore Targets by 2020	Long Term Targets
Sulphur Dioxide (SO_2)	24-hour mean: 50µg/m³ (WHO Interim Target) Annual mean: 15 µg/m³ (Sustainable Singapore Blueprint target)	24-hour mean: 20µg/m³ (WHO Final)
Particulate Matter ($PM_{2.5}$)	Annual mean: 12µg/m³ (Sustainable Singapore Blueprint target) 24-hour mean: 37.5µg/m³ (WHO Interim Target)	Annual mean: 10µg/m³ 24-hour mean: 25µg/m³ (WHO Final)
Particulate Matter (PM_{10})	Annual mean: 20 µg/m³ 24-hour mean: 50 µg/m³ (WHO Final)	
Ozone	8-hour mean: 100µg/m³ (WHO Final)	
Nitrogen Dioxide (NO_2)	Annual mean: 40µg/m³ 1-hour mean: 200µg/m³ (WHO Final)	
Carbon Monoxide (CO)	8-hour mean: 10mg/m³ 1-hour mean: 30mg/m³ (WHO Final)	

Appendix II - Site Photos







Appendix III - Calibration Certificate of DustTrak DRX Model 8534 (S/No. 853492806)

CERTIFICATE OF CALIBRATION AND TESTING

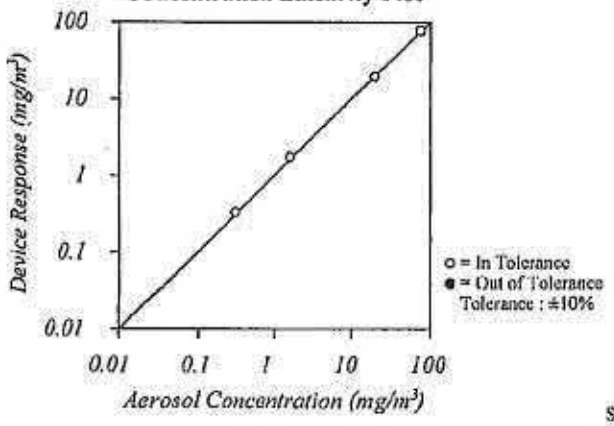
TSI Singapore Pte Ltd 150, Kampong Ampat
#08-05, KA Centre Singapore 368324
Phone: +65 6595 6391

Environment Conditions		
Temperature	22.8	°C
Relative Humidity	53	%RH
Barometric Pressure	1005.1	hPa

Model	8534
Serial Number	8534192806

☒ As Left ☐ As Found ☒ In Tolerance ☐ Out of Tolerance

Concentration Linearity Plot



System ID: DTII04-01

FLOW AND PRESSURE VERIFICATION — SYSTEM DTII04-01

Parameter	Standard	Measured	Allowable Range	Parameter	Standard	Measured	Allowable Range
Flow lpm	3.00	3.06	2.91 ~ 3.09	Pressure kPa	100.7	100.7	95.69 ~ 105.76
Full Flow lpm	N/A	4.81	>3.80				

TSI Incorporated does hereby certify that all materials, components, and workmanship used in the manufacture of this equipment are in strict accordance with the applicable specifications agreed upon by TSI and the customer and with all published specifications. All performance and acceptance tests required under this contract were successfully conducted according to required specifications. There is no NIST standard for optical mass measurements. Calibration of this instrument performed by TSI has been done using emery oil and has been nominally adjusted to respirable mass of standard ISO 12103-1, A1 test dust (Arizona dust). Our calibration ratio is greater than 1.2:1.

Measurement Variable	System ID	Last Cal.	Cal. Due	Measurement Variable	System ID	Last Cal.	Cal. Due
DC Voltage	E020115	10-01-20	31-01-21	Photometer	E020114	22-07-20	31-01-21
Microbalance	E020125	23-01-20	31-01-21	1 um PSL	698880	n/a	n/a
3 um PSL	206030	n/a	n/a	10 um PSL	212455	n/a	n/a
Pressure	E020123	22-01-20	31-01-21	Flowmeter	E020119	28-01-20	30-01-21

Mukhlis Zakariah
Calibrated

24 July, 2020
Date

TSI P/N 2300157

Appendix IV - Calibration Certificate of DustTrak DRX Model 8533 (S/No. 8533104509)

CERTIFICATE OF CALIBRATION AND TESTING

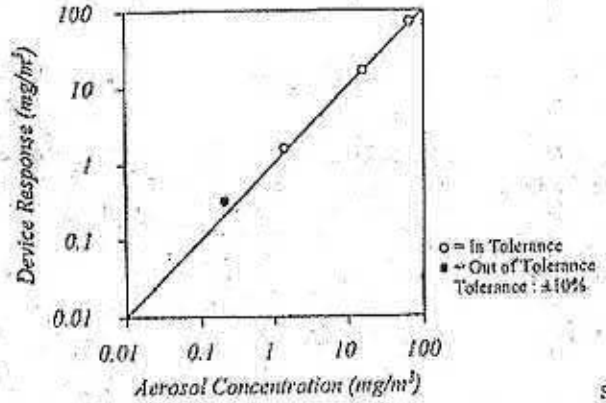
TSI Singapore Pte Ltd 150, Kampong Ampat
#08-05, KA Centre Singapore 368324
Phone: +65 6595 6391

Environment Conditions		
Temperature	22.8	°C
Relative Humidity	55	%RH
Barometric Pressure	1004.1	hPa

Model	8533
Serial Number	8533104509

☐ As Left ☐ In Tolerance
☒ As Found ☒ Out of Tolerance

Concentration Linearity Plot



System ID: DT1104-01

SYSTEM DT1104-01

FLOW AND PRESSURE VERIFICATION

Parameter	Standard	Measured	Allowable Range	Parameter	Standard	Measured	Allowable Range
Flow lpm	3.00	3.04	2.85 ~ 3.15	Pressure kPa	100.5	100.5	95.43 ~ 105.48
Full Flow lpm	N/A	3.83	>3.80				

Pump run time: 1983 Hours, Pump voltage: 189 Bits

TSI Incorporated does hereby certify that all materials, components, and workmanship used in the manufacture of this equipment are in strict accordance with the applicable specifications agreed upon by TSI and the customer and with all published specifications. All performance and acceptance tests required under this contract were successfully conducted according to required specifications. There is no NIST standard for optical mass measurements. Calibration of this instrument performed by TSI has been done using emery oil and has been nominally adjusted to respirable mass of standard ISO 12103-1, A1 test dust (Arizona dust). Our calibration ratio is greater than 1.2:1.

Measurement Variable	System ID	Last Cal.	Cal. Due
DC Voltage	E020115	14-01-21	31-01-22
Microbalance	E020125	27-01-20	31-01-22
3 um PSL	206030	n/a	n/a
Pressure	E020121	29-01-21	31-01-22

Measurement Variable	System ID	Last Cal.	Cal. Due
Photometer	E020114	29-01-21	31-07-21
1 um PSL	698880	n/a	n/a
10 um PSL	212455	n/a	n/a
Flowmeter	E020119	28-01-20	30-04-21

26 February, 2021

Verified

Date

TSI P/N 2300157

Appendix V - Calibration Certificate of DustTrak DRX Model 8534 (S/No. 8534171002)

CERTIFICATE OF CALIBRATION AND TESTING

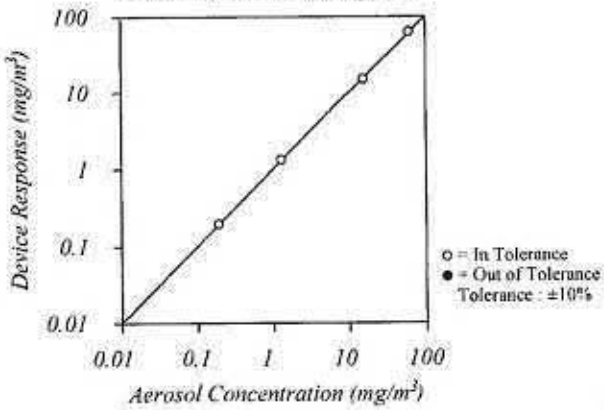
TSI Singapore Pte Ltd 150, Kampong Ampat
#05-05, KA Centre Singapore 368324
Phone: +65 6595 6391

Environment Conditions		
Temperature	22.4	°C
Relative Humidity	52	%RH
Barometric Pressure	1006.4	hPa

Model	8534
Serial Number	8534171002

☒ As Left ☐ As Found
☒ In Tolerance ☐ Out of Tolerance

Concentration Linearity Plot



System ID: DTII04-01

FLOW AND PRESSURE VERIFICATION — **SYSTEM DTII04-01**

Parameter	Standard	Measured	Allowable Range	Parameter	Standard	Measured	Allowable Range
Flow lpm	3.00	3.07	2.88 ~ 3.12	Pressure kPa	100.7	100.7	95.70 ~ 105.78
Full Flow lpm	N/A	4.85	>3.80				

TSI Incorporated does hereby certify that all materials, components, and workmanship used in the manufacture of this equipment are in strict accordance with the applicable specifications agreed upon by TSI and the customer and with all published specifications. All performance and acceptance tests required under this contract were successfully conducted according to required specifications. There is no NIST standard for optical mass measurements. Calibration of this instrument performed by TSI has been done using emery oil and has been nominally adjusted to respirable mass of standard ISO 12103-1, A1 test dust (Arizona dust). Our calibration ratio is greater than 1.2:1.

Measurement Variable	System ID	Last Cal.	Cal. Due	Measurement Variable	System ID	Last Cal.	Cal. Due
DC Voltage	E020115	14-01-21	31-01-22	Photometer	E020114	22-07-20	31-01-21
Microbalance	E020125	23-01-20	31-01-21	1 um PSL	698880	n/a	n/a
3 um PSL	206030	n/a	n/a	10 um PSL	212455	n/a	n/a
Pressure	E020123	22-01-20	31-01-21	Flowmeter	E020119	28-04-20	30-04-21

ESLEYER

Calibrated

25 January, 2021

Date

TSI P/N 2300157

Appendix V
Air Quality Receptors List (Construction Phase – Human Receptors)

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Table V-1: Air Sensitive Receptors Construction Phase (Human Receptors)

Distance	Land Use	Number of Receivers	Sensitivity of the Area
For Earthworks			
Within 20m	-	-	Priority 2
Between 20m to 50m	-	-	
Between 50m to 100m	Educational Institution: 1. Dulwich College	>100	
Between 100m to 200m	Educational Institution: 1. Dulwich College 2. Jurong Primary School 3. Jurongville Secondary School Residential: 1. HDB Blk 445B, 445C, 446, 446A Bukit Batok West Ave 8 2. HDB Blk 306- 310 Jurong East St 32 3. HDB Blk 331-337, 373, 374 Jurong East Ave 1 Commercial: 1. Blk 445 Bukit Batok West Ave 8 MSCP 2. Shell Bukit Batok West Ave 3	>100 >100	
Between 200m to 350m	Educational Institution: 1. Dulwich College 2. Princess Elizabeth Primary School 3. Jurong Primary School 4. Jurongville Secondary School 5. Hong Kah Secondary School Hospital/Medical Centre: 1. Jurong Polyclinic Residential: 1. HDB Blk 445A, 445B, 446, 446A Bukit Batok West Ave 8 2. HDB Blk 460B 460C 447 447A Bukit Batok West Ave 9 3. HDB Blk 301-311, 313, 314, 371-374 Jurong East St 32 4. HDB Blk 329-331, 332, 337, 338-341 Jurong East Ave 1 5. HDB Blk 408-410, 412, 414 Jurong West St 42 6. The Mayfair Condominium Place of Worship: 1. Thong Whye Tp Commercial: 1. Blk 445 Bukit Batok West Ave 8 MSCP 2. Blk 372 Jurong East St 32 MSCP 3. Yo:HA@Jurong	>100 10-100 >100	
For Construction			
Within 20m	-	-	Priority 2

Distance	Land Use	Number of Receivers	Sensitivity of the Area
Between 20m to 50m	-	-	
Between 50m to 100m	Educational Institution: 1. Dulwich College 2. Jurong Primary School Residential: 1. HDB Blk 407, 408 Jurong West St 42 2. HDB Blk 332-335, 374 Jurong East Ave 1 3. HDB Blk 307-310 Jurong East St 32	>100	
Between 100m to 200m	Educational Institution: 1. Dulwich College 2. Jurong Primary School 3. Jurongville Secondary School 4. Hong Kah Secondary School Residential: 1. HDB Blk 559, 561, 561A, 561B Jurong West St 42 2. HDB Blk 405-412 Jurong West St 42 3. HDB Blk 331-339, 373, 374 Jurong East Ave 1 4. HDB Blk 306- 310 Jurong East St 32 5. HDB Blk 445B, 445C, 446, 446A Bukit Batok West Ave 8 Commercial: 1. Blk 445 Bukit Batok West Ave 8 MSCP 2. Shell Bukit Batok West Ave 3 3. Blk 372A Jurong East St 32 MSCP	>100 >100	
Between 200m to 350m	Educational Institution: 1. Dulwich College 2. Princess Elizabeth Primary School 3. Jurong Primary School 4. Jurongville Secondary School 5. Hong Kah Secondary School 6. Hua Yi Secondary School Hospital/Medical Centre: 1. Jurong Polyclinic Residential: 1. HDB Blk 548, 553-559, 560A, 562 Jurong West St 42 2. HDB Blk 401-404, 413-417, 419, 430-433 Jurong West St 42 3. HDB Blk 320, 324, 328, 329, 330, 339-341, 371, 372 Jurong East Ave 1 4. HDB Blk 301-306, 311-314 Jurong East St 32 5. The Mayfair Condominium 6. HDB Blk 445A, 445B, 446, 446A Bukit Batok West Ave 8 7. HDB Blk 460B 460C 447 447A Bukit Batok West Ave 9	>100 10-100 >100	

Distance	Land Use	Number of Receivers	Sensitivity of the Area
	8. HDB Blk 301-311, 313, 314 Jurong East St 32 9. HDB Blk 371-374 Jurong East St 32 10. HDB Blk 329-331, 332, 337, 338-341 Jurong East Ave 1 11. HDB Blk 408-410, 412, 414 Jurong West St 42 12. The Mayfair Condominium 13. HDB Blk 445A, 445B, 446, 446A Bukit Batok West Ave 8 14. HDB Blk 447, 447A, 460A, 460B, 460C Bukit Batok West Ave 9 15. HDB Blk 440A, 440B, 440C, 440D, 441C, 443B, 443C, 443D Bukit Batok West Ave 8 Place of Worship: 1. Thong Whye Tp 2. Jurong Tp Commercial: 1. Blk 560 Jurong West St 42 MSCP 2. Jurong Clementi TC (Main Office) 3. Blk 372 Jurong East St 32 MSCP 4. Yo:HA@Jurong 5. Blk 443 Bukit Batok West Ave 8 MSCP		
For Trackout			
Within 20m	-	-	Priority 1
Between 20m to 50m	Educational Institution: 1. Dulwich College Residential: 1. HDB Blk 440D, 442, 442C, 443A, 443D Bukit Batok West Ave 8 Commercial: 1. Blk 443, 445 Bukit Batok West Ave 8 MSCP 2. Shell Bukit Batok West Ave 3	>100 >100	
Between 50m to 100m	Educational Institution: 1. Dulwich College 2. Jurong Primary School Residential: 1. HDB Blk 171, 172, 440D, 442, 442B, 442C, 443A, 443B, 443C, 443D,445B, 445C, 446, 446A Bukit Batok West Ave 8 2. HDB Blk 257, 261 Jurong East St 24 3. HDB Blk 308-310 Jurong East St 32 4. HDB Blk 335, 337, 373, 374 Jurong East Ave 1 5. HDB Blk 407-410, 547, 548, 549, 558, 561B Jurong West St 42 Commercial: 1. Blk 443, 45 Bukit Batok West Ave 8 MSCP 2. Shell Bukit Batok West Ave 3		

Appendix W
Baseline Airborne Noise Monitoring Results

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Table 41 Summary of Baseline Airborne Noise Monitoring Results for Sunday and Public Holidays at N8 29

Introduction

Under the contract L/025/21, the Singapore Housing & Development Board (HDB) appointed AECOM Singapore Pte Ltd (AECOM) to undertake an Environmental Impact Study (EIS) to assess the potential environmental impacts arising from, and associated with, the construction and operational phases of the proposed residential developments in Southern Tengah (hereafter referred to as the "Project").

The study will involve a quantitative assessment of the noise impacts arising from the Project's construction phase, and a qualitative assessment of noise impacts arising from the operational phase which will be discussed in the main report. This report details the noise monitoring plan to carry out the baseline airborne noise monitoring at the Project Site due to the construction phase of the Project, as part of the quantitative noise impact assessment. The purpose of conducting the baseline airborne noise monitoring is to determine the existing noise levels in the vicinity of locations surrounding the Project Site for further assessment and validation of noise level predictions.

Airborne Noise Monitoring Schedule

Unattended noise monitoring was conducted at the proposed locations to capture the existing noise level profiles in the vicinity. The monitoring dates and locations of the monitoring points are reflected in **Table 1** below.

Table 1 Baseline Monitoring Locations

No.	Monitoring ID	Location	Date of Monitoring
1	N1a	Dulwich College (rooftop)	10 Apr – 17 Apr 2021
2	N1b	HDB Land Lot (No. MK10-05123K) near Dulwich College (ground level)	10 Apr – 17 Apr 2021
3	N2	Tengah Forest (Future Residential)	02 Mar – 08 Mar 2021
4	N3	Block 374 HDB Jurong East	19 Apr – 25 Apr 2021
5	N4a	Block 409 HDB Jurong West (ground level)	16 Apr – 23 Apr 2021
6	N4b	Block 409 HDB Jurong West (mid-level)	16 Apr – 23 Apr 2021
7	N4c	Block 409 HDB Jurong West (rooftop)	16 Apr – 23 Apr 2021
8	N5a	Block 561B HDB Jurong West (ground level)	01 Apr – 08 Apr 2021
9	N5b	Block 561B HDB Jurong West (mid-level)	01 Apr – 08 Apr 2021
10	N5c	Block 561B HDB Jurong West (rooftop)	01 Apr – 08 Apr 2021
11	N6	Future Industrial Area	19 Apr – 25 Apr 2021
12	N7	Tengah Forest (Future Educational)	27 Apr – 04 May 2021
13	N8	Tengah Forest (Future Park/ Residential)	03 Mar – 09 Mar 2021

Airborne Noise Monitoring Equipment

Four (4) Norsonic 131 Sound Level Meter (SLM) with microphones were utilized to collect data for the Project. For the purpose of QA/QC, the SLM was calibrated before each monitoring session without any drift in calibration before and after monitoring to ensure that equipment readings remain within acceptable margins of error. In order to reduce the changes to recording unwanted noise caused by the wind, a windshield was attached to the microphone. Noise levels were recorded in 1-minute intervals using the L_{Aeq} descriptor, under a 'fast' time-weighting. Calibration certificates of the noise monitoring equipment as per **Table 2** are presented in **Annex B**.

Table 2 Airborne Noise Monitoring Equipment

Instrument	Brand	Model	Serial Numbers	Type
Norsonic 131	Norsonic	Norsonic 131	1313950	1
Norsonic 131	Norsonic	Norsonic 131	1313979	1
Norsonic 131	Norsonic	Norsonic 131	1313980	1
Norsonic 131	Norsonic	Norsonic 131	1313989	1



Figure 1 Airborne Noise Monitoring Setup

Baseline Airborne Noise Monitoring Data (Construction Phase)

The daily baseline airborne noise monitoring results for N1a – N8 for 7:00am – 7:00pm, 7:00pm – 10:00pm and 10:00pm – 7:00am are listed in this section. The time period that will be used for the airborne impact assessments for the construction phase is 7:00am – 7:00pm and 7:00pm – 10:00pm for the Weekday (Monday to Saturday) and under the assumption that no works would be carried out during the Weekend (Sunday/ Public Holiday). The corresponding graphs for the daily monitoring data are displayed in **Annex A**.

The recorded baseline noise levels in **Table 3** to **Table 15** are used to calculate the "adjusted maximum permissible noise level" in line with the directions provided in the applicable legislation for construction airborne noise impact assessment.

Table 3 Baseline Noise Monitoring Results at N1a

Monitoring period		$L_{Aeq(12hours)}$, dB		$L_{Aeq(1hour)}$, dB		$L_{Aeq(5mins)}$, dB			$L_{Aeq(15mins)}$, dB		
		7:00 am – 7:00 pm	7:00 pm – 7:00 am	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 11:00 pm	11:00 pm – 7:00 am
10-Apr-21	Min			60	50		56	49		55	49
Saturday	Max			61	57		68	58		64	58
	Average / Overall		56	60	53		59	53		58	52
11-Apr-21	Min			57	50	56	56	48	56	56	49
Sunday	Max			61	56	74	69	58	70	64	57
	Average / Overall	61	55	58	53	59	57	53	60	57	52
12-Apr-21	Min			56	50	55	56	48	56	55	49
Monday	Max			57	56	62	58	58	60	58	57
	Average / Overall	58	54	57	52	58	57	52	58	57	52
13-Apr-21	Min			56	51	55	56	49	56	56	51
Tuesday	Max			57	56	74	58	58	70	58	56
	Average / Overall	61	55	57	53	59	57	53	59	57	53
14-Apr-21	Min			56	52	54	55	50	54	55	51
Wednesday	Max			56	56	75	58	59	71	57	57
	Average / Overall	58	55	56	54	56	56	53	56	56	53
15-Apr-21	Min			55	49	54	54	46	54	54	48
Thursday	Max			55	55	75	57	57	73	56	56
	Average / Overall	60	53	55	52	56	55	52	57	55	51
16-Apr-21	Min			56	48	55	55	46	56	55	47
Friday	Max			56	56	74	57	58	70	57	57
	Average / Overall	61	54	56	51	58	56	51	59	56	51
17-Apr-21	Min			57	50	55	56	48	56	56	49
Saturday	Max			59	56	73	66	58	69	62	58
	Average / Overall	60	55	58	52	59	58	52	59	58	52

Table 4 Baseline Noise Monitoring Results at N1b

Monitoring period		$L_{Aeq(12hours)}$, dB		$L_{Aeq(1hour)}$, dB		$L_{Aeq(5mins)}$, dB			$L_{Aeq(15mins)}$, dB		
		7:00 am – 7:00 pm	7:00 pm – 7:00 am	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 11:00 pm	11:00 pm – 7:00 am
10-Apr-21	Min			66	61	67	65	59	67	66	60
Saturday	Max			67	66	71	69	68	70	68	66
	Average / Overall	68	65	67	64	68	67	63	68	67	63
11-Apr-21	Min			66	58	65	65	56	66	66	57
Sunday	Max			67	68	69	68	70	68	67	69
	Average / Overall	67	65	66	62	67	66	62	67	66	62
12-Apr-21	Min			67	59	65	66	55	65	66	59
Monday	Max			68	68	72	69	70	70	68	69
	Average / Overall	68	65	67	63	68	67	62	68	67	62
13-Apr-21	Min			66	59	64	65	56	65	66	57
Tuesday	Max			67	67	71	69	69	70	68	69
	Average / Overall	68	65	67	63	68	67	62	68	67	62
14-Apr-21	Min			67	58	65	66	52	66	65	57
Wednesday	Max			67	68	73	68	69	71	67	69
	Average / Overall	68	65	67	62	68	67	62	68	67	62
15-Apr-21	Min			67	60	65	65	56	66	66	58
Thursday	Max			68	68	70	69	70	70	69	69
	Average / Overall	68	65	67	63	68	67	63	68	67	62
16-Apr-21	Min			67	61	65	66	57	67	66	61
Friday	Max			68	67	75	69	68	73	69	67
	Average / Overall	69	65	67	64	69	67	64	69	67	63

Table 5 Baseline Noise Monitoring Results at N2

Monitoring period		$L_{Aeq(12hours)}$, dB		$L_{Aeq(1hour)}$, dB		$L_{Aeq(5mins)}$, dB			$L_{Aeq(15mins)}$, dB		
		7:00 am – 7:00 pm	7:00 pm – 7:00 am	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 11:00 pm	11:00 pm – 7:00 am
2-Mar-21	Min			56	52	51	52	50	51	52	50
Tuesday	Max			60	56	68	68	56	66	64	55
	Average / Overall	56	55	58	54	54	57	54	55	57	53
3-Mar-21	Min			58	51	51	52	50	52	52	50
Wednesday	Max			61	56	70	71	57	66	67	55
	Average / Overall	57	56	59	54	55	56	54	55	57	53
4-Mar-21	Min			53	52	50	51	51	50	52	52
Thursday	Max			56	55	57	57	57	57	57	57
	Average / Overall	53	54	55	54	53	55	54	53	55	54
5-Mar-21	Min			54	52	50	53	51	52	53	51
Friday	Max			55	55	69	57	57	67	56	56
	Average / Overall	57	54	55	53	55	55	53	55	55	53
6-Mar-21	Min			53	51	50	52	50	51	52	51
Saturday	Max			56	57	64	57	57	61	57	57
	Average / Overall	54	55	54	54	54	54	54	54	55	54
7-Mar-21	Min			57	53	50	52	51	52	53	52
Sunday	Max			62	61	72	62	61	72	62	61
	Average / Overall	61	59	60	57	57	60	57	57	60	56
8-Mar-21	Min			58	51	51	56	51	52	56	51
Monday	Max			63	57	70	69	58	68	66	57
	Average / Overall	57	57	60	54	55	59	54	55	59	53

Table 6 Baseline Noise Monitoring Results at N3

Monitoring period		$L_{Aeq(12hours)}$, dB		$L_{Aeq(1hour)}$, dB		$L_{Aeq(5mins)}$, dB			$L_{Aeq(15mins)}$, dB		
		7:00 am – 7:00 pm	7:00 pm – 7:00 am	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 11:00 pm	11:00 pm – 7:00 am
19-Apr-21	Min			70	62		69	60		68	61
Monday	Max			70	69		71	71		71	71
	Average / Overall		67	70	65		70	65		70	64
20-Apr-21	Min			69	62	69	69	60	69	68	61
Tuesday	Max			70	70	73	72	71	72	71	71
	Average / Overall	70	67	69	65	70	69	65	70	69	65
21-Apr-21	Min			69	61	69	69	60	69	68	60
Wednesday	Max			70	69	73	71	70	72	69	70
	Average / Overall	71	67	69	65	71	69	65	71	69	64
22-Apr-21	Min			69	62	69	68	60	69	68	61
Thursday	Max			70	69	72	71	71	72	70	71
	Average / Overall	70	67	69	65	70	69	65	70	69	65
23-Apr-21	Min			69	63	70	69	62	70	69	62
Friday	Max			70	69	73	71	72	72	71	70
	Average / Overall	71	67	70	66	71	70	66	71	70	65
24-Apr-21	Min			69	63	68	69	62	68	69	62
Saturday	Max			70	69	73	72	70	72	71	69
	Average / Overall	71	67	70	66	71	70	66	71	70	65
25-Apr-21	Min			69	60	67	69	59	67	68	60
Sunday	Max			70	69	70	71	71	70	70	70
	Average / Overall	69	67	70	64	69	70	64	69	69	64

Table 7 Baseline Noise Monitoring Results at N4a

Monitoring period		$L_{Aeq(12hours)}$, dB		$L_{Aeq(1hour)}$, dB		$L_{Aeq(5mins)}$, dB			$L_{Aeq(15mins)}$, dB		
		7:00 am – 7:00 pm	7:00 pm – 7:00 am	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 11:00 pm	11:00 pm – 7:00 am
16-Apr-21	Min			69	63		69	62		68	63
Friday	Max			70	69		71	70		70	69
	Average / Overall		67	70	65		70	65		69	65
17-Apr-21	Min			70	64	68	70	63	68	70	64
Saturday	Max			71	71	81	72	72	78	71	70
	Average / Overall	72	68	71	67	71	71	67	71	71	66
18-Apr-21	Min			71	62	68	70	60	68	69	62
Sunday	Max			71	70	75	72	72	73	71	72
	Average / Overall	70	68	71	66	69	71	66	69	71	65
19-Apr-21	Min			69	61	69	68	59	69	67	60
Monday	Max			70	69	84	73	70	82	71	70
	Average / Overall	73	66	69	64	72	69	64	72	69	64
20-Apr-21	Min			68	61	66	67	60	67	67	60
Tuesday	Max			70	71	81	75	73	78	73	73
	Average / Overall	71	67	68	65	69	68	65	70	68	64
21-Apr-21	Min			68	60	67	67	59	67	67	60
Wednesday	Max			70	68	83	74	70	78	72	70
	Average / Overall	71	66	69	64	70	69	63	70	68	63
22-Apr-21	Min			68	61	67	67	59	68	66	60
Thursday	Max			69	71	81	70	73	77	69	72
	Average / Overall	70	66	68	65	69	68	64	69	68	64
23-Apr-21	Min										
Friday	Max										
	Average / Overall										

Table 8 Baseline Noise Monitoring Results at N4b

Monitoring period		$L_{Aeq(12hours)}$, dB		$L_{Aeq(1hour)}$, dB		$L_{Aeq(5mins)}$, dB			$L_{Aeq(15mins)}$, dB		
		7:00 am – 7:00 pm	7:00 pm – 7:00 am	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 11:00 pm	11:00 pm – 7:00 am
16-Apr-21	Min			74	67		73	67		72	67
Friday	Max			75	73		75	74		75	73
	Average / Overall		72	74	70		74	70		74	69
17-Apr-21	Min			75	68	72	74	68	73	74	68
Saturday	Max			75	75	81	76	76	79	76	74
	Average / Overall	76	73	75	71	75	75	71	75	75	70
18-Apr-21	Min			75	66	72	74	64	72	74	65
Sunday	Max			75	74	77	76	76	76	76	76
	Average / Overall	74	72	75	70	74	75	70	74	75	69
19-Apr-21	Min			73	65	73	72	63	73	72	65
Monday	Max			74	73	83	75	75	81	74	75
	Average / Overall	76	71	73	69	75	73	69	75	73	68
20-Apr-21	Min			72	66	71	72	64	72	71	65
Tuesday	Max			74	75	79	75	77	76	74	77
	Average / Overall	74	71	73	69	74	73	69	74	73	69
21-Apr-21	Min			72	65	71	71	64	72	71	64
Wednesday	Max			74	73	82	75	75	80	74	74
	Average / Overall	75	70	73	68	74	73	68	74	73	68
22-Apr-21	Min			72	66	72	72	64	72	71	65
Thursday	Max			73	75	77	74	77	75	74	77
	Average / Overall	74	71	73	69	74	73	69	74	73	69
23-Apr-21	Min										
	Max										
	Average / Overall										

Table 9 Baseline Noise Monitoring Results at N4c

Monitoring period		$L_{Aeq(12hours)}$, dB		$L_{Aeq(1hour)}$, dB		$L_{Aeq(5mins)}$, dB			$L_{Aeq(15mins)}$, dB		
		7:00 am – 7:00 pm	7:00 pm – 7:00 am	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 11:00 pm	11:00 pm – 7:00 am
16-Apr-21	Min			67	61		67	60		66	60
Friday	Max			68	66		69	67		69	66
	Average / Overall		65	68	63		68	63		67	63
17-Apr-21	Min			69	62	66	68	61	67	68	61
Saturday	Max			69	68	81	69	70	78	69	67
	Average / Overall	71	66	69	64	70	69	64	70	69	64
18-Apr-21	Min			69	59	66	68	58	66	67	59
Sunday	Max			69	68	75	70	70	73	69	69
	Average / Overall	68	66	69	63	68	69	63	68	69	63
19-Apr-21	Min			67	59	66	66	56	66	65	58
Monday	Max			68	67	83	72	68	81	70	68
	Average / Overall	71	65	68	62	69	67	62	70	67	62
20-Apr-21	Min			66	59	65	65	57	66	64	58
Tuesday	Max			69	68	80	75	71	76	72	70
	Average / Overall	68	65	67	63	67	67	62	67	66	62
21-Apr-21	Min			66	58	65	65	57	66	65	57
Wednesday	Max			69	66	81	73	68	79	71	68
	Average / Overall	70	64	67	62	68	67	62	68	67	61
22-Apr-21	Min			66	59	66	65	57	66	64	58
Thursday	Max			67	68	69	68	70	69	67	70
	Average / Overall	67	64	66	62	67	66	62	67	66	62
23-Apr-21	Min										
Friday	Max										
	Average / Overall										

Table 10 Baseline Noise Monitoring Results at N5a

Monitoring period		$L_{Aeq(12hours)}$, dB		$L_{Aeq(1hour)}$, dB		$L_{Aeq(5mins)}$, dB			$L_{Aeq(15mins)}$, dB		
		7:00 am – 7:00 pm	7:00 pm – 7:00 am	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 11:00 pm	11:00 pm – 7:00 am
1-Apr-21	Min			65	59		64	58		65	58
Thursday	Max			66	65		67	66		67	65
	Average / Overall		63	66	62		66	61		65	61
2-Apr-21	Min			66	59	62	64	58	63	66	59
Friday	Max			66	66	71	68	67	69	67	66
	Average / Overall	66	64	66	62	66	66	62	66	66	62
3-Apr-21	Min			66	60	65	65	59	65	66	60
Saturday	Max			70	70	75	71	72	73	71	72
	Average / Overall	68	66	68	65	67	67	64	68	67	65
4-Apr-21	Min			66	57	64	65	55	65	64	56
Sunday	Max			67	66	74	68	68	72	67	68
	Average / Overall	68	64	66	61	67	66	61	68	66	61
5-Apr-21	Min			67	58	66	55	56	66	65	58
Monday	Max			69	66	73	75	69	73	71	68
	Average / Overall	69	65	68	62	68	68	62	68	67	61
6-Apr-21	Min			66	58	65	65	55	66	65	57
Tuesday	Max			69	66	74	74	68	71	71	68
	Average / Overall	68	65	68	62	68	67	62	68	67	61
7-Apr-21	Min			66	58	64	65	56	64	64	57
Wednesday	Max			69	65	75	74	68	71	71	68
	Average / Overall	65	67	68	61	67	67	61	67	67	61
8-Apr-21	Min										
Thursday	Max										
	Average / Overall										

Table 11 Baseline Noise Monitoring Results at N5b

Monitoring period		$L_{Aeq(12hours)}$, dB		$L_{Aeq(1hour)}$, dB		$L_{Aeq(5mins)}$, dB			$L_{Aeq(15mins)}$, dB		
		7:00 am – 7:00 pm	7:00 pm – 7:00 am	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 11:00 pm	11:00 pm – 7:00 am
1-Apr-21	Min			69	63		69	61		69	62
Thursday	Max			70	69		71	70		70	69
	Average / Overall		67	70	66		70	66		70	65
2-Apr-21	Min			71	64	67	70	63	68	70	63
Friday	Max			71	70	72	74	71	71	73	70
	Average / Overall	70	69	71	67	70	71	67	70	71	66
3-Apr-21	Min			70	65	70	70	63	70	70	64
Saturday	Max			71	71	75	72	73	75	72	72
	Average / Overall	72	69	71	68	71	71	68	71	71	68
4-Apr-21	Min			70	62	68	70	60	69	69	61
Sunday	Max			71	70	74	71	72	73	71	71
	Average / Overall	71	68	70	65	71	70	65	71	70	65
5-Apr-21	Min			72	64	70	70	61	70	70	63
Monday	Max			73	71	78	78	73	78	76	73
	Average / Overall	73	70	73	67	73	73	67	73	72	67
6-Apr-21	Min			70	63	70	69	61	71	69	62
Tuesday	Max			72	71	75	75	73	74	73	72
	Average / Overall	72	69	71	66	72	71	66	72	71	66
7-Apr-21	Min			70		68	69		69	69	
Wednesday	Max			72		75	76		74	74	
	Average / Overall	72		71		71	71		71	71	

Table 12 Baseline Noise Monitoring Results at N5c

Monitoring period		$L_{Aeq(12hours)}$, dB		$L_{Aeq(1hour)}$, dB		$L_{Aeq(5mins)}$, dB			$L_{Aeq(15mins)}$, dB		
		7:00 am – 7:00 pm	7:00 pm – 7:00 am	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 11:00 pm	11:00 pm – 7:00 am
1-Apr-21	Min			68	61		68	69		68	61
Thursday	Max			69	68		70	70		70	68
	Average / Overall		66	69	64		69	70		68	64
2-Apr-21	Min			69	62	66	68	61	67	68	61
Friday	Max			70	68	71	72	69	69	71	68
	Average / Overall	68	67	69	65	68	69	65	68	69	64
3-Apr-21	Min			69	63	68	68	62	68	68	63
Saturday	Max			69	70	74	70	72	74	70	70
	Average / Overall	70	68	69	66	70	69	66	70	69	66
4-Apr-21	Min			69	60	67	68	58	68	67	60
Sunday	Max			69	68	73	70	71	72	69	70
	Average / Overall	70	66	69	64	70	69	66	70	69	63
5-Apr-21	Min			70	61	69	65	59	69	68	61
Monday	Max			72	69	79	77	71	78	75	71
	Average / Overall	72	68	71	65	71	71	65	71	70	64
6-Apr-21	Min			68		69	67		69	67	
Tuesday	Max			71		74	75		73	73	
	Average / Overall	71		70		71	70		71	69	

Table 13 Baseline Noise Monitoring Results at N6

Monitoring period		$L_{Aeq(12hours)}$, dB		$L_{Aeq(1hour)}$, dB		$L_{Aeq(5mins)}$, dB			$L_{Aeq(15mins)}$, dB		
		7:00 am – 7:00 pm	7:00 pm – 7:00 am	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 11:00 pm	11:00 pm – 7:00 am
19-Apr-21	Min			74	66		73	64		72	65
Monday	Max			75	74		77	76		75	76
	Average / Overall		72	74	69		74	69		74	69
20-Apr-21	Min			73	67	72	72	65	73	72	66
Tuesday	Max			75	75	79	76	77	76	75	77
	Average / Overall	75	72	74	70	74	74	70	74	73	69
21-Apr-21	Min			73	66	72	72	63	73	72	65
Wednesday	Max			75	74	78	76	77	77	75	75
	Average / Overall	75	71	74	69	75	74	69	75	73	69
22-Apr-21	Min			74	67	71	73	64	72	72	65
Thursday	Max			74	75	76	76	77	76	75	77
	Average / Overall	75	72	74	70	75	74	70	75	74	69
23-Apr-21	Min			74	68	74	73	65	74	73	67
Friday	Max			74	74	81	76	75	78	75	73
	Average / Overall	75	72	74	70	75	74	70	75	74	70
24-Apr-21	Min			74	68	74	74	67	74	73	67
Saturday	Max			75	74	79	76	75	78	75	74
	Average / Overall	76	72	74	70	76	74	70	76	74	70
25-Apr-21	Min			73	65	72	73	63	73	72	64
Sunday	Max			74	74	77	75	76	75	75	76
	Average / Overall	73	72	74	69	73	74	69	73	74	69

Table 14 Baseline Noise Monitoring Results at N7

Monitoring period		$L_{Aeq(12hours)}$, dB		$L_{Aeq(1hour)}$, dB		$L_{Aeq(5mins)}$, dB			$L_{Aeq(15mins)}$, dB		
		7:00 am – 7:00 pm	7:00 pm – 7:00 am	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 11:00 pm	11:00 pm – 7:00 am
27-Apr-21	Min			58	46		48	44		49	45
Tuesday	Max			62	51		72	55		68	53
	Average / Overall		55	60	48		52	48		53	47
28-Apr-21	Min			50	46	49	49	44	50	49	45
Wednesday	Max			59	51	79	69	55	75	65	54
	Average / Overall	62	52	53	48	54	51	48	55	51	48
29-Apr-21	Min			50	47	49	49	46	50	50	47
Thursday	Max			51	51	59	52	55	56	52	54
	Average / Overall	53	50	51	49	52	51	49	52	51	49
30-Apr-21	Min			51	47	50	50	45	50	50	46
Friday	Max			52	51	71	54	55	68	52	53
	Average / Overall	58	50	51	49	54	51	49	54	51	49
1-May-21	Min			51	46	48	50	45	48	51	46
Saturday	Max			52	53	76	53	59	72	53	56
	Average / Overall	57	50	52	49	51	51	49	52	52	48
2-May-21	Min			50	47	48	45	45	49	48	46
Sunday	Max			51	52	60	76	55	56	53	54
	Average / Overall	52	50	51	49	52	52	49	52	51	49
3-May-21	Min			50	48	50	50	46	51	50	47
Monday	Max			54	52	76	61	57	71	58	55
	Average / Overall	59	50	52	49	55	51	49	56	51	49
4-May-21	Min			52	47	49	51	46	50	51	46
Tuesday	Max			53	52	76	58	56	75	55	55
	Average / Overall	61	50	53	49	55	52	49	55	52	49

Table 15 Baseline Noise Monitoring Results at N8

Monitoring period		$L_{Aeq(12hours)}$, dB		$L_{Aeq(1hour)}$, dB		$L_{Aeq(5mins)}$, dB			$L_{Aeq(15mins)}$, dB		
		7:00 am – 7:00 pm	7:00 pm – 7:00 am	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 11:00 pm	11:00 pm – 7:00 am
3-Mar-21	Min			57	49	53	53	47	54	53	48
Wednesday	Max			68	56	79	79	58	74	74	57
	Average / Overall	63	59	62	52	57	57	52	58	57	51
4-Mar-21	Min			54	47	54	54	46	54	53	47
Thursday	Max			56	55	60	56	58	59	56	57
	Average / Overall	56	53	55	51	56	55	51	56	55	51
5-Mar-21	Min			54	49	53	53	47	54	53	48
Friday	Max			56	53	79	57	55	74	56	54
	Average / Overall	62	53	55	51	56	55	51	57	55	51
6-Mar-21	Min			54	49	54	53	47	54	53	48
Saturday	Max			55	54	68	57	58	65	57	57
	Average / Overall	57	53	55	51	56	55	51	56	54	51
7-Mar-21	Min			58	51	53	57	51	53	58	51
Sunday	Max			60	58	76	60	60	75	60	60
	Average / Overall	64	57	59	55	59	59	55	59	59	54
8-Mar-21	Min			59	52	54	58	50	55	58	51
Monday	Max			70	59	78	79	60	73	75	59
	Average / Overall	62	61	64	54	58	62	54	58	62	54
9-Mar-21	Min			59	50	54	57	48	55	55	49
Tuesday	Max			72	56	83	82	58	78	77	58
	Average / Overall	64	63	66	53	58	62	53	59	61	52

Summary of Baseline Airborne Noise Monitoring Results for Construction Noise Impact Assessment

The baseline airborne noise monitoring results from N1a – N8 are summarized in this section. These data with background noise correction factor applied will be used to develop the noise criteria for this Project.

Table 16 Summary of Baseline Airborne Noise Monitoring Results for Monday –Saturday at N1a

Monitoring period		$L_{Aeq(12hours)}$, dB		$L_{Aeq(1hour)}$, dB		$L_{Aeq(5mins)}$, dB			$L_{Aeq(15mins)}$, dB		
		7:00 am – 7:00 pm	7:00 pm – 7:00 am	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 11:00 pm	11:00 pm – 7:00 am
Monday – Saturday (10 Apr 2021 and 12 Apr 2021 – 17 Apr 2021)	Min			55	48	54	54	46	54	54	47
	Max			61	57	75	68	59	73	64	58
	Average / Overall	60	55	57	53	58	57	52	58	57	52

Table 17 Summary of Baseline Airborne Noise Monitoring Results for Sunday and Public Holidays at N1a

Monitoring period		$L_{Aeq(12hours)}$, dB		$L_{Aeq(1hour)}$, dB		$L_{Aeq(5mins)}$, dB			$L_{Aeq(15mins)}$, dB		
		7:00 am – 7:00 pm	7:00 pm – 7:00 am	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 11:00 pm	11:00 pm – 7:00 am
Sunday (11 Apr 2021)	Min			57	50	56	56	48	56	56	49
	Max			61	56	74	69	58	70	64	57
	Average / Overall	61	55	58	53	59	57	53	60	57	52

Table 18 Summary of Baseline Airborne Noise Monitoring Results for Monday –Saturday at N1b

Monitoring period		$L_{Aeq(12hours)}$, dB		$L_{Aeq(1hour)}$, dB		$L_{Aeq(5mins)}$, dB			$L_{Aeq(15mins)}$, dB		
		7:00 am – 7:00 pm	7:00 pm – 7:00 am	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 11:00 pm	11:00 pm – 7:00 am
Monday – Saturday (10 Apr 2021 and 12 Apr 2021 – 17 Apr 2021)	Min			66	58	64	65	52	65	65	57
	Max			68	68	75	69	70	73	69	69
	Average / Overall	68	65	67	63	68	67	63	68	67	63

Table 19 Summary of Baseline Airborne Noise Monitoring Results for Sunday and Public Holidays at N1b

Monitoring period		$L_{Aeq(12hours)}$, dB		$L_{Aeq(1hour)}$, dB		$L_{Aeq(5mins)}$, dB			$L_{Aeq(15mins)}$, dB		
		7:00 am – 7:00 pm	7:00 pm – 7:00 am	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 11:00 pm	11:00 pm – 7:00 am
Sunday (11 Apr 2021)	Min			66	58	65	65	56	66	66	57
	Max			67	68	69	68	70	68	67	69
	Average / Overall	67	65	66	62	67	66	62	67	66	62

Table 20 Summary of Baseline Airborne Noise Monitoring Results for Monday –Saturday at N2

Monitoring period		$L_{Aeq(12hours)}$, dB		$L_{Aeq(1hour)}$, dB		$L_{Aeq(5mins)}$, dB			$L_{Aeq(15mins)}$, dB		
		7:00 am – 7:00 pm	7:00 pm – 7:00 am	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 11:00 pm	11:00 pm – 7:00 am
Monday – Saturday (2 Mar 2021 – 6 Mar 2021 and 8 Mar 2021)	Min			53	51	50	51	50	50	52	50
	Max			63	57	70	71	58	68	67	57
	Average / Overall	56	55	57	54	54	56	54	55	56	53

Table 21 Summary of Baseline Airborne Noise Monitoring Results for Sunday and Public Holidays at N2

Monitoring period		$L_{Aeq(12hours)}$, dB		$L_{Aeq(1hour)}$, dB		$L_{Aeq(5mins)}$, dB			$L_{Aeq(15mins)}$, dB		
		7:00 am – 7:00 pm	7:00 pm – 7:00 am	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 11:00 pm	11:00 pm – 7:00 am
Sunday (7 Mar 2021)	Min			57	53	50	52	51	52	53	52
	Max			62	61	72	62	61	72	62	61
	Average / Overall	61	59	60	57	57	60	57	57	60	56

Table 22 Summary of Baseline Airborne Noise Monitoring Results for Monday –Saturday at N3

Monitoring period		$L_{Aeq(12hours)}$, dB		$L_{Aeq(1hour)}$, dB		$L_{Aeq(5mins)}$, dB			$L_{Aeq(15mins)}$, dB		
		7:00 am – 7:00 pm	7:00 pm – 7:00 am	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 11:00 pm	11:00 pm – 7:00 am
Monday – Saturday (20 Apr 2021 – 24 Apr 2021)	Min			69	61	68	68	60	68	68	60
	Max			70	70	73	72	72	72	71	71
	Average / Overall	71	67	70	65	71	70	65	71	69	65

Table 23 Summary of Baseline Airborne Noise Monitoring Results for Sunday and Public Holidays at N3

Monitoring period		$L_{Aeq(12hours)}$, dB		$L_{Aeq(1hour)}$, dB		$L_{Aeq(5mins)}$, dB			$L_{Aeq(15mins)}$, dB		
		7:00 am – 7:00 pm	7:00 pm – 7:00 am	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 11:00 pm	11:00 pm – 7:00 am
Sunday (25 Apr 2021)	Min			69	60	67	69	59	67	68	60
	Max			70	69	70	71	71	70	70	70
	Average / Overall	69	67	70	64	69	70	64	69	69	64

Table 24 Summary of Baseline Airborne Noise Monitoring Results for Monday –Saturday at N4a

Monitoring period		$L_{Aeq(12hours)}$, dB		$L_{Aeq(1hour)}$, dB		$L_{Aeq(5mins)}$, dB			$L_{Aeq(15mins)}$, dB		
		7:00 am – 7:00 pm	7:00 pm – 7:00 am	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 11:00 pm	11:00 pm – 7:00 am
Monday – Saturday (16 Apr 2021 – 17 Apr 2021 and 19 Apr 2021 – 23 Apr 2021)	Min			68	60	66	67	59	67	66	60
	Max			71	71	84	75	73	82	73	73
	Average / Overall	71	67	69	65	70	69	65	70	69	64

Table 25 Summary of Baseline Airborne Noise Monitoring Results for Sunday and Public Holidays at N4a

Monitoring period		$L_{Aeq(12hours)}$, dB		$L_{Aeq(1hour)}$, dB		$L_{Aeq(5mins)}$, dB			$L_{Aeq(15mins)}$, dB		
		7:00 am – 7:00 pm	7:00 pm – 7:00 am	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 11:00 pm	11:00 pm – 7:00 am
Sunday (18 Apr 2021)	Min			71	62	68	70	60	68	69	62
	Max			71	70	75	72	72	73	71	72
	Average / Overall	70	68	71	66	69	71	66	69	71	65

Table 26 Summary of Baseline Airborne Noise Monitoring Results for Monday –Saturday at N4b

Monitoring period		$L_{Aeq(12hours)}$, dB		$L_{Aeq(1hour)}$, dB		$L_{Aeq(5mins)}$, dB			$L_{Aeq(15mins)}$, dB		
		7:00 am – 7:00 pm	7:00 pm – 7:00 am	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 11:00 pm	11:00 pm – 7:00 am
Monday – Saturday (16 Apr 2021 – 17 Apr 2021 and 19 Apr 2021 – 23 Apr 2021)	Min			72	65	71	71	63	72	71	64
	Max			75	75	83	76	77	81	76	77
	Average / Overall	75	71	74	69	74	73	69	74	73	69

Table 27 Summary of Baseline Airborne Noise Monitoring Results for Sunday and Public Holidays at N4b

Monitoring period		$L_{Aeq(12hours)}$, dB		$L_{Aeq(1hour)}$, dB		$L_{Aeq(5mins)}$, dB			$L_{Aeq(15mins)}$, dB		
		7:00 am – 7:00 pm	7:00 pm – 7:00 am	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 11:00 pm	11:00 pm – 7:00 am
Sunday (18 Apr 2021)	Min			75	66	72	74	64	72	74	65
	Max			75	74	77	76	76	76	76	76
	Average / Overall	74	72	75	70	74	75	70	74	75	69

Table 28 Summary of Baseline Airborne Noise Monitoring Results for Monday –Saturday at N4c

Monitoring period		$L_{Aeq(12hours)}$, dB		$L_{Aeq(1hour)}$, dB		$L_{Aeq(5mins)}$, dB			$L_{Aeq(15mins)}$, dB		
		7:00 am – 7:00 pm	7:00 pm – 7:00 am	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 11:00 pm	11:00 pm – 7:00 am
Monday – Saturday (16 Apr 2021 – 17 Apr 2021 and 19 Apr 2021 – 23 Apr 2021)	Min			66	58	65	65	56	66	64	57
	Max			69	68	83	75	71	81	72	70
	Average / Overall	69	65	67	63	68	67	63	68	67	62

Table 29 Summary of Baseline Airborne Noise Monitoring Results for Sunday and Public Holidays at N4c

Monitoring period		$L_{Aeq(12hours)}$, dB		$L_{Aeq(1hour)}$, dB		$L_{Aeq(5mins)}$, dB			$L_{Aeq(15mins)}$, dB		
		7:00 am – 7:00 pm	7:00 pm – 7:00 am	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 11:00 pm	11:00 pm – 7:00 am
Sunday (18 Apr 2021)	Min			69	59	66	68	58	66	67	59
	Max			69	68	75	70	70	73	69	69
	Average / Overall	68	66	69	63	68	69	63	68	69	63

Table 30 Summary of Baseline Airborne Noise Monitoring Results for Monday –Saturday at N5a

Monitoring period		$L_{Aeq(12hours)}$, dB		$L_{Aeq(1hour)}$, dB		$L_{Aeq(5mins)}$, dB			$L_{Aeq(15mins)}$, dB		
		7:00 am – 7:00 pm	7:00 pm – 7:00 am	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 11:00 pm	11:00 pm – 7:00 am
Monday – Saturday (1 Apr 2021 – 3 Apr 2021 and 5 Apr 2021 – 8 Apr 2021)	Min			65	58	62	55	55	63	64	57
	Max			70	70	75	75	72	73	71	72
	Average / Overall	67	65	67	62	67	67	62	67	67	62

Table 31 Summary of Baseline Airborne Noise Monitoring Results for Sunday and Public Holidays at N5a

Monitoring period		$L_{Aeq(12hours)}$, dB		$L_{Aeq(1hour)}$, dB		$L_{Aeq(5mins)}$, dB			$L_{Aeq(15mins)}$, dB		
		7:00 am – 7:00 pm	7:00 pm – 7:00 am	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 11:00 pm	11:00 pm – 7:00 am
Sunday (4 Apr 2021)	Min			66	57	64	65	55	65	64	56
	Max			67	66	74	68	68	72	67	68
	Average / Overall	68	64	66	61	67	66	61	68	66	61

Table 32 Summary of Baseline Airborne Noise Monitoring Results for Monday –Saturday at N5b

Monitoring period		$L_{Aeq(12hours)}$, dB		$L_{Aeq(1hour)}$, dB		$L_{Aeq(5mins)}$, dB			$L_{Aeq(15mins)}$, dB		
		7:00 am – 7:00 pm	7:00 pm – 7:00 am	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 11:00 pm	11:00 pm – 7:00 am
Monday – Saturday (1 Apr 2021 – 3 Apr 2021 and 5 Apr 2021 – 8 Apr 2021)	Min			69	63	67	69	61	68	69	62
	Max			73	71	78	78	73	78	76	73
	Average / Overall	72	69	71	67	71	71	67	71	71	66

Table 33 Summary of Baseline Airborne Noise Monitoring Results for Sunday and Public Holidays at N5b

Monitoring period		$L_{Aeq(12hours)}$, dB		$L_{Aeq(1hour)}$, dB		$L_{Aeq(5mins)}$, dB			$L_{Aeq(15mins)}$, dB		
		7:00 am – 7:00 pm	7:00 pm – 7:00 am	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 11:00 pm	11:00 pm – 7:00 am
Sunday (4 Apr 2021)	Min			70	62	68	70	60	69	69	61
	Max			71	70	74	71	72	73	71	71
	Average / Overall	71	68	70	65	71	70	65	71	70	65

Table 34 Summary of Baseline Airborne Noise Monitoring Results for Monday –Saturday at N5c

Monitoring period		$L_{Aeq(12hours)}$, dB		$L_{Aeq(1hour)}$, dB		$L_{Aeq(5mins)}$, dB			$L_{Aeq(15mins)}$, dB		
		7:00 am – 7:00 pm	7:00 pm – 7:00 am	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 11:00 pm	11:00 pm – 7:00 am
Monday – Saturday (1 Apr 2021 – 3 Apr 2021 and 5 Apr 2021 – 8 Apr 2021)	Min			68	61	66	65	59	67	67	61
	Max			72	70	79	77	72	78	75	71
	Average / Overall	70	67	70	65	70	69	66	70	69	65

Table 35 Summary of Baseline Airborne Noise Monitoring Results for Sunday and Public Holidays at N5c

Monitoring period		$L_{Aeq(12hours)}$, dB		$L_{Aeq(1hour)}$, dB		$L_{Aeq(5mins)}$, dB			$L_{Aeq(15mins)}$, dB		
		7:00 am – 7:00 pm	7:00 pm – 7:00 am	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 11:00 pm	11:00 pm – 7:00 am
Sunday (4 Apr 2021)	Min			69	60	67	68	58	68	67	60
	Max			69	68	73	70	71	72	69	70
	Average / Overall	70	66	69	64	70	69	66	70	69	63

Table 36 Summary of Baseline Airborne Noise Monitoring Results for Monday –Saturday at N6

Monitoring period		$L_{Aeq(12hours)}$, dB		$L_{Aeq(1hour)}$, dB		$L_{Aeq(5mins)}$, dB			$L_{Aeq(15mins)}$, dB		
		7:00 am – 7:00 pm	7:00 pm – 7:00 am	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 11:00 pm	11:00 pm – 7:00 am
Monday – Saturday (19 Apr 2021 – 24 Apr 2021)	Min			73	66	71	72	63	72	72	65
	Max			75	75	81	77	77	78	75	77
	Average / Overall	75	72	74	70	75	74	70	75	74	69

Table 37 Summary of Baseline Airborne Noise Monitoring Results for Sunday and Public Holidays at N6

Monitoring period		$L_{Aeq(12hours)}$, dB		$L_{Aeq(1hour)}$, dB		$L_{Aeq(5mins)}$, dB			$L_{Aeq(15mins)}$, dB		
		7:00 am – 7:00 pm	7:00 pm – 7:00 am	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 11:00 pm	11:00 pm – 7:00 am
Sunday (25 Apr 2021)	Min			73	65	72	73	63	73	72	64
	Max			74	74	77	75	76	75	75	76
	Average / Overall	73	72	74	69	73	74	69	73	74	69

Table 38 Summary of Baseline Airborne Noise Monitoring Results for Monday –Saturday at N7

Monitoring period		$L_{Aeq(12hours)}$, dB		$L_{Aeq(1hour)}$, dB		$L_{Aeq(5mins)}$, dB			$L_{Aeq(15mins)}$, dB		
		7:00 am – 7:00 pm	7:00 pm – 7:00 am	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 11:00 pm	11:00 pm – 7:00 am
Monday – Saturday (27 Apr 2021 – 1 May 2021 and 3 May 2021 – 4 May 2021)	Min			50	46	48	48	44	48	49	45
	Max			62	53	79	72	59	75	68	56
	Average / Overall	58	51	53	49	54	51	49	54	52	48

Table 39 Summary of Baseline Airborne Noise Monitoring Results for Sunday and Public Holidays at N7

Monitoring period		$L_{Aeq(12hours)}$, dB		$L_{Aeq(1hour)}$, dB		$L_{Aeq(5mins)}$, dB			$L_{Aeq(15mins)}$, dB		
		7:00 am – 7:00 pm	7:00 pm – 7:00 am	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 11:00 pm	11:00 pm – 7:00 am
Sunday (2 May 2021)	Min			50	47	48	45	45	49	48	46
	Max			51	52	60	76	55	56	53	54
	Average / Overall	52	50	51	49	52	52	49	52	51	49

Table 40 Summary of Baseline Airborne Noise Monitoring Results for Monday –Saturday at N8

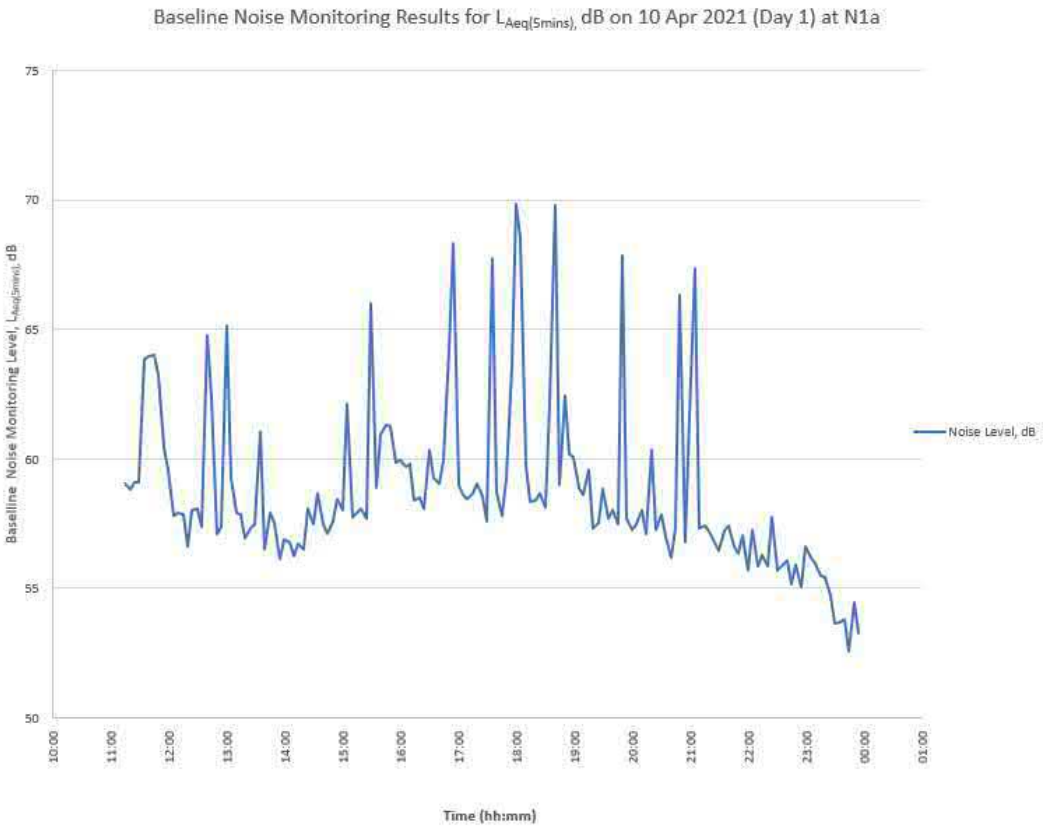
Monitoring period		$L_{Aeq(12hours)}$, dB		$L_{Aeq(1hour)}$, dB		$L_{Aeq(5mins)}$, dB			$L_{Aeq(15mins)}$, dB		
		7:00 am – 7:00 pm	7:00 pm – 7:00 am	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 11:00 pm	11:00 pm – 7:00 am
Monday – Saturday (3 Mar 2021 – 6 Mar 2021 and 8 Mar 2021 – 9 Mar 2021)	Min			54	47	53	53	46	54	53	47
	Max			72	59	83	82	60	78	77	59
	Average / Overall	61	57	59	52	57	58	52	58	57	52

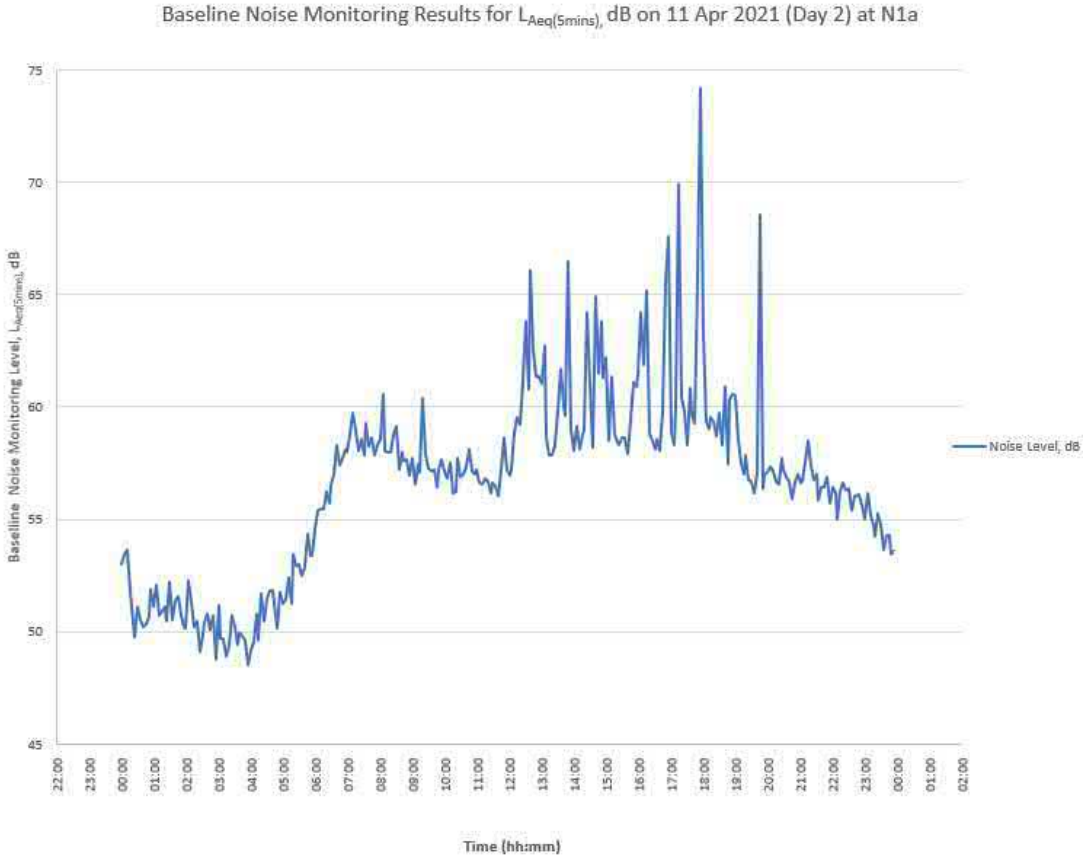
Table 41 Summary of Baseline Airborne Noise Monitoring Results for Sunday and Public Holidays at N8

Monitoring period		$L_{Aeq(12hours)}$, dB		$L_{Aeq(1hour)}$, dB		$L_{Aeq(5mins)}$, dB			$L_{Aeq(15mins)}$, dB		
		7:00 am – 7:00 pm	7:00 pm – 7:00 am	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 10:00 pm	10:00 pm – 7:00 am	7:00 am – 7:00 pm	7:00 pm – 11:00 pm	11:00 pm – 7:00 am
Sunday (7 Mar 2021)	Min			58	51	53	57	51	53	58	51
	Max			60	58	76	60	60	75	60	60
	Average / Overall	64	57	59	55	59	59	55	59	59	54

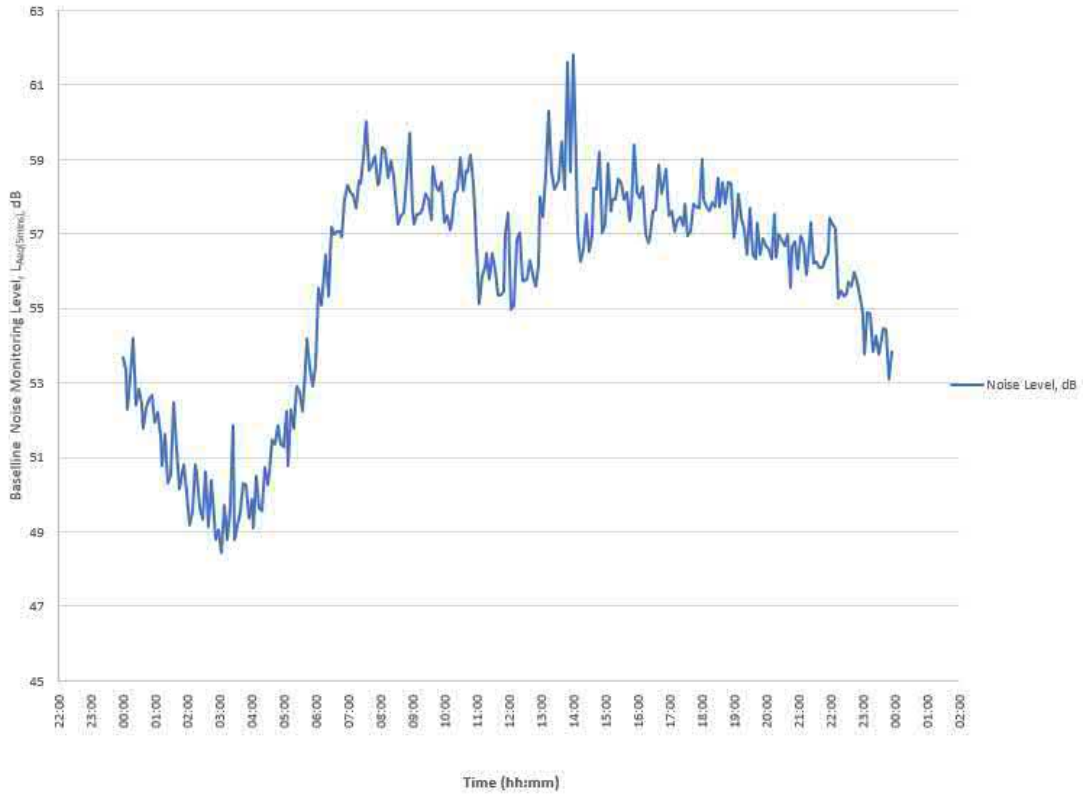
Annex A

Daily Monitoring Data at N1a

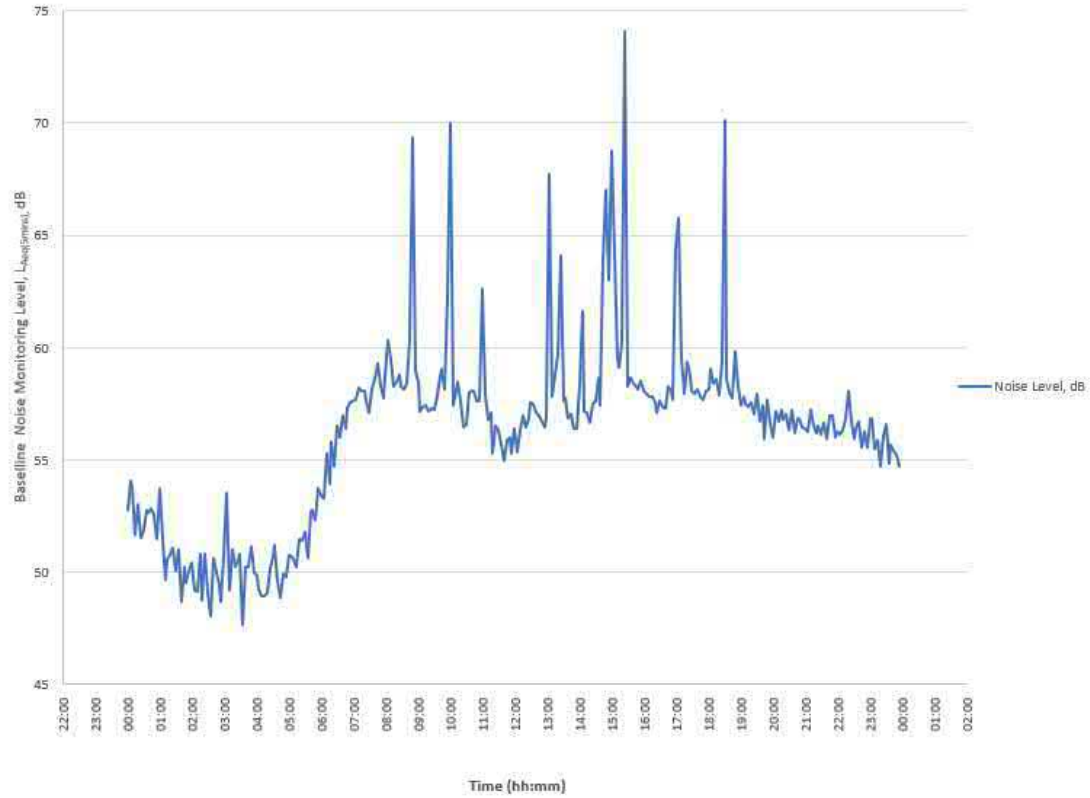


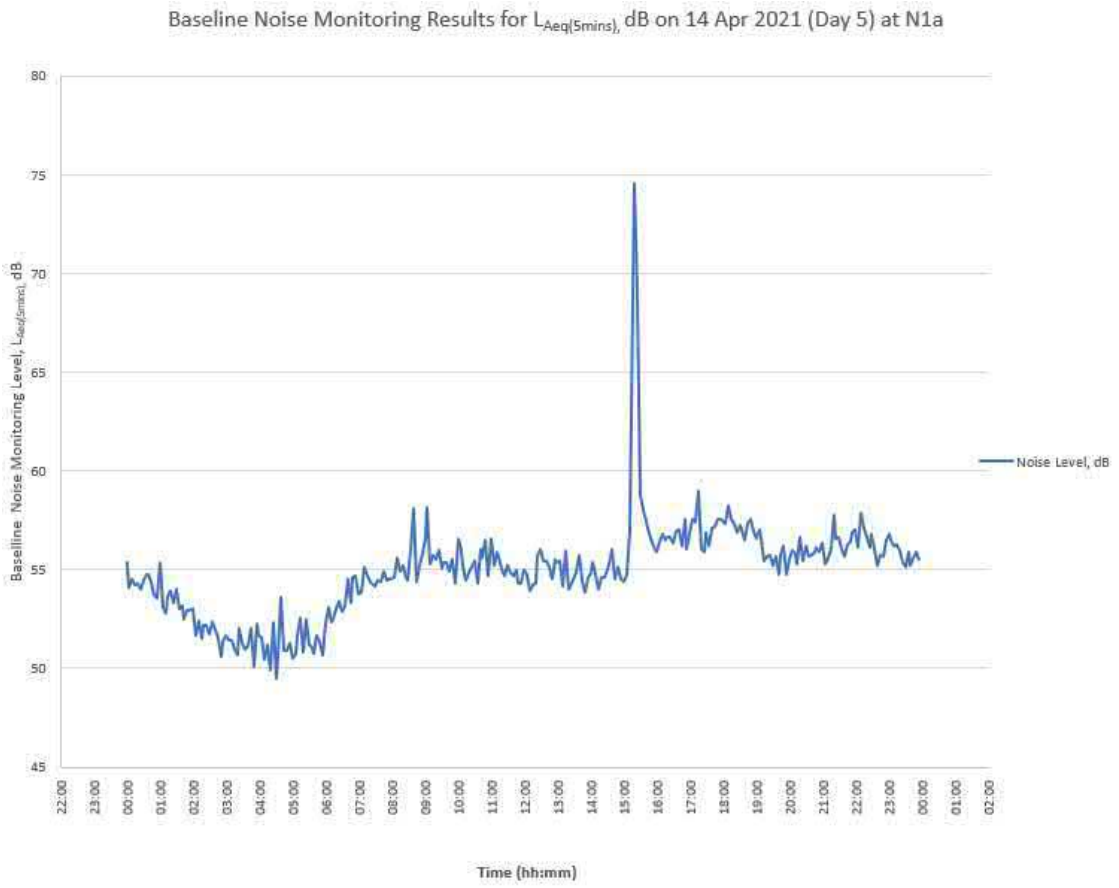


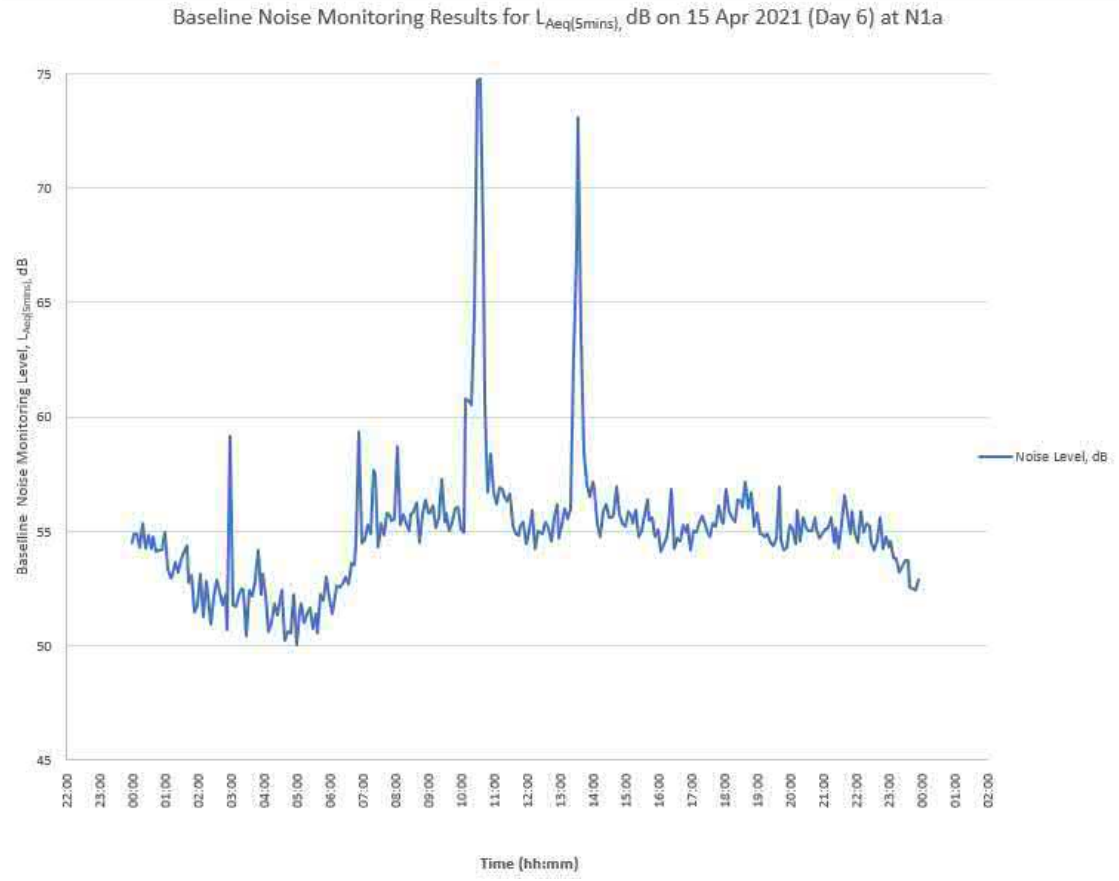
Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 12 Apr 2021 (Day 3) at N1a

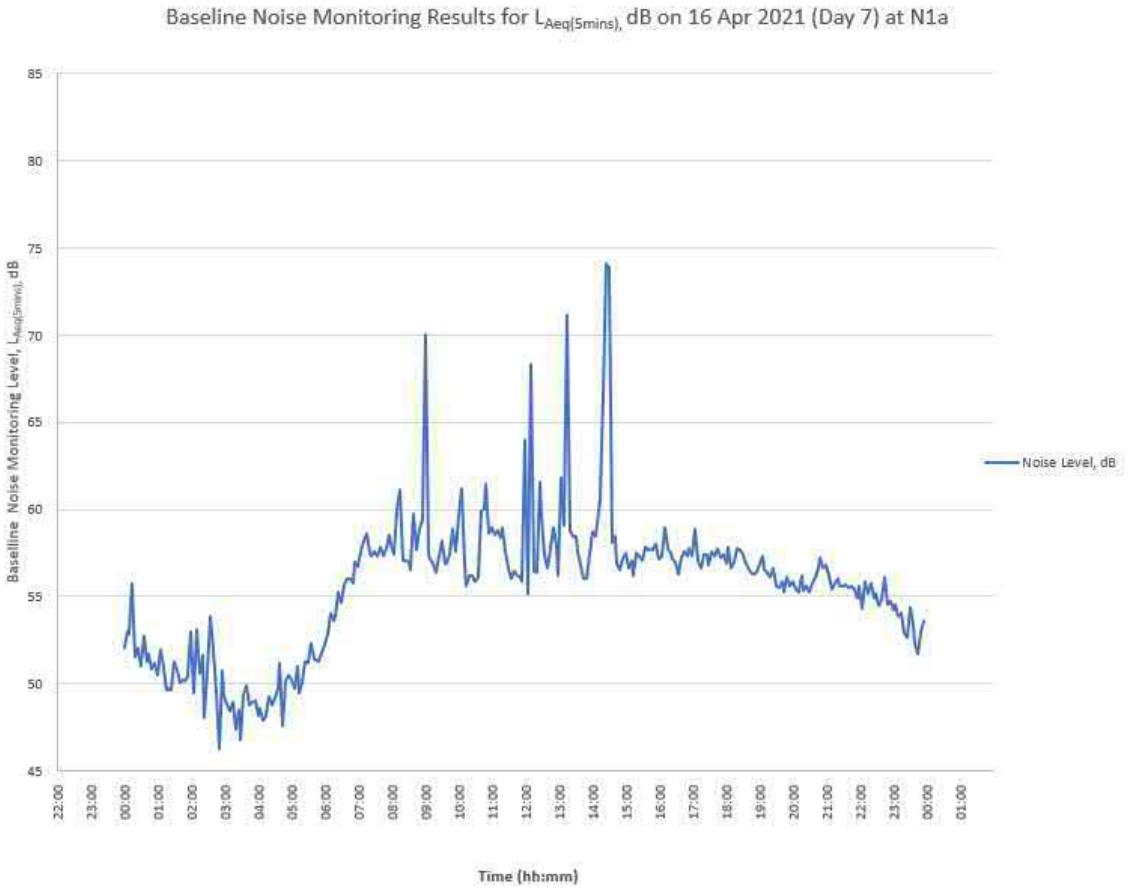


Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 13 Apr 2021 (Day 4) at N1a

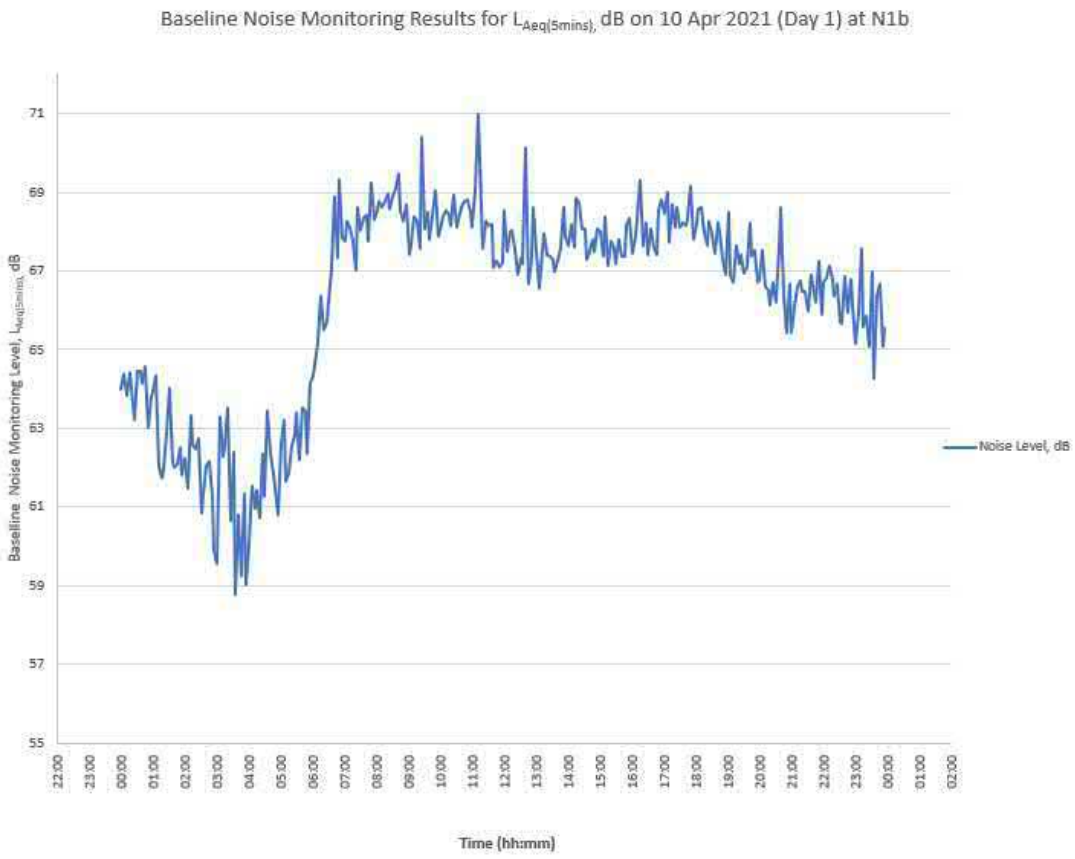


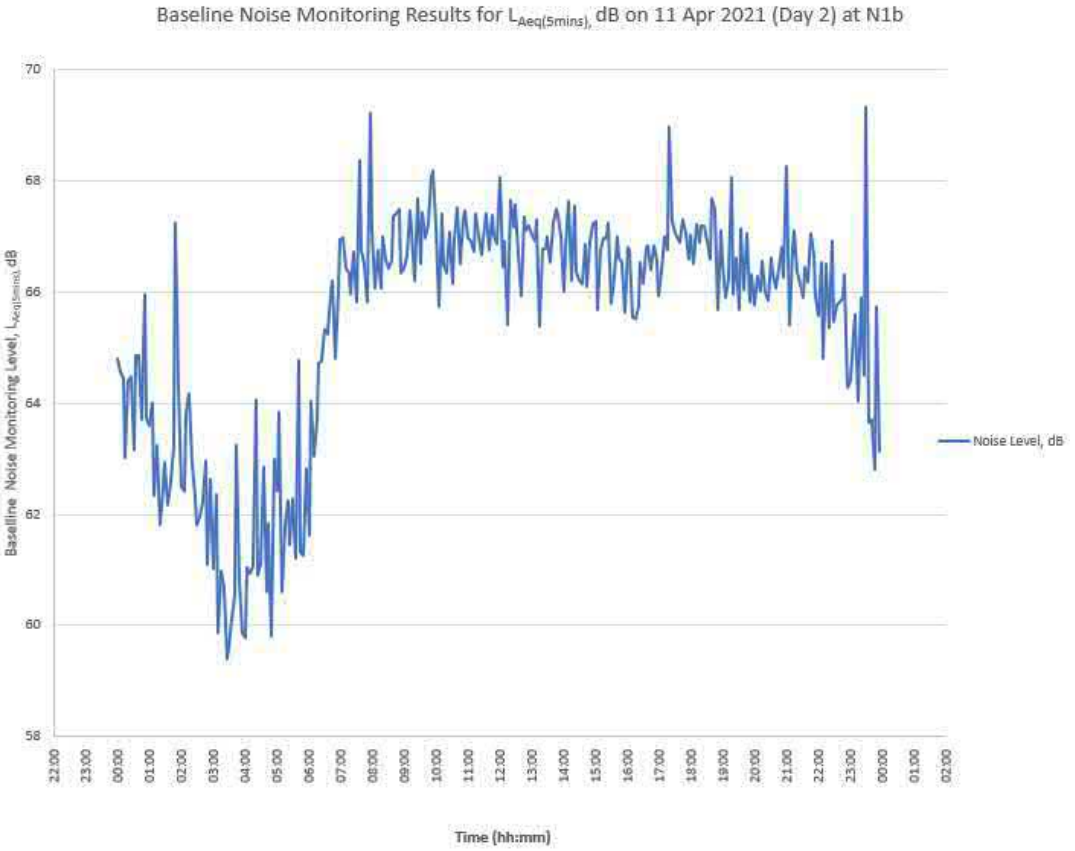

Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 14 Apr 2021 (Day 5) at N1a
Baselline Noise Monitoring Level, $L_{Aeq(5mins)}$, dB
80
75
70
65
60
55
50
45
22:00
23:00
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00
02:00
Time (hh:mm)
Noise Level, dB


Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 15 Apr 2021 (Day 6) at N1a
Baselline Noise Monitoring Level, $L_{Aeq(5mins)}$, dB
75
70
65
60
55
50
45
22:00
23:00
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00
02:00
Time (hh:mm)
Noise Level, dB

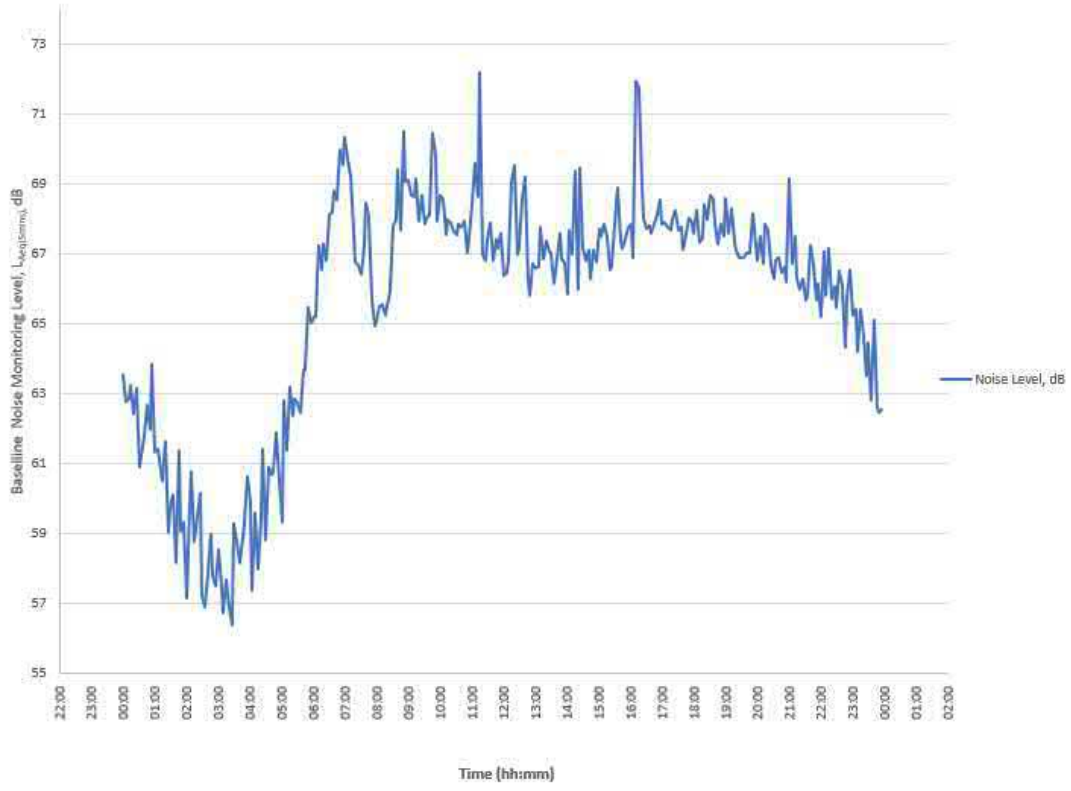

Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 16 Apr 2021 (Day 7) at N1a
Baselline Noise Monitoring Level, $L_{Aeq(5mins)}$, dB
85
80
75
70
65
60
55
50
45
22:00
23:00
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00
Time (hh:mm)
Noise Level, dB

Daily Monitoring Data at N1b

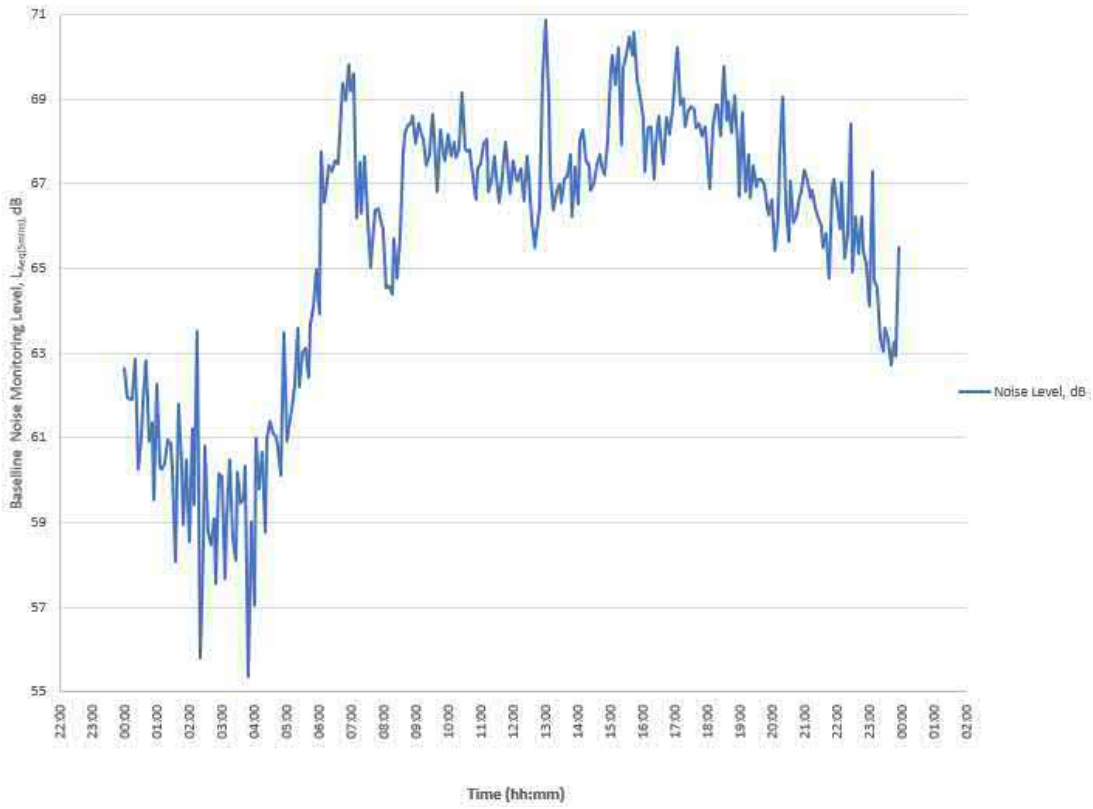




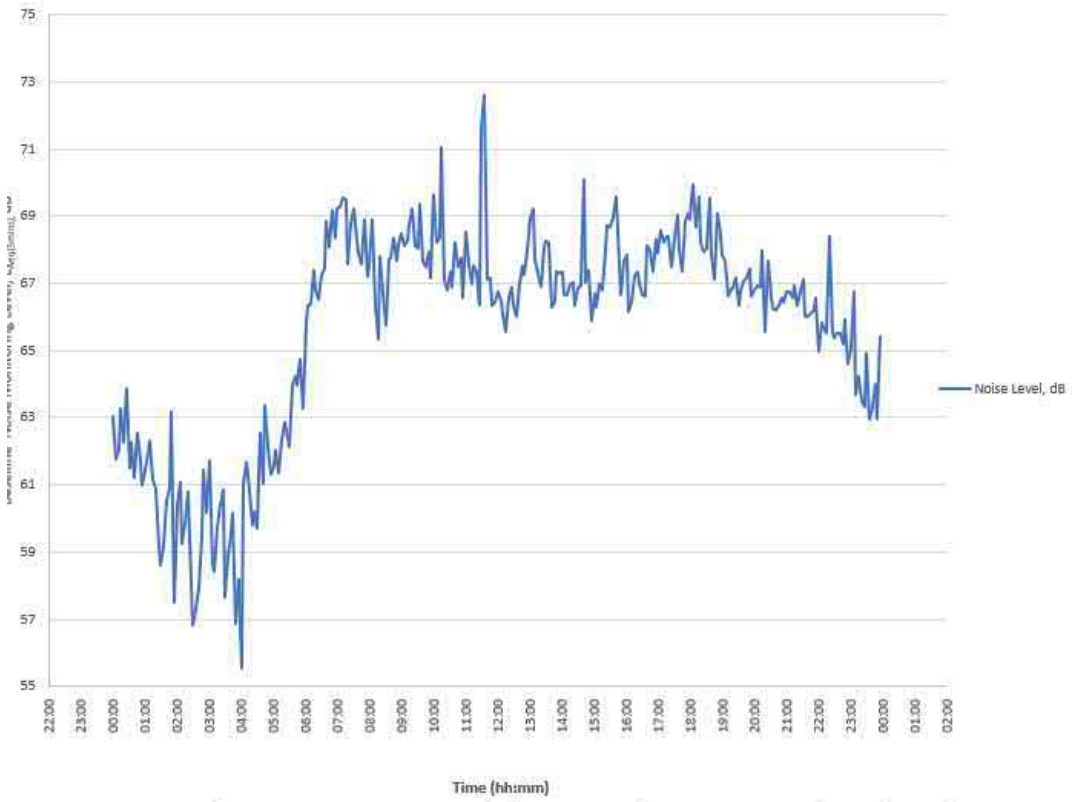
Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 12 Apr 2021 (Day 3) at N1b



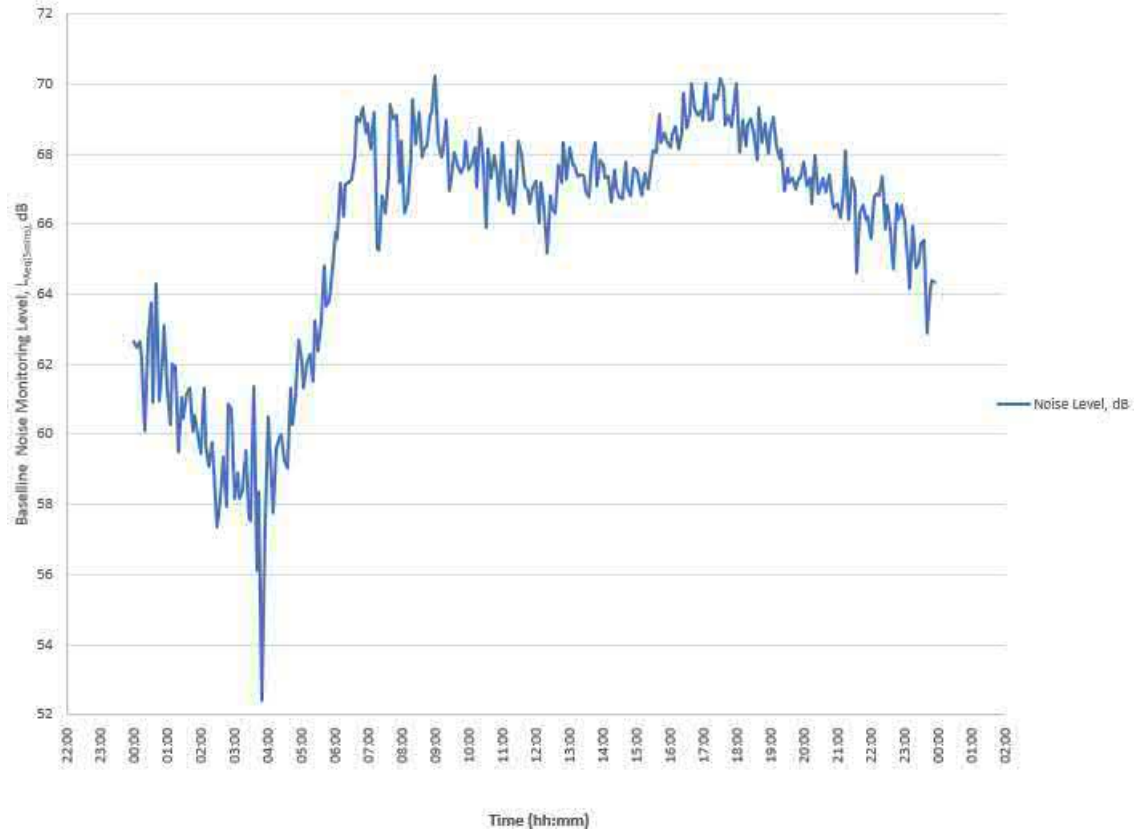
Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 13 Apr 2021 (Day 4) at N1b

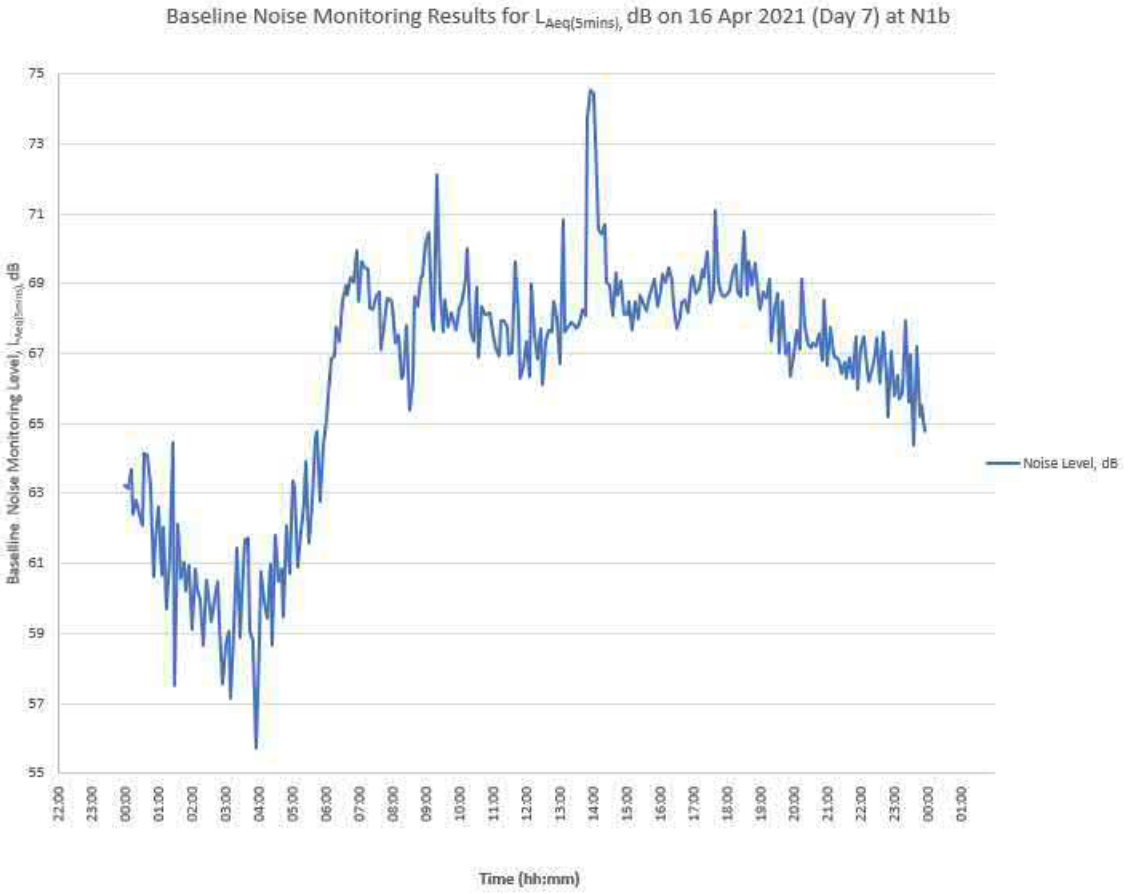


Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 14 Apr 2021 (Day 5) at N1b

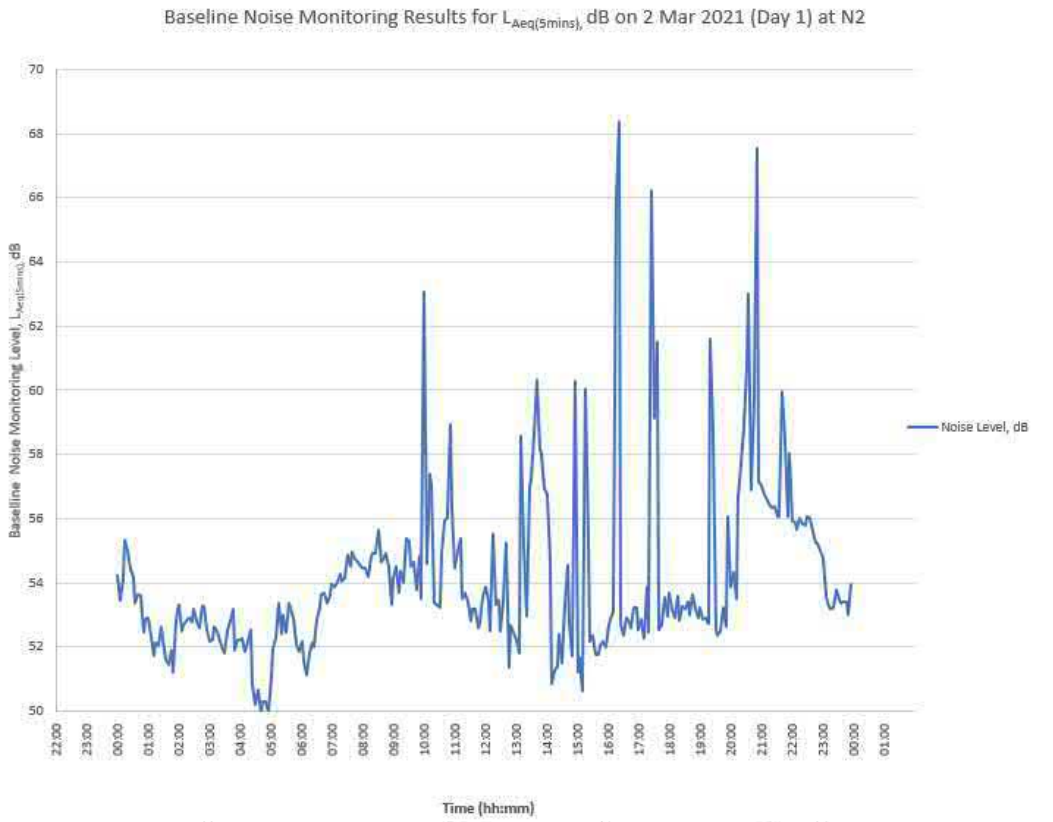


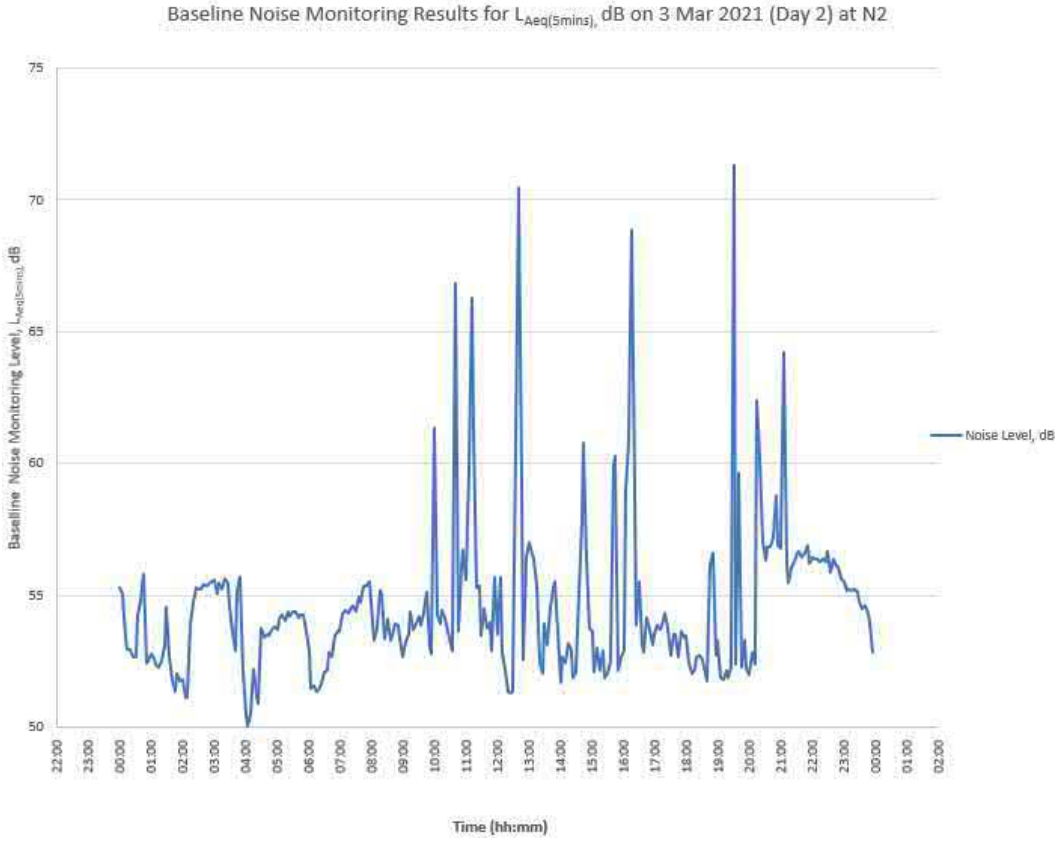
Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 15 Apr 2021 (Day 6) at N1b



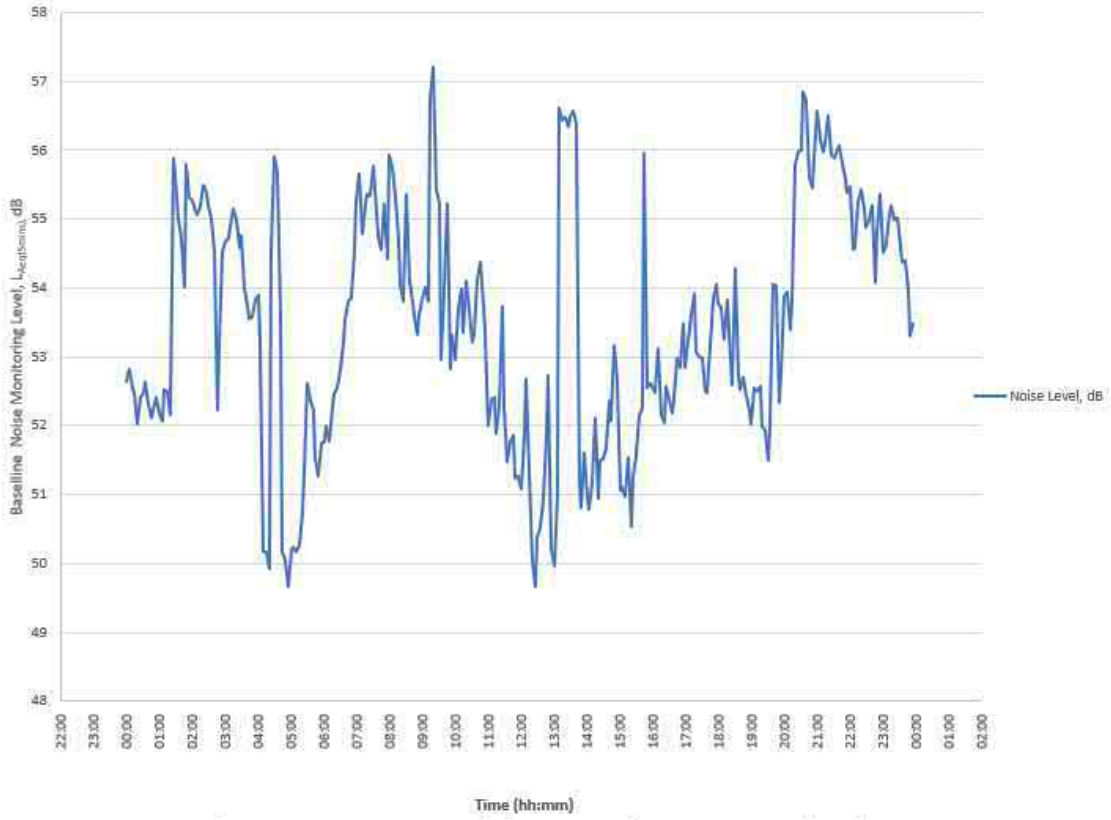

Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 16 Apr 2021 (Day 7) at N1b
Baselline Noise Monitoring Level, $L_{Aeq(5mins)}$, dB
75
73
71
69
67
65
63
61
59
57
55
22:00
23:00
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00
Time (hh:mm)
Noise Level, dB

Daily Monitoring Data at N2

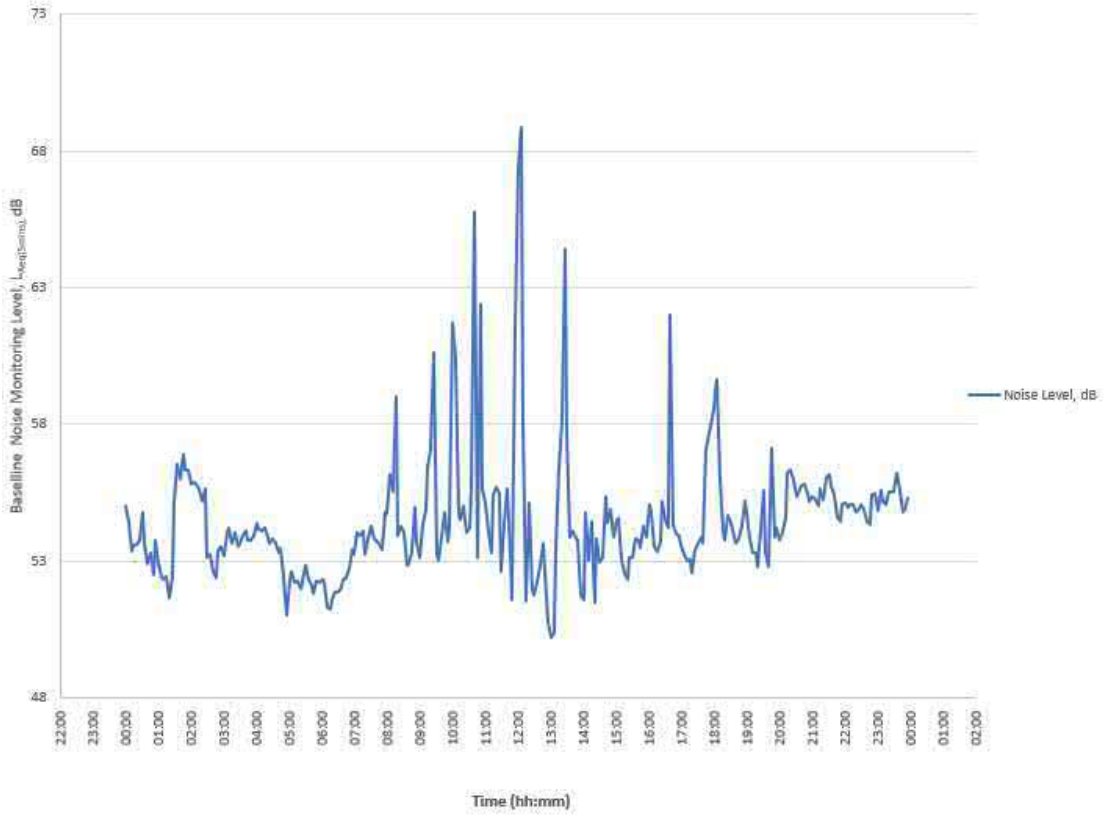




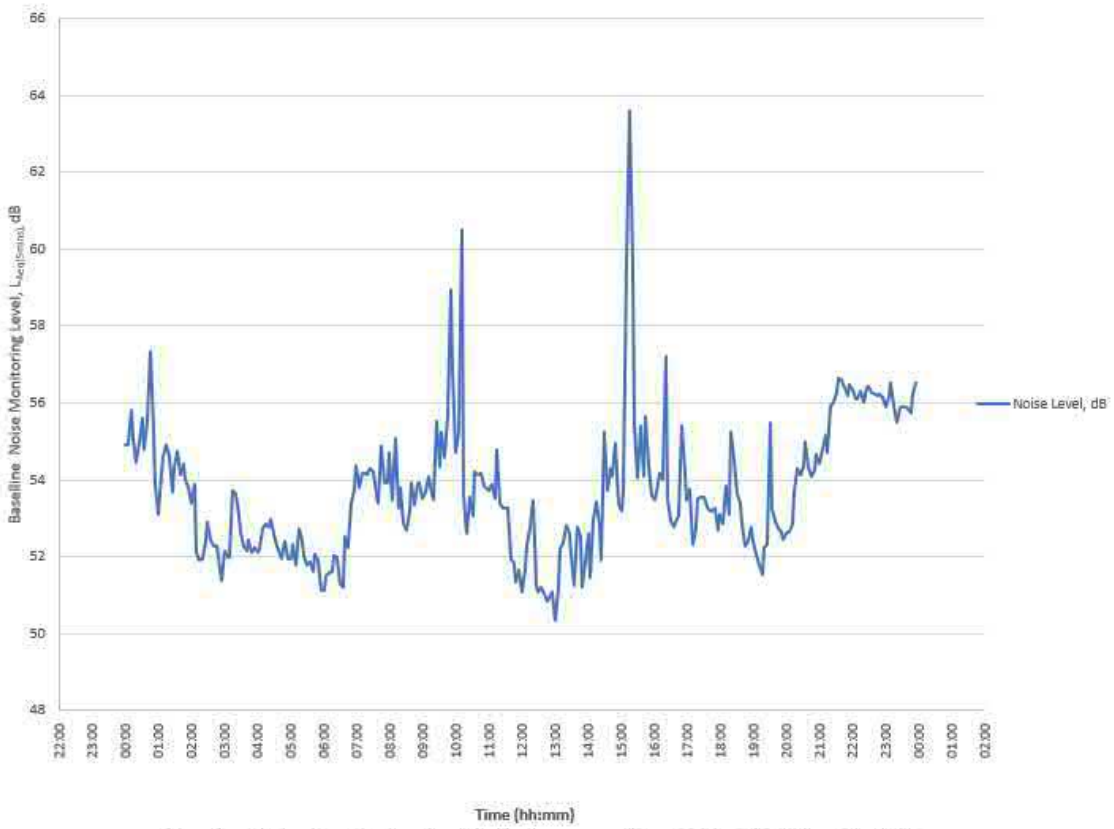
Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 4 Mar 2021 (Day 3) at N2



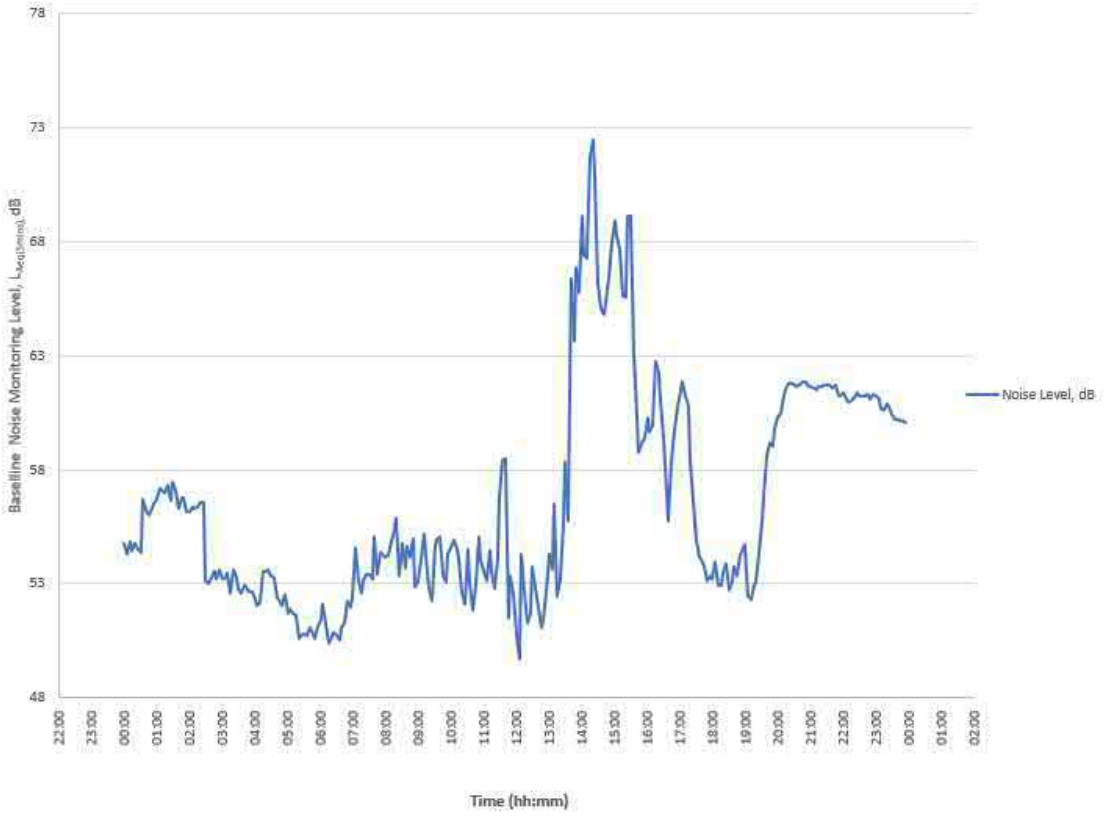
Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 5 Mar 2021 (Day 4) at N2

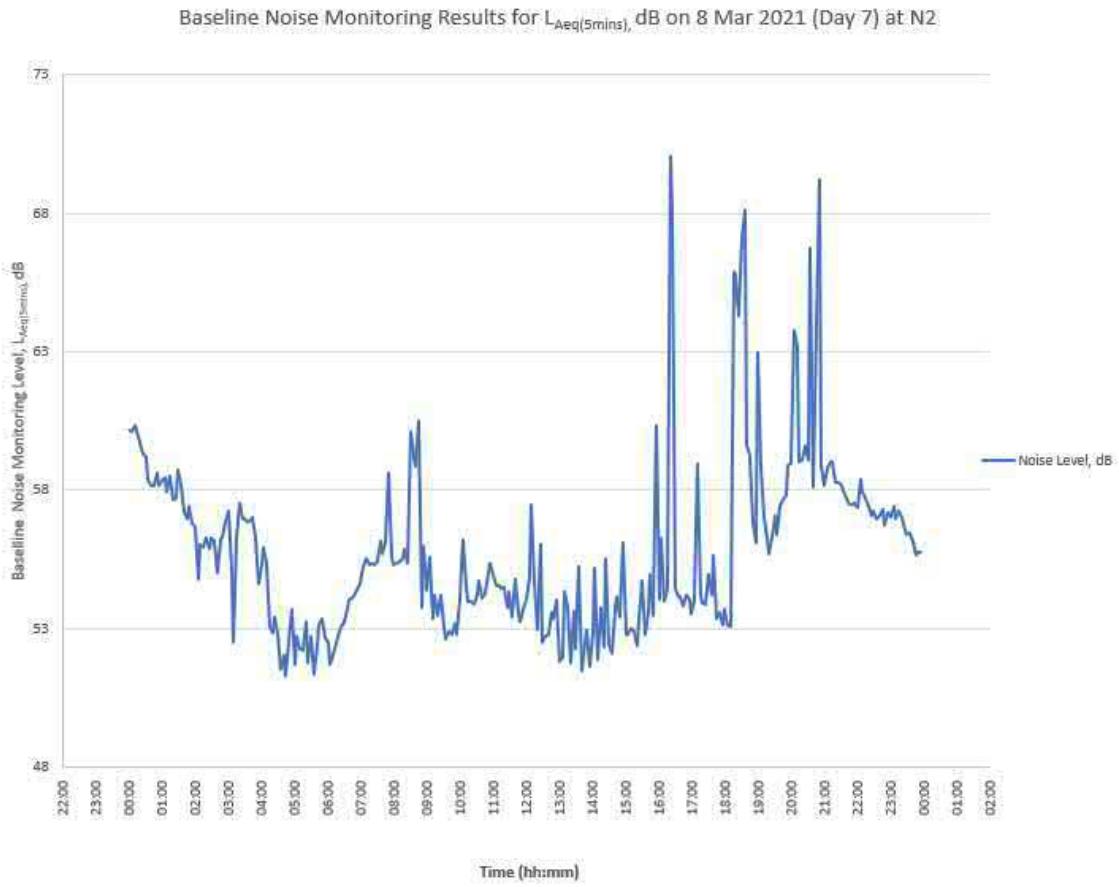


Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 6 Mar 2021 (Day 5) at N2

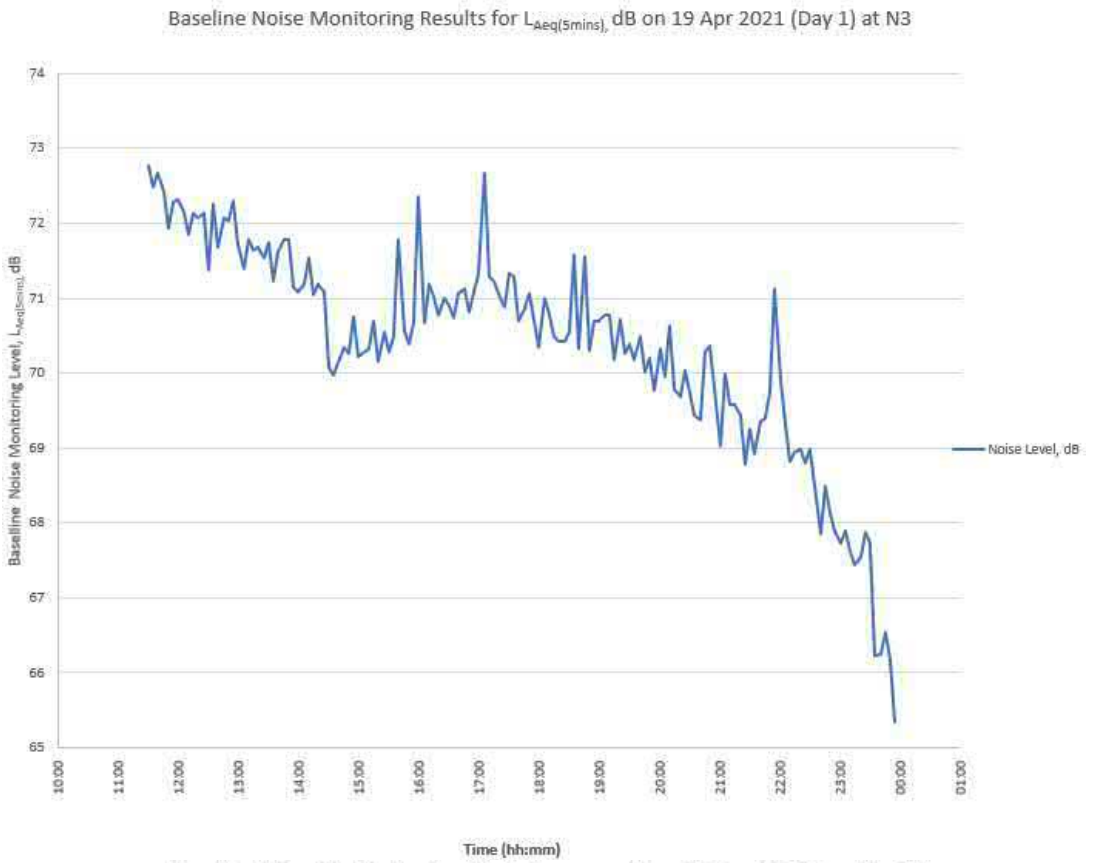


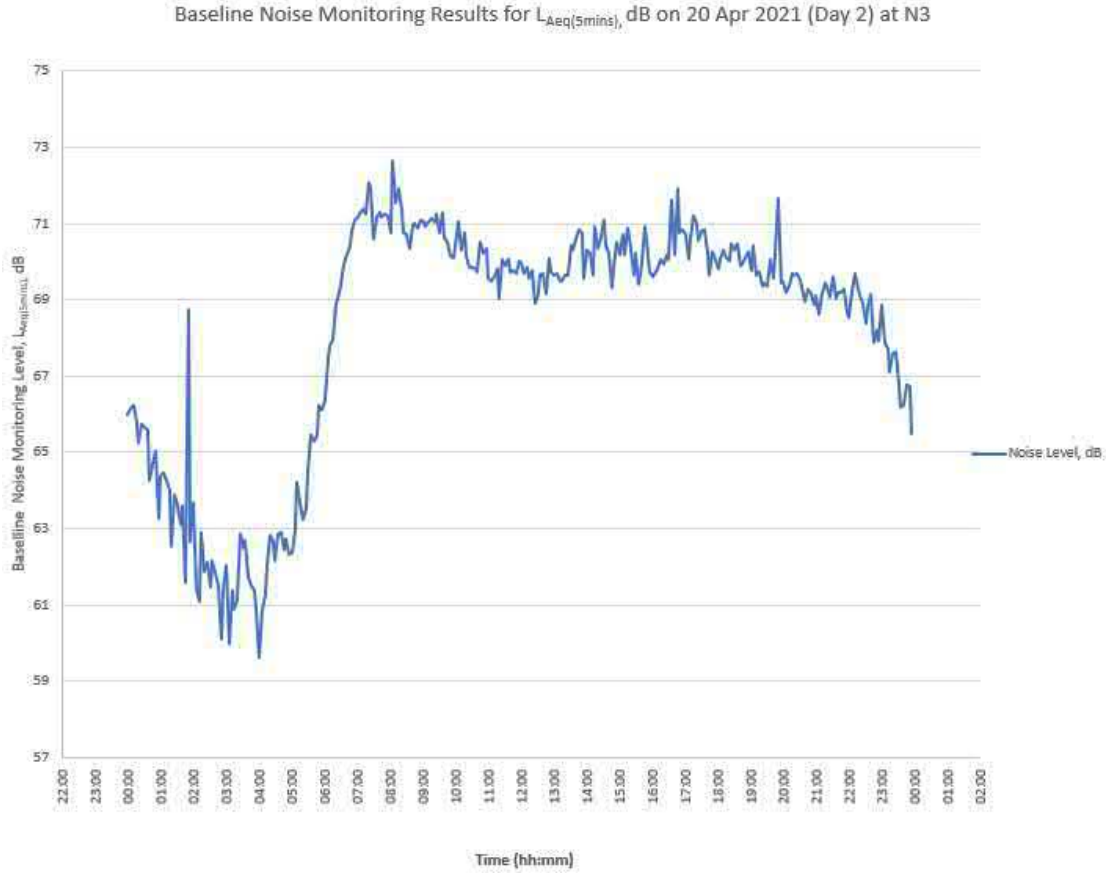
Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 7 Mar 2021 (Day 6) at N2



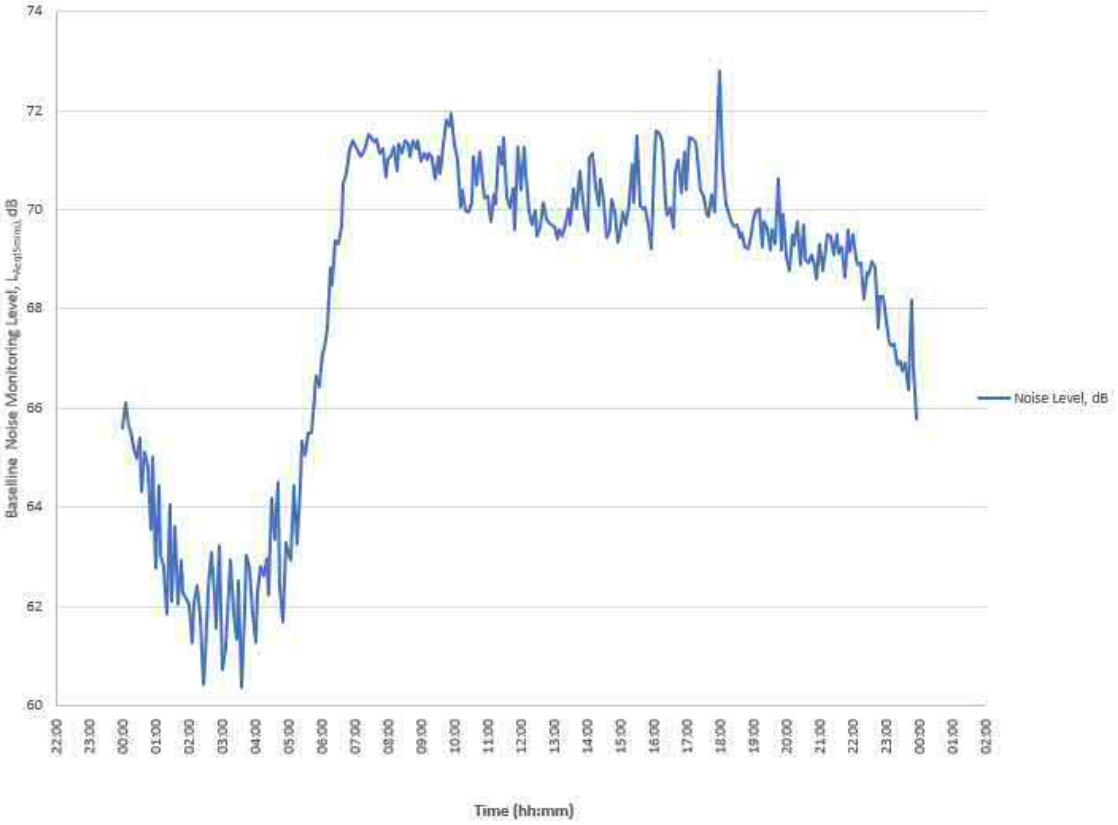

Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 8 Mar 2021 (Day 7) at N2
Baseline Noise Monitoring Level, $L_{Aeq(5mins)}$, dB
73
68
63
58
53
48
22:00
23:00
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00
02:00
Time (hh:mm)
Noise Level, dB

Daily Monitoring Data at N3

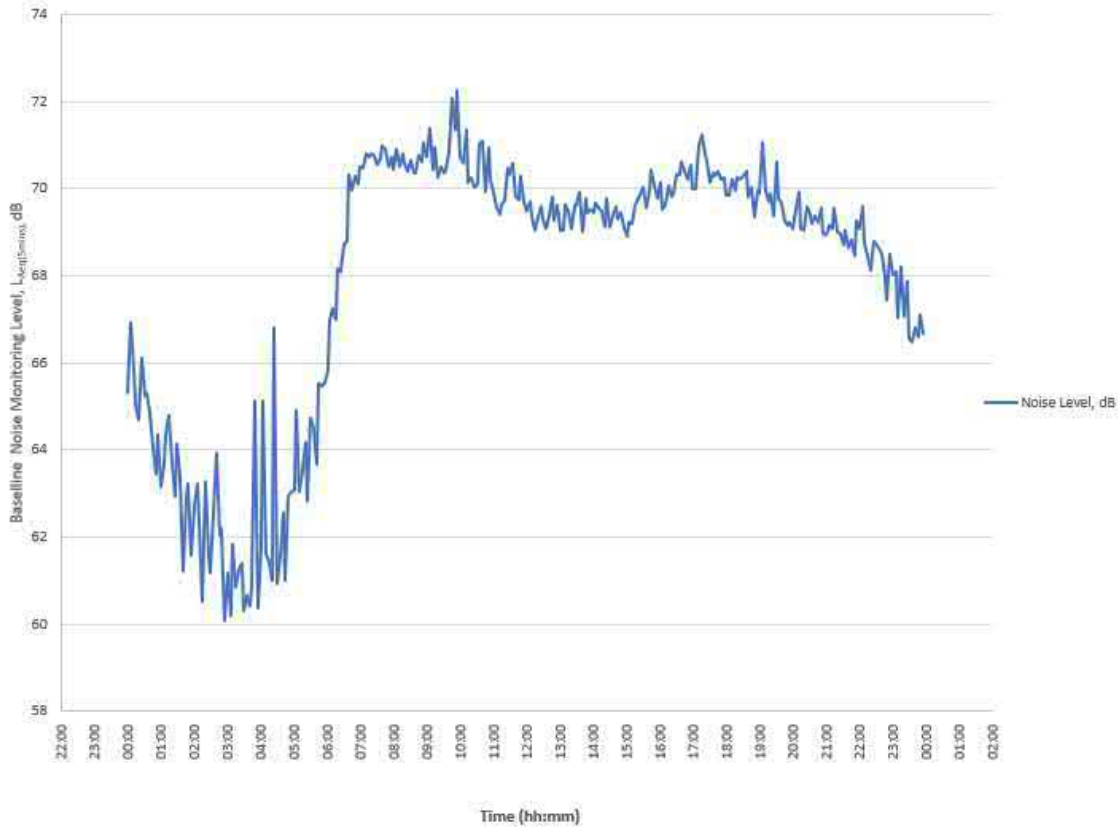




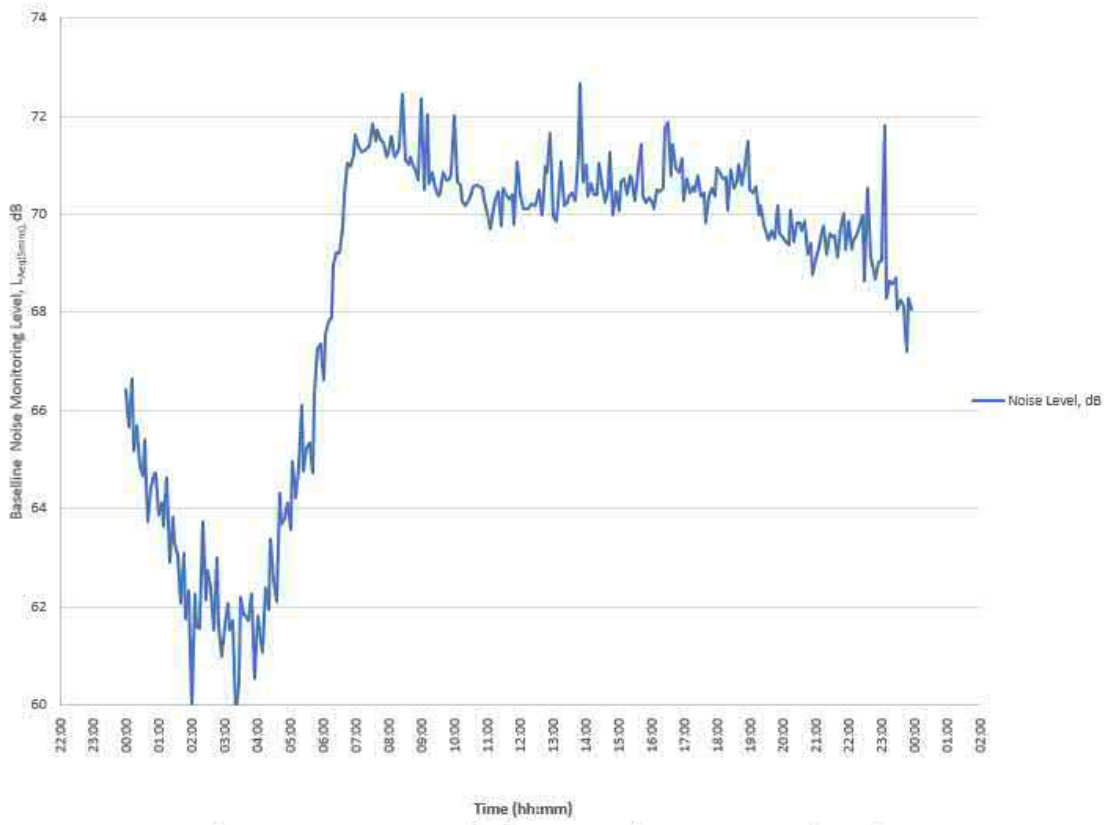
Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 21 Apr 2021 (Day 3) at N3



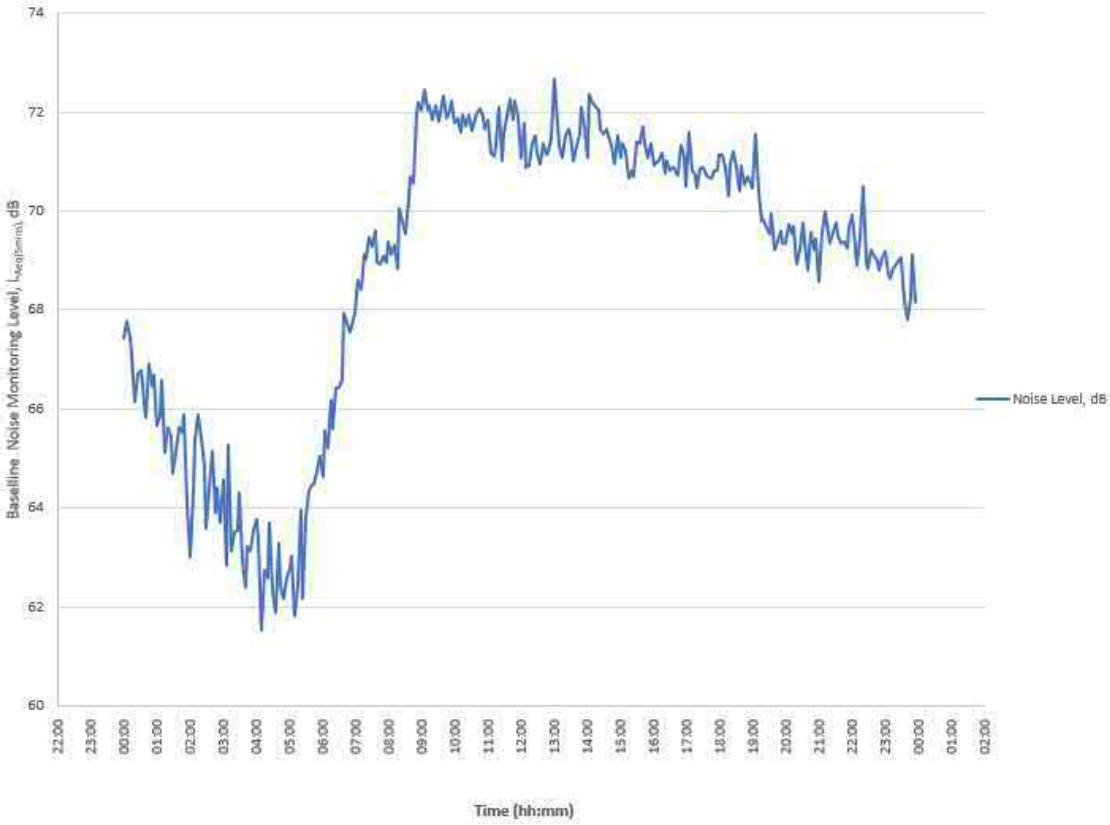
Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 22 Apr 2021 (Day 4) at N3

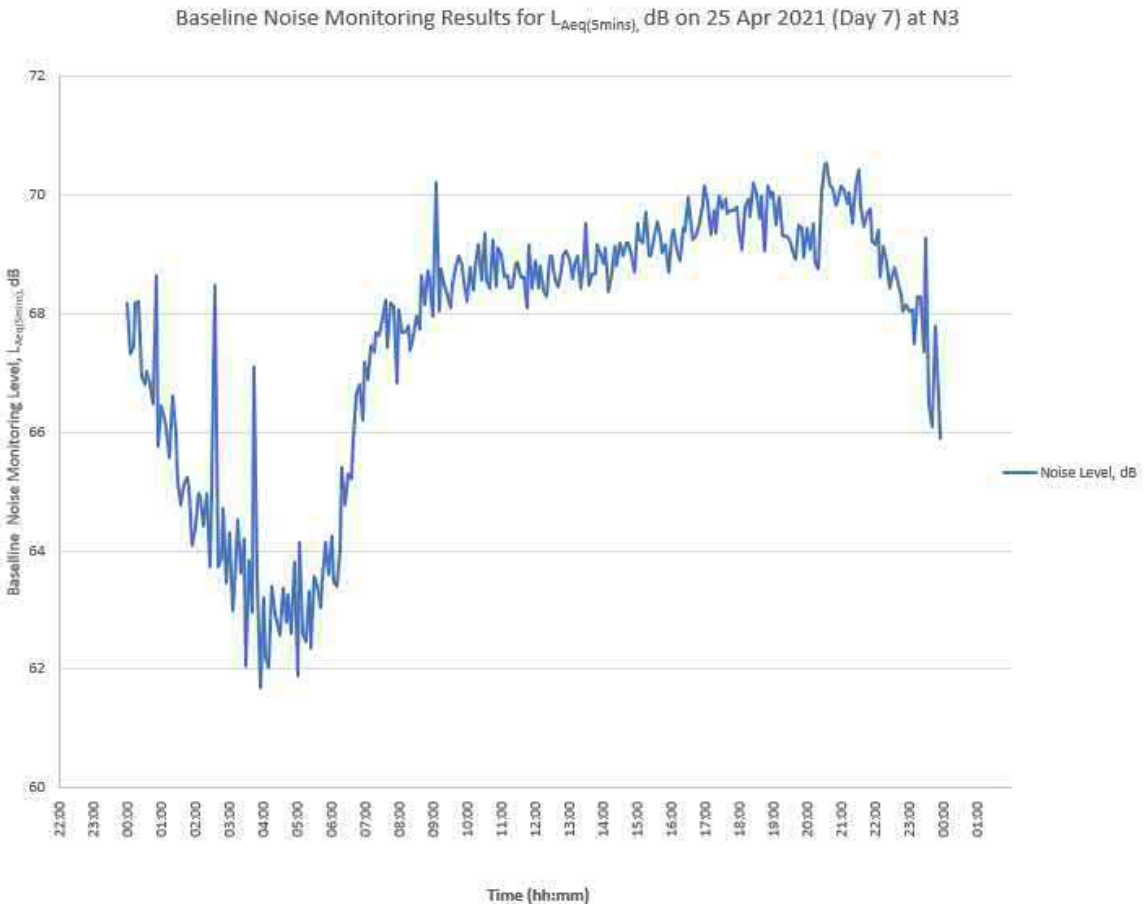


Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 23 Apr 2021 (Day 5) at N3



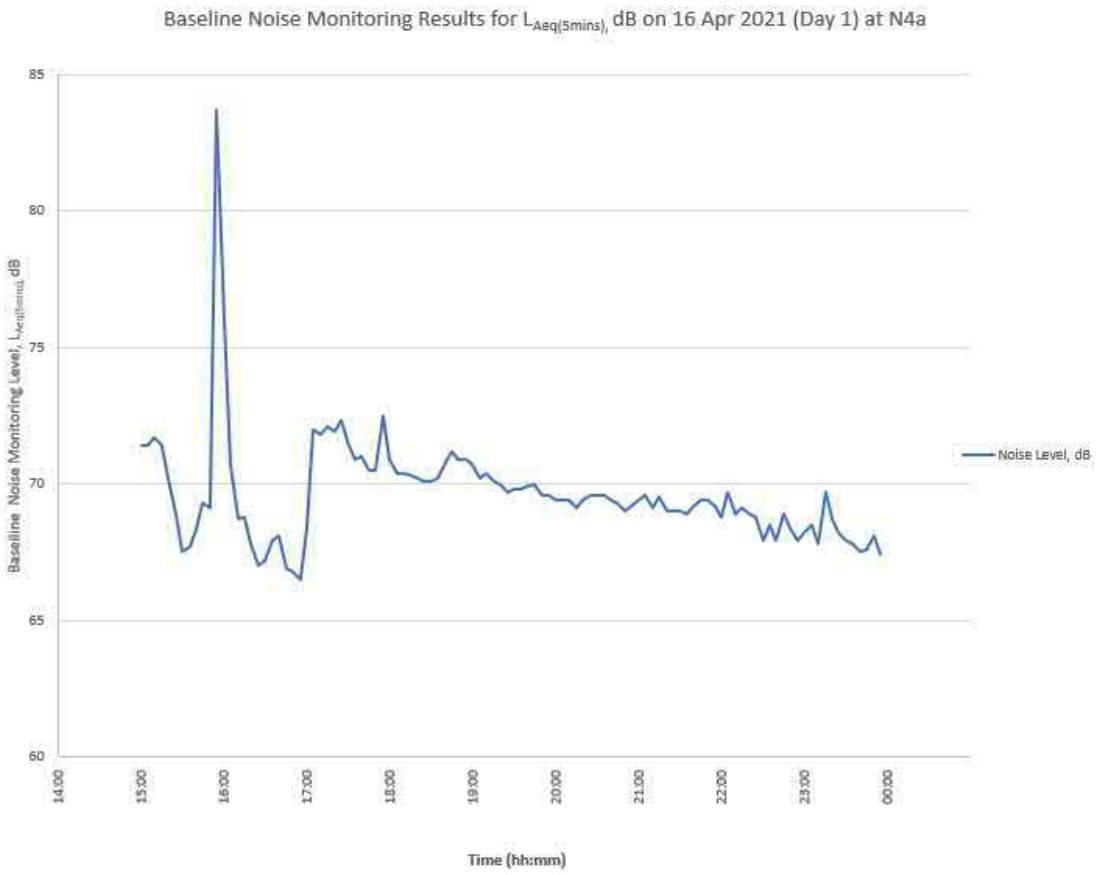
Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 24 Apr 2021 (Day 6) at N3

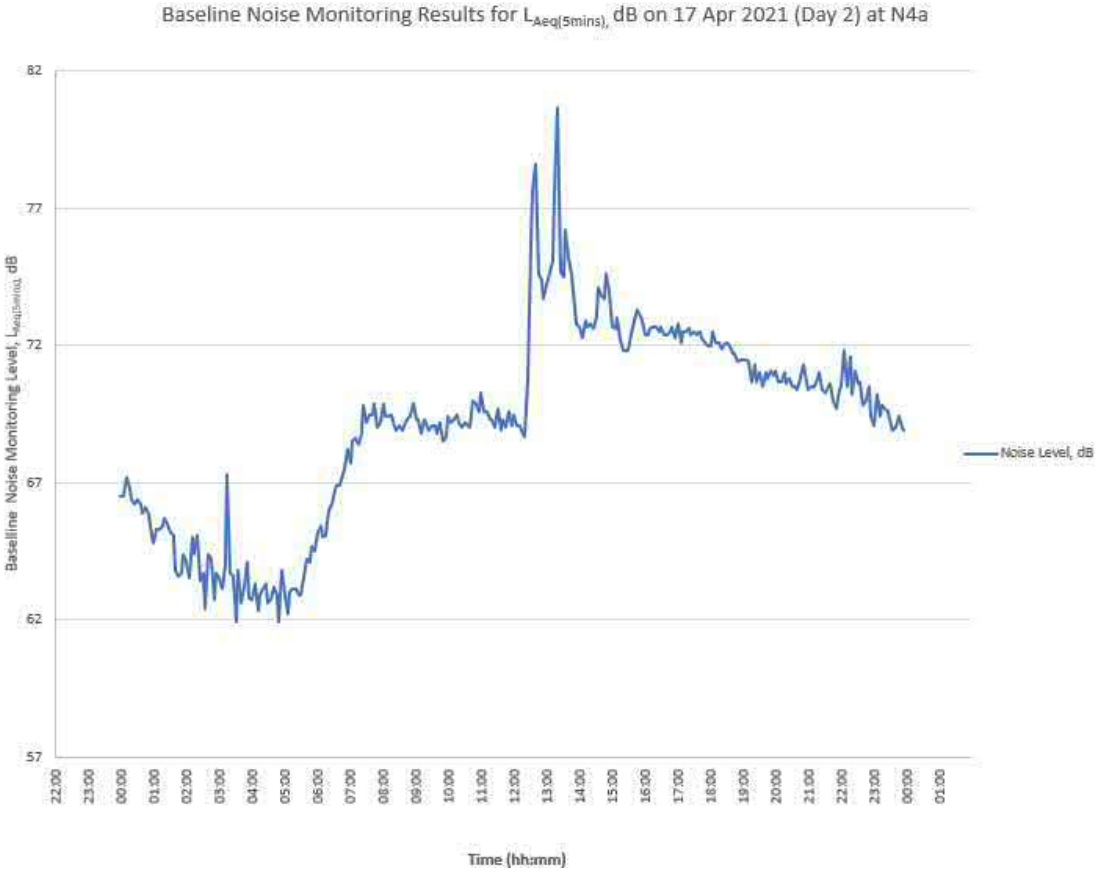


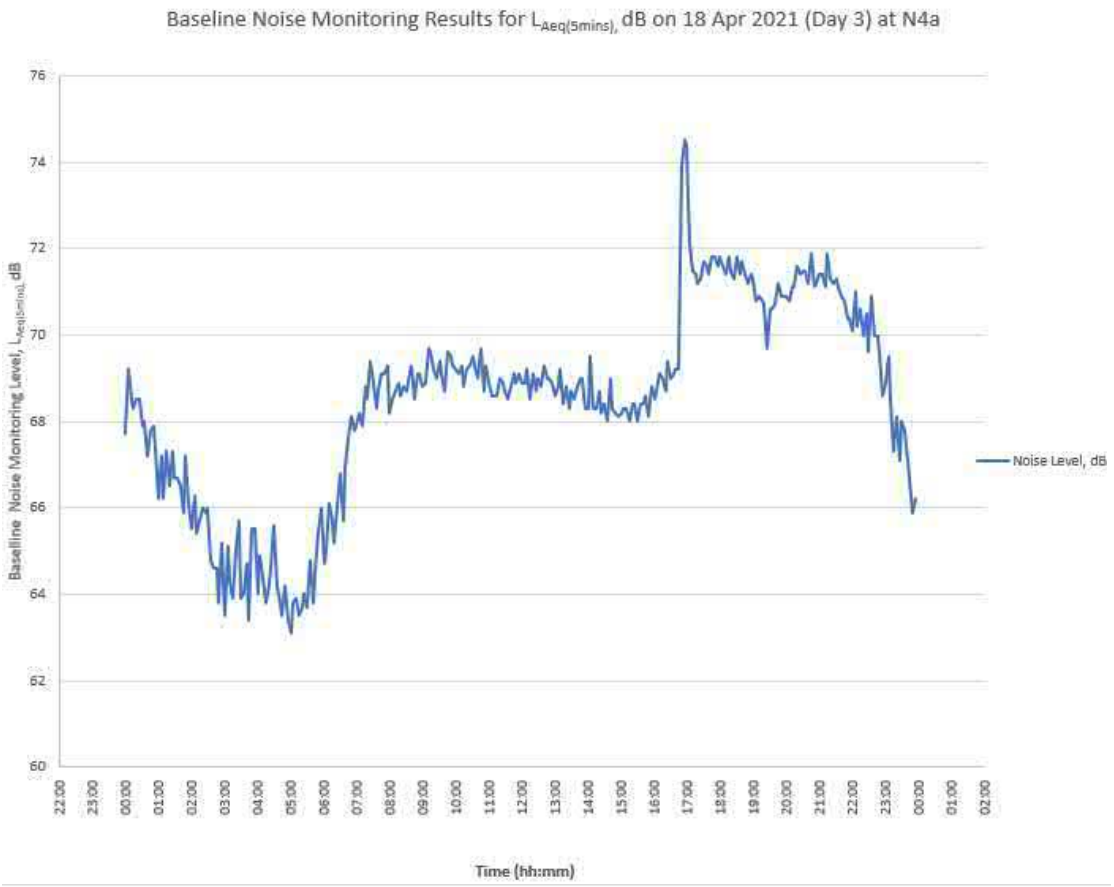

Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 25 Apr 2021 (Day 7) at N3
Baseline Noise Monitoring Level, $L_{Aeq(5mins)}$, dB
72
70
68
66
64
62
60
22:00
23:00
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00
Time (hh:mm)
Noise Level, dB

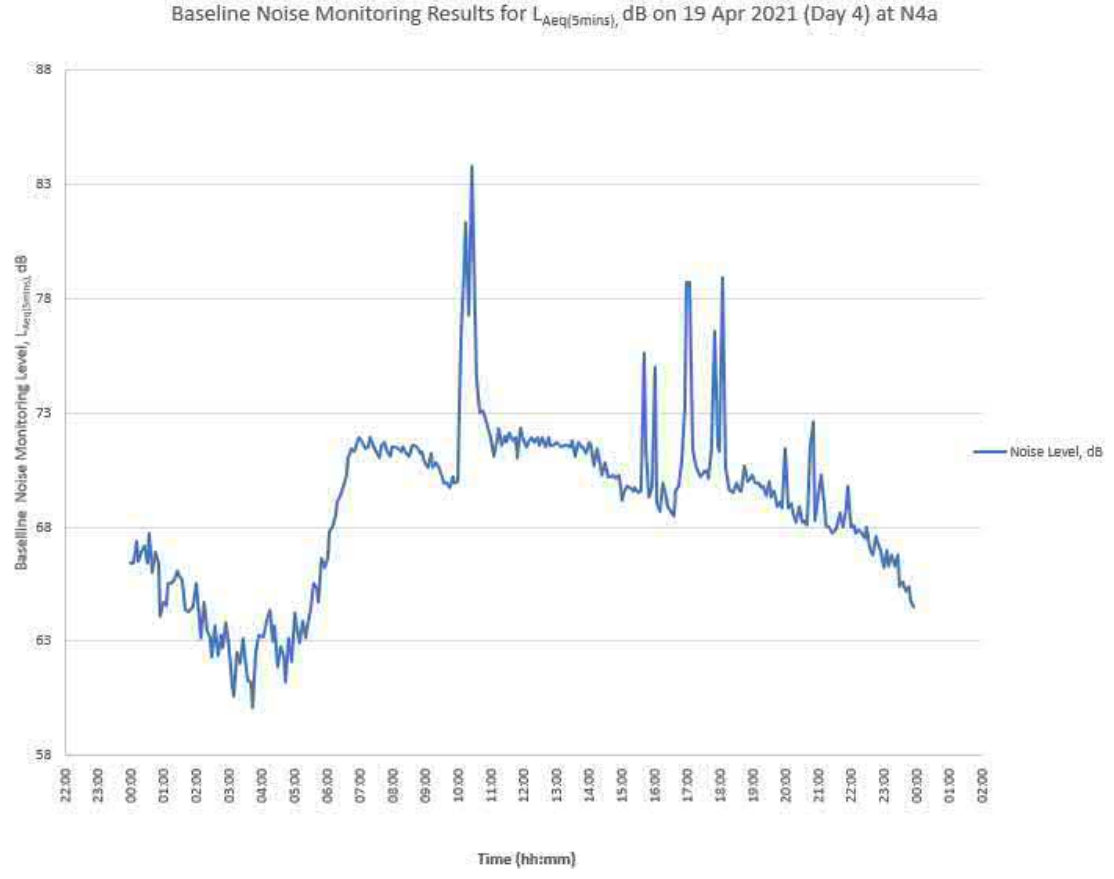
Daily Monitoring Data at N4a

Zzzz

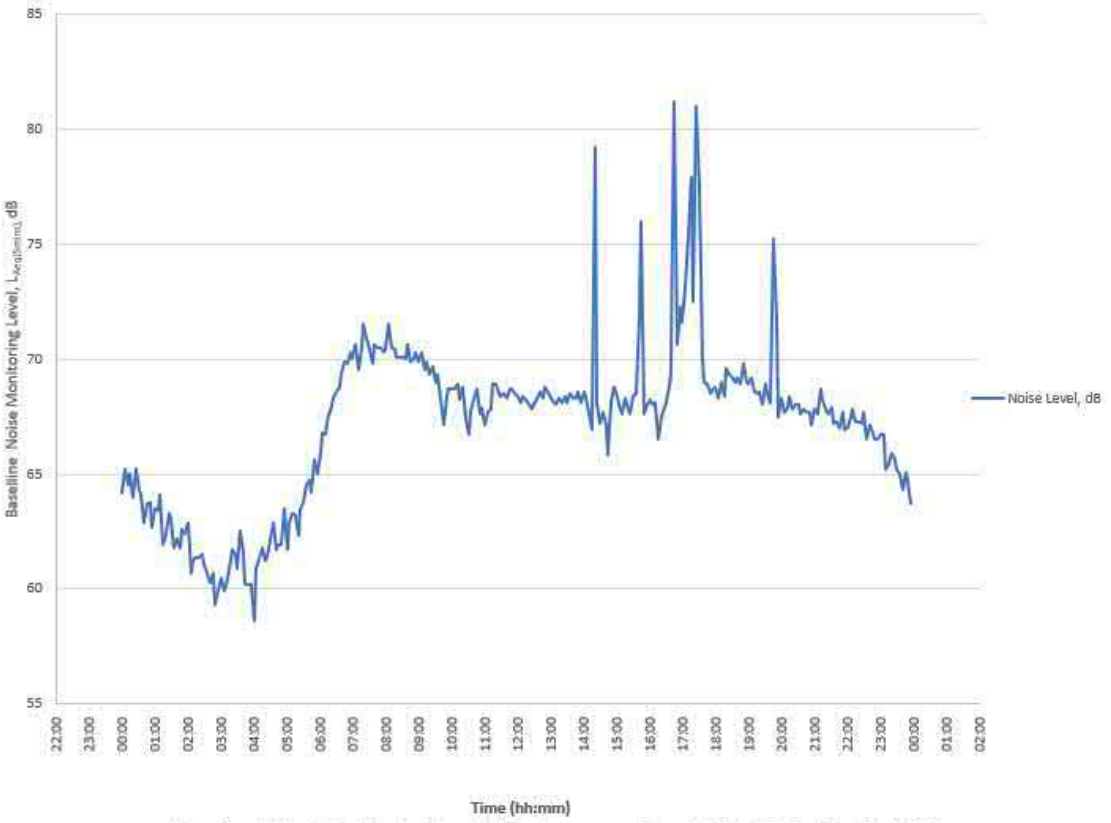




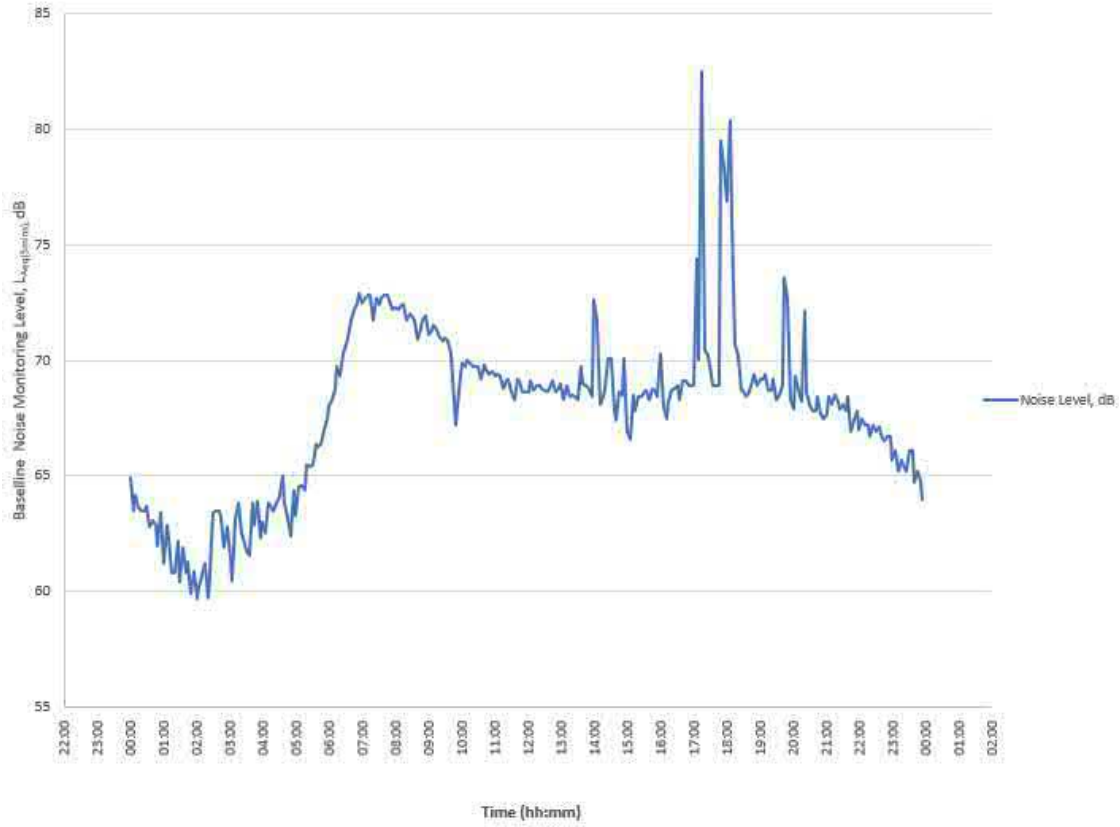

Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 18 Apr 2021 (Day 3) at N4a
Baselline Noise Monitoring Level, $L_{Aeq(5mins)}$, dB
76
74
72
70
68
66
64
62
60
22:00
23:00
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00
02:00
Time (hh:mm)
Noise Level, dB

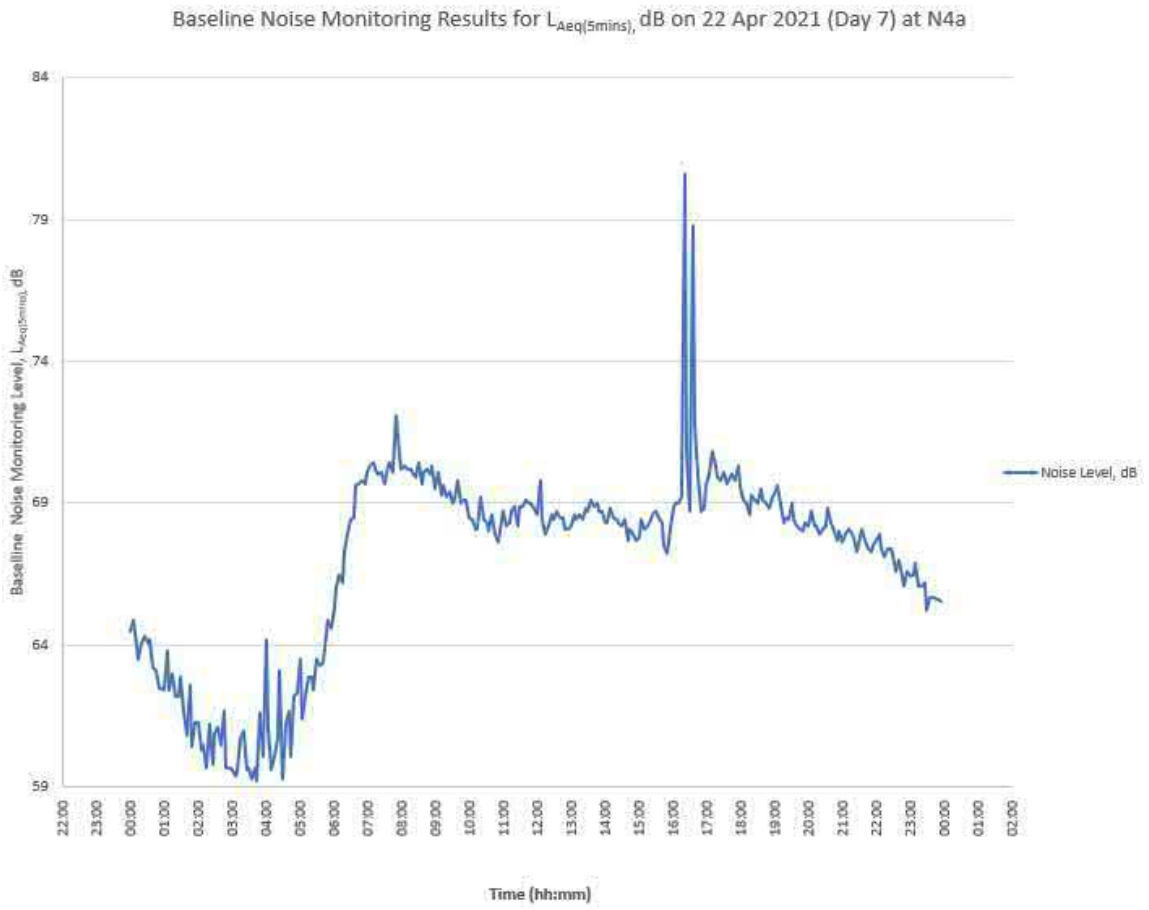

Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 19 Apr 2021 (Day 4) at N4a
Baselline Noise Monitoring Level, $L_{Aeq(5mins)}$, dB
88
83
78
73
68
63
58
22:00
23:00
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00
02:00
Time (hh:mm)
Noise Level, dB

Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 20 Apr 2021 (Day 5) at N4a

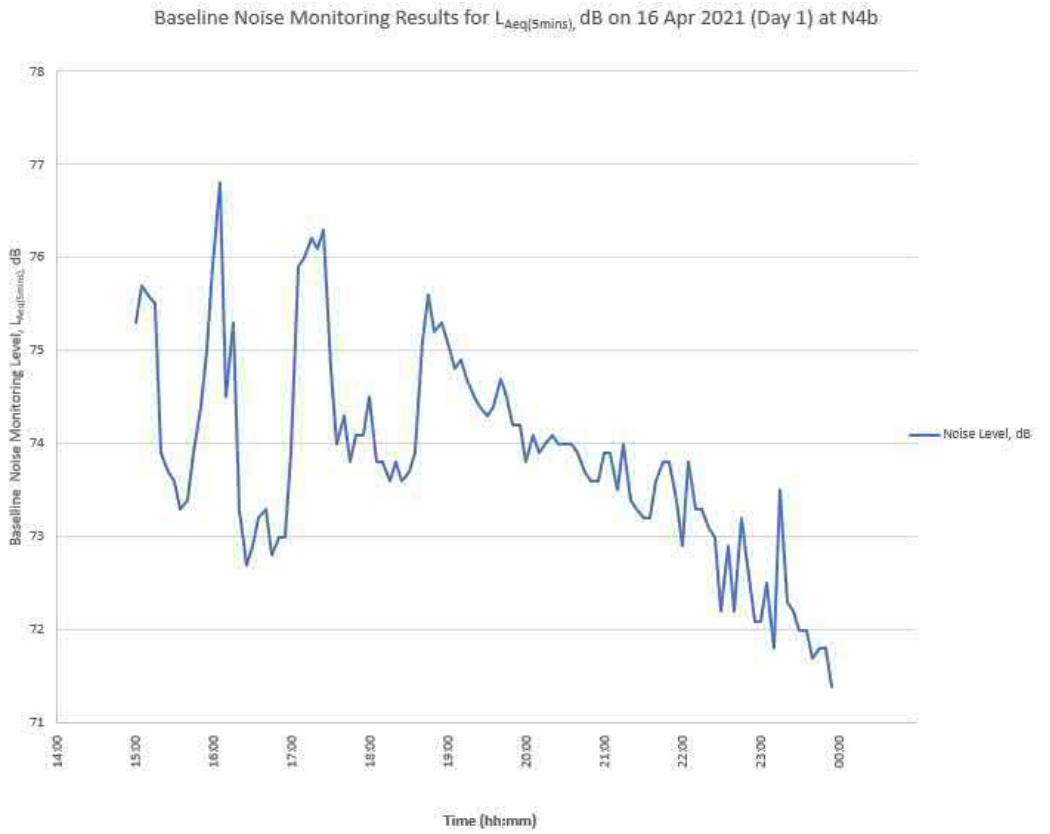


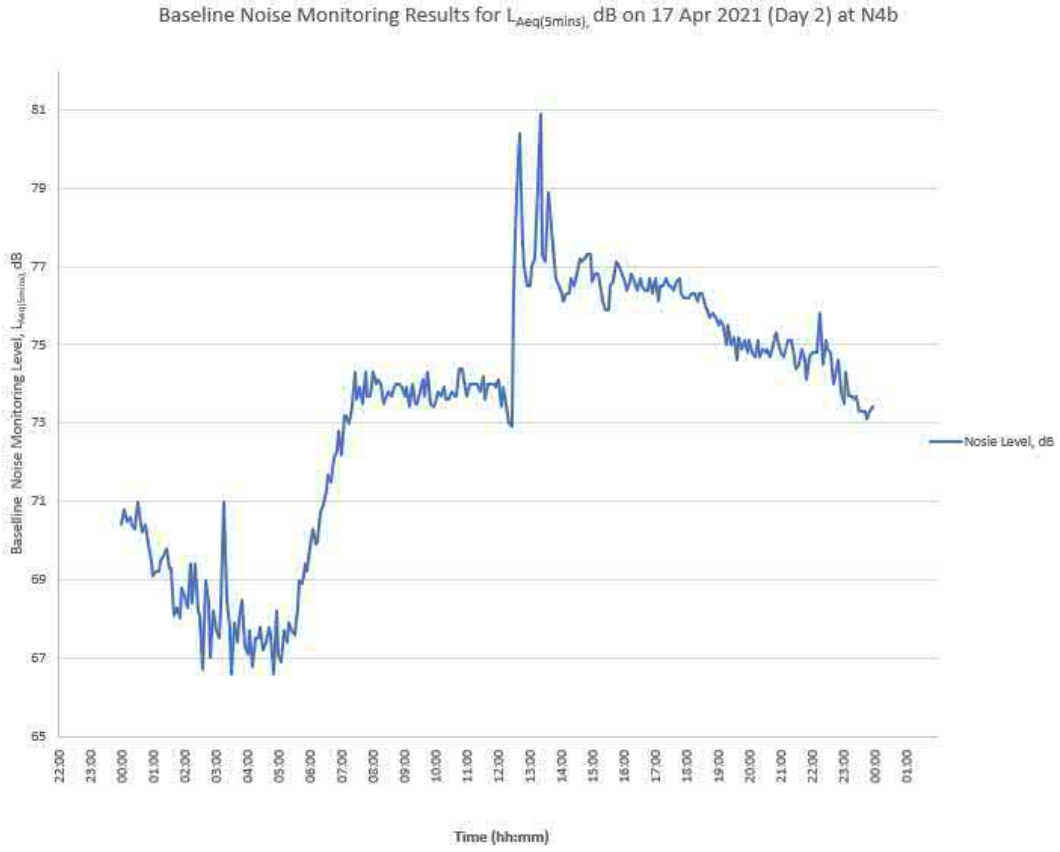
Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 21 Apr 2021 (Day 6) at N4a



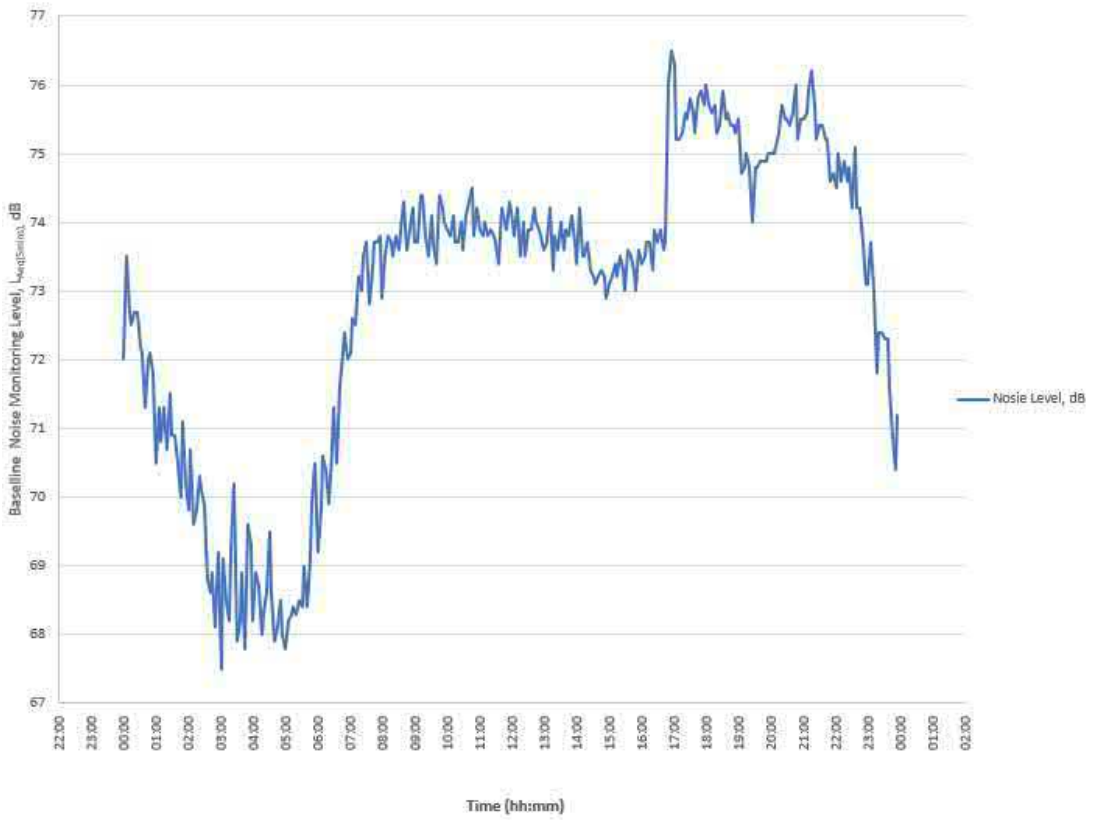

Baseline Noise Monitoring Results for $L_{Aeq(5mins),}$ dB on 22 Apr 2021 (Day 7) at N4a
Baselline Noise Monitoring Level, $L_{Aeq(5mins)}$ dB
84
79
74
69
64
59
22:00
23:00
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00
02:00
Time (hh:mm)
Noise Level, dB

Daily Monitoring Data at N4b

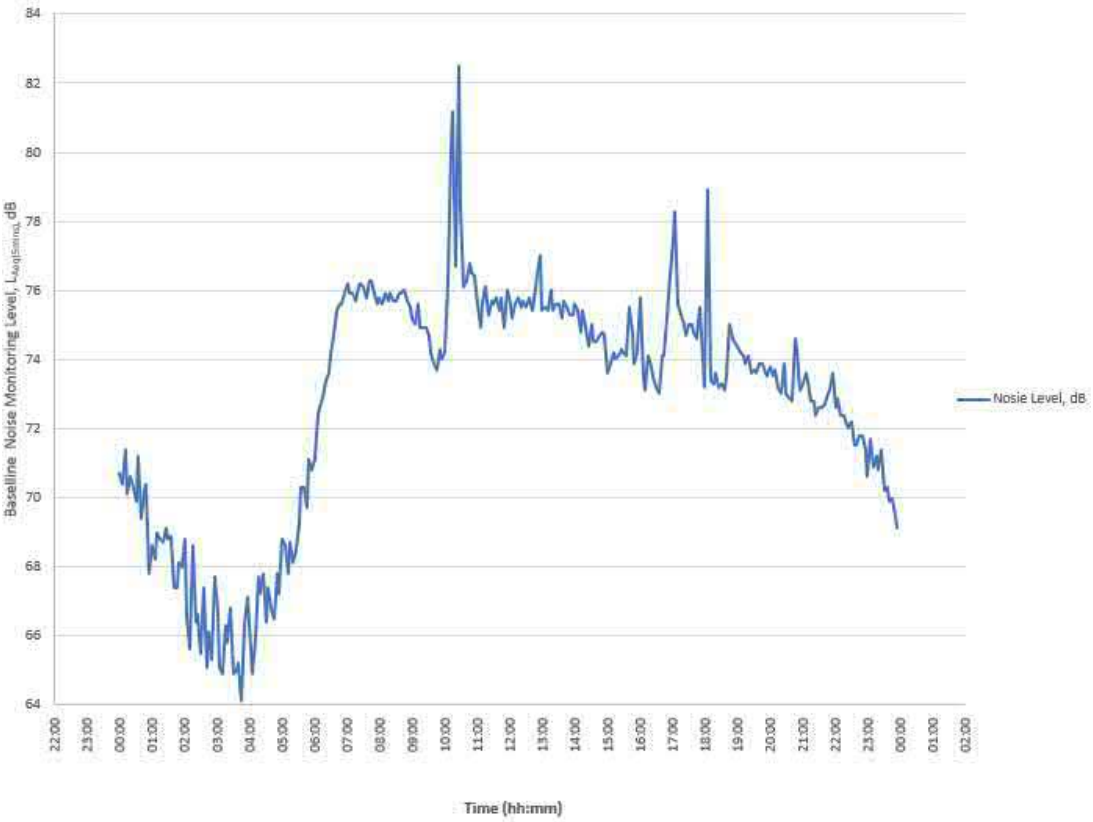




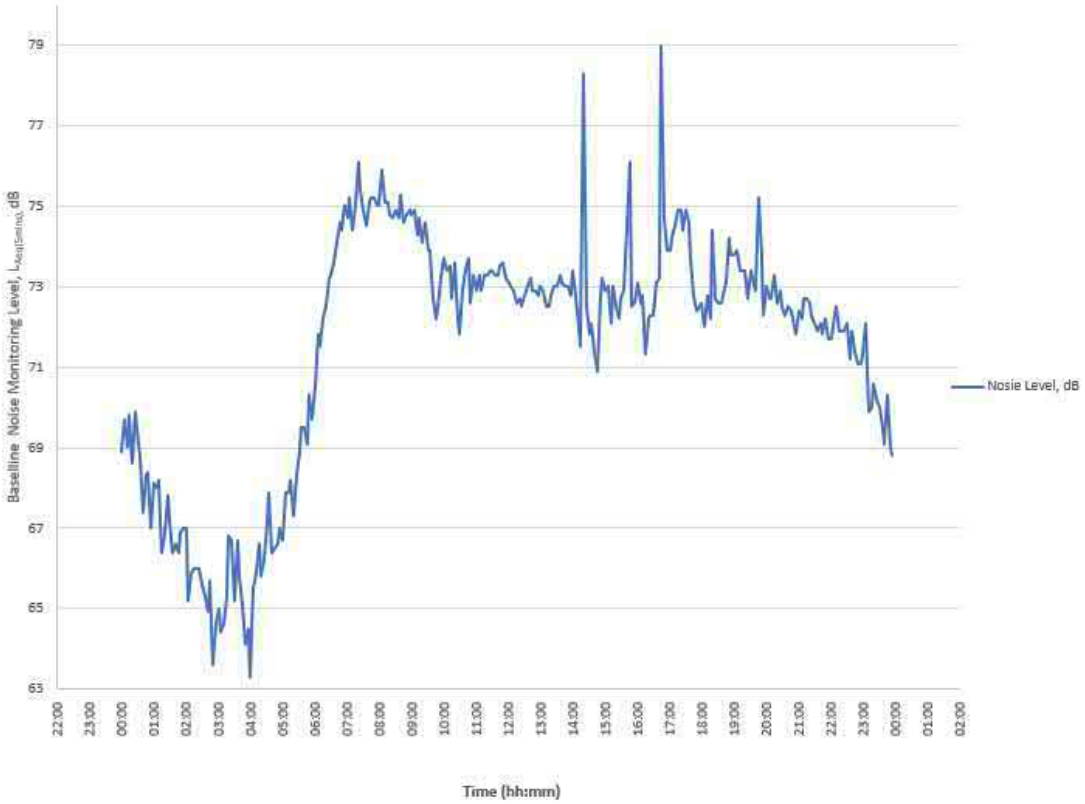
Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 18 Apr 2021 (Day 3) at N4b



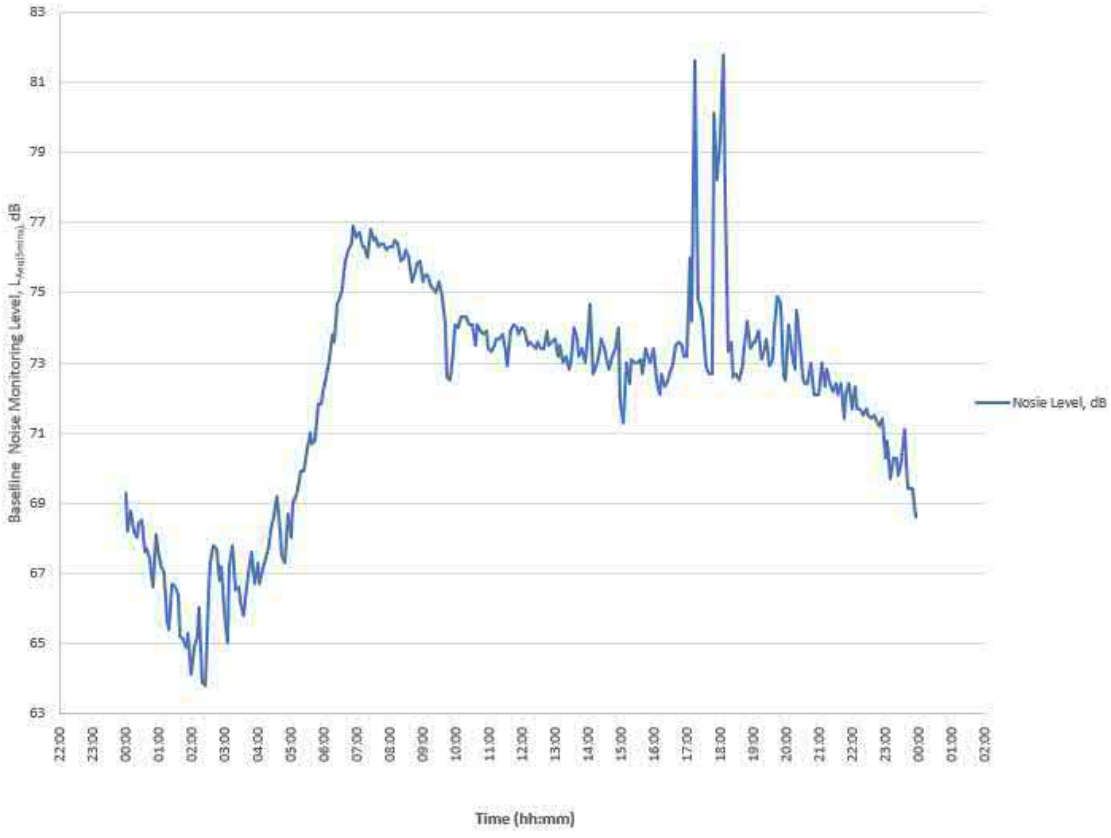
Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 19 Apr 2021 (Day 4) at N4b



Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 20 Apr 2021 (Day 5) at N4b

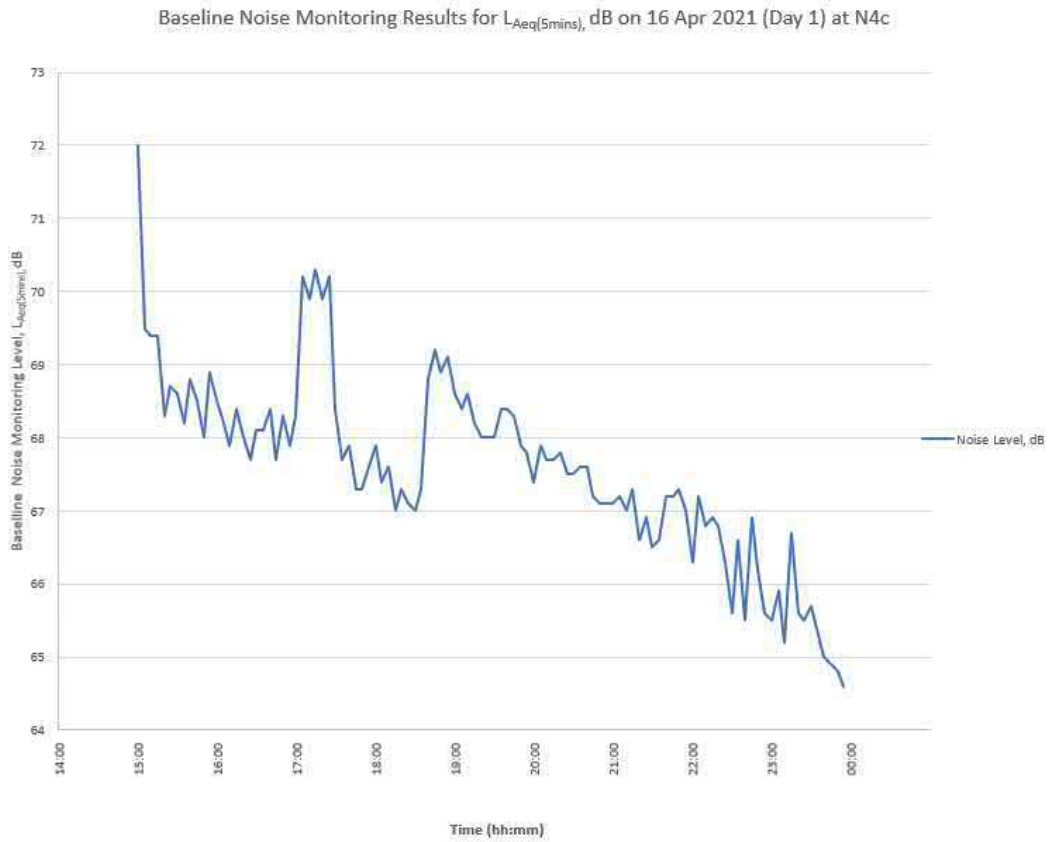


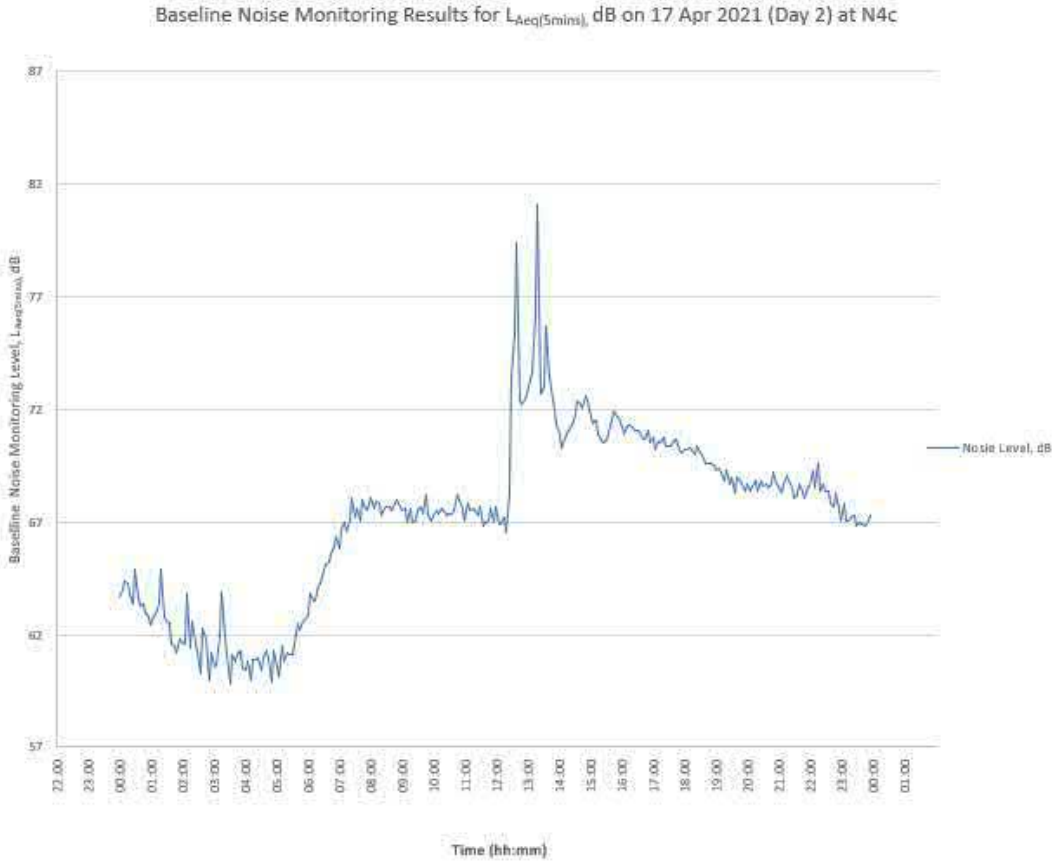
Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 21 Apr 2021 (Day 6) at N4b



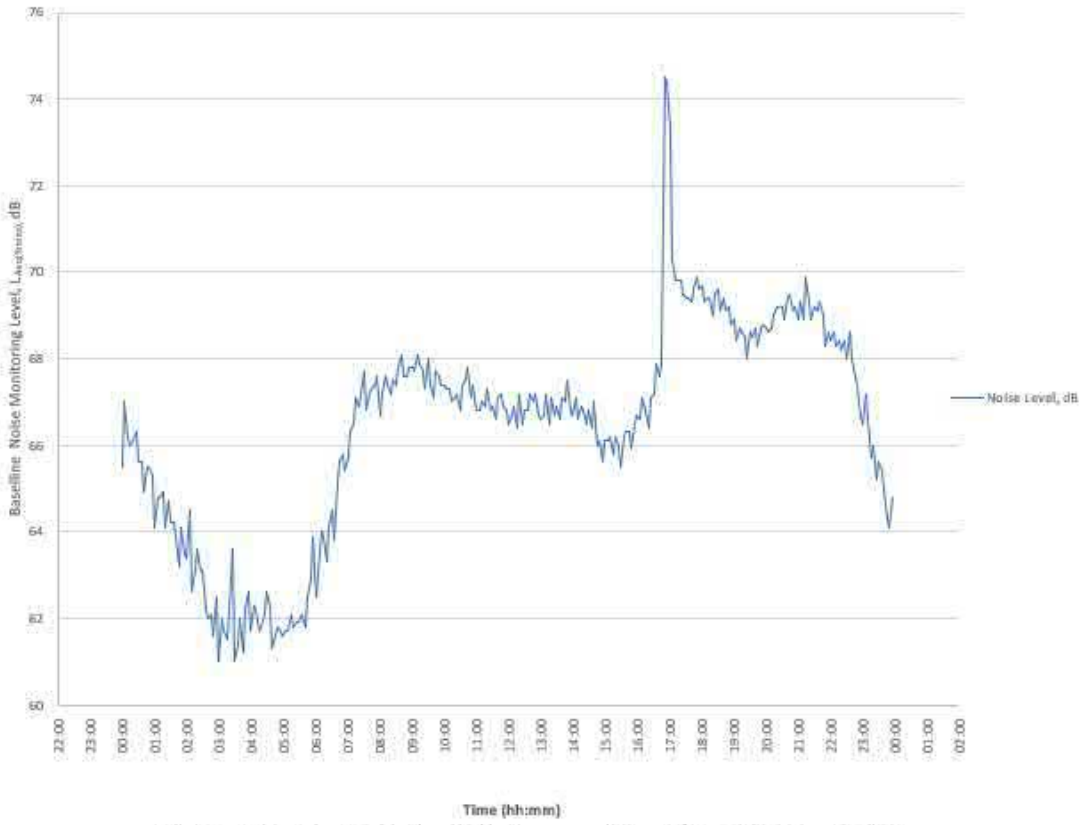

Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 22 Apr 2021 (Day 7) at N4b
Baselline Noise Monitoring Level, $L_{Aeq(5mins)}$, dB
77
75
73
71
69
67
65
63
22:00
23:00
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00
02:00
Time (hh:mm)
Nosie Level, dB

Daily Monitoring Data at N4c

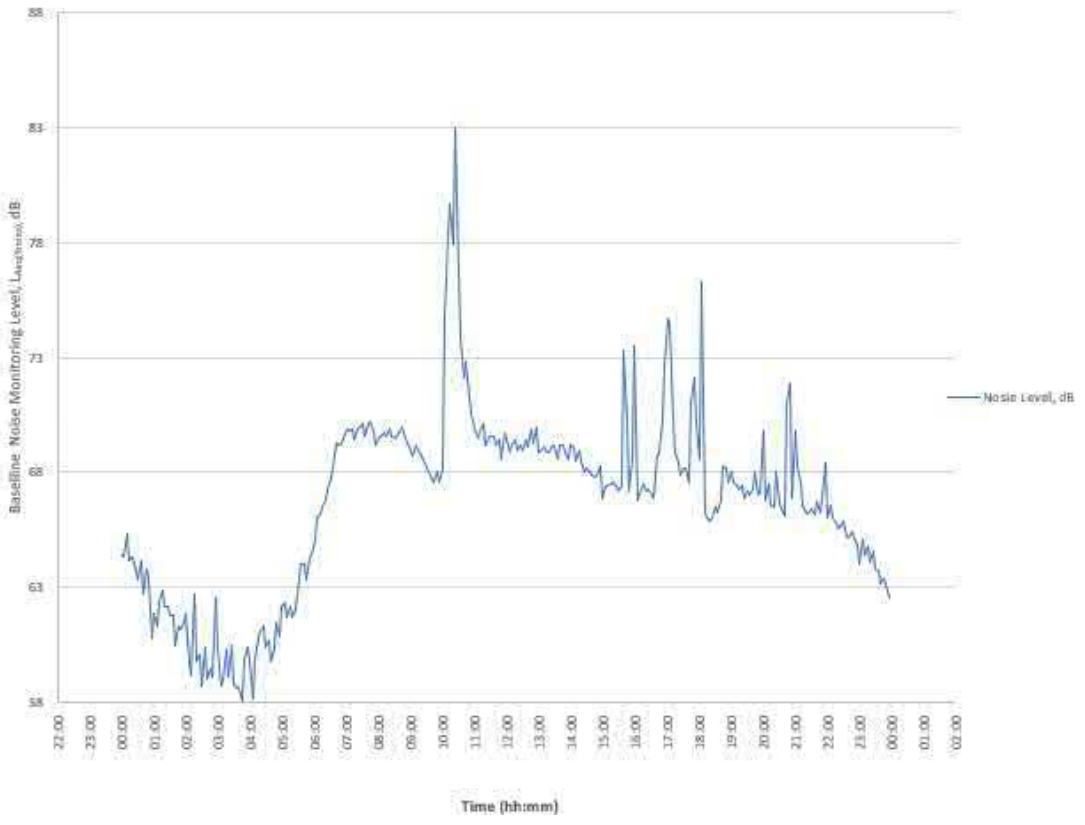




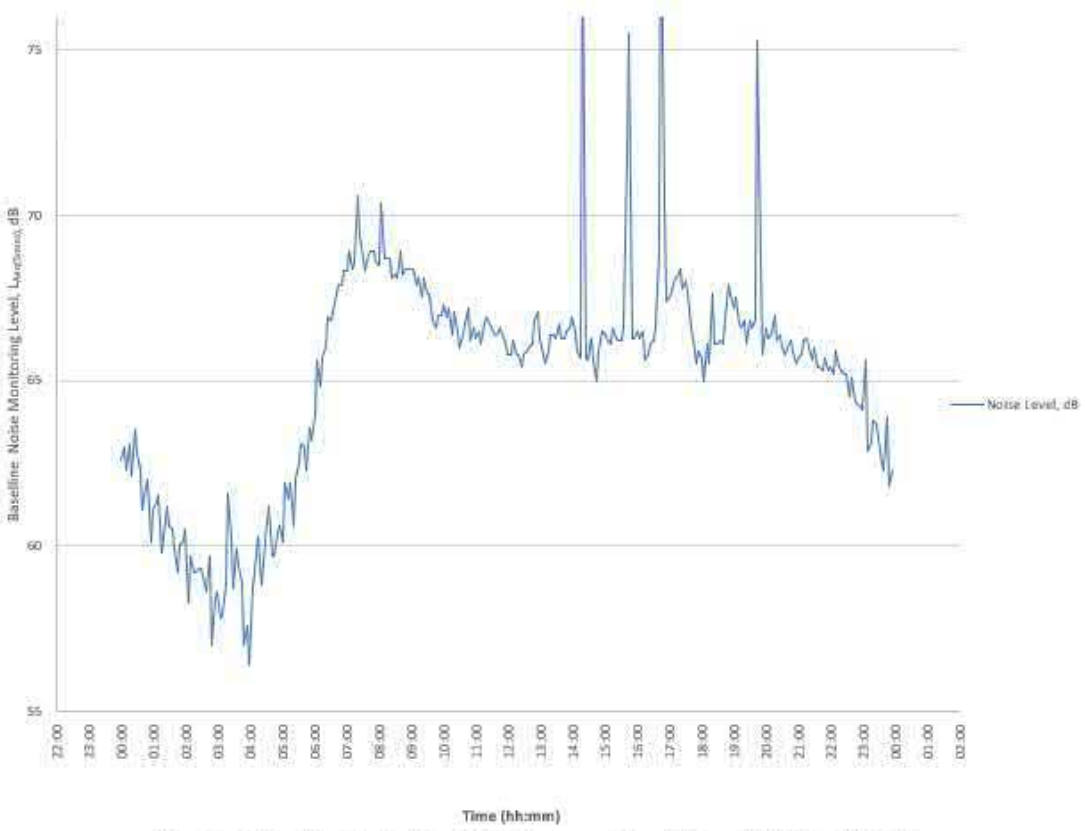
Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 18 Apr 2021 (Day 3) at N4c



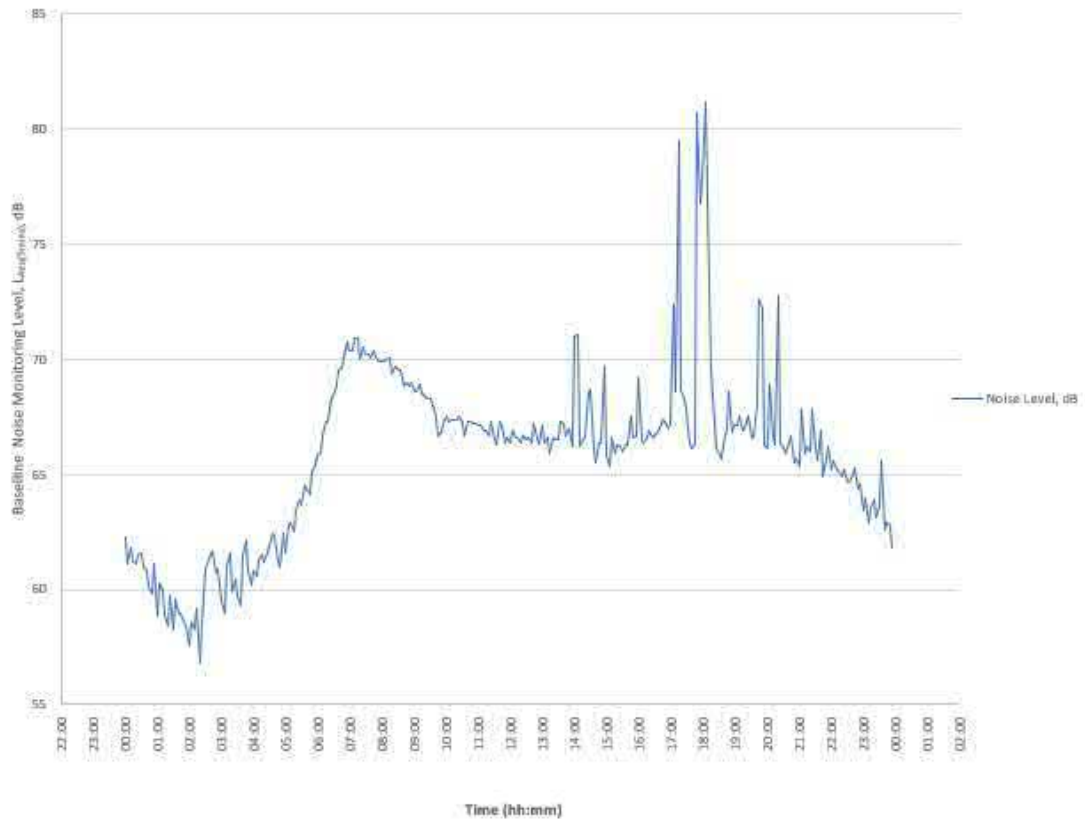
Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 19 Apr 2021 (Day 4) at N4c

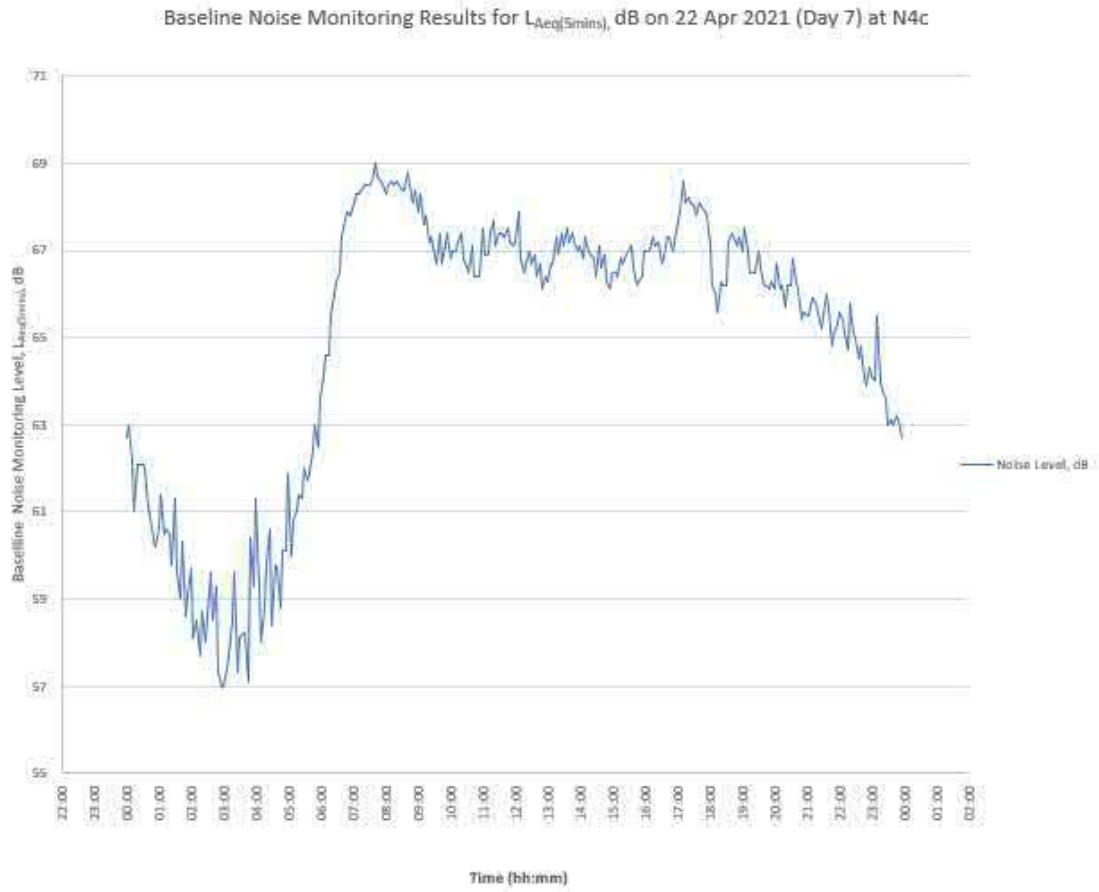


Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 20 Apr 2021 (Day 5) at N4c

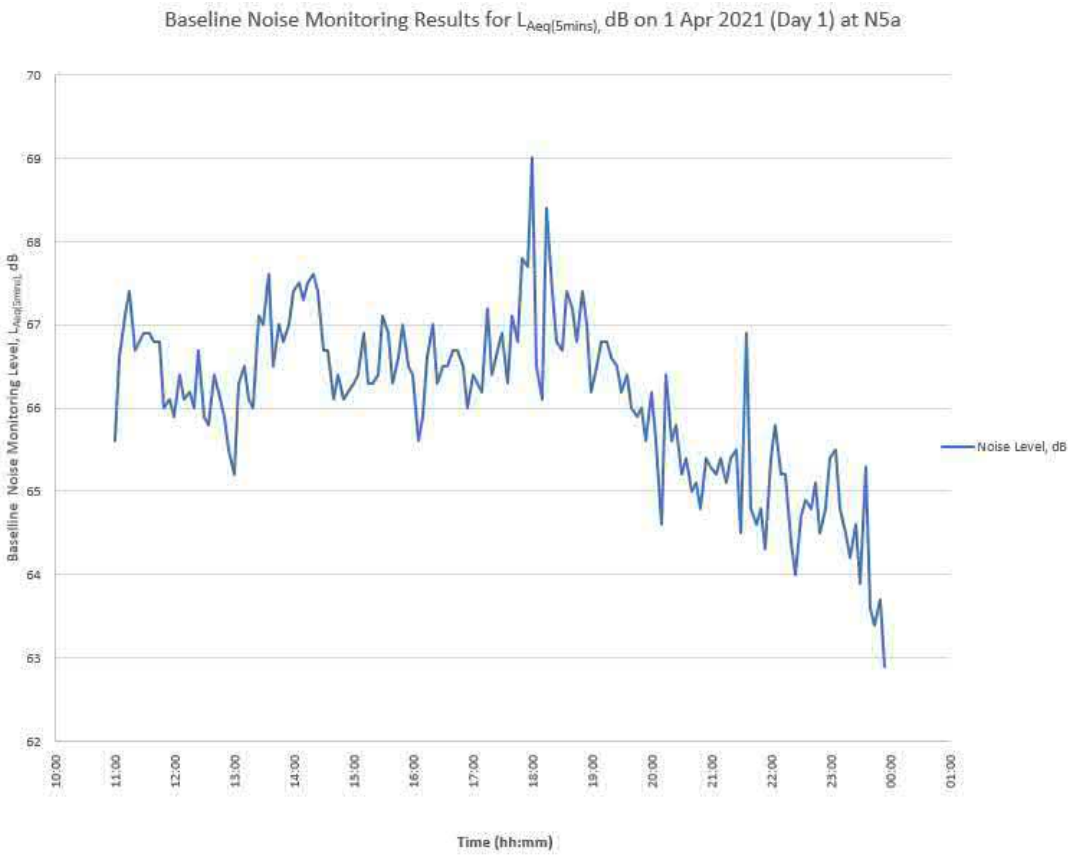


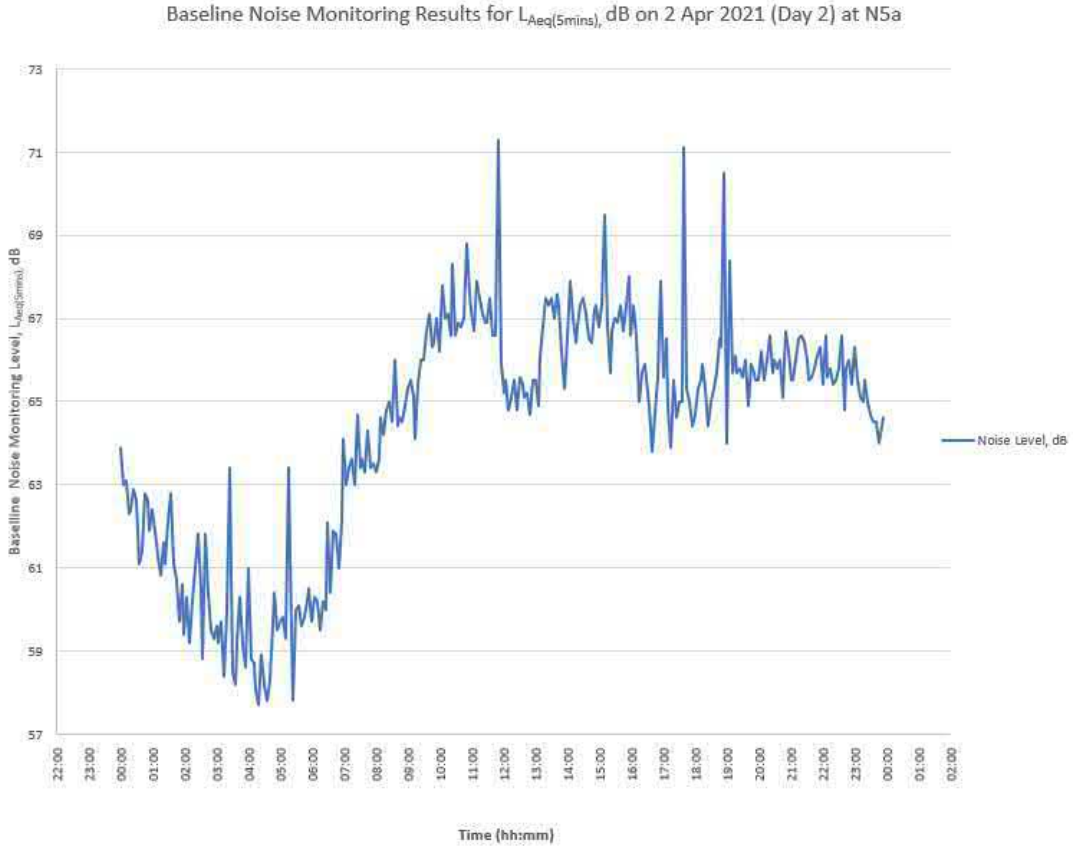
Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 21 Apr 2021 (Day 6) at N4c



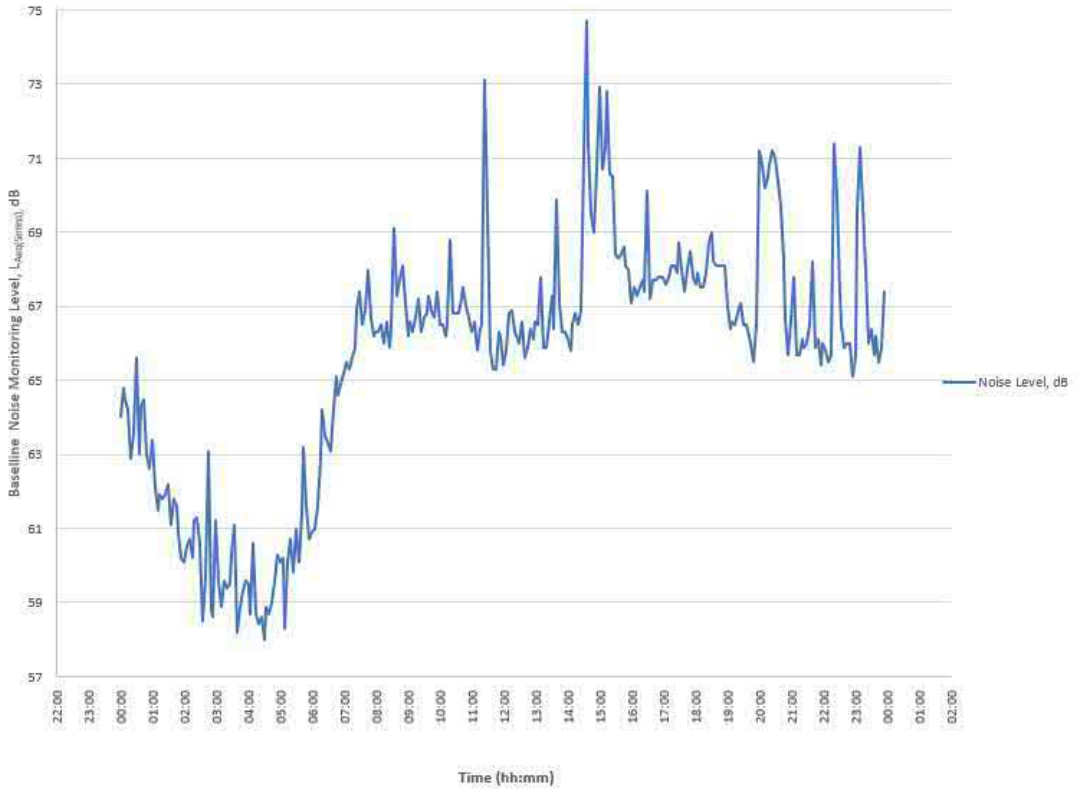

Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 22 Apr 2021 (Day 7) at N4c
Baseline Noise Monitoring Level, $L_{Aeq(5mins)}$, dB
71
69
67
65
63
61
59
57
55
22:00
23:00
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00
02:00
Time (hh:mm)
Noise Level, dB

Daily Monitoring Data at N5a

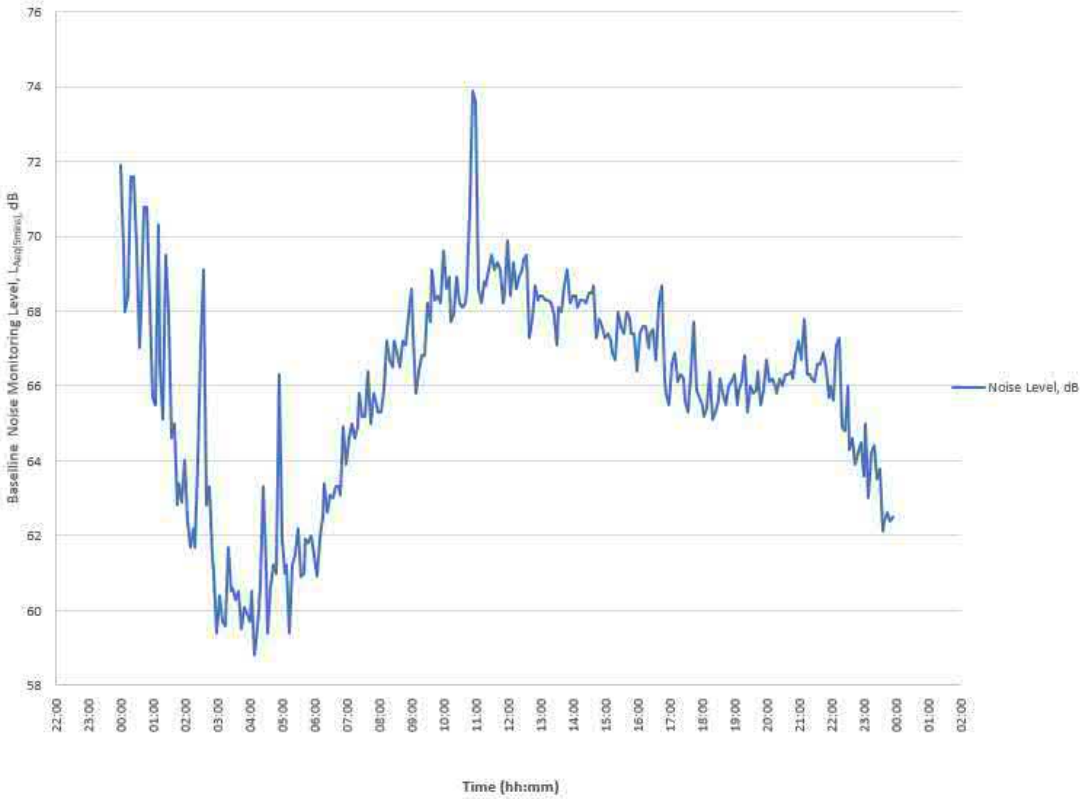




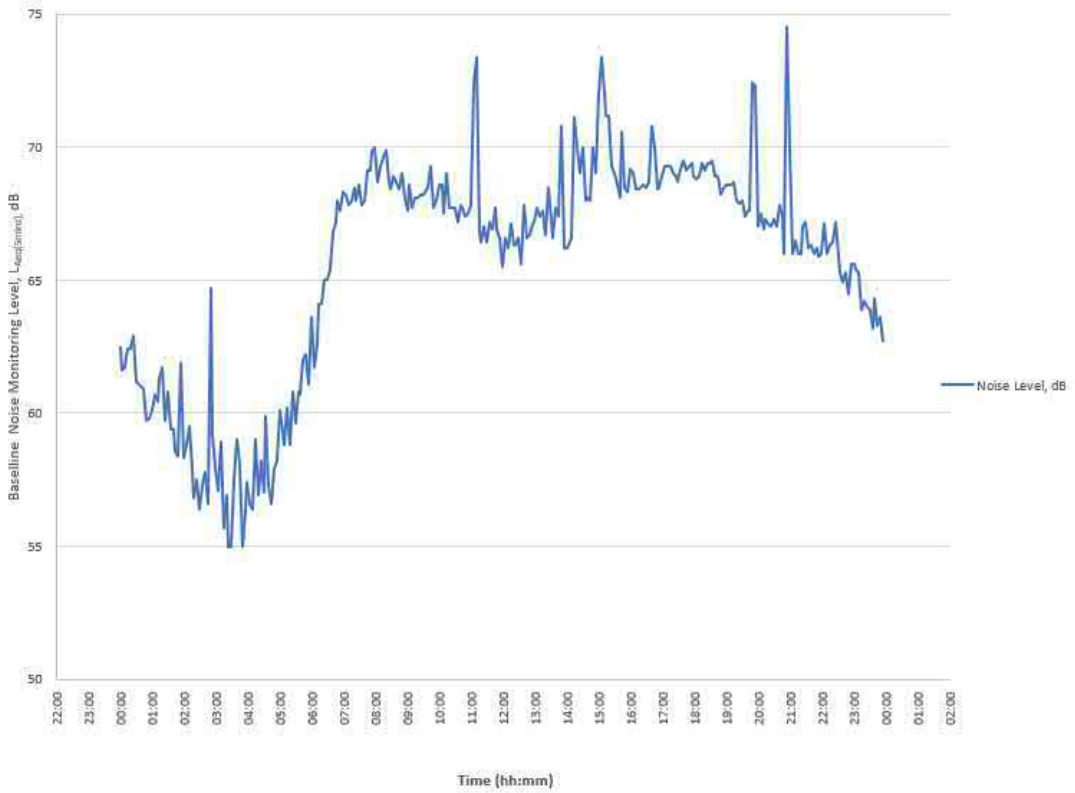
Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 3 Apr 2021 (Day 3) at N5a



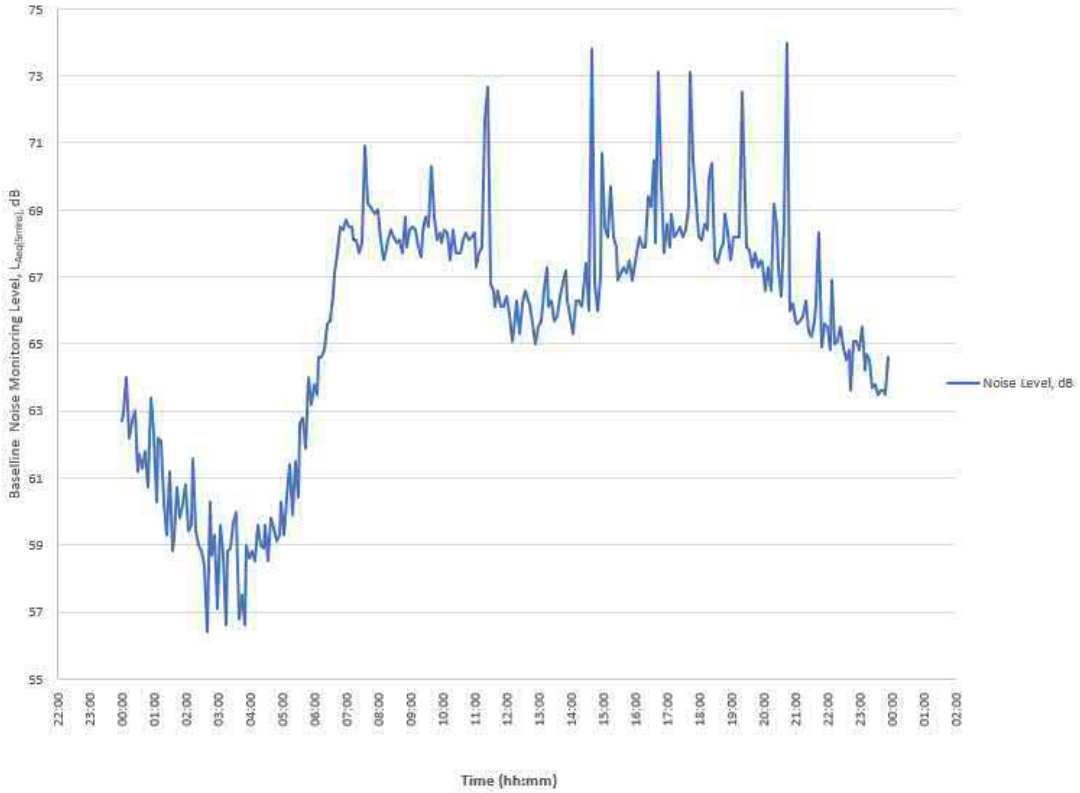
Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 4 Apr 2021 (Day 4) at N5a

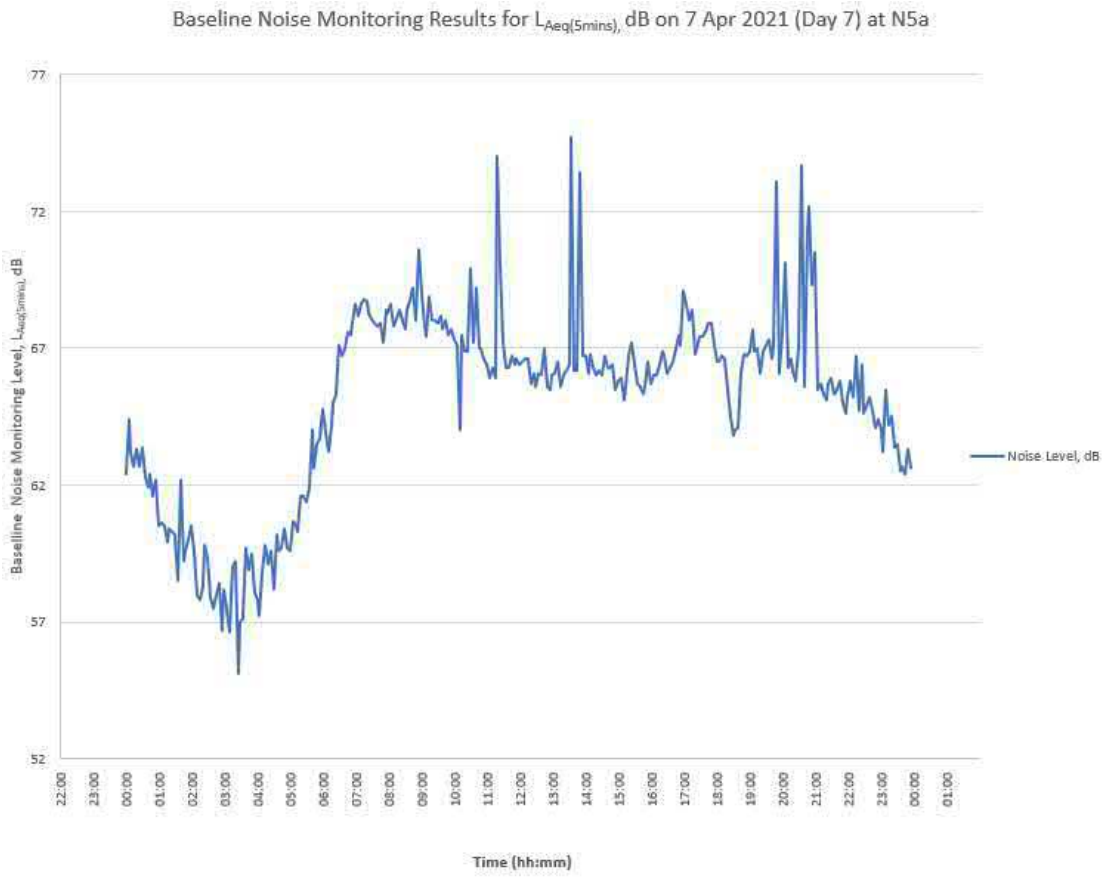


Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 5 Apr 2021 (Day 5) at N5a

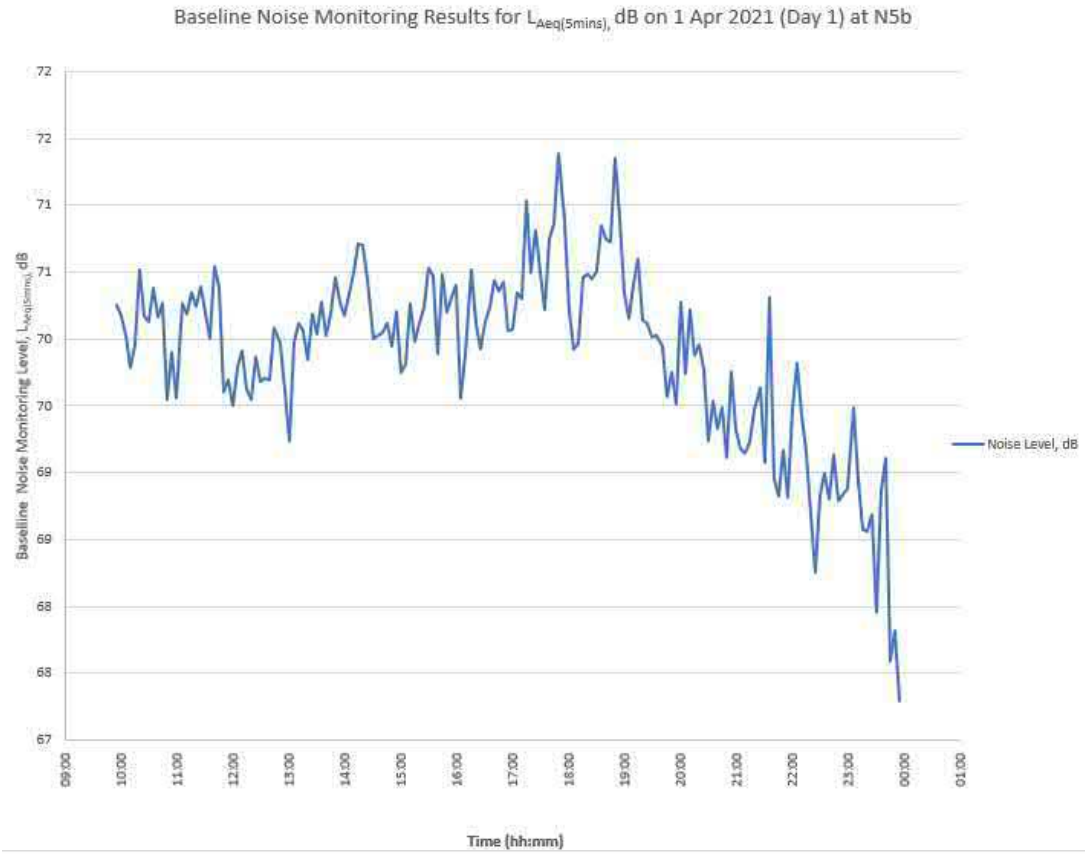


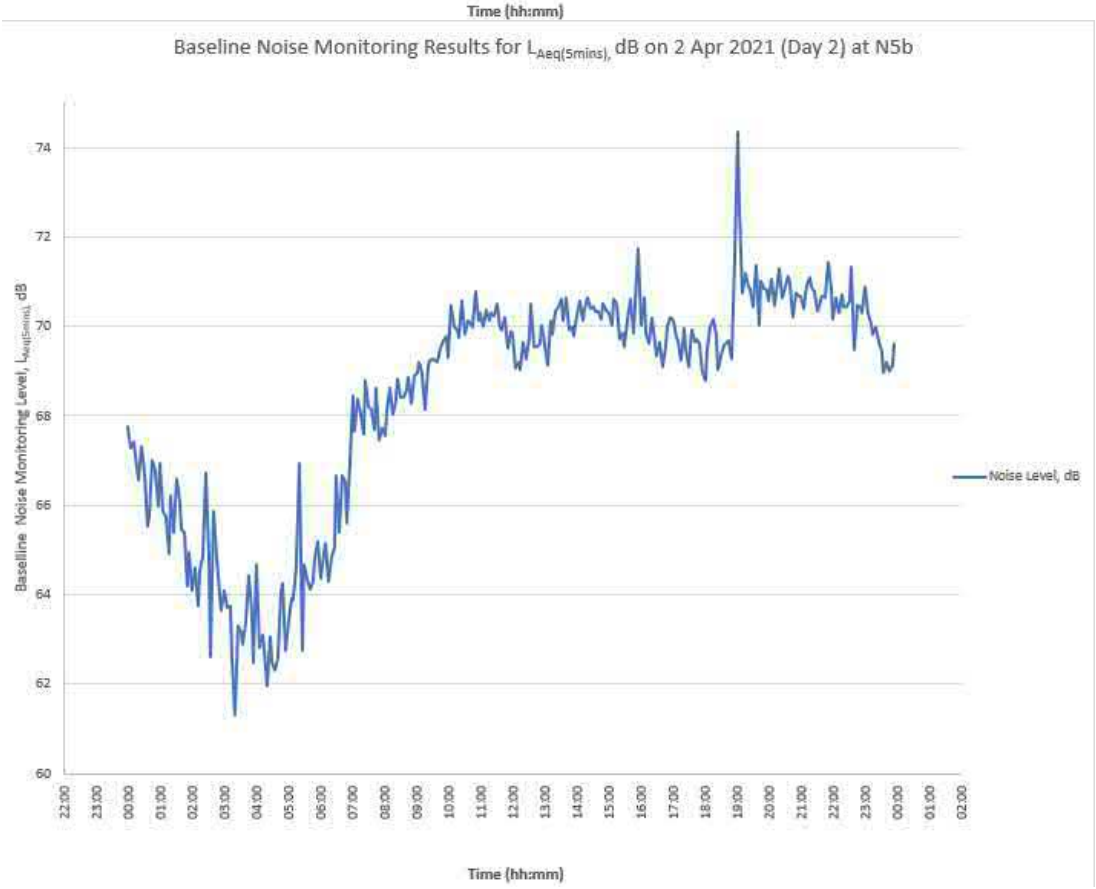
Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 6 Apr 2021 (Day 6) at N5a

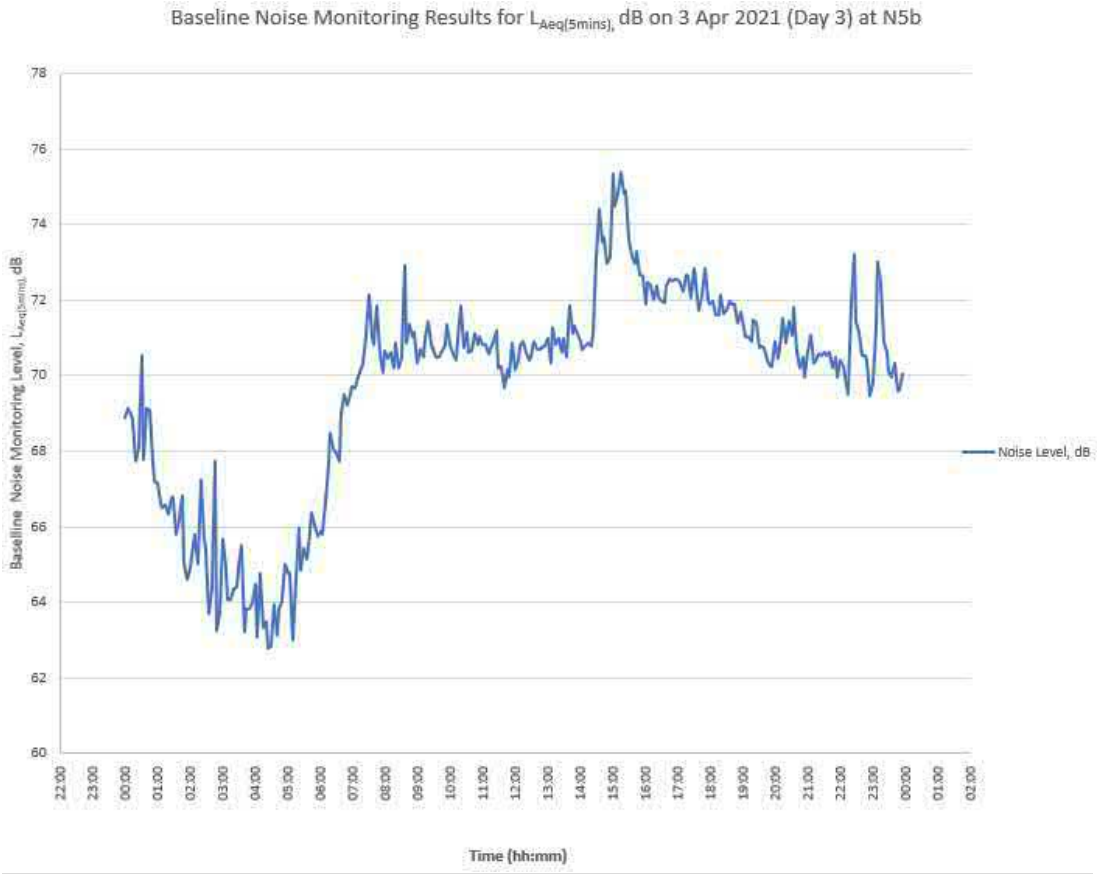


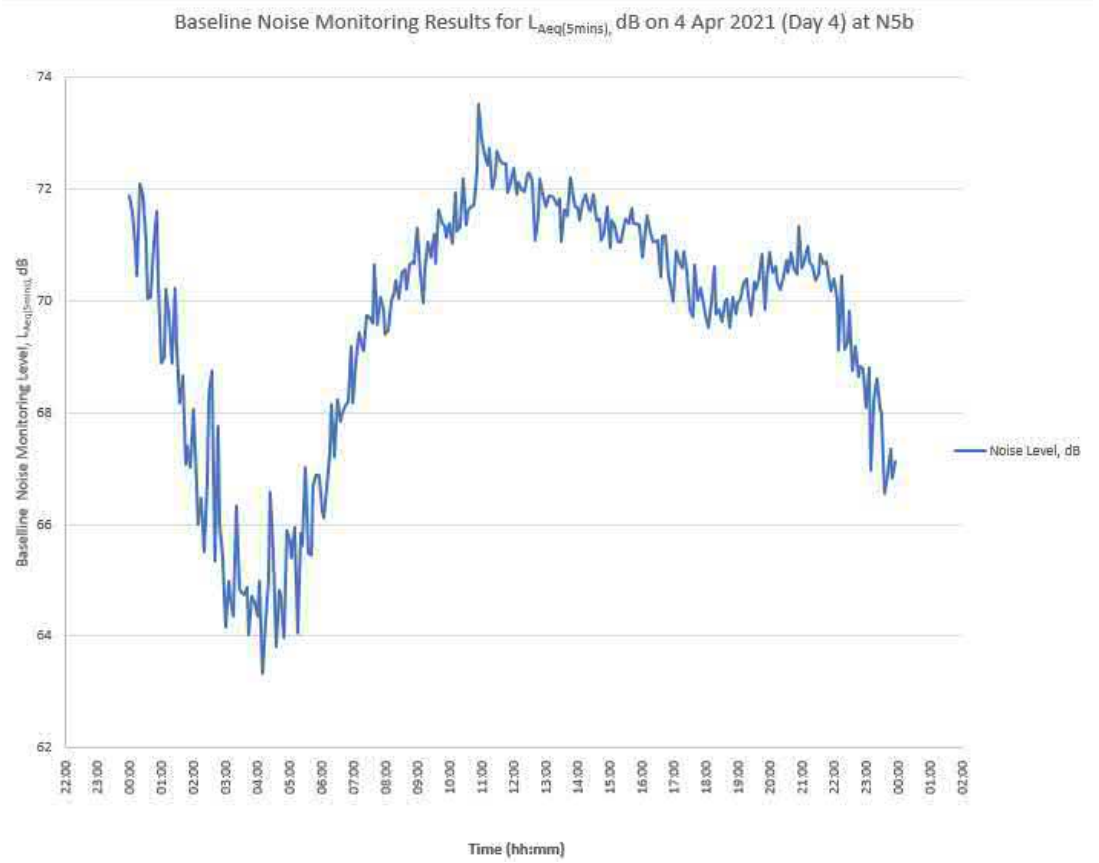

Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 7 Apr 2021 (Day 7) at N5a
Baselline Noise Monitoring Level, $L_{Aeq(5mins)}$, dB
77
72
67
62
57
52
22:00
23:00
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00
Time (hh:mm)
Noise Level, dB

Daily Monitoring Data at N5b

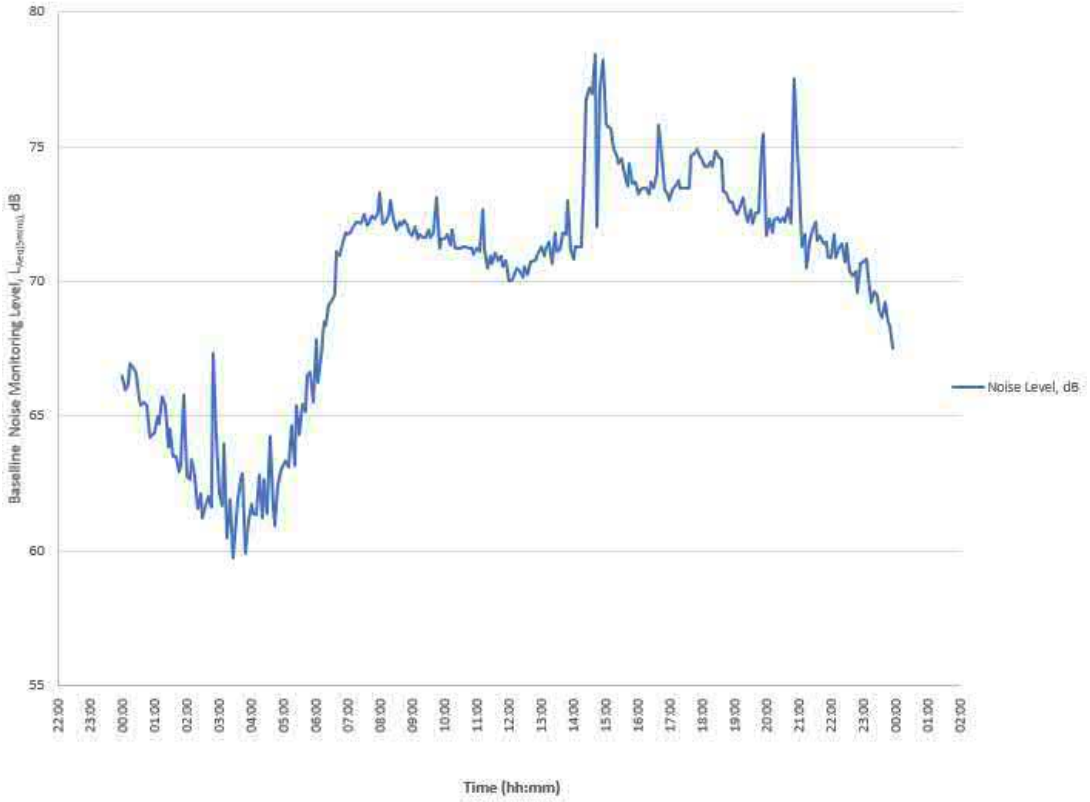




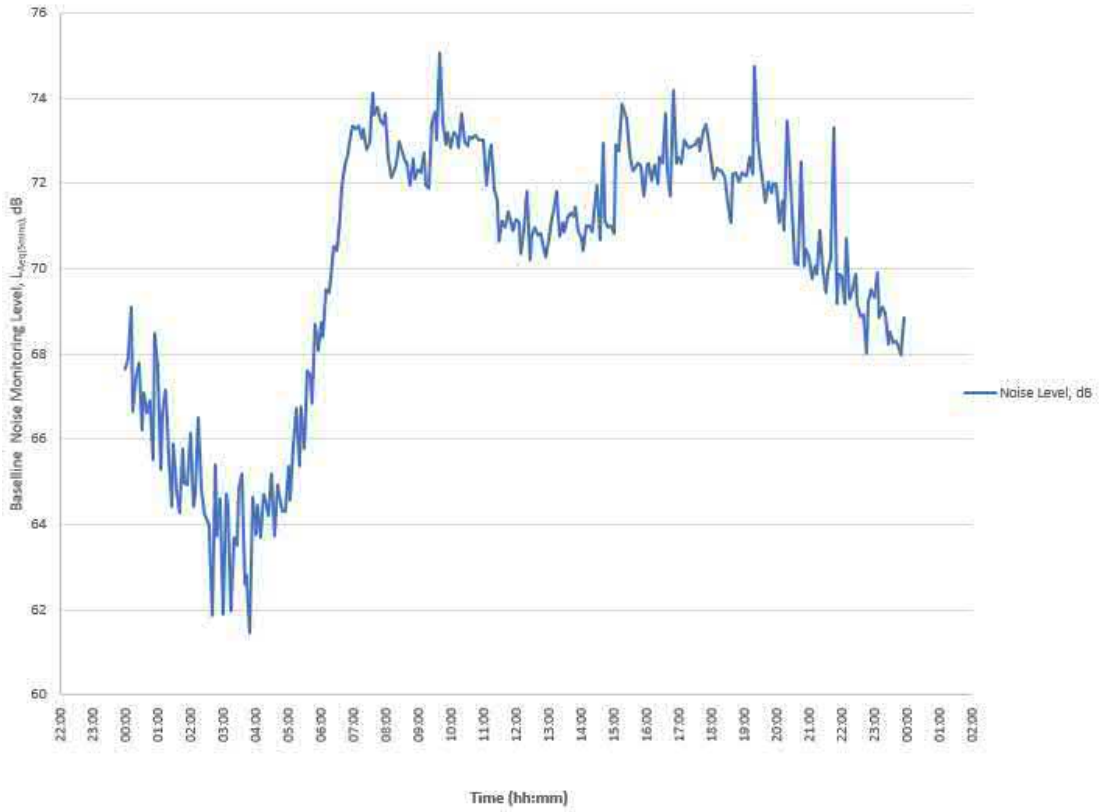

Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 3 Apr 2021 (Day 3) at N5b
Baselline Noise Monitoring Level, $L_{Aeq(5mins)}$, dB
78
76
74
72
70
68
66
64
62
60
22:00
23:00
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00
02:00
Noise Level, dB
Time (hh:mm)

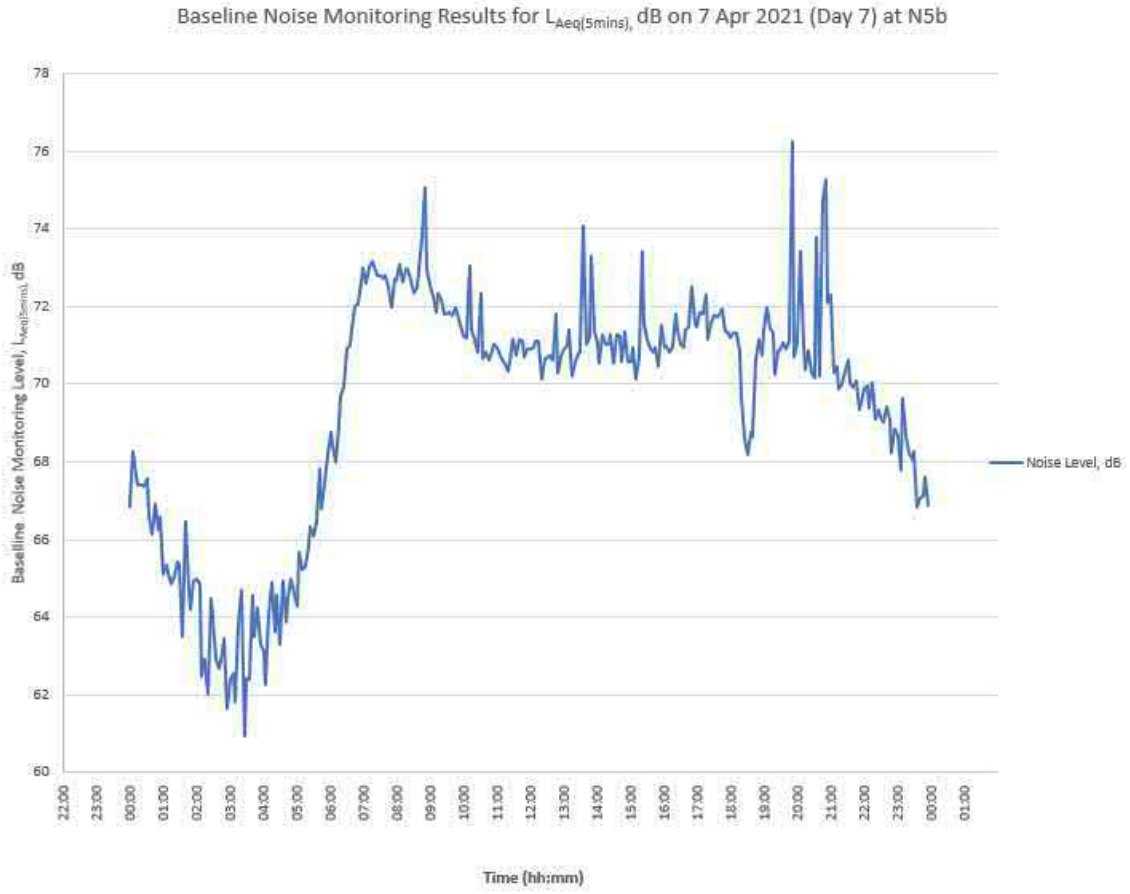

Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 4 Apr 2021 (Day 4) at N5b
Baselline Noise Monitoring Level, $L_{Aeq(5mins)}$, dB
74
72
70
68
66
64
62
22:00
23:00
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00
02:00
Noise Level, dB
Time (hh:mm)

Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 5 Apr 2021 (Day 5) at N5b

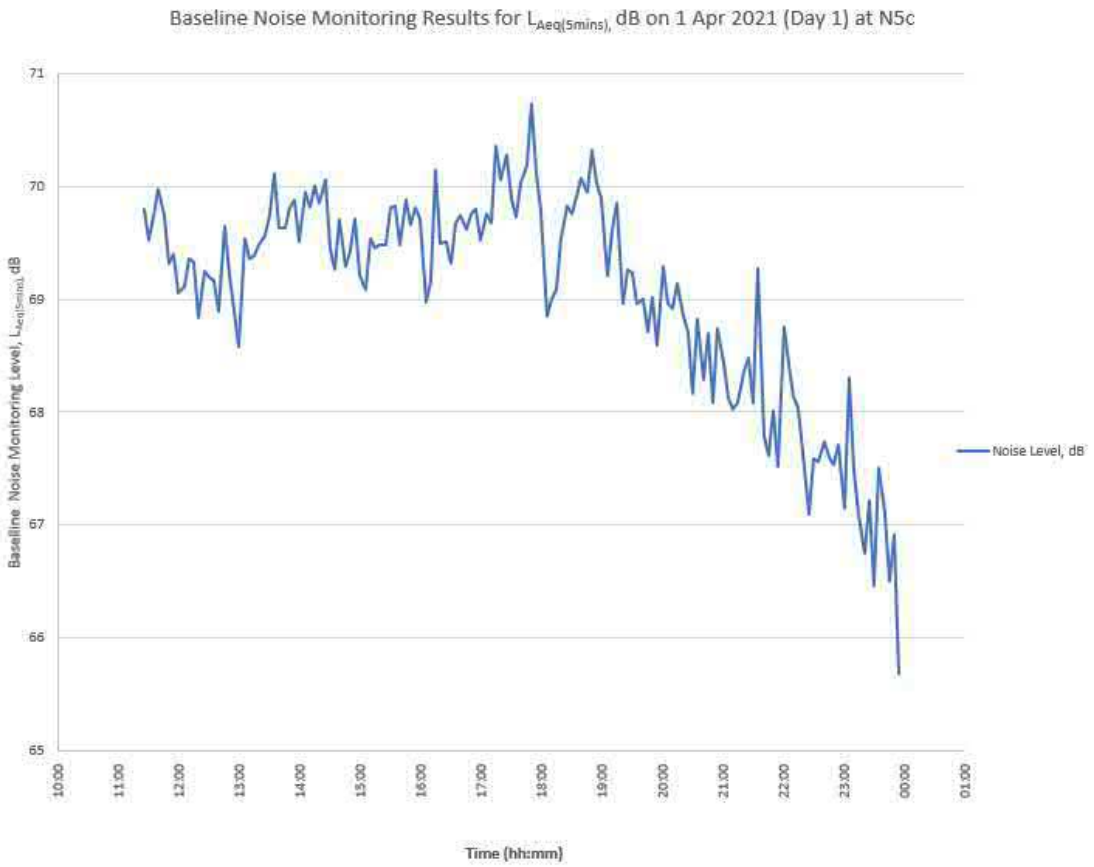


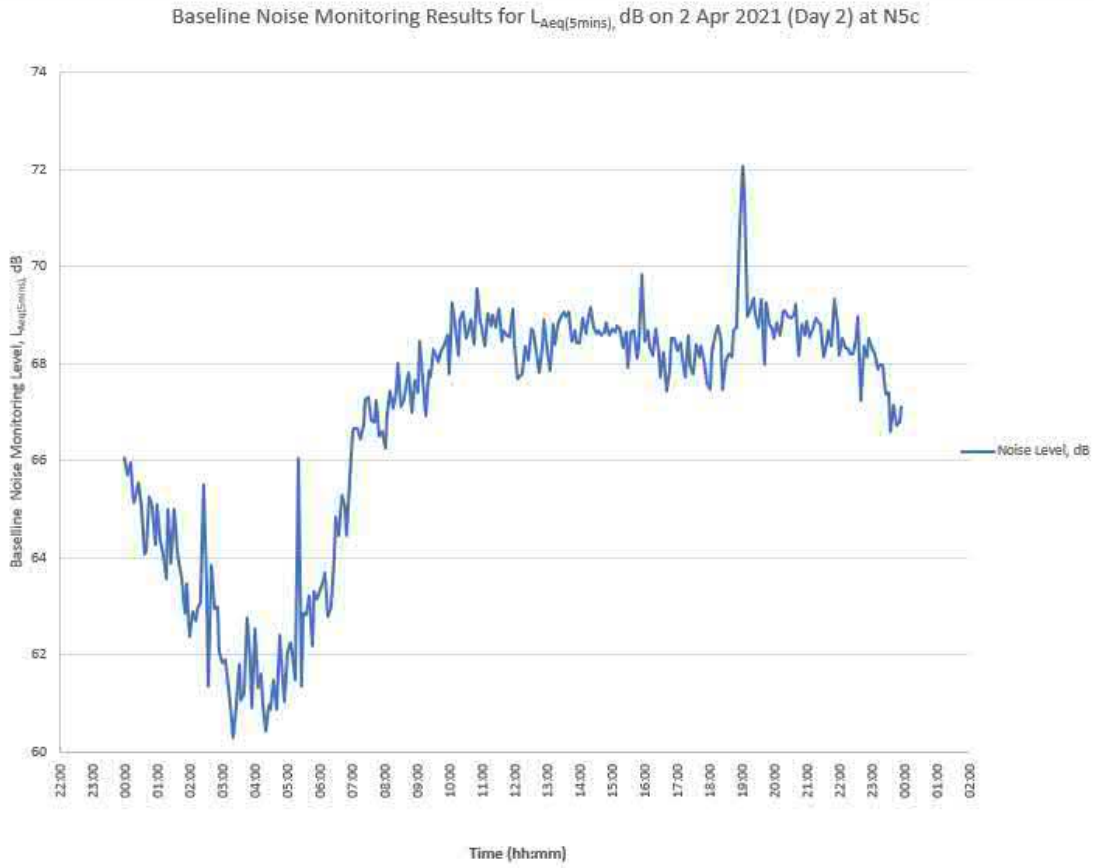
Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 6 Apr 2021 (Day 6) at N5b

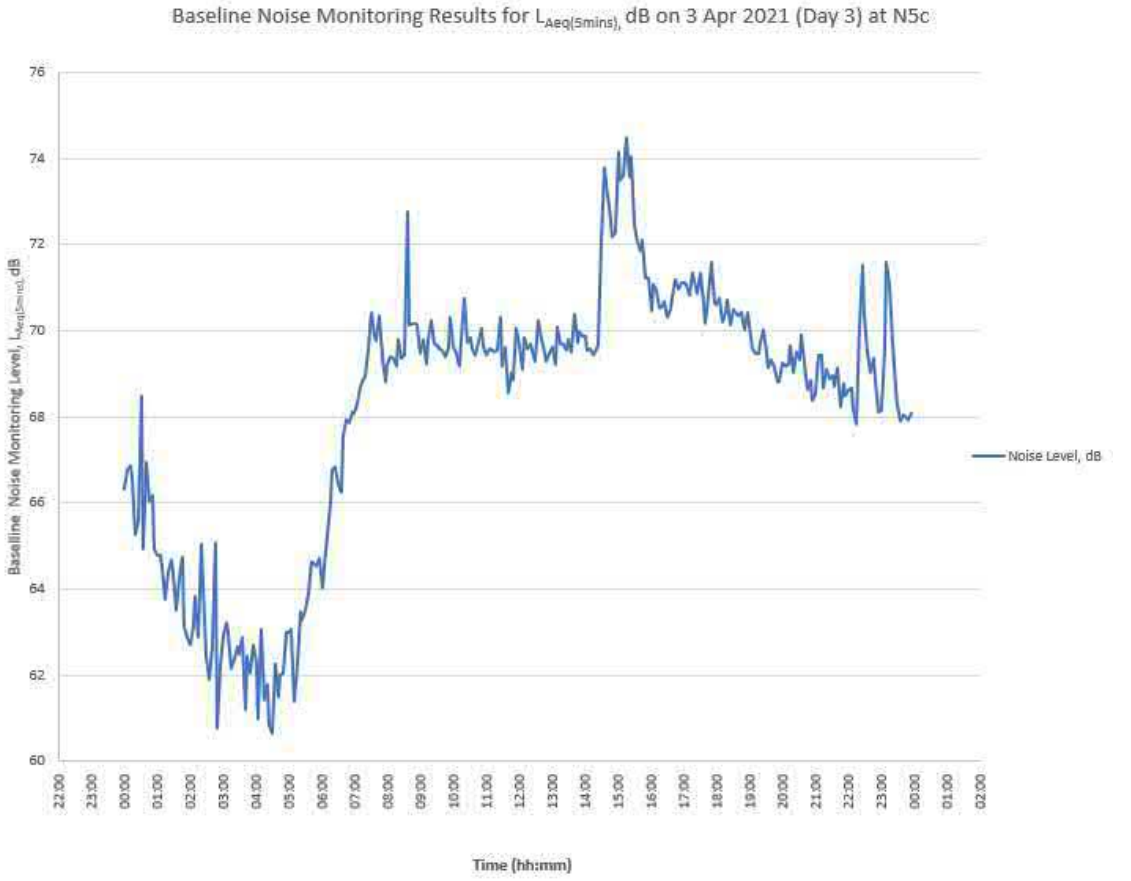


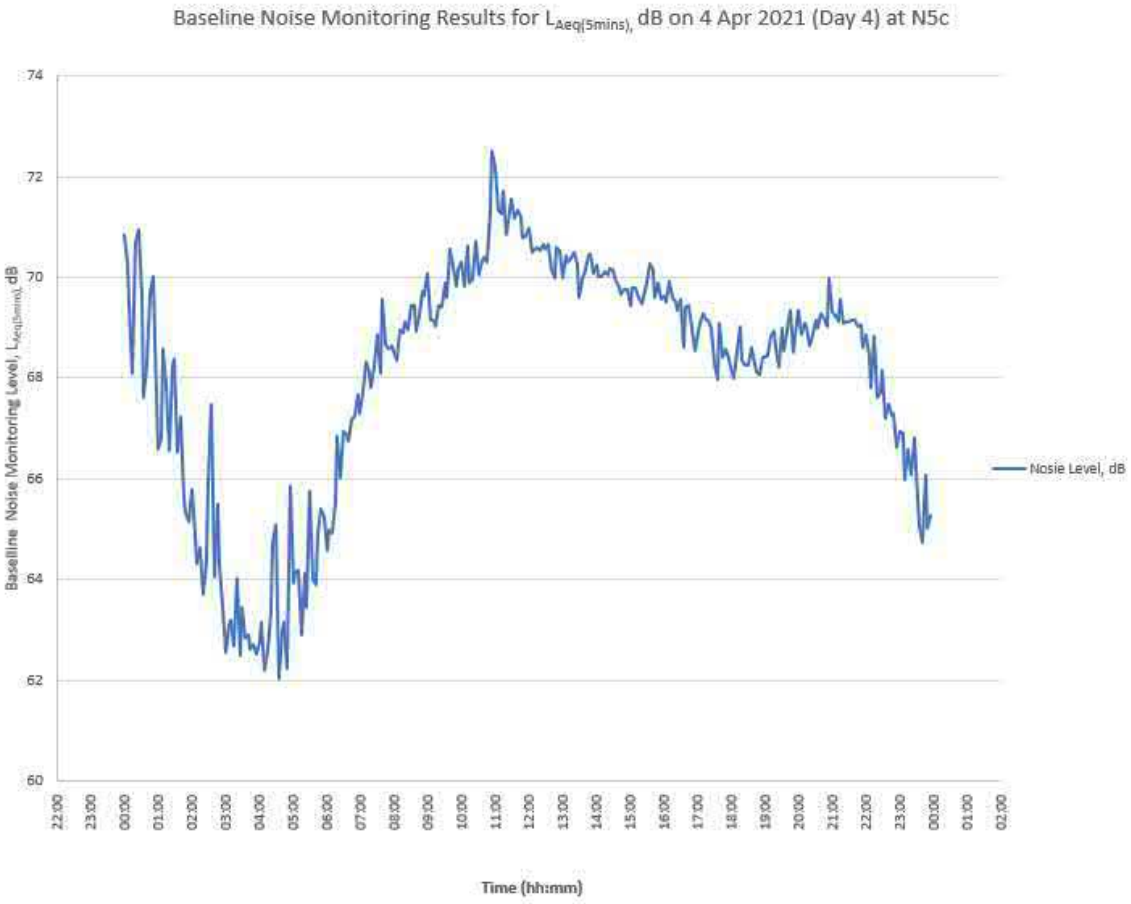

Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 7 Apr 2021 (Day 7) at N5b
Baseline Noise Monitoring Level, $L_{Aeq(5mins)}$, dB
78
76
74
72
70
68
66
64
62
60
22:00
23:00
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00
Time (hh:mm)
Noise Level, dB

Daily Monitoring Data at N5c

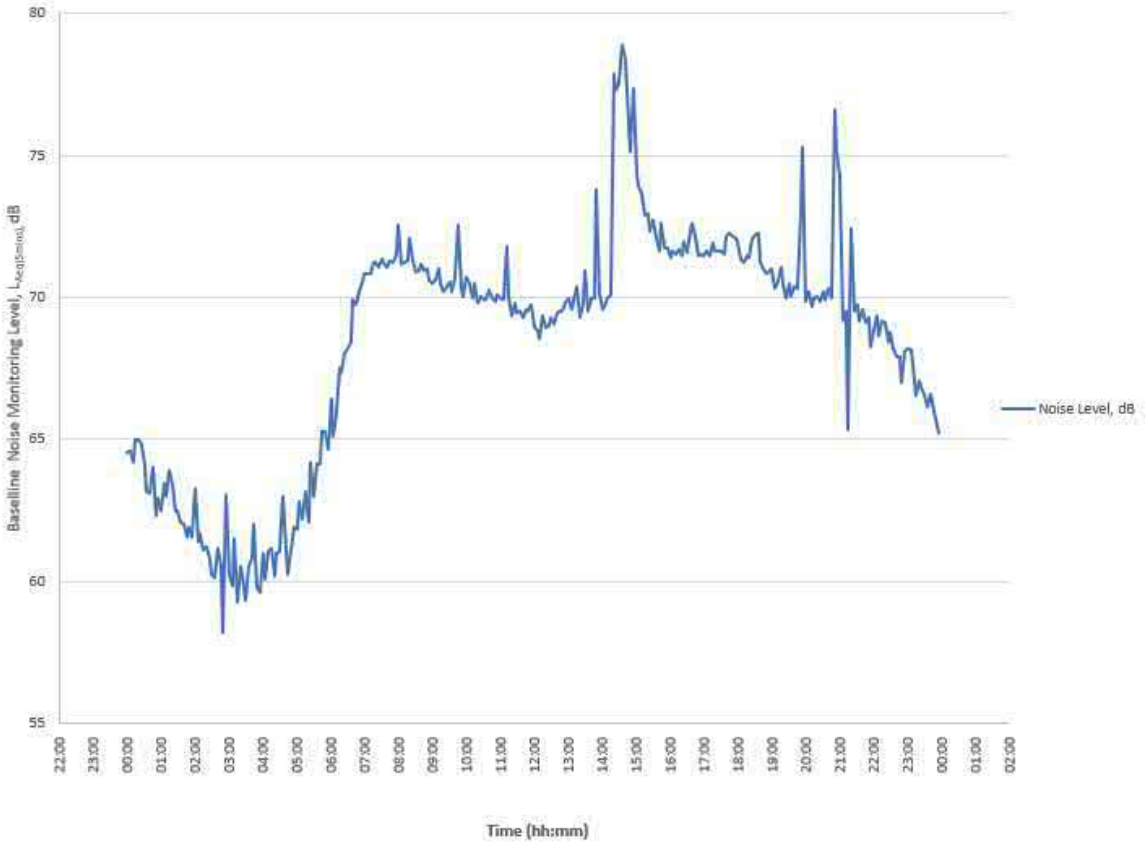




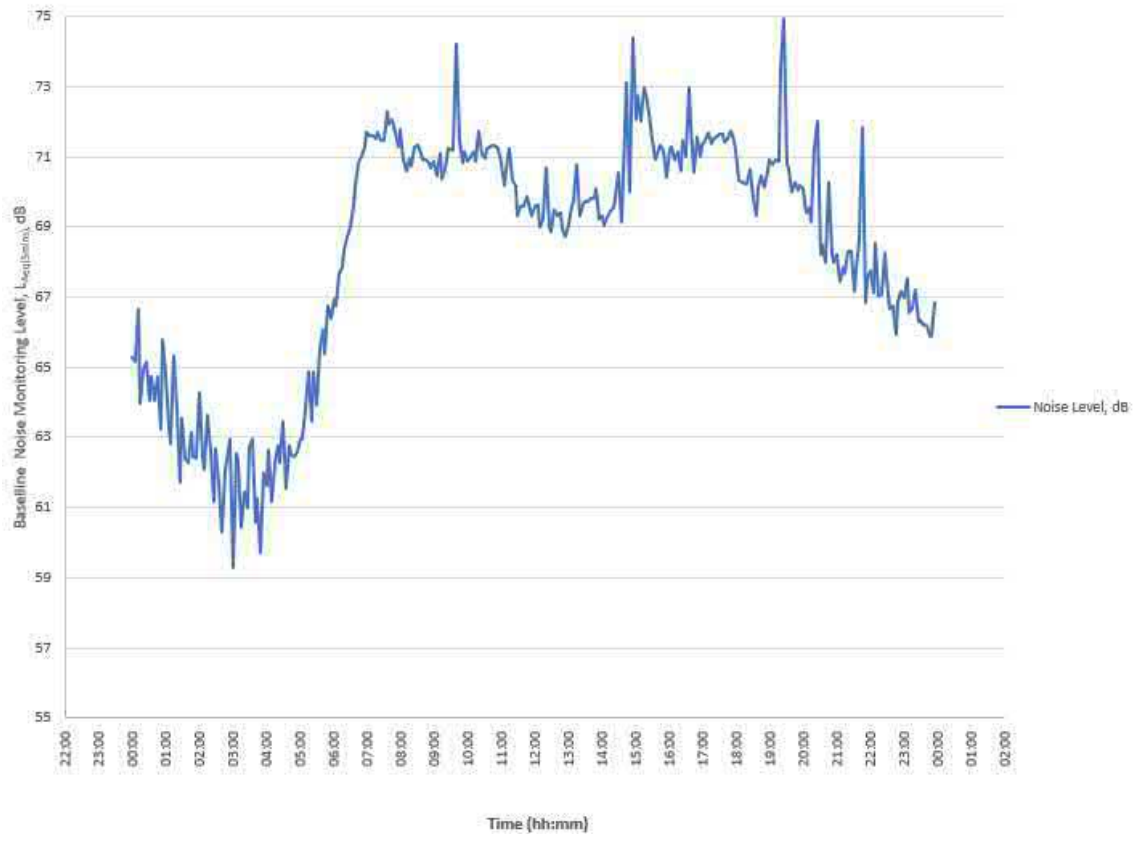

Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 3 Apr 2021 (Day 3) at N5c
Baseline Noise Monitoring Level, $L_{Aeq(5mins)}$, dB
76
74
72
70
68
66
64
62
60
22:00
23:00
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00
02:00
Time (hh:mm)
Noise Level, dB

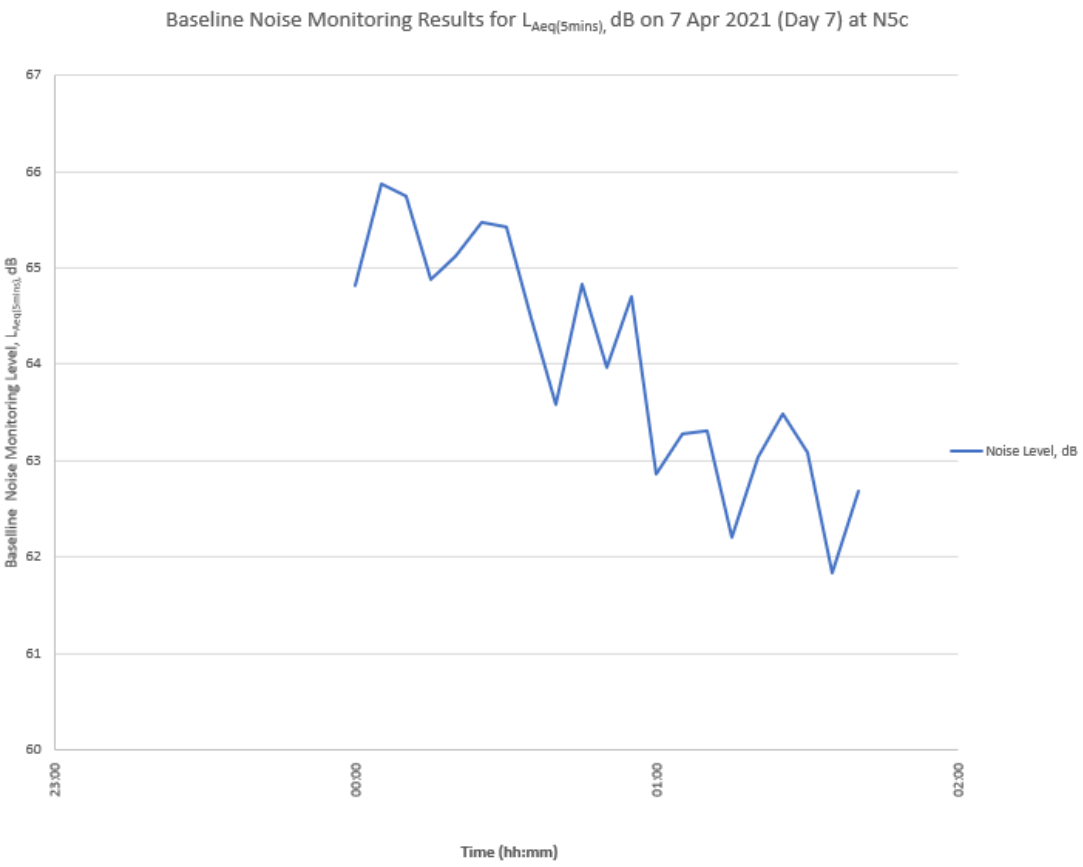

Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 4 Apr 2021 (Day 4) at N5c
Baseline Noise Monitoring Level, $L_{Aeq(5mins)}$, dB
74
72
70
68
66
64
62
60
22:00
23:00
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00
02:00
Time (hh:mm)
Nosie Level, dB

Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 5 Apr 2021 (Day 5) at N5c

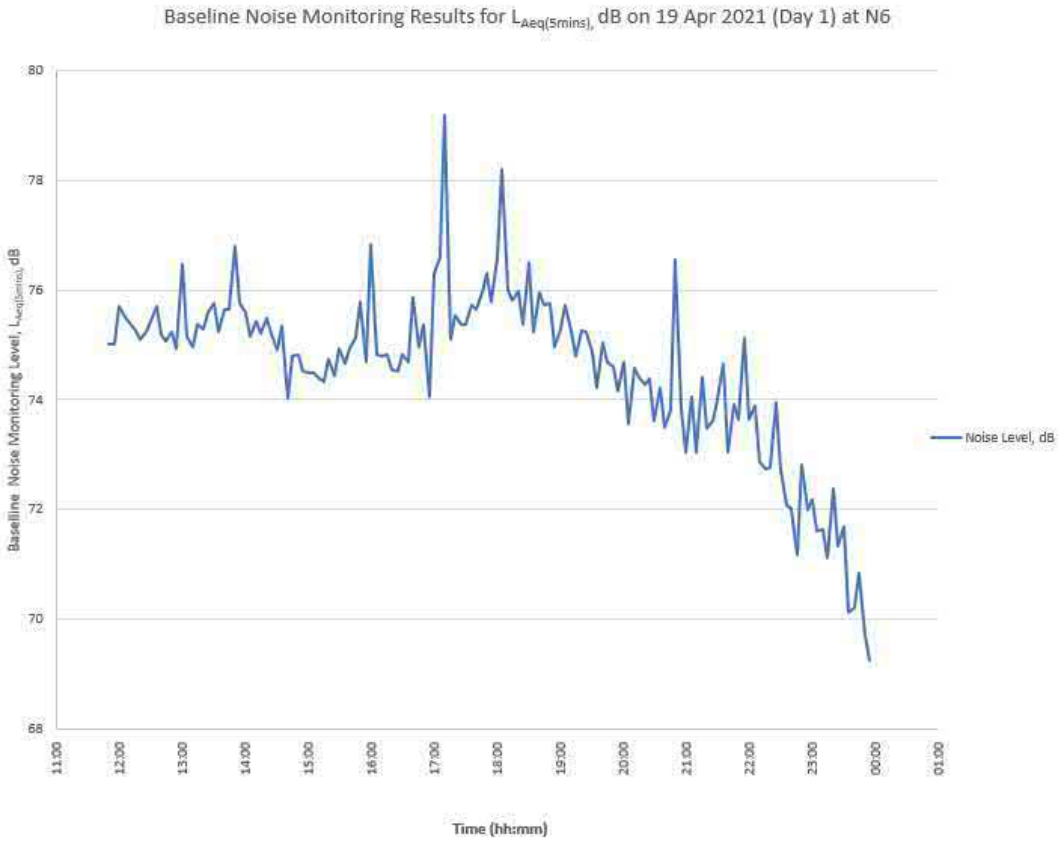


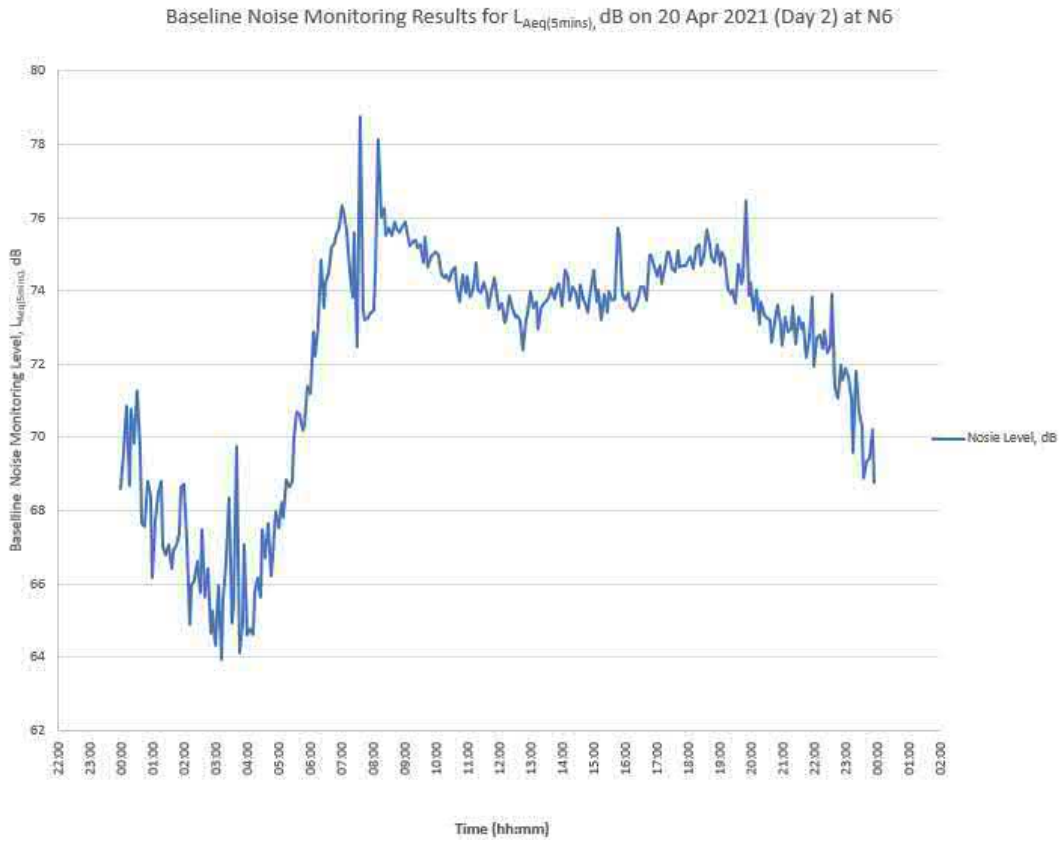
Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 6 Apr 2021 (Day 6) at N5c



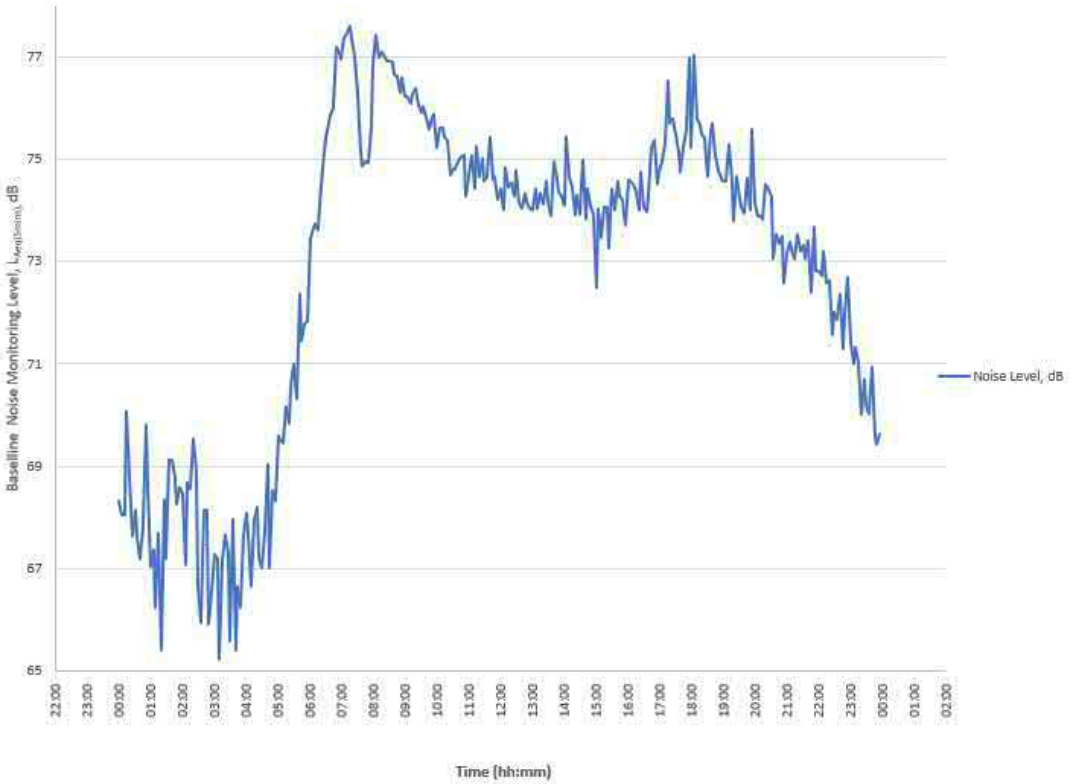

Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 7 Apr 2021 (Day 7) at N5c
67
66
65
64
63
62
61
60
Baselline Noise Monitoring Level, $L_{Aeq(5mins)}$, dB
23:00
00:00
01:00
02:00
Time (hh:mm)
Noise Level, dB

Daily Monitoring Data at N6

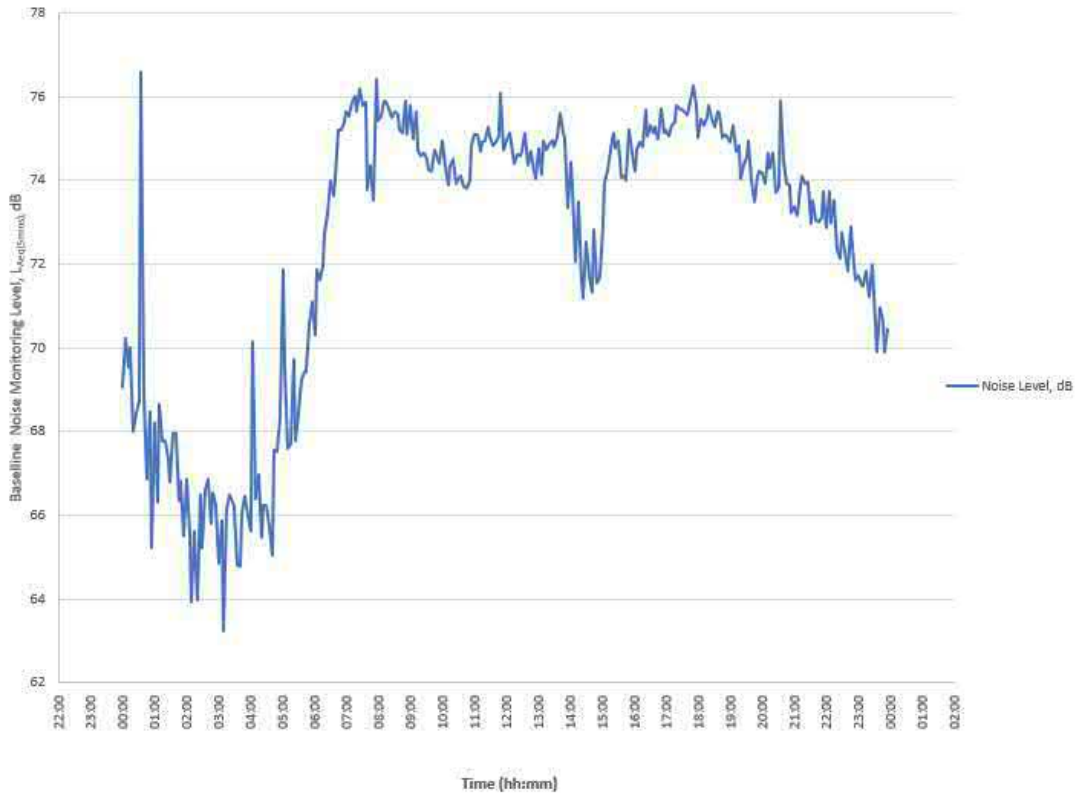


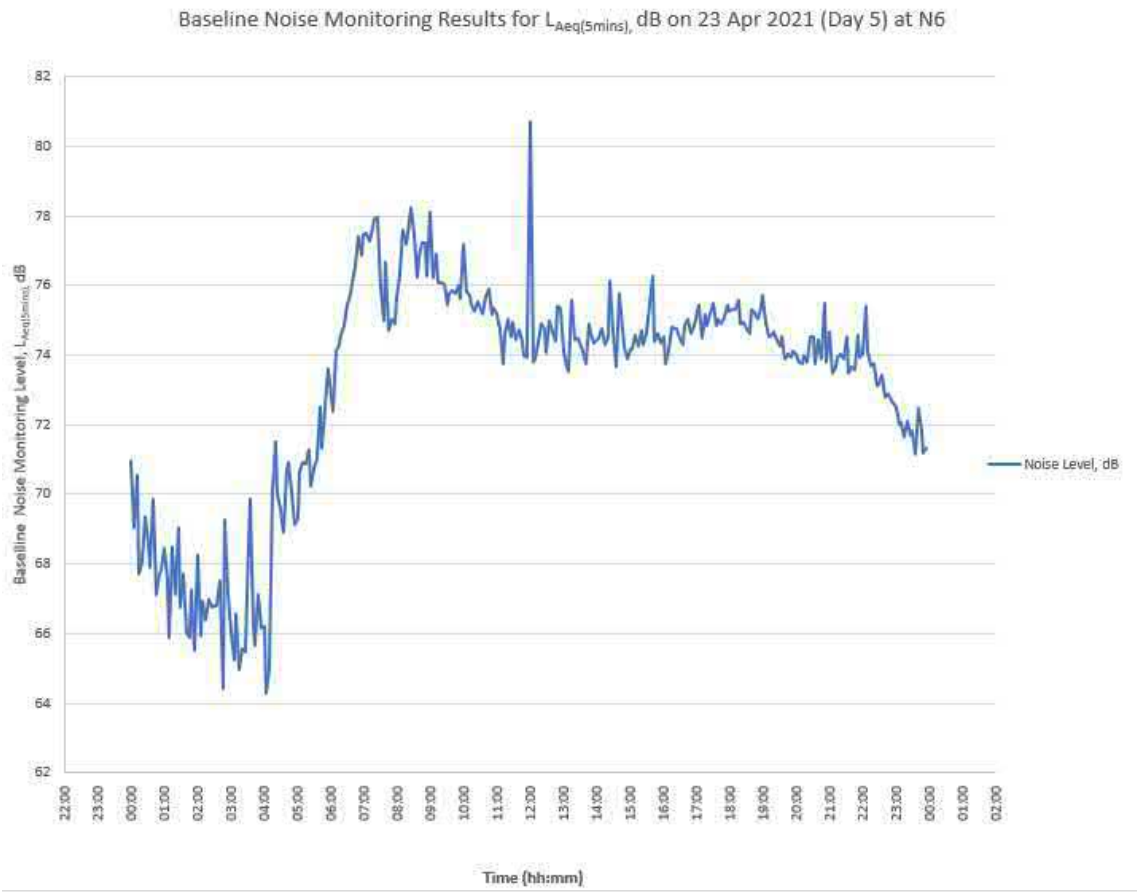


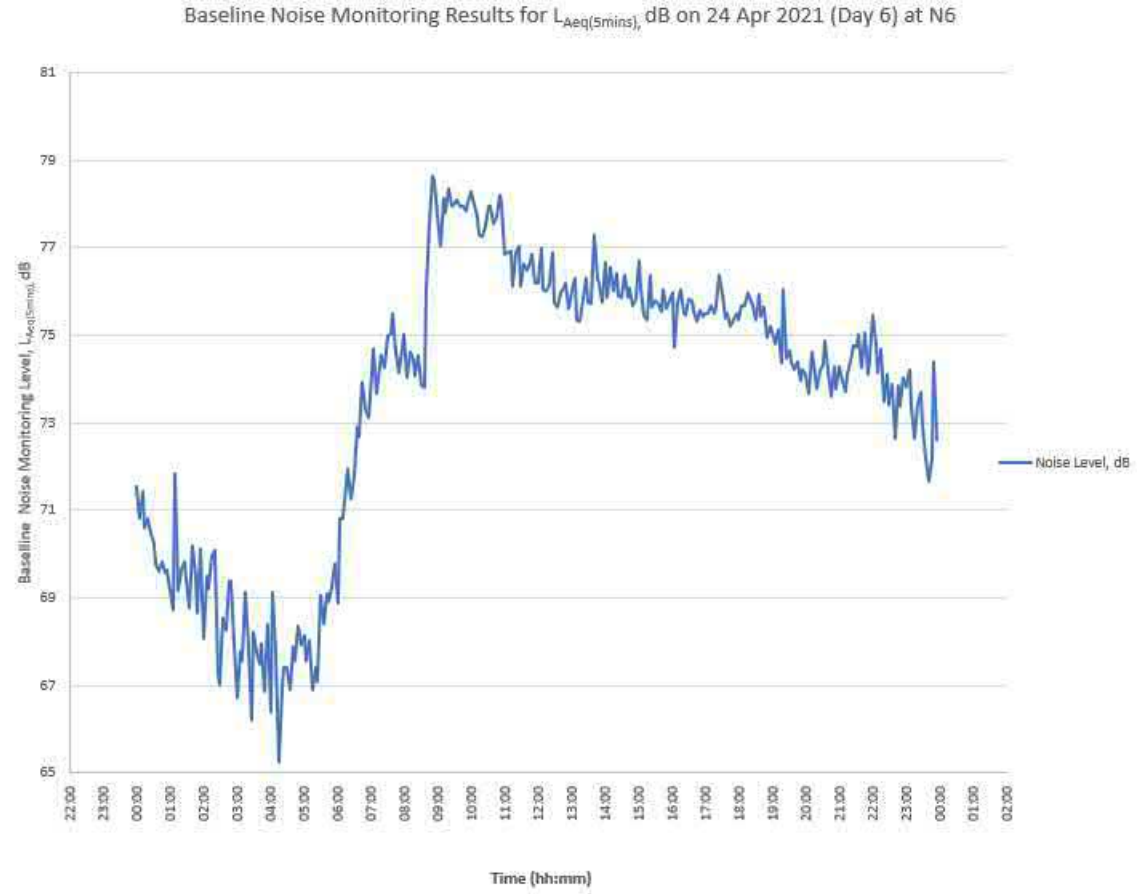
Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 21 Apr 2021 (Day 3) at N6

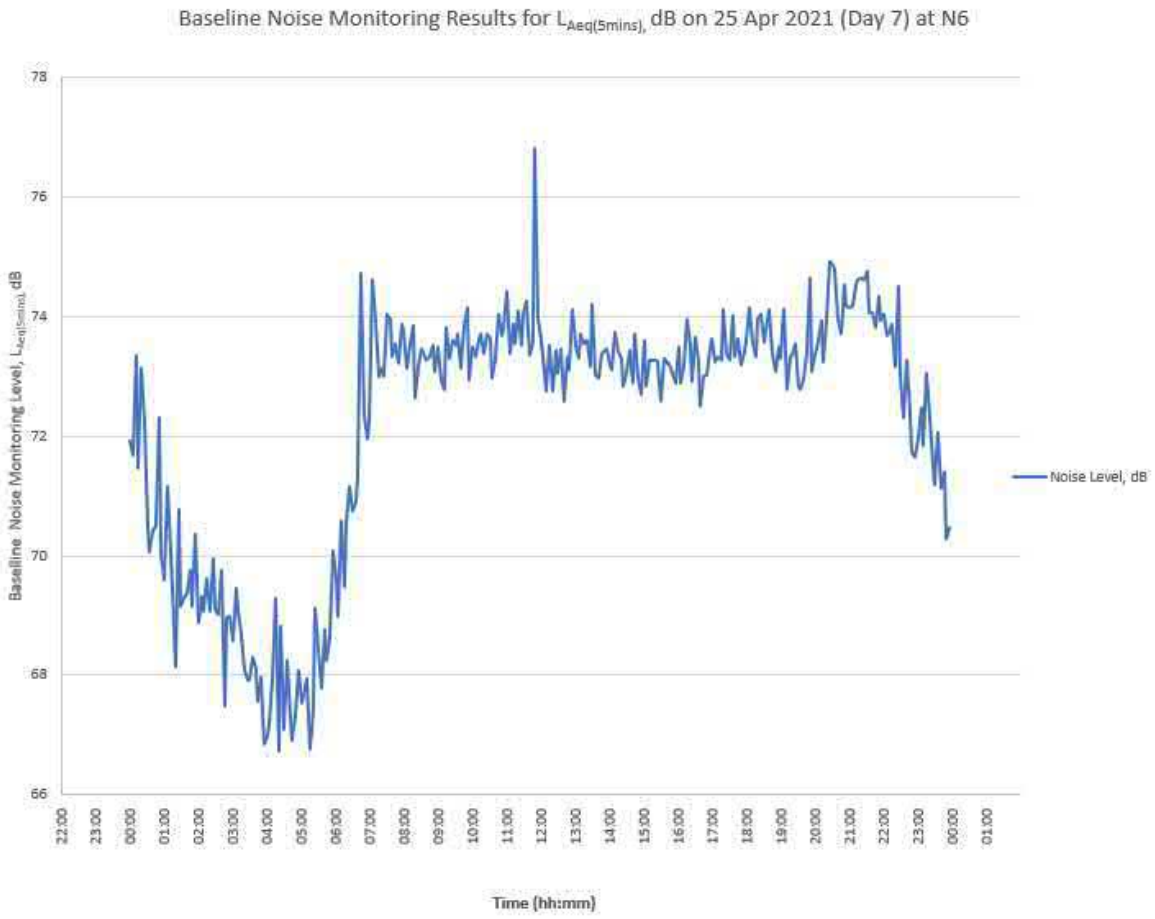


Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 22 Apr 2021 (Day 4) at N6

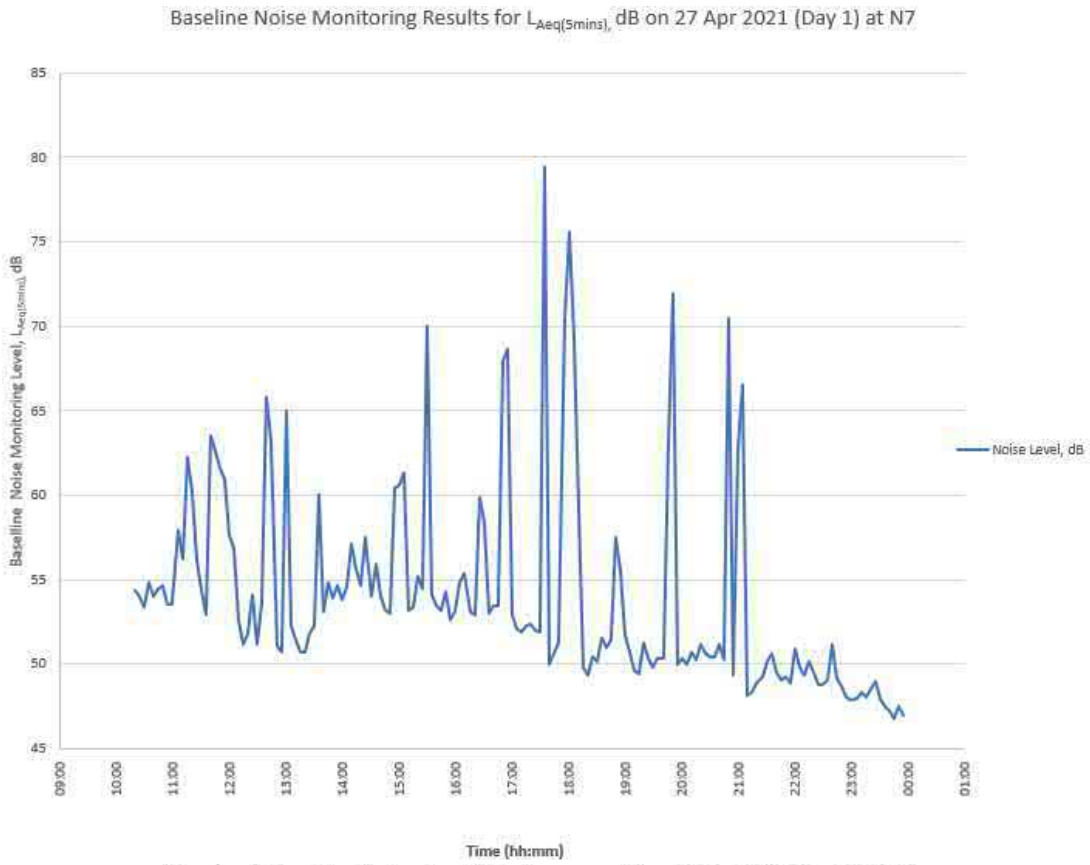


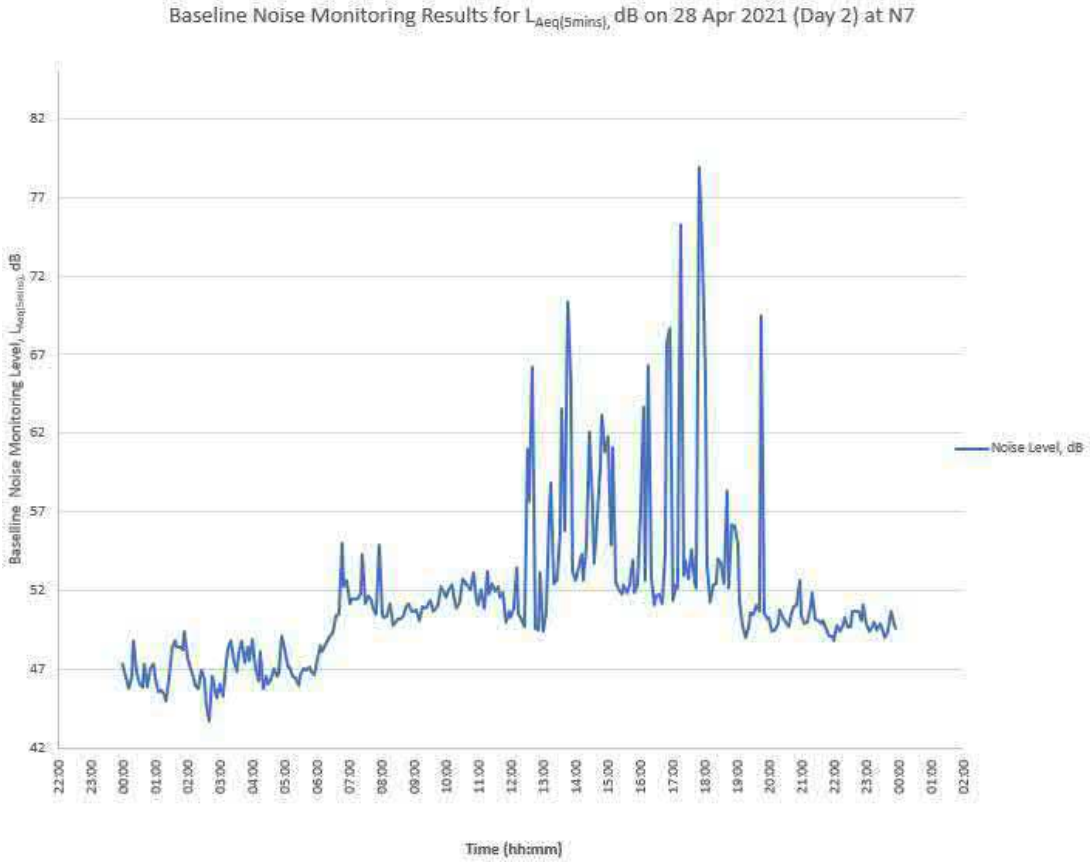

Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 23 Apr 2021 (Day 5) at N6
Baseline Noise Monitoring Level, $L_{Aeq(5mins)}$, dB
Time (hh:mm)
Noise Level, dB


Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 24 Apr 2021 (Day 6) at N6
Baseline Noise Monitoring Level, $L_{Aeq(5mins)}$, dB
Time (hh:mm)
Noise Level, dB

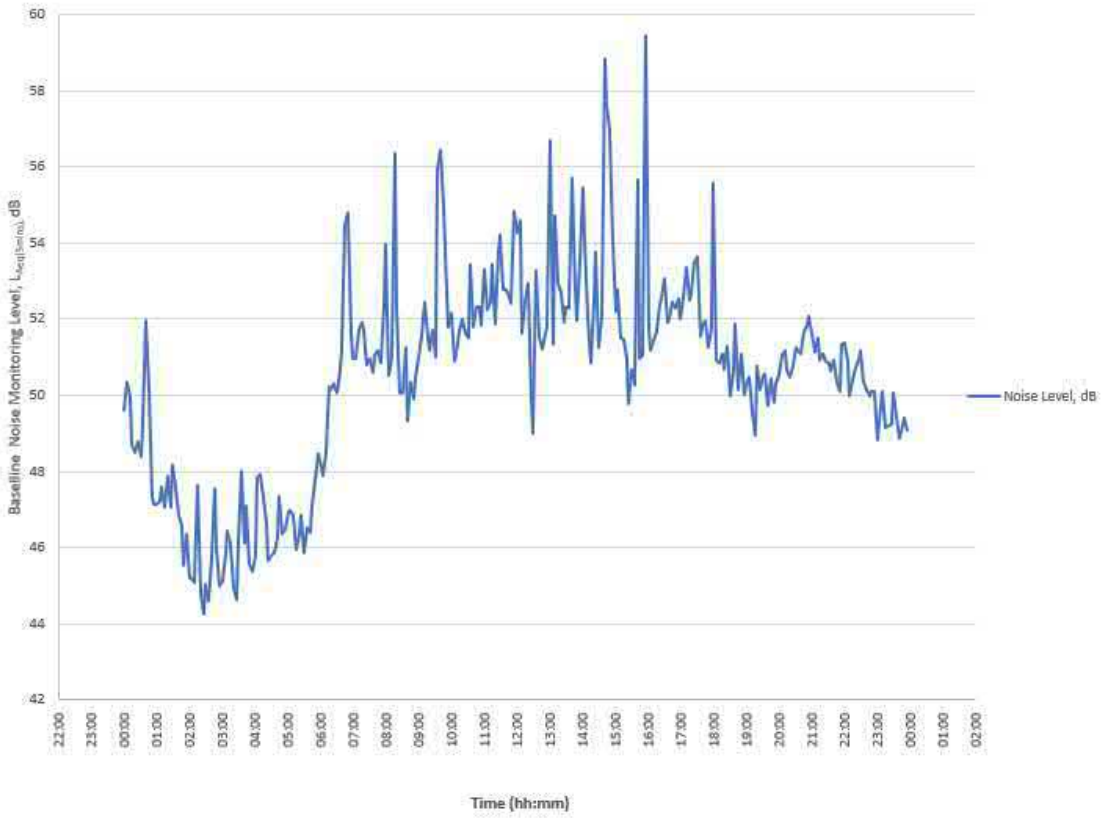

Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 25 Apr 2021 (Day 7) at N6
Baseline Noise Monitoring Level, $L_{Aeq(5mins)}$, dB
78
76
74
72
70
68
66
22:00
23:00
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00
Time (hh:mm)
Noise Level, dB

Daily Monitoring Data at N7

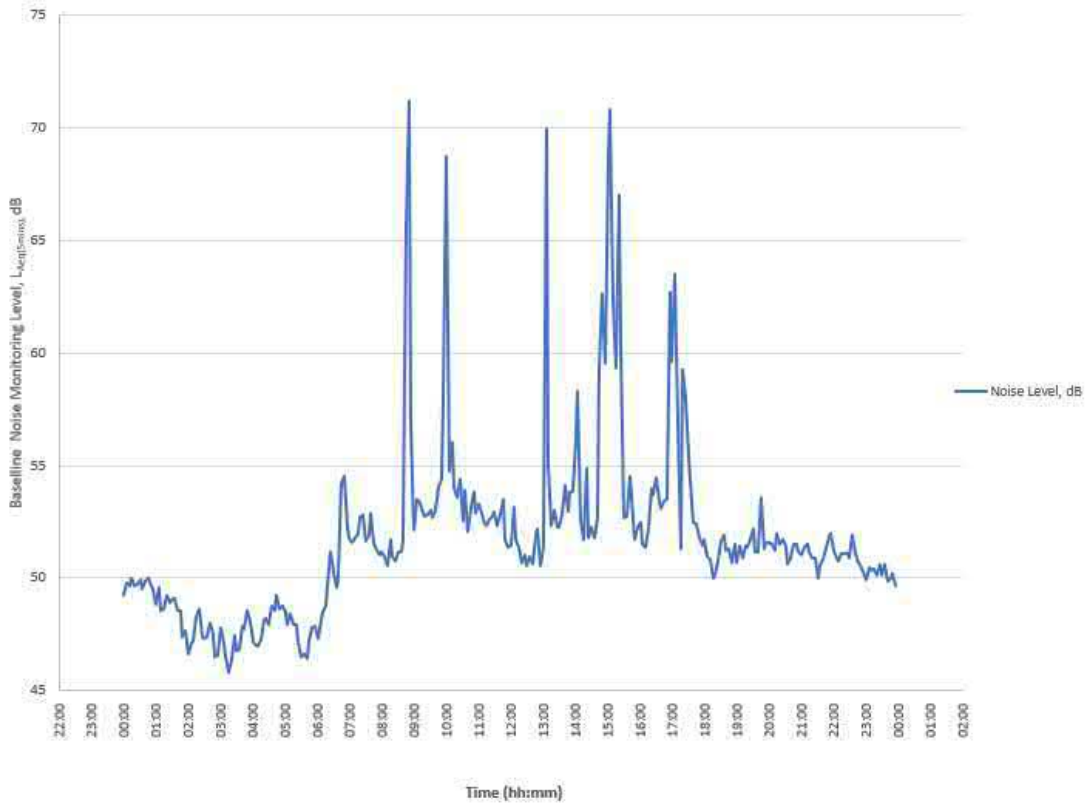


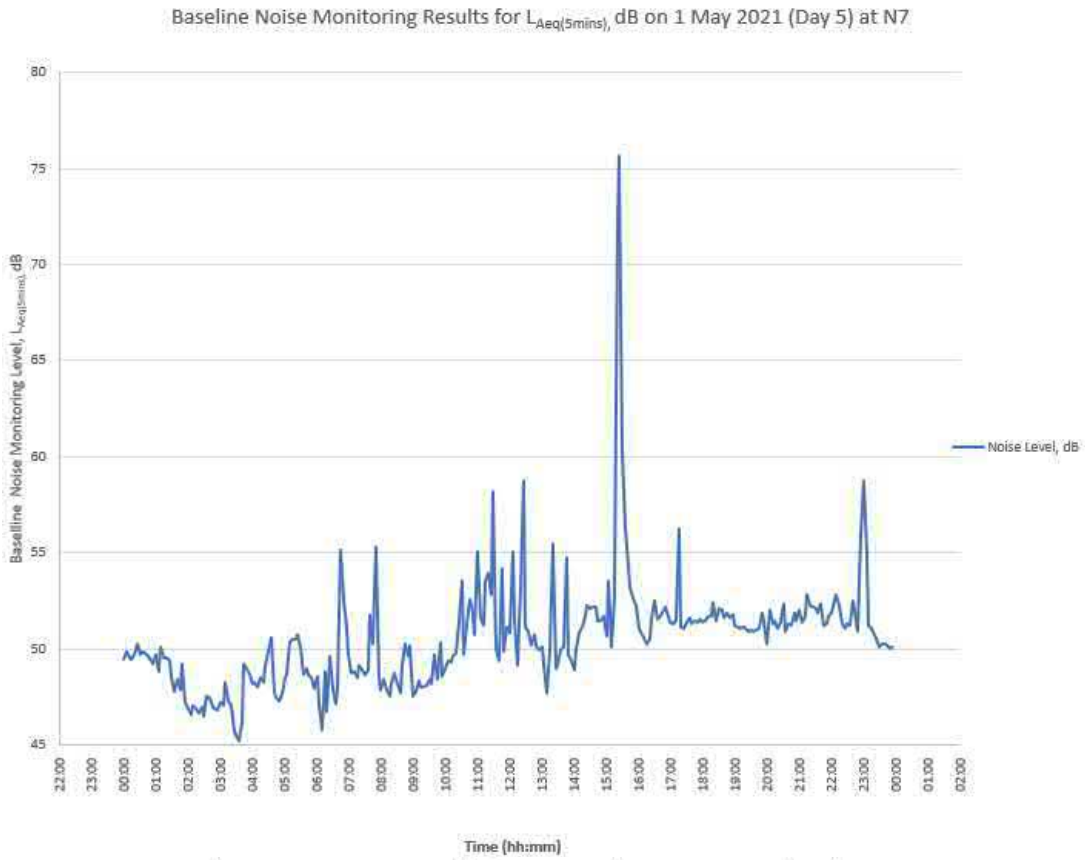


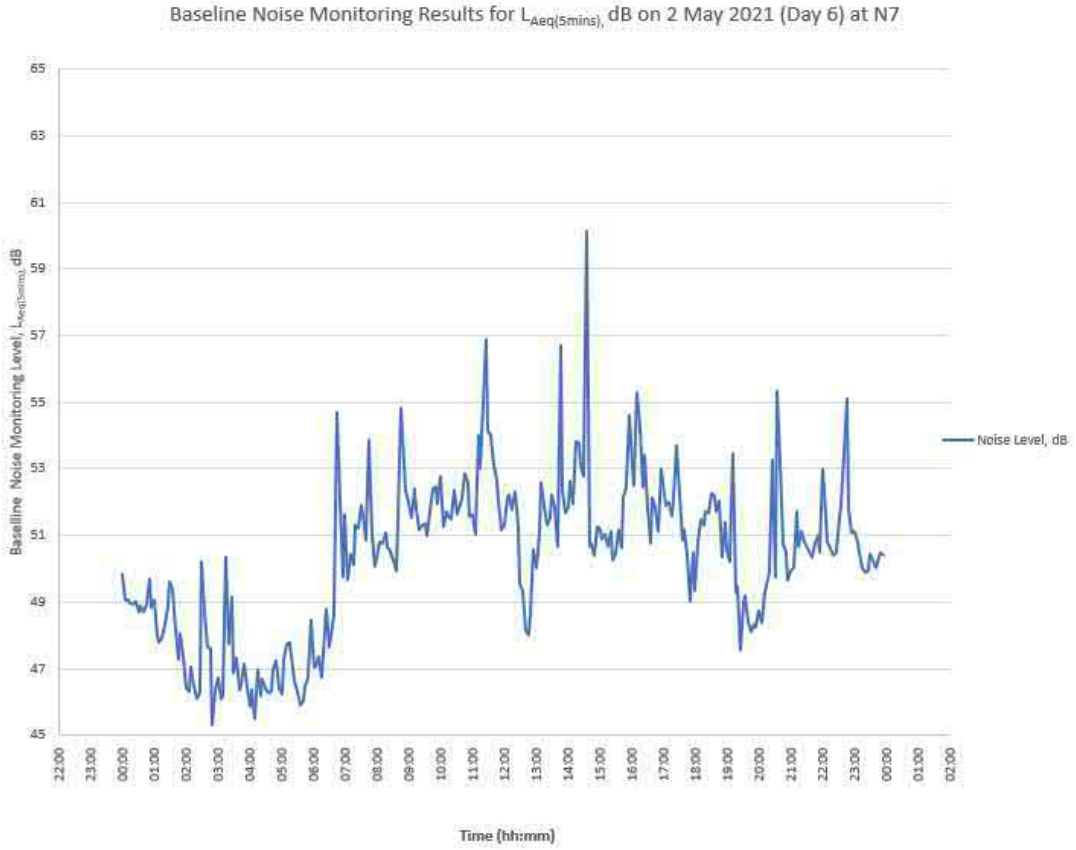
Baseline Noise Monitoring Results for $L_{Aeq(5mins),}$ dB on 29 Apr 2021 (Day 3) at N7

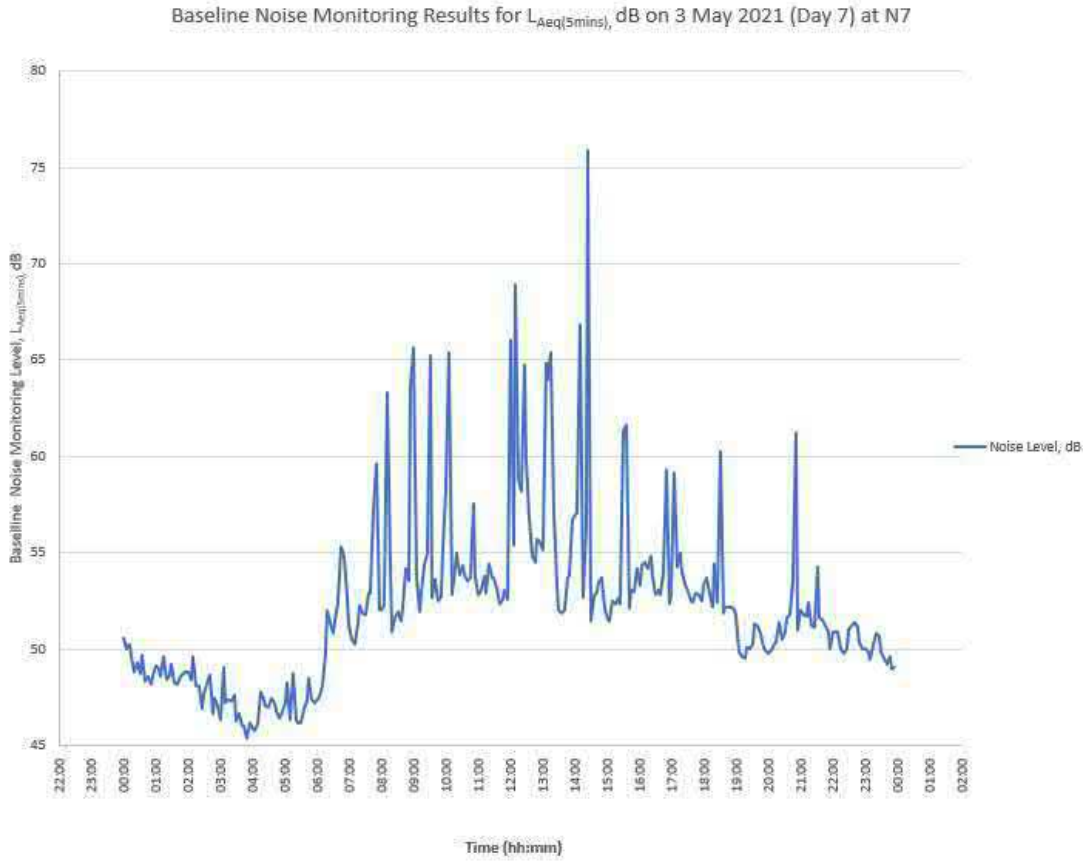


Baseline Noise Monitoring Results for $L_{Aeq(5mins),}$ dB on 30 Apr 2021 (Day 4) at N7

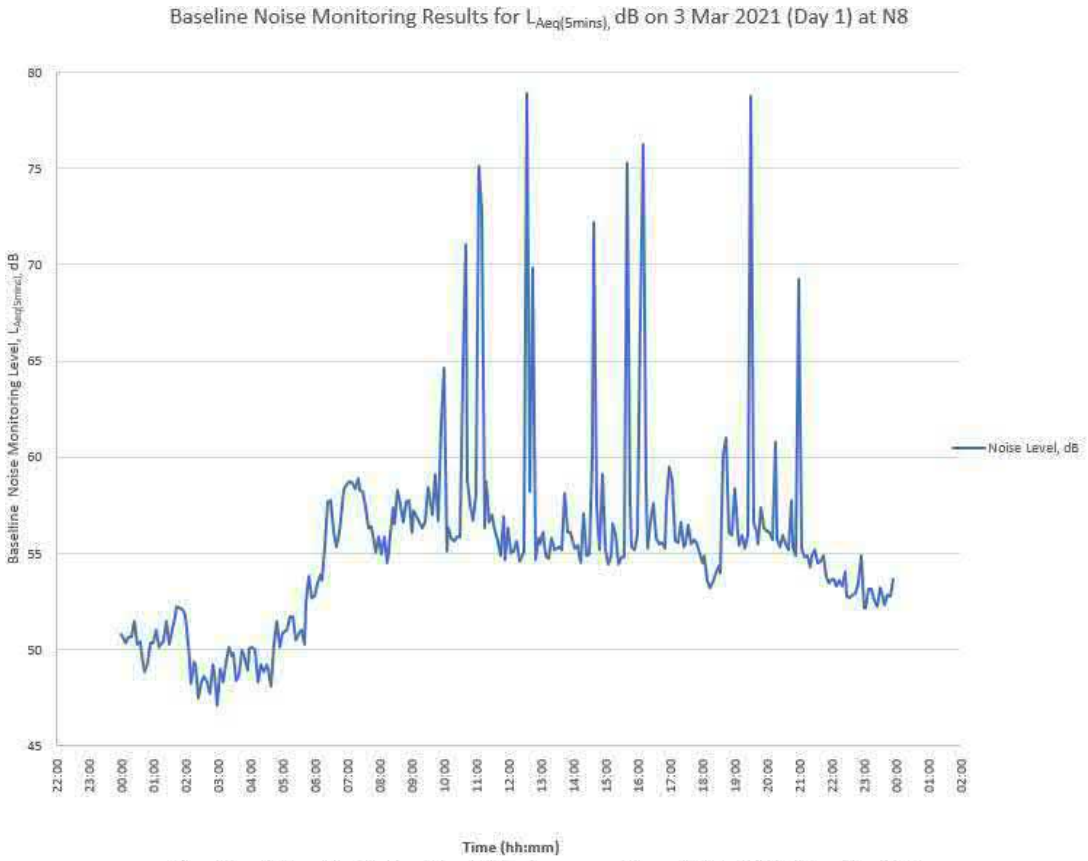


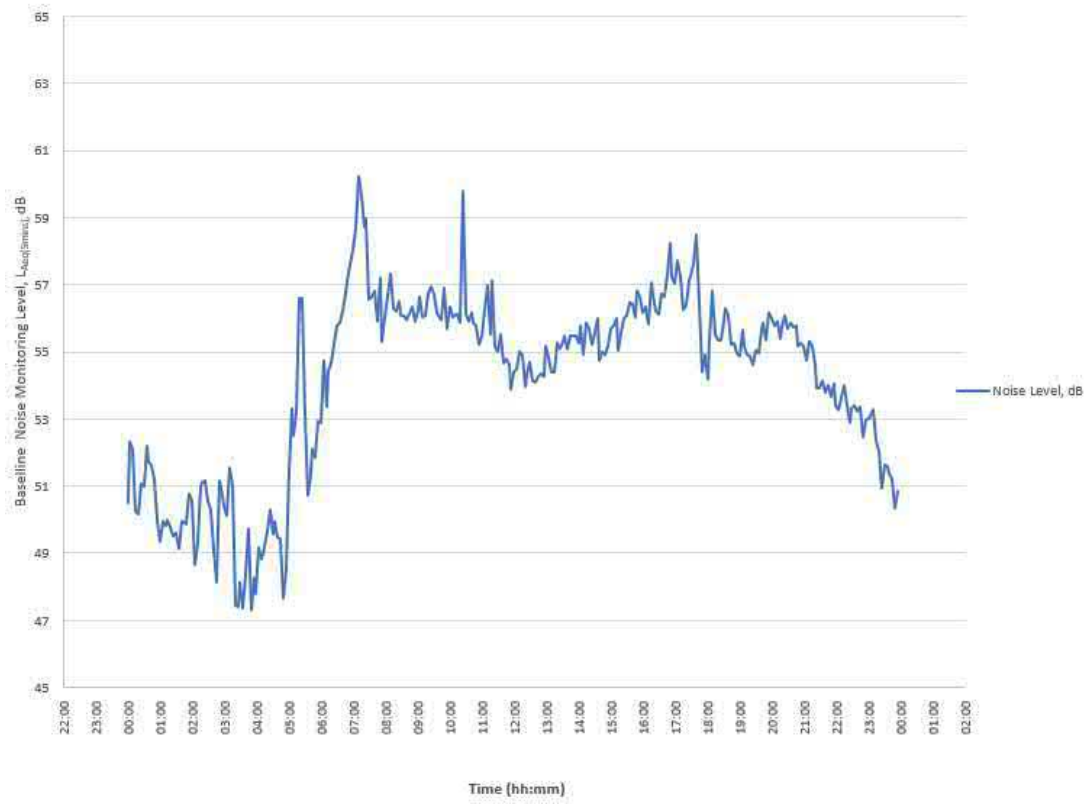

Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 1 May 2021 (Day 5) at N7
Baseline Noise Monitoring Level, $L_{Aeq(5mins)}$, dB
Time (hh:mm)
Noise Level, dB


Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 2 May 2021 (Day 6) at N7
Baseline Noise Monitoring Level, $L_{Aeq(5mins)}$, dB
Time (hh:mm)
Noise Level, dB

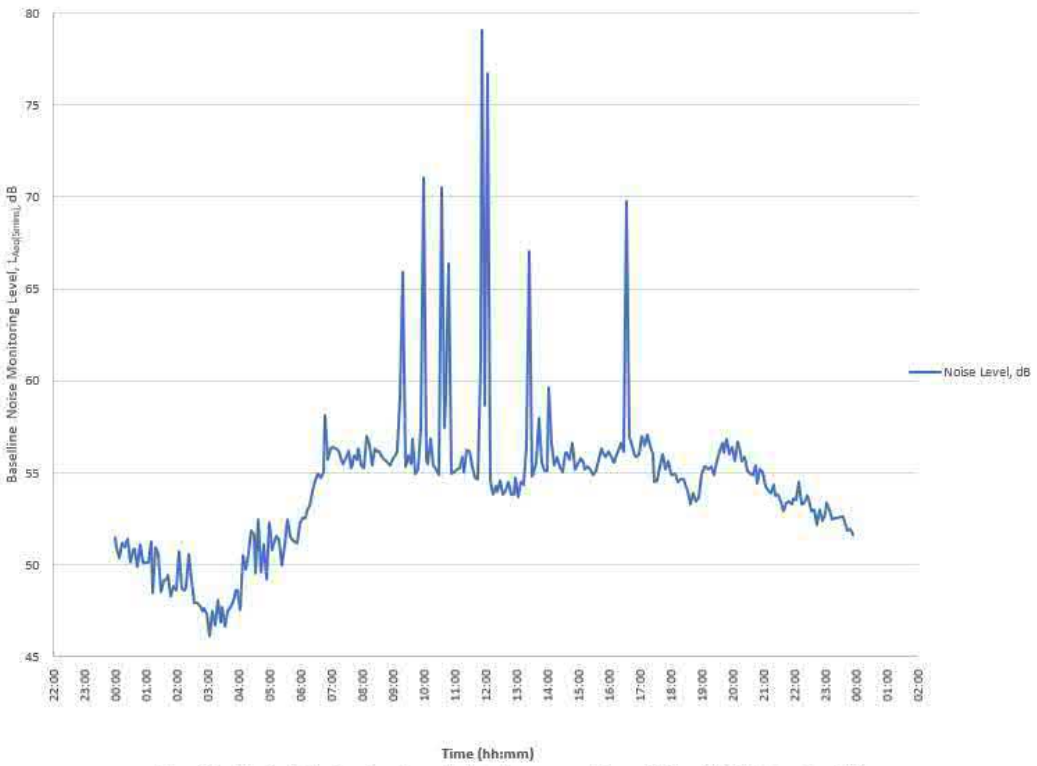

Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 3 May 2021 (Day 7) at N7
Baseline Noise Monitoring Level, $L_{Aeq(5mins)}$, dB
80
75
70
65
60
55
50
45
22:00
23:00
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00
02:00
Time (hh:mm)
Noise Level, dB

Daily Monitoring Data at N8

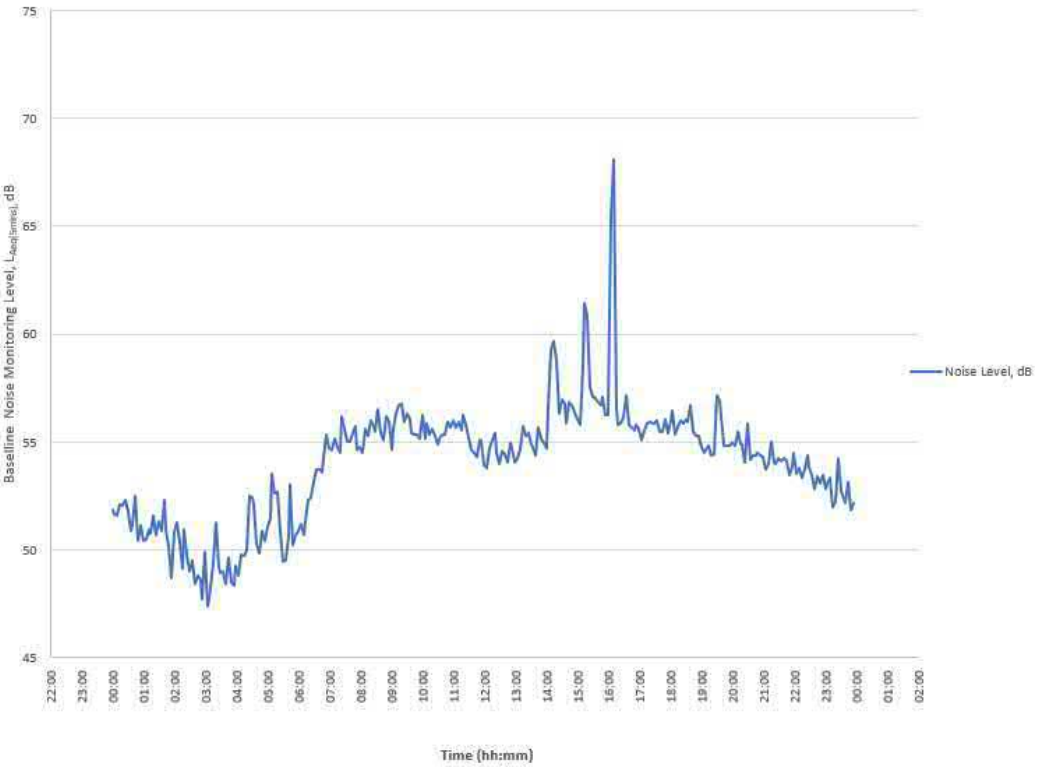




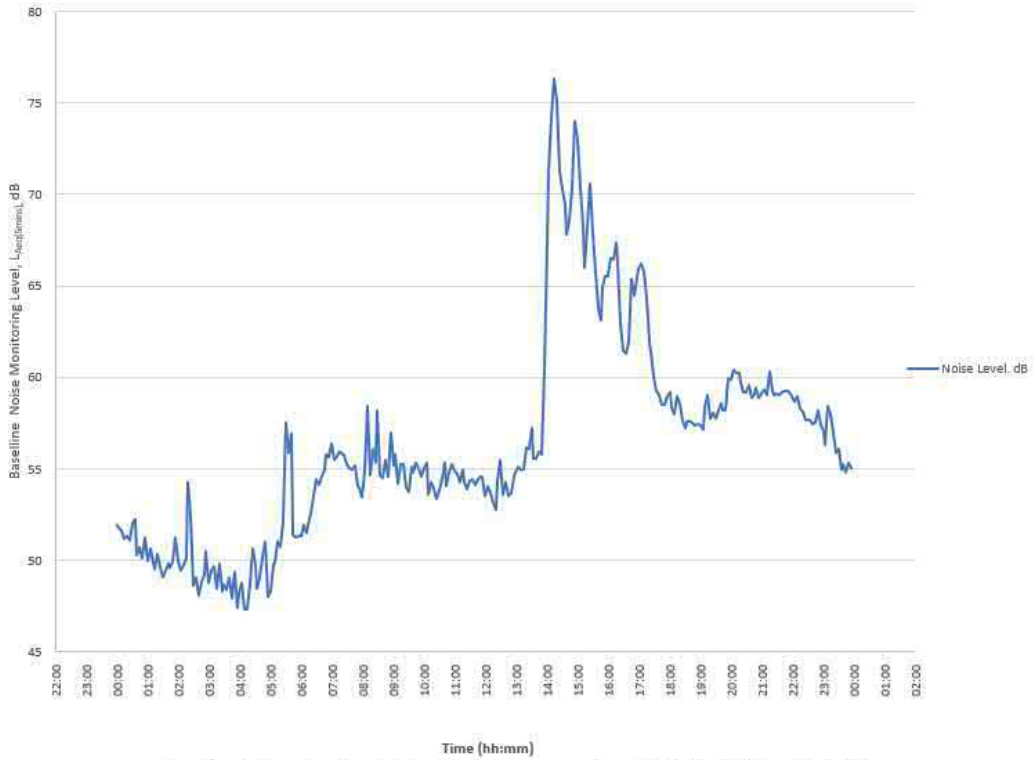
Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 5 Mar 2021 (Day 3) at N8



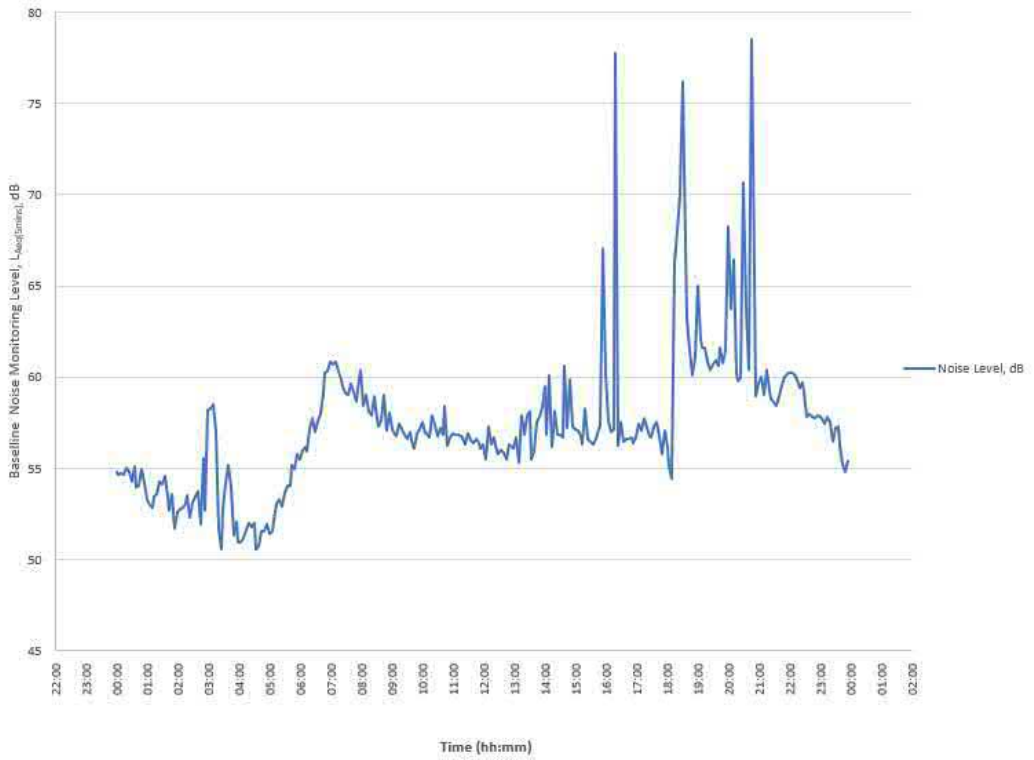
Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 6 Mar 2021 (Day 4) at N8

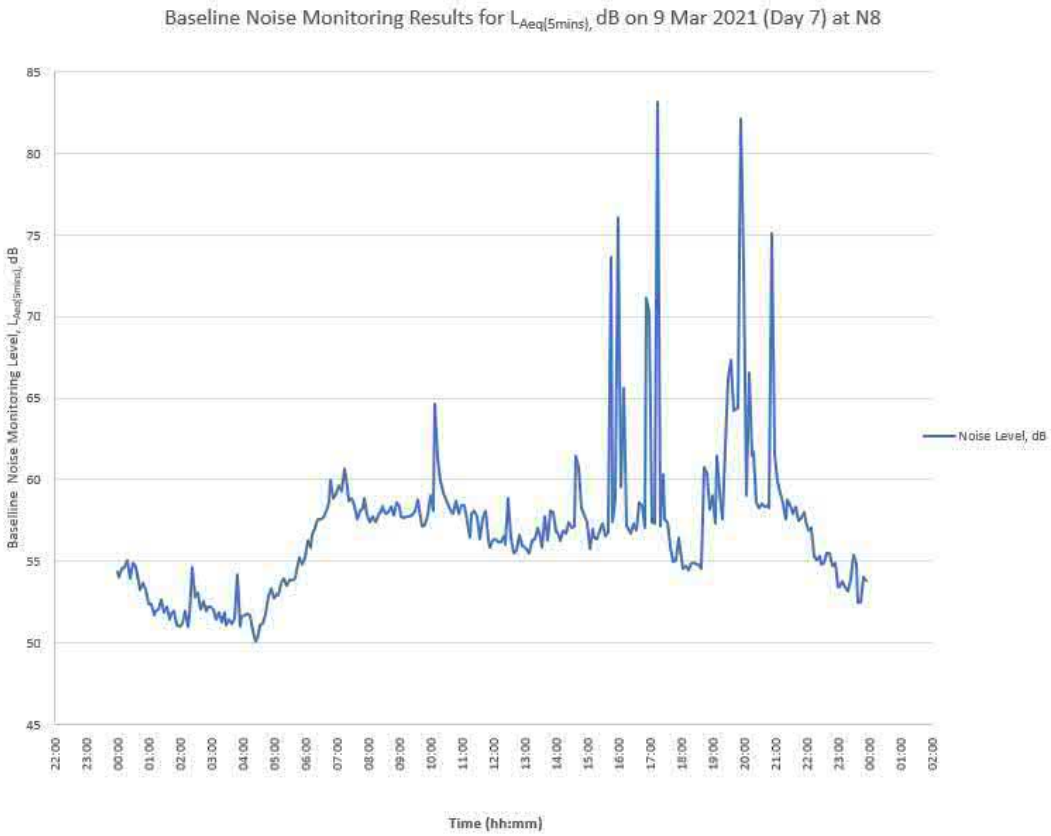


Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 7 Mar 2021 (Day 5) at N8



Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 8 Mar 2021 (Day 6) at N8




Baseline Noise Monitoring Results for $L_{Aeq(5mins)}$, dB on 9 Mar 2021 (Day 7) at N8
Baselline Noise Monitoring Level, $L_{Aeq(5mins)}$, dB
85
80
75
70
65
60
55
50
45
22:00
23:00
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00
02:00
Time (hh:mm)
Noise Level, dB

Annex B

NØ1

CALIBRATION CERTIFICATE

Certificate Number:	CR202101070330
Calibration Date:	07-Jan-2021
Calibration Due Date:	06-Jan-2022
Name of Client:	Abide Intelli Instruments Pte. Ltd.
Client's Address:	60 Kaki Bukit place #05-08 Eunos Techpark Singapore 415979 +65 6547 14289 (Office)
Instrument's Description:	Precision Sound Level Meter
Brand:	RION
Model:	NL-52
Unit Serial Number:	00464762
Microphone Number:	9336

This certificate certifies that the above instrument is calibrated and has met the standards of international specification under IEC 61672-2 as a Class 1 type instrument. The calibration process, a quality process, is carried out under strict calibration quality standards traceable to Singapore's National Metrology Centre(NMC).

- **Instrument individually calibrated by the Manufacturer**
- **Instrument individually calibrated by Abide Intelli Instruments**

Ambient Conditions:

Temperature	(22 ± 3)°C
Relative Humidity	(45 ± 10)%
Atmospheric Pressure	(99 ± 0.1)kPA

Sound Calibrator:

Serial Number	34178091
Model	RION NC-74
Calibrated By	National Metrology Centre
Report Number	AL001428
Calibration Date	2020-03-20

Calibration Officer
W.Y.Quek

Approving Officer
Jennifer Yang

N02

CALIBRATION CERTIFICATE

Certificate Number:	CR202104150361
Calibration Date:	15-Apr-2021
Calibration Due Date:	14-Apr-2022
Name of Client:	Abide Intelli Instruments Pte. Ltd.
Client's Address:	60 Kaki Bukit Place #05-08 Eunos Techpark Singapore 415979
Instrument's Description:	Precision Sound Level Meter
Brand:	RION
Model:	NL-52
Unit Serial Number:	00219961
Microphone Number:	10477

This certificate certifies that the above instrument is calibrated and has met the standards of international specification under IEC 61672-2 as a Class 1 type instrument. The calibration process, a quality process, is carried out under strict calibration quality standards traceable to Singapore's National Metrology Centre(NMC).

- **Instrument individually calibrated by the Manufacturer**
- **Instrument individually calibrated by Abide Intelli Instruments**

Ambient Conditions:

Temperature	(21 ± 3)°C
Relative Humidity	(44 ± 10)%
Atmospheric Pressure	(100 ± 0.1)kPA

Sound Calibrator:

Serial Number	34212951
Model	RION NC-75
Calibrated By	National Metrology Centre
Report Number	D212963E
Calibration Date	2021-02-01

Calibration Officer
W.Y.Quek

Approving Officer
Jennifer Yang

CALIBRATION CERTIFICATE

Certificate Number:	CR202011300313
Calibration Date:	30-Nov-2020
Calibration Due Date:	29-Nov-2021
Name of Client:	Astar Laboratory Pte Ltd
Client's Address:	27 Gul Avenue Singapore 629667
Instrument's Description:	Precision Sound Level Meter
Brand:	RION
Model:	NL-52
Unit Serial Number:	00998396
Microphone Number:	15894

This certificate certifies that the above instrument is calibrated and has met the standards of international specification under IEC 61672-2 as a Class 1 type instrument. The calibration process, a quality process, is carried out under strict calibration quality standards traceable to Singapore's National Metrology Centre(NMC).

- **Instrument individually calibrated by the Manufacturer**
- **Instrument individually calibrated by Abide Intelli Instruments**

Ambient Conditions:

Temperature	(22 ± 3)°C
Relative Humidity	(44 ± 10)%
Atmospheric Pressure	(99.9 ± 0.1)kPA

Sound Calibrator:

Serial Number	34178091
Model	RION NC-74
Calibrated By	National Metrology Centre
Report Number	AL001428
Calibration Date	2020-03-20

Calibration Officer
W.Y.Quek

Approving Officer
Jennifer Yang

CALIBRATION CERTIFICATE

Certificate Number:	CR202011300313
Calibration Date:	30-Nov-2020
Calibration Due Date:	29-Nov-2021
Name of Client:	Astar Laboratory Pte Ltd
Client's Address:	27 Gul Avenue Singapore 629667
Instrument's Description:	Precision Sound Level Meter
Brand:	RION
Model:	NL-52
Unit Serial Number:	00998396
Microphone Number:	15894

This certificate certifies that the above instrument is calibrated and has met the standards of international specification under IEC 61672-2 as a Class 1 type instrument. The calibration process, a quality process, is carried out under strict calibration quality standards traceable to Singapore's National Metrology Centre(NMC).

- **Instrument individually calibrated by the Manufacturer**
- **Instrument individually calibrated by Abide Intelli Instruments**

Ambient Conditions:

Temperature	(22 ± 3)°C
Relative Humidity	(44 ± 10)%
Atmospheric Pressure	(99.9 ± 0.1)kPA

Sound Calibrator:

Serial Number	34178091
Model	RION NC-74
Calibrated By	National Metrology Centre
Report Number	AL001428
Calibration Date	2020-03-20

Calibration Officer
W.Y.Quek

Approving Officer
Jennifer Yang

Appendix X
Airborne Noise Correction Criteria Calculations

Delivering a better world

Table 1 Background Noise Correction Calculations for $L_{Aeq(12hours)}$, dB for Weekdays (Monday - Saturday)

Types of Affected Buildings	Noise Criteria for $L_{Aeq(12hrs)}$, dB (Monday to Saturday)																									
	N1a		N1b		N2		N3		N4a		N4b		N4c		N5a		N5b		N5c		N6		N7		N8	
	7am – 7pm	7pm – 7am	7am – 7pm	7pm – 7am	7am – 7pm	7pm – 7am	7am – 7pm	7pm – 7am	7am – 7pm	7pm – 7am	7am – 7pm	7pm – 7am	7am – 7pm	7pm – 7am	7am – 7pm	7pm – 7am	7am – 7pm	7pm – 7am	7am – 7pm	7pm – 7am	7am – 7pm	7pm – 7am	7am – 7pm	7pm – 7am	7am – 7pm	7pm – 7am
(a) Hospitals, schools, institutions of higher learning, homes for the aged or sick etc.																										
Construction noise criteria	60	50	60	50	60	50	60	50	60	50	60	50	60	50	60	50	60	50	60	50	60	50	60	50	60	50
Overall baseline noise level	60	55	68	65	56	55	71	67	71	67	75	71	69	65	67	65	72	69	70	67	75	72	58	51	61	57
Difference between maximum permissible construction noise level and overall baseline noise level	0	5	8	15	4	5	11	17	11	17	15	21	9	15	7	15	12	19	10	17	15	22	2	1	1	7
Background noise correction factor	3	1	1	0	1	1	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	3	3	3	1
Corrected noise sensitive receptor criteria	63	56	69	65	61	56	71	67	71	67	75	71	70	65	68	65	72	69	70	67	75	72	63	54	64	58
(b) Residential buildings located less than 150 m from the construction site where the noise is being emitted																										
Construction noise criteria	75	NA	75	NA	75	NA	75	NA	75	NA	75	NA	75	NA	75	NA	75	NA	75	NA	75	NA	75	NA	75	NA
Overall baseline noise level	60	55	68	65	56	55	71	67	71	67	75	71	69	65	67	65	72	69	70	67	75	72	58	51	61	57
Difference between maximum permissible construction noise level and overall baseline noise level	15	NA	7	NA	19	NA	4	NA	4	NA	0	NA	6	NA	8	NA	3	NA	5	NA	0	NA	17	NA	14	NA
Background noise correction factor	0	0	1	0	0	0	1	0	2	0	3	0	1	0	1	0	2	0	1	0	3	0	0	0	0	0
Corrected noise sensitive receptor criteria	75	NA	76	NA	75	NA	76	NA	77	NA	78	NA	76	NA	76	NA	77	NA	76	NA	78	NA	75	NA	75	NA
(c) Buildings (other than those in paragraphs (a) and (b))																										
Construction noise criteria	75	65	75	65	75	65	75	65	75	65	75	65	75	65	75	65	75	65	75	65	75	65	75	65	75	65
Overall baseline noise level	60	55	68	65	56	55	71	67	71	67	75	71	69	65	67	65	72	69	70	67	75	72	58	51	61	57

Types of Affected Buildings	Noise Criteria for $L_{Aeq(12hrs)}$, dB (Monday to Saturday)																									
	N1a		N1b		N2		N3		N4a		N4b		N4c		N5a		N5b		N5c		N6		N7		N8	
	7am – 7pm	7pm – 7am	7am – 7pm	7pm – 7am	7am – 7pm	7pm – 7am	7am – 7pm	7pm – 7am	7am – 7pm	7pm – 7am	7am – 7pm	7pm – 7am	7am – 7pm	7pm – 7am	7am – 7pm	7pm – 7am	7am – 7pm	7pm – 7am	7am – 7pm	7pm – 7am	7am – 7pm	7pm – 7am	7am – 7pm	7pm – 7am	7am – 7pm	7pm – 7am
Difference between maximum permissible construction noise level and overall baseline noise level	15	10	7	0	19	10	4	2	4	2	0	6	6	0	8	0	3	4	5	2	0	7	17	14	14	8
Background noise correction factor	0	0	1	3	0	1	1	2	2	3	3	1	1	3	1	3	2	2	1	2	3	1	0	0	0	1
Corrected noise sensitive receptor criteria	75	65	76	68	75	66	76	69	77	70	78	72	76	68	76	68	77	71	76	69	78	73	75	65	75	66

Table 2 Background Noise Correction Calculations for $L_{Aeq(12hours)}$, dB for Weekend and Public Holidays (Sundays and Public Holidays)

Types of Affected Buildings	Noise Criteria for $L_{Aeq(12hrs)}$, dB (Monday to Saturday)																									
	N1a		N1b		N2		N3		N4a		N4b		N4c		N5a		N5b		N5c		N6		N7		N8	
	7am – 7pm	7pm – 7am	7am – 7pm	7pm – 7am	7am – 7pm	7pm – 7am	7am – 7pm	7pm – 7am	7am – 7pm	7pm – 7am	7am – 7pm	7pm – 7am	7am – 7pm	7pm – 7am	7am – 7pm	7pm – 7am	7am – 7pm	7pm – 7am	7am – 7pm	7pm – 7am	7am – 7pm	7pm – 7am	7am – 7pm	7pm – 7am	7am – 7pm	7pm – 7am
(a) Hospitals, schools, institutions of higher learning, homes for the aged or sick etc.																										
Construction noise criteria	60	50	60	50	60	50	60	50	60	50	60	50	60	50	60	50	60	50	60	50	60	50	60	50	60	50
Overall baseline noise level	61	55	67	65	61	59	69	67	70	68	74	72	68	66	68	64	71	68	70	66	73	72	52	50	64	57
Difference between maximum permissible construction noise level and overall baseline noise level	1	5	7	15	1	9	9	17	10	18	14	22	8	16	8	14	11	18	10	16	13	22	8	0	4	7
Background noise correction factor	3	1	1	0	3	1	1	0	1	0	0	0	1	0	1	0	0	0	1	0	0	0	1	3	1	1
Corrected noise sensitive receptor criteria	64	56	68	65	64	60	70	67	71	68	74	72	69	66	69	64	71	68	71	66	73	72	61	53	65	58
(b) Residential buildings located less than 150 m from the construction site where the noise is being emitted																										
Construction noise criteria	75	NA	75	NA	75	NA	75	NA	75	NA	75	NA	75	NA	75	NA	75	NA	75	NA	75	NA	75	NA	75	NA
Overall baseline noise level	61	55	67	65	61	59	69	67	70	68	74	72	68	66	68	64	71	68	70	66	73	72	52	50	64	57
Difference between maximum permissible construction noise level and overall baseline noise level	14	NA	8	NA	14	NA	6	NA	5	NA	1	NA	7	NA	7	NA	4	NA	5	NA	2	NA	23	NA	11	NA
Background noise correction factor	0	0	1	0	0	0	1	0	1	0	3	0	1	0	1	0	2	0	1	0	3	0	0	0	0	0
Corrected noise sensitive receptor criteria	75	NA	76	NA	75	NA	76	NA	76	NA	78	NA	76	NA	76	NA	77	NA	76	NA	78	NA	75	NA	75	NA
(c) Buildings (other than those in paragraphs (a) and (b))																										
Construction noise criteria	75	65	75	65	75	65	75	65	75	65	75	65	75	65	75	65	75	65	75	65	75	65	75	65	75	65
Overall baseline noise level	61	55	67	65	61	59	69	67	70	68	74	72	68	66	68	64	71	68	70	66	73	72	52	50	64	57

Types of Affected Buildings	Noise Criteria for $L_{Aeq(12hrs)}$, dB (Monday to Saturday)																									
	N1a		N1b		N2		N3		N4a		N4b		N4c		N5a		N5b		N5c		N6		N7		N8	
	7am – 7pm	7pm – 7am	7am – 7pm	7pm – 7am	7am – 7pm	7pm – 7am	7am – 7pm	7pm – 7am	7am – 7pm	7pm – 7am	7am – 7pm	7pm – 7am	7am – 7pm	7pm – 7am	7am – 7pm	7pm – 7am	7am – 7pm	7pm – 7am	7am – 7pm	7pm – 7am	7am – 7pm	7pm – 7am	7am – 7pm	7pm – 7am	7am – 7pm	7pm – 7am
Difference between maximum permissible construction noise level and overall baseline noise level	14	10	8	0	14	6	6	2	5	3	1	7	7	1	7	1	4	3	5	1	2	7	23	15	11	8
Background noise correction factor	0	1	1	3	0	1	1	3	1	2	3	1	1	3	1	3	2	2	1	3	3	1	0	0	0	1
Corrected noise sensitive receptor criteria	75	66	76	68	75	66	76	70	76	70	78	73	76	69	76	68	77	70	76	69	78	73	75	65	75	66

Table 3 Background Noise Correction Calculations for $L_{Aeq(1\ hour)}$, dB for Weekdays (Monday - Saturday)

Types of Affected Buildings	Noise Criteria for $L_{Aeq(1hr)}$, dB (Monday to Saturday)																									
	N1a		N1b		N2		N3		N4a		N4b		N4c		N5a		N5b		N5c		N6		N7		N8	
	7pm – 10pm	10pm – 7am	7pm – 10pm	10pm – 7am	7pm – 10pm	10pm – 7am	7pm – 10pm	10pm – 7am	7pm – 10pm	10pm – 7am	7pm – 10pm	10pm – 7am	7pm – 10pm	10pm – 7am	7pm – 10pm	10pm – 7am	7pm – 10pm	10pm – 7am	7pm – 10pm	10pm – 7am	7pm – 10pm	10pm – 7am	7pm – 10pm	10pm – 7am	7pm – 10pm	10pm – 7am
Residential buildings located less than 150 m from the construction site where the noise is being emitted																										
Construction noise criteria	65	55	65	55	65	55	65	55	65	55	65	55	65	55	65	55	65	55	65	55	65	55	65	55	65	55
Overall baseline noise level	57	53	67	63	57	54	70	65	69	65	74	69	67	63	67	62	71	67	70	65	74	70	53	49	59	52
Difference between maximum permissible construction noise level and overall baseline noise level	8	2	2	8	8	1	5	10	4	10	9	14	2	8	2	7	6	12	5	10	9	15	12	6	6	3
Background noise correction factor	1	2	2	1	1	3	1	0	1	1	1	0	2	1	2	1	1	0	1	0	1	0	0	1	1	2
Corrected noise sensitive receptor criteria	66	57	69	64	66	58	71	65	70	66	75	69	69	64	69	63	72	67	71	65	75	70	65	56	66	57

Table 4 Background Noise Correction Calculations for $L_{Aeq(15\ mins)}$, dB

Type of Affected Premises	Noise Criteria for $L_{Aeq(15mins)}$, dB																			
	N1a			N1b			N2			N3			N4a			N4b			N4c	
	7am - 7pm	7pm - 11pm	11pm - 7am	7am - 7pm	7pm - 11pm	11pm - 7am	7am - 7pm	7pm - 11pm	11pm - 7am	7am - 7pm	7pm - 11pm	11pm - 7am	7am - 7pm	7pm - 11pm	11pm - 7am	7am - 7pm	7pm - 11pm	11pm - 7am	7am - 7pm	7pm - 11pm	11pm - 7am
Noise Sensitive Premises such as hospital, home for the aged sick, library, etc.																				
Construction noise criteria	60	55	50	60	55	50	60	55	50	60	55	50	60	55	50	60	55	50	60	55	50
Overall baseline noise level	58	57	52	68	67	63	55	56	53	71	69	65	70	69	64	74	73	69	68	67	62
Difference between maximum permissible construction noise level and overall baseline noise level	2	2	2	8	12	13	5	1	3	11	14	15	10	14	14	14	18	19	8	12	12
Background noise correction factor	2	3	2	1	0	0	1	3	2	0	0	0	0	0	0	0	0	0	1	0	0
Corrected noise sensitive receptor criteria	62	60	54	69	67	63	61	59	55	71	69	65	70	69	64	74	73	69	69	67	62
Residential Premises																				
Construction noise criteria	65	60	55	65	60	55	65	60	55	65	60	55	65	60	55	65	60	55	65	60	55
Overall baseline noise level	58	57	52	68	67	63	55	56	53	71	69	65	70	69	64	74	73	69	68	67	62
Difference between maximum permissible construction noise level and overall baseline noise level	7	3	3	3	7	8	10	4	2	6	9	10	5	9	9	9	13	14	3	7	7
Background noise correction factor	1	2	2	2	1	1	0	2	3	1	1	1	1	1	1	1	0	0	2	1	1
Corrected noise sensitive receptor criteria	66	62	57	70	68	64	65	62	58	72	70	66	71	70	65	75	73	69	70	68	63
Others																					
Construction noise criteria	70	65	60	70	65	60	70	65	60	70	65	60	70	65	60	70	65	60	70	65	60
Overall baseline noise level	58	57	52	68	67	63	55	56	53	71	69	65	70	69	64	74	73	69	68	67	62

Type of Affected Premises	Noise Criteria for $L_{Aeq(15mins)}$, dB																			
	N1a			N1b			N2			N3			N4a			N4b			N4c	
	7am - 7pm	7pm - 11pm	11pm - 7am	7am - 7pm	7pm - 11pm	11pm - 7am	7am - 7pm	7pm - 11pm	11pm - 7am	7am - 7pm	7pm - 11pm	11pm - 7am	7am - 7pm	7pm - 11pm	11pm - 7am	7am - 7pm	7pm - 11pm	11pm - 7am	7am - 7pm	7pm - 11pm	11pm - 7am
Difference between maximum permissible construction noise level and overall baseline noise level	12	8	8	2	2	3	15	9	7	1	4	5	0	4	4	4	8	9	2	2	2
Background noise correction factor	0	1	1	3	3	2	0	1	1	3	1	1	3	2	1	1	1	1	3	3	2
Corrected noise sensitive receptor criteria	70	66	61	73	70	65	70	66	61	74	70	66	73	71	65	75	74	70	73	70	64

Type of Affected Premises	Noise Criteria for $L_{Aeq(15mins)}$, dB																	
	N5a			N5b			N5c			N6			N7			N8		
	7am - 7pm	7pm - 11pm	11pm - 7am	7am - 7pm	7pm - 11pm	11pm - 7am	7am - 7pm	7pm - 11pm	11pm - 7am	7am - 7pm	7pm - 11pm	11pm - 7am	7am - 7pm	7pm - 11pm	11pm - 7am	7am - 7pm	7pm - 11pm	11pm - 7am
Noise Sensitive Premises such as hospital, home for the aged sick, library, etc.																		
Construction noise criteria	60	55	50	60	55	50	60	55	50	60	55	50	60	55	50	60	55	50
Overall baseline noise level	67	67	62	71	71	66	70	69	65	75	74	69	54	52	48	58	57	52
Difference between maximum permissible construction noise level and overall baseline noise level	7	12	12	11	16	16	10	14	15	15	19	19	6	3	2	2	2	2
Background noise correction factor	1	0	0	0	0	0	0	0	0	0	0	0	1	2	3	2	2	3
Corrected noise sensitive receptor criteria	68	67	62	71	71	66	70	69	65	75	74	69	61	57	53	62	59	55
Residential Premises																		
Construction noise criteria	65	60	55	65	60	55	65	60	55	65	60	55	65	60	55	65	60	55
Overall baseline noise level	67	67	62	71	71	66	70	69	65	75	74	69	54	52	48	58	57	52

Type of Affected Premises	Noise Criteria for $L_{Aeq(15mins)}$, dB																	
	N5a			N5b			N5c			N6			N7			N8		
	7am - 7pm	7pm - 11pm	11pm - 7am	7am - 7pm	7pm - 11pm	11pm - 7am	7am - 7pm	7pm - 11pm	11pm - 7am	7am - 7pm	7pm - 11pm	11pm - 7am	7am - 7pm	7pm - 11pm	11pm - 7am	7am - 7pm	7pm - 11pm	11pm - 7am
Difference between maximum permissible construction noise level and overall baseline noise level	2	7	7	6	11	11	5	9	10	10	14	14	11	8	7	7	3	3
Background noise correction factor	2	1	1	1	0	0	1	1	1	0	0	0	0	1	1	1	2	2
Corrected noise sensitive receptor criteria	69	68	63	72	71	66	71	70	66	75	74	69	65	61	56	66	62	57
Others																		
Construction noise criteria	70	65	60	70	65	60	70	65	60	70	65	60	70	65	60	70	65	60
Overall baseline noise level	67	67	62	71	71	66	70	69	65	75	74	69	54	52	48	58	57	52
Difference between maximum permissible construction noise level and overall baseline noise level	3	2	2	1	6	6	0	4	5	5	9	9	16	13	12	12	8	8
Background noise correction factor	2	3	3	3	1	1	3	1	1	1	1	1	0	0	0	0	1	1
Corrected noise sensitive receptor criteria	72	70	65	74	72	67	73	70	66	76	75	70	70	65	60	70	66	61

Table 5 Background Noise Correction Calculations for $L_{Aeq(5\ mins)}$, dB for Weekdays (Monday - Saturday)

Types of Affected Buildings	Noise Criteria for $L_{Aeq(5mins)}$, dB (Monday to Saturday)																				
	N1a			N1b			N2			N3			N4a			N4b			N4c		
	7am – 7pm	7pm – 10pm	10pm – 7am	7am – 7pm	7pm – 10pm	10pm – 7am	7am – 7pm	7pm – 10pm	10pm – 7am	7am – 7pm	7pm – 7am	10pm – 7am	7am – 7pm	7pm – 7am	10pm – 7am	7am – 7pm	7pm – 7am	10pm – 7am	7am – 7pm	7pm – 7am	10pm – 7am
(a) Hospitals, schools, institutions of higher learning, homes for the aged or sick etc.																					
Construction noise criteria	75	55	55	75	55	55	75	55	55	75	55	55	75	55	55	75	55	55	75	55	55
Overall baseline noise level	58	57	52	68	67	63	54	56	54	71	70	65	70	69	65	74	73	69	68	67	63
Difference between maximum permissible construction noise level and overall baseline noise level	17	2	3	7	12	8	21	1	1	4	15	10	5	14	10	1	18	14	7	12	8
Background noise correction factor	0	3	2	1	0	1	0	3	3	1	0	0	1	0	1	3	0	0	1	0	1
Corrected noise sensitive receptor criteria	75	60	57	76	67	64	75	59	58	76	70	65	76	69	66	78	73	69	76	67	64
(b) Residential buildings located less than 150 m from the construction site where the noise is being emitted																					
Construction noise criteria	90	70	55	90	70	55	90	70	55	90	70	55	90	70	55	90	70	55	90	70	55
Overall baseline noise level	58	57	52	68	67	63	54	56	54	71	70	65	70	69	65	74	73	69	68	67	63
Difference between maximum permissible construction noise level and overall baseline noise level	32	13	3	22	3	8	36	14	1	19	0	10	20	1	10	16	3	14	22	3	8
Background noise correction factor	0	0	2	0	2	1	0	0	3	0	3	0	0	3	1	0	2	0	0	2	1
Corrected noise sensitive receptor criteria	90	70	57	90	72	64	90	70	58	90	73	65	90	73	66	90	75	69	90	72	64
(c) Buildings (other than those in paragraphs (a) and (b))																					
Construction noise criteria	90	70	70	90	70	70	90	70	70	90	70	70	90	70	70	90	70	70	90	70	70
Overall baseline noise level	58	57	52	68	67	63	54	56	54	71	70	65	70	69	65	74	73	69	68	67	63
Difference between maximum permissible construction noise level and overall baseline noise level	32	13	18	22	3	7	36	14	16	19	0	5	20	1	5	16	3	1	22	3	7

Types of Affected Buildings	Noise Criteria for $L_{Aeq(5mins)}$, dB (Monday to Saturday)																			
	N1a			N1b			N2			N3			N4a			N4b			N4c	
	7am – 7pm	7pm – 10pm	10pm – 7am	7am – 7pm	7pm – 10pm	10pm – 7am	7am – 7pm	7pm – 10pm	10pm – 7am	7am – 7pm	7pm – 7am	10pm – 7am	7am – 7pm	7pm – 7am	10pm – 7am	7am – 7pm	7pm – 7am	10pm – 7am	7am – 7pm	7pm – 7am	10pm – 7am
Background noise correction factor	0	0	0	0	2	1	0	0	0	0	3	1	0	3	1	0	2	3	0	2	1
Corrected noise sensitive receptor criteria	90	70	70	90	72	71	90	70	70	90	73	71	90	73	71	90	75	73	90	72	71

Types of Affected Buildings	Noise Criteria for $L_{Aeq(5mins)}$, dB (Monday to Saturday)																	
	N5a			N5b			N5c			N6			N7			N8		
	7am – 7pm	7pm – 7am	10pm – 7am	7am – 7pm	7pm – 7am	10pm – 7am	7am – 7pm	7pm – 7am	10pm – 7am	7am – 7pm	7pm – 7am	10pm – 7am	7am – 7pm	7pm – 7am	10pm – 7am	7am – 7pm	7pm – 7am	10pm – 7am
(a) Hospitals, schools, institutions of higher learning, homes for the aged or sick etc.																		
Construction noise criteria	75	55	55	75	55	55	75	55	55	75	55	55	75	55	55	75	55	55
Overall baseline noise level	67	67	62	71	71	67	70	69	66	75	74	70	54	51	49	57	58	52
Difference between maximum permissible construction noise level and overall baseline noise level	8	12	7	4	16	12	5	14	11	0	19	15	21	4	6	18	3	3
Background noise correction factor	1	0	1	2	0	0	1	0	0	3	0	0	0	2	1	0	2	2
Corrected noise sensitive receptor criteria	76	67	63	77	71	67	76	69	66	78	74	70	75	57	56	75	60	57
(b) Residential buildings located less than 150 m from the construction site where the noise is being emitted																		
Construction noise criteria	90	70	55	90	70	55	90	70	55	90	70	55	90	70	55	90	70	55
Overall baseline noise level	67	67	62	71	71	67	70	69	66	75	74	70	54	51	49	57	58	52
Difference between maximum permissible construction noise level and overall baseline noise level	23	3	7	19	1	12	20	1	11	15	4	15	36	19	6	33	12	3
Background noise correction factor	0	2	1	0	3	0	0	3	0	0	1	0	0	0	1	0	0	2
Corrected noise sensitive receptor criteria	90	72	63	90	74	67	90	73	66	90	75	70	90	70	56	90	70	57
(c) Buildings (other than those in paragraphs (a) and (b))																		
Construction noise criteria	90	70	70	90	70	70	90	70	70	90	70	70	90	70	70	90	70	70
Overall baseline noise level	67	67	62	71	71	67	70	69	66	75	74	70	54	51	49	57	58	52

Types of Affected Buildings	Noise Criteria for $L_{Aeq(5mins)}$, dB (Monday to Saturday)																	
	N5a			N5b			N5c			N6			N7			N8		
	7am – 7pm	7pm – 7am	10pm – 7am	7am – 7pm	7pm – 7am	10pm – 7am	7am – 7pm	7pm – 7am	10pm – 7am	7am – 7pm	7pm – 7am	10pm – 7am	7am – 7pm	7pm – 7am	10pm – 7am	7am – 7pm	7pm – 7am	10pm – 7am
Difference between maximum permissible construction noise level and overall baseline noise level	23	3	8	19	1	3	20	1	4	15	4	0	36	19	21	33	12	18
Background noise correction factor	0	2	1	0	3	2	0	3	2	0	1	3	0	0	0	0	0	0
Corrected noise sensitive receptor criteria	90	72	71	90	74	72	90	73	72	90	75	73	90	70	70	90	70	70

Table 6 Background Noise Correction Calculations for $L_{Aeq(5\ mins)}$, dB for Weekends and Public Holidays (Sundays and Public Holidays)

Types of Affected Buildings	Noise Criteria for $L_{Aeq(5mins)}$, dB (Monday to Saturday)																				
	N1a			N1b			N2			N3			N4a			N4b			N4c		
	7am – 7pm	7pm – 10pm	10pm – 7am	7am – 7pm	7pm – 10pm	10pm – 7am	7am – 7pm	7pm – 10pm	10pm – 7am	7am – 7pm	7pm – 7am	10pm – 7am	7am – 7pm	7pm – 7am	10pm – 7am	7am – 7pm	7pm – 7am	10pm – 7am	7am – 7pm	7pm – 7am	10pm – 7am
(a) Hospitals, schools, institutions of higher learning, homes for the aged or sick etc.																					
Construction noise criteria	75	55	55	75	55	55	75	55	55	75	55	55	75	55	55	75	55	55	75	55	55
Overall baseline noise level	59	57	53	67	66	62	57	60	57	69	70	64	70	60	68	74	75	70	68	69	63
Difference between maximum permissible construction noise level and overall baseline noise level	16	2	2	8	11	7	18	5	2	6	15	9	5	5	13	1	20	15	7	14	8
Background noise correction factor	0	2	2	1	0	1	0	1	3	1	0	1	1	1	0	3	0	0	1	0	1
Corrected noise sensitive receptor criteria	75	59	57	76	66	63	75	61	60	76	70	65	76	61	68	78	75	70	76	69	64
(b) Residential buildings located less than 150 m from the construction site where the noise is being emitted																					
Construction noise criteria	75	55	55	75	55	55	75	55	55	75	55	55	75	55	55	75	55	55	75	55	55
Overall baseline noise level	59	57	53	67	66	62	57	60	57	69	70	64	70	60	68	74	75	70	68	69	63
Difference between maximum permissible construction noise level and overall baseline noise level	16	2	2	8	11	7	18	5	2	6	15	9	5	5	13	1	20	15	7	14	8
Background noise correction factor	0	2	2	1	0	1	0	1	3	1	0	1	1	1	0	3	0	0	1	0	1
Corrected noise sensitive receptor criteria	75	59	57	76	66	63	75	61	60	76	70	65	76	61	68	78	75	70	76	69	64
(c) Buildings (other than those in paragraphs (a) and (b))																					
Construction noise criteria	90	70	70	90	70	70	90	70	70	90	70	70	90	70	70	90	70	70	90	70	70
Overall baseline noise level	59	57	53	67	66	62	57	60	57	69	70	64	70	60	68	74	75	70	68	69	63
Difference between maximum permissible construction noise level and overall baseline noise level	31	13	17	23	4	8	33	10	13	21	0	6	20	10	2	16	5	0	22	1	7

Types of Affected Buildings	Noise Criteria for $L_{Aeq(5mins)}$, dB (Monday to Saturday)																			
	N1a			N1b			N2			N3			N4a			N4b			N4c	
	7am – 7pm	7pm – 10pm	10pm – 7am	7am – 7pm	7pm – 10pm	10pm – 7am	7am – 7pm	7pm – 10pm	10pm – 7am	7am – 7pm	7pm – 7am	10pm – 7am	7am – 7pm	7pm – 7am	10pm – 7am	7am – 7pm	7pm – 7am	10pm – 7am	7am – 7pm	7pm – 7am	10pm – 7am
Background noise correction factor	0	0	0	0	2	1	0	0	0	0	3	1	0	1	3	0	1	3	0	3	1
Corrected noise sensitive receptor criteria	90	70	70	90	72	71	90	70	70	90	73	71	90	71	73	90	76	73	90	73	71

Types of Affected Buildings	Noise Criteria for $L_{Aeq(5mins)}$, dB (Monday to Saturday)																	
	N5a			N5b			N5c			N6			N7			N8		
	7am – 7pm	7pm – 7am	10pm – 7am	7am – 7pm	7pm – 7am	10pm – 7am	7am – 7pm	7pm – 7am	10pm – 7am	7am – 7pm	7pm – 7am	10pm – 7am	7am – 7pm	7pm – 7am	10pm – 7am	7am – 7pm	7pm – 7am	10pm – 7am
(a) Hospitals, schools, institutions of higher learning, homes for the aged or sick etc.																		
Construction noise criteria	75	55	55	75	55	55	75	55	55	75	55	55	75	55	55	75	55	55
Overall baseline noise level	67	66	61	71	70	65	70	69	66	73	74	69	52	52	49	59	59	55
Difference between maximum permissible construction noise level and overall baseline noise level	8	11	6	4	15	10	5	14	11	2	19	14	23	3	6	16	4	0
Background noise correction factor	1	0	1	2	0	0	1	0	0	3	0	0	0	2	1	0	2	3
Corrected noise sensitive receptor criteria	76	66	62	77	70	65	76	69	66	78	74	69	75	57	56	75	61	58
(b) Residential buildings located less than 150 m from the construction site where the noise is being emitted																		
Construction noise criteria	75	55	55	75	55	55	75	55	55	75	55	55	75	55	55	75	55	55
Overall baseline noise level	67	66	61	71	70	65	70	69	66	73	74	69	52	52	49	59	59	55
Difference between maximum permissible construction noise level and overall baseline noise level	8	11	6	4	15	10	5	14	11	2	19	14	23	3	6	16	4	0
Background noise correction factor	1	0	1	2	0	0	1	0	0	3	0	0	0	2	1	0	2	3
Corrected noise sensitive receptor criteria	76	66	62	77	70	65	76	69	66	78	74	69	75	57	56	75	61	58
(c) Buildings (other than those in paragraphs (a) and (b))																		
Construction noise criteria	90	70	70	90	70	70	90	70	70	90	70	70	90	70	70	90	70	70
Overall baseline noise level	67	66	61	71	70	65	70	69	66	73	74	69	52	52	49	59	59	55

Types of Affected Buildings	Noise Criteria for $L_{Aeq(5mins)}$, dB (Monday to Saturday)																	
	N5a			N5b			N5c			N6			N7			N8		
	7am – 7pm	7pm – 7am	10pm – 7am	7am – 7pm	7pm – 7am	10pm – 7am	7am – 7pm	7pm – 7am	10pm – 7am	7am – 7pm	7pm – 7am	10pm – 7am	7am – 7pm	7pm – 7am	10pm – 7am	7am – 7pm	7pm – 7am	10pm – 7am
Difference between maximum permissible construction noise level and overall baseline noise level	23	4	9	19	0	5	20	1	4	17	4	1	38	18	21	31	11	15
Background noise correction factor	0	2	1	0	3	1	0	3	1	0	2	3	0	0	0	0	0	0
Corrected noise sensitive receptor criteria	90	72	71	90	73	71	90	73	71	90	76	73	90	70	70	90	70	70

Appendix Y
List of Airborne Noise Ecological Receptors

Delivering a better world

No.	Type	Family	Scientific Name	Common Name	Global Status *(IUCN/CITES)*	National Status *(Ascher et al. (in prep); JXQ Lee, pers comm)*	Species of Conservation Significance	Native Status *(The Biodiversity of Singapore, 2020; JXQ Lee, pers comm)*	Probable Species	Recorded Species	Remarks	Auditory Sensitivity
1	Bee	Apidae	*Amegilla andrewsi*	Andrew's blue-banded digger bee	Not Assessed	Least Concern	No	Native	Yes	Yes		Priority 1
2	Bee	Apidae	*Amegilla korotonensis*	N.A	Not Assessed	Least Concern	No	Native	Yes	No		Priority 1
3	Bee	Apidae	*Apis andreniformis*	N.A	Not Assessed	Least Concern	No	Native	Yes	No		Priority 1
4	Bee	Apidae	*Apis cerana*	Eastern honey bee	Not Assessed	Least Concern	No	Native	Yes	Yes		Priority 1
5	Bee	Apidae	*Apis dorsata*	N.A	Not Assessed	Least Concern	No	Native	Yes	No		Priority 1
6	Bee	Apidae	*Apis florea*	N.A	Not Assessed	Non-native	No	Non-native	Yes	No		Priority 1
7	Bee	Apidae	*Braunsapis clarihirta*	N.A	Not Assessed	Least Concern	No	Native	Yes	No		Priority 1
8	Bee	Apidae	*Braunsapis cupulifera**	N.A	Not Assessed	Least Concern	No	Native	Yes	No		Priority 1
9	Bee	Apidae	*Braunsapis hewitti**	N.A	Not Assessed	Least Concern	No	Native	Yes	No		Priority 1
10	Bee	Apidae	*Braunsapis puangensis*	N.A	Not Assessed	Least Concern	No	Native	Yes	No		Priority 1
11	Bee	Apidae	*Ceratina collusor*	N.A	Not Assessed	Least Concern	No	Native	Yes	No		Priority 1
12	Bee	Apidae	*Ceratina dentipes*	N.A	Not Assessed	Least Concern	No	Native	Yes	No		Priority 1
13	Bee	Apidae	*Ceratina lieftincki*	N.A	Not Assessed	Not Assessed	No	Native	Yes	No		Priority 1
14	Bee	Apidae	*Ceratina nigrolateralis*	N.A	Not Assessed	Not Assessed	No	Native	Yes	No		Priority 1
15	Bee	Apidae	*Ceratina perforatrix*	N.A	Not Assessed	Least Concern	No	Native	Yes	No		Priority 1
16	Bee	Apidae	*Ceratina smaragdula*	N.A	Not Assessed	Not Assessed	No	Native	Yes	No		Priority 1
17	Bee	Apidae	*Ceratina* sp.	N.A	N.A	N.A	N.A	N.A	N.A	Yes		Priority 1
18	Bee	Apidae	*Ceratina unimaculata*	N.A	Not Assessed	Least Concern	No	Native	Yes	No		Priority 1
19	Bee	Apidae	*Tetragonula valdezi*	N.A	Not Assessed	Least Concern	No	Native	Yes	No		Priority 1
20	Bee	Apidae	*Thyreus ceylonicus*	N.A	Not Assessed	Least Concern	No	Native	Yes	No		Priority 1
21	Bee	Apidae	*Thyreus himalayensis*	N.A	Not Assessed	Least Concern	No	Native	Yes	Yes		Priority 1
22	Bee	Apidae	*Xylocopa aestuans*	White-cheeked carpenter bee	Not Assessed	Not Assessed	No	Native	Yes	No	*Xylocopa* sp. recorded may be *X. aestuans*	Priority 1
23	Bee	Apidae	*Xylocopa caerulea*	N.A	Not Assessed	Least Concern	No	Native	Yes	No		Priority 1
24	Bee	Apidae	*Xylocopa flavonigrescens*	N.A	Not Assessed	Least Concern	No	Native	Yes	No	*Xylocopa* sp. recorded may be *X. flavonigrescens*	Priority 1
25	Bee	Apidae	*Xylocopa latipes*	Broad-handed carpenter bee	Not Assessed	Least Concern	No	Native	Yes	Yes		Priority 1
26	Bee	Apidae	*Xylocopa myops*	N.A	Not Assessed	Data Deficient	No	Native	Yes	No		Priority 1
27	Bee	Colletidae	*Hylaeus penangensis*	N.A	Not Assessed	Least Concern	No	Native	Yes	No		Priority 1
28	Bee	Halictidae	*Lasioglossum adonidiae*	N.A	Not Assessed	Least Concern	No	Native	Yes	No		Priority 1
29	Bee	Halictidae	*Lasioglossum albescens*	N.A	Not Assessed	Least Concern	No	Native	Yes	No		Priority 1
30	Bee	Halictidae	*Lasioglossum deliense*	N.A	Not Assessed	Least Concern	No	Native	Yes	No		Priority 1
31	Bee	Halictidae	*Lasioglossum singapurellum*	N.A	Not Assessed	Least Concern	No	Native	Yes	No		Priority 1
32	Bee	Halictidae	*Lasioglossum vagans*	N.A	Not Assessed	Least Concern	No	Native	Yes	No		Priority 1
33	Bee	Halictidae	*Lipotriches ceratina*	N.A	Not Assessed	Least Concern	No	Native	Yes	Yes		Priority 1
34	Bee	Halictidae	*Nomia iridiscens*	Pearly-banded bee	Not Assessed	Least Concern	No	Native	Yes	Yes		Priority 1
35	Bee	Halictidae	*Nomia strigata*	Pearly-banded bee	Not Assessed	Least Concern	No	Native	Yes	Yes		Priority 1
36	Bee	Halictidae	*Patellapis murbanus*	N.A	Not Assessed	Least Concern	No	Native	Yes	No		Priority 1
37	Bee	Halictidae	*Pseudapis siamensis*	N.A	Not Assessed	Least Concern	No	Native	Yes	No		Priority 1
38	Bee	Megachilidae	*Euaspis polynesia*	N.A	Not Assessed	Least Concern	No	Native	Yes	No		Priority 1
39	Bee	Megachilidae	*Megachile conjuncta*	N.A	Not Assessed	Least Concern	No	Native	Yes	No		Priority 1
40	Bee	Megachilidae	*Megachile disjuncta*	N.A	Not Assessed	Non-native	No	Non-native	Yes	No		Priority 1
41	Bee	Megachilidae	*Megachile fulvipennis*	N.A	Not Assessed	Least Concern	No	Native	Yes	No		Priority 1

42	Bee	Megachilidae	*Megachile stulta*	N.A	Not Assessed	Least Concern	No	Native	Yes	No		Priority 1
43	Bee	Megachilidae	*Megachile tricincta*	N.A	Not Assessed	Least Concern	No	Native	Yes	No		Priority 1
44	Bee	Megachilidae	*Megachile umbripennis*	N.A	Not Assessed	Non-native	No	Non-native	Yes	No		Priority 1
45	Bee	Megachilidae	*Coelioxys confusus*	N.A	Not Assessed	Least Concern	No	Native	Yes	Yes		Priority 1
46	Bee	Megachilidae	*Heriades othonis*	N.A	Not Assessed	Least Concern	No	Native	Yes	No		Priority 1
47	Bee	Megachilidae	*Megachile laticeps*	N.A	Not Assessed	Least Concern	No	Native	Yes	Yes		Priority 1
48	Bee	Megachilidae	*Megachile subrixator*	N.A	Not Assessed	Least Concern	No	Native	Yes	No		Priority 1
49	Wasp	Ampulicidae	*Ampulex compressa*	Emerald cockroach wasp/Jewel wasp	Not Assessed	Least Concern	No	Native	Yes	No		Priority 1
50	Wasp	Crabronidae	*Liris subtessellatus*	N.A	Not Assessed	Least Concern	No	Native	Yes	Yes		Priority 1
51	Wasp	Crabronidae	*Tachytes cf. modestus*	N.A	Not Assessed	Least Concern	No	Native	Yes	No		Priority 1
52	Wasp	Crabronidae	*Trypoxylon sp.*	N.A	N.A	N.A	No	N.A	Yes	Yes		Priority 1
53	Wasp	Pompilidae	*Auplopus sp. (blue)*	N.A	N.A	Least Concern	No	Native	Yes	No		Priority 1
54	Wasp	Pompilidae	*Auplopus sp. (grey)*	N.A	N.A	Least Concern	No	Native	Yes	Yes		Priority 1
55	Wasp	Pompilidae	*Tachypompilus analis*	N.A	Not Assessed	Least Concern	No	Native	Yes	No		Priority 1
56	Wasp	Scoliidae	*Campsomeriella collaris*	N.A	Not Assessed	Least Concern	No	Native	Yes	No		Priority 1
57	Wasp	Scoliidae	*Phalerimeris phalerata*	N.A	Not Assessed	Least Concern	No	Native	Yes	No		Priority 1
58	Wasp	Sphecidae	*Chalybion bengalense*	N.A	Not Assessed	Least Concern	No	Native	Yes	Yes		Priority 1
59	Wasp	Sphecidae	*Hemichalybion sp.*	NA	Not Assessed	Least Concern	No	Native	Yes	No		Priority 1
60	Wasp	Sphecidae	*Isodontia diodon*	N.A	Not Assessed	Least Concern	No	Native	Yes	No		Priority 1
61	Wasp	Sphecidae	*Sceliphron javanum*	N.A	Not Assessed	Least Concern	No	Native	Yes	No		Priority 1
62	Wasp	Sphecidae	*Sceliphron madraspatanum*	N.A	Not Assessed	Least Concern	No	Native	Yes	No		Priority 1
63	Wasp	Sphecidae	*Sphex diabolicus*	N.A	Not Assessed	Least Concern	No	Native	Yes	No		Priority 1
64	Wasp	Sphecidae	*Sphex sericeus*	N.A	Not Assessed	Least Concern	No	Native	Yes	No		Priority 1
65	Wasp	Sphecidae	*Sphex subtruncatus*	N.A	Not Assessed	Least Concern	No	Native	Yes	No		Priority 1
66	Wasp	Vespidae	*Allorhynchium argentatum*	N.A	Not Assessed	Least Concern	No	Native	Yes	Yes		Priority 1
67	Wasp	Vespidae	*Antepipona sp. nr. bipustulata*	N.A	N.A	Least Concern	No	Native	Yes	Yes		Priority 1
68	Wasp	Vespidae	*Delta campaniforme*	N.A	Not Assessed	Least Concern	No	Native	Yes	No		Priority 1
69	Wasp	Vespidae	*Delta esuriens*	N.A	Not Assessed	Least Concern	No	Native	Yes	No		Priority 1
70	Wasp	Vespidae	*Delta pyriforme*	N.A	Not Assessed	Least Concern	No	Native	Yes	Yes		Priority 1
71	Wasp	Vespidae	*Elimus sp.*	N.A	N.A	Not Assessed	No	Native	Yes	No		Priority 1
72	Wasp	Vespidae	*Eumenes sp.*	N.A	Not Assessed	Not Assessed	No	N.A	Yes	Yes		Priority 1
73	Wasp	Vespidae	*Eustenogaster hauxwelli*	N.A	Not Assessed	Near Threatened	No	Native	Yes	No		Priority 1
74	Wasp	Vespidae	*Eustenogaster micans*	N.A	Not Assessed	Near Threatened	No	Native	Yes	No		Priority 1
75	Wasp	Vespidae	*Liostenogaster nitidipennis*	N.A	Not Assessed	Near Threatened	No	Native	Yes	No		Priority 1
76	Wasp	Vespidae	*Liostenogaster varipicta*	N.A	Not Assessed	Near Threatened	No	Native	Yes	Yes		Priority 1
77	Wasp	Vespidae	*Paraleptomenes miniatus*	N.A	Not Assessed	Least Concern	No	Native	Yes	No		Priority 1
78	Wasp	Vespidae	*Parapolybia varia*	Lesser paper wasp	Not Assessed	Near Threatened	No	Native	Yes	No		Priority 1
79	Wasp	Vespidae	*Parischnogaster mellyi*	N.A	Not Assessed	Least Concern	No	Native	Yes	Yes		Priority 1
80	Wasp	Vespidae	*Parischnogaster nigricans*	N.A	Not Assessed	Least Concern	No	Native	Yes	Yes		Priority 1
81	Wasp	Vespidae	*Phimenes flavopictus*	N.A	Not Assessed	Least Concern	No	Native	Yes	Yes		Priority 1
82	Wasp	Vespidae	*Polistes sagittarius*	Banded paper wasp	Not Assessed	Least Concern	No	Native	Yes	No		Priority 1
83	Wasp	Vespidae	*Polistes stigma*	N.A	Not Assessed	Least Concern	No	Native	Yes	No		Priority 1
84	Wasp	Vespidae	*Polistes tenebris*	N.A	Not Assessed	Data Deficient	No	Native	Yes	Yes		Priority 1
85	Wasp	Vespidae	*Provespa anomala*	Night hornet	Not Assessed	Least Concern	No	Native	Yes	No		Priority 1

86	Wasp	Vespidae	*Rhynchium haemorrhoidale*	N.A	Not Assessed	Least Concern	No	Native	Yes	Yes		Priority 1
87	Wasp	Vespidae	*Ropalidia erythrospila*	N.A	Not Assessed	Least Concern	No	Native	Yes	No		Priority 1
88	Wasp	Vespidae	*Ropalidia jacobsoni*	N.A	Not Assessed	Least Concern	No	Native	Yes	Yes		Priority 1
89	Wasp	Vespidae	*Ropalidia sp. (flavopicta group)*	N.A	Not Assessed	Data Deficient	No	Native	Yes	No		Priority 1
90	Wasp	Vespidae	*Ropalidia stigma*	N.A	Not Assessed	Least Concern	No	Native	Yes	Yes		Priority 1
91	Wasp	Vespidae	*Ropalidia sumatrae*	N.A	Not Assessed	Least Concern	No	Native	Yes	Yes		Priority 1
92	Wasp	Vespidae	*Ropalidia timida*	N.A	Not Assessed	Least Concern	No	Native	Yes	No		Priority 1
93	Wasp	Vespidae	*Stenodyneriellus guttulatus*	N.A	Not Assessed	Least Concern	No	Native	Yes	Yes		Priority 1
94	Wasp	Vespidae	*Subancistrocerus sichelii*	N.A	Not Assessed	Least Concern	No	Native	Yes	No		Priority 1
95	Wasp	Vespidae	*Subancistrocerus sp.*	N.A	Not Assessed	Data Deficient	No	Native	Yes	No		Priority 1
96	Wasp	Vespidae	*Vespa affinis*	Lesser banded hornet	Not Assessed	Not Assessed	No	Native	Yes	No		Priority 1
97	Wasp	Vespidae	*Vespa analis*	Yellow vented hornet	Not Assessed	Not Assessed	No	Native	Yes	No		Priority 1
98	Wasp	Vespidae	*Vespa tropica*	Greater banded hornet	Not Assessed	Not Assessed	No	Native	Yes	No		Priority 1

No.	Type	Family	Scientific Name	Common Name	Global Status *(IUCN/CITES)*	National Status *(Davison et al., 2008)*	Species of Conservation Signficance	Distribution/ Abundance/ Rarity *(Baker & Lim, 2012)*	Native Status *(Baker & Lim, 2012)*	Probable Species	Recorded Species	Auditory Sensitivity
1	Toad	Bufonidae	*Duttaphrynus melanostictus*	Asian toad	Least Concern	Not Assessed	No	Widespread and Common	Native	Yes	Yes	Priority 1
2	Frog	Dicroglossidae	*Fejervarya cancrivora*	Crab-eating frog	Least Concern	Not Assessed	No	Widespread and Common	Native	Yes	Yes	Priority 1
3	Frog	Dicroglossidae	*Fejervarya limnocharis*	Field frog	Least Concern	Not Assessed	No	Widespread and Common	Native	Yes	Yes	Priority 1
4	Frog	Dicroglossidae	*Limnonectes blythii*	Malayan giant frog	Near Threatened	Not Assessed	No	Widespread and Common	Native	Yes	Yes	Priority 1
5	Frog	Eleutherodactylidae	*Eleutherodactylus planirostris*	Greenhouse frog	Least Concern	Not Assessed	No	Widespread and Common	Non-native	Yes	No	Priority 1
6	Frog	Microhylidae	*Kaloula pulchra*	Banded bull frog	Least Concern	Not Assessed	No	Widespread and Common	Non-native	Yes	Yes	Priority 1
7	Frog	Microhylidae	*Microhyla butleri*	Painted chorus frog	Least Concern	Not Assessed	No	Widespread and Common	Native	Yes	Yes	Priority 1
8	Frog	Microhylidae	*Microhyla heymonsi*	Dark-sided chorus frog	Least Concern	Not Assessed	No	Widespread and Common	Native	Yes	Yes	Priority 1
9	Frog	Microhylidae	*Microhyla mukhlesuri*	East Asian ornate chorus frog	Least Concern	Not Assessed	No	Restricted and Rare	Non-native	Yes	Yes	Priority 1
10	Frog	Ranidae	*Hylarana erythraea*	Green paddy frog	Least Concern	Not Assessed	No	Widespread and Common	Native	Yes	Yes	Priority 1
11	Frog	Ranidae	*Lithobates catesbeianus*	American bullfrog	Least Concern	Not Assessed	No	Widespread and Common	Non-native	Yes	No	Priority 1
12	Frog	Ranidae	*Sylvirana guentheri*	Guenther's frog	Least Concern	Not Assessed	No	Widespread but Uncommon	Non-native	Yes	Yes	Priority 1
13	Frog	Rhacophoridae	*Polypedates leucomystax*	Four-lined tree frog	Least Concern	Not Assessed	No	Widespread and Common	Native	Yes	Yes	Priority 1

No.	Family	Scientific Name	Common Name	Global Status (IUCN/CITES)	National Status *(Davison et al., 2008)*	Species of Conservation Significance	Distribution/ Abundance/ Rarity *(NSS, 2020; Singapore Birds Project, 2020)*	Primary Native Status *(NSS, 2020; Singapre Birds Project, 2020)*	Probable Species	Recorded Species	Auditory Sensitivity
1	Acanthizidae	*Gerygone sulphurea*	Golden-bellied gerygone	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes	Priority 1
2	Accipitridae	*Accipiter gularis*	Japanese sparrowhawk	Least Concern	Not Assessed	No	Common	Winter visitor	Yes	No	Priority 1
3	Accipitridae	*Accipiter soloensis*	Chinese sparrowhawk	Least Concern	Not Assessed	No	Uncommon	Winter visitor	Yes	No	Priority 1
4	Accipitridae	*Accipiter trivirgatus*	Crested goshawk	Least Concern	Critically Endangered	Yes	Uncommon	Resident breeder	Yes	Yes	Priority 1
5	Accipitridae	*Aviceda leuphotes*	Black baza	Least Concern	Not Assessed	No	Common	Winter visitor	Yes	No	Priority 1
6	Accipitridae	*Buteo buteo*	Common buzzard	Least Concern	Not Assessed	No	Uncommon	Winter visitor	Yes	No	Priority 1
7	Accipitridae	*Elanus caeruleus*	Black-winged kite	Least Concern	Not Assessed	No	Uncommon	Resident breeder	Yes	No	Priority 1
8	Accipitridae	*Haliaeetus ichthyaetus*	Grey-headed fish eagle	Near Threatened	Critically Endangered	Yes	Uncommon	Resident breeder	Yes	Yes	Priority 1
9	Accipitridae	*Haliaeetus leucogaster*	White-bellied sea eagle	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes	Priority 1
10	Accipitridae	*Haliastur indus*	Brahminy kite	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes	Priority 1
11	Accipitridae	*Lophotriorchis kienerii*	Rufous-bellied hawk-eagle	Least Concern	Not Assessed	No	Rare	Winter visitor	Yes	No	Priority 1
12	Accipitridae	*Milvus migrans*	Black kite	Least Concern	Not Assessed	No	Rare	Winter visitor	Yes	No	Priority 1
13	Accipitridae	*Nisaetus cirrhatus*	Changeable hawk-eagle	Least Concern	Endangered	Yes	Uncommon	Resident breeder	Yes	Yes	Priority 1
14	Accipitridae	*Pernis ptilorhynchus*	Crested honey-buzzard	Least Concern	Not Assessed	No	Common	Winter visitor	Yes	Yes	Priority 1
15	Accipitridae	*Spilornis cheela*	Crested serpent eagle	Least Concern	Critically Endangered	Yes	Rare	Resident, breeding not proven	Yes	No	Priority 1
16	Acrocephalidae	*Acrocephalus orientalis*	Oriental reed warbler	Least Concern	Not Assessed	No	Common	Winter visitor	Yes	Yes	Priority 1
17	Aegithinidae	*Aegithina tiphia*	Common iora	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes	Priority 1
18	Alcedinidae	*Alcedo atthis*	Common kingfisher	Least Concern	Not Assessed	No	Common	Winter visitor	Yes	No	Priority 1
19	Alcedinidae	*Alcedo meninting*	Blue-eared kingfisher	Least Concern	Critically Endangered	Yes	Rare	Resident breeder	Yes	No	Priority 1
20	Alcedinidae	*Ceyx erithaca*	Oriental dwarf kingfisher	Least Concern	Not Assessed	No	Uncommon	Winter visitor	Yes	No	Priority 1
21	Alcedinidae	*Halcyon smyrnensis*	White-throated kingfisher	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes	Priority 1
22	Alcedinidae	*Pelargopsis capensis*	Stork-billed kingfisher	Least Concern	Not Assessed	No	Uncommon	Resident breeder	Yes	Yes	Priority 1
23	Alcedinidae	*Todiramphus chloris*	Collared kingfisher	Least Concern	Not Assessed	No	Abundant	Introduced resident breeder	Yes	Yes	Priority 1
24	Apodidae	*Aerodramus fuciphagus*	Edible-nest swiftlet	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	No	Priority 1
25	Apodidae	*Aerodramus maximus*	Black-nest swiftlet	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	No	Priority 1
26	Apodidae	*Aerodramus sp.*	N.A	N.A	N.A	N.A	N.A	N.A	N.A	Yes	Priority 1
27	Apodidae	*Apus pacificus*	Pacific swift	Least Concern	Not Assessed	No	Uncommon	Winter visitor	Yes	No	Priority 1
28	Apodidae	*Collocalia affinis*	Plume-toed swiftlet	Not Assessed	Not Assessed	Yes	Uncommon	Resident breeder	Yes	Yes	Priority 1
29	Ardeidae	*Ardea cinerea*	Grey heron	Least Concern	Vulnerable	Yes	Uncommon	Resident breeder	Yes	No	Priority 1
30	Ardeidae	*Ardea intermedia*	Intermediate egret	Least Concern	Not Assessed	No	Uncommon	Winter visitor	Yes	Yes	Priority 1
31	Ardeidae	*Ardea purpurea*	Purple heron	Least Concern	Endangered	Yes	Uncommon	Resident breeder	Yes	No	Priority 1
32	Ardeidae	*Ardeola bacchus*	Chinese pond heron	Least Concern	Not Assessed	No	Common	Winter visitor	Yes	No	Priority 1
33	Ardeidae	*Ardeola sp.*	Pond heron	N.A	N.A	N.A	N.A	N.A	N.A	Yes	Priority 1
34	Ardeidae	*Ardeola speciosa*	Javan pond heron	Least Concern	Not Assessed	No	Uncommon	Winter visitor	Yes	No	Priority 1
35	Ardeidae	*Bubulcus coromandus*	Eastern cattle egret	Least Concern	Not Assessed	No	Common	Winter visitor	Yes	No	Priority 1
36	Ardeidae	*Butorides striata*	Striated heron	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	No	Priority 1
37	Ardeidae	*Egretta garzetta*	Little egret	Least Concern	Not Assessed	No	Common	Winter visitor	Yes	No	Priority 1
38	Ardeidae	*Gorsachius melanolophus*	Malayan night heron	Least Concern	Not Assessed	No	Rare	Winter visitor	Yes	Yes	Priority 1
39	Ardeidae	*Ixobrychus cinnamomeus*	Cinnamon bittern	Least Concern	Not Assessed	No	Uncommon	Resident breeder	Yes	No	Priority 1
40	Ardeidae	*Ixobrychus eurhythmus*	Von Schrenck's bittern	Least Concern	Not Assessed	No	Uncommon	Winter visitor	Yes	No	Priority 1
41	Ardeidae	*Ixobrychus sinensis*	Yellow bittern	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	No	Priority 1
42	Ardeidae	*Nycticorax nycticorax*	Black-crowned night heron	Least Concern	Critically Endangered	Yes	Uncommon	Resident breeder	Yes	No	Priority 1
43	Bucerotidae	*Anthracoceros albirostris*	Oriental pied hornbill	Least Concern	Critically Endangered	Yes	Uncommon	Resident breeder	Yes	No	Priority 1
44	Cacatuidae	*Cacatua goffiniana*	Tanimbar corella	Near Threatened	Not Assessed	No	Common	Introduced resident breeder	Yes	No	Priority 1
45	Cacatuidae	*Cacatua sulphurea*	Yellow-crested cockatoo	Critically Endangered	Not Assessed	No	Uncommon	Introduced resident breeder	Yes	No	Priority 1
46	Campephagidae	*Lalage nigra*	Pied triller	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes	Priority 1
47	Campephagidae	*Pericrocotus divaricatus*	Ashy minivet	Least Concern	Not Assessed	No	Common	Winter visitor	Yes	Yes	Priority 1
48	Caprimulgidae	*Caprimulgus affinis*	Savanna nightjar	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes	Priority 1

49	Caprimulgidae	*Caprimulgus macrurus*	Large-tailed nightjar	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes	Priority 1
50	Charadriidae	*Vanellus indicus*	Red-wattled lapwing	Least Concern	Endangered	Yes	Uncommon	Resident breeder	Yes	Yes	Priority 1
51	Ciconiidae	*Mycteria cinerea*	Milky stork	Least Concern	Not Assessed	No	N.A	Introduced	Yes	No	Priority 1
52	Cisticolidae	*Cisticola juncidis*	Zitting cisticola	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	No	Priority 1
53	Cisticolidae	*Orthotomus atrogularis*	Dark-necked tailorbird	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes	Priority 1
54	Cisticolidae	*Orthotomus ruficeps*	Ashy tailorbird	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes	Priority 1
55	Cisticolidae	*Orthotomus sericeus*	Rufous-tailed tailorbird	Least Concern	Not Assessed	No	Uncommon	Resident breeder	Yes	No	Priority 1
56	Cisticolidae	*Orthotomus sutorius*	Common tailorbird	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes	Priority 1
57	Cisticolidae	*Prinia flaviventris*	Yellow-bellied prinia	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes	Priority 1
58	Columbidae	*Chalcophaps indica*	Common emerald dove	Least Concern	Not Assessed	No	Uncommon	Resident breeder	Yes	Yes	Priority 1
59	Columbidae	*Columba livia*	Rock dove	Least Concern	Not Assessed	No	Abundant	Introduced resident breeder	Yes	No	Priority 1
60	Columbidae	*Ducula bicolor*	Pied imperial pigeon	Least Concern	Not Assessed	No	Uncommon	Resident breeder	Yes	Yes	Priority 1
61	Columbidae	*Geopelia striata*	Zebra dove	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes	Priority 1
62	Columbidae	*Ptilinopus jambu*	Jambu fruit dove	Near Threatened	Not Assessed	No	Uncommon	Non-breeding visitor	Yes	No	Priority 1
63	Columbidae	*Spilopelia chinensis*	Spotted dove	Least Concern	Not Assessed	No	Abundant	Introduced resident breeder	Yes	Yes	Priority 1
64	Columbidae	*Treron vernans*	Pink-necked green pigeon	Least Concern	Not Assessed	No	Abundant	Resident breeder	Yes	Yes	Priority 1
65	Coraciidae	*Eurystomus orientalis*	Oriental dollarbird	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes	Priority 1
66	Corvidae	*Corvus macrorhynchos*	Large-billed crow	Least Concern	Not Assessed	No	Uncommon	Resident breeder	Yes	No	Priority 1
67	Corvidae	*Corvus splendens*	House crow	Least Concern	Not Assessed	No	Common	Introduced resident breeder	Yes	Yes	Priority 1
68	Cuculidae	*Cacomantis merulinus*	Plaintive cuckoo	Least Concern	Not Assessed	No	Uncommon	Resident breeder	Yes	Yes	Priority 1
69	Cuculidae	*Cacomantis sepulcralis*	Rusty-breasted cuckoo	Least Concern	Vulnerable	Yes	Uncommon	Resident breeder	Yes	Yes	Priority 1
70	Cuculidae	*Cacomantis sonneratii*	Banded bay cuckoo	Least Concern	Not Assessed	No	Uncommon	Resident breeder	Yes	No	Priority 1
71	Cuculidae	*Centropus bengalensis*	Lesser coucal	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	No	Priority 1
72	Cuculidae	*Centropus sinensis*	Greater coucal	Least Concern	Not Assessed	No	Uncommon	Resident breeder	Yes	No	Priority 1
73	Cuculidae	*Chrysococcyx minutillus*	Little bronze-cuckoo	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes	Priority 1
74	Cuculidae	*Chrysococcyx xanthorhynchus*	Violet cuckoo	Least Concern	Endangered	Yes	Uncommon	Resident breeder	Yes	No	Priority 1
75	Cuculidae	*Clamator coromandus*	Chestnut-winged cuckoo	Least Concern	Not Assessed	No	Uncommon	Winter visitor	Yes	No	Priority 1
76	Cuculidae	*Cuculus micropterus*	Indian cuckoo	Least Concern	Not Assessed	No	Uncommon	Winter visitor	Yes	No	Priority 1
77	Cuculidae	*Eudynamys scolopaceus*	Asian koel	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes	Priority 1
78	Cuculidae	*Hierococcyx fugax*	Malaysian hawk-cuckoo	Least Concern	Not Assessed	No	Uncommon	Non-breeding visitor	Yes	No	Priority 1
79	Cuculidae	*Hierococcyx sparverioides*	Large hawk-cuckoo	Least Concern	Not Assessed	No	Rare	Winter visitor	Yes	No	Priority 1
80	Cuculidae	*Phaenicophaeus sumatranus*	Chestnut-bellied malkoha	Near Threatened	Not Assessed	No	Uncommon	Resident breeder	Yes	No	Priority 1
81	Dicaeidae	*Dicaeum cruentatum*	Scarlet-backed flowerpecker	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes	Priority 1
82	Dicaeidae	*Dicaeum trigonostigma*	Orange-bellied flowerpecker	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	No	Priority 1
83	Dicruridae	*Dicrurus annectans*	Crow-billed drongo	Least Concern	Not Assessed	No	Uncommon	Winter visitor	Yes	No	Priority 1
84	Dicruridae	*Dicrurus paradiseus*	Greater racket-tailed drongo	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes	Priority 1
85	Estrildidae	*Lonchura atricapilla*	Chestnut munia	Least Concern	Not Assessed	No	Uncommon	Resident breeder	Yes	No	Priority 1
86	Estrildidae	*Lonchura cucullata*	Bronze mannikin	Least Concern	Not Assessed	No	N.A	Introduced	Yes	No	Priority 1
87	Estrildidae	*Lonchura ferruginosa*	White-capped munia	Least Concern	Not Assessed	No	Rare	Introduced resident breeder	Yes	No	Priority 1
88	Estrildidae	*Lonchura leucogastroides*	Javan munia	Least Concern	Not Assessed	No	Uncommon	Introduced resident breeder	Yes	No	Priority 1
89	Estrildidae	*Lonchura maja*	White-headed munia	Least Concern	Not Assessed	No	Uncommon	Resident breeder	Yes	No	Priority 1
90	Estrildidae	*Lonchura punctulata*	Scaly-breasted munia	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	No	Priority 1
91	Falconidae	*Falco tinnunculus*	Common kestrel	Least Concern	Not Assessed	No	Uncommon	Winter visitor	Yes	No	Priority 1
92	Hemiprocnidae	*Hemiprocne longipennis*	Grey-rumped treeswift	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	No	Priority 1
93	Hirundinidae	*Cecropis daurica*	Red-rumped swallow	Least Concern	Not Assessed	No	Uncommon	Winter visitor	Yes	No	Priority 1
94	Hirundinidae	*Hirundo rustica*	Barn swallow	Least Concern	Not Assessed	No	Abundant	Winter visitor	Yes	No	Priority 1
95	Hirundinidae	*Hirundo tahitica*	Pacific swallow	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	No	Priority 1
96	Laniidae	*Lanius cristatus*	Brown shrike	Least Concern	Not Assessed	No	Common	Winter visitor	Yes	Yes	Priority 1
97	Laniidae	*Lanius schach*	Long-tailed shrike	Least Concern	Not Assessed	No	Uncommon	Resident breeder	Yes	No	Priority 1
98	Laniidae	*Lanius tigrinus*	Tiger shrike	Least Concern	Not Assessed	No	Common	Winter visitor	Yes	No	Priority 1
99	Leiothrichidae	*Garrulax leucolophus*	White-crested laughingthrush	Least Concern	Not Assessed	No	Common	Introduced resident breeder	Yes	Yes	Priority 1
100	Megalaimidae	*Psilopogon haemacephalus*	Coppersmith barbet	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes	Priority 1

101	Megalaimidae	*Psilopogon lineatus*	Lineated barbet	Least Concern	Not Assessed	No	Uncommon	Introduced resident breeder	Yes	Yes	Priority 1
102	Meropidae	*Merops philippinus*	Blue-tailed bee-eater	Least Concern	Not Assessed	No	Common	Winter visitor	Yes	Yes	Priority 1
103	Meropidae	*Merops viridis*	Blue-throated bee-eater	Least Concern	Not Assessed	No	Common	Migrant breeder	Yes	Yes	Priority 1
104	Monarchidae	*Terpsiphone incei*	Amur paradise flycatcher	Least Concern	Not Assessed	No	Common	Winter visitor	Yes	No	Priority 1
105	Motacillidae	*Anthus rufulus*	Paddyfield pipit	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	No	Priority 1
106	Motacillidae	*Dendronanthus indicus*	Forest wagtail	Least Concern	Not Assessed	No	Uncommon	Winter visitor	Yes	Yes	Priority 1
107	Motacillidae	*Motacilla cinerea*	Grey wagtail	Least Concern	Not Assessed	No	Uncommon	Winter visitor	Yes	No	Priority 1
108	Motacillidae	*Motacilla tschutschensis*	Eastern yellow wagtail	Least Concern	Not Assessed	No	Common	Winter visitor	Yes	No	Priority 1
109	Muscicapidae	*Copsychus malabaricus*	White-rumped shama	Least Concern	Critically Endangered	Yes	Uncommon	Resident breeder	Yes	No	Priority 1
110	Muscicapidae	*Copsychus saularis*	Oriental magpie-robin	Least Concern	Endangered	Yes	Uncommon	Resident breeder	Yes	Yes	Priority 1
111	Muscicapidae	*Cyornis brunneatus*	Brown-chested jungle flycatcher	Vulnerable	Not Assessed	Yes	Uncommon	Winter visitor	Yes	No	Priority 1
112	Muscicapidae	*Ficedula mugimaki*	Mugimaki flycatcher	Least Concern	Not Assessed	No	Uncommon	Passage migrant	Yes	No	Priority 1
113	Muscicapidae	*Ficedula zanthopygia*	Yellow-rumped flycatcher	Least Concern	Not Assessed	No	Uncommon	Passage migrant	Yes	No	Priority 1
114	Muscicapidae	*Larvivora cyane*	Siberian blue robin	Least Concern	Not Assessed	No	Common	Winter visitor	Yes	Yes	Priority 1
115	Muscicapidae	*Muscicapa dauurica*	Asian brown flycatcher	Least Concern	Not Assessed	No	Common	Winter visitor	Yes	No	Priority 1
116	Muscicapidae	*Muscicapa sibirica*	Dark-sided flycatcher	Least Concern	Not Assessed	No	Uncommon	Winter visitor	Yes	No	Priority 1
117	Muscicapidae	*Muscicapa williamsoni*	Brown-streaked flycatcher	Least Concern	Not Assessed	No	Rare	Winter visitor	Yes	No	Priority 1
118	N.A	*Eos bornea*	Red lory	Least Concern	NA	No	N.A	Introduced	Yes	Yes	Priority 1
119	Nectariniidae	*Aethopyga siparaja*	Crimson sunbird	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	No	Priority 1
120	Nectariniidae	*Anthreptes malacensis*	Brown-throated sunbird	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes	Priority 1
121	Nectariniidae	*Arachnothera longirostra*	Little spiderhunter	Least Concern	Not Assessed	No	Uncommon	Resident breeder	Yes	No	Priority 1
122	Nectariniidae	*Cinnyris jugularis*	Olive-backed sunbird	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes	Priority 1
123	Nectariniidae	*Leptocoma brasiliana*	Van Hasselt's sunbird	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	No	Priority 1
124	Oriolidae	*Oriolus chinensis*	Black-naped oriole	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes	Priority 1
125	Pandionidae	*Pandion haliaetus*	Western osprey	Least Concern	Not Assessed	No	Common	Non-breeding visitor	Yes	No	Priority 1
126	Passeridae	*Passer montanus*	Eurasian tree sparrow	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	No	Priority 1
127	Pellorneidae	*Malacocincla abbotti*	Abbott's babbler	Least Concern	Not Assessed	No	Uncommon	Resident breeder	Yes	No	Priority 1
128	Phasianidae	*Excalfactoria chinensis*	King quail	Least Concern	Not Assessed	No	Uncommon	Resident breeder	Yes	No	Priority 1
129	Phasianidae	*Gallus gallus*	Red junglefowl	Least Concern	Endangered	Yes	Uncommon	Resident breeder	Yes	Yes	Priority 1
130	Phasianidae	*Gallus gallus (domestic)*	Domestic chicken	Not Assessed	Not Assessed	No	N.A	Introduced	Yes	No	Priority 1
131	Phylloscopidae	*Phylloscopus borealis*	Arctic warbler	Least Concern	Not Assessed	No	Common	Winter visitor	Yes	No	Priority 1
132	Phylloscopidae	*Phylloscopus coronatus*	Eastern crowned warbler	Least Concern	Not Assessed	No	Uncommon	Winter visitor	Yes	No	Priority 1
133	Phylloscopidae	*Phylloscopus inornatus*	Yellow-browed warbler	Least Concern	Not Assessed	No	Rare	Winter visitor	Yes	No	Priority 1
134	Picidae	*Chrysophlegma miniaceum*	Banded woodpecker	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes	Priority 1
135	Picidae	*Dinopium javanense*	Common flameback	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes	Priority 1
136	Picidae	*Micropternus brachyurus*	Rufous woodpecker	Least Concern	Not Assessed	No	Uncommon	Resident breeder	Yes	Yes	Priority 1
137	Picidae	*Picus vittatus*	Laced woodpecker	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes	Priority 1
138	Picidae	*Yungipicus moluccensis*	Sunda pygmy woodpecker	Least Concern	Not Assessed	No	Abundant	Resident breeder	Yes	Yes	Priority 1
139	Pittidae	*Pitta moluccensis*	Blue-winged pitta	Least Concern	Not Assessed	Yes	Uncommon	Migrant breeder	Yes	Yes	Priority 1
140	Pittidae	*Pitta sordida*	Hooded pitta	Least Concern	Not Assessed	No	Uncommon	Winter visitor	Yes	No	Priority 1
141	Ploceidae	*Ploceus philippinus*	Baya weaver	Least Concern	Not Assessed	No	Uncommon	Resident breeder	Yes	No	Priority 1
142	Psittaculidae	*Loriculus galgulus*	Blue-crowned hanging-parrot	Least Concern	Endangered	Yes	Uncommon	Resident breeder	Yes	Yes	Priority 1
143	Psittaculidae	*Psittacula alexandri*	Red-breasted parakeet	Near Threatened	Not Assessed	No	Common	Introduced resident breeder	Yes	Yes	Priority 1
144	Psittaculidae	*Psittacula krameri*	Rose-ringed parakeet	Least Concern	Not Assessed	No	Uncommon	Introduced resident breeder	Yes	Yes	Priority 1
145	Psittaculidae	*Psittacula longicauda*	Long-tailed parakeet	Vulnerable	Not Assessed	Yes	Common	Resident breeder	Yes	Yes	Priority 1
146	Psittaculidae	*Psittinus cyanurus*	Blue-rumped parrot	Near Threatened	Critically Endangered	No	Uncommon	Resident, breeding not proven	Yes	No	Priority 1
147	Psittaculidae	*Trichoglossus haematodus*	Coconut lorikeet	Least Concern	Not Assessed	No	Uncommon	Introduced resident breeder	Yes	Yes	Priority 1
148	Pycnonotidae	*Pycnonotus aurigaster*	Sooty-headed bulbul	Least Concern	Not Assessed	No	Uncommon	Introduced resident breeder	Yes	No	Priority 1
149	Pycnonotidae	*Pycnonotus goiavier*	Yellow-vented bulbul	Least Concern	Not Assessed	No	Abundant	Introduced resident breeder	Yes	Yes	Priority 1
150	Pycnonotidae	*Pycnonotus jocosus*	Red-whiskered bulbul	Least Concern	Not Assessed	No	Uncommon	Introduced resident breeder	Yes	No	Priority 1
151	Pycnonotidae	*Pycnonotus plumosus*	Olive-winged bulbul	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes	Priority 1

152	Pycnonotidae	*Pycnonotus zeylanicus*	Straw-headed bulbul	Critically Endangered	Endangered	Yes	Uncommon	Resident breeder	Yes	Yes	Priority 1
153	Rallidae	*Amaurornis phoenicurus*	White-breasted waterhen	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes	Priority 1
154	Rallidae	*Lewinia striata*	Slaty-breasted rail	Least Concern	Not Assessed	No	Uncommon	Resident breeder	Yes	No	Priority 1
155	Rallidae	*Rallina eurizonoides*	Slaty-legged crake	Least Concern	Not Assessed	No	Rare	Winter visitor	Yes	No	Priority 1
156	Rallidae	*Rallina fasciata*	Red-legged crake	Least Concern	Vulnerable	Yes	Uncommon	Resident breeder	Yes	Yes	Priority 1
157	Rallidae	*Zapornia fusca*	Ruddy-breasted crake	Least Concern	Not Assessed	No	Uncommon	Resident breeder	Yes	No	Priority 1
158	Rhipiduridae	*Rhipidura javanica*	Malaysian pied fantail	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes	Priority 1
159	Scolopacidae	*Actitis hypoleucos*	Common sandpiper	Least Concern	Not Assessed	No	Common	Winter visitor	Yes	No	Priority 1
160	Scolopacidae	*Gallinago gallinago*	Common snipe	Least Concern	Not Assessed	No	Common	Winter visitor	Yes	No	Priority 1
161	Scolopacidae	*Gallinago stenura*	Pin-tailed snipe	Least Concern	Not Assessed	No	Common	Winter visitor	Yes	No	Priority 1
162	Scolopacidae	*Rostratula benghalensis*	Greater painted-snipe	Least Concern	Critically Endangered	Yes	Rare	Resident breeder	Yes	No	Priority 1
163	Strigidae	*Ketupa ketupu*	Buffy fish owl	Least Concern	Critically Endangered	Yes	Uncommon	Resident breeder	Yes	No	Priority 1
164	Strigidae	*Otus lempiji*	Sunda scops owl	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes	Priority 1
165	Strigidae	*Strix seloputo*	Spotted wood owl	Least Concern	Critically Endangered	Yes	Uncommon	Resident breeder	Yes	No	Priority 1
166	Sturnidae	*Acridotheres javanicus*	Javan myna	Least Concern	Not Assessed	No	Abundant	Introduced resident breeder	Yes	Yes	Priority 1
167	Sturnidae	*Acridotheres tristis*	Common myna	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	No	Priority 1
168	Sturnidae	*Agropsar sturninus*	Daurian starling	Least Concern	Not Assessed	No	Common	Winter visitor	Yes	No	Priority 1
169	Sturnidae	*Aplonis panayensis*	Asian glossy starling	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes	Priority 1
170	Sturnidae	*Gracula religiosa*	Common hill myna	Least Concern	Not Assessed	No	Uncommon	Resident breeder	Yes	No	Priority 1
171	Timaliidae	*Mixornis gularis*	Pin-striped tit-babbler	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes	Priority 1
172	Turdidae	*Geokichla citrina*	Orange-headed thrush	Least Concern	Not Assessed	No	Uncommon	Winter visitor	Yes	No	Priority 1
173	Turdidae	*Geokichla sibirica*	Siberian thrush	Least Concern	Not Assessed	No	Rare	Passage migrant	Yes	No	Priority 1
174	Turdidae	*Turdus obscurus*	Eyebrowed thrush	Least Concern	Not Assessed	No	Uncommon	Passage migrant	Yes	No	Priority 1
175	Turnicidae	*Turnix suscitator*	Barred buttonquail	Least Concern	Not Assessed	No	Uncommon	Resident breeder	Yes	Yes	Priority 1
176	Tytonidae	*Tyto javanica*	Eastern barn owl	Least Concern	Not Assessed	No	Uncommon	Resident breeder	Yes	No	Priority 1
177	Zosteropidae	*Zosterops simplex*	Swinhoe's white-eye	Least Concern	Not Assessed	No	Common	Resident breeder	Yes	Yes	Priority 1

No.	Family	Scientific Name	Common Name	Global Status *(IUCN/CITES)*	National Status *(Davison et al., 2008; Jain et al, 2018)*	Species of Conservation Significance	Distribution/ Abundance /Rarity *(Khew, 2015)*	Probable Species	Recorded Species	Auditory Sensitivity
1	Hesperiidae	*Ampittia dioscorides camertes*	Bush hopper	Not Assessed	Not Assessed	No	Moderately common	Yes	No	Priority 2
2	Hesperiidae	*Ancistroides nigrita maura*	Chocolate demon	Not Assessed	Not Assessed	No	Common	Yes	Yes	Priority 2
3	Hesperiidae	*Astictopterus jama jama*	Forest hopper	Not Assessed	Nationally Extinct (Rediscovered)	Yes	Moderately rare	Yes	No	Priority 1
4	Hesperiidae	*Baoris farri farri*	Bamboo paintbrush swift	Not Assessed	Not Assessed	No	Moderately rare	Yes	No	Priority 1
5	Hesperiidae	*Baoris oceia*	Paintbrush swift	Not Assessed	Not Assessed	No	Moderately rare	Yes	No	Priority 1
6	Hesperiidae	*Borbo cinnara*	Formosan swift	Not Assessed	Endangered	Yes	Moderately common	Yes	Yes	Priority 1
7	Hesperiidae	*Burara harisa consobrina*	Orange awlet	Not Assessed	Not Assessed	No	Moderately rare	Yes	Yes	Priority 1
8	Hesperiidae	*Caltoris cormasa*	Full stop swift	Not Assessed	Not Assessed	No	Moderately rare	Yes	Yes	Priority 1
9	Hesperiidae	*Caltoris malaya*	Malayan swift	Not Assessed	Nationally Extinct (Rediscovered)	Yes	Moderately rare	Yes	No	Priority 1
10	Hesperiidae	*Caltoris philippina philippina*	Philippine swift	Not Assessed	Not Assessed	No	Rare	Yes	No	Priority 1
11	Hesperiidae	*Cephrenes acalle niasicus*	Plain palm dart	Not Assessed	Nationally Extinct (Rediscovered)	Yes	Moderately rare	Yes	No	Priority 1
12	Hesperiidae	*Cephrenes trichopepla*	Yellow palm dart	Not Assessed	Not assessed	No	Common	Yes	No	Priority 1
13	Hesperiidae	*Erionota hiraca apicalis*	White tipped skipper	Not Assessed	Not Assessed	No	Moderately rare	Yes	No	Priority 1
14	Hesperiidae	*Erionota sp.*	Skipper	N.A	N.A	N.A	N.A	N.A	Yes	Priority 1
15	Hesperiidae	*Erionota thrax thrax*	Banana skipper	Not Assessed	Not Assessed	No	Moderately common	Yes	No	Priority 1
16	Hesperiidae	*Erionota torus*	Torus skipper	Not Assessed	Not Assessed	No	Moderately rare	Yes	No	Priority 1
17	Hesperiidae	*Halpe ormenes vilasina*	Dark banded ace	Not Assessed	Not Assessed	No	Rare	Yes	No	Priority 1
18	Hesperiidae	*Hasora badra badra*	Common awl	Not Assessed	Not Assessed	No	Moderately common	Yes	No	Priority 1
19	Hesperiidae	*Hasora taminatus malayana*	White banded awl	Not Assessed	Not Assessed	No	Rare	Yes	No	Priority 1
20	Hesperiidae	*Hidari irava*	Coconut skipper	Not Assessed	Not Assessed	No	Common	Yes	No	Priority 1
21	Hesperiidae	*Iambrix salsala salsala*	Chestnut bob	Not Assessed	Not Assessed	No	Common	Yes	Yes	Priority 1
22	Hesperiidae	*Iambrix stellifer*	Starry bob	Not Assessed	Not Assessed	No	Moderately rare	Yes	No	Priority 1
23	Hesperiidae	*Matapa aria*	Common redeye	Not Assessed	Not Assessed	No	Moderately rare	Yes	No	Priority 1
24	Hesperiidae	*Mooreana trichoneura trichoneura*	Yellow flat	Not Assessed	Not assessed	No	Rare	Yes	No	Priority 1
25	Hesperiidae	*Notocrypta paralysos varians*	Banded demon	Not Assessed	Not Assessed	No	Moderately common	Yes	No	Priority 1
26	Hesperiidae	*Odontoptilum angulatum angulatum*	Chestnut angle	Not Assessed	Not Assessed	No	Moderately rare	Yes	No	Priority 1
27	Hesperiidae	*Oriens gola pseudolus*	Common dartlet	Not Assessed	Not Assessed	No	Moderately common	Yes	Yes	Priority 1
28	Hesperiidae	*Pelopidas agna agna*	Bengal swift	Not Assessed	Endangered	Yes	Moderately common	Yes	No	Priority 1
29	Hesperiidae	*Pelopidas assamensis*	Great swift	Not Assessed	Not Assessed	No	Moderately rare	Yes	No	Priority 1
30	Hesperiidae	*Pelopidas conjunctus conjunctus*	Conjoined swift	Not Assessed	Not assessed	No	Moderately rare	Yes	Yes	Priority 1
31	Hesperiidae	*Pelopidas mathias mathias*	Small branded swift	Not Assessed	Not Assessed	No	Common	Yes	Yes	Priority 1
32	Hesperiidae	*Pemara pugnans*	Pugnacious lancer	Not Assessed	Not Assessed	No	Very rare	Yes	No	Priority 1
33	Hesperiidae	*Plastingia naga*	Chequered lancer	Not Assessed	Not Assessed	No	Moderately common	Yes	No	Priority 1
34	Hesperiidae	*Polytremis lubricans lubricans*	Contiguous swift	Not Assessed	Not Assessed	No	Common	Yes	Yes	Priority 1
35	Hesperiidae	*Potanthus ganda*	N.A	Not Assessed	Not Assessed	No	N.A	Yes	No	Priority 1
36	Hesperiidae	*Potanthus omaha omaha*	Lesser dart	Not Assessed	Not Assessed	No	Common	Yes	Yes	Priority 1
37	Hesperiidae	*Potanthus serina*	Large dart	Not Assessed	Not assessed	No	Moderately common	Yes	No	Priority 1

38	Hesperiidae	*Potanthus trachala tytleri*	Detached dart	Not Assessed	Nationally Extinct (Rediscovered)	Yes	Moderately rare	Yes	No	Priority 1
39	Hesperiidae	*Pyroneura latoia latoia*	Yellow vein lancer	Not Assessed	Not Assessed	No	Moderately common	Yes	No	Priority 1
40	Hesperiidae	*Suastus gremius gremius*	Palm bob	Not Assessed	Not Assessed	No	Common	Yes	No	Priority 1
41	Hesperiidae	*Tagiades gana gana*	Large snow flat	Not Assessed	Not Assessed	No	Moderately rare	Yes	Yes	Priority 1
42	Hesperiidae	*Tagiades japetus atticus*	Common snow flat	Not Assessed	Not Assessed	No	Moderately common	Yes	No	Priority 1
43	Hesperiidae	*Taractrocera archias quinta*	Yellow grass dart	Not Assessed	Not Assessed	No	Moderately common	Yes	No	Priority 1
44	Hesperiidae	*Taractrocera ardonia lamia*	Spotted grass dart	Not Assessed	Not Assessed	No	Moderately rare	Yes	No	Priority 1
45	Hesperiidae	*Telicota augias augias*	Pale palm dart	Not Assessed	Not Assessed	No	Moderately common	Yes	No	Priority 1
46	Hesperiidae	*Telicota besta bina*	Besta palm dart	Not Assessed	Not Assessed	No	Moderately common	Yes	No	Priority 1
47	Hesperiidae	*Telicota colon stinga*	Common palm dart	Not Assessed	Nationally Extinct (Rediscovered)	Yes	Moderately common	Yes	No	Priority 1
48	Hesperiidae	*Telicota linna*	Linna palm dart	Not Assessed	Not assessed	No	Moderately rare	Yes	No	Priority 1
49	Hesperiidae	*Udaspes folus*	Grass demon	Not Assessed	Not Assessed	No	Moderately common	Yes	No	Priority 1
50	Hesperiidae	*Unkana ambasa batara*	Hoary palmer	Not Assessed	Not Assessed	No	Moderately rare	Yes	No	Priority 1
51	Hesperiidae	*Zographetus doxus*	Spotted flitter	Not Assessed	Not Assessed	No	Rare	Yes	No	Priority 1
52	Lycaenidae	*Acytolepis puspa lambi*	Common hedge blue	Not Assessed	Not Assessed	No	Moderately common	Yes	No	Priority 1
53	Lycaenidae	*Allotinus unicolor unicolor*	Lesser darkwing	Not Assessed	Not Assessed	No	Moderately common	Yes	No	Priority 1
54	Lycaenidae	*Anthene emolus goberus*	Ciliate blue	Not Assessed	Not Assessed	No	Common	Yes	No	Priority 1
55	Lycaenidae	*Anthene lycaenina miya*	Pointed ciliate blue	Not Assessed	Not Assessed	No	Moderately rare	Yes	No	Priority 1
56	Lycaenidae	*Arhopala amphimuta amphimuta*	N.A	Not Assessed	Nationally Extinct (Rediscovered)	Yes	Moderately common	Yes	No	Priority 1
57	Lycaenidae	*Arhopala antimuta antimuta*	Small tailless oakblue	Not Assessed	Nationally Extinct	Yes	Rare	Yes	No	Priority 1
58	Lycaenidae	*Arhopala centaurus nakula*	Centaur oakblue	Not Assessed	Not Assessed	No	Moderately common	Yes	Yes	Priority 1
59	Lycaenidae	*Arhopala major major*	N.A	Not Assessed	Data Deficient	No	Common	Yes	No	Priority 1
60	Lycaenidae	*Arhopala silhetensis adorea*	Sylhet oakblue	Not Assessed	Nationally Extinct (Rediscovered)	Yes	Rare	Yes	No	Priority 1
61	Lycaenidae	*Catochrysops panormus exiguus*	Silver forget-me-not	Not Assessed	Not Assessed	No	Moderately rare	Yes	No	Priority 1
62	Lycaenidae	*Catochrysops strabo strabo*	Forget-me-not	Not Assessed	Not Assessed	No	Moderately rare	Yes	No	Priority 1
63	Lycaenidae	*Catopyrops ancyra*	Ancyra blue	Not Assessed	Vulnerable	Yes	Moderately rare	Yes	No	Priority 1
64	Lycaenidae	*Cheritra freja frigga*	Common imperial	Least Concern	Not Assessed	No	Moderately rare	Yes	No	Priority 1
65	Lycaenidae	*Chilades pandava pandava*	Cycad blue	Not Assessed	Not Assessed	No	Common	Yes	No	Priority 1
66	Lycaenidae	*Curetis saronis sumatrana*	Sumatran sunbeam	Not Assessed	Not Assessed	No	Moderately common	Yes	No	Priority 1
67	Lycaenidae	*Deudorix epijarbas cinnabarus*	Cornelian	Not Assessed	Not Assessed	No	Rare	Yes	No	Priority 1
68	Lycaenidae	*Eooxylides tharis distanti*	Branded imperial	Not Assessed	Not Assessed	No	Common	Yes	No	Priority 1
69	Lycaenidae	*Euchrysops cnejus cnejus*	Gram blue	Not Assessed	Not Assessed	No	Moderately common	Yes	Yes	Priority 1
70	Lycaenidae	*Everes lacturnus rileyi*	Indian cupid	Not Assessed	Not Assessed	No	Rare	Yes	No	Priority 1
71	Lycaenidae	*Flos apidanus saturatus*	Plain plushblue	Not Assessed	Not Assessed	No	Moderately common	Yes	No	Priority 1
72	Lycaenidae	*Horaga syrinx maenala*	Ambon onyx	Not Assessed	Not Assessed	No	Moderately common	Yes	No	Priority 1
73	Lycaenidae	*Hypolycaena erylus teatus*	Common tit	Not Assessed	Not Assessed	No	Common	Yes	No	Priority 1
74	Lycaenidae	*Hypolycaena thecloides thecloides*	Dark tit	Not Assessed	Not Assessed	No	Moderately rare	Yes	No	Priority 1
75	Lycaenidae	*Ionolyce helicon merguiana*	Pointed line blue	Not Assessed	Not Assessed	No	Common	Yes	No	Priority 1
76	Lycaenidae	*Iraota rochana boswelliana*	Scarce silverstreak	Not Assessed	Not Assessed	No	Moderately common	Yes	No	Priority 1
77	Lycaenidae	*Jacoona anasuja anasuja*	Great imperial	Not Assessed	Data Deficient	No	Rare	Yes	No	Priority 1

78	Lycaenidae	*Jamides alecto ageladas*	Metallic caerulean	Not Assessed	Nationally Extinct (Rediscovered)	Yes	Moderately rare	Yes	No	Priority 1
79	Lycaenidae	*Jamides bochus nabonassar*	Dark caerulean	Not Assessed	Not Assessed	No	Moderately rare	Yes	No	Priority 1
80	Lycaenidae	*Jamides celeno aelianus*	Common caerulean	Not Assessed	Not Assessed	No	Common	Yes	Yes	Priority 1
81	Lycaenidae	*Lampides boeticus*	Pea blue	Not Assessed	Not Assessed	No	Common	Yes	Yes	Priority 1
82	Lycaenidae	*Liphyra brassolis abbreviata*	Moth butterfly	Not Assessed	Nationally Extinct (Rediscovered)	Yes	Very rare	Yes	No	Priority 1
83	Lycaenidae	*Logania marmorata damis*	Pale mottle	Not Assessed	Not Assessed	No	Moderately common	Yes	No	Priority 1
84	Lycaenidae	*Loxura atymnus fuconius*	Yamfly	Not Assessed	Not Assessed	No	Moderately common	Yes	No	Priority 1
85	Lycaenidae	*Megisba malaya sikkima*	Malayan	Not Assessed	Not Assessed	No	Moderately rare	Yes	Yes	Priority 1
86	Lycaenidae	*Miletus biggsii biggsii*	Bigg's brownwing	Not Assessed	Not Assessed	No	Moderately common	Yes	No	Priority 1
87	Lycaenidae	*Miletus gopara gopara*	N.A	Not Assessed	Nationally Extinct	Yes	Very rare	Yes	No	Priority 1
88	Lycaenidae	*Miletus symethus petronius*	Blue brownwing/great brownie	Not Assessed	Not Assessed	No	Moderately common	Yes	No	Priority 1
89	Lycaenidae	*Nacaduba berenice icena*	Rounded sixline blue	Not Assessed	Not Assessed	No	Common	Yes	No	Priority 1
90	Lycaenidae	*Nacaduba beroe neon*	Opaque sixline blue	Not Assessed	Not Assessed	No	Common	Yes	No	Priority 1
91	Lycaenidae	*Nacaduba biocellata*	Two spotted line blue	Not Assessed	Not Assessed	No	Moderately rare	Yes	No	Priority 1
92	Lycaenidae	*Nacaduba calauria malayica*	Dark malayan sixline blue	Not Assessed	Not Assessed	No	Moderately rare	Yes	No	Priority 1
93	Lycaenidae	*Nacaduba hermus*	Pale fourline blue	Not Assessed	Not Assessed	No	N.A	Yes	No	Priority 1
94	Lycaenidae	*Nacaduba kurava nemana*	Transparent sixline blue	Not Assessed	Nationally Extinct (Rediscovered)	Yes	Moderately common	Yes	No	Priority 1
95	Lycaenidae	*Nacaduba pactolus odon*	Large fourline blue	Not Assessed	Nationally Extinct (Rediscovered)	Yes	Moderately rare	Yes	No	Priority 1
96	Lycaenidae	*Petrelaea dana*	Dingy line blue	Not Assessed	Not Assessed	No	Moderately rare	Yes	No	Priority 1
97	Lycaenidae	*Poritia sumatrae sumatrae*	Sumatran gem	Not Assessed	Not Assessed	No	Moderately rare	Yes	No	Priority 1
98	Lycaenidae	*Prosotas aluta nanda*	Barred line blue	Not Assessed	Not assessed	No	Rare	Yes	No	Priority 1
99	Lycaenidae	*Prosotas dubiosa lumpura*	Tailless line blue	Not Assessed	Not Assessed	No	Common	Yes	Yes	Priority 1
100	Lycaenidae	*Prosotas nora superdates*	Common line blue	Not Assessed	Not Assessed	No	Moderately common	Yes	No	Priority 1
101	Lycaenidae	*Rachana jalindra burbona*	Banded royal	Not Assessed	Critically Endangered	Yes	Very rare	Yes	No	Priority 1
102	Lycaenidae	*Rapala dieneces dieneces*	Scarlet flash	Not Assessed	Not Assessed	No	Moderately rare	Yes	No	Priority 1
103	Lycaenidae	*Rapala iarbus iarbus*	Common red flash	Not Assessed	Not Assessed	No	Moderately common	Yes	No	Priority 1
104	Lycaenidae	*Rapala manea chozeba*	Slate flash	Not Assessed	Not Assessed	No	Moderately rare	Yes	No	Priority 1
105	Lycaenidae	*Rapala pheretima sequeira*	Copper flash	Not Assessed	Not Assessed	No	Moderately common	Yes	No	Priority 1
106	Lycaenidae	*Rapala suffusa barthema*	Suffused flash	Not Assessed	Not Assessed	No	Moderately common	Yes	No	Priority 1
107	Lycaenidae	*Rapala varuna orseis*	Indigo flash	Not Assessed	Not Assessed	No	Moderately rare	Yes	No	Priority 1
108	Lycaenidae	*Remelana jangala travana*	Chocolate royal	Not Assessed	Not Assessed	No	Moderately rare	Yes	No	Priority 1
109	Lycaenidae	*Semanga superba deliciosa*	N.A	Not Assessed	Not Assessed	No	Moderately rare	Yes	No	Priority 1
110	Lycaenidae	*Spalgis epius epius*	Apefly	Not Assessed	Not Assessed	No	Moderately common	Yes	No	Priority 1
111	Lycaenidae	*Spindasis lohita senama*	Long banded silverline	Not Assessed	Not Assessed	No	Moderately common	Yes	No	Priority 1
112	Lycaenidae	*Spindasis syama terana*	Club silverline	Not Assessed	Not Assessed	No	Moderately common	Yes	No	Priority 1
113	Lycaenidae	*Surendra vivarna amisena*	Acacia blue	Not Assessed	Not Assessed	No	Moderately common	Yes	No	Priority 1
114	Lycaenidae	*Tajuria cippus maxentius*	Peacock royal	Not Assessed	Not Assessed	No	Moderately common	Yes	No	Priority 1
115	Lycaenidae	*Tajuria dominus dominus*	N.A	Not Assessed	Not Assessed	No	Very rare	Yes	No	Priority 1
116	Lycaenidae	*Tajuria mantra mantra*	Felder's royal	Not Assessed	Not Assessed	No	Moderately rare	Yes	Yes	Priority 1
117	Lycaenidae	*Zeltus amasa maximinianus*	Fluffy tit	Not Assessed	Not Assessed	No	Moderately common	Yes	No	Priority 1
118	Lycaenidae	*Zizeeria maha serica*	Pale grass blue	Not Assessed	Not Assessed	No	Common	Yes	No	Priority 1

119	Lycaenidae	*Zizina otis lampa*	Lesser grass blue	Not Assessed	Not Assessed	No	Common	Yes	No	Priority 1
120	Lycaenidae	*Zizula hylax pygmaea*	Pygmy grass blue	Not Assessed	Not Assessed	No	Common	Yes	Yes	Priority 1
121	Nymphalidae	*Acraea terpsicore*	Tawny coster	Not Assessed	Not assessed	No	Common	Yes	Yes	Priority 1
122	Nymphalidae	*Amathusia phidippus phidippus*	Palm king	Not Assessed	Not Assessed	No	Moderately rare	Yes	Yes	Priority 1
123	Nymphalidae	*Athyma nefte subrata*	Colour sergeant	Not Assessed	Not Assessed	No	Common	Yes	No	Priority 1
124	Nymphalidae	*Athyma reta moorei*	Malay staff sergeant	Not Assessed	Not Assessed	Yes	Very rare	Yes	Yes	Priority 1
125	Nymphalidae	*Cethosia cyane*	Leopard lacewing	Not Assessed	Not assessed	No	Common	Yes	No	Priority 1
126	Nymphalidae	*Cethosia sp.*	Lacewing	N.A	N.A	N.A	N.A	N.A	Yes	Priority 1
127	Nymphalidae	*Cupha erymanthis lotis*	Rustic	Not Assessed	Not Assessed	No	Moderately common	Yes	No	Priority 1
128	Nymphalidae	*Danaus chrysippus chrysippus*	Plain tiger	Not Assessed	Not Assessed	No	Common	Yes	Yes	Priority 1
129	Nymphalidae	*Danaus genutia genutia*	Common tiger	Not Assessed	Not Assessed	No	Moderately common	Yes	No	Priority 1
130	Nymphalidae	*Danaus melanippus hegesippus*	Black veined tiger	Not Assessed	Not Assessed	No	Moderately common	Yes	No	Priority 1
131	Nymphalidae	*Discophora sondaica despoliata*	Common duffer	Not Assessed	Critically Endangered	Yes	Rare	Yes	No	Priority 1
132	Nymphalidae	*Doleschallia bisaltide bisaltide*	Autumn leaf	Not Assessed	Not assessed	No	Common	Yes	Yes	Priority 1
133	Nymphalidae	*Doleschallia bisaltide pratipa*	Autumn leaf	Not Assessed	Not assessed	No	Very rare	Yes	No	Priority 1
134	Nymphalidae	*Elymnias hypermnestra agina*	Common palmfly	Not Assessed	Not Assessed	No	Common	Yes	Yes	Priority 1
135	Nymphalidae	*Elymnias panthera panthera*	Tawny palmfly	Not Assessed	Not Assessed	No	Moderately common	Yes	Yes	Priority 1
136	Nymphalidae	*Euploea eyndhovii gardineri*	Striped black crow	Not Assessed	Not Assessed	No	Rare	Yes	No	Priority 1
137	Nymphalidae	*Euploea midamus singapura*	Blue spotted crow	Not Assessed	Not Assessed	No	Moderately common	Yes	No	Priority 1
138	Nymphalidae	*Euploea mulciber mulciber*	Striped blue crow	Not Assessed	Not Assessed	No	Common	Yes	No	Priority 1
139	Nymphalidae	*Euploea radamanthus radamanthus*	Magpie crow	Not Assessed	Not Assessed	No	Moderately common	Yes	No	Priority 1
140	Nymphalidae	*Euthalia aconthea gurda*	Baron	Not Assessed	Not Assessed	No	Common	Yes	No	Priority 1
141	Nymphalidae	*Euthalia adonia pinwilli*	Green baron	Not Assessed	Not Assessed	No	Moderately common	Yes	No	Priority 1
142	Nymphalidae	*Euthalia monina monina*	Malay baron	Not Assessed	Not Assessed	No	Common	Yes	No	Priority 1
143	Nymphalidae	*Faunis canens arcesilas*	Common faun	Not Assessed	Not Assessed	No	Common	Yes	No	Priority 1
144	Nymphalidae	*Hypolimnas anomala anomala*	Malayan eggfly	Not Assessed	Not Assessed	No	Common	Yes	Yes	Priority 1
145	Nymphalidae	*Hypolimnas bolina bolina*	Great eggfly	Not Assessed	Not Assessed	No	Moderately common	Yes	Yes	Priority 1
146	Nymphalidae	*Hypolimnas bolina jacintha*	Jacintha eggfly	Not Assessed	Not Assessed	No	Common	Yes	No	Priority 1
147	Nymphalidae	*Ideopsis vulgaris macrina*	Blue glassy tiger	Not Assessed	Not Assessed	No	Common	Yes	Yes	Priority 1
148	Nymphalidae	*Junonia almana javana*	Peacock pansy	Least Concern	Not Assessed	No	Common	Yes	Yes	Priority 1
149	Nymphalidae	*Junonia atlites atlites*	Grey pansy	Not Assessed	Not Assessed	No	Moderately common	Yes	Yes	Priority 1
150	Nymphalidae	*Junonia hedonia ida*	Chocolate pansy	Not Assessed	Not Assessed	No	Common	Yes	Yes	Priority 1
151	Nymphalidae	*Junonia orithya wallacei*	Blue pansy	Not Assessed	Not Assessed	No	Common	Yes	Yes	Priority 1
152	Nymphalidae	*Lasippa tiga siaka*	Malayan lascar	Not Assessed	Not Assessed	No	Common	Yes	Yes	Priority 1
153	Nymphalidae	*Lebadea martha parkeri*	Knight	Not Assessed	Not Assessed	No	Moderately common	Yes	No	Priority 1
154	Nymphalidae	*Lethe europa malaya*	Bamboo tree brown	Not Assessed	Not Assessed	No	Moderately rare	Yes	No	Priority 1
155	Nymphalidae	*Melanitis leda leda*	Common evening brown	Not Assessed	Not Assessed	No	Moderately rare	Yes	No	Priority 1
156	Nymphalidae	*Moduza procris milonia*	Commander	Not Assessed	Not Assessed	No	Moderately common	Yes	No	Priority 1
157	Nymphalidae	*Mycalesis mineus macromalayana*	Dark brand bush brown	Not Assessed	Not Assessed	No	Common	Yes	Yes	Priority 1
158	Nymphalidae	*Mycalesis orseis nautilus*	Purple bush brown	Not Assessed	Not Assessed	No	Rare	Yes	No	Priority 1
159	Nymphalidae	*Mycalesis perseoides perseoides*	Burmese bush brown	Not Assessed	Data Deficient	No	Common	Yes	Yes	Priority 1

160	Nymphalidae	*Mycalesis perseus cepheus*	Dingy bush brown	Not Assessed	Not Assessed	No	Moderately common	Yes	Yes	Priority 1
161	Nymphalidae	*Mycalesis visala phamis*	Long brand bush brown	Not Assessed	Not Assessed	No	Moderately common	Yes	Yes	Priority 1
162	Nymphalidae	*Neptis hylas papaja*	Common sailor	Not Assessed	Not Assessed	No	Moderately common	Yes	Yes	Priority 1
163	Nymphalidae	*Neptis leucoporos cresina*	Burmese sailor	Not Assessed	Not Assessed	No	Common	Yes	No	Priority 1
164	Nymphalidae	*Orsotriaena medus cinerea*	Dark grass brown	Not Assessed	Not Assessed	No	Common	Yes	No	Priority 1
165	Nymphalidae	*Pandita sinope sinope*	Colonel	Not Assessed	Not Assessed	No	Moderately rare	Yes	No	Priority 1
166	Nymphalidae	*Pantoporia hordonia hordonia*	Common lascar	Not Assessed	Not Assessed	No	Common	Yes	Yes	Priority 1
167	Nymphalidae	*Pantoporia paraka paraka*	Perak lascar	Not Assessed	Not Assessed	No	Moderately common	Yes	No	Priority 1
168	Nymphalidae	*Parantica agleoides agleoides*	Dark glassy tiger	Not Assessed	Not Assessed	No	Common	Yes	Yes	Priority 1
169	Nymphalidae	*Phaedyma columella singa*	Short banded sailor	Not Assessed	Not Assessed	No	Common	Yes	Yes	Priority 1
170	Nymphalidae	*Phalanta phalantha phalantha*	Leopard	Not Assessed	Not Assessed	No	Common	Yes	No	Priority 1
171	Nymphalidae	*Polyura hebe plautus*	Plain nawab	Not Assessed	Not Assessed	No	Common	Yes	No	Priority 1
172	Nymphalidae	*Polyura schreiber tisamenus*	Blue nawab	Not Assessed	Not Assessed	No	Moderately rare	Yes	No	Priority 1
173	Nymphalidae	*Symbrenthia hippoclus selangorana*	Malayan jester	Not Assessed	Not assessed	No	Very rare (seasonal migrant)	Yes	No	Priority 1
174	Nymphalidae	*Tanaecia iapis puseda*	Horsfield's baron	Not Assessed	Not Assessed	No	Common	Yes	No	Priority 1
175	Nymphalidae	*Tanaecia pelea pelea*	Malay viscount	Not Assessed	Not Assessed	No	Common	Yes	No	Priority 1
176	Nymphalidae	*Vindula dejone erotella*	Cruiser	Not Assessed	Not Assessed	No	Common	Yes	No	Priority 1
177	Nymphalidae	*Ypthima baldus newboldi*	Common five-ring	Not Assessed	Not Assessed	No	Common	Yes	No	Priority 1
178	Nymphalidae	*Ypthima horsfieldii humei*	Malayan five-ring	Not Assessed	Not Assessed	No	Common	Yes	No	Priority 1
179	Nymphalidae	*Ypthima huebneri*	Common four-ring	Not Assessed	Not Assessed	No	Moderately common	Yes	No	Priority 1
180	Nymphalidae	*Ypthima pandocus corticaria*	Common three-ring	Not Assessed	Not Assessed	No	Common	Yes	No	Priority 1
181	Papilionidae	*Chilasa clytia clytia*	Common mime	Not Assessed	Not Assessed	No	Common	Yes	No	Priority 1
182	Papilionidae	*Graphium agamemnon agamemnon*	Tailed jay	Not Assessed	Not Assessed	No	Common	Yes	Yes	Priority 1
183	Papilionidae	*Graphium sarpedon luctatius*	Common bluebottle	Not Assessed	Not Assessed	No	Common	Yes	Yes	Priority 1
184	Papilionidae	*Pachliopta aristolochiae asteris*	Common rose	Not Assessed	Vulnerable	Yes	Moderately common	Yes	No	Priority 1
185	Papilionidae	*Papilio demoleus malayanus*	Lime butterfly	Not Assessed	Not Assessed	No	Common	Yes	No	Priority 1
186	Papilionidae	*Papilio demolion demolion*	Banded swallowtail	Not Assessed	Not Assessed	No	Moderately common	Yes	No	Priority 1
187	Papilionidae	*Papilio memnon agenor*	Great mormon	Not Assessed	Not Assessed	No	Moderately common	Yes	No	Priority 1
188	Papilionidae	*Papilio polytes romulus*	Common mormon	Not Assessed	Not Assessed	No	Common	Yes	Yes	Priority 1
189	Papilionidae	*Troides amphrysus ruficollis*	Malayan birdwing	Not Assessed; CITES protected (Appendix II)	Nationally Extinct (Rediscovered)	Yes	Very rare (seasonal migrant)	Yes	No	Priority 1
190	Papilionidae	*Troides helena cerberus*	Common birdwing	Not Assessed; CITES protected (Appendix II)	Vulnerable	Yes	Moderately common	Yes	No	Priority 1
191	Pieridae	*Appias libythea olferna*	Striped albatross	Not Assessed	Not Assessed	No	Common	Yes	Yes	Priority 1
192	Pieridae	*Catopsilia pomona pomona*	Lemon emigrant	Not Assessed	Not Assessed	No	Common	Yes	Yes	Priority 1
193	Pieridae	*Catopsilia pyranthe pyranthe*	Mottled emigrant	Not Assessed	Not Assessed	No	Common	Yes	Yes	Priority 1
194	Pieridae	*Catopsilia scylla cornelia*	Orange emigrant	Not Assessed	Not Assessed	No	Common	Yes	Yes	Priority 1
195	Pieridae	*Delias hyparete metarete*	Painted jezebel	Not Assessed	Not Assessed	No	Common	Yes	Yes	Priority 1
196	Pieridae	*Eurema andersonii andersonii*	Anderson's grass yellow	Not Assessed	Not Assessed	No	Moderately common	Yes	No	Priority 1

197	Pieridae	*Eurema blanda snelleni*	Three spot grass yellow	Not Assessed	Not Assessed	No	Common	Yes	Yes	Priority 1
198	Pieridae	*Eurema hecabe contubernalis*	Common grass yellow	Not Assessed	Not Assessed	No	Common	Yes	Yes	Priority 1
199	Pieridae	*Leptosia nina malayana*	Psyche	Not Assessed	Not Assessed	No	Common	Yes	Yes	Priority 1
200	Pieridae	*Pieris canidia canidia*	Cabbage white	Not Assessed	Not Assessed	No	Moderately rare	Yes	No	Priority 1
201	Riodinidae	*Abisara saturata kausambioides*	Malayan plum judy	Not Assessed	Not Assessed	No	Moderately common	Yes	No	Priority 1
202	Riodinidae	*Laxita thuisto thuisto*	Lesser harlequin	Not Assessed	Not Assessed	No	Rare	Yes	No	Priority 1
203	Riodinidae	*Taxila haquinus haquinus*	Harlequin	Not Assessed	Endangered	Yes	Moderately rare	Yes	No	Priority 1

No.	Family	Scientific Name	Common Name	Global Status *(IUCN/CITES)*	National Status *(Davison et al., 2008)*	Species of Conservation Significance	Native Status *(Baker & Lim, 2012)*	Probable Species	Recorded Species	Auditory Sensitivity
1	Atyidae	*Caridina johnsoni*	Johnson's shrimp	Least Concern	Not Assessed	No	Native	Yes	Yes	Priority 3
2	Atyidae	*Caridina* sp.	N.A	N.A	N.A	N.A	N.A	N.A	Yes*	Priority 3
3	Gecarcinucidae	*Parathelphusa maculata*	Maculate freshwater crab	Least Concern	Not Assessed	No	Native	Yes	No	Priority 3
4	Palaemonidae	*Macrobrachium lanchesteri*	Ghost shrimp	Least Concern	Not Assessed	No	Non-native	Yes	Yes	Priority 3
5	Palaemonidae	*Macrobrachium malayanum*	Freshwater prawn	Least Concern	Not Assessed	No	Native	Yes	No	Priority 3
6	Palaemonidae	*Macrobrachium nipponense*	Oriental river prawn	Least Concern	Not Assessed	No	Non-native	Yes	Yes	Priority 3
7	Sesarmidae	*Geosesarma peraccae*	Peracca's land crab	Not Assessed	Vulnerable	Yes	Native	Yes	No	Priority 2

be *Caridina* cf. *johnsoni*

No.	Family	Scientific Name	Common Name	Global Status *(IUCN/CITES)*	National Status *(Davison et al., 2008)*	Species of Conservation Significance	Native Status *(Baker & Lim, 2012)*	Probable Species	Recorded Species	Auditory Sensitivity
1	Anabantidae	*Anabas testudineus*	Oriental Climbing Perch	Least Concern	Not Assessed	No	Native	Yes	Yes	Priority 3
2	Aplocheilidae	*Aplocheilus armatus*	Whitespot	Least Concern	Not Assessed	No	Native	Yes	Yes	Priority 3
3	Channidae	*Channa lucius*	Forest Snakehead	Least Concern	Not Assessed	No	Native	Yes	No	Priority 3
4	Channidae	*Channa striata*	Paddyfield Snakehead	Least Concern	Not Assessed	No	Native	Yes	Yes	Priority 3
5	Clariidae	*Clarias cf. batrachus*	Common Walking Catfish	Not Assessed	Not Assessed	No	Native	Yes	No	Priority 3
6	Cyprinidae	*Barbodes rhombeus*	Indochinese Spotted Barb	Least Concern	Not Assessed	No	Non-native	Yes	Yes	Priority 3
7	Cyprinidae	*Brachydanio albolineata*	Pearl Danio	Least Concern	Not Assessed	No	Non-native	Yes	No	Priority 3
8	Cyprinidae	*Brachydanio rerio*	Zebra Danio	Least Concern	Not Assessed	No	Non-native	Yes	No	Priority 3
9	Cyprinidae	*Osteochilus vittatus*	Bonylip Barb	Least Concern	Not Assessed	No	Non-native	Yes	No	Priority 3
10	Cyprinidae	*Puntigrus partipentazona*	Malayan tiger barb	Least Concern	Not Assessed	No	Non-native	Yes	Yes	Priority 3
11	Eleotrididae	*Oxyeleotris marmorata*	Marbled Gudgeon	Least Concern	Not Assessed	No	Non-native	Yes	Yes	Priority 3
12	Gobiidae	*Goby sp.*	N.A	N.A	N.A	N.A	N.A	Yes	Yes	Priority 3
13	Gobiidae	*Rhinogobius giurinus*	Barcheek goby	Least Concern	Not Assessed	No	Non-native	Yes	Yes	Priority 3
14	Gobiidae	*Rhinogobius similis*	Oriental river-goby	Not Assessed	Not Assessed	No	Non-native	Yes	Yes	Priority 3
15	Osphronemidae	*Trichopsis schalleri*	Mekong croaking gourami	Least Concern	Not Assessed	No	Non-native	Yes	Yes	Priority 3
16	Osphronemidae	*Betta imbellis*	Crescent Betta	Least Concern	Not Assessed	No	Native	Yes	No	Priority 3
17	Osphronemidae	*Betta pugnax*	Malayan Forest Betta	Least Concern	Not Assessed	No	Native	Yes	No	Priority 3
18	Osphronemidae	*Trichopodus trichopterus*	Threespot Gouramy	Least Concern	Not Assessed	No	Native	Yes	Yes	Priority 3
19	Osphronemidae	*Trichopsis vittata*	Croaking Gouramy	Least Concern	Not Assessed	No	Native	Yes	Yes	Priority 3
20	Poeciliidae	*Gambusia affinis*	Mosquitofish	Least Concern	Not Assessed	No	Non-native	Yes	No	Priority 3
21	Poeciliidae	*Poecilia reticulata*	Guppy	Not Assessed	Not Assessed	No	Non-native	Yes	Yes	Priority 3
22	Poeciliidae	*Poecilia sphenops*	Common Molly	Least Concern	Not Assessed	No	Non-native	Yes	No	Priority 3
23	Poeciliidae	*Xiphophorus maculatus*	Southern Platy	Data Deficient	Not Assessed	No	Non-native	Yes	No	Priority 3
24	Synbranchidae	*Monopterus albus*	Asian Swamp-eel	Least Concern	Not Assessed	No	Native	Yes	Yes	Priority 3
25	Zenarchopteridae	*Dermogenys collettei*	Sunda Pygmy Halfbeak	Not Assessed	Not Assessed	No	Native	Yes	Yes	Priority 3

No.	Family	Scientific Name	Common Name	Global Status *(IUCN, 2012)*	National Status *(Davison et al. 2008)*	Species of Conservation Significance	Distribution/Rarity *(Baker & Lim, 2012)*	Native Status *(Baker & Lim, 2012)*	Probable Species	Recorded Species	Auditory Sensitvity
1	Canidae	*Canis lupus familiaris*	Feral dog	Not Assessed	Not Assessed	No	N.A	Non-native	Yes	Yes	Priority 1
2	Cercopithecidae	*Macaca fascicularis*	Long-tailed macaque	Vulnerable	Not Assessed	Yes	Widespread and Common	Native	Yes	No	Priority 1
3	Felidae	*Felis catus*	Feral cat	Not Assessed	Not Assessed	No	N.A	Non-native	Yes	Yes	Priority 1
4	Manidae	*Manis javanica*	Sunda pangolin	Critically Endangered	Critically Endangered	Yes	Widespread but Rare	Native	Yes	Yes	Priority 1
5	Muridae	*Mus castaneus*	House mouse	Least Concern	Not Assessed	No	Widespread and Common	Native	Yes	No	Priority 1
6	Muridae	*Rattus annandalei*	Annandale's rat	Least Concern	Not Assessed	No	Restricted but Common	Native	Yes	No	Priority 1
7	Muridae	*Rattus exulans*	Polynesian rat	Least Concern	Not Assessed	No	Widespread but Uncommon	Native	Yes	No	Priority 1
8	Muridae	*Rattus norvegicus*	Brown rat	Least Concern	Not Assessed	No	Widespread and Common	Non-native	Yes	No	Priority 1
9	Muridae	*Rattus tanezumi*	Oriental house rat	Least Concern	Not Assessed	No	Widespread and Common	Native	Yes	Yes	Priority 1
10	Muridae	*Rattus tiomanicus*	Malaysian wood rat	Least Concern	Not Assessed	No	Widespread and Common	Native	Yes	Yes	Priority 1
11	Sciuridae	*Callosciurus notatus*	Plantain squirrel	Least Concern	Not Assessed	No	Widespread and Common	Native	Yes	Yes	Priority 1
12	Sciuridae	*Sundasciurus tenuis*	Slender squirrel	Least Concern	Not Assessed	No	Restricted but Common	Native	Yes	Yes	Priority 1
13	Soricidae	*Suncus murinus*	House shrew	Least Concern	Not Assessed	No	Widespread and Common	Native	Yes	Yes	Priority 1
14	Suidae	*Sus scrofa*	Wild pig	Least Concern	Not Assessed	No	Widespread and Common	Native	Yes	Yes	Priority 1
15	Tupaiidae	*Tupaia glis*	Common treeshrew	Least Concern	Not Assessed	No	Widespread and Common	Native	Yes	Yes	Priority 1
16	Viverridae	*Paradoxurus musangus*	Common palm civet	Least Concern	Not Assessed	No	Widespread but Uncommon	Native	Yes	Yes	Priority 1

No.	Type	Family	Scientific Name	Common Name	Global Status *(IUCN/CITES)*	National Status *(Soh et al., 2019)*	Species of Conservation Significance	Distribution/Rarity *(Soh et al. 2019)*	Probable Species	Recorded Species	Auditory Sensitivity
1	Damselfly	Coenagrionidae	*Agriocnemis femina*	Variable wisp	Least Concern	Least Concern	No	Widespread and Common	Yes	Yes	Priority 3
2	Damselfly	Coenagrionidae	*Agriocnemis nana*	Dwarf wisp	Least Concern	Endangered	Yes	Restricted and Very Rare	Yes	No	Priority 2
3	Damselfly	Coenagrionidae	*Agriocnemis rubescens*	Variable sprite	Least Concern	Least Concern	No	Widespread but Uncommon	Yes	No	Priority 3
4	Damselfly	Coenagrionidae	*Archibasis viola*	Violet sprite	Least Concern	Least Concern	No	Widespread and Common	Yes	No	Priority 3
5	Damselfly	Coenagrionidae	*Ceriagrion cerinorubellum*	Ornate coraltail	Least Concern	Least Concern	No	Widespread and Common	Yes	Yes	Priority 3
6	Damselfly	Coenagrionidae	*Ischnura senegalensis*	Common bluetail	Least Concern	Least Concern	No	Widespread and Common	Yes	Yes	Priority 3
7	Damselfly	Coenagrionidae	*Pseudagrion microcephalum*	Blue sprite	Least Concern	Least Concern	No	Widespread and Common	Yes	Yes	Priority 3
8	Damselfly	Coenagrionidae	*Teinobasis ruficollis*	Red-tailed sprite	Not Assessed	Near Threatened	No	Widespread but Rare	Yes	Yes	Priority 3
9	Damselfly	Platycnemididae	*Copera marginipes*	Yellow featherlegs	Least Concern	Least Concern	No	Widespread and Common	Yes	Yes	Priority 3
10	Damselfly	Platycnemididae	*Copera vittata*	Variable featherlegs	Least Concern	Vulnerable	Yes	Restricted and Rare	Yes	No	Priority 2
11	Damselfly	Platycnemididae	*Onychargia atrocyana*	Shorttail	Least Concern	Least Concern	No	Widespread but Uncommon	Yes	No	Priority 3
12	Dragonfly	Aeshnidae	*Anax guttatus*	Emperor	Least Concern	Least Concern	No	Widespread but Uncommon	Yes	No	Priority 3
13	Dragonfly	Aeshnidae	*Anax sp.*	N.A	N.A	N.A	N.A	N.A	N.A	Yes	Priority 3
14	Dragonfly	Aeshnidae	*Gynacantha dohrni*	Spear-tail duskhawker	Not Assessed	Least Concern	No	Widespread but Uncommon	Yes	No	Priority 3
15	Dragonfly	Aeshnidae	*Gynacantha subinterrupta*	Dingy duskhawker	Least Concern	Least Concern	No	Widespread but Uncommon	Yes	Yes	Priority 3
16	Dragonfly	Gomphidae	*Ictinogomphus decoratus*	Common flangetail	Least Concern	Least Concern	No	Widespread and Common	Yes	Yes	Priority 3
17	Dragonfly	Libellulidae	*Acisoma panorpoides*	Trumpet tail	Least Concern	Least Concern	No	Widespread and Common	Yes	Yes	Priority 3
18	Dragonfly	Libellulidae	*Aethriamanta aethra*	Blue adjudant	Least Concern	Least Concern	No	Widespread but Uncommon	Yes	No	Priority 3
19	Dragonfly	Libellulidae	*Aethriamanta brevipennis*	Scarlet adjudant	Least Concern	Least Concern	No	Widespread but Uncommon	Yes	No	Priority 3
20	Dragonfly	Libellulidae	*Aethriamanta gracilis*	Pond adjudant	Least Concern	Least Concern	No	Widespread and Common	Yes	No	Priority 3
21	Dragonfly	Libellulidae	*Agrionoptera insignis*	Grenadier	Least Concern	Least Concern	No	Widespread and Common	Yes	Yes	Priority 3
22	Dragonfly	Libellulidae	*Brachydiplax chalybea*	Blue dasher	Least Concern	Least Concern	No	Widespread and Common	Yes	Yes	Priority 3
23	Dragonfly	Libellulidae	*Brachythemis contaminata*	Common amberwing	Least Concern	Least Concern	No	Widespread and Common	Yes	No	Priority 3
24	Dragonfly	Libellulidae	*Camacinia gigantea*	Sultan	Least Concern	Least Concern	No	Widespread but Uncommon	Yes	No	Priority 3
25	Dragonfly	Libellulidae	*Cratilla lineata*	Lined forest skimmer	Least Concern	Near Threatened	Yes	Widespread but Rare	Yes	No	Priority 2
26	Dragonfly	Libellulidae	*Cratilla metallica*	Dark-tipped forest skimmer	Least Concern	Least Concern	No	Widespread and Common	Yes	No	Priority 3
27	Dragonfly	Libellulidae	*Crocothemis servilia*	Common scarlet	Least Concern	Least Concern	No	Widespread and Common	Yes	Yes	Priority 3
28	Dragonfly	Libellulidae	*Diplacodes nebulosa*	Black-tipped percher	Least Concern	Least Concern	No	Widespread but Uncommon	Yes	No	Priority 3
29	Dragonfly	Libellulidae	*Diplacodes trivialis*	Blue percher	Least Concern	Least Concern	No	Widespread and Common	Yes	Yes	Priority 3
30	Dragonfly	Libellulidae	*Hydrobasileus croceus*	Water monarch	Least Concern	Least Concern	No	Widespread and Common	Yes	No	Priority 3
31	Dragonfly	Libellulidae	*Lathrecista asiatica*	Scarlet grenadier	Least Concern	Least Concern	No	Widespread and Common	Yes	Yes	Priority 3
32	Dragonfly	Libellulidae	*Macrodiplax cora*	Coastal glider	Least Concern	Least Concern	No	Widespread and Common	Yes	No	Priority 3
33	Dragonfly	Libellulidae	*Nannophya pygmaea*	Scarlet pygmy	Least Concern	Least Concern	No	Widespread and Common	Yes	No	Priority 3
34	Dragonfly	Libellulidae	*Nesoxenia lineata*	Striped grenadier	Least Concern	Least Concern	No	Widespread but Uncommon	No	Yes	Priority 3
35	Dragonfly	Libellulidae	*Neurothemis fluctuans*	Common parasol	Least Concern	Least Concern	No	Widespread and Common	Yes	Yes	Priority 3
36	Dragonfly	Libellulidae	*Orchithemis pulcherrima*	Variable sentinel	Least Concern	Least Concern	No	Widespread and Common	Yes	No	Priority 3
37	Dragonfly	Libellulidae	*Orthetrum chrysis*	Spine-tufted skimmer	Least Concern	Least Concern	No	Widespread and Common	Yes	Yes	Priority 3
38	Dragonfly	Libellulidae	*Orthetrum glaucum*	Common blue skimmer	Least Concern	Least Concern	No	Widespread and Common	Yes	Yes	Priority 3
39	Dragonfly	Libellulidae	*Orthetrum luzonicum*	Slender blue skimmer	Least Concern	Least Concern	No	Widespread and Common	Yes	No	Priority 3
40	Dragonfly	Libellulidae	*Orthetrum sabina*	Variegated green skimmer	Least Concern	Least Concern	No	Widespread and Common	Yes	Yes	Priority 3
41	Dragonfly	Libellulidae	*Orthetrum testaceum*	Scarlet skimmer	Least Concern	Least Concern	No	Widespread and Common	Yes	Yes	Priority 3
42	Dragonfly	Libellulidae	*Pantala flavescens*	Wandering glider	Least Concern	Least Concern	No	Widespread and Common	Yes	Yes	Priority 3
43	Dragonfly	Libellulidae	*Potamarcha congener*	Common chaser	Least Concern	Least Concern	No	Widespread and Common	Yes	Yes	Priority 3
44	Dragonfly	Libellulidae	*Pseudothemis jorina*	Banded skimmer	Least Concern	Least Concern	No	Widespread but Uncommon	Yes	No	Priority 3
45	Dragonfly	Libellulidae	*Rhodothemis rufa*	Common redbolt	Least Concern	Least Concern	No	Widespread and Common	Yes	Yes	Priority 3
46	Dragonfly	Libellulidae	*Rhyothemis obsolescens*	Bronze flutterer	Least Concern	Least Concern	No	Widespread but Uncommon	Yes	No	Priority 3

47	Dragonfly	Libellulidae	*Rhyothemis phyllis*	Yellow-barred flutterer	Least Concern	Least Concern	No	Widespread and Common	Yes	Yes	Priority 3
48	Dragonfly	Libellulidae	*Rhyothemis triangularis*	Sapphire flutterer	Least Concern	Least Concern	No	Widespread but Uncommon	Yes	No	Priority 3
49	Dragonfly	Libellulidae	*Tholymis tillarga*	White-barred duskhawk	Least Concern	Least Concern	No	Widespread and Common	Yes	Yes	Priority 3
50	Dragonfly	Libellulidae	*Tramea transmarina*	Saddlebag glider	Least Concern	Least Concern	No	Widespread and Common	Yes	No	Priority 3
51	Dragonfly	Libellulidae	*Trithemis aurora*	Crimson dropwing	Least Concern	Least Concern	No	Widespread and Common	Yes	No	Priority 3
52	Dragonfly	Libellulidae	*Trithemis festiva*	Indigo dropwing	Least Concern	Least Concern	No	Widespread and Common	Yes	No	Priority 3
53	Dragonfly	Libellulidae	*Trithemis pallidinervis*	Dancing dropwing	Least Concern	Least Concern	No	Widespread but Uncommon	Yes	No	Priority 3
54	Dragonfly	Libellulidae	*Tyriobapta torrida*	Treehugger	Least Concern	Least Concern	No	Widespread and Common	Yes	No	Priority 3
55	Dragonfly	Libellulidae	*Urothemis signata*	Scarlet basker	Not Assessed	Least Concern	No	Widespread and Common	Yes	Yes	Priority 3
56	Dragonfly	Libellulidae	*Zyxomma petiolatum*	Slender duskdarter	Least Concern	Least Concern	No	Widespread and Common	Yes	Yes	Priority 3
57	Dragonfly	Macromiidae	*Epophthalmia vittigera*	Pond cruiser	Least Concern	Least Concern	No	Widespread and Common	Yes	No	Priority 3
58	Dragonfly	Synthemistidae	*Idionyx yolanda*	Shadowdancer	Not Assessed	Least Concern	No	Widespread but Uncommon	Yes	No	Priority 3

No.	Type	Family	Scientific Name	Common Name	Global Status *(IUCN/CITES)*	National Status *(Davison et al., 2008)*	Species of Conservation Signficance	Distribution/Abundance/Rarity *(Baker & Lim, 2012)*	Native Status *(Baker & Lim, 2012)*	Probable Species	Recorded Species	Auditory Sensitivity
1	Lizard	Agamidae	*Bronchocela cristatella*	Green crested lizard	Not Assessed	Not Assessed	No	Widespread but Uncommon	Native	Yes	Yes	Priority 1
2	Lizard	Agamidae	*Calotes versicolor*	Changeable lizard	Not Assessed	Not Assessed	No	Widespread and Common	Non-native	Yes	Yes	Priority 1
3	Lizard	Agamidae	*Draco sumatranus*	Sumatran flying dragon	Not Assessed	Not Assessed	No	Widespread and Common	Native	Yes	No	Priority 1
4	Lizard	Gekkonidae	*Gehyra mutilata*	Four-clawed gecko	Not Assessed	Not Assessed	No	Widespread and Common	Native	Yes	No	Priority 1
5	Lizard	Gekkonidae	*Gekko monarchus*	Spotted house gecko	Not Assessed	Not Assessed	No	Widespread and Common	Native	Yes	Yes	Priority 1
6	Lizard	Gekkonidae	*Hemidactylus brookii*	Brooke's house gecko	Not Assessed	Not Assessed	No	Restricted and Rare	Non-native	Yes	No	Priority 1
7	Lizard	Gekkonidae	*Hemidactylus frenatus*	Spiny-tailed house gecko	Least Concern	Not Assessed	No	Widespread and Common	Native	Yes	Yes	Priority 1
8	Lizard	Gekkonidae	*Hemidactylus platyurus*	Flat-tailed gecko	Not Assessed	Not Assessed	No	Widespread and Common	Native	Yes	No	Priority 1
9	Lizard	Gekkonidae	*Hemiphyllodactylus typus*	Lowland dwarf gecko	Least Concern	Vulnerable	Yes	Restricted and Rare	Native	Yes	Yes	Priority 1
10	Lizard	Scincidae	*Eutropis multifasciata*	Many-lined sun skink	Not Assessed	Not Assessed	No	Widespread and Common	Native	Yes	Yes	Priority 1
11	Lizard	Scincidae	*Lygosoma bowringii*	Garden supple skink	Not Assessed	Not Assessed	No	Widespread and Common	Native	Yes	No	Priority 1
12	Lizard	Varanidae	*Varanus nebulosus*	Clouded monitor	Not Assessed	Not Assessed	No	Restricted but Common	Native	Yes	No	Priority 1
13	Lizard	Varanidae	*Varanus salvator*	Malayan water monitor	Least Concern	Not Assessed	No	Widespread and Common	Native	Yes	Yes	Priority 1
14	Snake	Colubridae	*Ahaetulla prasina*	Oriental whip snake	Least Concern	Not Assessed	No	Widespread and Common	Native	Yes	Yes	Priority 3
15	Snake	Colubridae	*Chrysopelea paradisi*	Paradise gliding snake	Least Concern	Not Assessed	No	Widespread and Common	Native	Yes	No	Priority 3
16	Snake	Colubridae	*Coelognathus flavolineatus*	Common Malayan racer	Least Concern	Endangered	Yes	Widespread but Rare	Native	Yes	No	Priority 2
17	Snake	Colubridae	*Dendrelaphis caudolineatus*	Striped bronzeback	Least Concern	Not Assessed	No	Widespread and Common	Native	Yes	Yes	Priority 3
18	Snake	Colubridae	*Dendrelaphis pictus*	Painted bronzeback	Least Concern	Not Assessed	No	Widespread and Common	Native	Yes	Yes	Priority 3
19	Snake	Colubridae	*Lycodon capucinus*	House wolf snake	Least Concern	Not Assessed	No	Widespread and Common	Native	Yes	Yes	Priority 3
20	Snake	Colubridae	*Oligodon octolineatus*	Striped kukri snake	Least Concern	Not Assessed	No	Widespread and Common	Native	Yes	No	Priority 3
21	Snake	Colubridae	*Ptyas korros*	Indochinese rat snake	Least Concern	Not Assessed	No	Widespread but Uncommon	Native	Yes	Yes	Priority 3
22	Snake	Colubridae	*Sibynophis melanocephalus*	Black-headed collared snake	Least Concern	Endangered	Yes	Widespread but Uncommon	Native	Yes	No	Priority 2
23	Snake	Colubridae	*Xenochrophis vittatus*	Striped keelback	Least Concern	Not Assessed	No	Widespread and Common	Non-native	Yes	No	Priority 3
24	Snake	Elapidae	*Calliophis intestinalis*	Banded Malayan coral snake	Least Concern	Not Assessed	No	Widespread but Rare	Native	Yes	No	Priority 3
25	Snake	Elapidae	*Naja sumatrana*	Equatorial spitting cobra	Least Concern	Not Assessed	No	Widespread and Common	Native	Yes	No	Priority 3
26	Snake	Elapidae	*Ophiophagus hannah*	King cobra	Vulnerable	Endangered	Yes	Restricted and Rare	Native	Yes	No	Priority 2
27	Snake	Homalopsidae	*Homalopsis buccata*	Puff-faced water snake	Least Concern	Vulnerable	Yes	Widespread but Uncommon	Native	Yes	No	Priority 2
28	Snake	Pareidae	*Pareas margaritophorus*	White-spotted slug snake	Least Concern	Not Assessed	No	Widespread and Common	Non-native	Yes	No	Priority 3
29	Snake	Pythonidae	*Malayopython reticulatus*	Reticulated python	Least Concern	Not Assessed	No	Widespread and Common	Native	Yes	Yes	Priority 3
30	Snake	Typhlopidae	*Argyrophis muelleri*	White-bellied blind snake	Least Concern	Critically Endangered	Yes	Widespread but Rare	Native	Yes	No	Priority 2
31	Snake	Typhlopidae	*Indotyphlops braminus*	Brahminy blind snake	Least Concern	Not Assessed	No	Widespread and Common	Native	Yes	No	Priority 3
32	Snake	Xenopeltidae	*Xenopeltis unicolor*	Iridescent earth snake	Least Concern	Not Assessed	No	Widespread but Uncommon	Native	Yes	No	Priority 3
33	Turtle	Emydidae	*Trachemys decussata*	Cuban slider	Not Assessed	Not Assessed	No	NA	NA	Yes	No	Priority 3
34	Turtle	Emydidae	*Trachemys scripta*	Red-eared slider	Least Concern	Not Assessed	No	Widespread and Common	Non-native	Yes	Yes	Priority 3
35	Turtle	Geomydidae	*Cuora amboinensis*	Malayan box terrapin	Vulnerable; CITES protected (Appendix II)	Not Assessed	Yes	Restricted but Common	Native	Yes	Yes	Priority 2

36	Turtle	Geomydidae	*Heosemys grandis*	Giant Asian pond turtle	Vulnerable; CITES protected (Appendix II)	Not Assessed	No	NA	Non-native	Yes	Yes	Priority 3
37	Turtle	Trionychidae	*Amyda cartilaginea*	Asian softshell turtle	Vulnerable	Endangered	Yes	Restricted and Uncommon	Native	Yes	Yes	Priority 2

No.	Family	Scientific Name	Common Name	Global Status *(IUCN, 2012)*	National Status *(Davison et al. 2008)*	Species of Conservation Significance	Distribution/Rarity *(Baker & Lim, 2012)*	Native Status *(Baker & Lim, 2012)*	Probable Species	Recorded Species	Auditory Sensitivity
1	Emballonuridae	*Saccolaimus saccolaimus*	Pouch-bearing bat	Least Concern	Not Assessed	No	Widespread and Common	Native	Yes	Yes	Priority 1
2	Emballonuridae	*Taphozous melanopogon*	Black-bearded tomb bat	Least Concern	Endangered	Yes	Widespread but Rare	Native	Yes	No	Priority 1
3	Pteropodidae	*Cynopterus brachyotis*	Lesser dog-faced fruit bat	Least Concern	Not Assessed	No	Widespread and Common	Native	Yes	Yes	Priority 1
4	Pteropodidae	*Eonycteris spelaea*	Cave nectar bat	Least Concern	Not Assessed	No	Widespread but Uncommon	Native	Yes	No	Priority 1
5	Pteropodidae	*Pteropus vampyrus*	Large flying fox	Near Threatened	Not Assessed	No	N.A	Visitor	Yes	No	Priority 1
6	Vespertilionidae	*Myotis muricola*	Whiskered myotis	Least Concern	Not Assessed	No	Widespread and Common	Native	Yes	Yes	Priority 1
7	Vespertilionidae	*Pipistrellus javanicus*	Javan pipistrelle	Least Concern	Not Assessed	No	Widespread but Uncommon	Native	Yes	No	Priority 1
8	Vespertilionidae	*Scotophilus kuhlii*	Asiatic lesser yellow house bat	Least Concern	Not Assessed	No	Widespread and Common	Native	Yes	Yes	Priority 1
9	Vespertilionidae	*Tylonycteris fulvida*	Lesser bamboo bat	Least Concern	Critically Endangered	Yes	Restricted and Rare	Native	Yes	No	Priority 1
10	Vespertilionidae	*Tylonycteris malayana*	Greater bamboo bat	Least Concern	Not Assessed	Yes	Widespread and Common	Native	Yes	No	Priority 1

Appendix Z
Airborne Noise Predictions for Construction Phase

Delivering a better world

1. Tables

Ecological Impacts

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Table 1-1 Summary of Construction Noise Predictions – Scenario 1: Site Clearance, Ecological Impacts

Elevation	Representative Ecological Receptors	Nearest Noise Logger No. for Baseline Noise Monitoring Results	Affected Ecological Receptors	Construction Phase (Scenario 1: Site Clearance)							
				Predicted Construction Noise (Weekday Noise Criterion)				Worst Case Exceedance, dB(A)			
				$L_{Aeq(12\ hours)}$, dB	$L_{Aeq(1\ hour)}$, dB	$L_{Aeq(5\ mins)}$, dB		$L_{Aeq(12\ hours)}$, dB	$L_{Aeq(1\ hour)}$, dB	$L_{Aeq(5\ mins)}$, dB	
				7am – 7pm	7pm – 10pm	7am – 7pm	7pm – 10pm	7am – 7pm	7pm – 10pm	7am – 7pm	7pm – 10pm
Ground Level (1.5 m)	E1	**N7 (Tengah Forest – Future Educational)***	**Priority 1, Priority 2, and Priority 3**	58 (58)	62 (62)	79 (79)	72 (72)	1	0	0	0
	E2			58 (58)	62 (62)	79 (79)	72 (72)				
	E3			58 (58)	62 (62)	79 (79)	72 (72)				
	E4			58 (58)	62 (62)	79 (79)	72 (72)				
	E5			58 (58)	62 (62)	79 (79)	72 (72)				
	E6			58 (58)	62 (62)	79 (79)	72 (72)				
	E7			58 (58)	62 (62)	79 (79)	72 (72)				
	E8			**59 (58)**	62 (62)	79 (79)	72 (72)				
	E9			58 (58)	62 (62)	79 (79)	72 (72)				
Higher Elevation (10 m)	E1			58 (58)	62 (62)	79 (79)	72 (72)	2	1	0	0
	E2			58 (58)	62 (62)	79 (79)	72 (72)				
	E3			58 (58)	62 (62)	79 (79)	72 (72)				
	E4			58 (58)	62 (62)	79 (79)	72 (72)				
	E5			58 (58)	62 (62)	79 (79)	72 (72)				
	E6			58 (58)	62 (62)	79 (79)	72 (72)				
	E7			59 (58)	62 (62)	79 (79)	72 (72)				
	E8			**60 (58)**	**63 (62)**	79 (79)	72 (72)				
	E9			59 (58)	62 (62)	79 (79)	72 (72)				
Higher Elevation (15 m)	E1			58 (58)	62 (62)	79 (79)	72 (72)	2	1	0	0
	E2			58 (58)	62 (62)	79 (79)	72 (72)				
	E3			58 (58)	62 (62)	79 (79)	72 (72)				
	E4			58 (58)	62 (62)	79 (79)	72 (72)				
	E5			58 (58)	62 (62)	79 (79)	72 (72)				
	E6			58 (58)	62 (62)	79 (79)	72 (72)				
	E7			59 (58)	62 (62)	79 (79)	72 (72)				
	E8			**60 (58)**	**63 (62)**	79 (79)	72 (72)				
	E9			59 (58)	63 (62)	79 (79)	72 (72)				

Note:
** Refer to Table 10-1 of the Southern Tengah EIS Draft Final Report for more information on the nearest noise logger where the recorded maximum baseline noise monitoring results are used as the noise criterion as part of no-worse-off than maximum of baseline noise impact assessment for ecological receptors in this EIS, aligned with the approach and methodology used by Jacobs in Project No. D3332600 accepted by NEA.*

The predicted construction noise levels reflected above have been adjusted to account for pre-existing maximum baseline noise levels recorded at N7.

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*The Worst-Case Exceedance predicted on the Representative Ecological Receptors from the predicted construction noise results are indicated in **Bold** above.*

Table 1-2 Summary of Construction Noise Predictions – Scenario 2: Earthworks, Ecological Impacts

Elevation	Representative Ecological Receptors	Nearest Noise Logger No. for Baseline Noise Monitoring Results	Affected Ecological Receptors	Construction Phase (Scenario 2: Earthworks)			
				Predicted Construction Noise (Weekday Noise Criterion)		Worst Case Exceedance, dB(A)	
				$L_{Aeq(12\ hours)}$, dB	$L_{Aeq(5\ mins)}$, dB		
				7am-7pm	7am-7pm	$L_{Aeq(12\ hour)}$, dB	$L_{Aeq(5\ min)}$, dB
Ground Level (1.5 m)	E1	**N7 (Tengah Forest – Future Educational)***	**Priority 1, Priority 2, and Priority 3**	58 (58)	79 (79)	0	0
	E2			58 (58)	79 (79)		
	E3			58 (58)	79 (79)		
	E4			58 (58)	79 (79)		
	E5			58 (58)	79 (79)		
	E6			58 (58)	79 (79)		
	E7			58 (58)	79 (79)		
	E8			58 (58)	79 (79)		
	E9			58 (58)	79 (79)		
Higher Elevation (10 m)	E1			58 (58)	79 (79)	0	0
	E2			58 (58)	79 (79)		
	E3			58 (58)	79 (79)		
	E4			58 (58)	79 (79)		
	E5			58 (58)	79 (79)		
	E6			58 (58)	79 (79)		
	E7			58 (58)	79 (79)		
	E8			58 (58)	79 (79)		
	E9			58 (58)	79 (79)		
Higher Elevation (15 m)	E1			58 (58)	79 (79)	0	0
	E2			58 (58)	79 (79)		
	E3			58 (58)	79 (79)		
	E4			58 (58)	79 (79)		
	E5			58 (58)	79 (79)		
	E6			58 (58)	79 (79)		
	E7			58 (58)	79 (79)		
	E8			58 (58)	79 (79)		
	E9			58 (58)	79 (79)		

Note:
** Refer to Table 10-1 of the Southern Tengah EIS Draft Final Report for more information on the nearest noise logger where the recorded maximum baseline noise monitoring results are used as the noise criterion as part of no-worse-off than maximum of baseline noise impact assessment for ecological receptors in this EIS, aligned with the approach and methodology used by Jacobs in Project No. D3332600 accepted by NEA.*
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The predicted construction noise levels reflected above have been adjusted to account for pre-existing maximum baseline noise levels recorded at N7.
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No noise exceedance was predicted by the noise model for the ecological receptors subjected to noise emissions arising from the activities associated with Scenario 2: Earthworks.

Table 1-3 Summary of Construction Noise Predictions – Scenario 3: Infrastructure and Building Works, Ecological Impacts

Elevation	Representative Ecological Receptors	Nearest Noise Logger No. for Baseline Noise Monitoring Results	Affected Ecological Receptors	Construction Phase (Scenario 3: Infrastructure and Building Works)			
				Predicted Construction Noise (Weekday Noise Criterion)		Worst Case Exceedance, dB(A)	
				$L_{Aeq(12\ hours)}$, dB	$L_{Aeq(5\ mins)}$, dB		
				7am-7pm	7am-7pm	$L_{Aeq(12\ hour)}$, dB	$L_{Aeq(5\ min)}$, dB
Ground Level (1.5 m)	E1	**N7 (Tengah Forest – Future Educational)***	**Priority 1, Priority 2, and Priority 3**	58 (58)	79 (79)	0	0
	E2			58 (58)	79 (79)		
	E3			58 (58)	79 (79)		
	E4			58 (58)	79 (79)		
	E5			58 (58)	79 (79)		
	E6			58 (58)	79 (79)		
	E7			58 (58)	79 (79)		
	E8			58 (58)	79 (79)		
	E9			58 (58)	79 (79)		
Higher Elevation (10 m)	E1			58 (58)	79 (79)	1	0
	E2			58 (58)	79 (79)		
	E3			58 (58)	79 (79)		
	E4			58 (58)	79 (79)		
	E5			58 (58)	79 (79)		
	E6			58 (58)	79 (79)		
	E7			**59 (58)**	79 (79)		
	E8			58 (58)	79 (79)		
	E9			58 (58)	79 (79)		
Higher Elevation (15 m)	E1			58 (58)	79 (79)	1	0
	E2			58 (58)	79 (79)		
	E3			58 (58)	79 (79)		
	E4			58 (58)	79 (79)		
	E5			58 (58)	79 (79)		
	E6			**59 (58)**	79 (79)		
	E7			**59 (58)**	79 (79)		
	E8			58 (58)	79 (79)		
	E9			58 (58)	79 (79)		

Note:
** Refer to Table 10-1 of the Southern Tengah EIS Draft Final Report for more information on the nearest noise logger where the recorded maximum baseline noise monitoring results are used as the noise criterion as part of no-worse-off than maximum of baseline noise impact assessment for ecological receptors in this EIS, aligned with the approach and methodology used by Jacobs in Project No. D3332600 accepted by NEA.*

The predicted construction noise levels reflected above have been adjusted to account for pre-existing maximum baseline noise levels recorded at N7.

*The Worst-Case Exceedance predicted on the Representative Ecological Receptors from the predicted construction noise results are indicated in **Bold** above.*

Table 1-4 Summary of Construction Noise Predictions – Scenario 1: Site Clearance, Human Impacts (Weekdays)

No.	Noise Sensitive Receptors	Receptor Sensitivity	Nearest Noise Logger	Construction Phase (Scenario 1: Site Clearance)							
				Predicted Construction Noise (Weekday Noise Criterion)				Worst Case Exceedance, dB(A)	Impact Intensity	Impact Consequence	Likelihood	Impact Significance
				$L_{Aeq(12\ hours)}$, dB	$L_{Aeq(1\ hour)}$, dB	$L_{Aeq(5\ mins)}$, dB						
				7am-7pm	7pm-10pm	7am-7pm	7pm-10pm					
1	445A West Crest @ Bukit Batok, BB West Ave 8	2	N1b	35 (76)	36 (69)	36 (90)	36 (72)	–	Negligible	Very Low	Unlikely	Negligible
2	445B West Crest @ Bukit Batok, BB West Ave 8	2	N1b	34 (76)	35 (69)	36 (90)	36 (72)	–	Negligible	Very Low	Unlikely	Negligible
3	445C West Crest @ Bukit Batok, BB West Ave 8	2	N1b	34 (76)	35 (69)	36 (90)	36 (72)	–	Negligible	Very Low	Unlikely	Negligible
4	446 West Crest @ Bukit Batok, BB West Ave 8	2	N1b	32 (76)	33 (69)	34 (90)	34 (72)	–	Negligible	Very Low	Unlikely	Negligible
5	Block 112A Tengah Plantation Acres (Future HDB)	2	N1b	39 (76)	40 (69)	39 (90)	39 (72)	–	Negligible	Very Low	Unlikely	Negligible
6	Block 113A Tengah Plantation Acres (Future HDB)	2	N1b	37 (76)	38 (69)	38 (90)	38 (72)	–	Negligible	Very Low	Unlikely	Negligible
7	Block 113B Tengah Plantation Acres (Future HDB)	2	N1b	40 (76)	41 (69)	41 (90)	41 (72)	–	Negligible	Very Low	Unlikely	Negligible
8	Dulwich College (1)	1	N1b	31 (69)	32 (NA)	33 (76)	33 (67)	–	Negligible	Very Low	Unlikely	Negligible
9	Dulwich College (2)	1	N1b	30 (69)	31 (NA)	32 (76)	32 (67)	–	Negligible	Very Low	Unlikely	Negligible
10	Dulwich College Senior School Sports Hall	1	N1b	30 (69)	31 (NA)	32 (76)	32 (67)	–	Negligible	Very Low	Unlikely	Negligible
11	JE 2 Tengah Park MRT (U/C)	3	N1b	32 (76)	33 (NA)	34 (90)	34 (72)	–	Negligible	Imperceptible	Unlikely	Negligible
12	Shell Petrol Station Bukit Batok West Ave 3 (1)	3	N1b	25 (76)	26 (NA)	28 (90)	28 (72)	–	Negligible	Imperceptible	Unlikely	Negligible
13	Shell Petrol Station Bukit Batok West Ave 3 (2)	3	N1b	26 (76)	27 (NA)	28 (90)	28 (72)	–	Negligible	Imperceptible	Unlikely	Negligible
14	HDB Block 306 Jurong East Street 32	2	N3	28 (76)	29 (71)	30 (90)	30 (73)	–	Negligible	Very Low	Unlikely	Negligible
15	HDB Block 307 Jurong East Street 32	2	N3	30 (76)	31 (71)	33 (90)	33 (73)	–	Negligible	Very Low	Unlikely	Negligible
16	HDB Block 308 Jurong East Street 32	2	N3	34 (76)	35 (71)	36 (90)	36 (73)	–	Negligible	Very Low	Unlikely	Negligible
17	HDB Block 309 Jurong East Street 32	2	N3	33 (76)	34 (71)	36 (90)	36 (73)	–	Negligible	Very Low	Unlikely	Negligible
18	HDB Block 310 Jurong East Street 32	2	N3	34 (76)	35 (71)	37 (90)	37 (73)	–	Negligible	Very Low	Unlikely	Negligible
19	HDB Block 331 Jurong East Ave 1	2	N3	39 (76)	40 (71)	40 (90)	40 (73)	–	Negligible	Very Low	Unlikely	Negligible
20	HDB Block 332 Jurong East Ave 1	2	N3	44 (76)	45 (71)	45 (90)	45 (73)	–	Negligible	Very Low	Unlikely	Negligible
21	HDB Block 333 Jurong East Ave 1	2	N3	43 (76)	44 (71)	44 (90)	44 (73)	–	Negligible	Very Low	Unlikely	Negligible
22	HDB Block 334 Jurong East Ave 1	2	N3	42 (76)	43 (71)	42 (90)	42 (73)	–	Negligible	Very Low	Unlikely	Negligible
23	HDB Block 335 Jurong East Ave 1	2	N3	39 (76)	40 (71)	40 (90)	40 (73)	–	Negligible	Very Low	Unlikely	Negligible
24	HDB Block 336 Jurong East Ave 1	2	N3	34 (76)	35 (71)	35 (90)	35 (73)	–	Negligible	Very Low	Unlikely	Negligible
25	HDB Block 337 Jurong East Ave 1	2	N3	31 (76)	32 (71)	33 (90)	33 (73)	–	Negligible	Very Low	Unlikely	Negligible
26	HDB Block 373 Jurong East Street 32	2	N3	30 (76)	31 (71)	32 (90)	32 (73)	–	Negligible	Very Low	Unlikely	Negligible
27	HDB Block 374 Jurong East Street 32	2	N3	36 (76)	37 (71)	38 (90)	38 (73)	–	Negligible	Very Low	Unlikely	Negligible
28	Jurong Primary School (1)	1	N3	32 (71)	33 (NA)	34 (76)	34 (70)	–	Negligible	Very Low	Unlikely	Negligible
29	Jurong Primary School (2)	1	N3	28 (71)	29 (NA)	30 (76)	30 (70)	–	Negligible	Very Low	Unlikely	Negligible
30	Jurong Primary School (3)	1	N3	26 (71)	27 (NA)	28 (76)	28 (70)	–	Negligible	Very Low	Unlikely	Negligible
31	Jurong Primary School (4)	1	N3	34 (71)	35 (NA)	35 (76)	35 (70)	–	Negligible	Very Low	Unlikely	Negligible
32	Jurongville Secondary School (1)	1	N3	44 (71)	45 (NA)	45 (76)	45 (70)	–	Negligible	Very Low	Unlikely	Negligible
33	Jurongville Secondary School (2)	1	N3	42 (71)	43 (NA)	42 (76)	42 (70)	–	Negligible	Very Low	Unlikely	Negligible
34	Jurongville Secondary School (3)	1	N3	39 (71)	40 (NA)	40 (76)	40 (70)	–	Negligible	Very Low	Unlikely	Negligible
35	Jurongville Secondary School (4)	1	N3	40 (71)	41 (NA)	41 (76)	41 (70)	–	Negligible	Very Low	Unlikely	Negligible
36	Jurongville Secondary School (5)	1	N3	40 (71)	41 (NA)	40 (76)	40 (70)	–	Negligible	Very Low	Unlikely	Negligible
37	Former Hong Kah Secondary School (1)	1	N4	35 (70)	36 (NA)	36 (76)	36 (67)	–	Negligible	Very Low	Unlikely	Negligible
38	Former Hong Kah Secondary School (2)	1	N4	34 (70)	35 (NA)	35 (76)	35 (67)	–	Negligible	Very Low	Unlikely	Negligible
39	Former Hong Kah Secondary School (3)	1	N4	36 (70)	37 (NA)	36 (76)	36 (67)	–	Negligible	Very Low	Unlikely	Negligible

No.	Noise Sensitive Receptors	Receptor Sensitivity	Nearest Noise Logger	Construction Phase (Scenario 1: Site Clearance)								
				Predicted Construction Noise (Weekday Noise Criterion)				Worst Case Exceedance, dB(A)	Impact Intensity	Impact Consequence	Likelihood	Impact Significance
				$L_{Aeq(12\ hours)}$, dB	$L_{Aeq(1\ hour)}$, dB	$L_{Aeq(5\ mins)}$, dB						
				7am-7pm	7pm-10pm	7am-7pm	7pm-10pm					
40	Former Hong Kah Secondary School (4)	1	N4	35 (70)	36 (NA)	35 (76)	35 (67)	–	Negligible	Very Low	Unlikely	Negligible
41	Former Hong Kah Secondary School (5)	1	N4	35 (70)	36 (NA)	35 (76)	35 (67)	–	Negligible	Very Low	Unlikely	Negligible
42	Former Hong Kah Secondary School (6)	1	N4	28 (70)	29 (NA)	30 (76)	30 (67)	–	Negligible	Very Low	Unlikely	Negligible
43	Former Hong Kah Secondary School (7)	1	N4	36 (70)	37 (NA)	37 (76)	37 (67)	–	Negligible	Very Low	Unlikely	Negligible
44	Former Hong Kah Secondary School (8)	1	N4	38 (70)	39 (NA)	39 (76)	39 (67)	–	Negligible	Very Low	Unlikely	Negligible
45	Former Hong Kah Secondary School (9)	1	N4	39 (70)	40 (NA)	39 (76)	39 (67)	–	Negligible	Very Low	Unlikely	Negligible
46	Former Hong Kah Secondary School (10)	1	N4	37 (70)	38 (NA)	37 (76)	37 (67)	–	Negligible	Very Low	Unlikely	Negligible
47	Former Hong Kah Secondary School (11)	1	N4	29 (70)	30 (NA)	31 (76)	31 (67)	–	Negligible	Very Low	Unlikely	Negligible
48	HDB Block 405 (Hong Kah Court), Jurong West St 42	2	N4	35 (76)	36 (NA)	38 (90)	38 (72)	–	Negligible	Very Low	Unlikely	Negligible
49	HDB Block 406 (Hong Kah Court), Jurong West St 42	2	N4	36 (76)	37 (NA)	39 (90)	39 (72)	–	Negligible	Very Low	Unlikely	Negligible
50	HDB Block 407 (Hong Kah Court), Jurong West St 42	2	N4	44 (76)	45 (NA)	47 (90)	47 (72)	–	Negligible	Very Low	Unlikely	Negligible
51	HDB Block 408 (Hong Kah Court), Jurong West St 42	2	N4	44 (76)	45 (NA)	47 (90)	47 (72)	–	Negligible	Very Low	Unlikely	Negligible
52	HDB Block 409 Jurong West Street 42	2	N4	40 (76)	41 (NA)	43 (90)	43 (72)	–	Negligible	Very Low	Unlikely	Negligible
53	HDB Block 410 Jurong West Street 42	2	N4	39 (76)	40 (NA)	41 (90)	41 (72)	–	Negligible	Very Low	Unlikely	Negligible
54	HDB Block 559 Jurong West Street 42	2	N5	36 (76)	37 (69)	39 (90)	39 (72)	–	Negligible	Very Low	Unlikely	Negligible
55	HDB Block 561 Jurong West Street 42	2	N5	35 (76)	36 (69)	37 (90)	37 (72)	–	Negligible	Very Low	Unlikely	Negligible
56	HDB Block 561B Jurong West Street 42	2	N5	42 (76)	43 (69)	45 (90)	45 (72)	–	Negligible	Very Low	Unlikely	Negligible
57	JS 4 Hong Kah MRT (U/C)	3	N7	40 (75)	41 (NA)	43 (90)	43 (70)	–	Negligible	Imperceptible	Unlikely	Negligible
58	Block 131D Tengah Plantation Grange (Future HDB)	2	N8	49 (75)	50 (66)	49 (90)	49 (70)	–	Negligible	Very Low	Unlikely	Negligible
59	Block 133C Tengah Plantation Grange (Future HDB)	2	N8	47 (75)	48 (66)	47 (90)	47 (70)	–	Negligible	Very Low	Unlikely	Negligible

Table 1-5 Summary of Construction Noise Predictions – Scenario 2: Earthworks, Human Impacts (Weekdays)

No.	Noise Sensitive Receptors	Receptor Sensitivity	Nearest Noise Logger	Construction Phase (Scenario 2: Earthworks)						
				Predicted Construction Noise (Weekday Noise Criterion)		Worst Case Exceedance, dB(A)	Impact Intensity	Impact Consequence	Likelihood	Impact Significance
				$L_{Aeq(12\ hours)}$, dB 7am-7pm	$L_{Aeq(5\ mins)}$, dB 7am-7pm					
1	445A West Crest @ Bukit Batok, BB West Ave 8	2	N1b	34 (76)	37 (90)	–	Negligible	Very Low	Occasional	Minor
2	445B West Crest @ Bukit Batok, BB West Ave 8	2	N1b	35 (76)	38 (90)	–	Negligible	Very Low	Occasional	Minor
3	445C West Crest @ Bukit Batok, BB West Ave 8	2	N1b	34 (76)	37 (90)	–	Negligible	Very Low	Occasional	Minor
4	446 West Crest @ Bukit Batok, BB West Ave 8	2	N1b	32 (76)	35 (90)	–	Negligible	Very Low	Occasional	Minor
5	Block 112A Tengah Plantation Acres (Future HDB)	2	N1b	30 (76)	33 (90)	–	Negligible	Very Low	Occasional	Minor
6	Block 113A Tengah Plantation Acres (Future HDB)	2	N1b	36 (76)	39 (90)	–	Negligible	Very Low	Occasional	Minor
7	Block 113B Tengah Plantation Acres (Future HDB)	2	N1b	33 (76)	36 (90)	–	Negligible	Very Low	Occasional	Minor
8	Dulwich College (1)	1	N1b	30 (69)	33 (76)	–	Negligible	Very Low	Occasional	Minor
9	Dulwich College (2)	1	N1b	30 (69)	33 (76)	–	Negligible	Very Low	Occasional	Minor
10	Dulwich College Senior School Sports Hall	1	N1b	30 (69)	33 (76)	–	Negligible	Very Low	Occasional	Minor
11	JE 2 Tengah Park MRT (U/C)	3	N1b	34 (76)	37 (90)	–	Negligible	Imperceptible	Occasional	Negligible
12	Shell Petrol Station Bukit Batok West Ave 3 (1)	3	N1b	25 (76)	28 (90)	–	Negligible	Imperceptible	Occasional	Negligible
13	Shell Petrol Station Bukit Batok West Ave 3 (2)	3	N1b	26 (76)	29 (90)	–	Negligible	Imperceptible	Occasional	Negligible
14	HDB Block 306 Jurong East Street 32	2	N3	30 (76)	33 (90)	–	Negligible	Very Low	Occasional	Minor
15	HDB Block 307 Jurong East Street 32	2	N3	33 (76)	36 (90)	–	Negligible	Very Low	Occasional	Minor
16	HDB Block 308 Jurong East Street 32	2	N3	36 (76)	39 (90)	–	Negligible	Very Low	Occasional	Minor
17	HDB Block 309 Jurong East Street 32	2	N3	35 (76)	38 (90)	–	Negligible	Very Low	Occasional	Minor
18	HDB Block 310 Jurong East Street 32	2	N3	36 (76)	39 (90)	–	Negligible	Very Low	Occasional	Minor
19	HDB Block 331 Jurong East Ave 1	2	N3	29 (76)	32 (90)	–	Negligible	Very Low	Occasional	Minor
20	HDB Block 332 Jurong East Ave 1	2	N3	37 (76)	40 (90)	–	Negligible	Very Low	Occasional	Minor
21	HDB Block 333 Jurong East Ave 1	2	N3	37 (76)	40 (90)	–	Negligible	Very Low	Occasional	Minor
22	HDB Block 334 Jurong East Ave 1	2	N3	37 (76)	40 (90)	–	Negligible	Very Low	Occasional	Minor
23	HDB Block 335 Jurong East Ave 1	2	N3	37 (76)	40 (90)	–	Negligible	Very Low	Occasional	Minor
24	HDB Block 336 Jurong East Ave 1	2	N3	28 (76)	31 (90)	–	Negligible	Very Low	Occasional	Minor
25	HDB Block 337 Jurong East Ave 1	2	N3	32 (76)	35 (90)	–	Negligible	Very Low	Occasional	Minor
26	HDB Block 373 Jurong East Street 32	2	N3	32 (76)	35 (90)	–	Negligible	Very Low	Occasional	Minor
27	HDB Block 374 Jurong East Street 32	2	N3	36 (76)	39 (90)	–	Negligible	Very Low	Occasional	Minor
28	Jurong Primary School (1)	1	N3	34 (71)	37 (76)	–	Negligible	Very Low	Occasional	Minor
29	Jurong Primary School (2)	1	N3	30 (71)	33 (76)	–	Negligible	Very Low	Occasional	Minor
30	Jurong Primary School (3)	1	N3	26 (71)	29 (76)	–	Negligible	Very Low	Occasional	Minor
31	Jurong Primary School (4)	1	N3	33 (71)	36 (76)	–	Negligible	Very Low	Occasional	Minor
32	Jurongville Secondary School (1)	1	N3	32 (71)	35 (76)	–	Negligible	Very Low	Occasional	Minor
33	Jurongville Secondary School (2)	1	N3	32 (71)	35 (76)	–	Negligible	Very Low	Occasional	Minor
34	Jurongville Secondary School (3)	1	N3	27 (71)	30 (76)	–	Negligible	Very Low	Occasional	Minor
35	Jurongville Secondary School (4)	1	N3	29 (71)	32 (76)	–	Negligible	Very Low	Occasional	Minor
36	Jurongville Secondary School (5)	1	N3	28 (71)	31 (76)	–	Negligible	Very Low	Occasional	Minor
37	Former Hong Kah Secondary School (1)	1	N4	29 (70)	32 (76)	–	Negligible	Very Low	Occasional	Minor
38	Former Hong Kah Secondary School (2)	1	N4	25 (70)	28 (76)	–	Negligible	Very Low	Occasional	Minor
39	Former Hong Kah Secondary School (3)	1	N4	24 (70)	27 (76)	–	Negligible	Very Low	Occasional	Minor

No.	Noise Sensitive Receptors	Receptor Sensitivity	Nearest Noise Logger	Construction Phase (Scenario 2: Earthworks)						
				Predicted Construction Noise (Weekday Noise Criterion)		Worst Case Exceedance, dB(A)	Impact Intensity	Impact Consequence	Likelihood	Impact Significance
				$L_{Aeq(12\ hours)}$, dB 7am-7pm	$L_{Aeq(5\ mins)}$, dB 7am-7pm					
40	Former Hong Kah Secondary School (4)	1	N4	25 (70)	28 (76)	–	Negligible	Very Low	Occasional	Minor
41	Former Hong Kah Secondary School (5)	1	N4	24 (70)	27 (76)	–	Negligible	Very Low	Occasional	Minor
42	Former Hong Kah Secondary School (6)	1	N4	21 (70)	24 (76)	–	Negligible	Very Low	Occasional	Minor
43	Former Hong Kah Secondary School (7)	1	N4	28 (70)	31 (76)	–	Negligible	Very Low	Occasional	Minor
44	Former Hong Kah Secondary School (8)	1	N4	29 (70)	32 (76)	–	Negligible	Very Low	Occasional	Minor
45	Former Hong Kah Secondary School (9)	1	N4	28 (70)	31 (76)	–	Negligible	Very Low	Occasional	Minor
46	Former Hong Kah Secondary School (10)	1	N4	29 (70)	32 (76)	–	Negligible	Very Low	Occasional	Minor
47	Former Hong Kah Secondary School (11)	1	N4	20 (70)	23 (76)	–	Negligible	Very Low	Occasional	Minor
48	HDB Block 405 (Hong Kah Court), Jurong West St 42	2	N4	30 (76)	33 (90)	–	Negligible	Very Low	Occasional	Minor
49	HDB Block 406 (Hong Kah Court), Jurong West St 42	2	N4	30 (76)	33 (90)	–	Negligible	Very Low	Occasional	Minor
50	HDB Block 407 (Hong Kah Court), Jurong West St 42	2	N4	36 (76)	39 (90)	–	Negligible	Very Low	Occasional	Minor
51	HDB Block 408 (Hong Kah Court), Jurong West St 42	2	N4	36 (76)	39 (90)	–	Negligible	Very Low	Occasional	Minor
52	HDB Block 409 Jurong West Street 42	2	N4	35 (76)	38 (90)	–	Negligible	Very Low	Occasional	Minor
53	HDB Block 410 Jurong West Street 42	2	N4	34 (76)	37 (90)	–	Negligible	Very Low	Occasional	Minor
54	HDB Block 559 Jurong West Street 42	2	N5	32 (76)	35 (90)	–	Negligible	Very Low	Occasional	Minor
55	HDB Block 561 Jurong West Street 42	2	N5	28 (76)	31 (90)	–	Negligible	Very Low	Occasional	Minor
56	HDB Block 561B Jurong West Street 42	2	N5	36 (76)	39 (90)	–	Negligible	Very Low	Occasional	Minor
57	JS 4 Hong Kah MRT (U/C)	3	N7	30 (75)	33 (90)	–	Negligible	Imperceptible	Occasional	Negligible
58	Block 131D Tengah Plantation Grange (Future HDB)	2	N8	33 (75)	36 (90)	–	Negligible	Very Low	Occasional	Minor
59	Block 133C Tengah Plantation Grange (Future HDB)	2	N8	33 (75)	36 (90)	–	Negligible	Very Low	Occasional	Minor

Table 1-6 Summary of Construction Noise Predictions – Scenario 3: Infrastructure and Building Works, Human Impacts (Weekdays)

No.	Noise Sensitive Receptors	Receptor Sensitivity	Nearest Noise Logger	Construction Phase (Scenario 3: Infrastructure and Building Works)						
				Predicted Construction Noise (Weekday Noise Criterion)		Worst Case Exceedance, dB(A)	Impact Intensity	Impact Consequence	Likelihood	Impact Significance
				$L_{Aeq(12\ hours)}$, dB 7am-7pm	$L_{Aeq(5\ mins)}$, dB 7am-7pm					
1	445A West Crest @ Bukit Batok, BB West Ave 8	2	N1b	52 (76)	54 (90)	–	Negligible	Very Low	Likely	Minor
2	445B West Crest @ Bukit Batok, BB West Ave 8	2	N1b	54 (76)	56 (90)	–	Negligible	Very Low	Likely	Minor
3	445C West Crest @ Bukit Batok, BB West Ave 8	2	N1b	53 (76)	55 (90)	–	Negligible	Very Low	Likely	Minor
4	446 West Crest @ Bukit Batok, BB West Ave 8	2	N1b	50 (76)	52 (90)	–	Negligible	Very Low	Likely	Minor
5	Block 112A Tengah Plantation Acres (Future HDB)	2	N1b	49 (76)	51 (90)	–	Negligible	Very Low	Likely	Minor
6	Block 113A Tengah Plantation Acres (Future HDB)	2	N1b	56 (76)	58 (90)	–	Negligible	Very Low	Likely	Minor
7	Block 113B Tengah Plantation Acres (Future HDB)	2	N1b	51 (76)	53 (90)	–	Negligible	Very Low	Likely	Minor
8	Dulwich College (1)	1	N1b	49 (69)	51 (76)	–	Negligible	Very Low	Likely	Minor
9	Dulwich College (2)	1	N1b	48 (69)	50 (76)	–	Negligible	Very Low	Likely	Minor
10	Dulwich College Senior School Sports Hall	1	N1b	50 (69)	52 (76)	–	Negligible	Very Low	Likely	Minor
11	JE 2 Tengah Park MRT (U/C)	3	N1b	53 (76)	55 (90)	–	Negligible	Imperceptible	Likely	Negligible
12	Shell Petrol Station Bukit Batok West Ave 3 (1)	3	N1b	45 (76)	47 (90)	–	Negligible	Imperceptible	Likely	Negligible
13	Shell Petrol Station Bukit Batok West Ave 3 (2)	3	N1b	46 (76)	48 (90)	–	Negligible	Imperceptible	Likely	Negligible
14	HDB Block 306 Jurong East Street 32	2	N3	48 (76)	50 (90)	–	Negligible	Very Low	Likely	Minor
15	HDB Block 307 Jurong East Street 32	2	N3	49 (76)	51 (90)	–	Negligible	Very Low	Likely	Minor
16	HDB Block 308 Jurong East Street 32	2	N3	52 (76)	54 (90)	–	Negligible	Very Low	Likely	Minor
17	HDB Block 309 Jurong East Street 32	2	N3	51 (76)	53 (90)	–	Negligible	Very Low	Likely	Minor
18	HDB Block 310 Jurong East Street 32	2	N3	52 (76)	54 (90)	–	Negligible	Very Low	Likely	Minor
19	HDB Block 331 Jurong East Ave 1	2	N3	46 (76)	48 (90)	–	Negligible	Very Low	Likely	Minor
20	HDB Block 332 Jurong East Ave 1	2	N3	52 (76)	54 (90)	–	Negligible	Very Low	Likely	Minor
21	HDB Block 333 Jurong East Ave 1	2	N3	52 (76)	54 (90)	–	Negligible	Very Low	Likely	Minor
22	HDB Block 334 Jurong East Ave 1	2	N3	52 (76)	54 (90)	–	Negligible	Very Low	Likely	Minor
23	HDB Block 335 Jurong East Ave 1	2	N3	53 (76)	55 (90)	–	Negligible	Very Low	Likely	Minor
24	HDB Block 336 Jurong East Ave 1	2	N3	45 (76)	47 (90)	–	Negligible	Very Low	Likely	Minor
25	HDB Block 337 Jurong East Ave 1	2	N3	49 (76)	51 (90)	–	Negligible	Very Low	Likely	Minor
26	HDB Block 373 Jurong East Street 32	2	N3	49 (76)	51 (90)	–	Negligible	Very Low	Likely	Minor
27	HDB Block 374 Jurong East Street 32	2	N3	52 (76)	54 (90)	–	Negligible	Very Low	Likely	Minor
28	Jurong Primary School (1)	1	N3	51 (71)	53 (76)	–	Negligible	Very Low	Likely	Minor
29	Jurong Primary School (2)	1	N3	48 (71)	50 (76)	–	Negligible	Very Low	Likely	Minor
30	Jurong Primary School (3)	1	N3	45 (71)	47 (76)	–	Negligible	Very Low	Likely	Minor
31	Jurong Primary School (4)	1	N3	49 (71)	52 (76)	–	Negligible	Very Low	Likely	Minor
32	Jurongville Secondary School (1)	1	N3	46 (71)	48 (76)	–	Negligible	Very Low	Likely	Minor
33	Jurongville Secondary School (2)	1	N3	45 (71)	47 (76)	–	Negligible	Very Low	Likely	Minor
34	Jurongville Secondary School (3)	1	N3	45 (71)	47 (76)	–	Negligible	Very Low	Likely	Minor
35	Jurongville Secondary School (4)	1	N3	44 (71)	46 (76)	–	Negligible	Very Low	Likely	Minor
36	Jurongville Secondary School (5)	1	N3	42 (71)	44 (76)	–	Negligible	Very Low	Likely	Minor
37	Former Hong Kah Secondary School (1)	1	N4	45 (70)	47 (76)	–	Negligible	Very Low	Likely	Minor
38	Former Hong Kah Secondary School (2)	1	N4	43 (70)	45 (76)	–	Negligible	Very Low	Likely	Minor
39	Former Hong Kah Secondary School (3)	1	N4	39 (70)	41 (76)	–	Negligible	Very Low	Likely	Minor

No.	Noise Sensitive Receptors	Receptor Sensitivity	Nearest Noise Logger	Construction Phase (Scenario 3: Infrastructure and Building Works)						
				Predicted Construction Noise (Weekday Noise Criterion)		Worst Case Exceedance, dB(A)	Impact Intensity	Impact Consequence	Likelihood	Impact Significance
				$L_{Aeq(12\ hours)}$, dB 7am-7pm	$L_{Aeq(5\ mins)}$, dB 7am-7pm					
40	Former Hong Kah Secondary School (4)	1	N4	39 (70)	41 (76)	–	Negligible	Very Low	Likely	Minor
41	Former Hong Kah Secondary School (5)	1	N4	40 (70)	42 (76)	–	Negligible	Very Low	Likely	Minor
42	Former Hong Kah Secondary School (6)	1	N4	37 (70)	40 (76)	–	Negligible	Very Low	Likely	Minor
43	Former Hong Kah Secondary School (7)	1	N4	44 (70)	46 (76)	–	Negligible	Very Low	Likely	Minor
44	Former Hong Kah Secondary School (8)	1	N4	45 (70)	48 (76)	–	Negligible	Very Low	Likely	Minor
45	Former Hong Kah Secondary School (9)	1	N4	42 (70)	44 (76)	–	Negligible	Very Low	Likely	Minor
46	Former Hong Kah Secondary School (10)	1	N4	44 (70)	46 (76)	–	Negligible	Very Low	Likely	Minor
47	Former Hong Kah Secondary School (11)	1	N4	40 (70)	42 (76)	–	Negligible	Very Low	Likely	Minor
48	HDB Block 405 (Hong Kah Court), Jurong West St 42	2	N4	44 (76)	46 (90)	–	Negligible	Very Low	Likely	Minor
49	HDB Block 406 (Hong Kah Court), Jurong West St 42	2	N4	46 (76)	48 (90)	–	Negligible	Very Low	Likely	Minor
50	HDB Block 407 (Hong Kah Court), Jurong West St 42	2	N4	51 (76)	53 (90)	–	Negligible	Very Low	Likely	Minor
51	HDB Block 408 (Hong Kah Court), Jurong West St 42	2	N4	52 (76)	54 (90)	–	Negligible	Very Low	Likely	Minor
52	HDB Block 409 Jurong West Street 42	2	N4	52 (76)	54 (90)	–	Negligible	Very Low	Likely	Minor
53	HDB Block 410 Jurong West Street 42	2	N4	51 (76)	53 (90)	–	Negligible	Very Low	Likely	Minor
54	HDB Block 559 Jurong West Street 42	2	N5	45 (76)	47 (90)	–	Negligible	Very Low	Likely	Minor
55	HDB Block 561 Jurong West Street 42	2	N5	47 (76)	49 (90)	–	Negligible	Very Low	Likely	Minor
56	HDB Block 561B Jurong West Street 42	2	N5	50 (76)	52 (90)	–	Negligible	Very Low	Likely	Minor
57	JS 4 Hong Kah MRT (U/C)	3	N7	56 (75)	58 (90)	–	Negligible	Imperceptible	Likely	Negligible
58	Block 131D Tengah Plantation Grange (Future HDB)	2	N8	48 (75)	50 (90)	–	Negligible	Very Low	Likely	Minor
59	Block 133C Tengah Plantation Grange (Future HDB)	2	N8	48 (75)	50 (90)	–	Negligible	Very Low	Likely	Minor

Table 1-7 Summary of Construction Noise Predictions – Scenario 4: Building Works for Tengah Future Hospital, Human Impacts (Weekdays)

No.	Noise Sensitive Receptors	Receptor Sensitivity	Nearest Noise Logger	Construction Phase (Scenario 4: Building Works for Tengah Future Hospital)						
				Predicted Construction Noise (Weekday Noise Criterion)		Worst Case Exceedance, dB(A)	Impact Intensity	Impact Consequence	Likelihood	Impact Significance
				$L_{Aeq(12\ hours)}$, dB 7am-7pm	$L_{Aeq(5\ mins)}$, dB 7am-7pm					
1	445A West Crest @ Bukit Batok, BB West Ave 8	2	N1b	40 (76)	42 (90)	–	Negligible	Very Low	Likely	Minor
2	445B West Crest @ Bukit Batok, BB West Ave 8	2	N1b	38 (76)	40 (90)	–	Negligible	Very Low	Likely	Minor
3	445C West Crest @ Bukit Batok, BB West Ave 8	2	N1b	39 (76)	41 (90)	–	Negligible	Very Low	Likely	Minor
4	446 West Crest @ Bukit Batok, BB West Ave 8	2	N1b	38 (76)	40 (90)	–	Negligible	Very Low	Likely	Minor
5	Block 112A Tengah Plantation Acres (Future HDB)	2	N1b	45 (76)	47 (90)	–	Negligible	Very Low	Likely	Minor
6	Block 113A Tengah Plantation Acres (Future HDB)	2	N1b	42 (76)	44 (90)	–	Negligible	Very Low	Likely	Minor
7	Block 113B Tengah Plantation Acres (Future HDB)	2	N1b	40 (76)	42 (90)	–	Negligible	Very Low	Likely	Minor
8	Dulwich College (1)	1	N1b	34 (69)	36 (76)	–	Negligible	Very Low	Likely	Minor
9	Dulwich College (2)	1	N1b	38 (69)	40 (76)	–	Negligible	Very Low	Likely	Minor
10	Dulwich College Senior School Sports Hall	1	N1b	33 (69)	35 (76)	–	Negligible	Very Low	Likely	Minor
11	JE 2 Tengah Park MRT (U/C)	3	N1b	29 (76)	31 (90)	–	Negligible	Imperceptible	Likely	Negligible
12	Shell Petrol Station Bukit Batok West Ave 3 (1)	3	N1b	33 (76)	35 (90)	–	Negligible	Imperceptible	Likely	Negligible
13	Shell Petrol Station Bukit Batok West Ave 3 (2)	3	N1b	33 (76)	35 (90)	–	Negligible	Imperceptible	Likely	Negligible
14	HDB Block 306 Jurong East Street 32	2	N3	32 (76)	34 (90)	–	Negligible	Very Low	Likely	Minor
15	HDB Block 307 Jurong East Street 32	2	N3	33 (76)	35 (90)	–	Negligible	Very Low	Likely	Minor
16	HDB Block 308 Jurong East Street 32	2	N3	38 (76)	40 (90)	–	Negligible	Very Low	Likely	Minor
17	HDB Block 309 Jurong East Street 32	2	N3	38 (76)	40 (90)	–	Negligible	Very Low	Likely	Minor
18	HDB Block 310 Jurong East Street 32	2	N3	38 (76)	40 (90)	–	Negligible	Very Low	Likely	Minor
19	HDB Block 331 Jurong East Ave 1	2	N3	39 (76)	41 (90)	–	Negligible	Very Low	Likely	Minor
20	HDB Block 332 Jurong East Ave 1	2	N3	44 (76)	46 (90)	–	Negligible	Very Low	Likely	Minor
21	HDB Block 333 Jurong East Ave 1	2	N3	42 (76)	44 (90)	–	Negligible	Very Low	Likely	Minor
22	HDB Block 334 Jurong East Ave 1	2	N3	42 (76)	44 (90)	–	Negligible	Very Low	Likely	Minor
23	HDB Block 335 Jurong East Ave 1	2	N3	42 (76)	44 (90)	–	Negligible	Very Low	Likely	Minor
24	HDB Block 336 Jurong East Ave 1	2	N3	36 (76)	38 (90)	–	Negligible	Very Low	Likely	Minor
25	HDB Block 337 Jurong East Ave 1	2	N3	38 (76)	40 (90)	–	Negligible	Very Low	Likely	Minor
26	HDB Block 373 Jurong East Street 32	2	N3	36 (76)	38 (90)	–	Negligible	Very Low	Likely	Minor
27	HDB Block 374 Jurong East Street 32	2	N3	40 (76)	42 (90)	–	Negligible	Very Low	Likely	Minor
28	Jurong Primary School (1)	1	N3	38 (71)	40 (76)	–	Negligible	Very Low	Likely	Minor
29	Jurong Primary School (2)	1	N3	30 (71)	32 (76)	–	Negligible	Very Low	Likely	Minor
30	Jurong Primary School (3)	1	N3	30 (71)	32 (76)	–	Negligible	Very Low	Likely	Minor
31	Jurong Primary School (4)	1	N3	41 (71)	43 (76)	–	Negligible	Very Low	Likely	Minor
32	Jurongville Secondary School (1)	1	N3	43 (71)	45 (76)	–	Negligible	Very Low	Likely	Minor
33	Jurongville Secondary School (2)	1	N3	41 (71)	43 (76)	–	Negligible	Very Low	Likely	Minor
34	Jurongville Secondary School (3)	1	N3	43 (71)	45 (76)	–	Negligible	Very Low	Likely	Minor
35	Jurongville Secondary School (4)	1	N3	43 (71)	45 (76)	–	Negligible	Very Low	Likely	Minor
36	Jurongville Secondary School (5)	1	N3	42 (71)	44 (76)	–	Negligible	Very Low	Likely	Minor
37	Former Hong Kah Secondary School (1)	1	N4	43 (70)	45 (76)	–	Negligible	Very Low	Likely	Minor
38	Former Hong Kah Secondary School (2)	1	N4	42 (70)	44 (76)	–	Negligible	Very Low	Likely	Minor
39	Former Hong Kah Secondary School (3)	1	N4	35 (70)	37 (76)	–	Negligible	Very Low	Likely	Minor

No.	Noise Sensitive Receptors	Receptor Sensitivity	Nearest Noise Logger	Construction Phase (Scenario 4: Building Works for Tengah Future Hospital)						
				Predicted Construction Noise (Weekday Noise Criterion)		Worst Case Exceedance, dB(A)	Impact Intensity	Impact Consequence	Likelihood	Impact Significance
				$L_{Aeq(12\ hours)}$, dB 7am-7pm	$L_{Aeq(5\ mins)}$, dB 7am-7pm					
40	Former Hong Kah Secondary School (4)	1	N4	34 (70)	36 (76)	–	Negligible	Very Low	Likely	Minor
41	Former Hong Kah Secondary School (5)	1	N4	39 (70)	41 (76)	–	Negligible	Very Low	Likely	Minor
42	Former Hong Kah Secondary School h (6)	1	N4	34 (70)	36 (76)	–	Negligible	Very Low	Likely	Minor
43	Former Hong Kah Secondary School (7)	1	N4	42 (70)	44 (76)	–	Negligible	Very Low	Likely	Minor
44	Former Hong Kah Secondary School (8)	1	N4	42 (70)	44 (76)	–	Negligible	Very Low	Likely	Minor
45	Former Hong Kah Secondary School (9)	1	N4	36 (70)	38 (76)	–	Negligible	Very Low	Likely	Minor
46	Former Hong Kah Secondary School (10)	1	N4	43 (70)	45 (76)	–	Negligible	Very Low	Likely	Minor
47	Former Hong Kah Secondary School (11)	1	N4	38 (70)	40 (76)	–	Negligible	Very Low	Likely	Minor
48	HDB Block 405 (Hong Kah Court), Jurong West St 42	2	N4	45 (76)	47 (90)	–	Negligible	Very Low	Likely	Minor
49	HDB Block 406 (Hong Kah Court), Jurong West St 42	2	N4	49 (76)	51 (90)	–	Negligible	Very Low	Likely	Minor
50	HDB Block 407 (Hong Kah Court), Jurong West St 42	2	N4	51 (76)	53 (90)	–	Negligible	Very Low	Likely	Minor
51	HDB Block 408 (Hong Kah Court), Jurong West St 42	2	N4	52 (76)	54 (90)	–	Negligible	Very Low	Likely	Minor
52	HDB Block 409 Jurong West Street 42	2	N4	51 (76)	53 (90)	–	Negligible	Very Low	Likely	Minor
53	HDB Block 410 Jurong West Street 42	2	N4	50 (76)	52 (90)	–	Negligible	Very Low	Likely	Minor
54	HDB Block 559 Jurong West Street 42	2	N5	46 (76)	48 (90)	–	Negligible	Very Low	Likely	Minor
55	HDB Block 561 Jurong West Street 42	2	N5	46 (76)	48 (90)	–	Negligible	Very Low	Likely	Minor
56	HDB Block 561B Jurong West Street 42	2	N5	50 (76)	52 (90)	–	Negligible	Very Low	Likely	Minor
57	JS 4 Hong Kah MRT (U/C)	3	N7	55 (75)	57 (90)	–	Negligible	Imperceptible	Likely	Negligible
58	Block 131D Tengah Plantation Grange (Future HDB)	2	N8	43 (75)	45 (90)	–	Negligible	Very Low	Likely	Minor
59	Block 133C Tengah Plantation Grange (Future HDB)	2	N8	49 (75)	51 (90)	–	Negligible	Very Low	Likely	Minor

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