APPENDIX C

PROPOSED EXECUTIVE CONDOMINIUM HOUSING DEVELOPMENT LAND PARCEL AT MILTONIA CLOSE

ADDITIONAL CONDITIONS OF TENDER (TECHNICAL)

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PART I

1.0 GENERAL

1.1 The Successful Tenderer must, in addition to the Particulars and Conditions of Tender, observe and comply with these Additional Conditions of Tender (Technical) in the development and lease of the Land Parcel at Miltonia Close. The Particulars and Conditions of Tender and these Additional Conditions of Tender (Technical) shall be read in conjunction with the technical information booklet enclosed in the sale packet. The Successful Tenderer shall also comply with all applicable guidelines issued by the Competent Authorities and Public Utility Licensees. All proposals are subject to the approval of all relevant Competent Authorities and Public Utility Licensees.

1.2 The conditions and requirements of all relevant Competent Authorities and Public Utility Licensees set out in these Additional Conditions of Tender (Technical) and in the Conditions and Requirements of Relevant Competent Authorities and Public Utility Licensees and the appendices thereto (to be complied with by the Successful Tenderer at his own cost and expense) are provided to tenderers for their information only. Whilst every care and attention has been taken in the compilation and preparation of these conditions and requirements, HDB does not warrant that they constitute an exhaustive list of the conditions and requirements of the relevant Competent Authorities and Public Utility Licensees in respect of the development or that they are free from any errors or omissions. These conditions and requirements are subject to change by the relevant Competent Authorities and Public Utility Licensees and the onus lies on the Successful Tenderer to verify these conditions and requirements with HDB, the relevant Competent Authorities and Public Utility Licensees directly and comply with their prevailing conditions and requirements.

1.3 The Government and HDB are not liable to any tenderer and tenderers shall not claim against the Government and/or HDB for any errors and/or omissions in and for any loss suffered by any tenderer arising directly or indirectly from the reference to, usage of and/or reliance on the contents of these Additional Conditions of Tender (Technical), the Conditions and Requirements of Relevant Competent Authorities and Public Utility Licensees and appendices thereto.

1.4 All references to “the Successful Tenderer” herein shall be deemed to include “the approved developer” as defined in the Particulars and Conditions of Tender where the context so admits.

PART II

2.0 SUMMARY OF PLANNING REQUIREMENTS

A summary of the planning requirements is set out in Table 1. The detailed planning requirements are set out in Part III.

Table 1 – Summary of Planning Requirements for the Land

PARAMETERS	PROVISIONS / REQUIREMENTS
Site Area	15,451.2 sqm
Land Use / Zoning	Residential
Type of Proposed Development	Executive Condominium Housing Development
Gross Plot Ratio	2.8
Permissible Gross Floor Area (GFA)	Maximum GFA: 43,264 sqm Minimum GFA: 38,938 sqm
Building Height (maximum)	Subject to a technical height control of 90m Singapore Height Datum (SHD). The details are set out in Part III (Clause 3.4).

PART III

3.0 PLANNING PARAMETERS

3.1 PROPOSED DEVELOPMENT

The Land Parcel at Miltonia Close ("the Land") with a site area of 15,451.2 sqm shall be for Executive Condominium Housing Development ("the development"). The site area is the area measured up to the boundary lines as shown on the Certified Plan No. 93066.

Note: Executive Condominiums are non-landed housing developments that typically come with generous provision of communal and recreational facilities for the enjoyment of the residents.

3.2 ALLOWABLE GROSS FLOOR AREA (GFA)

The total GFA for the development shall not exceed 43,264 sqm but shall not be less than 38,938 sqm. Based on the site area of 15,451.2 sqm, the permissible Gross Plot Ratio (GPR) should not exceed 2.8*. The total GFA shall be computed in accordance with the Urban Redevelopment Authority's (URA's) Development Control Guidelines.

*Indicated for information of the Tenderer only.

3.3 BUILDING LINE / SETBACK

The Successful Tenderer shall at all times comply with URA's and the relevant Competent Authorities' requirements on the building line setback. Notwithstanding the generality of the foregoing, the building setbacks (including basement structures) shall be based on the boundary of the Land delineated on the Certified Plan No. 93066.

The Successful Tenderer shall conform to URA's Current Guidelines for Condominium Housing Development with regard to Building Spacing and Setback Standards.

3.4 BUILDING HEIGHT

The development shall be subject to a technical height control of 90m Singapore Height Datum. The technical and storey height control of the development is to comply with all applicable standing guidelines issued by the Competent Authorities, including URA's Development Control Guidelines. The Successful Tenderer is to check with the Competent Authorities on the standing guidelines as the guidelines are reviewed from time to time. The lowest technical and storey height control imposed by the Competent Authorities will be applicable to the Land. The final technical and storey height are subject to the approval of the Competent Authorities.

The Successful Tenderer shall ensure that all developments, structures and fixtures on the Land do not exceed the maximum allowable height of 90m Singapore Height Datum. Such developments, structures and fixtures include those on the roof tops, whether permanent or temporary, transient or stationary (including but not limited to building superstructure, water tanks, lift motor rooms, TV antennae, cranes, maintenance equipment, lightning conductors, solar panels, moving objects, vegetation, etc.) and all construction equipment and temporary structures (including but not limited to cranes, piling rigs, etc.) are subject to the same height limit.

All capital and operating costs or expenses incurred to meet all the above conditions and requirements will be borne by the Successful Tenderer.

The Successful Tenderer shall submit to the Civil Aviation Authority of Singapore (CAAS) a certified surveyor as-built plan prior to applying to the Building Control Authority (BCA) for the Temporary Occupation Permit or Certificate of Statutory Completion for the development on the Land.

The Successful Tenderer shall obtain CAAS' prior written approval before mobilising and/or installing any construction machineries on the Land. An application to CAAS is to be submitted by

the Successful Tenderer using the Crane Application Form available at URL: http://www.caas.gov.sg/e-services-forms/e-services/application-for-obstacle-clearance.

The Successful Tenderer shall consult MINDEF through DSTA (landuse@dsta.gov.sg) prior to the Design Gateway submission in CORENET X to obtain DSTA's clearance for the total building height and site layout. The submission shall include the location plan, site and elevation plans indicating the maximum heights and proposed vehicular access point(s). The submission shall also be copied to URA Development Control Group. Where applicable, the Successful Tenderer shall also reconsult DSTA, prior to the Construction Gateway submission.

In the event where there are any communication installations on the Land, the Successful Tenderer is advised to seek clearance from relevant agencies such as Info-communications Media Development Authority of Singapore (IMDA).

3.5 DEVELOPMENT CONTROL

The Successful Tenderer shall comply with the Development Control (DC) Guidelines issued or may be issued by the Competent Authority under the Planning Act 1998, unless otherwise stated in the Additional Conditions of Tender (Technical).

The building massing and design treatment of the development must be sensitive to the surrounding environment. The layout of the building blocks shall be subject to evaluation at the Development Application stage. The Successful Tenderer can refer to URA's circular dated 4 March 2010 titled "*Sensitive Design and Development: An Industry Guide of Good Practices to Minimise Wall-like Developments*" on possible design treatment options for the development.

In addition, regardless of when the development application is submitted to URA, the Successful Tenderer shall comply with the revised Gross Floor Area (GFA) and strata area definitions as set out in the circular "Harmonisation of floor area definitions by URA, SLA, BCA and SCDF" issued on 1 September 2022.

Where applicable, the Successful Tenderer's Qualified Person shall submit a Development Statement of Intent (DSI) together with their development proposal to the Competent Authority under the Planning Act 1998 at the formal submission stage in compliance with prevailing guidelines and circulars issued by the Competent Authority.

Existing Underground Structures

The Successful Tenderer shall be responsible, at his own cost and expense, to carry out his own site investigation to verify whether there is any sub-structure or other obstructions e.g. footings, piles, tree roots etc. in the ground of the Land, and ascertain their effect on the proposed development, including the removal of such sub-structure or obstructions, if necessary. The Successful Tenderer shall be deemed to have notice of any sub-structure or other obstructions in the ground of the Land and shall not raise any objection or requisition whatsoever in respect of any such sub-structure or other obstructions.

3.6 URBAN DESIGN AND ENVIRONMENT CONSIDERATIONS

Given that the development is located next to an existing residential development i.e. The Miltonia Residences, the Successful Tenderer is to ensure sensitive edge treatment along the western edge to minimise overlooking into adjacent development. i.e Miltonia Residences, and along the northern edge to avoid wall-like effect along Miltonia Close. As there may be future infrastructure works along the future road, the Successful Tenderer is to also ensure that there is appropriate edge treatment along the eastern edge to minimise disamenities, if any, e.g. during the construction phase, to future residents.

The architectural solution must respect the context/built environment of the Land in its setting and shall blend in with the surrounding developments and overall surrounding character/ambience. Where possible, the Successful Tenderer is to design for the blocks to step down towards Miltonia Residences and towards the southern edge, to maximize the views towards Lower Seletar Reservoir.

To facilitate easy wayfinding and provide directional cues to both motorists and pedestrians, the Successful Tenderer is encouraged to provide a wayfinding marker near the road junction of Miltonia Close and the future road, which will also mark the prominence of the development. The proposed marker can take many forms such as well-designed landscaping or prominent signage.

The Successful Tenderer shall ensure that the development and its activities will not cause any undue nuisance to the surrounding/adjacent developments in terms of noise, glare, smell and any other form of pollution. Please refer to the plan referenced in Appendix C(I) for the requirements listed above.

Yishun Town Design Guide

The Successful Tenderer is encouraged to refer to HDB's Yishun Town Design Guide (TDG) for the vision and design guidelines for Yishun. The full TDG will be issued upon the successful appointment of the Successful Tenderer. The Successful Tenderer shall contribute to the distinctiveness of Yishun and take reference from the neighbourhood sub-theme of 'Living Waterfront' in which the development lies. These include guidelines on public spaces, streetscape and urban edge, colour palette and landscape approach for the neighbourhood scale which can help to enhance placemaking of the estate. Please see extracted pages 60-68 from the Yishun TDG in Appendix C(II).

3.7 PLATFORM LEVEL

The existing levels of the Land are as shown in the Topographical Survey Plan No. 3521-CSS-TP-YS-0014-01. Public Utilities Board (PUB) has specified that the minimum platform level (MPL) for the Land shall not be lower than 12.6m above Singapore Height Datum, or 300mm above the adjacent road/ground level for general developments, 600mm for industrial/institutional/commercial/multiunit residential developments or any other level as determined by PUB as in stated in the latest edition of the 'Code of Practice on Surface Water Drainage', whichever is the highest. For basements of industrial, institutional, commercial or multi-unit residential developments, the minimum crest level shall be at least 300mm above the MPL as stated above. The final platform level is subject to the relevant Competent Authorities' approval. The Successful Tenderer shall pre-consult PUB(C&W) on the required MPL before making DC/BP submission in Corenet or Design Gateway/ Construction Gateway (where applicable) in Corenet X.

All the cost and expense incurred in carrying out cutting and filling of the existing ground, if necessary, to the proposed platform level shall be borne by the Successful Tenderer.

In changing the platform levels, the Successful Tenderer shall ensure that the revised platform levels of the Land shall satisfy the drainage requirements in compliance with PUB's current Codes of Practice on the Surface Water Drainage and the Sewerage & Drainage (Surface Water Drainage) Regulations. The Successful Tenderer shall also check and ensure that the revised platform level will still meet all the requirements of the relevant Competent Authorities.

The Successful Tenderer shall conduct thorough investigations of the Land and ensure that the runoff within, upstream of and adjacent to the Land can be effectively drained away without causing flooding within the Land and in the vicinity of the Land, all in compliance with the PUB's relevant Codes of Practice.

All earthworks, slope and embankments shall be contained within the boundaries of the Land.

3.8 VEHICULAR INGRESS / EGRESS

The Land Transport Authority (LTA) requires the Successful Tenderer to comply with the following requirements:

i) The vehicular access to the Land shall be taken from Miltonia Close. The approximate position of the access is as shown on the Site Plan, approximately 30m from the future slip road of T-Junction of Yishun Avenue 10/ Miltonia Close Extension. The exact location and

detailed proposal for the access point and the traffic layout arrangement are subject to the requirements and approval of the LTA and other relevant Competent Authorities at the formal submission stage.

ii) The Successful Tenderer shall design the boundary walls at the exit point/pedestrian side gates such that the line of sight amongst motorists/pedestrians/cyclists crossing the access is clear. The design shall be subject to the requirements and approval of the LTA and other relevant Competent Authorities at the formal submission stage.

iii) Any drop barrier to car park or internal driveway shall be located within the development site and designed for sufficient queuing space within the development to ensure smooth flow of vehicles along the main road. All drop off/pick up points shall be adequately designed for and not affect ingress/egress movement and should be located further inland.

iv) Access to service areas (e.g. bin centre, electrical substation, loading/unloading bays) shall be taken from within the development. Access to these service areas, if required, shall be taken via the ingress/egress point of the development as shown in the Site Plan, subject to the requirements and approval of the LTA and other relevant Competent Authorities. No separate service access will be allowed to be directly taken from the public roads.

v) The Successful Tenderer shall at his own cost and expense construct the vehicular culverts for the access and external works, and hand it over to the relevant Competent Authority for management and maintenance.

vi) The Successful Tenderer shall reconstruct the existing drain to a proper box culvert to withstand the vehicular loading in accordance with LTA SDRE. The proposed box culvert shall comply to the existing drain size and slope gradient. The box culvert is to tie-in to the existing drain smoothly and the clear depth of the existing drain shall not be reduced.

3.9 LOCATION OF BIN CENTRE

The bin centre shall be sensitively located within the Land such that it does not become a nuisance to residents in the surrounding developments. The entrance of the bin centre shall face inwards within the development. The design of the refuse management system shall comply from the Code of Practice on Environmental Health.

The Successful Tenderer shall ensure that the bin centre and its entrance area, including any parking space for refuse trucks, are located away from any adjacent residential developments (if any).

The service driveway for the bin centre is to be integrated within the Land and the length of the service driveway must be able to accommodate all service vehicles.

Lush planting and / or screening shall be provided to screen the bin centre and service areas from view of the residents in the adjacent residential developments (if any), and users of the surrounding public roads and walkways.

3.10 CAR PARKING REQUIREMENTS

LTA requires the Successful Tenderer to comply with the following requirements:

i) The Successful Tenderer is to ensure that the proposal and plans of the parking place and parking lots within the development comply fully with the prevailing Parking Places (Provision of Parking Places and Parking Lots) Rules 2018 and other relevant guidelines of the Authority.

ii) All critical dimensions of the parking layout such as size of parking lots, width of driveways/ramps, parking aisles, headroom clearance, etc. shall be clearly indicated on plan and sections.

iii) The design of the parking place shall include adequate spaces for vehicles to carry out furniture delivery or house-moving activities.

iv) The design and layout of the car park will be subject to the requirements and approval of the Authority and the relevant Competent Authorities and Public Utility Licenses under the LTA's requirements for the Land.

Electric Vehicles (EV) Charging Provision

v) The Successful Tenderer shall provide for the required EV charging provisions under the Electric Vehicles Charging Act (EVCA) 2022, if applicable. Please refer to the guidelines published on LTA's website at https://www.lta.gov.sg/content/ltagov/en/industry_innovations/technologies/electric_vehicles/transitioning_to_evs.html under 'Widening Coverage of Accessible EV Charging Points' for more information.

Bicycle Parking Provision

vi) The Successful Tenderer shall comply with LTA's requirements for bicycle parking provisions as set out in Appendix D Clause 3.0 and shall be subject to the evaluation and approval of the Authority and other relevant Competent Authorities.

PART IV

4.0 OTHER REQUIRED WORKS

4.1 MODIFICATION OF EXISTING FOOTPATH-CUM-DRAIN

LTA, PUB, and HDB requires the Successful Tenderer to comply with the following requirements:

i) There is an existing footpath-cum-drain within the Land. The Successful Tenderer is required to consult and obtain approval from LTA for the interim modification of the existing footpath-cum-drain out of the Land.

ii) The existing drain shall be reconstructed and realigned to abut the Road Reserve Line. PUB(C&W) shall be consulted earlier for the proposed works.

iii) The Successful Tenderer is required to coordinate and share with HDB the proposed and as-built plans for the modification works for HDB's reference.

4.2 PEDESTRIAN SIDE GATES AND SHELTERED CONNECTIVITY

LTA and PUB require the Successful Tenderer to comply with the following requirements:

i) The Successful Tenderer is to provide a side gate for pedestrians behind the bus stop along Miltonia Close.

ii) To ensure convenient and unimpeded pedestrian movement and connectivity around the Land Parcel, the Successful Tenderer shall, at his own cost and expense, construct a 2.4m wide and 2.4m minimum clear headroom covered linkway from the development to the nearest bus stop. The covered linkways shall be designed to meet the following requirements:

a. The linkway alignment shall be a direct route from the side gate to the bus stop shelter.

b. The covered linkway shall not encroach the clear width of the cycling path that has been safeguarded.

c. The covered linkway alignment shall be designed to be barrier-free and maintained at a constant level as much as possible. Any changes in levels are to be kept to a minimum and are to be mitigated using barrier-free ramps, subject to the requirements of the Authority and the relevant Competent Authorities.

d. The location, design and technical details of the covered linkway shall comply with the technical requirements of LTA as set out in Appendix D Clause 3.0 of the Conditions and Requirements of Relevant Competent Authorities and Public Utility Licensees, be subject to the evaluation and approval of the Authority and the relevant Competent Authorities at the formal submission stage. The Successful Tenderer shall take into account the site context such as topography and consider measures to mitigate potential issues (such as surface runoff during heavy rainfall) in the design of the sidetable, subject to relevant agencies' approvals.

e. The Successful Tenderer is to carry out localised modification of top slab of drain, if required, as the foundation of the linkway and to verify that the structural integrity of the drain will not be affected by the proposed covered linkway structure. The Successful Tenderer shall submit the structural design details to PUB for comments and approval before commencement of works.

f. The clear depths of the existing drain shall not be reduced due to the localised modification of top slab of drain (if required). The Successful Tenderer shall submit the following items:

    i. Professional Engineer (PE) endorsed structural assessment and analysis report to confirm and verify that the drain is not affected by the proposed covered linkway structure.

    ii. Professional Engineer (PE) endorsed visual assessment report to confirm and verify that the drain is in a good structurally and sound condition.

iii) The Successful Tenderer shall, at his own cost and expense, maintain the completed covered linkway to the satisfaction of the relevant Competent Authorities. LTA will only take over the portion of the covered linkway that is within the road reserve for maintenance upon the issue of Certificate of Statutory Completion (CSC).

<u>GENERAL DRAINAGE REQUIREMENTS FOR PROPOSED PEDESTRIAN COVERED LINKWAYS</u>

iv) Public Utilities Board (the Board) reserves the right to remove the covered linkway and any support structures, if the need arises for drainage works and/or maintenance purposes;

v) Surface runoff from the covered linkway shall be properly discharged to drains and not onto adjacent premises. Effectual drainage shall continue to be provided for the area around and in the vicinity of the covered linkway;

vi) The covered linkway shelter shall be graded towards the open grating.

vii) The internal width and depth of the drain shall be at least 600mm.

viii) Should there be an adjacent slope, the drain shall be realigned nearer to the boundary to cater for the surface runoff

ix) The covered linkway shall be independently supported with the foundations/footing located away from the drainage structures. However, should there be site constraints, the foundations/footing may be located on the drain top slab if the Qualified Person can verify

that the structural integrity of the drain will not be affected by the proposed covered linkway structure.

x) Where composite channel drains are affected, the drain shall be reconstructed into a reinforced concrete U-drain. If a concrete slab is to be built over a U-drain, the vertical clearance between the base of the concrete slab and the cope of the existing or proposed drain shall be at least 50mm;

xi) Gratings and other standard elements shall be designed in accordance with LTA's SDRE.

xii) The Successful Tenderer shall be responsible for the management and maintenance of the covered linkway structure, including foundations/footing and any associated facilities;

xiii) **For drains within Road Reserve**
The Successful Tenderer shall be responsible for the management and maintenance of the footpath, including the top slab and surface finishing of covered drains, under the covered linkway;

For drains within Drainage Reserve
The Successful Tenderer shall be responsible for the management and maintenance of the footpath, including the surface finishing, under the covered linkway. The minimum height clearance of the covered linkway shall be 5.4m at the entrance/exit to the maintenance access;

xiv) The Successful Tenderer shall be responsible for safeguarding the structural integrity of the affected drains when carrying out construction and/or maintenance works of the proposed covered linkway;

xv) Cut-off drains to capture runoff from the adjacent land, if required, shall be constructed by the Successful Tenderer. The Successful Tenderer shall be responsible for the maintenance of the cut-off drains.

xvi) The Successful Tenderer shall reinstate and rectify any damage to the drainage structures caused by their work at their own cost and to the Board's satisfaction upon the completion of the work;

xvii) The Successful Tenderer shall take measures to ensure public safety within the covered linkway; and

xviii) Lighting, if needed, shall be provided by the Successful Tenderer. The Successful Tenderer shall be responsible for the maintenance of the lighting and also bear the cost of consumption of electricity.

GENERAL DRAINAGE REQUIREMENTS FOR PROPOSED BUS SHELTERS

xix) The bus shelter shall be independently supported with the foundations/footing located away from the drainage structures. However, should there be site constraints, the foundations/footing may be located on the drain top slab if the Qualified Person can verify that the structural integrity of the drain will not be affected by the proposed bus shelter.

xx) Where channel drains or pipe culverts are affected by the proposed bus shelter, the drain shall be reconstructed into a reinforced concrete box drain to the latest design standards in the prevailing Code of Practice on Surface Water Drainage.

xxi) Where drains are reconstructed in conjunction with the upgrading or erection of new bus shelters, the drain shall incorporate a minimum 300mm false bottom or more, as determined by Public Utilities Board (the Board), to allow for possible future connections and re-grading

of the drain invert to tie-in with proposed invert levels of the upstream/downstream section of the existing drain, when the need arises.

xxii) If a concrete slab is to be built over a U-drain, the minimum vertical clearance between the base of the bus shelter slab and the top slab or cope of the drain should be 50mm.

xxiii) All proposals within Road Reserve shall comply with the prevailing design requirements stipulated under the Land Transport Authority (LTA) Standard Design of Road Elements (SDRE).

xxiv) The existing scupper drainage system shall be upgraded in compliance with the prevailing LTA's SDRE standards in conjunction with the upgrading or erection of new bus shelters;

xxv) The Successful Tenderer shall obtain and furnish LTA's agreement for the management and maintenance of the bus shelter and any associated facilities within the bus shelter;

xxvi) The Successful Tenderer shall be responsible for safeguarding the structural integrity of the affected drains when carrying out construction and/or maintenance works; and

xxvii) The Successful Tenderer shall reinstate and rectify any damage to the drainage structures caused by their work at their own cost and to the Board's satisfaction upon the completion of the work.

xxviii) In the event that both the bus shelter and drain structure are damaged by an accident caused by road user, LTA shall coordinate closely with PUB on the repair of both the bus shelter and drains structure when LTA moves in for emergency repair.

PART V

5.0 OTHER REQUIREMENTS

5.1 EXISTING C7 DRAIN AND DRAIN STRUCTURE

There is an existing drain structure and C7 drain within the Land serving as a temporary drainage system so that runoff received from the vacant site can be properly discharged to the public roadside drain.

The Successful Tenderer/ Qualified Person (QP) shall also verify where the other sites are in the surrounding area that are currently being served by the drain structure and C7 drain.

Should the Successful Tenderer need to remove the drain structure and C7 drain within the Land and replace it with a new internal drainage system that can serve the development, the Successful Tenderer will need to ensure that surface runoff from the surrounding sites served by the drain structure and C7 drain can still be discharged effectively to the public roadside drain.

Any proposal to alter, fill, block, interfere or divert the drains shall be submitted to PUB for approval.

The cost of removal of the drain structure and C7 drain and any other related works shall be entirely borne by the Successful Tenderer.

5.2 PRODUCTIVITY IMPROVEMENT

The Successful Tenderer is required to comply with the productivity improvement as stipulated under the Building Control (Buildability and Productivity) Regulations for the proposed development on the Land as set out in Appendix D Clause 10.0.

5.3 STORAGE AREA FOR PREFABRICATED PREFINISHED VOLUMETRIC CONSTRUCTION (PPVC) MODULES

If PPVC method of construction is adopted, the Successful Tenderer is required to set aside some space within the Land for storage and/or holding area for PPVC modules. No additional space outside the Land will be granted on TOL basis for this purpose.

5.4 CONDITIONS AND REQUIREMENTS FOR ENGINEERING WORKS AFFECTING HDB PROPERTIES

i) For engineering works that affect HDB properties, the Successful Tenderer/Qualified Person (QP) in charge of the engineering works shall submit to HDB an engineering works plan before the commencement of work. The engineering works plan shall be prepared, signed and supervised by the Successful Tenderer/QP. The following shall be included in the engineering works plan:

   a. Layout plan including site boundaries and cross-sectional details of works;

   b. Layout plan and cross-sectional details of retaining structure and temporary support;

   c. Method Statement of Construction;

   d. Design calculations for the works that affect HDB property;

   e. Soil investigation report of the site;

   f. Proposal for monitoring the effect of the works on HDB property.

ii) The Successful Tenderer/QP shall be fully responsible for the construction of all the works as shown in the works plan. The Successful Tenderer/QP shall also be responsible for carrying out the works in the manner as stated in the method statements.

iii) The Successful Tenderer/Contractor shall submit a Pre-Construction Survey Report to the relevant Town Council and the nearest HDB Branch before the installation of instrument on HDB property or the commencement of works.

The Successful Tenderer/Contractor shall highlight to Town Council on defect(s) that may have structural or public safety concerns and/or require close monitoring.

iv) The Successful Tenderer/QP shall submit a Building Impact Assessment Report to HDB (Building & Infrastructure Group) before the commencement of the works.

5.5 INSTRUMENTATION MONITORING

HDB requires the Successful Tenderer to comply with the following requirements:

i) For geotechnical building works that affect HDB properties, the Successful Tenderer/QP shall ensure that the proposed works do not affect the integrity or stability of the foundation and structure of HDB property. During the progress of the engineering works, the Successful Tenderer/QP must provide adequate means of instrumentation to monitor the effect of the engineering works on HDB property. The Successful Tenderer/QP shall submit the type and location of such monitoring instruments and frequency of reading to HDB for clearance. The physical movement to be monitored shall include but not be limited to the following:

   a. Lateral deflection of retaining structure;

   b. Vertical deflection of column of HDB property;

   c. Settlement of apron slab and beam of HDB property;

d. Levels of road or carpark or sewer manhole adjacent to HDB property;

e. Ground water level below/adjacent to HDB property;

f. Vibration movement in HDB property.

The Successful Tenderer/QP shall submit an instrumentation report to HDB every month until the completion of works.

ii) Instrumentation on Fiber Reinforced Polymer (FRP) columns (if any)

For the purpose of instrument installation, the diameter of holes drilled must not exceed 10mm on the fibre reinforced polymer wrapped column. The minimum spacing between these drilled holes is 300mm, centre-to-centre. No ram setting is allowed on the columns.

iii) Alert (Trigger) and Work Suspension (Allowable) Instrumentation Level

The Successful Tenderer/QP shall establish Alert and Work Suspension levels for the instrumentation reading of the physical movement mentioned in Clause 5.5(i) above. These Alert and Work Suspension instrumentation level readings shall be made known to HDB before the commencement of works. On breaching of Alert level at any location on site, the Successful Tenderer/QP is required to inform HDB and follow up with a report to HDB reviewing the movement and predicting further movement up to completion of the works. Where necessary, the Successful Tenderer/QP shall submit to HDB a proposal to mitigate further movement or install additional monitoring. On breaching a Work Suspension level at any location, the Successful Tenderer/QP shall stop the works immediately. The Successful Tenderer/QP shall immediately inform HDB and implement measures to mitigate further movement. The Successful Tenderer/QP shall allow the work to continue only if the measures implemented are proven to be effective by the relevant Authorities. The monitoring of movements shall be inclusive of another 6 months of monitoring after end of backfilling, shall be submitted to HDB.

iv) Vibration

The Successful Tenderer/QP shall ensure that the proposed works or method of working does not cause undue vibration or unease and discomfort to HDB residents and damage to HDB property. The Successful Tenderer/QP shall take steps to minimise the magnitude and frequency of any such vibrations. If vibration is expected from the proposed works, the Successful Tenderer/QP shall submit to HDB detailed calculations showing the magnitude, frequency and the resultant load imposed on HDB property. The condition on instrumentation and monitoring contained in Clauses 5.5(i) to 5.5(iii) above shall apply.

v) Cessation of Instrumentation Monitoring

When the Successful Tenderer/QP intends to cease the instrumentation monitoring, the Successful Tenderer/QP shall notify HDB and submit a PE endorsed closing report to cease instrumentation monitoring on HDB property.

Upon removal of the building monitoring instruments, the surface shall be reinstated to its original condition and Town Council shall be notified for inspection and take over after painting completed.

vi) Piling and Pipe Jacking Works

The Successful Tenderer/QP shall ensure that the method of piling, piling operation and pipe jacking do not affect the structural integrity or stability of the existing HDB buildings or any building under construction. Piling shall generally be constructed by non-displacement techniques such as augering. The stability of the ground shall be ensured by the use of appropriate measures designed by the Successful Tenderer/QP. Notwithstanding the method used in the piling work, the Successful Tenderer/QP shall review and closely monitor the technical parameters and Instrumentation level as stated in Clauses 5.5(i) to 5.5(iii) above. The Successful Tenderer/QP shall ensure that the noise generated as a result of the piling work is also kept to a minimum and within the limit set by the Relevant Authorities.

The Successful Tenderer/QP shall check the as-built plans on piling, footing, pile-cap and all related plans of the affected structures to ensure that their works do not encroach into existing piles, footings, pile-caps and other structures. A confirmation that such checks has been carried out shall be submitted to HDB (Building & Infrastructure Group) before work commences.

The structural drawings can be purchased at:

HDB Hub
480 Lorong 6 Toa Payoh Singapore 310480
Atrium 3rd Storey
Tel: 6490 3203
Email: hdb_sop@hdb.gov.sg

Attn: Officer-in-charge of Structural Drawings Plan

vii) Earth Retaining or Stabilising System, Excavation Work and Tunnelling Work

The Successful Tenderer/QP shall ensure that the construction of earth retaining or stabilising system (ERSS), the excavation work or the tunnelling work does not cause the lowering of ground water table or any soil movement underneath the HDB property. If the lowering of ground water table or soil movement is expected, the Successful Tenderer/QP shall ensure that the construction of ERSS, excavation work or tunnelling work does not cause the movement of HDB property to exceed the allowable building settlement or tilt movement as specified in the relevant building codes, conditions or requirements imposed by the relevant Authorities. The Successful Tenderer/QP shall also install recharge wells if required and submit to HDB detailed calculations showing the resultant load imposed and the corresponding maximum movement on HDB property. The conditions of instrumentation and monitoring set out in Clauses 5.5(i) to 5.5(iii) above shall also apply to ERSS, excavation work and tunnelling work.

5.6 SERVICES AND SOIL REPORT

The information on existing services and soil report is indicative only. The HDB shall not be liable for any damages suffered or expenses incurred as a result of the information given and shall not be held responsible for their accuracy. There may also be departures from the courses and there may also be other findings of which no record is held. The Successful Tenderer is advised to carry out his own site verification at his own cost.

For underground services lines, the Successful Tenderer shall also carry out his own site verification and arrange and obtain approval from the relevant Competent Authorities to carry out any diversion or provision of the services including sewer lines etc. The cost of such verification and diversion of services which may affect the Land to meet the specifications and requirements of the relevant Competent Authorities shall be fully borne by the Successful Tenderer.

All new services lines serving the development shall be contained within the Land boundaries. The approval of the relevant Competent Authorities must first be sought before any connection can be made. All costs incurred shall be borne by the Successful Tenderer.

There may be services within or near the Land. Prospective tenderers are required to carry out due diligence by purchasing the services plans from the respective service providers. Please contact the respective Services Providers for the services plans. For plans on electrical cables and gas, please approach the following Competent Authority and Public Utility Licensee for details, as they would like to keep a record of the parties who view the plans:

Electricity and Gas

SP PowerGrid Ltd
Mapping & Earthworks Administration Section
2 Kallang Sector

Singapore 349277
Tel: 6916 5022
Email: mea@spgroup.com.sg

All applications and requests for consultation, cable testing and diversion shall be submitted through the portal. Please visit https://ebiz.spgroup.com.sg/index.html to access the SP eBusiness Portal.

Singapore Telecommunications Limited (Singtel)

Singapore Telecommunications Limited
Outside Plant Engineering
375 Tanjong Katong Rd, #03-00
Blk 1 Tanjong Telecommunication Complex
Singapore 437132
Tel: 6342 5900 / Fax: 6440 6305
E-mail: g-plansale@singtel.com

More information on purchase of Singtel plant route plans are available at http://info.singtel.com/earthwork.

5.7 EXISTING FOOTINGS, OBSTRUCTIONS AND OTHER MATERIALS

There may be footings and other obstructions left in the ground. The Successful Tenderer shall at his own cost and expense, carry out his own site verification of the possible positions of the footings, obstructions and other materials and ascertain the effect of these on the development.

The costs of such verification, tests, removal of the possible footings, obstructions and other materials etc. which may affect the development shall be fully borne by the Successful Tenderer.

5.8 SLOPES AND EARTH RETAINING STRUCTURES

The Successful Tenderer shall ensure that all slopes and earth retaining structures where required shall be designed to comply with the requirements of the relevant Competent Authorities. All slopes and earth retaining structures shall be kept within the boundary of the Land.

The Successful Tenderer shall submit the details and design calculations prepared by a Professional Engineer for any proposed slopes or earth retaining structures to HDB and to the relevant Competent Authorities for approval before commencement of works.

5.9 WORKING AREA

The Successful Tenderer shall confine the construction work within the boundary of the Land. The Successful Tenderer shall not cause obstruction to other parties who may be working around the Land at the same time.

Hoarding shall be put up by the Successful Tenderer to ensure the safety and well-being of pedestrians. These hoarding shall be maintained in good condition throughout the project completion period of the development.

5.10 WORK BY OTHERS / AUTHORITIES' / AGENCIES' CONTRACTORS NEAR / WITHIN VICINITY OF CONTRACT BOUNDARIES

The Successful Tenderer shall coordinate with adjacent landowners, contractors and sub-contractors regarding the shared maintenance of the existing facilities and other construction systems including road furniture and public or work accesses.

There will be other contractors working near / within the vicinity of contract boundaries of the development. The Successful Tenderer shall be deemed to have knowledge of to know that other

contractors will be working near the contract boundaries and shall liaise / work with the Contractors on site to ensure any interfacing works with other contractors are carried out in a smooth and cordial manner. All interfacing works with other contractors' works are deemed to be included in the contract. No claim for additional costs and extension of contract/phases period time would be entertained on these grounds.

The Successful Tenderer shall be responsible for all necessary coordination, liaison, provision of attendance, accesses, etc. with all relevant Authorities' / Agencies' contractors and their subcontractors for the satisfactory completion of works.

For the Successful Tenderer's information, there are plans for future developments next to the Land. To support these future developments, infrastructure works may be carried by Agencies after 2030. The relevant stakeholders will be informed when plans are firm.

5.11 WORKING SPACE FOR HDB / LTA CIVIL ENGINEERING CONTRACTORS

The Successful Tenderer shall note that there will be future road construction / drain works / sewer / infrastructure works at the vicinity of the boundary of the development.

The Successful Tenderer shall note on the working spaces near the development boundary for the main road / drain works / sewer works / signalised pedestrian crossing / bus bay and bus shelter / infrastructure works carried out by HDB / PUB / LTA Civil Engineering Contractor. The Successful Tenderer would need to interface with the HDB / PUB / LTA Civil Engineering Contractor such that the progress of works at the interface by the respective contractors is not affected. The hoarding may be required to setback 5 m from the development boundary along Miltonia Road Extension to allow sufficient working space for HDB's construction of main road, drain and infrastructure works until 4Q2027 tentatively or any latest date subject to site progress. The required working space for HDB's construction of earthwork, services diversion, road, drainage and any infrastructure works is along the northern boundary of the Land. The Successful Tenderer shall note that construction access might be shared with HDB Earthworks Contractors / Civil Engineering Contractors until 4Q2027 tentatively or any latest date subject to site progress. The Contractor shall coordinate closely with HDB Earthworks Contractors / Civil Engineering Contractors on the use / location of construction access.

The State shall not be responsible for any delay in completion of the abovementioned proposed infrastructure works, whatsoever. The Successful Tenderer shall liaise with the HDB for the details, expected completion and commissioning date of the abovementioned infrastructure works such that it will not affect the TOP/CSC of the development. The Contractor shall coordinate closely with HDB Earthworks Contractors / Civil Engineering Contractors on the works timeline based on site progress, and relocate the hoarding upon completion of the infrastructure works.

Prior to commencement of hoarding works, the Successful Tenderer shall coordinate closely with HDB & the other contractors working near / within the vicinity of the contract boundaries of the development on the working space required for the construction of roads and drains fronting the development boundary.

The Successful Tenderer shall bear all the costs and expenses incurred arising from interfacing / facilitating the HDB / PUB / LTA Civil Engineering Contractor in carrying out the earthworks / service diversion works / main road / drain works / sewer works / signalised pedestrian crossing / bus bay and bus shelter / utilities services duct / infrastructure works. There shall not be additional claims by the Successful Tenderer. The Successful Tenderer shall include, but not limited to the following in the Tendered Sum:

i) The building hoarding / noise barriers/ construction access are to be shifted by the Successful Tenderer, and reconstructed to accommodate for the earthworks / service diversion works / main road / drain works / bus bay and bus shelter if and when applicable.

ii) When the earthworks / service diversion works / main road / drain works / bus bay and bus shelter are complete, if and when applicable, the building hoarding / noise barriers have to be shifted back to the development boundary by the Successful Tenderer.

iii) Where the need arises, the Successful Tenderer is required to provide all necessary washing facilities and manpower for vehicles exiting the project work site.

iv) The Successful Tenderer shall confine the construction works within the boundaries and shall not cause obstruction to other parties who may be working around the site at the same time.

v) Project Development Hoarding with lighting shall be put up by the Successful Tenderer to ensure the safety and wellbeing of pedestrians. These hoarding shall be maintained in good condition throughout the project completion period of the development.

vi) Diversion of the existing sewer and other services within the site.

vii) Any damages onto surrounding road construction / drainage / sewer / infrastructure works resulted from the Successful Tenderer's construction and / or by its project vehicles / equipment / machinery shall be made good at the Successful Tenderer's own cost, to the satisfaction of the HDB / PUB / LTA Civil Engineering Contractor and their respective client agency.

5.12 CLEANING AND MAINTENANCE OF ROADS AND DRAINS

The Successful Tenderer shall maintain the cleanliness of public roads and drains used by his vehicles throughout the project completion period. He shall construct a washing bay for the cleaning of earth-laden lorries before they leave the work site and shall be responsible for cleaning up all deposits left by his vehicles on the road. Adequate Earth Control Measures should be implemented at the Successful Tenderer's own cost to prevent any cloggage or silty discharges into the public drains.

The Successful Tenderer shall be responsible for paying any fines imposed by the relevant Competent Authorities e.g. Environmental Health Department, Traffic Police etc.

5.13 PLANS OF PROPOSED DEVELOPMENT

The Successful Tenderer shall submit the design of the proposed development in both DWG and IFC formats to HDB for its endorsement on behalf of the Government as landowner before submission to the regulatory agencies for clearance at each Regulatory Gateway. The HDB shall have the right to require the Successful Tenderer to amend and modify the above-mentioned plans submitted by him.

5.14 DEVIATIONS FROM PLANNING REQUIREMENTS

The requirements set out in this Part relating to location, height, size, area or extent of uses, etc., are specified with a view to achieving the relevant planning objectives as outlined or indicated in the provisions in this Part. The Successful Tenderer may submit for the HDB's consideration alternative proposal to any such requirements. Where HDB is satisfied that the alternative proposal will also serve to achieve the planning objective relevant to the requirement, the Successful Tenderer may be allowed to adopt such an alternative proposal instead; in which event, the relevant provisions in this Part shall be deemed to be complied with. HDB however reserves the absolute discretion to decide whether or not to allow any alternative proposal to be adopted.

5.15 PLANS OF PROPOSED DEVELOPMENT

The Successful Tenderer shall submit the design of the proposed development in both DWG and IFC formats to HDB for its endorsement on behalf of the Government as landowner before submission to the regulatory agencies for clearance at each Regulatory Gateway. The HDB shall have the right to require the Successful Tenderer to amend and modify the above-mentioned design submitted by him.

5.16 DEVIATIONS FROM PLANNING REQUIREMENTS

The requirements set out in this Part relating to location, height, size, area or extent of uses, etc., are specified with a view to achieving the relevant planning objectives as outlined or indicated in the provisions in this Part. The Successful Tenderer may submit for the HDB's consideration alternative proposal to any such requirements. Where HDB is satisfied that the alternative proposal will also serve to achieve the planning objective relevant to the requirement, the Successful Tenderer may be allowed to adopt such an alternative proposal instead; in which event, the relevant provisions in this Part shall be deemed to be complied with. HDB however reserves the absolute discretion to decide whether or not to allow any alternative proposal to be adopted.

5.17 PUBLIC COMMUNICATIONS PLAN

The Successful Tenderer is required to carry out a public communications plan as part of the efforts to keep the local community informed of the development plans for the Land.

The local community is defined as:

a) all residents of HDB flats, private condominiums / flats and landed houses;
b) Management Corporation Strata Title (MCST) Committee of private residential developments and Neighbourhood Committees; and
c) administration of schools and other institutions

that fall within a 100m (approximate) radius of the Land.

In addition, it shall include the local Member of Parliament (MP), Advisor, Constituency Director of the Constituency and General Manager of Town Council.

The Successful Tenderer is required to meet up with the local community (when required) to explain the internal development layout of the project and the mitigating measures.

The Successful Tenderer is required to handle any feedback from public arising from the proposed development and the associated works.

Stage 1: Prior to the first submission of plans to HDB for Endorsement

Prior to the erection of any hoarding or commencement of any clearance and / or tree-felling on the Land, the Successful Tenderer shall distribute flyers to the local community containing the following information and ensure this information are accurately presented:

a) Project information (e.g. type of development, number of units, storey height, vehicular access);
b) Location map showing hoarding, construction access etc;
c) Infrastructure works to be carried out and removal of existing facilities;
d) Key milestones in the construction programme [e.g. site clearance, hoarding works, commencement and duration of piling works, expected date of issuance of Temporary Occupation Permit (TOP)];
e) Details of proposed measures to mitigate the impact of development to the surrounding environment and users;
f) Contact details of the Successful Tenderer for the community to highlight issues such as noise and dust arising from the construction activities, and to provide feedback on the proposal; and
g) The hotline numbers of the relevant departments in BCA, HDB, MOM and URA.

Prior to the distribution of the flyer, the Successful Tenderer shall ensure that information as outlined above (a – g) are included in the flyer and inform the HDB on the distribution date with a copy of Form A as shown in **Appendix C (III)** and flyer.

After the distribution of the flyers, the Successful Tenderer shall submit to the HDB a duly completed Form B as shown in **Appendix C (IV)**. This Form B is to be submitted together with the first submission of plans to HDB for endorsement.

Upon submission of Form B to the HDB, the Successful Tenderer may proceed with the erection of hoarding, on which the contact details of the Successful Tenderer and the hotline numbers of relevant departments in BCA, HDB and MOM shall be prominently displayed.

Stage 2: Prior to the submission of plans to HDB for endorsement for WP application

After the grant of Provisional Permission by the Competent Authority under the Planning Act (Cap. 232) for the proposed development, the Successful Tenderer shall distribute additional flyers to the local community containing detailed information on the proposed development. The information to be provided shall include those in the Stage 1 flyer as well as (but not limited to) the following:

a. Schematic site layout showing the location of building blocks and facilities such as the bin centre, electrical substation, BBQ pits, etc.; and

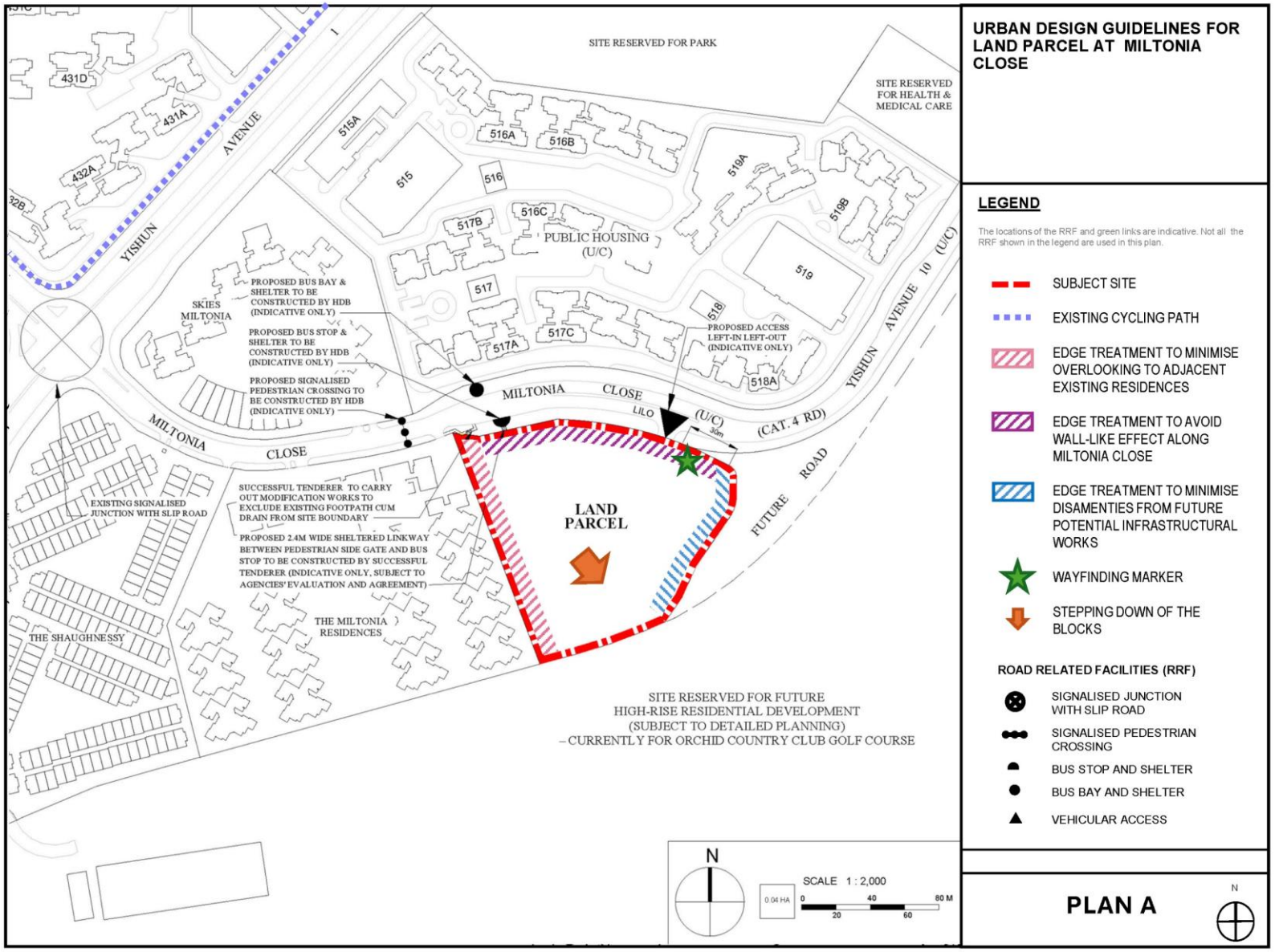
b. Indicative timeframe for the community to respond to the proposal, which shall be at least 2 weeks from the date the flyers are distributed.

The Successful Tenderer is required to submit a copy of the flyer for the HDB's approval before the distribution to the local community.

At least 2 weeks after the date of distribution of flyers, the Successful Tenderer shall submit to the HDB a duly completed Form C as shown in **Appendix C (V)** and a duly completed Form D as shown in **Appendix C (VI)**, which is a final collation of the feedback received on the proposed development, if any, together with an explanation of how the development proposal seeks to sensitively address the concerns raised by the local community. Both Forms C & D are to be submitted together with the submission of plan, which shall be made no earlier than 3 weeks from the date the flyers are distributed, to the HDB for endorsement.

After the endorsement of the submission of plans by the HDB, the Successful Tenderer is required to submit to the Competent Authority a copy of Form C & D as part of the application for planning approval.

The Successful Tenderer shall not commence structural works until the Competent Authority has given written consent for the Successful Tenderer to proceed to apply to BCA for the permit to commence structural works, or has granted Written Permission under the Planning Act 1998.


URBAN DESIGN GUIDELINES FOR LAND PARCEL AT MILTONIA CLOSE
SITE RESERVED FOR PARK
SITE RESERVED FOR HEALTH & MEDICAL CARE
431D
431A
432A
AVENUE
YISHUN
515A
515
516
516A
516B
516C
517B
517
517A
517C
518
518A
519
519A
519B
PUBLIC HOUSING (U/C)
YISHUN AVENUE 10 (U/C)
SKIES MILTONIA
PROPOSED BUS BAY & SHELTER TO BE CONSTRUCTED BY HDB (INDICATIVE ONLY)
PROPOSED BUS STOP & SHELTER TO BE CONSTRUCTED BY HDB (INDICATIVE ONLY)
PROPOSED SIGNALISED PEDESTRIAN CROSSING TO BE CONSTRUCTED BY HDB (INDICATIVE ONLY)
PROPOSED ACCESS LEFT-IN LEFT-OUT (INDICATIVE ONLY)
MILTONIA CLOSE
LILO (U/C)
30m
(CAT. 4 RD)
FUTURE ROAD
EXISTING SIGNALISED JUNCTION WITH SLIP ROAD
SUCCESSFUL TENDERER TO CARRY OUT MODIFICATION WORKS TO EXCLUDE EXISTING FOOTPATH CUM DRAIN FROM SITE BOUNDARY
PROPOSED 2.4M WIDE SHELTERED LINKWAY BETWEEN PEDESTRIAN SIDE GATE AND BUS STOP TO BE CONSTRUCTED BY SUCCESSFUL TENDERER (INDICATIVE ONLY, SUBJECT TO AGENCIES' EVALUATION AND AGREEMENT)
LAND PARCEL
THE MILTONIA RESIDENCES
THE SHAUGHNESSY
SITE RESERVED FOR FUTURE HIGH-RISE RESIDENTIAL DEVELOPMENT (SUBJECT TO DETAILED PLANNING) – CURRENTLY FOR ORCHID COUNTRY CLUB GOLF COURSE
N
0.04 HA
SCALE 1 : 2,000
0 20 40 60 80 M
LEGEND
The locations of the RRF and green links are indicative. Not all the RRF shown in the legend are used in this plan.
SUBJECT SITE
EXISTING CYCLING PATH
EDGE TREATMENT TO MINIMISE OVERLOOKING TO ADJACENT EXISTING RESIDENCES
EDGE TREATMENT TO AVOID WALL-LIKE EFFECT ALONG MILTONIA CLOSE
EDGE TREATMENT TO MINIMISE DISAMENTIES FROM FUTURE POTENTIAL INFRASTRUCTURAL WORKS
WAYFINDING MARKER
STEPPING DOWN OF THE BLOCKS
ROAD RELATED FACILITIES (RRF)
SIGNALISED JUNCTION WITH SLIP ROAD
SIGNALISED PEDESTRIAN CROSSING
BUS STOP AND SHELTER
BUS BAY AND SHELTER
VEHICULAR ACCESS
PLAN A
N

YISHUN – NEIGHBOURHOOD SCALE

Yishun (South) – Living Waterfront

Aerial view of Lower Seletar Reservoir

Boardwalk along Lower Seletar Reservoir Park

Water play area at Lower Seletar Reservoir Park

Sub-theme and Concept

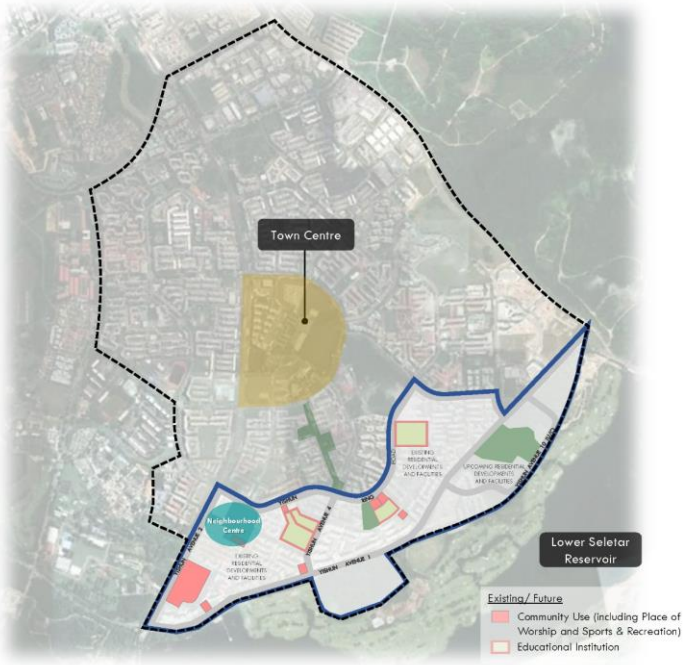
The area fronting Lower Seletar Reservoir presents the opportunity to offer waterfront living experience amongst greenery. There is also a variety water sports/ recreational activities available here to enliven the community and encourage residents to lead active and healthy lifestyles.

TRANQUIL LANDSCAPE
ECO-CONSCIOUS
PEACEFUL
VIEWS
LIVING WATERFRONT
SUSTAINABLE
ACTIVE LIVING
COMMUNITY-DRIVEN
BIODIVERSITY
WATER SPORTS

60

YISHUN – NEIGHBOURHOOD SCALE

Yishun (South) – Living Waterfront



Sub-theme and Concept

Planning and Design Considerations

- Respond sensitively to the lush greenery and waterbody along Lower Seletar Reservoir
- Safeguard Nature Ways along key corridors to provide ecological connectivity between nature reserves.
- Use of water and nature inspired elements (e.g. waves, ripples, special tree/ flower species found in the area) in the design of public spaces and housing developments
- Create a vibrant recreational residential environment that provides active spaces conducive for community gathering and bonding

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YISHUN – NEIGHBOURHOOD SCALE

Yishun (South) – Living Waterfront

Form and Massing

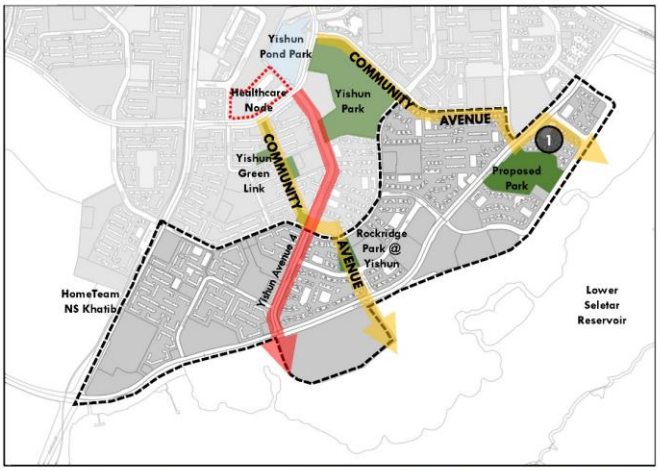
- Light/ floating forms (for low-rise buildings/ pavilions) to create a contemporary resort-like atmosphere which reinforces the waterfront identity of the area
- Building forms could also take inspiration from the fluid nature of water to create undulating/ wavy visual effect
- Buildings nearer to the waterfront edge could take on a terracing typology facing towards Lower Seletar Reservoir, where possible
- Blocks to capitalise on natural views towards the waterfront, where possible

Designed and positioned as an "Urban Retreat", the opening up of the HomeTeamNS Khatib Clubhouse creates a lofty verandah-like space

Heights and orientation of blocks could be staggered for optimal views towards the waterbody (example from Waterway Ridges, Punggol)

YISHUN – NEIGHBOURHOOD SCALE

Yishun (South) – Living Waterfront



Public Spaces

Community Avenues

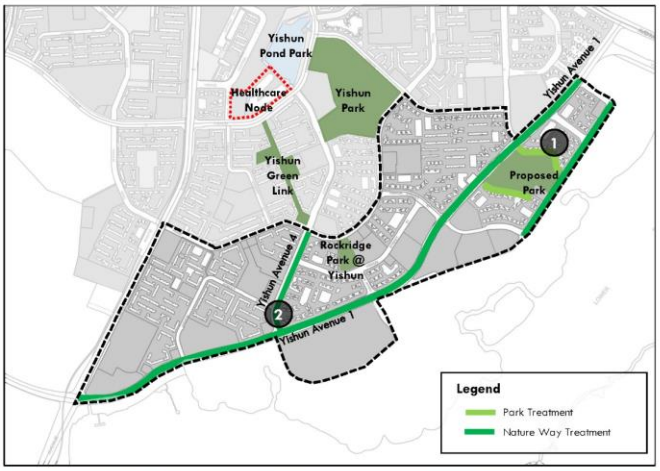
The Community Avenues are key pedestrian thoroughfares envisioned as tree-lined boulevards with lush roadside greenery, providing shade and connection for pedestrians from the Town Centre to the waterfront and park spaces.

- Activate community avenues as social corridors to the waterfront by introducing activity nodes i.e. meeting points, gathering spaces, play areas to encourage community bonding and active lifestyles
- Possible opportunities to link community avenues back to existing green network i.e. parks, PCN, Nature Ways, and green loop

Vanda Breeze @Yishun – Ground-storey facilities sited along Community Avenue (in yellow arrow) serve as key social corridor to the waterfront

YISHUN – NEIGHBOURHOOD SCALE

Yishun (South) – Living Waterfront



Streetscape and Urban Edge

Park Treatment
Buildings along this edge should have frontages facing the proposed park or step down towards the park to maximise views and activate the Community Avenues.

Nature Way Treatment
As part of NParks' Nature Ways (along Yishun Avenue 1), which are designed to provide park/ greenery connectivity, appropriate precinct spaces and landscaping strategies shall extend the greenery inwards of the housing parcels.

View of Vanda Breeze with building frontage facing the proposed park

Nature Way along Yishun Avenue 4

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YISHUN – NEIGHBOURHOOD SCALE

Yishun (South) – Living Waterfront

Colour Palette

In line with the 'Waterfront Living' sub-theme, the suggested colour palette for Yishun (South) is off-white and a range of grey shades for its primary colours, complemented by secondary colours and accent colours comprising blue, turquoise, purple and green shades. This colour palette is to strengthen the identity of the precinct.

Primary Colours
Unify the identity of the area, and form the main base of the colour scheme
(choose both primary colours)

BS 00 E 55 BS 18 C 31

Secondary Colours
Complement the primary base colours
(choose 1 or more secondary colours)

BS 14 E 50 BS 10 A 07

Accent Colours
Highlight certain architectural features, such as fins, ledges, canopies, spandrels, selected parts of gable end walls, etc.
(choose 1 or more accent colours)

BS 22 D 41 BS 18 E 51 BS 20 E 53 BS 18 D 43 BS 12 D 45

Facade and Roofscape

- Facade design and roof features can take inspiration from water elements (e.g. facade articulation that mimics the reflections of the water)
- Can also incorporate contemporary design features (e.g. verandahs)


Blue and green shades, as well as a wave-like roofscape, at Angsana Breeze @ Yishun


Shades of green on the facade of Saraca Breeze @ Yishun

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YISHUN – NEIGHBOURHOOD SCALE

Yishun (South) – Living Waterfront

From left: ABC Waters design features (example from Lower Seletar Reservoir Park), use of shade trees with clear trunks to allow for views through (example from Punggol Waterfront).

Landscape Approach

There are opportunities to frame views towards greenery or the waterfront, hence ensuring adequate clear trunk height for trees will allow for visual porosity towards such vistas. ABC Waters design features, such as rain gardens, can also be implemented where feasible to cleanse rainwater runoff.

Planting Concept

Use of freshwater swamp forest species being close to the waterfront. Planting can showcase trees with ornamental trunks, such as peeling or fissured barks, or trees with weeping canopies. This can be supplemented with other shade trees.

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YISHUN – NEIGHBOURHOOD SCALE

Yishun (South) – Living Waterfront

From left: Datum tree species is *Saraca thaipingensis*; examples of trees with ornamental trunks or weeping canopies include *Tristaniopsis whiteana*; *Tristaniopsis obovata* and *Cratoxylum cochinchinense*

From left: Examples of shade trees include *Dyera costulata*, *Diospyros lanceifolia and Palaquium obovatum*

Landscape Approach

Suggested Tree Species

The following list is intended as a guide for tree species selection and is not meant to be restrictive. Plant selection will need to consider the suitability of species for the site conditions and maintenance requirements.

Datum Tree

- *Saraca thaipingensis* (Yellow Saraca)

Trees with Ornamental Trunks or Weeping Canopies

- *Tristaniopsis* spp.
- *Cratoxylum cochinchinense* (Red Mempat)
- *Syzygium zeylanicum* (Kelat Merah)

Shade Trees

- *Dyera costulata* (Jelutong)
- *Dillenia grandifolia* (Stilted Simpoh)
- *Diospyros lanceifolia* (Common Malayan Ebony)
- *Palaquium obovatum* (White Gutta)*
- *Shorea* spp.*

*Species can be planted where large planting spaces are available, e.g. in parks or common greens

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YISHUN – NEIGHBOURHOOD SCALE

Yishun (South) – Living Waterfront

Overview of Key Urban Design Considerations

Transport

EXISTING PROPOSED

MRT Station

Facilities

Neighbourhood/ Commercial Centre

Plaza Space

Parks and Waterbodies

Park

Waterbody

Park Connector/ Cycling Path/ Round Island Route

Proposed Local Link between Developments

Key Corridors

Community Avenues

Nature Way

Key Nodes and Junctions

Landmark

Key Junction

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APPENDIX C (III)

FORM A
PUBLIC COMMUNICATIONS PLAN

Details of Developer	**To:**	**INSTRUCTION:**
Company Name: Address: Tel no: Email:	Land Sales & Lease Administration Housing & Development Board HDB Hub 480 Lorong 6 Toa Payoh Singapore 310480	This form is to be duly completed and submitted to the HDB prior to the distribution of the Stage 1 flyer.

Proposed Development:

_____

Lot no.: _____ TS/MK: _____

	Key milestone	**Proposed date of commencement* (MM/YYYY)**
1.	Send Stage 1 flyer to local Member of Parliament (MP) and Advisor	
2.	Distribution of Stage 1 flyer containing brief project information and contact details of parties specified	
3.	Submission of Form B	
4.	First submission of development proposal	
5.	Erection of hoarding / site clearance	
6.	Obtain grant of Provisional Permission	
7.	Send Stage 2 flyer to local Member of Parliament (MP) and Advisor	
8.	Distribution of Stage 2 flyer containing detailed project information	
9.	Submission of Form C	
10.	Submission of Form D	
11.	Construction schedule a) Piling b) Sub-structure c) Superstructure d) M&E works e) Finishes	

Name, Designation & Signature of Developer's representative

** Subject to changes. The HDB shall be kept informed of any changes to the public communications plan.*

APPENDIX C (IV)

FORM B
DECLARATION BY THE DEVELOPER (FOR FIRST SUBMISSION OF PLANS TO HDB)

INSTRUCTION: This form is to be duly completed and submitted to the HDB together with the first submission of plans for HDB's endorsement, which shall be made no earlier than 1 week from the date the flyers are distributed	
Details of Developer Company Name: Address: Tel no: Email:	**To:** Land Sales & Lease Administration Housing & Development Board HDB Hub 480 Lorong 6 Toa Payoh Singapore 310480
Proposed Development: _____ _____ Lot no.: _____ TS/MK: _____	
I, _____ (Name), _____ (Designation), hereby declare on behalf of the developer that in accordance with Condition 5.17 of the Additional Conditions of Tender, flyers containing brief information on the project and the contact details of the parties specified in the said Condition have been distributed to the local community* on _____ (Date).	
Signature:	Date:

** Local community is defined and includes the parties specified in Condition 5.17 of the Additional Conditions of Tender*

APPENDIX C (V)

FORM C
DECLARATION BY THE DEVELOPER

(FOR SUBMISSION OF PLANS SUBSEQUENT TO THE GRANT OF PROVISIONAL PERMISSION)

INSTRUCTION:

This form is to be duly completed and submitted to the HDB together with the submission of plans to HDB subsequent to the grant of Provisional Permission, which shall be made no earlier than 3 weeks from the date the flyers are distributed.

Details of Developer	**To:**
Company Name: Address: Tel no: Email:	Land Sales & Lease Administration Housing & Development Board HDB Hub 480 Lorong 6 Toa Payoh Singapore 310480

Proposed Development: _____

_____

Lot no.: _____ TS/MK: _____

I, _____ (Name), _____ (Designation), hereby declare on behalf of the developer that in accordance with Condition 5.17 of the Additional Conditions of Tender, flyers containing detailed information on the development project and the contact details of the parties specified in the said Condition have been distributed to the local community* on _____ (Date).

Details of preliminary feedback received from the local community (if any):
Signature: Date:

Local community is defined and includes the parties specified under Condition 5.17 of the Additional Conditions of Tender

APPENDIX C (VI)

FORM D
CONSOLIDATED FEEDBACK ON PROPOSED DEVELOPMENT

(FOR SUBMISSION OF PLANS SUBSEQUENT TO THE PROVISIONAL PERMISSION)

INSTRUCTION:

This form is to be duly completed and submitted to the HDB as part of the submission of the plans subsequent to the grant of the Provisional Permission, which shall be made no earlier than 3 weeks from the date the flyers are distributed.

Details of Developer	**To:**
Company Name: Address: Tel no: Email:	Land Sales & Lease Administration Housing & Development Board HDB Hub 480 Lorong 6 Toa Payoh Singapore 310480

DC Reference:
_____

Proposed Development:
_____

Lot no.: _____ TS/MK: _____

I, _____ (Name), _____ (Designation), hereby declare on behalf of the developer that in accordance with Condition 5.17 of the Additional Conditions of Tender, the table below has included all feedback that has been received from the local community, up to the date of the submission of this development application.

Feedback received from the local community and how the development proposal has sensitively addressed the feedback raised*:

Feedback Received from Local Community	**Proposed Measures**

Signature: Date:

** This must include all feedback received up to the point of the submission of the plans to HDB.*

APPENDIX D

PROPOSED EXECUTIVE CONDOMINIUM HOUSING DEVELOPMENT LAND PARCEL AT MILTONIA CLOSE CONDITIONS AND REQUIREMENTS OF RELEVANT COMPETENT AUTHORITIES AND PUBLIC UTILITY LICENSEES (FOR INFORMATION OF TENDERERS)

CONTENTS **PAGE**

1.0 DEFINITION

The lease of the Land Parcel at Miltonia Close ("the Land") is subject to the Additional Conditions of Tender and the Conditions of Tender for the Land contained in the eDeveloper's Tender Packet.

2.0 GENERAL CONDITIONS AND REQUIREMENTS

2.1 The Successful Tenderer is required to consult and comply with all technical conditions imposed by the relevant authorities such as Urban Redevelopment Authority, Land Transport Authority, National Environment Agency, Public Utilities Board, SP Power Grid and the Singapore Civil Defence Force etc.

2.2 The Successful Tenderer for the Land is required under the said Conditions of Tender to ascertain the exact and detailed conditions and requirements of all relevant Competent Authorities and Public Utility Licensees in respect of the development thereon and shall at his own cost and expense observe and comply with the same.

2.3 Without affecting the generality of paragraph 2.1 above and without prejudice to the obligations of the Successful Tenderer as set out therein, the contents herein are provided for the information of the tenderers only. Whilst every care and attention has been taken in the compilation and preparation hereof, it does not warrant that the contents herein represent all the conditions and requirements of the relevant Competent Authorities and Public Utility Licensees in respect of the development on the Land or that they are free from errors or omissions whatsoever. The contents herein are subject to changes by the relevant Competent Authorities and Public Utility Licensees concerned and the onus lies on the Successful Tenderer to verify these conditions and requirements directly with HDB, the relevant Competent Authorities and Public Utility Licensees and comply with their prevailing conditions and requirements.

2.4 A summary of the initial services requirements of the relevant Competent Authorities and Public Utility Licensees is set out herein. It serves only as an indication of the possible work involved with regards to services and is by no means exhaustive or final.

2.5 The Successful Tenderer shall ensure that the following requirements are complied with:

2.5.1 To consult and liaise directly with the relevant Competent Authorities and Public Utility Licensees regarding the actual locations of all service mains within the Land and on the requirements and conditions for services diversion, if any, and provision prior to the commencement of site work. All necessary precautions shall be taken by the Successful Tenderer to safeguard the service mains before they are diverted.

2.5.2 To engage his own licensed Cable Detection Worker and licensed Telecommunication Cable Detection Worker to carry out cable detection and if necessary to carry out trial trenches to locate any manholes and cable routes prior to the commencement of site work. The Successful Tenderer shall bear the cost of any diversion work.

2.5.3 To ensure that all service mains that do not need to be diverted are identified and provided with protection, if necessary, during the construction stage of the development. The cost of repairs to any damaged service main as a result of work carried out by the Successful Tenderer shall be borne by the Successful Tenderer.

2.5.4 To ensure that the relevant Competent Authorities and Public Utility Licensees are allowed free and unconditional access at all times to services that remain within the Land for the purpose of installation, maintenance, repair and improvement works and all other work and activities incidental thereto.

2.5.5 To make his own arrangements with the relevant Competent Authorities and Public Utility Licensees and pay for the fees and costs of any diversion and/ or "capping off" of existing services, provision of service mains and service connection, if any, in relation with the development.

2.5.6 To provide for all the internal distribution for water, electricity, drainage and sanitary discharge for the development.

2.5.7 To liaise with all the relevant Competent Authorities and Public Utility Licensees on upgrading the road reserves abutting the Land to ensure that the necessary roadside drains, sidetable, kerb, etc., are carried out in accordance with the prevailing Road Reserve requirements.

2.5.8 To ensure that all proposed infrastructure is to be implemented in accordance to the requirements of the relevant Competent Authorities, and to initiate and complete the handover of the relevant infrastructure to the respective Competent Authorities upon completion.

2.6 The Successful Tenderer shall be responsible to carry out at his own cost and expense his own site investigation to verify whether there is any sub-structure or other obstructions e.g. footings, piles, tree roots, etc., in the ground of the Land, and ascertain their effect on the development.

2.7 There may be some other existing services affected by the development. The Successful Tenderer shall inform the relevant Competent Authorities and Public Utility Licensees immediately and bear the necessary cost of diversion and/or "capping off" of these existing services, if any.

2.8 In general, no structure shall be sited close to or over existing and proposed services. The Successful Tenderer shall comply with all requirements as stipulated by the relevant Competent Authorities and Public Utility Licensees.

3.0 REQUIREMENTS OF LAND TRANSPORT AUTHORITY (LTA)

LTA requires the Successful Tenderer to comply with the following requirements:

i) All proposed street works and works within the road reserve, shall be designed, submitted, supervised and constructed in accordance with Street Works (Street Works by Private Persons) Regulations, Street Works (Works on Public Street) Regulations and the following prevailing standards and Code of Practice:

a. Code of Practice for Street Work Proposals relating to Development Works;

b. LTA Standard Details of Road Elements;

c. Materials & Workmanship Specifications for Civil & Structural Works;

d. Code of Practice for Works on Public Streets;

e. Code of Practice for Traffic Control at Work Zone

f. Infrastructure Design Criteria; and

g. Civil Design Criteria; and

h. Active Mobility Design Guide

ii) The technical details, extent and completion date of such works shall comply with the requirements of the LTA and other relevant Competent Authorities.

iii) The Successful Tenderer shall at his own cost and expense, carry out all the proposed works as detailed in the Additional Conditions of Tender (Technical).

iv) Detailed plan submission, including the traffic plans for the development showing the details of the accesses, circulation, traffic measures, etc., shall be made to LTA Plan Compliance Division (PCD) for review and clearance during the formal plan submission stages.

<u>Bicycle Parking facilities</u>

v) The Successful Tenderer is required to comply in full with the LTA bicycle parking requirement under the Parking Places (Provision of Parking Places and Parking Lots) Rules 2018. A guide for Bicycle Parking and related facilities can be found in the Code of Practice

for Street Works Proposals relating to Development Works and Code of Practice for Vehicle Parking Provision in Development Proposals.

vi) The Successful Tenderer is required to construct and provide a minimum number of bicycle parking lots within the Land at the rate of 1 bicycle parking lot for every 6 dwelling units or prevailing requirements set out by the relevant Competent Authority at the formal submission stage.

vii) As good practice, the Successful Tenderer should set aside 20% of the total bicycle parking lots on the ground floor where it is freely accessible and visible to visitors visiting the development.

viii) The bicycle parking lots shall be securely anchored and non-removable. The Successful Tenderer may, however, propose alternative layouts and designs for LTA's consideration and approval.

ix) The Successful Tenderer should consider existing vehicular and pedestrian movement when locating bicycle parking lots within the development. Bicycle parking lots shall be segregated from pedestrian walkways, driveways and car park access to ensure safety of motorists, pedestrians and cyclists. It is advantageous to provide separate pathways for cyclists and motorised vehicles to avoid conflict between cyclists and other road users.

x) The Successful Tenderer is strongly encouraged to provide higher capacity lifts to cater to higher cycling demand. The recommended dimensions for such lifts can be found in Code of Practice for Street Works Proposals relating to Development Works.

xi) The Successful Tenderer shall obtain clearance from the Competent Authority on all matters related to the bicycle parking facilities before commencing the construction of the bicycle parking lots.

Wayfinding Signage

xii) The Successful Tenderer is to provide a comprehensive wayfinding system to guide residents and visitors of the development to transportation nodes in the vicinity and towards the pedestrian and cyclist related facilities (e.g. bicycle parking) within the development. A guide for wayfinding signage and related facilities can be found in the Code of Practice for Street Work Proposals relating to Development Works.

xiii) The Successful Tenderer shall obtain clearance from the Competent Authority on all matters related to the wayfinding system before commencing construction of the development.

xiv) The Successful Tenderer shall be responsible for the maintenance of the wayfinding system at all times and shall bear all the costs related to the proper functioning of the wayfinding system.

Construction Access

xv) The construction access shall be taken from Miltonia Close at the location of the permanent access, as shown indicatively in the Site Plan. As there are proposed road works at Miltonia Close, the Successful Tenderer shall coordinate the access with the infra contractors.

xvi) The Successful Tenderer shall ensure that any existing pedestrian and/ or cyclist connectivity along the cul de sac of Miltonia Close is maintained during the construction period. Where necessary, traffic marshals shall be deployed to guide vehicular and pedestrian traffic.

xvii) Construction vehicles can only access the site during off-peak hours (9.30am to 5.00pm). The Successful Tenderer shall include the proposed construction access location and route in its Public Communication Plans (PCP).

xviii) The details of the proposed construction access are to be submitted to LTA PROMPT and the relevant Competent Authorities for approval before commencement of work on site.

xix) The Successful Tenderer shall at his own cost and expense, fully reinstate any modifications to the road features and/or rectify any damages to the road kerb / centre median / sidetable at Miltonia Close to the standards and satisfaction of the Competent Authorities.

Prefabricated Prefinished Volumetric Construction (PPVC)

xx) Feedback related to PPVC transportation activities

a. Feedback related to PPVC transportation activities shall be handled by the Successful Tenderer.

xxi) Delivery of PPVC Modules

a. The Successful Tenderer is to obtain a permit from LTA if the vehicle (with or without load) meets any of the following criteria:

i. Having an overall width exceeding 3 metres (or 2.6 metres when travelling on controlled roads). Please visit https://prompt.lta.gov.sg/WebUIPWAS/Home/Faq and see Q.2 under the “Permit for Vehicle Movement” tab; or

ii. Having a rear projection of 1.8 metres or 40% of the length of the load bearing vehicle (whichever is lesser); or

iii. Having an overall weight exceeding the vehicle type’s weight limit (please visit https://prompt.lta.gov.sg/WebUIPWAS/Home/Faq and see Q.1 under the “Permit for Vehicle Movement” tab)

b. In addition to a permit, Auxiliary Police Escort (escorted vehicle movement from 7 p.m. to 5 a.m. on arterial roads; or from 11 p.m. to 5 a.m. on expressways) is required if the vehicle (with or without load) also meets any of the following criteria:

i. Having an overall width of 3.4 metres or more; or

ii. Having an overall weight of 80,000 kilograms or more; or

iii. Having an overall height exceeding 4.5 metres

c. The Successful Tenderer shall comply with LTA guidelines “Special Vehicles that require Submission of Notice to LTA”.

xxii) Oversized Vehicle Delivery Operation / Access Point

a. Ingress/ Egress shall be taken off from off from the same location as the development’s main access point.

b. All construction related activities (including but not limited to loading/unloading, reversing of vehicles) must be carried out within the site.

c. Deliveries are to be carried out outside of AM and PM peak hours (6.30am – 9.30am, 5.00pm – 7.30pm).

d. Parking or waiting of construction vehicles/staff vehicles by the roadside is strictly prohibited.

e. Due to existing public buses plying through this area, please ensure that there is no road closure at all times and construction operations do not obstruct public buses. PPVC deliveries must be carried out after the last bus ceases operation, if necessary.

f. Marshalls must be deployed to help guide/regulate traffic and ensure smooth traffic flow.

g. The Successful Tenderer/Contractors are to plan the traffic routes properly.

xxiii) First-time applicants must register through LTA.PROMPT via https://prompt.lta.gov.sg/WebUIPWAS/Login.aspx for access. Applications are to be made at least 3 working days in advance.

4.0 REQUIREMENTS OF CATCHMENT AND WATERWAYS DEPARTMENT (C&W), PUBLIC UTILITIES BOARD (PUB)

PUB(C&W) requires the Successful Tenderer to comply with the following requirements:

i) The topography of the Land shall not be changed without the approval of PUB.

ii) There is an ongoing road and drain infrastructure works by HDB along the Miltonia Close Extension which is estimated to be completed by end 2027, subject to site conditions. Please liaise with, Mr Gao Hong Yang (Email: GAO_Hongyang@hdb.gov.sg, Tel: 6490 2552) for the latest project timeline and schedule. All surface runoff and drainage infrastructure within the development shall be constructed by the Successful Tenderer, connect and discharge to the new roadside drain along Miltonia Close Extension. Please submit the necessary documents such as proposed timeline for the connection works, method statement and construction sequence for connecting the Land's discharge drain to the roadside drain along Miltonia Close Extension via PUB Business Professional Portal at https://eservices.pub.gov.sg/bpp/account for PUB's comments and approval.

iii) The minimum platform level (MPL) for the subject site shall not be lower than 12.6m above Singapore Height Datum, or 300mm above the adjacent road/ground level for general developments, 600mm for industrial/institutional/commercial/multiunit residential developments or any other level as determined by PUB as in stated in the latest edition of the 'Code of Practice on Surface Water Drainage', whichever is the highest. For basements of industrial, institutional, commercial or multi-unit residential developments, the minimum crest level shall be at least 300mm above the MPL as stated above. Please pre-consult PUB(C&W) on the required MPL before making DC/BP submission in Corenet or Design Gateway/ Construction Gateway (where applicable) in Corenet X. In complying with the MPL requirement, thorough investigations of the site shall be conducted to determine suitable platform profiles to ensure that the runoff within, upstream of and adjacent to the subject site can be effectively drained away without causing flooding within the site and in the vicinity of the site. Any proposal to level/backfill the subject site shall be submitted to PUB(C&W) for comments and approval.

iv) The Successful Tenderer shall locate and identify all existing drains within and in the vicinity of the Land. The existing drainage system within and in the vicinity of the Land shall not be interfered with, in any manner, without written approval from PUB(C&W). All works shall not cause damage or affect the structural integrity of the roadside/outlet drains.

v) The development schedule of the Land shall be properly considered to avoid a situation where the Land and/or the lands in the vicinity become 'land locked' without proper drainage outlets. The runoff within, upstream of and adjacent to the Land shall be effectively drained away without causing flooding within the site and in the vicinity of the Land. Any proposal to level/backfill the Land shall be submitted for PUB(C&W)'s comments and clearance.

vi) All affected drains and Drainage Reserves (location and alignment) and their respective sizes shall be indicated in the detailed plan drawings. Details such as inverts/copes of affected drains, adjacent ground levels and amount of soil cover shall also be indicated in the detailed submission to PUB. All drain crossings within road reserves (e.g. culverts and roadside drains) shall be clearly highlighted in the plans. Detailed proposal plans shall be submitted at the detailed planning stage for PUB's comments and clearance before the commencement of works.

vii) The proposed site is within Sungei Seletar Water Catchment.

   a. The proposal shall not result in any loss of yield from the catchment area.

   b. Stringent pollution control measures shall be incorporated in the design and during the construction of the development.

c. All sewage and sullage water shall be discharged into a public sewer.

d. Bulk storage of toxic and hazardous materials shall not be allowed.

e. If there is any earth filling work at the development site, use good earth free of any debris or construction waste materials. If sand is used for backfilling, do not use marine sand. Only washed sand with chloride content not exceeding 0.01% (by Weight) shall be allowed. Test reports on the chloride content of the washed sand shall be submitted to PUB(C&W) for records before commencement of work.

viii) Safeguarding Of Existing Drains/Drainage Facilities During Construction Works

a. The Successful Tenderer shall ensure that the design and construction of the development will not cause damage and affect the structural integrity of the existing drains.

b. The Successful Tenderer shall ensure that the runoff within, upstream of and adjacent to the development shall be effectively drained away without causing flooding within the Land and in its vicinity.

c. The Successful Tenderer shall take due care and precautionary measures to ensure that no damage, settlement or any adverse impacts occurs to any existing drain/drainage facilities in the course of the works. Free flow of water in the drains shall be maintained at all times. Any damages caused to the drainage structures shall be reinstated at the Successful Tenderer own cost to the satisfaction of PUB(C&W).

d. The Successful Tenderer shall carry out an impact assessment to establish the influence zone of the proposed works which affect the existing drains and drainage facilities. The impact assessment to be submitted to PUB shall be endorsed by a qualified person (QP).

e. Pre-work and post-work surveys shall be submitted to PUB and shall cover drains/drainage facilities in the area affected by the work (and shall extend to at least the area within the second reserve of the MRT lines - if applicable). All drains/drainage facilities shall be located and identified. The survey shall show the levels of the drains/drainage facilities and shall be accompanied by a set of photographs showing the conditions of the drains/drainage facilities. All survey work shall be carried out by a Registered Surveyor.

f. The Successful Tenderer shall carry out soil instrumentation for monitoring the soil/geo-technical/structural movements or changes at and around the work-site in particularly existing drains/drainage facilities throughout the contract period. The–Successful Tenderer shall set the critical alert levels and put in place a contingency plan to rectify any damages to the drains/drainage facilities. The soil instrumentation shall be monitored daily and weekly summary reports of the results of the soil instrumentation shall be submitted to PUB. Any breach of the alert levels and/or anomaly found in the reports shall be immediately reported to PUB and rectified immediately to the full satisfaction of PUB. Details of the contingency plan including the schedule of works and organisation chart of the Successful Tenderer and consultant/contractor shall be submitted to PUB before commencement of works.

g. In the event of breach of alert levels and/or anomaly in the soil instrumentation results, the Successful Tenderer shall alert PUB immediately and activate the contingency plan to mitigate and rectify the situation. The analysis and rectification reports of the affected drains and drainage facilities shall be submitted to PUB for comments/approval.

h. The Successful Tenderer shall conduct a joint visual inspection and any defects identified shall be made good to the full satisfaction of PUB and shall follow up with an incident report for the affected drains and drainage facilities within 3 days including remedial/repair works. If necessary, briefing/meeting shall be conducted by the Successful Tenderer to address the damage and follow up actions to rectify the situation.

i. The method of construction of temporary drains and/or drains affected by the works shall be submitted to PUB for comments and approval before commencement of the works. Upon completion of the works, postcondition survey and topography survey of the affected drains shall be submitted and PUB may request for joint site inspection of the rectification works.

j. The Successful Tenderer shall inform PUB in writing at least one week before the commencement of any work at the site which affects drains.

ix) Effective erosion and sediment control measures shall be provided by the Successful Tenderer and the QP shall advise his developer/owner to provide such effective measures and facilities with inputs from Qualified Erosion Control Professional (including site management system and perimeter cut-off drain, silt traps, storage ponds, treatment plants, etc) to ensure clean discharge that complies with the statutory requirement. The proposed erosion and sediment control measures shall be submitted by a Qualified Erosion Control Professional (QECP) to Public Utilities Board before commencement of works. All affected watercourses shall be desilted and cleared until completion of work. For reference, the information can be found in the website https://www.pub.gov.sg/Professionals/Requirements/Earth-Control-Measures.

x) The planning, design, construction activities and procedures for plan submission shall comply fully with the requirements as stipulated in the latest edition of the Code of Practice on Surface Water Drainage and The Sewerage and Drainage (Surface Water Drainage) Regulations 2007. The latest version of the COP may be downloaded from the PUB website: https://www.pub.gov.sg/Professionals/Resources/Code-of-Practices.

xi) PUB has in 2006 launched the Active, Beautiful and Clean Waters (ABC Waters) Programme. As part of the Programme, PUB has launched ABC Waters design guidelines which provide ideas on how natural runoff treatment systems termed ABC Waters design features such as rain gardens, vegetated swales and bioretention swales can be integrated within a development. These features detain/ slow down stormwater runoff and improve water quality by using plants and soil. They also enhance landscape and biodiversity of the development. Specific information on the design of these features can be found at the website: https://www.pub.gov.sg/Professionals/Working-on-ABC-Waterways/ABC-Waters-Design-Guidelines.

xii) Industrial, commercial, institutional and residential developments greater than or equal to 0.2 hectares in size are required to control the peak runoff discharged from the development sites. The maximum allowable peak runoff to be discharged to the public drains will be calculated based on a runoff coefficient of 0.55, and for design storms with a return period of 10 years and for various storm durations of up to 4 hours (inclusive). Peak runoff reduction can be achieved through the implementation of ABC Waters design features and structural detention and retention features, such as:

a. Detention tanks;

b. Retention/Sedimentation ponds;

c. Wetlands;

d. Bioretention swales;

e. Porous pavements;

f. Bioretention basins or rain gardens, etc.

xiii) The Qualified Person (QP) shall be required to submit details (calculations and/or hydraulic model results) showing how the proposed system meets the required peak runoff rates. Due consideration shall be given to meeting ABC Waters stormwater quality objectives, which will often require treatment of stormwater runoff using ABC Waters design features. For design guidance on the ABC Waters design features, Successful Tenderer /QPs can refer to the ABC Waters Guidelines and relevant chapters in the Engineering Procedures, available on the PUB website.

xiv) PUB encourages the implementation of ABC Waters design features in the development as well as the achievement of ABC Waters certification. Information regarding ABC Waters Certification can be found via the link: https://www.pub.gov.sg/Professionals/Awards-and-Certification/ABC-Waters-Certification. If applicable, the design and construction supervision of ABC Waters design features as well as drawing up the maintenance plan for these features shall be carried out by an ABC Waters Professional. The Successful Tenderer may wish to contact Miss Kelly Sng (Email: Kelly_Sng@pub.gov.sg) for issues related to ABC Waters design features.

xv) Please contact Eng Bo Xuan (Email: Eng_Bo_Xuan@pub.gov.sg), Poh Li Ping (Email: Poh_Li_Ping@pub.gov.sg), Rosima Binte Abbas (Email: Rosima_Abbas@pub.gov.sg), Yu Pingping (Email: Yu_Pingping@pub.gov.sg), from PUB(C&W), if you need any clarifications.

5.0 REQUIREMENTS OF WATER RECLAMATION (NETWORK) DEPARTMENT (WRN), PUBLIC UTILITIES BOARD (PUB)

PUB (WRN) requires the Successful Tenderer to comply with the following requirements:

i) The planning of this project shall comply with the prevailing Code of Practice on Sewerage and Sanitary Works [thereafter referred to as the "COPSSW"]'

ii) There are abandoned 820mm diameter pumping mains within/ in the vicinity of the Land. Thorough site investigation shall be carried out to determine the exact positions and levels of the existing sewerage infrastructure.

iii) Drain – line connection for the Land shall be made to the proposed internal sewer within the adjacent public housing development, which is estimated to be completed by end 2027, subject to site conditions and authority clearances. Please liaise with, Mr Gao Hong Yang (Email: GAO_Hongyang@hdb.gov.sg, Tel: 6490 2552) and Ms Magdalene Tan (Email: Magdalene_EY_Tan@hdb.gov.sg, Tel: 6490 3221) for updates on project timeline and schedule of HDB's internal sewers. Details of the proposed drain - line connection to serve the development shall be submitted to PUB(WRN) for approval before commencement of works on site.

iv) No structure/object/building/piling/retaining structure, etc. (whether temporary or permanent), except lightweight and demountable elements (such as decking, awnings, fencing, planting troughs and link-way shelters), shall be sited over or across any sewers/pumping mains without the approval of PUB. All proposed structures shall be kept as far away from the existing sewers/pumping mains as possible and no nearer than the following minimum lateral clearances (also known as sewer/ pumping main setback), please refer to COPSSW Section 1.2.4.b Table 1. Proposed drains with a maximum width of 2m may over-cross sewers with a minimum vertical clearance of 1m (measured from the bottom of the drain structure to the crown of the sewer pipe) but they shall not be laid parallel to and over the sewer. More details can be found in COPSSW Section 1.2.4.

v) The Successful Tenderer shall take all necessary measures to protect all existing sewers, particularly large (≥900mm diameter) sewers, affected by, or in close proximity to the proposed works.

vi) No sewerage systems (including abandoned sewers/pumping mains, any sensors, meters, equipment, instruments, etc. within manholes) shall be altered/interfered with without the approval from PUB(WRN). Where diversion/removal of any sewer/pumping main is required, it shall be carried out by the Successful Tenderer at his own cost & expense. Details of the diversion (pipe size, gradient, invert level, etc.) shall be submitted to PUB(WRN) for approval before the commencement of works. The Successful Tenderer shall be responsible for seeking approval from all relevant authorities/landowners of affected land for any proposed sewerage works to be carried out beyond the development. Such approval or consent from the authorities/landowners shall not include any conditions that require PUB to provide a letter of undertaking to divert the sewerage infrastructure in future. The Successful Tenderer is to ensure that all sewerage and sanitary designs comply with PUB's COPSSW. All sewers and manholes shall be readily accessible at all times to PUB for inspection and maintenance.

vii) Where there are any Specified Activities (including excavation/tunnelling/pipe jacking/through soil boreholes/installation of earth retaining and stabilising structure (ERSS) for services diversions) within the Public Sewer Corridor [i.e. 10m for sewer/main of diameter <900mm, 20m for sewer/main of diameter ≥900mm and 40m for DTSS tunnel] as stipulated in COPSSW Section 2.1.2, a written approval from the Director, Water Reclamation Network (WRN) Department of PUB should first be obtained before carrying out the Specified Activities at the site. The Successful Tenderer/ QP shall make a Protection of Water and Sewer Pipes (POWS) submission via PUB's Business & Professional (B&P) Portal at https://eservices.pub.gov.sg/bpp prior to any commencement of the Specified Activities. The Successful Tenderer shall refer to COPSSW Section 2 for the technical requirements on sewer protection. The guideline on 'Prevention of Damage to Public Sewerage System' can be found in PUB website at https://www.pub.gov.sg/-/media/Images/Feature/Content Pages/Professionals/Compliance/Applications/Revised_PUB_WRN_AdvisoryNotes_Mar_2023.pdf. The Successful Tenderer/ QP/contractor is required to submit a notification to our Network Management Branch (NMB) at least 7 days before the commencement of any works or Specified Activities within the Public Sewer Corridor.

viii) The Successful Tenderer/ QP must check for the presence of public sewerage pipelines by referring to the Sewerage Information Plan (SIP) and through site investigation. The SIP is available on SLA's INLIS at https://app.sla.gov.sg/inlis/#/PUB/UP/Search. Please note that the sewerage information in SIPs is indicative and for reference only. A thorough site investigation, including trial trenches, shall be carried out to determine the exact position and levels of the existing sewers/pumping mains. For development control clearance of the proposed development/building/infrastructure/utility works, and to obtain the clearance certificate for the proposed sewerage/sanitary works, the Successful Tenderer/ QP shall prepare the necessary plans and submit the relevant applications via Corenet X or Corenet 2.0 to PUB's Building Plan Division (BPD).

ix) Please contact Koh King Siang (Email: Koh_King_Siang@pub.gov.sg), Andrew Julius Tionardy (Email: Andrew_Tionardy@pub.gov.sg), Zhang Xin (Email: Zhang_Xin@pub.gov.sg), from PUB(WRN), if you need any clarifications.

6.0 REQUIREMENTS OF WATER SUPPLY (NETWORK) DEPARTMENT (WSN), PUBLIC UTILITIES BOARD (PUB)

PUB(WSN) requires the Successful Tenderer to comply with the following requirements:

<u>WATER SUPPLY INFRASTRUCTURE/LAND USE</u>

i) Provision shall be made by the Successful Tenderer for PUB to lay new watermains, if required, along public road reserves / sidetables to the site. The cost for the laying of new watermains, if any, and connecting pipe to serve the above site shall be borne by the Successful Tenderer.

<u>SUBMISSION OF PLANS</u>

ii) If water supply is required, the Successful Tenderer shall engage a Professional Engineer/Licensed Plumber to submit the Notification of WSI Works to PUB. The design of the internal water reticulation system shall comply with the Public Utilities (Water Supply) Regulations, Singapore Standard 636 – Code of Practice for Water Services and all other relevant statutory requirements.

iii) Where pumping system or storage tanks are required for the water services, a Professional Engineer must submit the Notification of WSI Works together with a set of drawings to PUB. If all the fittings in the water service installation are receiving direct water supply from PUB watermain, then a Licensed Plumber shall be engaged to submit the Notification of WSI Works together with a set of drawings to PUB prior to commencement of the WSI works.

iv) For North BU, please contact PUB officer Mr Chin Wei Khin or Mr Murray Seah at Tel: 63809832. Email to: Chin_wei_khin@pub.gov.sg or Murray_seah@pub.gov.sg.

WATER SUPPLY PLAN (WSP)

v) The Land is in close proximity to PUB's proposed/under-construction/existing water pipes.

vi) The Water Supply Plan (WSP) shows the approximate positions of PUB's proposed/under construction/existing water pipes of 100 mm diameter and above in the vicinity of the proposed site. Smaller water pipes to customers' premises / properties may not be indicated. The presence of water meters near the work zone is an indication of the presence of water pipes. The latest WSP is available on SLA's INLIS portal at https://app.sla.gov.sg/inlis. Notwithstanding, during the planning/design stage, the Successful Tenderer determine by means of trial holes within your worksite to ascertain the exact alignment and levels of all the proposed/under-construction/existing water pipes and consult PUB(WSN) at the contact information provided below. No structures are allowed above water pipes at all times as they may pose damage risks and/or impede future maintenance access.

REQUIREMENT FOR CARRYING OUT DIVERSION OF WATER PIPES

vii) If there are water pipes affected by the development, PUB(WSN) will advise that the water pipes be diverted. Consultation for water pipes diversion must be made at least 6 months ahead of the development and the cost of diversion of any water pipes shall be fully borne by the Successful Tenderer. Please be advised to engage a qualified water pipe laying contractor with CR07 work head with at least 5 years of experience to carry out the diversion works.

REQUIREMENTS FOR CARRYING OUT WORKS WITHIN THE WATER PIPE CORRIDOR

viii) If there are works within the water pipe corridor, please comply with the protection and submission requirements stated in the Advisory-Prevention of Damage to Water pipes https://www.pub.gov.sg/Professionals/Requirements/Application. Submissions to seek approval for the works shall be made via PUB's online portal, Protection Of Water and Sewer pipes (POWS) at https://www.eservices.pub.gov.sg/bpp/account.

ix) For queries on matters relating to water pipes please contact PUB(WSN) officer at Tel: 63809832 or Email: PUB_WSN_NORTHBU@pub.gov.sg. For diversion of water mains, please contact PUB(WSN) officer Wang Ningxiang (Email: Wang_Ningxiang@pub.gov.sg) and Benedict Tay (Email: Benedict_Tay@pub.gov.sg).

WATER CONSERVATION

x) Water conservation measures as stipulated in the Public Utilities (Water Supply) Regulations and SS 636 – Code of Practice for Water Services shall be adopted.

xi) Water fittings (e.g. pipes, pipe fittings, valves, water storage tanks, taps and mixers (basin, sink/bib, shower), dual-flush low capacity flushing cisterns (LCFCs), flush valves, materials in contact with water, etc.) to be used in the development shall be tested for compliance with the standards and requirements as stipulated in PUB's Stipulation of Standards & Requirements for Water Fittings (PUB S&R) which is available for downloading from PUB's website at https://www.pub.gov.sg/Professionals/Requirements/Water-Supply-Services/Water-Fittings. Additionally, water fittings such as taps and mixers, LCFCs and flush valves shall be registered under the PUB's Mandatory Water Efficiency Labelling Scheme (MWELS).

xii) Only water fittings (i.e. taps and mixers, LCFCs, WC flush valves and urinal flush valves/waterless urinals) that are of at least 2-tick rating under PUB's MWELS shall be installed. The development should obtain the Water Efficient Building (Basic) Certification by PUB.

xiii) Unless with written permission by PUB, fixed or movable sprinklers are not allowed to be used to deliver any form of water supplied by PUB, including potable water, NEWater,

raw water, effluent water, industrial water for watering any garden, lawn or other land including commercial market gardens, commercial nurseries, sports grounds, golf courses, race courses, public and club tennis courts. Where possible, the Successful Tenderer is encouraged to use drought tolerant plants.

xiv) For non-domestic developments with estimated water requirements of at least 5,000 m3/month, and government developments with estimated water requirements at least 3,000 m3/month, private water meters in accordance to PUB's requirements to monitor water usage in the key areas as stipulated in the Fourth Schedule of the Public Utilities (Water Supply) Regulations shall be installed.

xv) Wherever possible, alternate sources of water (such as industrial water, high grade industrial water, sea water, recycled water, rainwater and AHU condensate etc) should be used to meet the non-potable water requirements of the development.

xvi) Wherever possible, water recycling system should be set up to reclaim water for reuse for non-potable purposes such as production process, toilet flushing, irrigation and as cooling tower make up water, etc.

xvii) Use non-water cooled systems (such as air-cooled, refrigerant-cooled, etc) for cooling purposes wherever possible.

xviii) Cooling towers should achieve minimum 7 and 10 Cycles of Concentration (COC) using potable water and NEWater respectively.

xix) From 1 January 2024, the following requirements apply to new projects (including expansion of existing plants) that will consume at least 60,000m3 of water annually:

a. Minimum 50% RR for wafer fabrication plants involved in front-end semiconductor manufacturing; and

b. Recycling of specified waste streams for electronics plants and biomedical plants. More details can be found at https://www.pub.gov.sg/Public/WaterLoop/Water-Conservation/Mandatory-Water-Efficiency-Requirements.

xx) Please contact Tay Zi Hui, Julia (Email: Julia_Tay@pub.gov.sg), from PUB(WSN), if you need any clarifications.

7.0 REQUIREMENTS OF NATIONAL PARKS BOARD (NPARKS)

NParks requires the Successful Tenderer to comply with the following requirements:

General Requirements

i) Pursuant to Section 14 of the Parks & Trees Act 2005, any tree with a girth exceeding one metre (measured one metre from the ground) growing on any Tree Conservation Area ("TCA") or any vacant land shall not be cut except with the prior approval of the Commissioner.

ii) If the Successful Tenderer intends to carry out any regulated activities under the Parks and Trees Act and its Regulations that arise out of or pursuant to the use of the Land, it must seek the Commissioner of Parks and Recreation's ("Commissioner") approval before doing so.

a. Before seeking the Commissioner's approval, the Successful Tenderer is required to consult the Commissioner, via Pre-submission consultation function in CORENET X at the planning and design stage of the development works concerning the Land.

b. The Successful Tenderer is required to present the following at the consultation:

i. A survey plan (survey done less than 2 years at the point of application and endorsed by the qualified surveyor) of the Land Parcel and its peripheral roads,

at a scale of at least 1:500. The plan must also clearly indicate the location, species, height and girth of trees at the Land Parcel; and

ii. All other relevant additional information such as location and site plans.

iii) The Successful Tenderer shall note and adhere to the following requirements in respect of the green verges surrounding the Land and planting areas within the Land. Further details of these requirements can be found in NParks' "Guidelines on Greenery Provision and Tree Conservation for Developments". It is available at https://www.nparks.gov.sg/publications-resources/guidelines-greenery-provision-tree-conservation-developments. In particular, the Successful Tenderer shall ensure that:

a. The width of the green verges adjacent to the Land and the width of the planting areas within the Land shall be in accordance with LTA's standard road code for that category of road or aligned with the existing green verge along the road, whichever is wider, unless otherwise reflected in the Control Plan.

b. The Successful Tenderer shall ensure that the green verges which are located adjacent to the Land are not affected by the development and subsequent use of the Land, including without limitation:

i. Ensuring that the construction or provision of any vehicular ingress / egress, acceleration / deceleration / storage / vehicular lanes, services access, bus stops, and any structure required under statute to be erected to divert or reconstruct services or road features/elements, shall not affect the trees and plants located in the green verge(s);

ii. Ensuring that the green verges are kept clear and shall be free from obstructions and encumbrances at all times, including without limitation bicycles parked on the green verges, illegal dumping, construction materials, or items left on the green verges;

iii. Ensuring that vehicular and service access points, pick-up / drop-off points, taxi laybys, loading / unloading bays and fire engine hard-standing areas are to be located within the Land and not within the green verge(s); and

iv. Ensuring that there is no change of soil level to the green verge(s) without prior approval from the Commissioner.

c. The Successful Tenderer must also ensure that the development on the Land complies with the requirements for green buffers, including without limitation the following:

i. The planting areas must be free from any encroachment above ground, and/or any structures or services are to be recessed to at least 2-metre below ground level and are not to slope with gradients steeper than 1:2.5.

iv) If there is any indication that the works at the Land Parcel will affect the green verge(s) / planting areas in any way whatsoever, the Successful Tenderer must seek the Commissioner's approval as set out in Appendix D Clause 7.0 (ii) as well as the approval of the other applicable authorities under the relevant legislation, for the conduct of the works that will affect the green verges/ planting areas via CORENET X.

<u>Other Technical Requirements</u>

v) The Successful Tenderer is to work with NParks on the planting palette for the green buffers and peripheral planting to further bolster ecological connectivity.

vi) Successful Tenderer is strongly encouraged to plant up the green verge along Miltonia Close Road using the Nature Way planting palette below. The list of plant species within this planting palette is non exhaustive. This will be at the Successful Tenderer's own initiative and cost, and to be handed over to NParks for maintenance upon completion.

Emergent	Canopy	Understory
Dillenia reticulata *Dyera costulata* *Palaquium obovatum* *Scaphium affine* *Shorea sumatrana* *Anisoptera megistocarpa* *Shorea leprosula* *Maranthes corymbosa*	*Hopea mengarawan* *Knema conferta* *Knema hookeriana* *Pterospermum javanica* *Sterculia macrophylla* *Syzygium papilosum* *Alstonia pneumatophora* *Hopea sangal* *Ochanostachys amentacea* *Sloetia elongata*	*Aidia densiflora* *Alsophila latebrosa* *Baccaurea parviflora* *Cyrtostachys renda* *Dillenia excelsa* *Diospyros lanceifolia* *Elaeocarpus marstersii* *Gardenia tubifera* *Ploiarium elegans* *Saraca cauliflora* *Tristaniopsis spp.* *Syzygium zeylanicum* *Carallia brachiata*

8.0 REQUIREMENTS OF NATIONAL ENVIRONMENT AGENCY (NEA)

NEA requires the Successful Tenderer to comply with the following requirements:

i) The Land is located within a water catchment area, where rainwater and surface runoff are collected in the downstream reservoir for treatment to produce drinking water by PUB. The development shall not cause pollution directly or indirectly to our water resources. Any activity that could cause contamination problem to our water resources shall not be carried out. Please also ensure that the requirements for developments in water catchment areas in Appendix D(I) are duly complied with.

ii) Sewage and used water from the development shall be discharged into the public sewer. The Successful Tenderer/QP of the development shall check with PUB (Water Reclamation Network Department) on the point of sewer connection and the allowable discharge rate. Holding tanks shall not be used at locations served by the sewer network.

iii) Refuse and other solid wastes generated from the development shall be collected by a licensed waste collector for disposal at an approved waste disposal facility. Please ensure that the proposed refuse storage and collection system (e.g. bin centre) is in compliance with the public health requirements stated in the Code of Practice on Environmental Health.

iv) Abatement measures shall be provided for all proposed M&E equipment installed in the development to mitigate the impact of noise, smell, fume, vapour or heat flux from operations and maintenance of these equipment on residential and noise sensitive premises. The Successful Tenderer/QP shall ensure that the noise emitted from the operations of M&E equipment installed in the development does not cause nuisance to surrounding residential and noise sensitive premises. The Successful Tenderer/QP may take reference to the NEA's Technical Guideline on Boundary Noise Limits for Air-Conditioning and Mechanical Ventilation Systems in Non-Industrial Buildings for the noise limits. A copy of the said Guideline may be viewed at the following website: https://www.nea.gov.sg/docs/default-source/default-document-library/technical-guideline-on-boundary-noise-limit-for-air-conditioning-and-mechanical-ventilation-systems-in-non-industrial-buildings---feb-2018.pdf.

v) The development is located in the vicinity of Orchid Country Club and Golf Course, proposed Health & Medical Care and residential developments. Hence, the site has high ambient noise level attributed to M&E equipment operations and community events/ activities carried out in the vicinity. The Successful Tenderer/QP shall factor the high ambient noise level and other nuisance impacts in the planning layout and design of the development, such as siting the residential buildings as far away as possible from the nuisances sources, and incorporate mitigation measures in the development to mitigate noise and other nuisances impact. The Successful Tenderer/QP shall also inform or socialise the prospective buyers of the apartment units of the potential dis-amenities posed by the activities carried out in the vicinity of the development. Abatement measures shall be provided to further mitigate the impact if nuisance sensitive uses are included in the development.

vi) In line with the Singapore Standard on Code of Practice for Pollution Control (i.e. SS593:2013), when a site that was used for past polluting activities which could pose potential public health risks is to be redeveloped, rezoned or reused for a non-polluting activity, a site assessment study should be conducted. If there are indicators that point to the presence of land contamination (e.g. visual signs of soil discolouration and/or odour) found at the subject site, a site assessment study should also be conducted. The purpose of the site assessment study is to determine the presence and extent of land contamination, along with the potential risks to public health. If the site assessment identifies any potentially unacceptable public health risks, appropriate remediation or mitigation measures shall be taken before the site is redeveloped for residential or any non-industrial use to ensure that it is suitable for its intended uses. The Successful Tenderer/ QP shall comply with the site assessment requirement if the subject site meets the abovementioned conditions.

vii) In accordance with the International Commission on Non-Ionizing Radiation Protection (ICNIRP) guideline published in 1998: https://www.icnirp.org/cms/upload/publications/ICNIRPemfgdl.pdf, the electromagnetic field emission from all the electrical installations and underground electrical cables should not result in the general public being exposed to extremely low frequency (ELF) magnetic field strength above or anywhere close to the guideline values. Similarly, the World Health Organisation (WHO) has recommended that (i) “Provided that the health, social and economic benefits of electric power are not compromised, implementing very low-cost precautionary procedures to reduce exposure is reasonable and warranted” and (ii) “Policy-makers, community planners and manufacturers should implement very low-cost measures when constructing new facilities and designing new equipment including appliances”. Taking guidance from WHO, NEA encourages the Successful Tenderer to explore the implementation of cost-effective measures as a precaution to further lower exposure to ELF radiation when building new facilities or modifying existing facilities.

viii) The development shall comply with all the applicable requirements and provisions of the Singapore Standard on Code of Practice for Pollution Control (i.e. SS593:2013), the Code of Practice on Environmental Health, the Environmental Protection and Management Act 1999, the Environmental Public Health Act 1987, the Energy Conservation Act 2012, the Radiation Protection Act 2007 and their Regulations.

ix) Under the Environmental Protection and Management (Control of Noise at Construction Sites) Regulations, construction sites within 150m of hospitals, schools, institutions of higher learning, homes for the aged sick or residential buildings have to comply with more stringent construction noise limits, especially during the evening and night-time hours. Hence the Successful Tenderer/ QP shall implement noise control measures during the construction period to ensure that the noise levels from the construction activities are within the noise limits and to minimise dis-amenity. In addition, construction sites within 150m of any hospital, home for the aged sick or residential building are not allowed to carry out construction activities from 10pm on Saturdays or eves of public holidays to 7am on the following Mondays or days after public holidays respectively.

x) From 1 Apr 2025, a new project* that meets the following two criteria is required to have noise barriers installed along the perimeter of the worksite:

a) Construction project value of **$50 million and above** (per project location), and
b) Worksite located within **75 meters** of nearby sensitive premises (e.g. hospital, school, institution of higher learning, home for the aged sick or residential building).

** Refers to tenders for construction projects that are published on and after 1 Apr 2025*

The noise barriers to be installed shall meet the specifications stated in the following circular: https://www.corenet.gov.sg/media/2392015/mandating-of-noise-barriers-at-selected-construction-sites.pdf. If you have any enquiries on the requirement for noise barriers at worksites, please contact NEA at NEA_Noisebarrier@nea.gov.sg.

9.0 REQUIREMENTS OF FIRE SAFETY DEPARTMENT (FSD), SINGAPORE CIVIL DEFENCE FORCE (SCDF)

SCDF requires the Successful Tenderer to comply with the Fire Safety Act 1993 and its Regulations, the prevailing "Code of Practice for Fire Safety Precautions in Buildings" (Fire Code), the relevant Codes of Practices & Guidelines, and SCDF Circulars. These general fire safety requirements are also applicable to any proposed temporary usage or installation. In addition, the following conditions will apply where applicable:

i) To consult SCDF on the specific design requirements if the premises is to store or handle hazardous materials. SCDF may impose the Quantitative Risk Assessment study (QRA) and/or additional fire safety requirements or disapprove such proposal if there are high fire safety risks to occupants within the premises or on the surrounding developments which cannot be mitigated.

ii) To consult SCDF on any specific developments or structures having impact on SCDF operations e.g. deep basement works (which are more than 4 storey or more than 24 metres in depth), tunnel or any other special developments, etc. SCDF may impose additional Fire Safety requirements.

iii) The Successful Tenderer shall ensure that their proposal will not affect existing other surrounding developments (neighbouring) such as their exit provision, sidelane/backlane, window openings [the unprotected openings requirements, i.e. the Successful Tenderer and their Qualified Person (QP) shall strictly observe these existing conditions and provide more setback if necessary to prevent fire spread] and fire engine accessway etc. The Successful Tenderer and their QP shall consult SCDF directly for those new proposed building structures to be sited near to common boundary line, as additional Fire Safety requirements may be imposed.

iv) For residential building or place of public assembly (Fire Code Cl 1.4.12) next to an existing Petrol Service Station, the Successful Tenderer shall provide sufficient[1] separation distance between the new development and the boundary of the Petrol Service Station.

v) For existing premises, the Successful Tenderer may wish to note that the SCDF's Plan Approval and Fire Safety Certificate (FSC) will have to be obtained if there is any change in use or involving any alteration/addition works. The Successful Tenderer shall ensure that the existing premises, including existing layouts and usages, have obtained the necessary Approvals from SCDF.

vi) For applications of non-exclusive and limited religious use, the Successful Tenderer shall liaise directly with the building owner/management to ensure their proposed usage and number of occupants for that particular room/floor does not exceed the limit as originally designed & approved for. The Successful Tenderer shall also provide the full details to the building owner/management so that the Emergency Response Plan (ERP) can be updated accordingly.

vii) For new road development (including road widening, realignment, road expunction and interim measures etc.), it shall not affect or encroach upon any part of existing development compounds. For public fire hydrant, the Successful Tenderer is to liaise with PUB directly for any proposed relocation or erection of new fire hydrant.

viii) For drainage system development (including widening, realignment, extension and interim measures etc.), it shall not affect or encroach upon any part of existing development compounds.

ix) Before making any commitment (purchase/occupation or rental/lease etc.) or commencement of any A&A works, the Successful Tenderer shall engage a Qualified Person (QP) to carry out a feasibility study to ensure the proposals is able to comply with all the Fire Safety requirements (the current Fire Code and other relevant

[1] Based on Fire Code Cl 9.6.2.a.2, the boundary line of petrol service stations shall be at least 50m from any residential building, or 90m from any place of public assembly (Fire Code Cl 1.4.12).

standards/guidelines/circulars). The feasibility study shall also ensure those existing fire safety provisions of surrounding developments are not affected.

a. For proposal involving A&A works, the QP will assist the Successful Tenderer to obtain the SCDF's Plan Approval and the Fire Safety Certificate (FSC). If the Successful Tenderer has any doubts or queries regarding the fire safety requirements or plan approval procedures, he may enquire the Fire Safety Department via SCDF_QP_Consultant@scdf.gov.sg.

b. Should the Successful Tenderer require information relating to the application of Fire Safety Certificate (FSC) or Temporary Fire Permit (TFP), the Successful Tenderer may visit the following listed links to obtain relevant information such as application criteria, pre-requisites and validity at (https://www.scdf.gov.sg/home/fire-safety/permits-and-certifications/fire-safety-certificate-temporary-fire-permit or https://www.scdf.gov.sg/home/fire-safety/permits-and-certifications/fire-certificate).

c. For projects involving petroleum and flammable materials (P&FM) such as refineries and warehouses used for handling & storage of bulk P&FM, the Successful Tenderer and their QP is strongly encouraged to arrange for a consultation with Hazmat Department (Email: md_faizal_latiff@scdf.gov.sg or Glen_Chua@scdf.gov.sg). Additional fire safety provisions and mitigation measures may be imposed.

10.0 REQUIREMENTS OF BUILDING AND CONSTRUCTION AUTHORITY (BCA)

BCA requires the Successful Tenderer to comply with the following requirements:

Environmental Sustainability

i) The BCA Green Mark Scheme is a green building rating system to evaluate a building for its environmental impact and performance. Under this scheme, a building will be assessed based on the level of environmental performance that can be achieved in its design and construction. More details are available at https://go.gov.sg/gm2021.

ii) The Successful Tenderer is required to incorporate energy-efficient, water-efficient and environmentally friendly design, technologies and practices to achieve a minimum BCA Green Mark Rating of Green Mark Platinum Super Low Energy (SLE) with exemplary performance under the Maintainability (Mt) section (i.e. obtain Maintainability Badge) for each development on the Land.

iii) The Successful Tenderer is required to apply to BCA for assessment of the environmental features and performance of each development under the BCA Green Mark Scheme and achieve the rating of Green Mark Platinum SLE with Maintainability Badge. In the application under the BCA Green Mark Scheme, the Successful Tenderer is to submit all relevant building plans and documents to BCA and to comply with all requirements, procedures, directions and requests, and pay all fees, charges and other amounts payable to BCA for, and in relation to, the assessment of each development under the BCA Green Mark Scheme. The Successful Tenderer is advised to render full co-operation to BCA, its officers, employees and agents in relation to the assessment.

Digitalisation

iv) The Successful Tenderer is required to carry out building works for the development on the Land in accordance with the requirements of integrated digital delivery (IDD) as set out in the Code of Practice on Buildability Addendum No. 1 in relation to IDD.

v) The Successful Tenderer is required to submit the preliminary IDD implementation plan to BCA for BCA's review within three months from completion of Design Gateway.

vi) When submitting the plans of building works for the development on the Land to the Commissioner of Building Control for approval at Construction Gateway, the Successful Tenderer is also required to include the final IDD implementation plan as stipulated under

the Building Control (Buildability and Productivity Regulations) 2011 and such IDD implementation plan must include the following:

a. the details of the five (5) IDD essential use cases that are adopted in respect of the building works; and

b. such other documents or information as may be required by the Commissioner of Building Control.

Productivity

vii) The Successful Tenderer is required to adopt suitable productive technologies for the development to achieve a minimum level of 30% productivity improvement*.

viii) The Successful Tenderer is also required to adopt the minimum level of use of prefabricated systems for the development on the Land as stipulated in the Building Control (Buildability and Productivity) Regulations 2011 as shown below:

a) Prefabricated structural systems of minimally advanced precast concrete system in respect of total structural floor area of the building works	65%
b) Prefabricated architectural systems in respect of total wall length of the building works	80%
c) Prefabricated mechanical, electrical and plumbing systems in respect of the total qualifying areas in the development as specified in the Code of Practice. The mechanical, electrical, and plumbing components or equipment are required to be manufactured and assembled in an accredited fabrication facility, in accordance with any accredited fabrication method.	65%
d) System formwork in respect of the total cast-in-place areas of super structural works	70%

ix) A Productivity Concept Implementation Plan (PCIP), which demonstrates a minimum level of 30% productivity improvement*, is to be submitted to the Building and Construction Authority in the following manner:
*compared to the base figure for 2010 as set out in BCA's website (at https://go.gov.sg/measuringprojectproductivity)

a. Within three months from obtaining clearance of Design Gateway, the Successful Tenderer is required to submit the Productivity Concept Implementation Plan (PCIP) to BCA as an Independent Submission before the Piling Gateway (where applicable) and/or the Construction Gateway.

b. As part of the application for Construction Gateway, the Successful Tenderer is required to submit the final PCIP, by incorporating and highlighting any design changes, to BCA together with the application for Construction Gateway. Once the PCIP has been approved by BCA, the Successful Tenderer is required to design and carry out the building works in accordance with the approved PCIP under the Building Control (Buildability and Productivity) Regulations 2011.

x) If the Successful Tenderer adopts Prefabricated Prefinished Volumetric Construction (PPVC) for the development, he shall:

a. include in all options and agreements for the sale, sublease or disposition of the residential units within the development such information as to highlight to the purchasers, sublessees or parties agreeing or intending to agree to accept from the Successful Tenderer the disposition of the residential units within the development that the PPVC method is used for the development and any resulting conditions of use of the residential units (arising from the use of the PPVC method), including but not limited to:

i. restrictions on hacking/alteration of load-bearing structures within the residential units;

ii. for localised chasing and drilling works on load-bearing structures within the residential units, the following shall apply:

1. appointing a Professional Engineer (PE) to issue a formal letter affixed with PE stamp and signed prior to carrying out such works to confirm that strengthening of the structures will not be required and that the structural integrity of the building will not be affected by the proposed works. The PE shall supervise the works being carried out, and provide a further formal letter affixed with PE stamp and signed after the completion of such works stating that such works are satisfactory;

2. obtaining clearance from the Management Corporation (MCST) of the development prior to carrying out such works, and in the case where there is no MCST constituted in respect of the development, obtaining clearance from the owner developer of the development prior to carrying out such works

iii. keeping access panels (if any) within the residential units unobstructed to facilitate periodic inspections

b. Ensure that the PPVC which is used must conform to the requirements set out in the Code of Practice in relation to PPVC.

c. The PPVC system adopted is to be of a concrete system and must allow for flexibility for removal of internal walls in the event the homeowners want to make any modifications to their units.

Buildability and Constructability Requirements

xi) The Successful Tenderer is required to adopt labour-efficient designs and construction technologies to achieve the Buildability and Constructability requirements as set out in the Code of Practice on Buildability for the development on the Land.

xii) Buildability considers the extent of standardisation, simplicity and integrated elements applied to buildings at the design stage and the potential impact of a building's design on labour usage. Constructability considers the level of adoption of labour-efficient construction methods and construction processes such as system formwork and climbable scaffolding which would result in savings in manpower and shorter construction time. More details are available at https://go.gov.sg/bpregulations.

xiii) The Successful Tenderer is required to consult BCA early before the Piling Gateway (where applicable) and/or the Construction Gateway, on the designs and productive technologies of the development to meet the Buildability and Constructability requirements as set out in the Code of Practice on Buildability.

xiv) The Successful Tenderer shall comply with the requirements, procedures, directions and requests of BCA and shall also render his full co-operation to BCA, its officers, employees and agents in relation to meeting the Buildability and Constructability Requirements.

Prefabricated Bathroom Units (PBU)

xv) The Successful Tenderer is required to adopt Prefabricated Bathroom Units (PBUs) for 65% or more of the bathroom units in the non-landed residential component of the development on the Land as stipulated under the Building Control (Buildability and Productivity) Regulations 2011.

xvi) The PBUs which are used must conform to the requirements set out in the Code of Practice on Buildability in relation to PBUs.

xvii) In situations where PPVC is adopted and the PPVC modules for the residential component of the development also contain bathroom units which conform to the latest Code of Practice on Buildability stipulated for both the PPVC and PBU units, the adoption of these modules can be counted towards meeting the required minimum levels of use for both the PPVC method and PBUs. The adoption of these PBU modules may also contribute towards meeting the minimum level of productivity improvement as stated in Clause 10.0 (vii).

Construction Quality Assessment System (CONQUAS)

xviii) The Successful Tenderer shall be required to refer and submit the development to BCA to be assessed for the construction quality of the building works under the Construction Quality Assessment System (CONQUAS).

xix) The Successful Tenderer is to comply with all requirements, procedures, directions and requests of BCA and pay all fees, charges and other amounts payable to BCA for and in relation to the assessment of the construction quality of the development under CONQUAS. The Successful Tenderer is to render full co-operation to BCA, its officers, employees and agents in relation to such assessment under CONQUAS.

Quality Mark (QM) for Good Workmanship

xx) The Successful Tenderer is required to apply for and comply with all the requirements under the BCA Quality Mark for Good Workmanship scheme in the non-landed residential component of the development on the Land.

Barrier-Free Accessibility (BFA) & Universal Design (UD)

xxi) The Successful Tenderer shall comply with the mandatory requirements specified under the prevailing Code on Accessibility in the Built Environment (Code). All areas or levels shall be made accessible for persons with disabilities and other intended users, including employees, visitors and the public, in accordance with the requirements specified under the prevailing Code.

xxii) Where there are direct pedestrian connections to adjacent developments, parks, walkways/linkways and commuter facilities like MRT station, public bus stops and taxi stands; whether underground, on grade or elevated, all such connecting routes must be made accessible for persons with disabilities.

xxiii) The development on the Land should be designed and constructed to be accessible and inclusive for diverse users, including persons with disabilities, the elderly and families with young children. The BCA Universal Design index self-assessment framework (UDi) evaluates the building's level of user-friendliness through its provision of user-friendly features. The Successful Tenderer is required to use the BCA Universal Design index (UDi) Checklist at the onset of design and strive to achieve higher UDi rating for the development. More details are available at http://go.gov.sg/bcaudi.

11.0 REQUIREMENTS OF MINISTRY OF DEFENCE (MINDEF)

MINDEF requires the Successful Tenderer to comply with the following requirements:

i) The Republic of Singapore Air Force's (RSAF) clearances shall be sought for the use of crane or tall construction machineries above 164m Singapore Height Datum (Email height_control@defence.gov.sg). If the Successful Tenderer wish to pre-consult RSAF on the maximum allowable height for the use of construction equipment and temporary structures, the Successful Tenderer can consult RSAF with a copy of the awarded letter and a copy of this conditions of tender. For civil aviation height and requirements, please consult the Civil Aviation Authority of Singapore ("CAAS"). The more stringent height restriction(s) from the respective agencies shall apply.

ii) If the proposal entails solar panels installation, the Successful Tenderer shall ensure that the lighting system and solar reflectance from materials (e.g. facade cladding, solar panels

etc) for the development must not affect aircraft in flight. The Successful Tenderer shall ensure that any working/outdoor lightings and solar reflectance must be directed downwards and/or shielded to prevent causing glare and confusion to pilots. The Successful Tenderer shall undertake all necessary rectifications at its own cost and expense to the satisfaction of the RSAF if the lightings are assessed by the RSAF to be a hazard to air navigation. The Successful Tenderer shall submit detailed plans on any glare-inducing installation to RSAF (Email: Height_Control@defence.gov.sg with the Subject Title: "Glare Proposal for AOD"), for comments prior to implementation.

iii) The development should not tap on or affect any MINDEF sub-stations at all times.

iv) All capital and operating costs or expenses incurred to meet all the above conditions and requirements will be borne by the Successful Tenderer.

12.0 REQUIREMENTS OF CIVIL AVIATION AUTHORITY OF SINGAPORE (CAAS)

CAAS requires the Successful Tenderer to comply with the following requirements:

i) There has been feedback of aircraft noise disturbance from residents staying in the vicinity of the development. These effects should be taken into account in the development, and in particular, in the design of the facilities and operating equipment. If necessary, the Successful Tenderer should assess if a noise study should be carried out. The proposal must not impose any constraint on Seletar Airport's operations and activities in any way.

13.0 ELECTRICITY

i) The Successful Tenderer shall liaise with the Transmission Licensee authorised under the Electricity Act for the electricity supply and any other electrical provisions required for the purpose of and in connection with the development.

ii) The Successful Tenderer shall apply to the SP PowerGrid Ltd directly for the electrification scheme and any electrical substation, which need to be constructed within the Land to serve the development. The Successful Tenderer shall be deemed to have included in his tender price for the construction of the electrical substation(s).

14.0 TELECOMMUNICATIONS

i) The Successful Tenderer shall liaise with the Public Telecommunication Licensees ("PTLs") authorised under the latest Telecommunication Act, for the telecommunication supply to the development.

ii) The Successful Tenderer shall provide all facilities for telecommunication services, such as MDF room, Telecom riser ducts, lead-in pipes and manholes etc., within the Land. All Telecom facilities shall be provided according to the prevailing Info-communications Media Development Authority of Singapore ("IMDA") "Code of Practice for Info-communications Facilities in Buildings" ("COPIF").

iii) The Successful Tenderer is advised to consult with and obtain the relevant maps or information from the PTLs (e.g. Singapore Telecommunications Ltd, StarHub Ltd, and NetLink Management Pte Ltd, etc.) and the Facilities- Based Operators ("FBOs") early during the planning stage of the development, on the location and diversion of existing Telecoms services.

iv) The Successful Tenderer may be required to compensate the affected telecommunication licensees for the removal or relocation cost, if they require the telecommunication licensees to remove or relocate their existing installation or plant.

v) The detailed Telecoms facilities plans by the Successful Tenderer for the development shall be submitted to and duly verified by Telecommunication Facility Co-ordination Committee ("TFCC") through the BCA's CORENET e-submission system, and approved by the IMDA prior to the commencement of works.

15.0 GAS

i) The Successful Tenderer shall liaise with a gas retailer on the requirements for gas supply to the Land. For reference, the information on gas pipeline network in Singapore and the list of gas retailers in the market can be found at https://www.ema.gov.sg/our-energy-story/energy-market-landscape/gas and https://www.ema.gov.sg/Licensees_Gas_Retailer.aspx.

ii) The Successful Tenderer shall at his own cost and expense, carry out trial trench / holes to determine the exact alignment and levels of any existing gas main within the Land and in the vicinity of the Land during the design stage and ascertain whether they will be affected by the development works. If affected, the Successful Tenderer shall liaise with the Gas Transporter to request for diversion.

iii) The Successful Tenderer shall provide a suitable diversion corridor and the proposed corridor for the gas mains diversion works must be made available without any obstructions. The Successful Tenderer shall contact gasenquiry@spgroup.com.sg for diversion consultation if the gas mains are affected and bear the necessary diversion cost.

iv) The Successful Tenderer shall submit a report to Gas Enquiry - gasenquiry@spgroup.com.sg, upon detecting any gas mains of which PowerGas have no records in the Land.

v) The Successful Tenderer is to submit written notice to SP PowerGrid Ltd (Earthworks Surveillance & Patrolling Section) if the intent is to carry out earthworks in the vicinity of gas pipelines at least 7 days prior to commencing the earthworks. All necessary precautionary measures must be taken to prevent damage to our gas pipelines at the work site.

vi) For further enquiries pertaining to the existing gas transmission pipelines, please email gastrans@spgroup.com.sg. A copy of "Notes for Working near Power Gas Transmission Pipeline" is appended for the Successful Tenderer's information in Appendix D(II).

vii) A copy of "Distribution Requirements for Distribution Gas Pipe Diversion Works" is enclosed for the Successful Tenderer's information in Appendix D(III).

viii) For advice on gas pipe damage prevention, the Successful Tenderer may contact Earthworks Surveillance & Patrolling section during office hours at Tel No. 69165119 or email espsection@spgroup.com.sg.

APPENDIX D(I)

POLLUTION CONTROL MEASURES FOR PROPOSED DEVELOPMENT WITHIN WATER CATCHMENT AREA

1 Storage of Toxic Chemicals

(a) No toxic or hazardous chemicals shall be used, stored or handled in the premises.

(b) Storage of fuel may be allowed subject to provision of pollution control measures as stipulated in the Singapore Standard on Code of Practice for Pollution Control (i.e. SS593:2013).

2 Public Sewerage System

(a) Public sewerage system shall be extended to serve the proposed developments.

(b) All sewage used water and trade effluent (e.g. wastewater) shall be collected and discharged into the public sewers in compliance with the Sewerage & Drainage Act and its Regulations.

3 Refuse Management System

The proposed bin centre or refuse holding area shall be designed in the manner such that refuse storage, handling and transfer activities (e.g. transfer of refuse from a collection cart to a compactor, etc.) are carried within a building equipped with pollution and nuisance control measures. In addition, all sullage water, including liquid from refuse compaction and wastewater from washing of refuse collection carts, bins, floors, etc. is to be discharged into the public sewer in accordance to the requirements imposed by PUB. The design of the refuse management system shall comply from the Code of Practice on Environmental Health.

4 Pollution Control Measures

The proposed developments shall be designed to ensure that all activities that generate trade effluent are carried out within buildings. All trade effluent generated shall be discharged into the public sewer in compliance with the conditions and requirements imposed by PUB, and not into any land or watercourse for storm water. In this respect, any proposed wash area in residential development, washing bay for vehicles in workshop, wash area for food preparation in eating establishment, etc. should comply with the above requirements.

5 Pollution Control Measures at Construction Stage

(a) During construction stage, sewage, used water and/or trade effluent from the construction sites shall be discharged into the public sewer, and not into any watercourse for storm water or onto any land.

(b) All washings activities shall be carried out within sheltered areas and used water and trade effluent generated shall be collected and discharged into the public sewer, and not into any watercourse for storm water or onto any land. For construction site where public sewer is not available, sewage, used water and trade effluent shall be collected in holdings tanks and subsequently, transported using a tanker or other means to a Water Reclamation Plant (WRP) approved by PUB for treatment and disposal.

(c) No servicing and repairing of mechanical plants and equipment are allowed in the construction sites. The said servicing and repair activities should be carried at authorised workshops

equipped with pollution control facilities.

(d) Fuel storage tanks, if provided, shall be equipped with containment facilities as stipulated in the Singapore Standard on Code of Practice for Pollution Control (i.e. SS593:2013).

(e) Construction site shall also comply with the earth control measures requirements as imposed by PUB.

Reviewed in Jun 2018

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To all concerned parties

We act for PowerGas Ltd.

NOTES FOR WORKING NEAR POWERGAS GAS TRANSMISSION PIPELINE

1. Introduction

1.1 The Gas Transmission Pipeline (GTP) is designed to carry gas at high pressures. It is buried underground with granite dust and earth backfill cover as required under LTA's regulations. Warning markers are planted near the gas pipeline or pasted on nearby lamppost to indicate its existence and warn third parties working in the area.

1.2 SPPG patrols the pipeline regularly to monitor works in the vicinity by third parties. Such works if done without knowing the existence and/or exact location of the pipeline can potentially damage the gas pipeline and/or it's coating. SPPG pays special attention to drilling, piling, blasting or any high impact works such as, excavation, tunneling works and construction of structures near or over the gas pipeline and gas plant.

1.3 Any party who intend to carry out any construction activities in the vicinity of the GTP shall notify and cooperate with SPPG to implement measures to protect the gas pipeline and gas plant from all possible damages.

2. Statutory Requirement

2.1 Section 32 Carrying out earthworks within vicinity of gas plant or gas pipe of the Gas Act (Chapter 116A) requires anyone who wants to carry out earthworks in the vicinity of the gas plant or gas pipe to;

(a) give the Gas Transporter (PowerGas) not less than 7 days' notice in writing of the date on which it is proposed to commence the earthworks;

(b) obtain from the Gas Transporter the necessary information on the location of the gas plant or gas pipe; and

(c) consult the Gas Transporter on the steps to be taken to prevent the gas plant or gas pipe from being damaged while the earthworks are being carried out.

2.2 Section 32 also requires the person carrying out the earthwork to comply with the requirements of the transporter, ensure precautionary measures are taken to prevent damage to the gas pipe or gas plant and provide access to the transporter for inspection or taking necessary protective measures.

2.3 Any person that contravenes this Section 32 is guilty of an offence and shall be liable to a fine not exceeding $100,000 or to imprisonment for a term not exceeding 5 years or both.

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3. Requirements on Third Parties working near the Gas Transmission Pipeline

3.1 Pre-work Consultation with SPPG

a) The works owner and contractor shall inform SPPG in advance of their intention to work in the vicinity of the GTP and submit NCE accordingly. Such works include excavation, piling, earthwork leveling, bore logging, trial holes, blasting, tunneling or any earth works. The proposed work with construction drawings and method of statements shall be given to SPPG to evaluate the impact of the works on the pipeline. This enables SPPG to advise on appropriate precautionary measures to be taken.

b) The works owner and contractor shall obtain the as-built drawings of GTP from SPPG. They are required to incorporate the pipeline alignment co-ordinates into their construction drawings. Please note that the information in the as-built drawings should be treated as confidential and should not be shared.

c) No works in the vicinity of GTP shall be carried out without prior consultation with SPPG. An impact assessment for the works and implementation of precautionary measures to prevent damage to the gas pipe or gas plant shall be submitted to SPPG

d) SPPG shall be kept informed of any changes to the proposed works.

e) No permanent structures shall be designed and constructed above the GTP. However, surface road over the pipeline without reducing the pipeline cover may be acceptable, subject to SPPG's concurrence.

3.2 Precautionary Measures during Works

a) The works owner and contractor shall take all necessary precautions to prevent any damages to the GTP during the construction stage. They shall inform SPPG before carrying out any excavation works near the gas pipeline and **report all damages** to the gas pipeline and its coating to SPPG. Repair shall be done immediately to prevent corrosion aggravation to the gas pipeline at the damage location and thus becoming a potential hazard.

b) All propose works shall be accompanied with Risk Assessment, Impact Assessment and Safe Works Methodology endorsed by QP.

c) If any **earthwork is within 5m of the pipeline (or more when required)**, a registered surveyor shall be engaged to peg the pipeline alignment (generally every 2m) and interpret the pipeline depth from the pipeline drawings. Pegging and marking shall be clear and prominent and remain as such for the duration of works. Trial holes to prove the location of the GTP shall be carried out and all trial holes shall only be done in the presence of SPPG officer. A SPPG RES(Registered Earthwork Supervisor) shall supervise the earthwork and monitor the pipeline depth closely based on the surveyor's interpretation.

d) Only manual excavation is allowed within 1m of the gas pipeline and only hand excavation is allowed within 0.5m of the gas pipeline.

e) Under no circumstance shall the GTP be exposed without written consent of SPPG. GTP shall only be exposed in the presence of SPPG Officer. If a GTP is exposed, the owner/contractor shall take the necessary measures to protect the pipe from any physical impact that may cause damage to the pipe and/or its coatings to the satisfaction of SPPG.

f) Do not shift or remove warning markers indicating the existence of the GTP at site without SPPG's approval. The contractor shall protect them from being damaged or tempered. In the event the warning markers are damaged, they shall be reported to SPPG and replaced immediately. Where necessary, additional temporary warning markers shall be installed to warn others of the presence of gas pipeline.

g) For **blasting works**, piling or any works that cause ground vibration, the peak particle velocity (PPV) of ground shock generated by the blast shall be limited to 15mm/s measured at the pipeline and 5mm/s measured at gas plant. The PPV shall be monitored in real time. SPPG shall be notified once the PPV reaches 10mm/s for the gas pipeline or 3mm/s for the gas plant.

h) For **tunneling, shaft excavation** and piling works, ground consolidation could occur due to ground water losses resulting in surface settlement. This settlement can potentially induce excessive stress on the pipeline. The contractor shall engage a Qualified Personnel conduct a risk assessment to assess the impact of tunneling on the surrounding area and to the GTP. To monitor the surface settlement, surface monitoring points shall be installed along the pipeline alignment at every 10m intervals for at least 100m pipe length from the tunnel or shaft. The settlement shall be regularly monitored while excavation or tunneling works are being carried out. A differential settlement attained less than 1:1000 will require all parties involved to assess the ground consolidation and evaluate the need to implement measure to arrest the consolidation. Contractors are advised to stop works when the differential settlement attained less than 1:714 and a thorough stress analysis of the pipeline shall be done by competent persons recognised by SPPG. Depending on the findings of the analysis, measures shall be taken to relieve the pipeline from stress induced. Final reinstatement of the differential settlement to relieve the stress on GTP shall be included (i.e. to settlement of 1:1000 or better). Detailed assessments are also required for any pipelines that have gross structural discontinuities (i.e: bends, tees, valves, etc)

i) For **crossing and parallel laying** of services to GTP, Table 1 shows the required separation distance between the GTP and other services or structures. It should be noted that other authorities may have stricter or additional requirements on minimum separation distance between proposed building / structure and the pipeline than what is stated here. Services crossing the pipeline shall not be at the previous boring pit locations of the pipeline, the locations are to be advised by SPPG. The services crossing over the GTP shall not be an obstruction for SPPG to access the GTP. (Generally, the services should not be wider than 1m and self-suspended without a support).

j) For movement of heavy haulage over the gas pipeline, the transporter shall submit the proposed route to SPPG. The load per axal shall be limited to 10tonne and sufficient load distribution shall be placed for crossing over the pipeline and if the pipeline is not buried under a proper road.

k) For any new development surrounding the GTP, the developer shall inform the property owner on the location of the pipeline within their premises and draw up measures to prevent any possible damage to it. Pipeline within a fenced compound shall be accessible to SPPG for patrolling and any maintenance works as and when required.

l) For laying of new pipeline or construction of new structure with cathodic protection, a proper study and survey needs to be implemented by the contractor to ensure no cathodic protection system are compromise or interfered with.

m) For major works that span over a long period of time, the owner and contractor shall hold monthly meetings to update SPPG on the progress and any changes to their works.

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3.3 Repair of Damage Pipe/Coating

In the event the pipe and/or its coating are damaged by the third party works or found damaged, **immediate report** shall be made to SPPG. SPPG will undertake the necessary repair works. All costs of such repairs shall be borne by the third party responsible for the damage.

3.4 Emergency Works

When emergency works have to be done near the pipeline in the interest of public or private safety, the owner and contractor shall **call SPPG** at the 24-hour hotline at **1800 752 1800** or **69167400**. SPPG officers will respond to site to advise on the approximate location of the gas pipeline. The contractor shall ensure safe works are executed for emergency works near the gas pipeline or gas plant. The Principal shall submit a written notice to ESP within 24 hours after the work has commenced.

4. Enquiries

The above requirements are only stated in general. The concerned party shall consult SPPG on all works near the GTP. SPPG reserves the right to alter any stated requirements or impose additional requirements that are necessary depending on site conditions and type of work. Refer all enquiries and correspondences on works near the GTP to:

Postal address

Transmission Pipelines Operations and Maintenance (TPOM) Section
SP PowerGrid Ltd (Gas Operation)
National Gas Control Centre
24A Senoko Ave
Singapore 758314

Email: gasenquiry@spgroup.com.sg

Telephone numbers

Transmission Pipelines Operations and Maintenance (TPOM) Section :
6916 6136 / 6916 6112

24-hour System Control Centre: **6916 7400**

24-hour Customer Service Centre: **1800 752 1800**

HEAD OF SECTION
TRANSMISSION PIPELINES OPERATIONS AND MAINTENANCE (TPOM)
GAS OPERATIONS
SP POWERGRID LTD
As agent for and on behalf of PowerGas Ltd

(This is a computer-generated document. No signature is required.)

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Table 1: Minimum Separation Distance Between GTP And Other Services / Structures

S/N	Service / Structure	Minimum separation distance / Requirements
1.	Bore / sheet piling	5.0m. May require real time monitoring of soil movement and settlement and additional Risk/Impact Assessment.
2.	200x200 Concrete Piles	3.0m
3.	Tunneling	Clearance distance 2.0m or more. Depending on size and depth, it may require real time monitoring of soil movement and settlement and additional Risk/Impact Assessment.
4.	Directional Drilling	2.0m plus radius of final tunnel size
5.	Formed Drain / Earth Drain	1.2m / 1.5m
6.	Minor Drain	0.5m
7.	Water/Sewer Pipe: less than 700mm dia.	1.0m
8.	Water/Sewer Pipe: 700mm dia. or larger	2.5m or more depending on size of pipe and construction method.
9.	Electric Cables: less than 22 KV	0.5m
10.	Electric Cables: 22KV and above	1.2m
11.	Telecom cables	0.5m
12.	Low pressure gas pipe	0.5m
13.	Shrubs	1.2m
14.	Trees	2.0m
15.	Soil Investigation	10.0m (If lesser, with positive identification of GTP)
16.	Posts / foundations for light, signs etc	1.5m
17.	Road Pavement	1.5m
18.	Off-Road Crossing for heavy vehicles	1.5m or more with 25mm steel plating on surface.
19.	Earthing Rods	5.0m

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Requirements for Distribution Gas Pipe Diversion Works

Planning Phase

1. Prior to any excavation works, the project owner / contractor shall request for gas services returns and acquire the gas plans.
2. Where any gas pipe is affected, the project owner / contractor shall liaise with Gas Distribution Planning section for diversion of pipes. As far as possible, no gas pipes shall be within the hoarding area of the work site.
3. The project owner / contractor shall provide a feasible corridor free from other underground services and away from semi-rigid / rigid pavements to facilitate the diversion work. If there are other underground services along the proposed corridor, the project owner / contractor shall consult and obtain the necessary clearances from the relevant agencies for the new gas pipe to be laid.
4. Depending on the extent and complexity of the diversion, a long lead time may be required. Hence, the project owner is advised to consult the planning team early.

Construction Phase

1. The project owner / contractor shall coordinate all diversion activities with Gas Distribution Projects section.
2. The consultant / contractor shall arrange a site walk with the SPPG Officer-in-Charge prior to the commencement of pipe laying works.
3. The project owner / contractor shall peg the confirmed pipe corridor.
4. A minimum clearance of 300mm shall be maintained between our gas pipes and all other services or structure.
5. Wherever possible, valves shall be installed to enable quick isolation of pipeline within the work site (e.g., crossing of bored tunnels, cut-and-cover tunnels). These isolation valves should not be located inside the work site.
6. Where the cut-and-cover tunnel runs parallel to the gas pipes, there shall be a minimum clearance of 5 metres from the diaphragm wall.
7. Once laying of gas pipeline is completed, pipe cleaning and pressure test will be conducted.
8. For works within third party worksites, a site inspection with the SPPG Officer-in-Charge shall be conducted prior to commissioning of the gas pipe to check that the site is in order.

Gas Pipeline Safety and Integrity

1. All vent shafts to the tunnels shall be at least 20 metres away from the gas pipes.
2. All piles shall be at least 5 metres away from the gas pipes, which shall be determined by trial holes.

3. All crossings over cut-and-cover tunnels shall be replaced temporarily with steel pipes for suspension and subsequently replaced with polyethylene pipes upon the completion of the construction work. The steel pipe supports shall be endorsed by a Professional Engineer (Civil) and submitted to SPPG Gas Operations. The support system shall allow access to the pipe for inspection and for fire-fighting purposes in the event of an emergency.

4. No air intake / outlet shall be located near the gas pipes.

5. Valve chambers which are still located within the work site due to site constraints, shall be raised 0.5 metres above ground level and kept visible and accessible at all times for emergency.

6. The project owner / contractor shall be aware of all gas pipes within the work site and shall ensure that all parties working within the site are also aware of the locations of the gas pipes. Where possible, prominent markers indicating the pipe route shall be displayed.

7. The project owner / contractor shall be responsible to maintain the integrity of the gas pipes, protection slabs, warning markers and gas chambers within the work site, and to comply with the following:

   a) No permanent structure is to be constructed over any gas pipe,
   b) No Electronic Parking System (EPS) is to be constructed over any gas pipe,
   c) No heavy machinery / equipment is allowed to be placed over any gas pipe,
   d) All gas chambers or standpipes must be barricaded prominently with "Danger" sign,
   e) Access shall be provided for gas inspection and maintenance to be conducted regularly along the pipe route within the work site.

8. Wherever possible, no hot work is allowed in the vicinity of the gas pipes. If hot work is unavoidable, the project owner / contractor shall take all necessary measures, including but not limited to the following:

   a) The site shall be certified gas-free by a qualified Safety Officer,
   b) Gas-free checks shall be conducted regularly before and throughout the work,
   c) All necessary precautions to prevent damage to the gas pipes shall be taken,
   d) All possible occurrence of fire hazards shall be eliminated and, if necessary, consult SPPG on other precautionary actions to be taken.

9. The project owner / contractor shall notify SPPG Gas Operations of any works directly or indirectly affecting the gas pipes.

10. The project owner / contractor shall monitor possible ground movements / soil subsidence in the vicinity of their work sites and inform SPPG Gas Operations immediately if any such movements / subsidence is observed / detected and where gas pipes are present.

11. In the event that any gas leak is detected, all works shall cease immediately and SPPG Gas Operations 24 hrs Gas Service Operation Centre shall be contacted at Tel: 1800-752-1800 for assistance.

Acknowledged by:
Project Name: _____

_____	_____
Signature & Stamp of Principal / Consultant	Signature & Stamp of Main Contractor
Name : _____	Name : _____
Designation : _____	Designation : _____