

**PROPOSED CHURCH DEVELOPMENT
LAND PARCEL AT BUKIT BATOK WEST AVENUE 5**

**ADDITIONAL CONDITIONS OF TENDER
(TECHNICAL)**

	CONTENTS	PAGE
PART I	GENERAL	42
PART II	PLANNING PARAMETERS	42
PART III	OTHER REQUIREMENTS	47

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 Bukit Batok West Avenue 5 (“the said Land”). 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, the 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 the HDB, the relevant Competent Authorities and the Public Utility Licensees directly and comply with their current 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 PLANNING PARAMETERS

2.1 PROPOSED DEVELOPMENT

The Land Parcel at Bukit Batok West Avenue 5 (“the said Land”) with a site area of 3,000.2 sq m shall be for Church development (“the said Development”). The site area is the area measured up to the boundary lines as shown on the Certified Plan No. 90530.

2.2 ALLOWABLE GROSS FLOOR AREA (GFA)

The total GFA for the said Development shall not exceed 4,801 sq m but shall not be less than 4,321 sq m. Based on the site area of 3,000.2 sq m, the permissible Gross Plot Ratio (GPR) should not exceed 1.6*. The total GFA shall be computed in accordance with Urban Redevelopment Authority’s (URA) Development Control Guidelines.

The supportable GFA for an ancillary columbarium, if any, may be lower than the general prevailing guidelines and shall be subject to the final approval of the authorities. URA will also closely evaluate the number of proposed niches in the ancillary columbarium for the site, taking into account all the relevant circumstances, including the needs of, and the potential disamenity to, the surrounding users.

*Indicated for information of the Tenderer only.

2.3 BUILDING LINE / SETBACK

The Successful Tenderer shall at all times comply with the 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 said Land delineated on the Certified Plan No. 90530.

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

2.4 BUILDING HEIGHT

The said Development shall be subject to a technical height control of 70m-80m AMSL. The maximum allowable storey height for the said Development is up to 5-storeys high and within 25m envelop control (including attic). The technical and storey height control of the said 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 said Land. The final technical and storey height are subject to the approval of the Competent Authorities.

The Successful Tenderer shall ensure that any and all developments, structures and fixtures on the said Land do not exceed the maximum allowable height of 70m-80m AMSL. Such developments, structures and fixtures including those on the roof tops of the building, whether permanent, temporary, transient or stationary (including but not limited to the building superstructure, TV antennae, water tanks, lift motor rooms, maintenance equipment, lightning conductors, moving objects, vegetation, etc) and all construction equipment and temporary structures (including but not limited to cranes, piling rigs, etc) shall all be subjected to the same height limit. Civil Aviation Authority of Singapore's (CAAS) clearance shall be sought for the use of crane or tall construction machineries, and Republic of Singapore Air Force's (RSAF) clearance shall be sought for construction equipment and temporary structures above 52m AMSL (email: Height_Control@defence.gov.sg).

The Successful Tenderer shall submit to CAAS and Defence Science & Technology Agency (DSTA) 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 said Development on the said Land.

The Successful Tenderer shall obtain CAAS' and RSAF's prior written approval before mobilising and/or installing any construction machineries on the said 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/caas/en/eServices_Forms/Application_for_Obstacle_Clearance/?_locale=en.

The Successful Tenderer is to consult URA's Development Control Group when the detailed development plans are available.

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

2.5 DEVELOPMENT CONTROL

The development must comply with Development Control Guidelines issued from time to time by the Competent Authority under the Planning Act (Cap 232), where applicable.

Where applicable, the Successful Tenderer's Qualified Person shall submit a Development Statement of Intent (DSI) together with their development proposal submitted to the Competent Authority under the Planning Act (Cap. 232) at the formal submission stage as per prevailing guidelines and circulars issued by the Competent Authority.

2.6 BUILDING LAYOUT

The building massing and design treatment of the said 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 said Development.

2.7 URBAN DESIGN AND ENVIRONMENT CONSIDERATIONS

The architectural solution must respect the context/built environment of the said Land in its setting.

The proposed design solution shall blend in with the surrounding developments and be conducive to the overall surrounding character/ambience.

The Successful Tenderer shall ensure that the said 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.

As the subject site is located in proximity to Tengah Air Base, aircraft noise and vibrations should be expected. As such, these effects should be taken into account in the proposed 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 MINDEF or curtail its existing and future developments, operations and activities in any way.

2.8 PLATFORM LEVEL

The existing levels of the said Land are as shown in the Topographical Survey Plan No. 3027-CAK-TP-BB-26139-01B. The Public Utilities Board (PUB) has specified that the minimum platform level for the said Land shall not be lower than 600mm above the adjacent road/ground levels, whichever is the highest. The final platform level is subject to the approval of the relevant Competent Authorities. The Successful Tenderer shall be required to seek approvals from the relevant Competent Authorities on the platform levels before commencement of its building layout design.

All the costs and expenses incurred in carrying out earth 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 is required to seek PUB's approval and ensure that the revised platform levels of the said Land 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 said Land and ensure that the runoff within, upstream of and adjacent to the said Land can be effectively drained away without causing flooding within the said Development and in the vicinity of the said 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 said Land.

2.9 PARKING LOTS

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

- i) The Successful Tenderer is required to fully comply with the physical parking requirements for cars, motorcycles, coaches or lorries (where applicable) as stipulated in the Parking Places (Provision of Parking Places and Parking Lots) Rules in force at the time the proposals and plans for the provision of parking lots on the development are first submitted to the LTA. No waiver on parking provision will be considered.
- ii) The car parking facilities will be subject to the requirements and approvals by the LTA and the relevant Competent Authorities at the formal submission stage.
- iii) The parking requirements shall be strictly complied with and the Successful Tenderer shall consider various means to meet the requirements such as surface parking, above ground parking and underground parking. Basement car parks shall have a setback from the boundaries according to URA's guidelines. No waiver or Range-based Car Parking Standard (RCPS) application on parking provision would be considered.
- iv) These parking lots shall be properly marked lots and comply fully with the layout dimensions as stipulated in the prevailing Parking Places (Provision of Parking Places and Parking Lots) Rules.
- v) In order to prevent illegal parking, the Successful Tenderer shall also submit a Standard Operating Procedure (SOP) to demonstrate how the increase in parking demand would be managed during major/special occasions when parking demand is higher than normal. Possible measures can include, but are not limited to, valet / tandem parking, encouraging the use of public transport and provision of shuttle services from / to MRT stations.
- vi) The SOP shall be submitted to LTA's Development and Building Control (DBC) for review and clearance during the Development Control (DC) and Building Plans (BP) stages.
- vii) The parking layout shall take into consideration both the needs of the worshippers as well as operational needs of the said Development.
- viii) The Successful Tenderer shall carry out the works at his own cost and expense.

2.10 VEHICULAR INGRESS / EGRESS

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

- i) The vehicular ingress / egress (the access) to the said Land shall be taken from Bukit Batok West Avenue 5 as shown indicatively in the Site Plan. The actual position is subject to LTA's approval based on the layout of the said Development to be proposed by the Successful Tenderer.
- ii) Access to service areas (e.g. bin centre, electrical substation, loading / unloading bays) shall be taken from within the said Development. No service access will be allowed to be taken from the public roads.
- iii) Any drop barrier to the car park or internal driveway shall be provided further inside the said Development's boundary so as to prevent spillage of vehicle queue onto the main road.
- iv) The Successful Tenderer shall at his own cost and expense construct the culverts for the access and hand it over to the relevant Competent Authorities for management and maintenance.
- v) Detailed plan submission, including the traffic plans for the said Development showing the details of the accesses etc., shall be made to Development Building Control (DBC), LTA, for review and clearance during the Development Control (DC) and Building Plan (BP) stage.

2.11 BICYCLE PARKING AND BICYCLE LIFT PROVISION

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

- i) 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.
- ii) Bicycle parking area(s) proposed based on dimensions illustrated in LTA's Code of Practice for Street Works Proposals relating to Development Works and Code of Practice for Vehicle Parking Provision in Development Proposals can be considered for GFA exemption. Any provision above the minimum requirement will be subjected to evaluation. The bicycle parking area(s), once approved, will not be allowed to be converted for other uses without the approval of the Authority and the relevant Competent Authorities.
- iii) The Successful Tenderer is encouraged to provide end-of-trip facilities such as showers, lockers and changing rooms in close proximity to the bicycle parking facilities where appropriate. These supporting facilities that fulfill LTA's guidelines can also be considered for GFA exemption subject to URA's evaluation. These area(s), once approved, are not allowed to be converted to other uses without the Competent Authority's approval.
- iv) The Successful Tenderer shall ensure at least one of the passenger lifts is able to accommodate minimum one horizontally standing bicycle, if the bicycle parking area is not located at ground level. The recommended dimensions for the lift can be found in Code of Practice for Street Works Proposals relating to Development Works.
- v) The Successful Tenderer should consider existing vehicular and pedestrian movement when locating bicycle parking lots within the subject site. 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.
- vi) The design and layout of the bicycle parking facilities will be subject to the requirements and approval of the Authority and the relevant Competent Authorities at the formal submission stage and as set out in LTA's Code of Practice for Street Works Proposals relating to Development Works and Code of Practice for Vehicle Parking Provision in Development Proposals.
- vii) The Successful Tenderer shall be responsible for the operation and maintenance of the bicycle parking lots at all times and shall bear all the costs related to the proper functioning of the bicycle parking lots. 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.

2.12 WAYFINDING PROVISION

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

- i) The Successful Tenderer is to provide a comprehensive wayfinding system for the public to easily find their way to any transportation nodes within the vicinity of the said Development and towards the pedestrian and cyclist related facilities (e.g. bicycle parking) within the said Development. A guide for Wayfinding signage and related facilities can be found in the Code of Practice for Street Works Proposals relating to Development Works or <https://www.lta.gov.sg/content/dam/ltaweb/corp/GreenTransport/2016/Guide%20for%20Wayfinding%20Signage.pdf>
- ii) The Successful Tenderer shall obtain clearance from the Competent Authority on all matters

related to the wayfinding system before commencing construction of the said Development.

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

PART III

3.0 OTHER REQUIREMENTS

3.1 CONSTRUCTION OF COVERED LINKWAY

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

- i) The Successful Tenderer is required to design and construct covered linkways from the said Development to the nearest bus stop along Bukit Batok West Avenue 5.
- ii) The parts of the covered linkways within the road reserve are to be designed as standalone structure i.e. separated from the internal structures. The detailed design and construction of the covered linkways are to comply with the requirements of LTA and the relevant Competent Authorities. The Successful Tenderer shall submit a detailed proposal of the covered linkways to LTA and all other relevant Authorities for approval.
- iii) The Successful Tenderer shall, at his own cost and expense, maintain the completed covered linkways to the satisfaction of the relevant Competent Authorities. LTA will only take over the portion of the covered linkways that is within the road reserve for maintenance upon the issue of Certificate of Statutory Completion (CSC).
- iv) All costs and expenses relating to the implementation of the proposed covered linkways and other incidental costs shall be borne by the Successful Tenderer.

3.2 PRE AND POST CONSTRUCTION SURVEY

- i) The Successful Tenderer/Qualified Person 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/Qualified Person. 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 including the types of equipment to be used;
 - d. Method Statement of temporary and permanent works for excavation and construction;
 - e. Design calculations for work which affects HDB property;
 - f. Soil investigation report of said Land;
 - g. Proposal for monitoring the effect of the works on HDB property;
 - h. Condition survey of HDB property including photographs by an independent party with appropriate qualifications before construction work.
- ii) The Successful Tenderer/Qualified Person shall submit to HDB the condition survey of HDB property including photographs by an independent party with appropriate qualifications after construction work.

3.3 INSTRUMENTATION MONITORING

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

- i) The Successful Tenderer/Qualified Person shall ensure that the proposed works do not affect the integrity or stability of the foundation and structure of HDB buildings. Hacking to existing HDB structures is not permitted. The minimum distance from existing edge of columns to proposed excavation/piling is 6 m. During the progress of the engineering works the Successful Tenderer/Qualified Person must provide adequate means of instrumentation to monitor the effect of the engineering works on HDB property. The Successful Tenderer/Qualified Person 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/building;
 - c. Settlement of apron slab and beam of HDB property/building;
 - d. Levels of road or carpark or sewer manhole adjacent to HDB property/building;
 - e. Ground water level below/adjacent to HDB property/building;
 - f. Vibration movement in HDB property/building.

The instrumentation readings shall be recorded and reviewed by the Successful Tenderer/Qualified Person, and he shall submit a report to HDB within a week of recording.

- 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. The minimum spacing between these drilled holes is 300mm, centre-to-centre. No ram setting is allowed on the columns. Upon removal of instruments, the column surface shall be reinstated to its original form, and painted.

- 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 Appendix C Clause 3.3(vi) below. These Alert and Work Suspension instrumentation level readings shall be agreed upon with HDB before the commencement of Engineering works. On reaching a Work Suspension (Allowable) level at any location on site, the Successful Tenderer/QP is required to inform HDB through handphone and email immediately and follow up with a report to HDB reviewing the movement and predicting further movement up to completion of construction. Where necessary, the Successful Tenderer/QP shall submit to HDB for clearance, a proposal to limit further movement or additional monitoring. On reaching a Work Suspension level at any location, the Successful Tenderer/QP shall cause the work to be stopped. The Successful Tenderer/QP shall immediately inform HDB and implement measures to stop further movement. The Successful Tenderer/QP shall allow the work to continue only if the measures implemented are proved to be effective. The monitoring of movements shall be inclusive of another 6 months of monitoring after end of backfilling, shall be submitted to HDB.

- iv) 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 Appendix C Clauses 3.3(i) to 3.3(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 Authority.

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.

v) Excavation Work

The Successful Tenderer/QP shall ensure that excavation work does not cause the lowering of ground water table nor any lateral soil movement. If the lowering of ground water table or soil movement is expected, the Successful Tenderer/QP shall submit to HDB detailed calculations showing expected scale and magnitude, and the resultant load imposed on HDB building. The conditions of instrumentation and monitoring set out in Appendix C Clause 3.3(vi) below shall also apply to excavation work.

vi) 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 Appendix C Clauses 3.3(i) to 3.3(iii) above shall apply.

3.4 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 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 and pay for the cost of any diversion or provision of the services including sewer lines etc. He shall be deemed to have included in his tender price such verification and diversion of services which may affect the said Land to meet the specifications of the relevant Competent Authorities.

All new services lines serving the said Development shall be contained within the said 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 said Land. Prospective tenderers are required to carry out due diligence by purchasing the services plans from the respective service providers. Please contact the respective service 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

Earthworks Monitoring & Cable Protection Section
Pasir Panjang District Office
25 Pasir Panjang Road
Singapore 117536
Tel: 6470 0660 / 6470 0621
Fax: 6475 9400 / 6479 5660

More information on purchase of cable or gas pipe plans are available under contact us at <http://www.singaporepower.com.sg>.

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>

3.5 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 said Development.

The Successful Tenderer shall be deemed to have taken into account the costs of such verification, tests, removal of the possible footings, obstructions and other materials etc which may affect the said Development in his tender price.

3.6 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 said 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.

3.7 WORKING AREA

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

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

3.9 PLANS OF PROPOSED DEVELOPMENT

The Successful Tenderer shall submit DC plans and BP to HDB for its endorsement on behalf of the Government as landowner before these plans are submitted to the Competent Authority for approval. The Successful Tenderer shall submit 2 extra sets of plans for HDB's retention.

The HDB shall have the right to require the Successful Tenderer to amend and modify the above mentioned plans submitted by him.

3.10 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 the 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 alternative proposal instead; in which event, the relevant provisions in this Part shall be deemed to be complied with. The HDB however reserves the absolute discretion to decide whether or not to allow any alternative proposal to be adopted.

**PROPOSED CHURCH DEVELOPMENT
LAND PARCEL AT BUKIT BATOK WEST AVENUE 5**

**CONDITIONS AND REQUIREMENTS OF RELEVANT COMPETENT AUTHORITIES
AND PUBLIC UTILITY LICENSEES
(FOR INFORMATION OF TENDERERS)**

CONTENTS	PAGE
1.0 DEFINITION	53
2.0 GENERAL CONDITIONS AND REQUIREMENTS	53
3.0 LAND TRANSPORT AUTHORITY (LTA)	54
4.0 PUBLIC UTILITIES BOARD (PUB), CATCHMENT AND WATERWAYS DEPARTMENT	54
5.0 PUBLIC UTILITIES BOARD (PUB), WATER RECLAMATION (NETWORK) DEPARTMENT	57
6.0 PUBLIC UTILITIES BOARD (PUB), WATER SUPPLY (NETWORK) DEPARTMENT	59
7.0 NATIONAL PARKS BOARD (NPARKS)	62
8.0 NATIONAL ENVIRONMENT AGENCY (NEA)	63
9.0 SINGAPORE CIVIL DEFENCE FORCE (SCDF), FIRE SAFETY AND SHELTER DEPARTMENT (FSSD)	64
10.0 ELECTRICITY	65
11.0 TELECOMMUNICATIONS	65
12.0 GAS	66

1.0 DEFINITION

The lease of the Land Parcel at Bukit Batok West Avenue 5 ("the said Land") is subject to the Additional Conditions of Tender and the Conditions of Tender for the said Land contained in the Developer's 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 said 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 said Land there on 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 said Development on the said 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 current 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 said 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 said 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 said 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 said Development.

- 2.5.6 to provide for all the internal distribution for water, electricity, drainage and sanitary discharge for the said Development.
- 2.5.7 to liaise with all the relevant Competent Authorities and Public Utility Licensees on upgrading the road reserves abutting the said Land to ensure that the necessary roadside drains, sidetable, kerb, etc are carried out in accordance with the prevailing Road Reserve requirements.
- 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 said Land, and ascertain their effect on the said Development.
- 2.7 There may be some other existing services affected by the said 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)

In addition to Appendix C clauses 2.9 to 2.12 and 3.1, LTA requires the Successful Tenderer to comply with the following requirements:

- i) The Successful Tenderer shall provide proper pick-up/drop-off points within the said Development to avoid affecting traffic on the roads.
- ii) The Successful Tenderer shall demonstrate that the pick-up/drop-off facilities within the said Development and internal circulation layout are operationally feasible and do not cause congestion on the public roads. This would be reviewed during the detailed plan submission stage to LTA.
- iii) All proposed street works, as well as proposed engineering / construction works within the road reserve shall be prepared/designed, submitted, supervised and constructed in accordance with Street Works (Private Street Works) Regulations, Street Works (Public Street Works) Regulations and the following prevailing standards and code of practice:
 - a) Street Works 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 Road Opening Works
 - e) Code of Practice for Traffic Control at Work Zone
 - f) Architectural Design Criteria
 - g) Civil Design Criteria
- iv) 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 spaces.
- v) The above comments should be incorporated in the detailed submission plans and to be submitted to LTA's Development and Building Control Division (DBC) at the DC and BP submission stages for approval.

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

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

- i) The said Land is not affected by the current drainage scheme.

- ii) Based on the latest edition of the COP on Surface Water Drainage, the minimum platform level (MPL) for the said Land shall not be lower than 600mm above the adjacent road/ground levels, whichever is the highest.
- iii) In complying with the minimum platform level requirement, the Successful Tenderer shall conduct thorough investigations of the said Land and determine suitable platform profiles to ensure that the runoff within, upstream of and adjacent to the said Land can be effectively drained away without causing flooding within the said Land and in the vicinity of the said Development. Any proposal to level/backfill the said Land shall be submitted to PUB for comments and approval.
- iv) The design and construction of the said Development within the said Land shall not cause or affect the structural integrity of the roadside drain/outlet drains.
- v) There may be other smaller drains on the said Land. The Successful Tenderer shall determine the details of these drains on the said Land. The Successful Tenderer shall also ensure that these drains are safeguarded in the said Land. Surface runoff from the said Land and all neighbouring lots must be allowed to discharge through the drains within the said Land. Please be reminded that all existing drains within the said Land shall not be altered/interfered with, without prior approval of the Department.
- vi) The existing drainage system shall not be altered or interfered with, without the prior approval of the PUB.
- vii) Any damages caused to the drainage structures shall be reinstated to the satisfaction of the PUB.
- viii) The said Land is within Kranji Water Catchment area. The following water catchment requirements are to be fully complied with:
 - a. Stringent pollution control measures shall be incorporated during the proposed works.
 - b. All sewage and sullage water shall be discharged into a public sewer.
 - c. Storage of toxic and hazardous materials shall not be allowed.
 - d. No pollutive contaminants shall be discharged into the drains leading into our stream intake.
 - e. If there are any earth filling works at the development site, good earth that is free of any debris or construction waste materials shall be used. 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 works.
 - f. Effective erosion and sediment control measures shall be provided by the Successful Tenderer and the Qualified Person (QP) shall advise the Successful Tenderer 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 (PUB) before commencement of works. All affected watercourses shall be desilted and cleared until completion of work. You may download the latest version of the COP from the PUB website <https://www.pub.gov.sg/>.
- ix) 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/abcwaters/designguidelines>

- x) 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 said Land. 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:

- Detention tanks;
- Retention/sedimentation ponds;
- Wetlands;
- Green roofs;
- Planter boxes;
- Bioretention swales;
- Porous pavements;
- Bioretention basins or rain gardens, etc.

The Successful Tenderer/ 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, the Successful Tenderer/ QP can refer to the ABC Waters Guidelines and relevant chapters in the Engineering Procedures, available on the PUB website.

- xi) PUB encourages the implementation of ABC Waters design features in the said 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/abcwaters/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 contact Ms Ong Geok Suat (ong_geok_suat@pub.gov.sg) and Ms Enid Chen (enid_chen@pub.gov.sg) for issues related to ABC Waters design features.

- xii) The planning, design, construction activities and procedures for plan submission shall comply fully with the requirements as stipulated in the current edition of the Code of Practice on Surface Water Drainage and The Sewerage and Drainage (Surface Water Drainage) Regulations 2007. The Successful Tenderer may download the latest version of the COP from the PUB website <https://www.pub.gov.sg/drainage/COPsurfacewaterdrainage>.

- xiii) Safeguarding of existing drains/drainage facilities during construction works:

- a) The Successful Tenderer shall take due care and precautionary measures to ensure that no damage or settlement occurs to any existing drain/ drainage facilities in the course of the works. 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 QP.
- b) Pre-work and post-work surveys shall be submitted to PUB and shall cover drains/ drainage facilities in the area affected by the works (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.

- c) The Successful Tenderer shall carry out soil instrumentation for monitoring the soil/ geotechnical/ 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. Details of the contingency plan including the schedule of works and organization chart of the Successful Tenderer and consultant/contractor shall be submitted to PUB before commencement of works.
- d) 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 analyses and rectification reports of the affected drains and drainage facilities shall be submitted to PUB for comments/approval.
- e) 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.
- f) 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, post-condition survey and topography survey of the affected drains shall be submitted and PUB may request for joint site inspection of the rectification works.
- g) The Successful Tenderer shall inform PUB in writing at least one week before the commencement of any work at the site which affects drains.

Please contact Ms Tan Sok Hian at Tel: 6571 4069 / Mdm Tan Boh Hong at Tel: 6731 3484 for any clarification on the requirements of PUB **Catchment and Waterways Department**.

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

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

- i) The planning of this project shall comply with the Code of Practice on Sewerage and Sanitary Works 2nd Edition 2019 [thereafter referred to as the "COPSSW (2nd Ed.)"].
- ii) There are existing 600mm diameter sewers and existing drain-lines within/in the vicinity of the proposed site. Thorough site investigation shall be carried out to determine the exact positions and levels of the existing sewerage infrastructure.
- iii) Manholes shall not be buried under any circumstances. Where there is a need to raise or lower any existing manholes, the Successful Tenderer shall liaise with PUB (WRN)'s Network Management Branch on such proposals and carry out the necessary works at his own cost and expense. The Successful Tenderer shall survey the final manhole top level using the affected existing manhole's invert level as the Temporary Bench Mark (TBM). The Successful Tenderer shall submit the as-built drawings, showing the final top levels of the impacted manholes, to PUB (WRN). For such proposals, please contact Mr Muhd Nur Afiq Selamat (email: muhd_nur_afiq_selamat@pub.gov.sg) or Mr Muhd Nabil Mohd Raus (email: muhd_nabil_mohd_raus@pub.gov.sg) at Tel: 6517 2230 from PUB(WRN).

- iv) The Successful Tenderer shall ensure that the premises is served by an adequate, effective and functional internal sanitary drainage and plumbing system and be connected to public sewers.
- v) For minimum clearances of utilities crossing and parallel to sewers, please refer to **COPSSW (2nd Ed.) Section 1.2.4 c**. In addition, pre- and post-construction CCTV inspection shall be carried out on the affected sewers and manholes. The CCTV reports and video shall be submitted to PUB(WRN). A WRc certified CCTV specialist contractor [<https://www.pub.gov.sg/Documents/RegisteredCCTVContractor.pdf>] shall be engaged to interpret, prepare, and certify CCTV reports in accordance with PUB(WRN)'s CCTV inspection requirements. Please note that the defect classification shall be in accordance with the latest edition of the WRc/WAA "**Manual of Sewer Condition Classification**".
- vi) All food establishments shall be provided with grease trap/interceptor of adequate capacity to prevent discharge of oils, fats and grease directly into the sewerage system in strict compliance with the **COPSSW (2nd Ed.), in particular Sections 4.2.2 and 4.6.1**. The grease traps shall be properly and regularly maintained such that the effluent from the grease traps shall meet the standards for discharging into the public sewerage system.
- vii) No building/ structure/piling/retaining structure, etc. (whether temporary or permanent), except lightweight and demountable elements (such as awnings, surface drains, compound boundary wall & 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):

Sewer/Pumping Main Nominal Diameter (mm), D	Sewer/ Pumping Main Depth (m)	Minimum Setback Distance (m)*
≤600	≤ 3	1.0
	> 3 and ≤ 5	1.5
	> 5	2.0

*measured from the outer most edge of the structure, including footings and overhangs, to the **centreline** of the sewer/pumping main pipe or DTSS.

- viii) More details can be found in **COPSSW (2nd Ed.) Sections 1.2.4 and 1.2.5**.
- ix) 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.
- x) The Successful Tenderer shall be responsible for seeking approval from all relevant authorities/land owners for the proposed sewerage works to be carried out beyond the development site. Such approval or consent from the land owner/authorities 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 Code of Practice.
- xi) All sewers and manholes shall be readily accessible at all times to PUB for inspection and maintenance.
- xii) All new vortex chambers shall be provided with air-tight and water-tight manhole covers. For any enquiries or clarifications, please contact Mr Peh Kok Heng (Tel: 6517 2225 or email: PEH_Kok_Heng@pub.gov.sg) or Mr Zulhilmi Mohammad Arif (Tel: 6517 2215 or email: Zulhilmi_MOHD_ARIF@pub.gov.sg) from PUB(WRN).

- xiii) Where there are any Specified Activities within the public sewer corridor [i.e. 10m for sewer/main of diameter <900mm, 20m for sewer/main of diameter \geq 900mm and 40m for DTSS tunnel] as stipulated in **COPSSW (2nd Ed.) 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 submit the Application Form via the Protection of Water and Sewer Pipes (POWS) at <http://bpu.pub.gov.sg/pows> prior to any commencement of the specified activities. The applicant shall refer to **COPSSW (2nd Ed.) Section 2** for the technical requirements on sewer protection.
- xiv) The Successful Tenderer shall take every measure to protect all existing sewers, particularly large diameter (\geq 900mm) sewers, affected by or in close proximity of the proposed works.
- xv) The Successful Tenderer 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://www.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.
- xvi) The guideline on 'Prevention of Damage to Public Sewerage System' can be found in PUB website at https://www.pub.gov.sg/Documents/WRN_AdvisoryNotes.pdf. The Successful Tenderer 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.

Please contact Ms Wong Kar Geok at Tel: 6731 3663 / Mr Zahirudin Bin Sulaiman at Tel: 6731 3582 for any clarification on the requirements of **Water Reclamation Network Department**.

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

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

I WATER SUPPLY INFRASTRUCTURE/LAND USE

- i) Provisions shall be made by the Successful Tenderer for PUB to lay new water pipes if required, along public road reserves / sidetables to the said Land. The cost for the laying of new water pipes, if any, and connecting pipe to serve the said Land shall be borne by the Successful Tenderer.

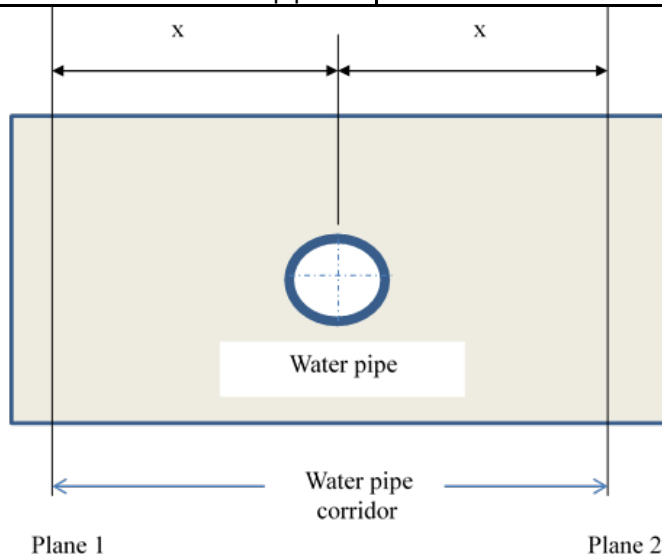
II MARKING OF WATER PIPES

- i) The positions of all the water pipes as shown are **approximate** only. The Successful Tenderer is to determine by means of trial holes the exact alignment and levels of all existing water pipes during the design stage and inform PUB's Water Supply Network Department (WSN) whether they are affected by the proposed works so that PUB(WSN) can advise whether diversion is required. If diversion is required for water pipes of 300 mm dia and below, consultation must be made at least 6 months ahead. Diversion of existing water pipes of 500 mm and above, being vital water pipes should be avoided unless absolutely necessary. If diversion of water pipes is required, the Successful Tenderer shall carry out the diversion works of PUB existing water pipes at the Successful Tenderer's own cost and according to PUB requirements. This is to enable the Successful Tenderer to have better control of their own schedule of work and ultimately timely delivery of their projects. The Successful Tenderer will need to engage a qualified contractor to carry out the diversion work. The Successful Tenderer is required to reconstitute all or some pipelines affected by the said Development with new pipelines of suitable sizes, alignment and linkup points, etc. as directed by PUB, to ensure the water supply network resiliency is not compromised. PUB will work together with the Successful Tenderer for them to carry out

the diversions especially for diversions within the said Development.

- ii) No structure either permanent or temporary may be erected over or within 1 metre from PUB's water pipes. Buried water pipes require a minimum cover of 1 metre, and the Successful Tenderer must provide adequate protection for the water pipes should the cover be removed or reduced.
- iii) No services shall overcross or be erected over any water pipes. Where a cable, pipe or drain undercrosses a water pipe, a clearance of 1 metre is required. No manhole is allowed on top of any water pipes. There must be a horizontal clearance of 1 metre between the manhole and water pipes.
- iv) The Successful Tenderer shall take all necessary precautions to safeguard and to avoid damage to all water pipes. The cost of repairs to any water pipe damaged as a result of work carried out is to be borne by the party who caused the damage. The party will also be required to indemnify the PUB against all losses and claims arising from damage to water pipe. The party will also be billed for the estimated quantities of water loss from the damaged pipe. **The Successful Tenderer shall comply with the requirements stated in the prevention of damage to PUB's water pipes as shown in the PUB-WSN Advisory Notes in Appendix D(I).**
- v) Under the Public Utilities (Protection of Water pipes infrastructure) Regulations 2017, the Successful Tenderer shall make a submission to PUB(WSN) for specified activities carried out within the protection corridor of the water pipes prior to the commencement of works. For water pipes < 300mm dia, notification to PUB(WSN) with the required documents indicated in Pg. 2 of the above Advisory Notes will suffice. For water pipes \geq 300mm dia, approval from PUB(WSN) is required prior to the commencement of works. Failure to comply will be guilty of an offence. Any person who is guilty of an offence under the Regulation shall be liable on conviction to a fine not exceeding \$10,000 and, in the case of a continuing offence, to a further fine not exceeding \$250 for every day or part of the day during which the offence continues after conviction. The protection corridor for water pipe is shown below. Submission of specified activities shall be made via email to PUB_WSN_Surveillance@pub.gov.sg or PUB's Online Submission Portal, Protection of Water and Sewer pipes (POWS). The website for POWS is as follows: <http://bpu.pub.gov.sg/pows>.

Water Pipe	Distance X on either side from the centreline
<900 mm Diameter	10 metres
\geq 900mm Diameter	20 metres
Tunnels and Tunnelled pipes	40 metres



- vi) In general, care should be exercised to prevent any damages to PUB's water pipes and

appurtenances. The Successful Tenderer is to note Section 57 of the Public Utilities Act which stipulates a duty to enquire on water pipes before any person digs, bores, trenches, grades, excavates, tunnels or breaks any ground with any mechanical equipment, tool or explosive. In addition, under Section 47A of the Public Utilities Act, any person who, whether wilfully or otherwise, removes, destroys or damages or causes or permits to be removed, destroyed or damaged, any water pipes belonging to or under the management or control of the Board, shall be guilty of an offence and shall be liable on conviction to a fine not exceeding \$40,000 or to imprisonment for a term not exceeding 3 months or to both; or if the water pipes is 300 mm or more in diameter, to a fine not exceeding \$200,000 or to imprisonment for a term not exceeding 3 years or to both. For more information of the Public Utilities Act, please refer to <https://sso.agc.gov.sg>

- vii) PUB's water pipes and connections must be accessible for maintenance and repair works at all times.
- viii) PUB's watermain valve chambers and appurtenances shall not be covered over.
- ix) PUB's water pipes shall not be subjected to more than 15 mm/s peak particle velocity for any work to be carried out in the vicinity of PUB's water pipe and appurtenances.
- x) Please inform PUB's 24-hour Water Service & Operations Centre at Telephone No. 6521 6488 immediately in the event of damage to any water pipe.

III SUBMISSION OF PLANS

- i) 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. The modes of water supply to be adopted are as follows:

S/n	Height of Highest Fittings Above Mean Sea Level	Method of Supply
i)	Less than 25 metres	Direct
ii)	Above 25 metres but below *37 metres	Indirect supply through high level storage tanks
iii)	Above 37 metres	Indirect supply through low level tank with pumping to high level tanks
	(* Refers to height of inlet pipe to high level storage tanks)	

- ii) Notwithstanding the above modes of supply, where water is essential for the operations of the proposed development, storage tanks of capacity equivalent to 1 day's water requirements shall be provided for the purpose of maintaining a continuous supply of water in the event of supply interruptions.
- iii) Where pumping system or storage tanks are required for the water services, a Professional Engineer must submit the Notification of Water Service Work together with a set of drawings to PUB(WSN). If all the fittings in the water service installation are receiving direct water supply from PUB mains, then a licensed plumber shall be engaged to submit the Notification of Water Service Work and a set of the drawings to PUB(WSN) prior to commencement of the installation work.
- iv) PUB is presently supplying NEWater for direct non-potable purposes such as for cooling towers, industrial processes, general washing, landscaping, and other non-potable purposes. All new non-domestic premises such as commercial and industrial developments, etc., including those existing premises undergoing addition/alteration works where it is applicable to use NEWater, are therefore required to provide a dedicated

NEWater pipe system now to facilitate the supply NEWater when it becomes available in future. Provision shall also be made for a NEWater storage tank to be installed within the premises with its inlet not higher than 15 m AMSL and a capacity equivalent to the 1 day's non-potable water requirement. There shall be no cross connection between the PUB water and NEWater supply pipelines. Developers/ consultants may consult PUB during the pre-planning stage on the detailed requirements.

- v) Water conservation measures as stipulated in the Public Utilities (Water Supply) Regulations and SS 636 – Code of Practice for Water Services shall be adopted.
- vi) Since April 2019, PUB has mandated the sale, supply and installation of at least 2-tick water fittings in all new and existing premises undergoing Addition & Alteration works. The said Development should obtain the Water Efficient Building (Basic) Certification by PUB.
- vii) 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.
- viii) For non-domestic developments with estimated water requirements at least 5,000 m³/mth, and government developments with estimated water requirements at least 3,000 m³/mth, 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.
- ix) 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 proposed development.
- x) 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.
- xi) Use non-water cooled systems (such as air-cooled, refrigerant-cooled, etc.) for cooling purposes wherever possible.
- xii) Cooling towers should achieve minimum 7 and 10 Cycles of Concentration (COC) using potable water and NEWater respectively.

Please contact Ms Olivia Teo at Tel: 6885 2530 / Mr Ow Zhao Hui at Tel: 6885 2551 for any clarification on the requirements of **PUB Water Supply Network Department**.

7.0 REQUIREMENTS OF NATIONAL PARKS BOARD (NPARKS)

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

- i) Pursuant to the Parks & Trees Act (Cap.216), any tree with a girth exceeding one metre measured 1.0 metre from the ground, growing on, any tree conservation area or any vacant area shall not be cut except with the prior approval of the Commissioner of Parks and Recreation.
- ii) The Successful Tenderer shall ensure that roadside trees and green verge(s) abutting the subject site are not to be affected, especially by 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, etc. Similarly, the Successful Tenderer shall ensure that pick-up/drop-off points, taxi lay-bys, loading/unloading bays and fire engine hard-standing areas are to be located within the subject site.
- iii) The Successful Tenderer shall replace the existing roadside green verge fronting the

subject site if it is affected by the said Development. The width of the replacement green verge should be in accordance to LTA's standard road code for that category of road or match the existing green verge along the road, whichever is wider.

- iv) There must be no change of soil level to the roadside planting verge without prior approval from NParks.
- v) There must be no widening or raising of existing carriageways and realignment of road kerbs and drains on abutting roads without prior approval from the relevant authorities.
- vi) Development works are to be confined within the said Development boundary and approved working boundaries. There must not be any illegal dumping and/or storing of construction materials beyond this approved boundary. The said Development shall not encroach beyond the Road Reserve Line and affect any roadside table.
- vii) The said Development is to comply with requirements for green buffers and 2-metre wide peripheral planting verges. The green buffers and peripheral planting verges must be free from any encroachment above ground, and/or are to be recessed to at least 2-metre below ground level, and are not to slope with gradients steeper than 1:2.5.
- viii) The Successful Tenderer shall consult NParks' Greenery and Development Planning (GDP) Branch early at the planning and design stage on the felling of any trees that may be affected by the proposed development with a copy of recently survey plan of the site (of less than 2 years) and its peripheral roads, at a scale of at least 1:500, clearly indicating information of trees, such as location, species, height and girth. Relevant additional information such as plans on construction hoardings should also be submitted.
- ix) The Successful Tenderer is to consult NParks on the tree protection criteria for roadside trees during early planning and design stage.
- x) The Successful Tenderer is to inform NParks at least 8 weeks before the commencement of works for NParks to transplant/salvage existing affected plants within the said Land and/or existing affected roadside tables.
- xi) The Successful Tenderer shall comply with planting provision and aeration requirements for open air parking at street level. More details can be viewed on NParks' website at <https://www.nparks.gov.sg/-/media/nparks-real-content/partner-us/developers-architects-and-engineers/gdp-handbook-2018-apr-3.pdf>. See Chapter 3 on "Planting Provision for Open Air Parking Area at Street Level".
- xii) Vehicles are strictly prohibited from roadside verges at all times.
- xiii) Any disturbance to the roadside greenery (trees, shrubs and turf) must be reinstated by the Successful Tenderer to NParks' satisfaction.

8.0 REQUIREMENTS OF NATIONAL ENVIRONMENT AGENCY (NEA)

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

- i) The said 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 said Development shall not cause pollution directly or indirectly to our water resources. Any activities that could cause contamination problem to our water resources shall not be carried out. The Successful Tenderer is to ensure that the requirements for developments in water catchment areas as shown in **Appendix D (II)** are duly complied with.
- ii) Sewage and used water from the said Development shall be discharged into the public sewer. The Successful Tenderer of the said Development shall check with PUB (WRN) on the point of sewer connection and the allowable discharge rate.
- iii) Abatement measures shall be provided for all proposed M&E equipment installed in the

said 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 QP/Successful Tenderer shall ensure that the noise emitted from the operations of M&E equipment installed in the said Development does not cause nuisance to surrounding residential and noise sensitive premises. The QP/Successful Tenderer shall comply with the NEA's Technical Guidelines 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>.

- iv) The management of the said Development shall:
 - a. Incorporate abatement measures in the design of the said Development to mitigate any potential disamenities posed to surrounding residential premises;
 - b. Pro-actively engage the community together with Ministry of Culture, Community and Youth (MCCY) to foster better understanding and tolerance of the religious rites and activities conducted at the proposed place of worship;
 - c. Take all practicable measures when conducting religious activities/ceremonies in the premises to minimise any potential disamenities posed to the neighbouring residential premises; and
 - d. Work with the relevant authorities and agencies to co-manage any feedbacks from residents, including implementing additional abatement measures where feasible to mitigate any potential disamenities posed by the religious rites and activities.
- v) The said Development shall comply with all the applicable requirements and provisions of the Singapore Standard on the Code of Practice for Pollution Control (i.e. SS593:2013), the Code of Practice on Environmental Health, the Code of Practice for the Control of Legionella Bacteria in Cooling Towers, the Guidelines on Boundary Noise Limits for Air-Conditioning and Mechanical Ventilation Systems in Non-Industrial Buildings, the Environmental Protection and Management Act, the Environmental Public Health Act, the Energy Conservation Act, and their Regulations.
- vi) Under the Environmental Protection and Management (Control of Noise at Construction Sites) Regulations, construction sites within 150 m of residential estate need to comply with the more stringent noise limits at construction stage especially during night time hours, Hence, the Successful Tenderer shall implement noise control measures during the construction period to ensure that the noise emission levels from the building and construction activities are within noise limits and would not cause nuisance to any nearby residents. In addition, construction activities are not allowed from 10pm on Saturday and eve of public holiday to 7am on the following Monday and the day after the public holiday respectively.

9.0 REQUIREMENTS OF FIRE SAFETY AND SHELTER DEPARTMENT (FSSD), SINGAPORE CIVIL DEFENCE FORCE (SCDF)

SCDF requires the Successful Tenderer to comply with the Fire Safety Act and Regulations, the prevailing "Code of Practice for Fire Safety Precautions in Buildings" (Fire Code), the relevant Codes of Practices and 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 when applicable:

- i) To consult SCDF on the specific design requirements if the premises is to store, handle, use, transport or import of hazardous materials, which may have impact within the premises or on the surrounding existing or new developments. SCDF may impose the Quantitative Risk Assessment study (QRA) and/or additional Fire Safety requirements, or disapprove such proposal if there is possible impact within the premises or on the surrounding developments.

- 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 said Development shall not affect other existing surrounding developments (neighbouring) such as their exit provision, sidelane / backlane, window openings [the unprotected openings requirements, i.e. the Successful Tenderer and their 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 FSSD (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 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 and 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.
- v) For new road development (including road widening, realignment, road expunction & interim measures, etc.), it shall not affect or encroach upon any part of existing development compounds. For public fire hydrant, do liaise with PUB directly for any proposed relocation or erection of new fire hydrant.
- vi) For drainage systems development (including widening, realignment, extension and interim measures, etc.), they should not affect or encroach upon any part of existing development compounds.
- vii) Before making any commitment (purchase/occupation or rental/lease, etc.) or commencement of any proposal, the Successful Tenderer shall engage a QP to carry out a feasibility study to ensure the entire premises and new proposals are able to comply with all the Fire Safety requirements (the Fire Code & other relevant standards/guidelines/circulars). The feasibility study shall also ensure those existing fire safety provisions of surrounding developments are not affected. The QP will then assist them to obtain the FSSD's Plan Approval and the FSC. If the Successful Tenderer has any doubts or queries regarding the fire safety requirements or plan approval procedures, he shall visit the FSSD at SCDF Headquarters, 91 Ubi Ave 4, for a walk-in consultation.

10.0 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 said 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 said Land to serve the said Development. The Successful Tenderer shall be deemed to have included in his tender price for the construction of the electrical substation(s).

11.0 TELECOMMUNICATIONS

- i) The Successful Tenderer shall liaise with the Telecommunication System Licensee authorised under the Telecommunication Act, for the telecommunication supply to the said 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 said 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.

- iii) The Successful Tenderer is advised to consult the relevant Telecommunication System Licensees (e.g. Singapore Telecommunications Ltd, StarHub Ltd, StarHub Cable Vision Ltd, SP Telecommunications Pte Ltd, etc) early during the planning stage of the said Development, on the location and diversion of existing Telecoms services.
- iv) The detailed Telecoms facilities plans for the said Development shall be submitted to and duly verified by Telecommunication Facility Co-ordination Committee (TFCC) through the CORENET esubmission system, and approved by the IMDA prior to the commencement of works.

12.0 GAS

- i) The Successful Tenderer shall liaise with the City Gas Pte Ltd on the requirements for gas supply to the said Land.
- 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 identified gas main 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. 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.

To: Agencies/ Developers/ Qualified Persons/ Contractors

PUB (WSN) ADVISORY NOTE- PREVENTION OF DAMAGE TO WATERMAINS

Our records show that there are existing watermains within and in the vicinity of your development lot. The Developer / Contractor is required to notify/obtain a written clearance from PUB (WSN) before carrying out any earth work/ piling work/ building work at the site, satisfying all the Conditions and Requirements set hereunder.

Works within the protection corridor of watermains < 300mm diameter require only a notification. There is no necessity to await PUB's response upon notification with the required declaration (Appendix 4) and supporting documents (1.A to 1.E) before commencement of work.

For works within the protection corridor of watermains \geq 300mm diameter, PUB will review the submissions within 14 working days, and if the declaration (Appendix 4) and all the documents (1.A to 1.E) are in order, grant in-principle clearance for the Works. **NO WORKS ARE TO COMMENCE UNTIL CLEARANCE HAS BEEN GRANTED BY PUB, to do so.**

Penalties under PUB Act/ Regulations

We would like to draw your attention to Section 57 of the Public Utilities Act which stipulates a duty to enquire on water mains if any person wishes to carry out any work in the vicinity of watermains. We wish to highlight that under Section 47A of the Public Utilities Act, any person who, whether wilfully or otherwise, removes, destroys or damages or causes or permits to be removed, destroyed or damaged, any watermains belonging to or under the management or control of the Board, shall be guilty of an offence and shall be liable on conviction to a fine not exceeding \$40,000 or to imprisonment for a term not exceeding 3 months or to both; or if the watermains is 300 mm or more in diameter, to a fine not exceeding \$200,000 or to imprisonment for a term not exceeding 3 years or to both.

Under the Public Utilities (Protection of Water Pipes Infrastructure) Regulations 2017, which stipulates that for water pipes smaller than 300mm, the QP/PE/contractor shall notify PUB before commencement of the works. No approval by PUB is needed. For water pipes equal to or larger than 300mm, the QP, PE or contractor shall submit an application to PUB and obtain PUB's approval before commencement of works. Any person who is guilty of an offence under the Regulation shall be liable on conviction to a fine not exceeding \$10,000 and, in the case of a continuing offence, to a further fine not exceeding \$250 for every day or part of the day during which the offence continues after conviction.

For more information of the Public Utilities Act and Regulations, please refer to <http://statutes.agc.gov.sg/>.



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Mandatory requirement before commencement of works

Our records show that there are existing watermains within and in the vicinity of your development lot. A copy of the **Watermains Plan** is attached, for your reference ONLY.

Where the proposed works are to be carried out within a watermain corridor (see para 4. A and 4. B), the Developer/ Contractor shall notify and obtain the written approval from PUB before the carrying out of any activity.

The below requirement are deemed necessary and must be carried out by you, failing which PUB's clearance will not be granted:

1.A	Declaration form by QP. Refer to Appendix 4.
1.B	Detailed method statement and drawings for the construction works, details of the machinery/equipment used with analyses / assessment to demonstrate that the construction method proposed will not cause any impact or damage to the watermain. Include PE endorsed design for the support of watermain and joints in case of the necessity to exposure the watermains (see para 6. G).
1.C	Construction Impact Assessment Report (CIAR) - The QP is to carry out a construction impact assessment of the construction effects of the works on the watermains in the vicinity of the works and submit the report to PUB. Refer to para 6. B for detail.
1.D	Instrumentation and monitoring plan of all the watermains that in the QP's view are likely to be affected by the works. Refer to para 8. A to H for detail.
1.E	PUB would require the owner/developer/contractor to install surveillance cameras for works within watermain setback distance (see para 3. B) for watermains \geq 900mm diameter (see para 9. A and B).

Who to make the submissions for the proposed works to PUB(WSN)

Before commencement of works, the owner/developer shall engage a Qualified Person to undertake the design and make and endorse all submissions to PUB.

For activities requiring BCA approval

- the QP is the PE appointed by the contractor/person carrying out activity

For activities not requiring BCA approval

- the QP is the PE appointed by the contractor/person carrying out activity, or
- contractor/person carrying out activity where PUB has dispensed the need for PE

The Professional Engineer shall have registered with the PE Board, Singapore and possess a valid practicing certificate.



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How to make the submissions for the proposed works to PUB(WSN)

Submissions shall be made via email to PUB_WSN_Surveillance@pub.gov.sg or via PUB's Online Submission Portal, Protection of Water Pipes and Sewers (POWS). POWS serves as a centralised portal for processing of submissions by Qualified Persons/Professional Engineers/Contractors prior to carrying out specified activities near water pipes and public sewers.

- The link to POWS is as follows: <https://bpu.pub.gov.sg/pows>.
- SingPass login is required to access the portal.

Contact for Enquires on the submission to PUB(WSN)

For submissions/enquiries on protection of water pipes, you may send an email or call the following officers:

- Potable Water/NEWater/Industrial Water pipelines at Northern & Eastern areas – Mr Delvis Chew at delvis_chew@pub.gov.sg or DID 96604443
- Potable Water/NEWater/Industrial Water pipelines at Central & Western areas – Mr Chu Guang Sing at chu_guang_sing@pub.gov.sg or PUB_WSN_Surveillance@pub.gov.sg or DID 82988420
- Raw Water pipelines – Mr Roderick Ho at roderick_ho@pub.gov.sg or DID 65172916
- General enquires – PUB_WSN_Surveillance@pub.gov.sg



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Appendix 1

Duty and Responsibility to locate and positively identify PUB watermains

2. A The information of the watermains on this plan is valid as at date plotted and is given without any liability for any error, mis-statement or omission therein. Positions of watermains as shown in the plan are **approximate** only. Smaller submains and connections to customers' premises /properties are not indicated in this PLAN.

2. B The exact locations and depths of all watermains (including the smaller submains and connections), must be positively identified by you on site by means of trial holes conducted using manual excavation. The presence of water meters nearby indicate the presence of connections and these pipes shall be positively identified on site by trial holes. The alignment of the watermains must be pegged on site, so that the alignment is clearly visible and appropriate protection measures can be adopted.

2. C Do have proper protection for our existing watermains during excavation. PUB's watermains are not to be exposed, suspended or otherwise interfered with without prior approval from PUB. All exposed watermains should have a PE's certification on the design for supporting the existing watermains.

2. D Our watermains and appurtenances must be accessible for maintenance and repairs at all times. All chambers and appurtenances within the construction site should be clearly demarcated, suitably protected and hoarded up. Under no circumstances, shall any earth spoil or debris or any construction activities cover our chambers and appurtenances. All other necessary precautions must be taken by the contractor to safeguard and to avoid the damage to the watermains.

2. E The alignment of the watermains must be pegged on site, so that the alignment is clearly visible and appropriate protection measures can be adopted. You shall reconfirm the alignment of the watermains before reapplying missing or faded pegs and surface markers on the ground or inside trench.

2. F You shall update the peggings / markings at the worksite after the carrying out of any watermain diversion, decommissioning of watermains or commissioning of new watermains. You shall brief all worksite personnel of the new positions of the watermains.

2. G Trial trenches conducted may not locate the watermains, as shown on the plan. This does not mean that the watermain is not there. The watermain may be the deeper than the depth of the trial holes. The Developer/ Contractor shall then undertake geophysical or other methods to positively identify and locate all the watermains, shown on the plan.

2. H Please contact PUB officer in-charge for assistance if you are unable to detect the exact locations of the watermains on site.



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General Requirements

3. A No structure, including rigid pavement either permanent or temporary shall be erected over our watermains. Our buried watermains require a minimum cover of one metre, and you must not at any time increase, reduce or remove this, without our approval. The Developer/ Contractor is required to provide adequate protection for our watermains.

3. B No structure either permanent or temporary shall be erected over or within the below minimum setback distance from the watermain.

WATERMAIN SETBACK DISTANCE CLEARANCE REQUIRED

Watermain Diameter (mm)	Nett Clearance Required
100 to 600 (depth ≤ 3m)	1.0m from outer edge of any structure to centreline of water pipe
100 to 600 (depth > 3m to 5m)	1.5m from outer edge of any structure to centreline of water pipe
150 to 600 (depth > 5m)	2.0m from outer edge of any structure to centreline of water pipe
> 600 to 1500	2.5m from outer edge of any structure to outer edge of water pipe
> 1500 to 2200	3.0m from outer edge of any structure to outer edge of water pipe
> 2200, Tunnels or Tunnelled pipes	4.0m from outer edge of any structure to outer edge of water pipe

3. C All services must undercross our watermains. Services undercrossing our watermains shall be protected throughout the entire width of the undercrossing section and a minimum clearance of 1 metre all-round the pipe must be provided.

3. D No heavy machinery or vehicles shall be driven over PUB watermains. Where vehicles need to cross any existing watermains, adequate protection would have to be installed e.g. use of steel plates over the ground with sufficient earth cover of 1m minimum, above the pipes for load distribution during construction access. There shall be no stacking and storage of materials or parking of vehicles directly above the watermains.

3. E PUB will not be held responsible for any damage or injury caused to any persons, property, road, etc as a result of watermain leakage due to the Developer/Contractor’s works. The Developer/Contractor shall be fully liable for any damage caused to adjacent property whether public or private as a result of any leakage from the watermain due to his works. The Developer/Contractor shall undertake all repairs to the adjacent property at his own costs and reimburse the owners directly for any consequential claims or expenses claimed by them. The

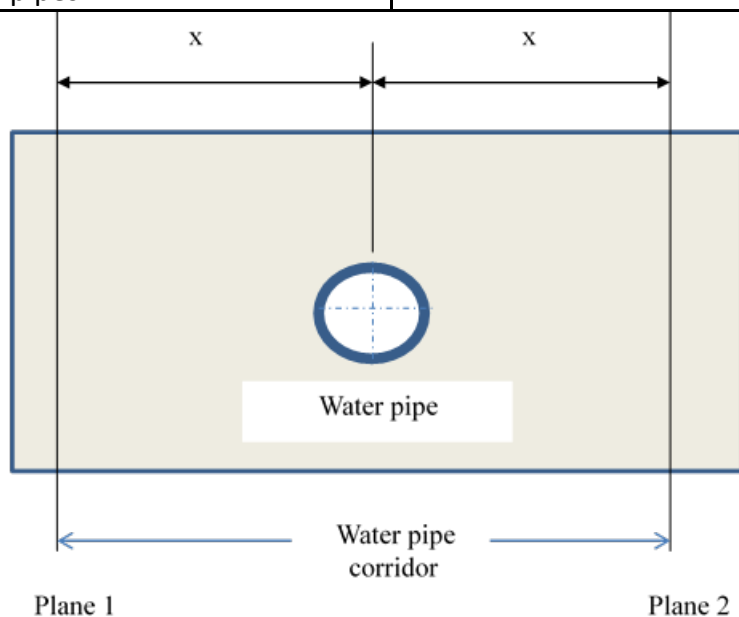
Developer/Contractor will also be required to indemnify PUB against all losses and claims arising from damage to watermains.

Verification of Proposed Works within Watermain Corridor

4. A After positively identifying existing watermains on site (including its depth and alignment), the Developer/ Contractor shall assess whether if the proposed works lie within the water main corridor, as indicated in the Table below.

4. B The water main corridor as set by PUB, is the distance between two vertical planes, on either side of the centreline of any watermain, as specified in the table below.

Water Pipe	Distance X on either side from the centreline
<900 mm Diameter	10 metres
≥ 900mm Diameter	20 metres
Tunnels and Tunnelled pipes	40 metres



Watermains Diversion for Proposed Works within Watermain Corridor

5. A The Developer / Contractor shall consult PUB at the earliest opportunity during the design stage on the handling of the affected watermain. The Developer / Contractor shall arrange for site meetings with PUB to seek PUB’s comments on whether the affected watermain should be diverted or remain in its original position with adequate protection measures implemented. If deemed necessary by PUB, the affected watermain shall be diverted out of the watermain corridor and the Developer / Contractor shall be responsible for engaging a Licensed Plumber / Contractor to carry out the diversion works according to PUB’s pipe-laying specifications. If PUB



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deems that diversion of the affected watermain is not feasible, the Developer / Contractor shall make necessary modifications or design changes to his works such that the watermain is either no longer affected or adequately protected by appropriate measures.

5. B If PUB deems that that the proposed works (whether within or outside of the watermain corridor) impose risks or constraints on the future operation, maintenance or repair of the watermain, PUB may direct the Developer/ Contractor to divert the watermain or make necessary modifications or designs changes to his works.

5. C In general, watermains of 500mm in diameter and above are considered critical and shall not be diverted unless absolutely necessary.

5. D The cost of all abovementioned diversions, modifications and design changes to proposed works, as PUB may direct, shall be borne by the Developer / Contractor.

Responsibilities Required from Qualified Persons

6. A The developer/contractor's QP shall submit for the information of PUB the procedures and methods for all excavation and other construction works within the entire corridor of the watermains to prevent damage to the watermains during the work. See para 1. A to 1. E.

6. B Construction Impact Assessment Report (CIAR) - The QP is to carry out a construction impact assessment of the construction effects of the works on the watermains in the vicinity of the works and submit the report to PUB. The report shall include the following details:

- (i) The ground conditions, geotechnical profiles and relevant borehole logs.
- (ii) The proposed construction equipment and methods, and sequencing of construction.
- (iii) Assessments on the use of the proposed construction equipment /methodology on the existing watermain, vibrations, ground displacements and groundwater draw downs and how the impacts would be mitigated to meet requirements. (See para 6. C to F)
- (iv) The damage potential and risks to the watermains.
- (v) Preventative and precautionary measures to protect the watermains from damage and remedial measures to be taken in the event of damage/incidents.

6. C Equipment Vibrations - Construction activities such as piling, excavation, soil improvement, diaphragm wall and retaining wall construction etc and the use of construction equipment such as piling/boring machine etc shall not subject the watermain to a peak particle velocity (PPV) exceeding 15 mm/s at any frequency. The QP shall provide a detailed impact assessment that clearly demonstrates the vibration attenuation for each of the equipment proposed to be used at the development site and in similar ground conditions to show that this vibration limit would not be exceeded on the existing watermains.

6. D Groundwater Drawdown – The developer/contractor's QP shall confirm that there will not be any groundwater drawdown in the vicinity of the PUB watermain. If there is drawdown



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of groundwater, the developer/contractor's QP shall propose mitigation measures.

6. E For Cement-lined Steel and Cement-lined Ductile Iron pipes:

In general, the allowable limits are as follows:

1. longitudinal deflection – not exceeding $L / 250$ or 20mm whichever is lesser, where L is defined as the calculated length of sagging pipe section, at ends of which there will be no expected horizontal nor vertical movement.
2. diametrical deformation – not exceeding 2% of the pipe diameter
3. The total stress on the pipe at any point (including existing stress and additional stress due to the proposed works) shall not exceed 133 N/mm^2 .

6. F For Cement-lined Cast Iron Pipes (with lead-caulked pipe-joints):

All cast iron pipes are assumed to take zero longitudinal deflection and zero diametrical deformation. This is because existing cast iron pipeline are old and due for replacement. They cannot be subject to any additional loading/ stresses. Development near a cast iron pipeline must be designed to prevent any increase in stress / strain to the pipeline.

6. G If water pipes are required to be exposed and supported to facilitate construction works, QP needs to provide PE endorsed design for the utility support. The watermain should be supported by box-in structural design that can fix the pipe rigidly on all 4 sides to prevent movement/deflection of the water main, especially at the spigot & socket or welded joint positions. Please provide wooden wedges or rubber shims in between the supports and pipe to further prevent any movement and damages to the pipes once the metal supports are in place. Extra precaution should be taken at the pipe bends due to additional thrust force at pipe bends.

6. H You shall not dig any trial holes in the vicinity of watermains without the written consent from PUB. You shall comply with any additional requirements that may be imposed by PUB.

6. I The QP shall advise PUB on the likely risk to the watermain and his proposed mitigating measures for preventing the water mains from damage to the satisfaction of PUB.

6. J If there are changes to the schedule for the carrying out of the work or changes in the work method, the QP shall study the implications, review the earlier impact assessment that had been carried out and promptly notify PUB if there are any changes to such earlier assessment.

Good Practices at Worksite

7. A You should provide full-time site supervisor to monitor the worksite operations for the entire duration of any work. You shall ensure that the site supervisor is familiar with these requirements.

7. B You shall ensure that daily site briefings with all worksite workers are conducted (in languages that are understood by all workers) to remind them about the location of the watermains and the measures to be taken to prevent damage to the watermains. You shall keep



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records of such daily briefings (which shall include but are not limited to date and time, venue and person conducting the briefings, contents of briefings and the list of worksite workers who have attended such briefings). You shall also disallow any worksite worker who has not attended such briefings from being involved with any part of the intended work. New staff must be briefed before they start work.

7. C You shall inform PUB officers of the identity of the Worksite management/ QP(S)/ Provisional Registered Excavator Operator (PREO)/ Registered Excavator Operator (REO), the proposed methods of carrying out of the work and/ or location of the proposed work. You shall also inform PUB officers if there are any changes to the above.

7. D You shall ensure that information on the presence of watermains in the vicinity of the worksite and all mitigation measures to be taken to prevent damage to such watermains have been communicated and adhered to by all personnel of all working levels in the project team, including sub-contractors and any third party who are in any way involved with any part if the intended work.

7. E You shall contact PUB if you find any live or abandoned watermains in the course of carrying out any work at the worksite which have not been shown in the Water Service Plan.

7. F You shall provide adequate lighting if the work are to be carried out at night.

7. G You shall engage only a REO or PREO to operate a powered mechanical excavator.

7. H You shall ensure that powered mechanical excavation is only used, under the close standing supervision of a full time site supervisor, when working near or above any watermain.

7. I You should implement a PTW system to monitor and ensure that all Earthworks are properly tracked and controlled if such Earthworks are to be carried out in the vicinity of watermains. Under the PTW system, such Earthwork shall be approved by the manager of the project or his authorised deputy. You shall periodically audit the PTW system for its effectiveness.

Instrumentation and Monitoring

8. A The QP shall include in the monitoring plan of all the watermains that in his view are likely to be affected by the works.

8. B The QP's method statement shall include the proposed monitoring intervals and all requirements imposed by PUB.

8. C The QP shall be responsible for ascertaining and setting the safe limits (including alert level and work suspension level) of ground movements, vibration levels or other changes for ensuring the structural integrity and proper functioning of all watermains. He shall provide comprehensive basis for the proposed safe limits. See para 6. C to F.



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8. D The QP shall verify and certify by monitoring that the permissible limits set for deformation and vibration are not exceeded.

8. E It shall be clearly understood that the submissions of the instrumentation monitoring results and reports to PUB are only for PUB's information. The QP shall be fully responsible for the analysis and interpretation of all the readings and measurements and for taking all remedial measures where necessary. When abnormal readings or measurements are obtained, QP shall immediately investigate the causes of the abnormalities and take all necessary remedial measures. QP shall promptly inform PUB should such abnormalities be likely to affect the structural integrity of the watermain.

8. F Instrumentation monitoring regime consists of inclinometers, ground settlement markers, vibration meters, piezometers, strain gauges, rod extensometers, etc. shall be carried out by QP to check whether ground movements & vibration impacts are within allowable limits during the construction works. Records of the instrumentation monitoring regime shall be endorsed by the QP and properly maintained at the site, submitted to PUB or made available for inspection by PUB upon request. See para 6. C to F.

8. G The QP shall monitor and review the instrumentation monitoring results daily, looking out particularly for excessive ground movements that may cause damage to the watermains. The QP shall submit the instrumentation monitoring records to PUB weekly or at a frequency otherwise stipulated by PUB. QP shall highlight in his submission if there are any excessive ground movements monitored or any other abnormalities.

8. H The QP shall stop the works immediately if the instrumentation monitoring results exceed the allowable limits and inform PUB immediately. The QP shall assess the impact on the watermain and submit a report and proposed mitigation measures to PUB.



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Appendix 2

Additional Requirements for submission prior to Commencement of Works

9. A PUB would require the owner/developer to install surveillance cameras for works within watermain setback distance (see para 3. B) for watermains \geq 900mm diameter:

- (i) Owner/developer shall provide web-based IP surveillance cameras to continuously monitor construction activities in the vicinity of the large diameter (\geq 900mm) watermain. The number of cameras to be provided shall be approved by PUB and shall be sufficient to **cover the entire corridor** of the watermains.
- (ii) The surveillance cameras must be able to capture still pictures and perform continuous video recording.
- (iii) The owner/developer shall provide PUB with the Internet website address for centralized viewing of the still picture and video recordings of the construction activities above PUB watermains captured by the surveillance cameras.

9. B The owner/developer is required to submit their proposed designs and notify / obtain an approval from PUB before commencement of the works.

Protection of Watermains from Damages

10. A Please inform PUB 24 hours Call Centre at Tel No. 1800-CALL PUB (1800-2255 782) immediately in the event of damage to a watermains.

10. B You and/ or your workers shall not attempt to repair or modify any damaged watermain.

10. C Please take all necessary measures to prevent damage to our watermains and appurtenances in the course of your work. I have attached a copy of the "DOs and DON'Ts" (see Appendix 3), which provides the details on the protection requirements for proposed works carried out in the vicinity of our water mains, for your compliance.

10. D PUB shall be entitled to ask you to stop work with immediate effect in the event of non-compliance to this Advisory. PUB shall not be liable to you in any way for any losses, claims or damages arising from or in connection with such stop work requests.

10. E You shall comply with any requirements as reasonably prescribed by PUB in PUB's review and endorsement of the relevant method statement and any other documents submitted by you in relation thereto for the work.

10. F The cost to repair any watermains damaged as a result of work carried out is to be borne by the party which causes the damage. The party will also be billed for repair of the mains and the estimated quantities of water lost from the damaged main. The party will also be required to indemnify PUB against all losses and claims arising from damage to watermains.

Other Administrative Notes



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11. A These requirements are applicable to all persons who carry out any work and strict compliance is required, unless otherwise permitted in writing to PUB. Please consult PUB, if necessary.

11. B The requirement stated above are not exhaustive. Additional requirements may be issued from time to time by PUB. These additional requirements, together with the requirements in this Advisory, shall form the full list of requirements that must be complied with at all times. You are advised to carry out all necessary assessment and take all necessary precautions to prevent damage to any existing watermains.



Water for All: Conserve, Value, Enjoy

Appendix 3

DOs AND DON'Ts WHILST WORKING IN THE VICINITY OF WATERMAINS

DOs

- 1 Do write in to PUB, Water Supply (Network) Dept for the latest watermains plans.
- 2 Do trial holes to identify the exact location of existing watermains.
- 3 Do use manual excavation especially near watermains.
- 4 Do use pipe locators with the assistance of valve chambers and hydrants to identify the location of existing watermains.
- 5 Do consult PUB, Water Supply (Network) Dept on the location of the existing watermains when you are unable to locate them.
- 6 Do lay services such as cables, pipes with a separation distance of one meter from PUB existing watermains.
- 7 Do have proper protection for our existing watermains during excavation (PE certification on design of supporting existing watermains is required).
- 8 Do peg the alignment of the watermains within the worksite clearly with signages/visible markers.
- 9 Do install instrumentation (eg. ground settlement markers, vibration meters to be placed at site to monitor the impact of soil movement/ vibration to PUB water mains) for monitoring at the site.

DON'Ts

- 1 Don't allow heavy machinery to move over PUB watermains without adequate protection (eg steel plate).
- 2 Don't use excavator for trial holes to locate the existing water mains when near them. The last 0.5m must be checked by use of probes and manual excavation.
- 3 Don't lay sewer pipes on top of our existing watermains.
- 4 Don't construct any structures on top of our existing watermains.
- 5 Don't allow our valve chambers to be covered over with construction debris especially at worksites. Contact PUB, Water Supply (Network) Dept for PUB valve chambers at worksites to be raised to prevent them from accidentally being covered over. Our watermains and connections must be accessible for maintenance and repair works at all times;
- 6 Don't expose our watermains without prior approval from us.
- 7 Don't erect any structure either permanent or temporary over or within one metre from our watermains. Our buried watermain requires a minimum cover of one metre, and you must provide adequate protection for our main should the cover be removed or reduced by your works.



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Appendix 4

**Declaration by Qualified Person for Specified Activity
within Water Pipe Protection Corridor**

Particulars of Qualified Person

Name : _____

Role in Project : _____

Reference Number : _____

Firm Name : _____

Firm Address : _____

Telephone Number : _____

Extension : _____

Mobile Number : _____

Email Address : _____

I confirm that:

- (1) I am the qualified person for the project/ works.
- (2) All the existing and proposed buildings/ structures, piling works including temporary works for excavation and all the proposed and existing PUB water pipes are shown in the plans submitted with this application.
- (3) The proposed development/ works/ building/ structure is not directly over or above any PUB water pipe or encroached on any minimum setback distance between structure and water pipes as stipulated in the Code of Practice for Water Services or PUB (WSN) Advisory: Prevention of Damage to Watermains.

I will comply with PUB's requirement on "PUB (WSN) Advisory: Prevention of Damage to Watermains"

I also declare that I will take every practical measure to ensure that the proposed development/ works will not disrupt or affect any existing PUB water pipe. I will not commence any temporary work/ piling work/ building work within the pipe protection corridor for existing water pipes $\geq 300\text{mm}$ diameter until a written clearance from Water Supply (Network) Department, PUB has been obtained.

I hereby confirm that the details of the proposed development/ works will be submitted separately.

Name and Signature of Qualified Person

Date



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Particulars of Project	
Project Reference Number	
Project Title	
Location Description [include Lot/Plot, MK/TS, House No., Building Address, Road Name and Postal Code]	

Particulars of Application
<p>Application for approval is required only for the following works (as shown in a) that are within the Water pipes Protection Corridor (as shown in b), and the affected Water Pipe is equal for more than 300mm diameter (as shown in c). Application for approval is required regardless of pipe size if exposure of pipe is required (as shown in d).</p> <p>(a) Select type of works</p> <ul style="list-style-type: none"> <input type="checkbox"/> Building/ structure works <input type="checkbox"/> Excavation works for any building, structure, road, railway, MRT, bridge, viaduct, flyover, drains or sewer works, including trial trenches and soil investigation works <input type="checkbox"/> Water pipe, gas pipe, or cable laying works <input type="checkbox"/> Boring, dredging, levelling, or piling <input type="checkbox"/> Ground improvement works <input type="checkbox"/> Driving or sinking of any earth rod, casing or tube into the ground <input type="checkbox"/> Storage or placement of large construction equipment, construction materials and stockpiling of earth or heavy objects <input type="checkbox"/> Works with potential to cause groundwater drawdown or cause soil settlement (e.g. deep shaft excavation, tunnelling works, jacking works) <p>(b) Select Water Pipe Protection Corridor</p> <ul style="list-style-type: none"> <input type="checkbox"/> Work is within 10m of water pipe less than 900mm diameter <input type="checkbox"/> Work is within 20m of water pipe equal or more than 900mm diameter <input type="checkbox"/> Work is within 40m of water pipe tunnel <p>(c) Select affected Water Pipe diameter size</p> <ul style="list-style-type: none"> <input type="checkbox"/> Affected water pipe is less than 300mm diameter (no approval from PUB required) <input type="checkbox"/> Affected water pipe is equal or more than 300mm diameter (approval from PUB required) <p>(d) Select necessity to expose and support affected pipe for extended period of time (more than 1 day)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Affected water pipe will not be exposed during course of work <input type="checkbox"/> Affected water pipe need to be exposed and supported to facilitate work (approval from PUB required regardless of pipe size)
<p>Stage of Development Submission:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Pre-consultation/ Planning stage <input type="checkbox"/> BCA's Permit to Commence Building/ Structure works obtained <input type="checkbox"/> Works to be commenced within 1 month from application <p>Expected commencement date: _____</p> <p>Expected completion date: _____</p>

**Notification/ Application for Approval of Works Affecting
PUB Water Pipes
[Under Public Utilities (Protection of Water Pipes Infrastructure) Regulations 2017]**

Attachments	
This application is accompanied by:	Submission
<p>(a) For all works within the Water Pipe Protection corridor.</p> <p>All the below documents as attached:</p> <p>(1) Water Service Plan (WSP) showing the existing water pipes near or within the site.</p> <p>(2) Layout plan endorsed by QP showing the proposed buildings/ structure (including retaining and boundary walls and footings, drains etc) overlaid on the WSP. The plan shall indicate the minimum setback distance for the existing water pipes.</p>	<p>Yes / No</p> <p>Yes / No</p>
<p>(b) All the following documents have been submitted:</p> <p>(1) Detailed method statement and drawings for the works, details of the machinery/equipment used with analyses/ assessment to demonstrate that the construction method proposed will not cause any impact or damage to the watermain.</p> <p>(2) Construction Impact Assessment Report (CIAR) of the construction effects of the works on the watermains in the vicinity of the works. The report shall include the following details:</p> <p>(i) The ground conditions, geotechnical profiles and relevant borehole logs.</p> <p>(ii) The proposed construction equipment and methods, and sequencing of construction.</p> <p>(iii) Assessments on the use of the proposed construction equipment /methodology on the existing watermain, vibrations, ground displacements and groundwater draw downs and how the impacts would be mitigated to meet requirements.</p> <p>(iv) The damage potential and risks to the watermains.</p> <p>(v) Preventative and precautionary measures to protect the watermains from damage and remedial measures to be taken in the event of damage/incidents.</p> <p>(3) The CIAR must show that the following parameters (if applicable) satisfy PUB's requirement:</p> <p>(i) For cement-lined Steel and Cement-lined Ductile Iron pipes</p> <ul style="list-style-type: none"> o longitudinal deflection – not exceeding $L / 250$ or 20mm whichever is lesser, where L is defined as the calculated 	<p>Yes / No</p> <p>Yes / No</p> <p>Yes / No</p>

<p>length of sagging pipe section, at ends of which there will be no expected horizontal nor vertical movement.</p> <ul style="list-style-type: none"> ○ diametrical deformation – not exceeding 2% of the pipe diameter ○ The total stress on the pipe at any point (including existing stress and additional stress due to the proposed works) shall not exceed 133 N/mm². <p>(ii) For Cement-lined Cast Iron Pipes (with lead-caulked pipe-joints):</p> <ul style="list-style-type: none"> ○ All cast iron pipes are assumed to take zero longitudinal deflection and zero diametrical deformation. <p>(iii) The water pipes should not be subjected to vibration of peak particle velocity (PPV) exceeding 15 mm/s</p> <p>(iv) There should not be groundwater drawdown in the vicinity of PUB pipe. If groundwater drawdown is expected, please show estimated result</p> <p>(4) Instrumentation and monitoring plan of all the watermains that in the QP's view are likely to be affected by the works</p> <p>(5) If water pipes are required to be exposed and supported to facilitate construction works, QP needs to provide PE endorsed design for the utility support</p>	<p>Yes / No</p> <p>Yes / No</p>
<p>(c) Additional requirement for works within water pipe setback distance for water pipes equal or more than 900mm diameter.</p> <p>The owner/developer is required to submit their proposed designs and obtain an approval from PUB before commencement of the works.</p> <p>(1) Owner/developer shall provide web-based IP surveillance cameras to continuously monitor construction activities in the vicinity of the affected water pipes. The number of cameras to be provided shall be approved by PUB and shall be sufficient to cover the entire corridor of the watermains.</p> <p>(2) The surveillance cameras must be able to capture still pictures and perform continuous video recording.</p> <p>(3) The owner/developer shall provide PUB with the Internet website address for centralized viewing of the still picture and video recordings of the construction activities above PUB watermains captured by the surveillance cameras.</p>	<p>Yes / No</p>
<p>(d) Other relevant information (if any)</p>	<p>Yes / No</p>

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 the 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 washing 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 sites where public sewer is not available, sewage, used water and trade effluent shall be collected in holding 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 the Code of Practice for Pollution Control (i.e. SS593:2013).
- e) The construction site shall also comply with the earth control measures requirements as imposed by PUB.