

HANDBOOK ON APPLICATION FOR WATER SUPPLY

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SECTION 1 - GENERAL

1.1 Introduction and Scope of Handbook

- 1.1.1 The Water Supply (Network) Department of the Public Utilities Board is responsible for operating and maintaining the water mains and connecting pipes up to the water meter. Water service installations downstream of a water meter shall be maintained by the consumer.
- 1.1.2 This Handbook is specially prepared to assist Developers, Architects and Professional Engineers, Licensed Plumbers, Government Departments and Statutory Boards in their application for water supply. This handbook also provides general information on water supply matters which may be of interest to all consumers. For general enquiries on water supply matters, please email to PUB_One@pub.gov.sg.

1.2 Relevant Public Utilities Act and Public Utilities Regulations

The Public Utilities Act 2001, the Public Utilities (Water Supply) Regulations, the Public Utilities (Regulated Works and WSI Design Works) Regulations 2018, the Public Utilities (Tariffs for Water) Regulations and the Public Utilities (Protection of Water Pipes Infrastructure) Regulations 2017 set out the requirements of the Water Supply (Network) Department. This Handbook should be read in conjunction with the latest edition of the Public Utilities Act 2001, the Public Utilities (Water Supply) Regulations, the Public Utilities (Regulated Works and WSI Design Works) Regulations 2018, the Public Utilities (Tariffs for Water) Regulations and the Public Utilities (Protection of Water Pipes Infrastructure) Regulations 2017.

1.3 Singapore Standard 636 - Code of Practice for Water Services

The Singapore Standard 636 - Code of Practice for Water Services sets out the accepted standard of good practice in plumbing work. All plumbing work should comply with this code of practice which is available for sale online at <https://www.singaporestandardseshop.sg>.

SECTION 2 - WATER QUALITY, MODE OF SUPPLY AND TARIFFS

2.1 Water Quality and Drinking Water Standards

- 2.1.1 The quality of PUB drinking water is regulated by the Environmental Public Health (EPH) (Quality of Piped Drinking Water) Regulations 2008. The drinking water standards set out under the EPH Regulations were based on the World Health Organisation Guidelines for Drinking-water Quality.
- 2.1.2 Water is fluoridated.
- 2.1.3 The typical quality of drinking water is available on the PUB website at <https://www.pub.gov.sg>.

2.2 Water Pressure and Availability of Water Supply

- 2.2.1 The water pressure available at different parts of the Island varies depending on the elevation of the land and on the time of the day. Generally, the Water Supply (Network) Department maintains a water pressure capable of supplying directly to water fittings not exceeding 25 metres above mean sea level (m AMSL). This means that water supply to water fittings above this level has to be indirect via water storage tanks. The daily water pressure in the distribution system varies with the consumption pattern, being at the highest when the consumption is minimum and lowest when consumption is at the peak. The following modes of supply (as stipulated in Singapore Standard 636 - Code of Practice for Water Services) are to be adopted:

Height of Highest Fitting (Above Mean Sea Level)	Mode of Supply
a Not exceeding 25 m	Direct supply to fittings from PUB mains.
b Above 25 m but not exceeding *37 m	Indirect supply through high level water storage tank.
c Above 37 m	Indirect supply through low level water transfer tank with pumping to high level water storage tank.
(* Refers to height of inlet pipe to high level water storage tank.)	

- 2.2.2 The high level water storage tanks should be sized to be equivalent to the one day's water requirements.
- 2.2.3 For mode (c), which is to be adopted for water supply to premises and tall buildings beyond the reach of direct mains pressure, the water from the Authority's mains will flow through a meter / master meter to a low level tank

with float-operated valve control. From the low level tank, pumps (with duplicate in case of breakdown) will deliver the water to high level tanks of storage capacity equivalent to one day's water requirements to cater for breakdown and emergencies. The high level tanks are to be provided with compartments and the pipework so arranged to enable maintenance and cleaning to be carried out without interruption to the water supply. The low level tank shall be located such that the inlet to the low level tank does not exceed 37 m above mean sea level (AMSL). Where the inlet to the low level tank is between 25 m AMSL and 30 m AMSL, the storage capacity of the low level tank should be sized to be at least 1/5 of the daily water requirements. Where the inlet to the low level tank is above 30 m AMSL, the capacity of the low level tank should be sized to be at least 1/3 of the daily water requirements.

- 2.2.4 Notwithstanding the modes of water supply, water storage tanks should be provided for premises such as hospitals, industrial premises and other important installations for the purpose of maintaining a continuous and steady supply of water in the event of interruptions to the water supply. The owner of premises with the highest water fittings not exceeding 25 m AMSL is allowed to determine the storage capacity required. Where the owner decides to provide a storage capacity of less than one day's water requirements, the owner shall undertake to bear full responsibility for the water storage needed to meet the operational requirements of the premises and shall not hold the Authority responsible for any interruption of water supply.

2.3 Water Tariffs

- 2.3.1 The tariffs presently applicable to the various categories of consumers are as follows:
- a Domestic tariffs
 - b Non-domestic tariff
 - c Tariff for Shipping
- 2.3.2 The schedule of tariffs is subject to change by amending the Public Utilities (Tariffs for Water) Regulations made by PUB from time to time.
- 2.3.3 Should there be a change in use of premises from domestic to non-domestic or vice versa, the consumer is advised to write in to the Water Supply (Network) Department for a change in the tariff within 7 days from the date of such change in use.

SECTION 3 - GENERAL INFORMATION FOR OBTAINING WATER SUPPLY

3.1 Limited WSI Design Works, WSI Design Works, WSI Works

- a “Limited WSI design works” means the designing of any water service installation that is to be installed downstream of a meter, where the water service installation being designed does not include any pumping equipment or storage tank.
- b “WSI design works” means the designing of any water service installation that is to be installed downstream of a meter, and includes any limited WSI design works.
- c “WSI works” means any works on any water service installation including constructing, erecting, installing, maintaining, altering, repairing or replacing the water service installation.

3.2 WSI Design Works Requiring a Professional Engineer

- 3.2.1 WSI design works can be carried out by a Professional Engineer as prescribed in the Public Utilities Act 2001. Where the water service installation involves pumping equipment or water tank, the Developer / Customer shall engage a Professional Engineer to design the water service installation. The Professional Engineer is also responsible for the supervision of the WSI works carried out by the Licensed Plumber.
- 3.2.2 The details of scope of work by the Professional Engineer are outlined in Section 4.

3.3 Limited WSI Design Works and WSI Works Requiring a Licensed Plumber

- 3.3.1 Limited WSI design works and WSI works shall only be carried out by a Licensed Plumber as prescribed in the Public Utilities Act 2001. Developer / Customer shall engage a Licensed Plumber to design (if no pumping equipment or water tank are required), construct, erect, install, alter, maintain, replace or repair the water service installation within its premises to convey the supply of water from PUB.
- 3.3.2 For cleaning and disinfection of potable water storage tanks, a Licensed Plumber is also required to be engaged.
- 3.3.3 The details of the scope of work by the Licensed Plumber are outlined in Section 5.

3.4 Simplified Procedure

- 3.4.1 Under the simplified procedure introduced for the design and installation of water service installations within the customer's premises, Professional Engineers / Licensed Plumbers are responsible for the WSI design works, limited WSI design works and WSI works under their charge. They are not required to obtain PUB's approval and apply for PUB's inspection before turn-on of water supply.
- 3.4.2 The simplified procedure requires the Professional Engineers / Licensed Plumbers to notify PUB before commencement of WSI works by submitting the site plans and schematic drawings of the WSI design works / limited WSI design works. Upon completion of WSI works, Professional Engineers / Licensed Plumbers are required to submit a Certificate of Satisfactory Completion of WSI Works certifying that the works are completed in accordance with the Public Utilities Board's requirements including the Public Utilities (Water Supply) Regulations, Singapore Standard 636 – Code of Practice for Water Services, other Authorities' requirements and other statutory requirements.

3.5 Capital Contribution from Developer and Connection Fees

- 3.5.1 Developer will be advised whether a capital contribution is required from him for the laying of new water mains. Any capital contribution must be paid outright to PUB before mainlaying commences. The capital contribution is in addition to the water connection fees or costs to be paid by Developer for laying the connecting pipe from the PUB main to the meter position. Time taken for mainlaying and installing the water connecting pipe depends on nature and magnitude of the work.
- 3.5.2 Developers applying for water supply to their private property development need only pay a standard connection fee depending on the diameter of the connecting pipe to the development. The connecting pipe will then be laid from the PUB water main to the meter position after the payment is made.
- 3.5.3 Developers of multi-unit private property developments which do not fall under the ambit of the Land Titles (Strata) Act 1967 shall design and install mains, connections, pumping stations and elevated reservoirs within the development in accordance with PUB's requirements and for purposes of operation and maintenance, hand them over, together with the land (if required), to PUB free of charge. Vesting of the land, upon which such pumping stations and elevated reservoirs are located, to PUB shall be free of charge and free from encumbrances. In addition, the Developers will be charged the standard connection fee for the cost of connecting the mains laid by them to PUB main based on the standard connection fees in Section 3.5.2.

Note : Section 3.5.2 and Section 3.5.3 do not apply to developments on offshore islands and temporary water supply.

- 3.5.4 Full payment of the connection fees or the capital contribution (if required) must be made to PUB. Customers will receive a tax invoice / quotation letter from PUB indicating the payment amount to be made to PUB and the various payment options.

3.6 Diversion of PUB Water Mains

- 3.6.1 Diversion of existing water mains may be required if the existing mains are affected by the proposed development. Developer / Consultant shall consult PUB at the earliest opportunity during the design stage on the handling of the affected existing mains. The Developer / Consultant shall arrange for site meetings with PUB to seek PUB's comments on whether the affected existing mains should be diverted or retained in its original position with adequate measures proposed to protect and to facilitate maintenance and repair of the mains.
- 3.6.2 If the existing water mains within the proposed site are affected by the proposed development, diversion of water mains may be required. If deemed necessary by PUB, the existing mains affected by the proposed development shall be diverted by the Developer, who shall be responsible for engaging a Licensed Plumber / qualified water pipe laying contractor to carry out the diversion works in accordance with PUB's pipe laying specifications and standard requirements. The Developer shall also bear any cost incurred by PUB for the diversion works. The Developer / Consultant will have to make the payment to PUB for the diversion works before diversion commences. If PUB deems that diversion of the existing mains is not feasible, the Developer / Consultant shall make necessary modifications or design changes to the WSI works such that the existing mains is either no longer affected or adequately protected by appropriate measures.

3.7 Protection of Water Pipes Infrastructure

3.7.1 Background

The Public Utilities (Protection of Water Pipes Infrastructure) Regulations 2017 was introduced on 30 Jun 2017. These new regulations aim to establish clear protection requirements for PUB water pipes infrastructure and streamline the approval process for the construction industry. This includes clear definitions of what constitutes 'specified activity' and defining a 'protected' water pipe corridor. The water pipe corridor is defined and shown in Figure 1.

3.7.2 Responsible person (RP) for making submission

- 3.7.2.1 Before commencement of works, the Owner / Developer shall engage a RP to undertake the design, and make and endorse all submissions to PUB.
- 3.7.2.2 For activities requiring the Building and Construction Authority's (BCA) approval, the RP is the Qualified Person appointed by the contractor / person carrying out the activity.

3.7.2.3 For activities not requiring BCA's approval, the RP is the Professional Engineer appointed by the contractor / person carrying out activity, or the contractor / person carrying out the activity where PUB has dispensed the need for Professional Engineer.

3.7.2.4 The Professional Engineer shall be registered with the Professional Engineers Board Singapore and possess a valid certificate.

3.7.3 Specified activities

The list of specified activities which when carried out within the specified PUB protection corridors, can only proceed after the RP notifies PUB (for water pipe < 300 mm diameter) or obtains approval from PUB (for water pipe \geq 300 mm) of the detailed plans for the specified activity is as follows:

- a the carrying out of any earthwork for site formation, whether by excavation, filling or backfilling;
- b the excavation of any trench, well, pond or pool, or excavation for any underground structure which is more than 0.5 metre in depth;
- c the excavation of earth, rock or other material by means of explosives;
- d the carrying out of any ground exploratory or testing work, including through soil boreholes and geological surveys;
- e the installation of any foundation, sheet-pile, piled foundation, earth retaining or stabilising structure, ground anchor, horizontal tie-back, or any other similar installation;
- f the carrying out of any ground stabilising work, including jet grouting, soil compacting and ground freezing;
- g the carrying out of any tunnelling, excavation work or jacking work;
- h the erection of any temporary or permanent structure, including any site office or show flat;
- i the installation of any heavy construction machine or plant, including the stacking and installation of any concrete block for pile testing;
- j the installation of any container box;
- k the planting of any tree or vegetation, or the carrying out of any landscaping activity; and
- l the stacking or transportation of any heavy material.

3.7.4 Obligations relating to specified activity

3.7.4.1 A contractor who is engaged in or is to carry out any specified activity within a part of a water pipe corridor through which a water pipe with a diameter of at

least 300 mm runs must ensure that the activity is carried out in accordance with an approved plan (including any amendment permitted to the plan) for the activity.

3.7.4.2 A contractor who is engaged in or is to carry out any specified activity within a part of a water pipe corridor through which a water pipe with a diameter of less than 300 mm runs must:

- a ensure that the activity is carried out in accordance with a plan for the activity (including any amendment to it) notice of which has been given to PUB; and
- b ensure that at least 28 days have elapsed starting from the date on which the notice was given to PUB, before the activity is carried out.

3.7.5 Application for approval of plan / notification for specified activity

3.7.5.1 An application made to PUB for the notification or approval of the plan for any specified activity within a water pipe corridor shall include:

- a a declaration form signed by the RP;
- b a method statement detailing how the specified activity is proposed to be carried out;
- c an impact assessment report on the water supply system running through the water pipe corridor;
- d instrumentation and monitoring plan of all the water pipes that are likely to be affected by the works;
- e IP surveillance CCTV plan for works within setback of pipes \geq 900 mm diameter; and
- f such other plan, information, technical report, certificate and document as PUB may require.

3.7.5.2 Other technical requirements will be advised during the pre-planning consultation stage.

3.7.6 Enquiries

Any enquiry on the requirement for protection of water pipes should be made to PUB_WSN_Surveillance@pub.gov.sg

3.8 Turn-on of Water Supply

When WSI works are satisfactorily completed and duly certified by Professional Engineers / Licensed Plumbers, the Customer / Owner will need to open an account with SP Services Ltd (SP) for turn-on of water supply. This can be done through SP's online portal or at any of SP's Customer Service Centres. A list of SP's Customer Service Centres and the details of opening a utilities account can be obtained from SP's website. Thereafter, the Professional Engineers or Licensed Plumbers can liaise with PUB to schedule a date / time to install the water meter.

3.9 Random Checks by PUB

- 3.9.1 After the water supply is turned-on, PUB will carry out checks on completed water service installation on a random basis. Where the water service installation is found to be not in compliance with the requirements specified, PUB will require the Professional Engineer / Licensed Plumber or the Owner / Developer or Customer to alter, repair or rectify the water service installation as required by PUB.
- 3.9.2 PUB will not be liable for any cost or expense incurred by Owner / Developer or Consumer to alter, repair or rectify the water service installation to the manner required by PUB.
- 3.9.3 PUB will have the right to refuse to connect its supply to any new water service installation or to disconnect from its supply any existing water service installation which does not conform to the requirements specified in Section 3.9.1 until such time as the requirements are complied with.

3.10 Maintenance of Water Service Installations

- 3.10.1 A water service installation shall be maintained:
 - a for so long as such water service installation is connected to receive water supplied by PUB; and
 - b by the following persons:
 - (i) in respect of the water service installation between the master meter and the sub-meter, by the consumer who is liable to pay for the consumption registered by the master meter;
 - (ii) in respect of the water service installation after the sub-meter, by the consumer who is liable to pay for the consumption registered by the sub-meter; and
 - (iii) in respect of the water service installation after the meter (not being a master meter or a sub-meter), by the consumer who is liable to pay for the consumption registered by the meter.

- 3.10.2 Any person who is required under Section 3.10.1(b) to maintain any part of a water service installation shall:
- a maintain and ensure the security of that part of the water service installation in accordance with these Regulations (refer to Section 1.2) and any applicable requirement specified in the PUB S&R Standard¹; and
 - b notify PUB immediately of any contamination of water in that part of the water service installation which comes to his knowledge.

3.11 Annual Inspection and Certification of Water Storage Tanks

For any part of a water service installation having any water storage tank, except in residential premises without master meter, the consumer responsible for the maintenance of that part of the water service installation is required to engage at least once every 12 months (or such longer period as PUB may allow in any particular case), a licensed plumber to inspect, and where necessary, to clean and disinfect the water storage tank and certify that:

- a the storage tank is fit and safe for the storage of piped water suitable for drinking (excluding NEWater);
- b the water contained in the storage tank is free from contamination or pollution and that there is no likelihood of such contamination or pollution;
- c water samples taken from the storage tank pass the appropriate chemical and bacteriological examinations;
- d the storage tank is properly maintained; and
- e there is no leakage and no likelihood of leakage in the water service installation, including the storage tank.

For cleaning and disinfection of storage tanks, the procedures stipulated in Annex A of the Singapore Standard 636 shall be adopted.

3.12 Security of Water Storage Tanks

- 3.12.1 A person responsible for the security of a water service installation having a storage tank from which piped water suitable for drinking (excluding NEWater) is drawn must ensure that:
- a the storage tank (including any tap fitted to the storage tank) and its appurtenances; and

¹ "PUB S&R Standard" means the document known as "PUB's Stipulation of Standards & Requirements for Water Fittings for Use in Potable Water Service Installations" published by PUB, as in force from time to time. A copy can be downloaded at <https://www.pub.gov.sg/compliance/watersupplyservices/standards>.

- b the premises where the storage tank and its appurtenances are located, are secured against unauthorised access and tampering.

3.12.2 Subject to Subsection 3.12.3, a person (A) responsible for the security of a water service installation having a storage tank from which piped water suitable for drinking (excluding NEWater) is drawn must ensure that:

- a no person, except with A's authority, has access to:
 - i the storage tank (including any tap fitted to the storage tank) and its appurtenances; or
 - ii the premises where the storage tank and its appurtenances are located;
- b the storage tank (including any tap fitted to the storage tank) and its appurtenances, and the premises where the storage tank and its appurtenances are located, are kept properly locked at all times;
- c checks are conducted regularly for the purpose of ascertaining whether paragraph (b) is being complied with;
- d proper records are kept of:
 - i persons granted access to the storage tank (including any tap fitted to the storage tank) and its appurtenances, or the premises where the storage tank and its appurtenances are located; and
 - ii checks conducted under paragraph (c), and that such records are made available for inspection by an authorised officer; and
- e PUB is notified without delay of any unauthorised access to the storage tank (including any tap fitted to the storage tank) or its appurtenances which comes to A's knowledge.

3.12.3 The requirements in Section 3.12.2 are not applicable to a person responsible for the security of a water service installation which does not take its water supply through a PUB master meter.

3.12.4 For water tanks in developments other than landed residential premises, Developer / Consultant / Owner shall ensure that all security measures stipulated in "Storage" in Singapore Standard 636 are complied with.

3.13 Water Supply to Landed Residential Premises

For landed residential premises with water fittings above 25 m AMSL, owners have the flexibility of deciding when they would like to install the water tank. Owners who opt to defer the installation of the water tank, however, must make the necessary provision now for the space and structural loading for installing the tank in future when necessary.

3.14 Water Storage Capacity

The following considerations affect the storage capacity:

- a the number of customers;
- b the type of building; and
- c the intended use of water in the building.

Each case should be judged based on its merits, but for general guidance, the estimated water requirements for various buildings can be found in the PUB website at <https://www.pub.gov.sg>.

SECTION 4 – SCOPE OF WORK UNDERTAKEN BY A PROFESSIONAL ENGINEER

4.1 WSI Design Works Undertaken by Professional Engineers

The type of WSI design works undertaken by Professional Engineers are given in Section 3.2. The procedure involves 6 stages as follows:

- a Pre-Planning Consultation with PUB (optional);
- b Submission of Notification of WSI Works before commencement of WSI works;
- c Payment for Capital Contribution, Connection Fees and Diversion Cost (if applicable);
- d Supervision of WSI works carried out by Licensed Plumber;
- e Submission of Certificate of Satisfactory Completion of WSI Works upon the satisfactory completion of WSI works; and
- f Liaise with PUB for the installation of water meter (if applicable).

4.2 Pre-Planning Consultation Stage (Optional)

4.2.1 Professional Engineers may consult PUB as early as possible on matters pertaining to the supply of water to the proposed development. Professional Engineers shall direct all enquiries to the Building Plan Division, Centralised Services Department.

4.2.2 The common issues that may be discussed during the pre-planning consultation stage include:

- a mode of water supply;
- b risk of contamination to PUB network through backflow;
- c water conservation measures;
- d availability of water mains in the development vicinity;
- e location of water meter; and
- f impact on existing mains and installation, etc.

4.2.3 Professional Engineers shall provide location and layout plans together with details such as:

- a estimated water requirements;
- b type of development;

- c phasing of development;
- d platform level of development;
- e reduced level of highest direct supply water fittings;
- f temporary water supply requirement during construction stage; and
- g approximate date of completion of project including date when water supply is expected to be turned-on.

4.3 Notification of WSI Works by Professional Engineers

- 4.3.1 Prior to the commencement of WSI works, Professional Engineer is required to submit a Notification together with a copy of site plan and a copy of the water reticulation system schematic drawing to PUB through the CORENET e-Submission System. The submission shall include the following information:
 - a estimated water requirements;
 - b particulars of the Licensed Plumber;
 - c type of development; and
 - d date of expected commencement and completion of WSI works.
- 4.3.2 Notifying PUB before commencement of WSI works is a mandatory requirement.
- 4.3.3 On receipt of the Notification of WSI Works, a reply will be sent to the Professional Engineer / Licensed Plumber with a copy to Customer / Developer. If applicable, a quotation indicating the cost of connection to be borne by the Customer / Developer will be attached to the reply.
- 4.3.4 In carrying out WSI design works, the Professional Engineer shall ensure that:
 - a the water service installation is designed in full compliance with the Public Utilities Board's requirements including the Public Utilities (Water Supply) Regulations, Singapore Standard 636 - Code of Practice for Water Services, other Authorities' requirements and other statutory requirements;
 - b potable water storage tanks shall not be located below sanitary pipes and other non-potable water pipes;
 - c all the water fittings installed in the water service installation shall be of the types that comply with standards prescribed / stipulated by PUB;
 - d no soldering shall be used for joining any water pipes / fittings;

- e only lead free materials shall be used for capillary joints;
- f all potable water tanks shall be watertight and there shall be no gap between the tank roof and wall;
- g all water conservation measures shall be adopted; and
- h private water meters to be installed in accordance with Section 9.2.

4.4 Supervision of WSI Works

Professional Engineer is required to supervise and ensure that the WSI works undertaken by the Licensed Plumber is carried out satisfactorily in compliance with the requirements.

4.5 Submission of Certificate of Satisfactory Completion of WSI Works

Within 7 days upon completion of the WSI works, the Professional Engineer shall inspect the water service installation and submit a Certificate of Satisfactory Completion to PUB to certify that:

- a he/she has supervised the construction of the water service installation and inspected the completed water service installation. He/she confirms that to the best of his/her knowledge and belief, the WSI works were carried out in accordance with the Public Utilities Board's requirements including the Public Utilities (Water Supply) Regulations, Singapore Standard 636 – Code of Practice for Water Services, other Authorities' requirements and other statutory requirements;
- b potable water storage tanks are not located below sanitary pipes and other non-potable water pipes;
- c all the water fittings installed in the water service installation are of the types that comply with standards prescribed / stipulated by PUB;
- d no soldering is used for joining any water pipes / fittings;
- e only lead free materials are used for capillary joints;
- f all potable water tanks are watertight and there is no gap between the tank roof and wall;
- g the water service installation and the associated electrical devices and equipment have been tested and are safe and acceptable for operation;
- h all water conservation measures have been adopted; and
- i private water meters to be installed in accordance with Section 9.2.

4.6 Turn-on of Water Supply

Where applicable, water meter will be installed upon receipt of the Certificate of Satisfactory Completion of WSI Works and after the Owner / Developer has opened an account with SP Services Ltd as described in Section 3.8.

4.7 CORENET e-Submission System

PUB is one of the agencies participating in CORENET e-Submission System. Professional Engineers are to make their submissions through the CORENET e-Submission System. Any enquiries on the e-Submission System can be made to CORENET's helpdesk at ess-helpdesk@nova-hub.com.

SECTION 5 – SCOPE OF WORK UNDERTAKEN BY A LICENSED PLUMBER

5.1 Limited WSI Design Works and WSI Works by Licensed Plumbers

The types of limited WSI design works and WSI works undertaken by Licensed Plumbers are given in Section 3.3. The procedure involves 4 stages as follows:

- a Submission of Notification of WSI Works before commencement of WSI works;
- b Payment for Connection Fees (if applicable);
- c Submission of Certificate of Satisfactory Completion of WSI Works upon the satisfactory completion of WSI works; and
- d Liaise with PUB for the installation of water meter (if applicable).

5.2 Notification of WSI Works by Licensed Plumbers

The procedure for notifying PUB of WSI works by Licensed Plumber is as follows:

- a prior to the commencement of WSI works, the Licensed Plumber is to submit a notification together with a copy of site plan (with proposed location of water meter) and a copy of the water reticulation system schematic drawing to PUB through the PUB's BPU portal at <http://www.pub.gov.sg/compliance/qualifiedpersonsportal/eservices/application>. Alternatively, the notification can be submitted through CORENET e-Submission System.
- b notifying PUB before commencement of WSI works is a mandatory requirement.
- c on receipt of the Notification of WSI Works, a reply will be sent to the Licensed Plumber with a copy to Customer / Developer. If applicable, a quotation indicating the connection fee to be borne by the Customer / Developer will be attached to the reply.

5.3 Payment for Connection Fees

Full payment of the connection fees or the capital contribution (if required) must be made to PUB. Customers will receive a tax invoice / quotation letter from PUB indicating the payment amount to be made to PUB and the various payment options.

5.4 Submission of Certificate of Satisfactory Completion of WSI Works

Within 7 days upon completion of the WSI works, the Licensed Plumber shall inspect the water service installation and submit a Certificate of Satisfactory Completion to PUB to certify that:

- a the water service installation was carried out in accordance with the Public Utilities Board's requirements including the Public Utilities (Water Supply) Regulations, Singapore Standard 636 - Code of Practice for Water Services, other Authorities' requirements and other statutory requirements;
- b potable water storage tanks are not located below sanitary pipes and other non-potable water pipes;
- c all the water fittings installed in the water service installation are of the types that comply with standards prescribed / stipulated by PUB;
- d no soldering is used for joining any water pipes / fittings;
- e only lead free materials are used for capillary joints;
- f all potable water tanks are watertight and there is no gap between the tank roof and wall;
- g the water service installation and the associated electrical devices and equipment have been tested and are safe and acceptable for operation;
- h all water conservation measures have been adopted; and
- i private water meters to be installed in accordance with Section 9.2.

5.5 Turn-on of Water Supply

Where applicable, water meter will be installed upon receipt of the Certificate of Satisfactory Completion of WSI Works and after the Owner / Developer has opened an account with SP Services Ltd as described in Section 3.8.

5.6 Temporary Water Supply

- 5.6.1 For temporary supply, the Developer / Customer must engage a Professional Engineer or a Licensed Plumber to carry out the WSI design works or limited WSI design works respectively. Thereafter, the Professional Engineer or the Licensed Plumber shall follow the same procedure of making the necessary submission of the Notification of WSI Works described in Section 4 and Section 5 respectively.
- 5.6.2 Upon completion of the WSI works, the Professional Engineer or the Licensed Plumber shall follow the same procedure of inspecting the water service installation and making the necessary submission of the Certificate of Satisfactory Completion described in Section 4 and Section 5 respectively.
- 5.6.3 For temporary water supply, besides opening of a utilities account with SP Services Ltd and the submission of the Certification of Satisfactory Completion by the Professional Engineer or the Licensed Plumber, the applicant must also obtain the necessary clearance from Water Reclamation (Network) Department, PUB before the temporary water supply can be turned-on.

5.7 Urgent Repair Work

- 5.7.1 Urgent repair work on defective pipes and fittings inside premises may be carried out by a Licensed Plumber without submitting the usual notification forms prior to proceeding with the urgent repair work.
- 5.7.2 The Licensed Plumber shall submit a Certificate of Satisfactory Completion of WSI Works not later than seven days after the completion of the urgent repair work.
- 5.7.3 "Urgent repair work" shall not mean extension or addition of extra fittings to the existing water service installation.

5.8 Extension of an Existing Water Service Installation

- 5.8.1 When a Licensed Plumber proposes to carry out an extension involving fixing of not more than one extra fitting, he may proceed with the work at his convenience, and upon completion, he shall submit a Certificate of Satisfactory Completion of WSI Works not later than seven days after the completion of the extension.
- 5.8.2 For extension of an existing water service installation and fixing of more than one extra fitting, the same procedure as provided in Section 5.2 to Section 5.5 shall be adopted by the Licensed Plumber.

5.9 Cleaning of Water Storage Tanks

Where a Licensed Plumber proposes to clean a water storage tank in any premises, the following procedure shall be adopted:

- a Prior to the commencement of WSI works, a Notification of WSI Works shall be submitted to PUB via BPU portal; and
- b Upon completion of the work, the Licensed Plumber is to submit the form for Inspection and Certification of Water Storage Tanks and the Certificate of Satisfactory Completion of WSI Works via the same BPU portal.

5.10 Minor Water Service Installation (WSI) works without prior notification to PUB

With effect from 1 Nov 2021, Licensed Plumbers are allowed to carry out selected minor WSI works without the need to submit prior notifications to PUB. However, a Certificate of Satisfactory Completion of WSI Works shall be submitted to PUB within 7 days of the completion of the above WSI works. The selected minor WSI works are as follows:

- a adding new tap points whereby there is already an existing piping network in the premises;
- b laying new water pipes to draw hot water from an existing storage water heater;
- c re-routing existing water pipes due to obstructions such as washing machine, etc;
- d altering a water point for a washing machine or a dishwasher to the correct position of the appliance's inlet; and
- e re-locating an existing storage water heater.

SECTION 6 - METERING REQUIREMENTS

6.1 Water Supplies to be Metered

Water supplied by PUB is metered. Except with the consent of the Water Supply (Network) Department, no supply of water will be given unless through a meter.

6.2 Meters

6.2.1 The following are the terms used to describe different functions of meters:

Type of Meter	Function
Meter	Any appliance or device supplied by PUB to measure, ascertain or regulate the amount of water taken or used from the supply of PUB.
Master-meter	Meter registering water all or part of which is subsequently registered by one or more sub-meters.
Sub-meter	Meter owned and maintained by PUB which registers all or part of any water which has already been metered since leaving the water main.

6.2.2 Every meter will be fixed and maintained by the Water Supply (Network) Department and will remain the property of the Water Supply (Network) Department.

6.2.3 All residential units must be metered individually for the water consumption.

6.2.4 A master and sub-meter scheme is applicable for multi-unit residential, commercial and industrial premises. Under this scheme, water is supplied to multi-unit premises through master meters which register the total volume of water used in the premises. The master meter account holder shall pay for the water charges based on the difference between the registration of the master meter and all the submeters, including leakages.

6.2.5 Any property with one assessment number will be granted one and only one meter. However, the following exceptions may be made:

- a If there are separate tenants occupying houses or apartments which have separate entrances, kitchens and bathroom facilities, one meter per house or apartment is permitted.
- b If a building is divided into entirely and absolutely separate apartments with separate entrances and if the same tariff is not applicable to all the apartments, then one meter per apartment is permitted.

6.3 Recommended Size of Meters Based on Monthly Consumption

The following table gives the recommended size of meters based on monthly consumption of water:

Size of Meter (mm)	15	25	50	100	150
Recommended Maximum Consumption (cubic metres/month)	130	700	5,000	20,000	45,000

6.4 Guidelines on Meter Positions

The position of the meter to be installed at any premises shall be determined by the Water Supply (Network) Department. Water meters shall be installed above ground. As a guide, the meter shall be installed in such a position that it can be easily accessed for meter installation, reading and maintenance work and at the same time its position should be unobtrusive. For new private landed housing developments, standard meter compartment as shown in Figure 2, shall be provided at the gate pillars. For renovation projects involving construction or reconstruction of gate pillars, customers are strongly encouraged to include this standard meter compartment at the gate pillars. Big meters of sizes 25 mm and above, fitted above ground and outside the building, should be housed in suitable brick or concrete chambers with drainage outlets. The chamber is to be constructed by and at the expense of the Developer / Owner. The design of the meter chamber shall comply with the requirements indicated in Singapore Standard 636.

SECTION 7 - WATER FITTINGS

7.1 Water Fitting Standards

- 7.1.1 Developer / Consultant / Owner / Professional Engineer / Licensed Plumber shall ensure that all water fittings to be used shall comply with the Standards and requirements stipulated by PUB and their use in water service installations shall conform to the Public Utilities (Water Supply) Regulations and Singapore Standard 636 - Code of Practice for Water Services.
- 7.1.2 A water fitting shall be deemed to comply with the stipulated Standards if it is tested as complying with such Standards by a testing laboratory accredited by the Singapore Accreditation Council (SAC) or its Mutual Recognition Arrangement partners. For more information, please visit SAC's website at <http://www.sac-accreditation.gov.sg>.
- 7.1.3 A list of the stipulated Standards and requirements which the water fittings shall comply with can be found at PUB's website at <https://www.pub.gov.sg>. If the Standards and requirements for a water fitting are not available, the Developer / Consultant / Owner shall approach PUB to stipulate the necessary Standards and requirements for compliance.

7.2 Mandatory Water Efficiency Labelling Scheme

7.2.1 Only water products and fittings that are labelled under PUB's Mandatory Water Efficiency Labelling Scheme (MWELS) shall be installed and used. The water efficiency ratings under the Scheme are as shown below:

Products / Fittings	Flow Rate / Flush Capacity Requirements	
	2-tick ✓✓	3-tick ✓✓✓
Shower Taps & Mixers (litres/minute)	> 5 to 7	5 or less
Basin Taps & Mixers (litres/minute)	> 2 to 4	2 or less
Sink/Bib Taps & Mixers (litres/minute)	> 4 to 6	4 or less
Dual-flush flushing Cisterns (litres per flush)	> 3.5 to 4.0 (full flush) > 2.5 to 3.0 (reduced flush)	3.5 or less (full flush) 2.5 or less (reduced flush)
Urinal Flush Valve & Waterless Urinals (litres per flush)	> 0.5 to 1	0.5 or less or waterless urinals
Water Closet (WC) Flush Valves (litres per flush)	>3.5 to 4.0	3.5 or less

From 1 Apr 2019, only fittings rated 2-tick and more are allowed for supply and installation.

From 1 Jan 2022, MWELS is extended to include WC flush valves with a flush volume of not more than 4.0 litres per flush, and only WC flush valves of 2-tick ratings or more are allowed for supply and installation.

A list of registered products can be found in PUB's WELS website at <http://www.pub.gov.sg/wels>.

7.2.2 All new and existing public sector premises are to achieve water efficient flow rates / flush volumes (please refer to PUB website at <https://www.pub.gov.sg> for information on water efficient flow rates / flush volumes). Such requirement is equivalent to installation of minimum 2-tick and 3-tick water fittings and wash basin taps respectively under the Mandatory WELS.

SECTION 8 - FIREFIGHTING SERVICES

8.1 Firefighting Service in Premises

- 8.1.1 The Water Supply (Network) Department shall be notified of the firefighting service in premises where such a service is necessary or expedient to enable water to be drawn from the PUB supply for the purpose of abating fire in such premises and where all necessary approvals have been obtained from the Fire Safety Department. Such firefighting service will have to include the provision of adequate storage tank or tanks, together with the necessary ancillary equipment, pipes and fittings to meet the flow and other requirements as specified by the relevant authorities.
- 8.1.2 The cost of the firefighting service including all connections to the PUB main will have to be borne by the Developer / Owner.
- 8.1.3 The design of firefighting system including private hydrants shall also comply with the mode of supply as stipulated in Singapore Standard 636 - Code of Practice for Water Services (see Section 6.6).
- 8.1.4 All pipes used for firefighting services shall be clearly differentiated for ease of identification.
- 8.1.5 In view of the fluctuation in pressure in PUB watermains, storage tanks with pumping equipment should therefore be provided to maintain a satisfactory firefighting service to meet the requirements of the Fire Safety Department and to comply with the relevant code of practice for firefighting service. The Water Supply (Network) Department, however, shall not be responsible for damage or loss caused by disconnection, diminution or failure of the supply due to water restriction or any other causes.
- 8.1.6 All pipes and fittings used for firefighting services, such as hydrant and hose reel, which are connected directly to the potable water service installations shall comply with the Standards and requirements stipulated by PUB.

8.2 Storage Tanks for Firefighting Equipment

A storage tank for firefighting is not a potable service and it is essential to ensure that:

- a A potable service (for domestic purpose) shall not derive its water supply from a non-potable firefighting service where separate tanks are provided.
- b A non-potable firefighting service may derive its water supply from a potable service if the former is provided with an appropriate anti-backflow (anti-siphonic) device or fitting(s) installed in a manner to avoid any possibility of contamination by the reverse flow of water.
- c Tanks supplying water for domestic purposes should not be used as storage tanks for wet rising mains / fire sprinklers.

8.3 Fire Sprinkler System

8.3.1 A separate main of adequate size shall be laid from the meter position to supply the sprinkler system only. This main shall be provided with a double check valve assembly. The connection and installation of sprinkler system shall be carried out in accordance with the requirements of the Fire Safety Department.

8.3.2 The double check valve assembly shall be housed in a suitable chamber.

SECTION 9 - WATER CONSERVATION AND PRIVATE WATER METERS

9.1 Water Conservation

It is important that water supplied by PUB is used efficiently and effectively at all times. Water conservation measures as required by PUB must therefore be adopted in both domestic and non-domestic premises, including construction sites in order to conserve water. The water conservation measures at various areas as specified under the Water Conservation section of Singapore Standard 636 – Code of Practice for Water Services are to be adopted.

9.2 Private Water Meters

The following premises are required to be installed with private water meters to measure water consumption at various water usage areas. The water usage areas to be monitored are specified under the Fourth Schedule of the Public Utilities (Water Supply) Regulations.

Type of Premises	Estimated Monthly Water Consumption (cubic metres)
Non-domestic premises (including public sector)	3,000 or more
Temporary water supply sites	5,000 or more

SECTION 10 - OTHER TYPES OF WATER

10.1 NEWater

NEWater is high grade water produced from treated used water by advanced water purification and membrane technologies. It is of a quality that exceeds drinking water standards stipulated by WHO and USEPA and is suitable for indirect potable use. The typical values of NEWater quality are available on the PUB website at <https://www.pub.gov.sg>.

At present, NEWater is available in:

Cluster	Area
Ulu Pandan	Western and Central areas, such as Jurong Island, Tuas, Jurong and City
Bedok	Eastern areas, such as Pasir Ris, Tampines, Bedok, Changi, Chai Chee and Loyang
Kranji	Northern areas such as, Woodlands, Kranji and Yishun
Seletar	North-eastern areas, such as Ang Mo Kio and Seletar

10.1.1 Use of NEWater

NEWater, where available, is supplied to commercial and industrial premises for non-potable uses, such as in cooling towers and suitable process uses, general washing, irrigation, etc.

All new non-domestic developments (eg commercial, industrial, etc) are required to provide a dedicated NEWater pipe system to take in NEWater for non-potable uses when NEWater becomes available in future. This requirement also applies to all existing non-domestic premises undergoing addition / alteration works.

NEWater shall not be used as primary source of water supply for firefighting.

For the above-mentioned proposals, provisions shall be made to receive PUB water as alternate source to NEWater in the event of an interruption due to urgent repairs, construction of new works, alteration to or maintenance of existing works. Examples of these include the provision of a spool piece with double check valves to facilitate switching over from NEWater to PUB water or via dual feed pipes supplying PUB water, through an air gap, and NEWater to the NEWater break tank. There shall be no cross-connection between the PUB water and NEWater supply pipes. For development proposals with the provision of NEWater submeter, there shall be no spool piece arrangement at the master meters for the purpose of providing alternate supply using PUB water.

10.1.2 Technical Requirements

To ensure a continuous and reliable supply of NEWater to the development, provision shall also be made for a NEWater storage tank to be installed within the premises. The NEWater service pipe to the tank shall not be laid higher than 15 m AMSL. The effective capacity of the NEWater tank should be sized to equivalent to the 1 day's non-potable water requirements.

Design proposals shall also comply with all requirements stipulated in the Singapore Standard 636 - Code of Practice for Water Services, where applicable.

10.2 Industrial Water

10.2.1 Industrial water (IW) is treated sewage effluent for use in industries that do not require high quality water. The typical values of IW are given in Appendix 1.

10.2.2 IW is only supplied to industries on Jurong Island.

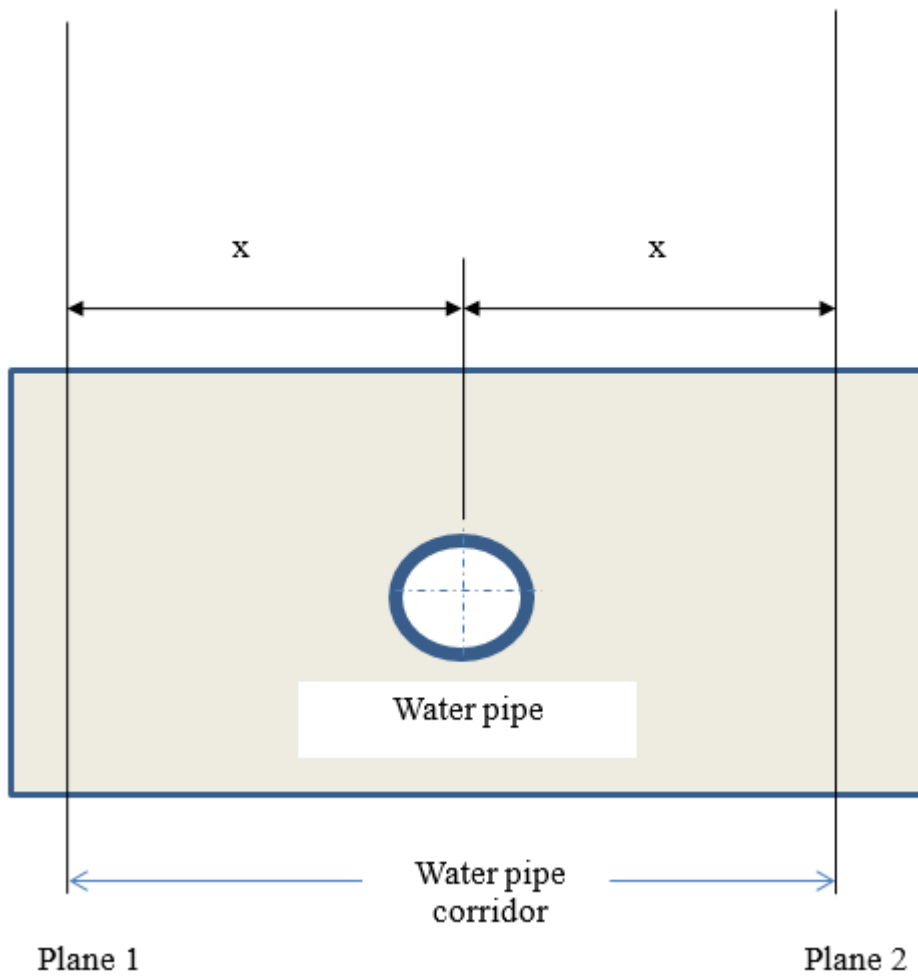
10.2.3 Companies using IW include chemical plants and petroleum refineries. IW is generally used for cooling applications.

10.3 Enquiries

Any enquiries on the supply of NEWater and IW should be made to PUB_One@pub.gov.sg.

Quality of Industrial Water (Typical Values)

Parameters (in mg/l unless otherwise stated)		Typical Value
1	Colour (Hazen Units)	10 - 20
2	Turbidity (NTU)	0.5 - 2.0
3	pH Value	6.8 - 7.3
4	BOD ₅ (5 days at 20° C)	1.0 - 5.0
5	Suspended Solids	< 8
6	Total Solid	350 - 1,300
7	Dissolved Oxygen	3.5 - 7.0
8	Free Ammonia	< 5
9	Chloride as Cl-	100 - 500
10	Total Hardness as CaCO ₃	100 - 250
11	Phosphate as P (PO ₄ -P)	1 - 4
12	Alkalinity as CaCO ₃	30 - 80
13	Conductivity (umhos/cm)	600 - 1,600



Where “X” is the distance of each of Plane 1 and Plane 2 from the centreline of the water pipe and is —

- a in the case of a water pipe with a diameter that is less than 900 mm, 10 m;
- b in the case of a water pipe with a diameter that is equal or more than 900 mm, 20 m; and
- c in the case of a pipe tunnel or a tunnelled main, 40 m.

Figure 1 : Water Pipe Corridor

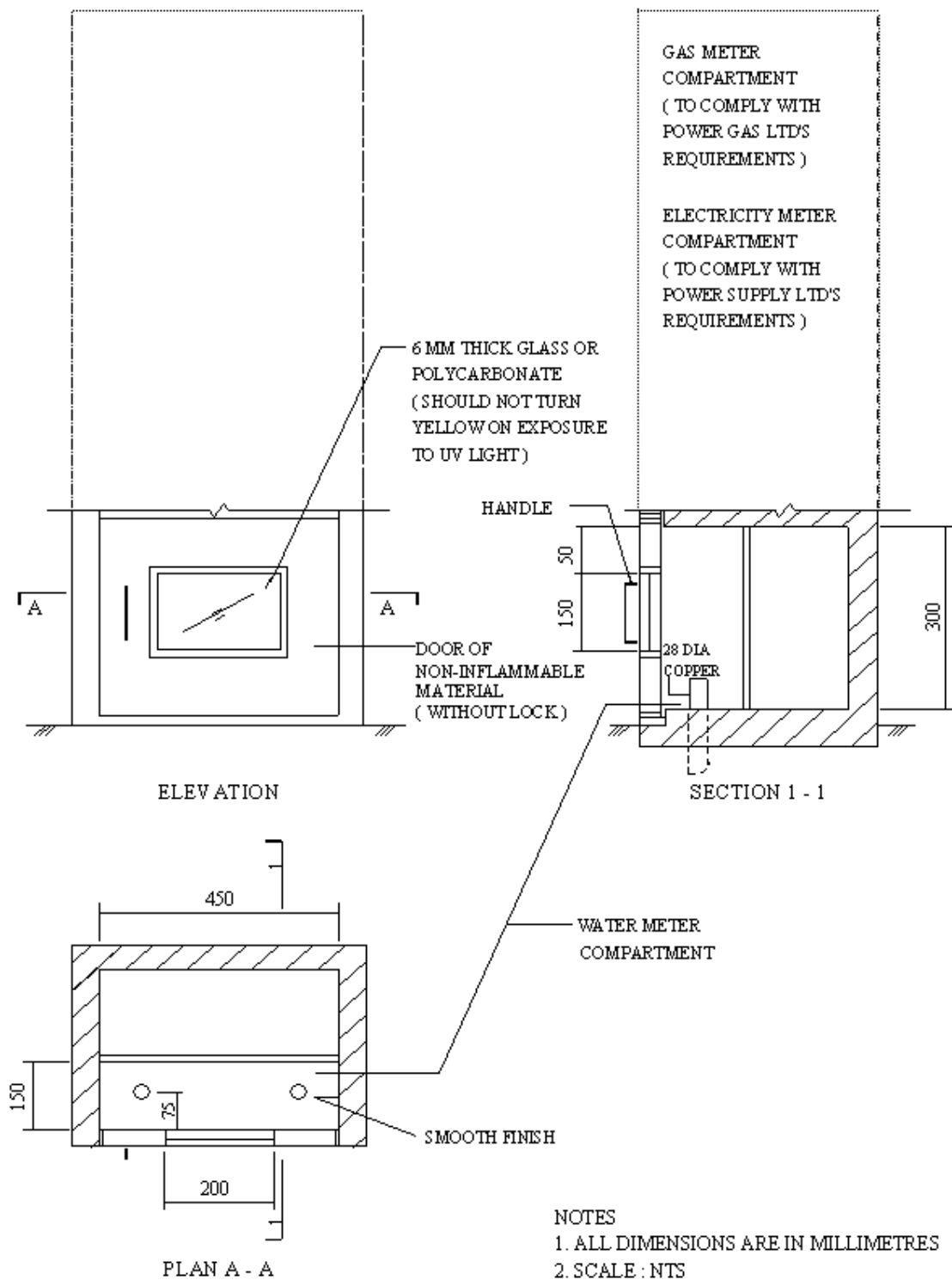


Figure 2 : Standard Water Meter Compartment at Gate Pillar (for Landed Properties)