Appendix 1: Checklist for Vetting Plumbing Proposals

Appendix 1: (1) Checklists for Vetting Plumbing Proposal - New Building

Cover Page

Address of Premises:

Name of Consumer:

Contact Tel. No.:

ASN No./CCID NO. (if applicable)

The plumbing proposal has been checked against the following checklists and all the technical requirements stated on the checklists have been taken into account in preparing the plumbing proposal.

*Chapter 3 Meter

*Chapter 4 Inside Service

*Chapter 5 Fire Service

*Chapter 6 Water Cisterns, Water Pumps and Other Miscellaneous

*Chapter 7 Water Conservation

Checklists prepared by,
(Authorised Person or
person signing the drawings)

Signature: _____

Name: _____

**please delete whichever is not applicable*

Checklists for Vetting Plumbing Proposal - New Building

Chapter 3 - Metering

Type: S = Statutory Requirements
E = Essential for approval of works

Referring to the clauses in Technical Requirements for Plumbing Works in Buildings (TR). You may cross out the clauses if not applicable
^ Please✓ as appropriate

	Type	Checked^	Remarks
#3.1 General			
3.1.3 All domestic unit shall be separately metered	E		
3.1.4 (a) Meter shall be sited in a meter room/box/chamber at convenient location in accessible communal area	E		
(b) For indirect supply system, the meter shall be sites in a meter room/box/chamber in accessible communal area at roof level or at other convenient locations	E		
3.1.5 In case the meters are sited at roof level, and system pressure is lower than 15m, fullway gate valves shall be fitted before meter positions.	E		
3.1.6 For connections up to and including 40 mm diameter, a loose jumper type stopcock shall be provided and placed with spindle in the vertical position at each meter position on the inlet side of the meter where the meter is not sited at roof level and where the pressure is considered adequate.	E		
3.1.7 For connections larger than 40 mm diameter, a gate valve shall be provided before the meter position and a non-return or check valve fitted on the delivery side as close as possible to the meter.	E		
3.1.8 For single jet meter and turbine meter installed in direct supply system, a strainer shall be installed upstream of the meter.	E		
3.1.9 & 3.1.10 For salt water flushing supply, (a) a meter position shall be provided for the purpose of periodic checking of consumption. It should be close to the lot boundary and connection to the Government mains or close to the point of connection from internal distribution mains whichever is applicable.	E		
(b) stop valve shall be fitted at the inlet side of the meter position and a non-return or check valve shall be fitted on the delivery side as close as possible to the meter.	E		

3.1.11

Minimum meter size requirement for business in categories as shown Table 3.1.11.1 of TR shall be followed. E

3.1.12

With an aim to prevent tampering of water meters, security seals shall be installed for all newly installed meters of size 40mm or above. E

3.2 Meter Position

3.2.1 (General Requirements for Meter Positions)

3.2.1.1

The following practice should be adopted in plumbing works design for meter positions:-

(a) fitting at meter position shall facilitate easy installation and removal of the water meter without the need to work on other pipes. E

(b) when sump and pump system is adopted and the meters are sited on convenient locations at roof level, the sump and pump system (including a sump tank and a roof storage tank) shall be fitted before meter positions. E

3.2.1.2

(a) For 15mm meter

(i) 20mm x 15mm bushes, or reducers at both sides of the meter position E

(ii) 200mm (clear effective length) distance piece of 15mm tube placed in between E

(iii) a long screw connector is provided immediately after the brush or reducer at the delivery side E

(b) For all meter size,

(i) the meter position shall also be provided similarly to 15mm meter with corresponding fittings and appropriate sizes. E

(ii) the length of distance piece should be referred to Figure 4 of the TR E

3.2.1.3

If a section of copper pipe is used either before or after a water meter position, that section of copper pipe between the water meter position and the first pipe clamp shall be jointed by screwed or flanged joints or soldering/brazing joint. E

3.2.1.4

PVC-U fittings shall be used at the meter position if PVC-U materials are used as inside services. Brass/copper longscrew (connector) shall be used at TMF position. Brass/copper fittings shall be used at the meter position if copper, lined galvanized steel or thermo-plastic materials are used as inside service. E

3.2.2(Architectural and M&E Requirement for meter room)

3.2.2.1

All water meters, including vacant meter positions and check meter positions, shall be arranged in groups of more than one meter positions and housed in meter rooms / boxes / cabinet / chamber. E

3.2.2.2

(a) The meter rooms/boxes/cabinets/chambers shall be designed solely for housing water meters to protect them against exposure to weather, falling objects and other undue external interferences and to facilitate reading and maintenance of water meters.	E		
(b) When preparing VPLD submission, the applicant shall submit the layout and elevation plans of the meter rooms/boxes with dimensions, including the width and height of the entrances (door openings in case of meter boxes) for the Water Authority's approval.	E		

3.2.2.3

No other building services such as drainage systems, fire hoses, M&E installations (equipment, cables and ducting, etc.) shall pass through or be placed inside the meter rooms/meter boxes/master meter rooms except lighting, ventilation, drainage, and smart metering if required by the WA etc., solely to facilitate meter reading and maintenance of water meters.	E		

3.2.2.4

The following architectural requirements as illustrated in Fig. 41 & 42 of TR shall be met:-

(a) (i) For meter rooms, the minimum distance between the outward face of the meter group and the wall/door opening directly opposite the meter group shall be 1000mm and there shall be no obstacles in between.	E		
(a) (ii) If the door to the meter room is to be opened at an inward position and it is at the opposite side of the meter group, the minimum perpendicular distance between the outward face of the meter group and the door (the point on the door that is nearest to the meter group) when it is fully opened is 600mm	E		
(b) (i) Minimum clear width of the door entrance to the meter room is 800mm	E		
(b) (ii) Maximum clear height of the door entrance to the meter room is 2000mm	E		
(b) (iii) Maximum clear depth of meter boxes measured from the outside face is 800mm	E		
(c) An entrance located at communal area for safe, free, and uninterrupted access to the meter room/box/cabinet/chamber shall be provided.	E		
(d) (i) Checked all door(s) to the meter room/box/cabinet and confirmed no self-closing device on it.	E		
(d) (ii) The lock of the door to the meter room is located at a level between 0.9m to 1.1m above the finished floor level.	E		
(d) (iii) Door to the meter room is equipped with handle either in the form of long cylindrical or spherical shape. Covered or flat sectioned handles shall not be used.	E		
(e) Outside of the door(s) to the meter room/box is clearly marked「水錶」,"Water Meters" in both Chinese and English of font size not less than 30mm	E		
(f) If there are more than one water meter room/box/cabinet inside a building block, master-key locks are used at all meter rooms/boxes/cabinets.	E		
(g) Meter rooms/boxes inside market/commercial complex are positioned in areas with clear access and with no obstruction.	E		

3.2.2.5

(a) (i) Minimum illumination at meter positions is 120 lux.	E		
(a) (ii) Minimum mechanical ventilation at the meter positions is 6 air-changes per hour.	E		
(b) Provision of adequate drainage inside the meter room and the meter box positioned at floor level	E		

3.2.3 (Permanent Display Board showing water meter details)

3.2.3.1

(a) Upon completion of the water meter installation, the Licensed Plumber (LP) shall install a permanent display board at the wall/door inside the meter room/box.	E		
(b) Top of the board shall not be higher than 1800 mm above the floor level	E		
(c) Bottom of the board shall not be lower than 500 mm for an individual meter above the floor level	E		
(d) This display board is constructed of durable plastic or corrosion-resistant plate	E		
(e) Words in block letters and diagrams on the display board are in black on light colour background with font size of standardized font type and be not less than 18 points (i.e. 7 mm in height).	E		
(f) Details of this display board are submitted by the applicant as part of the VPLD	E		

3.2.4 (Mounting Height of Water Meters in Meter Rooms/Boxes)

3.2.4.1

(a) For meters arranged in groups and meters installed inside meter boxes and cabinets, no meter position shall be lower than 300 mm nor higher than 1500 mm above the floor level	E		
(b) For projects where corridor meter arrangement is chosen and accepted, individual meter positions shall be at a suitable height not less than 750 mm but not more than 1500 mm above the floor level.	E		
(c) Minimum clearance should be provided for meters of trade supply according to Fig. 36.	E		

3.2.6 Location of Water Meter at Landscape Areas

3.2.6.1

For a meter installed in a landscape area, it should be installed above ground level. In case the meter is installed in a meter box/cabinet, there shall be a proper working space in front of the meter box/cabinet with a clear working headroom not less than 2m.	E		

3.2.6.2

A safe pedestrian access to the meter position should be provided.	E		

3.3 Master Meter and Check Meter

3.3.2 Principles of Master Meters Provision

3.3.2.1

Subject to Clause 3.3.2.3, master meter(s) shall be provided to fresh water and TMF inside service and fire service of all new developments with more	E		

than 1 building block, regardless of the total length of underground buried and concealed pipes.

3.3.2.3

Master meters shall be provided to fresh water and TMF inside service and fire service in all new government premises (including developments with no building block and single block building), no matter the connecting water pipes are buried, exposed or laid in service trench (applicable to all new government premises with Form WWO 542 submitted to WSD on or after 1st January 2021). E

3.3.3 Sub-meters provision for buried fresh water inside service and fire service

3.3.3.2

(a) (i) Sub-meter chambers with check meter positions shall be provided at underground branch mains on a building-cluster basis except for developments with 5 or less building blocks of the same type only. E

(a) (ii) Each building-cluster shall not include more than 5 building blocks of the same type in general. E

(b) For typical configuration of master meter and sub-meter chambers in a multiple-block development, Fig. 24 of TR shall be referred. E

(c) For details of sub-meter chambers, Fig. 25 of TR shall be referred. E

3.3.3.3

The installation of sub-meter chambers for TMF inside service are not required. E

3.3.3.4

Construction of a separate sub-meter chamber at a branch main is not required if:

(i) the check meter room inside a building block is located less than one straight pipe length of 6m from the tee-connection; or E

(ii) all the pipework between the tee-connection and the building block is exposed. E

3.3.4 Arrangements of Master Meter

3.3.4.1

One master meter shall be installed for each FW/TMF/FS inlet pipe supplying a development site at the lot boundary irrespective of the number of connection points to the government mains. E

3.3.4.2

The master meter room/cabinet/box shall be preferably located at-grade where feasible. Otherwise, full justifications for non-compliance with such requirement shall be provided to the WA for consideration and approval. E

3.3.4.3

Standard master meter room/cabinet/box configuration for all new developments are shown in Figs. 26 to 31 of TR. E

3.3.4.4 to 3.3.4.5

(a) In general, a minimum straight pipe lengths immediately upstream and downstream of a master meter or check meter shall be provided to ensure accuracy of master meters and check meters. E

(b) The upstream and downstream straight pipe length requirements for different type of meters shall not be less than the straight length requirement shown in Fig. 30 of TR.. E

3.3.4.9

(a) Master meters of diameter less than or equal to 100mm could be housed in a box or cabinet as shown in Fig. 31 of TR. E

(b) A master meter room will be required for master meters larger than 100mm in diameter. E

3.3.4.10 to 3.3.4.11

(a) If the water main is to be laid underneath private roads which is scheduled to be handed over to government within 5 years after completion, master meters shall be installed for each FW/TMF/FS inlet pipe supplying each group of buildings/podia at their respective boundaries. On top of this, master meters are also required at the estate's boundary as illustrated in Fig. 24 of TR. E

(b) If the handover is scheduled beyond 5 years after completion, the said master meter positions mentioned in Clause 3.3.4.10 are still required, except the positions are temporarily bridged over by short pieces. E

3.3.4.12

Fire service needs to be separated from the potable supply right at the lot boundary. E

3.3.4.13

Architectural and M&E requirements for the master meter room shall comply with the requirements in Sections 3.2.2.4 and 3.2.2.5. However, applicant may request for relaxation of the requirement with justifications and flexibility may be allowed at the discretion of the Water Authority. E

3.3.4.14

A strainer shall be installed upstream of all master meter. E

3.3.4.15

For pressure monitoring, a pressure tapping point at the straight pipe after flange adapter to master meters of 50mm and above shall be provided as shown in Fig. 27, 28, 31 and 43. As an alternative, pressure tapping point provided on a flange ring after the straight pipe is also permitted. The connection details of pressure tapping point installed by other methods shall be provided to the WA for consideration and approval. E

3.3.5 Check Meter Requirement

3.3.5.1

A check meter position shall be provided close to the end of the underground communal service supplying a building block for all fresh water and flushing water inside service and fire service. E

3.3.5.2

The check meter position shall be located at accessible communal areas for ease of meter reading and maintenance at all times. E

Checklists for Vetting Plumbing Proposal - New Building

Chapter 4 - Inside Service

Type: S = Statutory Requirements
E = Essential for approval of works

Referring to the clauses in Technical Requirements for Plumbing Works in Buildings (TR). You may cross out the clauses if not applicable
^ Please✓ as appropriate

	Type	Checked^	Remarks
#4.1 Pipe & Fitting Materials*			
4.1.1 General			
4.1.1.1			
Pipes and fittings shall conform to the relevant standards as listed in Part B of TR and the WWR.	E		
4.1.1.2			
All plumbing works using soldering for connecting copper pipes shall require prior permission of the WA.	E		
4.1.2 Requirements of Minimum Pipe Sizes			
4.1.2.1			
A pipe must not be less than 20mm in diameter, except that a branch pipe may be of 15mm or more in diameter if the pipe length is not longer than 3m and the pipe supplies only one draw-off point.	S		
4.1.3.1			
A bend or curve must not be made in any pipe so as to diminish the waterway or alter the internal diameter of the pipe.	S		
4.2 Fresh Water Supply			
4.2.1 General Requirements			
4.2.1.1			
All fresh water supplies to inside service, including TMF, shall be metered.	S		
4.2.1.2			
(a) All domestic supplies and concessionary supplies shall be separately metered.	E		
(b) For different applications of concessionary supplies, Section 4.2.5 of TR shall be referred.	E		
4.2.2 Supply Modes			
4.2.2.1			
Fresh water supply to buildings with an overall height of less than or equal to 12m can be effected in one of the two following ways:			
(a) direct supply system as illustrated in Fig. 5 in TR; or	E		
(b) indirect supply system, with a storage tank, a sump-and-pump system or a hydro-pneumatic pump system as illustrated in Fig. 5 and Fig. 6 in TR.	E		

4.2.2.2

Fresh water supply to buildings with an overall height of more than 12m shall be supplied solely by indirect supply systems as illustrated in Fig. 6 in TR (i.e. a sump and pump system, a hydro-pneumatic pump system) or any equivalent system as approved by the WA for all floors. [This clause is applicable to new applications with Form WWO 542 submitted on or after 1 January 2019 except for those applications which have Form WWO 132 submitted before 1 September 2018.] E

4.2.2.3

The minimum residual pressure for fresh water would be 15 to 20 meter head measured at the connection to the main. The fresh supply inside service should be designed to the minimum available residual pressure as advised by the WA. E

4.2.3 Backflow/ Cross-connection Prevention

4.2.3.1 Protection of Water Supplies

4.2.3.1.1

All water supply systems shall be designed, installed, and maintained in order to prevent contaminants from being introduced into the fresh water supply systems. E

4.2.3.1.2

No device or system that may cause contamination of a water supply shall be connected directly or indirectly to any part of an inside service without appropriate cross-connection prevention or backflow prevention control suitable for the level of hazard. E

4.2.3.2 Cross-Connection/Backflow Hazard Rating

4.2.3.2.1

Cross-connections are rated using three degrees of hazard, namely:-

(a) High Hazard E

Any condition, device or practice that, in connection with the water supply system, has the potential to cause death or serious health impact;

(b) Medium Hazard E

Any condition, device or practice that, in connection with the water supply system, has the potential to cause significant health impact; and

(c) Low Hazard E

Any condition, device or practice that, in connection with the water supply system, constitutes a nuisance but does not cause significant health impact.

4.2.3.3 Provision of Backflow Prevention Devices

4.2.3.3.1

(a) The fresh water supply shall be protected from the hazard(s) by installing appropriate device listed in Table 4.2.3.7.1. E

(b) Hazard ratings for some typical installations are listed in Table 4.2.3.7.2 for reference. E

4.2.3.3.2

Backflow prevention devices shall comply with the latest BS EN 1717 and all relevant standard(s) for the devices. E

4.2.3.4 Water Downstream of Backflow Prevention Device

4.2.3.4.1

Piping conveying water downstream of backflow prevention device, installed for high or medium hazard protection, shall be clearly and permanently labelled 'WARNING! NOT FOR DRINKING' at every outlet. E

4.2.3.5 Commissioning and Maintenance

4.2.3.5.2

If backflow prevention devices applicable to high hazard cases, e.g. backflow preventer/reduced pressure zone valve etc., they shall only be used with a maintenance program. If such program is unavailable, the backflow prevention devices shall not be fitted and break tank shall be provided. E

4.2.3.6 Backflow Prevention Device in Hot Water Systems

4.2.3.6.1

The backflow prevention device used in hot water systems shall be suitable for the specific hot water installation. E

4.2.3.7 Backflow Prevention Device and Hazard Levels for Applications

4.2.3.7.1

Tables 4.2.3.7.1 and 4.2.3.7.2 shall be referred commonly used backflow prevention devices and hazard levels for different applications. For concessionary water supplies, Clause 4.2.5.2 shall be referred. E

4.2.4 General Pipework Arrangement

4.2.4.1

(a) All plumbing works between the lot boundary and any master meter or check meter positions shall be exposed or laid in a proper service trench/duct to facilitate inspection and repairs. E

(b) Adequate drainage shall be provided to remove water inside the trench/duct. E

4.2.4.2

If the connection is not laid in an exposed manner at the lot boundary, then it shall be laid inside underground service trench/duct with adequate cover. The underground/buried water mains should be laid with cover according to the latest required minimum depth of services and associated installations stipulated by Highways Department. E

4.2.4.3

No water pipe shall be embedded within load bearing structural elements in longitudinal direction. Such structural elements include, but not limited to, columns, beams and slabs. Screeding above slabs should not be considered as structural elements. Hence, water pipe embedded in screeding is acceptable. The water pipe in screeding shall be considered as embedded pipes. E

4.2.4.4

Vertical water pipes piercing through structural slabs and transfer plates; and horizontal water pipes piercing through beams, columns and structural walls shall be protected by sleeving or other suitable means. E

4.2.4.5

Tee-branch valve has been provided in

(a) all underground water pipes and for all communal inside service; and E

(b) shall be located close to the main pipe E

4.2.4.6

(a) Sufficient cleansing taps shall be provided at each floors of car parks of a building E

(b) If it is not part of the cleansing supply system of the building, the cleansing supply at the car park shall be given from a fresh water cistern with a separate meter. E

4.2.4.7

No draw-off point in the inside services shall be subject to an excessive pressure of 6 bar or above. E

4.2.4.9 & 4.2.4.10

(a) For new sump and pump systems, a standby pumpset shall be provided. E

(b) The existing sump and pump system shall be provided with a standby pumpset unless this proves to be impracticable. E

4.2.5 Concessionary Usage of Mains Water

4.2.5.1

Concession usage of mains water are for the purpose listed in Clause 4.2.5.2 E

4.2.5.2

Compliance with the concessionary usages and requirements in this clause E

4.2.5.4

Draw-off tap that is freely accessible by the general public should be kept in an external protective box with using a tap external protective box with lock and key. E

4.2.5.4a

If an automatic irrigation system is used. Off-tank supply is required. E

4.2.5.5

Installation of water points for internal cleansing of open yards and for other miscellaneous domestic purposes in private houses of bungalow type or the like can be permitted as part of the domestic supply. This will not be taken as a concessionary supply. It is not necessary to install any receptacle for this type of water points. E

4.2.6 Metered Supply for Other Purposes

4.2.6.2 Supply for Temporary Structures and Modified/Converted Structures

4.2.6.2.2

The premises shall have separate access, proper drainage system and bear a proper postal address. E

4.2.6.3 Water Supply for Cooling / Air-conditioning / Humidification Purposes

4.2.6.3.1

Water supply shall not be used for any heating, cooling or humidification purposes except with the approval of the WA. S

4.2.6.3.2

Either fresh or salt mains water supply may be given for cooling / air-conditioning / humidification purposes if the system designed belongs to one of the categories listed in Clause 4.2.6.3.2 in TR. E

4.2.6.3.3

The application of mains water in evaporative type plants for purposes other than industrial process is limited to those cases where the cooling / air-conditioning / humidification system(s) is/ are critical for normal operation. The type of evaporative plant used should be of an enclosed design, so that wastage of water due to splashing is prevented. E

4.2.6.3.4

Prior to the installation of the fresh water cooling towers, applicants should apply for participation in the 'Fresh Water Cooling Towers Scheme' (FWCT Scheme) for air-conditioning systems administered by the Electrical and Mechanical Services Department (EMSD). The participation in the FWCT Scheme should comply with the requirements stipulated in the 'Code of Practice for Fresh Water Cooling Towers' promulgated by EMSD and the requirements of WSD E

4.2.7 Hot Water Systems

4.2.7.1 Non-Centralized Hot Water System

4.2.7.1.1

When the factory test pressure of the heater is at least 1.5 times the maximum static pressure at the mains water supply point, non-pressure type heaters, cistern type water heaters, unvented electric thermal storage water heaters satisfying the requirements stipulated in Clauses 4.2.7.1.12 and instantaneous water heaters are permitted to be connected direct to the supply pipe without the necessity of providing storage. S

4.2.7.1.2

When the factory test pressure of the heater is less than 1.5 times the maximum static water pressure at the mains water supply point then, for premises on direct supply, a water heater must be supplied with water from a cold water cistern. S

4.2.7.1.3

A separate mains water storage cistern of 45 litres capacity shall be provided for each flat to supply such hot water apparatus in Clause 4.2.7.1.2. E

4.2.7.1.4

Pressure type thermal storage heaters other than unvented electric thermal storage water heaters satisfying the requirements stipulated in Clauses 4.2.7.1.12 shall be supplied from storage cisterns no matter what the pressure at inlet point should be, except these are installed in flats supplied through the indirect or sump and pump system. S

4.2.7.1.5

For premises on direct supply, a separate mains water storage cistern of 45 litres capacity shall be provided for each flat to supply such hot water apparatus in Clause 4.2.7.1.4. E

4.2.7.1.6

For flats supplied from the roof storage cistern of an indirect or sump and pump system, no separate storage for hot water apparatus will be required but the supply to the apparatus shall be by a separate down feed supplying the apparatus only unless the arrangement in Clause 4.2.7.1.7 is applied. E

4.2.7.1.7

If the flats on the indirect system are supplied through an oversized down feed pipe, the pipe supplying the hot water apparatus shall be branched from the down feed at a point above the top of the apparatus. E

4.2.7.1.8

When gas geysers are to be installed on the top floor of a building supplied through storage cisterns, gas geysers with low pressure governors should be installed when the head available is less than 5 metres to the highest hot water draw-off point. E

4.2.7.1.9

If mixing valves, water blenders or combination fittings are to be used, the cold water supply to these fixtures shall be drawn from the same source as is supplying the hot water apparatus. In order to provide a balanced pressure and to obviate the risk of scalding should the supply at the source fail or be restricted for any reason. S

4.2.7.1.10

All pressure type thermal storage heaters shall be provided with a vent or expansion pipe taken from its highest point and discharge in the atmosphere above the storage cistern at sufficient height to prevent a constant outflow of hot water therefrom except for unvented electric thermal storage water heaters satisfying the requirements stipulated in Clauses 4.2.7.1.12 and 4.2.7.1.13 of TR. S

4.2.7.1.11

A loose jumper type valve shall be fitted on the inlet of the water heater if a non-return valve is not incorporated in such water heater, but this requirement S

does not apply to an electric water heater of the thermal storage type satisfying the requirements stipulated in Clauses 4.2.7.1.12 and 4.2.7.1.13 of Part A of TR.

4.2.7.1.12

All unvented electric thermal storage water heaters shall comply with the safety requirements under the Electrical Products (Safety) Regulation (Cap. 406 sub. leg.) — S

4.2.7.1.13

Every system incorporating an unvented electric water heater of the thermal storage type shall be provided with:-

(a) a supply pipe that branches off from the feed pipe at a point above the top of the water heater, or some other device to prevent the water from draining down from the water heater if there is a failure at the source of water supply; — S

(b) an anti-vacuum valve or some other device to prevent heated water from being syphoned back to the supply pipe; and — S

(c) a vessel to accommodate the expansion of heated water where that expansion is constrained by a non-return valve or some other device, incorporated at the inlet of the water heater. — S

4.2.7.2 Centralized Hot Water System

4.2.7.2.1 & 4.2.7.2.2

(a) The cold water feed pipe from the roof storage cistern shall supply the hot water system only — E

(b) The cold water feed pipe from sump tank with booster pump shall also be the same source for the hot water system. — E

4.2.7.2.3

(a) If mixing valves, water blenders or combination fittings are to be used, the cold water supply to these fixtures shall be drawn by a separate down feed from the hot water storage cistern. — E

(b) This outlet from storage tank shall be slightly lower than the feed to the hot water system in order to provide a balanced pressure and obviate the risk of scalding should the mains supply fail or be restricted. — E

4.2.7.2.4

(a) All centralised hot water systems utilising a boiler and cylinder, or calorifer, shall be provided with an expansion pipe taken from the highest point of the cylinder or calorifer, or if a secondary circulation system, from the highest point of such system. — E

(b) In either case the expansion pipe shall discharge to the atmosphere above the storage cistern at sufficient height to prevent a constant outflow of hot water therefrom. — E

4.2.7.2.5

No safety valves, air valves or relief valves be used as a substitute or replacement for an expansion pipe. — E

4.2.7.2.6

No control valve be installed on the expansion pipes between the highest point of the cylinder or calorifer, and the free end of such pipes — S

4.2.7.2.7

When a centralised hot water system of the boiler /cylinder or calorifer type is installed, in addition to the vent pipe as required in Clause 4.2.7.2.4 of TR, A safety valve or pressure relief valve shall be provided to the boiler or to the primary flow pipe as close to the boiler as possible. Such valve shall be set to discharge when the pressure in the boiler exceeds 35kPa above that of the static pressure of the system. — E

4.2.7.2.8

No tap or other means of drawing off water, (other than a screwed plug with a removable key for emptying the system for cleansing and repair), shall be connected to any part of the hot water system below the top of the hot water cylinder in such a way that the level of the water in cylinder can be lowered. — S

4.2.7.2.9

In a hot water system comprising more than one storage cylinders at different levels, Clause 4.2.7.2.8 should read as applying to the lowest cylinder. — E

4.2.7.2.10

To avoid wastage of water when repairs are being effected, a stop valve shall be fitted on the cold feed pipe at the outlet from the storage cistern. — E

4.2.7.2.11

If the storage cylinder is installed in a lower floor, an additional stop valve shall be fitted near the inlet to the cylinder. — E

4.2.7.2.12

Such stop valve shall have loose keys or hand-wheels which shall be kept in a safe place to prevent unauthorised interference. — E

4.2.7.2.13

A screwed plug with a removable key shall be provided at the lower part of the system for the purpose of draining down or emptying the system. — E

4.2.7.2.14

No stop valve shall be installed in the primary flow or return pipes except when a vent pipe is connected to the boiler and such installation shall only be made under skilled supervision. — E

4.2.7.2.16

Installation of boilers/ steam boilers shall comply with the relevant Boilers and Pressure Vessels Regulations [HK Law Chapter 56]. — S

4.2.7.2.17

Temperature and pressure relief valve, air vent and vacuum breaker shall be provided to hot water storage tanks and calorifers. E

4.3 Flushing Water Supply

4.3.1 Sources of Flushing Water Supply

#4.3.1.1

For inside service using government water supply for flushing, it shall comply with the requirements of the WWO/WWR and that of the WA. E

4.3.2 Pipe and Fitting Materials

4.3.2.1

All water tanks, pipes and fittings of flushing water systems must be of salt water resistant materials to the approval of the WA. Pipes and fittings shall conform to the relevant standards as listed in Part B of TR and the WWR. E

4.3.3 Metering Requirements

4.3.3.1

All flushing water supply systems shall be separate water supply systems. E

4.3.3.3

Water meter shall be installed in each flushing system receiving a TMF supply. TMF flushing water supply would normally be given to the entire building t Requirements stipulated in Section 3 of this TR is applicable. E

4.3.4 Supply Modes

Flushing water supply to buildings with an overall height less than or equal to 12m can be effected in one of the two following ways:

(a) indirect supply system (with direct supply to roof storage tank) as illustrated in Fig. 14 in TR; or E

(b) indirect supply system, with a sump and pump system or a hydro-pneumatic pump system as illustrated in Fig. 14 in TR. E

4.3.4.2

Flushing water supply to buildings with an overall height of more than 12m shall be supplied solely by indirect supply systems with a sump and pump system as illustrated in Fig. 14 or any equivalent system as approved by the WA for all floors. [This clause is applicable to new applications with Form WWO 542 submitted on or after 1 January 2019 except those applications which have Form WWO 132 submitted before 1 September 2018.] E

4.3.4.3

The minimum residual pressure of salt water supply is 15 meter head measured at the connection to the main. The flushing supply inside service should be designed to the minimum residual pressure as advised by the WA. E

4.3.5 General Pipework Arrangement

4.3.5.1

S

Under the provision of Buildings Ordinance (Chapter 123), all new buildings shall be provided with a plumbing system to supply water for flushing purposes and every part of such plumbing system, including the storage tank, shall be constructed of such materials that are suitable for use with salt water.

4.3.5.2

A separate water storage tank shall be provided for flushing purpose S

4.3.5.3

The inlet pipe to the separate storage tank should not be less than 40 mm diameter; its portion before meter position shall be exposed or laid in a proper service duct and extended to the lot boundary. E

4.3.5.4

To facilitate meter installation, a meter position shall be provided in the communal area of the building as close to the fresh supply meters as possible. Regarding general requirements for meter positions, Section 3.2 of Part A of TR shall be referred. E

4.3.5.5

In case a temporary mains fresh water supply is proposed to be provided as the alternative source to augment an existing independent (not Government) supply, the storage tank for the flushing cistern shall be constructed in accordance with Fig. 15. E

4.3.5.6

No draw-off point in the inside services shall be subject to pressure of 6 bar or above. E

4.3.5.7

A tee-branch valve shall be provided for all underground flushing water pipes, and for all pipe serving more than one domestic or commercial unit. E

4.3.5.8

Concerning requirement for flushing water storage capacity, Clause 6.2.5 shall be referred. E

Checklists for Vetting Plumbing Proposal - New Building

Chapter 5 - Fire Service

Type: S = Statutory Requirements
E = Essential for approval of works

Referring to the clauses in Technical Requirements for Plumbing Works in Buildings (TR). You may cross out the clauses if not applicable
^ Please✓ as appropriate

	Type	Checked^	Remarks
#5.1 General			
5.1.3 Plumbing systems using government water supply for fire services shall comply with the requirements of the WA.	E		
5.1.4 The use of water from fire service for purposes other than firefighting is prohibited.	S		
5.2 Metering Requirements			
5.2.1 Details of master meter and check meter positions shall be referred to Section 3.3.	E		
5.3 Pipe Materials			
5.3.1 Pipe and fittings shall conform to the relevant standards as listed in Part B of TR and the WWR.	E		
5.3.2 Consideration can be given for the use of wrought iron pipe and black steel pipe without being galvanized, upon application, for a fresh water fire service after a positive air break, i.e. fire service tank or sump tank.	E		
5.3.3 The materials for pipes and pipe fittings on a salt water fire service shall be capable of withstanding the corrosive effect of salt water.	E		
5.4 Supply Types and Arrangements			
5.4.1 General 5.4.1.1 and 5.4.1.2 (a) Fire service supply may be from fresh water or salt water source. The supply must be from an independent connection, i.e. entirely independent of other water supply arrangements within the building or development concerned.	E		
(b) For existing buildings, fire service installations obtaining water supply from existing fresh water tanks may be considered case-by-case by the WA and the Director of Fire Services.	E		

5.4.1.4

(a) All plumbing works between the lot boundary and master/check meter positions shall be exposed or laid in a proper service trench/duct to facilitate inspection and repairs. E

(b) Adequate drainage shall be provided to remove water inside the trench/duct. E

5.4.1.5

If the connection is not laid in an exposed manner at the lot boundary, then it shall be laid inside underground service trench/duct with adequate cover. The underground/buried water mains should be laid with cover according to the latest required minimum depth of services and associated installations stipulated by Highways Department. E

5.4.1.6

A fullway gate valve and a non-return valve have to be installed on the fire services as close to the Government water supply connection as possible. E

5.4.2 Sprinkler/Drencher System

5.4.2.2

Connection of Sprinkler / Drencher System

(a) For system situated in the recognised Waterworks unrestricted industrial supply, a dual connection from the Government unrestricted supply ring will be provided. E

(b) For a system outside the recognised Waterworks unrestricted industrial supply, twin connection, one from an unrestricted supply and one from a distribution will be provided. E

5.4.2.3

Where it is not practical to connect the fire services sprinkler / drencher system to an unrestricted supply main: E

Fire Services Department may require the provision of fire service tank to serve as secondary source for the fire service installation. Dependent upon Fire Services Department's requirements, a single or dual connection can be given to serve the fire service tank of secondary source.

5.4.2.4

Usage of supplies to fire services / drencher system

(a) No part of any fire service sprinkler / drencher system supplied from the Government mains shall be used for supplying any other services including other f other fire service installations, e.g. hose reels, except that a common suction tank can be used for both sprinkler / drencher and hose reel systems. E

(b) Any exemption from requirement in 15(a) should have the endorsement of the Director of Fire Services E

5.4.2.5

Where direct connections to sprinkler / drencher system are to be from the Government mains, an additional butterfly valve, without stop screw and lock nut on handle and strapped in open position, shall be installed at a point on the supply pipe before the fire service inlet and as close as possible to the control valves of the connections. E

5.4.2.6

FSD's endorsement shall be sought for the application for improvised sprinkler systems. E

5.4.3 Fire Hydrant/Hose Reel System

5.4.3.1

(a) Supply to hydrant / fire hose reel outlet must not be fed directly from the Government mains. E

(b) Fire hose reel outlets

(i) Fire hose reel outlets shall be housed in glass-fronted cabinets secured under lock and key. E

(ii) The glass panel shall:

(1) be of a frangible type; E

(2) not exceed 1.5mm in thickness; E

(3) be of such size and design so as not to cause any undue obstruction to the free use of hose reel. E

(iii) A metal or plastic striker shall be provided in the vicinity of the cabinet E

5.4.3.2

(a) Common tank arrangements for fire-fighting and flushing or other purposes are not acceptable when a Government supply is involved. E

(b) Where a building is to be provided with a non-Government flushing supply and where it is proposed to feed the fire service from that supply, the developer is advised to install an independent fire service system if it is envisaged that the fire service system may require to be connected to the Government mains at a later stage. E

5.4.3.3

Warning message shall be securely fixed on or near every hose reel outlet and the message shall be easily visible by the occupier. E

5.4.5 Fire Service Ring Mains

5.4.5.1

Fire service ring main in a large industrial complex shall be connected to an unrestricted supply main, if practical. In case this is not practical, a "dual" connection from the Government ring main shall be given. E

5.4.5.2

Fire service ring mains shall not be connected to or used for supplying any other service, except with the approval of the Water Authority. E

5.4.7 Installation of Sprinkler System for SCB/PCP and Composite Buildings

5.4.7.2

For applications to install the improvised sprinkler systems stated in (b) and (c) in Clause 5.4.7.1, endorsement and referral from the FSD must be provided when applying for water supply from WSD. E

Checklists for Vetting Plumbing Proposal - New Building

Chapter 6 - Water Cisterns, Water Pumps and Other Miscellaneous

Type: S = Statutory Requirements
E = Essential for approval of works

Referring to the clauses in Technical Requirements for Plumbing Works in Buildings (TR). You may cross out the clauses if not applicable
^ Please✓ as appropriate

	Type	Checked^	Remarks
#6.1 General			
6.1.1 No cistern for the storage of cold water shall be installed or used except with the permission in writing of the Water Authority who shall specify the maximum permitted capacity.	S		
6.1.2 No cistern for the storage of fresh water supplied from the waterworks shall, without the written permission of the WA, be so connected that it can be used for the storage of any water other than that supplied from the waterworks.	S		
6.2 Cold Water Cisterns (or Cold Water Tanks)			
6.2.1 Location			
6.2.1.1 Access for Maintenance and Inspection			
6.2.1.1.1 Water Storage Tanks shall be installed so that they are easily accessible for cleaning or repairs.	S		
6.2.1.1.2 Safe access shall be provided to all cisterns by means of a secure permanent ladder or readily available portable ladder.	S		
6.2.1.1.3 Where a cistern is installed inside a building and, due to limited headroom available, it is fixed with limited clearance from the ceiling or underside of the roof, a quickly detachable fitting must be used to enable it to be easily removed for cleansing and repair.	S		
6.2.1.1.4 For a water cisterns with top access, the access on top of the cisterns should have a minimum headroom of 800mm.	E		
6.2.1.2 Protection against Pollution of Potable Water by Non-Potable Water			
6.2.1.2.1 If a cistern for non-potable water is placed adjoining to a cistern for potable water, a physical break must be provided between the cisterns, such that the walls and slabs of the cisterns are separated, however, tie beams linking the cisterns for structural requirements may be fitted and, if fitted, must be	S		

constructed in a way that cross contamination of the cisterns via the tie beams is not possible.

6.2.2 Material Requirements

6.2.2.1

A cistern must be watertight, of adequate strength, properly supported and be made of concrete, stainless steel or fibre glass. S

6.2.2.2

For concrete fresh water cisterns/storage tank, all internal surface of floors, walls (to full height) and soffits of potable water storage cisterns should be lined with a non-toxic smooth finish. E

6.2.2.4

When fibreglass storage tank is to be used, prior approval by the Water Authority must be sought. Fibreglass storage cistern for potable water shall be of an approved type or certified to contain no toxic materials and suitable for storage of potable water. E

6.2.3 Cover for Water Tanks

6.2.3.1

A cistern must be so located as to minimize the risk of contamination of stored water and be fitted with a suitable close fittings lockable cover that is not airtight. The cover must be so positioned as to facilitate inspection and cleaning. The covers must be so positioned as to facilitate inspection and cleaning. S

6.2.3.2

(a) Every storage cistern shall have a lockable close fitting rigid cover secured by mechanical means which excludes light and the ingress of particles and / or insects from the cistern. E

(b) The cover shall be made of a material or materials which do not shatter or fragment when broken and which will not contaminate any condensate which may form on its underside or the stored water. E

(c) For the potable water storage cistern, the cover and its base frame shall possess double upstand edges interlocking one another to provide additional protection. E

6.2.3.3

Double sealed covers with locking devices shall be provided for all storage cisterns other than cisterns that provide supply solely for irrigation, flushing and fire-fighting. The double-sealed covers prevent the ingress of surface water. E

6.2.4 Installation Requirements for Inlet and Outlet Pipe

6.2.4.1.1

All outlet pipes from the storage cistern should, be positioned at the opposite side to the inlet supply pipe to prevent stagnation of water. E

6.2.4.2 Controlling Incoming Water Supply

6.2.4.2.1

The inlet of a single cistern fed by a gravity supply must be fitted with a ball float valve and stop valve. S

6.2.4.2.2

(a) For ball float valves of a nominal diameter not exceeding 50mm, their valve bodies must be made of copper alloy or stainless steel. S

(b) For ball float valves of a nominal diameter exceeding 50mm, their valve bodies must be made of copper alloy, stainless steel, epoxy coated cast iron or epoxy coated ductile iron. S

6.2.4.2.3

(a) Floats for use with fresh water must be made of copper alloy or stainless steel. S

(b) Floats for use with salt water must be made of plastic or stainless steel. S

6.2.4.2.4

Ball float valves fitted to a cistern must have the size of the orifice, the size of the float and the length of the lever so proportioned to one another that, when the float is immersed to an extent not exceeding half its volume, the valve is watertight against the highest pressure at which the valve may be required to work. S

6.2.4.2.5

A ball float valve or float-operated valve fitted to a cistern must be

(a) securely fixed to the cistern above the waterline of the float of the valve, and S

(b) must be supported independently of the inlet pipe (unless the inlet pipe is itself rigid and securely fixed to the cistern), in a position that no part of the body of the valve is submerged when the cistern is charged to the overflowing level. S

6.2.4.2.6

(a) If a ball float valve or float-operated valve is provided with a pipe so arranged as to discharge water into a cistern below its overflowing level, an air hole must be provided in the outlet chamber of the valve above the overflowing level. S

(b) The air hole must be of a size sufficient to prevent syphonage of water back through the valve. S

6.2.4.2.7

Ball float valves must not be fitted to a cistern that is used to contain heated water. S

6.2.4.2.8

The inlet of a single cistern fed by a pumped supply must be fitted with an automatic control switch and without any stop valve. S

6.2.4.2.9

(a) The ball valve or control switch shall shut off the supply when the water level is 25mm below the invert of the overflow pipe or the warning pipe if there exists one. S

(b) The invert of the inlet pipe or the face of the outlet nose of the ball valve shall be not less than 25mm above the top of the overflow pipe. S

6.2.4.2.10

(a) In case of a mixed flushing water supplies, the water tank shall be fitted with a ball float valve with submerged float control and a fullway gate valve for controlling and isolating the inflow of mains supply respectively. E

(b) For other source of flushing water supply, a ball float valve and a fullway gate valve shall be provided. E

(c) Performance of the ball float valve shall meet the requirements specified in case of gravity supply. E

6.2.4.3 Outlet Water Pipes

6.2.4.3.1

The invert of an outlet pipe from a water storage tank with capacity less than 5000 litres shall be at least 30 mm above the bottom of the tank; this distance shall be increased to 100 mm if the storage tank capacity is 5000 litres or more. E

6.2.4.3.2

A stop valve must be provided at the outlet of a cistern. and provision shall be made for a drain-off pipe to enable the cistern to be emptied. S

6.2.4.3.3

Fullway gate valves shall be used with as the stop valves in Cl. 6.2.4.3.2 at the outlet pipe of every water storage cistern. The drain-off pipe shall be properly plugged or adequate means shall be provided to prevent any unauthorized operation of the control valve at drain-off pipe. If the outlet of a flushing water cistern is of nominal size 50mm or below, a ball valve can be used to substitute the above gate valve. E

6.2.4.4 Overflow Pipes and Warning Pipes

6.2.4.4.1

All overflow and warning pipes of potable water storage cisterns shall be constructed of corrosion-resisting material. S

6.2.4.4.2

An overflow pipe shall be at least one commercial size larger than the inlet pipe and shall in no case be less than 25 mm in diameter must be fitted to a cistern and be extended to terminate in a conspicuous position. The overflow pipe must not be connected to a drain or sewer or to the overflow pipe from another cistern. S

6.2.4.4.3

The position of discharge should be in a communal area easily visible and accessible by the occupants. E

6.2.4.4.4

If the overflow pipe is not extended to terminate in a conspicuous position, the overflow pipe shall be installed with an overflow alarm with signal transferred to a 24-hourly manned management office for timely notification. Full justifications for such arrangement shall be provided to the WA for consideration and approval. E

6.2.4.4.5

In case of mixed flushing water supply as shown in Fig. 15, the overflow shall be twice the diameter of largest inlet or of nominal diameter 40mm, whichever is greater. E

6.2.4.4.6

No part of the overflow pipe shall be submerged inside the storage tank E

6.2.4.4.7

A grating and a self-closing non-return flap shall be provided at the overflow pipe outside the storage tank. E

6.2.4.4.8

A warning pipe shall be installed in addition to an overflow pipe. A warning pipe can be of any size not less than 25 mm in diameter and shall comply with all other requirements of an overflow pipe. E

6.2.4.4.9

The warning pipes shall be installed at a level below the overflow pipe and shall be either extended to conspicuous location, i.e. outside of the building periphery for roof tank or outside the pump room for sump tank, or installed with signal transferred to a 24-hourly manned management office. E

6.2.5 Size of Storage Tanks for Flushing, Domestic and Trade/Commercial Water Uses

6.2.5.1

The proportion of capacity of sump cistern to roof cistern is recommended to be in the order of 1:3. Otherwise, the designer shall demonstrate that the proposed ratio of sump cistern to roof cistern is capable of fulfilling the designed demand. E

6.2.5.2

The capacity of the flushing water storage shall be designed according to the criteria in Table 6.2.5.2.1 with a minimum capacity of 250 litres. [applicable to new applications with Form WWO 542 submitted on or after 1 January 2019 only.] E

6.2.5.3

Storage criteria for fresh water supply for domestic flats are given in Table 6.2.5.3.1. E

6.2.5.4

For industrial building:

(a) The entire internal services shall be supplied from storage cisterns with separate outlets / downpipes feeding independent systems to serve separately the industrial and processing purposes and the other general and ablution appliances. E

(b) These independence systems serving separately the industrial and processing purposes and the other general and ablution appliances should not be interconnected. E

6.2.5.5

The required capacity of storage tanks for industrial use is one-day demand. E

6.2.5.6

For trade/commercial premises, the storage criteria for fresh water supply shall be designed according to the criteria in Table 6.2.5.6.1 and Sections 6.2.5.7 to 6.2.5.9 of TR. The criteria shall apply to building types not listed in this Section in TR, yet having similar functions. In addition, designers should avoid oversize or undersize of the storage of water tanks which may result in water quality problems. However, applicant may request for relaxation of the requirement with justifications and flexibility will be allowed by the WA if justified. E

6.2.5.8

For hospital, the required storage criterion is one day's consumption as given by the hospital authorities E

6.2.5.9

For boilers, the required storage criterion is given in the formula under this section in TR. E

6.2.6 Other Recommendation/Requirement

6.2.6.2

When the capacity of water cistern exceeds 5000 litres, adoption of twin-tank system is required. The applicability shall also be subject to factors such as availability of plant room space. E

6.2.6.3 to 6.2.6.5

(a) A set of inlet, outlet and associated overflow and drain pipes shall be provided to each cistern compartment. E

(b) Each inlet of a twin-cistern fed by a pumped supply must be fitted with an automatic control switch and a stop valve for temporary isolation purpose. S

(c) For water supplies other than pumped supply, this inlet shall comply with requirements stated in Clause 6.2.4.2.1 of Part A of TR. E

6.3 Water Pumps

6.3.1

(a) Where a sump-and-pump system is used, it shall be provided with a duplicate pumpset. E

(b) The pumping capacity of the pumps shall not be less than the designed out-flow rate of the storage tank being supplied. E

6.5 Pressure Reducing Valves

6.5.1

No part in the internal pipework and/or draw-off point shall be subject to excessive high pressure. In case of excessive high pressure, provision of break pressure tanks at a suitable level of the internal supply system would be a positive and viable means to reduce the water pressure. Alternatively, pressure reducing valves may be provided in lieu of break pressure tank. E

6.5.2

Whenever a pressure reducing valve is installed,

(a) a bypass arrangement shall be incorporated with the provision of a second pressure reducing valve, except for fire service installations, to enable isolation of any defective pressure reducing valve for repair and replacement when necessary; E

(b) A pressure indicator shall be provided for pressure monitoring and the associated pipes and fittings shall be able to withstand the maximum pressure that may arise upon the failure of the pressure reducing valve as far as practicable. Fault alarm shall be installed with signal transferred to a 24-hourly manned management office for timely notification, except for fire service installations. E

6.6 Stop Valves for Draw-off Points

6.6.1

Individual stop valves shall be provided at all draw-off points or at a series of draw-off points if situated close together. E

6.7 Water Taps

6.7.1 Application of Water Taps

6.7.1.1

When infra-red sensor operated automatic taps are used as inside services, a stop cock or gate valve must be installed at the upstream of each fitting for manual isolation of water supply. E

6.7.1.2

Self-closing taps, of non-concussive type and of approved pattern, or infra-red operated automatic taps, shall be used for the public or communal lavatory basins. E

6.7.1.3

Except with the written permission of the Water Authority, fitting with a threaded outlet, or any device facilitating the connecting of rubber hose or another type of flexible hose, must not be used. S

6.7.2 Installation Requirements for Sanitary Fixtures Supplied by Water Taps

6.7.2.1

All taps supplying baths, lavatory basins, sinks or similar apparatus shall have a stop valve fixed in a readily accessible position to control the supply to each fitting or branch pipe supplying a range of fittings. S

6.7.2.2

Every inlet to a bath, lavatory basin or sink shall be distinct from, and unconnected with, any outlet therefrom and every outlet for emptying such bath, lavatory basin or sink shall be provided with a well-fitting and easily accessible watertight plug or some other equally suitable apparatus. S

6.7.2.3

The level of the hot or cold water draw-off point to a bath, lavatory basin or sink shall be above the level of the overflow. In the absence of overflow in the fixtures, the top edge of the bath, basin or sink shall be considered instead. S

6.7.2.4

If water supply to any bidets, sitz bath, slop and sluicing sink or similar apparatus is liable to be submerged, the following shall be provided:- S

(a) a storage cistern supplying water to such apparatus only;

(b) a storage cistern for flushing purposes only; or

(c) a hot water distribution system supplying such apparatus only.

6.8 Domestic Appliances

6.8.1 Water Purifiers/Filters

6.8.1.2

Domestic water purifiers/ filters must not be connected directly to the mains supply because of the possibility of contamination. E

6.8.1.3

When there is installation of any domestic filter or water filter incorporated in water using apparatuses (such as drinking fountain etc.), backflow prevention device shall be installed. E

6.8.1.4

Requirements for backflow prevention and written permission from the WA for typical types of water filters are summarized in Table 6.10.1.4.1. E

6.8.1.5

Sterilizers without or without attached filtering devices could be connected directly to the mains supply provided that backflow prevention device is provided upstream of the sterilizer such that there is no possibility of contaminating the mains supply. E

6.8.2 Washing Machines/Dishwashing Machines

6.8.2.2

Washing machines/ dishwashing machines with submerged inlets are considered to have high level of contamination hazard and must be installed with appropriate backflow prevention devices according to Table 4.2.3.7.1. E

6.10 Flushing Apparatus

6.10.1 General Requirements

6.10.1.2

(a) A flushing cistern must in all cases be supplied from a cistern. Except with the written permission of the Water Authority, the cistern must not be used to supply any other apparatus, appliance or fitting. S

(b) The cistern must be fitted with a suitable close fitting cover and provided with appropriate access to enable the cistern to be entered and cleaned. S

6.10.1.3

A trough water-closet or urinal must be fitted with a flushing cistern. S

6.10.1.4

A water-closet fitment or slop sink must be fitted with a flushing cistern. However, a pressure flushing valve may be installed for flushing without the provision of a flushing cistern if there is a suitable head of water. S

6.10.1.5

The internal diameter of flushing pipes shall:-

(a) in the case of water closet fitments, trough water closets and slop sinks, be not less than 30mm; S

(b) in the case of urinals (other than trough urinals), be not less than 15mm for each basin and stall; and S

(c) in the case of trough urinals, be not less than 15mm for every metre thereof. S

6.10.1.6

A flushing apparatus must be operated by mechanical means or a sensor. In the case of an automatic flushing apparatus, the method of control and the volume and frequency of the flushes must be designed to ensure adequate cleaning. S

6.10.2 Flushing Cisterns

6.10.2.1

(a) A flushing cistern must be fitted with a flushing device of the valveless syphonic or valve type. S

(b) A stop valve must be fixed in a readily accessible position so as to control the water supply to the cistern. S

6.10.2.2

A flushing cistern for a water-closet fitment or slop sink must be capable of giving a flush of not more than 15 litres of water on each occasion the fitment is used. S

6.10.2.3

The capacity of the flushing cistern in the case of trough water closets and urinals shall be approved by the WA subject to the discharge in the case of trough water closets being not less than 9 litres of water for every metre of the channel and the discharge in the case of urinal being not less than 4.5 litres of water for every basin or stall, or in the case of a trough urinal, every metre thereof. S

6.10.2.4

The WA would have no objection to accepting the use of flushing cisterns with discharge less than that required by the current regulations provided that the design flushing volume is compatible with the toilet bowl to ensure effective clearance of waste by a single flush and the flushing apparatus meets the requirements of the WA. [Ref. PNAP APP-99] E

6.10.2.5

A flushing cistern operated by mechanical means or a sensor must be fitted with a ball float valve that is arranged to refill the cistern within 2 minutes. S

6.10.2.6

Every flushing cistern shall have an overflow which shall discharge in a conspicuous location. S

6.10.2.8

The requirements on the use of valve type flushing cisterns are as follows:-

(a) The valve seal of the flushing device shall be easily replaceable. E

(b) A dual flush valve which is designed to give two different volumes of flush shall have a readily discernible method of actuating the flush at different volumes. Such method should be illustrated clearly and permanently displayed at the cistern nearby. E

(c) For dual flush devices, the reduced flushing volume shall not be more than two-thirds of the larger flushing volume. E

(d) The flushing devices must pass the 200,000-cycle endurance test. E

6.10.2.9

The components of all valve type flushing devices shall be of material that is suitable for the use of salt water S

6.10.2.10

For an existing building with permission to use government water supply for flushing purposes, any existing flushing apparatus found unsuitable shall be replaced with a proper apparatus as specified under Section 6.10. S

6.10.2.11

A filter which is readily accessible for inspection and cleaning shall be installed before a flushing valve. This filter can be replaced by a built-in strainer, which can be readily inspected and cleaned, in the flushing device. E

6.10.3 Flushing Valves (Flushometers)

6.10.3.1

The installation of flushing valves (flushometers) shall be permitted when the following requirements are fulfilled:-

(a) A filter/strainer shall be installed before a flushing valve or a group of flushing valves;	E		
(b) The cartridge and other valve components shall be easily replaceable.	E		
(c) Flushing valves shall be used within the range of working pressures specified by the manufacturer.	E		
(d) The flushing devices must pass the 200,000-cycle endurance test.	E		
(e) An effective maintenance management system shall be provided for frequent inspection and cleaning of filters, i.e. normally only public toilets (administered by government, quasi-government bodies, hotel operators, commercial complex management offices etc.) will be considered	E		
(f) A plate etched with the name of the responsible party and the telephone number in both Chinese and English shall be provided to facilitate users to report defective flushing valves. Other effective arrangements may also be considered; and	E		
(g) Flushing valve shall be of water efficiency Grade 1 or Grade 2 under Water Efficiency Labelling Scheme (WELS).	E		

6.10.3.2

The valve components shall be of material that is suitable for the use of salt water	S		

6.10.3.3

For an existing building with permission to use mains water (fresh or salt) for flushing purposes, any existing flushing apparatus found unsuitable shall be replaced with a proper apparatus as specified under section 6.10	S		

6.11 Earthing

6.11.1

Inside service as an earth electrode

(a) The metal work of an inside service shall not be used as an earth electrode.	E		

Checklists for Vetting Plumbing Proposal - New Building

Chapter 7 - Water Conservation

Type: S = Statutory Requirements
E = Essential for approval of works

Referring to the clauses in Technical Requirements for Plumbing in Hong Kong (TR). You may cross out the clauses if not applicable
^ Please✓ as appropriate

	Type	Checked^	Remarks
#7.1 General			
7.1.1 For all proposed plumbing works submitted using the Form WWO 46 for designated part of premises as listed below, the proposed products to be used for shower head for bathing, water tap and urinal flushing valve should comply with prescribed water efficiency grades registered under WELS.	E		
7.2 Minimum Flow Requirements for Fittings in Inside Service			
7.2.1 The minimum flow requirements for draw-off taps, single and combination taps shall conform to the specification in the relevant international standards. Relevant standards for respective tapware has been summarized in Part B of TR.	E		
7.3 Water Efficiency Requirements for Fittings in Inside Service (WSD Circular Letter No. 2/2017)			
7.3.1 Subject to exemption stipulated in Section 7.5 of Part A of TR, designated products (showers for bathing, water taps and urinal flushing valves) of prescribed water efficiency requirements registered under WELS shall be used in the following designated part of premises:- (i) Kitchens of the domestic premises; and (ii) Bathrooms and toilets of all premises.	E		
7.3.2 The products shall comply with the prescribed water efficiency requirements in Table 7.3.2.1 of TR	E		
7.4 Alternatives to Application of WELS Products			
7.4.1 The flow controller shall be a registered product under WELS and shall be of appropriate water efficiency grade to form a 'combined' water saving device that meets the prescribed water efficiency requirements.	E		

Appendix 1: (2) Checklists for Vetting Plumbing Proposal - Village House

Cover Page

Address of

Premises: Name of

Consumer: Contact

Tel. No.:

ASN No./CCID NO. (if applicable)

The plumbing proposal has been checked against the following checklists and all the technical requirements stated on the checklists have been taken into account in preparing the plumbing proposal.

*Chapter 3 Meter

*Chapter 4 Inside Service

*Chapter 6 Water Cisterns, Water Pumps and Other Miscellaneous

Checklists prepared by,
(Authorised Person or
person signing the drawings)

Signature: _____

Name: _____

**please delete whichever is not applicable*

Checklists for Vetting Plumbing Proposal - Village House

Chapter 3 - Metering

Type: S = Statutory Requirements
E = Essential for approval of works

Referring to the clauses in Technical Requirements for Plumbing Works in Buildings(TR). You may cross out the clauses if not applicable
^ Please ✓ as appropriate

	Type	Checked^	Remarks
#3.1 General			
3.1.3 All domestic unit shall be separately metered	E		
3.1.4 Location of water meter			
(a) For direct supply system, the meter shall be sited in a meter room/box/chamber at convenient location in accessible communal area	E		
(b) For indirect supply system, the meter shall be sites in a meter room/box/chamber in accessible communal area at roof level or at other convenient locations	E		
3.1.6 For connections up to and including 40 mm diameter, a loose jumper type stopcock shall be provided and placed with spindle in the vertical position at each meter position on the inlet side of the meter where the meter is not sited at roof level and where the pressure is considered adequate.	E		
3.1.9 & 3.1.10 For salt water flushing supply, (a) a meter position shall be provided for the purpose of periodic checking of consumption. It should be close to the lot boundary and connection to the Government mains or close to the point of connection from internal distribution mains whichever is applicable.	E		
(b) stop valve shall be fitted at the inlet side of the meter position and a non-return or check valve shall be fitted on the delivery side as close as possible to the meter.	E		
3.1.12 With an aim to prevent tampering of water meters, security seals shall be installed for all newly installed meters of size 40mm or above.	E		
3.2 Meter Position			
3.2.1 (General Requirements for Meter Position)			
3.2.1.1 The following practice should be adopted in plumbing works design for meter positions:-			

(a) fitting at meter position shall facilitate easy installation and removal of the water meter without the need to work on other pipe	E		

3.2.1.2

(a) For 15mm meter			
(i) 20mm x 15mm bushes, or reducers at both sides of the meter position	E		
(ii) 200mm (clear effective length) distance piece of 15mm tube placed in between	E		
(iii) a long screw connector is provided immediately after the brush or reducer at the delivery side	E		
(b) For all meter size,			
(i) the meter position shall also be provided similarly to 15mm meter with corresponding fittings and appropriate sizes.	E		
(ii) the length of distance piece should be referred to Figure 4 of the TR	E		

3.2.1.3

If a section of copper pipe is used either before or after a water meter position, that section of copper pipe between the water meter position and the first pipe clamp shall be jointed by screwed or flanged joints or soldering/brazing copper couplers.	E		

3.2.1.4

uPVC fittings shall be used at the meter position if uPVC materials are used as inside services. Brass/copper longscrew (connector) shall be used at TMF position. Brass/copper fittings shall be used at the meter position if copper, lined galvanized steel or thermo-plastic materials are used as inside service.	E		

3.2.2(Architectural and M&E Requirement for meter room)

3.2.2.1

All water meters, including vacant meter positions and check meter positions, shall be arranged in groups of more than one meter positions and housed in meter rooms / boxes / cabinet / chamber.	E		

3.2.2.2

(a) The meter rooms/boxes/cabinets/chambers shall be designed solely for housing water meters to protect them against exposure to weather, falling objects and other undue external interferences to facilitate reading and maintenance of water meters.	E		
(b) When preparing VPLD submission, the applicant shall submit the layout and elevation plans of the meter rooms/boxes with dimensions, including the width and height of the entrances (door openings in case of meter boxes) for the Water Authority's approval.	E		

3.2.2.3

No other building services such as drainage systems, fire hoses, M&E installations (equipment, cables and ducting, etc.) shall pass through or be	E		

placed inside the meter rooms/meter boxes/master meter rooms except lighting, ventilation, drainage, and smart metering if required by the WA etc., solely to facilitate meter reading and maintenance of water meters.

3.2.2.4

The following architectural requirements as illustrated in Fig. 41 & 42 in TR shall be met:-

(b) (iii) Maximum clear depth of meter boxes measured from the outside face is 800mm	E		
(c) An entrance located at communal area for safe, free, and uninterrupted access to the meter room/box/cabinet/chamber shall be provided.	E		
(d) (i) Checked all door(s) to the meter room/box/cabinet and confirmed no self-closing device on it.	E		
(e) Outside of the door(s) to the meter room/box is clearly marked「水錶」,"Water Meters" in both Chinese and English of font size not less than 30mm	E		
(g) For village type buildings and similar, water meters shall be installed in meter room(s)/box(es)/cabinet(s) located at the boundary and shall be accessible from the public area.	E		

3.2.2.5

(b) Provision of adequate drainage inside the meter room and the meter box positioned at floor level	E		

3.2.4 (Mounting Height of Water Meters in Meter Rooms/Boxes)

3.2.4.1

(a) For meters arranged in groups and meters installed inside meter boxes and cabinets, no meter position shall be lower than 300 mm nor higher than 1500 mm above the floor level	E		

3.2.6 Location of Water Meter at Landscape Areas

3.2.6.1

For a meter installed in a landscape area, it should be installed above ground level. In case the meter is installed in a meter box/cabinet, there shall be a proper working space in front of the meter box/cabinet with a clear working headroom not less than 2m.	E		

3.2.6.2

A safe pedestrian access to the meter position should be provided.	E		

3.3 Master Meter and Check Meter

3.3.2 Principles of Master Meters Provision

3.3.2.2

Subject to Clause 3.3.2.3, for single detached village type buildings and single block buildings, master meters will not be required but all pipework between the connection to the main and meter positions shall be exposed or laid in a proper service trench/duct, except that branch mains of less than one straight pipe length of 6 metres from tee-connection to a building block may be buried.	E		

Checklists for Vetting Plumbing Proposal

Chapter 4 - Inside Service

Type: S = Statutory Requirements
E = Essential for approval of works

Referring to the clauses in Technical Requirements for Plumbing Works in Buildings (TR). You may cross out the clauses if not applicable
^ Please ✓ as appropriate

	Type	Checked^	Remark
#4.1 Pipe & Fitting Materials			
4.1.1 General			
4.1.1.1			
Pipes and fittings shall conform to the relevant standards as listed in Part B of TR and the WWR.	E		
4.1.2 Requirements of Minimum Pipe Sizes			
4.1.2.1			
A pipe must not be less than 20mm in diameter, except that a branch pipe may be of 15mm or more in diameter if the pipe length is not longer than 3m and the pipe supplies only one draw-off point.	S		
4.2 Fresh Water Supply			
4.2.1 General Requirements			
4.2.1.1			
All fresh water supplies to inside service , including TMF, shall be metered.	S		
4.2.1.2			
(a) All domestic supplies and concessionary supplies shall be separately metered.	E		
(b) For different applications of concessionary supplies, Section 4.2.5 of TR shall be referred.	E		
4.2.3 Backflow/ Cross-connection Prevention			
4.2.3.1 Protection of Water Supplies			
4.2.3.1.1			
All water supply systems shall be designed, installed, and maintained in order to prevent contaminants from being introduced into the fresh water supply systems.	E		
4.2.3.1.2			
No device or system that may cause contamination of a water supply shall be connected directly or indirectly to any part of an inside service without	E		

appropriate cross-connection prevention or backflow prevention control suitable for the level of hazard.

4.2.3.2 Cross-Connection/Backflow Hazard Rating

4.2.3.2.1

Cross-connections are rated using three degrees of hazard, namely:-

(a) High Hazard E

Any condition, device or practice that, in connection with the water supply system, has the potential to cause death or serious health impact;

(b) Medium Hazard E

Any condition, device or practice that, in connection with the water supply system, has the potential to cause significant health impact; and

(c) Low Hazard E

Any condition, device or practice that, in connection with the water supply system, constitutes a nuisance but does not cause significant health impact.

4.2.3.3 Provision of Backflow Prevention Devices

4.2.3.3.1

(a) The fresh water supply shall be protected from the hazard(s) by installing appropriate device listed in Table 4.2.3.7.1. E

(b) Hazard ratings for some typical installations are listed in Table 4.2.3.7.2 for reference. E

4.2.3.3.2

Backflow prevention devices shall comply with the latest BS EN 1717 and all relevant standard(s) for the devices. E

4.2.3.4 Water Downstream of Backflow Prevention Device

4.2.3.4.1

Piping conveying water downstream of backflow prevention device, installed for high or medium hazard protection, shall be clearly and permanently labelled ‘WARNING! NOT FOR DRINKING’ at every outlet. E

4.2.3.5 Commissioning and Maintenance

4.2.3.5.2

If backflow prevention devices applicable to high hazard cases, e.g. backflow preventer/reduced pressure zone valve etc., they shall only be used with a maintenance program. If such program is unavailable, the backflow prevention devices shall not be fitted and break tank shall be provided. E

4.2.3.6 Backflow Prevention Device in Hot Water Systems

4.2.3.6.1

The backflow prevention device used in hot water systems shall be suitable for the specific hot water installation. E

4.2.3.7 Backflow Prevention Device and Hazard Levels for Applications

4.2.3.7.1

Tables 4.2.3.7.1 and 4.2.3.7.2 shall be referred commonly used backflow prevention devices and hazard levels for different applications. For concessionary water supplies, Clause 4.2.5.2 shall be referred.	E		

4.2.4 General Pipework Arrangement

4.2.4.3

No water pipe shall be embedded within load bearing structural elements in longitudinal direction. Such structural elements include, but not limited to, columns, beams and slabs. Screeding above slabs should not be considered as structural elements. Hence, water pipe embedded in screeding is acceptable. The water pipe in screeding shall be considered as embedded pipes.	E		

4.2.4.4

Vertical water pipes piercing through structural slabs and transfer plates; and horizontal water pipes piercing through beams, columns and structural walls shall be protected by sleeving or other suitable means.	E		

4.2.4.5

Tee-branch valve has been provided in

(a) all underground water pipes; and	E		
(b) and for all communal inside service	E		

4.2.4.7

No draw-off point in the inside services shall be subject to an excessive pressure of 6 bar or above.	E		

4.2.5 Concessionary Usage of Mains Water

4.2.5.1

Concession usage of mains water are for the purpose listed in Clause 4.2.5.2	E		

4.2.5.2

Compliance with the concessionary usages and requirements in this clause	E		

4.2.5.5

Installation of water points for internal cleansing of open yards and for other miscellaneous domestic purposes in private houses of bungalow type or the like can be permitted as part of the domestic supply. This will not be taken as a concessionary supply. It is not necessary to install any receptacle for this type of water points.	E		

4.2.7 Hot Water Systems

4.2.7.1 Non-Centralized Hot Water System

4.2.7.1.1

When the factory test pressure of the heater is at least 1.5 times the maximum static pressure at the mains water supply point, non-pressure type heaters, cistern type water heaters, unvented electric thermal storage water heaters satisfying the requirements stipulated in Clauses 4.2.7.1.12 and instantaneous water heaters are permitted to be connected direct to the supply pipe without the necessity of providing storage. S

4.2.7.1.2

When the factory test pressure of the heater is less than 1.5 times the maximum static water pressure at the mains water supply point then, for premises on direct supply, a water heater must be supplied with water from a cold water cistern. S

4.2.7.1.3

A separate mains water storage cistern of 45 litres capacity shall be provided for each flat to supply such hot water apparatus in Clause 4.2.7.1.2. E

4.2.7.1.4

Pressure type thermal storage heaters other than unvented electric thermal storage water heaters satisfying the requirements stipulated in Clauses 4.2.7.1.12 shall be supplied from storage cisterns no matter what the pressure at inlet point should be, except these are installed in flats supplied through the indirect or sump and pump system. S

4.2.7.1.5

For premises on direct supply, a separate mains water storage cistern of 45 litres capacity shall be provided for each flat to supply such hot water apparatus in Clause 4.2.7.1.4. E

4.2.7.1.6

For flats supplied from the roof storage cistern of an indirect or sump and pump system, no separate storage for hot water apparatus will be required but the supply to the apparatus shall be by a separate down feed supplying the apparatus only unless the arrangement in Clause 4.2.7.1.7 is applied. E

4.2.7.1.7

If the flats on the indirect system are supplied through an oversized down feed pipe, the pipe supplying the hot water apparatus shall be branched from the down feed at a point above the top of the apparatus. E

4.2.7.1.8

When gas geysers are to be installed on the top floor of a building supplied through storage cisterns, gas geysers with low pressure governors should be installed when the head available is less than 5 metres to the highest hot water draw-off point. E

4.2.7.1.9

If mixing valves, water blenders or combination fittings are to be used, the cold water supply to these fixtures shall be drawn from the same source as is supplying the hot water apparatus. In order to provide a balanced pressure and to obviate the risk of scalding should the supply at the source fail or be restricted for any reason. S

4.2.7.1.10

All pressure type thermal storage heaters shall be provided with a vent or expansion pipe taken from its highest point and discharge in the atmosphere above the storage cistern at sufficient height to prevent a constant outflow of hot water therefrom except for unvented electric thermal storage water heaters satisfying the requirements stipulated in Clauses 4.2.7.1.12 and 4.2.7.1.13 of TR. S

4.2.7.1.11

A loose jumper type valve shall be fitted on the inlet of the water heater if a non-return valve is not incorporated in such water heater, but this requirement does not apply to an electric water heater of the thermal storage type satisfying the requirements stipulated in Clauses 4.2.7.1.12 and 4.2.7.1.13 of Part A of TR. S

4.2.7.1.12

All unvented electric thermal storage water heaters shall comply with the safety requirements under the Electrical Products (Safety) Regulation (Cap. 406 sub. leg.) S

4.2.7.1.13

Every system incorporating an unvented electric water heater of the thermal storage type shall be provided with:-

(a) a supply pipe that branches off from the feed pipe at a point above the top of the water heater, or some other device to prevent the water from draining down from the water heater if there is a failure at the source of water supply; S

(b) an anti-vacuum valve or some other device to prevent heated water from being syphoned back to the supply pipe; and S

(c) a vessel to accommodate the expansion of heated water where that expansion is constrained by a non-return valve or some other device, incorporated at the inlet of the water heater. S

4.3 Flushing Water Supply

4.3.1 Sources of Flushing Water Supply

#4.3.1.1

For inside service using government water supply for flushing, it shall comply with the requirements of the WWO/WWR and that of the WA.. E

4.3.2 Pipe and Fitting Materials

4.3.2.1

All water tanks , pipes and fittings of flushing water systems must be of salt water resistant materials to the approval of the WA. Pipes and fittings shall conform to the relevant standards as listed in Part B of TR and the WWR. E

4.3.3 Metering Requirements

4.3.3.1

All flushing water supply systems shall be separate water supply systems. E

4.3.3.3

Water meter shall be installed in each flushing system receiving a TMF supply. TMF flushing water supply would normally be given to the entire building Requirements stipulated in Section 3 of this TR is applicable. E

4.3.5 General Pipework Arrangement

4.3.5.1

Under the provision of Buildings Ordinance (Chapter 123), all new buildings shall be provided with a plumbing system to supply water for flushing purposes and every part of such plumbing system, including the storage tank, shall be constructed of such materials that are suitable for use with salt water. S

4.3.5.2

A separate water storage tank shall be provided for flushing purpose S

4.3.5.3

The inlet pipe to the separate storage tank should not be less than 40 mm diameter; its portion before meter position shall be exposed or laid in a proper service duct and extended to the lot boundary. E

4.3.5.4

To facilitate meter installation, a meter position shall be provided in the communal area of the building as close to the fresh supply meters as possible. Regarding general requirements for meter positions, Section 3.2 of Part A of TR shall be referred. E

4.3.5.5

In case a temporary mains fresh water supply is proposed to be provided as the alternative source to augment an existing independent (not Government) supply, the storage tank for the flushing cistern shall be constructed in accordance with Fig. 15. E

4.3.5.6

No draw-off point in the inside services shall be subject to pressure of 6 bar or above.	E		

4.3.5.7

A tee-branch valve shall be provided for all underground flushing water pipes, flushing and for all pipes serving more than one domestic or commercial unit.	E		

4.3.5.8

Concerning requirement for flushing water storage capacity, Clause 6.2.5 shall be referred.	E		

Checklists for Vetting Plumbing Proposal

Chapter 6 - Water Cisterns, Water Pumps and Other Miscellaneous

Type: S = Statutory Requirements
E = Essential for approval of works

Referring to the clauses in Technical Requirements for Plumbing Works in Buildings(TR). You may cross out the clauses if not applicable
^ Please✓ as appropriate

	Type	Checked^	Remarks
#6.1 General			
6.1.1 No cistern for the storage of cold water shall be installed or used except with the permission in writing of the Water Authority who shall specify the maximum permitted capacity.	S		
6.1.2 No cistern for the storage of fresh water supplied from the waterworks shall, without the written permission of the WA, be so connected that it can be used for the storage of any water other than that supplied from the waterworks.	S		
6.2 Cold Water Cisterns (or Cold Water Tanks)			
6.2.1 Location			
6.2.1.1 Access for Maintenance and Inspection			
6.2.1.1.1 Water Storage Tanks shall be installed so that they are easily accessible for cleaning or repairs.	S		
6.2.1.1.2 Safe access shall be provided to all cisterns by means of a secure permanent ladder or readily available portable ladder.	S		
6.2.1.1.3 Where a cistern is installed inside a building and, due to limited headroom available, it is fixed with limited clearance from the ceiling or underside of the roof, a quickly detachable fitting must be used to enable it to be easily removed for cleansing and repair.	S		
6.2.1.1.4 For a water cisterns with top access, the access on top of the cisterns should have a minimum headroom of 800mm.	E		

6.2.2 Material Requirements

6.2.2.1

A cistern must be watertight, of adequate strength, properly supported and be made of concrete, stainless steel or fibre glass. S

6.2.2.2

For concrete fresh water cisterns/storage tank, all internal surface of floors, walls (to full height) and soffits of potable water storage cisterns should be lined with a non-toxic smooth finish. E

6.2.2.4

When fibreglass storage tank is to be used, prior approval by the Water Authority must be sought. Fibreglass storage cistern for potable water shall be of an approved type or certified to contain no toxic materials and suitable for storage of potable water. E

6.2.3 Cover for Water Tanks

6.2.3.1

A cistern must be so located as to minimize the risk of contamination of stored water and be fitted with a suitable close fittings lockable cover that is not airtight. The cover must be so positioned as to facilitate inspection and cleaning. The covers must be so positioned as to facilitate inspection and cleaning. S

6.2.3.2

(a) Every storage cistern shall have a lockable close fitting rigid cover secured by mechanical means which excludes light and the ingress of particles and / or insects from the cistern. E

(b) The cover shall be made of a material or materials which do not shatter or fragment when broken and which will not contaminate any condensate which may form on its underside or the stored water. E

6.2.4 Installation Requirements for Inlet and Outlet Pipe

6.2.4.1.1

All outlet pipes from the storage cistern should, be positioned at the opposite side to the inlet supply pipe to prevent stagnation of water. E

6.2.4.2 Controlling Incoming Water Supply

6.2.4.2.1

The inlet of a single cistern fed by a gravity supply must be fitted with a ball float valve and stop valve. S

6.2.4.2.2

(a) For ball float valves of a nominal diameter not exceeding 50mm, their valve bodies must be made of copper alloy or stainless steel. S

(b) For ball float valves of a nominal diameter exceeding 50mm, their valve bodies must be made of copper alloy, stainless steel, epoxy coated cast iron or epoxy coated ductile iron. S

6.2.4.2.3

(a) Floats for use with fresh water must be made of copper alloy or stainless steel.	S		
(b) Floats for use with salt water must be made of plastic or stainless steel.	S		

6.2.4.2.4

Ball float valves fitted to a cistern must have the size of the orifice, the size of the float and the length of the lever so proportioned to one another that, when the float is immersed to an extent not exceeding half its volume, the valve is watertight against the highest pressure at which the valve may be required to work.	S		

6.2.4.2.5

A ball float valve or float-operated valve fitted to a cistern must be

(a) securely fixed to the cistern above the waterline of the float of the valve, and	S		
(b) must be supported independently of the inlet pipe (unless the inlet pipe is itself rigid and securely fixed to the cistern), in a position that no part of the body of the valve is submerged when the cistern is charged to the overflowing level.	S		

6.2.4.2.6

(a) If a ball float valve or float-operated valve is provided with a pipe so arranged as to discharge water into a cistern below its overflowing level, an air hole must be provided in the outlet chamber of the valve above the overflowing level.	S		
(b) The air hole must be of a size sufficient to prevent syphonage of water back through the valve.	S		

6.2.4.2.7

Ball float valves must not be fitted to a cistern that is used to contain heated water.	S		

6.2.4.2.8

The inlet of a single cistern fed by a pumped supply must be fitted with an automatic control switch and without any stop valve.	S		

6.2.4.2.9

(a) The ball valve or control switch shall shut off the supply when the water level is 25mm below the invert of the overflow pipe or the warning pipe if there exists one.	S		
(b) The invert of the inlet pipe or the face of the outlet nose of the ball valve shall be not less than 25mm above the top of the overflow pipe.	S		

6.2.4.2.10

(a) In case of a mixed flushing water supplies, the water tank shall be fitted with a ball float valve with submerged float control and a fullway gate valve for controlling and isolating the inflow of mains supply respectively.	E		
(b) For other source of flushing water supply, a ball float valve and a fullway gate valve shall be provided.	E		
(c) Performance of the ball float valve shall meet the requirements specified in case of gravity supply.	E		

6.2.4.3 Outlet Water Pipes

6.2.4.3.1

The invert of an outlet pipe from a water storage tank with capacity less than 5000 litres shall be at least 30 mm above the bottom of the tank; this distance shall be increased to 100 mm if the storage tank capacity is 5000 litres or more. E

6.2.4.3.2

A stop valve must be provided at the outlet of a cistern. and provision shall be made for a drain-off pipe to enable the cistern to be emptied. S

6.2.4.3.3

Fullway gate valves shall be used with as the stop valves in Cl. 6.2.4.3.2 at the outlet pipe of every water storage cistern. The drain-off pipe shall be properly plugged or adequate means shall be provided to prevent any unauthorized operation of the control valve at drain-off pipe. If the outlet of a flushing water cistern is of nominal size 50mm or below, a ball valve can be used to substitute the above gate valve. E

6.2.4.4 Overflow Pipes and Warning Pipes

6.2.4.4.1

All overflow and warning pipes of potable water storage cisterns shall be constructed of corrosion-resisting material. S

6.2.4.4.2

The overflow pipe shall be at least one commercial size larger than the inlet pipe and shall in no case be less than 25 mm in diameter must be fitted to a cistern and be extended to terminate in a conspicuous position. The overflow pipe must not be connected to a drain or sewer or to the overflow pipe from another cistern. S

6.2.4.4.3

The position of discharge should be in a communal area easily visible and accessible by the occupants. E

6.2.4.4.4

If the overflow pipe is not extended to terminate in a conspicuous position, the overflow pipe shall be installed with an overflow alarm with signal transferred to a 24-hourly manned management office for timely notification. Full justifications for such arrangement shall be provided to the WA for consideration and approval. E

6.2.4.4.5

In case of mixed flushing water supply as shown in Fig. 15, the overflow shall be twice the diameter of largest inlet or of nominal diameter 40mm, whichever is greater. E

6.2.4.4.6

No part of the overflow pipe shall be submerged inside the storage tank E

6.2.4.4.7

A grating and a self-closing non-return flap shall be provided at the overflow pipe outside the storage tank. E

6.2.4.4.8

A warning pipe shall be installed in addition to an overflow pipe. A warning pipe can be of any size not less than 25 mm in diameter and shall comply with all other requirements of an overflow pipe. E

6.2.4.4.9

The warning pipes shall be installed at a level below the overflow pipe and shall be either extended to conspicuous location, i.e. outside of the building periphery for roof tank or outside the pump room for sump tank, or installed with signal transferred to a 24-hourly manned management office. E

6.2.5 Size of Storage Tanks for Flushing, Domestic and Trade/Commercial Water Uses

6.2.5.1

The proportion of capacity of sump cistern to roof cistern is recommended to be in the order of 1:3. Otherwise, the designer shall demonstrate that the proposed ratio of sump cistern to roof cistern is capable of fulfilling the designed demand. E

6.2.5.2

The capacity of the flushing water roof cistern shall be designed according to the criteria in Table 6.2.5.2.1 with a minimum capacity of 250 litres. [applicable to new applications with Form WWO 542 submitted on or after 1 January 2019 only.] E

6.2.5.3

Storage criteria for fresh water supply for domestic flats is listed in Table 6.2.5.3.1. E

6.2.6 Other Recommendation/Requirement

6.2.6.3 to 6.2.6.5

(a) A set of inlet, outlet and associated overflow and drain pipes shall be provided to each cistern compartment. E

(b) Each inlet of a twin-cistern fed by a pumped supply must be fitted with an automatic control switch and a stop valve for temporary isolation purpose. S

(c) For water supplies other than pumped supply, this inlet shall comply with requirements stated in Clause 6.2.4.2.1 of Part A of TR. E

6.5 Pressure Reducing Valves

6.5.1

No part in the internal pipework and/or draw-off point shall be subject to excessive high pressure. In case of excessive high pressure, provision of break E

pressure tanks at a suitable level of the internal supply system would be a positive and viable means to reduce the water pressure. Alternatively, pressure reducing valves may be provided in lieu of break pressure tank.

6.5.2

Whenever a pressure reducing valve is installed,

(a) a bypass arrangement shall be incorporated with the provision of a second pressure reducing valve, except for fire service installations, to enable isolation of any defective pressure reducing valve for repair and replacement when necessary; E

(b) A pressure indicator shall be provided for pressure monitoring and the associated pipes and fittings shall be able to withstand the maximum pressure that may arise upon the failure of the pressure reducing valve as far as practicable. Fault alarm shall be installed with signal transferred to a 24-hourly manned management office for timely notification, except for fire service installations. E

6.6 Stop Valves for Draw-off Points

6.6.1

Individual stop valves shall be provided at all draw-off points or at a series of draw-off points if situated close together. E

6.7 Water Taps

6.7.1 Application of Water Taps

6.7.1.1

When infra-red sensor operated automatic taps are used as inside services, a stop cock or gate valve must be installed at the upstream of each fitting for manual isolation of water supply. E

6.7.1.2

Self-closing taps, of non-concussive type and of approved pattern, or infra-red operated automatic taps, shall be used for the public or communal lavatory basins. E

6.7.1.3

Except with the written permission of the Water Authority, fitting with a threaded outlet, or any device facilitating the connecting of rubber hose or another type of flexible hose, must not be used. S

6.7.2 Installation Requirements for Sanitary Fixtures Supplied by Water Taps

6.7.2.1

All taps supplying baths, lavatory basins, sinks or similar apparatus shall have a stop valve fixed in a readily accessible position to control the supply to each fitting or branch pipe supplying a range of fittings. S

6.7.2.2

Every inlet to a bath, lavatory basin or sink shall be distinct from, and unconnected with, any outlet therefrom and every outlet for emptying such bath, lavatory basin or sink shall be provided with a well-fitting and easily accessible watertight plug or some other equally suitable apparatus. S

6.7.2.3

The level of the hot or cold water draw-off point to a bath, lavatory basin or sink shall be above the level of the overflow. In the absence of overflow in the fixtures, the top edge of the bath, basin or sink shall be considered instead. S

6.7.2.4

If water supply to any bidets, sitz bath, slop and sluicing sink or similar apparatus is liable to be submerged, the following shall be provided:- S

(a) a storage cistern supplying water to such apparatus only;

(b) a storage cistern for flushing purposes only; or

(c) a hot water distribution system supplying such apparatus only.

6.8 Domestic Appliances

6.8.1 Water Purifiers/Filters

6.8.1.2

Domestic water purifiers/ filters must not be connected directly to the mains supply because of the possibility of contamination. E

6.8.1.3

When there is installation of any domestic filter or water filter incorporated in water using apparatuses (such as drinking fountain etc.), backflow prevention device shall be installed. E

6.8.1.4

Requirements for backflow prevention and written permission from the WA for typical types of water filters are summarized in Table 6.10.1.4.1. E

6.8.1.5

Sterilizers without or without attached filtering devices could be connected directly to the mains supply provided that backflow prevention device is provided upstream of the sterilizer such that there is no possibility of contaminating the mains supply. E

6.8.2 Washing Machines/Dishwashing Machines

6.8.2.2

Washing machines/ dishwashing machines with submerged inlets are considered to have high level of contamination hazard and must be installed with appropriate backflow prevention devices according to Table 4.2.3.7.1. E

6.10 Flushing Apparatus

6.10.1 General Requirements

6.10.1.2

S

(a) A flushing cistern must in all cases be supplied from a cistern. Except with the written permission of the Water Authority, the cistern must not be used to supply any other apparatus, appliance or fitting.

(b) The cistern must be fitted with a suitable close fitting cover and provided with appropriate access to enable the cistern to be entered and cleaned. S

6.10.1.3

A trough water-closet or urinal must be fitted with a flushing cistern. S

6.10.1.4

A water-closet fitment or slop sink must be fitted with a flushing cistern. However, a pressure flushing valve may be installed for flushing without the provision of a flushing cistern if there is a suitable head of water. S

6.10.1.5

The internal diameter of flushing pipes shall:-

(a) in the case of water closet fitments, trough water closets and slop sinks, be not less than 30mm; S

(b) in the case of urinals (other than trough urinals), be not less than 15mm for each basin and stall; and S

(c) in the case of trough urinals, be not less than 15mm for every metre thereof. S

6.10.1.6

A flushing apparatus must be operated by mechanical means or a sensor. In the case of an automatic flushing apparatus, the method of control and the volume and frequency of the flushes must be designed to ensure adequate cleaning. S

6.10.2 Flushing Cisterns

6.10.2.1

(a) A flushing cistern must be fitted with a flushing device of the valveless syphonic or valve type. S

(b) A stop valve must be fixed in a readily accessible position so as to control the water supply to the cistern. S

6.10.2.2

A flushing cistern for a water-closet fitment or slop sink must be capable of giving a flush of not more than 15 litres of water on each occasion the fitment is used. S

6.10.2.3

The capacity of the flushing cistern in the case of trough water closets and urinals shall be approved by the WA subject to the discharge in the case of trough water closets being not less than 9 litres of water for every metre of the channel and the discharge in the case of urinal being not less than 4.5 litres of water for every basin or stall, or in the case of a trough urinal, every metre thereof. S

6.10.2.4

The WA would have no objection to accepting the use of flushing cisterns with discharge less than that required by the current regulations provided that the design flushing volume is compatible with the toilet bowl to ensure effective clearance of waste by a single flush and the flushing apparatus meets the requirements of the WA. [Ref. PNAP APP-99] E

6.10.2.5

A flushing cistern operated by mechanical means or a sensor must be fitted with a ball float valve that is arranged to refill the cistern within 2 minutes. S

6.10.2.6

Every flushing cistern shall have an overflow which shall discharge in a conspicuous location. S

6.10.2.8

The requirements on the use of valve type flushing cisterns are as follows:-

(a) The valve seal of the flushing device shall be easily replaceable. E

(b) A dual flush valve which is designed to give two different volumes of flush shall have a readily discernible method of actuating the flush at different volumes. Such method should be illustrated clearly and permanently displayed at the cistern nearby. E

(c) For dual flush devices, the reduced flushing volume shall not be more than two-thirds of the larger flushing volume. E

(d) The flushing devices must pass the 200,000-cycle endurance test. E

6.10.2.9

The components of all valve type flushing devices shall be of material that is suitable for the use of salt water S

6.10.2.10

For an existing building with permission to use government water supply for flushing purposes, any existing flushing apparatus found unsuitable shall be replaced with a proper apparatus as specified under Section 6.10. S

6.10.2.11

A filter which is readily accessible for inspection and cleaning shall be installed before a flushing valve. This filter can be replaced by a built-in strainer, which can be readily inspected and cleaned, in the flushing device. E

6.10.3 Flushing Valves (Flushometers)

6.10.3.1

The installation of flushing valves (flushometers) shall be permitted when the following requirements are fulfilled:-

(a) A filter/strainer shall be installed before a flushing valve or a group of flushing valves; E

(b) The cartridge and other valve components shall be easily replaceable. E

(c) Flushing valves shall be used within the range of working pressures specified by the manufacturer.	E		
(d) The flushing devices must pass the 200,000-cycle endurance test.	E		
(e) An effective maintenance management system shall be provided for frequent inspection and cleaning of filters, i.e. normally only public toilets (administered by government, quasi-government bodies, hotel operators, commercial complex management offices etc.) will be considered	E		
(f) A plate etched with the name of the responsible party and the telephone number in both Chinese and English shall be provided to facilitate users to report defective flushing valves. Other effective arrangements may also be considered; and	E		
(g) Flushing valve shall be of water efficiency Grade 1 or Grade 2 under Water Efficiency Labelling Scheme (WELS).	E		
6.10.3.2 The valve components shall be of material that is suitable for the use of salt water	S		
6.10.3.3 For an existing building with permission to use mains water (fresh or salt) for flushing purposes, any existing flushing apparatus found unsuitable shall be replaced with a proper apparatus as specified under Section 6.10.	S		

6.11 Earthing

6.11.1 Inside service as an earth electrode (a) The metal work of an inside service shall not be used as an earth electrode.	E		

Appendix 1: (3) Checklists for Vetting Plumbing Proposal - Separate Meter

Cover Page

Address of Premises:

Name of Consumer:

Contact Tel. No.:

ASN No./CCID NO. (if applicable)

The plumbing proposal has been checked against the following checklists and all the technical requirements stated on the checklists have been taken into account in preparing the plumbing proposal.

*Chapter 3 Meter

*Chapter 4 Inside Service

*Chapter 6 Water Cisterns, Water Pumps and Other Miscellaneous

* please delete as appropriate

Checklists prepared by,
(Authorised Person or
person signing the drawings)

Signature: _____

Name: _____

*please delete whichever is not applicable

Checklists for Vetting Plumbing Proposal - Separate Meter

Chapter 3 - Metering

Type: S = Statutory Requirements
E = Essential for approval of works

Referring to the clauses in Technical Requirements for Plumbing Works in Buildings(TR). You may cross out the clauses if not applicable
^ Please ✓ as appropriate

	Type	Checked^	Remarks
#3.1 General			
3.1.4			
(a) Meter shall be sited in a meter room/box/chamber at convenient location in accessible communal area	E		
(b) For indirect supply system, the meter shall be sites in a meter room/box/chamber in accessible communal area at roof level or at other convenient locations	E		
3.1.6			
For connections up to and including 40 mm diameter, a loose jumper type stopcock shall be provided and placed with spindle in the vertical position at each meter position on the inlet side of the meter where the meter is not sited at roof level and where the pressure is considered adequate.	E		
3.1.7			
For connections larger than 40 mm diameter, a gate valve shall be provided before the meter position and a non-return or check valve fitted on the delivery side as close as possible to the meter.	E		
3.1.8			
For single jet meter and turbine meter installed in direct supply system, a strainer shall be installed upstream of the meter.	E		
3.1.11			
Minimum meter size requirement for business accounts as shown Table 3.1.11.1 of TR shall be followed.	E		
3.1.12			
With an aim to prevent tampering of water meters, security seals shall be installed for all newly installed meters of size 40mm or above.	E		
3.2 Meter Position			
3.2.1 (General Requirements for Meter Position)			
3.2.1.1			
The following practice should be adopted in plumbing works design for meter positions:-			
(a) fitting at meter position shall facilitate easy installation and removal of the water meter without the need to work on other pipe	E		

3.2.1.2

(a) For 15mm meter

(i) 20mm x 15mm bushes, or reducers at both sides of the meter position	E		
(ii) 200mm (clear effective length) distance piece of 15mm tube placed in between	E		
(iv) a long screw connector is provided immediately after the brush or reducer at the delivery side	E		

(b) For all meter size,

(i) the meter position shall also be provided similarly to 15mm meter with corresponding fittings and appropriate sizes.	E		
(ii) the length of distance piece should be referred to Figure 4 of the TR	E		

3.2.1.3

If a section of copper pipe is used either before or after a water meter position, that section of copper pipe between the water meter position and the first pipe clamp shall be jointed by screwed or flanged joints or soldering/brazing copper couplers.	E		

3.2.1.4

PVC-U fittings shall be used at the meter position if PVC-U materials are used as inside services. Brass/copper longscrew (connector) shall be used at TMF position. Brass/copper fittings shall be used at the meter position if copper, lined galvanized steel or thermo-plastic materials are used as inside service.	E		

3.2.2(Architectural and M&E Requirement for meter room)

3.2.2.2

When preparing VPLD submission, the applicant shall submit the layout and elevation plans of the meter rooms/boxes with dimensions, including the width and height of the entrances (door openings in case of meter boxes) for the Water Authority's approval.	E		

3.2.4 (Mounting Height of Water Meters in Meter Rooms/Boxes)

3.2.4.1

(a) For meters arranged in groups and meters installed inside meter boxes and cabinets, no meter position shall be lower than 300 mm nor higher than 1500 mm above the floor level	E		
(b) For projects where corridor meter arrangement is chosen and accepted, individual meter positions shall be at a suitable height not less than 750 mm but not more than 1500 mm above the floor level.	E		
(c) Minimum clearance should be provided for meters of trade supply according to Fig. 36.	E		

3.5 Separate Metering in Existing Premises

3.5.1

The inside service shall be constructed from each flat to the existing common meter positions.	E		

3.5.2

In an occupied building,

(a) provide a temporary bypass arrangement as close to the delivery side of the meter as possible; and	E		
(b) the consumption of the temporary arrangement is measured by bulk meter.	E		

3.5.3

If part of an inside service is required to be retained as communal service, it is necessary to obtain an undertaking from the Developer/Owner, Management Committee, Landlords Association, Residents Association, Incorporated Owners, Mutual Aid Committee or an individual resident flat owner to accept responsibility for the common inside service from the connection to the main. If there is no consent for using the existing common inside service, a new connection is required for the conversion of some existing premises from a communal meter to separate meters and the new separate inside services become the responsibility of individual consumers.	E		

Checklists for Vetting Plumbing Proposal - Separate Meter

Chapter 4 - Inside Service

Type: S = Statutory Requirements
E = Essential for approval of works

Referring to the clauses in Technical Requirements for Plumbing Works in Buildings(TR). You may cross out the clauses if not applicable
^ Please✓ as appropriate

	Type	Checked^	Remarks
#4.1 Pipe & Fitting Materials			
4.1.1 General			
4.1.1.1			
Pipes and fittings shall conform to the relevant standards as listed in Part B of TR and the WWR.	E		
4.1.2 Requirements of Minimum Pipe Sizes			
4.1.2.1			
A pipe must not be less than 20mm in diameter, except that a branch pipe may be of 15mm or more in diameter if the pipe length is not longer than 3m and the pipe supplies only one draw-off point.	S		
4.2 Fresh Water Supply			
4.2.1 General Requirements			
4.2.1.1			
All fresh water supplies to inside service, including TMF, shall be metered.	S		
4.2.1.2			
(a) All domestic supplies and concessionary supplies shall be separately metered.	E		
(b) For different applications of concessionary supplies, Section 4.2.5 of TR shall be referred.	E		
4.2.3 Backflow/ Cross-connection Prevention			
4.2.3.1 Protection of Water Supplies			
4.2.3.1.1			
All water supply systems shall be designed, installed, and maintained in order to prevent contaminants from being introduced into the fresh water supply systems.	E		
4.2.3.1.2			
No device or system that may cause contamination of a water supply shall be connected directly or indirectly to any part of an inside service without appropriate cross-connection prevention or backflow prevention control suitable for the level of hazard.	E		

4.2.3.2 Cross-Connection/Backflow Hazard Rating

4.2.3.2.1

Cross-connections are rated using three degrees of hazard, namely:-

(a) High Hazard
Any condition, device or practice that, in connection with the water supply system, has the potential to cause death or serious health impact; E

(b) Medium Hazard
Any condition, device or practice that, in connection with the water supply system, has the potential to cause significant health impact; and E

(c) Low Hazard
Any condition, device or practice that, in connection with the water supply system, constitutes a nuisance but does not cause significant health impact. E

4.2.3.3 Provision of Backflow Prevention Devices

4.2.3.3.1

(a) The fresh water supply shall be protected from the hazard(s) by installing appropriate device listed in Table 4.2.3.7.1. E

(b) Hazard ratings for some typical installations are listed in Table 4.2.3.7.2 for reference. E

4.2.3.3.2

Backflow prevention devices shall comply with the latest BS EN 1717 and all relevant standard(s) for the devices. E

4.2.3.4 Water Downstream of Backflow Prevention Device

4.2.3.4.1

Piping conveying water downstream of backflow prevention device, installed for high or medium hazard protection, shall be clearly and permanently labelled 'WARNING! NOT FOR DRINKING' at every outlet. E

4.2.3.5 Commissioning and Maintenance

4.2.3.5.2

If backflow prevention devices applicable to high hazard cases, e.g. backflow preventer/reduced pressure zone valve etc., they shall only be used with a maintenance program. If such program is unavailable, the backflow prevention devices shall not be fitted and break tank shall be provided. E

4.2.3.6 Backflow Prevention Device in Hot Water Systems

4.2.3.6.1

The backflow prevention device used in hot water systems shall be suitable for the specific hot water installation. E

4.2.3.7 Backflow Prevention Device and Hazard Levels for Applications

4.2.3.7.1

Tables 4.2.3.7.1 and 4.2.3.7.2 shall be referred commonly used backflow prevention devices and hazard levels for different applications. For concessionary water supplies, Clause 4.2.5.2 shall be referred. E

4.2.4 General Pipework Arrangement

4.2.4.3

No water pipe shall be embedded within load bearing structural elements in longitudinal direction. Such structural elements include, but not limited to, columns, beams and slabs. Screeding above slabs should not be considered as structural elements. Hence, water pipe embedded in screeding is acceptable. The water pipe in screeding shall be considered as embedded pipes. E

4.2.4.4

Vertical water pipes piercing through structural slabs and transfer plates; and horizontal water pipes piercing through beams, columns and structural walls shall be protected by sleeving or other suitable means. E

4.2.4.5

Tee-branch valve has been provided in

(a) all underground water pipes; and E

(b) shall be located close to main pipe E

4.2.4.7

No draw-off point in the inside services shall be subject to a excessive pressure of 6 bar and above. E

4.2.5 Concessionary Usage of Mains Water

4.2.5.1

Concession usage of mains water are for the purpose listed in Clause 4.2.5.2 E

4.2.5.2

Compliance with the concessionary usages and requirements in this clause E

4.2.5.4

Draw-off tap that is freely accessible by the general public should be kept in an external protective box with lock and key. E

4.2.5.4a

If an automatic irrigation system is used. Off-tank supply is required. E

4.2.6 Metered Supply for Other Purposes

4.2.6.2 Supply for Temporary Structures and Modified/Converted Structures

4.2.6.2.2

The premises shall have separate access, proper drainage system and bear a proper postal address. E

4.2.7 Hot Water Systems

4.2.7.1 Non-Centralized Hot Water System

4.2.7.1.1

When the factory test pressure of the heater is at least 1.5 times the maximum static pressure at the mains water supply point, non-pressure type heaters, cistern type water heaters, unvented electric thermal storage water heaters satisfying the requirements stipulated in Clauses 4.2.7.1.12 and instantaneous water heaters are permitted to be connected direct to the supply pipe without the necessity of providing storage. S

4.2.7.1.2

When the factory test pressure of the heater is less than 1.5 times the maximum static water pressure at the mains water supply point then, for premises on direct supply, a water heater must be supplied with water from a cold water cistern. S

4.2.7.1.3

A separate mains water storage cistern of 45 litres capacity shall be provided for each flat to supply such hot water apparatus in Clause 4.2.7.1.2. E

4.2.7.1.4

Pressure type thermal storage heaters other than unvented electric thermal storage water heaters satisfying the requirements stipulated in Clauses 4.2.7.1.12 shall be supplied from storage cisterns no matter what the pressure at inlet point should be, except these are installed in flats supplied through the indirect or sump and pump system. S

4.2.7.1.5

For premises on direct supply, a separate mains water storage cistern of 45 litres capacity shall be provided for each flat to supply such hot water apparatus in Clause 4.2.7.1.4. E

4.2.7.1.6

For flats supplied from the roof storage cistern of an indirect or sump and pump system, no separate storage for hot water apparatus will be required but the supply to the apparatus shall be by a separate down feed supplying the apparatus only unless the arrangement in Clause 4.2.7.1.7 is applied. E

4.2.7.1.7

If the flats on the indirect system are supplied through an oversized down feed pipe, the pipe supplying the hot water apparatus shall be branched from the down feed at a point above the top of the apparatus. E

4.2.7.1.8

When gas geysers are to be installed on the top floor of a building supplied through storage cisterns, gas geysers with low pressure governors should be installed when the head available is less than 5 metres to the highest hot water draw-off point. E

4.2.7.1.9

If mixing valves, water blenders or combination fittings are to be used, the cold water supply to these fixtures shall be drawn from the same source as is supplying the hot water apparatus. In order to provide a balanced pressure and to obviate the risk of scalding should the supply at the source fail or be restricted for any reason. S

4.2.7.1.10

All pressure type thermal storage heaters shall be provided with a vent or expansion pipe taken from its highest point and discharge in the atmosphere above the storage cistern at sufficient height to prevent a constant outflow of hot water therefrom except for unvented electric thermal storage water heaters satisfying the requirements stipulated in Clauses 4.2.7.1.12 and 4.2.7.1.13 of TR. S

4.2.7.1.11

A loose jumper type valve shall be fitted on the inlet of the water heater if a non-return valve is not incorporated in such water heater, but this requirement does not apply to an electric water heater of the thermal storage type satisfying the requirements stipulated in Clauses 4.2.7.1.12 and 4.2.7.1.13 of Part A of TR. S

4.2.7.1.12

All unvented electric thermal storage water heaters shall comply with the safety requirements under the Electrical Products (Safety) Regulation (Cap. 406 sub. leg.) S

4.2.7.1.13

Every system incorporating an unvented electric water heater of the thermal storage type shall be provided with:-

(a) a supply pipe that branches off from the feed pipe at a point above the top of the water heater, or some other device to prevent the water from draining down from the water heater if there is a failure at the source of water supply; S

(b) an anti-vacuum valve or some other device to prevent heated water from being syphoned back to the supply pipe; and S

(c) a vessel to accommodate the expansion of heated water where that expansion is constrained by a non-return valve or some other device, incorporated at the inlet of the water heater. S

Checklists for Vetting Plumbing Proposal - Separate Meter

Chapter 6 - Water Cisterns, Water Pumps and Other Miscellaneous

Type: S = Statutory Requirements
E = Essential for approval of works

Referring to the clauses in Technical Requirements for Plumbing Works in Buildings(TR). You may cross out the clauses if not applicable
^ Please ✓ as appropriate

	Type	Checked^	Remarks
#6.1 General			
6.1.1 No cistern for the storage of cold water shall be installed or used except with the permission in writing of the Water Authority who shall specify the maximum permitted capacity.	S		
6.1.2 No cistern for the storage of fresh water supplied from the waterworks shall, without the written permission of the WA, be so connected that it can be used for the storage of any water other than that supplied from the waterworks.	S		
6.2 Cold Water Cisterns (or Cold Water Tanks)			
6.2.1 Location			
6.2.1.1 Access for Maintenance and Inspection			
6.2.1.1.1 Water Storage Tanks shall be installed so that they are easily accessible for cleaning or repairs.	S		
6.2.1.1.2 Safe access shall be provided to all cisterns by means of a secure permanent ladder or readily available portable ladder.	S		
6.2.1.1.3 Where a cistern is installed inside a building and, due to limited headroom available, it is fixed with limited clearance from the ceiling or underside of the roof, a quickly detachable fitting must be used to enable it to be easily removed for cleansing and repair.	S		
6.2.1.1.4 For a water cisterns with top access, the access on top of the cisterns should have a minimum headroom of 800mm.	E		
6.2.2 Material Requirements			
6.2.2.1 A cistern must be watertight, of adequate strength, properly supported and be made of concrete, stainless steel or fibre glass.	S		

6.2.2.2

For concrete fresh water cisterns/storage tank, all internal surface of floors, walls (to full height) and soffits of potable water storage cisterns should be lined with a non-toxic smooth finish. E

6.2.2.4

When fibreglass storage tank is to be used, prior approval by the Water Authority must be sought. Fibreglass storage cistern for potable water shall be of an approved type or certified to contain no toxic materials and suitable for storage of potable water. E

6.2.3 Cover for Water Tanks

6.2.3.1

A cistern must be so located as to minimize the risk of contamination of stored water and be fitted with a suitable close fittings lockable cover that is not airtight. The cover must be so positioned as to facilitate inspection and cleaning. The covers must be so positioned as to facilitate inspection and cleaning. S

6.2.3.2

(a) Every storage cistern shall have a lockable close fitting rigid cover secured by mechanical means which excludes light and the ingress of particles and / or insects from the cistern. E

(b) The cover shall be made of a material or materials which do not shatter or fragment when broken and which will not contaminate any condensate which may form on its underside or the stored water. E

(c) For the potable water storage cistern, the cover and its base frame shall possess double upstand edges interlocking one another to provide additional protection. E

6.2.3.3

Double sealed covers with locking devices shall be provided for all storage cisterns other than cisterns that provide supply solely for irrigation, flushing and fire-fighting. The double-sealed covers prevent the ingress of surface water. E

6.2.4 Installation Requirements for Inlet and Outlet Pipe

6.2.4.1.1

All outlet pipes from the storage cistern should, be positioned at the opposite side to the inlet supply pipe to prevent stagnation of water. E

6.2.4.2 Controlling Incoming Water Supply

6.2.4.2.1

The inlet of a single cistern fed by a gravity supply must be fitted with a ball float valve and stop valve. S

6.2.4.2.2

(a) For ball float valves of a nominal diameter not exceeding 50mm, their valve bodies must be made of copper alloy or stainless steel. S

(b) For ball float valves of a nominal diameter exceeding 50mm, their valve bodies must be made of copper alloy, stainless steel, epoxy coated cast iron or epoxy coated ductile iron. S

6.2.4.2.3

(a) Floats for use with fresh water must be made of copper alloy or stainless steel. S

6.2.4.2.4

Ball float valves fitted to a cistern must have the size of the orifice, the size of the float and the length of the lever so proportioned to one another that, when the float is immersed to an extent not exceeding half its volume, the valve is watertight against the highest pressure at which the valve may be required to work. S

6.2.4.2.5

A ball float valve or float-operated valve fitted to a cistern must be

(a) securely fixed to the cistern above the waterline of the float of the valve, and S

(b) must be supported independently of the inlet pipe (unless the inlet pipe is itself rigid and securely fixed to the cistern), in a position that no part of the body of the valve is submerged when the cistern is charged to the overflowing level. S

6.2.4.2.6

(a) If a ball float valve or float-operated valve is provided with a pipe so arranged as to discharge water into a cistern below its overflowing level, an air hole must be provided in the outlet chamber of the valve above the overflowing level. S

(b) The air hole must be of a size sufficient to prevent syphonage of water back through the valve. S

6.2.4.2.7

Ball float valves must not be fitted to a cistern that is used to contain heated water. S

6.2.4.2.8

The inlet of a single cistern fed by a pumped supply must be fitted with an automatic control switch and without any stop valve. S

6.2.4.2.9

(a) The ball valve or control switch shall shut off the supply when the water level is 25mm below the invert of the overflow pipe or the warning pipe if there exists one. S

(b) The invert of the inlet pipe or the face of the outlet nose of the ball valve shall be not less than 25mm above the top of the overflow pipe. S

6.2.4.2.10

(a) In case of a mixed flushing water supplies, the water tank shall be fitted with a ball float valve with submerged float control and a fullway gate valve for controlling and isolating the inflow of mains supply respectively. E

(c) Performance of the ball float valve shall meet the requirements specified in case of gravity supply. E

6.2.4.3 Outlet Water Pipes

6.2.4.3.1

The invert of an outlet pipe from a water storage tank with capacity less than 5000 litres shall be at least 30 mm above the bottom of the tank; this distance shall be increased to 100 mm if the storage tank capacity is 5000 litres or more. E

6.2.4.3.2

A stop valve must be provided at the outlet of a cistern. and provision shall be made for a drain-off pipe to enable the cistern to be emptied. S

6.2.4.3.3

Fullway gate valves shall be used with as the stop valves in Cl. 6.2.4.3.2 at the outlet pipe of every water storage cistern. The drain-off pipe shall be properly plugged or adequate means shall be provided to prevent any unauthorized operation of the control valve at drain-off pipe. If the outlet of a flushing water cistern is of nominal size 50mm or below, a ball valve can be used to substitute the above gate valve. E

6.2.4.4 Overflow Pipes and Warning Pipes

6.2.4.4.1

All overflow and warning pipes of potable water storage cisterns shall be constructed of corrosion-resisting material. S

6.2.4.4.2

The overflow pipe shall be at least one commercial size larger than the inlet pipe and shall in no case be less than 25 mm in diameter must be fitted to a cistern and be extended to terminate in a conspicuous position. The overflow pipe must not be connected to a drain or sewer or to the overflow pipe from another cistern. S

6.2.4.4.3

The position of discharge should be in a communal area easily visible and accessible by the occupants. E

6.2.4.4.4

If the overflow pipe is not extended to terminate in a conspicuous position, the overflow pipe shall be installed with an overflow alarm with signal transferred to a 24-hourly manned management office for timely notification. Full justifications for such arrangement shall be provided to the WA for consideration and approval. E

6.2.4.4.6

No part of the overflow pipe shall be submerged inside the storage tank E

6.2.4.4.7

A grating and a self-closing non-return flap shall be provided at the overflow pipe outside the storage tank. E

6.2.4.4.8

A warning pipe shall be installed in addition to an overflow pipe. A warning pipe can be of any size not less than 25 mm in diameter and shall comply with all other requirements of an overflow pipe. E

6.2.4.4.9

The warning pipes shall be installed at a level below the overflow pipe and shall be either extended to conspicuous location, i.e. outside of the building periphery for roof tank or outside the pump room for sump tank, or installed with signal transferred to a 24-hourly manned management office. E

6.2.5 Size of Storage Tanks for Flushing, Domestic and Trade/Commercial Water Uses

6.2.5.1

The proportion of capacity of sump cistern to roof cistern is recommended to be in the order of 1:3. Otherwise, the designer shall demonstrate that the proposed ratio of sump cistern to roof cistern is capable of fulfilling the designed demand. E

6.2.5.2

The capacity of the flushing water storage shall be designed according to the criteria in Table 6.2.5.2.1 with a minimum capacity of 250 litres. [applicable to new applications with Form WWO 542 submitted on or after 1 January 2019 only.] E

6.2.5.3

Storage criteria for fresh water supply for domestic flats is listed in Table 6.2.5.3.1. E

6.2.5.4

For industrial building:

(a) The entire internal services shall be supplied from storage cisterns with separate outlets / downpipes feeding independent systems to serve separately the industrial and processing purposes and the other general and ablution appliances. E

(b) These independence systems serving separately the industrial and processing purposes and the other general and ablution appliances should not be interconnected. E

6.2.5.5

The required capacity of storage tanks for industrial use is one-day demand. E

6.2.5.6

For trade/commercial premises, the storage criteria for fresh water supply shall be designed according to the criteria in Table 6.2.5.6.1 and Sections 6.2.5.7 to 6.2.5.9 of TR. The criteria shall apply to building types not listed in this Section in TR, yet having similar functions. In addition, designers should avoid oversize or undersize of the storage of water tanks which may result in water quality problems. However, applicant may request for relaxation of the requirement with justifications and flexibility will be allowed by the WA if justified. E

6.2.5.8

For hospital, the required storage criterion is one day's consumption as given by the hospital authorities E

6.2.5.9

For boilers, the required storage criterion is given in the formula under this section in TR. E

6.2.6 Other Recommendation/Requirement

6.2.6.2

When the capacity of water cistern exceeds 5000 litres, adoption of twin-tank system is required. The applicability shall also be subject to factors such as availability of plant room space. E

6.2.6.3 to 6.2.6.5

(a) A set of inlet, outlet and associated overflow and drain pipes shall be provided to each cistern compartment. E

(b) Each inlet of a twin-cistern fed by a pumped supply must be fitted with an automatic control switch and a stop valve for temporary isolation purpose. S

(c) For water supplies other than pumped supply, this inlet shall comply with requirements stated in Clause 6.2.4.2.1 of Part A of TR. E

6.5 Pressure Reducing Valves

6.5.1

No part in the internal pipework and/or draw-off point shall be subject to excessive high pressure. In case of excessive high pressure, provision of break pressure tanks at a suitable level of the internal supply system would be a positive and viable means to reduce the water pressure. Alternatively, pressure reducing valves may be provided in lieu of break pressure tank. E

6.5.2

Whenever a pressure reducing valve is installed,

(a) a bypass arrangement shall be incorporated with the provision of a second pressure reducing valve, except for fire service installations, to enable E

isolation of any defective pressure reducing valve for repair and replacement when necessary;

(b) A pressure indicator shall be provided for pressure monitoring and the associated pipes and fittings shall be able to withstand the maximum pressure that may arise upon the failure of the pressure reducing valve as far as practicable. Fault alarm shall be installed with signal transferred to a 24-hourly manned management office for timely notification, except for fire service installations. E

6.6 Stop Valves for Draw-off Points

6.6.1

Individual stop valves shall be provided at all draw-off points or at a series of draw-off points if situated close together. E

6.7 Water Taps

6.7.1 Application of Water Taps

6.7.1.1

When infra-red sensor operated automatic taps are used as inside services, a stop cock or gate valve must be installed at the upstream of each fitting for manual isolation of water supply. E

6.7.1.2

Self-closing taps, of non-concussive type and of approved pattern, or infra-red operated automatic taps, shall be used for the public or communal lavatory basins. E

6.7.1.3

Except with the written permission of the Water Authority, fitting with a threaded outlet, or any device facilitating the connecting of rubber hose or another type of flexible hose, must not be used. S

6.7.2 Installation Requirements for Sanitary Fixtures Supplied by Water Taps

6.7.2.1

All taps supplying baths, lavatory basins, sinks or similar apparatus shall have a stop valve fixed in a readily accessible position to control the supply to each fitting or branch pipe supplying a range of fittings. S

6.7.2.2

Every inlet to a bath, lavatory basin or sink shall be distinct from, and unconnected with, any outlet therefrom and every outlet for emptying such bath, lavatory basin or sink shall be provided with a well-fitting and easily accessible watertight plug or some other equally suitable apparatus. S

6.7.2.3

The level of the hot or cold water draw-off point to a bath, lavatory basin or sink shall be above the level of the overflow. In the absence of overflow in the fixtures, the top edge of the bath, basin or sink shall be considered instead. S

6.7.2.4

S

If water supply to any bidets, sitz bath, slop and sluicing sink or similar apparatus is liable to be submerged, the following shall be provided:-

(a) a storage cistern supplying water to such apparatus only;

(b) a storage cistern for flushing purposes only; or

(c) a hot water distribution system supplying such apparatus only.

6.8 Domestic Appliances

6.8.1 Water Purifiers/Filters

6.8.1.2

Domestic water purifiers/ filters must not be connected directly to the mains supply because of the possibility of contamination. E

6.8.1.3

When there is installation of any domestic filter or water filter incorporated in water using apparatuses (such as drinking fountain etc.), backflow prevention device shall be installed. E

6.8.1.4

Requirements for backflow prevention and written permission from the WA for typical types of water filters are summarized in Table 6.10.1.4.1. E

6.8.1.5

Sterilizers without or without attached filtering devices could be connected directly to the mains supply provided that backflow prevention device is provided upstream of the sterilizer such that there is no possibility of contaminating the mains supply. E

6.8.2 Washing Machines/Dishwashing Machines

6.8.2.2

Washing machines/ dishwashing machines with submerged inlets are considered to have high level of contamination hazard and must be installed with appropriate backflow prevention devices according to Table 4.2.3.7.1. E

6.11 Earthing

6.11.1

Inside service as an earth electrode

(a) The metal work of an inside service shall not be used as an earth electrode. E