

**General Specification for Plumbing and Drainage Installation
in Government Buildings of the Hong Kong Special Administrative Region
2012 Edition (Incorporating Corrigendum No. GSPD01-2012)**

The 2012 edition (incorporating Corrigendum No. GSPD01-2012) of the General Specification for Plumbing and Drainage Installation incorporates updates and revisions to the 2012 edition. Please refer to the summary of major changes for revisions in comparison with the 2012 edition.

Electronic version of this 2012 edition (incorporating Corrigendum No. GSPD01-2012) can be viewed on the ArchSD Internet homepage.

In view of the revisions and new additions, there will be an introductory period of 3 months in preparation for full implementation of this 2012 edition (incorporating Corrigendum No. GSPD01-2012) as contract document by 19 November 2012. In summary,

- For tenders to be invited on or after 19 November 2012, this 2012 edition (incorporating Corrigendum No. GSPD01-2012) shall be used.
- Existing contracts (including contracts using previous editions tendered before 19 November 2012) will not be affected.

**MAJOR CHANGES IN THE CORRIGENDUM (NO. GSPD01-2012) OF THE
GENERAL SPECIFICATION FOR PLUMBING AND DRAINAGE INSTALLATION
IN GOVERNMENT BUILDINGS OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION
2012 EDITION**

Old Ref. No.	New Ref. No.	Major Changes
Clauses in Section A, B, C, D and E		Defined terms to use Capital Letter, i.e. “Site, Installations, Tender, Drawings, Building Contractor, Representatives, Maintenance Period”.
Clauses in Section A, B, C, D and E		Replace “Contractor” by “PD Contractor”.
Clauses in Section A, B, C, D and E		Replace “pipeworks” by “pipework”.
Clauses in Section A, B, C, D and E		Replace “Works” by “Installations”.
Clauses in Section A, B, C, D and E		Add year and amendment number, if applicable, for each BS, EN, BSEN, ISO standard quoted.
Clauses in Section A, B, C, D and E		Replace “Buildings Department” by “BD”.
Clauses in Section A, B, C, D and E		Replace “Environmental Protection Department” by “EPD”.
Clauses in Section A, B, C, D and E		Replace “Water Supplies Department” by “WSD”.

Old Ref. No.	New Ref. No.	Major Changes
Clauses in Section A, B, C, D and E		Replace “Fire Services Department” by “FSD”.
Clauses in Section A, B, C, D and E		Replace “Electrical & Mechanical Services Department” by “EMSD”.
Clauses in Section A, B, C, D and E		Replace “Architectural Services Department” by “ArchSD”.
Clauses in Section A		Replace “Chapter” by “Cap”.
TABLE OF CONTENT		
B1.11	B1.11	Revise the title to “Cleaning and Disinfection of Installations”
B1.11.2	B1.11.2	Revise the title to “Methodology of Cleaning and Disinfection”
B1.11.3	B1.11.3	Title deleted.
B1.11.4	B1.11.4	Title deleted.
B1.11.5	B1.11.5	Title deleted.
SECTION D7	SECTION D7	Title revised as “DOCUMENTS AND DATA REQUIRED FOR HAND-OVER”

Old Ref. No.	New Ref. No.	Major Changes
<u>PART A – SCOPE AND GENERAL REQUIREMENTS</u>		
SECTION A2 – STATUTORY OBLIGATIONS AND OTHER REGULATIONS		
A2.1 – STATUTORY OBLIGATIONS AND OTHER REQUIREMENTS		
A2.1.2 (i)	A2.1.2 (i)	Change to “Code of Practice for Energy Efficiency of Building Services Installation, issued by EMSD;”
SECTION A3 – EXECUTION OF INSTALLATIONS		
A3.1 – THE INTERNATIONAL SYSTEM OF UNITS (SI)		
A3.1	A3.1	Revise the clause as “The International System of Units (Système International D'Unités) of weights and measures shall be used for all materials, equipment and measurements.”
<u>PART B – INSTALLATION METHODOLOGY</u>		
SECTION B1 – INSTALLATION OF PLUMBING SYSTEMS		
B1.1 – GENERAL		
B1.1.2	B1.1.2	Delete the scope of down feed pipes to street fire hydrants.
B1.3 – FIXING PIPES AND FITTINGS		
B1.3.3	B1.3.3	Delete the role of pipework coordination by PD Contractor.

Old Ref. No.	New Ref. No.	Major Changes
B1.3.3	B1.3.3	Delete the requirement of fall of pipework to 1 in 100mm minimum.
B1.3.3	B1.3.3	Delete the requirement of minimum separation between vertical pipework and adjacent wall for avoidance of rodent.
B1.3.3	B1.3.3	Add the requirement of “unless otherwise approved by the Architect” for pipework casting in or build into chases in walls and floor.
B1.4 – JOINTING PIPES AND FITTINGS		
B1.4.1	B1.4.1	Add the requirement of “unless otherwise approved by the Architect” for pipe joint to be made in the thickness of any wall, floor and ceiling.
B1.4.5	B1.4.5	Replace “BS EN 1092-1: 2007 PN16” to “BS EN 1092-2: 1997 PN16 as minimum”.
B1.6.1	B1.6.1	Re-phrase of clause.
B1.7.2	B1.7.2	Re-phrase of clause.
B1.7.3	deleted	Delete the clause.
B1.8 – CISTERNS AND TANKS		
B1.8.1	B1.8.1	Add “as recommended by the manufacturer” for connection of steel pipes to steel or glass fibre reinforced plastics cisterns and tanks.
B1.8.2	B1.8.2	Add “or the face of the outlet nose of the ball float valve” after the “inlet pipe”.

Old Ref. No.	New Ref. No.	Major Changes
B1.8.3	B1.8.3	Replace “galvanized” with “FRP or stainless steel”.
B1.8.3	B1.8.3	Delete “and seal covers with grease”.
B1.11 –CLEANING AND DISINFECTION OF INSTALLATIONS		
B1.11	B1.11	Revision of section title.
B1.11.1	B1.11.1	Revision of clause and add general requirements on cleaning and disinfection of installation.
B1.11.2	B1.11.2	Revision of clause and add requirements on methodology of cleaning and disinfection.
B1.11.3	deleted	Deletion of clause.
B1.11.4	deleted	Deletion of clause.
B1.11.5	deleted	Deletion of clause.
SECTION B2 – INSTALLATION OF ABOVE GROUND DRAINAGE SYSTEMS		
B2.1 – GENERAL		
B2.1.2	B2.1.2	Add “stainless steel or” before “gunmetal”.
B2.3 – FIXING PIPES AND FITTINGS		
B2.3.1	B2.3.1	Replace “Petroleum based” with “protective”.

Old Ref. No.	New Ref. No.	Major Changes
B2.3.1	B2.3.1	Add “add tees” after “elbows”.
B2.3.1	B2.3.1	Add “stainless steel or” before “gunmetal”.
B2.3.3	B2.3.3	Delete “Gutters shall be laid generally to falls of 1 in 300 (minimum)”.
B2.5 – PIPEWORK SUPPORT		
B2.5.1	B2.5.1	Add “stainless steel or” before “gunmetal”.
B2.5.2	B2.5.2	Add “per standard” before “length of pipe”.
B2.6 – PIPEWORK PENETRATING BUILDING STRUCTURE		
B2.6.1(c)	B2.6.1(c)	Add “as shown in the Drawings” after “surfaces”
B2.6.2(a)(i)	B2.6.2(a)(i)	Change “B3.6.1” to “B2.6.1”.
B2.6.5(c)	B2.6.5(c)	Add “or as specified by pipe manufacturer” after “specification”.

Old Ref. No.	New Ref. No.	Major Changes
<u>PART C – MATERIAL AND EQUIPMENT SPECIFICATION</u>		
SECTION C1 –PLUMBING SYSTEMS		
C1.5 – STRAINERS		
C1.5.5(a)	C1.5.5(a)	Change “BS EN 1563: 1997” to “BS EN 1563: 2011”.
C1.5.5	C1.5.6	Change duplicated clause no. C1.5.5 to C1.5.6.
C1.6 – VALVES		
C1.6.2	C1.6.2	Change “BS EN 1563: 1997” to “BS EN 1563: 2011”.
C1.6.3	C1.6.3	Change “BS EN 1563: 1997” to “BS EN 1563: 2011”.
C1.7 – PRESSURE REDUCING VALVES		
C1.7.2(a)	C1.7.2(a)	Change “BS EN 1563: 1997” to “BS EN 1563: 2011”.
C1.7.2(b)	C1.7.2(b)	Change “BS EN 1563: 1997” to “BS EN 1563: 2011”.
C1.7.2(b)	C1.7.2(b)	Change “BS EN 1563: 1997” to “BS EN 1563: 2011”.

Old Ref. No.	New Ref. No.	Major Changes
SECTION C3 – UNDERGROUND DRAINAGE SYSTEMS		
C3.1 – PIPES AND FITTINGS		
C3.1.4	C3.1.4	Change “a minimum withdrawal of 38mm when there is no deflection of the joint” to “an allowable spigot withdrawal of minimum 38mm”.
C3.1.4	C3.1.4	Add “or cast on” after “welded on”.
C3.2 – VALVES		
C3.2.1	C3.2.1	Add “If the full unbalanced pressure is greater than 250Nm, a gear box fitted in the valves shall be provided” for opening effort of valve exceed 250Nm.
C3.2.1	C3.2.1	Add “For cast iron or ductile iron valves, materials for assembly bolts and nuts shall be in according to manufacturer’s recommendation” for assembly bolts and nuts.
C3.2.2	C3.2.2	Add “or BS 5163-1:2004 in conjunction with BS EN 1074-1:2000 and BS EN 1074-2:2000” after “BS EN 1171: 2002”.
C3.2.2	C3.2.2	Change “Grade EN-GJL-220” to “Grade EN-GJL-250” and add “or spheroidal graphite cast iron to BS EN 1563:2011 Grade EN-GJS-400-15” after “Grade EN-GJL-250”.
C3.2.2	C3.2.2	Add “or stainless steel” after “aluminium bronze to BS EN 12163: 2011 grade CA 104” for stems.
C3.2.2	C3.2.2	Delete “Outside screw rising stems shall be completed with perspex protection tubes and open/close indicators”.

Old Ref. No.	New Ref. No.	Major Changes
C3.3 – MANHOLES, CHAMBERS AND GULLIES		
C3.3.7	C3.3.7	Change “BS EN 1563: 1997” to “BS EN 1563: 2011”.
<u>PART D – INSPECTION, TESTING & COMMISSIONING</u>		
SECTION D6 – INSPECTION AND TESTING DURING CONSTRUCTION PERIOD		
D6.5	Deleted	Delete Clause D6.5 for CCTV inspection for drainage pipework.
<u>ANNEX I – LIST OF TECHNICAL STANDARDS AND QUALITY STANDARDS QUOTED IN THIS GENERAL SPECIFICATION</u>		
Annex I	Annex I	Add “BS 8558: 2011 – Guide to the design, installation, testing and maintenance of services supplying water for domestic use within buildings and their cartilages”.
Annex I	Annex I	Change “BS EN 1563: 1997” to “BS EN 1563: 2011”.

ARCHITECTURAL SERVICES DEPARTMENT
BUILDING SERVICES BRANCH

GENERAL SPECIFICATION FOR
PLUMBING AND DRAINAGE INSTALLATION
IN GOVERNMENT BUILDINGS OF
THE HONG KONG SPECIAL ADMINISTRATIVE REGION
2012 EDITION

Corrigendum No. GSPD01-2012
(August 2012)

The following clauses are amended in the above General Specification.

Clauses

PART A

SCOPE AND GENERAL REQUIREMENTS

SECTION A2

STATUTORY OBLIGATIONS AND OTHER REGULATIONS

A2.1 STATUTORY OBLIGATIONS AND OTHER REQUIREMENTS

A2.1.2 Other Requirements

- (i) Code of Practice for Energy Efficiency of Building Services Installation, issued by EMSD;

SECTION A3

EXECUTION OF INSTALLATIONS

A3.1 THE INTERNATIONAL SYSTEM OF UNITS (SI)

The International System of Units (Système International D'Unités) of weights and measures shall be used for all materials, equipment and measurements.

A3.7 SAMPLE BOARD

Within 6 weeks of the acceptance of his Tender and prior to the commencement of the Installations, the PD Contractor shall submit to the Architect for approval a sample board of essential components proposed to be used in the Contract. However, the PD Contractor may request the Architect in writing for a longer period for submission if 6 weeks are practically insufficient.

Items displayed shall be deemed to be adequate for the Installations unless otherwise clearly indicated. Each sample, with clear numbering and labeling, shall be firmly fixed onto a rigid wooden or metal board. A list shall also be affixed on the sample board to show the item description, make and brand, country of origin and locations of installation (if not generally used). Samples rejected by the Architect shall be replaced as soon as possible. Upon approval of all items, the Architect will endorse the list on the sample board and the PD Contractor shall deliver the board to the site office for reference.

The board shall contain samples of all "compact" sized materials and accessories to be used in the Installations. Written approval of all samples and technical details shall be obtained from the Architect before commencement of any installation work.

In the context of this General Specification the term "compact" means any item that will fit into a 300 mm cube.

The following items shall be included in the sample board as a minimum:

- (a) Pipework, fitting and their support complete with fixing accessories;
- (b) Valves; and
- (c) Vibration isolator

Additional items may be required by the Architect and/or as specified.

SECTION A4

DRAWINGS AND MANUALS

A4.2 INSTALLATION DRAWINGS

A4.2.1 Drawing Submission Schedule

The PD Contractor shall submit a detailed installation drawing submission schedule and programme to the Architect. The PD Contractor shall allow reasonable time in the programme for vetting of the installation drawings by the Architect and for drawing resubmissions as necessary.

The PD Contractor shall submit to the Architect a comprehensive "Submission Schedule" of installation drawings and builder's work drawings within 2 weeks after the acceptance of Tender, taking into account of the overall programme of the Installations including any Specialist Works and works by the utility undertakings. No equipment shall be delivered to the Site and no work shall be executed until the installation drawings have been approved by the Architect. The PD Contractor shall ensure that the installation drawings and builder's work drawings are progressively submitted in accordance with the approved "Submission Schedule".

The PD Contractor shall provide at least 6 hard copies and one electronic copy, unless otherwise specified in the Contract or the Sub-contract as appropriate, of the approved installation drawings to the Architect for distribution.

A4.3 AS-BUILT DRAWINGS

A4.3.1 Submission of As-built Drawings

The PD Contractor shall submit 3 sets of the first draft prints of as-built drawings within 28 days of the issuance of the certification of completion in accordance with the Contract to the Architect for checking. The Architect after checking the above draft prints shall return one set of the marked up copies of these as-built drawings to the PD Contractor within 42 days from the date of submission of the PD Contractor's draft prints with comments. The PD Contractor shall within a further 28 days from the date of receiving the Architect's comments on the draft as-built drawings re-submit to the Architect for his approval another 3 sets of the second draft prints of as-built drawings with the Architect's comments incorporated. This process of submission and approval shall continue until the final approval of the Architect on these as-built drawing is obtained.

The final approved as-built drawings shall be in 3 sets of hard copy and 3 sets of electronic copies. These shall be submitted within 21 days from the date of final approval. Each electronic copy shall be in the form of CD-ROM, labeled, with cross reference to a printed list of files explaining the contents and purpose of each file and supplied in sturdy plastic containers.

The detailed requirements and the media of as-built drawings set out in the Contract shall be followed as appropriate.

PART B

INSTALLATION METHODOLOGY

SECTION B1

INSTALLATION OF PLUMBING SYSTEMS

B1.1 GENERAL

The scope of works under this section shall include the complete plumbing installation for fresh, flush, fire service pipework systems as shown on the Drawings and as specified, including but not limited to:

- B1.1.1 Fresh and flush water pipework installations commencing from the government mains at the entry of Site boundary to individual sanitary fixtures, gas water heaters and taps. Part of the plumbing installation inside pump room, including the pumpset, ball float valve etc., will be carried out by other Sub-contractor for fire service and water pump installation where shown on the Drawings or as specified. The installation of gas water heater, if applicable, will be carried out by a separate gas water heater contractor;
- B1.1.2 Fire service water pipework installation commencing from the government mains at the entry of the Site boundary including the up-feed pipes to the fire service roof/transfer tank. Part of the plumbing installation inside pump room, including the pumpset, ball float valve etc., will be carried out by other contractor for fire service and water pump installation where shown on the Drawings or as specified; and
- B1.1.3 Extend and connect the fresh, flush and fire service water pipes to the government mains outside the Site boundary, if applicable. Where shown in the Drawings or as specified, connection shall be made to existing in-service supply mains of adjacent building blocks instead of government mains.

The complete installation shall mean, not only the major items of equipment and apparatus conveyed in this Specification, but all the incidental sundry components necessary for the complete execution of the works and for the proper operation of the installation with their labour charges, whether or not these supply components are mentioned in detail in the Contract.

The PD Contractor shall make all necessary applications to WSD and attend upon their representative for the purpose of tests and inspections for the plumbing installation.

B1.3 FIXING PIPES AND FITTINGS

B1.3.3 Pipework Arrangement

Water pipes shall not run over electrical switchgear; inside transformer room, switch room, generator room, meter room, telephone equipment room, PABX room, riser duct for electrical services, or any other rooms containing electrical hazard.

Unless otherwise approved, do not embed pipes in concrete or grout in or install in such a way as to make alterations difficult at a later date.

Pipes requiring protection against corrosion shall be fixed with 40 mm (minimum) clearance between the pipe, structure or adjacent surfaces.

Pipework shall not be casting in or build into chases in walls and floor unless otherwise approved by the Architect. Where this is unavoidable and approved, pipes shall be wrapped in an approved protective tape.

Pipework installation shall avoid contact between certain dissimilar metals in particular avoid the direct contact of copper with galvanized iron or steel pipes. If unavoidable use gunmetal joints between dissimilar metals.

B1.4 JOINTING PIPES AND FITTINGS

B1.4.1 General

All pipe joints shall be carried out in accordance with the manufacturer's instructions. Pipe joint shall not be made in the thickness of any wall, floor and ceiling unless otherwise approved by the Architect.

Particular care shall be taken to ensure that joints are not built in and if bends are necessary they shall be made bends and not jointed bends.

Expansion joint shall be provided for all pipework passing through any building expansion joint.

Jointing rings, couplings and adaptors shall be of types recommended by the manufacturer of the pipes being jointed.

Cut ends of pipes and gutters clean and square, and chamfer internally or externally if required using equipment appropriate to the material.

Jointing material shall not project into the bore of pipes or fittings.

For push-in joint, caulk gaskin firmly into sockets.

B1.4.5 Jointing of Ductile Iron Pipes

All ductile iron pipes shall be jointed with screwed flanges or flanged fittings. Flanges shall comply with BS EN 1092-2: 1997 PN16 as minimum.

B1.6 THERMAL INSULATION

B1.6.1 Thermal insulation to the requirements as specified in this Specification or other parts of the Contract shall be applied to hot water supply pipework and fittings.

B1.7 VALVES

B1.7.2 Non-return valve shall be installed in such a manner that the water flow direction is in an upward direction.

B1.7.3 **[Clause B1.7.3 was deleted.]**

B1.8 CISTERNS AND TANKS

B1.8.1 Connection of Pipes

Generally, when connecting pipes to cisterns and tanks, ensure that cisterns and tanks are properly supported to avoid undue stress on the pipe connections. Correctly position holes for the connection of pipes to cisterns and tanks. Remove all debris and fillings. Holes in cisterns and tanks shall not be formed by flame cutters.

Connect steel pipes to steel or glass fibre reinforced plastics cisterns and tanks by either:

- (a) backnuts and washers both inside and outside
- (b) by using bolted or welded flanged connections
- (c) as recommended by the manufacturer

Connect plastic pipes to steel or glass fibre reinforced plastics cisterns by a backnut to the inside. Use corrosion resistant support washers on both the inside and outside of the cistern or tank.

Connect copper pipes to GRP cisterns or tanks in a similar manner.

Do not connect copper pipes to steel cisterns or tanks.

Connect pipes to concrete tanks with short thread flanged connections having a puddle flange either cast or welded on. Ensure that the connections are properly aligned both in the horizontal and vertical planes when being cast into the concrete. Compact around the puddle flange to ensure a water tight joint.

The top of the overflow pipe shall be not less than 25 mm below the invert of the inlet pipe or the face of the outlet nose of the ball float valve.

B1.8.2 Connection of Overflow Pipes

Overflow pipes shall be one pipe size larger than the inlet pipe and in no case less than 25 mm diameter and shall be extended to terminate in conspicuous positions.

The top of the overflow pipe shall be not less than 25 mm below the invert of the inlet pipe or the face of the outlet nose of the ball float valve.

B1.8.3 Tank Covers

Certain access covers and frames may be supplied by the Government, as scheduled on the Drawings.

Fit FRP or stainless steel access covers and frames to water tanks.

Fit double sealed access covers to potable water tanks.

Bed and haunch access cover frames in cement mortar.

B1.10 PROTECTION OF WORKS

B1.10.3 Underground Pipework

Underground pipework shall be protected against corrosion and mechanical damage.

Pipework shall be cleaned after joining and to be treated with two coats of good quality bituminous paint and wrap it with petrolatum tape for protection against corrosion due to water, salts and soil organics, and rest it on sand or sieved soil before the trench is backfilled.

All underground pipework shall be pressure tested before the application of bituminous paint and petrolatum tape.

B1.11 CLEANING AND DISINFECTION OF INSTALLATIONS

B1.11.1 General

The plumbing installation pipework and water storage tanks shall be thoroughly flushed clean to remove rust, sludge and sediment upon commissioning. Potable water distribution pipework and associated water storage tanks shall be further disinfected upon completion of cleaning.

Disinfection of plumbing installation for potable use shall be carried out not more than 7 days before hand over the installation to users for operation. Where the plumbing installation for potable use is not brought into use immediately after commissioning, it shall be disinfected before use unless it has been flushed weekly to maintain a flow of water.

B1.11.2 Methodology of Cleaning and Disinfection

The PD Contractor shall carry out the cleaning and disinfection in accordance to the requirements as stipulated in the Testing and Commissioning Procedure for Plumbing and Drainage Installation in Government Buildings Hong Kong issued by the Building Services Branch, Architectural Services Department and to the satisfaction of the Water Authority.

For pipework downstream of the water tank or downstream of the

water meter for the case of direct feed system, the disinfection process shall in accordance to BS 8558: 2011.

The PD Contractor shall submit a cleaning and disinfection plan indicating the scope of work, detail of the compartmentation if any, work schedule, method statement, procedures and equipment for checking and testing, location of sampling, method statement for the de-chlorination, etc. for the Architect's approval prior to carrying out the work.

Any discharge of disinfectant solution or used water for disinfection shall comply with the Water Pollution Control Ordinance (Cap. 358). The PD Contractor shall submit a method statement for the de-contamination of used water to the Architect for approval.

SECTION B2

INSTALLATION OF ABOVE GROUND DRAINAGE SYSTEMS

B2.1 GENERAL

B2.1.2 Bolted access doors or inspection units shall be provided to all branches and bends (other than ventilating and anti-syphon pipes) and at the foot of main soil stacks. Access doors to cast iron soil stacks shall be fitted with stainless steel or gunmetal bolts.

B2.3 FIXING PIPES AND FITTINGS

B2.3.1 General Details

Inspect pipes and fittings inside and out before fixing. Reject any which are defective.

Fix pipes and fittings securely with fixings and fastenings appropriate to the location and the material.

Do not cast in or build pipes into chases in walls and floors unless approved by the Architect, in which case: -

- (a) Coat all pipes which come into direct contact with concrete with an approved protective tape;
- (b) Ensure that there are no joints in straight pipes built in other than elbows and tees.

Avoid crimping and restricting the diameter of tubes when forming bends in pipes.

Do not fix roof outlet gratings until after all other work at roof level is completed. Outlets that are contaminated in any way shall be replaced.

Surface Channel and floor drain shall be flush with the walkway surface.

Bolted access doors or inspection units shall be provided at all branches and bends other than ventilating and anti-syphon pipes, and at the foot of main soil stacks. The access doors or inspection units shall be fitted to cast iron soil stacks with stainless steel or gunmetal bolts and rubber gaskets.

Unless expressly authorised by the Architect, interchangeability shall not be allowed between different plastic pipe manufacturer's products.

Pipes requiring protection against corrosion shall be fixed with 40mm (minimum) clearance between the pipe, structure or adjacent surfaces. Avoid fixing such pipes at internal angles.

Vertical pipes in situations which are accessible to rodents shall be placed at least 100 mm away from any adjacent wall or pipe to a minimum height from ground level of 1500 mm.

B2.5 PIPEWORK SUPPORT

B2.5.1 General

Support pipes on flat roofs and canopies at least 150 mm above roof and canopy finish on concrete blocks with pipe clamps.

Do not use branch pipes that connect to vertical pipes as pipe supports.

Corrosion-resistant fixings such as stainless steel brackets and connections or similar corrosion-resistant fixing supports shall be used. The fixings shall be properly anchored into solid wall.

Pipe brackets shall be of stainless steel to BS EN 10088-3: 2005 number 1.4301 or SAE Grade 304 or other approved material. The pattern shall suit the type of pipe and the surface to which they are to be fixed, including where appropriate:

- (a) Flanged ends for building in;
- (b) Plain round ends for fixing in drilled holes with an approved grout;
- (c) Approved expanding bolts or stud anchors for fixing to concrete, brickwork etc.;

- (d) Threaded ends for fixing to steelwork, or wood, or panel wall with plug as required;
- (e) Countersunk-holed face plates for screwing to wood or plugs, or panel wall with plug;
- (f) Brackets lined with resilient plastic at pipe clamps for plastic pipes, plastic coated pipes and cast iron pipes.

Bolts for cast iron and steel pipework shall be of brass, cadmium plated steel or other non-corrodible metal.

Bolts for soil stack access doors for cast iron and steel pipework shall be of stainless steel or gunmetal.

Wood screw shall be brass with countersunk heads and of a length sufficient to ensure a secure fixing.

Plugs for fixing to hard materials shall be of proprietary plastic, fibre, soft metal or similar material. Plugs for fixing to friable materials, plasterboard and the like shall be of proprietary fixings specially designed for the purpose. Plugs containing asbestos shall not be used.

B2.5.2 Pipe Bracket Intervals

Pipe bracket shall be installed at intervals not exceeding those shown in Table B2.5.2 for straight runs, and with not less than one bracket per standard length of pipe. All brackets shall be equally spaced.

Table B2.5.2 - Spacing of Pipe Fixing

Pipes	Nominal Size (mm)	Maximum Spacing (mm)	
		Vertical pipes	Horizontal pipes
Cast iron and ductile iron	All	3000	1750
Steel	Up to 15	2400	1800
	20 and 25	3000	2400
	32	3000	2700
	40 and 50	3600	3000
	65 and 80	4500	3600
	125 and 150	5400	4500
UPVC	Up to 25	1500	750
	32	1800	900
	40 and 50	2000	1000
	65 to 150	2500	1200

B2.6 PIPEWORK PENETRATING BUILDING STRUCTURE

B2.6.1 Pipes Through Walls and Floors

Where pipes pass through walls or floors:

- (a) Cast or build in UPVC sleeves to BS 3505: 1986 or BS EN ISO 1452-1: 2009 with 2 to 12 mm clearance to allow for expansion and movement of pipe.
- (b) Finish sleeves flush with finished face of walls and ceilings and projecting 100 mm above finished floor level.
- (c) Provide loose plastic or chromium plated cover plates, when specified, to ends of sleeves visible in completed work. Plates shall be 50 mm larger than the external diameter of pipe and either clipped to the pipe or screwed or plugged and screwed to the adjacent surfaces as shown in the Drawings.
- (d) If required to be water tight, point with approved mastic sealant.
- (e) No split PVC sleeves shall be permitted.

B2.6.2 Pipes Through Fire Rated Walls and Floors

Where pipes pass through fire rated walls or floors which are not fire compartment walls or floor:

- (a) For metal pipes pass through fire rated walls or floors which are not fire compartment walls or floors, either of the following shall be used:
 - (i) The installation shall be as Clause B2.6.1 but
 - Cast or built in galvanized mild steel pipe sleeves to BS EN 10255: 2004 with 20mm clearance.
 - Well caulk the voids between the pipes and the sleeves for the full length with mineral wool or approved equivalent material designed for fire separation purposes in compliance with the Code of Practice for Fire Safety in Buildings.
 - (ii) Firmly fix sealing system around the pipes to properly seal up the voids between the pipes and the fire rated walls or floors in compliance with the

Code of Practice for Fire Safety in Buildings. The sealing system shall be tested to BS EN 1366-3: 2009 or BS 476-20: 1987.

- (b) For non-metal or plastic pipes pass through fire rated walls or floors which are not fire compartment walls or floors, firmly fix sealing system around the pipes to properly seal up the voids between the pipes and the fire rated walls or floors in compliance with the Code of Practice for Fire Safety in Buildings. The sealing system shall be tested to BS EN 1366-3: 2009 or BS 476-20: 1987.

Where pipes pass through fire compartment walls or floors:

- (a) For metal pipes pass through fire compartment walls or floors, suitable intumescent coating or sealant shall be used to maintain the required fire compartment. The sealing system shall be tested to BS EN 1366-3: 2009 or BS 476-20: 1987 and the installation of which shall be in accordance with the manufacturer's recommendations.
- (b) For non-metal or plastic pipes pass through fire compartment walls or floors, suitable fire collars shall be used. The fire collars shall be tested to BS EN 1366-3: 2009 or BS 476-20: 1987 with integrity not less than of the fire compartment walls or floors as prescribed under the relevant Building Regulation and the Code of Practice for Fire Safety in Buildings. The fire collars shall be fixed at underneath of fire compartment floors or walls or other locations around the pipes in accordance with the manufacturer's recommendations.

B2.6.5 Pipes Through Flat Roofs

Where pipes pass through flat roofs incorporating either asphalt or proprietary roofing waterproofing material:

- (a) Cast or build in cast iron or galvanized mild steel sleeve to BS EN 10255: 2004 with 2 to 12 mm clearance projecting 150 mm above roof finish.
- (b) Caulk space and point both ends with approved mastic sealant.
- (c) Cover tops of sleeves with lead collars as per roofing specification or as specified by pipe manufacturer.

SECTION B4

PAINTINGS, FINISHINGS AND IDENTIFICATION

B4.1 GENERAL

All surfaces except otherwise specified, other than those indicated to be left self finished such as stainless steel, anodized aluminium, or otherwise approved by the Architect, shall be finished in first class paint work as appropriate. All metallic surfaces shall be wire-brushed and cleaned to make it free from rust, scale, dirt and grease prior to painting. Primer shall be applied to metal surface on the same day as they have been clean. All work shall be carried out by qualified tradesmen.

Pipework concealed in false ceiling or pipe ducts not normally accessible need not be painted, unless otherwise specified but appropriate colour code identifications shall be applied.

All paint shall comply with the requirement in General Specification for Building and shall be approved by the Architect.

All painting works shall be completed and left in ventilated environment for at least one week, or the curing period recommended by the paint manufacturer whichever is longer, before occupation or handover of the renovated area.

All surfaces shall be painted and finished as specified to meet and match the aesthetic architectural design as required.

PART C

MATERIAL AND EQUIPMENT SPECIFICATION

SECTION C1

PLUMBING SYSTEMS

C1.5 STRAINERS

C1.5.5 The construction of fresh water and flush water application strainer with nominal sizes above 50 mm shall be as following: -

- (a) Body & cover: grey cast iron to BS EN 1561: 2011 EN-GJL-250, or spheroidal graphite cast iron to BS EN 1563: 2011 EN-GJS-400-15;
- (b) Screen: austenitic chromium nickel stainless steel or austenitic chromium nickel molybdenum stainless steel to BS EN 10088-1: 2005 number 1.4301 or 1.4401;
- (c) Drain plug: malleable iron or copper alloy; and
- (d) Cast iron components shall be coated with an epoxy based material.

C1.5.6 All bronze type strainers shall be of screwed female end connection to BS 21: 1985 and all cast iron type strainers shall be of flanged end connection to BS EN 1092-2: 1997 PN16.

[Correction of typo error to clause number]

C1.6 VALVES

C1.6.2 Valves for Fresh Water and Fire Service Application

For nominal sizes up to and including 50 mm: -

- (a) Body, bonnet and disc: copper alloy to BS EN 1982: 2008 CuSn5Zn5Pb5;
- (b) Stem: brass to high tensile brass or leaded brass to BS EN 12163: 2011.

For nominal sizes above 50 mm:

- (a) Body and bonnet: grey cast iron to BS EN 1561: 2011 EN-GJL-250, or spheroidal graphite cast iron to BS EN 1563: 2011 EN-GJS-400-15;

(b) Disc and seat:

- Solid or trimmed with bronze to BS EN 1982: 2008 CuSn5Zn5Pb5;
- Resilient material to BS EN 681-1: 1996, Type WA, Hardness Category "70" with nominal thickness of minimum 1.5 mm on the non-seating areas and 4.0 mm on the seating areas, and in case for potable water application, showing compliance with full tests of effect on water quality to BS 6920-1: 2000.

(c) Stem

- For underground application as well as cast iron gate valve installed in fresh potable water or street fire hydrant system, stainless steel to BS EN 10088-3: 2005 number 1.4057.
- For applications other than that mentioned in above clause, brass to high tensile brass or leaded brass to BS EN 12163: 2011 or stainless steel to BS EN 10088-3: 2005 number 1.4301, 1.4401, 1.4006, 1.4005, 1.4021 or 1.4057.

C1.6.3 Valves for Flush Water Application

For nominal sizes up to and including 50 mm:

(a) Plastic Type Valve

- Body, bonnet and disc: PVC or UPVC;
- Stem: one-piece with O-ring for positive sealing of the body;
- Valve shall be operated by wrench turned in a clockwise direction to close when facing the wrench;
- Suitable stops for both fully open and fully closed positions of valve shall be provided;
- Socket or union shall be suitable for direct connecting to pipe to which it is installed;
- It shall be suitable for both the working pressure and test pressure of the piping system in which it is installed with working pressure of at least 10 bar at 35°C unless otherwise specified.

- (b) Metallic Type Valve
 - Body, bonnet and disc: copper alloy to BS EN 1982: 2008 CuSn5Zn5Pb5;
 - Stem: brass to high tensile brass or leaded brass to BS EN 12163: 2011.

For nominal sizes 65 mm and above:

- (a) Body and bonnet: grey cast iron to or BS EN 1561: 2011 EN-GJL-250, or spheroidal graphite cast iron to BS EN 1563: 2011 EN-GJS-400-15;
- (b) Disc and seat:
 - Solid or trimmed with zinc free bronze to BS EN 1982 CuSn10 or trimmed with austenitic chromium nickel stainless steel or austenitic chromium nickel molybdenum stainless steel to BS EN 10293: 2005.
 - Resilient material to BS EN 681-1: 1996, Type WA, Hardness Category "70" with nominal thickness of minimum 1.5 mm on the non-seating areas and 4.0 mm on the seating areas.
- (c) Stem: stainless steel to BS EN 10088-3: 2005 number 1.4301 or 1.4401 or 1.4057.

C1.7 PRESSURE REDUCING VALVES

C1.7.2 Pilot Type Pressure Reducing Valves

Pilot type pressure reducing valve shall be hydraulically operated, pilot-controlled and of diaphragm or piston-actuated type. The whole valve shall be assembled and tested by the manufacturer.

The valve shall be provided with a strainer in the pilot control system. It shall be of flanged-end connection with flange to BS EN 1092-2: 1997 PN16. The main valve and its pilot control system shall contain no packing glands or stuffing boxes.

The valve shall be capable to reduce a higher inlet pressure to a steady downstream pressure regardless of fluctuations in flow rate and/or varying inlet pressure. The downstream pressure shall be adjustable and could be reduced down to a pressure suitable for the application. The valve shall be selected by the PD Contractor in such way that no cavitation shall occur within the anticipated flow and pressure ranges.

Means shall be provided for adjusting the response of the valve to changes in inlet pressure without the use of special tools.

The valve, when in operation, shall not cause any noise nuisance. Otherwise, a suitable acoustic enclosure to cover the valve shall be provided.

The operating pressure range of the valve shall be suitable for the particular application. Unless otherwise specified, the minimum rated working pressure of the valve shall not less than 16 bar.

Each valve shall be hydraulic tested at 1.5 times the nominal pressure of the valve for a period of not less than 1 minute at the factory.

The valve shall be of the type approved by the Water Authority as in accordance with its application. Details of the pressure reduction against flow rate and inlet pressure performance curve within the specified pressure range and test certificates /reports issued by accredited laboratories confirming that the valve has been tested in accordance with the requirements of this Specification shall be submitted to the Architect for examination and approval of use.

The valve shall have the minimum standard as specified below for its intended purposes: -

- (a) Body and bonnet: cast iron to BS EN 1561: 2011 EN-GJL-250 or ductile iron to BS EN 1563: 2011. The body shall be epoxy or polyester coated both inside and outside.
- (b) Disc:
 - Solid or trimmed with bronze to BS EN 1982: 2008 CuSn5Zn5Pb5, or with stainless steel to BS EN 10088-2: 2005 number 1.4301, or with ductile iron to BS EN 1563: 2011; or trimmed with rubber compound for use in fresh water.
 - Solid or trimmed with zinc free bronze to BS EN 1982: 2008 CuSn10 or stainless steel to BS EN 10088-2: 2005 number 1.4301 or ductile iron to BS EN 1563: 2011 with epoxy /polyester coated; or trimmed with rubber compound for use in flush water.
- (c) Seat:
 - Bronze trimmed as disc for use in fresh water.
 - Zinc free bronze or stainless steel trimmed as disc for use in flush water.

(d) Stem:

- High tensile brass or leaded brass to BS EN 12163: 2011 or stainless steel to BS EN 10088-3: 2005 number 1.4006, 1.4005 or 1.4021 for use in fresh water.
- Stainless steel to BS EN 10088-3: 2005 number 1.4301 or 1.4401 for use in flush water.

SECTION C3

UNDERGROUND DRAINAGE SYSTEMS

C3.1 PIPES AND FITTINGS

C3.1.4 Ductile Iron Pipes and Fittings

Ductile iron pipes and fittings shall be to BS EN 598: 2007 with amendment A1: 2009 with cement mortar lining internally and zinc coating externally.

Unless otherwise specified, ductile iron pipework shall be of push-on type flexible joint with rubber sealing gasket. It shall be capable to withstand a minimum angular deflection of 4° and an allowable spigot withdrawal of minimum 38mm.

Flanged joints, if specified, shall be of PN16 rating complying with BS EN 1092-1: 2007.

Pipes that are to be built in to structures shall have puddle flanges welded on or cast on.

C3.2 VALVES

C3.2.1 General

Handwheels and tee keys shall turn in a clockwise direction to close the valve.

Handwheels shall have a smooth rim with the direction of opening and closing clearly cast in.

The opening effort required at any point on the handwheel shall not exceed 250N when operated against the full unbalanced pressure. If the full unbalanced pressure is greater than 250Nm, a gear box fitted in the valves shall be provided.

Extension stems shall be of the same grade of stainless steel as the stems and shall be connected by muff couplings.

Handwheels, tee keys, headstocks, guide brackets for stems, supporting brackets, surface boxes and other fittings shall be of cast iron to BS EN 1561: 2011.

Assembly bolts and nuts shall be of stainless steel to BS EN ISO 3506-1: 2009 of grade A4 and property class 80. Washers shall be of stainless steel equivalent to SAE grade 316 S31. For cast iron or ductile iron valves, materials for assembly bolts and nuts shall be in accordance to manufacturer's recommendation.

C3.2.2 Gate Valves

Gate valves shall be of double flange ended and solid wedge type to BS EN 1171: 2002 or BS 5163-1:2004 in conjunction with BS EN 1074-1:2000 and BS EN 1074-2:2000, with a nominal pressure designation of PN16 and flange to BS EN 1092-1: 2007 PN16.

The bodies and wedges shall be of cast iron to BS EN 1561: 2011 Grade EN-GJL-250 or spheroidal graphite cast iron to BS EN 1563:2011 Grade EN-GJS-400-15 with removable seat rings made from gunmetal to BS EN 1982: 2008 CuSn5Zn5Pb5.

Stem nuts shall be made from gunmetal to BS EN 1982: 2008 CuSn5Zn5Pb5.

Stems shall be of aluminium bronze to BS EN 12163: 2011 grade CA 104 or stainless steel.

A fitted plate showing the position of the valve in the closed, quarter closed, half closed, three quarters closed and fully open positions shall be provided.

Chains for chain operated gate valves shall be of mild steel to BS EN 10095: 1999 and hot dip galvanized.

C3.3 MANHOLES, CHAMBERS AND GULLIES

C3.3.7 Ductile Iron Manhole Covers and Frames

Ductile iron manhole covers and frames shall comply with BS EN 124: 1994. Grade of ductile iron shall be of EN-GJS-500-7 to BS EN 1563: 2011.

Bolts for loosely coupling separate sections of covers shall be stainless steel hexagon headed complete with hexagon nuts to BS EN 10088-1: 2005 number 1.4301 or SAE Grade 304 with dimensions complying with BS 4190: 2001.

The units shall be cleanly cast, free from air holes, sand holes, voids due to shrinkage, gas inclusions or other causes, cold shuts, chill

and any surface defects and neatly dressed and fettled.

The units shall have dimensions as indicated on the Drawings and have sharp edges removed.

Covers shall have the raised design as shown on the Drawings with manufacturer's name cast integrally with the unit in a raised form. All markings shall be clearly legible.

The units shall be coated with 2 layers of black non-toxic water-based bituminous coating to BS 3416: 1991 or 2 layers of black non-toxic coal-tar based coating to BS 4164: 2002 after thoroughly cleaned to remove moulding sands, rust or any other impurity. The coating shall be free of bare patches or lack of adhesion.

The units shall be compatible with their seatings which shall be manufactured in such a way to ensure stability and quietness in use.

Bedding material for manhole frames shall be non-shrinkage with compressive strength exceeding 30 N/mm².

The units shall be capable of withstanding the minimum test loads and having the minimum masses given in Table C3.3.7.

Table C3.3.7 - Minimum Test Load and Mass of Ductile Iron Manhole Cover and Frame

Type	Minimum Mass (kg)	Test Requirements	
		Diameter of Block (mm)	Test Load (t)
Class E600 standard 675 square ductile iron manhole cover	110	250	600
Frame	58	250	600

PART D

INSPECTION, TESTING & COMMISSIONING

D1 GENERAL

Throughout the execution of the installation, the PD Contractor shall be responsible for ensuring compliance with the Regulations included in Section A2 and shall notify the Architect of any infringement which directly or indirectly detracts from the safe and satisfactory operation of the installation(s) whether or not such infringement relates to the works covered in the Contract or to those associated with others.

D1.1 Standards and requirements for the testing and commissioning works are listed shall be in accordance to:-

- (a) Statutory Obligations and other requirements, Specifications and Standards specified in Section A2 of Part A;
- (b) Building Services Branch Testing and Commissioning Procedure for Plumbing and Drainage Installation in Government Buildings Hong Kong; and
- (c) Manufacturers' recommendations and specifications.

D1.2 The PD Contractor is required to appoint a competent and experienced testing and commissioning engineer responsible for the overall planning, organizing, coordinating, supervising and monitoring of the testing and commissioning works and also certifying all results and reports from the testing and commissioning works. The PD Contractor shall submit, at the commencement of the Contract, information detailing qualification and experience of the testing and commissioning engineer for the Architect's approval.

D1.3 It is necessary to require the PD Contractor to provide, at no cost to the Employer, all necessary equipment, apparatus, tools and materials for carrying out of testing and commissioning works.

- (a) Master Programmed of Testing and Commissioning Works

The PD Contractor is required to submit a programme for testing and commissioning works shall be submitted at the commencement of the Contract, usually within the first three months. The programme shall indicate the tentative dates of all tests and commissioning works that will be carried

out throughout the whole contract and all necessary submissions and approval relating to testing and commissioning and ensure that the testing and commissioning programme matches the master programme for construction and that all testing and commissioning works are complete before the completion date of the Contract.

(b) Inspection, Testing and Commissioning Methods and Procedures

The PD Contractor is required to submit detailed inspection, testing and commissioning methods and procedures together with report formats for reporting inspection, testing and commissioning results for the Architect's approval at least four months before commencement of testing and commissioning works, or four months after the commencement of the Contract, whichever is earlier.

(c) Labor and Materials

The PD Contractor is required to be responsible for provision of all labour and both consumable and non-consumable materials for carrying out testing and commissioning works at their expenses. Electricity supply, water and LP gas and town gas for carrying out of testing and commissioning works shall also be arranged and provided by the PD Contractor at no cost to the Employer.

(d) Supply of Inspection, Measuring and Testing Equipment

The PD Contractor is required to supply the calibrated equipment and instrument for testing and commissioning works in accordance with the requirements as specified.

(e) Readiness for Commissioning and Testing

The PD Contractor is required to check the completion of the works to be tested or commissioned, the associated builder's works and the associated building services installations to ensure that testing and commissioning can be proceeded in a safe and satisfactory manner without obstruction.

(f) "Type-test" Certificate

"Type-test" for equipment shall be carried out at the manufacturers' works or elsewhere appropriate in

order to demonstrate their compliance with the Regulation or requirements. "Type-test" certificates together with the corresponding drawings, sketches, reports and any other necessary documents shall be submitted to the Architect for approval before delivery of the equipment.

D1.4 Prior to the testing and commissioning works, the PD Contractor shall check the completion of the installation works, associated builder's work and related building services installations, to ensure that commissioning can be proceeded without obstruction. Before any installation is subjected to commissioning and site testing, it shall be thoroughly cleaned both internally and externally. All pipes shall be thoroughly cleaned and flushed before filling with water.

The PD Contractor shall be responsible for initially setting the plants to work including: -

- (a) Preliminary checks to ensure that all systems and system components are in a satisfactory and safe condition before start up;
- (b) Preliminary adjustment and setting of all plant and equipment consistent with eventual design performance;
- (c) Carrying out pressure test, hydraulic test and other tests required before energising the equipment and plant;
- (d) Checking the proper functioning of the protective devices and safety valves in the installation and carrying out all necessary safety testing;
- (e) Energising and setting to work on all plants; and
- (f) Initial regulation and demonstration that the installation delivers the correct rate of flow at the conditions specified in the Contract.

For specialist plant or equipment, the PD Contractor shall arrange for it to be commissioned, certified and tested by the manufacturer's skilled commissioning engineer and/or technician.

Where the tests involved other plumbing and drainage installations already in operation in other parts of the building outside the Site or works area, the PD Contractor shall co-ordinate with relevant parties, where necessary, on the temporary suspension of other plumbing and drainage installations for the tests.

D1.5 The PD Contractor is required to provide advanced notice for inspection, testing and commissioning works as follows:-

(a) Off-site Inspection and Testing

An advanced notice of at least one week before commencement of the inspection or test shall be provided.

(b) On-site Inspection, Testing and Commissioning

An advanced notice of at least 4 calendar days before commencement of inspection, testing or commissioning shall be provided.

D1.6 Documentation and Deliverables

The PD Contractor shall record all commissioning information and testing results at the witness of the Architect or his representatives. Commissioning and testing record shall be properly checked and certified by contractor's Testing and Commissioning Engineer and signed by the Architect or his representative who has witnessed the testing or commissioning before submission to the Architect. The PD Contractor shall submit full commissioning and testing report to the Architect within 14 calendar days after completion of commissioning and testing of the installation.

D3 TESTING AND COMMISSIONING - GENERAL

D3.3 Where specified, the PD Contractor shall nominate a competent independent Specialist to conduct commissioning work.

D3.4 Where specified, the PD Contractor shall employ an approved specialist testing and commissioning firm who shall be named in the returned Tender Documents.

D6 INSPECTION AND TESTING DURING CONSTRUCTION PERIOD

D6.2 Test at Factory

The PD Contractor shall note that the Architect may require witness of tests and inspections of locally and/or overseas manufactured equipment during construction at the manufacturer's works. Where this requirement is indicated in the Contract, the PD Contractor shall allow for making the necessary arrangements; including and indicating the Architect's travel and subsistence expenses in the Contract.

D6.5 Close Circuit Television (CCTV) Inspection of Drainage Pipework

[Clause D6.5 was deleted.]

D7 DOCUMENTS AND DATA REQUIRED FOR HAND-OVER

D7.3 “As-built” Drawings

All necessary copies of "As-built" drawings as detailed in the Contract and this General Specification shall be provided upon handover.

ANNEX I

LIST OF TECHNICAL STANDARDS AND QUALITY STANDARDS QUOTED IN THIS GENERAL SPECIFICATION

The following is a list of technical standards and quality standards quoted in this General Specification. The technical standards and quality standards indicate the basic requirements. The PD Contractor may offer products, materials and equipment complying with alternative internationally recognized equivalent standards acceptable to the Architect and demonstrated to be equivalent in terms of construction, functions, performance, general appearance and standard of quality to the relevant standards or other standards specified in this General Specification to the Architect for approval.

Standard	Description
BS 21: 1985 (Partially replaced by BS EN 10226-1: 2004)	Specification for pipe threads for tubes and fittings where pressure-tight joints are made on the threads (metric dimensions)
BS 65: 1991	Specification for vitrified clay pipes, fittings and ducts, also flexible mechanical joints for use solely with surface water pipes and fittings
BS 143 and 1256: 2000	Threaded pipe fittings in malleable cast iron and cast copper alloy
BS 416-1: 1990	Discharge and ventilating pipes and fittings, sand-cast or spun in cast iron. Specification for spigot and socket systems
BS 417-2: 1987	Specification for galvanized low carbon steel cisterns, cistern lids, tanks and cylinders. Metric units
BS 437: 2008	Specification for cast iron drain pipes, fittings and their joints for socketed and socketless systems
BS 476-20: 1987	Fire tests on building materials and structures. Method for determination of the fire resistance of elements of construction (general principles)
BS 1196: 1989	Specification for clayware field drain pipes and junctions
BS 1212-1: 1990	Float operated valves. Specification for piston type float operated valves (copper alloy body) (excluding floats)
BS 1212-2: 1990	Float operated valves. Specification for diaphragm type float operated valves (copper alloy body) (excluding floats)

Standard	Description
BS 1377-2: 1990	Methods of test for soils for civil engineering purposes. Classification tests
BS 1968: 1953	Specification for floats for ballvalves (copper)
BS 2456: 1990	Specification for floats (plastics) for float operated valves for cold water services
BS 3416: 1991	Specification for bitumen-based coatings for cold application, suitable for use in contact with potable water
BS 3505: 1986	Specification for unplasticized polyvinyl chloride (PVC-U) pressure pipes for cold potable water
BS 3506: 1969 (Replaced by BS EN 1452-1 to 5: 1999 but remains current)	Specification for unplasticized PVC pipe for industrial uses
BS 4164: 2002	Specification for coal-tar-based hot-applied coating materials for protecting iron and steel, including a suitable primer
BS 4190: 2001	ISO metric black hexagon bolts, screws and nuts. Specification
BS 4346-1: 1969 (Replaced by BS EN 1452-1 to 5:1999 but remains current)	Joints and fittings for use with unplasticized PVC pressure pipes. Injection moulded unplasticized PVC fittings for solvent welding for use with pressure pipes, including potable water supply
BS 4346-2: 1970 (Replaced by BS EN 1452-1 to 5: 1999 but remains current)	Joints and fittings for use with unplasticized PVC pressure pipes. Mechanical joints and fittings, principally of unplasticized PVC
BS 4514: 2001	Unplasticized PVC soil and ventilating pipes of 82.4 mm minimum mean outside diameter, and fittings and accessories of 82.4 mm and of other sizes. Specification
BS 4622: 1970	Specification for grey iron pipes and fittings
BS 4660: 2000 (Partially replaced by BS EN 13598-1: 2010)	Thermoplastics ancillary fittings of nominal sizes 110 and 160 for below ground gravity drainage and sewerage
BS 4800: 2011	Schedule of paint colours for building purposes

Standard	Description
BS 4962: 1989	Specification for plastics pipes and fittings for use as subsoil field drains
BS 5154: 1991 (Partially replaced by BS EN 12288: 2003)	Specification for copper alloy globe, globe stop and check, check and gate valves
BS 5163-1: 2004	Valves for waterworks purposes. Predominantly key-operated cast iron gate valves. Code of practice
BS 5163-2: 2004	Valves for waterworks purposes. Stem caps for use on isolating valves and associated water control apparatus. Specification
BS 5255: 1989 (Partially replaced by BS EN 1329-1: 2000 BS EN 1455-1: 2000 BS EN 1519-1: 2000 BS EN 1565-1: 2000 and BS EN 1566-1: 2000)	Specification for thermoplastics waste pipe and fittings
BS 5911-1: 2002 with amendment A2: 2010	Concrete pipes and ancillary concrete products. Specification for unreinforced and reinforced concrete pipes (including jacking pipes) and fittings with flexible joints (complementary to BS EN 1916:2002)
BS 5911-3: 2010	Concrete pipes and ancillary concrete products. Specification for unreinforced and reinforced concrete manholes and soakaways
BS 6920-1: 2000	Suitability of non-metallic products for use in contact with water intended for human consumption with regard to their effect on the quality of the water. Specification
BS 8558: 2011	Guide to the design, installation, testing and maintenance of services supplying water for domestic use within buildings and their curtilages.
BS EN 124: 1994	Gully tops and manhole tops for vehicular and pedestrian areas. Design requirements, type testing, marking, quality control
BS EN 197-1: 2011	Cement. Composition, specifications and conformity criteria for common cements
BS EN 274-1: 2002	Waste fittings for sanitary appliances. Requirements

Standard	Description
BS EN 295-1: 1991	Vitrified clay pipes and fittings and pipe joints for drains and sewers. Requirements
BS EN 295-10: 2005	Vitrified clay pipes and fittings and pipe joints for drains and sewers. Performance requirements
BS EN 295-2: 1991	Vitrified clay pipes and fittings and pipe joints for drains and sewers. Quality control and sampling
BS EN 295-3: 1991	Vitrified clay pipes and fittings and pipe joints for drains and sewers. Test methods
BS EN 295-4: 1995	Vitrified clay pipes and fittings and pipe joints for drains and sewers. Requirements for special fittings, adaptors and compatible accessories
BS EN 295-5: 1994	Vitrified clay pipes and fittings and pipe joints for drains and sewers. Requirements for perforated vitrified clay pipes and fittings
BS EN 295-7: 1996	Vitrified clay pipes and fittings and pipe joints for drains and sewers. Requirements for vitrified clay pipes and joints for pipe jacking
BS EN 545: 2010	Ductile iron pipes, fittings, accessories and their joints for water pipelines. Requirements and test methods
BS EN 598: 2007 with amendment A1: 2009	Ductile iron pipes, fittings, accessories and their joints for sewerage applications. Requirements and test methods
BS EN 681-1: 1996	Elastomeric seals. Material requirements for pipe joint seals used in water and drainage applications. Vulcanized rubber
BS EN 877: 1999 with amendment A1: 2006	Cast iron pipes and fittings, their joints and accessories for the evacuation of water from buildings. Requirements, test methods and quality assurance
BS EN 1057: 2006 with amendment A1: 2010	Copper and copper alloys. Seamless, round copper tubes for water and gas in sanitary and heating applications
BS EN 1074-1: 2000	Valves for water supply. Fitness for purpose requirements and appropriate verification tests. General requirements
BS EN 1074-2: 2000	Valves for water supply. Fitness for purpose requirements and appropriate verification tests. Isolating valves
BS EN 1092-1: 2007	Flanges and their joints. Circular flanges for pipes, valves, fittings and accessories, PN designated. Steel flanges

Standard	Description
BS EN 1092-2: 1997	Flanges and their joints. Circular flanges for pipes, valves, fittings and accessories, PN designated. Cast iron flanges
BS EN 1092-3: 2003	Flanges and their joints. Circular flanges for pipes, valves, fittings and accessories, PN designated. Copper alloy flanges
BS EN 1171: 2002	Industrial valves. Cast iron gate valves
BS EN 1254-1: 1998	Copper and copper alloys. Plumbing fittings. Fittings with ends for capillary soldering or capillary brazing to copper tubes
BS EN 1254-2: 1998	Copper and copper alloys. Plumbing fittings. Fittings with compression ends for use with copper tubes
BS EN 1254-4: 1998	Copper and copper alloys. Plumbing fittings. Fittings combining other end connections with capillary or compression ends
BS EN 1254-5: 1998	Copper and copper alloys. Plumbing fittings. Fittings with short ends for capillary brazing to copper tubes
BS EN 1329-1: 2000	Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure. Unplasticized poly(vinyl chloride) (PVC-U). Specifications for pipes, fittings and the system
BS EN 1366-3: 2009	Fire resistance tests for service installations. Penetration seals
BS EN 1401-1: 2009	Plastic piping systems for non-pressure underground drainage and sewerage. Unplasticized poly(vinyl chloride) (PVC-U). Specifications for pipes, fittings and the system
BS EN 1561: 2011	Founding. Grey cast irons
BS EN 1562: 1997	Founding. Malleable cast irons
BS EN 1563: 2011	Founding. Spheroidal graphite cast iron
BS EN 1916: 2002	Concrete pipes and fittings, unreinforced, steel fibre and reinforced
BS EN 1917: 2002	Concrete manholes and inspection chambers, unreinforced, steel fibre and reinforced
BS EN 1982: 2008	Copper and copper alloys. Ingots and castings

Standard	Description
BS EN 10088-1: 2005	Stainless steels. List of stainless steels
BS EN 10088-2: 2005	Stainless steels. Technical delivery conditions for sheet/plate and strip of corrosion resisting steels for general purposes
BS EN 10088-3: 2005	Stainless steels. Technical delivery conditions for semi-finished products, bars, rods, wire, sections and bright products of corrosion resisting steels for general purposes
BS EN 10095: 1999	Heat resisting steels and nickel alloys
BS EN 10217-1: 2002	Welded steel tubes for pressure purposes. Technical delivery conditions. Non-alloy steel tubes with specified room temperature properties
BS EN 10217-7: 2005	Welded steel tubes for pressure purposes. Technical delivery conditions. Stainless steel tubes
BS EN 10226-1: 2004	Pipe threads where pressure tight joints are made on the threads. Taper external threads and parallel internal threads. Dimensions, tolerances and designation
BS EN 10242: 1995	Threaded pipe fittings in malleable cast iron
BS EN 10255: 2004	Non-alloy steel tubes suitable for welding and threading. Technical delivery conditions
BS EN 10293: 2005	Steel castings for general engineering uses
BS EN 10312: 2002 with amendment A1: 2005	Welded stainless steel tubes for the conveyance of aqueous liquids including water for human consumption. Technical delivery conditions
BS EN 12056-2: 2000	Gravity drainage systems inside buildings. Sanitary pipework, layout and calculation
BS EN 12163: 2011	Copper and copper alloys. Rod for general purposes
BS EN 12200-1: 2000	Plastics rainwater piping systems for above ground external use. Unplasticized poly (vinyl chloride) (PVC-U). Specifications for pipes, fittings and the system
BS EN 12288: 2010	Industrial valves. Copper alloy gate valves
BS EN 12334: 2001	Industrial valves. Cast iron check valves

Standard	Description
BS EN 13101: 2002	Steps for underground man entry chambers. Requirements, marking, testing and evaluation of conformity
BS EN 13280: 2001	Specification for glass fibre reinforced cisterns of one-piece and sectional construction, for the storage, above ground, of cold water
BS EN 13598-1: 2010	Plastics piping systems for non-pressure underground drainage and sewerage. Unplasticized poly(vinyl chloride) (PVC-U), polypropylene (PP) and polyethylene (PE). Specifications for ancillary fittings including shallow inspection chambers
BS EN 13789: 2010	Industrial valves. Cast iron globe valves
BS EN ISO 1452-1: 2009	Plastics piping systems for water supply and for buried and above-ground drainage and sewerage under pressure. Unplasticized poly(vinyl chloride) (PVC U). General
BS EN ISO 1452-2: 2009	Plastics piping systems for water supply and for buried and above-ground drainage and sewerage under pressure. Unplasticized poly(vinyl chloride) (PVC U). Pipes
BS EN ISO 1452-3: 2009	Plastics piping systems for water supply and for buried and above-ground drainage and sewerage under pressure. Unplasticized poly(vinyl chloride) (PVC U). Fittings
BS EN ISO 1461: 2009	Hot dip galvanized coatings on fabricated iron and steel articles. Specifications and test methods
BS EN ISO 3506-1: 2009	Mechanical properties of corrosion-resistant stainless steel fasteners. Bolts, screws and studs
BS EN ISO 5667-1: 2006	Water quality. Sampling. Guidance on the design of sampling programmes and sampling techniques
BS EN ISO 5667-3: 2003	Water quality. Sampling. Guidance on the preservation and handling of water samples
BS EN ISO 9001: 2008	Quality management systems. Requirements
BS ISO 3864-1: 2011	Graphical symbols. Safety colours and safety signs. Design principles for safety signs and safety markings
BS ISO 5667-5: 2006	Water quality. Sampling. Guidance on sampling of drinking water from treatment works and piped distribution systems