General Specification for Drainage Installation

in Government Buildings of the Hong Kong Special Administrative Region

2017 Edition (Incorporating Corrigendum No. GSDI01-2017)

The General Specification for Drainage Installation in Government Buildings of the Hong Kong Special Administrative Region 2017 Edition (hereinafter referred to as "General Specification for Drainage Installation 2017 edition") is reviewed from time to time to ensure that requirements stipulated in the document are clear, concise and in pace with technological advancements.

Corrigendum No. GSDI01-2017 is issued to incorporate updates and revisions to the General Specification for Drainage Installation 2017 edition which are highlighted in the ensuing summary of major changes.

Electronic version of the General Specification for Drainage Installation 2017 edition incorporating Corrigendum No. GSDI01-2017 can be viewed on the ArchSD Internet website.

After an introductory period of 3 months, the General Specification for Drainage Installation 2017 edition (incorporating Corrigendum No. GSDI01-2017) shall apply to all tenders to be invited on or after 1 April 2020.

(12/2019)

MAJOR CHANGES IN THE CORRIGENDUM (NO. GSDI01-2017) OF THE

GENERAL SPECIFICATION FOR DRAINAGE INSTALLATION

IN GOVERNMENT BUILDINGS OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION

2017 EDITION

Old Ref. No.	New Ref. No.	Major Changes
PART A - SCOPE AND GENERAL REQUIREMENTS		
SECTION A2 –STATUTORY OBLIGATIONS AND OTHER REGULATIONS		
A2.1.2	A2.1.2	- Added "Stormwater Drainage Manual issued by DSD" - Deleted "Handbook on Plumbing Installation for Buildings issued by WSD" - Added "Guide to Application for Water Supply issued by WSD" and "Technical Requirements for Plumbing Works in Buildings" issued by WSD - Renumbering
SECTION A3 – EXECUTION OF INSTALLATIONS		
A3.2 (f)	A3.2 (f)	Punctuation correction.
A3.13	A3.13	Added "The standards for identify pipes, including colour coding, label location, and information about pipe contents shall be designed generally to BS 1710: 2014."
SECTION A4 – DRAWINGS AND MANUALS		
A4.2.3 (a)	A4.2.3 (a)	Added "and"
PART B – INSTALLATION METHODOLOGY		
SECTION B1 – ABOVE GROUND DRAINAGE SYSTEMS		
B1.1.2	B1.1.2	Amended as "Surface water drainage above ground shall be designed and installed generally to BS EN 752: 2008and as per requirement stipulated in the Stormwater Drainage Manual published by DSD when applicable."

Old Ref. No.	New Ref. No.	Major Changes
B1.1.3	B1.1.3	Added "Rainwater drainage shall be designed as per requirement stipulated in the Stormwater Drainage Manual published by DSD."
B1.5.1 (e)	B1.5.1 (e)	Added "and"
SECTION B2 – UNDERGROUND DRAINAGE SYSTEMS		
B2.1.4	B2.1.4	- Amended as "Concrete shall be as specified in Section 6 of the General Specification for Building and listed as follows shall be of appropriate concrete grade strength and approved by the Supervising Officer" (a) Delete Grade 20/20 (b) Delete Grade 10/20 (c) Delete Grade 10/40
B2.2.1 (d)	B2.2.1 (d)	Add "and"
B2.5.4	B2.5.4	- Amended (a) as "Pipes shall be supported at the required level by precast concrete wedges, blocks or cradles or by other methods of appropriate concrete grade strength and approved by the Supervising Officer." - Amended (e) as "Pipes for drainage works which are within 1 m below the surface of a carriageway shall be protected with concrete surround in appropriate grade strength as approved by Supervising Officer." - Amended last paragraph as "Unless otherwise specified, pipes for subsoil and cut-off drains shall be bedded on a 75 mm thick concrete in appropriate strength …."
B2.11.1	B2.11.1	- Amended as "Concrete work for manholes, inspection chamber, gullies, catchpits, surface channels etc. cast in-situ shall be structural concrete grade strength as specified in General Specification of Building and approved by the Supervising Officer." - Amended as "If the pipe is external it shall be surrounded with concrete in appropriate grade strength as approved by the Supervising Officer"

Old Ref. No.	New Ref. No.	Major Changes
		- Amended as "Concrete shall be of appropriate grade strength as approved by the Supervising Officer." - Added "A desilting opening for manhole should not be smaller than 750 mm by 900 mm, and it should be placed along the centre line of the stormwater drain to facilitate desilting. - A man access opening for manhole should not be smaller than 675mm by 675mm. If cat ladders are installed in a manhole, the minimum clear opening should be 750mm by 900mm. A man access opening should be placed off the centre line of the stormwater drain for deep manholes and along the centre line of the stormwater drain for shallow manholes with depths less than 1.2 m."
B2.11.2	B2.11.2	Amended as "Fill excavations around manholes and chambers in carriageways using concrete in appropriate grade strength as approved by the Supervising Officer."
B2.11.3	B2.11.3	Amended as "Fill any excess excavation beyond the channel walls with concrete in appropriate grade strength as approved by the Supervising Officer."
SECTION B4 – PAINTINGS, FINISHING AND IDENTIFICATION		
B4.3	B4.3	Amended "BS ISO 3864-1: 2011" into "BS 1710: 2014"
PART C – MATERIAL AND EQUIPMENT SPECIFICATION		
SECTION C1 – ABOVE GROUND DRAINAGE SYSTEMS		
C1.1.2	C1.1.2	Deleted color requirement of UPVC rainwater pipe, gutters and fittings
Nil	C1.1.5	Added new clause, "First flush device/vortex filter shall be installed at the downstream of rainwater pipe(s) before entering the rainwater collection tank to remove dirt such as fallen leaves from rainwater collected over roof. The minimum capacity of the first flush device shall be 20 to 25 litres per $100m^2$ of catchment area. The body of vortex filter shall be made of robust, tough and non-corrosive type material and equipped with a removable stainless steel bucket type with handle for lifting up, filter of minimum 95% filtering efficiency. The cover of vortex filter shall be securely locked to avoid flapping under pressure."
C1.3.4	C1.3.4	Added "securing clamps such as" and "Technical hydraulic calculations by the manufacturer shall be submitted for approval."

Old Ref. No.	New Ref. No.	Major Changes
SECTION C2 – UNDERGROUND DRAINAGE SYSTEMS		
Table C2.3.7	Table C2.3.7	- Replaced “600t” by “60t” for test load requirement of Class E600 standard 675 square ductile iron manhole cover - Replace “600t” by 60t” for test load requirement of Frame.
ANNEX I - LIST OF TECHNICAL STANDARDS AND QUALITY STANDARDS QUOTED IN THIS GENERAL SPECIFICATION		
		- Added “BS 1710: 2014 Specification for identification of pipelines and services” - Deleted “BS EN 10250-4: 2000 Open steel die forgings for general engineering purposes. Stainless steels” - Deleted “IEC 60085: 2007 Electrical insulation – Thermal evaluation and designation” - Amended “BS ISO 3864-1: 2011 Graphical symbols. Safety colours and safety signs. Design principles for safety signs and safety markings” into “BS 1710: 2014 Specification for identification of pipelines and services”

ARCHITECTURAL SERVICES DEPARTMENT

BUILDING SERVICES BRANCH

GENERAL SPECIFICATION FOR DRAINAGE INSTALLATION IN GOVERNMENT BUILDINGS OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION 2017 EDITION

Corrigendum No. GSDI01-2017

(Effective from 1 April 2020)

The following clauses are amended in the above edition of General Specification for Drainage Installation.

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

(a) Practice Notes for Authorised Persons, Registered Structural Engineers and Registered Geotechnical Engineers issued by BD;

(b) Practice Notes of Professional Persons Environmental Consultative Committee issued by EPD;

(c) Guide to Application for Water Supply issued by WSD;

(d) Technical Requirements for Plumbing Works in Buildings issued by WSD;

(e) Codes of Practice for Minimum Fire Service Installations and Equipment and Inspection, Testing and Maintenance of Installations and Equipment published by FSD;

(f) Requirements and Circular Letters of FSD;

(g) Code of Practice for Fire Safety in Buildings published by BD;

(h) Code of Practice for the Electricity (Wiring) Regulations published by EMSD;

(i) Code of Practice for Energy Efficiency of Building Services Installation, issued by EMSD; hereinafter referred as the "Building Energy Code" or "BEC";

(j) General Specification for Building issued by ArchSD;

(k) General Specification for Air-conditioning, Refrigeration, Ventilation and Central Monitoring & Control System Installation in Government Buildings of the HKSAR, issued by ArchSD;

(l) General Specification for Electrical Installation in Government Buildings of the HKSAR, issued by ArchSD;

(m) General Specification for Fire Service Installation in Government Buildings of the HKSAR, issued by ArchSD;

(n) General Specification for Plumbing Installation in Government Buildings of the HKSAR, issued by ArchSD;

(o) Design Manual: Barrier Free Access 2008 published by BD;

(p) Technical Memorandum to issue Air Pollution Abatement Notice to control Air Pollution from Stationary Processes issued by EPD;

(q) Technical Memorandum for the Assessment of Noise from Places other than Domestic Premises, Public Places or Construction Sites issued by EPD;

(r) Technical Memorandum - Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters issued by EPD;

(s) Technical Memorandum on Environmental Impact Assessment Process issued by EPD;

(t) Code of Practice for Prevention of Legionnaires' Disease issued by the Prevention of Legionnaires' Disease Committee, the Government of the HKSAR;

(u) The Supply Rules and other requirements issued by the relevant local electricity supplier and Water Authority;

(v) A Guide to the Water Pollution Control Ordinance issued by EPD;

(w) Grease Trap for Restaurant and Food Processors issued by EPD;

(x) Guidelines for the Design of Small Sewage Treatment Plants issued by EPD;

(y) Guidelines on Maintenance and Repair of Drainage System and Sanitary Fitments issued by BD, and

(z) Stormwater Drainage Manual issued by DSD.

SECTION A3

EXECUTION OF INSTALLATIONS

A3.2 PROGRAMME OF INSTALLATIONS

(f) Dates of requirement of temporary facilities necessary for testing & commissioning, e.g. electricity supply, water and town gas;

A3.13 LABEL

In order to make cross reference to the Operation/Maintenance/Service Manuals and Schematic Drawings, etc., the Drainage Contractor shall provide labels for marking all valves, pipework, filtration tanks, fuses, terminals, lamps, switches, handles, keys, instruments, gauges, control and other equipment, etc. and elsewhere to facilitate maintenance or as directed by the Supervising Officer with engraved multi-layer laminate or similar material.

Wording shall be submitted to the Supervising Officer for approval before manufacture.

The standards for identify pipes, including colour coding, label location, and information about pipe contents shall be designed generally to BS 1710: 2014.

All labels shall be of adequate size as to give clearance between lettering and fixings to ensure an aesthetic arrangement on completion. Pipeline labels shall generally be not smaller than 100 mm x 20 mm. Where applicable, labels shall be fixed utilising non-ferrous round head bolts and nuts or woodscrews. Adhesives or self tapping screws are not acceptable.

For pipelines or valves, where applicable, labels shall be fixed by means of a key ring attached to the upper corner of the pipe mounting bracket or the hand wheel of valves. The labels shall be suspended from brass or stainless steel chain loops over the relevant pipe.

The Drainage Contractor shall submit a schedule for all labels, notices, identifications for the Supervising Officer's approval prior to order and installation. The information of the schedule shall include the description of the items, height and font type of the text, dimensions of the labels and material used.

All English lettering used on labels shall be "Bold" capitals (except otherwise directed) with black letters on white labels for normal purposes. Where special colours or details are required these shall be as specified or directed.

All labels shall be in English complete with translation in Chinese characters. The Chinese translations shall be referred to the "Glossaries of Terms Commonly Used in Government Departments" issued by Civil Service Bureau of the Government of the HKSAR. Sample of label and notice shall be submitted to the Supervising Officer for agreement. In general, height for the English lettering shall be of 8mm with that for Chinese characters to match.

For electrical panels or other items, lettering shall be:-

(a) Black on white for normal purposes;

(b) Red letters on white where connected to essential supply; and

(c) Green letters on white where operated by direct current.

SECTION A4

DRAWINGS AND MANUALS

A4.2 INSTALLATION DRAWINGS

A4.2.3 Contents of Installation Drawings

In accordance with the provisions of this General Specification and as stated elsewhere in the Contract, the installation drawings must incorporate details of the actual plant and equipment items as approved by the Supervising Officer.

The Drainage Contractor shall ensure all installation drawings are accurate representation of the Installations, before submitting them to the Supervising Officer. All installation drawings shall be fully dimensioned and suitably scaled showing construction, sizes, weights, arrangements, operating clearances and performance characteristics.

(a) "Installation drawings" shall generally include, but not limited to, the following:-

- Symbols and notations same as and compatible with the Employer's own Contract Drawings' standard;

- Complete layout/assemblies including all necessary minor items and accessories;

- Positions of all fixings, hangers and supports;

- Maintenance spaces for all withdrawable items, such as gratings, cleaning eyes, access points, manholes, etc.; and

- Lifting points and safe working weights of each item. Note: These may be shown on separate drawings, if necessary, to avoid confusion.

PART B – INSTALLATION METHODOLOGY

SECTION B1

ABOVE GROUND DRAINAGE SYSTEMS

B1.1 GENERAL

B1.1.2 Surface water drainage above ground shall be designed and installed generally to BS EN 752: 2008 and as per requirement stipulated in the Stormwater Drainage Manual published by DSD when applicable.

B1.1.3 Rainwater drainage shall be designed as per requirement stipulated in the Stormwater Drainage Manual published by DSD.

B1.5 PIPEWORK SUPPORT

B1.5.1 General

(e) Countersunk-holed face plates for screwing to wood or plugs, or panel wall with plug; and

SECTION B2

UNDERGROUND DRAINAGE SYSTEMS

B2.1 GENERAL

B2.1.4 Concrete shall be as specified in Section 6 of the General Specification for Building and listed as follows shall be of appropriate concrete grade strength and approved by the Supervising Officer:

(a) Channels, manholes, inspection chambers, gullies, catchpits and all reinforced concrete work.

(b) Pipe bedding, pipe haunching, pipe surrounds and all other work.

(c) Filling.

B2.2 HANDLING AND STORAGE

B2.2.1 General

(d) Place slings around the pipes and fittings and provide padding at the points of contact between pipes and fittings and metal lifting appliances and slings; and

B2.5 BEDDING AND LAYING OF PIPES

B2.5.4 Concrete Bedding, Haunch and Backfilling

Concrete bedding, haunch and backfilling to pipelines for drainage works shall be constructed as follows: -

(a) Pipes shall be supported at the required level by precast concrete wedges, blocks or cradles or by other methods of appropriate concrete grade strength and approved by the Supervising Officer. One support shall be placed adjacent to each end of each pipe and the spacing between supports not to exceed 3 m. Compressible sheeting shall be placed between the pipes and supports.

(b) Flexible joints shall be formed in concrete bed, haunch and surround at flexible joints in pipelines. Joint filler shall be placed next to the flexible joint in the pipeline and to extend for the complete thickness of the bed, haunch and surround. Precut the filler to the finished profile of concrete and pipe. Joint filler shall be 25 mm thick for pipes not greater than 1200 mm diameter and 50 mm thick for pipes greater than 1200 mm diameter.

(c) Polythene sheeting or a blinding layer shall be placed on the trench bottom before concreting.

(d) Concrete shall be placed evenly over the complete width of the end and over the complete length of the pipe being concreted up to a level of 25 mm below the underside of the pipe. Concrete shall be placed on one side of the pipe only and work under the pipe until the concrete spread under the pipe. Concrete shall be placed equally on both sides of the pipe to the specified level.

(e) Pipes for drainage works which are within 1 m below the surface of a carriageway shall be protected with concrete surround in appropriate grade strength as approved by

Supervising Officer.

(f) Keep concrete and pipes damp until backfilling placed.

(g) Do not commence backfilling for at least 24 hours from time of placing concrete.

If specified, place and secure reinforcement in position. Reinforcement shall not pass through flexible joints in the concrete bedding.

Unless otherwise specified, pipes for subsoil and cut-off drains shall be bedded on a 75 mm thick concrete in appropriate strength, which is to be brought up until at least one third of the depth of the pipe is supported and in the case of perforated pipes, no line of perforations is blocked. Pipes for subsoil and cut off drains shall be laid generally in accordance with the requirements for other drains.

B2.11 MANHOLES, CHAMBERS, GULLIES AND CHANNELS

B2.11.1 Manholes, Chambers and Gullies

Concrete work for manholes, inspection chamber, gullies, catchpits, surface channels etc. cast in-situ shall be structural concrete grade strength as specified in General Specification of Building and approved by the Supervising Officer. All internal faces of these structures shall be rendered with cement mortar so as to provide a smooth and impervious surface.

Step irons and ladders shall be built in as work proceeds.

Set precast concrete units for manholes and chambers vertically with step irons staggered and vertically aligned above each other.

A desilting opening for manhole should not be smaller than 750 mm by 900 mm, and it should be placed along the centre line of the stormwater drain to facilitate desilting.

A man access opening for manhole should not be smaller than 675mm by 675mm. If cat ladders are installed in a manhole, the minimum clear opening should be 750mm by 900mm. A man access opening should be placed off the centre line of the stormwater drain for deep manholes and along the centre line of the stormwater drain for shallow manholes with depths less than 1.2 m.

Seal joints between precast units and lifting holes with cement mortar, removing any excess and pointing the joints.

Drop pipes to manholes shall be coated cast iron, provided with bolted access doors, or swept tee fitted with a capped end. If the pipe is external it shall be surrounded with concrete in appropriate grade strength as approved by the Supervising Officer, if internal it shall be secured with holderbats.

Fill concrete surround to gullies up to the sides of the excavation.

Set the frames for manhole covers and gully gratings to the same level of the surrounding surface, allowing for falls and cambers, using brickwork or concrete as shown on the drawings. Do not exceed three courses of brickwork below frames. Concrete shall be of appropriate grade strength as approved by the Supervising Officer.

Provide two keys for each pattern of cover used.

Ensure the manhole covers of incoming and outgoing services are located within the site boundary and can be easily accessible and free from obstacles to facilitate future maintenance.

B2.11.2 Filling Around Manholes and Chambers

Fill excavations around manholes and chambers in carriageways using concrete in appropriate grade strength as approved by the Supervising Officer.

Fill around other manholes and chambers with fine fill material.

B2.11.3 Channels

Provide and prepare formed joints in surface channels at maximum 10 m intervals and as specified.

Construct the top surfaces of side walls of concrete open channels to the same levels as the adjoining permanent works. Fill any excess excavation beyond the channel walls with concrete in appropriate grade strength as approved by the Supervising Officer.

Surface channels on walkways shall be positioned away from tactile guide paths and other essential markings on the walkway surface.

Channel covers shall be securely fixed and flush with the adjacent walkway surface.

Cover grating slots should run perpendicular to the dominant direction of travel.

SECTION B4

PAINTINGS, FINISHING AND IDENTIFICATION

B4.3 IDENTIFICATION OF PIPELINES

All pipework in the pump rooms shall be finished generally in accordance with BS 1710: 2014. All pipework, where exposed on surfaces outside the pump room, shall be painted either as in the pump room or to match the surrounding surface with distinguishing colour code bands plus flow arrows in the specified colour scheme as directed by the Supervising Officer.

Pipes and pipelines shall be painted in colours either in accordance with BS 1710: 2014 or as directed by the Supervising Officer completed with the identification colour code indicators. The basic identification colour or the decoration colour shall be applied over the whole length of the pipe with colour code indicators placed at all junctions, at both sides of valves, wall penetrations and at any other places where identification is necessary as directed by the Supervising Officer.

Valves may be painted in the same colour as the associated pipework. However, if the pipeline is part of the fire service installation and has been coded only with the safety colour, the valves involved shall be fully painted "safety-red".

The direction of flow of fluid shall be indicated by an arrow over the basic identification colour and painted white or black in order to contrast clearly with the basic identification colour.

Schedule of paint colours shall be to BS 4800: 2011.

PART C – MATERIAL AND EQUIPMENT SPECIFICATION

SECTION C1

ABOVE GROUND DRAINAGE SYSTEMS

C1.1 PIPES AND FITTINGS FOR SURFACE WATER DRAINAGE

C1.1.2 UPVC Rainwater Pipes, Gutters and Fittings

UPVC rainwater pipes, gutters and fittings shall be to BS EN 1329-1: 2014 and BS 4514: 2001 where applicable.

UPVC pipes and fittings shall have solvent welded spigot and socket joints.

C1.1.5 First Flush Device / Vortex Filter

First flush device/vortex filter shall be installed at the downstream of rainwater pipe(s) before entering the rainwater collection tank to remove dirt such as fallen leaves from rainwater collected over roof. The minimum capacity of the first flush device shall be 20 to 25 litres per $100m^2$ of catchment area. The body of vortex filter shall be made of robust, tough and non-corrosive type material and equipped with a removable stainless steel bucket type with handle for lifting up, filter of minimum 95% filtering efficiency. The cover of vortex filter shall be securely locked to avoid flapping under pressure.

C1.3 CAST IRON SOCKETLESS PIPES AND FITTINGS FOR SURFACE WATER AND FOUL WATER DRAINAGE

C1.3.4 All joints must be mechanically connected. If such joints are subjected to thrust loads due to changes of direction and gradient, branches and plugs or overloading, securing clamps such as grip collars or high pressure couplings shall be used to prevent misalignment or disconnection of the pipework. Technical hydraulic calculations by the manufacturer shall be submitted to the Supervising Officer for approval.

SECTION C2

UNDERGROUND DRAINAGE SYSTEMS

C2.3 MANHOLES, CHAMBERS AND GULLIES

C2.3.7 Ductile Iron Manhole Covers and Frames

Table C2.3.7 - 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	60
Frame	58	250	60