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2 INTERNAL DRAINAGE WORKS

2.1 GENERAL

2.1.1 Scope

1 This Part specifies the requirements for internal drainage pipework, internal drainage systems and sanitary appliances.

2 Related Sections and Parts are as follows:

This Section

Part 1..... General
Part 7 ..... Commissioning of Systems

Section 1 General
Section 8 Sewerage
Section 9 Mechanical and Electrical

2.1.2 Reference

1 The following standards are referred to in this Part:

BS 416.....Discharge and ventilating pipes and fittings, sand-cast or spun in cast iron

BS 437.....Specification for cast iron spigot and socket drain pipes and fittings

BS 539.....Dimensions of fittings for use with clay drains and sewer pipes

BS 1010.....Specification for draw-off taps and stopvalves for water services (screw-down patterns)

BS 1125.....WC flushing cisterns

BS 1184.....Specification copper and copper alloy traps

BS 1188.....Ceramic wash basins and pedestals

BS 1206.....Fireclay sinks. Dimensions and workmanship

BS 1212.....Float operated valves

BS 1244.....Metal sinks for domestic purposes

BS 1254.....Specification for WC seats (plastics)

BS 1255.....WC seats (plastics)

BS 2456.....Specification for floats (plastics) for ballvalves for hot and cold water

BS 3402.....Quality of vitreous china sanitary appliances

BS 5254.....Polypropylene waste pipe and fittings (external diameter 34.6 mm, 41.0 mm and 54.1 mm)

BS 5503.....Specification for vitreous china washdown WC pans with horizontal outlet

BS 5572.....Sanitary Pipework

BS 5889.....One-part gun grade silicone-based sealants

BS 8313.....Code of Practice for accommodation of building services in ducts

EN 1329 .....Unplasticized PVC soil and ventilation pipes, fittings and accessories

EN 1453 .....Multilayer Unplasticized PVC soil and ventilation pipes, fittings and accessories

EN 1455 .....Thermoplastics waste pipe and fittings

EN 1519 .....Plastic piping systems for soil and waste discharge (low and high temperature) within the building structure – Polyethylene (PE)

2.1.3 Contractor's Responsibility

1 The Contractor is responsible for checking the dimensions of all internal drainage works to be installed against the availability of space at their intended installation location.

2.1.4 System Description

1 Internal drainage systems shall generally conform to the relevant provisions of BS 5572.

2 Internal drainage systems shall comprise the minimum pipework necessary to carry away the discharges from sanitary appliances in buildings quickly and quietly.

3 Drainage pipework installations shall be such that there is no leakage of contaminated water or foul air into the building.

4 Drainage systems, including materials, joints, supports and fixings shall be durable under the expected operating conditions.

5 Pipework and fittings in drainage systems shall be installed so that defective parts can be replaced without undue difficulty.

2.1.5 Site Work

1 A check should be made to ensure that all holes, chases and ducts required for pipework have been properly provided in accordance with the relevant provisions of BS 8313.

2 Where several pipes pass through floors in close proximity, the Contractor may provide a single framed opening in lieu of individual sleeves. Framed openings shall be to the approval of the Engineer and shall be provided with 100 mm high curbs, on all sides.

2.1.6 Fixing

1 Water supply and discharge pipes should be installed before sanitary appliances are fixed. Before fixing an appliance into position, the Contractor shall ensure that the discharge pipe is clear of obstruction. Joints between appliances and traps and/or pipes should be of the union or detachable type.

2 Sinks and baths should be installed so that they drain to the outlet by gravity.

3 Cistern overflow pipes should be arranged to give a visible warning of discharge.

2.1.7 Sealants

1 Sealants shall comply with the relevant provisions of BS 5889, type B (high modulus sealant) with a fungicide incorporated. The sealant should be applied using a purpose made gun or devise.

2.1.8 Inspection

1 Upon completion of the work, all appliances, materials and workmanship should be carefully examined for defects and for faults in installation. Any defects or faults shall be corrected before the appliances are handed over for use.

2.2 INTERNAL DRAINAGE PIPEWORK

2.2.1 General

1 Pipes and fittings used shall be suitable for their purpose.

2 If pipes, pipe joints and pipe fittings are of dissimilar metals, measures shall be taken to prevent electrolytic corrosion.

3 The Contractor shall comply with all the recommendations of manufacturers when jointing pipes of different materials.

2.2.2 Materials

1 Soil, waste and ventilating pipes, fittings and accessories for above ground drainage systems shall comply with the relevant provisions of the appropriate standard, as set out in Table 2.1.

Table 2.1
Standards for pipes, fittings and accessories
for above ground drainage systems

Material	Standard
Cast Iron	BS 416, Parts 1 and 2
PVC-U (soil and ventilating)	EN 1329
PE (soil and ventilating)	EN 1519
Multilayer PVC-U (soil and ventilating)	EN 1453
Polypropylene (waste)	BS 5254
Plastic (waste)	EN 1455

2 Internal drainage pipes and fittings for below ground applications shall comply with the relevant provisions of Section 8, Sewerage.

2.3 LABORATORY DRAINAGE SYSTEMS

2.3.1 General

1 The chemical resistance properties of pipes, fittings, jointing systems and any other drainage accessory shall be suitable for conveying all solutions expected to be discharged to the drainage system. Where possible, technical advisory services provided by manufacturers shall be used to ascertain the suitability of products to be used in the drainage system. A full list of the solutions expected to be discharged to the drainage system is given in the Project Documentation.

2 Drainage systems for the collection of solutions which are not permitted to be discharged to existing drainage facilities shall be kept totally separate from other drainage systems.

3 Drainage systems to which grit, gravel, sand or other granular material shall be discharged shall have sufficient abrasion resistance properties and be fitted with suitable traps and catch basins.

2.4 GULLIES

2.4.1 Floor Gullies

1 Floor gullies shall comply with the requirements of the following paragraphs unless otherwise detailed in the Project Documentation.

2 Floor gullies shall be coated cast iron and comply with the relevant provisions of BS 539. They shall have a 90 mm diameter trapped outlet and be fitted with a galvanised flat grating of an approved type.

3 Floor drains shall be selected with sufficient grate free area to pass the anticipated flow. The grate free area is defined as the total area of the drainage openings in the grate and shall be not less than 1.5 times greater than the pipe to which the grate is draining.

4 With the exception of those located in toilets, all floor drains fitted with traps shall incorporate a removable bucket.

5 The gully should be installed on a firm base and located relative to the floor finish. The method of fixing shall be as detailed in the Project Documentation.

2.5 ACCESS TO DRAINS

2.5.1 General

1 Sufficient and suitable access should be provided to enable all pipework to be tested and maintained effectively. Access covers, plugs or caps should be sited so as to facilitate the insertion of testing apparatus and the use of equipment for cleaning and/or for the removal of blockages. The use of apparatus or equipment should not be impeded by the structure or other services.

2 Access points should not be located where their use may give rise to nuisance or danger if spillage occurs.

2.6 ROOF TERMINATION

2.6.1 Ventilating Pipes and Stack Vents

1 Ventilating pipes and stack vents shall terminate with a domical cage or other cover that does not restrict air flow. They shall be positioned so that foul air does not cause a nuisance or health hazard.

2.7 PUMPING FACILITIES

2.7.1 Sump Pumps

1 Sump pumps shall comply with the relevant provisions of Section 9, Mechanical and Electrical Equipment.

2.8 SANITARYWARE INSTALLATIONS

2.8.1 General

1 Sanitary fittings shall, unless otherwise stated in the Project Documentation, be as described in the following Clauses.

2 Where screws are used to fix sanitary appliances to concrete, blockwork or brickwork they shall be rust-proofed steel and plugged.

2.8.2 Pedestal WC Pans

1 Pedestal WC pans shall be of white glazed fireclay and shall comply with the relevant provisions of BS 5503. They shall have P, Q or S traps as required. WC seats shall be black plastic and shall comply with the relevant provisions of BS 1254. The traps shall be provided with antisyphonage outlets, where required

2 Where pans are fixed to timber floors they shall be jointed to the drain pipe with hemp gaskin and red lead putty. Where pans are fixed to concrete floors, they shall be jointed to the drain pipe with cement/sand mortar mixed in a 1:2 ratio. The pans shall be screwed to the floor.

2.8.3 Squat Type Toilet

1 Squat type toilets shall comprise a closet of white vitreous china complying with the relevant provisions of BS 3402 for sinking into the floors and integral or separate tread plates in a matching material. They shall have P, Q or S trap as required. The traps shall be provided with antisyphonage outlets, where required.

2 The closets and tread plates shall be set into a concrete bed with the top surface level with the floor finish.

2.8.4 Flushing Cisterns for Toilets

1 Flushing cisterns shall be black plastic or white vitreous china complying with the relevant provisions of BS 1125 and shall be the single flushing type. They shall be fitted with a nylon or brass ball valve complying with the relevant provisions of BS 1212 with a plastic float complying with the relevant provisions of BS 2456. They shall have connections for 12 mm diameter supply and 20 mm diameter overflow pipes. Flush pipes complying with the relevant provisions of BS 1125 shall be provided and shall be of galvanised mild steel.

2 Flush pipes shall be jointed to the bottom of the cisterns by means of watertight unions which allow for easy removal and shall be jointed to WC pans by means of approved rubber cone connectors. The cisterns shall be fixed to walls with screws.

3 High level cisterns shall be provided with chromium plated chains with rubber pull handles. They shall be fixed a height of 1500 mm from finished floor level to the underside of the cistern. Flush pipes shall be 30 mm diameter and shall be fixed with pipe clips which shall be screwed to walls.

4 Low level cisterns shall be provided with chromium plated lever flushing handles. They shall be fixed at a height of 600 mm from finished floor level to the underside of the cistern. Flush pipes shall be 35 mm diameter.

2.8.5 Slab Urinals

1 Urinal slabs shall be white glazed fireclay and shall have end screens. All urinals shall have a white glazed fireclay floor channel and white glazed fireclay fluted treads set flush with the floor finish. The channel shall have a 40 mm diameter chromium plated brass outlet with hinged grating.

2 The urinal slabs, channel and floor treads shall be bedded in cement mortar and jointed and painted with white cement. The flushing cistern shall be a white glazed fireclay automatic flushing cistern, complete with cover, and shall be fixed on white porcelain enamelled cast iron brackets which shall be screwed to the wall.

3 Flush pipes and spreaders shall be chromium plated and shall be fixed to walls with chromium plated holderbats. A 40 mm diameter trap with 40 mm or 75 mm deep seal as necessary shall be provided.

2.8.6 Bowl Urinals

1 Urinals bowls shall be white glazed fireclay with lipped basin and flushing rim. Urinal bowls shall be screwed to the wall. Flushing cisterns, flushing pipes and spreaders shall be as described for slab urinals. The bowl urinals shall be complete with chromium plated brass outlet and trap.

2.8.7 Wash-basins

1 Wash-basins shall be white glazed fireclay size 625 mm x 450 mm overall and shall comply with the relevant provisions of BS 1188. Each basin shall be provided with a 30 mm diameter chromium plated waste outlet and rubber plug with a chromium plated chain and stay.

2 A 30 mm diameter trap shall be fixed to each basin having a 40 mm deep seal and one or two 12 mm pillar taps shall be fixed as required. Where only one tap only is required, the basin shall be provided with a tap hole stopper to match the basin. Unless otherwise specified, each wash-basin shall be fixed on two cast iron brackets complying with the relevant provisions of BS 1255 which shall be screwed to the wall. If required the pedestal WC pan shall match the basin.

2.8.8 Sinks

1 Ceramic sinks shall be white glazed fireclay size 600 mm x 450 mm x 250 mm deep and shall comply with the relevant provisions of BS 1206.

2 Metal sinks shall be stainless steel or aluminium to the sizes stated in the Project Documentation and shall comply with the relevant provisions of BS 1244.

3 Each sink shall be provided with a 40 mm chromium plated brass waste outlet, outlet grating, overflow and rubber plug with chromium plated chain and stay. A 40 mm diameter trap shall be fixed to each sink having a 40 mm or 75 mm deep seal as necessary. Each sink shall have one or two 12 mm diameter pillar or bib taps, as required. Where only one tap is required, a tap hole stopper to match the sink shall be provided. Pillar taps shall have 150 mm raising pieces and bib taps shall have extension pieces of adequate length.

4 Sinks shall be supported and fixed on brackets or legs unless otherwise specified in the Project Documentation. Two cast iron brackets shall be used for sinks supported and fixed on brackets. The brackets shall comply with the relevant provisions of BS 1255 and shall be screwed to the wall. Legs for supporting sinks shall be of cast iron or galvanised steel with a painted finish. Sinks shall be fixed at a height of 550 mm from the outlet grating to finished floor level.

2.8.9 Showers

1 Shower fittings shall comprise a 100 mm diameter adjustable chromium plated brass inclined shower head with rose and 12 mm diameter supply pipe(s) with 12 mm diameter stop valve(s) to control the water supply.

2 The shower head shall be fixed a height of 1800 mm above the finished floor level. All exposed pipework and fittings serving the showers within the shower area shall be chromium plated and fixed with chromium plated holderbats.

2.8.10 Taps

1 All taps shall comply with the relevant provisions of BS 1010. Taps shall be of the following type as appropriate and, where necessary, shall be provided with extension pieces.

(a) pillar taps shall be 12 mm diameter chromium plated brass with cross heads.

(b) bib taps, unless otherwise stated, shall be 12 mm diameter chromium plated brass with cross heads, complete with backplate elbow or wall flange. Bib taps to stand pipes shall be 12 mm diameter unplated brass, and shall have an extended nozzle suitable for hose connections.

2.8.11 Traps

1 Traps shall be of the following types:-

(a) traps for sinks, lavatory basins and baths shall be copper, brass, or aluminium complying with the relevant provisions of BS 1184, complete with cleaning eye. Traps to sinks, baths shall have an overflow connection.

(b) traps for urinals with suspended drains shall be 75 mm diameter cast iron complying with the relevant provisions of BS 416, Table 14. They shall be fitted with cast iron connectors and threaded to receive the outlet from the urinal.

(c) traps for urinals with buried drainage shall be 75 mm diameter cast iron complying with the relevant provisions of BS 437. They shall be fitted with cast iron connectors and threaded to receive the outlet from the urinal.

END OF PART