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3 EXTERNAL DRAINAGE WORKS

3.1 GENERAL

3.1.1 Scope

1 This Part specifies the requirements for pipework and accessories for external drainage works in building areas. External drainage works includes foul water sewerage and surface water sewerage.

2 Related Sections and Parts are as follows:

This Section

Part 1 General

Part 6 Commissioning of Systems

Section 1	General
Section 5	Concrete
Section 6	Roadworks
Section 8	Sewerage

3.1.2 References

1 The following standards are referred to in this Part:

BS 2494 Elastomeric seals for joints in pipework and pipeline

BS 4346 Joints and fittings for use with unplasticized PVC pressure pipes.

BS 6209 Solvent cement for non-pressure thermoplastic pipe systems

EN 295 Vitrified clay pipes and fittings and pipe joints for drains and sewers

EN 1401 unplasticized polyvinyl chloride (PVC-U) pipes and plastic fittings of nominal sizes 110 and 160 for below ground drainage and sewage

EN 1401 Unplasticized PVC pipe and fittings for gravity sewers

EN 13476 Multilayer unplasticized polyvinyl chloride (PVC-U) pipes and plastic fittings of nominal sizes 110 and 400 for below ground drainage and sewage and gravity sewers

ISO 4633 Rubber Seals - Joints rings for supply, drainage

3.1.3 System Description

1 Pipes and fittings to be used for foul sewerage shall be suitable for carrying sewage at temperatures of up to 45°C or as mentioned in the Project Document with hydrogen sulphide concentrations up to 400 mg/l.

2 Pipes shall be suitable for immersion in corrosive groundwater conditions typically exhibiting the following characteristics unless otherwise specified:

SO₃ Content : 1.7 g/l

Cl Content : 1.07 g/l

pH : 8.6

Conductivity : 4000 µs/cm

- 3 The Contractor shall be responsible for providing a jointing system as recommended by the pipe manufacturer that enables the installation and use of the designated pipeline systems.

3.2 PIPEWORK

3.2.1 General

- 1 Pipes shall have adequate strength to meet the loading requirements, be sufficiently robust to withstand site handling and be sufficiently durable to remain watertight for the anticipated life of the system.
- 2 Pipes and joints should remain sufficiently water tight to prevent the ingress of ground water and the ingress of effluent when subject to ground movement and settlement.

3.2.2 Vitrified Clay Pipework

- 1 Vitrified clay pipes and fittings for drains and sewers shall comply with the relevant provisions of EN 295.
- 2 Pipes shall have spigot and socket joints complying with the relevant provisions of EN 295. Joints shall have elastomeric joint seals. Complying with the relevant provision of ISO 4633 or, BS 2494 (Type D) and shall be obtained from the pipe manufacturer. For pipes up to 150 mm diameter, push-fit (sleeve type) polypropylene flexible couplings may be used in place of spigot and socket joints.
- 3 All other requirements related to the manufacture, inspection and testing of vitrified clay pipes shall be in accordance with the relevant provision of Section 8, Sewerage.

3.2.3 Unplasticized Polyvinyl Chloride (PVC-U) Pipework

- 1 PVC-U pipe joints and fittings for gravity drains and sewers shall comply with the relevant provisions of EN 1401 or EN 13476.
- 2 Joints shall have elastomeric joint seals complying with the relevant provisions of ISO 4633 or EN 681-1 and shall be obtained from the pipe manufacturer.
- 3 Solvent cements for jointing PVC-U pipes shall comply with BS 4346. For pipes and fittings complying with EN 1401 or EN 13476, solvent cement may alternatively comply with EN 14680.
- 4 All other requirements related to the manufacture, inspection and testing of PVC-U pipes shall be in accordance with the relevant provisions of Section 8, Sewerage.

3.2.4 Testing of Pipework

- 1 Internal and external pressure tests shall be carried out on external drainage pipes. Test procedures are detailed in Part 6 of this Section.

3.3 ACCESSORIES

3.3.1 Gullies and Gully Gratings

- 1 Gullies and gully gratings shall comply with the relevant provisions of Section 6, Roadworks.

3.4 CONNECTION TO EXISTING PIPELINES

3.4.1 Connections to Existing Government Mains

- 1 Connections to existing Government mains shall comply with the relevant provisions of Section 8, Sewerage, and the following clauses.
- 2 Where possible and practicable, connections shall be made to future connection ports in existing Government manholes. The caps on future connection ports to which connections are made shall be cleaned and delivered to the government stores in accordance with the relevant provisions of Section 1, General.
- 3 Where it is not possible or practicable to utilise future connection ports in existing manholes, connections shall be made by either breaking into existing manholes or constructing new manholes on existing mains.
- 4 If it is necessary to break into an existing manhole, the Contractor shall break into the manhole wall, insert pipework, break out the existing benching, construct benching to suit new connection and make good. If necessary, the Contractor shall relocate the access ladder and the cover slab to suit the new benching layout.
- 5 Manholes built on an existing Government main shall be constructed in accordance with Clause 6 of this Part. On completion, such manholes shall become the property of the government.
- 6 The Contractor shall be responsible for all over-pumping operations associated with making connections to Government mains.

END OF PART