

Chapter 10

SURFACE DRAINAGE

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CHAPTER 10: SURFACE DRAINAGE

List of Bureau of Indian Standard Codes to be followed		
Sl. No.	IS No.	Subject
1	IS: 458	Concrete pipes
2	IS:783	Code of practice for laying concrete pipes.
3	IS:1726	Specification for cast iron manhole covers and frames.
4	IS:7740	Code of practice for road gullies

10.0 GENERAL

Storm or Surface water drainage shall be done according to the provisions of this Section of the General Specifications.

10.0.1 Existing services plans furnished, if any will be for information purposes only and do not necessarily indicate exact locations, depths, offsets, etc. Small items of service are not normally indicated on the Drawings. The Contractor shall uncover and verify the existence of all services. Temporary protection during the construction shall not be measured and paid for but shall be considered as a subsidiary obligation under the Contract and no separate measurement or payment will be made unless separate Items are provided.

10.0.1 This work shall include for working in close proximity to existing service utilities, the provision of temporary supports to services, any special protective measures required by the Service Authorities and/or the Engineer, dewatering, excavation in any materials, backfilling, levelling and compaction of excavations. It also includes for supply and placing of bedding and surround materials (except concrete for pipelines which shall be measured separately or as otherwise stated in the Bill Item description), disposal of debris to tip and disposal of unsuitable material and/or surplus suitable material.

10.0.2 All rates shall include for finishing as per the requirements of the Specifications.

10.0.3 All Concrete Surround of storm water pipes shall be with grade 40/20 concrete.

10.1 GULLIES & CONNECTIONS

10.1.1 "Supply and Install Kerb Gully/ flush gully" shall include for supplying and installing with all necessary excavation and backfilling, gully grating, hinged cover and frame all of ductile iron and the gully pot of GRP complete with approved removable bucket, sand deflector, precast concrete make-up and concrete surround to the pot and spout.

10.1.2 The rate for "uPVC Gully Connection Pipe" shall include all necessary excavation and backfilling, cutting, jointing, bends, collars, adaptors, etc. The lengths of uPVC pipes shall be measured from the edge of the gully pot concrete surround to the edge of carrier drain or outside face of chamber as shown on the Drawings. Concrete surround to gully connection pipe shall be measured separately.

Where gully pipes are laid but no kerb entry gullies are to be installed, the rate shall include for provision and installation of end caps and approved concrete marker slabs suitably inscribed and installed as directed by the Engineer-in-charge. The Contractor shall obtain prior approval of the exact locations from the Engineer-in-charge

10.1.3 Supply and installation of saddle or tee connections of different diameters shall include but not limited to the additional excavation around the pipes, provision and installation of saddles or tees/reducers, etc. on the carrier pipelines, couplings, pipe bedding and all incidentals necessary to complete the work. All connections to carrier

pipes of diameter less than 500mm shall be by tee connections.

- 10.1.4** “Break Out existing Gully and Replace” shall include removal of existing frame & cover, gully pot and concrete surround, refurbishment of frame and cover or provision of new frame and cover, new complete gully pot concrete surround and reinstatement of kerbs, road and footpath etc. to original condition.

10.2 STORM WATER UPVC/GRP/RC CARRIER PIPELINES

10.2.1 Pipelines

Storm water drainage pipelines are made up of uPVC/GRP/RC carrier drains and gully pipes.

- 10.2.1.1** This work shall include all necessary excavation, dewatering, temporary supports, provision of pipes and fittings, installation, bedding and surround, backfilling, with suitable material from excavation or with approved imported suitable graded material to be compacted in layers of 15 cm to 95% MDD, warning tapes, water testing the pipelines and all incidentals necessary to complete the works.

- 10.2.1.2** Bedding and surround to GRP and uPVC pipes will vary depending on the cover depth of pipe and as indicated in the drawing.

- 10.2.1.3** The depth to invert is measured from formation level. Wherever a minimum clear cover of 1.00 metre below FRL or 0.60 metre below footpath is not available a concrete surround is given to the pipe and is measured under relevant item in the bill. Where a fill has to be constructed to provide the above mentioned minimum cover for the pipe, the Contractor shall, at no additional cost, construct the fill, prior to excavating the trench in order to lay the pipeline.

- 10.2.1.4** The work for pipelines shall include, in addition to the works mentioned above, for all cutting, jointing, bends, collars, tees, short pieces, adaptors etc., and connecting to receiving chambers etc.

10.3 BUILT UP DRAINS

- 10.3.1** Drains shall be built exact to line, levels and gradient. Drains shall be constructed in concrete, RCC, stone masonry or brick masonry as specified. Bottom and side walls shall be plastered in cement mortar 1:4 and finished smooth.

- 10.3.2** The drains shall be open or covered. Pre-cast R.C.C cover slab of appropriate thickness and steel shall be provided for cover drains. The pre-cast cover slabs shall be capable of withstanding loads under traffic wherever traffic is expected over the drains.

10.4 MEASUREMENT

- 10.4.1** The length of pipeline shall be measured along the centreline of the pipeline between inside faces of the structures, manholes, inspection and collection chambers and the like. The average depth to invert between terminal points shall be calculated as the arithmetic mean of the measurement of depth from the existing ground level or finished ground level or the formation level of the road if the road is constructed under this Contract, whichever is lowest, to invert level of the pipe taken at intervals of 10 metres along the pipeline, starting from their downstream end. For lengths of pipelines less than 10 metres long the measurement of depth shall be the average depth as specified above, measured at each end of the pipeline.

Where pipelines pass into structures and the material of the pipes in the structure walls is different from the pipe material external to the structure, then this short length of alternative pipe material shall not be measured as a separate item. Any additional costs associated with this short length of alternative pipe material shall be included in the items for structures.

Concrete, masonry, plastering etc. shall be measured in quantities.

10.5 RATE

10.5.1 The rate for pipe laying for cutting and reinstating existing roads shall include for saw cutting existing asphalt, excavation in the road, backfill, and reinstate road and all other incidental works, in order to lay pipes to any depth.

10.6 MANHOLES AND CHAMBERS:

10.6.1 The work shall include but not be limited to all necessary excavation, formwork, provision of concrete, reinforcement, GRP coated step irons, building pipes into the walls, removal of surplus materials, backfilling, reinstatement and all incidentals necessary to complete the manhole and chambers. The manhole's cover slab shall be RCC cover slab constructed integral with CI/DI manhole covers where the covers are smaller than the chamber dimensions. Manhole chambers in places of traffic shall be of heavy duty type. The chamber walls shall be of concrete, brick masonry or stone masonry as per specifications.

10.6.2 Inside of the chambers and benching shall be plastered and finished smooth to provide minimum obstruction to flow.

10.6.3 Any abortive excavation for manholes, catch pits or chambers due to the relocation of works instructed in writing by the Engineer-in-Charge shall be measured and paid under the item "Abortive Excavation".