



HYDERABAD

# STANDARD TECHNICAL SPECIFICATION FOR DRAINAGE AND SANITATION

PEDC/STD.SPEC/  
23- REV 00

Page 1 of 16

## DRAINAGE AND SANITATION

REV. NO.	PRAPARED	APPROVED	DATE
00	Marina	P Mishra	

### **COPYRIGHT AND CONFIDENTIAL**

The information on this document is the property of BHARAT HEVY ELECTRICAL LTD.It must not be used directly or indirectly in any way detrimental to the interest of the Company.



HYDERABAD

## STANDARD TECHNICAL SPECIFICATION FOR DRAINAGE AND SANITATION

PEDC/STD.SPEC/  
23- REV 00

Page 2 of 16

### 1.0 SCOPE

1.1.0 This section covers the layout and construction of drains for roof water, surface water and sewage together with all fittings and fixtures and inclusive of ancillary works, such as connections, manholes, manholes and inspection chambers used within the building and from the building to the connection to a public sewer or to treatment work. Septic tank and soak pit dispersion trenches.

### 2.0.0 INSTALLATION

#### 2.0.1 General

All pipe lines, Locations of fittings and fixtures, etc., shall be as per drawings or as directed by the Engineer, Correctness of lines, plumb, orientation, symmetry and levels shall be strictly ensured. All items shall be fully secured against movement in any direction and so located as to allow easy maintenance.

All pipe lines, fittings and fixtures shall be installed leak proof. When the works under scope of this specification linked up with works executed by others, the connections shall be such as to prevent any splashing or emission of foul odour and gases.

#### 2.1.0 Rainwater Down corners

Rainwater down corners shall be standards Cast Iron of Asbestos Cement pipes. In case where specifically desired. M.S. pipes may also be M.S. pipes shall be painted outside with two coats or anti corrosive paints under a coat of primer.

Rainwater down corners shall run along and be secured to walls, columns etc., where desired by the Engineer these may have to be installed in chase cut in the structured . All pipes shall be wall secured and supported by adequately strong brackets. The brackets may be wrought iron clevis type, split ring type of perforated strap iron type as approved by the Engineer. For vertical runs each pipe shall hang freely on its brackets fixed just below the socket. Suitable spacer blocks shall be provided against the vertical surface to which the pipe is fixed.

All bends and junction shall be supplied with water tight clean outs.

Proof and floor drains and vard gullies shall be installed. If required by cutting into the structure and grouted with 1:2:4 cement concrete. All gutters shall be provided with removable grating.

All horizontal pipes shall have a minimum fall of 1 in 100.

#### 2.1.0 Gutters

The gutters shall be made of G.I. of A.C. All gutters shall be supplied by reputable specialized firms. Each section shall be sufficiently rigid, edges and



HYDERABAD

## STANDARD TECHNICAL SPECIFICATION FOR DRAINAGE AND SANITATION

PEDC/STD.SPEC/  
23- REV 00

Page 3 of 16

corners straight and the slopes perfectly uniform G.I. gutters shall have the edges strengthened by suitable means.

Unless noted otherwise the gutters shall have a minimum fall of in 120. Adequate number of string supports shall be provided so that there is no deflection even when the gutter is full. Each point must have a support. Unless otherwise specified the supports shall be fabricated M.S. brackets. All junctions shall be thoroughly water tight. The joints may be made by riveting, bolting or soldering. All joints between successive lengths of gutters shall have an overlap of at least 5 cm. The drop in the overlap shall always be in the direction of the fall of the gutter. Ends of gutters shall be closed water tight. Junction with rainwater down corners shall be made fully watertight and secured.

### 2.2.0 Soil and Drainage Pipes

#### 2.2.1 Gradients

If not specified the minimum gradients of solid and drainage pipes line shall be as follows:

100 mm nominal dia: 1 in 35

150 mm nominal dia: 1 in 65

230 mm nominal dia: 1 in 120

300 mm nominal dia: 1 in 200

#### 2.3.2 Relation with water supply pipe lines

Unless specifically cleared by the Engineer, under no circumstances shall special drainage and soil pipes be allowed to come close to water supply pipelines.

#### 2.3.3 Laying

Each separate pipe shall be individually set for line and for level. Where lengths of sewer or drain pipes are laid in trench, properly ; painted sight rails shall be fixed across the trench at a height, equal to length of the bonding rod fixed across trench at a height, equal to length of the bonding rod to be used, above the required invert level of the drain or sewer at the point where the sight is fixed. More sight rails shall be required at manholes, change of gradient and intermediate positions if the distance for sighting is more than 50 ft. The foot of the wall of the pipe. Each pipe shall be separately and accurately boned between sight rails.

#### 2.3.3 Support and protection on Pipelines

All pipes shall be laid with sockets leading uphill, preferably the pipe shall rest on solid and even foundations for the full length of the barrel. However, the



HYDERABAD

## STANDARD TECHNICAL SPECIFICATION FOR DRAINAGE AND SANITATION

PEDC/STD.SPEC/  
23- REV 00

Page 4 of 16

pipe manufacturer's instruction as approved by the Engineer shall be followed in the matter of support and jointing.

To achieve full and continuous support, concrete for bedding and packing is the best. Where pipes are not bedded on concrete, the floor shall be left slightly high and carefully placed so that the pipe barrels rest on undisturbed ground. If anywhere the excavation has been carried too low packing shall be done in concrete. Where laid on rock or very hard ground which cannot be easily excavated to a smooth surface, the pipes shall be laid on a cradle of fine concrete floor of gravel and crushed stone over laid with concrete or on a well consolidated gravel and crushed stone bed as desired by the Engineer. PVC or similar pipes shall be laid directly on stable soil.

The minimum support and protection for glazed stoneware pipes shall be as follows:

- a) When cover is less than 2 meter below ground level and where pipes are unavoidably exposed above ground surface, the pipes shall be completely encased or surrounded with concrete.
- b) Where pipes are laid on soft solid with the maximum water table rising above the invert of the pipe, the sewer shall be bedded on concrete.
- c) Where the pipes have to be laid on soft solid with the maximum water table rising above the invert of the pipe, but below the top of the barrel the pipe sewer shall be hunched.
- d) Where maximum water table is likely to rise above the top of the barrel or wherever the pipe is laid on soft soil the pipe sewers shall be completely encased or surrounded with concrete.

Vitrified clay pipe shall be laid on a bed of 150 mm thick cement concrete (1:3:6) nominal mix by volume.

Cast iron pipes and concrete pipes may be supported on suitable concrete or brick support, where specified. The supports shall be located close to ends. Spacing of intermediate supports shall be as decided by the Engineer, Pipes shall be secured to the supports by approved means.

Anchoring of pipes where necessary shall be achieved by suitable concrete encasing designed for the expected thrust.

### 2.3.4 Entry into Structure.

For entry of the pipelines into any building of structure suitable conduit after the structure or sleeves shall be used. The conduits and sleeves shall be such as to allow easy repairs and replacement of the pipes when openings of chases are required to be made in the structure for entry of pipe lines, After laying of the pipeline the opening and chases shall be mended.



HYDERABAD

## STANDARD TECHNICAL SPECIFICATION FOR DRAINAGE AND SANITATION

PEDC/STD.SPEC/  
23- REV 00

Page 5 of 16

### 2.3.5 Ducts

Where solid waste and ventilating pipes are accommodated in ducts, access to cleaning areas shall be provided. Connection to drain shall be through a gully with sealed cover to guard against ingress of sewer gas, vermin or backflow.

### 2.3.6 Traps and Ventilating pipes

Pipes are carrying of the waste from water a closets and water a closed and waste water and overflow water from baths, wash basins, sinks to drains shall be trapped immediately beneath such fixtures. Traps shall have minimum water seal of 50 mm and shall be ventilated whenever such ventilation is necessary to maintain water seal of the trap.

Ventilating pipes shall be carried up vertically the drain to a height of at least 600 mm above the outer covering of the roof of the building or as shown on drawings. All vertical venting, anti – syphonage and similar pipe shall be covered on top with a cowl. The cowl. Shall be made of G.I. unless desired otherwise by the Engineer.

### 2.3.7 Manhole and Inspection Chambers

The maximum distance between manholes shall be 30 meter unless specially permitted otherwise. In addition , at every change of alignment gradient or diameter there shall be a manhole or inspection chamber. The distance between manhole or inspection chamber and gully chamber shall not exceed 6 meters unless desired otherwise. Manhole shall be constructed so as to be water tight under test. The bending at the sides shall be carried out in such a manner as to provide no lodgment for any splashing in case of accidental flashing of the chamber. The channel or drain at the bottom of chamber shall be plastered with 1:2 cement , sand mortar and finished smooth the grade. The channels and drains shall be shaped and laid to provide smooth flow.

Connecting to existing sewer lines shall be through a manhole.

Manholes shall be provided with standard G.I. covers. The covers shall be close fittings so as to prevent gases from coming out suitable heavy duty covers shall be used where necessary as decided by the Engineer.

### 2.3.8 Cutting of Pipes

Manufacture's instructions shall be followed for cutting of pipes where necessary. Suitable and approved tools shall be used for the cutting so as to leave surface clean and squat to the axis of the pipe.

### 2.3.10 Jointing



HYDERABAD

## STANDARD TECHNICAL SPECIFICATION FOR DRAINAGE AND SANITATION

PEDC/STD.SPEC/  
23- REV 00

Page 6 of 16

Jointing of laid pipes shall be so planned as to avoid completely any movement or strain to the joints already made. If any joint is suspected to be damaged it shall be opened out and redone.

All joints between pipes, pipes and fittings and manholes shall be gas –tight when above ground and watertight. When underground Method of jointing shall be as per instructions of the pipe and fittings manufacturer and as approved by the Engineer. However , in the absence of any instruction available from the manufacturer the methods as detailed here under shall be used.

### a) Cast Iron Pipes

Socket and spigot pipes shall be jointed by the cast lead joints. The spigot shall be centered in the socket of the next pipe by tightly caulking in sufficient turns of tarred gasket or hemp yarn to have unfilled half the depth of socket. When the gasket or hemp yarn has been caulked tightly a jointing shall be placed round the barrel and tightened against the face of the socket to prevent air lock. Molten lead shall then be poured in to fill the remainder of the socket and caulked with suitable tools right round the joint to make up for shrinkage of the molten metal on cooling and shall be finished 3 mm behind the socket face.

Joint in cast iron pipes with special jointing arrangements like ‘Tyton’ joints etc., shall follow the instructions of the manufacturers.

In special cases if fanged joints are accepted by the Engineer the joints shall be made lead-proof by inserting approved type of rubber gaskets. The bolts shall be secured in stages to avoid uneven strain.

### b) Concrete Pipes

Care shall be taken to place the collar centrally over the joint.

### c) Glassed Stone water Pipes

Tarred gasket or hump yarn soaked in thick cement slurry shall first be placed round the spigot of each pipe previously laid . The pipe shall then be adjusted and fixed in the correct position and the gasket caulked tightly so as not to fill more than  $\frac{1}{4}$  of the total depth of the socket. The remainder of the socket shall be filled with a stiff mixture of cement mortar of 1:1 proportion. Then the socket is filled, a fillet shall be formed round the joint with a trowel, forming an angle of 45 deg. With the barrel of the pipe. The newly made joints shall be protected, unit set and shall be covered with damp cloth or other suitable materials.

### d) Vitrified clay Pipes



HYDERABAD

## STANDARD TECHNICAL SPECIFICATION FOR DRAINAGE AND SANITATION

PEDC/STD.SPEC/  
23- REV 00

Page 7 of 16

The shall be made from refractory clay mixed with crushed pottery and stone and burnt at a height temperature. These shall be hard, compact and glazed to make them acid resistant and impervious, and shall be obtained from approved manufacturer.

Special care shall be taken in handing these pipes. The pipes shall not be jointed until the earth has been partly refilled over the portion of the pipe between the joint holes. Before laying the second pipe, the socket of the first pipe laid shall be thinly painted all round on the inside with cement slurry (1 part of cement and 2 parts of clean, sharp sand ). A ring of rope yarn (closely twisted heap or jute dipped in neat cement paste or tar or bitumen, shall be inserted in the socket or pipe and driven home with caulking tools. The rope shall fully encircle the spigot with a slight overlap and shall not occupy more then one fourth of the total depth of the socket. Where the spigot end of the pipe is made for receiving the gasket, it shall be wrapped with two or three turns of tarred spun, as close to the end as possible, before inserting into the socket. The joint shall then be completely filled with cement mortar (1:1 ) which shall have very little water and leveled to from a splayed fillet at a an angle of 45 degrees with the outside pipe. Special care shall be taken so that any excess mortar etc., left inside the pipe joints is neatly cleaned off immediately after each joint is made . A semi-circular wooden scrapper or a rubber disc to which a long handle is fixed could be used for this purpose.

### e) **Lead Pies**

No lead pipes shall be used unless specifically mentioned in the specification. The joints in lead pipes shall be made as wiped solder joint. The minimum and the maximum length of the wiped solder joints shall be 8 cm, and 9cm respectively. The solder shall generally consist of two parts of lead and one part of tin.

### f) **Polythylene Pipes**

The joints shall be thermo-welded or bolted as per manufacturer's instructions.

### g) **Jointing Cast Iron Pipes with Stoneware Pipes**

Where any cast iron soil pipe, ventilating pipe or trap is connected with a Stoneware or semi-vitrified waste pipe or drain communicating with a sewer, the beaded spigot end of such cast iron soil type, waste or ventilating pipe or trap shall be inserted in to a socket of such stoneware pipe or drain and the joint made with motar consisting of one part of cement and one part of clean shape sand after placing a ratted gasket or hemp yarn soaked in neat cement slurry round the joint and inserted in it by means of a caulking tool.

### h) **Jointing Stone ware with Cast Iron Pipe**



HYDERABAD

## STANDARD TECHNICAL SPECIFICATION FOR DRAINAGE AND SANITATION

PEDC/STD.SPEC/  
23- REV 00

Page 8 of 16

Where any water closet pan or earth ware trap connected to such a pan is to be jointed with a cast Iron soil socket, shall always be of a flexible nature. Such joint shall be made with admixture of bitumen and chopped asbestos fibre.

### 2.4.0 Trenches and other excavations

Width of the trench at the bottom shall be such as to provide 200 mm clearance on either side of the pipe for facility of laying and jointing.

Excavated material, shall be stacked sufficiently away from the edge of the trench and the side of the spoil bank shall not be allowed to endanger the stability of the excavation. Spoil may be carted away and used for filling the trench behind the work.

Turf, top soil or other surface materials shall be set aside, turf being carefully rolled and stacked for use in reinstatement.

All excavation shall be properly timbered, where necessary.

Efficient arrangements for dewatering during excavation and keeping it dry till backfilling shall be made to the satisfaction of the Engineer, Sumps for dewatering shall be located away from the pipe layout.

Where the excavation proceeds through roads necessary permissions shall be secured by the Contractors from the appropriate authorities.

Special care shall be taken not to damage underground services, cables etc. These when exposed shall be kept adequately supported till the trench is backfilled.

The backfilling shall be done only after the pipeline has been tested and approved by the Engineer. Special care shall be taken under and sides of the pipe during hand packing with selected material. At least 300 mm over the pipe shall also be filled with soft earth or sand. Consolidation shall be done in 150 mm layers. The surface water shall be prevented from getting into the filled up trench. Traffic shall not be inconvenienced by heaping up unduly the backfilling material to compensate future settlement. All future settlements shall be made good regularly to minimize inconvenience of traffic where applicable.

### 2.5.0 Fixtures

The Tenderer shall mention in his type and make of the fixtures he intends to enclose manufacturer's current catalogues. In the absence of any such agreement, the Engineer shall be at liberty to choose any type and make.

All fixtures and fitting shall be of approved quality and type manufactured by well known manufacturers. All items brought to the site must bear





## STANDARD TECHNICAL SPECIFICATION FOR DRAINAGE AND SANITATION

PEDC/STD.SPEC/  
23- REV 00

Page 9 of 16

HYDERABAD

identification marks of the type of the manufacturer. Procurements shall be made well in advance and inspected and approved, immediately by the Engineer. All fixtures shall be adequately protected, coved and plugged till handed over.

All fittings , gratings, fasteners, unless specified otherwise, shall be chromium plated. The connecting lead pipes and bonds shall weigh at least 3 kg per 25 mm dia. Per meter length. Where PVC or similar pipes are allowed the Contractor shall produce the test reports and convince the Engineer about their durability.

Unless specified in the contract the fixtures shall be as specified herein after.

### 2.5.1 Water closet

#### a) Raised type

It shall include glazed vitreous china basin with siphon, open front solid plastic seat and plastic cover, low level glazed stoneware flushing cistern with valve less fittings, supply connections and necessary fittings. All fittings shall be chromium plated. Colour of basin , cistern, seal and cover shall be as desired by the Engineer.

#### b) Squatting type

It shall include glazed vitreous china pan with integrated foot rests and high level cast iron flushing cistern with valve less fittings, supply connections and necessary fittings. All fittings shall be chromium plated. The foot rests shall be made of white glazed vitreous china with grooved surface. The flushing cistern shall be painted as desired by the Engineer.

### 2.5.2 Urinals

It shall consist of wall type glazed vitreous china urinals, cast iron automatic flushing cistern complete with supply connections, flush pipe PVC pipes, gratings, traps and all other necessary fittings. Automatic flushing shall be approximately once every five minutes for a number of urinals located together may be served by cistern of adequate capacity. All fittings shall be chrome plated.

### 2.5.3 Wash basin.

It shall be made of glazed vitreous china. The basin shall be flat back, wall hung by painted cast iron brackets and complete with pillar Cocks. PVC waste pipes with traps, perforated waste complete with necessary fittings. All fittings, including faucets shall be chromium plated. Hot and cold mixer waste



HYDERABAD

## STANDARD TECHNICAL SPECIFICATION FOR DRAINAGE AND SANITATION

PEDC/STD.SPEC/  
23- REV 00

Page 10 of 16

chin and waste washers shall be provided where specified in the Schedule of items.

### 2.5.4 Sink

It shall be made of glazed stoneware. It shall be wall hand by painted cast iron brackets and complete with one brass faucet with nylon washers, chin, waste washers, PVT waste pipes with traps, perforated waste with necessary fittings. All fittings including facets shall be chromium plated.

### 2.5.5 Bathroom mirror

It shall be made of the best quality 6 mm thick beveled glass and produced by a reputed mirror manufacturer. It shall be wall mounted with adjustable revolving brackets. The brackets, screws and other fitting shall be chromium plated, fixed type square edged installed mirrors shall be provided where indicated and flush with the wall face.

### 2.5.6 Glass shelves

Glass shelves shall consist of 6 mm thick clear glass with guard rails and shall be wall mounted with brackets. All brackets, guard and screws shall be chromium plated.

### 2.5.7 Towel rail

Towel rail shall be 20 mm dia . chromium plated MS pipes wall mounted with steel brackets. The brackets, screws etc, shall also be chromium plated.

### 2.5.8 Soap holder

It shall be made of chromium plated strong members. The holders shall be Wall mounted with chromium plated screws.

### 2.5.9 liquid soap dispenser

It shall be round and easily revolving with removable threaded nozzle. The body, bracket for wall mounting and screw shall be chromium plated.

### 2.5.10 Toilet roll holder

It shall be made of glazed vitreous china with suitable cover cum cutter Wall mounting screws shall be chromium plated.

### 2.5.11 Installation

All plumbing fitting and fixtures shall be installation in most workman like manner by skilled workers. These shall be perfect in level, plump , plane, location and symmetry. All items shall be securely anchored to walls and floors. All cuttings in walls and floors shall be made good by the Contractor.



HYDERABAD

## STANDARD TECHNICAL SPECIFICATION FOR DRAINAGE AND SANITATION

PEDC/STD.SPEC/  
23- REV 00

Page 11 of 16

### 2.6.0 Septic tank & effluent disposal

#### 2.6.1 Septic tank

Septic tank shall consist of the tank itself with inlet and outlets there from complete with all necessary earthworks and back fitting. The details of septic tank shall be as shown on drawings. This items shall also including ventilating pipe of at least 100 mm dia whose top shall be provided with a suitable mosquito proof wire mesh and cowl. Ventilating pipe shall extend to a height of about 2 meter when the septic tank is at least 15 meter away from the nearest building and to a height of 2 meter above the top building when it is located closer then 15 meter. Ventilating pipes can be connected to the normal soil ventilating system of the building where allowed.

#### 2.6.2 Effluent Disposal

The effluent from the septic tank shall be disposed by allowing it into an open channel or a body of water if the concerned authority approves or in to a soak pit for absorption by soil or shall be allowed to be absorbed by soil through open pointed SW pipes laid in a trench filled with broken bricks.

#### 2.6.3 Soap pit

The soak pit shall be complete as shown on drawings. The pit shall be lined with stone, brick or concrete blocks set in cement mortar (1:6 ) and filled with brick bats. Inlet pipe shall be taken down to a depth of 900 mm from the top as an anti – mosquito measure.

#### 2.6.4 Open joined SW pipe/Dispersion Trenches

Minimum dia. Of the SW pipes shall be 150 mm nominal. The trench for laying the pipes shall be minimum 600 x 600 mm pipes. The joint of the pipes shall be left unsealed. The entire length of the pipe within the trench shall be buried in a 250 mm layer gravel or crushed stone of uniform size. On top of gravel/crushed stone layer is a 150 mm bed of well graded coarse aggregate. Ordinary soil is used for filling the top of trench.

#### 2.6.5 Commissioning Septic tank

After the septic tank has been proved water tight and the seawater system is checked the tank shall be filled with water to its outlet level before the sewage is let into the tank. . It shall be seeded with well-digested sludge obtained from septic tank or sludge digestion tank. In the absence of digested sludge a small quantity of decaying organic matter such as digested cow- dung may be introduced.

### 3.0.0 TESTING AND ACCEPTANCE



HYDERABAD

## STANDARD TECHNICAL SPECIFICATION FOR DRAINAGE AND SANITATION

PEDC/STD.SPEC/  
23- REV 00

Page 12 of 16

### 3.1.0 Inspection before Installtion

All pipes, fittings and fixtures shall be inspected, before delivery at to see

Whether they conform to accepted standards. The pipes shall again  
Inspected on site before laying by sounding to disclose cracks. All defective  
Items shall be clearly marked and forthwith removed from the site.

### 3.2.0 Testing of Pipelines

Comprehensive tests of all pipe lines shall be made by simulating conditions of  
use. The method of actual testes shall be decided by the Engineer. All test data  
shall be recorded and submitted to the Engineer for review and instruction. The  
Engineer's description regarding tolerance shall be final.

General guidance are given below.

#### a) Smoke test

All soil pipes, waste pipes and vent pipes and all other pipes when above  
ground shall be approved gas tight any a smoke test conducted under a  
pressure of 25 mm of water and minted for 15 minutes after all trap seals  
have been filled with water. The smoke is produced by burning oily waste  
or tar paper or similar material in the combustion chamber of a smoke  
machine. Chemical smokes are not satisfactory.

#### b) Water test

For pipes other then Cast Iron Glazed ware and concrete pipes shall be  
subjected to a test pressure of at least 1.5 m head of water at the highest  
point of the section under tests. The tolerance figure of two liters per  
centimeter of diameter per kilometer may be allowed during a period of 10  
(ten) minutes. The test shall be carried out by suitably plugging the low  
end of the drain and the ends of connections, if any , and filling the system  
with water. A knuckle bond shall be temporarily jointed in at the top end  
and a sufficient length of the vertical pipe jointed to it so as to provided  
required test head or the top end may be plugged with a connection to a  
hose ending in a funnel which could be raised or lowered till the required  
head is obtained and fixed suitably for observation.

Subsidence of test water may due to one or more of the following cases:

- a) Absorption by pipes and joints
- b) Sweating of pipes of joints
- c) Leakage at joints or from defective pipes
- d) Trapped air.



HYDERABAD

## STANDARD TECHNICAL SPECIFICATION FOR DRAINAGE AND SANITATION

PEDC/STD.SPEC/  
23- REV 00

Page 13 of 16

Allowance shall be made for (a) by adding water until absorption has ceased and after which the test proper should commence. Any leakage and the defective part of the work shall be cut out and made good.

### **For cast iron pipes**

Cast iron sewers and drains shall be tested as for glazed water and concrete pipes. The drain plug shall be suitably strutted to prevent their being forced out of the pipe during the test.

### **c) For straightness**

- i) By inserting at the high end of the sewer or drain a smooth ball of a diameter 13 mm less than pipe bore. In the absence of obstruction. Such as yarn or mortar projecting through the joint, the ball will roll down the invert of the pipe and emerge at the lower end and
- ii) By means of a mirror at one end of the line and lamp at the other. If the pipe line is straight, the full circle of light may be observed. The mirror will also indicate obstruction in the barrel if the pipeline is not straight.

### **3.3.0 Tasting septic tank**

The septic tank shall be tested for water tightness. It shall be filled up with water and allowed to soak for 24 hours. Then, it shall be topped up and allowed to stand again for 24 hours and loss of level recorded. The fall shall not be more than 15 mm.

### **3.4.0 Fixtures etc.**

All fixtures and fitting shall be connected by water tight joints. No dripping shall be accepted.

### **4.0.0 RATES**

Rates shall be unit rates for the complete work as detailed out in the Specification unless any particular portion is specifically excluded in the Schedule of Items.

If any material fittings or fixtures are provided by the Owner free, the Contractor shall have to take delivery, keep in safe custody and be responsible till fitted and handed over.

### **5.0.0 MEASUREMENT**

For method of measurement regarding work under scope of this Specification IS: 1200 ( part-XVI ) shall be followed unless contrary to the following:



## STANDARD TECHNICAL SPECIFICATION FOR DRAINAGE AND SANITATION

PEDC/STD.SPEC/  
23- REV 00

Page 14 of 16

HYDERABAD

### 5.1.0 Trenches

Unless particular items are including in the Schedule, no separate measurement shall be made for lead, lifted dewatering, dressing, storing, backfilling consolidation etc., that may be required in this connection.

### 5.2.0 Concrete, masonry

Unless lumped with other items in the Schedule the measurement shall be on gross area or volume basis as mentioned under relevant items.

### 5.3.0 Pipe Work

No separate measurement shall be made for special supports and fixtures, cutting chases, holes and rectification unless specially indicated in the Schedule of items. If the specials and separately indicated in the schedule, the measurement for these shall be over and above the measurement, of the pipe work as mentioned below:

The pipes of different nominal bores shall be measured separately. The pipe work shall be measured in length inclusive of sockets specials, fittings etc., in position.

### 5.4.0 Fittings and fixtures

Measurement for fittings and fixtures where applicable shall be in number for the complete item inclusive of anchors, brackets and fasteners required. However, in special cases anchors, brackets and similar items may be measured separately if included as such in the Schedule of items.

### 5.5.0 Chases and holes

No measurement shall be made for cutting chases, holes etc., and making good for any work within the scope of this specification and shall be inclusive.

### 5.6.0 Painting

All items likely to rust shall be painted with one coat of primer which shall not be measured separately. Where finishing coat of paints are supplied that shall be measured as indicated in the Schedule of items. Usually, painting of pipes shall be measured in length for each different nominal diameter without giving any extra allowance for specials sockets, etc.

### 5.7.0 Septic tank, Soak pit

Usually it shall be measured in number for the complete septic tank or soak pit as per drawings. All earthwork, backfilling masonry, concrete, manhole, pipes



HYDERABAD

## STANDARD TECHNICAL SPECIFICATION FOR DRAINAGE AND SANITATION

PEDC/STD.SPEC/  
23- REV 00

Page 15 of 16

and fittings including. In case, it is intended to pay for individual items the same shall be indicated in the Schedule and measured in number, length area or volume as appropriate.

### 6.0.0 CODES AND STANDARDS

#### Some of the important Codes and Standards relevant to this specification

Shall be follow : Latest editions shall always be consulted.

- IS : 1172 - Code of basic requirements for water supply drainage and Sanitation.
- IS : 1200 - Laying of water and sewer lines including appurtenant (Pt: XVI)
- IS : 1239 - Mild steel Tubes and Mild steel Tubular and other wrought (Part I & II) steel pipe fittings.
- IS : 1536 - Centrifugally cast (Spun) iron pressure pipes for water gas Sewage.
- IS : 1537 - Vertically cast iron pressure pipe for water, gas & sewage
- IS : 3486 - Cast iron spigot & socket drain pipes.
- IS : 1742 - Code of Practice for building drainage.
- IS : 5329 - Code of Practice for sanitary pipe work above ground for Buildings.
- IS : 2470 - Code of Practice for designs and construction of septic Tank for small and large installations.
- IS : 3076 - Low density polyethylene pipes for potable water supplies
- IS : 4984 - High density polyethylene pipes for potable water supplies.
- IS : 1537 - Vertically cast iron pressure pipe for water, gas & sewage
- IS : 1538 - Cast Iron fittings for pressure pipes for water, gas & sewage
- IS : 1230 - Cast Iron rain water pipes and fittings
- IS : 3889 - Centrifugally cast (spun ) iron spigot & socket soil waste and ventilating pipes, fittings and accessories



## STANDARD TECHNICAL SPECIFICATION FOR DRAINAGE AND SANITATION

PEDC/STD.SPEC/  
23- REV 00

Page 16 of 16

HYDERABAD

- IS : 1729 - Sand cast iron spigot & socket soil, waste and ventilating pipes and accessories
- IS : 1626 - Asbestos cement building pipes, gutters and fittings ( Spigot & socket types )
- IS : 458 - Concrete pipes ( with and without reinforcement )
- IS : 783 - Code of practice of laying of concrete pipes
- IS : 784 - Prestressed Concrete pipes
- IS : 651 - Salt glazed stoneware pipes & fittings
- IS : 4127 - Code of practice of laying of glazed stoneware pipes.
- IS : 1726 - Cast Iron manhole covers & frames intended for use in drainage works
- IS : 5961 - Cast Iron gratings for drainage purposes
- IS : 5219 - 'P' & 'S' traps  
(Part I)
- IS : 771 - Glassed earth-ware sanitary appliance
- IS : 772 - general requirements of enamelled cast iron sanitary appliances
- IS : 774 - Flushing Cistern for water closets & urinals (Valueless Siphonic type)
- IS : 775 - Cast Iron brackets & supports for wash basins and sinks
- IS : 2548 - Plastic water closed seats & covers
- IS : 2527 - Code of practice for fixing rain water gutters and down-pipes for roof drainage