GOVERNMENT OF MADHYA PRADESH,
URBAN ADMINISTRATION AND DEVELOPMENT DEPARTMENT

INTEGRATED STANDARD SCHEDULE OF RATES
(4 VOLUMES)

VOLUME - 1

WATER SUPPLY, SEWERAGE AND TUBE WELL WORKS

INFORCE FROM

1st JUNE 2011

ISSUED BY

COMMISSIONER
Urban Administration and Development Department
Government of Madhya Pradesh, Bhopal

FOREWORD

The 74th Constitutional Amendment has created a focus on improving and strengthening Urban infrastructure and systems in Urban Local Bodies. With the availability of substantial funds from various sources and with our own increased revenues, shortage of development funds is no longer a major constraint for development. However ensuring the effective utilization of available funds is a major concern.

Procurement processes in the Urban Local Bodies is one such area which requires basic system improvement and transparency. Estimating the cost of works correctly prior to the execution is one of the major challenges. Till now, Urban Administration and Development Department, Government of Madhya Pradesh did not have its own Standard Schedule of Rates which forms a basis for estimating the costs of various Building and Infrastructure works including Water Supply, Drainage, Road, Sewerage and Sanitation and Electrical Works. Presently Urban Local Bodies have to depend on Schedule of Rates of various Works Departments of the State Government such as MP Public Health Engineering Department, Public Works Department, Water Resource Department etc. for civil works and Madhya Pradesh State Electricity Board for electrical works. The infrastructure and maintenance works done by our Urban Local Bodies are town specific as well as need specific and therefore, new items are required to be created which are currently not mentioned in these SoRs. Hence the Department of Urban Administration and Development has decided to develop its own Integrated Standard Schedule of Rates for all Building and Infrastructure and maintenance works keeping in view the current and future requirements of the Urban Local Bodies.

I am extremely happy that the Department, with the assistance of Project Utthan, Madhya Pradesh Urban Services for the Poor (MPUSP), a DFID assisted programme has taken up this task and have completed it.

To complete this task, a 18 member Working Group was formed vide order number यांप्र/7/09/2442 dated 12th October 2009. This Working Group decided about the various items required by Urban Local Bodies to carry out the infrastructure development and construction works smoothly, and to be included in the ISSR.

The ISSR is prepared in four parts i.e. Volume - 1 Water Supply, Sewerage & Tube well works, Volume - 2 Building works, Volume - 3 Road & Bridge works, Volume - 4 Electrical works. Specifications for various works have also been illustrated in three separate volumes.

An Output Review Panel was also constituted vide order number MPUSP/Engg./SSRs/10/439, Bhopal Dated 23-7-2010. The Output Review Panel reviewed the process outputs and finalized various reports including Rate Analysis for various items under Integrated Standard Schedule of Rates.

All the volumes of the ISSR along with the applications are also available on the Website of UADD (mpurban.gov.in). Arrangements have been made for annual updation of the ISSR. This will help the Urban Local Bodies in preparing cost estimates close to the prevailing market values and hence, avoid high tender rates.

I extend my sincere thanks to the Project Director, Project Utthan, MPUSP, UADD, Bhopal and to all the members of Working Group and the Output Review Panel for taking keen interest in completing the voluminous job of preparation & completion of ISSR well in time.

I am sure that this Integrated Standard Schedule of Rates will be quite useful for all the construction, development and maintenance works of Urban Local Bodies of Madhya Pradesh.

(S.N. Mishra)
Commissioner
Urban Administration and Development
Government of Madhya Pradesh
Bhopal

MEMBERS OF WORKING GROUP

1.	Shri K. K. Shrivastava, Chief Engineer, Directorate of Urban Administration and Development, Bhopal	Chairman
2.	Shri C. S. Sankule, Chief Engineer, Project Uday, Department of Urban Administration and Development, Bhopal	Member
3.	Shri Ashok Khare, Superintending Engineer, Directorate of Urban Administration and Development, Bhopal	Member
4.	Shri R.N. Songara, Superintending Engineer, Directorate of Urban Administration and Development, Bhopal	Member
5.	Shri S.K. Sogani, Superintending Engineer, Deputy Director office, UADD, Jabalpur	Member
6.	Shri J.M. Dagaonkar Superintending Engineer, Municipal Corporation, Ujjain	Member
7.	Shri H.K. Jain Superintending Engineer, Municipal Corporation, Indore	Member
8.	Shri S.K. Devgan Deputy City Engineer, Municipal Corporation, Bhopal	Member
9.	Shri K.K. Shrivastava Executive Engineer, Municipal Corporation, Gwalior	Member
10.	Shri B.K. Sonwani, Executive Engineer, Deputy Director office, UADD, Sagar	Member
11.	Shri A.G. Khan, Executive Engineer, Deputy Director office, UADD, Bhopal	Member
12.	Shri Avinash Dubey Incharge Executive Engineer., Deputy Director office, UADD, Rewa	Member
13.	Shri Pradeep Nigam Incharge Executive Engineer, Deputy Director office, UAD, Indore	Member
14.	Shri Anand Singh, Assistant Engineer, Directorate of UAD	Member
15.	Shri Rakesh Rawat, Assistant Engineer, Municipal Council, Hoshangabad	Member
16.	Shri P.P. Kaithwas, Assistant Engineer, Municipal Council, Neemuch	Member
17.	Shri J.P. Gupta Former Deputy Director (Engineering) MSU, MPUSP, UADD, Bhopal	Member Secretary
18.	Shri S.K. Goyal Engineering Consultant MPUSP Technical Consultancy Team, Bhopal	Member

MEMBERS OF OUTPUT REVIEW PANEL

1.	Shri Ashok Khare, Chief Engineer (In Charge), Directorate of Urban Administration and Development, Bhopal	Chairman
2.	Shri M.J.S Tulsi, Deputy Director (Engineering), Project Utthan, Municipal Support Unit, MPUSP, Department of Urban Administration and Development, Bhopal	Convener
3.	Shri Kamlesh Bhatnagar, Assistant Engineer, Project Utthan, Municipal Support Unit, MPUSP, Department of Urban Administration and Development, Bhopal	Special Invitee
4.	Shri Shyam Mehndi Ratta, Engineering Consultant, MPUSP Technical Consultancy Team, Bhopal	Member
5.	Shri Sunil Koul, Engineering Consultant, MPUSP Technical Consultancy Team, Bhopal	Member
6.	Shri Harsh Vardhan Sharma, Engineering Consultant, MPUSP Technical Consultancy Team, Bhopal	Member
7.	Shri Sanjay Saxena, E-Governance Consultant, MPUSP Technical Consultancy Team, Bhopal	Member
8.	Shri Ashwin Lamba, E-Governance Consultant, MPUSP Technical Consultancy Team, Bhopal	Member

ITEMS OF UNIFIED SSR FOR WATER SUPPLY , SEWERAGE, DRAINAGE & TUBE WELL

INDEX

GENERAL NOTES

1 The SOR of UADD Department consists of 4 Volumes

VOLUME - I	Water Supply, Sewerage and Tube Well Works
VOLUME - II	Building Works
VOLUME - III	Road & Bridge Works
VOLUME - IV	Electrical Works

2 The contents of each Volume are given below

VOLUME - I
WATER SUPPLY, SEWERAGE AND TUBE WELL WORKS

1	Cast Iron Socket & Spigot Pipes and Specials with with lead joints.
2	Cast Iron Tyton Pipes with Tyton Joints.
3	Cast Iron Pipes and Specials with flanged joints.
4	Ductile Iron Pressure Pipes and Special with Tyton joints.
5	Unplasticized PVC Pipes & Fittings for potable water supply.
6	Cast Iron Valves.
7	Galvanised Iron Pipes, Specials and Gun Metal/Brass Metal Fittings.
8	HDPE Pipes and Specials.
9	GRP Pipes and Specials.
10	Asbestos Cement Pressure Pipe and Cast Iron Fittings.
11	Salt Glazed Stoneware Pipes.
12	Unplasticized Non-Pressure Polyvinyl Chloride (PVC-U) Pipes for use in underground sewerage system.
13	Reinforced Cement concrete Pipes.
14	Sewer Appurtenances.
15	Civil Works for Water Supply & Sewerage works.
16	Miscellaneous.
17	Drawings for Water Supply & Sewerage.
18	Drilling of Tube Wells.

VOLUME - II
BUILDING WORKS

1	Carriage of Material
2	Earth work
3	Mortars
4	Concrete work
5	Reinforced Cement Concrete
6	Brick work
7	Stone work
8	Marble work
9	Wood Work & P.V.C. Work
10	Steel work
11	Flooring
12	Roofing

13	Finishing
14	Repair to Building
15	Dismantling & Demolishing
16	Pile work
17	Aluminum work
18	Water proofing
19	Horticulture & Landscaping
20	Form Work
21	Hire Charges of Machine
22	Rain Water Harvesting, Recycle and Reuse of waste water
23	Building Water Supply
24	Building Drainage
25	Sanitary Installation

VOLUME - III
ROAD & BRIDGES WORKS

ROAD	
1	Carriage of Material
2	Site Clearance
3	Earth work, erosion control and Drainage
4	Sub-Bases, Bases (Non-Bituminous) and Shoulders
5	Bases and Surface courses (Bituminous)
6	Cement Concrete Pavements
7	Geosynthetics and Reinforced Earth
8	Traffic Signs, marking & other Road Appurtenances.
9	Supply of Material
10	Maintenance of Roads
11	Horticulture
12	Survey & investigation, Preparation of D.P.R. and other Miscellaneous items
BRIDGE	
13	Foundations
14	Sub-Structure
15	Super-Structure
16	River Training and protection works
17	Repair and Rehabilitation

VOLUME - IV
ELECTRICAL WORKS
PART – 1 – INTERNAL ELECTRIFICATION

1	Wiring in surface /concealed rigid P.V.C. conduit system.
2	Wiring in surface /concealed rigid Steel conduit system.
3	Wiring in surface rigid P.V.C. casing capping system
4	Wiring in existing/conduit/P.V.C. casing capping system
5	Sub Mains in surface/concealed rigid steel conduit system.
6	Rewiring in existing conduit.
7	Control switch gear/Bus bar.
8	MCCB's, Isolators, MCB's, MCB-DB and fixing.
9	Accessories/Panel/Lamp/Telephone wires/Fans/Luminaries.

10	Miscellaneous
11	Earthing
12	Labour rates for wiring.

PART – 2 – EXTERNAL ELECTRIFICATION

13	External Electrification and over head lines
14	Power Cable & laying.
15	Transformers. & Fire Extinguishers.
16	High Mast
17	Pump Set with G.I. Pipe
18	Solar Street Light System
19	Supply of Materials

General Notes

3 Rate for completed items include the cost of following :-

3.1 All material, labour, workmanship, templates, tools, hire and running charges of plants & machinery required to complete the work, unless specified otherwise.

3.2 All lead & lift of materials required for execution of work inclusive of charges like duties, tax, royalty etc.

3.3 Provision for erection, removal of centering form works, scaffolding, benching, ladders and all other applications etc, required for execution of the work, unless otherwise specified.

3.4 Provision for necessary covering to protect the work/structure from inclement weather etc. and damage arising from falling of materials or rains, fire etc shall be the responsibility of the contractor.

3.5 Curing wherever required including arrangement of water and also including its lead or lift whatsoever.

4 The mode of measurements shall be as per provisions contained in the relevant chapters and in specifications/relevant IS codes.

5 All materials shall conform to the relevant prevailing Indian Standard Specifications. All material before use in works shall require approval of the Engineer in charge, who will get them sampled, tested as per relevant IS code at contractor's cost and samples so approved shall be kept in the office of the concerned Engineer-in-charge till finalization of the work.

6 Material obtained from excavation shall be the property of the Local body (Municipal Corporation, Municipal Council & Nagar Panchayat).

7 Hard Rock available from excavation, shall be used for conversion into coarse aggregates or for other construction material and shall be issued to the contractor on the rate as decided by competent authority.

8 Cement :-

8.1 Where contract provides for cement to be arranged by the Contractor himself, only I.S.I. Marked cement as per IS for 33 grade cement, IS 269 for 43 grade cement, IS 8112 for 53 grade cement, IS 12269 for Portland Pozzolana cement, IS 1489 Part - I & II specifications shall be allowed to be used in the work subject to the prescribed tests.

8.2 Make of cement shall be got approved by the Engineer-in-charge. The engineer in charge shall get cement tested as per relevant IS codes, at the cost of the contractor, before use in work.

8.3 Pozzolona cement is now being widely produced all over the country. This may be used in structures as per provisions of IS code.

8.4 When the strength of concrete required upto M-30, then O.P.C. 33 grade conforming to IS 269-1989 or P.P.C. conforming to IS : 1489-1991 may be used.

8.5 When the strength of concrete required is more than M-30, the O.P.C. 43 grade conforming to IS : 8112-1989 shall be used.

8.6 For prestressed concrete works where the strength of concrete required is more than M-30, then O.P.C. 53 grade cement conforming to IS : 12269-1987 shall be used.

8.7 In specific cases requiring higher grade of strength, use of Ordinary Portland Cement (OPC) should be invariably ensured.

8.8 The arrangement for necessary equipment and testing shall have to be made by the contractor himself at site, as decided by the Engineer-in-Charge. All expenses shall be borne by the contractor.

8.9 Any lot of cement brought to site by the contractor, would be permitted to be used in the work only after the satisfactory results of the tests, under the supervision of the Engineer-in- Charge or his authorised representative. The record of the test results shall be maintained in register mentioned in subsequent para.

8.10 A duplicate register as prescribed by the competent authority of technical authority shall be maintained at the site of the work. Extract certified copies of the entries for each month shall be submitted to the Engineer-in-Charge by the Contractor.

8.11 The original register shall also be submitted to the Engineer-in-Charge on completion of the work by the Contractor.

9 Nominal mix would be adopted for cement concrete M-7.5, M-10, M-15 and M-20 Design mix shall have to be adopted for concrete of higher strengths as per IS 456-2000.

10 Steel :-

10.1 Steel used for reinforcement shall conform as per under :-

(a) Mild Steel and medium tensile steel bars shall conform to IS : 432 (Part-I),
(b) Hot rolled deformed bars shall conform to IS : 1139,
(c) Cold twisted bars shall conform to IS : 1786,
(d) Hard drawn steel wire fabric shall conform to IS : 1566 and
(e) Rolled steel made from structural steel shall conform to IS : 226.

10.2 All reinforcement shall be free from loose mill scales, loose rust and coats of paints, oil, mud or other coatings which may destroy or reduce bond.

10.3 Only such steel obtained from main producers of steel i.e. SAIL, IISCO, TISCO or such steel rolling mills as having license from the B.I.S. to manufacture such steel for reinforcements, shall be allowed to be used in the work. The make of the steel shall be approved by engineer-in-charge.

10.4 The Contractor shall have to produce Test Certificate in the proforma prescribed approved by B.I.S. from the manufacturer for every batch of steel brought to the site of work.

10.5 Before commencement of use of steel, from any batch brought to site the of the work by the contractor, the Engineer-in-Charge shall arrange to get samples tested for nominal mass, tensile strength, bend test and rebend test from any Laboratory of his choice at the cost of Contractor. The selection of test specimens and frequency shall be as per relevant I.S. specification of the steel used.

11 If any item of work is found not upto the prescribed standard but the Engineer-in-charge is of the opinion that the same is structurally adequate and can be accepted at a reduced rate, then in such case, the Engineer-in-charge shall submit proposal for the same, supported by an analysis in justification thereof, through proper channel to the chief engineer UADD to obtain his approval expeditiously (ordinarily within 15 days). The approved analysis along with orders of the chief engineer should be appended to the final bill of the contractor.

12 In case of any contradiction in the provisions of the specifications and this schedule of rates, the decision of Chief Engineer, UADD will be of precedence.

13 (a) Rates of items would apply for work order/piece work system also.
(b) Rates payable for any work to be done departmentally then rates should be reduced by 10.434% (contractor profit percentage 10% + T&P charge 2%) i.c. 100x12/115 = 10.434%.

14 Interpretations :- The Chief Engineer, UADD, Bhopal shall be the sole deciding Authority as to the meaning, interpretation and implications of various provisions in this schedule of rates. His decision shall be final and binding on all concerned.

15 Safety :- The contractor shall be fully and solely responsible for making all the safety arrangements pertaining to the work. The contractor shall be fully responsible and liable in all respects for any accidents and subsequent legal action initiated by any party including the department.

16 Latest IS codes with up to date amendments shall be applicable.

17 Labour rate as per labour Commissioner Madhya Pradesh Order No. 29105-354 Dt. 30.9.2010.

18 All commiditey Price Index

SPECIAL NOTES FOR
WATER SUPPLY, SEWERAGE AND TUBE WELL WORKS

1 The materials such as pipes specials, valves etc either supply by local body or by the contractor shall conform to the specification mentioned in the schedule of rates and should in variably conform to the relevant I.S. Standards, B.S. standards/ material of best quality available in the market shall only to be used.

2 The work shall be executed in accordance with the U.A.D.D. specifications. In all cases, the latest revision of the Indian standards/codes for pipes, specials, valves etc. shall also be referred to. Latest C.P.H.E.E.O. manual, published by the Ministry of Urban Development, Govt. of India shall also be applicable. Incase of any discrepancy, the decision of C.E., U.A.D.D. shall be final.

3 Complete: The provision of all such materials and labour and the performance of all such workmanship which may be necessary for the proper execution of the work in best workmanship, manner but not particularly described in the items of schedule of rates.

4 Best: shall mean that in the opinion of the Engineer-in-Charge, there is no superior material or article or class of workmanship available in the market.

5 No alternative materials other than specified will generally be allowed to be used in the works except when their use becomes absolutely necessary in the interest of work on such grounds as non-availability in the market due to reasons beyond control.

6 As per prevailing excise duty norms there is excise duty exemption on certain diameter of Water Supply Pipes of different material class. All though in the computation of item rates for pipes, the rates are inclusive of excise duty but excise duty exemption shall be obtained as per prevailing rules for such pipes. This benefit shall be availed by the local bodies. All the concerned officers shall be responsible to get all the exemptions of such taxes and duties.

7 The labour only provided in the Schedule of Rates includes the cost of all labour including necessary handling of the materials at site of work and all workmanship. The labour rates adopted for preparation of S.O.R. are inclusive of provision for weekly holiday.

8 The rates for completed items in the schedule of rates include the following.

1	2% for T&P
2	3% for over head charges
3	10% for contractor's profit

9 In exceptional cases if any work is found to be sub-standard, but the Engineer-in-charge is of the opinion that the same can be accepted at a reduced rate, then the Engineer-in-charge shall submit proposals for the same, supported by an analysis and justification of such reduction, to the next higher authority to obtain his/her approval expeditiously (ordinarily within 15 days). The approved analysis along with orders of the competent authority of Technical sanction should be appended to the final bill of the contractor.

10 For Departmental Works rates should be reduced by 10.434% (Contractor profit percentage 10% + T & P charge 2% i.e. 100x12/115 = 10.434%)

11 (a) Rates for transportation in Chapter No. 16 (Miscellaneous) Item No. 16.15 "Carriage of Material" includes :-
(i) Loading and unloading
(ii) Stacking at suitable places as directed by the Engineer-in-charge, the weights of the container of any material shall be ignored.

12 Testing :-

12.1 The testing of the pipe line work shall be as per the provisions of the relevant IS codes.

12.2 The contractor, on completion, or whenever required by the Engineer-in-Charge, shall prove all materials and pipes, fittings, joints and other accessories etc. to be clear, clean, perfect in working conditions and strong enough to withstand the test so specified in different items of the specifications/applicable IS codes.

12.3 For this purpose the contractor at his own expense, shall provide all instruments & suitable appliances and carry out the necessary test before the Engineer-in-Charge or his authorised representative to his entire satisfaction.

12.4 The contractor shall rectify any defects as to the materials or workmanship, so noticed during the test and the defective portions re-tested at this expense.

12.5 Till such time the test is completed 10% of the bill amount shall be withheld from the contractor's running bill and same will be released only after testing, up to the entire satisfaction of the Engineer-in-Charge.

13 If Govt./local body water source like water supply distribution pipe line, tube well, well etc. is used for construction activity by the contractor then water charges shall be deducted at the rate of 1% of the amount paid to the contractor from the item involving the use of water.

CHAPTER 1
CAST IRON SOCKET AND SPIGOT PIPES AND SPECIALS WITH LEAD JOINTS

1 C.I. Pipes shall confirm to IS: 1536 -1989 duly inspected and tested and having BIS certification mark.

2 Specials shall confirm to IS: 1538 - 1993 duly inspected and tested and having BIS certification mark.

3 jointing material lead shall confirm to IS:782 - 1978 duly inspected and tested and having BIS certification mark.

4 Code of practice for laying of cast iron pipes shall be as per IS:3114 - 1994

Methods for sampling of Cast Iron Pipes & fittings shall be as per IS : 11606

5 Each pipe shall have the following mark either cast, stamped or indelivery painted on it, Marking may be done on the socket faces of pipe centrifugally cast in metal mould or on the outside of the socket or on the barrel of pipe centrifugally cast in sand mould

a) Manufacturer's name, initials or identification mark;
b) The nominal diameter;
c) Class reference;
d) Mass of Pipe
e) The last two digits of the year of manufacture.

6 The pipes and fittings shall be inspected for defects and be rung with a light hammer, preferably while suspended, to detect cracks. Smearing the outside with chalk dust helps the location of cracks. If doubt persists further confirmation may be obtained by purring a kerosene which seeps through and shows on the outer surface.

7 Tolerance for thickness and length of pipe shall be acceptable as given below :

Tolerance on Thickness

	Dimensions	Tolerance in mm	
a)	Wall thickness	- (1+0.05 e)	
Where e = is the thickness of the wall in millimeters			

Tolerance on Length

	Type of Casting	Tolerance in mm	
a)	Socket and spigot, and plain ended pipes	± 100	
Where e = is the thickness of the wall in millimeters			

8 Tolerance in length and thickness of specials shall be as given below :

Tolerances on thickness

The tolerances on the wall thickness and flange thickness of fittings are limited as follows

Dimension	Tolerance, mm	
Wall thickness	- (2 + 0.05 e)	
Where e = the standard thickness of the wall in millimeters		

Tolerances on Lengths

The tolerances on lengths of fittings, normally manufactured, shall be as follows :

Type of fittings	Nominal Dia	Tolerance (mm)
Socket fittings and spigot pieces	Up to and including 450 mm	± 20
	All diameters	± 10

9 Laying :

Laying of pipes and fittings/specials includes all precautions to guard against possible damaged to the existing structure/pipes lines, cables etc., taking precautions to prevent dirt from entering the pipe ends, lowering and laying pipes and specials in the trenches with specials arrangement such as cranes, tripods with chain pulley block, use of slings of canvas etc. to fit the ends of pipes and fittings/ specials to lift and lower the same. Inspection of pipes and fittings for defects by striking with a light hammer while suspended. Laying of pipes perfectly true in alignment and to gradient etc.

10 As per prevailing excise duty norms there is excise duty exemption on certain diameter of Water Supply Pipes of different material class. All though in the computation of item rates for pipes, the rates are inclusive of excise duty but excise duty exemption shall be obtained as per prevailing rules for such pipes. This benefit shall be availed by the local bodies. All the concerned officers shall be responsible to get all the exemptions of such taxes and duties.

11 **Measurement:**

The net length of pipes as laid or fixed should be measured in running meters correct to a cm. Specials should be excluded and enumerated and paid for separately. The portion of the pipe within the collar at the joints shall not be included in the length of pipe work.

12 **Rates**

a) The rates include charges for all tools & plants, chain pulley blocks, other appliances etc. required for lifting and laying the pipes and specials in positions as per approved drawing.

b) The rates include provision and use of all coverings etc. to protect the works from inclement weather etc. and from damages from fall of materials, and other causes.

(For Detail Refer to Specifications prepared by the Urban Administration and Development Department, IS Codes & CPHEEO Manual)

CHAPTER 1- CAST IRON SOCKET AND SPIGOT PIPES AND SPECIALS WITH LEAD JOINTS

S.No.	Particulars of Items	Unit	Rates (in Rs.)		
1.1	Providing, laying and jointing of socket and spigot cast iron (Spun) Pipes including testing of joints, cost of pipes and jointing materials etc. complete. [socket & spigot cast iron (spun) pipes shall conform to IS 1536 : 1989 and laying work shall conform to IS 3114 : 1994, Pig lead shall conform to IS 782:1978]		LA Class	A Class	B Class
	80mm diameter	RM	946.00	1023.00	1093.00
	100mm diameter	RM	1148.00	1256.00	1335.00
	125mm diameter	RM	1446.00	1571.00	1686.00
	150mm diameter	RM	1747.00	1904.00	2043.00
	200mm diameter	RM	2549.00	2752.00	2963.00
	250mm diameter	RM	3419.00	3705.00	3956.00
	300mm diameter	RM	4393.00	4780.00	5158.00
	350mm diameter	RM	5513.00	5956.00	6435.00
	400mm diameter	RM	6701.00	7292.00	7846.00
	450mm diameter	RM	8150.00	8910.00	9578.00
	500mm diameter	RM	9607.00	10422.00	11239.00
	600mm diameter	RM	12844.00	13965.00	15075.00
	700mm diameter	RM	16500.00	17960.00	19344.00
	750mm diameter	RM	18480.00	20128.00	21766.00
	800mm diameter	RM	20739.00	22509.00	24270.00
	900mm diameter	RM	25201.00	27395.00	29589.00
	1000mm diameter	RM	30238.00	32911.00	35463.00
1.2	Labour for laying in position socket & spigot cast iron (Spun) pipes. [Laying work shall conform to IS 3114 : 1994]				
			LA Class	A' Class	B' Class
	80mm diameter	RM	10.00	11.00	11.00
	100mm diameter	RM	12.00	13.00	14.00
	125mm diameter	RM	16.00	17.00	18.00
	150 mm diameter	RM	19.00	21.00	23.00
	200mm diameter	RM	28.00	31.00	33.00
	250mm diameter	RM	39.00	42.00	45.00
	300mm diameter	RM	50.00	55.00	59.00
	350mm diameter	RM	64.00	69.00	74.00
	400mm diameter	RM	77.00	84.00	90.00
	450mm diameter	RM	94.00	103.00	110.00
	500mm diameter	RM	109.00	118.00	127.00
	600mm diameter	RM	150.00	162.00	174.00
	700mm diameter	RM	189.00	205.00	220.00
	750mm diameter	RM	210.00	228.00	245.00
	800mm diameter	RM	233.00	252.00	272.00
	900mm diameter	RM	288.00	312.00	336.00
	1000mm diameter	RM	349.00	378.00	406.00

S.No.	Particulars of Items	Unit	Rates (in Rs.)	
1.3	Jointing of socket & spigot cast iron (spun) pipes and specials class 'LA' 'A' and 'B' including labour & cost of jointing materials (i.e. pig lead and spun yarn) etc. and testing of the joints complete. [Caulking lead shall conform to IS 782 : 1978]			
	80mm diameter	Each	252.00	
	100mm diameter	Each	298.00	
	125mm diameter	Each	376.00	
	150mm diameter	Each	455.00	
	200mm diameter	Each	649.00	
	250mm diameter	Each	796.00	
	300mm diameter	Each	946.00	
	350mm diameter	Each	1072.00	
	400mm diameter	Each	1258.00	
	450mm diameter	Each	1719.00	
	500mm diameter	Each	1838.00	
	600mm diameter	Each	2358.00	
	700mm diameter	Each	2691.00	
	750mm diameter	Each	3024.00	
	800mm diameter	Each	3657.00	
	900mm diameter	Each	4128.00	
	1000mm diameter	Each	4761.00	
1.4	Labour for jointing of socket & spigot cast iron (spun) pipes and specials class 'LA' 'A' and 'B' including testing of joints but excluding cost of jointing materials (i.e. pig lead and spun yarn). [conforming to IS 3114 : 1994,]			
	80mm diameter	Each	81.00	
	100mm diameter	Each	85.00	
	125mm diameter	Each	126.00	
	150mm diameter	Each	129.00	
	200mm diameter	Each	171.00	
	250mm diameter	Each	212.00	
	300mm diameter	Each	253.00	
	350mm diameter	Each	265.00	
	400mm diameter	Each	342.00	
	450mm diameter	Each	383.00	
	500mm diameter	Each	406.00	
	600mm diameter	Each	548.00	
	700mm diameter	Each	585.00	
	750mm diameter	Each	637.00	
	800mm diameter	Each	697.00	
	900mm diameter	Each	796.00	
	1000mm diameter	Each	865.00	
1.5	Providing and laying in position double socket cast iron 90° bend. [conforming to IS 1538 - 1993 , IS 3114 : 1994		Medium Class	Heavy Class
	80mm diameter	Each	NA	1062.00

S.No.	Particulars of Items	Unit		Rates (in Rs.)
	100mm diameter	Each	1357.00	1416.00
	125mm diameter	Each	1829.00	1947.00
	150mm diameter	Each	2419.00	2537.00
	200mm diameter	Each	3717.00	3953.00
	250mm diameter	Each	5369.00	5782.00
	300mm diameter	Each	7375.00	7965.00
	350mm diameter	Each	10687.00	11583.00
	400mm diameter	Each	13759.00	14975.00
	450mm diameter	Each	16959.00	18559.00
	500mm diameter	Each	21631.00	23678.00
	600mm diameter	Each	31742.00	34942.00
	700mm diameter	Each	44605.00	49277.00
	750mm diameter	Each	51965.00	57532.00
	800mm diameter	Each	62583.00	69411.00
	900mm diameter	Each	82670.00	92084.00
	1000mm diameter	Each	105874.00	118006.00
1.6	Providing and laying in position 45° bend double socket cast iron. [conforming to IS 1538 -1993 , IS 3114 : 1994]		Medium Class	Heavy Class
	80mm diameter	Each	NA	1062.00
	100mm diameter	Each	1357.00	1416.00
	125mm diameter	Each	1770.00	1888.00
	150mm diameter	Each	2301.00	2419.00
	200mm diameter	Each	3422.00	3658.00
	250mm diameter	Each	4897.00	5251.00
	300mm diameter	Each	6667.00	7139.00
	350mm diameter	Each	9471.00	10175.00
	400mm diameter	Each	12031.00	12927.00
	450mm diameter	Each	14655.00	15871.00
	500mm diameter	Each	18367.00	19839.00
	600mm diameter	Each	26366.00	28670.00
	700mm diameter	Each	36350.00	39613.00
	750mm diameter	Each	41917.00	45821.00
	800mm diameter	Each	50119.00	54826.00
	900mm diameter	Each	64970.00	71400.00
	1000mm diameter	Each	82405.00	90692.00
1.7	Providing and laying in position double socket cast iron 22½° bend. [conforming to IS 1538 - 1993 , IS 3114 : 1994]		Medium Class	Heavy Class
	80mm diameter	Each	NA	944.00
	100mm diameter	Each	1180.00	1239.00
	125mm diameter	Each	1534.00	1593.00
	150mm diameter	Each	2006.00	2065.00
	200mm diameter	Each	3009.00	3127.00
	250mm diameter	Each	4248.00	4425.00
	300mm diameter	Each	5605.00	5900.00
	350mm diameter	Each	7871.00	8319.00
	400mm diameter	Each	9919.00	10495.00
	450mm diameter	Each	11903.00	12607.00
	500mm diameter	Each	14847.00	15743.00
	600mm diameter	Each	21055.00	22463.00
	700mm diameter	Each	28542.00	30590.00

S.No.	Particulars of Items	Unit		Rates (in Rs.)
	750mm diameter	Each	33086.00	35262.00
	800mm diameter	Each	38982.00	41899.00
	900mm diameter	Each	49987.00	53898.00
	1000mm diameter	Each	62848.00	67887.00
1.8	Providing and laying in position double socket cast iron 11¼° bend. [conforming to IS 1538 - 1993 , IS 3114 : 1994]			
			Medium Class	Heavy Class
	80mm diameter	Each	826.00	885.00
	100mm diameter	Each	1062.00	1121.00
	125mm diameter	Each	1416.00	1475.00
	150mm diameter	Each	1829.00	1888.00
	200mm diameter	Each	2714.00	2832.00
	250mm diameter	Each	3835.00	3953.00
	300mm diameter	Each	5074.00	5251.00
	350mm diameter	Each	7040.00	7360.00
	400mm diameter	Each	8831.00	9215.00
	450mm diameter	Each	10495.00	11007.00
	500mm diameter	Each	13119.00	13759.00
	600mm diameter	Each	18367.00	19327.00
	700mm diameter	Each	24702.00	26110.00
	750mm diameter	Each	28350.00	30014.00
	800mm diameter	Each	33214.00	35402.00
	900mm diameter	Each	42495.00	45214.00
	1000mm diameter	Each	53036.00	56484.00
1.9	Providing and laying in position all socket cast iron Tees (all sizes in Millimeters) Body x Branch Dia. [conforming to IS 1538 -1993 , IS 3114 : 1994]			
			Medium Class	Heavy Class
	80x80	Each	1284.00	1343.00
	100x80	Each	1576.00	1635.00
	100x100	Each	1693.00	1752.00
	125x80	Each	1985.00	2102.00
	125x100	Each	2102.00	2219.00
	125x125	Each	2277.00	2394.00
	150x80	Each	2511.00	2627.00
	150x100	Each	2627.00	2744.00
	150x125	Each	2744.00	2919.00
	150x150	Each	2919.00	3094.00
	200x80	Each	3678.00	3912.00
	200x100	Each	3795.00	4029.00
	200x125	Each	3912.00	4145.00
	200x150	Each	4087.00	4321.00
	200x200	Each	4496.00	4729.00
	250x80	Each	5138.00	5488.00
	250x100	Each	5255.00	5605.00
	250x125	Each	5430.00	5780.00
	250x150	Each	5605.00	5955.00

S.No.	Particulars of Items	Unit	Rates (in Rs.)	
	250x200	Each	5955.00	6306.00
	250x250	Each	6364.00	6773.00
	300x80	Each	6948.00	7473.00
	300x100	Each	7006.00	7532.00
	300x125	Each	7181.00	7707.00
	300x150	Each	7298.00	7824.00
	300x200	Each	7765.00	8291.00
	300x250	Each	8174.00	8758.00
	300x300	Each	8699.00	9283.00
	350x200	Each	10815.00	11647.00
	350x250	Each	11327.00	12159.00
	350x300	Each	11903.00	12735.00
	350x350	Each	12479.00	13375.00
	400x200	Each	13567.00	14655.00
	400x250	Each	14079.00	15167.00
	400x300	Each	14591.00	15743.00
	400x350	Each	15231.00	16383.00
	400x400	Each	15999.00	17151.00
	450x250	Each	17535.00	18879.00
	450x300	Each	18111.00	19455.00
	450x350	Each	18751.00	20095.00
	450x400	Each	19391.00	20735.00
	450x450	Each	20159.00	21567.00
	500x250	Each	20927.00	22782.00
	500x300	Each	21503.00	23358.00
	500x350	Each	22143.00	23998.00
	500x400	Each	22782.00	24702.00
	500x450	Each	23550.00	25470.00
	500x500	Each	24446.00	26430.00
	600x300	Each	30462.00	33342.00
	600x350	Each	31102.00	33982.00
	600x400	Each	31870.00	34750.00
	600x450	Each	32638.00	35582.00
	600x500	Each	33470.00	36414.00
	600x600	Each	35454.00	38525.00
	700x350	Each	42749.00	46653.00
	700x400	Each	43517.00	47485.00
	700x450	Each	44349.00	48381.00
	700x500	Each	45181.00	49213.00
	700x600	Each	46909.00	50877.00
	700x700	Each	49149.00	53244.00
	750x400	Each	49981.00	54716.00
	750x450	Each	50877.00	55612.00
	750x500	Each	51773.00	56572.00
	750x600	Each	53500.00	58300.00
	750x700	Each	55484.00	60284.00

S.No.	Particulars of Items	Unit		Rates (in Rs.)
	750x750	Each	56892.00	61756.00
	800x400	Each	59401.00	65102.00
	800x450	Each	60263.00	66030.00
	800x500	Each	61191.00	66958.00
	800x600	Each	63180.00	68947.00
	800x700	Each	65235.00	71069.00
	800x750	Each	66296.00	72196.00
	800x800	Each	67887.00	73853.00
	900x450	Each	77566.00	85389.00
	900x500	Each	78494.00	86317.00
	900x600	Each	80682.00	88637.00
	900x700	Each	82936.00	90891.00
	900x750	Each	83996.00	92018.00
	900x800	Each	85190.00	93145.00
	900x900	Each	88239.00	96327.00
	1000x500	Each	98979.00	109255.00
	1000x600	Each	101101.00	111443.00
	1000x700	Each	103752.00	114227.00
	1000x750	Each	104879.00	115420.00
	1000x800	Each	106139.00	116614.00
	1000x900	Each	108658.00	119133.00
	1000x1000	Each	112238.00	122779.00
1.10	Providing and laying in position all socketed cast iron crosses (all sizes in millimeter). [conforming to IS 1538 - 1993 , IS 3114 : 1994]			
			Medium Class	Heavy Class
	80 mm	Each	1799.00	1861.00
	100 mm	Each	2296.00	2420.00
	125 mm	Each	3102.00	3226.00
	150 mm	Each	3971.00	4157.00
	200 mm	Each	6018.00	6329.00
	250 mm	Each	8500.00	8996.00
	300 mm	Each	11540.00	12223.00
1.11	Providing and laying in position socket & spigot cast iron tapers (Reducer) (all sizes in mm). [conforming to IS 1538 - 1993 , IS 3114 : 1994]			
			Medium Class	Heavy Class
	100x80	Each	876.00	934.00
	125x80	Each	1168.00	1226.00
	125x100	Each	1226.00	1343.00
	150x80	Each	1460.00	1576.00
	150x100	Each	1518.00	1635.00
	150x125	Each	1635.00	1810.00
	200x100	Each	2160.00	2335.00
	200x125	Each	2277.00	2452.00

S.No.	Particulars of Items	Unit	Rates (in Rs.)	
	200x150	Each	2452.00	2627.00
	250x125	Each	3094.00	3270.00
	250x150	Each	3211.00	3445.00
	250x200	Each	3562.00	3853.00
	300x150	Each	4321.00	4671.00
	300x200	Each	4729.00	5138.00
	300x250	Each	5138.00	5663.00
	350x200	Each	6250.00	6770.00
	350x250	Each	6770.00	7356.00
	350x300	Each	7291.00	8007.00
	400x250	Each	8528.00	9309.00
	400x300	Each	9179.00	10025.00
	400x350	Each	9830.00	10806.00
	450x350	Each	11002.00	12043.00
	450x400	Each	11783.00	12955.00
	500x350	Each	12629.00	13736.00
	500x400	Each	13410.00	14647.00
	500x450	Each	14256.00	15624.00
	600x400	Each	17901.00	19530.00
	600x450	Each	18814.00	20571.00
	600x500	Each	19790.00	21678.00
	700x500	Each	23761.00	25909.00
	700x600	Each	25975.00	28448.00
	750x600	Each	29230.00	32029.00
	750x700	Each	31899.00	35088.00
	800x600	Each	30886.00	33752.00
	800x700	Each	33433.00	36745.00
	800x750	Each	34898.00	38400.00
	900x700	Each	39992.00	43686.00
	900x750	Each	41457.00	47252.00
	900x800	Each	42985.00	45405.00
	1000x800	Each	48781.00	53302.00
	1000x900	Each	52092.00	57187.00

1.12	Providing and laying in position Double Socket cast iron tapers (reducer) (all sizes in mm). [conforming to IS 1538 - 1993 , IS 3114 : 1994]		Medium Class	Heavy Class
	100x80	Each	876.00	1051.00

S.No.	Particulars of Items	Unit	Rates (in Rs.)	
	125x80	Each	1168.00	1576.00
	125x100	Each	1226.00	1752.00
	150x80	Each	1460.00	1810.00
	150x100	Each	1518.00	1985.00
	150x125	Each	1635.00	2219.00
	200x100	Each	2160.00	2511.00
	200x125	Each	2277.00	2744.00
	200x150	Each	2452.00	2978.00
	250x125	Each	3094.00	3386.00
	250x150	Each	3211.00	3620.00
	250x200	Each	3562.00	4204.00
	300x150	Each	4321.00	4379.00
	300x200	Each	4729.00	4904.00
	300x250	Each	5138.00	5547.00
	350x200	Each	6250.00	7617.00
	350x250	Each	6770.00	8528.00
	350x300	Each	7291.00	9504.00
	400x250	Each	8528.00	9700.00
	400x300	Each	9179.00	10676.00
	400x350	Each	9830.00	11783.00
	450x350	Each	11002.00	12694.00
	450x400	Each	11783.00	13866.00
	500x350	Each	12629.00	14452.00
	500x400	Each	13410.00	15689.00
	500x450	Each	14257.00	16665.00
	600x400	Each	17902.00	19530.00
	600x450	Each	18814.00	20181.00
	600x500	Each	19790.00	21613.00
	700x500	Each	23761.00	25258.00
	700x600	Each	25975.00	28448.00
	750x600	Each	29230.00	30597.00
	750x700	Each	31899.00	33982.00
	800x600	Each	30358.00	33354.00
	800x700	Each	33620.00	37082.00
	800x750	Each	35617.00	39279.00
	900x700	Each	38014.00	41875.00
	900x750	Each	40144.00	46203.00
	900x800	Each	43540.00	46069.00
	1000x800	Each	46669.00	51395.00
	1000x900	Each	50796.00	56122.00

S.No.	Particulars of Items	Unit	Rates (in Rs.)	
1.13	Providing and laying in position cast iron collars. [conforming to IS 1538 - 1993 , IS 3114 : 1994]			
			Medium Class	Heavy Class
	80mm diameter	Each	759.00	817.00
	100mm diameter	Each	934.00	993.00
	125mm diameter	Each	1226.00	1284.00
	150mm diameter	Each	1576.00	1635.00
	200mm diameter	Each	2219.00	2335.00
	250mm diameter	Each	3036.00	3211.00
	300mm diameter	Each	3970.00	4145.00
	350mm diameter	Each	5536.00	5793.00
	400mm diameter	Each	6630.00	7080.00
	450mm diameter	Each	8175.00	8561.00
	500mm diameter	Each	9719.00	10234.00
	600mm diameter	Each	13195.00	13903.00
	700mm diameter	Each	17315.00	18216.00
	750mm diameter	Each	19568.00	20598.00
	800mm diameter	Each	22607.00	23866.00
	900mm diameter	Each	28109.00	29700.00
	1000mm diameter	Each	34341.00	36264.00
1.14	Providing and laying in position cast iron socket caps. [conforming to IS 1538 - 1993 , IS 3114 : 1994]			
				Heavy Class
	80mm diameter	Each		409.00
	100mm diameter	Each		525.00
	125mm diameter	Each		701.00
	150mm diameter	Each		876.00
	200mm diameter	Each		1401.00
	250mm diameter	Each		1985.00
	300mm diameter	Each		2686.00
	350mm diameter	Each		3904.00
	400mm diameter	Each		4928.00
	450mm diameter	Each		6208.00
	500mm diameter	Each		7551.00
	600mm diameter	Each		10943.00
	700mm diameter	Each		15039.00
	750mm diameter	Each		17407.00
	800mm diameter	Each		20817.00
	900mm diameter	Each		26850.00
	1000mm diameter	Each		34076.00
1.15	Providing and laying in position cast iron plugs. [conforming to IS 1538 - 1993 , IS 3114 : 1994]			
			Medium Class	Heavy Class
	80mm diameter	Each	117.00	175.00
	100mm diameter	Each	175.00	234.00
	125mm diameter	Each	292.00	350.00
	150mm diameter	Each	467.00	525.00
	200mm diameter	Each	759.00	817.00
	250mm diameter	Each	1168.00	1284.00
	300mm diameter	Each	1635.00	1752.00
	350mm diameter	Each	2335.00	2519.00

S.No.	Particulars of Items	Unit	Rates (in Rs.)	
	400mm diameter	Each	3133.00	3318.00
	450mm diameter	Each	3994.00	4239.00
	500mm diameter	Each	4977.00	5284.00
	600mm diameter	Each	7373.00	7803.00
	700mm diameter	Each	10506.00	11059.00
	750mm diameter	Each	12350.00	12964.00
	800mm diameter	Each	15579.00	16309.00
	900mm diameter	Each	20353.00	21281.00
	1000mm diameter	Each	26120.00	27247.00
1.16	Providing and laying in position sizes of socket & spigot or all socketed cast iron specials class MEDIUM or HEAVY which does not appear in above items of schedule. [conforming to IS 1538 - 1993 , IS 3114 : 1994]			
			Medium Class	Heavy Class
	80mm to 300mm dia	Kg	58.00	58.00
	Above 300mm Dia	Kg	62.00	62.00
1.17	Labour for laying in position double socket cast iron 45° bends. [conforming to IS 3114 : 1994]		Medium Class	Heavy Class
	80mm diameter	Each	NA	19.00
	100mm diameter	Each	25.00	26.00
	125mm diameter	Each	32.00	34.00
	150mm diameter	Each	42.00	44.00
	200mm diameter	Each	62.00	66.00
	250mm diameter	Each	88.00	95.00
	300mm diameter	Each	120.00	129.00
	350mm diameter	Each	158.00	169.00
	400mm diameter	Each	200.00	215.00
	450mm diameter	Each	244.00	264.00
	500mm diameter	Each	306.00	330.00
	600mm diameter	Each	439.00	477.00
	700mm diameter	Each	605.00	660.00
	750mm diameter	Each	698.00	763.00
	800mm diameter	Each	806.00	881.00
	900mm diameter	Each	1044.00	1148.00
	1000mm diameter	Each	1325.00	1458.00
1.18	Labour for laying in position double socket cast iron 90^0 bends. [conforming to IS 3114 : 1994]		Medium Class	Heavy Class
	80mm diameter	Each	NA	19.00
	100mm diameter	Each	25.00	26.00
	125mm diameter	Each	33.00	35.00
	150mm diameter	Each	44.00	46.00
	200mm diameter	Each	67.00	71.00
	250mm diameter	Each	97.00	104.00
	300mm diameter	Each	133.00	144.00
	350mm diameter	Each	178.00	193.00
	400mm diameter	Each	229.00	249.00
	450mm diameter	Each	282.00	309.00
	500mm diameter	Each	360.00	394.00
	600mm diameter	Each	529.00	582.00
	700mm diameter	Each	743.00	821.00

S.No.	Particulars of Items	Unit		Rates (in Rs.)
	750mm diameter	Each	865.00	958.00
	800mm diameter	Each	1006.00	1116.00
	900mm diameter	Each	1329.00	1480.00
	1000mm diameter	Each	1702.00	1897.00
1.19	Labour for laying in position double socket cast iron 22½°. bends. [conforming to IS 3114 : 1994]		Medium Class	Heavy Class
	80mm diameter	Each	NA	17.00
	100mm diameter	Each	21.00	22.00
	125mm diameter	Each	28.00	29.00
	150mm diameter	Each	36.00	37.00
	200mm diameter	Each	54.00	56.00
	250mm diameter	Each	77.00	80.00
	300mm diameter	Each	101.00	107.00
	350mm diameter	Each	131.00	139.00
	400mm diameter	Each	165.00	175.00
	450mm diameter	Each	198.00	210.00
	500mm diameter	Each	247.00	262.00
	600mm diameter	Each	351.00	374.00
	700mm diameter	Each	475.00	509.00
	750mm diameter	Each	551.00	587.00
	800mm diameter	Each	627.00	674.00
	900mm diameter	Each	804.00	866.00
	1000mm diameter	Each	1010.00	1091.00
1.20	Labour for laying in position double socket cast iron 11¼ ° bends. [conforming to IS 3114 : 1994]		Medium Class	Heavy Class
	80mm diameter	Each	NA	16.00
	100mm diameter	Each	19.00	20.00
	125mm diameter	Each	26.00	27.00
	150mm diameter	Each	33.00	34.00
	200mm diameter	Each	49.00	51.00
	250mm diameter	Each	69.00	71.00
	300mm diameter	Each	92.00	95.00
	350mm diameter	Each	117.00	123.00
	400mm diameter	Each	147.00	153.00
	450mm diameter	Each	175.00	183.00
	500mm diameter	Each	218.00	229.00
	600mm diameter	Each	306.00	322.00
	700mm diameter	Each	411.00	435.00
	750mm diameter	Each	472.00	500.00
	800mm diameter	Each	534.00	569.00
	900mm diameter	Each	683.00	727.00
	1000mm diameter	Each	853.00	908.00
1.21	Labour for laying in position all socket cast iron, tees (all Sizes in mm). [conforming to IS 3114 : 1994]		Medium Class	Heavy Class
	80x80	Each	23.00	25.00
	100x80	Each	29.00	30.00
	100x100	Each	31.00	32.00
	125x80	Each	36.00	38.00
	125x100	Each	38.00	40.00

S.No.	Particulars of Items	Unit	Rates (in Rs.)	
	125x125	Each	42.00	44.00
	150x80	Each	46.00	48.00
	150x100	Each	48.00	50.00
	150x125	Each	50.00	53.00
	150x150	Each	53.00	56.00
	200x80	Each	67.00	71.00
	200x100	Each	69.00	74.00
	200x125	Each	71.00	76.00
	200x150	Each	75.00	79.00
	200x200	Each	82.00	86.00
	250x80	Each	94.00	100.00
	250x100	Each	96.00	102.00
	250x125	Each	99.00	106.00
	250x150	Each	102.00	109.00
	250x200	Each	109.00	115.00
	250x250	Each	116.00	124.00
	300x80	Each	127.00	136.00
	300x100	Each	128.00	137.00
	300x125	Each	131.00	141.00
	300x150	Each	133.00	143.00
	300x200	Each	142.00	151.00
	300x250	Each	149.00	160.00
	300x300	Each	159.00	169.00
	350x200	Each	180.00	194.00
	350x250	Each	189.00	202.00
	350x300	Each	198.00	212.00
	350x350	Each	208.00	223.00
	400x200	Each	226.00	244.00
	400x250	Each	234.00	253.00
	400x300	Each	243.00	262.00
	400x350	Each	254.00	273.00
	400x400	Each	266.00	286.00
	450x250	Each	292.00	314.00
	450x300	Each	302.00	324.00
	450x350	Each	312.00	335.00
	450x400	Each	323.00	345.00
	450x450	Each	336.00	359.00
	500x250	Each	348.00	379.00
	500x300	Each	358.00	389.00
	500x350	Each	369.00	400.00
	500x400	Each	379.00	411.00
	500x450	Each	392.00	424.00
	500x500	Each	407.00	440.00
	600x300	Each	507.00	555.00
	600x350	Each	518.00	566.00
	600x400	Each	531.00	579.00
	600x450	Each	543.00	593.00
	600x500	Each	557.00	606.00
	600x600	Each	590.00	642.00
	700x350	Each	712.00	777.00

S.No.	Particulars of Items	Unit	Rates (in Rs.)	
	700x400	Each	725.00	791.00
	700x450	Each	739.00	806.00
	700x500	Each	752.00	819.00
	700x600	Each	781.00	847.00
	700x700	Each	818.00	887.00
	750x400	Each	832.00	911.00
	750x450	Each	847.00	926.00
	750x500	Each	862.00	942.00
	750x600	Each	891.00	971.00
	750x700	Each	924.00	1004.00
	750x750	Each	947.00	1028.00
	800x400	Each	955.00	1046.00
	800x450	Each	969.00	1061.00
	800x500	Each	984.00	1076.00
	800x600	Each	1016.00	1108.00
	800x700	Each	1049.00	1142.00
	800x750	Each	1066.00	1161.00
	800x800	Each	1091.00	1187.00
	900x450	Each	1247.00	1373.00
	900x500	Each	1262.00	1387.00
	900x600	Each	1297.00	1425.00
	900x700	Each	1333.00	1461.00
	900x750	Each	1350.00	1479.00
	900x800	Each	1369.00	1497.00
	900x900	Each	1418.00	1548.00
	1000x500	Each	1591.00	1756.00
	1000x600	Each	1625.00	1791.00
	1000x700	Each	1668.00	1836.00
	1000x750	Each	1686.00	1855.00
	1000x800	Each	1706.00	1875.00
	1000x900	Each	1747.00	1915.00
	1000x1000	Each	1804.00	1974.00
1.22	Labour for laying in position all socket cast iron crosses. (all sizes in mm. [conforming to IS 3114 : 1994]).			
			Medium Class	Heavy Class
	80mm diameter	Each	31.00	32.00
	100mm diameter	Each	39.00	42.00
	125mm diameter	Each	53.00	55.00
	150mm diameter	Each	68.00	71.00
	200mm diameter	Each	103.00	109.00
	250mm diameter	Each	146.00	155.00
	300mm diameter	Each	198.00	210.00
1.23	Labour for laying in position socket and spigot cast iron tapers, (reducer) (all Sizes in mm). [conforming to IS 3114 : 1994]			
			Medium Class	Heavy Class
	100x80	Each	16.00	17.00
	125x80	Each	21.00	22.00
	125x100	Each	22.00	25.00

S.No.	Particulars of Items	Unit	Rates (in Rs.)	
	150x80	Each	27.00	29.00
	150x100	Each	28.00	30.00
	150x125	Each	31.00	33.00
	200x100	Each	39.00	43.00
	200x125	Each	42.00	45.00
	200x150	Each	45.00	48.00
	250x125	Each	56.00	60.00
	250x150	Each	59.00	63.00
	250x200	Each	65.00	70.00
	300x150	Each	79.00	85.00
	300x200	Each	86.00	94.00
	300x250	Each	94.00	103.00
	350x200	Each	102.00	111.00
	350x250	Each	111.00	120.00
	350x300	Each	119.00	131.00
	400x250	Each	140.00	152.00
	400x300	Each	150.00	164.00
	400x350	Each	161.00	177.00
	450x350	Each	180.00	197.00
	450x400	Each	193.00	212.00
	500x350	Each	207.00	225.00
	500x400	Each	220.00	240.00
	500x450	Each	233.00	256.00
	600x400	Each	293.00	320.00
	600x450	Each	308.00	337.00
	600x500	Each	324.00	355.00
	700x500	Each	389.00	424.00
	700x600	Each	425.00	466.00
	750x600	Each	478.00	524.00
	750x700	Each	522.00	574.00
	800x600	Each	517.00	565.00
	800x700	Each	559.00	615.00
	800x750	Each	584.00	643.00
	900x700	Each	669.00	731.00
	900x750	Each	694.00	791.00
	900x800	Each	719.00	760.00
	1000x800	Each	816.00	892.00
	1000x900	Each	872.00	957.00

S.No.	Particulars of Items	Unit	Rates (in Rs.)	
1.24	Labour for laying in position Double Socket cast iron tapers (Reducer) (all sizes in mm). [conforming to IS 3114 : 1994]		Medium Class	Heavy Class
	100x80	Each	16.00	19.00
	125x80	Each	21.00	29.00
	125x100	Each	22.00	32.00
	150x80	Each	27.00	33.00
	150x100	Each	28.00	36.00
	150x125	Each	30.00	40.00
	200x100	Each	39.00	46.00
	200x125	Each	42.00	50.00
	200x150	Each	45.00	54.00
	250x125	Each	56.00	62.00
	250x150	Each	59.00	66.00
	250x200	Each	65.00	77.00
	300x150	Each	79.00	80.00
	300x200	Each	86.00	90.00
	300x250	Each	94.00	101.00
	350x200	Each	102.00	125.00
	350x250	Each	111.00	140.00
	350x300	Each	119.00	156.00
	400x250	Each	140.00	159.00
	400x300	Each	150.00	175.00
	400x350	Each	161.00	193.00
	450x350	Each	180.00	208.00
	450x400	Each	193.00	227.00
	500x350	Each	207.00	237.00
	500x400	Each	220.00	257.00
	500x450	Each	233.00	273.00
	600x400	Each	293.00	320.00
	600x450	Each	308.00	330.00
	600x500	Each	324.00	354.00
	700x500	Each	389.00	413.00
	700x600	Each	425.00	466.00
	750x600	Each	478.00	501.00
	750x700	Each	522.00	556.00
	800x600	Each	486.00	534.00
	800x700	Each	538.00	594.00
	800x750	Each	570.00	629.00

S.No.	Particulars of Items	Unit		Rates (in Rs.)
	900x700	Each	608.00	670.00
	900x750	Each	643.00	740.00
	900x800	Each	697.00	737.00
	1000x800	Each	747.00	823.00
	1000x900	Each	813.00	898.00
1.25	Labour for laying in position cast Iron Collars. [conforming to IS 3114 : 1994]		Medium Class	Heavy Class
	80mm diameter	Each	14.00	15.00
	100mm diameter	Each	17.00	18.00
	125mm diameter	Each	22.00	23.00
	150mm diameter	Each	29.00	30.00
	200mm diameter	Each	40.00	43.00
	250mm diameter	Each	55.00	59.00
	300mm diameter	Each	72.00	76.00
	350mm diameter	Each	92.00	96.00
	400mm diameter	Each	110.00	117.00
	450mm diameter	Each	135.00	142.00
	500mm diameter	Each	161.00	169.00
	600mm diameter	Each	218.00	230.00
	700mm diameter	Each	287.00	302.00
	750mm diameter	Each	324.00	341.00
	800mm diameter	Each	363.00	384.00
	900mm diameter	Each	452.00	477.00
	1000mm diameter	Each	552.00	583.00
1.26	Labour for laying in position socketed cast iron caps. [conforming to IS 3114 : 1994]			Heavy Class
	80mm diameter	Each		7.00
	100mm diameter	Each		10.00
	125mm diameter	Each		13.00
	150mm diameter	Each		16.00
	200mm diameter	Each		26.00
	250mm diameter	Each		36.00
	300mm diameter	Each		49.00
	350mm diameter	Each		65.00
	400mm diameter	Each		82.00
	450mm diameter	Each		103.00
	500mm diameter	Each		126.00
	600mm diameter	Each		182.00
	700mm diameter	Each		250.00
	750mm diameter	Each		290.00
	800mm diameter	Each		335.00
	900mm diameter	Each		432.00
	1000mm diameter	Each		548.00
1.27	Labour for laying in position cast iron plugs. [conforming to IS 3114 : 1994]		Medium Class	Heavy Class
	80mm diameter	Each	2.00	3.00
	100mm diameter	Each	3.00	4.00
	125mm diameter	Each	5.00	6.00
	150mm diameter	Each	9.00	10.00

S.No.	Particulars of Items	Unit		Rates (in Rs.)
	200mm diameter	Each	14.00	15.00
	250mm diameter	Each	21.00	23.00
	300mm diameter	Each	30.00	32.00
	350mm diameter	Each	40.00	44.00
	400mm diameter	Each	54.00	58.00
	450mm diameter	Each	69.00	74.00
	500mm diameter	Each	86.00	92.00
	600mm diameter	Each	128.00	135.00
	700mm diameter	Each	182.00	192.00
	750mm diameter	Each	214.00	225.00
	800mm diameter	Each	250.00	262.00
	900mm diameter	Each	327.00	342.00
	1000mm diameter	Each	420.00	438.00
1.28	Labour for laying in position sizes of socket & spigot or all socketed cast iron standard specials class 'MEDIUM' or 'HEAVY' Which do not appear in above items of the schedule. [conforming to IS 3114 : 1994]		Medium Class	Heavy Class
	80 mm to 1000 mm Dia	Kg	1.00	1.00

CHAPTER - 2
CAST IRON TYTON PIPES WITH TYTON JOINTS

1 C.I. Pipes shall confirm to IS: 1536 - 1989 duly inspected and tested and having BIS certification mark.

2 Specials shall confirm to IS: 1538 - 1983 duly inspected and tested and having BIS certification mark.

3 Tyton rubber sealing ring/Tyton rubber gasket shall be as per IS:5382- 1985 and ISI marked.

4 The rings shall be homogeneous, free from porosity, frit, excessive blooms, blisters or other visible surface imperfections. The fin or flash shall be reduce as much possible and in any case the thickness of it shall not exceed 0.4 mm and the width 0.8 mm. Unless otherwise specified, the materials shall be black.

5 Rubber ring tyton joints shall be used for jointing of CI pipe lines outside the building and other external water supply installations. Wherever required, for internal water supply piping arrangements with CI pipes, shall be connected by flanged joints.

6 As per prevailing excise duty norms there is excise duty exemption on certain diameter of Water Supply Pipes of different material class. All though in the computation of item rates for pipes, the rates are inclusive of excise duty but excise duty exemption shall be obtained as per prevailing rules for such pipes. This benefit shall be availed by the local bodies. All the concerned officers shall be responsible to get all the exemptions of such taxes and duties.

7 Laying of pipe shall be as per clause IS:3114 - 1994
Laying of pipes and fittings/specials includes all precautions to guard against possible damaged to the existing structure/pipes lines, cables etc., taking precautions to prevent dirt from entering the pipe ends, lowering and laying pipes and specials in the trenches with specials arrangement such as cranes, tripods with chain pulley block, use of slings of canvas etc. to fit the ends of pipes and fittings/ specials to lift and lower the same. Inspection of pipes and fittings for defects by striking with a light hammer while suspended. Laying of pipes perfectly true in alignment and to gradient etc.

8 **Measurement**
The net length of pipes as laid or fixed should be measured in running meters correct to a cm. Specials should be excluded and enumerated and paid separately. The portion of the pipe within the collar at the joints shall not be included in the length of pipe work.

9 **Rates**

a) The rates include charges for all tools & plants, chain pulley blocks, other appliances etc. required for lifting and laying the pipes and specials in positions as per approved drawing.

b) The rates include provision and use of all coverings etc. to protect the works from inclement weather etc. and from damages from fall of materials, and other causes.

(For Detail Refer to Specifications prepared by the Urban Administration and Development Department, IS Codes & CPHEEO Manual)

CHAPTER 2- CAST IRON TYTON PIPES WITH TYTON JOINTS

S.No.	Particulars of Items	Unit	Rates (in Rs.)		
2.1	Providing, laying and jointing cast iron tyton pipes with tyton joints including testing of joints, cost of pipes and jointing materials etc complete. [Cast iron (tyton) pipes shall conform to IS 1536 : 1989 and rubber sealing rings shall conform to IS 5382:1985)		LA Class	A Class	B Class
	80mm diameter	Meter	905.00	981.00	1051.00
	100mm diameter	Meter	1115.00	1206.00	1285.00
	125mm diameter	Meter	1385.00	1509.00	1624.00
	150mm diameter	Meter	1670.00	1827.00	1966.00
	200mm diameter	Meter	2440.00	2643.00	2854.00
	250mm diameter	Meter	3288.00	3574.00	3825.00
	300mm diameter	Meter	4241.00	4627.00	5006.00
	350mm diameter	Meter	5341.00	5784.00	6263.00
	400mm diameter	Meter	6506.00	7098.00	7652.00
	450mm diameter	Meter	7870.00	8629.00	9297.00
	500mm diameter	Meter	9320.00	10135.00	10952.00
	600mm diameter	Meter	12477.00	13597.00	14708.00
	700mm diameter	Meter	16105.00	17565.00	18950.00
	750mm diameter	Meter	18038.00	19686.00	21324.00
	800mm diameter	Meter	20191.00	21961.00	23722.00
	900mm diameter	Meter	24580.00	26774.00	28968.00
	1000mm diameter	Meter	29263.00	32220.00	34772.00
2.2	Labour for laying in position cast iron tyton pipes.		LA Class	A Class	B Class
	80mm diameter	Meter	10.00	11.00	11.00
	100mm diameter	Meter	12.00	13.00	14.00
	125mm diameter	Meter	16.00	17.00	18.00
	150mm diameter	Meter	19.00	21.00	23.00
	200mm diameter	Meter	28.00	31.00	33.00
	250mm diameter	Meter	39.00	42.00	45.00
	300mm diameter	Meter	50.00	55.00	59.00
	350mm diameter	Meter	64.00	69.00	74.00
	400mm diameter	Meter	77.00	84.00	90.00
	450mm diameter	Meter	94.00	103.00	110.00
	500mm diameter	Meter	109.00	118.00	127.00
	600mm diameter	Meter	150.00	162.00	174.00
	700mm diameter	Meter	189.00	205.00	220.00
	750mm diameter	Meter	210.00	228.00	245.00
	800mm diameter	Meter	233.00	252.00	272.00
	900mm diameter	Meter	288.00	312.00	336.00
	1000mm diameter	Meter	349.00	378.00	406.00

S.No.	Particulars of Items	Unit	Rates (in Rs.)
2.3	Jointing of tyton pipes of class 'LA' 'A' and 'B' including testing of joints and cost of jointing materials (i.e. Rubber Gasket and Soap solution etc.). [Conform to IS 5382: 1985]		
	80mm diameter	Each	44.00
	100mm diameter	Each	46.00
	125mm diameter	Each	67.00
	150mm diameter	Each	71.00
	200mm diameter	Each	103.00
	250mm diameter	Each	142.00
	300mm diameter	Each	184.00
	350mm diameter	Each	211.00
	400mm diameter	Each	286.00
	450mm diameter	Each	317.00
	500mm diameter	Each	402.00
	600mm diameter	Each	521.00
	700mm diameter	Each	717.00
	750mm diameter	Each	816.00
	800mm diameter	Each	919.00
	900mm diameter	Each	1025.00
	1000mm diameter	Each	1303.00
2.4	Labour for jointing of tyton pipes class 'LA' 'A' and 'B' including testing of joints but excluding cost of Rubber Gasket.		
	80mm diameter	Each	11.00
	100mm diameter	Each	11.00
	125mm diameter	Each	21.00
	150mm diameter	Each	21.00
	200mm diameter	Each	28.00
	250mm diameter	Each	34.00
	300mm diameter	Each	41.00
	350mm diameter	Each	41.00
	400mm diameter	Each	55.00
	450mm diameter	Each	61.00
	500mm diameter	Each	65.00
	600mm diameter	Each	88.00
	700mm diameter	Each	104.00
	750mm diameter	Each	108.00
	800mm diameter	Each	115.00
	900mm diameter	Each	135.00
	1000mm diameter	Each	148.00

CHAPTER - 3
CAST IRON PIPES AND SPECIALS WITH FLANGED JOINTS

1 The Horizontal Cast C.I. double flanged pipes shall conform to IS 7181-1986 (reaffirmed 2005) duly inspected and tested and having BIS certification mark.

2 The C.I. fittings shall conform to IS - 1538- 1993 duly inspected and tested and having BIS certification mark.

3 Method of sampling of cast iron pipes & fittings shall conform to IS 11606-1986.

4 Specification for rubber and insertions shall conform to IS 1638.

5 Code of structural steel in general building construction (for nuts and bolts) shall conform to IS 800.

6 Flanged pipes centrifugally cast with screwed/welded flanges shall conform to IS 1536-2001

7 Tolerance :

7.1 Tolerance on thickness-

The tolerances on the wall thickness of pipes and flange thickness of pipes shall be as follows:

Dimension	**Tolerance mm**
Wall thickness	-(1+ 0.05e)
Flange thickness	±(2 + 0.05ь)
Where e = Thickness of pipe in mm, and ь = Thickness of flange in mm	

7.2 Tolerance on Mass of fittings-

The mass of fittings are given in the specification prepared by UADD. Tolerance on mass of fittings shall be as below :-

(i) The permissible tolerances on standard mass of fittings shall be ± 8 percent except for bends, fittings with more than one branch and non-standard fittings, in which case the tolerance shall be ± 12 percent. Fittings of a heavier mass than the maximum may be accepted provided they comply in every other respect with the requirement of this standard.

7.3 Permissible Deviation in double flanged cast iron pipe (Horizontal) from a straight Line. The pipes shall be straight. When rolled along two gantries separated by approximately two thirds the lengths of the pipes to be checked, the maximum deviation fm, shall be thus

fm < 1.25L.

8 Laying of pipes and fittings/specials includes all precautions to guard against possible damaged to the existing structure/pipes lines, cables etc., taking precautions to prevent dirt from entering the pipe ends, lowering and laying pipes and specials in the trenches with specials arrangement such as cranes, tripods with chain pulley block, use of slings of canvas etc. to fit the ends of pipes and fittings/ specials to lift and lower the same. Inspection of pipes and fittings for defects by striking with a light hammer while suspended. Laying of pipes perfectly true in alignment and to gradient etc.

9 **Fixing** means laying in specified position to ensure interconnection between all flanged pipes, fittings and valves. It is also to ensure that the bolt holes of two flanges of the pipe/ fittings are correctly aligned.

10 As per prevailing excise duty norms there is excise duty exemption on certain diameter of Water Supply Pipes of different material class. All though in the computation of item rates for pipes, the rates are inclusive of excise duty but excise duty exemption shall be obtained as per prevailing rules for such pipes. This benefit shall be availed by the local bodies. All the concerned officers shall be responsible to get all the exemptions of such taxes and duties.

11 Measurement :

The net length of pipes as laid or fixed should be measured in running meters correct to a cm. Specials should be excluded and enumerated and paid for separately. The portion of the pipe

within the collar at the joints should not be included in the length of pipe work.

12 Rates :

(i) The rates include the charge for all tools and plant such as chain pulley blocks and other appliances etc. required for lifting and laying the pipes and specials in position.

(ii) The rates include provision and use of all coverings etc. to protect the works from inclement weather etc. and from damages from fall of materials and other causes.

(iii) The rates include provision of handling, storing under cover as required and returning of empty cases or container to the store without any extra cost, for such materials as may be supplied by the Department.

(For Detail Refer to Specifications prepared by the Urban Administration and Development Department, IS Code & CPHEEO Manual)

CHAPTER 3 -CAST IRON PIPES AND SPECIALS WITH FLANGED JOINTS

S.No.	Particulars of Items	Unit	Rates (in Rs.)
3.1	Providing and fixing double flanged cast iron (horizontal cast) pipe as per IS : 7181 of One Meter length.		
	80mm diameter	Each	1435.00
	100mm diameter	Each	1783.00
	125mm diameter	Each	2306.00
	150mm diameter	Each	2691.00
	200mm diameter	Each	3851.00
	250mm diameter	Each	5171.00
	300mm diameter	Each	6632.00
	350mm diameter	Each	9050.00
	400mm diameter	Each	11049.00
	450mm diameter	Each	13192.00
	500mm diameter	Each	15486.00
	600mm diameter	Each	20820.00
	700mm diameter	Each	27128.00
	750mm diameter	Each	30772.00
3.2	Labour only for fixing including positioning of pipe cleaning of pipes/flange ends, local carriage for pipe at site etc. double flanged cast iron (horizontal cast) pipe as per IS : 7181 of One Meter length.		
	80mm diameter	Each	25.00
	100mm diameter	Each	32.00
	125mm diameter	Each	41.00
	150mm diameter	Each	48.00
	200mm diameter	Each	68.00
	250mm diameter	Each	92.00
	300mm diameter	Each	117.00
	350mm diameter	Each	160.00
	400mm diameter	Each	196.00
	450mm diameter	Each	234.00
	500mm diameter	Each	275.00
	600mm diameter	Each	369.00
	700mm diameter	Each	481.00
	750mm diameter	Each	546.00
3.3	Providing and fixing double flanged cast iron (horizontal cast) pipe as per IS : 7181 of Two Meter length.		
	80mm diameter	Each	2431.00
	100mm diameter	Each	3062.00
	125mm diameter	Each	3972.00
	150mm diameter	Each	4706.00
	200mm diameter	Each	6744.00
	250mm diameter	Each	9207.00
	300mm diameter	Each	11937.00
	350mm diameter	Each	15776.00
	400mm diameter	Each	19241.00
	450mm diameter	Each	23122.00
	500mm diameter	Each	27041.00
	600mm diameter	Each	36267.00

S.No.	Particulars of Items	Unit	Rates (in Rs.)
	700mm diameter	Each	46988.00
	750mm diameter	Each	53119.00
3.4	Labour only for fixing including positioning of pipe cleaning of pipes/flange ends, local carriage for pipe at site etc. double flanged cast iron (horizontal cast) pipe as per IS : 7181 of Two Meter length.		
	80mm diameter	Each	44.00
	100mm diameter	Each	55.00
	125mm diameter	Each	72.00
	150mm diameter	Each	85.00
	200mm diameter	Each	122.00
	250mm diameter	Each	167.00
	300mm diameter	Each	215.00
	350mm diameter	Each	285.00
	400mm diameter	Each	348.00
	450mm diameter	Each	418.00
	500mm diameter	Each	489.00
	600mm diameter	Each	656.00
	700mm diameter	Each	850.00
	750mm diameter	Each	961.00
3.5	Providing and fixing double flanged cast iron (horizontal cast) pipe as per IS : 7181 of 2.75 M length		
	80mm diameter	Each	3137.00
	100mm diameter	Each	3968.00
	125mm diameter	Each	5148.00
	150mm diameter	Each	6171.00
	200mm diameter	Each	8837.00
	250mm diameter	Each	12011.00
	300mm diameter	Each	15730.00
	350mm diameter	Each	20531.00
	400mm diameter	Each	25036.00
	450mm diameter	Each	30147.00
	500mm diameter	Each	35211.00
	600mm diameter	Each	47189.00
	700mm diameter	Each	61026.00
	750mm diameter	Each	68917.00
3.6	Labour only for fixing including positioning of pipe cleaning of pipes/flange ends, local carriage for pipe at site etc. double flanged cast iron (horizontal cast) pipe as per IS : 7181 of 2.75 Meter length.		
	80mm diameter	Each	58.00
	100mm diameter	Each	73.00
	125mm diameter	Each	95.00
	150mm diameter	Each	113.00
	200mm diameter	Each	163.00
	250mm diameter	Each	222.00
	300mm diameter	Each	290.00
	350mm diameter	Each	379.00
	400mm diameter	Each	462.00

S.No.	Particulars of Items	Unit	Rates (in Rs.)
	450mm diameter	Each	556.00
	500mm diameter	Each	650.00
	600mm diameter	Each	871.00
	700mm diameter	Each	1127.00
	750mm diameter	Each	1272.00
3.7	Jointing of double flanged cast iron (horizontal cast) pipes and specials class 'A' and 'B' including labour & cost of jointing materials (i.e. Bolt, Nuts and Rubber insertions) including testing of joint etc. complete [Conform to IS 800 Nuts & Bolts & IS 1638 rubber insertions:]		
	80mm diameter	Each	67.00
	100mm diameter	Each	115.00
	125mm diameter	Each	121.00
	150mm diameter	Each	167.00
	200mm diameter	Each	178.00
	250mm diameter	Each	256.00
	300mm diameter	Each	268.00
	350mm diameter	Each	360.00
	400mm diameter	Each	524.00
	450mm diameter	Each	594.00
	500mm diameter	Each	708.00
	600mm diameter	Each	959.00
	700mm diameter	Each	1178.00
	750mm diameter	Each	1368.00
3.8	Labour for jointing of flanged cast iron pipes and specials class 'A' and 'B' including testing of joints but excluding cost of jointing materials (i.e. Bolts & Nut, Rubber insertion)		
	80mm diameter	Each	18.00
	100mm diameter	Each	25.00
	125mm diameter	Each	30.00
	150mm diameter	Each	35.00
	200mm diameter	Each	40.00
	250mm diameter	Each	50.00
	300mm diameter	Each	52.00
	350mm diameter	Each	60.00
	400mm diameter	Each	67.00
	450mm diameter	Each	69.00
	500mm diameter	Each	70.00
	600mm diameter	Each	77.00
	700mm diameter	Each	82.00
	750mm diameter	Each	89.00
3.9	Labour only for jointing double flanged horizontally cast iron pipes and specials in vertical or inclined direction including testing of joints but excluding cost of jointing materials (i.e. bolts, nuts and rubber insertion sheet) [Conform to IS 800 IS 1638:]		

S.No.	Particulars of Items	Unit	Rates (in Rs.)	
3.9.1	80mm to 750mm dia in truly vertical position	200% above the rates provided vide item No. 3.2, 3.4 & 3.6		
3.9.2	In inclined position at inclination 45% & above	100% above rates provided vide item No. 3.2, 3.4 & 3.6		
3.9.3	In inclined position at inclination less than 45%	Same as rates provided vide item No. 3.2, 3.4 & 3.6		
3.10	Providing & Laying in position cast iron flanged sockets (confirming to IS 1538)		Medium Class	Heavy Class
	80mm diameter	Each	701.00	759.00
	100mm diameter	Each	876.00	934.00
	125mm diameter	Each	1109.00	1168.00
	150mm diameter	Each	1460.00	1518.00
	200mm diameter	Each	2102.00	2160.00
	250mm diameter	Each	3386.00	3620.00
	300mm diameter	Each	4321.00	4612.00
	350mm diameter	Each	5890.00	6266.00
	400mm diameter	Each	7269.00	7707.00
	450mm diameter	Each	8396.00	8898.00
	500mm diameter	Each	10214.00	10840.00
	600mm diameter	Each	13848.00	14662.00
	700mm diameter	Each	18109.00	19174.00
	750mm diameter	Each	20552.00	21743.00
3.11	Providing and laying in position cast iron flanged spigot (tail piece) [Conform to IS 1538]		Medium Class	Heavy Class
	80mm diameter	Each	642.00	701.00
	100mm diameter	Each	759.00	817.00
	125mm diameter	Each	993.00	1109.00
	150mm diameter	Each	1226.00	1343.00
	200mm diameter	Each	2043.00	2277.00
	250mm diameter	Each	2744.00	3094.00
	300mm diameter	Each	3503.00	3970.00
	350mm diameter	Each	4530.00	5066.00
	400mm diameter	Each	5484.00	6199.00
	450mm diameter	Each	6497.00	7331.00
	500mm diameter	Each	7749.00	8702.00
	600mm diameter	Each	11981.00	13530.00
	700mm diameter	Each	15557.00	17584.00
	750mm diameter	Each	17643.00	19908.00
3.12	Providing and laying in position cast iron double flanged 90° bends [Conform to IS 1538]		Medium Class	Heavy Class
	80mm diameter	Each	715.00	775.00
	100mm diameter	Each	954.00	1013.00
	125mm diameter	Each	1252.00	1371.00
	150mm diameter	Each	1729.00	1848.00
	200mm diameter	Each	2682.00	2921.00
	250mm diameter	Each	3874.00	4292.00
	300mm diameter	Each	5364.00	5961.00
	350mm diameter	Each	7557.00	8417.00
	400mm diameter	Each	9953.00	11121.00
	450mm diameter	Each	12350.00	13886.00

S.No.	Particulars of Items	Unit	Rates (in Rs.)	
	500mm diameter	Each	15852.00	17818.00
	600mm diameter	Each	24085.00	27157.00
	700mm diameter	Each	34775.00	39260.00
	750mm diameter	Each	41042.00	46388.00
3.13	Providing and laying in position cast iron double flanged 45° bends [Conform to IS 1538]			Heavy Class
	80mm diameter	Each		834.00
	100mm diameter	Each		1073.00
	125mm diameter	Each		1490.00
	150mm diameter	Each		2027.00
	200mm diameter	Each		3219.00
	250mm diameter	Each		4768.00
	300mm diameter	Each		6676.00
	350mm diameter	Each		7066.00
	400mm diameter	Each		9155.00
	450mm diameter	Each		11366.00
	500mm diameter	Each		14193.00
	600mm diameter	Each		21013.00
	700mm diameter	Each		29799.00
	750mm diameter	Each		35144.00
3.14	Providing and laying in position cast iron double flanged 90° Duck Foot Bend. [Conform to IS 1538]		Medium Class	Heavy Class
	80mm diameter	Each	1192.00	1252.00
	100mm diameter	Each	1490.00	1550.00
	125mm diameter	Each	2027.00	2146.00
	150mm diameter	Each	2682.00	2801.00
	200mm diameter	Each	4172.00	4411.00
	250mm diameter	Each	6199.00	6616.00
	300mm diameter	Each	8702.00	9298.00
	350mm diameter	Each	12776.00	13670.00
	400mm diameter	Each	16736.00	17950.00
	450mm diameter	Each	20761.00	22358.00
	500mm diameter	Each	26446.00	28490.00
	600mm diameter	Each	40053.00	43246.00
3.15	Providing and laying in position cast iron all flanged Tees (all sizes in mm) Body x Branch. [Conform to IS 1538]		Medium Class	Heavy Class
	80x80	Each	1229.00	1290.00
	100x80	Each	1413.00	1536.00
	100x100	Each	1475.00	1597.00
	125x80	Each	1782.00	1966.00
	125x100	Each	1966.00	2089.00
	125x125	Each	2028.00	2212.00
	150x80	Each	2335.00	2519.00
	150x100	Each	2396.00	2580.00
	150x125	Each	2519.00	2765.00

S.No.	Particulars of Items	Unit	Rates (in Rs.)	
	150x150	Each	2642.00	2888.00
	200x80	Each	3441.00	3809.00
	200x100	Each	3502.00	3871.00
	200x125	Each	3686.00	4055.00
	200x150	Each	3809.00	4178.00
	200x200	Each	4117.00	4547.00
	250x80	Each	4915.00	5468.00
	250x100	Each	4977.00	5530.00
	250x125	Each	5161.00	5714.00
	250x150	Each	5345.00	5898.00
	250x200	Each	5653.00	6267.00
	250x250	Each	6083.00	6697.00
	300x80	Each	6697.00	7496.00
	300x100	Each	6820.00	7619.00
	300x125	Each	6943.00	7741.00
	300x150	Each	7127.00	7926.00
	300x200	Each	7496.00	8356.00
	300x250	Each	7926.00	8786.00
	300x300	Each	8356.00	9278.00
	350x200	Each	9524.00	10590.00
	350x250	Each	9775.00	10840.00
	350x300	Each	10652.00	11780.00
	350x350	Each	10966.00	12219.00
	400x200	Each	11843.00	13221.00
	400x250	Each	12093.00	13472.00
	400x300	Each	13033.00	14537.00
	400x350	Each	13409.00	14976.00
	400x400	Each	13848.00	15414.00
	450x250	Each	14537.00	16292.00
	450x300	Each	15477.00	17357.00
	450x350	Each	15853.00	17795.00
	450x400	Each	16229.00	18171.00
	450x450	Each	16605.00	18547.00
	500x250	Each	17607.00	19738.00
	500x300	Each	18673.00	20928.00
	500x350	Each	19111.00	21430.00
	500x400	Each	19550.00	21868.00
	500x450	Each	19926.00	22307.00
	500x500	Each	20365.00	22746.00
	600x300	Each	25941.00	29200.00
	600x350	Each	26568.00	29764.00
	600x400	Each	27069.00	30390.00
	600x450	Each	27445.00	30829.00
	600x500	Each	27884.00	31267.00

S.No.	Particulars of Items	Unit	Rates (in Rs.)	
	600x600	Each	28886.00	32333.00
	700x350	Each	35716.00	40228.00
	700x400	Each	36217.00	40792.00
	700x450	Each	36781.00	41356.00
	700x500	Each	37283.00	41920.00
	700x600	Each	38285.00	42985.00
	700x700	Each	39601.00	44301.00
	750x400	Each	41481.00	46744.00
	750x450	Each	41982.00	47246.00
	750x500	Each	42671.00	47998.00
	750x600	Each	43486.00	48812.00
	750x700	Each	44301.00	49627.00
	750x750	Each	45115.00	50441.00
	800x400	Each	49322.00	55536.00
	800x450	Each	49840.00	56119.00
	800x500	Each	50423.00	56766.00
	800x600	Each	51653.00	58061.00
	800x700	Each	52882.00	59290.00
	800x750	Each	53594.00	60067.00
	800x800	Each	54436.00	60909.00
	900x450	Each	62527.00	70618.00
	900x500	Each	63433.00	71589.00
	900x600	Each	64727.00	73013.00
	900x700	Each	66022.00	74372.00
	900x750	Each	66799.00	75149.00
	900x800	Each	67575.00	75925.00
	900x900	Each	68676.00	77026.00
3.16	Providing and laying in position cast iron double flanged Tapers (all size in mm) Body x Branch. [Conform to IS 1538]		Medium Class	Heavy Class
	100x80	Each	656.00	715.00
	125x80	Each	1073.00	1192.00
	125x100	Each	1192.00	1311.00
	150x80	Each	1252.00	1371.00
	150x100	Each	1371.00	1490.00
	150x125	Each	1490.00	1609.00
	200x100	Each	1729.00	1848.00
	200x125	Each	1848.00	2027.00
	200x150	Each	2027.00	2205.00
	250x125	Each	2265.00	2444.00
	250x150	Each	2384.00	2623.00
	250x200	Each	2742.00	2980.00

S.No.	Particulars of Items	Unit	Rates (in Rs.)	
	300x150	Each	2801.00	3040.00
	300x200	Each	3159.00	3457.00
	300x250	Each	3576.00	3874.00
	350x200	Each	4950.00	5451.00
	350x250	Each	5451.00	6015.00
	350x300	Each	6015.00	6642.00
	400x250	Each	6141.00	6830.00
	400x300	Each	6767.00	7519.00
	400x350	Each	7457.00	8271.00
	450x300	Each	7331.00	8146.00
	450x350	Each	8208.00	9086.00
	450x400	Each	8960.00	9900.00
	500x350	Each	9023.00	10026.00
	500x400	Each	9838.00	10903.00
	500x450	Each	10527.00	11655.00
	600x400	Each	11905.00	13159.00
	600x450	Each	12532.00	13911.00
	600x500	Each	13535.00	14976.00
	700x500	Each	15916.00	17607.00
	700x600	Each	17983.00	19863.00
	750x600	Each	19174.00	21179.00
	750x700	Each	21555.00	23811.00
	800x600	Each	21619.00	23820.00
	800x700	Each	24079.00	26538.00
	800x750	Each	25114.00	27703.00
	900x700	Each	26862.00	29645.00
	900x750	Each	28027.00	30940.00
	900x800	Each	29839.00	32882.00
	1000x800	Each	33529.00	36895.00
	1000x900	Each	36247.00	39937.00
3.17	Providing and laying in position all flanged cast iron crosses [Conform to IS 1538]		Medium Class	Heavy Class
	80mm diameter	Each	1551.00	1675.00
	100mm diameter	Each	1923.00	2110.00
	125mm diameter	Each	2544.00	2854.00
	150mm diameter	Each	3350.00	3723.00
	200mm diameter	Each	5212.00	5770.00
	250mm diameter	Each	7569.00	8376.00
	300mm diameter	Each	10237.00	11168.00

S.No.	Particulars of Items	Unit	Rates (in Rs.)	
3.18	Providing and laying in position all flanged cast iron blank flanges [Conform to IS 1538]			Heavy Class
	80mm diameter	Each		292.00
	100mm diameter	Each		350.00
	125mm diameter	Each		467.00
	150mm diameter	Each		642.00
	200mm diameter	Each		934.00
	250mm diameter	Each		1343.00
	300mm diameter	Each		1868.00
	350mm diameter	Each		2716.00
	400mm diameter	Each		3474.00
	450mm diameter	Each		4232.00
	500mm diameter	Each		5370.00
	600mm diameter	Each		7960.00
	700mm diameter	Each		11181.00
	750mm diameter	Each		13076.00
	800mm diameter	Each		15477.00
	900mm diameter	Each		19773.00
	1000mm diameter	Each		25647.00
3.19	Labour for laying in position cast iron flanged sockets. Excluding cost of the cast iron flanged socket which is to be provided by the local body.		Medium Class	Heavy Class
	80mm diameter	Each	13.00	14.00
	100mm diameter	Each	16.00	17.00
	125mm diameter	Each	20.00	21.00
	150mm diameter	Each	27.00	28.00
	200mm diameter	Each	38.00	39.00
	250mm diameter	Each	62.00	66.00
	300mm diameter	Each	79.00	84.00
	350mm diameter	Each	100.00	107.00
	400mm diameter	Each	124.00	131.00
	450mm diameter	Each	143.00	151.00
	500mm diameter	Each	174.00	184.00
	600mm diameter	Each	236.00	249.00
	700mm diameter	Each	308.00	326.00
	750mm diameter	Each	350.00	370.00
3.20	Labour for laying in position cast iron flanged Spigot. Excluding cost of the cast iron flanged spigot which is to be provided by the local body.		Medium Class	Heavy Class
	80mm diameter	Each	12.00	13.00
	100mm diameter	Each	14.00	15.00
	125mm diameter	Each	18.00	20.00
	150mm diameter	Each	22.00	25.00
	200mm diameter	Each	37.00	42.00
	250mm diameter	Each	50.00	56.00
	300mm diameter	Each	64.00	72.00
	350mm diameter	Each	81.00	91.00
	400mm diameter	Each	98.00	111.00
	450mm diameter	Each	116.00	131.00
	500mm diameter	Each	139.00	156.00

S.No.	Particulars of Items	Unit	Rates (in Rs.)	
	600mm diameter	Each	214.00	242.00
	700mm diameter	Each	278.00	314.00
	750mm diameter	Each	315.00	356.00
3.21	Labour for laying in position cast iron double flanged 90° Bend. Excluding cost of the cast iron double flanged 90 degree bend which is to be provided by the local body.		Medium Class	Heavy Class
	80mm diameter	Each	13.00	14.00
	100mm diameter	Each	17.00	18.00
	125mm diameter	Each	22.00	25.00
	150mm diameter	Each	31.00	33.00
	200mm diameter	Each	48.00	52.00
	250mm diameter	Each	69.00	77.00
	300mm diameter	Each	96.00	107.00
	350mm diameter	Each	131.00	146.00
	400mm diameter	Each	173.00	193.00
	450mm diameter	Each	214.00	241.00
	500mm diameter	Each	275.00	309.00
	600mm diameter	Each	418.00	471.00
	700mm diameter	Each	603.00	681.00
	750mm diameter	Each	712.00	805.00
3.22	Labour for laying in position cast iron double flanged 45° bend . Excluding cost of the cast iron double flanged 45 degree bend which is to be provided by the local body.			Heavy Class
	80mm diameter	Each		15.00
	100mm diameter	Each		19.00
	125mm diameter	Each		27.00
	150mm diameter	Each		36.00
	200mm diameter	Each		58.00
	250mm diameter	Each		85.00
	300mm diameter	Each		119.00
	350mm diameter	Each		123.00
	400mm diameter	Each		159.00
	450mm diameter	Each		197.00
	500mm diameter	Each		246.00
	600mm diameter	Each		364.00
	700mm diameter	Each		517.00
	750mm diameter	Each		610.00
3.23	Labour for laying in position cast iron double flanged 90° duck foot bend. Excluding cost of the cast iron double flanged 90 degree duck foot bend which is to be provided by the local body.		Medium Class	Heavy Class
	80mm diameter	Each	21.00	22.00
	100mm diameter	Each	27.00	28.00
	125mm diameter	Each	36.00	38.00
	150mm diameter	Each	48.00	50.00
	200mm diameter	Each	75.00	79.00
	250mm diameter	Each	111.00	118.00
	300mm diameter	Each	156.00	166.00
	350mm diameter	Each	213.00	228.00

S.No.	Particulars of Items	Unit	Rates (in Rs.)	
	400mm diameter	Each	279.00	299.00
	450mm diameter	Each	346.00	373.00
	500mm diameter	Each	441.00	475.00
	600mm diameter	Each	668.00	721.00
3.24	Labour for laying in position cast iron all flanged tees (all sizes in mm). Excluding cost of the cast iron double flanged tees (all sizes in mm) which is to be provided by the local body.		Medium Class	Heavy Class
	Body x Branch			
	80x80	Each	21.00	22.00
	100x80	Each	25.00	27.00
	100x100	Each	26.00	28.00
	125x80	Each	31.00	34.00
	125x100	Each	34.00	36.00
	125x125	Each	35.00	38.00
	150x80	Each	40.00	44.00
	150x100	Each	42.00	45.00
	150x125	Each	44.00	48.00
	150x150	Each	46.00	50.00
	200x80	Each	60.00	66.00
	200x100	Each	61.00	67.00
	200x125	Each	64.00	70.00
	200x150	Each	66.00	72.00
	200x200	Each	71.00	79.00
	250x80	Each	85.00	95.00
	250x100	Each	86.00	96.00
	250x125	Each	90.00	99.00
	250x150	Each	93.00	102.00
	250x200	Each	98.00	109.00
	250x250	Each	106.00	116.00
	300x80	Each	116.00	130.00
	300x100	Each	118.00	132.00
	300x125	Each	120.00	134.00
	300x150	Each	124.00	137.00
	300x200	Each	130.00	145.00
	300x250	Each	137.00	152.00
	300x300	Each	145.00	161.00
	350x200	Each	162.00	180.00
	350x250	Each	166.00	184.00
	350x300	Each	181.00	200.00
	350x350	Each	186.00	208.00
	400x200	Each	201.00	224.90
	400x250	Each	206.00	229.00

S.No.	Particulars of Items	Unit	Rates (in Rs.)	
	400x300	Each	222.00	247.00
	400x350	Each	228.00	255.00
	400x400	Each	236.00	262.00
	450x250	Each	247.00	277.00
	450x300	Each	263.00	295.00
	450x350	Each	270.00	303.00
	450x400	Each	276.00	309.00
	450x450	Each	282.00	315.00
	500x250	Each	299.00	336.00
	500x300	Each	318.00	356.00
	500x350	Each	325.00	364.00
	500x400	Each	332.00	372.00
	500x450	Each	339.00	379.00
	500x500	Each	346.00	387.00
	600x300	Each	441.00	497.00
	600x350	Each	452.00	506.00
	600x400	Each	460.00	517.00
	600x450	Each	467.00	524.00
	600x500	Each	474.00	532.00
	600x600	Each	491.00	550.00
	700x350	Each	607.00	684.00
	700x400	Each	616.00	694.00
	700x450	Each	626.00	703.00
	700x500	Each	634.00	713.00
	700x600	Each	651.00	731.00
	700x700	Each	674.00	753.00
	750x400	Each	705.00	795.00
	750x450	Each	714.00	804.00
	750x500	Each	726.00	816.00
	750x600	Each	740.00	830.00
	750x700	Each	753.00	844.00
	750x750	Each	767.00	858.00
	800x400	Each	812.00	914.00
	800x450	Each	821.00	924.00
	800x500	Each	830.00	935.00
	800x600	Each	850.00	956.00
	800x700	Each	871.00	976.00
	800x750	Each	882.00	989.00
	800x800	Each	896.00	1003.00
	900x450	Each	1029.00	1163.00
	900x500	Each	1044.00	1179.00
	900x600	Each	1066.00	1202.00
	900x700	Each	1087.00	1224.00
	900x750	Each	1100.00	1237.00
	900x800	Each	1113.00	1250.00

S.No.	Particulars of Items	Unit	Rates (in Rs.)	
	900x900	Each	1131.00	1268.00
3.25	Labour for laying in position cast iron double flanged Tapers (all sizes in mm). Excluding cost of the cast iron double flanged Tapers (all sizes in mm) which is to be provided by the local body.		Medium Class	Heavy Class
	Body x Branch			
	100x80	Each	12.00	13.00
	125x80	Each	19.00	21.00
	125x100	Each	21.00	23.00
	150x80	Each	22.00	25.00
	150x100	Each	25.00	27.00
	150x125	Each	27.00	29.00
	200x100	Each	31.00	33.00
	200x125	Each	33.00	36.00
	200x150	Each	36.00	39.00
	250x125	Each	40.00	44.00
	250x150	Each	43.00	47.00
	250x200	Each	49.00	53.00
	300x150	Each	50.00	54.00
	300x200	Each	56.00	62.00
	300x250	Each	64.00	69.00
	350x200	Each	84.00	93.00
	350x250	Each	93.00	102.00
	350x300	Each	102.00	113.00
	400x250	Each	104.00	116.00
	400x300	Each	115.00	128.00
	400x350	Each	127.00	141.00
	450x300	Each	125.00	139.00
	450x350	Each	140.00	155.00
	450x400	Each	152.00	168.00
	500x350	Each	153.00	171.00
	500x400	Each	167.00	185.00
	500x450	Each	179.00	198.00
	600x400	Each	202.00	224.00
	600x450	Each	213.00	237.00
	600x500	Each	230.00	255.00
	700x500	Each	271.00	299.00
	700x600	Each	306.00	338.00

S.No.	Particulars of Items	Unit	Rates (in Rs.)	
	750x600	Each	326.00	360.00
	750x700	Each	367.00	405.00
	800x600	Each	356.00	392.00
	800x700	Each	396.00	437.00
	800x750	Each	413.00	456.00
	900x700	Each	442.00	488.00
	900x750	Each	461.00	509.00
	900x800	Each	491.00	541.00
	1000x800	Each	552.00	607.00
	1000x900	Each	597.00	658.00
3.26	Labour for laying in position all flanged cast iron crosses . Excluding cost of the all flanged cast iron crosses which is to be provided by the local body.		Medium Class	Heavy Class
	80mm diameter	Each	27.00	29.00
	100mm diameter	Each	33.00	36.00
	125mm diameter	Each	44.00	49.00
	150mm diameter	Each	58.00	64.00
	200mm diameter	Each	90.00	99.00
	250mm diameter	Each	130.00	144.00
	300mm diameter	Each	176.00	192.00
3.27	Labour for laying in position cast iron blank flanges. Excluding cost of the cast iron blank flanges which is to be provided by the local body.			Heavy Class
	80mm diameter	Each		5.00
	100mm diameter	Each		6.00
	125mm diameter	Each		9.00
	150mm diameter	Each		12.00
	200mm diameter	Each		17.00
	250mm diameter	Each		25.00
	300mm diameter	Each		34.00
	350mm diameter	Each		46.00
	400mm diameter	Each		59.00
	450mm diameter	Each		71.00
	500mm diameter	Each		91.00
	600mm diameter	Each		134.00
	700mm diameter	Each		189.00
	750mm diameter	Each		221.00
	800mm diameter	Each		261.00
	900mm diameter	Each		334.00
	1000mm diameter	Each		433.00
3.28	Providing and laying in position sizes of flanged cast iron standard specials class medium or heavy which does not appear in above items of the schedule.		Medium Class	Heavy Class
	80mm to 300mm dia	Kg	62.00	62.00
	Above 300mm Dia	Kg	64.00	64.00

S.No.	Particulars of Items	Unit	Rates (in Rs.)
3.29	Labour for laying in position sizes of flanged cast iron standard specials which does not appear in above items of the schedule. Excluding the cost of the special which are to be provided by the local body.		
	80mm to 750mm	Kg	1.00

CHAPTER- 4
DUCTILE IRON PRESSURE PIPES AND SPECIALS WITH TYTON JOINTS

1 (i) Centrifugally cast (spun) Dutice Iron pressure pipes shall conform to IS 8329-2000 duly inspected and tested and having BIS certification mark.

(ii) The Cement Mortar lining in the pipe shall be as per IS - 11906-1986.

2 Ductile Iron fittings for pressure pipes shall conform to IS 9523-2000 duly inspected and tested and having BIS certification mark.

3 Rubber sealing rings shall conform to IS 5382-2000 duly inspected and tested and having BIS certification mark.

4 The laying of D.I. Pipe shall conform to IS - 12288 - 1987.

5 Permissible Deviation from a straight line :-

The pipes shall be reasonably straight. When the pipe is rolled along gantries, separated by distance approximately two-thirds the length of the pipe to be checked, the maximum deviation from a straight line in mm shall not be greater than 1.25 times the length L, in meters of the pipe; thus:

$$f_m \leq 1.25 \ x \ L$$

Where

f_m = maximum deviation from straight line, and

L = length of the pipe.

6 Marking on pipes

Each pipe shall have as cast or stamped or legibly and indelibly painted on it with the following appropriate marks:

(a) Indication of the source of manufacture:
(b) the nominal diameter
(c) Class reference :
(d) The last two digits of the year of manufacture:
(e) The non-standard length of the pipe if specially ordered:
(f) Where applicable, an indication of length over which the pipe is suitable for cutting on site: and
(g) A short white line at the spigot end of the Pipe with push-on joint in sizes DN 700 and above, to indicate the major axis of the spigot.
(h) on the socket faces of pipe centrifugally cast in metal mould, and
(i) on the outside of the socket or on the barrel of pipe centrifugally cast in sand mould.

7 Marking on fittings

Each fittings shall have as cast, stamped or indelibly painted on it, the following appropriate marks.

(a) Indication of the source of manufacture.
(b) The nominal diameter
(c) The last two digits of the year of manufacture.
(d) PN rating of flanges when applicable, and
(e) Any other mark required by the purchaser.
(f) Marking may be done on the barrel of castings or on the outside of the sockets.
(g) The fittings may also be marked with the Standard Mark.

8 Bedding of Pipes:

The trench bottom shall be even and smooth so as to provide a proper support for the pipe over its entire length, and shall be free from stones, lumps, roots and other hard objects that may endure the pipe or coating. Holes shall be dug in the trench bottom to accommodate sockets so as to ensure continuous contact between the trench and the entire pipe barrel between socket holes.

9 Laying of DI Pipes :-

9.1 Laying of pipes and fittings/specials includes all precautions to guard against possible damaged to the existing structure/pipes lines, cables etc., taking precautions to prevent dirt from entering the pipe ends, lowering and laying pipes and specials in the trenches with specials arrangement such as cranes, tripods with chain pulley block, use of slings of canvas etc. to fit the ends of pipes and fittings/ specials to lift and lower the same. Inspection of pipes and fittings for defects by striking with a light hammer while suspended. Laying of pipes perfectly true in alignment and to gradient etc.

9.2 Pipes should be lowered into the trench with tackle suitable for the weight of pipes. For smaller sizes, upto 200 mm nominal bore, the pipe may be lowered by the use of ropes but for heavier pipes suitable mechanical equipment have to be used.

10 Tolerance of Length

The tolerance on length of pipes shall be as follows:

Type of Casting	Tolerance mm
(i) Socket and spigot and plain ended pipes	± 100
(ii) Flanged pipes	± 10

11 As per prevailing excise duty norms there is excise duty exemption on certain diameter of Water Supply Pipes of different material class. All though in the computation of item rates for pipes, the rates are inclusive of excise duty but excise duty exemption shall be obtained as per prevailing rules for such pipes. This benefit shall be availed by the local bodies. All the concerned officers shall be responsible to get all the exemptions of such taxes and duties.

12 Rubber gasket

12.1 The material of rubber gaskets for use with mechanical joints and push-on-joints shall conform to IS : 5382, unless otherwise agreed between the manufacturer and the purchaser.

12.2 In the case of push-on-joints for sizes "DN 600" and above the sockets may be with or without centering rings.

12.3 Marking - Each sealing ring or packing or both shall be marked indelibly with :

(a) The manufacturer's name or trade-mark, if any:

(b) The month and year of manufacture: and

(c) The type followed by a word, 'Water'.

13 Tyton Joints (Rubber Ring Joints)

13.1 Tyton joint is sturdy push on type joint. The sockets of the pipes to receive tyton joints are specially designed to contain elongated grooved gasket. The inside contour of the socket bell provides a seat for the circular rubber ring in a modified bulb shaped gasket. An internal ridge in the socket fits into the groove of the gasket. A slight taper on the plain end (chamfer) of the pipe facilitates assembly.

13.2 Flanged Joints

Flanged cast iron pipes, screwed / welded flanged cast iron pipes and flanged specials are joint by means of flanges. The jointing material used between flanges shall be rubber insertion 3 mm thick. Each bolt should be tyton a little at a time taking care to tighten diametrically opposite bolts alternatively. The practice of fully tightening the bolts one after another is highly undesirable.

14 Measurement

All measurements should be of the finished work.

15 Rates

(i) The rates include charges for all tools and plant, chain pulley blocks, other appliances etc. required for lifting and laying of the pipes and specials in position as per approved drawings.

(ii) The rates include provision and use of all coverings etc. to protect the works from inclement weather etc. and from damages from fall of materials, and other causes.

(iii) The rate include provision of handling, storing under cover as required and returning of empty cases or container to U.A.D. Department stores without any extra cost, for such materials as may be supplied by the department.

(For Detail Refer to Specifications prepared by the Urban Administration and Development Department, IS Code & CPHEEO Manual)

CHAPTER 4- DUCTILE IRON PRESSURE PIPES AND SPECIAL WITH TYTON JOINTS

S. No.	Particulars of Items	Unit	Rate (in Rs.)
4.1	Providing, laying and jointing socket & spigot centrifugally cast (Spun) Ductile Iron pressure pipes with inside cement mortar lining (class K-7) conforming to IS 8329/2000 with suitable Rubber Gasket (Push on) joints as per IS:5382/85 including testing of joint (laying conforming to IS 12288 : 1987)		
	80mm diameter	Meter	943.00
	100mm diameter	Meter	999.00
	150mm diameter	Meter	1463.00
	200mm diameter	Meter	1867.00
	250mm diameter	Meter	2443.00
	300mm diameter	Meter	3086.00
	350mm diameter	Meter	3856.00
	400mm diameter	Meter	4577.00
	450mm diameter	Meter	5419.00
	500mm diameter	Meter	6261.00
	600mm diameter	Meter	8297.00
	700mm diameter	Meter	10969.00
	750mm diameter	Meter	13339.00
	800mm diameter	Meter	14506.00
	900mm diameter	Meter	17889.00
	1000mm diameter	Meter	21489.00
4.2	Labour for laying in position socket & spigot Ductile Iron(k-7) pressure pipes. [Conform to IS 12288:1987]		
	80mm diameter	Meter	8.00
	100mm diameter	Meter	9.00
	150mm diameter	Meter	14.00
	200mm diameter	Meter	19.00
	250mm diameter	Meter	25.00
	300mm diameter	Meter	31.00
	350mm diameter	Meter	42.00
	400mm diameter	Meter	50.00
	450mm diameter	Meter	60.00
	500mm diameter	Meter	68.00
	600mm diameter	Meter	94.00
	700mm diameter	Meter	122.00
	750mm diameter	Meter	134.00
	800mm diameter	Meter	153.00
	900mm diameter	Meter	183.00
	1000mm diameter	Meter	227.00
4.3	Providing, laying and jointing socket & spigot centrifugally cast (Spun) Ductile Iron pressure pipes with inside cement mortar lining (class K-9) conforming to IS 8329/2000 with suitable Rubber Gasket (Push on) joints as per IS:5382/85 including testing of joint (laying conforming to IS 12288 : 1987)		
	80mm diameter	Meter	1037.00

S. No.	Particulars of Items	Unit	Rate (in Rs.)
	100mm diameter	Meter	1097.00
	150mm diameter	Meter	1613.00
	200mm diameter	Meter	2156.00
	250mm diameter	Meter	2884.00
	300mm diameter	Meter	3647.00
	350mm diameter	Meter	4550.00
	400mm diameter	Meter	5472.00
	450mm diameter	Meter	6471.00
	500mm diameter	Meter	7510.00
	600mm diameter	Meter	9788.00
	700mm diameter	Meter	12149.00
	750mm diameter	Meter	13537.00
	800mm diameter	Meter	14888.00
	900mm diameter	Meter	18248.00
	1000mm diameter	Meter	21981.00
4.4	Labour for laying in position socket & spigot Ductile Iron (k-9) pressure pipes. [Conform to IS 12288:1987]		
	80mm diameter	Meter	10.00
	100mm diameter	Meter	11.00
	150mm diameter	Meter	16.00
	200mm diameter	Meter	22.00
	250mm diameter	Meter	30.00
	300mm diameter	Meter	38.00
	350mm diameter	Meter	50.00
	400mm diameter	Meter	60.00
	450mm diameter	Meter	71.00
	500mm diameter	Meter	81.00
	600mm diameter	Meter	111.00
	700mm diameter	Meter	138.00
	750mm diameter	Meter	153.00
	800mm diameter	Meter	166.00
	900mm diameter	Meter	205.00
	1000mm diameter	Meter	245.00
4.5	Jointing DI pipes class k-7 and k-9 including testing of joints and cost of jointing materials (rubber ISI marked Gasket (push on) joint as per IS-5382/85 and soap solution etc.)		
	80mm diameter	Each	74.00
	100mm diameter	Each	66.00
	150mm diameter	Each	98.00
	200mm diameter	Each	138.00
	250mm diameter	Each	183.00
	300mm diameter	Each	233.00
	350mm diameter	Each	267.00
	400mm diameter	Each	340.00
	450mm diameter	Each	376.00
	500mm diameter	Each	472.00
	600mm diameter	Each	577.00

S. No.	Particulars of Items	Unit	Rate (in Rs.)
	700mm diameter	Each	775.00
	750mm diameter	Each	887.00
	800mm diameter	Each	995.00
	900mm diameter	Each	1093.00
	1000mm diameter	Each	1381.00
4.6	Labour Charges for jointing D.I. Pipes class K7 & K9 including joints but excluding cost of Rubber Gasket. (push on) [Conform to IS 12288:1987]		
	80mm diameter	Each	41.00
	100mm diameter	Each	31.00
	150mm diameter	Each	48.00
	200mm diameter	Each	62.00
	250mm diameter	Each	76.00
	300mm diameter	Each	90.00
	350mm diameter	Each	97.00
	400mm diameter	Each	107.00
	450mm diameter	Each	117.00
	500mm diameter	Each	131.00
	600mm diameter	Each	138.00
	700mm diameter	Each	152.00
	750mm diameter	Each	166.00
	800mm diameter	Each	173.00
	900mm diameter	Each	180.00
	1000mm diameter	Each	193.00
4.7	Providing and Laying ductile iron PN-16 type flanged sockets conforming to IS-9523/2000 having dimension as per table 23 of IS-9523/2000 in the nominal diameter/sizes with external bitumen coating and internal cement mortar lining with finishing as per clause 13 of IS-9523/2000. (laying conforming to IS 12288 : 1987)		
	80mm	Each	573.00
	100mm	Each	650.00
	150mm	Each	990.00
	200mm	Each	1515.00
	250mm	Each	2048.00
	300mm	Each	2733.00
	350mm	Each	3985.00
	400mm	Each	5026.00
	450mm	Each	5901.00
	500mm	Each	7452.00
	600mm	Each	10803.00
	700mm	Each	16374.00
	750mm	Each	18619.00
	800mm	Each	21161.00
	900mm	Each	26405.00
	1000mm	Each	34306.00

S. No.	Particulars of Items	Unit	Rate (in Rs.)
4.8	Labour charges only for Laying Ductile Iron PN-16 type flanged sockets conforming to IS-9523/2000 having dimension as per table 23 of IS-9523/2000 in the nominal diameter/sizes with external bitumen coating and internal cement mortar lining with finishing as per clause 13 of IS-9523/2000. (laying conforming to IS 12288 : 1987)		
	80mm	Each	16.00
	100mm	Each	17.00
	150mm	Each	23.00
	200mm	Each	27.00
	250mm	Each	39.00
	300mm	Each	54.00
	350mm	Each	74.00
	400mm	Each	95.00
	450mm	Each	120.00
	500mm	Each	140.00
	600mm	Each	174.00
	700mm	Each	267.00
	750mm	Each	329.00
	800mm	Each	378.00
	900mm	Each	426.00
	1000mm	Each	533.00
4.9	Providing and Laying ductile PN-16 type iron flanged spigot conforming to IS-9523/2000 having dimension as per table 24 of IS-9523/2000 in the nominal diameter/sizes with external bitumen coating and internal cement mortar lining with finishing as per clause 13 of IS-9523/2000. (laying conforming to IS 12288 : 1987)		
	80mm	Each	573.00
	100mm	Each	687.00
	150mm	Each	1027.00
	200mm	Each	1590.00
	250mm	Each	2271.00
	300mm	Each	3027.00
	350mm	Each	4572.00
	400mm	Each	5866.00
	450mm	Each	6907.00
	500mm	Each	8618.00
	600mm	Each	12468.00
	700mm	Each	18908.00
	750mm	Each	21278.00
	800mm	Each	23730.00
	900mm	Each	28954.00
	1000mm	Each	35816.00

S. No.	Particulars of Items	Unit	Rate (in Rs.)
4.10	Labour only for Laying Ductile Iron PN-16 type flanged Spigot conforming to IS-9523/2000 having dimension as per table 24 of IS-9523/2000 in the nominal diameter/sizes with external bitumen coating and internal cement mortar lining with finishing as per clause 13 of IS-9523/2000. (laying conforming to IS 12288 : 1987)		
	80mm	Each	16.00
	100mm	Each	17.00
	150mm	Each	23.00
	200mm	Each	27.00
	250mm	Each	39.00
	300mm	Each	50.00
	350mm	Each	66.00
	400mm	Each	85.00
	450mm	Each	105.00
	500mm	Each	116.00
	600mm	Each	140.00
	700mm	Each	204.00
	750mm	Each	287.00
	800mm	Each	349.00
	900mm	Each	378.00
	1000mm	Each	485.00
4.11	Providing & laying Ductile iron Mechanical joint collar with follower glands conforming to IS-9523/2000 having dimension as per table 24 of IS-9523/2000 in the nominal diameter/sizes with external bitumen coating and internal cement mortar lining. (laying conforming to IS 12288 : 1987)		
	80mm	Each	1747.00
	100mm	Each	2074.00
	150mm	Each	3240.00
	200mm	Each	4161.00
	250mm	Each	6044.00
	300mm	Each	7930.00
	350mm	Each	11900.00
	400mm	Each	14528.00
	450mm	Each	16865.00
	500mm	Each	19908.00
	600mm	Each	25711.00
	700mm	Each	32565.00
	750mm	Each	35499.00
	800mm	Each	40617.00
	900mm	Each	50869.00
	1000mm	Each	68177.00

S. No.	Particulars of Items	Unit	Rate (in Rs.)
4.12	Labour only for Laying Ductile Iron Mechanical Joint collar with follower glands conforming to IS-9523/2000 having dimension as per table 24 of IS-9523/2000 in the nominal diameter/sizes with external bitumen coating and internal cement mortar lining. (laying conforming to IS 12288 : 1987)		
	80mm	Each	26.00
	100mm	Each	31.00
	150mm	Each	50.00
	200mm	Each	61.00
	250mm	Each	83.00
	300mm	Each	107.00
	350mm	Each	146.00
	400mm	Each	185.00
	450mm	Each	215.00
	500mm	Each	248.00
	600mm	Each	314.00
	700mm	Each	470.00
	750mm	Each	536.00
	800mm	Each	620.00
	900mm	Each	744.00
	1000mm	Each	949.00
4.13	Providing & Laying Ductile Iron Double Socket 90° Bends conforming to IS-9523/2000 having dimension as per table 15 of IS-9523/2000 in the following nominal diameter/sizes with external bitumen coating and internal cement mortar lining. (laying conforming to IS 12288 : 1987)		
	80mm	Each	645.00
	100mm	Each	760.00
	125mm	Each	1064.00
	150 mm	Each	1517.00
	200mm	Each	2352.00
	250mm	Each	3342.00
	300mm	Each	5157.00
	350mm	Each	8632.00
	400mm	Each	9688.00
	450mm	Each	11269.00
	500mm	Each	16421.00
	600mm	Each	22766.00
	700mm	Each	39041.00
	750mm	Each	46957.00
	800mm	Each	53224.00
	900mm	Each	69645.00
	1000mm	Each	94966.00
4.14	Labour charges for Laying Ductile Iron Double Socket 90° Bends conforming to IS-9523/2000 having dimension as per table 15 of IS-9523/2000 in the nominal diameter/sizes with external bitumen coating and internal cement mortar lining. (laying conforming to IS 12288 : 1987)		

S. No.	Particulars of Items	Unit	Rate (in Rs.)
	80mm	Each	13.00
	100mm	Each	16.00
	125mm	Each	22.00
	150 mm	Each	29.00
	200mm	Each	46.00
	250mm	Each	69.00
	300mm	Each	98.00
	350mm	Each	130.00
	400mm	Each	166.00
	450mm	Each	216.00
	500mm	Each	267.00
	600mm	Each	405.00
	700mm	Each	591.00
	750mm	Each	714.00
	800mm	Each	793.00
	900mm	Each	1060.00
	1000mm	Each	1443.00
4.15	Providing & Laying Ductile Iron Double Socket 45° Bends conforming to IS-9523/2000 having dimension as per table 16 of IS-9523/2000 in the nominal diameter/sizes with external bitumen coating and internal cement mortar lining. (laying conforming to IS 12288 : 1987)		
	80mm	Each	569.00
	100mm	Each	758.00
	125mm	Each	911.00
	150 mm	Each	1027.00
	200mm	Each	1900.00
	250mm	Each	2730.00
	300mm	Each	3792.00
	350mm	Each	4770.00
	400mm	Each	6074.00
	450mm	Each	9001.00
	500mm	Each	12182.00
	600mm	Each	15420.00
	700mm	Each	27096.00
	750mm	Each	32289.00
	800mm	Each	36073.00
	900mm	Each	47484.00
	1000mm	Each	61410.00
4.16	Labour charges for Laying Ductile Iron Double Socket 45° Bends conforming to IS-9523/2000 having dimension as per table 16 of IS-9523/2000 in the nominal diameter/sizes with external bitumen coating and internal cement mortar lining. (laying conforming to IS 12288 : 1987)		
	80mm	Each	12.00
	100mm	Each	14.00
	125mm	Each	19.00
	150 mm	Each	23.00
	200mm	Each	40.00

S. No.	Particulars of Items	Unit	Rate (in Rs.)
	250mm	Each	52.00
	300mm	Each	72.00
	350mm	Each	94.00
	400mm	Each	123.00
	450mm	Each	159.00
	500mm	Each	195.00
	600mm	Each	286.00
	700mm	Each	390.00
	750mm	Each	490.00
	800mm	Each	534.00
	900mm	Each	721.00
	1000mm	Each	932.00
4.17	Providing & Laying Ductile Iron Double Socket 22.5° Bends conforming to IS-9523/2000 having dimension as per table 17 of IS-9523/2000 in the nominal diameter/sizes with external bitumen coating and internal cement mortar lining. (laying conforming to IS 12288 : 1987)		
	80mm	Each	531.00
	100mm	Each	609.00
	125mm	Each	761.00
	150 mm	Each	989.00
	200mm	Each	1634.00
	250mm	Each	2315.00
	300mm	Each	3151.00
	350mm	Each	3734.00
	400mm	Each	5373.00
	450mm	Each	5820.00
	500mm	Each	8226.00
	600mm	Each	9326.00
	700mm	Each	18384.00
	750mm	Each	24268.00
	800mm	Each	27533.00
	900mm	Each	34715.00
	1000mm	Each	45584.00
4.18	Labour charges for Laying Ductile Iron Double Socket 22.5° Bends conforming to IS-9523/2000 having dimension as per table 17 of IS-9523/2000 in the nominal diameter/sizes with external bitumen coating and internal cement mortar lining. (laying conforming to IS 12288 : 1987)		
	80mm	Each	10.00
	100mm	Each	13.00
	125mm	Each	17.00
	150 mm	Each	22.00
	200mm	Each	35.00
	250mm	Each	46.00
	300mm	Each	63.00
	350mm	Each	78.00
	400mm	Each	101.00

S. No.	Particulars of Items	Unit	Rate (in Rs.)
	450mm	Each	124.00
	500mm	Each	149.00
	600mm	Each	228.00
	700mm	Each	303.00
	750mm	Each	368.00
	800mm	Each	411.00
	900mm	Each	527.00
	1000mm	Each	692.00
4.19	Providing & Laying Ductile Iron Double Socket 11.25° bends conforming to IS-9523/2000 having dimension as per table 18 of IS-9523/2000 in the nominal diameter/sizes with external bitumen coating and internal cement mortar lining. (laying conforming to IS 12288 : 1987)		
	80mm	Each	531.00
	100mm	Each	645.00
	125mm	Each	835.00
	150 mm	Each	987.00
	200mm	Each	1480.00
	250mm	Each	2201.00
	300mm	Each	2884.00
	350mm	Each	3383.00
	400mm	Each	4250.00
	450mm	Each	5132.00
	500mm	Each	7527.00
	600mm	Each	9288.00
	700mm	Each	17083.00
	750mm	Each	20047.00
	800mm	Each	22783.00
	900mm	Each	28490.00
	1000mm	Each	36088.00
4.20	Labour charges for Laying Ductile Iron Double Socket 11.25° bends conforming to IS-9523/2000 having dimension as per table 18 of IS-9523/2000 in the nominal diameter/sizes with external bitumen coating and internal cement mortar lining. (laying conforming to IS 12288 : 1987)		
	80mm	Each	10.00
	100mm	Each	13.00
	125mm	Each	16.00
	150 mm	Each	20.00
	200mm	Each	30.00
	250mm	Each	43.00
	300mm	Each	58.00
	350mm	Each	68.00
	400mm	Each	84.00
	450mm	Each	115.00
	500mm	Each	130.00
	600mm	Each	190.00
	700mm	Each	248.00
	750mm	Each	303.00

S. No.	Particulars of Items	Unit	Rate (in Rs.)
	800mm	Each	338.00
	900mm	Each	433.00
	1000mm	Each	548.00
4.21	Providing & Laying Ductile Iron All socket Tees conforming to IS-9523/2000 having dimension as per table 21 of IS-9523/2000 in the nominal diameter/sizes with external bitumen coating and internal cement mortar lining with finishing as per clause 13 of IS-9523/2000. (laying conforming to IS 12288 : 1987) (All sizes in mm)		
	80x80	Each	1170.00
	100x80	Each	1366.00
	100x100	Each	1462.00
	150x80	Each	1950.00
	150x100	Each	2145.00
	150x150	Each	2535.00
	200x80	Each	2828.00
	200x100	Each	3024.00
	200x150	Each	3511.00
	200x200	Each	3903.00
	250x80	Each	3750.00
	250x100	Each	4055.00
	250x150	Each	4561.00
	250x250	Each	5777.00
	300x100	Each	5169.00
	300x200	Each	6499.00
	300x300	Each	7912.00
4.22	Labour charges for Laying Ductile Iron All socket Tees conforming to IS-9523/2000 having dimension as per table 21 of IS-9523/2000 in the nominal diameter/sizes with external bitumen coating and internal cement mortar lining. (laying conforming to IS 12288 : 1987) (All sizes in mm)		
	80x80	Each	18.00
	100x80	Each	21.00
	100x100	Each	22.00
	150x80	Each	30.00
	150x100	Each	33.00
	150x150	Each	39.00
	200x80	Each	43.00
	200x100	Each	46.00
	200x150	Each	54.00

S. No.	Particulars of Items	Unit	Rate (in Rs.)
	200x200	Each	62.00
	250x80	Each	55.00
	250x100	Each	60.00
	250x150	Each	67.00
	250x250	Each	85.00
	300x100	Each	76.00
	300x200	Each	107.00
	300x300	Each	122.00
4.23	Providing & Laying Ductile Iron Double Socket branch flange Tee conforming to IS-9523/2000 having dimension as per table 21 of IS-9523/2000 in the nominal diameter/sizes with external bitumen coating and internal cement mortar lining with finishing as per clause 13 of IS-9523/2000. (laying conforming to IS 12288 : 1987) (All sizes in mm)		
	80x80	Each	912.00
	100x80	Each	989.00
	100x100	Each	1141.00
	150x80	Each	1519.00
	150x100	Each	1559.00
	150x150	Each	2125.00
	200x80	Each	2052.00
	200x100	Each	2428.00
	200x150	Each	2659.00
	200x200	Each	3190.00
	250x80	Each	2510.00
	250x100	Each	2811.00
	250x150	Each	3421.00
	250x200	Each	4395.00
	250x250	Each	4556.00
	300x80	Each	5241.00
	300x100	Each	3647.00
	300x150	Each	6198.00
	300x200	Each	4415.00
	300x250	Each	8068.00
	300x300	Each	6456.00
	350x100	Each	5106.00
	350x200	Each	6492.00
	350x350	Each	9356.00
	400x80	Each	9182.00
	400x100	Each	5892.00

S. No.	Particulars of Items	Unit	Rate (in Rs.)
	400x150	Each	6930.00
	400x200	Each	7367.00
	400x300	Each	9100.00
	400x400	Each	11956.00
	450x100	Each	7190.00
	450x250	Each	9534.00
	500x100	Each	8232.00
	500x200	Each	9118.00
	500x400	Each	14731.00
	500x500	Each	18023.00
	600x200	Each	13861.00
4.24	Labour charges for Laying Ductile Iron Double Socketed Branch Flange Tee Conforming to IS-9523/2000 having dimension as per table 21 of IS-9523/2000 in the nominal diameter/sizes with external bitumen coating and internal cement mortar lining. (laying conforming to IS 12288 : 1987) (All sizes in mm)		
	80x80	Each	19.00
	100x80	Each	22.00
	100x100	Each	25.00
	150x80	Each	31.00
	150x100	Each	34.00
	150x150	Each	42.00
	200x80	Each	43.00
	200x100	Each	47.00
	200x150	Each	55.00
	200x200	Each	65.00
	250x80	Each	55.00
	250x100	Each	58.00
	250x150	Each	73.00
	250x200	Each	80.00
	250x250	Each	92.00
	300x80	Each	71.00
	300x100	Each	76.00
	300x150	Each	86.00
	300x200	Each	99.00
	300x250	Each	113.00
	300x300	Each	132.00
	350x100	Each	89.00
	350x200	Each	116.00

S. No.	Particulars of Items	Unit	Rate (in Rs.)
	350x350	Each	174.00
	400x80	Each	104.00
	400x100	Each	110.00
	400x150	Each	128.00
	400x200	Each	139.00
	400x300	Each	172.00
	400x400	Each	223.00
	450x100	Each	132.00
	450x250	Each	181.00
	500x100	Each	154.00
	500x200	Each	190.00
	500x400	Each	276.00
	500x500	Each	337.00
	600x200	Each	257.00
4.25	Providing & Laying Ductile Iron Double Socket Reducer conforming to IS-9523/2000 having dimension as per table 21 of IS-9523/2000 in the nominal diameter/sizes with external bitumen coating and internal cement mortar lining with finishing as per clause 13 of IS-9523/2000. (laying conforming to IS 12288 : 1987) (All sizes in mm)		
	100x80	Each	645.00
	150x80	Each	913.00
	150x100	Each	952.00
	200x100	Each	1445.00
	200x150	Each	1559.00
	250x150	Each	1981.00
	300x150	Each	3186.00
	300x200	Each	3037.00
	300x250	Each	2214.00
	350x200	Each	4588.00
	350x250	Each	3991.00
	350x300	Each	3564.00
	400x250	Each	4858.00
	400x300	Each	4813.00
	400x350	Each	4761.00
	450x350	Each	6064.00
	450x400	Each	5548.00

S. No.	Particulars of Items	Unit	Rate (in Rs.)
	500x350	Each	7970.00
	500x400	Each	7793.00
	600x400	Each	11272.00
	600x500	Each	10226.00
4.26	Labour charges for Laying ductile iron double socket reducer conforming to IS-9523/2000 having dimension as per table 20 of IS-9523/2000 in the nominal diameter/sizes with external bitumen coating and internal cement mortar lining with finishing as per clause 13 of IS-9523/2000. (laying conforming to IS 12288 : 1987) (All sizes in mm)		
	100x80	Each	12.00
	150x80	Each	20.00
	150x100	Each	22.00
	200x100	Each	31.00
	200x150	Each	34.00
	250x150	Each	47.00
	300x150	Each	61.00
	300x200	Each	61.00
	300x250	Each	56.00
	350x200	Each	81.00
	350x250	Each	79.00
	350x300	Each	78.00
	400x250	Each	97.00
	400x300	Each	94.00
	400x350	Each	84.00
	450x350	Each	112.00
	450x400	Each	106.00
	500x350	Each	148.00
	500x400	Each	140.00
	600x400	Each	218.00
	600x500	Each	193.00

S. No.	Particulars of Items	Unit	Rate (in Rs.)
4.27	Providing and Laying ductile iron PN-10 type flanged sockets conforming to IS-9523/2000 having dimension as per table 23 of IS-9523/2000 in the nominal diameter/sizes with external bitumen coating and internal cement mortar lining with finishing as per clause 13 of IS-9523/2000. (laying conforming to IS 12288 : 1987)		
	80mm	Each	543.00
	100mm	Each	616.00
	150mm	Each	942.00
	200mm	Each	1447.00
	250mm	Each	1952.00
	300mm	Each	2601.00
	350mm	Each	3789.00
	400mm	Each	4775.00
	450mm	Each	5593.00
	500mm	Each	7067.00
	600mm	Each	10272.00
	700mm	Each	15608.00
	750mm	Each	17767.00
	800mm	Each	20142.00
	900mm	Each	25188.00
	1000mm	Each	32737.00
4.28	Labour only for Laying Ductile Iron PN-10 type flanged sockets conforming to IS-9523/2000 having dimension as per table 23 of IS-9523/2000 in the nominal diameter/sizes with external bitumen coating and internal cement mortar lining with finishing as per clause 13 of IS-9523/2000. (laying conforming to IS 12288 : 1987)		
	80mm	Each	13.00
	100mm	Each	15.00
	150mm	Each	23.00
	200mm	Each	33.00
	250mm	Each	43.00
	300mm	Each	57.00
	350mm	Each	73.00
	400mm	Each	90.00
	450mm	Each	100.00
	500mm	Each	120.00
	600mm	Each	175.00
	700mm	Each	305.00
	750mm	Each	391.00
	800mm	Each	397.00
	900mm	Each	506.00
	1000mm	Each	651.00

S. No.	Particulars of Items	Unit	Rate (in Rs.)
4.29	Providing and Laying ductile PN-10 type iron flanged spigot conforming to IS-9523/2000 having dimension as per table 24 of IS-9523/2000 in the nominal diameter/sizes with external bitumen coating and internal cement mortar lining with finishing as per clause 13 of IS-9523/2000. (laying conforming to IS 12288 : 1987)		
	80mm	Each	545.00
	100mm	Each	654.00
	150mm	Each	983.00
	200mm	Each	1526.00
	250mm	Each	2178.00
	300mm	Each	2901.00
	350mm	Each	4377.00
	400mm	Each	5610.00
	450mm	Each	6606.00
	500mm	Each	8251.00
	600mm	Each	11958.00
	700mm	Each	18207.00
	750mm	Each	20425.00
	800mm	Each	22723.00
	900mm	Each	27807.00
	1000mm	Each	34365.00
4.30	Labour only for Laying Ductile Iron PN-10 type flanged Spigot conforming to IS-9523/2000 having dimension as per table 24 of IS-9523/2000 in the nominal diameter/sizes with external bitumen coating and internal cement mortar lining with finishing as per clause 13 of IS-9523/2000. (laying conforming to IS 12288 : 1987)		
	80mm	Each	14.00
	100mm	Each	18.00
	150mm	Each	29.00
	200mm	Each	41.00
	250mm	Each	58.00
	300mm	Each	74.00
	350mm	Each	95.00
	400mm	Each	117.00
	450mm	Each	144.00
	500mm	Each	173.00
	600mm	Each	245.00
	700mm	Each	436.00
	750mm	Each	482.00
	800mm	Each	509.00
	900mm	Each	657.00
	1000mm	Each	797.00

S. No.	Particulars of Items	Unit	Rate (in Rs.)
4.31	Providing, Laying & Jointing of welded double flanged centrifugal cast (spun) ductile Iron pressure pipes conforming to IS:8329/2000 in the length of 1m. for class K-9 with inside cement mortar lining for the sizes/dia pipes. (laying conforming to IS 12288 : 1987)		
	100mm	Each	4232.00
	150mm	Each	5720.00
	200mm	Each	8068.00
	250mm	Each	10232.00
	300mm	Each	13063.00
	350mm	Each	18654.00
	400mm	Each	23273.00
	450mm	Each	29117.00
	500mm	Each	32701.00
	600mm	Each	44333.00
	700mm	Each	55056.00
4.32	Providing, Laying & jointing of welded double flanged centrifugal cast (spun) ductile Iron pressure pipes conforming to IS:8329/2000 in the length of 2m. for class K-9 with inside cement mortar, lining for the sizes/dia pipes. (laying conforming to IS 12288 : 1987)		
	100mm	Each	5414.00
	150mm	Each	7453.00
	200mm	Each	10450.00
	250mm	Each	13430.00
	300mm	Each	17102.00
	350mm	Each	23652.00
	400mm	Each	29232.00
	450mm	Each	36173.00
	500mm	Each	40922.00
	600mm	Each	55121.00
	700mm	Each	68761.00
4.33	Providing , Laying and Jointing of welded double flanged centrifugal cast (spun) ductile Iron pressure pipes conforming to IS:8329/2000 in the length of 3m for class K-9 with inside cement mortar, lining for the sizes/dia pipes. (laying conforming to IS 12288 : 1987)		
	100mm	Each	6634.00
	150mm	Each	9238.00
	200mm	Each	12907.00
	250mm	Each	16721.00
	300mm	Each	21260.00
	350mm	Each	28821.00
	400mm	Each	35406.00
	450mm	Each	43497.00
	500mm	Each	49444.00

S. No.	Particulars of Items	Unit	Rate (in Rs.)
	600mm	Each	66318.00
	700mm	Each	82972.00
4.34	Providing, Laying and Jointing welded double flanged centrifugal cast (spun) ductile Iron pressure pipes conforming to IS 8329/2000 in the length of 4m for class K-9 with inside cement mortar lining for the sizes/dia pipes. (laying conforming to IS 12288 : 1987)		
	100mm	Each	7855.00
	150mm	Each	11023.00
	200mm	Each	15363.00
	250mm	Each	20012.00
	300mm	Each	25418.00
	350mm	Each	33990.00
	400mm	Each	41580.00
	450mm	Each	50821.00
	500mm	Each	57966.00
	600mm	Each	77515.00
	700mm	Each	97183.00
4.35	Providing, Laying and Jointing welded double flanged centrifugal cast (spun) ductile Iron pressure pipes conforming to IS:8329/2000 in the length of 4.5m. for class K-9 with inside cement mortar lining for the sizes/dia pipes. (laying conforming to IS 12288 : 1987)		
	100mm	Each	8466.00
	150mm	Each	11915.00
	200mm	Each	16592.00
	250mm	Each	21656.00
	300mm	Each	27497.00
	350mm	Each	36574.00
	400mm	Each	44667.00
	450mm	Each	54483.00
	500mm	Each	62226.00
	600mm	Each	83114.00
	700mm	Each	104249.00
4.36	Providing, Laying and Jointing welded double flanged centrifugal cast (spun) ductile Iron pressure pipes conforming to IS:8329/2000 in the length of 5m. for class K-9 with inside cement mortar lining for the sizes/dia pipes. (laying conforming to IS 12288 : 1987)		
	100mm	Each	9078.00
	150mm	Each	12810.00
	200mm	Each	17824.00
	250mm	Each	23313.00
	300mm	Each	29590.00
	350mm	Each	39197.00

S. No.	Particulars of Items	Unit	Rate (in Rs.)
	400mm	Each	47808.00
	450mm	Each	58220.00
	500mm	Each	66597.00
	600mm	Each	88879.00
	700mm	Each	111561.00
4.37	Providing, Laying and Jointing of welded double flanged centrifugal cast (spun) ductile Iron pressure pipes conforming to IS:8329/2000 in the length of 5.2m. for class K-9 with inside cement mortar lining for the sizes/dia pipes. (laying conforming to IS 12288 : 1987)		
	100mm	Each	9322.00
	150mm	Each	13168.00
	200mm	Each	18315.00
	250mm	Each	23970.00
	300mm	Each	30422.00
	350mm	Each	40230.00
	400mm	Each	49042.00
	450mm	Each	59684.00
	500mm	Each	68301.00
	600mm	Each	91118.00
	700mm	Each	114404.00
4.38	Labour only for Laying welded double flanged centrifugal cast (spun) ductile Iron pressure pipes conforming to IS:8329/2000 in the length of 1m. for class K-9 with inside cement mortar lining for the sizes/dia pipes. (laying conforming to IS 12288 : 1987)		
	100mm	Each	42.00
	150mm	Each	63.00
	200mm	Each	85.00
	250mm	Each	114.00
	300mm	Each	147.00
	350mm	Each	175.00
	400mm	Each	207.00
	450mm	Each	245.00
	500mm	Each	284.00
	600mm	Each	382.00
	700mm	Each	489.00
4.39	Labour only for Laying welded double flanged centrifugal cast (spun) ductile Iron pressure pipes confirming to IS: 8329/2000 in the length of 2m. for class K-9 with inside cement mortar lining for the sizes/dia pipes. (laying conforming to IS 12288 : 1987)		
	100mm	Each	69.00
	150mm	Each	103.00
	200mm	Each	140.00

S. No.	Particulars of Items	Unit	Rate (in Rs.)
	250mm	Each	182.00
	300mm	Each	232.00
	350mm	Each	260.00
	400mm	Each	301.00
	450mm	Each	344.00
	500mm	Each	377.00
	600mm	Each	481.00
	700mm	Each	660.00
4.40	Labour only for Laying welded double flanged centrifugal cast (spun) ductile Iron pressure pipes conforming to IS: 8329/2000 in the length of 3m. for class K-9 with inside cement mortar, lining for the sizes/dia pipes. (laying conforming to IS 12288 : 1987)		
	100mm	Each	96.00
	150mm	Each	143.00
	200mm	Each	195.00
	250mm	Each	250.00
	300mm	Each	317.00
	350mm	Each	344.00
	400mm	Each	394.00
	450mm	Each	443.00
	500mm	Each	470.00
	600mm	Each	579.00
	700mm	Each	831.00
4.41	Labour only for Laying welded double flanged centrifugal cast (spun) ductile Iron pressure pipes conforming to IS: 8329/2000 in the length of 4m. for class K-9 with inside cement mortar, lining for the sizes/dia pipes. (laying conforming to IS 12288 : 1987)		
	100mm	Each	123.00
	150mm	Each	183.00
	200mm	Each	250.00
	250mm	Each	318.00
	300mm	Each	402.00
	350mm	Each	429.00
	400mm	Each	487.00
	450mm	Each	542.00
	500mm	Each	563.00
	600mm	Each	678.00
	700mm	Each	1001.00
4.42	Labour only for Laying and Jointing welded double flanged centrifugal cast (spun) ductile Iron pressure pipes conforming to IS: 8329/2000 in the length of 4.5m. for class K-9 with inside cement mortar, lining for the sizes/dia pipe. (laying conforming to IS 12288 : 1987)		
	100mm	Each	136.00

S. No.	Particulars of Items	Unit	Rate (in Rs.)
	150mm	Each	204.00
	200mm	Each	277.00
	250mm	Each	352.00
	300mm	Each	445.00
	350mm	Each	471.00
	400mm	Each	533.00
	450mm	Each	592.00
	500mm	Each	610.00
	600mm	Each	728.00
	700mm	Each	1086.00
4.43	Labour only for Laying welded double flanged centrifugal cast (spun) ductile Iron pressure pipes conforming to IS: 8329/2000 in the length of 5m. for class K-9 with inside cement mortar lining for the sizes/dia pipes. (laying conforming to IS 12288 : 1987)		
	100mm	Each	159.00
	150mm	Each	234.00
	200mm	Each	322.00
	250mm	Each	438.00
	300mm	Each	557.00
	350mm	Each	704.00
	400mm	Each	848.00
	450mm	Each	1019.00
	500mm	Each	1205.00
	600mm	Each	1616.00
	700mm	Each	2012.00
4.44	Labour only for Laying welded double flanged centrifugal cast (spun) ductile Iron pressure pipes conforming to IS:8329/2000 in the length of 5.2m for class K-9 with inside cement mortar lining for the sizes/dia pipes. (laying conforming to IS 12288 : 1987)		
	100mm	Each	165.00
	150mm	Each	242.00
	200mm	Each	333.00
	250mm	Each	451.00
	300mm	Each	574.00
	350mm	Each	721.00
	400mm	Each	867.00
	450mm	Each	1039.00
	500mm	Each	1224.00
	600mm	Each	1636.00
	700mm	Each	2046.00

CHAPTER- 5
UNPLASTICIZED PVC PIPES & FITTINGS FOR POTABLE WATER SUPPLY

1 Unplasticized PVC pipes for potable water supply as per IS 4985-2000 duly inspected and tested and having BIS certification mark.

2 Selection, Handling, storage and installation of UPVC Pipes as per IS 7634 (Part-3) - 2003

3 Specification of Injection Moulded PVC socket fittings with solvent cement joints shall be as per IS 7834 (Part-I to VIII) - 1987.

4 Visual Appearance

(i) The colour of the pipes shall be light grey. Slight variations in the appearance of the colour are permitted.

(ii) The internal and external surfaces of the pipe shall be smooth, clean and free from grooving and other defects. Slight shallow longitudinal grooves or irregularities in the pipe shall be permissible provided the wall thickness remains within the permissible limits.

(iii) Each pipe may also be marked with the standard mark of BIS certification.

5 Storage

(i) PVC solvent cement should be stored in a cool place except when actually in use at the site. The solvent cement has a limited self life when not stored in hermetically sealed containers.

(ii) Pipes should be stacked on a surface flat and free from sharp objects, stones or projection in order to avoid deformation of damage. Ends of pipes should be protected from abrasion and chipping.

6 In rocky area 15 cm. cushion of sand or moorum below and above the pipes should be provided as per IS 7634 (Part III) : 2003. *(See Drawing No.-3)*

7 Marking

Each pipe shall be clearly and indelibly marked in ink/paint or hot embossed on white base at intervals of not more than 3 meters, in colour as indicated below.

(a) Manufacturer's name or trade-mark
(b) Out side diameter,
(c) Out side diameter,
(d) Class of pipe and pressure rating
(e) Batch and lot number
(f) The word plumbing in the case of plumbing pipes.
(g) Each pipe may also be marked with the standard mark BIS certification.

Class of Pipe	Colour
Class 3	Green
Class 4	Brown
Class 5	Yellow

8 Marking of fittings

(i) All fittings shall be clearly and indelibly marked at a prominent place visible even after the installation of the fittings with the following :

(a) Manufacturer's identification mark, and

(b) Size of the fitting and the appropriate class (working pressure) of IS : 4985 - 1988 to which the pressure rating of the fitting corresponds.

(ii) PVC fittings also conforming to specific requirements as prescribed in the relevant parts of the standard may also be marked with the standard Mark.

9 The work shall be executed in accordance with the specifications in of work and all relevant latest IS codes.

10 Laying of pipes and fittings/specials includes all precautions to guard against possible damaged to the existing structure/pipes lines, cables etc., taking precautions to prevent dirt from entering the pipe ends, lowering and laying pipes and specials in the trenches with specials arrangement such as cranes, tripods with chain pulley block, use of slings of canvas etc. to fit the ends of pipes and fittings/ specials to lift and lower the same. Inspection of pipes and fittings for defects by striking with a light hammer while suspended. Laying of pipes perfectly true in alignment and to gradient etc.

11 As per prevailing excise duty norms there is excise duty exemption on certain diameter of Water Supply Pipes of different material class. All though in the computation of item rates for pipes, the rates are inclusive of excise duty but excise duty exemption shall be obtained as per prevailing rules for such pipes. This benefit shall be availed by the local bodies. All the concerned officers shall be responsible to get all the exemptions of such taxes and duties.

12 Measurement

All measurement should be of the finished work only. The net length of pipes as laid or fixed shall be measured in running meters correct to 10mm. Specials shall be excluded and measured and paid separately under the relevant item. The portion of the pipe inside the joints shall not be included in the length of pipe work. Excavation, refilling, masonry and concrete work wherever required shall be measured and paid for separately under relevant items of work.

13 Rates

(i) The rate include the charges for all tools and plants and other appliances required for lifting, laying and jointing of pipes, specials and fittings in position as per approved drawings.

(ii) The rate includes provision for use of all coverings etc. to protect the works and inclement weather etc. and damages from fall of materials and other causes.

(iii) The rate includes provision of handling, storing as required and returning of empty bags or containers to the local body /departmental stores, without any extra cost for such materials as may be supplied by the department.

(For Detail Refer to Specifications prepared by the Urban Administration and Development Department, IS Code & CPHEEO Manual)

CHAPTER 5 - UNPLASTICIZED PVC PIPES & FITTINGS FOR POTABLE WATER SUPPLY

S.No.	Particulars of Items	Unit	Rates (in Rs.)		
5.1	Providing, laying and jointing following P.V.C. pipes with solvent cement joint for 6, 8 and 10 kg/ sq. cm. pressures including testing of joints, cost of jointing materials etc. complete in all respect. [Conform to IS 4985:2000 and IS 7634 (PT-3)		6Kg/Cm^2	8 Kg/Cm^2	10Kg/Cm^2
	90 mm dia.	RM.	121.00	153.00	187.00
	110 mm dia.	RM.	173.00	226.00	278.00
	140 mm dia.	RM.	296.00	282.00	459.00
	160 mm dia.	RM.	469.00	498.00	602.00
	180 mm dia.	RM.	465.00	626.00	764.00
	200 mm dia.	RM.	593.00	775.00	944.00
	250 mm dia	RM.	1019.00	1293.00	1603.00
	315 mm dia	RM.	1562.00	2035.00	2539.00
5.2	Labour for laying in position following PVC pipes of 6, 8 and 10Kg/Sqcm. pressure.		6Kg/Cm^2	8 Kg/Cm^2	10Kg/Cm^2
	90 mm dia.	RM.	3.00	3.00	3.00
	110 mm dia.	RM.	3.00	3.00	3.00
	140 mm dia.	RM.	3.00	3.00	3.00
	160 mm dia.	RM.	5.00	5.00	5.00
	180 mm dia.	RM.	5.00	5.00	5.00
	200 mm dia.	RM.	5.00	5.00	5.00
	250 mm dia	RM.	6.00	6.00	6.00
	315 mm dia	RM.	6.00	6.00	6.00
5.3	Providing, Solvent Cement Joints to PVC Pipes and fittings of 6, 8 and 10 Kg/Sq cm. Pressure including testing of joints and cost of jointing materials (i.e. socket, coupler & solvent cement) [conform to IS 7634 (PT-3) : 2003]		6Kg/Cm^2	8 Kg/Cm^2	10Kg/Cm^2
	90 mm dia.	Each	12.00	12.00	12.00
	110 mm dia.	Each	14.00	14.00	14.00
	140 mm dia.	Each	19.00	19.00	19.00
	160 mm dia.	Each	23.00	23.00	23.00
	180 mm dia.	Each	28.00	28.00	28.00
	200 mm dia.	Each	33.00	33.00	33.00
	250 mm dia	Each	48.00	48.00	48.00
	315 mm dia	Each	56.00	56.00	56.00

S.No.	Particulars of Items	Unit	Rates (in Rs.)		
5.4	Labour for providing solvent cement joints to PVC pipes and fittings of 6, 8 and 10Kg /Sq cm. Pressure including testing of joints but excluding cost of jointing materials (i.e. coupler and solvent cement) [Conform to IS 4985:2000 and IS 7634 (PT-3)				
			6Kg/Cm^2	8 Kg/Cm^2	10Kg/Cm^2
	90 mm dia.	Each	7.00	7.00	7.00
	110 mm dia.	Each	7.00	7.00	7.00
	140 mm dia.	Each	8.00	8.00	8.00
	160 mm dia.	Each	10.00	10.00	10.00
	180 mm dia.	Each	13.00	13.00	13.00
	200 mm dia.	Each	17.00	17.00	17.00
	250 mm dia	Each	24.00	24.00	24.00
	315 mm dia	Each	27.00	27.00	27.00
5.5	Providing and laying in position following PVC bends suitable for 6, 8 and 10 Kg/Sq. cm. pressure pipes. [Conform to IS 4985:2000 and IS 7634 (PT-3) :2003, IS 7834 (PT-I to VIII: 1987]				
			6Kg/Cm^2	8 Kg/Cm^2	10Kg/Cm^2
	90 mm dia.	Each	103.00	153.00	198.00
	110 mm dia.	Each	146.00	236.00	304.00
	140 mm dia.	Each	455.00	555.00	813.00
	160 mm dia.	Each	655.00	991.00	1066.00
	180 mm dia.	Each	943.00	1160.00	1650.00
	200 mm dia.	Each	1279.00	1922.00	1900.00
	250 mm dia	Each	3024.00	-	4938.00
	315 mm dia	Each	5998.00	-	9777.00
5.6	Providing and laying in position following PVC Tees, suitable for 6, 8 and 10 Kg/Sqcm. Pressure pipes. [Conform to IS 4985:2000 and IS 7634 (PT-3) :2003, IS 7834 (PT-I to VIII: 1987]				
			6Kg/Cm^2	8 Kg/Cm^2	10Kg/Cm^2
	90 mm dia.	Each	56.00	76.00	90.00
	100 mm dia.	Each	100.00	133.00	145.00
	140 mm dia.	Each	171.00	200.00	240.00
	160 mm dia.	Each	211.00	347.00	416.00
	180 mm dia.	Each	419.00	484.00	580.00
	200 mm dia.	Each	628.00	708.00	794.00
5.7	Providing and laying in position following PVC flanged tail pieces suitable for 6, 8 and 10 Kg./Sq. cm. Pressure pipes. [Conform to IS 4985:2000 and IS 7634 (PT-3) :2003, IS 7834 (PT-I to VIII: 1987]				
			6Kg/Cm2	8 Kg/Cm2	10Kg/Cm2
	90 mm dia.	Each	43.00	65.00	86.00
	110 mm dia.	Each	59.00	77.00	133.00
	140 mm dia.	Each	98.00	106.00	216.00
	160 mm dia.	Each	119.00	154.00	246.00

S.No.	Particulars of Items	Unit	Rates (in Rs.)		
	180 mm dia.	Each	139.00	182.00	317.00
	200 mm dia.	Each	171.00	220.00	400.00
5.8	Providing and laying in position following PVC end Cap (plugs) suitable for 6, 8 and 10 Kg/Sq cm. Pressure pipes. [Conform to IS 4985:2000 and IS 7634 (PT-3) :2003, IS 7834 (PT-I to VIII: 1987]				
			6Kg/Cm2	8 Kg/Cm2	10Kg/Cm2
	90 mm dia.	Each	21.00	22.00	26.00
	110 mm dia.	Each	26.00	32.00	41.00
	140 mm dia.	Each	35.00	54.00	80.00
	160 mm dia.	Each	68.00	80.00	109.00
	180 mm dia.	Each	88.00	124.00	172.00
	200 mm dia.	Each	126.00	143.00	186.00
5.9	Providing and laying in position PVC coupler suitable for 6, 8 and 10 Kg/Sq. cm. Pressure pipes [Conform to IS 4985:2000 and IS 7634 (PT-3) :2003, IS 7834 (PT-I to VIII: 1987]				
			6Kg/Cm2	8 Kg/Cm2	10Kg/Cm2
	90 mm dia.	Each	36.00	48.00	52.00
	110 mm dia.	Each	57.00	72.00	90.00
	140 mm dia.	Each	112.00	154.00	172.00
	160 mm dia.	Each	259.00	191.00	246.00
	180 mm dia.	Each	230.00	309.00	343.00
	200 mm dia	Each	295.00	386.00	488.00
	250 mm dia	Each	674.00	-	1093.00
	315 mm dia	Each	1339.00	-	2178.00
5.10	Providing and laying in position of following PVC Reducers suitable for 6, 8 and 10 Kg/Sq cm. Pressure pipes. [Conform to IS 4985:2000 and IS 7634 (PT-3) :2003, IS 7834 (PT-I to VIII: 1987]				
			6Kg/Cm2	8 Kg/Cm2	10Kg/Cm2
	110x90 mm dia.	Each	40.00	43.00	58.00
	140x90 mm dia.	Each	55.00	63.00	71.00
	160x90 mm dia.	Each	60.00	94.00	83.00
	140x110 mm dia.	Each	56.00	82.00	91.00
	160x110 mm dia.	Each	70.00	94.00	128.00
	160x140 mm dia.	Each	74.00	151.00	181.00
	180x90 mm dia	Each	95.00	123.00	147.00
	180x110 mm dia	Each	101.00	156.00	210.00
	180x140 mm dia	Each	118.00	182.00	246.00
	180x160 mm dia	Each	133.00	203.00	273.00
	200x110 mm dia.	Each	148.00	163.00	222.00
	200x140 mm dia	Each	178.00	187.00	198.00
	200x160 mm dia	Each	202.00	220.00	237.00
	200x180 mm dia	Each	237.00	246.00	296.00

S.No.	Particulars of Items	Unit	Rates (in Rs.)		
5.11	Labour for laying in position all types of PVC fittings such as bends, tees, plugs etc. for following PVC pipes. [Conform to IS 4985:2000 and IS 7634 (PT-3) :2003, IS 7834 (PT-I to VIII: 1987]		6Kg/Cm^2	8 Kg/Cm^2	10Kg/Cm^2
	90 mm dia.	Each	2.00	2.00	2.00
	110 mm dia.	Each	2.00	2.00	2.00
	140 mm dia.	Each	3.00	3.00	3.00
	160 mm dia.	Each	3.00	3.00	3.00
	180 mm dia.	Each	3.00	3.00	3.00
	200 mm dia.	Each	3.00	3.00	3.00

CHAPTER- 6
CAST IRON VALVES

1 Sluice valves for water works purposes (50 to 1200 mm size) shall be as per IS 14846 - 2000 duly inspected and tested and having BIS certification mark.

2 Butterfly valves for General purpose shall be as per IS 13095 - 1996 duly inspected and tested and having BIS certification mark.

3 Installation and maintenance of sluice valves shall be as per IS 2685 - 1971.

4 Non return valve/reflux valve shall be as per IS 5312 - 2003 (Part I & II) duly inspected and tested and having BIS certification mark.

5 For air valve shall be as per IS 14845 - 2000 duly inspected and tested and having BIS certification mark.

6 All Joints shall conform to relevant Indian Standards.

7 Marking & testing
(i) The standard marking and packing of the valves shall be done as per IS : 14846. The direction of rotation for OPEN, CLOSE position shall be marked on the hand wheel and on the bonnet of the valve.
(ii) Testing of sluice valve should be done for close end in accordance with IS : 14846.

(iii) All the valves should be inspected for flaw detection test in accordance with the IS: 14846.

8 (i) All grit and foreign matters are removed from the inside of the valves before placing in pipes.
(ii) All the four faces are thoroughly cleaned and coated with a thin layer of mineral grease.

(iii) It is important to check tightening of gland with a pair of inside calipers. Clearance between the top of the stuffing box and the underside of the gland should be uniform on all the sides.

9 **Fixing** means laying in specified position to ensure interconnection between all flanged pipes, fittings and valves. It is also to ensure that the bolt holes of two flanges of the pipe/ fittings are correctly aligned.

10 Measurement
All measurements should be of the finished work

11 Rates
(i) The rates include all tools and plants, chain pulley block, other appliances etc. required for lifting and laying the valves in position as per approved drawings.
(ii) The rates include provision and use of all coverings etc. to protect, the works from inclement whether etc. from damaging by fall of materials and due to other causes.

(iii) The rates include provision of handling and storing under cover as required and returning of empty cases or containers if any to the local body stores without any extra cost, for such materials as may be supplied by the department.

(For Detail Refer to Specifications prepared by the Urban Administration and Development Department, IS Code & CPHEEO Manual)

CHAPTER 6 - CAST IRON VALVES

S.No.	Particulars of Items	Unit	Rates (in Rs.)	
6.1	Providing & fixing of Cast iron double flanged sluice valves as per I.S.:14846-2000 fitted with cast iron cap including jointing & testing with cost of jointing material such as bolts, nuts, rubber insertions etc. all complete			
			PN-1.0	PN-1.6
	50mm dia	Each	1927.00	2083.00
	65mm dia	Each	2042.00	2197.00
	80mm dia	Each	2632.00	2842.00
	100mm dia	Each	3584.00	3745.00
	125mm dia	Each	4410.00	4664.00
	150mm dia	Each	5672.00	5833.00
	200mm dia	Each	9247.00	10369.00
	250 mm dia	Each	15516.00	16080.00
	300mm dia	Each	17625.00	18840.00
6.2	Fixing including Jointing of Cast iron double flanged sluice valves fitted with cast iron cap testing with cost of jointing material such as bolts, nuts, rubber insertions etc. all complete (only valve to be supplied by the department free of cost). [conform to IS 2685 : 1971]			
			PN-1.0	PN-1.6
	50mm dia	Each	125.00	125.00
	65mm dia	Each	132.00	132.00
	80mm dia	Each	138.00	138.00
	100mm dia	Each	235.00	235.00
	125mm dia	Each	247.00	247.00
	150mm dia	Each	267.00	267.00
	200mm dia	Each	503.00	503.00
	250mm dia	Each	576.00	576.00
	300mm dia	Each	641.00	641.00
	350 mm dia	Each	916.00	916.00
	400 mm dia	Each	1034.00	1034.00
	450 mm dia	Each	1805.00	1805.00
	500 mm dia	Each	1789.00	1789.00
	600 mm dia	Each	2893.00	2893.00
	700 mm dia	Each	3228.00	3228.00
	750 mm dia	Each	3434.00	3434.00
	800 mm dia	Each	2997.00	2997.00
	900 mm dia	Each	3074.00	3074.00
	1000 mm dia	Each	3151.00	3151.00
6.3	Labour for laying and fixing of cast iron double flanged sluice valves (vide item no.2) including jointing and testing but without cost of Jointing materials. (Conforming to I.S.:14846-2000)			
			PN-1.0	PN-1.6
	50mm dia	Each	29.00	29.00
	65mm dia	Each	33.00	33.00
	80mm dia	Each	35.00	35.00
	100mm dia	Each	43.00	43.00
	125mm dia	Each	52.00	52.00

S.No.	Particulars of Items	Unit	Rates (in Rs.)	
	150mm dia	Each	64.00	64.00
	200mm dia	Each	100.00	100.00
	250mm dia	Each	144.00	144.00
	300mm dia	Each	190.00	190.00
	350mm dia	Each	329.00	329.00
	400mm dia	Each	398.00	398.00
	450mm dia	Each	446.00	446.00
	500mm dia	Each	564.00	564.00
	600mm dia	Each	874.00	874.00
	700mm dia	Each	1007.00	1007.00
	750mm dia	Each	1044.00	1044.00
	800mm dia	Each	1192.00	1192.00
	900mm dia	Each	1265.00	1265.00
	1000mm dia	Each	1339.00	1339.00
6.4a	Providing & fixing cast iron double flanged single door reflux (non return) valves including jointing & testing with cost of jointing material such as bolts, nuts and rubber insertion all complete as per IS :5312 (Part I)		PN- 1.0	
	50mm dia	Each	1066.00	
	65mm dia	Each	1389.00	
	80mm dia	Each	1688.00	
	100mm dia	Each	2390.00	
	150mm dia	Each	3897.00	
	200mm dia	Each	7000.00	
	250mm dia	Each	9931.00	
	300mm dia	Each	13833.00	
	350mm dia	Each	25332.00	
6.4b	Providing & fixing cast iron double flanged multi door reflux (non return) valves including jointing & testing with cost of jointing material such as bolts, nuts and rubber insertion all complete as per IS : 5312 (Part II)		PN- 0.6	PN- 1.0
	400mm dia	Each	54532.00	60512.00
	450mm dia	Each	69094.00	75074.00
	500mm dia	Each	96724.00	115069.00
	600mm dia	Each	144233.00	163675.00
	700mm dia	Each	169619.00	227488.00
	750mm dia	Each	263029.00	275598.00
	800mm dia	Each	301358.00	325439.00
6.5	Labour for laying and fixing of Cast Iron Double Flanged reflux (non return) valves including jointing & testing but without cost and jointing materials.		PN- 0.6	PN- 1.0
	50mm dia	Each	29.00	29.00
	65mm dia	Each	33.00	33.00
	80mm dia	Each	35.00	35.00
	100mm dia	Each	43.00	43.00
	150mm dia	Each	64.00	64.00

S.No.	Particulars of Items	Unit	Rates (in Rs.)	
	200mm dia	Each	100.00	100.00
	250mm dia	Each	144.00	144.00
	300mm dia	Each	190.00	190.00
	350mm dia	Each	291.00	291.00
	400mm dia	Each	398.00	398.00
	450mm dia	Each	446.00	446.00
	500mm dia	Each	564.00	564.00
	600mm dia	Each	874.00	874.00
	700mm dia	Each	1007.00	1007.00
	750mm dia	Each	1044.00	1044.00
	800mm dia	Each	1155.00	1155.00
	900 mm dia	Each	1265.00	1265.00
	1000mm dia	Each	1339.00	1339.00
6.6	Providing & fixing cast iron butterfly valves including jointing & testing with cost of jointing material such as bolts, nuts and rubber insertion all complete as per IS :13095-1991		PN- 1.0	PN- 1.6
	50mm dia	Each	1658.00	1704.00
	65mm dia	Each	2029.00	2037.00
	80mm dia	Each	2151.00	2211.00
	100mm dia	Each	2720.00	2797.00
	150mm dia	Each	4107.00	4225.00
	200mm dia	Each	8178.00	8416.00
	250mm dia	Each	11552.00	11888.00
	300mm dia	Each	14111.00	14521.00
6.7	Labour for laying and fixing of Cast Iron butterfly valves including jointing & testing but without cost and jointing materials		PN- 1.0	PN- 1.6
	50mm dia	Each	29.00	29.00
	65mm dia	Each	33.00	33.00
	80mm dia	Each	35.00	35.00
	100mm dia	Each	43.00	43.00
	150mm dia	Each	64.00	64.00
	200mm dia	Each	78.00	78.00
	250mm dia	Each	103.00	103.00
	300mm dia	Each	166.00	166.00
6.8	Providing & fixing cast iron single air valves, small orifice with screwed end as per IS : 14845-2000 including jointing & testing with cost of jointing material and rubber insertion all complete as per IS :13095-1991		PN- 1.0	PN- 1.6
	25mm dia	Each	620.00	692.00
	40mm dia	Each	754.00	814.00
6.9	Labour for laying and fixing of Cast Iron Air valves small orifice with screwed end .		PN- 1.0	PN- 1.6
	25mm dia	Each	13.00	13.00
	40mm dia	Each	15.00	15.00

S.No.	Particulars of Items	Unit	Rates (in Rs.)	
6.10	Providing & fixing cast iron single air valves, large orifice with screwed end as per IS : 14845-2000 including jointing & testing with cost of jointing material and rubber insertion all complete as per IS :13095-1991		PN- 1.0	PN- 1.6
	25mm dia	Each	800.00	931.00
	40mm dia	Each	814.00	1161.00
	50mm dia	Each	998.00	1178.00
6.11	Labour for laying and fixing of Cast Iron Air valves large orifice with screwed end.		PN- 1.0	PN- 1.6
	25mm dia	Each	13.00	13.00
	40mm dia	Each	15.00	15.00
	50mm dia	Each	20.00	20.00
6.12	Providing & fixing cast iron double air valves, flanged without in-built isolating valve as per IS : 14845-2000 including jointing & testing with cost of jointing material and rubber insertion all complete as per IS :13095-1991		PN- 1.0	PN- 1.6
	40mm dia	Each	1612.00	1540.00
	50mm dia	Each	2105.00	1926.00
	65mm dia	Each	2518.00	2542.00
	80mm dia	Each	2698.00	2770.00
	100mm dia	Each	3450.00	3391.00
	150mm dia	Each	5451.00	5750.00
	200mm dia	Each	7959.00	9096.00
6.13	Labour for laying and fixing of Cast Iron double air valves, flanged without in-built isolating valve.		PN- 1.0	PN- 1.6
	40mm dia	Each	18.00	18.00
	50mm dia	Each	33.00	33.00
	65mm dia	Each	39.00	39.00
	80mm dia	Each	39.00	39.00
	100mm dia	Each	55.00	55.00
	150mm dia	Each	75.00	75.00
	200mm dia	Each	118.00	118.00
6.14	Providing & fixing cast iron double air valves, flanged with in-built isolating valve as per IS : 14845-2000 including jointing & testing with cost of jointing material and rubber insertion all complete as per IS :13095-1991		PN- 1.0	PN- 1.6
	40mm dia	Each	1492.00	1672.00
	80mm dia	Each	1932.00	2231.00
	100mm dia	Each	2254.00	6740.00
	150mm dia	Each	2281.00	11553.00
	200mm dia	Each	8617.00	18786.00

S.No.	Particulars of Items	Unit	Rates (in Rs.)	
6.15	Labour for laying and fixing of Cast Iron double air valves, flanged with in-built isolating valve.		PN- 1.0	PN- 1.6
	40mm dia	Each	18.00	18.00
	80mm dia	Each	39.00	39.00
	100mm dia	Each	55.00	55.00
	150mm dia	Each	75.00	75.00
	200mm dia	Each	118.00	118.00
6.16	Providing and fixing of cast iron plain ended sluice valves as per IS : 14846-2000 fitted with cast iron cap including jointing and testing with cost of jointing material C.I. detachable joints confirming to IS 8794/1988 with bolts, nuts and rubber rings confirming to IS 5382/85 & IS-10292/88 (Class 10) all complete.		PN- 1.0	
	80mm dia	Each	2928.00	
	100mm dia	Each	3958.00	
	150mm dia	Each	6357.00	
	200mm dia	Each	10253.00	
	300mm dia	Each	19277.00	

CHAPTER- 7
GALVANISED IRON PIPES, SPECIALS AND GUN METAL OR BRASS FITTINGS

1 The pipes (tubes) shall be galvanized mild steel hot finished seamless (HFS) or welded (ERW) HRIW or HFW screwed and socketed conforming to the requirements of IS 1239 for light, medium & heavy grade. They shall be of the diameter (nominal bore) specified in the description of the item. The sockets shall be designated by the respective nominal bore of the pipes for which they are intended.

2 Galvanizing shall conform to IS 4736 : The zinc coating shall be uniform, adherent, reasonably smooth and free from such imperfections as flux, ash and dross inclusions, bare batches, black spots, pimples, lumping runs, rust stains, bulky white deposits and blisters. The pipes and sockets shall be cleanly finished, well galvanized in and out and free from cracks, surfaces flaws, laminations and other defects. All screw threads shall be clean and well cut. The ends shall be cut cleanly and square with the axis of the tube.

3 Marking

(i) Each tube shall be marked with manufacturer's name or trade-mark, IS No. i.e. IS 1239 (Part I) and class of tubes, i.e. is, L, M., and H, for light, medium and heavy class.

(ii) The different classes of tubes shall be distinguished by colour bands, which shall be applied as follows before the tubes leave the manufacturer's works :

4 Thickness, dimension & Mass of the tube shall be as per Class 8.1.1 of IS: 1239 - 2004.

5 The Tolerances on thickness and Mass

(a)

Nominal bore : in mm	Mass of Screwed & Socketed G.I. Pipes (in Kg per mtr.)		
	Light	Medium	Heavy
6	0.363	0.407	0.49
8	0.519	0.645	0.769
10	0.676	0.845	1.03
15	0.956	1.22	1.45
20	1.39	1.57	1.88
25	2	2.43	2.95
32	2.57	3.13	3.82
40	3.27	3.6	4.41
50	4.15	5.1	6.26
65	5.83	6.54	8.05
80	6.89	8.53	10.1
100	10	12.5	14.8
125		16.4	18.4
150		19.5	21.9

(b) Tolerance Mass :

(i) Single tube (Light series) + not limited

			- 8 percent
	(ii)	Single tube (medium and heavy series)	± 10 percent
	(iii)	For quantities per load of 10 tonnes, Min (light series)	+ 7.5 percent - 5 percent
	(iv)	For quantities per load of 10 tonnes, Min (medium and heavy series)	± 7.5 percent

(c)	Tolerance Thickness :		
	(i)	Welded tubes :	
		Light tubes	+ not limited - 8 percent
		Medium and heavy	+ not limited - 10 percent
	(ii)	Seamless tubes	+ not limited - 10 percent

6 Tolerances in length of tubes

(i) Each tubes shall be within mm $^{+\ 6}_{-\ 0}$ the specified exact lengths.

(ii) Each tube shall be within ± 150 mm of the specified approximate length, when approximate lengths are required either for screwed and socketed tubes or for plain end tubes.

7 Work shall be executed in accordance with the specifications in vogue in U.A.D.D. and all the relevant latest version of I.S. specifications detailed below :-

S.No.	IS Number	Title
1.	IS 1239 (PT-I) : 2004	Mild steel tubes, tubular and other wrought steel fittings, Part-I Steel Tubes.
2.	IS 1239 (PT-II) : 1992	Mild steel tubes, tubular and other wrought steel fittings, Part-II Mild steel tubular and other wrought steel pipes fittings.
3.	IS 1978 : 1982	Line pipes
4.	IS 4736 : 1986	Hot-dip zinc coating on mild steel tubes
5.	IS 778:1984 (Reaffirmed 2005)	Copper alloy gates, globe and check valves for water works purposes.
6.	IS 2692 : 1989	Ferrules for water services - Specifications.

8 Laying of pipes and fittings/specials includes all precautions to guard against possible damaged to the existing structure/pipes lines, cables etc., taking precautions to prevent dirt from entering the pipe ends, lowering and laying pipes and specials in the trenches with specials arrangement such as cranes, tripods with chain pulley block, use of slings of canvas etc. to fit the ends of pipes and fittings/ specials to lift and lower the same. Inspection of pipes and fittings for defects by striking with a light hammer while suspended. Laying of pipes perfectly true in alignment and to gradient etc.

9 As per prevailing excise duty norms there is excise duty exemption on certain diameter of Water Supply Pipes of different material class. All though in the computation of item rates for pipes, the rates are inclusive of excise duty but excise duty exemption shall be obtained as per prevailing rules for such pipes. This benefit shall be availed by the local bodies. All the concerned officers shall be responsible to get all the exemptions of such taxes and duties.

10 Measurement

All measurements should be of the finished work.

11 Rates :

(i) The rates include charges for all tools and plants, other appliances etc. required for lifting and laying the pipes, specials and fittings in position as per approved drawings.

(ii) The rates include provision and use of all coverings etc. to protect the works from inclement weather etc. and from damages from fall of materials and other causes.

(iii) If the material is supplied by department, then it shall be issued from departmental store and no extra charges for carting the same from store to site of work shall be paid.

(For Detail Refer to Specifications prepared by the Urban Administration and Development Department, IS Code & CPHEEO Manual)

CHAPTER 7 - GALVANISED IRON PIPES, SPECIALS AND GUN METAL OR BRASS FITTINGS

S.No.	Particulars of Items	Unit	Rates (in Rs.)		
7.1	Providing laying and jointing of galvanised Iron (MS) Pipes with specials (such as bends, elbows, tees etc) class light, medium & heavy including testing of joints, cost of pipes, specials and jointing materials all complete. Pipes and sockets conforming to IS-1239/2004 Part-I & Part-II.		Light	Medium	Heavy
	15mm dia	RM	83.00	96.00	107.00
	20mm dia	RM	111.00	121.00	136.00
	25mm dia	RM	152.00	174.00	189.00
	32mm dia	RM	196.00	217.00	247.00
	40mm dia	RM	240.00	260.00	299.00
	50mm dia	RM	294.00	334.00	399.00
	65mm dia	RM	400.00	427.00	529.00
	80mm dia	RM	478.00	555.00	651.00
	100mm dia	RM	679.00	777.00	927.00
	125mm dia	RM	-	1050.00	1162.00
	150mm dia	RM	-	1251.00	1407.00
7.2	Labour for laying and jointing of galvanised Iron (MS) pipes with specials (such as bends, elbows, tees etc) class light, medium & heavy including testing of joints and cost of jointing materials but excluding cost of pipes & specials.		Light	Medium	Heavy
	15mm dia	RM	7.00	7.00	7.00
	20mm dia	RM	7.00	7.00	7.00
	25mm dia	RM	10.00	10.00	10.00
	32mm dia	RM	12.00	12.00	12.00
	40mm dia	RM	14.00	14.00	14.00
	50mm dia	RM	18.00	18.00	24.00
	65mm dia	RM	28.00	28.00	35.00
	80mm dia	RM	29.00	31.00	38.00
	100mm dia	RM	41.00	45.00	48.00
	125mm dia	RM	-	55.00	62.00
	150mm dia	RM	-	75.00	75.00
7.3	Providing and fixing full way gate valves tested to 21.00 kg/sq.cm. confirming to IS 778/1984 (Reaffirmed 2005) Class-I		Screwed	Flanged	
	15mm dia	Each	122.00	182.00	
	20mm dia	Each	191.00	325.00	
	25mm dia	Each	221.00	377.00	
	32mm dia	Each	338.00	459.00	
	40mm dia	Each	447.00	550.00	

S.No.	Particulars of Items	Unit		Rates (in Rs.)
	50mm dia	Each	673.00	1009.00
	65mm dia	Each	1268.00	2275.00
	80mm dia	Each	1991.00	3285.00
	100mm dia	Each	3775.00	4767.00
7.4	Providing and fixing full way gate valves tested to 21.00 kg/sq.cm. confirming to IS 778/1984 (Reaffirmed 2005) Class-II		Screwed	Flanged
	15mm dia	Each	171.00	182.00
	20mm dia	Each	338.00	343.00
	25mm dia	Each	377.00	381.00
	32mm dia	Each	447.00	457.00
	40mm dia	Each	549.00	549.00
	50mm dia	Each	991.00	1009.00
	65mm dia	Each	2274.00	2275.00
	80mm dia	Each	3189.00	3291.00
	100mm dia	Each	4767.00	4784.00
7.5	Providing and fixing class-I Globe wheel valves, confirming to IS 778/1984 (Reaffirmed 2005), tested to 21.09 kg/sq.cm.		Screwed	Flanged
	15mm dia	Each	163.00	198.00
	20mm dia	Each	174.00	253.00
	25mm dia	Each	189.00	280.00
	32mm dia	Each	261.00	378.00
	40mm dia	Each	351.00	506.00
	50mm dia	Each	591.00	831.00
	65mm dia	Each	968.00	1362.00
	80mm dia	Each	1141.00	2514.00
	100mm dia	Each	3750.00	4096.00
7.6	Providing and fixing class-II Globe wheel valves, confirming to IS 778/1984 (Reaffirmed 2005), tested to 21.09 kg/sq.cm.		Screwed	Flanged
	15mm dia	Each	200.00	209.00
	20mm dia	Each	250.00	253.00
	25mm dia	Each	271.00	280.00
	32mm dia	Each	375.00	378.00
	40mm dia	Each	499.00	512.00
	50mm dia	Each	834.00	835.00
	65mm dia	Each	1175.00	1366.00
	80mm dia	Each	2475.00	2512.00
	100mm dia	Each	4094.00	4094.00
7.7	Providing and fixing gun metal/ brass check (non-return) valves Class-I, confirming to IS-778/1984 (Reaffirmed 2005) female ends, tested to 21.09 kg/sq.cm.		Screwed	Flanged

S.No.	Particulars of Items	Unit		Rates (in Rs.)
	15mm dia	Each	90.00	228.00
	20mm dia	Each	125.00	239.00
	25mm dia	Each	190.00	280.00
	32mm dia	Each	267.00	430.00
	40mm dia	Each	348.00	627.00
	50mm dia	Each	447.00	727.00
	65mm dia	Each	596.00	1083.00
	80mm dia	Each	1290.00	1697.00
	100mm dia	Each	2176.00	2147.00
7.8	Providing and fixing gun metal/ brass check (non-return) valves Class-II, confirming to IS-778/1984 (Reaffirmed 2005) female ends, tested to 21.09 kg/sq.cm.		Screwed	Flanged
	15mm dia	Each	229.00	228.00
	20mm dia	Each	239.00	239.00
	25mm dia	Each	279.00	280.00
	32mm dia	Each	430.00	429.00
	40mm dia	Each	629.00	636.00
	50mm dia	Each	787.00	788.00
	65mm dia	Each	1670.00	1133.00
	80mm dia	Each	1688.00	1697.00
	100mm dia	Each	2147.00	2147.00
7.9	Providing and fixing GM or brass ferrules confirming to IS-2692/1984 (Reaffirmed 2005), tested to 21.09 kg/sq.cm. i/c boring and tapping the main		Screwed	
	15mm dia	Each	292.00	
	20mm dia	Each	515.00	
	25mm dia	Each	684.00	
	32mm dia	Each	1001.00	
	40mm dia	Each	1451.00	
	50mm dia	Each	1875.00	
7.10	Labour for laying and fixing Screwed or flanged full way gate valves Class-I		Screwed	Flanged
	15mm dia	Each	7.00	7.00
	20mm dia	Each	8.00	9.00
	25mm dia	Each	8.00	12.00
	32mm dia	Each	9.00	13.00
	40mm dia	Each	12.00	13.00
	50mm dia	Each	20.00	27.00
	65mm dia	Each	40.00	66.00
	80mm dia	Each	60.00	100.00
	100mm dia	Each	106.00	133.00
7.11	Labour for laying and fixing Screwed or flanged full way gate valves Class-II		Screwed	Flanged

S.No.	Particulars of Items	Unit		Rates (in Rs.)
	15mm dia	Each	7.00	7.00
	20mm dia	Each	9.00	9.00
	25mm dia	Each	12.00	12.00
	32mm dia	Each	13.00	13.00
	40mm dia	Each	13.00	13.00
	50mm dia	Each	27.00	27.00
	65mm dia	Each	66.00	66.00
	80mm dia	Each	100.00	100.00
	100mm dia	Each	133.00	133.00
7.12	Labour for laying and fixing Screwed or flanged globe wheel valves Class-I		Screwed	Flanged
	15mm dia	Each	7.00	7.00
	20mm dia	Each	7.00	7.00
	25mm dia	Each	7.00	8.00
	32mm dia	Each	7.00	11.00
	40mm dia	Each	9.00	16.00
	50mm dia	Each	19.00	24.00
	65mm dia	Each	27.00	40.00
	80mm dia	Each	33.00	60.00
	100mm dia	Each	65.00	89.00
7.13	Labour for laying and fixing Screwed or flanged globe wheel valves Class-II		Screwed	Flanged
	15mm dia	Each	7.00	7.00
	20mm dia	Each	7.00	7.00
	25mm dia	Each	8.00	8.00
	32mm dia	Each	11.00	11.00
	40mm dia	Each	16.00	16.00
	50mm dia	Each	24.00	24.00
	65mm dia	Each	40.00	40.00
	80mm dia	Each	60.00	60.00
	100mm dia	Each	80.00	80.00
7.14	Labour for laying and fixing Screwed or flanged check (non-return) valves Class-I,		Screwed	Flanged
	15mm dia	Each	3.00	7.00
	20mm dia	Each	3.00	7.00
	25mm dia	Each	7.00	9.00
	32mm dia	Each	7.00	12.00
	40mm dia	Each	9.00	19.00
	50mm dia	Each	12.00	19.00
	65mm dia	Each	17.00	29.00
	80mm dia	Each	35.00	47.00
	100mm dia	Each	53.00	60.00
7.15	Labour for laying and fixing Screwed or flanged check (non-return) valves Class-II,		Screwed	Flanged
	15mm dia	Each	7.00	7.00

S.No.	Particulars of Items	Unit	Rates (in Rs.)		
	20mm dia	Each	7.00	7.00	
	25mm dia	Each	9.00	9.00	
	32mm dia	Each	12.00	12.00	
	40mm dia	Each	19.00	19.00	
	50mm dia	Each	19.00	19.00	
	65mm dia	Each	29.00	29.00	
	80mm dia	Each	47.00	47.00	
	100mm dia	Each	60.00	60.00	
7.16	Labour for laying and fixing GM or brass ferrules		Screwed		
	15mm dia	Each	60.00		
	20mm dia	Each	93.00		
	25mm dia	Each	120.00		
	32mm dia	Each	186.00		
	40mm dia	Each	266.00		
	50mm dia	Each	345.00		
7.17	Providing & fixing water taps		Stainless Steel	CI self closing	Brass Heavy Duty
	15mm dia	Each	523.00	331.00	331.00
	20mm dia	Each	582.00	379.00	369.00
	25mm dia	Each	597.00	403.00	417.00
7.18	Labour for laying & fixing water taps		Stainless Steel	CI self closing	Brass Heavy Duty
	15mm dia	Each	22.00	22.00	22.00
	20mm dia	Each	22.00	22.00	22.00
	25mm dia	Each	22.00	22.00	22.00
7.19	Painting G.I. pipes and fittings with synthetic enamel white paint over a ready mixed priming coat, both of approved quality for new work :				
	15 mm diameter pipe. -	Meter	5.00		
	20 mm diameter pipe.	Meter	6.00		
	25 mm diameter pipe	Meter	8.00		
	32 mm diameter pipe.	Meter	9.00		
	40 mm diameter pipe.	Meter	11.00		
	50 mm diameter pipe.	Meter	13.00		
7.20	Repainting G.I. pipes and fittings with synthetic enamel white paint of approved quality :				
	15 mm diameter pipe.	Meter	3.00		
	20 mm diameter pipe.	Meter	3.00		
	25 mm diameter pipe	Meter	4.00		
	32 mm diameter pipe.	Meter	5.00		
	40 mm diameter pipe.	Meter	5.00		
	50 mm diameter pipe.	Meter	6.00		

S.No.	Particulars of Items	Unit	Rates (in Rs.)
7.21	Painting G.I. pipes and fittings with two coats of anti-corrosive bitumastic paint of approved quality :		
	15 mm diameter pipe.	Meter	3.00
	20 mm diameter pipe.	Meter	3.00
	25 mm diameter pipe	Meter	4.00
	32 mm diameter pipe.	Meter	5.00
	40 mm diameter pipe.	Meter	6.00
	50 mm diameter pipe.	Meter	7.00
	65 mm diameter pipe	Meter	9.00
	80 mm diameter pipe	Meter	10.00
7.22	Providing and fixing G.I. Union in G.I. pipe line including cutting and threading the pipe and making long screws etc complete (new work) :		
	15 mm diameter pipe.	Meter	79.00
	20 mm diameter pipe.	Meter	101.00
	25 mm diameter pipe	Meter	111.00
	32 mm diameter pipe.	Meter	128.00
	40 mm diameter pipe.	Meter	170.00
	50 mm diameter pipe.	Meter	245.00
	65 mm diameter pipe	Meter	447.00
	80 mm diameter pipe	Meter	531.00
7.23	Providing and fixing G.I. Union in existing G.I. pipe line, cutting and threading the pipe and making long screws including excavation, refilling the earth or cutting of wall and making good the same complete wherever required :		
	15 mm diameter pipe.	Each	152.00
	20 mm diameter pipe.	Each	174.00
	25 mm diameter pipe	Each	185.00
	32 mm diameter pipe.	Each	202.00
	40 mm diameter pipe.	Each	244.00
	50 mm diameter pipe.	Each	346.00
	65 mm diameter pipe	Each	548.00
	80 mm diameter pipe	Each	632.00
7.24	Providing and fixing C.I. double acting air valve of approved quality with bolts, nuts, rubber insertions etc. complete (The tail pieces, tapers etc if required will be paid separately) :		
	50 mm diameter	Each	1926.00
	80 mm diameter	Each	2770.00
	100 mm diameter	Each	3391.00

CHAPTER- 8
HDPE PIPES & SPECIALS

1 High Density polyethylene pipes for Water Supply shall be as per IS : 4984

2 Rubber sealing rings for gas mains, water mains and sewers shall be as per IS : 5382.

3 Laying & jointing of polyethylene (PE) Pipes shall be as per IS : 7634

4 Colour

4.1 The colour of the pipe shall be black for the purpose of identification of the pipes covered in this standard. Each pipe shall contain minimum three equispaced longitudinal stripes of width 3 mm (Min) in blue colour. These stripes shall be more than 0.2 mm in depth. The material of the stripes shall be of the same type of resin, as used in the base compound for the pipe.

5 Length of straight Pipe & marking on pipe

5.1 The length of straight pipe used shall be more than 6 m or as agreed by Engineer in charge. Short lengths of 3 meter (minimum) up to a Maximum of 10 % of the total supply may be permitted.

5.2 Each straight length of pipe shall be clearly marked in indelible ink/paint on either end and for coil at both ends or hot embossed on white base every meter throughout the length of pipe/coil with the following information:

5.2.1 Manufacturer's name/Trade-mark,

5.2.2 Designation of pipe

5.2.3 Lot No./Batch No.

5.2.4 BIS certification marking on each pipe.

6 Appearance

Pipe shall be free from all defect including indentation, delaminating, bubbles, pinholes, cracks, pits, blisters, foreign inclusion that due to their nature degree or extent detrimentally affect the strength and Serviceability of the pipe. The pipe shall be as uniform as commercially practicable in colour opacity, density and other physical properties as per relevant IS code or equivalent International Code. The inside surface of each pipe shall be free of scouring, cavities, bulges, dents, ridges and other defects that result in a variation of inside diameter from that obtained on adjacent unaffected portions of the surface. The pipe ends shall be cut clearly and square to the axis of the pipe within the tolerance as per IS: 4984

7 Handling, Transportation storage and Lowering of pipes.

• If transportation of HDPE pipes from a distance greater than 300km than pipes shall be received only when bare coils of pipe have been wrapped with Hessian cloth.

• The truck for transportation of the PE pipes shall be exclusively used for PE pipes only with no other material loaded-especially no metallic, glass and wooden items. The truck shall not have sharp edges that can damage the pipe.

• At the time of opening coils it must be remembered that the coils are under tension and must be open in control manner

• Straight length should be stored on horizontal racks giving continuous support.

• Loss/damages during transit, handling, storage will be to the contractor's account.

8 Fittings and specials :

All HDPE fittings/specials shall be fabricated or injection moulded at factory as per IS: 8360 (Part-I & Part-III) and as per IS: 8008 (Part-I to Part-IX). Fittings will be butt welded on the pipes or other fittings by use of heat fusion.

9 Test to Establish Perfectibility/portability of work

Specimen of pipe shall be tested to establish the suitability for use in carrying potable water

(i) Smell of the extract
(ii) Clarity of the colour of the extract
(iii) Acidity and Alkality
(iv) Global migration UV absorbing material Heavy metals
(v) Unreacted monomers (styrens) and biological tests

10 Hydraulic Test

After laying the pipe hydraulic test shall be done to conform the quality of work and material. There should not be any signs of localized swelling, leakage or weeping.

11 Laying of pipes and fittings/specials includes all precautions to guard against possible damaged to the existing structure/pipes lines, cables etc., taking precautions to prevent dirt from entering the pipe ends, lowering and laying pipes and specials in the trenches with specials arrangement such as cranes, tripods with chain pulley block, use of slings of canvas etc. to fit the ends of pipes and fittings/ specials to lift and lower the same. Inspection of pipes and fittings for defects by striking with a light hammer while suspended. Laying of pipes perfectly true in alignment and to gradient etc.

12 As per prevailing excise duty norms there is excise duty exemption on certain diameter of Water Supply Pipes of different material class. All though in the computation of item rates for pipes, the rates are inclusive of excise duty but excise duty exemption shall be obtained as per prevailing rules for such pipes. This benefit shall be availed by the local bodies. All the concerned officers shall be responsible to get all the exemptions of such taxes and duties.

13 Measurement

The net length of fixed pipe shall be measured in running meters correct to 10mm. The portion of the pipe inside the joints shall not be included in the length of pipe work. Specials shall be excluded and measured and paid separately under the relevant item.

14 Rates :

The rate shall include the cost of the material and labour involve in all operations described in the item.

(For Detail Refer to Specifications prepared by the Urban Administration and Development Department, IS Code & CPHEEO Manual)

CHAPTER 8 -- HDPE PIPES & SPECIALS

S.No	Particulars of Items	Unit	Rate (in Rs.)		
8.1	Providing, laying, Jointing & field testing of High Density Polyethylene pipes, (HDPE) confirming to IS 4984/ 14151/ 12786/ 13488 with necessary jointing material like mechanical connector or jointing pipes by heating to the ends of pipes with the help of Teflon coated electric mirror/ heater to the required temperature and then pressing the ends together against each other, to form a monolithic & leak proof joint by thermosetting process. It may be required to be done with Jacks/Hydraulic Jacks/ But fusion machine. (50mm & above fusion jointed & below 50mm mechanical jointed)		6 Kg/sq.cm :	8 Kg/sq.cm :	10 Kg/sq.cm :
	PE-100				
1	20 mm dia	RM	31.00	32.00	33.00
2	25 mm dia	RM	37.00	39.00	41.00
3	32 mm dia	RM	47.00	48.00	48.00
4	40 mm dia	RM	59.00	62.00	71.00
5	50 mm dia	RM	73.00	89.00	105.00
6	63 mm dia	RM	111.00	138.00	164.00
7	75 mm dia	RM	158.00	194.00	232.00
8	90 mm dia	RM	217.00	272.00	325.00
9	110 mm dia	RM	311.00	399.00	477.00
10	125 mm dia	RM	404.00	513.00	613.00
11	140 mm dia	RM	502.00	637.00	761.00
12	160 mm dia	RM	654.00	831.00	996.00
13	180 mm dia	RM	818.00	1043.00	1269.00
14	200 mm dia	RM	1011.00	1292.00	1558.00
15	225 mm dia	RM	1277.00	1630.00	1961.00
16	250 mm dia	RM	1566.00	2005.00	2412.00
17	280 mm dia	RM	1955.00	2506.00	3013.00
18	315 mm dia	RM	2467.00	3160.00	3809.00
19	355 mm dia	RM	3147.00	4028.00	4880.00
20	400 mm dia	RM	4061.00	5211.00	6313.00
21	450 mm dia	RM	5142.00	6606.00	7970.00
22	500 mm dia	RM	6355.00	8146.00	9843.00
23	560 mm dia	RM	7951.00	10222.00	12326.00
24	630 mm dia	RM	10046.00	12913.00	15596.00
25	710 mm dia	RM	10326.00	13069.00	16193.00
8.2	Providing and laying Bend 90° confirming to IS specifications.		6 Kg/sq.cm :	8 Kg/sq.cm :	10 Kg/sq.cm :
1	20 mm dia	Each	23.00	24.00	25.00
2	25 mm dia	Each	26.00	28.00	30.00

S.No	Particulars of Items	Unit	Rate (in Rs.)		
3	32 mm dia	Each	34.00	36.00	37.00
4	40 mm dia	Each	39.00	41.00	42.00
5	50 mm dia	Each	50.00	55.00	61.00
6	63 mm dia	Each	69.00	74.00	101.00
7	75 mm dia	Each	106.00	111.00	128.00
8	90 mm dia	Each	168.00	181.00	209.00
9	110 mm dia	Each	230.00	271.00	289.00
10	125 mm dia	Each	330.00	315.00	487.00
11	140 mm dia	Each	452.00	566.00	671.00
12	160 mm dia	Each	651.00	821.00	979.00
13	180 mm dia	Each	903.00	1146.00	1376.00
14	200 mm dia	Each	1215.00	1548.00	1864.00
15	225 mm dia	Each	1714.00	2184.00	2626.00
16	250 mm dia	Each	2319.00	2970.00	3574.00
17	280 mm dia	Each	3235.00	4149.00	4991.00
18	315 mm dia	Each	4584.00	5879.00	7092.00
19	355 mm dia	Each	6514.00	8352.00	10128.00
20	400 mm dia	Each	9470.00	12172.00	14760.00
21	450 mm dia	Each	13439.00	17306.00	20907.00
22	500 mm dia	Each	18451.00	23713.00	28695.00
23	560 mm dia	Each	25807.00	33273.00	40192.00
24	630 mm dia	Each	36718.00	47326.00	57253.00
25	710 mm dia	Each	52353.00	67499.00	81857.00
8.3	Providing and laying Bend 45˚confirming to IS specifications.		6 Kg/sq.cm :	8 Kg/sq.cm :	10 Kg/sq.cm :
1	20 mm dia	Each	23.00	24.00	25.00
2	25 mm dia	Each	25.00	26.00	29.00
3	32 mm dia	Each	25.00	28.00	33.00
4	40 mm dia	Each	32.00	34.00	44.00
5	50 mm dia	Each	45.00	45.00	60.00
6	63 mm dia	Each	79.00	79.00	107.00
7	75 mm dia	Each	123.00	123.00	164.00
8	90 mm dia	Each	180.00	180.00	246.00
9	110 mm dia	Each	273.00	273.00	400.00
10	125 mm dia	Each	380.00	290.00	589.00
11	140 mm dia	Each	558.00	395.00	845.00
12	160 mm dia	Each	809.00	567.00	1218.00
13	180 mm dia	Each	1099.00	784.00	1674.00
14	200 mm dia	Each	1453.00	1053.00	2223.00
15	225 mm dia	Each	2054.00	1478.00	3159.00
16	250 mm dia	Each	2779.00	2003.00	4260.00
17	280 mm dia	Each	3815.00	2791.00	5764.00
18	315 mm dia	Each	5862.00	3947.00	8834.00
19	355 mm dia	Each	8442.00	5329.00	12754.00
20	400 mm dia	Each	11519.00	6898.00	18401.00
21	450 mm dia	Each	15112.00	8808.00	23640.00
22	500 mm dia	Each	21146.00	10859.00	33246.00
23	560 mm dia	Each	29331.00	13601.00	33483.00
24	630 mm dia	Each	37619.00	17181.00	33960.00

S.No	Particulars of Items	Unit	Rate (in Rs.)		
25	710 mm dia	Each	42421.00	17593.00	34377.00
8.4	Providing and laying Equal Tee confirming to IS specifications.		6 Kg/sq.cm :	8 Kg/sq.cm :	10 Kg/sq.cm :
1	20 mm dia	Each	25.00	27.00	28.00
2	25 mm dia	Each	33.00	36.00	37.00
3	32 mm dia	Each	34.00	37.00	38.00
4	40 mm dia	Each	39.00	42.00	43.00
5	50 mm dia	Each	52.00	58.00	69.00
6	63 mm dia	Each	86.00	96.00	106.00
7	75 mm dia	Each	143.00	149.00	186.00
8	90 mm dia	Each	261.00	265.00	323.00
9	110 mm dia	Each	388.00	398.00	471.00
10	125 mm dia	Each	426.00	535.00	635.00
11	140 mm dia	Each	584.00	736.00	875.00
12	160 mm dia	Each	849.00	1075.00	1284.00
13	180 mm dia	Each	1184.00	1506.00	1811.00
14	200 mm dia	Each	1600.00	2042.00	2460.00
15	225 mm dia	Each	2267.00	2892.00	3477.00
16	250 mm dia	Each	3066.00	3930.00	4728.00
17	280 mm dia	Each	4286.00	5498.00	6612.00
18	315 mm dia	Each	6087.00	7807.00	9412.00
19	355 mm dia	Each	8663.00	11102.00	13455.00
20	400 mm dia	Each	12582.00	16164.00	19586.00
21	450 mm dia	Each	17083.00	21981.00	26529.00
22	500 mm dia	Each	24532.00	31506.00	38091.00
23	560 mm dia	Each	34343.00	44242.00	53392.00
24	630 mm dia	Each	48861.00	62921.00	76044.00
25	710 mm dia	Each	69717.00	89800.00	108788.00
8.5	Providing and laying Pipe end confirming to IS specifications.		6 Kg/sq.cm :	8 Kg/sq.cm :	10.0 Kg/sq.cm :
1	20 mm dia	Each	35.00	37.00	40.00
2	25 mm dia	Each	37.00	40.00	42.00
3	32 mm dia	Each	40.00	42.00	44.00
4	40 mm dia	Each	42.00	47.00	48.00
5	50 mm dia	Each	49.00	51.00	53.00
6	63 mm dia	Each	60.00	62.00	64.00
7	75 mm dia	Each	76.00	84.00	86.00
8	90 mm dia	Each	114.00	130.00	132.00
9	110 mm dia	Each	151.00	178.00	180.00
10	125 mm dia	Each	233.00	267.00	269.00
11	140 mm dia	Each	296.00	338.00	341.00
12	160 mm dia	Each	300.00	355.00	357.00
13	180 mm dia	Each	470.00	540.00	542.00
14	200 mm dia	Each	474.00	556.00	559.00
15	225 mm dia	Each	484.00	593.00	595.00
16	250 mm dia	Each	800.00	818.00	820.00
17	280 mm dia	Each	865.00	908.00	910.00
18	315 mm dia	Each	1116.00	1383.00	1385.00

S.No	Particulars of Items	Unit		Rate (in Rs.)	
19	355 mm dia	Each	1544.00	1883.00	1885.00
20	400 mm dia	Each	1923.00	2352.00	2355.00
21	450 mm dia	Each	2274.00	2818.00	2821.00
22	500 mm dia	Each	2869.00	3540.00	3543.00
23	560 mm dia	Each	4093.00	4935.00	4938.00
24	630 mm dia	Each	3501.00	4567.00	4569.00
25	710 mm dia	Each	5395.00	7020.00	7022.00
8.6	Providing and laying Reducer 6 kg/sq.cm : confirming to IS specifications.		STEP I	STEP II	STEP III
1	20 mm dia	Each	-	-	-
2	25 mm dia	Each	40.00	-	-
3	32 mm dia	Each	46.00	46.00	-
4	40 mm dia	Each	52.00	52.00	57.00
5	50 mm dia	Each	63.00	65.00	67.00
6	63 mm dia	Each	76.00	77.00	78.00
7	75 mm dia	Each	95.00	97.00	103.00
8	90 mm dia	Each	102.00	108.00	114.00
9	110 mm dia	Each	102.00	128.00	131.00
10	125 mm dia	Each	109.00	149.00	154.00
11	140 mm dia	Each	130.00	165.00	169.00
12	160 mm dia	Each	171.00	218.00	221.00
13	180 mm dia	Each	203.00	280.00	285.00
14	200 mm dia	Each	236.00	329.00	331.00
15	225 mm dia	Each	310.00	427.00	447.00
16	250 mm dia	Each	365.00	474.00	496.00
17	280 mm dia	Each	485.00	518.00	521.00
18	315 mm dia	Each	646.00	630.00	683.00
19	355 mm dia	Each	926.00	887.00	1088.00
20	400 mm dia	Each	973.00	1109.00	1265.00
21	450 mm dia	Each	1290.00	1461.00	4545.00
22	500 mm dia	Each	1574.00	1850.00	5412.00
23	560 mm dia	Each	2271.00	2391.00	10653.00
24	630 mm dia	Each	2697.00	2815.00	11381.00
25	710 mm dia	Each	3531.00	3639.00	23178.00
8.7	Providing and laying Reducer 8 kg/sq.cm : confirming to IS specifications.		STEP I	STEP II	STEP III
1	20 mm dia	Each	-	-	-
2	25 mm dia	Each	40.00	-	-
3	32 mm dia	Each	46.00	46.00	-
4	40 mm dia	Each	53.00	53.00	58.00
5	50 mm dia	Each	63.00	66.00	69.00
6	63 mm dia	Each	87.00	89.00	93.00
7	75 mm dia	Each	102.00	106.00	111.00
8	90 mm dia	Each	111.00	118.00	125.00
9	110 mm dia	Each	117.00	123.00	142.00
10	125 mm dia	Each	122.00	161.00	169.00
11	140 mm dia	Each	155.00	199.00	207.00
12	160 mm dia	Each	194.00	261.00	267.00

S.No	Particulars of Items	Unit		Rate (in Rs.)	
13	180 mm dia	Each	230.00	320.00	339.00
14	200 mm dia	Each	287.00	399.00	424.00
15	225 mm dia	Each	354.00	439.00	476.00
16	250 mm dia	Each	465.00	494.00	533.00
17	280 mm dia	Each	597.00	656.00	661.00
18	315 mm dia	Each	835.00	864.00	945.00
19	355 mm dia	Each	994.00	1051.00	1239.00
20	400 mm dia	Each	1249.00	1419.00	1519.00
21	450 mm dia	Each	1571.00	1750.00	1734.00
22	500 mm dia	Each	2053.00	2258.00	2281.00
23	560 mm dia	Each	2636.00	2724.00	2849.00
24	630 mm dia	Each	2936.00	3030.00	3053.00
25	710 mm dia	Each	2976.00	3232.00	3313.00

8.8 Providing and laying Reducer 10 kg/sq.cm : confirming to IS specifications.

			STEP I	STEP II	STEP III
1	20 mm dia	Each	-	-	-
2	25 mm dia	Each	46.00	-	-
3	32 mm dia	Each	51.00	52.00	-
4	40 mm dia	Each	58.00	58.00	64.00
5	50 mm dia	Each	68.00	71.00	73.00
6	63 mm dia	Each	82.00	85.00	91.00
7	75 mm dia	Each	101.00	106.00	112.00
8	90 mm dia	Each	113.00	122.00	125.00
9	110 mm dia	Each	118.00	143.00	154.00
10	125 mm dia	Each	133.00	162.00	174.00
11	140 mm dia	Each	140.00	179.00	191.00
12	160 mm dia	Each	186.00	238.00	249.00
13	180 mm dia	Each	220.00	307.00	319.00
14	200 mm dia	Each	258.00	361.00	373.00
15	225 mm dia	Each	340.00	472.00	483.00
16	250 mm dia	Each	402.00	455.00	549.00
17	280 mm dia	Each	572.00	582.00	586.00
18	315 mm dia	Each	716.00	793.00	809.00
19	355 mm dia	Each	1030.00	1088.00	1212.00
20	400 mm dia	Each	1081.00	1234.00	1409.00
21	450 mm dia	Each	1537.00	1741.00	1787.00
22	500 mm dia	Each	1875.00	2062.00	2135.00
23	560 mm dia	Each	2536.00	2671.00	2709.00
24	630 mm dia	Each	3012.00	3070.00	3199.00
25	710 mm dia	Each	3185.00	3256.00	3344.00

S.No	Particulars of Items	Unit	Rate (in Rs.)		
8.9	Providing butt fusion welded joint/jointing by heating to the ends with the help of Teflon coated electric mirror/heater ends together etc. by thermosetting process to HDPE Pipe and specials. (6kg, 8kg, 10kg) (50mm & above fusion jointed & below 50mm mechanical jointed)	Unit	Rate		
1	20 mm dia	Each	47.00		
2	25 mm dia	Each	47.00		
3	32 mm dia	Each	52.00		
4	40 mm dia	Each	64.00		
5	50 mm dia	Each	71.00		
6	63 mm dia	Each	93.00		
7	75 mm dia	Each	116.00		
8	90 mm dia	Each	129.00		
9	110 mm dia	Each	142.00		
10	125 mm dia	Each	171.00		
11	140 mm dia	Each	181.00		
12	160 mm dia	Each	196.00		
13	180 mm dia	Each	206.00		
14	200 mm dia	Each	220.00		
15	225 mm dia	Each	244.00		
16	250 mm dia	Each	288.00		
17	280 mm dia	Each	308.00		
18	315 mm dia	Each	336.00		
19	355 mm dia	Each	375.00		
20	400 mm dia	Each	438.00		
21	450 mm dia	Each	587.00		
22	500 mm dia	Each	702.00		
23	560 mm dia	Each	866.00		
24	630 mm dia	Each	978.00		
25	710 mm dia	Each	1125.00		
8.10	Providing and laying End Cap confirming to IS specifications.		6 Kg	8 Kg	10 Kg
1	20 mm dia	Each	36.00	36.00	37.00
2	25 mm dia	Each	36.00	37.00	39.00
3	32 mm dia	Each	38.00	39.00	40.00
4	40 mm dia	Each	39.00	40.00	43.00
5	50 mm dia	Each	46.00	52.00	53.00
6	63 mm dia	Each	61.00	62.00	65.00
7	75 mm dia	Each	75.00	78.00	83.00
8	90 mm dia	Each	85.00	86.00	91.00
9	110 mm dia	Each	96.00	92.00	96.00
10	125 mm dia	Each	107.00	152.00	156.00
11	140 mm dia	Each	159.00	182.00	188.00
12	160 mm dia	Each	190.00	271.00	283.00
13	180 mm dia	Each	279.00	328.00	341.00
14	200 mm dia	Each	336.00	394.00	410.00

S.No	Particulars of Items	Unit	Rate (in Rs.)		
15	225 mm dia	Each	403.00	413.00	540.00
16	250 mm dia	Each	535.00	624.00	653.00
17	280 mm dia	Each	645.00	719.00	1042.00
18	315 mm dia	Each	821.00	902.00	1316.00
19	355 mm dia	Each	1070.00	1232.00	2267.00
20	400 mm dia	Each	1658.00	1874.00	2911.00
21	450 mm dia	Each	2361.00	2542.00	4829.00
22	500 mm dia	Each	3506.00	3773.00	5662.00
23	560 mm dia	Each	4966.00	5282.00	8289.00
24	630 mm dia	Each	7016.00	7775.00	10157.00
25	710 mm dia	Each	7340.00	8562.00	11726.00

CHAPTER- 9
GRP PIPES AND SPECIALS

1 GRP Pipes, Joints and Fittings for use for Potable Water Supply shall be as per IS 12709 : 1994

2 Glass Fibre reinforced plastics (GRP) Pipes, Joints and fittings for use for sewerage, industrial waste and water (other than Potable) shall be as per IS 14402 : 1996

3 Installation of GRP Piping system –code of practice shall be as per IS 13916 : 1994

4 Rubber sealing rings for gas mains, water mains and sewers shall be as per IS 5382 : 1985

5 For fiber glass pressure pipe shall be as per American Water Works Association (AWWA) 950

6 Standard practice for clarifying visual defects in glass reinforced plastic laminated parts shall be as per American Society for Testing & Material (ASTM) 2563

7 Specification for fiber Glass Pressure Pipes shall be as per ASTM 3517

8 Standard specification for contact moulded “Fibre glass” flanges shall be as per ASTM D 5421.

9 Specification for Glass Fibre resin forced Plastic Pressure Pipes, Joints & Fittings shall be as per British Standard (BS) -5480

10 Handling of Pipe :-

(i) All pipe sections and fittings shall be supported on timber saddles spaced at 4m center to center with a maximum overhang of 2 m. Pipes with diameter greater than 1 m may be stored on their delivery cradles at a maximum distance of 6 m c/c. Stock height should not generally exceed 2 m. Pipe shall be strapped to the vehicle over the support points using non-metallic pliable straps or ropes only.

(ii) Pipes and fittings with diameters of less than 1 m may be stored directly on sandy soil, the ground should be flat and free from sharp projection and stones/rocks bigger than 40 mm in diameter or of other potentially damaging debris. If the surface is not flat or is slopping, then all the pipes shall be checked to prevent rolling.

(iii) All rubber rings, gasket and other items shall be stored in a cool, dry and dark place to avoid damage of any kind.

(iv) During delivery, all sections shall be handled by such means and in such a manner that no distortion or damage is done to the protection or to the section as a whole.

(v) Pipes shall be handled and transported to the site carefully as per the general Specifications for laying of Pipes and fittings given in this chapter and as per IS 783.

11 Transportation of pipes :-

(i) Pipes manufactured at factory are to be carried to the site of work directly or stacked suitably and neatly along the alignment/road side/elsewhere near by the work site, as directed by the Engineer.

(ii) All pipes shall be loaded in trucks by mechanical crane/tripod and unloaded carefully using crane/tripod. No unloading using crow bars or on tyres will be allowed in any case. Rubber belt may be used instead of crow bars or chains.

(iii) Extreme care shall be taken while handling the pipes. Damages during transit will be to the Contractor's account and replacement for such pipes has to be made by the contractor without any extra cost.

12 Tolerances for GRP fitting :-

Except for flanged pipe work, which may require closer tolerances, the permissible deviations on the manufacturer's declared length of a fitting, exclusive of the socket where applicable, shall be 25 mm taken from the point of intersection to the end of the fitting.

13 Soundness :-

Each length of pipe of nominal diameter upto 1400 mm shall withstand without leakage or cracking the internal hydrostatic test pressures.

14 Marking :-

Both ends of pipe shall be marked with bold letters not less than 12mm in height and in a colour and type that remains legible under normal handling and installation procedures. The marking shall include the following :

(i) The manufacturer's name or trade-mark.
(ii) The nominal pipe diameter
(iii) Class of pipe (pressure and stiffness), and
(iv) Batch No. or date of manufacture.

15 Laying of pipes and fittings/specials includes all precautions to guard against possible damaged to the existing structure/pipes lines, cables etc., taking precautions to prevent dirt from entering the pipe ends, lowering and laying pipes and specials in the trenches with specials arrangement such as cranes, tripods with chain pulley block, use of slings of canvas etc. to fit the ends of pipes and fittings/ specials to lift and lower the same. Inspection of pipes and fittings for defects by striking with a light hammer while suspended. Laying of pipes perfectly true in alignment and to gradient etc.

16 As per prevailing excise duty norms there is excise duty exemption on certain diameter of Water Supply Pipes of different material class. All though in the computation of item rates for pipes, the rates are inclusive of excise duty but excise duty exemption shall be obtained as per prevailing rules for such pipes. This benefit shall be availed by the local bodies. All the concerned officers shall be responsible to get all the exemptions of such taxes and duties.

17 **GRP Pipes conforming to IS 14402 : 1996** for use for Sewerage, Industrial waste and water (other than potable) shall not be tested as mentioned above at 9.13.1. This pipes may be used for raw water pumping also. While placing order for procurement of pipes relevant code should be clearly mentioned according to the purpose for which pipes are to be used.

18 Measurement :-

The net length of pipes as laid or fixed shall be measured in running meter correct to 10mm. Special shall be excluded & measured and paid for separately. The part of the pipe within the joint shall not be included in the length of pipe. Other work like masonry, concrete etc. shall also be measured separately.

19 Rates :-

The rate shall include the cost of material and labour involved in all the operation described in the item including the cost of concrete which shall be paid separately.

(For Detail Refer to Specifications prepared by the Urban Administration and Development Department, IS Code & CPHEEO Manual)

CHAPTER 9 -- GRP PIPES AND SPECIALS

S.No.	Particulars of Items	Unit	Rate (in Rs.)
9.1	Supplying, laying, jointing, field testing, commissioning, complete at site of GRP pipes PN-6.0(6.0kg/sqcm) conforming to IS 12709 for water application/ IS 14402 for sewerage application, including cost of coupling, pipe material, transportation, loading, unloading, stacking and labour work complete stiffness class 124kpa (2500N/m²)		
1	300 mm dia	RM	2108.00
2	350 mm dia	RM	2455.00
3	400 mm dia	RM	2720.00
4	450 mm dia	RM	3135.00
5	500 mm dia	RM	3581.00
6	600 mm dia	RM	4622.00
7	700 mm dia	RM	5821.00
8	800 mm dia	RM	7306.00
9	900 mm dia	RM	8585.00
10	1000 mm dia	RM	11059.00
11	1100 mm dia	RM	12832.00
12	1200 mm dia	RM	14390.00
9.2	Supplying, laying, jointing, field testing, commissioning, complete at site of GRP pipes PN-9.0(9.0kg/sqcm) conforming to IS 12709 for water application/ IS 14402 for sewerage application, including cost of coupling, pipe material, transportation, loading, unloading and stacking and labour work complete stiffness class 124kpa (2500N/m²)		
1	300 mm dia	RM	2175.00
2	350 mm dia	RM	2534.00
3	400 mm dia	RM	2851.00
4	450 mm dia	RM	3282.00
5	500 mm dia	RM	3727.00
6	600 mm dia	RM	4841.00
7	700 mm dia	RM	6078.00
8	800 mm dia	RM	7662.00
9	900 mm dia	RM	8957.00
10	1000 mm dia	RM	11233.00
11	1100 mm dia	RM	13222.00
12	1200 mm dia	RM	15621.00
13	1300 mm dia	RM	18345.00
14	1400 mm dia	RM	20861.00
15	1500 mm dia	RM	23516.00
16	1600 mm dia	RM	26102.00
17	1700 mm dia	RM	28681.00
18	1800 mm dia	RM	30346.00
9.3	Supplying, laying, jointing, field testing, commissioning, complete of GRP pipes PN-12.0(12.0kg/sqcm) conforming to IS 12709 for water application/ IS 14402 for sewerage application, including cost of coupling, pipe material, transportation, loading, unloading and stacking and labour work complete stiffness class 124kpa (2500N/m²)		

S.No.	Particulars of Items	Unit	Rate (in Rs.)
1	300 mm dia	RM	2235.00
2	350 mm dia	RM	2630.00
3	400 mm dia	RM	2911.00
4	450 mm dia	RM	3401.00
5	500 mm dia	RM	3859.00
6	600 mm dia	RM	5080.00
7	700 mm dia	RM	6412.00
8	800 mm dia	RM	8018.00
9	900 mm dia	RM	9587.00
10	1000 mm dia	RM	12147.00
11	1100 mm dia	RM	14303.00
12	1200 mm dia	RM	16536.00
13	1300 mm dia	RM	19392.00
14	1400 mm dia	RM	20705.00
15	1500 mm dia	RM	23974.00
16	1600 mm dia	RM	26127.00
17	1700 mm dia	RM	28194.00
18	1800 mm dia	RM	29478.00
9.4	Supplying, laying, jointing, field testing, commissioning, complete of GRP pipes specials conforming to IS 12709 for water application, including cost of material, transportation, loading, unloading and stacking and labour complete.		rates in terms of per meter cost of GRP pipe
	90˚ Bend with one coupling	Each	5.50 times per mtr. Cost of pipe
	60˚ Bend with one coupling	Each	4.50 times per mtr. Cost of pipe
	45˚ Bend with one coupling	Each	3.75 times per mtr. Cost of pipe
	30˚ Bend with one coupling	Each	3.25 times per mtr. Cost of pipe
	22.5˚ Bend with one coupling	Each	2.25 times per mtr. Cost of pipe
	11.25˚ Bend with one coupling	Each	1.75 times per mtr. Cost of pipe
	GRP Equal Tee.	Each	1.00 times per mtr. Cost of pipe
	Flanged tailpiece (length 0.65 mtr)	Each	1.00 times per mtr. Cost of pipe
	Lamination (Butt strap joint) joint	Each	2.50 times per mtr. Cost of pipe
	Double belt coupling	Each	6.50 times per mtr. Cost of pipe

CHAPTER- 10
ASBESTOS CEMENT PRESSURE PIPES AND CAST IRON FITTINGS

1 Asbestos Cement Pressure Pipes & Asbestos Cement Couplings – Asbestos cement pressure pipes & Asbestos Cement Couplings shall conform to IS:1592-2003

2 Cast Iron detachable Joints for use with asbestos cement pressure pipe shall be as per IS 8794 : 1988

3 Cast Iron Specials for ACP Pipe shall conform to the material and strength requirements of IS: 5531-1988.

4 Rubber rings – Rubber rings used in jointing shall comply with the requirements of IS: 10292 -1988.

5 Laying of pipe shall be as per IS Code : 6530 : 1972.

6 All the pipes, Specials Joints to be used in the work shall confirm to relevant Indian Standards only inspected and tested and having B.I.S. certification marks.

7 Trenches and Excavation

7.1 The trenches shall be so dug that the pipes may be laid to the required alignment and at required depth.

7.1.1 Width- the width of the trench above pipe level shall be as small as possible but shall provide sufficient space necessary for jointing the pipes. The trench width shall be such as to provide a space of 300 mm on either side of the pipe.

7.1.2 Depth – The pipe shall have a minimum soil cover of 750 mm when laid under foot paths and side walks. 900 mm when laid under roads with light traffic or under cultivated soils and 1.25 m when laid under roads with heavy traffic. When the soil has a poor bearing capacity and is subject to heavy traffic, the pipes shall be laid on a concrete cradle. An extra trench depth of 100 mm shall be provided for each jointing pit.

7.2 The excavation of the trench shall be so carried out that the digging of the trenches does not get far ahead of the laying operations.

7.2.1 The wall of the trench shall be cut generally to a slope of ¼ : 1 or ½ : 1 depending on the nature of the soil.

7.3 To protect person from injury and to avoid damage to property, adequate barricades, construction signs, red lanterns and guards as required shall be placed and maintained during the progress of the construction work and until it is safe for the traffic to use the roadways.

8 Testing

8.1 The pipes shall be tested as specified in IS: 5913-1970 in the factory. Hence the purpose of field testing is to check the quality of workman ship and also to check whether the pipes have been damaged in transits. As such, the test pressure shall be kept as 1.5 times the actual operating pressure, unless a higher test pressure is specified.

8.2 It is recommended to test the portions of the line by subjecting to pressure test as the laying progresses before the entire line is completed. In this way any error of workmanship will be found immediately and can be corrected at a minimum cost.

8.3 Usually the length of the section to be tested shall not exceed 500m.

8.4 Prior to testing enough back fill shall be placed over the pipeline to resist upward thrust. All thrust blocks forming part of the finished line shall have been sufficiently cured and no temporary bracing shall be used.

8.5 The open end of the section can be sealed temporarily with an end cap having an outlet which can serve as an air relief vent or for filling the line or for filling the line, as may be required.

8.6 The blind face of the end cap shall be properly braced during testing by screw jacks and wooden planks or steel plate.

8.7 The section of the line to be tested shall be filled with water manually or by a low pressure pump. Air shall be vented from all high spots in the pipeline before making the pressure strength test because required pressure for the pressure strength test.

8.8 Asbestos cement pipes always absorb a certain amount of water. Therefore, after the line is filled, it should be allowed to stand for 24 hours, before pressure testing and the line shall be again filled.

8.9 The test pressure shall be gradually raised at the rate of approximately one kg/cm²/min.

8.10 The duration of the test period if not specified shall be sufficient to make a careful check on the pipeline section.

8.11 After the test has been completed, the trench shall be filled back. Care shall be taken to avoid back filling with large stones which might damage the pipe.

9 Items of ACP Pipes shall be used in repair work only. As far as possible ACP Pipes shall be replaced preferably by PVC Pipe using suitable detachable joints.

10 Laying of pipes and fittings/specials includes all precautions to guard against possible damaged to the existing structure/pipes lines, cables etc., taking precautions to prevent dirt from entering the pipe ends, lowering and laying pipes and specials in the trenches with specials arrangement such as cranes, tripods with chain pulley block, use of slings of canvas etc. to fit the ends of pipes and fittings/ specials to lift and lower the same. Inspection of pipes and fittings for defects by striking with a light hammer while suspended. Laying of pipes perfectly true in alignment and to gradient etc.

11 As per prevailing excise duty norms there is excise duty exemption on certain diameter of Water Supply Pipes of different material class. All though in the computation of item rates for pipes, the rates are inclusive of excise duty but excise duty exemption shall be obtained as per prevailing rules for such pipes. This benefit shall be availed by the local bodies. All the concerned officers shall be responsible to get all the exemptions of such taxes and duties.

12 Measurements :-
All measurement should be of the finished work.

13 Rates :-

(i) The rates include charges for all tools and plants, chain, pulley blocks and other appliances etc for lifting and laying the pipes and fittings in position as per approved drawings.

(ii) The rates include provision and use of all covering etc. to protect the work from inclement weather etc. and from damages from fall for materials and other causes.

(iii) The rates include provision of handling, storing under cover as required and returning of empty cases or containers to the Urban local body store. The material may be supplied from local body store, without any extra cost for all such materials. No transportation charges from carting of material to site of work from store shall be paid.

(For Detail Refer to Specifications prepared by the Urban Administration and Development Department, IS Code & CPHEEO Manual)

CHAPTER NO. 10 ASBESTOS CEMENT PRESSURE PIPES AND CAST IRON FITTINGS

S.No.	Particulars of Items	Unit	Rate (in Rs)		
10.1	Providing, laying and jointing of Asbestos cement pressure pipe ISI marked and conforming to IS-1592/03 tested to the required pressure including testing of joints, cost of pipes & detachable joint ISI marked conforming to Is/8794/1988 all complete.				
			Class 10	Class 15	Class 20
	80mm	Meter	159.00	162.00	179.00
	100mm	Meter	213.00	216.00	252.00
	125mm	Meter	276.00	294.00	362.00
	150mm	Meter	383.00	423.00	505.00
	200mm	Meter	646.00	764.00	937.00
	250mm	Meter	881.00	1035.00	1261.00
	300mm	Meter	1147.00	1395.00	1727.00
	350mm	Meter	1429.00	1698.00	2209.00
10.2	Providing, laying and jointing of Asbestos cement pressure pipe with A.C. coupler Joint ISI marked and conforming to IS-1592/03 tested to the required pressure including testing of joints, cost of pipes all complete.				
			Class 10	Class 15	Class 20
	80mm	Meter	121.00	121.00	132.00
	100mm	Meter	159.00	159.00	191.00
	125mm	Meter	230.00	231.00	283.00
	150mm	Meter	339.00	338.00	418.00
	200mm	Meter	531.00	638.00	803.00
	250mm	Meter	750.00	876.00	1082.00
	300mm	Meter	1010.00	1219.00	1614.00
	350mm	Meter	1348.00	1662.00	2162.00
10.3	Labour for laying in position Asbestos cement pressure pipes class 10,15,20				
	80mm	Meter	3.00		
	100mm	Meter	4.00		
	125mm	Meter	5.00		
	150mm	Meter	7.00		
	200mm	Meter	13.00		
	250mm	Meter	17.00		
	300mm	Meter	24.00		
	350mm	Meter	27.00		

S.No.	Particulars of Items	Unit	Rate (in Rs)		
10.4	Providing & fixing detachable joints to asbestos cement pressure pipes and fittings including C.I. detachable joints confirming to IS/8794/1988 with bolts, nuts and rubber rings confirming to IS-5382/85 & IS-10292/88				
			Class 10	Class 15	Class 20
	80mm	Each	230.00	234.00	238.00
	100mm	Each	283.00	287.00	301.00
	125mm	Each	367.00	374.00	399.00
	150mm	Each	459.00	471.00	487.00
	200mm	Each	646.00	671.00	691.00
	250mm	Each	842.00	877.00	911.00
	300mm	Each	1038.00	1061.00	1172.00
	350mm	Each	1238.00	1756.00	2040.00
10.5	Labour for providing detachable joints to asbestos cement pressure pipes and fittings class 10, 15 & 20 including testing of joints but excluding cost of C.I. Detachable joints.				
	80mm	Each	33.00		
	100mm	Each	45.00		
	125mm	Each	53.00		
	150mm	Each	59.00		
	200mm	Each	66.00		
	250mm	Each	70.00		
	300mm	Each	79.00		
	350mm	Each	88.00		
10.6	Providing and laying in position Cast Iron plain ended 90 degree bends confirming to IS/5531/1988 (Reaffirmed 2002)				
			Class 10	Class 15	Class 20
	80mm	Each	433.00	433.00	496.00
	100mm	Each	587.00	604.00	741.00
	125mm	Each	804.00	844.00	1026.00
	150mm	Each	1083.00	1197.00	1465.00
	200mm	Each	1852.00	2080.00	2548.00
	250mm	Each	2770.00	3041.00	3724.00
	300mm	Each	3960.00	4441.00	5455.00
	350mm	Each	5873.00	6517.00	7938.00
10.7	Labour for laying in position Cast Iron plain ended 90 degree bends confirming to IS/5531/1988 (Reaffirmed 2002)				
			Class 10	Class 15	Class 20
	80mm	Each	7.00	7.00	8.00
	100mm	Each	9.00	9.00	12.00
	125mm	Each	13.00	14.00	16.00
	150mm	Each	17.00	19.00	23.00
	200mm	Each	29.00	32.00	40.00
	250mm	Each	43.00	45.00	55.00

S.No.	Particulars of Items	Unit	Rate (in Rs)		
	300mm	Each	61.00	65.00	80.00
	350mm	Each	77.00	86.00	95.00
10.8	Providing and laying in position Cast Iron plain ended 45 degree bends confirming to IS/5531/1988 (Reaffirmed 2002)		Class 10	Class 15	Class 20
	80mm	Each	441.00	441.00	503.00
	100mm	Each	573.00	595.00	732.00
	125mm	Each	767.00	801.00	984.00
	150mm	Each	1002.00	1121.00	1368.00
	200mm	Each	1574.00	1866.00	2301.00
	250mm	Each	2346.00	2622.00	3234.00
	300mm	Each	3245.00	3732.00	4619.00
	350mm	Each	4643.00	5277.00	6521.00
10.9	Labour for laying in position Cast Iron plain ended 45 degree bends confirming to IS/5531/1988 (Reaffirmed 2002)		Class 10	Class 15	Class 20
	80mm	Each	7.00	7.00	7.00
	100mm	Each	9.00	9.00	11.00
	125mm	Each	12.00	12.00	15.00
	150mm	Each	16.00	17.00	21.00
	200mm	Each	24.00	30.00	36.00
	250mm	Each	36.00	41.00	50.00
	300mm	Each	50.00	58.00	72.00
	350mm	Each	60.00	69.00	87.00
10.10	Providing and laying in position Cast Iron plain ended 22.5 degree bends confirming to IS/5531/1988 (Reaffirmed 2002)		Class 10	Class 15	Class 20
	80mm	Each	325.00	325.00	371.00
	100mm	Each	422.00	439.00	548.00
	125mm	Each	548.00	581.00	724.00
	150mm	Each	701.00	821.00	1015.00
	200mm	Each	1140.00	1367.00	1710.00
	250mm	Each	1596.00	1864.00	2343.00
	300mm	Each	2161.00	2644.00	3334.00
	350mm	Each	3182.00	3846.00	4858.00
10.11	Labour for laying in position Cast Iron plain ended 22.5 degree bends confirming to IS/5531/1988 (Reaffirmed 2002)		Class 10	Class 15	Class 20
	80mm	Each	5.00	5.00	6.00
	100mm	Each	7.00	7.00	9.00
	125mm	Each	9.00	9.00	11.00
	150mm	Each	11.00	13.00	16.00
	200mm	Each	18.00	21.00	27.00
	250mm	Each	25.00	29.00	37.00
	300mm	Each	35.00	41.00	52.00
	350mm	Each	42.00	50.00	65.00

S.No.	Particulars of Items	Unit	Rate (in Rs)		
10.12	Providing and laying in position Cast Iron plain ended 11¼ degree bends confirming to IS/5531/1988 (Reaffirmed 2002)		Class 10	Class 15	Class 20
	80mm	Each	268.00	268.00	302.00
	100mm	Each	342.00	359.00	456.00
	125mm	Each	439.00	473.00	593.00
	150mm	Each	559.00	672.00	838.00
	200mm	Each	889.00	1123.00	1425.00
	250mm	Each	1220.00	1487.00	1904.00
	300mm	Each	1618.00	2109.00	2707.00
	350mm	Each	2361.00	3033.00	3909.00
10.13	Labour for laying in position Cast Iron plain ended 11¼ degree bends confirming to IS/5531/1988 (Reaffirmed 2002)		Class 10	Class 15	Class 20
	80mm	Each	4.00	4.00	5.00
	100mm	Each	5.00	6.00	7.00
	125mm	Each	7.00	7.00	9.00
	150mm	Each	9.00	10.00	13.00
	200mm	Each	14.00	18.00	22.00
	250mm	Each	19.00	23.00	30.00
	300mm	Each	25.00	33.00	42.00
	350mm	Each	35.00	43.00	56.00
10.14	Providing and laying in position Cast Iron plain ended Tees Body & Branch confirming to IS/5531/1988 (Reaffirmed 2002)		Class 10	Class 15	Class 20
	80 x 80 mm	Each	559.00	559.00	640.00
	100 x 80 mm	Each	697.00	726.00	835.00
	100 x 100mm	Each	778.00	801.00	991.00
	125 x 80 mm	Each	905.00	922.00	1095.00
	125 x 100mm	Each	985.00	1020.00	1302.00
	125 x 125mm	Each	1089.00	1147.00	1406.00
	150 x 80mm	Each	1279.00	1395.00	1688.00
	150 x 100mm	Each	1331.00	1457.00	1786.00
	150 x125 mm	Each	1406.00	1538.00	1884.00
	150 x 150 mm	Each	1498.00	1677.00	2051.00
	200 x 80 mm	Each	2149.00	2385.00	2904.00
	200 x100mm	Each	2206.00	2454.00	3109.00
	200 x125 mm	Each	2287.00	2540.00	3281.00
	200 x 150mm	Each	2385.00	2725.00	3681.00
	200 x 200mm	Each	2644.00	3001.00	4288.00
	250 x 80 mm	Each	3249.00	3525.00	4399.00
	250 x 100mm	Each	3312.00	3594.00	4401.00
	250 x 125mm	Each	3405.00	3693.00	4517.00
	250 x 150mm	Each	3503.00	3837.00	4695.00
	250 x 200mm	Each	3779.00	4176.00	5116.00
	250 x250mm	Each	4079.00	4488.00	5513.00

S.No.	Particulars of Items	Unit	Rate (in Rs)		
	300 x 80mm	Each	4701.00	5190.00	6337.00
	300x 100mm	Each	4764.00	5259.00	6453.00
	300 x 125mm	Each	4856.00	5364.00	6567.00
	300 x 150mm	Each	4903.00	5450.00	6682.00
	300 x 200mm	Each	5265.00	5876.00	7201.00
	300 x 250mm	Each	5576.00	6222.00	7604.00
	300 x 300mm	Each	5934.00	6682.00	8238.00
	350x200mm	Each	8024.00	8807.00	10764.00
	350x250mm	Each	8416.00	9198.00	11221.00
	350x300mm	Each	8872.00	9785.00	11938.00
	350x350mm	Each	9329.00	10307.00	12656.00
10.15	Labour for laying in position Cast Iron plain ended Tees Body & Branch confirming to IS/5531/1988 (Reaffirmed 2002)		Class 10	Class 15	Class 20
	80 x 80 mm	Each	9.00	9.00	10.00
	100 x 80 mm	Each	11.00	11.00	13.00
	100 x 100mm	Each	12.00	12.00	15.00
	125 x 80 mm	Each	14.00	14.00	17.00
	125 x 100mm	Each	15.00	16.00	20.00
	125 x 125mm	Each	17.00	18.00	22.00
	150 x 80mm	Each	20.00	22.00	26.00
	150 x 100mm	Each	21.00	22.00	28.00
	150 x125 mm	Each	22.00	24.00	29.00
	150 x 150 mm	Each	23.00	26.00	32.00
	200 x 80 mm	Each	33.00	37.00	45.00
	200 x100mm	Each	34.00	38.00	46.00
	200 x125 mm	Each	35.00	39.00	48.00
	200 x 150mm	Each	37.00	42.00	51.00
	200 x 200mm	Each	41.00	46.00	57.00
	250 x 80 mm	Each	50.00	54.00	66.00
	250 x 100mm	Each	51.00	55.00	68.00
	250 x 125mm	Each	53.00	57.00	70.00
	250 x 150mm	Each	54.00	59.00	72.00
	250 x 200mm	Each	58.00	64.00	79.00
	250 x250mm	Each	63.00	69.00	85.00
	300 x 80mm	Each	73.00	80.00	98.00
	300x 100mm	Each	73.00	81.00	100.00
	300 x 125mm	Each	75.00	83.00	101.00
	300 x 150mm	Each	76.00	84.00	103.00
	300 x 200mm	Each	81.00	91.00	111.00
	300 x 250mm	Each	86.00	96.00	117.00
	300 x 300mm	Each	92.00	103.00	127.00
	350x200mm	Each	109.00	120.00	146.00
	350x250mm	Each	115.00	125.00	153.00
	350x300mm	Each	121.00	133.00	163.00
	350x350mm	Each	127.00	140.00	172.00

S.No.	Particulars of Items	Unit	Rate (in Rs)		
10.16	Providing and laying in position Cast Iron plain ended Crosses confirming to IS/5531/1988 (Reaffirmed 2002)		Class 10	Class 15	Class 20
	80 x 80mm	Each	740.00	740.00	837.00
	100 x 100mm	Each	1019.00	1049.00	1304.00
	125 x 125mm	Each	1420.00	1492.00	1832.00
	150x 150mm	Each	1940.00	2189.00	2680.00
	200 x 200mm	Each	3421.00	3924.00	4816.00
	250 x 250mm	Each	5240.00	5816.00	7157.00
	300 x 300mm	Each	7642.00	8673.00	10674.00
	350x350mm	Each	11809.00	13242.00	16177.00
10.17	Labour for laying in position Cast Iron plain ended Crosses confirming to IS/5531/1988 (Reaffirmed 2002)		Class 10	Class 15	Class 20
	80 x 80mm	Each	11.00	11.00	12.00
	100 x 100mm	Each	15.00	15.00	19.00
	125 x 125mm	Each	21.00	22.00	27.00
	150x 150mm	Each	28.00	32.00	39.00
	200 x 200mm	Each	50.00	57.00	71.00
	250 x 250mm	Each	77.00	85.00	105.00
	300 x 300mm	Each	112.00	127.00	156.00
	350x350mm	Each	154.00	173.00	211.00
10.18	Providing and laying in position Cast Iron plain ended Reducers confirming to IS/5531/1988 (Reaffirmed 2002)		Class 10	Class 15	Class 20
	100 x80mm	Each	473.00	478.00	570.00
	125 x 80mm	Each	548.00	564.00	672.00
	125 x 100mm	Each	604.00	627.00	769.00
	150 x 80mm	Each	633.00	690.00	827.00
	150 x 100mm	Each	690.00	753.00	928.00
	150 x 125 mm	Each	764.00	838.00	1026.00
	200 x 100mm	Each	912.00	1037.00	1282.00
	200 x 125mm	Each	986.00	1117.00	1380.00
	200 x 150mm	Each	1072.00	1248.00	1539.00
	250 x 125mm	Each	1208.00	1356.00	1631.00
	250 x 150mm	Each	1294.00	1487.00	1847.00
	250 x 200mm	Each	1511.00	1767.00	2199.00
	300 x 150mm	Each	1550.00	1852.00	2314.00
	300 x 200mm	Each	1773.00	2137.00	2668.00
	300 x 250mm	Each	1983.00	2365.00	2849.00
	350 x 300mm	Each	4089.00	4685.00	5769.00
10.19	Labour for laying in position Cast Iron plain ended Reducers confirming to IS/5531/1988 (Reaffirmed 2002)		Class 10	Class 15	Class 20
	100 x80mm	Each	7.00	7.00	9.00
	125 x 80mm	Each	9.00	9.00	10.00
	125 x 100mm	Each	9.00	10.00	12.00

S.No.	Particulars of Items	Unit	Rate (in Rs)		
	150 x 80mm	Each	10.00	11.00	13.00
	150 x 100mm	Each	11.00	12.00	14.00
	150 x 125 mm	Each	12.00	13.00	16.00
	200 x 100mm	Each	14.00	16.00	20.00
	200 x 125mm	Each	15.00	17.00	22.00
	200 x 150mm	Each	17.00	19.00	24.00
	250 x 125mm	Each	19.00	21.00	26.00
	250 x 150mm	Each	20.00	23.00	29.00
	250 x 200mm	Each	24.00	28.00	34.00
	300 x 150mm	Each	24.00	29.00	36.00
	300 x 200mm	Each	28.00	33.00	42.00
	300 x 250mm	Each	31.00	37.00	44.00
	350 x 300mm	Each	57.00	65.00	80.00
10.20	Providing and laying in position Cast Iron Flange spigot (Adopter) confirming to IS/5531/1988 (Reaffirmed 2002)		Class 10	Class 15	Class 20
	80mm	Each	427.00	427.00	455.00
	100mm	Each	518.00	524.00	588.00
	125mm	Each	651.00	674.00	749.00
	150mm	Each	824.00	882.00	985.00
	200mm	Each	1186.00	1308.00	1486.00
	250mm	Each	1982.00	2120.00	2437.00
	300mm	Each	2507.00	2753.00	3186.00
	350mm	Each	3559.00	3869.00	4474.00
10.21	Labour for laying in position Cast Iron Flange spigot (Adopter) confirming to IS/5531/1988 (Reaffirmed 2002)		Class 10	Class 15	Class 20
	80mm	Each	7.00	7.00	7.00
	100mm	Each	8.00	8.00	9.00
	125mm	Each	10.00	10.00	12.00
	150mm	Each	13.00	14.00	15.00
	200mm	Each	18.00	20.00	23.00
	250mm	Each	31.00	33.00	38.00
	300mm	Each	40.00	42.00	49.00
	350mm	Each	52.00	54.00	63.00
10.22	Providing and laying in position Cast Iron end plugs (Dead end cap) confirming to IS/5531/1988 (Reaffirmed 2002)		Class 10	Class 15	Class 20
	80mm	Each	194.00	194.00	211.00
	100mm	Each	268.00	279.00	314.00
	125mm	Each	365.00	388.00	461.00
	150mm	Each	490.00	581.00	690.00
	200mm	Each	867.00	1061.00	1277.00
	250mm	Each	1271.00	1504.00	1806.00
	300mm	Each	1795.00	2229.00	2673.00
	350mm	Each	2679.00	3280.00	3927.00

S.No.	Particulars of Items	Unit	Rate (in Rs)		
10.23	Labour for laying in position Cast Iron end plugs (Dead end cap) confirming to IS/5531/1988 (Reaffirmed 2002)		Class 10	Class 15	Class 20
	80mm	Each	3.00	3.00	3.00
	100mm	Each	4.00	4.00	5.00
	125mm	Each	6.00	6.00	7.00
	150mm	Each	8.00	9.00	11.00
	200mm	Each	14.00	17.00	20.00
	250mm	Each	20.00	23.00	28.00
	300mm	Each	28.00	35.00	42.00
	350mm	Each	37.00	45.00	54.00

CHAPTER- 11
SALT GLAZED STONEWARE PIPE

1 Salt glazed stone ware pipe shall be as per IS 651 - 2007. SP1 pipe shall be used having crushing strength of 16kN/m duly inspected and tested and having BIS certification mark.

2 Laying of glazed stone ware pipe shall be as per IS 4127.
Laying of pipes and fittings/specials includes all precautions to guard against possible damaged to the existing structure/pipes lines, cables etc., taking precautions to prevent dirt from entering the pipe ends, lowering and laying pipes and specials in the trenches with specials arrangement such as cranes, tripods with chain pulley block, use of slings of canvas etc. to fit the ends of pipes and fittings/ specials to lift and lower the same. Inspection of pipes and fittings for defects by striking with a light hammer while suspended. Laying of pipes perfectly true in alignment and to gradient etc.

3 Transportation of Pipe
(i) While unloading, pipes shall not be thrown from the truck on hard ground.

(ii) Unloading of pipes on timber skids without a steadying rope and thus allowing the pipes to bump hard against one another should not be allowed.

(iii) In order to avoid damage to the pipes and especially to the spigot end, pipes should not be dragged along concrete and similar pavements with hard surfaces.

4 Testing
(i) The pipe and fittings shall be inspected for defects and be rung with a light hammer preferably while suspended, to detect cracks.

(ii) Hydraulic test, Absorption test, test for resistance to action of acid & test for crushing strength etc. shall be done as per IS 651 and IS 4147.

(iii) Necessary tests of the pipe shall be as per IS 651 and test results shall be kept for record.

(iv) Each section of sewer shall be tested for water tightness preferably between manhole to man hole.

(v) Before commencing the hydraulic test the pipelines shall be filled with water for about a week before commencing the application of pressure to allow for the absorption by pipe wall.

(vi) The sewers are tested by plugging the upper end (with a provision for an air out let) of the pipe with stopcock. The water is filled through a funnel connected at the lower end provided with a plug. After the air has expelled through the air out let, the stop cock is closed and water level in the funnel is noted after 30 minutes and gravity of water required to restore the original water level is determined. The pipe line under pressure is then inspected while the funnel is still in position. There shall be no leaks in the pipe or joints (small sweating on the pipe surface is permitted).

(vii) Any sewer or part there of that does not meet the test shall be emptied and repaired or re-laid as required and tested again.

(viii) The leakage of quantity of water to be supplied to maintain the test pressure during the period of 10 minutes shall not exceed 0.2 litres/mm dia. of pipe per kilometer length per day.

5 Stone ware pipe shall be cement jointed.

6 Back filling of the trench shall not be commenced until the length of pipes there in has been tested and passed.

7 Where pipe are laid under road and pavement subjected to heavy traffic loads the trenches may be covered with R.C.C. slab.

8 Providing and laying cement concrete 1:5:10 (1 cement:5 fine sand: 10 graded stone aggregate 40 mm nominal size) up to haunches of SW – pipes including bed concrete i/c curing, testing etc complete for 100mm to 300mm dia SW pipe For Type "Concrete up to Haunches " shall be as per *Drawing No. 8 (1)*

9 Providing and laying cement concrete 1:5:10 (1 cement:5 fine sand: 10 graded stone aggregate 40 mm nominal size) around S.W. pipe including bed concrete 15 cm thick i/c curing, testing etc. complete for 100 mm dia. to 300 mm dia pipe. (For type" Concrete Alround") shall be as per *Drawing No. 8 (2)*

10 Measurement

The length of pipes shall be measured in the running meters nearest to 10mm as laid or fixed, from inside of one manhole to the inside of the other manhole. The length shall be taken, along the centre line of the pipes. Overall fittings, such as bends, junctions, etc., shall not be measured separately. Excavation, refilling, shoring and timbering in trenches and cement concretising where ever required shall be measured separately under relevant item of work.

11 Rates

The rate shall include the cost of material and labour involved in all the operation described above excluding the cost of concrete which shall be paid separately.

(For Detail Refer to Specifications prepared by the Urban Administration and Development Department, IS Code & CPHEEO Manual)

CHAPTER 11 -- SALT GLAZED STONEWARE PIPE

S.No.	Particulars of Items	Unit	Rate (in Rs.)
11.1	Providing and Laying and Jointing salt glazed stone ware (S.W.) pipes socket and spigot ISI marked as per IS 651-2007 SP1 class with stiff cement mortar 1:1 including testing of joints etc. complete.		
	100 mm	Per Meter	142.00
	150 mm	Per Meter	217.00
	200 mm	Per Meter	450.00
	250 mm	Per Meter	627.00
	300 mm	Per Meter	1035.00
11.2	Laying and Jointing salt glazed stone ware (S.W.) pipes s&s (socket and spigot) with stiff cement mortar 1:1 including testing of joints complete.		
	100mm	Per Meter	45.00
	150 mm	Per Meter	67.00
	200 mm	Per Meter	85.00
	250 mm	Per Meter	108.00
	300 mm	Per Meter	125.00
11.3	Providing and laying Cement concrete grade M-5 (Nominal Mix) with 40 mm nominal size stone aggregate up to haunches of SW – pipes including bed concrete i/c curing, testing etc complete for 100mm to 300mm dia SW pipe For Type "Concrete up to Haunches ") *Drawing No. 8 (1)*		
	100mm dia pipe	Per Meter	165.00
	150mm dia	Per Meter	267.00
	200mm dia	Per Meter	314.00
	250mm dia	Per Meter	366.00
	300mm dia	Per Meter	422.00
11.4	Providing and laying Cement concrete grade M-5 (Nominal Mix) with 40 mm nominal size stone aggregate around S.W. pipe including bed concrete 15 cm thick i/c curing, testing etc. complete for 100 mm dia. to 300 mm dia pipe. (For type" Concrete Alround") *Drawing No. 8 (2)*		
	100mm dia SW pipe	Per Meter	347.00
	150mm dia	Per Meter	424.00
	200mm dia	Per Meter	495.00
	250mm dia	Per Meter	572.00
	300mm dia	Per Meter	656.00

CHAPTER- 12
UNPLASTICIZED NON-PRESSURE POLYVINYL CHLORIDE (PVC-U) PIPES FOR USE IN UNDERGROUND SEWERAGE SYSTEMS

1 Unplasticized polyvinyl chloride (PVC - U) pipes shall be as per IS 15328. & having BIS Certification mark.

2 Laying of Unplasticized polyvinyl chloride (PVC - U) pipe shall be as per IS 7634 (Part-3) : 2003

3 The solvent cement shall conform to the requirements laid down in IS 14182.

4 Integral sockets for either solvent-cement welding or for jointing with elastomeric sealing rings pipes made of uplastticized polyvinyl chloride (PVC-U) of nominal outside diameters ranging from 110mm upto and including 630 mm, intended for underground (buried) non-pressure gravity drain and sewer applications for transportation of soil and waste discharge of domestic origin, surface water (storm water).

5 Dimensions of Pipes :

(i) Mean outside diameter :- The mean outside diameter, outside diameter at any point and tolerances shall be as give in the table 1 of IS 15328 and shall be measured according to the method in IS:12235 (part-1).

(ii) Wall thickness :- The nominal wall thickness, e, shall be in accordance with table 2 of IS 15328. Tolerances in outside diameters shall be those given in IS 4985.

6 Marking :-

The colour of marking shall be different from the basic colour of the pipe. It shall be as

(i) Identification of the source of manufacture.

(ii) Outside diameter,

(iii) Stiffness class, and

(iv) Batch or lot number

7 Joints :

Elastomeric Sealing rings :- Elastomeric sealing rings shall be free from substances (for example, plasticizers) that can have a detrimental effect on the polyvinyl chloride of the pipe or fittings used in conjunction with the pipes.

8 Laying of pipes includes all precautions to guard against possible damaged to the existing structure/pipes lines, cables etc., taking precautions to prevent dirt from entering the pipe ends, lowering and laying pipes and specials in the trenches with specials arrangement such as cranes, tripods with chain pulley block, use of slings of canvas etc. to fit the ends of pipes and fittings/ specials to lift and lower the same. Inspection of pipes and fittings for defects by striking with a light hammer while suspended. Laying of pipes perfectly true in alignment and to gradient etc.

9 Minimum Cover

9.1 A minimum cover of 0.9 m should be ensured when normal truck traffic is expected and 1.8m should ensured when heavy truck traffic is expected.

9.2 Bedding and backfill material must be free from boulders, sharp stones, flints etc.

9.3 Bedding should be prepared by laying on soft soil duly compacting and watering so that thickness of bedding is 100 mm to 150 mm. Please refer *Drawing No. 3*

10 Measurement

All measurement should be of the finished work only. The net length of pipes as laid or fixed shall be measured in running meters correct to 10mm. The portion of the pipe inside the joints shall not be included in the length of pipe work. Excavation, refilling, masonry and concrete work wherever required shall be measured and paid for separately under relevant items of work.

11 Rates

The rate shall include the cost of material and labour involved in all the operation described above excluding the cost of concrete which shall be paid separately.

(For Detail Refer to Specifications prepared by the Urban Administration and Development Department, IS Code & CPHEEO Manual)

CHAPTER 12 -- UNPLASTICIZED NON-PRESSURE POLYVINYL CHLORIDE (PVC-U) PIPES FOR USE IN UNDERGROUND SEWERAGE SYSTEMS

S.No.	Particulars of Items	Unit	Rates (in Rs.)
12.1	Providing, laying and jointing following P.V.C. - U pipes with solvent cement joint for Non-pressure gravity drain and sewer applications including testing of joints, cost of jointing materials etc. complete in all respect. [Conform to IS 15328:2003, solvent cement shall conform to IS 14182].		
	110 mm dia.	Per Meter	172.00
	125 mm dia	Per Meter	231.00
	160 mm dia	Per Meter	318.00
	200 mm dia	Per Meter	562.00
	250 mm dia	Per Meter	921.00

CHAPTER- 13
REINFORCED CEMENT CONCRETE PIPES

1 All the pipes, specials, joints to be used in the work shall be as per Indian Standards 458 - 2003 duly inspected and tested and having BIS certification mark

2 Laying and Jointing shall be as per IS 783:1985

3 Transportation :-
(1) Reasonable care shall be exercised in loading, transporting and unloading concrete pipes. Handling shall be such as to avoid impact. Gradual unloading by inclined plane or by chain block is recommended.

4 Tests to be conducted at manufacturing units before taking delivery :-
4.1 All samples for testing purpose shall be selected at random.
4.2 Samples of pipes shall be subjected to following test in accordance with IS : 3597

4.2.1 Hydrostatic test
4.2.2 Three edge bearing test
4.2.3 Permeability test
4.3 At the time manufacture of such pipes compressive strength of the concrete cubes shall be tested as per IS : 516.

5 Laying of Pipe :-
5.1 Pipes shall be lowered in to the trench carefully by mechanical appliances. Under no circumstances shall the pipes be dropped or dumped in to the trench.

5.2 All pipe sections and connections shall be inspected carefully before being laid. Broken or defective pipes or connections shall not be used.

5.3 All lumps, blisters and excess coating materials shall be removed gently from the ends of each pipe and they should be wiped clean and dry before the pipe is laid.

5.4 In the case of pipes with joints to be made with loose collars, the collars shall be slipped on before the next pipe is laid.

5.5 Every precaution shall be taken to prevent foreign materials from entering the pipe when it is being placed in the line

5.6 Pipes shall be laid true to line and grade as specified.

5.7 Sight rails provided at all change of directions or gradients and at distances of about 15 meters. Straight lengths with centre line marked on each horizontal rail which is fixed at true level, shall be used for laying all inverts with the help of proper boning rods.

4.8 Laying of pipes shall always proceed upgrade of a slope. If the pipes have spigot and socket joints, the socket ends shall face upstream. In the case of pipes with joints to be made with loose collars, the collars shall be slipped on before the next pipe is laid.

5.9 The pipe shall be secured in place with approved back fill material or concrete tamped under it except at the joint portion.

5.10 Precautions shall be taken to prevent dirt from entering the joint space.

5.11 At times when pipe laying is not in progress the open ends of pipe shall be closed by a water tight plug or canvas or other means approved by the Engineer in charge.

5.12 Trench shall be kept free from water until the material in the joints has hardened.

5.13 When the pipe is closed and the trench liable to be flooded by rain, care shall be taken to prevent the pipe from damage.

5.14 Walking or working on the completed pipe shall not be permitted until the trench has been back filled to a height of at least 30 cm over the pipe, except as may be necessary in tamping or back filling.

5.15 The cutting of pipe for inserting, fittings or closure pieces shall be done in a neat and workmanlike manner without danger to the pipe so as to leave a smooth surface and at right angles to the axis of the pipe.

5.16 The connection to an existing sewer shall be done through manholes.

5.17 Before connecting a pipe to a manhole, a relieving arch or any other similar protection device should be made in the manhole for the safety of the pipe.

5.18 The pipe when laid should not be subjected to super imposed load beyond what the pipe can safely take up.

6 Pipe Bedding: *(See Drawing No.- 9)*

6.1 In case where the foundation conditions are unsafe such as in the proximity of trees or poles, under existing or proposed tracks, under manholes etc; the pipe shall be encased, in low strength concrete bedding or compacted sand or gravel.

6.2 The following class of pipe beddings are recommended as per CPHEEO manual. The class of bedding depends upon the site condition and loading.

Class A bedding- It may be either concrete cradle or concrete arch depending upon the design.

Class B bedding- It is having a shaped bottom or compacted granular bedding with a carefully compacted back fill.

Class C bedding- It is ordinary bedding having a compacted granular bedding with a lightly compacted back fill.

6.3 The pipe bedding materials must remain firm and not permit displacement of pipes. Where rock or other unyielding foundation material is encountered, bedding shall be according to one of the classes A, B or C but with the following additional requirements.

6.3.1 Class A bedding-The hard unyielding material should be excavated down to the bottom of the concrete cradle.
6.3.2 Class B or C bedding- The hard unyielding material should be excavated below the bottom of the pipe and pipe bell to depth of at least 15cm.
6.3.3 The width of trench should be at least 1.25 times the outside dia of pipe and it should be refilled with granular material.

6.4 When the pipe is laid in a trench in rock, hard clay, shale or other hard material, the space below the pipe shall be excavated and replaced with an equalising bed of concrete, sand or compacted earth. In no place the pipe shall be laid directly on such hard material.

7 Jointing : *(See Drawing No.-10)*
7.1 The socket and spigot pipes are laid and jointed with rubber gasket.

7.2 In case of collar jointed pipe, the jointing shall be done with hemp yarn soaked in cement slurry tamped with just sufficient quantity of water to have a consistency of semi dry condition, well packed and thoroughly rammed with caulking tools and then filled with cement mortar 1:2. The joint shall be finished off with a fillet slopping at 45 degrees to the surface of the pipe. The finished joint shall be protected and cured for at least 24 hours. For jointing procedure should be followed as per I.S. 783 – 1985.

8 Testing :- Sampling & testing of pipe shall be done as per IS 458.
8.1 Each section of sewer shall be tested for water tightness preferably between manholes.

8.2 In case of cement mortar joints, the sewer line shall be tested three days after the cement mortar joints have been made.

8.3 The pipe line shall be filled with water for about a week before commencing the application of pressure to allow for the absorption by pipe wall.

8.4 The pipe line shall be tested by plugging the upper end with a provision for an air outlet pipe with stop cock. The water shall be filled through a funnel connected at the lower end provided with a plug. After expelling the air through the air outlet, the stop cock shall be closed and water level in the funnel shall be raised to 2.5 m above the invert at the upper end. Water level in the funnel is noted after 30 minutes and the quantity of water required to restore the original water level in the funnel is determined. The pipe line under pressure is then inspected while funnel is still in position. There shall not be any leaks in the pipe or joints (small sweating on the pipe surface is permitted).

8.5 Any sewer or part thereof that doesn't meet the test shall be emptied and repaired or re-laid as required and tested again.

8.6 The leakage or quantity of water to be supplied to maintain the test pressure during the period of 10 minutes should not exceed 0.2 liters / mm diameter of pipe per Km. length per day.

8.7 For no+n pressure pipes the leakage should be observed for a period of 24 hours if feasible.

8.8 Ex filtration test for detection of leakage shall be carried out at a time when the ground water table is low.

8.9 Air testing shall be done particularly in large diameter pipes when the required quantity of water is not available for testing. It is done as per procedure given in CPHEEO manual.

9 Back filling of trenches:

9.1 The method of backfilling to be used shall vary with the width of trench, the character of material excavated, the method of excavation and degree of compaction required.

9.2 In open country, it shall be sufficient to mound the trench and after natural settlement return to regrade the areas.

9.3 In developed streets, it shall be compacted to minimize the load.

9.4 Soft material screened free from stones or hard substances shall first be used and hand pressed under and around the pipes to half the height. Similar soft material shall then be put up to a height of 30 cm. above the top of pipe and this will be moistened with water and well rammed. The remaining trench can be filled with hard material, in layers each not exceeding 60 cm. At each stage the filling shall be well rammed, consolidated and completely saturated with water and then only further filling shall be continued.

10 Measurements

All RCC pipes should be measured according to the work actually done and on allowance should be made for any waste in cutting to the exact length required. The measurement for pipes should be in running meter nearest to a cm. of length along the centre line of pipe as actually laid at work site.

11 Rates :

The rate shall include the cost of the material and labour involved in all the operation described in the items.

(For Detail Refer to Specifications prepared by the Urban Administration and Development Department, IS Code & CPHEEO Manual)

CHAPTER 13 -- REINFORCED CEMENT CONCRETE PIPES

Sl NO.	Particulars of Items	Unit	Rate (in Rs.)
13.1	Providing, Laying and jointing non-pressure (NP2) RCC socket & spigot pipes with rubber gasket joint including testing of joints. [Conforming to IS ; 458-1988, ISI marked laying as per IS 783:1985)		
	100 mm dia	Per Meter	264.00
	150 mm dia	Per Meter	272.00
	200 mm dia	Per Meter	286.00
	225 mm dia	Per Meter	313.00
	250 mm dia	Per Meter	338.00
	300 mm dia	Per Meter	479.00
	350 mm dia	Per Meter	567.00
	400 mm dia	Per Meter	646.00
	450 mm dia	Per Meter	775.00
	500 mm dia	Per Meter	839.00
	600 mm dia	Per Meter	1101.00
	700 mm dia	Per Meter	1399.00
	800 mm dia	Per Meter	1946.00
	900 mm dia	Per Meter	2395.00
	1000 mm dia	Per Meter	2798.00
	1100 mm dia	Per Meter	3309.00
	1200 mm dia	Per Meter	4058.00
	1600 mm dia	Per Meter	6850.00
	1800 mm dia	Per Meter	8028.00
13.2	Labour only for Laying and Jointing non-pressure (NP2) RCC socket & spigot pipes with rubber gasket joint including testing of joints. (IS 783:1985)		
	100 mm dia	Per Meter	11.00
	150 mm dia	Per Meter	15.00
	200 mm dia	Per Meter	19.00
	225 mm dia	Per Meter	24.00
	250 mm dia	Per Meter	24.00
	300 mm dia	Per Meter	38.00
	350 mm dia	Per Meter	43.00
	400 mm dia	Per Meter	49.00
	450 mm dia	Per Meter	61.00
	500 mm dia	Per Meter	66.00
	600 mm dia	Per Meter	93.00
	700 mm dia	Per Meter	106.00
	800 mm dia	Per Meter	137.00
	900 mm dia	Per Meter	170.00
	1000 mm dia	Per Meter	172.00
	1100 mm dia	Per Meter	202.00
	1200 mm dia	Per Meter	236.00
	1600 mm dia	Per Meter	308.00
	1800 mm dia	Per Meter	430.00

SI NO.	Particulars of Items	Unit	Rate (in Rs.)
13.3	Providing and Laying non-pressure (NP3) RCC socket & spigot pipes with rubber gasket joint including testing of joints. [Conforming to IS ; 458-1988, ISI marked laying as per IS 783:1985)		
	150 mm dia	Per Meter	302.00
	225 mm dia	Per Meter	389.00
	250 mm dia	Per Meter	448.00
	300 mm dia	Per Meter	664.00
	350 mm dia	Per Meter	1117.00
	400 mm dia	Per Meter	1373.00
	450 mm dia	Per Meter	1555.00
	500 mm dia	Per Meter	1700.00
	600 mm dia	Per Meter	2407.00
	700 mm dia	Per Meter	2823.00
	800 mm dia	Per Meter	3887.00
	900 mm dia	Per Meter	4785.00
	1000 mm dia	Per Meter	5094.00
	1100 mm dia	Per Meter	6109.00
	1200 mm dia	Per Meter	7223.00
	1400 mm dia	Per Meter	8669.00
	1600 mm dia	Per Meter	10476.00
	1800 mm dia	Per Meter	12203.00
13.4	Labour only for Laying and Jointing non-pressure (NP3) RCC socket & spigot pipes with rubber gasket joint including testing of joints. (IS 783:1985)		
	150 mm dia	Per Meter	15.00
	225 mm dia	Per Meter	28.00
	250 mm dia	Per Meter	31.00
	300 mm dia	Per Meter	51.00
	350 mm dia	Per Meter	118.00
	400 mm dia	Per Meter	129.00
	450 mm dia	Per Meter	145.00
	500 mm dia	Per Meter	159.00
	600 mm dia	Per Meter	195.00
	700 mm dia	Per Meter	229.00
	800 mm dia	Per Meter	297.00
	900 mm dia	Per Meter	362.00
	1000 mm dia	Per Meter	383.00
	1100 mm dia	Per Meter	423.00
	1200 mm dia	Per Meter	458.00
	1400 mm dia	Per Meter	478.00
	1600 mm dia	Per Meter	572.00
	1800 mm dia	Per Meter	684.00

SI NO.	Particulars of Items	Unit	Rate (in Rs.)
13.5	Providing, Laying and Jointing non-pressure (NP4) RCC socket & spigot pipes with rubber gasket joint including testing of joints. [Conforming to IS ; 458-1988, ISI marked laying as per IS 783:1985)		
	150 mm dia	Per Meter	406.00
	225 mm dia	Per Meter	477.00
	250 mm dia	Per Meter	538.00
	300 mm dia	Per Meter	767.00
	350 mm dia	Per Meter	1376.00
	400 mm dia	Per Meter	1519.00
	450 mm dia	Per Meter	1801.00
	500 mm dia	Per Meter	1999.00
	600 mm dia	Per Meter	2819.00
	700 mm dia	Per Meter	3392.00
	800 mm dia	Per Meter	4364.00
	900 mm dia	Per Meter	5319.00
	1000 mm dia	Per Meter	5675.00
	1100 mm dia	Per Meter	6719.00
	1200 mm dia	Per Meter	7702.00
	1400 mm dia	Per Meter	9837.00
	1600 mm dia	Per Meter	11729.00
	1800 mm dia	Per Meter	13733.00
13.6	Labour only for Laying and Jointing non-pressure (NP4) RCC socket & spigot pipes with rubber gasket joint including testing of joints. (IS 783:1985)		
	150 mm dia	Per Meter	15.00
	225 mm dia	Per Meter	31.00
	250 mm dia	Per Meter	31.00
	300 mm dia	Per Meter	51.00
	350 mm dia	Per Meter	118.00
	400 mm dia	Per Meter	133.00
	450 mm dia	Per Meter	145.00
	500 mm dia	Per Meter	159.00
	600 mm dia	Per Meter	219.00
	700 mm dia	Per Meter	242.00
	800 mm dia	Per Meter	310.00
	900 mm dia	Per Meter	362.00
	1000 mm dia	Per Meter	389.00
	1100 mm dia	Per Meter	423.00
	1200 mm dia	Per Meter	467.00
	1400 mm dia	Per Meter	487.00
	1600 mm dia	Per Meter	572.00
	1800 mm dia	Per Meter	684.00

CHAPTER- 14
SEWER APPURTENANCES

1 Manhole :-

(i) Manhole are the Important & essential Items in any Sewerage System. Manhole are classified as

(a) Straight-through manholes, (b) Junction Manholes, (c) Side Entrance Manholes, (d) Drop Manholes, (e) Scraper (Service) Type Manhole, (f) Flushing manholes.

(ii) Manholes are the essential ancillary structure in any sewerage system. They are provided for inspection, testing, cleaning, repairing and removal of obstruction from sewer line.

(iii) Manhole should be built at every change of alignment, gradient or diameter, at the head of all sewer and branches and at every junction of two or more sewers on sewer, which is to be cleaned manually or which cannot be entered for cleaning or inspection.

(iv) The Maximum spacing of manholes in the sewer shall be kept as follows: -

Pipe dia (mm)	Max. Spacing (meter)
Upto 900	30
900 to 1500	90 - 150
1500 to 2000	150 - 200
Above 2000	300

A spacing allowance of 100m per 1m dia of sewer is a general rule in case of very large sewers.

(v) Manhole Covers :-

The covers and frames shall conform to IS 1726 for cast iron and IS 12592 for pre-cast concrete covers. The size of manhole covers should be such that there should be clear opening of not less than 560mm diameter for manholes exceeding 0.9m depths.

2 Inverted siphon

When it is found necessary to cross obstruction like nallah by sewers line that shall be crossed by Inverted Syphon i.e. by laying the sewer under the obstruction (nallah) and regaining as much elevation as possible after the nallah is passed. As the siphons are depressed below the hydraulic grade line, maintenance of self cleaning velocity at all flows is very important. Two considerations, which govern the profile of a siphon, are provision for hydraulic losses and provisions for cleaning.

3 Storm Water Inlets :-

(i) Storm water inlets are device meant to admit the surface run off to the sewers and form a very important part of the systems. Therefore their location and design shall be given careful considerations.

(ii) Storm water inlets may be categorised under three major groups viz. curb inlets, gutter inlets and combination inlets, each being either depressed or flush depending upon their elevation with reference to the pavement surface.

4 **Sewer Ventilators :-**

(i) It is necessary to make provision for the escape of air to take care of the exigencies of full flow and also to keep the sewage as fresh as possible especially in outfall sewers. In case of storm sewers providing ventilating manhole covers serves the purpose.

(ii) Ventilating columns/ shafts shall be provided at an internal of 180m in all mains intercepting and outfall sewers, near the manholes.

(iii) The connections of house drains to the sewer shall be allowed without the use of any intercepting trap and thus permitting ventilation of laterals and branch sewers via. House drains and their ventilating pipes.

5 **Measurement :-**

Manholes shall be enumerated under relevant items. The depth of the manhole shall be reckoned from the top level of C.I. cover to the invert level of channel. The depth shall be measured correct to 10mm. The extra depth shall be measured and paid as extra over the specified depth.

6 **Rates :-**

The rate shall include the cast of the material and labour involved in all the operation described in the items.

(For Detail Refer to Specifications prepared by the Urban Administration and Development Department, IS Code & CPHEEO Manual)

CHAPTER 14 - SEWER APPURTENANCES

S.No.	Particulars of Items	Unit	Rate (in Rs.)
14.1	Providing and fixing SW gully trap complete with CI grating, Brick masonry chamber in cement mortar 1:4 (1 cement : 4 fine sand) water tight CI cover with frame of 30x30cm size including necessary Excavation, cement concrete grade M-5 (Nominal Mix) with stone aggregate 40mm nominal size, fixing CI cover with frame in Cement concrete grade M-15 (Nominal Mix) with stone aggregate 20mm nominal size, 12 mm thick cement plaster 1:2 (1 cement:2 coarse sand) finished with a floating coat of neat cement complete.		
14.1.1	100x100mm size "P" Gully Trap Chamber	Each	1137.00
14.1.2	125x100mm size "p", "Q" or "S" type Gully trap chamber	Each	1187.00
14.1.3	180x150mm size "P" or "S" type	Each	1243.00
14.2	Constructing Brick masonry manhole in cement mortar 1:4 (1cement:4 fine sand) RCC top slab Cement Concrete grade M-15 (Nominal Mix) with stone aggregate 20mm nominal size, foundation in cement concrete grade M-7.5 (Nominal Mix) with stone aggregate 40mm nominal size, inside plastering 12 mm thick with cement mortar 1:3 (1 cement:3 coarse sand) finished with a floating coat of neat cement and making channels in Cement Concrete grade M-15 (Nominal Mix) with stone aggregate 20mm nominal size including finishing the channel to shape, curing etc. with CI cover with frame etc.		
14.2.1	Man hole with above specifications having inside size 90x80 cm and 45 cm deep including C.I. cover with frame (light duty) 455x610 mm internal dimensions total weight of cover and frame to be not less than 38 kg (weight of cover 23 kg and weight of frame 15 kg):	Each	6122.00
14.2.2	Man hole with above specifications having inside size 90x80 cm and 60 cm deep including C.I. cover with frame (light duty) 455x610 mm internal dimensions total weight of cover and frame to be not less than 38 kg (weight of cover 23 kg and weight of frame 15 kg):	Each	6706.00
14.2.3	Man hole with above specifications having inside size 120x90 cm and 90 cm deep including C.I. cover with frame (medium duty) 500 mm internal diameter, total weight of cover and frame to be not less than 116 kg (weight of cover 58 kg and weight of frame 58 kg):	Each	13694.00
14.2.4	Man hole with above specifications having inside size 120x90 cm and 90 cm deep including C.I. cover with frame (heavy duty) 560 mm internal diameter, total weight of cover and frame to be not less than 208 kg (weight of cover 108 kg and weight of frame 100 kg)	Each	17606.00
14.2.5	Man hole for property connection (House connection) in narrow lanes.		
14.2.5.1	Man hole with above specifications having inside size 900x450mm and 900mm deep including Pre Cast RCC Man hole Cover (Heavy Duty) 500mm dia having 100mm thickness conforming to IS : 12592 - 2002 complete. (See Drawing No.-24)	Each	6395.00
14.2.5.2	Man hole with above specifications having inside size 600x450mm and 900mm deep including Pre Cast RCC Man hole Cover (Heavy Duty) 500mm dia having 100mm thickness conforming to IS : 12592 - 2002 complete. (See Drawing No.-25)	Each	4977.00
14.3	Extra for depth of man holes given at item 14.2		

S.No.	Particulars of Items	Unit	Rate (in Rs.)
14.3.1	90x80cm size manhole	per meter	3885.00
14.3.2	120x90cm size manhole over item.	per meter	4647.00
14.4	Construction of circular type of manhole 1500 mm internal dia. at bottom, 560 mm dia at top, total depth of manhole 2650mm in brick masonry with 1:5 cement mortar (1 cement : 5 fine sand), 12 mm thick Cement plaster 1:3 (1 cement : 3 coarse sand) finished with a floating coat of neat cement. 30 cm thick foundation in Cement concrete grade M-7.5 (Nominal Mix) with stone aggregate 40 mm nominal size, RCC Cement Concrete grade M-20 (Nominal Mix) with 20mm Nominal size on top slab and making channel in cement concrete grade M-15 (Nominal Mix) with stone aggregate 20 mm nominal size neatly finished, curing fixing of ISI marked reinforced concrete heavy duty cover (including transportation of cover) complete. as per standard design *(Drawing No. 15)*	Each	15721.00
14.4.1	Construction of circular type of manhole 1500 mm internal dia; depth 2650 mm as per item 11.4 but fitted with circular type C.I. manhole cover with frame having 116 kg weight (58 Kg cover + 58 Kg frame) in place of RCC heavy duty cover.	Each	18890.00
14.4.2	Extra for increasing depth of manhole mentioned at Item No. 14.4 from depth 2.65m to 4.25 m	per meter	7183.00
14.4.3	Extra for increasing depth of manhole mentioned at Item No. 14.4 from depth 4.25m to 9.75m	per meter	12286.00
14.5	Construction of circular type manhole 900 mm internal dia. at bottom, 560 mm dia at top total depth of manhole 900 mm in brick masonry with 1:5 cement mortar (1 cement : 5 fine sand), 12 mm thick Cement plaster 1:3 (1 cement : 3 coarse sand) finished with a floating coat of neat cement. 22.5 cm foundation in cement concrete grade M-10 (Nominal Mix) with stone aggregate 40mm nominal size, RCC top slab cement concrete M-20 (Nominal Mix) with stone aggregate 20mm nominal size and making channel in cement concrete grade M-15 (Nominal Mix) with stone aggregate 20mm nominal size neatly finished, curing fixing of ISI marked heavy duty SFRC cover etc. complete as per standard design.	Each	5681.00
14.5.1	Extra for increasing depth of manhole mentioned at Item No. 14.5 from depth of 900mm to 1650mm.	Meter	3223.00
14.6	Providing MS/CI foot rests and fixing in manhole with CC blocks of Cement Concrete grade M-10 (Nominal Mix) with stone aggregate 20 mm nominal size of size 20x20x10cm		
14.6.1	With 20mm square bar/ casting one foot rest (average weight of 1 foot rest 2.35kg)	Kg.	57.00
14.6.2	With 20mm round bar foot rest (average weight of 1 foot rest 1.85kg)	Kg.	61.00

S.No.	Particulars of Items	Unit	Rate (in Rs.)
14.7	Making connection of drain or sewer line with existing service lines manhole including breaking into and making good the walls, floors etc. with cement concrete grade M-15 (Nominal Mix) with stone aggregate 20mm nominal size plastered with Cement Mortar 1:3 (1 Cement : 3 coarse sand) finished with a floating coat of neat cement and making necessary channels etc. complete.		
14.7.1	For 100 to 150 mm dia pipes	Each	262.00
14.7.2	For 250 to 300 mm dia pipes	Each	295.00
14.7.3	For 350 to 450 mm dia pipes	Each	402.00
14.8	Providing SCI drop connection with SCI drop pipe and bend encased alround with Cement concrete grade M-5 (Nominal Mix) with stone aggregate 40mm nominal size including cutting holes and making good with brick work in cement mortar 1:5(1 cement:5 fine sand) plastered with cement mortar 1:3 (1 cement: 3 coarse sand) on inside walls including lead caulked joints and jointing SW pipes & SCI pipes with stiff cement mortar 1:1(1 cement: 1sand) including making required channel etc. complete.		
	(i) For 100 mm drop connection	each	3223.00
	(ii) For 150mm dia drop connection	each	4344.00
	(iii) Extra rate for depths of drop more than 60 cm		
	(a) 100mm dia Sand cast iron drop connection	Per meter	1086.00
	(b) 150mm dia Sand cast iron drop connection	Per meter	1628.00
14.9	Road Gully Chambers :- Construction of Brick masonry road gully chambers with brick work in cement mortar 1:5 (1 cement: 5 fine sand) and 12mm plaster 1:3 including foundation in cement concrete grade M-5 (Nominal Mix) with stone aggregate 40mm nominal size		
14.9.1	Chamber 45x45x77.5cm with vertical grating 450x100 mm size	each	3045.00
14.9.2	Chamber 50x45x60cm with 500x450mm CI Horizontal grating with frame.	each	2677.00
14.9.3	Chamber 110 x 50 x 77.5cm with 500x450 mm horizontal and 450x100 mm vertical gratings both.	each	5101.00
14.9.4	Providing & fixing of ISI marked pre cast reinforced cement concrete manhole cover including frame and transporting at site, cost of all material etc.		
	1. 560 mm dia heavy duty	Each	1172.00
	2. 600 mm dia heavy duty	Each	1458.00
	3. 560 mm dia extra heavy duty	Each	1569.00
	4 450x900 mm dia extra heavy duty	Each	2219.00
	5. 600 mm x 900 mm extra heavy duty rectangular	Each	3067.00

S.No.	Particulars of Items	Unit	Rate (in Rs.)
14.10	Construction of circular type manhole 1200mm internal dia at bottom, 560mm dia at top in brick masonry class designation 40 with 1:4 cement mortar 1:4 (1 cement : 4 Coarse sand) 1680m depth, 12mm thick cement plaster 1:3 cement plaster (1 cement : 3 Coarse sand) finished with a floating coat of neat cement. 30cm thick foundation in cement concrete grade M-10 (Nominal Mix) with stone aggregate 40mm nominal size, RCC grade M-20 (Nominal Mix) with stone aggregate M-20 nominal size on top slab and making channel in cement concrete grade M-15 (Nominal Mix) with stone aggregate 20mm nominal size neatly finished, curing and fixing of SFRC cover and frame (heavy duty HD-20) 560mm internal dia conforming to IS 12592.	Each	10745.00
14.11	Extra for increasing depth of manhole mentioned at Item No. 14.10 from 1680 mm to 2290 mm with modular brick class designation 40.	Meter	4301.00
14.12	Supplying and fixing C.I. cover without frame for manholes :		
14.12.1	455x610 mm rectangular C.I. cover (light duty) the weight of the cover to be not less than 23 kg.	Each	1340.00
14.12.2	500 mm diameter C.I. cover (medium duty) the weight of the cover to be not less than 58 kg.	Each	3312.00
14.12.3	560 mm diameter C.I, cover (heavy duty) the weight of the cover to be not less than 108 kg.	Each	5400.00
14.13	Replacement of M.S. foot rests in manholes including dismantling concrete blocks and fixing with 20x20x10 cm cement concrete blocks cement concrete grade M-10 (Nominal Mix) with stone aggregate 20mm nominal size.		
14.13.1	With 20x20 mm square bar	Each	168.00
14.13.2	With 20 mm diameter round bar	Each	146.00
14.14	Dismantling of manhole including R.C.C. top slab, C.I. cover with frame including stacking of useful materials near the site and disposal of unserviceable materials into municipal dumps/within 50 m lead :		
14.14.1	Rectangular manhole 90x80 cm and 45 cm deep	Each	399.00
14.14.2	Rectangular manhole 120x90 cm and 90 cm deep	Each	699.00
14.14.3	Rectangular arch type manhole 140x90cm and 2.45m deep.	Each	1323.00
14.14.4	Circular manhole 1.22 m diameter and 1.68 m deep.	Each	843.00
14.15	Extra for depth of manholes dismantled:		
14.15.1	Rectangular manhole 90x80 cm and 45 cm deep	Meter	318.00
14.15.2	Rectangular manhole 120x90 cm and 90 cm deep	Meter	379.00
14.15.3	Rectangular arch type manhole 140x90 cm and 2.45m deep (upto 4.25 m depth).	Meter	551.00
14.15.4	Circular manhole 122 cm diameter and 1.68 m deep (upto 2.29 m depth)	Meter	818.00
14.16	Cleaning of sewers		

S.No.	Particulars of Items	Unit	Rate (in Rs.)
14.16.1	Cleaning of sewers by means of manual labour using hand tools like pick axes, manhole guards, tripod stands, danger flags, lanterns, batteries, safety lamps, lead acetate paper, silt drums, ropes, iron hooks, hand carts, plunger rods (cleaning rods), observation rods, shovels etc. Qty of silt, debris etc. to be removed from manholes chambers after cleaning of sewers and manholes.		
(A)	Not exceeding a total length of 50 meters from manhole or cleaning eyes to the next manhole		
	100 mm	50 Mtr.	77.00
	150 mm	50 Mtr.	108.00
	200 mm	50 Mtr.	168.00
	300 mm	50 Mtr.	264.00
(B)	Exceeding 50 meters but not exceeding 100 meters		
	100 mm	50 Mrt to 100 Mtr.	154.00
	150 mm	50 Mrt to 100 Mtr.	215.00
	200 mm	50 Mrt to 100 Mtr.	337.00
	300 mm	50 Mrt to 100 Mtr.	535.00
14.16.2	Pumping out to removed the sewers blockage my using suitable pump sets operated by generators, whole assembly mounted on four wheel trailer/ pickup van.	Per Hour	51.00
14.16.3	Cleaning of sewers upto 300mm dia by manila rod and cloth ball/ sewer rod/ Roding machine with flexible sewer rods etc. including removal of blockage of manhole complete.	Each	360.00
14.16.4	Cleaning of sewers (all sizes) by jetting machine/ sewer cleaning machine equipped with air and water jetting by removal of blockage of manhole and cleaning sewers manhole to manhole by jetting complete.	Day	2149.00
14.16.5	Removal of debris/malwa collected in manholes by manual means/ mechanical means complete.	Cum	139.00

CHAPTER- 15
REQUIRED CIVIL WORKS FOR WATER SUPPLY & SEWERAGE WORKS

1 Earth work shall be done as per IS 1200 (Part-1) : 1992

2 Excavation shall be done as per safety codes IS 3764 : 1992

3 Concrete work shall be done as per IS 456 : 2000

4 Cement shall be used as IS standard given below :-

4.1 When the strength of concrete required is upto M-20, then O.P.C. conforming to IS 269-1989 or P.P.C. confirming to IS : 1498-1976 may be used.

4.2 When the strength of concrete required is more than M-20 but upto M-30, then O.P.C. conforming to IS : 8112 - 1989 shall be used.

4.3 Pozzolona cement is now being widely produced all over country. This may be used in structures contact with water as per I.S. code. In specific cases requiring higher grade of strength, use of Ordinary Portland Cement (OPC) should invariably be ensured.

4.4 For prestressed concrete works if the strength of concrete required is more than M-30, then O.P.C. conforming to IS : 12269-1987 shall be used.

5 Steel shall be used as per IS standard given below :-

5.1 Mild steel and medium tensile steel bars shall conform to IS :432 (Part- I),
5.2 Hot rolled deformed bars shall conform to IS : 1139,
5.3 Cold Twisted bars shall conform to IS : 1786,
5.4 Hard drawn steel wire fabric shall conform to IS : 1566 and
5.5 Rolled steel made from structural steel shall conform to IS : 226.

6 Sand

6.1 Sand is the fine aggregate which is obtained either from natural source like river bank or from pits etc. Sand can also be produce by crushing stone are gravels. It should pass through 4.75 mm IS sieve.

6.2 Sand should be free from clay, dust or silt. The permissible limit for the same is 5% by weight.

6.3 Sand should be free from organic impurities as determined is in accordance with IS : 2386 (Part-II)

6.4 For plaster sand used should conform to IS : 1542/1960

6.5 For masonry work sand used should conform to is : 166/1965

7 Coarse aggregate

7.1 Coarse aggregate should retain on 4.75 mm IS sieve.
7.2 (a) Uncrushed gravel/Stone obtain from natural sources,
7.3 (b) crushed gravel/stone obtain from crushing of gravel/hard stone or

7.4 (c) partially crushed gravel/stone by mixing of the above two (a & b) is called coarse aggregate.

7.5 It should not contain coal, lignite, pyrites mica , shale, clay, soft fragments, and other organic impurities

7.6 It should not contain any material which is liable to caused detrimental effect on steel reinforcement.

7.7 The maximum quantity of deleterious material should not exceed the limits as shown in table 1 of IS: 383/1970, when tested in accordance with IS:2386/1963.

7.8 The crushing value of the aggregate should not exceed 45 % when determined in accordance with the IS: 2386 (Part-IV)-1963 for concrete other than wearing surfaces and 30 % for concrete for wearing surfaces such as runways, roads and pavement.

7.9 The coarse aggregate shall satisfy the following requirement of grading.

I.S. Sieve	**Percentage by Weight Passing the sieve**		
	40 mm	**20 mm**	**12.5 mm**
63 mm	100	-----	--
40 mm	95-100	100	--
20 mm	30-70	95-100	100
12.5 mm	---	---	90-100
10 mm	10-35	25-55	40-85

8 Bricks

8.1 Common burnt clay bricks should be as per IS:1077 classes of common burnt bricks

8.2 Class: Classes of Common Burnt Clay Bricks as under :

Class Designation	Average Compressive strength not less than	
	N/mm²	Kgf/cm² (aprox)
25	25.0	250
20	20..0	200

9 Mortar

9.1 The mortar mixing shall preferably be done in mechanical mixer operated manually or by power. Hand mixing can be restored to as long as uniform density of the mix and its strength are assured subject to prior approval of Engineer-in-charge.

9.2 Hand mixing operation, if permitted, carried out on clean water tight platform when cement and sand shall be first mixed dry in required proportion several times till the mixture is of uniform. Minimum quantity of water shall be added to bring the mortar to the consistency of stiff paste.

9.3 Mortar shall be mixed only in such quantity as required for immediate use. The mortar normally be considered to use within 30 minutes. Mortar remains unused after 30 minutes shall be rejected and removed from site.

10 Plaster

Plastering shall be done where shown on as per drawing. Plastering shall be started from top and worked down. Wooden screeds 75mm wide and of the thickness of the plaster shall be fixed vertically 2.5 to 4 meter. apart to act as gauge and guide in applying plaster. The mortar shall be laid on the wall between the screeds using the plasters float and pressing the mortar so that packed joints are properly filled. The plaster shall there be finished off with a wooden straight edge reaching across the screeds. The straight edge shall be worked on the screeds with small upward and side ways motion 50mm to 75mm at a time. Finally, the surface shall be finished off with a plasters wooden float. Metal floats shall not be used.

Curing shall be commenced as soon as mortar used for finishing has hardened sufficiently and not to be damaged during curing. It shall be kept wet for a period of at least 7 days.

11 Form work :-

11.1 Form work shall include all temporary form for forming concrete of shape with all props, staging, centering required for support.

11.2 All material shall confirm to relevant I.S. specifications

11.3 Form work shall be constructed with metal or timber, for metal all bolts should be counter sunk.

11.4 The form work should be robust and strong and joint shall be leak proof. Staging must have cross bracing and diagonal bracing in both direction.

11.5 The rates include provision of gradient in form work for terrace roof and gradient shall be provided necessarily for water drained out quickly and effectively. Concrete shall not be freely dropped into place from height exceeding 1.50 meter. And it shall be compacted in its final position within 30 minutes of its discharge from mixer. It shall be compacted thoroughly by vibration or other means during placing so as to produce a dense homogenous void free mass having required surface finish.

11.6 No plaster is permitted on the concrete surface. Bottom and side surfaces shall give a uniform in textured smooth surface and good appearance. Concrete having rough non-uniform texture and honey combing in more than 5% area shall be rejected and payment for the form work shall not be made.

12 Measurements :-

Measurements shall be taken for complete finished item as per details given in specification.

13 Rates :-

Rates include labour, material equipment and machineries required for completion of items.

(For Detail Refer to Specifications prepared by the Urban Administration and Development Department, IS Code & CPHEEO Manual)

CHAPTER 15 - REQUIRED CIVIL WORKS FOR PUBLIC HEALTH ENGINEERING

S.No.	Particulars of Items	Unit	Rates (in Rs.)
15.1	Earth work in Excavation for pipe trench in all kinds of soil and WBM in areas including dressing, watering and ramming and disposal of Excavated earth lead upto 50 meters and lift upto 1.5m, disposal earth to be leveled, neatly dressed.	Per cum	110.00
15.2	For muddy area	Per cum	132.00
15.3	Earth work in excavation for pipe trench in all kinds of rocks in areas including dressing, stacking of useful material and disposal of unserviceable one upto 50 m lead and lift upto 1.5 m.		
	(a) Soft rock with or without blasting or bituminous pavement / cement concrete road.	Per cum	174.00
	(b) Hard rock requiring blasting.	Per cum	296.00
	(c) Hard rock requiring chiseling / where blasting is prohibited.	Per cum	342.00
15.4	Extra for every additional lift of 1.5m or part there of over item 18.1 to 18.3.	Per cum	4.00
15.5	Extra for every additional lead up to 50 m or part thereof over item 18.1 to 18.3.	Per cum	41.00
15.6	Earth work in Excavation of Foundation for Structures as per drawing and technical specification including setting out, construction of shoring and bracing, removal of stumps and other deleterious matter, dressing of sides and bottom and backfilling with approved material etc. and as per relevant clause of section 300 & 2100		
	Ordinary soil		
	1) upto 3 m depth	Per cum	58.00
	2) 3.0 m to 6.0 m depth	Per cum	75.00
15.7	Pumping out water caused by springs, tides or river seepage, broken water mains or drains or well or the like.	Per KL	44.00
15.8	(a) Filling available excavated earth in trenches, plinth sides of foundation in layers not exceeding 20cm. in depth including consolidation of each layer by ramming watering, lead up to 50m and lift up to 1.5m in all kinds of soils	Per cum	23.00
	(b) Filling available excavated earth in trenches, lead up to 50m and lift up to 1.5m in all kind of soil excluding watering and ramming.	Per Cum	15.00
15.9	Filling with moorum for pipe bedding or over the pipe including supply of moorum	Per cum	384.00

S.No.	Particulars of Items	Unit	Rates (in Rs.)
15.10.1	Demolishing Brick work in lime mortar in any mix including stacking of serviceable material and disposal of unserviceable material with in 50 meter lead.	Cum	132.00
15.10.2	Demolishing Brick work in cement mortar in any mix including stacking of serviceable material and disposal of unserviceable material with in 50 meter lead.	Cum	319.00
15.11	Demolishing stone rubble masonry in lime mortar including stacking of serviceable material and disposal of unserviceable material with in 50 meter lead	Cum	180.00
15.12	Demolishing stone rubble masonry in cement mortar in any mix including stacking of serviceable material and disposal of unserviceable material with in 50 meter lead.	Cum	342.00
15.13	(a) Dismantling stone slab paving of any thickness in cement or lime mortar of any ratio including all leads and lifts.	Sqm	36.00
	(b) Dismantling kharanja of any thickness in cement mortar of any mix.	Sqm	31.00
15.14	(a) Fixing in cement mortar 1:6 (1 cement : 6 sand) stone slab 30 mm thick.	Sqm	255.00
	(b) Labour only for fixing of stone set paving of any thickness.	Sqm	65.00
	(c) Fixing in C.M. 1:6 Kharanja of any thickness	Sqm.	255.00
	(d) Labour only for fixing of stone in Kharanja.	Sqm	65.00
15.15	Cutting of Water bound macadam road and making good the same including supply of extra quantities of materials i.e. aggregate, moorum screening and labour required.	Cum	561.00
15.16	Cutting of bituminous road portion and making good the same including supply of extra quantities of materials i.e. aggregate, moorum screening and labour required.	Cum	1243.00
15.17	Providing and laying mechanically mixed cement concrete with crushed stone aggregate excluding centering and shuttering (with 40mm nominal size graded stone aggregate)		
(a)	In foundation and plinth		
i	M-5	cum	2344.00
ii	M-7.5	cum	2559.00
iii	M-10	cum	2840.00
iv	M-15	cum	3362.00
(b)	(b) In walls & Superstructure up to 4 meter. height above plinth (with 40mm nominal graded metal)		
i.	M-10	cum	2965.00
ii.	M-15	cum	3487.00

S.No.	Particulars of Items	Unit	Rates (in Rs.)
15.18	Providing & laying mechanically mixed cement concrete 20mm maximum size graded crushed stone including cost of centering & shuttering.		
(a)	In Plinth & foundation		
i	M-10	cum	3017.00
ii	M-15	cum	3546.00
iii	M-20	cum	3970.00
(b)	In walls and superstructure up to 4 meter. height above plinth (with 20mm nominal graded metal) excluding the cost of centering shuttering.		
i	M-10 (Nominal mix)	cum	3026.00
ii	M-15 (Nominal mix)	Cum	3535.00
iii	M-20 (Nominal Mix)	Cum	3942.00
iv	M-25 (design mix)	cum	4425.00
(c)	Providing plain cement concrete M-10 nominal mix with 40mm maximum size stone aggregate in foundation (excluding form work) as per relevant I.S. Standard.		
(i)	Base concrete for coloums	cum	2840.00
15.19	Providing and laying in position machine batched, machine mixed and machine vibrated design mix cement concrete of specified grade for reinforced cement concrete work including concrete laying, cost of centering, shuttering, finishing and including Admixtures in recommended proportions as per IS 9103 to accelerate, retard setting of concrete, improve workability without impairing strength and durability as per direction of Engineer-in-charge. M-20 grade design mix reinforced cement concrete by using 405 kg. of cement per cum of concrete. All work up to plinth level excluding the cost of reinforcement.		
(i)	RCC Grade M20	cum	4524.00
(ii)	RCC Grade M30	cum	4594.00
(iii)	RCC Grade M35	cum	4620.00
(iv)	RCC Grade M25	cum	4545.00
(v)	PCC Grade M25	cum	4494.00
(vi)	PCC Grade M30	cum	4520.00
15.20	Providing and laying Plain/ Reinforcement cement concrete in sub structure or complete section including cost of form work staging/bracing and shuttering complete as per drawing and technical specification and as per relevant I.S. Standard (Height above average ground level).		
(i)	PCC Grade M-20		
a)	Height upto 5m	cum	4199.00
b)	Height beyond 5m and upto 10m	cum	4284.00
(ii)	PCC Grade M-25		
a)	Height upto 5m	cum	4765.00

S.No.	Particulars of Items	Unit	Rates (in Rs.)
b)	Height beyond 5m and upto 10m	cum	4862.00
c)	Height above 10m	cum	5008.00
(iii)	PCC Grade M30		
a)	Height upto 5m	cum	4827.00
b)	Height beyond 5m and upto 10m	cum	4915.00
c)	Height above 10m	cum	5047.00
(iv)	RCC Grade M20		
a)	Height upto 5m	cum	4785.00
b)	Height beyond 5m and upto 10m	cum	4872.00
c)	Height above 10m	cum	5003.00
(v)	RCC Grade M25		
a)	Height upto 5m	cum	4819.00
b)	Height beyond 5m and upto 10m	cum	4906.00
c)	Height above 10m	cum	5038.00
(vi)	RCC Grade M30		
a)	Height upto 5m	cum	4883.00
b)	Height beyond 5m and upto 10m	cum	4970.00
c)	Height above 10m	cum	5105.00
(vii)	RCC Grade M35		
a)	Height upto 5m	cum	4934.00
b)	Height beyond 5m and upto 10m	cum	5024.00
c)	Height above 10m	cum	5158.00
15.21	Providing and Laying plain/ Reinforcement cement concrete in super structure ring beam Dom, walls, beam etc section including cost of form work staging/bracing and shuttering complete as per drawing and technical specification and as per relevant clauses of I.S. Standard.		
(A)	RCC Grade M20		
a)	Height upto 5m	cum	5494.00
b)	Height beyond 5m and upto 10m	cum	5713.00
c)	Height above 10m	cum	5933.00
B	RCC Grade M25		
a)	Height upto 5m	cum	5592.00
b)	Height beyond 5m and upto 10m	cum	5815.00
c)	Height above 10m	cum	6039.00
C	RCC Grade M 30		
a)	Height upto 5m	cum	5723.00
b)	Height beyond 5m and upto 10m	cum	5952.00
c)	Height above 10m	cum	6181.00
15.22	STEEL		

S.No.	Particulars of Items	Unit	Rates (in Rs.)
A	Providing and placing in position cold twisted or un-coated HYSD steel bar and hot rolled deformed steel reinforcement for R.C.C. work i/c cutting, bending, binding etc. complete i/c cost of binding wire and wastage.		
	Sub structure	Kg	43.00
	Super structure	Kg	43.00
B	Steel work in single section i/c cutting, hoisting, fixing in position and applying a primary coat of lead paint. In R.S. Joint in flat iron/angle/ tee/channel/ square/round bar.	Kg	51.00
C	Steel work in riveted /bolted in built-up section truss and frame i/c cutting/hoisting/fixing in position and applying a priming coat of paint. In R.S. Joint in flat iron /angle /tee/ channel / square / round bar.	Kg	52.00
D	Steel work is welded in built-up section tee & frame i/c cutting hoisting/fixing and painting with red lead paint. (i) In R.S. Joint in flat iron /angle / channel / bar.	Kg	58.00
E	Supplying ,Fitting and placing un-coated HYSD bar reinforcement in foundation complete as per drawing and technical specification and relevant clauses of section	Kg	43.00
F	Supplying ,Fitting and placing un-coated HYSD bar reinforcement in Sub - structure complete as per drawing and technical specification and relevant clauses of section 1600	Kg	43.00
G	Supplying ,Fitting and placing un-coated HYSD bar reinforcement in Super - structure complete as per drawing and technical specification and relevant clauses of section 1600	Kg	43.00
15.23	CEMENT MORTAR		
A	Cement Mortar 1:3 (1 Cement : 3 sand)	Cum	3428.00
B	Cement Mortar 1:4 (1 Cement : 4 sand)	Cum	2797.00
C	Cement Mortar 1:5 (1 Cement : 5 sand)	Cum	2457.00
D	Cement Mortar 1:6 (1 Cement : 6 sand)	Cum	2165.00
E	Cement Mortar 1:8 (1 Cement : 8 sand)	Cum	1918.00
15.24	BRICK WORK		
a	Brick work with well burnt chimney bricks having crushing strength not less than 25 kg/cm^2 and water absorption not more than 25% in foundation & plinth.		
i	In Cement Mortar 1:3	Cum	3326.00
ii	In Cement Mortar 1:4	Cum	3143.00
iii	In Cement Mortar 1:5	Cum	3044.00
iv	In Cement Mortar 1:6	Cum	2959.00

S.No.	Particulars of Items	Unit	Rates (in Rs.)
b	Brick work with well burnt chimney bricks having crushing strength not less than 25 kg/cm2 and water absorption not more than 20% above plinth level including cost of form work.		
i	In Cement Mortar 1:3	Cum	3355.00
ii	In Cement Mortar 1:4	Cum	3172.00
iii	In Cement Mortar 1:5	Cum	3502.00
iv	In Cement Mortar 1:6	Cum	3413.00
C	Extra rate for Brick work with well burnt chimney bricks having crushing strength not less than 25 kg/cm² and water absorption not more than 20% above four meter height.	Cum	65.00
D	Half brick work with well burnt chimney bricks crushing strength not less than 40kg/cm² and water absorption not more than 20% is superstructure including cost of form work upto floor 2 level.		
i	Cement mortar 1:4	Sqm	446.00
ii	Cement mortar 1:6	Sqm	429.00
E	Brick work with open bhatta bricks having crushing strength not less than 20 Kg/ cm2 and water absorption not more than 25 % in foundation of plinth. In cement mortar 1:8	Cum	2663.00
15.25	PLASTER		
a	12mm thick cement plaster in single coat including finishing even, smooth and curing including cost of form work complete.		
i	1:3(Cement 1: Sand 3)	Sqm	97.00
ii	1:4(Cement 1: Sand 4)	Sqm	86.00
iii	1:5(Cement 1: Sand 5)	Sqm	81.00
iv	1:6(Cement 1: Sand 6)	Sqm	74.00
b	15mm thick cement plaster in single coat finished even, smooth and curing including cost of form work complete.		
i	in CM 1:3	Sqm	114.00
ii	in CM 1:4	Sqm	101.00
iii	in CM 1:5	Sqm	94.00
iv	in CM 1:6	Sqm	88.00
c	Neat cement punning	Sqm	20.00
d	18mm thick cement plaster in 2 coats under layer 12mm CM 1:5 (1 cement:5 coarse sand) and top layer 6mm thick cement plaster 1:3 (1 cement:3 fine sand) finished even, smooth and curing including cost of form work complete.	Sqm	125.00
15.26	Excavation of DUG-WELL/SEPTIC TANK ETC.		
15.26.1	Excavation in soft or ordinary soil including 50 m lead and 1.5 m lift with dressing.	Cum	33.00

S.No.	Particulars of Items	Unit	Rates (in Rs.)
15.26.2	Excavation in hard soil including 50 m lead and 1.5 m lift with dressing.	Cum	41.00
15.26.3	Excavation in moorum and moorum mixed with boulder including 50 m lead and 1.5 m lift with dressing.	Cum	59.00
15.26.4	Add Extra in items 2801 to 2803 above for depth.		
	(a) Beyond 1.5 m to 3 m	Cum	3.00
	(b) Beyond 3 m to 4.5 m	cum	6.00
	(c) Beyond 4.5 m to 6 m	Cum	6.00
	(d) Beyond 6 m to 7.5 m	cum	12.00
	(e) Beyond 7.5 to 9 m	cum	15.00
	(f) Beyond 9 m to 10.5 m	cum	16.00
	(g) Beyond 10.5 m to 12 m	cum	21.00
	(h) Beyond 12 m to 13.5 m	cum	24.00
	(i) Beyond 13.5 m to 15 m	cum	27.00
	(j) Beyond 15 m to 16.5 m	cum	29.00
	(k) Beyond 16.5 m to 18 m	cum	33.00
	(l) Beyond 18 m to 19.5 m	cum	36.00
	(m) Beyond 19.5 m to 21 m	cum	39.00
	(n) Beyond 21 m to 22.5 m	cum	42.00
	(o) Beyond 22.5 m to 24 m	cum	45.00
15.26.5	Excavation in disintegrated rock including 50 m lead and 1.5 m lift with dressing	cum	117.00
15.26.6	Excavation in soft rock including 50 m lead and 1.5 m lift with dressing.	Cum	199.00
15.26.7	Excavation in hard rock including 50 m lead and 1.5 m lift-		
	(a) Blasting permitted	cum	328.00
	(b) Blasting prohibited (i.e. wedged and chiselled)	cum	384.00
15.26.8	Add extra in items Nos. 2805 to 2807 above for depth.		
	(a) Beyond 1.5 m to 3 m	cum	4.00
	(b) Beyond 3 m to 4.5 m	cum	8.00
	(c) Beyond 4.5 m to 6 m	cum	12.00
	(d) Beyond 6 m to 7.5 m	cum	16.00
	(e) Beyond 7.5 to 9 m	cum	20.00
	(f) Beyond 9 m to 10.5 m	cum	24.00
	(g) Beyond 10.5 m to 12 m	cum	28.00
	(h) Beyond 12 m to 13.5 m	cum	32.00
	(i) Beyond 13.5 m to 15 m	cum	36.00
	(j) Beyond 15 m to 16.5 m	cum	40.00
	(k) Beyond 16.5 m to 18 m	cum	44.00
	(l) Beyond 18 m to 19.5 m	cum	48.00
	(m) Beyond 19.5 m to 21 m	cum	52.00
	(n) Beyond 21 m to 22.5 m	cum	59.00
	(o) Beyond 22.5 m to 24 m	cum	61.00
	(p) Beyond 24 m to 25.5 m	cum	65.00

S.No.	Particulars of Items	Unit	Rates (in Rs.)
	(q) Beyond 25.5 m to 27 m	cum	69.00
	® Beyond 27 m to 28.5 m	cum	73.00
	(s) Beyond 28.5 m to 30 m	cum	77.00
15.27	CLEANING OF DUG-WELL		
	Cleaning of open well/step well by removal of refuse materials, vegitable, silt, mud, rubbles, etc excluding pumping of water from well.	cum	39.00
	Extra rate for lifting the material during the cleaning of well for every 1.5m additional depth	Cum	3.00
15.28	CONSTRUCTION OF STOP DAM		
15.28.1	Labour only for fixing in position single steel shutter for stop dam including all handling, cleaning of grooves i.e. removal of foreign materials such as dust, sand, silt etc. including greasing, oiling where ever required , excluding cost of all materials & staking at site. (Over all dimension of shutters to be considered.)	Sqm	44.00
15.28.2	Labour only for removing single steel shutter for stop dam including all handling, unscrewing, oiling where ever required ,excluding cost of all materials & staking at site. (Over all dimension of shutters to be considered.)	Sqm	44.00
15.28.3	Labour only for fixing in position the steel/wooden karri shutters for stop dam excluding filling the puddle earth but including all handling ,cleaning of grooves of foreign materials such as dust, sand, silt etc. including greasing, oiling where ever required ,excluding cost of all materials. (Over all dimension of karri shutters to be considered.)	Sqm	43.00
15.28.4	Labour only for removing the steel/wooden karri shutters for stop dam without removal of puddle earth but including handling , unscrewing ,oiling where ever necessary excluding cost of all materials & stacking at site. (Over all dimension of karri shutters to be considered.)	Sqm	43.00
15.28.5	Detailed Geo referenced topographical mapping and development of graphic database for any selected area using digital state of art total station G.P.S., Automatic levels etc. including transfer of entire area data to computer system in different Geo referenced layer/themes using features of standard software compatible with urban area project system design software package including supply of soft copies and hard copies in appropriate state.	Hect.	132.00
15.28.6	Catchment area survey –		
	(a) Chain and compass survey along ridge line by Departmental Officer	km	909.00
	(b) Leveling along ridgeline and cross-sections.	km	561.00

CHAPTER- 16
MISCELLANEOUS

1 The works to be executed in accordance with the General specifications of the Urban Administration & Development Department, relevant IS codes for pipes/specials, jointing materials and laying works.

2 All materials shall conform to relevant ISS.

3 Where cracked pipe or cut piece is required to be used on line to take a tyton ring joint, it is necessary to cut the cracked portion and chamfer the pipe. In a cut piece, only chamfering would be required. These rates have been introduced separately for cutting and chamfering. The rates include requirement of tools and plants, lead and lift etc.

4 During the course of execution, it sometimes becomes necessary to provide a non-standard special to fit into the pipeline. This can be conveniently made out of steel plates. An item to cover such emergency is also provided for in the schedule. Similarly, item to provide a mild steel flange has also been introduced to over the specific requirement during execution.

5 An item for laying and jointing steel pipes, incorporating field welding has also been introduced to cover the special requirements during execution.

6 All pavements, paved foot paths, curbing, gutters, shrubbery, fences, poles, rod or other property and surface structures removed or disturbed as a part of the work shall be restored to a condition equal to that before the work began, furnishing all labour and material incidental thereto. In restoring the pavement sound materials may be reuse. No Permanent pavement shall be restored unless and until, in the opinion of the Engineer in charge the condition of the backfill is such as to properly support the pavement.

7 Pavement and road surface may be removed as a part of the trench excavation and the amount removed shall depend upon the width of trench specified for the installation of the pipe and the width and length of the pavement area required to be removed for laying pipes. The width of pavement removal along the normal trench for the installation of the pipe shall not exceed the width of the trench specified by more then 15 cm on each side of the trench. Wherever in the opinion of the Engineer in charge existing conditions make it necessary or advisable to remove additional pavement, it shall be removed as directed by the Engineer in charge.

8 All construction material, and all tools and temporary structures shall be removed form the site as directed by the Engineer in charge. All dirt, rubbish and excess earth form the excavation shall be taken off to a specified dumping site as directed by Engineer in Charge and the construction site shall be kept clean to the satisfaction of the Engineer-in-charge.

9 Where any pavement, shrubbery, fence, poles or other property and surface structures have been damaged, removed or disturbed during the course of the work, such property and surface structures shall be replaced or repaired after completion of work.

10 Measurements

Measurement shall be made according to the work actually done and pavement shall be made accordingly.

11 Rates :

The rate shall include the cost of the material and labour involved in all the operation described in the items. The rates include all plants, chain, pulley blocks, other appliances etc. required for execution of the works. Rates for items and making good roads etc. include lead for the materials.

(For Detail Refer to Specifications prepared by the Urban Administration and Development Department, IS Code & CPHEEO Manual)

CHAPTER 16 -- MISCELLANEOUS

S. No.	Particulars of Items	Unit	Rates (in Rs.)
16.1	Labour for cutting following cast iron pipes of any type and class.		
	80 mm dia.	Per Cut	20.00
	100 mm dia.	Per Cut	26.00
	150 mm dia.	Per Cut	46.00
	200 mm dia.	Per Cut	62.00
	250 mm dia.	Per Cut	78.00
	300 mm dia.	Per Cut	109.00
	350 mm dia.	Per Cut	123.00
	400 mm dia.	Per Cut	141.00
	450 mm dia.	Per Cut	155.00
	500 mm dia.	Per Cut	189.00
	600 mm dia.	Per Cut	216.00
	700 mm dia.	Per Cut	235.00
	750 mm dia.	Per Cut	249.00
	800 mm dia.	Per Cut	287.00
	900 mm dia.	Per Cut	309.00
	1000mm dia	Per Cut	330.00
16.2	Labour for cutting following Asbestos Cement Pressure Pipes of any type and class.		
	80 mm dia.	Per Cut	10.00
	100 mm dia.	Per Cut	14.00
	150 mm dia.	Per Cut	25.00
	200 mm dia.	Per Cut	34.00
	250mm dia	Per Cut	40.00
	300mm dia	Per Cut	56.00
	350mm dia	Per Cut	63.00
16.3	Labour for cutting following Ductile iron pipes of any type and class.		
	80 mm dia.	Per Cut	19.00
	100 mm dia.	Per Cut	24.00
	150 mm dia.	Per Cut	43.00
	200 mm dia.	Per Cut	57.00
	250 mm dia.	Per Cut	71.00
	300 mm dia.	Per Cut	101.00
	350 mm dia.	Per Cut	112.00
	400 mm dia.	Per Cut	126.00
	450 mm dia.	Per Cut	140.00
	500 mm dia.	Per Cut	168.00
	600 mm dia.	Per Cut	197.00
	700 mm dia.	Per Cut	209.00
	750 mm dia.	Per Cut	224.00
	800 mm dia.	Per Cut	251.00
	900 mm dia.	Per Cut	278.00
	1000mm dia	Per Cut	296.00

S. No.	Particulars of Items	Unit	Rates (in Rs.)		
16.4	Labour for cutting following Galvanised iron (MS) pipes of any type and class.				
	15 mm dia.	Per Cut	3.00		
	20 mm dia.	Per Cut	5.00		
	25 mm dia.	Per Cut	8.00		
	32 mm dia.	Per Cut	9.00		
	40 mm dia.	Per Cut	11.00		
	50 mm dia.	Per Cut	13.00		
	65 mm dia.	Per Cut	15.00		
	80 mm dia.	Per Cut	16.00		
	100 mm dia.	Per Cut	20.00		
	125 mm dia.	Per Cut	23.00		
	150 mm dia.	Per Cut	26.00		
16.5	Labour for cutting following P.V.C pipes of any type and class.				
	90mm dia	Per Cut	4.00		
	110mm dia	Per Cut	6.00		
	140mm dia	Per Cut	11.00		
	160mm dia	Per Cut	12.00		
	180mm dia	Per Cut	14.00		
	200mm dia	Per Cut	15.00		
16.6	Chamfering cast iron pipes of all types and classes to make suitable for tyton joints.				
	80mm to150 mm dia.	Per End	340.00		
	200 mm dia.	Per End	420.00		
	250 mm dia.	Per End	467.00		
	300 mm dia.	Per End	521.00		
	400 mm dia.	Per End	604.00		
	450 mm dia.	Per End	688.00		
	500 mm dia.	Per End	737.00		
	600 mm dia.	Per End	815.00		
	700 mm dia.	Per End	935.00		
	750 mm dia.	Per End	1002.00		
	800 mm dia.	Per End	1135.00		
	900 mm dia.	Per End	1196.00		
	1000 mm dia.	Per End	1316.00		
16.7	Dismantling following old cast iron socket and spigot pipes class 'L.A.' 'A' & 'B' including breaking lead caulked joints, melting of lead and making it in to blocks including stacking of pipes at site lead upto 50 meters.		LA	A	B
	80 mm dia.	RM	5.00	5.00	6.00
	100 mm dia.	RM	6.00	7.00	7.00
	125 mm dia.	RM	9.00	10.00	10.00
	150 mm dia.	RM	11.00	11.00	13.00
	200 mm dia.	RM	15.00	16.00	18.00
	250 mm dia.	RM	21.00	22.00	24.00
	300 mm dia.	RM	28.00	29.00	31.00

S. No.	Particulars of Items	Unit	Rates (in Rs.)		
	350 mm dia.	RM	33.00	36.00	39.00
	400 mm dia.	RM	40.00	44.00	47.00
	450 mm dia.	RM	47.00	53.00	58.00
	500 mm dia.	RM	56.00	61.00	66.00
	600 mm dia.	RM	75.00	82.00	88.00
	700 mm dia.	RM	97.00	102.00	116.00
	750 mm dia.	RM	111.00	120.00	129.00
	800 mm dia	RM	126.00	132.00	143.00
	900 mm dia	RM	148.00	161.00	177.00
	1000 mm dia.	RM	180.00	195.00	210.00
16.8	Manufacturing and supply of specials made out of M.S. steel plate or HR coil conforming to IS 3589-2001 or its latest revision/amendment, 5mm to 6mm thick plate in shapes and sizes required as per site conditions including cost of steel plate & other electrical & mechanical material, including Submerged Arc welded, including cost of transportation, loading and unloading complete approved by Engineer-in-Charge. (This is applicable only when standard special are not available).	P. Kg.		80.00	
16.9	Providing & fixing in position Cast Iron Manhole Covers and frame conforming to IS-1726. All the exposed edges rounded end finished in cement mortar 1:3 etc. complete.	P. Kg.		47.00	
16.10	Labour only for fixing in position Cast Iron Manhole Covers & frame conforming to IS-1726.	P. Kg.		3.00	
16.11	Provision of public stand posts for urban poor				
16.11.1	Providing and constructing two stand post as per type design with excavation 15 cm thick PCC 1:3:6 bedding 20 mm thick PCC 1:2:4 convert for platform of 1.75 M dia. with side curb and bucket rest, 80 mm dia , heavy duty GI pipe central post duly filled therein with C.C. 1:2:4, 2.4 M long, 20mm dia medium G.I. pipe from point of tapping to stand post additional 20mm dia G.I. pipe 6 m long fixed up to 15 mm dia self closing water taps, one brass ferule etc. complete together with all labour and material charges as per drawing and as directed by Engineer-in-charge when good foundation in available. Rate includes draining arrangement by excavating open gutters complete. (Drawing No.- 22)	Each		4287.00	

S. No.	Particulars of Items	Unit	Rates (in Rs.)
16.11.2	Providing and constructing two taps stand post as per type design with excavation 30 cm thick boulder filling j15 cm thick PCC in 1:3:6 , 20 mm thick RCC 1:2:4 platform of 1.75 M dia. with side curb and bucket rest, 80 mm dia, heavy duty GI pipe central post duly filled therein with C.C. 1:2:4, 2.4 M long, 20mm dia medium G.I. pipe 6 m long fixed up to two 15 mm dia self closing water taps, one brass ferule etc. complete together with all labour and material charges as per directed by Engineer-in-charge when B.C. soil is available. Rate includes draining arrangement by excavating open gutters complete. *(Drawing No.-23)*	Each	4572.00
16.12	Disinfecting C.I. water mains by flushing with water containing bleaching powder at 0.5 gms per liter of water and cleaning the same with fresh water, operation to be repeated three times including getting the sample of water from the disinfected main tested in the Govt. / Municipal/ Authorised laboratory :		
	80mm diameter	100 Meter	292.00
	100mm diameter	100 Meter	383.00
	125mm diameter	100 Meter	480.00
	150mm diameter	100 Meter	580.00
	200mm diameter	100 Meter	781.00
	250mm diameter	100 Meter	995.00
	300mm diameter	100 Meter	1127.00
	350mm diameter	100 Meter	1268.00
	400mm diameter	100 Meter	1421.00
	450mm diameter	100 Meter	1580.00
	500mm diameter	100 Meter	1751.00
	600mm diameter	100 Meter	2109.00
16.13	Extra for every operation of disinfecting the C.I. main by flushing with water containing bleaching powder at 0.5 gms per liter of water and cleaning the same with fresh water, including getting the samples of water tested in the Govt. / Municipal/ Authorised laboratory :		
	80mm diameter	100 Meter	108.00
	100mm diameter	100 Meter	136.00
	125mm diameter	100 Meter	160.00
	150mm diameter	100 Meter	188.00
	200mm diameter	100 Meter	281.00
	250mm diameter	100 Meter	331.00
	300mm diameter	100 Meter	381.00
	350mm diameter	100 Meter	453.00
	400mm diameter	100 Meter	526.00
	450mm diameter	100 Meter	604.00
	500mm diameter	100 Meter	649.00
	600mm diameter	100 Meter	848.00

S. No.	Particulars of Items	Unit		Rates (in Rs.)
16.14	Manufacturing, providing and supplying spirally welded/ERW/SAW/ fabricated M.S. Pipes (Commercial Quality) including procurements of plates, gas cutting to required size rolling, tack welding assembling in suitable lengths to form pipes, welding on automatic welding machine and forming "V" edge on both ends of pipes including all taxes (Central and local), railway freight, insurance unloading from railway wagon, loading into truck, transport to stores /site unloading, stacking etc, complete as per IS 3589 and IS 5504 as applicable as per specifications (No negative tolerance in thickness is permissible).	Per Kg		71.00
16.15	Carriage of Material by Mechanical transport including loading unloading & stacking etc.			
16.15.1	Lime, Alum, Bleaching powder, moorum, building rubbish (Malba)	Distance	Per	Rate in Rs.
	1. Distance	1 Km	Cum	41.00
	2. Distance	2 Km	Cum	47.00
	3. Distance	3 Km	Cum	53.00
	4. Distance	4 Km	Cum	59.00
	5. Distance	5 Km	Cum	65.00
	6. Beyond 5 km upto 10km. Add per km		Cum	5.00
	7. Beyond 10 km, upto 20km add per km		Cum	4.00
	8. Beyond 20 km, add per km		Cum	3.00
16.15.2	Earth			
	1. Distance	1 Km	Cum	51.00
	2. Distance	2 Km	Cum	59.00
	3. Distance	3 Km	Cum	66.00
	4. Distance	4 Km	Cum	74.00
	5. Distance	5 Km	Cum	81.00
	6. Beyond 5 km upto 10km. Add per km		Cum	7.00
	7. Beyond 10 km, upto 20km add per km		Cum	6.00
	8. Beyond 20 km, add per km		Cum	4.00
16.15.3	G.I, C.I., D.I., CC, ACP pipes below 100mm dia and other heavy material and machinery Cement, Stone blocks.			
	1. Distance	1 Km	Per Tonne	36.00
	2. Distance	2 Km	Per Tonne	42.00
	3. Distance	3 Km	Per Tonne	47.00
	4. Distance	4 Km	Per Tonne	53.00
	5. Distance	5 Km	Per Tonne	58.00
	6. Beyond 5 km upto 10km. Add per km		Per Tonne	5.00
	7. Beyond 10 km, upto 20km add per km		Per Tonne	4.00
	8. Beyond 20 km, add per km		Per Tonne	3.00

S. No.	Particulars of Items	Unit	Rates (in Rs.)	
16.15.4	Steel			
	1. Distance	1 Km	Per Tonne	36.00
	2. Distance	2 Km	Per Tonne	42.00
	3. Distance	3 Km	Per Tonne	47.00
	4. Distance	4 Km	Per Tonne	53.00
	5. Distance	5 Km	Per Tonne	58.00
	6. Beyond 5 km upto 10km. Add per km		Per Tonne	5.00
	7. Beyond 10 km, upto 20km add per km		Per Tonne	4.00
	8. Beyond 20 km, add per km		Per Tonne	3.00
16.15.5	R.C.C., Pipes, Steel Pipes, ACP pipes, CI & DI Pipes			
16.15.5.1	100mm dia			
	1. Distance	1 Km	Per Tonne	89.00
	2. Distance	2 Km	Per Tonne	103.00
	3. Distance	3 Km	Per Tonne	116.00
	4. Distance	4 Km	Per Tonne	129.00
	5. Distance	5 Km	Per Tonne	142.00
	6. Beyond 5 km upto 10km. Add per km		Per Tonne	11.00
	7. Beyond 10 km, upto 20km add per km		Per Tonne	10.00
	8. Beyond 20 km, add per additional km		Per Tonne	7.00
16.15.5.2	150mm dia			
	1. Distance	1 Km	Per Tonne	149.00
	2. Distance	2 Km	Per Tonne	171.00
	3. Distance	3 Km	Per Tonne	194.00
	4. Distance	4 Km	Per Tonne	215.00
	5. Distance	5 Km	Per Tonne	236.00
	6. Beyond 5 km upto 10km. Add per km		Per Tonne	19.00
	7. Beyond 10 km, upto 20km add per km		Per Tonne	16.00
	8. Beyond 20 km, add per additional km		Per Tonne	12.00
16.15.5.3	200mm dia			
	1. Distance	1 Km	Per Tonne	242.00
	2. Distance	2 Km	Per Tonne	279.00
	3. Distance	3 Km	Per Tonne	315.00
	4. Distance	4 Km	Per Tonne	350.00
	5. Distance	5 Km	Per Tonne	384.00
	6. Beyond 5 km upto 10km. Add per km		Per Tonne	31.00
	7. Beyond 10 km, upto 20km add per km		Per Tonne	26.00
	8. Beyond 20 km, add per additional km		Per Tonne	20.00
16.15.5.4	250mm dia			
	1. Distance	1 Km	Per Tonne	344.00
	2. Distance	2 Km	Per Tonne	396.00
	3. Distance	3 Km	Per Tonne	448.00
	4. Distance	4 Km	Per Tonne	497.00
	5. Distance	5 Km	Per Tonne	546.00
	6. Beyond 5 km upto 10km. Add per km		Per Tonne	44.00
	7. Beyond 10 km, upto 20km add per km		Per Tonne	37.00
	8. Beyond 20 km, add per additional km		Per Tonne	28.00

S. No.	Particulars of Items	Unit	Rates (in Rs.)	
16.15.5.5	300mm dia			
	1. Distance	1 Km	Per Tonne	425.00
	2. Distance	2 Km	Per Tonne	490.00
	3. Distance	3 Km	Per Tonne	553.00
	4. Distance	4 Km	Per Tonne	615.00
	5. Distance	5 Km	Per Tonne	674.00
	6. Beyond 5 km upto 10km. Add per km		Per Tonne	55.00
	7. Beyond 10 km, upto 20km add per km		Per Tonne	46.00
	8. Beyond 20 km, add per additional km		Per Tonne	35.00
16.15.5.6	350mm dia			
	1. Distance	1 Km	Per Tonne	595.00
	2. Distance	2 Km	Per Tonne	685.00
	3. Distance	3 Km	Per Tonne	775.00
	4. Distance	4 Km	Per Tonne	861.00
	5. Distance	5 Km	Per Tonne	944.00
	6. Beyond 5 km upto 10km. Add per km		Per Tonne	77.00
	7. Beyond 10 km, upto 20km add per km		Per Tonne	65.00
	8. Beyond 20 km, add per additional km		Per Tonne	49.00
16.15.5.7	400mm dia			
	1. Distance	1 Km	Per Tonne	811.00
	2. Distance	2 Km	Per Tonne	935.00
	3. Distance	3 Km	Per Tonne	1056.00
	4. Distance	4 Km	Per Tonne	1174.00
	5. Distance	5 Km	Per Tonne	1287.00
	6. Beyond 5 km upto 10km. Add per km		Per Tonne	104.00
	7. Beyond 10 km, upto 20km add per km		Per Tonne	88.00
	8. Beyond 20 km, add per additional km		Per Tonne	67.00
16.15.5.8	450mm & 500mm dia			
	1. Distance	1 Km	Per Tonne	992.00
	2. Distance	2 Km	Per Tonne	1142.00
	3. Distance	3 Km	Per Tonne	1291.00
	4. Distance	4 Km	Per Tonne	1435.00
	5. Distance	5 Km	Per Tonne	1574.00
	6. Beyond 5 km upto 10km. Add per km		Per Tonne	128.00
	7. Beyond 10 km, upto 20km add per km		Per Tonne	108.00
	8. Beyond 20 km, add per additional km		Per Tonne	82.00
16.15.5.9	600, 700, 750mm & 800mm dia			
	1. Distance	1 Km	Per Tonne	1488.00
	2. Distance	2 Km	Per Tonne	1714.00
	3. Distance	3 Km	Per Tonne	1937.00
	4. Distance	4 Km	Per Tonne	2152.00
	5. Distance	5 Km	Per Tonne	2360.00
	6. Beyond 5 km upto 10km. Add per km		Per Tonne	191.00
	7. Beyond 10 km, upto 20km add per km		Per Tonne	162.00
	8. Beyond 20 km, add per additional km		Per Tonne	123.00
16.15.5.10	900mm dia			
	1. Distance	1 Km	Per Tonne	2231.00

S. No.	Particulars of Items	Unit	Rates (in Rs.)	
	2. Distance	2 Km	Per Tonne	2571.00
	3. Distance	3 Km	Per Tonne	2905.00
	4. Distance	4 Km	Per Tonne	3228.00
	5. Distance	5 Km	Per Tonne	3541.00
	6. Beyond 5 km upto 10km. Add per km		Per Tonne	287.00
	7. Beyond 10 km, upto 20km add per km		Per Tonne	243.00
	8. Beyond 20 km, add per additional km		Per Tonne	184.00
16.15.5.11	1000, 1100 and 1200mm dia			
	1. Distance	1 Km	Per Tonne	2975.00
	2. Distance	2 Km	Per Tonne	3427.00
	3. Distance	3 Km	Per Tonne	3873.00
	4. Distance	4 Km	Per Tonne	4304.00
	5. Distance	5 Km	Per Tonne	4721.00
	6. Beyond 5 km upto 10km. Add per km		Per Tonne	383.00
	7. Beyond 10 km, upto 20km add per km		Per Tonne	324.00
	8. Beyond 20 km, add per additional km		Per Tonne	245.00
16.16	Hire Charges of Plants & Machinery inclusive of operator and cleaner but excluding Diesel and oil.			
	1. Truck		Per Day	1014.00
	2. Water Tanker		Per Day	1120.00
	3. Dumper		Per Day	1108.00
	4. Tractor with Trolley		Per Day	607.00
	5. Road Roller		Per Day	1066.00
	6. Concrete Mixer		Per Day	486.00
16.17	**Electromagnetic Bulk Flow Meters** Supply of Electromagnetic full bore meter complete as per specification including transportation to site, storage, safety, installation, testing, commissioning, making connections with existing pipe line, including excavation at site, cuts in the existing pipe system, dewatering and reinstating the same after completion of installation as per specification and drawings including all taxes. Accuracy of meter + 0.3% of measured value, Flange connection as per AWWA & IS, Liner: Hard Rubber, Fully welded sensor housing complying to IP 68 standard, Electrodes SS 316, Sensor housing SS 304, Cable gland 1/2" NPT, Sensor housing fully welded SS 304 housing with protective Polyurethane paint, Flow Transmitter/ Converter : Microprocessor based, modular design display 2 line back lit LCD for indication of actual flow rate, forward, reverse, sumtotalizer, Perfection category : IP 65 Dia in mm			
1	50mm		Each	96966.00
2	65mm		Each	99178.00

S. No.	Particulars of Items	Unit	Rates (in Rs.)	
3	80mm		Each	103007.00
4	100 mm		Each	113916.00
5	150mm		Each	120406.00
6	200 mm		Each	127597.00
7	250 mm		Each	155740.00
8	300 mm		Each	181249.00
9	400 mm		Each	211222.00
10	450 mm		Each	304570.00
11	500 mm		Each	379849.00
12	600 mm		Each	389469.00
13	700 mm		Each	500036.00
14	900 mm		Each	820748.00
15	1000 mm		Each	911506.00
16	1200 mm		Each	1071085.00
17	1400 mm		Each	1380530.00
18	2000 mm		Each	1482960.00
19	Lightening Arrester Unit		Each	7357.00
20	MS Panel with Transmitter, Totalizer, etc as per specifications		Each	12586.00
21	Uninterruptible Power Supply [6hr Battery Backup (500 VA)]		Each	25172.00
16.18	Supply & Installation of Domestic Water Meters of inferential type, multijet, magnetically coupled, having dry dial, straight reading Class B conforming to is : 779/1994, ISO and EEC approved, including transportation to site, storage, safety, installation, testing, commissioning, making connections with existing pipeline, including excavation at site, dewatering and reinstating the same after completion of installation as per specifications including all taxes.			
	Dia in mm			
	15 mm	No	1152.00	
	20 mm	No	1941.00	
	25 mm	No	3485.00	
	40 mm	No	6515.00	
16.19	Woltman Turbine Bulk Meters Supply of Woltman Turbine Bulk meters class B, multijet, magnetically coupled as per specifications conforming to is 770/1994, ISO 4064/1 and EEC approved, including transportation to site, storage, safety, installation, testing, commissioning, making connections with existing pipeline, including excavation at site, dewatering and reinstating the same after completion of installation as per specifications and drawings including all taxes.			
	Dia in mm			
	50 mm	No	9608.00	

S. No.	Particulars of Items	Unit	Rates (in Rs.)
	65 mm	No	10529.00
	80 mm	No	12523.00
	100 mm	No	16543.00
	125 mm	No	21255.00
	150 mm	No	26980.00
	200 mm	No	26980.00
	250 mm	No	84231.00
	300 mm	No	138191.00
	400 mm	No	247428.00
16.20	Dirt Box with S.S. Strainer		
	Dirt Box with S.S. Strainer as per specifications		
	Dia in mm		
	50 mm	No	3027.00
	65 mm	No	3356.00
	80 mm	No	4317.00
	100 mm	No	5922.00
	125 mm	No	10417.00
	150 mm	No	12378.00
	200 mm	No	18557.00
	250 mm	No	32310.00
	300 mm	No	47196.00
	400 mm	No	78966.00

CHAPTER- 17
DRILLING OF TUBE WELLS

1 Tube well construction shall be as per IS 2800 (Pt-1) - 2001

2 Tube well testing shall be as per IS 2800 (Pt-2) - 1999

3 Specification for Gravel for use as pack in tube wells shall be as per IS 4097 - 1999 (Reaffirmed 1999)

4 Methods of tube well development shall be as per IS 11189 - 1999

5 Unplasticized PVC screen and casing pipes for bore/tube well shall be as per IS 12818-1992.

6 Mild Steel tubes, tubular & other wrought steel fittings specification IS 1239 (Part-1&2)- 1990.

7 Deep well hand pumps, components and special tools shall be as per IS 15500 (Pt- 1 to 8)

8 Specification for un-plasticized PVC pipes for potable water supply IS 4985-2000.

9 A complete tube well shall mean :-
(a) A borehole vertical within the prescribed non-vertical limits drilled upto designed depth in alluviums or rocky areas.

(b) Installation of requisite well assembly i.e., housing pipe, blind pipe, slotted pipe or strainers, bail plug and other accessories.

(c) Placing of suitable gravel pack (in case of gravel, packed tube-wells). Placing of suitable sand pack (in case of sand packed tube-wells)

(d) Development of tube-well with object of :-
(i) Producing effect of natural gravel pack (in case of naturally packed design).

(ii) Producing maximum sand free yield of water for the specified standard draw down in alluvium and rocky areas.

(e) Conducting yield test by over pumping of the tube well.

(F) The tube well shall be disinfected after completion of the yield test.

9 Tube wells drilled shall be perfectly vertical. The rates for drilling are inclusive of the verticality test required to be conducted. All the relevant Indian Standards specifications of the B.I.S. shall also be applicable.

10 For locating the proper site for tube well construction within the selected habitation, if resistivity survey is required then the resistively survey shall be carried out by a well qualified and experienced geohydrologist using his own suitable resistively meter.

11 Yield test shall be done as per para 5.3 of IS - 2800 (Pt-2)

12 In all types of tube wells the casing pipe of specified diameter shall be lowered up to a minimum depth of 9 meters below ground level. If the collapsible strata in overburden continue beyond 9 meters depth then the casing pipe shall be lowered up to rock level and embedded in rock in a depth of 0.15 meter. The casing pipe shall also be extended above ground level in a height of about 0.3 meter.

13 The diameter of ordinary tube wells shall be 125 mm up to bottom level of the casing pipe and 115 mm in the rock below the casing. Such tube wells shall be designated as 125/115 mm dia ordinary tube wells.

14 The telescopic tube wells in the basaltic rock area where intertrappean formation (collapsible strata between the rocks) is present. The nominal diameter of the tube well upto the level of intertrappean formation shall be 150 mm. The intertrappean formation shall be encased by 125 mm dia G.I. casing pipe. Therefore, the finished nominal diameter of tube well in the intertrappean formation shall be 125 mm but in the rock below the intertrappean formation, the nominal diameter of tube well shall be 115 mm. Such tube wells shall be designated as 150/125/115 mm dia (telescopic) ordinary tube wells.

15 The nominal diameter of ordinary tube well constructed for installation of power pumps shall be 150 mm or 200 mm for the entire depth depending upon the type of size of pump to be installed in the tube well. Such tube wells shall be designated as 150 mm dia ordinary tube well & 200 mm dia ordinary tube wells.

16 The gravel packed tube wells shall be constructed in alluvial formations, suitable for such tube wells, in which the fine and uniform sand is present in the water bearing aquifer. The gravel packed tube wells should be constructed after obtaining necessary clearance from the competent authority.

17 Precautions should be taken to prevent damage to the tube well during the drilling. Precautions should also be taken to avoid any accident during drilling.

18 Precautions should be taken to prevent damage to the pipes and other assembly during lowering in to the well.

19 Development of tube well :-

19.1 The well shall be developed either by surging and agitating or by over pumping and back washing with an air lift and velocity jetting etc. Any other acceptable method may also be adopted. This development process shall be continued until the stabilization of sand and gravel pack has taken place.

19.2 The development of the tube well by over pumping should be done at 15 percent to 25 percent higher discharge than the expected discharge from the tube well. The final discharge should be free from sand with a maximum tolerance of 20 parts of sand in one million parts of water by volume after 20 minutes of starting the pump.

20 Testing of yield and draw down :

20.1 The drawing off of water through a tube well results in a lowering of water level. This drawdown creates a hydraulic gradient in the water bearing material with the result that under ground flow into the tube well takes place. The rate of inflow depends upon the hydraulic gradient, permeability and saturated thickness of water bearing material and of tube well construction.

20.2 After the well has been completely constructed and cleaned out and the depth of the well accurately measured, this test should be carried out.

20.3 This test is conducted by installing a test pump in the tube well temporarily and pumping out water. At each rate of discharge, pumping is carried out at least for 30 minutes. If the water level and discharge are found to fluctuating, development is carried out for some more hours, until the discharge becomes steady and sand content is with in tolerable limits. The specific capacities of the well for various pumping rates are computed based on drawdown test data. Discharge may be measured by any method detailed in 13.7 of IS : 5120-1977 "Technical requirements for rot dynamic special purpose pumps (first revision).

20.4 Since the yield is influenced by a number of factors such as geological formation, rainfall. Neighboring tube wells, etc. the pumping rate shall, in general, not exceed 60 percent of the yield determined by test.

21 The water sample for chemical analysis shall be collected in 2 liters plastic bottle and samples for bacteriological analysis shall be collected in 300 ml sterilized bottle as per the direction of Engineer in charge. Only testing charges will be borne by the urban local body.

22 All care and precautions shall be taken and it shall be ensured that there shall be no accidents while drilling the borehole. Proper dress and equipments like gumboots, helmets etc. shall be provided by the contractor to the workmen at site.

23 If a tube well is found dry or with less yield and if it is not to be used for water supply due to any reason, the tube well shall be fitted with MS cap securely and a concrete block of 0.45m X 0.45m X 0.45m with M15 cement concrete would be constructed on it to prevent any accident or damage to the tube well and also to use the bore at any later stage for recharging or for any other purpose.

24 Measurement :-

Depth of the bore & length of the pipes shall be measured in Rmt. Cap shall be measured in number. Gravel shall be measured in cum after deducting the voids.

25 Rates :-

The rate shall include the cost of the material and labour involved in all the operation described in the items.

(For Detail Refer to Specifications prepared by the Urban Administration and Development Department, IS Code & CPHEEO Manual)

CHAPTER 17 -- DRILLING OF TUBE WELLS

S.No.	Particulars of Items	Unit	Rate (In Rs.)
A	**Resisitivity Survey**		
17.1	Carrying out the resistivity survey by VES method using Schlumberger configuration for locating the proper spot for drilling of tube well with in the selected habitation, including Photography, interpretation of resistivity data and submission of report in the desired format along with resistivity necessary graph, photographs and readings.	Per Successful point	1103.00
B	**Construction of Ordinary Tube well**		
17.2	Drilling of perfectly vertical bore hole of a diameter suitable to receive 125mm nominal diameter casing pipe upto desired depth below ground level inclusive of the labour charges for transporting, lowering and fixing of 125mm nominal diameter M.S./G.I./U.P.V.C. casing pipe inside the bore hole including all works pertaining to drilling such as transportation, installation and removal of drilling machine etc. complete.		
17.2.1	in all types of collapsible strata consisting of soils, clays, sand, moorum, gravel, boulders etc.	Meter	295.00
17.2.2	in all types of rocks.	Meter	385.00
17.3	Drilling of perfectly vertical bore hole of 115 mm diameter up to desired depth below ground level in all types of rocks including all works pertaining to drilling such as transportation, installation and removal of drilling machine etc. complete.	Meter	361.00
17.4	Drilling of perfectly vertical bore hole of a diameter suitable to receive 150mm nominal diameter casing pipe upto desired depth below ground level inclusive of the labour charges for transporting, lowering and fixing of 150mm nominal diameter M,S./G.I./U.P.V.C. casing pipe inside the bore hole including all works pertaining to drilling such as transportation, installation and removal of drilling machine etc. complete.		
17.4.1	in all types of collapsible strata consisting of soils, clays, sand, moorum, gravel, boulders etc.	Meter	331.00
17.4.2	in all types of rocks.	Meter	425.00
17.5.	Drilling of perfectly vertical bore hole of 150mm diameter upto desired depth below ground level in all types of rock including all works pertaining to drilling such as transportation, installation and removal of drilling machine etc. complete	Meter	435.00

S.No.	Particulars of Items	Unit	Rate (In Rs.)
17.6	Drilling of perfectly vertical bore hole of a diameter suitable to receive 200mm nominal diameter casing pipe upto desired depth below ground level inclusive of the labour charges for transporting, lowering and fixing of 200mm nominal diameter M,S./G.I./U.P.V.C. casing pipe inside the bore hole including all works pertaining to drilling such as transportation, installation and removal of drilling machine etc. complete.		
17.6.1	in all types of collapsible strata consisting of soils, clays, sand, moorum, gravel, boulders etc.	Meter	355.00
17.6.2	in all types of rocks.	Meter	452.00
17.7.	Drilling of perfectly vertical bore hole of 200mm diameter upto desired depth below ground level including all works pertaining to drilling such as transportation, installation and removal of drilling machine etc. complete.		
17.7.1	In all types of collapsible strata (intertrappean formation) including charges for transportation, lowering and fixing of 150mm nominal diameter GI casing pipe, welded joints only.	Meter	380.00
17.7.2	in all types of rocks.	Meter	454.00
17.8	Drilling of perfectly vertical bore hole of 150mm diameter up to desired depth below ground level in all types of strata including all works pertaining to drilling such as transportation, installation and removal of drilling machine etc. complete. In intertrappean formations (collapsible strata between rocks) including charges for transportation and making all necessary arrangements etc. including lowering and fixing of 125mm nominal diameter (gig. or U.P.V.C.) Casing pipe.	Meter	432.00
17.9	Providing and fixing of well cap on top of the tube well for protection M.S. Caps		
17.9.1	100mm dia	each	160.00
17.9.2	125mm dia	each	177.00
17.9.3	150mm dia	each	206.00
17.9.4	200mm dia	each	243.00
C	**Construction of Gravel Packed Tube well**		

S.No.	Particulars of Items	Unit	Rate (In Rs.)
17.10	Drilling of perfectly vertical bore hole of following diameters for construction of Gravel Packed tube well up to desired depth in alluvial formation consisting of Soils, Clays, Sand, Gravel, Moorum, Boulders etc. and retaining the bore hole by using suitable drilling mud or foam or temporary housing pipe including all works pertaining to drilling such as transportation, installation and removal of drilling machine etc. complete.		
17.10.1	300mm diameter	Meter	477.00
17.10.2	350mm diameter	Meter	522.00
17.10.3	400mm diameter	Meter	549.00
17.11	Labour charges for assembling, centering and lowering of properly designed casing pipe assembly inside the bore hole drilled for construction of Gravel Packed tube well including the cost of providing and fixing of centraliser, and transportation of casing assembly etc. complete.		
17.11.1	Casing assembly composed of 100mm diameter blank and slotted G.I. Casing pipes	Meter	36.00
17.11.2	Casing assembly composed of 150mm diameter blank and slotted G.I. Casing pipes	Meter	55.00
17.11.3	Casing assembly composed of 200mm diameter blank and slotted G.I. Casing pipes	Meter	67.00
17.11.4	Casing assembly composed of 100mm dia. UPVC blank and screened pipes.	Meter	26.00
17.11.5	Casing assembly composed of 150mm dia UPVC blank and screened pipes.	Meter	31.00
17.11.6	Casing assembly composed of 200mm dia UPVC blank and screened pipes.	Meter	40.00
17.12	Providing and fixing of M.S. bail plug as per I.S. 2800 (PART-I) 2001 in the bottom of casing assembly		
17.12.1	100mm dia	each	292.00
17.12.2	150mm dia	each	368.00
17.12.3	200mm dia	each	451.00
17.13	Providing gravel packing with uniformly graded gravel as per I.S. 4097 of 1999 (revised up to date) in the annular space between outer wall of casing pipe assembly and inner wall of bore hole including cost of gravel, transportation, stacking, washing and packing in layers of suitable thickness including all lead and lifts complete.	Cu.m	594.00
D	**Installation of Hand Pumps**		

S.No.	Particulars of Items	Unit	Rate (In Rs.)
17.14.1	Labour charges for installation of India Mark II Hand Pump with 30 meter long 32mm dia riser pipe assembly and all other accessories including transportation of Hand Pump from specified departmental stores to site.	each	346.00
17.14.2	Add to Item No.-1, above for fixing the extra length of riser pipe assembly beyond 30 meters	Meter	10.00
E	**Development, yield test of Tube wells**		
17.15	Labour charges for installation of submersible pumping sets at 50m or more depth temporarily in the tubewell for a maximum of eight hours for the purpose of conducting yield test for tube well. (Any one of the below depending on the approximate yield observed during drilling operations).		
17.15.1	Submersible pumping sets upto 2.2 kW.	Each	888.00
17.15.2	Submersible pumping set upto 2.2 kW to 7.5 kW.	Each	968.00
17.15.3	Submersible pumping set above 7.5 kW	Each	1008.00
17.16	Conducting the yield test of tube well by operating the pumping set continuously for a desired time period and measuring the discharge and drawdown of tube well at a suitable time interval as per the direction of Engineer in Charge including cost of energy, cost of installation of suitable measuring device and hire charges of pumping set etc. complete.		
17.16.1	Submersible pumping sets upto 2.2 kW.	Per Hour	297.00
17.16.2	Submersible pumping set upto 2.2 kW to 7.5 kW.	Per Hour	311.00
17.16.3	Submersible pumping set above 7.5 kW	Per Hour	311.00
17.17	Labour charges for taking out the submersible pumping set from tube well after completion of yield test or development of tube well.		
17.17.1	Submersible pumping sets upto 2.2 kW.	Each	687.00
17.17.2	Submersible pumping set upto 2.2 kW to 7.5 kW.	Each	750.00
17.17.3	Submersible pumping set above 7.5 kW	Each	806.00
17.18	Development of gravel packed tube well by Air compressor of suitable capacity including hire charges for all the required tools and plants etc. complete, for maximum duration of eight hours.	Per Hour	446.00
17.19	Measurement of yield of tube well by operating hand pump continuously for four hours manually.	Each	400.00
F	**Supply of ISI mark Hand Pumps : G.I. Riser, G.I. Casing & UPVC Casing Pipes**		

S.No.	Particulars of Items	Unit	Rate (In Rs.)
17.20	ISI mark India mark-II deep well hand pump complete with 10 Nos. MS connecting rods, (12mm x 3M long) Normal stand assembly.	Each	6045.00
17.21	ISI mark India mark -II deep well hand pump complete with 10 Nos. MS connecting rods, (12mm x 3M long) telescopic stand assembly.	Each	6096.00
17.22	ISI mark India Mark-II extra deep well hand pump complete with 20 Nos. MS connecting rods (12mm x 3M)2 counter weight electro galvanized & passivated normal stand assembly.	Each	8941.00
17.23	ISI mark India mark-II extra deep well hand pump complete with 20 Nos. MS connecting rods (12mm x 3m)2 counter weight electro galvanized & passivated telescopic stand assembly.	Each	9132.00
17.24	ISI Mark 32mm dia G.I. riser pipe in 3 meter length socketed on one end as per I.S. 1239 (Part-I) 1990 up-to-date amendments and socket as per I.S. 2062/1990 up-to-date amendment.	Meter	177.00
17.25	Supply of I.S.I. marked G.I. casing pipe (Plain) medium class in 4 to 7 meters length one end fitted with socket as per I.S. 1239 (Part-1 & Part-2) 1992 with IVth revision (Up-to-date amendments)		
17.25.1	100mm dia	Meter	702.00
17.25.2	125mm dia	Meter	939.00
17.25.3	150mm dia	Meter	1117.00
17.26	I.S.I. marked UPVC casing pipe confirming to IS 4985/1988 (with up-to-date amendments)		
17.26.1	Screen pipes with ribs 100mm dia	Meter	318.00
17.26.2	Screen pipes with ribs 125mm dia	Meter	503.00
17.26.3	Screen pipes with ribs 150mm dia	Meter	665.00
17.26.4	Screen pipes with ribs 200mm dia	Meter	1171.00
17.26.5	CM casing pipes 100mm dia	Meter	226.00
17.26.6	CM casing pipes 125mm dia	Meter	362.00
17.26.7	CM casing pipes 150mm dia	Meter	442.00
17.26.8	CM casing pipes 200mm dia	Meter	932.00
17.26.9	CS casing pipes 150mm dia	Meter	391.00
17.26.10	CS casing pipes 200mm dia	Meter	744.00
G	**Disinfection of tube wells**		
17.27	Disinfection of tube well by using bleaching powder solution as per direction of Engineer-in-Charge including cost of all material & labour.	Each tube well	23.00

S.No.	Particulars of Items	Unit	Rate (In Rs.)
17.28	Construction of platforms in different strata and as per site conditions.		
17.28.1	Construction of 76 cm x 76 cm x 40 cm foundation block in M-15 cement concrete for fixing the pedestal of Hand Pump including excavation, cost of material and labour etc. complete	Each	785.00
17.28.2	Construction of cement concrete platform as per design around the hand pump in M-15 cement concrete including excavation, centering, shuttering, cost of all the materials and labour and curing etc. complete.	Each	2486.00
17.28.3	Construction of cement concrete platform as per design around the hand pump in M-15 cement concrete including excavation, centering, shuttering, cost of all the materials and labour and curing etc. complete. Including filling in 30 cm depth after removing Black cotton soil including ramming, watering etc. complete in areas of Black cotton soils.	Each	3002.00
17.28.4	Construction of cement concrete drain as per design in M-15 cement concrete including excavation, centering, shuttering, cost of all the materials and labour and curing etc. complete.	Meter	275.00
17.28.5	Construction of cement concrete drain as per design in M-15 cement concrete including excavation, centering, shuttering, cost of all the materials and labour and curing etc. complete. Including filling in 30 cm depth after removing Black cotton soil including ramming, watering etc. complete in areas of Black cotton soils.	Meter	316.00
17.29	Construction of concrete block over dry tube wells for protection of size 0.45m x 0.45m x 0.45m in M-15 cement concrete mix.	Each	311.00

ANNEXURE-1

RESISTIVITY SURVEY REPORT

Name of local body ……..…….District ……

Ward Number …….. Mohalla/Basti……

Name of Contractor .....……. Registration no. of machine

Work Order No…… Date ……

Date of Survey ……

Name of Geohydrologist ……

Model No. & Make of Resistivity meter used for sounding ……

Maps (Not to scale) Showing the location of survey point (To be attached separately in A-4 size sheet).

DATA SHEET OF FIELD MEASUREMENTS

S.No.	AB/2 Meters	MN/2 Meters	Spacing Factor K K = 3.14 (AM/AN)/MN	Measured resistance (OHMS)	Resistively OHM-M

ANNEXURE-2

STRATA - CHART

Name of local boby ……..District …….

Ward Number ……. Mohalla/Basti …….

Name of Contractor …….. Registration No. of Machine

Work Order No. …… Date ……

Date of Starting of Tube well construction …….

Date of completion of tube well construction ……

Name of Sub-Engineer in charge of work …….

Measurement Book Number ……

Exact location of drilling ……

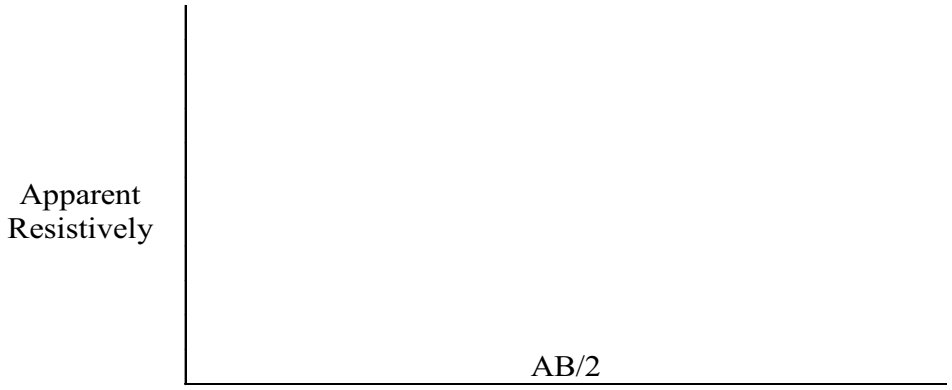
G		L	Details
Depth		Strata	1. Type of tube well .....
			2. Diameter of tube well .....
			3. Total depth of tube well .....
			4. Details of casing pipe
			Type (G.I./UPVC/BLANK/SLOTTED)
			Diameter ..... mm
			Length ..... meter
			5. Static water level in the tube well .....
			6. Type of pump installed .....
			7. Length of riser pipe installed
			Type (G.I./UPVC) .....
			8. Yield of tube well .....
			9. Draw down at above yield

Signature of Contractor

Signature of
Sub Engineer
Office .....

Signature of
Assistant Engineer
Office .....

Location



Interpretation Report

Possible Strata expected at the spot

S.No.	Possible Strata Form	Depth below Ground Level to		Remark

Recommendation :-

Signature of Geohyrologist

ANNEXURE -3

Name of local body ……..…….District …….

Ward Number ……..…. Mohalla/Basti……

Name of Contractor .....……. Registration no. of machine

Work Order No…… Date ……

Date of yield test ……..

Diameter of tube well ……. Depth of tube well …….

Result of the Test

S.No.	Type of tube well	Dia of bore	Dia. of casing	Drift in mm at 30m depth (all in one direction) **to be filled by concerned engineer**	Permissible limit of vertically in 30m depth (all in one direction)
1.	Shallow	up to 30 cm	15 cm		15 mm
2.	Shallow & deep	37.2 cm or 40 cm	20 cm		30 mm
3.	Deep	45 cm or more	25 cm or more		50 mm

Signature of Contractor

Signature of Sub-Engineer

Signature of Assistant Engineer

ANNEXURE-4

YIELD TEST OF TUBE WELLS

Name of local body ……..…….District ……

Ward Number ……. Mohalla/Basti……

Name of Contractor .....…… Registration no. of machine

Work Order No…… Date ……..

Date of yield test ……

Diameter of tube well ……. Depth of tube well ……

Static water level in tube well ……

Type and K.W. of pumping set used for yield test ……

Type of measuring device used for measurement of discharge ……

Depth at which the pumping set installed ……

Time at which the yield test started ……

Data Sheet of field measurement

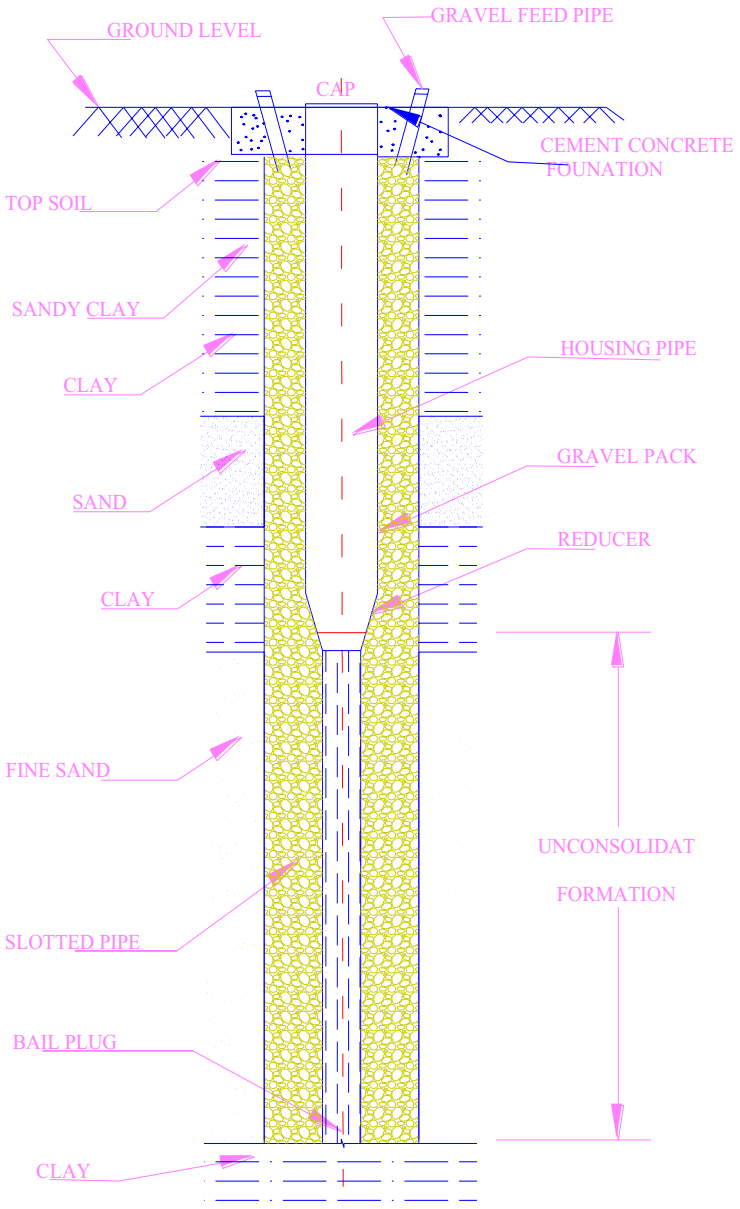
S.No.	Time	Water level in the tube well measured from top of casing pipe	Discharge of tube well
1 2 3			

Signature of Contractor

Signature of Sub-Engineer

Signature of Assistant Engineer

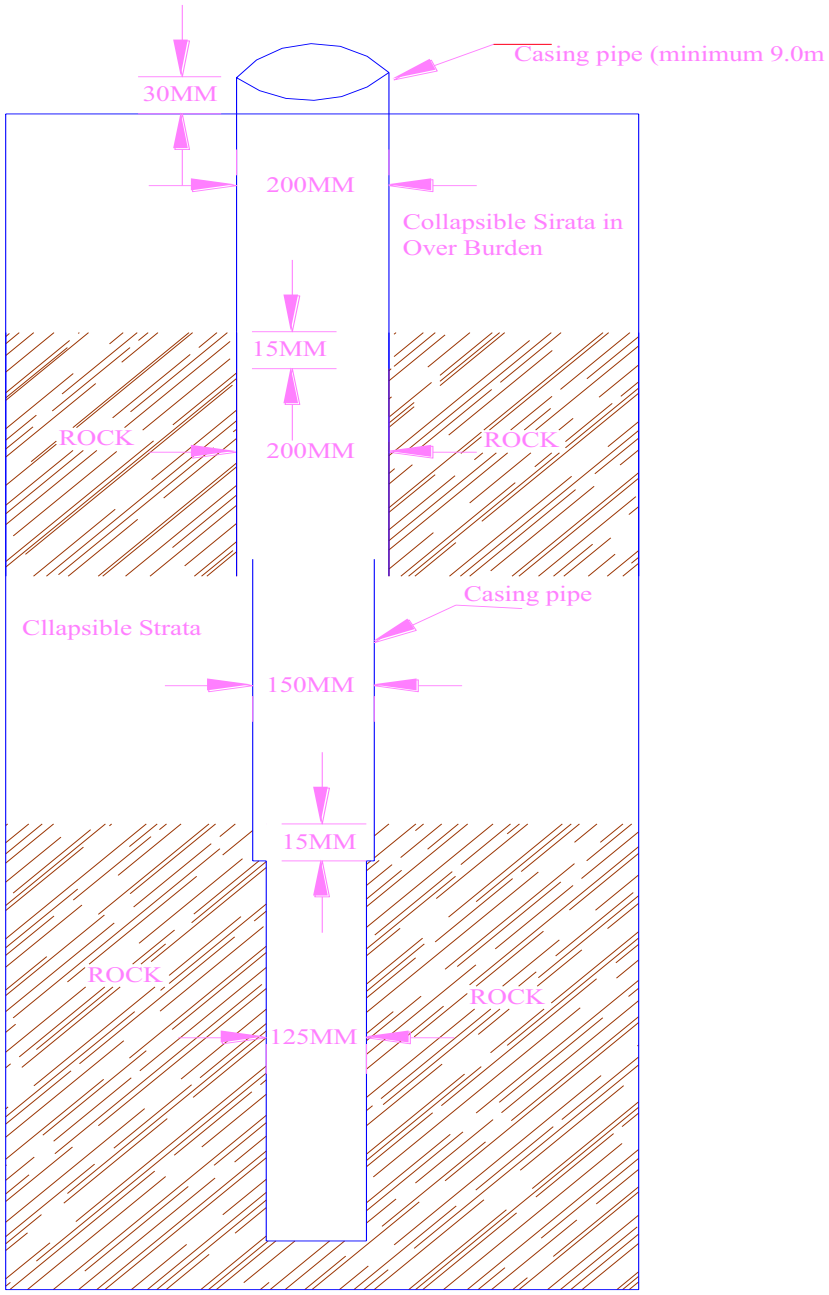
GAVEL PACKED TUBE WELLS

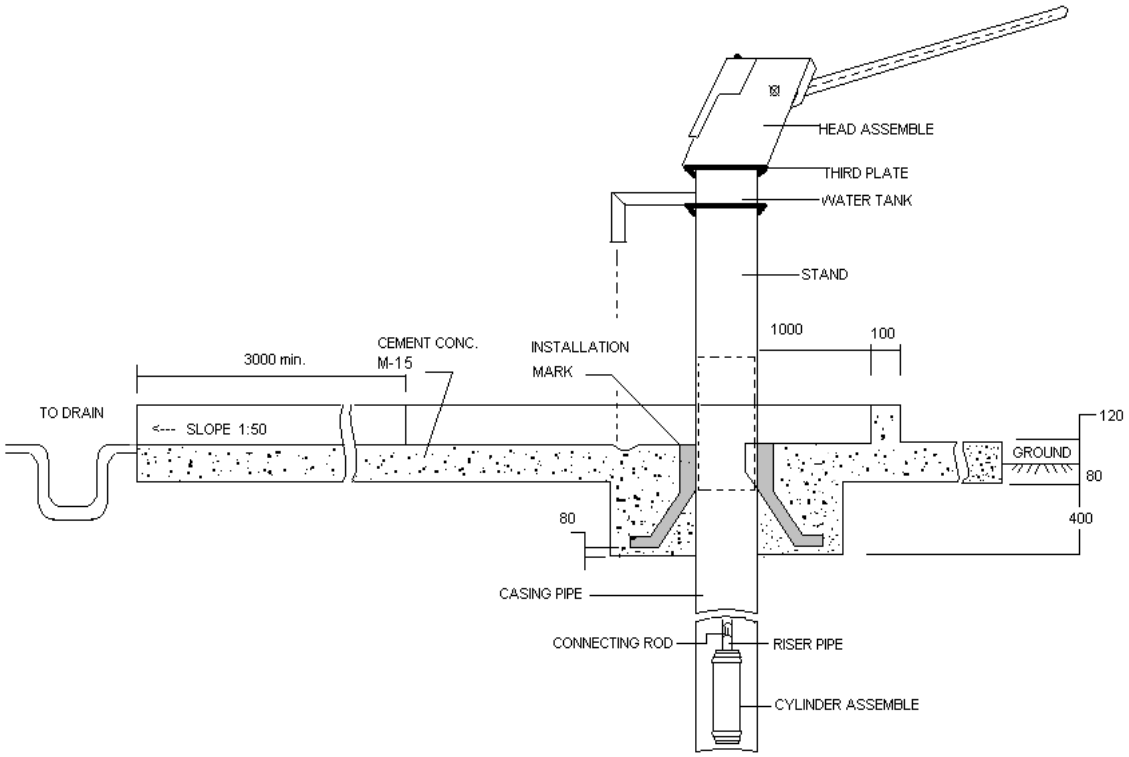


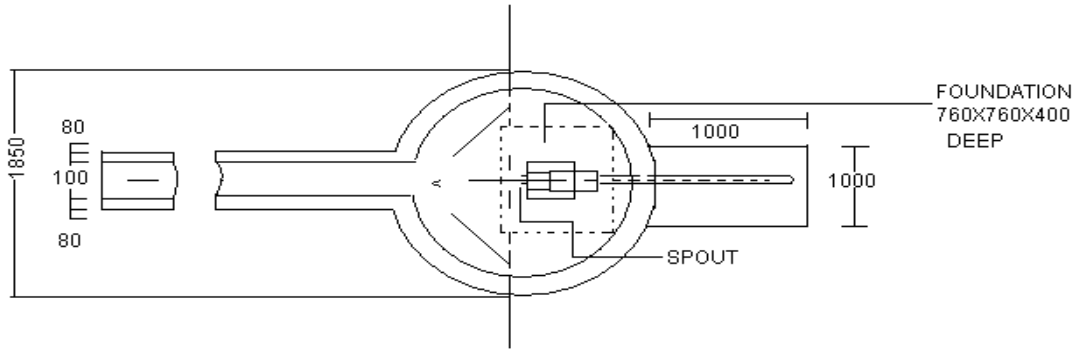
SLOTTED WELL(ARTIFICIALGRAVEL PACK)

TELESCOPIC TUBE EWLL

200/150 125mm dia




HEAD ASSEMBLE
THIRD PLATE
WATER TANK
STAND
1000
100
3000 min.
CEMENT CONC.
M-15
INSTALLATION
MARK
TO DRAIN
<--- SLOPE 1:50
120
GROUND
80
400
80
CASING PIPE
CONNECTING ROD
RISER PIPE
CYLINDER ASSEMBLE



All dimensions in millimeters

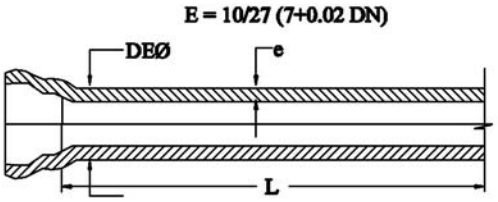
Figure not to scale

Typical Set-Up For Deepwell Handpumb

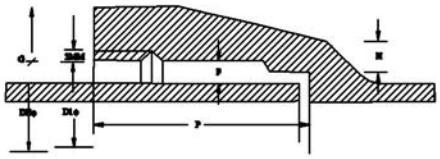
CHAPTER- 18

Drawings for Water Supply & Sewerage

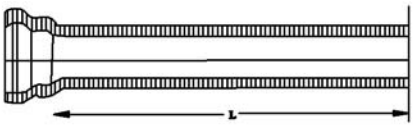
S & S and Flanged Pipes



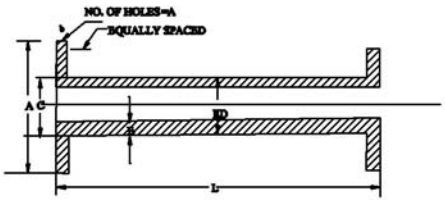
Cantrifugally Cast Socket & Spigot Pipe



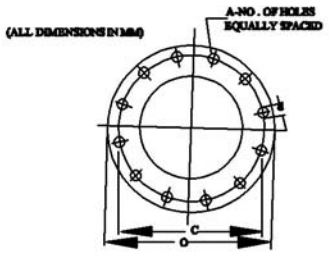
Dimensions of socket and spigot pipes (IS - 1536)



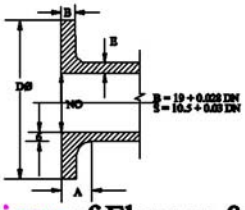
Socket & Spigot Vertical Cast Pipe



Flanged pipes - Vertlically Cast



Standard Flange Drilling of Flanged pipe

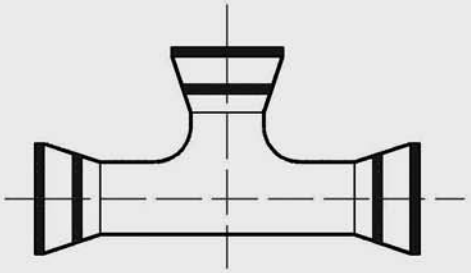


Dimensions of Flanges & Fittings

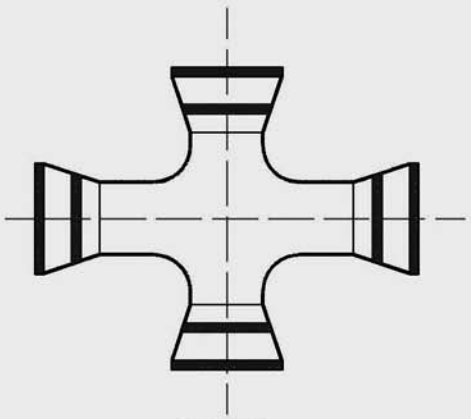
Drawing No.-1

Fittings & Specials

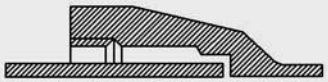
UNION



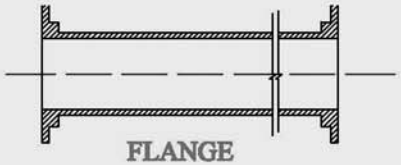
BRANCH - "T"



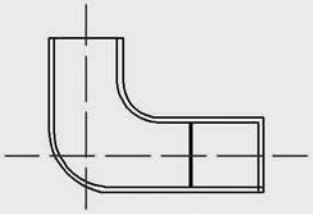
CROSS



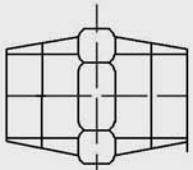
SOCKET / SPIGOT



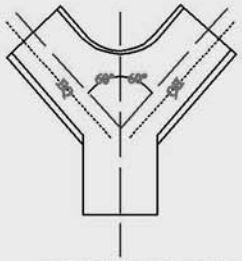
FLANGE



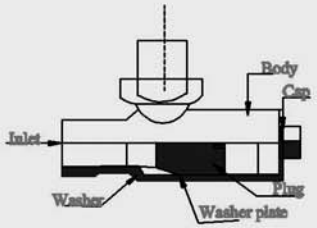
ELBOW



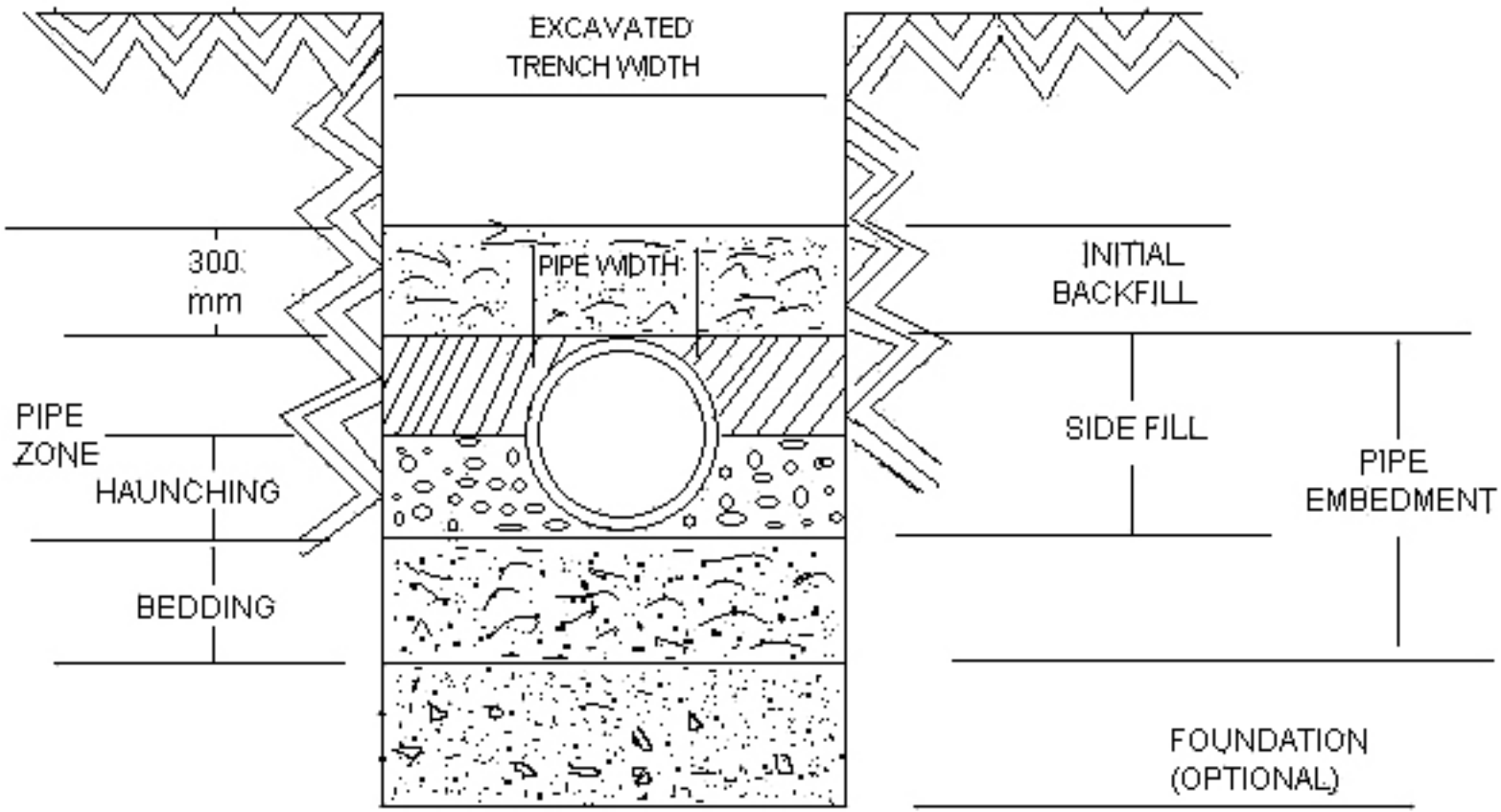
NIPPLE



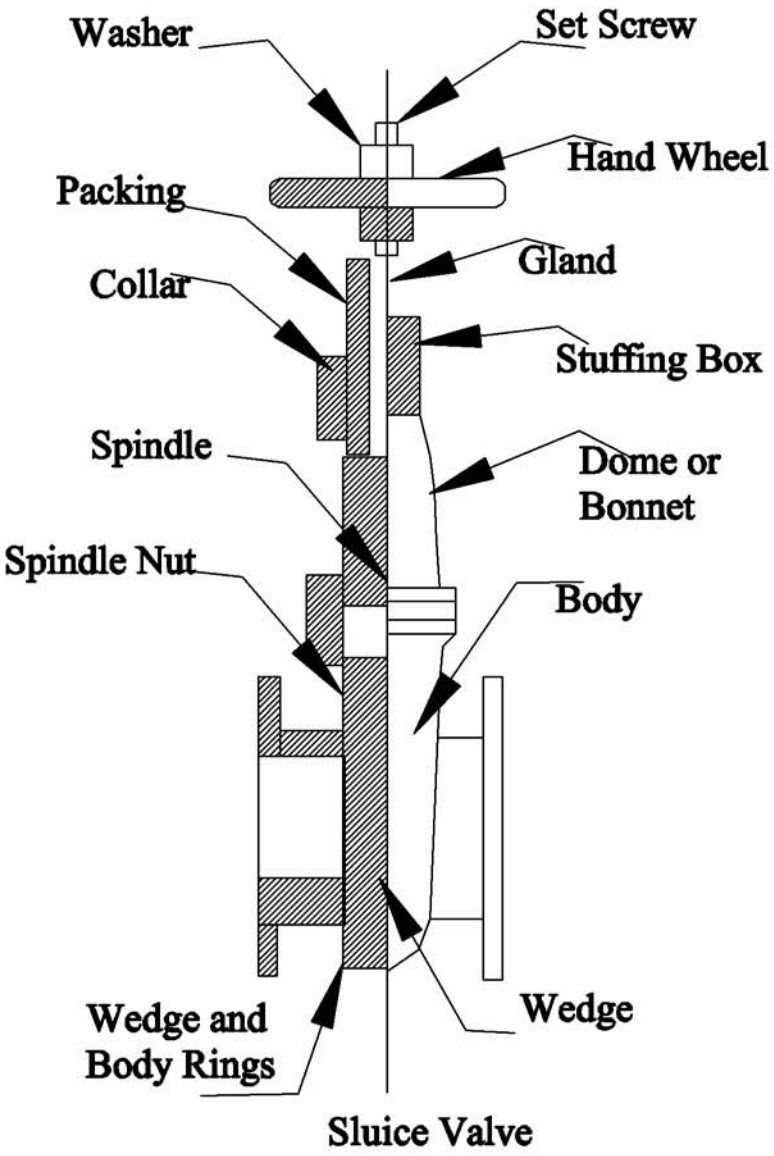
BRANCH - "Y"



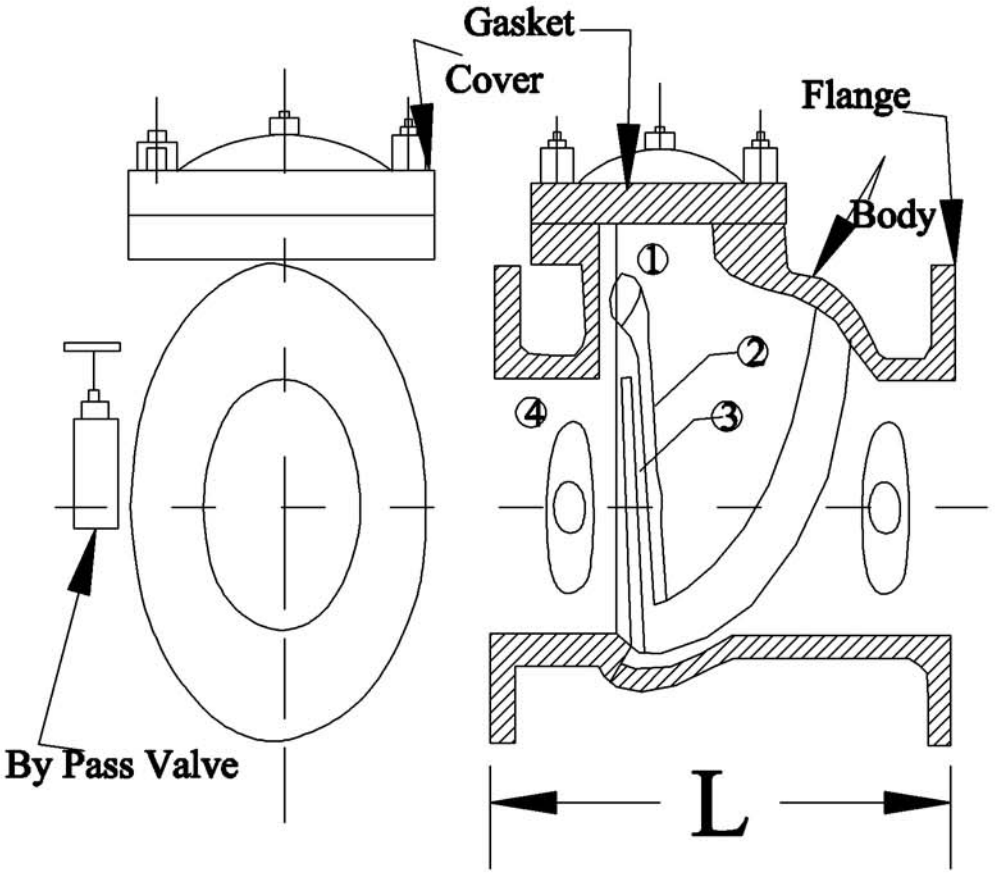
Drawing No.-2


EXCAVATED
TRENCH WIDTH
300
mm
PIPE WIDTH
INITIAL
BACKFILL
PIPE
ZONE
HAUNCHING
SIDE FILL
PIPE
EMBEDMENT
BEDDING
FOUNDATION
(OPTIONAL)

Sluice Valve & Non - Return Valve



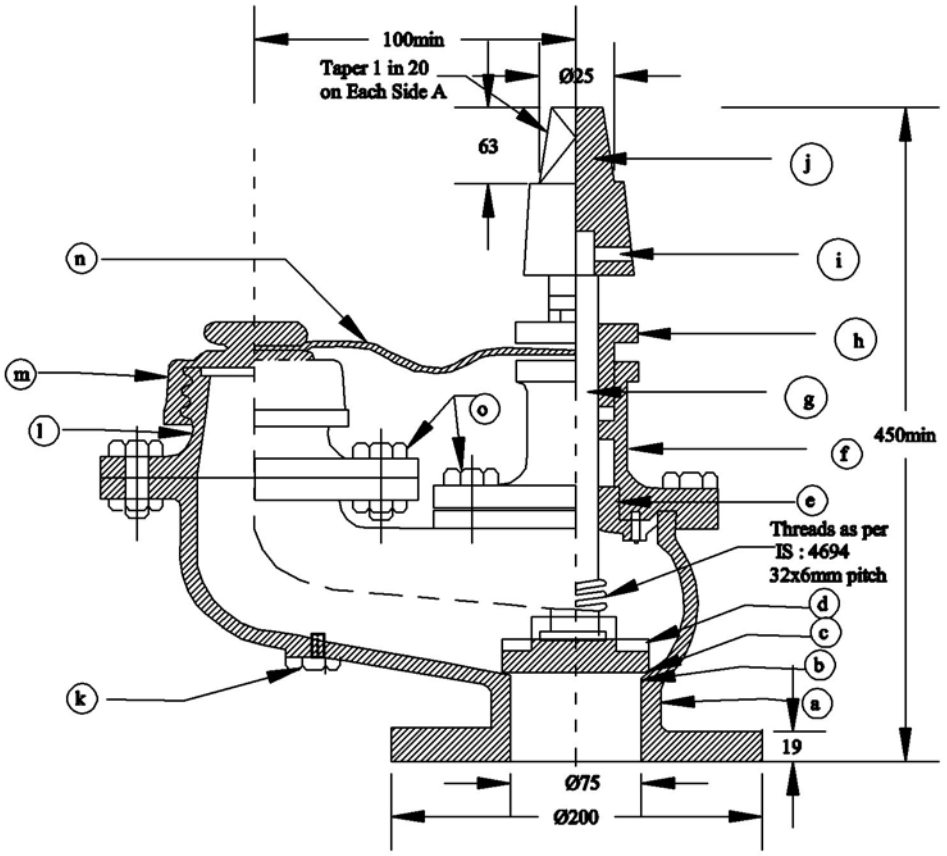
Sluice Valve



NON - RETURN VALVE

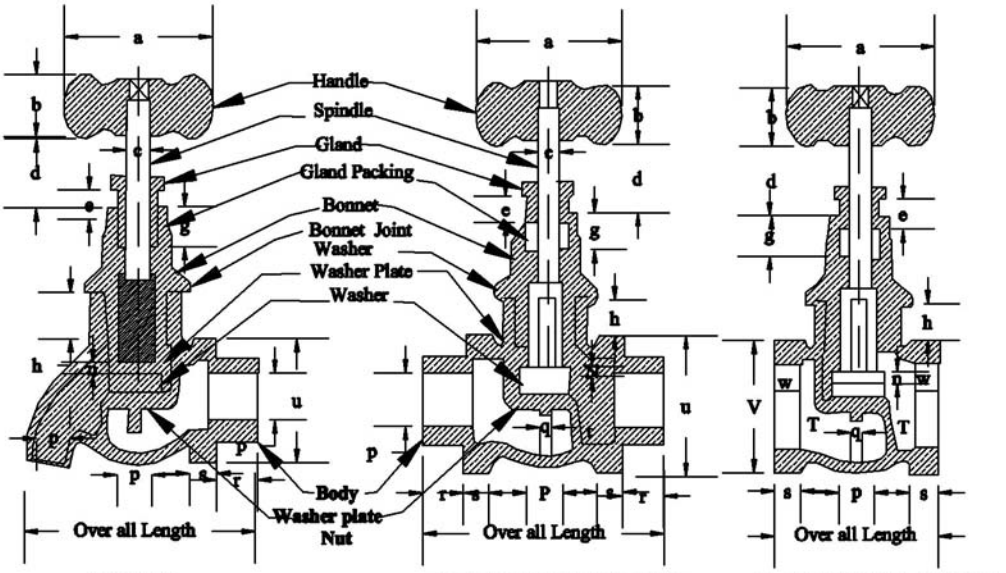
Drawing No.-4

Underground Fire Hydrant, Sluice Valve Gate



NO.	DESCRIPTION	MAT.	MAT. SPECIFICATION
a	Body	C.I.	IS 210-1972 FG -200
b	Valve seat	G.M.	IS 318-1981 LTB -2
c	Washer	Rubber	IS 937-1981
d	Valve	G.M.	IS 318- 1981 LTB - 2
e	Spindle nut	G.M.	IS 318 -1981 LTB - 2
f	Bonnet	C.I.	IS 210 - 1978 FG - 200
g	Spindle	Brass	IS 319 - 1989
h	Gland	C.I.	IS 210 - 1978 FG - 200
i	Grush screw (12mm)	M.S.	IS 6094 - 1981
j	Spindle cap	C.I.	IS 210 -1978 FG - 200
k	Drain bolt	M.S.	-
l	Outlet	G.M.	IS 318 - 1981 LTB -2
m	Cap	C.I.	IS 210 - 1978 FG - 200
n	Chain	Gal.MS.	-
o	Nut and Bolt	M.S.	-

Bib Taps & Stop Valves



BIB TAP | **EXTERNALLY THREADED STOP VALVE** | **INTERNALLY THREADED STOP VALVE**

ALL DIMENSIONS IN MILLIMETERS

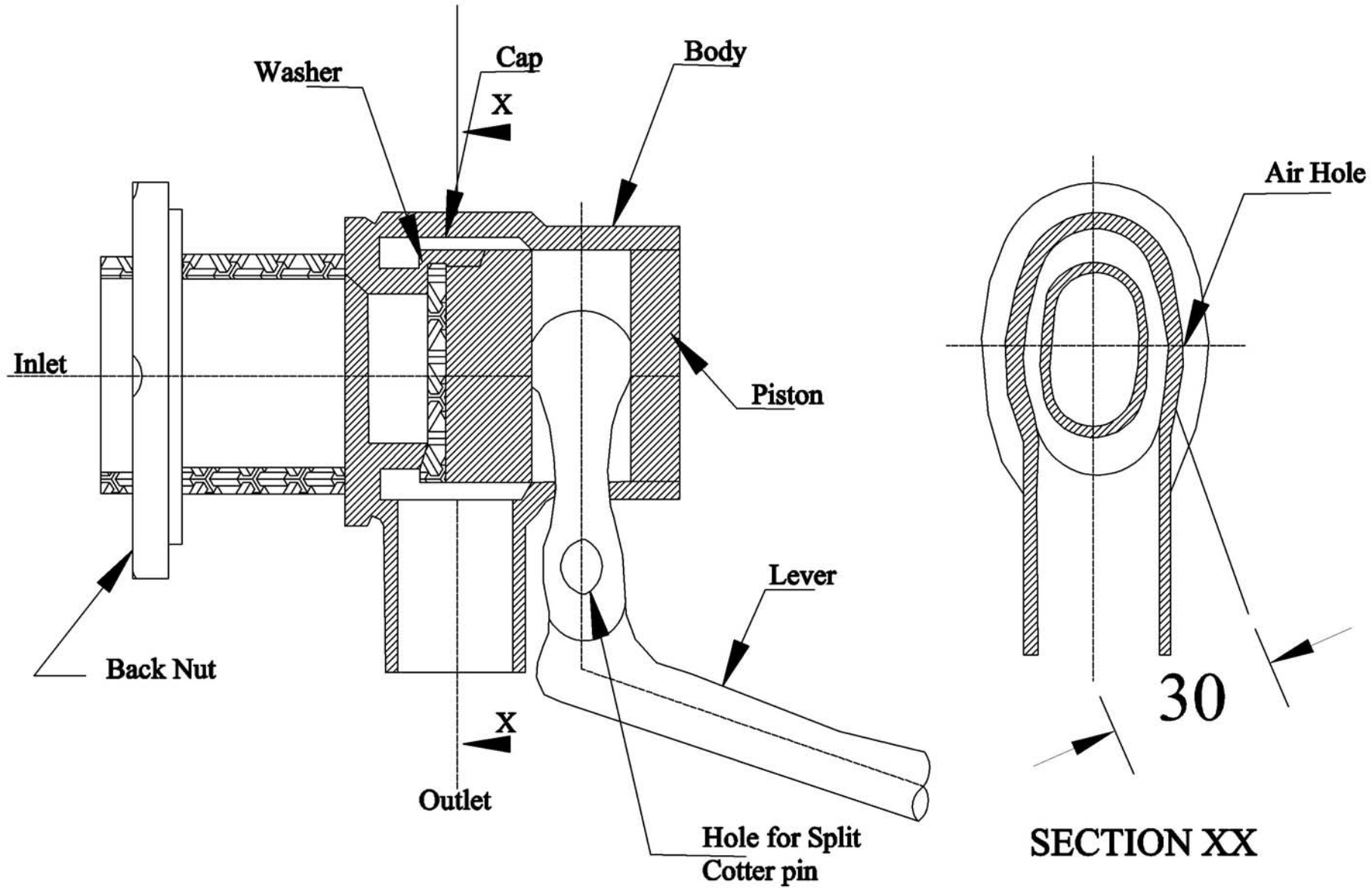
Nominal sizes	Dimensions. Min.																					Lift of washer plate (with washerin position.
	a	b	c	d	e	f	g	h	i	k	l	m	n	p +0.0 -0.5	q	r	s	t	u	v	w	
8	47.8	13.3	7.8	16.5	6.3	2.0	7.9	7.0	3.8	10.0	M20x1.5	14.3	2.8	6.5	2.4	11.0	4.7	1.6	15.2	19.5	7	3.5
10	54.0	14.0	9.4	18.7	7.5	2.0	9.5	9.5	4.7	11.5	M20x1.5	15.9	3.2	9.0	3.2	11.4	7.9	2.0	20.8	23.3	7	4
15	54.0	14.0	9.4	19.0	7.5	2.0	9.5	11.0	5.6	11.5	M24x1.5	19.0	3.2	13.0	4.1	15.0	9.5	2.0	25.6	28.3	9	4.6
20	60.4	15.7	10.9	20.1	8.9	2.5	11.1	12.5	6.4	13.5	M30x1.5	25.4	4.0	18.0	4.9	16.3	10.3	2.0	30.5	33.0	10.5	6
25	66.8	18.0	12.5	23.0	10.1	2.5	12.7	13.0	7.1	17.0	M39x1.5	33.3	4.0	23.0	4.9	19.1	11.0	2.8	37.6	42.4	11.5	7
32	74.6	20.5	14.1	30.9	11.4	2.5	14.3	16.0	7.8	19.0	M48x1.5	40.1	4.3	30	5.9	21.4	12.7	32	47.2	52.1	13.5	9.5
40	82.5	22.0	15.7	33.3	12.7	2.5	15.9	17.5	8.6	20.5	M56x1.5	47.7	5.5	36	6.6	21.4	14.3	3.2	56.4	58.5	13.5	11
50	95.0	25.3	17.3	35.9	14.0	2.5	17.4	17.5	12.5	26.0	M72x1.5	63.5	6.3	46	8.3	25.1	15.9	4.0	70.1	71.5	16.5	14.5

Note

1. Length of thread R includes cut back under hexagon, if any.
2. The values of K are for core diameter.
3. The diameter of U and V are for face to face.
4. The dimenison F is packing space.

Drawing No.- 6

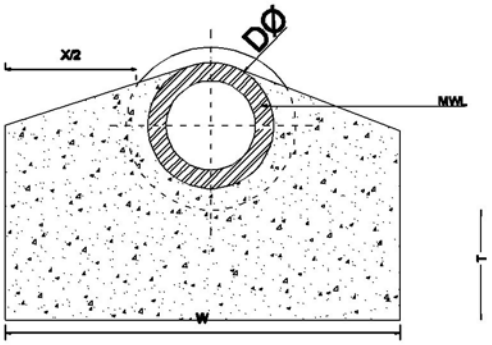
Ball Valves



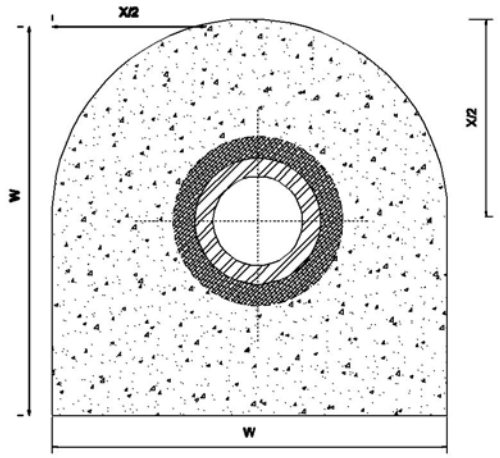
Drawing No.-7

Bedding / Encasing Stoneware Pipes

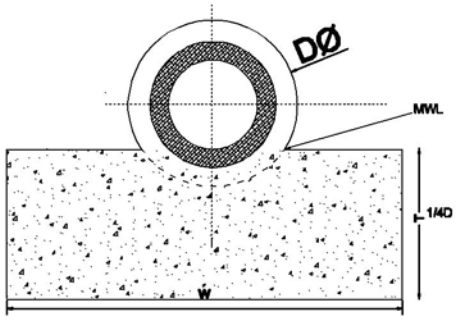
(1) CONCRETE UPTO HAUNCHES



(2) CONCRETE ALL ROUND



(3) CONCRETE BEDDING



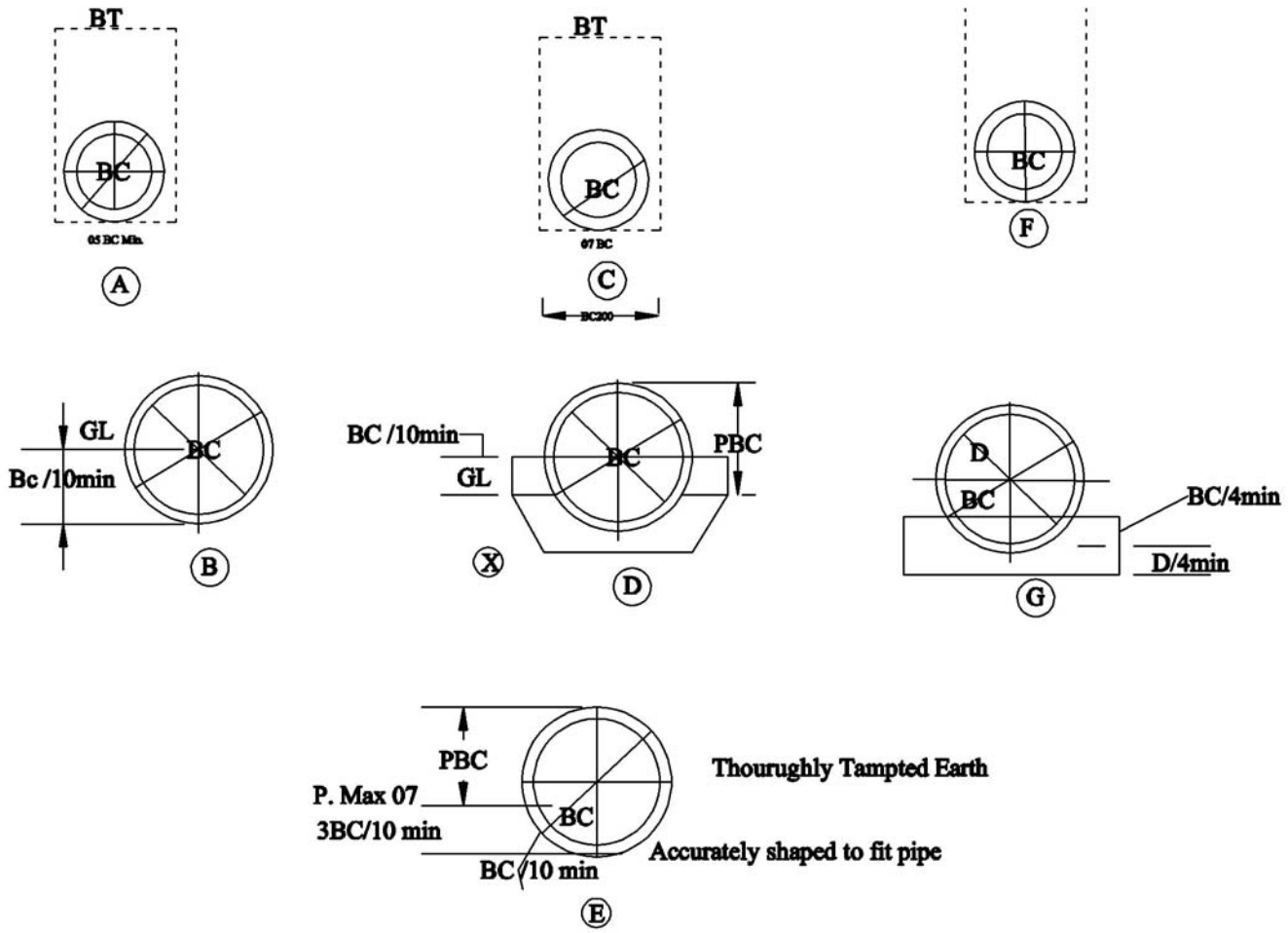
W = D + X where D is the external dimetre of the pipe

X = { 300up to trench depth of 1200
{ 400 trench depth more then 1200

T = 100 for pipes under 150, ¼th Internal dia subject to a min of 150 mm and max 300 mm for pipes more than 150 dia

MWL = Maximum water level

Bedding of Pipes

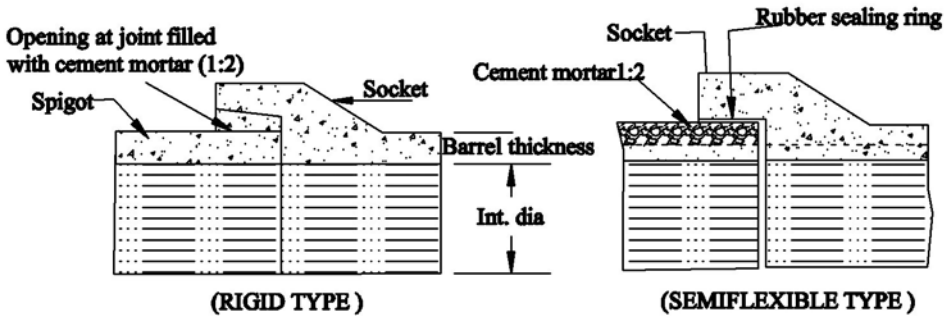


D = internal diameter
BC = horizontal breadth outside of the pipes in meters (i.e. external diameter in case of a circular pipe)
BT = horizontal width of trench immediately below the top of the pipe in meters
h = height of fill above top of pipe in meters
X = min 200 for 'H' <5000 when 'H'> 5000, 10 for every 250 of 'H'

FIG.	BEDDING	LOAD FACTOR
A	Ordinary	1.5
B	---DO---	---
C	First Class	1.9
D	---DO---	---
E	---DO---	---
F	Concrete Craddle	2.25 TO 3.4
G	---DO---	---

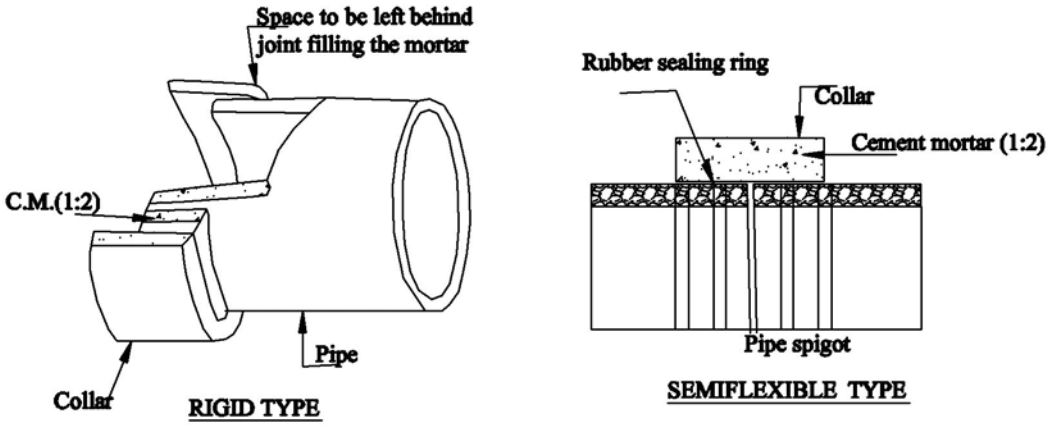
Drawing No.-9

Joints of Concrete Pipes



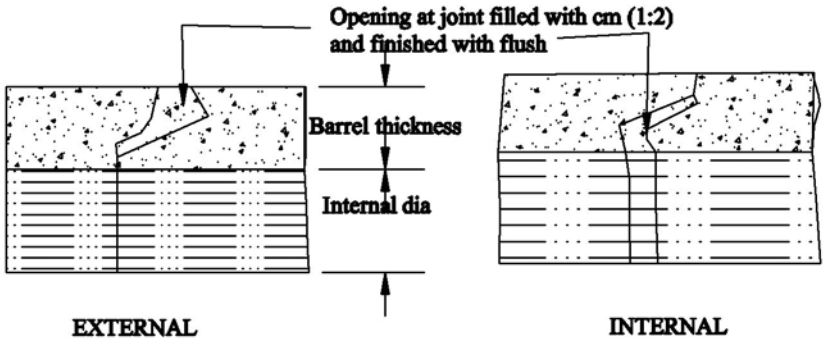
(RIGID TYPE) (SEMIFLEXIBLE TYPE)

SPIGOT & SOCKET JOINTS



RIGID TYPE SEMIFLEXIBLE TYPE

COLLR JOINTS

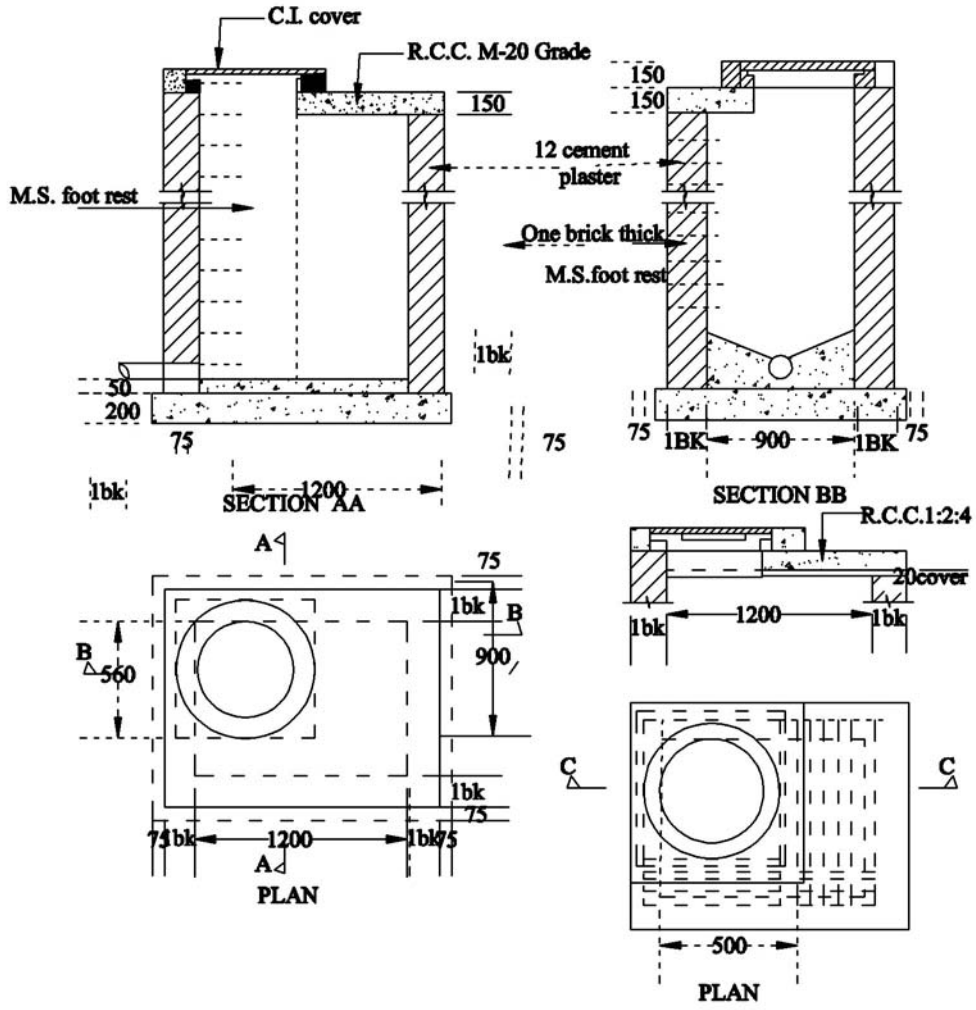


EXTERNAL INTERNAL

FLUSH JOINTS

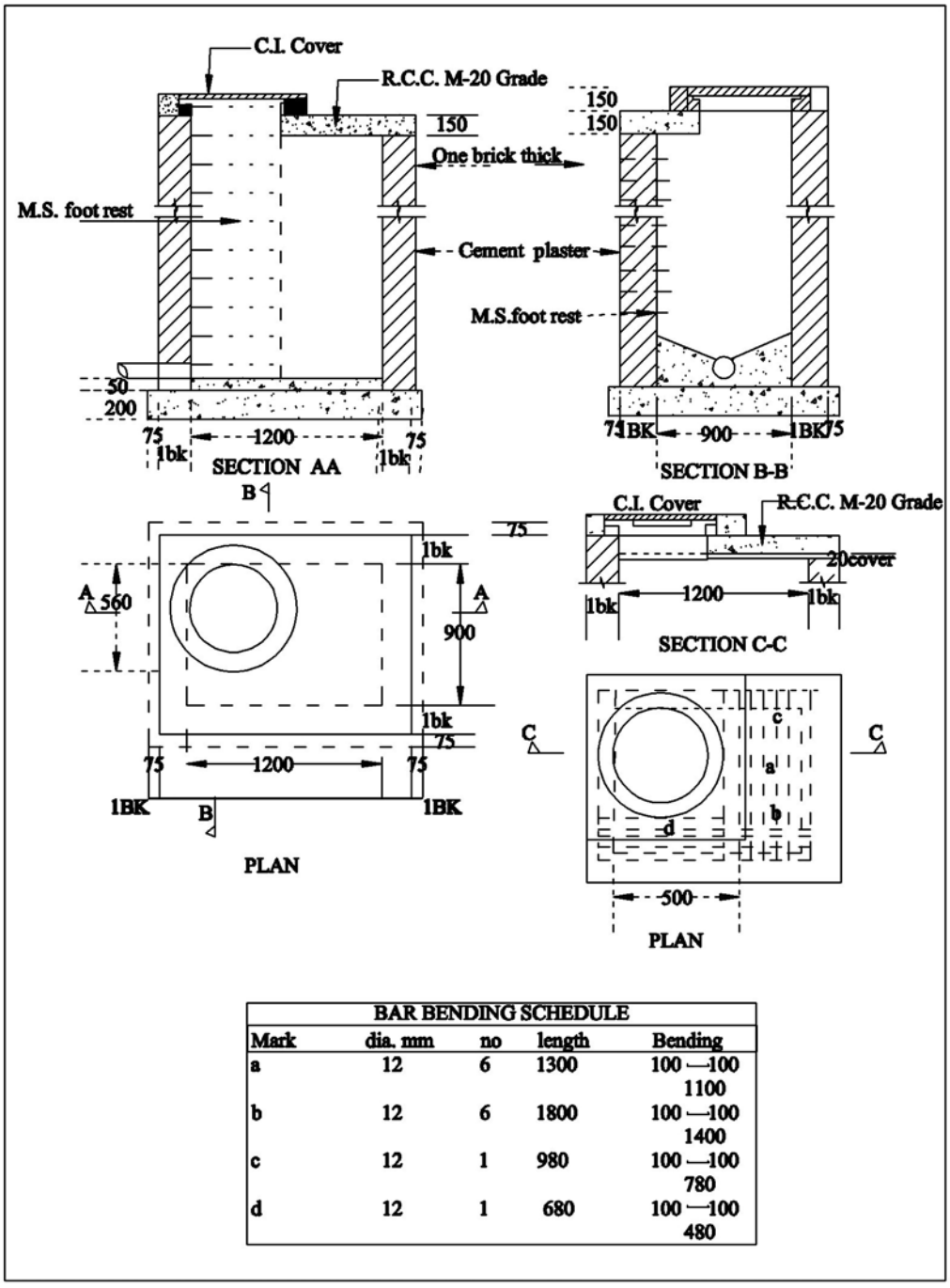
Drawing No.-10

MAN HOLE SIZE 1200 X 900 HEAVY DUTY COVER



BAR BENDING SCHEDULE				
Mark	dia. mm	no	length	Bending
a	12	4	1200	100 — 100 1000
b	12	4	1300	100 — 100 1100
c	12	1	580	100 — 100 380
d	12	1	625	100 — 100 425

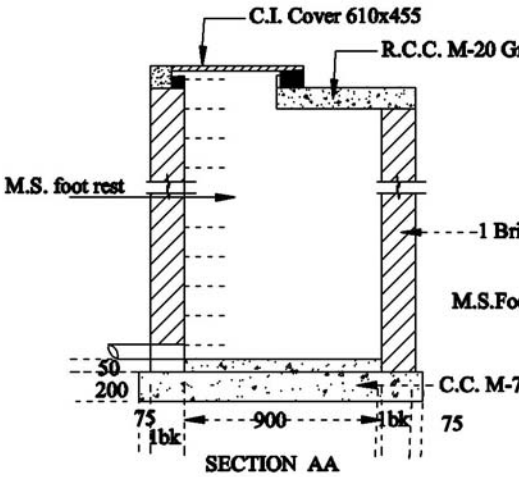
MAN HOLE SIZE OF 1200 X 900 WITH MEDIUM DUTY COVER



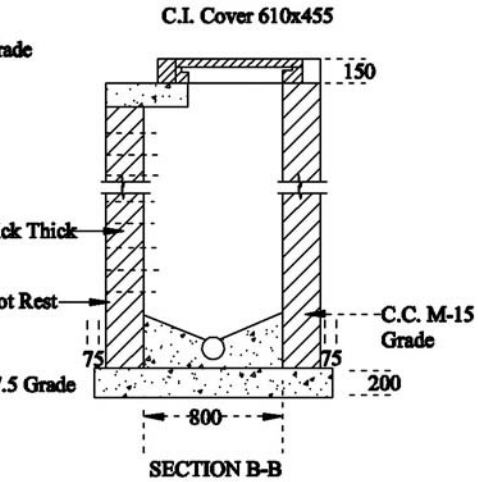
BAR BENDING SCHEDULE				
Mark	dia. mm	no	length	Bending
a	12	6	1300	100 — 100 1100
b	12	6	1800	100 — 100 1400
c	12	1	980	100 — 100 780
d	12	1	680	100 — 100 480

Drawing No.- 12

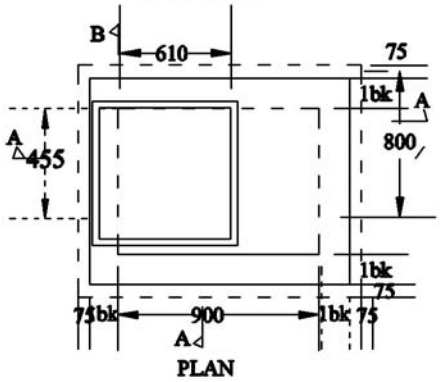
MAN HOLE SIZE 900 X 800 LIGHT DUTY COVER



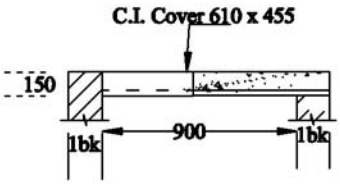
SECTION AA



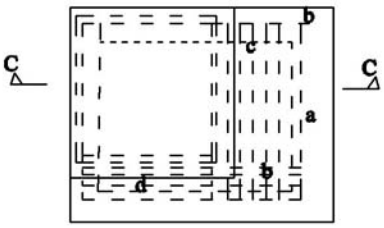
SECTION B-B



PLAN



SECTION C-C

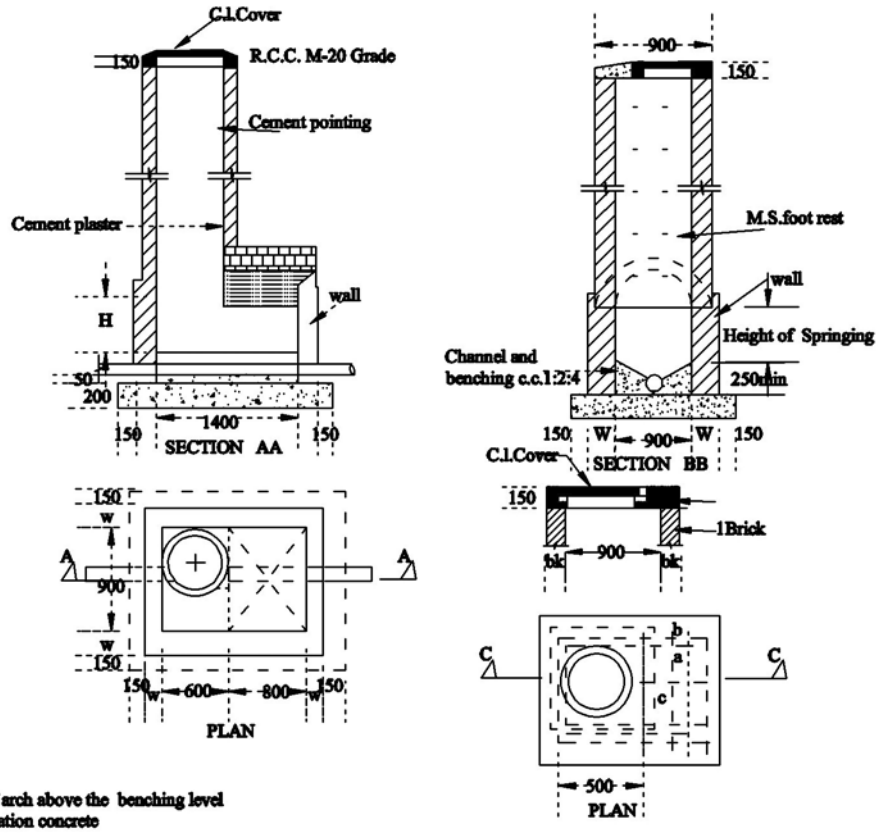


PLAN

BAR BENDING SCHEDULE				
Mark	diamm	no	length	Bending
a	12	4	1200	100 — 100 1000
b	12	4	1300	100 — 100 1100
c	12	4	580	100 — 100 380
d	12	4	525	100 — 100 425

Drawing No.-13

MAN HOLE ARCHED TYPE 1400X900



W- Width of wall
H- Height of spring of arch above the benching level
T- Thickness of foundation concrete

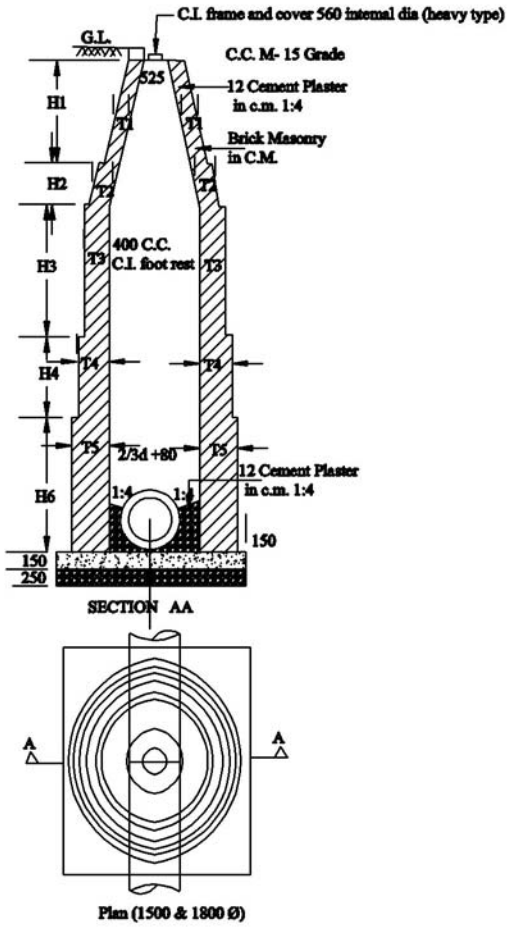
Depth of manhole from top of C.I. Cover	From top of 4250 (w)	From top of 4250 to 9750 from top (w)	Beyond 9750 from top (w)	H	T
2450 To 4250	1 Bk	----------	----------	900	200
More then 4250 upto 9750	1 Bk	1½ Bk	----------	1800	300
More then 9750	1 Bk	1½ Bk	2 Bk	1800	300

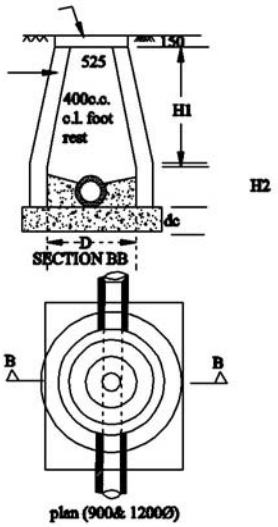
BAR BENDING SCHEDULE				
Mark	diam.	No	length	Bending
a	12	5	1000	100 — 100 800
b	12	3	1300	100 — 100 1100
c	12	1	680	100 — 100 480
a	12	5	1000	100 — 100 800
b	12	2	1300	100 — 100 1100
c	12	1	620	100 — 100 420

All Dimensions in mm

Drawing No.-14

MAN HOLE



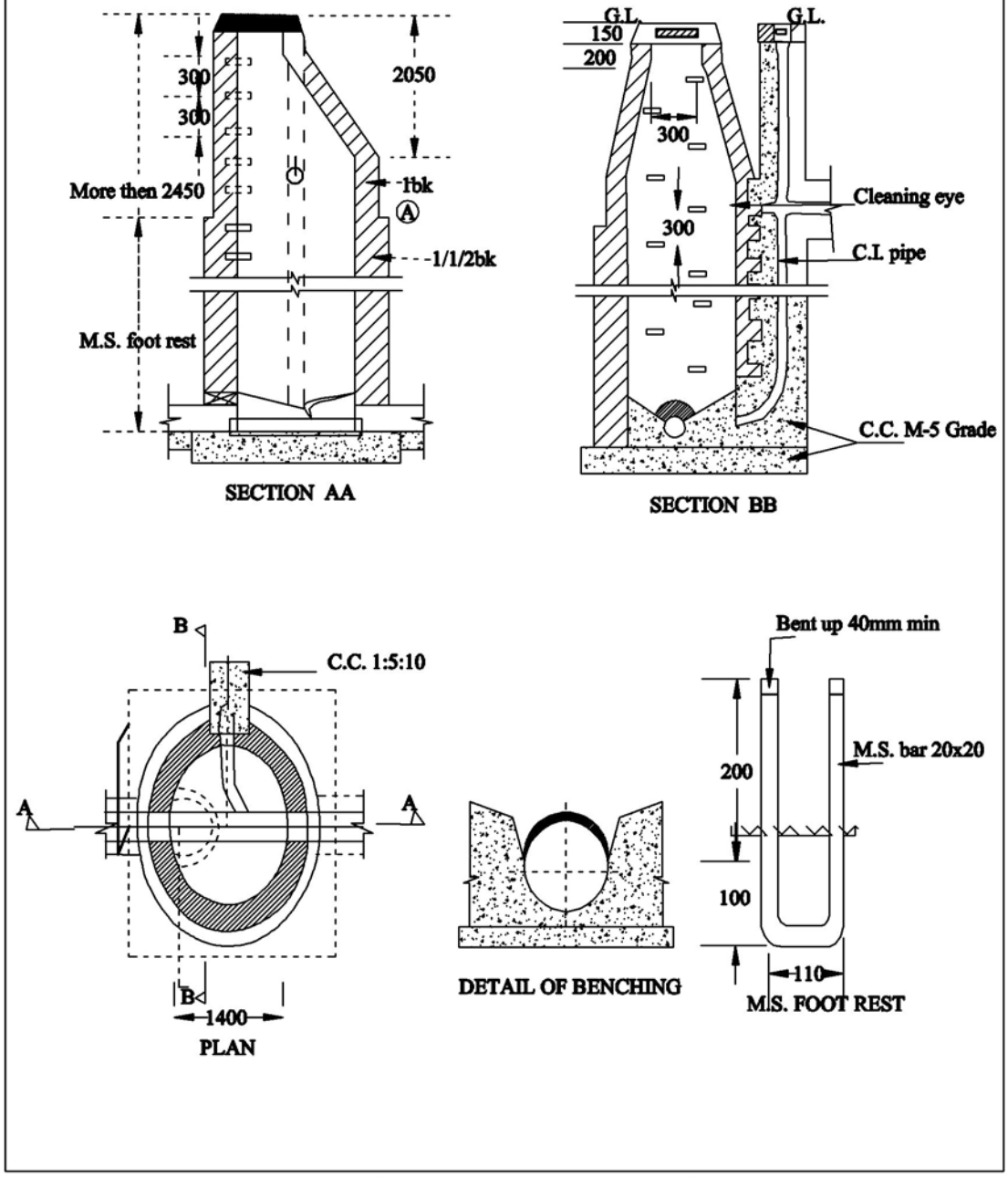


H - Height of Wall
T - Thickness of Wall
D - Dia of Manhole
d - Dia of Pipe
dc - Depth of Bed Conc.

Dia Man hole	H1	H2	H3	H4	H5	T1	T2	T3	T4	T5	Bed Conc. Dc	Remarks
900	750	Depth Variable Upto 750	-	-	-	1 Bk	1 Bk	-	-	-	226	The soling to be provided if engineer-in-charge feels necessary)
1200	1350	- do -	-	-	-	1 Bk	1 Bk	-	-	-	300	
1500	1950	750	2100	4050	DEPTH Variable Upto 4000	1 Bk	1 ½ Bk	2 Bk	2 ½ Bk	3 Bk	300	
1800	1950	750	2250	4030	- do -	1 Bk	1 ½ Bk	2 Bk	2 ½ Bk	3 Bk	300	

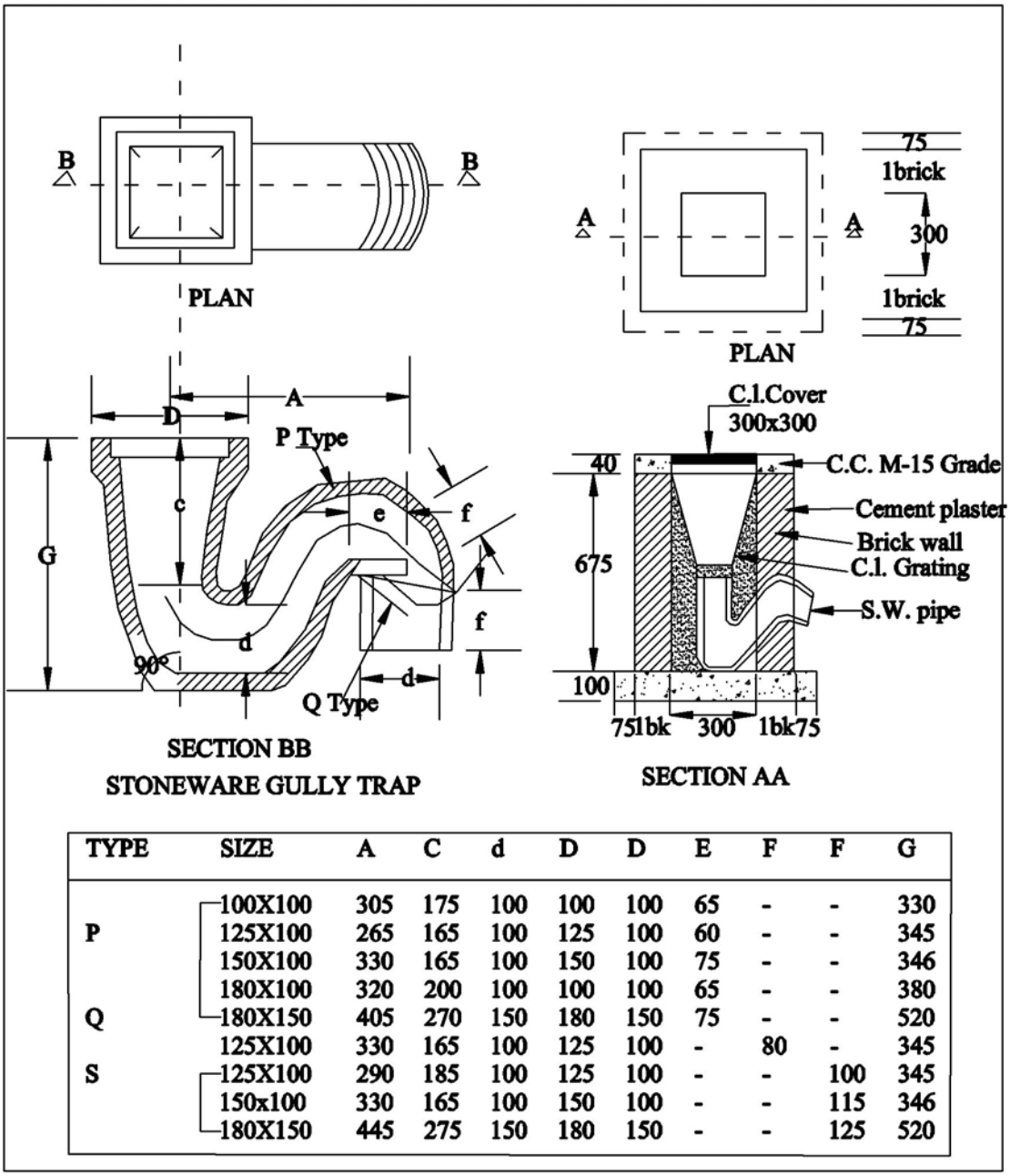
Drawing No.15

DROP MANHOLE



Drawing No.16

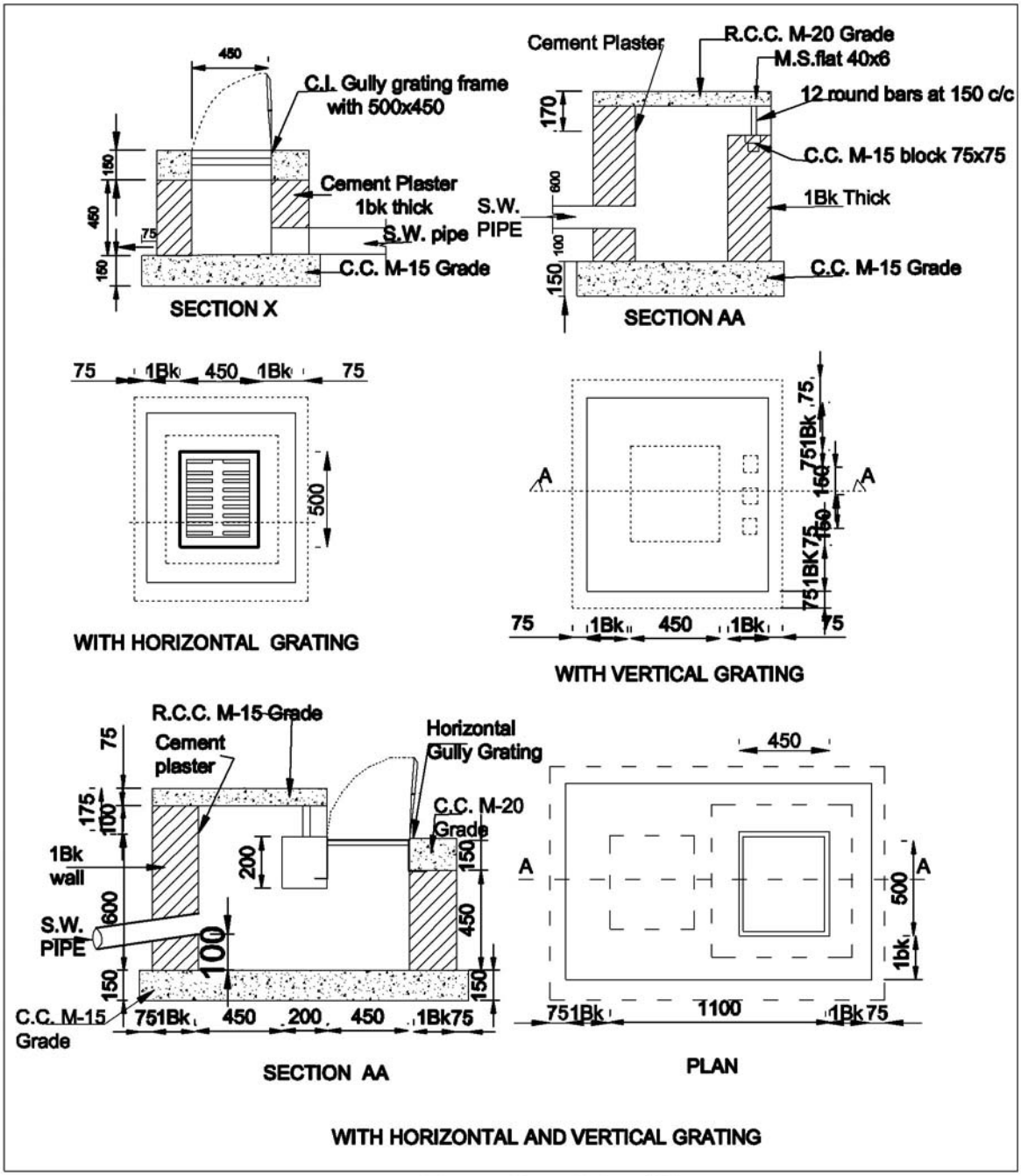
Gully Trap



TYPE	SIZE	A	C	d	D	D	E	F	F	G
P	100X100	305	175	100	100	100	65	-	-	330
	125X100	265	165	100	125	100	60	-	-	345
	150X100	330	165	100	150	100	75	-	-	346
	180X100	320	200	100	100	100	65	-	-	380
Q	180X150	405	270	150	180	150	75	-	-	520
S	125X100	330	165	100	125	100	-	80	-	345
	125X100	290	185	100	125	100	-	-	100	345
	150x100	330	165	100	150	100	-	-	115	346
	180X150	445	275	150	180	150	-	-	125	520

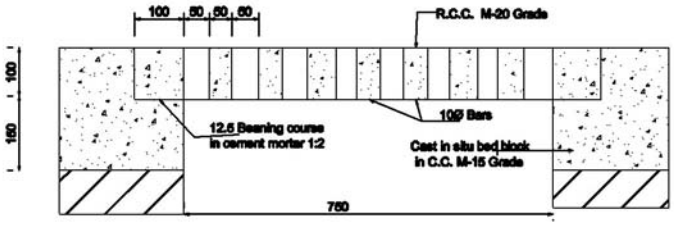
Drawing No.17

ROAD GULLY CHAMBER

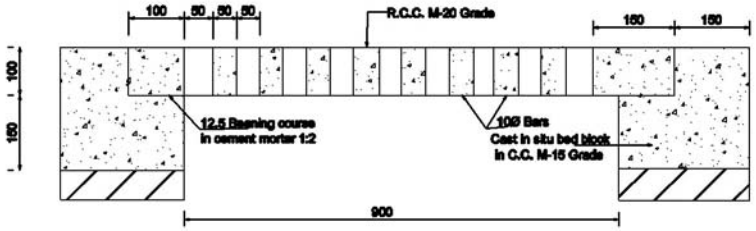


Drawing No.18

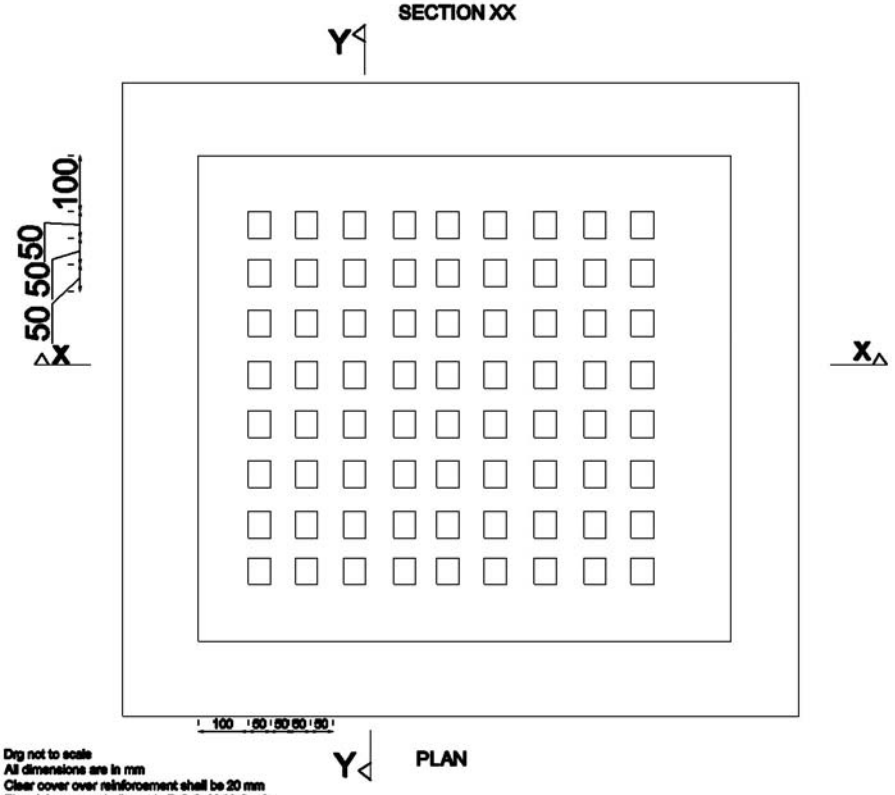
Road Gully Grating



SECTION YY



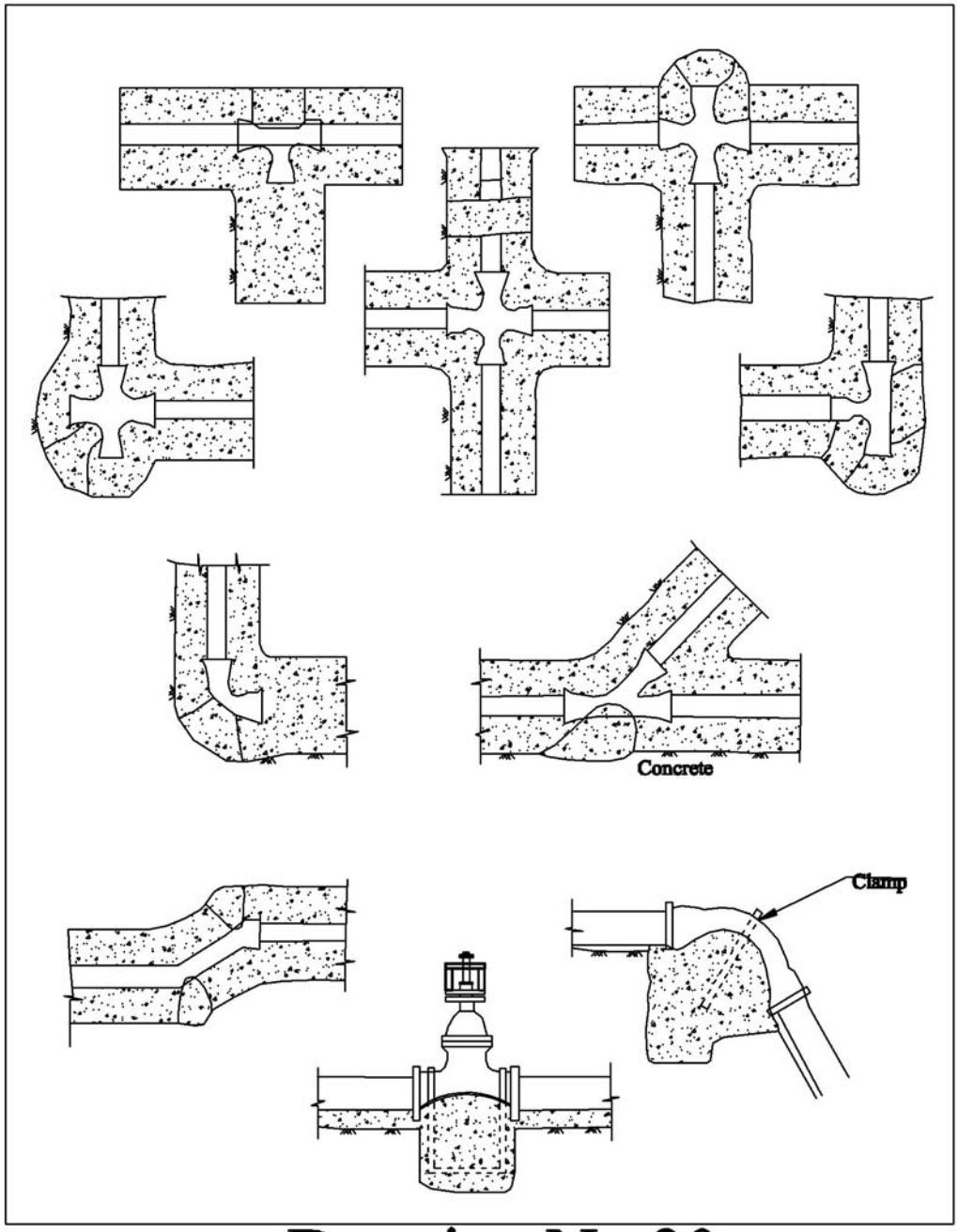
SECTION XX



PLAN

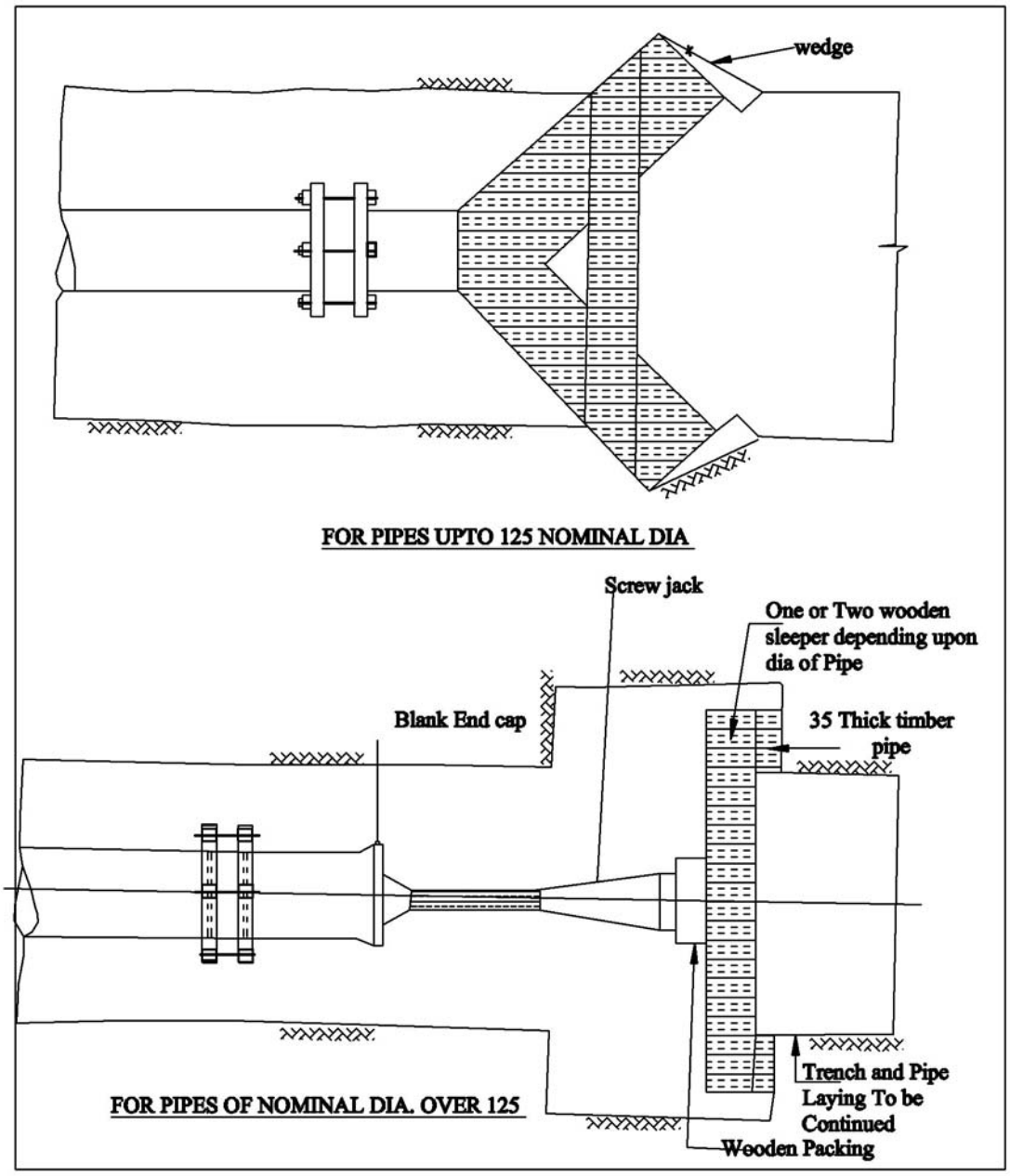
1. Drg not to scale
2. All dimensions are in mm
3. Clear cover over reinforcement shall be 20 mm
4. The slab covers shall cast in R.C.C. M-20 Grade
5. The R.C.C. cover shall be properly cured

Thrust Blocks

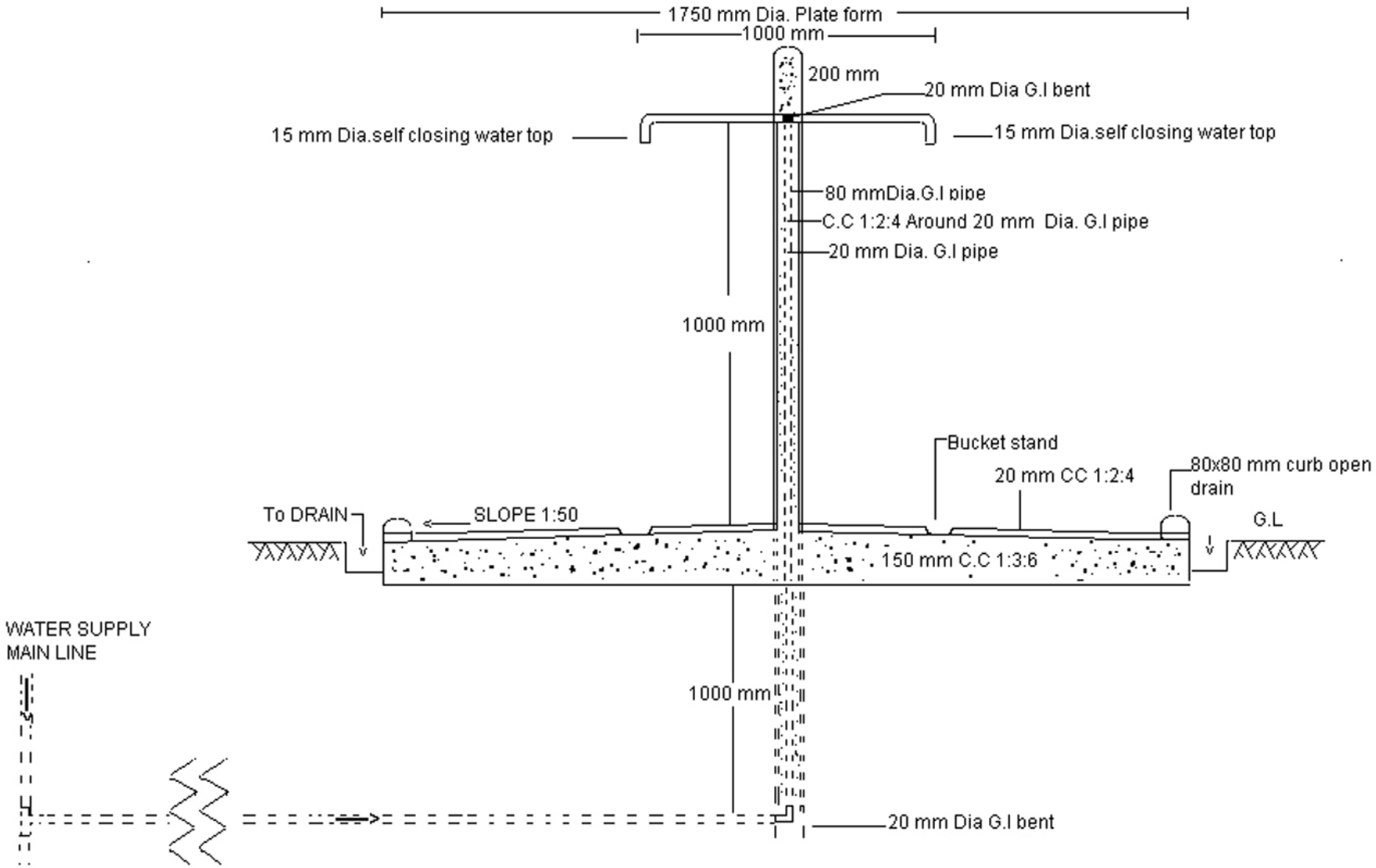


Drawing No.20

CLOSURE OF PIPES FOR HYDROSTATIC TEST



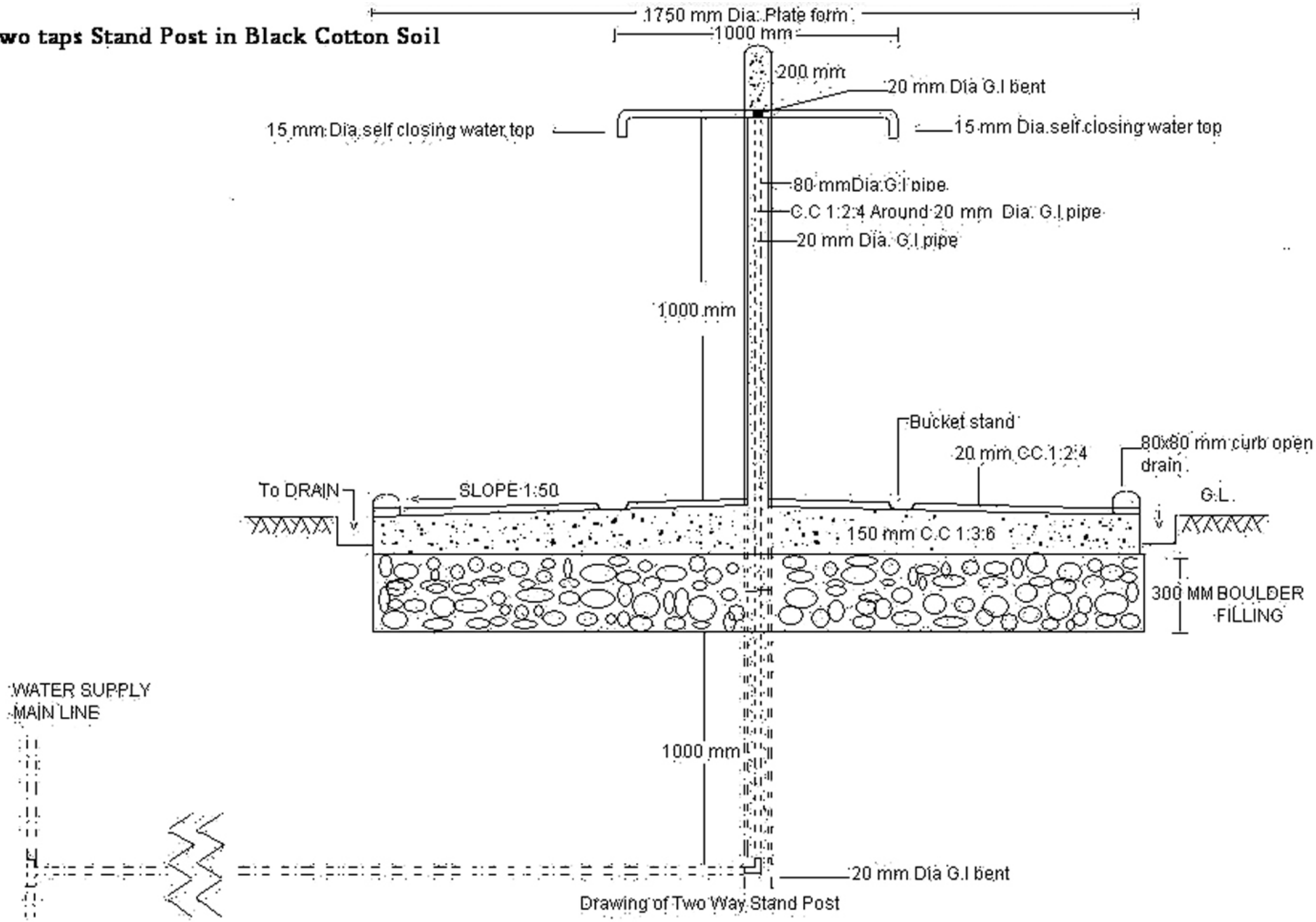
Drawing No .21



Drawing of Two Way Stand Post

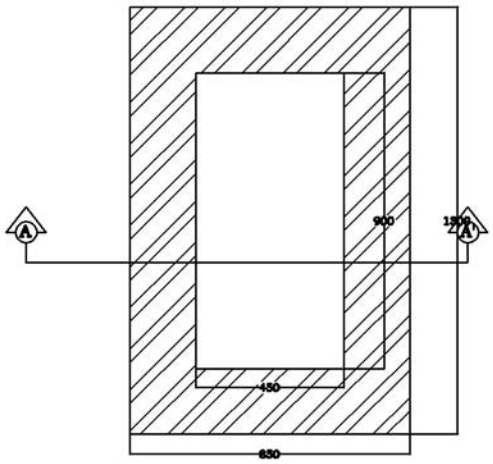
All dimensions are in milimeter

Two taps Stand Post in Black Cotton Soil

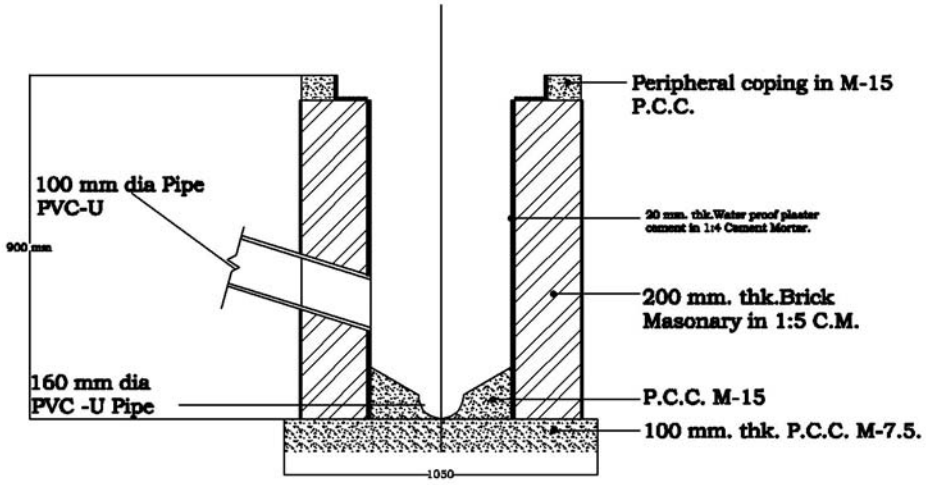


Drawing No. 23

MANHOLE CHAMBER 900MM X 450 MM



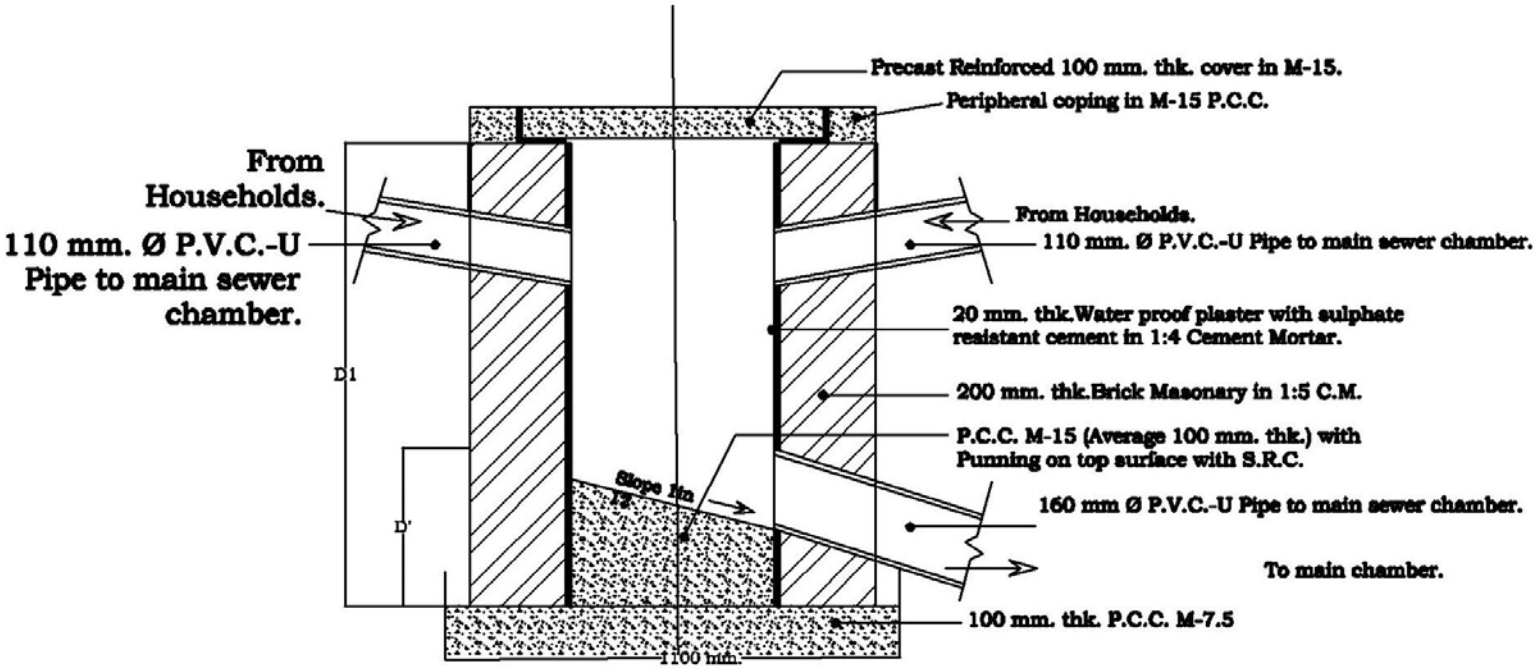
PLAN MAIN SEWER CHAMBER



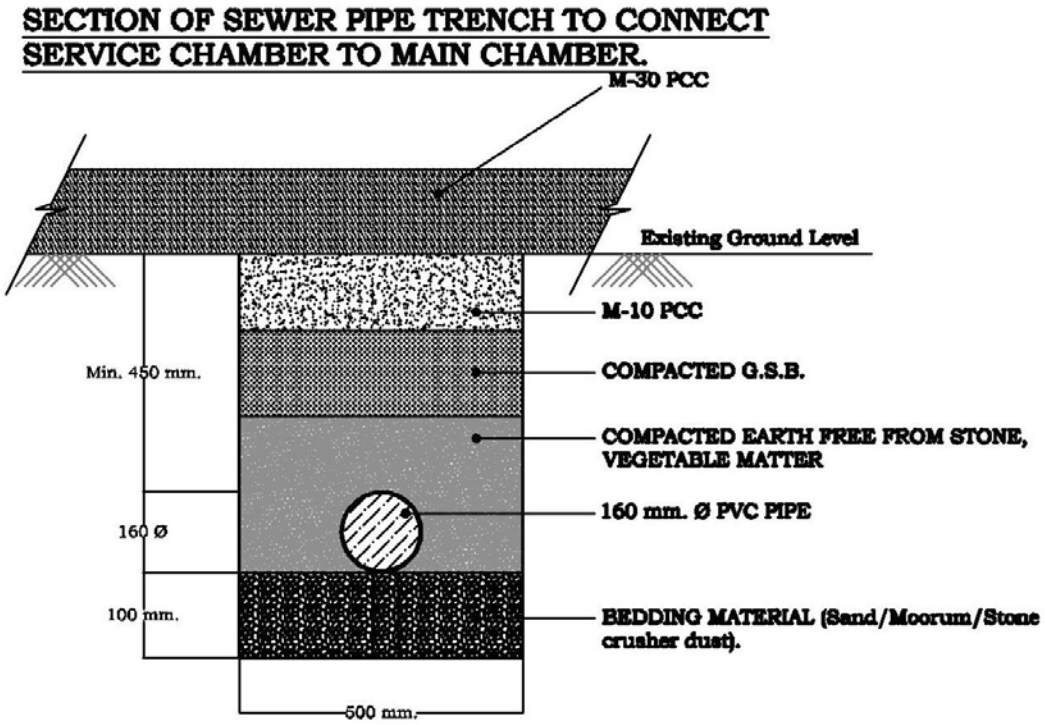
SECTION AT AA OF MAIN SEWER CHAMBER

* Note :- 1. D' depends as per site conditions.
2. D varies from 0.60 m. to 3.00 m.

HOUSE CHAMBER 450 X 600 MM



SERVICE CHAMBER



DRAWING NO.25

Annexure "1"

Weight, Perimeter and sectional Area of Metric Steel Bars.

Diameter (mm)	Weight per meter in kg	Perimeter Cm	Sectionl Area of Steel bars in Sq. Cms.
5	0.154	1.571	0.196
6	0.222	1.887	0.282
7	0.302	2.2	0.385
8	0.395	2.514	0.503
10	0.617	3.143	0.786
12	0.888	3.771	1.131
14	1.208	4.4	1.54
16	1.578	5.028	2.011
18	1.998	5.657	2.546
20	2.466	6.286	3.143
22	2.984	6.914	3.803
24	3.551	7.543	4.526
25	3.853	7.857	4.911
36	4.163	8.171	5.311
28	4.834	8.8	6.16
30	5.549	9.428	7.071
32	6.31	10.057	8.046
34	7.13	10.686	9.083
36	7.99	11.314	10.183
40	9.87	12.571	12.571
45	12.5	14.143	15.911
50	15.41	15.714	19.643

Annexure "2"
Weight of Flats per meter

Width in mm.	Thickness in MM.														
	5	5.5	6	7	8	9	10	11	12	14	16	18	20	22	25
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
12	0.471	0.518	0.565	0.659	0.753	0.848	0.942	1.036	1.130	1.319	1.507	1.695	1.884	2.072	2.355
16	0.628	0.691	0.753	0.879	1.005	1.130	1.256	1.381	1.507	1.759	2.009	2.261	2.512	2.763	3.140
20	0.785	0.863	0.942	1.099	1.256	1.413	1.570	1.727	1.884	2.198	2.512	2.826	3.140	3.454	3.925
25	0.981	1.079	1.177	1.374	1.570	1.766	1.962	2.158	2.355	2.747	3.140	3.532	3.924	4.317	4.906
32	1.256	1.381	1.507	1.758	2.009	2.360	2.512	2.763	3.014	3.516	4.019	4.521	5.023	5.526	6.279
40	1.570	1.727	1.884	2.198	2.512	2.826	3.140	3.453	3.768	4.395	5.023	5.651	6.279	6.907	7.849
50	1.962	2.158	2.355	2.747	3.140	3.532	3.924	4.317	4.709	5.494	6.279	7.064	7.849	8.634	9.811
63	2.472	2.720	2.967	3.461	3.956	4.450	4.945	5.439	5.934	6.923	7.912	8.901	9.890	10.879	12.362
80	3.139	3.454	3.768	4.395	5.023	5.651	6.279	6.907	7.535	8.791	10.470	11.303	12.585	13.814	15.398
100	3.924	4.317	4.709	5.494	6.279	7.064	7.849	8.634	9.419	10.989	12.558	14.128	15.698	17.268	19.622
125	4.905	5.396	5.887	6.868	7.849	8.830	9.811	10.792	11.773	13.736	15.698	17.660	19.622	21.585	24.520
160	6.275	6.907	7.536	8.791	10.047	11.303	12.558	13.814	15.07	17.582	20.093	22.605	25.117	27.628	31.396

Annexure "3"

Approximate outer DI Meter and thickness of steel tubes

Nominal Bore		Approximate outer dia		Thickness in M.M.			Thickness in Inch			S.W.G.			Weight per meter of black tube plain ends in kg		
M.M.	Inch	M.M.	Inch	Light	Medium	Heavy	Light	Medium	Heavy	Light	Medium	Heavy	Light	Medium	Heavy
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
15	1/2"	21.3	27/32"	2.00	2.65	3.25	0.08	0.10	0.13	14	12	10	0.95	1.22	1.45
20	3/4"	26.9	11/16"	2.35	2.65	3.25	0.09	0.10	0.13	13	12	10	1.41	1.58	1.90
25	1"	33.7	111/32"	2.65	3.25	4.05	0.10	0.13	0.16	12	10	8	2.01	2.41	2.97
32	1¼"	42.4	111/16"	2.65	3.25	4.05	0.10	0.13	0.16	12	10	8	2.58	3.11	3.84
40	1-1/2"	48.3	129/32"	2.90	3.25	4.05	0.12	0.13	0.16	11	10	8	3.25	3.61	4.43
50	2"	60.3	23/8"	2.90	3.65	4.50	0.12	0.14	0.18	11	9	7	4.11	5.10	6.17
65	2-1/2"	76.10	3"	3.25	3.65	4.50	0.13	0.14	0.18	10	9	7	0.80	6.51	7.90
80	3"	88.9	3-1/2"	3.25	4.05	4.85	0.13	0.16	0.19	10	8	6	6.81	8.47	10.00
100	4"	114.3	4-1/2"	6.25	4.50	5.40	0.14	0.18	0.21	9	7	5	9.89	12.10	14.40
125	5"	139.7	5-1/2"	.-	4.85	5.40		0.19	0.21		6	5	–	16.20	17.80
150	6"	165.1	6-1/2	-	4.85	5.40		0.19	0.21		6	5	–	19.20	21.20

Annexure "4"

IMPORTANT CONVERSION TABLE

Unit	Conversion
1 kiloliter	1000 liter
1 kiloliter	1 cum
1cum	1000 liter
1cu feet	28.317 liter
	0.028 cum
	6.24 gallons imperial
	7.48 gallons. U. s
1 cum	219.97 gallons imperial
	264.17 gallons us
1 liter	0.22 gallons imp(britsh)
1 gallons imperial	1.2 u.s gallons
1gallons imperial	4.546 liter
1 H.P	0.7457 kilowatt
1 H.P hr	0.7457 k.w.hr
1 metric HP	733.50 watt
1 kilowatt	1000 watt
	1.341 HP
	1.36 HP
1 Acre	43560 sq feet
1 sq kilo meter	100 hectare
1 sq mile	259 hectare
	640 acre
	2.59 sq kilo meter
1 cubic feet x .02832	cubic meters
1 cubic feet x 2.832×10^{4}	cubic centimeters
1 cubic feet x 6.229	imperial gallons
1 cubic feet x 28.32	litters
1 cubic feet per second x .02831	cubic meter per second
cubic feet per second x 0.6463	million u.s gallon per day
cubic meter per second x 2.282×10^{7}	u.s gallons per minutes
gallons imperial x 4.546	litters
gallons imperial x 4.546×10^{-3}	cubic meters
gram force per centimeter x 9.807×10^{-3}	Newton per minute
kilo gram force per square meter x 98.07	kilo Pascal