GOVERNMENT OF MADHYA PREDESH
PUBLIC HEALTH ENGINEERING DEPARTMENT

मध्यप्रदेश शासन

UNIFIED SCHEDULE OF RATES
FOR
WATER SUPPLY AND SEWERAGE WORKS

IN FORCE FROM

2nd December, 2009

Issued
By

Engineer in Chief
Public Health Engineering Department
Bhopal, Madhya Pradesh

CONTENTS

** PREFACE **

The present Unified Schedule of Rates (USOR) for the works of Water Supply and Sewerage was made applicable from **18th September, 2002** in Public Health Engineering Department for the entire State of Madhya Pradesh. As many years have passed since the issue of this USOR, it was necessary to revise it looking to the changes in the prices of material and labour etc. involved in construction of water supply and sewerage works. The Unified Schedule of Rates for the works of Water Supply and Sewerage has been revised to facilitate the preparation of realistic estimates and bringing uniformity in the rates and specifications of various Water Supply and Sewerage Schemes being implemented by the Public Health Engineering Department in Madhya Pradesh.

I extend my thanks to Shri K.K. Payasi, Chief Engineer, Shri H.P. Khare and Shri N.P. Malviya, Superintending Engineer, Shri Sudhir Kalra, Shri. P.C. Jain, Shri S.K. Khare, Shri Shrinivas Prasad and Shri Devendra Kumar Jain, Executive Engineers, Shri Avinash Nema, Smt. Smriti Babulkar, Assistant Engineers and Shri Rajeev Nandi Sub Engineer, Shri Dinesh Nair & Shri G.P. Soni, Draughts men for their commendable efforts in preparing this schedule of rates.

This Unified Schedule of Rates (USOR) for Water Supply and Sewerage works shall come in to force from **2nd December, 2009**.

(Sudhir Saxena)
Engineer-in-Chief
Public Health Engineering Department
Madhaya Pradesh, Bhopal

UNIFIED SCHEDULE OF RATES

GENERAL NOTES

1. **Definitions:**
The following terms and expressions wherever they appear in the schedule of rates shall have the meaning and implications assigned to them.

(i) **Engineer in Charge** :- Engineer in Charge would refer to the Executive Engineer of Public Health Engineering Division in charge of work .

(ii) **Diameter :-** Diameter of pipes, specials, valves etc. shall be the nominal internal diameter of the bore except for PVC pipe for which the diameter of pipe will denote the outer nominal diameter of pipe. These would be as per IS codes.

(iii) **Providing & Fixing :-** The provision of all materials and labour and the performance of all workmanship together with the use of all materials and labour, transport, tools, plants, appliances and all other provisions necessary for the proper execution of work as described in the concerned item of schedule of rates and the provision and uses of all coverings or casing etc. necessary to protect the work from inclement weather etc. and from damages from falling materials or other causes and all required safety arrangements.

(iv) **Laying and Fixing only :-**
As defined, for 'providing and fixing' except the provision of the materials (which will be supplied free of cost by the department for incorporation in the work) to be fixed or laid, but including taking supply of the articles from the Public Health Engineering Department Stores and the provisions of materials necessary for the proper execution of the work as described in the item of schedule of rates which are subsidiary to, but are not supplied as part of the principal articles such as bolts, nuts, packing, jointing materials etc, and the like unless other-wise specifically excluded and mentioned in the tender documents. This also include closing, preparing, loading and returning empty cases, containers, bags & baggage of the articles provided by the Department if any, to the place of issue without any extra charges.

(v) **Loading and unloading of pipe :-**
During unloading, the pipe shall not be drawn on hard ground and shall be gently unloaded using proper supports without causing any damage to the pipe etc. Unloading of pipes on timber skids without steadying rope and thus allowing the pipe to bump against one another shall not be allowed and the contractor shall be responsible for any damage.

(vi) Best:

With reference to quality of materials and workmanship the word 'BEST' when used shall mean that in the opinion of the Engineer-in-Charge, there is no superior material or article or class of workmanship obtainable in the market.

(vii) (a) I.S.S.:

The Indian Standard Specifications as issued by the Bureau of Indian Standards, New Delhi current and updated.

(b) B.S.S.

The British Standard Specifications as issued by the British Standard Institution current and up dated.

(viii) 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 due to their petty nature.

2. Approval of materials:

All materials shall be used strictly in accordance with the specifications and of the description and make as detailed in items of schedule of rate. The quantity of the various kinds of materials to be used in the works shall in all cases be determined by the Executive Engineer. All materials before use in the works shall require prior approval of the Engineer-in-charge.

When materials are specified to comply with an I.S. or B.S., the contractor shall, if required, furnish the manufactures' certificate that the materials satisfy the requirement of the I.S. or B.S. respectively.

3. Alternative:

No alternative materials other than those specified in the agreement 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 import restrictions or any other particular reasons beyond control of the contractor. But in all such cases, the Executive Engineer after satisfying himself about the facts will permit in writing the use of such alternatives and will recommend suitable alternation in rates for such works to the competent authority. No permission for using such alternative material shall however be granted if so mentioned in the tender documents.

4. Laying:

The approximate positions of all fittings shall generally be shown on the plans prepared for the purpose. But it will be the sole responsibility of the contractor

to ascertain the work on the spot and the exact position where each fitting is to be fixed from the Engineer-in-Charge before carrying out the work.

When the pipe is closed and trench gets flooded by rain, due care shall be taken to prevent the pipe from flooding.

5. Testing of materials:

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 here-in-under different items of the specifications. For this purpose the contractor at his own expense, shall provide all instruments and suitable appliances and carry out the necessary test before the Engineer-in-Charge or his representative to his entire satisfaction. The contractor shall rectify any defects as to the materials or workmanship, so noticed, and the defective portions re-tested at his expense. Till such time the test is completed an extra 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 such material /works shall be replaced/redone if so required by the Engineer in Charge.

6. **Lead:** Rates include all leads & lifts for the materials and no extra lead on account of shifting of materials from one place to another is payable, unless it is specifically mentioned in the contract agreement.

7. Specifications:

Work shall be executed in accordance with the specifications given in this schedule and the specifications for works in vogue in P.H.E.D., Govt of M.P., and the specifications attached with the 'Notice Inviting Tenders' and the ‘Contract Agreement'. Latest C.P.H.E.E.O. manual, published by the Ministry of Urban Development, Govt. of India shall also be applicable. In case of any discrepancy, the specific provision in the 'Contract Agreement' will take precedence and the decision of the authority, sanctioning the tender, shall be binding and final.

The materials to be used in works i.e. pipes; specials, valves etc. are to be supplied by the departmental store, unless otherwise mentioned in the contract document. As such, specifications for the same are not given in this schedule of rates. In case any materials are required to be supplied by the contractor for any particular work, materials conforming to relevant I.S. Specification, B.S. specification, material of best quality available in the market shall only to be used. after the approval of the Engineer in Charge.

8. Civil works:

It shall be done as per specification given in chapter XII and standard IS code for each work.

9. 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 consequences.

10. Interpretation:

The Engineer in Chief P.H.E.D., 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.

11. Award of Contract:-

The rates for various items of works given in this Unified Schedule of Rates are based on average current market rates of materials & labour for whole of the Madhya Pradesh State. The market rates may vary from place to place in the State depending upon the local conditions. No contract should, therefore be awarded directly on the rates given in this Unified Schedule of Rates without inviting proper tenders.

12. Applicability of Rates for Departmental Work :-

The rates for various items of works given in this Unified Schedule of Rates includes for 1% overhead, 10% contractor's profit, 2% T & P, 3% sundries and 1% water charges. If the work is carried out Departmentally then the rates applicable for Departmental works shall be 10.25% (reduction by element of contractor's profit 10% and T&P 2% i.e. 100/117x12 = 10.25%) less than the rates of various items given in this Unified Schedule of Rates. The over all rate to carry out the work departmentally shall be decided by the Superintending Engineer of the circle based on prevailing rate in circle after deducting 10.25% from the rates . No work shall be done departmentally unless other wise permitted in writing by the competent authority as per manual provisions.

13. As per prevailing excise duty norms, duty exemption is on certain diameter of Water Supply Pipes. Therefore no excise duty is considered while computing the rates for cast iron pipes and A.C. Pressure pipe., it will be payable as per actual on producing the necessary certificate on this account to respective Executive Engineer of the Division where such work is executed after the award of the contract and after obtaining full excise duty excise duty exemption as per prevailing rules. All the concerned officers shall be responsible to get all the prevailing exemptions in any tax or duty as per prevailing policy. The computation of rates for D.I. pipes, S.W. pipes, R.C.C. pipe, U.P.V.C. pipes and G.I.pipes are inclusive of excise duty but excise duty exemption shall be

obtained as per prevailing rules for these pipes also and this benefit shall be availed by the deptt.

14. All necessary permissions regarding road cutting, blasting, electrical line/ pole shifting, road diversion/closer, under ground utility services shifting/ closer disturbance, tree cutting etc. and all other permissions or licenses or permits etc. where ever applicable, such as from labour dept., mining dept., P& T dept., Electricity board or company, district administration, PWD, WRD, Local urban bodies etc. shall also be obtained by the contractor from the competent authority at his own cost. The contractor shall be fully responsible for any consequences for any lapse in this.

CHAPTER – I

CAST IRON PIPES AND SPECIALS WITH SOCKET AND SPIGOT (LEAD JOINTS)

Chapter – I

CAST IRON PIPES AND SPECIALS WITH SOCKET AND SPIGOT (CLASS LA, A, B)

NOTES:

1. The C.I.pipe shall conform to IS -1536-1976
2. The C.I.fittings shall conform to IS -1538-1976 (Part I to XXIV).
3. The laying of C.I. pipes shall be done as per IS -3114:1985
4. The caulking lead shall conform to IS 782: 1978
5. All measurement shall be of the finished work.
6. Work shall be executed in accordance with the relevant Indian Standard Specifications (Updated) and all the conditions of the agreement of the work.

SOCKET & SPIGOT CAST IRON PIPES WITH LEAD JOINTS (CLASS LA, A and B)

S.No.	Items	Unit	Rates in Rs.			
1.1	**Providing, laying and jointing following socket and spigot Cast Iron (Spun) Pipes including testing of joints, cost of pipes and jointing materials etc. complete.**		**LA Class**	**A' Class**	**B' Class**	
	80mm diameter	RM	869.00	947.00	948.00	
	100mm diameter	RM	1033.00	1143.00	1154.00	
	125mm diameter	RM	1295.00	1429.00	1458.00	
	150mm diameter	RM	1575.00	1742.00	1777.00	
	200mm diameter	RM	2300.00	2545.00	2581.00	
	250mm diameter	RM	3072.00	3380.00	3452.00	
	300mm diameter	RM	3934.00	4347.00	4501.00	
	350mm diameter	RM	4936.00	5416.00	5625.00	
	400mm diameter	RM	5977.00	6608.00	6854.00	
	450mm diameter	RM	7315.00	8116.00	8370.00	
	500mm diameter	RM	8592.00	9460.00	9819.00	
	600mm diameter	RM	11413.00	12594.00	13111.00	
	700mm diameter	RM	14624.00	16162.00	16847.00	
	750mm diameter	RM	16390.00	18124.00	18964.00	
	800mm diameter	RM	18313.00	20188.00	21082.00	
	900mm diameter	RM	22193.00	24510.00	25710.00	
	1000mm diameter	RM	26491.00	29308.00	30779.00	

S.No.	Items	Unit	Rates in Rs.			
1.2	**Labour for laying in position following socket & spigot Cast Iron (Spun) pipes.**		**LA Class**	**A' Class**	**B' Class**	
	80mm diameter	RM	9.80	10.70	11.40	
	100mm diameter	RM	12.20	13.40	14.30	
	125mm diameter	RM	15.90	17.30	18.60	
	150mm diameter	RM	19.80	21.70	23.30	
	200mm diameter	RM	28.90	31.60	33.90	
	250mm diameter	RM	39.70	43.30	46.80	
	300mm diameter	RM	51.20	56.00	60.70	
	350mm diameter	RM	64.50	70.00	75.90	
	400mm diameter	RM	78.50	85.80	92.60	
	450mm diameter	RM	94.70	104.00	112.20	
	500mm diameter	RM	110.90	120.80	130.70	
	600mm diameter	RM	147.70	161.30	174.70	
	700mm diameter	RM	192.50	210.30	227.20	
	750mm diameter	RM	215.60	235.70	255.70	
	800mm diameter	RM	241.30	262.90	284.40	
	900mm diameter	RM	293.90	320.70	347.50	
	1000mm diameter	RM	253.10	385.70	416.90	
1.3	**Providing lead caulked joints to following socket & spigot Cast Iron (spun) pipes and specials class 'LA' 'A' and 'B' including testing of the joints and cost of jointing materials (i.e. pig lead and spun yarn) etc. complete.**					
	80mm diameter	Each			232	
	100mm diameter	Each			282	
	125mm diameter	Each			330	
	150mm diameter	Each			419	
	200mm diameter	Each			603	
	250mm diameter	Each			731	
	300mm diameter	Each			863	
	350mm diameter	Each			1035	
	400mm diameter	Each			1169	
	450mm diameter	Each			1589	
	500mm diameter	Each			1708	
	600mm diameter	Each			2186	
	700mm diameter	Each			2521	
	750mm diameter	Each			2849	

S.No.	Items	Unit	Rates in Rs.			
	800mm diameter	Each			3104	
	900mm diameter	Each			3471	
	1000mm diameter	Each			3682	
1.4	**Labour for providing lead caulked joints to following 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).**					
	80mm diameter	Each			70.00	
	100mm diameter	Each			81.00	
	125mm diameter	Each			91.00	
	150mm diameter	Each			111.00	
	200mm diameter	Each			152.00	
	250mm diameter	Each			183.00	
	300mm diameter	Each			213.00	
	350mm diameter	Each			274.00	
	400mm diameter	Each			305.00	
	450mm diameter	Each			335.00	
	500mm diameter	Each			366.00	
	600mm diameter	Each			488.00	
	700mm diameter	Each			548.00	
	750mm diameter	Each			609.00	
	800mm diameter	Each			670.00	
	900mm diameter	Each			762.00	
	1000mm diameter	Each			792.00	
1.5	**Providing and laying in position following double socket Cast Iron 90° bend.**				**Medium Class**	**Heavy Class**
	80	mm	Dia	Each	-	990.00
	100	mm	Dia	Each	1271.00	1320.00
	125	mm	Dia	Each	1714.00	1815.00
	150	mm	Dia	Each	2266.00	2365.00
	200	mm	Dia	Each	3483.00	3686.00
	250	mm	Dia	Each	5030.00	5391.00
	300	mm	Dia	Each	6910.00	7426.00
	350	mm	Dia	Each	10261.00	11072.00
	400	mm	Dia	Each	13210.00	14314.00
	450	mm	Dia	Each	16282.00	17740.00
	500	mm	Dia	Each	20767.00	22634.00

S.No.	Items	Unit	Rates in Rs.			
	600	mm	Dia	Each	30475.00	33400.00
	700	mm	Dia	Each	42825.00	47103.00
	750	mm	Dia	Each	49891.00	54994.00
	800	mm	Dia	Each	58001.00	64048.00
	900	mm	Dia	Each	76618.00	84969.00
	1000	mm	Dia	Each	98123.00	108888.0
1.6	**Providing and laying in 45° bend position following double socket Cast Iron**				**Medium Class**	**Heavy Class**
	80	mm	Dia	Each	-	988.00
	100	mm	Dia	Each	1262.00	1317.00
	125	mm	Dia	Each	1646.00	1756.00
	150	mm	Dia	Each	2140.00	2250.00
	200	mm	Dia	Each	3183.00	3403.00
	250	mm	Dia	Each	4555.00	4884.00
	300	mm	Dia	Each	6201.00	6640.00
	350	mm	Dia	Each	9034.00	9706.00
	400	mm	Dia	Each	11476.00	12330.00
	450	mm	Dia	Each	13979.00	15138.00
	500	mm	Dia	Each	17519.00	18923.00
	600	mm	Dia	Each	25149.00	30399.00
	700	mm	Dia	Each	34672.00	37785.00
	750	mm	Dia	Each	39982.00	43706.00
	800	mm	Dia	Each	46450.00	50812.00
	900	mm	Dia	Each	60213.00	66173.00
	1000	mm	Dia	Each	76372.00	84053.00
1.7	**Providing following double socket Cast Iron laying in position 22½° bend.**				**Medium Class**	**Heavy Class**
	80	mm	Dia	Each	-	874.00
	100	mm	Dia	Each	1098.00	1147.00
	125	mm	Dia	Each	1427.00	-
	150	mm	Dia	Each	1866.00	1911.00
	200	mm	Dia	Each	2799.00	2894.00
	250	mm	Dia	Each	3951.00	4096.00
	300	mm	Dia	Each	5214.00	5461.00
	350	mm	Dia	Each	7508.00	7900.00
	400	mm	Dia	Each	9461.00	9967.00
	450	mm	Dia	Each	11354.00	11972.00

S.No.	Items	Unit	Rates in Rs.			
	500	mm	Dia	Each	14162.00	14950.00
	600	mm	Dia	Each	20083.00	21331.00
	700	mm	Dia	Each	27225.00	29049.00
	750	mm	Dia	Each	31559.00	33486.00
	800	mm	Dia	Each	36128.00	38661.00
	900	mm	Dia	Each	46327.00	49734.00
	1000	mm	Dia	Each	58247.00	62396.00
1.8	**Providing and laying in position following double socket Cast Iron 11¼° bend.**				**Medium Class**	**Heavy Class**
	80	mm	Dia	Each	823.00	988.00
	100	mm	Dia	Each	1043.00	1317.00
	125	mm	Dia	Each	1372.00	1756.00
	150	mm	Dia	Each	1756.00	2250.00
	200	mm	Dia	Each	2634.00	3403.00
	250	mm	Dia	Each	3677.00	4884.00
	300	mm	Dia	Each	4884.00	6640.00
	350	mm	Dia	Each	7020.00	9706.00
	400	mm	Dia	Each	8790.00	12330.00
	450	mm	Dia	Each	10499.00	15138.00
	500	mm	Dia	Each	13124.00	18923.00
	600	mm	Dia	Each	18435.00	27347.00
	700	mm	Dia	Each	24905.00	37785.00
	750	mm	Dia	Each	28629.00	43706.00
	800	mm	Dia	Each	32810.00	50812.00
	900	mm	Dia	Each	41903.00	66173.00
	1000	mm	Dia	Each	52348.00	84053.00
1.9	**Providing and laying in position following all socket Cast Iron Tees (all sizes in Milimeters) Body x Branch Dia**				**Medium Class**	**Heavy Class**
	80	x	80	Each	1192.00	1246.00
	100	x	80	Each	1463.00	1517.00
	100	x	100	Each	1571.00	1625.00
	125	x	80	Each	1842.00	1951.00
		x	100	Each	1951.00	2059.00

S.No.	Items	Unit	Rates in Rs.			
		x	125	Each	2113.00	2221.00
	150	x	80	Each	2330.00	2438.00
		x	100	Each	2438.00	2547.00
		x	125	Each	2547.00	2709.00
		x	150	Each	2709.00	2872.00
	200	x	80	Each	3413.00	3630.00
		x	100	Each	3522.00	3739.00
		x	125	Each	3630.00	3847.00
		x	150	Each	3793.00	4009.00
		x	200	Each	4172.00	4389.00
	250	x	80	Each	4768.00	5093.00
		x	100	Each	4876.00	5201.00
		x	125	Each	5039.00	5364.00
		x	150	Each	5201.00	5527.00
		x	200	Each	5527.00	5852.00
		x	250	Each	5906.00	6285.00
	300	x	80	Each	6448.00	6935.00
		x	100	Each	6502.00	6989.00
		x	125	Each	6664.00	7152.00
		x	150	Each	6773.00	7260.00
		x	200	Each	7206.00	7694.00
		x	250	Each	7585.00	8127.00
		x	300	Each	8073.00	8615.00
	350	x	200	Each	10316.00	11110.00
		x	250	Each	10804.00	11598.00
		x	300	Each	11354.00	12147.00
		x	350	Each	11903.00	12758.00
	400	x	200	Each	12941.00	13979.00
		x	250	Each	13429.00	14467.00
		x	300	Each	13918.00	15016.00
		x	350	Each	14528.00	15627.00
		x	400	Each	15260.00	16359.00
	450	x	250	Each	16725.00	18007.00
		x	300	Each	17275.00	18557.00
		x	350	Each	17885.00	19167.00
	Body x Branch Dia	x	400	Each	18496.00	19778.00

S.No.	Items	Unit	Rates in Rs.			
		x	450	Each	19228.00	20571.00
	500	x	250	Each	19961.00	21731.00
		x	300	Each	20510.00	22280.00
		x	350	Each	21120.00	22891.00
		x	400	Each	21731.00	23562.00
		x	450	Each	22463.00	24295.00
		x	500	Each	23318.00	25210.00
	600	x	300	Each	29056.00	31803.00
		x	350	Each	29666.00	32413.00
		x	400	Each	30399.00	33146.00
		x	450	Each	31131.00	33939.00
		x	500	Each	31925.00	34733.00
		x	600	Each	33817.00	36747.00
	700	x	350	Each	40776.00	44499.00
		x	400	Each	41508.00	45293.00
		x	450	Each	42302.00	46148.00
		x	500	Each	43095.00	46941.00
		x	600	Each	44744.00	48528.00
		x	700	Each	46880.00	50787.00
	750	x	400	Each	47674.00	52191.00
		x	450	Each	48528.00	53045.00
		x	500	Each	49383.00	53961.00
		x	600	Each	51031.00	55609.00
		x	700	Each	52923.00	57501.00
		x	750	Each	54266.00	58905.00
	800	x	400	Each	55052.00	60336.00
		x	450	Each	55851.00	61196.00
		x	500	Each	56711.00	62056.00
		x	600	Each	58554.00	63961.00
		x	700	Each	60459.00	65866.0
		x	750	Each	61442.00	66910.00
		x	800	Each	62917.00	68446.00
	900	x	450	Each	71887.00	79137.00
		x	500	Each	72747.00	79997.00
		x	600	Each	74775.00	82148.00

S.No.	Items	Unit	Rates in Rs.			
		x	700	Each	76864.00	84237.00
		x	750	Each	77847.00	85281.00
		x	800	Each	78953.00	86326.00
		x	900	Each	81779.00	89275.00
	1000	x	500	Each	91733.00	101256.00
		x	600	Each	93699.00	103284.00
		x	700	Each	96157.00	105864.00
		x	750	Each	97201.00	106970.00
		x	800	Each	98368.00	108076.00
		x	900	Each	100703.0	110411.00
		x	1000	Each	104021.0	113790.00
1.10	**Providing and laying in position following all socketed Cast Iron crosses (all sizes in millimeter).**				**Medium Class**	**Heavy Class**
	80	mm		Each	1704.00	1763.00
	100	mm		Each	2174.00	2291.00
	125	mm		Each	2938.00	3055.00
	150	mm		Each	3760.00	3937.00
	200	mm		Each	5699.00	5993.00
	250	mm		Each	8049.00	8519.00
	300	mm		Each	10928.00	11575.00
1.11	**Providing and laying in position following socket & spigot Cast Iron tapers (Reducer) (all sizes in mm).**				**Medium Class**	**Heavy Class**
	100	x	80	Each	815.00	869.00
	125	x	80	Each	1086.00	1141.00
	125	x	100	Each	1086.00	1141.00
	150	x	80	Each	1141.00	1249.00
	150	x	100	Each	1358.00	1466.00
	150	x	125	Each	1358.00	1466.00
	200	x	100	Each	1412.00	1521.00
	200	x	125	Each	1521.00	1684.00
	200	x	150	Each	2010.00	2173.00
	250	x	125	Each	2118.00	2281.00
	250	x	150	Each	2281.00	2444.00

S.No.	Items	Unit	Rates in Rs.			
	250	x	200	Each	2118..00	2281.00
	300	x	150	Each	2281.00	2444.00
	300	x	200	Each	2879.00	3042.00
	300	x	250	Each	2987.00	3204.00
	350	x	200	Each	3732.00	4037.00
	350	x	250	Each	4527.00	4894.00
	350	x	300	Each	4955.00	5383.00
	400	x	250	Each	5383.00	5934.00
	400	x	300	Each	5873.00	6362.00
	400	x	350	Each	6362.00	6913.00
	450	x	350	Each	6851.00	7524.00
	450	x	400	Each	8014.00	8748.00
	500	x	350	Each	8625.00	9421.00
	500	x	400	Each	9237.00	10155.00
	500	x	450	Each	10338.00	11317.00
	600	x	400	Each	11072.00	12173.00
	600	x	450	Each	11868.00	12907.00
	600	x	500	Each	12602.00	13764.00
	700	x	500	Each	13397.00	14681.00
	700	x	600	Each	16823.00	18352.00
	750	x	600	Each	17679.00	19331.00
	750	x	700	Each	18597.00	20371.00
1.12	**Providing and laying in position following Double Socket Cast Iron tapers (reducer) (all sizes in mm)**				**Medium Class**	**Heavy Class**
	100	x	80	Each	819.00	873.00
	125	x	80	Each	1092.00	1146.00
	125	x	100	Each	1146.00	1255.00
	150	x	80	Each	1365.00	1474.00
	150	x	100	Each	1419.00	1528.00
	150	x	125	Each	1637.00	1692.00
	200	x	100	Each	2020.00	2183.00
	200	x	125	Each	2129.00	2292.00
	200	x	150	Each		2456.00

S.No.	Items	Unit	Rates in Rs.			
	250	x	150	Each	3002.00	3220.00
	250	x	200	Each	3330.00	3712.00
	300	x	150	Each	4039.00	4367.00
	300	x	200	Each	4421.00	4803.00
	300	x	250	Each	4803.00	5677.00
	350	x	200	Each	5898.00	6390.00
	350	x	250	Each	6990.00	6943.00
	350	x	300	Each	6881.00	7557.00
	400	x	250	Each	8049.00	8786.00
	400	x	300	Each	8663.00	9462.00
	400	x	350	Each	9278.00	10199.00
	450	x	350	Each	10384.00	10384.00
	450	x	400	Each	11121.00	12227.00
	500	x	350	Each	11920.00	12964.00
	500	x	400	Each	12657.00	13824.00
	500	x	450	Each	13456.00	14746.00
	600	x	400	Each	16897.00	18433.00
	600	x	450	Each	17757.00	19416.00
	600	x	500	Each	18678.00	20460.00
	700	x	500	Each	22426.00	24454.00
	700	x	600	Each	24515.00	26850.00
	750	x	600	Each	27587.00	30229.00
	750	x	700	Each	30107.00	33117.00
1.13	**Providing and laying in position following Cast Iron collars.**				**Medium Class**	**Heavy Class**
	80	mm	Dia	Each	759.00	759.00
	100	mm	Dia	Each	921.00	921.00
	125	mm	Dia	Each	1138.00	1192.00
	150	mm	Dia	Each	1463.00	1517.00
	200	mm	Dia	Each	2059.00	2167.00
	250	mm	Dia	Each	2817.00	2980.00
	300	mm	Dia	Each	3684.00	3847.00
	350	mm	Dia	Each	5004.00	5237.00
	400	mm	Dia	Each	5993.00	6400.00
	450	mm	Dia	Each	7389.00	7738.00
	500	mm	Dia	Each	8786.00	9251.00
	600	mm	Dia	Each	11928.00	12568.00

S.No.	Items	Unit	Rates in Rs.			
	700	mm	Dia	Each	15651.00	16466.00
	750	mm	Dia	Each	17688.00	18619.00
	800	mm	Dia	Each	19977.00	21090.00
	900	mm	Dia	Each	24839.00	26245.00
	1000	mm	Dia	Each	30346.00	32045.00
1.14	**Providing and laying in position following Cast Iron socket caps.**					
	80	mm	Dia	Each		379.00
	100	mm	Dia	Each		488.00
	125	mm	Dia	Each		650.00
	150	mm	Dia	Each		813.00
	200	mm	Dia	Each		1300.00
	250	mm	Dia	Each		1842.00
	300	mm	Dia	Each		2492.00
	350	mm	Dia	Each		3793.00
	400	mm	Dia	Each		4788.00
	450	mm	Dia	Each		6032.00
	500	mm	Dia	Each		7338.00
	600	mm	Dia	Each		10634.00
	700	mm	Dia	Each		14613.00
	750	mm	Dia	Each		16914.00
	800	mm	Dia	Each		17139.00
	900	mm	Dia	Each		22106.00
	1000	mm	Dia	Each		28055.00
1.15	**Providing and laying in position following Cast Iron plugs.**				**Medium Class**	**Heavy Class**
	80	mm	Dia	Each	155.00	159.00
	100	mm	Dia	Each	206.00	212.00
	125	mm	Dia	Each	309.00	318.00
	150	mm	Dia	Each	464.00	477.00
	200	mm	Dia	Each	721.00	690.00
	250	mm	Dia	Each	1133.00	1061.00
	300	mm	Dia	Each	1546.00	1485.00
	350	mm	Dia	Each	2476.00	2363.00
	400	mm	Dia	Each	3262.00	3171.00
	450	mm	Dia	Each	4167.00	4042.00
	500	mm	Dia	Each	5194.00	5037.00
	600	mm	Dia	Each	7671.00	7462.00

S.No.	Items	Unit	Rates in Rs.			
	700	mm	Dia	Each	10872.00	10634.00
	750	mm	Dia	Each	12744.00	12499.00
	800	mm	Dia	Each	14954.00	14613.00
	900	mm	Dia	Each	19513.00	19091.00
	1000	mm	Dia	Each	24983.00	24501.00
1.16	**Providing and laying in position following sizes of socket & spigot or all socketed Cast Iron specials class MEDIUM or HEAVY which does not appear in above items of schedule.**				**Medium Class**	**Heavy Class**
	80mm to 300mm dia	Kg			54.00	54.00
	Above 300mm Dia	Kg			58.00	58.00
1.17	**Labour for laying in position following double socket cast iron 45° bends.**				**Medium Class**	**Heavy Class**
	80	mm	Dia	Each	15.00	-
	100	mm	Dia	Each	20.00	19.00
	125	mm	Dia	Each	27.00	25.00
	150	mm	Dia	Each	35.00	33.00
	200	mm	Dia	Each	53.00	49.00
	250	mm	Dia	Each	75.00	70.00
	300	mm	Dia	Each	102.00	96.00
	350	mm	Dia	Each	135.00	125.00
	400	mm	Dia	Each	171.00	159.00
	450	mm	Dia	Each	210.00	194.00
	500	mm	Dia	Each	263.00	243.00
	600	mm	Dia	Each	422.00	349.00
	700	mm	Dia	Each	524.00	481.00
	750	mm	Dia	Each	606.00	555.00
	800	mm	Dia	Each	700.00	640.00
	900	mm	Dia	Each	912.00	830.00
	1000	mm	Dia	Each	1159.00	1053.00

S.No.	Items	Unit	Rates in Rs.			
1.18	**Labour for laying in position following double socket cast iron 90^0 bends.**					
					Medium Class	**Heavy Class**
	80	mm	Dia	Each	-	-
	100	mm	Dia	Each	19.00	19.00
	125	mm	Dia	Each	26.00	26.00
	150	mm	Dia	Each	35.00	35.00
	200	mm	Dia	Each	53.00	53.00
	250	mm	Dia	Each	77.00	77.00
	300	mm	Dia	Each	106.00	106.00
	350	mm	Dia	Each	141.00	141.00
	400	mm	Dia	Each	182.00	182.00
	450	mm	Dia	Each	224.00	224.00
	500	mm	Dia	Each	286.00	286.00
	600	mm	Dia	Each	420.00	420.00
	700	mm	Dia	Each	590.00	590.00
	750	mm	Dia	Each	688.00	688.00
	800	mm	Dia	Each	800.00	800.00
	900	mm	Dia	Each	1056.00	1056.00
	1000	mm	Dia	Each	1353.00	1353.00
1.19	**Labour for laying in position following double socket cast iron 22½°. bends.**				**Medium Class**	**Heavy Class**
	80 mm		Dia	Each	-	14.00
	100 mm		Dia	Each	17.00	18.00
	125 mm		Dia	Each	22.00	23.00
	150 mm		Dia	Each	29.00	30.00
	200 mm		Dia	Each	45.00	45.00
	250 mm		Dia	Each	61.00	63.00
	300 mm		Dia	Each	80.00	85.00
	350 mm		Dia	Each	104.00	110.00
	400 mm		Dia	Each	131.00	139.00
	450 mm		Dia	Each	158.00	167.00

S.No.	Items	Unit	Rates in Rs.			
	500 mm		Dia	Each	196.00	208.00
	600 mm		Dia	Each	279.00	297.00
	700 mm		Dia	Each	378.00	405.00
	750 mm		Dia	Each	438.00	467.00
	800 mm		Dia	Each	498.00	535.00
	900 mm		Dia	Each	635.00	689.00
	1000 mm		Dia	Each	803.00	864.00
1.20	**Labour for laying in position following double socket cast iron 11¼ bends.**				**Medium Class**	**Heavy Class**
	80 mm		Dia	Each	13.00	15.0
	100 mm		Dia	Each	16.00	20.00
	125 mm		Dia	Each	21.00	27.00
	150 mm		Dia	Each	27.00	35.00
	200 mm		Dia	Each	41.00	53.00
	250 mm		Dia	Each	57.00	75.0
	300 mm		Dia	Each	75.00	102.00
	350 mm		Dia	Each	97.00	135.00
	400 mm		Dia	Each	122.00	171.00
	450 mm		Dia	Each	146.00	210.00
	500 mm		Dia	Each	182.00	263.00
	600 mm		Dia	Each	256.00	379.00
	700 mm		Dia	Each	346.00	524.00
	750 mm		Dia	Each	397.00	606.00
	800 mm		Dia	Each	452.00	700.00
	900 mm		Dia	Each	578.00	912.00
	1000 mm		Dia	Each	722.00	1159.00
1.21	**Labour for laying in position following all socket Cast Iron, tees (all Sizes in mm)**				**Medium Class**	**Heavy Class**
	80	x	80	Each	19	19
	100	x	80	Each	23	24
	100	X	100	Each	25	25
	125	x	80	Each	29	30

S.No.	Items	Unit	Rates in Rs.			
	125	x	100	Each	30	32
	125	x	125	Each	33	35
	150	x	80	Each	36	38
		x	100	Each	38	40
	150	x	125	Each	40	42
		x	150	Each	42	45
	200	x	80	Each	53	57
		x	100	Each	55	58
	200	x	125	Each	57	60
		x	150	Each	59	63
		x	200	Each	65	69
	250	x	80	Each	75	80
		x	100	Each	76	81
		x	125	Each	79	84
		x	150	Each	81	86
		x	200	Each	86	91
		x	250	Each	92	98
	300	x	80	Each	101	108
		x	100	Each	102	109
		x	125	Each	104	112
		x	150	Each	106	113
		x	200	Each	113	120
		x	250	Each	119	127
		x	300	Each	126	135
	350	x	200	Each	143	154
		x	250	Each	150	161
		x	300	Each	158	169
		x	350	Each	165	177
	400	x	200	Each	180	194
		x	250	Each	186	201
		x	300	Each	193	208
		x	350	Each	202	217
		x	400	Each	212	227
	450	x	250	Each	232	250

S.No.	Items	Unit	Rates in Rs.			
		x	300	Each	240	257
		x	350	Each	248	266
		x	400	Each	257	274
		x	450	Each	267	285
	500	x	250	Each	277	302
		x	300	Each	285	309
		x	350	Each	293	318
		x	400	Each	302	327
		x	450	Each	312	337
		x	500	Each	324	350
	600	x	300	Each	403	441
		x	350	Each	412	450
		x	400	Each	422	460
		x	450	Each	432	471
		x	500	Each	443	482
		x	600	Each	469	510
	700	x	350	Each	566	617
		x	400	Each	576	628
		x	450	Each	587	640
		x	500	Each	598	651
		x	600	Each	621	673
		x	700	Each	650	705
	750	x	400	Each	662	724
		x	450	Each	673	736
		x	500	Each	685	749
		x	600	Each	708	772
		x	700	Each	734	798
		x	750	Each	753	817
	800	x	400	Each	759	832
		x	450	Each	770	844
		x	500	Each	782	855
		x	600	Each	807	882
		x	700	Each	833	908
		x	750	Each	847	922

S.No.	Items	Unit	Rates in Rs.			
		x	800	Each	867	944
	900	x	450	Each	991	1091
		x	500	Each	1003	1103
		x	600	Each	1031	1132
		x	700	Each	1060	1161
		x	750	Each	1073	1176
		x	800	Each	1088	1190
		x	900	Each	1127	1231
	1000	x	500	Each	1265	1396
		x	600	Each	1292	1424
		x	700	Each	1326	1459
		x	750	Each	1340	1475
		x	800	Each	1356	1490
		x	900	Each	1388	1522
		x	1000	Each	1434	1569
1.22	**Labour for laying in position following all socket Cast Iron crosses. (all sizes in mm)**				**Medium Class**	**Heavy Class**
	80 mm		Dia	Each	25.00	25.00
	100 mm		Dia	Each	31.00	33.00
	125 mm		Dia	Each	42.00	44.00
	150 mm		Dia	Each	54.00	57.00
	200 mm		Dia	Each	82.00	86.00
	250 mm		Dia	Each	116.00	123.00
	300 mm		Dia	Each	158.00	167.00
1.23	**Labour for laying in position following socket and spigot Cast Iron tapers, (reducer) (all Sizes in mm)**				**Medium Class**	**Heavy Class**
	100	x	80	Each	13	14
	125	x	80	Each	17	18
	125	x	100	Each	18	19
	150	x	80	Each	21	23
		x	100	Each	22	24
	150	x	125	Each	24	26

S.No.	Items	Unit	Rates in Rs.			
	200	x	100	Each	31	34
	200	x	125	Each	33	36
		x	150	Each	36	38
	250	x	125	Each	45	47
	250	x	150	Each	47	50
		x	200	Each	52	56
	300	x	150	Each	63	68
		x	200	Each	69	75
		x	250	Each	75	82
	350	x	200	Each	81	88
		x	250	Each	88	96
		x	300	Each	95	104
	400	x	250	Each	111	121
		x	300	Each	119	130
		x	350	Each	128	141
	450	x	350	Each	143	157
		x	400	Each	153	169
	500	x	350	Each	164	179
		x	400	Each	174	191
	500	x	450	Each	185	203
	600	x	400	Each	233	254
		x	450	Each	245	268
		x	500	Each	257	282
	700	x	500	Each	309	337
		x	600	Each	338	370
	750	x	600	Each	380	417
		x	700	Each	415	457
1.24	**Labour for laying in position following Double Socket cast iron tapers (Reducer) (all sizes in mm)**				**Medium Class**	**Heavy Class**
	100	x	80	Each	21	23
	125	x	80	Each	31	34
	125	x	100	Each	47	50
	150	x	80	Each	63	68
	150	x	100	Each	69	75
	150	x	125	Each	81	88
	200	x	100	Each	95	104

S.No.	Items	Unit	Rates in Rs.			
	200	x	125	Each	111	121
	200	x	150	Each	119	130
	250	x	150	Each	128	141
	250	x	200	Each	153	169
	300	x	150	Each	164	179
	300	x	200	Each	174	191
	300	x	250	Each	257	282
	350	x	200	Each	13	14
	350	x	250	Each	22	24
	350	x	300	Each	15	38
	400	x	250	Each	52	58
	400	x	300	Each	75	88
	400	x	350	Each	88	96
	450	x	350	Each	143	143
	450	x	400	Each	17	18
	500	x	350	Each	18	19
	500	x	400	Each	25	26
	500	x	450	Each	33	36
	600	x	400	Each	309	337
	600	x	450	Each	338	370
	600	x	500	Each	380	417
	700	x	500	Each	415	457
	700	x	600	Each	185	203
	750	x	600	Each	233	254
	750	x	700	Each	245	268
1.25	**Labour for laying in position following Cast Iron Collars**				**Medium Class**	**Heavy Class**
	80 mm		Dia	Each	12	12
	100 mm		Dia	Each	14	14
	125 mm		Dia	Each	18	19
	150 mm		Dia	Each	23	24
	200 mm		Dia	Each	32	34
	250 mm		Dia	Each	44	47
	300 mm		Dia	Each	58	60
	350 mm		Dia	Each	73	76
	400 mm		Dia	Each	87	93

S.No.	Items	Unit	Rates in Rs.			
	450 mm		Dia	Each	108	113
	500 mm		Dia	Each	128	135
	600 mm		Dia	Each	174	183
	700 mm		Dia	Each	228	240
	750 mm		Dia	Each	257	271
	800 mm		Dia	Each	289	305
	900 mm		Dia	Each	359	379
	1000 mm		Dia	Each	439	463
1.26	**Labour for laying in position following socketed Cast Iron caps.**					
	80 mm		Dia	Each		6
	100 mm		Dia	Each		8
	125 mm		Dia	Each		10
	150 mm		Dia	Each		13
	200 mm		Dia	Each		20
	250 mm		Dia	Each		29
	300 mm		Dia	Each		39
	350 mm		Dia	Each		52
	400 mm		Dia	Each		65
	450 mm		Dia	Each		82
	500 mm		Dia	Each		100
	600 mm		Dia	Each		145
	700 mm		Dia	Each		199
	750 mm		Dia	Each		230
	800mm		Dia	Each		266
	900mm		Dia	Each		343
	1000mm		Dia	Each		435
1.27	**Labour for laying in position following Cast Iron plugs.**				**Medium Class**	**Heavy Class**
	80 mm		Dia	Each	3	3
	100 mm		Dia	Each	3	3
	125 mm		Dia	Each	5	5
	150 mm		Dia	Each	8	8
	200 mm		Dia	Each	11	12
	250 mm		Dia	Each	17	19
	300 mm		Dia	Each	24	25

S.No.	Items	Unit	Rates in Rs.			
	350 mm		Dia	Each	32	35
	400 mm		Dia	Each	43	46
	450 mm		Dia	Each	55	58
	500 mm		Dia	Each	69	73
	600 mm		Dia	Each	102	108
	700 mm		Dia	Each	145	152
	750 mm		Dia	Each	170	179
	800 mm		Dia	Each	199	208
	900 mm		Dia	Each	260	272
	1000 mm		Dia	Each	334	348
1.28	**Labour for laying in position following 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.**				**Medium Class**	**Heavy Class**
	80 mm to 750 mm Dia			Kg	0.58	0.58

CHAPTER – II

CAST IRON TYTON PIPES WITH TYTON JOINTS

Chapter – II

CAST IRON TYTON PIPES WITH TYTON JOINTS (CLASS LA, A, B)

NOTES:

1. The C.I. pipe shall conform to IS -1536-1976

2. The C.I. fittings shall conform to IS -1538-1976 (Part I to XXIV).

3. The laying of C.I. pipes shall be done as per IS -3114:1985

4. The caulking lead shall conform to IS 782: 1978

5. All measurement shall be of the finished work.

6. Work shall be executed in accordance with the relevant Indian Standard Specifications (Updated) and all the conditions of the agreement of the work.

7. The rubber sealing rings for jointing of pipe line shall be conforming to IS 5382: 1985

SOCKET AND SPIGOT CAST IRON PIPES WITH TYTON JOINTS (CLASS LA, A, AND B)

S.No.	Items	Unit	Rates in Rs.		
2.1	**Providing, laying and jointing following Cast Iron tyton pipes with tyton joints including testing of joints, cost of pipes and jointing materials etc complete.**				
			LA Class	**A' Class**	**B' Class**
	80mm diameter	Meter	797.00	865.00	926.00
	100mm diameter	Meter	965.00	1067.00	1131.00
	125mm diameter	Meter	1219.00	1340.00	1431.00
	150mm diameter	Meter	1479.00	1628.00	1743.00
	200mm diameter	Meter	2158.00	2347.00	2527.00
	250mm diameter	Meter	2909.00	3167.00	3391.00
	300mm diameter	Meter	3746.00	4097.00	4429.00
	350mm diameter	Meter	4715.00	5116.00	5537.00
	400mm diameter	Meter	5742.00	6274.00	6762.00
	450mm diameter	Meter	6938.00	7621.00	8210.00
	500mm diameter	Meter	8202.00	8940.00	9659.00

S.No.	Items	Unit	Rates in Rs.		
	600mm diameter	Meter	10926.00	11926.00	12902.00
	700mm diameter	Meter	14102.00	15402.00	16621.00
	750mm diameter	Meter	15798.00	17263.00	18709.00
	800mm diameter	Meter	17683.00	19258.00	20810.00
	900mm diameter	Meter	21520.00	23463.00	25406.00
	1000mm diameter	Meter	25859.00	28227.00	30487.00
2.2	**Labour for laying in position following Cast Iron tyton pipes.**		**LA Class**	**A' Class**	**B' Class**
	80mm diameter	Meter	10.00	11.0	11.00
	100mm diameter	Meter	12.00	13.00	14.00
	125mm diameter	Meter	16.00	17.00	19.00
	150mm diameter	Meter	20.00	22.00	23.00
	200mm diameter	Meter	29.00	32.00	34.00
	250mm diameter	Meter	40.00	43.00	47.00
	300mm diameter	Meter	51.00	56.00	61.00
	350mm diameter	Meter	64.00	70.00	76.00
	400mm diameter	Meter	79.00	86.00	93.00
	450mm diameter	Meter	95.00	104.00	112.00
	500mm diameter	Meter	111.00	121.00	131.00
	600mm diameter	Meter	148.00	161.00	175.00
	700mm diameter	Meter	151.00	210.00	227.00
	750mm diameter	Meter	216.00	236.00	256.00
	800mm diameter	Meter	241.00	263.00	284.00
	900mm diameter	Meter	294.00	321.00	347.00
	1000mm diameter	Meter	353.00	386.00	417.00
2.3	**Providing tyton joints to following 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.).**				
	80mm diameter	Each		60.0	
	100mm diameter	Each		69.00	
	125mm	Each		81.00	
	150mm diameter	Each		109.00	
	200mm diameter	Each		145.00	
	250mm diameter	Each		197.00	
	300mm diameter	Each		233.00	
	350mm diameter	Each		260.00	
	400mm diameter	Each		321.00	
	450mm diameter	Each		357.00	

S.No.	Items	Unit	Rates in Rs.		
	500mm diameter	Each		442.00	
	600mm diameter	Each		525.00	
	700mm diameter	Each		688.00	
	750mm diameter	Each		784.00	
	800mm diameter	Each		870.00	
	900mm diameter	Each		961.00	
	1000mm diameter	Each		1186.00	
2.4	**Labour for providing tyton joints to following tyton pipes class 'LA' 'A' and 'B' including testing of joints but excluding cost of Rubber Gasket.**				
	80mm diameter	Each		38	
	100mm diameter	Each		43	
	125mm diameter	Each		50	
	150mm diameter	Each		72	
	200mm diameter	Each		87	
	250mm diameter	Each		116	
	300mm diameter	Each		123	
	350mm diameter	Each		130	
	400mm diameter	Each		152	
	450mm diameter	Each		159	
	500mm diameter	Each		181	
	600mm diameter	Each		188	
	700mm diameter	Each		210	
	750mm diameter	Each		231	
	800mm diameter	Each		239	
	900mm diameter	Each		260	
	1000mm diameter	Each		274	

CHAPTER – III

CAST IRON PIPES AND SPECIALS

WITH

FLANGED JOINTS

Chapter – III

CAST IRON PIPES AND SPECIALS WITH FLANGED JOINTS

(CLASS B)

NOTES:

1. The Horizontal C.I. double flanged pipe shall conform to IS -7181-1986

2. The C.I. fittings shall conform to IS -1538-1976 (Part I to XXIV).

3. The laying of C.I. pipes shall be done as per IS -3114:1985

4. All measurement shall be of the finished work.

5. Work shall be executed in accordance with the relevant Indian Standard Specifications (Updated) and all the conditions of the agreement of the work.

CAST IRON PIPES AND SPECIALS WITH FLANGED JOINTS (CLASS A, B)

S.No.	ITEMS	Unit	Rates in Rs.	
3.1	**Providing, fixing following double flanged Cast Iron (horizontal cast) pipe per IS : 7181 of *One Meter* length.**			
	80mm dia	Each	1242.00	
	100mm dia	Each	1499.00	
	125mm dia	Each	1995.00	
	150mm dia	Each	2293.00	
	200mm dia	Each	3281.00	
	250mm dia	Each	4411.00	
	300mm dia	Each	5657.00	
	350mm dia	Each	8059.00	
	400mm dia	Each	9841.00	
	450mm dia	Each	11912.00	
	500mm dia	Each	13985.00	
	600mm dia	Each	18798.00	
	700mm dia	Each	24496.00	
	750mm dia	Each	27789.00	
3.2	**Labour only for fixing following double flanged Cast Iron (horizontal cast) pipe per IS : 7181 of *One Meter* length.**			
	80mm dia	Each	26.00	
	100mm dia	Each	32.00	
	125mm dia	Each	41.00	
	150mm dia	Each	52.00	
	200mm dia	Each	74.00	

S.No.	ITEMS	Unit	Rates in Rs.	
	250mm dia	Each	99.00	
	300mm dia	Each	128.00	
	350mm dia	Each	161.00	
	400mm dia	Each	197.00	
	450mm dia	Each	235.00	
	500mm dia	Each	276.00	
	600mm dia	Each	371.00	
	700mm dia	Each	483.00	
	750mm dia	Each	548.00	
3.3	**Providing, fixing following double flanged Cast Iron (horizontal cast) pipe per IS : 7181 of *Two Meter* length.**			
	80mm dia	Each	2146.00	
	100mm dia	Each	2625.00	
	125mm dia	Each	3507.00	
	150mm dia	Each	4027.00	
	200mm dia	Each	5786.00	
	250mm dia	Each	7821.00	
	300mm dia	Each	10080.00	
	350mm dia	Each	147333.00	
	400mm dia	Each	17482.00	
	450mm dia	Each	21299.00	
	500mm dia	Each	24911.00	
	600mm dia	Each	33402.00	
	700mm dia	Each	43284.00	
	750mm dia	Each	48935.00	
3.4	**Labour only for fixing following double flanged Cast Iron (horizontal cast) pipe per IS : 7181 of *Two Meter* length.**			
	80mm dia	Each	30.00	
	100mm dia	Each	38.00	
	125mm dia	Each	49.00	
	150mm dia	Each	61.00	
	200mm dia	Each	88.00	
	250mm dia	Each	119.00	
	300mm dia	Each	154.00	
	350mm dia	Each	194.00	
	400mm dia	Each	236.00	
	450mm dia	Each	284.00	
	500mm dia	Each	332.00	
	600mm dia	Each	445.00	

S.No.	ITEMS	Unit	Rates in Rs.	
	700mm dia	Each	577.00	
	750mm dia	Each	652.00	
3.5	**Providing, fixing following double flanged Cast Iron (horizontal cast) pipe per IS : 7181 of *2.75 M* length.**			
	80mm dia	Each	2824.00	
	100mm dia	Each	3470.00	
	125mm dia	Each	4640.00	
	150mm dia	Each	5328.00	
	200mm dia	Each	7665.00	
	250mm dia	Each	10378.00	
	300mm dia	Each	13398.00	
	350mm dia	Each	19038.00	
	400mm dia	Each	23213.00	
	450mm dia	Each	28339.00	
	500mm dia	Each	33105.00	
	600mm dia	Each	44355.00	
	700mm dia	Each	57375.00	
	750mm dia	Each	64795.00	
3.6	**Labour only for fixing following double flanged Cast Iron (horizontal cast) pipe per IS : 7181 of *2.75 Meter* length.**			
	80mm dia	Each	58.00	
	100mm dia	Each	74.00	
	125mm dia	Each	96.00	
	150mm dia	Each	120.00	
	200mm dia	Each	173.00	
	250mm dia	Each	234.00	
	300mm dia	Each	302.00	
	350mm dia	Each	381.00	
	400mm dia	Each	464.00	
	450mm dia	Each	559.00	
	500mm dia	Each	653.00	
	600mm dia	Each	875.00	
	700mm dia	Each	1132.00	
	750mm dia	Each	1278.00	
3.7	**Providing flanged joints to following 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)**			

S.No.	ITEMS	Unit	Rates in Rs.	
	including testing of joint etc. complete			
	80mm dia	Each	59	
	100mm dia	Each	102	
	125mm dia	Each	107	
	150mm dia	Each	164	
	200mm dia	Each	171	
	250mm dia	Each	242	
	300mm dia	Each	258	
	350mm dia	Each	333	
	400mm dia	Each	420	
	450mm dia	Each	534	
	500mm dia	Each	656	
	600mm dia	Each	947	
	700mm dia	Each	1134	
	750mm dia	Each	1228	
	800mm dia	Each	1689	
	900mm dia	Each	1940	
	1000mm dia	Each	2560	
3.8	**Labour for Providing Flanged joint to following 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 dia	Each	17	
	100mm dia	Each	22	
	125mm dia	Each	26	
	150mm dia	Each	30	
	200mm dia	Each	35	
	250mm dia	Each	39	
	300mm dia	Each	43	
	350mm dia	Each	48	
	400mm dia	Each	52	
	450mm dia	Each	56	
	500mm dia	Each	61	
	600mm dia	Each	65	
	700mm dia	Each	70	
	750mm dia	Each	74	
	800mm dia	Each	78	
	900mm dia	Each	83	
	1000mm dia	Each	87	

S.No.	ITEMS	Unit	Rates in Rs.	
3.9	**Labour only for providing flanged joints to following double flanged horizontally Cast Iron pipes and specials in vertical or inclined direction including testing of joints but excluding cost or jointing materials (i.e. bolts, nuts and rubber insertion sheet)**			
	80mm to 750mm dia in truly vertical position	200% above the rates provided vide item No.3.2, 3.4 & 3.6		
	In inclined position at inclination 45% & above	100% above rates provided vide item No. 3.2, 3.4 & 3.6		
	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 following Cast Iron flanged sockets (all sizes in mm) confirming to IS 1538**		**Medium Class**	**Heavy Class**
	80mm dia	Each	823.00	710.00
	100mm dia	Each	1013.00	873.00
	125mm dia	Each	1267.00	-
	150mm dia	Each	1647.00	1419.00
	200mm dia	Each	1710.00	2020.00
	250mm dia	Each	3926.00	3384.00
	300mm dia	Each	5003.00	4312.00
	350mm dia	Each	5984.00	5984.00
	400mm dia	Each	7360.00	7360.00
	450mm dia	Each	8497.00	8497.00
	500mm dia	Each	10353.00	10353.00
	600mm dia	Each	14003.00	14003.00
	700mm dia	Each	18311.00	18311.00
	750mm dia	Each	20765.00	20765.00
	800mm dia	Each	23398.00	23398.00
	900mm dia	Each	28484.00	28484.00
	1000mm dia	Each	34708.00	34708.00
3.11	**Providing and laying in position following Cast Iron flanged spigot (tail piece)**			
	80mm dia	Each	79.00	118.00
	100mm dia	Each	84.00	128.00
	125mm dia	Each	-	-
	150mm dia	Each	103.00	172.00
	200mm dia	Each	137.00	251.00

S.No.	ITEMS	Unit	Rates in Rs.	
	250mm dia	Each	166.00	320.00
	300mm dia	Each	197.00	393.00
	350mm dia	Each	240.00	456.00
	400mm dia	Each	280.00	546.00
	450mm dia	Each	321.00	636.00
	500mm dia	Each	373.00	744.00
	600mm dia	Each	547.00	1128.00
	700mm dia	Each	694.00	1449.00
	750mm dia	Each	780.00	1634.00
	800mm dia	Each	871.00	1828.00
	900mm dia	Each	1046.00	2206.00
	1000mm dia	Each	1257.00	2665.00
3.12	**Providing and laying in position following Cast Iron double flanged 90° bends (all sizes in mm)**		**Medium Class**	**Heavy Class**
	80mm dia	Each	-	724
	100mm dia	Each	892	947
	125mm dia	Each	1170	1282
	150mm dia	Each	1616	1727
	200mm dia	Each	2508	2731
	250mm dia	Each	3622	4012
	300mm dia	Each	5015	5573
	350mm dia	Each	7375	8214
	400mm dia	Each	9713	10852
	450mm dia	Each	12051	13550
	500mm dia	Each	15469	17387
	600mm dia	Each	23503	26500
	700mm dia	Each	33935	38312
	750mm dia	Each	40050	45266
	800mm dia	Each	47185	53360
	900mm dia	Each	62174	70688
	1000mm dia	Each	81600	92571
3.13	**Providing and laying in position following Cast Iron double flanged 45° bends (all sizes in mm)**			
	80mm dia	Each	-	
	100mm dia	Each	962.00	
	125mm dia	Each	1302.00	
	150mm dia	Each	1755.00	
	200mm dia	Each	2773.00	
	250mm dia	Each	4075.00	
	300mm dia	Each	5660.00	
	350mm dia	Each	6481.00	

S.No.	ITEMS	Unit	Rates in Rs.	
	400mm dia	Each	8413.00	
	450mm dia	Each	10344.00	
	500mm dia	Each	12962.00	
	600mm dia	Each	19069.00	
	700mm dia	Each	27045.00	
	750mm dia	Each	31844.00	
3.14	**Providing and laying in position following Cast Iron double flanged 90° Duck Foot Bend**		**Medium Class**	**Heavy Class**
	80mm dia	Each	1378	1378
	100mm dia	Each	1640	1706
	125mm dia	Each	2231	2362
	150mm dia	Each	2953	3084
	200mm dia	Each	4593	4856
	250mm dia	Each	6824	7283
	300mm dia	Each	9580	10236
	350mm dia	Each	11968	12806
	400mm dia	Each	15678	16815
	450mm dia	Each	19448	20944
	500mm dia	Each	24774	26689
	600mm dia	Each	37520	40513
3.15	**Providing and laying in position following Cast Iron all flanged Tees (all sizes in mm) Body x Branch**		**Medium Class**	**Heavy Class**
	80x80	Each	1198	1258
	100x80	Each	1378	1497
	100x100	Each	1438	1557
	125x80	Each	1737	1917
	125x100	Each	1917	2037
	125x125	Each	1977	2156
	150x80	Each	2276	2456
	150x100	Each	2336	2516
	150x125	Each	2456	2695
	150x150	Each	2576	2815
	200x80	Each	3354	3714
	200x100	Each	3414	3774
	200x125	Each	3594	3953
	200x150	Each	3714	4073
	200x200	Each	4013	4432
	250x80	Each	4792	5331
	250x100	Each	4852	5391
	250x125	Each	5031	5571
	250x150	Each	5211	5750

S.No.	ITEMS	Unit	Rates in Rs.	
	250x200	Each	5511	6110
	250x250	Each	5930	6529
	300x80	Each	6529	7308
	300x100	Each	6649	7427
	300x125	Each	6769	7547
	300x150	Each	6948	7727
	300x200	Each	7308	8146
	300x250	Each	7727	8565
	300x300	Each	8146	9045
	350x200	Each	9105	10123
	350x250	Each	9344	10362
	350x300	Each	10183	11261
	350x350	Each	10482	11680
	400x200	Each	11321	12639
	400x250	Each	11560	12878
	400x300	Each	12459	13896
	400x350	Each	12818	14316
	400x400	Each	13238	14735
	450x250	Each	13896	15574
	450x300	Each	14795	16592
	450x350	Each	15154	17011
	450x400	Each	15514	17371
	450x450	Each	15873	17730
	500x250	Each	16831	18868
	500x300	Each	17850	20006
	500x350	Each	18269	20485
	500x400	Each	18688	20905
	500x450	Each	19048	21324
	500x500	Each	19467	21743
	600x300	Each	24798	27913
	600x350	Each	25397	28452
	600x400	Each	25876	29051
	600x450	Each	26236	29470
	600x500	Each	26655	29889
	600x600	Each	27613	30908
	700x350	Each	34142	38455
	700x400	Each	34621	38994
	700x450	Each	35160	39533
	700x500	Each	35640	40072
	700x600	Each	36598	41090
	700x700	Each	37856	42348
	750x400	Each	39653	44684
	750x450	Each	40132	45163

S.No.	ITEMS	Unit	Rates in Rs.	
	750x500	Each	40791	45882
	750x600	Each	41570	46661
	750x700	Each	42348	47440
	750x750	Each	43127	48218
	800x400	Each	45948	51736
	800x450	Each	46430	52279
	800x500	Each	46973	52882
	800x600	Each	48118	54088
	800x700	Each	49264	55234
	800x750	Each	49927	55957
	800x800	Each	50711	56741
	900x450	Each	58248	65786
	900x500	Each	59093	66690
	900x600	Each	60299	68017
	900x700	Each	61505	69283
	900x750	Each	62228	70007
	900x800	Each	62952	70730
	900x900	Each	63977	71755
3.16	**Providing and laying in position following Cast Iron double flanged Tapers (all size in mm)**			
	Body x Branch		**Medium Class**	**Heavy Class**
	100x80	Each	760	765
	125x80	Each	1140	1267
	x100	Each	1267	1393
	150x80	Each	1330	1457
	x100	Each	1457	1583
	x125	Each	1583	1710
	200x100	Each	1837	1963
	x125	Each	1963	2153
	x150	Each	2153	2343
	250x125	Each	2406	2596
	x150	Each	2533	2786
	x200	Each	2913	3166
	300x150	Each	2976	3230
	x200	Each	3356	3673
	x250	Each	3800	4116
	350x200	Each	5003	5510
	x250	Each	5510	6080
	x300	Each	6080	6343
	400x250	Each	5864	6523
	x300	Each	6463	7181

S.No.	ITEMS	Unit	Rates in Rs.	
	x350	Each	7121	7899
	450x300	Each	7001	7779
	x350	Each	7839	8677
	x400	Each	8557	9455
	500x350	Each	8617	9575
	x400	Each	9395	10412
	x450	Each	10053	11130
	600x400	Each	11370	12567
	x450	Each	11968	13285
	x500	Each	12926	14302
	700x500	Each	15200	16815
	x600	Each	17174	18970
	750x600	Each	18311	20226
	x700	Each	20585	22740
	800x600	Each	19987	22022
	x700	Each	22261	24535
	x750	Each	23218	25612
	900x700	Each	24834	27407
	x750	Each	25911	28604
	X800	Each	27587	30399
	1000x800	Each	30998	34110
	x900	Each	33511	36922
3.17	**Providing and laying in position following all flanged Cast Iron crosses (all sizes in mm)**			
	80mm dia	Each	1576.00	
	100mm dia	Each	2018.00	
	125mm dia	Each	2648.00	
	150mm dia	Each	3468.00	
	200mm dia	Each	5360.00	
	250mm dia	Each	7756.00	
	300mm dia	Each	10594.00	
3.18	**Providing and laying in position following all flanged Cast Iron blank flanges (all sizes in mm)**			
	80mm dia	Each		-
	100mm dia	Each		341.00
	125mm dia	Each		455.00
	150mm dia	Each		626.00
	200mm dia	Each		910.00
	250mm dia	Each		1308.00
	300mm dia	Each		1820.00
	350mm dia	Each		2691.00

S.No.	ITEMS	Unit	Rates in Rs.	
	400mm dia	Each		3442.00
	450mm dia	Each		4193.00
	500mm dia	Each		5320.00
	600mm dia	Each		7886.00
	700mm dia	Each		11078.00
	750mm dia	Each		12955.00
	800mm dia	Each		15333.00
	900mm dia	Each		19589.00
	1000mm dia	Each		25410.00
3.19	**Labour for laying in position following Cast Iron flanged sockets (all sizes in mm)**			
			Medium Class	**Heavy Class**
	80mm dia	Each	9.00	10.00
	100mm dia	Each	11.00	12.00
	125mm dia	Each	14.00	16.00
	150mm dia	Each	18.00	19.00
	200mm dia	Each	30.00	33.00
	250mm dia	Each	40.00	45.00
	300mm dia	Each	51.00	58.00
	350mm dia	Each	64.00	72.00
	400mm dia	Each	78.00	88.00
	450mm dia	Each	92.00	104.00
	500mm dia	Each	110.00	124.00
	600mm dia	Each	170.00	192.00
	700mm dia	Each	221.00	250.00
	750mm dia	Each	250.00	283.00
	800mm dia	Each	282.00	318.00
	900mm dia	Each	342.00	385.00
	1000mm dia	Each	415.00	468.00
3.20	**Labour for laying in position following Cast Iron flanged Spigot (all sizes in mm)**		**Medium Class**	**Heavy Class**
	80mm dia	Each	9.00	10.00
	100mm dia	Each	11.00	12.00
	125mm dia	Each	14.00	16.00
	150mm dia	Each	18.00	19.00
	200mm dia	Each	30.00	33.00
	250mm dia	Each	40.00	45.00
	300mm dia	Each	51.00	58.00
	350mm dia	Each	64.00	72.00
	400mm dia	Each	78.00	88.00
	450mm dia	Each	92.00	104.00

S.No.	ITEMS	Unit	Rates in Rs.	
	500mm dia	Each	110.00	124.00
	600mm dia	Each	170.00	192.00
	700mm dia	Each	221.00	250.00
	750mm dia	Each	250.00	283.00
	800mm dia	Each	282.00	318.00
	900mm dia	Each	342.00	385.00
	1000mm dia	Each	415.00	468.00
3.21	**Labour for laying in position following Cast Iron double flanged 90° Bend (all sizes in mm)**		**Medium Class**	**Heavy class**
	80mm dia	Each		11.00
	100mm dia	Each	14.00	14.00
	125mm dia	Each	18.00	19.00
	150mm dia	Each	25.00	26.00
	200mm dia	Each	38.00	41.00
	250mm dia	Each	56.00	61.00
	300mm dia	Each	76.00	84.00
	350mm dia	Each	104.00	116.00
	400mm dia	Each	137.00	153.00
	450mm dia	Each	170.00	191.00
	500mm dia	Each	219.00	246.00
	600mm dia	Each	332.00	374.00
	700mm dia	Each	479.00	541.00
	750mm dia	Each	566.00	639.00
	800mm dia	Each	667.00	754.00
	900mm dia	Each	878.00	999.00
	1000mm dia	Each	1153.00	1308.00
3.22	**Labour for laying in position following Cast Iron double flanged 45° bend (all sizes in mm)**			
	80mm dia	Each		-
	100mm dia	Each		10.00
	125mm dia	Each		13.00
	150mm dia	Each		18.00
	200mm dia	Each		28.00
	250mm dia	Each		42.00
	300mm dia	Each		58.00
	350mm dia	Each		60.00
	400mm dia	Each		78.00
	450mm dia	Each		96.00
	500mm dia	Each		120.00
	600mm dia	Each		177.00
	700mm dia	Each		251.00

S.No.	ITEMS	Unit	Rates in Rs.	
	750mm dia	Each		295.00
3.23	**Labour for laying in position following Cast Iron double flanged 90° duck foot bend. (all sizes in mm)**		**Medium Class**	**Heavy Class**
	80mm dia	Each	12.00	18.00
	100mm dia	Each	14.00	22.00
	125mm dia	Each	20.00	30.00
	150mm dia	Each	26.00	40.00
	200mm dia	Each	40.00	63.00
	250mm dia	Each	60.00	94.00
	300mm dia	Each	84.00	132.00
	350mm dia	Each	115.00	181.00
	400mm dia	Each	151.00	238.00
	450mm dia	Each	188.00	296.00
	500mm dia	Each	239.00	378.00
	600mm dia	Each	362.00	573.00
3.24	**Labour for laying in position following Cast Iron all flanged tees (all sizes in mm)**		**Medium Class**	**Heavy Class**
	Body x Branch			
	80x80	Each	16.94	17.79
	100x80	Each	19.481	21.18
	100x100	Each	20.328	22.02
	125x80	Each	24.563	27.10
	125x100	Each	27.104	28.80
	125x125	Each	27.951	30.49
	150x80	Each	32.186	34.73
	150x100	Each	33.033	35.57
	150x125	Each	34.727	38.12
	150x150	Each	36.421	39.81
	200x80	Each	47.432	52.51
	200x100	Each	48.279	53.36
	200x125	Each	50.82	55.90
	200x150	Each	52.514	57.60
	200x200	Each	56.749	62.68
	250x80	Each	67.76	75.38
	250x100	Each	68.607	76.23
	250x125	Each	71.148	78.77
	250x150	Each	73.689	81.31
	250x200	Each	77.924	86.39
	250x250	Each	83.853	92.32
	300x80	Each	92.323	103.33

S.No.	ITEMS	Unit	Rates in Rs.	
	300x100	Each	94.017	105.03
	300x125	Each	95.711	106.72
	300x150	Each	98.252	109.26
	300x200	Each	103.334	115.19
	300x250	Each	109.263	121.12
	300x300	Each	115.192	127.90
	350x200	Each	128.744	143.14
	350x250	Each	132.132	146.53
	350x300	Each	143.99	159.24
	350x350	Each	148.225	165.17
	400x200	Each	160.083	178.72
	400x250	Each	163.471	182.11
	400x300	Each	176.176	196.50
	400x350	Each	181.258	202.43
	400x400	Each	187.187	208.36
	450x250	Each	196.504	220.22
	450x300	Each	209.209	234.62
	450x350	Each	214.291	240.55
	450x400	Each	219.373	245.63
	450x450	Each	224.455	250.71
	500x250	Each	238.007	266.81
	500x300	Each	252.406	282.90
	500x350	Each	258.335	289.67
	500x400	Each	264.264	295.60
	500x450	Each	269.346	301.53
	500x500	Each	275.275	307.46
	600x300	Each	350.658	394.70
	600x350	Each	359.128	402.33
	600x400	Each	365.904	410.80
	600x450	Each	370.986	416.72
	600x500	Each	376.915	422.65
	600x600	Each	390.467	437.05
	700x350	Each	482.79	543.77
	700x400	Each	489.566	551.40
	700x450	Each	497.189	559.02
	700x500	Each	503.965	566.64
	700x600	Each	517.517	581.04
	700x700	Each	535.304	598.83
	750x400	Each	560.714	631.86
	750x450	Each	567.49	638.64
	750x500	Each	576.807	648.80
	750X600	Each	587.818	659.81
	750x700	Each	598.829	670.82

S.No.	ITEMS	Unit	Rates in Rs.	
	750x750	Each	609.84	681.84
	800x400	Each	645.414	726.73
	800x450	Each	652.19	734.35
	800x500	Each	659.813	742.82
	800x600	Each	675.906	759.76
	800x700	Each	691.999	775.85
	800x750	Each	701.316	786.02
	800x800	Each	712.327	797.03
	900x450	Each	818.202	924.08
	900x500	Each	830.06	936.78
	900x600	Each	847	955.42
	900x700	Each	863.94	973.20
	900x750	Each	874.104	983.37
	900x800	Each	884.268	993.53
	900x900	Each	898.667	1007.93
3.25	**Labour for laying in position following Cast Iron double flanged Tapers (all sizes in mm)**		**Medium Class**	**Heavy Class**
	Body x Branch			
	100x80	Each	10.16	10.16
	125x80	Each	15.25	16.94
	125x100	Each	16.94	18.63
	150x80	Each	17.79	19.48
	150x100	Each	19.48	21.18
	150x125	Each	21.18	22.87
	200x100	Each	24.56	26.26
	200x125	Each	26.26	28.80
	200x150	Each	28.80	31.34
	250x125	Each	32.19	34.73
	250x150	Each	33.88	37.27
	250x200	Each	38.96	42.35
	300x150	Each	39.81	43.20
	300x200	Each	44.89	49.13
	300x250	Each	50.82	55.06
	350x200	Each	66.91	73.69
	350x250	Each	73.69	81.31
	350x300	Each	81.31	89.78
	400x250	Each	83.01	92.32
	400x300	Each	91.48	101.64
	400x350	Each	100.79	111.80
	450x300	Each	99.10	110.11
	450x350	Each	110.96	122.82

S.No.	ITEMS	Unit	Rates in Rs.	
	450x400	Each	121.12	133.83
	500x350	Each	121.97	135.52
	500x400	Each	132.98	147.38
	500x450	Each	142.30	157.54
	600x400	Each	160.93	177.87
	600x450	Each	169.40	188.03
	600x500	Each	182.95	202.43
	700x500	Each	215.14	238.01
	700x600	Each	243.09	268.50
	750x600	Each	259.18	286.29
	750x700	Each	291.37	321.86
	800x600	Each	282.90	311.70
	800x700	Each	315.08	347.27
	800x750	Each	328.64	362.52
	900x700	Each	351.51	387.93
	900x750	Each	366.75	404.87
	900x800	Each	390.47	430.28
	1000x800	Each	438.75	482.79
	1000x900	Each	474.00	522.60
3.26	**Labour for laying in position following all flanged Cast Iron crosses (all sizes in mm)**			
	80mm dia	Each	15.00	25.00
	100mm dia	Each	19.00	33.00
	125mm dia	Each	26.00	44.00
	150mm dia	Each	33.00	57.00
	200mm dia	Each	51.00	86.00
	250mm dia	Each	71.00	123.00
	300mm dia	Each	97.00	167.00
3.27	**Labour for laying in position following Cast Iron blank flanges (all sizes in mm)**			
	80mm dia	Each		-
	100mm dia	Each		5.00
	125mm dia	Each		7.00
	150mm dia	Each		9.00
	200mm dia	Each		14.00
	250mm dia	Each		19.00
	300mm dia	Each		27.00
	350mm dia	Each		36.00
	400mm dia	Each		47.00

S.No.	ITEMS	Unit	Rates in Rs.	
	450mm dia	Each		57.00
	500mm dia	Each		72.00
	600mm dia	Each		107.00
	700mm dia	Each		150.00
	750mm dia	Each		175.00
	800mm dia	Each		208.00
	900mm dia	Each		265.00
	1000mm dia	Each		344.00
3.28	**Providing and laying in position following 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	45	45
	Above 300mm Dia	Kg	50	50
3.29	**Labour for laying in position following sizes of flanges, Cast Iron standard specials which does not appear in above items of the schedule**			
	80mm to 750mm	Kg	0.847	0.847
3.30	**Labour for laying in position following double flanged Cast Iron (horizontal cast) pipe per IS : 7181 of *One Meter* length.**			
	80mm dia	mtr.		23.00
	100mm dia	mtr.		29.00
	125mm dia	mtr.		37.00
	150mm dia	mtr.		47.00
	200mm dia	mtr.		67.00
	250mm dia	mtr.		89.00
	300mm dia	mtr.		115.00
	350mm dia	mtr.		145.00
	400mm dia	mtr.		177.00
	450mm dia	mtr.		212.00
	500mm dia	mtr.		249.00
	600mm dia	mtr.		334.00
	700mm dia	mtr.		435.00
	750mm dia	mtr.		494.00
3.31	**Labour for laying in position following double flanged Cast Iron (horizontal cast) pipe per IS : 7181 of *Two Meter* length.**			
	80mm dia	mtr.		40.00

S.No.	ITEMS	Unit	Rates in Rs.	
	100mm dia	mtr.		50.00
	125mm dia	mtr.		65.00
	150mm dia	mtr.		82.00
	200mm dia	mtr.		118.00
	250mm dia	mtr.		159.00
	300mm dia	mtr.		205.00
	350mm dia	mtr.		258.00
	400mm dia	mtr.		315.00
	450mm dia	mtr.		379.00
	500mm dia	mtr.		443.00
	600mm dia	mtr.		594.00
	700mm dia	mtr.		769..00
	750mm dia	mtr.		870.00
3.32	**Labour for laying in position following double flanged Cast Iron (horizontal cast) pipe per IS : 7181 of *2.75m* length.**			
	80mm dia	mtr.		52.00
	100mm dia	mtr.		66.00
	125mm dia	mtr.		86.00
	150mm dia	mtr.		108.00
	200mm dia	mtr.		156.00
	250mm dia	mtr.		211.00
	300mm dia	mtr.		272.00
	350mm dia	mtr.		343.00
	400mm dia	mtr.		418.00
	450mm dia	mtr.		504.00
	500mm dia	mtr.		588.00
	600mm dia	mtr.		788.00
	700mm dia	mtr.		1020.00
	750mm dia	mtr.		1152.00
3.33	Labour only for laying following Horizontal Cast Iron Pipes in inclined or vertical position			
	80mm to 750mm dia			
	In truly vertical position 200% above rates provided vide item No. 3.30, 3.31, 3.32 In inclined position at inclination 45% & above 100% above rates provided vide item No. 3.30, 3.31, 3.32 In inclined position at inclination less than 45% Same as rates provided vide item No. 3.30, 3.31, 3.32			

CHAPTER – IV

DUCTILE IRON PRESSURE PIPES AND SPECIALS WITH (TYTON JOINTS)

Chapter – IV

DUCTILE IRON PRESSURE PIPES AND SPECIALS WITH (TYTON JOINTS)

NOTES:

1. The Centrifugally cast (Spun D.I. pipe) shall be conforming to IS - 8329:1977.
2. The D.I. fittings for pressure pipes shall be confirming to IS - 9523:1980
3. Cement Mortar lining in the pipe shall be done as per IS - 11906:1986
4. The laying of D.I. pipe shall be confirming to IS - 12288:1987
5. Rubber sealing rings shall be confirming to IS - 5382:1985
6. All measurement shall be of the finished work.
7. Work shall be executed in accordance with the Indian Standard Specifications and special notes if any, covered in the agreement of the work.

DUCTILE IRON PRESSURE PIPES AND SPECIALS WITH (TYTON JOINTS)

S. No.	Items	Unit	Rates in Rs.
4.1	**Providing, laying and jointing following 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**		
	100mm diameter	Meter	962.00
	150mm diameter	Meter	1422.00
	200mm diameter	Meter	1808.00
	250mm diameter	Meter	2343.00
	300mm diameter	Meter	2952.00
	350mm diameter	Meter	3694.00
	400mm diameter	Meter	4410.00
	450mm diameter	Meter	5237.00
	500mm diameter	Meter	5971.00
	600mm diameter	Meter	8015.00
	700mm diameter	Meter	10445.00
	750mm diameter	Meter	12881.00
	800mm diameter	Meter	13821.00
	900mm diameter	Meter	17299.00
	1000mm diameter	Meter	20464.00
4.2	**Labour for laying in position following socket & spigot Ductile Iron(k-7) pressure pipes**		
	100mm diameter	Meter	14.00
	150mm diameter	Meter	21.00

S. No.	Items	Unit	Rates in Rs.
	200mm diameter	Meter	28.00
	250mm diameter	Meter	38.00
	300mm diameter	Meter	47.00
	350mm diameter	Meter	59.00
	400mm diameter	Meter	70.00
	450mm diameter	Meter	83.00
	500mm diameter	Meter	97.00
	600mm diameter	Meter	131.00
	700mm diameter	Meter	177.00
	750mm diameter	Meter	205.00
	800mm diameter	Meter	234.00
	900mm diameter	Meter	284.00
	1000mm diameter	Meter	338.00
4.3	**Providing, laying and jointing following 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**		
	100mm diameter	Meter	1060.00
	150mm diameter	Meter	1571.00
	200mm diameter	Meter	2097.00
	250mm diameter	Meter	2779.00
	300mm diameter	Meter	3518.00
	350mm diameter	Meter	4385.00
	400mm diameter	Meter	5299.00
	450mm diameter	Meter	6275.00
	500mm diameter	Meter	7217.00
	600mm diameter	Meter	9353.00
	700mm diameter	Meter	11594.00
	750mm diameter	Meter	13047.00
	800mm diameter	Meter	14201.00
	900mm diameter	Meter	17615.00
	1000mm diameter	Meter	20965.00
4.4	**Labour for laying in position following socket & spigot Ductile Iron (k-9) pressure pipes**		
	100mm diameter	Meter	17.00
	150mm diameter	Meter	25.00
	200mm diameter	Meter	35.00

S. No.	Items	Unit	Rates in Rs.
	250mm diameter	Meter	47.00
	300mm diameter	Meter	60.00
	350mm diameter	Meter	74.00
	400mm diameter	Meter	88.00
	450mm diameter	Meter	104.00
	500mm diameter	Meter	122.00
	600mm diameter	Meter	165.00
	700mm diameter	Meter	209.00
	750mm diameter	Meter	235.00
	800mm diameter	Meter	260.00
	900mm diameter	Meter	316.00
	1000mm diameter	Meter	376.00
4.5	**Providing Rubber ISI marked Gasket (push on) joint as per IS-5382/85 to following DI pipes class k-7 and k-9 including testing of joints and cost of jointing materials (Rubber Gasket and soap solution etc.)**		
	100mm diameter	Each	57.00
	125mm diameter	Each	67.00
	150mm diameter	Each	89.00
	200mm diameter	Each	115.00
	250mm diameter	Each	155.00
	300mm diameter	Each	196.00
	350mm diameter	Each	222.00
	400mm diameter	Each	288.00
	450mm diameter	Each	314.00
	500mm diameter	Each	396.00
	600mm diameter	Each	481.00
	700mm diameter	Each	647.00
	750mm diameter	Each	740.00
	800mm diameter	Each	827.00
	900mm diameter	Each	916.00
	1000mm diameter	Each	1144.00

S. No.	Items	Unit	Rates in Rs.
4.6	**Labour for providing Rubber Gasket (push on) joints to following D.I. Pipes class K8 & K9 including joints but excluding cost of Rubber Gasket.**		
	100mm diameter	Each	43.00
	125mm diameter	Each	51.00
	150mm diameter	Each	72.00
	200mm diameter	Each	80.00
	250mm diameter	Each	101.00
	300mm diameter	Each	116.00
	350mm diameter	Each	124.00
	400mm diameter	Each	145.00
	450mm diameter	Each	153.00
	500mm diameter	Each	174.00
	600mm diameter	Each	182.00
	700mm diameter	Each	207.00
	750mm diameter	Each	225.00
	800mm diameter	Each	233.00
	900mm diameter	Each	254.00
	1000mm diameter	Each	276.00
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 following nominal diameter/sizes with external bitumen coating and internal cement mortar lining with finishing as per clause 13 of IS-9523/2000.**		
	80mm	Each	797.00
	100mm	Each	897.00
	150mm	Each	1395.00
	200mm	Each	2088.00
	250mm	Each	2794.00
	300mm	Each	3827.00
	350mm	Each	4997.00
	400mm	Each	6138.00
	450mm	Each	6895.00
	500mm	Each	8791.00
	600mm	Each	12797.00

S. No.	Items	Unit	Rates in Rs.
	700mm	Each	26393.00
	750mm	Each	33758.00
	800mm	Each	33712.00
	900mm	Each	42524.00
	1000mm	Each	54692.00
4.8	**Labour 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 following nominal diameter/sizes with external bitumen coating and internal cement mortar lining with finishing as per clause 13 of IS-9523/2000.**		
	80mm	Each	9.00
	100mm	Each	10.00
	150mm	Each	16.00
	200mm	Each	23.00
	250mm	Each	31.00
	300mm	Each	43.00
	350mm	Each	50.00
	400mm	Each	63.00
	450mm	Each	76.00
	500mm	Each	100.00
	600mm	Each	143.00
	700mm	Each	212.00
	750mm	Each	274.00
	800mm	Each	274.00
	900mm	Each	346.00
	1000mm	Each	433.00
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 following nominal diameter/sizes with external bitumen coating and internal cement mortar lining with finishing as per clause 13 of IS-9523/2000.**		
	80mm	Each	816.00
	100mm	Each	1000.00
	150mm	Each	1694.00
	200mm	Each	2304.00

S. No.	Items	Unit	Rates in Rs.
	250mm	Each	3426.00
	300mm	Each	4569.00
	350mm	Each	6479.00
	400mm	Each	7408.00
	450mm	Each	9430.00
	500mm	Each	10582.00
	600mm	Each	18936.00
	700mm	Each	34912.00
	750mm	Each	38634.00
	800mm	Each	40461.00
	900mm	Each	51708.00
	1000mm	Each	62699.00
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 following nominal diameter/sizes with external bitumen coating and internal cement mortar lining with finishing as per clause 13 of IS-9523/2000.**		
	80mm	Each	9.00
	100mm	Each	13.00
	150mm	Each	20.00
	200mm	Each	30.00
	250mm	Each	42.00
	300mm	Each	56.00
	350mm	Each	66.00
	400mm	Each	82.00
	450mm	Each	96.00
	500mm	Each	136.00
	600mm	Each	185.00
	700mm	Each	283.00
	750mm	Each	305.00
	800mm	Each	330.00
	900mm	Each	422.00
	1000mm	Each	495.00

S. No.	Items	Unit	Rates in Rs.
4.11	**Providing and 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 following nominal diameter/sizes with external bitumen and internal cement mortar lining.**		
	80mm	Each	1952.00
	100mm	Each	2222.00
	150mm	Each	3462.00
	200mm	Each	4534.00
	250mm	Each	6325.00
	300mm	Each	8240.00
	350mm	Each	11546.00
	400mm	Each	13097.00
	450mm	Each	15163.00
	500mm	Each	20342.00
	600mm	Each	25741.00
	700mm	Each	29588.00
	750mm	Each	32275.00
	800mm	Each	36888.00
	900mm	Each	46204.00
	1000mm	Each	62041.00
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 following nominal diameter/sizes with internal cement mortar lining.**		
	80mm	Each	21.00
	100mm	Each	24.00
	150mm	Each	40.00
	200mm	Each	57.00
	250mm	Each	64.00
	300mm	Each	80.00
	350mm	Each	100.00
	400mm	Each	125.00
	450mm	Each	146.00
	500mm	Each	175.00
	600mm	Each	233.00

S. No.	Items	Unit	Rates in Rs.
	700mm	Each	262.00
	750mm	Each	298.00
	800mm	Each	331.00
	900mm	Each	408.00
	1000mm	Each	567.00
4.13	**Providing and 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.**		
	80mm	Each	874.00
	100mm	Each	1068.00
	125mm	Each	1440.00
	150 mm	Each	1942.00
	200mm	Each	3107.00
	250mm	Each	4526.00
	300mm	Each	6537.00
	350mm	Each	9704.00
	400mm	Each	12524.00
	450mm	Each	16471.00
	500mm	Each	21607.00
	600mm	Each	33537.00
	700mm	Each	52216.00
	750mm	Each	60326.00
	800mm	Each	72482.00
	900mm	Each	95929.00
	1000mm	Each	166451.00
4.14	**Labour only 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 following nominal diameter/sizes with external bitumen coating and internal cement mortar lining.**		
	80mm	Each	10.00
	100mm	Each	13.00
	125mm	Each	17.00
	150 mm	Each	23.00

S. No.	Items	Unit	Rates in Rs.
	200mm	Each	37.00
	250mm	Each	56.00
	300mm	Each	79.00
	350mm	Each	105.00
	400mm	Each	134.00
	450mm	Each	175.00
	500mm	Each	216.00
	600mm	Each	327.00
	700mm	Each	478.00
	750mm	Each	577.00
	800mm	Each	652.00
	900mm	Each	856.00
	1000mm	Each	1165.00
4.15	**Providing and Laying Ductile Iron Double Socket 45° Bends conforming to IS-9523/2000 having dimension as per table 16 of IS-9523/2000 in the following nominal diameter/sizes with external bitumen coating and internal cement mortar lining.**		
	80mm	Each	777.00
	100mm	Each	971.00
	125mm	Each	1262.00
	150 mm	Each	1553.00
	200mm	Each	2526.00
	250mm	Each	3519.00
	300mm	Each	4926.00
	350mm	Each	7219.00
	400mm	Each	9029.00
	450mm	Each	11959.00
	500mm	Each	15285.00
	600mm	Each	23631.00
	700mm	Each	36050.00
	750mm	Each	40842.00
	800mm	Each	49418.00
	900mm	Each	64402.00
	1000mm	Each	112092.00

S. No.	Items	Unit	Rates in Rs.
4.16	**Labour only 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 following nominal diameter/sizes with external bitumen coating and internal cement mortar lining.**		
	80mm	Each	9.00
	100mm	Each	12.00
	125mm	Each	15.00
	150 mm	Each	19.00
	200mm	Each	33.00
	250mm	Each	42.00
	300mm	Each	58.00
	350mm	Each	76.00
	400mm	Each	99.00
	450mm	Each	128.00
	500mm	Each	157.00
	600mm	Each	231.00
	700mm	Each	332.00
	750mm	Each	396.00
	800mm	Each	443.00
	900mm	Each	583.00
	1000mm	Each	753.00
4.17	**Providing and 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 following nominal diameter/sizes with external bitumen coating and internal cement mortar lining.**		
	80mm	Each	680.00
	100mm	Each	874.00
	125mm	Each	1165.00
	150 mm	Each	1456.00
	200mm	Each	2234.00
	250mm	Each	3018.00
	300mm	Each	4224.00
	350mm	Each	5979.00
	400mm	Each	7448.00
	450mm	Each	9588.00

S. No.	Items	Unit	Rates in Rs.
	500mm	Each	12293.00
	600mm	Each	18857.00
	700mm	Each	27827.00
	750mm	Each	31025.00
	800mm	Each	37632.00
	900mm	Each	47305.00
	1000mm	Each	79841.00
4.18	**Labour only 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 following nominal diameter/sizes with external bitumen coating and internal cement mortar lining.**		
	80mm	Each	8.00
	100mm	Each	10.00
	125mm	Each	14.00
	150 mm	Each	17.00
	200mm	Each	28.00
	250mm	Each	37.00
	300mm	Each	51.00
	350mm	Each	63.00
	400mm	Each	82.00
	450mm	Each	100.00
	500mm	Each	120.00
	600mm	Each	184.00
	700mm	Each	250.00
	750mm	Each	297.00
	800mm	Each	338.00
	900mm	Each	425.00
	1000mm	Each	559.00
4.19	**Providing and 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 following nominal diameter/sizes with external bitumen coating and internal cement mortar lining**		
	80mm	Each	680.00
	100mm	Each	874.00
	125mm	Each	1068.00
	150 mm	Each	1359.00

S. No.	Items	Unit	Rates in Rs.
	200mm	Each	2039.00
	250mm	Each	2817.00
	300mm	Each	3822.00
	350mm	Each	5301.00
	400mm	Each	6541.00
	450mm	Each	8353.00
	500mm	Each	10505.00
	600mm	Each	15991.00
	700mm	Each	22927.00
	750mm	Each	25326.00
	800mm	Each	31270.00
	900mm	Each	39088.00
	1000mm	Each	66971.00
4.20	**Labour only 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 following nominal diameter/sizes with external bitumen coating and internal cement mortar lining.**		
	80mm	Each	8.00
	100mm	Each	10.00
	125mm	Each	13.00
	150 mm	Each	16.00
	200mm	Each	24.00
	250mm	Each	35.00
	300mm	Each	47.00
	350mm	Each	55.00
	400mm	Each	68.00
	450mm	Each	93.00
	500mm	Each	105.00
	600mm	Each	154.00
	700mm	Each	210.00
	750mm	Each	245.00
	800mm	Each	280.00
	900mm	Each	350.00
	1000mm	Each	443.00

S. No.	Items	Unit	Rates in Rs.
4.21	**Providing and Laying Ductile Iron All socket Tees conforming to IS-9523/2000 having dimension as per table 21 of IS-9523/2000 in the following nominal diameter/sizes with external bitumen coating and internal cement mortar lining with finishing as per clause 13 of IS-9523/2000.**		
	80mm x 80mm	Each	1201.00
	100mm x 80mm	Each	1400.00
	100mm x 100mm	Each	1501.00
	150mm x 80mm	Each	2025.00
	150mm x 100mm	Each	2228.00
	150mm x 150mm	Each	2633.00
	200mm x 80mm	Each	2915.00
	200mm x 100mm	Each	3116.00
	200mm x 150mm	Each	3645.00
	200mm x 200mm	Each	4152.00
	250mm x 80mm	Each	3746.00
	250mm x 100mm	Each	4050.00
	250mm x 150mm	Each	4556.00
	250mm x 250mm	Each	5774.00
	300mm x 100mm	Each	5190.00
	300mm x 200mm	Each	6489.00
	300mm x 300mm	Each	7984.00
4.22	**Labour only for Laying Ductile Iron All socket Tees conforming to IS-9523/2000 having dimension as per table 21 of IS-9523/2000 in the following nominal diameter/sizes with external bitumen coating and internal cement mortar lining.**		
	80mm x 80mm	Each	14.00
	100mm x 80mm	Each	16.00
	100mm x 100mm	Each	17.00
	150mm x 80mm	Each	23.00
	150mm x 100mm	Each	26.00
	150mm x 150mm	Each	30.00
	200mm x 80mm	Each	34.00
	200mm x 100mm	Each	36.00
	200mm x 150mm	Each	42.00

S. No.	Items	Unit	Rates in Rs.
	200mm x 200mm	Each	48.00
	250mm x 80mm	Each	43.00
	250mm x 100mm	Each	47.00
	250mm x 150mm	Each	52.00
	250mm x 250mm	Each	69.00
	300mm x 100mm	Each	68.00
	300mm x 200mm	Each	84.00
	300mm x 300mm	Each	96.00
4.23	**Providing and 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 following nominal diameter/sizes with external bitumen coating and internal cement mortar lining with finishing as per clause 13 of IS-9523/2000.**		
	80mm x 80mm	Each	1391.00
	100mm x 80mm	Each	1495.00
	100mm x 100mm	Each	1598.00
	150mm x 80mm	Each	2086.00
	150mm x 100mm	Each	2141.00
	150mm x 150mm	Each	2682.00
	200mm x 80mm	Each	2885.00
	200mm x 100mm	Each	3077.00
	200mm x 150mm	Each	3587.00
	200mm x 200mm	Each	4138.00
	250mm x 80mm	Each	3824.00
	250mm x 100mm	Each	3882.00
	250mm x 150mm	Each	4751.00
	250mm x 200mm	Each	5388.00
	250mm x 250mm	Each	6212.00
	300mm x 80mm	Each	4954.00
	300mm x 100mm	Each	5169.00
	300mm x 150mm	Each	5901.00
	300mm x 200mm	Each	6735.00
	300mm x 250mm	Each	7664.00
	300mm x 300mm	Each	8309.00
	350mm x 100mm	Each	6702.00
	350mm x 200mm	Each	8634.00

S. No.	Items	Unit	Rates in Rs.
	350mm x 350mm	Each	12969.00
	400mm x 80mm	Each	7932.00
	400mm x 100mm	Each	8273.00
	400mm x 150mm	Each	9093.00
	400mm x 200mm	Each	10457.00
	400mm x 300mm	Each	12985.00
	400mm x 400mm	Each	16525.00
	450mm x 100mm	Each	9970.00
	450mm x 250mm	Each	13611.00
	500mm x 100mm	Each	12450.00
	500mm x 200mm	Each	15313.00
	500mm x 400mm	Each	22062.00
	500mm x 500mm	Each	25996.00
	600mm x 200mm	Each	22018.00
4.24	**Labour only 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 following nominal diameter/sizes with external bitumen coating and internal cement mortar lining.**		
	80mm x 80mm	Each	15.00
	100mm x 80mm	Each	17.00
	100mm x 100mm	Each	20.00
	150mm x 80mm	Each	23.00
	150mm x 100mm	Each	24.00
	150mm x 150mm	Each	29.00
	200mm x 80mm	Each	33.00
	200mm x 100mm	Each	33.00
	200mm x 150mm	Each	42.00
	200mm x 200mm	Each	49.00
	250mm x 80mm	Each	42.00
	250mm x 100mm	Each	44.00
	250mm x 150mm	Each	51.00
	250mm x 200mm	Each	63.00
	250mm x 250mm	Each	71.00
	300mm x 80mm	Each	52.00
	300mm x 100mm	Each	57.00

S. No.	Items	Unit	Rates in Rs.
	300mm x 150mm	Each	68.00
	300mm x 200mm	Each	76.00
	300mm x 250mm	Each	89.00
	300mm x 300mm	Each	103.00
	350mm x 100mm	Each	68.00
	350mm x 200mm	Each	87.00
	350mm x 350mm	Each	136.00
	400mm x 80mm	Each	75.00
	400mm x 100mm	Each	78.00
	400mm x 150mm	Each	93.00
	400mm x 200mm	Each	107.00
	400mm x 300mm	Each	141.00
	400mm x 400mm	Each	182.00
	450mm x 100mm	Each	93.00
	450mm x 250mm	Each	132.00
	500mm x 100mm	Each	107.00
	500mm x 200mm	Each	155.00
	500mm x 400mm	Each	241.00
	500mm x 500mm	Each	294.00
	600mm x 200mm	Each	199.00
4.25	**Providing and Laying Ductile Iron Double Socket Reducer conforming to IS-9523/2000 having dimension as per table 21 of IS-9523/2000 in the following nominal diameter/sizes with external bitumen coating and internal cement mortar lining with finishing as per clause 13 of IS-9523/2000.**		
	100mm x 80mm	Each	777.00
	150mm x 80mm	Each	1262.00
	150mm x 100mm	Each	1263.00
	200mm x 100mm	Each	1942.00
	200mm x 150mm	Each	1944.00
	250mm x 150mm	Each	2817.00
	300mm x 150mm	Each	3820.00
	300mm x 200mm	Each	3820.00
	300mm x 250mm	Each	3519.00

S. No.	Items	Unit	Rates in Rs.
	350mm x 200mm	Each	5642.00
	350mm x 250mm	Each	5417.00
	350mm x 300mm	Each	5081.00
	400mm x 250mm	Each	6993.00
	400mm x 300mm	Each	6767.00
	400mm x 350mm	Each	6207.00
	450mm x 350mm	Each	8347.00
	450mm x 400mm	Each	7783.00
	500mm x 350mm	Each	11102.00
	500mm x 400mm	Each	10387.00
	600mm x 400mm	Each	16118.00
	600mm x 500mm	Each	14568.00
4.26	**Labour only for laying ductile iron double socket reducer conforming to IS-9523/2000 having dimension as per table 20 of IS-9523/2000 in the following nominal diameter/sizes with external bitumen coating and internal cement mortar lining with finishing as per clause 13 of IS-9523/2000**		
	100mm x 80mm	Each	9.00
	150mm x 80mm	Each	15.00
	150mm x 100mm	Each	16.00
	200mm x 100mm	Each	23.00
	200mm x 150mm	Each	26.00
	250mm x 150mm	Each	35.00
	250mm x 200mm	Each	33.00
	300mm x 150mm	Each	45.00
	300mm x 200mm	Each	45.00
	300mm x 250mm	Each	42.00
	350mm x 200mm	Each	61.00
	350mm x 250mm	Each	59.00
	350mm x 300mm	Each	58.00
	400mm x 250mm	Each	72.00
	400mm x 300mm	Each	70.00
	400mm x 350mm	Each	68.00
	450mm x 350mm	Each	87.00

S. No.	Items	Unit	Rates in Rs.
	450mm x 400mm	Each	82.00
	500mm x 350mm	Each	111.00
	500mm x 400mm	Each	105.00
	600mm x 400mm	Each	163.00
	600mm x 500mm	Each	149.00
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 following nominal diameter/sizes with external bitumen coating and internal cement mortar lining with finishing as per clause 13 of IS-9523/2000.**		
	80mm	Each	797.00
	100mm	Each	897.00
	150mm	Each	1395.00
	200mm	Each	2088.00
	250mm	Each	2794.00
	300mm	Each	3827.00
	350mm	Each	4997.00
	400mm	Each	6138.00
	450mm	Each	6895.00
	500mm	Each	8791.00
	600mm	Each	12797.00
	700mm	Each	26393.00
	750mm	Each	33758.00
	800mm	Each	33758.00
	900mm	Each	42524.00
	1000mm	Each	54692.00
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 following nominal diameter/sizes with external bitumen coating and internal cement mortar lining with finishing as per clause 13 of IS-9523/2000.**		
	80mm	Each	9.00
	100mm	Each	10.00
	150mm	Each	16.00

S. No.	Items	Unit	Rates in Rs.
	200mm	Each	23.00
	250mm	Each	31.00
	300mm	Each	43.00
	350mm	Each	50.00
	400mm	Each	63.00
	450mm	Each	76.00
	500mm	Each	100.00
	600mm	Each	143.00
	700mm	Each	212.00
	750mm	Each	274.00
	800mm	Each	274.00
	900mm	Each	346.00
	1000mm	Each	433.00
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 following nominal diameter/sizes with external bitumen coating and internal cement mortar lining with finishing as per clause 13 of IS-9523/2000.**		
	80mm	Each	816.00
	100mm	Each	1000.00
	150mm	Each	1694.00
	200mm	Each	2304.00
	250mm	Each	3426.00
	300mm	Each	4569.00
	350mm	Each	6479.00
	400mm	Each	7408.00
	450mm	Each	9430.00
	500mm	Each	10582.00
	600mm	Each	18936.00
	700mm	Each	34912.00
	750mm	Each	38634.00
	800mm	Each	40461.00
	900mm	Each	51708.00
	1000mm	Each	62699.00

S. No.	Items	Unit	Rates in Rs.
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 following nominal diameter/sizes with external bitumen coating and internal cement mortar lining with finishing as per clause 13 of IS-9523/2000.**		
	80mm	Each	9.00
	100mm	Each	13.00
	150mm	Each	20.00
	200mm	Each	30.00
	250mm	Each	42.00
	300mm	Each	56.00
	350mm	Each	66.00
	400mm	Each	82.00
	450mm	Each	96.00
	500mm	Each	136.00
	600mm	Each	185.00
	700mm	Each	283.00
	750mm	Each	305.00
	800mm	Each	330.00
	900mm	Each	422.00
	1000mm	Each	495.00
4.31	**Providing, Laying and 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 following sizes/dia pipes.**		
	100mm	Each	3728.00
	150mm	Each	5050.00
	200mm	Each	7049.00
	250mm	Each	8789.00
	300mm	Each	11265.00
	350mm	Each	16077.00
	400mm	Each	20344.00
	450mm	Each	25418.00
	500mm	Each	28536.00

S. No.	Items	Unit	Rates in Rs.
	600mm	Each	38889.00
	700mm	Each	48298.00
4.32	**Providing, Laying and 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 following sizes/dia pipes.**		
	100mm	Each	4846.00
	150mm	Each	6689.00
	200mm	Each	9301.00
	250mm	Each	11801.00
	300mm	Each	15071.00
	350mm	Each	20832.00
	400mm	Each	26021.00
	450mm	Each	32153.00
	500mm	Each	36373.00
	600mm	Each	49183.00
	700mm	Each	61370.00
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 following sizes/dia pipes**		
	100mm	Each	5964.00
	150mm	Each	8328.00
	200mm	Each	11553.00
	250mm	Each	14813.00
	300mm	Each	18877.00
	350mm	Each	25585.00
	400mm	Each	31699.00
	450mm	Each	38888.00
	500mm	Each	44209.00
	600mm	Each	59478.00
	700mm	Each	74442.00

S. No.	Items	Unit	Rates in Rs.
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 following sizes/dia pipes.**		
	100mm	Each	7083.00
	150mm	Each	9967.00
	200mm	Each	13805.00
	250mm	Each	17825.00
	300mm	Each	22465.00
	350mm	Each	30339.00
	400mm	Each	37376.00
	450mm	Each	45622.00
	500mm	Each	52046.00
	600mm	Each	69772.00
	700mm	Each	87515.00
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 following sizes/dia pipes.**		
	100mm	Each	7642.00
	150mm	Each	10786.00
	200mm	Each	14931.00
	250mm	Each	19331.00
	300mm	Each	24464.00
	350mm	Each	32715.00
	400mm	Each	40214.00
	450mm	Each	48990.00
	500mm	Each	55963.00
	600mm	Each	74920.00
	700mm	Each	94052.00

S. No.	Items	Unit	Rates in Rs.
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 following sizes/dia pipes.**		
	100mm	Each	8201.00
	150mm	Each	11606.00
	200mm	Each	16057.00
	250mm	Each	20837.00
	300mm	Each	26489.00
	350mm	Each	35092.00
	400mm	Each	43054.00
	450mm	Each	52357.00
	500mm	Each	59882.00
	600mm	Each	80067.00
	700mm	Each	100587.00
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 following sizes/dia pipes**		
	100mm	Each	8446.00
	150mm	Each	11912.00
	200mm	Each	16552.00
	250mm	Each	21498.00
	300mm	Each	27324.00
	350mm	Each	36139.00
	400mm	Each	44304.00
	450mm	Each	53840.00
	500mm	Each	61606.00
	600mm	Each	82331.00
	700mm	Each	103466.00
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 following sizes/dia pipes**		
	100mm	Each	31.00
	150mm	Each	48.00
	200mm	Each	64.00

S. No.	Items	Unit	Rates in Rs.
	250mm	Each	84.00
	300mm	Each	105.00
	350mm	Each	137.00
	400mm	Each	165.00
	450mm	Each	192.00
	500mm	Each	226.00
	600mm	Each	299.00
	700mm	Each	393.00
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 following sizes/dia pipes.**		
	100mm	Each	52.00
	150mm	Each	79.00
	200mm	Each	107.00
	250mm	Each	140.00
	300mm	Each	175.00
	350mm	Each	230.00
	400mm	Each	276.00
	450mm	Each	323.00
	500mm	Each	377.00
	600mm	Each	496.00
	700mm	Each	647.00
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 following sizes/dia pipes.**		
	100mm	Each	73.00
	150mm	Each	111.00
	200mm	Each	150.00
	250mm	Each	195.00
	300mm	Each	246.00
	350mm	Each	323.00
	400mm	Each	386.00
	450mm	Each	453.00
	500mm	Each	527.00
	600mm	Each	692.00
	700mm	Each	900.00

S. No.	Items	Unit	Rates in Rs.
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 following sizes/dia pipes**		
	100mm	Each	94.00
	150mm	Each	143.00
	200mm	Each	193.00
	250mm	Each	251.00
	300mm	Each	253.00
	350mm	Each	416.00
	400mm	Each	497.00
	450mm	Each	584.00
	500mm	Each	678.00
	600mm	Each	889.00
	700mm	Each	1154.00
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 following sizes/dia pipe**		
	100mm	Each	104.00
	150mm	Each	159.00
	200mm	Each	214.00
	250mm	Each	279.00
	300mm	Each	316.00
	350mm	Each	462.00
	400mm	Each	552.00
	450mm	Each	649.00
	500mm	Each	754.00
	600mm	Each	987.00
	700mm	Each	1281.00
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 following sizes/dia pipes.**		
	100mm	Each	115.00

S. No.	Items	Unit	Rates in Rs.
	150mm	Each	175.00
	200mm	Each	236.00
	250mm	Each	307.00
	300mm	Each	387.00
	350mm	Each	509.00
	400mm	Each	607.00
	450mm	Each	714.00
	500mm	Each	829.00
	600mm	Each	1085.00
	700mm	Each	1407.00
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 following sizes/dia pipes.**		
	100mm	Each	125.00
	150mm	Each	175.00
	200mm	Each	257.00
	250mm	Each	335.00
	300mm	Each	422.00
	350mm	Each	555.00
	400mm	Each	663.00
	450mm	Each	780.00
	500mm	Each	905.00
	600mm	Each	1184.00
	700mm	Each	1534.00

CHAPTER – V

ASBESTOS CEMENT PRESSURE PIPES AND CAST IRON FITTINGS

Chapter – V

ASBESTOS CEMENT PRESSURE PIPES AND CAST IRON FITTINGS

NOTES:

1. The A.C.P. pipes shall be confirming to IS - 1592:1980
2. The laying of A.C.P pipes shall be done as per IS - 6530: 1972
3. C.I. specials for A.C.P. pipes shall be done as per IS - 5531:1977
4. The C.I.D. joints shall be confirming to IS - 8794:1988
5. The rubber sealing of the D. Joint shall be confirming to IS - 10292:1988
6. All measurement shall be of the finished work.
7. Work shall be executed in accordance with the Indian Standards Specifications and special notes if any, covered in the agreement of the work.

ASBESTOS CEMENT PRESSURE PIPES AND CAST IRON FITTINGS

Item No.	Items	Unit	Rate in Rupees		
			Class 10	Class 15	Class 20
5.1	**Providing, laying and jointing of following 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**				
	80mm	Mtr.	136.00	139.00	152.00
	100mm	Mtr.	181.00	186.00	211.00
	125 mm	Mtr.	237.00	264.00	309.00
	150mm	Mtr.	322.00	361.00	418.00
	200mm	Mtr.	534.00	652.00	876.00
	250mm	Mtr.	764.00	881.00	1037.00
	300mm	Mtr.	976.00	1173.00	1370.00
	350 mm	Mtr.	-	1524.00	-
5.2	**Providing, laying and jointing of following 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**				

Item No.	Items	Unit	Rate in Rupees		
	80mm	Mtr.	131.00	136.00	147.00
	100mm	Mtr.	171.00	182.00	209.00
	125 mm	Mtr.	234.00	262.00	325.00
	150mm	Mtr.	340.00	410.00	492.00
	200mm	Mtr.	541.00	692.00	853.00
	250mm	Mtr.	768.00	960.00	1156.00
	300mm	Mtr.	1021.00	1376.00	1692.00
	350 mm	Mtr.	-	1857.00	-
5.3	**Labour for laying in position following Asbestos cement pressure pipes class 10,15,20**				
	80mm	Mtr.	3.00	3.00	3.00
	100mm	Mtr.	4.00	4.00	4.00
	125mm	Mtr.	5.00	5.00	5.00
	150mm	Mtr.	7.00	7.00	7.00
	200mm	Mtr.	13.00	13.00	13.00
	250mm	Mtr.	17.00	17.00	17.00
	300mm	Mtr.	24.00	24.00	24.00
	350mm	Mtr.	-	28.00	-
5.4	**Providing detachable joints to following 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**				
	80mm	Each	214.00	223.00	235.00
	100mm	Each	275.00	271.00	288.00
	125mm	Each	334.00	350.00	378.00
	150mm	Each	464.00	465.00	467.00
	200mm	Each	595.00	614.00	660.00
	250mm	Each	873.00	867.00	867.00
	300mm	Each	1159.00	1105.00	1091.00
	350mm	Each	-	1654.00	-
5.5	**Labour for providing detachable joints to following 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	34.00	35.00
	100mm	Each	39.00	40.00	41.00
	125mm	Each	45.00	46.00	47.00

Item No.	Items	Unit	Rate in Rupees		
	150mm	Each	50.00	52.00	53.00
	200mm	Each	56.00	58.00	59.00
	250mm	Each	62.00	64.00	65.00
	300mm	Each	68.00	70.00	71.00
	350mm	Each	-	76.00	77.00
5.6	**Providing A.C. Coupler joints to following A.C. pressure pipes confirming to IS specification including testing of joints rubber ring complete.**				
	80mm	Each	88.00	91.00	98.00
	100mm	Each	101.00	107.00	120.00
	125mm	Each	159.00	176.00	212.00
	150mm	Each	235.00	277.00	328.00
	200mm	Each	234.00	290.00	349.00
	250mm	Each	348.00	426.00	506.00
	300mm	Each	533.00	706.00	860.00
	350mm	Each	-	1321.00	-
5.7	**Labour for providing A.C. Coupler joint for the following asbestos cement pressure pipes and fittings class 10, 15 & 20 including testing of joint but excluding cost of A.C. Coupler and rubber rings**				
	80mm	Each	26.00	27.00	28.00
	100mm	Each	31.00	32.00	33.00
	125mm	Each	36.00	37.00	37.00
	150mm	Each	40.00	41.00	42.00
	200mm	Each	45.00	46.00	47.00
	250mm	Each	50.00	51.00	52.00
	300mm	Each	55.00	56.00	57.00
	350mm	Each	-	60.00	-
5.8	**Providing & laying in position following cast iron plain ended standard specials confirming to IS/5531/1988 (Reaffirmed 2002)**				
(i)	**Cast Iron Plain ended 90° Bend**		**Class 10**	**Class 15**	**Class 20**
	80mm	Each	469.00	469.00	538.00
	100mm	Each	639.00	658.00	811.00
	125mm	Each	882.00	991.00	1134.00
	150mm	Each	1199.00	1330.00	1642.00
	200mm	Each	2102.00	2378.00	2955.00
	250mm	Each	3234.00	3584.00	4481.00
	300mm	Each	4795.00	5459.00	6904.00

Item No.	Items	Unit	Rate in Rupees		
	350 mm	Each	7435.00	8381.00	10561.00
(ii)	**Cast Iron Plain ended 45° Bend**		**Class 10**	**Class 15**	**Class 20**
	80mm	Each	481.00	481.00	481.00
	100mm	Each	627.00	653.00	807.00
	125mm	Each	846.00	884.00	1093.00
	150mm	Each	1113.00	1251.00	1538.00
	200mm	Each	1781.00	2130.00	2663.00
	250mm	Each	2720.00	3064.00	3850.00
	300mm	Each	3865.00	4509.00	5728.00
	350mm	Each	5905.00	6812.00	8661.00
(iii)	**Cast Iron Plain ended 22½° Bend**		**Class 10**	**Class 15**	**Class 20**
	80mm	Each	351.00	351.00	401.00
	100mm	Each	457.00	476.00	595.00
	125mm	Each	595.00	633.00	792.00
	150mm	Each	766.00	901.00	1121.00
	200mm	Each	1264.00	1528.00	1931.00
	250mm	Each	1796.00	2115.00	2699.00
	300mm	Each	2475.00	3076.00	3961.00
	350mm	Each	3639.00	4470.00	5780.00
(iv)	**Cast Iron Plain ended 11¼° Bend**		**Class 10**	**Class 15**	**Class 20**
	80mm	Each	289.00	289.00	326.00
	100mm	Each	369.00	388.00	494.00
	125mm	Each	476.00	513.00	646.00
	150mm	Each	608.00	735.00	920.00
	200mm	Each	978.00	1245.00	1595.00
	250mm	Each	1356.00	1668.00	2164.00
	300mm	Each	1823.00	2412.00	3155.00
	350mm	Each	2711.00	3546.00	4653.00
(v)	**Cast Iron Plain ended Tees**				
	Body & Branch		**Class 10**	**Class 15**	**Class 20**
	80x80mm	Each	601.00	601.00	690.00
	100x80mm	Each	754.00	786.00	907.00
	100x100mm	Each	843.00	869.00	1082.00
	125X80mm	Each	984.00	1004.00	1199.00
	125X100mm	Each	1075.00	1114.00	1435.00
	125X125mm	Each	1192.00	1258.00	1555.00
	150x80mm	Each	1409.00	1542.00	1884.00
	150x100mm	Each	1469.00	1615.00	1999.00
	150X125mm	Each	1555.00	1709.00	2115.00
	150x150mm	Each	1662.00	1870.00	2315.00
	200X80 mm	Each	2433.00	2720.00	3365.00
	200X100 mm	Each	2503.00	2805.00	3496.00

Item No.	Items	Unit	Rate in Rupees		
	200X125mm	Each	2601.00	2912.00	3628.00
	200X150 mm	Each	2720.00	3141.00	3850.00
	200X200 mm	Each	3040.00	3489.00	4375.00
	250X80 mm	Each	3805.00	4163.00	5192.00
	250X100 mm	Each	3887.00	4254.00	5333.00
	250X125mm	Each	4006.00	4382.00	5491.00
	250X150 mm	Each	4133.00	4573.00	5738.00
	250X200 mm	Each	4496.00	5028.00	6327.00
	250X250 mm	Each	4896.00	5451.00	6896.00
(vi)	**Cast Iron Plain ended Tees**				
	300x80 to 350x350mm				
	Body & Branch		**Class 10**	**Class 15**	**Class 20**
	300X80mm	Each	5746.00	6434.00	8111.00
	300X100mm	Each	5834.00	6532.00	8284.00
	300X125mm	Each	5962.00	6681.00	8459.00
	300X150mm	Each	6027.00	6805.00	8634.00
	300X200mm	Each	6540.00	7425.00	9436.00
	300X250mm	Each	6988.00	7938.00	10072.00
	300X300mm	Each	7510.00	8634.00	11095.00
	350X200mm	Each	10076.00	11249.00	14327.00
	350X250mm	Each	10658.00	11847.00	15076.00
	350X300mm	Each	11348.00	12761.00	16275.00
	350X350mm	Each	12049.00	13590.00	17503.00
(vii)	**Cast Iron Plain ended Crosses**		**Class 10**	**Class 15**	**Class 20**
	80X80mm	Each	793.00	793.00	899.00
	100X100mm	Each	1100.00	1134.00	1420.00
	125X125mm	Each	1551.00	1634.00	2025.00
	150X150mm	Each	2153.00	2446.00	3037.00
	200X200mm	Each	3955.00	4600.00	5782.00
	250X250mm	Each	6362.00	7169.00	9125.00
	300X300mm	Each	9862.00	11477.00	14804.00
	350X350mm	Each	16106.00	18538.00	23838.00
(viii)	**Cast Iron Plain ended Reducers**		**Class 10**	**Class 15**	**Class 20**
	100X80mm	Each	513.00	520.00	620.00
	125X80mm	Each	595.00	614.00	735.00
	125X100mm	Each	658.00	684.00	843.00
	150X80mm	Each	690.00	754.00	907.00
	150X100mm	Each	754.00	824.00	1023.00
	150X125mm	Each	837.00	920.00	1134.00
	200X100mm	Each	1004.00	1147.00	1429.00
	200X125mm	Each	1088.00	1238.00	1542.00
	200X150mm	Each	1186.00	1389.00	1729.00

Item No.	Items	Unit	Rate in Rupees		
	250X125mm	Each	1343.00	1515.00	1904.00
	250X150mm	Each	1442.00	1668.00	2095.00
	250X200mm	Each	1695.00	1999.00	2524.00
	300X150mm	Each	1742.00	2102.00	2664.00
	300X200mm	Each	2006.00	2447.00	3105.00
	300X250mm	Each	2260.00	2728.00	3336.00
	350X200mm	Each	4080.00	4698.00	5880.00
	350X250mm	Each	4594.00	5248.00	6596.00
	350X300mm	Each	5187.00	6024.00	7600.00
(ix)	**Cast Iron Adopter (Flange Spigot)**		**Class 10**	**Class 15**	**Class 20**
	(T.P.)				
	80mm	Each	457.00	457.00	488.00
	100mm	Each	557.00	564.00	633.00
	125mm	Each	703.00	728.00	811.00
	150mm	Each	894.00	959.00	1075.00
	200 mm	Each	1304.00	1442.00	1648.00
	250 mm	Each	2232.00	2398.00	2784.00
	300mm	Each	2869.00	3177.00	3724.00
	350mm	Each	3875.00	4274.00	5017.00
(x)	**Cast Iron Blank end cap**		**Class 10**	**Class 15**	**Class 20**
	(Dead end cap)				
	80mm	Each	208.00	208.00	227.00
	100mm	Each	289.00	301.00	363.00
	125mm	Each	394.00	419.00	501.00
	150mm	Each	532.00	633.00	754.00
	200mm	Each	952.00	1173.00	1422.00
	250mm	Each	1416.00	1688.00	2047.00
	300mm	Each	2033.00	2559.00	3112.00
	350mm	Each	2923.00	3636.00	4424.00
5.9	**Labour for laying in position following cast iron plain ended standard specials confirming to IS/5531/1988 (Reaffirmed 2002)**				
(i)	**Cast Iron Plain ended 90° Bend**		**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	47.00	58.00
	300mm	Each	62.00	69.00	85.00
	350 mm	Each	84.00	93.00	114.00

Item No.	Items	Unit	Rate in Rupees		
(ii)	**Cast Iron Plain ended 45° Bend**		**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	29.00	36.00
	250mm	Each	36.00	41.00	50.00
	300mm	Each	50.00	58.00	72.00
	350mm	Each	66.00	76.00	93.00
(iii)	**Cast Iron Plain ended 22½° Bend**		**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	34.00	41.00	52.00
	350mm	Each	43.00	52	66.00
(iv)	**Cast Iron Plain ended 11¼° Bend**		**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	32.00	41.00	53.00
(v)	**Cast Iron Plain ended Tees**				
	Body & Branch		**Class 10**	**Class 15**	**Class 20**
	80x80mm	Each	9.00	9.00	10.00
	100x80mm	Each	11.00	11.00	13.00
	100x100mm	Each	12.00	12.00	15.00
	125X80mm	Each	14.00	14.00	17.00
	125X100mm	Each	15.00	16.00	20.00
	125X125mm	Each	17.00	18.00	22.00
	150x80mm	Each	20.00	22.00	26.00
	150x100mm	Each	21.00	22.00	28.00
	150X125mm	Each	22.00	24.00	29.00
	150x150mm	Each	23.00	26.00	32.00
	200X80 mm	Each	33.00	37.00	45.00
	200X100 mm	Each	34.00	38.00	46.00
	200X125mm	Each	35.00	39.00	48.00

Item No.	Items	Unit	Rate in Rupees		
	200X150 mm	Each	37.00	42.00	51.00
	200X200 mm	Each	41.00	46.00	57.00
	250X80 mm	Each	50.00	54.00	66.00
	250X100 mm	Each	51.00	55.00	68.00
	250X125mm	Each	53.00	57.00	70.00
	250X150 mm	Each	54.00	59.00	72.00
	250X200 mm	Each	58.00	64.00	79.00
	250X250 mm	Each	63.00	69.00	85.00
(vi)	**Cast Iron Plain ended Tees**				
	300x80 to 350x350mm				
	Body & Branch		**Class 10**	**Class 15**	**Class 20**
	300X80mm	Each	73.00	80.00	98.00
	300X100mm	Each	73.00	81.00	100.00
	300X125mm	Each	75.00	83.00	101.00
	300X150mm	Each	76.00	84.00	103.00
	300X200mm	Each	81.00	91.00	111.00
	300X250mm	Each	86.00	96.00	117.00
	300X300mm	Each	92.00	103.00	127.00
	350X200mm	Each	109.00	120.00	147.00
	350X250mm	Each	115.00	125.00	153.00
	350X300mm	Each	121.00	133.00	163.00
	350X350mm	Each	127.00	140.00	172.00
(vii)	**Cast Iron Plain ended Crosses**		**Class 10**	**Class 15**	**Class 20**
	80X80mm	Each	11.00	11.00	12.00
	100X100mm	Each	15.00	15.00	19.00
	125X125mm	Each	21.00	22.00	27.00
	150X150mm	Each	28.00	32.00	39.00
	200X200mm	Each	50.00	57.00	71.00
	250X250mm	Each	77.00	85.00	105.00
	300X300mm	Each	112.00	127.00	156.00
	350X350mm	Each	154.00	172.00	211.00
(viii)	**Cast Iron Plain ended Reducers**		**Class 10**	**Class 15**	**Class 20**
	100X80mm	Each	7.00	7.00	9.00
	125X80mm	Each	9.00	9.00	10.00
	125X100mm	Each	9.00	10.00	12.00
	150X80mm	Each	10.00	11.00	13.00
	150X100mm	Each	11.00	12.00	14.00
	150X125mm	Each	12.00	13.00	16.00
	200X100mm	Each	14.00	16.00	20.00
	200X125mm	Each	15.00	17.00	22.00
	200X150mm	Each	17.00	19.00	24.00
	250X125mm	Each	19.00	21.00	26.00

Item No.	Items	Unit	Rate in Rupees		
	250X150mm	Each	20.00	23.00	29.00
	250X200mm	Each	24.00	28.00	34.00
	300X150mm	Each	24.00	29.00	36.00
	300X200mm	Each	28.00	33.00	42.00
	300X250mm	Each	31.00	37.00	44.00
	350X200mm	Each	46.00	52.00	64.00
	350X250mm	Each	51.00	58.00	71.00
	350X300mm	Each	57.00	66.00	81.00
(ix)	**Cast Iron Adopter (Flange Spigot)**		**Class 10**	**Class 15**	**Class 20**
	(T.P.)				
	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
	250 mm	Each	31.00	33.00	38.00
	300mm	Each	39.00	42.00	49.00
	350mm	Each	48.00	53.00	61.00
(x)	**Cast Iron Blank end cap**		**Class 10**	**Class 15**	**Class 20**
	(Dead end cap)				
	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	46.00	55.00
5.10	**Labour for laying in position Cast Iron Plain Ended Specials all sizes of any class which does not appear in this U.S.O.R.**				
	80mm to 350mm dia	Quintal	89.00	89.00	89.00

CHAPTER – VI

GALVANISED IRON PIPES, SPECIALS AND GUN METAL OR BRASS FITTINGS

Chapter – VI

GALVANISED IRON PIPES, SPECIALS AND GUN METAL OR BRASS FITTINGS

NOTES:

1. The G.I. pipes shall be confirming to IS - 1239:2004 (Part II)
2. The hot dip Zinc coating on M.S. tubes shall be confirming to IS - 4736: 1986
3. The Copper alloy Gate valves, Globe wheel valves, Check valves shall be confirming to IS - 778: 1984 (Reaffirmed 2005)
4. The ferrules for water service connection shall be confirming to IS - 8794:1988
5. All measurement shall be of the finished work.
6. Work shall be executed in accordance with the Indian Standards Specifications and special notes if any, covered in the agreement of the work.

GALVANISED IRON PIPES, SPECIALS AND GUN METAL OR BRASS FITTINGS

Item No.	ITEMS	Unit	Rate in Rupees		
6.1	**Providing laying and jointing of following galvanised Iron 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-II**				
			Light	**Medium**	**Heavy**
	15mm dia	R Mtr.	73.00	71.00	91.00
	20mm dia	R Mtr.	93.00	89.00	117.00
	25mm dia	R Mtr.	133.00	130.00	166.00
	32mm dia	R Mtr.	163.00	164.00	210.00
	40mm dia	R Mtr.	205.00	193.00	250.00
	50mm dia	R Mtr.	244.00	264.00	410.00
	65mm dia	R Mtr.	337.00	352.00	537.00
	80mm dia	R Mtr.	419.00	454.00	666.00
	100mm dia	R Mtr.	584.00	651.00	775.00

Item No.	ITEMS	Unit	Rate in Rupees		
	125mm dia	R Mtr.	-	823.00	1000.00
	150mm dia	R Mtr.	-	979.00	1201.00
6.2	**Labour for laying and jointing of following 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	R Mtr.	6.00	6.00	6.00
	20mm dia	R Mtr.	6.00	6.00	7.00
	25mm dia	R Mtr.	9.00	10.00	10.00
	32mm dia	R Mtr.	10.00	11.00	11.00
	40mm dia	R Mtr.	13.00	13.00	14.00
	50mm dia	R Mtr.	14.00	16.00	19.00
	65mm dia	R Mtr.	23.00	23.00	28.00
	80mm dia	R Mtr.	25.00	27.00	32.00
	100mm dia	R Mtr.	36.00	40.00	41.00
	125mm dia	R Mtr.	-	53.00	53.00
	150mm dia	R Mtr.	-	64.00	65.00
6.3	**Providing and fixing following gate (full way) valves tested to 300lbs/Sq inch or 21.00 kg/sq.cm. confirming to IS 778/1984 (Reaffirmed 2005) Class-I**				
				Screwed	**Flanged**
	15mm dia	Each		110.00	167.00
	20mm dia	Each		175.00	302.00
	25mm dia	Each		204.00	349.00
	32mm dia	Each		314.00	427.00
	40mm dia	Each		416.00	513.00
	50mm dia	Each		625.00	940.00
	65mm dia	Each		1175.00	2113.00
	80mm dia	Each		1847.00	3047.00
	100mm dia	Each		3510.00	4433.00
6.4	**Providing and fixing following gate (full way) valves tested to 300lbs/Sq inch or 21.00 kg/sq.cm. confirming to IS**				

Item No.	ITEMS	Unit	Rate in Rupees		
	778/1984 (Reaffirmed 2005) Class-II				
				Screwed	**Flanged**
	15mm dia	Each		157.00	167.00
	20mm dia	Each		314.00	319.00
	25mm dia	Each		349.00	353.00
	32mm dia	Each		416.00	425.00
	40mm dia	Each		512.00	512.00
	50mm dia	Each		923.00	940.00
	65mm dia	Each		2112.00	2113.00
	80mm dia	Each		2955.00	3053.00
	100mm dia	Each		4433.00	4449.00
6.5	**Providing and fixing following class-I Globe wheel valves, confirming to IS 778/1984 (Reaffirmed 2005), tested to 21.09 kg/sq.cmt.**				
				Screwed	**Flanged**
	15mm dia	Each		150.00	183.00
	20mm dia	Each		160.00	236.00
	25mm dia	Each		174.00	260.00
	32mm dia	Each		243.00	351.00
	40mm dia	Each		327.00	469.00
	50mm dia	Each		548.00	772.00
	65mm dia	Each		901.00	1265.00
	80mm dia	Each		1060.00	2348.00
	100mm dia	Each		3536.00	3842.00
6.6	**Providing and fixing following class-II Globe wheel valves, confirming to IS 778/1984 (Reaffirmed 2005), tested to 21.09 kg/sq.cmt.**				
				Screwed	**Flanged**
	15mm dia	Each		185.00	194.00
	20mm dia	Each		233.00	236.00
	25mm dia	Each		252.00	260.00
	32mm dia	Each		349.00	351.00
	40mm dia	Each		462.00	475.00
	50mm dia	Each		775.00	776.00
	65mm dia	Each		1086.00	1269.00
	80mm dia	Each		2310.00	2346.00
	100mm dia	Each		3840.00	3840.00

Item No.	ITEMS	Unit	Rate in Rupees	
6.7	**Providing and fixing following check (non-return) valves Class-I, confirming to IS-778/1984 (Reaffirmed 2005) female ends, tested to 21.09 kg/sq.cmt.**			
			Screwed	**Flanged**
	15mm dia	Each	83.00	212.00
	20mm dia	Each	116.00	222.00
	25mm dia	Each	175.00	260.00
	32mm dia	Each	249.00	400.00
	40mm dia	Each	324.00	582.00
	50mm dia	Each	416.00	678.00
	65mm dia	Each	554.00	1008.00
	80mm dia	Each	1201.00	1579.00
	100mm dia	Each	2031.00	1997.00
6.8	**Providing and fixing following check (non-return) valves Class-II, confirming to IS-778/1984 (Reaffirmed 2005) female ends, tested to 21.09 kg/sq.cmt.**			
			Screwed	**Flanged**
	15mm dia	Each	213.00	212.00
	20mm dia	Each	222.00	222.00
	25mm dia	Each	259.00	260.00
	32mm dia	Each	400.00	399.00
	40mm dia	Each	584.00	591.00
	50mm dia	Each	735.00	736.00
	65mm dia	Each	1054.00	1056.00
	80mm dia	Each	1570.00	1579.00
	100mm dia	Each	1997.00	1997.00
6.9	**Providing and fixing following 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	222.00	
	20mm dia	Each	404.00	
	25mm dia	Each	540.00	
	32mm dia	Each	780.00	

Item No.	ITEMS	Unit	Rate in Rupees		
	40mm dia	Each		1134.00	
	50mm dia	Each		1463.00	
6.10	**Labour for laying and fixing Screwed or flanged Gate valves (full way) Class-I**				
				Screwed	**Flanged**
	15mm dia	Each		3.00	4.00
	20mm dia	Each		5.00	8.00
	25mm dia	Each		5.00	9.00
	32mm dia	Each		8.00	11.00
	40mm dia	Each		11.00	13.00
	50mm dia	Each		16.00	24.00
	65mm dia	Each		30.00	54.00
	80mm dia	Each		48.00	78.00
	100mm dia	Each		90.00	114.00
6.11	**Labour for laying and fixing Screwed or flanged Gate valves (full way) Class-II**				
				Screwed	**Flanged**
	15mm dia	Each		4.00	4.00
	20mm dia	Each		8.00	8.00
	25mm dia	Each		9.00	9.00
	32mm dia	Each		11.00	11.00
	40mm dia	Each		13.00	13.00
	50mm dia	Each		24.00	24.00
	65mm dia	Each		54.00	54.00
	80mm dia	Each		76.00	79.00
	100mm dia	Each		114.00	114.00
6.12	**Labour for laying and fixing Screwed or flanged globe wheel valves Class-I**				
				Screwed	**Flanged**
	15mm dia	Each		4.00	5.00
	20mm dia	Each		4.00	6.00
	25mm dia	Each		4.00	7.00
	32mm dia	Each		6.00	9.00
	40mm dia	Each		8.00	12.00
	50mm dia	Each		14.00	20.00
	65mm dia	Each		23.00	33.00
	80mm dia	Each		27.00	60.00
	100mm dia	Each		91.00	99.00

Item No.	ITEMS	Unit	Rate in Rupees		
6.13	**Labour for laying and fixing Screwed or flanged globe wheel valves Class-II**				
				Screwed	**Flanged**
	15mm dia	Each		5.00	5.00
	20mm dia	Each		6.00	6.00
	25mm dia	Each		6.00	7.00
	32mm dia	Each		9.00	9.00
	40mm dia	Each		12.00	12.00
	50mm dia	Each		20.00	20.00
	65mm dia	Each		28.00	33.00
	80mm dia	Each		59.00	60.00
	100mm dia	Each		99.00	99.00
6.14	**Labour for laying and fixing Screwed or flanged check (non-return) valves Class-I,**				
				Screwed	**Flanged**
	15mm dia	Each		2.00	5.00
	20mm dia	Each		3.00	6.00
	25mm dia	Each		5.00	7.00
	32mm dia	Each		6.00	10.00
	40mm dia	Each		8.00	15.00
	50mm dia	Each		11.00	17.00
	65mm dia	Each		14.00	26.00
	80mm dia	Each		31.00	41.00
	100mm dia	Each		52.00	51.00
6.15	**Labour for laying and fixing Screwed or flanged check (non-return) valves Class-II,**				
				Screwed	**Flanged**
	15mm dia	Each		5.00	5.00
	20mm dia	Each		6.00	6.00
	25mm dia	Each		7.00	7.00
	32mm dia	Each		10.00	10.00
	40mm dia	Each		15.00	15.00
	50mm dia	Each		19.00	19.00
	65mm dia	Each		27.00	27.00
	80mm dia	Each		40.00	41.00
	100mm dia	Each		51.00	51.00
6.16	**Labour for laying and fixing following GM or brass ferrules**				
				Screwed	
	15mm dia	Each		46.00	

Item No.	ITEMS	Unit	Rate in Rupees		
	20mm dia	Each		83.00	
	25mm dia	Each		111.00	
	32mm dia	Each		160.00	
	40mm dia	Each		232.00	
	50mm dia	Each		300.00	
6.17	**Providing & fixing water taps**				
			Stainless Steel	**CI self closing**	**Brass Heavy Duty**
	15mm dia	Each	427.00	263.00	263.00
	20mm dia	Each	477.00	304.00	296.00
	25mm dia	Each	-	-	337.00
6.18	**Labour for laying & fixing water taps**				
			Stainless Steel	**CI self closing**	**Brass Heavy Duty**
	15mm dia	Each	34.00	21.00	21.00
	20mm dia	Each	38.00	24.00	24.00
	25mm dia	Each	-	-	27.00

CHAPTER – VII

P.V.C. PIPES

Chapter – VII

P.V.C. PIPES

NOTES:

1. The Unplasticized P.V.C. pipes shall be confirming to IS - 4985:2000
2. The laying and jointing of UPVC pipes shall be done as per IS - 4736: 1986
3. The injection mould PVC fitting with solvent cement joint shall be confirming to IS - 7834: 1975 (Part I to VIII)
4. All measurement shall be of the finished work.
5. Work shall be executed in accordance with the Indian Standards Specifications and special notes if any, covered in the agreement of the work.

S.No.	Items	Unit	Rates in RS.		
7.1	**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.**				
			6Kg/Cm^2	**8 Kg/Cm^2**	**10Kg/Cm^2**
	90 mm dia.	R. mtr.	73.00	96.00	102.00
	110 mm dia.	R. mtr.	103.00	147.00	154.00
	140 mm dia.	R. mtr.	170.00	245.00	237.00
	160 mm dia.	R. mtr.	199.00	299.00	309.00
	180 mm dia.	R. mtr.	269.00	442.00	491.00
	200 mm dia.	R. mtr.	345.00	542.00	639.00
7.2	**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.	R. mtr.	2.00	2.00	2.00
	110 mm dia.	R. mtr.	2.00	2.00	2.00
	140 mm dia.	R. mtr.	2.00	2.00	2.00
	160 mm dia.	R. mtr.	3.00	3.00	3.00
	180 mm dia.	R. mtr.	3.00	3.00	3.00
	200 mm dia.	R. mtr.	4.00	4.00	4.00

S.No.	Items	Unit	Rates in RS.		
7.3	**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)**				
			6Kg/Cm^2	**8 Kg/Cm^2**	**10Kg/Cm^2**
	90 mm dia.	Each	14.00	14.00	14.00
	110 mm dia.	Each	17.00	17.00	17.00
	140 mm dia.	Each	23.00	23.00	23.00
	160 mm dia.	Each	31.00	31.00	31.00
	180 mm dia.	Each	34.00	34.00	34.00
	200 mm dia.	Each	49.00	49.00	49.00
7.4	**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)**				
			6Kg/Cm^2	**8 Kg/Cm^2**	**10Kg/Cm^2**
	90 mm dia.	Each Joint	10.00	10.00	10.00
	100 mm dia.	Each Joint	11.00	11.00	11.00
	140 mm dia.	Each Joint	13.00	13.00	13.00
	160 mm dia.	Each Joint	18.00	18.00	18.00
	180 mm dia.	Each Joint	20.00	20.00	20.00
	200 mm dia.	Each Joint	25.00	25.00	25.00
7.5	**Providing and laying in position following PVC bends suitable for 6, 8 and 10 Kg/Sq. cm. pressure pipes.**				
			6Kg/Cm^2	**8 Kg/Cm^2**	**10Kg/Cm^2**
	90 mm dia.	Each	64.00	84.00	104.00
	110 mm dia.	Each	91.00	130.00	169.00
	140 mm dia.	Each	174.00	241.00	307.00
	160 mm dia.	Each	229.00	337.00	446.00

S.No.	Items	Unit	Rates in RS.		
	180 mm dia.	Each	417.00	553.00	688.00
	200 mm dia.	Each	606.00	768.00	930.00
7.6	**Providing and laying in position following PVC Tees, suitable for 6, 8 and 10 Kg/Sqm. Pressure pipes.**				
			6Kg/Cm^2	**8 Kg/Cm^2**	**10Kg/Cm^2**
	90 mm dia.	Each	79.00	91.00	103.00
	100 mm dia.	Each	102.00	130.00	157.00
	140 mm dia.	Each	265.00	262.00	259.00
	160 mm dia.	Each	408.00	435.00	462.00
	180 mm dia.	Each	480.00	562.00	645.00
	200 mm dia.	Each	516.00	868.00	1220.00
7.7	**Providing and laying in position following PVC flanged tail pieces suitable for 6, 8 and 10 Kg./Sq. cm. Pressure pipes.**				
			6Kg/Cm2	8 Kg/Cm2	10Kg/Cm2
	90 mm dia.	Each	47.00	49.00	51.00
	110 mm dia.	Each	70.00	81.00	92.00
	140 mm dia.	Each	113.00	144.00	176.00
	160 mm dia.	Each	197.00	217.00	237.00
	180 mm dia.	Each	266.00	326.00	386.00
	200 mm dia.	Each	354.00	382.00	411.00
7.8	**Providing and laying in position following PVC end Cap (plugs) suitable for 6, 8 and 10 Kg/Sq cm. Pressure pipes.**				
			6Kg/Cm2	8 Kg/Cm2	10Kg/Cm2
	90 mm dia.	Each	27.00	28.00	29.00
	110 mm dia.	Each	36.00	41.00	47.00
	140 mm dia.	Each	57.00	73.00	88.00
	160 mm dia.	Each	99.00	109.00	119.00
	180 mm dia.	Each	133.00	163.00	192.00
	200 mm dia.	Each	177.00	191.00	205.00
7.9	**Providing and laying in position PVC coupler suitable for 6, 8 and 10 Kg/Sq. cm. Pressure pipes**.				
			6Kg/Cm2	8 Kg/Cm2	10Kg/Cm2

S.No.	Items	Unit	Rates in RS.		
	90 mm dia.	Each	41.00	51.00	61.00
	110 mm dia.	Each	66.00	84.00	102.00
	140 mm dia.	Each	127.00	159.00	190.00
	160 mm dia.	Each	181.00	230.00	280.00
	180 mm dia.	Each	247.00	316.00	384.00
	200 mm dia	Each	346.00	444.00	541.00
7.10	**Providing and laying in position of following PVC Reducers suitable for 6, 8 and 10 Kg/Sq cm. Pressure pipes.**				
			6Kg/Cm2	8 Kg/Cm2	10Kg/Cm2
	110x90 mm dia.	Each	51.00	66.00	80.00
	140x90 mm dia.	Each	84.00	105.00	126.00
	160x90 mm dia.	Each	138.00	177.00	217.00
	140x110 mm dia.	Each	82.00	106.00	130.00
	160x110 mm dia.	Each	106.00	142.00	177.00
	160x140 mm dia.	Each	-	-	161.00
	200x110 mm dia.	Each	-	-	800.00
	200x160 mm dia	Each	-	-	416.00
7.11	**Labour for laying in position all types of PVC fittings such as bends, tees, plugs etc. for following PVC pipes.**				
			6Kg/Cm^2	**8 Kg/Cm^2**	**10Kg/Cm^2**
	90 mm dia.	Each	3.00	3.00	3.00
	110 mm dia.	Each	3.00	3.00	3.00
	140 mm dia.	Each	4.00	4.00	4.00
	160 mm dia.	Each	4.00	4.00	4.00
	180 mm dia.	Each	5.00	5.00	5.00
	200 mm dia.	Each	6.00	6.00	6.00

CHAPTER – VIII

CAST IRON VALVES

Chapter – VIII

CAST IRON VALVES

NOTES:

1. The Sluice Valves (50-1200 mm size) shall be confirming to IS -14846:2000
2. The resilient seated C.I. Air relief valve shall be confirming to IS - 14845: 2000
3. The Swing check type reflux valves shall be confirming to IS - 5312: 2004 (Part I & II)
4. The Butter fly valves shall be confirming to IS - 13095:1991
5. All measurement shall be of the finished work.
6. Work shall be executed in accordance with the Indian Standards Specifications and special notes if any, covered in the agreement of the work.

S.No.	Items	Unit	Rates in Rupees			
8.1	**Providing & fixing of following 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		1951.00		2270.00
	65mm dia	Each		2066.00		2379.00
	80mm dia	Each		2665.00		3014.00
	100mm dia	Each		2804.00		3892.00
	150mm dia	Each		5889.00		5927.00
	200mm dia	Each		9540.00		10361.00
	300mm dia	Each		18142.00		18698.00
8.2	**Fixing of following 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 deptt. free of cost.**				**PN-1.0**	
	50mm dia	Each			122.00	

S.No.	Items	Unit	Rates in Rupees			
	65mm dia	Each			125.00	
	80mm dia	Each			127.00	
	100mm dia	Each			216.00	
	125mm dia	Each			231.00	
	150mm dia	Each			350.00	
	200mm dia	Each			390.00	
	250mm dia	Each			564.00	
	300mm dia	Each			628.00	
	350 mm dia	Each			885.00	
	400 mm dia	Each			1111.00	
	450 mm dia	Each			1373.00	
	500 mm dia	Each			1708.00	
	600 mm dia	Each			2528.00	
	700 mm dia	Each			3004.00	
	750 mm dia	Each			3219.00	
	800 mm dia	Each			4253.00	
	900 mm dia	Each			4811.00	
	1000 mm dia	Each			6106.00	
8.3	**Labour for laying and fixing of following cast iron double flanged sluice valves (vide item no.1) including jointing and testing but without cost of Jointing materials.**					
	50mm dia	Each			24.00	
	65mm dia	Each			30.00	
	80mm dia	Each			34.00	
	100mm dia	Each			47.00	
	125mm dia	Each			54.00	
	150mm dia	Each			66.00	
	200mm dia	Each			82.00	
	250mm dia	Each			134.00	
	300mm dia	Each			170.00	
	350mm dia	Each			261.00	
	400mm dia	Each			340.00	
	450mm dia	Each			383.00	
	500mm dia	Each			478.00	
	600mm dia	Each			727.00	
	700mm dia	Each			834.00	
	750mm dia	Each			866.00	
	800mm dia	Each			984.00	

S.No.	Items	Unit	Rates in Rupees			
8.4a	**Providing & fixing following 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)**					
		CLASS- PN- 1.0				
	50mm dia	Each			1032.00	
	65mm dia	Each			1305.00	
	80mm dia	Each			1630.00	
	100mm dia	Each			2599.00	
	150mm dia	Each			4231.00	
	200mm dia	Each			7544.00	
	250mm dia	Each			10882.00	
	300mm dia	Each			14944.00	
	350mm dia	Each			26138.00	
8.4b	**Providing & fixing following 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)**					
			CLASS PN- 0.6		**CLASS PN- 1.0**	
	400mm dia	Each		52703.00		58680.00
	450mm dia	Each		67466.00		73444.00
	500mm dia	Each		94084.00		112015.00
	600mm dia	Each		140702.00		158634.00
	700mm dia	Each		164983.00		218777.00
	750mm dia	Each		254826.00		266780.00
	800mm dia	Each		293400.00		315515.00
8.5	**Labour for laying and fixing of following Cast Iron Double Flanged reflux (non return) valves including jointing & testing**					

S.No.	Items	Unit	Rates in Rupees			
	but without cost and jointing materials					
	50mm dia	Each			24.00	
	65mm dia	Each			30.00	
	80mm dia	Each			34.00	
	100mm dia	Each			47.00	
	125mm dia	Each			54.00	
	150mm dia	Each			66.00	
	200mm dia	Each			82.00	
	250mm dia	Each			134.00	
	300mm dia	Each			170.00	
	350mm dia	Each			261.00	
	400mm dia	Each			340.00	
	450mm dia	Each			383.00	
	500mm dia	Each			478.00	
	600mm dia	Each			727.00	
	700mm dia	Each			834.00	
	750mm dia	Each			866.00	
	800mm dia	Each			984.00	
8.6	**Providing & fixing following 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**					
			CLASS PN- 1.0		**CLASS PN- 1.6**	
	50mm dia	Each		1623.00		1683.00
	65mm dia	Each		1986.00		1986.00
	80mm dia	Each		2108.00		2168.00
	100mm dia	Each		2738.00		2857.00
	150mm dia	Each		4204.00		4443.00
	200mm dia	Each		8193.00		8910.00
	250mm dia	Each		11610.00		12806.00
	300mm dia	Each		14082.00		14441.00
8.7	**Labour for laying and fixing of following Cast Iron butterfly valves including jointing & testing but without cost and jointing materials**					
	50mm dia	Each			24.00	

S.No.	Items	Unit	Rates in Rupees			
	65mm dia	Each			30.00	
	80mm dia	Each			34.00	
	100mm dia	Each			47.00	
	150mm dia	Each			54.00	
	200mm dia	Each			66.00	
	250mm dia	Each			82.00	
	300mm dia	Each			134.00	
8.8	**Providing & fixing following 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**					
			CLASS PN- 1.0		**CLASS PN- 1.6**	
	25mm dia	Each		656.00		625.00
	40mm dia	Each		696.00		756.00
8.9	**Labour for laying and fixing of following Cast Iron Air valves small orifice with screwed end .**					
	25mm dia	Each			10.00	
	40mm dia	Each			13.00	
8.10	**Providing & fixing following 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**					
			CLASS PN- 1.0		**CLASS PN- 1.6**	
	25mm dia	Each		729.00		864.00
	40mm dia	Each		783.00		980.00
	50mm dia	Each		944.00		1140.00
8.11	**Labour for laying and fixing of following Cast Iron Air valves large orifice**					

S.No.	Items	Unit	Rates in Rupees			
	with screwed end .					
	25mm dia	Each			10.00	
	40mm dia	Each			13.00	
	50mm dia	Each			24.00	
8.12	**Providing & fixing following 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**					
			CLASS PN- 1.0		**CLASS PN- 1.6**	
	40mm dia	Each		1499.00		-
	50mm dia	Each		1921.00		1790.00
	65mm dia	Each		-		2340.00
	80mm dia	Each		2534.00		2594.00
	100mm dia	Each		3252.00		3320.00
	150mm dia	Each		5251.00		5610.00
	200mm dia	Each		7690.00		8766.00
8.13	**Labour for laying and fixing of following Cast Iron double air valves, flanged without in-built isolating valve.**					
	40mm dia	Each			13.00	
	50mm dia	Each			24.00	
	65mm dia	Each			30.00	
	80mm dia	Each			34.00	
	100mm dia	Each			47.00	
	150mm dia	Each			54.00	
	200mm dia	Each			66.00	
8.14	**Providing & fixing following 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-**					

S.No.	Items	Unit	Rates in Rupees			
	1991					
			CLASS PN- 1.0		**CLASS PN- 1.6**	
	40mm dia	Each		1313.00		1499.00
	80mm dia	Each		1745.00		2056.00
	100mm dia	Each		2128.00		6264.00
	150mm dia	Each		3936.00		10989.00
	200mm dia	Each		8264.00		17612.00
8.15	**Labour for laying and fixing of following Cast Iron double air valves, flanged with in-built isolating valve.**					
	40mm dia	Each			13.00	
	80mm dia	Each			54.00	
	100mm dia	Each			66.00	
	150mm dia	Each			24.00	
	200mm dia	Each			47.00	

CHAPTER –IX

LAYING AND JOINTING OF SALT GLAZED STONEWARE PIPES

CHAPTER IX
Laying and jointing of Salt Glazed Stoneware Pipes

Notes :

9.1.1 The salt Glazed Stoneware pipe shall be confirming to IS -651 :1980.

9.1.2 The laying to S.W. pipes shall be done as per IS - 4127: 1983

9.1.3 The bedding of the S.W. pipes shall be as per the specification given in the CPHEEO manual of Sewerage & Sewage treatment, payment for which shall be made as per chapter XII allied civil works.

9.1.4 The testing of the sewer line & refilling shall be done as per CPHEEO manual on sewerage and sewage management.

9.1.5 In order to avoid damage to the pipes and especially to the spigot end, pipes shall nt be dragged along concrete and similar pavements with hard surfaces.

9.1.6 The pipes and fittings shall be inspected for defects and be rung with a light hammer preferably while suspended to detect cracks.

9.1.7 All lumps, blisters and excess coating materials shall be removed gently from the socket and spigot of each pipe. The out side of the spigot and the inside of the socket shall be wiped clean and dry before the pipe is laid.

9.1.8 In shallow trenches, manual handing is enough but in deep trenches, they shall be lowered in to the trench by mean of ropes. Under no circumstances the pipe shall be dropped or dumped into the trench.

9.1.9 Every precaution shall be taken to prevent foreign material from entering the pipe when it is being placed in the line.

9.1.10 The pipe between two manholes shall be laid truly in a straight line without vertical and horizontal undulations. The pipe shall be laid true to line and grade as specified in the relevant specifications.

9.1 **Laying:**

9.1.1 while unloading, pipes shall not be thrown from the truck on hard ground.

9.1.2 **Trenches:**
The width of trench at and below the top of sewer should be the minimum necessary for its proper installation with the due consideration to its bedding. It should be as per clause 7.1.1 page 126 of construction of sewers as per CPHEEO manual on sewerage and sewage treatment (second edition).

9.1.3 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.

9.1.4 Where the sewer has to be laid in a soft under ground strata or in a reclaimed land, the trench shall be excavated deeper than what is ordinary required. The trench bottom shall be stabilised by the addition of coarse gravel or rock, in case of very bed soil the trench bottom shall be filled in with cement concrete. For class of bedding details clause 6.5.3.1 page 116 of CPHEEO manual on sewerage and sewage treatment should be followed.

9.1.5 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.

9.1.6 The pipe and fittings shall be inspected for defects and be rung with a light hammer preferably while suspended, to detect cracks.

9.1.7 All lumps, blisters and excess coating materials shall be removed gently from the socket and spigot and of each pipe and the outside of the spigot and the inside of the socket shall be wiped clean an dry before the pipe is laid.

9.1.8 In shallow trenches manual handing is enough but in deep trenches, they should be lowered into the trench by means of ropes. Under no circumstances shall the pipes be dropped or dumped into the trench.

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

9.1.10 The pipes between two main holes shall be laid truly in a straight line without vertical and horizontal undulations. The pipes shall be laid true to line and grade as specified.

9.1.11 Sight rails shall be provided at all changes of direction or gradient and at distances of about 15 meters along straight lengths, with centre line marked each horizontal rail, which shall be fixed at true level, shall be used for laying all inverts.

9.1.12 Normally the socket ends should face the up stream. When the line runs up hill the socket ends should face the upgrade.

9.1.13 The stone ware pipes shall be laid with sockets facing up the gradient, on desired, special bedding. Hunching or encasing may be provided where conditions so demand as discussed in clause 6.5 of CPHEEO manual on sewerage and sewage treatment 1993 (Second Edition).

9.1.14 Where pipes are not bedded on concrete, the trench floor shall be left slightly high and carefully buttoned up as pipe laying proceeds, so that the pipes barrels rest on firm and undisturbed ground. If the excavation has been carried too low the desired levels shall be made up with concrete 1:5:10 (1cement: 5

fine sand: 10 graded stone aggregate 40 mm nominal size) for which no extra payment shall be made. The pipe shall be secured in place with approved back fill material or concrete tamped under it, except at the socket.

9.1.15 Pipe and fittings, which do not allow a sufficient and uniform space for joints, shall be removed and replaced with pipe and fittings of proper dimensions to ensure such uniform space.

9.1.16 When pipe laying is not in progress, the open ends of pipe shall be closed by a water light plug or canvas or other means approved by the Engineer in charge.

9.1.17 Trenches shall be kept free from water until the material in the joints has hardens.

9.1.18 The cutting of pipe for inserting, fittings or closure pieces shall be done in a neat and workman like manner without damage to the pipe or inside casting so as to leave a smooth surface and at right angle to the axis of the pipe.

9.1.19 The Engineer In-charge should consult the appropriate authorities before preparing plans and specifications for pipeline crossing Railway lines, Irrigation channels or similar other works & services.

9.1.20 The connection to an existing sewer shall be done through manholes. All the precaution and care shall be taken for safety of the workmen.

9.1.21 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.

9.1.22 The pipes when laid, should not be subjected to superimposed load beyond their safe crushing strength.

9.2 **Jointing:**

9.2.1 The stoneware pipes shall be cement jointed.

9.2.2 The materials shall consist of the following.

(a) Spun yarn or tarred gaskets.
(b) Cement.
(c) Sand

9.2.3. In each joint, spun yarn soaked in neat cement slurry or tarred gasket shall be passed round the joint and inserted in it by means of a caulking tool. More yarn or gasket shall be added if necessary and shall be well caulked. Yarn or gasket so rammed shall not occupy more then one fourth of the depth of socket.

9.2.4 Cement mortar (1:1) (one part of cement to one part of sand) shall be slightly moistened and carefully inserted by hand into the remaining space of the joint after caulking of yarn or gasket. The mortar shall than be caulked into the joint with a caulking tool. More cement mortar shall be added until the joint space has been completely filled with tightly caulked mortar. The joint shall then be finished off neatly outside the socket at an angle of 45 degrees (IS 4127-1983)

9.2.5 The cement mortar joints shall be cured at least for seven days before testing.

9.2.6 The joint with cast iron or concrete pipes shall be made with cement joints.

9.3 **Testing:**

9.3.1 Each section of sewer shall be tested for water tightness preferably between manholes.

9.3.2 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.

9.3.3 The sewers are tested by plugging the upper end with a provision for an air out let 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 any leaks in the pipe or joints (small sweating on the pipe surface is permitted).

9.3.4 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..

9.3.5 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 kilometre length per day.

9.3.6 It should be done as per clause 7.1.5 page 131 of CPHEEO manual on sewerage and sewage treatment (1993 second edition).

9.4 **Refilling** :

No trench shall be filled in unless the sewer stretches have been tested and approved for water tightness of joints. However partial filling may be done keeping the joints open to avoid disturbance. Soft material screened free from

stones or hard substances shall first be used and hand pressured under and around the pipes to half their height. Similarly soft material shall be put up to a height of 30cm above top of pipe and then this will be moistened with water and well rammed. The reminder of the trench can be filled with hard material, in stages, 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. It should be done as per procedure given in clause 7.1.9 page 133 of CPHEEO manual on sewerage and sewage treatment (1993 second edition).

9.5 **Measurements:**

The lengths of pipe shall be measured in the running meters nearest to a cm as laid or fixed, from in side 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, junction, etc., which 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.

9.6 **Rate :**

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

Laying and jointing of Salt Glazed Stoneware Pipes (Pipes conforming to IS: 651-1992)

S. No.	Items	Unit	Rates in Rs.
9.1	Providing and Laying and Jointing salt glazed stone ware (S.W.) pipes socket and spigot with stiff cement mortar 1:1 including testing of joints complete		
	100mm	Per Meter	139.00
	150 mm	Per Meter	212.00
	200 mm	Per Meter	421.00
	250 mm	Per Meter	589.00
	300 mm	Per Meter	955.00
9.2	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	52.00
	150 mm	Per Meter	77.00
	200 mm	Per Meter	93.00
	250 mm	Per Meter	115.00
	300 mm	Per Meter	133.00
9.3	Providing and laying cement concrete 1:5:10 (1 cement:5 fine send: 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")		
	100mm dia SW pipe	cum	241.00

S. No.	Items	Unit	Rates in Rs.
	150mm dia	cum	295.00
	200mm dia	cum	344.00
	250mm dia	cum	377.00
	300mm dia	cum	457.00
9.4	Providing and laying cement concrete 1:5:10 (1 cement:5 fine send: 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 ")		
	100mm dia pipe	cum	114.00
	150mm dia	cum	185.00
	200mm dia	cum	219.00
	250mm dia	cum	255.00
	300mm dia	cum	294.00

CHAPTER- X

LAYING & JOINTING OF REINFORCED CEMENT CONCRETE PIPES

CHAPTER- X
LAYING & JOINTING OF
REINFORCED CEMENT CONCRETE PIPES
(PIPES CONFORMING TO IS : 458-1988)

All the pipes, specials, joints to be used in the work shall conform to relevant Indian Standards duly inspected and tested and having B.I.S. certification mark.

10.1 Laying:

10.1.1 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.

10.1.2 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.

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

10.1.4 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.

10.1.5 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.

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

10.1.7 Pipes shall be laid in true line and grade, as specified.

10.1.8 Sight rails provided at all change of directions or gradients and at distances of about 15 metered along. 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.

10.1.9 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 cases of pipes with joints to be made with loose collars, the collars shall be slipped one before the next pipe is laid.

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

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

10.1.12 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.

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

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

10.1.15 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.

10.1.16 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.

10.1.17 The Engineer-in-Charge should consult the appropriate authorities before preparing plans and specifications for pipe line crossing railway lines, Irrigation, channels or similar other works and services.

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

10.1.19 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.

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

10.2 **Pipe Bedding:**

10.2.1 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.

10.2.2 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-depend upon	It may either concrete cradle or concrete arch the design.
Class B bedding-bedding	It is having a shaped bottom or compacted granular with a carefully compacted back fill.
Class C bedding-bedding	It is ordinary bedding having a compacted granular with a lightly compacted back fill.

10.2.3 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.
Class A bedding-The hard unyielding material should be excavated down to the bottom of the concrete cradle.
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.
The width of trench should be at least 1.25 times the outside dia of pipe and it should be refilled with granular material.

10.2.4 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.

10.2.5 The bedding shall be as per details given in chapter VI 'Structural design of buried sewer' given in CPHEEO manual on sewerage and sewage treatment (1993 second edition).

10.3 **Jointing:**

(a) The socket and spigot pipes are laid and jointed with rubber gasket.

(b) 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 shall be followed as per I.S. 783 – 1985.

10.4 **Testing:**

10.4.1 Each section of sewer shall be tested for water tightness preferably between manholes.

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

10.4.3 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.

10.4.4 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 invet 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).

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

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

10.4.7 For non pressure pipes the leakage should be observed for a period of 24 hours .

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

10.4.9 Air testing shall be done particularly in large diameter pipes when the required quantity of water is not available for testing subjected to the provisions made in the agreement. It is done as per procedure given in CPHEEO manual (1993 second edition).

10.5 **Back filling of trenches:**

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.

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

(2) In developed streets, it shall be compacted to minimize the load.

(3) 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.

LAYING & JOINTING OF REINFORCED CEMENT CONCRETE PIPES (PIPES CONFORMING TO IS : 458-1988)

S.No	Items	Unit	Rates in Rs.		
10.1	**Providing and Laying non-pressure (NP2) RCC socket & spigot pipes with rubber gasket joint including testing of joints.**		**Up to 100 km**	**100-200 km**	**Above 200 km**
	100 mm	Per Meter	180.00	184.00	188.00
	150 mm	Per Meter	230.00	236.00	240.00
	200 mm	Per Meter	285.00	293.00	298.00
	250 mm	Per Meter	350.00	358.00	365.00
	300 mm	Per Meter	481.00	494.00	504.00
	350 mm	Per Meter	544.00	559.00	571.00
	400 mm	Per Meter	671.00	690.00	706.00
	450 mm	Per Meter	736.00	756.00	773.00
	500 mm	Per Meter	857.00	882.00	901.00
	600 mm	Per Meter	1049.00	1079.00	1102.00
	700 mm	Per Meter	1300.00	1338.00	1368.00
	800 mm	Per Meter	1737.00	1789.00	1831.00
	900 mm	Per Meter	2272.00	2343.00	2399.00
	1000 mm	Per Meter	2659.00	2742.00	2808.00
	1100 mm	Per Meter	2991.00	3084.00	3159.00
	1200 mm	Per Meter	3556.00	3668.00	3758.00
	1600 mm	Per Meter	5154.00	5322.00	5457.00
10.2	Labour only for Laying and Jointing non-pressure (NP2) RCC socket & spigot pipes with rubber gasket joint including testing of joints.				
	100 mm	Per Meter			9.00
	150 mm	Per Meter			13.00
	200 mm	Per Meter			16.00
	250 mm	Per Meter			21.00
	300 mm	Per Meter			31.00
	350 mm	Per Meter			38.00
	400 mm	Per Meter			43.00
	450 mm	Per Meter			53.00
	500 mm	Per Meter			58.00
	600 mm	Per Meter			80.00
	700 mm	Per Meter			93.00
	800 mm	Per Meter			119.00
	900 mm	Per Meter			149.00

S.No	Items	Unit	Rates in Rs.		
	1000 mm	Per Meter			151.00
	1100 mm	Per Meter			181.00
	1200 mm	Per Meter			213.00
	1600 mm	Per Meter			272.00
10.3	**Providing and Laying non-pressure (NP3) RCC socket & spigot pipes with rubber gasket joint including testing of joints.**				
	150 mm	Per Meter	325.00	334.00	342.00
	250 mm	Per Meter	488.00	502.00	513.00
	300 mm	Per Meter	701.00	723.00	740.00
	350 mm	Per Meter	1105.00	1140.00	1167.00
	400 mm	Per Meter	1359.00	1402.00	1436.00
	450 mm	Per Meter	1526.00	1575.00	1615.00
	500 mm	Per Meter	1677.00	1731.00	1774.00
	600 mm	Per Meter	2267.00	2341.00	2401.00
	700 mm	Per Meter	2682.00	2771.00	2843.00
	800 mm	Per Meter	3575.00	3697.00	3795.00
	900 mm	Per Meter	4368.00	4520.00	4641.00
	1000 mm	Per Meter	4614.00	4775.00	4904.00
	1100 mm	Per Meter	5624.00	5823.00	5983.00
	1200 mm	Per Meter	6553.00	6787.00	6974.00
	1400 mm	Per Meter	7961.00	8246.00	8474.00
	1600 mm	Per Meter	9567.00	9912.00	10188.00
	1800 mm	Per Meter	11096.00	11498.0	11820.00
10.4	**Labour only for Laying and Jointing non-pressure (NP3) RCC socket & spigot pipes with rubber gasket joint including testing of joints.**				
	150 mm	Per Meter			14.00
	250 mm	Per Meter			27.00
	300 mm	Per Meter			43.00
	350 mm	Per Meter			100.00
	400 mm	Per Meter			112.00
	450 mm	Per Meter			124.00
	500 mm	Per Meter			135.00
	600 mm	Per Meter			171.00
	700 mm	Per Meter			196.00
	800 mm	Per Meter			252.00
	900 mm	Per Meter			315.00

S.No	Items	Unit	Rates in Rs.		
	1000 mm	Per Meter			317.00
	1100 mm	Per Meter			364.00
	1200 mm	Per Meter			393.00
	1400 mm	Per Meter			422.00
	1600 mm	Per Meter			496.00
	1800 mm	Per Meter			595.00
10.5	**Providing and Laying non-pressure (NP4) RCC socket & spigot pipes with rubber gasket joint including testing of joints.**				
	250 mm	Per Meter	563.00	580.00	594.00
	300 mm	Per Meter	782.00	807.00	826.00
	350 mm	Per Meter	1323.00	1367.00	1401.00
	400 mm	Per Meter	1477.00	1525.00	1563.00
	450 mm	Per Meter	1732.00	1789.00	1835.00
	500 mm	Per Meter	1927.00	1991.00	2042.00
	600 mm	Per Meter	2636.00	2726.00	2798.00
	700 mm	Per Meter	3162.00	3271.00	3358.00
	800 mm	Per Meter	4025.00	4166.00	4279.00
	900 mm	Per Meter	4875.00	5048.00	5187.00
	1000 mm	Per Meter	5156.00	5339.00	5485.00
	1100 mm	Per Meter	6090.00	6308.00	6484.00
	1200 mm	Per Meter	7050.00	7304.00	7507.00
	1400 mm	Per Meter	8823.00	9144.00	9401.00
	1600 mm	Per Meter	10476.00	10859.0	11166.00
	1800 mm	Per Meter	12313.00	12767.0	13126.00
10.6	**Labour only for Laying and Jointing non-pressure (NP4) RCC socket & spigot pipes with rubber gasket joint including testing of joints.**				
	250 mm	Per Meter			27.00
	300 mm	Per Meter			43.00
	350 mm	Per Meter			100.00
	400 mm	Per Meter			112.00
	450 mm	Per Meter			124.00
	500 mm	Per Meter			136.00
	600 mm	Per Meter			184.00
	700 mm	Per Meter			210.00
	800 mm	Per Meter			268.00
	900 mm	Per Meter			315.00
	1000 mm	Per Meter			334.00

S.No	Items	Unit	Rates in Rs.		
	1100 mm	Per Meter			364.00
	1200 mm	Per Meter			412.00
	1400 mm	Per Meter			423.00
	1600 mm	Per Meter			496.00
	1800 mm	Per Meter			595.00

CHAPTER- XI

SEWER APPURTENANCES

CHAPTER XI
SEWER APPURTENANCES

SEWER APPURTENANCES

Following are the General Sewer Appurtenances-

(I) Manholes
(II) Inverted Siphons
(III) Storm Water Inlets
(IV) Sewer Ventilators

Out of the above, manholes are the most essential items in any sewerage system.

11.1 Manholes

11.1.1 Function

Manholes is the essential ancillary structure in any sewerage system. They shall be provided for inspection, testing, cleaning, repairing and removal of obstruction from sewer line.

11.1.2 Provision: -

Manholes 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.

11.1.3 Spacing: -

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

Pipe dia (mm)	Max. Spacing (mt)
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.

11.1.4 Types of manholes:

Following is the general classification of manholes-

11.1.4.1 Straight-through manholes: -

The simplest type of manhole is that built on a straight run of sewer with no side junctions. Where there is a change in the size of sewer, the soffit or crown

level of the two sewers should be the same, except where special conditions require otherwise.

11.1.4.2 Junction Manholes: -

A manhole should be built at every junction of two or more sewers, and the curved portions of the inverts of tributary sewers should be formed within the manhole. To achieve this with the best economy of space, the chamber may be built of a shape other than rectangular. The soffit of the smaller sewer at a junction should be not lower than that of the larger sewer, in order to avoid the surcharging of the former when the letter is running full, and the hydraulic design usually assumes such a condition. The gradient of the smaller sewer may be increased from the previous manhole sufficiently to reduce the difference of invert level at the point of junction to a convenient amount.

11.1.4.3 Side Entrance Manholes: -

In large sewer or where it is difficult to obtain direct vertical access to the sewer from ground level, owing to existing services, gas, water etc. the access shaft should be constructed in the nearest convenient position off the line of sewer, and connected to the manhole chamber by a lateral passage.

In the tunnelled sewer the shaft and the lateral access heading may be used as a working shaft, the tunnel being broken out from the end of the heading, or alternatively the shaft and heading may be used as a working shaft, the tunnel being broken out from the end of the heading, or alternatively the shaft and heading maybe constructed after the main tunnel is completed, provision having been made for breaking in from the access heading to build the chamber.

The floor of the side-entrance passage, which should fall at about 1 in 30 towards the sewer, should enter the chamber not lower than the soffit level of the sewer. In large sewer where the floor of the side entrance passage is above the soffit either steps or a ladder (which should be protected either by a removable handrail or by safety chains) should be provided to reach the benching.

11.1.4.4 Drop Manholes; -

When a sewer connects with another sewer, where the difference in level between water lines (peak flow levels) of main line and the invert level of branch line is more than 600 mm or a drop of more than 600 mm is required to be given in the same sewer line and it is uneconomical or impractical to arrange the connection with in 600 mm a drop connection shall be provided for which is manholes maybe built incorporating a vertical or nearly vertical drop pipe from the higher sewer to the lower one. This pipes maybe either outside the shaft and

enclosed in concrete or supported on brackets inside the shaft, which should be suitably enlarged. If the drop pipe is outside the shaft, a continuation of the sewer should be built through the shaft wall to from a rodding and inspection eye, which should be provided with a half blank flange. If the drop pipe is inside the shaft. It should be in cast iron and it would be advantageous to provide adequate means for rodding and water cushion of 150 mm depth should also be provided. The diameter of the backdrop should be at-least as large as that of the incoming pipe

The drop pipe should terminate at its lower end with a plain or duck-foot bend turned so as to discharge its flow at 45 degree or less then to the direction of the flow in the main sewer and the pipe, unless of cast iron, should be surrounded with 150 mm of concrete.
In the case of sewer over 450 mm in diameter the drop in level may be accomplished by one of the following methods: -

(a) A cascade: - This is a steep ramp composed of steps over which the flow is broken up and retarded. A pipe connecting the two levels is often concreted under the steps to allow small flow to pass without trickling over the steps. The cascade steps maybe made of heavy-duty bricks of class- I quality (IS: 2180-1985) cement concrete with granolithic finish or dressed granite.

(b) A Ramp: - A ramp maybe formed by increasing the grade of the last length of the upper sewer to about 45 degrees or by constructing a steeply graded channel or culvert leading from the high level to the low level sewer. In order to break up the flow down the ramp and minimize the turbulence in the main sewer the floor of culvert ramp should be obstructed by raced transverse ribs of either bricks or concrete at 1.50m intervals and a stilling pool provided at the bottom of the ramp and

(c) By drop in previous successive manholes instead of providing the total drop require at the junction manholes, the same may be achieved by giving smaller deeps in successive manhole preceding the junction manhole. Thus, for example, if a total drop of 2.4m is required to be given, 0.6m drop maybe given in each of the previous three manholes and the last 0.6m-drop maybe given at the junction manhole.

11.1.4.5 Scraper (Service) Type Manhole: -

All sewers above 450mm diameter should have manhole at intervals for 110 to 120 m of scraper type. This manhole should have clear opening of 1200 X 900 mm at top to facilitate lowering of buckets.

11.1.4.6 Flushing manholes: -

Where it is not possible to obtain self-cleaning velocities due to flatness of the gradient specially at the top end of branch sewer which receive very little flow, it is essential that same form of flushing device be incorporated in the system. This can be done by making grooves at intervals of 45 to 50m in the main drains in which wooden planks are inserted & water allow to head up and which will rush on with great velocity when the planks are removed. Alternatively, an overhead water tanks is built, from which connection are made through pipe flushing hydrants to rush water to the sewer. The relevant Indian standard is :IS 4111(part two).Flushing can be very conveniently accomplished by use of fire hydrant or tanker.

Where flushing manhole is provided, they are located generally at the head of a sewer. Sufficient velocity shall be imparted in the sewer to wash away the deposited solid. The flush is usually effective up to a certain distance after which the imparted velocity gets dissipated.

The automatic systems which are operated by mechanical units gets often corroded by the sewer gases and do not generally function satisfactorily and hence are not recommended. In case of hard chock ages in sewers, care should be exercised to be ensuring that there is no possibility or back flow of sewer into the water supply mains.
Approximate quantities of water needed for flushing are as follows: -

S.No.	**Slope**	**Quantity of water (litres)**	
	200mmdia	250mmdia	300mmdia
1.	0.00502300	2500	3000
2.	0.00751500	1800	2300
3.	0.01001300	1500	2000
4.	0.0200500	800	1000
5.	0.0300400	500	700

11.2. Constructional Details: -

Manhole is usually constructed directly over the centre line of the sewer they are usually constructed with brickwork. However in areas where sewers are to be laid in high water condition manhole shall be constructed in R.C.C. They are circular, rectangular or square in shape. Manholes should be of such size as will allow necessary cleaning and inspection of manholes.

(a) Rectangular Manholes - The minimum internal sizes of rectangular manholes between brick face should be as follows:
(I) For depth of manholes less than 0.9m, 900mm x 800mm and
(ii) For depths of manholes from 0.9mm and upto 2.5m, 1200mm x 900mm

(b) **Arch type manholes -** For depth of 2.5m and above, arch type manholes can be provided and the internal size of the chambers between brick faces shall be 1400mm x 900mm. The width of manhole chamber on bents and junction of pipes with diameter greater than 450mm should be suitably increased to 900mm or more so that benching width on either side of the channel at-least 200mm.

11.3. Circular manholes -

Circular manholes are longer than rectangular and arch type manhole and thus there are preferred over rectangular as well as arch type manholes. The circular manholes can be provided for all depths starting from 0.9m circular manholes are straight down in lower portion and slanting in top portion so as to narrow down the top opening equal to internal dia.of manhole over. Depending upon the depth of manhole, the diameter of manhole changes. The internal diameter of circular manholes may be kept as following for verifying depths.

(I) For depths 0.9m and up to 1.65mm, 900mm diameter.
(ii) For depths above 1.65m and up to 2.30m, 1200mm diameter.
(iii) For depths above 2.30m and up to 9.0m, 1500mm diameter.
(iv) For depths above 9.0m and up to 14.0m, 1800mm diameter.

Typical circular manholes are shown in fig.6

If the sewer is constructed in a tunnel, the manhole should be located at the access or working shaft and the manhole chamber maybe constructed of a size to suit the working shaft or vice-versa.

The width /diameter of the manhole should not be less than internal diameter of the sewer +150mm benching as both sides (150mm$_+$ 150mm) The opening for entry into the manhole (without cover) should be such minimum diameters as to allow a workman with the cleaning equipments into the interior of the manhole without difficulty. A minimum clear opening of 60cm preferably circular is recommended. Suitable steps usually cast iron shall be provided for entry.

Access shaft for large sewers - Access shaft shall be circular in shape and shall have a minimum internal dia of 750mm, where the depth of the shaft exceeds 3m suitable dimensions shall be provided to facilitate cleaning and maintenance.

Access shaft where built of brick work should be carvel led on three sides to reduce it to the size of the opening in the cover frame, and to provide easy access on the fourth side to step iron or ladder .In determining sizes the dimensions of the maintenance equipments likely to be used in sewer, shall be kept in view.

Where the diameter of the sewer is increased, the crown of the entering leaving pipes shall be fixed at the same level and necessary slopes given in the inverted of the manholes chamber .In exceptional cases and where unavoidable the crown of the entering sewer maybe fixed at lower level but in each cases too the peak flow level of the two sewer shall be kept the same.

A slab generally of plain cement concrete at least 150mm thick should be provided at the base to support the walls of the manhole and to prevent the entry of foul water. The thickness of the base also shall be suitably increased up to 300mm, for manholes on large dia sewers, with adequate reinforcement provided to withstand excessive uplift pressures. In the case of larger manholes, the flow in the sewer should be carried in **U**-Shaped smooth channel constructed integrally with the concrete base of the manhole. The side of the channel should be equal to the dia. of the largest sewer pipe. The adjacent floor should have a slope of 1 in 10 draining to the channel. Where more than one sewer enters the manhole the flow through channel should be curved smoothly and should have sufficient capacity to carry the maximum flow.

It is desirable to place the first pipe joint outside the manhole as close as practicable. The pipe shall be built inside the wall of the manhole flush with the internal periphery protected with an arch of masonry or cement concrete to prevent it from being crushed.

The sidewalls of the manhole are usually constructed of cement brickwork 250mm thick and corbelled suitably to accommodate the frame of the manhole cover.

The inside and outside of the brickwork should be plastered with cement mortar 1:3 (1 cement: 3 coarse sand) and inside finished smooth with a coat of neat cement.

Where subsoil water condition exist, a richer mix may be used and it shall further be water proofed with addition of approved water proofing compound in a quantity as per manufacturer's specifications.

11.4 Covers and frames: -

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. When cast iron manhole covers and frames are used they shall confirm to IS 1726 (parts 1 to 7). The frames of manhole shall be firmly embedded to correct alignment and level in plain concrete on the top of masonry. After completion of the work, manhole covers shall be sealed by means of thick grease.

Where sewer are to be laid in high subsoil water conditions, manholes maybe constructed in R.C.C. of grade M 20 or 1:1.5:3. The manholes in this type of construction shall be preferably circular.

Heavy reinforced concrete covers with suitable lifting arrangements could also be used instead of C.I manhole covers. However pre-cast cement concrete covers reinforced by materials other than mild steel should be used provided that those are properly tested & certified for use by competent authority. Fibre reinforcement plastic covers (FRP) conforming to relevant IS: may be used wherever such covers are available.

11.5. Inverted siphon

11.5.1 Function and provision

In the course of laying sewers, at times it is found necessary to cross obstructions like nallah etc. Such obstruction shall be crossed by means of "Inverted Syphon" i.e. by laying the sewer under the obstruction and regaining as much elevation as possible after the obstruction 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 case of cleaning.

11.5.2. Construction

To ensure self-cleaning velocities for the wide variations in flows, generally, two or more pipes not less than 200mm dia are provided in parallel so that up to the average flows, first pipe is used and when the flow exceeds the average, the second and subsequent pipes take the balance flow. Siphons may need cleaning other than gravity sewers and hence should not have any sharp bends either horizontal or vertical. Only smooth curves of adequate radius should be used. The design criteria for inverted syphons are given in IS: 411 part -III. It is necessary to have a self-cleaning velocity of 1.0 mps for the minimum flow to avoid deposition in the line.
Provision should be made for isolating the individual pipes as well as the siphon to facilitate cleaning.
It is desirable to provide a course screen to prevent the entry of rags etc, into the siphon.

11.5.3. Inlet and outlet chambers: -

In the multiple pipe siphon, the inlet should be such that the pipes coming to action successively as the flow increases. This may be achieved by providing lateral with heights kept in accordance with the depth of flow at which one or

more siphon pipes functions. In the two-pipe siphon, the first should take 1.25 to 1.5 times the average flow and second should take the balance of the flow.

A manhole at each end of the siphon should be provided with clearance for rodding. The design of inlet and outlet chambers should allow sufficient room for entry for cleaning and maintenance of siphons. The outlet chambers should be so designed as to prevent the flow of sewage into pipes, which are not being used at the time of minimum flow.

11.6. Hatch box:

Hatch boxes of adequate size in manholes shall be provided on the pipes so as to give access into the pipes for rodding.

11.7. By pass:

Proper by pass arrangements should be provided from the inlet chamber and if required special arrangements should be made for pumping the sewage to the lower reach of sewer line. Alternatively a vacuum pump maybe provided at the outlet to overcome maintenance problems arising out of dogging and silting of siphons. If it is possible a blow off may be installed at the low point to facilitate emergency maintenance operations.

11.8 storm water inlets :-

There are device meant to admit the surface runoff to the sewers and form a very important part of the systems. Their location and design should therefore be given careful considerations.

Storm water inlets maybe 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.

The actual structure of an inlet is usually made of brickwork. Normally cast-iron gratings conforming to IS : 5961 shall be used . In case there is no vehicular traffic, fabricated steel gratings maybe used. The clear opening shall not be more than 25mm. The connecting pipe from the street inlet to the main street sewer should not be less than 200mm in dia. and should have sufficient slope.

Maximum spacing of inlets would depend upon various conditions of road surface, size and type of inlet and rainfall. A maximum spacing of 30m is recommended.

11.9. Sewer ventilators :-

In a modern, well designed sewerage system, there is no need to provide ventilation on such elaborate scale considered necessary in the past, especially with the present day policy to omit intercepting traps in house connections. The

ventilating columns/shafts are not necessary where intercepting traps are not provided. It is necessary however, 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 can do these.

11.9.1 Provision: -

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

11.9.2. Construction: -

The ventilating shaft shall consist of vertical columns of R.C.C. or cast iron about 6 to 8 metre in height and about 100 to 150mm in diameter (opening) at the top, the diameter increasing uniformly towards the bottom for stability.

The shaft shall be provided with a Crowell or fitted with a wire ground at the top. 11.9.3 If R.C.C. cover as given in item no. 11.8.4 is to be used in place of C.I. cover with frame then the following deduction shall be made in the respective item :

(a)	For item 11.2.1	Rs. 2021.00
(b)	For item 11.2.2	Rs. 2021.00
(c)	For item 11.2.3	Rs. 6172.00
(d)	For item 11.2.4	Rs. 11067.00

SEWER APPURTENANCES

S.No.	Items	Unit	Rate (Rs.)
11.1	Providing and fixing SW gully trap complete with CI grating, Brick masonry chamber in cement mortar 1:5 (i cement :5fine sand) water tight CI cover with frame of 30x30cm size including necessary Excavation, cement concrete CC 1:5:10 (1 cement: 5 fine sand: 10 graded stone aggregate 40mm size),CC 1:2:4(1cement:2coarse sand:4 graded stone aggregate 20mm nominal size) for fixing CI cover with frame,12 mm thick cement plaster 1:2 (1 cement:2 coarse sand) finished with a floating coat of neat cement complete.		
11.1.1	100x100mm size "P" Gully Trap Chamber	Each	1103.00
11.1.2	125x100mm size "p", "Q" or "S" type Gully trap chamber	Each	1158.00
11.1.3	180x150mm size "P" or "S"type	Each	1220.00
11.2	Man Holes :-Constructing Brick masonry manhole in cement mortar 1:5 (1cement:5 fine sand) RCC top slab 1:2:4(1cement:2 coarse sand:4 graded stone aggregate 20 mm nominal size) foundation concrete 1:4:8 (1cement:4coarse sand:8 graded 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 CC 1:2:4 (1cement:2 coarse sand:4 graded stone aggregate 20 mm nominal size) including finishing the channel to shape, curing etc. with CI cover with frame etc.		
11.2.1	For 1 no. 90x80x45cm deep with cover and frame of (23+15)38 kg	Each	6290.00
11.2.2	For 1 no. 90x80x60cm man hole with CI cover (light duty) of (23+15)38 kg	Each	6734.00
11.2.3	1 no. 120x90x90cm deep manhole including CI cover 500 mm internal diameter with weight of cover and frame 116kg (58 kg cover + 58 kg frame)	Each	16537.00

S.No.	Items	Unit	Rate (Rs.)
11.2.4	1 no. manhole of size 120x90x90cm deep including CI cover with frame 560 m internal diameter, total weight of cover and frame not less than 208 kg (108 kg weight of cover and 100kg weight of frame) with chamber	Each	22354.00
11.3	Extra for depth up to 1.00 m for man holes over item 11.2		
11.3.1	90x80cm size manhole	per meter	3338.00
11.3.2	120x90cm size manhole over item.	per meter	3922.00
11.4	Construction of circular type manhole 1500 mm internal dia. of bottom, 560 mm dia at top in brick masonry with 1:5 cement mortar (1 cement : 5 fine sand), Cement plaster 1:3(1cement : 3 sand) finished with a floating coat of neat cement RCC 1:2:4 top slab (1 cement : 2 sand : 4 graded stone aggregate 40mm nominal size , and making channel in cement concrete 1:2:4 mix (1cement :2 sand :4 graded stone aggregate 20mm nominal size) neatly finished curing fixing of ISI marked reinforced concrete heavy duty cover including transportation etc. complete. For depth up to 2650 mm	Each	15120.00
11.4.1	For1 no. manhole 2650 mm deep with 116 kg weight of (cover + frame) of one circular type manhole	Each	20111.00
	Extra for depth for circular type manholes over item 11.4		
11.4.2	Depth 2.65m to 4.25 m per meter depth	per meter	8044.00
11.4.3	Depth 4.25m to 9.75m	per meter	11061.00

S.No.	Items	Unit	Rate (Rs.)
11.4.5(a)	Construction of circular type manhole 900 mm internal dia. of bottom, 560 mm dia at top in brick masonry with 1:5 cement mortar (1 cement : 5 fine sand), Cement plaster 1:3(1 cement : 3 sand) finished with a floating coat of neat cement RCC 1:2:4 top slab (1 cement : 2 sand : 4 graded stone aggregate 40mm nominal size , and making channel in cement concrete 1:2:4 mix (1cement :2 sand :4 graded stone aggregate 20mm nominal size) neatly finished curing fixing of ISI marked heavy duty reinforced concrete cover etc. complete. Up to depth of 900 mm.	Each	6191.00
11.4.5(b)	Add extra up to a depth of 1650mm	Each	2476..00
11.4.6(a)	Construction of circular type manhole 1200mm internal dia. of bottom, 560mm dia at top in brick masonry with 1:5 cement mortar (1 cement : 5 sand), Cement plaster 1:3(1 cement : 3 sand) finished with a floating coat of neat cement RCC 1:2:4 top slab (1 cement : 2 sand : 4 graded stone aggregate 40mm nominal size , and making channel in cement concrete 1:2:4 mix (1cement :2 sand :4 graded stone aggregate 20mm nominal size) neatly finished curing fixing of ISI marked heavy duty reinforced concrete cover etc. complete. Up to depth of 1650 mm.	Each	10177..00
11.4.6(b)	Add extra per meter up to a depth of 2300 mm	Per meter	2951.00
11.5	Providing MS foot rests and fixing in manhole with CC blocks of 1:3:6 (1 cement:3 sand : 6 graded stone aggregate 20mm nominal size) of size 20x20x10cm		
11.5.1	With 20mm square bar one foot rest	Each	178.00
11.5.2	With 20mm round bar foot rest	Each	156.00
11.6	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 1:2:4 (1 Cement plastered with CM 1:3:3 coarse sand) finished with a floating coat of neat cement		

S.No.	Items	Unit	Rate (Rs.)
	and making necessary channels etc. complete.		
11.6.1	For 100 to 250 mm dia pipes	Each	270.00
11.6.2	For 250 to 300 mm dia pipes	Each	327.00
11.6.3	For 350 to 450 mm dia pipes	Each	435.00
11.7	Providing SCI drop connection with SCI drop pipe and bend encased alround with CC 1:5:10 (1 cement: 5 fine sand: 10 graded stone aggregate 40 mm 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 & SCL pipes with stiff cement mortar 1:1(1 cement: 1sand) including making required channel etc. complete. (i) For 100 mm drop connection one No. (ii) For 150mm dia drop connection will be 150% of 100mm dia. (iii) Extra rate shall be payable for depths of drop more than 60 cm	 each each per meter	 2818..00 4228.00 846.00
11.8	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 concrete 1:5:10 (1 cement :5fine sand :10 graded stone aggregate 40mm nominal size)		
11.8.1	45x45x77.5cm with vertical grating for 1 No. chamber	each	2208.00
11.8.2	Chamber 50x45x60cm with 500x450mm CI Horizontal grating with frame.	each	1888.00
11.8.3	Chamber 110 x 50 x 77.5cm with horizontal and vertical gratings both.	each	3846.00
11.8.4	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	1660.00

S.No.	Items	Unit	Rate (Rs.)
	2. 600 mm dia heavy duty	Each	2080.00
	3. 560 mm dia extra heavy duty	Each	2160.00
	4. 600 mm x 900 mm extra heavy duty rectangular	Each	3850.00
	5. 450 mm x 900 mm extra heavy duty rectangular	Each	2780.00

CHAPTER XII

ALLIED CIVIL WORKS

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ALLIED CIVIL WORKS

Excavation And Preparation Of Trench

12.1 The rates for various items of civil works given in this chapter shall be applicable for the civil works connected with laying and jointing of water supply and sewerage pipeline works only. These rates shall not be applicable for the items of civil works for which the rates has already given in the relevant chapters.

12.2 The trenches shall run in perfectly straight line between points or manholes, as shown on the approved drawings.

12.3 The excavation of the trench shall be commenced at the downstream end of the sewer and be continued up the gradient.

12.4 The trench shall be excavated only so far in advance of pipe laying as specified by the Engineer in Charge. It shall usually be so regulated as to enable the excavation to be completed about one day in advance of pipe laying.

12.5 The trench shall be so shored and drained that the workmen may work there in safely and efficiently.

12.6 The trench shall be kept free from water. Excavation below water table shall be done after dewatering trenches. The discharge of the trench dewatering pumps shall be conveyed either to discharge channels or to natural drains.

12.7 The excavation shall be carried out with manual labour or with suitable mechanical equipment as approved by the Engineer in charge.

12.8 When the pipeline is under a roadway, a minimum cover of 100 cm is recommended for adoption but it may be modified to suit local conditions and in case of A.C. pipe a cover of at least 1.25 m is provided. Where the pipe line or drains crosses the road, the road crossing shall be excavated half at a time, the 2nd half being, commenced after the pipes have been laid in the 1st half and the trench refilled. Necessary safety measures for traffic as directed shall be adopted. All water mains; cables and any other such services etc. met within the course of excavation shall be carefully protected and supported. Care shall be taken not to disturb the electrical and communicator cable met with during course of excavation, removal of which if necessary shall be arranged by the engineer in charge.

12.9 Trench shall be of sufficient width to provide a free working space on either side of pipe. At the bottom between the faces, it shall be such as to provide not less than 200mm clearance on either side of pipe. Additional width shall have to be provided at position of sockets, flenges, D.Joints for jointing. Depth of pit at such places shall also be sufficient to permit finishing of joints.

12.10 In obtaining the formation of the bottom of the trenches in case of sewer line, the usual method of using sight rails and boning rods shall be adopted during the whole of the process. The sight rails shall be fixed at all changes of direction or gradient and at suitable intervals, which may not be more than 15 meters apart, before excavation is started. The centre line shall be marked on each horizontal rail, which is fixed at true level.

12.11 The excavation shall be boned in at least once in every 2 meters, the foot of the boning rod being set on a block of wood of the exact thickness of the material of the pipes.

12.12 Except where special foundations are to be provided, the trench shall be excavated in accordance with one of the following alternatives as may be considered appropriate by the Engineer in charge.

(a) The trench shall be excavated to the exact gradient specified so that no making of the sub grade by back filling is required and the concrete bed, where required, may be prepared with greatest ease giving a uniform and continuous bearing and support for the pipe.

(b) When the bottom of the trench at the specified gradient is found to be unstable or to include ashes and cinders, all types of refuse, vegetable or other organic material, or large pieces or fragments of inorganic material, they shall be removed to the satisfaction of the Engineer in charge. Before laying the concrete bed, where necessary, the specific gradient shall be attained by back filling with an approved material in compacted layers of 8 cm. The layers shall then be tamped as directed by the Engineer in Charge.

(c) The bed of the trench, if in soft or made up earth, shall be well watered and rammed before laying the pipes and the depression. If any shall be properly filled with approved earth and consolidated in 20 cm layer.

(d) The bed of the trench, if in B.C. Soil, shall be excavated 20cm more than the normal depth and then filled up by moorum.

12.13 If the sides of the trench are not vertical the toes of the side slopes shall end at the top of the pipe and practically, vertical sided trench shall be dug from these down to the sub grade.

12.14 The bottom of the trench shall be properly trimmed off to present a plain surface and all irregularities shall be levelled.

12.15 Where rock and large stone or boulders are encountered the trench shall be trimmed to a depth of at least 8 cm below the level at which the bottom of the barrel of the pipe is to be laid and the trench brought back to the required grade by filling with selected fine sand broken stone (passing sieve of 12.5mm aperture size) and compacted so as to provide a smooth bedding for the pipes.

12.16 After the Excavation of the trench is completed hollows shall be cut at required position to receive the socket of the pipe and these hollows shall be of sufficient depth to ensure that the bearer of the pipe shall rest throughout their entire length on the solid ground and that sufficient space left for joining the under side of the pipe joint. These socket holds shall be refilled with sand after joining the pipe.

12.17 Where the bottom of the trench at sub grade is found to consist of material which is unstable to such a degree that, in the opinion of the Engineer in charge, it cannot be removed and replaced with an approved material thoroughly compacted in place to support the pipe properly, a suitable foundation for the consist of piling, timbers or other materials, in accordance with plan prepared by the Engineer in Charge shall be constructed.

12.18 Trench excavation in rock in inhabited areas should be done by hammering and chiselling or other appropriate mechanical means but not by blasting.

12.19 Excavation for trenches in rock by blasting shall be permitted only in open areas, with the written permission of the competent authority, after the Engineer in charge has satisfied himself that there is no danger to persons or property if blasting is done in that area. All necessary licenses etc shall be the responsibility of the contractor.

12.20 Proper precautions shall be taken for the protection of persons or property during blasting by the contractor after obtaining necessary permission for blasting from the concerned authorities..

12.21 The hours of blasting shall be fixed by the Engineer in charge in consultation with the concerned local authorities.

12.22 The procedure of blasting shall conform to the requirements of local administration controlling authorities.

12.23 Open cut deep trenches in bad ground shall be sheeted and braced as required by local municipal regulations and as may be necessary to protect life, property or the work. Payment shall be regulated as per terms of the agreement.

12.24 When close sheeting is required, it shall be so driven as to prevent adjacent soil from entering the trench either below or through such sheeting for which no extra payment shall be made.

12.25 Engineer in charge shall have the right to order the sheeting to be driven to the full depth of the trench or to such additional depths as may be required for the protection of the work, as per manual on water supply and sewage and sewage treatment (1993 Second edition) for which no extra payment shall be made.

12.26 Where the soil in the lower limits of a trench has the necessary stability, the Engineer in charge at his discretion, may permit stopping of the driving of sheeting at some designated elevation above the trench bottom for which no extra payment shall be made.

12.27 Sheeting done in trenches near heavy or important buildings shall be left in ground, if any settlement of the buildings is anticipated as per direction of Engineer in Charge and for which no extra payment shall be made.

12.28 Sheeting and bracing which have been ordered left in place should be removed for a distance of 90 cm. below the established street level or the existing surface of the street whichever is lower for which no extra payment shall be made.

12.29 Trench bracing, except that which has been left in place may be removed after the back filling has been completed or has been brought up to such an elevation as to permit its safe removal for which no extra payment shall be made.

12.30 Sheeting and bracing may be removed before filling the trench, but only in such manner as will ensure the adequate protection of the completed work and adjacent structures.

12.31 All surface materials which in the opinion of the Engineer in charge, are suitable for reuse in restoring the surface, shall be kept separate from the general excavation material as directed by the Engineer in charge.

12.32 The excavated material shall be not placed within one meter or half of the depth of the trench, whichever is greater, from the edge of the trench. The excavated material shall be separated and stacked so that in refilling it may

be re laid and compacted in the order to the satisfaction of the engineer in charge.

12.33 (a) If the hard rock is found throughout the depth, then the trench after pipe laying should be filled up with good excavated earth except B.C. soil, if available within 50m lead, on either side of pipe and up to 30cm above the pipe and remaining depth shall be filled up with excavated hard rock. The balance hard rock shall be compulsorily issued to the contractor at such issue rate, which are specified in the contract agreement. after maintaining proper M.A.S. account. If good soil and hard rock in excavation is obtained, then suitable action as explained above shall be taken accordingly.

If hard rock in excavation is obtained throughout the length and no good soil is obtained on either side within 50m of excavation then it shall be filled up by moorum and payment shall be made as per item No. 12.8. In this case overall rock shall be compulsorily issued on the rates, to be specified in the contract agreement. after maintaining proper M.A.S. account. Payment shall be regulated as per terms of agreement at appropriate rate.

12.33 (b) In case of B.C. soil the side of pipe and filling above 30 cm of pipe shall be done by moorum and balance depth shall be filled up by excavated B.C. Soil.

12.34 Hydrants under pressure, surface boxes, fire or other utility controls shall be left unobstructed and accessible until the work is completed.

12.35 Gutters shall be kept clear or other satisfactory provisions made for street drainage and natural watercourses shall not be obstructed.

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

12.37 All materials, piles, equipment and pipe which may serve as obstructions to traffic shall be enclosed by fences or barricade and shall be protected by proper lights when the visibility is poor.

12.38 The rules and regulations or the local authority regarding safety provisions shall be observed.

12.39 The work shall be carried in such a manner, which will cause the least interruption to traffic, and the road or street may be closed in such a manner that it causes the least interruption to the traffic.

12.40 Where it is necessary for traffic to cross open trenches, suitable cross over planks shall be provided.

12.41 Suitable signs indicating that a street is closed shall be placed and necessary detour signs for the proper maintenance of traffic shall be provided.

12.42 Temporary support, adequate protection and maintenance of all underground and surface structure, drains, sewers and other obstructions encountered in the progress of the work shall be provided under the direction of the Engineer in charge.

12.43 The structure, which may have to be disturbed, shall be restored upon completion of the work.

12.44 Trees, shrubbery, fences, poles and all other property and surface structures shall be protected unless their removal is shown on the drawing or authorised by the Engineer in charge.

12.45 Root of trees within a distance of about 0.5m from the site of the pipeline shall be removed or killed for which no extra payment shall be made.

12.46 No valve or other control of the existing serving shall be operated without the permission of the Engineer in charge.

12.47 The rates include the element of hire and running charges of all types of plants, machinery & equipment, required to complete the work, unless specified otherwise.

12.48 The rates also include the element of testing of samples of various materials brought by contractor for use on the work, as well as other necessary test for item of work as stipulated in the specifications.

12.49 The work should not be accepted in any case if the contractor fails to observe the instruction of department regarding testing of material.

12.50 Before making any payment, it will be responsibility of the officer making payment to assure that all tests are as per prescribed frequency have been carried out and found as per requirement.

12.51 The contractor shall have to provide bound ruled register named as Site Order Book it shall be kept in the charge of Deptt. Supervisory staff inspecting officer will enter their remarks in this book which will be noted by contractor or his authorized representative for compliance and report

As mentioned in para 12.9, the width of excavation shall be as per specification given in the relevant I.S. Specification. The bottom width, which shall be kept as minimum required for the work as per ISS and if the depth of the trench is more the top width shall depend on the angle of repose for a particular type of soil where the pipe line is to be laid.

12.52 The rate for cutting and making in the same condition include all lead of the material.

12.53 The contractor shall be fully responsible to carry out the work in a most safe way and he shall be fully liable and responsible for any accidents due to any reason, during the currency of the contract.

II. SPECIFICATION FOR CIVIL WORKS

All the civil works shall be done strictly as per relevant I.S. Specifications and all the materials shall also confirm to the relevant I.S. Specifications. All the necessary tests of material and work shall be carried out for each work. Where applicable, the contractor shall also submit manufacturer's test certificates for materials to the Engineer in Charge.

Materials Specification

(a) Cement :

Cement to be used in the work shall be any of the following types with prior approval of Engineer-in-charge.

Ordinary Portland cement 43 or 53 grade confirming to IS : 8112-1489 or P.P.C. conforming to I.S. : 1489 bearing ISI mark.

(b) Coarse Aggregate :

coarse aggregate consist of clear, hard, strong, dense, nonporous and durable pieces of crushed stone. They shall not consist pieces of elongated particles salt, alkali, vegetable matter or other deleterious material.

All coarse aggregate shall confirm to IS:383 & tests for conformity shall be carried out as per IS:2386 Part I to VIII. The maximum value of flakiness index for coarse aggregate shall not exceed 35%. The coarse aggregate shall satisfy the following requirement of grading.

I.S. Sieve	Percentage by Weight Passing the Sieve		
	40mm	**20mm**	**12.5mm**
63mm	100	--	--
40mm	95 – 100	100	--
20mm	30 - 70	95 – 100	100
12.5mm	--	--	90 – 100
10mm	10 – 35	25 – 55	40 – 85
4.75mm	0 – 5	0 – 10	0 – 10

(c) Sand / Fine Aggregate :

Sand shall not contain dust, lumps, soft or flaky materials fine aggregate having positive alkali silica reaction shall not used. All fine aggregate shall confirm to IS : 383. The fineness modular of fine aggregate shall neither be less than 2.0 nor greater than 3.5. Sand to be used in work shall confirm to IS-1542-1960 for plaster and IS-166-1965 for masonry work.

(d) Water :

Water used for mixing and curing shall be clean and free from injurious amounts of oils, acids, salts, sugar, organic material or other substances that may be deleterious to concrete potable water in generally consider satisfactory for mixing and curing of concrete.

(e) Steel :

For R.C.C. works steel to be used shall confirms to IS-1786. All steel be procured from original producer and no re-rolled steel shall be used in the work. Only new steel shall be delivered to site. Brittle burnt, defective, cracked bar shall be discarded.

(f) Concrete :

Normally concrete shall be mixed either in a concrete mixer or in a batching & mixing plant. Hand mixing is prohibited and under unavoidable circumstances it should be done only with the prior permission of Engineer-in-charge. Mixing shall be continue till materials are uniformly distributed and a uniform colour of entire mass is obtained and each particle of aggregate shows coating of cement. In no case mixing shall be done for less than 2 minutes. Concrete shall be transported and placed as near as practicable to its final position within 30 minutes of its discharge from the mixer.

(i) Structural steel shall be of tested, standard quality confirming to IS-226-69 and commercial quality shall confirm to IS-1977-69.

(ii) Steel work riveted or bolted shall confirm to IS-1148-1968 and IS-800-1962.

(iii) Welding of steel shall be electric arc welding as per IS-816-1956 and shall be on the lines given in 800-1962.

(iv) Rolled steel section for fabrication of steel shall confirm to IS-7452-1974.

(v) Rates of steel angle includes all forgoing, reducing to required size, shape and figure, drilling, tapping, punching etc. and every description of workmanship that may be necessary to fabricate, finish, erect and fix in position in perfect manner.

(g) Bricks :

(i) The brick work shall be carried out as per relevant I.S. Specifications and the drawing, specification and direction by the Engineer-in-charge.

(ii) Burnt clay bricks shall confirm to the requirement of IS-1077. They shall be free from cracks and flaws and nodules of free lime. The brick shall have smooth rectangular faces with sharp edges and corners.

(iii) Cement mortar for work shall be as per the relevant specification.

(iv) All bricks shall be thoroughly socked in tank filled with water for minimum period one hour prior to being laid Such socked bricks shall be stacked on a clean place where they are not contaminated with earth / dirt etc.

(v) The thickness of joint shall not exceed 10mm

(vi) The Brick work shall be built in uniform layers.

(vii) Brick work shall be done true to plumb in specified manner. All courses shall be laid truly horizontal and vertical joints shall be truly vertical.

(viii) In case of vertical or inclined joints proper bond between old and new masonry has to ensured by interlocking the bricks.

(ix) Green work / fresh work shall be protected from rain by suitable covering and shall be kept constantly moist on all faces for minimum of 7 days.

MORTAR :

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. 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 still paste.

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

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 mt. 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 not be damaged during curing. It shall be kept wet for a period of at least 7 days.

FORM WORK :

(i) Form work shall include all temporary form for forming concrete of shape with all props, staging, centring required for support.

(ii) All material shall confirm to relevant I.S. specifications

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

(iv) 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.

(v) 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 mt. 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.

ALLIED CIVIL WORKS

S.No.	Items	Unit	Rates in
12.1	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	107.00
12.2	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 cum	161.00
12.3	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. (b) Hard rock requiring blasting. (c) Hard rock requiring chiseling / where blasting is prohibited.	 Per cum Per cum Per cum	 263.00 311.00 331.00
12.4	Extra for every additional lift of 1.5m or part there of over item 12.1 to 12.3.	Per cum	3.00
12.5	Extra for every additional lead up to 50 m or part thereof over item 12.1 to 12.3.	Per cum	34.00
12.6	Pumping out water caused by springs, tides or river seepage, broken water mains or drains or the like	Per KL	39.00
12.7	(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 (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 Per Cum	17.00 11.00
12.8	Filling with moorum for pipe bedding or over the pipe including supply of moorum	Per cum	170.00

S.No.	Items	Unit	Rates in
12.9	Demolishing Brick work in lime or cement mortar in any mix including stacking of serviceable material and disposal of unserviceable material with in 50 meter lead.	Cum	262.00
12.10	Demolishing stone rubble masonry in lime mortar including stacking of serviceable material and disposal of unserviceable material with in 50 meter lead	Cum	141.00
12.11	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	307.00
12.12	(a) Dismantling stone set paving of any thickness in cement or lime mortar of any ratio including all leads and lifts.	Sqm	32.00
	(b) Dismantling kharanja of any thickness in cement mortar of any mix.	Sqm	28.00
12.13	(a) Fixing in cement mortar 1:6 (1 cement : 6 sand) stone slab 30 mm thick.	Sqm	72.00
	(b) Labour only for fixing of stone set paving of any thickness.	Sqm	29.00
	(c)Fixing in C.M. 1:6 Kharanja of any thickness	Sqm.	115.00
	(d) Labour only for fixing of stone in Kharanja.	Sqm	28.00
12.14	Restoring the W.B.M. Road excavated for laying of pipeline by providing laying and compacting of WBM sub-base/base course including preparation and compaction of sub-base and spreading of clean and crushed aggregate to proper grade and camber including application of screenings for interlocking, sprinkling of water and rolling with power roller with grading material (63 mm to 45 mm size) with moorum as screenings.	Cum	403.00

S.No.	Items	Unit	Rates in
12.15	Restoring the bituminous surface of the road excavated for laying of pipeline by providing 20mm thick open graded premix carpet (O.G.P.C.) consists of laying and compacting open graded carpet composed of premixed aggregate 13.2 mm size @ 0.18 cum/ 10sq.m. with bitumen binder @ 14.6 kg/ 10 sqm including providing primer coat with bituminous emulsion at the rate of 9.0 kg/ 10sqm. Over granular base and providing tack coat with bitumen over granular surface (not primed) i/c preparation of surface mixed in hot mix plant and hot laid with paver finisher and rolled with smooth wheeled tendem type roller (Minimum thickness of (O.G.P.C.) shall not be less than 20mm at any place).	Sqm	1184.00
12.16	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	1:5:10	cum	1632.00
ii	1:4:8	cum	1815.00
iii	1:3:6	cum	1835.00
iv	1:2:4	cum	2604.00
(b)	In walls & Superstructure up to 4 mt. height above plinth (with 40mm nominal graded metal)		
i.	1:3:6	cum	2077.00
ii.	1:2:4	cum	2646.00
12.17	Providing & laying mechanically mixed cement concrete 20mm nominal size graded crushed stone excluding cost of centering & shuttering.		
(a)	In Plinth & foundation		
i	1:3:6	cum	2123.00
ii	1:2:4	cum	2624.00
iii	1:1$^{1}/_{2}$:3	cum	3025.00
iv	1:1:2	cum	3907.00

S.No.	Items	Unit	Rates in
(b)	In walls and superstructure up to 4 mt. height above plinth (with 20mm nominal graded metal)		
i	1:3:6	cum	2140.00
ii	1:2:4	Cum	2646.00
iii	1:1 1/2:3	Cum	3050.00
iv	1:1:2	cum	4112.00
12.18	**REINFORCED CEMENT CONCRETE**		
(a)	Providing & laying mechanically mixed R.C.C. excluding centering & shuttering and reinforcement in foundation/plinth (20mm graded metal)		
i	M 20	cum	2613.00
ii	M 25	cum	3021.00
iii	M 30	cum	4091.00
(b)	Providing & laying mechanically mixed R.C.C. excluding centering & shuttering and reinforcement in superstructure up to 4 mt. height above plinth level (20mm graded metal)		
i	M 20	cum	2718.00
ii	M 25	cum	3140.00
iii	M 30	cum	4247.00
12.19	**STEEL**		
A	Providing and placing in position cold twisted steel and hot rolled deformed steel reinforcement for R.C.C. work including cutting, bending, binding etc. complete including cost of binding wire and wastage.	Kg	44.00
B	Steel work in single section including 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	60.00
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	61.00
D	Steel work is welded in built-up section tee & frame including cutting hoisting/fixing and painting with red lead paint		

S.No.	Items	Unit	Rates in
	painting with red lead paint.		
	(i) In R.S. Joint in flat iron /angle / channel /bar.	Kg	63.00
12.20	**CEMENT MORTAR**		
A	Cement Mortar 1:3 (1 Cement : 3 sand)	Cum	2551.00
B	Cement Mortar 1:4 (1 Cement : 4 sand)	Cum	2057.00
C	Cement Mortar 1:5 (1 Cement : 5 sand)	Cum	1712.00
D	Cement Mortar 1:6 (1 Cement : 6 sand)	Cum	1497.00
E	Cement Mortar 1:8 (1 Cement : 8 sand)	Cum	1239.00
12.21	**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 20% in foundation & plinth.		
i.	In Cement Mortar 1:3	Cum	2576.00
ii.	In Cement Mortar 1:4	Cum	2413.00
iii.	In Cement Mortar 1:5	Cum	2462.00
iv.	In Cement Mortar 1:6	Cum	2259.00
(b)	Brick work with well burnt chimney bricks having crushing strength not less than 25 kg/cm^2 and water absorption not more than 20% above plinth level up to four meter		
i.	In Cement Mortar 1:3	Cum	2634.00
ii.	In Cement Mortar 1:4	Cum	2501.00
iii.	In Cement Mortar 1:5	Cum	2529.00
iv.	In Cement Mortar 1:6	Cum	2308.00
(c)	Extra rate for Brick work with well burnt chimney bricks having crushing strength not less than 25 kg/cm^2 and water absorption not more than 20% above four meter height.	Cum	74.00
(d)	Half brick work with well burnt chimney bricks water absorption not less than 25kg/cm ^{2} and water absorption not more than 20% is superstructure up to 4 mt. height.		
i.	Cement mortar 1:4	Sqm	275.00
ii.	Cement mortar 1:6	Sqm	271.00

S.No.	Items	Unit	Rates in
(e)	Brick work with open bhatta bricks having crushing strength not less than 20 Kg/ cm^2 and water absorption not more than 25 % in foundation of plinth. In cement mortar 1:8	Cum	1484.00
12.22	**PLASTER**		
(a)	12mm thick cement plaster in single coat including finishing even, smooth and curing complete.		
i.	1:3(Cement 1: Sand 3)	Sqm	83.00
ii	1:4(Cement 1: Sand 4)	Sqm	74.00
iii	1:5(Cement 1: Sand 5)	Sqm	68.00
iv	1:6(Cement 1: Sand 6)	Sqm	64.00
(b)	15mm thick cement plaster in single coat finished even, smooth and curing complete		
i.	in CM 1:3	Sqm	97.00
ii	in CM 1:4	Sqm	86.00
iii	in CM 1:5	Sqm	79.00
iv	in CM 1:6	Sqm	75.00
v.	Neat cement punning	Sqm	12.00
(c)	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 complete.	Sqm	99.00
12.23	**FORM WORK**		
(a)	Providing and fixing form work i/c centering, shuttering, strutting, staging, propping, bracing etc. complete and i/c removal of Form work.		
i.	Foundation/ footing/ column base/ plinth beam/ slabs of any shape and size up to plinth level	Sqm	78.00
ii.	Walls of any thickness included attached buttresses etc.	Sqm	112.00
(b)	Providing and fixing form work i/c centering, shuttering, strutting, staging, propping, bracing etc. i/c removal of Form work. and up to 4 mtr. height.		

S.No.	Items	Unit	Rates in
i.	Beam/Lintel/Cantilever/Walls/slabs	Sqm	92.00
ii.	Column (Rect. Square, Circular), Pillars, abutments posts & stairs	Sqm	166
12.24	Providing and fixing of sheeting including necessary bracing in order to maintain the stability of soil and if necessary sheeting may be left under as per the instruction of Engineer in Charge.	Sqm	54.00
12.25	Hammer dressed coursed rubble masonry in foundation and plinth in C.M. 1:6	Cum	1663.00
12.26	White washing with white lime & indigo to give and even shade after removal of dirt, dust mortar drop etc. on new work (three or more coats)	Sqm	5.00
12.27	Providing and fixing 1 mm thick M.S. sheet shutters with frame and diagonal braces of 40X40X6 mm angle iron, 3.15mm M.S. gusset plates at the junction and corners including necessary fitting complete including applying a priming coat of approved steel primer with diagonal braces and central cross piece of M.S. angle/flats as required.	Sqm	1674.00
12.28	Painting (two or more coats) with synthetic enamel paint on new work over and including an under coat of suitable shade without priming coat to give an even shade.	Sqm	30.00
12.29	Finishing walls with water proofing cement paint (Snowcem / Durocem etc.) of required shade. on new work (two or more coats applied @ 3.84Kg. /10 sqm.)	Sqm.	31.00

CHAPTER XIII

MISCELLANEOUS

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MISCELLANEOUS

NOTES:

13.1. The rates include all tools and plants, chain, pulley blocks, other appliances etc. required for execution of the works.

13.2 The works to be executed in accordance with the I.S.Specifications, General specifications in vogue in P.H.E. Department and the special notes if any covered under the N.I.T. of the work.

13.3 Rates for items of cutting and making good roads etc. include lead for the materials.

13.4 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 for 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.

13.5 During the course of execution, it sometimes becomes necessary to provide a non-standard special to fit into the pipeline. This can be made out of steel plates.

13.6 All materials shall conform to relevant ISS.

13.7 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 an 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.

13.8 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.

13.9 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.

13.10 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.

MISCELLANEOUS

S. No.	Items	Per	Rates in Rs.
13.1	Labour for cutting following cast iron pipes of any type and class.		
	80 mm dia.	Cut	18.00
	100 mm dia.	Cut	24.00
	150 mm dia.	Cut	46.00
	200 mm dia.	Cut	61.00
	250 mm dia.	Cut	77.00
	300 mm dia.	Cut	107.00
	350 mm dia.	Cut	122.00
	400 mm dia.	Cut	138.00
	450 mm dia.	Cut	153.00
	500 mm dia.	Cut	184.00
	600 mm dia.	Cut	214.00
	700 mm dia.	Cut	230.00
	750 mm dia.	Cut	245.00
	800 mm dia.	Cut	275.00
	900 mm dia.	Cut	306.00
13.2	Labour for cutting following Asbestos Cement Pressure Pipes of any type and class.		
	80 mm dia.	Cut	9.00
	100 mm dia.	Cut	12.00
	150 mm dia.	Cut	23.00
	200 mm dia.	Cut	30.00
	250 mm dia.	Cut	38.00
	300 mm dia.	Cut	53.00
	350 mm dia.	Cut	61.00
13.3	Labour for cutting following P. V. C. Pipes of any type and class.		
	80 mm dia.	Cut	4.00
	100 mm dia.	Cut	6.00
	150 mm dia.	Cut	11.00
	200 mm dia.	Cut	15.00
13.4	Labour only for cutting following Ductile Iron pipes of any type and class.		
	80 mm dia.	Cut	16
	100 mm dia.	Cut	22
	150 mm dia.	Cut	41
	200 mm dia.	Cut	55
	250 mm dia.	Cut	69

S. No.	Items	Per	Rates in Rs.
	300 mm dia.	Cut	96
	350 mm dia.	Cut	110
	400 mm dia.	Cut	124
	450 mm dia.	Cut	138
	500 mm dia.	Cut	166
	600 mm dia.	Cut	193
	700 mm dia.	Cut	207
	750 mm dia.	Cut	221
	800 mm dia.	Cut	248
	900 mm dia.	Cut	275
13.5	Labour for cutting following Galvanised Iron (MS) Pipes of any type and class.		
	15 mm dia.	Cut	3
	20 mm dia.	Cut	5
	25 mm dia.	Cut	7
	32 mm dia.	Cut	8
	40 mm dia.	Cut	10
	50 mm dia.	Cut	12
	65 mm dia.	Cut	14
	80 mm dia.	Cut	15
	100 mm dia	Cut	18
	125 mm dia	Cut	21
	150 mm dia	Cut	24
13.6	Chamfering cast iron pipes of all types and classes to make suitable for tyton joints.		
	Up To150 mm dia.	End	349.00
	200 mm dia.	End	437.00
	250 mm dia.	End	480.00
	300 mm dia.	End	546.00
	400 mm dia.	End	655.00
	450 mm dia.	End	712.00
	500 mm dia.	End	764.00
	600 mm dia.	End	874.00
	700 mm dia.	End	983.00
	750 mm dia.	End	1092.00
	800 mm dia.	End	1201.00
	900 mm dia.	End	1310.00
	1000 mm dia.	End	1420.00

S. No.	Items	Per	Rates in Rs.		
13.7	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 60 mtrs.		LA	A	B
	80 mm dia.	R.Mtr.	5.00	5.00	6.00
	100 mm dia.	R.Mtr.	6.00	7.00	7.00
	125 mm dia.	R.Mtr.	8.00	9.00	9.00
	150 mm dia.	R.Mtr.	10.00	11.00	12.00
	200 mm dia.	R.Mtr.	14.00	16.00	17.00
	250 mm dia.	R.Mtr.	20.00	22.00	23.00
	300 mm dia.	R.Mtr.	26.00	28.00	30.00
	350 mm dia.	R.Mtr.	32.00	35.00	38.00
	400 mm dia.	R.Mtr.	39.00	43.00	46.00
	450 mm dia.	R.Mtr.	47.00	52.00	56.00
	500 mm dia.	R.Mtr.	55.00	60.00	65.00
	600 mm dia.	R.Mtr.	74.00	81.00	87.00
	700 mm dia.	R.Mtr.	96.00	101.00	114.00
	750 mm dia.	R.Mtr.	108.00	118.00	128.00
	800 mm dia	R.Mtr.	121.00	131.00	142.00
	900 mm dia	R.Mtr.	147.00	160.00	174.00
	1000 mm dia.	R.Mtr.	177.00	193.00	208.00
13.8	Manufacturing and supply of specials made out of M.S. steel plates as per design to be approved by the Engineer in Charge, in shapes and sizes required by site conditions including cost of steel plates & other electrical & mechanical material complete.	P. Kg.	69.00		
13.9	Providing & fixing in position Cast Iron Manhole Covers and frame conforming to IS-1726. All the exposed edges rounded end finished in cement mortor 1:3 etc. complete.	P. Kg.	55.00		
13.10	Labour only for fixing in position Cast Iron Manhole Covers & frame conforming to IS-1726.	P. Kg.	2.00		

S. No.	Items	Per	Rates in Rs.	
13.11	Providing and fixing of ISI marked precast reinforced cement concrete manhole cover including frame and transporting at site , cost of material etc.			
	1. 560 mm dia. heavy duty	Each	1660.00	
	2. 600 mm dia heavy duty	Each	2080.00	
	3. 560 mm dia. extra heavy duty	Each	2160.00	
	4. 600mmX900 mm extra heavy duty rectangular	Each	3850.00	
	5. 450mm X 900 mm extra heavy duty rectangular	Each	2780.00	
13.12	Unloading from railway wagon, pipes and machinery			
(a)	Pipes upto 500 mm dia and machinery below 1.00 tonne	Tonne	19.00	
(b)	Pipes 500 mm dia and above heavy Machinery weighing more than one tonne require use of crane etc.	Tonne	102.00	
13.13	Stacking of pipe and machinery at station Yard.	Tonne		56.00
13.14	Carriage of Material by Mechanical transport including loading unloading & stacking etc.			
13.14.1	Lime, Alum., Bleaching Powder	**Distance**	**Per**	**Rates in Rs.**
	1. Distance	1 Km.	Cum	38.00
	2. Distance	2 km	Cum	45.00
	3. Distance	3 km	Cum	51.00
	4. Distance	4 km	Cum	59.00
	5. Distance	5 km	Cum	64.00
	6. Beyond 5km upto 10km. add per km		Cum	5.11
	7. Beyond 10km. upto 20km. add per km.		Cum	4.96
	8. Beyond 20km. add per km.		Cum	4.34
13.14.2	Earth & Moorum			
	1. Distance	1km	Cum	48.00
	2. Distance	2 km	Cum	56.00

S. No.	Items	Per	Rates in Rs.	
	3. Distance	3 km	Cum	64.00
	4. Distance	4 km	Cum	73.00
	5. Distance	5 km	Cum	80.00
	6. Beyond 5km upto 10km. add per km		Cum	6.39
	7. Beyond 10km. upto 20km. add per km.		Cum	6.20
	8. Beyond 20km. add per km.		Cum	5.42
13.14.3 (a)	G.I.,C.I., ACP Pipes below 100mm dia and other heavy material and machinery			
	1. Distance	1km	Per Tonne	32.00
	2. Distance	2 km	Per Tonne	39.00
	3. Distance	3 km	Per Tonne	44.00
	4. Distance	4 km	Per Tonne	50.00
	5. Distance	5 km	Per Tonne	55.00
	6. Beyond 5km upto 10km. add per km		Per Tonne	4.38
	7. Beyond 10km. upto 20km. add per km.		Per Tonne	4.25
	8. Beyond 20km. add per additional		Per Tonne	3.72
13.14.3 (b)	PVC pipes - 90,110,140,160,180,200 mm dia pipes			
	1. Distance	1km	Per Tonne	87.00
	2. Distance	2 km	Per Tonne	102.00
	3. Distance	3 km	Per Tonne	116.00
	4. Distance	4 km	Per Tonne	133.00
	5. Distance	5 km	Per Tonne	145.00
	6. Beyond 5km upto 10km. add per km		Per Tonne	12.00
	7. Beyond 10km. upto 20km. add per km.		Per Tonne	11.00
	8. Beyond 20km. add per additional		Per Tonne	10.00
13.14.4	Steel (All types)			
	1. Distance	1km	Per Tonne	87.00
	2. Distance	2 km	Per Tonne	102.00
	3. Distance	3 km	Per Tonne	116.00
	4. Distance	4 km	Per Tonne	133.00
	5. Distance	5 km	Per Tonne	145.00
	6. Beyond 5km upto 10km. add per km		Per Tonne	12.00
	7. Beyond 10km. upto 20km. add		Per Tonne	11.00

S. No.	Items	Per	Rates in Rs.	
	per km.			
	8. Beyond 20km. add per additional		Per Tonne	10.00
13.14.5	R.C.C., Pipes, Steel Pipes, ACP pipes, CI & DI Pipes			
13.14.5.1	100,150,200,250 & 300 mm dia			
	1. Distance	1 Km.	Per Tonne	39.00
	2. Distance	2 km	Per Tonne	46.00
	3. Distance	3 km	Per Tonne	52.00
	4. Distance	4 km	Per Tonne	60.00
	5. Distance	5 km	Per Tonne	66.00
	6. Beyond 5km upto 10km. add per km		Per Tonne	5.23
	7. Beyond 10km. upto 20 km. add per km.		Per Tonne	5.08
	8. Beyond 20km. add per additional km.		Per Tonne	4.44
13.14.5.2	350,400,450 & 500 mm dia			
	1. Distance	1 Km.	Per Tonne	41.00
	2. Distance	2 km	Per Tonne	47.00
	3. Distance	3 km	Per Tonne	54.00
	4. Distance	4 km	Per Tonne	62.00
	5. Distance	5 km	Per Tonne	67.00
	6. Beyond 5km upto 10km. add per km		Per Tonne	5.38
	7. Beyond 10km. upto 20km. add per km.		Per Tonne	5.23
	8. Beyond 20km. add per additional km.		Per Tonne	4.57
13.14.5.3	600,700,750,800 & 900mm dia			
	1. Distance	1 Km.	Per Tonne	42.00
	2. Distance	2 km	Per Tonne	49.00
	3. Distance	3 km	Per Tonne	55.00
	4. Distance	4 km	Per Tonne	65.00
	5. Distance	5 km	Per Tonne	69.00
	6. Beyond 5km upto 10km. add per km		Per Tonne	5.53
	7. Beyond 10km. upto 20km. add per km.		Per Tonne	5.37
	8. Beyond 20km. add per additional km.		Per Tonne	4.70
13.14.5.4	1000, 1100 and 1200mm dia			
	1. Distance	1 Km.	Per Tonne	64.00
	2. Distance	2 km	Per Tonne	75.00

S. No.	Items	Per	Rates in Rs.	
	3. Distance	3 km	Per Tonne	85.00
	4. Distance	4 km	Per Tonne	98.00
	5. Distance	5 km	Per Tonne	107.00
	6. Beyond 5km upto 10km. add per km		Per Tonne	8.52
	7. Beyond 10km. upto 20km. add per km.		Per Tonne	8.27
	8. Beyond 20km. add per additional km.		Per Tonne	7.23

DRAWINGS