GOVERNMENT OF MADHYA PREDESH
PUBLIC HEALTH ENGINEERING DEPARTMENT



मध्यप्रदेश शासन

UNIFIED SCHEDULE OF RATES
FOR
WATER SUPPLY, SEWERAGE, SEWERAGE MAINTENANCE, DRILLING OF TUBEWELL, HAND PUMP/POWER PUMP INSTALLATION,GROUND WATER RECHARGING AND OTHER MISCELLANEOUS WORKS

IN FORCE FROM

1st of June 2016

Issued
By

Engineer - in - Chief
Public Health Engineering Department
Bhopal, Madhya Pradesh

कार्यालय प्रमुख अभियंता
लोक स्वास्थ्य यांत्रिकी विभाग
सतपुड़ा भवन, भोपाल

कमांक / 129 / प्र.अ. / स्था.(राज) / लो.स्वा.यां.वि / 16 भोपाल, दिनांक 31.5.2016

परिपत्र

लोक स्वास्थ्य यांत्रिकी विभाग के अन्तर्गत जल प्रदाय, सीवरेज, सीवरेज संधारण, नलकूप खनन, हैण्डपंप / पावर पंप स्थापना, भूजल संवर्धन एवं अन्य विविध कार्यो हेतु एकीकृत दर सूची प्रकाशित की गई है। दर सूची दिनांक 01.06.2016 से प्रभावशील होगी।

31/5/16
(जी.एस.डामोर)
प्रमुख अभियन्ता

पृ. कमांक / 4288 / प्र.अ. / स्था.(राज) / लो.स्वा.यां.वि. / 16 भोपाल, दिनांक 31.5.20126
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14. आदेश नस्ती

प्रमुख अभियन्ता

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PREFACE

The present Schedule of Rates for the various works of - Water Supply & Sewerage (applicable from 02/12/2009), construction of tubewell (applicable from 05/04/2012) and sewerage maintenance (applicable from 14/11/2011) were made applicable in Public Health Engineering Department for the entire state of Madhya Pradesh. As many years have passed since the issue of these SOR's, it was necessary to revise these, looking to the hike in the prices of material and labour etc. involved in above works.

A unified schedule of rates for all the above works including installation of hand pump / power pump, ground water recharging, tube well cleaning ,tubewell hydro fracturing, submersible pump repairing and other miscellaneous works related to the Public Health Engineering Department have been framed, to facilitate the preparation of realistic estimates and bringing uniformity in the rates and specifications of various type of works to be executed by the Public Health Engineering Department in Madhya Pradesh. Additional chapters for various pipe materials such as - Poly-ethylene, Mild steel, Bar wrapped steel cylinder, Double wall corrugated etc. have also been incorporated in this USOR.

I extend my thanks to Shri C.S. Sankule, Chief Engineer, Shri Ashok Baghel, in-charge Chief Engineer (E&M), Shri Deepak Ratnawat, Shri R.K. Hirodiya, Superitending Engineers, Shri Pramod Raghuvanshi, Shri D.K. Jain, Shri Alok Kumar Jain, Shri Sunil Kumar Chaturvedi, Shri M.C. Ahirwar, Shri Rajesh Dubey, Executive Engineers, Shri R.K. Chawla, Shri Praveen Saxena, Shri J.P. Ganote, Shri Sunil Shakargaye, Assistant Engineers, Shri R.P. Shrivastava, Jyoti Mahobiya, Shri Priyank Patel, Sub Engineers, Shri Mahesh Pal & Shri Brijesh Singh, Computer Operator for their commendable efforts in preparing this schedule of rates.

This Unified Schedule of Rates (USOR) for the work of Water Supply, Sewerage , Sewerage maintenance, drilling of tubewell,hand pump / power pump installation, ground water recharging and other miscellaneous works shall come in to force from 1st of June 2016.

31/5/16

(G.S. Damor)
Engineer-In-Chief
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Madhaya Pradesh, Bhopal

UNIFIED SCHEDULE OF RATES
GENERAL NOTES-
WATER SUPPLY AND SEWERAGE WORKS

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 returning empty cases, containers, bags & baggage of the articles provided by the Department if any,up to the place of issue without any extra charges, such as loading,unloading stacking and transportation etc.

(v) **Loading and unloading of pipe :-**

During unloading, the pipe shall not be thrown 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 steady rope and support 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 floating.

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 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 XVI 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. Application of Rates for Departmental Work:-

The rates for various items of works given in this Unified Schedule of Rates includes for 10% contractor's profit, 1% T&P, 3% sundries and 1% water charges. If the work is carried out Departmentally then the rates applicable for Departmental works shall be 9.56% [(100x11)/115](say 10%) 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% from the rates. However no work shall be done departmentally unless otherwise permitted in writing by the competent authority as per manual provisions.

13. As per prevailing excise duty norms, duty exemption is available 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 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, G.I. pipes are exclusive of excise duty and 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 deptt., Mining deptt., P & T deptt., 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.

PART - (A)

WATER SUPPLY & SEWERAGE WORKS

CHAPTER – I

CAST IRON PIPES AND SPECIALS WITH SOCKET AND SPIGOT JOINTS (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 (Pig 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	1084.39	1177.80	1264.10
	100mm diameter	RM	1371.24	1510.11	1610.20
	125mm diameter	RM	1754.98	1915.47	2063.71
	150mm diameter	RM	2176.90	2385.06	2570.43
	200mm diameter	RM	3168.75	3438.36	3719.68
	250mm diameter	RM	4273.86	4660.66	4985.66
	300mm diameter	RM	5520.67	6035.67	6537.81
	350mm diameter	RM	6931.32	7476.77	8148.16
	400mm diameter	RM	8453.48	9238.11	9970.38
	450mm diameter	RM	10358.59	11378.74	12270.83
	500mm diameter	RM	12125.32	13208.96	14288.06
	600mm diameter	RM	13805.47	15876.20	16869.97
	700mm diameter	RM	17815.49	20503.37	21914.92
	750mm diameter	RM	19953.00	22979.32	24661.38
	800mm diameter	RM	28195.92	32659.47	35665.12
	900mm diameter	RM	34396.68	39869.20	43624.98

S. No.	Items	Unit	Rates in Rs.		
	1000mm diameter	RM	41357.92	48003.25	52325.30
1.2	**Labour for laying in position following socket & spigot cast iron (Spun) pipes.**		**LA Class**	**A' Class**	**B' Class**
	80mm diameter	RM	16.48	17.90	19.20
	100mm diameter	RM	20.41	22.47	24.27
	125mm diameter	RM	26.59	29.03	31.16
	150mm diameter	RM	33.15	36.33	39.21
	200mm diameter	RM	48.50	52.62	56.52
	250mm diameter	RM	65.35	71.16	75.94
	300mm diameter	RM	84.27	92.13	97.60
	350mm diameter	RM	106.18	115.17	122.38
	400mm diameter	RM	129.21	141.20	150.09
	450mm diameter	RM	155.81	171.17	180.53
	500mm diameter	RM	182.40	198.70	210.48
	600mm diameter	RM	243.08	265.37	281.60
	700mm diameter	RM	313.69	342.71	365.81
	750mm diameter	RM	351.32	384.10	411.66
	800mm diameter	RM	496.46	545.90	595.34
	900mm diameter	RM	605.64	666.41	728.21
	1000mm diameter	RM	728.21	802.37	873.44
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			151.65
	100mm diameter	Each			203.33
	125mm diameter	Each			219.24
	150mm diameter	Each			296.74
	200mm diameter	Each			445.76
	250mm diameter	Each			538.34
	300mm diameter	Each			672.77
	350mm diameter	Each			716.69
	400mm diameter	Each			848.31
	450mm diameter	Each			1128.68
	500mm diameter	Each			1310.73
	600mm diameter	Each			1457.93
	700mm diameter	Each			1711.62
	750mm diameter	Each			2004.88
	800mm diameter	Each			2591.58
	900mm diameter	Each			3189.15

S. No.	Items	Unit	Rates in Rs.		
	1000mm diameter	Each			3786.84
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			119.40
	100mm diameter	Each			165.17
	125mm diameter	Each			172.13
	150mm diameter	Each			238.80
	200mm diameter	Each			333.35
	250mm diameter	Each			400.02
	300mm diameter	Each			505.48
	350mm diameter	Each			572.15
	400mm diameter	Each			619.43
	450mm diameter	Each			838.84
	500mm diameter	Each			1000.05
	600mm diameter	Each			1066.72
	700mm diameter	Each			1255.81
	750mm diameter	Each			1472.78
	800mm diameter	Each			2000.10
	900mm diameter	Each			2527.42
	1000mm diameter	Each			3054.75
1.5	**Providing and laying in position following double socket cast iron 90° bend.**			**Medium Class**	**Heavy Class**
	80 mm diameter	Each		1378.88	1557.37
	100mm diameter	Each		1961.25	2078.76
	125mm diameter	Each		2541.72	2737.60
	150mm diameter	Each		3376.03	3589.30
	200mm diameter	Each		5172.03	5559.44
	250mm diameter	Each		7284.05	7904.39
	300mm diameter	Each		9897.78	10751.05
	350mm diameter	Each		13287.08	14478.78
	400mm diameter	Each		16985.95	18561.94
	450mm diameter	Each		21052.53	23158.82
	500mm diameter	Each		26656.30	29288.85
	600mm diameter	Each		38251.41	42268.27
	700mm diameter	Each		53180.42	58920.22

S. No.	Items	Unit	Rates in Rs.		
	750mm diameter	Each		61990.21	68804.28
	800mm diameter	Each		72633.88	80644.63
	900mm diameter	Each		95602.21	106489.08
	1000mm diameter	Each		121958.26	135865.40
1.6	**Providing and laying in position following double socket cast iron 45° bend.**			**Medium Class**	**Heavy Class**
	80 mm diameter	Each		1322.40	1493.82
	100mm diameter	Each		1880.05	1994.03
	125mm diameter	Each		2366.14	2554.96
	150mm diameter	Each		3099.00	3305.21
	200mm diameter	Each		4618.91	4992.20
	250mm diameter	Each		6433.66	6963.14
	300mm diameter	Each		8662.79	9348.48
	350mm diameter	Each		11917.68	12893.15
	400mm diameter	Each		15039.95	16255.57
	450mm diameter	Each		18457.87	20131.71
	500mm diameter	Each		22980.52	24964.41
	600mm diameter	Each		32197.20	35205.02
	700mm diameter	Each		43882.88	48037.05
	750mm diameter	Each		50674.59	55614.74
	800mm diameter	Each		59083.97	64788.35
	900mm diameter	Each		76358.45	84001.99
	1000mm diameter	Each		96444.06	106170.91
1.7	**Providing and laying in position following double socket cast iron 22½° bend.**			**Medium Class**	**Heavy Class**
	80 mm diameter	Each		1141.32	1382.70
	100mm diameter	Each		1708.31	1823.38
	125mm diameter	Each		2136.26	2259.96
	150mm diameter	Each		2813.65	2954.66
	200mm diameter	Each		4223.97	4467.03
	250mm diameter	Each		5802.16	6136.37
	300mm diameter	Each		7599.00	8091.79
	350mm diameter	Each		10456.72	11163.30
	400mm diameter	Each		13091.09	13971.28
	450mm diameter	Each		15874.18	17001.92
	500mm diameter	Each		19659.44	21033.46
	600mm diameter	Each		27126.88	29186.64

S. No.	Items	Unit	Rates in Rs.		
	700mm diameter	Each		36550.47	39199.39
	750mm diameter	Each		42161.25	45249.63
	800mm diameter	Each		48605.18	52485.51
	900mm diameter	Each		62159.44	67227.69
	1000mm diameter	Each		77809.61	84215.47
1.8	**Providing and laying in position following double socket cast iron 11¼° bend.**			**Medium Class**	**Heavy Class**
	80 mm diameter	Each		1185.77	1290.74
	100mm diameter	Each		1543.76	1657.43
	125mm diameter	Each		1961.85	2084.21
	150mm diameter	Each		2560.25	2700.01
	200mm diameter	Each		3810.95	4051.33
	250mm diameter	Each		5222.95	5487.26
	300mm diameter	Each		6850.31	7204.36
	350mm diameter	Each		9483.73	10040.62
	400mm diameter	Each		11818.72	12474.37
	450mm diameter	Each		14227.58	15130.78
	500mm diameter	Each		17638.61	18713.25
	600mm diameter	Each		23983.37	25519.21
	700mm diameter	Each		31835.21	33960.20
	750mm diameter	Each		36622.68	39112.30
	800mm diameter	Each		42093.62	45150.65
	900mm diameter	Each		53701.90	57422.93
	1000mm diameter	Each		66732.48	71342.04
1.9	**Providing and laying in position following all socket cast iron Tees, Body x Branch Dia (all sizes in Milimeters)**			**Medium Class**	**Heavy Class**
	80x 80	Each		1762.25	1869.48
	100x 80	Each		2197.39	2209.96
	100x 100	Each		2333.58	2449.52
	125x 80	Each		2697.17	2754.72
	125x 100	Each		2833.36	2994.28
	125x 125	Each		3037.64	3230.37
	150x 80	Each		3447.62	3367.57
	150x 100	Each		3583.81	3607.13

S. No.	Items	Unit	Rates in Rs.		
	150x 125	Each		3720.00	3843.23
	150x 150	Each		3924.29	4202.51
	200 x 80	Each		5072.78	4865.66
	x 100	Each		5208.97	5105.22
	x 125	Each		5345.16	5273.22
	x 150	Each		5549.44	5632.50
	x 200	Each		6026.11	6407.21
	x 80	Each		6936.40	6704.23
	x 100	Each		7072.59	6943.79
	x 125	Each		7276.87	7179.88
	x 150	Each		7481.16	7539.16
	x 200	Each		7889.73	8245.78
	x 250	Each		8366.39	8975.70
	300 x 80	Each		9292.27	9019.46
	x 100	Each		9360.37	9190.92
	x 125	Each		9564.65	9427.02
	x 150	Each		9700.84	9718.20
	x 200	Each		10245.60	10561.01
	x 250	Each		10722.27	11290.93
	x 300	Each		11335.12	12172.64
	350 x 200	Each		12758.78	13284.81
	x 250	Each		13303.54	14014.73
	x 300	Each		13916.39	14896.44
	x 350	Each		14529.25	15665.24
	400 x 200	Each		15926.18	16485.27
	x 250	Each		16470.94	17215.20
	x 300	Each		17015.70	18096.91
	x 350	Each		17696.65	18865.70
	x 400	Each		18513.79	19946.08
	450 x 250	Each		20610.95	21164.71
	x 300	Each		21223.81	22046.42
	x 350	Each		21904.76	22815.21
	x 400	Each		22585.71	23759.40
	x 450	Each		23402.85	25205.37
	500 x 250	Each		24562.35	25318.50
	x 300	Each		25175.21	26200.21
	x 350	Each		25856.16	26969.01

S. No.	Items	Unit	Rates in Rs.		
	x 400	Each		26537.11	27981.29
	x 450	Each		27354.25	29359.17
	x 500	Each		28307.58	30744.70
	600 x 300	Each		34915.93	36823.03
	x 350	Each		35596.88	37591.83
	x 400	Each		36414.02	38672.20
	x 450	Each		37231.16	40118.18
	x 500	Each		38116.39	41367.52
	x 600	Each		40227.34	43909.06
	700 x 350	Each		48432.30	51074.64
	x 400	Each		49249.44	52223.11
	x 450	Each		50134.68	53737.18
	x 500	Each		51019.91	54986.52
	x 600	Each		52858.48	57051.39
	x 700	Each		55241.80	60078.28
	750 x 400	Each		56648.32	59917.84
	x 450	Each		57601.65	61431.91
	x 500	Each		58554.98	62817.45
	x 600	Each		60393.54	64950.41
	x 700	Each		62504.49	67568.73
	x 750	Each		64002.58	69721.43
	800 X 400	Each		65609.15	68565.91
	x 450	Each		66494.38	70079.98
	x 500	Each		67447.71	71397.42
	x 600	Each		69490.56	73734.67
	x 700	Each		71601.51	76421.08
	x 750	Each		72691.03	78165.21
	x 800	Each		74325.31	81040.98
	900 x 450	Each		85397.08	89963.72
	x 500	Each		86350.41	91281.16
	x 600	Each		88597.55	93958.88
	x 700	Each		90912.78	96781.49
	x 750	Each		92002.30	98525.62
	x 800	Each		93228.01	100856.63
	x 900	Each		96360.38	105320.33

S. No.	Items	Unit	Rates in Rs.		
	1000 x 500	Each		108521.92	114842.03
	x 600	Each		110700.96	117383.56
	x 700	Each		113424.76	120750.93
	x 750	Each		114582.37	122563.15
	x 800	Each		115876.18	124962.26
	x 900	Each		118463.79	128745.01
	x 1000	Each		122140.92	133685.62
1.10	**Providing and laying in position following all socketed cast iron crosses Dia (all sizes in millimeter).**			**Medium Class**	**Heavy Class**
	80 mm	Each		2327.96	2438.26
	100 mm	Each		2991.95	3182.12
	125 mm	Each		3940.21	4139.08
	150 mm	Each		5074.13	5361.56
	200 mm	Each		7685.85	8150.40
	250 mm	Each		10693.71	11395.68
	300 mm	Each		14425.75	15365.14
1.11	**Providing and laying in position following socket & spigot cast iron tapers (Reducer) Dia (all sizes in mm).**			**Medium Class**	**Heavy Class**
	100 x 80	Each		1420.44	1435.69
	125 x 80	Each		1797.43	1789.56
	125 x 100	Each		1868.20	2034.48
	150 x 80	Each		2288.90	2214.21
	150 x 100	Each		2359.67	2388.35
	150 x 125	Each		2572.00	2632.48
	200 x 100	Each		3401.45	3237.65
	200 x 125	Each		3543.00	3411.00
	200 x 150	Each		3755.32	3778.32
	250 x 125	Each		4695.08	4401.85
	250 x 150	Each		4836.63	4769.17
	250 x 200	Each		5261.28	5562.64
	300 x 150	Each		6426.28	6255.43
	300 x 200	Each		6921.70	7119.67

S. No.	Items	Unit	Rates in Rs.		
	300 x 250	Each		7417.13	7941.81
	350 x 200	Each		7285.52	7429.22
	350 x 250	Each		7788.42	8180.15
	350 x 300	Each		8291.32	9077.62
	400 x 250	Each		9725.03	10066.02
	400 x 300	Each		10353.65	11026.36
	400 x 350	Each		10982.28	11868.56
	450 x 350	Each		12576.68	13062.95
	450 x 400	Each		13331.03	14206.26
	500 x 350	Each		14490.61	14697.37
	500 x 400	Each		15244.96	15840.68
	500 x 450	Each		16062.17	17344.36
	600 x 400	Each		19789.90	20555.37
	600 x 450	Each		20669.97	22121.91
	600 x 500	Each		21612.91	23554.68
	700 x 500	Each		25889.66	27640.74
	700 x 600	Each		28026.98	30386.78
	750 x 600	Each		31691.39	33844.22
	750 x 700	Each		34268.75	37306.13
1.12	**Providing and laying in position following Double Socket cast iron tapers (reducer) Dia (all sizes in mm)**			**Medium Class**	**Heavy Class**
	100 x 80	Each		1301.76	1434.82
	125 x 80	Each		1639.19	2000.58
	125 x 100	Each		1702.05	2292.54
	150 x 80	Each		2091.10	2252.03
	150 x 100	Each		2153.96	2543.99
	150 x 125	Each		2279.69	2827.25
	200 x 100	Each		3108.70	3109.75
	200 x 125	Each		3234.43	3393.01
	200 x 150	Each		3423.02	3799.46
	250 x 150	Each		4401.47	4490.95
	250 x 200	Each		4778.65	5417.62
	300 x 150	Each		5840.79	5308.16

S. No.	Items	Unit	Rates in Rs.		
	300 x 200	Each		6280.83	6171.97
	300 x 250	Each		6720.87	7048.62
	350 x 200	Each		7285.52	8246.43
	350 x 250	Each		7788.42	9311.67
	350 x 300	Each		8291.32	10523.46
	400 x 250	Each		9725.03	10443.20
	400 x 300	Each		10353.65	11654.99
	400 x 350	Each		10982.28	12811.50
	450 x 350	Each		12576.68	13691.57
	450 x 400	Each		13331.03	15086.33
	500 x 350	Each		14490.61	15388.86
	500 x 400	Each		15244.96	16846.48
	500 x 450	Each		16062.17	18350.16
	600 x 400	Each		19789.90	21183.99
	600 x 450	Each		20669.97	21744.73
	600 x 500	Each		21612.91	23491.82
	700 x 500	Each		25889.66	27012.12
	700 x 600	Each		28026.98	30386.78
	750 x 600	Each		31691.39	32461.24
	750 x 700	Each		34268.75	36237.47
1.13	**Providing and laying in position following cast iron collars.**			**Medium Class**	**Heavy Class**
	80 mm Dia	Each		1081.37	1183.37
	100 mm Dia	Each		1364.63	1475.33
	125 mm Dia	Each		1702.05	1821.45
	150 mm Dia	Each		2216.82	2353.62
	200 mm Dia	Each		3171.57	3406.02
	250 mm Dia	Each		4212.89	4534.12
	300 mm Dia	Each		5463.62	5808.77
	350 mm Dia	Each		6656.90	7091.01
	400 mm Dia	Each		7964.88	8611.49
	450 mm Dia	Each		9936.46	10618.07
	500 mm Dia	Each		11787.52	12616.60
	600 mm Dia	Each		15389.52	16494.17
	700 mm Dia	Each		19854.86	21213.33
	750 mm Dia	Each		22576.32	24125.76
	800 mm Dia	Each		26032.14	27813.65

S. No.	Items	Unit	Rates in Rs.		
	900 mm Dia	Each		32379.63	34540.69
	1000 mm Dia	Each		39418.86	41959.46
1.14	**Providing and laying in position following cast iron socket caps.**				
	80 mm Dia	Each			743.33
	100 mm Dia	Each			972.43
	125 mm Dia	Each			1192.83
	150 mm Dia	Each			1536.41
	200 mm Dia	Each			2400.22
	250 mm Dia	Each			3214.01
	300 mm Dia	Each			4237.21
	350 mm Dia	Each			5268.00
	400 mm Dia	Each			6537.03
	450 mm Dia	Each			8355.02
	500 mm Dia	Each			10039.24
	600 mm Dia	Each			13665.36
	700 mm Dia	Each			18195.93
	750 mm Dia	Each			21108.36
	800 mm Dia	Each			24921.98
	900 mm Dia	Each			31837.61
	1000 mm Dia	Each			39885.00
1.15	**Providing and laying in position following cast iron plugs.**			**Medium Class**	**Heavy Class**
	80 mm Dia	Each		389.88	491.88
	100 mm Dia	Each		547.41	658.12
	125 mm Dia	Each		696.25	815.65
	150 mm Dia	Each		1022.44	1159.23
	200 mm Dia	Each		1600.00	1771.59
	250 mm Dia	Each		2201.29	2459.66
	300 mm Dia	Each		2949.12	3231.41
	350 mm Dia	Each		3639.50	4010.75
	400 mm Dia	Each		4696.03	5091.19
	450 mm Dia	Each		6038.98	6594.87
	500 mm Dia	Each		7387.15	8027.64
	600 mm Dia	Each		10046.21	10899.41
	700 mm Dia	Each		13694.33	14738.49
	750 mm Dia	Each		16101.49	17273.74

S. No.	Items	Unit	Rates in Rs.		
	800 mm Dia	Each		19368.72	20647.33
	900 mm Dia	Each		25024.72	26557.16
	1000 mm Dia	Each		31623.91	33410.16
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		79.10	79.10
	Above 300mm Dia	Kg		76.30	76.30
1.17	**Labour for laying in position following double socket cast iron 45° bends.**			**Medium Class**	**Heavy Class**
	80 mm Dia	Each		31.52	35.46
	100 mm Dia	Each		45.31	47.28
	125 mm Dia	Each		59.10	63.04
	150 mm Dia	Each		76.83	80.77
	200 mm Dia	Each		114.26	122.14
	250 mm Dia	Each		163.51	175.33
	300 mm Dia	Each		222.61	238.37
	350 mm Dia	Each		291.56	313.23
	400 mm Dia	Each		370.36	397.94
	450 mm Dia	Each		451.13	488.56
	500 mm Dia	Each		565.39	610.70
	600 mm Dia	Each		811.64	882.56
	700 mm Dia	Each		1118.96	1219.43
	750 mm Dia	Each		1290.35	1410.52
	800 mm Dia	Each		1489.32	1629.19
	900 mm Dia	Each		1930.60	2121.69
	1000 mm Dia	Each		2448.71	2694.96
1.18	**Labour for laying in position following double socket cast iron 90^0 bends.**			**Medium Class**	**Heavy Class**
	80 mm Dia	Each		31.52	35.46
	100 mm Dia	Each		45.31	47.28
	125 mm Dia	Each		61.07	65.01

S. No.	Items	Unit	Rates in Rs.		
	150 mm Dia	Each		80.77	84.71
	200 mm Dia	Each		124.11	131.99
	250 mm Dia	Each		179.27	193.06
	300 mm Dia	Each		246.25	265.95
	350 mm Dia	Each		328.99	356.57
	400 mm Dia	Each		423.55	460.98
	450 mm Dia	Each		522.05	571.30
	500 mm Dia	Each		665.86	728.90
	600 mm Dia	Each		977.12	1075.62
	700 mm Dia	Each		1373.09	1516.90
	750 mm Dia	Each		1599.64	1771.03
	800 mm Dia	Each		1859.68	2062.59
	900 mm Dia	Each		2456.59	2736.33
	1000 mm Dia	Each		3146.09	3506.60
1.19	**Labour for laying in position following double socket cast iron 22½°. bends.**			**Medium Class**	**Heavy Class**
	80 mm Dia	Each		25.61	31.52
	100 mm Dia	Each		39.40	41.37
	125 mm Dia	Each		51.22	53.19
	150 mm Dia	Each		66.98	68.95
	200 mm Dia	Each		100.47	104.41
	250 mm Dia	Each		141.84	147.75
	300 mm Dia	Each		187.15	197.00
	350 mm Dia	Each		242.31	256.10
	400 mm Dia	Each		305.35	323.08
	450 mm Dia	Each		366.42	388.09
	500 mm Dia	Each		457.04	484.62
	600 mm Dia	Each		648.13	691.47
	700 mm Dia	Each		884.53	941.66
	750 mm Dia	Each		1018.49	1085.47
	800 mm Dia	Each		1158.36	1245.04
	900 mm Dia	Each		1485.38	1601.61
	1000 mm Dia	Each		1867.56	2017.28

S. No.	Items	Unit	Rates in Rs.		
1.20	**Labour for laying in position following double socket cast iron 11¼ ° bends.**			**Medium Class**	**Heavy Class**
	80 mm Dia	Each		27.58	29.55
	100 mm Dia	Each		35.46	37.43
	125 mm Dia	Each		47.28	49.25
	150 mm Dia	Each		61.07	63.04
	200 mm Dia	Each		90.62	94.56
	250 mm Dia	Each		128.05	131.99
	300 mm Dia	Each		169.42	175.33
	350 mm Dia	Each		216.70	226.55
	400 mm Dia	Each		271.86	283.68
	450 mm Dia	Each		323.08	338.84
	500 mm Dia	Each		403.85	423.55
	600 mm Dia	Each		565.39	594.94
	700 mm Dia	Each		760.42	803.76
	750 mm Dia	Each		872.71	923.93
	800 mm Dia	Each		986.97	1051.98
	900 mm Dia	Each		1262.77	1343.54
	1000 mm Dia	Each		1576.00	1678.44
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		43.34	45.31
	100 x 80	Each		53.19	55.16
	100 X 100	Each		57.13	59.10
	125 x 80	Each		66.98	70.92
	125 x 100	Each		70.92	74.86
	125 x 125	Each		76.83	80.77
	150 x 80	Each		84.71	88.65
	x 100	Each		88.65	92.59
	150 x 125	Each		92.59	98.50
	x 150	Each		98.50	104.41
	200 x 80	Each		124.11	131.99
	x 100	Each		128.05	135.93
	200 x 125	Each		131.99	139.87
	x 150	Each		137.90	145.78

S. No.	Items	Unit	Rates in Rs.		
	x 200	Each		151.69	159.57
	250 x 80	Each		173.36	185.18
	x 100	Each		177.30	189.12
	x 125	Each		183.21	195.03
	x 150	Each		189.12	200.94
	x 200	Each		200.94	212.76
	x 250	Each		214.73	228.52
	300 x 80	Each		234.43	252.16
	x 100	Each		236.40	254.13
	x 125	Each		242.31	260.04
	x 150	Each		246.25	263.98
	x 200	Each		262.01	279.74
	x 250	Each		275.80	295.50
	x 300	Each		293.53	313.23
	350 x 200	Each		332.93	358.54
	x 250	Each		348.69	374.30
	x 300	Each		366.42	392.03
	x 350	Each		384.15	411.73
	400 x 200	Each		417.64	451.13
	x 250	Each		433.40	466.89
	x 300	Each		449.16	484.62
	x 350	Each		468.86	504.32
	x 400	Each		492.50	527.96
	450 x 250	Each		539.78	581.15
	x 300	Each		557.51	598.88
	x 350	Each		577.21	618.58
	x 400	Each		596.91	638.28
	x 450	Each		620.55	663.89
	500 x 250	Each		644.19	701.32
	x 300	Each		661.92	719.05
	x 350	Each		681.62	738.75
	x 400	Each		701.32	760.42
	x 450	Each		724.96	784.06
	x 500	Each		752.54	813.61

S. No.	Items	Unit	Rates in Rs.		
	600 x 300	Each		937.72	1026.37
	x 350	Each		957.42	1046.07
	x 400	Each		981.06	1069.71
	x 450	Each		1004.70	1095.32
	x 500	Each		1030.31	1120.93
	x 600	Each		1091.38	1185.94
	700 x 350	Each		1315.96	1436.13
	x 400	Each		1339.60	1461.74
	x 450	Each		1365.21	1489.32
	x 500	Each		1390.82	1514.93
	x 600	Each		1444.01	1566.15
	x 700	Each		1512.96	1639.04
	750 x 400	Each		1538.57	1684.35
	x 450	Each		1566.15	1711.93
	x 500	Each		1593.73	1741.48
	x 600	Each		1646.92	1794.67
	x 700	Each		1707.99	1855.74
	x 750	Each		1751.33	1901.05
	800 x 400	Each		1765.12	1934.54
	x 450	Each		1790.73	1962.12
	x 500	Each		1818.31	1989.70
	x 600	Each		1877.41	2048.80
	x 700	Each		1938.48	2111.84
	x 750	Each		1970.00	2145.33
	x 800	Each		2017.28	2194.58
	900 x 450	Each		2304.90	2537.36
	x 500	Each		2332.48	2564.94
	x 600	Each		2397.49	2633.89
	x 700	Each		2464.47	2700.87
	x 750	Each		2495.99	2734.36
	x 800	Each		2531.45	2767.85
	x 900	Each		2622.07	2862.41
	1000 x 500	Each		2941.21	3246.56
	x 600	Each		3004.25	3311.57

S. No.	Items	Unit	Rates in Rs.		
	x 700	Each		3083.05	3394.31
	x 750	Each		3116.54	3429.77
	x 800	Each		3153.97	3465.23
	x 900	Each		3228.83	3540.09
	x 1000	Each		3335.21	3648.44
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		57.13	59.10
	100 mm Dia	Each		72.89	76.83
	125 mm Dia	Each		98.50	102.44
	150 mm Dia	Each		126.08	131.99
	200 mm Dia	Each		191.09	200.94
	250 mm Dia	Each		269.89	285.65
	300 mm Dia	Each		366.42	388.09
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		29.55	31.52
	125 x 80	Each		39.40	41.37
	125 x 100	Each		41.37	45.31
	150 x 80	Each		49.25	53.19
	x 100	Each		51.22	55.16
	150 x 125	Each		57.13	61.07
	200 x 100	Each		72.89	78.80
	200 x 125	Each		76.83	82.74
	x 150	Each		82.74	88.65
	250 x 125	Each		104.41	110.32
	250 x 150	Each		108.35	116.23
	x 200	Each		120.17	130.02
	300 x 150	Each		145.78	157.60
	x 200	Each		159.57	173.36
	x 250	Each		173.36	191.09
	350 x 200	Each		189.12	204.88
	x 250	Each		204.88	222.61
	x 300	Each		220.64	242.31
	400 x 250	Each		258.07	281.71

S. No.	Items	Unit	Rates in Rs.		
	x 300	Each		277.77	303.38
	x 350	Each		297.47	327.02
	450 x 350	Each		332.93	364.45
	x 400	Each		356.57	392.03
	500 x 350	Each		382.18	415.67
	x 400	Each		405.82	443.25
	500 x 450	Each		431.43	472.80
	600 x 400	Each		541.75	591.00
	x 450	Each		569.33	622.52
	x 500	Each		598.88	656.01
	700 x 500	Each		719.05	784.06
	x 600	Each		786.03	860.89
	750 x 600	Each		884.53	969.24
	x 700	Each		965.30	1061.83
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		29.55	35.46
	125 x 80	Each		39.40	53.19
	125 x 100	Each		41.37	59.10
	150 x 80	Each		49.25	61.07
	150 x 100	Each		51.22	66.98
	150 x 125	Each		55.16	74.86
	200 x 100	Each		72.89	84.71
	200 x 125	Each		76.83	92.59
	200 x 150	Each		82.74	100.47
	250 x 150	Each		108.35	122.14
	250 x 200	Each		120.17	141.84
	300 x 150	Each		145.78	147.75
	300 x 200	Each		159.57	165.48
	300 x 250	Each		173.36	187.15
	350 x 200	Each		189.12	230.49
	350 x 250	Each		204.88	258.07
	350 x 300	Each		220.64	287.62
	400 x 250	Each		258.07	293.53
	400 x 300	Each		277.77	323.08
	400 x 350	Each		297.47	356.57
	450 x 350	Each		332.93	384.15

S. No.	Items	Unit		Rates in Rs.	
	450 x 400	Each		356.57	419.61
	500 x 350	Each		382.18	437.34
	500 x 400	Each		405.82	474.77
	500 x 450	Each		431.43	504.32
	600 x 400	Each		541.75	610.70
	600 x 450	Each		569.33	610.70
	600 x 500	Each		598.88	654.04
	700 x 500	Each		719.05	764.36
	700 x 600	Each		786.03	860.89
	750 x 600	Each		884.53	925.90
	750 x 700	Each		965.30	1028.34
1.25	**Labour for laying in position following cast Iron Collars**			**Medium Class**	**Heavy Class**
	80 mm Dia	Each		25.61	27.58
	100 mm Dia	Each		31.52	33.49
	125 mm Dia	Each		41.37	43.34
	150 mm Dia	Each		53.19	55.16
	200 mm Dia	Each		74.86	78.80
	250 mm Dia	Each		102.44	108.35
	300 mm Dia	Each		133.96	139.87
	350 mm Dia	Each		169.42	177.30
	400 mm Dia	Each		202.91	216.70
	450 mm Dia	Each		250.19	262.01
	500 mm Dia	Each		297.47	313.23
	600 mm Dia	Each		403.85	425.52
	700 mm Dia	Each		529.93	557.51
	750 mm Dia	Each		598.88	630.40
	800 mm Dia	Each		671.77	709.20
	900 mm Dia	Each		835.28	882.56
	1000 mm Dia	Each		1020.46	1077.59
1.26	**Labour for laying in position following socketed cast iron caps.**				
	80 mm Dia	Each			13.79
	100 mm Dia	Each			17.73
	125 mm Dia	Each			23.64
	150 mm Dia	Each			29.55
	200 mm Dia	Each			47.28

S. No.	Items	Unit	Rates in Rs.		
	250 mm Dia	Each			66.98
	300 mm Dia	Each			90.62
	350 mm Dia	Each			120.17
	400 mm Dia	Each			151.69
	450 mm Dia	Each			191.09
	500 mm Dia	Each			232.46
	600 mm Dia	Each			336.87
	700 mm Dia	Each			462.95
	750 mm Dia	Each			535.84
	800mm Dia	Each			618.58
	900mm Dia	Each			797.85
	1000mm Dia	Each			1012.58
1.27	**Labour for laying in position following cast iron plugs.**			**Medium Class**	**Heavy Class**
	80 mm Dia	Each		3.94	5.91
	100 mm Dia	Each		5.91	7.88
	125 mm Dia	Each		9.85	11.82
	150 mm Dia	Each		15.76	17.73
	200 mm Dia	Each		25.61	27.58
	250 mm Dia	Each		39.40	43.34
	300 mm Dia	Each		55.16	59.10
	350 mm Dia	Each		74.86	80.77
	400 mm Dia	Each		100.47	106.38
	450 mm Dia	Each		128.05	135.93
	500 mm Dia	Each		159.57	169.42
	600 mm Dia	Each		236.40	250.19
	700 mm Dia	Each		336.87	354.60
	750 mm Dia	Each		395.97	415.67
	800 mm Dia	Each		462.95	484.62
	900 mm Dia	Each		604.79	632.37
	1000 mm Dia	Each		776.18	809.67
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		1.97	1.97

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	1175.26	1205.87	1294.45
	100mm diameter	Meter	1473.54	1545.41	1648.53
	125mm diameter	Meter	1869.64	1960.93	2113.06
	150mm diameter	Meter	2301.99	2441.69	2632.07
	200mm diameter	Meter	3338.91	3520.72	3808.94
	250mm diameter	Meter	4482.18	4771.91	5105.92
	300mm diameter	Meter	5789.82	6179.38	6694.34
	350mm diameter	Meter	7247.43	7656.57	8343.59
	400mm diameter	Meter	8938.88	9458.29	10209.78
	450mm diameter	Meter	10922.57	11646.62	12562.90
	500mm diameter	Meter	12745.20	13521.46	14627.53
	600mm diameter	Meter	14561.38	16275.39	17301.22

S.No.	Items	Unit	Rates in Rs.		
	700mm diameter	Meter	18867.84	21018.66	22473.12
	750mm diameter	Meter	21169.37	23556.60	25287.98
	800mm diameter	Meter	29587.91	33477.06	36561.72
	900mm diameter	Meter	36168.35	40866.86	44720.36
	1000mm diameter	Meter	43451.36	49203.47	53642.18
2.2	**Labour for laying in position following cast iron tyton pipes.**		**LA Class**	**A' Class**	**B' Class**
	80mm diameter	Meter	16.48	17.90	19.20
	100mm diameter	Meter	20.41	22.47	24.27
	125mm diameter	Meter	26.59	29.03	31.16
	150mm diameter	Meter	33.15	36.33	39.21
	200mm diameter	Meter	48.50	52.62	56.52
	250mm diameter	Meter	65.35	71.16	75.94
	300mm diameter	Meter	84.27	92.13	97.60
	350mm diameter	Meter	106.18	115.17	122.38
	400mm diameter	Meter	129.21	141.20	150.09
	450mm diameter	Meter	155.81	171.17	180.53
	500mm diameter	Meter	182.40	198.70	210.48
	600mm diameter	Meter	243.08	265.37	281.60
	700mm diameter	Meter	313.69	342.71	365.81
	750mm diameter	Meter	351.32	384.10	411.66
	800mm diameter	Meter	496.46	545.90	595.34
	900mm diameter	Meter	605.64	666.41	728.21
	1000mm diameter	Meter	728.21	802.37	873.44
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			80.19
	100mm diameter	Each			88.79
	125mm	Each			97.38
	150mm diameter	Each			103.65
	200mm diameter	Each			138.96
	250mm diameter	Each			166.23
	300mm diameter	Each			214.78
	350mm diameter	Each			247.86
	400mm diameter	Each			402.16
	450mm diameter	Each			461.95
	500mm diameter	Each			500.44
	600mm diameter	Each			620.29
	700mm diameter	Each			877.33
	750mm diameter	Each			1020.35

S.No.	Items	Unit			Rates in Rs.
	800mm diameter	Each			1114.99
	900mm diameter	Each			1433.76
	1000mm diameter	Each			1687.15
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			51.15
	100mm diameter	Each			53.94
	125mm diameter	Each			56.73
	150mm diameter	Each			59.52
	200mm diameter	Each			62.30
	250mm diameter	Each			75.64
	300mm diameter	Each			81.21
	350mm diameter	Each			94.55
	400mm diameter	Each			123.40
	450mm diameter	Each			136.73
	500mm diameter	Each			146.19
	600mm diameter	Each			178.92
	700mm diameter	Each			209.46
	750mm diameter	Each			218.92
	800mm diameter	Each			232.25
	900mm diameter	Each			272.26
	1000mm diameter	Each			293.35

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	1618.15	
	100mm dia	Each	2119.76	
	125mm dia	Each	2594.13	
	150mm dia	Each	3198.46	
	200mm dia	Each	4422.32	
	250mm dia	Each	6030.09	
	300mm dia	Each	7630.83	
	350mm dia	Each	9548.20	
	400mm dia	Each	12014.94	
	450mm dia	Each	14777.72	
	500mm dia	Each	17100.87	
	600mm dia	Each	20616.72	
	700mm dia	Each	26792.39	
	750mm dia	Each	29673.04	
3.2	**Labour only for fixing following double flanged cast iron (horizontal cast) pipe per IS : 7181 of *One Meter* length.**			
	80mm dia	Each	118.78	
	100mm dia	Each	128.29	
	125mm dia	Each	140.05	
	150mm dia	Each	152.18	
	200mm dia	Each	173.11	
	250mm dia	Each	216.63	

S.No.	ITEMS	Unit	Rates in Rs.	
	300mm dia	Each	246.70	
	350mm dia	Each	295.27	
	400mm dia	Each	376.01	
	450mm dia	Each	429.27	
	500mm dia	Each	474.78	
	600mm dia	Each	600.91	
	700mm dia	Each	732.62	
	750mm dia	Each	789.16	
3.3	**Providing, fixing following double flanged cast iron (horizontal cast) pipe per IS : 7181 of *Two Meter* length.**			
	80mm dia	Each	2980.11	
	100mm dia	Each	3865.84	
	125mm dia	Each	4809.00	
	150mm dia	Each	5956.14	
	200mm dia	Each	8398.28	
	250mm dia	Each	11419.26	
	300mm dia	Each	14609.61	
	350mm dia	Each	18193.84	
	400mm dia	Each	22696.57	
	450mm dia	Each	27934.32	
	500mm dia	Each	32375.18	
	600mm dia	Each	38968.37	
	700mm dia	Each	50492.43	
	750mm dia	Each	56234.82	
3.4	**Labour only for fixing following double flanged cast iron (horizontal cast) pipe per IS : 7181 of *Two Meter* length.**			
	80mm dia	Each	135.26	
	100mm dia	Each	148.71	
	125mm dia	Each	166.64	
	150mm dia	Each	185.32	
	200mm dia	Each	221.61	
	250mm dia	Each	281.98	
	300mm dia	Each	330.97	
	350mm dia	Each	401.46	
	400mm dia	Each	505.22	
	450mm dia	Each	585.08	
	500mm dia	Each	657.18	
	600mm dia	Each	843.99	
	700mm dia	Each	1046.30	
	750mm dia	Each	1140.48	

S.No.	ITEMS	Unit	Rates in Rs.	
3.5	**Providing, fixing following double flanged cast iron (horizontal cast) pipe per IS : 7181 of *2.75 M* length.**			
	80mm dia	Each	3989.21	
	100mm dia	Each	5160.08	
	125mm dia	Each	6450.21	
	150mm dia	Each	7999.53	
	200mm dia	Each	11343.87	
	250mm dia	Each	15412.13	
	300mm dia	Each	19780.48	
	350mm dia	Each	24598.43	
	400mm dia	Each	30610.88	
	450mm dia	Each	37684.91	
	500mm dia	Each	43694.11	
	600mm dia	Each	52549.79	
	700mm dia	Each	68032.20	
	750mm dia	Each	75892.67	
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	135.26	
	100mm dia	Each	148.71	
	125mm dia	Each	166.64	
	150mm dia	Each	185.32	
	200mm dia	Each	221.61	
	250mm dia	Each	281.98	
	300mm dia	Each	330.97	
	350mm dia	Each	401.46	
	400mm dia	Each	505.22	
	450mm dia	Each	585.08	
	500mm dia	Each	657.18	
	600mm dia	Each	843.99	
	700mm dia	Each	1046.30	
	750mm dia	Each	1140.48	
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) including testing of joint etc. complete**			

S.No.	ITEMS	Unit	Rates in Rs.	
	80mm dia	Each	128.10	
	100mm dia	Each	186.84	
	125mm dia	Each	189.63	
	150mm dia	Each	220.40	
	200mm dia	Each	223.18	
	250mm dia	Each	320.45	
	300mm dia	Each	326.03	
	350mm dia	Each	451.28	
	400mm dia	Each	666.66	
	450mm dia	Each	810.56	
	500mm dia	Each	913.28	
	600mm dia	Each	1132.54	
	700mm dia	Each	1546.17	
	750mm dia	Each	1555.63	
	800mm dia	Each	1714.68	
	900mm dia	Each	2052.43	
	1000mm dia	Each	2423.27	
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	51.15	
	100mm dia	Each	53.94	
	125mm dia	Each	56.73	
	150mm dia	Each	59.52	
	200mm dia	Each	62.30	
	250mm dia	Each	75.64	
	300mm dia	Each	81.21	
	350mm dia	Each	94.55	
	400mm dia	Each	123.40	
	450mm dia	Each	136.73	
	500mm dia	Each	146.19	
	600mm dia	Each	178.92	
	700mm dia	Each	209.46	
	750mm dia	Each	218.92	
	800mm dia	Each	232.25	
	900mm dia	Each	272.26	
	1000mm dia	Each	293.35	

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	850.51	921.39
	100mm dia	Each	1063.14	1134.02
	125mm dia	Each	1346.64	1417.52
	150mm dia	Each	1771.90	1842.78
	200mm dia	Each	2551.54	2622.41
	250mm dia	Each	4110.81	4394.31
	300mm dia	Each	5244.82	5599.20
	350mm dia	Each	6662.34	7087.60
	400mm dia	Each	8221.61	8717.75
	450mm dia	Each	9497.38	10064.39
	500mm dia	Each	11552.79	12261.55
	600mm dia	Each	15663.59	16584.98
	700mm dia	Each	20483.16	21688.05
	750mm dia	Each	23247.32	24593.97
	800mm dia	Each	26194.22	27713.17
	900mm dia	Each	31888.04	33737.16
	1000mm dia	Each	38855.85	41109.02
3.11	**Providing and laying in position following cast iron flanged spigot (tail piece)**			
	80mm dia	Each	779.64	850.51
	100mm dia	Each	915.46	985.88
	125mm dia	Each	1197.14	1337.98
	150mm dia	Each	1478.81	1619.65
	200mm dia	Each	2464.69	2746.37
	250mm dia	Each	3309.73	3732.25

S.No.	ITEMS	Unit	Rates in Rs.	
	300mm dia	Each	4225.19	4788.54
	350mm dia	Each	5351.90	5985.68
	400mm dia	Each	6478.62	7323.65
	450mm dia	Each	7675.75	8661.63
	500mm dia	Each	9154.57	10281.28
	600mm dia	Each	14154.37	15985.28
	700mm dia	Each	18379.55	20773.83
	750mm dia	Each	20844.25	23520.20
	800mm dia	Each	23233.18	23530.85
	900mm dia	Each	27901.16	33479.73
	1000mm dia	Each	33529.40	38378.04
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	952.08	1031.42
	100mm dia	Each	1261.24	1813.03
	125mm dia	Each	1655.38	2443.65
	150mm dia	Each	2286.00	3862.55
	200mm dia	Each	3547.24	5675.58
	250mm dia	Each	5123.79	7882.76
	300mm dia	Each	7094.48	10799.38
	350mm dia	Each	9695.79	14267.79
	400mm dia	Each	12770.06	17815.03
	450mm dia	Each	20337.51	22859.99
	500mm dia	Each	30900.40	34841.78
	600mm dia	Each	44616.40	50370.81
	700mm dia	Each	52656.81	59514.81
	750mm dia	Each	62146.53	70323.38
	800mm dia	Each	73218.08	82897.88
	900mm dia	Each	96476.86	109817.95
	1000mm dia	Each	126620.65	143814.47
3.13	**Providing and laying in position following cast iron double flanged 45° bends (all sizes in mm)**			
	80mm dia	Each	1110.76	
	100mm dia	Each	1428.12	
	125mm dia	Each	1983.50	
	150mm dia	Each	2697.55	
	200mm dia	Each	4284.35	
	250mm dia	Each	6347.19	
	300mm dia	Each	8886.06	
	350mm dia	Each	9124.08	
	400mm dia	Each	11821.64	

S.No.	ITEMS	Unit	Rates in Rs.	
	450mm dia	Each	14677.87	
	500mm dia	Each	18327.50	
	600mm dia	Each	27134.22	
	700mm dia	Each	38479.82	
	750mm dia	Each	45382.39	
3.14	**Providing and laying in position following cast iron double flanged 90° Duck Foot Bend**		**Medium Class**	**Heavy Class**
	80mm dia	Each	1452.64	1525.28
	100mm dia	Each	1815.80	1888.44
	125mm dia	Each	2469.49	2614.76
	150mm dia	Each	3268.45	3413.71
	200mm dia	Each	5084.25	5374.78
	250mm dia	Each	7553.75	8062.17
	300mm dia	Each	10604.30	11330.62
	350mm dia	Each	14526.44	15543.29
	400mm dia	Each	19029.63	20409.64
	450mm dia	Each	23605.46	25421.26
	500mm dia	Each	30069.72	32393.95
	600mm dia	Each	45540.37	49171.98
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	1490.21	1564.72
	100x80	Each	1713.74	1862.76
	100x100	Each	1788.25	1937.27
	125x80	Each	2160.80	2384.33
	125x100	Each	2384.33	2533.35
	125x125	Each	2458.84	2682.37
	150x80	Each	2831.39	3054.92
	150x100	Each	2905.90	3129.43
	150x125	Each	3054.92	3352.96
	150x150	Each	3203.94	3501.99
	200x80	Each	4172.58	4619.64
	200x100	Each	4247.09	4694.15
	200x125	Each	4470.62	4917.68
	200x150	Each	4619.64	5066.70
	200x200	Each	4992.19	5513.76
	250x80	Each	5960.83	6631.42
	250x100	Each	6035.34	6705.93
	250x125	Each	6258.87	6929.46
	250x150	Each	6482.40	7152.99
	250x200	Each	6854.95	7600.05

S.No.	ITEMS	Unit	Rates in Rs.	
	250x250	Each	7376.52	8121.62
	300x80	Each	8121.62	9090.26
	300x100	Each	8270.65	9239.28
	300x125	Each	8419.67	9388.30
	300x150	Each	8643.20	9611.83
	300x200	Each	9090.26	10133.40
	300x250	Each	9611.83	10654.98
	300x300	Each	10133.40	11251.06
	350x200	Each	11325.57	12592.24
	350x250	Each	11623.61	12890.29
	350x300	Each	12666.75	14007.94
	350x350	Each	13039.31	14529.51
	400x200	Each	14082.45	15721.68
	400x250	Each	14380.49	16019.72
	400x300	Each	15498.15	17286.39
	400x350	Each	15945.21	17807.97
	400x400	Each	16466.78	18329.54
	450x250	Each	17286.39	19372.68
	450x300	Each	18404.05	20639.36
	450x350	Each	18851.11	21160.93
	450x400	Each	19298.17	21607.99
	450x450	Each	19745.24	22055.06
	500x250	Each	20937.40	23470.75
	500x300	Each	22204.08	24886.45
	500x350	Each	22725.65	25482.53
	500x400	Each	23247.22	26004.10
	500x450	Each	23694.28	26525.67
	500x500	Each	24215.85	27047.25
	600x300	Each	30847.27	34721.81
	600x350	Each	31592.38	35392.40
	600x400	Each	32188.46	36137.51
	600x450	Each	32635.52	36659.08
	600x500	Each	33157.09	37180.65
	600x600	Each	34349.26	38447.33
	700x350	Each	42470.88	47835.63
	700x400	Each	43066.97	48506.22
	700x450	Each	43737.56	49176.81
	700x500	Each	44333.64	49847.40
	700x600	Each	45525.81	51114.08
	700x700	Each	47090.52	52678.80
	750x400	Each	49325.83	55584.70
	750x450	Each	49921.92	56180.78

S.No.	ITEMS	Unit	Rates in Rs.	
	750x500	Each	50741.53	57074.91
	750x600	Each	51710.16	58043.54
	750x700	Each	52678.80	59012.17
	750x750	Each	53647.43	59980.81
	800x400	Each	56776.86	63929.86
	800x450	Each	57372.95	64600.45
	800x500	Each	58043.54	65345.55
	800x600	Each	59459.24	66835.76
	800x700	Each	60874.93	68251.45
	800x750	Each	61694.55	69145.58
	800x800	Each	62663.18	70114.21
	900x450	Each	71976.97	81290.76
	900x500	Each	73020.11	82408.42
	900x600	Each	74510.32	84047.64
	900x700	Each	76000.53	85612.36
	900x750	Each	76894.65	86506.48
	900x800	Each	77788.78	87400.61
	900x900	Each	79055.45	88667.28
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	798.95	871.59
	125x80	Each	1307.38	1452.64
	x100	Each	1452.64	1597.91
	150x80	Each	1525.28	1670.54
	x100	Each	1670.54	1815.80
	x125	Each	1815.80	1961.07
	200x100	Each	2106.33	2251.60
	x125	Each	2251.60	2469.49
	x150	Each	2469.49	2687.39
	250x125	Each	2760.02	2977.92
	x150	Each	2905.29	3195.82
	x200	Each	3341.08	3631.61
	300x150	Each	3413.71	3704.24
	x200	Each	3849.51	4212.67
	x250	Each	4357.93	4721.09
	350x200	Each	5737.94	6319.00
	x250	Each	6319.00	6972.69
	x300	Each	6972.69	7699.01
	400x250	Each	7117.95	7916.91
	x300	Each	7844.27	8715.86
	x350	Each	8643.23	9587.45

S.No.	ITEMS	Unit	Rates in Rs.	
	450x300	Each	8497.96	9442.18
	x350	Each	9514.81	10531.67
	x400	Each	10386.40	11475.88
	500x350	Each	10459.03	11621.15
	x400	Each	11403.25	12638.00
	x450	Each	12202.21	13509.58
	600x400	Each	13800.11	15252.76
	x450	Each	14526.44	16124.34
	x500	Each	15688.55	17359.09
	700x500	Each	18448.57	20409.64
	x600	Each	20845.43	23024.40
	750x600	Each	22225.45	24549.68
	x700	Each	24259.15	26728.64
	800x600	Each	24985.47	27600.23
	x700	Each	27019.17	29779.19
	x750	Each	28181.28	31086.57
	900x700	Each	30142.35	33265.54
	x750	Each	31449.73	34718.18
	X800	Each	33483.43	36897.15
	1000x800	Each	37623.47	41400.34
	x900	Each	40674.02	44814.05
3.17	**Providing and laying in position following all flanged cast iron crosses (all sizes in mm)**			
	80mm dia	Each	1985.33	2144.15
	100mm dia	Each	2461.80	2700.04
	125mm dia	Each	3255.93	3653.00
	150mm dia	Each	4288.30	4764.78
	200mm dia	Each	6670.69	7385.41
	250mm dia	Each	9688.39	10720.76
	300mm dia	Each	13103.15	14294.34
3.18	**Providing and laying in position following all flanged cast iron blank flanges (all sizes in mm)**			
	80mm dia	Each		374.69
	100mm dia	Each		449.62
	125mm dia	Each		599.50
	150mm dia	Each		824.31
	200mm dia	Each		1198.99
	250mm dia	Each		1723.55
	300mm dia	Each		2397.99
	350mm dia	Each		3222.30
	400mm dia	Each		4121.54

S.No.	ITEMS	Unit	Rates in Rs.	
	450mm dia	Each		5020.79
	500mm dia	Each		6369.66
	600mm dia	Each		9442.08
	700mm dia	Each		13263.88
	750mm dia	Each		15511.99
	800mm dia	Each		18359.61
	900mm dia	Each		23455.33
	1000mm dia	Each		30424.49
3.19	**Labour for laying in position following cast iron flanged sockets (all sizes in mm)**		**Medium Class**	**Heavy Class**
	80mm dia	Each	23.64	25.61
	100mm dia	Each	29.55	31.52
	125mm dia	Each	37.43	39.40
	150mm dia	Each	49.25	51.22
	200mm dia	Each	70.92	72.89
	250mm dia	Each	114.26	122.14
	300mm dia	Each	145.78	155.63
	350mm dia	Each	185.18	197.00
	400mm dia	Each	228.52	242.31
	450mm dia	Each	263.98	279.74
	500mm dia	Each	321.11	340.81
	600mm dia	Each	435.37	460.98
	700mm dia	Each	569.33	602.82
	750mm dia	Each	646.16	683.59
	800mm dia	Each	728.07	770.29
	900mm dia	Each	886.33	937.73
	1000mm dia	Each	1080.00	1142.63
3.20	**Labour for laying in position following cast iron flanged Spigot (all sizes in mm)**		**Medium Class**	**Heavy Class**
	80mm dia	Each	21.67	23.64
	100mm dia	Each	25.61	27.58
	125mm dia	Each	33.49	37.43
	150mm dia	Each	41.37	45.31
	200mm dia	Each	68.95	76.83
	250mm dia	Each	92.59	104.41
	300mm dia	Each	118.20	133.96
	350mm dia	Each	149.72	167.45
	400mm dia	Each	181.24	204.88
	450mm dia	Each	214.73	242.31
	500mm dia	Each	256.10	287.62
	600mm dia	Each	395.97	447.19
	700mm dia	Each	514.17	581.15

S.No.	ITEMS	Unit	Rates in Rs.	
	750mm dia	Each	583.12	657.98
	800mm dia	Each	649.95	658.28
	900mm dia	Each	780.54	936.60
	1000mm dia	Each	937.99	1073.63
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	23.64	25.61
	100mm dia	Each	31.52	45.31
	125mm dia	Each	41.37	61.07
	150mm dia	Each	57.13	96.53
	200mm dia	Each	88.65	141.84
	250mm dia	Each	128.05	197.00
	300mm dia	Each	177.30	269.89
	350mm dia	Each	242.31	356.57
	400mm dia	Each	319.14	445.22
	450mm dia	Each	508.26	571.30
	500mm dia	Each	772.24	870.74
	600mm dia	Each	1115.02	1258.83
	700mm dia	Each	1315.96	1487.35
	750mm dia	Each	1553.12	1757.47
	800mm dia	Each	1829.81	2071.72
	900mm dia	Each	2411.08	2744.49
	1000mm dia	Each	3164.41	3594.10
3.22	**Labour for laying in position following cast iron double flanged 45° bend (all sizes in mm)**			
	80mm dia	Each		27.58
	100mm dia	Each		35.46
	125mm dia	Each		49.25
	150mm dia	Each		66.98
	200mm dia	Each		106.38
	250mm dia	Each		157.60
	300mm dia	Each		220.64
	350mm dia	Each		226.55
	400mm dia	Each		293.53
	450mm dia	Each		364.45
	500mm dia	Each		455.07
	600mm dia	Each		673.74
	700mm dia	Each		955.45
	750mm dia	Each		1126.84

S.No.	ITEMS	Unit	Rates in Rs.	
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	39.40	41.37
	100mm dia	Each	49.25	51.22
	125mm dia	Each	66.98	70.92
	150mm dia	Each	88.65	92.59
	200mm dia	Each	137.90	145.78
	250mm dia	Each	204.88	218.67
	300mm dia	Each	287.62	307.32
	350mm dia	Each	394.00	421.58
	400mm dia	Each	516.14	553.57
	450mm dia	Each	640.25	689.50
	500mm dia	Each	815.58	878.62
	600mm dia	Each	1235.19	1333.69
3.24	**Labour for laying in position following cast iron all flanged tees (all sizes in mm) Body x Branch**		**Medium Class**	**Heavy Class**
	80x80	Each	39.40	41.37
	100x80	Each	45.31	49.25
	100x100	Each	47.28	51.22
	125x80	Each	57.13	63.04
	125x100	Each	63.04	66.98
	125x125	Each	65.01	70.92
	150x80	Each	74.86	80.77
	150x100	Each	76.83	82.74
	150x125	Each	80.77	88.65
	150x150	Each	84.71	92.59
	200x80	Each	110.32	122.14
	200x100	Each	112.29	124.11
	200x125	Each	118.20	130.02
	200x150	Each	122.14	133.96
	200x200	Each	131.99	145.78
	250x80	Each	157.60	175.33
	250x100	Each	159.57	177.30
	250x125	Each	165.48	183.21
	250x150	Each	171.39	189.12
	250x200	Each	181.24	200.94
	250x250	Each	195.03	214.73
	300x80	Each	214.73	240.34
	300x100	Each	218.67	244.28
	300x125	Each	222.61	248.22
	300x150	Each	228.52	254.13

S.No.	ITEMS	Unit	Rates in Rs.	
	300x200	Each	240.34	267.92
	300x250	Each	254.13	281.71
	300x300	Each	267.92	297.47
	350x200	Each	299.44	332.93
	350x250	Each	307.32	340.81
	350x300	Each	334.90	370.36
	350x350	Each	344.75	384.15
	400x200	Each	372.33	415.67
	400x250	Each	380.21	423.55
	400x300	Each	409.76	457.04
	400x350	Each	421.58	470.83
	400x400	Each	435.37	484.62
	450x250	Each	457.04	512.20
	450x300	Each	486.59	545.69
	450x350	Each	498.41	559.48
	450x400	Each	510.23	571.30
	450x450	Each	522.05	583.12
	500x250	Each	553.57	620.55
	500x300	Each	587.06	657.98
	500x350	Each	600.85	673.74
	500x400	Each	614.64	687.53
	500x450	Each	626.46	701.32
	500x500	Each	640.25	715.11
	600x300	Each	815.58	918.02
	600x350	Each	835.28	935.75
	600x400	Each	851.04	955.45
	600x450	Each	862.86	969.24
	600x500	Each	876.65	983.03
	600x600	Each	908.17	1016.52
	700x350	Each	1122.90	1264.74
	700x400	Each	1138.66	1282.47
	700x450	Each	1156.39	1300.20
	700x500	Each	1172.15	1317.93
	700x600	Each	1203.67	1351.42
	700x700	Each	1245.04	1392.79
	750x400	Each	1304.14	1469.62
	750x450	Each	1319.90	1485.38
	750x500	Each	1341.57	1509.02
	750X600	Each	1367.18	1534.63
	750x700	Each	1392.79	1560.24
	750x750	Each	1418.40	1585.85
	800x400	Each	1501.14	1690.26
	800x450	Each	1516.90	1707.99
	800x500	Each	1534.63	1727.69

S.No.	ITEMS	Unit	Rates in Rs.	
	800x600	Each	1572.06	1767.09
	800x700	Each	1609.49	1804.52
	800x750	Each	1631.16	1828.16
	800x800	Each	1656.77	1853.77
	900x450	Each	1903.02	2149.27
	900x500	Each	1930.60	2178.82
	900x600	Each	1970.00	2222.16
	900x700	Each	2009.40	2263.53
	900x750	Each	2033.04	2287.17
	900x800	Each	2056.68	2310.81
	900x900	Each	2090.17	2344.30
3.25	**Labour for laying in position following cast iron double flanged Tapers (all sizes in mm)**			
	Body x Branch		**Medium Class**	**Heavy Class**
	100x80	Each	21.67	23.64
	125x80	Each	35.46	39.40
	125x100	Each	39.40	43.34
	150x80	Each	41.37	45.31
	150x100	Each	45.31	49.25
	150x125	Each	49.25	53.19
	200x100	Each	57.13	61.07
	200x125	Each	61.07	66.98
	200x150	Each	66.98	72.89
	250x125	Each	74.86	80.77
	250x150	Each	78.80	86.68
	250x200	Each	90.62	98.50
	300x150	Each	92.59	100.47
	300x200	Each	104.41	114.26
	300x250	Each	118.20	128.05
	350x200	Each	155.63	171.39
	350x250	Each	171.39	189.12
	350x300	Each	189.12	208.82
	400x250	Each	193.06	214.73
	400x300	Each	212.76	236.40
	400x350	Each	234.43	260.04
	450x300	Each	230.49	256.10
	450x350	Each	258.07	285.65
	450x400	Each	281.71	311.26
	500x350	Each	283.68	315.20
	500x400	Each	309.29	342.78
	500x450	Each	330.96	366.42
	600x400	Each	374.30	413.70

S.No.	ITEMS	Unit	Rates in Rs.	
	600x450	Each	394.00	437.34
	600x500	Each	425.52	470.83
	700x500	Each	500.38	553.57
	700x600	Each	565.39	624.49
	750x600	Each	602.82	665.86
	750x700	Each	657.98	724.96
	800x600	Each	677.68	748.60
	800x700	Each	732.84	807.70
	800x750	Each	764.36	843.16
	900x700	Each	817.55	902.26
	900x750	Each	853.01	941.66
	900x800	Each	908.17	1000.76
	1000x800	Each	1020.46	1122.90
	1000x900	Each	1103.20	1215.49
3.26	**Labour for laying in position following all flanged cast iron crosses (all sizes in mm)**		**Medium Class**	**Heavy Class**
	80mm dia	Each	49.25	53.19
	100mm dia	Each	61.07	66.98
	125mm dia	Each	80.77	90.62
	150mm dia	Each	106.38	118.20
	200mm dia	Each	165.48	183.21
	250mm dia	Each	240.34	265.95
	300mm dia	Each	325.05	354.60
3.27	**Labour for laying in position following cast iron blank flanges (all sizes in mm)**			
	80mm dia	Each	-	9.85
	100mm dia	Each	-	11.82
	125mm dia	Each	-	15.76
	150mm dia	Each	-	21.67
	200mm dia	Each	-	31.52
	250mm dia	Each	-	45.31
	300mm dia	Each	-	63.04
	350mm dia	Each	-	84.71
	400mm dia	Each	-	108.35
	450mm dia	Each	-	131.99
	500mm dia	Each	-	167.45
	600mm dia	Each	-	248.22
	700mm dia	Each	-	348.69
	750mm dia	Each	-	407.79
	800mm dia	Each	-	482.65
	900mm dia	Each	-	616.61

S.No.	ITEMS	Unit	Rates in Rs.	
	1000mm dia	Each	-	799.82
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	65.00	65.00
	Above 300mm dia	Kg	75.00	75.00
3.29	**Labour for laying in position following sizes of flanged, cast iron standard specials which does not appear in above items of the schedule**			
	80mm to 750mm dia	Kg	1.97	1.97
3.30	**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. 3.2, 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		

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 cost of rubber gasket.**		
	100mm diameter	Meter	1022.71
	150mm diameter	Meter	1445.89
	200mm diameter	Meter	1875.34
	250mm diameter	Meter	2472.04
	300mm diameter	Meter	3121.85
	350mm diameter	Meter	3715.36
	400mm diameter	Meter	4451.28
	450mm diameter	Meter	5239.33
	500mm diameter	Meter	6239.31
	600mm diameter	Meter	8160.13
	700mm diameter	Meter	11231.44
	750mm diameter	Meter	12486.70
	800mm diameter	Meter	14944.77
	900mm diameter	Meter	18179.18
	1000mm diameter	Meter	20889.13
4.2	**Labour for laying in position following socket & spigot Ductile Iron(k-7) pressure pipes**		
	100mm diameter	Meter	19.48

S. No.	Items	Unit	Rates in Rs.
	150mm diameter	Meter	26.33
	200mm diameter	Meter	39.68
	250mm diameter	Meter	52.46
	300mm diameter	Meter	66.56
	350mm diameter	Meter	87.97
	400mm diameter	Meter	105.32
	450mm diameter	Meter	124.50
	500mm diameter	Meter	145.90
	600mm diameter	Meter	192.74
	700mm diameter	Meter	244.66
	750mm diameter	Meter	319.54
	800mm diameter	Meter	405.34
	900mm diameter	Meter	498.86
	1000mm diameter	Meter	601.14
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 cost of rubber gasket.**		
	100mm diameter	Meter	1151.31
	150mm diameter	Meter	1627.53
	200mm diameter	Meter	2096.39
	250mm diameter	Meter	2674.02
	300mm diameter	Meter	3397.75
	350mm diameter	Meter	4211.01
	400mm diameter	Meter	5183.33
	450mm diameter	Meter	6148.28
	500mm diameter	Meter	7253.54
	600mm diameter	Meter	9482.59
	700mm diameter	Meter	12459.00
	750mm diameter	Meter	14690.18
	800mm diameter	Meter	15962.90
	900mm diameter	Meter	19957.01
	1000mm diameter	Meter	23891.34
4.4	**Labour for laying in position following socket & spigot Ductile Iron (k-9) pressure pipes**		
	100mm diameter	Meter	21.92
	150mm diameter	Meter	33.04
	200mm diameter	Meter	46.64

S. No.	Items	Unit	Rates in Rs.
	250mm diameter	Meter	61.41
	300mm diameter	Meter	77.98
	350mm diameter	Meter	102.09
	400mm diameter	Meter	122.33
	450mm diameter	Meter	144.63
	500mm diameter	Meter	169.44
	600mm diameter	Meter	223.71
	700mm diameter	Meter	306.39
	750mm diameter	Meter	411.17
	800mm diameter	Meter	534.11
	900mm diameter	Meter	663.64
	1000mm diameter	Meter	803.49
4.5	**Providing ISI marked Rubber 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.)**		
	80mm diameter	Each	80.19
	100mm diameter	Each	88.79
	125mm diameter	Each	97.38
	150mm diameter	Each	103.65
	200mm diameter	Each	138.96
	250mm diameter	Each	166.23
	300mm diameter	Each	214.78
	350mm diameter	Each	247.86
	400mm diameter	Each	402.16
	450mm diameter	Each	461.95
	500mm diameter	Each	500.44
	600mm diameter	Each	620.29
	700mm diameter	Each	877.33
	750mm diameter	Each	1020.35
	800mm diameter	Each	1114.99
	900mm diameter	Each	1433.76
	1000mm diameter	Each	1687.15
4.6	**Labour for providing Rubber Gasket (push on) joints to following D.I. Pipes class K-7 & K-9 including joints but excluding cost of Rubber Gasket.**		

S. No.	Items	Unit	Rates in Rs.
	80mm diameter	Each	51.15
	100mm diameter	Each	53.94
	125mm diameter	Each	56.73
	150mm diameter	Each	59.52
	200mm diameter	Each	62.30
	250mm diameter	Each	75.64
	300mm diameter	Each	81.21
	350mm diameter	Each	94.55
	400mm diameter	Each	123.40
	450mm diameter	Each	136.73
	500mm diameter	Each	146.19
	600mm diameter	Each	178.92
	700mm diameter	Each	209.46
	750mm diameter	Each	218.92
	800mm diameter	Each	232.25
	900mm diameter	Each	272.26
	1000mm diameter	Each	293.35
4.7	**Providing and Laying ductile iron K-12 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.**		
	100mm	Each	1190.46
	150mm	Each	1926.51
	200mm	Each	2534.02
	250mm	Each	3808.86
	300mm	Each	4449.76
	350mm	Each	6668.45
	400mm	Each	7498.77
	450mm	Each	9120.58
	500mm	Each	11509.11
	600mm	Each	15929.35
	700mm	Each	30870.62
	750mm	Each	35608.99
	800mm	Each	40392.67
	900mm	Each	50556.76
	1000mm	Each	65802.29

S. No.	Items	Unit	Rates in Rs.
4.8	**Labour only for Laying Ductile Iron K-12 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.**		
	100mm	Each	17.73
	150mm	Each	27.58
	200mm	Each	41.37
	250mm	Each	55.16
	300mm	Each	72.89
	350mm	Each	94.56
	400mm	Each	120.17
	450mm	Each	149.72
	500mm	Each	189.12
	600mm	Each	242.31
	700mm	Each	327.02
	750mm	Each	358.54
	800mm	Each	435.37
	900mm	Each	541.75
	1000mm	Each	701.32
4.9	**Providing and Laying ductile K-12 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.**		
	100mm	Each	1340.86
	150mm	Each	2762.15
	200mm	Each	3369.67
	250mm	Each	4841.04
	300mm	Each	6314.38
	350mm	Each	8922.93
	400mm	Each	10701.01
	450mm	Each	13274.52
	500mm	Each	14405.94
	600mm	Each	22739.76
	700mm	Each	39997.49
	750mm	Each	43198.88

S. No.	Items	Unit	Rates in Rs.
	800mm	Each	46400.26
	900mm	Each	61554.53
	1000mm	Each	80300.77
4.10	**Labour only for Laying Ductile Iron K-12 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.**		
	100mm	Each	19.70
	150mm	Each	31.52
	200mm	Each	45.31
	250mm	Each	63.04
	300mm	Each	82.74
	350mm	Each	110.32
	400mm	Each	137.90
	450mm	Each	173.36
	500mm	Each	216.70
	600mm	Each	313.23
	700mm	Each	386.12
	750mm	Each	437.34
	800mm	Each	488.56
	900mm	Each	585.09
	1000mm	Each	730.87
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.**		
	100mm	Each	2928.54
	150mm	Each	3908.00
	200mm	Each	4748.10
	250mm	Each	6979.84
	300mm	Each	9333.21
	350mm	Each	12731.35
	400mm	Each	14074.69
	450mm	Each	18337.59

S. No.	Items	Unit	Rates in Rs.
	500mm	Each	22172.40
	600mm	Each	29980.11
	700mm	Each	32898.83
	750mm	Each	49760.65
	800mm	Each	54371.23
	900mm	Each	78648.03
	1000mm	Each	89938.30
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.**		
	100mm	Each	43.34
	150mm	Each	61.07
	200mm	Each	76.83
	250mm	Each	110.32
	300mm	Each	128.05
	350mm	Each	177.30
	400mm	Each	206.85
	450mm	Each	236.40
	500mm	Each	275.80
	600mm	Each	346.72
	700mm	Each	520.08
	750mm	Each	579.18
	800mm	Each	654.04
	900mm	Each	762.39
	1000mm	Each	953.48
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.**		
	100mm	Each	1401.71
	125mm	Each	1756.57
	150 mm	Each	2195.71
	200mm	Each	2786.01
	250mm	Each	3497.28
	300mm	Each	4382.93

S. No.	Items	Unit	Rates in Rs.
	350mm	Each	5487.04
	400mm	Each	6870.12
	450mm	Each	8594.05
	500mm	Each	10843.53
	600mm	Each	13644.54
	700mm	Each	16993.62
	750mm	Each	21183.42
	800mm	Each	26570.39
	900mm	Each	33277.50
	1000mm	Each	41122.10
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.**		
	100mm	Each	21.67
	125mm	Each	31.52
	150 mm	Each	39.40
	200mm	Each	63.04
	250mm	Each	90.62
	300mm	Each	128.05
	350mm	Each	171.39
	400mm	Each	222.61
	450mm	Each	289.59
	500mm	Each	368.39
	600mm	Each	561.45
	700mm	Each	791.94
	750mm	Each	927.87
	800mm	Each	1101.23
	900mm	Each	1467.65
	1000mm	Each	1899.08
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.**		
	100mm	Each	1207.15

S. No.	Items	Unit	Rates in Rs.
	125mm	Each	1509.92
	150 mm	Each	1915.73
	200mm	Each	3078.72
	250mm	Each	4211.03
	300mm	Each	6388.27
	350mm	Each	9855.78
	400mm	Each	13089.73
	450mm	Each	15661.08
	500mm	Each	20761.65
	600mm	Each	30308.83
	700mm	Each	51458.42
	750mm	Each	54426.62
	800mm	Each	57426.34
	900mm	Each	101442.21
	1000mm	Each	134794.04
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.**		
	100mm	Each	19.70
	125mm	Each	25.61
	150 mm	Each	31.52
	200mm	Each	51.22
	250mm	Each	70.92
	300mm	Each	96.53
	350mm	Each	128.05
	400mm	Each	161.54
	450mm	Each	210.79
	500mm	Each	265.95
	600mm	Each	401.88
	700mm	Each	551.60
	750mm	Each	638.28
	800mm	Each	756.48
	900mm	Each	998.79
	1000mm	Each	1282.47

S. No.	Items	Unit	Rates in Rs.
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.**		
	100mm	Each	1130.35
	125mm	Each	1374.24
	150 mm	Each	1704.48
	200mm	Each	2506.55
	250mm	Each	3414.87
	300mm	Each	5214.51
	350mm	Each	7591.44
	400mm	Each	9496.62
	450mm	Each	11929.05
	500mm	Each	14952.04
	600mm	Each	23122.23
	700mm	Each	40378.88
	750mm	Each	47741.40
	800mm	Each	55129.53
	900mm	Each	75909.96
	1000mm	Each	101759.08
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.**		
	100mm	Each	17.73
	125mm	Each	23.64
	150 mm	Each	27.58
	200mm	Each	43.34
	250mm	Each	61.07
	300mm	Each	80.77
	350mm	Each	102.44
	400mm	Each	131.99
	450mm	Each	167.45
	500mm	Each	210.79
	600mm	Each	309.29
	700mm	Each	421.58

S. No.	Items	Unit	Rates in Rs.
	750mm	Each	484.62
	800mm	Each	573.27
	900mm	Each	742.69
	1000mm	Each	902.26
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**		
	100mm	Each	1056.74
	125mm	Each	1297.44
	150 mm	Each	1658.35
	200mm	Each	2385.59
	250mm	Each	3126.82
	300mm	Each	4376.15
	350mm	Each	6633.84
	400mm	Each	8483.29
	450mm	Each	10454.22
	500mm	Each	12318.69
	600mm	Each	18282.23
	700mm	Each	32427.38
	750mm	Each	39104.49
	800mm	Each	45813.12
	900mm	Each	67158.43
	1000mm	Each	82599.45
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.**		
	100mm	Each	17.73
	125mm	Each	21.67
	150 mm	Each	25.61
	200mm	Each	41.37
	250mm	Each	55.16
	300mm	Each	72.89
	350mm	Each	90.62
	400mm	Each	112.29

S. No.	Items	Unit	Rates in Rs.
	450mm	Each	143.81
	500mm	Each	179.27
	600mm	Each	262.01
	700mm	Each	346.72
	750mm	Each	395.97
	800mm	Each	476.74
	900mm	Each	608.73
	1000mm	Each	756.48
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.**		
	100mm x 80mm	Each	1955.95
	100mm x 100mm	Each	1928.48
	150mm x 80mm	Each	2634.35
	150mm x 100mm	Each	2638.29
	150mm x 150mm	Each	3044.11
	200mm x 80mm	Each	3616.27
	200mm x 100mm	Each	3590.77
	200mm x 150mm	Each	4117.54
	200mm x 200mm	Each	4737.81
	250mm x 80mm	Each	4641.60
	250mm x 100mm	Each	4614.88
	250mm x 150mm	Each	5485.87
	250mm x 250mm	Each	7023.26
	300mm x 100mm	Each	5081.84
	300mm x 200mm	Each	8030.67
	300mm x 300mm	Each	10330.85
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.**		
	100mm x 80mm	Each	27.58
	100mm x 100mm	Each	29.55

S. No.	Items	Unit	Rates in Rs.
	150mm x 80mm	Each	37.43
	150mm x 100mm	Each	41.37
	150mm x 150mm	Each	47.28
	200mm x 80mm	Each	55.16
	200mm x 100mm	Each	59.10
	200mm x 150mm	Each	66.98
	200mm x 200mm	Each	78.80
	250mm x 80mm	Each	70.92
	250mm x 100mm	Each	74.86
	250mm x 150mm	Each	84.71
	250mm x 250mm	Each	108.35
	300mm x 100mm	Each	96.53
	300mm x 200mm	Each	122.14
	300mm x 300mm	Each	151.69
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.**		
	100mm x 80mm	Each	2106.35
	100mm x 100mm	Each	2183.15
	150mm x 80mm	Each	2964.60
	150mm x 100mm	Each	2886.83
	150mm x 150mm	Each	3836.33
	200mm x 80mm	Each	3559.36
	200mm x 100mm	Each	3651.62
	200mm x 150mm	Each	4819.48
	200mm x 200mm	Each	5824.92
	250mm x 80mm	Each	3723.55
	250mm x 100mm	Each	5641.14
	250mm x 150mm	Each	5845.55
	250mm x 200mm	Each	7103.70
	250mm x 250mm	Each	8440.62

S. No.	Items	Unit	Rates in Rs.
	300mm x 80mm	Each	5851.46
	300mm x 100mm	Each	6166.98
	300mm x 150mm	Each	7635.64
	300mm x 200mm	Each	8465.19
	300mm x 250mm	Each	9833.51
	300mm x 300mm	Each	10654.25
	350mm x 100mm	Each	8694.06
	350mm x 200mm	Each	11419.90
	350mm x 350mm	Each	17839.21
	400mm x 80mm	Each	10262.82
	400mm x 100mm	Each	11429.93
	400mm x 150mm	Each	12204.54
	400mm x 200mm	Each	13922.96
	400mm x 300mm	Each	19341.70
	400mm x 400mm	Each	19822.52
	450mm x 100mm	Each	12708.52
	450mm x 250mm	Each	17263.00
	500mm x 100mm	Each	14241.78
	500mm x 200mm	Each	22641.41
	500mm x 400mm	Each	31739.27
	500mm x 500mm	Each	30243.73
	600mm x 200mm	Each	26631.48
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.**		
	100mm x 80mm	Each	29.55
	100mm x 100mm	Each	31.52
	150mm x 80mm	Each	41.37
	150mm x 100mm	Each	43.34
	150mm x 150mm	Each	53.19
	200mm x 80mm	Each	57.13
	200mm x 100mm	Each	61.07
	200mm x 150mm	Each	70.92
	200mm x 200mm	Each	82.74
	250mm x 80mm	Each	72.89

S. No.	Items	Unit	Rates in Rs.
	250mm x 100mm	Each	76.83
	250mm x 150mm	Each	88.65
	250mm x 200mm	Each	100.47
	250mm x 250mm	Each	116.23
	300mm x 80mm	Each	94.56
	300mm x 100mm	Each	98.50
	300mm x 150mm	Each	112.29
	300mm x 200mm	Each	126.08
	300mm x 250mm	Each	143.81
	300mm x 300mm	Each	163.51
	350mm x 100mm	Each	118.20
	350mm x 200mm	Each	147.75
	350mm x 350mm	Each	212.76
	400mm x 80mm	Each	133.96
	400mm x 100mm	Each	141.84
	400mm x 150mm	Each	159.57
	400mm x 200mm	Each	175.33
	400mm x 300mm	Each	218.67
	400mm x 400mm	Each	273.83
	450mm x 100mm	Each	175.33
	450mm x 250mm	Each	236.40
	500mm x 100mm	Each	210.79
	500mm x 200mm	Each	254.13
	500mm x 400mm	Each	366.42
	500mm x 500mm	Each	447.19
	600mm x 200mm	Each	350.66
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	1043.99
	150mm x 80mm	Each	1140.20
	150mm x 100mm	Each	1435.09
	200mm x 100mm	Each	2513.39

S. No.	Items	Unit	Rates in Rs.
	200mm x 150mm	Each	2402.28
	250mm x 150mm	Each	3524.75
	300mm x 150mm	Each	5152.62
	300mm x 200mm	Each	4967.91
	300mm x 250mm	Each	4812.64
	350mm x 200mm	Each	7294.81
	350mm x 250mm	Each	7031.55
	350mm x 300mm	Each	6408.90
	400mm x 250mm	Each	9504.68
	400mm x 300mm	Each	8948.73
	400mm x 350mm	Each	7856.52
	450mm x 350mm	Each	10600.46
	450mm x 400mm	Each	9891.24
	500mm x 350mm	Each	13865.93
	500mm x 400mm	Each	13393.09
	600mm x 400mm	Each	21351.84
	600mm x 500mm	Each	18545.41
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	19.70
	150mm x 80mm	Each	27.58
	150mm x 100mm	Each	25.61
	200mm x 100mm	Each	35.46
	200mm x 150mm	Each	43.34
	250mm x 150mm	Each	53.19
	300mm x 150mm	Each	63.04
	300mm x 200mm	Each	70.92
	300mm x 250mm	Each	78.80
	350mm x 200mm	Each	96.53
	350mm x 250mm	Each	94.56
	350mm x 300mm	Each	102.44
	400mm x 250mm	Each	124.11

S. No.	Items	Unit	Rates in Rs.
	400mm x 300mm	Each	120.17
	400mm x 350mm	Each	131.99
	450mm x 350mm	Each	147.75
	450mm x 400mm	Each	163.51
	500mm x 350mm	Each	212.76
	500mm x 400mm	Each	260.04
	600mm x 400mm	Each	305.35
	600mm x 500mm	Each	374.30
4.27	**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	2844.91
	150mm	Each	3720.13
	200mm	Each	4915.29
	250mm	Each	6266.81
	300mm	Each	7659.99
	350mm	Each	9660.90
	400mm	Each	11814.76
	450mm	Each	15976.24
	500mm	Each	17956.92
	600mm	Each	23750.62
	700mm	Each	29652.89
	750mm	Each	34509.87
	800mm	Each	36404.85
	900mm	Each	44611.51
	1000mm	Each	53822.62
4.28	**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	5242.56
	150mm	Each	6980.62
	200mm	Each	9291.68
	250mm	Each	11980.37

S. No.	Items	Unit	Rates in Rs.
	300mm	Each	14531.22
	350mm	Each	18510.26
	400mm	Each	22517.54
	450mm	Each	30332.93
	500mm	Each	33946.64
	600mm	Each	45262.25
	700mm	Each	56516.74
	750mm	Each	65233.65
	800mm	Each	68989.86
	900mm	Each	84990.82
	1000mm	Each	102560.51
4.29	**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	7640.21
	150mm	Each	10241.11
	200mm	Each	13668.07
	250mm	Each	17693.94
	300mm	Each	21447.75
	350mm	Each	27359.61
	400mm	Each	33220.32
	450mm	Each	44689.63
	500mm	Each	49936.37
	600mm	Each	66773.88
	700mm	Each	83380.59
	750mm	Each	95957.42
	800mm	Each	101574.87
	900mm	Each	125370.13
	1000mm	Each	151298.41
4.30	**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.**		

S. No.	Items	Unit	Rates in Rs.
	100mm	Each	10037.86
	150mm	Each	13501.60
	200mm	Each	18044.46
	250mm	Each	23407.50
	300mm	Each	28364.29
	350mm	Each	36208.97
	400mm	Each	43923.10
	450mm	Each	59046.32
	500mm	Each	65926.09
	600mm	Each	88285.51
	700mm	Each	110246.42
	750mm	Each	126681.20
	800mm	Each	134159.89
	900mm	Each	165749.45
	1000mm	Each	199210.88
4.31	**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	11236.68
	150mm	Each	15131.85
	200mm	Each	20232.66
	250mm	Each	26264.29
	300mm	Each	31709.28
	350mm	Each	40633.64
	400mm	Each	49274.49
	450mm	Each	66224.67
	500mm	Each	73920.96
	600mm	Each	99041.32
	700mm	Each	123676.37
	750mm	Each	142043.09
	800mm	Each	150472.09
	900mm	Each	185958.80
	1000mm	Each	224405.25

S. No.	Items	Unit	Rates in Rs.
4.32	**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	12435.51
	150mm	Each	16762.09
	200mm	Each	22420.85
	250mm	Each	29121.07
	300mm	Each	35280.83
	350mm	Each	45058.32
	400mm	Each	54625.88
	450mm	Each	73403.02
	500mm	Each	81915.82
	600mm	Each	109797.14
	700mm	Each	137112.24
	750mm	Each	157404.98
	800mm	Each	166744.90
	900mm	Each	206128.76
	1000mm	Each	247948.77
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 5.2m. for class K-9 with inside cement mortar lining for the following sizes/dia pipes**		
	100mm	Each	12915.04
	150mm	Each	17414.19
	200mm	Each	23296.13
	250mm	Each	30263.78
	300mm	Each	36519.14
	350mm	Each	46828.19
	400mm	Each	56766.44
	450mm	Each	76274.36
	500mm	Each	85113.77
	600mm	Each	114099.47
	700mm	Each	142481.07
	750mm	Each	163549.74
	800mm	Each	173281.60
	900mm	Each	214224.32

S. No.	Items	Unit	Rates in Rs.
	1000mm	Each	258521.78
4.34	**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	49.25
	150mm	Each	78.80
	200mm	Each	106.38
	250mm	Each	141.84
	300mm	Each	181.24
	350mm	Each	222.61
	400mm	Each	265.95
	450mm	Each	311.26
	500mm	Each	364.45
	600mm	Each	486.59
	700mm	Each	626.46
	750mm	Each	717.08
	800mm	Each	786.03
	900mm	Each	949.54
	1000mm	Each	1148.51
4.35	**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	84.71
	150mm	Each	137.90
	200mm	Each	185.18
	250mm	Each	248.22
	300mm	Each	317.17
	350mm	Each	390.06
	400mm	Each	466.89
	450mm	Each	549.63
	500mm	Each	642.22
	600mm	Each	853.01
	700mm	Each	1091.38
	750mm	Each	1235.19

S. No.	Items	Unit	Rates in Rs.
	800mm	Each	1361.27
	900mm	Each	1644.95
	1000mm	Each	1973.94
4.36	**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	120.17
	150mm	Each	197.00
	200mm	Each	263.98
	250mm	Each	354.60
	300mm	Each	498.41
	350mm	Each	557.51
	400mm	Each	667.83
	450mm	Each	788.00
	500mm	Each	919.99
	600mm	Each	1219.43
	700mm	Each	1556.30
	750mm	Each	1753.30
	800mm	Each	1936.51
	900mm	Each	2340.36
	1000mm	Each	2799.37
4.37	**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	155.63
	150mm	Each	256.10
	200mm	Each	342.78
	250mm	Each	460.98
	300mm	Each	679.65
	350mm	Each	724.96
	400mm	Each	868.77
	450mm	Each	1026.37
	500mm	Each	1197.76
	600mm	Each	1585.85

S. No.	Items	Unit	Rates in Rs.
	700mm	Each	2023.19
	750mm	Each	2271.41
	800mm	Each	2511.75
	900mm	Each	3035.77
	1000mm	Each	2799.37
4.38	**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	173.36
	150mm	Each	285.65
	200mm	Each	382.18
	250mm	Each	514.17
	300mm	Each	657.00
	350mm	Each	808.69
	400mm	Each	969.24
	450mm	Each	1145.56
	500mm	Each	1336.65
	600mm	Each	1769.06
	700mm	Each	2253.68
	750mm	Each	2530.47
	800mm	Each	2819.07
	900mm	Each	3403.18
	1000mm	Each	4037.52
4.39	**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	191.09
	150mm	Each	315.20
	200mm	Each	421.58
	250mm	Each	567.36
	300mm	Each	860.89
	350mm	Each	892.41
	400mm	Each	1069.71

S. No.	Items	Unit	Rates in Rs.
	450mm	Each	1264.74
	500mm	Each	1475.53
	600mm	Each	1952.27
	700mm	Each	2490.08
	750mm	Each	2789.52
	800mm	Each	3086.99
	900mm	Each	3731.18
	1000mm	Each	3624.80
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 5.2m for class K-9 with inside cement mortar lining for the following sizes/dia pipes.**		
	100mm	Each	198.18
	150mm	Each	327.02
	200mm	Each	437.34
	250mm	Each	588.64
	300mm	Each	752.15
	350mm	Each	925.90
	400mm	Each	1109.90
	450mm	Each	1312.41
	500mm	Each	1531.08
	600mm	Each	2025.55
	700mm	Each	2579.12
	750mm	Each	2893.14
	800mm	Each	3221.74
	900mm	Each	3889.96
	1000mm	Each	4615.32

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 15	**Class 20**	**Class 25**
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.	228.00	251.00	280.00
	100mm	Mtr.	305.00	338.00	368.00
	125 mm	Mtr.	429.00	505.00	601.00
	150mm	Mtr.	549.00	616.00	646.00
	200mm	Mtr.	868.00	1028.00	1115.00
	250mm	Mtr.	1144.00	1265.00	1414.00
	300mm	Mtr.	1455.00	1549.00	1829.00
	350 mm	Mtr.	2238.00	2789.00	3387.00
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.	304.00	320.00	350.00
	100mm	Mtr.	401.00	420.00	462.00
	125 mm	Mtr.	523.00	598.00	699.00
	150mm	Mtr.	644.00	707.00	756.00
	200mm	Mtr.	939.00	1098.00	1286.00
	250mm	Mtr.	1219.00	1371.00	1523.00
	300mm	Mtr.	1544.00	1637.00	1921.00
	350 mm	Mtr.	2221.00	2808.00	3450.00
5.3	**Labour for laying in position following Asbestos cement pressure pipes class 15,20,25**				
	80mm	Mtr.	6.00	6.00	6.00
	100mm	Mtr.	8.00	8.00	8.00
	150mm	Mtr.	12.00	12.00	12.00
	200mm	Mtr.	19.00	19.00	19.00
	250mm	Mtr.	25.00	25.00	25.00
	300mm	Mtr.	32.00	32.00	32.00
	350 mm	Mtr.	40.00	40.00	40.00
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	346.00	362.00	380. 00
	100mm	Each	423. 00	446. 00	470.10
	125mm	Each	533. 00	569. 00	609. 00
	150mm	Each	658. 00	662.00	667.00
	200mm	Each	930. 00	992. 00	1058. 00
	250mm	Each	1215. 00	1224. 00	1234.00
	300mm	Each	1478. 00	1545. 00	1615. 00
	350mm	Each	2146. 00	2149. 00	2151. 00
5.5	**Labour for providing detachable joints to following asbestos cement pressure pipes and fittings class 15, 20 & 25 including testing of joints but excluding cost of C.I. Detachable joints.**				
	80mm	Each	79. 00	81. 00	83. 00
	100mm	Each	92. 00	95. 00	97.00
	125mm	Each	106. 00	109. 00	111. 00

Item No.	Items	Unit	Rate in Rupees		
	150mm	Each	120. 00	123. 00	125. 00
	200mm	Each	134.00	136. 00	139. 00
	250mm	Each	148. 00	150. 00	153. 00
	300mm	Each	162.00	164. 00	166. 00
	350mm	Each	176. 00	178. 00	180. 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	132.00	137.00	147.00
	100mm	Each	152.00	161.00	180.00
	125mm	Each	239.00	264.00	318.00
	150mm	Each	353.00	416.00	492.00
	200mm	Each	364.00	435.00	523.00
	250mm	Each	522.00	639.00	759.00
	300mm	Each	799.00	1059.00	1290.00
	350mm	Each	1982.00	1982.00	1982.00
5.7	**Labour for providing A.C. Coupler joint for the following asbestos cement pressure pipes and fittings class 15, 20 & 25 including testing of joint but excluding cost of A.C. Coupler and rubber rings**				
	80mm	Each	62. 00	65. 00	67.00
	100mm	Each	74. 00	76. 00	79. 00
	125mm	Each	86. 00	86. 00	88. 00
	150mm	Each	95. 00	97.00	99.00
	200mm	Each	106. 00	109. 00	111. 00
	250mm	Each	118. 00	120.00	123. 00
	300mm	Each	129. 00	132. 00	134.00
	350mm	Each	139. 00	139. 00	139. 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 15**	**Class 20**	**Class 25**
	80mm	Each	560. 00	641. 00	722.00
	100mm	Each	781. 00	958. 00	1083.00
	125mm	Each	1090. 00	1326. 00	1503. 00
	150mm	Each	1547. 00	1893. 00	2129. 00
	200mm	Each	2689.00	3293. 00	3721. 00
	250mm	Each	3934. 00	4818. 00	5334. 00

Item No.	Items	Unit	Rate in Rupees		
	300mm	Each	5747. 00	7058. 00	7809. 00
	350 mm	Each	8003.00	9756.00	11357. 00
(ii)	Cast Iron Plain ended 45° Bend		**Class 15**	**Class 20**	**Class 25**
	80mm	Each	538. 00	615. 00	692. 00
	100mm	Each	727. 00	895. 00	1014.00
	125mm	Each	979.00	1203. 00	1364. 00
	150mm	Each	1371. 00	1671. 00	1895. 00
	200mm	Each	2280. 00	2811.00	3210. 00
	250mm	Each	3203.00	3951. 00	4441. 00
	300mm	Each	4560. 00	5644. 00	6392.00
	350mm	Each	6479. 00	8003.00	9375. 00
(iii)	Cast Iron Plain ended 22½° Bend		**Class 15**	**Class 20**	**Class 25**
	80mm	Each	407.00	464.00	542.00
	100mm	Each	549.00	685.00	799.00
	125mm	Each	728.00	965.00	1070.00
	150mm	Each	1027.00	1269.00	1498.00
	200mm	Each	1712.00	2140.00	2554.00
	250mm	Each	2333.00	2932.00	3431.00
	300mm	Each	3310.00	4173.00	4936.00
	350mm	Each	4670.00	5897.00	7116.00
(iv)	Cast Iron Plain ended 11¼° Bend		**Class 15**	**Class 20**	**Class 25**
	80mm	Each	327.00	369.00	445.00
	100mm	Each	439.00	557.00	668.00
	125mm	Each	578.00	724.00	884.00
	150mm	Each	821.00	1023.00	1246.00
	200mm	Each	1371.00	1740.00	2144.00
	250mm	Each	1817.00	2325.00	2812.00
	300mm	Each	2575.00	3306.00	4044.00
	350mm	Each	3649.00	4694.00	5786.00
(v)	Cast Iron Plain ended Tees				
	Body & Branch		**Class 15**	**Class 20**	**Class 25**
	80x80mm	Each	698.00	799.00	922.00
	100x80mm	Each	907.00	1044.00	1181.00
	100x100mm	Each	1001.00	1238.00	1418.00
	125X80mm	Each	1152.00	1368.00	1534.00
	125X100mm	Each	1274.00	1627.00	1829.00
	125X125mm	Each	1433.00	1757.00	2002.00
	150x80mm	Each	1743.00	2110.00	2376.00
	150x100mm	Each	1822.00	2232.00	2520.00
	150X125mm	Each	1923.00	2354.00	2671.00
	150x150mm	Each	2095.00	2563.00	2902.00
	200X80 mm	Each	2981.00	3629.00	4090.00
	200X100 mm	Each	3067.00	3759.00	4234.00

Item No.	Items	Unit	Rate in Rupees		
	200X125mm	Each	3175.00	3888.00	4392.00
	200X150 mm	Each	3406.00	4104.00	4630.00
	200X200 mm	Each	3751.00	4608.00	5235.00
	250X80 mm	Each	4407.00	4652.00	5912.00
	250X100 mm	Each	4493.00	5501.00	6063.00
	250X125mm	Each	4616.00	5645.00	6236.00
	250X150 mm	Each	4796.00	5868.00	6487.00
	250X200 mm	Each	5220.00	6394.00	7107.00
	250X250 mm	Each	5609.00	6891.00	7632.00
(vi)	Cast Iron Plain ended Tees				
	300x80 to 350x350mm				
	Body & Branch		**Class 15**	**Class 20**	**Class 25**
	300X80mm	Each	6488.00	7921.00	8713.00
	300X100mm	Each	6574.00	8065.00	8857.00
	300X125mm	Each	6704.00	8209.00	9073.00
	300X150mm	Each	6812.00	8353.00	9217.00
	300X200mm	Each	7345.00	9001.00	9937.00
	300X250mm	Each	7777.00	9505.00	10225.00
	300X300mm	Each	8353.00	10297.00	11449.00
	350X200mm	Each	9721.00	11881.00	13753.00
	350X250mm	Each	10153.00	12385.00	14401.00
	350X300mm	Each	10801.00	13177.00	15337.00
	350X350mm	Each	11377.00	13969.00	16201.00
(vii)	Cast Iron Plain ended Crosses		**Class 15**	**Class 20**	**Class 25**
	80X80mm	Each	918.00	1039.00	1204.00
	100X100mm	Each	1302.00	1618.00	1866.00
	125X125mm	Each	1851.00	2273.00	2619.00
	150X150mm	Each	2717.00	3326.00	3800.00
	200X200mm	Each	4869.00	5975.00	6848.00
	250X250mm	Each	7217.00	8880.00	9934.00
	300X300mm	Each	10762.00	13245.00	14826.00
	350X350mm	Each	15980.00	19522.00	22734.00
(viii)	Cast Iron Plain ended Reducers		**Class 15**	**Class 20**	**Class 25**
	100X80mm	Each	619.00	737.00	840.00
	125X80mm	Each	729.00	869.00	995.00
	125X100mm	Each	811.00	995.00	1142.00
	150X80mm	Each	892.00	1068.00	1223.00
	150X100mm	Each	973.00	1201.00	1378.00
	150X125mm	Each	1083.00	1326.00	1533.00
	200X100mm	Each	1341.00	1658.00	1990.00
	200X125mm	Each	1444.00	1783.00	2085.00
	200X150mm	Each	1614.00	1989.00	2321.00
	250X125mm	Each	1754.00	2196.00	2527.00

Item No.	Items	Unit	Rate in Rupees		
	250X150mm	Each	1923.00	2387.00	2763.00
	250X200mm	Each	2284.00	2844.00	3316.00
	300X150mm	Each	2395.00	2992.00	3500.00
	300X200mm	Each	2763.00	3448.00	4060.00
	300X250mm	Each	3058.00	3684.00	4480.00
	350X200mm	Each	4547.00	5582.00	6447.00
	350X250mm	Each	5034.00	6192.00	7118.00
	350X300mm	Each	5706.00	7026.00	8107.00
(ix)	Cast Iron Adopter (Flange Spigot)		**Class 15**	**Class 20**	**Class 25**
	(T.P.)				
	80mm	Each	524.00	559.00	602.00
	100mm	Each	644.00	722.00	779.00
	125mm	Each	828.00	920.00	1041.00
	150mm	Each	1083.00	1210.00	1324.00
	200 mm	Each	1607.00	1826.00	2032.00
	250 mm	Each	2605.00	2994.00	3242.00
	300mm	Each	3384.00	3915.00	4297.00
	350mm	Each	4316.00	4991.00	5622.00
(x)	Cast Iron Blank end cap		**Class 15**	**Class 20**	**Class 25**
	(Dead end cap)				
	80mm	Each	254.00	277.00	329.00
	100mm	Each	367.00	442.00	531.00
	125mm	Each	509.00	606.00	741.00
	150mm	Each	763.00	906.00	1093.00
	200mm	Each	1392.00	1676.00	2036.00
	250mm	Each	1976.00	2373.00	2829.00
	300mm	Each	2926.00	3510.00	4221.00
	350mm	Each	3893.00	4659.00	5509.00
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 15**	**Class 20**	**Class 25**
	80mm	Each	15.00	17.00	19.00
	100mm	Each	21.00	26.00	29.00
	125mm	Each	29.00	35.00	40.00
	150mm	Each	41.00	51.00	57.00
	200mm	Each	72.00	88.00	99.00
	250mm	Each	105.00	129.00	143.00
	300mm	Each	154.00	189.00	209.00
	350 mm	Each	207.00	252.00	294.00
(ii)	Cast Iron Plain ended 45° Bend		**Class 15**	**Class 20**	**Class 25**
	80mm	Each	15. 00	17. 00	20.00

Item No.	Items	Unit	Rate in Rupees		
	100mm	Each	20.00	25.00	29.00
	125mm	Each	28.00	34.00	38.00
	150mm	Each	39.00	47.00	53.00
	200mm	Each	64.00	79.00	90.00
	250mm	Each	90.00	111.00	125.00
	300mm	Each	128.00	159.00	180.00
	350mm	Each	167.00	207.00	242.00
(iii)	Cast Iron Plain ended 22½° Bend		**Class 15**	**Class 20**	**Class 25**
	80mm	Each	11.00	13.00	15.00
	100mm	Each	15.00	19.00	22.00
	125mm	Each	20.00	25.00	30.00
	150mm	Each	28.00	35.00	41.00
	200mm	Each	47.00	59.00	71.00
	250mm	Each	64.00	81.00	95.00
	300mm	Each	91.00	115.00	136.00
	350mm	Each	116.00	147.00	177.00
(iv)	Cast Iron Plain ended 11¼° Bend		**Class 15**	**Class 20**	**Class 25**
	80mm	Each	9.00	10.00	13.00
	100mm	Each	12.00	16.00	19.00
	125mm	Each	16.00	20.00	25.00
	150mm	Each	23.00	29.00	35.00
	200mm	Each	39.00	49.00	61.00
	250mm	Each	51.00	66.00	80.00
	300mm	Each	73.00	94.00	114.00
	350mm	Each	91.00	117.00	144.00
(v)	Cast Iron Plain ended Tees				
	Body & Branch		**Class 15**	**Class 20**	**Class 25**
	80x80mm	Each	19.00	22.00	25.00
	100x80mm	Each	25.00	29.00	32.00
	100x100mm	Each	27.00	34.00	39.00
	125X80mm	Each	32.00	37.00	42.00
	125X100mm	Each	35.00	45.00	50.00
	125X125mm	Each	39.00	48.00	55.00
	150x80mm	Each	48.00	58.00	65.00
	150x100mm	Each	50.00	61.00	69.00
	150X125mm	Each	53.00	64.00	73.00
	150x150mm	Each	57.00	70.00	79.00
	200X80 mm	Each	82.00	99.00	112.00
	200X100 mm	Each	84.00	103.00	116.00
	200X125mm	Each	87.00	106.00	120.00
	200X150 mm	Each	93.00	112.00	127.00
	200X200 mm	Each	103.00	126.00	143.00
	250X80 mm	Each	121.00	127.00	162.00

Item No.	Items	Unit	Rate in Rupees		
	250X100 mm	Each	123.00	151.00	166.00
	250X125mm	Each	126.00	154.00	171.00
	250X150 mm	Each	131.00	161.00	177.00
	250X200 mm	Each	143.00	175.00	194.00
	250X250 mm	Each	153.00	189.00	209.00
(vi)	Cast Iron Plain ended Tees				
	300x80 to 350x350mm				
	Body & Branch		**Class 15**	**Class 20**	**Class 25**
	300X80mm	Each	177.00	217.00	238.00
	300X100mm	Each	180.00	221.00	242.00
	300X125mm	Each	183.00	225.00	248.00
	300X150mm	Each	186.00	229.00	252.00
	300X200mm	Each	201.00	246.00	272.00
	300X250mm	Each	213.00	260.00	280.00
	300X300mm	Each	229.00	282.00	313.00
	350X200mm	Each	266.00	325.00	376.00
	350X250mm	Each	278.00	339.00	394.00
	350X300mm	Each	296.00	361.00	420.00
	350X350mm	Each	311.00	382.00	443.00
(vii)	Cast Iron Plain ended Crosses		**Class 15**	**Class 20**	**Class 25**
	80X80mm	Each	24.00	27.00	32.00
	100X100mm	Each	34.00	42.00	49.00
	125X125mm	Each	48.00	59.00	69.00
	150X150mm	Each	71.00	87.00	99.00
	200X200mm	Each	127.00	156.00	179.00
	250X250mm	Each	189.00	232.00	260.00
	300X300mm	Each	282.00	347.00	388.00
	350X350mm	Each	382.00	467.00	544.00
(viii)	Cast Iron Plain ended Reducers		**Class 15**	**Class 20**	**Class 25**
	100X80mm	Each	17.00	20.00	22.00
	125X80mm	Each	20.00	23.00	27.00
	125X100mm	Each	22.00	27.00	31.00
	150X80mm	Each	24.00	29.00	33.00
	150X100mm	Each	26.00	32.00	37.00
	150X125mm	Each	29.00	35.00	41.00
	200X100mm	Each	36.00	44.00	52.00
	200X125mm	Each	39.00	48.00	56.00
	200X150mm	Each	43.00	53.00	62.00
	250X125mm	Each	47.00	59.00	68.00
	250X150mm	Each	51.00	64.00	74.00
	250X200mm	Each	61.00	76.00	89.00
	300X150mm	Each	64.00	80.00	94.00
	300X200mm	Each	74.00	92.00	109.00

Item No.	Items	Unit	Rate in Rupees		
	300X250mm	Each	82.00	99.00	120.00
	350X200mm	Each	116.00	142.00	164.00
	350X250mm	Each	128.00	158.00	182.00
	350X300mm	Each	146.00	179.00	207.00
(ix)	Cast Iron Adopter (Flange Spigot)		**Class 15**	**Class 20**	**Class 25**
	(T.P.)				
	80mm	Each	15.00	16.00	17.00
	100mm	Each	18.00	20.00	22.00
	125mm	Each	23.00	26.00	29.00
	150mm	Each	30.00	34.00	37.00
	200mm	Each	45.00	51.00	57.00
	250 mm	Each	72.00	83.00	90.00
	300mm	Each	94.00	109.00	120.00
	350mm	Each	117.00	136.00	153.00
(x)	Cast Iron Blank end cap		**Class 15**	**Class 20**	**Class 25**
	(Dead end cap)				
	80mm	Each	7.00	7.00	9.00
	100mm	Each	10.00	12.00	14.00
	125mm	Each	13.00	16.00	20.00
	150mm	Each	20.00	24.00	29.00
	200mm	Each	37.00	44.00	54.00
	250mm	Each	52.00	62.00	74.00
	300mm	Each	77.00	92.00	111.00
	350mm	Each	101.00	121.00	143.00
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	197.00	197.00	197.00

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 (MS) Pipes with specials (such as bends, elbows, tees etc) class light, medium & heavy including testing of joints, cost of pipes, specials and jointing materials all complete. Pipes and sockets conforming to IS-1239/2011 Part-II**				
			Light	**Medium**	**Heavy**
	15mm dia	R Mtr.	87	109	129
	20mm dia	R Mtr.	121	137	163
	25mm dia	R Mtr.	168	203	244
	32mm dia	R Mtr.	206	249	302
	40mm dia	R Mtr.	269	296	360
	50mm dia	R Mtr.	331	404	493
	65mm dia	R Mtr.	471	528	644
	80mm dia	R Mtr.	552	678	800
	100mm dia	R Mtr.	783	971	1144
	125mm dia	R Mtr.	-	1269	1422
	150mm dia	R Mtr.	-	1520	1705

Item No.	ITEMS	Unit	Rate in Rupees		
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.	9	10	11
	20mm dia	R Mtr.	10	11	12
	25mm dia	R Mtr.	15	17	18
	32mm dia	R Mtr.	16	18	20
	40mm dia	R Mtr.	21	23	25
	50mm dia	R Mtr.	23	25	28
	65mm dia	R Mtr.	37	41	45
	80mm dia	R Mtr.	40	45	49
	100mm dia	R Mtr.	58	65	71
	125mm dia	R Mtr.	75	84	92
	150mm dia	R Mtr.	92	102	113
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		403	523
	20mm dia	Each		520	675
	25mm dia	Each		857	1114
	32mm dia	Each		1246	1620
	40mm dia	Each		1601	2081
	50mm dia	Each		2405	3126
	65mm dia	Each		4421	5748
	80mm dia	Each		6179	8033
	100mm dia	Each		11683	15188
6.4	**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-II**				
				Screwed	**Flanged**
	15mm dia	Each		502	653
	20mm dia	Each		640	832
	25mm dia	Each		1064	1383

Item No.	ITEMS	Unit	Rate in Rupees		
	32mm dia	Each		1555	2021
	40mm dia	Each		1901	2471
	50mm dia	Each		3014	3918
	65mm dia	Each		5497	7146
	80mm dia	Each		7578	9851
	100mm dia	Each		14005	18206
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		366	475
	20mm dia	Each		532	691
	25mm dia	Each		824	1071
	32mm dia	Each		1338	1740
	40mm dia	Each		1831	2380
	50mm dia	Each		2510	3264
	65mm dia	Each		4850	6305
	80mm dia	Each		6439	8371
	100mm dia	Each		10995	14293
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		452	587
	20mm dia	Each		641	834
	25mm dia	Each		1019	1325
	32mm dia	Each		1667	2167
	40mm dia	Each		2275	2958
	50mm dia	Each		3180	4134
	65mm dia	Each		5639	7331
	80mm dia	Each		7327	9525
	100mm dia	Each		13170	17121
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		366	475
	20mm dia	Each		532	691

Item No.	ITEMS	Unit	Rate in Rupees		
	25mm dia	Each		824	1071
	32mm dia	Each		1338	1740
	40mm dia	Each		1831	2380
	50mm dia	Each		2510	3264
	65mm dia	Each		4850	6305
	80mm dia	Each		6439	8371
	100mm dia	Each		10995	14293
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		438	570
	20mm dia	Each		638	829
	25mm dia	Each		989	1285
	32mm dia	Each		1605	2087
	40mm dia	Each		2196	2855
	50mm dia	Each		3013	3917
	65mm dia	Each		5820	7566
	80mm dia	Each		7727	10045
	100mm dia	Each		13193	17151
6.9	**Providing and fixing following GM or brass ferrules confirming to IS-2692/1989 (Reaffirmed 2005), tested to 21.09 kg/sq.cm. i/c boring and tapping the main**				
				Screwed	
	15mm dia	Each		450	
	20mm dia	Each		647	
	25mm dia	Each		1699	
6.10	**Labour for laying and fixing Screwed or flanged Gate valves (full way) Class-I**				
				Screwed	**Flanged**
	15mm dia	Each		10	13
	20mm dia	Each		13	17
	25mm dia	Each		21	27
	32mm dia	Each		31	40
	40mm dia	Each		39	51
	50mm dia	Each		59	77
	65mm dia	Each		109	141
	80mm dia	Each		152	198
	100mm dia	Each		288	374

Item No.	ITEMS	Unit	Rate in Rupees		
6.11	**Labour for laying and fixing Screwed or flanged Gate valves (full way) Class-II**				
				Screwed	**Flanged**
	15mm dia	Each		12	16
	20mm dia	Each		16	20
	25mm dia	Each		26	34
	32mm dia	Each		38	50
	40mm dia	Each		47	61
	50mm dia	Each		74	96
	65mm dia	Each		135	176
	80mm dia	Each		186	242
	100mm dia	Each		345	448
6.12	**Labour for laying and fixing Screwed or flanged globe wheel valves Class-I**				
				Screwed	**Flanged**
	15mm dia	Each		9	12
	20mm dia	Each		13	17
	25mm dia	Each		20	26
	32mm dia	Each		33	43
	40mm dia	Each		45	59
	50mm dia	Each		62	80
	65mm dia	Each		119	155
	80mm dia	Each		158	206
	100mm dia	Each		271	352
6.13	**Labour for laying and fixing Screwed or flanged globe wheel valves Class-II**				
				Screwed	**Flanged**
	15mm dia	Each		11	14
	20mm dia	Each		16	21
	25mm dia	Each		25	33
	32mm dia	Each		41	53
	40mm dia	Each		56	73
	50mm dia	Each		78	102
	65mm dia	Each		139	180
	80mm dia	Each		180	234
	100mm dia	Each		324	421
6.14	**Labour for laying and fixing Screwed or flanged check (non-return) valves Class-I,**				
	15mm dia	Each		9	12
	20mm dia	Each		13	17

Item No.	ITEMS	Unit	Rate in Rupees		
	25mm dia	Each		20	26
	32mm dia	Each		33	43
	40mm dia	Each		45	59
	50mm dia	Each		62	80
	65mm dia	Each		119	155
	80mm dia	Each		158	206
	100mm dia	Each		271	352
6.15	**Labour for laying and fixing Screwed or flanged check (non-return) valves Class-II,**				
				Screwed	**Flanged**
	15mm dia	Each		11	14
	20mm dia	Each		16	20
	25mm dia	Each		24	32
	32mm dia	Each		40	51
	40mm dia	Each		54	70
	50mm dia	Each		74	96
	65mm dia	Each		143	186
	80mm dia	Each		190	247
	100mm dia	Each		325	422
6.16	**Labour for laying and fixing following GM or brass ferrules**				
				Screwed	
	15mm dia	Each		88	
	20mm dia	Each		127	
	25mm dia	Each		333	
6.17	**Providing & fixing water taps**				
			Stainless Steel	**CI self closing**	**Brass Heavy Duty**
	15mm dia	Each	966	614	375
	20mm dia	Each	1068	694	682
	25mm dia	Each	0	0	1222
6.18	**Labour for laying & fixing water taps**				
			Stainless Steel	**CI self closing**	**Brass Heavy Duty**
	15mm dia	Each	74	47	29
	20mm dia	Each	82	53	53
	25mm dia	Each	0	0	94
6.19	**Providing and fixing Screwed Ball valves tested to 21.09 kg/cm confirming to IS 778/1984**				
				Screwed	
	15mm dia	Each		393	

Item No.	ITEMS	Unit	Rate in Rupees		
	20mm dia	Each		542	
	25mm dia	Each		842	
	32mm dia	Each		1438	
	40mm dia	Each		2041	
	50mm dia	Each		3005	
	65mm dia	Each		6365	
	80mm dia	Each		10942	
	100mm dia	Each		17002	
6.20	**Labour only for fixing Screwed Ball valves tested to 21 kg/cm confirming to IS 778/1984**				
	15mm dia	Each		10	
	20mm dia	Each		13	
	25mm dia	Each		21	
	32mm dia	Each		35	
	40mm dia	Each		50	
	50mm dia	Each		74	
	65mm dia	Each		157	
	80mm dia	Each		269	
	100mm dia	Each		418	
6.21	**Providing and fixing G. I. Union in G.I. Pipe line i/c cutting threading testing etc. complete (New work) confirming to IS 1879**				
	15mm dia	Each		100	
	20mm dia	Each		172	
	25mm dia	Each		223	
	32mm dia	Each		293	
	40mm dia	Each		398	
	50mm dia	Each		514	
	65mm dia	Each		820	
	80mm dia	Each		1247	
	100mm dia	Each		1942	
6.22	**Labour for fixing G. I. Union in G.I. Pipe line i/c cutting threading testing etc. complete (New work)**				
	15mm dia	Each		8	
	20mm dia	Each		13	
	25mm dia	Each		17	
	32mm dia	Each		23	
	40mm dia	Each		31	
	50mm dia	Each		40	

Item No.	ITEMS	Unit	Rate in Rupees		
	65mm dia	Each		63	
	80mm dia	Each		96	
	100mm dia	Each		149	
6.23	**Providing and fixing G. I. Union in G.I. Pipe line i/c cutting threading testing etc. complete (Old work) confirming to IS 1879**				
	15mm dia	Each		109	
	20mm dia	Each		187	
	25mm dia	Each		243	
	32mm dia	Each		319	
	40mm dia	Each		433	
	50mm dia	Each		560	
	65mm dia	Each		893	
	80mm dia	Each		1357	
	100mm dia	Each		2114	
6.24	**Labour for fixing G. I. Union in G.I. Pipe line i/c cutting threading testing etc. complete (Old work)**				
	15mm dia	Each		15	
	20mm dia	Each		26	
	25mm dia	Each		34	
	32mm dia	Each		45	
	40mm dia	Each		61	
	50mm dia	Each		79	
	65mm dia	Each		126	
	80mm dia	Each		192	
	100mm dia	Each		299	
6.25	**Providing and fixing G. I. socket in G.I. Pipe line i/c cutting threading testing etc. complete (Old work) confirming to IS 1879**				
	15mm dia	Each		23	
	20mm dia	Each		32	
	25mm dia	Each		45	
	32mm dia	Each		67	
	40mm dia	Each		82	
	50mm dia	Each		138	
	65mm dia	Each		180	
	80mm dia	Each		267	
	100mm dia	Each		445	
	125mm dia	Each		602	
	150mm dia	Each		702	

Item No.	ITEMS	Unit	Rate in Rupees		
6.26	**Labour only for fixing G. I. socket in G.I. Pipe line i/c cutting threading testing etc. complete (Old work)**				
	15mm dia	Each		5	
	20mm dia	Each		7	
	25mm dia	Each		10	
	32mm dia	Each		15	
	40mm dia	Each		18	
	50mm dia	Each		31	
	65mm dia	Each		40	
	80mm dia	Each		59	
	100mm dia	Each		99	
	125mm dia	Each		133	
	150mm dia	Each		156	
6.27	**Providing and fixing G. I. Bend 90 degree in G.I. Pipe line i/c cutting threading testing etc. complete (Old work) confirming to IS 1879**				
	15mm dia	Each		48	
	20mm dia	Each		70	
	25mm dia	Each		119	
	32mm dia	Each		202	
	40mm dia	Each		241	
	50mm dia	Each		370	
	65mm dia	Each		459	
	80mm dia	Each		542	
	100mm dia	Each		1565	
	125mm dia	Each		1774	
	150mm dia	Each		2158	
6.28	**Labour only for fixing G. I. Bend 90 degree in G.I. Pipe line i/c cutting threading testing etc. complete (Old work)**				
	15mm dia	Each		11	
	20mm dia	Each		15	
	25mm dia	Each		26	
	32mm dia	Each		45	
	40mm dia	Each		53	
	50mm dia	Each		82	
	65mm dia	Each		102	
	80mm dia	Each		120	
	100mm dia	Each		347	

Item No.	ITEMS	Unit	Rate in Rupees		
	125mm dia	Each		393	
	150mm dia	Each		478	
6.29	**Providing and fixing G. I. Tee in G.I. Pipe line i/c cutting threading testing etc. complete (Old work) confirming to IS 1879**				
	15mm dia	Each		62	
	20mm dia	Each		103	
	25mm dia	Each		141	
	32mm dia	Each		239	
	40mm dia	Each		311	
	50mm dia	Each		510	
	65mm dia	Each		876	
	80mm dia	Each		1122	
	100mm dia	Each		2081	
	150mm dia	Each		5160	
6.30	**Labour only for fixing G. I. Tee in G.I. Pipe line i/c cutting threading testing etc. complete (Old work)**				
	15mm dia	Each		14	
	20mm dia	Each		23	
	25mm dia	Each		31	
	32mm dia	Each		53	
	40mm dia	Each		69	
	50mm dia	Each		113	
	65mm dia	Each		194	
	80mm dia	Each		249	
	100mm dia	Each		461	
	150mm dia	Each		1144	
6.31	**Providing and fixing G. I. Elbow in G.I. Pipe line i/c cutting threading testing etc. complete (Old work) confirming to IS 1879**				
	15mm dia	Each		44	
	20mm dia	Each		76	
	25mm dia	Each		104	
	32mm dia	Each		170	
	40mm dia	Each		213	
	50mm dia	Each		402	
	65mm dia	Each		630	
	80mm dia	Each		850	
	100mm dia	Each		1653	

Item No.	ITEMS	Unit	Rate in Rupees		
	150mm dia	Each		4511	
6.32	**Labour only for fixing G.I. elbow in G.I. Pipe line i/c cutting threading testing etc. complete (Old work)**				
	15mm dia	Each		10	
	20mm dia	Each		17	
	25mm dia	Each		23	
	32mm dia	Each		38	
	40mm dia	Each		47	
	50mm dia	Each		89	
	65mm dia	Each		140	
	80mm dia	Each		188	
	100mm dia	Each		366	
	150mm dia	Each		1000	
6.33	**Providing and fixing G. I. Nipple of minimum length in G.I. Pipe line i/c cutting threading testing etc. complete (Old work) confirming to IS 1879**				
	15mm dia	Each		27	
	20mm dia	Each		42	
	25mm dia	Each		61	
	32mm dia	Each		103	
	40mm dia	Each		126	
	50mm dia	Each		188	
	65mm dia	Each		348	
	80mm dia	Each		513	
	100mm dia	Each		958	
	150mm dia	Each		3148	
6.34	**Labour only for fixing G. I. . Nipple of minimum length in G.I. Pipe line i/c cutting threading testing etc. complete (Old work)**				
	15mm dia	Each		6	
	20mm dia	Each		9	
	25mm dia	Each		13	
	32mm dia	Each		23	
	40mm dia	Each		28	
	50mm dia	Each		42	
	65mm dia	Each		77	
	80mm dia	Each		114	
	100mm dia	Each		212	

Item No.	ITEMS	Unit	Rate in Rupees		
	150mm dia	Each		698	
6.35	**Providing and fixing G. I. Barrel Nipple (reducer) in G.I. Pipe line i/c cutting threading testing etc. complete (New work) confirming to IS 1879**				
	15X80mm	Each		27	
	15X100mm	Each		33	
	20X80mm	Each		35	
	20X100mm	Each		38	
	25X80mm	Each		46	
	25X100mm	Each		48	
	32X80mm	Each		65	
	32X100mm	Each		84	
	40X80mm	Each		89	
	40X100mm	Each		114	
	50X80mm	Each		95	
	50X100mm	Each		126	
	50X150mm	Each		135	
	65X80mm	Each		101	
	65X100mm	Each		160	
	65X150mm	Each		234	
	80X100mm	Each		173	
	80X150mm	Each		198	
	100X150mm	Each		295	
6.36	**Labour only for fixing G. I. . Barrel Nipple (reducer)G.I. Pipe line i/c cutting threading testing etc. complete (New work)**				
	15X80mm	Each		2	
	15X100mm	Each		3	
	20X80mm	Each		3	
	20X100mm	Each		3	
	25X80mm	Each		4	
	25X100mm	Each		4	
	32X80mm	Each		6	
	32X100mm	Each		7	
	40X80mm	Each		8	
	40X100mm	Each		10	
	50X80mm	Each		8	
	50X100mm	Each		11	
	50X150mm	Each		12	
	65X80mm	Each		9	
	65X100mm	Each		14	

Item No.	ITEMS	Unit	Rate in Rupees		
	65X150mm	Each		20	
	80X100mm	Each		15	
	80X150mm	Each		17	
	100X150mm	Each		26	
6.37	**Providing and fixing G. I. Barrel Nipple (reducer) in G.I. Pipe line i/c cutting threading testing etc. complete (Old work) confirming to IS 1879**				
	15X80mm	Each		32	
	15X100mm	Each		39	
	20X80mm	Each		41	
	20X100mm	Each		44	
	25X80mm	Each		54	
	25X100mm	Each		56	
	32X80mm	Each		76	
	32X100mm	Each		99	
	40X80mm	Each		105	
	40X100mm	Each		134	
	50X80mm	Each		112	
	50X100mm	Each		148	
	50X150mm	Each		159	
	65X80mm	Each		119	
	65X100mm	Each		188	
	65X150mm	Each		275	
	80X100mm	Each		204	
	80X150mm	Each		233	
	100X150mm	Each		347	
6.38	**Labour only for fixing G. I. Barrel Nipple (reducer)G.I. Pipe line i/c cutting threading testing etc. complete (Old work)**				
	15X80mm	Each		7	
	15X100mm	Each		9	
	20X80mm	Each		9	
	20X100mm	Each		10	
	25X80mm	Each		12	
	25X100mm	Each		12	
	32X80mm	Each		17	
	32X100mm	Each		22	
	40X80mm	Each		23	
	40X100mm	Each		30	
	50X80mm	Each		25	
	50X100mm	Each		33	

Item No.	ITEMS	Unit	Rate in Rupees		
	50X150mm	Each		35	
	65X80mm	Each		26	
	65X100mm	Each		42	
	65X150mm	Each		61	
	80X100mm	Each		45	
	80X150mm	Each		52	
	100X150mm	Each		77	
6.39	**Providing and fixing G. I. threaded Flange in G.I. Pipe line i/c cutting threading testing etc. complete (New work) confirming to IS 1879**				
	15mm dia	Each		71	
	20mm dia	Each		75	
	25mm dia	Each		94	
	32mm dia	Each		112	
	40mm dia	Each		138	
	50mm dia	Each		177	
	65mm dia	Each		210	
	80mm dia	Each		282	
	100mm dia	Each		374	
	125mm dia	Each		610	
	150mm dia	Each		696	
	200mm dia	Each		1135	
6.40	**Labour only for fixing G. I. threaded Flange in G.I. Pipe line i/c cutting threading testing etc. complete (New work)**				
	15mm dia	Each		6	
	20mm dia	Each		7	
	25mm dia	Each		8	
	32mm dia	Each		10	
	40mm dia	Each		12	
	50mm dia	Each		15	
	65mm dia	Each		18	
	80mm dia	Each		25	
	100mm dia	Each		33	
	125mm dia	Each		53	
	150mm dia	Each		60	
	200mm dia	Each		99	
6.41	**Providing and fixing G. I. threaded Flange in G.I. Pipe line i/c cutting threading testing etc. complete (Old work) confirming**				

Item No.	ITEMS	Unit	Rate in Rupees		
	to IS 1879				
	15mm dia	Each		83	
	20mm dia	Each		88	
	25mm dia	Each		111	
	32mm dia	Each		131	
	40mm dia	Each		162	
	50mm dia	Each		209	
	65mm dia	Each		247	
	80mm dia	Each		332	
	100mm dia	Each		440	
	125mm dia	Each		718	
	150mm dia	Each		819	
	200mm dia	Each		1336	
6.42	**Labour only for fixing G. I. threaded Flange in G.I. Pipe line i/c cutting threading testing etc. complete (Old work)**				
	15mm dia	Each		18	
	20mm dia	Each		20	
	25mm dia	Each		25	
	32mm dia	Each		29	
	40mm dia	Each		36	
	50mm dia	Each		46	
	65mm dia	Each		55	
	80mm dia	Each		74	
	100mm dia	Each		98	
	125mm dia	Each		159	
	150mm dia	Each		181	
	200mm dia	Each		296	
6.43	**Providing and fixing wrought steel Plug in G.I. Pipe line with outer threading testing etc. complete (New & Old work) confirming to IS 1879**				
	15mm dia	Each		19	
	20mm dia	Each		24	
	25mm dia	Each		36	
	32mm dia	Each		58	
	40mm dia	Each		80	
	50mm dia	Each		123	
	65mm dia	Each		159	
	80mm dia	Each		199	
	100mm dia	Each		354	
	150mm dia	Each		873	

Item No.	ITEMS	Unit	Rate in Rupees		
6.44	**Labour only for fixing wrought steel Plug in G.I. Pipe line with outer threading testing etc. complete.**				
	15mm dia	Each		1	
	20mm dia	Each		2	
	25mm dia	Each		3	
	32mm dia	Each		5	
	40mm dia	Each		7	
	50mm dia	Each		11	
	65mm dia	Each		14	
	80mm dia	Each		17	
	100mm dia	Each		31	
	150mm dia	Each		76	
6.45	**Providing and fixing wrought steel Cap Plug with outer threading in G.I. Pipe line testing etc. complete confirming to IS 1879**				
	15mm dia	Each		32	
	20mm dia	Each		45	
	25mm dia	Each		68	
	32mm dia	Each		97	
	40mm dia	Each		130	
	50mm dia	Each		181	
	65mm dia	Each		231	
	80mm dia	Each		373	
	100mm dia	Each		640	
	150mm dia	Each		1982	
6.46	**Labour only for fixing wrought steel CapPlug with outer threading in G.I. Pipe line testing etc. complete**				
	15mm dia	Each		3	
	20mm dia	Each		4	
	25mm dia	Each		6	
	32mm dia	Each		9	
	40mm dia	Each		11	
	50mm dia	Each		16	
	65mm dia	Each		20	
	80mm dia	Each		32	
	100mm dia	Each		56	
	150mm dia	Each		172	
6.47	**Providing and fixing G. I. cross**				

Item No.	ITEMS	Unit	Rate in Rupees		
	with outer threading in G.I. Pipe line i/c cutting threading testing etc. complete (Old work) confirming to IS 1879				
	15mm dia	Each		99	
	20mm dia	Each		131	
	25mm dia	Each		195	
	32mm dia	Each		307	
	40mm dia	Each		389	
	50mm dia	Each		615	
6.48	**Labour only for fixing G. I. cross outer threading in G.I. Pipe line i/c cutting threading testing etc. complete (Old work)**				
	15mm dia	Each		22	
	20mm dia	Each		29	
	25mm dia	Each		43	
	32mm dia	Each		68	
	40mm dia	Each		86	
	50mm dia	Each		136	
6.49	**Providing and fixing Tank Nipple with outer threading in G.I. Pipe line i/c cutting threading testing etc. complete confirming to IS 1879**				
	15mm dia	Each		76	
	20mm dia	Each		105	
	25mm dia	Each		176	
	32mm dia	Each		251	
	40mm dia	Each		329	
	50mm dia	Each		522	
6.50	**Labour only for Tank Nipple with outer threading in G.I. Pipe line i/c cutting threading testing etc. complete**				
	15mm dia	Each		7	
	20mm dia	Each		9	
	25mm dia	Each		15	
	32mm dia	Each		22	
	40mm dia	Each		29	
	50mm dia	Each		45	

CHAPTER – VII

P.V.C. PIPES & FITTINGS

Chapter – VII

P.V.C. PIPES & FITTINGS

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.

P.V.C. PIPES & FITTINGS

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.	137.00	184.00	211.00
	110 mm dia.	R. mtr.	203.00	269.00	310.00
	140 mm dia.	R. mtr.	328.00	449.00	498.00
	160 mm dia.	R. mtr.	419.00	571.00	647.00
	180 mm dia.	R. mtr.	520.00	728.00	799.00
	200 mm dia.	R. mtr.	666.00	894.00	1039.00
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.	3.00	3.00	3.00
	110 mm dia.	R. mtr.	4.00	4.00	4.00
	140 mm dia.	R. mtr.	5.00	5.00	5.00
	160 mm dia.	R. mtr.	6.00	6.00	6.00
	180 mm dia.	R. mtr.	8.00	8.00	8.00
	200 mm dia.	R. mtr.	11.00	11.00	11.00
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)**				

S.No.	Items	Unit	Rates in Rs.		
			6Kg/Cm^2	**8 Kg/Cm^2**	**10Kg/Cm^2**
	90 mm dia.	Each	22.00	22.00	22.00
	110 mm dia.	Each	25.00	25.00	25.00
	140 mm dia.	Each	31.00	31.00	31.00
	160 mm dia.	Each	36.00	36.00	36.00
	180 mm dia.	Each	39.00	39.00	39.00
	200 mm dia.	Each	55.00	55.00	55.00
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	17.00	17.00	17.00
	110 mm dia.	Each Joint	18.00	18.00	18.00
	140 mm dia.	Each Joint	20.00	20.00	20.00
	160 mm dia.	Each Joint	21.00	21.00	21.00
	180 mm dia.	Each Joint	23.00	23.00	23.00
	200 mm dia.	Each Joint	29.00	29.00	29.00
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	188.00	247.00	311.00
	110 mm dia.	Each	330.00	425.00	477.00
	140 mm dia.	Each	726.00	956.00	1153.00
	160 mm dia.	Each	999.00	1347.00	1619.00
	180 mm dia.	Each	1472.00	1876.00	2252.00
	200 mm dia.	Each	1944.00	2463.00	2884.00
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	103.00	118.00	144.00
	110 mm dia.	Each	136.00	173.00	230.00
	140 mm dia.	Each	346.00	365.00	383.00
	160 mm dia.	Each	534.00	569.00	652.00
	180 mm dia.	Each	628.00	735.00	954.00
	200 mm dia.	Each	675.00	1142.00	1672.00

S.No.	Items	Unit	Rates in Rs.		
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	73.00	76.00	79.00
	110 mm dia.	Each	145.00	168.00	190.00
	140 mm dia.	Each	234.00	298.00	364.00
	160 mm dia.	Each	408.00	449.00	490.00
	180 mm dia.	Each	551.00	675.00	799.00
	200 mm dia.	Each	733.00	790.00	850.00
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	41.00	41.00	42.00
	110 mm dia.	Each	59.00	63.00	67.00
	140 mm dia.	Each	90.00	108.00	123.00
	160 mm dia.	Each	150.00	164.00	166.00
	180 mm dia.	Each	202.00	238.00	269.00
	200 mm dia.	Each	257.00	276.00	283.00
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**
	90 mm dia.	Each	47.00	58.00	83.00
	110 mm dia.	Each	75.00	91.00	135.00
	140 mm dia.	Each	162.00	203.00	256.00
	160 mm dia.	Each	230.00	292.00	367.00
	180 mm dia.	Each	326.00	417.00	503.00
	200 mm dia	Each	421.00	540.00	705.00
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	79.00	96.00	109.00
	140x90 mm dia.	Each	121.00	145.00	155.00
	160x90 mm dia.	Each	205.00	251.00	273.00
	180x90 mm dia.	Each	280.00	310.00	329.00
	140x110 mm dia.	Each	123.00	150.00	156.00

S.No.	Items	Unit	Rates in Rs.		
	160x110 mm dia.	Each	152.00	213.00	267.00
	180x110 mm dia.	Each	305.00	324.00	349.00
	200x110 mm dia.	Each	356.00	434.00	489.00
	160x140 mm dia.	Each	160.00	211.00	265.00
	180x140 mm dia.	Each	330.00	352.00	379.00
	200x140 mm dia	Each	369.00	391.00	418.00
	180x160 mm dia	Each	351.00	376.00	412.00
	200x160 mm dia.	Each	397.00	455.00	512.00
	200x180 mm dia.	Each	422.00	479.00	539.00
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	7.00	7.00	7.00
	110 mm dia.	Each	8.00	8.00	8.00
	140 mm dia.	Each	9.00	9.00	9.00
	160 mm dia.	Each	12.00	12.00	12.00
	180 mm dia.	Each	13.00	13.00	13.00
	200 mm dia.	Each	14.00	14.00	14.00
7.12	**Providing and fixing PVC D-joint (Detachable joint) in PVC pipe line suitable for classes up to 10kg/sqcm Pressure pipes. i/c nut bolt, cutting of pipe, testing of joints etc complete.**				
			6Kg/Cm^2	**8 Kg/Cm^2**	**10Kg/Cm^2**
	90 mm dia.	Each	131.00	131.00	131.00
	110 mm dia.	Each	148.00	148.00	148.00
	140 mm dia.	Each	197.00	197.00	197.00
	160 mm dia.	Each	230.00	230.00	230.00
	180mm dia.	Each	271.00	271.00	271.00
	200mm dia.	Each	394.00	394.00	394.00
7.13	**Labour only for fixing PVC D-joint (Detachable joint) in PVC pipe line suitable for classes up to 10kg/sqcm Pressure pipes. i/c cutting of pipe, testing of joints etc complete.**				
			6Kg/Cm^2	**8 Kg/Cm^2**	**10Kg/Cm^2**
	90 mm dia.	Each	38.00	38.00	38.00
	110 mm dia.	Each	43.00	43.00	43.00
	140 mm dia.	Each	58.00	58.00	58.00
	160 mm dia.	Each	67.00	67.00	67.00

S.No.	Items	Unit	Rates in Rs.		
	180mm dia.	Each	79.00	79.00	79.00
	200mm dia.	Each	115.00	115.00	115.00
7.14	**Providing and fixing PVC Service Saddle piece in PVC Pipe line suitable for classes upto 10 kg/sqcm pressure Pipe i/c taping, boring of pipe and testing of joints etc complete**				
			6Kg/Cm^2	**8 Kg/Cm^2**	**10Kg/Cm^2**
	90 mm dia.	Each	291.00	390.00	489.00
	110 mm dia.	Each	352.00	466.00	580.00
	140 mm dia.	Each	394.00	520.00	650.00
	160 mm dia.	Each	467.00	616.00	770.00
	200mm dia.	Each	814.00	1074.00	1342.00
7.15	**Labour only for fixing PVC Service Saddle piece in PVC Pipe line suitable for classes upto 10 kg /sqcm pressure Pipe i/c taping, boring of pipe and testing of joints etc complete**				
			6Kg/Cm^2	**8 Kg/Cm^2**	**10Kg/Cm^2**
	90 mm dia.	Each	73.00	98.00	122.00
	110 mm dia.	Each	88.00	117.00	145.00
	140 mm dia.	Each	98.00	130.00	161.00
	160 mm dia.	Each	116.00	153.00	189.00
	200mm dia.	Each	203.00	270.00	335.00

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.

CAST IRON VALVES

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	2145.00	2515.00
	65mm dia	Each	2384.00	2636.00
	80mm dia	Each	2963.00	3345.00
	100mm dia	Each	3997.00	4025.00
	125mm dia	Each	5042.00	5065.00
	150mm dia	Each	6072.00	6101.00
	200mm dia	Each	10823.00	10880.00
	250mm dia	Each	16710.00	16809.00
	300mm dia	Each	21044.00	21165.00
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	207.00	
	65mm dia	Each	211.00	

S.No.	Items	Unit	Rates in Rupees	
	80mm dia	Each	215.00	
	100mm dia	Each	338.00	
	125mm dia	Each	368.00	
	150mm dia	Each	491.00	
	200mm dia	Each	677.00	
	250mm dia	Each	1099.00	
	300mm dia	Each	1235.00	
	350 mm dia	Each	2033.00	
	400 mm dia	Each	3154.0	
	450 mm dia	Each	3818.00	
	500 mm dia	Each	4827.00	
	600 mm dia	Each	7030.00	
	700 mm dia	Each	8353.00	
	750 mm dia	Each	8951.00	
	800 mm dia	Each	11826.00	
	900 mm dia	Each	13378.00	
	1000 mm dia	Each	16979.00	
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	69.00	
	65mm dia	Each	86.00	
	80mm dia	Each	98.00	
	100mm dia	Each	135.00	
	125mm dia	Each	158.00	
	150mm dia	Each	197.00	
	200mm dia	Each	293.00	
	250mm dia	Each	422.00	
	300mm dia	Each	545.00	
	350mm dia	Each	951.00	
	400mm dia	Each	1125.00	
	450mm dia	Each	1345.00	
	500mm dia	Each	1627.00	
	600mm dia	Each	2475.00	
	700mm dia	Each	2839.00	
	750mm dia	Each	2948.00	
	800mm dia	Each	3349.00	
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**		**CLASS-PN- 1.0**	

S.No.	Items	Unit	Rates in Rupees	
	bolts,nuts and rubber insertion all complete as per IS :5312 (Part I)			
	50mm dia	Each	1299.00	
	65mm dia	Each	1644.00	
	80mm dia	Each	2052.00	
	100mm dia	Each	3272.00	
	150mm dia	Each	5310.00	
	200mm dia	Each	9980.00	
	250mm dia	Each	16481.00	
	300mm dia	Each	20791.00	
	350mm dia	Each	36079.00	
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	69304.00	77164.00
	450mm dia	Each	88718.00	96579.00
	500mm dia	Each	123720.00	147300.00
	600mm dia	Each	185023.00	208604.00
	700mm dia	Each	216953.00	287692.00
	750mm dia	Each	335096.00	350816.00
	800mm dia	Each	385821.00	414902.00
8.5	**Labour for laying and fixing of following Cast Iron Double Flanged reflux (non return) valves including jointing & testing but without cost of jointing materials**			
	50mm dia	Each	55.00	
	65mm dia	Each	69.00	
	80mm dia	Each	79.00	
	100mm dia	Each	109.00	
	125mm dia	Each	125.00	
	150mm dia	Each	153.00	
	200mm dia	Each	190.00	
	250mm dia	Each	310.00	
	300mm dia	Each	393.00	
	350mm dia	Each	603.00	
	400mm dia	Each	786.00	
	450mm dia	Each	885.00	
	500mm dia	Each	1105.00	
	600mm dia	Each	1680.00	

S.No.	Items	Unit	Rates in Rupees	
	700mm dia	Each	1928.00	
	750mm dia	Each	2002.00	
	800mm dia	Each	2274.00	
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	1948.00	2020.00
	65mm dia	Each	2502.00	2595.00
	80mm dia	Each	2656.00	2732.00
	100mm dia	Each	3450.00	3600.00
	150mm dia	Each	5276.00	5576.00
	200mm dia	Each	10815.00	11761.00
	250mm dia	Each	17531.00	19337.00
	300mm dia	Each	19574.00	20073.00
8.7	**Labour for laying and fixing of following Cast Iron butterfly valves including jointing & testing but without cost of jointing materials**			
	50mm dia	Each	55.00	
	65mm dia	Each	69.00	
	80mm dia	Each	79.00	
	100mm dia	Each	109.00	
	150mm dia	Each	125.00	
	200mm dia	Each	153.00	
	250mm dia	Each	190.00	
	300mm dia	Each	310.00	
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	1302.00	1363.00
	40mm dia	Each	2101.00	2176.00
8.9	**Labour for laying and fixing of following Cast Iron Air valves small orifice with screwed end i/c jointing & testing but without cost of jointing material.**			

S.No.	Items	Unit	Rates in Rupees	
	25mm dia	Each	23.00	
	40mm dia	Each	30.00	
8.10	**Providing & fixing following cast iron single acting 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	1302.00	1363.00
	40mm dia	Each	2101.00	2176.00
	50mm dia	Each	2201.00	2247.00
8.11	**Labour for laying and fixing of following Cast Iron Air valves large orifice with screwed end i/c jointing & testing but without cost of jointing material. .**			
	25mm dia	Each	23.00	
	40mm dia	Each	30.00	
	50mm dia	Each	55.00	
8.12	**Providing & fixing following cast iron double acting 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	1799.00	1893.00
	50mm dia	Each	2305.00	2448.00
	65mm dia	Each	2948.00	3047.00
	80mm dia	Each	3193.00	3268.00
	100mm dia	Each	4098.00	4183.00
	150mm dia	Each	6590.00	7040.00
	200mm dia	Each	10151.00	11571.00
8.13	**Labour for laying and fixing of following Cast Iron double acting air valves, flanged without in-built isolating valve.**			
	40mm dia	Each	30.00	
	50mm dia	Each	55.00	
	65mm dia	Each	69.00	
	80mm dia	Each	79.00	
	100mm dia	Each	109.00	

S.No.	Items	Unit	Rates in Rupees	
	150mm dia	Each	125.00	
	200mm dia	Each	153.00	
8.14	**Providing & fixing following cast iron double acting air valves, flanged with in-built isolating valve as per IS : 14845-2000 including jointing & testing with cost of jointing material and rubber insertion all complete as per IS :13095-1991**		**CLASS PN- 1.0**	**CLASS PN- 1.6**
	40mm dia	Each	1576.00	1799.00
	80mm dia	Each	2199.00	2591.00
	100mm dia	Each	2681.00	3893.00
	150mm dia	Each	4940.00	6791.00
	200mm dia	Each	10908.00	13248.00
8.15	**Labour for laying and fixing of following Cast Iron double acting air valves, flanged with in-built isolating valve.**			
	40mm dia	Each	30.00	
	80mm dia	Each	55.00	
	100mm dia	Each	109.00	
	150mm dia	Each	125.00	
	200mm dia	Each	153.00	

CHAPTER IX

HDPE PIPE, MDPE PIPE & SPECIALS

CHAPTER IX
HDPE PIPE, MDPE PIPE & SPECIALS

NOTES:

This specification covers the requirements for successfully designing, manufacturing, supplying, laying, jointing and testing at works and site of High Density Polyethylene Pipes used for water supply. Use of HDPE Pipes shall be of pressure class of minimum PN 6 or above.

Applicable Codes

The manufacturing, testing, supplying, laying, jointing and testing at work sites of HDPE pipes shall comply with IS: 4984-1995 all currently applicable statutes, regulations, standards and amendments and others as follows-

Code no.	Title / Specification
IS 4984	High Density Polyethylene Pipes for Water Supply
IS 2530	Methods of test for polyethylene molding materials and polyethylene compounds GRP Pipes, Joints and Fittings for use for Potable Water Supply
IS 5382	Rubber sealing rings for gas mains, water mains and sewers.
IS 4905	Methods for random sampling
IS 7328	High density polyethylene materials for molding and extrusion
IS 7634	Laying & Jointing of Polyethylene (PE) Pipes
IS 9845	Method of analysis for the determination of specific and/or overall migration of constituents of plastics material and articles intended to come into contact with foodstuffs
IS 10141	Positive list of constituents of polyethylene in contact with food stuffs, pharmaceuticals and drinking water.
IS 10146	Polyethylene for its safe use in contact with foodstuff, Pharmaceuticals and drinking water.

Color

The color of the pipe shall be black.

Materials

The material used for the manufacturer of pipes should not constitute toxicity hazard, should not support microbial growth, should not give rise to unpleasant taste or odour, cloudiness or discoloration of water. Pipe manufacturers shall obtain a certificate to this effect from the manufacturers of raw material by any internationally reputed organization as per the satisfaction of the Engineer-in-Charge.

Raw Material

(a) Resin used to manufacture the HDPE pipes shall be 100% virgin PE Black pre-compounded confirming to IS: 4984, IS: 7328 and ISO: 4427-2007 (latest version). The resin proposed to be used for manufacturing of the pipes should also comply with the following norms as per ISO 9080-2003 (latest version).

(b) The resin should also have been certified by an independent laboratory of international repute like Bodycote/Slevan/Advantica for having passed 10,000 hour long term hydrostatic strength (LTHS) test extrapolated to 50 years to show that the resin has a minimum MRS of over 10MPa. There should not be any brittle knee at 80^{O}C before 5000 hours. Self certificate of any resin manufacturer will not be acceptable.

(c) Certificate from reputed organization OR Raw material supplier for having passed the full scale rapid crack propagation test as per ISO 13478. High density Polyethylene (HDPE) used for the manufacture of pipes shall conform to designation PEEWA-50-T-003 of IS 7328. HDPE conforming to designation PEEWA-50- T-003 of IS: 7328 may also be used. Melt Flow Rate (MFR) of the specific base density material shall also conform to clause of IS: 7328.

(d) The resin shall be compounded with carbon black. The carbon black content in the material shall be within 2.5±0.5% and the dispersion of carbon black shall be satisfactory when tested as per IS: 2530.

Anti-oxidant

The percentage of anti-oxidant used shall not be more than 0.3 percent by mass of finished resin. The anti-oxidant used shall be physiologically harmless and shall be selected from the list given in IS: 10141

Reworked Material

No addition of Reworked/ Recycled Material from the manufacturer's own rework material resulting from the manufacture of pipes is permissible and the vendor is required to use only 100% virgin resin compound.

Maximum Ovality of Pipe

The outside diameter of pipes, tolerance on the same and ovality of pipe shall be as given in table 2 of IS 4984.

Detectability

HDPE Pipes shall be detectable when buried underground, by providing an insulated copper wire having minimum diameter of 1.20 mm, firmly attached along the entire length of pipe.

To avoid theft or dislocation during handling / laying or earth refilling in trench, the insulated Copper wire shall be firmly fixed on the outer surface of HDPE pipe at Pipe manufacturer's works through external adhesion or co-extrusion or any other appropriate method.

Length of Straight Pipe

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

Coiling

The pipes supplied in coils shall be coiled on drums of minimum diameter of 25 times the nominal diameter of the pipe ensuring that kinking of pipe is prevented. Pipe beyond 110mm dia shall be supplied in straight length not less than 6m.

Fittings & Specials

All HDPE fittings/ specials shall be of minimum PN 6 or above Pressure class, fabricated in accordance with IS: 8360 (Part I & III). PE Injection molded fittings shall be as per IS: 8008 (Part I to IX). All fittings/specials shall be fabricated or molded at factory only. No fabrication or molding will be allowed at site, unless specifically permitted by the Engineer-in-Charge. Fittings will be welded to the pipes or other fittings by use of Electro- fusion process. Recommended makes for PE / Compression fittings / specials are Kimplas, Georg-Fischer, Glynwed, Trustlene, Astore, Magnum and GPS.

Bends

HDPE bends shall be plain square ended conforming to IS: 8360 Part I & III Specifications. Bends shall be molded.

Tees

HDPE Tees shall be plain square ended conforming to IS: 8360 Part I & II Specifications. Tees may be equal tees or reduced take off tees. Tees shall be molded.

Reducers

HDPE Reducers shall be plain square ended conforming to IS: 8008 Part I & VII Specifications. Reducer must be molded.

Flanged HDPE Pipe Ends

HDPE Stub ends shall be square ended conforming to IS: 8008 Part I & VI Specifications. Stub ends will be welded on the pipe. Flange will be of slip on flange type as described below.

Slip-On Flanges

Slip-on flanges shall be metallic flanges covered by epoxy coating or plastic powder coating. Slip-on-flanges shall be conforming to standard maching relevant flange of valves, pipes etc. Nominal pressure rating of flanges will be PN10.

Electro Fusion Tapping Saddle, Branch Saddle & Electro Fusion fittings:

a. All the Electro fusion fittings should be manufactured with top quality virgin pre-compounded PE 100 resin which should be compatible with the distribution mains.
b. The products shall comply with the requirements of EN 12201-3, EN 1555-3 or ISO 8085-3.
c. All the fittings shall be of SDR 11 rating.
d. The fittings shall have the approval from any three Agencies like KIWA, DVGW, WRC-NSF, U.K. CIPET etc.
e. All the products shall be manufactured by injection molding using virgin compounded PE 100 polymer having a melt flow rate

between 0.2- 1.4 grams/10 minutes and shall be compatible for fusing on PE 100 distribution mains manufactured according to the relevant national or international standards. The polymer used should comply with the requirements of EN 12201 -1. Process voltage of all saddles must not exceed a maximum of 40 volts.

f. Compression Fitting-

Compression fitting used for House service connection should comply as per ISO 14236 with Threaded metal inserts –SS 304 with BSP Threads

g. Pressure Testing-

The Pressure rating of compression fittings should be as per clause 8 of ISO 14236 which shall be PN 16

h. Dimensions-

The Dimension of compression fittings shall be as per clause 7.1of ISO 14236 Performed.

- Leak tightness under internal pressure.
- Leak tightness under internal Vacuum.
- Long term Pressure Test for Leak tightness for assembled joint
- MRS Value as per ISO 9080
- Resistance to Internal Pressure.

i. Effects on Quality of Water-

The Compression fitting for intended for conveyance of Potable water for Human consumption to be tested to comply with BS 6920 specifications in any of the laboratories like DVGW/ KIWA/ SPGN/ WRC –NSF and certificate of compliance to be produced for the following parameters:

a. Odor & Flavor of Water.
b. Appearance of Water.
c. Growth of Micro Organism.
d. Extraction of Metals.

All fittings with threaded ends should be with BSP threads.

HDPE Pipe, MDPE Pipe & Specials

S.No.	Items	Unit	Rates in Rs.		
9.1	Providing, Laying, Jointing & field testing of High Density Polyethylene pipes, (HDPE) confirming to IS 4984/ 14151/ 12786/ 13488 with necessary jointing material like mechanical connector of jointing pipes by heating to the ends of pipes with the help of Teflon coated electric mirror/ heater to the required temperature and then pressing the ends together against each other, to form a monolithic & leak proof joint by thermosetting process. It may be required to be done with Jack/Hydraulic Jacks/ Butt fusion machine. (50 mm & above fusion jointed & below 50mm mechanical jointed)				
	Pressure ⟶		**6Kg/sq.cm :**	**8Kg/sq.cm :**	**10 Kg/sq.cm:**
	63 mm dia	R. mtr.	126.33	159.49	186.62
	75 mm dia	R. mtr.	177.79	223.00	255.31
	90 mm dia	R. mtr.	250.13	313.43	362.28
	110 mm dia	R. mtr.	370.74	465.68	556.11
	125 mm dia	R. mtr.	505.77	631.78	744.60
	140 mm dia	R. mtr.	627.00	788.18	931.77
	160 mm dia	R. mtr.	820.20	1028.26	1215.80
	180 mm dia	R. mtr.	1033.67	1297.40	1531.84
	200 mm dia	R. mtr.	1281.98	1608.72	1907.62
9.2	Providing and laying Bend 90' confirming to IS specifications.				
	Pressure ⟶		**6Kg/sq.cm :**	**8Kg/sq.cm :**	**10 Kg/sq.cm:**
	63 mm dia	Each	87.00	93.00	124.00
	75 mm dia	Each	135.00	139.00	159.00
	90 mm dia	Each	208.00	223.00	255.00
	110 mm dia	Each	276.00	322.48	345.00
	125 mm dia	Each	396.00	378.00	579.00
	140 mm dia	Each	538.00	670.00	792.00
	160 mm dia	Each	771.00	968.6	1152.00
	180 mm dia	Each	1065.00	1347.00	1614.00
	200 mm dia	Each	1427.00	1813.00	2180.00
9.3	Providing and laying Bend 45' confirming to IS specification.				
	Pressure ⟶		**6Kg/sq.cm :**	**8Kg/sq.cm :**	**10 Kg/sq.cm:**
	Pressure ⟶		**6Kg/sq.cm :**	**8Kg/sq.cm :**	**10 Kg/sq.cm:**
	63 mm dia	Each	100.00	100.00	132.00

S.No.	Items	Unit	Rates in Rs.		
	75 mm dia	Each	153.00	153.00	202.00
	90 mm dia	Each	220.00	220.00	298.00
	110 mm dia	Each	326.00	325.00	473.00
	125 mm dia	Each	454.00	350.00	696.00
	140 mm dia	Each	662.00	472.00	995.00
	160 mm dia	Each	955.00	674.00	1429.00
	180 mm dia	Each	1292.00	927.00	1959.00
	200 mm dia	Each	1702.00	1239.00	2596.00
9.4	Providing and laying Equal Tee confirming to IS specification				
	Pressure		**6Kg/sq.cm :**	**8Kg/sq.cm :**	**10 Kg/sq.cm:**
	63 mm dia	Each	107.00	118.00	131.00
	75 mm dia	Each	177.00	184.00	226.00
	90 mm dia	Each	314.00	319.00	386.00
	110 mm dia	Each	459.00	474.00	554.00
	125 mm dia	Each	507.00	635.00	751.00
	140 mm dia	Each	693.00	868.00	1029.00
	160 mm dia	Each	1001.00	1263.00	1505.00
	180 mm dia	Each	1391.00	1764.00	2117.00
	200 mm dia	Each	1873.00	2386.00	2872.00
9.5	Providing and laying Pipe end confirming to IS specification.				
	Pressure ⟶		**6Kg/sq.cm :**	**8Kg/sq.cm :**	**10 Kg/sq.cm:**
	63 mm dia	Each	77.00	79.00	82.00
	75 mm dia	Each	99.00	108.00	108.00
	90 mm dia	Each	144.00	162.00	162.00
	110 mm dia	Each	183.00	216.00	216.00
	125 mm dia	Each	284.00	322.00	322.00
	140 mm dia	Each	358.00	407.00	407.00
	160 mm dia	Each	364.00	428.00	428.00
	180 mm dia	Each	563.00	643.00	643.00
	200 mm dia	Each	557.00	664.00	657.00
9.6	Providing and laying Reducer: confirming to IS specifications.				
	Pressure ⟶		**6Kg/sq.cm :**	**8Kg/sq.cm :**	**10 Kg/sq.cm:**
	63 mm dia	Each	95.00	96.00	99.00
	75 mm dia	Each	121.00	123.00	130.00
	90 mm dia	Each	131.00	137.00	144.00
	110 mm dia	Each	130.00	160.00	158.00
	125 mm dia	Each	139.00	186.00	177.00
	140 mm dia	Each	165.00	205.00	211.00
	160 mm dia	Each	215.00	268.00	258.00

S.No.	Items	Unit	Rates in Rs.		
	180 mm dia	Each	253.00	342.00	319.00
	200 mm dia	Each	292.00	399.00	389.00
9.7	Providing butt fusion welded joint/joining by heating to the ends with the help of Teflon coated electric mirror/heater ends together etc. by thermosetting processes to HDPE Pipe and specials. (6 kg. 8 kg. 10 kg.) (50 mm & above fusion jointed & below 50 mm mechanical jointed)				
	63 mm dia	Each	110.00		
	75 mm dia	Each	138.00		
	90 mm dia	Each	153.00		
	110 mm dia	Each	168.00		
	125 mm dia	Each	203.00		
	140 mm dia	Each	215.00		
	160 mm dia	Each	233.00		
	180 mm dia	Each	246.00		
	200 mm dia	Each	262.00		
9.8	Providing and laying End Cap confirming to IS specifications. Pressure ⟶		**6Kg/sq.cm :**	**8Kg/sq.cm :**	**10 Kg/sq.cm:**
	63 mm dia	Each	78.00	79.00	84.00
	75 mm dia	Each	97.00	102.00	107.00
	90 mm dia	Each	110.00	111.00	118.00
	110 mm dia	Each	97.00	115.00	121.00
	125 mm dia	Each	138.00	190.00	194.00
	140 mm dia	Each	199.00	226.00	232.00
	160 mm dia	Each	236.00	330.00	343.00
	180 mm dia	Each	340.00	396.00	413.00
	200 mm dia	Each	406.00	474.00	494.00
9.9	Providing and Supplying Blue MDPE pipes conforming to ISO 4427:1996 manufactured from virgin resin PE 80 Food grade compounded Raw Material having Blue Colour only with quality assurance certificate from quality agencies like WRC/CIPET (India)/ DVGM/KIWA/SPGN etc. for usage				

S.No.	Items	Unit	Rates in Rs.		
	in Drinking Water System The cost shall include testing of all materials, all taxes Central, State, Municipal, Inspection charges, transportation up to site, transit insurance, loading, unloading, stacking etc. complete.				
9.9.1	PN 16 (SDR 9)		**6Kg/sq.cm :**	**8Kg/sq.cm :**	**10 Kg/sq.cm:**
	20 mm dia	R. mtr	38.00		
	25 mm dia	R. mtr	52.00		
	32 mm dia	R. mtr	87.00		
	40 mm dia	R. mtr	113.00		
	50 mm dia	R. mtr	172.00		
	63 mm dia	R. mtr	258.00		
	75 mm dia	R. mtr	342.00		
	90 mm dia	R. mtr	494.00		
	110 mm dia	R. mtr	734.00		
9.9.2	PN 12.5 (SDR 11)				
	25 mm dia	R. mtr	52.00		
	32 mm dia	R. mtr	87.00		
	40 mm dia	R. mtr	104.00		
	50 mm dia	R. mtr	151.00		
	63 mm dia	R. mtr	203.00		
	75 mm dia	R. mtr	284.00		
	90 mm dia	R. mtr	412.00		
	110 mm dia	R. mtr	610.00		
9.9.3	PN 10 (SDR 13.6)				
	63 mm dia	R. mtr	174.00		
	75 mm dia	R. mtr	246.00		
	90 mm dia	R. mtr	354.00		
	110 mm dia	R. mtr	522.00		
9.10	Providing & Supply of Electro Fusion Tapping Ferrule (Branch Tapping Saddle) female BSP Threaded with SS 304 insert fittings in accordance with BS EN 12201 : Part-3 suitable for drinking water with in black/blue colour manufactured from compounded PE80/PE100 pipes, in pressure rating SDR 11 with min PN 12.5 rated to central, state & municipal, inspection				

S.No.	Items	Unit	Rates in Rs.
	charges, transportation up to site, transit insurance, loading, unloading, stacking etc. complete.		
9.10.1	Electo Fusion Tapping Ferrule Saddle		
9.10.1.1	63x15mm	Each	1159.00
9.10.1.2	63x20mm	Each	1159.00
9.10.1.3	63x25mm	Each	1159.00
9.10.1.4	75x15mm	Each	1159.00
9.10.1.5	75x20mm	Each	1159.00
9.10.1.6	75x25mm	Each	1159.00
9.10.1.7	90x15mm	Each	1159.00
9.10.1.8	90x20mm	Each	1159.00
9.10.1.9	90x25mm	Each	1159.00
9.10.1.10	90x32mm	Each	1503.00
9.10.1.11	90X40mm	Each	1503.00
9.10.1.12	90X50mm	Each	1503.00
9.10.1.13	110X15mm	Each	1159.00
9.10.1.14	110X20mm	Each	1159.00
9.10.1.15	110X25mm	Each	1159.00
9.10.1.16	110X32mm	Each	1503.00
9.10.1.17	110x40mm	Each	1503.00
9.10.1.18	110x50mm	Each	1503.00
9.10.1.19	160x15mm	Each	1159.00
9.10.1.20	160x20mm	Each	1159.00
9.10.1.21	160x25mm	Each	1159.00
9.10.1.22	160x32mm	Each	1643.00
9.10.1.23	160x40mm	Each	1643.00
9.10.1.24	160x50mm	Each	1643.00
9.10.1.25	200x15mm	Each	1636.00
9.10.1.26	200x20mm	Each	1636.00
9.10.1.27	200x25mm	Each	1636.00
9.10.1.28	200x32mm	Each	2366.00
9.10.1.29	200x40mm	Each	2366.00
9.10.1.30	200x50mm	Each	2366.00
9.10.1.31	250x15mm	Each	1636.00
9.10.1.32	250x20mm	Each	1636.00

S.No.	Items	Unit	Rates in Rs.
9.10.1.33	250x25mm	Each	1636.00
9.10.1.34	250x32mm	Each	2366.00
9.10.1.35	250x40mm	Each	2366.00
9.10.1.36	250x50mm	Each	2366.00
9.10.1.37	315x15mm	Each	1949.00
9.10.1.38	315x20mm	Each	1949.00
9.10.1.39	315x25mm	Each	1949.00
9.10.1.40	315x32mm	Each	2645.00
9.10.1.41	315x40mm	Each	2645.00
9.10.1.42	315x50mm	Each	2645.00
9.11	Providing & Supply of Compression fitting, PN 16 rated in conformation to ISO: 14236-2000 and shall be tested as per ISO: 3459, ISO: 3501 & ISO: 3503, suitable for drinking water & approved by WRAS, UKI KIWA etc., in food grade polypropylene and shall be inclusive of all cost such as testing, all taxes related to central, state & municipal, inspection charges, transportation up to site, transit insurance, loading, unloading, stacking etc. complete.		
9.11.1	Compression Fittings Metal inserted Compression Female Threaded Adaptor with SS 304 Material		
9.11.1.1	20x15mm	Each	197.00
9.11.1.2	25x20mm	Each	255.00
9.11.1.3	32x25mm	Each	348.00
9.11.1.4	40x32mm	Each	592.00
9.11.1.5	50x40mm	Each	766.00
9.11.1.6	63x50mm	Each	1044.00
9.11.2	Metal inserted Compression Male Threaded Adaptor with SS 304 Material		
9.11.2.1	20x15mm	Each	197.00
9.11.2.2	25X20mm	Each	255.00
9.11.2.3	32X25mm	Each	348.00
9.11.2.4	40X32mm	Each	592.00

S.No.	Items	Unit	Rates in Rs.
9.11.2.5	50x40mm	Each	766.00
9.11.2.6	63x50mm	Each	1044.00
9.11.3	Compression 90 Deg. Elbow threaded male off take in Metal		
9.11.3.1	20x15mm	Each	209.00
9.11.3.2	25X20mm	Each	278.00
9.11.3.3	32X25mm	Each	383.00
9.11.3.4	40X32mm	Each	1334.00
9.11.3.5	50x40mm	Each	1740.00
9.11.3.6	63x50mm	Each	2552.00
9.11.4	Compression 90 Deg. Elbow threaded Female off take in Metal		
9.11.4.1	20x15mm	Each	209.00
9.11.4.2	25X20mm	Each	278.00
9.11.4.3	32X25mm	Each	383.00
9.11.4.4	40X32mm	Each	1334.00
9.11.4.5	50x40mm	Each	1740.00
9.11.4.6	63x50mm	Each	2552.00
9.11.5	Compression 90 Deg. Elbow		
9.11.5.1	20mm	Each	128.00
9.11.5.2	25mm	Each	174.00
9.11.5.3	32mm	Each	226.00
9.11.5.4	40mm	Each	452.00
9.11.5.5	50mm	Each	643.00
9.11.5.6	63mm	Each	871.00
9.12	Providing & Supply of PVC Ball Valves in PN16 rating with one end compression using Blue color compression nut in polypropylene material & other end with female threads conforming to ISO:4422-4, certified from WRAS UK/KIWA etc. suitable for food products & drinking water, female threads in accordance with ISO:7/BS/:21/IS: 554 and shall be inclusive of all cost such as testing, all taxes related to central, state & municipal, inspection charges, transportation up to site, transit insurance, loading, unloading, stacking etc. complete.		

S.No.	Items	Unit	Rates in Rs.
9.12.1	PVC Ball Valve with Compression & Female Threads.		
9.12.1.1	20x15mm	Each	203.00
9.12.1.2	25X20mm	Each	263.00
9.12.1.3	32X25mm	Each	297.00
9.12.1.4	40X32mm	Each	638.00
9.12.1.5	50x40mm	Each	855.00
9.12.1.6	63x50mm	Each	1314.00
9.13	Providing & Supplying of Clamp Saddle (DI Strap Saddle) for House Service connections from metal pipe water distribution mains shall be of fastened strap type with threaded outlet for service connection. Clamp Saddle shall be suitable for nominal size of distribution mains pipe line. The strap shall be elastomer coated (insulated) type for firm grip on pipe as well as to protect the coating on the pipe and to insulate the unidentical metals. The saddle shall be single strap type up to pipe sizes of NB 600 and service outlet 15mm, 20mm & 25mm. Fasteners shall be of threaded nut bolt washer type. The sealing between the saddle and mains shall be obtained by using a profiled elastomer seal matching to the curvature of the pipe. The seal shall be of elastomer type, suitable for all potable water application. The material of construction of the body, straps, fasteners etc. shall be of non-corrosive material such as engineering plastic (PE/PP) or stainless steel or a combination of both.		
9.13.1.1	80 NB x 15mm, 20mm, 25mm	Each	1160
9.13.1.2	100 NB x 15mm, 20mm, 25mm	Each	1276
9.13.1.3	150 NB x 15mm, 20mm, 25mm	Each	1508
9.13.1.4	200 NB x 15mm, 20mm, 25mm	Each	1740
9.13.1.5	250 NB x 15mm, 20mm, 25mm	Each	1972
9.13.1.6	300 NB x 15mm, 20mm, 25mm	Each	2204
9.14	Providing & Supply of Electro Fusion Fittings in accordance with		

S.No.	Items	Unit	Rates in Rs.
	BS EN 12201 : Part-3 suitable for drinking water with in black/blue color manufactured from compounded PE80/PE100 virgin polymer and compatible with PE80/PE100 pipes, in pressure rated SDR 11 with min PN 12.5 rated for water application and shall be inclusive of all cost such as testing, all taxes related to central state & municipal, inspection charges, transportation up to site, transit insurance, loading, unloading, stacking etc. complete.		
9.14.1	Electro Fusion Coupler		
9.14.1.1	20mm	Each	116.00
9.14.1.2	25mm	Each	116.00
9.14.1.3	32mm	Each	116.00
9.14.1.4	40mm	Each	215.00
9.14.1.5	50mm	Each	266.00
9.14.1.6	63mm	Each	287.00
9.14.1.7	75mm	Each	515.00
9.14.1.8	90mm	Each	552.00
9.14.1.9	110mm	Each	786.00
9.14.1.10	125mm	Each	799.00
9.14.1.11	140mm	Each	1714.00
9.14.1.12	160mm	Each	1879.00
9.14.1.13	180mm	Each	2806.00
9.14.1.14	200mm	Each	3663.00
9.14.1.15	225mm	Each	4349.00
9.14.1.16	250mm	Each	5299.00
9.14.1.17	280mm	Each	10617.00
9.14.1.18	315mm	Each	10656.00
9.14.2	Electro Fusion Equal Tee		
9.14.2.1	20mm	Each	290.00
9.14.2.2	25mm	Each	290.00
9.14.2.3	32mm	Each	290.00
9.14.2.4	40mm	Each	984.00
9.14.2.5	50mm	Each	1093.00
9.14.2.6	63mm	Each	1218.00

S.No.	Items	Unit	Rates in Rs.
9.14.2.7	75mm	Each	1624.00
9.14.2.8	90mm	Each	2018.00
9.14.2.9	110mm	Each	2436.00
9.14.2.10	125mm	Each	3016.00
9.14.2.11	140mm	Each	6835.00
9.14.2.12	160mm	Each	6835.00
9.14.2.13	180mm	Each	9976.00
9.14.2.14	200mm	Each	12760.00
9.14.2.15	225mm	Each	15080.00
9.14.2.16	250mm	Each	22040.00
9.14.2.17	280mm	Each	24360.00
9.14.2.18	315mm	Each	26680.00
9.14.3	Electro Fusion Elbow 90 Deg.		
9.14.3.1	20mm	Each	290.00
9.14.3.2	25mm	Each	290.00
9.14.3.3	32mm	Each	290.00
9.14.3.4	40mm	Each	763.00
9.14.3.5	50mm	Each	763.00
9.14.3.6	63mm	Each	763.00
9.14.3.7	75mm	Each	1678.00
9.14.3.8	90mm	Each	2288.00
9.14.3.9	110mm	Each	3050.00
9.14.3.10	125mm	Each	3660.00
9.14.3.11	140mm	Each	7778.00
9.14.3.12	160mm	Each	10065.00
9.14.3.13	180mm	Each	12963.00
9.14.3.14	200mm	Each	24400.00
9.14.3.15	225mm	Each	27450.00
9.14.3.16	250mm	Each	30500.00
9.14.3.17	280mm	Each	33550.00
9.14.3.18	315mm	Each	38125.00
9.14.4	Electro Fusion Reducer		
9.14.4.1	25x20mm	Each	232.00
9.14.4.2	32x20mm	Each	232.00
9.14.4.3	32x25mm	Each	232.00
9.14.4.4	40x32mm	Each	777.00

S.No.	Items	Unit	Rates in Rs.
9.14.4.5	50x32mm	Each	974.00
9.14.4.6	50x40mm	Each	1076.00
9.14.4.7	63x32mm	Each	1148.00
9.14.4.8	63x40mm	Each	1161.00
9.14.4.9	63x50mm	Each	1346.00
9.14.4.10	90x63mm	Each	1904.00
9.14.4.11	90x75mm	Each	2436.00
9.14.4.12	110x75mm	Each	3074.00
9.14.4.13	110x90mm	Each	3503.00
9.14.4.14	125x90mm	Each	4431.00
9.14.4.15	125x110mm	Each	4431.00
9.14.4.16	140x90mm	Each	4872.00
9.14.4.17	140x110mm	Each	4872.00
9.14.4.18	140x125mm	Each	4872.00
9.14.4.19	160x110mm	Each	6380.00
9.14.4.20	160x125mm	Each	6380.00
9.14.4.21	160x140mm	Each	6380.00
9.14.4.22	180x125mm	Each	7192.00
9.14.4.23	180x140mm	Each	7192.00
9.14.4.24	180x160mm	Each	7192.00
9.14.4.25	200x160mm	Each	8584.00
9.14.4.26	200x180mm	Each	8584.00
9.14.4.27	225x160mm	Each	10440.00
9.14.4.28	225x180mm	Each	10440.00
9.14.4.29	225x200mm	Each	10440.00
9.14.4.30	250x160mm	Each	12760.00
9.14.4.31	250x200mm	Each	12760.00
9.14.4.32	250x225mm	Each	12760.00
9.14.5	Electro Fusion End Cap		
9.14.5.1	20mm	Each	176.00
9.14.5.2	25mm	Each	176.00
9.14.5.3	32mm	Each	176.00
9.14.5..4	40mm	Each	383.00
9.14.5.5	50mm	Each	464.00
9.14.5.6	63mm	Each	673.00
9.14.5.7	75mm	Each	1009.00

S.No.	Items	Unit	Rates in Rs.
9.14.5.8	90mm	Each	1276.00
9.14.5.9	110mm	Each	1624.00
9.14.5.10	125mm	Each	1972.00
9.14.5.11	140mm	Each	2900.00
9.14.5.12	160mm	Each	4176.00
9.14.5.13	180mm	Each	5104.00
9.14.5.14	200mm	Each	6032.00
9.14.5.15	225mm	Each	9860.00
9.14.5.16	250mm	Each	11600.00
9.14.5.17	280mm	Each	12760.00
9.14.5.18	315mm	Each	13920.00
9.14.6	Spigot Long Neck Pipe End (Stub End) for Electro Fusion Joint		
9.14.6.1	63mm	Each	415.00
9.14.6.2	75mm	Each	467.00
9.14.6.3	90mm	Each	586.00
9.14.6.4	110mm	Each	893.00
9.14.6.5	125mm	Each	1407.00
9.14.6.6	140mm	Each	1601.00
9.14.6.7	160mm	Each	2291.00
9.14.6.8	180mm	Each	3089.00
9.14.6.9	200mm	Each	3631.00
9.14.6.10	225mm	Each	4356.00
9.14.6.11	250mm	Each	5003.00
9.14.6.12	280mm	Each	5600.00
9.14.6.13	315mm	Each	7279.00
9.15	Providing and supply of Zero Velocity Valves of renowned make duly tested inclusive of all taxes related to central, state and municipal, inclusive of excise duty, inspection charges, transportation charges, transit insurance, loading/ unloading and stacking at site/ store etc. complete.		
9.15.1	100mm 10 kg/cm2	Each	68440.00
9.15.2	100mm 15 kg/cm2	Each	73660.00
9.15.3	100mm 20 kg/cm2	Each	75400.00
9.15.4	100mm 25 kg/ cm2	Each	86536.00

S.No.	Items	Unit	Rates in Rs.
9.15.5	150mm 10 kg/cm2	Each	88044.00
9.15.6	150mm 15 kg/cm2	Each	94656.00
9.15.7	150mm 20 kg/cm2	Each	104168.00
9.15.8	150mm 25 kg/ cm2	Each	119712.00
9.15.9	200mm 10 kg/cm2	Each	91988.00
9.15.10	200mm 15 kg/cm2	Each	98948.00
9.15.11	200mm 20 kg/cm2	Each	108808.00
9.15.12	200mm 25 kg/ cm2	Each	125280.00
9.15.13	250mm 10 kg/cm2	Each	103820.00
9.15.14	250mm 15 kg/cm2	Each	111708.00
9.15.15	250mm 20 kg/cm2	Each	122728.00
9.15.16	250mm 25 kg/ cm2	Each	141172.00
9.15.17	300mm 10 kg/cm2	Each	116928.00
9.15.18	300mm 15 kg/cm2	Each	125628.00
9.15.19	300mm 20 kg/cm2	Each	138156.00
9.15.20	300mm 25 kg/ cm2	Each	158688.00
9.15.21	350mm 10 kg/cm2	Each	121104.00
9.15.22	350mm 15 kg/cm2	Each	130268.00
9.15.23	350mm 20 kg/cm2	Each	143144.00
9.15.24	350mm 25 kg/ cm2	Each	164720.00
9.15.25	400mm 10 kg/cm2	Each	133864.00
9.15.26	400mm 15 kg/cm2	Each	143840.00
9.15.27	400mm 20 kg/cm2	Each	158340.00
9.15.28	400mm 25 kg/ cm2	Each	182120.00
9.15.29	450mm 10 kg/ cm2	Each	155672.00
9.15.30	450mm 15 kg/ cm2	Each	167388.00
9.15.31	450mm 20 kg/ cm2	Each	184092.00
9.15.32	450mm 25 kg/ cm2	Each	211816.00
9.15.33	500mm 10 kg/ cm2	Each	179916.00
9.15.34	500mm 15 kg/ cm2	Each	193372.00
9.15.35	500mm 20 kg/ cm2	Each	212860.00
9.15.36	500mm 25 kg/ cm2	Each	244876.00
9.15.37	600mm 10 kg/ cm2	Each	220516.00
9.15.38	600mm 15 kg/ cm2	Each	237104.00
9.15.39	600mm 20 kg/ cm2	Each	260768.00
9.15.40	600mm 25 kg/ cm2	Each	299860.00

S.No.	Items	Unit	Rates in Rs.
9.15.41	700mm 10 kg/ cm2	Each	310996.00
9.15.42	700mm 15 kg/ cm2	Each	334312.00
9.15.43	700mm 20 kg/ cm2	Each	367720.00
9.15.44	700mm 25 kg/ cm2	Each	422936.00
9.15.45	750mm 10 kg/ cm2	Each	351712.00
9.15.46	750mm 15 kg/ cm2	Each	378160.00
9.15.47	750mm 20 kg/ cm2	Each	415860.00
9.15.48	750mm 25 kg/ cm2	Each	478384.00
9.15.49	800mm 10 kg/ cm2	Each	388136.00
9.15.50	800mm 15 kg/ cm2	Each	417252.00
9.15.51	800mm 20 kg/ cm2	Each	417252.00
9.15.52	800mm 25 kg/ cm2	Each	528032.00
9.15.53	900mm 10 kg/ cm2	Each	461448.00
9.15.54	900mm 15 kg/ cm2	Each	496132.00
9.15.55	900mm 20 kg/ cm2	Each	545548.00
9.15.56	900mm 25 kg/ cm2	Each	627560.00
9.15.57	1000mm 10 kg/ cm2	Each	586728.00
9.15.58	1000mm 15 kg/ cm2	Each	630692.00
9.15.59	1000mm 20 kg/ cm2	Each	693680.00
9.15.60	1000mm 25 kg/ cm2	Each	797964.00
9.15.61	1100mm 10 kg/ cm2	Each	719780.00
9.15.62	1100mm 15 kg/ cm2	Each	773836.00
9.15.63	1100mm 20 kg/ cm2	Each	851208.00
9.15.64	1100mm 25 kg/ cm2	Each	978924.00
9.15.65	1200mm 10 kg/ cm2	Each	887980.00
9.15.66	1200mm 15 kg/ cm2	Each	954680.00
9.15.67	1200mm 20 kg/ cm2	Each	1050032.00
9.15.68	1200mm 25 kg/ cm2	Each	1207676.00
9.15.69	1300mm 10 kg/ cm2	Each	1278784.00
9.15.70	1300mm 15 kg/ cm2	Each	1359404.00
9.15.71	1300mm 20 kg/ cm2	Each	1447448.00
9.15.72	1300mm 25 kg/ cm2	Each	1590476.00
9.15.73	1400mm 10 kg/ cm2	Each	1395712.00
9.15.74	1400mm 15 kg/ cm2	Each	1500344.00
9.15.75	1400mm 20 kg/ cm2	Each	1650332.00
9.15.76	1400mm 25 kg/ cm2	Each	1897992.00

S.No.	Items	Unit	Rates in Rs.
9.15.77	1500mm 10 kg/ cm2	Each	1778860.00
9.15.78	1500mm 15 kg/ cm2	Each	1912144.00
9.15.79	1500mm 20 kg/ cm2	Each	2103312.00
9.15.80	1500mm 25 kg/ cm2	Each	2418948.00
9.16	Providing and supply of Air cushion Valves of renowned make duly tested inclusive of all taxes related to central, state and municipal, inclusive of excise duty, inspection charges, transportation charges, transit insurance, loading/ unloading and stacking at site/ store etc. complete.		
9.16.1	Air cushion valves 100 mm TP 10 kg/cm2	Each	76328.00
9.16.2	Air cushion valves 100 mm TP 15 kg/cm2	Each	83868.00
9.16.3	Air cushion valves 100 mm TP 20 kg/cm2	Each	92220.00
9.16.4	Air cushion valves 100 mm TP 25 kg/cm2	Each	106140.00
9.16.5	Air cushion valves 150 mm TP 10 kg/cm2	Each	115768.00
9.16.6	Air cushion valves 150 mm TP 15 kg/cm2	Each	127252.00
9.16.7	Air cushion valves 150 mm TP 20 kg/cm2	Each	140012.00
9.16.8	Air cushion valves 150 mm TP 25 kg/cm2	Each	161008.00
9.16.9	Air cushion valves 200 mm TP 10 kg/cm2	Each	123540.00
9.16.10	Air cushion valves 200 mm TP 15 kg/cm2	Each	135952.00
9.16.11	Air cushion valves 200 mm TP 20 kg/cm2	Each	149524.00
9.16.12	Air cushion valves 200 mm TP 25 kg/cm2	Each	171796.00
9.16.13	Air cushion valves 300 mm TP 10 kg/cm2	Each	173768.00
9.16.14	Air cushion valves 300 mm TP 15 kg/cm2	Each	191284.00
9.16.15	Air cushion valves 300 mm TP 20 kg/cm2	Each	219936.00
9.16.16	Air cushion valves 300 mm TP 25 kg/cm2	Each	252880.00

CHAPTER- X

MILD STEEL PIPES AND SPECIALS

CHAPTER – X

MILD STEEL PIPES AND SPECIALS

10.1. **Scope**

10.1.1 This Specification covers the requirements for manufacturing, supplying, laying, jointing, testing at works, site of Electrically Welded Steel pipes, internally lined with cement concrete and externally coated with cement mortar, used for water supply mains.

10.2. **Applicable Codes**

IS : 3589 Seamless/Electrically Welded Steel Pipes for Water, Gas, Sewage Specification

IS: 5822 Code of Practice for laying of Electrically Welded Steel Pipes for Water Supply.

IS : 7322 Specification for Specials for Steel Cylinder Reinforced Concrete Pipes

IS : 432 Mild Steel and Medium Tensile Bars Reinforcement Part I

IS:432(Part II) : Specifications for Mild Steel and Medium Tensile Bars and Hard Drawn Steel Wire (Third Revision)

IS: 2328 Flattening Test for Seamless Pipes

IS : 12269 Specification for 53 Grade Ordinary Portland Cement (OPC)

IS: 6452 Specification for High Alumina Cement for Structural Use (Ist Revision)

IS : 8112 Specification for Curing of High Strength OPC

IS : 8041 Specifications for Curing of Rapid Hardening Cement

IS : 269 Specifications for Ordinary Portland Cement (OPC)

IS : 455 Specifications for Portland Slag Cement

IS : 1489 Specifications for Portland Pozzolana Cement

IS : 8043 Specifications for Hydrophobic Portland Cement

IS : 3600 Methods of Testing Fusion Welded Joints and Weld Metal in

IS : 1969 Steel cylinder pipes with concrete lining and coating (specifications)

Part I Steel :

10.2.1. Other I.S. Codes not Specifically mentioned here but pertaining to the use of Electrically Welded Steel pipes shall form part of these Specifications.

10.3 The preferred outside Diameter and thickness of the pipes shall be as per the Table -1 of IS : 1916: 1969

10.4. Length : The pipes shall be manufactured in lengths of 6m, unless otherwise specified.

10.5. Welding : For manufacturing of the pipes at site, the welding & testing should comply with IS: 816.

10.6. Fabrication of specials: Specials such as bends, tapers, tees shall Conform to IS: 7322, Specials shall be fabricated by cutting plates of the specified thickness to the required shape obtained by developing the form of specials at site.

10.7. **Measurement:**

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

10.8. Rates

The rates include charges for all tools & plants, required for lifting and laying of the pipes and specials in positions as per approved drawing and specifications.

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

10.9. The rates shown in item are exclusive the cost of any type of coating but dimensionally suitable for internal epoxy lining. In case of inside cement mortar lining extra weight of shell shall be adjusted at the rate of Rs. 81.00 (Eighty one only) per kg according to the following factor.

Extra mass per meter length of pipe = t_c x t x 0.01233

Where in t_c = Cement mortar coating thickness in mm

t = Shell thickness in mm

10.10. The estimated rates for pipe using steel plate (shell) thickness other than mentioned in item shall be adjusted to the rate of Rs. 81.00 per kg for deffered thickness.

M.S. PIPES AND SPECIALS

S. No.	Item	Unit	Rate (in Rs.)
10.1	Manufacturing and Supplying of following M.S. pipes as per IS specifications, duly testing for usage in Drinking water inclusive of all materials, all taxes and duties inspection charges, transit insurance, loading/unloading FOR site and stacking etc. complete as per direction of Engineer-in-Charge. (Excluding protective coating)		
10.1.1	Dia of pipe 250.00 mm (I.D) Thickness of pipe		
i)	4mm	RM	1782.00
ii)	6mm	RM	2702.00
iii)	8mm	RM	3643.00
10.1.2	Dia of pipe 300.00 mm (I.D) Thickness of pipe :		
i)	4mm	RM	2132.00
ii)	6mm	RM	3229.00
iii)	8mm	RM	4348.00
10.1.3	Dia of pipe 350.00 mm (I.D) Thickness of pipe :		
i)	4mm	RM	2483.00
ii)	6mm	RM	3756.00
iii)	8mm	RM	5054.00
10.1.4	Dia of pipe 400.00 mm (I.D) Thickness of pipe :		
i)	4mm	RM	2833.00
ii)	6mm	RM	4284.00
iii)	8mm	RM	5760.00
iV)	10mm	RM	7229.00
10.1.5	Dia of pipe 450.00 mm (I.D) Thickness of pipe :		
i)	4mm	RM	3184.00
ii)	6mm	RM	4811.00
iii)	8mm	RM	6466.00
iV)	10mm	RM	8111.00
10.1.6	Dia of pipe 500.00 mm (I.D) Thickness of pipe :		
i)	5mm	RM	4409.00
ii)	6mm	RM	5339.00
iii)	8mm	RM	7171.00
iV)	10mm	RM	8992.00
V)	12mm	RM	10886.00
10.1.7	Dia of pipe 550.00 mm (I.D) Thickness of pipe		
i)	5mm	RM	4846.00
ii)	6mm	RM	5866.00
iii)	8mm	RM	7877.00
iV)	10mm	RM	9874.00
V)	12mm	RM	11949.00

S. No.	Item	Unit	Rate (in Rs.)
10.1.8	Dia of pipe 600.00 mm (I.D) Thickness of pipe :		
i)	6mm	RM	6394.00
ii)	8mm	RM	8583.00
iii)	10mm	RM	10755.00
iV)	12mm	RM	13011.00
10.1.9	Dia of pipe 650.00 mm (I.D) Thickness of pipe		
i)	6mm	RM	6922.00
ii)	8mm	RM	9289.00
iii)	10mm	RM	11637.00
iV)	12mm	RM	14074.00
10.1.10	Dia of pipe 700.00 mm (I.D) Thickness of pipe :		
i)	6mm	RM	7449.00
ii)	8mm	RM	9995.00
iii)	10mm	RM	12518.00
iV)	12mm	RM	16137.00
V)	14mm	RM	17630.00
10.1.11	Dia of pipe 750.00 mm (I.D) Thickness of pipe :		
i)	7mm	RM	9287.00
ii)	8mm	RM	10700.00
iii)	10mm	RM	13400.00
iV)	12mm	RM	16200.00
10.1.12	Dia of pipe 800.00 mm (I.D) Thickness of pipe :		
i)	7mm	RM	9900.00
ii)	8mm	RM	11406.00
iii)	10mm	RM	14281.00
iV)	12mm	RM	17262.00
10.1.13	Dia of pipe 850.00 mm (I.D) Thickness of pipe :		
i)	8mm	RM	12112.00
ii)	10mm	RM	16163.00
iii)	12mm	RM	18325.00
10.1.14	Dia of pipe 900.00 mm (I.D) Thickness of pipe :		
i)	8mm	RM	12818.00
ii)	10mm	RM	16044.00
iii)	12mm	RM	19388.00
10.1.15	Dia of pipe 950.00 mm (I.D) Thickness of pipe :		
i)	8mm	RM	13524.00
ii)	10mm	RM	16926.00
iii)	12mm	RM	20451.00
10.1.16	Dia of pipe 1000.00 mm (I.D) Thickness of pipe :		
i)	8mm	RM	14229.00
ii)	10mm	RM	17807.00
iii)	12mm	RM	21613.00
10.1.17	Dia of pipe 1050.00 mm (I.D) Thickness of pipe :		
i)	8mm	RM	14935.00

S. No.	Item	Unit	Rate (in Rs.)
ii)	10mm	RM	18689.00
iii)	12mm	RM	22576.00
10.1.18	Dia of pipe 1100.00 mm (I.D) Thickness of pipe :		
i)	10mm	RM	19570.00
ii)	12mm	RM	23639.00
10.1.19	Dia of pipe 1150.00 mm (I.D) Thickness of pipe :		
i)	10mm	RM	20452.00
ii)	12mm	RM	24702.00
10.1.20	Dia of pipe 1200.00 mm (I.D) Thickness of pipe :		
i)	10mm	RM	21333.00
ii)	12mm	RM	25765.00
10.1.21	Dia of pipe 1250.00 mm (I.D) Thickness of pipe :		
i)	10mm	RM	22216.00
ii)	12mm	RM	26827.00
10.1.22	Dia of pipe 1300.00 mm (I.D) Thickness of pipe :		
i)	10mm	RM	23096.00
ii)	12mm	RM	27890.00
10.1.23	Dia of pipe 1350.00 mm (I.D) Thickness of pipe :		
i)	10mm	RM	23978.00
ii)	12mm	RM	28953.00
10.1.24	Dia of pipe 1400.00 mm (I.D) Thickness of pipe :		
i)	12mm	RM	30016.00
ii)	14mm	RM	34911.00
10.1.25	Dia of pipe 1450.00 mm (I.D) Thickness of pipe :		
i)	12mm	RM	31078.00
ii)	14mm	RM	36145.00
10.1.26	Dia of pipe 1500.00 mm (I.D) Thickness of pipe :		
i)	12mm	RM	32141.00
ii)	14mm	RM	37380.00
10.1.27	Dia of pipe 1550.00 mm (I.D) Thickness of pipe :		
i)	12mm	RM	33204.00
ii)	14mm	RM	38614.00
10.1.28	Dia of pipe 1600.00 mm (I.D) Thickness of pipe :		
i)	14mm	RM	39848.00
ii)	16mm	RM	45134.00
10.1.29	Dia of pipe 1650.00 mm (I.D) Thickness of pipe :		
i)	14mm	RM	41083.00
ii)	16mm	RM	46531.00
iii)	18mm	RM	52631.00
10.1.30	Dia of pipe 1700.00 mm (I.D) Thickness of pipe :		
i)	14mm	RM	42317.00
ii)	16mm	RM	48256.00
iii)	18mm	RM	54209.00

S. No.	Item	Unit	Rate (in Rs.)
10.1.31	Dia of pipe 1750.00 mm (I.D) Thickness of pipe		
i)	14mm	RM	43551.00
ii)	16mm	RM	49662.00
iii)	18mm	RM	55786.00
10.1.32	Dia of pipe 1800.00 mm (I.D) Thickness of pipe :		
i)	14mm	RM	63283.00
ii)	16mm	RM	51068.00
iii)	18mm	RM	57364.00
10.1.33	Dia of pipe 1850.00 mm (I.D) Thickness of pipe :		
i)	14mm	RM	46020.00
ii)	16mm	RM	52116.00
iii)	20mm	RM	65021.00
10.1.34	Dia of pipe 1900.00 mm (I.D) Thickness of pipe :		
i)	16mm	RM	53513.00
ii)	18mm	RM	60519.00
iii)	20mm	RM	6676000
10.1.35	Dia of pipe 1950.00 mm (I.D) Thickness of pipe :		
i)	16mm	RM	54909.00
ii)	18mm	RM	62096.00
iii)	20mm	RM	68498.00
10.1.36	Dia of pipe 2000.00 mm (I.D) Thickness of pipe :		
i)	16mm	RM	56306.00
ii)	20mm	RM	70237.00
	FABRICATION OF M.S. PIPE AND SPECIALS		
10.2	Fabrication of M.S. pipes & specials as per relevant IS specifications inclusive of cost of all materials taxes and duties inspection charges, transit insurance, loading/unloading FOR site and stacking etc. complete as for direction of Engineer-in-Charge.		
	Fabricating pipes and specials from Steel plates (all thickness as per design)	Kg.	81.00
10.3	Labour only for laying of MS pipe and specials as per approved specification complete as directed by Engineer incharge	Kg	1.15
10.4	Providing and applying primer and one coat of red oxide externally	Sqm	35.00
10.5	Providing and applying primer and one coat of red oxide of iron paint, internally	Sqm	75.00
	Laying of M.S. Pipes and Specials		
10.6	Labour Only for laying of M.S. Pipes as per approved specification and as directed by Engineer incharge.		

S. No.	Item	Unit	Rate (in Rs.)
10.6.1	4mm to 8mm thick		
	250mm Upto 500mm. dia	RM	68.00
	Above 500mm. Upto 750mm. dia	RM	110.00
	Above 750mm. Upto 1050mm. dia	RM	152.00
10.6.2	10mm to 12mm thick		
	400mm Upto 750mm. dia	RM	182.00
	Above 750mm. Upto 1050mm. dia	RM	251.00
	Above 1050mm. Upto 1200mm. dia	RM	313.00
	Above 1200mm. Upto 1550mm. dia	RM	375.00
10.6.3	14mm to 20mm thick		
	Above 700mm. Upto 1000mm. dia	RM	299.00
	Above 1000mm. Upto 1250mm. dia	RM	373.00
	Above 1250mm. Upto 1450mm. dia	RM	446.00
	Above 1450mm. Upto 1750mm. dia	RM	528.00
	Above 1750mm. Upto 2000mm. dia	RM	618.00
10.7	Providing rigid welded joint to the following MS pipes including testing of joints and cost of jointing material as per relevant approved specification complete.		
10.7.1	Dia of pipe 250.00 mm (I.D) Thickness of pipe :		
i)	4mm	RM	52.00
ii)	6mm	RM	107.00
iii)	8mm	RM	223.00
10.7.2	Dia of pipe 300.00 mm (I.D) Thickness of pipe :		
i)	4mm	RM	62.00
ii)	6mm	RM	127.00
iii)	8mm	RM	256.00
10.7.3	Dia of pipe 350.00 mm (I.D) Thickness of pipe :		
i)	4mm	RM	72.00
ii)	6mm	RM	148.00
iii)	8mm	RM	307.00
10.7.4	Dia of pipe 400.00 mm (I.D) Thickness of pipe :		
i)	4mm	RM	82.00
ii)	6mm	RM	168.00
iii)	8mm	RM	349.00
iv)	10mm	RM	429.00
10.7.5	Dia of pipe 450.00 mm (I.D) Thickness of pipe :		
i)	4mm	RM	92.00
ii)	6mm	RM	189.00
iii)	8mm	RM	391.00
iv)	10mm	RM	480.00
10.7.6	Dia of pipe 500.00 mm (I.D) Thickness of pipe :		
i)	5mm	RM	103.00
ii)	6mm	RM	209.00

S. No.	Item	Unit	Rate (in Rs.)
iii)	8mm	RM	433.00
iv)	10mm	RM	531.00
v)	12mm	RM	955.00
10.7.7	Dia of pipe 550.00 mm (I.D) Thickness of pipe :		
i)	5mm	RM	113.00
ii)	6mm	RM	230.00
iii)	8mm	RM	475.00
iv)	10mm	RM	582.00
v)	12mm	RM	1046.00
10.7.8	Dia of pipe 600.00 mm (I.D) Thickness of pipe :		
i)	6mm	RM	250.00
ii)	8mm	RM	517.00
iii)	10mm	RM	633.00
iv)	12mm	RM	1137.00
10.7.9	Dia of pipe 650.00 mm (I.D) Thickness of pipe :		
i)	6mm	RM	270.00
ii)	8mm	RM	559.00
iii)	10mm	RM	684.00
iv)	12mm	RM	1228.00
10.7.10	Dia of pipe 700.00 mm (I.D) Thickness of pipe :		
i)	6mm	RM	291.00
ii)	8mm	RM	601.00
iii)	10mm	RM	735.00
iv)	12mm	RM	1319.00
v)	14mm	RM	1327.00
10.7.11	Dia of pipe 750.00 mm (I.D) Thickness of pipe :		
i)	7mm	RM	312.00
ii)	8mm	RM	643.00
iii)	10mm	RM	786.00
iv)	12mm	RM	1410.00
10.7.12	Dia of pipe 800.00 mm (I.D) Thickness of pipe :		
i)	7mm	RM	333.00
ii)	8mm	RM	684.00
iii)	10mm	RM	837.00
iv)	12mm	RM	1601.00
10.7.13	Dia of pipe 850.00 mm (I.D) Thickness of pipe :		
i)	8mm	RM	726.00
ii)	10mm	RM	888.00
iii)	12mm	RM	1593.00
10.7.14	Dia of pipe 900.00 mm (I.D) Thickness of pipe :		
i)	8mm	RM	768.00
ii)	10mm	RM	939.00
iii)	12mm	RM	1664.00
10.7.15	Dia of pipe 950.00 mm (I.D) Thickness of pipe :		

S. No.	Item	Unit	Rate (in Rs.)
i)	8mm	RM	810.00
ii)	10mm	RM	990.00
iii)	12mm	RM	1775.00
10.7.16	Dia of pipe 1000.00 mm (I.D) Thickness of pipe		
i)	8mm	RM	852.00
ii)	10mm	RM	1041.00
iii)	12mm	RM	1866.00
10.7.17	Dia of pipe 1050.00 mm (I.D) Thickness of pipe :		
i)	8mm	RM	894.00
ii)	10mm	RM	1092.00
iii)	12mm	RM	1957.00
10.7.18	Dia of pipe 1100.00 mm (I.D) Thickness of pipe :		
i)	10mm	RM	1144.00
ii)	12mm	RM	2048.00
10.7.19	Dia of pipe 1150.00 mm (I.D) Thickness of pipe :		
i)	10mm	RM	1195.00
ii)	12mm	RM	2139.00
10.7.20	Dia of pipe 1200.00 mm (I.D) Thickness of pipe :		
i)	10mm	RM	1246.00
ii)	12mm	RM	2230.00
10.7.21	Dia of pipe 1250.00 mm (I.D) Thickness of pipe :		
i)	10mm	RM	1297.00
ii)	12mm	RM	2321.00
10.7.22	Dia of pipe 1300.00 mm (I.D) Thickness of pipe :		
i)	10mm	RM	1348.00
ii)	12mm	RM	2412.00
10.7.23	Dia of pipe 1350.00 mm (I.D) Thickness of pipe :		
i)	10mm	RM	1399.00
ii)	12mm	RM	2504.00
10.7.24	Dia of pipe 1400.00 mm (I.D) Thickness of pipe :		
i)	12mm	RM	2595.00
ii)	14mm	RM	2602.00
10.7.25	Dia of pipe 1450.00 mm (I.D) Thickness of pipe :		
i)	12mm	RM	2686.00
ii)	14mm	RM	2693.00
10.7.26	Dia of pipe 1500.00 mm (I.D) Thickness of pipe :		
i)	12mm	RM	2777.00
ii)	14mm	RM	2784.00
10.7.27	Dia of pipe 1550.00 mm (I.D) Thickness of pipe :		
i)	12mm	RM	2868.00
ii)	14mm	RM	2875.00
10.7.28	Dia of pipe 1600.00 mm (I.D) Thickness of pipe :		
i)	14mm	RM	2966.00
ii)	16mm	RM	2974.00

S. No.	Item	Unit	Rate (in Rs.)
10.7.29	Dia of pipe 1650.00 mm (I.D) Thickness of pipe		
i)	14mm	RM	3058.00
ii)	16mm	RM	3065.00
iii)	18mm	RM	3072.00
10.7.30	Dia of pipe 1700.00 mm (I.D) Thickness of pipe :		
i)	14mm	RM	3149.00
ii)	16mm	RM	3156.00
iii)	18mm	RM	3163.00
10.7.31	Dia of pipe 1750.00 mm (I.D) Thickness of pipe :		
i)	14mm	RM	3240.00
ii)	16mm	RM	3247.00
iii)	18mm	RM	3254.00
10.7.32	Dia of pipe 1800.00 mm (I.D) Thickness of pipe :		
i)	14mm	RM	3331.00
ii)	16mm	RM	3338.00
iii)	18mm	RM	3345.00
10.7.33	Dia of pipe 1850.00 mm (I.D) Thickness of pipe :		
i)	14mm	RM	3422.00
ii)	16mm	RM	3429.00
iii)	20mm	RM	3444.00
10.7.34	Dia of pipe 1900.00 mm (I.D) Thickness of pipe :		
i)	16mm	RM	3520.00
ii)	18mm	RM	3528.00
iii)	20mm	RM	3535.00
10.7.35	Dia of pipe 1950.00 mm (I.D) Thickness of pipe		
i)	16mm	RM	3611.00
ii)	18mm	RM	3619.00
iii)	20mm	RM	3226.00
10.7.36	Dia of pipe 2000.00 mm (I.D) Thickness of pipe :		
i)	16mm	RM	3703.00
ii)	20mm	RM	3717.00
10.8	Providing & applying 30 mm thick 1:3 cement mortar coating out side face of M.S pipe as per relevant IS specification along with fixing of (100 x3 mm) wire mesh as per approved specification per Sqmm	Sqm	478.00
10.9	Providing & applying inside 20 mm thick 1:2 cement mortar on inside face of pipe as per relevant IS specification as directed by Engineer in Charge	Sqm	350.00
10.10	Providing & applying 400 micron epoxy coating as per relevat IS specification on out side face of pipe	Sqm	160.00
10.11	Providing & applying 400 micron food grade epoxy coating on inside face of pipe as per relevant IS specification	Sqm	250.00

CHAPTER- XI

BAR WRAPPED STEEL CYLINDER PIPES

(BWSC)

CHAPTER-XI

BAR WRAPPED STEEL CYLINDER PIPES (BWSC)

11.1 Scope

This specification covers the requirements for design, manufacturing, testing, supplying, laying, jointing, welding and testing at site works of Bar Wrapped Steel Cylinder (BWSC) Pipes used for water supply mains.

11.2. Applicable Codes

IS : 226	Specifications for structural Steel (Standard Quality)
IS : 383	Specifications for coarse and fine aggregates from natural sources for concrete.
IS : 432	Specifications for mild steel and medium tensile steel bar/wires for concrete reinforcement.
Part 1	Mild Steel and medium tensile steel bar/wires
Part 2	Hard drawn steel wire
IS : 1566	Specifications for Hard Drawn Steel Wire for Concrete Reinforcement
IS : 2062	Specifications for Steel for General Structural Purposes
IS : 3597	Methods of Test for Concrete Pipes
IS : 3658	Code of Practice for liquid penetrant flaw detection
IS : 5822	Code of Practice for laying of Electrically Welded Steel Pipes for Water Supply
IS : 7322	Specifications for Specials for Steel Cylinder Reinforced Concrete pipes
IS: 15155	Specifications for Bar Wrapped steel Cylinder Pipes (including Fittings)
AWWA	Manual M-9 Concrete pressure pipe
EN 641	Reinforced Concrete Pressure Pipe, Cylinder Type, including Joints & fittings.

11.2.1. Other I.S. Codes not Specifically mentioned here but pertaining to the use of BWSC pipes form part of these Specifications.

11.3. **Design Criteria**

11.3.1. The reinforcement of the pipe shall consist of a welded steel cylinder and bar/wire is directly wrapped under low tension. The average circumferential stress in the steel cylinder and bar/wire reinforcement of the pipe shall be as given below:

11.3.1.1 At factory test pressure, stress shall not exceed 187 N/mm^2 nor 75 percent of the minimum yield strength of the steel used in the cylinder.

11.3.1.2 At site test pressure, stress shall not exceed 165 N/mm^2 nor 75 percent of the minimum yield strength of the steel used in the cylinder.

11.3.1.3 At working pressure, stress shall not exceed 125 N/mm^2 nor 50 percent of the minimum yield strength of the steel used in the cylinder.

11.4. Preparing Pipe faces for Welding: Before aligning, assembling and welding, the pipe faces shall be cleaned by scrapping by wire brushes or any other method specified by the authority.

11.5. **Welding** : Generally the welding of pipe in the field should comply with IS 816: 1969.

11.5.1 For field welding rates applicable for similar welding in M.S. Pipes, shall be adopted.

11.6. **Internal Diameter** : The internal diameter shall be measured at each end of the pipe at approximately 50mm from the ends. Two measurements of the internal diameter at 90º to each other shall be made at each end and centre. The internal diameter shall be maintained within the tolerance specified.

11.7. Wall Thickness : Measurement of outside circumference of the pipe shall be made at three positions and average outside diameter of the pipe shall be calculated. The inside diameter shall be measured at three positions and average shall be calculated.

11.8. **Specials and Fittings**

11.8.1. The steel for fabricated steel plate specials, is cut, shaped and welded so that finished special has the required shape and internal dimensions. Adjacent segments are jointed by butt welding. Before lining and coating the welding of special shall be tested by use of hot oil or dye penetrant according to IS 3658 and defects, if any shall be rectified. The steel plate thickness for specials shall be as given in IS 7322.

11.8.2. All the specials shall be tested for hydrostatic pressure as specified for BWSC pipes and to the pressure specified for pipes in the reaches where the specials are fitted.

11.9. For Preparing, mixing and placing of cement mortar in the field on joints (after laying & welding) rate as per P.S.C. pipes Lowering, laying & jointing shall be adopted.

11.10. When ever manufacturer is separate and contractor for lowering, laying, jointing & testing are different, the principal contractor shall enter in to the agreement with BWSC pipe manufacturer for satisfactory manufacturing, transporting, lowering, laying, jointing and testing of pipe.

11.11. **Measurement:**

The net length of pipes as laid or fixed shall be measured in running meters correct to a cm. Specials shall be excluded and measured and paid separately under the relevant item. The portion of the pipe at the joints (inside the joints) shall not be included in the length of pipe work.

Excavation, refilling, masonry and concrete work wherever required shall be measured and paid for separately under relevant items of work.

11.12. Rates

The rate shall include the cost of materials and labour involved in all the operations except for the items measured/enumerated separately under clause 'Measurements', which shall be paid for separately.

Bar Wrapped Steel Cylinder Pipes (BWSC)

Sr.No.	Item	Unit	Rate (In Rs.)
11.1.	Providing and supplying Bar Wrapped Steel Cylinder Pipes Test Presure 4 Kg/Sqcm		
	350 mm	RM	2539.00
	400 mm	RM	2920.00
	450 mm	RM	3340.00
	500 mm	RM	3977.00
	600 mm	RM	5061.00
	700 mm	RM	5959.00
	800 mm	RM	6825.00
	900 mm	RM	8625.00
	1000 mm	RM	9925.00
	1100 mm	RM	14164.00
	1200 mm	RM	16749.00
	1300 mm	RM	16711.00
	1400 mm	RM	18611.00
	1500 mm	RM	20062.00
	1600 mm	RM	22954.00
11.2.	Labour only for laying & jointing Bar Wrapped Steel Cylinder Pipes Test Pressure 4 Kg/Sqcm including cost of jointing material as per relevant IS specification.		
	350 mm	RM	457.00
	400 mm	RM	526.00
	450 mm	RM	601.00
	500 mm	RM	716.00
	600 mm	RM	810.00
	700 mm	RM	953.00
	800 mm	RM	1092.00
	900 mm	RM	1380.00
	1000 mm	RM	1390.00
	1100 mm	RM	1982.00
	1200 mm	RM	2205.00
	1300 mm	RM	2340.00
	1400 mm	RM	2047.00
	1500 mm	RM	2207.00
	1600 mm	RM	2525.00

Sr.No.	Item	Unit	Rate (In Rs.)
11.3	Providing and supplying Bar Wrapped Steel Cylinder Pipes Test Pressure 6 Kg/Sqcm		
	350 mm	RM	2544.00
	400 mm	RM	2931.00
	450 mm	RM	3356.00
	500 mm	RM	3995.00
	600 mm	RM	5086.00
	700 mm	RM	5977.00
	800 mm	RM	6844.00
	900 mm	RM	8634.00
	1000 mm	RM	9950.00
	1100 mm	RM	14164.00
	1200 mm	RM	16764.00
	1300 mm	RM	16731.00
	1400 mm	RM	18626.00
	1500 mm	RM	20082.00
	1600 mm	RM	22974.00
11.4	Labour only for laying & jointing Bar Wrapped Steel Cylinder Pipes Test Pressure 6 Kg/Sqcm including cost of jointing material as per relevant IS specification.		
	350 mm	RM	457.00
	400 mm	RM	528.00
	450 mm	RM	604.00
	500 mm	RM	719.00
	600 mm	RM	814.00
	700 mm	RM	956.00
	800 mm	RM	1095.00
	900 mm	RM	1381.00
	1000 mm	RM	1393.00
	1100 mm	RM	1983.00
	1200 mm	RM	2207.00
	1300 mm	RM	2342.00
	1400 mm	RM	2049.00
	1500 mm	RM	2209.00
	1600 mm	RM	2527.00
11.5	Providing and supplying Bar Wrapped Steel Cylinder Pipes Test Pressure 8 Kg/Sqcm		

Sr.No.	Item	Unit	Rate (In Rs.)
	350 mm	RM	2547.00
	400 mm	RM	2951.00
	450 mm	RM	3374.00
	500 mm	RM	4017.00
	600 mm	RM	5111.00
	700 mm	RM	5998.00
	800 mm	RM	6866.00
	900 mm	RM	8641.00
	1000 mm	RM	9976.00
	1100 mm	RM	14179.00
	1200 mm	RM	16784.00
	1300 mm	RM	16756.00
	1400 mm	RM	18645.00
	1500 mm	RM	20104.00
	1600 mm	RM	22996.00
11.6	Labour only for laying & jointing Bar Wrapped Steel Cylinder Pipes Test Pressure 8 Kg/Sqcm including cost of jointing material as per relevant IS specification.		
	350 mm	RM	458.00
	400 mm	RM	531.00
	450 mm	RM	607.00
	500 mm	RM	723.00
	600 mm	RM	818.00
	700 mm	RM	960.00
	800 mm	RM	1099.00
	900 mm	RM	1383.00
	1000 mm	RM	1397.00
	1100 mm	RM	1985.00
	1200 mm	RM	2210.00
	1300 mm	RM	2346.00
	1400 mm	RM	2051.00
	1500 mm	RM	2211.00
	1600 mm	RM	2530.00
11.7	Providing and supplying Bar Wrapped Steel Cylinder Pipes Test Pressure 10 Kg/Sqcm		
	350 mm	RM	2549.00

Sr.No.	Item	Unit	Rate (In Rs.)
	400 mm	RM	2976.00
	450 mm	RM	3396.00
	500 mm	RM	4042.00
	600 mm	RM	5139.00
	700 mm	RM	6023.00
	800 mm	RM	6891.00
	900 mm	RM	8647.00
	1000 mm	RM	10006.00
	1100 mm	RM	14199.00
	1200 mm	RM	16809.00
	1300 mm	RM	16781.00
	1400 mm	RM	18670.00
	1500 mm	RM	20129.00
	1600 mm	RM	23021.00
11.8	Labour only for laying & jointing Bar Wrapped Steel Cylinder Pipes Test Pressure 10 Kg/Sqcm including cost of jointing material as per relevant IS specification.		
	350 mm	RM	459.00
	400 mm	RM	536.00
	450 mm	RM	611.00
	500 mm	RM	728.00
	600 mm	RM	822.00
	700 mm	RM	964.00
	800 mm	RM	1103.00
	900 mm	RM	1384.00
	1000 mm	RM	1401.00
	1100 mm	RM	1988.00
	1200 mm	RM	2213.00
	1300 mm	RM	2349.00
	1400 mm	RM	2054.00
	1500 mm	RM	2214.00
	1600 mm	RM	2532.00
11.9	Providing and supplying Bar Wrapped Steel Cylinder Pipes Test Pressure 12 Kg/Sqcm		
	350 mm	RM	2552.00
	400 mm	RM	3004.00
	450 mm	RM	3422.00

Sr.No.	Item	Unit	Rate (In Rs.)
	500 mm	RM	4070.00
	600 mm	RM	5169.00
	700 mm	RM	6052.00
	800 mm	RM	7249.00
	900 mm	RM	8659.00
	1000 mm	RM	10487.00
	1100 mm	RM	14224.00
	1200 mm	RM	16834.00
	1300 mm	RM	16807.00
	1400 mm	RM	18700.00
	1500 mm	RM	21726.00
	1600 mm	RM	24097.00
11.10	Labour only for laying & jointing Bar Wrapped Steel Cylinder Pipes Test Pressure 12 Kg/Sqcm including cost of jointing material as per relevant IS specification.		
	350 mm	RM	459.00
	400 mm	RM	541.00
	450 mm	RM	616.00
	500 mm	RM	733.00
	600 mm	RM	827.00
	700 mm	RM	968.00
	800 mm	RM	1160.00
	900 mm	RM	1385.00
	1000 mm	RM	1468.00
	1100 mm	RM	1991.00
	1200 mm	RM	2217.00
	1300 mm	RM	2353.00
	1400 mm	RM	2057.00
	1500 mm	RM	2390.00
	1600 mm	RM	2651.00
11.11	Providing and supplying Bar Wrapped Steel Cylinder Pipes Test Pressure 14 Kg/Sqcm		
	350 mm	RM	2555.00
	400 mm	RM	3026.00
	450 mm	RM	3507.00
	500 mm	RM	4114.00
	600 mm	RM	5220.00

Sr.No.	Item	Unit	Rate (In Rs.)
	700 mm	RM	6600.00
	800 mm	RM	8457.00
	900 mm	RM	9439.00
	1000 mm	RM	11724.00
	1100 mm	RM	14284.00
	1200 mm	RM	16063.00
	1300 mm	RM	17788.00
	1400 mm	RM	20571.00
	1500 mm	RM	23125.00
	1600 mm	RM	28751.00
11.12	Labour only for laying & jointing Bar Wrapped Steel Cylinder Pipes Test Pressure 14 Kg/Sqcm including cost of jointing material as per relevant IS specification.		
	350 mm	RM	460.00
	400 mm	RM	545.00
	450 mm	RM	631.00
	500 mm	RM	741.00
	600 mm	RM	835.00
	700 mm	RM	1056.00
	800 mm	RM	1353.00
	900 mm	RM	1610.00
	1000 mm	RM	1641.00
	1100 mm	RM	2000.00
	1200 mm	RM	2249.00
	1300 mm	RM	2490.00
	1400 mm	RM	2263.00
	1500 mm	RM	2544.00
	1600 mm	RM	3163.00
11.13	Providing and supplying Bar Wrapped Steel Cylinder Pipes Test Pressure 16 Kg/Sqcm		
	350 mm	RM	2560.00
	400 mm	RM	3051.00
	450 mm	RM	3640.00
	500 mm	RM	4466.00
	600 mm	RM	5684.00
	700 mm	RM	7242.00
	800 mm	RM	8878.00

Sr.No.	Item	Unit	Rate (In Rs.)
	900 mm	RM	10203.00
	1000 mm	RM	11849.00
	1100 mm	RM	16269.00
	1200 mm	RM	17862.00
	1300 mm	RM	19423.00
	1400 mm	RM	22968.00
	1500 mm	RM	25941.00
	1600 mm	RM	29478.00
11.14	Labour only for laying & jointing Bar Wrapped Steel Cylinder Pipes Test Pressure 16 Kg/Sqcm including cost of jointing material as per relevant IS specification.		
	350 mm	RM	461.00
	400 mm	RM	549.00
	450 mm	RM	655.00
	500 mm	RM	804.00
	600 mm	RM	909.00
	700 mm	RM	1169.00
	800 mm	RM	1420.00
	900 mm	RM	1632.00
	1000 mm	RM	1659.00
	1100 mm	RM	2138.00
	1200 mm	RM	2501.00
	1300 mm	RM	2719.00
	1400 mm	RM	2526.00
	1500 mm	RM	2854.00
	1600 mm	RM	3243.00
11.15	Providing and supplying Bar Wrapped Steel Cylinder Pipes Test Pressure 18 Kg/Sqcm		
	350 mm	RM	2565.00
	400 mm	RM	3091.00
	450 mm	RM	3716.00
	500 mm	RM	4623.00
	600 mm	RM	5938.00
	700 mm	RM	7563.00
	800 mm	RM	9545.00
	900 mm	RM	10709.00
	1000 mm	RM	12523.00

Sr.No.	Item	Unit	Rate (In Rs.)
	1100 mm	RM	16012.00
	1200 mm	RM	18768.00
	1300 mm	RM	20885.00
	1400 mm	RM	24316.00
	1500 mm	RM	27234.00
	1600 mm	RM	32045.00
11.16	Labour only for laying & jointing Bar Wrapped Steel Cylinder Pipes Test Pressure 18 Kg/Sqcm including cost of jointing material as per relevant IS specification.		
	350 mm	RM	462.00
	400 mm	RM	556.00
	450 mm	RM	669.00
	500 mm	RM	832.00
	600 mm	RM	950.00
	700 mm	RM	1210.00
	800 mm	RM	1627.00
	900 mm	RM	1713.00
	1000 mm	RM	1753.00
	1100 mm	RM	2242.00
	1200 mm	RM	2628.00
	1300 mm	RM	2924.00
	1400 mm	RM	2675.00
	1500 mm	RM	2996.00
	1600 mm	RM	3525.00
11.17	Providing and supplying Bar Wrapped Steel Cylinder Pipes Test Pressure 20 Kg/Sqcm		
	350 mm	RM	2591.00
	400 mm	RM	3148..00
	450 mm	RM	3889.00
	500 mm	RM	4975.00
	600 mm	RM	6401.00
	700 mm	RM	8205.00
	800 mm	RM	10341.00
	900 mm	RM	11773.00
	1000 mm	RM	13725.00
	1100 mm	RM	17638.00
	1200 mm	RM	20619.00

Sr.No.	Item	Unit	Rate (In Rs.)
	1300 mm	RM	23002.00
	1400 mm	RM	26437.00
	1500 mm	RM	29748.00
	1600 mm	RM	34471.00
11.18	Labour only for laying & jointing Bar Wrapped Steel Cylinder Pipes Test Pressure 20 Kg/Sqcm including cost of jointing material as per relevant IS specification.		
	350 mm	RM	466.00
	400 mm	RM	567.00
	450 mm	RM	700.00
	500 mm	RM	896.00
	600 mm	RM	1024.00
	700 mm	RM	1313.00
	800 mm	RM	1655.00
	900 mm	RM	1884.00
	1000 mm	RM	1922.00
	1100 mm	RM	2469.00
	1200 mm	RM	2887.00
	1300 mm	RM	3220.00
	1400 mm	RM	2908.00
	1500 mm	RM	3272.00
	1600 mm	RM	3792.00

CHAPTER –XII

STONE WARE PIPES FOR SEWERS

CHAPTER XII
STONE WARE PIPES FOR SEWERS
(Pipes conforming to IS: 651-1992)

Notes :

12.1.1 The salt Glazed stoneware pipe shall be confirming to IS-651 : 1980.

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

12.1.3 The bedding of the S.W. pipes shall be as per the specification given in the CPHEEO mannual of sewerage & sewage treatment, payment for which shall be made as per chapter XII allied civil works.

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

12.1.5 In order to avoid damage to the pipes and especially to the spigot end, pipes shall not be dragged along concrete and similar pavements with hard surfaces.

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

12.1.7 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.

12.1.8 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.

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

12.1.10 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.

12.1 **Laying:**

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

12.1.2 **Trenches:**

The width of trench 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).

12.1.3 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.

12.1.4 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 ordinarily 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.

12.1.5 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.

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

12.1.7 All lumps, blisters and excess coating materials shall be removed gently from the socket and spigot end 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.

12.1.8 In shallow trenches manual handling is enough but in deep trenches, they should be lowered into the trench by means of ropes. Under no circumstances shall not the pipes be dropped or dumped into the trench.

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

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

12.1.11 Sight rails 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 is fixed at true level, shall be used for laying all inverts.

12.1.12 Normally the socket ends should face the up stream. When the line runs on hill the socket ends should face the upgrade of slope.

12.1.13 The stone ware pipes shall be laid with sockets facing up the gradient, if required special bedding, haunching or encasing may be provided where conditions so demand as discussed in clause 6.5 of CPHEEO manual on sewerage and sewage treatment.

12.1.14 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 cement: 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.

12.1.15 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.

12.1.16 At times 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.

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

12.1.18 When the pipe is closed and the trench to be flooded by rain; care shall be taken to prevent the pipe from floating.

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

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

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

12.1.22 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.

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

12.2 **Jointing:**

12.2.1 The stoneware pipes shall be cement jointed.

12.2.2 The materials shall consist of the following.

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

12.2.3. 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.

12.2.4 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)

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

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

12.3 **Testing:**

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

12.3.2 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.

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12.3.3 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).

12.3.4 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..

12.3.5 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.

12.3.6 It should be done as per clause 7.1.5 page 131 of CPHEEO manual on sewerage and sewage treatment.

12.4 **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.

12.5 **Measurements:**

The lengths of pipe shall be measured in the running meters nearest to a cm as laid or fixed, from inside of one manhole to the inside of the other manhole the length shall be taken. Along the centre line of the pipes overall fittings. Such as bends, junction, etc., which shall not be measured separately. Excavation refilling shoring and timbering in trenches and cement concreting where ever required shall be measured separately under relevant item of work.

12.6 **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.

STONE WARE PIPES FOR SEWERS

(Pipes conforming to IS: 651-1992)

S. No.	Items	Unit	Rates in Rs.
12.1	Providing, 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	187.00
	150 mm	Per Meter	309.00
	200 mm	Per Meter	550.00
	250 mm	Per Meter	771.00
	300 mm	Per Meter	1235.00
12.2	Labour only for 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	79.00
	150 mm	Per Meter	116.00
	200 mm	Per Meter	142.00
	250 mm	Per Meter	187.00
	300 mm	Per Meter	215.00
12.3	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	Per Meter	471.00
	150mm dia	Per Meter	576.00
	200mm dia	Per Meter	671.00
	250mm dia	Per Meter	735.00
	300mm dia	Per Meter	891.00
12.4	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 ")		

S. No.	Items	Unit	Rates in Rs.
	100mm dia pipe	Per Meter	223.00
	150mm dia	Per Meter	361.00
	200mm dia	Per Meter	426.00
	250mm dia	Per Meter	496.00
	300mm dia	Per Meter	573.00
12.5	Dismantling of old S.W. pipes including breaking of joints and bed concrete stacking of useful materials near the site within 50 m lead and disposal of unserviceable materials in to municipal dumps :		
	100mm dia pipe	Per Meter	24.00
	150mm dia	Per Meter	26.00
	200mm dia	Per Meter	28.00
	250mm dia	Per Meter	30.00
	300mm dia	Per Meter	31.00

CHAPTER- XIII

REINFORCED CEMENT CONCRETE PIPES

CHAPTER- XIII
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.

13.1 Laying:

13.1.1 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.

13.1.2 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.

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

13.1.4 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.

13.1.5 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.

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

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

13.1.8 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.

13.1.9 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.

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

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

13.1.12 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.

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

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

13.1.15 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.

13.1.16 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.

13.1.17 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.

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

13.1.19 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.

13.1.20 The pipe when laid should not be subjected to super imposed load beyond their safe crushing strength which the pipe can safely take up.

13.2 **Pipe Bedding:**

13.2.1 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.

13.2.2 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.

13.2.3 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.

13.2.4 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.

13.2.5 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).

13.3 **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.

13.4 **Testing:**

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

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

13.4.3 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.

13.4.4 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).

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

13.4.6 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 pipe per Km. length per day.

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

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

13.4.9 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).

13.5 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.

REINFORCED CEMENT CONCRETE PIPES

(PIPES CONFORMING TO IS : 458-1988)

S.No.	Items	Unit	Rates(Rs)
13.1	**Providing and Laying non-pressure (NP2) RCC socket & spigot pipes with rubber gasket joint including testing of joints.**		
	100 mm	Per Meter	463.00
	150 mm	Per Meter	489.00
	200 mm	Per Meter	568.00
	250 mm	Per Meter	687.00
	300 mm	Per Meter	947.00
	350 mm	Per Meter	1095.00
	400 mm	Per Meter	1274.00
	450 mm	Per Meter	1545.00
	500 mm	Per Meter	1679.00
	600 mm	Per Meter	2125.00
	700 mm	Per Meter	2789.00
	800 mm	Per Meter	3670.00
	900 mm	Per Meter	4288.00
	1000 mm	Per Meter	4971.00
	1100 mm	Per Meter	5969.00
	1200 mm	Per Meter	7442.00
	1600 mm	Per Meter	15705.00
13.2	**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	70.00
	150 mm	Per Meter	112.00
	200 mm	Per Meter	130.00
	250 mm	Per Meter	168.00
	300 mm	Per Meter	209.00
	350 mm	Per Meter	215.00
	400 mm	Per Meter	244.00
	450 mm	Per Meter	282.00
	500 mm	Per Meter	312.00
	600 mm	Per Meter	382.00
	700 mm	Per Meter	428.00
	800 mm	Per Meter	512.00
	900 mm	Per Meter	618.00
	1000 mm	Per Meter	677.00
	1100 mm	Per Meter	747.00
	1200 mm	Per Meter	857.00
	1600 mm	Per Meter	1245.00

13.3	**Providing and Laying non-pressure (NP3) RCC socket & spigot pipes with rubber gasket joint including testing of joints.**		
	150 mm	Per Meter	649.00
	250 mm	Per Meter	1013.00
	300 mm	Per Meter	1263.00
	350 mm	Per Meter	2019.00
	400 mm	Per Meter	2498.00
	450 mm	Per Meter	2754.00
	500 mm	Per Meter	3188.00
	600 mm	Per Meter	3442.00
	700 mm	Per Meter	4413.00
	800 mm	Per Meter	5604.00
	900 mm	Per Meter	6947.00
	1000 mm	Per Meter	7573.00
	1100 mm	Per Meter	9570.00
	1200 mm	Per Meter	10812.00
	1400 mm	Per Meter	14745.00
	1600 mm	Per Meter	16319.00
	1800 mm	Per Meter	20612.00
13.4	**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	112.00
	250 mm	Per Meter	179.00
	300 mm	Per Meter	235.00
	350 mm	Per Meter	351.00
	400 mm	Per Meter	396.00
	450 mm	Per Meter	437.00
	500 mm	Per Meter	481.00
	600 mm	Per Meter	581.00
	700 mm	Per Meter	655.00
	800 mm	Per Meter	803.00
	900 mm	Per Meter	982.00
	1000 mm	Per Meter	1091.00
	1100 mm	Per Meter	1140.00
	1200 mm	Per Meter	1244.00
	1400 mm	Per Meter	1606.00
	1600 mm	Per Meter	1859.00
	1800 mm	Per Meter	2184.00
13.5	**Providing and Laying non-pressure (NP4) RCC socket & spigot pipes with rubber gasket joint including testing of joints.**		
	250 mm	Per Meter	1139.00

	300 mm	Per Meter	1472.00
	350 mm	Per Meter	2296.00
	400 mm	Per Meter	2662.00
	450 mm	Per Meter	3207.00
	500 mm	Per Meter	3304.00
	600 mm	Per Meter	4208.00
	700 mm	Per Meter	5179.00
	800 mm	Per Meter	6579.00
	900 mm	Per Meter	8104.00
	1000 mm	Per Meter	8705.00
	1100 mm	Per Meter	10211.00
	1200 mm	Per Meter	12148.00
	1400 mm	Per Meter	16089.00
	1600 mm	Per Meter	17559.00
	1800 mm	Per Meter	25262.00
13.6	**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	179.00
	300 mm	Per Meter	235.00
	350 mm	Per Meter	351.00
	400 mm	Per Meter	396.00
	450 mm	Per Meter	437.00
	500 mm	Per Meter	481.00
	600 mm	Per Meter	581.00
	700 mm	Per Meter	655.00
	800 mm	Per Meter	803.00
	900 mm	Per Meter	982.00
	1000 mm	Per Meter	1095.00
	1100 mm	Per Meter	1140.00
	1200 mm	Per Meter	1284.00
	1400 mm	Per Meter	1606.00
	1600 mm	Per Meter	1859.00
	1800 mm	Per Meter	2144.00
13.7	**Providing, Laying & jointing non-pressure (NP2) RCC pipes with collars jointed with stiff mixture of cement mortar in the proportion 1:2 (1 cement : 2 sand) including testing of joints.**		
	150 mm	Per Meter	297.00
	200 mm	Per Meter	439.00
	250 mm	Per Meter	517.00
	300 mm	Per Meter	559.00
	350 mm	Per Meter	679.00

	400 mm	Per Meter	790.00
	450 mm	Per Meter	913.00
	500 mm	Per Meter	948.00
	600 mm	Per Meter	1045.00
	700 mm	Per Meter	1730.00
	800 mm	Per Meter	2314.00
	900 mm	Per Meter	2886.00
	1000 mm	Per Meter	3625.00
	1100 mm	Per Meter	4151.00
	1200 mm	Per Meter	4815.00
13.8	**Labour only for laying & jointing non-pressure (NP2) RCC pipes with collars jointed with stiff mixture of cement mortar in the proportion 1:2 (1 cement : 2 sand) including testing of joints.**		
	150 mm	Per Meter	61.00
	200 mm	Per Meter	81.00
	250 mm	Per Meter	101.00
	300 mm	Per Meter	108.00
	350 mm	Per Meter	121.00
	400 mm	Per Meter	126.00
	450 mm	Per Meter	140.00
	500 mm	Per Meter	148.00
	600 mm	Per Meter	178.00
	700 mm	Per Meter	195.00
	800 mm	Per Meter	210.00
	900 mm	Per Meter	263.00
	1000 mm	Per Meter	332.00
	1100 mm	Per Meter	398.00
	1200 mm	Per Meter	486.00
13.9	**Providing, Laying & jointing non-pressure (NP3) RCC pipes with collars jointed with stiff mixture of cement mortar in the proportion 1:2 (1 cement : 2 sand) including testing of joints**		
	150 mm	Per Meter	384.00
	200 mm	Per Meter	571.00
	250 mm	Per Meter	629.00
	300 mm	Per Meter	702.00
	350 mm	Per Meter	111/1.00
	400 mm	Per Meter	1513.00
	450 mm	Per Meter	1627.00
	500 mm	Per Meter	2032.00
	600 mm	Per Meter	2123.00
	700 mm	Per Meter	3391.00

	800 mm	Per Meter	3643.00
	900 mm	Per Meter	4311.00
	1000 mm	Per Meter	4801.00
	1100 mm	Per Meter	5983.00
	1200 mm	Per Meter	7208.00
13.10	**Labour only for laying & jointing non-pressure (NP3) RCC pipes with collars jointed with stiff mixture of cement mortar in the proportion 1:2 (1 cement : 2 sand) including testing of joints.**		
	150 mm	Per Meter	64.00
	200 mm	Per Meter	85.00
	250 mm	Per Meter	105.00
	300 mm	Per Meter	112.00
	350 mm	Per Meter	126.00
	400 mm	Per Meter	132.00
	450 mm	Per Meter	145.00
	500 mm	Per Meter	154.00
	600 mm	Per Meter	184.00
	700 mm	Per Meter	203.00
	800 mm	Per Meter	218.00
	900 mm	Per Meter	273.00
	1000 mm	Per Meter	344.00
	1100 mm	Per Meter	414.00
	1200 mm	Per Meter	505.00
13.11	**Providing, Laying & jointing non-pressure (NP4) RCC pipes with collars jointed with stiff mixture of cement mortar in the proportion 1:2 (1 cement : 2 sand) including testing of joints**		
	150 mm	Per Meter	412.00
	200 mm	Per Meter	579.00
	250 mm	Per Meter	674.00
	300 mm	Per Meter	933.00
	350 mm	Per Meter	1542.00
	400 mm	Per Meter	1714.00
	450 mm	Per Meter	1809.00
	500 mm	Per Meter	2151.00
	600 mm	Per Meter	2794.00
	700 mm	Per Meter	3434.00
	800 mm	Per Meter	4283.00
	900 mm	Per Meter	5379.00
	1000 mm	Per Meter	6006.00
	1100 mm	Per Meter	7009.00
	1200 mm	Per Meter	7273.00

13.12	**Labour only for Laying & jointing non-pressure (NP4) RCC pipes with collars jointed with stiff mixture of cement mortar in the proportion 1:2 (1 cement : 2 sand) including testing of joints.**		
	150 mm	Per Meter	67.00
	200 mm	Per Meter	88.00
	250 mm	Per Meter	110.00
	300 mm	Per Meter	117.00
	350 mm	Per Meter	132.00
	400 mm	Per Meter	137.00
	450 mm	Per Meter	151.00
	500 mm	Per Meter	160.00
	600 mm	Per Meter	191.00
	700 mm	Per Meter	210.00
	800 mm	Per Meter	227.00
	900 mm	Per Meter	283.00
	1000 mm	Per Meter	356.00
	1100 mm	Per Meter	430.00
	1200 mm	Per Meter	525.00

CHAPTER- XIV

DOUBLE WALL CORRUGATED (DWC) PIPES

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1. Dimensions of Pipes : (i) Mean outside diameter :- The mean outside diameter, outside diameter at any point and tolerances shall be as give in the table 1 of IS 15328 and shall be measured according to the method in IS:12235 (part-1). (ii) Wall thickness :- The nominal wall thickness, e, shall be in accordance with table 2 of IS 15328. Tolerances in outside diameters shall be those given in IS 4985.

2. Marking :- The colour of marking shall be different from the basic colour of the pipe. It shall be as under. (i) Identification of the source of manufacture. (ii) Outside diameter, (iii) Stiffness class, and (iv) Batch or lot number

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

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

5. Minimum Cover

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

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

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

6. Providing and supply of DWC HDPE pipes class SN8 for non pressure underground sewerage drainage application as per EN: 13476-3 is also given in the given chapter. Pipes and fittings shall be as per relevant BIS/ISO specifications. Material should be used after obtaining third party quality assurance certificate

7. Measurement

All measurement should be of the finished work only. The net length of pipes as laid or fixed shall be measured in running meters correct to 10mm. The

portion of the pipe inside the joints shall not be included in the length of pipe work. Excavation, refilling, masonry and concrete work wherever required shall be measured and paid for separately under relevant items of work.

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

DOUBLE WALL CORRUGATED (DWC) PIPES

S.No.	Items	Unit	Rate in Rs.		
14.1	Providing of DWC HDPE Pipes of renowned manufacturer duly tested inclusive of all taxes related to central, state and municipal, inclusive of excise duty, inspection charges, transportation charges, transit insurance, loading/ unloading and stacking at site/ store etc, complete.	RM			
	Internal Dia/Outer dia				
14.1.1	100 mm/ 120 mm	RM			211
14.1.2	135 mm/ 160 mm	RM			274
14.1.3	150 mm/ 180 mm	RM			355
14.1.4	170 mm/ 200 mm	RM			409
14.1.5	200 mm/ 238 mm	RM			545
14.1.6	250 mm/ 290 mm	RM			936
14.1.7	300 mm/ 345 mm	RM			1287
14.1.8	400 mm/ 480 mm	RM			1947
14.1.9	500 mm/ 580 mm	RM			3119
14.1.10	600 mm/ 715 mm	RM			4907
14.1.11	800 mm/ 955 mm	RM			8296
14.1.12	1000 mm/ 1200 mm	RM			13341
14.2	laying and jointing of specified DWC HDPE Pipes including transportation, loading/ unloading and stacking at site etc complete.				
	Internal Dia/Outer dia				
14.2.1	100 mm/ 120 mm	RM			23.00
14.2.2	135 mm/ 160 mm	RM			25.00
14.2.3	150 mm/ 180 mm	RM			35.00
14.2.4	170 mm/ 200 mm	RM			35.00
14.2.5	200 mm/ 238 mm	RM			35.00
14.2.6	250 mm/ 290 mm	RM			45.00
14.2.7	300 mm/ 345 mm	RM			86.00
14.2.8	400 mm/ 480 mm	RM			86.00
14.2.9	500 mm/ 580 mm	RM			139.00
14.2.10	600 mm/ 715 mm	RM			139.00
14.2.11	800 mm/ 955 mm	RM			180.00
14.2.12	1000 mm/ 1200 mm	RM			246.00

S.No.	Items	Unit	Rate in Rs.		
14.3	Providing of fittings for structural wall polyethylene piping systems (pipe with online/offline coupler and elasticmeric sealing ring) with non-smooth external annular corrugated and smooth internal surfaces(double wall)for non – pressure underground sewerage, drainage as per IS 16098(PART-2):2013&EN 13476-3.				
	Internal dia/Outer dia		**Coupler Rate**	**Sealing Ring Rate**	**Bend Rate**
14.3.1	100 mm/ 120 mm	RM	68.00	16.00	293.00
14.3.2	135 mm/ 160 mm	RM	101.00	25.00	385.00
14.3.3	150 mm/ 180 mm	RM	150.00	32.00	505.00
14.3.4	170 mm/ 200 mm	RM	218.00	44.00	702.00
14.3.5	200 mm/ 238 mm	RM	258.00	74.00	815.00
14.3.6	250 mm/ 290 mm	RM	700.00	178.00	1601.00
14.3.7	300 mm/ 345 mm	RM	1515.00	402.00	2525.00
14.3.8	400 mm/ 480 mm	RM	2008.00	620.00	4016.00
14.3.9	500 mm/ 580 mm	RM	3098.00	815.00	6334.00
14.3.10	600 mm/ 715 mm	RM	3970.00	1957.00	9662.00
14.3.11	800 mm/ 955 mm	RM	8652.00	4877.00	20712.00
14.3.13	1000 mm/ 1200 mm	RM	12623.00	7172.00	29720.00

CHAPTER- XV

SEWER APPURTENANCES

CHAPTER XV
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.

15.1 Manholes

15.1.1 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.

15.1.2 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.

15.1.3 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.

15.1.4 Types of manholes:

Following is the general classification of manholes-

15.1.4.1 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.

15.1.4.2 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.

15.1.4.3 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.

15.1.4.4 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 end.

(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.

15.1.4.5 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.

15.1.4.6 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

15.2. 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.

15.3. 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 good quality as per manufacturer's specifications.

15.4 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.

15.5. Inverted siphon

15.5.1 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.

15.5.2. 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.

15.5.3. 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.

15.6. 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.

15.7. Bypass:

Proper bypass 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 may be provided at the outlet to overcome maintenance problems arising out of silting of siphons. If it is possible a blow off may be installed at the low point to facilitate emergency maintenance operations.

15.8 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.

15.9. 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.

15.9.1 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.

15.9.2. 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 Cowel 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.)
15.1	Providing and fixing SW gully trap complete with CI grating, Brick masonry chamber in cement mortar 1:5 (1 cement :5 fine 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.		
15.1.1	100x100mm size "P" Gully Trap Chamber	Each	1737.00
15.1.2	125x100mm size "P", "Q" or "S" type Gully trap chamber	Each	1808.00
15.1.3	180x150mm size "P" or "S" type	Each	1920.00
	MAN HOLES		
15.2	Constructing Brick Masonry Manhole in Cement Mortar 1 :4 (1 cement : 4 fine sand) R.C.C. top slab 1:1.5:3 (1 cement : 1.5 coarse sand : 3 graded stone aggregate 20 mm nominal size), foundation concrete 1:4:8 mix (1cement : 4 coarse sand : 8 graded stone aggregate 40mm nominal size) inside plastering 12mm thick with cement mortar 1:3 (1cement : 3 fine sand) finished with a floating coat of neat cement and making channels in CC 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20mm nominal size) including finishing the channel to shape, curing etc. (Excavation foot rest and external cement plaster shall be paid for separately)		
15.2.1	Inside size 90x80 cm and 45 cm deep including CI cover with frame 455x610 mm internal dimensions total weight of cover and frames to be not less than (23+15) 38 kg .	Each	9322.00
15.2.2	Inside size 90x80 cm and 60 cm deep including CI cover with frame 455x610mm internal dimensions total weight of cover and frames to be not less than (23+15) 38 kg	Each	10054.00

S.No.	Items	Unit	Rate (Rs.)
15.2.3	Inside size 120x90 cm and 90 cm deep Manhole including CI cover with frame (medium duty) 500 mm internal diameter total weight of cover and frame to be not less than (58+58) 116 kg.	Each	19705.00
15.2.4	Inside size 120x90 cm and 90 cm deep Manhole including CI cover with frame (Heavy duty) 560 mm internal diameter total weight of cover and frame to be not less than (108+100) 208 kg.	Each	25942.00
15.2.5	Manhole for property (House) connection		
(i)	Inside size 60x60 cm and 90 cm deep manhole with fixing of ISI marked pre cast RCC manhole cover & frame i/c transportation etc. 600x600 mm size heavy duty .	Each	7964.00
(ii)	Inside size 60x45 cm and 60 cm deep manhole with fixing of ISI marked pre cast RCC manhole cover & frame i/c transportation etc. 600x450 mm size heavy duty	Each	6118.00
15.3	Extra for depth up to 1.00 m for man holes over item 11.2		
15.3.1	90x80cm size manhole over item	per meter	5129.00
15.3.2	120x90cm size manhole over item.	per meter	6130.00
15.3.3	60x60cm size manhole over item	per meter	3688.00
15.3.4	60x45 cm size manhole over item	per meter	3330.00
15.4	Constructing Brick Masonry Circular Manhole 1500 mm internal dia at bottom & 560 mm dia at top in cement Mortar 1:4 (1 cement: 4 fine sand), inside Cement plaster 12 mm thick with cement mortar 1:3 (1 cement : 3 fine sand) finished with a floating coat of neat cement, foundation concrete 20 cm thick in 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 40 mm nominal size) and making channels in cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20mm nominal size) finished with a floating coat of neat cement etc. all complete.		

S.No.	Items	Unit	Rate (Rs.)
15.4.1	For one manhole 2650 mm deep with fixing of 560 mm dia ISI marked reinforcement cement concrete cover & frame heavy duty including transportation etc. in cement concrete 1:2:4 all complete. (Excavation, foot rests & cement plaster at the external surface shall be paid for separately)	Each	24680.00
15.4.2	For one manhole 2650 mm deep with fixing of 560 mm dia CI cover & frame (medium duty) weight not less than (58+58) 116 kg. including transportation etc. in cement concrete 1:2:4 all complete. (Excavation, foot rests & cement plaster at the external surface shall be paid for separately)	Each	29980.00
15.5	Extra for depth for circular manholes over item 11.4		
15.5.1	Depth 2.65m to 4.25 m	per meter	9872.00
15.5.2	Depth 4.25m to 9.75m	per meter	13574.00
15.6	Constructing Brick Masonry Circular Manhole 1200 mm internal dia at bottom & 560 mm dia at top in cement Mortar 1:4 (1 cement: 4 fine sand), inside Cement plaster 12 mm thick with cement mortar 1:3 (1 cement : 3 fine sand) finished with a floating coat of neat cement, foundation concrete 20 cm thick in 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 40 mm nominal size) and making channels in cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20mm nominal size) finished with a floating coat of neat cement etc. all complete.		
15.6.1	For one manhole 1650 mm deep with fixing of 560 mm dia ISI marked reinforcement cement concrete cover & frame heavy duty including transportation etc. in cement concrete 1:2:4 all complete. (Excavation, foot rests & cement plaster at the external surface shall be paid for separately)	Each	15880.00
15.6.2	Add extra for depth 1.65 to 2.30 mtr.	Per Mtr.	6352.00

S.No.	Items	Unit	Rate (Rs.)
15.7	Constructing Brick Masonry Circular Manhole 900 mm internal dia at bottom & 560 mm dia at top in cement Mortar 1:4 (1 cement: 4 fine sand), inside Cement plaster 12 mm thick with cement mortar 1:3 (1 cement : 3 fine sand) finished with a floating coat of neat cement, foundation concrete 20 cm thick in 1:3:6 (1 cement : 3 fine sand : 6 graded stone aggregate 40 mm nominal size) and making channels in cement concrete 1:2:4 (1 cement : 2 coarse sand : 4 graded stone aggregate 20mm nominal size) finished with a floating coat of neat cement etc. all complete.		
15.7.1	For one Manhole 900mm deep with fixing of 560 mm dia ISI marked reinforcement cement concrete cover & frame heavy duty including transportation etc. in cement concrete 1:2:4 all complete. (Excavation, foot rests & cement plaster at the external surface shall be paid for separately)	Each	11808.00
15.7.2	Add extra for depth 0.90 to 1.65 mtr.	Each	4723.00
15.8	Providing MS foot rests i/c fixing in manhole with 20x20x10cm CC blocks of 1:3:6 (1 cement:3 coarse sand : 6 graded stone aggregate 20mm nominal size)		
15.8.1	With 20mm square bar foot rest	Each	273.00
15.8.2	With 20mm round bar foot rest	Each	239.00
15.9	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 : 2 coarse sand : 4 graded stone aggregate 20mm nominal size), cement plastered with CM 1:3(1 cement : 3 coarse sand) finished with a floating coat of neat cement and making necessary channels etc. complete.		
15.9.1	For 100 to 200 mm dia pipes	Each	335.00
15.9.2	For 250 to 300 mm dia pipes	Each	386.00
15.9.3	For 350 to 450 mm dia pipes	Each	546.00

S.No.	Items	Unit	Rate (Rs.)
15.10	Providing SCI (Sand Cast Iron) drop connection with SCI (Sand Cast Iron) drop pipe and bend encased alround with CC 1:5:10 (1 cement: 5 coarse 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 fine sand) on inside walls including lead caulked joints and jointing SW pipes & SCI pipes with stiff cement mortar 1:1(1 cement: 1fine sand) including making required channel etc. complete.		
15.10.1	100 mm dia Sand cast iron drop connection	Each	4759.00
15.10.2	150 mm dia Sand cast iron drop connection	Each	7139.00
15.10.3	Extra rate shall be payable for depths of drop more than 60 cm		
(i)	100 mm dia Sand cast iron drop connection	Per mtr.	1428.00
(ii)	150 mm dia Sand cast iron drop connection	Per mtr.	2142.00
15.11	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 thick plaster in cement mortar 1:3 including foundation concrete 1:5:10 (1 cement :5 coarse sand :10 graded stone aggregate 40mm nominal size) including excavation etc. complete.		
15.11.1	Chamber 45x45x77.5cm with vertical grating 450x100 mm	each	4178.00
15.11.2	Chamber 50x45x60cm with horizontal grating 500x450 mm	each	3641.00
15.11.3	Chamber 110 x 50 x 77.5cm with horizontal 500 x 450 mm and vertical gratings 450x100 mm both.	each	6670.00
	REPAIRING		
15.12	Dismantling of manhole including R.C.C./C.C. top slab, CI / pre cast RCC cover with frame including stacking of useful materials near the site and disposal of unserviceable materials into municipal dumps within 50 m lead		
15.12.1	Manhole size 90x80 and 45 cm deep	Each	710.00
15.12.2	Manhole size 90x80 and 60 cm deep	Each	779.00
15.12.3	Manhole size 120x90 and 90 cm deep	Each	1161.00
15.12.4	Manholes size 60x45 and 60 cm deep.	Each	382.00
15.12.5	Manholes size 60x60 and 90 cm deep.	Each	548.00
15.12.6	Extra for depth of manholes dismantling		

S.No.	Items	Unit	Rate (Rs.)
(i)	Manhole size 90x80 cm, depth above 60 cm	Per Mtr.	463.00
(ii)	Manhole size 120x90cm, depth above 90 cm	Per Mtr.	551.00
(iii)	Manholes size 60x45 cm, depth above 60 cm	Per Mtr.	325.00
(iv)	Manholes size 60x60 cm, depth above 90 cm	Per Mtr.	358.00
15.12.7	Manhole 1.50 m dia circular and 2.65 m deep	Each	2520.00
15.12.8	Manhole 1.20 m dia circular, and 1.65 m deep	Each	1570.00
15.12.9	Manhole 0.90 m dia circular and 0.90 m deep	Each	949.00
15.12.10	Extra for depth of manholes dismantling		
(i)	Manhole 1.50 m dia circular, depth 2.65 to 4.25m	Per Mtr.	1008.00
(ii)	Manhole 1.50 m dia circular, depth 4.25 to 9.75m	Per Mtr.	1386.00
(iii)	Manhole 1.20 m dia circular, depth 1.65 to 2.30 m	Per Mtr.	628.00
(iv)	Manhole 0.90 m dia circular, depth 0.90 to 1.65m	Per Mtr.	380.00
15.13	Replacement of M.S. Foot rests in manhole including dismantling concrete block and fixing with 20x20x10 cm C.C. blocks of 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 20mm nominal size)		
15.13.1	With 20mm square bar foot rest.	Each	305.00
15.13.2	With 20mm round bar foot rest.	Each	271.00
15.14	Pumping out to removed the sewers blockage by using suitable pump sets operated by generators , whole assembly mounted on two/four wheels trailer / pickup van. Including diesel & labour charges etc.	Per Hours	175.00
15.15	Providing and fixing in position Cast Iron Manhole Covers and frame conforming to IS 1726. All exposed edges rounded end finished in cement mortar etc. complete.	Kg.	71.00
15.16	Labour only for fixing in position Cast Iron Manhole Covers & frame conforming to IS-1726.	Kg	4.00
15.17	Providing & fixing of ISI marked pre cast reinforced cement concrete manhole cover including frame and transporting at site, cost of all material etc.		
15.17.1	500 mm dia extra heavy duty	Each	3036.00
15.17.2	560 mm dia extra heavy duty	Each	3336.00
15.17.3	600 mm dia extra heavy duty	Each	3636.00
15.17.4	500 mm dia heavy duty	Each	2384.00
15.17.5	560 mm dia heavy duty	Each	2652.00
15.17.6	600 mm dia heavy duty	Each	3353.00
15.17.7	600 x 900 mm size extra heavy duty	Each	5421.00
15.17.8	600 x 900 mm size heavy duty	Each	4721.00

S.No.	Items	Unit	Rate (Rs.)
15.17.9	450 x 900 mm size heavy duty	Each	3923.00
15.17.10	600 X 600 mm size extra heavy duty	Each	3361.00
15.17.11	600 X 600 mm size heavy duty	Each	2664.00
15.17.12	600 X 600 mm size medium duty	Each	2065.00
15.17.13	600 X 450 mm size heavy duty	Each	2436.00
15.17.14	600 X 450 mm size medium duty	Each	1820.00
15.17.15	450 X 450 mm size heavy duty	Each	1836.00
15.17.16	450 X 450 mm size medium duty	Each	1536.00
15.18	Providing & fixing of ISI marked pre cast reinforced cement concrete manhole cover without frame and transporting at site, cost of all material etc.		
15.18.1	500 mm dia extra heavy duty	Each	1730.00
15.18.2	560 mm dia extra heavy duty	Each	2130.00
15.18.3	600 mm diaextra heavy duty	Each	2630.00
15.18.4	500 mm dia heavy duty	Each	1398.00
15.18.5	560 mm dia heavy duty	Each	1854.00
15.18.6	600 mm dia heavy duty	Each	2424.00
15.18.7	600 x 900 mm size extra heavy duty	Each	4115.00
15.18.8	600 x 900 mm size heavy duty	Each	3906.00
15.18.9	450 x 900 mm size heavy duty	Each	2994.00
15.18.10	600 X 600 mm size extra heavy duty	Each	2161.00
15.18.11	600 X 600 mm size heavy duty	Each	1945.00
15.18.12	600 X 600 mm size medium duty	Each	1375.00
15.18.13	600 X 450 mm size heavy duty	Each	1740.00
15.18.14	600 X 450 mm size medium duty	Each	1170.00
15.18.15	450 X 450 mm size heavy duty	Each	1230.00
15.18.16	450 X 450 mm size medium duty	Each	930.00

CHAPTER XVI

ALLIED CIVIL WORKS

CHAPTER XVI
ALLIED CIVIL WORKS

Excavation And Preparation Of Trench

16.1 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.

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

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

16.4 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.

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

16.6 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.

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

16.8 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.

16.9 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, flanges, D-Joints for jointing. Depth of pit at such places shall also be sufficient to permit finishing of joints.

16.10 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.

16.11 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.

16.12 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.

16.13 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.

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

16.15 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.

16.16 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.

16.17 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.

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

16.19 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.

16.20 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..

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

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

16.23 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.

16.24 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.

16.25 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.

16.26 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.

16.27 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.

16.28 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.

16.29 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.

16.30 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.

16.31 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.

16.32 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.

16.33 (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 at the rate of Rs 155 per cum 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.

16.33 (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.

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

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

16.36 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.

16.37 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.

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

16.39 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.

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

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

16.42 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.

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

16.44 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.

16.45 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.

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

16.47 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.

16.48 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.

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

16.50 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.

16.51 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.

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

16.53 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 forging, 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 stiff 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, centering 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 Rs.
	EXCAVATION		
16.1	Surface dressing of the ground including removing vegetation and in - equalities not exceeding 15 cm deep and disposal of rubbish, lead up to 50 m and lift up to 1.5 m. All kind of soil	100 Sqm	909.00
16.2	Clearing jungle including uprooting of rank vegetation, grass, brush wood, trees and saplings of girth up to 30 cm measured at a height of 1 m above ground level and removal of rubbish up to a distance of 50 m outside the periphery of the area cleared.	100 Sqm	468.00
16.3	Clearing grass and removal of rubbish up to a distance of 50 m outside the periphery of the area cleared.	100 Sqm	241.00
16.4	Earth work in excavation by mechanical means (Hydraulic excavator) / manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including disposal of excavated earth, lead up to 50 m and lift up to 1.5 m, disposed earth to be leveled and neatly dressed. All kind of soil	Cum	131.00
16.5	For muddy area	cum	196.00
16.6	Earth work in excavation by mechanical means (Hydraulic excavator) / manual means over areas (exceeding 30 cm in depth, 1.5 m in width as well as 10 sqm on plan) including disposal of excavated earth, lead up to 50 m and lift up to 1.5 m, disposed earth to be leveled and neatly dressed. Soft rock with or without blasting or bituminous pavement / cement concrete road.		
(a)	In ordinary or Soft rock with or without blasting or bituminous pavement / cement concrete road.		244.00
(b)	Hard rock (requiring blasting.)		421.00
(c)	Hard rock requiring chiseling / where blasting is prohibited.		563.00
16.7	Extra for every additional lift of 1.5m or part there of over item 12.4 to 12.6.	cum	6.00
16.8	Extra for every additional lead up to 50 m or part thereof over item 12.4 to 12.6.	cum	68.00
16.9	Pumping out water caused by springs, tides or river seepage, broken water mains or drains or the like	KL	73.00

S.No.	Items	Unit	Rates in Rs.
16.10 (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	cum	32.00
(b)	Filling available excavated earth in trenches, lead up to 50m and lift up to 1.5m in all kind of soil excluding watering and ramming.	Cum	21.00
16.11 (a)	Filling with moorum for pipe bedding or over the pipe including supply of moorum	cum	490.00
(b)	Filling with crusher stone dust for pipe bedding or over the pipe including supply of crusher stone dust.	cum	693.00
	DISMANTLING & DEMOLISHING		
16.12	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 as per direction of engineer-in-charge. (In cement mortar)	Cum	551.00
16.13	Demolishing stone rubble masonary manually/ mechanical means including stacking of serviceable material and disposal of unserviceable material with in 50 meter lead as per direction of engineer-in-charge.(In lime mortar)	Cum	311.00
16.14	Demolishing stone rubble masonary manually/ mechanical means including stacking of serviceable material and disposal of unserviceable material with in 50 meter lead as per direction of engineer-in-charge.(In cement mortar)	Cum	658.00
16.15	Demolishing cement concrete manually / by mechanical means including disposal of material within 50 m lead as per direction of engineer-in- charge.		
16.15.1	Nominal concrete 1:3:6 or richer mix (i/c equivalent design mix)	Cum	654
16.15.2	Nominal concrete 1:4:8 or Leaner mix (i/c equivalent design mix)	Cum	403
16.16	Demolishing R.C.C. work manually / by mechanical means including stacking of steel bars and disposal of unserviceable material within 50 m lead as per direction of engineer-in- charge.	Cum	954
16.17	Dismantling old plaster or skirting raking out joints and cleaning the surface for plaster including disposal of rubbish to the dumping within 50 meters lead.	Sqm	13

S.No.	Items	Unit	Rates in Rs.
16.18 (a)	Dismantling stone slab flooring laid in cement mortar including stacking of serviceable material and disposal of unserviceable material within 50 m lead	Sqm	72.00
(b)	Dismantling kharanja of any thickness in cement mortar of any mix	Sqm	55.00
	REPAIRS TO BUILDING/ ROAD WORK		
16.19 (a)	Fixing of stone slab 30 mm thick in cement mortar 1:6 (1 cement 6 sand)	Sqm	116.00
(b)	Labour only for Fixing of stone slab 30 mm thick in cement mortar 1:6 (1 cement 6 sand)	Sqm	61.00
(c)	Fixing in C.M. 1:6 Kharanja of any thickness	Sqm.	382.00
(d)	Labour only for fixing of stone in Kharanja.	Sqm	60.00
16.20	Cutting of Water bound macadam road and making good the same including supply of extra quantities of materials i.e. aggregate, moorum screening and labour required.	Cum	927.00
16.21	Cutting of Bituminous road and making good the same including supply of extra quantities of materials i.e. aggregate, moorum screening and labour required.	Cum	1944.00
	CEMENT CONCRETE		
16.22	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 (M-5)	cum	3371.00
ii	1:4:8 (M-7.5)	cum	3633.00
iii	1:3:6 (M-10)	cum	3981.00
iv	1:2:4 (M-15)	cum	4807.00
(b)	In walls & Superstructure up to 4 mt. height above plinth (with 40mm nominal graded metal)		
i.	1:3:6 (M-10)	cum	4043.00
ii.	1:2:4 (M-15)	cum	4869.00
16.23	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 (M-10)	cum	4137.00
ii	1:2:4 (M-15)	cum	4845.00
iii	1:$1^{1}/_{2}$:3 (M-20)	cum	5411.00

S.No.	Items	Unit	Rates in Rs.
iv	1:1:2 (M-25)	cum	6898.00
(b)	In walls and superstructure up to 4 mt. height above plinth (with 20mm nominal graded metal)		
i	1:3:6 (M-10)	cum	4200.00
ii	1:2:4 (M-15)	Cum	4908.00
iii	1:1 1/2:3 (M-20)	Cum	5474.00
iv	1:1:2 (M-25)	cum	6961.00
	REINFORCED CEMENT CONCRETE		
16.24 (a)	Providing & laying mechanically mixed R.C.C. excluding centering & shuttering and reinforcement in foundation/plinth (20mm graded metal)		
i	1:1.5:3 (M 20)	cum	5051.00
ii	1:1:2 (M 25)	cum	6538.00
iii	1:0.75:1.5 (M 30)	cum	6877.00
(b)	Providing & laying mechanically mixed R.C.C. excluding centering & shuttering and reinforcement in superstructure up to 4 mtr. Height above plinth level (20mm graded metal)		
i	1:1.5:3 (M 20)	cum	5082.00
ii	1:1:2 (M 25)	cum	6569.00
iii	1:0.75:1.5 (M 30)	cum	6908.00
	STEEL		
16.25 (a)	Providing and placing in position cold twisted steel and hot rolled deformed steel reinforcement for R.C.C. work i/c cutting, bending, binding etc. complete i/c cost of binding wire and wastage.	Kg	63.00
(b)	Structural steel work in single section, fixed with or without connecting plate, including cutting, hoisting fixing in position and applying a priming coat of approved steel primer all complete.	Kg	65.00
(c)	Structural steel work riveted, bolted or welded in built-up section trusses and framed work i/c cutting /hoisting /fixing in position and applying a priming coat of approved steel primer all complete.	Kg	70.00
(d)	Steel work is welded in built-up section/ framed work, including cutting hoisting, fixing in position and applying a priming coat of approved steel primer using structural steel etc. as required.		
(i)	In stringers treads landings etc. of stair cases including use of chequered plate wherever required all complete.	Kg	79.00

S.No.	Items	Unit	Rates in Rs.
(ii)	In gratings, frames, guard bar, ladder , railings, brackets, gates and similar works	Kg	83.00
16.26	Providing and fixing 1mm thick M.S. sheet door shutters with frame and diagonal braces of 40x40x6 mm angle iron, 3mm M.S. gusset plates at the junctions and corners i/c all necessary fittings complete including applying a priming coat of approved steel primer. with diagonal braces and central cross pices of M.S. angle / flats as required.	Sqm	2883.00
	CEMENT MORTAR		
16.27 (a)	Cement Mortar 1:3 (1 Cement : 3 sand)	Cum	5203.00
(b)	Cement Mortar 1:4 (1 Cement : 4 sand)	Cum	4305.00
(c)	Cement Mortar 1:5 (1 Cement : 5 sand)	Cum	3739.00
(d)	Cement Mortar 1:6 (1 Cement : 6 sand)	Cum	3385.00
(e)	Cement Mortar 1:8 (1 Cement : 8 sand)	Cum	3183.00
	BRICK WORK		
16.28 (a)	Brick work with well burnt chimney bricks having crushing strength not less than 25 kg/cm² and water absorption not more than 20 % in foundation & plinth i/c curing etc. complete.		
i.	In Cement Mortar 1:3	Cum	5509.00
ii.	In Cement Mortar 1:4	Cum	5181.00
iii.	In Cement Mortar 1:5	Cum	5039.00
iv.	In Cement Mortar 1:6	Cum	4950.00
(b)	Brick work with well burnt chimney bricks having crushing strength not less than 25 kg/cm² and water absorption not more than 20% in super structure above plinth level and up to floor two level i/c form work & curing etc. complete.		
i.	In Cement Mortar 1:3	Cum	5978.00
ii.	In Cement Mortar 1:4	Cum	5479.00
iii.	In Cement Mortar 1:5	Cum	5326.00
iv.	In Cement Mortar 1:6	Cum	5230.00
(c)	Extra rate for Brick work in superstructure above floor two level for each additional floor or part thereof respective item.	Cum	139.00
(d)	Half brick masonary with well burnt chimney bricks crushing strength not less than 25kg/cm² and water absorption not more than 20% is superstructure above plinth level and up to floor two level.		

S.No.	Items	Unit	Rates in Rs.
i.	Cement mortar 1:3	Sqm	690.00
ii.	Cement mortar 1:4	Sqm	603.00
(e)	Brick work with open Bhatta bricks having crushing strength not less than 20 kg/cm² and water absorption not more than 25% in foundation & plinth i/c curing etc. complete.		
(i)	In Cement Mortar 1:3	Cum	4783.00
(ii)	In Cement Mortar 1:4	Cum	4541.00
(iii)	In Cement Mortar 1:5	Cum	4388.00
(iv)	In Cement Mortar 1:6	Cum	4292.00
(f)	Brick work with open Bhatta bricks having crushing strength not less than 20 kg/cm² and water absorption not more than 25% in super structure above plinth level and up to floor two level i/c form work & curing etc. complete.		
(i)	In Cement Mortar 1:3	Cum	5253.00
(ii)	In Cement Mortar 1:4	Cum	4753.00
(iii)	In Cement Mortar 1:5	Cum	4600.00
(iv)	In Cement Mortar 1:6	Cum	4504.00
	PLASTER		
16.29 (a)	12mm thick cement plaster in single coat including finishing even, smooth and curing complete.		
i.	1:3(Cement 1: Sand 3)	Sqm	155.00
ii	1:4(Cement 1: Sand 4)	Sqm	142.00
iii	1:5(Cement 1: Sand 5)	Sqm	134.00
iv	1:6(Cement 1: Sand 6)	Sqm	129.00
(b)	15mm thick cement plaster in single coat i/c finished even, smooth and curing complete		
i.	in CM 1:3	Sqm	169.00
ii	in CM 1:4	Sqm	154.00
iii	in CM 1:5	Sqm	144.00
iv	in CM 1:6	Sqm	138.00
v.	Neat cement punning	Sqm	23.00
(c)	18mm thick cement plaster in 2 coats under layer 12mm CP 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	192.00
(d)	20 mm thick cement plaster in single coat i/c finishing even, smooth and curing complete		

S.No.	Items	Unit	Rates in Rs.
i.	in CM 1:3	Sqm	212.00
ii	in CM 1:4	Sqm	192.00
iii	in CM 1:5	Sqm	179.00
iv	in CM 1:6	Sqm	171.00
	FORM WORK		
16.30	Providing & fixing form work i/c centering and shuttering including strutting, propping etc. and removal of form work for:		
i	Foundation , footing, bases of columns ,etc for mass concrete	sqm	178.00
ii	Wall (any thickness) including attached pilasters, buttresses, plinth and string courses etc.	sqm	309.00
iii	Suspended floors, roofs, landings, balconies and access platform.	sqm	343.00
iv	Lintels, beams , plinth beams, girders, bressumers and cantilevers.	sqm	286.00
v	Columns, pillars, piers, Abutments, posts and Struts	sqm	395.00
vi	Stairs, (excluding landings) except spiral- staircases	sqm	426.00
	STONE WORK		
16.31	Coursed rubble masonry (first sort) with hard stone in foundation and plinth cement mortar 1:6	cum	4276.00
16.32	Coursed rubble masonry (Second sort) with hard stone in foundation and plinth Cement mortar 1:6	cum	3991.00
16.33	Coursed rubble masonry with hard stone (first or Second sort) in Superstructure above plinth level and up to floor two level.		
i	Masonry work (first sort) in Cement mortar 1:6	cum	4840.00
ii	Masonry work (Second sort) in Cement mortar 1:6	cum	4556.00
16.34	Extra Coursed rubble masonry with hard stone (first or Second sort) in Superstructure above floor II level for every floors or part thereof.	cum	100.00
16.35	Extra Coursed rubble masonry with hard stone (first or Second sort) in		
i	Square or rectangular pillars	cum	337.00
ii	Circular pillars	cum	1168.00
16.36	Pointing on stone work with cement mortar 1:3 (1 cement : 3 fine sand)		
i	Flush / ruled pointing	sqm	117.00
ii	Raised and cut pointing	sqm	213.00

S.No.	Items	Unit	Rates in Rs.
	FINISHING WORK		
16.37	White washing with lime to give an even shade :		
i	New work (three or more coats)	sqm	14.00
16.38	White washing with lime to give an even shade :		
i	Old work (two or more coats)	sqm	8.00
ii	Old work (One or more coats)	sqm	5.00
16.39	Finishing walls with water proofing cement paint of required shade :		
i	New work (two or more coats applied @ 3.84 kg/10 sqm)	sqm	51.00
16.40	Finishing walls with Acrylic Smooth exterior paint of required shade :		
i	New work (two or more coats applied @ 1.67 ltr/10 sqm over and including priming coat of exterior primer applied @ 2.20 kg/ 10sqm)	sqm	88.00
16.41	Painting with synthetic enamel paint of approved brand and manufacture to give an even shade :		
i	(two or more coats) on New work	sqm	65.00
16.42	Painting with synthetic enamel paint of approved brand and manufacture to give an even shade :		
i	(One or more coats) on Old work	sqm	42.00

CHAPTER XVII

GENERAL MISCELLANEOUS

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NOTES:

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

17.2 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.

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

17.4 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.

17.5 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.

17.6 All materials shall conform to relevant ISS.

17.7 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.

17.8 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.

17.9 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.

17.10 All construction material, and all tools and temporary structures shall be removed from the site as directed by the Engineer in charge. All dirt, rubbish and excess earth from 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.

GENERAL MISCELLANEOUS

S. No.	Items	Unit	Rates in Rs.
17.1	Labour for cutting following cast iron pipes of any type and class.		
	80 mm dia.	Per Cut	43.00
	100 mm dia.	Per Cut	59.00
	150 mm dia.	Per Cut	111.00
	200 mm dia.	Per Cut	148.00
	250 mm dia.	Per Cut	184.00
	300 mm dia.	Per Cut	221.00
	350 mm dia.	Per Cut	256.00
	400 mm dia.	Per Cut	293.00
	450 mm dia.	Per Cut	329.00
	500 mm dia.	Per Cut	366.00
	600 mm dia.	Per Cut	434.00
	700 mm dia.	Per Cut	470.00
	750 mm dia.	Per Cut	505.00
	800 mm dia.	Per Cut	542.00
	900 mm dia.	Per Cut	578.00
17.2	Labour for cutting following Asbestos Cement Pressure Pipes of any type and class.		
	80 mm dia.	Per Cut	22.00
	100 mm dia.	Per Cut	30.00
	150 mm dia.	Per Cut	56.00
	200 mm dia.	Per Cut	74.00
	250 mm dia.	Per Cut	92.00
	300 mm dia.	Per Cut	111.00
	350 mm dia.	Per Cut	128.00
17.3	Labour for cutting following P. V. C. Pipes of any type and class.		
	80 mm dia.	Per Cut	11.00
	100 mm dia.	Per Cut	15.00
	150 mm dia.	Per Cut	28.00
	200 mm dia.	Per Cut	37.00
17.4	Labour only for cutting following Ductile Iron pipes of any type and class.		
	80 mm dia.	Per Cut	38
	100 mm dia.	Per Cut	52
	150 mm dia.	Per Cut	98
	200 mm dia.	Per Cut	130

S. No.	Items	Unit	Rates in Rs.
	250 mm dia.	Per Cut	162
	300 mm dia.	Per Cut	194
	350 mm dia.	Per Cut	225
	400 mm dia.	Per Cut	258
	450 mm dia.	Per Cut	290
	500 mm dia.	Per Cut	322
	600 mm dia.	Per Cut	382
	700 mm dia.	Per Cut	414
	750 mm dia.	Per Cut	444
	800 mm dia.	Per Cut	477
	900 mm dia.	Per Cut	509
17.5	Labour for cutting following Galvanised Iron (MS) Pipes of any type and class.		
	15 mm dia.	Per Cut	4
	20 mm dia.	Per Cut	7
	25 mm dia.	Per Cut	10
	32 mm dia.	Per Cut	15
	40 mm dia.	Per Cut	20
	50 mm dia.	Per Cut	24
	65 mm dia.	Per Cut	29
	80 mm dia.	Per Cut	37
	100 mm dia	Per Cut	39
	125 mm dia	Per Cut	45
	150 mm dia	Per Cut	50
17.6	Chamfering cast iron pipes of all types and classes to make suitable for tyton joints.	Per Cut	
	Up To150 mm dia.	Each End	767
	200 mm dia.	Each End	954
	250 mm dia.	Each End	1051
	300 mm dia.	Each End	1194
	400 mm dia.	Each End	1433
	450 mm dia.	Each End	1558
	500 mm dia.	Each End	1672
	600 mm dia.	Each End	1911
	700 mm dia.	Each End	2150
	750 mm dia.	Each End	2389
	800 mm dia.	Each End	2628
	900 mm dia.	Each End	2867
	1000 mm dia.	Each End	3106

S. No.	Items	Unit	Rates in Rs.		
17.7	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.	**8.25**	8.95	9.60
	100 mm dia.	R.Mtr.	10.20	11.25	12.12
	125 mm dia.	R.Mtr.	13.30	14.51	15.58
	150 mm dia.	R.Mtr.	16.57	18.16	19.58
	200 mm dia.	R.Mtr.	24.25	26.31	28.26
	250 mm dia.	R.Mtr.	32.69	35.58	37.97
	300 mm dia.	R.Mtr.	42.14	46.07	48.80
	350 mm dia.	R.Mtr.	53.09	57.59	61.19
	400 mm dia.	R.Mtr.	64.61	70.60	75.05
	450 mm dia.	R.Mtr.	77.90	85.58	90.31
	500 mm dia.	R.Mtr.	91.20	99.35	105.24
	600 mm dia.	R.Mtr.	121.54	132.68	140.80
	700 mm dia.	R.Mtr.	156.83	171.36	182.91
	750 mm dia.	R.Mtr.	175.66	192.05	205.83
	800 mm dia	R.Mtr.	248.23	272.95	297.68
	900 mm dia	R.Mtr.	302.81	333.21	364.13
	1000 mm dia.	R.Mtr.	364.11	401.19	436.72
17.8	Unloading from railway wagon, pipes and machinery				
(a)	Pipes upto 500 mm dia and machinery below 1.00 tonne	Tonne	38.00		
(b)	Pipes 500 mm dia and above heavy Machinery weighing more than one tonne require use of crane etc.	Tonne	204.00		
17.9	Stacking of pipe and machinery at station Yard.	Tonne	56.00		
17.10	Carriage of Material by Mechanical transport including loading unloading & stacking etc.				
17.10.1	Lime, Alum., Bleaching Powder	**Distance**	**Per**		**Rates in Rs.**
	1. Distance	1 Km.	Cum		85.00
	2. Distance	2 km	Cum		97.00
	3. Distance	3 km	Cum		108.00
	4. Distance	4 km	Cum		119.00
	5. Distance	5 km	Cum		130.00
	6. Beyond 5km upto 10km. add		Cum		10.00

S. No.	Items	Unit	Rates in Rs.	
	per km			
	7. Beyond 10km. upto 20km. add per km.		Cum	8.00
	8. Beyond 20km. add per km.		Cum	7.00
17.10.2	Earth & Moorum		Cum	
	1. Distance	1 km	Cum	106.00
	2. Distance	2 km	Cum	121.00
	3. Distance	3 km	Cum	135.00
	4. Distance	4 km	Cum	149.00
	5. Distance	5 km	Cum	162.00
	6. Beyond 5km upto 10km. add per km		Cum	12.00
	7. Beyond 10km. upto 20km. add per km.		Cum	10.00
	8. Beyond 20km. add per km.		Cum	8.00
17.10.3(a)	G.I.,C.I.,ACP Pipes below 100mm dia and other heavy material and machinery		Cum	
	1. Distance	1 km	Per Tonne	75.00
	2. Distance	2 km	Per Tonne	86.00
	3. Distance	3 km	Per Tonne	96.00
	4. Distance	4 km	Per Tonne	106.00
	5. Distance	5 km	Per Tonne	115.00
	6. Beyond 5km upto 10km. add per km		Per Tonne	9.00
	7. Beyond 10km. upto 20km. add per km.		Per Tonne	7.00
	8. Beyond 20km. add per additional		Per Tonne	6.00
17.10.3(b)	PVC pipes- 90,110,140,160,180,200 mm dia pipes			
	1. Distance	1 km	Per Tonne	196.00
	2. Distance	2 km	Per Tonne	222.00
	3. Distance	3 km	Per Tonne	250.00
	4. Distance	4 km	Per Tonne	274.00
	5. Distance	5 km	Per Tonne	300.00
	6. Beyond 5 Km upto 10 km. add per km		Per Tonne	22.00
	7. Beyond 10 km. upto 20 km. add per km.		Per Tonne	18.00
	8. Beyond 20 km. add per additional		Per Tonne	15.00

S. No.	Items	Unit	Rates in Rs.	
17.10.4	Steel (All types)			
	1. Distance	1 km	Per Tonne	75.00
	2. Distance	2 km	Per Tonne	86.00
	3. Distance	3 km	Per Tonne	96.00
	4. Distance	4 km	Per Tonne	106.00
	5. Distance	5 km	Per Tonne	115.00
	6. Beyond 5km upto 10km. add per km		Per Tonne	9.00
	7. Beyond 10km. upto 20km. add per km.		Per Tonne	7.00
	8. Beyond 20km. add per additional km.		Per Tonne	6.00
17.10.5	R.C.C., Pipes, Steel Pipes, ACP pipes, CI & DI Pipes			
17.10.5.1	100,150,200,250,&300 mm dia			
	1. Distance	1 Km.	Per Tonne	177.00
	2. Distance	2 km	Per Tonne	201.00
	3. Distance	3 km	Per Tonne	224.00
	4. Distance	4 km	Per Tonne	246.00
	5. Distance	5 km	Per Tonne	268.00
	6. Beyond 5km upto 10km. Add per km		Per Tonne	19.00
	7.Beyond 10km. upto 20km. add per km.		Per Tonne	16.00
	8. Beyond 20km. add per additional km.		Per Tonne	13.00
17.10.5.2	350,100,450,& 500 mm dia			
	1. Distance	1 Km.	Per Tonne	182.00
	2. Distance	2 km	Per Tonne	210.00
	3. Distance	3 km	Per Tonne	230.00
	4. Distance	4 km	Per Tonne	255.00
	5. Distance	5 km	Per Tonne	280.00
	6. Beyond 5km upto 10km. add per km		Per Tonne	20.00
	7. Beyond 10km. upto 20km. add per km.		Per Tonne	16.00
	8.Beyond 20km. add per additional km.		Per Tonne	13.00
17.10.5.3	600,700,750,800&900mm dia			
	1. Distance	1 Km.	Per Tonne	185.00
	2. Distance	2 km	Per Tonne	215.00
	3. Distance	3 km	Per Tonne	236.00
	4. Distance	4 km	Per Tonne	262.00
	5. Distance	5 km	Per Tonne	289.00

S. No.	Items	Unit	Rates in Rs.	
	6. Beyond 5km upto 10km. add per km		Per Tonne	20.00
	7. Beyond 10km. upto 20km. add per km.		Per Tonne	16.00
	8.Beyond 20km. add per additional km.		Per Tonne	13.00
17.10.5.4	1000,1100, and 1200 mm dia			
	1. Distance	1 Km.	Per Tonne	257.00
	2. Distance	2 km	Per Tonne	320.00
	3. Distance	3 km	Per Tonne	350.00
	4. Distance	4 km	Per Tonne	393.00
	5. Distance	5 km	Per Tonne	430.00
	6. Beyond 5km upto 10km. add per km		Per Tonne	29.00
	7. Beyond 10km. upto 20km. add per km.		Per Tonne	25.00
	8. Beyond 20km. add per additional km.		Per Tonne	22.00
17.11	Providing and installation of automatic water level indicator for supervisory control cum auto on/off of motor pump assembly inclusive of control panel ,500 mtr long 2 core ,4 pair cable for small rural water supply scheme, having source within 500mtr as per approved specification and as directed by Engineer in charge.(In case of lesser length of cable,equivalent amount @ Rs 12 /-per meter of short length will be deducted from above rate)		1 Job	18000.00
17.12	Providing and installation of automatic water level indicator for supervisory control cum auto on/off panel of motor pump assembly, using GSM module based water level controller and accessories for small water supply scheme, having source more than 500mtr but within 10 Kms as per approved specification and as directed by Engineer in charge.		1 Job	25000.00

PART (B)

CONSTRUCTION OF TUBEWELL AND ALLIED WORKS

GENERAL NOTES-
CONSTRUCTION OF TUBEWELL AND ALLIED WORKS

1. The rates for various items of drilling works given in this unified schedule of rates are based on average rates 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 shall, therefore be awarded directly at the rates given in this unified schedule of rates without inviting tenders as per rules.

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

3. The rates for drilling provided in the Unified Schedule of Rates are inclusive of depreciation charges of all the machinery, tools & plants required for drilling operation, transportation of drilling machine, erection of machine at site, removal of machine from site after completion, cost of water, cost of drilling mud, fuel, labour and all other unforeseen items for drilling work and clearance of site after completion of work.

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

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

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

7. The ordinary tube wells constructed for installation of hand pumps in the basaltic rock area where intertrappean formation (collapsible strata between the rocks) is present. The nominal diameter of the tube well up to the level of intertrappean formation shall be 150 mm. The intertrappean formation shall be encased by 125 mm dia G.I. casing pipe. Therefore, the finished nominal diameter of tube well in the intertrappean formation shall be 125 mm but in the rock below the intertrappean formation, the nominal diameter of tube well shall

be 115 mm. Such tube wells shall be designated as 150/125/115 mm dia ordinary tube wells.

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

9. The gravel packed tube wells shall be constructed in alluvial formations, suitable for such tube wells, in which the fine and uniform sand is present in the water bearing aquifer. Such tube wells shall be constructed by direct circulation rotary drilling method or reverse circulation rotary drilling method using suitable rotary drilling machine.

10. The diameters of boreholes for construction of 100 mm, 150 mm & 200 mm finished nominal diameter gravel packed tube wells shall be 300 mm, 350 mm and 400 mm respectively exclusive of pipe wall thickness. The thickness of the gravel shroud around the screen shall generally be not less than 10 cm. Such tube wells shall be designated as 300(100) mm dia, 350(150) mm dia, 400(200) mm dia gravel packed tube wells.

11. The gravel packed tube wells shall be constructed only after obtaining the technical clearance of drawing & design of gravel packed tube well from the concerned Chief Engineer.

12. The rates are inclusive of the preparation and submission of strata chart of the tube well constructed in the prescribed proforma.

13. It shall be the responsibility of the contractor to collect the water sample from completed tube well and send it to departmental laboratory for chemical and bacteriological analysis. The water sample for chemical analysis shall be collected in 2 liters plastic bottle and samples for bacteriological analysis shall be collected in 300 ml sterilized bottle as per the direction of Engineer in charge. Only testing charges will be borne by the department.

14. All risks of accidents and Jamming and breaking of drilling tools etc. shall be contractor's liability. No extra charges shall be payable to the contractor on this account.

15. Contractor shall also make arrangements of first aid facilities for any accident. All care and precautions shall be taken and it shall be ensured that there shall be no accidents while drilling the borehole. Proper dress and equipments like gumboots, helmets etc. shall be provided by the contractor to the workmen at site.

16. During any operation carried out for construction of tube well, if any tool, pipe etc. falls down in the tube well then the contractor shall carry out the necessary fishing operation at his own cost. The contractor shall use his own equipment for such operation. If the tube well becomes useless due to any reason, it shall be treated as abandoned tube well and no payment shall be made for such abandoned tube well.

The contractor shall be fully responsible to fill up the abandoned bore hole with hard soil including compaction and watering so as to make top surface as good as original soil immediately and before shifting the drilling machine to prevent any accident. No payment would be made to the contractor on account of this.

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

18. The Lowering and fixing of casing pipe in ordinary tube well and lowering of casing assembly in the gravel packed tube wells shall be done in the presence of authorised representative of the Engineer in Charge of work. The G.I. casing pipe to be lowered and fixed in intertrappean formation shall be jointed by welding only. In the case of gravel packed tube well it shall be ensured by the contractor that the slotted pipes or screened pipes shall be lowered in the tube well at the locations of water bearing aquifers as per design. The contractor shall also ensure that joints of the pipes in casing assembly are rigid and water tight and a bail plug is properly fixed in the bottom of casing assembly.

19. All the gravel to be used, as pack in gravel packed tube wells shall be as specified in IS 4097: 1988 (Reaffirmed - 1993).

20. The development of tube well shall be continued during drilling operation. At the time of flushing by compressor the discharge from tube well during the development process shall also be measured by 'V' notch for yield and shall be recorded on regular intervals for which no separate payment shall be made. In case of gravel packed tube wells, development by compressor for minimum eight hours after completion of drilling of tube well shall be done and paid as per item number 4 of chapter 5. The development of ordinary tubewells (other than gravel packed tubewells) shall be done by the drilling machines during the drilling operations and no separate payment for development of such ordinary tubewells shall be made. The development of all type of the tubewells shall be done as per IS
specifications (IS11189 – 1985)

21. In case of ordinary tubewells (other than gravel packed tubewells) where power pump is to be installed, the yield test of tube well shall be conducted by suitable capacity single phase or three phase submersible pumping set to be operated by generator set or by taking temporary electric connection at site. It shall be the responsibility of the contractor to arrange for suitable capacity submersible pumping set, generator set, or temporary electrical connection, suitable measuring equipments for measuring the discharge and draw down of the tube well. The rates for item of yield test given in this unified schedule of rates include all such arrangements. The maximum duration of yield test shall be eight hours.

22. The tube well shall be disinfected after completion of yield test using bleaching powder solution as per the direction of Engineer in charge, and paid as per provision in the USoR.

23. The installation of hand pump over the tube well shall be carried out as per IS specifications (IS15500 PART 1 to 8– 2004). All the exterior parts of pump coming in contact with the water shall be thoroughly cleaned and dusted with bleaching powder. The hand pump after installation shall be tested for its proper installation by operating it continuously at least for four hour and measuring the rate of discharge from hand pump. The rates for the item of installation of hand pump and yield test by hand pump given in this unified schedule of rates shall be applicable.

24. For construction of platform and drain for the hand pump, the contractor shall use only steel plate frame shuttering designed as per the dimensional requirement of platform and drain. This shuttering shall be got approved from the Engineer-in-Charge. In case of construction of platforms in areas having black cotton soil, the top thirty centimeters of the black cotton soil shall be excavated and replaced with morrum boulder, duly rammed and watered in layers, prior to the construction of such platforms including drain, pedestal and washing platform. Rates for these works have been provided for in the USoR.

25. All contracts based on this unified schedule of rates shall be governed by the directions and other notes and conditions given in this unified schedule of rates, in addition to all the other conditions of the agreement. As the rates in this unified schedule of rates are linked to these conditions and directions, it shall not be necessary to attach the copies of these conditions to the contract agreement.

26. In the interpretation of description of items or rates of this unified schedule of rates and specifications, the decision of the Engineer-In- Chief shall be final.

27. The issue rates of casing pipes, hand pumps and other material given in Annexure-1 of this unified schedule rates are only for the purpose of preparing

realistic estimates. These rates are not given for making purchases or for entering into any contracts.

28. The rates for various items of works given in this unified schedule of rates includes for 1% overhead and 10% contractor's profit. If the work is carried out departmentally then the rates applicable for departmental works shall be at-least 9.90% [(100x11)/111] less than the rates of various items given in this unified schedule of rates.

29. The following Indian standard shall be referred to:-

(1) I.S.2800 (Part-I) :1991 (Reaffirmed 2001)- Code of practice for construction & testing of tube wells/Bore wells.

(2) I.S. 2800(Part-II):1979 (Reaffirmed 1999)- Code of practice for construction & testing of tube wells/Bore wells.

(3) I.S. 4097-1988(Reaffirmed 1999): Specification for Gravel for use as pack in tube wells

(4) I.S. 11189-1985(Reaffirmed 1999): Methods of tubewell development.

(5) I.S.1239 (Part-I) 1990 Mild steel tubes, tubular & other wrought steel fittings-specifications.

(6) I.S. 12818: 1992 Unplasticized PVC screen and casing pipes for bore/tube well- specification.

(7) I.S. 15500(Parts 1 to 8) Deep well hand pumps, components and special tools- specifications.

(8) The issue rates for various items like Hand pump, Casing pipes etc. has been arrived after adding 3% storage and handling charges and these rates are to be considered for preparation of estimates only and no payment of material shall be made on the basis of these issue rates.

(9) Rate for hand pump is taken as per LUN Contract Ref. No. RC/2011 2012/0156 dt. 28 Mar 2012, MPLUN Service Commission @2% Service Tax on MPLUN @ 10.30%

(10) Rate for G.I. Pipe medium class is taken as per LUN R/L No. LUN/MKT/Coord/PS-XY 2010-11/2181/R.II dated 26.02.11 & i/c of third party inspection charges @0.5% & CST /VAT etc. @ 4%.

(11) Rates for UPVC casing pipe are taken as per LUN RC/LUN/MKT /2010-11/0128-2 dated 4.03.11, & i/c of third party inspection charges @0.5% & CST /VAT etc. @ 4%.

CHAPTER - XVIII

RESISTIVITY SURVEY

CHAPTER- XVIII
RESISTIVITY SURVEY

S.No.	Item	Unit	Rate in Rs.
18.1	Carrying out the resistivity survey by VES method using Schlumberger configuration for locating the proper spot eith three soundings for drilling of tube well within the selected habitation, including photography , interpretation of resistivity data and submission of report in the desired format along with resistivity readings, necessary graph and photographs.	Per successful point	1580.00

CHAPTER - XIX

CONSTRUCTION OF ORDINARY TUBE WELL

CHAPTER- XIX
CONSTRUCTION OF ORDINARY TUBE WELL

S.No.	Item	Unit	Rate in Rs.
19.1	Drilling of perfectly vertical bore hole of a diameter to receive 125 mm nominal diameter casing pipe upto desired depth below ground level inclusive of the labour charges for transporting, lowering and fixing of 125 mm nominal diameter M.S./U.P.V.C casing pipe indise the bore hole including all works pertaining to drilling such as transportation , installation and removal of drilling machine etc. complete.		
(a)	In all type of collapsible strata consisting of soils, clays, sand , moorum, gravel, blouders etc.	Meter	496
(b)	In all types of rocks.	Meter	588
19.2	Drilling of perfectly vertical bore hole of 115 m.m. diameter up to desired depth below ground level in all types of rocks including all works pertaining to drilling such as transportation, installation and removal of drilling machine etc. complete.	Meter	540
19.3	Drilling of perfectly vertical bore hole of a diameter suitable to receive 150 mm nominal diameter casing pipe upto desired depth below ground level inclusive of the labour charges for transporting, lowering and fixing of 150 mm nominal diameter and fixing of 150 mm nominal diameter M.S./ G.I. / U.P.V.C. casing pipe inside the bore hole including all works pertaining to drilling such as transportation, installation and removal of drilling machine etc. complete.		
(a)	In all type of collapsible strata consisting of soils, clays, sand , moorum, gravel, blouders etc.	Meter	516
(b)	In all types of rocks.	Meter	624
19.4	Drilling of perfectly vertical bore hole of 150 m.m. diameter up to desired depth below ground level in all types of rock including all works pertaining to drilling such as transportation, installation and removal of drilling machine etc. complete.	Meter	596

S.No.	Item	Unit	Rate in Rs.
19.5	Drilling of perfectly vertical bore hole of a diameter suitable to receive 200 mm nominal diameter casing pipe upto desired depth below ground level inclusive of the labour charges for transporting, lowering and fixing of 200 mm nominal diameter M.S./ G.I. / U.P.V.C. casing pipe inside the bore hole including all works pertaining to drilling such as transportation, installation and removal of drilling machine etc. complete.		
(a)	In all type of collapsible strata consisting of soils, clays, sand , moorum, gravel, blouders etc.	Meter	541
(b)	In all types of rocks.	Meter	708
19.6	Drilling of perfectly vertical bore hole of 200 m.m. diameter up to desired depth below ground level including all works pertaining to drilling such as transportation, installation and removal of drilling machine etc. complete.		
(a)	In all type of collapsible strata (intertrappean formation) including charges for transportation , lowering and fixing of 150 mm nominal diameter GI casing pipe, welded joints only .	Meter	616
(b)	In all types of rocks.	Meter	765
19.7	Drilling of perfectly vertical bore hole of 150 mm diameter up to desired depth below ground level un all types of strata including all works pertaining to drilling such as transportion installation and removal of drilling machine etc. complete in intertrappean formations (collapsible strata between rocks) including charges for transportation and making all necessary arranhements etc, including lowering and fixing of 125 mm nominal diameter (G.I. or U.P.V.C. casing pipe .	Meter	596
19.8	Providing and fixing of well cap on top of the tube well for protection		
	M. S. Caps -		
(a)	100 mm dia.	each	270
(b)	125 mm dia.	each	305
(c)	150 mm dia.	each	370
(d)	200 mm dia.	each	400
19.9	Construction of concrete block over dry tube wells for protection of size 0.45m x 0.45m x 0.45 m in M-15 cement concrete mix.	each	574

CHAPTER-XX

CONSTRUCTION OF GRAVEL PACKED TUBEWELL

CHAPTER-XX
CONSTRUCTION OF GRAVEL PACKED TUBEWELL

S.No.	Item	Unit	Rate in Rs.
20.1	Drilling of perfectly vertical bore hole of following diameters for construction of Gravel Packed tubewell up to desired depth in alluvial formation consisting of Soils, Clays, Sand, Gravel, Moorum, Boulders etc. and retaining the bore hole by using suitable drilling mud or foam or temporary housing pipe including all works pertaining to drilling such as transportation, installation and removal of drilling machine etc. complete.		
(a)	300 m.m diameter	Meter	843
(b)	350 m.m diameter	Meter	876
(c)	400 m.m diameter	Meter	905
20.2	Labour charges for assembling, centering and lowering of properly designed casing pipe assembly inside the bore hole drilled for construction of Gravel Packed tube well including the cost of providing and fixing of centraliser, and transportation of casing assembly etc. complete .		
(a)	Casing assembly composed of 100 m.m. diameter blank and slotted G.I. Casing pipes.	Meter	41
(b)	Casing assembly composed of 150 m.m. diameter blank and slotted G.I. Casing pipes.	Meter	54
(c)	Casing assembly composed of 200 m.m. diameter blank and slotted G.I. Casing pipes.	Meter	67
(d)	Casing assembly composed of 100 m.m. dia. UPVC blank and screened pipes.	Meter	29
(e)	Casing assembly composed of 150 m.m. dia. UPVC blank and screened pipes.	Meter	40
(f)	Casing assembly composed of 200 m.m. dia. UPVC blank and screened pipes.	Meter	52
20.3	Providing and fixing of M.s. bail plug as per I.S. 2800 (PART-I) 1991 in the bottom of casing assembly		
(a)	100 m.m diameter	each	530
(b)	150 m.m diameter	each	605
(c)	200 m.m diameter	each	690

S.No.	Item	Unit	Rate in Rs.
20.4	Providing gravel packing with uniformly graded gravel as per I.S.4097 of 1967 (revised uo to date) in the annular space between outer wall of casing pipe assembly and inner wall of bore hole including cost of gravel , transportation, stacking , washing and packing in layers of suitable thickness including all lead and lifts complete .	CU.m	3800
20.5	Providing and fixing of well cap on top of the tube well for protection		
	M. S. Caps -		
(a)	100 mm dia.	each	270
(b)	125 mm dia.	each	305
(c)	150 mm dia.	each	370
(d)	200 mm dia.	each	400
20.6	Construction of concrete block over dry tube wells for protection of size 0.45m x 0.45m x 0.45 m in M-15 cement concrete mix.	each	574

CHAPTER-XXI

INSTALLATION OF HAND PUMP AND CONSTRUCTION OF PLATFORM DRAIN AND SOAKAGE PIT

CHAPTER-XXI
INSTALLATION OF HAND PUMP AND CONSTRUCTION OF PLATFORM DRAIN AND SOAKAGE PIT

S.No.	Item	Unit	Rate in Rs.
21.1	Labour charges for installation of India Mark II Hand Pump with 30 neter long 32 mm dia. Riser pipe assembly and all other accessories including transportation of Hnad Pump from specified departmental stores to sote.	Each	804
21.2	Add to item No. 1 above for fixing the extra length of riser pipe assembly beyond 30 meters	meter	23
21.3	Construction of 76 cm x 76 cm x 40 cm foundation block in 1:2:4 cement concrete for fixing the pedestal of Hnad Pump including excavation , cost of material and labours etc. complete.	Each	889
21.4	Construction of cement concrete plateform as per design around the hand pump in 1:2:4 cement concrete including excavation, centering, shuttering, cost of all the materials and labours and curing etc. complete.	Each	4700
21.5	Construction of cement concrete plateform as per design around the hand pump in 1:2:4 cement concrete including excavation, centering, shuttering, cost of all the materials and labour and curing etc. complete. Including filling in 30 cm depth after removing Black cotton soil including remming, watering etc. complete in areas of Black cotton soils.	Each	5025
21.6	Construction of cement concrete drain as per design in 1:2:4 cement concrete including excavation, centering, shuttering, cost of all the materials and labour and curing etc. complete.	meter	368
21.7	Construction of cement concrete drain as per design in 1:2:4 cement concrete including excavation, centering, shuttering, cost of all the materials and labour and curing etc. complete. Including filling in 30 cm depth after removing Black cotton soil including ramming, watering etc. complete in areas of Black cotton soils.	meter	475

S.No.	Item	Unit	Rate in Rs.
21.8	Construction of 1.20 cm x 1.20 cm x 0.20 m cement concrete washing plateform in cement concrete 1:2:4 including excavation, centering, shuttering, cost of all the materials and labour and curing etc. complete.	Each	1438
21.9	Construction of 1.20 cm x 1.20 cm x 0.20 m cement concrete washing plateform in cement concrete 1:2:4 including excavation, centering, shuttering, cost of all the materials and labour and curing etc. complete. Including filling in 30 cm depth after removing Black cotton soil including ramming, watering etc. complete in areas of Black cotton soils.	Each	1618
21.10	Construction of soakage pit of 70 cm dia. And 1.0 m deep including excavation, brick lining at top in 1:4 cement mortar, filling broken bricks etc. and cost of all the materials and labour and curing etc. complete.	Each	875

CHAPTER- XXII

DEVELOPMENT, YIELD TEST AND DIS-INFECTION OF TUBE WELL

CHAPTER- XXII
DEVELOPMENT, YIELD TEST AND DISINFECTION OF TUBE WELL

S.No.	Item	Unit	Rate in Rs.
22.1	Labour charges for installation of submersible pumping sets at 50 m or more depth temporarily in the tubewell for a maximum of eight hours for the purpose of conducting yield test of tubewell. (Any one of the below depending on the approximate yield observed during drilling operations.)	Each	
	(a) Submersible pumping sets upto 2.2 kW	Each	1356
	(b) Submersible pumping set above 2.2 kW to 7.5 kW	Each	1508
	(c) Submersible pumping set above 7.5 kW	Each	1655
22.2	Conducting the yield test of tubewell by operating the pumping set continuously for a desired time period and measuring the discharge and drawdown of tubewell at a suitable time interval as per the direction of Engineer in Charge including cost of energy, cost of installation of suitable measuring device and hire charges of pumping set etc. complete.		
(a)	Submersible pumping set upto 2.2 kW	Per hour	526
(b)	Submersible pumping set above 2.2 kW to 7.5 kW	Per hour	564
(c)	Submersible pumping set above 7.5 kW	Per hour	638
22.3	Labour charges for taking out the submersible pumping set for tubewell after completion of yield test or development of tubewell.		
(a)	Submersible pumping set upto 2.2 kW	Each	1225
(b)	Submersible pumping set above 2.2 kW to 7.5 kW	Each	1380
(c)	Submersible pumping set above 7.5 kW	Each	1615
22.4	Development of gravel packed tubewell by Air Compressor of suitable capacity including hire charges for all the required tools and plants etc. complete, for maximum duration of eight hours.	Per hour	785

S.No.	Item	Unit	Rate in Rs.
22.5	Measurement of yield of tube well by operating hand pump continuously for four hours manually.	Each	625
22.6	Disinfection of tube well using bleaching powder solution as per the direction of the Engineer in Charge including the cost of bleaching powder and labour etc. complete.	Each	50

CHAPTER- XXIII

ODEX TYPE OF TUBEWELL

CHAPTER- XXIII
ODEX TYPE OF TUBEWELL

S.No.	Item	Unit	Rate in Rs.
23.1	Drilling of perfectly vertical bore hole by odex method of a diameter to receive 125 mm nominal diameter casing pipe upto desired depth below ground level inclusive of the labour charges for transporting, lowering and fixing of 125 mm nominal diameter suitable for odex drilling M.S./G.I./ Seamless casing pipe indise the bore hole BY welding joint including all works pertaining to drilling such as transportation , installation and removal of drilling machine etc. complete.		
(a)	In all type of collapsible strata consisting of soils, clays, sand , moorum, gravel, blouders etc.	Meter	677
(b)	In all types of rocks.	Meter	753
23.2	After complition of bore hole by odex method making of slots cutting on casing pipe at the aquifers level . The size of slots is 2mm wide x 7.5mm long in set of 4 slots arround the length wise in casing pipe (G.I./MS/Seamless) . Each meter length of casing should have 140 slots on total cylindrical portion of casing pipe .	Meter	414
23.3	Cost of casing shoe (Guide Bush) for odex drilling	Each	4600
23.4	Drilling of perfectly vertical bore hole by odex method of a diameter to receive 150 mm nominal diameter casing pipe upto desired depth below ground level inclusive of the labour charges for transporting, lowering and fixing of 125 mm nominal diameter suitable for odex drilling M.S./G.I./ Seamless casing pipe indise the bore hole BY welding joint including all works pertaining to drilling such as transportation , installation and removal of drilling machine etc. complete.		
(a)	In all type of collapsible strata consisting of soils, clays, sand , moorum, gravel, blouders etc.	Meter	723
(b)	In all types of rocks.	Meter	810
23.5	After complition of bore hole by odex method making of slots cutting on casing pipe at the aquifers level . The size of slots is 2mm wide x 7.5mm long in set of 4 slots arround the length wise in casing pipe (G.I./MS/Seamless) . Each meter length of casing should have 172 slots on total cylindrical portion of casing pipe .	Meter	
23.6	Cost of casing shoe (Guide Bush) for odex drilling	Each	5350

CHAPTER- XXIV

MISCELLANEOUS ITEMS OF TUBEWELL

CHAPTER- XXIV
MISCELLANEOUS ITEMS OF TUBEWELL

S.No.	Item	Unit	Rate in Rs.
	HYDROFRACTURING AND CLEANING OF TUBEWELL		
24.1	Hydrofracturing of perfectly vertical bore hole for 150/115 mm diameter bore hole upto 90 m depth below ground level including transportation, installation and removing of Hydrofracturing unit.	1 Job	13255.00
24.2	Cleaning of perfectly vertical bore hole for 200/150/115 mm diameter bore hole upto 60 m depth below ground level including transportation, installation and removing of Drilling machine.	1 Job	10725.00
24.3	Add to item no. 1 above cleaning beyond 60 m depth.	Per meter	110.00
	CONSTRUCTION OF RECHARGING PIT IN SUBMERGENCE AREA		
24.4	Construction of recharging pit of internal size 2.00 X 2.00 X 1.35 mtr. near Existing tubewell , in submargence area of pond / reservoir Incuding excavation, base concrete, brick masonry work and providing and filling filter media like boulders, gravels, and coarse sand as per specifications, and drawing no. 1 complete.	per job	41124.00
	CONSTRUCTION OF RECHARGING PIT AROUND EXISTING DRY TUBE WELL WITH STIENING AND CATCH DRAIN		
24.5	Construction of recharging circular pit of 3.00 m outer dia and 2.00m depth around the existing dry tubewell, perforation work in casing pipe and providing and fixing of nariyal rope around perforated area in full length, stiening work and surrounding catch drain work with M-20 RCC , making 90 mm dia circular holes by fixing pieces of 90 mm dia PVC pipes @ 300 mm c/c before concreting of steining work of recharge pit just below G.L. to permit rain water to enter in to the pit from catch drain , providing and filling of recharge pit by filter media like boulders, gravels and coarse sand as per specifications and drawing no. 2 complete.	per job	54277.00

S.No.	Item	Unit	Rate in Rs.
	CONSTRUCTION OF RECHARGING PIT AROUND DRY TUBE WELL		
24.6	Construction of recharging circular pit of 3.00 m dia and 2.00m depth around the dry tubewell, perforation work in casing pipe and providing and fixing of nariyal rope around perforated area in full length, providing and filling of recharge pit by boulders, gravels and coarse sand as filter media and making ground slope towards the constructed pit to divert the rain water (in soft/hard rock area) as per specifications and drawing no. 3 complete.	per job	16518.00
	REPAIRING OF HAND PUMP		
24.7	Labour only for minor repairing work of India Mark II hand pump including replacement of unserviceable parts i.e chain, handle,axle either one or more parts as the case may be along with overhauling of handpump set and transportation etc as per approved specifications inclusive of the free services of departmental technician (Material will be supplied by the department).	1 Job	435.00
24.8	Labour only for major repairing work of India Mark II hand pump including replacement of unserviceable parts such as washer, cylinder, riser pipe, link rod either one or more parts as the case may be along with overhauling, minor repairing work and transportation etc as per approved specification inclusive of free services of departmental technician (Material will be supplied by the department).	1 Job	842.00
24.9	Labour only for minor repairing work of India Mark II hand pump including replacement of unserviceable parts i.e chain, handle,axle either one or more parts as the case may be along with overhauling of handpump set and transportation etc as per approved specifications (Material will be supplied by the department).	1 Job	532.00
24.10	Labour only for major repairing work of India Mark II hand pump including replacement of unserviceable parts such as washer, cylinder, riser pipe, link rod either one or more parts as the case may be along with overhauling, minor repairing work and transportation etc as per approved specification (Material will be supplied by the department).	1 Job	971.00

S.No.	Item	Unit	Rate in Rs.
	TAKING OUT FALLEN HAND PUMP PIPE LINE ASSEMBLEY FROM TUBE WELL		
24.11	Labour only for taking out of fallen hand pump pipe line assembly from tube well using special T&P required for the same i/c depositing all the obtained material in departmental store complete item .-Depth up to 150 mtr.	1 Job	2247.00
	REMOVING OF UNSERVICEABLE HANDPUMP		
24.12	Removing of unserviceable hand pump along with assembly from existing tube well i/c excavation, cutting of casing pipe if necessary, dismantling CC around pedestal, caping of tube well i/c making of cement concrete block M-15 size 0.45x0.45x0.45 cm and depositing all the obtained material in departmental store .	1 Job	1864.00
24.13	**LOWERING & TAKING OUT OF SUBMERSIBLE PUMP SET**		
24.13.1	Labour only for taking out of single phase submersible pumping set of capacity 1 to 3 HP from the tube well with flexible/ rigid pipe line assembly, electrical cable, nylone rope, testing etc. complete including disconnecting the electrical cable from pump & starter -Depth up to 150 mtr..	1 Job	1408.00
24.13.2	Labour only for lowering of single phase submersible pumping set of capacity 1 to 3 HP in the tube well with flexible/ rigid pipe line assembly, electrical cable, nylone rope, testing etc. complete including connecting the electrical cable from pump & starter - Depth up to 150 mtr.	1 Job	1546.00
24.13.3	Labour only for taking out of three phase submersible pumping set from the tube well with pipe line assembly, electrical cable, testing etc. complete including disconnecting the electrical cable from pump & starter .		
(i)	3 HP to 7.5 HP - Depth up to 150 mtr.	1 Job	1822.00
(ii)	Above 7.5 HP to 12.5 HP - Depth up to 150 mtr.	1 Job	2098.00
(iii)	Above 12.5 HP - Depth up to 150 mtr.	1 Job	2374.00
24.13.4	Labour only for lowering of three phase submersible pumping set in the tube well with pipe line assembly, electrical cable, testing etc. complete including connecting the electrical cable from pump & starter .		

S.No.	Item	Unit	Rate in Rs.
(i)	3 HP to 7.5 HP - Depth up to 150 mtr.	1 Job	1960.00
(ii)	Above 7.5 HP to 12.5 HP - Depth up to 150 mtr.	1 Job	2236.00
(iii)	Above 12.5 HP - Depth up to 150 mtr.	1 Job	2512.00
	TAKING OUT FALLEN SUBMERSIBLE PUMPING SET FROM TUBE WELL		
24.14	Labour only for taking out of fallen submersible pumping set from the tube well with pipe line assembly, electrical cable etc. complete using special T&P required for the same i/c depositing all the obtained material in departmental store .		
(i)	**1 to 3 HP - Depth up to 150 mtr.**	1 Job	2398.00
(ii)	**3 to 7.5 HP - Depth up to 150 mtr.**	1 Job	2550.00
(iii)	**7.5 to 12.5 HP - Depth up to 150 mtr.**	1 Job	2854.00
(iv)	**Above 12.5 HP - Depth up to 150 mtr.**	1 Job	3157.00
	REPAIRING OF SUBMERSIBLE MOTOR PUMP SET		
24.15.1	Removing the old burn winding from stator & cleaning of slot then complete rewinding of submersible motor by using PVC insulated ISI marked quality copper conductor with suitable gauge including insulating material like bamboo, strip, fire proof papers, leeve, cotton tape, PVC tape including cable jointing of motor.		
A	**Single phase 100 mm dia**		
	1 HP	1 Job	1975.00
	2 HP	1 Job	2475.00
	3 HP	1 Job	2660.00
B	**Three Phase 100mm & 150 mm Dia.**		
	3 HP (100mm dia.)	1 Job	2938.00
	4 HP (100mm dia.)	1 Job	3030.00
	5 HP (100mm dia.)	1 Job	3401.00
	3 HP (150mm dia.)	1 Job	3004.00
	4 HP (150mm dia.)	1 Job	3097.00
	5 HP (150mm dia.)	1 Job	3533.00
	6 HP (150mm dia.)	1 Job	3864.00
	Above 6.0 to7.5 HP (150mm dia.)	1 Job	5529.00
	Above 7.5 to 10 HP (150mm dia.)	1 Job	6165.00
	Above 10.0 to 12.5 HP (150mm dia.)	1 Job	7091.00
	Above 12.5 to 15 HP (150mm dia.)	1 Job	7553.00

S.No.	Item	Unit	Rate in Rs.
24.15.2	**Providing & Fixing of non return valve body**		
	1 HP to 5 HP /100mm	1 Job	521.00
	3 HP to 15 HP / 150mm	1 Job	751.00
24.15.3	**Providing & Fixing of Discharge outlet**		
	1 HP to 5 HP /100mm	1 Job	293.00
	3 HP to 15 HP / 150mm	1 Job	403.00
24.15.4	**Providing & Fixing of Adjusting Cap**		
	1 HP to 5 HP /100mm	1 Job	81.00
	3 HP to 15 HP / 150mm	1 Job	86.00
24.15.5	**Providing & Fixing of L N key BMM**		
	1 HP to 5 HP /100mm	1 Job	29.00
	3 HP to 15 HP / 150mm	1 Job	35.00
24.15.6	**Providing & Fixing of Bush for D O L**		
	1 HP to 5 HP /100mm	1 Job	184.00
	3 HP to 15 HP / 150mm	1 Job	213.00
24.15.7	**Providing & Fixing of Sleeve for D O L**		
	1 HP to 5 HP /100mm	1 Job	161.00
	3 HP to 15 HP / 150mm	1 Job	178.00
24.15.8	**Providing & Fixing of stage case CI**	1 Job	
	3 HP to 15 HP / 150mm		406.00
24.15.9	**Providing & Fixing of Bowl bush GM**		
	3 HP to 15 HP / 150mm	1 Job	224.00
24.15.10	**Providing & Fixing of Bowl bush Rubber**		
	3 HP to 15 HP / 150mm	1 Job	132.00
24.15.11	**Providing & Fixing of Neck Ring GM**		
	3 HP to 15 HP / 150mm	1 Job	190.00
24.15.12	**Providing & Fixing of Pump sleeve SS**		
	3 HP to 15 HP / 150mm	1 Job	144.00
24.15.13	**Providing & Fixing of Motor Bush GM**		
	1 HP to 5 HP /100mm	1 Job	466.00
	3 HP to 15 HP / 150mm	1 Job	575.00

S.No.	Item	Unit	Rate in Rs.
24.15.14	**Providing & Fixing of moter bush Rubber**		
	1 HP to 5 HP /100mm	1 Job	322.00
	3 HP to 15 HP / 150mm	1 Job	380.00
24.15.15	**Providing & Fixing of Impeller**		
	1 HP to 5 HP /100mm **PP**	1 Job	75.00
	3 HP to 15 HP / 150mm **GM**	1 Job	495.00
24.15.16	**Providing & Fixing of Diffuser GM**		
	3 HP to 15 HP / 150mm	1 Job	313.00
24.15.17	**Providing & Fixing of Diffuser PP**		
	1 HP to 5 HP /100mm	1 Job	75.00
	3 HP to 15 HP / 150mm	1 Job	167.00
24.15.18	**Providing & Fixing of sand guard**		
	1 HP to 5 HP /100mm	1 Job	75.00
	3 HP to 15 HP / 150mm	1 Job	167.00
24.15.19	**Providing & Fixing of Distance piece**		
	1 HP to 5 HP /100mm	1 Job	55.00
	3 HP to 15 HP / 150mm	1 Job	132.00
24.15.20	**Providing & Fixing of Oil seal**		
	1 HP to 5 HP /100mm	1 Job	58.00
	3 HP to 15 HP / 150mm	1 Job	63.00
24.15.21	**Providing & Fixing of Oil seal Sleeve**		
	1 HP to 5 HP /100mm	1 Job	132.00
	3 HP to 15 HP / 150mm	1 Job	196.00
24.15.22	**Providing & Fixing of Nylon Nut**		
	1 HP to 5 HP /100mm	1 Job	12.00
	3 HP to 15 HP / 150mm	1 Job	14.00
24.15.23	**Providing & Fixing of Stud for Suction**		
	1 HP to 5 HP /100mm	1 Job	24.00
	3 HP to 15 HP / 150mm	1 Job	32.00
24.15.24	**Providing & Fixing of GM Washer**		
	1 HP to 5 HP /100mm	1 Job	9.00
	3 HP to 15 HP / 150mm	1 Job	15.00

S.No.	Item	Unit	Rate in Rs.
24.15.25	**Providing & Fixing of Grub Screw**		
	1 HP to 5 HP /100mm	1 Job	14.00
	3 HP to 15 HP / 150mm	1 Job	14.00
24.15.26	**Providing & Fixing of Pump Shaft (SS) per Stage**		
	3 HP to 15 HP / 150mm	1 Job	219.00
			288.00
24.15.27	**Providing & Fixing of Pump Shaft Key**		
	1 HP to 5 HP /100mm	1 Job	63.00
	3 HP to 15 HP / 150mm	1 Job	75.00
24.15.28	**Providing & Fixing of Suction Housing**		
	1 HP to 5 HP /100mm	1 Job	288.00
	3 HP to 15 HP / 150mm	1 Job	414.00
24.15.29	**Providing & Fixing of Pump Coupling & Motor Coupling**		
	1 HP to 5 HP /100mm	1 Job	437.00
	3 HP to 15 HP / 150mm	1 Job	644.00
24.15.30	**Providing & Fixing of Suction Housing Plate**		
	3 HP to 15 HP / 150mm	1 Job	292.00
24.15.31	**Providing & Fixing of Intermediate suction Case**		
	3 HP to 15 HP / 150mm	1 Job	207.00
24.15.32	**Providing & Fixing of Suction Housing Bush**		
	3 HP to 15 HP / 150mm	1 Job	270.00
24.15.33	**Providing & Fixing of Intermediate suction Bush**		
	3 HP to 15 HP / 150mm	1 Job	270.00
24.15.34	**Providing & Fixing of stud for Motor flange upper**		
	1 HP to 5 HP /100mm	1 Job	21.00
	3 HP to 15 HP / 150mm	1 Job	25.00
24.15.35	**Providing & Fixing of stud for Motor flange lower**		
	1 HP to 5 HP /100mm	1 Job	32.00
	3 HP to 15 HP / 150mm	1 Job	40.00
24.15.36	**Providing & Fixing of Bearing Housing upper**		
	1 HP to 5 HP /100mm	1 Job	403.00
	3 HP to 15 HP / 150mm	1 Job	621.00

S.No.	Item	Unit	Rate in Rs.
24.15.37	**Providing & Fixing of Bearing Housing lower**		
	1 HP to 5 HP /100mm	1 Job	403.00
	3 HP to 15 HP / 150mm	1 Job	621.00
24.15.38	**Providing & Fixing of upper flange & lower flange**		
	1 HP to 5 HP /100mm	1 Job	219.00
	3 HP to 15 HP / 150mm	1 Job	270.00
24.15.39	**Providing & Fixing of Motor base**		
	1 HP to 5 HP /100mm	1 Job	495.00
	3 HP to 15 HP / 150mm	1 Job	644.00
24.15.40	**Providing & Fixing of Thrust bearing plate complete**		
	1 HP to 5 HP /100mm	1 Job	844.00
	3 HP to 15 HP / 150mm	1 Job	959.00
24.15.41	**Providing & Fixing of Thrust bearing (Carben)**		
	1 HP to 5 HP /100mm	1 Job	575.00
	3 HP to 15 HP / 150mm	1 Job	713.00
24.15.42	**Providing & Fixing of Revolving disk**		
	1 HP to 5 HP /100mm	1 Job	414.00
	3 HP to 15 HP / 150mm	1 Job	633.00
24.15.43	**Providing & Fixing of Thrust bearing housing CI**		
	1 HP to 5 HP /100mm	1 Job	161.00
	3 HP to 15 HP / 150mm	1 Job	247.00
24.15.44	**Providing & Fixing of Rotor Sleeve**		
	1 HP to 5 HP /100mm	1 Job	207.00
	3 HP to 15 HP / 150mm	1 Job	253.00
24.15.45	**Providing & Fixing of Rubber Parts**	1 Job	
	1 HP to 5 HP /100mm	1 Job	69.00
	3 HP to 15 HP / 150mm		92.00
24.15.46	**Providing & Fixing of Intermediate coupling**		
	1 HP to 5 HP /100mm	1 Job	345.00
	3 HP to 15 HP / 150mm	1 Job	380.00

S.No.	Item	Unit	Rate in Rs.
24.15.47	**Providing & Fixing of Flange locking**		
	1 HP to 5 HP /100mm	1 Job	58.00
	3 HP to 15 HP / 150mm	1 Job	63.00
24.15.48	**Providing & Fixing of Disk Locking**		
	1 HP to 5 HP /100mm	1 Job	23.00
	3 HP to 15 HP / 150mm	1 Job	25.00
24.15.49	**Providing & Fixing of Chuck Nut**		
	1 HP to 5 HP /100mm	1 Job	44.00
	3 HP to 15 HP / 150mm	1 Job	58.00
24.15.50	**Providing & Fixing of 8 mm Nut SS**		
	3 HP to 15 HP / 150mm	1 Job	14.00
24.15.51	**Providing & Fixing of 10 mm Nut SS**		
	1 HP to 15 HP / 150mm	1 Job	18.00
24.15.52	**Providing & Fixing of 12 mm Nut SS**		
	1 HP to 15 HP / 150mm	1 Job	23.00
24.15.53	**Providing & Fixing of Stud for Suction**		
	1 HP to 15 HP / 150mm	1 Job	29.00
24.15.54	**Providing & Fixing of Top Bush & Top Sleeve**		
	1 HP to 5 HP /100mm	1 Job	322.00
	3 HP to 15 HP / 150mm	1 Job	391.00
24.15.55	**Providing & Fixing of Pump intermediate bush & sleeve**		
	1 HP to 5 HP /100mm	1 Job	311.00
	3 HP to 15 HP / 150mm	1 Job	380.00
24.15.56	**Providing & Fixing of Pump stainer**		
	1 HP to 5 HP /100mm	1 Job	123.00
	3 HP to 15 HP / 150mm	1 Job	169.00
24.15.57	**Providing & Fixing of center D O**		
	1 HP to 5 HP /100mm	1 Job	196.00
	3 HP to 15 HP / 150mm	1 Job	403.00
24.15.58	**Providing & Fixing of New rotor**		
	1 HP (100 mm dia)	1 Job	5980.00

S.No.	Item	Unit	Rate in Rs.
	2 HP (100 mm dia)	1 Job	6440.00
	3 HP (100 mm dia)	1 Job	7245.00
	4 HP (100 mm dia)	1 Job	7935.00
	5 HP (100 mm dia)	1 Job	8625.00
	3 HP (150 mm dia)	1 Job	9660.00
	4 HP (150 mm dia)	1 Job	9775.00
	5 HP (150 mm dia)	1 Job	10005.00
	6 HP (150 mm dia)	1 Job	10695.00
	Above 6.0 to7.5 HP (150 mm)	1 Job	12190.00
	Above 7.5 to 10 HP (150 mm)	1 Job	13455.00
	Above 10.0 to 12.5 HP (150 mm)	1 Job	18400.00
	Above 12.5 to 15 HP (150 mm)	1 Job	20700.00
24.15.59	**Providing & Fixing of Adapter Piece**		
	1 HP to 5 HP /100mm	1 Job	207.00
	3 HP to 15 HP / 150mm	1 Job	288.00
24.15.60	**Providing & Fixing of Water drain plug**		
	1 HP to 5 HP /100mm	1 Job	46.00
	3 HP to 15 HP / 150mm	1 Job	58.00
24.15.61	**Providing & Fixing of Cable Guard**		
	1 HP to 5 HP /100mm	1 Job	135.00
	3 HP to 15 HP / 150mm	1 Job	169.00
24.15.62	**Labour only for stator servicing :-**		
	1 HP - 5 HP / 100 mm	1 Job	575.00
	3 HP - 5 HP / 150mm	1 Job	598.00
	5 HP - 10 HP / 150mm	1 Job	748.00
	10 HP - 15 HP / 150mm	1 Job	863.00
24.15.63	**Labour only for Rotor Balancing :-**		
	1 HP - 5 HP / 100 mm	1 Job	920.00
	3 HP - 5 HP / 150mm	1 Job	1035.00
	5 HP - 10 HP / 150mm	1 Job	1265.00
	10 HP - 15 HP / 150mm	1 Job	1610.00
24.15.64	Labour only for Impeller Brass welding & Turning	1 Job	345.00
24.15.65	Labour only for Motor Rotor sleeve turning & grinding	1 Job	748.00
24.15.66	Labour only for Flange stud Welding	1 Job	46.00

S.No.	Item	Unit	Rate in Rs.
24.15.67	Labour only for Motor opening, servicing, fitting & testing	1 Job	518.00
24.15.68	Labour only for Copper welding, Turning & Grinding to enduring of rotor	1 Job	920.00
24.15.69	Labour only for Welding Turning key way cutting of coupling side of rotor	1 Job	460.00
24.15.70	Labour only for Pump opening & fitting	1 Job	460.00
	REPAIRING OF CONTROL PANEL		
24.15.71	Providing & Fixing of Relay unit L&T Type	1 Job	684.00
24.15.72	Providing & Fixing of Relay unit BCH Type	1 Job	1547.00
24.15.73	Providing & Fixing of Contacter L&T Type - 16 Amp	1 Job	1317.00
24.15.74	Providing & Fixing of Contacter BCH Type - 16 Amp	1 Job	1892.00
24.15.75	Providing & Fixing of Contacter BCH Type - 25 Amp	1 Job	2467.00
24.15.76	Providing & Fixing of Kit Point Set L&T Type	1 Job	512.00
24.15.77	Providing & Fixing of Kit Point Set BCH Type - 16 Amp	1 Job	972.00
24.15.78	Providing & Fixing of Kit Point Set BCH Type - 25 Amp	1 Job	742.00
24.15.79	Providing & Fixing of No Volt Coil L&T Type	1 Job	512.00
24.15.80	Providing & Fixing of No Volt Coil BCH Type	1 Job	512.00
24.15.81	Providing & Fixing of Timer Set L&T Type	1 Job	1547.00
24.15.82	Providing & Fixing of Timer Set BCH Type	1 Job	1892.00
24.15.83	Providing & Fixing of Auxillary Switch	1 Job	638.00
24.15.84	Providing & Fixing of Timer Coil	1 Job	477.00
24.15.85	Providing & Fixing of Amp meter (Round)	1 Job	150.00
24.15.86	Providing & Fixing of Volt Meter (Round)	1 Job	150.00
24.15.87	Providing & Fixing of Amp meter (Square)	1 Job	207.00
24.15.88	Providing & Fixing of Volt Meter (Square)	1 Job	207.00
24.15.89	Providing & Fixing of ON Switch	1 Job	104.00
24.15.90	Providing & Fixing of Off Switch	1 Job	104.00
24.15.91	Providing & Fixing of Terminal Plate	1 Job	167.00
24.15.92	Providing & Fixing of Indicator Lamp	1 Job	40.00
24.15.93	Providing & Fixing of MCB -Single Pole - 16 -25 Amp	1 Job	132.00
24.15.94	Providing & Fixing of MCB -Three Pole - 32 Amp	1 Job	789.00
24.15.95	Providing & Fixing of MCB -Three Pole - 40 Amp	1 Job	742.00
24.15.96	Providing & Fixing of MCB -Three Pole - 63 Amp	1 Job	799.00
24.15.97	Providing & Fixing of Capacitor 36 MFD	1 Job	397.00
24.15.98	Providing & Fixing of Capacitor 50 MFD	1 Job	397.00
24.15.99	Providing & Fixing of Capacitor 120-150 MFD	1 Job	420.00

S.No.	Item	Unit	Rate in Rs.
24.15.100	Providing & Fixing of Capacitor 200-250 MFD	1 Job	443.00
24.15.101	**Providing and fixing of suitable rating ISI marked wired with lugs & sleeves in place of burnt wiring of control panel.**		
	1 HP - 3 HP (Single Phase)	1 Job	495.00
	3 HP - 5 HP (Three Phase)	1 Job	610.00
	5 HP - 10 HP (Three Phase)	1 Job	840.00
	10 HP - 15 HP (Three Phase)	1 Job	1070.00
	REPLACEMENT OF FLAT COPPER CABLE		
24.15.102	**Providing and fixing of ISI marked PVC insulated three core flat copper cable.**		
	1.5 sq mm	1 Job	53.00
	2.5 sq mm	1 Job	81.00
	4.0 sq mm	1 Job	118.00
	6.0 sq mm	1 Job	173.00

ANNEXURE-1

ISSUE RATES OF ISI MARK HAND PUMPS. G.I. RISER, G.I. CASING & UPVC CASING PIPES FOR PREPARATION OF ESTIMATES ONLY.

S.No.	Item	Unit	Rate in Rs.
1	ISI mark India mark-II deep well hand pump complete with 10 Nos. MS connecting rods. (12 mm x 3 M long) Normal stand assembly .	Each	6709
2	ISI mark India mark-II deep well hand pump complete with 10 Nos. MS connecting rods. (12 mm x 3 M long) telescopic stand assembly .	Each	6813
3	ISI mark India mark-II extra deep well hand pump complete with 20 Nos. MS connecting rods. (12 mm x 3 M long) 2 counter weight lectrogalvanized & passivated normal stand assembly .	Each	9826
4	ISI mark India mark-II extra deep well hand pump complete with 20 Nos. MS connecting rods. (12 mm x 3 M long) 2 counter weight electrogalvanized & passivated telescopic stand assembly .	Each	9964
5	ISI Mark 32 mm dia. G.I. riser pipe in 3 meter length socketed on one end as per I.S. 1239 (Part I) 1990 up-to- date amendments and socket as per I.S. 2062/1990 up-to-date amendment.	Meter	202
6	ISI marked G.I. casing pipe (Plain) medium class in 4 to 7 meters length one end fitted with socket as per I.S.: 1239 (Part-2) 1992 with IV th revision (Up-to-date amendments).		
	100 mm dia	Meter	695
	125 mm dia	Meter	927
	150 mm dia	Meter	1116
7	ISI marked UPVC casing pipe Confirming to IS 12818/92 (with up-to-date amendments).		
	Screen pipes with ribs 100 mm dia	Meter	392
	Screen pipes with ribs 150 mm dia	Meter	693
	Screen pipes with ribs 200 mm dia	Meter	1098
	CM casing pipes 100 mm dia	Meter	284
	CM casing pipes 125 mm dia	Meter	454
	CM casing pipes 150 mm dia	Meter	488
	CM casing pipes 200 mm dia	Meter	923
	CS casing pipes 150 mm dia	Meter	424
	CS casing pipes 200 mm dia	Meter	754

ANNEXURE-2

STRATA - CHART

District ..... Block .....Panchayat……

Name of Revenue village..... Name of habitation .....

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

Agreement No. .....Work Order No.....

Date of starting of Tube well construction .....

Date of completion of tube well construction .....

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

Measurement Book Number.....

Exact location of drilling ……..

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

Signature of contractor

Signature of
Sub-Engineer
Office ……

Signature of
Assistant Engineer
Office…….

ANNEXURE-3

RESISTIVITY SURVEY REPORT

District ..... Block .....Panchayat……

Name of Revenue village..... Name of habitation .....

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

Agreement No. .....Work Order No.....

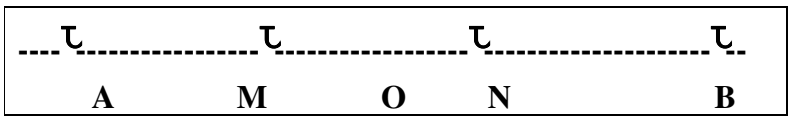
Date of Survey .....

Name of Geohydrologist .....

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

Maps (Not to scale) Showing the location of survey point (To be attached separately

in A-4 size sheet.



DATA SHEET OF FIELD MEASUREMENTS

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

Plot

Apparent
Resistivity

AB/2

Interpretation Report.

Possible Strata expected at the spot

S.No	Possible Strata	Depth below Ground Level		Remark
		From	To	

Recommendation :-

Signature of Geo-hydrologist

ANNEXURE-4

YIELD TEST OF TUBE WELLS.

District ..... Block .....Panchayat……

Name of Revenue village..... Name of habitation .....

Name of contractor .....

Agreement No. ..... Work order No.....

Date of yield test .....

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

Static water level in tube well .....

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

Type of measuring device used for measurement of discharge .....

Depth at which the pumping set installed.....

Time at which the yield test started .....

Data sheet of field measurements

S.N.	Time	Water level in the tube well measured from top of casing pipe	Discharge of tube well
1. 2. 3.			

Signature of Contractor

Signature of Sub-Engineer

Signature of Assistant Engineer

(C)

SEWERAGE MAINTENANCE WORKS

GENERAL NOTES-

SEWERAGE MAINTENANCE

1. Contractor is bound to follow the guide line of CPHEEO manual on sewerage & sewage treatment system (Part-B) issued by Ministry of Urban Devlopment, New Delhi w.e.f. November 2013
2. The tools, plant, machinery and pumps required for cleaning should be arranged by the contractor at his own cost.
3. The payment will be made after successful testing of line only. No payment will be made for testing work in pieces.
4. No payment will be made for dewatering whatsoever involve in cleaning of manhole & sewer line. The payment of Dat (temporary plugging of chambers) will be made for cleaning of chamber only in accordance with volume of pipes, manholes and drains. The rates of Dat are included in the SOR.
5. The manhole cover for replacement will be issued from the store & no extra payment will be made for loading, unloading and transportation of manhole cover with frame upto the work site.
6. The contractor shall be fully and solely responsible for making all safety arrangements pertaining to the work such as barricading, lighting , arrangement of gas masks, safety belts and oxygen cylinder etc.
7. Shifting of silt and garbage will be done as per the direction of the Engineer-in-charge.
8. Providing and fixing of CI/SFRC manhole cover with frame may be replaced(if required) but the cover shall be as per ISI mark only. The payment will be made as per rates applicable in the USOR.
9. The rates for various works given in the unified schedule of rates include contractor profit over head expenses, water and T&P expenses.
10. Some poisonous & inflammable gases are observed in deep sewers manholes, to prevent any disaster due to trance gases, the safety of cleaning staff is the responsibility of the contractor.
11. The department is not responsible for any accident during cleaning of sewer line. The contractor is fully responsible for any compensation to labour or for any legal action arising due to the accident.

CHAPTER XXV

SEWERAGE MAINTENANCE WORKS

CHAPTER- XXV

SEWERAGE MAINTENANCE

S.No.	Item	Unit	Rates in Rs.
25.1	Lifting & Placing of manhole cover during cleaning of chocked sewer line & manhole.		
i.	SFRC 500 mm dia size	Each	23.00
ii.	SFRC 560 mm dia size	Each	28.00
iii	SFRC 600 mm dia size	Each	34.00
iv	SFRC 450x900 mm size	Each	39.00
v	SFRC 600x450 mm size	Each	23.00
vi	SFRC 600x600 mm size	Each	28.00
vii	SFRC 600x900 mm size	Each	34.00
viii	SFRC 1.2 x 0.9 mtr. size	Each	84.00
ix	C.I. 560 mm dia size	Each	34.00
x	C.I. 1.2 x 0.9 mtr. Size	Each	73.00
25.2	Lifting & placing of manholes cover & frame including dismantling of existing C.C. coping during Raising of manholes (civil work to be paid separately)		
i.	SFRC 500 mm dia size	Each	62.00
ii.	SFRC 560 mm dia size	Each	74.00
iii	SFRC 600 mm dia size	Each	85.00
iv	SFRC 450x900 mm size	Each	102.00
v	SFRC 600x450 mm size	Each	62.00
vi	SFRC 600x600 mm size	Each	74.00
vii	SFRC 600x900 mm size	Each	85.00
viii	SFRC 1.2 x 0.9 mtr. size	Each	176.00
ix	C.I. 560 mm dia size	Each	85.00
x	C.I. 1.2 x 0.9 mtr. Size	Each	147.00
25.3	Replacement of SFRC manhole cover with frame or without frame of approved quality of any shape & size with cost of material & labour (civil work to be paid separately)	Kg.	20.00
25.4	Labour only for replacement of SFRC manhole cover with frame or without frame of any shape & size (civil work to be paid separately)	Kg`	2.00
25.5	Making arrangement for dat (plugging of sewer) including all required material such as steel plate, manila rope, gunny bags, earth etc. or by any other plugging device with all required T & P and safety equipment including dewatering.		
25.5.1	**Depth upto 1.5 m**		
i.	100 mm dia	Each	525.00
ii.	150 mm dia	Each	704.00

S.No.	Item	Unit	Rates in Rs.
iii.	200 mm dia	Each	707.00
iv	250 mm dia	Each	711.00
v	300 mm dia	Each	716.00
(a)	**Extra rate of depth 1.5m to 3m or part**		
	100 mm dia to 300 mm	Each	33.00
(b)	**Extra rate of depth 3m to 4.5 or part**		
	100 mm dia. to 300 mm	Each	66.00
(c)	**Extra rate of depth 4.5 m to 6m or part**		
	100 mm dia to 300 mm	Each	99.00
25.5.2	**Depth upto 1.5 m for RCC Sewer.**		
i.	350 mm dia	Each	981.00
ii.	400 mm dia	Each	988.00
iii.	450 mm dia	Each	995.00
iv.	500 mm dia	Each	1004.00
(a)	**Extra rate of depth 1.5 m to 3m or part**		
	350 mm to 500 mm dia	Each	44.00
(b)	**Extra rate of depth 3m to 4.5 m or part**		
	350 mm to 500 mm dia	Each	88.00
(c)	**Extra rate of depth 4.5m to 6m or part**		
	350 mm dia to 500 mm	Each	132.00
(d)	**Extra rate of depth 6m to 7.5 m or part**		
	350 mm dia to 500 mm	Each	176.00
(e)	**Extra rate of depth 7.5m to 9m or part**		
	350 mm dia 500 mm	Each	264.00
25.5.3	**Depth upto 1.5 m for RCC Sewer.**		
i.	600 mm dia	Each	1400.00
ii.	700 mm dia	Each	1422.00
iii.	800 mm dia	Each	1446.00
iv.	900 mm dia	Each	1474.00
v.	1000 mm dia	Each	1504.00
(a)	**Extra rate of depth. 1.5m to 3m to or part**		
	600 mm to 1000 mm dia	Eact	61.00
(b)	**Extra rate of depth. 3m to 4.5 m to or part**		
	600 mm to 1000 mm dia	Each	122.00
(c)	**Extra rate of depth. 4.5 m to 6m to or part**		
	600 mm dia to 1000 mm	Each	183.00
(d)	**Extra rate of depth. 6m to 7.5m or part**		
	600 mm dia to 1000mm	Each	244.00
(e)	**Extra rate of depth. 7.5m to 9m or part**		
	600 mm dia to 1000 mm	Each	436.00
25.5.4	**Depth upto 1.5 m for RCC Sewer.**		
i.	1200mm dia	Each	2011.00
ii.	1400 mm dia	Each	2118.00

S.No.	Item	Unit	Rates in Rs.
iii.	1600 mm dia	Each	2216.00
iv.	1800 mm dia	Each	2326.00
(a)	**Extra rate of depth 1.5 to 3m to or part**		
	1200 mm to 1800 mm dia	Each	80.00
(b)	**Extra rate of depth 3m to 4.5 m to or part**		
	1200 mm to 1800 mm dia	Each	160.00
(c)	**Extra rate of depth 4.5m to 6m to or part**		
	1200 mm to 1800 mm dia	Each	240.00
(d)	**Extra rate of depth 6m to 7.5 m or part**		
	1200 mm to 1800 mm dia	Each	320.00
(e)	**Extra rate of depth 7.5 m to 9m or part**		
	1200 mm to 1800 mm dia	Each	480.00
(f)	**Extra rate of depth 9m to 10.5m or part**		
	1200 mm to 1800 mm dia	Each	641.00
(g)	**Extra rate of depth 10.5 m to 12m or part**		
	1200 mm to 1800 mm dia	Each	801.00
25.6	Cleaning of Silt, sludge brick bats, polythene bags, garbage etc. from chocked sewer manholes / sewer drains & Nallahs/ wet well of SPH/ Anaerobic & Facultative Pond of STP with all required T&P such as bucket, manila rope, and all required safety equipment such as safety belt, gas mask, oxygen cylinder etc. including disposal of silt/ sludge upto 50 mtr lead & 1.5 mtr. lift as directed by Engineer-in-Charge including dewatering but excluding dat (plugging of sewer pipe line)		
	Depth up to 1.5 mtr	Cu.M	**380.00**
(a)	Extra rate for depth 1.5 m to 3m or part	Cu.M	19.00
(b)	Extra rate for depth 3m to 4.5 m or part	Cu.M	38.00
(c)	Extra rate for depth 4.5 m to 6m or part	Cu.M	43.00
(d)	Extra rate for depth 6m to 7.5 m or part	Cu.M	47.00
(e)	Extra rate for depth 7.5m to 9m or part	Cu.M	53.00
(f)	Extra rate for depth 9m to 10.5 m or part	Cu.M	56.00
(g)	Extra rate for depth 10.5 m to 12m or part	Cu.M	65.00
25.7	Cleaning of Silt, sludge brick bats, polythene bags, garbage etc. from chocked sewer line with all required T&P and Safety equipment such as bucket, manila rope, safety belt, gas mask, oxygen cylinder etc. including disposal of silt, sludge upto 50m lead & lift up to 1.5mtr. as directed by Engineer-in- Charge including dewatering but excluding dat (plugging of sewer pipe line)		
25.7.1	**150 mm dia**	Per Meter	**32.00**
(a)	Extra rate for depth 1.5 m to 3m or part	Per Meter	2.00
(b)	Extra rate for depth 3m to 4.5 m or part	Per Meter	3.00

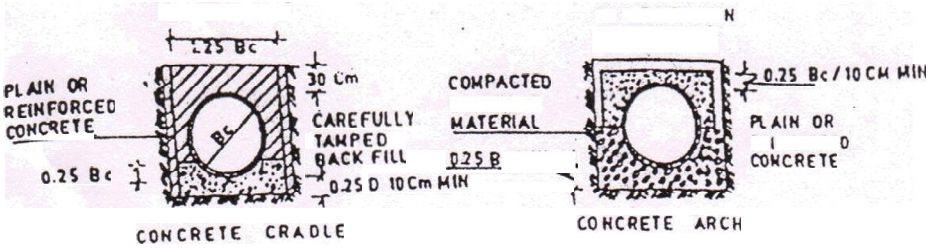
S.No.	Item	Unit	Rates in Rs.
(c)	Extra rate for depth 4.5 m to 6m or part	Per Meter	5.00
25.7.2	**200 mm dia**	Per Meter	**39.00**
(a)	Extra rate for depth 1.5 m to 3m or part	Per Meter	2.00
(b)	Extra rate for depth 3m to 4.5 m or part	Per Meter	4.00
(c)	Extra rate for depth 4.5 m to 6m or part	Per Meter	6.00
(d)	Extra rate for depth 6m to 7.5 m or part	Per Meter	8.00
25.7.3	**250 mm dia**	Per Meter	**46.00**
(a)	Extra rate for depth 1.5 m to 3m or part	Per Meter	2.00
(b)	Extra rate for depth 3m to 4.5 m or part	Per Meter	5.00
(c)	Extra rate for depth 4.5 m to 6m or part	Per Meter	7.00
(d)	Extra rate for depth 6m to 7.5 m or part	Per Meter	9.00
25.7.4	**300 mm dia**	Per Meter	**55.00**
(a)	Extra rate for depth 1.5 m to 3m or part	Per Meter	3.00
(b)	Extra rate for depth 3m to 4.5 m or part	Per Meter	6.00
(c)	Extra rate for depth 4.5 m to 6m or part	Per Meter	8.00
(d)	Extra rate for depth 6m to 7.5 m or part	Per Meter	11.00
25.7.5	**350 mm dia RCC**	Per Meter	**197.00**
(a)	Extra rate for depth 1.5 m to 3m or part	Per Meter	10.00
(b)	Extra rate for depth 3m to 4.5 m or part	Per Meter	20.00
(c)	Extra rate for depth 4.5 m to 6m or part	Per Meter	29.00
(d)	Extra rate for depth 6m to 7.5 m or part	Per Meter	39.00
(e)	Extra rate for depth 7.5m to 9m or part	Per Meter	59.00
25.7.6	**400 mm dia RCC**	Per Meter	**236.00**
(a)	Extra rate for depth 1.5 m to 3m or part	Per Meter	12.00
(b)	Extra rate for depth 3m to 4.5 m or part	Per Meter	24.00
(c)	Extra rate for depth 4.5 m to 6m or part	Per Meter	35.00
(d)	Extra rate for depth 6m to 7.5 m or part	Per Meter	47.00
(e)	Extra rate for depth 7.5m to 9m or part	Per Meter	71.00
25.7.7	**450 mm dia RCC**	Per Meter	**271.00**
(a)	Extra rate for depth 1.5 m to 3m or part	Per Meter	14.00
(b)	Extra rate for depth 3m to 4.5 m or part	Per Meter	27.00
(c)	Extra rate for depth 4.5 m to 6m or part	Per Meter	40.00
(d)	Extra rate for depth 6m to 7.5 m or part	Per Meter	54.00
(e)	Extra rate for depth 7.5m to 9m or part	Per Meter	81.00
25.7.8	**500 mm dia RCC**	Per Meter	**295.00**
(a)	Extra rate for depth 1.5 m to 3m or part	Per Meter	15.00
(b)	Extra rate for depth 3m to 4.5 m or part	Per Meter	29.00
(c)	Extra rate for depth 4.5 m to 6m or part	Per Meter	45.00
(d)	Extra rate for depth 6m to 7.5 m or part	Per Meter	59.00
(e)	Extra rate for depth 7.5m to 9m or part	Per Meter	88.00
(a)	Extra rate for depth 9m to 10.5m or part	Per Meter	118.00
25.7.9	**600 mm dia RCC**	Per Meter	**354.00**
(a)	Extra rate for depth 1.5 m to 3m or part	Per Meter	18.00

S.No.	Item	Unit	Rates in Rs.
(b)	Extra rate for depth 3m to 4.5 m or part	Per Meter	35.00
(c)	Extra rate for depth 4.5 m to 6m or part	Per Meter	53.00
(d)	Extra rate for depth 6m to 7.5 m or part	Per Meter	71.00
(e)	Extra rate for depth 7.5m to 9m or part	Per Meter	106.00
(f)	Extra rate for depth 9m to 10.5m or part	Per Meter	142.00
25.7.10	**700 mm dia RCC**	Per Meter	**425.00**
(a)	Extra rate for depth 1.5 m to 3m or part	Per Meter	21.00
(b)	Extra rate for depth 3m to 4.5 m or part	Per Meter	42.00
(c)	Extra rate for depth 4.5 m to 6m or part	Per Meter	64.00
(d)	Extra rate for depth 6m to 7.5 m or part	Per Meter	85.00
(e)	Extra rate for depth 7.5m to 9m or part	Per Meter	127.00
(f)	Extra rate for depth 9m to 10.5m or part	Per Meter	170.00
25.7.11	**750 mm dia RCC**	Per Meter	**468.00**
(a)	Extra rate for depth 1.5 m to 3m or part	Per Meter	23.00
(b)	Extra rate for depth 3m to 4.5 m or part	Per Meter	47.00
(c)	Extra rate for depth 4.5 m to 6m or part	Per Meter	70.00
(d)	Extra rate for depth 6m to 7.5 m or part	Per Meter	94.00
(e)	Extra rate for depth 7.5m to 9m or part	Per Meter	141.00
(f)	Extra rate for depth 9m to 10.5m or part	Per Meter	187.00
25.7.12	**800 mm dia RCC**	Per Meter	**473.00**
(a)	Extra rate for depth 1.5 m to 3m or part	Per Meter	26.00
(b)	Extra rate for depth 3m to 4.5 m or part	Per Meter	51.00
(c)	Extra rate for depth 4.5 m to 6m or part	Per Meter	77.00
(d)	Extra rate for depth 6m to 7.5 m or part	Per Meter	103.00
(e)	Extra rate for depth 7.5m to 9m or part	Per Meter	159.00
(f)	Extra rate for depth 9m to 10.5m or part	Per Meter	212.00
25.7.13	**900 mm dia RCC**	Per Meter	**590.00**
(a)	Extra rate for depth 1.5 m to 3m or part	Per Meter	29.00
(b)	Extra rate for depth 3m to 4.5 m or part	Per Meter	59.00
(c)	Extra rate for depth 4.5 m to 6m or part	Per Meter	88.00
(d)	Extra rate for depth 6m to 7.5 m or part	Per Meter	118.00
(e)	Extra rate for depth 7.5m to 9m or part	Per Meter	177.00
(f)	Extra rate for depth 9m to 10.5m or part	Per Meter	236.00
25.7.14	**1000 mm dia RCC**	Per Meter	**676.00**
(a)	Extra rate for depth 1.5 m to 3m or part	Per Meter	34.00
(b)	Extra rate for depth 3m to 4.5 m or part	Per Meter	68.00
(c)	Extra rate for depth 4.5 m to 6m or part	Per Meter	100.00
(d)	Extra rate for depth 6m to 7.5 m or part	Per Meter	135.00
(e)	Extra rate for depth 7.5m to 9m or part	Per Meter	203.00
(f)	Extra rate for depth 9m to 10.5m or part	Per Meter	270.00
(g)	Extra rate for depth 10.5m to 12m or part	Per Meter	338.00
25.7.15	**1200 mm dia RCC**	Per Meter	**808.00**
(a)	Extra rate for depth 1.5 m to 3m or part	Per Meter	40.00

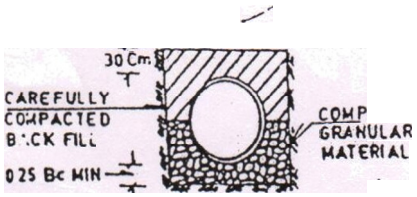
S.No.	Item	Unit	Rates in Rs.
(b)	Extra rate for depth 3m to 4.5 m or part	Per Meter	81.00
(c)	Extra rate for depth 4.5 m to 6m or part	Per Meter	121.00
(d)	Extra rate for depth 6m to 7.5 m or part	Per Meter	162.00
(e)	Extra rate for depth 7.5m to 9m or part	Per Meter	242.00
(f)	Extra rate for depth 9m to 10.5m or part	Per Meter	323.00
(g)	Extra rate for depth 10.5m to 12m or part	Per Meter	404.00
25.7.16	**1400 mm dia RCC**	Per Meter	**933.00**
(a)	Extra rate for depth 1.5 m to 3m or part	Per Meter	47.00
(b)	Extra rate for depth 3m to 4.5 m or part	Per Meter	93.00
(c)	Extra rate for depth 4.5 m to 6m or part	Per Meter	140.00
(d)	Extra rate for depth 6m to 7.5 m or part	Per Meter	187.00
(e)	Extra rate for depth 7.5m to 9m or part	Per Meter	280.00
(f)	Extra rate for depth 9m to 10.5m or part	Per Meter	373.00
(g)	Extra rate for depth 10.5m to 12m or part	Per Meter	466.00
25.7.17	**1600 mm dia RCC**	Per Meter	**1073.00**
(a)	Extra rate for depth 1.5 m to 3m or part	Per Meter	54.00
(b)	Extra rate for depth 3m to 4.5 m or part	Per Meter	107.00
(c)	Extra rate for depth 4.5 m to 6m or part	Per Meter	161.00
(d)	Extra rate for depth 6m to 7.5 m or part	Per Meter	215.00
(e)	Extra rate for depth 7.5m to 9m or part	Per Meter	321.00
(f)	Extra rate for depth 9m to 10.5m or part	Per Meter	429.00
(g)	Extra rate for depth 10.5m to 12m or part	Per Meter	536.00
25.7.18	**1800 mm dia RCC**	Per Meter	**1234.00**
(a)	Extra rate for depth 1.5 m to 3m or part	Per Meter	62.00
(b)	Extra rate for depth 3m to 4.5 m or part	Per Meter	123.00
(c)	Extra rate for depth 4.5 m to 6m or part	Per Meter	185.00
(d)	Extra rate for depth 6m to 7.5 m or part	Per Meter	247.00
(e)	Extra rate for depth 7.5m to 9m or part	Per Meter	370.00
(f)	Extra rate for depth 9m to 10.5m or part	Per Meter	493.00
(g)	Extra rate for depth 10.5m to 12m or part	Per Meter	617.00
25.8	Removing of all weeds and other growth with roots i/c refused material such as polythene, cloths, algae etc. from facultative pond of STP and disposal up to 50 mtr lead and 1.5 mtr lift as directed by Engineer in Charge including all required T&P, boat with boatman, bamboo, plunger, cutter, bucket, rope etc. and all safety equipments such as safety belt, gas mask , oxygen cylinder etc.	Sq M	18.00
25.9	Carriage of desilted sludge & other material from sewage components by mechanical transport including loading unloading & stacking etc.		
	1. Distance 1 km	Cum	127.00
	2. Distance 2 km	Cum	145.00

S.No.	Item	Unit	Rates in Rs.
	3. Distance 3 km	Cum	162.00
	4. Distance 4 km	Cum	179.00
	5. Distance 5 km	Cum	194.00
	6. Beyond 5km upto 10km. add per km	Cum	14.00
	7. Beyond 10km. upto 20km. add per km.	Cum	12.00
	8. Beyond 20km. add per additional	Cum	10.00

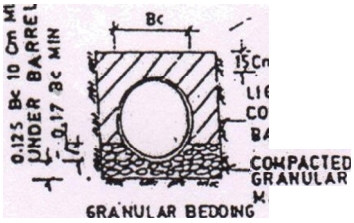
DRAWINGS



CLASS A



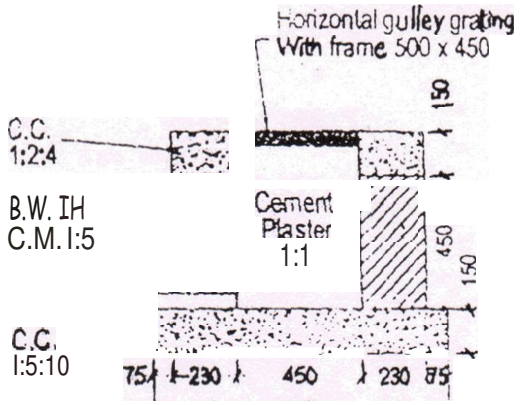
CLASS. B



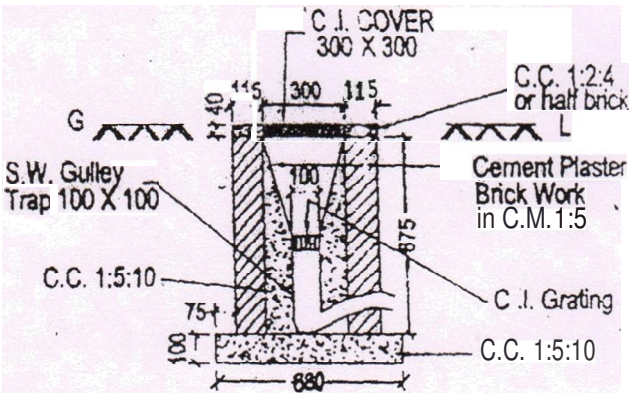
CLASS. C

FIG.]- • CLassES OF BEODING FOR "cououiT IN TRENCH

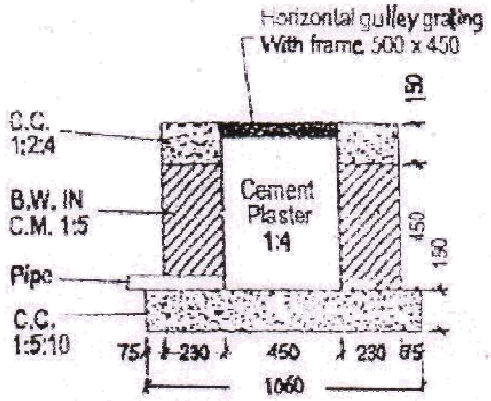
NOTE : IN ROCK, TRENCH IS EXCAVATED ATLEAST 15Cm BELOW THE BELL OF THE PIPE EXCEPT WHERE CONCRETE CRADLE IS USED.



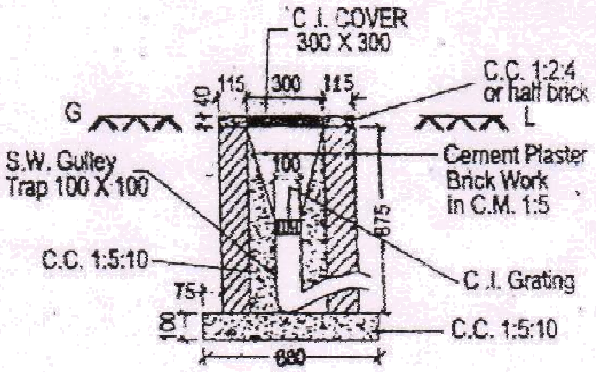
ROAO GULt.EY 0fJAI BER
450 X SOIL X690 (HORIZONTAL)
FIGURE• 2



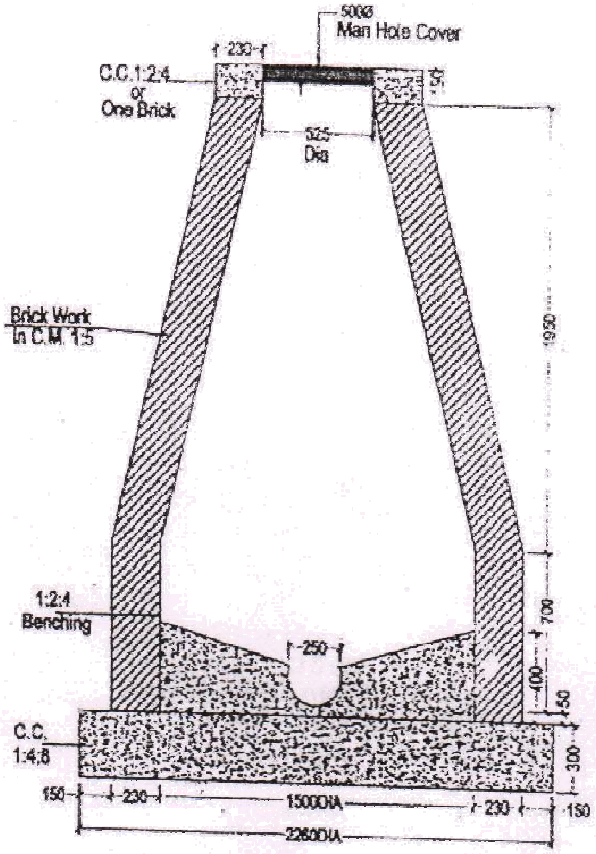
GULLEY TRAP CHAMBER
FOR100X103mm.
GULLY TRAP
FIGURE-3



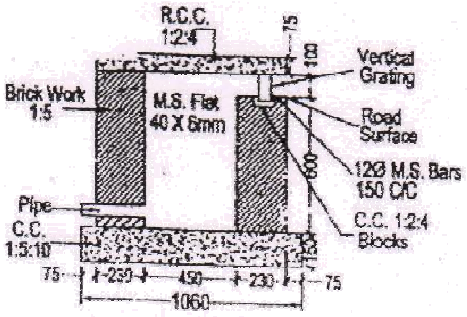
ROAD GULLEY CHAMBER
450 X 500 X 600 (HORIZONTAL)
FIGURE- 2



GULLEY TRAP CHAMBER
FOR 100 X 100 mm.
GULLY TRAP
FIGURE-3



CIRCULAR TYPE MAN HOLE
FIGURE - 6

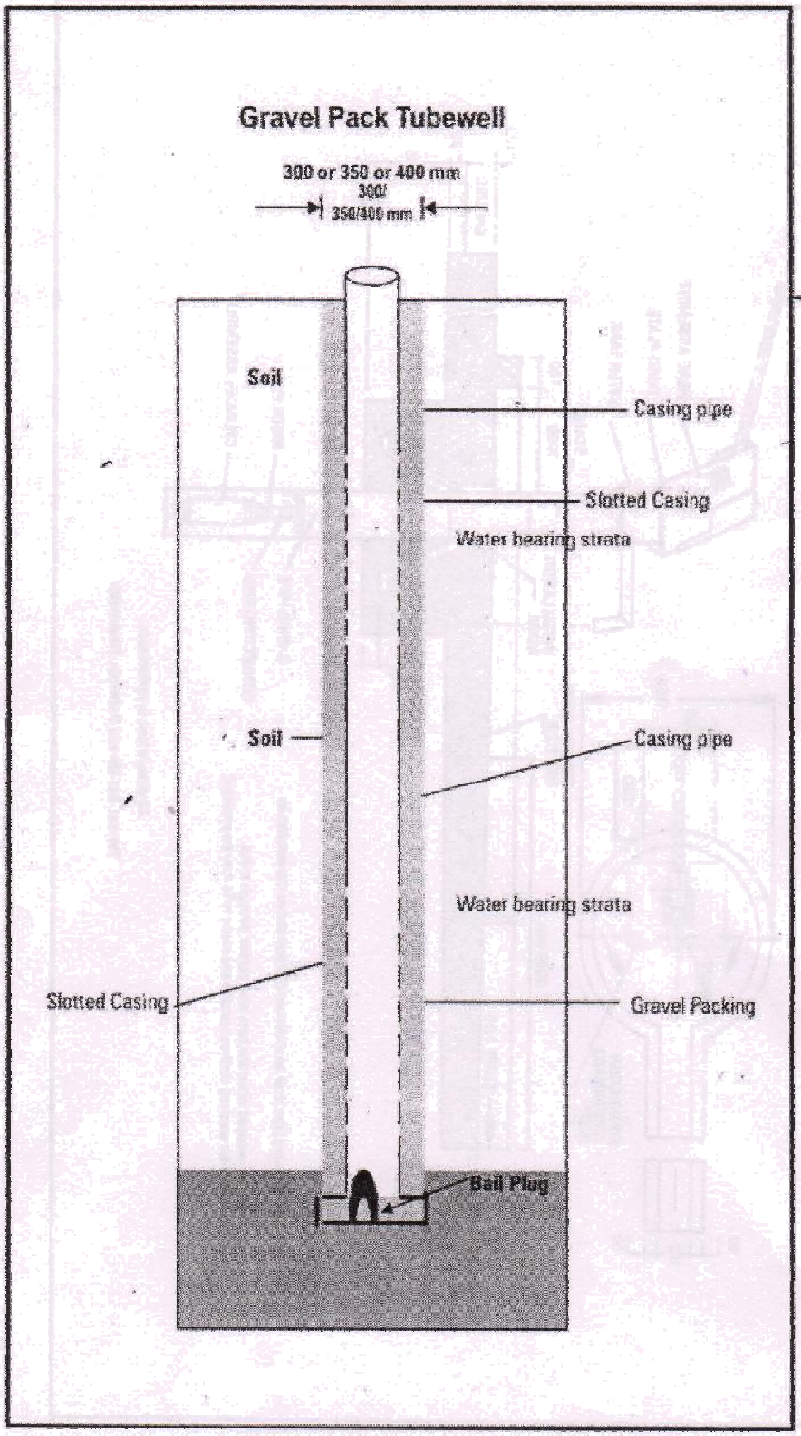


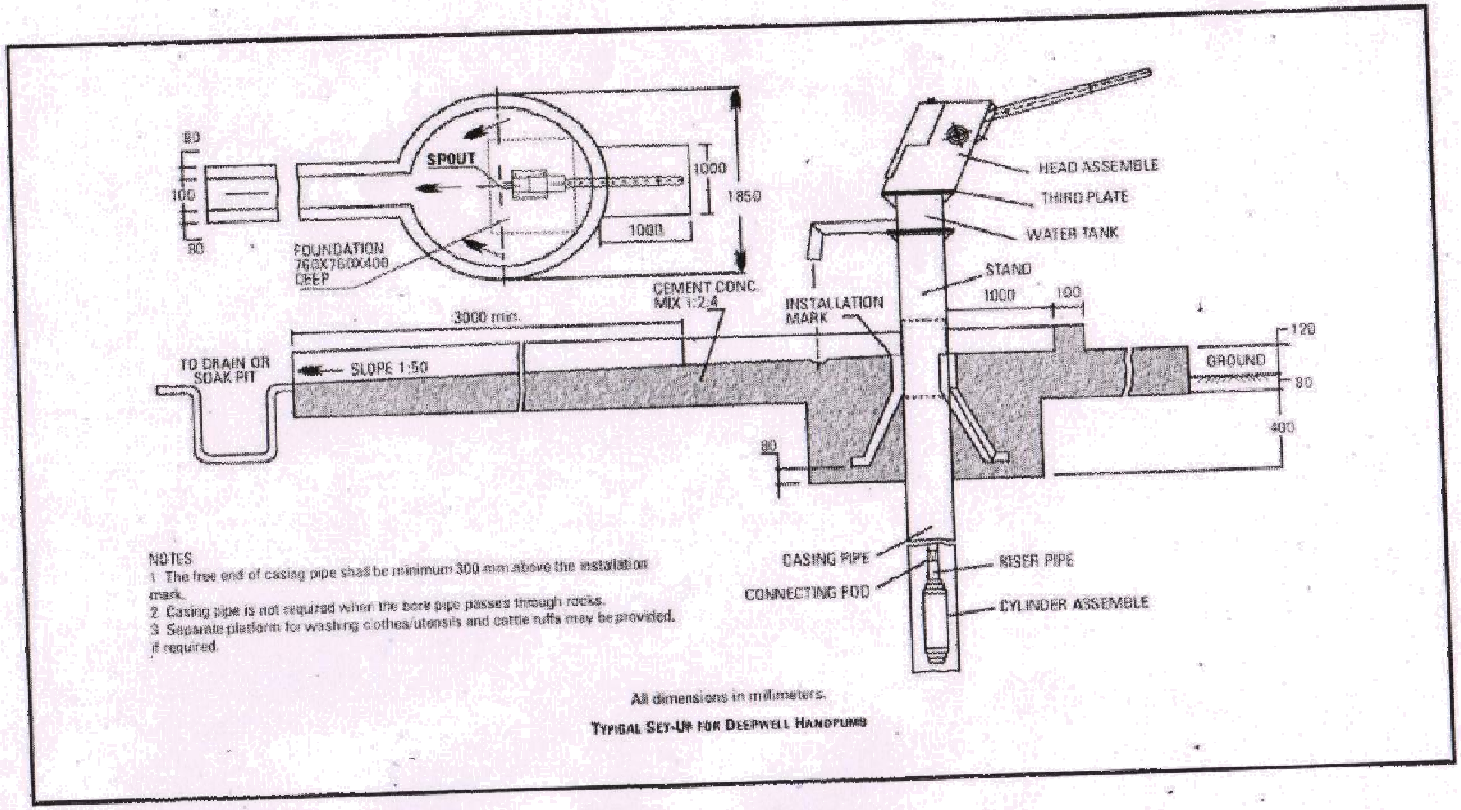
ROAD GULLEY CHAMBER
400 X 450 X 775 (VERTICAL GRATIN
FIGURE - 7

175

TYPICAL DETAIL OF CEMENT JOINTS FOR GLAZED STONEWARE PIPES

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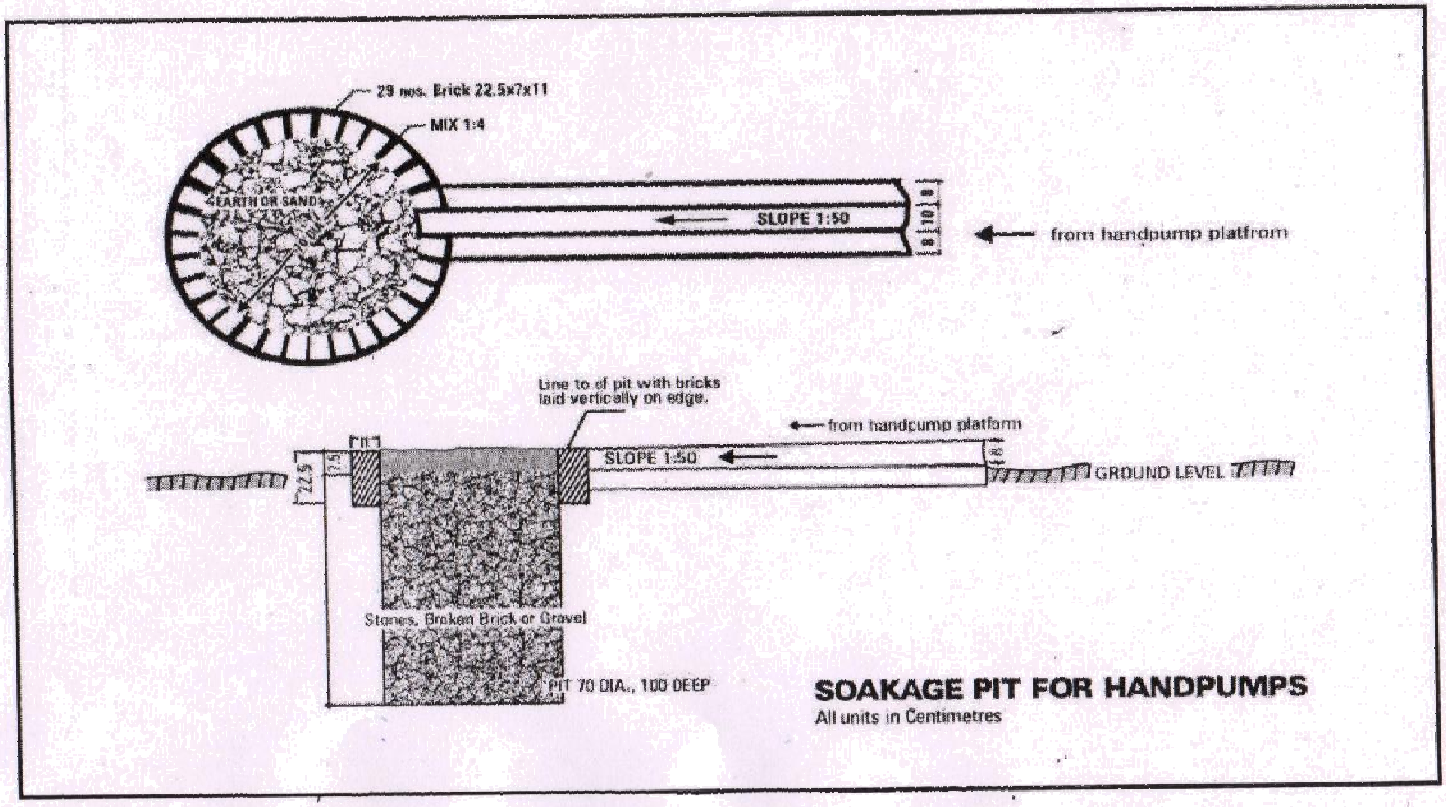

Gravel Pack Tubewell
300 or 350 or 400 mm
300/
350/400 mm
Soil
Casing pipe
Slotted Casing
Water bearing strata
Soil
Casing pipe
Water bearing strata
Slotted Casing
Gravel Packing
Ball Plug



NOTES
1 The free end of casing pipe shall be minimum 300 mm above the installation mark.
2 Casing pipe is not required when the bore pipe passes through rocks.
3 Separate platform for washing clothes/utensils and cattle ruffs may be provided, if required.

All dimensions in millimeters.

TYPICAL SET-UP FOR DEEPWELL HANDPUMP

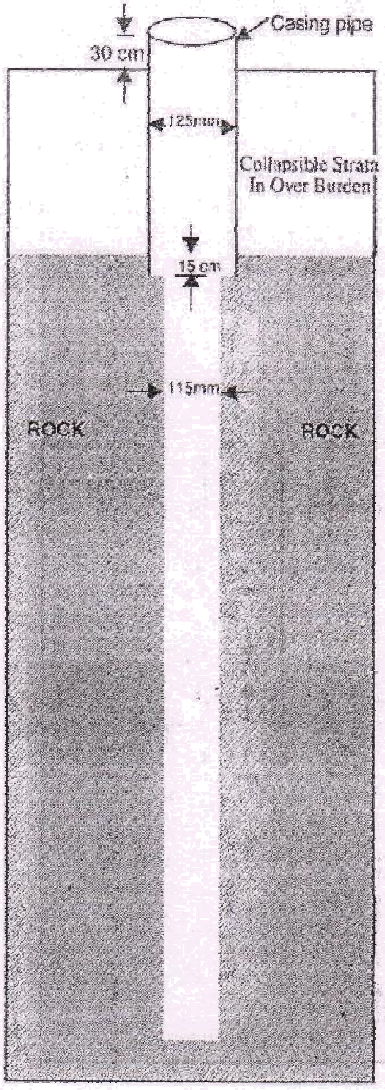


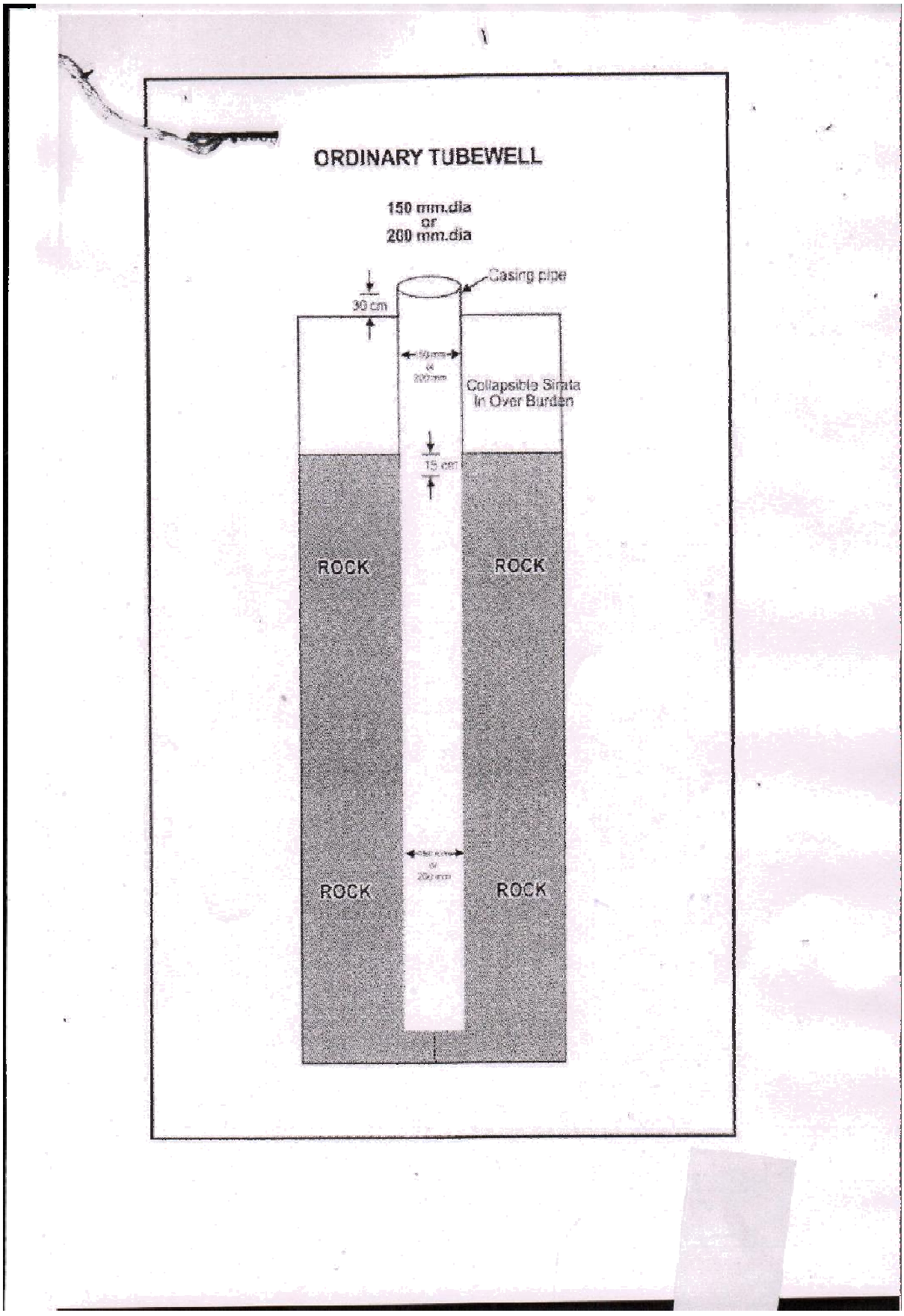
SOAKAGE PIT FOR HANDPUMPS

All units in Centimetres

ORDINARY TUBEWELL

125 /115 mm.dia




ORDINARY TUBEWELL
150 mm.dia
or
200 mm.dia
Casing pipe
90 cm
Collapsible Strata
In Over Burden
15 cm
ROCK
ROCK
ROCK
ROCK

200/150/125 mm dia. TUBEWELL

