GOVERNMENT OF MADHYA PRADESH
PUBLIC HEALTH ENGINEERING DEPARTMENT

UNIFIED SCHEDULE OF RATES
FOR
WATER SUPPLY, SEWERAGE,
AND ALLIED WORKS

IN FORCE FROM 3rd JULY 2018

Issued by
Engineer-In-Chief
Public Health Engineering Department
Madhya Pradesh, Bhopal

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PUBLIC HEALTH ENGINEERING DEPARTMENT

मध्यप्रदेश शासन

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Price : 500/-

कार्यालय प्रमुख अभियंता
लोक स्वास्थ्य यांत्रिकी विभाग
जल भवन, बाणगंगा, भोपाल– 462 003
दूरभाष क्रमांक (0755) 2779411–12

क्रमांक 120/SE/my/प्र.अ./ मोनि/लोस्वायांवि/2018 भोपाल, दिनांक 03-7-2018

//परिपत्र//

लोक स्वास्थ्य यांत्रिकी विभाग के अंतर्गत जल प्रदाय, सीवरेज एवं अन्य संबंधित कार्यों हेतु एकीकृत दर अनुसूची प्रकाशित की गई है, जिसकी दरें जी.एस.टी. रहित हैं। दर अनुसूची दिनांक 03.07.2018 से प्रभावशील होगी।

3.7.18
(के. के. सोनगरिया)
प्रमुख अभियंता

पृ.क्रमांक 120/SE/my/प्र.अ./मोनि/लोस्वायांवि/2018 भोपाल, दिनांक 03-7-2018

प्रतिलिपि :–

1. निज सचिव, मान. मंत्रीजी, लोक स्वास्थ्य यांत्रिकी विभाग, भोपाल।
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3. प्रबंध संचालक, म.प्र. जल निगम मर्यादित, विन्ध्याचल भवन, भोपाल।
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5. प्रमुख अभियंता, लोक निर्माण विभाग, भोपाल।
6. प्रमुख अभियंता, नगरीय प्रशासन एवं विकास विभाग, भोपाल।
7. प्रमुख अभियंता, ग्रामीण यांत्रिकी सेवा, भोपाल।
8. परियोजना निदेशक, म.प्र. जल निगम मर्यादित, विन्ध्याचल भवन, भोपाल।
9. मुख्य अभियंता, ग्रामीण यांत्रिकी सेवा, भोपाल।
10. समस्त मुख्य अभियंता, लोक स्वास्थ्य यांत्रिकी विभाग ——————
11. समस्त अधीक्षण यंत्री, लोक स्वास्थ्य यांत्रिकी विभाग ——————
12. समस्त कार्यपालन यंत्री, लोक स्वास्थ्य यांत्रिकी खण्ड ——————
13. समस्त सहायक, यंत्री, लोक स्वास्थ्य यांत्रिकी उपखण्ड ——————
14. आदेश नस्ती।

3.7.18
प्रमुख अभियंता

CONTENTS

PREFACE

The Unified Schedule of Rates for Water Supply, Sewerage and Allied works were made applicable in Public Health Engineering Department for the entire state of Madhya Pradesh as "Unified Schedule of Rates" which was enforced form 1st June 2016. As two years have passed since the issue of this USOR and meanwhile the new taxation system in the form of Goods & Service Tax (GST) has also been enforced from 1st July 2017.This has substantially effected the rates of all the items of the USOR. So, it was necessary to revise the USOR looking to the hike in the prices of materials and labour etc. involved in above works and segregate the GST portion to be paid separately over and above the USOR rates as per the prevailing government norms from time to time.

This USOR contains the rates of all the items without GST. GST shall be paid separately as per prevailing government norms as claimed by the contractor in his bill.

All the estimates based on this USOR will include GST as an extra amount as per prevailing rates on the sum of the estimate to arrive at the gross amount.

This Unified Schedule of Rates for all the works related to the Public Health Engineering Department has been revised 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.

I extend my thanks to Shri Ashok Baghel, Chief Engineer (E&M), Shri C.K. Singh, Shri R.K. Hirodiya, Superitending Engineers; Shri P.K. Raghuvanshi, Shri Alok Kumar Jain, Shri Ajay Diwakar, Shri Sunil Kumar Chaturvedi, Shri Udit Garg, Executive Engineers; Shri R.K. Chawla, Shri C.S. Kawalkar, Shri Sunil Shakargaye, Shri C.B. Magarde, Shri J.P. Ganote, Assistant Engineers; Shri Rajendra Kumar Shrivastava, Shri Priyank Patel, Sub Engineers; Shri Mahesh Pal Computer Operator Shri Suresh Jasutkar, Stenographer for their commendable efforts in preparing this schedule of rates.

This Unified Schedule of Rates (USOR) for the work of Water Supply, Sewerage and Allied works shall come in to force from 3rd of July 2018.

3.7.18

(K.K. Songaria)
Engineer-In-Chief
Public Health Engineering Department
Madhaya Pradesh, Bhopal

PART - (A)

WATER SUPPLY
&
SEWERAGE WORKS

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 testing, closing, preparing, loading and returning empty cases, containers, bags & baggage of the articles provided by the Department if any, to the place of issue without any extra charges.

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

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

(vi) **Best:**

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

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

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

(b) B.S.S.

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

(viii) **Complete:**

The provision of all such materials and labour and the performance of all such workmanship which may be necessary for the proper execution of the work in best workmanship manner but not particularly described in the items of schedule of rates due to their petty nature.

2. Approval of materials:

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

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

3. Alternative:

No alternative materials other than those specified in the agreement will generally be allowed to be used in the works except when their use becomes absolutely necessary in the interest of work on such grounds as non-availability in the market due to import restrictions or any other particular reasons beyond control of the contractor. But in all such cases, the Executive Engineer after satisfying himself about the facts will permit in writing the use of such alternatives and will recommend suitable alternation in rates for such works to the competent authority. No permission for using such alternative material shall however be granted if so mentioned in the tender documents.

4. Laying:

The approximate positions of all fittings shall generally be shown on the plans prepared for the purpose. But it will be the sole responsibility of the contractor to ascertain the work on the spot and the exact position where each fitting is to be fixed from the Engineer-in-Charge before carrying out the work.

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

5. Testing of materials:

The contractor, on completion, or whenever required by the Engineer-in-Charge, shall prove all materials and pipes, fittings, joints and other accessories etc. to be clear, clean, perfect in working conditions and strong enough to withstand the test so specified here-in-under different items of the specifications. For this purpose the contractor at his own expense, shall provide all instruments and suitable appliances and carry out the necessary test before the Engineer-in-Charge or his representative to his entire

satisfaction. The contractor shall rectify any defects as to the materials or workmanship, so noticed, and the defective portions re-tested at his expense. Till such time the test is completed an extra 10% of the bill amount shall be withheld from the contractor's running bill and same will be released only after testing, up to the entire satisfaction of the Engineer-in-Charge such material/works shall be replaced/redone if so required by Engineer in Charge.

6. **Lead:**

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

7. Specifications:

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

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

8. Civil works:

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

9. Safety:

The contractor shall be fully and solely responsible for making all the safety arrangements pertaining to the work. The contractor shall be fully responsible and liable in all respects for any accidents and subsequent legal consequences.

10. Interpretation:

The Engineer in Chief P.H.E.D., Bhopal shall be the sole deciding Authority as to the meaning, interpretation and implications of various provisions in this schedule of rates. His decision shall be final and binding on all concerned.

11. Award of Contract:-

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

12. 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] 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 9.56% from the rates. No work shall be done departmentally unless other wise permitted in writing by the competent authority as per manual provisions.

13. As per prevailing excise duty norms, duty exemption is on certain diameter of Water Supply Pipes. Therefore no excise duty is considered while computing the rates for cast iron pipes and A.C. Pressure pipe., it will be payable as per actual on producing the necessary certificate on this account to respective Executive Engineer of the Division where such work is executed after the award of the contract and after obtaining full excise duty 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 of 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 dept., mining dept., P& T dept., Electricity board or company district administration, PWD, WRD, Local Urban bodies etc. shall also be obtained by the contractor from the competent authority at his own cost. The contractor shall be fully responsible for any consequences for any lapse in this.

CHAPTER – I

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

Chapter – I

CAST IRON PIPES AND SPECIALS WITH SOCKET AND SPIGOT 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 measurements 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. **This USOR contains the rates of all the items without GST. GST shall be paid separately as per prevailing government norms as claimed by the contractor in his bill.**
All the estimates based on this USOR will include GST as an extra amount as per prevailing rates on the sum of the estimate to arrive at the gross amount.

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.**		**Class LA**	**Class A**	**Class** B
	80mm Dia	RM	1085.00	1179.00	1264.00
	100mm Dia	RM	1344.00	1480.00	1598.00
	125mm Dia	RM	1722.00	1879.00	2017.00
	150mm Dia	RM	2146.00	2352.00	2539.00
	200mm Dia	RM	3086.00	3348.00	3596.00
	250mm Dia	RM	4085.00	4448.00	4747.00
	300mm Dia	RM	5268.00	5759.00	6101.00
	350mm Dia	RM	6518.00	7070.00	7641.00
	400mm Dia	RM	7932.00	8668.00	9214.00
	50mm Dia	RM	9565.00	10508.00	11082.00
	500mm Dia	RM	11197.00	12198.00	12921.00
	600mm Dia	RM	14922.00	16291.00	17287.00
	700mm Dia	RM	18906.00	20656.00	22048.00
	750mm Dia	RM	20783.00	22721.00	24352.00
	800mm Dia	RM	29368.00	32293.00	35218.00

S.No.	Items	Unit	Rates in Rs.		
	900mm Dia	RM	35151.00	38678.00	42264.00
	1000mm Dia	RM	41451.00	45673.00	49718.00
1.2	**Labour for laying in position following socket & spigot cast iron (Spun) pipes.**		**Class LA**	**Class A**	**Class** B
	80mm Dia	RM	18.00	20.00	21.00
	100mm Dia	RM	22.00	25.00	27.00
	125mm Dia	RM	29.00	32.00	34.00
	150mm Dia	RM	36.00	40.00	43.00
	200mm Dia	RM	53.00	58.00	62.00
	250mm Dia	RM	72.00	78.00	83.00
	300mm Dia	RM	92.00	101.00	107.00
	350mm Dia	RM	116.00	126.00	134.00
	400mm Dia	RM	142.00	155.00	165.00
	450mm Dia	RM	171.00	188.00	198.00
	500mm Dia	RM	200.00	218.00	231.00
	600mm Dia	RM	267.00	291.00	309.00
	700mm Dia	RM	344.00	376.00	401.00
	750mm Dia	RM	385.00	421.00	452.00
	800mm Dia	RM	545.00	599.00	653.00
	900mm Dia	RM	664.00	731.00	799.00
	1000mm Dia	RM	799.00	880.00	958.00
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 Dia	Each	179.00	179.00	179.00
	100mm Dia	Each	236.00	236.00	236.00
	125mm Dia	Each	258.00	258.00	258.00
	150mm Dia	Each	347.00	347.00	347.00
	200mm Dia	Each	521.00	521.00	521.00
	250mm Dia	Each	631.00	631.00	631.00
	300mm Dia	Each	786.00	786.00	786.00
	350mm Dia	Each	845.00	845.00	845.00
	400mm Dia	Each	999.00	999.00	999.00
	450mm Dia	Each	1327.00	1327.00	1327.00
	500mm Dia	Each	1531.00	1531.00	1531.00
	600mm Dia	Each	1722.00	1722.00	1722.00
	700mm Dia	Each	2022.00	2022.00	2022.00
	750mm Dia	Each	2367.00	2367.00	2367.00
	800mm Dia	Each	2992.00	2992.00	2992.00
	900mm Dia	Each	3635.00	3635.00	3635.00

S.No.	Items	Unit	Rates in Rs.		
	1000mm Dia	Each	4281.00	4281.00	4281.00
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 Dia	Each	125.00	125.00	125.00
	100mm Dia	Each	172.00	172.00	172.00
	125mm Dia	Each	180.00	180.00	180.00
	150mm Dia	Each	250.00	250.00	250.00
	200mm Dia	Each	353.00	353.00	353.00
	250mm Dia	Each	423.00	423.00	423.00
	300mm Dia	Each	533.00	533.00	533.00
	350mm Dia	Each	603.00	603.00	603.00
	400mm Dia	Each	654.00	654.00	654.00
	450mm Dia	Each	885.00	885.00	885.00
	500mm Dia	Each	1058.00	1058.00	1058.00
	600mm Dia	Each	1129.00	1129.00	1129.00
	700mm Dia	Each	1334.00	1334.00	1334.00
	750mm Dia	Each	1570.00	1570.00	1570.00
	800mm Dia	Each	2117.00	2117.00	2117.00
	900mm Dia	Each	2663.00	2663.00	2663.00
	1000mm Dia	Each	3210.00	3210.00	3210.00
1.5	**Providing and laying in position following double socket cast iron 90° bend.**			**Medium Class**	**Heavy Class**
	80mm Dia	Each		1394.00	1597.00
	100mm Dia	Each		1975.00	2123.00
	125mm Dia	Each		2554.00	2786.00
	150mm Dia	Each		3391.00	3652.00
	200mm Dia	Each		5195.00	5652.00
	250mm Dia	Each		7303.00	8006.00
	300mm Dia	Each		9912.00	10861.00
	350mm Dia	Each		13261.00	14561.00
	400mm Dia	Each		16942.00	18637.00
	450mm Dia	Each		20990.00	23275.00
	500mm Dia	Each		26554.00	29373.00
	600mm Dia	Each		38027.00	42271.00
	700mm Dia	Each		52811.00	58799.00
	750mm Dia	Each		61569.00	68662.00
	800mm Dia	Each		72133.00	80436.00

S.No.	Items	Unit	Rates in Rs.		
	900mm Dia	Each		94857.00	106041.00
	1000mm Dia	Each		120928.00	135137.00
1.6	**Providing and laying in position following double socket cast iron 45° bend.**			**Medium Class**	**Heavy Class**
	80mm Dia	Each		1394.00	1597.00
	100mm Dia	Each		1975.00	2123.00
	125mm Dia	Each		2485.00	2717.00
	150mm Dia	Each		3253.00	3514.00
	200mm Dia	Each		4851.00	5307.00
	250mm Dia	Each		6753.00	7386.00
	300mm Dia	Each		9086.00	9898.00
	350mm Dia	Each		11910.00	12997.00
	400mm Dia	Each		15022.00	16362.00
	450mm Dia	Each		18430.00	20288.00
	500mm Dia	Each		22928.00	25107.00
	600mm Dia	Each		32054.00	35302.00
	700mm Dia	Each		43637.00	48061.00
	750mm Dia	Each		50405.00	55649.00
	800mm Dia	Each		58764.00	64792.00
	900mm Dia	Each		75870.00	83855.00
	1000mm Dia	Each		95755.00	105840.00
1.7	**Providing and laying in position following double socket cast iron 22½° bend.**			**Medium Class**	**Heavy Class**
	80mm Dia	Each		1188.00	1460.00
	100mm Dia	Each		1768.00	1917.00
	125mm Dia	Each		2210.00	2373.00
	150mm Dia	Each		2909.00	3101.00
	200mm Dia	Each		4369.00	4688.00
	250mm Dia	Each		5996.00	6423.00
	300mm Dia	Each		7848.00	8453.00
	350mm Dia	Each		10132.00	10934.00
	400mm Dia	Each		12675.00	13659.00
	450mm Dia	Each		15372.00	16662.00
	500mm Dia	Each		19017.00	20556.00
	600mm Dia	Each		26152.00	28405.00
	700mm Dia	Each		35175.00	38035.00
	750mm Dia	Each		40592.00	43916.00
	800mm Dia	Each		46818.00	50925.00
	900mm Dia	Each		59799.00	65082.00

S.No.	Items	Unit	Rates in Rs.		
	1000mm Dia	Each		74778.00	81378.00
1.8	**Providing and laying in position following double socket cast iron 11¼° bend.**			**Medium Class**	**Heavy Class**
	80mm Dia	Each		1257.00	1391.00
	100mm Dia	Each		1631.00	1779.00
	125mm Dia	Each		2072.00	2235.00
	150mm Dia	Each		2703.00	2895.00
	200mm Dia	Each		4025.00	4344.00
	250mm Dia	Each		5514.00	5873.00
	300mm Dia	Each		7229.00	7696.00
	350mm Dia	Each		9208.00	9868.00
	400mm Dia	Each		11466.00	12237.00
	450mm Dia	Each		13808.00	14884.00
	500mm Dia	Each		17097.00	18351.00
	600mm Dia	Each		23165.00	24920.00
	700mm Dia	Each		30695.00	33057.00
	750mm Dia	Each		35330.00	38085.00
	800mm Dia	Each		40631.00	43957.00
	900mm Dia	Each		51764.00	55767.00
	1000mm Dia	Each		64254.00	69147.00
1.9	**Providing and laying in position following all socket cast iron Tees (all sizes in Milimeters) Body x Branch Dia**			**Medium Class**	**Heavy Class**
	80x80	Each		1855.00	1991.00
	100x80	Each		2308.00	2346.00
	100x100	Each		2450.00	2601.00
	125x80	Each		2834.00	2914.00
	125x100	Each		2976.00	3169.00
	125x125	Each		3189.00	3425.00
	150x80	Each		3345.00	3552.00
	150x100	Each		3764.00	3808.00
	150x125	Each		3905.00	4064.00
	150x150	Each		4118.00	4455.00
	200x80	Each		5331.00	5796.00
	200x100	Each		5473.00	5938.00
	200x125	Each		5615.00	6080.00
	200x150	Each		5828.00	6293.00

S.No.	Items	Unit	Rates in Rs.		
	200x200	Each		6325.00	6790.00
	250x80	Each		7287.00	7934.00
	250x100	Each		7429.00	8076.00
	250x125	Each		7642.00	8288.00
	250x150	Each		7854.00	8501.00
	250x200	Each		8280.00	8927.00
	250x250	Each		8777.00	9495.00
	300x80	Each		9756.00	10656.00
	300x100	Each		9827.00	10727.00
	300x125	Each		10040.00	10940.00
	300x150	Each		10182.00	11082.00
	300x200	Each		10750.00	11650.00
	300x250	Each		11247.00	12217.00
	300x300	Each		11885.00	12856.00
	350x200	Each		13380.00	14607.00
	350x250	Each		13947.00	15174.00
	350x300	Each		14586.00	15813.00
	350x350	Each		15225.00	16523.00
	400x200	Each		16699.00	18249.00
	400x250	Each		17266.00	18817.00
	400x300	Each		17834.00	19456.00
	400x350	Each		18544.00	20166.00
	400x400	Each		19396.00	21017.00
	450x250	Each		21591.00	22199.00
	450x300	Each		22230.00	23147.00
	450x350	Each		22940.00	23975.00
	450x400	Each		23650.00	24992.00
	450x450	Each		24501.00	26570.00
	500x250	Each		25726.00	26528.00
	500x300	Each		26365.00	27476.00
	500x350	Each		27075.00	28304.00
	500x400	Each		27784.00	29392.00
	500x450	Each		28636.00	30899.00
	500x500	Each		29630.00	32373.00
	600x300	Each		36538.00	38547.00
	600x350	Each		37248.00	39375.00
	600x400	Each		38099.00	40534.00
	600x450	Each		38951.00	42112.00

S.No.	Items	Unit	Rates in Rs.		
	600x500	Each		39874.00	43445.00
	600x600	Each		42074.00	46169.00
	700x350	Each		50655.00	53427.00
	700x400	Each		51507.00	54657.00
	700x450	Each		52429.00	56306.00
	700x500	Each		53352.00	57639.00
	700x600	Each		55268.00	59866.00
	700x700	Each		57752.00	63091.00
	750x400	Each		59256.00	62677.00
	750x450	Each		60249.00	64326.00
	750x500	Each		61243.00	65800.00
	750x600	Each		63159.00	68099.00
	750x700	Each		65359.00	70898.00
	750x750	Each		66920.00	73220.00
	800x400	Each		68594.00	71690.00
	800x450	Each		69517.00	73339.00
	800x500	Each		70511.00	74742.00
	800x600	Each		72640.00	77254.00
	800x700	Each		74840.00	80124.00
	800x750	Each		75975.00	82020.00
	800x800	Each		77679.00	85044.00
	900x450	Each		89217.00	94062.00
	900x500	Each		90211.00	95466.00
	900x600	Each		92553.00	98332.00
	900x700	Each		94966.00	101344.00
	900x750	Each		96101.00	103241.00
	900x800	Each		97379.00	105697.00
	900x900	Each		100644.00	110389.00
	1000x500	Each		113324.00	120021.00
	1000x600	Each		115595.00	122746.00
	1000x700	Each		118434.00	126326.00
	1000x750	Each		119640.00	128293.00
	1000x800	Each		120989.00	130820.00
	1000x900	Each		123685.00	134803.00
	1000x1000	Each		127518.00	139998.00

S.No.	Items	Unit	Rates in Rs.		
1.10	**Providing and laying in position following all socketed cast iron crosses (all sizes in millimeter).**			**Medium Class**	**Heavy Class**
	80mm	Each		2289.00	2423.00
	100mm	Each		2938.00	3156.00
	125mm	Each		3861.00	4093.00
	150mm	Each		4974.00	5303.00
	200mm	Each		7535.00	8060.00
	250mm	Each		10468.00	11240.00
	300mm	Each		14110.00	15127.00
1.11	**Providing and laying in position following socket & spigot cast iron tapers (Reducer) (all sizes in mm).**			**Medium Class**	**Heavy Class**
	100x80	Each		1457.00	1494.00
	125x80	Each		1840.00	1849.00
	125x100	Each		1911.00	2104.00
	150x80	Each		2344.00	2609.00
	150x100	Each		2415.00	2680.00
	150x125	Each		2628.00	2715.00
	200x100	Each		3486.00	3880.00
	200x125	Each		3628.00	4022.00
	200x150	Each		3841.00	4235.00
	250x125	Each		4803.00	5237.00
	250x150	Each		4945.00	5450.00
	250x200	Each		5370.00	5946.00
	300x150	Each		6563.00	7249.00
	300x200	Each		7059.00	7817.00
	300x250	Each		7556.00	8146.00
	350x200	Each		8199.00	8422.00
	350x250	Each		8767.00	9282.00
	350x300	Each		9334.00	10301.00
	400x250	Each		10950.00	11411.00
	400x300	Each		11660.00	12501.00
	400x350	Each		12369.00	13471.00
	450x350	Each		14140.00	14820.00
	450x400	Each		14991.00	16120.00
	500x350	Each		16287.00	16665.00
	500x400	Each		17139.00	17966.00

S.No.	Items	Unit	Rates in Rs.		
	500x450	Each		18061.00	19686.00
	600x400	Each		22273.00	23288.00
	600x450	Each		23267.00	25080.00
	600x500	Each		24331.00	26696.00
	700x500	Each		29151.00	31309.00
	700x600	Each		31564.00	34459.00
	750x600	Each		35694.00	38362.00
	750x700	Each		38603.00	42297.00
1.12	**Providing and laying in position including testing following Double Socket cast iron tapers (reducer) (all sizes in mm)**			**Medium Class**	**Heavy Class**
	100x80	Each		1457.00	1636.00
	125x80	Each		1840.00	2275.00
	125x100	Each		1911.00	2601.00
	150x80	Each		2344.00	2893.00
	150x100	Each		2415.00	3106.00
	150x125	Each		2557.00	3212.00
	200x100	Each		3486.00	4093.00
	200x125	Each		3628.00	4377.00
	200x150	Each		1855.00	4661.00
	250x150	Each		4945.00	5663.00
	250x200	Each		5370.00	6372.00
	300x150	Each		6563.00	6895.00
	300x200	Each		7059.00	7533.00
	300x250	Each		7556.00	8005.00
	350x200	Each		8199.00	9345.00
	350x250	Each		8767.00	10559.00
	350x300	Each		9334.00	11933.00
	400x250	Each		10950.00	11837.00
	400x300	Each		11660.00	13211.00
	400x350	Each		12369.00	14536.00
	450x350	Each		14140.00	15529.00
	450x400	Each		14991.00	17114.00
	500x350	Each		16287.00	17446.00
	500x400	Each		17139.00	19101.00
	500x450	Each		18061.00	20821.00
	600x400	Each		22273.00	23998.00
	600x450	Each		23267.00	24654.00
	600x500	Each		24331.00	26625.00

S.No.	Items	Unit	Rates in Rs.		
	700x500	Each		29151.00	30599.00
	700x600	Each		31564.00	34459.00
	750x600	Each		35694.00	36801.00
	750x700	Each		38603.00	41091.00
1.13	**Providing and laying in position following cast iron collars**			**Medium Class**	**Heavy Class**
	80mm dia	Each		1188.00	1322.00
	100mm dia	Each		1493.00	1642.00
	125mm dia	Each		1866.00	2029.00
	150mm dia	Each		2428.00	2620.00
	200mm dia	Each		3475.00	3794.00
	250mm dia	Each		4619.00	5047.00
	300mm dia	Each		5990.00	6457.00
	350mm dia	Each		7501.00	8090.00
	400mm dia	Each		8977.00	9819.00
	450mm dia	Each		11177.00	12111.00
	500 mm dia	Each		13257.00	14369.00
	600 mm dia	Each		17334.00	18805.00
	700 mm dia	Each		22376.00	24168.00
	750 mm dia	Each		25446.00	27489.00
	800 mm dia	Each		29254.00	31583.00
	900 mm dia	Each		36333.00	39127.00
	1000mm dia	Each		44201.00	47459.00
1.14	**Providing and laying in position following cast iron socket caps.**				
	80mm dia	Each		293.00	381.00
	100mm dia	Each		392.00	510.00
	125mm dia	Each		421.00	547.00
	150mm dia	Each		570.00	741.00
	200mm dia	Each		860.00	1032.00
	250mm dia	Each		1041.00	1250.00
	300mm dia	Each		1311.00	1573.00
	350mm dia	Each		1386.00	1663.00
	400mm dia	Each		1653.00	1984.00
	450mm dia	Each		2146.00	2360.00
	500 mm dia	Each		2519.00	2771.00
	600 mm dia	Each		2756.00	3032.00
	700 mm dia	Each		3247.00	3572.00
	750 mm dia	Each		3828.00	4211.00
	800 mm dia	Each		5005.00	5406.00
	900 mm dia	Each		6182.00	6677.00
	1000 mm dia	Each		7366.00	7955.00

S.No.	Items	Unit	Rates in Rs.		
1.15	**Providing and laying in position following cast iron plugs.**			**Medium Class**	**Heavy Class**
	80mm dia	Each		431.00	565.00
	100mm dia	Each		599.00	747.00
	125mm dia	Each		765.00	928.00
	150mm dia	Each		1120.00	1312.00
	200mm dia	Each		1755.00	2005.00
	250mm dia	Each		2418.00	2776.00
	300mm dia	Each		3238.00	3636.00
	350mm dia	Each		4088.00	4606.00
	400mm dia	Each		5280.00	5837.00
	450mm dia	Each		6768.00	7560.00
	500 mm dia	Each		8279.00	9178.00
	600 mm dia	Each		11290.00	12476.00
	700 mm dia	Each		15407.00	16844.00
	750 mm dia	Each		18121.00	19738.00
	800 mm dia	Each		21716.00	23477.00
	900 mm dia	Each		28013.00	30096.00
	1000 mm dia	Each		35383.00	37788.00
1.16	**Providing and laying in position following sizes of socket & spigot or all socketed cast iron specials class MEDIUM or HEAVY which does not appear in above items of schedule.**			**Medium Class**	**Heavy Class**
	80mm to 300mm Dia	Kg		87.00	87.00
	Above 300mm Dia	Kg		84.00	84.00
1.17	**Labour for laying in position following double socket cast iron 45° bends.**			**Medium Class**	**Heavy Class**
	80mm dia	Each		34.00	38.00
	100mm dia	Each		49.00	51.00
	125mm dia	Each		63.00	68.00
	150mm dia	Each		82.00	87.00
	200mm dia	Each		122.00	131.00
	250mm dia	Each		175.00	188.00
	300mm dia	Each		238.00	255.00
	350mm dia	Each		312.00	335.00
	400mm dia	Each		397.00	426.00
	450mm dia	Each		483.00	523.00
	500 mm dia	Each		606.00	654.00
	600 mm dia	Each		869.00	945.00

S.No.	Items	Unit	Rates in Rs.		
	700 mm dia	Each		1198.00	1306.00
	750 mm dia	Each		1382.00	1511.00
	800 mm dia	Each		1595.00	1745.00
	900 mm dia	Each		2068.00	2272.00
	1000mm dia	Each		2623.00	2886.00
1.18	**Labour for laying in position following double socket cast Iron 90^0 bends**			**Medium Class**	**Heavy Class**
	80mm dia	Each		34.00	38.00
	100mm dia	Each		49.00	51.00
	125mm dia	Each		65.00	70.00
	150mm dia	Each		87.00	91.00
	200mm dia	Each		133.00	141.00
	250mm dia	Each		192.00	207.00
	300mm dia	Each		264.00	285.00
	350mm dia	Each		352.00	382.00
	400mm dia	Each		454.00	494.00
	450mm dia	Each		559.00	612.00
	500 mm dia	Each		713.00	781.00
	600 mm dia	Each		1047.00	1152.00
	700 mm dia	Each		1471.00	1625.00
	750 mm dia	Each		1713.00	1897.00
	800 mm dia	Each		1992.00	2209.00
	900 mm dia	Each		2631.00	2931.00
	1000mm dia	Each		3370.00	3756.00
1.19	**Labour for laying in position following double socket cast iron 22½°. bends.**			**Medium Class**	**Heavy Class**
	80mm dia	Each		27.00	34.00
	100mm dia	Each		42.00	44.00
	125mm dia	Each		55.00	57.00
	150mm dia	Each		72.00	74.00
	200mm dia	Each		108.00	112.00
	250mm dia	Each		152.00	158.00
	300mm dia	Each		200.00	211.00
	350mm dia	Each		260.00	274.00
	400mm dia	Each		327.00	346.00
	450mm dia	Each		392.00	416.00
	500 mm dia	Each		490.00	519.00
	600 mm dia	Each		694.00	741.00
	700 mm dia	Each		947.00	1009.00
	750 mm dia	Each		1091.00	1163.00
	800 mm dia	Each		1241.00	1334.00

S.No.	Items	Unit	Rates in Rs.		
	900 mm dia	Each		1591.00	1715.00
	1000mm dia	Each		2000.00	2161.00
1.20	**Labour for laying in position following double socket castiron 11¼ ° bends.**			**Medium Class**	**Heavy Class**
	80mm dia	Each		30.00	32.00
	100mm dia	Each		38.00	40.00
	125mm dia	Each		51.00	53.00
	150mm dia	Each		65.00	68.00
	200mm dia	Each		97.00	101.00
	250mm dia	Each		137.00	141.00
	300mm dia	Each		181.00	188.00
	350mm dia	Each		232.00	243.00
	400mm dia	Each		291.00	304.00
	450mm dia	Each		346.00	363.00
	500 mm dia	Each		433.00	454.00
	600 mm dia	Each		606.00	637.00
	700 mm dia	Each		814.00	861.00
	750 mm dia	Each		935.00	990.00
	800 mm dia	Each		1057.00	1127.00
	900 mm dia	Each		1353.00	1439.00
	1000mm dia	Each		1688.00	1798.00
1.21	**Labour for laying in position including testing following all socket cast iron, tees (all Sizes in mm)**			**Medium Class**	**Heavy Class**
	80x80	Each		46.00	49.00
	100x80	Each		57.00	59.00
	100x100	Each		61.00	63.00
	125x80	Each		72.00	76.00
	125x100	Each		76.00	80.00
	125x125	Each		82.00	87.00
	150x80	Each		91.00	95.00
	150x100	Each		95.00	99.00
	150x125	Each		99.00	106.00
	150x150	Each		106.00	112.00
	200x80	Each		133.00	141.00
	200x100	Each		137.00	146.00
	200x125	Each		141.00	150.00
	200x150	Each		148.00	156.00
	200x200	Each		162.00	171.00
	250x80	Each		186.00	198.00
	250x100	Each		190.00	203.00

S.No.	Items	Unit	Rates in Rs.		
	250x125	Each		196.00	209.00
	250x150	Each		203.00	215.00
	250x200	Each		215.00	228.00
	250x250	Each		230.00	245.00
	300x80	Each		251.00	270.00
	300x100	Each		253.00	272.00
	300x125	Each		260.00	279.00
	300x150	Each		264.00	283.00
	300x200	Each		281.00	300.00
	300x250	Each		295.00	317.00
	300x300	Each		314.00	335.00
	350x200	Each		357.00	384.00
	350x250	Each		373.00	401.00
	350x300	Each		392.00	420.00
	350x350	Each		411.00	441.00
	400x200	Each		447.00	483.00
	400x250	Each		464.00	500.00
	400x300	Each		481.00	519.00
	400x350	Each		502.00	540.00
	400x400	Each		528.00	565.00
	450x250	Each		578.00	622.00
	450x300	Each		597.00	641.00
	450x350	Each		618.00	663.00
	450x400	Each		639.00	684.00
	450x450	Each		665.00	711.00
	500x250	Each		690.00	751.00
	500x300	Each		709.00	770.00
	500x350	Each		730.00	791.00
	500x400	Each		751.00	814.00
	500x450	Each		776.00	840.00
	500x500	Each		806.00	871.00
	600x300	Each		1004.00	1099.00
	600x350	Each		1025.00	1120.00
	600x400	Each		1051.00	1146.00
	600x450	Each		1076.00	1173.00
	600x500	Each		1104.00	1201.00
	600x600	Each		1169.00	1270.00

S.No.	Items	Unit	Rates in Rs.		
	700x350	Each		1409.00	1538.00
	700x400	Each		1435.00	1566.00
	700x450	Each		1462.00	1595.00
	700x500	Each		1490.00	1623.00
	700x600	Each		1547.00	1677.00
	700x700	Each		1620.00	1756.00
	750x400	Each		1648.00	1804.00
	750x450	Each		1677.00	1834.00
	750x500	Each		1707.00	1865.00
	750x600	Each		1764.00	1922.00
	750x700	Each		1829.00	1988.00
	750x750	Each		1876.00	2036.00
	800x400	Each		1891.00	2072.00
	800x450	Each		1918.00	2102.00
	800x500	Each		1948.00	2131.00
	800x600	Each		2011.00	2194.00
	800x700	Each		2076.00	2262.00
	800x750	Each		2110.00	2298.00
	800x800	Each		2161.00	2351.00
	900x450	Each		2469.00	2718.00
	900x500	Each		2498.00	2747.00
	900x600	Each		2568.00	2821.00
	900x700	Each		2640.00	2893.00
	900x750	Each		2673.00	2929.00
	900x800	Each		2711.00	2965.00
	900x900	Each		2808.00	3066.00
	1000x500	Each		3150.00	3477.00
	1000x600	Each		3218.00	3547.00
	1000x700	Each		3302.00	3636.00
	1000x750	Each		3338.00	3674.00
	1000x800	Each		3378.00	3711.00
	1000x900	Each		3458.00	3792.00
	1000x1000	Each		3572.00	3908.00
1.22	**Labour for laying in position following all socket cast iron crosses. (all sizes in mm)**			**Medium Class**	**Heavy Class**
	80mm dia	Each		61.00	63.00

S.No.	Items	Unit	Rates in Rs.		
	100mm dia	Each		78.00	82.00
	125mm dia	Each		106.00	110.00
	150mm dia	Each		135.00	141.00
	200mm dia	Each		205.00	215.00
	250mm dia	Each		289.00	306.00
	300mm dia	Each		392.00	416.00
1.23	**Labour for laying in position including testing following socket and spigot cast iron tapers, (reducer) (all Sizes in mm)**			**Medium Class**	**Heavy Class**
	100x80	Each		32.00	34.00
	125x80	Each		42.00	44.00
	125x100	Each		44.00	49.00
	150x80	Each		53.00	57.00
	150x100	Each		55.00	59.00
	150x125	Each		61.00	65.00
	200x100	Each		78.00	84.00
	200x125	Each		82.00	89.00
	200x150	Each		89.00	95.00
	250x125	Each		112.00	118.00
	250x150	Each		116.00	124.00
	250x200	Each		129.00	139.00
	300x150	Each		156.00	169.00
	300x200	Each		171.00	186.00
	300x250	Each		186.00	205.00
	350x200	Each		203.00	219.00
	350x250	Each		219.00	238.00
	350x300	Each		236.00	260.00
	400x250	Each		276.00	302.00
	400x300	Each		298.00	325.00
	400x350	Each		319.00	350.00
	450x350	Each		357.00	390.00
	450x400	Each		382.00	420.00
	500x350	Each		409.00	445.00
	500x400	Each		435.00	475.00
	500x450	Each		462.00	506.00
	600x400	Each		580.00	633.00
	600x450	Each		610.00	667.00
	600x500	Each		641.00	703.00

S.No.	Items	Unit	Rates in Rs.		
	700x500	Each		770.00	840.00
	700x600	Each		842.00	922.00
	750x600	Each		947.00	1038.00
	750x700	Each		1034.00	1137.00
1.24	**Labour for laying in position including testing following Double Socket cast iron taper (reducer (all sizes in mm)**			**Medium Class**	**Heavy Class**
	100x80	Each		32.00	38.00
	125x80	Each		42.00	57.00
	125x100	Each		44.00	63.00
	150x80	Each		53.00	65.00
	150x100	Each		55.00	72.00
	150x125	Each		59.00	80.00
	200x100	Each		78.00	91.00
	200x125	Each		82.00	99.00
	200x150	Each		89.00	108.00
	250x150	Each		116.00	131.00
	250x200	Each		129.00	152.00
	300x150	Each		156.00	158.00
	300x200	Each		171.00	177.00
	300x250	Each		186.00	200.00
	350x200	Each		203.00	247.00
	350x250	Each		219.00	276.00
	350x300	Each		236.00	308.00
	400x250	Each		276.00	314.00
	400x300	Each		298.00	346.00
	400x350	Each		319.00	382.00
	450x350	Each		357.00	411.00
	450x400	Each		382.00	449.00
	500x350	Each		409.00	468.00
	500x400	Each		435.00	509.00
	500x450	Each		462.00	540.00
	600x400	Each		580.00	654.00
	600x450	Each		610.00	654.00
	600x500	Each		641.00	701.00
	700x500	Each		770.00	819.00
	700x600	Each		842.00	922.00
	750x600	Each		947.00	992.00
	750x700	Each		1034.00	1101.00

S.No.	Items	Unit	Rates in Rs.		
1.25	**Labour for laying in position including testing following cast Iron Collars**			**Medium Class**	**Heavy Class**
	80 mm Dia	Each		27.00	30.00
	100 mm Dia	Each		34.00	36.00
	125 mm Dia	Each		44.00	46.00
	150 mm Dia	Each		57.00	59.00
	200 mm Dia	Each		80.00	84.00
	250 mm Dia	Each		110.00	116.00
	300 mm Dia	Each		143.00	150.00
	350 mm Dia	Each		181.00	190.00
	400 mm Dia	Each		217.00	232.00
	450 mm Dia	Each		268.00	281.00
	500 mm Dia	Each		319.00	335.00
	600 mm Dia	Each		433.00	456.00
	700 mm Dia	Each		568.00	597.00
	750 mm Dia	Each		641.00	675.00
	800 mm Dia	Each		720.00	760.00
	900 mm Dia	Each		895.00	945.00
	1000 mm Dia	Each		1093.00	1154.00
1.26	**Labour for laying in position following socketed cast iron caps.**			**Medium Class**	**Heavy Class**
	80 mm Dia	Each		10.00	15.00
	100 mm Dia	Each		13.00	19.00
	125 mm Dia	Each		18.00	25.00
	150 mm Dia	Each		22.00	32.00
	200 mm Dia	Each		35.00	51.00
	250 mm Dia	Each		50.00	72.00
	300 mm Dia	Each		68.00	97.00
	350 mm Dia	Each		90.00	129.00
	400 mm Dia	Each		114.00	162.00
	450 mm Dia	Each		143.00	205.00
	500 mm Dia	Each		174.00	249.00
	600 mm Dia	Each		253.00	361.00
	700 mm Dia	Each		347.00	496.00
	750 mm Dia	Each		402.00	574.00
	800 mm Dia	Each		464.00	663.00
	900 mm Dia	Each		598.00	855.00
	1000 mm Dia	Each		759.00	1085.00

S.No.	Items	Unit	Rates in Rs.		
1.27	**Labour for laying in position including testing following cast iron plugs.**			**Medium Class**	**Heavy Class**
	80 mm Dia	Each		4.00	6.00
	100 mm Dia	Each		6.00	8.00
	125 mm Dia	Each		11.00	13.00
	150 mm Dia	Each		17.00	19.00
	200 mm Dia	Each		27.00	30.00
	250 mm Dia	Each		42.00	46.00
	300 mm Dia	Each		59.00	63.00
	350 mm Dia	Each		80.00	87.00
	400 mm Dia	Each		108.00	114.00
	450 mm Dia	Each		137.00	146.00
	500 mm Dia	Each		171.00	181.00
	600 mm Dia	Each		253.00	268.00
	700 mm Dia	Each		361.00	380.00
	750 mm Dia	Each		424.00	445.00
	800 mm Dia	Each		496.00	519.00
	900 mm Dia	Each		648.00	677.00
	1000 mm Dia	Each		831.00	867.00
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		2.00	2.00

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 measurements 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
8. **This USOR contains the rates of all the items without GST. GST shall be paid separately as per prevailing government norms as claimed by the contractor in his bill.**
   All the estimates based on this USOR will include GST as an extra amount as per prevailing rates on the sum of the estimate to arrive at the gross amount.

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.**				
			Class LA	**Class A**	**Class B**
	80mm Dia	Meter	1177.00	1205.00	1293.00
	100mm Dia	Meter	1448.00	1513.00	1634.00
	125mm Dia	Meter	1839.00	1921.00	2063.00
	150mm Dia	Meter	2281.00	2405.00	2596.00
	200mm Dia	Meter	3302.00	3424.00	3678.00
	250mm Dia	Meter	4347.00	4550.00	4857.00
	300mm Dia	Meter	5603.00	5891.00	6243.00
	350mm Dia	Meter	6907.00	7235.00	7251.00
	400mm Dia	Meter	8554.00	8869.00	9431.00
	450mm Dia	Meter	10283.00	10750.00	11345.00
	500mm Dia	Meter	11942.00	12481.00	13226.00
	600mm Dia	Meter	15853.00	16668.00	17695.00
	700mm Dia	Meter	20185.00	21139.00	22572.00
	750mm Dia	Meter	22186.00	23258.00	24935.00
	800mm Dia	Meter	30914.00	33053.00	36051.00
	900mm Dia	Meter	37003.00	39598.00	43275.00

S.No.	Items	Unit	Rates in Rs.		
	1000mm Dia	Meter	43575.00	46771.00	50923.00
2.2	**Labour for laying in position including testing following cast iron tyton pipes.**		**Class LA**	**Class- A**	**Class-B**
	80mm Dia	Meter	18.00	20.00	21.00
	100mm Dia	Meter	22.00	25.00	27.00
	125mm Dia	Meter	29.00	32.00	34.00
	150mm Dia	Meter	36.00	40.00	43.00
	200mm Dia	Meter	53.00	58.00	62.00
	250mm Dia	Meter	72.00	78.00	83.00
	300mm Dia	Meter	92.00	101.00	107.00
	350mm Dia	Meter	116.00	126.00	134.00
	400mm Dia	Meter	142.00	155.00	165.00
	450mm Dia	Meter	171.00	188.00	198.00
	500mm Dia	Meter	200.00	218.00	231.00
	600mm Dia	Meter	267.00	291.00	309.00
	700mm Dia	Meter	344.00	376.00	401.00
	750mm Dia	Meter	385.00	421.00	452.00
	800mm Dia	Meter	545.00	599.00	653.00
	900mm Dia	Meter	664.00	731.00	799.00
	1000mm Dia	Meter	799.00	880.00	958.00
2.3	**Providing tyton joints to following tyton pipes of class 'LA' 'A' and 'B' including testing of joints and cost of jointing materials (i.e. Rubber Gasket and Soap solution etc.).**				
	80mm Dia	Each			83.00
	100mm Dia	Each			92.00
	125mm Dia	Each			103.00
	150mm Dia	Each			117.00
	200mm Dia	Each			191.00
	250mm Dia	Each			228.00
	300mm Dia	Each			292.00
	350mm Dia	Each			335.00
	400mm Dia	Each			556.00
	450mm Dia	Each			640.00
	500mm Dia	Each			652.00
	600mm Dia	Each			808.00
	700mm Dia	Each			1123.00
	750mm Dia	Each			1233.00
	800mm Dia	Each			1306.00
	900mm Dia	Each			1566.00
	1000mm Dia	Each			1788.00

S.No.	Items	Unit	Rates in Rs.		
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 Dia	Each			55.00
	100mm Dia	Each			58.00
	125mm Dia	Each			61.00
	150mm Dia	Each			65.00
	200mm Dia	Each			68.00
	250mm Dia	Each			82.00
	300mm Dia	Each			88.00
	350mm Dia	Each			102.00
	400mm Dia	Each			132.00
	450mm Dia	Each			146.00
	500mm Dia	Each			156.00
	600mm Dia	Each			190.00
	700mm Dia	Each			222.00
	750mm Dia	Each			232.00
	800mm Dia	Each			246.00
	900mm Dia	Each			289.00
	1000mm Dia	Each			310.00

CHAPTER – III

CAST IRON PIPES AND SPECIALS WITH FLANGED JOINTS

Chapter – III
CAST IRON PIPES AND SPECIALS WITH FLANGED JOINTS

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 measurements 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.
6. **This USOR contains the rates of all the items without GST. GST shall be paid separately as per prevailing government norms as claimed by the contractor in his bill.**
   All the estimates based on this USOR will include GST as an extra amount as per prevailing rates on the sum of the estimate to arrive at the gross amount.

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

S.No.	ITEMS	Unit	Rates in Rs.	
3.1	**Providing, fixing and testing following double flanged cast iron (horizontal cast) pipe per IS : 7181 of *One Meter* length.**			
	80mm Dia	Each	1673.00	
	100mm Dia	Each	2140.00	
	125mm Dia	Each	2607.00	
	150mm Dia	Each	3216.00	
	200mm Dia	Each	4374.00	
	250mm Dia	Each	5841.00	
	300mm Dia	Each	7368.00	
	350mm Dia	Each	9136.00	
	400mm Dia	Each	11414.00	
	450mm Dia	Each	13828.00	
	500mm Dia	Each	15990.00	
	600mm Dia	Each	21160.00	
	700mm Dia	Each	27042.00	
	750mm Dia	Each	29447.00	
3.2	**Labour only for fixing including testing following double flanged cast iron (horizontal cast) pipe per IS : 7181 of *One Meter* length.**			
	80mm Dia	Each	128.00	
	100mm Dia	Each	139.00	
	125mm Dia	Each	152.00	
	150mm Dia	Each	166.00	

S.No.	ITEMS	Unit	Rates in Rs.	
	200mm Dia	Each	189.00	
	250mm Dia	Each	236.00	
	300mm Dia	Each	269.00	
	350mm Dia	Each	321.00	
	400mm Dia	Each	406.00	
	450mm Dia	Each	463.00	
	500mm Dia	Each	513.00	
	600mm Dia	Each	646.00	
	700mm Dia	Each	788.00	
	750mm Dia	Each	850.00	
3.3	**Providing, fixing including testing following double flanged cast iron (horizontal cast) pipe per IS : 7181 of *Two Meter* length.**			
	80mm Dia	Each	3036.00	
	100mm Dia	Each	3850.00	
	125mm Dia	Each	4779.00	
	150mm Dia	Each	5934.00	
	200mm Dia	Each	8244.00	
	250mm Dia	Each	10982.00	
	300mm Dia	Each	14024.00	
	350mm Dia	Each	17308.00	
	400mm Dia	Each	21431.00	
	450mm Dia	Each	25970.00	
	500mm Dia	Each	30087.00	
	600mm Dia	Each	39986.00	
	700mm Dia	Each	50911.00	
	750mm Dia	Each	55701.00	
3.4	**Labour only for fixing including testing following double flanged cast iron (horizontal cast) pipe per IS : 7181 of *Two Meter* length.**			
	80mm Dia	Each	146.00	
	100mm Dia	Each	161.00	
	125mm Dia	Each	181.00	
	150mm Dia	Each	202.00	
	200mm Dia	Each	242.00	
	250mm Dia	Each	307.00	
	300mm Dia	Each	361.00	
	350mm Dia	Each	438.00	
	400mm Dia	Each	548.00	
	450mm Dia	Each	634.00	
	500mm Dia	Each	713.00	
	600mm Dia	Each	913.00	
	700mm Dia	Each	1132.00	

S.No.	ITEMS	Unit	Rates in Rs.	
	750mm Dia	Each	1235.00	
3.5	**Providing, fixing including testing following double flanged cast iron (horizontal cast) pipe per IS : 7181 of *2.75 M* length.**			
	80mm Dia	Each	4045.00	
	100mm Dia	Each	5116.00	
	125mm Dia	Each	6386.00	
	150mm Dia	Each	7945.00	
	200mm Dia	Each	11106.00	
	250mm Dia	Each	14784.00	
	300mm Dia	Each	18946.00	
	350mm Dia	Each	23349.00	
	400mm Dia	Each	28838.00	
	450mm Dia	Each	34948.00	
	500mm Dia	Each	40509.00	
	600mm Dia	Each	53905.00	
	700mm Dia	Each	68554.00	
	750mm Dia	Each	75102.00	
3.6	**Labour only for fixing including testing following double flanged cast iron (horizontal cast) pipe per IS : 7181 of *2.75 Meter* length.**			
	80mm Dia	Each	146.00	
	100mm Dia	Each	161.00	
	125mm Dia	Each	181.00	
	150mm Dia	Each	202.00	
	200mm Dia	Each	242.00	
	250mm Dia	Each	307.00	
	300mm Dia	Each	361.00	
	350mm Dia	Each	438.00	
	400mm Dia	Each	548.00	
	450mm Dia	Each	634.00	
	500mm Dia	Each	713.00	
	600mm Dia	Each	913.00	
	700mm Dia	Each	1132.00	
	750mm Dia	Each	1235.00	
3.7	**Providing flanged joints to following double flanged cast iron (horizontal cast) pipes and specials class 'A' and 'B' including labour& cost of jointing materials (i.e. Bolt, Nuts and Rubber insertions) including testing of joint etc. complete**			

S.No.	ITEMS	Unit	Rates in Rs.	
	80mm Dia	Each	155.00	
	100mm Dia	Each	214.00	
	125mm Dia	Each	218.00	
	150mm Dia	Each	249.00	
	200mm Dia	Each	252.00	
	250mm Dia	Each	350.00	
	300mm Dia	Each	356.00	
	350mm Dia	Each	482.00	
	400mm Dia	Each	699.00	
	450mm Dia	Each	843.00	
	500mm Dia	Each	947.00	
	600mm Dia	Each	1167.00	
	700mm Dia	Each	1587.00	
	750mm Dia	Each	1597.00	
	800mm Dia	Each	1757.00	
	900mm Dia	Each	2104.00	
	1000mm Dia	Each	2475.00	
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	55.00	
	100mm Dia	Each	58.00	
	125mm Dia	Each	61.00	
	150mm Dia	Each	65.00	
	200mm Dia	Each	68.00	
	250mm Dia	Each	82.00	
	300mm Dia	Each	88.00	
	350mm Dia	Each	102.00	
	400mm Dia	Each	132.00	
	450mm Dia	Each	146.00	
	500mm Dia	Each	156.00	
	600mm Dia	Each	190.00	
	700mm Dia	Each	222.00	
	750mm Dia	Each	232.00	
	800mm Dia	Each	246.00	
	900mm Dia	Each	289.00	
	1000mm Dia	Each	310.00	

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 including testing following cast iron flanged sockets (all sizes in mm) confirming to IS 1538**		**Medium Class**	**Heavy Class**
	80mm Dia	Each	862.00	933.00
	100mm Dia	Each	1077.00	1149.00
	125mm Dia	Each	1364.00	1436.00
	150mm Dia	Each	1795.00	1867.00
	200mm Dia	Each	2585.00	2657.00
	250mm Dia	Each	4164.00	4452.00
	300mm Dia	Each	5313.00	5672.00
	350mm Dia	Each	6749.00	7180.00
	400mm Dia	Each	8329.00	8831.00
	450mm Dia	Each	9621.00	10196.00
	500mm Dia	Each	11703.00	12421.00
	600mm Dia	Each	15868.00	16801.00
	700mm Dia	Each	20750.00	21971.00
	750mm Dia	Each	23550.00	24915.00
	800mm Dia	Each	26536.00	28074.00
	900mm Dia	Each	32304.00	34177.00
	1000mm Dia	Each	39362.00	41645.00
3.11	**Providing and laying in position including testing following cast iron flanged spigot (tail piece)**			
	80mm Dia	Each	790.00	862.00
	100mm Dia	Each	933.00	1005.00
	125mm Dia	Each	1221.00	1364.00
	150mm Dia	Each	1508.00	1651.00
	200mm Dia	Each	2513.00	2800.00
	250mm Dia	Each	3375.00	3805.00
	300mm Dia	Each	4308.00	4882.00

S.No.	ITEMS	Unit	Rates in Rs.	
	350mm Dia	Each	5457.00	6103.00
	400mm Dia	Each	6606.00	7467.00
	450mm Dia	Each	7826.00	8831.00
	500mm Dia	Each	9334.00	10483.00
	600mm Dia	Each	14432.00	16299.00
	700mm Dia	Each	18740.00	21181.00
	750mm Dia	Each	21253.00	23981.00
	800mm Dia	Each	23689.00	23992.00
	900mm Dia	Each	28448.00	34136.00
	1000mm Dia	Each	34187.00	39130.00
3.12	**Providing and laying in position including testing following cast iron double flanged 90° bends (all sizes in mm)**		**Medium Class**	**Heavy Class**
	80mm Dia	Each	862.00	933.00
	100mm Dia	Each	1149.00	1651.00
	125mm Dia	Each	1508.00	2226.00
	150mm Dia	Each	2082.00	3518.00
	200mm Dia	Each	3231.00	5170.00
	250mm Dia	Each	4667.00	7180.00
	300mm Dia	Each	6462.00	9837.00
	350mm Dia	Each	8831.00	12996.00
	400mm Dia	Each	11632.00	16227.00
	450mm Dia	Each	18524.00	20822.00
	500mm Dia	Each	28146.00	31736.00
	600mm Dia	Each	40639.00	45880.00
	700mm Dia	Each	47962.00	54209.00
	750mm Dia	Each	56606.00	64054.00
	800mm Dia	Each	66691.00	75507.00
	900mm Dia	Each	87876.00	100028.00
	1000mm Dia	Each	115332.00	130993.00
3.13	**Providing and laying in position including testing following cast iron double flanged 45° bends (all sizes in mm)**			
	80mm Dia	Each	949.00	1005.00
	100mm Dia	Each	1220.00	1292.00
	125mm Dia	Each	1694.00	1795.00
	150mm Dia	Each	2304.00	2441.00
	200mm Dia	Each	3659.00	3877.00
	250mm Dia	Each	5420.00	5744.00
	300mm Dia	Each	7589.00	8042.00
	350mm Dia	Each	7792.00	8257.00
	400mm Dia	Each	10096.00	10698.00
	450mm Dia	Each	12535.00	13283.00

S.No.	ITEMS	Unit	Rates in Rs.	
	500mm Dia	Each	15652.00	16586.00
	600mm Dia	Each	23173.00	24556.00
	700mm Dia	Each	32862.00	34823.00
	750mm Dia	Each	38756.00	41070.00
3.14	**Providing and laying in position including testing following cast iron double flanged 90° Duck Foot Bend**		**Medium Class**	**Heavy Class**
	80mm Dia	Each	1436.00	1508.00
	100mm Dia	Each	1795.00	1867.00
	125mm Dia	Each	2441.00	2585.00
	150mm Dia	Each	3231.00	3375.00
	200mm Dia	Each	5026.00	5313.00
	250mm Dia	Each	7467.00	7970.00
	300mm Dia	Each	10483.00	11201.00
	350mm Dia	Each	14360.00	15365.00
	400mm Dia	Each	18812.00	20176.00
	450mm Dia	Each	23335.00	25130.00
	500mm Dia	Each	29725.00	32023.00
	600mm Dia	Each	45019.00	48609.00
3.15	**Providing and laying in position including testing following cast iron all flanged Tees (all sizes in mm) Body x Branch**		**Medium Class**	**Heavy Class**
	80x80	Each	1436.00	1508.00
	100x80	Each	1651.00	1795.00
	100x100	Each	1723.00	1867.00
	125x80	Each	2082.00	2298.00
	125x100	Each	2298.00	2441.00
	125x125	Each	2369.00	2585.00
	150x80	Each	2728.00	2944.00
	150x100	Each	2800.00	3016.00
	150x125	Each	2944.00	3231.00
	150x150	Each	3087.00	3375.00
	200x80	Each	4021.00	4452.00
	200x100	Each	4093.00	4523.00
	200x125	Each	4308.00	4739.00
	200x150	Each	4452.00	4882.00
	200x200	Each	4811.00	5313.00
	250x80	Each	5744.00	6390.00
	250x100	Each	5816.00	6462.00
	250x125	Each	6031.00	6677.00
	250x150	Each	6247.00	6893.00
	250x200	Each	6606.00	7324.00
	250x250	Each	7108.00	7826.00

S.No.	ITEMS	Unit	Rates in Rs.	
	300x80	Each	7826.00	8760.00
	300x100	Each	7970.00	8903.00
	300x125	Each	8113.00	9047.00
	300x150	Each	8329.00	9262.00
	300x200	Each	8760.00	9765.00
	300x250	Each	9262.00	10267.00
	300x300	Each	9765.00	10842.00
	350x200	Each	10914.00	12134.00
	350x250	Each	11201.00	12421.00
	350x300	Each	12206.00	13498.00
	350x350	Each	12565.00	14001.00
	400x200	Each	13570.00	15150.00
	400x250	Each	13857.00	15437.00
	400x300	Each	14934.00	16658.00
	400x350	Each	15365.00	17160.00
	400x400	Each	15868.00	17663.00
	450x250	Each	16658.00	18668.00
	450x300	Each	17735.00	19889.00
	450x350	Each	18165.00	20391.00
	450x400	Each	18596.00	20822.00
	450x450	Each	19027.00	21253.00
	500x250	Each	20176.00	22617.00
	500x300	Each	21396.00	23981.00
	500x350	Each	21899.00	24556.00
	500x400	Each	22402.00	25058.00
	500x450	Each	22832.00	25561.00
	500x500	Each	23335.00	26063.00
	600x300	Each	29725.00	33459.00
	600x350	Each	30443.00	34105.00
	600x400	Each	31018.00	34823.00
	600x450	Each	31448.00	35326.00
	600x500	Each	31951.00	35828.00
	600x600	Each	33100.00	37049.00
	700x350	Each	40926.00	46096.00
	700x400	Each	41500.00	46742.00
	700x450	Each	42147.00	47388.00
	700x500	Each	42721.00	48034.00
	700x600	Each	43870.00	49255.00
	700x700	Each	45378.00	50763.00
	750x400	Each	47532.00	53563.00
	750x450	Each	48106.00	54137.00
	750x500	Each	48896.00	54999.00
	750x600	Each	49829.00	55932.00
	750x700	Each	50763.00	56866.00
	800x400	Each	54712.00	61604.00

S.No.	ITEMS	Unit	Rates in Rs.	
	800x450	Each	55286.00	62251.00
	800x500	Each	55932.00	62969.00
	800x600	Each	57296.00	64405.00
	800x700	Each	58661.00	65769.00
	800x750	Each	59450.00	66630.00
	800x800	Each	60384.00	67564.00
	900x450	Each	69359.00	78334.00
	900x500	Each	70364.00	79411.00
	900x600	Each	71800.00	80990.00
	900x700	Each	73236.00	82498.00
	900x750	Each	74098.00	83360.00
	900x800	Each	74959.00	84221.00
	900x900	Each	76180.00	85442.00
3.16	**Providing and laying in position including testing following cast iron double flanged Tapers (all size in mm) Body x Branch**		**Medium Class**	**Heavy Class**
	100x80	Each	790.00	862.00
	125x80	Each	1292.00	1436.00
	125x100	Each	1436.00	1580.00
	150x80	Each	1508.00	1651.00
	150x100	Each	1651.00	1795.00
	150x125	Each	1795.00	1939.00
	200x100	Each	2082.00	2226.00
	200x125	Each	2226.00	2441.00
	200x150	Each	2441.00	2657.00
	250x125	Each	2728.00	2944.00
	250x150	Each	2872.00	3159.00
	250x200	Each	3303.00	3590.00
	300x150	Each	3375.00	3662.00
	300x200	Each	3805.00	4164.00
	300x250	Each	4308.00	4667.00
	350x200	Each	5672.00	6247.00
	350x250	Each	6247.00	6893.00
	350x300	Each	6893.00	7611.00
	400x250	Each	7036.00	7826.00
	400x300	Each	7754.00	8616.00
	400x350	Each	8544.00	9478.00
	450x300	Each	8401.00	9334.00
	450x350	Each	9406.00	10411.00
	450x400	Each	10267.00	11344.00
	500x350	Each	10339.00	11488.00
	500x400	Each	11273.00	12493.00
	500x450	Each	12062.00	13355.00

S.No.	ITEMS	Unit	Rates in Rs.	
	600x400	Each	13642.00	15078.00
	600x450	Each	14360.00	15940.00
	600x500	Each	15509.00	17160.00
	700x500	Each	18237.00	20176.00
	700x600	Each	20607.00	22761.00
	750x600	Each	21971.00	24268.00
	750x700	Each	23981.00	26422.00
	800x600	Each	24699.00	27284.00
	800x700	Each	26710.00	29438.00
	800x750	Each	27858.00	30730.00
	900x700	Each	29797.00	32884.00
	900x750	Each	31089.00	34320.00
	900X800	Each	33100.00	36474.00
	1000x800	Each	37192.00	40926.00
	1000x900	Each	40208.00	44301.00
3.17	**Providing and laying in position including testing following all flanged cast iron crosses (all sizes in mm)**			
	80mm Dia	Each	1795.00	1939.00
	100mm Dia	Each	2226.00	2441.00
	125mm Dia	Each	2944.00	3303.00
	150mm Dia	Each	3877.00	4308.00
	200mm Dia	Each	6031.00	6677.00
	250mm Dia	Each	8760.00	9693.00
	300mm Dia	Each	11847.00	12924.00
3.18	**Providing and laying in position including testing following all flanged cast iron blank flanges (all sizes in mm)**			
	80mm Dia	Each	323.00	359.00
	100mm Dia	Each	388.00	431.00
	125mm Dia	Each	517.00	574.00
	150mm Dia	Each	711.00	790.00
	200mm Dia	Each	1034.00	1149.00
	250mm Dia	Each	1486.00	1651.00
	300mm Dia	Each	2068.00	2298.00
	350mm Dia	Each	2779.00	3087.00
	400mm Dia	Each	3554.00	3949.00
	450mm Dia	Each	4330.00	4811.00
	500mm Dia	Each	5493.00	6103.00
	600mm Dia	Each	8142.00	9047.00
	700mm Dia	Each	11438.00	12709.00
	750mm Dia	Each	13376.00	14863.00
	800mm Dia	Each	15832.00	17591.00

S.No.	ITEMS	Unit	Rates in Rs.	
	900mm Dia	Each	20226.00	22473.00
	1000mm Dia	Each	26236.00	29151.00
3.19	**Labour for laying in position including testing following cast iron flanged sockets (all sizes in mm)**		**Medium Class**	**Heavy Class**
	80mm Dia	Each	25.00	27.00
	100mm Dia	Each	32.00	34.00
	125mm Dia	Each	40.00	42.00
	150mm Dia	Each	53.00	55.00
	200mm Dia	Each	76.00	78.00
	250mm Dia	Each	122.00	131.00
	300mm Dia	Each	156.00	167.00
	350mm Dia	Each	198.00	211.00
	400mm Dia	Each	245.00	260.00
	450mm Dia	Each	283.00	300.00
	500mm Dia	Each	344.00	365.00
	600mm Dia	Each	466.00	494.00
	700mm Dia	Each	610.00	646.00
	750mm Dia	Each	692.00	732.00
	800mm Dia	Each	780.00	825.00
	900mm Dia	Each	949.00	1004.00
	1000mm Dia	Each	1157.00	1224.00
3.20	**Labour for laying in position including testing following cast iron flanged Spigot (all sizes in mm)**		**Medium Class**	**Heavy Class**
	80mm Dia	Each	23.00	25.00
	100mm Dia	Each	27.00	30.00
	125mm Dia	Each	36.00	40.00
	150mm Dia	Each	44.00	49.00
	200mm Dia	Each	74.00	82.00
	250mm Dia	Each	99.00	112.00
	300mm Dia	Each	127.00	143.00
	350mm Dia	Each	160.00	179.00
	400mm Dia	Each	194.00	219.00
	450mm Dia	Each	230.00	260.00
	500mm Dia	Each	274.00	308.00
	600mm Dia	Each	424.00	479.00
	700mm Dia	Each	551.00	622.00
	750mm Dia	Each	625.00	705.00
	800mm Dia	Each	696.00	705.00
	900mm Dia	Each	836.00	1003.00
	1000mm Dia	Each	1005.00	1150.00

S.No.	ITEMS	Unit	Rates in Rs.	
3.21	**Labour for laying in position including testing following cast iron double flanged 90° Bend (all sizes in mm)**		**Medium Class**	**Heavy class**
	80mm Dia	Each	25.00	27.00
	100mm Dia	Each	34.00	49.00
	125mm Dia	Each	44.00	65.00
	150mm Dia	Each	61.00	103.00
	200mm Dia	Each	95.00	152.00
	250mm Dia	Each	137.00	211.00
	300mm Dia	Each	190.00	289.00
	350mm Dia	Each	260.00	382.00
	400mm Dia	Each	342.00	477.00
	450mm Dia	Each	544.00	612.00
	500mm Dia	Each	827.00	933.00
	600mm Dia	Each	1194.00	1348.00
	700mm Dia	Each	1409.00	1593.00
	750mm Dia	Each	1663.00	1882.00
	800mm Dia	Each	1960.00	2219.00
	900mm Dia	Each	2582.00	2940.00
	1000mm Dia	Each	3389.00	3850.00
3.22	**Labour for laying in position including testing following cast iron double flanged 45° bend (all sizes in mm)**			
	80mm Dia	Each	27.00	30.00
	100mm Dia	Each	34.00	38.00
	125mm Dia	Each	47.00	53.00
	150mm Dia	Each	65.00	72.00
	200mm Dia	Each	103.00	114.00
	250mm Dia	Each	152.00	169.00
	300mm Dia	Each	213.00	236.00
	350mm Dia	Each	218.00	243.00
	400mm Dia	Each	283.00	314.00
	450mm Dia	Each	351.00	390.00
	500mm Dia	Each	439.00	487.00
	600mm Dia	Each	649.00	722.00
	700mm Dia	Each	921.00	1023.00
	750mm Dia	Each	1086.00	1207.00
3.23	**Labour for laying in position including testing following cast iron double flanged 90° duck foot bend. (all sizes in mm)**		**Medium Class**	**Heavy Class**
	80mm Dia	Each	42.00	44.00
	100mm Dia	Each	53.00	55.00

S.No.	ITEMS	Unit	Rates in Rs.	
	125mm Dia	Each	72.00	76.00
	150mm Dia	Each	95.00	99.00
	200mm Dia	Each	148.00	156.00
	250mm Dia	Each	219.00	234.00
	300mm Dia	Each	308.00	329.00
	350mm Dia	Each	422.00	452.00
	400mm Dia	Each	553.00	593.00
	450mm Dia	Each	686.00	739.00
	500mm Dia	Each	874.00	941.00
	600mm Dia	Each	1323.00	1428.00
3.24	**Labour for laying in position including testing following cast iron all flanged tees (all sizes in mm) Body x Branch**		**Medium Class**	**Heavy Class**
	80x80	Each	42.00	44.00
	100x80	Each	49.00	53.00
	100x100	Each	51.00	55.00
	125x80	Each	61.00	68.00
	125x100	Each	68.00	72.00
	125x125	Each	70.00	76.00
	150x80	Each	80.00	87.00
	150x100	Each	82.00	89.00
	150x125	Each	87.00	95.00
	150x150	Each	91.00	99.00
	200x80	Each	118.00	131.00
	200x100	Each	120.00	133.00
	200x125	Each	127.00	139.00
	200x150	Each	131.00	143.00
	200x200	Each	141.00	156.00
	250x80	Each	169.00	188.00
	250x100	Each	171.00	190.00
	250x125	Each	177.00	196.00
	250x150	Each	184.00	203.00
	250x200	Each	194.00	215.00
	250x250	Each	209.00	230.00
	300x80	Each	230.00	257.00
	300x100	Each	234.00	262.00
	300x125	Each	238.00	266.00
	300x150	Each	245.00	272.00
	300x200	Each	257.00	287.00
	300x250	Each	272.00	302.00
	300x300	Each	287.00	319.00
	350x200	Each	321.00	357.00
	350x250	Each	329.00	365.00
	350x300	Each	359.00	397.00

S.No.	ITEMS	Unit	Rates in Rs.	
	350x350	Each	369.00	411.00
	400x200	Each	399.00	445.00
	400x250	Each	407.00	454.00
	400x300	Each	439.00	490.00
	400x350	Each	452.00	504.00
	400x400	Each	466.00	519.00
	450x250	Each	490.00	549.00
	450x300	Each	521.00	584.00
	450x350	Each	534.00	599.00
	450x400	Each	546.00	612.00
	450x450	Each	559.00	625.00
	500x250	Each	593.00	665.00
	500x300	Each	629.00	705.00
	500x350	Each	644.00	722.00
	500x400	Each	658.00	736.00
	500x450	Each	671.00	751.00
	500x500	Each	686.00	766.00
	600x300	Each	874.00	983.00
	600x350	Each	895.00	1002.00
	600x400	Each	912.00	1023.00
	600x450	Each	924.00	1038.00
	600x500	Each	939.00	1053.00
	600x600	Each	973.00	1089.00
	700x350	Each	1203.00	1355.00
	700x400	Each	1220.00	1374.00
	700x450	Each	1239.00	1393.00
	700x500	Each	1255.00	1412.00
	700x600	Each	1289.00	1447.00
	700x700	Each	1334.00	1492.00
	750x400	Each	1397.00	1574.00
	750x450	Each	1414.00	1591.00
	750x500	Each	1437.00	1616.00
	750X600	Each	1464.00	1644.00
	750x700	Each	1492.00	1671.00
	750x750	Each	1519.00	1699.00
	800x400	Each	1608.00	1810.00
	800x450	Each	1625.00	1829.00
	800x500	Each	1644.00	1850.00
	800x600	Each	1684.00	1893.00
	800x700	Each	1724.00	1933.00
	800x750	Each	1747.00	1958.00
	800x800	Each	1775.00	1986.00
	900x450	Each	2038.00	2302.00
	900x500	Each	2068.00	2334.00
	900x600	Each	2110.00	2380.00

S.No.	ITEMS	Unit	Rates in Rs.	
	900x700	Each	2152.00	2424.00
	900x750	Each	2178.00	2450.00
	900x800	Each	2203.00	2475.00
	900x900	Each	2239.00	2511.00
3.25	**Labour for laying in position including testing following cast iron double flanged Tapers (all sizes in mm)**			
	Body x Branch		**Medium Class**	**Heavy Class**
	100x80	Each	23.00	25.00
	125x80	Each	38.00	42.00
	125x100	Each	42.00	46.00
	150x80	Each	44.00	49.00
	150x100	Each	49.00	53.00
	150x125	Each	53.00	57.00
	200x100	Each	61.00	65.00
	200x125	Each	65.00	72.00
	200x150	Each	72.00	78.00
	250x125	Each	80.00	87.00
	250x150	Each	84.00	93.00
	250x200	Each	97.00	106.00
	300x150	Each	99.00	108.00
	300x200	Each	112.00	122.00
	300x250	Each	127.00	137.00
	350x200	Each	167.00	184.00
	350x250	Each	184.00	203.00
	350x300	Each	203.00	224.00
	400x250	Each	207.00	230.00
	400x300	Each	228.00	253.00
	400x350	Each	251.00	279.00
	450x300	Each	247.00	274.00
	450x350	Each	276.00	306.00
	450x400	Each	302.00	333.00
	500x350	Each	304.00	338.00
	500x400	Each	331.00	367.00
	500x450	Each	354.00	392.00
	600x400	Each	401.00	443.00
	600x450	Each	422.00	468.00
	600x500	Each	456.00	504.00
	700x500	Each	536.00	593.00
	700x600	Each	606.00	669.00
	750x600	Each	646.00	713.00
	750x700	Each	705.00	776.00
	800x600	Each	726.00	802.00

S.No.	ITEMS	Unit	Rates in Rs.	
	800x700	Each	785.00	865.00
	800x750	Each	819.00	903.00
	900x700	Each	876.00	966.00
	900x750	Each	914.00	1009.00
	900x800	Each	973.00	1072.00
	1000x800	Each	1093.00	1203.00
	1000x900	Each	1182.00	1302.00
3.26	**Labour for laying in position including testing following all flanged cast iron crosses (all sizes in mm)**		**Medium Class**	**Heavy Class**
	80mm Dia	Each	53.00	57.00
	100mm Dia	Each	65.00	72.00
	125mm Dia	Each	87.00	97.00
	150mm Dia	Each	114.00	127.00
	200mm Dia	Each	177.00	196.00
	250mm Dia	Each	257.00	285.00
	300mm Dia	Each	348.00	380.00
3.27	**Labour for laying in position including testing following cast iron blank flanges (all sizes in mm)**			
	80mm Dia	Each	9.00	11.00
	100mm Dia	Each	11.00	13.00
	125mm Dia	Each	15.00	17.00
	150mm Dia	Each	21.00	23.00
	200mm Dia	Each	30.00	34.00
	250mm Dia	Each	44.00	49.00
	300mm Dia	Each	61.00	68.00
	350mm Dia	Each	82.00	91.00
	400mm Dia	Each	104.00	116.00
	450mm Dia	Each	127.00	141.00
	500mm Dia	Each	161.00	179.00
	600mm Dia	Each	239.00	266.00
	700mm Dia	Each	336.00	373.00
	750mm Dia	Each	393.00	437.00
	800mm Dia	Each	465.00	517.00
	900mm Dia	Each	594.00	660.00
	1000mm Dia	Each	771.00	857.00
3.28	**Providing and laying in position including testing 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**

S.No.	ITEMS	Unit	Rates in Rs.	
	80mm to 300mm dia	Kg	62.00	62.00
	Above 300mm dia	Kg	71.00	71.00
3.29	**Labour for laying in position including testing following sizes of flanges, cast iron standard specials which does not appear in above items of the schedule**			
	80mm to 750mm dia	Kg	2.00	2.00
3.30	**Labour only for laying including testing 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 WITH (TYTON JOINTS) VALVES AND SPECIALS

Chapter – IV
DUCTILE IRON PRESSURE PIPES WITH (TYTON JOINTS) VALVES AND SPECIALS

NOTES:

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

2 The jointing materials i.e. Tyton rings if supplied by the Department from departmental store, no extra charges for carting of the same to site of work will be payable. In case jointing materials are required to be arranged by the contractor the same should confirm to relevant Indian standard duly inspected and tested and bearing B.I.S. certification Mark.

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

4 The rates include provision and use of all coverings etc. to protect the work from inclement weather etc. and from damages from falling materials and other causes.

5 The rate include provision of handling, storing under cover as required and returning of empty cases or container to Public Health Engineering Department Stores without any extra cost, for such materials as may be supplied by the department.

6 All measurements should be of the finished work.

7 Fitting must of superior quality & equivalent to Kiswak /Electrosteel /Kejriwal /Jindal.

8 Rates include the supply of pipes and specials at departmental store/site store.

9 Works will be executed in accordance with the general specifications in vogue in P.H.E. Department and the specials notes if any, covered in the contract agreement of the work and all the relevant latest version of I.S. Specifications as detailed below;

S.No.	I.S. Number	Title
1.	IS 8329:2000	Centrifugally cast (spun) ductile iron pressure pipes for water, gas and sewage (Third revision)
2.	IS 9523:2000	Ductile Iron fittings for pressure pipes for water, gas and sewage.
3.	IS 12288:1987	Code of practice for use and laying of ductile iron pipes.
4.	IS 5328:1985	Rubber sealing rings for gas mains, water mains and sewage (First revision)
5.	IS 14846:2000	The Sluice Valves (50-1200 mm size)
6.	IS 14845: 2000	The resilient seated C.I. Air relief valve
7.	IS 5312: 2004	The Swing check type reflux valves

	(Part I & II)	
8.	**IS 13095:1991**	**The Butter fly valves**

10. **This USOR contains the rates of all the items without GST. GST shall be paid separately as per prevailing government norms as claimed by the contractor in his bill.**

All the estimates based on this USOR will include GST as an extra amount as per prevailing rates on the sum of the estimate to arrive at the gross amount.

DUCTILE IRON PRESSURE PIPES WITH (TYTON JOINTS) VALVES AND SPECIALS

S. No.	Items	Unit	Rates in Rs.
4.1	**Providing, laying and jointing including testing 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**		
	100mm Dia	Metre	927.00
	150mm Dia	Metre	1302.00
	200mm Dia	Metre	1704.00
	250mm Dia	Metre	2246.00
	300mm Dia	Metre	2860.00
	350mm Dia	Metre	3438.00
	400mm Dia	Metre	4167.00
	450mm Dia	Metre	4949.00
	500mm Dia	Metre	5930.00
	600mm Dia	Metre	7732.00
	700mm Dia	Metre	10731.00
	750mm Dia	Metre	12111.00
	800mm Dia	Metre	13594.00
	900mm Dia	Metre	16539.00
	1000mm Dia	Metre	19889.00
4.2	**Labour for laying in position including testing following socket & spigot Ductile Iron(K-7) pressure pipes**		
	100mm Dia	Metre	21.00
	150mm Dia	Metre	29.00
	200mm Dia	Metre	44.00
	250mm Dia	Metre	58.00
	300mm Dia	Metre	73.00
	350mm Dia	Metre	97.00
	400mm Dia	Metre	116.00

S. No.	Items	Unit	Rates in Rs.
	450mm Dia	Metre	137.00
	500mm Dia	Metre	160.00
	600mm Dia	Metre	211.00
	700mm Dia	Metre	268.00
	750mm Dia	Metre	351.00
	800mm Dia	Metre	445.00
	900mm Dia	Metre	547.00
	1000mm Dia	Metre	660.00
4.3	**Providing, laying and jointing including testing 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**		
	100mm Dia	Metre	1041.00
	150mm Dia	Metre	1469.00
	200mm Dia	Metre	2003.00
	250mm Dia	Metre	2679.00
	300mm Dia	Metre	3404.00
	350mm Dia	Metre	4124.00
	400mm Dia	Metre	4972.00
	450mm Dia	Metre	5887.00
	500mm Dia	Metre	6987.00
	600mm Dia	Metre	9113.00
	700mm Dia	Metre	11969.00
	750mm Dia	Metre	13263.00
	800mm Dia	Metre	14518.00
	900mm Dia	Metre	17654.00
	1000mm Dia	Metre	21213.00
4.4	**Labour for laying in position including testing following socket & spigot Ductile Iron (K-9) pressure pipes**	Metre	
	100mm Dia	Metre	21.00
	150mm Dia	Metre	29.00
	200mm Dia	Metre	44.00
	250mm Dia	Metre	58.00
	300mm Dia	Metre	73.00
	350mm Dia	Metre	97.00
	400mm Dia	Metre	116.00
	450mm Dia	Metre	137.00
	500mm Dia	Metre	160.00

S. No.	Items	Unit	Rates in Rs.
	600mm Dia	Metre	211.00
	700mm Dia	Metre	268.00
	750mm Dia	Metre	351.00
	800mm Dia	Metre	445.00
	900mm Dia	Metre	547.00
	1000mm Dia	Metre	660.00
4.5	**Providing Rubber ISI marked Gasket (push on) joint as per IS-5382/85 to following DI pipes class K-7 and K-9 including testing of joints and cost of jointing materials (Rubber Gasket and soap solution etc.)**		
	100mm Dia	Each	92.00
	150mm Dia	Each	117.00
	200mm Dia	Each	191.00
	250mm Dia	Each	228.00
	300mm Dia	Each	292.00
	350mm Dia	Each	335.00
	400mm Dia	Each	556.00
	450mm Dia	Each	640.00
	500mm Dia	Each	652.00
	600mm Dia	Each	808.00
	700mm Dia	Each	1123.00
	750mm Dia	Each	1233.00
	800mm Dia	Each	1306.00
	900mm Dia	Each	1566.00
	1000mm Dia	Each	1788.00
4.6	**Labour for providing including testing,Rubber Gasket (push on) joints to following D.I. Pipes class K-7 & K-9 including joints but excluding cost of Rubber Gasket.**		
	100mm Dia	Each	58.00
	150mm Dia	Each	65.00
	200mm Dia	Each	68.00
	250mm Dia	Each	82.00
	300mm Dia	Each	88.00
	350mm Dia	Each	102.00
	400mm Dia	Each	132.00
	450mm Dia	Each	146.00
	500mm Dia	Each	156.00

S. No.	Items	Unit	Rates in Rs.
	600mm Dia	Each	190.00
	700mm Dia	Each	222.00
	750mm Dia	Each	232.00
	800mm Dia	Each	246.00
	900mm Dia	Each	289.00
	1000mm Dia	Each	310.00
	DUCTILE IRON FITTING PN- 16 Note:- If PN-10 fitting is used than 90% of rate is payable in payable for providing and fixing of fitting.		
4.7	**Providing and Laying including testing ductile iron PN 16 type flanged sockets conforming to IS-9523/2000 having dimension as per table 23 of IS-9523/2000 in the following nominal diameter/sizes with external bitumen coating and internal cement mortar lining with finishing as per clause 13 of IS-9523/2000.**		
	100mm	Each	1016.00
	150mm	Each	1581.00
	200mm	Each	2371.00
	250mm	Each	3162.00
	300mm	Each	4178.00
	350mm	Each	6497.00
	400mm	Each	8256.00
	450mm	Each	10286.00
	500mm	Each	12993.00
	600mm	Each	17847.00
	700mm	Each	28380.00
	750mm	Each	31115.00
	800mm	Each	37783.00
	900mm	Each	47015.00
	1000mm	Each	60863.00
4.8	**Labour only for Laying including testing Ductile Iron PN 16 type flanged sockets conforming to IS-9523/2000 having dimension as per table 23 of IS-9523/2000 in the following nominal diameter/sizes with external bitumen coating and internal cement mortar lining with finishing as per clause 13 of IS-9523/2000.**		
	100mm	Each	19.00
	150mm	Each	30.00
	200mm	Each	44.00

S. No.	Items	Unit	Rates in Rs.
	250mm	Each	59.00
	300mm	Each	78.00
	350mm	Each	101.00
	400mm	Each	129.00
	450mm	Each	160.00
	500mm	Each	203.00
	600mm	Each	260.00
	700mm	Each	350.00
	750mm	Each	384.00
	800mm	Each	466.00
	900mm	Each	580.00
	1000mm	Each	751.00
4.9	**Providing and Laying including testing ductile PN 16 type iron flanged spigot conforming to IS-9523/2000 having dimension as per table 24 of IS-9523/2000 in the following nominal diameter/sizes with external bitumen coating and internal cement mortar lining with finishing as per clause 13 of IS-9523/2000.**		
	100mm	Each	1129.00
	150mm	Each	1807.00
	200mm	Each	2597.00
	250mm	Each	3613.00
	300mm	Each	4743.00
	350mm	Each	7579.00
	400mm	Each	9474.00
	450mm	Each	11910.00
	500mm	Each	14888.00
	600mm	Each	21520.00
	700mm	Each	33509.00
	750mm	Each	37954.00
	800mm	Each	42399.00
	900mm	Each	50776.00
	1000mm	Each	63428.00
4.10	**Labour only for Laying including testing Ductile Iron PN 16 type flanged Spigot conforming to IS-9523/2000 having dimension as per table 24 of IS-9523/2000 in the following nominal diameter/sizes with external bitumen coating and internal cement mortar lining with finishing as per clause 13 of IS-9523/2000.**		
	100mm	Each	21.00

S. No.	Items	Unit	Rates in Rs.
	150mm	Each	34.00
	200mm	Each	49.00
	250mm	Each	68.00
	300mm	Each	89.00
	350mm	Each	118.00
	400mm	Each	148.00
	450mm	Each	186.00
	500mm	Each	232.00
	600mm	Each	335.00
	700mm	Each	414.00
	750mm	Each	468.00
	800mm	Each	523.00
	900mm	Each	627.00
	1000mm	Each	783.00
4.11	**Providing and Laying including testing 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	2087.00
	150mm	Each	3072.00
	200mm	Each	3970.00
	250mm	Each	5986.00
	300mm	Each	7019.00
	350mm	Each	11152.00
	400mm	Each	13649.00
	450mm	Each	15606.00
	500mm	Each	18402.00
	600mm	Each	23356.00
	700mm	Each	43733.00
	750mm	Each	48903.00
	800mm	Each	55546.00
	900mm	Each	65344.00
	1000mm	Each	84234.00
4.12	**Labour only for Laying including testing 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	46.00

S. No.	Items	Unit	Rates in Rs.
	150mm	Each	65.00
	200mm	Each	82.00
	250mm	Each	118.00
	300mm	Each	137.00
	350mm	Each	190.00
	400mm	Each	222.00
	450mm	Each	253.00
	500mm	Each	295.00
	600mm	Each	371.00
	700mm	Each	557.00
	750mm	Each	620.00
	800mm	Each	701.00
	900mm	Each	817.00
	1000mm	Each	1021.00
4.13	**Providing and Laying including testing 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	1126.00
	150 mm	Each	2047.00
	200mm	Each	3276.00
	250mm	Each	4709.00
	300mm	Each	6654.00
	350mm	Each	11316.00
	400mm	Each	14698.00
	450mm	Each	19120.00
	500mm	Each	24323.00
	600mm	Each	32922.00
	700mm	Each	50249.00
	750mm	Each	62395.00
	800mm	Each	66920.00
	900mm	Each	88649.00
	1000mm	Each	110139.00
4.14	**Labour only for Laying including testing 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.**		

S. No.	Items	Unit	Rates in Rs.
	100mm	Each	23.00
	150 mm	Each	42.00
	200mm	Each	68.00
	250mm	Each	97.00
	300mm	Each	137.00
	350mm	Each	184.00
	400mm	Each	238.00
	450mm	Each	310.00
	500mm	Each	395.00
	600mm	Each	601.00
	700mm	Each	848.00
	750mm	Each	994.00
	800mm	Each	1179.00
	900mm	Each	1572.00
	1000mm	Each	2034.00
4.15	**Providing and Laying including testing 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	1024.00
	125mm	Each	1331.00
	150 mm	Each	1638.00
	200mm	Each	2662.00
	250mm	Each	3685.00
	300mm	Each	5016.00
	350mm	Each	8455.00
	400mm	Each	10666.00
	450mm	Each	13917.00
	500mm	Each	17559.00
	600mm	Each	26534.00
	700mm	Each	45654.00
	750mm	Each	52828.00
	800mm	Each	62611.00
	900mm	Each	82666.00
	1000mm	Each	106145.00
4.16	**Labour only for Laying including testing 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.**		

S. No.	Items	Unit	Rates in Rs.
	100mm	Each	21.00
	125mm	Each	27.00
	150 mm	Each	34.00
	200mm	Each	55.00
	250mm	Each	76.00
	300mm	Each	103.00
	350mm	Each	137.00
	400mm	Each	173.00
	450mm	Each	226.00
	500mm	Each	285.00
	600mm	Each	430.00
	700mm	Each	591.00
	750mm	Each	684.00
	800mm	Each	810.00
	900mm	Each	1070.00
	1000mm	Each	1374.00
4.17	**Providing and Laying including testing 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	921.00
	125mm	Each	1228.00
	150 mm	Each	1433.00
	200mm	Each	2252.00
	250mm	Each	3173.00
	300mm	Each	4197.00
	350mm	Each	6764.00
	400mm	Each	8715.00
	450mm	Each	11056.00
	500mm	Each	13917.00
	600mm	Each	20358.00
	700mm	Each	34892.00
	750mm	Each	40110.00
	800mm	Each	47447.00
	900mm	Each	61469.00
	1000mm	Each	74676.00

S. No.	Items	Unit	Rates in Rs.
4.18	**Labour only for Laying including testing 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	19.00
	125mm	Each	25.00
	150 mm	Each	30.00
	200mm	Each	46.00
	250mm	Each	65.00
	300mm	Each	87.00
	350mm	Each	110.00
	400mm	Each	141.00
	450mm	Each	179.00
	500mm	Each	226.00
	600mm	Each	331.00
	700mm	Each	452.00
	750mm	Each	519.00
	800mm	Each	614.00
	900mm	Each	795.00
	1000mm	Each	966.00
4.19	**Providing and Laying including testing 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	921.00
	125mm	Each	1126.00
	150 mm	Each	1331.00
	200mm	Each	2150.00
	250mm	Each	2866.00
	300mm	Each	3788.00
	350mm	Each	5983.00
	400mm	Each	7414.00
	450mm	Each	9495.00
	500mm	Each	11836.00
	600mm	Each	17299.00
	700mm	Each	28697.00
	750mm	Each	32773.00
	800mm	Each	39458.00
	900mm	Each	52719.00
	1000mm	Each	62611.00

S. No.	Items	Unit	Rates in Rs.
4.20	**Labour only for Laying including testing 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	19.00
	125mm	Each	23.00
	150 mm	Each	27.00
	200mm	Each	44.00
	250mm	Each	59.00
	300mm	Each	78.00
	350mm	Each	97.00
	400mm	Each	120.00
	450mm	Each	154.00
	500mm	Each	192.00
	600mm	Each	281.00
	700mm	Each	371.00
	750mm	Each	424.00
	800mm	Each	511.00
	900mm	Each	652.00
	1000mm	Each	810.00
4.21	**Providing and Laying including testing 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	1433.00
	100mm x 100mm	Each	1536.00
	150mm x 80mm	Each	1945.00
	150mm x 100mm	Each	2150.00
	150mm x 150mm	Each	2457.00
	200mm x 80mm	Each	2866.00
	200mm x 100mm	Each	3071.00
	200mm x 150mm	Each	3574.00
	200mm x 200mm	Each	4095.00
	250mm x 80mm	Each	3685.00
	250mm x 100mm	Each	3890.00
	250mm x 150mm	Each	4402.00

S. No.	Items	Unit	Rates in Rs.
	250mm x 250mm	Each	5630.00
	300mm x 100mm	Each	5016.00
	300mm x 200mm	Each	6347.00
	300mm x 300mm	Each	7882.00
4.22	**Labour only for Laying including testing 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	30.00
	100mm x 100mm	Each	32.00
	150mm x 80mm	Each	40.00
	150mm x 100mm	Each	44.00
	150mm x 150mm	Each	51.00
	200mm x 80mm	Each	59.00
	200mm x 100mm	Each	63.00
	200mm x 150mm	Each	72.00
	200mm x 200mm	Each	84.00
	250mm x 80mm	Each	76.00
	250mm x 100mm	Each	80.00
	250mm x 150mm	Each	91.00
	250mm x 250mm	Each	116.00
	300mm x 100mm	Each	103.00
	300mm x 200mm	Each	131.00
	300mm x 300mm	Each	162.00
4.23	**Providing and Laying including testing 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	1694.00
	100mm x 100mm	Each	1807.00
	150mm x 80mm	Each	2371.00
	150mm x 100mm	Each	2484.00
	150mm x 150mm	Each	3049.00

S. No.	Items	Unit	Rates in Rs.
	200mm x 80mm	Each	3275.00
	200mm x 100mm	Each	3501.00
	200mm x 150mm	Each	4065.00
	200mm x 200mm	Each	4743.00
	250mm x 80mm	Each	4178.00
	250mm x 100mm	Each	4404.00
	250mm x 150mm	Each	5081.00
	250mm x 200mm	Each	5759.00
	250mm x 250mm	Each	6662.00
	300mm x 80mm	Each	5432.00
	300mm x 100mm	Each	5646.00
	300mm x 150mm	Each	6436.00
	300mm x 200mm	Each	7227.00
	300mm x 250mm	Each	8243.00
	300mm x 300mm	Each	9372.00
	350mm x 100mm	Each	8121.00
	350mm x 200mm	Each	10151.00
	350mm x 350mm	Each	14617.00
	400mm x 80mm	Each	9204.00
	400mm x 100mm	Each	9745.00
	400mm x 150mm	Each	10963.00
	400mm x 200mm	Each	12011.00
	400mm x 300mm	Each	15023.00
	400mm x 400mm	Each	18813.00
	450mm x 100mm	Each	12046.00
	450mm x 250mm	Each	16242.00
	500mm x 100mm	Each	14482.00
	500mm x 200mm	Each	17460.00
	500mm x 400mm	Each	25174.00
	500mm x 500mm	Each	30724.00
	600mm x 200mm	Each	24092.00
4.24	**Labour only for Laying including testing 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	32.00
	100mm x 100mm	Each	34.00
	150mm x 80mm	Each	44.00

S. No.	Items	Unit	Rates in Rs.
	150mm x 100mm	Each	46.00
	150mm x 150mm	Each	57.00
	200mm x 80mm	Each	61.00
	200mm x 100mm	Each	65.00
	200mm x 150mm	Each	76.00
	200mm x 200mm	Each	89.00
	250mm x 80mm	Each	78.00
	250mm x 100mm	Each	82.00
	250mm x 150mm	Each	95.00
	250mm x 200mm	Each	108.00
	250mm x 250mm	Each	124.00
	300mm x 80mm	Each	101.00
	300mm x 100mm	Each	106.00
	300mm x 150mm	Each	120.00
	300mm x 200mm	Each	135.00
	300mm x 250mm	Each	154.00
	300mm x 300mm	Each	175.00
	350mm x 100mm	Each	127.00
	350mm x 200mm	Each	158.00
	350mm x 350mm	Each	228.00
	400mm x 80mm	Each	143.00
	400mm x 100mm	Each	152.00
	400mm x 150mm	Each	171.00
	400mm x 200mm	Each	188.00
	400mm x 300mm	Each	234.00
	400mm x 400mm	Each	293.00
	450mm x 100mm	Each	188.00
	450mm x 250mm	Each	253.00
	500mm x 100mm	Each	226.00
	500mm x 200mm	Each	272.00
	500mm x 400mm	Each	392.00
	500mm x 500mm	Each	479.00
	600mm x 200mm	Each	376.00
4.25	**Providing and Laying including testing 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	823.00
	150mm x 80mm	Each	1333.00
	150mm x 100mm	Each	1331.00
	200mm x 100mm	Each	2043.00

S. No.	Items	Unit	Rates in Rs.
	200mm x 150mm	Each	1951.00
	250mm x 150mm	Each	2764.00
	300mm x 150mm	Each	3777.00
	300mm x 200mm	Each	3886.00
	300mm x 250mm	Each	3593.00
	350mm x 200mm	Each	6373.00
	350mm x 250mm	Each	6115.00
	350mm x 300mm	Each	5868.00
	400mm x 250mm	Each	8066.00
	400mm x 300mm	Each	7678.00
	400mm x 350mm	Each	7179.00
	450mm x 350mm	Each	9499.00
	450mm x 400mm	Each	9004.00
	500mm x 350mm	Each	12256.00
	500mm x 400mm	Each	11667.00
	600mm x 400mm	Each	18113.00
	600mm x 500mm	Each	16908.00
4.26	**Labour only for laying including testing 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	21.00
	150mm x 80mm	Each	30.00
	150mm x 100mm	Each	27.00
	200mm x 100mm	Each	38.00
	200mm x 150mm	Each	46.00
	250mm x 150mm	Each	57.00
	300mm x 150mm	Each	68.00
	300mm x 200mm	Each	76.00
	300mm x 250mm	Each	84.00
	350mm x 200mm	Each	103.00
	350mm x 250mm	Each	101.00
	350mm x 300mm	Each	110.00
	400mm x 250mm	Each	133.00
	400mm x 300mm	Each	129.00
	400mm x 350mm	Each	141.00
	450mm x 350mm	Each	158.00
	450mm x 400mm	Each	175.00
	500mm x 350mm	Each	228.00

S. No.	Items	Unit	Rates in Rs.
	500mm x 400mm	Each	279.00
	600mm x 400mm	Each	327.00
	600mm x 500mm	Each	401.00
4.27	**Providing , Laying including testing 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 Dia	Each	3047.00
	150mm Dia	Each	3974.00
	200mm Dia	Each	5234.00
	250mm Dia	Each	6664.00
	300mm Dia	Each	8126.00
	350mm Dia	Each	10243.00
	400mm Dia	Each	12506.00
	450mm Dia	Each	16879.00
	500mm Dia	Each	18956.00
	600mm Dia	Each	25071.00
	700mm Dia	Each	31285.00
	750mm Dia	Each	36381.00
	800mm Dia	Each	38385.00
	900mm Dia	Each	47044.00
	1000mm Dia	Each	56761.00
4.28	**Providing, Laying including testing 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 Dia	Each	5519.00
	150mm Dia	Each	7356.00
	200mm Dia	Each	9796.00
	250mm Dia	Each	12639.00
	300mm Dia	Each	15324.00
	350mm Dia	Each	19530.00
	400mm Dia	Each	23751.00
	450mm Dia	Each	31986.00
	500mm Dia	Each	35788.00
	600mm Dia	Each	47739.00

S. No.	Items	Unit	Rates in Rs.
4.29	**Providing , Laying including testing and Jointing of welded double flanged centrifugal cast (spun) ductile Iron pressure pipes conforming to IS:8329/2000 in the length of 3 m for class K-9 with inside cement mortar, lining for the following sizes/dia pipes**		
	100mm Dia	Each	8054.00
	150mm Dia	Each	10804.00
	200mm Dia	Each	14424.00
	250mm Dia	Each	18680.00
	300mm Dia	Each	22638.00
	350mm Dia	Each	28888.00
	400mm Dia	Each	35068.00
	450mm Dia	Each	47166.00
	500mm Dia	Each	52695.00
	600mm Dia	Each	70485.00
4.30	**Providing, Laying including testing and Jointing welded double flanged centrifugal cast (spun) ductile Iron pressure pipes conforming to IS 8329/2000 in the length of 4m for class K-9 with inside cement mortar lining for the following sizes/dia pipes.**		
	100mm Dia	Each	10589.00
	150mm Dia	Each	14252.00
	200mm Dia	Each	19051.00
	250mm Dia	Each	24722.00
	300mm Dia	Each	29952.00
	350mm Dia	Each	38245.00
	400mm Dia	Each	46385.00
	450mm Dia	Each	62346.00
	500mm Dia	Each	69603.00
	600mm Dia	Each	93231.00
4.31	**Providing, Laying including testing and Jointing welded double flanged centrifugal cast (spun) ductile Iron pressure pipes conforming to IS:8329/2000 in the length of 4.5 m. for class K-9 with inside cement mortar lining for the following sizes/dia pipes.**		
	100mm Dia	Each	11856.00
	150mm Dia	Each	15975.00
	200mm Dia	Each	21365.00
	250mm Dia	Each	27743.00

S. No.	Items	Unit	Rates in Rs.
	300mm Dia	Each	33488.00
	350mm Dia	Each	42924.00
	400mm Dia	Each	52044.00
	450mm Dia	Each	69937.00
	500mm Dia	Each	78056.00
	600mm Dia	Each	104604.00
4.32	**Providing, Laying including testing 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 Dia	Each	13124.00
	150mm Dia	Each	17699.00
	200mm Dia	Each	23679.00
	250mm Dia	Each	30763.00
	300mm Dia	Each	37266.00
	350mm Dia	Each	47602.00
	400mm Dia	Each	57702.00
	450mm Dia	Each	77527.00
	500mm Dia	Each	86510.00
	600mm Dia	Each	115977.00
4.33	**Providing, Laying including testing 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 Dia	Each	13631.00
	150mm Dia	Each	18389.00
	200mm Dia	Each	24604.00
	250mm Dia	Each	31972.00
	300mm Dia	Each	38574.00
	350mm Dia	Each	49474.00
	400mm Dia	Each	59966.00
	450mm Dia	Each	80563.00
	500mm Dia	Each	89891.00
	600mm Dia	Each	120527.00
4.34	**Labour only for Laying including testing 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 Dia	Each	53.00
	150mm Dia	Each	84.00

S. No.	Items	Unit	Rates in Rs.
	200mm Dia	Each	114.00
	250mm Dia	Each	152.00
	300mm Dia	Each	194.00
	350mm Dia	Each	238.00
	400mm Dia	Each	285.00
	450mm Dia	Each	333.00
	500mm Dia	Each	390.00
	600mm Dia	Each	521.00
4.35	**Labour only for Laying including testing 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 Dia	Each	91.00
	150mm Dia	Each	148.00
	200mm Dia	Each	198.00
	250mm Dia	Each	266.00
	300mm Dia	Each	340.00
	350mm Dia	Each	418.00
	400mm Dia	Each	500.00
	450mm Dia	Each	589.00
	500mm Dia	Each	688.00
	600mm Dia	Each	914.00
4.36	**Labour only for Laying including testing 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 Dia	Each	129.00
	150mm Dia	Each	211.00
	200mm Dia	Each	283.00
	250mm Dia	Each	380.00
	300mm Dia	Each	534.00
	350mm Dia	Each	597.00
	400mm Dia	Each	715.00
	450mm Dia	Each	844.00
	500mm Dia	Each	985.00
	600mm Dia	Each	1306.00

S. No.	Items	Unit	Rates in Rs.
4.37	**Labour only for Laying including testing 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 Dia	Each	167.00
	150mm Dia	Each	274.00
	200mm Dia	Each	367.00
	250mm Dia	Each	494.00
	300mm Dia	Each	728.00
	350mm Dia	Each	776.00
	400mm Dia	Each	931.00
	450mm Dia	Each	1099.00
	500mm Dia	Each	1283.00
	600mm Dia	Each	1699.00
4.38	**Labour only for Laying including testing 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 Dia	Each	186.00
	150mm Dia	Each	306.00
	200mm Dia	Each	409.00
	250mm Dia	Each	551.00
	300mm Dia	Each	704.00
	350mm Dia	Each	866.00
	400mm Dia	Each	1038.00
	450mm Dia	Each	1227.00
	500mm Dia	Each	1432.00
	600mm Dia	Each	1895.00
4.39	**Labour only for Laying including testing 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 Dia	Each	205.00
	150mm Dia	Each	338.00
	200mm Dia	Each	452.00
	250mm Dia	Each	608.00
	300mm Dia	Each	922.00
	350mm Dia	Each	956.00

S. No.	Items	Unit	Rates in Rs.
	400mm Dia	Each	1146.00
	450mm Dia	Each	1355.00
	500mm Dia	Each	1580.00
	600mm Dia	Each	2091.00
4.40	**Labour only for Laying including testing 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 Dia	Each	212.00
	150mm Dia	Each	350.00
	200mm Dia	Each	468.00
	250mm Dia	Each	630.00
	300mm Dia	Each	806.00
	350mm Dia	Each	992.00
	400mm Dia	Each	1189.00
	450mm Dia	Each	1406.00
	500mm Dia	Each	1640.00
	600mm Dia	Each	2170.00

DUCTILE IRON VALVES

S. No.	Item	Unit	Rates inRs.	
4.41	**Providing & fixing of following Ductile iron double flanged sluice valves as per I.S.:14846-2000 fitted with cap including jointing & testing with cost of jointing material such as bolts, nuts, rubber insertions etc. all complete**		**CLASS PN- 10**	**CLASS PN-16**
	80mm dia	Each	6486.00	6799.00
	100mm dia	Each	8717.00	9136.00
	150mm dia	Each	13296.00	11986.00
	200mm dia	Each	21645.00	21961.00
	250mm dia	Each	30919.00	41126.00
	300mm dia	Each	48535.00	54205.00
	350mm dia	Each	71260.00	85086.00
	400mm dia	Each	107438.00	107438.00
	450mm dia	Each	151161.00	151161.00
	500mm dia	Each	201969.00	201969.00

S. No.	Item	Unit	Rates inRs.	
4.42	**Fixing of following Ductile iron double flanged sluice valves fitted with 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.**		**CLASS PN-10/PN-16**	
	80mm dia	Each	225.00	
	100mm dia	Each	352.00	
	150mm dia	Each	511.00	
	200mm dia	Each	706.00	
	250mm dia	Each	1141.00	
	300mm dia	Each	1290.00	
	350 mm dia	Each	2128.00	
	400 mm dia	Each	3267.00	
	450 mm dia	Each	3953.00	
	500 mm dia	Each	4990.00	
4.43	**Labour for laying and fixing of following ductile iron double flanged sluice valves (vide item no.1) including jointing and testing but without cost of Jointing materials.**		**CLASS PN-10/PN-16**	
	80mm dia	Each	107.00	
	100mm dia	Each	148.00	
	150mm dia	Each	216.00	
	200mm dia	Each	323.00	
	250mm dia	Each	464.00	
	300mm dia	Each	599.00	
	350 mm dia	Each	1046.00	
	400 mm dia	Each	1237.00	
	450 mm dia	Each	1479.00	
	500 mm dia	Each	1790.00	
4.44	**Providing & fixing following ductile iron double flanged check valvewithout damper (non-returnvalve) 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- 10**	**CLASS PN-16**
	200mm dia	Each	21481.00	21797.00
	250mm dia	Each	30548.00	40755.00
	300mm dia	Each	48467.00	57916.00
	350 mm dia	Each	70920.00	84746.00
	400 mm dia	Each	106865.00	106865.00
	500 mm dia	Each	202073.00	202073.00
	600 mm dia	Each	315199.00	315199.00
4.45	**Labour for laying and fixing of following ductile iron double flanged check valve without damper (non-return valve)including jointing & testing with cost of jointing material such as bolts,nuts and**		**CLASS PN-10/PN-16**	

S. No.	Item	Unit	Rates inRs.	
	rubber insertion all complete as per IS : 5312 (Part II)			
	200mm dia	Each	542.00	
	250mm dia	Each	770.00	
	300mm dia	Each	1222.00	
	350 mm dia	Each	1788.00	
	400 mm dia	Each	2694.00	
	500 mm dia	Each	5094.00	
	600 mm dia	Each	7946.00	
4.46	**Labour for laying and fixing of following ductile iron double flanged check valve without damper (non-return valve)excluding jointing & testing with cost of jointing material such as bolts,nuts and rubber insertion all complete as per IS : 5312 (Part II)**		**CLASS PN-10/PN-16**	
	200mm dia	Each	206.00	
	250mm dia	Each	337.00	
	300mm dia	Each	428.00	
	350 mm dia	Each	657.00	
	400 mm dia	Each	856.00	
	500 mm dia	Each	1203.00	
	600 mm dia	Each	1829.00	
4.47	**Providing & fixing following ductile 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- 10**	**CLASS PN-16**
	100mm dia	Each	6300.00	7940.00
	150mm dia	Each	7380.00	9288.00
	200mm dia	Each	9977.00	12557.00
	250mm dia	Each	14709.00	20337.00
	300mm dia	Each	17650.00	26253.00
	350mm dia	Each	49644.00	62471.00
	400mm dia	Each	59215.00	74518.00
	450mm dia	Each	69943.00	88099.00
	500mm dia	Each	96720.00	121703.00
4.48	**Labour for laying and fixing of following ductile iron butterfly valves including jointing & testing but without cost of jointing materials**		**CLASS PN-10/PN-16**	
	100mm dia	Each	118.00	
	150mm dia	Each	136.00	
	200mm dia	Each	166.00	
	250mm dia	Each	206.00	
	300mm dia	Each	337.00	
	350mm dia	Each	484.00	
	400mm dia	Each	577.00	

S. No.	Item	Unit	Rates inRs.	
	450mm dia	Each	682.00	
	500mm dia	Each	943.00	
4.49	**Labour for laying and fixing of following Ductile Iron butterfly valves including jointing & testing but with cost of jointing materials**		**CLASS PN-10/PN-16**	
	100mm dia	Each	159.00	
	150mm dia	Each	186.00	
	200mm dia	Each	252.00	
	250mm dia	Each	371.00	
	300mm dia	Each	445.00	
	350mm dia	Each	1252.00	
	400mm dia	Each	1493.00	
	450mm dia	Each	1763.00	
	500mm dia	Each	2438.00	
4.50	**Providing & fixing following ductile iron single chamber triple function temper proof 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- 10**	**CLASS PN-16**
	50mm dia	Each	6137.00	6436.00
	80mm dia	Each	6423.00	6736.00
	100mm dia	Each	8582.00	9000.00
	150mm dia	Each	11771.00	11771.00
4.51	**Labour for laying and fixing of following ductile iron single chamber triple function temper proof air valves small orifice with screwed end i/c jointing & testing but without cost of jointing material.**		**CLASS PN-10/PN-16**	
	50mm dia	Each	60.00	
	80mm dia	Each	86.00	
	100mm dia	Each	118.00	
	150mm dia	Each	136.00	
4.52	**Labour for laying and fixing of following ductile iron single chamber triple function temper proof Air valves small orifice with screwed end i/c jointing & testing but with cost of jointing material.**		**CLASS PN-10/PN-16**	
	50mm dia	Each	155.00	
	80mm dia	Each	162.00	
	100mm dia	Each	216.00	
	150mm dia	Each	297.00	

CHAPTER – V

ASBESTOS CEMENT PRESSURE PIPES

AND

CAST IRON FITTINGS

Chapter – V

ASBESTOS CEMENT PRESSURE PIPES AND CAST IRON FITTINGS

NOTES:

1. The A.C.P. pipes shall be confirming to IS - 1592:1980
2. The laying of A.C.P pipes shall be done as per IS - 6530: 1972
3. C.I. specials for A.C.P. pipes shall be done as per IS - 5531:1977
4. The C.I.D. joints shall be confirming to IS - 8794:1988
5. The rubber sealing of the D. Joint shall be confirming to IS - 10292:1988
6. All measurements 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.
8. **This USOR contains the rates of all the items without GST. GST shall be paid separately as per prevailing government norms as claimed by the contractor in his bill.**

   All the estimates based on this USOR will include GST as an extra amount as per prevailing rates on the sum of the estimate to arrive at the gross amount.

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 manufactured by mazza process**				
	80mm Dia	Mtr.	266.00	296.00	333.00
	100mm Dia	Mtr.	351.00	430.00	519.00
	125 mm Dia	Mtr.	459.00	554.00	678.00
	150mm Dia	Mtr.	624.00	758.00	934.00
	200mm Dia	Mtr.	1019.00	1277.00	1582.00
	250mm Dia	Mtr.	1322.00	1729.00	2040.00
	300mm Dia	Mtr.	1799.00	2293.00	2860.00
	350 mm Dia	Mtr.	2321.00	2911.00	3547.00

Item No.	Items	Unit	Rate in Rupees		
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 manufactured by mazza process**				
	80mm Dia	Mtr.	361.00	381.00	350.00
	100mm Dia	Mtr.	485.00	567.00	662.00
	125 mm Dia	Mtr.	603.00	697.00	826.00
	150mm Dia	Mtr.	702.00	827.00	991.00
	200mm Dia	Mtr.	1068.00	1290.00	1580.00
	250mm Dia	Mtr.	1375.00	1691.00	2054.00
	300mm Dia	Mtr.	1825.00	2290.00	2844.00
	350 mm Dia	Mtr.	2285.00	2884.00	3537.00
5.3	**Labour for laying in position including testing following Asbestos cement pressure pipes class 15,20,25**				
	80mm Dia	Mtr.	7.00	7.00	7.00
	100mm Dia	Mtr.	8.00	8.00	8.00
	125 mm Dia	Mtr.	11.00	11.00	11.00
	150mm Dia	Mtr.	13.00	13.00	13.00
	200mm Dia	Mtr.	21.00	21.00	21.00
	250mm Dia	Mtr.	27.00	27.00	27.00
	300mm Dia	Mtr.	35.00	35.00	35.00
	350 mm Dia	Mtr.	43.00	43.00	43.00
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 manufactured by mazza process including testing**				
	80mm Dia	Each	294.00	318.00	341.00
	100mm Dia	Each	360.00	394.00	406.00
	125 mm Dia	Each	475.00	506.00	539.00
	150mm Dia	Each	552.00	595.00	648.00
	200mm Dia	Each	748.00	861.00	914.00
	250mm Dia	Each	997.00	1148.00	1221.00
	300mm Dia	Each	1209.00	1424.00	1517.00
	350 mm Dia	Each	1849.00	1852.00	1854.00

Item No.	Items	Unit	Rate in Rupees		
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 Dia	Each	86.00	88.00	91.00
	100mm Dia	Each	101.00	103.00	106.00
	125 mm Dia	Each	116.00	118.00	121.00
	150mm Dia	Each	131.00	133.00	136.00
	200mm Dia	Each	146.00	148.00	151.00
	250mm Dia	Each	161.00	164.00	166.00
	300mm Dia	Each	176.00	179.00	181.00
	350 mm Dia	Each	191.00	194.00	196.00
5.6	**Providing A.C. Coupler joints to following A.C. pressure pipes confirming to IS specification including testing of joints rubber ring complete manufactured by mazza process**				
	80mm Dia	Each	138.00	146.00	160.00
	100mm Dia	Each	146.00	154.00	173.00
	125 mm Dia	Each	234.00	260.00	314.00
	150mm Dia	Each	361.00	435.00	523.00
	200mm Dia	Each	384.00	481.00	615.00
	250mm Dia	Each	559.00	761.00	863.00
	300mm Dia	Each	881.00	1207.00	1524.00
	350 mm Dia	Each	2199.00	2263.00	2326.00
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 Dia	Each	68.00	70.00	73.00
	100mm Dia	Each	81.00	83.00	86.00
	125 mm Dia	Each	93.00	93.00	96.00
	150mm Dia	Each	103.00	106.00	108.00
	200mm Dia	Each	116.00	118.00	121.00
	250mm Dia	Each	128.00	131.00	133.00
	300mm Dia	Each	141.00	143.00	146.00
	350 mm Dia	Each	151.00	151.00	151.00
5.8	**Providing & laying in position including testing following cast iron plain ended standard specials confirming to IS/5531/1988 (Reaffirmed 2002) manufactured by mazza process**				

Item No.	Items	Unit	Rate in Rupees		
(i)	Cast Iron Plain ended 90° Bend		**Class 15**	**Class 20**	**Class 25**
	80mm Dia	Each	545.00	624.00	703.00
	100mm Dia	Each	760.00	932.00	1054.00
	125 mm Dia	Each	1061.00	1291.00	1463.00
	150mm Dia	Each	1506.00	1843.00	2072.00
	200mm Dia	Each	2617.00	3205.00	3621.00
	250mm Dia	Each	3829.00	4689.00	5191.00
	300mm Dia	Each	5593.00	6869.00	7600.00
	350 mm Dia	Each	7529.00	9178.00	10683.00
(ii)	Cast Iron Plain ended 45° Bend		**Class 15**	**Class 20**	**Class 25**
	80mm Dia	Each	552.00	631.00	710.00
	100mm Dia	Each	746.00	918.00	1040.00
	125 mm Dia	Each	1004.00	1233.00	1398.00
	150mm Dia	Each	1405.00	1714.00	1943.00
	200mm Dia	Each	2337.00	2882.00	3291.00
	250mm Dia	Each	3284.00	4051.00	4553.00
	300mm Dia	Each	4675.00	5786.00	6553.00
	350 mm Dia	Each	6095.00	7529.00	8819.00
(iii)	Cast Iron Plain ended 22½° Bend		**Class 15**	**Class 20**	**Class 25**
	80mm Dia	Each	409.00	466.00	545.00
	100mm Dia	Each	552.00	688.00	803.00
	125 mm Dia	Each	731.00	911.00	1076.00
	150mm Dia	Each	1032.00	1276.00	1506.00
	200mm Dia	Each	1721.00	2151.00	2567.00
	250mm Dia	Each	2345.00	2947.00	3449.00
	300mm Dia	Each	3327.00	4194.00	4962.00
	350 mm Dia	Each	4230.00	5342.00	6446.00
(iv)	Cast Iron Plain ended 11¼° Bend		**Class 15**	**Class 20**	**Class 25**
	80mm Dia	Each	337.00	380.00	459.00
	100mm Dia	Each	452.00	574.00	688.00
	125 mm Dia	Each	595.00	746.00	911.00
	150mm Dia	Each	846.00	1054.00	1283.00
	200mm Dia	Each	1412.00	1793.00	2208.00
	250mm Dia	Each	1871.00	2395.00	2897.00
	300mm Dia	Each	2653.00	3406.00	4166.00
	350 mm Dia	Each	3305.00	4252.00	5241.00
(v)	Cast Iron Plain ended Tees				
	Body & Branch		**Class 15**	**Class 20**	**Class 25**
	80x80mm	Each	695.00	796.00	918.00
	100x80mm	Each	903.00	1040.00	1176.00
	100x100mm	Each	997.00	1233.00	1412.00
	125X80mm	Each	1147.00	1362.00	1527.00
	125X100mm	Each	1269.00	1620.00	1821.00
	125X125mm	Each	1427.00	1749.00	1993.00

Item No.	Items	Unit	Rate in Rupees		
	150x80mm	Each	1735.00	2101.00	2366.00
	150x100mm	Each	1814.00	2223.00	2510.00
	150X125mm	Each	1914.00	2345.00	2660.00
	150x150mm	Each	2086.00	2553.00	2890.00
	200X80 mm	Each	2968.00	3641.00	4073.00
	200X100 mm	Each	3054.00	3743.00	4216.00
	200X125mm	Each	3162.00	3872.00	4374.00
	200X150 mm	Each	3391.00	4087.00	4610.00
	200X200 mm	Each	3736.00	4589.00	5213.00
	250X80 mm	Each	4388.00	4632.00	5887.00
	250X100 mm	Each	4474.00	5478.00	6037.00
	250X125mm	Each	4596.00	5621.00	6209.00
	250X150 mm	Each	4775.00	5844.00	6460.00
	250X200 mm	Each	5198.00	6367.00	7077.00
	250X250 mm	Each	5585.00	6862.00	7600.00
(vi)	Cast Iron Plain ended Tees				
	300x80 to 350x350mm				
	Body & Branch		**Class 15**	**Class 20**	**Class 25**
	300X80mm	Each	6460.00	7887.00	8676.00
	300X100mm	Each	6546.00	8030.00	8819.00
	300X125mm	Each	6675.00	8174.00	9034.00
	300X150mm	Each	6783.00	8317.00	9178.00
	300X200mm	Each	7313.00	8963.00	9895.00
	300X250mm	Each	7744.00	9464.00	10181.00
	300X300mm	Each	8317.00	10253.00	11400.00
	350X200mm	Each	9680.00	11831.00	13695.00
	350X250mm	Each	10110.00	12332.00	14340.00
	350X300mm	Each	10755.00	13121.00	15272.00
	350X350mm	Each	11329.00	13910.00	16133.00
(vii)	Cast Iron Plain ended Crosses		**Class 15**	**Class 20**	**Class 25**
	80X80mm	Each	875.00	989.00	1147.00
	100X100mm	Each	1240.00	1542.00	1778.00
	125X125mm	Each	1764.00	2165.00	2495.00
	150X150mm	Each	2588.00	3169.00	3621.00
	200X200mm	Each	4639.00	5693.00	6525.00
	250X250mm	Each	6876.00	8461.00	9464.00
	300X300mm	Each	10253.00	12619.00	14125.00
	350X350mm	Each	13910.00	16993.00	19789.00
(viii)	Cast Iron Plain ended Reducers		**Class 15**	**Class 20**	**Class 25**
	100X80mm	Each	602.00	717.00	817.00
	125X80mm	Each	710.00	846.00	968.00
	125X100mm	Each	789.00	968.00	1111.00
	150X80mm	Each	868.00	1040.00	1190.00
	150X100mm	Each	946.00	1169.00	1341.00

Item No.	Items	Unit	Rate in Rupees		
	150X125mm	Each	1054.00	1291.00	1491.00
	200X100mm	Each	1305.00	1613.00	1879.00
	200X125mm	Each	1405.00	1735.00	2029.00
	200X150mm	Each	1570.00	1936.00	2259.00
	250X125mm	Each	1706.00	2137.00	2459.00
	250X150mm	Each	1871.00	2323.00	2689.00
	250X200mm	Each	2223.00	2768.00	3227.00
	300X150mm	Each	2330.00	2911.00	3406.00
	300X200mm	Each	2689.00	3356.00	3951.00
	300X250mm	Each	2976.00	3585.00	4359.00
	350X200mm	Each	4223.00	5184.00	5987.00
	350X250mm	Each	4675.00	5750.00	6611.00
	350X300mm	Each	5299.00	6525.00	7529.00
(ix)	Cast Iron Adopter (Flange Spigot)		**Class 15**	**Class 20**	**Class 25**
	(T.P.)				
	80mm	Each	531.00	566.00	609.00
	100mm	Each	652.00	731.00	789.00
	125mm	Each	839.00	932.00	1054.00
	150mm	Each	1097.00	1226.00	1341.00
	200 mm	Each	1628.00	1850.00	2058.00
	250 mm	Each	2639.00	3033.00	3284.00
	300mm	Each	3427.00	3965.00	4352.00
	350mm	Each	4266.00	4933.00	5557.00
(x)	Cast Iron Blank end cap		**Class 15**	**Class 20**	**Class 25**
	(Dead end cap)				
	80mm	Each	244.00	265.00	315.00
	100mm	Each	351.00	423.00	509.00
	125mm	Each	488.00	581.00	710.00
	150mm	Each	731.00	868.00	1047.00
	200mm	Each	1334.00	1606.00	1950.00
	250mm	Each	1893.00	2273.00	2710.00
	300mm	Each	2803.00	3363.00	4044.00
	350mm	Each	3678.00	4402.00	5205.00
5.9	**Labour for laying in position including testing 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	16.00	18.00	21.00
	100mm	Each	22.00	27.00	31.00
	125mm	Each	31.00	38.00	43.00
	150mm	Each	44.00	54.00	61.00
	200mm	Each	77.00	94.00	106.00
	250mm	Each	112.00	137.00	152.00

Item No.	Items	Unit	Rate in Rupees		
	300mm	Each	164.00	201.00	222.00
	350 mm	Each	220.00	269.00	313.00
(ii)	Cast Iron Plain ended 45° Bend		**Class 15**	**Class 20**	**Class 25**
	80mm	Each	16.00	18.00	21.00
	100mm	Each	22.00	27.00	30.00
	125mm	Each	29.00	36.00	41.00
	150mm	Each	41.00	50.00	57.00
	200mm	Each	68.00	84.00	96.00
	250mm	Each	96.00	119.00	133.00
	300mm	Each	137.00	169.00	192.00
	350mm	Each	178.00	220.00	258.00
(iii)	Cast Iron Plain ended 22½° Bend		**Class 15**	**Class 20**	**Class 25**
	80mm	Each	12.00	14.00	16.00
	100mm	Each	16.00	20.00	24.00
	125mm	Each	21.00	27.00	31.00
	150mm	Each	30.00	37.00	44.00
	200mm	Each	50.00	63.00	75.00
	250mm	Each	69.00	86.00	101.00
	300mm	Each	97.00	123.00	145.00
	350mm	Each	124.00	156.00	189.00
(iv)	Cast Iron Plain ended 11¼° Bend		**Class 15**	**Class 20**	**Class 25**
	80mm	Each	10.00	11.00	13.00
	100mm	Each	13.00	17.00	20.00
	125mm	Each	17.00	22.00	27.00
	150mm	Each	25.00	31.00	38.00
	200mm	Each	41.00	52.00	65.00
	250mm	Each	55.00	70.00	85.00
	300mm	Each	78.00	100.00	122.00
	350mm	Each	97.00	124.00	153.00
(v)	Cast Iron Plain ended Tees				
	Body & Branch		**Class 15**	**Class 20**	**Class 25**
	80x80mm	Each	20.00	23.00	27.00
	100x80mm	Each	26.00	30.00	34.00
	100x100mm	Each	29.00	36.00	41.00
	125X80mm	Each	34.00	40.00	45.00
	125X100mm	Each	37.00	47.00	53.00
	125X125mm	Each	42.00	51.00	58.00
	150x80mm	Each	51.00	61.00	69.00
	150x100mm	Each	53.00	65.00	73.00
	150X125mm	Each	56.00	69.00	78.00
	150x150mm	Each	61.00	75.00	85.00
	200X80 mm	Each	87.00	106.00	119.00
	200X100 mm	Each	89.00	110.00	123.00
	200X125mm	Each	93.00	113.00	128.00

Item No.	Items	Unit	Rate in Rupees		
	200X150 mm	Each	99.00	120.00	135.00
	200X200 mm	Each	109.00	134.00	153.00
	250X80 mm	Each	128.00	136.00	172.00
	250X100 mm	Each	131.00	160.00	177.00
	250X125mm	Each	135.00	165.00	182.00
	250X150 mm	Each	140.00	171.00	189.00
	250X200 mm	Each	152.00	186.00	207.00
	250X250 mm	Each	163.00	201.00	222.00
(vi)	Cast Iron Plain ended Tees				
	Body & Branch		**Class 15**	**Class 20**	**Class 25**
	300X80mm	Each	189.00	231.00	254.00
	300X100mm	Each	192.00	235.00	258.00
	300X125mm	Each	195.00	239.00	264.00
	300X150mm	Each	199.00	243.00	269.00
	300X200mm	Each	214.00	262.00	290.00
	300X250mm	Each	227.00	277.00	298.00
	300X300mm	Each	243.00	300.00	334.00
	350X200mm	Each	283.00	346.00	401.00
	350X250mm	Each	296.00	361.00	420.00
	350X300mm	Each	315.00	384.00	447.00
	350X350mm	Each	332.00	407.00	472.00
(vii)	Cast Iron Plain ended Crosses		**Class 15**	**Class 20**	**Class 25**
	80X80mm	Each	26.00	29.00	34.00
	100X100mm	Each	36.00	45.00	52.00
	125X125mm	Each	52.00	63.00	73.00
	150X150mm	Each	76.00	93.00	106.00
	200X200mm	Each	136.00	167.00	191.00
	250X250mm	Each	201.00	248.00	277.00
	300X300mm	Each	300.00	369.00	413.00
	350X350mm	Each	407.00	497.00	579.00
(viii)	Cast Iron Plain ended Reducers		**Class 15**	**Class 20**	**Class 25**
	100X80mm	Each	18.00	21.00	24.00
	125X80mm	Each	21.00	25.00	28.00
	125X100mm	Each	23.00	28.00	33.00
	150X80mm	Each	25.00	30.00	35.00
	150X100mm	Each	28.00	34.00	39.00
	150X125mm	Each	31.00	38.00	44.00
	200X100mm	Each	38.00	47.00	55.00
	200X125mm	Each	41.00	51.00	59.00
	200X150mm	Each	46.00	57.00	66.00
	250X125mm	Each	50.00	63.00	72.00
	250X150mm	Each	55.00	68.00	79.00
	250X200mm	Each	65.00	81.00	94.00
	300X150mm	Each	68.00	85.00	100.00

Item No.	Items	Unit	Rate in Rupees		
	300X200mm	Each	79.00	98.00	116.00
	300X250mm	Each	87.00	105.00	128.00
	350X200mm	Each	124.00	152.00	175.00
	350X250mm	Each	137.00	168.00	194.00
	350X300mm	Each	155.00	194.00	220.00
(ix)	Cast Iron Adopter (Flange Spigot) (T.P.)		**Class 15**	**Class 20**	**Class 25**
	80mm	Each	16.00	17.00	18.00
	100mm	Each	19.00	21.00	23.00
	125mm	Each	25.00	27.00	31.00
	150mm	Each	32.00	36.00	39.00
	200mm	Each	48.00	54.00	60.00
	250 mm	Each	77.00	89.00	96.00
	300mm	Each	100.00	116.00	127.00
	350mm	Each	125.00	144.00	163.00
(x)	Cast Iron Blank end cap(Dead end cap)		**Class 15**	**Class 20**	**Class 25**
	80mm	Each	7.00	8.00	9.00
	100mm	Each	10.00	12.00	15.00
	125mm	Each	14.00	17.00	21.00
	150mm	Each	21.00	25.00	31.00
	200mm	Each	39.00	47.00	57.00
	250mm	Each	5.00	67.00	79.00
	300mm	Each	82.00	98.00	118.00
	350mm	Each	108.00	129.00	152.00
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	210.00	210.00	210.00

CHAPTER – VI

GALVANISED IRON PIPES, GUN METAL / BRASS VALVES AND 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.
7. **This USOR contains the rates of all the items without GST. GST shall be paid separately as per prevailing government norms as claimed by the contractor in his bill.**
   All the estimates based on this USOR will include GST as an extra amount as per prevailing rates on the sum of the estimate to arrive at the gross amount.

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 galvanized 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.	84.00	106.00	125.00
	20mm dia	R Mtr.	118.00	134.00	159.00
	25mm dia	R Mtr.	169.00	204.00	245.00
	32mm dia	R Mtr.	207.00	250.00	303.00
	40mm dia	R Mtr.	269.00	296.00	360.00

Item No.	ITEMS	Unit	Rate in Rupees		
	50mm dia	R Mtr.	330.00	402.00	490.00
	65mm dia	R Mtr.	473.00	531.00	647.00
	80mm dia	R Mtr.	541.00	665.00	783.00
	100mm dia	R Mtr.	793.00	982.00	1157.00
	125mm dia	R Mtr.	-	1283.00	1438.00
	150mm dia	R Mtr.	-	1433.00	1607.00
6.2	**Labour for laying and jointing of following galvanized 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.	10.00	11.00	12.00
	20mm dia	R Mtr.	11.00	12.00	13.00
	25mm dia	R Mtr.	16.00	17.00	19.00
	32mm dia	R Mtr.	17.00	18.00	20.00
	40mm dia	R Mtr.	21.00	24.00	26.00
	50mm dia	R Mtr.	23.00	26.00	29.00
	65mm dia	R Mtr.	39.00	43.00	47.00
	80mm dia	R Mtr.	41.00	46.00	51.00
	100mm dia	R Mtr.	61.00	68.00	75.00
	125mm dia	R Mtr.	-.	88.00	96.00
	150mm dia	R Mtr.	-	105.00	115.00
6.3	**Providing and fixing following gate (full way) valves tested to 300lbs/Sq inch or 21.00 kg/sq.cm. confirming to IS 778/1984 (Reaffirmed 2005) Class-I**				
				Screwed	**Flanged**
	15mm dia	Each		416.00	541.00
	20mm dia	Each		537.00	698.00
	25mm dia	Each		885.00	1151.00
	32mm dia	Each		1287.00	1673.00
	40mm dia	Each		1653.00	2149.00
	50mm dia	Each		2483.00	3228.00
	65mm dia	Each		4566.00	5936.00
	80mm dia	Each		6382.00	8297.00
	100mm dia	Each		12066.00	15686.00
6.4	**Providing and fixing following gate (full way) valves tested to 300lbs/Sq inch or 21.00 kg/sq.cm.**				

Item No.	ITEMS	Unit	Rate in Rupees		
	confirming to IS 778/1984 (Reaffirmed 2005) Class-II				
				Screwed	**Flanged**
	15mm dia	Each		519.00	674.00
	20mm dia	Each		661.00	860.00
	25mm dia	Each		1099.00	1428.00
	32mm dia	Each		1606.00	2088.00
	40mm dia	Each		1963.00	2552.00
	50mm dia	Each		3113.00	4047.00
	65mm dia	Each		5678.00	7381.00
	80mm dia	Each		7827.00	10175.00
	100mm dia	Each		14464.00	18803.00
6.5	**Providing and fixing following class-I Globe wheel valves, confirming to IS 778/1984 (Reaffirmed 2005), tested to 21.09 kg/sq.cmt.**				
				Screwed	**Flanged**
	15mm dia	Each		378.00	491.00
	20mm dia	Each		549.00	714.00
	25mm dia	Each		851.00	1106.00
	32mm dia	Each		1382.00	1797.00
	40mm dia	Each		1891.00	2458.00
	50mm dia	Each		2593.00	3371.00
	65mm dia	Each		5009.00	6511.00
	80mm dia	Each		6650.00	8645.00
	100mm dia	Each		11355.00	14762.00
6.6	**Providing and fixing following class-II Globe wheel valves, confirming to IS 778/1984 (Reaffirmed 2005), tested to 21.09 kg/sq.cmt.**				
				Screwed	**Flanged**
	15mm dia	Each		467.00	607.00
	20mm dia	Each		662.00	861.00
	25mm dia	Each		1053.00	1369.00
	32mm dia	Each		1722.00	2238.00
	40mm dia	Each		2350.00	3055.00
	50mm dia	Each		3284.00	4270.00
	65mm dia	Each		5824.00	7571.00
	80mm dia	Each		7567.00	9837.00
	100mm dia	Each		13602.00	17683.00

Item No.	ITEMS	Unit	Rate in Rupees		
6.7	**Providing and fixing following check (non-return) valves Class-I, confirming to IS-778/1984 (Reaffirmed 2005) female ends, tested to 21.09 kg/sq.cmt.**				
				Screwed	**Flanged**
	15mm dia	Each		378.00	491.00
	20mm dia	Each		549.00	714.00
	25mm dia	Each		851.00	1106.00
	32mm dia	Each		1382.00	1797.00
	40mm dia	Each		1891.00	2458.00
	50mm dia	Each		2593.00	3371.00
	65mm dia	Each		5009.00	6511.00
	80mm dia	Each		6650.00	8645.00
	100mm dia	Each		11355.00	14762.00
6.8	**Providing and fixing following check (non-return) valves Class-II, confirming to IS-778/1984 (Reaffirmed 2005) female ends, tested to 21.09 kg/sq.cmt.**				
				Screwed	**Flanged**
	15mm dia	Each		453.00	588.00
	20mm dia	Each		659.00	856.00
	25mm dia	Each		1021.00	1327.00
	32mm dia	Each		1658.00	2156.00
	40mm dia	Each		2268.00	2949.00
	50mm dia	Each		3112.00	4045.00
	65mm dia	Each		6011.00	7814.00
	80mm dia	Each		7980.00	10375.00
	100mm dia	Each		13626.00	17714.00
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		495.00	
	20mm dia	Each		712.00	
	25mm dia	Each		1869.00	
6.10	**Labour for laying, fixing including testing and carriage of Screwed or flanged Gate valves (full way) Class-I**				

Item No.	ITEMS	Unit	Rate in Rupees		
				Screwed	**Flanged**
	15mm dia	Each		15.00	19.00
	20mm dia	Each		19.00	25.00
	25mm dia	Each		32.00	41.00
	32mm dia	Each		46.00	60.00
	40mm dia	Each		59.00	77.00
	50mm dia	Each		89.00	115.00
	65mm dia	Each		163.00	212.00
	80mm dia	Each		228.00	297.00
	100mm dia	Each		431.00	561.00
6.11	**Labour for laying, fixing and including testing carriage of Screwed or flanged Gate valves (full way) Class-II**				
				Screwed	**Flanged**
	15mm dia	Each		19.00	24.00
	20mm dia	Each		24.00	31.00
	25mm dia	Each		39.00	51.00
	32mm dia	Each		57.00	75.00
	40mm dia	Each		70.00	91.00
	50mm dia	Each		111.00	145.00
	65mm dia	Each		203.00	264.00
	80mm dia	Each		280.00	364.00
	100mm dia	Each		517.00	672.00
6.12	**Labour for laying, fixing and including testing carriage of Screwed or flanged globe wheel valves Class-I**				
				Screwed	**Flanged**
	15mm dia	Each		14.00	18.00
	20mm dia	Each		20.00	26.00
	25mm dia	Each		30.00	40.00
	32mm dia	Each		49.00	64.00
	40mm dia	Each		68.00	88.00
	50mm dia	Each		93.00	121.00
	65mm dia	Each		179.00	233.00
	80mm dia	Each		238.00	309.00
	100mm dia	Each		406.00	528.00
6.13	**Labour for laying, fixing and including testing carriage of Screwed or flanged globe wheel valves Class-II**				
				Screwed	**Flanged**
	15mm dia	Each		17.00	22.00

Item No.	ITEMS	Unit	Rate in Rupees		
	20mm dia	Each		24.00	31.00
	25mm dia	Each		38.00	49.00
	32mm dia	Each		62.00	80.00
	40mm dia	Each		84.00	109.00
	50mm dia	Each		117.00	153.00
	65mm dia	Each		208.00	271.00
	80mm dia	Each		271.00	352.00
	100mm dia	Each		486.00	632.00
6.14	**Labour for laying, fixing and including testing carriage of Screwed or flanged check (non-return) valves Class-I,**				
	15mm dia	Each		14.00	18.00
	20mm dia	Each		20.00	26.00
	25mm dia	Each		30.00	40.00
	32mm dia	Each		49.00	64.00
	40mm dia	Each		68.00	88.00
	50mm dia	Each		93.00	121.00
	65mm dia	Each		179.00	233.00
	80mm dia	Each		238.00	309.00
	100mm dia	Each		406.00	528.00
6.15	**Labour for laying, fixing and including testing carriage of Screwed or flanged check (non-return) valves Class-II,**				
				Screwed	**Flanged**
	15mm dia	Each		16.00	21.00
	20mm dia	Each		24.00	31.00
	25mm dia	Each		37.00	47.00
	32mm dia	Each		59.00	77.00
	40mm dia	Each		81.00	105.00
	50mm dia	Each		111.00	145.00
	65mm dia	Each		215.00	279.00
	80mm dia	Each		285.00	371.00
	100mm dia	Each		487.00	633.00
6.16	**Labour for laying, fixing and including testing carriage of following GM or brass ferrules**				
				Screwed	
	15mm dia	Each		132.00	
	20mm dia	Each		191.00	
	25mm dia	Each		500.00	

Item No.	ITEMS	Unit	Rate in Rupees		
6.17	**Providing & fixing including testing water taps**				
			Stainless Steel	**CI self closing**	**Brass Heavy Duty**
	15mm dia	Each	195.00	250.00	364.00
	20mm dia	Each	250.00	310.00	490.00
6.18	**Labour for fixing including testing and carriage of water taps**		**Stainless Steel**	**CI self closing**	**Brass Heavy Duty**
	15mm dia	Each	8.00	10.00	13.00
	20mm dia	Each	10.00	12.00	18.00
6.19	**Providing and fixing Screwed Ball valves tested to 21.09 kg/cm confirming to IS 778/1984**				
	15mm dia	Each		406.00	
	20mm dia	Each		559.00	
	25mm dia	Each		870.00	
	32mm dia	Each		1485.00	
	40mm dia	Each		2108.00	
	50mm dia	Each		3104.00	
	65mm dia	Each		6574.00	
	80mm dia	Each		11300.00	
	100mm dia	Each		17559.00	
6.20	**Labour only for fixing and carriage of Ball valves tested to 21 kg/cm confirming to IS 778/1984**				
	15mm dia	Each		15.00	
	20mm dia	Each		20.00	
	25mm dia	Each		31.00	
	32mm dia	Each		53.00	
	40mm dia	Each		75.00	
	50mm dia	Each		111.00	
	65mm dia	Each		235.00	
	80mm dia	Each		404.00	
	100mm dia	Each		628.00	
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		107.00	
	20mm dia	Each		184.00	
	25mm dia	Each		238.00	
	32mm dia	Each		313.00	

Item No.	ITEMS	Unit	Rate in Rupees		
	40mm dia	Each		425.00	
	50mm dia	Each		550.00	
	65mm dia	Each		876.00	
	80mm dia	Each		1332.00	
	100mm dia	Each		2075.00	
6.22	**Labour for fixing G. I. Union in G.I. Pipe line i/c cutting threading, testing and carriage of etc. complete (New work)**				
	15mm dia	Each		13.00	
	20mm dia	Each		22.00	
	25mm dia	Each		29.00	
	32mm dia	Each		38.00	
	40mm dia	Each		52.00	
	50mm dia	Each		67.00	
	65mm dia	Each		107.00	
	80mm dia	Each		162.00	
	100mm dia	Each		252.00	
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		130.00	
	20mm dia	Each		223.00	
	25mm dia	Each		289.00	
	32mm dia	Each		379.00	
	40mm dia	Each		515.00	
	50mm dia	Each		666.00	
	65mm dia	Each		1062.00	
	80mm dia	Each		1614.00	
	100mm dia	Each		2515.00	
6.24	**Labour for fixing G. I. Union in G.I. Pipe line i/c cutting threading, testing and carriage etc. complete (Old work)**				
	15mm dia	Each		35.00	
	20mm dia	Each		60.00	
	25mm dia	Each		77.00	
	32mm dia	Each		101.00	
	40mm dia	Each		138.00	
	50mm dia	Each		178.00	
	65mm dia	Each		284.00	
	80mm dia	Each		432.00	
	100mm dia	Each		673.00	

Item No.	ITEMS	Unit	Rate in Rupees		
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		22.00	
	20mm dia	Each		33.00	
	25mm dia	Each		45.00	
	32mm dia	Each		67.00	
	40mm dia	Each		82.00	
	50mm dia	Each		138.00	
	65mm dia	Each		180.00	
	80mm dia	Each		268.00	
	100mm dia	Each		446.00	
	125mm dia	Each		603.00	
	150mm dia	Each		704.00	
6.26	**Labour only for fixing G.I. socket in G.I. Pipe line i/c cutting threading, testing and carriage of etc. complete . (Old work)**				
	15mm dia	Each		6.00	
	20mm dia	Each		9.00	
	25mm dia	Each		12.00	
	32mm dia	Each		18.00	
	40mm dia	Each		22.00	
	50mm dia	Each		37.00	
	65mm dia	Each		48.00	
	80mm dia	Each		72.00	
	100mm dia	Each		119.00	
	125mm dia	Each		161.00	
	150mm dia	Each		188.00	
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		45.00	
	20mm dia	Each		65.00	
	25mm dia	Each		111.00	
	32mm dia	Each		189.00	
	40mm dia	Each		225.00	
	50mm dia	Each		345.00	
	65mm dia	Each		428.00	
	80mm dia	Each		505.00	

Item No.	ITEMS	Unit	Rate in Rupees		
	100mm dia	Each		1453.00	
	125mm dia	Each		1652.00	
	150mm dia	Each		2011.00	
6.28	**Labour only for fixing G. I. Bend 90 degree in G.I. Pipe line i/c cutting threading, testing and carriage etc. complete (Old work)**			.	
	15mm dia	Each		12.00	
	20mm dia	Each		17.00	
	25mm dia	Each		30.00	
	32mm dia	Each		50.00	
	40mm dia	Each		60.00	
	50mm dia	Each		92.00	
	65mm dia	Each		114.00	
	80mm dia	Each		135.00	
	100mm dia	Each		389.00	
	125mm dia	Each		442.00	
	150mm dia	Each		538.00	
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		69.00	
	20mm dia	Each		113.00	
	25mm dia	Each		155.00	
	32mm dia	Each		263.00	
	40mm dia	Each		342.00	
	50mm dia	Each		561.00	
	65mm dia	Each		964.00	
	80mm dia	Each		1234.00	
	100mm dia	Each		2289.00	
6.30	**Labour only for fixing G. I. Tee in G.I. Pipe line i/c cutting threading, testing and carriage etc. complete (Old work)**				
	15mm dia	Each		18.00	
	20mm dia	Each		30.00	
	25mm dia	Each		41.00	
	32mm dia	Each		70.00	
	40mm dia	Each		91.00	
	50mm dia	Each		150.00	
	65mm dia	Each		258.00	
	80mm dia	Each		330.00	
	100mm dia	Each		612.00	

Item No.	ITEMS	Unit	Rate in Rupees		
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		48.00	
	20mm dia	Each		83.00	
	25mm dia	Each		114.00	
	32mm dia	Each		187.00	
	40mm dia	Each		235.00	
	50mm dia	Each		442.00	
	65mm dia	Each		693.00	
	80mm dia	Each		935.00	
	100mm dia	Each		1818.00	
6.32	**Labour only for fixing G. I. Elbwo in G.I. Pipe line i/c cutting threading testing etc. complete (Old work)**				
	15mm dia	Each		13.00	
	20mm dia	Each		22.00	
	25mm dia	Each		30.00	
	32mm dia	Each		50.00	
	40mm dia	Each		63.00	
	50mm dia	Each		118.00	
	65mm dia	Each		186.00	
	80mm dia	Each		250.00	
	100mm dia	Each		487.00	
6.33	**Providing and fixing G. I. Nipple of minimum length in G.I. Pipe line i/c cutting, threading, testing and carriage etc. complete (Old work) confirming to IS 1879**				
	15mm dia	Each		30.00	
	20mm dia	Each		46.00	
	25mm dia	Each		67.00	
	32mm dia	Each		113.00	
	40mm dia	Each		139.00	
	50mm dia	Each		207.00	
	65mm dia	Each		382.00	
	80mm dia	Each		564.00	
	100mm dia	Each		1054.00	

Item No.	ITEMS	Unit	Rate in Rupees		
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		8.00	
	20mm dia	Each		12.00	
	25mm dia	Each		18.00	
	32mm dia	Each		30.00	
	40mm dia	Each		37.00	
	50mm dia	Each		55.00	
	65mm dia	Each		102.00	
	80mm dia	Each		151.00	
	100mm dia	Each		282.00	
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		25.00	
	15x100mm	Each		30.00	
	20x80mm	Each		31.00	
	20x100mm	Each		34.00	
	25x80mm	Each		42.00	
	25x100mm	Each		43.00	
	32x80mm	Each		58.00	
	32x100mm	Each		75.00	
	40x80mm	Each		81.00	
	40x100mm	Each		103.00	
	50x80mm	Each		87.00	
	50x100mm	Each		113.00	
	50x150mm	Each		122.00	
	65x80mm	Each		90.00	
	65x100mm	Each		145.00	
	65x150mm	Each		210.00	
	80x100mm	Each		167.00	
	80x150mm	Each		178.00	
	100x150mm	Each		266.00	
	80x125mm	Each		293.00	
	100x125mm	Each		362.00	
	125x150mm	Each		487.00	
6.36	**Labour only for fixing G. I. . Barrel Nipple (reducer)G.I. Pipe line i/c cutting threading testing etc. complete (New work)**				

Item No.	ITEMS	Unit	Rate in Rupees		
	15x80mm	Each		3.00	
	15x100mm	Each		4.00	
	20x80mm	Each		4.00	
	20x100mm	Each		4.00	
	25x80mm	Each		5.00	
	25x100mm	Each		5.00	
	32x80mm	Each		7.00	
	32x100mm	Each		9.00	
	40x80mm	Each		10.00	
	40x100mm	Each		13.00	
	50x80mm	Each		11.00	
	50x100mm	Each		14.00	
	50x150mm	Each		15.00	
	65x80mm	Each		11.00	
	65x100mm	Each		18.00	
	65x150mm	Each		26.00	
	80x100mm	Each		20.00	
	80x150mm	Each		22.00	
	100x150mm	Each		32.00	
	80x125mm	Each		36.00	
	100x125mm	Each		44.00	
	125x150mm	Each		59.00	
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		30.00	
	15x100mm	Each		36.00	
	20x80mm	Each		37.00	
	20x100mm	Each		42.00	
	25x80mm	Each		50.00	
	25x100mm	Each		52.00	
	32x80mm	Each		71.00	
	32x100mm	Each		91.00	
	40x80mm	Each		98.00	
	40x100mm	Each		125.00	
	50x80mm	Each		105.00	
	50x100mm	Each		137.00	
	50x150mm	Each		148.00	
	65x80mm	Each		109.00	
	65x100mm	Each		176.00	
	65x150mm	Each		255.00	
	80x100mm	Each		203.00	

Item No.	ITEMS	Unit	Rate in Rupees		
	80x150mm	Each		216.00	
	100x150mm	Each		322.00	
	80x125mm	Each		356.00	
	100x125mm	Each		439.00	
	125x150mm	Each		590.00	
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		8.00	
	15x100mm	Each		10.00	
	20x80mm	Each		10.00	
	20x100mm	Each		11.00	
	25x80mm	Each		13.00	
	25x100mm	Each		14.00	
	32x80mm	Each		19.00	
	32x100mm	Each		24.00	
	40x80mm	Each		26.00	
	40x100mm	Each		34.00	
	50x80mm	Each		28.00	
	50x100mm	Each		37.00	
	50x150mm	Each		40.00	
	65x80mm	Each		29.00	
	65x100mm	Each		47.00	
	65x150mm	Each		68.00	
	80x100mm	Each		54.00	
	80x150mm	Each		58.00	
	100x150mm	Each		86.00	
	80x125mm	Each		95.00	
	100x125mm	Each		117.00	
	125x150mm	Each		158.00	
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		76.00	
	20mm dia	Each		80.00	
	25mm dia	Each		101.00	
	32mm dia	Each		119.00	
	40mm dia	Each		147.00	
	50mm dia	Each		189.00	
	65mm dia	Each		224.00	
	80mm dia	Each		301.00	

Item No.	ITEMS	Unit	Rate in Rupees		
	100mm dia	Each		400.00	
	125mm dia	Each		652.00	
	150mm dia	Each		743.00	
	200mm dia	Each		1213.00	
6.40	**Labour only for fixing G.I. threaded Flange in G.I. Pipe line i/c cutting threading, testing and carriage etc.complete(New work)**				
	15mm dia	Each		9.00	
	20mm dia	Each		10.00	
	25mm dia	Each		12.00	
	32mm dia	Each		14.00	
	40mm dia	Each		18.00	
	50mm dia	Each		23.00	
	65mm dia	Each		27.00	
	80mm dia	Each		37.00	
	100mm dia	Each		49.00	
	125mm dia	Each		79.00	
	150mm dia	Each		90.00	
	200mm dia	Each		147.00	
6.41	**Providing and fixing G. I. threaded Flange in G.I. Pipe line i/c cutting threading testing etc. complete (Old work) confirming to IS 1879**				
	15mm dia	Each		92.00	
	20mm dia	Each		97.00	
	25mm dia	Each		122.00	
	32mm dia	Each		144.00	
	40mm dia	Each		178.00	
	50mm dia	Each		229.00	
	65mm dia	Each		272.00	
	80mm dia	Each		365.00	
	100mm dia	Each		484.00	
	125mm dia	Each		790.00	
	150mm dia	Each		901.00	
	200mm dia	Each		1470.00	
6.42	**Labour only for fixing G. I. threaded Flange in G.I. Pipe line i/c cutting threadingt,testing and carriage etc. complete (Old work)**				
	15mm dia	Each		25.00	
	20mm dia	Each		26.00	
	25mm dia	Each		33.00	

Item No.	ITEMS	Unit	Rate in Rupees		
	32mm dia	Each		39.00	
	40mm dia	Each		48.00	
	50mm dia	Each		61.00	
	65mm dia	Each		73.00	
	80mm dia	Each		98.00	
	100mm dia	Each		130.00	
	125mm dia	Each		211.00	
	150mm dia	Each		241.00	
	200mm dia	Each		393.00	
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		20.00	
	20mm dia	Each		27.00	
	25mm dia	Each		44.00	
	32mm dia	Each		73.00	
	40mm dia	Each		104.00	
	50mm dia	Each		160.00	
	65mm dia	Each		206.00	
	80mm dia	Each		258.00	
	100mm dia	Each		459.00	
6.44	**Labour only for fixing wrought steel Plug in G.I. Pipe line with outer threading, testing and carriage etc. complete. (Old Work)**				
	15mm dia	Each		5.00	
	20mm dia	Each		7.00	
	25mm dia	Each		12.00	
	32mm dia	Each	+	20.00	
	40mm dia	Each		28.00	
	50mm dia	Each		43.00	
	65mm dia	Each		55.00	
	80mm dia	Each		69.00	
	100mm dia	Each		123.00	
6.45	**Providing and fixing wrought steel Cap Plug with threading in G.I. Pipe line testing etc. complete confirming ti IS:1879 (New & Old Work)**				
	15mm dia	Each		39.00	
	20mm dia	Each		57.00	

Item No.	ITEMS	Unit	Rate in Rupees		
	25mm dia	Each		90.00	
	32mm dia	Each		128.00	
	40mm dia	Each		168.00	
	50mm dia	Each		235.00	
	65mm dia	Each		299.00	
	80mm dia	Each		483.00	
	100mm dia	Each		829.00	
6.46	**Labour only for fixing wrought steel Cap Plug with threading in G.I. Pipe line, testing and carriage etc. complete (Old work)**				
	15mm dia	Each		10.00	
	20mm dia	Each		15.00	
	25mm dia	Each		24.00	
	32mm dia	Each		34.00	
	40mm dia	Each		45.00	
	50mm dia	Each		63.00	
	65mm dia	Each		80.00	
	80mm dia	Each		129.00	
	100mm dia	Each		222.00	
6.47	**Providing and fixing G. I. Cross with outer threading in G.I. Pipe line i/c cutting threading testing etc. complete (Old work)**				
	15mm dia	Each		109.00	
	20mm dia	Each		144.00	
	25mm dia	Each		214.00	
	32mm dia	Each		338.00	
	40mm dia	Each		428.00	
	50mm dia	Each		676.00	
6.48	**Labour only for fixing G. I. cross outer threading in G.I. Pipe line i/c cutting, threading, testing and carriage etc. complete (Old work)**				
	15mm dia	Each		29.00	
	20mm dia	Each		39.00	
	25mm dia	Each		57.00	
	32mm dia	Each		90.00	
	40mm dia	Each		115.00	
	50mm dia	Each		181.00	

Item No.	ITEMS	Unit	Rate in Rupees		
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		81.00	
	20mm dia	Each		112.00	
	25mm dia	Each		188.00	
	32mm dia	Each		268.00	
	40mm dia	Each		352.00	
	50mm dia	Each		558.00	
6.50	**Labour only for Tank Nipple with outer threading in G.I. Pipe line i/c cutting, threading, testing and carriage etc. complete**				
	15mm dia	Each		10.00	
	20mm dia	Each		14.00	
	25mm dia	Each		23.00	
	32mm dia	Each		33.00	
	40mm dia	Each		43.00	
	50mm dia	Each		68.00	

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 measurements 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.
6. **This USOR contains the rates of all the items without GST. GST shall be paid separately as per prevailing government norms as claimed by the contractor in his bill.**

   All the estimates based on this USOR will include GST as an extra amount as per prevailing rates on the sum of the estimate to arrive at the gross amount.

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.	156.00	226.00	257.00
	110 mm dia.	R. mtr.	217.00	307.00	351.00
	140 mm dia.	R. mtr.	362.00	516.00	570.00
	160 mm dia.	R. mtr.	463.00	655.00	738.00
	180 mm dia.	R. mtr.	603.00	870.00	954.00
	200 mm dia.	R. mtr.	814.00	1120.00	1297.00
7.2	**Labour for laying in position including testing 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.	4.00	4.00	4.00
	110 mm dia.	R. mtr.	5.00	5.00	5.00
	140 mm dia.	R. mtr.	6.00	6.00	6.00
	160 mm dia.	R. mtr.	7.00	7.00	7.00
	180 mm dia.	R. mtr.	9.00	9.00	9.00

S.No.	Items	Unit	Rates in RS.		
	200 mm dia.	R. mtr.	12.00	12.00	12.00
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)**				
			6Kg/Cm^2	**8 Kg/Cm^2**	**10Kg/Cm^2**
	90 mm dia.	Each	24.00	24.00	24.00
	110 mm dia.	Each	27.00	27.00	27.00
	140 mm dia.	Each	33.00	33.00	33.00
	160 mm dia.	Each	39.00	39.00	39.00
	180 mm dia.	Each	42.00	42.00	42.00
	200 mm dia.	Each	58.00	58.00	58.00
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	19.00	19.00	19.00
	110 mm dia.	Each Joint	20.00	20.00	20.00
	140 mm dia.	Each Joint	22.00	22.00	22.00
	160 mm dia.	Each Joint	24.00	24.00	24.00
	180 mm dia.	Each Joint	26.00	26.00	26.00
	200 mm dia.	Each Joint	32.00	32.00	320.00
7.5	**Providing and laying in position including testing 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	153.00	202.00	250.00
	110 mm dia.	Each	248.00	336.00	398.00
	140 mm dia.	Each	592.00	814.00	942.00
	160 mm dia.	Each	788.00	1110.00	1322.00
	180 mm dia.	Each	1190.00	1513.00	1816.00
	200 mm dia.	Each	1470.00	1943.00	2348.00

S.No.	Items	Unit	Rates in RS.		
7.6	**Providing and laying in position including testing 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	91.00	112.00	127.00
	110 mm dia.	Each	120.00	210.00	251.00
	140 mm dia.	Each	314.00	331.00	348.00
	160 mm dia.	Each	521.00	547.00	667.00
	180 mm dia.	Each	645.00	787.00	987.00
	200 mm dia.	Each	870.00	1146.00	1512.00
7.7	**Providing and laying in position including testing 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	65.00	69.00	74.00
	110 mm dia.	Each	128.00	137.00	146.00
	140 mm dia.	Each	204.00	218.00	233.00
	160 mm dia.	Each	350.00	374.00	401.00
	180 mm dia.	Each	469.00	501.00	537.00
	200 mm dia.	Each	621.00	664.00	713.00
7.8	**Providing and laying in position including testing 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	37.00	44.00	58.00
	110 mm dia.	Each	53.00	63.00	84.00
	140 mm dia.	Each	83.00	101.00	135.00
	160 mm dia.	Each	137.00	167.00	226.00
	180 mm dia.	Each	183.00	224.00	304.00
	200 mm dia.	Each	221.00	272.00	369.00
7.9	**Providing and laying in position including testing PVC coupler suitable for 6, 8 and 10 Kg/Sq. cm. Pressure pipes**.				
			6Kg/Cm2	**8 Kg/Cm2**	**10Kg/Cm2**
	90 mm dia.	Each	50.00	60.00	85.00
	110 mm dia.	Each	79.00	94.00	133.00
	140 mm dia.	Each	148.00	178.00	277.00
	160 mm dia.	Each	260.00	315.00	356.00
	180 mm dia.	Each	364.00	433.00	446.00
	200 mm dia	Each	469.00	508.00	536.00

S.No.	Items	Unit	Rates in RS.		
7.10	**Providing and laying in position including testing 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	70.00	83.00	99.00
	140x90 mm dia.	Each	111.00	130.00	141.00
	160x90 mm dia.	Each	141.00	167.00	243.00
	180x90 mm dia.	Each	147.00	174.00	258.00
	140x110 mm dia.	Each	114.00	135.00	158.00
	160x110 mm dia.	Each	141.00	167.00	245.00
	180x110 mm dia.	Each	198.00	236.00	265.00
	200x110 mm dia.	Each	254.00	302.00	351.00
	160x140 mm dia.	Each	146.00	173.00	207.00
	180x140 mm dia.	Each	207.00	246.00	286.00
	200x140 mm dia	Each	342.00	408.00	473.00
	180x160 mm dia	Each	224.00	266.00	309.00
	200x160 mm dia.	Each	360.00	430.00	499.00
	200x180 mm dia.	Each	372.00	444.00	515.00
7.11	**Labour for laying in position including testing 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	10.00	10.00	10.00
	160 mm dia.	Each	12.00	12.00	12.00
	180 mm dia.	Each	12.00	12.00	12.00
	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	110.00	110.00	110.00
	110 mm dia.	Each	124.00	124.00	124.00
	140 mm dia.	Each	166.00	166.00	166.00
	160 mm dia.	Each	193.00	193.00	193.00
	180mm dia.	Each	228.00	228.00	228.00
	200mm dia.	Each	331.00	331.00	331.00

S.No.	Items	Unit	Rates in RS.		
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	18.00	18.00	18.00
	110 mm dia.	Each	20.00	20.00	20.00
	140 mm dia.	Each	26.00	26.00	26.00
	160 mm dia.	Each	31.00	31.00	31.00
	180mm dia.	Each	36.00	36.00	36.00
	200mm dia.	Each	53.00	53.00	53.00

CHAPTER – VIII

CAST IRON VALVES

Chapter – VIII
CAST IRON VALVES

NOTES:

1. The Sluice Valves (50-1000 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 conforming 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.
7. **This USOR contains the rates of all the items without GST and the GST shall be paid separately as per prevailing government norms as claimed by the contractor in his bill.**

   All the estimates based on this USOR will include GST as an extra amount as per prevailing rates on the sum of the estimate to arrive at the gross amount.

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	2432.00	2610.00
	65mm dia	Each	2870.00	3085.00
	80mm dia	Each	3397.00	3647.00
	100mm dia	Each	4671.00	5006.00
	125mm dia	Each	5678.00	6101.00
	150mm dia	Each	6933.00	7434.00
	200mm dia	Each	12068.00	12965.00
	250mm dia	Each	17742.00	18896.00
	300mm dia	Each	22207.00	23670.00

S.No.	Items	Unit	Rates in Rupees	
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	208.00	
	65mm dia	Each	215.00	
	80mm dia	Each	225.00	
	100mm dia	Each	352.00	
	125mm dia	Each	384.00	
	150mm dia	Each	511.00	
	200mm dia	Each	706.00	
	250mm dia	Each	1141.00	
	300mm dia	Each	1290.00	
	350 mm dia	Each	2128.00	
	400 mm dia	Each	3267.00	
	450 mm dia	Each	3953.00	
	500 mm dia	Each	4990.00	
	600 mm dia	Each	7230.00	
	700 mm dia	Each	8603.00	
	750 mm dia	Each	9251.00	
	800 mm dia	Each	12176.00	
	900 mm dia	Each	13778.00	
	1000 mm dia	Each	17489.00	
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	76.00	
	65mm dia	Each	95.00	
	80mm dia	Each	107.00	
	100mm dia	Each	148.00	
	125mm dia	Each	174.00	
	150mm dia	Each	216.00	
	200mm dia	Each	323.00	
	250mm dia	Each	464.00	
	300mm dia	Each	599.00	
	350mm dia	Each	1046.00	
	400mm dia	Each	1237.00	
	450mm dia	Each	1479.00	
	500mm dia	Each	1790.00	
	600mm dia	Each	2723.00	
	700mm dia	Each	3123.00	

S.No.	Items	Unit	Rates in Rupees	
	750mm dia	Each	3243.00	
	800mm dia	Each	3684.00	
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 bolts,nuts and rubber insertion all complete as per IS :5312 (Part I)**		**CLASS-PN- 1.0**	
	50mm dia	Each	1873.00	
	65mm dia	Each	2347.00	
	80mm dia	Each	2923.00	
	100mm dia	Each	3745.00	
	150mm dia	Each	6481.00	
	200mm dia	Each	12582.00	
	250mm dia	Each	18758.00	
	300mm dia	Each	24286.00	
	350mm dia	Each	42082.00	
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- 1.0**	**CLASS PN-1.60**
	400mm dia	Each	50419.00	59609.00
	450mm dia	Each	59233.00	85230.00
	500mm dia	Each	105694.00	159546.00
	600mm dia	Each	145494.00	199172.00
	700mm dia	Each	165868.00	251499.00
	750mm dia	Each	243391.00	292609.00
	800mm dia	Each	276660.00	334562.00
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	60.00	
	65mm dia	Each	75.00	
	80mm dia	Each	86.00	
	100mm dia	Each	118.00	
	125mm dia	Each	136.00	
	150mm dia	Each	166.00	
	200mm dia	Each	206.00	
	250mm dia	Each	337.00	

S.No.	Items	Unit	Rates in Rupees	
	300mm dia	Each	428.00	
	350mm dia	Each	657.00	
	400mm dia	Each	856.00	
	450mm dia	Each	964.00	
	500mm dia	Each	1203.00	
	600mm dia	Each	1829.00	
	700mm dia	Each	2099.00	
	750mm dia	Each	2179.00	
	800mm dia	Each	2476.00	
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	1534.00	1610.00
	65mm dia	Each	1756.00	1844.00
	80mm dia	Each	2009.00	2109.00
	100mm dia	Each	2675.00	2808.00
	150mm dia	Each	3407.00	3577.00
	200mm dia	Each	6524.00	6850.00
	250mm dia	Each	10930.00	11476.00
	300mm dia	Each	14919.00	15664.00
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	60.00	
	65mm dia	Each	75.00	
	80mm dia	Each	86.00	
	100mm dia	Each	118.00	
	150mm dia	Each	136.00	
	200mm dia	Each	166.00	
	250mm dia	Each	206.00	
	300mm dia	Each	337.00	
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	2864.00	3007.00
	40mm dia	Each	3036.00	3188.00

S.No.	Items	Unit	Rates in Rupees	
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.**			
	25mm dia	Each	25	
	40mm dia	Each	33	
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	2864.00	3007.00
	40mm dia	Each	3036.00	3188.00
	50mm dia	Each	3523.00	3699.00
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	25.00	
	40mm dia	Each	33.00	
	50mm dia	Each	60.00	
8.12	**Providing & fixing following cast iron double acting air valves, flanged without inbuilt 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	3254.00	3416.00
	50mm dia	Each	3853.00	4045.00
	65mm dia	Each	4066.00	4269.00
	80mm dia	Each	5673.00	5956.00
	100mm dia	Each	8874.00	9317.00
	150mm dia	Each	16412.00	17233.00
	200mm dia	Each	27973.00	29372.00
8.13	**Labour for laying and fixing including testing following Cast Iron double acting air valves, flanged without in-built isolating valve.**			
	40mm dia	Each	33.00	
	50mm dia	Each	60.00	
	65mm dia	Each	75.00	
	80mm dia	Each	86.00	

S.No.	Items	Unit	Rates in Rupees	
	100mm dia	Each	118.00	
	150mm dia	Each	136.00	
	200mm dia	Each	166.00	
8.14	**Providing & fixing following cast iron double acting air valves, flanged with inbuilt 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	3576.00	3755.00
	80mm dia	Each	6232.00	6543.00
	100mm dia	Each	9751.00	10239.00
	150mm dia	Each	18040.00	18942.00
	200mm dia	Each	28813.00	30253.00
8.15	**Labour for laying and fixing, including testing following Cast Iron double acting air valves, flanged with in-built isolating valve.**			
	40mm dia	Each	33.00	
	80mm dia	Each	60.00	
	100mm dia	Each	118.00	
	150mm dia	Each	136.00	
	200mm dia	Each	166.00	

CHAPTER IX

HDPE PIPE, MDPE PIPE
(POLYETHYLENE PIPES FOR WATER SUPPLY)
& SPECIALS

CHAPTER IX
HDPE PIPE, MDPE PIPE & SPECIALS

NOTES:

1. 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.

2. Applicable Codes

The manufacturing, testing, supplying, laying, jointing and testing at work sites of HDPE pipes shall comply with IS: 4984-2016 all currently applicable statutes, regulations, standards and amendments and others as follows-

Code no.	Title / Specification
IS 4984	High Density Polyethylene Pipes renamed as PE (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.

3. Color

The color of the pipe shall be black.

4. 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 in charge.

5. 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. Internal 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 wit 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.

6. 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 harm less and shall be selected from the list given in IS: 10141

7. 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.

8. 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.

9. 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.

10. Length of Straight Pipe

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

11. 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.

12. 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 on 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.

13. Bends

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

14. 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.

15. Reducers

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

16. 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.

17. 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 mating relevant flange of valves, pipes etc. Nominal pressure rating of flanges will be PN10.

18. 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.
f. Process voltage of all saddles must not exceed a maximum of 40 volts.

19. Compression Fitting-

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

Pressure Testing-

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

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.

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.
e.

All fittings with threaded ends should be with BSP threads.

20. This USOR contains the rates of all the items without GST. GST shall be paid separately as per prevailing government norms as claimed by the contractor in his bill.

All the estimates based on this USOR will include GST as an extra amount as per prevailing rates on the sum of the estimate to arrive at the gross amount.

HDPE PIPE (NOW RENAMED AS POLYETHYLENE PIPES)
MDPE PIPE & SPECIALS

S.No.	Items	Unit	Rates in Rs.		
9.1	**Providing, Laying, Jointing & field testing of HDPE pipes (High Density Polyethylene Pipes) 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.	114.00	140.00	173.00
	75 mm dia	R. mtr.	164.00	201.00	246.00
	90 mm dia	R. mtr.	232.00	282.00	353.00
	110 mm dia	R. mtr.	388.00	426.00	518.00
	125 mm dia	R. mtr.	451.00	546.00	668.00
	140 mm dia	R. mtr.	563.00	686.00	837.00
	160 mm dia	R. mtr.	753.00	900.00	1097.00
	180 mm dia	R. mtr.	930.00	1129.00	1389.00
	200 mm dia	R. mtr.	1151.00	1395.00	1708.00
	225 mm dia	R. mtr.	1456.00	1765.00	2171.00
	250 mm dia	R. mtr.	1795.00	2173.00	2668.00
	280 mm dia	R. mtr.	2240.00	2731.00	3349.00
	315 mm dia	R. mtr.	2825.00	3460.00	4238.00
9.2	**Providing and laying including testing Bend 90° confirming to IS specifications.**				
	Pressure ⟶		**6Kg/ sq.cm :**	**8Kg/ sq.cm :**	**10 Kg/ sq.cm:**
	63 mm dia	Each	83.00	89.00	124.00
	75 mm dia	Each	129.00	133.00	159.00
	90 mm dia	Each	199.00	213.00	255.00
	110 mm dia	Each	264.00	308.00	345.00
	125 mm dia	Each	379.00	457.00	579.00
	140 mm dia	Each	514.00	641.00	792.00
	160 mm dia	Each	737.00	926.00	1152.00
	180 mm dia	Each	1018.00	1288.00	1614.00
	200 mm dia	Each	1364.00	1733.00	2180.00

S.No.	Items	Unit	Rates in Rs.		
9.3	**Providing and laying including testing Bend 45° confirming to IS specification.**				
	Pressure ⟶		**6Kg/ sq.cm :**	**8Kg/ sq.cm :**	**10 Kg/ sq.cm:**
	63 mm dia	Each	96.00	96.00	126.00
	75 mm dia	Each	146.00	146.00	193.00
	90 mm dia	Each	210.00	210.00	285.00
	110 mm dia	Each	312.00	359.00	452.00
	125 mm dia	Each	434.00	526.00	665.00
	140 mm dia	Each	633.00	738.00	951.00
	160 mm dia	Each	913.00	1122.00	1366.00
	180 mm dia	Each	1235.00	1364.00	1873.00
	200 mm dia	Each	1627.00	1758.00	2482.00
9.4	**Providing and laying including testing Equal Tee confirming to IS specification**				
	Pressure ⟶		**6Kg/ sq.cm : PN 6**	**8Kg/ sq.cm : PN 8**	**10Kg/ sq.cm: PN 10**
	63 mm dia	Each	102.00	113.00	125.00
	75 mm dia	Each	169.00	176.00	216.00
	90 mm dia	Each	300.00	305.00	369.00
	110 mm dia	Each	439.00	453.00	530.00
	125 mm dia	Each	485.00	607.00	718.00
	140 mm dia	Each	663.00	830.00	984.00
	160 mm dia	Each	957.00	1207.00	1439.00
	180 mm dia	Each	1330.00	1686.00	2024.00
	200 mm dia	Each	1791.00	2281.00	2746.00
9.5	**Providing and laying including testing Pipe end confirming to IS specification.**				
	Pressure ⟶		**6Kg/ sq.cm : PN 6**	**8Kg/ sq.cm : PN 8**	**10Kg/ sq.cm: PN 10**
	63 mm dia	Each	74.00	76.00	78.00
	75 mm dia	Each	95.00	103.00	103.00
	90 mm dia	Each	138.00	155.00	155.00
	110 mm dia	Each	175.00	207.00	207.00
	125 mm dia	Each	272.00	308.00	308.00
	140 mm dia	Each	342.00	389.00	389.00
	160 mm dia	Each	348.00	409.00	409.00
	180 mm dia	Each	538.00	615.00	615.00
	200 mm dia	Each	573.00	635.00	657.00

S.No.	Items	Unit	Rates in Rs.		
9.6	**Providing and laying including testing Reducer: confirming to IS specifications.**				
	Pressure ⟶		**6Kg/sq. cm : PN 6**	**8Kg/sq.cm : PN 8**	**10Kg/sq.cm: PN 10**
	63 mm dia	Each	91.00	92.00	95.00
	75 mm dia	Each	116.00	118.00	124.00
	90 mm dia	Each	125.00	131.00	138.00
	110 mm dia	Each	127.00	153.00	163.00
	125 mm dia	Each	133.00	178.00	182.00
	140 mm dia	Each	158.00	196.00	202.00
	160 mm dia	Each	206.00	256.00	285.00
	180 mm dia	Each	242.00	327.00	363.00
	200 mm dia	Each	279.00	381.00	406.00
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) including testing**				
	63 mm dia	Each	105.00		
	75 mm dia	Each	132.00		
	90 mm dia	Each	146.00		
	110 mm dia	Each	161.00		
	125 mm dia	Each	194.00		
	140 mm dia	Each	206.00		
	160 mm dia	Each	223.00		
	180 mm dia	Each	235.00		
	200 mm dia	Each	250.00		
9.8	**Providing and laying including testing End Cap confirming to IS specifications.**				
	Pressure ⟶		**6Kg/ sq.cm :**	**8Kg/ sq.cm :**	**10 Kg/ sq.cm:**
	63 mm dia	Each	75.00	76.00	80.00
	75 mm dia	Each	93.00	98.00	102.00
	90 mm dia	Each	105.00	106.00	113.00
	110 mm dia	Each	110.00	110.00	116.00

S.No.	Items	Unit	Rates in Rs.		
	125 mm dia	Each	132.00	182.00	185.00
	140 mm dia	Each	190.00	216.00	222.00
	160 mm dia	Each	226.00	315.00	328.00
	180 mm dia	Each	325.00	379.00	395.00
	200 mm dia	Each	388.00	453.00	472.00
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 in Drinking Water System The cost shall include testing of all materials, Inspection charges, transportation up to site, transit insurance, loading, unloading, stacking etc. complete.**				
	PN 16 (SDR 9)		**6Kg/ sq.cm :**	**8Kg/ sq.cm :**	**10 Kg/ sq.cm:**
	20 mm dia	R. mtr	36.00		
	25 mm dia	R. mtr	50.00		
	32 mm dia	R. mtr	83.00		
	40 mm dia	R. mtr	108.00		
	50 mm dia	R. mtr	164.00		
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 . The cost such as testing, inspection charges, transportation up to site, transit insurance, loading, unloading, stacking etc. complete.**				
9.10.1	**Electo Fusion Tapping Ferrule Saddle**				
9.10.1	63x15mm	Each	999.00		
9.10.2	63x20mm	Each	999.00		
9.10.3	63x25mm	Each	999.00		
9.10.4	75x15mm	Each	999.00		
9.10.5	75x20mm	Each	999.00		
9.10.6	75x25mm	Each	999.00		

S.No.	Items	Unit	Rates in Rs.
9.10.7	90x15mm	Each	999.00
9.10.8	90x20mm	Each	999.00
9.10.9	90x25mm	Each	999.00
9.10.10	90x32mm	Each	1296.00
9.10.11	90X40mm	Each	1296.00
9.10.12	90X50mm	Each	1296.00
9.10.13	110X15mm	Each	999.00
9.10.14	110X20mm	Each	999.00
9.10.15	110X25mm	Each	999.00
9.10.16	110X32mm	Each	1296.00
9.10.17	110x40mm	Each	1296.00
9.10.18	110x50mm	Each	1296.00
9.10.19	160x15mm	Each	999.00
9.10.20	160x20mm	Each	999.00
9.10.21	160x25mm	Each	999.00
9.10.22	160x32mm	Each	1416.00
9.10.23	160x40mm	Each	1416.00
9.10.24	160x50mm	Each	1416.00
9.10.25	200x15mm	Each	1410.00
9.10.26	200x20mm	Each	1410.00
9.10.27	200x25mm	Each	1410.00
9.10.28	200x32mm	Each	2040.00
9.10.29	200x40mm	Each	2040.00
9.10.30	200x50mm	Each	2040.00
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, inspection charges, transportation up to site, transit insurance, loading, unloading, stacking etc. complete.**		
9.11.1.1	**Compression Fittings Metal inserted Compression Female Threaded Adaptor with SS 304 Material**		
9.11.1.1	20x15mm	Each	170.00
9.11.1.2	25x20mm	Each	220.00

S.No.	Items	Unit	Rates in Rs.
9.11.1.3	32x25mm	Each	300.00
9.11.1.4	40x32mm	Each	510.00
9.11.1.5	50x40mm	Each	660.00
9.11.1.6	63x50mm	Each	900.00
9.11..2	**Metal inserted Compression Male Threaded Adaptor with SS 304 Material**		
9.11.2.1	20x15mm	Each	170.00
9.10.2.2	25X20mm	Each	220.00
9.11.2.3	32X25mm	Each	300.00
9.11.2.4	40X32mm	Each	510.00
9.11.2.5	50x40mm	Each	660.00
9.11.2.6	63x50mm	Each	900.00
9.11.3	**Compression 90˚ Elbow threaded male off take in Metal**		
9.11.3.1	20x15mm	Each	180.00
9.11.3.2	25X20mm	Each	240.00
9.11.3.3	32X25mm	Each	330.00
9.11.3.4	40X32mm	Each	1150.00
9.11.3.5	50x40mm	Each	1500.00
9.11.3.6	63x50mm	Each	2200.00
9.11.4	**Compression 90˚ Elbow threaded Female off take in Metal**		
9.11.4.1	20x15mm	Each	180.00
9.11.4.2	25X20mm	Each	240.00
9.11.4.3	32X25mm	Each	330.00
9.11.4.4	40X32mm	Each	1150.00
9.11.4.5	50x40mm	Each	1500.00
9.11.4.6	63x50mm	Each	2200.00
9.11.5	**Compression 90˚Elbow**		
9.11.5.1	20mm	Each	110.00
9.11.5.2	25mm	Each	150.00
9.11.5.3	32mm	Each	195.00
9.11.5.4	40mm	Each	390.00
9.11.5.5	50mm	Each	554.00
9.11.5.6	63mm	Each	751.00
9.12	**Providing & Supply of PVC Ball Valves in PN16 rating with one end compression using Blue color compression nut in polypropylene**		

S.No.	Items	Unit	Rates in Rs.
	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, inspection charges, transportation up to site, transit insurance, loading, unloading, stacking etc. complete.		
	PVC Ball Valve with Compression & Female Threads.		
9.12.1	20x15mm	Each	175.00
9.12.2	25X20mm	Each	227.00
9.12.3	32X25mm	Each	256.00
9.12.4	40X32mm	Each	550.00
9.12.5	50x40mm	Each	737.00
9.12.6	63x50mm	Each	1133.00
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. and shall be inclusive of all cost such as testing,**		

S.No.	Items	Unit	Rates in Rs.
	inspection charges, transportation up to site, transit insurance, loading, unloading, stacking etc. complete.		
9.13.1	80 NB x 15mm, 20mm, 25mm	Each	1000.00
9.13.2	100 NB x 15mm, 20mm, 25mm	Each	1100.00
9.13.3	150 NB x 15mm, 20mm, 25mm	Each	1300.00
9.13.4	200 NB x 15mm, 20mm, 25mm	Each	1500.00
9.13.5	250 NB x 15mm, 20mm, 25mm	Each	1700.00
9.13.6	300 NB x 15mm, 20mm, 25mm	Each	1900.00
9.14	**Providing & Supply of Electro Fusion Fittings in accordance with 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, 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	100.00
9.14.1.2	25mm	Each	100.00
9.14.1.3	32mm	Each	100.00
9.14.1.4	40mm	Each	185.00
9.14.1.5	50mm	Each	229.00
9.14.1.6	63mm	Each	247.00
9.14.1.7	75mm	Each	444.00
9.14.1.8	90mm	Each	476.00
9.14.1.9	110mm	Each	678.00
9.10.1.10	125mm	Each	689.00
9.14.1.11	140mm	Each	1478.00
9.14.1.12	160mm	Each	1620.00
9.14.1.13	180mm	Each	2419.00
9.14.1.14	200mm	Each	3158.00
9.14.1.15	225mm	Each	3749.00
9.14.1.16	250mm	Each	4568.00
9.14.1.17	280mm	Each	9153.00

S.No.	Items	Unit	Rates in Rs.
9.14.1.18	315mm	Each	9186.00
9.14.2	**Electro Fusion Equal Tee**		
9.14.2.1	20mm	Each	250.00
9.14.2.2	25mm	Each	250.00
9.14.2.3	32mm	Each	250.00
9.14.2.4	40mm	Each	848.00
9.14.2.5	50mm	Each	942.00
9.14.2.6	63mm	Each	1050.00
9.14.2.7	75mm	Each	1400.00
9.14.2.8	90mm	Each	1740.00
9.14.2.9	110mm	Each	2100.00
9.14.2.10	125mm	Each	2600.00
9.14.2.11	140mm	Each	5892.00
9.14.2.12	160mm	Each	8600.00
9.14.2.13	180mm	Each	11000.00
9.14.2.14	200mm	Each	13000.00
9.14.2.15	225mm	Each	19000.00
9.14.2.16	250mm	Each	21000.00
9.14.2.17	280mm	Each	23000.00
9.14.3	**Electro Fusion Elbow 90°**		
9.14.6.3.1	20mm	Each	190.00
9.14.3.2	25mm	Each	190.00
9.14.3.3	32mm	Each	190.00
9.14.3.4	40mm	Each	500.00
9.14.3.5	50mm	Each	500.00
9.14.3.6	63mm	Each	500.00
9.14.3.7	75mm	Each	1100.00
9.14.3.8	90mm	Each	1500.00
9.14.3.9	110mm	Each	2000.00
9.14.3.10	125mm	Each	2400.00
9.14.3.11	140mm	Each	5100.00
9.14.3.12	160mm	Each	6600.00
9.14.3.13	180mm	Each	8500.00
9.14.3.14	200mm	Each	16000.00
9.14.3.15	225mm	Each	18000.00
9.14.3.16	250mm	Each	20000.00

S.No.	Items	Unit	Rates in Rs.
9.14.3.17	280mm	Each	22000.00
9.14.3.18	315mm	Each	25000.00
9.16.4	**Electro Fusion Reducer**		
9.14.4.1	25x20mm	Each	200.00
9.14.4.2	32x20mm	Each	200.00
9.14.4.3	32x25mm	Each	200.00
9.14.4.4	40x32mm	Each	670.00
9.14.4.5	50x32mm	Each	840.00
9.14.4.6	50x40mm	Each	928.00
9.14.4.7	63x32mm	Each	990.00
9.14.4.8	63x40mm	Each	1001.00
9.14.4.9	63x50mm	Each	1160.00
9.14.4.10	90x63mm	Each	1641.00
9.14.4.11	90x75mm	Each	2100.00
9.14.4.12	110x75mm	Each	2650.00
9.14.4.13	110x90mm	Each	3020.00
9.14.4.14	125x90mm	Each	3820.00
9.14.4.15	125x110mm	Each	3820.00
9.14.4.16	140x90mm	Each	4200.00
9.14.4.17	140x110mm	Each	4200.00
9.14.4.18	140x125mm	Each	4200.00
9.14.4.19	160x110mm	Each	5500.00
9.14.4.20	160x125mm	Each	5500.00
9.14.4.21	160x140mm	Each	5500.00
9.14.4.22	180x125mm	Each	6200.00
9.14.4.23	180x140mm	Each	6200.00
9.14.4.24	180x160mm	Each	6200.00
9.14.4.25	200x160mm	Each	7400.00
9.14.4.26	200x180mm	Each	7400.00
9.14.4.27	225x160mm	Each	9000.00
9.14.4.28	225x180mm	Each	9000.00
9.14.4.29	225x200mm	Each	9000.00
9.14.4.30	250x160mm	Each	11000.00
9.14.4.31	250x200mm	Each	11000.00
9.14.4.32	250x225mm	Each	11000.00
9.14.5	**Electro Fusion End Cap**		
9.14.5.1	20mm	Each	152.00

S.No.	Items	Unit	Rates in Rs.
9.14.5.2	25mm	Each	152.00
9.14.5.3	32mm	Each	152.00
9.14.5..4	40mm	Each	330.00
9.14.5.5	50mm	Each	400.00
9.14.5.6	63mm	Each	580.00
9.14.5.7	75mm	Each	870.00
9.14.5.8	90mm	Each	1100.00
9.14.5.9	110mm	Each	1400.00
9.14.5.10	125mm	Each	1700.00
9.14.5.11	140mm	Each	2500.00
9.14.5.12	160mm	Each	3600.00
9.14.5.13	180mm	Each	4400.00
9.14.5.14	200mm	Each	5200.00
9.14.5.15	225mm	Each	8500.00
9.14.5.16	250mm	Each	10000.00
9.14.5.17	280mm	Each	11000.00
9.14.5.18	315mm	Each	12000.00
9.14.6	**Spigot Long Neck Pipe End (Stub End) for Electro Fusion Joint**		
9.14.6.1	63mm	Each	358.00
9.14.6.2	75mm	Each	403.00
9.14.6.3	90mm	Each	505.00
9.14.6.4	110mm	Each	770.00
9.14.6.5	125mm	Each	1213.00
9.14.6.6	140mm	Each	1380.00
9.14.6.7	160mm	Each	1975.00
9.14.6.8	180mm	Each	2663.00
9.14.6.9	200mm	Each	3130.00
9.14.6.10	225mm	Each	3755.00
9.14.6.11	250mm	Each	4313.00
9.14.6.12	280mm	Each	4828.00
9.14.6.13	315mm	Each	6275.00

CHAPTER- X

MILD STEEL PIPES AND SPECIALS

CHAPTER – X

MILD STEEL PIPES AND SPECIALS

NOTES :

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

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

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 Steel cylinder pipes with concrete lining and crating (specifications)

Part I

Steel :

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.

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

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

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

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 on ground.

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.

8. Rates

The rates include charges for all tools & plants, required for lifting and laying 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.

9. The rates shown in item are exclusive of 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. The estimate 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.

11 This USOR contains the rates of all the items without GST. GST shall be paid separately as per prevailing government norms as claimed by the contractor in his bill.

All the estimates based on this USOR will include GST as an extra amount as per prevailing rates on the sum of the estimate to arrive at the gross amount.

M.S. PIPES AND SPECIALS

S. No.	Item	Unit	Rate (in Rs.)
10.1	Manufacturing, Supplying at site & laying, jointing of following M.S. pipes as per IS specifications, duly testing for usage in Drinking water inclusive of all materials, inspection charges, transit insurance, loading/unloading, FOR site and stacking etc. complete as per direction of Engineer-in-Charge. (Excluding protective coating)		

S. No.	Item	Unit	Rate (in Rs.)
10.1.1	Dia of pipe 100.00 mm (I.D) Thickness of pipe		
(i)	4mm	RM	671.00
(ii)	6mm	RM	1030.00
(iii)	8mm	RM	1404.00
10.1.2	Dia of pipe 150.00 mm (I.D) Thickness of pipe		
(i)	4mm	RM	994.00
(ii)	6mm	RM	1515.00
(iii)	8mm	RM	2054.00
10.1.3	Dia of pipe 200.00 mm (I.D) Thickness of pipe		
(i)	4mm	RM	1317.00
(ii)	6mm	RM	2001.00
(iii)	8mm	RM	2703.00
10.1.4	Dia of pipe 250.00 mm (I.D) Thickness of pipe		
(i)	4mm	RM	1639.00
(ii)	6mm	RM	2486.00
(iii)	8mm	RM	3353.00
10.1.5	Dia of pipe 300.00 mm (I.D) Thickness of pipe :		
(i)	4mm	RM	1962.00
(ii)	6mm	RM	2972.00
(iii)	8mm	RM	4003.00
10.1.6	Dia of pipe 350.00 mm (I.D) Thickness of pipe :		
(i)	4mm	RM	2284.00
(ii)	6mm	RM	3457.00
(iii)	8mm	RM	4652.00
10.1.7	Dia of pipe 400.00 mm (I.D) Thickness of pipe :		
(i)	4mm	RM	2607.00
(ii)	6mm	RM	3943.00
(iii)	8mm	RM	5302.00
(iv)	10mm	RM	6653.00
10.1.8	Dia of pipe 450.00 mm (I.D) Thickness of pipe :		
(i)	4mm	RM	2930.00
(ii)	6mm	RM	4429.00
(iii)	8mm	RM	5951.00
(iv)	10mm	RM	7464.00
10.1.9	Dia of pipe 500.00 mm (I.D) Thickness of pipe :		
(i)	5mm	RM	4054.00
(ii)	6mm	RM	4914.00
(iii)	8mm	RM	6601.00
(iv)	10mm	RM	8276.00
(v)	12mm	RM	10021.00
10.1.10	Dia of pipe 550.00 mm (I.D) Thickness of pipe		
(i)	5mm	RM	4455.00
(ii)	6mm	RM	5400.00
(iii)	8mm	RM	7251.00
(iv)	10mm	RM	9087.00

S. No.	Item	Unit	Rate (in Rs.)
(v)	12mm	RM	10999.00
10.1.11	Dia of pipe 600.00 mm (I.D) Thickness of pipe :		
(i)	6mm	RM	5885.00
(ii)	8mm	RM	7900.00
(iii)	10mm	RM	9897.00
(iv)	12mm	RM	11978.00
10.112	Dia of pipe 650.00 mm (I.D) Thickness of pipe		
(i)	6mm	RM	6371.00
(ii)	8mm	RM	8450.00
(iii)	10mm	RM	10709.00
(iv)	12mm	RM	12956.00
10.1.13	Dia of pipe 700.00 mm (I.D) Thickness of pipe :		
(i)	6mm	RM	6856.00
(ii)	8mm	RM	9199.00
(iii)	10mm	RM	11520.00
(iv)	12mm	RM	13934.00
(v)	14mm	RM	16219.00
10.1.14	Dia of pipe 750.00 mm (I.D) Thickness of pipe :		
(i)	7mm	RM	8543.00
(ii)	8mm	RM	9849.00
(iii)	10mm	RM	12331.00
(iv)	12mm	RM	14912.00
10.1.15	Dia of pipe 800.00 mm (I.D) Thickness of pipe :		
(i)	7mm	RM	9107.00
(ii)	8mm	RM	10499.00
(iii)	10mm	RM	13143.00
(iv)	12mm	RM	15891.00
10.1.16	Dia of pipe 850.00 mm (I.D) Thickness of pipe :		
(i)	8mm	RM	11148.00
(ii)	10mm	RM	13954.00
(iii)	12mm	RM	16869.00
10.1.17	Dia of pipe 900.00 mm (I.D) Thickness of pipe :		
(i)	8mm	RM	11798.00
(ii)	10mm	RM	14765.00
(iii)	12mm	RM	17847.00
10.1.18	Dia of pipe 950.00 mm (I.D) Thickness of pipe :		
(i)	8mm	RM	12447.00
(ii)	10mm	RM	15576.00
(iii)	12mm	RM	18825.00
10.1.19	Dia of pipe 1000.00 mm (I.D) Thickness of pipe :		
(i)	8mm	RM	13097.00
(ii)	10mm	RM	16387.00
(iii)	12mm	RM	19804.00
10.1.20	Dia of pipe 1050.00 mm (I.D) Thickness of pipe :		
(i)	8mm	RM	13747.00

S. No.	Item	Unit	Rate (in Rs.)
(ii)	10mm	RM	17198.00
(iii)	12mm	RM	20782.00
10.1.21	Dia of pipe 1100.00 mm (I.D) Thickness of pipe :		
(i)	10mm	RM	18010.00
(ii)	12mm	RM	21761.00
10.1.22	Dia of pipe 1150.00 mm (I.D) Thickness of pipe :		
(i)	10mm	RM	18821.00
(ii)	12mm	RM	22739.00
10.1.23	Dia of pipe 1200.00 mm (I.D) Thickness of pipe :		
(i)	10mm	RM	19632.00
(ii)	12mm	RM	23717.00
10.1.24	Dia of pipe 1250.00 mm (I.D) Thickness of pipe :		
(i)	10mm	RM	20443.00
(ii)	12mm	RM	24695.00
10.1.25	Dia of pipe 1300.00 mm (I.D) Thickness of pipe :		
(i)	10mm	RM	21254.00
(ii)	12mm	RM	25673.00
10.1.26	Dia of pipe 1350.00 mm (I.D) Thickness of pipe :		
(i)	10mm	RM	22065.00
(ii)	12mm	RM	26652.00
10.1.27	Dia of pipe 1400.00 mm (I.D) Thickness of pipe :		
(i)	12mm	RM	27630.00
(ii)	14mm	RM	3491.00
10.1.28	Dia of pipe 1450.00 mm (I.D) Thickness of pipe :		
(i)	12mm	RM	28608.00
(ii)	14mm	RM	33252.00
10.1.29	Dia of pipe 1500.00 mm (I.D) Thickness of pipe :		
(i)	12mm	RM	29586.00
(ii)	14mm	RM	34387.00
10.1.30	Dia of pipe 1550.00 mm (I.D) Thickness of pipe :		
(i)	12mm	RM	30565.00
(ii)	14mm	RM	35523.00
10.1.31	Dia of pipe 1600.00 mm (I.D) Thickness of pipe :		
(i)	14mm	RM	36658.00
(ii)	16mm	RM	41786.00
10.1.32	Dia of pipe 1650.00 mm (I.D) Thickness of pipe :		
(i)	14mm	RM	37794.00
(ii)	16mm	RM	43079.00
(iii)	18mm	RM	48377.00
10.1.33	Dia of pipe 1700.00 mm (I.D) Thickness of pipe :		
(i)	14mm	RM	38929.00
(ii)	16mm	RM	44372.00
(iii)	18mm	RM	49827.00
10.1.34	Dia of pipe 1750.00 mm (I.D) Thickness of pipe		
(i)	14mm	RM	40065.00

S. No.	Item	Unit	Rate (in Rs.)
(ii)	16mm	RM	45664.00
(iii)	18mm	RM	51277.00
10.1.35	Dia of pipe 1800.00 mm (I.D) Thickness of pipe :		
(i)	14mm	RM	41200.00
(ii)	16mm	RM	46957.00
(iii)	18mm	RM	52727.00
10.1.36	Dia of pipe 1850.00 mm (I.D) Thickness of pipe :		
(i)	14mm	RM	42336.00
(ii)	16mm	RM	48250.00
(iii)	20mm	RM	60117.00
10.1.37	Dia of pipe 1900.00 mm (I.D) Thickness of pipe :		
(i)	16mm	RM	49543.00
(ii)	18mm	RM	55627.00
(iii)	20mm	RM	61725.00
10.1.38	Dia of pipe 1950.00 mm (I.D) Thickness of pipe :		
(i)	16mm	RM	50835.00
(ii)	18mm	RM	57077.00
(iii)	20mm	RM	63332.00
10.1.39	Dia of pipe 2000.00 mm (I.D) Thickness of pipe :		
(i)	16mm	RM	52128.00
(ii)	18mm	RM	58527.00
(iii)	20mm	RM	64939.00
	FABRICATION OF M.S. PIPE AND SPECIALS		
10.2	**Fabrication of M.S. pipes & specials from steel plates as per relevant IS specifications inclusive of cost of all materials, for any thickness as per design, inspection charges, testing, transit insurance, loading/ unloading, FOR site and stacking etc. complete as per direction of the Engineer in charge. fabricating of pipes and specials from steel plates .**	Kg.	73.00
10.3	**Labour only for lowering and laying of MS pipe and specials as per approved specification complete as directed by Engineer incharge**	Kg	1.21
10.4	**Providing and applying primer and one coat of red oxide externally**	Sqm	33.00
10.5	**Providing and applying primer and one coat of red oxide of iron paint, internally**	Sqm	71.00
	Laying of M.S. Pipes and Specials		
10.6	**Labour Only for lowering & laying of M.S. Pipes as per approved specification and as directed by Engineer incharge.**		
10.6.1	4mm to 8mm thick		

S. No.	Item	Unit	Rate (in Rs.)
	100mm Upto 500mm. dia	RM	71.00
	Above 500mm. Upto 750mm. dia	RM	116.00
	Above 750mm. Upto 1050mm. dia	RM	160.00
10.6.2	10mm to 12mm thick		
	400mm Upto 750mm. dia	RM	191.00
	Above 750mm. Upto 1050mm. dia	RM	264.00
	Above 1050mm. Upto 1200mm. dia	RM	329.00
	Above 1200mm. Upto 1550mm. dia	RM	394.00
10.6.3	14mm to 20mm thick		
	Above 700mm. Upto 1000mm. dia	RM	314.00
	Above 1000mm. Upto 1250mm. dia	RM	392.00
	Above 1250mm. Upto 1450mm. dia	RM	468.00
	Above 1450mm. Upto 1750mm. dia	RM	554.00
	Above 1750mm. Upto 2000mm. dia	RM	649.00
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	55.00
(ii)	6mm	RM	112.00
(iii)	8mm	RM	234.00
10.7.2	Dia of pipe 300.00 mm (I.D) Thickness of pipe :		
(i)	4mm	RM	65.00
(ii)	6mm	RM	133.00
(iii)	8mm	RM	269.00
10.7.3	Dia of pipe 350.00 mm (I.D) Thickness of pipe :		
(i)	4mm	RM	76.00
(ii)	6mm	RM	155.00
(iii)	8mm	RM	322.00
10.7.4	Dia of pipe 400.00 mm (I.D) Thickness of pipe :		
(i)	4mm	RM	86.00
(ii)	6mm	RM	176.00
(iii)	8mm	RM	366.00
(iv)	10mm	RM	450.00
10.7.5	Dia of pipe 450.00 mm (I.D) Thickness of pipe :		
(i)	4mm	RM	97.00
(ii)	6mm	RM	198.00
(iii)	8mm	RM	411.00
(iv)	10mm	RM	504.00
10.7.6	Dia of pipe 500.00 mm (I.D) Thickness of pipe :		
(i)	5mm	RM	108.00
(ii)	6mm	RM	219.00
(iii)	8mm	RM	455.00
(iv)	10mm	RM	558.00

S. No.	Item	Unit	Rate (in Rs.)
(v)	12mm	RM	1003.00
10.7.7	Dia of pipe 550.00 mm (I.D) Thickness of pipe :		
(i)	5mm	RM	119.00
(ii)	6mm	RM	242.00
(iii)	8mm	RM	499.00
(iv)	10mm	RM	611.00
(v)	12mm	RM	1098.00
10.7.8	Dia of pipe 600.00 mm (I.D) Thickness of pipe :		
(i)	6mm	RM	263.00
(ii)	8mm	RM	543.00
(iii)	10mm	RM	665.00
(iv)	12mm	RM	1194.00
10.7.9	Dia of pipe 650.00 mm (I.D) Thickness of pipe :		
(i)	6mm	RM	284.00
(ii)	8mm	RM	587.00
(iii)	10mm	RM	718.00
(iv)	12mm	RM	1289.00
10.7.10	Dia of pipe 700.00 mm (I.D) Thickness of pipe :		
(i)	6mm	RM	306.00
(ii)	8mm	RM	631.00
(iii)	10mm	RM	772.00
(iv)	12mm	RM	1385.00
(v)	14mm	RM	1393.00
10.7.11	Dia of pipe 750.00 mm (I.D) Thickness of pipe :		
(i)	7mm	RM	328.00
(ii)	8mm	RM	675.00
(iii)	10mm	RM	825.00
(iv)	12mm	RM	1481.00
10.7.12	Dia of pipe 800.00 mm (I.D) Thickness of pipe :		
(i)	7mm	RM	350.00
(ii)	8mm	RM	718.00
(iii)	10mm	RM	879.00
(iv)	12mm	RM	1681.00
10.7.13	Dia of pipe 850.00 mm (I.D) Thickness of pipe :		
(i)	8mm	RM	762.00
(ii)	10mm	RM	932.00
(iii)	12mm	RM	1673.00
10.7.14	Dia of pipe 900.00 mm (I.D) Thickness of pipe :		
(i)	8mm	RM	806.00
(ii)	10mm	RM	986.00
(iii)	12mm	RM	1747.00
10.7.15	Dia of pipe 950.00 mm (I.D) Thickness of pipe :		
(i)	8mm	RM	851.00
(ii)	10mm	RM	1040.00
(iii)	12mm	RM	1864.00

S. No.	Item	Unit	Rate (in Rs.)
10.7.16	Dia of pipe 1000.00 mm (I.D) Thickness of pipe		
(i)	8mm	RM	895.00
(ii)	10mm	RM	1093.00
(iii)	12mm	RM	1959.00
10.7.17	Dia of pipe 1050.00 mm (I.D) Thickness of pipe :		
(i)	8mm	RM	939.00
(ii)	10mm	RM	1147.00
(iii)	12mm	RM	2055.00
10.7.18	Dia of pipe 1100.00 mm (I.D) Thickness of pipe :		
(i)	10mm	RM	1201.00
(ii)	12mm	RM	2150.00
10.7.19	Dia of pipe 1150.00 mm (I.D) Thickness of pipe :		
(i)	10mm	RM	1255.00
(ii)	12mm	RM	2246.00
10.7.20	Dia of pipe 1200.00 mm (I.D) Thickness of pipe :		
(i)	10mm	RM	1308.00
(ii)	12mm	RM	2342.00
10.7.21	Dia of pipe 1250.00 mm (I.D) Thickness of pipe :		
(i)	10mm	RM	1362.00
(ii)	12mm	RM	2437.00
10.7.22	Dia of pipe 1300.00 mm (I.D) Thickness of pipe :		
(i)	10mm	RM	1415.00
(ii)	12mm	RM	2533.00
10.7.23	Dia of pipe 1350.00 mm (I.D) Thickness of pipe :		
(i)	10mm	RM	1469.00
(ii)	12mm	RM	2629.00
10.7.24	Dia of pipe 1400.00 mm (I.D) Thickness of pipe :		
(i)	12mm	RM	2725.00
(ii)	14mm	RM	2732.00
10.7.25	Dia of pipe 1450.00 mm (I.D) Thickness of pipe :		
(i)	12mm	RM	2820.00
(ii)	14mm	RM	2828.00
10.7.26	Dia of pipe 1500.00 mm (I.D) Thickness of pipe :		
(i)	12mm	RM	2916.00
(ii)	14mm	RM	2923.00
10.7.27	Dia of pipe 1550.00 mm (I.D) Thickness of pipe :		
(i)	12mm	RM	3011.00
(ii)	14mm	RM	3019.00
10.7.28	Dia of pipe 1600.00 mm (I.D) Thickness of pipe :		
(i)	14mm	RM	3114.00
(ii)	16mm	RM	3123.00
10.7.29	Dia of pipe 1650.00 mm (I.D) Thickness of pipe		
(i)	14mm	RM	3211.00
(ii)	16mm	RM	3218.00
(iii)	18mm	RM	3226.00

S. No.	Item	Unit	Rate (in Rs.)
10.7.30	Dia of pipe 1700.00 mm (I.D) Thickness of pipe :		
(i)	14mm	RM	3306.00
(ii)	16mm	RM	3314.00
(iii)	18mm	RM	3321.00
10.7.31	Dia of pipe 1750.00 mm (I.D) Thickness of pipe :		
(i)	14mm	RM	3402.00
(ii)	16mm	RM	3409.00
(iii)	18mm	RM	3417.00
10.7.32	Dia of pipe 1800.00 mm (I.D) Thickness of pipe :		
(i)	14mm	RM	3498.00
(ii)	16mm	RM	3505.00
(iii)	18mm	RM	3512.00
10.7.33	Dia of pipe 1850.00 mm (I.D) Thickness of pipe :		
(i)	14mm	RM	3593.00
(ii)	16mm	RM	3600.00
(iii)	20mm	RM	3616.00
10.7.34	Dia of pipe 1900.00 mm (I.D) Thickness of pipe :		
(i)	16mm	RM	3696.00
(ii)	18mm	RM	3704.00
(iii)	20mm	RM	3712.00
10.7.35	Dia of pipe 1950.00 mm (I.D) Thickness of pipe		
(i)	16mm	RM	3792.00
(ii)	18mm	RM	3800.00
(iii)	20mm	RM	3387.00
10.7.36	Dia of pipe 2000.00 mm (I.D) Thickness of pipe :		
(i)	16mm	RM	3888.00
(ii)	20mm	RM	3903.00
10.8	**Providing & applying 30 mm thick 1:3 cement mortar coating out side face of M.S pipe as per relevant IS specification including testing along with fixing of (100 x3 mm) wire mesh as per approved specification per Sqmm**	Sqm	430.00
10.9	**Providing & applying inside 20 mm thick 1:2 cement mortar on inside face of pipe as per relevant IS specification including testing as directed by Engineer in Charge**	Sqm	315.00
10.10	**Providing & applying 400 micron epoxy coating as per relevat IS specification on out side face of pipe including testing.**	Sqm	144.00
10.11	**Providing & applying 400 micron food grade epoxy coating on inside face of pipe as per relevant IS specification including testing.**	Sqm	225.00

CHAPTER- XI

BAR WRAPPED STEEL CYLINDER PIPES (BWSC)

CHAPTER-XI

BAR WRAPPED STEEL CYLINDER PIPES (BWSC)

NOTES :

1. Scope

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

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.

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

3. Design Criteria

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:

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.

3.1.2 At site test pressure, stress shall neither exceed 165 N/mm^2 nor 75 percent of the minimum yield strength of the steel used in the cylinder.

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.

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.

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

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

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.

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.

8. **Specials and Fittings**

8.1 . The steel for fabricated steel plate specials, in 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.

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.

9. For lowering, laying & pouring of cement mortar in the field on joints (after laying & welding) rate as per P.S.C. pipes Lowering, laying & jointing shall be adopted.

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. 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.

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.

13. This USOR contains the rates of all the items without GST. GST shall be paid separately as per prevailing norms as claimed by the contractor in his bill. All the estimates based on this USOR will include GST as an extra amount as per prevailing rates on the sum of the estimate to arrive at the gross amount.

BAR WRAPPED STEEL CYLINDER PIPES (BWSC)

Sr.No.	Item	Unit	Rate (In Rs.)
11.1.	**Providing Bar Wrapped Steel Cylinder Pipes test Presure 4 Kg/Sqcm including testing, inspection, trasportaion at site, transit insurance, loading unloading & stacking etc. complete.**		
	350 mm	RM	2360.00
	400 mm	RM	2696.00
	450 mm	RM	3120.00
	500 mm	RM	3473.00
	600 mm	RM	4622.00
	700 mm	RM	5429.00
	800 mm	RM	6204.00
	900 mm	RM	7844.00
	1000 mm	RM	9054.00
	1100 mm	RM	13221.00
	1200 mm	RM	14668.00
	1300 mm	RM	16056.00
	1400 mm	RM	17863.00
	1500 mm	RM	20687.00
	1600 mm	RM	22028.00

Sr.No.	Item	Unit	Rate (In Rs.)
11.2.	**Labour only for laying & jointing Bar Wrapped Steel Cylinder Pipes test Presure 4 Kg/Sqcm including testing & cost of jointing material as per relevant IS specification.**		
	350 mm	RM	480.00
	400 mm	RM	552.00
	450 mm	RM	631.00
	500 mm	RM	752.00
	600 mm	RM	850.00
	700 mm	RM	1001.00
	800 mm	RM	1147.00
	900 mm	RM	1449.00
	1000 mm	RM	1459.00
	1100 mm	RM	2081.00
	1200 mm	RM	2315.00
	1300 mm	RM	2457.00
	1400 mm	RM	2150.00
	1500 mm	RM	2317.00
	1600 mm	RM	2651.00
11.3	**Providing Bar Wrapped Steel Cylinder Pipes test Presure 6 Kg/Sqcm including testing, inspection, trasportaion at site, transit insurance, loading unloading & stacking etc. complete.**		
	350 mm	RM	2364.00
	400 mm	RM	2700.00
	450 mm	RM	2124.00
	500 mm	RM	3481.00
	600 mm	RM	4629.00
	700 mm	RM	5444.00
	800 mm	RM	6212.00
	900 mm	RM	7852.00
	1000 mm	RM	9067.00
	1100 mm	RM	13229.00
	1200 mm	RM	14680.00
	1300 mm	RM	16065.00
	1400 mm	RM	17875.00
	1500 mm	RM	20703.00
	1600 mm	RM	22048.00

Sr.No.	Item	Unit	Rate (In Rs.)
11.4	Labour only for laying & jointing Bar Wrapped Steel Cylinder Pipes test Presure 6 Kg/Sqcm including testing & cost of jointing material as per relevant IS specification.		
	350 mm	RM	481.00
	400 mm	RM	554.00
	450 mm	RM	634.00
	500 mm	RM	755.00
	600 mm	RM	854.00
	700 mm	RM	1004.00
	800 mm	RM	1150.00
	900 mm	RM	1451.00
	1000 mm	RM	1463.00
	1100 mm	RM	2082.00
	1200 mm	RM	2317.00
	1300 mm	RM	2459.00
	1400 mm	RM	2151.00
	1500 mm	RM	2319.00
	1600 mm	RM	2653.00
11.5	**Providing Bar Wrapped Steel Cylinder Pipes test Presure 8 Kg/Sqcm including testing, inspection, trasportaion at site, transit insurance, loading unloading & stacking etc. complete.**		
	350 mm	RM	2367.00
	400 mm	RM	2708.00
	450 mm	RM	3129.00
	500 mm	RM	3491.00
	600 mm	RM	4635.00
	700 mm	RM	5461.00
	800 mm	RM	6222.00
	900 mm	RM	7857.00
	1000 mm	RM	9080.00
	1100 mm	RM	13241.00
	1200 mm	RM	14697.00
	1300 mm	RM	16074.00
	1400 mm	RM	17891.00
	1500 mm	RM	20721.00
	1600 mm	RM	22063.00

Sr.No.	Item	Unit	Rate (In Rs.)
11.6	**Labour only for laying & jointing Bar Wrapped Steel Cylinder Pipes test Presure 8 Kg/Sqcm including testing & cost of jointing material as per relevant IS specification.**		
	350 mm	RM	481.00
	400 mm	RM	558.00
	450 mm	RM	638.00
	500 mm	RM	759.00
	600 mm	RM	859.00
	700 mm	RM	1008.00
	800 mm	RM	1153.00
	900 mm	RM	1452.00
	1000 mm	RM	1466.00
	1100 mm	RM	2084.00
	1200 mm	RM	2320.00
	1300 mm	RM	2463.00
	1400 mm	RM	2153.00
	1500 mm	RM	2322.00
	1600 mm	RM	2656.00
11.7	**Providing Bar Wrapped Steel Cylinder Pipes test Presure 10 Kg/Sqcm including testing, inspection, trasportaion at site, transit insurance, loading unloading & stacking etc. complete.**		
	350 mm	RM	2368.00
	400 mm	RM	2717.00
	450 mm	RM	3136.00
	500 mm	RM	3501.00
	600 mm	RM	4644.00
	700 mm	RM	5482.00
	800 mm	RM	6234.00
	900 mm	RM	7862.00
	1000 mm	RM	9096.00
	1100 mm	RM	13258.00
	1200 mm	RM	14717.00
	1300 mm	RM	16087.00
	1400 mm	RM	17911.00
	1500 mm	RM	20742.00
	1600 mm	RM	22083.00

Sr.No.	Item	Unit	Rate (In Rs.)
11.8	**Labour only for laying & jointing Bar Wrapped Steel Cylinder Pipes test Presure 10 Kg/Sqcm including testing & cost of jointing material as per relevant IS specification.**		
	350 mm	RM	482.00
	400 mm	RM	562.00
	450 mm	RM	642.00
	500 mm	RM	764.00
	600 mm	RM	863.00
	700 mm	RM	1012.00
	800 mm	RM	1158.00
	900 mm	RM	1453.00
	1000 mm	RM	1471.00
	1100 mm	RM	2087.00
	1200 mm	RM	2324.00
	1300 mm	RM	2467.00
	1400 mm	RM	2156.00
	1500 mm	RM	2325.00
	1600 mm	RM	2659.00
11.9	**Providing Bar Wrapped Steel Cylinder Pipes test Presure 12 Kg/Sqcm including testing, inspection, trasportaion at site, transit insurance, loading unloading & stacking etc. complete.**		
	350 mm	RM	2371.00
	400 mm	RM	2723.00
	450 mm	RM	3141.00
	500 mm	RM	3513.00
	600 mm	RM	4656.00
	700 mm	RM	5505.00
	800 mm	RM	6522.00
	900 mm	RM	7869.00
	1000 mm	RM	9476.00
	1100 mm	RM	13278.00
	1200 mm	RM	14738.00
	1300 mm	RM	16103.00
	1400 mm	RM	17936.00
	1500 mm	RM	20976.00
	1600 mm	RM	22094.00

Sr.No.	Item	Unit	Rate (In Rs.)
11.10	**Labour only for laying & jointing Bar Wrapped Steel Cylinder Pipes test Presure 12 Kg/Sqcm including testing & cost of jointing material as per relevant IS specification.**		
	350 mm	RM	482.00
	400 mm	RM	568.00
	450 mm	RM	647.00
	500 mm	RM	769.00
	600 mm	RM	868.00
	700 mm	RM	1017.00
	800 mm	RM	1218.00
	900 mm	RM	1455.00
	1000 mm	RM	1542.00
	1100 mm	RM	2091.00
	1200 mm	RM	2328.00
	1300 mm	RM	2471.00
	1400 mm	RM	2160.00
	1500 mm	RM	2509.00
	1600 mm	RM	2783.00
11.11	**Providing Bar Wrapped Steel Cylinder Pipes test Presure 14 Kg/Sqcm including testing, inspection, trasportaion at site, transit insurance, loading unloading & stacking etc. complete.**		
	350 mm	RM	2373.00
	400 mm	RM	2733.00
	450 mm	RM	3151.00
	500 mm	RM	3576.00
	600 mm	RM	4744.00
	700 mm	RM	5909.00
	800 mm	RM	7136.00
	900 mm	RM	8632.00
	1000 mm	RM	10876.00
	1100 mm	RM	13327.00
	1200 mm	RM	14903.00
	1300 mm	RM	16890.00
	1400 mm	RM	19383.00
	1500 mm	RM	24192.00
	1600 mm	RM	25464.00

Sr.No.	Item	Unit	Rate (In Rs.)
11.12	**Labour only for laying & jointing Bar Wrapped Steel Cylinder Pipes test Presure 14 Kg/Sqcm including testing & cost of jointing material as per relevant IS specification**.		
	350 mm	RM	483.00
	400 mm	RM	572.00
	450 mm	RM	663.00
	500 mm	RM	778.00
	600 mm	RM	877.00
	700 mm	RM	1109.00
	800 mm	RM	1421.00
	900 mm	RM	1586.00
	1000 mm	RM	1723.00
	1100 mm	RM	2100.00
	1200 mm	RM	2361.00
	1300 mm	RM	2615.00
	1400 mm	RM	2376.00
	1500 mm	RM	2671.00
	1600 mm	RM	3321.00
11.13	**Providing Bar Wrapped Steel Cylinder Pipes test Presure 16 Kg/Sqcm including testing, inspection, trasportaion at site, transit insurance, loading unloading & stacking etc. complete.**		
	350 mm	RM	2377.00
	400 mm	RM	2745.00
	450 mm	RM	3173.00
	500 mm	RM	3770.00
	600 mm	RM	5004.00
	700 mm	RM	6269.00
	800 mm	RM	7123.00
	900 mm	RM	9211.00
	1000 mm	RM	11136.00
	1100 mm	RM	13762.00
	1200 mm	RM	15897.00
	1300 mm	RM	18186.00
	1400 mm	RM	20849.00
	1500 mm	RM	24808.00
	1600 mm	RM	27276.00

Sr.No.	Item	Unit	Rate (In Rs.)
11.14	**Labour only for laying & jointing Bar Wrapped Steel Cylinder Pipes test Presure 16 Kg/Sqcm including testing & cost of jointing material as per relevant IS specification.**		
	350 mm	RM	484.00
	400 mm	RM	577.00
	450 mm	RM	688.00
	500 mm	RM	844.00
	600 mm	RM	955.00
	700 mm	RM	1217.00
	800 mm	RM	1492.00
	900 mm	RM	1714.00
	1000 mm	RM	1742.00
	1100 mm	RM	2246.00
	1200 mm	RM	2626.00
	1300 mm	RM	2855.00
	1400 mm	RM	2653.00
	1500 mm	RM	2996.00
	1600 mm	RM	3405.00
11.15	**Providing Bar Wrapped Steel Cylinder Pipes test Presure 18 Kg/Sqcm including testing, inspection, trasportaion at site, transit insurance, loading unloading & stacking etc. complete.**		
	350 mm	RM	2381.00
	400 mm	RM	2753.00
	450 mm	RM	3326.00
	500 mm	RM	3959.00
	600 mm	RM	5282.00
	700 mm	RM	6631.00
	800 mm	RM	7596.00
	900 mm	RM	9789.00
	1000 mm	RM	11941.00
	1100 mm	RM	14615.00
	1200 mm	RM	16933.00
	1300 mm	RM	19346.00
	1400 mm	RM	22401.00
	1500 mm	RM	26495.00
	1600 mm	RM	29600.00

Sr.No.	Item	Unit	Rate (In Rs.)
11.16	**Labour only for laying & jointing Bar Wrapped Steel Cylinder Pipes test Presure 18 Kg/Sqcm including testing & cost of jointing material as per relevant IS specification.**		
	350 mm	RM	485.00
	400 mm	RM	584.00
	450 mm	RM	702.00
	500 mm	RM	874.00
	600 mm	RM	998.00
	700 mm	RM	1271.00
	800 mm	RM	1608.00
	900 mm	RM	1799.00
	1000 mm	RM	1841.00
	1100 mm	RM	2354.00
	1200 mm	RM	2759.00
	1300 mm	RM	3070.00
	1400 mm	RM	2808.00
	1500 mm	RM	3146.00
	1600 mm	RM	3709.00
11.17	**Providing Bar Wrapped Steel Cylinder Pipes test Presure 20 Kg/Sqcm including testing, inspection, trasportaion at site, transit insurance, loading unloading & stacking etc. complete.**		
	350 mm	RM	2462.00
	400 mm	RM	2912.00
	450 mm	RM	3520.00
	500 mm	RM	4222.00
	600 mm	RM	5630.00
	700 mm	RM	7114.00
	800 mm	RM	8892.00
	900 mm	RM	10625.00
	1000 mm	RM	13222.00
	1100 mm	RM	15835.00
	1200 mm	RM	18370.00
	1300 mm	RM	21049.00
	1400 mm	RM	24614.00
	1500 mm	RM	29589.00
	1600 mm	RM	32698.00

Sr.No.	Item	Unit	Rate (In Rs.)
11.18	**Labour only for laying & jointing Bar Wrapped Steel Cylinder Pipes test Presure 20 Kg/Sqcm including testing & cost of jointing material as per relevant IS specification.**		
	350 mm	RM	490.00
	400 mm	RM	595.00
	450 mm	RM	734.00
	500 mm	RM	940.00
	600 mm	RM	1075.00
	700 mm	RM	1378.00
	800 mm	RM	1737.00
	900 mm	RM	1978.00
	1000 mm	RM	2018.00
	1100 mm	RM	2593.00
	1200 mm	RM	3031.00
	1300 mm	RM	3381.00
	1400 mm	RM	3053.00
	1500 mm	RM	3436.00
	1600 mm	RM	3981.00

CHAPTER –XII

STONE WARE PIPES FOR SEWERS

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

Notes :

1.1 The salt Glazed stoneware pipe shall be confirming to IS-651 : 1992.

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

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.

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

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.

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

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.

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.

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

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.

2 Laying:

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

3. **Trenches:**

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

3.1 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.

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

3.3 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.

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

3.6 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.

3.7 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.

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

3.9 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.

3.10 Sight rails provided at all changes of direction or gradient sand 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.

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

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

3.14 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.

3.15 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.

3.16 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.

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

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

3.19 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.

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

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

3.22 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.

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

4. Jointing:

4.1 The stoneware pipes shall be cement jointed.

4.2 The materials shall consist of the following.

(a) Spun yarn or tarred gaskets.

(b) Cement.

(c) Sand

4.3. 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.

4.4 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)

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

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

5. Testing:

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

5.2 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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5.3 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).

5.4 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..

5.5 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.

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

6. 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.

7. 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.

8. 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.

9. This USOR contains the rates of all the items without GST. GST shall be paid separately as per prevailing government norms as claimed by the contractor in his bill.
All the estimates based on this USOR will include GST as an extra amount as per prevailing rates on the sum of the estimate to arrive at the gross amount.

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

S. No.	Items	Unit	Rates in Rs.
12.1	Providing and Laying and Jointing salt glazed stone ware (S.W.) pipes socket and spigot with stiff cement mortar 1:1 including testing of joints complete		
	100mm	R. Meter	252.00
	150 mm	R. Meter	364.00
	200 mm	R. Meter	588.00
	250 mm	R. Meter	942.00
	300 mm	R. Meter	1250.00
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	R. Meter	81.00
	150 mm	R. Meter	117.00
	200 mm	R. Meter	139.00
	250 mm	R. Meter	182.00
	300 mm	R. Meter	207.00
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	R. Meter	514.00
	150mm dia	R. Meter	628.00
	200mm dia	R. Meter	733.00
	250mm dia	R. Meter	802.00
	300mm dia	R. Meter	972.00
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	R. Meter	244.00
	150mm dia	R. Meter	394.00
	200mm dia	R. Meter	465.00
	250mm dia	R. Meter	542.00
	300mm dia	R. Meter	625.00
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	R. Meter	27.00
	150mm dia	R. Meter	30.00
	200mm dia	R. Meter	32.00
	250mm dia	R. Meter	34.00
	300mm dia	R. Meter	36.00

CHAPTER- XIII

REINFORCED CEMENT CONCRETE PIPES

CHAPTER- XIII
REINFORCED CEMENT CONCRETE PIPES
(PIPES CONFORMING TO IS : 458-1988)

NOTES :

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.

1. Laying:

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.

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.

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

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.

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.

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

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

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.

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.

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

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

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.

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

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.

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.

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.

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.

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

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.

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

2. Pipe Bedding:

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.

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

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

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.

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.

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).

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.

4. Testing:

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

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

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.

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).

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.

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

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

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

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).

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.

6. This USOR contains the rates of all the items without GST. GST shall be paid separately as per prevailing government norms as claimed by the contractor in his bill.

All the estimates based on this USOR will include GST as an extra amount as per prevailing rates on the sum of the estimate to arrive at the gross amount.

CHAPTER XIII
REINFORCED CEMENT CONCRETE PIPES
(PIPES CONFORMING TO IS : 458-1988)

Sr.No.	Item	Unit	Rate (In Rs.)
13.1	**Providing and Laying non-pressure (NP2) RCC socket & spigot pipes with rubber gasket joint including testing of joints.**		
	100 mm Dia	Per Meter	418.00
	150 mm Dia	Per Meter	436.00
	200 mm Dia	Per Meter	508.00
	250 mm Dia	Per Meter	617.00
	300 mm Dia	Per Meter	843.00
	350 mm Dia	Per Meter	965.00
	400 mm Dia	Per Meter	1127.00
	450 mm Dia	Per Meter	1361.00
	500 mm Dia	Per Meter	1481.00
	600 mm Dia	Per Meter	1868.00
	700 mm Dia	Per Meter	2449.00
	800 mm Dia	Per Meter	3201.00
	900 mm Dia	Per Meter	3750.00
	1000 mm Dia	Per Meter	4341.00
	1100 mm Dia	Per Meter	5211.00
	1200 mm Dia	Per Meter	6494.00
	1600 mm Dia	Per Meter	10420.00
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 Dia	Per Meter	76.00
	150 mm Dia	Per Meter	120.00
	200 mm Dia	Per Meter	139.00
	250 mm Dia	Per Meter	180.00
	300 mm Dia	Per Meter	223.00
	350 mm Dia	Per Meter	226.00
	400 mm Dia	Per Meter	258.00
	450 mm Dia	Per Meter	296.00
	500 mm Dia	Per Meter	329.00
	600 mm Dia	Per Meter	399.00
	700 mm Dia	Per Meter	447.00
	800 mm Dia	Per Meter	534.00
	900 mm Dia	Per Meter	642.00
	1000 mm Dia	Per Meter	703.00
	1100 mm Dia	Per Meter	775.00
	1200 mm Dia	Per Meter	890.00
	1600 mm Dia	Per Meter	1285.00
13.3	**Providing and Laying non-pressure (NP3) RCC socket & spigot pipes with rubber gasket joint including testing of joints.**		

Sr.No.	Item	Unit	Rate (In Rs.)
	150 mm Dia	Per Meter	568.00
	250 mm Dia	Per Meter	888.00
	300 mm Dia	Per Meter	1109.00
	350 mm Dia	Per Meter	1502.00
	400 mm Dia	Per Meter	1927.00
	450 mm Dia	Per Meter	2129.00
	500 mm Dia	Per Meter	2411.00
	600 mm Dia	Per Meter	2901.00
	700 mm Dia	Per Meter	3831.00
	800 mm Dia	Per Meter	4849.00
	900 mm Dia	Per Meter	5752.00
	1000 mm Dia	Per Meter	6564.00
	1100 mm Dia	Per Meter	7497.00
	1200 mm Dia	Per Meter	8243.00
	1400 mm Dia	Per Meter	10320.00
	1600 mm Dia	Per Meter	12168.00
	1800 mm Dia	Per Meter	15568.00
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 Dia	Per Meter	120.00
	250 mm Dia	Per Meter	165.00
	300 mm Dia	Per Meter	229.00
	350 mm Dia	Per Meter	355.00
	400 mm Dia	Per Meter	389.00
	450 mm Dia	Per Meter	444.00
	500 mm Dia	Per Meter	477.00
	600 mm Dia	Per Meter	591.00
	700 mm Dia	Per Meter	653.00
	800 mm Dia	Per Meter	797.00
	900 mm Dia	Per Meter	985.00
	1000 mm Dia	Per Meter	1097.00
	1100 mm Dia	Per Meter	1140.00
	1200 mm Dia	Per Meter	1233.00
	1400 mm Dia	Per Meter	1599.00
	1600 mm Dia	Per Meter	1899.00
	1800 mm Dia	Per Meter	2228.00
13.5	**Providing and Laying non-pressure (NP4) RCC socket & spigot pipes with rubber gasket joint including testing of joints.**		
	250 mm Dia	Per Meter	992.00
	300 mm Dia	Per Meter	1410.00
	350 mm Dia	Per Meter	1980.00
	400 mm Dia	Per Meter	2301.00
	450 mm Dia	Per Meter	2762.00
	500 mm Dia	Per Meter	3124.00
	600 mm Dia	Per Meter	3626.00
	700 mm Dia	Per Meter	4465.00
	800 mm Dia	Per Meter	5656.00

Sr.No.	Item	Unit	Rate (In Rs.)
	900 mm Dia	Per Meter	6622.00
	1000 mm Dia	Per Meter	7500.00
	1100 mm Dia	Per Meter	8245.00
	1200 mm Dia	Per Meter	9168.00
	1400 mm Dia	Per Meter	11734.00
	1600 mm Dia	Per Meter	14203.00
	1800 mm Dia	Per Meter	18233.00
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 Dia	Per Meter	191.00
	300 mm Dia	Per Meter	249.00
	350 mm Dia	Per Meter	362.00
	400 mm Dia	Per Meter	409.00
	450 mm Dia	Per Meter	451.00
	500 mm Dia	Per Meter	498.00
	600 mm Dia	Per Meter	598.00
	700 mm Dia	Per Meter	674.00
	800 mm Dia	Per Meter	825.00
	900 mm Dia	Per Meter	1006.00
	1000 mm Dia	Per Meter	1121.00
	1100 mm Dia	Per Meter	1169.00
	1200 mm Dia	Per Meter	1316.00
	1400 mm Dia	Per Meter	1686.00
	1600 mm Dia	Per Meter	1899.00
	1800 mm Dia	Per Meter	2228.00
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 Dia	Per Meter	269.00
	200 mm Dia	Per Meter	392.00
	250 mm Dia	Per Meter	418.00
	300 mm Dia	Per Meter	492.00
	350 mm Dia	Per Meter	611.00
	400 mm Dia	Per Meter	709.00
	450 mm Dia	Per Meter	849.00
	500 mm Dia	Per Meter	879.00
	600 mm Dia	Per Meter	974.00
	700 mm Dia	Per Meter	1534.00
	800 mm Dia	Per Meter	2041.00
	900 mm Dia	Per Meter	2629.00
	1000 mm Dia	Per Meter	3179.00
	1100 mm Dia	Per Meter	3671.00
	1200 mm Dia	Per Meter	4473.00
13.8	**Labour only for laying & jointing non-pressure (NP2) RCC pipes with collars jointed**		

Sr.No.	Item	Unit	Rate (In Rs.)
	with stiff mixture of cement mortar in the proportion 1:2 (1 cement : 2 sand) including testing of joints.		
	150 mm Dia	Per Meter	65.00
	200 mm Dia	Per Meter	86.00
	250 mm Dia	Per Meter	108.00
	300 mm Dia	Per Meter	115.00
	350 mm Dia	Per Meter	128.00
	400 mm Dia	Per Meter	134.00
	450 mm Dia	Per Meter	147.00
	500 mm Dia	Per Meter	156.00
	600 mm Dia	Per Meter	186.00
	700 mm Dia	Per Meter	205.00
	800 mm Dia	Per Meter	220.00
	900 mm Dia	Per Meter	277.00
	1000 mm Dia	Per Meter	351.00
	1100 mm Dia	Per Meter	425.00
	1200 mm Dia	Per Meter	523.00
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 Dia	Per Meter	344.00
	200 mm Dia	Per Meter	510.00
	250 mm Dia	Per Meter	564.00
	300 mm Dia	Per Meter	656.00
	350 mm Dia	Per Meter	982.00
	400 mm Dia	Per Meter	1376.00
	450 mm Dia	Per Meter	1474.00
	500 mm Dia	Per Meter	1651.00
	600 mm Dia	Per Meter	1915.00
	700 mm Dia	Per Meter	2975.00
	800 mm Dia	Per Meter	3140.00
	900 mm Dia	Per Meter	3673.00
	1000 mm Dia	Per Meter	4411.00
	1100 mm Dia	Per Meter	5228.00
	1200 mm Dia	Per Meter	5527.00
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 Dia	Per Meter	68.00
	200 mm Dia	Per Meter	90.00
	250 mm Dia	Per Meter	112.00
	300 mm Dia	Per Meter	120.00
	350 mm Dia	Per Meter	134.00
	400 mm Dia	Per Meter	139.00

Sr.No.	Item	Unit	Rate (In Rs.)
	450 mm Dia	Per Meter	153.00
	500 mm Dia	Per Meter	162.00
	600 mm Dia	Per Meter	193.00
	700 mm Dia	Per Meter	213.00
	800 mm Dia	Per Meter	229.00
	900 mm Dia	Per Meter	288.00
	1000 mm Dia	Per Meter	364.00
	1100 mm Dia	Per Meter	442.00
	1200 mm Dia	Per Meter	544.00
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 Dia	Per Meter	371.00
	200 mm Dia	Per Meter	520.00
	250 mm Dia	Per Meter	606.00
	300 mm Dia	Per Meter	832.00
	350 mm Dia	Per Meter	1359.00
	400 mm Dia	Per Meter	1440.00
	450 mm Dia	Per Meter	1546.00
	500 mm Dia	Per Meter	1774.00
	600 mm Dia	Per Meter	2042.00
	700 mm Dia	Per Meter	3156.00
	800 mm Dia	Per Meter	3307.00
	900 mm Dia	Per Meter	3888.00
	1000 mm Dia	Per Meter	4685.00
	1100 mm Dia	Per Meter	5301.00
	1200 mm Dia	Per Meter	5738.00
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 Dia	Per Meter	71.00
	200 mm Dia	Per Meter	94.00
	250 mm Dia	Per Meter	117.00
	300 mm Dia	Per Meter	125.00
	350 mm Dia	Per Meter	139.00
	400 mm Dia	Per Meter	145.00
	450 mm Dia	Per Meter	159.00
	500 mm Dia	Per Meter	168.00
	600 mm Dia	Per Meter	200.00
	700 mm Dia	Per Meter	221.00
	800 mm Dia	Per Meter	238.00
	900 mm Dia	Per Meter	298.00
	1000 mm Dia	Per Meter	377.00
	1100 mm Dia	Per Meter	459.00
	1200 mm Dia	Per Meter	566.00

CHAPTER- XIV

DOUBLE WALL CORRUGATED (DWC) PIPES

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DOUBLE WALL CORRUGATED (DWC) PIPES

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 be 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.

9. This USOR contains the rates of all the items without GST. GST shall be paid separately as per prevailing government norms as claimed by the contractor in his bill.

All the estimates based on this USOR will include GST as an extra amount as per prevailing rates on the sum of the estimate to arrive at the gross amount.

DOUBLE WALL CORRUGATED (DWC) PIPES

S.No.	Items	Unit	Rate in Rs.		
14.1	Providing of DWC/ PE (Earlier HDPE) Pipes of renowned manufacturer duly tested and inspected i/c 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			147
14.1.2	135 mm/ 160 mm	RM			220
14.1.3	150 mm/ 180 mm	RM			260
14.1.4	170 mm/ 200 mm	RM			314
14.1.5	200 mm/ 238 mm	RM			431
14.1.6	250 mm/ 290 mm	RM			671
14.1.7	300 mm/ 345 mm	RM			895
14.1.8	400 mm/ 480 mm	RM			1619
14.1.9	500 mm/ 580 mm	RM			2360
14.1.10	600 mm/ 715 mm	RM			4069
14.1.11	800 mm/ 955 mm	RM			6747
14.1.12	1000 mm/ 1200 mm	RM			10989
14.2	Laying and jointing of DWC /PE (HDPE) Pipes of renowned manufacturer duly tested, and inspected i/c transportation charges, transit insurance, loading/ unloading and stacking at site/ store etc, complete.				
	Internal Dia/Outer dia				
14.2.1	100 mm/ 120 mm	RM			24.00

S.No.	Items	Unit	Rate in Rs.		
14.2.2	135 mm/ 160 mm	RM			26.00
14.2.3	150 mm/ 180 mm	RM			37.00
14.2.4	170 mm/ 200 mm	RM			37.00
14.2.5	200 mm/ 238 mm	RM			37.00
14.2.6	250 mm/ 290 mm	RM			47.00
14.2.7	300 mm/ 345 mm	RM			90.00
14.2.8	400 mm/ 480 mm	RM			90.00
14.2.9	500 mm/ 580 mm	RM			146.00
14.2.10	600 mm/ 715 mm	RM			146.00
14.2.11	800 mm/ 955 mm	RM			189.00
14.2.12	1000 mm/ 1200 mm	RM			258.00
14.3	Providing 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	47.00	11.00	204.00
14.3.2	135 mm/ 160 mm	RM	81.00	20.00	310.00
14.3.3	150 mm/ 180 mm	RM	110.00	23.00	370.00
14.3.4	170 mm/ 200 mm	RM	167.00	34.00	538.00
14.3.5	200 mm/ 238 mm	RM	204.00	59.00	645.00
14.3.6	250 mm/ 290 mm	RM	502.00	128.00	1148.00
14.3.7	300 mm/ 345 mm	RM	1053.00	280.00	1756.00
14.3.8	400 mm/ 480 mm	RM	1670.00	516.00	3340.00
14.3.9	500 mm/ 580 mm	RM	2344.00	617.00	4793.00
14.3.10	600 mm/ 715 mm	RM	3292.00	1623.00	8013.00
14.3.11	800 mm/ 955 mm	RM	7037.00	3967.00	16846.00
14.3.13	1000 mm/ 1200 mm	RM	10398.00	5908.00	24480.00

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.

1 Manholes

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.

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.

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.

1.4 Types of manholes:

Following is the general classification of manholes-

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.

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.

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.

1.4.4 Drop Manholes; -

When a sewer connects with another sewer, where the difference in level between water lines (peak flow levels) of main line and the invert level of branch line is more than 600 mm or a drop of more than 600 mm is required to be given in the same sewer line and it is uneconomical or impractical to arrange the connection with in 600 mm a drop connection shall be provided for which is manholes maybe built incorporating a vertical or nearly vertical drop pipe from the higher sewer to the lower one. This pipes maybe either outside the shaft and enclosed in concrete or supported on brackets inside the shaft, which should be suitably enlarged. If the drop pipe is outside the shaft, a continuation of the sewer should be built through the shaft wall to from a rodding and inspection eye, which should be provided with a half blank flange. If the drop pipe is inside the shaft. It should be in cast iron and it would be advantageous to

provide adequate means for rodding and water cushion of 150 mm depth should also be provided. The diameter of the backdrop should be at-least as large as that of the incoming pipe

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

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

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

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

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.

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

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.

3. Circular manholes -

Circular manholes are longer than rectangular and arch type manhole and thus there are preferred over rectangular as well as arch type manholes. The circular manholes can be provided for all depths starting from 0.9m circular manholes are straight down in lower portion and slanting in top portion so as to narrow down

the top opening equal to internal dia.of manhole over. Depending upon the depth of manhole, the diameter of manhole changes. The internal diameter of circular manholes may be kept as following for verifying depths.

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

Typical circular manholes are shown in fig.6

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

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

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

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

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

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

slope of 1 in 10 draining to the channel. Where more than one sewer enters the manhole the flow through channel should be curved smoothly and should have sufficient capacity to carry the maximum flow.

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

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

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

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

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.

5. Inverted siphon

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.

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.

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.

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.

7. By pass:

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

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.

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.

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.

9.2. Construction: -

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

10. This USOR contains the rates of all the items without GST. GST shall be paid separately as per prevailing government norms as claimed by the contractor in his bill.

All the estimates based on this USOR will include GST as an extra amount as per prevailing rates on the sum of the estimate to arrive at the gross amount.

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	1850.00
15.1.2	125x100mm size "P", "Q" or "S" type Gully trap chamber	Each	1927.00
15.1.3	180x150mm size "P" or "S" type	Each	2019.00
	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	9468.00
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	10266.00

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	20434.00
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	27334.00
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	7986.00
(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	6053.00
15.3	Extra for depth up to 1.00 m for man holes over item 15.2		
15.3.1	90x80cm size manhole over item	per meter	5321.00
15.3.2	120x90cm size manhole over item.	per meter	6358.00
15.3.3	60x60cm size manhole over item	per meter	4024.00
15.3.4	60x45 cm size manhole over item	per meter	3635.00
15.4	Constructing Brick Masonry Circular Man Hole 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 upto 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	Each	25490.00
15.4.2	For one manhole upto 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	Each	31942.00
15.5	Extra for depth for circular manholes over item 15.4		
15.5.1	Depth 2.65m to 4.25 m	per meter	10196.00
15.5.2	Depth 4.25m to 9.75m	per meter	14020.00
15.6	Constructing Brick Masonry Circular Man Hole 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 upto 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	Each	16126.00
15.6.2	Add extra for depth 1.65 to 2.30 mtr.	Per Mtr.	6450.00

S.No.	Items	Unit	Rate (Rs.)
15.7	Constructing Brick Masonry Circular Man Hole 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	11727.00
15.7.2	Add extra for depth 0.90 to 1.65 mtr.	Each	4691.00
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	255.00
15.8.2	With 20mm round bar foot rest	Each	225.00
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	347.00
15.9.2	For 250 to 300 mm dia pipes	Each	398.00
15.9.3	For 350 to 450 mm dia pipes	Each	650.00

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	4667.00
15.10.2	150 mm dia Sand cast iron drop connection	Each	7001.00
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.	1400.00
(ii)	150 mm dia Sand cast iron drop connection	Per mtr.	2100.00
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	4304.00
15.11.2	Chamber 50x45x60cm with horizontal grating 500x450 mm	each	3814.00
15.11.3	Chamber 110 x 50 x 77.5cm with horizontal 500 x 450 mm and vertical gratings 450x100 mm both.	each	6667.00
	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	832.00
15.12.2	Manhole size 90x80 and 60 cm deep	Each	918.00
15.12.3	Manhole size 120x90 and 90 cm deep	Each	1375.00
15.12.4	Manholes size 60x45 and 60 cm deep.	Each	450.00
15.12.5	Manholes size 60x60 and 90 cm deep.	Each	653.00

S.No.	Items	Unit	Rate (Rs.)
15.12.6	Extra for depth of manholes dismantling		
(i)	Manhole size 90x80 cm, depth above 60 cm	Per Mtr.	528.00
(ii)	Manhole size 120x90cm, depth above 90 cm	Per Mtr.	629.00
(iii)	Manholes size 60x45 cm, depth above 60 cm	Per Mtr.	371.00
(iv)	Manholes size 60x60 cm, depth above 90 cm	Per Mtr.	409.00
15.12.7	Manhole 1.50 m dia circular and upto 2.65 m deep	Each	2872.00
15.12.8	Manhole 1.20 m dia circular, and upto 1.65 m deep	Each	1788.00
15.12.9	Manhole 0.90 m dia circular and upto 0.90 m deep	Each	1080.00
15.12.10	Extra for depth of manholes dismantling		
(i)	Manhole 1.50 m dia circular, depth 2.65 to 4.25m	Per Mtr.	1149.00
(ii)	Manhole 1.50 m dia circular, depth 4.25 to 9.75m	Per Mtr.	1580.00
(iii)	Manhole 1.20 m dia circular, depth 1.65 to 2.30 m	Per Mtr.	715.00
(iv)	Manhole 0.90 m dia circular, depth 0.90 to 1.65m	Per Mtr.	432.00
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	284.00
15.13.2	With 20mm round bar foot rest.	Each	255.00
15.14	Pumping out to remove the sewers blockages 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	215.00
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.	75.00
15.16	Labour only for fixing in position Cast Iron Manhole Covers & frame conforming to IS-1726.	Kg	5.00
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	2636.00

S.No.	Items	Unit	Rate (Rs.)
15.17.2	560 mm dia extra heavy duty	Each	2836.00
15.17.3	600 mm dia extra heavy duty	Each	3236.00
15.17.4	500 mm dia heavy duty	Each	1986.00
15.17.5	560 mm dia heavy duty	Each	2336.00
15.17.6	600 mm dia heavy duty	Each	2586.00
15.17.7	600 x 900 mm size extra heavy duty	Each	4536.00
15.17.8	600 x 900 mm size heavy duty	Each	3986.00
15.17.9	450 x 900 mm size heavy duty	Each	3536.00
15.17.10	600 X 600 mm size extra heavy duty	Each	3236.00
15.17.11	600 X 600 mm size heavy duty	Each	2486.00
15.17.12	600 X 600 mm size medium duty	Each	2036.00
15.17.13	600 X 450 mm size heavy duty	Each	2286.00
15.17.14	600 X 450 mm size medium duty	Each	1936.00
15.17.15	450 X 450 mm size heavy duty	Each	1736.00
15.17.16	450 X 450 mm size medium duty	Each	1436.00
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	1630.00
15.18.2	560 mm dia extra heavy duty	Each	1930.00
15.18.3	600 mm dia extra heavy duty	Each	2230.00
15.18.4	500 mm dia heavy duty	Each	1280.00
15.18.5	560 mm dia heavy duty	Each	1630.00
15.18.6	600 mm dia heavy duty	Each	2030.00
15.18.7	600 x 900 mm size extra heavy duty	Each	3930.00
15.18.8	600 x 900 mm size heavy duty	Each	3630.00
15.18.9	450 x 900 mm size heavy duty	Each	2730.00
15.18.10	600 X 600 mm size extra heavy duty	Each	1980.00
15.18.11	600 X 600 mm size heavy duty	Each	1830.00
15.18.12	600 X 600 mm size medium duty	Each	1280.00
15.18.13	600 X 450 mm size heavy duty	Each	1580.00
15.18.14	600 X 450 mm size medium duty	Each	1050.00
15.18.15	450 X 450 mm size heavy duty	Each	1080.00
15.18.16	450 X 450 mm size medium duty	Each	880.00

CHAPTER XVI

ALLIED CIVIL WORKS

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ALLIED CIVIL WORKS

Excavation And Preparation Of Trench

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.

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

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

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.

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

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.

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

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.

9. Trench shall be of sufficient width to provide a free working space on either side of pipe. At the bottom between the faces, it shall be such as to provide not less than 200mm clearance on either side of pipe. Additional width shall

have to be provided at position of sockets, flenges, D.Joints for jointing. Depth of pit at such places shall also be sufficient to permit finishing of joints.

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.

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

12. 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 or granular material.

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.

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

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. 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.

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.

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

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.

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..

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

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

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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. 16.11. In this case overall rock shall be compulsorily issued at the rate of Rs 170 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.

(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.

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

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

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.

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.

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

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.

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

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.

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.

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

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.

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.

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

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.

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.

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

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.

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.

52 The rate for cutting and making in the same condition include all lead of the material and also required work and equipment to complete the work as per specification and as directed by Engineer incharge.

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 be used. All fine aggregate shall confirm to IS : 383. The fineness modulus 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. Clay content should not be more than permissible limit.

(d) Water :

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

(e) Steel :

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

(f) Concrete :

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

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

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

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

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

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

(g) Bricks :

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

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

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

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

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

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

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

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

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

(h) MORTAR :

The mortar mixing shall preferably be done in mechanical mixer operated manually or by power. Hand mixing can be restored to as long as uniform density of the mix and its strength are assured subject to prior approval of Engineer-in-charge. Hand mixing operation, if permitted, carried out on clean water tight platform when cement and sand shall be first mixed dry in required proportion several times till the mixture is of uniform. Minimum quantity of water shall be added to bring the mortar to the consistency of still paste.

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

(i) 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.

(j) FORM WORK :

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

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

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

(iv) The form work should be robust and strong and joint shall be leak proof, staging must have cross bracing and diagonal bracing in both direction.

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

This USOR contains the rates of all the items without GST. GST shall be paid separately as per prevailing government norms as claimed by the contractor in his bill.

All the estimates based on this USOR will include GST as an extra amount as per prevailing rates on the sum of the estimate to arrive at the gross amount.

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	1038.00
16.2(a)	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	535.00
16.2(b)	Clearing grass and removal of rubbish up to a distance of 50 m outside the periphery of the area cleared.	100 Sqm	274.00
16.3	Installation of HDPE pipe by Horizontal Direction Drilling Method including preparing and setting up the plant and equipment, making string of new pipe material, installing new pipe string and making the system ready for commissioning by HDD operation including drilling, stringing, reaming and pulling back the new pipe on the designed bore path alignment, proper disposal of drilling fluid, as per code of practice for horizontal direction drilling technique suiting indian conditions. Required pipes/ specials and other civil work shall be paid separately-in all types of soils. (This item shall be executed only after prior permission of Superintending Engineer)		
	HDPE pipe of any class-90 mm outer dia	Meter	451.00
	HDPE pipe of any class-110 mm outer dia	Meter	492.00
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	140.00
16.5	For muddy area	cum	210.00
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		

S.No.	Items	Unit	Rates in Rs.
	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.		255.00
(b)	Hard rock (requiring blasting.)		436.00
(c)	Hard rock requiring chiseling / where blasting is prohibited.		587.00
16.7	Extra for every additional lift of 1.5m or part there of over item 16.4 to 16.6.	cum	7.00
16.8	Extra for every additional lead up to 50 m or part thereof over item 16.4 to 16.6.	cum	77.00
16.9	Pumping out water caused by springs, tides or river seepage, broken water mains or drains or the like	KL	81.00
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	37.00
(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	24.00
16.11 (a)	Supply & Filling moorum for pipe bedding or over the pipe (including supply of moorum)	cum	643.00
(b)	Supply & Filling crusher stone dust for pipe bedding or over the pipe (including supply of crusher stone dust.)	cum	882.00
	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	629.00
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	354.00

S.No.	Items	Unit	Rates in Rs.
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	750.00
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	745.00
16.15.2	Nominal concrete 1:4:8 or Leaner mix (i/c equivalent design mix)	Cum	459.00
16.15.3	Dismantling of Cement Concrete Pavment by mechanical means using pneumatic tools, cutter breaking to pieces not exceeding 0.02 cum in volume and stock piling at designated locations and disposal of dismantled materials up to a lead of 1000 metres, stacking serviceable and unserviceable materials separately	Cum	968.00
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	1087.00
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	14.00
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	82.00
(b)	Dismantling kharanja of any thickness in cement mortar of any mix	Sqm	63.00
	REPAIRS TO BUILDING/ ROAD WORK		
16.19 (a)	Providing & Fixing of stone slab 30 mm thick in cement mortar 1:6 (1 cement 6 sand)	Sqm	148.00
(b)	Labour only for Fixing of stone slab 30 mm thick in cement mortar 1:6 (1 cement 6 sand)	Sqm	68.00
(c)	Providing & Fixing of Kharanja of any thickness in C.M. 1:6 (1 cement 6 sand)	Sqm.	498.00
(d)	Labour only for fixing of Kharanja of any thickness.	Sqm	132.00

S.No.	Items	Unit	Rates in Rs.
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 including compaction inlayer by appropriate methods.	Cum	1045.00
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 including compaction inlayer by appropriate methods.	Cum	2121.00
	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	3472.00
ii	1:4:8 (M-7.5)	cum	3682.00
iii	1:3:6 (M-10)	cum	3965.00
iv	1:2:4 (M-15)	cum	4661.00
(b)	**In walls & Superstructure up to 4 mt. height above plinth (with 40mm nominal graded metal)**		
i.	1:3:6 (M-10)	cum	4038.00
ii.	1:2:4 (M-15)	cum	4733.00
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	4113.00
ii	1:2:4 (M-15)	cum	4695.00
iii	$1:1^{1}/_{2}$:3 (M-20)	cum	5161.00
iv	1:1:2 (M-25)	cum	6385.00
(b)	**In walls and superstructure up to 4 mt. height above plinth (with 20mm nominal graded metal)**		
i	1:3:6 (M-10)	Cum	4187.00

S.No.	Items	Unit	Rates in Rs.
ii	1:2:4 (M-15)	Cum	4769.00
iii	1:1$^{1}/_{2}$:3 (M-20)	Cum	5235.00
iv	1:1:2 (M-25)	Cum	6458.00
	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	4751.00
ii	1:1:2 (M 25)	cum	5974.00
iii	1:0.75:1.5 (M 30)	cum	6294.00
(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	4787.00
ii	1:1:2 (M 25)	cum	6010.00
iii	1:0.75:1.5 (M 30)	cum	6331.00
	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	55.00
(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	59.00
(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	76.00
(d)	Steel work in welded 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.		

S.No.	Items	Unit	Rates in Rs.
(i)	In stringers treads landings etc. of stair cases including use of chequered plate wherever required all complete.	Kg	79.00
(ii)	In gratings, frames, guard bar, ladder , railings, brackets, gates and similar works	Kg	97.00
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 pieces of M.S. angle / flats as required.	Sqm	2892.00
	CEMENT MORTAR		
16.27 (a)	Cement Mortar 1:3 (1 Cement : 3 sand)	Cum	4671.00
(b)	Cement Mortar 1:4 (1 Cement : 4 sand)	Cum	3917.00
(c)	Cement Mortar 1:5 (1 Cement : 5 sand)	Cum	3451.00
(d)	Cement Mortar 1:6 (1 Cement : 6 sand)	Cum	3160.00
(e)	Cement Mortar 1:8 (1 Cement : 8 sand)	Cum	3063.00
	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	5985.00
ii.	In Cement Mortar 1:4	Cum	5703.00
iii.	In Cement Mortar 1:5	Cum	5587.00
iv.	In Cement Mortar 1:6	Cum	5514.00
(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	6520.00

S.No.	Items	Unit	Rates in Rs.
ii.	In Cement Mortar 1:4	Cum	6004.00
iii.	In Cement Mortar 1:5	Cum	5878.00
iv.	In Cement Mortar 1:6	Cum	5794.00
(c)	Extra rate for Brick work in superstructure above floor two level for each additional floor or part thereof respective item.	Cum	159.00
(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.		
i.	Cement mortar 1:3	Sqm	752.00
ii.	Cement mortar 1:4	Sqm	690.00
(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	5695.00
(ii)	In Cement Mortar 1:4	Cum	5491.00
(iii)	In Cement Mortar 1:5	Cum	5364.00
(iv)	In Cement Mortar 1:6	Cum	5287.00
(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	6395.00
(ii)	In Cement Mortar 1:4	Cum	5713.00
(iii)	In Cement Mortar 1:5	Cum	5587.00
(iv)	In Cement Mortar 1:6	Cum	5509.00
	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	156.00

S.No.	Items	Unit	Rates in Rs.
ii	1:4(Cement 1: Sand 4)	Sqm	146.00
iii	1:5(Cement 1: Sand 5)	Sqm	139.00
iv	1:6(Cement 1: Sand 6)	Sqm	135.00
(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	157.00
iii	in CM 1:5	Sqm	148.00
iv	in CM 1:6	Sqm	143.00
v.	Neat cement punning	Sqm	27.00
(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	196.00
(d)	20 mm thick cement plaster in single coat i/c finishing even, smooth and curing complete		
i.	in CM 1:3	Sqm	211.00
ii	in CM 1:4	Sqm	194.00
iii	in CM 1:5	Sqm	183.00
iv	in CM 1:6	Sqm	177.00
	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	182.00
ii	Wall (any thickness) including attached pilasters, buttresses, plinth and string courses etc.	sqm	317.00
iii	Suspended floors, roofs, landings, balconies and access platform.	sqm	354.00
iv	Lintels, beams , plinth beams, girders, bressumers and cantilevers.	sqm	298.00
v	Columns, pillars, piers, Abutments, posts and Struts	sqm	406.00
vi	Stairs, (excluding landings) except spiral- staircases	sqm	429.00
16.31	**Close timbering in trenches including strutting, shoring and packing cavities(wherever required) complete (Measurement to be taken of the face area timbered**)		

S.No.	Items	Unit	Rates in Rs.
i	Depth not exceeding 1.5 mtr.	Sqm	168.00
ii	Depth exceeding 1.5 mtr. but not exceeding 3.0 mtr.	Sqm	173.00
iii	Depth exceeding 3.0 mtr. but not exceeding 4.5 mtr.	Sqm	178.00
iv	Depth exceeding 4.5 mtr. but not exceeding 6.0 mtr.	Sqm	183.00
v	Depth exceeding 6.0 mtr. but not exceeding 7.5 mtr.	Sqm	188.00
vi	Depth exceeding 7.5 mtr. but not exceeding 9.0 mtr.	Sqm	193.00
16.32	Close Timbering in case of shafts, wells, cesspits manholes and the like including strutting, shoring and packing cavities (wherever required) etc. complete (Measurements to be taken of the face area timbered)		
i	Depth not exceeding 1.5 mtr.	Sqm	171.00
ii	Depth exceeding 1.5 mtr. but not exceeding 3.0 mtr.	Sqm	181.00
iii	Depth exceeding 3.0 mtr. but not exceeding 4.5 mtr.	Sqm	192.00
iv	Depth exceeding 4.5 mtr. but not exceeding 6.0 mtr.	Sqm	202.00
v	Depth exceeding 6.0 mtr. but not exceeding 7.5 mtr.	Sqm	212.00
vi	Depth exceeding 7.5 mtr. but not exceeding 9.0 mtr.	Sqm	222.00
	STONE WORK		
16.33	Coursed rubble masonry (first sort) with hard stone in foundation and plinth cement mortar 1:6	cum	4341.00
16.34	Coursed rubble masonry (Second sort) with hard stone in foundation and plinth Cement mortar 1:6	cum	4047.00
16.35	**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	4971.00
ii	Masonry work (Second sort) in Cement mortar 1:6	cum	4677.00
16.36	Extra Coursed rubble masonry with hard stone (first or Second sort) in Superstructure above floor II level for every floors or part thereof.	cum	110.00

S.No.	Items	Unit	Rates in Rs.
16.37	**Extra Coursed rubble masonry with hard stone (first or Second sort) in**		
i	Square or rectangular pillars	cum	366.00
ii	Circular pillars	cum	1228.00
16.38	**Pointing on stone work with cement mortar 1:3 (1 cement : 3 fine sand)**		
i	Flush / ruled pointing	sqm	127.00
ii	Raised and cut pointing	sqm	232.00
	FINISHING WORK		
16.39	White washing with lime to give an even shade :		
i	New work (three or more coats)	sqm	15.00
16.40	White washing with lime to give an even shade :		
i	Old work (two or more coats)	sqm	9.00
ii	Old work (One or more coats)	sqm	5.00
16.41	Finishing walls with water proofing cement paint of required shade :		
i	New work (two or more coats applied @ 3.84 kg/10 sqm)	sqm	53.00
16.42	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	91.00
16.43	Painting with synthetic enamel paint of approved brand and manufacture to give an even shade :		
i	(two or more coats) on New work	sqm	68.00
16.44	Painting with synthetic enamel paint of approved brand and manufacture to give an even shade :		
i	(One or more coats) on Old work	sqm	45.00

S.No.	Items	Unit	Rates in Rs.
	CONSTRUCTION OF BRICK MASONARY VALVE CHAMBER		
16.45	Construction of Brick masonary valve chamber with 20 cm thick wall in 1:6 C.M. with 12mm thick 1:4 Cement Plaster and base course 10 cm. thick in M-15. Inside Dimensions 110x80x100cm M-20 RCC chamber cover size 130x100cmx120cm including cost of materials, labour etc. complete.	No.	6219.00

CHAPTER XVII

GENERAL MISCELLANEOUS

CHAPTER XVII
GENERAL MISCELLANEOUS

NOTES:

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

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.

3 Rates for items of cutting and making good roads etc. include lead for the materials and reconstruction by appropriate compaction equipment and methods as per relevant IS Codes.

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.

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.

6. All materials shall conform to relevant ISS.

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

8. 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.

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 reused. 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.

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

11. This USOR contains the rates of all the items without GST. GST shall be paid separately as per prevailing government norms as claimed by the contractor in his bill.
All the estimates based on this USOR will include GST as an extra amount as per prevailing rates on the sum of the estimate to arrive at the gross amount.

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	48.00
	100 mm dia.	Per Cut	65.00
	150 mm dia.	Per Cut	121.00
	200 mm dia.	Per Cut	162.00
	250 mm dia.	Per Cut	201.00
	300 mm dia.	Per Cut	241.00
	350 mm dia.	Per Cut	280.00
	400 mm dia.	Per Cut	320.00
	450 mm dia.	Per Cut	359.00
	500 mm dia.	Per Cut	400.00
	600 mm dia.	Per Cut	475.00
	700 mm dia.	Per Cut	514.00
	750 mm dia.	Per Cut	553.00
	800 mm dia.	Per Cut	593.00
	900 mm dia.	Per Cut	633.00
17.2	Labour for cutting following Asbestos Cement Pressure Pipes of any type and class.		
	80 mm dia.	Per Cut	24.00
	100 mm dia.	Per Cut	33.00
	150 mm dia.	Per Cut	61.00
	200 mm dia.	Per Cut	81.00
	250 mm dia.	Per Cut	100.00
	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	12.00
	100 mm dia.	Per Cut	16.00
	150 mm dia.	Per Cut	30.00
	200 mm dia.	Per Cut	41.00
17.4	Labour only for cutting following Ductile Iron pipes of any type and class.		
	80 mm dia.	Per Cut	42.00
	100 mm dia.	Per Cut	57.00
	150 mm dia.	Per Cut	106.00
	200 mm dia.	Per Cut	142.00
	250 mm dia.	Per Cut	177.00
	300 mm dia.	Per Cut	212.00

S. No.	Items	Unit	Rates in Rs.
	350 mm dia.	Per Cut	246.00
	400 mm dia.	Per Cut	281.00
	450 mm dia.	Per Cut	316.00
	500 mm dia.	Per Cut	352.00
	600 mm dia.	Per Cut	418.00
	700 mm dia.	Per Cut	452.00
	750 mm dia.	Per Cut	487.00
	800 mm dia.	Per Cut	522.00
	900 mm dia.	Per Cut	557.00
17.5	Labour for cutting following Galvanised Iron (MS) Pipes of any type and class.		
	15 mm dia.	Per Cut	4.00
	20 mm dia.	Per Cut	7.00
	25 mm dia.	Per Cut	10.00
	32 mm dia.	Per Cut	15.00
	40 mm dia.	Per Cut	20.00
	50 mm dia.	Per Cut	24.00
	65 mm dia.	Per Cut	29.00
	80 mm dia.	Per Cut	37.00
	100 mm dia	Per Cut	39.00
	125 mm dia	Per Cut	45.00
	150 mm dia	Per Cut	50.00
17.6	Chamfering cast iron pipes of all types and classes to make suitable for tyton joints.		
	Up To150 mm dia.	Each End	851.00
	200 mm dia.	Each End	1059.00
	250 mm dia.	Each End	1167.00
	300 mm dia.	Each End	1326.00
	400 mm dia.	Each End	1591.00
	450 mm dia.	Each End	1730.00
	500 mm dia.	Each End	1857.00
	600 mm dia.	Each End	2122.00
	700 mm dia.	Each End	2387.00

S. No.	Items	Unit	Rates in Rs.		
	750 mm dia.	Each End	2652.00		
	800 mm dia.	Each End	2918.00		
	900 mm dia.	Each End	3183.00		
	1000 mm dia.	Each End	3148.00		
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.		**Class LA**	**Class A**	**Class B**
	80 mm dia.	R.Mtr.	9.00	10.00	11.00
	100 mm dia.	R.Mtr.	11.00	12.00	13.00
	125 mm dia.	R.Mtr.	15.00	16.00	17.00
	150 mm dia.	R.Mtr.	18.00	20.00	22.00
	200 mm dia.	R.Mtr.	27.00	29.00	31.00
	250 mm dia.	R.Mtr.	36.00	39.00	42.00
	300 mm dia.	R.Mtr.	47.00	51.00	54.00
	350 mm dia.	R.Mtr.	59.00	64.00	68.00
	400 mm dia.	R.Mtr.	72.00	79.00	84.00
	450 mm dia.	R.Mtr.	87.00	96.00	101.00
	500 mm dia.	R.Mtr.	102.00	111.00	118.00
	600 mm dia.	R.Mtr.	136.00	149.00	157.00
	700 mm dia.	R.Mtr.	175.00	191.00	203.00
	750 mm dia.	R.Mtr.	195.00	213.00	228.00
	800 mm dia	R.Mtr.	275.00	302.00	329.00
	900 mm dia	R.Mtr.	335.00	369.00	403.00
	1000 mm dia.	R.Mtr.	403.00	444.00	483.00
17.8	**Unloading from railway wagon, pipes and machinery**				
(a)	Pipes upto 500 mm dia and machinery below 1.00 tonne	Tonne	450.00		
(b)	Pipes 500 mm dia and above heavy Machinery weighing more than one tonne require use of crane etc.	Tonne	2040.00		
17.9	Stacking of pipe and machinery at station Yard.	Tonne	580.00		
17.10	Carriage of Material by Mechanical transport including loading unloading & stacking etc.				

S. No.	Items	Unit	Rates in Rs.	
17.10.1	**Lime, Alum., Bleaching Powder**	**Distance**	**Per**	**Rates in Rs.**
	1. Distance	1 Km.	Cum	90.00
	2. Distance	2 km	Cum	103.00
	3. Distance	3 km	Cum	116.00
	4. Distance	4 km	Cum	128.00
	5. Distance	5 km	Cum	140.00
	6. Beyond 5km upto 10km. add per km		Cum	10.00
	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	113.00
	2. Distance	2 km	Cum	129.00
	3. Distance	3 km	Cum	145.00
	4. Distance	4 km	Cum	160.00
	5. Distance	5 km	Cum	175.00
	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	80.00
	2. Distance	2 km	Per Tonne	92.00
	3. Distance	3 km	Per Tonne	103.00
	4. Distance	4 km	Per Tonne	114.00
	5. Distance	5 km	Per Tonne	124.00
	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	204.00
	2. Distance	2 km	Per Tonne	231.00
	3. Distance	3 km	Per Tonne	260.00
	4. Distance	4 km	Per Tonne	285.00
	5. Distance	5 km	Per Tonne	312.00
	6. Beyond 5 Km upto 10 km. add per km		Per Tonne	23.00
	7. Beyond 10 km. upto 20 km. add per km.		Per Tonne	19.00
	8. Beyod 20 km. add per additional		Per Tonne	16.00

S. No.	Items	Unit	Rates in Rs.	
17.10.4	Steel (All types)			
	1. Distance	1 km	Per Tonne	80.00
	2. Distance	2 km	Per Tonne	92.00
	3. Distance	3 km	Per Tonne	103.00
	4. Distance	4 km	Per Tonne	114.00
	5. Distance	5 km	Per Tonne	124.00
	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	184.00
	2. Distance	2 km	Per Tonne	209.00
	3. Distance	3 km	Per Tonne	233.00
	4. Distance	4 km	Per Tonne	256.00
	5. Distance	5 km	Per Tonne	279.00
	6. Beyond 5km upto 10km. Add per km		Per Tonne	20.00
	7. Beyond 10km. upto 20km. add per km.		Per Tonne	17.00
	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	1228.00
	2. Distance	2 km	Per Tonne	1391.00
	3. Distance	3 km	Per Tonne	1553.00
	4. Distance	4 km	Per Tonne	1708.00
	5. Distance	5 km	Per Tonne	1859.00
	6. Beyond 5km upto 10km. add per km		Per Tonne	135.00
	7. Beyond 10km. upto 20km. add per km.		Per Tonne	110.00
	8.Beyond 20km. add per additional km		Per Tonne	90.00
17.10.5.3	**600,700,750,800&900mm dia**			
	1. Distance	1 Km.	Per Tonne	3070.00
	2. Distance	2 km	Per Tonne	3478.00
	3. Distance	3 km	Per Tonne	3882.00
	4. Distance	4 km	Per Tonne	4269.00
	5. Distance	5 km	Per Tonne	4647.00
	6. Beyond 5km upto 10km. add per km		Per Tonne	336.00
	7. Beyond 10km. upto 20km. add per km.		Per Tonne	276.00
	8.Beyond 20km. add per additional km.		Per Tonne	224.00

S. No.	Items	Unit	Rates in Rs.	
17.10.5.4	**1000,1100, and 1200 mm dia**			
	1. Distance	1 Km.	Per Tonne	6139.00
	2. Distance	2 km	Per Tonne	6688.00
	3. Distance	3 km	Per Tonne	7763.00
	4. Distance	4 km	Per Tonne	8539.00
	5. Distance	5 km	Per Tonne	9293.00
	6. Beyond 5km upto 10km. add per km		Per Tonne	673.00
	7. Beyond 10km. upto 20km. add per km.		Per Tonne	551.00
	8. Beyond 20km. add per additional km.		Per Tonne	448.00
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
17.13	Providing and supply of Electro Fusion Tapping Ferrule (Branch Tapping saddle) Female BSP Threaded woth SS 304 insert fittings in accordance with BS EN 12201: Part-3 suitable for drinking water with in black/ blue color manufactured from compounded PE 80/ PE-100 virgin polymer and compatible with PE80/PE 100 pipes, in pressure rating SDR 11 with min PN 12.5 rated for water application with	No.		1980.00

S. No.	Items	Unit	Rates in Rs.	
	elecctro fusion tapping ferrule saddle, 90x15mm and providing and supplying blue 20mm dia PN-16 MDPE pipes 5-10 mtr confirming to IS 4427:1996 Manufactured from virgin resin PE 80 food grade compounded Raw Material having Blue color only with quality assurance certificate from quality agencies like WRC/ CIPET (India) / DVGM/ KIWA/ SPGN etc. for usage 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 i/c cost of 15mm dia UPVC pipe sockety Elbow, Union 20x15 mm dia PVC reducer and providing and stainless steel water tap with grouting of vertical pipe as per requirement as per approved specification and as directed by Engineer in charge.			
17.14	House hold connection with 15mm S.S. tap including earth work in excavaton for pipe trench in all kinds of soil & W.B.M. in areas with demolishing cement concrete road and reconstruction of same good with providing and fixing 15mm G.M./ brass ferrule 90x15mm MS/ PVC Clamp in main line 15mm dia PVC pipe heavy class from main pipe line to house of consumer up to 5 to 10 meter long as per site condition PVC specials such as 15mm PVC sockets elbows, union with all other work pertaining to it job completed, as per approved specification and as directed by Engineer incharge	1 JOb		1620.00
17.15	House hold connection with 15mm S.S. tap including earth work in excavaton for pipe trench in all kinds of soil & W.B.M. in areas with demolishing cement concrete road and reconstruction of same good with providing and fixing 15mm G.M./ brass ferrule 90x15mm MS/ PVC Clamp in main line, 15mm dia G.I. pipe from main pipe line to house of consumer up to 5 to 10 meter long as per site condition i/c specials such as G.I. Bends, elbows, tees,union etc. with all other work pertaining to job completed, as per approved specification and as directed by Engineer incharge	Job		1800.00

S. No.	Items	Unit	Rates in Rs.	
	RECTANGULAR CONCRETE BLOCK PAVEMENT			
17.16	Manufacturing, laying of cement concrete blocks of cement Concrete (C.C.) M30 grade and spreading 25mm thick sand under neath and filling joints with sand on existing base including testing.			
(i)	Concrete M30 grade for block, (0.600x0.450x0.200) (Concrete M30 for edge block, (0.300x0.300x0.300))	Sqm		1271.00
(ii)	Concrete M30 grade for block, (0.450x0.300x0.150) (Concrete M30 edge for block, (0.300x0.300x0.300))	Sqm		1076.00
	INTERLOCKING CONCRETE BLOCK PAVEMENT			
17.17 (i)	Providing and Laying of Interlocking Concrete Block Pavements having thickness 80 mm over bedding sand conforming to table 1500.6 shall be uniformly laid to a compacted thickness of 30mm complete including testing.	Sqm		498.00
(ii)	Providing and Laying of Interlocking Concrete Block Pavements having thickness 60 mm overbedding sand conforming to table 1500.6 shall be uniformly laid to a compacted thickness of 25mm complete.	Sqm		431.00
17.18	Supply & erection of readymade mini pump house (control panel box) GI sheet of 18 gauge of size 90cmx90cm x60cm with 40x40x5mm angle Iron frame to fix it 200mm below ground level with hold fasts grouted in foundation and 300mm above ground level for clearance suitable for fixing of control panel, fuse unit, main switch etc. as per approved specification.	Each		13500.00
17.19	Provision for Jointing of TW to Rising Main with cost of Material/ specials such as GI Union / CI Flange, GI Reducer UPVC MTA FTA etc. as per	Job		2700.00

S. No.	Items	Unit	Rates in Rs.	
	requiement of site i/c cost of labour etc. complete as per approved specification and as directed by Engineer in charge.			
17.20	Provision for jointing of Rising main to supmp well/OHT and OHT to Distribution pipe line with cost of material/specials such as Bends, MTA as per rerquirement of site i/c cost of labour with excavation, labour as per requirement complete as per approved specification and as directed by Engineer in charge.	Job		4500.00
17.21	Providing and Installation of automatic water level controller (Auto switch off) with accessories i/c labour and material etc. complete, as per approved specification and directed by Engineer in charge.	Job		7200
17.22	Provision for inter connection of old to new pipe line with excavation of trench as per requirement/ repairing of leakage of pipe line of any diameter & type of pipe line in muddy area i/c searching of leakage point, dewetering the trench, repairing the leakage laying & jointing of pipe and specials, back filling the trench i/c testing of joints cost of labour & specials such as D-joints couplers, solvent cement etc. complete Job work as per approved specification and as directed by Engineer in charge.			
	50mm dia	Job		1350.00
	90mm dia	Job		1800.00
	110mm dia	Job		2250.00
17.23	Provision for inter connection of old to new pipe line with excavation of trench as per requirement of any diameter & type of pipe line in muddy area i/c dewetering the trench laying & jointing of pipe and specials, back filling the trench i/c testing of joints cost of labour & specials such as D-Joints couplers, solvent cement etc, complete job work as per approved specification and as directed by Engineer in charge.			

S. No.	Items	Unit	Rates in Rs.	
	50/90mm dia	Job		1575.00
	90/110 mm dia	Job		2025.00
	110/110mm dia	Job		2250.00
	90/90 mm dia	Job		1800.00
17.24	Supply of Woltman Turbine Bulk meter class b, multijet, magnetically coupled as per specifications conforming to IS 770/1994, ISO 4064/1 and EEC approved, including transportation to site, storage, safety, installation, testing commissioning, making connection with existing pipeline having total measuring capacity of 10,000 Kilolitre with least cound of one Kilolitre including excavation at site, dewetering and reinstating the same after completion and as per specifications including all taxes.	Job		13500.00
17.25	Provision for Rewindidng of submerssible Motor of any diameter i/c cost of material, labour, transportation etc. complete in case of breakdown maintenance as per approved specification and as directed by Engineer in charge.	Job		4500.00
17.26	Provision for Repairing of submerssible pump of any diameter i/c cost of material, labour, transportation etc. in case of breakdown maintenance as per approved specification and as directed by Engineer in charge	Job		2250.00
17.27	Provision for Repairing of Starter/ control panel i/c cost of material, labour, transportation etc. complete as per approved specification and as directed by Engineer in charge	Job		1080.00
17.28	Provision for Repairing of old existing CI Sluice Valve i/c repairing of spindle, check nut, changing of gland, lathe work as per requirement, changing of nut bolt, rubber sheet etc. complete as per approved specification and as directed by Engineer in charge.	Job		1250.00
	BOUNDARY PILLAR			
17.29	Reinforced cement concrete M15 grade boundary pillars/local stone of standard	Each		470.00

S. No.	Items	Unit	Rates in Rs.	
	design, fixed in position including finishing and lettering but excluding painting .			
	G.I.BARBED WIRE FENCING 1.2 M. HIGH			
17.30	Providing and fixing 1.2 m high GI barbed wire fencing with 1.8 m RCC posts 150 mm x 150 mm placed every 3 m centre-to-centre founded in M15 grade cement concrete, 0.6 m below ground level, every 15th post, last but one end post and corner post shall be strutted on both sides and end post on one side only and provided with 9 horizontal lines and 2 diagonals interwoven with horizontal wires, fixed with GI staples, turn buckles etc. complete .	R.M.		357.00
	G.I.BARBED WIRE FENCING 1.8 M. HIGH			
17.31	Providing and fixing 1.8 m high GI barbed wire fencing with 2.4 m RCC M15 grade 150 mm x 150 mm concrete post placed every 3 m centre-to-centre founded in M15 grade cement concrete, 0.6 m below ground level, every 15th post, last but one end post and corner post shall be strutted on both sides and end post on one side only and provided with 12 horizontal lines and 2 diagonals interwoven with horizontal wires, fixed with GI staples, turn buckles etc. complete..	R.M.		503.00
	SIGN BOARD			
17.32	Providing and fixing of typical informatory sign board. Three MS Plates of 1.6 mm thick, top and middle plate duly welded with MS flat iron 25mm x 5m size on back on edges. The lower plate will be welded with MS angle iron frame of 25mm x 25mm x 5mm. The angle iron frame of the lower most plate and flat iron frame of middle plate will be welded to 2 nos. 75mm x 75 mm of 12 SWG sheet tubes posts duly embedded in cement concrete M-	Job		12467.00

S. No.	Items	Unit	Rates in Rs.	
	15 grade blocks of 450mm x 450mm x 600mm, 600mm below ground level. The top most diamond plate will be welded to middle plate by 47mm x 47mm of 12 SWG steel plate tube. All M.S. will be stove enameled on both sides. Lettering and printing arrows, border etc. will be painted with ready mixed synthetic enamel paint of superior quality in required shade and colour. All sections of framed posts and steel tube will be painted with primer and two coats of epoxy paint complete.			
17.33	Construction of cement concrete information board in CC 1:2.5:5 (M15) with skin reinforcement of 8 mm dia HYSD bars @ 300 mm C/C both ways size including excavation, base concrete (M-15), priming, painting two coats synthetic enamel paint on new concrete surface including painting-figring Logo and Slogen including writing of all information about the project etc. complete. As directed by the Engineer incharge.	Job		9152.00
17.34	Providing and fixing of typical information board made of 75mm square or 75mm dia. circular steel tube of 12 SWG 3.2 m hight and cross member 2 Nos. 1m long, fixed with Angle iron 50 x 50 x 5 mm MS angle on the back side 2Nos vertical and 4 Nos horizontal. It is mounted by 2 plates of 1.6mm thick and size 900 x 750 mm, the pipe shall be erracted on 600 x 600 x 750 mm foundation blocks at appropriate depth made of cement concrete 1:2:4, painted by standard color with lettering, border, heading and logo etc. using sinthetic enamel paint of superior quality including welding, excavation, concreting, painting of base, border and lettering, painting and other required details etc complete as directed by Engineer-in-charge.	Job		17036.00

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 cased 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(Reaffirmed1999): 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% & G S T Extra

(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% & G S T Extra

30. This USOR contains the rates of all the items without GST. GST shall be paid separately as per prevailing government norms as claimed by the contractor in his bill.

All the estimates based on this USOR will include GST as an extra amount as per prevailing rates on the sum of the estimate to arrive at the gross amount.

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 with 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	1606.00
18.2	Geophysical & Hydrological Survey for lineament marking in field unconfined aquifer analysis, analyzing ground water movement, estimation of SWI yield finalizing of recharging structure, inclusive of preparation of requisite map and final report as per hydro-geological specification for recharging shaft along with all activities.	1 Job	5960.00

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./ G.I /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	499.00
(b)	In all types of rocks.	Meter	581.00
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	548.00
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, boulders etc.	Meter	518.00
(b)	In all types of rocks.	Meter	628.00
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	599.00
19.5	Drilling of perfectly vertical bore hole of 165 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	603.00

S.No.	Item	Unit	Rate in Rs.
19.6	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, boulders etc.	Meter	536.00
(b)	In all types of rocks.	Meter	707.00
19.7	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	611.00
(b)	In all types of rocks.	Meter	763.00
19.8	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 transportation installation and removal of drilling machine etc. complete in intertrappean formations (collapsible strata between rocks) including charges for transportation and making all necessary arrangements' etc, including lowering and fixing of 125 mm nominal diameter (G.I. or U.P.V.C. casing pipe .	Meter	615.00
19.9	Providing and fixing of well cap on top of the tube well for protection		
	M. S. Caps -		
(a)	100 mm dia.	each	270.00
(b)	125 mm dia.	each	305.00
(c)	150 mm dia.	each	370.00
(d)	200 mm dia.	each	400.00
20	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 complete work.	each	619.00

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 tube well up to desired depth in alluvial formation consisting of Soils, Clays, Sand, Gravel, Moorum, Boulders etc. and retaining the bore hole by using suitable drilling mud or foam or temporary housing pipe including all works pertaining to drilling such as transportation, installation and removal of drilling machine etc. complete.		
(a)	300 m.m diameter	Meter	836.00
(b)	350 m.m diameter	Meter	878.00
(c)	400 m.m diameter	Meter	917.00
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	44.00
(b)	Casing assembly composed of 150 m.m. diameter blank and slotted G.I. Casing pipes.	Meter	57.00
(c)	Casing assembly composed of 200 m.m. diameter blank and slotted G.I. Casing pipes.	Meter	70.00
(d)	Casing assembly composed of 100 m.m. dia. UPVC blank and screened pipes.	Meter	30.00
(e)	Casing assembly composed of 150 m.m. dia. UPVC blank and screened pipes.	Meter	41.00
(f)	Casing assembly composed of 200 m.m. dia. UPVC blank and screened pipes.	Meter	53.00
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	530.00
(b)	150 m.m diameter	each	605.00
(c)	200 m.m diameter	each	690.00

S.No.	Item	Unit	Rate in Rs.
20.4	Providing gravel packing with uniformly graded gravel as per I.S.4097 of 1967 (revised up to date) in the annular space between outer wall of casing pipe assembly and inner wall of bore hole including cost of gravel , transportation, stacking , washing and packing in layers of suitable thickness including all lead and lifts complete .	Cu.m	4211.00
20.5	Providing gravel with uniformly graded gravel as per I.S.4097 of 1967 (revised up to date) for gravel packing .	Cu.m	3800.00
20.6	Providing and fixing of well cap on top of the tube well for protection		
	M. S. Caps -		
(a)	100 mm dia.	each	270.00
(b)	125 mm dia.	each	305.00
(c)	150 mm dia.	each	370.00
(d)	200 mm dia.	each	400.00
20.7	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 complete work.	each	619.00

CHAPTER-XXI

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

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

S.No.	Item	Unit	Rate in Rs.
21.1	Labour charges for installation of India Mark II Hand Pump with 30 meter long 32 mm dia. Riser pipe assembly and all other accessories including transportation of Hnad Pump from specified departmental stores to site.	Each	1031.00
21.2	Add to item No. 1 above for fixing the extra length of riser pipe assembly beyond 30 meters	meter	20.00
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 Hand Pump including excavation , cost of material and labours etc. complete.	Each	941.00
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	4121.00
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 ramming, watering etc. complete in areas of Black cotton soils.	Each	4482.00
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	323.00
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	450.00

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 platform in cement concrete 1:2:4 including excavation, centering, shuttering, cost of all the materials and labour and curing etc. complete.	Each	1289.00
21.9	Construction of 1.20 cm x 1.20 cm x 0.20 m cement concrete washing platform 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	1456.00
21.10	Construction of sokage 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	949.00

CHAPTER- XXII

DEVELOPMENT, YIELD TEST AND DISINFECTION OF TUBE WELL

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

S.No.	Item	Unit	Rate in Rs.
22.1	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 up to 1 to 3 H.P.	Per hour	631.00
(b)	Submersible pumping set above 3 to 7.5 H.P.	Per hour	677.00
(c)	Submersible pumping set above 7.5 H.P.	Per hour	766.00
22.2	Development of gravel packed tube well by Air Compressor of suitable capacity including hire charges for all the required tools and plants etc. complete, for maximum duration of eight hours.	Per hour	942.00
22.3	Measurement of yield of tube well by operating hand pump continuously for four hours manually.	Each	688.00
22.4	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	60.00

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 up to 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 inside 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, boulders etc.	Meter	743.00
(b)	In all types of rocks.	Meter	864.00
23.2	After completion 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 around 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	455.00
23.3	Cost of casing shoe (Guide Bush) for odex drilling	Each	5060.00
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	804.00
(b)	In all types of rocks.	Meter	975.00
23.5	After completion 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 around 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	525.00
23.6	Cost of casing shoe (Guide Bush) for odex drilling	Each	5850.00

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	Hydro fracturing of perfectly vertical bore hole for 200/150/115 mm diameter bore hole up to 90 m depth below ground level including yield testing before and after Hydro fracture, transportation, installation and removing of Hydro fracturing unit.	1 Job	13463.00
24.2	Cleaning of perfectly vertical bore hole for 200/150/115 mm diameter bore hole up to 60 mtrs depth below ground level including transportation, installation and removing of Drilling machine.	1 Job	12641.00
24.3	Add to item no. 24.2 above cleaning beyond 60 m depth.	Per meter	132.00
24.4	Survey work dry/ low yield tube well hydro fracturing of tube well for detection of fracture zones in tube well by using the hole camera with monitor including transportation and providing C.D. & photographs.	Each	1483.00
24.5	Labour charges for taking out assembly from the tube well of India Mark II hand pump with 30 meters long 32mm dia riser pipe assembly and all other accessories.	Each	870.00
24.6	Add to item No. 24.5 above for fixing extra length of pipe beyond 30 meters.	Per Mtr.	29.00
24.7	Labour charges for lowering the assembly with complete fittings of India Mark II Hand pump from the tube well with 32mm dia 30 Meters long riser pipe assembly and other accessories	Each	728.00
24.8	Add to above item No. 24.7 for fixing extra length of riser pipe assembly beyond 30 meters.	Per Mtr	24.00
	CONSTRUCTION OF RECHARGING PIT IN SUBMERGENCE AREA		
24.9	Construction of recharging pit of internal size 2.00 X 2.00X1.35 mtr. near Existing tube well , in submergence area of pond / reservoir Including excavation, base concrete, brick masonry work and providing and filling filter media like boulders, gravels, sand and synthetic membrance below sand as per specifications, and drawing no.19 complete.	1 Job	41124.00

S.No.	Item	Unit	Rate in Rs.
	CONSTRUCTION OF RECHARGING PIT AROUND EXISTING TUBE WELL GIVING LESS YIELD WITH STEINING AND CATCH DRAIN		
24.10	Construction of recharging circular pit of 3.00 m outer dia and 2.00 mtrs depth around the existing tube well giving less yield perforation work in casing pipe and providing and fixing of nariyal rope around perforated area in full length, steening 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 sand and synthetic membrane below sand as per specifications and drawing no. 20 complete.	1 Job	54277.00
	CONSTRUCTION OF RECHARGING PIT AROUND TUBE WELL GIVING LESS YIELD		
24.11	Construction of recharging circular pit of 3.00 m dia and 2.00m depth around the dry tube well, 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 sand as filter media, synthetic membrance below sand and making ground slope towards the constructed pit to divert the rain water (in soft/hard rock area) as per specifications and drawing no. 21 complete.	1 Job	16518.00
	REPAIRING OF HAND PUMP		
24.12	Labour only for minor repairing work of India Mark II hand pump including replacement of unserviceable parts ie chain, handle, axle either one or more parts as the case may be along with overhauling of hand pump 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	457.00
24.13	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	1 Job	1058.00

S.No.	Item	Unit	Rate in Rs.
	etc as per approved specification inclusive of free services of departmental technician (Material will be supplied by the department).		
24.14	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 hand pump set and transportation etc as per approved specifications (Material will be supplied by the department).	1 Job	585.00
24.15	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	1109.00
	TAKING OUT FALLEN HAND PUMP PIPE LINE ASSEMBLEY FROM TUBE WELL		
24.16	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	2472.00
24.16.1	Removal of ordinarily Fallen Pipe Line of Hand Pump from Tube well i/c arrangement of labour, skilled person & arrangement of all tools and plant required for the job i/c all safety measures and transportation of recovered material from village to the departmental store or transportation of material required for hand pump installation from store to village, installation of Handpump i/c loading, unloading etc. complete.	1 Job	6126.00
24.16.2	Removal of choked fallen pipe line of Hand Pump from TW i/c arrangement of additonal labour skilled person, arrangement of all special type tools and plant required for the job, i/c all safety measures etc. all complete. (This item will be paid in addition to item No.24.16.1 if fallen pipe line is chocked)	1 Job	2226.00
	REMOVING OF UNSERVICEABLE		

S.No.	Item	Unit	Rate in Rs.
	HANDPUMP		
24.17	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	2050.00
24.18	**LOWERING & TAKING OUT OF SUBMERSIBLE PUMP SET**		
24.18.1	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	1549.00
24.18.2	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	1701.00
24.18.3	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	2004.00
(ii)	Above 7.5 HP to 12.5 HP - Depth up to 150 mtr.	1 Job	2308.00
(iii)	Above 12.5 HP - Depth up to 150 mtr.	1 Job	2611.00
24.18.4	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 .		
(i)	3 HP to 7.5 HP - Depth up to 150 mtr.	1 Job	2156.00
(ii)	Above 7.5 HP to 12.5 HP - Depth up to 150 mtr.	1 Job	2460.00
(iii)	Above 12.5 HP - Depth up to 150 mtr.	1 Job	2763.00
	TAKING OUT FALLEN SUBMERSIBLE PUMPING SET FROM TUBE WELL		
24.19	Labour only for taking out of fallen submersible pumping set from the tube well with pipe line assembly, electrical cable etc. complete using special		

S.No.	Item	Unit	Rate in Rs.
	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	2758.00
(ii)	3 to 7.5 HP - Depth up to 150 mtr.	1 Job	2933.00
(iii)	7.5 to 12.5 HP - Depth up to 150 mtr.	1 Job	3382.00
(iV)	Above 12.5 HP - Depth up to 150 mtr.	1 Job	3630.00
24.20	**REPAIRING OF SUBMERSIBLE MOTOR PUMP SET**		
24.20.1	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
24.20.2	Providing & Fixing of non return valve body		
	1 HP to 5 HP /100mm	1 Job	427.00
	3 HP to 15 HP / 150mm	1 Job	616.00
24.20.3	Providing & Fixing of Discharge outlet		
	1 HP to 5 HP /100mm	1 Job	240.00
	3 HP to 15 HP / 150mm	1 Job	330-.00
24.20.4	Providing & Fixing of Adjusting Cap		
	1 HP to 5 HP /100mm	1 Job	66.00
	3 HP to 15 HP / 150mm	1 Job	71.00
24.20.5	Providing & Fixing of L N key BMM		
	1 HP to 5 HP /100mm	1 Job	24.00
	3 HP to 15 HP / 150mm	1 Job	29.00

S.No.	Item	Unit	Rate in Rs.
24.20.6	Providing & Fixing of Bush for D O L		
	1 HP to 5 HP /100mm	1 Job	151.00
	3 HP to 15 HP / 150mm	1 Job	175.00
24.20.7	Providing & Fixing of Sleeve for D O L		
	1 HP to 5 HP /100mm	1 Job	132.00
	3 HP to 15 HP / 150mm	1 Job	146.00
24.20.8	Providing & Fixing of stage case CI	1 Job	
	3 HP to 15 HP / 150mm		333.00
24.20.9	Providing & Fixing of Bowl bush GM		
	3 HP to 15 HP / 150mm	1 Job	184.00
24.20.10	Providing & Fixing of Bowl bush Rubber		
	3 HP to 15 HP / 150mm	1 Job	108.00
24.20.11	Providing & Fixing of Neck Ring GM		
	3 HP to 15 HP / 150mm	1 Job	156.00
24.20.12	Providing & Fixing of Pump sleeve SS		
	3 HP to 15 HP / 150mm	1 Job	118.00
	1 HP to 5 HP /100mm	1 Job	382.00
	3 HP to 15 HP / 150mm	1 Job	472.00
24.20.14	Providing & Fixing of moter bush Rubber		
	1 HP to 5 HP /100mm	1 Job	264.00
	3 HP to 15 HP / 150mm	1 Job	312.00
24.20.15	Providing & Fixing of Impeller		
	1 HP to 5 HP /100mm PP	1 Job	62.00
	3 HP to 15 HP / 150mm GM	1 Job	406.00
24.20.16	Providing & Fixing of Diffuser GM		
	3 HP to 15 HP / 150mm	1 Job	257.00
24.20.17	Providing & Fixing of Diffuser PP		
	1 HP to 5 HP /100mm	1 Job	62.00
	3 HP to 15 HP / 150mm	1 Job	137.00
24.20.18	Providing & Fixing of sand guard		
	1 HP to 5 HP /100mm	1 Job	62.00
	3 HP to 15 HP / 150mm	1 Job	137.00
24.20.19	Providing & Fixing of Distance piece		
	1 HP to 5 HP /100mm	1 Job	45.00
	3 HP to 15 HP / 150mm	1 Job	108.00
24.20.20	Providing & Fixing of Oil seal		
	1 HP to 5 HP /100mm	1 Job	48.00
	3 HP to 15 HP / 150mm	1 Job	52.00
24.20.21	Providing & Fixing of Oil seal Sleeve		
	1 HP to 5 HP /100mm	1 Job	108.00
	3 HP to 15 HP / 150mm	1 Job	161.00
24.20.22	Providing & Fixing of Nylon Nut		
	1 HP to 5 HP /100mm	1 Job	10.00

S.No.	Item	Unit	Rate in Rs.
	3 HP to 15 HP / 150mm	1 Job	11.00
24.20.23	Providing & Fixing of Stud for Suction		
	1 HP to 5 HP /100mm	1 Job	20.00
	3 HP to 15 HP / 150mm	1 Job	26.00
24.20.24	Providing & Fixing of GM Washer		
	1 HP to 5 HP /100mm	1 Job	7.00
	3 HP to 15 HP / 150mm	1 Job	12.00
24.20.25	Providing & Fixing of Grub Screw		
	1 HP to 5 HP /100mm	1 Job	11.00
	3 HP to 15 HP / 150mm	1 Job	11.00
24.20.26	Providing & Fixing of Pump Shaft (SS) per Stage		
	3 HP to 15 HP / 150mm	1 Job	180.00
24.20.27	Providing & Fixing of Pump Shaft Key		
	1 HP to 5 HP /100mm	1 Job	52.00
	3 HP to 15 HP / 150mm	1 Job	62.00
24.20.28	Providing & Fixing of Suction Housing		
	1 HP to 5 HP /100mm	1 Job	236.00
	3 HP to 15 HP / 150mm	1 Job	339.00
24.20.29	Providing & Fixing of Pump Coupling & Motor Coupling		
	1 HP to 5 HP /100mm	1 Job	358.00
	3 HP to 15 HP / 150mm	1 Job	528.00
24.20.30	Providing & Fixing of Suction Housing Plate		
	3 HP to 15 HP / 150mm	1 Job	239.00
24.20.31	Providing & Fixing of Intermediate suction Case		
	3 HP to 15 HP / 150mm	1 Job	170.00
24.20.32	Providing & Fixing of Suction Housing Bush		
	3 HP to 15 HP / 150mm	1 Job	221.00
24.20.33	Providing & Fixing of Intermediate suction Bush		
	3 HP to 15 HP / 150mm	1 Job	221.00
24.20.34	Providing & Fixing of stud for Motor flange upper		
	1 HP to 5 HP /100mm	1 Job	17.00
	3 HP to 15 HP / 150mm	1 Job	21.00
24.20.35	Providing & Fixing of stud for Motor flange lower		
	1 HP to 5 HP /100mm	1 Job	26.00
	3 HP to 15 HP / 150mm	1 Job	33.00
24.20.36	Providing & Fixing of Bearing Housing upper		
	1 HP to 5 HP /100mm	1 Job	330.00
	3 HP to 15 HP / 150mm	1 Job	509.00
24.20.37	Providing & Fixing of Bearing Housing lower		
	1 HP to 5 HP /100mm	1 Job	330.00
	3 HP to 15 HP / 150mm	1 Job	509.00
24.20.38	Providing & Fixing of upper flange & lower flange		
	1 HP to 5 HP /100mm	1 Job	180.00

S.No.	Item	Unit	Rate in Rs.
	3 HP to 15 HP / 150mm	1 Job	221.00
24.20.39	Providing & Fixing of Motor base		
	1 HP to 5 HP /100mm	1 Job	406.00
	3 HP to 15 HP / 150mm	1 Job	528.00
24.20.40	Providing & Fixing of Thrust bearing plate complete		
	1 HP to 5 HP /100mm	1 Job	692.00
	3 HP to 15 HP / 150mm	1 Job	786.00
24.20.41	Providing & Fixing of Thrust bearing (Carben)		
	1 HP to 5 HP /100mm	1 Job	472.00
	3 HP to 15 HP / 150mm	1 Job	585.00
24.20.42	Providing & Fixing of Revolving disk		
	1 HP to 5 HP /100mm	1 Job	339.00
	3 HP to 15 HP / 150mm	1 Job	519.00
24.20.43	Providing & Fixing of Thrust bearing housing CI		
	1 HP to 5 HP /100mm	1 Job	132.00
	3 HP to 15 HP / 150mm	1 Job	203.00
24.20.44	Providing & Fixing of Rotor Sleeve		
	1 HP to 5 HP /100mm	1 Job	170.00
	3 HP to 15 HP / 150mm	1 Job	207.00
24.20.45	Providing & Fixing of Rubber Parts	1 Job	
	1 HP to 5 HP /100mm	1 Job	57.00
	3 HP to 15 HP / 150mm		75.00
24.20.46	Providing & Fixing of Intermediate coupling		
	1 HP to 5 HP /100mm	1 Job	283.00
	3 HP to 15 HP / 150mm	1 Job	312.00
24.20.47	Providing & Fixing of Flange locking		
	1 HP to 5 HP /100mm	1 Job	48.00
	3 HP to 15 HP / 150mm	1 Job	52.00
24.20.48	Providing & Fixing of Disk Locking		
	1 HP to 5 HP /100mm	1 Job	19.00
	3 HP to 15 HP / 150mm	1 Job	21.00
24.20.49	Providing & Fixing of Chuck Nut		
	1 HP to 5 HP /100mm	1 Job	36.00
	3 HP to 15 HP / 150mm	1 Job	48.00
24.20.50	Providing & Fixing of 8 mm Nut SS		
	3 HP to 15 HP / 150mm	1 Job	11.00
24.20.51	Providing & Fixing of 10 mm Nut SS		
	1 HP to 15 HP / 150mm	1 Job	15.00
24.20.52	Providing & Fixing of 12 mm Nut SS		
	1 HP to 15 HP / 150mm	1 Job	19.00
24.20.53	Providing & Fixing of Stud for Suction		
	1 HP to 15 HP / 150mm	1 Job	24.00
24.20.54	Providing & Fixing of Top Bush & Top Sleeve		
	1 HP to 5 HP /100mm	1 Job	264.00

S.No.	Item	Unit	Rate in Rs.
	3 HP to 15 HP / 150mm	1 Job	32.00
24.20.55	Providing & Fixing of Pump intermediate bush & sleeve		
	1 HP to 5 HP /100mm	1 Job	255.00
	3 HP to 15 HP / 150mm	1 Job	312.00
24.20.56	Providing & Fixing of Pump stainer		
	1 HP to 5 HP /100mm	1 Job	101.00
	3 HP to 15 HP / 150mm	1 Job	139.00
24.20.57	Providing & Fixing of center D O		
	1 HP to 5 HP /100mm	1 Job	161.00
	3 HP to 15 HP / 150mm	1 Job	330.00
24.20.58	Providing & Fixing of New rotor		
	1 HP (100 mm dia)	1 Job	4904.00
	2 HP (100 mm dia)	1 Job	5281.00
	3 HP (100 mm dia)	1 Job	5941.00
	4 HP (100 mm dia)	1 Job	6507.00
	5 HP (100 mm dia)	1 Job	7073.00
	3 HP (150 mm dia)	1 Job	7921.00
	4 HP (150 mm dia)	1 Job	8016.00
	5 HP (150 mm dia)	1 Job	8204.00
	6 HP (150 mm dia)	1 Job	8770.00
	Above 6.0 to7.5 HP (150 mm)	1 Job	9996.00
	Above 7.5 to 10 HP (150 mm)	1 Job	11033.00
	Above 10.0 to 12.5 HP (150 mm)	1 Job	15088.00
	Above 12.5 to 15 HP (150 mm)	1 Job	16974.00
24.20.59	Providing & Fixing of Adapter Piece		
	1 HP to 5 HP /100mm	1 Job	170.00
	3 HP to 15 HP / 150mm	1 Job	236.00
24.20.60	Providing & Fixing of Water drain plug		
	1 HP to 5 HP /100mm	1 Job	38.00
	3 HP to 15 HP / 150mm	1 Job	48.00
24.20.61	Providing & Fixing of Cable Guard		
	1 HP to 5 HP /100mm	1 Job	111.00
	3 HP to 15 HP / 150mm	1 Job	139.00
24.20.62	Labour only for stator servicing :-		
	1 HP - 5 HP / 100 mm	1 Job	472.00
	3 HP - 5 HP / 150mm	1 Job	490.00
	5 HP - 10 HP / 150mm	1 Job	613.00
	10 HP - 15 HP / 150mm	1 Job	708.00
24.20.63	Labour only for Rotor Balancing :-		
	1 HP - 5 HP / 100 mm	1 Job	754.00
	3 HP - 5 HP / 150mm	1 Job	849.00
	5 HP - 10 HP / 150mm	1 Job	1037.00
	10 HP - 15 HP / 150mm	1 Job	1320.00

S.No.	Item	Unit	Rate in Rs.
24.20.64	Labour only for Impeller Brass welding & Turning	1 Job	283.00
24.20.65	Labour only for Motor Rotor sleeve turning & grinding	1 Job	613.00
24.20.66	Labour only for Flange stud Welding	1 Job	38.00
24.20.67	Labour only for Motor opening, servicing, fitting & testing	1 Job	425.00
24.20.68	Labour only for Copper welding, Turning & Grinding to enduring of rotor	1 Job	754.00
24.20.69	Labour only for Welding Turning key way cutting of coupling side of rotor	1 Job	377.00
24.20.70	Labour only for Pump opening & fitting	1 Job	377.00
	REPAIRING OF CONTROL PANEL		
24.20.71	Providing & Fixing of Relay unit L&T Type	1 Job	561.00
24.20.72	Providing & Fixing of Relay unit BCH Type	1 Job	1269.00
24.20.73	Providing & Fixing of Contacter L&T Type - 16 Amp	1 Job	1080.00
24.20.74	Providing & Fixing of Contacter BCH Type - 16 Amp	1 Job	1551.00
24.20.75	Providing & Fixing of Contacter BCH Type - 25 Amp	1 Job	2023.00
24.20.76	Providing & Fixing of Kit Point Set L&T Type	1 Job	420.00
24.20.77	Providing & Fixing of Kit Point Set BCH Type -16 Amp	1 Job	797.00
24.20.78	Providing & Fixing of Kit Point Set BCH Type - 25 Amp	1 Job	608.00
24.20.79	Providing & Fixing of No Volt Coil L&T Type	1 Job	420.00
24.20.80	Providing & Fixing of No Volt Coil BCH Type	1 Job	420.00
24.20.81	Providing & Fixing of Timer Set L&T Type	1 Job	1269.00
24.20.82	Providing & Fixing of Timer Set BCH Type	1 Job	1551.00
24.20.83	Providing & Fixing of Auxillary Switch	1 Job	523.00
24.20.84	Providing & Fixing of Timer Coil	1 Job	391.00
24.20.85	Providing & Fixing of Amp meter (Round)	1 Job	123.00
24.20.86	Providing & Fixing of Volt Meter (Round)	1 Job	123.00
24.20.87	Providing & Fixing of Amp meter (Square)	1 Job	170.00
24.20.88	Providing & Fixing of Volt Meter (Square)	1 Job	170.00
24.20.89	Providing & Fixing of ON Switch	1 Job	85.00
24.20.90	Providing & Fixing of Off Switch	1 Job	85.00
24.20.91	Providing & Fixing of Terminal Plate	1 Job	137.00
24.20.92	Providing & Fixing of Indicator Lamp	1 Job	33.00
24.20.93	Providing & Fixing of MCB -Single Pole - 16 -25 Amp	1 Job	108.00

S.No.	Item	Unit	Rate in Rs.
24.20.94	Providing & Fixing of MCB -Three Pole - 32 Amp	1 Job	647.00
24.20.95	Providing & Fixing of MCB -Three Pole - 40 Amp	1 Job	608.00
24.20.96	Providing & Fixing of MCB -Three Pole - 63 Amp	1 Job	655.00
24.20.97	Providing & Fixing of Capacitor 36 MFD	1 Job	326.00
24.20.98	Providing & Fixing of Capacitor 50 MFD	1 Job	326.00
24.20.99	Providing & Fixing of Capacitor 120-150 MFD	1 Job	344.00
24.20.100	Providing & Fixing of Capacitor 200-250 MFD	1 Job	363.00
24.20.101	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	406.00
	3 HP - 5 HP (Three Phase)	1 Job	500.00
	5 HP - 10 HP (Three Phase)	1 Job	689.00
	10 HP - 15 HP (Three Phase)	1 Job	877.00
	REPLACEMENT OF FLAT COPPER CABLE		
24.20.102	**Providing and fixing of ISI marked PVC insulated three core flat copper cable.**		
	1.5 sq mm	1 Job	43.00
	2.5 sq mm	1 Job	66.00
	4.0 sq mm	1 Job	97.00
	6.0 sq mm	1 Job	142.00
	HORIZONTAL / INCLINED / VERTICAL BORES INSIDE THE DUG WELL		
24.20.103	Labour charges for lowering and taking out the drilling machine mast assembly, drill rods and drilling equipments etc. and installation of drilling machines mast inside the dug well Complete work.	Each	3460.00
24.20.104	Drilling of Horizontal / Inclined / Vertical bore hole of 115 mm diameter inside existing dug well up to desired depth with insertion of suitable perforated PVC/HDPE/ G.I..Pipe provided by department in all types of strata i.e. Soil, Rock, Hard Rock including all works pertaining to drilling such as transportation, installation and removal of drilling machine in side dug well etc. complete.	Per meter	908.00
	SINGLE/ THREE PHASE SUBMERSIBLE/ CENTRIFUGAL MOTOR PUMP SET		
24.20.105	Supplying & Installation of Energy efficiant five star		

S.No.	Item	Unit	Rate in Rs.
	BEE rating ISI Marked required capacity single phase, 50 Hz, 220V, deep well submersible pump Stainless Steel body, suitable for 4"/6" tube well with Contral Panel Starter suitable for Submersible pump with dry run protection, connections, including clamps, bore cap etc. as required as per specifications but excluding pipe, SS/ Nylon wire rope and connection cable.		
(i)	0.5 H.P. with 6 to 7 stages, Head Mt. 46-13 Discharge LPM 10-55	Each	20553
(ii)	1 H.P. with upto 5 stages, Head Mt. 35-15 Discharge LPM 40-125	Each	21716
(iii)	1 H.P. with 7 to 8 stages, Head Mt. 61-18 Discharge LPM 25-90	Each	22085
(iv)	1 H.P. with 10 to 11 stages, Head Mt. 74-21 Discharge LPM 15-55	Each	22879
(v)	1 H.P. with 12 to 14 stages, Head Mt. 91-28 Discharge LPM 10-45	Each	23588
(vi)	1.5 H.P. with up to 6 stages, Head Mt. 42-17 Discharge LPM 65-150	Each	25795
(vii)	1.5 H.P. with up to 7 to 8 stages, Head Mt. 56-21 Discharge LPM 40-125	Each	26504
(viii)	1.5 H.P. with to 10 to 11 stages, Head Mt. 84-26 Discharge LPM 25-90	Each	26051
(ix)	1.5 H.P. with 16 to 17 stages, Head Mt. 114-33 Discharge LPM 15-55	Each	26135
(x)	1.5 H.P. with 18 to 20 stages, Head Mt. 130-41 Discharge LPM 10-45	Each	28064
(xi)	2 H.P. with up to 7 to 8 stages, Head Mt. 56-16 Discharge LPM 65-205	Each	29505
(xii)	2 H.P. with to 10 to 11 stages, Head Mt. 77-30 Discharge LPM 40-125	Each	29760
(xiii)	2 H.P. with 14 to 15 stages, Head Mt. 114-36 Discharge LPM 25-90	Each	28569
(xiv)	2 H.P. with 20 to 22 stages, Head Mt. 147-42 Discharge LPM 15-55	Each	28144
(xv)	2 H.P. with 25 stages, Head Mt. 163-58 Discharge LPM 10-45	Each	32738
(xvi)	3 H.P. with 10 to 12 stages, Head Mt. 84-23 Discharge LPM 65-205	Each	31660
(xvii)	3 H.P. with 15 to 17 stages, Head Mt. 119-45 Discharge LPM 40-125	Each	32614
(xviii)	3 H.P. with 20 to 22 stages, Head Mt. 167-51 Discharge LPM 25-90	Each	31320

S.No.	Item	Unit	Rate in Rs.
24.20.106	Supplying & Installation of Energy efficiant five star BEE rating ISI Marked required capacity of Three Phase, 50 Hz, 415V, deep well submersible pump Steel body, suitable for 6"tube well with Control Panel Starter suitable for Submersible pump with dry run protection, single phase preventer, connections, including clamps, bore cap etc. as required as per specifications but excluding pipe and connection cable.		
(i)	3 H.P. with up to 6 stages, Head Mt. 55-7 Discharge LPM 60-510	Each	35576
(ii)	5 H.P. with up to 5 stages, Head Mt. 55-13 Discharge LPM 120-510	Each	39914
(iii)	5 H.P. with 8 to 9 stages, Head Mt. 83-32 Discharge LPM 60-270	Each	42638
(iv)	5 H.P. with 10 to 11 stages, Head Mt. 101-40 Discharge LPM 60-270	Each	45020
(v)	7.5 H.P. with 8 to 10 stages, Head Mt. 117-31 Discharge LPM 60-420	Each	49845
(vi)	7.5 H.P. with 13 to 14 stages, Head Mt. 129-52 Discharge LPM 60-270	Each	56699
(vii)	7.5 H.P. with 15 stages, Head Mt. 138-60 Discharge LPM 60-270	Each	58883
(viii)	10 H.P. with 16 stages, Head Mt. 147-64 Discharge LPM 60-270	Each	62060
(ix)	10 H.P. with 20 stages, Head Mt. 184-80 Discharge LPM 60-270	Each	68414
24.20.107	Supplying and laying of submersible flat cable ISI marked 3 core copper wire of suitable size with proper clamping of approved make.		
(i)	2.5 Sq.mm.multi strand	Per Mtr	119
(ii)	4.0 Sq.mm.multi strand	Per Mtr	167
(iii)	6.0 Sq.mm.multi strand	Per Mtr	247
(iv)	10.0 Sq.mm.multi strand	Per Mtr	398
24.20.108	Supplying and laying of approved Make Nylon rope 12mm thick complete with binding for support of pump and motor	Per Mtr	60
24.20.109	Supplying and laying of approved make stainless steel wire rope 6 mm thick complete with binding for support of pump and motor	Per Mtr	137
24.20.110	Supplying and Installation of approved Make required capacity single phase, 50 Hz, 220V, Centrifugal		

S.No.	Item	Unit	Rate in Rs.
	Mono-block pump self priming, with Starter, connections, base channel foundation etc. as required as per specifications but excludding Pipe and connection cable.		
(i)	1 H.P. Head Mt.6-30, Discharge LPH 2400-900	Each	11803
(ii)	1 H.P. Head Mt.21-45, Discharge LPH 1800-400 (Domestic Model)	Each	7330
24.20.111	Supplying & Installation of approved Make required capacity single phase, 50 Hz, 240V, Centrifugal Mono-block pump, with Starter, connections, base channel foundation etc. as required as per specifications but excluding Pipe and connection cable.		
(i)	1.0 H.P. Head Mt.3-24, Discharge LPH 27000-1500	Each	11315
(ii)	1.5 H.P. Head Mt.3-21, Discharge LPH 39600-6000	Each	13592
(iii)	2.0 H.P. Head Mt.3-18, Discharge LPH 48600-3000	Each	15088
24.20.112	Supplying & Installation of approved Make required capacity 3 phase, 50 Hz, 415V, Centrifugal Mono-block pump, with Starter,i/c single phase preventor, connections, base channel foundation etc. as required as per specifications but excluding Pipe and connection cable.		
(i)	3.0 H.P. Head Mt.6-15, Discharge LPM 740-465	Each	19076
(ii)	5.0 H.P. Head Mt.6-33, Discharge LPM 1380-450	Each	23370
(iii)	7.5 H.P. Head Mt.24-37, Discharge LPM 780-320	Each	29917
24.20.113	Supplying & Installation of Five star BEE rating ISI Marked required capacity of Three phase, 50 Hz, 415V, Open well Submersible pump, with Control Panel Starter with Dry Run Protection, single phase preventer, connections, etc. as required as per specifications but excluding pipe and connection cable.		
(i)	3.0 H.P. Head Mt.15-24, Discharge LPM 615-195	Each	22252
(ii)	5.0 H.P. Head Mt.15-24, Discharge LPM 930-420	Each	23917

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	6709.00
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	6813.00
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	9826.00
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	9964.00
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	202.00
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	695.00
	125 mm dia	Meter	927.00
	150 mm dia	Meter	1116.00
7	ISI marked UPVC casing pipe Confirming to IS 12818/92 (with up-to-date amendments).		
	Screen pipes with ribs 100 mm dia	Meter	392.00
	Screen pipes with ribs 150 mm dia	Meter	693.00
	Screen pipes with ribs 200 mm dia	Meter	1098.00
	CM casing pipes 100 mm dia	Meter	284.00
	CM casing pipes 125 mm dia	Meter	454.00
	CM casing pipes 150 mm dia	Meter	488.00
	CM casing pipes 200 mm dia	Meter	923.00
	CS casing pipes 150 mm dia	Meter	424.00
	CS casing pipes 200 mm dia	Meter	754.00

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

GEOPHYSICAL RESISTIVITY SURVEY REPORT

1. District ..... Block .....Panchayat……
2. Name of village..... Name of habitation .....
3. Name of Hydrogeologist.....Registration no. & Date of Validity…….
4. Agreement No & Date. .....Work Order No.....No. of Survey alloted.....
5. Date of Survey: - .....
6. Name of PHED Person (Mechanic/Sub Eng./DC/BC):
7. Model No & Make of Resistivity meter used for sounding.....
8. Resistivity Survey Purpose:-.. HP/PWSS
9. Toposheet No/HGM No.: - -
10. Geomorphology of the area :- Valley/PLW/PLM/PLU/PPS
11. Geological Succession of the area under investigation :- Alluvium/Basalt/ Granite/others
12. Hydrogeology of the area:- River system following & Static water table
13. Details of the Resistivity Survey : No. of VES- 03 (Interpretation by Schlumberger method)

Vertical Electric Sounding data	Latitude / Longitude of VES	App. Resistivity of layer in ohm (m)				Thickness of layer in (m)				Total depth (m)
		ρ1 (in Ohm-m)	ρ2(in Ohm-m)	ρ3(in Ohm-m)	ρ4(in Ohm-m)	h1	h2	h3	h4	H
VES No. I										
VES No. II										
VES No. III										

Subsequently, the above interpretation on the layers identified are geologically Presented in the following sequence:

15. Recommended site :-

i. Location of Site: - --------- Longitude E: ---------- Latitude N: - ----------
ii. Direction of site from Village…….

S.No	Characteristics:- Sub-Surface Strata (Litholog) expected.	Depth below Ground Level (m)		Aquifer (I, II, III)	Shallow/Deeper Aquifer
		From	To		

iii. Type of drilling machine :-D.T.H./combination bore/Gravel Pack
iv. Diameter of T/W:-
v. Depth of Tube well :- ……mt
vi. Expected Casing (Compact & Perforated) requirement : - ----to----mt / ---to--mt/ ---to --mt.

vii. Expected Yield :- ……LPH (Liter Per Hour)
viii. Remarks :
ix. Suggestive Recharge Structure :-

16. Enclosures :-
(i) Photocopy of Toposheet / HGM Map of area.
(ii) Map (Not to scale) showing the location of Survey Point (to be attached separately) in A4 size sheet.
(iii) Location site plan of three sounding sites
(iv) Reading chart of Sounding
(v) Depth probe graph /curves.
(vi) Photograph of site with installed instrument
(vii) Detail of Private Tube well nearby:

S. No.	Location of Tube well	Depth (m)	Yield (LPH)

Signature of AE/Sub Eng. / DC(Hydrologist) **Signature of Geo-hydrologist & Seal**

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 .....

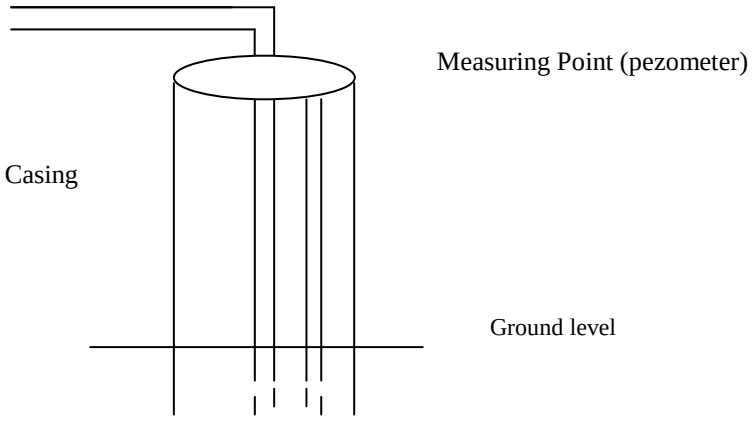
Type and K.W. of pumping set used for yield test .....

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

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

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

Sketch of casing pipe
with measuring point



Pump Test Results

S. No.	Time	Step No.	Duration of step (hrs.)	Discharge (cu. mtr. / hr.)	Water level in the tube well measured from ground level at the end of each step in meters	Draw Down in meters = static water level (-) water level at the end of pumping at given time	Remark
1							
2							
3							
4							

Note :- Discharge at static water level shell be taken on dependable yield of Tube well.

Signature of Contractor

Signature of Sub-Engineer

Signature of Assistant Engineer

PART-(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.

10. **This USOR contains the rates of all the items without GST. GST shall be paid separately as per prevailing government norms as claimed by the contractor in his bill.**
    All the estimates based on this USOR will include GST as an extra amount as per prevailing rates on the sum of the estimate to arrive at the gross amount.

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	26.00
ii.	SFRC 560 mm dia size	Each	32.00
iii	SFRC 600 mm dia size	Each	39.00
iv	SFRC 450x900 mm size	Each	45.00
v	SFRC 600x450 mm size	Each	26.00
vi	SFRC 600x600 mm size	Each	32.00
vii	SFRC 600x900 mm size	Each	39.00
viii	SFRC 1.2 x 0.9 mtr. size	Each	84.00
ix	C.I. 560 mm dia size	Each	39.00
x	C.I. 1.2 x 0.9 mtr. Size	Each	96.00
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	72.00
ii.	SFRC 560 mm dia size	Each	85.00
iii	SFRC 600 mm dia size	Each	97.00
iv	SFRC 450x900 mm size	Each	117.00
v	SFRC 600x450 mm size	Each	72.00
vi	SFRC 600x600 mm size	Each	85.00
vii	SFRC 600x900 mm size	Each	97.00
viii	SFRC 1.2 x 0.9 mtr. size	Each	169.00
ix	C.I. 560 mm dia size	Each	97.00
x	C.I. 1.2 x 0.9 mtr. Size	Each	201.00
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 and other plugging device with all required T & P and safety equipment including dewatering.**		

S.No.	Item	Unit	Rates in Rs.
25.5.1	**Depth upto 1.5 m**		
i.	100 mm dia	Each	607.00
ii.	150 mm dia	Each	811.00
iii.	200 mm dia	Each	814.00
iv	250 mm dia	Each	818.00
v	300 mm dia	Each	822.00
(a)	**Extra rate of depth 1.5m to 3m or part**		
	100 mm dia to 300 mm	Each	39.00
(b)	**Extra rate of depth 3m to 4.5 or part**		
	100 mm dia. to 300 mm	Each	78.00
(c)	**Extra rate of depth 4.5 m to 6m or part**		
	100 mm dia to 300 mm	Each	116.00
25.5.2	**Depth upto 1.5 m for RCC Sewer.**		
i.	350 mm dia	Each	1108.00
ii.	400 mm dia	Each	1115.00
iii.	450 mm dia	Each	1122.00
iv.	500 mm dia	Each	1130.00
(a)	**Extra rate of depth 1.5 m to 3m or part**		
	350 mm to 500 mm dia	Each	51.00
(b)	**Extra rate of depth 3m to 4.5 m or part**		
	350 mm to 500 mm dia	Each	102.00
(c)	**Extra rate of depth 4.5m to 6m or part**		
	350 mm dia to 500 mm	Each	153.00
(d)	**Extra rate of depth 6m to 7.5 m or part**		
	350 mm dia to 500 mm	Each	204.00
(e)	**Extra rate of depth 7.5m to 9m or part**		
	350 mm dia 500 mm	Each	306.00
25.5.3	**Depth upto 1.5 m for RCC Sewer.**		
i.	600 mm dia	Each	1577.00
ii.	700 mm dia	Each	1598.00
iii.	800 mm dia	Each	1623.00
iv.	900 mm dia	Each	1650.00
v.	1000 mm dia	Each	1679.00
(a)	**Extra rate of depth. 1.5m to 3m to or part**		
	600 mm to 1000 mm dia	Eact	71.00
(b)	**Extra rate of depth. 3m to 4.5 m to or part**		
	600 mm to 1000 mm dia	Each	142.00
(c)	**Extra rate of depth. 4.5 m to 6m to or part**		
	600 mm dia to 1000 mm	Each	213.00
(d)	**Extra rate of depth. 6m to 7.5m or part**		
	600 mm dia to 1000mm	Each	284.00
(e)	**Extra rate of depth. 7.5m to 9m or part**		
	600 mm dia to 1000 mm	Each	506.00

S.No.	Item	Unit	Rates in Rs.
25.5.4	**Depth upto 1.5 m for RCC Sewer.**		
i.	1200mm dia	Each	2239.00
ii.	1400 mm dia	Each	2344.00
iii.	1600 mm dia	Each	2440.00
iv.	1800 mm dia	Each	2548.00
(a)	**Extra rate of depth 1.5 to 3m to or part**		
	1200 mm to 1800 mm dia	Each	93.00
(b)	**Extra rate of depth 3m to 4.5 m to or part**		
	1200 mm to 1800 mm dia	Each	186.00
(c)	**Extra rate of depth 4.5m to 6m to or part**		
	1200 mm to 1800 mm dia	Each	279.00
(d)	**Extra rate of depth 6m to 7.5 m or part**		
	1200 mm to 1800 mm dia	Each	372.00
(e)	**Extra rate of depth 7.5 m to 9m or part**		
	1200 mm to 1800 mm dia	Each	559.00
(f)	**Extra rate of depth 9m to 10.5m or part**		
	1200 mm to 1800 mm dia	Each	745.00
(g)	**Extra rate of depth 10.5 m to 12m or part**		
	1200 mm to 1800 mm dia	Each	931.00
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	**441.00**
(a)	Extra rate for depth 1.5 m to 3m or part	Cu.M	22.00
(b)	Extra rate for depth 3m to 4.5 m or part	Cu.M	44.00
(c)	Extra rate for depth 4.5 m to 6m or part	Cu.M	50.00
(d)	Extra rate for depth 6m to 7.5 m or part	Cu.M	55.00
(e)	Extra rate for depth 7.5m to 9m or part	Cu.M	62.00
(f)	Extra rate for depth 9m to 10.5 m or part	Cu.M	66.00
(g)	Extra rate for depth 10.5 m to 12m or part	Cu.M	77.00
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**		

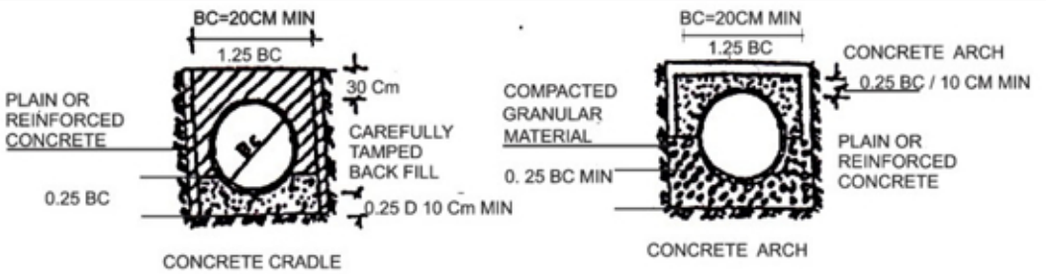
S.No.	Item	Unit	Rates in Rs.
	of silt, sludge upto 50m lead & lift up to 1.5mtr. as directed by Engineer-in- Charge including dewatering but excluding dat (plugging of sewer pipe line)		
25.7.1	**150 mm dia**	Per Mtr.	**37.00**
(a)	Extra rate for depth 1.5 m to 3m or part	Per Mtr.	2.00
(b)	Extra rate for depth 3m to 4.5 m or part	Per Mtr.	4.00
(c)	Extra rate for depth 4.5 m to 6m or part	Per Mtr.	6.00
25.7.2	**200 mm dia**	Per Mtr.	**45.00**
(a)	Extra rate for depth 1.5 m to 3m or part	Per Mtr.	2.00
(b)	Extra rate for depth 3m to 4.5 m or part	Per Mtr.	5.00
(c)	Extra rate for depth 4.5 m to 6m or part	Per Mtr.	7.00
(d)	Extra rate for depth 6m to 7.5 m or part	Per Mtr.	9.00
25.7.3	**250 mm dia**	Per Mtr.	**53.00**
(a)	Extra rate for depth 1.5 m to 3m or part	Per Mtr.	3.00
(b)	Extra rate for depth 3m to 4.5 m or part	Per Mtr.	5.00
(c)	Extra rate for depth 4.5 m to 6m or part	Per Mtr.	8.00
(d)	Extra rate for depth 6m to 7.5 m or part	Per Mtr.	11.00
25.7.4	**300 mm dia**	Per Mtr.	**64.00**
(a)	Extra rate for depth 1.5 m to 3m or part	Per Mtr.	3.00
(b)	Extra rate for depth 3m to 4.5 m or part	Per Mtr.	6.00
(c)	Extra rate for depth 4.5 m to 6m or part	Per Mtr.	10.00
(d)	Extra rate for depth 6m to 7.5 m or part	Per Mtr.	13.00
25.7.5	**350 mm dia RCC**	Per Mtr.	**227.00**
(a)	Extra rate for depth 1.5 m to 3m or part	Per Mtr.	11.00
(b)	Extra rate for depth 3m to 4.5 m or part	Per Mtr.	23.00
(c)	Extra rate for depth 4.5 m to 6m or part	Per Mtr.	34.00
(d)	Extra rate for depth 6m to 7.5 m or part	Per Mtr.	45.00
(e)	Extra rate for depth 7.5m to 9m or part	Per Mtr.	68.00
25.7.6	**400 mm dia RCC**	Per Mtr.	**273.00**
(a)	Extra rate for depth 1.5 m to 3m or part	Per Mtr.	14.00
(b)	Extra rate for depth 3m to 4.5 m or part	Per Mtr.	27.00
(c)	Extra rate for depth 4.5 m to 6m or part	Per Mtr.	41.00
(d)	Extra rate for depth 6m to 7.5 m or part	Per Mtr.	55.00
(e)	Extra rate for depth 7.5m to 9m or part	Per Mtr.	82.00
25.7.7	**450 mm dia RCC**	Per Mtr.	**314.00**
(a)	Extra rate for depth 1.5 m to 3m or part	Per Mtr.	16.00
(b)	Extra rate for depth 3m to 4.5 m or part	Per Mtr.	31.00
(c)	Extra rate for depth 4.5 m to 6m or part	Per Mtr.	47.00
(d)	Extra rate for depth 6m to 7.5 m or part	Per Mtr.	63.00
(e)	Extra rate for depth 7.5m to 9m or part	Per Mtr.	84.00
25.7.8	**500 mm dia RCC**	Per Mtr.	**341.00**
(a)	Extra rate for depth 1.5 m to 3m or part	Per Mtr.	17.00

S.No.	Item	Unit	Rates in Rs.
(b)	Extra rate for depth 3m to 4.5 m or part	Per Mtr.	34.00
(c)	Extra rate for depth 4.5 m to 6m or part	Per Mtr.	52.00
(d)	Extra rate for depth 6m to 7.5 m or part	Per Mtr.	68.00
(e)	Extra rate for depth 7.5m to 9m or part	Per Mtr.	102.00
(a)	Extra rate for depth 9m to 10.5m or part	Per Mtr.	136.00
25.7.9	**600 mm dia RCC**	Per Mtr.	**409.00**
(a)	Extra rate for depth 1.5 m to 3m or part	Per Mtr.	20.00
(b)	Extra rate for depth 3m to 4.5 m or part	Per Mtr.	41.00
(c)	Extra rate for depth 4.5 m to 6m or part	Per Mtr.	61.00
(d)	Extra rate for depth 6m to 7.5 m or part	Per Mtr.	82.00
(e)	Extra rate for depth 7.5m to 9m or part	Per Mtr.	123.00
(f)	Extra rate for depth 9m to 10.5m or part	Per Mtr.	164.00
25.7.10	**700 mm dia RCC**	Per Mtr.	**491.00**
(a)	Extra rate for depth 1.5 m to 3m or part	Per Mtr.	25.00
(b)	Extra rate for depth 3m to 4.5 m or part	Per Mtr.	49.00
(c)	Extra rate for depth 4.5 m to 6m or part	Per Mtr.	74.00
(d)	Extra rate for depth 6m to 7.5 m or part	Per Mtr.	98.00
(e)	Extra rate for depth 7.5m to 9m or part	Per Mtr.	147.00
(f)	Extra rate for depth 9m to 10.5m or part	Per Mtr.	196.00
25.7.11	**750 mm dia RCC**	Per Mtr.	**541.00**
(a)	Extra rate for depth 1.5 m to 3m or part	Per Mtr.	26.00
(b)	Extra rate for depth 3m to 4.5 m or part	Per Mtr.	55.00
(c)	Extra rate for depth 4.5 m to 6m or part	Per Mtr.	81.00
(d)	Extra rate for depth 6m to 7.5 m or part	Per Mtr.	108.00
(e)	Extra rate for depth 7.5m to 9m or part	Per Mtr.	162.00
(f)	Extra rate for depth 9m to 10.5m or part	Per Mtr.	216.00
25.7.12	**800 mm dia RCC**	Per Mtr.	**547.00**
(a)	Extra rate for depth 1.5 m to 3m or part	Per Mtr.	30.00
(b)	Extra rate for depth 3m to 4.5 m or part	Per Mtr.	59.00
(c)	Extra rate for depth 4.5 m to 6m or part	Per Mtr.	89.00
(d)	Extra rate for depth 6m to 7.5 m or part	Per Mtr.	119.00
(e)	Extra rate for depth 7.5m to 9m or part	Per Mtr.	183.00
(f)	Extra rate for depth 9m to 10.5m or part	Per Mtr.	245.00
25.7.13	**900 mm dia RCC**	Per Mtr.	**682.00**
(a)	Extra rate for depth 1.5 m to 3m or part	Per Mtr.	34.00
(b)	Extra rate for depth 3m to 4.5 m or part	Per Mtr.	68.00
(c)	Extra rate for depth 4.5 m to 6m or part	Per Mtr.	102.00
(d)	Extra rate for depth 6m to 7.5 m or part	Per Mtr.	136.00
(e)	Extra rate for depth 7.5m to 9m or part	Per Mtr.	205.00
(f)	Extra rate for depth 9m to 10.5m or part	Per Mtr.	273.00
25.7.14	**1000 mm dia RCC**	Per Mtr.	**781.00**
(a)	Extra rate for depth 1.5 m to 3m or part	Per Mtr.	39.00
(b)	Extra rate for depth 3m to 4.5 m or part	Per Mtr.	78.00

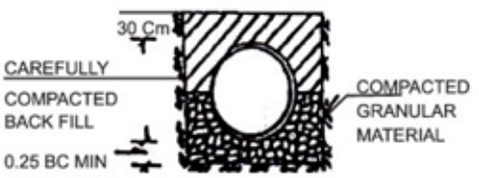
S.No.	Item	Unit	Rates in Rs.
(c)	Extra rate for depth 4.5 m to 6m or part	Per Mtr.	116.00
(d)	Extra rate for depth 6m to 7.5 m or part	Per Mtr.	156.00
(e)	Extra rate for depth 7.5m to 9m or part	Per Mtr.	234.00
(f)	Extra rate for depth 9m to 10.5m or part	Per Mtr.	312.00
(g)	Extra rate for depth 10.5m to 12m or part	Per Mtr.	390.00
25.7.15	**1200 mm dia RCC**	Per Mtr.	**933.00**
(a)	Extra rate for depth 1.5 m to 3m or part	Per Mtr.	47.00
(b)	Extra rate for depth 3m to 4.5 m or part	Per Mtr.	93.00
(c)	Extra rate for depth 4.5 m to 6m or part	Per Mtr.	140.00
(d)	Extra rate for depth 6m to 7.5 m or part	Per Mtr.	187.00
(e)	Extra rate for depth 7.5m to 9m or part	Per Mtr.	280.00
(f)	Extra rate for depth 9m to 10.5m or part	Per Mtr.	373.00
(g)	Extra rate for depth 10.5m to 12m or part	Per Mtr.	467.00
25.7.16	**1400 mm dia RCC**	Per Mtr.	**1078.00**
(a)	Extra rate for depth 1.5 m to 3m or part	Per Mtr.	54.00
(b)	Extra rate for depth 3m to 4.5 m or part	Per Mtr.	108.00
(c)	Extra rate for depth 4.5 m to 6m or part	Per Mtr.	162.00
(d)	Extra rate for depth 6m to 7.5 m or part	Per Mtr.	216.00
(e)	Extra rate for depth 7.5m to 9m or part	Per Mtr.	323.00
(f)	Extra rate for depth 9m to 10.5m or part	Per Mtr.	431.00
(g)	Extra rate for depth 10.5m to 12m or part	Per Mtr.	539.00
25.7.17	**1600 mm dia RCC**	Per Mtr.	**1239.00**
(a)	Extra rate for depth 1.5 m to 3m or part	Per Mtr.	62.00
(b)	Extra rate for depth 3m to 4.5 m or part	Per Mtr.	124.00
(c)	Extra rate for depth 4.5 m to 6m or part	Per Mtr.	186.00
(d)	Extra rate for depth 6m to 7.5 m or part	Per Mtr.	248.00
(e)	Extra rate for depth 7.5m to 9m or part	Per Mtr.	371.00
(f)	Extra rate for depth 9m to 10.5m or part	Per Mtr.	496.00
(g)	Extra rate for depth 10.5m to 12m or part	Per Mtr.	619.00
25.7.18	**1800 mm dia RCC**	Per Mtr.	**1425.00**
(a)	Extra rate for depth 1.5 m to 3m or part	Per Mtr.	71.00
(b)	Extra rate for depth 3m to 4.5 m or part	Per Mtr.	142.00
(c)	Extra rate for depth 4.5 m to 6m or part	Per Mtr.	213.00
(d)	Extra rate for depth 6m to 7.5 m or part	Per Mtr.	285.00
(e)	Extra rate for depth 7.5m to 9m or part	Per Mtr.	427.00
(f)	Extra rate for depth 9m to 10.5m or part	Per Mtr.	570.00
(g)	Extra rate for depth 10.5m to 12m or part	Per Mtr.	713.00
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**	Sq M	20.00

S.No.	Item	Unit	Rates in Rs.
	with boatman, bamboo, plunger, cutter, bucket, rope etc. and all safety equipments such as safety belt, gas mask, oxygen cylinder etc.		
25.9	**Carriage of desilted sludge & other material from sewage components by mechanical transport including loading unloading & stacking etc.**		
	1. Distance 1 km	Cum	136.00
	2. Distance 2 km	Cum	155.00
	3. Distance 3 km	Cum	174.00
	4. Distance 4 km	Cum	192.00
	5. Distance 5 km	Cum	210.00
	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

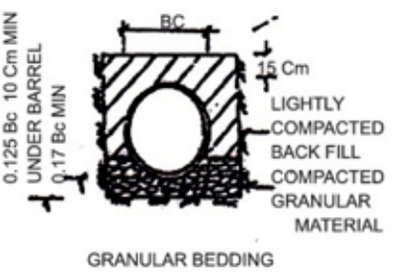


CLASS A



Compacted Granular Bedding

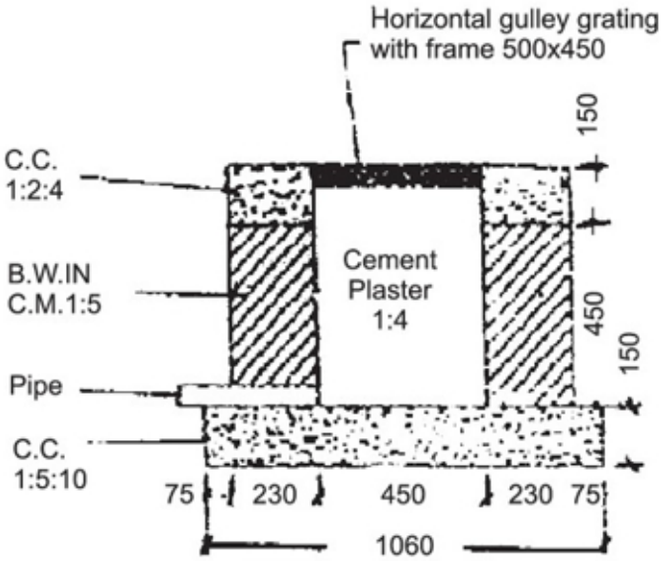
CLASS B



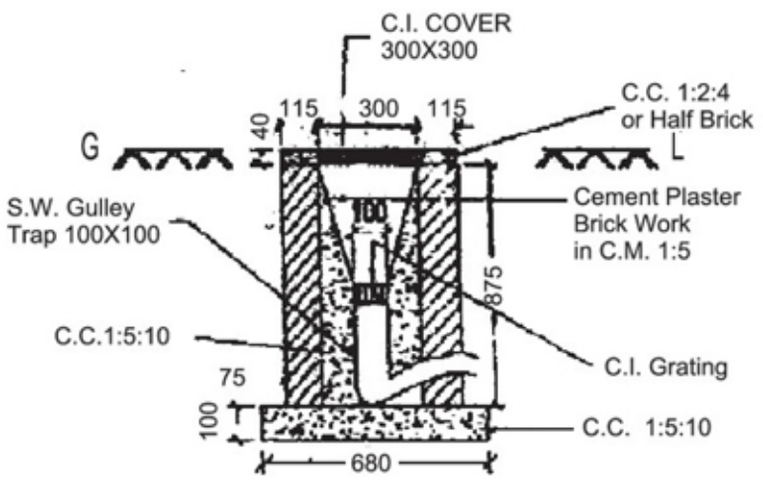
CLASS C

FIG 1. CLASSES OF BEDDING FOR CONDUIT IN TRENCH

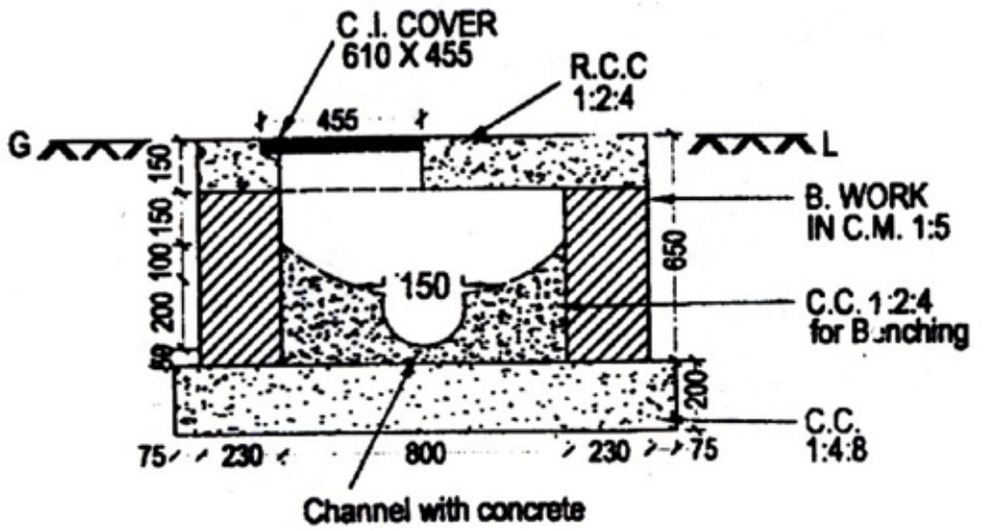
NOTE : IN ROCK, TRECNCH IS EXCAVATED ATLEAST 15 Cm BELOW THE BELL OF THE EXCEPT WHERE CONCRETE CRADLE IS USED.



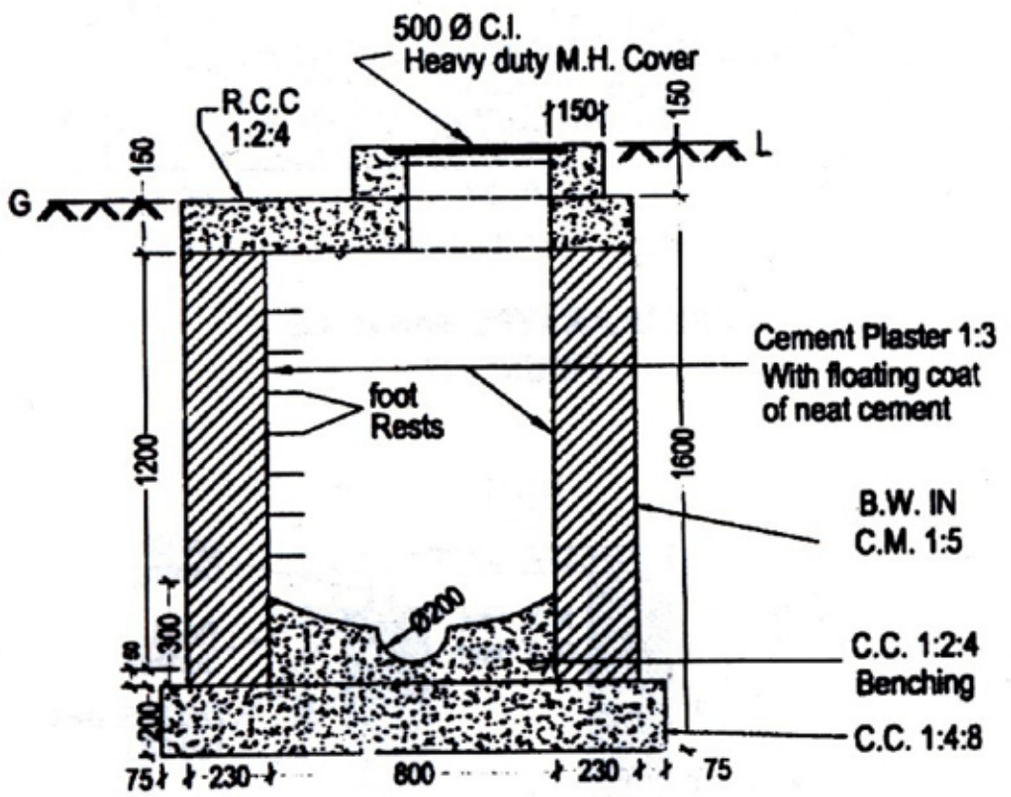
ROAD GULLEY CHAMBER
450X500 X600 (HORIZONTAL)
FIGURE 2



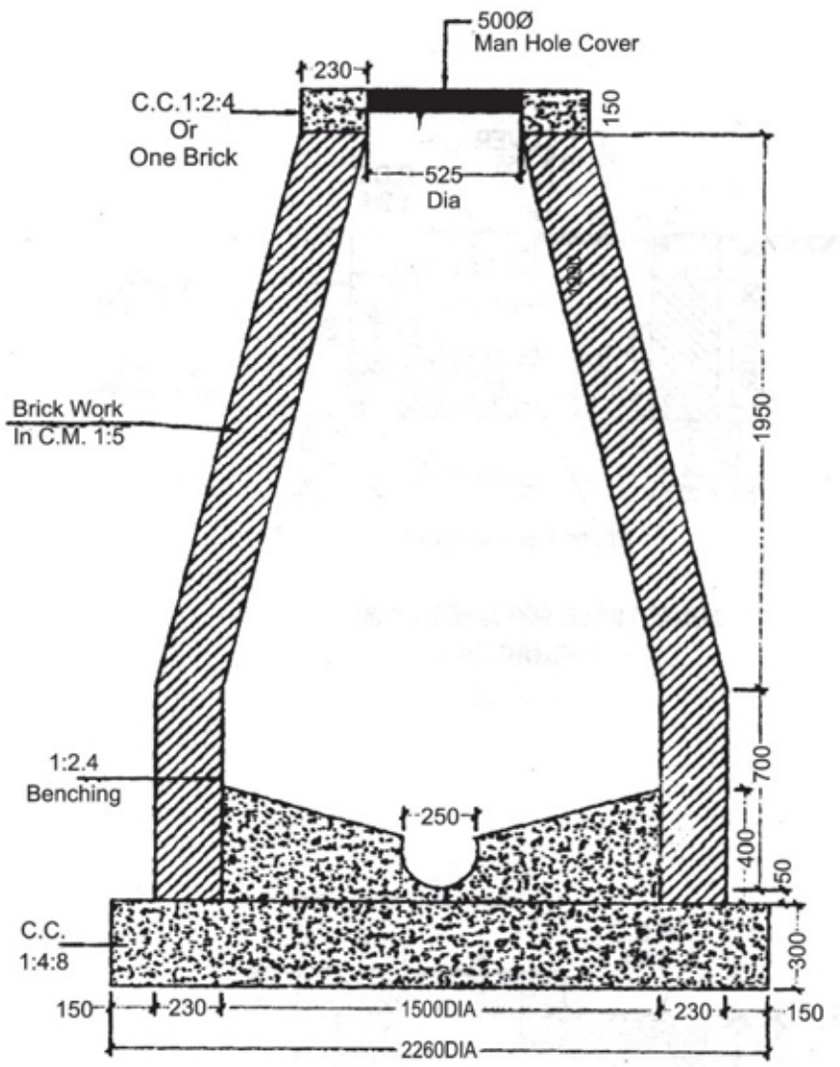
GULLEY TRAP CHAMBER
FOR 100X100 mm.
GULLY TRAP
FIGURE - 3



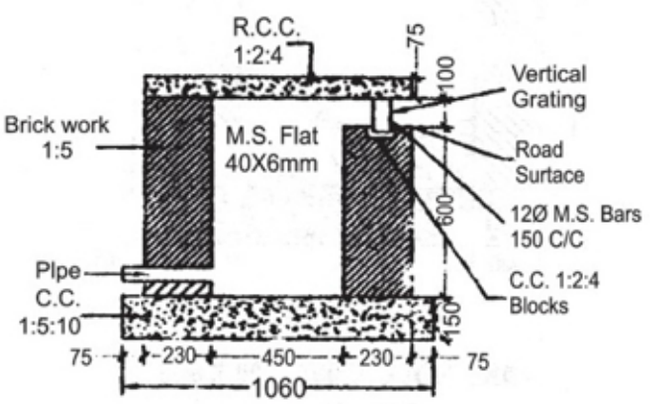
MAN HOLE 900X800X450
FIGURE - 4



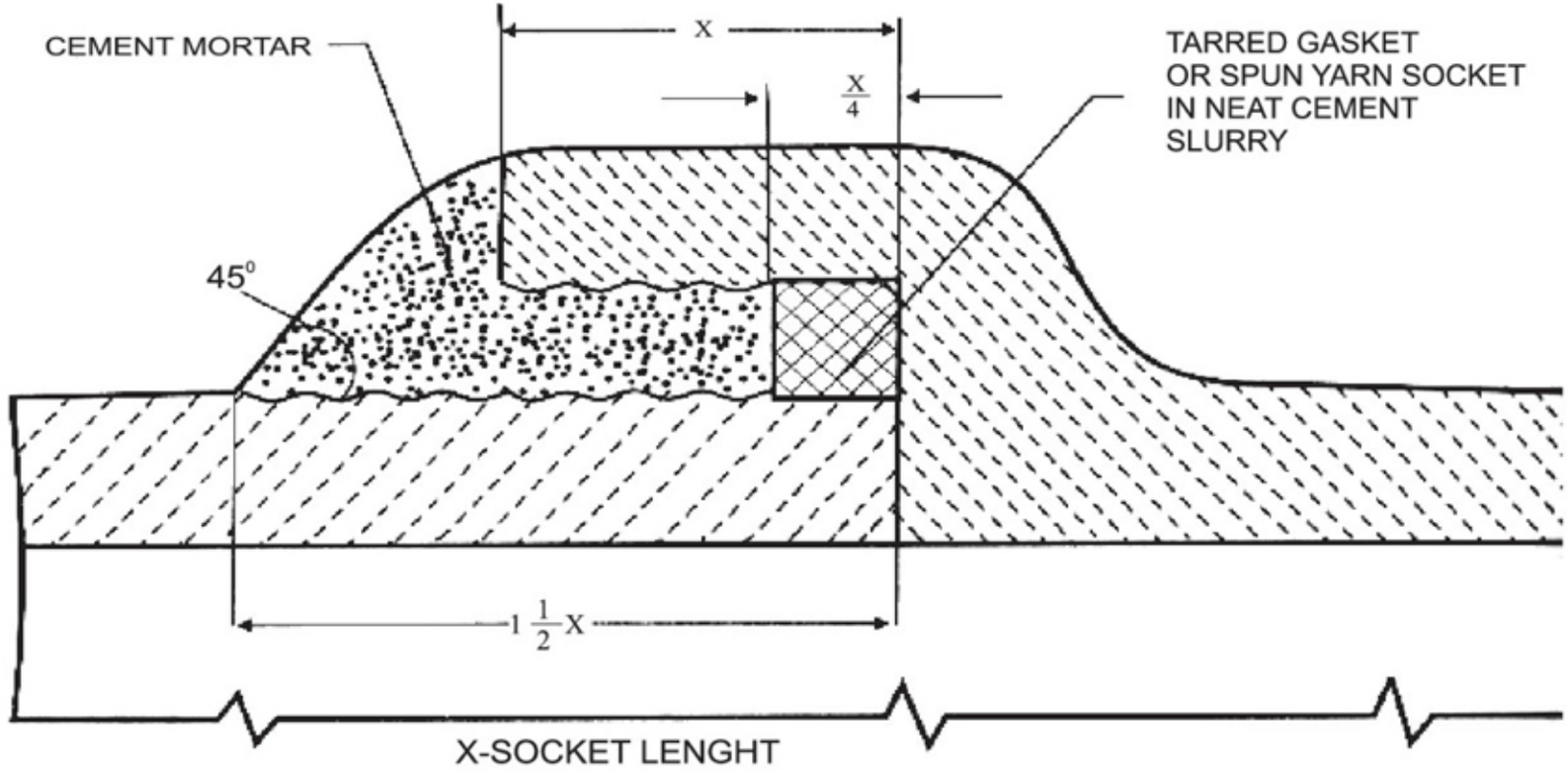
MAN HOLE 1200X800X800
FIGURE - 5



CIRCULAR TYPE MAN HOLE
FIGURE -6

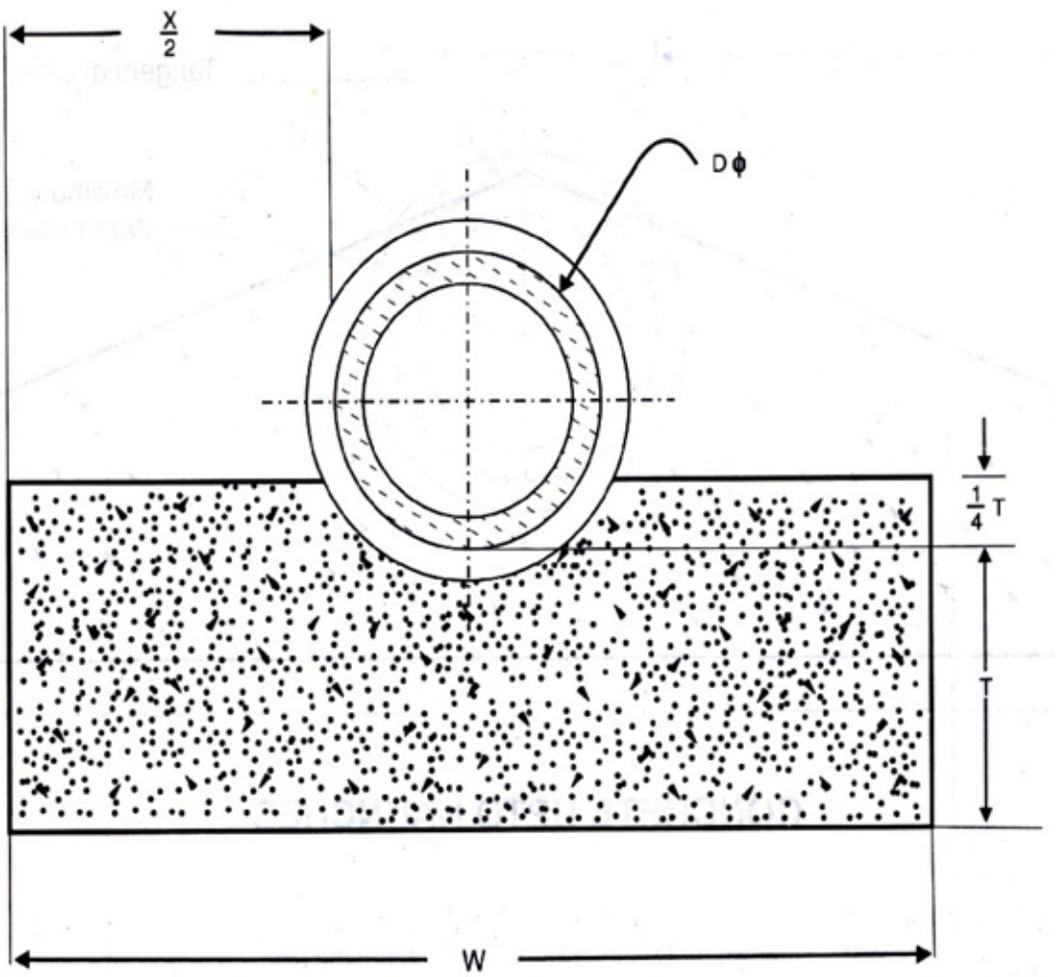


ROAD GULLEY CHAMBER
400X450X775 (VERTICAL GRATING)
FIGURE -7



TYPICAL DETAIL OF CEMENT JOINTS FOR GLAZED STONEWARE PIPES

FIGURE - 8



BEDDING

W = D+X. where D is the external diameter of the pipe.

X = 300mm upto trench depth of 1200mm

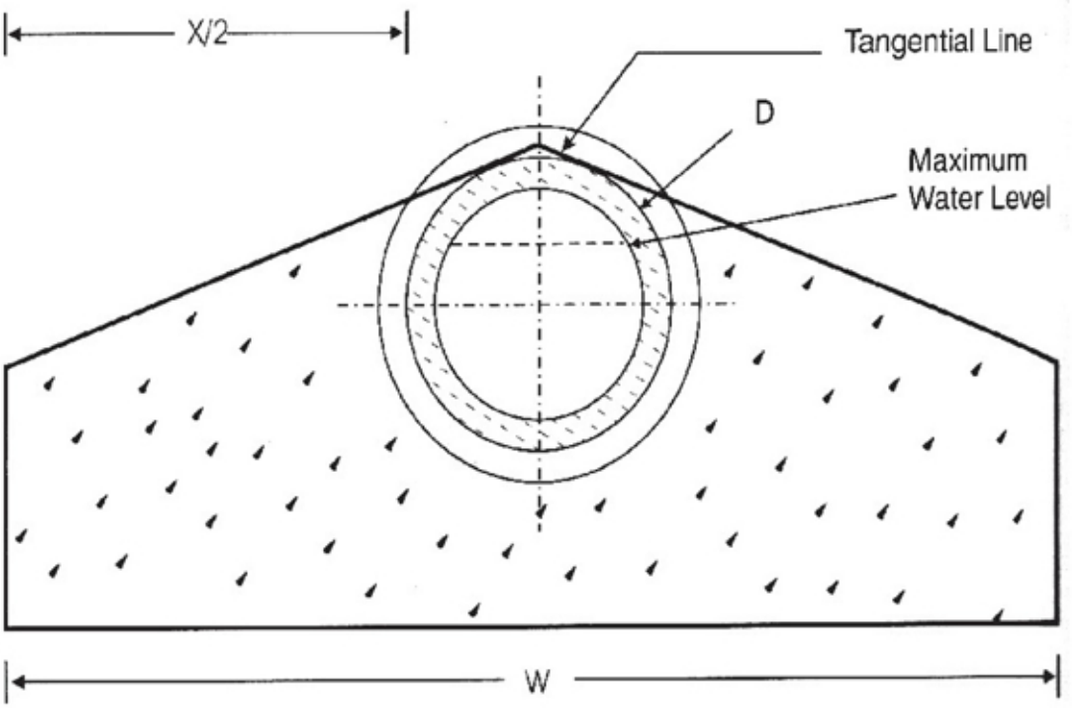
400mm for trench depth more than 1200mm

T = 100 mm for pipes under 150mm

1/4th internal dia. subject to a min. of 150mm and max.

300 mm. for pipes more than 150 mm dia.

FIGURE - 9



CONCRETE UPTO HAUNCHES

W = D+X. where D is the external diameter of the pipe.

X = 300mm upto trench depth of 1200mm

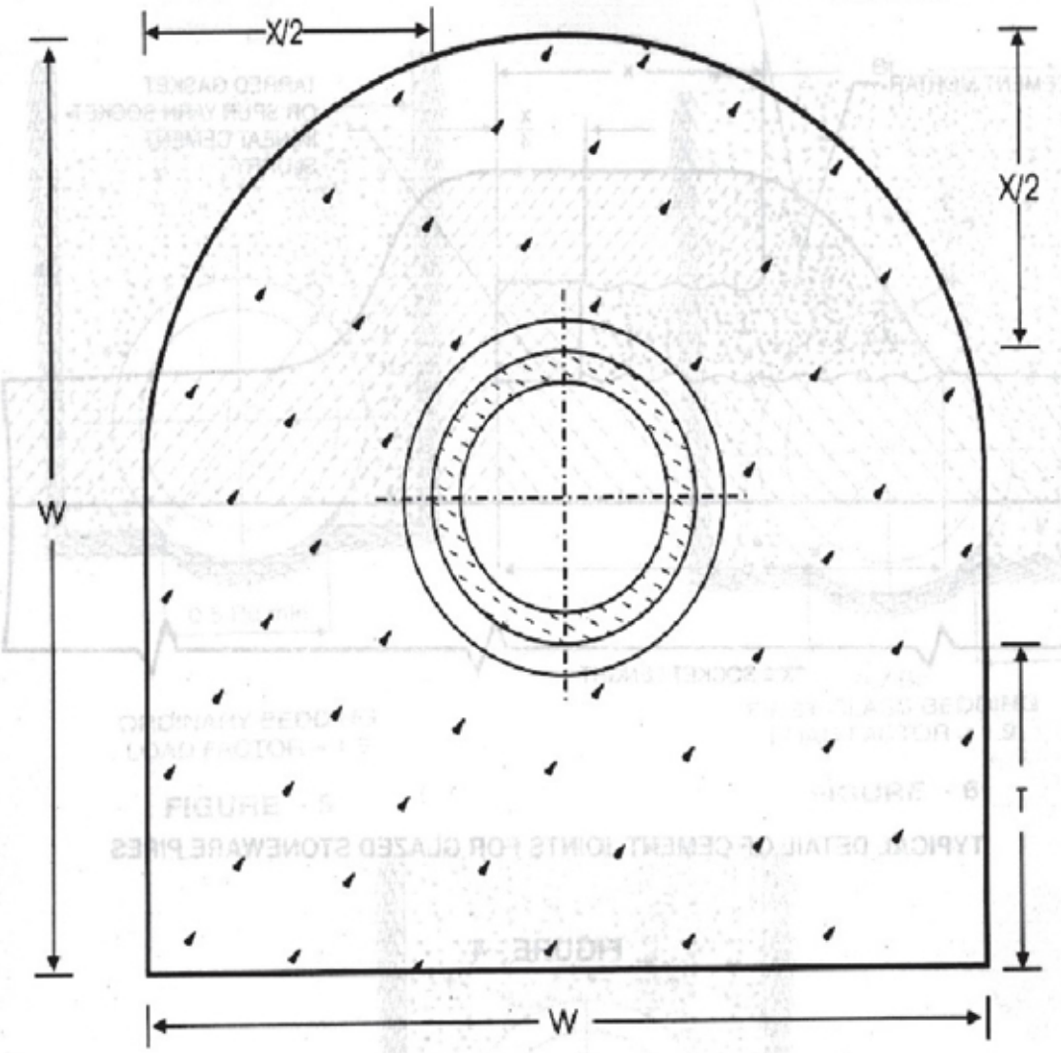
400mm for trench depth more than 1200mm

T = 100 mm for pipes under 150mm

1/4th internal dia. subject to a min. of 150mm and max.

300 mm. for pipes more than 150 dia.

FIGURE - 10



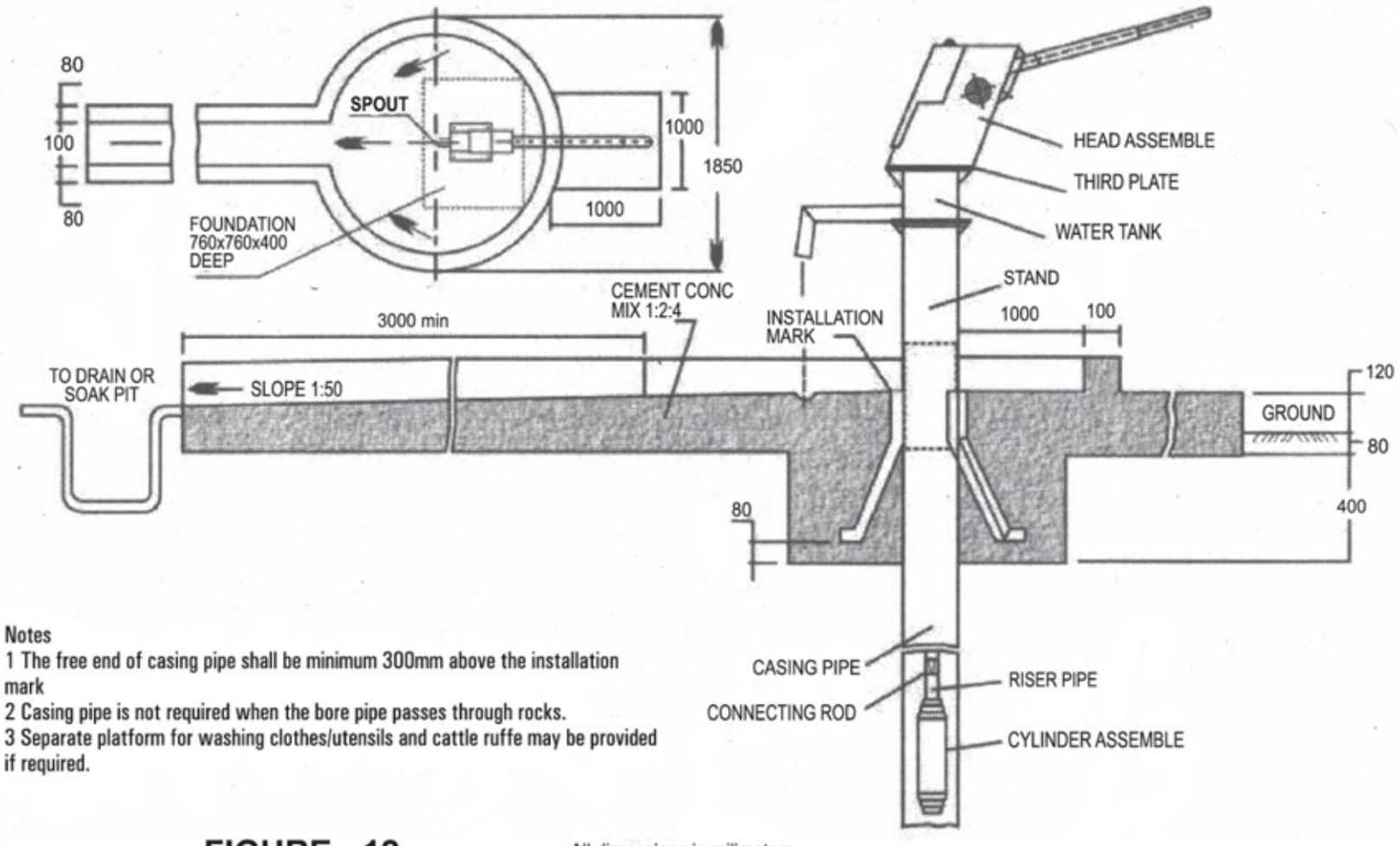
CONCRETE ALROUND

T = 100 mm for pipes under 150mm
1/4th internal dia. subject to a min. of 150mm and max. 300 mm.for pipes more than 150 dia.

W = D+X. where D is the external diameter of the pipe.

X = 300mm upto trench depth of 1200mm
400mm for trench depth more than 1200mm

FIGURE - 11

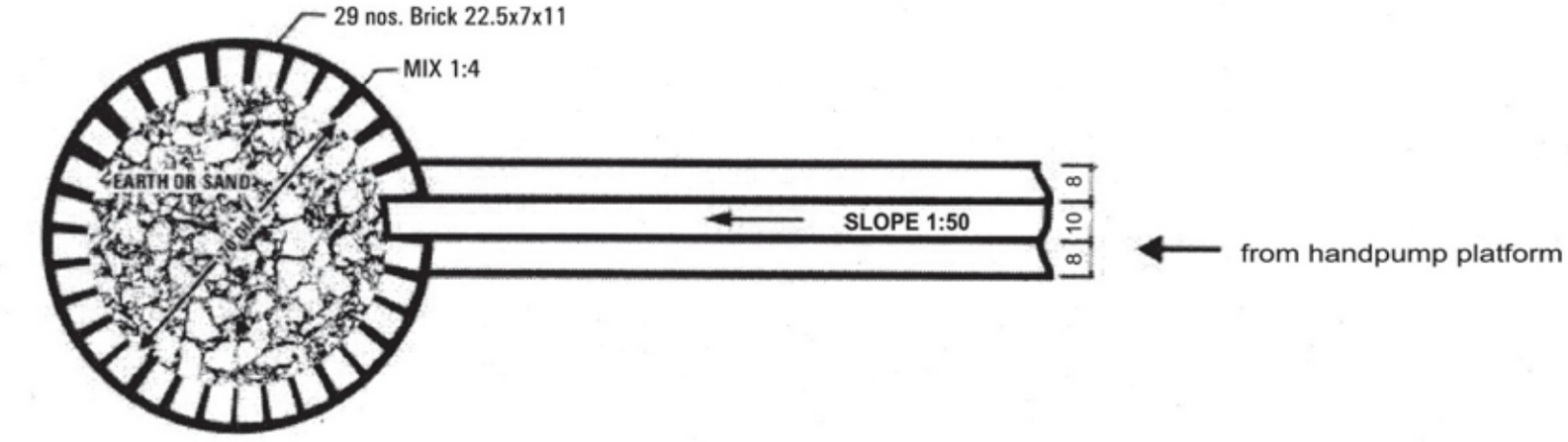


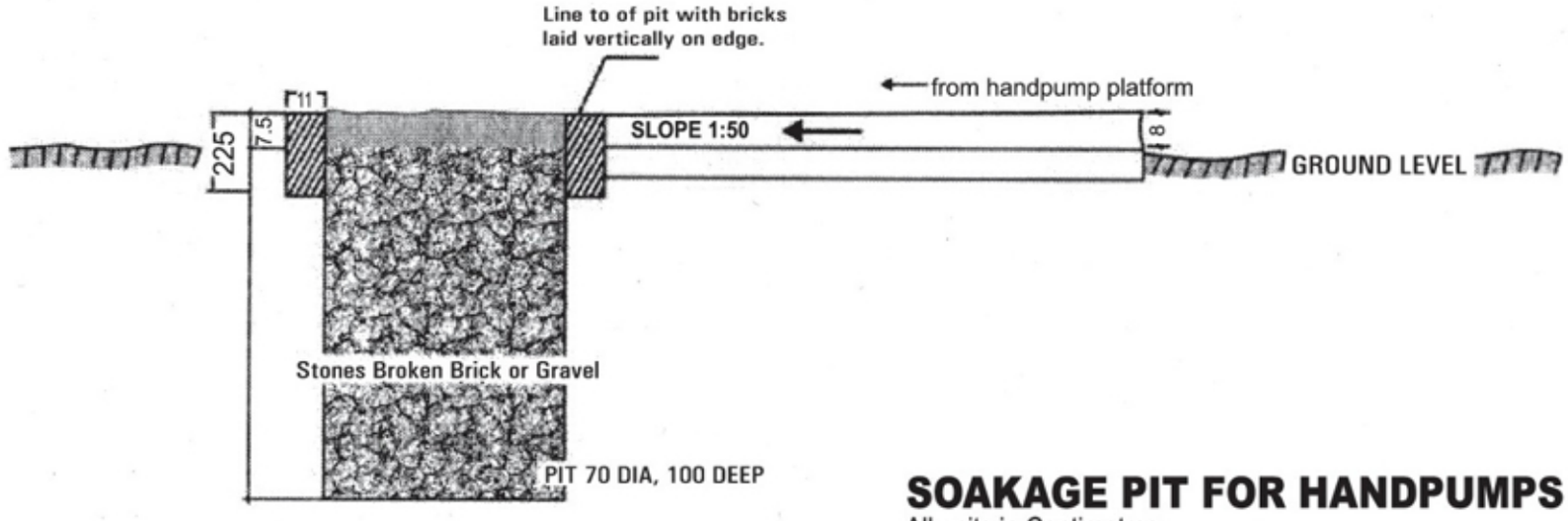
Notes
1 The free end of casing pipe shall be minimum 300mm above the installation mark
2 Casing pipe is not required when the bore pipe passes through rocks.
3 Separate platform for washing clothes/utensils and cattle ruffe may be provided if required.

FIGURE - 12

All dimensions in milimeters,

TYPICAL SET-UP FOR DEEPWELL HANDPUMP





SOAKAGE PIT FOR HANDPUMPS

All units in Centimetres

FIGURE - 13

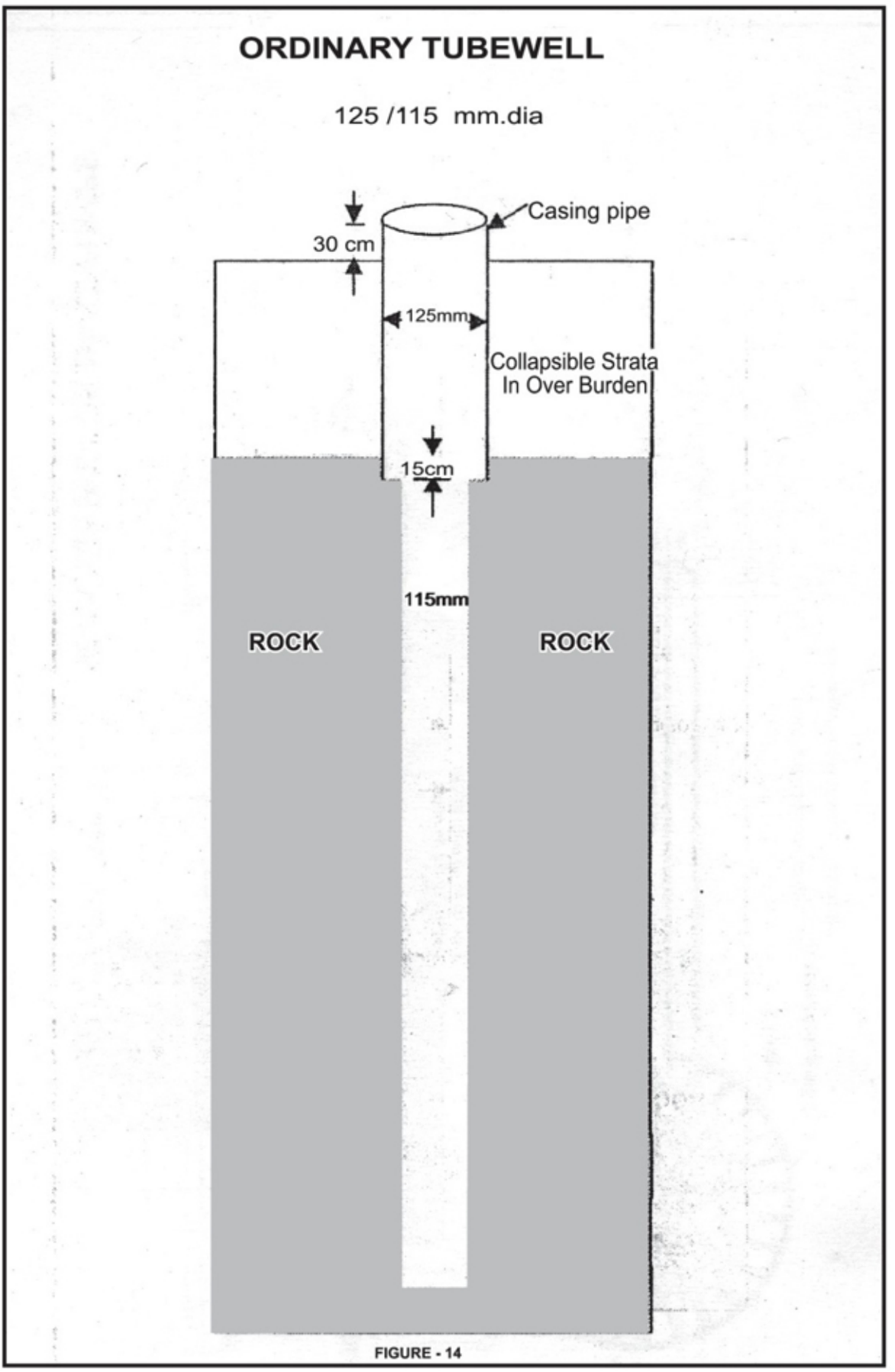

ORDINARY TUBEWELL
125 /115 mm.dia
Casing pipe
30 cm
125mm
Collapsible Strata
In Over Burden
15cm
115mm
ROCK
ROCK

FIGURE - 14

ORDINARY TUBEWELL

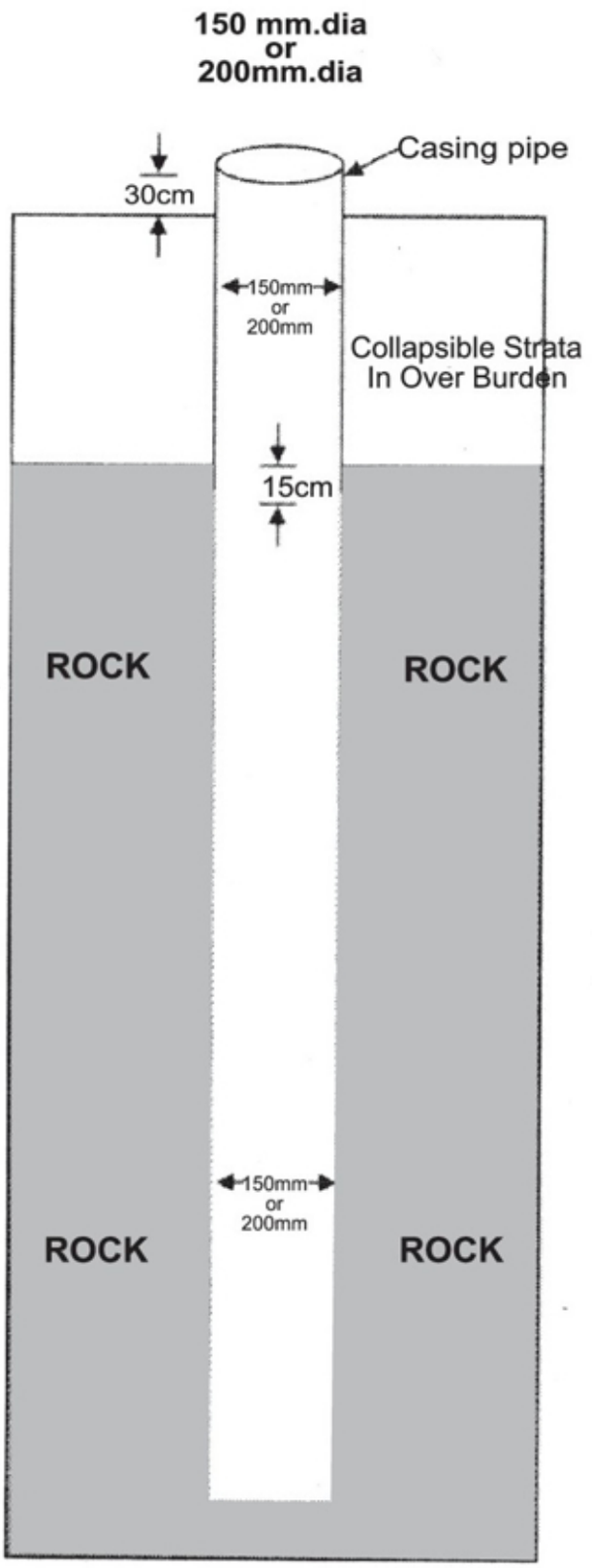


FIGURE - 15

200/150/125 mm dia. TUBEWELL

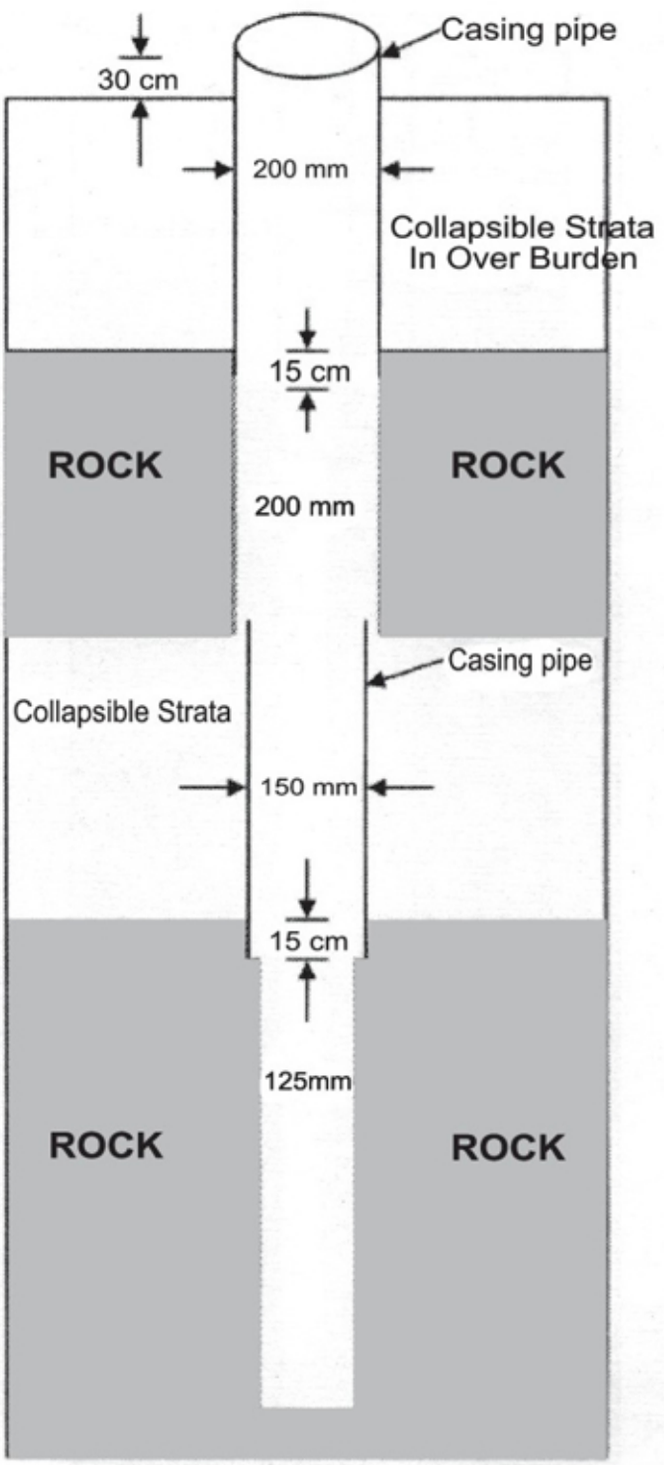


FIGURE - 16

150/125/115 mm dia. TUBEWELL

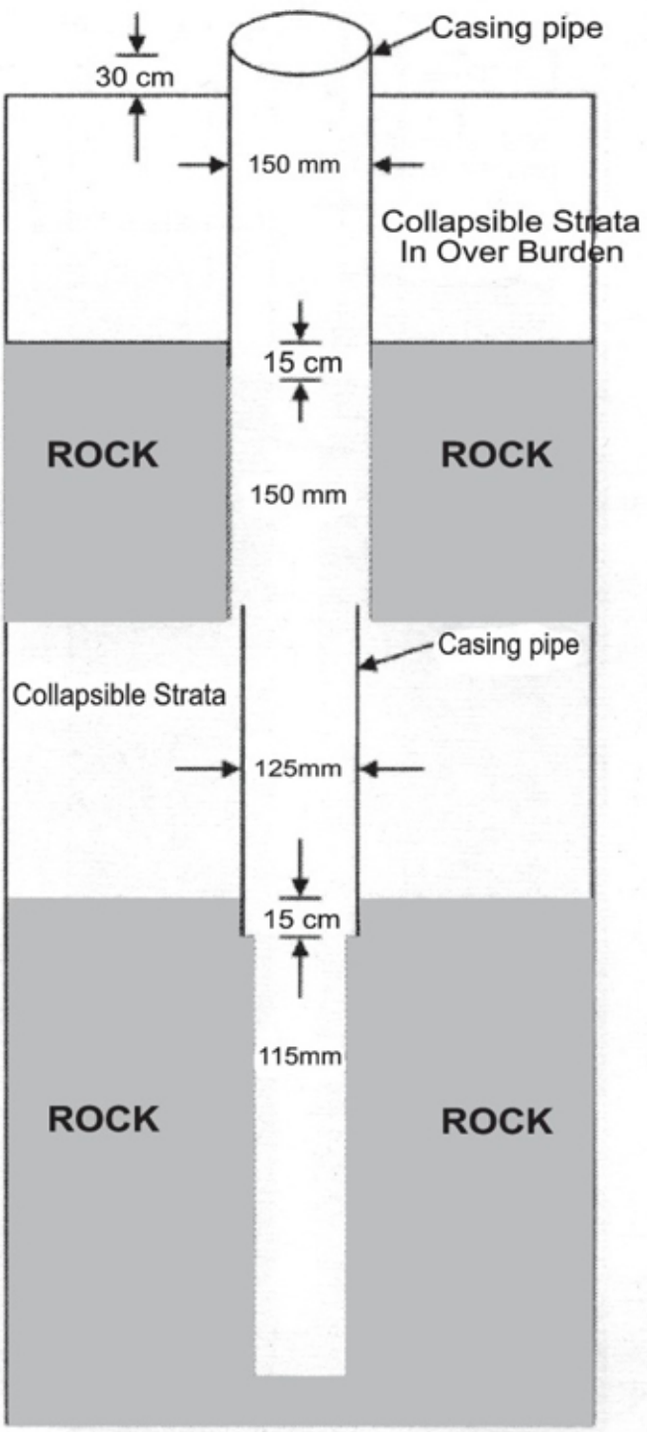


FIGURE - 17

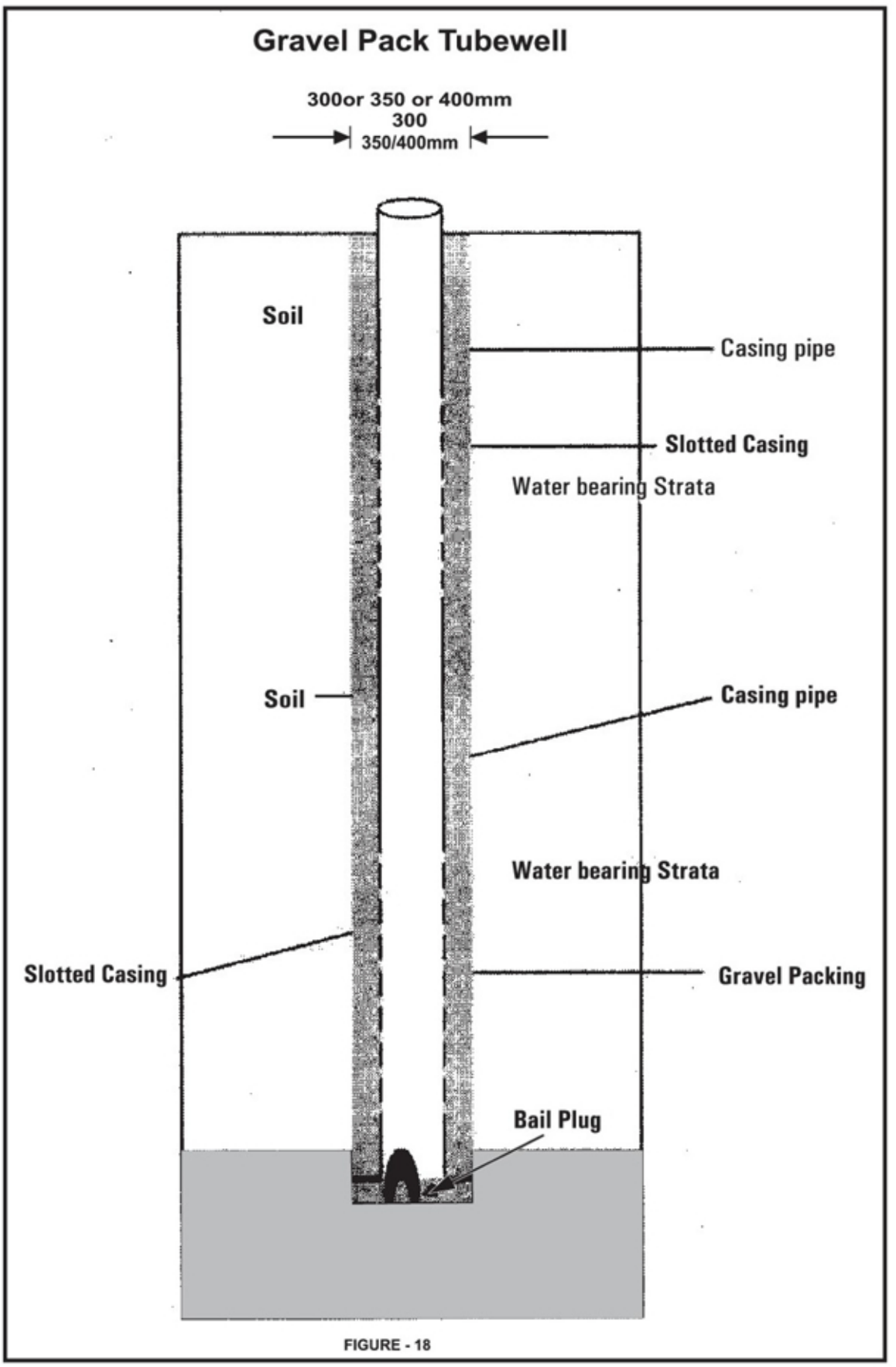
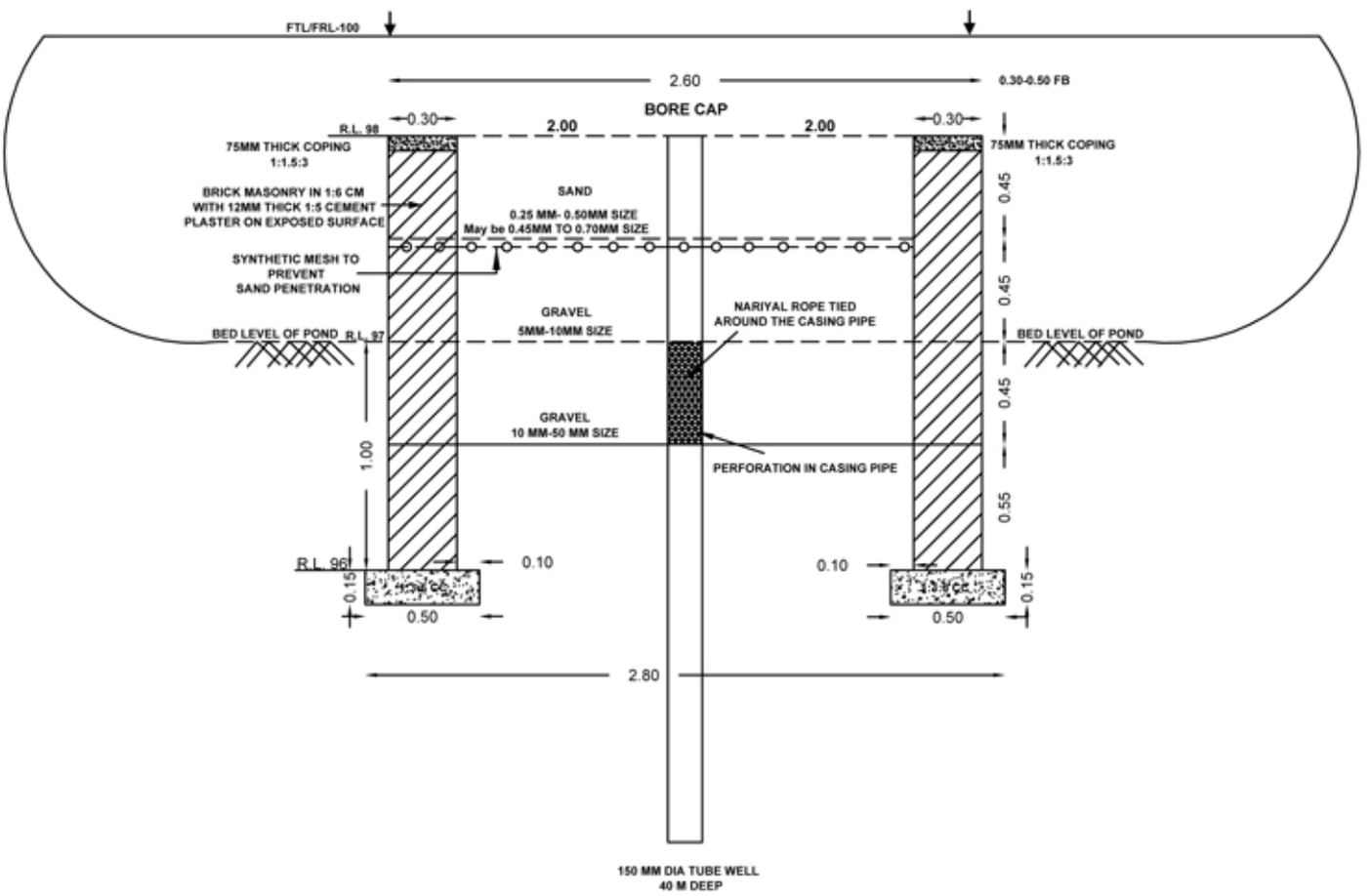

Gravel Pack Tubewell
300or 350 or 400mm
300
350/400mm
Soil
Casing pipe
Slotted Casing
Water bearing Strata
Soil
Casing pipe
Water bearing Strata
Slotted Casing
Gravel Packing
Bail Plug

FIGURE - 18

DRAWING No. 19

DRAWING FOR CONSTCURTION OF RECHARGING PIT ONLY FOR CONSTRUCTION OF RECHARGING SHAFT IN SUBMERGENCE



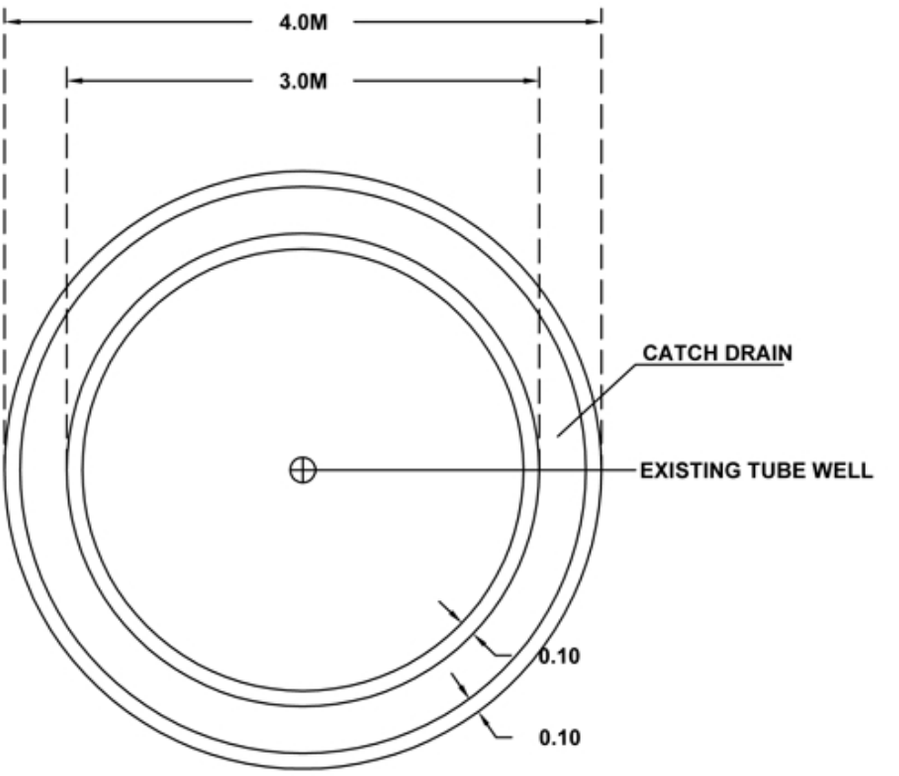
NOTE :-

1. ALL DIMENSION IN METERS
2. MINIMUM CASING IN RECHARGE SHAFT SHALL BE 9.00M OR UPTO HARD STRATA IT IS TO PREVENT ENTRY OF POLLUTED WATER IN AQUIFER
3. RECTANGULAR PITS INTERNAL SIZE = 2.00X2.00X1.35M
   NOT TO SCALE

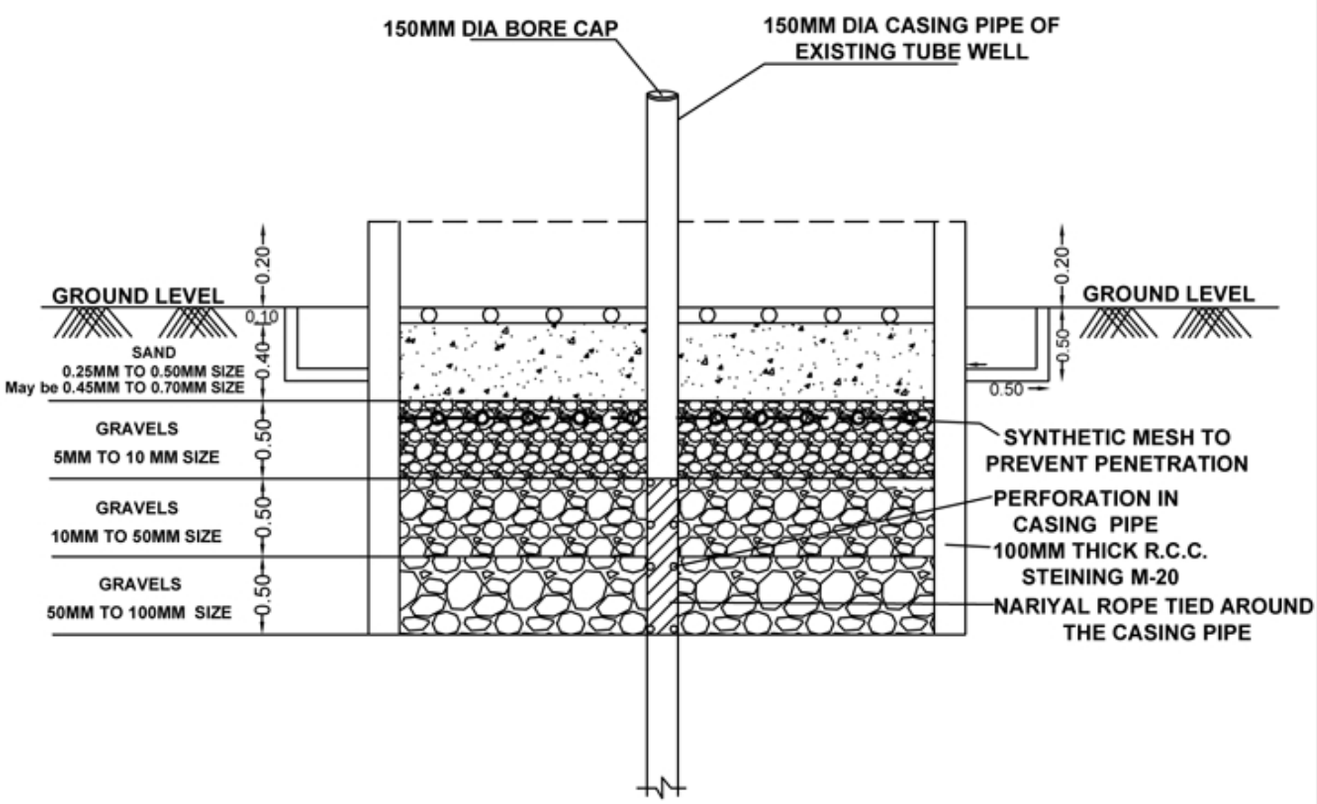
RECHARGE SHAFT WITH VERTICAL FILTER TO BE CONSTRUCTED IN THE SUBMERGENCE OF RESERVOIR

DRAWING No. 20

DRAWING FOR CONSTCURTION OF RECHARGING PIT WITH STEINING AND CATCH DRAIN AROUND TUBE WELL



PLAN



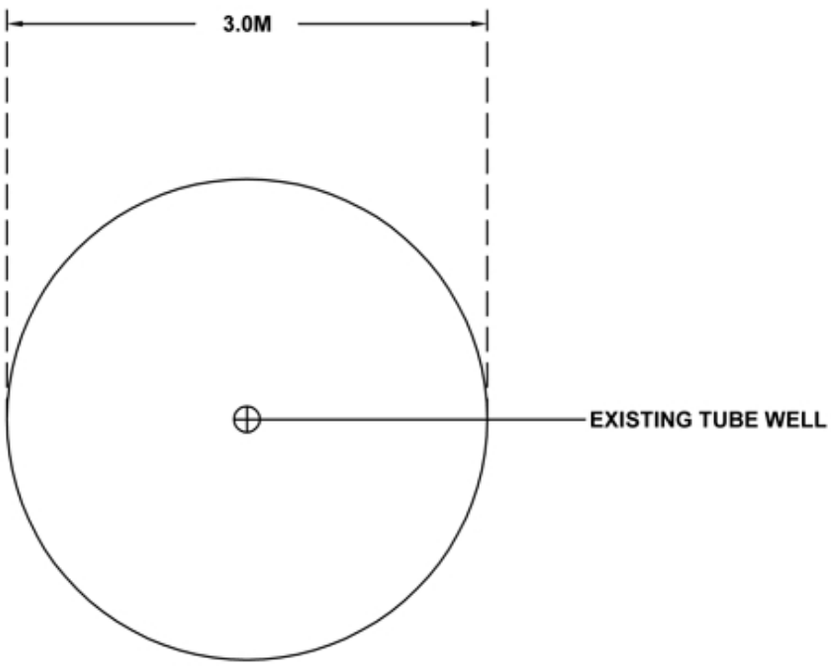
ALL DIMENSION IN METERS

SECTIONAL ELEVATION

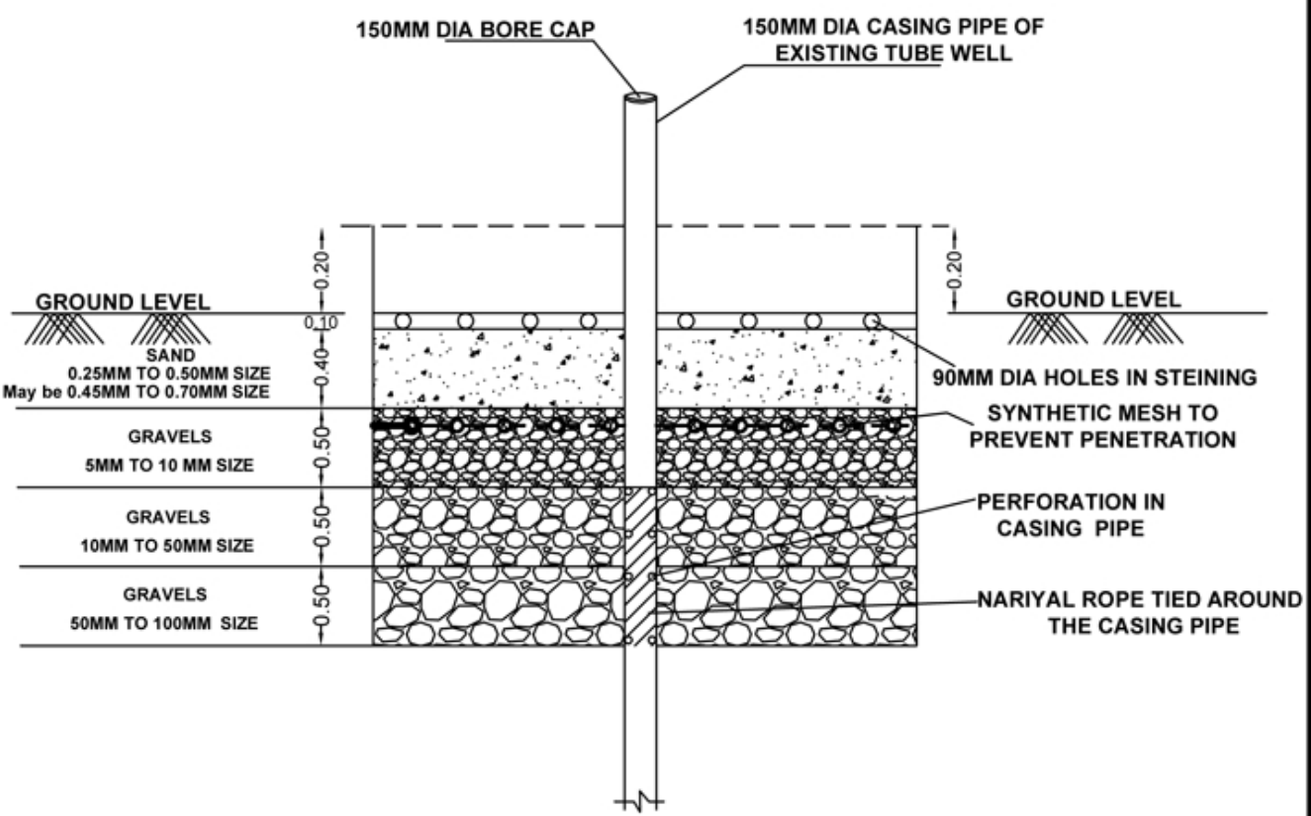
NOT TO SCALE

DRAWING No. 21

DRAWING FOR CONSTCURTION OF RECHARGING PIT AROUND TUBE WELL, IN SOFT/HARD ROCK AREA



PLAN



SECTIONAL ELEVATION

ALL DIMENSION IN METERS

NOT TO SCALE