BIHAR URBAN INFRASTRUCTURE DEVELOPMENT CORPORATION LIMITED

Volume-II

FINANCIAL BID

FOR

CONSTRUCTION OF INTERCEPTION & DIVERSION WORKS INCLUDING 3 PUMPING STATIONS, RISING MAIN, NEW TAPPINGS, TAPPINGS FOR 6 DRAINS (Thana Chowk Nala, Chakwara Sthan, Sidh Nath Ghat, Dhaurani Tola Nala, Chinta Mani Chak Ghat Nala, Mokama Ghat Nalaa) CONTROLLED WITH SCADA & CONSTRUCTION OF SEWAGE TREATMENT PLANT OF CAPACITY 8 MLD INCLUDING DISPOSAL & REUSE FACILITY WITH 2 MONTHS TRIAL, RUN, TESTING, COMMISSIONING & MAINTENANCE OF COMPLETE SYSTEM ON DESIGN BUILD OPERATE (DBOT) BASIS & THERE AFTER OPERATION & MAINTENANCE FOR 15 YEARS FOR MOKAMA TOWN, BIHAR, INDIA

(Town. Mokama)

UNDER

"NAMAMI GANGE" SCHEME

CONSTRUCTION OF INTERCEPTION & DIVERSION WORKS INCLUDING 3 PUMPING STATIONS, RISING MAIN, NEW TAPPINGS, TAPPINGS FOR 6 DRAINS (Thana Chowk Nala, Chakwara Sthan, Sidh Nath Ghat, Dhaurani Tola Nala, Chinta Mani Chak Ghat Nala, Mokama Ghat Nalaa) CONTROLLED WITH SCADA & CONSTRUCTION OF SEWAGE TREATMENT PLANT OF CAPACITY 8 MLD INCLUDING DISPOSAL & REUSE FACILITY WITH 2 MONTHS TRIAL, RUN, TESTING, COMMISSIONING & MAINTENANCE OF COMPLETE SYSTEM ON DESIGN BUILD OPERATE (DBOT) BASIS & THERE AFTER OPERATION & MAINTENANCE FOR 15 YEARS FOR MOKAMA TOWN, BIHAR, INDIA

(Town. Mokama)

ABSTRACT OF TOTAL COST

SEWAGE TREATMENT PLANT AND I & D ALLIED WORKS INCLUDING SPSs

Grand Summary

No.	Component	Price
1.	Design-Build price for STP and allied infrastructure (Schedule A)	
2	Design-Build price for I & D and allied Works including SPSs (Schedule B)	
3 A.	Total O & M Price of STP for 15 years	
3 B	NPV of Total O & M Price of STP for 15 years	
4 A.	Total O & M Price of I & D works including SPSs for 15 years	
4 B	NPV of Total O & M Price of I & D works including SPSs for 15 years	
5.	Cost of Land requirement for setting up the STP facility as indicated in the bid	
Total Price based on quoted O&M prices including price of land (1+2+3A+4A+5) = *[in figures]* *[In words]*		
Total Price based on NPV of quoted O&M prices including price of land (1+2+3B+4B+5) = *[in figures]* *[In words]*		

SCHEDULE A

Table Ab2 - Price Schedule: PART A (STP) – Design-Build Price

S.N.	Works Activity		Design-Build Price
1	CONSTRUCTING OF STP OF CAPACITY 8 MLD		
Break-up of Price of item 1 above			
1A	Civil and Structural Works (including that required for disposal an d reuse)		
1B	Installation, testing and commissioning of Electro – mechanical and Instrumentation equipment and accessories including equipments for electricity generation from solar photovoltaic arrangement.		
C	Ancillary works like, internal roads, area grading etc.		
	Total Design Build Price		
	Amount in Words		

Indicative Flow

Indicative Flow for the purpose of evaluation of bidsduring the Operations Period shall be as follows:

Year of Operations	**Indicative Sewage flow rate for STP& MPS (MLD)***
1- Year One	7.26
2- Year Two	7.31
3- Year Three	7.36
4- Year Four	7.41
5- Year Five	7.46
6- Year Six	7.51
7- Year Seven	7.56
8- Year Eight	7.61
9- Year Nine	7.66
10- Year Ten	7.72
11- Year Eleven	7.77
12- Year Twelve	7.82
13- Year Thirteen	7.87
14- Year Fourteen	7.93
15- Year Fifteen	8.00

***"Indicative flow rate** for STP" means the rate of sewage flow which is projected by the Owner to be available for treatment in the STP facility for each of the 15 years of the O & M period.

Table Ab3 - Price Schedule

PARTS B & C (STP) and Annual O&M Price and Additional O&M Price

Year of Operations	Currency INR	PART B Annual O & M Price for treatment of Threshold Sewage Flow of 7.26 MLD (Amount) (a)	PART C Annual Additional O&M Price for treatment of additional sewage flow in excess of the Threshold flow on a per MLD basis (Amount Per MLD) (b)	Total Annual O&M Price, assuming Indicative Sewage Flow reaching the STP c = a + b* x (x = indicative flow minus threshold sewage flow)	NPV factor (d) (Based on discount factor of 10% p.a.)	Value e= c*d
1					**0.909**	
2					**0.826**	
3					**0.751**	
4					**0.683**	
5					**0.621**	
6					**0.564**	
7					**0.513**	
8					**0.467**	
9					**0.424**	
10					**0.386**	
11					**0.350**	
12					**0.319**	
13					**0.290**	
14					**0.263**	
15					**0.239**	
Total O&M Price (Gross) for 15 years assuming "Indicative Sewage Flow Rate" (as per Total of Column 'c') in figures: in words: **NPV of Total O&M Price for 15 years assuming "Indicative Sewage Flow Rate"** (as per Total of Column 'e') in figures: in words:						

The area of the land that is required for the STP, roads, drains and other appurtenant reuse infrastructure in accordance ……. square meters.

Cost of Land

S. N.	Component	
1.	Area of Land Required for STP as per given Technology by Bidder …… SQM	

2.	Price of Land per square meter as per Bid Data Sheet clause 3.3 (c)	
Total Price of Land**(INR)**:		
Amount in Words:		

1.9 Part D (STP)The Electricity Consumption guaranteed by the bidder

Table Ab4 - Part D (STP) Guaranteed Electricity Consumption

Year of Operations	***Guaranteed Electricity Consumption for the year (KWh / MLD)***
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	

Notes B:

1. Bidder shall indicate the land requirement for STP, roads, drains and other appurtenant structures in Square Metres, along with calculations considering the proposed treatment process.
2. The Bidder shall provide along with the price schedule a separate table giving details of taxes, GST, duties, levies and other applicable taxes considered by him and included in the prices offered under Part A& Part B.

3. The prices quoted in each of the sub parts of the Price Schedules shall be supported by sufficient justification, financial model and support materials / calculations showing the methods and the rates assumed at arriving these numbers.

Signature of the Bidder
Name of the Bidders
Rubber stamp with Designation

Signature of the Engineer
Name of the Engineer
Designation

Date

SCHEDULE "B"

I&D & Allied works

Table Ab3, Design-Build Price of I& D with Allied works including SPSs.

S.N.	Works Activity		Design-Build Price
1	**CONSTRUCTING OF INTERCEPTION & DIVERSION WORKS INCLUDING 3 Nos PUMPING STATIONS, RISING MAIN, SEWER LINE, NEW TAPPINGS, RENOVATIONS OF OLD TAPPINGS & CLEANING OF SEWER LINE FOR Mokama & 6 OTHER DRAINS (**Thana Chowk nala, Chakwara Sthan Gravity, Sidh Nath Ghat, Dhaurani Tola Nala, Ram Ghat Nala, Chinta Mani Chak Ghat Nala, Mokama Ghat Nala **)**		
Break-up of Price of item 1 above			
1A	Civil & Electromechanical Works of I & D Works (including SPSs and Rising Main)		
	Total Design Build Price		
	Amount in Words		

Indicative Sewage Flow Rate for SPS

Year of Operations	Indicative Sewage flow rate (MLD)		
	SPS A	**SPS B**	**SPS C**
1st year	4.28	0.63	2.42
2 nd Year	4.31	0.63	2.44
3 rd year	4.33	0.64	2.45
4 th year	4.36	0.64	2.47
5 th Year	4.39	0.65	2.48
6 th year	4.42	0.65	2.50
7 th Year	4.44	0.65	2.51
8 th year	4.47	0.66	2.53
9 th year	4.50	0.66	2.55
10 th year	4.53	0.67	2.56
11th year	4.56	0.67	2.58
12th year	4.59	0.68	2.59
13th year	4.62	0.68	2.61
14th year	4.64	0.68	2.63
15th year	4.67	0.69	2.64

Indicative Sewage flow rate for SPS means the rate of sewage flow which is projected by the Owner to be available for handling in the SPS for each of the 15 years of the O&M period.

O&M Price for Operation and Maintenance of the Sewerage Network and Sewage Pumping Stations in each of the 15 years of the Operations Period as provided in the table below

Overall O&M Prices for Sewerage Network including Rising Mains and SPSs etc

Table 5

Year of Operations	**Annual Operation and Maintenance Price for Sewerage Network including Rising Main and SPSs**[1]		**NPV Factor** (Based on discount factor of 10% p.a.)	**NPV of O&M Price** *Col 5* **= Col 2 * Col 4**
	In Figures	**In words**		
(1)	(2)	(3)	(4)	(5)
1			0.909	
2			0.826	
3			0.751	
4			0.683	
5			0.621	
6			0.564	
7			0.513	
8			0.467	
9			0.424	
10			0.386	
11			0.350	
12			0.319	
13			0.290	
14			0.263	
15			0.239	
NPV of Total O&M Price for 15 years				

Figures in Table 3 are derived from Figures in Table 4

Note:

1. . The bidder shall furnish break-up of the O&M prices as under for each year along with the respective calculation sheets in support of the Part B (lump-sum) prices quoted in the Table above.
   [i] O&M charges for as applicable for each size of sewerage lineseparately on per Km basis;
   [ii] O&M charges for the each set of pumping stations; and
   [iii] O& M charges for other assets, if any.
2. . The break-up of charges quoted by the bidder (Operator) shall be basis for determining the variation in the O&M payments for any period during which the scope of O&M services of the Operator is varied by the Owner owing to variation in the lengths of sewerage lines and number of pumping stations to be operated and

[1]Bidder may quote in more than one currency in accordance with ITB 3.12.

maintained during the contract term, (Please refer Article 2 of Schedule 6 to the contract relating to Terms and procedure of Payment.)

3. The Bidder shall provide along with the price schedule a separate table giving details of taxes, duties, levies and other applicable taxes considered by him and included in the prices offered under Part A & Part B.Service Tax shall not be included in the prices and the same shall be paid separately by the Owner, if applicable, against proof of applicability and payment.

PART C – Guaranteed Electricity Consumption for SPS

Table 7 A

The Electricity Consumption guaranteed by the bidder shall be as under:
For SPS A

Year of Operations	***Guaranteed Annual Energy Consumptionfor Sewage flow rate (KWh / MLD of Sewage pumped over the year)***
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	

Table 7 B

The Electricity Consumption guaranteed by the bidder shall be as under:
For SPS B

Year of Operations	***Guaranteed Annual Energy Consumption for Sewage flow rate (KWh / MLD of Sewage pumped over the year)***
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	

Table 7 C

The Electricity Consumption guaranteed by the bidder shall be as under:
For SPS C

Year of Operations	***Guaranteed Annual Energy Consumption for Sewage flow rate (KWh / MLD of Sewage pumped over the year)***
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	

Summary of O & M Price

Table 8

Year			**Quoted Bid Price for 15 Years O&M**		
	Sewer network & rising mains	SPS A	SPS B	SPS C	Total Price (2+3+4+5)
1	2	3	4	5	6
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
Total					

2.0 I&D: Ramghat Nallah

Item Description	Quantity	Total Amount
Drain construction Cost	Detailes are attached	
Outfall Structure cost	Detailes are attached	
Generator Room Cost	Detailes are attached	
Operator Quarter Cost	Detailes are attached	
Elctrical Component Cost	Detailes are attached	
DG Cost	Detailes are attached	
Rising Main Cost	Detailes are attached	
Pump and screen cost	Detailes are attached	
Total Cost, Rs		

2.1: Drain Construction Cost																				
												Existing Drain Size				Proposed Drain Size			
Sl. No.	Name of Drains/ Nallah falling in Ganga River	Length of Drain (m) to be constructed	Velocity (m/sec)	Distance (m)	Flow (m3/sec)	Width	Depth	Area	Effective flow area	Flow	Flow (MLD)	Width	Height			Width	Height	I&D	Remark
1	Thana Chowk nala	100	0.12	100	0.015	0.50	1.00	0.5	10%	0.00615	0.53	0.50	1.00			1.00	1.00	Gravity/Diversion	Ram Ghat
2	Chakwara Sthan	400	0.11	100	0.014	1.00	1.50	1.5	10%	0.016611	1.44	1.00	1.50			1.50	1.50	Gravity/Diversion	Ram Ghat
3	Sidh Nath Ghat Dhaurani Tola Nala	150	0.12	100	0.002	1.00	1.50	1.5	10%	0.018657	1.61	1.00	1.50			1.50	1.50	Gravity/Diversion	Ram Ghat
4	Ram Ghat Nala	100	0.09	100	0.002	1.00	1.50	1.5	10%	0.013	1.12	1.00	1.50			1.50	1.50	Pumping	TO STP
Total Cost, Rs																Drain construction cost including diversion			

Note: Design for diversion will be workout as per site condition, additional length of drain is to be included in diversion.

2.2 STORM DRAIN OUTFALL STRUCTURE - BOQ

	SIZE OF DRAIN AT OUTFALL	**(Width)**	**1.0**	**Mtr**	
S.No.	**Prticular of items**			**Unit**	**Quantity**
1	Earth work excavation in foundation trenches or drains including dressing of sides and ramming of bottoms, lift as follows, including getting out the excavated soil and disposal of surplus excavated soil as directed, with all lead and lift complete as per the specification and as directed by the Engineer			Cum	15.88
	In all types soils				15.60
	Depth upto 1.5 m				2.25
					33.73
	1.5 m to 3.0 m				43.40
2	Sand filling upto 300mm in Plinth including watering and compacting in layers of 150 mm thick as per specifications and as directed by the Engineer.			Cum	3.18
					3.12
					0.45
					6.75
3	Providing and laying in position cement concrete of specified grade excluding the cost of centring and shuttering - all work upto plinth level in 1:3:6 (1 Cement : 3 coarse sand : 6 granded stone)			Cum	4.07
					4.00
					0.08
					8.15
4	Providing and laying in position machine batched, machine mixed, and machine vibrated design mix cement concrete of specified grade for reinforced cement concrete structural elements, excluding the cost of centering, shuttering, finishing and reinforcement, M-20 grade reinforced cement concrete.			Cum	6.11
					6.00
					6.00
					0.11
					8.14
					3.00
					29.36
5	Centring and Shuttering including strutting, propping etc. and removal of form for vertical walls			Sqm	81.42
					20.00
					101.42
6	Reinforcement for R. C. C work including straightening, cutting, bending, placing in position and binding all complete. Thermo - Mechanically Treated bars TMTC - 500 (Quantity at 90 kg/cum)			Kg	2642.40
					2642.40
7	Carriage of the following materials from quarry to work site including loading, unloading and staking at work site as per specification & direction of E/I.			Aggregate	
				Coarse Sand	
				Local Sand	
				Cement	
				Steel	**2.64**
8	Fabrication & supply of water tight structuraal steel sliding type low head gate for dam head sluice and canals with gate leaf and frame as per IS 5620 complete with brass / stainless steel lining of appropriate size for seal seats and sill and seals seat				240
8.1	For roof slab			Sqm	20
8.2	Weather shade,Chajjas, corbels etc. including edges			Sqm	1.2
9	Reinforcement for R. C. C work including straightening, cutting, bending, placing in position and binding all complete. Thermo - Mechanically Treated bars				10
	Steel quantities			kg	900.00
10	Brick work with bricks of class designation 100A in foundations and plinth in Extra for Brick work in superstructure above plinth level upto floor V cum			Cum	6.21
11	12 mm Cement plaster in course sand in 1:3 (1 cement : 3 coarse sand) (for Internal walls)			Sqm	27
12	12 mm Cement plaster in course sand in 1:3 (1 cement : 3 coarse sand) (for ceiling)				20
13	20 mm Cement plaster in course sand in 1:3 (1 cement : 3 coarse sand) (for External walls)			Sqm	27.9
14	Wall painting with plastic emulsion paint of approved brand and manufacture to give an even shade : Two or more coats on new work (for Internal walls)			Sqm	27
15	Wall painting with plastic emulsion paint of approved brand and manufacture to give an even shade : Two or more coats on new work (for ceiling)			Sqm	20
16	Appying one coat of cement primer of approved brand and manufacture on wall surface (for External walls)			Sqm	27.9
17	Providing wood work in frames of door, window clerestory windows and other frames, wrought framed and fixed in position in local wood for Door			Cum	0.5
18	Providing and fixing paneled or paneled and glazed shutters for doors, windows and clerestory windows including black enameled MS butt hinges with necessary screws excluding panelling which will be paid for separately - 30 mm thick				
	For Doors			Sqm	1.8
19	Providing and fixing glazing in aluminium door, window V shutters and partition etc with PVC / neoprene gasket etc. complete as per the architectural drawings and the directions of Engineer incharge. (Cost of aluminium snap bading shall be paid in basic item). With glass pans of 5.50 mm thickness (Weight not less than 13.75 kg/sqm)			Sqm	0.5
20	Providing and laying Ceramic glazed floor tiles (400x400) mm (thickness to be specified by the manufacturer) of 1st quality conforming to IS:13755 of NITCO, ORIENT, SOMANY, KAJARIA or equivalent make in colours such as White, Ivory, Grey, Fume, Red, Brown, laid on 20 mm thick cement mortar 1:4 (1 cement : 4 coarse sand) including grouting the joints with white cement and matching pigments etc, complete.			Sqm	20

2.2.1: Cost Estimate for Outfall Structures					
Sl no.	**Description of Item**	**Unit**	**Quantity**	**Rate**	**Amount**
1	Earth work excavation in foundation trenches or drains including dressing of sides and ramming of bottoms, lift as follows, including getting out the excavated soil and disposal of surplus excavated soil as directed, with all lead and lift complete as per the specification and as directed by the Engineer. All kinds of soils				
1.1.1	Upto1.50m depth	cum	33.73		
	1.5 m to 3 m	cum	43.40		
2	Sand filling upto 300mm in Plinth including watering and compacting in layers of 150 mm thick as per specifications and as directed by the Engineer.	cum	6.75		
3	Providing and laying in position cement concrete of specified grade excluding the cost of centring and shuttering - all work upto plinth level in 1:3:6 (1 Cement : 3 coarse sand : 6 granded stone)	Cum	8.15		
4	Providing and laying in position machine batched, machine mixed, and machine vibrated design mix cement concrete of specified grade for reinforced cement concrete structural elements, excluding the cost of centering, shuttering, finishing and reinforcement, M-20 grade reinforced cement concrete.	Cum	29.36		
5	Centring and Shuttering including strutting, propping etc. and removal of form for vertical walls	sqm	101.42		
6	Reinforcement for R. C. C work including straightening, cutting, bending, placing in position and binding all complete. Thermo - Mechanically Treated bars TMTC - 500 (Quantity at 90 kg/cum)	Kg	2642.40		
7	Carriage of the following materials from quarry to work site including loading, unloading and staking at work site as per specification & direction of E/I.				
	Aggregate	Cum	56.52		
	Sand	Cum	28.26		
	Cement	MT	25.20		
	Steel	MT	2.6424		
8	Wrought iron and mild steel welded work (using angles, square bars, tees and channel grills, grating frames, gates and tree guards of any size and design etc. including cost of screens and welding rods or bolts and nuts complete fixed in position but without the cost of excavation and concrete for fixing which will be paid separately	Kg	240.00		
	Erection of gates (a) 30% item NO- 8		240.00		
8.0	Centring and Shuttering including strutting, propping etc. and removal of form for Roof slab				
8.1	For roof slab	Sqm	20.00		
8.2	Weather shade,Chajjas, corbels etc. including edges	Sqm	1.20		
9.0	Reinforcement for R. C. C work including straightening, cutting, bending, placing in position and binding all complete. Thermo - Mechanically Treated bars		10.00		
	Steel quantities	kg	900.00		
10.0	Brick work with bricks of class designation 100A in foundations and plinth in :Extra for Brick work in superstructure above plinth level upto floor V cum	Cum	6.21		
11.0	12 mm Cement plaster in course sand in 1:3 (1 cement : 3 coarse sand) **(for Internal walls)**	Sqm	27.00		

Sl no.	Description of Item	Unit	Quantity	Rate	Amount
12.0	12 mm Cement plaster in course sand in 1:3 (1 cement : 3 coarse sand) **(for ceiling)**		20.00		
13.0	20 mm Cement plaster in course sand in 1:3 (1 cement : 3 coarse sand) **(for External walls)**	Sqm	27.90		
14.0	Wall painting with plastic emulsion paint of approved brand and manufacture to give an even shade : Two or more coats on new work **(for Internal walls)**	Sqm	27.00		
15.0	Wall painting with plastic emulsion paint of approved brand and manufacture to give an even shade : Two or more coats on new work **(for ceiling)**	Sqm	27.00		
16.0	Appying one coat of cement primer of approved brand and manufacture on wall surface **(for External walls)**	Sqm	20.00		
17.0	Providing wood work in frames of door, window clerestory windows and other frames, wrought framed and fixed in position in local wood for Door	Cum	27.90		
18.0	Providing and fixing paneled or paneled and glazed shutters for doors, windows and clerestory windows including black enameled MS butt hinges with necessary screws excluding panelling which will be paid for separately - 30 mm thick		0.50		
	For Doors	Sqm	1.80		
19.0	Providing and fixing glazing in aluminium door, window V shutters and partition etc with PVC / neoprene gasket etc. complete as per the architectural drawings and the directions of Engineer incharge. (Cost of aluminium snap bading shall be paid in basic item). With glass pans of 5.50 mm thickness (Weight not less than 13.75 kg/sqm)	Sqm	0.50		
20.0	Providing and laying Ceramic glazed floor tiles (400x400) mm (thickness to be specified by the manufacturer) of 1st quality conforming to IS:13755 of NITCO, ORIENT, SOMANY, KAJARIA or equivalent make in colours such as White, Ivory, Grey, Fume, Red, Brown, laid on 20 mm thick cement mortar 1:4 (1 cement : 4 coarse sand) including grouting the joints with white cement and matching pigments etc, complete.	Sqm	20.00		
Total Cost, Rs					

2.2.2: DETAILS OF MEASUREMENT (Carriage Items)						
S.No.	Particulars of item	Unit	Quantity	Cement (Kg)	Sand (Cum)	Aggregate (Cum)
1	RCC (1:1.5:3)	Cum	59.36	23447.20	24.58	49.15
2	PCC (1:3:6)	Cum	8.15	1752.25	3.68	7.37
Total				**25199**	**28.26**	**56.52**

2.3 Cost estimate of Generator Room					
Sl. No.	Item description	Unit	Quantity	Rate (INR)	Amount (INR)
	Earth work				
1.0	Earthwork in excavation in foundation trenches or drains (not exceeding 1.5 m width or 10 sqm on plan) including dressing of sides and ramming of bottoms, lift upto 1.5 m including getting out the excavated soil and disposals of surplus excavated soil as directed, within a lead of 50 m. (For all kinds of soil)				
1.1	From 0 m to 1.5 m	Cum	22.54		
1.2	From 1.5 m to 3 m	Cum	1.35		
2.0	Supplying and Filling on plinth with local sand and under floors including watering, ramming consolidating and dressing complete. For Generater room	Cum	7.20		
3.0	Providing and laying in position cement concrete of specified grade excluding the cost of centring and shuttering - all work upto plinth level in 1:3:6 (1 Cement : 3 coarse sand : 6 granded stone upto 20 mm nominal size)	Cum	7.33		
4.0	Providing and laying in position machine batched, machine mixed, and machine vibrated design mix cement concrete of specified grade for reinforced cement concrete structural elements, excluding the cost of centering, shuttering, finishing and reinforcement, M-20 grade reinforced cement concrete.				
4.1	For Footings	Cum	1.44		
4.2	Column below GL up to Plinth	Cum	0.26		
4.3	Plinth beams	Cum	1.61		
4.4	For columns above Ground levels	Cum	0.87		
4.5	Lintel beams	Cum	1.43		
4.6	Roof Beams	Cum	1.33		
4.7	For roof slab	Cum	4.32		
4.8	For Sunshades over Door & Windows :	Cum	0.23		
5.0	Centring and Shuttering including strutting, propping etc. and removal of form for				
5.1	For footing - F	Sqm	4.80		
5.2	Column upto GL - C	Sqm	4.60		
5.3	Plinth beams :	Sqm	14.00		
6.0	Centring and Shuttering including strutting, propping etc. and removal of form for	Sqm			
6.1	Lintel beams	Sqm	12.40		
6.2	Roof beams	Sqm	12.40		
7.0	Centring and Shuttering including strutting, propping etc. and removal of form for				
	Column	Sqm	15.09		
8.0	Centring and Shuttering including strutting, propping etc. and removal of form for Roof slab				
8.1	For roof slab	Sqm	24.00		
8.2	Weather shade,Chajjas, corbels etc. including edges	Sqm	4.13		
9.0	Reinforcement for R. C. C work including straightening, cutting, bending, placing in position and binding all complete. Thermo - Mechanically Treated bars				
	steel quantities	MT	1.34		
10.0	Brick work with bricks of class designation 100A in foundations and plinth in :Extra for Brick work in superstructure above plinth level upto floor V cum	Cum	17.53		
11.0	12 mm Cement plaster in course sand in 1:3 (1 cement : 3 coarse sand) **(for Internal walls)**	Sqm	64.48		
12.0	12 mm Cement plaster in course sand in 1:3 (1 cement : 3 coarse sand) **(for ceiling)**				
	Generator room	Sqm	24.00		

13.0	20 mm Cement plaster in course sand in 1:3 (1 cement : 3 coarse sand) **(for External walls**)	Sqm	89.54		
14.0	Wall painting with plastic emulsion paint of approved brand and manufacture to give an even shade : Two or more coats on new work **(for Internal walls)**	Sqm	64.48		
15.0	Wall painting with plastic emulsion paint of approved brand and manufacture to give an even shade : Two or more coats on new work **(for ceiling)**	Sqm	24.00		
16.0	Appying one coat of cement primer of approved brand and manufacture on wall surface **(for External walls)**	Sqm	89.54		
17.0	Providing wood work in frames of door, window clerestory windows and other frames, wrought framed and fixed in position in local wood for Door	Cum	0.16		
18.0	Providing and fixing paneled or paneled and glazed shutters for doors, windows and clerestory windows including black enameled MS butt hinges with necessary screws excluding panelling which will be paid for separately - 30 mm thick				
	For Doors	Sqm	4.20		
19.0	Providing and fixing glazing in aluminium door, window V shutters and partition etc with PVC / neoprene gasket etc. complete as per the architectural drawings and the directions of Engineer incharge. (Cost of aluminium snap bading shall be paid in basic item). With glass pans of 5.50 mm thickness (Weight not less than 13.75 kg/sqm)	Sqm	4.32		
20.0	Providing and laying Ceramic glazed floor tiles (400x400) mm (thickness to be specified by the manufacturer) of 1st quality conforming to IS:13755 of NITCO, ORIENT, SOMANY, KAJARIA or equivalent make in colours such as White, Ivory, Grey, Fume, Red, Brown, laid on 20 mm thick cement mortar 1:4 (1 cement : 4 coarse sand) including grouting the joints with white cement and matching pigments etc, complete.				
	Generater room	Sqm	24.00		
21.0	Cement plaster skirting (upto 30 cm height) with cement mortar 1:3 (1 cement : 3 coarse sand) finished with a floating coat of neat cement. **18 mm thick**	Sqm	2.70		
22.0	Providing and laying in situ five course water proofing treatment with glass fibre tissue reinforced bitumen over roof consisting of first coat of bitumen primer @ 0.40 kg per sqm, 2nd and 4th courses of bonding material 1.60 kg per sqm which shall consist of blown type bitumen of grade 85/25 conforming to IS : 702, third layer of glass fibre tissue course as specified, fifth, the top most layer of stone grit 6 mm and down size or pea-seized gravel sprad @ 6 dm^3 per sqm including preparation of surface excluding grading for slope etc. compete.	Sqm	24.00		
23.0	Providing and fixing on wall face unplastidsed-PVC (working pressure 4 kgf per sqm) rain water pipes conforming to IS :4985 including jointing with seal ring conforming to IS: 5382 leaving 10 mm gap for thermal expansion. **110 mm diameter**	m	13.50		
24.0	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20 cm in depth : consolidating each deposited layer by ramming and wateing lead.	Cum	14.86		
25.0	**Carriage of Materials :**				
	Aggregate	Cum	16.66		
	Coarse Sand	Cum	31.07		
	Local Sand	Cum	7.20		
	Cement	MT	6.01		
	Steel	MT	0.14		
	Brick (1000 Nos)		8.59		
	Total Cost				

2.4 Cost Estimate of Operators Quarter					
Sl. No	Item description	Unit	Quantity	Rate (INR)	Amount (INR)
1	Earthwork in excavation in foundation trenches or drains (not exceeding 1.5 m width or 10 sqm on plan) including dressing of sides and ramming of bottoms, lift upto 1.5 m including getting out the excavated soil and disposals of surplus excavated soil as directed, within a lead of 50 m. (For all kinds of soil)				
1.1	From 0 m to 1.5 m	Cum	36.72		
1.2	From 1.5 m to 3 m	Cum	3.24		
2	Supplying and Filling on plinth with local sand and under floors including watering, ramming consolidating and dressing complete.	Cum	18.82		
3	Providing and laying in position cement concrete of specified grade excluding the cost of centring and shuttering - all work upto plinth level in 1:3:6 (1 Cement : 3 coarse sand : 6 granded stone)	Cum	23.51		
4	Providing and laying in position machine batched, machine mixed, and machine vibrated design mix cement concrete of specified grade for reinforced cement concrete structural elements, excluding the cost of centering, shuttering, finishing and reinforcement, M-20 grade reinforced cement concrete.				
4.1	For Columnn Footing	Cum	4.48		
4.2	For Column below GL up to plinth	Cum	0.74		
4.3	For Plinth beams-PB	Cum	5.08		
4.4	For columns above GL	Cum	2.45		
4.5	For lintel beams	Cum	2.04		
4.6	For Roof beams	Cum	3.59		
4.7	For Roof slab	Cum	12.03		
4.8	For Parapet	Cum	2.39		
5	Providing and laying in position machine batched, machine mixed, and machine vibrated design mix cement concrete of specified grade for reinforced cement concrete structural elements, excluding the cost of centering, shuttering, finishing and reinforcement, M-20 grade reinforced cement concrete.				
5.1	Sunshade over Windows	Cum	0.89		
5.2	For Lofts & Racks	Cum	1.88		
6	Centring and Shuttering including strutting, propping etc. and removal of form for				
6.1	For Columnn Footing (C1 F1)	Sqm	10.80		
6.2	For Column below GL up to plinth	Sqm	51.36		
6.3	For Plinth beams-PB	Sqm	41.65		
6.4	For columns above GL	Sqm	42.66		
6.5	For lintel beams	Sqm	23.43		
6.6	For Roof beams	Sqm	30.97		
6.7	For Roof slab	Sqm	131.94		
6.8	For Parapet	Sqm	4.90		
7	Reinforcement for R. C. C work including straightening, cutting, bending, placing in position and binding all complete. Thermo - Mechanically Treated bars	MT	4.14		
8	Brick work with bricks of class designation 100A in foundations and plinth in :Extra for Brick work in superstructure above plinth level upto floor V cum	Cum	31.58		
9	12 mm Cement plaster in course sand in 1:3 (1 cement : 3 coarse sand) (for Internal walls)	Sqm	167.68		
10	12 mm Cement plaster in course sand in 1:3 (1 cement : 3 coarse sand)	Sqm	58.41		

	(for ceiling)				
11	20 mm Cement plaster in course sand in 1:3 (1 cement : 3 coarse sand) (for External walls)	Sqm	147.88		

12	Wall painting with plastic emulsion paint of approved brand an	Sqm	226.09		
13	Appying one coat of cement primer of approved brand and manufacture on wall surface (for External walls)	Sqm	191.98		
14	Providing wood work in frames of door, window clerestory windows and other frames, wrought framed and fixed in position in local wood	Cum	0.50		
15	Providing and fixing paneled or paneled and glazed shutters for doors, windows and clerestory windows including black enameled MS butt hinges with necessary screws excluding panelling which will be paid for separately - 30 mm thick	Sqm	6.93		
16	Providing and fixing glazing in aluminium door, window ventilator shutters and partition etc with PVC / neoprene gasket etc. complete as per the architectural drawings and the directions of Engineer incharge. (Cost of aluminium snap bading shall be paid in basic item). With glass pans of 5.50 mm thickness (Weight not less than 13.75 kg/sqm)				
16.1	For Windows	Sqm	8.28		
16.2	For Ventilators	Sqm	0.72		
17	Providing and fabricating and fixing of M S grill for window protection etc ,. As per specification, drawing and as directed by the engineer				
	For Windows & Ventilators	kg	9.00		
18	Providing and laying in situ five course water proofing treatment with glass fibre tissue reinforced bitumen over roof consisting of first coat of bitumen primer @ 0.40 kg per sqm, 2nd and 4th courses of bonding material 1.60 kg per sqm which shall consist of blown type bitumen of grade 85/25 conforming to IS : 702, third layer of glass fibre tissue course as specified, fifth, the top most layer of stone grit 6 mm and down size or pea-seized gravel sprad @ 6 dm^3 per sqm including preparation of surface excluding grading for slope etc. compete.				
18.1	Slope concrete	Sqm	74.92		
19	Providing and laying Ceramic glazed floor tiles 400x400 mm (thickness to be specified by the manufacturer) of 1 st quality conforming to IS : 13755 of NITCO , ORIENT , SOMANY , KAJARIA or equivalent make in colours such as white , Ivory , Grey , Fume , Red , Brown , laid on 20 mm thick cement motar 1:4 (1 cement: 4 Coarse sand) including grouting the joints with white cement and matching pigments etc, complete.				
	Total quantity		58.41		
20	Providing and fixing first quality ceramic glazed wall tiles conforming to IS 15622 (thickness to be specified by the manufacturer) of approved maike in all colours shades except burgundy, bottle green, black of any size as approved by engineer incharge in skirting risers of steps and dados over 12 mm thick bed of cement mortar (1:3) and jointing with grey cement slurry at 3.3 kg per sqm including pointing in white cement mixed with pigment of matching shade complete				
	Total quantity	Rmt	55.67		
21	Providing and laying Ceramic glazed floor tiles 400x400 mm (thickness to be specified by the manufacturer) of 1st quality conforming to IS : 13755 of NITCO , ORIENT , SOMANY , KAJARIA or equivalent make in colours except white , Ivory , Grey , Fume , Red , Brown , laid on 20 mm thick cement motar 1:4 (1 cement: 4 Coarse sand) including grouting the joints with white cement and matching pigments etc, complete.				
21.1	Toilet	Sqm	5.85		
22	Providing and laying Ceramic glazed floor tiles 400x400 mm (thickness to be specified by the manufacturer) of 1st quality conforming to IS : 13755 of NITCO , ORIENT , SOMANY , KAJARIA or equivalent make in colours except white , Ivory , Grey , Fume , Red , Brown , laid on 20 mm thick cement motar 1:4 (1 cement: 4 Coarse sand) including grouting the joints with white cement and matching pigments etc, complete.				
22.1	Toilet Walls	Sqm	17.54		

23	Providing and fixing on wall face unplastidsed-PVC(working pressure 4 kgf per sqm) rain water pipes conforming to IS :4985 including jointing with seal ring conforming to IS: 5382 leaving 10 mm gap for thermal expansion	Rmt	15.60		
24	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20 cm in depth : consolidating each deposited layer by ramming and wateing lead.	Cum	25.88		
25	Carriage of Materials :				
	Aggregate	Cum	52.34		
	Coarse Sand	Cum	68.34		
	Local Sand	Cum	18.82		
	Cement	MT	18.80		
	Steel	MT	0.00		
	Brick (1000 Nos)		15.48		
	Total Cost				
26.0	**Plumbing work :**				
26.1	Stainless steel kitchen sink - without drain board 470 mm X 420 mm bowl depth 178 mm	No.	1		
26.2	Salem Stainless steel AISI - 304 (18/8) Round basin 405 mm X 355 mm	No.	2		
26.3	PTMT - Soap Dish/Holder 138 mm X 102 mm X 75 mm	No.	3		
26.4	White vitreous china dual purpose closet (Anglo Indian W.C.) suitable for use as squatting pan or European type water closet as per manufacturer's specifications	No.	1		
26.4.1	White Vitreous china 10 lit. (full flush) capacity controlled low levelflushing cistern with all fittings	No.	1		
26.5	C.P.brass toilet paper holder of standard size	No.	3		
26.6	PTMT - Towel Rail (600 mm)	No.	3		
26.7	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes,having thermal stability for hot & cold water supply, including all CPVC plain & brass threaded fittings, including fixing the pipe with clamps at 1.00 m spacing. This includes jointing of pipes & fittings with one step CPVC solvent cement and testing of joints complete as per direction of Engineer in Charge.				
26.7.1	15 mm nominal outer dia Pipes	m	25		
26.7.2	25 mm nominal outer dia Pipes	m	25		
26.7.3	32 mm nominal outer dia Pipes	m	15		
26.8	uPVC pipes (working pressure 4 kg / cm2) Single socketed pipe				
26.8.1	75 mm	m	30		
26.8.2	110 mm	m	30		
26.9	15 mm C.P. brass tap with elbow operation lever	No.	4		
26.10	Gunmetal non-return valve-horizontal (screwed end) 25 mm dia	No.	1		
26.11	Providing and placing on terrace (at all floor levels) polyethylene water storage tank, ISI : 12701 marked, with cover and suitable locking arrangement and making necessary holes for inlet, outlet and overflow pipes but without fittings and the base support for tank.	lit	2000		
26.12	Brass full way valve with C.I. wheel (screwed end) 40 mm dia	No	1		
26.13	Gunmetal non-return valve-horizontal (screwed end) 25 mm dia	No	1		
26.14	Constructing brick masonry chamber for underground C.I. inspection chamber and bends with bricks in cement mortar 1:4 (1 cement : 4 coarse sand) C.I. cover with frame (light duty) 455x610 mm internal dimensions, total weight of cover with frame to be not less than 38kg (weight of cover 23 kg and weight of frame 15 kg), R.C.C. top slab with 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size), foundation concrete 1:5:10 (1 cement : 5 fine sand : 10 graded stone aggregate 40 mm nominal size), inside plastering 12 mm thick with cement mortar 1:3 (1 cement : 3 coarse sand), finished smooth with a floating coat of neat cement on walls and bed concrete etc. complete as per standard design : With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	No	1		

26.15	Providing and fixing square-mouth S.W. gully trap class SP-1 complete with C.I. grating brick masonry chamber with water tight C.I. cover with frame of 300 x300 mm size (inside) the weight of cover to be not less than 4.50 kg and frame to be not less than 2.70 kg as per standard design With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	No	1		
26.16	Circular shape 560 mm dia precast R.C.C. manhole cover with frame - H.D. - 35	No	1		
	Total Cost of Sanitary items				
	Total Cost				

2.5 Cost estimate For Electrical Components For Pump-house					
Sl.No	**Description**	**Unit**	**Quantity**	**Rate (INR)**	**Amount (INR)**
1.0	**EARTHING**				
1.1	Neutral Earthing - Earthing with Copper earth plate 600mmx600mmx3mm thick including accesseries, and providing masonary enclosure with cover plate having locking arrangement and watering pipe of 2.7m long etc with charcoal/coke and salt as required.	No	2		
1.2	Body Earthing - Earthing with Gi earth pipe 4.5m long, 40mm dia including accesseries, and providing masonary enclosure with cover plate having locking arrangement and watering pipe etc with charcoal/coke and salt as required.	No	2		
2.0	**LT PANEL BOARD (Indoor type)**				
2.1	Supplying and fixing following way prewired SP&N MCB distribution board of steel sheet for 240 volts on surface/ recess complete with loose wire box, terminal connectors for all incoming and outgoing circuits, duly prewired with suitable size FRLS PVC insulated copper conductor up to terminal blocks, tinned copper bus bar, neutral link, earth bar, din bar, detachable gland plate, interconnections, powder painted including earthing etc. as required. (But without MCB/ RCCB/ Isolator) 2 + 8 way/10 way, Double door	No	1		
2.2	**MCCB DISTRIBUTION BOARDS**				
	Providing and fixing 100A rating and 16KA breaking capacity and pole TP MCCB in existing cubicle panel board including drilling holes in cubicle panel, making connections, ets as required.	No	1		
2.3	**MINIATURE CIRCUIT BREAKERS**				
	Supplying and fixing 32A, triple pole and neutral, 415V, "C" curve, miniature circuit breaker for inductive load of triple pole and neutral in the existing MCB DB complete with connections, testing and commitioning etc as required.	No	2		
2.4	**MINIATURE CIRCUIT BREAKERS**				
	Supplying and fixing 32A, single pole and neutral, 240V, "C" curve, miniature circuit breaker for inductive load of single pole and neutral in the existing MCB DB complete with connections, testing and commitioning etc as required.	No	1		
2.5	**EARTHING**				
	Body Earthing - Earthing with Gi earth pipe 4.5m long, 40mm dia including accesseries, and providing masonary enclosure with cover plate having locking arrangement and watering pipe etc with charcoal/coke and salt as required.	No	2		
3.0	**DISTRIBUTION BOARD**				
3.1	Supply and fixing 4+12 way, single door, horizontal type thee pole and neutral, sheet steel, MCB DB, 415V, on surface/recess, complete with tinned copper bus bar, nuetral bus bar, earth bar, din bar, interconnections, powdered painted including earthing etc as required. (but without MCB/RCCB/isolators)	m	1		
3.2	**EARTHING**				
	Body Earthing - Earthing with Gi earth pipe 4.5m long, 40mm dia including accesseries, and providing masonary enclosure with cover plate having locking arrangement and watering pipe etc with charcoal/coke and salt as required.	No	2		
4	**CABLES**				
	Supply of LT UG cable having Copper conductor PVC insulated,Sheathed ,galvanised steel wire /steel tap armoured cable with PVC outer sheathing 1.1 KV class)				
4.1	4Cx16 sq mm + 2x16 sq mm earth wire	m	1		
4.2	4Cx10 sq mm + 2x10 sq mm earth wire	m	6.5		
4.3	4Cx4 sq mm + 2x4 sq mm earth wire	m	15		
4.4	2Cx2.5 sq mm + 1x2.5 sq mm earth wire	m	14		
5.0	**LUMINARIES, SOCKETS AND SWITCHES**				
5.1	120W Gate lamp with fitting	No	2		
5.2	40W flourescent lamp	No	4		
5.3	70W MH Lamp for site lighting	No	4		
5.4	Single switched socket with multi purpose	No	2		
5.5	Switches	No	6		
	Total Cost				

2.6 Cost estimate For Electrical Components For Pumphouse					
Sl.No	Description	Unit	Quantity	Rate (INR)	Amount (INR)
1.0	**DIESEL GENERATOR 50 KVA**				
1.1	50 KVA, 40KW, 415V, 50 Hz, comprising of Perkins Engine Coupled to Stamford make Alternator, complete with all Standard accessories and ATS with Acoustic enclosure.	No	1		
1.2	**EARTHING**				
1.2.1	Neutral Earthing - Earthing with Copper earth plate 600mmx600mmx3mm thick including accesseries, and providing masonary enclosure with cover plate having locking arrangement and watering pipe of 2.7m long etc with charcoal/coke and salt as required.	No	2		
1.2.2	Body Earthing - Earthing with Gi earth pipe 4.5m long, 40mm dia including accesseries, and providing masonary enclosure with cover plate having locking arrangement and watering pipe etc with charcoal/coke and salt as required.	No	2		
2.0	**LT PANEL BOARD (Indoor type)**				
2.1	Supplying and fixing 4 ways surface/recess mounting, vertical type, 415V, TPN MCB distribution board of sheet steel, dust protected , duly powder painted, inclusive of 200A tinned copper bus bar, common neutral link, earth bar, din bar for mounting MCB's, with provision of 100A TP 16KA MCCB as incommer, interconnection between incomer MCCB and bus bars (but without MCB,s /MCCB's) as required. (Note : Vertical type MCB TPDB is normally used where 3 phase outlets are required.)	No	1		
2.2	**MCCB DISTRIBUTION BOARDS**				
	Providing and fixing 100A rating and 16KA breaking capacity and pole TP MCCB in existing cubicle panel board including drilling holes in cubicle panel, making connections, ets as required.	No	1		
2.3	**MINIATURE CIRCUIT BREAKERS**				
	Supplying and fixing 32A, triple pole and neutral, 415V, "C" curve, miniature circuit breaker for inductive load of triple pole and neutral in the existing MCB DB complete with connections, testing and commitioning etc as required.	No	2		
2.4	**MINIATURE CIRCUIT BREAKERS**				
	Supplying and fixing 32A, single pole and neutral, 240V, "C" curve, miniature circuit breaker for inductive load of single pole and neutral in the existing MCB DB complete with connections, testing and commitioning etc as required.	No	1		
2.5	**EARTHING**				
	Body Earthing - Earthing with Gi earth pipe 4.5m long, 40mm dia including accesseries, and providing masonary enclosure with cover plate having locking arrangement and watering pipe etc with charcoal/coke and salt as required.	No	2		
3.0	**DISTRIBUTION BOARD**				
3.1	Supply and fixing 4+12 way, single door, horizontal type thee pole and neutral, sheet steel, MCB DB, 415V, on surface/recess, complete with tinned copper bus bar, nuetral bus bar, earth bar, din bar, interconnections, powdered painted including earthing etc as required. (but without MCB/RCCB/isolators)	m	1		
3.2	**EARTHING**				
	Body Earthing - Earthing with Gi earth pipe 4.5m long, 40mm dia including accesseries, and providing masonary enclosure with cover plate having locking arrangement and watering pipe etc with charcoal/coke and salt as required.	No	2		
4.0	**CABLES**				
	Supply of LT UG cable having Copper conductor PVC insulated,Sheathed ,galvanised steel wire /steel tap armoured cable with PVC outer sheathing 1.1 KV class)				
4.1	4Cx16 sq mm + 2x16 sq mm earth wire	m	1		
4.2	4Cx10 sq mm + 2x10 sq mm earth wire	m	6.5		
4.3	4Cx4 sq mm + 2x4 sq mm earth wire	m	15		
4.4	2Cx2.5 sq mm + 1x2.5 sq mm earth wire	m	14		
5.0	**LUMINARIES, SOCKETS AND SWITCHES**				
5.1	120W Gate lamp with fitting	No	2		
5.2	40W flourescent lamp	No	4		
5.3	70W MH Lamp for site lighting	No	4		

5.4	Single switched socket with multi purpose	No	2		
5.5	Switches	No	6		
Total Cost					

2.7 SITC of Mechanical Components at each Pumping Station					
Sl.No	**Description**	**Quantity**	**Units**	**Rate**	**Amount**
1	**Manually Cleaned Bar Screen**				
	The screen shall be of removable type and shall consist of a welded stainless steel (AISI410) frame with vertical flats spaced at 30 mm. The flats shall not be less than 10 mm in thickness and not less than 50 mm deep. The flats shall not have any joint. The spacing between the flats shall be uniform and preferably so maintained by adequate number of spacers, which shall be so located as not to interfere with the raking operation. To facilitate the manual cleaning of the screen the inclination of the screen shall be between 45º and 60º to the horizontal. Single piece screen width should not be more than 1.5 m.Two numbers stainless steel rollers shall be fixed on each side of frame to facilitate rolling contact with guide channel during lifting and lowering of screen.				
1.2	(500 X 1500) mm	4	Nos		
2	Providing, erecting and giving test of Non clog sewage submersible pump set with SS CF8 M impeller,CI casing,SS 316 shaft suitable for 3 Ph ,415 V , 50 Hz A.C. Supply, submersible motor having TEFC enclooouser with class F insulation and IP 68 protection .The pump shall be operated at 1450 RPM .The scope shall include required accessories viz automatic coupling device,guide pipe,,chain with shakle,flat submersible cable upto starter panel through suitable GI pipe (30 mtr 3 Core flat copper for each pump with necessary electrical connection with the starter panel and as per specifications. (HP)				
	22 HP	4	Nos		
	4 Pumps for 2 lean, 1 peak and 1 average flow				
3	Providing Supplying erection testing and commissioning of 2 Tonne capacity Mobile Crane				
3.1	1 T Capacity for 7 m lift.	1	Nos		
	Total Cost, Rs				

2.8 Rising Main Data Sheet														
Sl. No.	Chainage		Diameter (mm)	L (m)	B (mm)	Avg Depth of cut (m)	Sand Bediing depth (m)	Total Depth (m)	Total Quantity (cum)	Pipe Volume (cum)	Sand Bedding (cum)	Refilling (cum)	Disposal (cum)	Depth wise excvation quantity (Cum)
	From	To												0.0 to 2 m
1	2	3	4	5	6	7	8	9=7+8	10= 5x6x9	11=0.786*4^2*5	12 =5*6 *8	13= 10-11-12	14 =11+12	
1	Zone I		300.00	3395.36	0.90	1.35	0.15	1.50	4583.74	240.19	458.37	3885.17	698.56	4583.74
		Total		3395.36		1.50			4583.74	240.19	458.37	3885.17	698.56	4583.74

2.8.1 Rising Main - BOQ							
Sl. No.	**Description of Item**	**Unit**	**.**				**Quantity**
1.0	Excavating trenches of required width for pipes cables, etc., including excavation for sockets, and dressing of sides, ramming of bottoms, depth upto 1.5 m including getting out the excavated soil, and then returning the soil as required, in layers not exceeding 20 cm in depth including consolidating each deposited layer by ramming, watering etc., and disposing of surplus excavated soil as directed, within a lead of 50 m.						
1.1	**0.0 to 1.5 mtr. Depth**						
	do - in all kindes of soil - 100%	m					4583.74
2.0	Supplying and Filling in plinth with local sand and under floors including , watering, ramming consolidation and dressing complete.	cum					458.37
3.0	Providing and laying S&S Centrifugally Cast (Spun) / Ductile Iron. Pipes conforming to IS : 8329 **:DI-K9 (MM)**						
3.1	300.00	m					3395.36
4	Providing push on joints to Centifugally (Spun) Cast Iron Pipes or Ductile Iron Pipes inculding testing of joints and the cost of rubber gasket (one at every 6m).						
4.1	300.00	Joint					566
5.0	Providing and laying D.I. specials of class K-12 suitable for push-on jointing as per IS : 9523 :						
5.1	**Bends-As per BS 4772 code**						
	90 degree (63.5 Kg)	kg					444.50
5.2	**Taper-As per BS 4772 code**						
	300x200mm (34.5 Kg)	kg					34.50
5.3	**Tee-As per BS 4772 code**						
	300x300x300 mm (79.5 Kg)	kg					79.50
6.0	Providing and fixing **C.I. sluice valves (**with cap) complete with bolts, nuts, rubber insertions etc.(the tail pieces if required will be paid separately)						
6.1	300.00	No					4.00
7.0	Providing and fixing **C.I. sluice valves for Scouring (**with cap) complete with bolts, nuts, rubber insertions etc.(the tail pieces if required will be paid separately)						
7.1	300.00	No					3.00
8.0	Providing & Constructing masonry Chamber 1.5x1.5x1.5 m inside, in brick work in cement mortar 1:3 (1 cement : 3 coarse sand) for valve, with cast insitu RCC slab with necessary reinforcment.The valve chamber shall be plastered with CM 1:4, A levelling coars of M10 shall be provided.The cost is inclusive of excavation , disposal and construction of valve chamber with moduar bricks plasting with cement mortar with all lead and lift etc., as per specification & drawing.						
8.1	Sluice valve chambers	No					3.00
8.2	Scour valve chambers	No					3.00
9.0	Providing and constructing of the RCC Thrust Blocks for DI bends including the excavations of soils up to the required depth ,disposal of soils after refilling with selected available earth,providing PCC including cost of labours,materials tools,curing etc., complete as per drawing and as directed by the Engineer (inclusive of cost of steel)						
9.4	300.00	No	7.00				7.00
	Enter Total pipe length	3395.36	m				
	Percentage of CC Road in town	70	%				2376.752
	Percentage of Asphalt Road in town	30	%				1018.608
10	**Dismantling and restoration of roads :**						

10.1	Dismantling of cement concrete pavement (dismantling of cement concrete pavements by mechanical means using pneumatic tools, breaking to pieces not exceeding 0.02 cum in volume and stock pilling at designated locations and disposal of dismantled materials up to a lead of 1000 metres, stacking serviceable and unserviceable material	cum	320.86
10.2	Bituminous courses by mechanical means	cum	45.84
	Granular courses by manualmeans	cum	534.77
11	Restoration of road as per the specification and as directed by the engineer		
11.3.1	Restoration of CC road		
a	Compacting original ground supporting subgrade (Loosening of the ground upto a level of 500 mm below the subgrade level, watered, graded and compacted in layers to meet requirement of table 300-2 for subgrade construction.) Rolling with vibratory roller	cum	1527.91
b	**Wet Mix Macadam -** Providing, laying, spreading and compacting graded stone aggregate to wet mix macadam specification including premixing the material with water at OMC in mechanical mix plant carriage of mixed mathod of tipper to site, laying in uniform layers with paver in sub-base/base course on a well prepared surface and compacting with vibratory roller to achieve the desired density complete as per Specification	cum	114.59
c	Cement Concrete Pavement (Construction of un-reinforced, dowel jointed, plain cement concrete pavement over a prepared sub base with 43 grade cement @ 400 kg per cum, coarse and fine aggregate conforming to IS 383, maximum size of coarse aggregate not exceeding 25 mm, mixed in a batching and mixing plant as per approved mix design, transported to site, laid with a fixed form or slip form paver, spread, compacted and finished in a continuous operation including provision of contraction, expansion, construction and longitudinal joints, joint filler, separation membrane, sealant primer, joint sealant, debonding strip, dowel bar, tie rod, admixtures as approved, curing compound,finishing to lines and grades as per drawing)	cum	320.86
12.0	**Granular Sub-base with Close graded Material (By Mix in Place Method) -** Construction of **Granular sub-base(GSB)** by providing close graded Material, spreading in uniform layers with motor grader on prepared surface, mixing by mix in place method by rotavator at OMC, and compacting with vibratory power roller to achieve the desired density, complete as per Technical Specification		
		cum	320.86
	Total for Grading II Matrerial (50% of Total)	cum	160.43
	Total for Grading I Matrerial (50% of Total)	cum	160.43
b	**Wet Mix Macadam -** Providing, laying, spreading and compacting graded stone aggregate to wet mix macadam specification including premixing the material with water at OMC in mechanical mix plant carriage of mixed mathod of tipper to site, laying in uniform layers with paver in sub-base/base course on a well prepared surface and compacting with vibratory roller to achieve the desired density complete as per Specification	cum	534.77
c	**Pavement Courses - Bituminous**		
	Prime Coat - Providing and applying primer coat with Bitumen emulsion on prepared surface of granular base including cleaning of road surface and spraying primer at the rate of 0.6kg/sqm using mechnical means complete	sqm	2139.08
	Tack Coat - Providing and applying tack coat with Bitumen emulsion using emulsion pressure distributor at the rate of 0.2 kg per sqm on the prepared bituminous/granular surface cleaned with mechancial broom .	sqm	2139.08
	Providing and laying **Dense graded bituminous macadam** with 100-120 TPH batch HMP producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 4.0 to 4.5 % by weight of total mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MoRTH specifications Clause 507. (Grading II -19mm nominal size)	cum	53.48

2.8.2 Rising Main - Cost Estimate					
Sl. No.	**Description of Item**	**Unit**	**Quantity**	**Rate (INR)**	**Amount (INR)**
1.0	Excavating trenches of required width for pipes cables, etc., including excavation for sockets, and dressing of sides, ramming of bottoms, depth upto 1.5 m including getting out the excavated soil, and then returning the soil as required, in layers not exceeding 20 cm in depth including consolidating each deposited layer by ramming, watering etc., and disposing of surplus excavated soil as directed, within a lead of 50 m.				
1.1	**0.0 to 1.5 mtr. Depth**				
	do - in all kindes of soil - 100%	m			
2.0	Supplying and Filling in plinth with local sand and under floors including , watering, ramming consolidation and dressing complete.	cum			
3.0	Providing and laying S&S Centrifugally Cast (Spun) / Ductile Iron. Pipes conforming to IS : 8329 **:DI-K9**				
3.1	300.00	m			
4	Providing push on joints to Centifugally (Spun) Cast Iron Pipes or Ductile Iron Pipes inculding testing of joints and the cost of rubber gasket (one at every 6m).				
4.1	300.00	Joint			
5.0					
5.1	**Bends-As per BS 4772 code**				
	90 degree (63.5 Kg)	kg			
5.2	**Taper-As per BS 4772 code**				
	300x200mm (34.5 Kg)	kg			
5.3	**Tee-As per BS 4772 code**				
	300x300x300 mm (79.5 Kg)	kg			
6.0	Providing and fixing **C.I. sluice valves (**with cap) complete with bolts, nuts, rubber insertions etc.(the tail pieces if required will be paid separately)				
6.1	300.00	No			
7.0	Providing and fixing **C.I. sluice valves for Scouring (**with cap) complete with bolts, nuts, rubber insertions etc.(the tail pieces if required will be paid separately)				
7.1	300.00	No			
8.0	Providing & Constructing masonry Chamber 1.5x1.5x1.5 m inside, in brick work in cement mortar 1:3 (1 cement : 3 coarse sand) for valve, with cast insitu RCC slab with necessary reinforcment.The valve chamber shall be plastered with CM 1:4, A levelling coars of M10 shall be provided.The cost is inclusive of excavation , disposal and construction of valve chamber with moduar bricks plasting with cement mortar with all lead and lift etc., as per specification & drawing.				
8.1	Sluice valve chambers	No			
8.2	Scour valve chambers	No			
9.0	Providing and constructing of the RCC Thrust Blocks for DI bends including the excavations of soils up to the required depth ,disposal of soils after refilling with selected available earth,providing PCC including cost of labours,materials tools,curing etc., complete as per drawing and as directed by the Engineer (inclusive of cost of steel)				
9.1	90 degree	No			
	Enter Total pipe length	3395.36			
	Percentage of CC Road in town	70.00			
	Percentage of Asphalt Road in town	30.00			
10	Dismantling and restoration of roads :				
10.1	Dismantling of cement concrete pavement (dismantling of cement concrete pavements by mechanical means using pneumatic tools, breaking to pieces not exceeding 0.02 cum in volume and stock pilling at designated locations and disposal of dismantled materials up to a lead of 1000 metres, stacking serviceable and unserviceable material	cum			
10.2	Dismantalling of flexible Pavements(dismantling of flexible pavements and disposal of dismantled materials up to a lead of 1000 m, stacking serviceable and unserviseable materials separately)				
	Bituminous courses by mechanical means	cum			

	Granular courses by manualmeans	cum			

11	Restoration of road as per the specification and as directed by the engineer						
11.1	Restoration of CC road						
a	Compacting original ground supporting subgrade (Loosening of the ground upto a level of 500 mm below the subgrade level, watered, graded and compacted in layers to meet requirement of table 300-2 for subgrade construction.) Rolling with vibratory roller	cum	1	1527.91			
b	**Wet Mix Macadam -** Providing, laying, spreading and compacting graded stone aggregate to wet mix macadam specification including premixing the material with water at OMC in mechanical mix plant carriage of mixed mathod of tipper to site, laying in uniform layers with paver in sub-base/base course on a well prepared surface and compacting with vibratory roller to achieve the desired density complete as per Specification	cum	1	114.59			
c	Cement Concrete Pavement (Construction of un-reinforced, dowel jointed, plain cement concrete pavement over a prepared sub base with 43 grade cement @ 400 kg per cum, coarse and fine aggregate conforming to IS 383, maximum size of coarse aggregate not exceeding 25 mm, mixed in a batching and mixing plant as per approved mix design, transported to site, laid with a fixed form or slip form paver, spread, compacted and finished in a continuous operation including provision of contraction, expansion, construction and longitudinal joints, joint filler, separation membrane, sealant primer, joint sealant, debonding strip, dowel bar, tie rod, admixtures as approved, curing compound,finishing to lines and grades as per drawing)	cum	1	320.86			
12	**Pavement Courses - Granular**						
	Granular Sub-base with Close graded Material (By Mix in Place Method) - Construction of **Granular sub-base(GSB)** by providing close graded Material, spreading in uniform layers with motor grader on prepared surface, mixing by mix in place method by rotavator at OMC, and compacting with vibratory power roller to achieve the desired density, complete as per Technical Specification						
		cum	1				
	Total for Grading II Matrerial (50% of Total)	cum		160.43			
	Total for Grading I Matrerial (50% of Total)	cum		160.43			
b	**Wet Mix Macadam -** Providing, laying, spreading and compacting graded stone aggregate to wet mix macadam specification including premixing the material with water at OMC in mechanical mix plant carriage of mixed mathod of tipper to site, laying in uniform layers with paver in sub-base/base course on a well prepared surface and compacting with vibratory roller to achieve the desired density complete as per Specification	cum	1	534.77			
	Pavement Courses - Bituminous						
c	**Prime Coat -** Providing and applying primer coat with Bitumen emulsion on prepared surface of granular base including cleaning of road surface and spraying primer at the rate of 0.6kg/sqm using mechnical means complete	sqm	1	2139.08			
	Tack Coat - Providing and applying tack coat with Bitumen emulsion using emulsion pressure distributor at the rate of 0.2 kg per sqm on the prepared bituminous/granular surface cleaned with mechancial broom .	sqm	1	2139.08			
	Providing and laying **Dense graded bituminous macadam** with 100-120 TPH batch HMP producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 4.0 to 4.5 % by weight of total mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MoRTH specifications Clause 507. (Grading II -19mm nominal size)	cum	1	53.48			
	Total Cost, Rs						

2.9 THRUST BLOCK - 90-degree					
Sl No	**Particulars**	**Unit**	**Quantity**	**Rate INR**	**Amount INR**
1	Providing and laying in position machine batched, machine mixed, and machine vibrated design mix cement concrete of specified grade for reinforced cement concrete structural elements, excluding the cost of centering, shuttering, finishing and reinforcement, M-20 grade reinforced cement concrete.	cum			
		cum	2.250		
	Reduction for Pipe	cum	0.012		
	Total Quantity	cum	2.238		
2	Reinforcement for R. C. C work including straightening, cutting, bending, placing in position and binding all complete. Thermo - Mechanically Treated bars - 10 mm dia	MT	0.011		
3	Centring and Shuttering including strutting, propping etc. and removal of form for				
		sqm	3.000		
		sqm	3.000		
4	Carriage of Materials				
	Sand	cum	0.127		
	Aggregate	cum	0.255		
	Cement	MT	0.114		
	Steel	MT	0.001		

2.10 VALVE CHAMBER (MASONARY)

Sl. No	Item description	Unit	Qty	Rates (INR)	Amount (INR)
	Earthwork in excavation over areas (exceeding 1.5m in depth 1.5 in width as well as 10 sqm on plan) including disposal of excavated earth lead upto 50m and lift upto 1.5m, disposal earth to be leveled and neatly dressed.				
1	From 0 m to 1.5 m	cum	7.02		
	From 3 m to 4.5 m	m^3	0.00		
	From 4.5 m to 6 m	m^3	0.00		
2	From 6 m to 7.5 m	m^3	0.00		
2	Providing and laying in position cement concrete of specified grade excluding the cost of centring and shuttering - all work upto plinth level in **1:3:6 (1 Cement : 3 coarse sand : 6 granded stone)**	cum	0.48		
3	Providing and laying in position machine batched, machine mixed and machine vibrated design mix cement concrete of specified grade for reinforced cement concrete structural elements, excluding the cost of centering, shuttering, finishing and reinforcement, **M-20** grade reinforced cement concrete.				
	Top slab	cum	0.60		
	Total		0.60		
	Brick work with bricks of class designation 100B in foundations and plinth in : Cement Mortar 1:4 (1 cement : 4 coarse sand) Extra for Brick work in superstructure above plinth level upto floor V cum				
4	Walls				
	Long walls	cum	1.50		
	Short walls	cum	1.13		
	Total Quantity for walls	cum	2.63		
5	Reinforcement for R. C. C work including straightening, cutting, bending, placing in position and binding all complete. Thermo - Mechanically Treated bars - 10 mm dia	MT	0.06		
6	Cement plaster in course sand in 1:3 -20 mm thick (1 cement : 3 coarse sand)	Sqm	18.00		
7	Providing orange colour safety foot rest of minimum 6 mm thick plastic encapsulated as per IS : 10910 on 12 mm dia steel bar conforming to IS : 1786 having minimum cross section as 23 mm X 25 mm and overall minimum length 263 mm and width as 165 mm with minimum 112 mm space between protruded legs having 2 mm tread on top surface by ribbing or chequering besides necessary and adequate anchoring projections on tail length on 138 mm as per standard drawing and suitable to with stand the bend test and chemical resistance test as per specifications and having manufacture's permanent identification mark to be visible even after fixing, including fixing in manholes with 30 X 20 X15 cm cement concrete block 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 20 mm nominal size) complete as per standard design.	Each	5		
	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20 cm in depth : consolidating each deposited layer by ramming and wateing lead.				
8	Total Earth work Quantity	cum	7.02		
	Deduct P.C.C quantity	cum	-0.48		
	Deduct Wall Quantity	cum	-5.40		
	Total Quantity	cum	1.13		
	Carriage of Materials				
	Coarse Sand	cum	0.92		
	Aggregate	cum	0.96		
9	Cement	MT	0.88		
	Steel	MT	0.01		
	Bricks (1000 Nos)		1.30		
	Total Cost				
	Total Cost, Rs				

2.11 Pumping Main Design - Economical Diameter

Year	Discharge		Design Parameters	Stage I		Stage II	Unit	Pipe material
			Discharge at Start	4.28	MLD	4.69	MLD	D.I.
2020	4.28	MLD	Discharge at End of Period	4.69	MLD	4.97	MLD	
2035	4.69	MLD	Avg. Discharge	4.49	MLD	4.83	MLD	
2050	4.97	MLD	Pumping hours at the End of Period	20.00	hrs	20.00	hrs	
			Avg. Pumping hours during the Period	19.13	hrs	19.44	hrs	
Design Period	15		Life of Electric Motors	15.00	years	15.00	hrs	
			Combined Eff. Of Pump Sets	75.00	%	75.00	%	
Static Head	10.00	m	Energy Charges	6.50	Rs./Unit	12.00	Rs./Unit	
			Interest Rate	10.00	%	10.00	%	
Terminal Head		m	Length of Pipeline	3395.36	m	3395.36	m	
			Capitalisation Coefficient for 15years	7.6061		7.6061		
Static + Terminal Head	10.00	m	Hazen William Coefficient for DI Pipes	140		120		
			Pump Cost per KW in Rs.	10000.00	Rs./KW	20000.00	Rs./KW	
			KW Reqd	0.852	per m Head	0.903	per m Head	
			Avg Annual Electrical Charge in Rs.	45407.04	per KW	85190.70	per KW	

Stage I

S. No.	I.D. (mm)	I.D. (m)	Discahrge (MLD)	Discahrge (m^3/sec)	Velocity (m/sec)	Frictional Head Loss per 1000m (m)	Total Frictional Head Loss (m)	Other Losses (m)	Total Head Loss (m)	Total Head (m)	Power Reqd (KW)	Pump Cost including 50% standby (Lakhs Rs.)
1	250	0.25	4.49	0.065	1.33	6.15	20.90	2.09	22.99	32.99	28.106	
2	300	0.30	4.49	0.065	0.92	2.53	8.60	0.86	9.46	19.46	16.580	
3	350	0.35	4.49	0.065	0.68	1.20	4.06	0.41	4.47	14.47	12.325	
4	400	0.40	4.49	0.065	0.52	0.62	2.12	0.21	2.33	12.33	10.506	
5	450	0.45	4.49	0.065	0.41	0.35	1.19	0.12	1.31	11.31	9.639	
6	600	0.60	4.49	0.065	0.23	0.09	0.29	0.03	0.32	10.32	8.796	
7	600	0.60	4.49	0.065	0.23	0.09	0.29	0.03	0.32	10.32	8.796	

Stage II

S. No.	I.D. (mm)	I.D. (m)	Discahrge (MLD)	Discahrge (m^3/sec)	Velocity (m/sec)	Frictional Head Loss per 1000m (m)	Total Frictional Head Loss (m)	Other Losses (m)	Total Head Loss (m)	Total Head (m)	Power Reqd (KW)	Pump Cost including 50% standby (Lakhs Rs.)
1	100	0.10	4.49	0.065	8.29	533.55	1811.59	181.16	1992.75	2002.75	1706.377	
2	150	0.15	4.49	0.065	3.69	74.06	251.48	25.15	276.62	286.62	244.208	
3	200	0.20	4.49	0.065	2.07	18.25	61.95	6.20	68.15	78.15	66.581	
4	250	0.25	4.49	0.065	1.33	6.15	20.90	2.09	22.99	32.99	28.106	
5	300	0.30	4.49	0.065	0.92	2.53	8.60	0.86	9.46	19.46	16.580	
6	350	0.35	4.49	0.065	0.68	1.20	4.06	0.41	4.47	14.47	12.325	
7	400	0.40	4.49	0.065	0.52	0.62	2.12	0.21	2.33	12.33	10.506	
8	450	0.45	4.49	0.065	0.41	0.35	1.19	0.12	1.31	11.31	9.639	
9	500	0.50	4.49	0.065	0.33	0.21	0.71	0.07	0.79	10.79	9.190	
10	600	0.60	4.49	0.065	0.23	0.09	0.29	0.03	0.32	10.32	8.796	
11	700	0.70	4.49	0.065	0.17	0.04	0.14	0.01	0.15	10.15	8.650	

I.D. (mm)	Rate per m length (Rs.) of DI Pipe	Pipe Cost (Lakhs Rs.)	Stage I				Grand Total of Capitilised Cost (Lakhs Rs.)
			Pump Cost (Lakhs Rs.)	Annual Energy Charges (Lakhs Rs.)	Capitilised Energy Charges (Lakhs Rs.)	Capitilised Total Cost (Lakhs Rs.)	
100	1024.6	34.789	255.957	774.82	5893.31	6184.05	
150	1537.0	52.187	36.631	110.89	843.42	932.24	
200	2114.6	71.798	9.987	30.23	229.95	311.74	
250	2945.9	100.024	4.216	12.76	97.07	201.31	
300	3663.7	124.396	2.487	7.53	57.26	184.14	
350	4503.1	152.896	1.849	5.60	42.57	197.31	
400	5768.7	195.868	1.576	4.77	36.28	233.73	

450	6668.8	226.430	1.446	4.38	33.29	261.17
500	8421.7	285.947	1.378	4.17	31.74	319.06
600	10168.7	345.264	1.319	3.99	30.38	376.96
700	14059.3	477.364	1.298	3.93	29.88	508.54

3.0 I&D Nallah: Chinta Mani Chak Ghat		
Item Description	**Quantity**	**Total Amount**
Drain construction Cost	Detailes are attached	
Outfall Structure cost	Detailes are attached	
Generator Room cost	Detailes are attached	
Operator Quarter Cost	Detailes are attached	
Elctrical Component Cost	Detailes are attached	
DG Cost	Detailes are attached	
Rising main cost	Detailes are attached	
Pump and screen cost	Detailes are attached	
Total Cost, Rs		

3.1 : Drain Construction Cost																	
										Existing Drain Size				Proposed Drain Size			
Sl. No.	**Name of Drains/ Nallah falling in Ganga River**	**Length of Drain (m) to be constructed**	**Velocity (m/sec)**	**Width**	**Depth**	**Area**	**effective flow area**	**Flow**	**Flow (MLD)**	**Width**	**Height**	**Rate**	**Drain Cost**	**Width**	**Height**	**I&D**	**Remark**
1	Chinta Mani Chak Ghat Nala	600	0.10	1.00	1.50	1.5	10%	0.015	1.27	1.00	1.50			1.50	1.50	Pumping	TO STP

3.2 STORM DRAIN OUTFALL STRUCTURE - BOQ					
SIZE OF DRAIN AT OUTFALL		(Width)	1.5	Mtr	
S.No.	Prticular of items			Unit	Quantity
1	Earth work excavation in foundation trenches or drains including dressing of sides and ramming of bottoms, lift as follows, including getting out the excavated soil and disposal of surplus excavated soil as directed, with all lead and lift complete as per the specification and as directed by the Engineer In all types soils Depth upto 1.5 m			Cum	13.50 21.60 3.00 **38.10**
	1.5 m to 3.0 m				41.40
2	Sand filling upto 300mm in Plinth including watering and compacting in layers of 150 mm thick as per specifications and as directed by the Engineer.			Cum	2.70 4.32 0.60 **7.62**
3	Providing and laying in position cement concrete of specified grade excluding the cost of centring and shuttering - all work upto plinth level in 1:3:6 (1 Cement : 3 coarse sand : 6 granded stone)			Cum	2.75 4.40 0.15 **7.30**
4	Providing and laying in position machine batched, machine mixed, and machine vibrated design mix cement concrete of specified grade for reinforced cement concrete structural elements, excluding the cost of centering, shuttering, finishing and reinforcement, M-20 grade reinforced cement concrete.			Cum	4.13 6.60 6.60 0.21 5.50 3.30 **26.34**
5	Centring and Shuttering including strutting, propping etc. and removal of form for vertical walls			Sqm	55.00 22.00 **77.00**
6	Reinforcement for R. C. C work including straightening, cutting, bending, placing in position and binding all complete. Thermo - Mechanically Treated bars TMTC - 500 (Quantity at 90 kg/cum)			Kg	2370.60 **2370.60**
7	Carriage of the following materials from quarry to work site including loading, unloading and staking at work site as per specification & direction of E/I.			Aggregate	
				Coarse Sand	
				Local Sand	
				Cement	
				Steel	2.37
8	Fabrication & supply of water tight structuraal steel sliding type low head gate for dam head sluice and canals with gate leaf and frame as per IS 5620 complete with brass / stainless steel lining of appropriate size for seal seats and sill and seals seat				240
8.1	For roof slab			Sqm	22
8.2	Weather shade,Chajjas, corbels etc. including edges			Sqm	1.2
9	Reinforcement for R. C. C work including straightening, cutting, bending, placing in position and binding all complete. Thermo - Mechanically Treated bars				11
	steel quantities			kg	990.00
10	Brick work with bricks of class designation 100A in foundations and plinth in :Extra for Brick work in superstructure above plinth level upto floor V cum			Cum	6.555
11	12 mm Cement plaster in course sand in 1:3 (1 cement : 3 coarse sand) (for Internal walls)			Sqm	28.5
12	12 mm Cement plaster in course sand in 1:3 (1 cement : 3 coarse sand) (for ceiling)				22
13	20 mm Cement plaster in course sand in 1:3 (1 cement : 3 coarse sand) (for External walls)			Sqm	29.4
14	Wall painting with plastic emulsion paint of approved brand and manufacture to give an even shade : Two or more coats on new work (for Internal walls)			Sqm	28.5

3.2 STORM DRAIN OUTFALL STRUCTURE - BOQ					
SIZE OF DRAIN AT OUTFALL		(Width)	1.5	Mtr	
S.No.	Prticular of items			Unit	Quantity
15	Wall painting with plastic emulsion paint of approved brand and manufacture to give an even shade : Two or more coats on new work (for ceiling)			Sqm	22
16	Appying one coat of cement primer of approved brand and manufacture on wall surface (for External walls)			Sqm	29.4
17	Providing wood work in frames of door, window clerestory windows and other frames, wrought framed and fixed in position in local wood for Door			Cum	0.5
18	Providing and fixing paneled or paneled and glazed shutters for doors, windows and clerestory windows including black enameled MS butt hinges with necessary screws excluding panelling which will be paid for separately - 30 mm thick				
	For Doors			Sqm	1.8
19	Providing and fixing glazing in aluminium door, window V shutters and partition etc with PVC / neoprene gasket etc. complete as per the architectural drawings and the directions of Engineer incharge. (Cost of aluminium snap bading shall be paid in basic item). With glass pans of 5.50 mm thickness (Weight not less than 13.75 kg/sqm)			Sqm	0.5
20	Providing and laying Ceramic glazed floor tiles (400x400) mm (thickness to be specified by the manufacturer) of 1st quality conforming to IS:13755 of NITCO, ORIENT, SOMANY, KAJARIA or equivalent make in colours such as White, Ivory, Grey, Fume, Red, Brown, laid on 20 mm thick cement mortar 1:4 (1 cement : 4 coarse sand) including grouting the joints with white cement and matching pigments etc, complete.				22

3.2.1 Cost Estimate for Outfall Structures					
Sl No.	**Description of Item**	**Unit**	**Quantity**	**Rate (INR)**	**Amount (INR)**
1	Earth work excavation in foundation trenches or drains including dressing of sides and ramming of bottoms, lift as follows, including getting out the excavated soil and disposal of surplus excavated soil as directed, with all lead and lift complete as per the specification and as directed by the Engineer. All kinds of soils				
1.1.1	Upto1.50m depth	cum	38.10		
	1.5 m to 3 m	cum	41.40		
2	Sand filling upto 300mm in Plinth including watering and compacting in layers of 150 mm thick as per specifications and as directed by the Engineer.	cum	7.62		
3	Providing and laying in position cement concrete of specified grade excluding the cost of centring and shuttering - all work upto plinth level in 1:3:6 (1 Cement : 3 coarse sand : 6 granded stone)	Cum	7.30		
4	Providing and laying in position machine batched, machine mixed, and machine vibrated design mix cement concrete of specified grade for reinforced cement concrete structural elements, excluding the cost of centering, shuttering, finishing and reinforcement, M-20 grade reinforced cement concrete.	Cum	26.34		
5	Centring and Shuttering including strutting, propping etc. and removal of form for vertical walls	sqm	77.00		
6	Reinforcement for R. C. C work including straightening, cutting, bending, placing in position and binding all complete. Thermo - Mechanically Treated bars TMTC - 500 (Quantity at 90 kg/cum)	Kg	2370.60		
7	Carriage of the following materials from quarry to work site including loading, unloading and staking at work site as per specification & direction of E/I.				
	Aggregate	Cum	55.73		
	Sand	Cum	27.87		
	Cement	MT	25.01		
	Steel	MT	2.37		
8	Wrought iron and mild steel welded work (using angles, square bars, tees and channel grills, grating frames, gates and tree guards of any size and design etc. including cost of screens and welding rods or bolts and nuts complete fixed in position but without the cost of excavation and concrete for fixing which will be paid separately	Kg	240.00		
	Erection of gates (a) 30% item NO- 8	kg	240.00		
8.0	Centring and Shuttering including strutting, propping etc. and removal of form for Roof slab				
8.1	For roof slab	Sqm	22.00		
8.2	Weather shade,Chajjas, corbels etc. including edges	Sqm	1.20		
9.0	Reinforcement for R. C. C work including straightening, cutting, bending, placing in position and binding all complete. Thermo - Mechanically Treated bars		11.00		
	steel quantities	kg	990.00		
10.0	Brick work with bricks of class designation 100A in foundations and plinth in :Extra for Brick work in	Cum	6.56		

	superstructure above plinth level upto floor V cum				

Sl No.	Description of Item	Unit	Quantity	Rate (INR)	Amount (INR)
11.0	12 mm Cement plaster in course sand in 1:3 (1 cement : 3 coarse sand) **(for Internal walls)**	Sqm	28.50		
12.0	12 mm Cement plaster in course sand in 1:3 (1 cement : 3 coarse sand) **(for ceiling)**		22.00		
13.0	20 mm Cement plaster in course sand in 1:3 (1 cement : 3 coarse sand) **(for External walls)**	Sqm	29.40		
14.0	Wall painting with plastic emulsion paint of approved brand and manufacture to give an even shade : Two or more coats on new work **(for Internal walls)**	Sqm	28.50		
15.0	Wall painting with plastic emulsion paint of approved brand and manufacture to give an even shade : Two or more coats on new work **(for ceiling)**	Sqm	28.50		
16.0	Appying one coat of cement primer of approved brand and manufacture on wall surface **(for External walls)**	Sqm	22.00		
17.0	Providing wood work in frames of door, window clerestory windows and other frames, wrought framed and fixed in position in local wood for Door	Cum	29.40		
18.0	Providing and fixing paneled or paneled and glazed shutters for doors, windows and clerestory windows including black enameled MS butt hinges with necessary screws excluding panelling which will be paid for separately - 30 mm thick		0.50		
	For Doors	Sqm	1.80		
19.0	Providing and fixing glazing in aluminium door, window V shutters and partition etc with PVC / neoprene gasket etc. complete as per the architectural drawings and the directions of Engineer incharge. (Cost of aluminium snap bading shall be paid in basic item). With glass pans of 5.50 mm thickness (Weight not less than 13.75 kg/sqm)	Sqm	0.50		
20.0	Providing and laying Ceramic glazed floor tiles (400x400) mm (thickness to be specified by the manufacturer) of 1st quality conforming to IS:13755 of NITCO, ORIENT, SOMANY, KAJARIA or equivalent make in colours such as White, Ivory, Grey, Fume, Red, Brown, laid on 20 mm thick cement mortar 1:4 (1 cement : 4 coarse sand) including grouting the joints with white cement and matching pigments etc, complete.	sqm	22.00		
Total Cost, Rs					

3.2.2 DETAILS OF MEASUREMENT (Carriage Items)						
S.No.	**Particulars of item**	**Unit**	**Quantity**	**Cement (Kg)**	**Sand (Cum)**	**Aggregate (Cum)**
1	RCC (1:1.5:3)	Cum	59.34	23439.30	24.57	49.13
2	PCC (1:3:6)	Cum	7.30	1569.50	3.30	6.60
	Total			**25009**	**27.87**	**55.73**

3.3 Cost estimate of Generator Room					
Sl. No.	Item description	Unit	Quantity	Rate (INR)	Amount (INR)
	Earth work				
1.0	Earthwork in excavation in foundation trenches or drains (not exceeding 1.5 m width or 10 sqm on plan) including dressing of sides and ramming of bottoms, lift upto 1.5 m including getting out the excavated soil and disposals of surplus excavated soil as directed, within a lead of 50 m. (For all kinds of soil)				
1.1	From 0 m to 1.5 m	Cum	22.54		
1.2	From 1.5 m to 3 m	Cum	1.35		
2.0	Supplying and Filling on plinth with local sand and under floors including watering, ramming consolidating and dressing complete. For Generater room	Cum	7.20		
3.0	Providing and laying in position cement concrete of specified grade excluding the cost of centring and shuttering - all work upto plinth level in 1:3:6 (1 Cement : 3 coarse sand : 6 granded stone upto 20 mm nominal size)	Cum	7.33		
4.0	Providing and laying in position machine batched, machine mixed, and machine vibrated design mix cement concrete of specified grade for reinforced cement concrete structural elements, excluding the cost of centering, shuttering, finishing and reinforcement, M-20 grade reinforced cement concrete.				
4.1	For Footings	Cum	1.44		
4.2	Column below GL up to Plinth	Cum	0.26		
4.3	Plinth beams	Cum	1.61		
4.4	For columns above Ground levels	Cum	0.87		
4.5	Lintel beams	Cum	1.43		
4.6	Roof Beams	Cum	1.33		
4.7	For roof slab	Cum	4.32		
4.8	For Sunshades over Door & Windows :	Cum	0.23		
5.0	Centring and Shuttering including strutting, propping etc. and removal of form for				
5.1	For footing - F	Sqm	4.80		
5.2	Column upto GL - C	Sqm	4.60		
5.3	Plinth beams :	Sqm	14.00		
6.0	Centring and Shuttering including strutting, propping etc. and removal of form for	Sqm			
6.1	Lintel beams	Sqm	12.40		
6.2	Roof beams	Sqm	12.40		
7.0	Centring and Shuttering including strutting, propping etc. and removal of form for				
	Column	Sqm	15.09		
8.0	Centring and Shuttering including strutting, propping etc. and removal of form for Roof slab				
8.1	For roof slab	Sqm	24.00		
8.2	Weather shade,Chajjas, corbels etc. including edges	Sqm	4.13		
9.0	Reinforcement for R. C. C work including straightening, cutting, bending, placing in position and binding all complete. Thermo - Mechanically Treated bars				
	steel quantities	MT	1.34		
10.0	Brick work with bricks of class designation 100A in foundations and plinth in :Extra for Brick work in superstructure above plinth level upto floor V cum	Cum	17.53		
11.0	12 mm Cement plaster in course sand in 1:3 (1 cement : 3 coarse sand) **(for Internal walls)**	Sqm	64.48		
12.0	12 mm Cement plaster in course sand in 1:3 (1 cement : 3 coarse sand) **(for ceiling)**				
	Generator room	Sqm	24.00		

13.0	20 mm Cement plaster in course sand in 1:3 (1 cement : 3 coarse sand) **(for External walls**)	Sqm	89.54		
14.0	Wall painting with plastic emulsion paint of approved brand and manufacture to give an even shade : Two or more coats on new work **(for Internal walls)**	Sqm	64.48		
15.0	Wall painting with plastic emulsion paint of approved brand and manufacture to give an even shade : Two or more coats on new work **(for ceiling)**	Sqm	24.00		
16.0	Appying one coat of cement primer of approved brand and manufacture on wall surface **(for External walls)**	Sqm	89.54		
17.0	Providing wood work in frames of door, window clerestory windows and other frames, wrought framed and fixed in position in local wood for Door	Cum	0.16		
18.0	Providing and fixing paneled or paneled and glazed shutters for doors, windows and clerestory windows including black enameled MS butt hinges with necessary screws excluding panelling which will be paid for separately - 30 mm thick				
	For Doors	Sqm	4.20		
19.0	Providing and fixing glazing in aluminium door, window V shutters and partition etc with PVC / neoprene gasket etc. complete as per the architectural drawings and the directions of Engineer incharge. (Cost of aluminium snap bading shall be paid in basic item). With glass pans of 5.50 mm thickness (Weight not less than 13.75 kg/sqm)	Sqm	4.32		
20.0	Providing and laying Ceramic glazed floor tiles (400x400) mm (thickness to be specified by the manufacturer) of 1st quality conforming to IS:13755 of NITCO, ORIENT, SOMANY, KAJARIA or equivalent make in colours such as White, Ivory, Grey, Fume, Red, Brown, laid on 20 mm thick cement mortar 1:4 (1 cement : 4 coarse sand) including grouting the joints with white cement and matching pigments etc, complete.				
	Generater room	Sqm	24.00		
21.0	Cement plaster skirting (upto 30 cm height) with cement mortar 1:3 (1 cement : 3 coarse sand) finished with a floating coat of neat cement. **18 mm thick**	Sqm	2.70		
22.0	Providing and laying in situ five course water proofing treatment with glass fibre tissue reinforced bitumen over roof consisting of first coat of bitumen primer @ 0.40 kg per sqm, 2nd and 4th courses of bonding material 1.60 kg per sqm which shall consist of blown type bitumen of grade 85/25 conforming to IS : 702, third layer of glass fibre tissue course as specified, fifth, the top most layer of stone grit 6 mm and down size or pea-seized gravel sprad @ 6 dm^3 per sqm including preparation of surface excluding grading for slope etc. compete.	Sqm	24.00		
23.0	Providing and fixing on wall face unplastidsed-PVC (working pressure 4 kgf per sqm) rain water pipes conforming to IS :4985 including jointing with seal ring conforming to IS: 5382 leaving 10 mm gap for thermal expansion. **110 mm diameter**	m	13.50		
24.0	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20 cm in depth : consolidating each deposited layer by ramming and wateing lead.	Cum	14.86		
25.0	**Carriage of Materials :**				
	Aggregate	Cum	16.66		
	Coarse Sand	Cum	31.07		
	Local Sand	Cum	7.20		
	Cement	MT	6.01		
	Steel	MT	0.14		
	Brick (1000 Nos)		8.59		
	Total Cost				

3.4 Cost Estimate of Operators Quarter					
Sl. No	Item description	Unit	Quantity	Rate (INR)	Amount (INR)
1	Earthwork in excavation in foundation trenches or drains (not exceeding 1.5 m width or 10 sqm on plan) including dressing of sides and ramming of bottoms, lift upto 1.5 m including getting out the excavated soil and disposals of surplus excavated soil as directed, within a lead of 50 m. (For all kinds of soil)				
1.1	From 0 m to 1.5 m	Cum	36.72		
1.2	From 1.5 m to 3 m	Cum	3.24		
2	Supplying and Filling on plinth with local sand and under floors including watering, ramming consolidating and dressing complete.	Cum	18.82		
3	Providing and laying in position cement concrete of specified grade excluding the cost of centring and shuttering - all work upto plinth level in 1:3:6 (1 Cement : 3 coarse sand : 6 granded stone)	Cum	23.51		
4	Providing and laying in position machine batched, machine mixed, and machine vibrated design mix cement concrete of specified grade for reinforced cement concrete structural elements, excluding the cost of centering, shuttering, finishing and reinforcement, M-20 grade reinforced cement concrete.				
4.1	For Columnn Footing	Cum	4.48		
4.2	For Column below GL up to plinth	Cum	0.74		
4.3	For Plinth beams-PB	Cum	5.08		
4.4	For columns above GL	Cum	2.45		
4.5	For lintel beams	Cum	2.04		
4.6	For Roof beams	Cum	3.59		
4.7	For Roof slab	Cum	12.03		
4.8	For Parapet	Cum	2.39		
5	Providing and laying in position machine batched, machine mixed, and machine vibrated design mix cement concrete of specified grade for reinforced cement concrete structural elements, excluding the cost of centering, shuttering, finishing and reinforcement, M-20 grade reinforced cement concrete.				
5.1	Sunshade over Windows	Cum	0.89		
5.2	For Lofts & Racks	Cum	1.88		
6	Centring and Shuttering including strutting, propping etc. and removal of form for				
6.1	For Columnn Footing (C1 F1)	Sqm	10.80		
6.2	For Column below GL up to plinth	Sqm	51.36		
6.3	For Plinth beams-PB	Sqm	41.65		
6.4	For columns above GL	Sqm	42.66		
6.5	For lintel beams	Sqm	23.43		
6.6	For Roof beams	Sqm	30.97		
6.7	For Roof slab	Sqm	131.94		
6.8	For Parapet	Sqm	4.90		
7	Reinforcement for R. C. C work including straightening, cutting, bending, placing in position and binding all complete. Thermo - Mechanically Treated bars	MT	4.14		
8	Brick work with bricks of class designation 100A in foundations and plinth in :Extra for Brick work in superstructure above plinth level upto floor V cum	Cum	31.58		
9	12 mm Cement plaster in course sand in 1:3 (1 cement : 3 coarse sand) (for Internal walls)	Sqm	167.68		
10	12 mm Cement plaster in course sand in 1:3 (1 cement : 3 coarse sand) (for ceiling)	Sqm	58.41		
	20 mm Cement plaster in course sand in 1:3 (1 cement : 3				

11	coarse sand) (for External walls)	Sqm	147.88		

12	Wall painting with plastic emulsion paint of approved brand an	Sqm	226.09		
13	Appying one coat of cement primer of approved brand and manufacture on wall surface (for External walls)	Sqm	191.98		
14	Providing wood work in frames of door, window clerestory windows and other frames, wrought framed and fixed in position in local wood	Cum	0.50		
15	Providing and fixing paneled or paneled and glazed shutters for doors, windows and clerestory windows including black enameled MS butt hinges with necessary screws excluding panelling which will be paid for separately - 30 mm thick	Sqm	6.93		
16	Providing and fixing glazing in aluminium door, window ventilator shutters and partition etc with PVC / neoprene gasket etc. complete as per the architectural drawings and the directions of Engineer incharge. (Cost of aluminium snap bading shall be paid in basic item). With glass pans of 5.50 mm thickness (Weight not less than 13.75 kg/sqm)				
16.1	For Windows	Sqm	8.28		
16.2	For Ventilators	Sqm	0.72		
17	Providing and fabricating and fixing of M S grill for window protection etc ,. As per specification, drawing and as directed by the engineer				
	For Windows & Ventilators	kg	9.00		
18	Providing and laying in situ five course water proofing treatment with glass fibre tissue reinforced bitumen over roof consisting of first coat of bitumen primer @ 0.40 kg per sqm, 2nd and 4th courses of bonding material 1.60 kg per sqm which shall consist of blown type bitumen of grade 85/25 conforming to IS : 702, third layer of glass fibre tissue course as specified, fifth, the top most layer of stone grit 6 mm and down size or pea-seized gravel sprad @ 6 dm^3 per sqm including preparation of surface excluding grading for slope etc. compete.				
18.1	Slope concrete	Sqm	74.92		
19	Providing and laying Ceramic glazed floor tiles 400x400 mm (thickness to be specified by the manufacturer) of 1 st quality conforming to IS : 13755 of NITCO , ORIENT , SOMANY , KAJARIA or equivalent make in colours such as white , Ivory , Grey , Fume , Red , Brown , laid on 20 mm thick cement motar 1:4 (1 cement: 4 Coarse sand) including grouting the joints with white cement and matching pigments etc, complete.				
	Total quantity		58.41		
20	Providing and fixing first quality ceramic glazed wall tiles conforming to IS 15622 (thickness to be specified by the manufacturer) of approved maike in all colours shades except burgundy, bottle green, black of any size as approved by engineer incharge in skirting risers of steps and dados over 12 mm thick bed of cement mortar (1:3) and jointing with grey cement slurry at 3.3 kg per sqm including pointing in white cement mixed with pigment of matching shade complete				
	Total quantity	Rmt	55.67		
21	Providing and laying Ceramic glazed floor tiles 400x400 mm (thickness to be specified by the manufacturer) of 1st quality conforming to IS : 13755 of NITCO , ORIENT , SOMANY , KAJARIA or equivalent make in colours except white , Ivory , Grey , Fume , Red , Brown , laid on 20 mm thick cement motar 1:4 (1 cement: 4 Coarse sand) including grouting the joints with white cement and matching pigments etc, complete.				
21.1	Toilet	Sqm	5.85		
22	Providing and laying Ceramic glazed floor tiles 400x400 mm (thickness to be specified by the manufacturer) of 1st quality conforming to IS : 13755 of NITCO , ORIENT , SOMANY , KAJARIA or equivalent make in colours except white , Ivory , Grey , Fume , Red , Brown , laid on 20 mm thick cement motar 1:4 (1 cement: 4 Coarse sand) including grouting the joints with white cement and matching pigments etc, complete.				
22.1	Toilet Walls	Sqm	17.54		

23	Providing and fixing on wall face unplastidsed-PVC(working pressure 4 kgf per sqm) rain water pipes conforming to IS :4985 including jointing with seal ring conforming to IS: 5382 leaving 10 mm gap for thermal expansion	Rmt	15.60		
24	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20 cm in depth : consolidating each deposited layer by ramming and wateing lead.	Cum	25.88		
25	Carriage of Materials :				
	Aggregate	Cum	52.34		
	Coarse Sand	Cum	68.34		
	Local Sand	Cum	18.82		
	Cement	MT	18.80		
	Steel	MT	0.00		
	Brick (1000 Nos)		15.48		
	Total Cost				
26.0	**Plumbing work :**				
26.1	Stainless steel kitchen sink - without drain board 470 mm X 420 mm bowl depth 178 mm	No.	1		
26.2	Salem Stainless steel AISI - 304 (18/8) Round basin 405 mm X 355 mm	No.	2		
26.3	PTMT - Soap Dish/Holder 138 mm X 102 mm X 75 mm	No.	3		
26.4	White vitreous china dual purpose closet (Anglo Indian W.C.) suitable for use as squatting pan or European type water closet as per manufacturer's specifications	No.	1		
26.4.1	White Vitreous china 10 lit. (full flush) capacity controlled low levelflushing cistern with all fittings	No.	1		
26.5	C.P.brass toilet paper holder of standard size	No.	3		
26.6	PTMT - Towel Rail (600 mm)	No.	3		
26.7	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes,having thermal stability for hot & cold water supply, including all CPVC plain & brass threaded fittings, including fixing the pipe with clamps at 1.00 m spacing. This includes jointing of pipes & fittings with one step CPVC solvent cement and testing of joints complete as per direction of Engineer in Charge.				
26.7.1	15 mm nominal outer dia Pipes	m	25		
26.7.2	25 mm nominal outer dia Pipes	m	25		
26.7.3	32 mm nominal outer dia Pipes	m	15		
26.8	uPVC pipes (working pressure 4 kg / cm2) Single socketed pipe				
26.8.1	75 mm	m	30		
26.8.2	110 mm	m	30		
26.9	15 mm C.P. brass tap with elbow operation lever	No.	4		
26.10	Gunmetal non-return valve-horizontal (screwed end) 25 mm dia	No.	1		
26.11	Providing and placing on terrace (at all floor levels) polyethylene water storage tank, ISI : 12701 marked, with cover and suitable locking arrangement and making necessary holes for inlet, outlet and overflow pipes but without fittings and the base support for tank.	lit	2000		
26.12	Brass full way valve with C.I. wheel (screwed end) 40 mm dia	No	1		
26.13	Gunmetal non-return valve-horizontal (screwed end) 25 mm dia	No	1		
26.14	Constructing brick masonry chamber for underground C.I. inspection chamber and bends with bricks in cement mortar 1:4 (1 cement : 4 coarse sand) C.I. cover with frame (light duty) 455x610 mm internal dimensions, total weight of cover with frame to be not less than 38kg (weight of cover 23 kg and weight of frame 15 kg), R.C.C. top slab with 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size), foundation concrete 1:5:10 (1 cement : 5 fine sand : 10 graded stone aggregate 40 mm nominal size), inside plastering 12 mm thick with cement mortar 1:3 (1 cement : 3 coarse sand), finished smooth with a floating coat of neat cement on walls and bed concrete etc. complete as per standard design : With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	No	1		

26.15	Providing and fixing square-mouth S.W. gully trap class SP-1 complete with C.I. grating brick masonry chamber with water tight C.I. cover with frame of 300 x300 mm size (inside) the weight of cover to be not less than 4.50 kg and frame to be not less than 2.70 kg as per standard design With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	No	1		
26.16	Circular shape 560 mm dia precast R.C.C. manhole cover with frame - H.D. - 35	No	1		
	Total Cost of Sanitary items				
	Total Cost				

3.5 Cost estimate For Electrical Components For Pump-house					
Sl.No	**Description**	**Unit**	**Quantity**	**Rate (INR)**	**Amount (INR)**
1.0	**EARTHING**				
1.1	Neutral Earthing - Earthing with Copper earth plate 600mmx600mmx3mm thick including accesseries, and providing masonary enclosure with cover plate having locking arrangement and watering pipe of 2.7m long etc with charcoal/coke and salt as required.	No	2		
1.2	Body Earthing - Earthing with Gi earth pipe 4.5m long, 40mm dia including accesseries, and providing masonary enclosure with cover plate having locking arrangement and watering pipe etc with charcoal/coke and salt as required.	No	2		
2.0	**LT PANEL BOARD (Indoor type)**				
2.1	Supplying and fixing following way prewired SP&N MCB distribution board of steel sheet for 240 volts on surface/ recess complete with loose wire box, terminal connectors for all incoming and outgoing circuits, duly prewired with suitable size FRLS PVC insulated copper conductor up to terminal blocks, tinned copper bus bar, neutral link, earth bar, din bar, detachable gland plate, interconnections, powder painted including earthing etc. as required. (But without MCB/ RCCB/ Isolator) 2 + 8 way/10 way, Double door	No	1		
2.2	**MCCB DISTRIBUTION BOARDS**				
	Providing and fixing 100A rating and 16KA breaking capacity and pole TP MCCB in existing cubicle panel board including drilling holes in cubicle panel, making connections, ets as required.	No	1		
2.3	**MINIATURE CIRCUIT BREAKERS**				
	Supplying and fixing 32A, triple pole and neutral, 415V, "C" curve, miniature circuit breaker for inductive load of triple pole and neutral in the existing MCB DB complete with connections, testing and commitioning etc as required.	No	2		
2.4	**MINIATURE CIRCUIT BREAKERS**				
	Supplying and fixing 32A, single pole and neutral, 240V, "C" curve, miniature circuit breaker for inductive load of single pole and neutral in the existing MCB DB complete with connections, testing and commitioning etc as required.	No	1		
2.5	**EARTHING**				
	Body Earthing - Earthing with Gi earth pipe 4.5m long, 40mm dia including accesseries, and providing masonary enclosure with cover plate having locking arrangement and watering pipe etc with charcoal/coke and salt as required.	No	2		
3.0	**DISTRIBUTION BOARD**				
3.1	Supply and fixing 4+12 way, single door, horizontal type thee pole and neutral, sheet steel, MCB DB, 415V, on surface/recess, complete with tinned copper bus bar, nuetral bus bar, earth bar, din bar, interconnections, powdered painted including earthing etc as required. (but without MCB/RCCB/isolators)	m	1		
3.2	**EARTHING**				
	Body Earthing - Earthing with Gi earth pipe 4.5m long, 40mm dia including accesseries, and providing masonary enclosure with cover plate having locking arrangement and watering pipe etc with charcoal/coke and salt as required.	No	2		
4	**CABLES**				
	Supply of LT UG cable having Copper conductor PVC insulated,Sheathed ,galvanised steel wire /steel tap armoured cable with PVC outer sheathing 1.1 KV class)				
4.1	4Cx16 sq mm + 2x16 sq mm earth wire	m	1		
4.2	4Cx10 sq mm + 2x10 sq mm earth wire	m	6.5		
4.3	4Cx4 sq mm + 2x4 sq mm earth wire	m	15		
4.4	2Cx2.5 sq mm + 1x2.5 sq mm earth wire	m	14		
5.0	**LUMINARIES, SOCKETS AND SWITCHES**				
5.1	120W Gate lamp with fitting	No	2		
5.2	40W flourescent lamp	No	4		
5.3	70W MH Lamp for site lighting	No	4		
5.4	Single switched socket with multi purpose	No	2		
5.5	Switches	No	6		
	Total Cost				

3.6 Cost estimate For Electrical Components For Pumphouse

Sl.No	Description	Unit	Quantity	Rate (INR)	Amount (INR)
1.0	**DIESEL GENERATOR 50 KVA**				
1.1	50 KVA, 40KW, 415V, 50 Hz, comprising of Perkins Engine Coupled to Stamford make Alternator, complete with all Standard accessories and ATS with Acoustic enclosure.	No	1		
1.2	**EARTHING**				
1.2.1	Neutral Earthing - Earthing with Copper earth plate 600mmx600mmx3mm thick including accesseries, and providing masonary enclosure with cover plate having locking arrangement and watering pipe of 2.7m long etc with charcoal/coke and salt as required.	No	2		
1.2.2	Body Earthing - Earthing with Gi earth pipe 4.5m long, 40mm dia including accesseries, and providing masonary enclosure with cover plate having locking arrangement and watering pipe etc with charcoal/coke and salt as required.	No	2		
2.0	**LT PANEL BOARD (Indoor type)**				
2.1	Supplying and fixing 4 ways surface/recess mounting, vertical type, 415V, TPN MCB distribution board of sheet steel, dust protected , duly powder painted, inclusive of 200A tinned copper bus bar, common neutral link, earth bar, din bar for mounting MCB's, with provision of 100A TP 16KA MCCB as incommer, interconnection between incomer MCCB and bus bars (but without MCB,s /MCCB's) as required. (Note : Vertical type MCB TPDB is normally used where 3 phase outlets are required.)	No	1		
2.2	**MCCB DISTRIBUTION BOARDS**				
	Providing and fixing 100A rating and 16KA breaking capacity and pole TP MCCB in existing cubicle panel board including drilling holes in cubicle panel, making connections, ets as required.	No	1		
2.3	**MINIATURE CIRCUIT BREAKERS**				
	Supplying and fixing 32A, triple pole and neutral, 415V, "C" curve, miniature circuit breaker for inductive load of triple pole and neutral in the existing MCB DB complete with connections, testing and commitioning etc as required.	No	2		
2.4	**MINIATURE CIRCUIT BREAKERS**				
	Supplying and fixing 32A, single pole and neutral, 240V, "C" curve, miniature circuit breaker for inductive load of single pole and neutral in the existing MCB DB complete with connections, testing and commitioning etc as required.	No	1		
2.5	**EARTHING**				
	Body Earthing - Earthing with Gi earth pipe 4.5m long, 40mm dia including accesseries, and providing masonary enclosure with cover plate having locking arrangement and watering pipe etc with charcoal/coke and salt as required.	No	2		
3.0	**DISTRIBUTION BOARD**				
3.1	Supply and fixing 4+12 way, single door, horizontal type thee pole and neutral, sheet steel, MCB DB, 415V, on surface/recess, complete with tinned copper bus bar, nuetral bus bar, earth bar, din bar, interconnections, powdered painted including earthing etc as required. (but without MCB/RCCB/isolators)	m	1		
3.2	**EARTHING**				
	Body Earthing - Earthing with Gi earth pipe 4.5m long, 40mm dia including accesseries, and providing masonary enclosure with cover plate having locking arrangement and watering pipe etc with charcoal/coke and salt as required.	No	2		
4.0	**CABLES**				
	Supply of LT UG cable having Copper conductor PVC insulated,Sheathed ,galvanised steel wire /steel tap armoured cable with PVC outer sheathing 1.1 KV class)				
4.1	4Cx16 sq mm + 2x16 sq mm earth wire	m	1		
4.2	4Cx10 sq mm + 2x10 sq mm earth wire	m	6.5		
4.3	4Cx4 sq mm + 2x4 sq mm earth wire	m	15		
4.4	2Cx2.5 sq mm + 1x2.5 sq mm earth wire	m	14		
5.0	**LUMINARIES, SOCKETS AND SWITCHES**				
5.1	120W Gate lamp with fitting	No	2		
5.2	40W flourescent lamp	No	4		
5.3	70W MH Lamp for site lighting	No	4		
5.4	Single switched socket with multi purpose	No	2		

5.5	Switches	No	6		
Total Cost					

3.7 SITC of Mechanical Components at each Pumping Station					
Sl.No	**Description**	**Quantity**	**Units**	**Rate**	**Amount**
1	**Manually Cleaned Bar Screen**				
	The screen shall be of removable type and shall consist of a welded stainless steel (AISI410) frame with vertical flats spaced at 30 mm. The flats shall not be less than 10 mm in thickness and not less than 50 mm deep. The flats shall not have any joint. The spacing between the flats shall be uniform and preferably so maintained by adequate number of spacers, which shall be so located as not to interfere with the raking operation. To facilitate the manual cleaning of the screen the inclination of the screen shall be between 45º and 60º to the horizontal. Single piece screen width should not be more than 1.5 m.Two numbers stainless steel rollers shall be fixed on each side of frame to facilitate rolling contact with guide channel during lifting and lowering of screen.				
1.2	(500 X 1500) mm	4	Nos		
2	Providing, erecting and giving test of Non clog sewage submersible pump set with SS CF8 M impeller,CI casing,SS 316 shaft suitable for 3 Ph ,415 V , 50 Hz A.C. Supply, submersible motor having TEFC encloouser with class F insulation and IP 68 protection .The pump shall be operated at 1450 RPM .The scope shall include required accessories viz automatic coupling device,guide pipe,,chain with shakle,flat submersible cable upto starter panel through suitable GI pipe (30 mtr 3 Core flat copper for each pump with necessary electrical connection with the starter panel and as per specifications. (HP)				
	4HP 4 Pumps for 2 lean, 1 peak and 1 average flow	4	Nos		
3	Providing Supplying erection testing and commissioning of 2 Tonne capacity Mobile Crane				
3.1	1 T Capacity for 7 m lift.	1	Nos		
	Total Cost, Rs				

3.8: Rising Main Data														
Sl. No. No	Chainage		Diameter (mm)	L (m)	B (mm)	Avg Depth of cut (m)	Sand Bediing depth (m)	Total Depth (m)	Total Quantity (cum)	Pipe Volume (cum)	Sand Bedding (cum)	Refilling (cum)	Disposal (cum)	Depth wise excvation quantity (Cum)
	From	To												0.0 to 2 m
1	2	3	4	5	6	7	8	9=7+8	10= 5x6x9	11=0.786*4^2*5	12 =5*6 *8	13= 10-11-12	14 =11+12	
1	Zone I		150.00	2857.21	0.75	1.35	0.15	1.50	3214.36	50.53	321.44	2842.40	371.97	3214.36
Total				**2857.21**		**4.05**			**3214.36**	**50.53**	**321.44**	**2842.40**	**371.97**	**3214.36**

3.8.1: Rising Main - BOQ							
Sl. No.	**Description of Item**	**Unit**					**Quantity**
1.0	Excavating trenches of required width for pipes cables, etc., including excavation for sockets, and dressing of sides, ramming of bottoms, depth upto 1.5 m including getting out the excavated soil, and then returning the soil as required, in layers not exceeding 20 cm in depth including consolidating each deposited layer by ramming, watering etc., and disposing of surplus excavated soil as directed, within a lead of 50 m.						
1.1	**0.0 to 1.5 mtr. Depth**						
	do - in all kindes of soil - 100%	m					3214.36
2.0	Supplying and Filling in plinth with local sand and under floors including , watering, ramming consolidation and dressing complete.	cum					321.44
3.0	Providing and laying S&S Centrifugally Cast (Spun) / Ductile Iron. Pipes conforming to IS : 8329 **:DI-K9 (MM)**						
3.1	150.00	m					2857.21
4	Providing push on joints to Centifugally (Spun) Cast Iron Pipes or Ductile Iron Pipes inculding testing of joints and the cost of rubber gasket (one at every 6m).						
4.1	150.00	Joint					476
5.0	Providing and laying D.I. specials of class K-12 suitable for push-on jointing as per IS : 9523 :						
5.1	**Bends-As per BS 4772 code**						
	90 degree (63.5 Kg)	kg					444.50
5.2	**Taper-As per BS 4772 code**						
	300x200mm (34.5 Kg)	kg					34.50
5.3	**Tee-As per BS 4772 code**						
	300x300x300 mm (79.5 Kg)	kg					79.50
6.0	Providing and fixing **C.I. sluice valves (**with cap) complete with bolts, nuts, rubber insertions etc.(the tail pieces if required will be paid separately)						
6.1	150.00	No					4.00
7.0	Providing and fixing **C.I. sluice valves for Scouring (**with cap) complete with bolts, nuts, rubber insertions etc.(the tail pieces if required will be paid separately)						
7.1	150.00	No					3.00
8.0	Providing & Constructing masonry Chamber 1.5x1.5x1.5 m inside, in brick work in cement mortar 1:3 (1 cement : 3 coarse sand) for valve, with cast insitu RCC slab with necessary reinforcment.The valve chamber shall be plastered with CM 1:4, A levelling coars of M10 shall be provided.The cost is inclusive of excavation , disposal and construction of valve chamber with moduar bricks plasting with cement mortar with all lead and lift etc., as per specification & drawing.						
8.1	Sluice valve chambers	No					3.00
8.2	Scour valve chambers	No					3.00
9.0	Providing and constructing of the RCC Thrust Blocks for DI bends including the excavations of soils up to the required depth ,disposal of soils after refilling with selected available earth,providing PCC including cost of labours,materials tools,curing etc., complete as per drawing and as directed by the Engineer (inclusive of cost of steel)						
9.4	150.00	No					7.00
	Enter Total pipe length	2857.21	M				
	Percentage of CC Road in town	70	%				2000.047
	Percentage of Asphalt Road in town	30	%				857.163
10	**Dismantling and restoration of roads :**						

10.1	Dismantling of cement concrete pavement (dismantling of cement concrete pavements by mechanical means using pneumatic tools, breaking to pieces not exceeding 0.02 cum in volume and stock pilling at designated locations and disposal of dismantled materials up to a lead of 1000 metres, stacking serviceable and unserviceable material	cum					270.01
10.2	Bituminous courses by mechanical means	cum					38.57
	Granular courses by manualmeans	cum					450.01
11	Restoration of road as per the specification and as directed by the engineer						
11.3.1	Restoration of CC road						
a	Compacting original ground supporting subgrade (Loosening of the ground upto a level of 500 mm below the subgrade level, watered, graded and compacted in layers to meet requirement of table 300-2 for subgrade construction.) Rolling with vibratory roller	cum					1285.74
b	**Wet Mix Macadam -** Providing, laying, spreading and compacting graded stone aggregate to wet mix macadam specification including premixing the material with water at OMC in mechanical mix plant carriage of mixed mathod of tipper to site, laying in uniform layers with paver in sub-base/base course on a well prepared surface and compacting with vibratory roller to achieve the desired density complete as per Specification	cum					96.43
c	Cement Concrete Pavement (Construction of un-reinforced, dowel jointed, plain cement concrete pavement over a prepared sub base with 43 grade cement @ 400 kg per cum, coarse and fine aggregate conforming to IS 383, maximum size of coarse aggregate not exceeding 25 mm, mixed in a batching and mixing plant as per approved mix design, transported to site, laid with a fixed form or slip form paver, spread, compacted and finished in a continuous operation including provision of contraction, expansion, construction and longitudinal joints, joint filler, separation membrane, sealant primer, joint sealant, debonding strip, dowel bar, tie rod, admixtures as approved, curing compound,finishing to lines and grades as per drawing)	cum					270.01
12.0	**Granular Sub-base with Close graded Material (By Mix in Place Method) -** Construction of **Granular sub-base(GSB)** by providing close graded Material, spreading in uniform layers with motor grader on prepared surface, mixing by mix in place method by rotavator at OMC, and compacting with vibratory power roller to achieve the desired density, complete as per Technical Specification						
		cum					270.01
	Total for Grading II Matrerial (50% of Total)	cum					135.00
	Total for Grading I Matrerial (50% of Total)	cum					135.00
b	**Wet Mix Macadam -** Providing, laying, spreading and compacting graded stone aggregate to wet mix macadam specification including premixing the material with water at OMC in mechanical mix plant carriage of mixed mathod of tipper to site, laying in uniform layers with paver in sub-base/base course on a well prepared surface and compacting with vibratory roller to achieve the desired density complete as per Specification	cum					450.01
c	**Pavement Courses - Bituminous**						
	Prime Coat - Providing and applying primer coat with Bitumen emulsion on prepared surface of granular base including cleaning of road surface and spraying primer at the rate of 0.6kg/sqm using mechnical means complete	sqm					1800.04
	Tack Coat - Providing and applying tack coat with Bitumen emulsion using emulsion pressure distributor at the rate of 0.2 kg per sqm on the prepared bituminous/granular surface cleaned with mechancial broom .	sqm					1800.04
	Providing and laying **Dense graded bituminous macadam** with 100-120 TPH batch HMP producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 4.0 to 4.5 % by weight of total mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MoRTH specifications Clause 507. (Grading II -19mm nominal size)	cum					45.00

3.8.2: Rising Main- Cost Estimate					
Sl. No.	**Description of Item**	**Unit**	**Quantity**	**Rate (INR)**	**Amount (INR)**
1.0	Excavating trenches of required width for pipes cables, etc., including excavation for sockets, and dressing of sides, ramming of bottoms, depth upto 1.5 m including getting out the excavated soil, and then returning the soil as required, in layers not exceeding 20 cm in depth including consolidating each deposited layer by ramming, watering etc., and disposing of surplus excavated soil as directed, within a lead of 50 m.				
1.1	**0.0 to 1.5 mtr. Depth**				
	do - in all kindes of soil - 100%	m	3214.36		
2.0	Supplying and Filling in plinth with local sand and under floors including , watering, ramming consolidation and dressing complete.	cum	321.44		
3.0	Providing and laying S&S Centrifugally Cast (Spun) / Ductile Iron. Pipes conforming to IS : 8329 **:DI-K9**				
3.1	150.00	m	2857.2		
4	Providing push on joints to Centifugally (Spun) Cast Iron Pipes or Ductile Iron Pipes inculding testing of joints and the cost of rubber gasket (one at every 6m).				
4.1	150.00	Joint	476		
5.0	Providing and laying D.I. specials of class K-12 suitable for push-on jointing as per IS : 9523 :				
5.1	**Bends-As per BS 4772 code**				
	90 degree (63.5 Kg)	kg	444.50		
5.2	**Taper-As per BS 4772 code**				
	300x200mm (34.5 Kg)	kg	34.50		
5.3	**Tee-As per BS 4772 code**				
	300x300x300 mm (79.5 Kg)	kg	79.50		
6.0	Providing and fixing **C.I. sluice valves (**with cap) complete with bolts, nuts, rubber insertions etc.(the tail pieces if required will be paid separately)				
6.1	150.00	No	4.00		
7.0	Providing and fixing **C.I. sluice valves for Scouring (**with cap) complete with bolts, nuts, rubber insertions etc.(the tail pieces if required will be paid separately)				
7.1	150.00	No	3.00		
8.0	Providing & Constructing masonry Chamber 1.5x1.5x1.5 m inside, in brick work in cement mortar 1:3 (1 cement : 3 coarse sand) for valve, with cast insitu RCC slab with necessary reinforcment.The valve chamber shall be plastered with CM 1:4, A levelling coars of M10 shall be provided.The cost is inclusive of excavation , disposal and construction of valve chamber with moduar bricks plasting with cement mortar with all lead and lift etc., as per specification& drawing.				
8.1	Sluice valve chambers	No	4.00		
8.2	Scour valve chambers	No	4.00		
9.0	Providing and constructing of the RCC Thrust Blocks for DI bends including the excavations of soils up to the required depth ,disposal of soils after refilling with selected available earth,providing PCC including cost of labours,materials tools,curing etc., complete as per drawing and as directed by the Engineer (inclusive of cost of steel)				
9.1	90 degree	No	2.00		
	Enter Total pipe length	2857.21	M		
	Percentage of CC Road in town	70.00	%		
	Percentage of Asphalt Road in town	30.00	%		
10	**Dismantling and restoration of roads :**				
10.1	Dismantling of cement concrete pavement (dismantling of cement concrete pavements by mechanical means using pneumatic tools, breaking to pieces not exceeding 0.02 cum in volume and stock pilling at designated locations	cum	270.01		

	and disposal of dismantled materials up to a lead of 1000 metres, stacking serviceable and unserviceable material				

10.2	Dismantalling of flexible Pavements(dismantling of flexible pavements and disposal of dismantled materials up to a lead of 1000 m, stacking serviceable and unserviseable materials separately)					
	Bituminous courses by mechanical means	cum		38.57		
	Granular courses by manualmeans	cum		450.01		
11	Restoration of road as per the specification and as directed by the engineer					
11.1	Restoration of CC road					
a	Compactingoriginalgroundsupportingsubgrade (Loosening of the ground upto a level of 500 mm below the subgrade level, watered, graded and compacted in layers to meet requirement of table 300-2 for subgrade construction.) Rolling with vibratory roller	cum		1285.74		
b	**Wet Mix Macadam -** Providing, laying, spreading and compacting graded stone aggregate to wet mix macadam specification including premixing the material with water at OMC in mechanical mix plant carriage of mixed mathod of tipper to site, laying in uniform layers with paver in sub-base/base course on a well prepared surface and compacting with vibratory roller to achieve the desired density complete as per Specification	cum		96.43		
c	Cement Concrete Pavement (Construction of un-reinforced, dowel jointed, plain cement concrete pavement over a prepared sub base with 43 grade cement @ 400 kg per cum, coarse and fine aggregate conforming to IS 383, maximum size of coarse aggregate not exceeding 25 mm, mixed in a batching and mixing plant as per approved mix design, transported to site, laid with a fixed form or slip form paver, spread, compacted and finished in a continuous operation including provision of contraction, expansion, construction and longitudinal joints, joint filler, separation membrane, sealant primer, joint sealant, debonding strip, dowel bar, tie rod, admixtures as approved, curing compound,finishing to lines and grades as per drawing)	cum		270.01		
12	**Pavement Courses - Granular**					
	Granular Sub-base with Close graded Material (By Mix in Place Method) - Construction of **Granular sub-base(GSB)** by providing close graded Material, spreading in uniform layers with motor grader on prepared surface, mixing by mix in place method by rotavator at OMC, and compacting with vibratory power roller to achieve the desired density, complete as per Technical Specification					
		cum				
	Total for Grading II Matrerial (50% of Total)	cum		135.00		
	Total for Grading I Matrerial (50% of Total)	cum		135.00		
b	**Wet Mix Macadam -** Providing, laying, spreading and compacting graded stone aggregate to wet mix macadam specification including premixing the material with water at OMC in mechanical mix plant carriage of mixed mathod of tipper to site, laying in uniform layers with paver in sub-base/base course on a well prepared surface and compacting with vibratory roller to achieve the desired density complete as per Specification	cum		450.01		
	Pavement Courses - Bituminous					
	Prime Coat - Providing and applyingprimer coat with Bitumen emulsion on prepared surface of granular base including cleaning of road surface and spraying primer at the rate of 0.6kg/sqm using mechnical means complete	sqm		1800.04		
c	**Tack Coat -** Providing and applying tack coat with Bitumen emulsion using emulsion pressure distributor at the rate of 0.2 kg per sqm on the prepared bituminous/granular surface cleaned with mechancial broom .	sqm		1800.04		
	Providing and laying **Dense graded bituminous macadam** with 100-120 TPH batch HMP producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 4.0 to 4.5 % by weight of total mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MoRTH specifications Clause 507. (Grading II -19mm nominal size)	cum		45.00		

Total Cost, Rs			

3.9 THRUST BLOCK - 90-degree					
Sl No	**Particulars**	**Unit**	**Quantity**	**Rate**	**Amount INR**
1	Providing and laying in position machine batched, machine mixed, and machine vibrated design mix cement concrete of specified grade for reinforced cement concrete structural elements, excluding the cost of centering, shuttering, finishing and reinforcement, M-20 grade reinforced cement concrete.	cum			
		cum	2.25		
	Reduction for Pipe	cum	0.01236		
	Total Quantity	cum	2.23764		
2	Reinforcement for R. C. C work including straightening, cutting, bending, placing in position and binding all complete. Thermo - Mechanically Treated bars - 10 mm dia	MT	0.01119		
3	Centring and Shuttering including strutting, propping etc. and removal of form for	sqm	3		
		sqm	3		
4	Carriage of Materials				
	Sand	cum	0.13		
	Aggregate	cum	0.25		
	Cement	MT	0.11		
	Steel	MT	0.00		

3.10 VALVE CHAMBER (MASONARY)					
Sl. No	**Item description**	**Unit**	**Qty**	**Rates (INR)**	**Amount (INR)**
	Earthwork in excavation over areas (exceeding 1.5m in depth 1.5 in width as well as 10 sqm on plan) including disposal of excavated earth lead upto 50m and lift upto 1.5m, disposal earth to be leveled and neatly dressed.				
1	From 0 m to 1.5 m	cum	7.02		
	From 3 m to 4.5 m	m^3	0.00		
	From 4.5 m to 6 m	m^3	0.00		
2	From 6 m to 7.5 m	m^3	0.00		
2	Providing and laying in position cement concrete of specified grade excluding the cost of centring and shuttering - all work upto plinth level in **1:3:6 (1 Cement : 3 coarse sand : 6 granded stone)**	cum	0.48		
3	Providing and laying in position machine batched, machine mixed and machine vibrated design mix cement concrete of specified grade for reinforced cement concrete structural elements, excluding the cost of centering, shuttering, finishing and reinforcement, **M-20** grade reinforced cement concrete.				
	Top slab	cum	0.60		
	Total		0.60		
4	Brick work with bricks of class designation 100B in foundations and plinth in : Cement Mortar 1:4 (1 cement : 4 coarse sand) Extra for Brick work in superstructure above plinth level upto floor V cum				
	Walls				
	Long walls	cum	1.50		
	Short walls	cum	1.13		
	Total Quantity for walls	cum	2.63		
5	Reinforcement for R. C. C work including straightening, cutting, bending, placing in position and binding all complete. Thermo - Mechanically Treated bars - 10 mm dia	MT	0.06		
6	Cement plaster in course sand in 1:3 -20 mm thick (1 cement : 3 coarse sand)	Sqm	18.00		
7	Providing orange colour safety foot rest of minimum 6 mm thick plastic encapsulated as per IS : 10910 on 12 mm dia steel bar conforming to IS : 1786 having minimum cross section as 23 mm X 25 mm and overall minimum length 263 mm and width as 165 mm with minimum 112 mm space between protruded legs having 2 mm tread on top surface by ribbing or chequering besides necessary and adequate anchoring projections on tail length on 138 mm as per standard drawing and suitable to with stand the bend test and chemical resistance test as per specifications and having manufacture's permanent identification mark to be visible even after fixing, including fixing in manholes with 30 X 20 X15 cm cement concrete block 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 20 mm nominal size) complete as per standard design.	Each	5		
	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20 cm in depth : consolidating each deposited layer by ramming and wateing lead.				
8	Total Earth work Quantity	cum	7.02		
	Deduct P.C.C quantity	cum	-0.48		
	Deduct Wall Quantity	cum	-5.40		
	Total Quantity	cum	1.13		
	Carriage of Materials				
	Coarse Sand	cum	0.92		
	Aggregate	cum	0.96		
9	Cement	MT	0.88		
	Steel	MT	0.01		
	Bricks (1000 Nos)		1.30		
	Total Cost				
	Total Cost, Rs				

3.11 Pumping Main Design - Economical Diameter

Year	Discharge		Design Parameters	Stage I		Stage II		Pipe material
			Discharge at Start	0.63	MLD	0.69	MLD	D.I.
2020	0.63	MLD	Discharge at End of Period	0.69	MLD	0.73	MLD	
2035	0.69	MLD	Avg. Discharge	0.66	MLD	0.71	MLD	
2050	0.73	MLD	Pumping hours at the End of Period	20.00	hrs	20.00	hrs	
			Avg. Pumping hours during the Period	19.13	hrs	19.45	hrs	
Design Period	15		Life of Electric Motors	15.00	years	15.00	hrs	
			Combined Eff. Of Pump Sets	75.00	%	75.00	%	
Static Head	16.00	m	Energy Charges	6.50	Rs./Unit	12.00	Rs./Unit	
			Interest Rate	10.00	%	10.00	%	
Terminal Head		m	Length of Pipeline	2857.21	m	2857.21	m	
			Capitalisation Coefficient for 15years	7.6061		7.6061		
Static + Terminal Head	16.00	m	Hazen William Coefficient for DI Pipes	140		120		
			Pump Cost per KW in Rs.	10000.00	Rs./KW	20000.00	Rs./KW	
			KW Reqd	0.125	per m Head	0.133	per m Head	
			Avg Annual Electrical Charge in Rs.	45418.04	per KW	85258.36	per KW	

Stage I

S. No.	I.D. (mm)	I.D. (m)	Discahrge (MLD)	Discahrge (m^3/sec)	Velocity (m/sec)	Frictional Head Loss per 1000m (m)	Total Frictional Head Loss (m)	Other Losses (m)	Total Head Loss (m)	Total Head (m)	Power Reqd (KW)	Pump Cost including 50% standby (Lakhs Rs.)
1	250	0.25	0.66	0.010	0.20	0.18	0.51	0.05	0.56	16.56	2.075	
2	300	0.30	0.66	0.010	0.14	0.07	0.21	0.02	0.23	16.23	2.034	
3	350	0.35	0.66	0.010	0.10	0.03	0.10	0.01	0.11	16.11	2.019	
4	400	0.40	0.66	0.010	0.08	0.02	0.05	0.01	0.06	16.06	2.013	
5	450	0.45	0.66	0.010	0.06	0.01	0.03	0.00	0.03	16.03	2.010	
6	600	0.60	0.66	0.010	0.03	0.00	0.01	0.00	0.01	16.01	2.007	
7	600	0.60	0.66	0.010	0.03	0.00	0.01	0.00	0.01	16.01	2.007	

Stage II

S. No.	I.D. (mm)	I.D. (m)	Discahrge (MLD)	Discahrge (m^3/sec)	Velocity (m/sec)	Frictional Head Loss per 1000m (m)	Total Frictional Head Loss (m)	Other Losses (m)	Total Head Loss (m)	Total Head (m)	Power Reqd (KW)	Pump Cost including 50% standby (Lakhs Rs.)
1	100	0.10	0.66	0.010	1.22	15.34	43.82	4.38	48.20	64.20	8.047	
2	150	0.15	0.66	0.010	0.54	2.13	6.08	0.61	6.69	22.69	2.844	
3	200	0.20	0.66	0.010	0.31	0.52	1.50	0.15	1.65	17.65	2.212	
4	250	0.25	0.66	0.010	0.20	0.18	0.51	0.05	0.56	16.56	2.075	
5	300	0.30	0.66	0.010	0.14	0.07	0.21	0.02	0.23	16.23	2.034	
6	350	0.35	0.66	0.010	0.10	0.03	0.10	0.01	0.11	16.11	2.019	
7	400	0.40	0.66	0.010	0.08	0.02	0.05	0.01	0.06	16.06	2.013	
8	450	0.45	0.66	0.010	0.06	0.01	0.03	0.00	0.03	16.03	2.010	
9	500	0.50	0.66	0.010	0.05	0.01	0.02	0.00	0.02	16.02	2.008	
10	600	0.60	0.66	0.010	0.03	0.00	0.01	0.00	0.01	16.01	2.007	
11	700	0.70	0.66	0.010	0.02	0.00	0.00	0.00	0.00	16.00	2.006	

I.D. (mm)	Rate per m length (Rs.) of DI Pipe	Pipe Cost (Lakhs Rs.)	Stage I				Grand Total of Capitilised Cost (Lakhs Rs.)
			Pump Cost (Lakhs Rs.)	Annual Energy Charges (Lakhs Rs.)	Capitilised Energy Charges (Lakhs Rs.)	Capitilised Total Cost (Lakhs Rs.)	
100	1024.6	29.275	1.207	3.65	27.80	58.28	
150	1537.0	43.915	0.427	1.29	9.83	54.17	
200	2114.6	60.419	0.332	1.00	7.64	68.39	
250	2945.9	84.171	0.311	0.94	7.17	91.65	
300	3663.7	104.680	0.305	0.92	7.03	112.01	
350	4503.1	128.663	0.303	0.92	6.98	135.94	
400	5768.7	164.824	0.302	0.91	6.95	172.08	

450	6668.8	190.542	0.301	0.91	6.94	197.79
500	8421.7	240.626	0.301	0.91	6.94	247.86
600	10168.7	290.541	0.301	0.91	6.93	297.77
700	14059.3	401.704	0.301	0.91	6.93	408.93

4.0 I&D Nallah - Mokama Ghat Nallah		
Item Description	**Quantity**	**Total Amount**
Drain construction Cost	Detailes are attached	
Outfall Structure cost	Detailes are attached	
Generator Room cost	Detailes are attached	
Operator Quarter Cost	Detailes are attached	
Elctrical Component	Detailes are attached	
DG Cost	Detailes are attached	
Rising main cost	Detailes are attached	
Pump and screen cost	Detailes are attached	
Total Cost, Rs		

4.1: Drain Construction Cost

				Existing Drain Size						Proposed Drain Size							
Sl. No.	**Name of Drains/ Nallah falling in Ganga River**	**Length of Drain (m) to be constructed**	**Velocity (m/sec)**	**Width**	**Depth**	**Area**	**Effective flow area**	**Flow**	**Flow (MLD)**	**Width**	**Height**	**Rate**	**Drain Cost**	**Width**	**Height**	**I&D**	**Remark**
6	Mokama Ghat Nala	100	0.10	1.00	1.50	1.5	10%	0.015	1.30	1.00	1.50			1.50	1.50	Pumping	TO STP

4.2: Outfall Structure - BOQ					
SIZE OF DRAIN AT OUTFALL		(Width)	1.5	Mtr	
S.No.	Prticular of items			Unit	Quantity
1	Earth work excavation in foundation trenches or drains including dressing of sides and ramming of bottoms, lift as follows, including getting out the excavated soil and disposal of surplus excavated soil as directed, with all lead and lift complete as per the specification and as directed by the Engineer In all types soils Depth upto 1.5 m			Cum	13.50 21.60 3.00 **38.10**
	1.5 m to 3.0 m				41.40
2	Sand filling upto 300mm in Plinth including watering and compacting in layers of 150 mm thick as per specifications and as directed by the Engineer.			Cum	2.70 4.32 0.60 **7.62**
3	Providing and laying in position cement concrete of specified grade excluding the cost of centring and shuttering - all work upto plinth level in 1:3:6 (1 Cement : 3 coarse sand : 6 granded stone)			Cum	2.75 4.40 0.15 **7.30**
4	Providing and laying in position machine batched, machine mixed, and machine vibrated design mix cement concrete of specified grade for reinforced cement concrete structural elements, excluding the cost of centering, shuttering, finishing and reinforcement, M-20 grade reinforced cement concrete.			Cum	4.13 6.60 6.60 0.21 5.50 3.30 **26.34**
5	Centring and Shuttering including strutting, propping etc. and removal of form for vertical walls			Sqm	55.00 22.00 **77.00**
6	Reinforcement for R. C. C work including straightening, cutting, bending, placing in position and binding all complete. Thermo - Mechanically Treated bars TMTC - 500 (Quantity at 90 kg/cum)			Kg	2370.60 2370.60
7	Carriage of the following materials from quarry to work site including loading, unloading and staking at work site as per specification & direction of E/I.			Aggregate Coarse Sand Local Sand Cement Steel	 2.3706
8	Fabrication & supply of water tight structuraal steel sliding type low head gate for dam head sluice and canals with gate leaf and frame as per IS 5620 complete with brass / stainless steel lining of appropriate size for seal seats and sill and seals seat				240
8.1	For roof slab			Sqm	22
8.2	Weather shade,Chajjas, corbels etc. including edges			Sqm	1.2
9	Reinforcement for R. C. C work including straightening, cutting, bending, placing in position and binding all complete. Thermo - Mechanically Treated bars				11
	steel quantities			kg	990.00
10	Brick work with bricks of class designation 100A in foundations and plinth in :Extra for Brick work in superstructure above plinth level upto floor V cum			Cum	6.555
11	12 mm Cement plaster in course sand in 1:3 (1 cement : 3 coarse sand) (for Internal walls)			Sqm	28.5
12	12 mm Cement plaster in course sand in 1:3 (1 cement : 3 coarse sand) (for ceiling)			Sqm	22
13	20 mm Cement plaster in course sand in 1:3 (1 cement : 3 coarse sand) (for External walls)			Sqm	29.4
14	Wall painting with plastic emulsion paint of approved brand and manufacture to give an even shade : Two or more coats on new work (for Internal walls)			Sqm	28.5

4.2: Outfall Structure - BOQ					
SIZE OF DRAIN AT OUTFALL		(Width)	1.5	Mtr	
S.No.	Prticular of items			Unit	Quantity
15	Wall painting with plastic emulsion paint of approved brand and manufacture to give an even shade : Two or more coats on new work (for ceiling)			Sqm	22
16	Appying one coat of cement primer of approved brand and manufacture on wall surface (for External walls)			Sqm	29.4
17	Providing wood work in frames of door, window clerestory windows and other frames, wrought framed and fixed in position in local wood for Door			Cum	0.5
18	Providing and fixing paneled or paneled and glazed shutters for doors, windows and clerestory windows including black enameled MS butt hinges with necessary screws excluding panelling which will be paid for separately - 30 mm thick				
	For Doors			Sqm	1.8
19	Providing and fixing glazing in aluminium door, window V shutters and partition etc with PVC / neoprene gasket etc. complete as per the architectural drawings and the directions of Engineer incharge. (Cost of aluminium snap bading shall be paid in basic item). With glass pans of 5.50 mm thickness (Weight not less than 13.75 kg/sqm)			Sqm	0.5
20	Providing and laying Ceramic glazed floor tiles (400x400) mm (thickness to be specified by the manufacturer) of 1st quality conforming to IS:13755 of NITCO, ORIENT, SOMANY, KAJARIA or equivalent make in colours such as White, Ivory, Grey, Fume, Red, Brown, laid on 20 mm thick cement mortar 1:4 (1 cement : 4 coarse sand) including grouting the joints with white cement and matching pigments etc, complete.			Sqm	22

4.2.1 Cost Estimate for Outfall Structures					
Sl no.	**Description of Item**	**Unit**	**Quantity**	**Rate (INR)**	**Amount (INR)**
1	Earth work excavation in foundation trenches or drains including dressing of sides and ramming of bottoms, lift as follows, including getting out the excavated soil and disposal of surplus excavated soil as directed, with all lead and lift complete as per the specification and as directed by the Engineer. All kinds of soils				
1.1.1	Upto1.50m depth	cum	38.10		
	1.5 m to 3 m	cum	41.40		
2	Sand filling upto 300mm in Plinth including watering and compacting in layers of 150 mm thick as per specifications and as directed by the Engineer.	cum	7.62		
3	Providing and laying in position cement concrete of specified grade excluding the cost of centring and shuttering - all work upto plinth level in 1:3:6 (1 Cement : 3 coarse sand : 6 granded stone)	Cum	7.30		
4	Providing and laying in position machine batched, machine mixed, and machine vibrated design mix cement concrete of specified grade for reinforced cement concrete structural elements, excluding the cost of centering, shuttering, finishing and reinforcement, M-20 grade reinforced cement concrete.	Cum	26.34		
5	Centring and Shuttering including strutting, propping etc. and removal of form for vertical walls	sqm	77.00		
6	Reinforcement for R. C. C work including straightening, cutting, bending, placing in position and binding all complete. Thermo - Mechanically Treated bars TMTC - 500 (Quantity at 90 kg/cum)	Kg	2370.60		
7	Carriage of the following materials from quarry to work site including loading, unloading and staking at work site as per specification & direction of E/I.				
	Aggregate	Cum	55.73		
	Sand	Cum	27.87		
	Cement	MT	25.01		
	Steel	MT	2.3706		
8	Wrought iron and mild steel welded work (using angles, square bars, tees and channel grills, grating frames, gates and tree guards of any size and design etc. including cost of screens and welding rods or bolts and nuts complete fixed in position but without the cost of excavation and concrete for fixing which will be paid separately	Kg	240.00		
	Erection of gates (a) 30% item NO- 8	kg	240.00		
8.0	Centring and Shuttering including strutting, propping etc. and removal of form for Roof slab				
8.1	For roof slab	Sqm	22.00		
8.2	Weather shade,Chajjas, corbels etc. including edges	Sqm	1.20		
9.0	Reinforcement for R. C. C work including straightening, cutting, bending, placing in position and binding all complete. Thermo - Mechanically Treated bars		11.00		
	steel quantities	kg	990.00		
10.0	Brick work with bricks of class designation 100A in foundations and plinth in :Extra for Brick work in superstructure above plinth level upto floor V cum	Cum	6.56		
11.0	12 mm Cement plaster in course sand in 1:3 (1 cement : 3 coarse sand) **(for Internal walls)**	Sqm	28.50		
12.0	12 mm Cement plaster in course sand in 1:3 (1 cement : 3 coarse sand) **(for ceiling)**	Sqm	22.00		

Sl no.	Description of Item	Unit	Quantity	Rate (INR)	Amount (INR)
13.0	20 mm Cement plaster in course sand in 1:3 (1 cement : 3 coarse sand) **(for External walls)**	Sqm	29.40		
14.0	Wall painting with plastic emulsion paint of approved brand and manufacture to give an even shade : Two or more coats on new work **(for Internal walls)**	Sqm	28.50		
15.0	Wall painting with plastic emulsion paint of approved brand and manufacture to give an even shade : Two or more coats on new work **(for ceiling)**	Sqm	28.50		
16.0	Appying one coat of cement primer of approved brand and manufacture on wall surface **(for External walls)**	Sqm	22.00		
17.0	Providing wood work in frames of door, window clerestory windows and other frames, wrought framed and fixed in position in local wood for Door	Cum	29.40		
18.0	Providing and fixing paneled or paneled and glazed shutters for doors, windows and clerestory windows including black enameled MS butt hinges with necessary screws excluding panelling which will be paid for separately - 30 mm thick		0.50		
	For Doors	Sqm	1.80		
19.0	Providing and fixing glazing in aluminium door, window V shutters and partition etc with PVC / neoprene gasket etc. complete as per the architectural drawings and the directions of Engineer incharge. (Cost of aluminium snap bading shall be paid in basic item). With glass pans of 5.50 mm thickness (Weight not less than 13.75 kg/sqm)	Sqm	0.50		
20.0	Providing and laying Ceramic glazed floor tiles (400x400) mm (thickness to be specified by the manufacturer) of 1st quality conforming to IS:13755 of NITCO, ORIENT, SOMANY, KAJARIA or equivalent make in colours such as White, Ivory, Grey, Fume, Red, Brown, laid on 20 mm thick cement mortar 1:4 (1 cement : 4 coarse sand) including grouting the joints with white cement and matching pigments etc, complete.	Sqm	22.00		
	Total Cost, Rs				

4.2.2 DETAILS OF MEASUREMENT (Carriage Items)						
S.No.	**Particulars of item**	**Unit**	**Quantity**	**Cement (Kg)**	**Sand (Cum)**	**Aggregate (Cum)**
1	RCC (1:1.5:3)	Cum	59.34	23439.30	24.57	49.13
2	PCC (1:3:6)	Cum	7.30	1569.50	3.30	6.60
	Total			**25009**	**27.87**	**55.73**

4.3 Cost estimate of Generator Room					
Sl. No.	**Item description**	**Unit**	**Quantity**	**Rate (INR)**	**Amount (INR)**
	Earth work				
1.0	Earthwork in excavation in foundation trenches or drains (not exceeding 1.5 m width or 10 sqm on plan) including dressing of sides and ramming of bottoms, lift upto 1.5 m including getting out the excavated soil and disposals of surplus excavated soil as directed, within a lead of 50 m. (For all kinds of soil)				
1.1	From 0 m to 1.5 m	Cum	22.54		
1.2	From 1.5 m to 3 m	Cum	1.35		
2.0	Supplying and Filling on plinth with local sand and under floors including watering, ramming consolidating and dressing complete. For Generater room	Cum	7.20		
3.0	Providing and laying in position cement concrete of specified grade excluding the cost of centring and shuttering - all work upto plinth level in 1:3:6 (1 Cement : 3 coarse sand : 6 granded stone upto 20 mm nominal size)	Cum	7.33		
4.0	Providing and laying in position machine batched, machine mixed, and machine vibrated design mix cement concrete of specified grade for reinforced cement concrete structural elements, excluding the cost of centering, shuttering, finishing and reinforcement, M-20 grade reinforced cement concrete.				
4.1	For Footings	Cum	1.44		
4.2	Column below GL up to Plinth	Cum	0.26		
4.3	Plinth beams	Cum	1.61		
4.4	For columns above Ground levels	Cum	0.87		
4.5	Lintel beams	Cum	1.43		
4.6	Roof Beams	Cum	1.33		
4.7	For roof slab	Cum	4.32		
4.8	For Sunshades over Door & Windows :	Cum	0.23		
5.0	Centring and Shuttering including strutting, propping etc. and removal of form for				
5.1	For footing - F	Sqm	4.80		
5.2	Column upto GL - C	Sqm	4.60		
5.3	Plinth beams :	Sqm	14.00		
6.0	Centring and Shuttering including strutting, propping etc. and removal of form for	Sqm			
6.1	Lintel beams	Sqm	12.40		
6.2	Roof beams	Sqm	12.40		
7.0	Centring and Shuttering including strutting, propping etc. and removal of form for				
	Column	Sqm	15.09		
8.0	Centring and Shuttering including strutting, propping etc. and removal of form for Roof slab				
8.1	For roof slab	Sqm	24.00		
8.2	Weather shade,Chajjas, corbels etc. including edges	Sqm	4.13		
9.0	Reinforcement for R. C. C work including straightening, cutting, bending, placing in position and binding all complete. Thermo - Mechanically Treated bars				
	steel quantities	MT	1.34		
10.0	Brick work with bricks of class designation 100A in foundations and plinth in :Extra for Brick work in superstructure above plinth level upto floor V cum	Cum	17.53		
11.0	12 mm Cement plaster in course sand in 1:3 (1 cement : 3 coarse sand) **(for Internal walls)**	Sqm	64.48		
12.0	12 mm Cement plaster in course sand in 1:3 (1 cement : 3 coarse sand) **(for ceiling)**				

	Generator room	Sqm	24.00		

13.0	20 mm Cement plaster in course sand in 1:3 (1 cement : 3 coarse sand) **(for External walls**)	Sqm	89.54		
14.0	Wall painting with plastic emulsion paint of approved brand and manufacture to give an even shade : Two or more coats on new work **(for Internal walls)**	Sqm	64.48		
15.0	Wall painting with plastic emulsion paint of approved brand and manufacture to give an even shade : Two or more coats on new work **(for ceiling)**	Sqm	24.00		
16.0	Appying one coat of cement primer of approved brand and manufacture on wall surface **(for External walls)**	Sqm	89.54		
17.0	Providing wood work in frames of door, window clerestory windows and other frames, wrought framed and fixed in position in local wood for Door	Cum	0.16		
18.0	Providing and fixing paneled or paneled and glazed shutters for doors, windows and clerestory windows including black enameled MS butt hinges with necessary screws excluding panelling which will be paid for separately - 30 mm thick				
	For Doors	Sqm	4.20		
19.0	Providing and fixing glazing in aluminium door, window V shutters and partition etc with PVC / neoprene gasket etc. complete as per the architectural drawings and the directions of Engineer incharge. (Cost of aluminium snap bading shall be paid in basic item). With glass pans of 5.50 mm thickness (Weight not less than 13.75 kg/sqm)	Sqm	4.32		
20.0	Providing and laying Ceramic glazed floor tiles (400x400) mm (thickness to be specified by the manufacturer) of 1st quality conforming to IS:13755 of NITCO, ORIENT, SOMANY, KAJARIA or equivalent make in colours such as White, Ivory, Grey, Fume, Red, Brown, laid on 20 mm thick cement mortar 1:4 (1 cement : 4 coarse sand) including grouting the joints with white cement and matching pigments etc, complete.				
	Generater room	Sqm	24.00		
21.0	Cement plaster skirting (upto 30 cm height) with cement mortar 1:3 (1 cement : 3 coarse sand) finished with a floating coat of neat cement. **18 mm thick**	Sqm	2.70		
22.0	Providing and laying in situ five course water proofing treatment with glass fibre tissue reinforced bitumen over roof consisting of first coat of bitumen primer @ 0.40 kg per sqm, 2nd and 4th courses of bonding material 1.60 kg per sqm which shall consist of blown type bitumen of grade 85/25 conforming to IS : 702, third layer of glass fibre tissue course as specified, fifth, the top most layer of stone grit 6 mm and down size or pea-seized gravel sprad @ 6 dm^3 per sqm including preparation of surface excluding grading for slope etc. compete.	Sqm	24.00		
23.0	Providing and fixing on wall face unplastidsed-PVC (working pressure 4 kgf per sqm) rain water pipes conforming to IS :4985 including jointing with seal ring conforming to IS: 5382 leaving 10 mm gap for thermal expansion. **110 mm diameter**	m	13.50		
24.0	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20 cm in depth : consolidating each deposited layer by ramming and wateing lead.	Cum	14.86		
25.0	**Carriage of Materials :**				
	Aggregate	Cum	16.66		
	Coarse Sand	Cum	31.07		
	Local Sand	Cum	7.20		
	Cement	MT	6.01		
	Steel	MT	0.14		
	Brick (1000 Nos)		8.59		
	Total Cost				

4.4 Cost Estimate of Operators Quarter					
Sl. No	Item description	Unit	Quantity	Rate (INR)	Amount (INR)
1	Earthwork in excavation in foundation trenches or drains (not exceeding 1.5 m width or 10 sqm on plan) including dressing of sides and ramming of bottoms, lift upto 1.5 m including getting out the excavated soil and disposals of surplus excavated soil as directed, within a lead of 50 m. (For all kinds of soil)				
1.1	From 0 m to 1.5 m	Cum	36.72		
1.2	From 1.5 m to 3 m	Cum	3.24		
2	Supplying and Filling on plinth with local sand and under floors including watering, ramming consolidating and dressing complete.	Cum	18.82		
3	Providing and laying in position cement concrete of specified grade excluding the cost of centring and shuttering - all work upto plinth level in 1:3:6 (1 Cement : 3 coarse sand : 6 granded stone)	Cum	23.51		
4	Providing and laying in position machine batched, machine mixed, and machine vibrated design mix cement concrete of specified grade for reinforced cement concrete structural elements, excluding the cost of centering, shuttering, finishing and reinforcement, M-20 grade reinforced cement concrete.				
4.1	For Columnn Footing	Cum	4.48		
4.2	For Column below GL up to plinth	Cum	0.74		
4.3	For Plinth beams-PB	Cum	5.08		
4.4	For columns above GL	Cum	2.45		
4.5	For lintel beams	Cum	2.04		
4.6	For Roof beams	Cum	3.59		
4.7	For Roof slab	Cum	12.03		
4.8	For Parapet	Cum	2.39		
5	Providing and laying in position machine batched, machine mixed, and machine vibrated design mix cement concrete of specified grade for reinforced cement concrete structural elements, excluding the cost of centering, shuttering, finishing and reinforcement, M-20 grade reinforced cement concrete.				
5.1	Sunshade over Windows	Cum	0.89		
5.2	For Lofts & Racks	Cum	1.88		
6	Centring and Shuttering including strutting, propping etc. and removal of form for				
6.1	For Columnn Footing (C1 F1)	Sqm	10.80		
6.2	For Column below GL up to plinth	Sqm	51.36		
6.3	For Plinth beams-PB	Sqm	41.65		
6.4	For columns above GL	Sqm	42.66		
6.5	For lintel beams	Sqm	23.43		
6.6	For Roof beams	Sqm	30.97		
6.7	For Roof slab	Sqm	131.94		
6.8	For Parapet	Sqm	4.90		
7	Reinforcement for R. C. C work including straightening, cutting, bending, placing in position and binding all complete. Thermo - Mechanically Treated bars	MT	4.14		
8	Brick work with bricks of class designation 100A in foundations and plinth in :Extra for Brick work in superstructure above plinth level upto floor V cum	Cum	31.58		
9	12 mm Cement plaster in course sand in 1:3 (1 cement : 3 coarse sand) (for Internal walls)	Sqm	167.68		
10	12 mm Cement plaster in course sand in 1:3 (1 cement : 3 coarse sand) (for ceiling)	Sqm	58.41		
	20 mm Cement plaster in course sand in 1:3 (1 cement : 3				

11	coarse sand) (for External walls)	Sqm	147.88		

12	Wall painting with plastic emulsion paint of approved brand an	Sqm	226.09		
13	Appying one coat of cement primer of approved brand and manufacture on wall surface (for External walls)	Sqm	191.98		
14	Providing wood work in frames of door, window clerestory windows and other frames, wrought framed and fixed in position in local wood	Cum	0.50		
15	Providing and fixing paneled or paneled and glazed shutters for doors, windows and clerestory windows including black enameled MS butt hinges with necessary screws excluding panelling which will be paid for separately - 30 mm thick	Sqm	6.93		
16	Providing and fixing glazing in aluminium door, window ventilator shutters and partition etc with PVC / neoprene gasket etc. complete as per the architectural drawings and the directions of Engineer incharge. (Cost of aluminium snap bading shall be paid in basic item). With glass pans of 5.50 mm thickness (Weight not less than 13.75 kg/sqm)				
16.1	For Windows	Sqm	8.28		
16.2	For Ventilators	Sqm	0.72		
17	Providing and fabricating and fixing of M S grill for window protection etc ,. As per specification, drawing and as directed by the engineer				
	For Windows & Ventilators	kg	9.00		
18	Providing and laying in situ five course water proofing treatment with glass fibre tissue reinforced bitumen over roof consisting of first coat of bitumen primer @ 0.40 kg per sqm, 2nd and 4th courses of bonding material 1.60 kg per sqm which shall consist of blown type bitumen of grade 85/25 conforming to IS : 702, third layer of glass fibre tissue course as specified, fifth, the top most layer of stone grit 6 mm and down size or pea-seized gravel sprad @ 6 dm^3 per sqm including preparation of surface excluding grading for slope etc. compete.				
18.1	Slope concrete	Sqm	74.92		
19	Providing and laying Ceramic glazed floor tiles 400x400 mm (thickness to be specified by the manufacturer) of 1 st quality conforming to IS : 13755 of NITCO , ORIENT , SOMANY , KAJARIA or equivalent make in colours such as white , Ivory , Grey , Fume , Red , Brown , laid on 20 mm thick cement motar 1:4 (1 cement: 4 Coarse sand) including grouting the joints with white cement and matching pigments etc, complete.				
	Total quantity		58.41		
20	Providing and fixing first quality ceramic glazed wall tiles conforming to IS 15622 (thickness to be specified by the manufacturer) of approved maike in all colours shades except burgundy, bottle green, black of any size as approved by engineer incharge in skirting risers of steps and dados over 12 mm thick bed of cement mortar (1:3) and jointing with grey cement slurry at 3.3 kg per sqm including pointing in white cement mixed with pigment of matching shade complete				
	Total quantity	Rmt	55.67		
21	Providing and laying Ceramic glazed floor tiles 400x400 mm (thickness to be specified by the manufacturer) of 1st quality conforming to IS : 13755 of NITCO , ORIENT , SOMANY , KAJARIA or equivalent make in colours except white , Ivory , Grey , Fume , Red , Brown , laid on 20 mm thick cement motar 1:4 (1 cement: 4 Coarse sand) including grouting the joints with white cement and matching pigments etc, complete.				
21.1	Toilet	Sqm	5.85		
22	Providing and laying Ceramic glazed floor tiles 400x400 mm (thickness to be specified by the manufacturer) of 1st quality conforming to IS : 13755 of NITCO , ORIENT , SOMANY , KAJARIA or equivalent make in colours except white , Ivory , Grey , Fume , Red , Brown , laid on 20 mm thick cement motar 1:4 (1 cement: 4 Coarse sand) including grouting the joints with white cement and matching pigments etc, complete.				
22.1	Toilet Walls	Sqm	17.54		

23	Providing and fixing on wall face unplastidsed-PVC(working pressure 4 kgf per sqm) rain water pipes conforming to IS :4985 including jointing with seal ring conforming to IS: 5382 leaving 10 mm gap for thermal expansion	Rmt	15.60		
24	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20 cm in depth : consolidating each deposited layer by ramming and wateing lead.	Cum	25.88		
25	Carriage of Materials :				
	Aggregate	Cum	52.34		
	Coarse Sand	Cum	68.34		
	Local Sand	Cum	18.82		
	Cement	MT	18.80		
	Steel	MT	0.00		
	Brick (1000 Nos)		15.48		
	Total Cost				
26.0	**Plumbing work :**				
26.1	Stainless steel kitchen sink - without drain board 470 mm X 420 mm bowl depth 178 mm	No.	1		
26.2	Salem Stainless steel AISI - 304 (18/8) Round basin 405 mm X 355 mm	No.	2		
26.3	PTMT - Soap Dish/Holder 138 mm X 102 mm X 75 mm	No.	3		
26.4	White vitreous china dual purpose closet (Anglo Indian W.C.) suitable for use as squatting pan or European type water closet as per manufacturer's specifications	No.	1		
26.4.1	White Vitreous china 10 lit. (full flush) capacity controlled low levelflushing cistern with all fittings	No.	1		
26.5	C.P.brass toilet paper holder of standard size	No.	3		
26.6	PTMT - Towel Rail (600 mm)	No.	3		
26.7	Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes,having thermal stability for hot & cold water supply, including all CPVC plain & brass threaded fittings, including fixing the pipe with clamps at 1.00 m spacing. This includes jointing of pipes & fittings with one step CPVC solvent cement and testing of joints complete as per direction of Engineer in Charge.				
26.7.1	15 mm nominal outer dia Pipes	m	25		
26.7.2	25 mm nominal outer dia Pipes	m	25		
26.7.3	32 mm nominal outer dia Pipes	m	15		
26.8	uPVC pipes (working pressure 4 kg / cm2) Single socketed pipe				
26.8.1	75 mm	m	30		
26.8.2	110 mm	m	30		
26.9	15 mm C.P. brass tap with elbow operation lever	No.	4		
26.10	Gunmetal non-return valve-horizontal (screwed end) 25 mm dia	No.	1		
26.11	Providing and placing on terrace (at all floor levels) polyethylene water storage tank, ISI : 12701 marked, with cover and suitable locking arrangement and making necessary holes for inlet, outlet and overflow pipes but without fittings and the base support for tank.	lit	2000		
26.12	Brass full way valve with C.I. wheel (screwed end) 40 mm dia	No	1		
26.13	Gunmetal non-return valve-horizontal (screwed end) 25 mm dia	No	1		
26.14	Constructing brick masonry chamber for underground C.I. inspection chamber and bends with bricks in cement mortar 1:4 (1 cement : 4 coarse sand) C.I. cover with frame (light duty) 455x610 mm internal dimensions, total weight of cover with frame to be not less than 38kg (weight of cover 23 kg and weight of frame 15 kg), R.C.C. top slab with 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size), foundation concrete 1:5:10 (1 cement : 5 fine sand : 10 graded stone aggregate 40 mm nominal size), inside plastering 12 mm thick with cement mortar 1:3 (1 cement : 3 coarse sand), finished smooth with a floating coat of neat cement on walls and bed concrete etc. complete as per standard design : With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	No	1		

26.15	Providing and fixing square-mouth S.W. gully trap class SP-1 complete with C.I. grating brick masonry chamber with water tight C.I. cover with frame of 300 x300 mm size (inside) the weight of cover to be not less than 4.50 kg and frame to be not less than 2.70 kg as per standard design With common burnt clay F.P.S. (non modular) bricks of class designation 7.5	No	1		
26.16	Circular shape 560 mm dia precast R.C.C. manhole cover with frame - H.D. - 35	No	1		
	Total Cost of Sanitary items				
	Total Cost				

4.5 Cost estimate For Electrical Components For Pump-house					
Sl.No	**Description**	**Unit**	**Quantity**	**Rate (INR)**	**Amount (INR)**
1.0	**EARTHING**				
1.1	Neutral Earthing - Earthing with Copper earth plate 600mmx600mmx3mm thick including accesseries, and providing masonary enclosure with cover plate having locking arrangement and watering pipe of 2.7m long etc with charcoal/coke and salt as required.	No	2		
1.2	Body Earthing - Earthing with Gi earth pipe 4.5m long, 40mm dia including accesseries, and providing masonary enclosure with cover plate having locking arrangement and watering pipe etc with charcoal/coke and salt as required.	No	2		
2.0	**LT PANEL BOARD (Indoor type)**				
2.1	Supplying and fixing following way prewired SP&N MCB distribution board of steel sheet for 240 volts on surface/ recess complete with loose wire box, terminal connectors for all incoming and outgoing circuits, duly prewired with suitable size FRLS PVC insulated copper conductor up to terminal blocks, tinned copper bus bar, neutral link, earth bar, din bar, detachable gland plate, interconnections, powder painted including earthing etc. as required. (But without MCB/ RCCB/ Isolator) 2 + 8 way/10 way, Double door	No	1		
2.2	**MCCB DISTRIBUTION BOARDS**				
	Providing and fixing 100A rating and 16KA breaking capacity and pole TP MCCB in existing cubicle panel board including drilling holes in cubicle panel, making connections, ets as required.	No	1		
2.3	**MINIATURE CIRCUIT BREAKERS**				
	Supplying and fixing 32A, triple pole and neutral, 415V, "C" curve, miniature circuit breaker for inductive load of triple pole and neutral in the existing MCB DB complete with connections, testing and commitioning etc as required.	No	2		
2.4	**MINIATURE CIRCUIT BREAKERS**				
	Supplying and fixing 32A, single pole and neutral, 240V, "C" curve, miniature circuit breaker for inductive load of single pole and neutral in the existing MCB DB complete with connections, testing and commitioning etc as required.	No	1		
2.5	**EARTHING**				
	Body Earthing - Earthing with Gi earth pipe 4.5m long, 40mm dia including accesseries, and providing masonary enclosure with cover plate having locking arrangement and watering pipe etc with charcoal/coke and salt as required.	No	2		
3.0	**DISTRIBUTION BOARD**				
3.1	Supply and fixing 4+12 way, single door, horizontal type thee pole and neutral, sheet steel, MCB DB, 415V, on surface/recess, complete with tinned copper bus bar, nuetral bus bar, earth bar, din bar, interconnections, powdered painted including earthing etc as required. (but without MCB/RCCB/isolators)	m	1		
3.2	**EARTHING**				
	Body Earthing - Earthing with Gi earth pipe 4.5m long, 40mm dia including accesseries, and providing masonary enclosure with cover plate having locking arrangement and watering pipe etc with charcoal/coke and salt as required.	No	2		
4	**CABLES**				
	Supply of LT UG cable having Copper conductor PVC insulated,Sheathed ,galvanised steel wire /steel tap armoured cable with PVC outer sheathing 1.1 KV class)				
4.1	4Cx16 sq mm + 2x16 sq mm earth wire	m	1		
4.2	4Cx10 sq mm + 2x10 sq mm earth wire	m	6.5		
4.3	4Cx4 sq mm + 2x4 sq mm earth wire	m	15		
4.4	2Cx2.5 sq mm + 1x2.5 sq mm earth wire	m	14		
5.0	**LUMINARIES, SOCKETS AND SWITCHES**				
5.1	120W Gate lamp with fitting	No	2		
5.2	40W flourescent lamp	No	4		
5.3	70W MH Lamp for site lighting	No	4		
5.4	Single switched socket with multi purpose	No	2		
5.5	Switches	No	6		

				Total Cost	

4.6 Cost estimate For Electrical Components For Pumphouse

Sl.No	Description	Unit	Quantity	Rate (INR)	Amount (INR)
1.0	**DIESEL GENERATOR 50 KVA**				
1.1	50 KVA, 40KW, 415V, 50 Hz, comprising of Perkins Engine Coupled to Stamford make Alternator, complete with all Standard accessories and ATS with Acoustic enclosure.	No	1		
1.2	**EARTHING**				
1.2.1	Neutral Earthing - Earthing with Copper earth plate 600mmx600mmx3mm thick including accesseries, and providing masonary enclosure with cover plate having locking arrangement and watering pipe of 2.7m long etc with charcoal/coke and salt as required.	No	2		
1.2.2	Body Earthing - Earthing with Gi earth pipe 4.5m long, 40mm dia including accesseries, and providing masonary enclosure with cover plate having locking arrangement andwateringpipeetc with charcoal/coke and salt as required.	No	2		
2.0	**LT PANEL BOARD (Indoor type)**				
2.1	Supplying and fixing 4 ways surface/recess mounting, vertical type, 415V, TPN MCB distribution board of sheet steel, dust protected , duly powder painted, inclusive of 200A tinned copper bus bar, common neutral link, earth bar, din bar for mounting MCB's, with provision of 100A TP 16KA MCCB as incommer, interconnection between incomer MCCB and bus bars (but without MCB,s /MCCB's) as required. (Note : Vertical type MCB TPDB is normally used where 3 phase outlets are required.)	No	1		
2.2	**MCCB DISTRIBUTION BOARDS**				
	Providing and fixing 100A rating and 16KA breaking capacity and pole TP MCCB in existing cubicle panel board including drilling holes in cubicle panel, making connections, ets as required.	No	1		
2.3	**MINIATURE CIRCUIT BREAKERS**				
	Supplying and fixing 32A, triple pole and neutral, 415V, "C" curve, miniature circuit breaker for inductive load of triple pole and neutral in the existing MCB DB complete with connections, testing and commitioning etc as required.	No	2		
2.4	**MINIATURE CIRCUIT BREAKERS**				
	Supplying and fixing 32A, single pole and neutral, 240V, "C" curve, miniature circuit breaker for inductive load of single pole and neutral in the existing MCB DB complete with connections, testing and commitioning etc as required.	No	1		
2.5	**EARTHING**				
	Body Earthing - Earthing with Gi earth pipe 4.5m long, 40mm dia including accesseries, and providing masonary enclosure with cover plate having locking arrangement andwateringpipeetc with charcoal/coke and salt as required.	No	2		
3.0	**DISTRIBUTION BOARD**				
3.1	Supply and fixing 4+12 way, single door, horizontal type thee pole and neutral, sheet steel, MCB DB, 415V, on surface/recess, complete with tinned copper bus bar, nuetral bus bar, earth bar, din bar, interconnections, powdered painted including earthing etc as required. (but without MCB/RCCB/isolators)	m	1		
3.2	**EARTHING**				
	Body Earthing - Earthing with Gi earth pipe 4.5m long, 40mm dia including accesseries, and providing masonary enclosure with cover plate having locking arrangement andwateringpipeetc with charcoal/coke and salt as required.	No	2		
4.0	**CABLES**				
	Supply of LT UG cable having Copper conductor PVC insulated,Sheathed ,galvanised steel wire /steel tap armoured cable with PVC outer sheathing 1.1 KV class)				
4.1	4Cx16 sq mm + 2x16 sq mm earth wire	m	1		
4.2	4Cx10 sq mm + 2x10 sq mm earth wire	m	6.5		

4.3	4Cx4 sq mm + 2x4 sq mm earth wire	m	15			
4.4	2Cx2.5 sq mm + 1x2.5 sq mm earth wire	m	14			
5.0	**LUMINARIES, SOCKETS AND SWITCHES**					
5.1	120W Gate lamp with fitting	No	2			
5.2	40W flourescent lamp	No	4			
5.3	70W MH Lamp for site lighting	No	4			
5.4	Single switched socket with multi purpose	No	2			
5.5	Switches	No	6			
	Total Cost					

4.7: Rising Main Data														
Sl. No. No	Chainage		Diameter (mm)	L (m)	B (mm)	Avg Depth of cut (m)	Sand Bediing depth (m)	Total Depth (m)	Total Quantity (cum)	Pipe Volume (cum)	Sand Bedding (cum)	Refilling (cum)	Disposal (cum)	Depth wise excvation quantity (Cum)
	From	To												0.0 to 2 m
1	2	3	4	5	6	7	8	9=7+8	10= 5x6x9	11=0.786*4^2*5	12 =5*6 *8	13= 10-11-12	14 =11+12	
1	Zone I		200.00	2123.00	0.80	1.35	0.15	1.50	2547.60	66.75	254.76	2226.09	321.51	2547.60
Total				**2123.00**		**4.05**			**2547.60**	**66.75**	**254.76**	**2226.09**	**321.51**	**2547.60**

4.7.1: Rising Main - BOQ							
Sl. No.	**Description of Item**	**Unit**					**Quantity**
1.0	Excavating trenches of required width for pipes cables, etc., including excavation for sockets, and dressing of sides, ramming of bottoms, depth upto 1.5 m including getting out the excavated soil, and then returning the soil as required, in layers not exceeding 20 cm in depth including consolidating each deposited layer by ramming, watering etc., and disposing of surplus excavated soil as directed, within a lead of 50 m.						
1.1	**0.0 to 1.5 mtr. Depth**						
	do - in all kindes of soil - 100%	m					2547.60
2.0	Supplying and Filling in plinth with local sand and under floors including , watering, ramming consolidation and dressing complete.	cum					254.76
3.0	Providing and laying S&S Centrifugally Cast (Spun) / Ductile Iron. Pipes conforming to IS : 8329 **:DI-K9 (MM)**						
3.1	200.00	m					2123.00
4	Providing push on joints to Centifugally (Spun) Cast Iron Pipes or Ductile Iron Pipes inculding testing of joints and the cost of rubber gasket (one at every 6m).						
4.1	200.00	Joint					354
5.0	Providing and laying D.I. specials of class K-12 suitable for push-on jointing as per IS : 9523 :						
5.1	**Bends-As per BS 4772 code**						
	90 degree (63.5 Kg)	kg					317.50
5.2	**Taper-As per BS 4772 code**						
	300x200mm (34.5 Kg)	kg					34.50
5.3	**Tee-As per BS 4772 code**						
	300x300x300 mm (79.5 Kg)	kg					79.50
6.0	Providing and fixing **C.I. sluice valves (**with cap) complete with bolts, nuts, rubber insertions etc.(the tail pieces if required will be paid separately)						
6.1	200.00	No					4.00
7.0	Providing and fixing **C.I. sluice valves for Scouring (**with cap) complete with bolts, nuts, rubber insertions etc.(the tail pieces if required will be paid separately)						
7.1	200.00	No					3.00
8.0	Providing & Constructing masonry Chamber 1.5x1.5x1.5 m inside, in brick work in cement mortar 1:3 (1 cement : 3 coarse sand) for valve, with cast insitu RCC slab with necessary reinforcment.The valve chamber shall be plastered with CM 1:4, A levelling coars of M10 shall be provided.The cost is inclusive of excavation , disposal and construction of valve chamber with moduar bricks plasting with cement mortar with all lead and lift etc., as per specification & drawing.						
8.1	Sluice valve chambers	No					3.00
8.2	Scour valve chambers	No					3.00
9.0	Providing and constructing of the RCC Thrust Blocks for DI bends including the excavations of soils up to the required depth ,disposal of soils after refilling with selected available earth,providing PCC including cost of labours,materials tools,curing etc., complete as per drawing and as directed by the Engineer (inclusive of cost of steel)						
9.4	200.00	No	5.00				5.00
	Enter Total pipe length	2123.00	m				
	Percentage of CC Road in town	70	%				1486.1
	Percentage of Asphalt Road in town	30	%				636.9
10	**Dismantling and restoration of roads :**						

10.1	Dismantling of cement concrete pavement (dismantling of cement concrete pavements by mechanical means using pneumatic tools, breaking to pieces not exceeding 0.02 cum in volume and stock pilling at designated locations and disposal of dismantled materials up to a lead of 1000 metres, stacking serviceable and unserviceable material	cum					200.62
10.2	Bituminous courses by mechanical means	cum					28.66
	Granular courses by manualmeans	cum					334.37
11	Restoration of road as per the specification and as directed by the engineer						
11.3.1	Restoration of CC road						
a	Compacting original ground supporting subgrade (Loosening of the ground upto a level of 500 mm below the subgrade level, watered, graded and compacted in layers to meet requirement of table 300-2 for subgrade construction.) Rolling with vibratory roller	cum					955.35
b	**Wet Mix Macadam -** Providing, laying, spreading and compacting graded stone aggregate to wet mix macadam specification including premixing the material with water at OMC in mechanical mix plant carriage of mixed mathod of tipper to site, laying in uniform layers with paver in sub-base/base course on a well prepared surface and compacting with vibratory roller to achieve the desired density complete as per Specification	cum					71.65
c	Cement Concrete Pavement (Construction of un-reinforced, dowel jointed, plain cement concrete pavement over a prepared sub base with 43 grade cement @ 400 kg per cum, coarse and fine aggregate conforming to IS 383, maximum size of coarse aggregate not exceeding 25 mm, mixed in a batching and mixing plant as per approved mix design, transported to site, laid with a fixed form or slip form paver, spread, compacted and finished in a continuous operation including provision of contraction, expansion, construction and longitudinal joints, joint filler, separation membrane, sealant primer, joint sealant, debonding strip, dowel bar, tie rod, admixtures as approved, curing compound,finishing to lines and grades as per drawing)	cum					200.62
12.0	**Granular Sub-base with Close graded Material (By Mix in Place Method) -** Construction of **Granular sub-base(GSB)** by providing close graded Material, spreading in uniform layers with motor grader on prepared surface, mixing by mix in place method by rotavator at OMC, and compacting with vibratory power roller to achieve the desired density, complete as per Technical Specification						
		cum					200.62
	Total for Grading II Matrerial (50% of Total)	cum					100.31
	Total for Grading I Matrerial (50% of Total)	cum					100.31
b	**Wet Mix Macadam -** Providing, laying, spreading and compacting graded stone aggregate to wet mix macadam specification including premixing the material with water at OMC in mechanical mix plant carriage of mixed mathod of tipper to site, laying in uniform layers with paver in sub-base/base course on a well prepared surface and compacting with vibratory roller to achieve the desired density complete as per Specification	cum					334.37
c	**Pavement Courses - Bituminous**						
	Prime Coat - Providing and applying primer coat with Bitumen emulsion on prepared surface of granular base including cleaning of road surface and spraying primer at the rate of 0.6kg/sqm using mechnical means complete	sqm					1337.49
	Tack Coat - Providing and applying tack coat with Bitumen emulsion using emulsion pressure distributor at the rate of 0.2 kg per sqm on the prepared bituminous/granular surface cleaned with mechancial broom .	sqm					1337.49
	Providing and laying **Dense graded bituminous macadam** with 100-120 TPH batch HMP producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 4.0 to 4.5 % by weight of total mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade, level and alignment, rolling with smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MoRTH specifications Clause 507. (Grading II -19mm nominal size)	cum					33.44

4.7.2: Rising Main - Cost Estimate							
Sl. No.	**Description of Item**	**Unit**	**No.**	**Quantity**	**Rate (INR)**	**Amount (INR)**	
1.0	Excavating trenches of required width for pipes cables, etc., including excavation for sockets, and dressing of sides, ramming of bottoms, depth upto 1.5 m including getting out the excavated soil, and then returning the soil as required, in layers not exceeding 20 cm in depth including consolidating each deposited layer by ramming, watering etc., and disposing of surplus excavated soil as directed, within a lead of 50 m.						
1.1	0.0 to 1.5 mtr. Depth						
	do - in all kindes of soil - 100%	m		2547.60			
2.0	Supplying and Filling in plinth with local sand and under floors including , watering, ramming consolidation and dressing complete.	cum		254.76			
3.0	Providing and laying S&S Centrifugally Cast (Spun) / Ductile Iron. Pipes conforming to IS : 8329 **:DI-K9**						
3.1	200.00	m		2123.0			
4	Providing push on joints to Centifugally (Spun) Cast Iron Pipes or Ductile Iron Pipes inculding testing of joints and the cost of rubber gasket (one at every 6m).						
4.1	200.00	Joint		354			
5.0							
5.1	**Bends-As per BS 4772 code**						
	90 degree (63.5 Kg)	kg		317.50			
5.2	**Taper-As per BS 4772 code**						
	300x200mm (34.5 Kg)	kg		34.50			
5.3	**Tee-As per BS 4772 code**						
	300x300x300 mm (79.5 Kg)	kg		79.50			
6.0	Providing and fixing **C.I. sluice valves (**with cap) complete with bolts, nuts, rubber insertions etc.(the tail pieces if required will be paid separately)						
6.1	200.00	No		4.00			
7.0	Providing and fixing **C.I. sluice valves for Scouring (**with cap) complete with bolts, nuts, rubber insertions etc.(the tail pieces if required will be paid separately)						
7.1	200.00	No		3.00			
8.0	Providing & Constructing masonry Chamber 1.5x1.5x1.5 m inside, in brick work in cement mortar 1:3 (1 cement : 3 coarse sand) for valve, with cast insitu RCC slab with necessary reinforcment.The valve chamber shall be plastered with CM 1:4, A levelling coars of M10 shall be provided.The cost is inclusive of excavation , disposal and construction of valve chamber with moduar bricks plasting with cement mortar with all lead and lift etc., as per specification & drawing.						
8.1	Sluice valve chambers	No		4.00			
8.2	Scour valve chambers	No		4.00			
9.0	Providing and constructing of the RCC Thrust Blocks for DI bends including the excavations of soils up to the required depth ,disposal of soils after refilling with selected available earth,providing PCC including cost of labours,materials tools,curing etc., complete as per drawing and as directed by the Engineer (inclusive of cost of steel)						
9.1	90 degree	No		2.00			
	Enter Total pipe length	2123.00		m			
	Percentage of CC Road in town	70.00		%			
	Percentage of Asphalt Road in town	30.00		%			

10	**Dismantling and restoration of roads :**						
10.1	Dismantling of cement concrete pavement (dismantling of cement concrete pavements by mechanical means using pneumatic tools, breaking to pieces not exceeding 0.02 cum in volume and stock pilling at designated locations and disposal of dismantled materials up to a lead of 1000 metres, stacking serviceable and unserviceable material	cum		200.62			

10.2	Dismantalling of flexible Pavements(dismantling of flexible pavements and disposal of dismantled materials up to a lead of 1000 m, stacking serviceable and unserviseable materials separately)						
	Bituminous courses by mechanical means	cum		28.66			
	Granular courses by manualmeans	cum		334.37			
11	Restoration of road as per the specification and as directed by the engineer						
11.1	Restoration of CC road						
a	Compacting original ground supporting subgrade (Loosening of the ground upto a level of 500 mm below the subgrade level, watered, graded and compacted in layers to meet requirement of table 300-2 for subgrade construction.) Rolling with vibratory roller	cum		955.35			
b	**Wet Mix Macadam -** Providing, laying, spreading and compacting graded stone aggregate to wet mix macadam specification including premixing the material with water at OMC in mechanical mix plant carriage of mixed mathod of tipper to site, laying in uniform layers with paver in sub-base/base course on a well prepared surface and compacting with vibratory roller to achieve the desired density complete as per Specification	cum		71.65			
c	Cement Concrete Pavement (Construction of un-reinforced, dowel jointed, plain cement concrete pavement over a prepared sub base with 43 grade cement @ 400 kg per cum, coarse and fine aggregate conforming to IS 383, maximum size of coarse aggregate not exceeding 25 mm, mixed in a batching and mixing plant as per approved mix design, transported to site, laid with a fixed form or slip form paver, spread, compacted and finished in a continuous operation including provision of contraction, expansion, construction and longitudinal joints, joint filler, separation membrane, sealant primer, joint sealant, debonding strip, dowel bar, tie rod, admixtures as approved, curing compound,finishing to lines and grades as per drawing)	cum		200.62			
12	**Pavement Courses - Granular**						
	Granular Sub-base with Close graded Material (By Mix in Place Method) - Construction of **Granular sub-base(GSB)** by providing close graded Material, spreading in uniform layers with motor grader on prepared surface, mixing by mix in place method by rotavator at OMC, and compacting with vibratory power roller to achieve the desired density, complete as per Technical Specification	cum					
	Total for Grading II Matrerial (50% of Total)	cum		100.31			
	Total for Grading I Matrerial (50% of Total)	cum		100.31			
b	**Wet Mix Macadam -** Providing, laying, spreading and compacting graded stone aggregate to wet mix macadam specification including premixing the material with water at OMC in mechanical mix plant carriage of mixed mathod of tipper to site, laying in uniform layers with paver in sub-base/base course on a well prepared surface and compacting with vibratory roller to achieve the desired density complete as per Specification	cum		334.37			
	Pavement Courses - Bituminous						
	Prime Coat - Providing and applying primer coat with Bitumen emulsion on prepared surface of granular base including cleaning of road surface and spraying primer at the rate of 0.6kg/sqm using mechnical means complete	sqm		1337.49			
c	**Tack Coat -** Providing and applying tack coat with Bitumen emulsion using emulsion pressure distributor at the rate of 0.2 kg per sqm on the prepared bituminous/granular surface cleaned with mechancial broom .	sqm		1337.49			
	Providing and laying **Dense graded bituminous macadam** with 100-120 TPH batch HMP producing an average output of 75 tonnes per hour using crushed aggregates of specified grading, premixed with bituminous binder @ 4.0 to 4.5 % by weight of total mix and filler, transporting the hot mix to work site, laying with a hydrostatic paver finisher with sensor control to the required grade, level and alignment, rolling with	cum		33.44			

	smooth wheeled, vibratory and tandem rollers to achieve the desired compaction as per MoRTH specifications Clause 507. (Grading II -19mm nominal size)						
Total Cost, Rs							

4.8 SITC of Mechanical Components at each Pumping Station						
Sl.No	**Description**	**Quantity**	**Units**	**Rate**	**Amount**	**Rate Reference**
1	**Manually Cleaned Bar Screen**					
	The screen shall be of removable type and shall consist of a welded stainless steel (AISI410) frame with vertical flats spaced at 30 mm. The flats shall not be less than 10 mm in thickness and not less than 50 mm deep. The flats shall not have any joint. The spacing between the flats shall be uniform and preferably so maintained by adequate number of spacers, which shall be so located as not to interfere with the raking operation. To facilitate the manual cleaning of the screen the inclination of the screen shall be between 45º and 60º to the horizontal. Single piece screen width should not be more than 1.5 m.Two numbers stainless steel rollers shall be fixed on each side of frame to facilitate rolling contact with guide channel during lifting and lowering of screen.					
1.2	(500 X 1500) mm	4				
2	Providing, erecting and giving test of Non clog sewage submersible pump set with SS CF8 M impeller,CI casing,SS 316 shaft suitable for 3 Ph ,415 V , 50 Hz A.C. Supply, submersible motor having TEFC enclouser with class F insulation and IP 68 protection .The pump shall be operated at 1450 RPM .The scope shall include required accessories viz automatic coupling device,guide pipe,,chain with shakle,flat submersible cable upto starter panel through suitable GI pipe (30 mtr 3 Core flat copper for each pump with necessary electrical connection with the starter panel and as per specifications. (HP)					
	16HP	4				
	4 Pumps for 2 lean, 1 peak and 1 average flow					
3	Providing Supplying erection testing and commissioning of 2 Tonne capacity Mobile Crane					
3.1	1 T Capacity for 7 m lift.	1				
	Total Cost, Rs					

4.9 VALVE CHAMBER (MASONARY)						
Sl. No	Item description	Unit	Qty	Rates (INR)	Amount (INR)	
	Earthwork in excavation over areas (exceeding 1.5m in depth 1.5 m in width as well as 10 sqm on plan) including disposal of excavated earth lead upto 50m and lift upto 1.5m, disposal earth to be leveled and neatly dressed.					
1	From 0 m to 1.5 m	cum	7.02			
	From 3 m to 4.5 m	m^3	0.00			
	From 4.5 m to 6 m	m^3	0.00			
2	From 6 m to 7.5 m	m^3	0.00			
2	Providing and laying in position cement concrete of specified grade excluding the cost of centring and shuttering - all work upto plinth level in **1:3:6 (1 Cement : 3 coarse sand : 6 granded stone)**	cum	0.48			
3	Providing and laying in position machine batched, machine mixed and machine vibrated design mix cement concrete of specified grade for reinforced cement concrete structural elements, excluding the cost of centering, shuttering, finishing and reinforcement, **M-20** grade reinforced cement concrete.					
	Top slab	cum	0.60			
	Total		0.60			
4	Brick work with bricks of class designation 100B in foundations and plinth in : Cement Mortar 1:4 (1 cement : 4 coarse sand) Extra for Brick work in superstructure above plinth level upto floor V cum					
	Walls					
	Long walls	cum	1.50			
	Short walls	cum	1.13			
	Total Quantity for walls	cum	2.63			
5	Reinforcement for R. C. C work including straightening, cutting, bending, placing in position and binding all complete. Thermo - Mechanically Treated bars - 10 mm dia	MT	0.06			
6	Cement plaster in course sand in 1:3 -20 mm thick (1 cement : 3 coarse sand)	Sqm	18.00			
7	Providing orange colour safety foot rest of minimum 6 mm thick plastic encapsulated as per IS : 10910 on 12 mm dia steel bar conforming to IS : 1786 having minimum cross section as 23 mm X 25 mm and overall minimum length 263 mm and width as 165 mm with minimum 112 mm space between protruded legs having 2 mm tread on top surface by ribbing or chequering besides necessary and adequate anchoring projections on tail length on 138 mm as per standard drawing and suitable to with stand the bend test and chemical resistance test as per specifications and having manufacture's permanent identification mark to be visible even after fixing, including fixing in manholes with 30 X 20 X15 cm cement concrete block 1:3:6 (1 cement : 3 coarse sand : 6 graded stone aggregate 20 mm nominal size) complete as per standard design.	Each	5			
	Filling available excavated earth (excluding rock) in trenches, plinth, sides of foundations etc. in layers not exceeding 20 cm in depth : consolidating each deposited layer by ramming and wateing lead.					
8	Total Earth work Quantity	cum	7.02			
	Deduct P.C.C quantity	cum	-0.48			
	Deduct Wall Quantity	cum	-5.40			
	Total Quantity	cum	1.13			
	Carriage of Materials					
	Coarse Sand	cum	0.92			
	Aggregate	cum	0.96			
9	Cement	MT	0.88			
	Steel	MT	0.01			
	Bricks (1000 Nos)		1.30			
	Total Cost					
	Total Cost, Rs					

4.10 THRUST BLOCK - 90-degree					
Sl No	Particulars	Unit	Quantity	Rate	Amount INR
1	Providing and laying in position machine batched, machine mixed, and machine vibrated design mix cement concrete of specified grade for reinforced cement concrete structural elements, excluding the cost of centering, shuttering, finishing and reinforcement, M-20 grade reinforced cement concrete.	cum			
		cum	2.25		
	Reduction for Pipe	cum	0.01236		
	Total Quantity	cum	2.23764		
2	Reinforcement for R. C. C work including straightening, cutting, bending, placing in position and binding all complete. Thermo - Mechanically Treated bars - 10 mm dia	MT	0.01119		
3	Centring and Shuttering including strutting, propping etc. and removal of form for	sqm	3		
		sqm	3		
4	Carriage of Materials				
	Sand	cum	0.13		
	Aggregate	cum	0.25		
	Cement	MT	0.11		
	Steel	MT	0.00		

4.11: Pumping Main Design - Economical Diameter

Year	Discharge		Design Parameters	Stage I		Stage II		Pipe material
			Discharge at Start	2.42	MLD	2.65	MLD	D.I.
2020	2.42	MLD	Discharge at End of Period	2.65	MLD	2.81	MLD	
2035	2.65	MLD	Avg. Discharge	2.54	MLD	2.73	MLD	
2050	2.81	MLD	Pumping hours at the End of Period	20.00	hrs	20.00	hrs	
			Avg. Pumping hours during the Period	19.13	hrs	19.43	hrs	
Design Period	15		Life of Electric Motors	15.00	years	15.00	hrs	
			Combined Eff. Of Pump Sets	75.00	%	75.00	%	
Static Head	10.00	m	Energy Charges	6.50	Rs./Unit	12.00	Rs./Unit	
			Interest Rate	10.00	%	10.00	%	
Terminal Head		m	Length of Pipeline	2123.00	m	2123.00	m	
			Capitalisation Coefficient for 15years	7.6061		7.6061		
Static + Terminal Head	10.00	m	Hazen William Coefficient for DI Pipes	140		120		
			Pump Cost per KW in Rs.	10000.00	Rs./KW	20000.00	Rs./KW	
			KW Reqd	0.481	per m Head	0.510	per m Head	
			Avg Annual Electrical Charge in Rs.	45421.94	per KW	85164.34	per KW	

Stage I

S. No.	I.D. (mm)	I.D. (m)	Discahrge (MLD)	Discahrge (m^3/sec)	Velocity (m/sec)	Frictional Head Loss per 1000m (m)	Total Frictional Head Loss (m)	Other Losses (m)	Total Head Loss (m)	Total Head (m)	Power Reqd (KW)	Pump Cost including 50% standby (Lakhs Rs.)
1	250	0.25	2.54	0.037	0.75	2.14	4.54	0.45	4.99	14.99	7.218	
2	300	0.30	2.54	0.037	0.52	0.88	1.87	0.19	2.05	12.05	5.803	
3	350	0.35	2.54	0.037	0.38	0.42	0.88	0.09	0.97	10.97	5.281	
4	400	0.40	2.54	0.037	0.29	0.22	0.46	0.05	0.51	10.51	5.058	
5	450	0.45	2.54	0.037	0.23	0.12	0.26	0.03	0.29	10.29	4.951	
6	600	0.60	2.54	0.037	0.13	0.03	0.06	0.01	0.07	10.07	4.848	
7	600	0.60	2.54	0.037	0.13	0.03	0.06	0.01	0.07	10.07	4.848	

Stage II

S. No.	I.D. (mm)	I.D. (m)	Discahrge (MLD)	Discahrge (m^3/sec)	Velocity (m/sec)	Frictional Head Loss per 1000m (m)	Total Frictional Head Loss (m)	Other Losses (m)	Total Head Loss (m)	Total Head (m)	Power Reqd (KW)	Pump Cost including 50% standby (Lakhs Rs.)
1	100	0.10	2.54	0.037	4.69	185.36	393.52	39.35	432.87	442.87	213.204	
2	150	0.15	2.54	0.037	2.08	25.73	54.63	5.46	60.09	70.09	33.742	
3	200	0.20	2.54	0.037	1.17	6.34	13.46	1.35	14.80	24.80	11.940	
4	250	0.25	2.54	0.037	0.75	2.14	4.54	0.45	4.99	14.99	7.218	
5	300	0.30	2.54	0.037	0.52	0.88	1.87	0.19	2.05	12.05	5.803	
6	350	0.35	2.54	0.037	0.38	0.42	0.88	0.09	0.97	10.97	5.281	
7	400	0.40	2.54	0.037	0.29	0.22	0.46	0.05	0.51	10.51	5.058	
8	450	0.45	2.54	0.037	0.23	0.12	0.26	0.03	0.29	10.29	4.951	
9	500	0.50	2.54	0.037	0.19	0.07	0.16	0.02	0.17	10.17	4.896	
10	600	0.60	2.54	0.037	0.13	0.03	0.06	0.01	0.07	10.07	4.848	
11	700	0.70	2.54	0.037	0.10	0.01	0.03	0.00	0.03	10.03	4.830	

I.D. (mm)	Rate per m length (Rs.) of DI Pipe	Pipe Cost (Lakhs Rs.)	Stage I				Grand Total of Capitilised Cost (Lakhs Rs.)
			Pump Cost (Lakhs Rs.)	Annual Energy Charges (Lakhs Rs.)	Capitilised Energy Charges (Lakhs Rs.)	Capitilised Total Cost (Lakhs Rs.)	
100							
150							
200							
250							
300							
350							
400							
450							

500								
600								
700								

DETAILS OF MEASUREMENT (DRAIN D-1)			
Drain D-1 (1000 x 500 mm) along Internal Roads			
S.No.	**Particulars of item**	**Unit**	**Qty.**
1(a)	Earth work in excavation in foundation trenches or drains (not exceeding 1.5 m in width or 10 sqm on plan) including dressing of sides and ramming of bottoms, lift upto 1.5 m . including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m. In all types of soil	cum	1.25
1(b)	Earth work in excavation in foundation trenches or drains (not exceeding 1.5 m in width or 10 sqm on plan) including dressing of sides and ramming of bottoms, lift upto 1.5 m . including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m. In all types of soil Extra including for carriage of Sludge	cum	0.15
1 (C)	Open timbering in trenches including strutting and shoring complete (Measurements to be taken of the face area timbered).		
	Depth not exceeding 1.5 m.	Sqm	1.50
	Depth exceeding 1.5 m but not exceeding 3 m	Sqm	0.00
2	Providing and laying in position cement concrete of specified grade exluding the cost of centring and shuttering-all work upto plinth level. (PCC in Drain Bottom) 1:3:6 (1 Cement :3 coarse sand :6 graded stone agregate 40 mm nominal size)	cum	0.25
3	Providing designation 100 A one brick flat soling joints filled with local sand including cost of watering, taxes, royalty all complete as per building specification and direction of E/I,	Sqm	1.66
4	Brick work with bricks of class designation 100A in foundations and plinth in : Cement mortar 1:6 (1 cement: 6 coarse sand)	cum	0.28
5	Plastering with cement mortar (1:3) on brick work in sub-structure as per Technical specifications	Per 10 sqm	0.15
6	Providing and laying in position cement concrete of specified grade exluding the cost of centring and shuttering-all work upto plinth level. (Screed in Drain Channel) 1:2:4 (1 Cement :3 coarse sand :4 graded stone agregate 20 mm nominal size)	cum	0.10
7	Providing and fixing precast cement concrete Kerb stone block M-30 grade(size 375mmx300mm	R Mtr	1.00
8	Centring and shuttering including strutting,propping etc. and removal of form for Walls (any thickness) including attached pilasters. Butteresses, plinth and string courses etc.	Sqm	1.00
9	Providing, precast cement concrete Jali 1:2:4(1 cement:2 coarse sand:4 stone aggregate 6mm nominal size) reinforced with 1.6 mm dia mild steel wire including roughening cleaning, fixing and finishing in cement mortar 1:3 (1 cement:3 fine sand) etc. Complete excluding plastering of the jambs, sills and soffits. 50 mm thick	Sqm	0.55

Drain D-1 (1000 x 500 mm) along Internal Roads - Cost Estimate						
S.No.	**BSR Ref.**	**Particulars of item**	**Qty**	**Rate**	**Unit**	**Amount**
1(a)	BIHAR SoR-2016/ Item No. 2.8.1	Earth work in excavation in foundation trenches or drains (not exceeding 1.5 m in width or 10 sqm on plan) including dressing of sides and ramming of bottoms, lift upto 1.5 m . including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m. In all types of soil	1.25		Per cum	
1(b)	BIHAR SoR-2016/ Item No. 2.8.1	Earth work in excavation in foundation trenches or drains (not exceeding 1.5 m in width or 10 sqm on plan) including dressing of sides and ramming of bottoms, lift upto 1.5 m . including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m. In all types of soil Extra including for carriage of Sludge	0.15		Per cum	
1 (C)	BIHAR SoR-2016/ Item No. 2.20	Open timbering in trenches including strutting and shoring complete (Measurements to be taken of the face area timbered).				
		Depth not exceeding 1.5 m.	1.5		sqm	
		Depth exceeding 1.5 m but not exceeding 3 m	0		sqm	
2	BIHAR SoR-2016/ Item No. 4.4.2	Providing and laying in position cement concrete of specified grade exluding the cost of centring and shuttering-all work upto plinth level. (PCC in Drain Bottom) 1:3:6 (1 Cement :3 coarse sand :6 graded stone agregate 40 mm nominal size)	0.25		Per cum	
3	BIHAR SoR-2016/ Item No. 11.72	Providing designation 100 A one brick flat soling joints filled with local sand including cost of watering, taxes, royalty all complete as per building specification and direction of E/I,	1.66		Sqm	
4	BIHAR SoR-2016/ Item No. 6.1A. Sub-item no. 6.1.14A	Brick work with bricks of class designation 100A in foundations and plinth in : Cement mortar 1:6 (1 cement: 6 coarse sand)	0.28		Per cum	
5	RCD-SOR-2017 Item No-13.3	Plastering with cement mortar (1:3) on brick work in sub-structure as per Technical specifications	0.15		Per 10 sqm	
6	BIHAR SoR-2016/ Item No. 4.5.2	Providing and laying in position cement concrete of specified grade exluding the cost of centring and shuttering-all work upto plinth level. (Screed in Drain Channel) 1:2:4 (1 Cement :3 coarse sand :4 graded stone agregate 20 mm nominal size)	0.1		Per cum	
7	RCD-SOR 2017 Item No-M-200	Providing and fixing precast cement concrete Kerb stone block M-30 grade(size 375mmx300mm	1		Per R / Mtr	
8	BIHAR SoR-2016/ Item No. 5.9.2	Centring and shuttering including strutting,propping etc. and removal of form for Walls (any thickness) including attached pilasters. Butteresses, plinth and string courses etc.	1		Sqm	
9	BIHAR SoR-2016/ Item No. 5.18.1	Providing, precast cement concrete Jali 1:2:4(1 cement:2 coarse sand:4 stone aggregate 6mm nominal size) reinforced with 1.6 mm dia mild steel wire including roughening cleaning, fixing and finishing in cement mortar 1:3 (1 cement:3 fine sand) etc. Complete excluding plastering of the jambs, sills and soffits. 50 mm thick	0.55		Sqm	
		Per Meter Cost for Drain D-4 (1000 x 500) =				

DETAILS OF MEASUREMENT (DRAIN D-2)			
Drain D-2 (1500 x 1000 mm) along Roads			
S.No.	Particulars of item	Unit	Qty.
1(a)	Earth work in excavation in foundation trenches or drains (not exceeding 1.5 m in width or 10 sqm on plan) including dressing of sides and ramming of bottoms, lift upto 1.5 m . Including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m. In all types of soil	cum	5.94
1(b)	Extra for every additional lift of 1.5 m or part thereof in : Ali kinds of soil.	cum	1.89
1 (C)	Open timbering in trenches including strutting and shoring complete (Measurements to be taken of the face area timbered).		
	Depth not exceeding 1.5 m.	Sqm	3.00
	Depth exceeding 1.5 m but not exceeding 3 m	Sqm	1.40
2	Earth work in excavation in foundation trenches or drains (not exceeding 1.5 m in width or 10 sqm on plan) including dressing of sides and ramming of bottoms, lift upto 1.5 m . Including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m. In all types of soil Extra including for carriage of Sludge	cum	0.15
3	Providing and laying in position cement concrete of specified grade exluding the cost of centring and shuttering-all work upto plinth level. (PCC in Drain Bottom) 1:3:6 (1 Cement :3 coarse sand :6 graded stone agregate 40 mm nominal size)	cum	0.18
		cum	0.30
		cum	**0.48**
4	Providing designation 100 A one brick flat soling joints filled with local sand including cost of watering, taxes, royalty all complete as per building specification and direction of E/I,	Sqm	2.70
5	Providing and laying in position specified grade of reinforced cement concrete excluding the cost of centring, shuttering ,finishing and reinforcement-All work up to plinth level 1:1:5:3(1 cement: 1.5 coarse sand:3 graded stone aggregate 20 mm nominal size)	cum	0.36
		cum	0.51
		cum	**0.87**
6	Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete. Thermo-Mechanically Treated bars TMTC-500- 8mm dia.	Kg	10.44
7	Providing and laying in position cement concrete of specified grade exluding the cost of centring and shuttering-all work upto plinth level. (Screed in Drain Channel) 1:2:4 (1 Cement :3 coarse sand :4 graded stone agregate 20 mm nominal size)	cum	0.15
8	Providing and fixing precast cement concrete Kerb stone block M-30 grade(size 375mmx300mm	R Mtr	1.00
9	Centring and shuttering including strutting,propping etc. and removal of form for Walls (any thickness) including attached pilasters. Butteresses, plinth and string courses etc.	Sqm	3.40
10	Providing, precast cement concrete Jali 1:2:4(1 cement:2 coarse sand:4 stone aggregate 6mm nominal size) reinforced with 1.6 mm dia mild steel wire including roughening cleaning, fixing and finishing in cement mortar 1:3 (1 cement:3 fine sand) etc. Complete excluding plastering of the jambs, sills and soffits. 50 mm thick	Sqm	1.60

Drain D-6 (1500 x 1000 mm) along Roads						
S.No.	**BSR Ref.**	**Particulars of item**	**Qty**	**Rate**	**Unit**	**Amount**
1(a)	BIHAR SoR-2016/ Item No. 2.8.1	Earth work in excavation in foundation trenches or drains (not exceeding 1.5 m in width or 10 sqm on plan) including dressing of sides and ramming of bottoms, lift upto 1.5 m . including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m. In all types of soil	5.94		Per cum	
1(b)	BIHAR SoR-2016/ Item No. 2.27.1	Extra for every additional lift of 1.5 m or part thereof in : Ali kinds of soil.	1.89		Per cum	
1 (C)	BIHAR SoR-2016/ Item No. 2.20	Open timbering in trenches including strutting and shoring complete (Measurements to be taken of the face area timbered).			sqm	
		Depth not exceeding 1.5 m.	3		sqm	
		Depth exceeding 1.5 m but not exceeding 3 m	1.4		sqm	
2	BIHAR SoR-2016/ Item No. 2.8.1	Earth work in excavation in foundation trenches or drains (not exceeding 1.5 m in width or 10 sqm on plan) including dressing of sides and ramming of bottoms, lift upto 1.5 m . including getting out the excavated soil and disposal of surplus excavated soil as directed, within a lead of 50 m. In all types of soil Extra including for carriage of Sludge	0.15		Per cum	
3	BIHAR SoR-2016/ Item No. 4.4.2	Providing and laying in position cement concrete of specified grade exluding the cost of centring and shuttering-all work upto plinth level. (PCC in Drain Bottom) 1:3:6 (1 Cement :3 coarse sand :6 graded stone agregate 40 mm nominal size)	0.48		Per cum	
4	BIHAR SoR-2016/ Item No. 11.72	Providing designation 100 A one brick flat soling joints filled with local sand including cost of watering, taxes, royalty all complete as per building specification and direction of E/I,	2.7		Sqm	
5	BIHAR SoR-2016/ Item No. 5.1.2	Providing and laying in position specified grade of reinforced cement concrete excluding the cost of centring, shuttering ,finishing and reinforcement-All work up to plinth level 1:1:5:3(1 cement: 1.5 coarse sand:3 graded stone aggregate 20 mm nominal size)	0.87		Per cum	
6	BIHAR SoR-2016/ Item No. 5.22.7A	Reinforcement for R.C.C. work including straightening, cutting, bending, placing in position and binding all complete. Thermo-Mechanically Treated bars TMTC-500- 8mm dia.	10.44		Kg	
7	BIHAR SoR-2016/ Item No. 4.5.2	Providing and laying in position cement concrete of specified grade exluding the cost of centring and shuttering-all work upto plinth level. (Screed in Drain Channel) 1:2:4 (1 Cement :3 coarse sand :4 graded stone agregate 20 mm nominal size)	0.15		Per cum	
8	RCD-SOR-2017 Item No-M-200	Providing and fixing precast cement concrete Kerb stone block M-30 grade(size 375mmx300mm	1		Per R / Mtr	
9	BIHAR SoR-2016/ Item No. 5.9.2	Centring and shuttering including strutting,propping etc. and removal of form for Walls (any thickness) including attached pilasters. Butteresses, plinth and string courses etc.	3.4		Sqm	
10	BIHAR SoR-2016/ Item No. 5.18.1	Providing, precast cement concrete Jali 1:2:4(1 cement:2 coarse sand:4 stone aggregate 6mm nominal size) reinforced with 1.6 mm dia mild steel wire including roughening cleaning, fixing and finishing in cement mortar 1:3 (1 cement:3 fine sand) etc. Complete excluding plastering of the jambs, sills and soffits. 50 mm thick	1.6		Sqm	
		Per Meter Cost for Drain D-6 (1500 x 1000) =				