SWSM
Uttar Pradesh

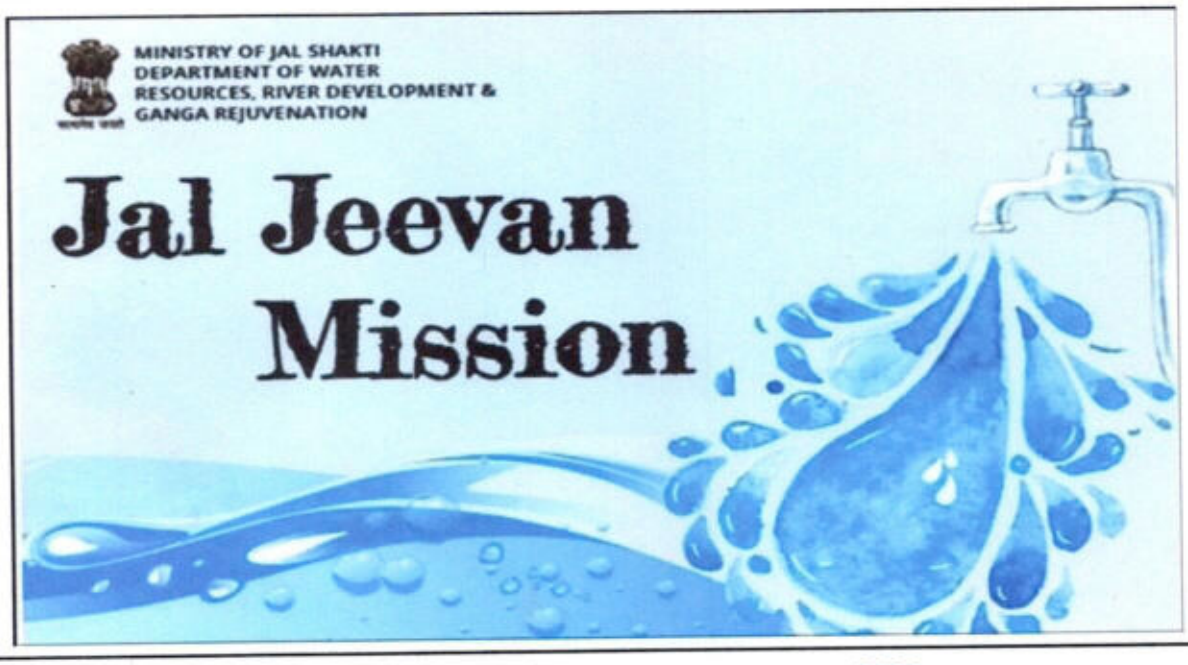
Implementation of various rural water supply projects comprising of tube well/Intake Well, WTP, rising/ pressure mains, CWRs, overhead tanks, distribution pipe networks, individual house connections, public stand posts, Retrofitting etc. located in the State of Uttar Pradesh.

Detailed Project Report for JAIRAMPUR W/S Scheme

Block: GAURA District: PRATAPGARH

Gram Panchayats : JAIRAMPUR

PHASE : 3



Design Year(2053) Population =		5824
Total Project Cost	= Rs.	343.31 Lacs
Per capita cost	= Rs.	5330

Client:	Executive Director, State water & Sanitation Mission Namami Gange & Rural Water Supply Department Lucknow, Uttar Pradesh
Contractor:	JMC Projects (I) Ltd.

Submission for approval					
REVISION NO.	DESCRIPTION	DATE	SUBMITTED BY JMC Projects (I) Ltd.	CHECKED By	APPROVED

DESIGNED BY Earthtech Engineers

Document No.	UP-PRATAPGARH- GAURA	JAIRAMPUR	1-DPR-DOC-001

State Water & Sanitation Mission (SWSM),
Govt. of Uttar Pradesh

INDEX

SALIENT FEATURES

JAIRAMPUR WATER SUPPLY SCHEME UNDER - SWSM
BLOCK- GAURA & DISTRICT- PRATAPGARH

1. Name of state : UTTAR PRADESH
2. Name of District : PRATAPGARH
3. Name of Tehsil : RANIGANJ
4. Name of Block : GAURA
5. Name of Programme : Under Jal Jeevan Mission (JJM) Programme
6. Name of Scheme : JAIRAMPUR Gram Panchayath Scheme
7. No. of GP's Covered : 1 JAIRAMPUR
8. No. of revenue villages : 1 Jairampur
9. No. of Habitations : 2 1.Jairampur 2.Kurmiyan
10. Population : Year wise SC/ST population calculation
11. Rate of water supply : 64.71 LPCD (55 LPCD + 15% UFW)
12. Nature of source : Ground water
13. Source of development : Tube Well
14. Daily water demand :

S.No.	G.P NAME	R.V. NAME	2011 VILLAGE CODE	HABITATION NAMES
1	JAIRAMPUR	Jairampur	159765	1.Jairampur 2.Kurmiyan

S.No.	DESCRIPTION	YEAR	TOTAL	SC/ST	FHTC
1	As per census year	2011	2914	126	422
2	Base year	2023	4290	185	621
3	Middle year	2038	4824	209	699
4	Design year	2053	5824	252	843

S.No.	STAGE	YEAR	DAILY WATER DEMAND IN KLD	DAILY WATER DEMAND IN MLD
1	Base year	2023	278	0.278
2	Middle year	2038	312	0.312
3	Design year	2053	377	0.377

15. No. of Tube Well : 2

16. Nature of Treatment : Chlorination through hypochlorite solution By electro-mechanical type chlorinating Plant – 1 No.

17 Conveyance Main:

A Rising Main :

200 mm DI K-9 530 m

B Column Pipe :

80 mm MS/GI 8 Nos.

18. Pumping plant for tube well:

No. & Type of Pumping pant : 2 of Submersible pump

S.No.	G.P NAME	R.V. NAME	Discharge	Head (M)	B.H.P. of 2 Sets
1	JAIRAMPUR	Jairampur	400 LPM of 2 Sets	48	10.0 HP & 10 HP

19 Solar Capacity : 32.0 KW

20 Service Storage:

S.No.	Name of Village	Capacity (KL)	Staging (M)
1	JAIRAMPUR	250	12

21 Distribution System:

(I) Peak Factor : 3

(II) Minimum Terminal Pressure : 7 m

(III) Minimum size of pipe : 63 mm

(IV) Detail of pipes:

Pipeline Type	Material	Class	Diameter (mm)	Length (m)
Distribution Mains	HDPE	PN-6 PE100	63	1,954
Distribution Mains	HDPE	PN-6 PE100	75	2,148
Distribution Mains	HDPE	PN-6 PE100	90	1,731
Distribution Mains	HDPE	PN-6 PE100	110	383
Distribution Mains	HDPE	PN-6 PE100	125	0
Distribution Mains	HDPE	PN-6 PE100	140	134
Distribution Mains	HDPE	PN-6 PE100	160	0
Distribution Mains	HDPE	PN-6 PE100	180	0
Distribution Mains	HDPE	PN-6 PE100	200	0
Distribution Mains	DI	K7	250	0
Distribution Mains	DI	K7	300	0
			Total Length (m)	6,350

(VII) Design based on Computer System (Hazen William Formula)

(VIII) Appurtenant Works:

S.No.	NAME OF APPURTENANT WORK	SIZE IN MM	NO. OF FITTINGS
1	Sluice Valve	80	2
		100	1
		125	0
		150	0

		200	0
2	Air Valve	20	1
		50	0
		80	0
3	Scour Valve	80	1
		100	0
		150	0
		200	0
4	**Fire Hydrant**	**80**	**1**

SL.No.	Description of Work	Qty.	Unit	Amount (Rs.) (In Lacs)
1	2	3	4	5
A.	**Civil work :**			
1	Pump house & Chlorinating room	1	Job	10.07
2	Rising Main	530	Rmt	14.35
3	Over head tank- KL 250	1	Nos	47.04
	Staging- 12			
4	Distribution System	6350.00	Rmt	64.07
5	Boundary Wall and approach raod	1	Job	13.88
6	Staff Quarter	1	Nos	0.00
7	Surveying and Designing	1	Job	2.55
	Total (A)			**151.97**
B.	**E&M Work :**			
1	Cost of Tubewell	2	Nos.	49.319
2	Cost of pumping plant and Chlorinating	2	Set	18.59
3	Solar plant	32.0	KW	22.72
4	Electrification of pump house, SCADA.	2	Nos.	15.32
	TOTAL (B)			**105.95**
	TOTAL (A+B)			**257.913**

Per capita cost without centage (Rs.)	For year 2023 -	**₹ 7,236**	Per Capita
	For year 2037 -	**₹ 6,435**	Per Capita
	For year 2053 -	**₹ 5,330**	Per Capita

PROJECT REPORT

1 INTRODUCTION:

This document covers the Detailed Project report of **JAIRAMPUR** village Water Distribution scheme.

Name of the Gram Panchayats : **JAIRAMPUR**
Name of the Block : **GAURA**
Name of the District : **PRATAPGARH**
No. of Revenue Grams Covered : **1**
No. of Habitations Covered : **2**
Quality Affected/Near Qaulity Affected Area **NO**

2 DESIGN CRITERIA

The Design Criteria adopted for the works proposed under this detailed project Report accordance with the directives / guidelines issued by Ministry of Jal Shakti Department of Drinking Water and Sanitation National Jal Jeevan Mission.

3 POPULATION

Population based on Year 2011 Census is 2914

Initial Stage, Middle stage and Ultimate Stage has been adopted as 2023, 2038 and 2053 respectively. Population for the stages of the scheme has been calculated by the standard prescribed methods. Population adopted for the Initial stage year 2023, Middle stage year 2038 and Ultimate Stage Year 2053 are as under:

Table: Revenue Villags Underthe Gram Panchayat

S.No.	R.Village Name	Village Code	2011 Population	No of HH	SC & ST Population
1	Jairampur	159765	2914	422	126
		TOTAL:	2914	422	126

Table : Population Adopted

GP/Village	Year	Population
JAIRAMPUR	Initial Stage Year - 2023	4290
	Intermediate Stage Year - 2038	4824
	Ultimate Stage Year - 2053	5824

WATER DEMAND

The water demand has been calculated on the basis of 55 Liters per head per day and 15% Unaccounter Water losses has been considered. A filtration loss of 5% is considered for raw water demand calculations. Water requirement for different stages of the scheme is detailed below:

Table : Demand Adopted

GP Name	Year	Water Demand
JAIRAMPUR	Initial Stage Year 2023	278
	Intermediate Stage Year 2038	312
	Ultimate Stage Year 2053	377

4

5 WATER SUPPLY SOURCE

Tubewells are successful in this area. Number of tubewells considered are 2. Water discharge of 400 LPM is required as per intermediate year demand, considering 6.5 hrs. of pumping.

As pumping rate shall be lesser than 60% of yield of tubewell. So, critical yield shall be achived 666.667 LPM of 2 Sets. We assume that critical yield is available in this proposed area.

6 RISING MAIN

From the proposed tube wells water will be conveyed to the R.C.C Overhead Tank through Rising Main. Therefore, Rising Main of 150 mm dia DI K-7 pipe with length 530 meters has been provided.

Table : Rising Main Summary

Pipeline Type	Material	Diameter(mm)	Length (m)	
Column Pipe	MS/GI	80	8	Nos. of 3m
Rising Mains	DI K-9	200	530	

7 PUMPING PLANT

At the tube well Submersible Type Pumping Plant 2 Sets of 400 Liters per Minute discharge, 48 mt. head with 10 H.P.& 10 H.P have been provided.

Total Head of pumping plant has been worked out as below:

Sr. No.	Particulars	Head	Unit
1	Depth of water below ground level	15.0	m
2	Avg. Draw Down Depth while	4.5	m
3	Seasonal Variation	5.0	m
4	Max. DrawDown during Pumping	4.5	m
5	Staging of RCC Overhead Tank	12	m
6	Depth of Tank	3.50	m
7	GL Diff. between T/W & ESR Site	1.00	m
8	Head loss in the Pipeline	0.01	m
9	Residual Head/ Terminal Head	1.00	m
10	Lossed inside Pump House	1.00	m
	Total:	47.5	m
	Say:	48	m

Note: Depth of water availability below ground level may vary depending upon the actual water level at that particular location of drilling, which will lead to change in required pump head.

8 PUMPING HOURS

Based on the Standard Norms / Design Criteria 6.5 hour pumping has been adopted for Intermediate stage.

9 OVERHEAD TANK

The capacity of Over-head tank has been calculated by performing mass balancing over a duration of 24 hours by considering distribution consumption pattern for the mid stage demand. The capacity calculated is 250 KL with 12 m staging.

FINANCIAL STATEMENT

34th

2.37 17

ANNEXURE 1 ESTIMATE FOR
JAIRAMPUR WATER SUPPLY SCHEME UNDER - SWSM
BLOCK- GAURA & DISTRICT- PRATAPGARH
FORM "J" (COMPREHENSIVE)
(with GST & Centage)

SL. No.	Description of Work	Amount in lakh	%age charges	Amount in lakh	Govt. of Central Share (50%)	Govt. of State Share (50%)	
1	2	3	4	5	6	7	
1	Cost of Work Total (Civil + E/M) 252.7 195.526	~~257.91~~	-	~~257.91~~	128.96	128.9563	195.58
2	Contingencies	~~257.91~~	2.00%	~~5.16~~	~~2.58~~	~~2.58~~	3.91
	Total Cost (A)=			~~263.07~~	~~131.54~~	131.54	199.49
3	GST (B)	~~263.07~~	18.00%	~~47.35~~	~~23.68~~	~~23.68~~	35.91
	Total Cost including contingency & GST (A+B)=			~~310.42~~	~~155.21~~	155.21	235.40
4	Centage charges (C)	~~263.07~~	12.50%	~~32.88~~		~~32.88~~	24.94
	Grand Total (A+B+C)			**~~343.31~~**	**~~155.21~~**	**188.10**	260.33
5	Total O&M Cost for 10 years			~~66.18~~	~~33.09~~	~~33.09~~	50.18
	Total with O&M			**~~409.48~~**	**~~188.30~~**	**~~221.18~~**	310.52
	Say (in Lakh)			**~~409.48~~**	**~~188.30~~**	**~~221.18~~**	310.52

SUBMITTED BY

(Authorized Signitary)
JMC Projects (I) Ltd.

CHECKED BY

Assistant Engineer
Division Office
U.P. Jal Nigam (Rural)
Pratapgarh

Executive Engineer
Division Office
U.P. Jal Nigam (Rural)
Pratapgarh

RECOMMENDED BY

Supritendent Engineer
Circle office
U.P.Jal Nigam (Rural)
Prayagraj

(तकनीकी प्रकोष्ठ)
राज्य पेयजल एवं स्वछता मिशन

Chief Engineer
U.P Jal Nigam (Rural)
Kanpur

(REETIKA RAI)
Executive Engineer
State Water & Sanitation Mission
Uttar Pradesh

ANNEXURE 2 ESTIMATE FOR

JAIRAMPUR WATER SUPPLY SCHEME UNDER - SWSM
BLOCK- GAURA & DISTRICT- PRATAPGARH

FORM "J" (CIVIL WORKS) (Amount - Rs in lakh)

(with GST & Centage)

SL. No.	Description of Work	Amount in lakh	%age charges	Amount in lakh	Govt. of Central Share (50%)	Govt. of U.P. Share (50%)
1	2	3	4	5	6	7
1	Basic Cost of Work	151.97	-	151.97	75.98	75.98
2	Contingencies	151.97	2.00%	3.04	1.52	1.52
	Total Cost (A)			**155.01**	**77.50**	**77.50**
3	GST (B)	155.01	18.00%	27.90	13.95	13.95
	Cost of work (including contingency & GST) (A+B)			**182.91**	**91.45**	**91.45**
4	Centage charges (C)	155.01	12.50%	19.38		19.38
	Grand Total (A+B+C)=			**202.28**	**91.45**	**110.83**
	Total			**202.28**	**91.45**	**110.83**
	Say (in Lakh)			**202.28**	**91.45**	**110.83**

SUBMITTED BY

(Authorized Signitary)
JMC Projects (I) Ltd.

CHECKED BY

Assistant Engineer
Division Office
U.P. Jal Nigam (Rural)
Pratapgarh

Executive Engineer
Division Office
U.P. Jal Nigam (Rural)
Pratapgarh

RECOMMENDED BY

Supritendent Engineer
Circle office
U.P.Jal Nigam (Rural)
Prayagraj

Chief Engineer
U.P.Jal Nigam (Rural)
Kanpur

ANNEXURE 3 ESTIMATE FOR

JAIRAMPUR WATER SUPPLY SCHEME UNDER - SWSM
BLOCK- GAURA & DISTRICT- PRATAPGARH

FORM "J" (E/M WORK) (Amount - Rs in lakh)

SL. No.	Description of Work	Amount in lakh	%age charges	Amount in lakh	Govt. of Central Share (50%)	Govt. of U.P. Share (50%)
1	2	3	4	5	6	7
1	Basic Cost of Work	105.95	-	105.95	52.97	52.97
2	Contingencies	105.95	2.00%	2.12	1.06	1.06
	Total Cost (A)			**108.06**	**54.03**	**54.03**
3	GST (B)	108.06	18.00%	19.45	9.73	9.73
	Cost of work (including contingency & GST) (A+B)			**127.52**	**63.76**	**63.76**
4	Centage charges (C)	108.06	12.50%	13.51		13.51
	Grand Total (A+B+C)=			**141.02**	**63.76**	**77.27**
	Total Cost of Scheme			**141.02**	**63.76**	**77.27**
	Say (in Lakh)			**141.02**	**63.76**	**77.27**

SUBMITTED BY

(Authorized Signitary)
JMC Projects (I) Ltd.

CHECKED BY

05/11/2022

Junior Engineer (T)
Division Office (E&M)
U.P. Jal Nigam (Rural)
Prayagraj

Assistant Engineer
Division Office (E&M)
U.P. Jal Nigam (Rural)
Prayagraj

RECOMMENDED BY

Executive Engineer
Division Office(E&M)
U.P Jal Nigam (Rural),
Prayagraj

Superintending Engineer
Circle office (E&M)
U.P.Jal Nigam (Rural)
Kanpur

Chief Engineer
U.P.Jal Nigam (Rural)
Kanpur

JAIRAMPUR WATER SUPPLY SCHEME UNDER - SWSM
BLOCK- GAURA & DISTRICT- PRATAPGARH
GENERAL ABSTRACT OF COST (COMPREHENSIVE)

SL. No.	Description of Work	Qty.	Unit	Amount (Rs.) (In lakh)	
1	2	3	4	5	
A.	**Civil work :**				
1	Pump house & Chlorinating room	1	Job	10.07	
2	Rising Main	530	Rmt	14.35	
3	125 ~~250~~ KL R.C.C. Over head tank 12 Staging	1	Nos	~~45.37~~ ~~47.04~~	
4	Distribution System	6350	Rmt	~~64.07~~	41.00
5	Boundary Wall, approach road and Misc. works within campus	1	Job	~~13.88~~	10.5
6	Staff Quarter	1	Nos	0.00	
7	Survey, Design & Preperation of DPR	1	Job	~~2.55~~ ~~2.52~~	1.94
	Sub Total (A)			~~147.74~~ ~~151.97~~	109.84
	Total (A)			~~151.97~~	

B.	E&M Work :			
1	Cost of Tubewell	2	Nos.	46.52 ~~49.3189~~
2	Cost of pumping plant and Chlorinating Plant	2	Set	17.42 ~~18.59~~
3	Solar Panel System	32.0	KW	~~22.72~~
4	Electrification of pump house	2	Nos.	~~15.320~~
	Sub Total (B)			~~101.98~~ ~~105.95~~
	Total (B)			~~105.95~~
	TOTAL (A+B)			~~257.91~~

21.80
85.74

~~252.17~~ ~~109.84~~
195.576

(Authorized Signitary)
JMC Projects (I) Ltd.

30/9/17

Assistant Engineer
Division Office
U.P. Jal Nigam (Rural)
Pratapgarh

PROJECT ECONOMICS

ANNEXURE 9 ESTIMATE FOR
JAIRAMPUR WATER SUPPLY SCHEME UNDER - SWSM
BLOCK- GAURA & DISTRICT- PRATAPGARH
ABSTRACT OF ECONOMICS

Sl. No	Particulars	Initial Stage 2023	Middle Stage 2038	Ultimate Stage 2053
1	2	3	4	5
1	Design Population	4290	4824	5824
2	Rate of water supply per capita per day (ltr)	64.71	64.71	64.71
3	Maximum requirement of water per day (Kl)	278	312	377
4	Avg. Requirement of water per day (Kl)	208	234	282.65
5	Annual production of water (Kl)	1,01,326	1,13,939	137557.93
6	Total estimated cost of the scheme (Rs. In Lac)	310.42	310.42	310.42
7	Total annual income (Rs.)	5,96,419	10,47,904	2176025
8	Total annual recurring expenditure in (Rs.)	5,26,142	10,93,322	2645840
9	Net Profit (+)/ Loss(-)	70,277	-45,418	-469814
10	Per capita cost including Contingency	6,132	5,453	4517
10	Per capita cost including Contingency & GST (Rs.)	7,236	6,435	5330
11	Cost of production of water per Kl.	5	10	19
12	Per capita maintenance cost (Rs.)	123	227	454
13	Per capita income (Rs.)	139	217	374

ANNEXURE 10 ESTIMATE FOR

JAIRAMPUR WATER SUPPLY SCHEME UNDER - SWSM
BLOCK- GAURA & DISTRICT- PRATAPGARH

ANNUAL INCOME

Sl.	Particulars	Initial Stage	Middle Stage	Ultimate Stage
No.		2023	2038	2053
1	2	3	4	5
1.A	Design Population	4,290	4,824	5824
1.B	Floating population (if any) Total Population to be			
2	Rate of water supply (lpcd)	64.71	64.71	64.71
3	Daily water requirement. (Kl)	278	312	377
4	Annual water requirement. (Kl)	101326	113939	137557.93
5	No. of houses hold connection	621	699	843
6	No. of taxable houses	621	699	843
7	Monthly charges	80	125	215
8	Minimum annual connection charges for domestic uses through house connection @ Rs. 80/-, 125/- & 215/- per connection per month.	596419	1047904	2176025
	Total Income	5,96,419	10,47,904	2176025
9	Annual maintenance expenditure in Rs.	5,26,142	10,93,322	2645840
10	Net Profit (+) /Loss(-) in Rs.	70,277	-45,418	-469814
	Say (in lakh)	**0.70**	**-0.45**	**-4.70**

ANNEXURE 11 ESTIMATE FOR

JAIRAMPUR WATER SUPPLY SCHEME UNDER - SWSM
BLOCK- GAURA & DISTRICT- PRATAPGARH

ANNUAL RECURRING EXPENDITURE ON MAINTENANCE

Sl.	Particulars	Initial Stage	Middle Stage	Ultimate Stage (2053)
No.		2023	2038	2053
1	2	3	4	5
1	Expenditure of O&M	5,26,142	10,93,322	22,71,924
	Total	**5,26,142**	**10,93,322**	22,71,924
	Say	**5,26,150**	**10,93,330**	22,71,930

ANNEXURE 12 ESTIMATE FOR

JAIRAMPUR WATER SUPPLY SCHEME UNDER - SWSM
BLOCK- GAURA & DISTRICT- PRATAPGARH

RECURRING EXPENDITURE ON ELECTRICITY

Sl No.	Particulars	Initial Stage	Middle Stage	Ultimate Stage
		2023	**2038**	**2053**
1	2	3	4	5
1	Total HP Proposed at Tubewell (2 Sets)	**20.0**	**20.0**	**20.0**
2	Total HP for ESR Feed Pump	0	0	0
3	Other Power	2.7	2.7	2.7
4	Total HP at Water Works	22.7	22.7	22.7
5	Total KW	16.93	16.93	16.93
6	No. of days for lean period when solar power not available	365	365	365
7	Pumping Hours	6.63	7.45	9.00
8	Total Unit	40977	46078	55630
9	Cost per Unit	6.5	8	10
10	Total energy charges	266353	368624	556298
	Say Rs.	**266353**	**368624**	**556298**

ANNEXURE 13 ESTIMATE FOR

JAIRAMPUR WATER SUPPLY SCHEME UNDER - SWSM
BLOCK- GAURA & DISTRICT- PRATAPGARH

ANNUAL RECCURING EXPENDITURE ON WATER CESS LEVI TO BE PAID TO WATER POLLUTION CONTROL BOARD

Sl. No.	Particulars	Initial Stage (2023)	Middle Stage (2038)	Ultimate Stage (2053)
1	2	3	4	5
1	Total population	4290	4824	5824
2	Daily water requirement in Kl	278	312	377
3	Annual production of water in kl/year	101326	113939	137558
4	Average@ 75% of Total	75995	85454	103168
5	Water cess levi @ Rs. 0.1 per kl	10133	11394	13756
	Say	10100	11400	13800

Opertation & Maintenane for 10 Year

Measurement & Abstract Sheet

Sr. No.	BOQ Item No.	Description	Unit	No.	Qty	Rate in lac	Amnt	Remarks
1	50.00	**Operation and Maintenance:-** Operation and Maintenance for 10 years of water supply schemes after completion including staff required for operation and maintenance, chemicals, all materails, specials T & P for operation and maintenance excluding electricity charges. **(2% of Capex cost for first year of O&M)**						
		Capital Cost of the Scheme				263.07		Defect Liability is for one year and is concurrent with first
		2% of capex cost a				5.26		
		Total cost for base year				5.26		
		O&M for First Year	Rs	1	1.00	5.3	5.26	
		O&M for Second Year	Rs	1	1.00	5.5	5.52	The rates so decided will be valid for the year 2020—21 & 2021-22. The work shall be aWardea by SW5M/DWSM. Price adjustment during 0&M is applicable with escalation of 5% each year from next year to the base year (after lst Year of 0&M).
		O&M for Third Year	Rs	1	1.00	5.8	5.80	
		O&M for Fourth Year	Rs	1	1.00	6.1	6.09	
		O&M for Fifth Year	Rs	1	1.00	6.4	6.40	
		O&M for Sixth Year	Rs	1	1.00	6.7	6.72	
		O&M for Seveth Year	Rs	1	1.00	7.1	7.05	
		O&M for Eighth Year	Rs	1	1.00	7.4	7.40	
		O&M for Ninth Year	Rs	1	1.00	7.8	7.77	
		O&M for Tenth Year	Rs	1	1.00	8.2	8.16	
	Total Cost for Opertation & Maintenane for 10 Year						**66.18**	
	Gross cost of Project with O/M (in Lac)						**409.48**	

DETAILED PROJECT REPORT

Opertation & Maintenane for 10 Year for Civil work

Measurement & Abstract Sheet

Sr. No.	BOQ Item No.	Description	Unit	No.	L	B / D	H	Qty	Rate in lac	Amnt
1	50.10	**Operation and Maintenance:-** Operation and Maintenance for 10 years of water supply schemes after completion including staff required for operation and maintenance, chemicals, all materails, specials T & P for operation and maintenance excluding electricity charges. **(2% of Capex cost for first year of O&M)**								
		Capital Cost of the Scheme							155.01	
		2% of capex cost							3.10	
		Total cost for base year							3.10	
		O&M for First Year	Rs	1				1.00	3.1	3.10
		O&M for Second Year	Rs	1				1.00	3.3	3.26
		O&M for Third Year	Rs	1				1.00	3.4	3.42
		O&M for Fourth Year	Rs	1				1.00	3.6	3.59
		O&M for Fifth Year	Rs	1				1.00	3.8	3.77
		O&M for Sixth Year	Rs	1				1.00	4.0	3.96
		O&M for Seveth Year	Rs	1				1.00	4.2	4.15
		O&M for Eighth Year	Rs	1				1.00	4.4	4.36
		O&M for Ninth Year	Rs	1				1.00	4.6	4.58
		O&M for Tenth Year	Rs	1				1.00	4.8	4.81
	Total Cost for Opertation & Maintenane for 10 Year									**38.99**

DETAILED PROJECT REPORT

Opertation & Maintenane for 10 Year for E/M Works

Measurement & Abstract Sheet

Sr. No.	BOQ Item No.	Description	Unit	No.	L	B / D	H	Qty	Rate in lac	Amnt
1	50.20	**Operation and Maintenance:-** Operation and Maintenance for 10 years of water supply schemes after completion including staff required for operation and maintenance, chemicals, all materails, specials T & P for operation and maintenance excluding electricity charges. **(2% of Capex cost for first year of O&M)**								
		Capital Cost of the Scheme							108.06	
		2% of capex cost							2.16	
		Total cost for base year							2.161	
		O&M for First Year	Rs	1				1.00	2.16	2.16
		O&M for Second Year	Rs	1				1.00	2.3	2.27
		O&M for Third Year	Rs	1				1.00	2.4	2.38
		O&M for Fourth Year	Rs	1				1.00	2.5	2.50
		O&M for Fifth Year	Rs	1				1.00	2.6	2.63
		O&M for Sixth Year	Rs	1				1.00	2.8	2.76
		O&M for Seveth Year	Rs	1				1.00	2.9	2.90
		O&M for Eighth Year	Rs	1				1.00	3.0	3.04
		O&M for Ninth Year	Rs	1				1.00	3.2	3.19
		O&M for Tenth Year	Rs	1				1.00	3.4	3.35
	Total Cost for Opertation & Maintenane for 10 Year									**27.18**

DETAILED PROJECT REPORT

JAIRAMPUR WATER SUPPLY SCHEME UNDER - SWSM

BLOCK- GAURA & DISTRICT- PRATAPGARH

BREAK UP OF COST

SL. No.	Sub Head	Quoted Amount in lakh	Building	R.C.C Reservoir	Pipe Line	Machinery	Misc.
1	2	3	4	5	6	7	8
A.	**Civil works :**						
1	Pump house & Chlorinating room	10.07	10.07				
2	Rising Main	14.35			14.35		
3	250 KL R.C.C. Over head tank	47.04		47.04			
	12 M Staging						
4	Distribution System	64.07			64.07		
5	Boundary Wall and approach raod	13.88					13.88
6	Staff Quarter	0.00					
7	Survey, Design & Preperation of DPR In Lac	2.55					2.55
	(Total A)	**151.97**	**10.07**	**47.04**	**78.43**		**16.43**

B.	E&M works:						
1	Cost of Tubewell construction	49.319				49.32	
2	Cost of pumping plant ,Chlorinating Plant	18.59				18.59	
3	Solar Panel System	22.72					22.72
4	Electrification of pump house,	15.32				15.32	
	Total (B)	**105.95**	0.00	0.00	0.00	83.23	0.00
	Total (A+B)	**257.91**	10.07	47.04	78.43	83.23	16.43
	Total Cost (A+B)	**257.91**					
	Contingencies (2%)	**5.16**					
	Total Cost -	**263.07**					
	GST (18%)	**47.35**					
	Grand Total including GST and Contingency(In Lakh)	**310.42**					
	Centage (12.5%)	**32.88**					
	Grand Total (In Lakh)	**343.31**					
	Cost for O/M for 10 Year	**66.18**					
	Grand Total with O/M (In Lakh)	**409.48**					

CIVIL : TECHNICAL & DESIGN

5.1 TECHNICAL REPORT

i) Design Criteria

The Design Criteria adopted for the works proposed under this detailed project Report are in accordance with the directives / guidelines issued by Ministry of Jal Shakti Department of Drinking Water and Sanitation National Jal Jeevan Mission.

Design Criteria for Head Loss or Pressure Drop:

Friction Head Loss per Meter of pipe are computed by using Hazen William Formula given below:

$$Q = [1.292 * 10^{-5} * C * (d^{2.63}) * (S^{0.54})]$$

Where,

C - Hazen William coefficient

d - Pipe Diameter in mm

Q - Discharge in cubic meter per hour

S - Friction Slope

Hazen William Co-efficient:

It is a factor or value used to indicate the smoothness of the interior of a pipe. The higher the C Factor, the smoother the pipe, the greater the carrying capacity, and the smaller the friction or energy losses from water flowing in the pipe. It is used in calculating the relative roughness of a pipe against the size of its diameter.

In this case, following C values for DI and HDPE pipes are taken:

For

DI pipes, C = 140

HDPE pipes, C = 145

ii) Design Period

The water supply projects are designed to meet the requirements over a 30-year period.

Base year	-	2023
Intermediate design year	-	2038
Ultimate design year	-	2053

In this project, various facilities of water supply works are designed to meet the requirement of the following design periods.

Table : Design period of various facilities in water supply system

Sr. No.	Facilities in Water Supply	Design Capacity (Years)
1	Tubewell	**15**
2	Overhead Tanks	**15**
3	Rising/Distribution System	**30**

Population Details

Name of Gram Panchayat-		JAIRAMPUR				
S.No.	Villages in JAIRAMPUR Gram Panchayat	Census	Total Pop.	SC/ST	Habitation/Tola	Household as per 2011
1	Jairampur	1971	1000	11	1.Jairampur 2.Kurmiyan	422
		1981	1045	43		
		1991	1048	47		
		2001	2608	130		
		2011	2914	126		
	Total Population as per 2011		2914	126	Total HH as per 2011	422

Population Details

Note: For population forecasting, available data of the past decades for particular GP has been considered.

The population projection for different stages of the design period has been done by the different standard prescribed methods detailed below:

(i) Arithmetical Increase Method
(ii) Geometrical Increase Method
(iii) Incremental Increase Method
(iv) Simple Graph Method
(v) Semi Log Graph Method.

As stated above population figures of last five decades that is for 1981,1991, 2001 and 2011 are available, based on these figures increase in population over previous decades, percentage increase in population and the incremental increase in population have been computed and these details are tabulated below:

Table : Population of concerned Gram Panchayat based on census during last five decades

Population Projection Calculation

Table : Population Projection Calculation

Sr. no.	Census Year	Total Population	Increase per decade	Incremental Increase in Population	Incremental Increase (taking -ve value zero)	Percentage Increase in Population	Percentage Increase in Population
1	1971	1000					
1	1981	1045	45			4.5%	4.50
2	1991	1048	3	-42	-42	0.3%	4.79
3	2001	2608	1560	1557	1557	148.9%	153.64
4	2011	2914	306	-1254	-1254	11.7%	165.38
Total			1914	261	261		165.38
Average			479	87	87	Rg=	165.38
Say			479	87	87	6.89%	165.38

A) Arithmetical Increase Method

Pn =P0+ (n.x)

Population in Year 2023-	2914+(479*1.2)	**3488**
Population in Year 2038-	2914+(479*2.7)	**4206**
Population in Year 2053-	2914+(479*4.2)	**4924**

B) Incremental Increase Method

Population in Year 2023	(2914+(479*1.2)+(1.2*(1+1.2)*87)/2)	**3603**
Population in Year 2038	**(2914+(479*2.7)+(2.7*(1+2.7)*87)/2)**	**4641**
Population in Year 2053	**(2914+(479*4.2)+(4.2*(1+4.2)*87)/2)**	**5874**

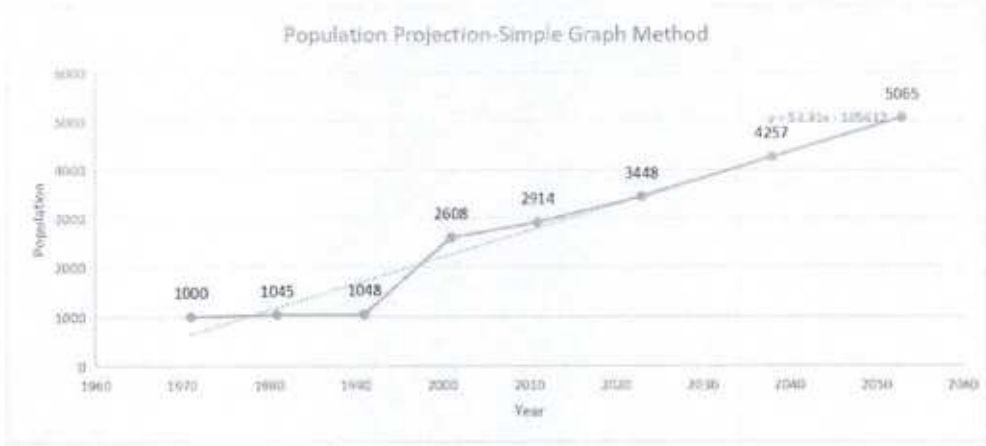
C) Geometric Increase Method

Population in Year 2023	2914*(1+0.0689)^1.2	**3157**
Population in Year 2038	2914*(1+0.0689)^2.7	**3489**
Population in Year 2053	2914*(1+0.0689)^4.2	**3855**

D) Simple Graphical Method: -

In this method, the population curve of the Gram Panchayat (i.e., the population vs. past decades) is smoothly extended for obtaining values for the future population. The line of best fit has been obtained by the method of least squares. Based on this comparison, a graph of populations versus decades is plotted and extrapolated.

Year		Population
1971		**1000**
1981		**1045**
1991		**1048**
2001		**2608**
2011		**2914**
2023		**3448**
2038		**4257**
2053		**5065**



Population Projection by Simple Graphical Increase Method

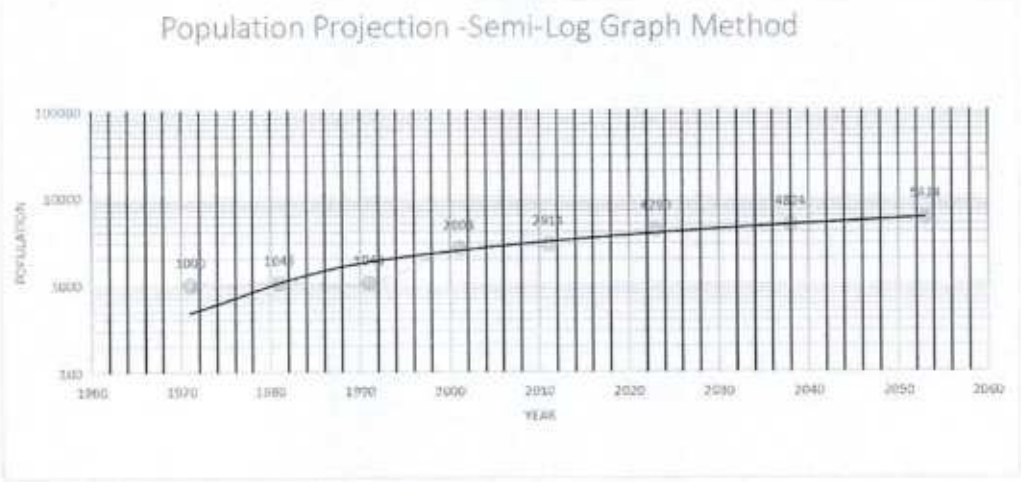
Table : Population Projection by Simple Graphical Increase Method

Population in the year	2023	**3448**
Population in the year	2038	**4257**
Population in the year	2053	**5065**

E) SEMI-LOG GRAPHICAL METHOD:

It is useful for data with exponential relationships, or where one variable covers a large range of values. This is a line with slope and vertical intercept. This method gives increased values compared to the figures obtained by the arithmetical increase method with increase in duration. Following table shows the projected population for future years by this method.

Census Year	Total Population	
1971		1000
1981		1045
1991		1048
2001		2608
2011		2914
2023		4290
2038		4824
2053		5824



Population Projection by Semi Log Graphical Method

Table : Population Projection by Semi log Graphical Method

(i)	Population in the year	2023		**4290**
(ii)	Population in the year	2038		**4824**
(iii)	Population in the year	2053		**5824**

SUMMARY OF PROJECTED POPULATION:

The population has been projected by various methods and has been summarized in the table below.

Table : Summary of various Population Projection Methods

Sr. No.	Method of Population	Census Population 2011	Projected Population 2023	2038	2053	Ratio	Nearer to All methods Av.sum
1	Arithmetical Increase	2914	3488	4206	4924	41%	
2	Geometrical Increase	2914	3157	3489	3855	22%	
3	Incremental Increase	2914	3603	4641	5874	63%	
4	Simple Graphical	2914	3448	4257	5065	47%	
5	Semi Log Graph	2914	4290	4824	5824	36%	SLG
			3597	**4283**	**5108**		

DESIGN POPULATION	**4290**	**4824**	**5824**

36%
2023 Pop.

Thus, population figures worked out by the Semi Log Graph Method are more realistic, reasonable

ADOPTED POPULATION

Projected population figure arrived by Semi Log Graph Method are closer to the pattern of growth of population compared to average of all population projection methods. Thus, population figure worked out by Semi Log Graph Method are realistic, reasonable and conform to the pattern of growth of population of the village which is as under:

DESIGN POPULATION	Initial (2023)	Intermediate(2038)	Ultimate (2053)
	4290	**4824**	**5824**

Table : Population Ratio

Year	Population	Population Ratio
2011	**2914**	-
2023	**4290**	**1.00**
2038	**4824**	**1.12**
2053	**5824**	**1.36**

Population Ratio

CENSUS	POPULATION	Pop factor
2011	2914	-
2023	4290	1.00
2038	4824	1.12
2053	5824	1.36

iv) RATE OF WATER SUPPLY

The water demand has been calculated on the basis of 55 Liters per head per day and 15% Unaccounter Water losses has been considered. A filtration loss of 5% is considered for raw water demand calculations, Rte of water supply in LPCD 64.71

V) WATER DEMAND

Water requirement for different stages of the scheme is detailed below:

GP NAME	YEAR/STAGE	POPUATION	LPCD	LOSSES (%)	TOTAL DEMAND (KLD)
JAIRAMPUR	Initial Stage Year 2023	4290	55	15	278
	Intermediate Stage Year 2038	4824	55	15	312
	Ultimate Stage Year 2053	5824	55	15	377

Vi) SOURCE OF WATER SUPPLY

Tubewells are successful in this area. Number of tubewells considered are 2 Water discharge of 400 LPM is required as per intermediate year demand, considering 6.5 hrs. of pumping.

As pumping rate shall be lesser than 60% of yield of tubewell. So, minimum tubewell yield required is 667 LPM of 2 Sets. We assume that required yield is available in this proposed area.

Vii) REQUIREMENT OF TUBE WELLS & PUMPING HOURS

Design of Tubewell discharge

Population 2038	=	4824	
Rate of supply	=	64.71	lpcd
Water demand	=	312	KLD
Pumping hours	=	6.5	Hrs
Borewell yield required	=	48.02	Cum/hr
Discharge available for single bore	=	90	Cum/hr
No.of bores required	=	0.534	No.s

No.of Tubewells provided = 1 No.s

Discharge of Tubewell = 800 LPM = 800 LPM approx.

Say = 400 LPM of 2 Sets

Pumping hours = Design demand/Bore yield (cum/hr)

Design demand, 2023	=	277.61	Cum/day
Design demand, 2038	=	312.16	Cum/day
Design demand, 2053	=	376.87	Cum/day
Bore discharge	=	48.02	Cum/hr
Pumping hours 2023	=	11.57	Hrs
Pumping hours 2038	=	13.01	Hrs
Pumping hours 2053	=	15.70	Hrs

S.NO	PARTICULARS	STAGE/YEAR		
		2023	2038	2053
1	Population	4290	4824	5824
2	Rate of Water Supply LPCD	64.71	64.71	64.71
3	Daily Water Demand in KLD	278	312	377
4	Discharge from Tube well Required in LPM	712	800	966
5	Since Ground Water Yield of District is 700 LPM So We Take 2 Nos. Tubewell		400	
6	No of Tubewells required	1	2	2
7	Actual Pumping Hrs	11.6	13.0	15.7

NOTE: Solar panels shall be installed to meet power requirement for Intermediate stages, subjected to availabiliy of the required land area in the permises.

Viii HEAD OF

Total head of pumping plant has been worked

Sr.	Particulars	Head	U
1	Depth of water below ground level	15.00	m
2	Avg. Draw Down Depth while Operation	4.50	m
3	Seasonal Variation	5.00	m
4	Max. DrawDown during Pumping	4.50	m
5	Staging of RCC Overhead Tank	12	m
6	Depth of Tank	3.50	m
7	GL Diff. between T/W & ESR Site	1.00	m
8	Head loss in the Pipeline	0.01	m
9	Residual Head/ Terminal Head	1.00	m
10	Lossed inside Pump House	1.00	m
Total:		47.5	m
Say:		48	m

NOTE: Depth of water availability below ground level may vary depending upon the actual water level at that particular location of drilling, which will lead to change in required pump head.

ix PUMP HP AND MOTOR KW CALCULATIONS :-

Tubewell to OHT

Sr. No.	Particulars	Head Pump 1	Un
1	Proposed Tubewell Total discharge	400	lpm
2	Proposed Tubewell Total discharge	24.0	m3/hr
3	Total Pump Head	48	m
4	Pump Efficiency	70%	
5	BKW of motor ((QxH)/(367xEfficiency))	4.48	KW
6	Multiplying Factor is selected 1.3 for above BKW as per manual	5.83	KW
7	BHP of motor (1 HP = 0.7457 KW)	7.82	HP
8	Provided motor rating in HP	10.00	HP
9	Provided motor rating in KW	7.46	KW

For TW-2

Sr. No.	Particulars	Head Pump 2	Un
1	Proposed Tubewell Total discharge	400	lpm
2	Proposed Tubewell Total discharge	24.0	m3/hr
3	Total Pump Head	50	m
4	Pump Efficiency	70%	
5	BKW of motor ((QxH)/(367xEfficiency))	4.67	KW
6	Multiplying Factor is selected 1.3 for above BKW as per manual	6.07	KW
7	BHP of motor (1 HP = 0.7457 KW)	8.14	HP
8	Provided motor rating in HP	10.00	HP
9	Provided motor rating in KW	7.46	KW

ix) OVER HEAD

The capacity of Over-head tank has been calculated by performing mass balancing over a duration of 24 hours by considering distribution consumption pattern for the mid stage demand. The capacity calculated is 250 KL with 12 m staging. .

Intermediate Demand (KLD)	312	Number of Tanks	1
Inflow Hours (Hrs)	6.5	Final capacity	250

x) **RISING MAIN**

Details of Rising main are given below:

Pipeline Type	Dia (mm)	Material	Length (m)
RISING MAIN	200	K-9	30
RISING MAIN	200	K-9	500
Total Length (in m)			530

xi) **DISTRIBUTION SYSTEM**

The distribution system has been designed on the basis of following parameters as per Design criteria

(a) Rate of water supply	55 LPCD + 15% losses = 64.71 LPCD
(b) Design period	30 Years
(c) Miimum terminal pressure	7 m
(d) Peak factor	3
(e) Min diameter of Mains	63 mm

(f) DI pipe and HDPE Pipe PE-100 Grade PN-6 working pressure has been provided.

xii) **STAND POST**

2 no. Of Public Stand post will be provided in each revenue village.

xiii) **FUNCTIONAL HOUSEHOLD TAP CONNECTION (FHTC)**

Total number of households as per census JAIRAMPUR Gram Panchayat are 422 nos. Considering the growth in population anticipated households for JAIRAMPUR Gram Panchayat at different stages of

schemes are as under:

FHTC at Initial Stage Year 2023	621
FHTC at Intermediate Stage Year 2038	699
FHTC at Ultimate Stage Year 2053	843

xiv) CROSSINGS

Provision and arrangement shall be done for trenchless crossing of National and state highway road and Railway track with MS casing pipe of required size as per IS: 3589 & made from confining to IS: 2062. Provision for Nala /Culvert crossing along the alignment of pipeline shall be completed as per instructions of Engineer in charge. Casing of pipe is done by concreting. For all other road crossing casing pipe of RCC NP-3 with required size shall be used.

xv) DESIGN STATEMENTS

The design statements are provided as design statements and attached along with this report

Size of Housing pipe

Bowl dia of Pump of 400 LPM capacity of 2 Sets	150	mm
Screen Pipe Size	150	mm
Housing pipe dia required	200	mm

Depth of Tube well

Drilling depth of Tubewell bore	300	m
Lowering of Tubewell Assembly	270	m

Drilling Depth is taken at least 10% higher than lowering of tube well assembly length to accommodate the settlement of bore mud and falling strata of bore during pulling of Drill Rod and lowering of Tube well assembly to ensure the full and proper lowering of Tubewell assembly.

Note: - Actual depth of tube well may vary if required during execution.

The thickness of MSERW pipe shall be minimum 7.1 mm Thick

5.2. CIVIL SCOPE OF WORK

5.2.1 SCOPE

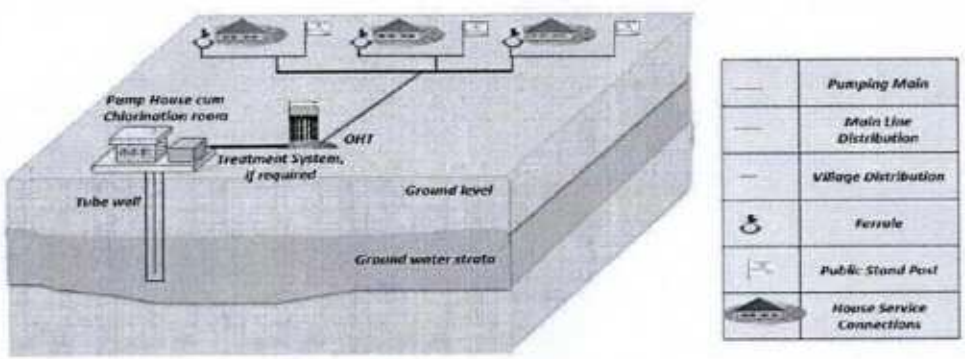
Water and Sanitation Mission, Uttar Pradesh (SWSM) proposes to take up Construction, operation & Maintenance for 10 years, of various Water Supply Projects in Rural Areas of Uttar Pradesh through District Water and Sanitation Mission (DWSM) and Gram Panchayat.

Civil scope for this gram panchayat includes design and construction of the following:

SCOPE OF WORK

Sr. No.	Structre	Details	
1	Over Head Tank (OHT)	Capacity (in KL)=	250
		Staging (in m)	12
		Soil bearing capacity (SBC) - As per Soil report data.	
		Construction method — OHT	
		Staging - Cast-In-Situ / Structural Steel/ Precast Container MOC- RCC/ Steel Tank	
2	Pump House cum Chlorination Room	Dimensions- 2.5 m X 3.0m X 3.0m	
		SBC- As per Soil report data (8 T/ Sq. Mt.)	
		Construction method- Pre-Engineered Brick masonry	
3	Boundary Wall	Boundary wall shall be of 1.3m height and 115mm thick Brick Masonry panels / Precast Panels.	
		230mm X 230mm Brick pillar to be provided at 3m center to center.	
		Construction method- Brick masonry / Precast.	
4	Valve Chamber	Valve chamber shall be constructed in brick masonry.	

2.2. **SALIENT FEATURES: CIVIL AND STRUCTURAL WORKS**



5.2.2 SA IENT FEATURES: CIVIL AND STRUCTURAL WORKS

i) CODE & STANDARDS

All desig work will be based on Indian Standards (IS) codes (latest revisions), with amendments, if any, as on date. Apart fr n these coc s, specific design guidelines laid in the contract documents are followed.

The desi; 1 is carried out in conformity with following IS code latest editions.

- 456 -2000 – Plain and reinforced concrete -Code of practice.
- IS:3370 (Part-1)-2009 – Concrete Structures for Storage of Liquids – Code of Practice Part-1 General Requirements.
- IS: 3370 (Part-2) - 2009 – Concrete Structures for Storage of Liquids – Code of Practice Part-2 Reinforced Concrete Structures.
- IS: 3370 (Part-4) - 1967 – Concrete Structures for Storage of Liquids – Code of Practice Part-4 Design Tables.
- IS: 875 -1987 (Part-1,2,5) - Code of practice for Design Loads for Building and Structures.
- IS: 875 -2015 (Part-3) - Code of practice for Design Loads for Building and Structures.
- IS: 1893-2016 (Part-1) - Criteria for Earthquake Resistant design of structures - General Provisions of buildings.
- IS: 1893-2014 (Part-2) - Criteria for Earthquake Resistant design of structures - Liquid Retaining Tanks.
- IS 800 - Code of Practice for general construction in steel.
- IS 806 - Code of Practice for use of steel tubes in general building construction.
- IS 13920 : 2016 – Ductile detailing of reinforced concrete structures subjected to seismic force– code of practice.
- SP: 16 – Design Aids for Reinforced Concrete.
- SP: 24 – Explanatory Handbook on Indian Standard Code of Practice for Plain and Reinforced Concrete.
- SP: 34 - Handbook on Concrete Reinforcement and Detailing.

ii) Units of measurements

All units used in the analysis and design are in SI system unless noted otherwise.

iii) Computer Program/ Software

STAAD-PRO software is used for analysis and design and also in-house Excel spread sheets are used for design.

5.2.3 SITE CONDITIONS

i) Design Ground Elevation

Finished Ground Level / Natural Ground level (NGL) for this gram panchayat shall be as per survey.The safe bearing capacity (SBC) considered for design purpose is 8T/sqm at the depth of 2m from the NGL.There may be poor soil conditions below 2m, in that case additional rate will be paid for the pile foundation if required in the future.

5.2.4 MATERIAL

i) Concrete Mix

Ordinary Portland cement of 43 grade conforming to latest IS codes shall be used and minimum cement content shall be as per the IS: 456-2000.

Minimum Cement Content in Concrete

Sr. No.	Grade of Concrete	Minimum Cement Content in Concrete (Kg/m³)
1	M15	240
2	M20	300
3	M25	300
4	M30	320
5	M40	360

ii) **Concrete Grade**

GRADE OF CONCRETE

Sr. No.	Description	Grade of Concrete
1	Mass filling/ Plum Concrete	M5
2	PCC below Footing-100mmthick and 100mm projection	M15
3	Valve chamber/pipe encasement/ thrust blocks	M20
4	Non- Liquid retaining structures (including staging of OHT)	M25
5	RCC of Liquid retaining structures	M30
6	Precast Structures	M40

iii) **Reinforcement bars**

Reinforcement bars will be High yield strength deformed bars Fe 500 TMT for structures confirming to IS: 1786-2008.

iv) **Brick Masonry**

All external and internal walls shall be in 230 mm thick and shall be of class designation 10 or best locally available approved by Employer made of good brick earth thoroughly burnt and shall be of deep cherry red or coppercolor.Brick shall be well bonded and laid in English bond unless otherwise specified.

5.2.5 STRUCTURAL ANALYSIS

i) **Modelling**

The structures are modelled in STAAD-PRO with the appropriate support condition provided as required.

ii) **Basic loads**

All building sand structures shall be designed to resist the worst combination of the following loads/stresses under test and working conditions;

- Dead Load
- Imposed Loads or Live Loads
- Monorail Load
- Wind Loads
- Seismic Loads
- Hydrodynamic Pressure Load
- Vehicular Surcharge
- Earth Pressure
- Pump & Equipment Loads

Dead Load

Dead load comprises of the self-weight of all the permanent structural components including walls, floors, columns, roofs, partitions, stairways, equipment's etc., as applicable to individual structures.

The following unit weight of material shall be considered for computation of loads. Loads given in IS:875(Part-I) shall considered for the material not listed below.

DEAD LOAD DETAILS

Sr. No.	Material	Unit Weight
1	Water	10 kN/m^3
2	Soil	18 kN/m^3
3	Plain Cement Concrete	24 kN/m^3
4	Reinforced Cement Concrete	25 kN/m^3
5	Structural Steel	78.5 kN/m^3
6	Floor finish	24 kN/m^3
7	Brickwork	22 kN/m^3
8	Plaster (applied to masonry surface)	18 kN/m^3

Imposed Load

The Imposed loads considered shall not be less than that specified in IS:875(Part-II). Floors and supporting members, which may be subjected to equipment live loads, shall be designed based on the weight of the equipment or specifically defined loads, whichever is greater.
Following minimum loads shall be considered in the design of structure as per IS 875.

LIVE LOAD DETAILS

Sr. No.	Location	Live Load
1	Roof Slab- accessible	1.5 kN/m^2
2	Roof Slab- inaccessible	0.75 kN/m^2
3	Live load on floors	3.0 kN/m^2
4	Platform, Stairways, Corridors, Walkways	3.0 kN/m^2
5	Toilet	2.0 kN/m^2
6	Surcharge load	10 kN/m^2

Monorail Loads

Mono rail and supporting columns shall be designed for vertical and horizontal forces including impact forces. All lifting beams and monorails shall have their design loads increased for impact factor.

Impact factor:

Impact loads for monorail, shall be taken as per IS:875(Part-II). The minimum impact factors to be used in design shall be as follows:

Monorail loads:

As per IS 875(Part-II)-1987, cl. 6.3, Pg.16

a. Impact factor of 10% of lifted load in case of hand operated chain pulley block.
b. Impact factor of 25% of lifted load of electrical pulley and support design.

Wind Load (WDL)

Wind load on structure shall be calculated as per provisions latest version of IS:875-2015(Part-III).The wind shall be assumed to blow in any direction and most unfavorable condition shall be considered. Following parameters shall be considered for the wind load calculation.

Basic wind speed = 47 m/sec
Risk coefficient (k1) = 1.00
Terrain category for (k2) factor = Category-2
Topography factor (k3) = 1.0
Importance factor (k4) = 1.0

Seismic Load (SL/EQ)

All the structures will be designed for seismic forces using provisions of IS:1893(Part–I)-2016 and IS:1893(Part-II)-2014.

The design horizontal seismic coefficient 'Ah' for the structure will be determine using the followingexpression:

Ah = [(Z/2) (I/R) (Sa/g)]

Seismic zone = III

Zone Factor (Z) = 0.16

Response reduction factor for Building- R = 3 (For OMRF) and R=5 (For SMRF)

Response reduction factor for OHT"s - R=2.5 (For OMRF) and R=4 (For SMRF)

Importance factor, I =1.5

Damping = 5%

Value of Sa/g is taken from Fig.2 IS 1893 (as per soil condition)

Hydrodynamic Load

Dynamic Increment of loads due to seismic shall be considered in the design as per latest standards. Same to be considered in working/operating condition i.e.water level is considered upto TWL for calculating dynamic increment loads.

Deflection Criteria

Deflection Criteria shall be in accordance with IS:456 for concrete structures, Forsteel Structures IS 800 shall be followed.

5.2.6 DESIGN METHODOLOGY

i) General

The Structure in contact with water including the members covering the same such as roof of a tanks, channel, chamber etc.) shall be designed as crackeds ection with limited crack width of 0.2mm as per IS3370 - 2009 part 2. Basement RC walls and slabs below ground shall also be designed by cracked method of design as liquid retaining structures.

ii) Design Norms for Foundation

General

All Structures, building foundations, equipment foundations, water retaining structures, trenches, pits etc. Shall be designed as per NIT & relevant IS codes.

Foundation

The minimum depth of foundation for all structures, building and frame foundation sand load bearing walls shall be conforming to IS: 1904.

Foundation for all structures shall be decided based on loading arrangement, load intensity and soil strata. The safe bearing capacity (SBC) considered for design purpose is as per Soil investigation data.

Design forces are obtained from STAAD Pro analysis and checked for bearing capacity, overturning and sliding. Capacity is increased by 25% for all the loads combination with wind/seismic. The foundation is designed asper limit state method of design as per IS: 456:2000.

iii) Minimum Cover to Reinforcement

Minimum clear cover to main reinforcement shall be as per relevant IS codes.

iv) Minimum Percentage of Steel

For buildings: As per IS:456-2000.

For liquid retaining structure: The minimum reinforcements in walls, floors and roofs of liquid retaining structures in each of two directions at right angles shall be as per IS 3370.

v) **Minimum Thickness of Structural Components**

Minimum member thickness for different structural elements shall be as per design requirement.

vi) **Minimum Bar Diameter**

The minimum bar diameter for all the elements shall be as per IS codes. However, diameter shall not be less than 10mm for main reinforcement and 8mm in case of distribution.

vii) **Minimum Bar Spacing**

The minimum spacing for all the elements shall be considered as per IS3370 for liquid retaining structures and as per IS 456 for other Structures.

5.2.7 Construction Method

i) **Precast /Structural Steel/Cast-In-situ Structures:**

For all OHTs, staging shall be Cast-In-situ/Structural Steel/Precast and Container shall be in RCC/Steel.

For Pump house and Chlorination building, construction method shall be Prefab/Precast/Cast-In-situ.

For precast construction, wet joint–coupler connection or dry joint–bolted connection is to be followed. In case of precast, grade of concrete shall be M40.

5.2.8 Road Reinstatement

Road cut open during laying of pipe line shall be back filled & properly restored after laying of the pipe. Restoration shall be similar to the existing road specification e.g., WBM, CC / RCC roads etc.Material used for refilling the existing area should be same as that used in the existing road. Road restoration work shall be carried out as per the standard specifications.

Note:

Quantity of road restoration and excavation will be at actuals , as per the availability of site road condition at the time of execution.

5.3 TREATMENT PROCESS

We presume that portable water from tubewells is suitable for human consumption. For Disinfection purpose Hypo based Chlorine dosing system (HDPE Tank & Dosing Metering Pump) shall be provided to maintain residual chlorine end as per IS 10500.

However, during execution / O&M period water samples from proposed tubewells shall be checked for parameters like TDS, Hardness, Iron, Fluoride & Arsenic. If any of mentioned parameters exceeds beyond the limit of human consumption as per IS 10500, suitable treatment shall be provided to make water fit for drinking purpose. Accordingly, DPR may be revised during execution.

Note: If any of mentioned parameters exceeds beyond the limit of human consumption as per IS 10500, suitable treatment shall be provided to make water fit for drinking purpose. Accordingly, DPR may be revised during execution(cost of treatment unit is not included in this DPR).

5.4 ELECTRICAL & INSTRUMENTATION SCOPE OF WORK

5.4.1 Electrical Scope of Work / General

- Scope of electrical works for water supply system shall include the design, manufacture, testing at manufacturers' works, delivery to Site, off-loading, storage, erection, testing and setting to work a complete electrical installation including but not limited to: -
- The UPPCL/SWSM will provided edicated 415V, 3Ph, 4Wire, 50Hz, AC Power Supply for Power demand less than 50kVA. For Power demands more than 50kVA dedicated 11kV, 3Ph, 3Wire Power Supply including 11/0.433KV transformer, shall be arranged by UPPCL/SWSM. From this metering, point on wards to the proposed Electrical building and further distribution of Power up totail end is in contractor's scope of Work.
- Available in coming power supply shall be fed to 0.415kV LT Switch board to complete the system in totality with required measuring and protection devices.
- All 415 VLT motors shall be suitable for Submersible pumping set for T/W Bore and shall be suitable for direct coupling to the squirrel cage electric induction, water cooled type submersible motorsuitable to operate on 415 ± 10% V, 3 phase, 50 cycles/sec.
- 415 VLT Switch board shall feed the entire plant load by taking power supply from the secondary of Automatic Voltage Stabilizer. The Stabilizer will be Copper wound manually operated at input 250–500V & output 400–440V filled with transformer oil conforming to relevant IS.
- In case of adequate land for Solar power systems for required power generation shall be provided within the proposed plant premises.
- The 415V LT Switchboard shall be of metal enclosed, dust proof, indoor type with IP 54 protection.
- Starter feeder shall be provided for all motors
- Earthing shall be carried out as per the IS 3043: 2018 and as per contract document.
- Lightning protection shall be provided for the buildings & tall structures as per IEC 62305 Part 2 & 3.
- All the execution of electrical works shall confirm to specifications as per IS/UP Electricity board standards.

5.4.2 System Design Parameters

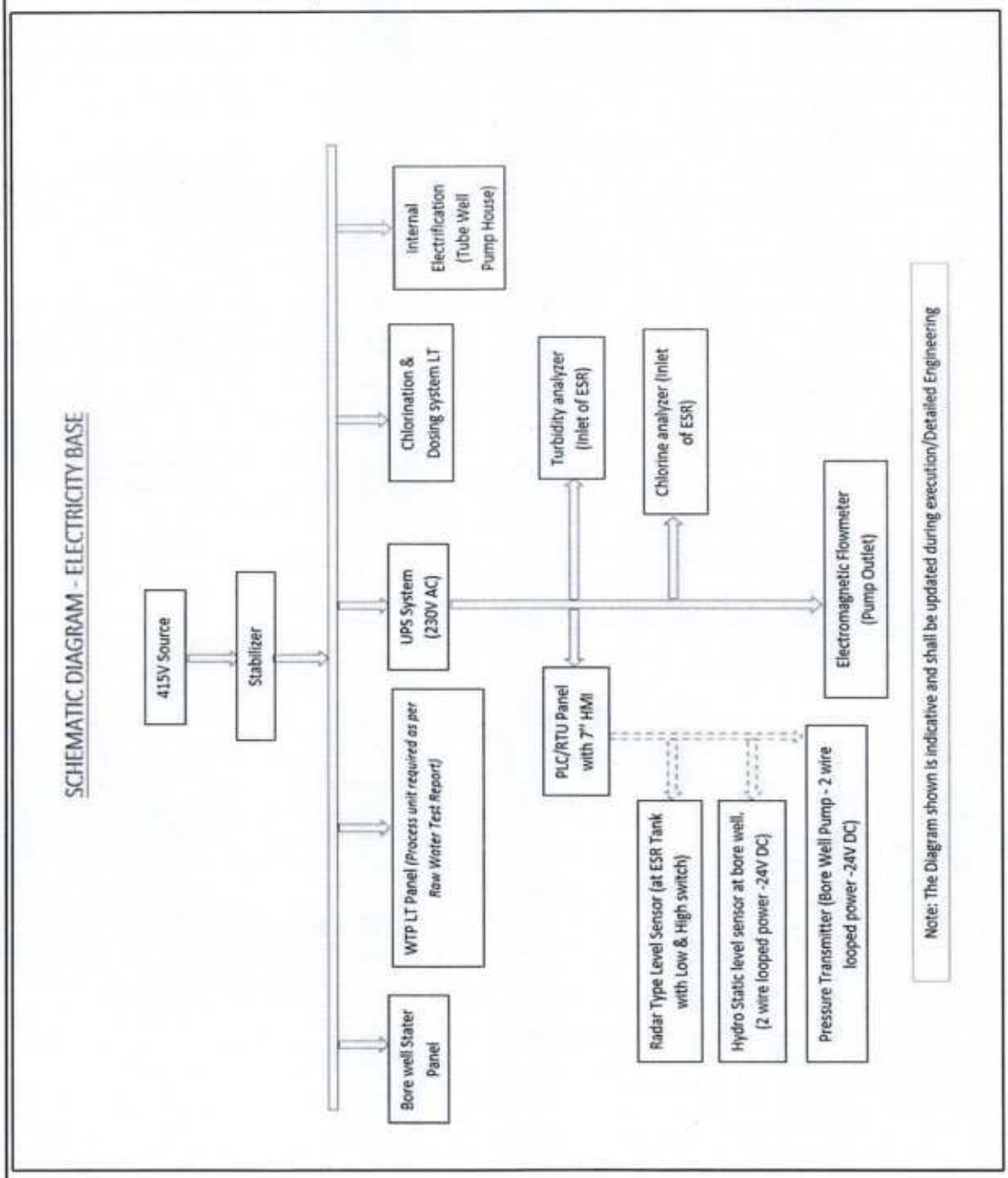
Source of Supply:

Incoming Supply:

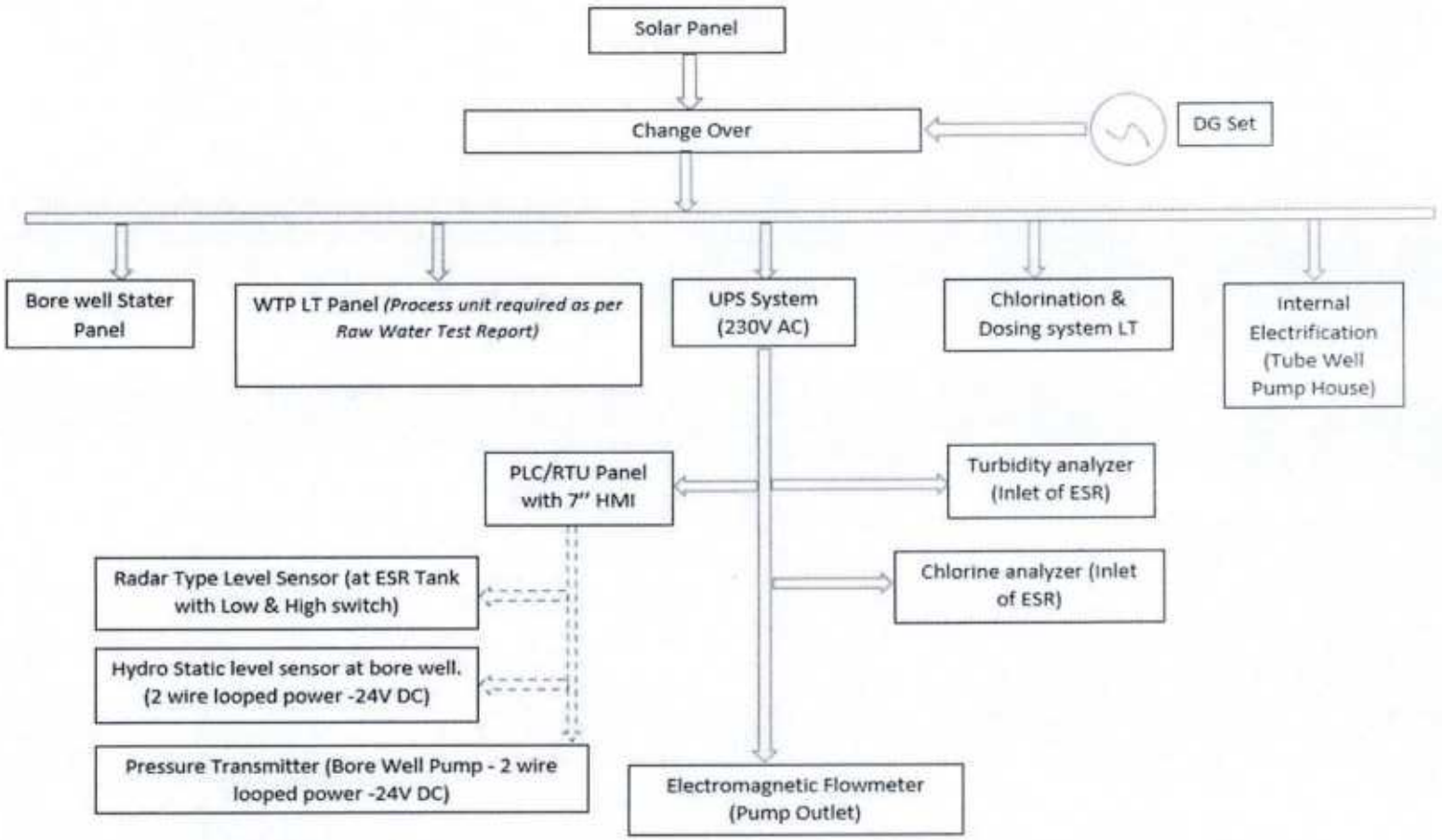
Dedicated 415V, 3Ph, 4 Wire, 50 Hz, AC Power Supply shall be arranged by UPPCL/ SWSM for Power demand less than 50kVA. For Power demands more than 50 kVA dedicated 11kV, 3Ph, 3 Wire Power Supply including 11/0.433kV transformer, shall be arranged by UPPCL/SWSM.

a. Incoming supply	415V, 3-Ph, 4-Wire, 50 Hz, AC (For Load < 50 kVA)
b. Interplant Power Distribution Supply	
For Pumping Station	11kV, 3-Ph, 3-Wire, 50 Hz, AC (For Load > 50 kVA)
For Auxiliary Power Supply	415V, 3-Ph, 4-Wire, 50 Hz, AC
c. Rated Frequency	230 V, 1-Ph, 2-Wire, 50Hz, AC
d. Voltage variation	50 Hz
e. Frequency variation	+10% to -10%
f. Combined Voltage variation	+5% to -5%
g. Neutral earthing	10% (absolute sum)

Meteorological Data:	Solid earthing for 415V and below
a. Design Ambient Temperature	50°C.
b. Maximum relative humidity (%)	80
c. Environment	Humid climate subject to heavy Rainfall
d. Altitude Level	Less than 1000 MSL
Fault Level	
a. 11 kV System	: 500 MVA / Sec (As per IS 2026-5)
b. 415 V System	
Main LT Panel	: 25 kA for 1 sec.
Sub distribution panel	: 10 kA for 1 sec.



SCHEMATIC DIAGRAM - SOLAR POWER BASE *(If Opted)*



Note: The Diagram shown is indicative and shall be updated during execution/Detailed Engineering

5.4.3 ELECTRICAL DESIGN PHILOSOPHY

The following power system studies and sizing calculations will be performed during the engineering stage, where necessary to confirm adequacy of equipment ratings and overall distribution system performance.

(a) **Transformer Sizing:**

Transformer shall be selected based on the following criteria

a. Determined by the maximum demand (kVA) of the load at steady state condition plus 20% additional capacities.

b. Starting kVA of the largest rating motor with all other loads in service, such that impact on transformer transient behavior during largest motor starting condition with respect to type of starters.

c. Permissible Voltage regulation of the transformer during steady state and transient condition will be verified.

Allowable Voltage Drop during Transient: 10%

Allowable Voltage Drop during Steady State: 5%

Based on the above condition transformer size shall be selected to nearest available standard rating.

(b) Solar System:

Provision of solar power is subject to availability of adequate land within the proposed plant premises.

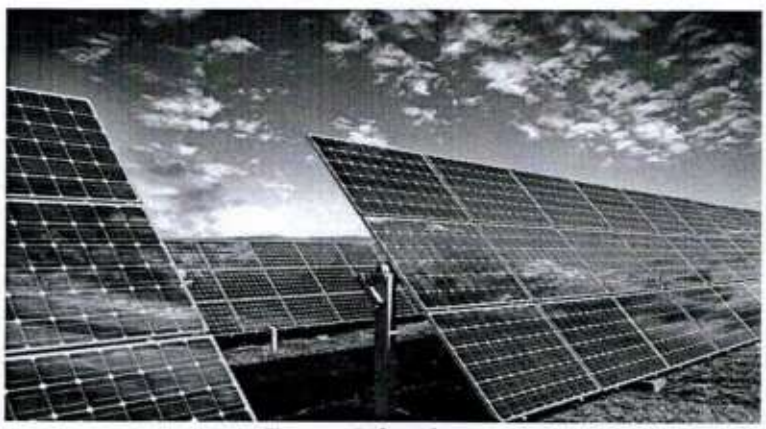


Figure : Solar Plant

In order to cater the entire installation adequate capacity of solar generation shall be provided in proposed pumping station wherever adequate land is available. The selection procedure and installation of solar component shall be as follows.

Size of the PV modules – The size of the PV module will be selected based on the peak watt (Wp) & climate of site locations. For Uttar Pradesh average solar irradiation shall be considered as per UP Metrological data. Individual PV module shall be interconnected to meet the required solar demand.

Inverter – The solar inverter will be designed to produce the load current as per the continuous wattage as well as peak wattage requirement.

Area Requirement

Type of Solar Panel – Monocrystalline with minimum 3 point of output

Efficiency Limit – 18-21%

Approx. Shade free Area requirement – 10 Sq. meter/kW

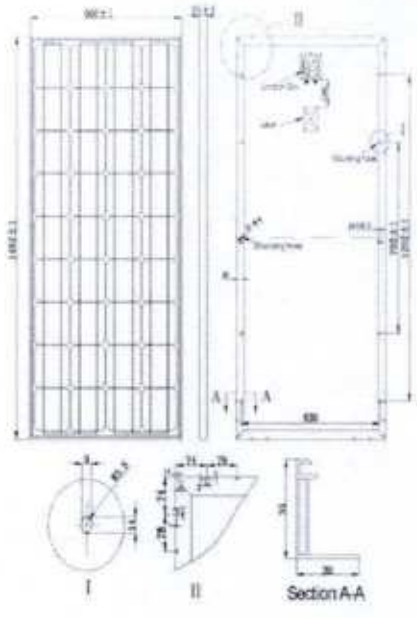


Figure: PV Array GA Drawing

Power and Control Cables

LT Power cables considered are of 1.1 kV grade, 90°C rating, Copper conductor, XLPE insulation, and galvanized single flat steel strip armor for twin & multi core cables, PVC compound for overall sheathing.

- 3 Core LT cable shall be used for the motor Feeder.
- 3.5 Core Cables shall be Used for all Power Supply.

Condition 1: Checking of Current Carrying Capacity of Cable

Cable Derated Current (ICDC) > Full Load Current (IFLC)

Condition 2: Checking for Allowable Voltage Drop during Starting & Running Condition

a) Allowable Voltage Drop During Starting = 5%

b) Allowable Voltage Drop During Running = 3V or 5%

*Starting Condition Voltage Drop will be Applicable for Motors Only

Earthing system:

The Earth Resistivity Topography (ERT) of soil shall be carried out at site with the aim to determine an average value of electrical resistivity of soil for design of Earthing system. Mean value of Earth resistivity shall be arrived based on the test report at site location. The soil resistivity of the various sites has been done by the conventional Wenner's four electrode method as per IS 3043 - 2018 and the results are tabulated in terms of Polar curve to arrive the mean value of Earth resistivity. The earthing grid will be designed based on fault current of the system as per IS 3043:2018.

It shall be consisting of the following:

i. GI Earth plates of 600 X 600 X 6 mm size as per latest relevant ISS/IER.

ii. GI water pipes of required length and 40mm dia. As per latest relevant ISS/IER.

iii. Aluminum Earth strip of adequate size as per relevant ISS/IER and in required quantities to cover complete installation in double run. The strip shall be without kinks and without any joints.

iv. Necessary quantities of lugs and clamps etc. for proper earthing.

v. Necessary quantities of salt and coal shall be supplied at the time of erection.

vi. Earth chamber CI box 300 X 300 mm as per ISS/IE

The main objectives of earthing calculation are:

a) Selection of Main Earth grid Conductor with respect to system fault level

b) Calculate the No. of Earth Pits Required.

c) Maintaining the overall grid resistance less than one ohms.

(f) Lightning Protection system:

All electrical equipment will be satisfactorily protected against the effects of electrical surges due to lightning strike in accordance with IEC and local regulations.

Each Lightning down conductor shall be provided with a testing joint in an accessible position, between 0.5 meters and 1.5 meters above ground level. Connections from each down conductor shall be made to individual grounding electrodes.

Lightning protection system shall be provided in accordance with BS EN 62305:2006

I. Providing and fixing of Lightening conductor finial, made of 25 mm dia.300 mm long GI tube, having single prong at top, with 85 mm dia 6 mm thick GI base plate including holes complete as per requirement.

II. Providing and fixing of G.I. tape 20 mmx3 mm thick on parapet or surface of wall for lightning conductor complete as required.

III. Providing and fixing testing joint, made of 20 mm x 3 mm thick G.I. strip, 125 mm long, with 4 nos. of G.I. bolts, nuts, chuck nuts and spring washers etc. complete as required.

IV. Lightning protection grounding, in which all structures, are grounded; and surge arresters are used to protect equipment.

ILLUMINATION SYSTEM

For internal electricification of Tubewell pump house lighting system has been considered

5.4.4 INSTRUMENTATION

The scope of instrumentation, control and automation (ICA) works comprise of Design, manufacture, programming and configuration, off site testing, delivery to site, installation and erection, testing, commissioning,

S.NO.	TUBEWELL/WTP OPERATION TIMING	OPERATION TIMING FOR SUPPLY OF WATER
A.	Solar Powered	
i.	10:00 am - 4:30 pm	24 hrs
ii.		

Notes: WTP & Tube well Operation hours are only indicative. It depends upon the availability supply voltage and ESR water level and intensity of solar system

ANNEXURE NO. 6 - ECONOMIC SIZE OF RISING MAIN FROM TUBE WELL-1 TO ESR

Name Of Project : Implementation Of Various Rural Water Supply Projects Including O&M For 10 Years In The State Of Uttar Pradesh

CLIENT: STATE WATER & SANITATION MISSION (SWSM) **STRETCH:** **Tube Well-1 to ESR**

Nature of Fluid: Raw water

1) WATER REQUIREMENT:

INITIAL:	0.469	MLD
INTERMEDIATE:	0.622	MLD
ULTIMATE:	0.842	MLD

2)	RL of Target location	54.64	m
3)	Suction level	18.14	m
4)	Length of Pumping Main	30.00	m
5)	Static Head for Pump	1.00	m
6)	Design period	30	years
7)	Combined Efficiency of pump	60	%
8)	Cost of Pumping unit	25000	Rs/Kw
9)	Interest Rate	10	%
10)	Life of Elec Motor and Pumps	15	yrs
11)	Energy Charges	725	Paise /unit
12)	Pumping Hours	6.5	Hrs
13)	Residual Head	3.00	mtrs

PIPE DATA				
DIA	TYPE OF MATERIAL	CLASS	HWC	RATE (Rs/m)
80	DI	K9	140	905.41
100	DI	K9	140	1191.41
125	DI	K9	140	1411.41
150	DI	K9	140	1728.48
200	DI	K9	140	2332.32
250	DI	K9	140	3103.50
300	DI	K9	140	3877.60

SOLUTION:

		First Fifteen Years	Second Fifteen Years
1)	Discharge at installation	0.469 MLD	0.622 MLD
2)	Discharge at the end of 15 years	0.622 MLD	0.842 MLD
3)	Average Discharge	0.546 MLD	0.732 MLD
4)	Average Hours of pumping average discharge	5.70 hrs	5.65 hrs
5)	Average Discharge in Cumecs	0.03 m3/sec	0.04 m3/sec
6)	Kw required at the above	0.43 *H1	0.59 *H2
7)	combined efficiency of pumping set		
8)	Annual cost (Rs.) of electrical Energy	15082 * Kw1	14956 * Kw2

ANNEXURE NO. 6 - ECONOMIC SIZE OF RISING MAIN FROM TUBE WELL-1 TO ESR

TABLE – 1: STRETCH: Tube Well-1 to ESR

S. No	Pipe Size, mm	Frictional Head loss per 1000 m		Velocity m/s		FIRST STAGE			SECOND STAGE		
						Frictional Loss in Pipeline	Other losses	Total Head	Frictional Loss in Pipeline	Other losses	Total Head
		First Stage Flow	Second Stage Flow	First Stage Flow	Second Stage Flow	m	m	m	m	m	m
1	80	301.05	527.05	5.29	7.16	9.03	1.35	14.39	15.81	2.37	21.18
2	100	101.54	177.77	3.39	4.58	3.05	0.46	7.50	5.33	0.80	9.13
3	125	34.25	59.96	2.17	2.93	1.03	0.15	5.18	1.80	0.27	5.07
4	150	14.09	24.67	1.50	2.04	0.42	0.06	4.49	0.74	0.11	3.85
5	200	3.47	6.08	0.85	1.15	0.10	0.02	4.12	0.18	0.03	3.21
6	250	1.17	2.05	0.54	0.73	0.04	0.01	4.04	0.06	0.01	3.07
7	300	0.48	0.84	0.38	0.51	0.01	0.00	4.02	0.03	0.00	3.03

TABLE – 2: STRETCH: Tube Well-1 to ESR

KILOWATTS, COST OF PUMP SETS REQUIRED FOR DIFFERENT PIPE SIZES AND PIPE COST

S. No	Pipe Size (mm)	Class of Pipe	First Stage of Flow			Class of Pipe	Second Stage of Flow			Cost of Pipe per Unit Length	Cost of pipeline in THS (Rs.)
			Total Head in meters	Kw req'd Plus 50% Stand By	Pump Cost @ Rs 30000 per KW in THS		Total Head in meters	Kw req'd Plus 50% Stand By	Pump Cost @ Rs 30000 per KW in THS		
1	80	DI	14.39	9.38	234.52	DI	21.18	13.81	345.32	905	27.16
2	100	DI	7.50	4.89	122.32	DI	9.13	5.96	148.89	1191	35.74
3	125	DI	5.18	3.38	84.47	DI	5.07	3.31	82.63	1411	42.34
4	150	DI	4.49	2.93	73.13	DI	3.85	2.51	62.78	1728	51.85
5	200	DI	4.12	2.69	67.16	DI	3.21	2.09	52.32	2332	69.97
6	250	DI	4.04	2.63	65.87	DI	3.07	2.00	50.06	3104	93.11
7	300	DI	4.02	2.62	65.48	DI	3.03	1.98	49.38	3878	116.33

ANNEXURE NO. 6 - ECONOMIC SIZE OF RISING MAIN FROM TUBE WELL-1 TO ESR

TABLE – 3: STRETCH: Tube Well-1 to ESR

COMPARITIVE STATEMENT OF OVERALL STRUCTURE OF PUMPING MAIN FOR DIFFERENT PIPE SIZES

S. No	First Stage Flow				Second Stage Flow				Grand Total of Capitalized cost for 30 years in THS (Rs)	Pipe Diameter in (mm)	Pipe Material
	Cost of Pump Sets in THS	Annual Energy Cost in THS	Capitalized Energy in THS (Rs)	Capitalized Total Cost in THS (Rs)	Cost of Pump Sets in THS	Annual Energy Cost in THS	Capitalized Energy in THS (Rs)	Initial Investments or pump and Annual Energy Cost in THS (Rs)			
1	234.52	70.74	538.08	772.60	345.32	103.29	785.67	270.75	1070.51	80	DI
2	122.32	36.90	280.64	402.95	148.89	44.54	338.74	116.73	555.43	100	DI
3	84.47	25.48	193.80	278.27	82.63	24.72	187.99	64.78	385.40	125	DI
4	73.13	22.06	167.79	240.93	62.78	18.78	142.84	49.22	342.00	150	DI
5	67.16	20.26	154.09	221.25	52.32	15.65	119.04	41.02	332.24	200	DI
6	65.87	19.87	151.12	216.98	50.06	14.97	113.89	39.25	349.34	250	DI
7	65.48	19.75	150.23	215.71	49.38	14.77	112.35	38.72	370.75	300	DI

CONCLUSION:

Diameter for this stretch of pipeline with least cost is 200 mm dia K-9

ANNEXURE NO. 6 - ECONOMIC SIZE OF RISING MAIN FROM TUBE WELL-2 TO ESR

Name Of Project : Implementation Of Various Rural Water Supply Projects Including O&M For 10 Years In The State Of Uttar Pradesh

CLIENT: STATE WATER & SANITATION MISSION (SWSM) **STRETCH:** **Tube Well-2 to ESR**

Nature of Fluid: Raw water

1) WATER REQUIREMENT:

INITIAL:	0.469	MLD
INTERMEDIATE:	0.622	MLD
ULTIMATE:	0.842	MLD

2)	RL of Target location	54.64	m
3)	Suction level	18.14	m
4)	Length of Pumping Main	500.00	m
5)	Static Head for Pump	1.00	m
6)	Design period	30	years
7)	Combined Efficiency of pump	60	%
8)	Cost of Pumping unit	25000	Rs/Kw
9)	Interest Rate	10	%
10)	Life of Elec Motor and Pumps	15	yrs
11)	Energy Charges	725	Paise /unit
12)	Pumping Hours	6.5	Hrs
13)	Residual Head	3.00	mtrs

PIPE DATA

DIA	TYPE OF MATERIAL	CLASS	HWC	RATE (Rs/m)
80	DI	K9	140	905.41
100	DI	K9	140	1191.41
125	DI	K9	140	1411.41
150	DI	K9	140	1728.48
200	DI	K9	140	2332.32
250	DI	K9	140	3103.50
300	DI	K9	140	3877.60

SOLUTION:

		First Fifteen Years	Second Fifteen Years
1)	Discharge at installation	0.469 MLD	0.622 MLD
2)	Discharge at the end of 15 years	0.622 MLD	0.842 MLD
3)	Average Discharge	0.546 MLD	0.732 MLD
4)	Average Hours of pumping average discharge	5.70 hrs	5.65 hrs
5)	Average Discharge in Cumecs	0.03 m3/sec	0.04 m3/sec
6)	Kw required at the above	0.43 *H1	0.59 *H2
7)	combined efficiency of pumping set		
8)	Annual cost (Rs.) of electrical Energy	15082 * Kw1	14956 * Kw2

ANNEXURE NO. 6 - ECONOMIC SIZE OF RISING MAIN FROM TUBE WELL-2 TO ESR

TABLE – 1: STRETCH: Tube Well-2 to ESR

S. No	Pipe Size, mm	Frictional Head loss per 1000 m		Velocity m/s		FIRST STAGE			SECOND STAGE		
						Frictional Loss in Pipeline	Other losses	Total Head	Frictional Loss in Pipeline	Other losses	Total Head
		First Stage Flow	Second Stage Flow	First Stage Flow	Second Stage Flow	m	m	m	m	m	m
1	80	301.05	527.05	5.29	7.16	150.53	22.58	177.11	263.53	39.53	306.06
2	100	101.54	177.77	3.39	4.58	50.77	7.62	62.39	88.89	13.33	105.22
3	125	34.25	59.96	2.17	2.93	17.13	2.57	23.69	29.98	4.50	37.48
4	150	14.09	24.67	1.50	2.04	7.05	1.06	12.10	12.34	1.85	17.19
5	200	3.47	6.08	0.85	1.15	1.74	0.26	6.00	3.04	0.46	6.49
6	250	1.17	2.05	0.54	0.73	0.59	0.09	4.67	1.02	0.15	4.18
7	300	0.48	0.84	0.38	0.51	0.24	0.04	4.28	0.42	0.06	3.49

TABLE – 2: STRETCH: Tube Well-2 to ESR

KILOWATTS, COST OF PUMP SETS REQUIRED FOR DIFFERENT PIPE SIZES AND PIPE COST

S. No	Pipe Size (mm)	Class of Pipe	First Stage of Flow			Class of Pipe	Second Stage of Flow			Cost of Pipe per Unit Length	Cost of pipeline in THS (Rs.)
			Total Head in meters	Kw req'd Plus 50% Stand By	Pump Cost @ Rs 30000 per KW in THS		Total Head in meters	Kw req'd Plus 50% Stand By	Pump Cost @ Rs 30000 per KW in THS		
1	80	DI	177.11	115.48	2887.11	DI	306.06	199.57	4989.22	905	452.71
2	100	DI	62.39	40.68	1017.03	DI	105.22	68.61	1715.26	1191	595.71
3	125	DI	23.69	15.45	386.25	DI	37.48	24.44	610.96	1411	705.71
4	150	DI	12.10	7.89	197.31	DI	17.19	11.21	280.18	1728	864.24
5	200	DI	6.00	3.91	97.75	DI	6.49	4.23	105.87	2332	1166.16
6	250	DI	4.67	3.05	76.18	DI	4.18	2.72	68.12	3104	1551.75
7	300	DI	4.28	2.79	69.72	DI	3.49	2.27	56.81	3878	1938.80

ANNEXURE NO. 6 - ECONOMIC SIZE OF RISING MAIN FROM TUBE WELL-2 TO ESR

TABLE – 3: STRETCH: Tube Well-2 to ESR

COMPARITIVE STATEMENT OF OVERALL STRUCTURE OF PUMPING MAIN FOR DIFFERENT PIPE SIZES

S. No	First Stage Flow				Second Stage Flow				Grand Total of Capitalized cost for 30 years in THS (Rs)	Pipe Diameter in (mm)	Pipe Material
	Cost of Pump Sets in THS	Annual Energy Cost in THS	Capitalized Energy in THS (Rs)	Capitalized Total Cost in THS (Rs)	Cost of Pump Sets in THS	Annual Energy Cost in THS	Capitalized Energy in THS (Rs)	Initial Investments or pump and Annual Energy Cost in THS (Rs)			
1	2887.11	870.89	6624.08	9511.19	4989.22	1492.40	11351.31	3911.79	13875.69	80	DI
2	1017.03	306.78	2333.43	3350.45	1715.26	513.08	3902.50	1344.85	5291.00	100	DI
3	386.25	116.51	886.20	1272.46	610.96	182.75	1390.04	479.02	2457.18	125	DI
4	197.31	59.52	452.71	650.02	280.18	83.81	637.47	219.68	1733.94	150	DI
5	97.75	29.49	224.27	322.01	105.87	31.67	240.88	83.01	1571.19	200	DI
6	76.18	22.98	174.79	250.97	68.12	20.38	154.99	53.41	1856.13	250	DI
7	69.72	21.03	159.97	229.69	56.81	16.99	129.26	44.54	2213.04	300	DI

CONCLUSION:

Diameter for this stretch of pipeline with least cost is 200 mm dia K-9

A. Tube well Location

Each Tube well cum OHSR location shall be provided with the following design provisions for effective monitoring and control.

Field Instrumentation

i) One no. Hydro static type level sensor at each tube well.

ii) One No. Pressure transmitter shall be provided at submersible pump discharge line.

iii) One No.Turbidity analyser shall be provided for continous monitoring of quality and characteristics of water at OHSR inlet line

iv) One No. Radar type level sensor for level indicator with low and high NO/NC contact will be provided of OHSR for control operation of tubewell pump

* One no. Electromagnetic flow meter will be provided at Pump outlet line for measuring the flow rate & total discharge flow.

* One no. Residual chlorine analyzer shall be provided for continuous monitoring of chlorine dosing in water at OHST inlet line.

All analogue field instruments (Transmitters) shall be hooked up with the Tube well cum OHSR RTU System through conventional hardware based 4-20mA signal for continuous monitoring , control, interlock and recording.

UPS System

One no. Standalone UPS System of suitable rating for providing 230V AC output supply & SMF lead acid battery bank with capacity for 60 minutes battery backup system will be provided in control room for powering of all field instruments.

Power Requirement of Scheme for TW-1

SI no	Description	Calculation	Unit	Remarks
Input				
1	Load Details			
1.1	Tubewell Motor	7.46	KW	
1.2	Light Fan	2		
Output				
2	Demand calculation (unavailibity of adequate land for solar power plant)			
2.1	Total Load	9.46	KW	

2.2	Total load (In KVA)	11.13	KVA	PF OF 0.85
2.3	Margin	20%		
2.4	Total load with margin	13.36	KVA	
2.5	Total power Demand	15	KVA	
Note : For Load requirement up to 50kVA 415V Power feeder & beyond 50KVA 11KV power feeder with Transformer shall be arranged by SWSM/UPPCL.				
3	Solar Power Calculation			
3.1	Solar Demand for Motor (1.4 x 10 Motor load)	14	KW	
3.2	Auxiliary load	2	KWp	
3.3	Selected Solar Power	16	KWp	
3.4	Approx shade free area requirements	160	Sqm	
4	Servo Stabilizer Sizing Calcn.			
4.1	Motor Load	7.46	KW	(10.0 Motor load*0.746= 7.46)
4.2	Auxiliary load	2.00	KW	
4.3	Total load	9.46	KW	
4.4	Total load (In KVA) = 9.46/0.8	11.83	KVA	Power factor of 0.8
4.5	Servo Stabilizer Sizing Calcn.	14.190	KVA	20% Margin
4.6	Next Available Servo Stabilizer Size	15	KVA	Rating as per COTS

Power Requirement of Scheme for TW-2

SI no	Description	Calculation	Unit	Remarks
Input				
1	Load Details			
1.1	Tubewell Motor	7.46	KW	
1.2	Light Fan	2		
Output				
2	Demand calculation (unavailibity of adequate land for solar power plant)			
2.1	Total Load	9.46	KW	
2.2	Total load (In KVA)	11.13	KVA	PF OF 0.85
2.3	Margin	20%		
2.4	Total load with margin	13.36	KVA	
2.5	Total power Demand	15	KVA	
Note : For Load requirement up to 50kVA 415V Power feeder & beyond 50KVA 11KV power feeder with Transformer shall be arranged by SWSM/UPPCL.				
3	Solar Power Calculation			
3.1	Solar Demand for Motor (1.4 x 10 Motor load)	14	KW	
3.2	Auxiliary load	2	KWp	
3.3	Selected Solar Power	16	KWp	

3.4	Approx shade free area requirements	160	Sqm	
4	Servo Stabilizer Sizing Calcn.			
4.1	Motor Load	7.46	KW	(10 Motor load*0.746= 7.46)
4.2	Auxiliary load	2.00	KW	
4.3	Total load	9.46	KW	
4.4	Total load (In KVA) = 9.46/0.8	11.83	KVA	Power factor of 0.8
4.5	Servo Stabilizer Sizing Calcn.	14.190	KVA	20% Margin
4.6	Next Available Servo Stabilizer Size	15	KVA	Rating as per COTS

Automation

One No. stanalone MICRO PLC with DI/DO/AI/AO card, Modbus communication ports, power supply(24VDC), programming & troubleshooting software, suitable communication modules, HMI, Alarm Annunciator, Panel enclosure (wall/floormounted) for mounting of RTU, modem, laptop etc. with DNP3 protocol shall be considered at each OHSR/Tubewell for effective control
& monitoring (by measuring the field instruments).

Following Software provisions with necessary licenses shall be provided:

- 7" HMI SCADA Software
- MICRO PLC Programming software

For field Cabling from field Instruments to RTU, 660/1100V grade, Multi Stranded Copper conductor with PVC insulation, shielding, outer sheath and GI round wire armored cable shall be considered

- For analog signals, individual and overall shielded 0.5 Sq.mm Copper cable shall be considered.
- For digital signals, 1.5 sq.mm Copper cable shall be considered.
- For Power cables, 2.5 Sq.mm Copper cable shall be taken into consideration.

Seperate Earthing pit shall be provided at each Tube well cum OHSR location. Looped Signal ground cable shall be connected to electronic earth grid and Looped Frame ground cable shall be connected with the electrical earth grid itself.

DESIGN CONTROL & OPERATION PHILOSOPHY

Each system PLC/RTU is used to perform following basic operations

- Providing ON/OFF commands to various drives, actuators on the predefined sequence of operation, fulfilment of safety interlocks to optimize the operation.
- Reading the values of different process parameters from field instruments, electrical devices, energy meters etc. installed in the plant.
- MICRO PLC/RTU capacity shall be designed to handle the required number of Digital Inputs, Digital Outputs
- For appropriate operation of the system, norms are defined considering various devices shall be connected to PLC/RTU.

MICRO PLC input, output considerations for drives, field instruments

OPERATION PHILOSOPHY

REMOTE MODE

This mode is valid only if the provided equipment of the pumping station like Motor Drives, Pumps are healthy. Local/Remote selector switch provided in the respective Motor control panelare selected to "Remote" position for PLC/RTU-SCADA operation and respective position feedback will be indicated on HMIScreen. The provided SCADA system consist of AUTO, MANUAL & TEST modes of operation.

LOCAL MODE

The selector switch provided on electrical panel(MCC) is selected to LOCAL and status of mode

OVERALL OPERATION

All the workstations shall have suitable SCADA modules will be connected on Ethernet network.

The Operation Station of each section will have following facilities:

- MIMIC diagram with animation to show the status of equipment and process of the respective section.
- Facility to Pop —up alarms as they occur in the pumping station.
- Facility to accept and reset the alarms.
- Facility to display & print Alarm history with real time stamp.
- Facility to display and print periodic process reports, operating time of all key equipment. Log in and security

The system has three levels of password facility for operation of the pumping station/OHSR.

- Facility to display and print trends for key process parameters like, Level, Flow, pressure data with real time stamp.

The workstation will store all the data, which will be retrieved by operation terminals for purpose of display of reports and trends.

Unless logged in the system will not respond to any operation. Following is the description of levels of protection.

- Level 1: Operator Level, which enables operator to operate any device in Auto or manual Mode or check and print the trends, reports.
- Level 2: Supervisor level allows supervisor to change the process parameters and set points within specified limit.
- Level 3: Designer Level, allows the commissioning engineer to change equipment related variables which should

STORAGE CAPACITY OF RESERVOIR (MID STAGE)

OHT CALCULATION BY DRAW OFF PATTERN METHOD

A:- Water Requirement at MID stage = 312.16 KL

B:- Average hourly demand 'a' = 312.16104/24 13.01 KL/Hr

C:- Peak factor = 3

D:- Av. Pumping hour = 6.50 Hrs

E:- Average hourly input (24 hrs.x a / av. Pumping hrs.) = 24/6.5xa ,=3.69a

Hours	Total hour	Rate of Inflow	Total Inflow	Cummulative inflow	Rate of Draw off	Total Draw off	Cummulative Draw off	Difference Excess/Deficit
1	2	3	4	5	6	7	8	9
0.00-4.00	4.00	0 a	0 a	0 a	0.08 a	0.32 a	0.32 a	0.32 a
4.00-5.00	1.00	0 a	0 a	0 a	0.2 a	0.2 a	0.52 a	0.52 a
5.00-6.00	1.00	0 a	0 a	0 a	0.5 a	0.5 a	1.02 a	1.02 a
6.00-8.00	2.00	0 a	0 a	0 a	3 a	6 a	7.02 a	7.02 a
8.00-9.00	1.00	0 a	0 a	0 a	3 a	3 a	10.02 a	10.02 a
9.00-10.00	1.00	3.692 a	3.692 a	3.692 a	2 a	2 a	12.02 a	8.328 a
10.00-12.00	2.00	3.692 a	7.384 a	11.08 a	1 a	2 a	14.02 a	2.944 a
12.00-13.30	1.50	3.692 a	5.538 a	16.61 a	1 a	1.5 a	15.52 a	-1.094 a
13.30-14.30	1.00	3.692 a	3.692 a	20.31 a	0.25 a	0.25 a	15.77 a	-4.536 a
14.30-15.30	1.00	3.692 a	3.692 a	24.00 a	0.24 a	0.24 a	16.01 a	-7.988 a
15.30-16.00	0.50	0 a	0 a	24.00 a	1 a	0.5 a	16.51 a	-7.488 a
16.00-16.30	0.50	0 a	0 a	24.00 a	1 a	0.5 a	17.01 a	-6.988 a
16.30-17.00	0.50	0 a	0 a	24.00 a	2 a	1 a	18.01 a	-5.988 a
17.00-17.30	0.50	0 a	0 a	24.00 a	2 a	1 a	19.01 a	-4.988 a
17.30-18.00	0.50	0 a	0 a	24.00 a	2 a	1 a	20.01 a	-3.988 a
18.00-19.00	1.00	0 a	0 a	24.00 a	2 a	2 a	22.01 a	-1.988 a
19.00-20.30	1.50	0 a	0 a	24.00 a	1 a	1.5 a	23.51 a	-0.488 a
20.30-21.00	0.50	0 a	0 a	24.00 a	0.5 a	0.25 a	23.76 a	-0.238 a
21.00-22.00	1.00	0 a	0 a	24.00 a	0.08 a	0.08 a	23.84 a	-0.158 a
22.00-23.00	1.00	0 a	0 a	24.00 a	0.08 a	0.08 a	23.92 a	-0.078 a
23.00-24.00	1.00	0 a	0 a	24.00 a	0.08 a	0.08 a	24 a	0.002 a

Balancing Capacity of reservoir = max excess-max. deficit

Balancing Capacity of reservoir = 10.02 (-) -7.99 x a

= 18.01 x a

Required Storage Capacity (KL) 234.22

Say --> 250 KL 12 m Staging

Proposed Storage Capacity (KL) 250

STATEMENT -2: Design of Water Treatment Unit

1. Water Demand Year for Treatment	2038	
2. Water Demand	312	CUM
3. Supply Hours	6.5	Hr
4. Design Flow for Treatment	48.02	Cum/Hr
	800	LPM
5. Bore Well Design Flow	400	LPM
6. Max Flow	400	LPM
7. Plant Capacity Provided	400	LPM

8. Type of Treatment

UnitProposed	
Automatic Dosing System for chemical injection	Yes
Flouride Removal Plant	No
Iron Removal Plant	No
Arsenic Removal Plant	No

Type of Treatment Proposed		Chlorination
Capacity of ESR	250	KL
No. of Storage Reservior	1	No

VALVES:

Valve Type	Diameter (mm)		Quantity
Sluice Valve (Manual)	80.00		2
	100.00		1
	125.00		0
	150.00		0
	200.00		0
	250.00		0
	300.00		0
Air Valve	20.00		1
	50.00		0
	80.00		0
	150.00		0
Scour Valve	80.00		1
	100.00		0
	150.00		0
	200.00		0
	250.00		0
	300.00		0

No.of Thrust blocks = 3 No.s

2.01

HYDRAULIC DESIGN REPORT

Pipe Table

Following table gives the detailed output of the hydraulic design of the scheme extracted as per designed in WaterGEMS

Table : Pipe Table

Label	Length (m)	Diameter (mm)	Start Node	Stop Node	HDPE	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (cm)	Headloss Gradient (m/km)	Population covered in 2053
P-92	89	140	OHT	J-71	HDPE	145	5.426	0.350	0.087	0.001	83
P-93	45	140	J-74	OHT	HDPE	145	-6.572	0.430	0.063	0.001	42
P-85	62	110	J-87	J-82	HDPE	145	3.574	0.380	0.091	0.002	58
P-86	37	110	J-71	J-87	HDPE	145	4.152	0.440	0.071	0.002	35
P-87	8	110	J-62	J-90	HDPE	145	-4.663	0.490	0.019	0.002	7
P-88	33	110	J-89	J-62	HDPE	145	-4.977	0.520	0.090	0.003	31
P-89	61	110	J-90	J-60	HDPE	145	-4.217	0.440	0.121	0.002	57
P-90	58	110	J-60	J-74	HDPE	145	-5.379	0.570	0.180	0.003	54
P-91	123	110	J-91	J-89	HDPE	145	-5.777	0.610	0.437	0.004	115
P-70	572	90	J-31	J-86	HDPE	145	-0.900	0.140	0.172	0.000	534
P-71	85	90	J-91	J-3	HDPE	145	0.792	0.120	0.020	0.000	79
P-72	111	90	J-92	J-66	HDPE	145	1.604	0.250	0.097	0.001	104
P-73	285	90	J-31	J-57	HDPE	145	0.440	0.070	0.023	0.000	266
P-74	224	90	J-86	J-28	HDPE	145	-1.736	0.270	0.228	0.001	209
P-75	33	90	J-3	J-69	HDPE	145	0.668	0.110	0.006	0.000	31
P-76	80	90	J-69	J-31	HDPE	145	0.524	0.080	0.009	0.000	75
P-77	18	90	J-30	J-78	HDPE	145	3.610	0.570	0.070	0.004	17
P-78	58	90	J-78	J-28	HDPE	145	2.525	0.400	0.117	0.002	54
P-79	26	90	J-82	J-30	HDPE	145	3.696	0.580	0.109	0.004	24
P-80	64	90	J-77	J-75	HDPE	145	-1.597	0.250	0.056	0.001	60
P-81	73	90	J-75	J-79	HDPE	145	-2.619	0.410	0.158	0.002	68
P-82	18	90	J-79	J-88	HDPE	145	-2.748	0.430	0.042	0.002	17
P-83	74	90	J-88	J-92	HDPE	145	-2.947	0.460	0.201	0.003	69
P-84	10	90	J-92	J-91	HDPE	145	-4.756	0.750	0.065	0.007	9
P-38	38	75	J-49	J-61	HDPE	145	-0.953	0.220	0.031	0.001	35
P-39	97	75	J-83	J-84	HDPE	145	-0.410	0.090	0.017	0.000	90
P-40	318	75	J-66	J-85	HDPE	145	1.153	0.260	0.368	0.001	297
P-41	21	75	J-61	J-60	HDPE	145	-1.015	0.230	0.019	0.001	20
P-42	53	75	J-62	J-52	HDPE	145	-0.414	0.090	0.009	0.000	49
P-43	87	75	J-89	J-53	HDPE	145	-1.056	0.240	0.085	0.001	81
P-44	226	75	J-14	J-4	HDPE	145	-0.244	0.060	0.015	0.000	211
P-45	55	75	J-4	J-2	HDPE	145	-0.749	0.170	0.029	0.001	51
P-46	17	75	J-48	J-45	HDPE	145	0.431	0.100	0.003	0.000	16
P-47	44	75	J-45	J-44	HDPE	145	-0.585	0.130	0.014	0.000	41
P-48	169	75	J-84	J-75	HDPE	145	-0.700	0.160	0.078	0.001	158
P-49	29	75	J-27	J-80	HDPE	145	0.406	0.090	0.005	0.000	27
P-50	7	75	J-5	J-4	HDPE	145	-0.203	0.050	0.000	0.000	7
P-51	11	75	J-50	J-52	HDPE	145	0.498	0.160	0.006	0.001	10
P-52	17	75	J-53	J-50	HDPE	145	-1.165	0.260	0.020	0.001	16
P-53	178	75	J-77	J-2	HDPE	145	0.498	0.110	0.043	0.000	166
P-54	80	75	J-2	J-68	HDPE	145	-0.580	0.130	0.026	0.000	75
P-55	201	75	J-78	J-70	HDPE	145	0.795	0.180	0.117	0.001	187
P-56	17	75	J-68	J-85	HDPE	145	-0.777	0.180	0.009	0.001	16
P-57	30	75	J-50	J-49	HDPE	145	-1.725	0.390	0.073	0.002	28
P-58	52	75	J-49	J-45	HDPE	145	-0.898	0.200	0.038	0.001	49
P-59	46	75	J-48	J-44	HDPE	145	-0.497	0.110	0.011	0.000	43
P-60	37	75	J-57	J-63	HDPE	145	0.102	0.020	0.000	0.000	35
P-61	28	75	J-42	J-40	HDPE	145	-1.342	0.300	0.043	0.002	26
P-62	25	75	J-70	J-73	HDPE	145	0.483	0.110	0.006	0.000	23

P-63	12	75	J-73	J-20	HDPE	145	0.288	0.070	0.001	0.000	11
P-64	27	75	J-28	J-27	HDPE	145	0.465	0.110	0.006	0.000	25
P-65	14	75	J-44	J-42	HDPE	145	-1.191	0.270	0.018	0.001	13
P-66	53	75	J-81	J-76	HDPE	145	-0.410	0.090	0.009	0.000	49
P-67	28	75	J-76	J-14	HDPE	145	-0.855	0.190	0.019	0.001	26
P-68	61	75	J-14	J-83	HDPE	145	-0.942	0.210	0.048	0.001	57
P-69	70	75	J-83	J-77	HDPE	145	-0.771	0.170	0.038	0.001	65
P-1	12	63	J-13	J-69	HDPE	145	-0.013	0.000	0.000	0.000	11
P-2	26	63	J-56	J-55	HDPE	145	-0.028	0.010	0.000	0.000	24
P-3	36	63	J-24	J-70	HDPE	145	-0.038	0.010	0.000	0.000	34
P-4	37	63	J-35	J-71	HDPE	145	-1.009	0.320	0.079	0.002	35
P-5	40	63	J-73	J-22	HDPE	145	0.113	0.040	0.001	0.000	37
P-6	121	63	J-37	J-38	HDPE	145	0.127	0.040	0.006	0.000	113
P-7	171	63	J-76	J-8	HDPE	145	0.180	0.060	0.015	0.000	160
P-8	43	63	J-11	J-10	HDPE	145	-0.045	0.010	0.000	0.000	40
P-9	16	63	J-17	J-79	HDPE	145	-0.017	0.010	0.000	0.000	15
P-10	17	63	J-65	J-63	HDPE	145	-0.018	0.010	0.000	0.000	16
P-11	19	63	J-30	J-32	HDPE	145	0.020	0.010	0.000	0.000	18
P-12	27	63	J-21	J-20	HDPE	145	-0.028	0.010	0.000	0.000	25
P-13	34	63	J-22	J-23	HDPE	145	0.035	0.010	0.000	0.000	32
P-14	36	63	J-5	J-6	HDPE	145	0.038	0.010	0.000	0.000	34
P-15	53	63	J-40	R-7	HDPE	145	-1.310	0.420	0.181	0.003	49
P-16	45	63	J-68	J-1	HDPE	145	0.048	0.020	0.000	0.000	42
P-17	49	63	J-80	J-26	HDPE	145	0.052	0.020	0.000	0.000	46
P-18	65	63	J-12	J-81	HDPE	145	-0.068	0.020	0.001	0.000	61
P-19	72	63	J-39	J-37	HDPE	145	-0.075	0.020	0.001	0.000	67
P-20	49	63	J-88	J-18	HDPE	145	0.051	0.020	0.000	0.000	46
P-21	51	63	J-43	J-42	HDPE	145	-0.053	0.020	0.000	0.000	48
P-22	62	63	J-90	J-54	HDPE	145	-0.584	0.190	0.048	0.001	58
P-23	11	63	J-9	J-10	HDPE	145	-0.011	0.000	0.000	0.000	10
P-24	33	63	J-87	J-37	HDPE	145	0.439	0.140	0.015	0.001	31
P-25	13	63	J-63	J-64	HDPE	145	0.013	0.000	0.000	0.000	12
P-26	104	63	J-20	J-19	HDPE	145	0.109	0.040	0.004	0.000	97
P-27	85	63	J-40	J-35	HDPE	145	-0.262	0.080	0.015	0.000	79
P-28	19	63	J-15	J-84	HDPE	145	-0.005	0.000	0.000	0.000	18
P-29	129	63	J-80	J-25	HDPE	145	0.136	0.040	0.007	0.000	120
P-30	57	63	J-7	J-5	HDPE	145	-0.060	0.020	0.001	0.000	53
P-31	13	63	J-54	J-55	HDPE	145	-0.662	0.210	0.012	0.001	12
P-32	145	63	J-55	J-74	HDPE	145	-0.884	0.280	0.240	0.002	135
P-33	8	63	J-52	J-51	HDPE	145	0.008	0.000	0.000	0.000	7
P-34	113	63	J-33	J-82	HDPE	145	0.333	0.110	0.031	0.000	105
P-35	12	63	J-85	J-67	HDPE	145	0.012	0.000	0.000	0.000	11
P-36	79	63	J-35	J-33	HDPE	145	0.535	0.170	0.052	0.001	74
P-37	51	63	J-10	J-81	HDPE	145	-0.165	0.050	0.004	0.000	48
	6348										*5921*

2.02 Calculations for Staging Height of OHT

GL at OHT	Highest Point			Farthest Point			LDL Reqd	Staging Ht reqd	Staging Ht proposed
	Level	Dist from OHT	Losses @ avg 3 m/km	Level	Dist From OHT	Losses @ avg 3 m/km			
(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)
98.00	100.79	1936.67	5.81	97.18	4340	13.02	110.04	12.04	12

2.03 Junction Table

Following table gives the details of the pressure maintained at each node: Minimum Pressure: 8.6 m, Maximum Pressure: 12.2 m

Table : Junction Table

Label	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)	Pressure (m H2O)	Population covered in 2053
OHT	99.26	13.019	109.91	10.6	26
J-1	97.62	0.048	108.55	10.9	21
J-2	98.14	0.329	108.52	10.4	146
J-3	98.85	0.124	109.07	10.2	55
J-4	98.39	0.302	108.5	10.1	134
J-5	97.98	0.105	108.5	10.5	47
J-6	98.07	0.038	108.5	10.4	17
J-7	97.73	0.060	108.49	10.7	27
J-8	98.28	0.180	108.45	10.1	80
J-9	98.69	0.011	108.45	9.7	5
J-10	98.69	0.109	108.45	9.7	49
J-11	98.62	0.045	108.45	9.8	20
J-12	98.47	0.068	108.45	10	30
J-13	98.56	0.013	109.06	10.5	6
J-14	98.78	0.330	108.48	9.7	147
J-15	98.39	0.005	108.55	10.1	2
J-17	98.34	0.017	108.78	10.4	8
J-18	98.25	0.051	108.82	10.6	23
J-19	97.62	0.109	109.45	11.8	49
J-20	97.37	0.151	109.45	12.1	67
J-21	97.27	0.028	109.45	12.2	12
J-22	97.18	0.078	109.45	12.2	35
J-23	97.51	0.035	109.45	11.9	16
J-24	97.52	0.038	109.46	11.9	17
J-25	98.36	0.136	109.44	11.1	61
J-26	97.61	0.052	109.44	11.8	23
J-27	98.29	0.059	109.45	11.1	26
J-28	98.31	0.324	109.46	11.1	144
J-30	98.79	0.066	109.64	10.8	29
J-31	98.38	0.984	109.06	10.7	438
J-32	98.81	0.020	109.64	10.8	9
J-33	98.86	0.202	109.78	10.9	90
J-35	99.21	0.212	109.83	10.6	94
J-37	98.79	0.237	109.83	11	105
J-38	97.73	0.127	109.82	12.1	57
J-39	98.61	0.075	109.83	11.2	33
J-40	99.2	0.230	109.82	10.6	102
J-42	99.26	0.098	109.78	10.5	44
J-43	98.75	0.053	109.78	11	24
J-44	99.1	0.109	109.76	10.6	49

J-45	98.9	0.118	109.74	10.8	53
J-48	99.51	0.066	109.75	10.2	29
J-49	99.16	0.126	109.71	10.5	56
J-50	99.75	0.062	109.63	9.9	28
J-51	100.79	0.008	109.63	8.8	4
J-52	99.58	0.076	109.63	10	34
J-53	99.91	0.109	109.61	9.7	49
J-54	98.37	0.079	109.68	11.3	35
J-55	97.84	0.194	109.7	11.8	86
J-56	98.5	0.028	109.7	11.2	12
J-57	98.31	0.339	109.03	10.7	151
J-60	99.69	0.147	109.76	10.1	65
J-61	100.01	0.062	109.74	9.7	28
J-62	99.2	0.100	109.62	10.4	45
J-63	98.1	0.070	109.03	10.9	31
J-64	98.33	0.013	109.03	10.7	6
J-65	98.02	0.018	109.03	11	8
J-66	97.48	0.451	108.93	11.4	201
J-67	97.9	0.012	108.56	10.6	5
J-68	97.87	0.149	108.55	10.7	66
J-69	99.2	0.131	109.06	9.8	58
J-70	99.23	0.274	109.46	10.2	122
J-71	99.26	0.265	109.91	10.6	118
J-73	99.1	0.081	109.45	10.3	36
J-74	98.9	0.309	109.94	11	138
J-75	98.67	0.322	108.62	9.9	143
J-76	99.57	0.265	108.46	8.9	118
J-77	99.51	0.328	108.57	9	146
J-78	99.16	0.290	109.57	10.4	129
J-79	99.75	0.112	108.78	9	50
J-80	100.79	0.218	109.44	8.6	97
J-81	99.58	0.177	108.45	8.9	79
J-82	99.91	0.212	109.75	9.8	94
J-83	98.37	0.240	108.53	10.1	107
J-84	97.84	0.285	108.55	10.7	127
J-85	99.2	0.364	108.56	9.3	162
J-86	99.23	0.836	109.23	10	346
J-87	99.26	0.139	109.84	10.6	62
J-88	98.75	0.148	108.82	10.1	66
J-89	99.1	0.256	109.53	10.4	114
J-90	98.9	0.138	109.64	10.7	61
J-91	98.67	0.229	109.09	10.4	102
J-92	99.57	0.205	109.03	9.4	91
		13.309			5923

Note :- Peak Factor -3

2.04 Pressure Pipe Inventory

Dia	Length (in m)	Length (in m)	Vol.
63	1,954	1,954	0.01
75	2,148	2,148	0.01
90	1,731	1,731	0.01
110	383	383	0.00
125	0	0	0.00
140	134	134	0.00
160	0	0	0.00
180	0	0	0.00
200	0	0	0.00
All Dia	6,350	6,350	0.03

Road Cutting Details

Trench Width for CC Road - D + 300 mm
Trench Width for BT Road - D + 300 mm
Trench Width for Interlocking Road - D + 300 mm
Trench Width for BOE Road - D + 300 mm
Trench Width for Kachha Road - D + 300 mm

S.No.	Pipe No.	Length	Dia	Width Of Cutting	Total Surface Cutting	BT Road	Interlocking Road	CC Road	BOE	Kachha Road	Trench Depth	Vol. of Trench
1	P-92	89	140	0.44	39.16	0	0	39.16	0	0	1.14	44.64
2	P-93	45	140	0.44	19.8	0	0	19.8	0	0	1.14	22.57
3	P-85	62	110	0.41	25.42	0	0	0	0	25.42	1.11	28.22
4	P-86	37	110	0.41	15.17	0	0	15.17	0	0	1.11	16.84
5	P-87	8	110	0.41	3.28	0	0	3.28	0	0	1.11	3.64
6	P-88	33	110	0.41	13.53	0	0	13.53	0	0	1.11	15.02
7	P-89	61	110	0.41	25.01	0	0	0	0	25.01	1.11	27.76
8	P-90	58	110	0.41	23.78	0	0	0	0	23.78	1.11	26.40
9	P-91	123	110	0.41	50.43	0	0	0	0	50.43	1.11	55.98
10	P-70	572	90	0.39	223.08	0	0	0	0	223.08	1.09	243.16
11	P-71	85	90	0.39	33.15	0	33.15	0	0	0	1.09	36.13
12	P-72	111	90	0.39	43.29	0	43.29	0	0	0	1.09	47.19
13	P-73	285	90	0.39	111.15	111.15	0	0	0	0	1.09	121.15
14	P-74	224	90	0.39	87.36	0	0	0	0	87.36	1.09	95.22
15	P-75	33	90	0.39	12.87	0	0	0	12.87	0	1.09	14.03
16	P-76	80	90	0.39	31.2	0	0	0	31.2	0	1.09	34.01
17	P-77	18	90	0.39	7.02	0	0	7.02	0	0	1.09	7.65
18	P-78	58	90	0.39	22.62	0	0	22.62	0	0	1.09	24.66
19	P-79	26	90	0.39	10.14	0	0	10.14	0	0	1.09	11.05
20	P-80	64	90	0.39	24.96	0	0	24.96	0	0	1.09	27.21
21	P-81	73	90	0.39	28.47	0	0	28.47	0	0	1.09	31.03
22	P-82	18	90	0.39	7.02	0	0	7.02	0	0	1.09	7.65
23	P-83	74	90	0.39	28.86	0	0	28.86	0	0	1.09	31.46
24	P-84	10	90	0.39	3.9	0	0	3.9	0	0	1.09	4.25
25	P-38	38	75	0.375	14.25	0	0	0	14.25	0	1.075	15.32
26	P-39	97	75	0.375	36.375	0	0	0	0	36.375	1.075	39.10
27	P-40	318	75	0.375	119.25	0	0	0	0	119.25	1.075	128.19
28	P-41	21	75	0.375	7.875	0	7.875	0	0	0	1.075	8.47
29	P-42	53	75	0.375	19.875	0	19.875	0	0	0	1.075	21.37
30	P-43	87	75	0.375	32.625	0	32.625	0	0	0	1.075	35.07
31	P-44	226	75	0.375	84.75	0	0	0	84.75	0	1.075	91.11
32	P-45	55	75	0.375	20.625	0	0	0	20.625	0	1.075	22.17
33	P-46	17	75	0.375	6.375	0	0	0	6.375	0	1.075	6.85
34	P-47	44	75	0.375	16.5	0	0	0	16.5	0	1.075	17.74
35	P-48	169	75	0.375	63.375	0	0	0	63.375	0	1.075	68.13
36	P-49	29	75	0.375	10.875	10.875	0	0	0	0	1.075	11.69
37	P-50	7	75	0.375	2.625	0	0	0	0	2.625	1.075	2.82
38	P-51	11	75	0.375	4.125	0	4.125	0	0	0	1.075	4.43
39	P-52	17	75	0.375	6.375	0	0	0	6.375	0	1.075	6.85
40	P-53	178	75	0.375	66.75	0	0	0	0	66.75	1.075	71.76
41	P-54	80	75	0.375	30	30	0	0	0	0	1.075	32.25
42	P-55	201	75	0.375	75.375	0	0	0	0	75.375	1.075	81.03
43	P-56	17	75	0.375	6.375	6.375	0	0	0	0	1.075	6.85
44	P-57	30	75	0.375	11.25	0	0	0	11.25	0	1.075	12.09
45	P-58	52	75	0.375	19.5	0	0	0	19.5	0	1.075	20.96
46	P-59	46	75	0.375	17.25	0	17.25	0	0	0	1.075	18.54
47	P-60	37	75	0.375	13.875	0	0	0	0	13.875	1.075	14.92
48	P-61	28	75	0.375	10.5	0	10.5	0	0	0	1.075	11.29
49	P-62	25	75	0.375	9.375	9.375	0	0	0	0	1.075	10.08
50	P-63	12	75	0.375	4.5	4.5	0	0	0	0	1.075	4.84
51	P-64	27	75	0.375	10.125	0	0	10.125	0	0	1.075	10.88
52	P-65	14	75	0.375	5.25	0	5.25	0	0	0	1.075	5.64
53	P-66	53	75	0.375	19.875	0	0	19.875	0	0	1.075	21.37
54	P-67	28	75	0.375	10.5	0	0	10.5	0	0	1.075	11.29
55	P-68	61	75	0.375	22.875	0	0	22.875	0	0	1.075	24.59
56	P-69	70	75	0.375	26.25	0	0	0	0	26.25	1.075	28.22
57	P-1	12	63	0.363	4.356	0	0	0	4.356	0	1.063	4.63
58	P-2	26	63	0.363	9.438	0	0	0	9.438	0	1.063	10.03

59	P-3	36	63	0.363	13.068	0	0	0	13.068	0	1.063	13.89
60	P-4	37	63	0.363	13.431	0	0	0	13.431	0	1.063	14.28
61	P-5	40	63	0.363	14.52	0	0	0	14.52	0	1.063	15.43
62	P-6	121	63	0.363	43.923	0	0	0	43.923	0	1.063	46.69
63	P-7	171	63	0.363	62.073	0	0	0	62.073	0	1.063	65.98
64	P-8	43	63	0.363	15.609	15.609	0	0	0	0	1.063	16.59
65	P-9	16	63	0.363	5.808	0	0	0	0	5.808	1.063	6.17
66	P-10	17	63	0.363	6.171	0	0	0	0	6.171	1.063	6.56
67	P-11	19	63	0.363	6.897	0	0	0	0	6.897	1.063	7.33
68	P-12	27	63	0.363	9.801	0	0	0	0	9.801	1.063	10.42
69	P-13	34	63	0.363	12.342	0	0	0	0	12.342	1.063	13.12
70	P-14	36	63	0.363	13.068	0	0	0	0	13.068	1.063	13.89
71	P-15	53	63	0.363	19.239	0	0	0	0	19.239	1.063	20.45
72	P-16	45	63	0.363	16.335	0	0	0	0	16.335	1.063	17.36
73	P-17	49	63	0.363	17.787	0	0	0	0	17.787	1.063	18.91
74	P-18	65	63	0.363	23.595	0	0	0	0	23.595	1.063	25.08
75	P-19	72	63	0.363	26.136	0	0	0	0	26.136	1.063	27.78
76	P-20	49	63	0.363	17.787	0	17.787	0	0	0	1.063	18.91
77	P-21	51	63	0.363	18.513	0	18.513	0	0	0	1.063	19.68
78	P-22	62	63	0.363	22.506	0	22.506	0	0	0	1.063	23.92
79	P-23	11	63	0.363	3.993	0	0	3.993	0	0	1.063	4.24
80	P-24	33	63	0.363	11.979	0	11.979	0	0	0	1.063	12.73
81	P-25	13	63	0.363	4.719	0	0	0	0	4.719	1.063	5.02
82	P-26	104	63	0.363	37.752	37.752	0	0	0	0	1.063	40.13
83	P-27	85	63	0.363	30.855	0	0	0	30.855	0	1.063	32.80
84	P-28	19	63	0.363	6.897	0	0	0	6.897	0	1.063	7.33
85	P-29	129	63	0.363	46.827	46.827	0	0	0	0	1.063	49.78
86	P-30	57	63	0.363	20.691	0	0	0	0	20.691	1.063	21.99
87	P-31	13	63	0.363	4.719	0	0	0	4.719	0	1.063	5.02
88	P-32	145	63	0.363	52.635	0	0	0	52.635	0	1.063	55.95
89	P-33	8	63	0.363	2.904	0	2.904	0	0	0	1.063	3.09
90	P-34	113	63	0.363	41.019	0	0	0	0	41.019	1.063	43.60
91	P-35	12	63	0.363	4.356	4.356	0	0	0	0	1.063	4.63
92	P-36	79	63	0.363	28.677	0	0	0	28.677	0	1.063	30.48
93	P-37	51	63	0.363	18.513	0	0	18.513	0	0	1.063	19.68
					2405.109	276.819	247.629	309.811	571.662	999.188		2596.43

ROAD RESTORATION DETAIL

Sl. No	OD Dia (mm)	Pipe Material	Total Length	ROAD LENGTH					BT ROAD				CC ROAD				KC ROAD				BOE ROAD				IL ROAD			
				BT	CC	KC	BOE	IL	Width (m)	BT Road Restoration in m2	Depth of Excavation (m)	Vol. of Excavation (BT)	Width (m)	CC Road Restoration in m2	Depth of Excavation (m)	Vol. of Excavation (BT)	Width (m)	KC Road Restoration in m2	Depth of Excavation (m)	Vol. of Excavation (BT)	Width (m)	BOE Road Restoration in m2	Depth of Excavation (m)	Vol. of Excavation (BT)	Width (m)	IL Road Restoration in m2	Depth of Excavation (m)	Vol of Excavation (BT)
1	63	HDPE	1954	288	62	616	784	203	0.363	104.5	1.063	111.1	0.363	22.51	1.063	23.92	0.363	223.6	1.063	237.7	0.363	284.6	1.063	302.5	0.363	73.69	1.063	78.33
2	75	HDPE	2148	163	169	908	648	260	0.375	61.13	1.075	65.71	0.375	63.38	1.075	68.13	0.375	340.5	1.075	366	0.375	243	1.075	261.2	0.375	97.5	1.075	104.8
3	90	HDPE	1731	285	341	796	113	196	0.39	111.2	1.09	121.2	0.39	133	1.09	145	0.39	310.4	1.09	338.4	0.39	44.07	1.09	48.04	0.39	76.44	1.09	83.32
4	110	HDPE	383	0	78	304	0	0	0.41	0	1.11	0	0.41	31.98	1.11	35.5	0.41	124.6	1.11	138.4	0.41	0	1.11	0	0.41	0	1.11	0
5	125	HDPE	0	0	0	0	0	0	0.425	0	1.125	0	0.425	0	1.125	0	0.425	0	1.125	0	0.425	0	1.125	0	0.425	0	1.125	0
6	140	HDPE	134	0	134	0	0	0	0.44	0	1.14	0	0.44	58.96	1.14	67.21	0.44	0	1.14	0	0.44	0	1.14	0	0.44	0	1.14	0
7	160	HDPE	0	0	0	0	0	0	0.46	0	1.16	0	0.46	0	1.16	0	0.46	0	1.16	0	0.46	0	1.16	0	0.46	0	1.16	0
Total -			6350	736	784	2624	1545	659		276.8		298		309.8		339.7		999.2		1080		571.7		611.8		247.6		266.5

where

BT = Bituminous road
CC = Cement Concrete road
KC = Kacha Road
BOE = Bricks Road
IL = Interlocking roads/ Pavers road

Excavation- 2596 cum

Process Calculations

Name of the GP: **JAIRAMPUR**

Population as per census	2011	=	2914
No. of House holds in 2011		=	422
Population for Base year,	2023	=	4290
No. of House holds in 2023		=	621
Population for Intermediate design	2038	=	4824
No. of House holds in 2038		=	699
Population for Pipe design	2053	=	5824
No. of House holds in 2053		=	843
Clear water supply Demand (End User)		=	55 LPCD
Clear water Demand (UFW - 15%)		=	55/(1-0.15)
		=	64.71 LPCD
No. of Pumping Hours		=	**6.5** Hr
Total Clear water Demand for Intermediate year (2038)		=	4824 *64.71/1000/24
		=	13.007 m³/Hr
Total Clear water Demand for Ultimate year (2053)		=	5824 *64.71/1000/24
		=	**15.703** m³/Hr

Tubewell:

	Discharge Required	=	4824 *64.71/1000/6.5
		=	48.02 m³/Hr
		=	800 LPM
No. of tubewells provided		=	**2** Nos
Discharge of 2 Tubewell		=	400 LPM

S.NO	PARTICULARS	STAGE/YEAR		
		2023	**2038**	**2053**
1	Population	4290	4824	5824
2	Rate of Water Supply LPCD	64.71	64.71	64.71
3	Daily Water Demand in KLD	278	312	377
4	Discharge from Tube well Required in LPM	712	800	966
5	Discharge Tubewells proposed	400	400	400
6	No of Tubewells proposed	2	2	3
7	Actual Pumping Hrs	11.6	6.5	15.7

Allowable velocity in Inlet pipe	=		2	m/sec	
Area of Inlet Pipe required	=	Q/V			
	=		400	/1000/60/1.98	
	=	0.003367	m^2		
	=		3367	mm^2	
Dia of Inlet pipe required	=		86.6	mm	
Dia of column pipe considered	=		**80**	mm	
Dia of Inlet Pipe valves	=		**80**	mm	
Motor power Required:					
Discharge Required (Q)	=		24.00	m3/hr	
Head Required (H)	=		48	m	
Pump Efficiency (ɳ)	=		**70**	%	
kW of pump 1	=	(Q*H*ρ)/367* η			
	= (	24.00	* 48	*1)/	
	(	367	* 70	)	
	=	4.4842	kW		
Add margin of 30 % on acount of voltage fluctuation	=				
	4.484	+	30% of	4.4842	
	=		5.83	kW	
	=		7.81	HP	
Pump Considered	=		**10.00**	HP	
Head Required (H)	=		50	m	
kW of pump 2	=	(Q*H*ρ)/367* η			
	= (	24.00	* 50	*1)/	
	(	367	* 70	)	
	=	4.6711	kW		
Add margin of 30 % on acount of voltage fluctuation	=				
	4.671	+	30% of	4.6711	
	=		6.07	kW	
	=		8.14	HP	
Pump Considered	=		**10.00**	HP	

Capacity of Solar Plant:

Capcity of solar plant (Including 2KW Auxiliary load) for T/W-1	=	(1.4*	10.00	)+2	kW
	=	**16**	KW		
Capcity of solar plant (Including 2KW Auxiliary load) for T/W-2	=	(1.4*	10.00	)+2	kW
	=	**16**	KW		
	=	32.0 kW		for 2 Sets	

Capacity of Chlorinator:

Ultimate Demand (2053)	=	15.703	m^3/Hr	
Discharge passing through mains per day	=	376.87	kL	
Dosage of Chlorine required	=	**0.5**	mg/Lit	
Quantity of Chlorine required	=	376.87	*1000*0.5/1000	
	=	188.44	Grams/Day	
	=	0.188	Kgs/Day	

Capacity of DG Set 1:

H.P. of Motor	=	10.00	HP	
	=	7.46	KW	
Load of Light & Fan	=	2.00	KW	
Total K.W	=	9.46	KW	
Load in KVA (Assuming Pf=0.8)	=	11.83	KVA	
Assuming 20% Additional load for safety purpose	=	11.83	+	2.37
Considering 80% efficiency, DG Set Size	=	14.19	KVA	
Next Available Rating of DG set as per Departmental No	=	**15**	KVA	

Capacity of DG Set 2:

H.P. of Motor	=	10.00	HP	
	=	7.46	KW	
Load of Light & Fan	=	2.00	KW	
Total K.W	=	9.46	KW	
Load in KVA (Assuming Pf=0.8)	=	11.83	KVA	
Assuming 20% Additional load for safety purpose	=	11.83	+	2.37
Considering 80% efficiency, DG Set Size	=	14.19	KVA	
Next Available Rating of DG set as per Departmental No	=	**15**	KVA	

Design of drilling and size of Pipes for Construction of Tube Well

	Discharge required	400	LPM	
	Qty. Pumped /hr	24	m^3/hr	(Q (in LPM) X 60) / 1000
	Qty. Pumped /sec	0.0067	m^3/ Sec	Q (in m^3/hr) / 60 X 60

Design Criteria:

(A) Size of pipes (Screens/slotted pipes)

For discharge of 36 m^3/hr permissible limit of vertical velocity for following size of pipes are as follows:

Sl. No	Dia of Pipe	Vertical Velocity in	Remark
1	150 mm dia	0.377	Over size
2	200 mm dia	0.212	Over size
3	300 mm dia	0.094	Over size except housing

Vertical Velocity in M/sec = Qty. Pumped /sec (m^3/Sec)/($\prod xD^2$)/4

Permissible vertical velocity is 0.6 to 1.2 m/s. velocity for 150mm pipes lies in range. To ensure longer life of T.W. we take 150mm dia MSERW pipe for construction of tube well.

(B) Length of slotted pipe

Taking 20% opening area and contraction coefficient as 0.5 for slot size 3/64" X 3"				$\prod$XD (of suitable pipe in mtr)X15%X0.5
Suitable Size			150	mm dia
The effective opening area for one mt. length			0.0353	Sqm.
Horizontal Velocity mtr/sec as per IS code				
Max. permissible entrance velocity			0.03	m/sec
To ensure longer life of tube well design velocity			0.018	m/sec
Total open Area required --------				
Discharge in m^3/sec	=	0.0067	0.37	m2
Designed velocity		/0.018		
Hence effective length of 150mm slotted pipe	=	0.37	10	m
		/ 0.0353		
Additional Length of slotted pipe due to plain length of 30cms. at both ends of 2 Nos pips of 6 mtr length= 0.30x2x2 no of pipes			1.2	mts
Total Length of 150 mm dia slotted pipe required after			11.69	mts
Actual Slotted length available x 6m			12	mts

(C)	**Drilling Size**						
(a)	**For casing pipe of 150 mm dia as plain/Screen pipe**						
	Size of pipe					150	mm.N.B
	thickness of gravel shroud around the screen as per norms					13 to 18	cm
	Taking thickness of gravel shroud around the screen					14	cm
	The drilling size for casing of 150mm dia pipe						
	O.D. of pipe					168.3	mm
	Thickness of gravel shroud around the screen					140	mm

	hence bore dia (168.3+140X2=448.3)	448.3	mm
	Hence size of bore for 150 mm casing pipe has been taken into consideration	**450**	mm
(b)	**For casing pipe of 200 mm dia as housing pipe**		
	Size of pipe	**200**	mm.N.B
	O.D. of pipe	223.9	mm
	Thickness of Gravel shroud around the screen as per norms	13 to 18	cm
	Taking thickness of gravel shroud around the screen	14	cm
©	**The drilling size for casing of 200 mm dia pipe**		
	O.D. of pipe	223.9	
	Thickness of gravel shroud around the screen	140	mm
	hence bore dia (223.9+140X2=603.9)	503.9	mm
	Hence size of bore for 200mm casing pipe has been taken into consideration	**500**	mm
(D)	**Depth of Tube**		
(i)	Drilling Depth of tube well bore	**300**	M
(ii)	Lowering of Tube well assembly	**270**	M
	Drilling Depth is taken at least 10% higher than lowering of tube well assembly length to accommodate the settlement of bore mud and falling strata of bore during pulling of Drill Rod and lowering of Tube well assembly to ensure the full and proper lowering of Tube well assembly		
(iii)			

MECHANICAL : TECHNICAL & DESIGN DETAILS

STATEMENT -20:DESIGN DETAILS OF BORE WELL

Sr. No	Component	Value	Unit
(A)	**Design of bore well**		
1	Design year	2038	
2	Design Demand	312.16	KLD
3	Pumping hours	6.5	Hrs
4	Bore well Yield	48.02	Cum/hr
5	Sustainable Yeild %	100	%
6	Sustainable Design discharge	48.02	Cum/hr
7	Yield of Bore well available	90.00	Cum/hr
8	No.of Bore well required	0.534	No.s
9	Provide Bore well	2	No.s
(B)	**Screen pipe design**		
1	Bore well discharge	48.02	Cum/hr
	Design flow adopted	400	LPM
2	Sceen dia required	150	mm
3	Permissible entrance velocity in m/s	0.03	m/s
4	For longer life of Tubewell adopted Entrance velocity	0.018	m/s
5	Area required (A) = Q/V	0.370	Sqm
6	Effective opening area	50%	%
7	Opening area requied	0.556	Sqm
8	Effective area for Rmt	0.071	Sqm
9	Hence, Effective length of slotted pipe	11.69	m
10	Length of each pipe	6.0	m
11	Plain length at each end of a single pipe	0.3	m
12	Effective Slotted length of single pipe	5.4	m
13	Total no. of Pipe Required	3	Nos.
14	Actual Slotted length available	11.69	Rmt
15	Actual Slotted length provided	12	Rmt
(C)	**Bore drilling**		
1	Screen pipe Size	150	mm
2	Thickness of pipe	7.1	mm
3	Outer diameter	500	mm
4	Gravel packing size around screen	15	cm
5	Bore dia shall be	515	mm
6	Bore drilling depth	300	m
(D)	**Housing pipe**		
1	Design flow	400	LPM
2	Screen pipe size	150	mm
3	Housing pipe dia reqd.	200	mm
4	Housing pipe legth	60	m
(E)	**Depth of Bore well**		
1	Drillling depth	300	m
2	Tube well assembly depth	270	m

(F)	**Development by flushing of Tube well**	50	Hrs
1	Turbidity & Chlorine analyser	2	No.s
2	Hydro static level censor at all Tube well Pumping system	2	No.s
3	SITC of Column pipe of MS pipe for connecting Submersible pumps		
	32mm Dia size - MS pipe	0	Rmt
	40mm Dia size - MS pipe	0	Rmt
	50mm Dia size - MS pipe	0	Rmt
	65mm Dia size - MS pipe 5.4mm thk.	0	Rmt
	80mm Dia size - MS pipe 5.4mm thk.	24	Rmt
	100mm Dia size - MS pipe 5.4mm thk.	0	Rmt
	150mm Dia size - MS pipe 7.1mm thk.	0	Rmt

STATEMENT -21:DESIGN CALCULATIONS FOR PUMPING MACHINERY

Sr. No	Component	Value	Unit
	Data for the pumping machinery		
	Clear water rising main NO/NAME	RWRM	
	Pumping from	Borewell	
	Pumping to	ESR	
	Provided:		
	Pump house of size (3.60 x 3.0 x 3.6)m, Chlorination room of size (2.50 x 1.8 x 3.0)m as per type design	0	
	Pump house of size (2.50 x 3.0 x 3.0)m, Chlorination room of size (1.5 x 1.3 x 3.0)m as per depatmental type design and drawing (DWG NO - D-2) and as per the civil sepcification of civil work.	2	
2	**Duty of Pumps**		
	Duty Pumps	2	No
	Stand by pump	0	No
	Hours of pumping	6.5	Hrs
	Pump discharge combine (2038)	48.02	Cum/Hr
		13.34	L/Sec
3	**Design of pump (2038)**		
	Economic dia size	**150**	mm
	Head loss Gradient M/KM	**1.83**	m/km
	Frictional head loss in line	**0.09**	m
	Add 10% for minor losses	**0.01**	m
	Static head	**45.5**	mtr
	Add station loss	**2**	mtr
	Design head required	**47.5**	mtr
	Depth of water below ground level	15.0	m
	Avg. Draw Down Depth while Operation	4.5	m
	Seasonal Variation	5.0	m
	Max. DrawDown during Pumping	4.5	m
	Staging of RCC Overhead Tank	12	m
	Depth of Tank	3.50	m
	GL Diff. between T/W & ESR Site	1.00	m
	Head loss in the Pipeline	0.01	m
	Residual Head/ Terminal Head	1.00	m
	Lossed inside Pump House	1.00	m
	Design head requried	47.5	m
	Design head provided	48.0	m

	Power calculation (2038)		
	Pump effiency I]	70%	%
	HP requried (QxHx1.00/75xI])	6.01	HP
	Add power margin as per CPHEEO manual	30%	
	HP requried after adding power margin	7.81	HP
	HP provided	10.0	HP
	KW required	7.46	KW
	Provide Pumps of Following Configuration		
	Type of pump	Submersible	
	Design Discharge	48.02	
	Design Head	48.0	m
	No of Working pumps	1	No
	No of Stand by pumps	0	No
	Pump HP Provided	10.0	HP
	Combine Discharge	48.02	Cum/Hr
	Combine HP	10.0	HP
	Connected Load	10.0	HP
	Auxilary Load	3	HP
	Total Connected Load	13	HP
	Total Connected Load	9.70	KW
	Load Factor	0.45	
	Max Demand	21.55	KVA
	Add 10% margin	2.16	KVA
	Total Max Demand	23.71	KVA

Valve Data

One nos. of sluice valves have been provided at the outlet of tubewell. One will be placed at rising main to OHT and another will be placed at the inlet of the bypass chamber. One Sluice valve of required size has been provided at each of OHSR inlet pipe, Outlet pipe, Washout Pipe and for bypass arrangement. For multi village scheme, one number of sluice valve has been provided at the entry of each village. Air valve of required size has been provided at required regular intervals in main distribution line from OHT to village entry point. Also, one sluice value type fire hydrant consisting of 80 mm dia sluice valve has been provided inside the OHSR campus boundary.

Valve	Diameter (mm)	Quantity
Sluice Valve	80.00	2
	100.00	1
	125.00	0
	150.00	0
	200.00	0
	250.00	0
	300.00	0
	350.00	0
	400.00	0
	450.00	0
	500.00	0
	600.00	0
	700.00	0
	750.00	0
Air Valve	20.00	1
	50.00	0
	80.00	0
	150.00	0
Scour Valve	80.00	1
	100.00	0
	150.00	0
	200.00	0
	250.00	0
	300.00	0
	400.00	0
	450.00	0
	500.00	0
	600.00	0
	700.00	0
	750.00	0

Number of Thrust Blocks = 3 No.s

Tubewell Profile:

No. of Tubewells Required = 2 Nos.

Yeild of each tubewell required = 400 LPM

Total Depth of tube well considered = 300 m

(i) Depth of Drill before Dia reduction for housing pipe = 65 m

(ii) Depth of Drill after Dia reduction for housing pipe = 235 m

Depth of Pipe Assembly = 270 m

(i) Depth of Housing pipe = 60

(ii) Depth of casing pipe below = 210

Dia of tube well:

Upto 65 m below GL = 500 mm

From 65 m to 300 m below GL = 450 mm

MS Casing Pipe Assemly:

Upto 60 m below GL = 200 mm Ø

From 60 m to 270 m below GL = 150 mm Ø

Gravel Infill in the Borewell:

Volume of Borewell A = PI()/4*(((500^2)/10^6)*65)+(PI()/4*(((450^2)/10^6)*235)

50.1124 m^3

Volume of Casing Pipes/ Assembly pipe B = PI()/4*(((200^2)/10^6)*60)+(PI()/4*(((150^2)/10^6)*210)

5.59313 m^3

Net Volume of Gravel = A - B

= 44.519313

Cavities (Compressure force and other = 50% of total volume of gravel

= 22.259656

Total Gavel Quantity = 66.778969 m^3 67 m^3 Say

Length of Slotted Pipe			=	12 m
Dia of Outlet pipe			=	150 mm
E&M Items:				
Capacity of Compressor			=	600 PSI
OP Unit Discharge			=	1 Cusec
Capacity of Solar	=	**32.0** kW		
Stabalizer	=	**15** kVA & 15 kVA		
Electromagnetic flow	=	**80** mm		
Soft starter	=	**22** kW		
Auto phase reversal	=	**125** Amp		

JAIRAMPUR WATER SUPPLY SCHEME UNDER - SWSM
BLOCK- GAURA & DISTRICT- PRATAPGARH
GENERAL ABSTRACT OF COST (CIVIL)

SL. No.	Description of Work	Qty.	Unit	Amount (Rs.) (In Lakh)	
1	2	3	4	5	
	Civil work :				
1	Pump house & Chlorinating room , Bye pass	1	Job	10.07	
2	Rising Main	530	Rmt	14.35	
3	~~250~~ 125 KL R.C.C. Over head tank 12 Staging	1	Nos	~~47.04~~	31.98
4	Distribution System	6350.00	Rmt	~~64.07~~	41.00
5	Boundary Wall and approach raod	1	Job	~~13.88~~	10.5
6	Staff Quarter	1	Nos	0.00	
7	Survey, Design & Preperation of DPR In Lac			~~2.55~~	1.94
	TOTAL			~~151.97~~	109.84

(Authorized Signitary)
JMC Projects (I) Ltd.

Assistant Engineer
Division Office
U.P. Jal Nigam (Rural)
Pratapgarh

CIVIL ESTIMATE

ESTIMATE FOR
Jairampur Gram Panchayat - VILLAGE(S) WATER SUPPLY SCHEME
UNDER - SWSM
BLOCK - GAURA, Tehsil - RANIGANJ, District -PRATAPGARH

ESTIMATE AND DETAIL MEASUREMENT OF PUMP HOUSE

S. No	SOR		Item of Work	No	L	B	H/D	Qty	Rate	Unit	Amount	Remarks
1	SOR-28		Provide all materials labour T&P etc. complete and construct Pump house size (2.5x3.0x3.0)m Chlorinating room size (1.8x1.2x3.0)m as per departmental type design and drawing (drawing no-D-2) and as per the specifications for civil work given in the bid document including supply of all material labour and T&P etc complete as per instructions of Engineer -in - charge.	1	2.5	3	3	1	492800.00	each	492800	Room size shall be selected based on pump capacity. (For Pumps > 10 HP) For T/W-1
2	SOR-28		Provide all materials labour T&P etc. complete and construct Pump house size (2.5x3.0x3.0)m Chlorinating room size (1.8x1.2x3.0)m as per departmental type design and drawing (drawing no-D-2) and as per the specifications for civil work given in the bid document including supply of all material labour and T&P etc complete as per instructions of Engineer -in - charge.	1	2.5	3	3	1	492800.00	each	492800	For T/W-2
3	SOR-29		Provide all materials labour T&P etc. complete and constructed Bye-pass chamber for pump house (1000 (L) x 1000 (W) x 1150 (H) mm) drawing (drawing no.D-3) and as per the specifications for civil work given in the bid document including supply of all material labour and T&P etc complete as per instructions of Engineer -in -charge.	1				1	21,500.00	Each	21500	
			Total								1007100	
			Say in Lacs								10.07	

ESTIMATE FOR

Jairampur Gram Panchayat - VILLAGE(S) WATER SUPPLY SCHEME

UNDER - SWSM

BLOCK - GAURA, Tehsil - RANIGANJ, District -PRATAPGARH

ESTIMATE AND DETAIL MEASUREMENT OF RISING MAIN

S. No	SOR	Item of Work	No	L	B	H/D	Qty	Rate	Unit	Amount	Remarks
1		Excavation of earth in ordinary soil (loam, claY or sand) for pipe line and rising main trenches ncluding lift upto 1.50 m and lead upto 50 m and refilling watering, ramming of the excavated earth nto the trench and also disposal of surplus earth upto 50m from the center of the trenches including supply of all material labour, T&P etc complete as per instructions of Engineer -in -charge.									
		200 mm dia K-9	1	530	0.75	1.15	457.13				
					Total-		457.13				
	SOR -31.01	Ordinary Soil				100%	457.13	240.00	Cum	109710	
2	SOR-32.03	Supply of following sizes (D I) pipes for rising main/distribution system conforming to relevant IS 8329/2000 Specifications with all jointing màterials such as specials conforming to latest / relevalent IS Specification , suitable for DI pipe as per IS 1239/2000 and IS 8329/ 2000 or their latest amendment including F.O.R. destination and all taxes and insurance etc with loading , unloading and carting up to site of work also including specials for these pipes and lowering them into the trenches and laying true ti alignment and gradient and jointing etc complete (including testing of pipe lines and cutting of pipes for making up the length but excluding the cost of trenches). all complete as per instruction of Engineer in charge									
		200 mm dia K-9	1	530			530	2,332.32	Rmt	1236129.6	
3	SOR-34.03	Sluice valve - 200 mm dia	2				2	29,250.00	Nos	58500	
4	SOR-38.02	Sluice valve chamber (surface box Type)	2				2	5,000.00	Nos	10000	
5	SOR-39.01	Design and construct Thrust Block made in R.C.C. with cement, coarse sand & 20 mm gavgg. stone ballast in proportion of 1:1.5:3 for pipe line, including supply of MS reinforcemént wrought to required shape as rie¿esse/ ,its bending, fixing & binding the 44.00 s9me with 0.50 mm thick binding wire tn position & necessary centering & 8hufterIng ncluding curing and supply of all materials labour, T & P etc. required for propel cornpleasn of the work and as per specification for RCC work as per instruction of Engineer -in -charge.	1				1	12,000.00	Cum	12000	

6	SOR-39.02	Providing reinforcement of Thrust block for reinforced concrete work including distribution bars, stirrups, binders etc. initia straightening and removal of loose rust (if necessary), cutting to requisite length, hooking and bending tu correct shape, placing" in proper position and binding with wire at every inter-section, complete as per drawing and direction.		1	1%	0.08	78.5	112.00	KG	8792	
		Total								1435131.6	
				Say in Lacs						14.3513	

ESTIMATE FOR

Jairampur Gram Panchayat - VILLAGE(S) WATER SUPPLY SCHEME

UNDER - SWSM

BLOCK - GAURA, Tehsil - RANIGANJ, District -PRATAPGARH

ESTIMATE AND DETAIL MEASUREMENT OF RCC OVERHEAD TANK

S. No.	SOR	Item of Work	No	L	B	H/D	Qty	Rate	Unit	Amount	Remarks
1	SOR-30.15	Supply of all materials labour T&P etc. for complete construction of R.C.C. Over Head Tank of following capacity and staging above ground level with main components including cost of soil testing and assuming bearing capacity of soil as 8 MT with supply of design and drawings.All the water retaining components of OHT shall be casted in M-30 concrete and minimum grade of concrete of foundation and staging should be M-25 with approved cement coarse sand and stone grit as per I.S. 11682 and I.S.456Seismic effects and wind load should be taken into consideration as per I.S. 1893 for earthquake resistance and I.S. 875 part-III for wind load on structure and including 1M wide RCC staircase 1 m wide R.C.C. M30 balcony M.S. ladder made of 50x50x6 mm angle section and 20mm plain M.S. bars with hand rails of 20mm medium class G.I. pipes One aluminum ladder inside the tank from top dome to bottom dome R.C.C. railing with 20mm dia medium class G.I.pipe (in 3 rows) on both sides of stair case, Top dome per 3 hour supported on 50x50x6mm M.S. angle section spaced at intervals not more than 1.5m Proper ventilator at top dome in circular shape of 1.2 m dia Water level indicator fabricated with sensor connecting to automation Lightening conductor as per I.S.S.2309 or its latest amendments of latest electricity rules consisting of proper elevation rod with 5 or more fork points as prescribed in ISS 2309-1969 and ISS 3013-1966 C.I. manhole of min 60x60cm size with locking arrangement Supply fixing jointing of D.I.D/F Pipes of appropriate size with D.I.D/F specials conforming to IS 8329/2000 as vertical pipes for inlet outlet overflow and washout as per latest / relevant I.S. specifications with all jointing materials for proper completion of work Construction of bed blocks in 1:2:4 PCC with cement coarse sand and approved stone grit Construction of washout / overflow chamber and chambers for sluice / butter fly valves as per departmental type design and drawing Supply of 200 mm dia PVC pipe as per I.S.- 4985/2000 for disposal of water from overflow and washout chamber to suitable point outside the water works compound Painting of all concrete surface and steel pipe works with three coats of Apex Altitude.										
			~~250~~ 125	KL	12	m Staging		~~4703800.00~~ 4537000	Job		
								~~4703800.00~~	job	~~4703800.00~~ ~~4703800~~	3157700
		Total								~~47.038~~	
		Say in Lacs								~~45.37~~ 31.58	

ESTIMATE FOR
Jairampur Gram Panchayat - VILLAGE(S) WATER SUPPLY SCHEME
UNDER - SWSM
BLOCK - GAURA, Tehsil - RANIGANJ, District -PRATAPGARH

ESTIMATE AND DETAIL MEASUREMENT OF DISTRIBUTION SYSTEM

S. No.	SOR	Item of Work	No	L	B	H/D	Qty	Rate	Unit	Amount	Remarks
		Distribution System									
1		Supply of following sizes pipes for distribution system conforming to latest/ relevant I.S. 4984/I99S Spaciffcations with all jointing materials and specials conforming to latest/relevant IS. specifications deluding F.O.R. destination and all Eaxes and insurance etc. with loading, unloading and Carting up to $Ite' of work, also includlng specials for these pipes and lowering them into the trenches and lpyTng trtté to alignment and gradient and jointing etc. complete (including testing of pipe lines and cutting of pipes for making up the length but excluding the cost of trenches) all complete as per Instructions of Engineer -in - charge.									
	SOR-33.09	200 mm dia HDPE Pipe PN-6: Class PE-100	1	0			0	1,139.00	Rmt	0	
	SOR-33.08	180 mm dia HDPE Pipe PN-6: Class PE-100	1	0			0	929.00	Rmt	0	
	SOR-33.07	160 mm dia HDPE Pipe PN-6; Class PE-100	1	0			0	753.00	Rmt	0	
	SOR-33.06	140 mm dia HDPE Pipe PN-6: Class PE-100	1	134			134	595.00	Rmt	79730	
	SOR-33.05	125 mm dia HDPE Pipe PN-6: Class PE-100	1	0			0	471.00	Rmt	0	
	SOR-33.04	110 mm dia HDPE Pipe PN-6: Class PE-100	1	383			383	369.00	Rmt	141327	
	SOR-33.03	90 mm dia HDPE Pipe PN-6: Class PE-100	1	1731			1731	254.00	Rmt	439674	
	SOR-33.02	75 mm dia HDPE Pipe PN-6: Class PE-100	1	2148			2148	190.00	Rmt	408120	
	SOR-33.01	63 mm dia HDPE Pipe PN-6: Class PE-100	1	1954			1954	146.00	Rmt	285284.00	

2			Valves & Fittings in Distribution System							Rmt		
			Apply and carting up to site of work of the following dia DI butterfly /sluice valves, class 1, working pressure 10 Kg/cm2 confirming to IS: 780/1969 or its latest amendment, including valve fitting & Dismantling Joints F.O.R. destination, and owering them into the already prepared trenches, fixing in position and jointing them with pipelines and tesEing etc complete and also including supply of jointing mäte'clak plc complete including all taxes and nsurance, as per instructions of Engineer in Charge								
2.1	SOR-34.03		Sluice valve - 200 mm dia	0				0	29,250.00	Nos	0	
2.2	SOR-34.04		Sluice valve - 150 mm dia	0				0	19,500.00	Nos	0	
2.3	SOR-34.05		Sluice valve - 125 mm dia	0				0	16,900.00	Nos	0	
2.4	SOR-34.06		Sluice valve - 100 mm dia	1				1	14,300.00	Nos	14300	
2.5	SOR-34.07		Sluice valve - 80 mm dia	2				2	11,700.00	Nos	23400	
2.6	SOR-34.08		Scour valve - 80 mm dia	1				1	11,700.00	Nos	11700	
2.7	SOR-35.03		PRV 150 mm dia	0				0	1,24,575.00	Nos	0	
3			Supply and installation, testing etc. of single/double ball type air valve conforming to latest/relevent I.S. specifications including all taxes and insurance, carting up to site of work and lowering them into the trenches fixing in position and jointing them with pipelines and testing etc. complete (including supply of joincing materials and Valve fittings etc complete) as per nstructions of Engineer.								

3.1	SOR-36.02	50 mm	0				0	23,170.33	Nos	0	
3.2	SOR-36.01	20 mm	1				1	10,229.21	Nos	10229.21	
4	SOR-37	Supply of under ground sluice value type fire hydrant consisting of 80 mm dia sluice valve, B0mm dia tail pieces, 80mm dia duck foot bend and 80 mm dia standard makes iron coupling with cap and etc. complete conforming to" latest/reinvent _S.specifications incl‹ ding all taxes and "nsurance up to site of work and lowering them into the trenches, fixing in position and jointing them with pipelines and testing etc. complete (including sUpply of jointing materials and Valve fittings etc. complete as per instructions of Engineer -in - charge.	1				1	24,500.00	Nos	24500	
5		Distribution system - Pipeline Excavation									
		Excavation of earth in ordinary soil (foam, clay or sand) for pipe flne and rising main trenches including lift upto 1.5g ft\ and lead upto 50 m and refilling watering, ramming of the excavated earth intc the trench and also disposal of surplus earth upto 50m from the center of the trenches including supply of al] material labour, T&P etc complete as per instructions of Engineer -in -charge.									

	SOR-31.01	Ordinary Soil	100%			2000	2596.43	240.00	Cum	623142.1	480000
6		Provision of following types of Culvert crossing along the alignment of pipe Engineer -in -charge. (casing of pipe is done by concreting)									
	SOR-45.01	Nala/Culvert Crossing (width -3.5 m) upto Dia 300 mm	7				7	21,500.00	Nos	150500	0
7	SOR-47.06	Road Crossing									
		300 mm dia Pipe	15.5				15.5	4,500.00	Rmt	67500	22500
8	SOR-48	Making house connection should be done atleast 2 m inside the boundary wall with provision of la{ horn distribution line to outer wall of house, with supply of 1 m G.I. pipe (15 mm) (above ground & average 5 mtr. MDPE Pipe (20 mm) (below ground) including specials, saddle, Tap,etc. at su‹tabl‹ 6lzet. T&I' etc. including excavation, laying and jointing for proper compleLion of work as ps nstructions o(Engineer as per Dwg 12 (excluding road restoration}									
		House service connections	621 538				621 538	3,700.00	Nos	2297700	1990600

9	SOR-49	Public stand post	2				2	10,000.00	Nos	20000	
10		Construction of following type chambers as per department type design and drawing ncluding Heavy duty M.S. Manhole Cover and all materials, labour, T&P etc complete for proper completion of work as per nstructions of Engineer -in - charge.									
10.1	SOR-38.01	Sluice valve chamber (masonry Type)									
		dia u to 200 mm - IOOO (L), 1200 (W),1300.(H) mm	0				0	26,500.00	Nos	0	
10.2	SOR-38.02	Sluice valve chamber (surface box Type)	3				3	5,000.00	Nos	15000	
10.3	SOR-38.03	Fire Hydrant chamber (750 (L) X 4S0 (W) X 1000 (H) mm)	1				1	19,000.00	Nos	19000	
10.4	SOR-38.04	Air Valve chamber-350 (L) x 350 (W) x 500 (H) mm	1				1	9,500.00	Nos	9500	
10.6	SOR-38.05	Scour Valve Chamber dia upto 200 mm - 1000 (L) x 1200 (W) x 1300 (H) mm	1				1	30,475.00	Nos	30475	
		2.5875 x 0.01 x 0.78									
10.7	SOR-38.06	PRV Valve Chamber - 1000 (L) x 1200 (W) x 1300 (H) mm	0				0	29,150.00	Nos	0	
11	SOR-39.01	Design and construct Thrust Block made in R.C.C. with cement, coarse sand & 20 mm gavgg. stone ballast in proportion of 1:1.5:3 for pipe line, including supply of MS reinforcemént wrought to required shape as rie¿esse/ ,its bending, fixing & binding the 44.00 s9me with 0.50 mm thick binding wire tn position & necessary centering & 8hufterIng ncluding curing and supply of all materials labour, T & P etc. required for propel cornpleasn of the work and as per specification for RCC work as per instruction of Engineer -in -charge.	3				3.6	12,000.00	Cum	43200	

12	SOR-39.02	Providing reinforcement of Thrust block for reinforced concrete work including distribution bars, stirrups, binders etc initia straightening and removal of loose rust (if necessary), cutting to requisite length, hooking and bending tu correct shape, placing" in proper position and binding with wire at every inter-section, complete as per drawing and direction.		3.6	1%	0.28	282.6	112.00	KG	31651.2	
13			**Distribution System** - Road **dismantling** and restoration								
			Dismantling and Reinstatement of the following type of road surface with old and new materials including supply of all materials, labour, T&P etc. required for proper completion of the work as per instructions of Engineer in -charge.								
13.1	SOR-44.01		B.O.E/ BR Surface	ROAD CUTTING AND RESTORATION statement attached			571.66	450.00	sqm	257247.9	0
13.2	SOR-44.02		Bituminous surface				276.82	1989.5	sqm	550742.4733	182833.4
13.3	SOR-44.03		Interlocking surface				247.63	1293.0	sqm	320184.297	18471.15
13.4	SOR-44.04		C.C. Road				309.81	1721.4	sqm	533308.6554	18926.9
			Total							6407415.821	
			Say (in Lakh)							64.07415821	

4100190

41.00

5003180.3953

5364511.85

ESTIMATE FOR
Jairampur Gram Panchayat - VILLAGE(S) WATER SUPPLY SCHEME
UNDER - SWSM
BLOCK - GAURA, Tehsil - RANIGANJ, District -PRATAPGARH

ESTIMATE AND DETAIL MEASUREMENT OF BOUNDARY WALL INTERNAL ROADS AND ANCILLIARY CIVIL WORKS WITHIN

S. No.	SOR	Item of Work	No	L	B	H/D	Qty	Rate	Unit	Amount	Remarks
1	SOR-19	Construction of 1.3 m high and 115mm thick boundary wall with 230 mmx230 mm thick pillar made n Brick masonry in 1 cement and 4 sand mortar, the spacing between two pillar should not be more than 3.0 m c/c and the depth of foundation should not be less than 0.60m, at the site at water works as per departmental type design and drawirig, and, as per specifications given in the bid document ncluding supply of all materials, labour T&P etc for proper completion of work as per instructions of Engineer -in - charge.									
		2x(30+25)-4.8	1	~~94~~			~~94~~				
		Total Boundary Wall for Campus minus Gate	1	~~105.2~~			~~105.2~~	7,360.00	Rmt	~~774272~~	691840
2	SOR-20	Supply and fixing of 3.6 m x 1.20 m MS gate including fabrication and supply of steel and construction of bounary wall pillars of size 1.35mx0.23mx0.23m with ornamental brick work 115mm th. around RCC as per departmental type design and drawing (Drawing No. D-1) and as per specifications laid down in the bid document including supply of all material labourT&P etc required for proper completion of work as per instructions of Engineer-in-charge.									
		MS Gate	1				1	52,000.00	Nos	52000	
3	SOR-21	MS Wicket gate	1				1	19,000.00	Nos	19000	
		Total								~~845272~~	762840
		Say in Lacs								~~8.453~~	7.62

ESTIMATE FOR
Jairampur Gram Panchayat - VILLAGE(S) WATER SUPPLY SCHEME
UNDER - SWSM
BLOCK - GAURA, Tehsil - RANIGANJ, District -PRATAPGARH

ESTIMATE AND DETAIL MEASUREMENT FOR APPROACH ROADS AND ANCILLIARY CIVIL WORKS

S. No.	SOR		Item of Work	No	L	B	H/D	Qty	Rate	Unit	Amount	Remarks
1	SOR-22		Construction of Interlocking pavement for approach to water works, as per departmental type design and drawing and as per specifications fald down in the bid document, including supply of all materials, labour, T&P etc required for proper completion of work as per instructions of Engineer in -charge.									
			BOE Pavement for Approach		15			15				
				1	~~30~~	3		~~90~~	1,070.50	Sqm	~~96345~~	16057.5
2	SOR-23		GSB (Gravel Sub Base)	1	30	3	0.1	0.0	2,800.00	Cum	0	
3	SOR-26		Drain	1	10 ~~104.4~~			10 ~~104.4~~	1,854.00	Mtr	~~193557.6~~	18548
4	SOR-41		Water recharge Mechanism within the water works campus	2				2	126362.00	Job	252724	
			Total								~~542626.6~~	287321.5
			Say in Lacs								~~5.426266~~	2.87

ESTIMATE FOR
Jairampur Gram Panchayat - VILLAGE(S) WATER SUPPLY SCHEME
UNDER - SWSM
BLOCK - GAURA, Tehsil - RANIGANJ, District -PRATAPGARH

ESTIMATE AND DETAIL MEASUREMENT FOR SURVEY & DESIGN

S. No,	SOR		Item of Work	No	L	B	H/D	Qty	Rate	Unit	Amount	Remarks
1	SOR-1		All the works including Hydrological Survey								0	
			Survey and Design	1% of Capex				1	255359	Nos	~~255358.9702~~	
			Total								~~255358.9702~~	
			Say in Lacs								~~2.55~~	

JAIRAMPUR WATER SUPPLY SCHEME UNDER - SWSM
BLOCK- GAURA & DISTRICT- PRATAPGARH

GENERAL ABSTRACT OF COST (E/M)

SL. No.	Description of Work	Qty.	Unit	Amount (Rs.) (In lakh)	
1	2	3	4	5	
	E&M Work :				
1	Cost of Tubewell	2	Nos.	~~49.32~~	46.52
2	Cost of pumping plant and Chlorinating Plant	2	Set	~~18.59~~	17.42
3	Solar Panel System	32	KW	~~22.72~~	
4	Electrification of pump house	2	Nos.	~~15.32~~	21.80
	TOTAL			~~105.95~~	85.74

(Authorized Signitary)
JMC Projects (I) Ltd.

05/11/2022

Assistant Engineer (E&M)
Division Office
U.P. Jal Nigam (Rural)
Pratapgarh

E/M ESTIMATE

ESTIMATE FOR
Jairampur Gram Panchayat - VILLAGE(S) WATER SUPPLY SCHEME
UNDER - SWSM
BLOCK - GAURA, Tehsil - RANIGANJ, District -PRATAPGARH

ESTIMATE AND DETAIL MEASUREMENT OF TUBEWELL CONSTRUCTION

S. No.	SOR	Item of Work	No	L	T/W-1	T/W-2	Qty	Rate	Unit	Amount	Remarks
1	SOR-2	Drilling of Borehole for Tube well construction by DC/RC/DTH Rig Machine including transportation, erection, dismantling of Rig and associated T&P complete in all respect including required all material labor etc									
		Number of Tubewells to be constructed	TW				2		Nos.		
		DC/RC Drilling up to 100 Mtr.									
1.1	SOR-2.03	500 MMD			65	65	130	2,298.50	Rmt	298805.00	
1.2	SOR-2.02	450 MMD			35	35	70	2,265.00	Rmt	158550.00	
2		DC/RC Drilling FROM 101 Mtr. TO 200 Mt.Deep	TW								
2.1	SOR-2.06	450 MM dia			100	100	200	2,558.00	Rmt	511600.00	
3		DC/RC Drilling FROM 201 Mtr. TO 300 Mt.Deep	TW								
3.1	SOR-2.10	450 MM dia			100	100	200	2,854.40	Rmt	570880.00	
4		Tubewell Assembly									
		MSERW plain pipe,As per IS 4270 7.1mm Thickness	Nos.								
4.1	SOR-3.02	150 mm			198	198	396	2,000.00	Rmt	792000.00	
4.2	SOR-3.03	200 mm			60	60	120	2,550.00	Rmt	306000.00	
4.1		MSERW slotted pipe as per IS8110 7.1mm Thickness									
	SOR-3.06	150 mm			12	12	24	3,080.00	Rmt	73920.00	
		MS Ring									
5	SOR-3.11	200 mm ø MS. Ring made by 150 mm x 12 mm Flat			10	10	20	1,600.00	Nos.	32000.00	
6	SOR-3.10	150 mm ø MS. Ring made by 150 mm x 12 mm Flat			43	43	86	1,270.00	Nos.	109220.00	
7		MS Bail plug As per IS 2800									
8	SOR-3.14	150 mm ø M.S. Bail Plug			1	1	2	1,725.00	Nos.	3450.00	
		Reducer-									
9	SOR-3.18	200 x 150 mm Reducer			1	1	2	4,150.00	Nos.	8300.00	
		MSSI Clamp- As per IS 2800									
10	SOR-3.24	200 mm ø MS S.I. Clamp			1	1	2	2,000.00	Nos.	4000.00	
11		TW Assy Support-									
	SOR-3.28	200 mm ø Tubewell Assembly Support			1	1	2	15,500.00	Nos.	31000.00	
12		MS Well Cap-									
	SOR-3.32	200 mm ø MS Well Cap			1	1	2	1,350.00	Nos.	2700.00	
13		Centre Guide-									
	SOR-3.34	Center guide for 150mm øTW Assembly			18	18	36	920.00	Nos.	33120.00	
14	SOR-4	Lowering of above assembly with welding of parts complete in all respect with all required material, T&P, Labour, etc									As Per RFP
		Lowering up to 100 Mtr. Deep									
14.1	SOR-4.02	150 mm MSERW PLANE/SLOTTED PIPE			40	40	80	341.00	Mtr.	27280.00	
14.2	SOR-4.03	200 mm MSERW PLANE/SLOTTED PIPE			60	60	120	418.00	Mtr.	50160.00	
		Lowering from 101 Mtr. To 200 Mtr. Deep									

14.3	SOR-4.06	150 mm MSERW PLANE/SLOTTED PIPE			100	100	200	418.00	Mtr.	83600.00	
		Lowering from 201 Mtr. To 300 Mtr. Deep									
14.4	SOR-4.10	150 mm MSERW PLANE/SLOTTED PIPE			70	70	140	495.00	Mtr.	69300.00	
15	SOR-4.17	Logging of Borehole by Electric logging			1	1	2	18,000.00	Job	36000.00	
16	SOR-5	Supplying and unconsolidated packing of gravel with suitable size			~~58~~ ~~67~~	~~58~~ ~~67~~	118 ~~134~~	7,500.00	Cum	870000 ~~1005000.00~~	
17	SOR-4.18	Zone Testing for QPV Areas including all Materials , T&P and Labour					0	50,000.00	Job	0.00	
18		**Development of Tubewell**									
19	SOR-6.04	Charges for Development by 600 PSI Compressor per hour			40 ~~50~~	40 ~~50~~	80 ~~100~~	5,000.00	Hr	400000 ~~500000.00~~	
20	SOR-6.06	Charges for Development of TW by 1 cusec OP Unit			~~100~~ 80	~~100~~ 80	~~200~~ 160	1,125.00	Hr	180000 ~~225000.00~~	
		Total (in Rs.)						4651885		~~4931885~~	
		Say (In Lakh)								~~49.31885~~	
										46.52	

ESTIMATE FOR
Jairampur Gram Panchayat - VILLAGE(S) WATER SUPPLY SCHEME
UNDER - SWSM
BLOCK - GAURA, Tehsil - RANIGANJ, District -PRATAPGARH

ESTIMATE AND DETAIL MEASUREMENT OF PUMPING PLANT AND CHLORINATOR PLANT

S. No.	SOR		Item of Work	No	L	T/W-1	T/W-2	Qty	Rate	Unit	Amount	Remarks
1			Pumps & Fittings									
			SITC of Pumping plant including pumps with motors starter, pannel, cable, complete in all respect with all required matcrial T&P labour etc									
			Number of TW Pumping Plants to be constructed					2		Nos		
1	SOR-7.02	10.0	HP			1		1	230200.00	Nos	230200	
	SOR-7.02	10.0	HP				1	1	230200.00	Nos	230200	
			Valves & Fittings in Pump House								0	
2	SOR-10.01		Electrically operated Sluice Valve PN 1.0 dia 80 mm			2	2	4	138000.00	Nos	552000	
3	SOR-34.07		Sluice valve - 80 mm dia					0	11700.00	Nos	0	
4			Check Valve / Non Return Valve 80 mm			1	1	2	11700.00	Nos	23400	
5	SOR-42.01		3 Mtr. Long column pipe of MS Pipe for connecting submersible pump as per contract aggreement.									
			80mm dia - MS pipe			4	4	8	4,500.00	No.	36000.00	
			Process									
6	SOR-13		Supply , Installation of chlorinating system with dosing pump 0-6 I.PH capacity with 100 Litres(1w+1s) tanks,valves ,pipes with required acessories (Automatic hosing System for chemical injection)			1	1	2	64,000.00	Job	128000	
	SOR-		Electromagnetic flow meters									
7	51.01	80	mm			1	1	2	100000.00	Nos	200000	
8	SOR-11		Providing and installation hydrostatic level sensor at all tubewell pumping system including cii accessories etc. Complete as per instructions at Engineer -in —charge.			1	1	2	126000.00	Nos	252000	
9	Ext.		Chain Pulley Block - 2 Tonne			1	1	~~2~~	~~58,433.00~~	Nos	~~116866~~	0.00
10	SOR-9		Pressure Transmitter			1	1	2	45,000.00	Nos	90000	
			Total						174180		~~1858666~~	
			Say in Lacs								~~18.58666~~	

17.42

ESTIMATE FOR
Jairampur Gram Panchayat - VILLAGE(S) WATER SUPPLY SCHEME
UNDER - SWSM
BLOCK - GAURA, Tehsil - RANIGANJ, District -PRATAPGARH

ESTIMATE AND DETAIL MEASUREMENT OF SOLAR PLANT

S. No.	SOR		Item of Work	No	L	T/W-1	T/W-2	Qty	Rate	Unit	Amount	Remarks
			Number of TV Pumping Plant to be constructed									
1	SOR-18		SITC of Solar power plant (for complete plant) including solar pannel, Structure, invertor etc complete in all respect with required materiail, T&P labour			14.0	14.0	28.0	71,000.00	KW	1988000	
2	SOR-18		2 KW Solar Power Backup for Auxiliary load (Light and Fan etc.) with 150 AH Tubular 24V battery, Inverter etc. as per Engineer-in-Charge.			2.0	2.0	4.0	71,000.00	KW	284000	
			Total (in Rs.)								2272000	
			Say in Lacs								22.72	

ESTIMATE FOR

Jairampur Gram Panchayat - VILLAGE(S) WATER SUPPLY SCHEME

UNDER - SWSM

BLOCK - GAURA, Tehsil - RANIGANJ, District -PRATAPGARH

ESTIMATE AND DETAIL MEASUREMENT OF ELECTRICAL AND INSTRUMENTATION

S. No.	SOR		Item of Work	No	L	T/W-1	T/W-2	Qty	Rate	Unit	Amount	Remarks
			Number of TW Pumping Plants to be constructed									
1	SOR-43		Installation of suitable capable of simple T.W. automation system to control operation of the pumping plant with respect to high/low water level in OHT with RTU panel , 7" HMI screen , surge dévicé including enrgy meter inside the pump house with arrangement for communication of data with GSM and GPRS system to show required parameters including all accessorlas etc complete in all respect as per Instructions of Engineer -in —charge.			1	1	2	375000.00	Nos	750000	
2	SOR-53		Complete cabling for tubewell inlcuding all power and controlcables of all equipments at pumphouse and OHT			1	1	2	60,000.00	Nos.	120000	
3	SOR-17		Internal electrificaton of tubewell			1	1	2	25,000.00	LS	50000	
4	SOR-12.03		SITC of Oil Cooled Servo Voltage Stabilizer (150-460 V Range with Protection Devices for High Low voltage Cut off , overload Protection included Oil filling , Earthing and Power Wiring etc Job complete in all respect with all required material, T&P labour .									
4.1		15	(in KVA) Stabilizer					1 ~~0~~	166111.11	Nos	0	166111.11
		15	(in KVA) Stabilizer					1 ~~0~~	166111.11	Nos	0	166111.11
5	SOR-54		SCADA Software					0	26,74,000.0	Nos	0	
			Additional Works									
6			Power backup using DG Set for at lean period of 45 days.									
6.1		15	KVA			1		~~1~~	3,06,000.00	Nos.	~~306000~~	00
		15	KVA				1	~~1~~	3,06,000.00	Nos.	~~306000~~	0
			Total								~~1532000~~	1252222.22
			Say in Lacs								~~15.32~~	12.52

Electric Connection UPPCL + 9.28

21.80

BOQ

Sl. No.	Item Description	UOM	Rate	Qty.	Amount
Surveying & Design					
1	**SURVEY:** All the works including Hydrological survey, topographical survey, Design charges including preparation and approval of DPR	LS	1%of ECV	1.000	255358.9702
Tubewell					
2	**Tubewell construction:** Drilling of Borehole for Tubewell construction by DC/RC/DTH Rig Machine including transportaion, erection, dismantling of Rig and assosiated T&P complete in all respect including required all material labour etc.				
	DC/RC Drilling up to 100Mtr.				
	500 MMØ	Mtr.	2,298.50	130	298805.00
	450 MMØ	Mtr.	2,265.00	70	158550
	DC/RC Drilling from 101 Mtr. To 200 Mtr.Deep				
	450 MMØ	Mtr.	2,558.00	200	511600
	DC/RC Drilling from 201 Mtr. To 300 Mtr.Deep				
	450 MMØ	Mtr.	2,854.40	200	570880
	Development / Flushing of tubewell	Hr.	3,043.17	0	
3	**Zone Testing**				
	Zone Testing for QPV Areas including all Materials , T&P and Labour etc for Completion of work.-	Job	50,000.00	0	0
	Cement Sealing for QPV Areas including all Materials , T&P and Labour		1000.00	0	0
4	**Tubwell Assembly:**				
	MSERW plain pipe As per IS 4270				
	200 MMØ	Mtr.	2,550.00	120.00	306000
	150 MMØ	Mtr.	2,000.00	396.00	792000
	MSERW pipe/ LCG slotted pipe As per IS 8110				

	150 MMØ	Mtr.	3,080.00	24.00	73920
5	**MS Ring-** (100 to 300 mm a MS. Ring made by 175 mm x 16 mm Flat), (200 mm a MS. Ring made by 150 mm x 12 mm Flat)				
	200	No.s	1,600.00	20	32000
	150	No.s	1,270.00	86	109220
6	**MS Bail plug As per IS 2800**				
	150 mm ø M.S. Bail Plug	No.s	1,725.00	2	3450
7	**Reducer-**				
	200 x 150 mm Reducer	No.s	4,150.00	2	8300
8	**MSSI Clamp- As per IS 2800**				
	200 mm ø MS S.I. Clamp	No.s	2,000.00	2	4000
9	**TW Assy Support-**				
	200 mm ø Tubewell Assembly Support	No.s	15,500.00	2	31000
10	**MS Well Cap-**				
	200 mm ø MS Well Cap	No.s	1,350.00	2	2700
11.0	Center guide for 150 mm Ø tW Assembly	No.s	920.00	36	33120
12	**Lowering of Tube well Assembly:** Lowering of above assembly with welding of parts complete in all respect with all required material, T&P, labour, etc.				
	MSERW Plain/Slotted Pipe Lowering up to 100 Mtr. Deep				
	200 MMØ MSERW Plain/Slotted Pipe	Mtr.	418.00	120	50160
	150 MMØ MSERW Plain/Slotted Pipe	Mtr.	341.00	80	27280
	MSERW Plane/Slotted Pipe Lowering from 100 Mtr. To				
	150 MMØ MSERW Plane/Slotted Pipe	Mtr.	418.00	200	83600
	MSERW Plane/Slotted Pipe Lowering from 100 Mtr. To				
	150 MMØ MSERW Plane/Slotted Pipe	Mtr.	495.00	140	69300
13	Logging of Borehole by Electric logging	Job	18000.00	2	36000
14	**Borwell Gravel Infill:** Supplying and unconsolidated packing of gravel with suitable size.	Cum	7,500.00	134	1005000

15	**Development of Tube well:**				
	600 PSI Compressor per hour	Hr.	5,000.00	100	500000
	Charges for Development of TW by 1 Cusec OP Unit	Hr.	1,125.00	200	225000
16	Complete cabling for tubewell inlcuding all power and controlcables of all equipments at pumphouse and OHT	Nos.	60,000.00	2	120000
17	Internal electrificaton of water works campus.	LS	25,000.00	2	50000
Pump House:					
18.1	Provide all materials labour T&P etc. complete and construct Pump house size (3.6x3.0x3.0)m Chlorinating room size (2.5x1.8x3.0)m as per departmental type design and drawing (drawing no-D-2) and as per the specifications for civil work given in the bid document including supply of all material labour and T&P etc complete as per instructions of Engineer	Job	492800.00	1	492800
18.2	Provide all materials labour T&P etc. complete and construct Pump house size (3.6x3.0x3.0)m Chlorinating room size (2.5x1.8x3.0)m as per departmental type design and drawing (drawing no-D-2) and as per the specifications for civil work given in the bid document including supply of all material labour and T&P etc complete as per instructions of Engineer	Job	492800.00	1	492800
19	**Bye-pass chamber for pump house:** Provide all materials, labour, T&P etc. complete and constructed Bye-pass chamber for pump house (1000 (L) x 1000 (W) x 1150 (H) mm) drawing (drawing no.D-3) and as per the specifications for civil work given in the bid document, including supply of all material, labour and T&P etc complete as per instructions of Engineer -in -charge.	No.	21,500.00	1	21500
Rising Main:					
20	Supply of following sizes (D.I.) pipes for rising main/distribution system conforming to latest/relevant I.S. 8329/2000 Specifications with all jointing materials such as specials conforming to latest /relevant I.S. specifications, suitable for D.I pipes, as per IS-1239 /2000 and IS 8329/2000 or their latest amendment including F.O.R. destination and all taxes and insurance etc. with loading, unloading and Carting up to site of work, also including specials for these pipes and lowering them into the trenches and laying true to alignment and gradient and jointing etc. complete (including testing of pipe lines and cutting of pipes for making up the length but excluding the cost of trenches).all complete as per instructions of Engineer -in - charge.				

	200 mm dia K-9	Mtr.	2,332.32	530.000	1236129.6

21	**Excavation for Rising main:** Excavation of earth in ordinary soil (loam, clay or sand) for pipe line and rising main trenches including lift upto 1.50 m and lead upto 50 m and refilling watering, ramming of the excavated earth into the trench and also disposal of surplus earth upto 50m from the center of the trenches including supply of all material labour, T&P etc complete as per instructions of Engineer -in -charge.		Cum.	240.00	457.125	109710
Overhead Tank:						
22	**Over Head Tank: R.C.C**					
	Supply of all materials labour T&P etc. for complete construction of MS Over Head Tank of capacity below staging above ground level with main components.					
	Capacity (in KL)-	250				
	Staging (in m)-	12	Job	4703800	1	4703800
Distribution System:						
23	**Earthwork Excavation:** Excavation of earth in ordinary soil (loam, clay or sand) for pipe line and rising main trenches including lift upto 1.50 m and lead upto 50 m and refilling watering, ramming of the excavated earth into the trench and also disposal of surplus earth upto 50m from the center of the trenches including supply of all material labour, T&P etc complete as per instructions of Engineer -in -charge.					
	Ordinary Soil		Cum.	240.00	2596.425	623142.0857
	Mixed soil with Kankar (Hard Soil)		Cum.	269.05	0.000	0
	Hard rock		Cum.	1,318.39	0.000	0
24	**HDPE Pipes:** Supply of following sizes pipes for distribution system conforming to latest/ relevant I.S. 4984/1995 Specifications with all jointing materials and specials					
	63 mm dia HDPE Pipe PN-6: Class PE-100		Rmt	146.00	1954.000	285284
	75 mm dia HDPE Pipe PN-6: Class PE-100		Rmt	190.00	2148.000	408120
	90 mm dia HDPE Pipe PN-6: Class PE-100		Rmt	254.00	1731.000	439674
	110 mm dia HDPE Pipe PN-6: Class PE-100		Rmt	369.00	383.000	141327
	125 mm dia HDPE Pipe PN-6: Class PE-100		Rmt	471.00	0.000	0
	140 mm dia HDPE Pipe PN-6: Class PE-100		Rmt	595.00	134.000	79730
	160 mm dia HDPE Pipe PN-6: Class PE-100		Rmt	753.00	0.000	0
	180 mm dia HDPE Pipe PN-6: Class PE-100		Rmt	929.00	0.000	0
	200 mm dia HDPE Pipe PN-6: Class PE-100		Rmt	1139.00	0.000	0

25	**DI Pipes:** Supply of following sizes (D.I.) pipes for rising main/distribution system conforming to latest/relevant I.S. 8329/2000 Specifications with all jointing materials such as specials conforming to latest /relevant I.S. specifications, suitable for D.I pipes, as per IS-1239 /2000 and IS 8329/2000 or their latest amendment including F.O.R. destination and all taxes and insurance etc. with loading, unloading and Carting up to site of work, also including specials for these pipes and lowering them into the trenches and laying true to alignment and gradient and jointing etc. complete (including testing of pipe lines and cutting of pipes for making up the length but excluding the cost of trenches).all complete as per instructions of Engineer -in - charge.				
	250 mm dia K-7	Rmt	2,588.98	0.000	0
	300 mm dia K-7	Rmt	3,182.50	0.000	0
24	**Sluice Valves:** Supply and carting up to site of work of the following dia DI butterfly /sluice valves, class I, working pressure 10 Kg/cm2 confirming to IS: 780/1969 or its latest amendments, **including valve fittings & Dismantling Joints as per requirement** F.O.R. destination, and lowering them into the already prepared trenches, fixing in position and jointing them with pipelines and testing etc. complete and also including supply of jointing materials etc. complete including all taxes and insurance, as per instructions of Engineer -in -charge.				
	Sluice valve - 80 mm dia	Nos.	11,700.00	2	23400
	Sluice valve - 100 mm dia	Nos.	14,300.00	1	14300
	Sluice valve - 125 mm dia	Nos.	16,900.00	0	0
	Sluice valve - 150 mm dia	Nos.	19,500.00	0	0
	Sluice valve - 200 mm dia	Nos.	29,250.00	2	58500
	Sluice valve - 250 mm dia	Nos.	48,109.00	0	0
	Sluice valve - 300 mm dia	Nos.	64,042.00	0	0
	Check valve- 80 mm dia	Nos.	11,700.00	2	23400
	PRV 150 mm dia	Nos.	1,24,575.00	0	0
26	**Scour valves:**				
	Scour valve - 80 mm dia	Nos.	11,700.00	1	11700

	Scour valve - 100 mm dia	Nos.	14,300.00	0	0
	Scour valve - 150 mm dia	Nos.	19,500.00	0	0
	Scour valve - 200 mm dia	Nos.	29,250.00	0	0
	Scour valve - 250 mm dia	Nos.	48,109.48	0	0
27	**Air Valve:** Supply and installation, testing etc. of single/double ball type air valve conforming to latest/relevent I.S. specifications including all taxes and insurance, carting up to site of work and lowering them into the trenches, fixing in position and jointing them with pipelines and testing etc. complete (including supply of jointing materials and Valve fittings etc complete) as per instructions of Engineer.	Nos.			
	Air Valve - 20 mm dia	Nos.	10,229.21	1.000	10229.21
	Air Valve - 50 mm dia	Nos.	23,170.33	0.000	0
	Air Valve - 80 mm dia	Nos.	23,170.33	0.000	0
	Air Valve - 150 mm dia	Nos.	41,024.88	0.000	0
27	**Fire Hydrant:** Supply of under ground sluice value type fire hydrant consisting of 80 mm dia sluice valve, 80mm dia tail pieces, 80mm dia duck foot bend and 80 mm dia standard makes iron coupling with cap and etc. complete conforming to latest/relevent I.S.specifications including all taxes and insurance up to site of work and lowering them into the trenches, fixing in position and jointing them with pipelines and testing etc. complete (including supply of jointing materials and Valve fittings etc. complete as per instructions of Engineer -in - charge.	Nos.	24,500.00	1.000	24500
28	**Valve Chambers:** Construction of following type chambers as per department type design and drawing including Heavy duty M.S. Manhole Cover and all materials, labour, T&P etc complete for proper completion of work as per instructions of Engineer -in -charge.				
	Sluice valve chamber - dia upto 200 mm - 1000 (L) x 1200 (W) x 1300 (H) mm	No.	26,500.00	0	0
	Sluice valve chamber (surface box Type)	No.	5,000.00	5	25000

	Fire Hydrant chamber (750 (L) X 450 (W) X 1000 (H)	No.	19,000.00	1	19000
	Air Valve Chamber of size 350 (L) x 350 (W) x 500 (H)	No.	9,500.00	1	9500
	Scour Valve Chamber - dia upto 200 mm - 1000 (L) x	No.	30,475.00	1	30475
	PRV Valve Chamber - 1000 (L) x 1200 (W) x 1300 (H) mm	No.	29,150.00	0	0
29	**Thrust Blocks:** Design and construct Thrust Block (1.0 x 1.0 x 0.6) made in R.C.C. with cement, coarse sand & 20 mm gauge stone ballast in proportion of 1:1.5:3, for pipe line, including supply of MS reinforcement wrought to required shape as necessary ,its bending, fixing & binding the same with 0.50 mm thick binding wire in position & necessary centering & shuttering including curing and supply of all materials, labour, T & P etc. required for proper completion of the work and as per specifications for RCC work as per instructions of Engineer -in -charge.				
	Design and construct Thrust Block made in Reinforced Cement concrete (1:1.5:3), with graded stone chips (20 mm nominal size) excluding shuttering and reinforcement, as per technical requirements.	Cum.	12,000.00	4.600	55200
	Providing reinforcement of Thrust block for reinforced concrete work including distribution bars, stirrups, binders etc. initial straightening and removal of loose rust (if necessary), cutting to requisite length, hooking and bending to correct shape, placing in proper position and binding with wire at every inter-section, complete as per drawing and direction.	KG	112.00	361.100	40443.2

30	**House Connection:** Making house connection should be done atleast 2 m inside the boundary wall with provision of tap from distribution line to outer wall of house, with supply of 1 m G.I. pipe (15 mm) (above ground) & average 5 mtr. HDPE/MDPE Pipe (20 mm) (below ground) including specials, saddle, Tap,etc. of suitable size, T&P etc. including excavation, laying and jointing for proper completion of work as per instructions of Engineer as per Dwg 12 (excluding road restoration)	Nos.	3,700	621	2297700
31	**Stand posts:** Construction of single tap pillar type stand post as per type design	Nos.	10,000.00	2	20000
32	**Dismantling and Reinstatement:** Dismantling and Reinstatement of the following type of road surface with old and new materials including supply of all materials labour T&P etc. required for proper completion of the work as per instructions of Engineer -in -charge.				
	B.O.E. surface (50% of existing bricks to be reused)	sqm	450.00	571.662	257247.9

	Bituminous surface	sqm	1989.54	276.819	550742.4733
	Interlocking Road	sqm	1293.00	247.629	320184.297
	C.C. Road	sqm	1721.40	309.811	533308.6554
33	**Culvert crossing:** Provision for following types of Culvert crossing along the alignment of pipe line complete as per instructions of Engineer -in -charge. (casing of pipe is done by concreting)				
	Nala/Culvert Crossing (width -3.5 m) upto Dia 300 mm	Nos	21,500.00	7	150500
34	**Trenchless crossings:**				
	Survey site Investigation Planning , design Drawings as per State Road manual and vetting / checked from State Road Divisional Office and taking NOC for trenchless crossing of National highway road and Railway track(crossing length 15m to 25m), Road for of required dia Rising main pipe with casing pipe as required for proper completion of work required size of MS casing pipe as per drawing and as per (IS:3589 & made from confining to IS:2062) with 750 Micron PU coating internally and 250 micron anti corrosive bituminous paint externally by trenchless technology method at an average depth 3.60 mtr from normal ground level up to top of casing pipe including excavation & filling of Pit, Dewatering arrangement, Supporting system for soil, also including supply and fixing of 2 no Sluice valve ISI Mark, construction of sluice valve chamber etc. all complete work including supply & fixing specials in carrier pipe over main pipe, as per specification given in the bid documents including supply of all materials, labour T&P etc. for proper completion of work as per instructions of Engineer -in -charge.				
	Railway Line crossing (Upto Dia 350 mm)	m	60,000.00	**0.000**	0

	National Highway road crossing (Upto Dia 350 mm)	m	40,000.00	**0.000**	0
	State Highway road crossing (Upto Dia 350 mm)	m	27,000.00	**0.000**	0
35	**Road Crossing:** Excavation in foundation of trench of proper size in soil mixed with moorum, Shingle, Kankar, soft rock, hard rock, including refilling, dressing and ramming earth or sand or bajri, ballast, including providing, supply, carting, lowering, laying and jointing of casing pipe of RCC NP-3 with appropriate size, with rubber ring joint, sand filling in gap inside RCC pipe, insertion of distribution pipe into the encasing pipe including supply of T&P, including concrete of 150 mm thick in with 40mm gauge brick ballast local sand and cement in proportion of 8:4:1, provision for barricading, labour for traffic diversion etc. Complete for proper completion of work as per instruction of Engineer.				

	300 mm dia. Pipe	Rm	4,500.00	**15.000**	67500
Boundary Wall:					
36	**Boundary wall:** Construction of 1.3 m high and 115mm thick boundary wall with 230 mmx230 mm thick pillar made in Brick masonry in 1 cement and 4 sand mortar, the spacing between two pillar should not be more than 3.0 m c/c and the depth of foundation should not be less than 0.60m, at the site of water works as per departmental type design and drawing, and, as per specifications given in the bid document including supply of all materials, labour T&P etc.for proper completion of work as per instructions of Engineer -in - charge. (Drawing No.D-1)	Rmt	7,360.00	105.200	774272
37	**MS gate:** Supply and fixing of 3.6 m x 1.20 m MS gate including fabrication and supply of steel and construction of bounary wall pillars of size 1.35mx0.23mx0.23m with ornamental brick work 115mm thk. around RCC, as per departmental type design and drawing (Drawing No. D-1) and as per specifications laid down in the bid document, including supply of all material, labour,T&P etc. Required for proper completion of work as per instructions of Engineer-in-charge.	No.	52,000.00	1	52000
38	**MS wicket gate:** Supply and fixing of 1.2m wide MS wicket gate including fabrication and supply of steel and construction of boundary wall pillars etc. as per specifications laid down in the bid document, including supply of all material, labour,T&P etc.required for proper completion of work as per instructions of Engineer-in- charge.	No.	19,000.00	1	19000
Approach Road and ancilliary civil works:					0
39	**BOE pavement:** Construction of Interlocking pavement for approach to water works, as per departmental type design and drawing and as per specifications laid down in the bid document, including supply of all materials , labour, T&P etc.required for proper completion of work as per instructions of Engineer -in -charge.	Sqm.	1,070.50	90.000	96345

	Construction of granular sub base by providing coarse grade materials, spreading in uniform layers including watering and compaction complete.	Cum	2,800.00	0.000	0
40	**Semicircular Drain:** Provision for inside semicircular drain 200mm dia including supply of all materials, labour and T & P etc. complete.	Rmt	1,854.00	104.400	193557.6
41	**Percolation Pit:** Water recharge Mechanism within the water works campus	Job	126362.00	2	252724
42	**Approach Road:** Construction of WBM road to enable vehicular moment from established nearby road to campus entrance	cum	3,029.00	0.000	0
Staff Quarters:					
43	**Single room staff quarter / office room:** Provide all materials labour, T&P etc. and construct single room staff quarter / office room at water works site identified by the Engineer-in-charge as per department type design and drawing and specifications of civil works laid down in the bid document, including all material labour, T&P etc complete for proper completion of work as per instructions of Engineer -in -charge. (Drawing No.D-7)	No	958000.00	0	0
					0
Pumping & Chlorinating Plant:					0
44	**Submersible Pump:** SITC of Energy efficiant AC Submmercible Pumping plant with submercible flat cable of suitable length , main Piping & Valves with 08 nos Column Pipes , Distance piece for Rising Main and Bypas side ,NRV cum Pump and Column Pipe Jointer, Power wiring, Chemical earthing , Painting, wiring of pump house (internal & External) and Installation Job of Pumping Plant complete in all respect with all required material, T&P labour complete in all respect for following duties in Solar Powered				0
	10 H.P	Nos.	230200.00	1	230200
	10 H.P	Nos.	230200.00	1	230200

45	**Column Pipe: (MS / GI PIPE)** 3Mtr. Long Column Pipe as per IS 1239 with Necessary packings and nut & Bolts etc.				
	80 mm Dia size - MS / GI PIPE	Nos.	4,500.00	8	36000
46	**Hydrostatic level sensor:** Providing and installation hydrostatic level sensor at all tubewell pumping system including all accessories etc. complete in all respect as per instructions of Engineer -in – charge.	Nos.	126000.00	2	252000
47	Electrically operated D.I. Sluice Valve Metal seated PN 1.0 dia 80 mm	Nos.	138000.00	4	552000
48	**Pressure Transmitter:**	Nos.	45,000.00	2	90000
49	**RO Plant System:**				0
	Electronic type chlorinating dosing system(1W+1S) with 6 LPH capacity 4kg/cm2 working pressure with 200 Litres tank and valves pipes with all required acessories	JOB	64,000.00	2	128000
	Fluoride Removal Plant: Supplying, installation, testing, commissioning of Fluoride removal plant for required capacity including transportation and labour charges as complete. (vendor have to select the technology based on capacity (Electrolytic-de fluoridation plant or media based system). Rates for400 KLD/ 500 LPM	LS	8062500.00	0	0
	Iron Removal Plant: Supplying, installation, testing, commissioning of Iron removal plant which includes vessel, media, piping valves etc. for required capacity including transportation and labour charges as complete. Rates for400 KLD/ 500 LPM	LS	6062500.00	0	0
	Arsenic Removal Plant: Supplying, installation, testing, commissioning of Arsenic removal plant which include vessel, media, piping valves etc. for required capacity including transportation and labour charges as complete. Rates for400 KLD/ 500 LPM	LS	9000000.00	0	0
50	**Electromagnetic flow meters:**				0
	80 mm	Nos.	100000.00	2	200000

Solar Plant:					
53	**Solar power plant:** SITC of Solar power plant (for complete plant including solar panals , VFD ,Structure,earthing of all electrical items , Balance of system with auxillary load arrangements for Field monitoring devices , Cleaning arrangements for solar panals , Interlocking Pavement below solar panals and Installation and commisioning with civil works etc. complete in all respect with required material T&P labour	KW	71,000.00	32.000	2272000
54	**Energy Backup:** Power backup using DG set for at lean period of 45 days				
	15 KVA	Job	3,06,000.00	1	306000.000
	15 KVA	Job	3,06,000.00	1	306000.000
Electrical & Instrumentation :					
55	SITC of Oil Cooled Servo Voltage Stabilizer (150-460 Range with Protection Devices for High Low voltage Cut off , overload Protection included Oil filling , Earthing and Power Wiring etc Job complete in all respect with all required material, T&P labour .				
	15 KVA Stabilizer	Nos.	166111.11	0	0
	15 KVA Stabilizer	Nos.	166111.11	0	0
56	**Automation system to control operation of the pumping plant:** Installation of suitable capacity simple T.W. automation system to control operation of the pumping plant with respect to high/low water level in OHT iwith RTU panel , 7" HMI screen , surge device including enrgy meter inside the pump house with arrangement for communication of data with GSM and GPRS system to show required parameters including all accessories etc. complete in all respect as per instructions of Engineer -in –charge.	Job	375000.00	2	750000

57	**SCADA software:**				0
	Master control plc with CPU, SCADA software including GSM/GPRS modem,necessray firewall,ethernet switch,CCTV system	Nos.	2674000.00	0	0
59	**Chain Pulley Block - 2 Tonne**				0
	Chain Pulley Block - 2 Tonne	Nos.	58,433.00	2	116866
					0
LS for Non-provisional Item:					0
60	**LS for Non-provisional Item and departmental taxes ,**	Job	15,00,000.00	0.000	0
					0
				Village/Scheme wise gross value:	**2,57,91,255.99**
				Add GST @18%:	**4642426.078**

Operation and Maintenance:					
61	Operation and Maintenance for 10 years of water supply schemes after completion including staff required for operation and maintenance, chemicals, all materails, specials T & P for operation and maintenance excluding electricity charges.				
	For first year	%	2% of capex Cost		526141.6222
	For Second year	%	Increment of 5% previous		552448.7033
	For Third year	%	Increment of 5% previous		580071.1385
	For Fourth year	%	Increment of 5% previous		609074.6954
	For Fifth year	%	Increment of 5% previous		639528.4302
	For Sixth year	%	Increment of 5% previous		671504.8517
	For Seventh year	%	Increment of 5% previous		705080.0943
	For Eighth year	%	Increment of 5% previous		740334.099
	For Ninthyear	%	Increment of 5% previous		777350.804
	For Tenth year	%	Increment of 5% previous		816218.3442
				10 Years O&M total amount:	**66,17,752.78**
				Total Project Cost:	**3,70,51,434.85**

ESTIMATE FOR
Jairampur Gram Panchayat - VILLAGE(S) WATER SUPPLY SCHEME
UNDER - SWSM
BLOCK - GAURA, Tehsil - RANIGANJ, District -PRATAPGARH

SOR

Sl. No.	Item Description	Unit	SOR	Quoted. Rate
1.00	**Survey**			
1.01	All the works including Hydrological survey, topographical survey, Design charges including preparation and approval of DPR 1% of ECV	LS	1% of ECV	
2.00	**DC/RC Drilling including Hiring Transportaion , Erection , Dismantling with Loading and unloading of Rig and assosiated T&P complete in all respect including required all material labour & T&P etc.**			
	Tubewell Construction			
	DC/RC Drilling up to 100 Mtr.			
2.01	400 MMØ	Mtr.	2112.37	2112.37
2.02	450 MMØ	Mtr.	2265.00	2265.00
2.03	500 MMØ	Mtr.	2298.50	2298.50
2.04	600 MMØ	Mtr.	2310.00	2310.00
	DC/RC Drilling from 101 Mtr. To 200 Mtr.Deep			
2.05	400 MMØ	Mtr.	2358.00	2358.00
2.06	450 MMØ	Mtr.	2558.00	2558.00
2.07	500 MMØ	Mtr.	2796.89	2796.89
2.08	600 MMØ	Mtr.	3274.67	3274.67
	DC/RC Drilling from 201 Mtr. To 300 Mtr.Deep			
2.09	400 MMØ	Mtr.	2654.40	2654.40
2.10	450 MMØ	Mtr.	2854.40	2854.40

2.11	500 MMØ	Mtr.	3039.00	3039.00
2.12	600 MMØ	Mtr.	3408.19	3408.19
	DC/RC Drilling from 301 Mtr. To 400 Mtr.Deep & above			
2.13	400 MMØ	Mtr.	2852.79	2852.79
2.14	450 MMØ	Mtr.	3012.79	3012.79
2.15	500 MMØ	Mtr.	3179.00	3179.00
2.16	600 MMØ	Mtr.	3511.42	3511.42
	DTH Drilling upto 200.0 Mtr.Deep			
2.17	200/165 MMØ (in over burden/Hard Rock)	Mtr.	1250.00	1250.00
2.18	Development / Flushing of tubewell	Hr.	2900.00	2900.00
3.00	**Tubwell Assembly:**			
	MSERW plain pipe As per IS 4270			
3.01	100 MMØ	Mtr.	1200.00	1200.00
3.02	150 MMØ	Mtr.	2000.00	2000.00
3.03	200 MMØ	Mtr.	2550.00	2550.00
3.04	300 MMØ	Mtr.	3990.00	3990.00
	MSERW Pipe slotted pipe as per IS 8110			
3.05	100 MMØ	Mtr.	1570.00	1570.00
3.06	150 MMØ	Mtr.	3080.00	3080.00
3.07	200 MMØ	Mtr.	3833.80	3833.80
3.08	300 MMØ	Mtr.	5707.45	5707.45
	MS Ring			
3.09	100 mm ø MS. Ring made by 150 mm x 12 mm Flat	No.	1000.00	1000.00
3.10	150 mm ø MS. Ring made by 150 mm x 12 mm Flat	No.	1270.00	1270.00
3.11	200 mm ø MS. Ring made by 150 mm x 12 mm Flat	No.	1600.00	1600.00

3.12	300 mm ø MS. Ring made by 175 mm x 16 mm Flat	No.	2070.00	2070.00
	MS Bail plug As per IS 2800			
3.13	100 mm ø M.S. Bail Plug	No.	1500.00	1500.00
3.14	150 mm ø M.S. Bail Plug	No.	1725.00	1725.00
3.15	200 mm ø M.S. Bail Plug	No.	2070.00	2070.00
3.16	300 mm ø M.S. Bail Plug	No.	3000.00	3000.00
	Reducer-			
3.17	300 x 200 mm Reducer	No.	6550.00	6550.00
3.18	200 x 150 mm Reducer	No.	4150.00	4150.00
3.19	300 x 150 mm Reducer	No.	5500.00	5500.00
3.20	200 x 100 mm Reducer	No.	3550.00	3550.00
3.21	150 x 100 mm Reducer	No.	2850.00	2850.00
	MSSI Clamp- As per IS 2800			
3.22	100 mm ø MS S.I. Clamp	No.	1250.00	1250.00
3.23	150 mm ø MS S.I. Clamp	No.	1500.00	1500.00
3.24	200 mm ø MS S.I. Clamp	No.	2000.00	2000.00
3.25	300 mm ø MS S.I. Clamp	No.	4050.00	4050.00
	TW Assy Support-			
3.26	100 mm ø Tubewell Assembly Support	No.	10500.00	10500.00
3.27	150 mm ø Tubewell Assembly Support	No.	13500.00	13500.00
3.28	200 mm ø Tubewell Assembly Support	No.	15500.00	15500.00
3.29	300 mm ø Tubewell Assembly Support	No.	17500.00	17500.00
	MS Well Cap-			
3.30	100 mm ø MS Well Cap	No.	1000.00	1000.00
3.31	150 mm ø MS Well Cap	No.	1250.00	1250.00
3.32	200 mm ø MS Well Cap	No.	1350.00	1350.00
3.33	300 mm ø MS Well Cap	No.	1550.00	1550.00
	Centre Guide-			
3.34	Center guide for 150mm øTW Assembly	No.	920.00	920.00
3.35	Center guide for 200mm ø TW Assembly	No.	1040.00	1040.00
4.00	**Lowering of above Tubewell assembly including Carting upto site and welding of parts complete in all respect with all required material T&P labour etc.**			
	Lowering up to 100 Mtr. Deep			
4.01	100 MMØ MSERW Plane/Slotted Pipe	Mtr.	193.94	193.94
4.02	150 MMØ MSERW Plane/Slotted Pipe	Mtr.	341.00	341.00
4.03	200 MMØ MSERW Plane/Slotted Pipe	Mtr.	418.00	418.00
4.04	300 MMØ MSERW Plain/Slotted Pipe	Mtr.	433.00	433.00
	Lowering from 101 Mtr. To 200 Mtr. Deep			
4.05	100 MMØ MSERW Plane/Slotted Pipe	Mtr.	352.00	352.00
4.06	150 MMØ MSERW Plane/Slotted Pipe	Mtr.	418.00	418.00
4.07	200 MMØ MSERW Plane/Slotted Pipe	Mtr.	495.00	495.00
4.08	300 MMØ MSERW Plane/Slotted Pipe	Mtr.	638.00	638.00
	Lowring from 201 Mtr. To 300 Mtr. Deep			
4.09	100 MMØ MSERW Plane/Slotted Pipe	Mtr.	418.00	418.00
4.10	150 MMØ MSERW Plane/Slotted Pipe	Mtr.	495.00	495.00
4.11	200 MMØ MSERW Plane/Slotted Pipe	Mtr.	572.00	572.00
4.12	300 MMØ MSERW Plane/Slotted Pipe	Mtr.	715.00	715.00
	Lowring from 301 Mtr. To 400 Mtr. Deep & above			
4.13	100 MMØ MSERW Plane/Slotted Pipe	Mtr.	430.00	430.00
4.14	150 MMØ MSERW Plane/Slotted Pipe	Mtr.	500.00	500.00
4.15	200 MMØ MSERW Plane/Slotted Pipe	Mtr.	577.00	577.00
4.16	300 MMØ MSERW Plane/Slotted Pipe	Mtr.	720.00	720.00
4.17	Logging of Borehole by Electric logging	Job	18000.00	18000.00
4.18	Zone Testing for QPV Areas including all Materials , T&P and Labour	Job	50000.00	50000.00
4.19	Cement Sealing for QPV Areas including all Materials , T&P and Labour etc for Completion of work.-	Mtr.	1000.00	1000.00
5.00	**Supplying and unconsolidated packing of gravel with suitable size**	Cum	7500.00	7500.00
6.00	**Development of Tube well**			
6.01	150 PSI Compressor per hour	Hr.	3050.00	3050.00

6.02	250 PSI Compressor per hour	Hr.	3650.00	3650.00
6.03	350 PSI Compressor per hour	Hr.	4250.00	4250.00
6.04	600 PSI Compressor per hour	Hr.	5000.00	5000.00
6.05	Charges for Development of TW by 0.5 Cusec OP Unit	Hr.	840.00	840.00
6.06	Charges for Development of TW by 1 cusec OP Unit	Hr.	1125.00	1125.00
6.07	Charges for Development of TW by 3 cusec OP Unit	Hr.	1400.00	1400.00
7.00	**SITC of Energy efficiant AC Submmercible Pumping plant with submercible flat cable of suitable length , main Piping & Valves with 08 nos Column Pipes , Distance piece for Rising Main and Bypas side ,NRV cum Pump and Column Pipe Jointer, Power wiring, Chemical earthing , Painting, wiring of pump house (internal & External) and Installation Job of Pumping Plant complete in all respect with all required material, T&P labour complete in all respect for following duties in Solar Powered Applications-**			
7.01	7.5HP	Nos.	228500.00	228500.00
7.02	10 HP	Nos.	230200.00	230200.00
7.03	12.5 HP	Nos.	238800.00	238800.00
7.04	15 HP	Nos.	252100.00	252100.00
7.05	17.5 HP	Nos.	276504.56	276504.56
7.06	20 HP	Nos.	295500.00	295500.00
7.07	25 HP	Nos.	334043.48	334043.48
7.08	30 HP	Nos.	359160.00	359160.00
8.00	**SITC of Energy efficiant AC Submmercible Pumping plant including Soft Starter with submercible flat cable of suitable length , main Piping & Valves with 8 Nos Column Pipes , Distance piece for Rising Main and Bypas side ,NRV cum Pump and Column Pipe Jointer, Power wiring, Chemical earthing , Painting, wiring of pump house (internal & External) and Installation Job of Pumping Plant complete in all respect with all required material, T&P labour etc for following duties in Grid Powered Applications-**			
8.01	7.5HP (80 mm Dia size Main piping And valves)	Nos.	280038.00	280038.00
8.02	10 HP (100 mm Dia size Main piping And valves)	Nos.	319795.00	319795.00
8.03	12.5 HP (100 mm Dia size Main piping And valves)	Nos.	334745.00	334745.00
8.04	15 HP (150 mm Dia size Main piping And valves)	Nos.	368995.00	368995.00
8.05	17.5 HP (150 mm Dia size Main piping And valves)	Nos.	370670.00	370670.00
8.06	20 HP (150 mm Dia size Main piping And valves)	Nos.	392633.00	392633.00
8.07	25 HP (150 mm Dia size Main piping And valves)	Nos.	433990.00	433990.00
8.08	30 HP (150 mm Dia size Main piping And valves)	Nos.	465860.00	465860.00
	Variation in HP due to change of site locations increased / decreased in per HP of the proposed pumping plants.	Rate / HP	30467.00	30467.00
9.00	Pressure Transmitter	Nos.	45000.00	45000.00
10.01	Electrically operated D.I. Sluice Valve Metal seated PN 1.0 dia 80 mm	Nos.	138000.00	138000.00
10.02	Electrically operated D.I. Sluice Valve Metal seated PN 1.0 dia 100 mm	Nos.	143750.00	143750.00
10.03	Electrically operated DI Sluice Valve metal seated PN 1.0 dia 150 mm	Nos.	150000.00	150000.00
10.04	Electrically operated DI Sluice Valve Metal SeatedPN 1.0 dia 200 mm	Nos.	172500.00	172500.00
11.00	Providing and installation hydrostatic level sensor at all tubewell pumping system including all accessories etc. complete in all respect as per instructions of Engineer -in –charge.	Nos.	126000.00	126000.00
12.00	**SITC of Oil Cooled Servo Voltage Stabilizer (150-460 V Range with Protection Devices for High Low voltage Cut off , overload Protection included Oil filling , Earthing and Power Wiring etc Job complete in all respect with all required material, T&P labour .**			
12.01	7.5 KVA	Nos.	44722.22	44722.22
12.02	10 KVA	Nos.	127777.78	127777.78
12.03	15 KVA	Nos.	166111.11	166111.11

12.04	20 KVA	Nos.	191666.67	191666.67
12.05	25 KVA	Nos.	204444.44	204444.44
12.06	30 KVA	Nos.	230000.00	230000.00
12.07	40 KVA	Nos.	281111.11	281111.11
12.08	50 KVA	Nos.	319444.44	319444.44
12.09	60 KVA	Nos.	345000.00	345000.00
13.00	Electronic type chlorinating dosing system(1W+1S) with 6 LPH capacity 4kg/cm^2 working pressure with 200 Litres tank and valves pipes with all required acessories	JOB	64000.00	64000.00
14.00	Fluoride Removal Plant: Supplying installation testing commissioning of Fluoride removal plant for required capacity including transportation and labour charges as complete. (vendor have to select the technology based on capacity (Electrolytic-de fluoridation plant or media based system). Rates for400 KLD/ 500 LPM	LS	8062500.00	8062500.00
15.00	Iron Removal Plant: Supplying installation testing commissioning of Iron removal plant which includes vessel media piping valves etc. for required capacity including transportation and labour charges as complete. Rates for400 KLD/ 500 LPM	LS	6062500.00	6062500.00
16.00	Arsenic Removal Plant: Supplying installation testing commissioning of Arsenic removal plant which include vessel media piping valves etc. for required capacity including transportation and labour charges as complete. Rates for400 KLD/ 500 LPM	LS	9000000.00	9000000.00
17.00	Internal electrificaton of water works campus.	LS	25000.00	25000.00
18.00	SITC of Solar power plant (for complete plant) including solar panals , VFD , Structure,earthing of all electrical items , Balance of system with auxillary load arrangements for Field monitoring devices , Cleaning arrangements for solar panals , Interlocking Pavement below solar panals and Installation and commisioning with civil works etc. complete in all respect with required material T&P labour	KW	71000.00	71000.00
19.00	Construction of 1.3 m high and 115mm thick boundary wall with 230 mmx230 mm thick pillar made in Brick masonry in 1 cement and 4 sand mortar the spacing between two pillar should not be more than 3.0 m c/c and the depth of foundation should not be less than 0.60m at the site of water works as per departmental type design and drawing and as per specifications given in the bid document including supply of all materials labour T&P etc.for proper completion of work as per instructions of Engineer -in - charge. (Drawing No.D-1)	Rmt	7360.00	7360.00
20.00	Supply and fixing of 3.6 m x 1.20 m MS gate including fabrication and supply of steel and construction of bounary wall pillars of size 1.35mx0.23mx0.23mwith ornamental brick work 115mm th. around RCC as per departmental type design and drawing (Drawing No. D-1) and as per specifications laid down in the bid document including supply of all material labourT&P etc.required for proper completion of work as per instructions of Engineer-in-charge.	No.	52000.00	52000.00
21.00	Supply and fixing of 1.2m wide MS wicket gate including fabrication and supply of steel and construction of boundary wall pillars etc. as per specifications laid down in the bid document including supply of all material labourT&P etc.required for proper completion of work as per instructions of Engineer-in- charge.	No.	19000.00	19000.00
22.00	Construction of Interlocking pavement for approach to water works as per departmental type design and drawing and as per specifications laid down in the bid document including supply of all materials labour T&P etc.required for proper completion of work as per instructions of Engineer -in -charge.	Sqm.	1070.50	1070.50

23.00	Construction of granular sub base by providing coarse grade materials spreading in uniform layers including watering and compaction complete.	Cum	2800.00	2800.00
24.00	Construction of WBM by providing grade materials spreading in uniform layers including watering and compaction complete.	Cum	3029.00	3029.00
25.00	Earth filling work for proper leveling of water work site in accordance with the contour map and Grid map of existing site enclosed (Drawing no.D-1) including leveling dressing excavation and filling of earth where necessary and also including all labour materials T&P etc.required for proper completion of works and also including carriage of earth from within a distance of about 8 km. from the site of works as per instructions of Engineer -in - charge.	cum	890.00	890.00
26.00	Provision for inside square drain including supply of all materials labour and T & P etc. complete.	Rmt	1854.00	1854.00
27.00	Provide all materials labour T&P etc. complete and construct Pump house size (3.6x3.0x3.0)m Chlorinating room size (2.5x1.8x3.0)m as per departmental type design and drawing (drawing no-D-2) and as per the specifications for civil work given in the bid document including supply of all material labour and T&P etc complete as per instructions of Engineer -in - charge.	Job	600000.00	600000.00
28.00	Provide all materials labour T&P etc. complete and construct Pump house size (2.5x3.0x3.0)m Chlorinating room size (1.8x1.2x3.0)m as per departmental type design and drawing (drawing no-D-2) and as per the specifications for civil work given in the bid document including supply of all material labour and T&P etc complete as per instructions of Engineer -in - charge.	Job	492800.00	492800.00
29.00	Provide all materials labour T&P etc. complete and constructed Bye-pass chamber for pump house (1000 (L) x 1000 (W) x 1150 (H) mm) drawing (drawing no.D-3) and as per the specifications for civil work given in the bid document including supply of all material labour and T&P etc complete as per instructions of Engineer -in -charge.	No.	21500.00	21500.00

30.00	Supply of all materials labour T&P etc. for complete construction of R.C.C. Over Head Tank of following capacity and staging above ground level with main components including cost of soil testing and assuming bearing capacity of soil as 8 MT with supply of design and drawings.All the water retaining components of OHT shall be casted in M-30 concrete and minimum grade of concrete of foundation and staging should be M-25 with approved cement coarse sand and stone grit as per I.S. 11682 and I.S.456Seismic effects and wind load should be taken into consideration as per I.S. 1893 for earthquake resistance and I.S. 875 part-III for wind load on structure and including 1M wide RCC staircase 1 m wide R.C.C. M30 balcony M.S. ladder made of 50x50x6 mm angle section and 20mm plain M.S. bars with hand rails of 20mm medium class G.I. pipes One aluminum ladder inside the tank from top dome to bottom dome R.C.C. railing with 20mm dia medium class G.I.pipe (in 3 rows) on both sides of stair case supported on 50x50x6mm M.S. angle section spaced at intervals not more than 1.5m Proper ventilator at top dome in circular shape of 1.2 m dia Water level indicator fabricated with sensor connecting to automation Lightening conductor as per I.S.S.2309 or its latest amendments of latest electricity rules consisting of proper elevation rod with 5 or more fork points as prescribed in ISS 2309-1969 and ISS 3013-1966 C.I. manhole of min 60x60cm size with locking arrangement Supply fixing jointing of D.I.D/F Pipes of appropriate size with D.I.D/F specials conforming to IS 8329/2000 as vertical pipes for inlet outlet			
30.01	50 Kl 10 M Staging	Job	1751500.00	1751500.00
30.02	50 Kl 12 M Staging	Job	1861700.00	1861700.00
30.03	75 Kl 10 M Staging	Job	2257500.00	2257500.00
30.04	75 Kl 12 M Staging	Job	2354625.00	2354625.00
30.05	100 Kl 12 M Staging	Job	3029400.00	3029400.00
30.06	100 Kl 16 M Staging	Job	3216700.00	3216700.00
	125 Kl 12 M Staging	Job	3211150.00	3211150.00
30.07	150 Kl 12 M Staging	Job	3392900.00	3392900.00
30.08	150 Kl 16 M Staging	Job	3613200.00	3613200.00
30.09	175 Kl 12 M Staging	Job	3624300.00	3624300.00
30.10	175 Kl 16 M Staging	Job	3899700.00	3899700.00
30.11	200 Kl 12 M Staging	Job	3943700.00	3943700.00
30.12	200 Kl 16 M Staging	Job	4197100.00	4197100.00
30.13	200 Kl 18 M Staging	Job	4263200.00	4263200.00
30.14	225 Kl 12 M Staging	Job	4378500.00	4378500.00
30.15	250 Kl 12 M Staging	Job	4703800.00	4703800.00
30.16	300 Kl 12 M Staging	Job	5121375.00	5121375.00
30.17	300 Kl 16 M Staging	Job	5684300.00	5684300.00
30.18	350 Kl 14 M Staging	Job	6398437.50	6398437.50
30.19	400 Kl 14 M Staging	Job	6973100.00	6973100.00

	350 Kl 16 M Staging	Job	6474687.50	6474687.50
30.20	400 Kl 16 M Staging	Job	7215500.00	7215500.00
30.21	500 Kl 14 M Staging	Job	7590000.00	7590000.00
31.00	Excavation of earth in ordinary soil (loam clay or sand) for pipe line and rising main trenches including lift upto 1.50 m and lead upto 50 m and refilling watering ramming of the excavated earth into the trench and also disposal of surplus earth upto 50m from the center of the trenches including supply of all material labour T&P etc complete as per instructions of Engineer -in -charge.			
31.01	ordinary soil	Cum.	240.00	240.00
31.02	Mixed soil with Kankar	Cum.	280.00	280.00
31.03	Soft rock	Cum.	943.82	943.82
31.04	Hard rock	Cum.	1319.18	1319.18
32.00	Supply of following sizes (D.I.) pipes for rising main/distribution system conforming to latest/relevant I.S. 8329/2000 Specifications with all jointing materials such as specials conforming to latest /relevant I.S. specifications suitable for D.I pipes as per IS-1239 /2000 and IS 8329/2000 or their latest amendment including F.O.R. destination and all taxes and insurance etc. with loading unloading and Carting up to site of work also including specials for these pipes and lowering them into the trenches and laying true to alignment and gradient and jointing etc. complete (including testing of pipe lines and cutting of pipes for making up the length but excluding the cost of trenches) all complete as per instructions of Engineer -in - charge.			

32.01	300 mm dia K-9	Rmt	3958.00	3958.00
32.02	250 mm dia K-9	Rmt	3103.50	3103.50
32.03	200 mm dia K-9	Rmt	2332.32	2332.32
32.04	150 mm dia K-9	Rmt	1728.48	1728.48
32.05	125 mm dia K-9	Rmt	1430.32	1430.32
32.06	100 mm dia K-9	Rmt	1191.41	1191.41
32.07	80 mm dia K-9	Rmt	913.95	913.95
32.08	300 mm dia K-7	Rmt	3184.41	3184.41
32.09	250 mm dia K-7	Rmt	2590.53	2590.53
32.10	200 mm dia K-7	Rmt	1868.21	1868.21
32.11	150 mm dia K-7	Rmt	1512.51	1512.51
32.12	125 mm dia K-7	Rmt	1313.89	1313.89
32.13	100 mm dia K-7	Rmt	1017.12	1017.12
32.14	80 mm dia K-7	Rmt	915.56	915.56
33.00	Supply of following sizes pipes for distribution system conforming to latest/ relevant I.S. 4984/1995 Specifications with all jointing materials and specials conforming to latest /relevant I.S. specifications including F.O.R. destination and all taxes and insurance etc. with loading unloading and Carting up to site of work also including specials for these pipes and lowering them into the trenches and laying true to alignment and gradient and jointing etc. complete (including testing of pipe lines and cutting of pipes for making up the length but excluding the cost of trenches) all complete as per instructions of Engineer -in - charge.			
33.01	63 mm dia HDPE Pipe PN-6: Class PE-100	Rmt	146.00	146.00
33.02	75 mm dia HDPE Pipe PN-6: Class PE-100	Rmt	190.00	190.00
33.03	90 mm dia HDPE Pipe PN-6: Class PE-100	Rmt	254.00	254.00
33.04	110 mm dia HDPE Pipe PN-6: Class PE-100	Rmt	369.00	369.00
33.05	125 mm dia HDPE Pipe PN-6: Class PE-100	Rmt	471.00	471.00
33.06	140 mm dia HDPE Pipe PN-6: Class PE-100	Rmt	595.00	595.00
33.07	160 mm dia HDPE Pipe PN-6: Class PE-100	Rmt	753.00	753.00
33.08	180 mm dia HDPE Pipe PN-6: Class PE-100	Rmt	929.00	929.00
33.09	200 mm dia HDPE Pipe PN-6: Class PE-100	Rmt	1139.00	1139.00
34.00	Supply and carting up to site of work of the following dia DI butterfly /sluice valves class I working pressure 10 Kg/cm2 confirming to IS: 780/1969 or its latest amendments including valve fittings & Dismantling Joints as per requirement F.O.R. destination and lowering them into the already prepared trenches fixing in position and jointing them with pipelines and testing etc. complete and also including supply of jointing materials etc. complete ,including all taxes and insurance as per instructions of Engineer -in -charge.			
34.01	Sluice valve - 300 mm dia	Nos.	64042.00	64042.00
34.02	Sluice valve - 250 mm dia	Nos.	48109.00	48109.00
34.03	Sluice valve - 200 mm dia	Nos.	29250.00	29250.00
34.04	Sluice valve - 150 mm dia	Nos.	19500.00	19500.00
34.05	Sluice valve - 125 mm dia	Nos.	16900.00	16900.00
34.06	Sluice valve - 100 mm dia	Nos.	14300.00	14300.00
34.07	Sluice valve - 80 mm dia	Nos.	11700.00	11700.00
34.08	Scour valve - 80 mm dia	Nos.	11700.00	11700.00
34.09	Scour valve - 100 mm dia	Nos.	14300.00	14300.00
34.10	Scour valve - 150 mm dia	Nos.	19500.00	19500.00
34.11	Scour valve - 200 mm dia	Nos.	29250.00	29250.00
34.12	Scour valve - 250 mm dia	Nos.	48109.48	48109.48
35.00	**Pressure release valve**			
35.01	PRV 80 mm dia	Nos.	54219.00	54219.00
35.02	PRV 100 mm dia	Nos.	80025.00	80025.00
35.03	PRV 150 mm dia	Nos.	124575.00	124575.00
36.00	Supply and installation testing etc. of single/double ball type air valve conforming to latest/relevent I.S. specifications including all taxes and insurance carting up to site of work and lowering them into the trenches fixing in position and jointing them with pipelines and testing etc. complete (including supply of jointing materials and Valve fittings etc complete) as per instructions of Engineer.			

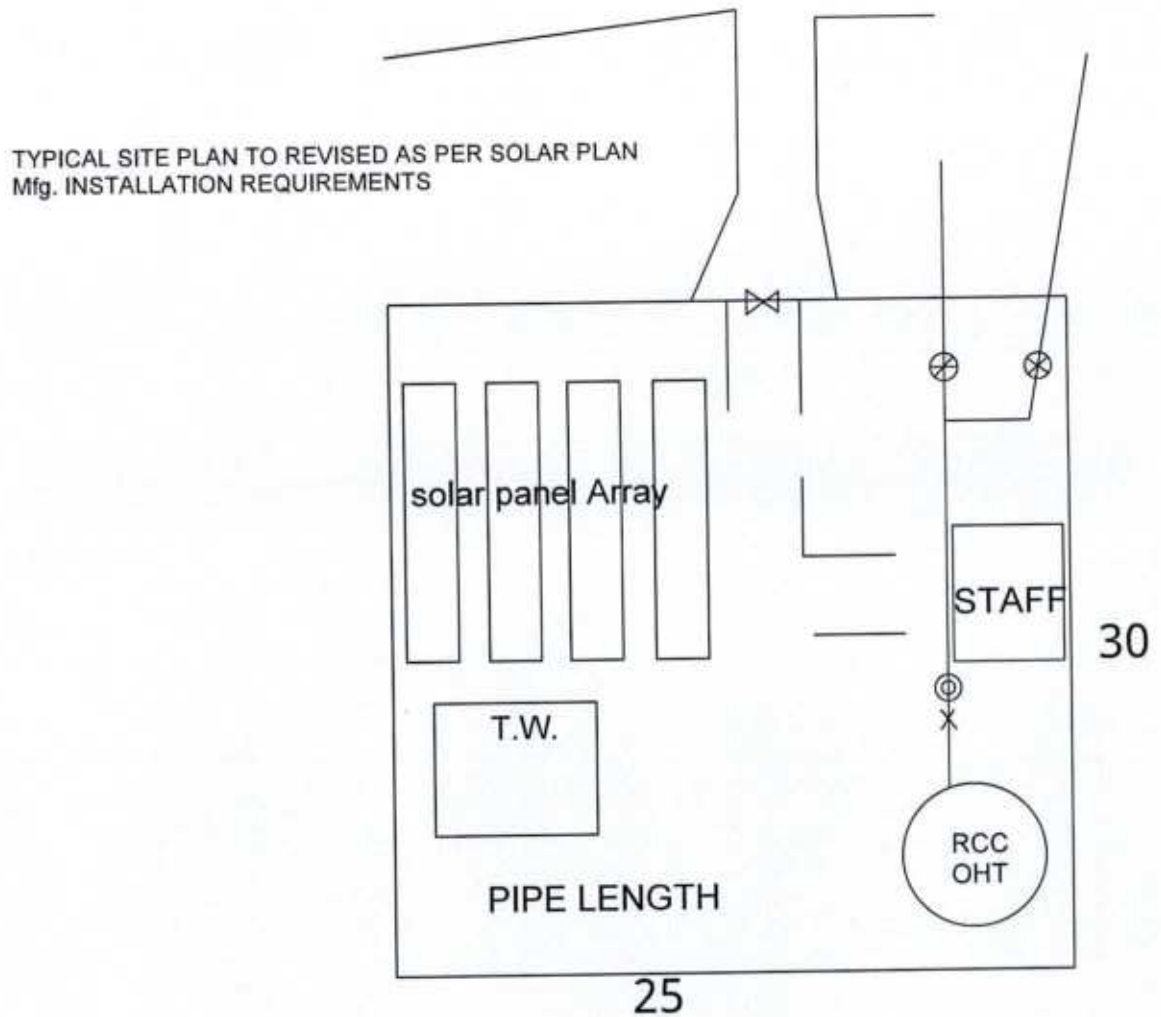
36.01	20 mm	Nos.	10229.21	10229.21
36.02	50 mm	Nos.	23170.33	23170.33
36.03	80 mm	Nos.	23170.33	23170.33
36.04	150 mm	Nos.	41024.88	41024.88
37.00	Supply of under ground sluice value type fire hydrant consisting of 80 mm dia sluice valve 80mm dia tail pieces 80mm dia duck foot bend and 80 mm dia standard makes iron coupling with cap and etc. complete conforming to latest/relevent I.S.specifications including all taxes and insurance up to site of work and lowering them into the trenches fixing in position and jointing them with pipelines and testing etc. complete (including supply of jointing materials and Valve fittings etc. complete as per instructions of Engineer -in - charge.	Nos.	24500.00	24500.00
38.00	Construction of following type chambers as per department type design and drawing including Heavy duty M.S. Manhole Cover and all materials labour T&P etc complete for proper completion of work as per instructions of Engineer -in -charge.			
38.01	Sluice valve chamber (masonry Type)			
	dia upto 200 mm - 1000 (L) x 1200 (W) x 1300 (H) mm	No.	26500.00	26500.00
38.02	Sluice valve chamber (surface box Type)	No.	5000.00	5000.00
38.03	Fire Hydrant chamber (750 (L) X 450 (W) X 1000 (H) mm)	No.	19000.00	19000.00
38.04	Air Valve Chamber			
	350 (L) x 350 (W) x 500 (H) mm	No.	9500.00	9500.00
38.05	Scour Valve Chamber			
	dia upto 200 mm - 1000 (L) x 1200 (W) x 1300 (H) mm	No.	30475.00	30475.00
38.06	PRV Valve Chamber - 1000 (L) x 1200 (W) x 1300 (H) mm	No.	29150.00	29150.00
39.00	Design and construct Thrust Block made in R.C.C. with cement coarse sand & 20 mm gauge stone ballast in proportion of 1:1.5:3 for pipe line including supply of MS reinforcement wrought to required shape as necessary its bending fixing & binding the same with 0.50 mm thick binding wire in position & necessary centering & shuttering including curing and supply of all materials labour T & P etc. required for proper completion of the work and as per specifications for RCC work as per instructions of Engineer -in -charge.			
39.01	Design and construct Thrust Block made in Reinforced Cement concrete (1:1.5:3) with graded stone chips (20 mm nominal size) excluding shuttering and reinforcement as per technical requirements.	Cum.	12000.00	12000.00
39.02	Providing reinforcement of Thrust block for reinforced concrete work including distribution bars stirrups binders etc. initial straightening and removal of loose rust (if necessary) cutting to requisite length hooking and bending to correct shape placing in proper position and binding with wire at every inter-section complete as per drawing and direction.	KG	112.00	112.00
40.00	Provide all materials labour T&P etc. and construct single room staff quarter / office room at water works site identified by the Engineer-in-charge as per department type design and drawing and specifications of civil works laid down in the bid document including all material labour T&P etc complete for proper completion of work as per instructions of Engineer -in -charge. (Drawing No.D-7)	No	958000.00	958000.00
41.00	Water recharge Mechanism within the water works campus	Job	126362.00	126362.00
42.00	**Asset Replacement items**			
	SITC of Energy efficiant AC Submmercible Pumping plant including Soft Starter with submersible flat cable of suitable length , main Piping & Valves with 8 Nos Column Pipes , Distance piece for Rising Main and Bypas side,NRV cum Pump and Column Pipe Jointer, Power wiring, Chemical earthing ,Painting, wiring of pump house (internal & External) and Installation Job of Pumping Plant complete in all respect with all required material, T&P labour etc for following duties in Grid Powered			
	7.5HP (80 mm Dia size Main piping And valves)	Nos.	280038	280038.00
	5HP (80 mm Dia size Main piping And valves)	Nos.	241725	241725.00
	10HP (100 mm Dia size Main piping And valves)	Nos.	319795	319795.00

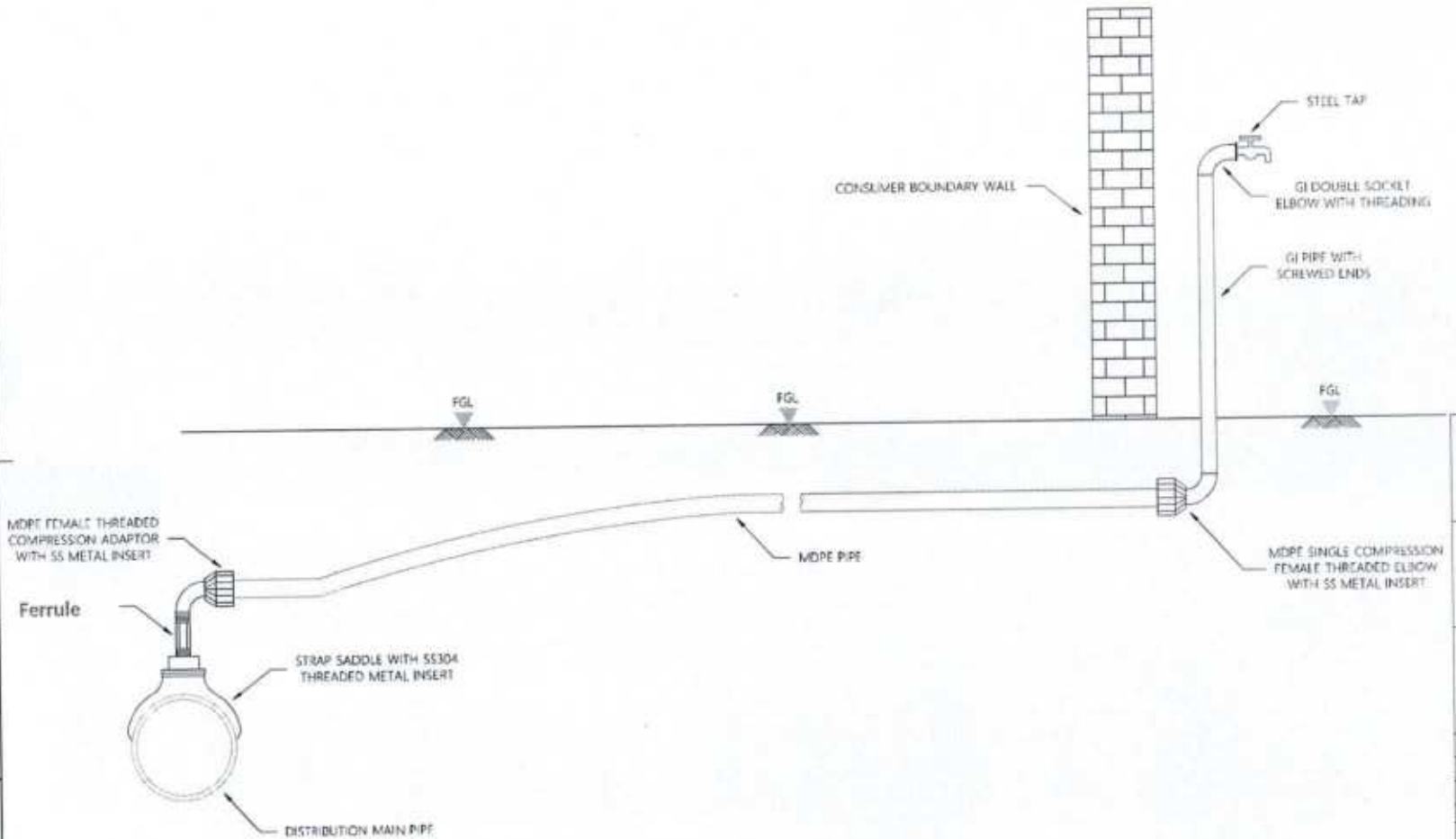
	12.5HP (100 mm Dia size Main piping And valves)	Nos.	334745	334745.00
	15HP (150 mm Dia size Main piping And valves)	Nos.	368995	368995.00
	17.5HP (150 mm Dia size Main piping And valves)	Nos.	370670	370670.00
	20HP (150 mm Dia size Main piping And valves)	Nos.	392633	392633.00
	25HP (150 mm Dia size Main piping And valves)	Nos.	433990	433990.00
	30HP (150 mm Dia size Main piping And valves)	Nos.	465860	465860.00
	Pressure Transmitter	Nos.	45000	45000.00
	Electrically operated D.I. Sluice Valve Metal seated PN 1.0 dia 80 mm	Nos.	138000	138000.00
	Electrically operated D.I. Sluice Valve Metal seated PN 1.0 dia 100 mm	Nos.	143750	143750.00
	Electrically operated D.I. Sluice Valve Metal seated PN 1.0 dia 150 mm	Nos.	150000	150000.00
	Electrically operated D.I. Sluice Valve Metal seated PN 1.0 dia 200 mm	Nos.	172500	172500.00
42.00	**3Mtr. Long Column Pipe as per IS 1239 with Necessary packings and nut & Bolts etc.**			
42.01	80 mm Dia size - MS pipe	nos	4500.00	4500.00
42.02	100 mm Dia size - MS pipe	nos	5150.00	5150.00
42.03	150 mm Dia size - MS pipe	nos	7151.10	7151.10
43.00	Installation of suitable capacity simple T.W. automation system to control operation of the pumping plant with respect to high/low water level in OHT and regulate Pressure with RTU panel , 7" HMI screen ,UPS with battery and stand for minimum 2 Hour backup , Protection device for phase Reversal for Grid powered Applications , surge device including enrgy meter inside the pump house with arrangement for communication of data with GSM and GPRS system to show required parameters including all accessories etc. complete in all respect as per instructions of Engineer -in –charge.	Job	375000.00	375000.00
44.00	Dismantling and Reinstatement of the following type of road surface with old and new materials including supply of all materials labour T&P etc. required for proper completion of the work as per instructions of Engineer -in -charge.			
44.01	B.O.E. surface (50% of existing bricks to be reused)	sqm	450.00	450.00
44.02	Bituminous surface	sqm	1989.54	1989.54
44.03	Interlocking Road	sqm	1293.00	1293.00
44.04	C.C. Road	sqm	1721.40	1721.40
45.00	Provision for following types of Culvert crossing along the alignment of pipe line complete as per instructions of Engineer -in -charge. (casing of pipe is done by concreting)			
45.01	Nala/Culvert Crossing (width -3.5 m) upto Dia 300 mm	Nos	21500.00	21500.00
46.00	**Trenchless crossings**			
	Survey site Investigation Planning design Drawings as per State Road manual and vetting / checked from State Road Divisional Office and taking NOC for trenchless crossing of National highway road and Railway track(crossing length 15m to 25m) Road for of required dia Rising main pipe with casing pipe as required for proper completion of work required size of MS casing pipe as per drawing and as per (IS:3589 & made from confining to IS:2062) with 750 Micron PU coating internally and 250 micron anti corrosive bituminous paint externally by trenchless technology method at an average depth 3.60 mtr from normal ground level up to top of casing pipe including excavation & filling of Pit Dewatering arrangement Supporting system for soil also including supply and fixing of 2 no Sluice valve ISI Mark construction of sluice valve chamber etc. all complete work including supply & fixing specials in carrier pipe over main pipe as per specification given in the bid documents including supply of all materials labour T&P etc. for proper completion of work as per instruction of Engineer.			
46.01	Railway Line crossing (Upto Dia 350 mm)	m	60000.00	60000.00
46.02	National Highway road crossing (Upto Dia 350 mm)	m	40000.00	40000.00

46.03	State Highway road crossing (Upto Dia 350 mm)	m	27000.00	27000.00
47.00	Road Crossing - Excavation in foundation of trench of proper size in soil mixed with moorum, Shingle, Kankar, soft rock, hard rock, including refilling, dressing and ramming earth or sand or bajri, ballast, including providing, supply, carting, lowering, laying and jointing of casing pipe of RCC NP-3 with appropriate size, with rubber ring joint, sand filling in gap inside RCC pipe, insertion of distribution pipe into the encasing pipe including supply of T&P, including concrete of 150 mm thick in with 40mm gauge brick ballast local sand and cement in proportion of 8:4:1, provision for barricading, labour for traffic diversion etc. Complete for proper completion of work as per instruction of Engineer.			
47.01	50 mm dia. Pipe	Rmt	1610.00	1610.00
47.02	100 mm dia. Pipe	Rmt	1955.00	1955.00
47.03	150 mm dia. Pipe	Rmt	2300.00	2300.00
47.04	200 mm dia. Pipe	Rmt	2760.00	2760.00
47.05	250 mm dia. Pipe	Rmt	4000.00	4000.00
47.06	300 mm dia. Pipe	Rmt	4500.00	4500.00
47.07	350 mm dia. Pipe	Rmt	5000.00	5000.00
47.08	400 mm dia. Pipe	Rmt	5405.00	5405.00
47.09	450 mm dia. Pipe	Rmt	6000.00	6000.00
47.10	500 mm dia. Pipe	Rmt	6500.00	6500.00
47.11	600 mm dia. Pipe	Rmt	7600.00	7600.00
48.00	Making house connection should be done atleast 2 m inside the boundary wall with provision of tap from distribution line to outer wall of house with supply of 1 m above GL G.I. pipe (15 mm) (above ground) & average 5 mtr. MDPE Pipe (20 mm) (below ground) including specials saddle Tapetc. of suitable size T&P etc. including excavation laying and jointing for proper completion of work as per instructions of Engineer as per Dwg 12 (excluding road restoration)	Nos.	3700.00	3700.00
49.00	Construction of single tap pillar type stand post as per type design	Nos.	10000.00	10000.00
50.00	Operation and Maintenance for 10 years of water supply schemes after completion including staff required for operation and maintenance chemicals all materails specials T & P for operation and maintenance excluding electricity charges.	%	2% of capex Cost for first year of O&M	
51.00	**CE/UL Certified Electromagnetic flow meters**			
51.01	80mm	Nos.	100000.00	100000.00
51.02	100mm	Nos.	125000.00	125000.00
51.03	150mm	Nos.	150000.00	150000.00
51.04	200mm	Nos.	190000.00	190000.00
51.05	250mm	Nos.	225000.00	225000.00
51.06	300mm	Nos.	260000.00	260000.00
51.07	350mm	Nos.	330000.00	330000.00
51.08	400mm	Nos.	420000.00	420000.00
51.09	450mm	Nos.	500000.00	500000.00
51.10	500mm	Nos.	550000.00	550000.00
52.00	Radar type Level transmitter	Nos.	120000.00	120000.00
53.00	complete cabling for tubewell inlcuding all power and controlcables of all equipments at pumphouse and OHT	Nos.	60000.00	60000.00
54.00	Master control system with PLC and Unlimited SCADA software , Large Video screen ,12" HMI High Resolution , Redundent CPU Kit with memory Card ,Ethernet Module for communication ,GPRS Gateway for Data collect, Redundent power supply for PLC System , 3 KVA UPS , GSM/GPRS modem necessray firewall and protection devices, ethernet switch ,CCTV system with network video recorder,Surge Protection devices , Laptop for Engineering work station and Operating work station including 2 ton AC for control room and Necessary furniture for MCS Room etc.	Nos.	2674000.00	2674000.00
	7.5 KVA	Nos.	240000	240000.00
	10 KVA	Nos.	260000	260000.00

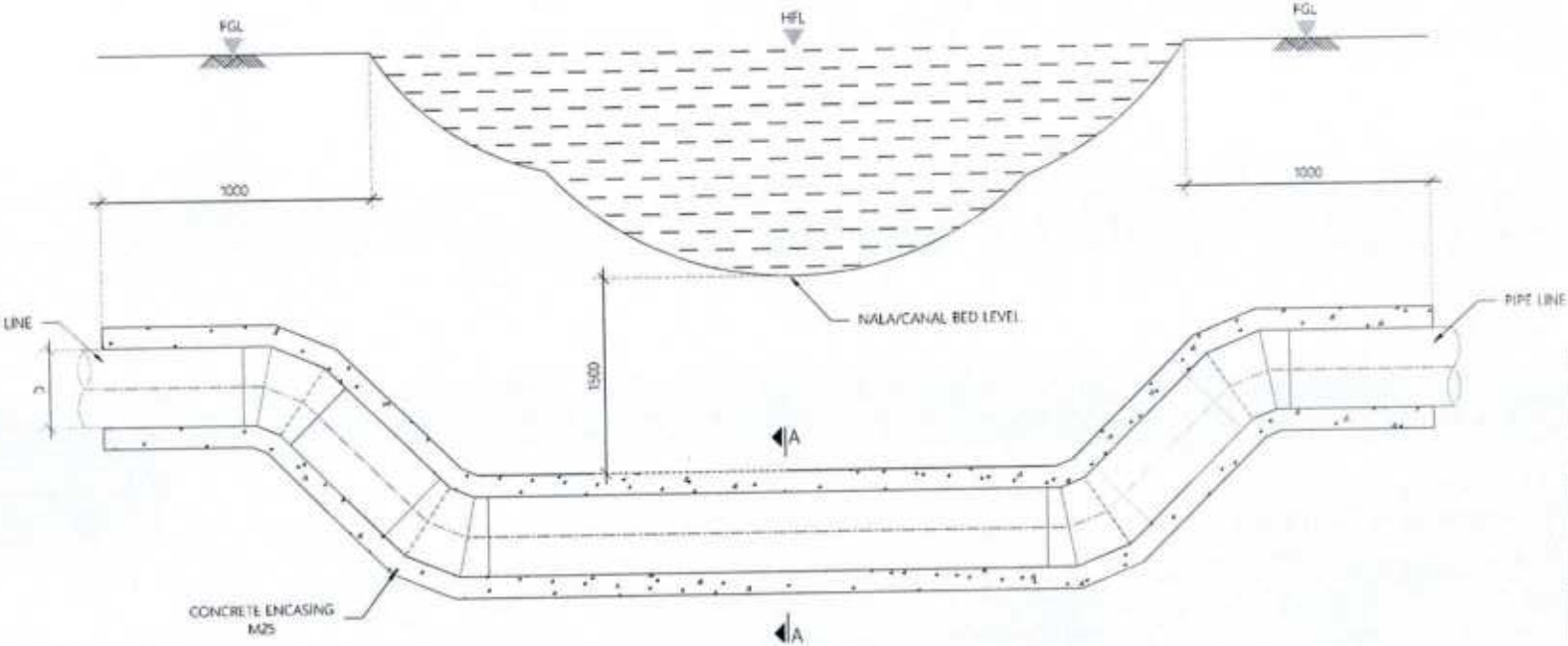
	15 KVA	Nos.	306000	306000.00
	20 KVA	Nos.	370000	370000.00
	25 KVA	Nos.	389000	389000.00
	30 KVA	Nos.	405000	405000.00
	40 KVA	Nos.	483000	483000.00
	45 KVA	Nos.	495000	495000.00
	50 KVA	Nos.	555000	555000.00
	62.5 KVA	Nos.	569000	569000.00
	Additional items			0.00
55.00	DG Set			0.00
	7.5 KVA	Nos.	240000	240000.00
	10 KVA	Nos.	260000	260000.00
	15 KVA	Nos.	306000	306000.00
	20 KVA	Nos.	370000	370000.00
	25 KVA	Nos.	389000	389000.00
	30 KVA	Nos.	405000	405000.00
	40 KVA	Nos.	483000	483000.00
	45 KVA	Nos.	495000	495000.00
	50 KVA	Nos.	555000	555000.00
	62.5 KVA	Nos.	569000	569000.00
56	Check Valve / Non Return Valve 150 mm	Nos.	54219	54219.00
57	Chain Pulley Block - 1 Tonne	Nos.	18600	18600.00
	Chain Pulley Block - 2 Tonne	Nos.	26740	26740.00
58	Bulk Flow meter 100 -150 mm	Nos.	50000	50000.00
59	LED Street Lights	Nos.	15500	15500

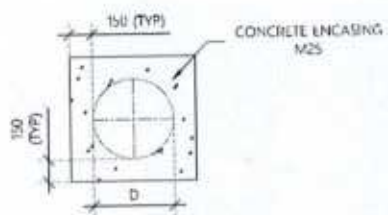
TYPICAL SITE PLAN OF PROPOSED WATER WORK





LEGENDS	
MIN	MINIMUM
SS	STAINLESS STEEL
GI	GALVANISED IRON
FGL	FINISHED GROUND LEVEL
MDPE	MEDIUM DENSITY POLYETHYLENE

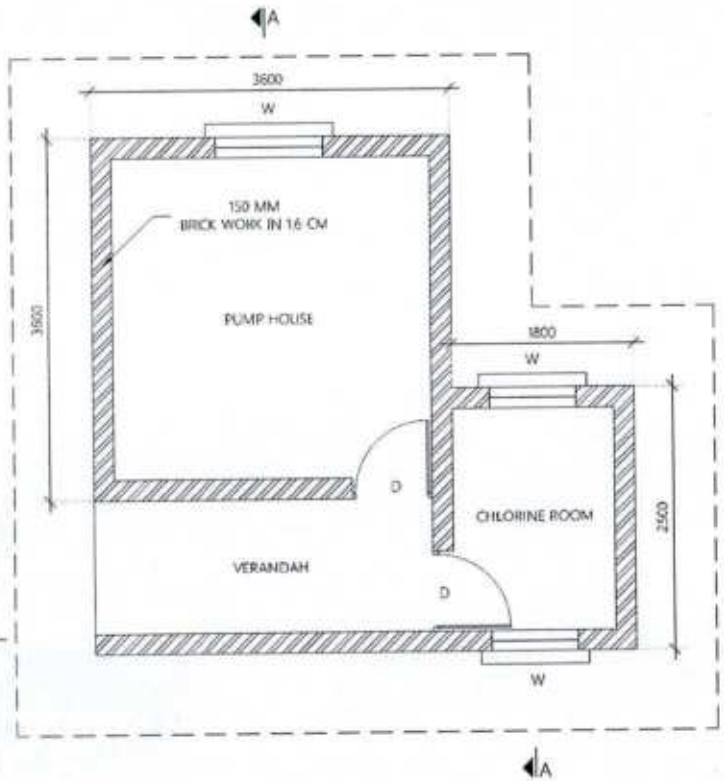




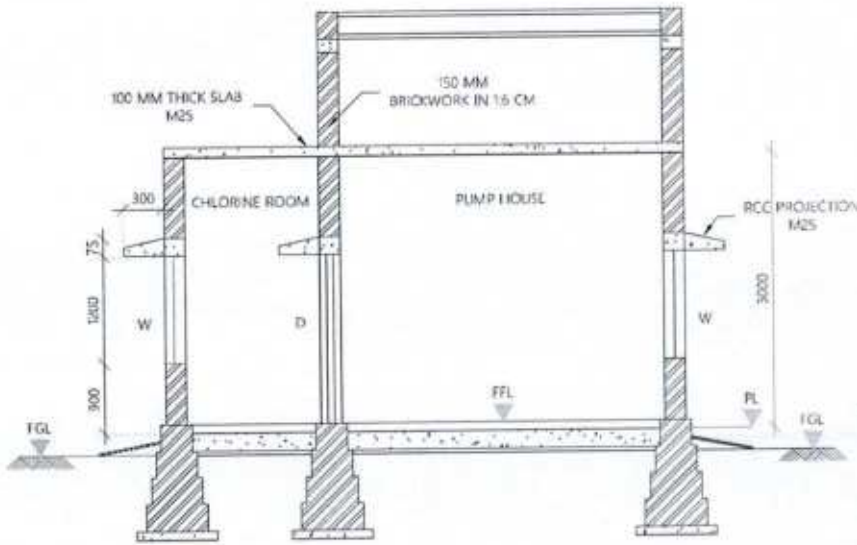
SECTION A-A

LEGENDS	
D	DIAMETER
FGL	FINISHED GROUND LEVEL
HFL	HIGH FLOOD LEVEL

STATE WATER SANITATION MISSION
JAL JEEVAN MISSION PHASE - I



PLAN

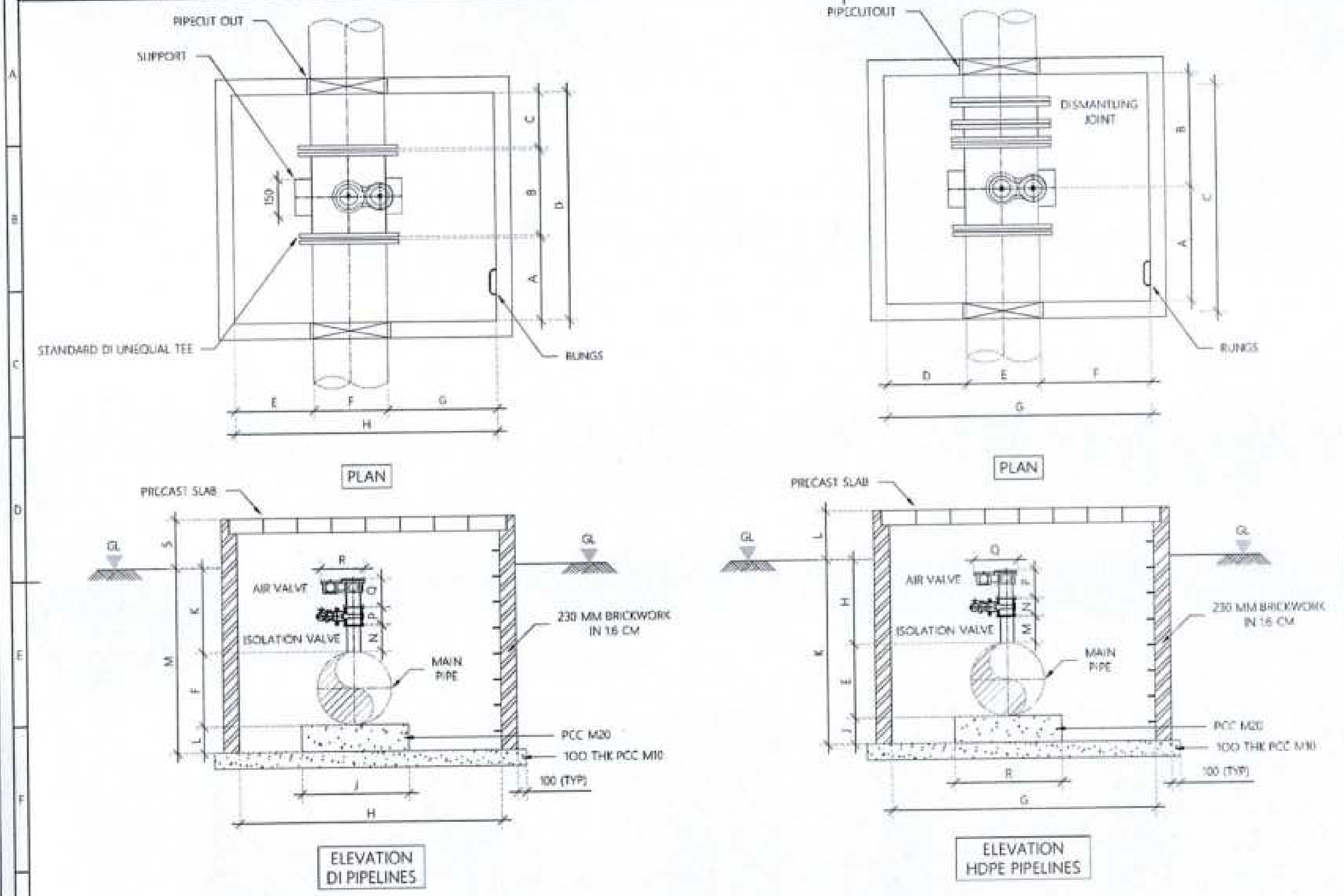


SECTION A-A

LEGENDS	
FFL	FINISHED FLOOR LEVEL
FGL	FINISHED GROUND LEVEL
D	DOOR
W	WINDOW
PL	PLINTH LEVEL

SCHEDULE OF DOOR & WINDOW			
TYPE	WIDTH	HEIGHT	DESCRIPTION
D	900	2000	SINGLE SHUTTER
W	900	1200	SINGLE SHUTTER

STATE WATER SANITATION MISSION
JAL JEEVAN MISSION PHASE 2



HDPE PIPELINES

MAIN PIPE SIZE	MAIN PIPE OD	BRANCH PIPE SIZE & AIR VALVE SIZE	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R
63	63	40	450	450	900	419	63	420	900	1000	127	1200	300	300	178	200	324	125
75	75	50	450	450	900	413	75	452	900	1000	125	1200	300	300	178	200	352	125
90	90	90	450	450	900	405	90	406	900	1000	110	1200	300	300	178	165	352	150

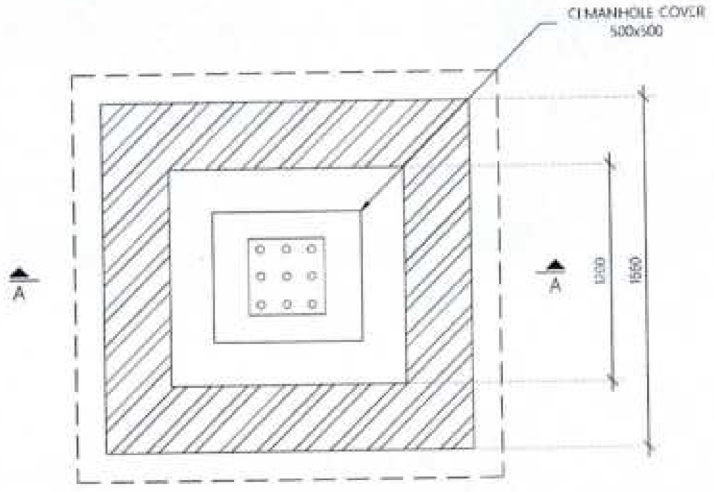
DI PIPELINES

MAIN PIPE SIZE	MAIN PIPE OD	BRANCH PIPE SIZE & AIR VALVE SIZE	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S
100	118	50	250	380	284	900	391	118	391	900	150	1000	282	1400	175	178	260	352	300
125	141.3	50	250	380	284	900	391	141	391	900	150	1000	259	1400	175	178	260	352	300
150	170	50	250	440	304	1000	365	170	365	900	200	1000	260	1450	205	178	260	352	300
200	222	50	250	520	274	1050	339	222	339	900	250	1000	278	1500	235	178	260	352	300
250	274	80	250	700	291	1250	313	274	313	900	300	1000	326	1600	265	203	305	373	300
300	326	80	250	800	294	1350	267	326	307	900	350	1000	234	1600	290	203	305	373	300
350	378	80	250	850	294	1400	352	378	370	1100	400	1000	322	1700	325	203	305	373	300
400	429	100	250	900	294	1450	330	429	341	1100	450	1000	321	1750	305	229	360	424	400

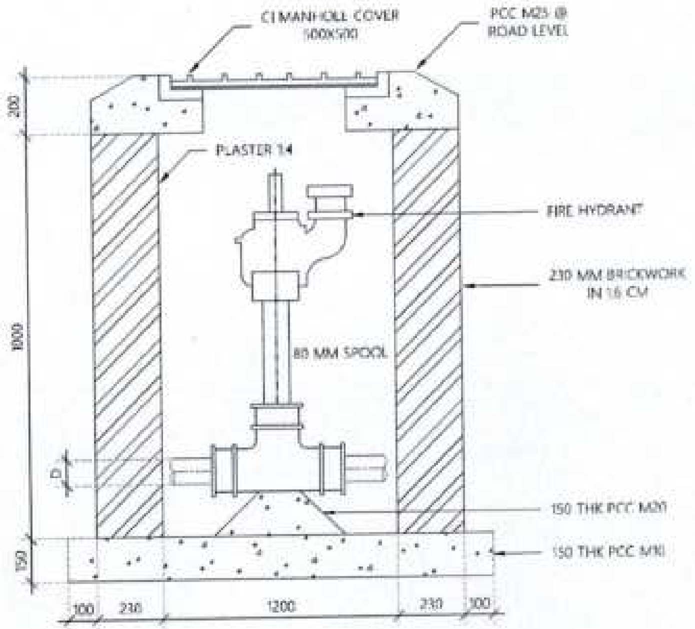
STATE WATER SANITATION MISSION
NAMAMI GANGE & RURAL WATER SUPPLY DEPARTMENT
GOVERNMENT OF UTTAR PRADESH

PROJECT: JAL JEEVAN MISSION PHASE 2

TITLE: GENERAL ARRANGEMENT DRAWING FOR AIR VALVE CHAMBER



PLAN

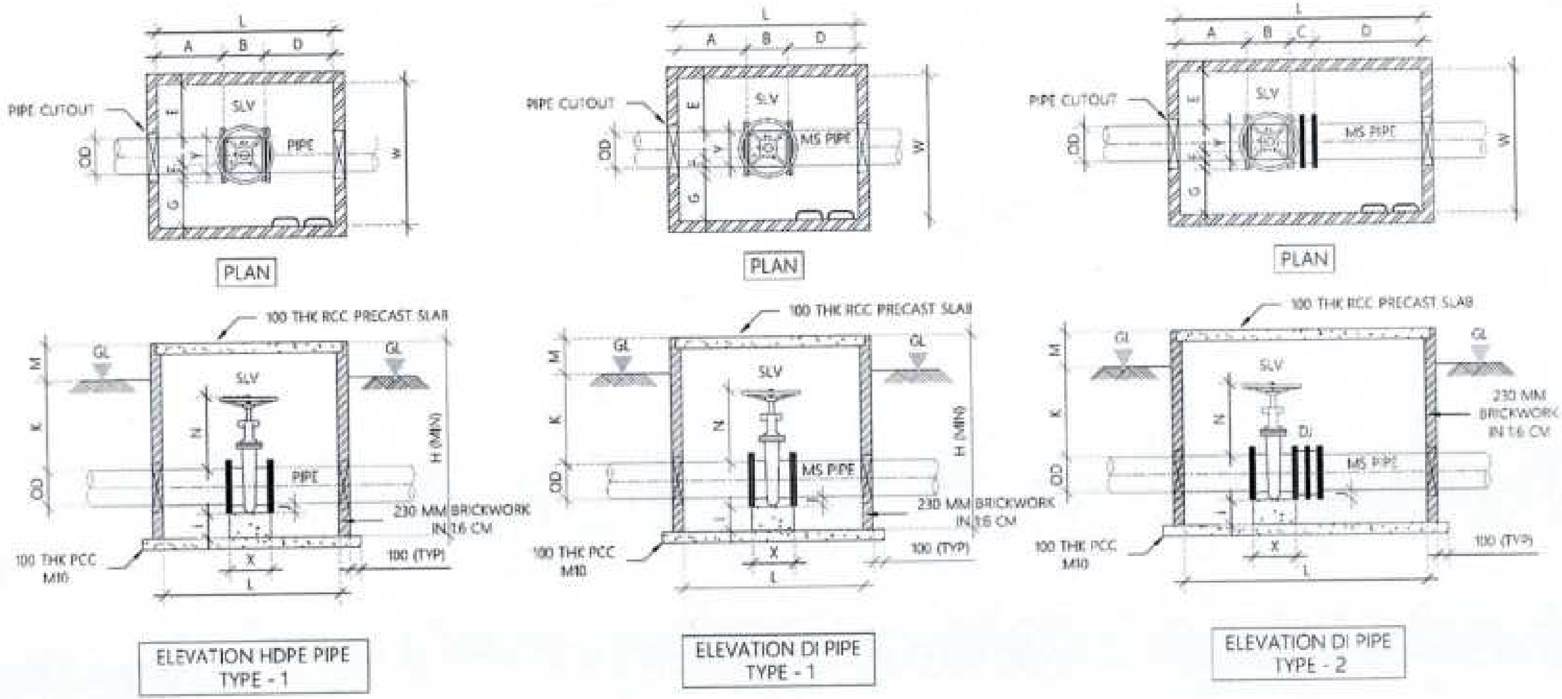


SECTION

STATE WATER SANITATION MISSION
NAMAMI GANGE & RURAL WATER SUPPLY DEPARTMENT
GOVERNMENT OF UTTAR PRADESH

JAL JEEVAN MISSION

GENERAL ARRANGEMENT DRAWING FOR FIRE HYDRANT CHAMBER



SLUICE VALVE CHAMBER DETAILS (HDPE PIPELINES)

SR. NO.	PIPE DIA (MM)	VALVE TYPE	VALVE DIA (MM)	A	GASKET	B	C	D	E	F	G	I	J	OD	K	M	N	X	Y	L	W	H	TYPE
1	63	SLUICE VALVE	50	300	6	178	0	366	350	165	385	300	51	63	786	150	365	200	100	850	900	1350	1
2	75	SLUICE VALVE	65	300	6	190	0	354	350	185	365	299	55	75	771	150	380	200	100	850	900	1350	1
3	90	SLUICE VALVE	80	300	6	201	0	341	350	200	350	300	55	90	755	150	425	200	100	850	900	1350	1

SLUICE VALVE CHAMBER DETAILS (DI PIPELINES)

SR. NO.	PIPE DIA (MM)	VALVE TYPE	VALVE DIA (MM)	A	GASKET	B	C	D	E	F	G	I	J	OD	K	M	N	X	Y	L	W	H	TYPE
1	400	SLUICE VALVE	400	300	9	406	300	325	350	561	385	300	68	429	1069	150	1110	400	400	450	1300	1950	2
2	350	SLUICE VALVE	350	300	9	381	250	380	350	505	445	300	64	378	1058	150	1020	400	350	1400	1300	1950	2
3	300	SLUICE VALVE	300	300	9	356	350	335	350	445	355	300	60	326	1014	150	910	350	300	1350	1150	1850	2
4	250	SLUICE VALVE	250	300	6	333	300	311	350	395	355	300	61	274	765	150	835	300	250	950	1100	1550	1
5	200	SLUICE VALVE	200	300	6	292	0	302	300	340	360	300	59	222	769	150	725	300	200	900	1000	1500	1
6	150	SLUICE VALVE	150	300	6	267	0	327	350	285	365	300	58	170	822	150	595	250	150	900	1000	1500	1
7	125	SLUICE VALVE	125	300	6	254	0	340	350	250	350	300	53	144	753	150	485	250	125	900	950	1400	1
8	100	SLUICE VALVE	100	300	6	229	0	365	350	220	380	300	51	118	781	150	470	200	100	900	950	1400	1

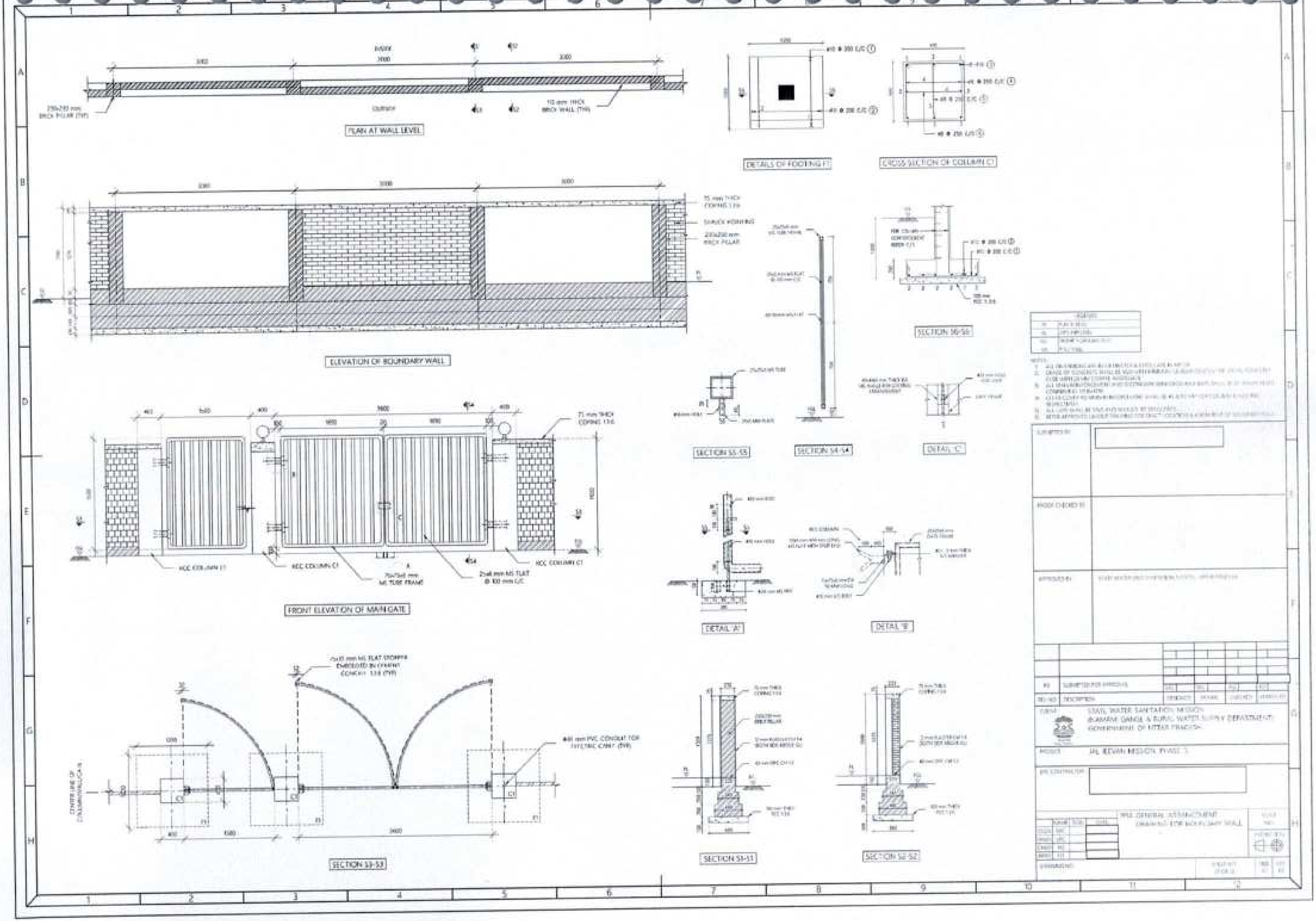
LEGENDS

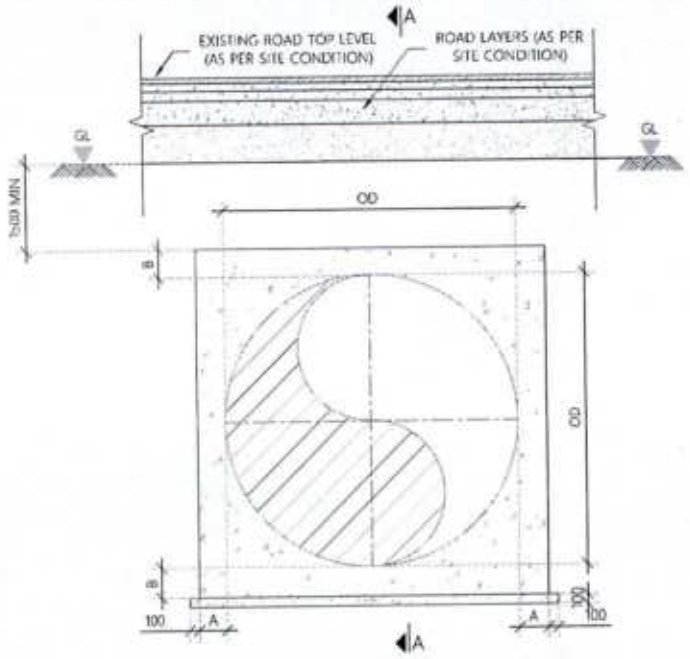
SV	SLUICE VALVE
GL	GROUND LEVEL
DI	DISMANTLING JOINT

STATE WATER SANITATION MISSION
(NAMAMI GANGE & RURAL WATER SUPPLY DEPARTMENT)
GOVERNMENT OF UTTAR PRADESH

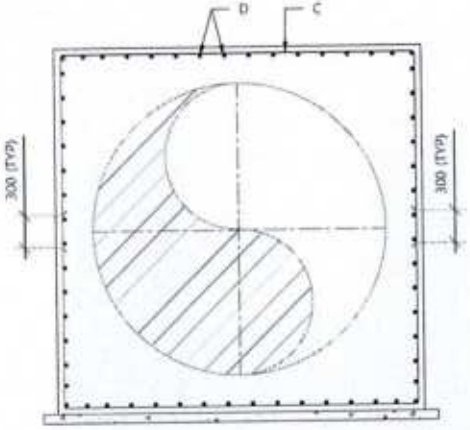
PROJECT: JAL JEEVAN MISSION PHASES

TITLE: GENERAL ARRANGEMENT DRAWING FOR SLUICE VALVE CHAMBER

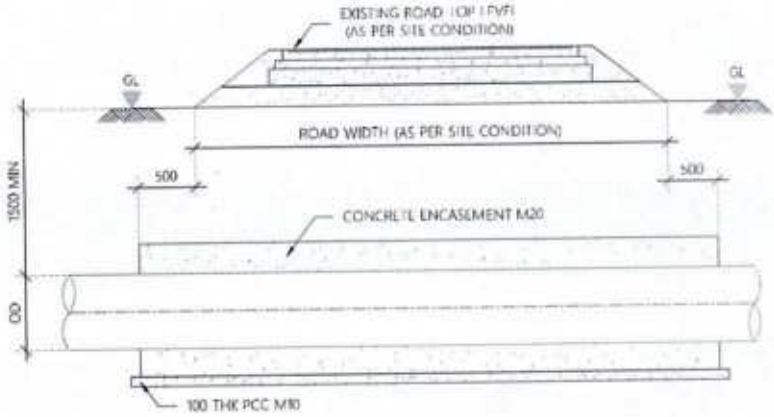

PLAN AT WALL LEVEL
230x230 mm BRICK PILLAR (TYP)
110 mm THICK BRICK WALL (TYP)
DETAILS OF FOOTING F1
CROSS SECTION OF COLUMN C1
ELEVATION OF BOUNDARY WALL
75 mm THICK COPING 1:1:6
SHAVEX POINTING
230x230 mm BRICK PILLAR
SECTION S6-S6
FRONT ELEVATION OF MAIN GATE
71 mm THICK COPING 1:1:6
RCC COLUMN C1
75x75x6 mm MS TUBE FRAME
25x6 mm MS FLAT @ 100 mm C/C
SECTION S5-S5
SECTION S4-S4
DETAIL 'C'
DETAIL 'A'
DETAIL 'B'
SECTION S3-S3
50x10 mm MS FLAT STOPPER EMBEDDED IN CEMENT CONCRETE 1:3:6 (TYP)
Φ40 mm PVC CONDUIT FOR ELECTRIC CABLE (TYP)
SECTION S1-S1
SECTION S2-S2
SUBMITTED FOR APPROVAL
DESCRIPTION
STATE WATER SANITATION MISSION
NAMAMI GANGE & RURAL WATER SUPPLY DEPARTMENT
GOVERNMENT OF UTTAR PRADESH
JAL JEEVAN MISSION PHASE 3
GENERAL ARRANGEMENT DRAWING FOR BOUNDARY WALL



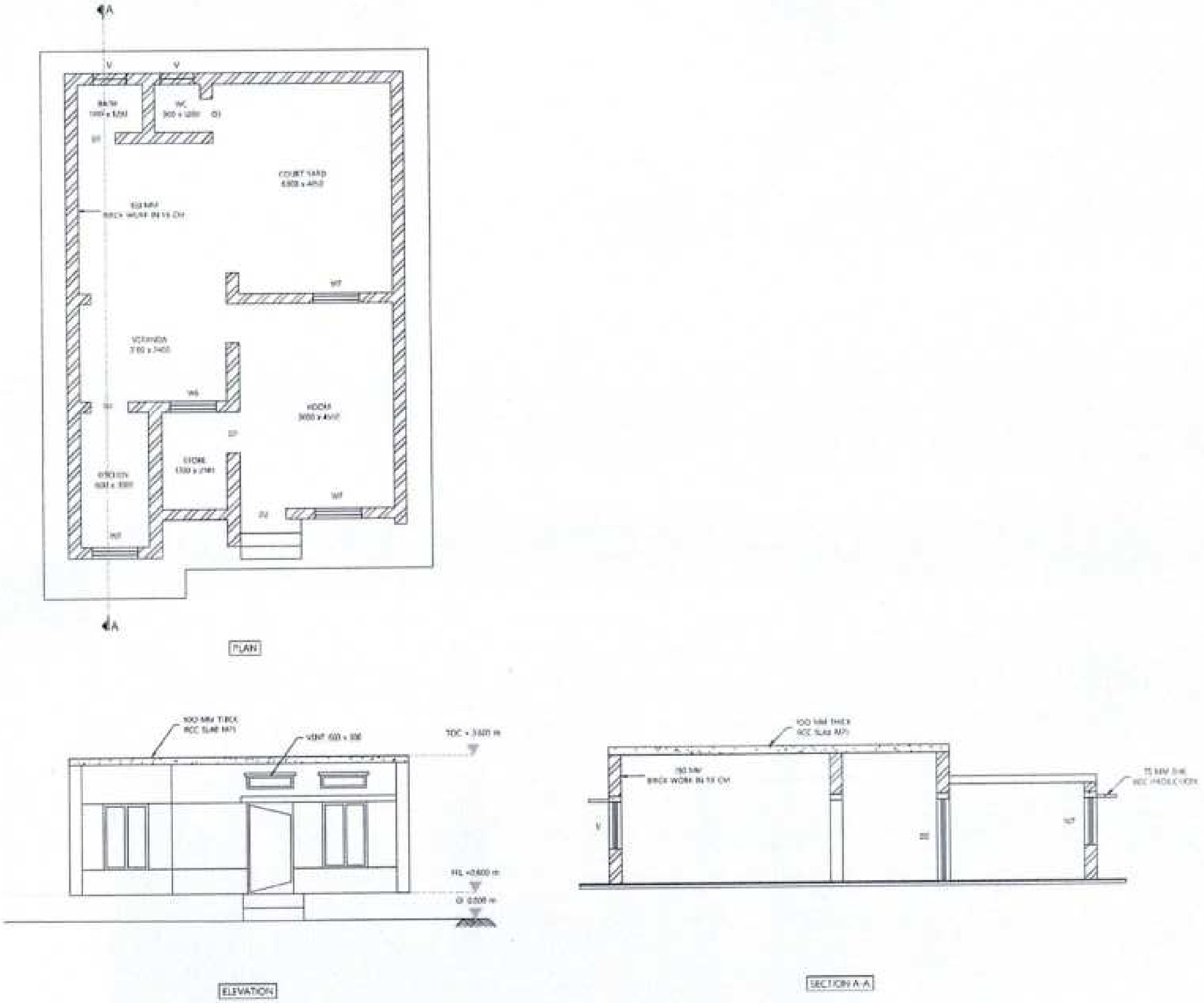
PIPE ENCASEMENT AT ROAD CROSSING (NUMERATION DETAIL)



PIPE ENCASEMENT AT ROAD CROSSING (RC DETAIL)



SECTION A-A

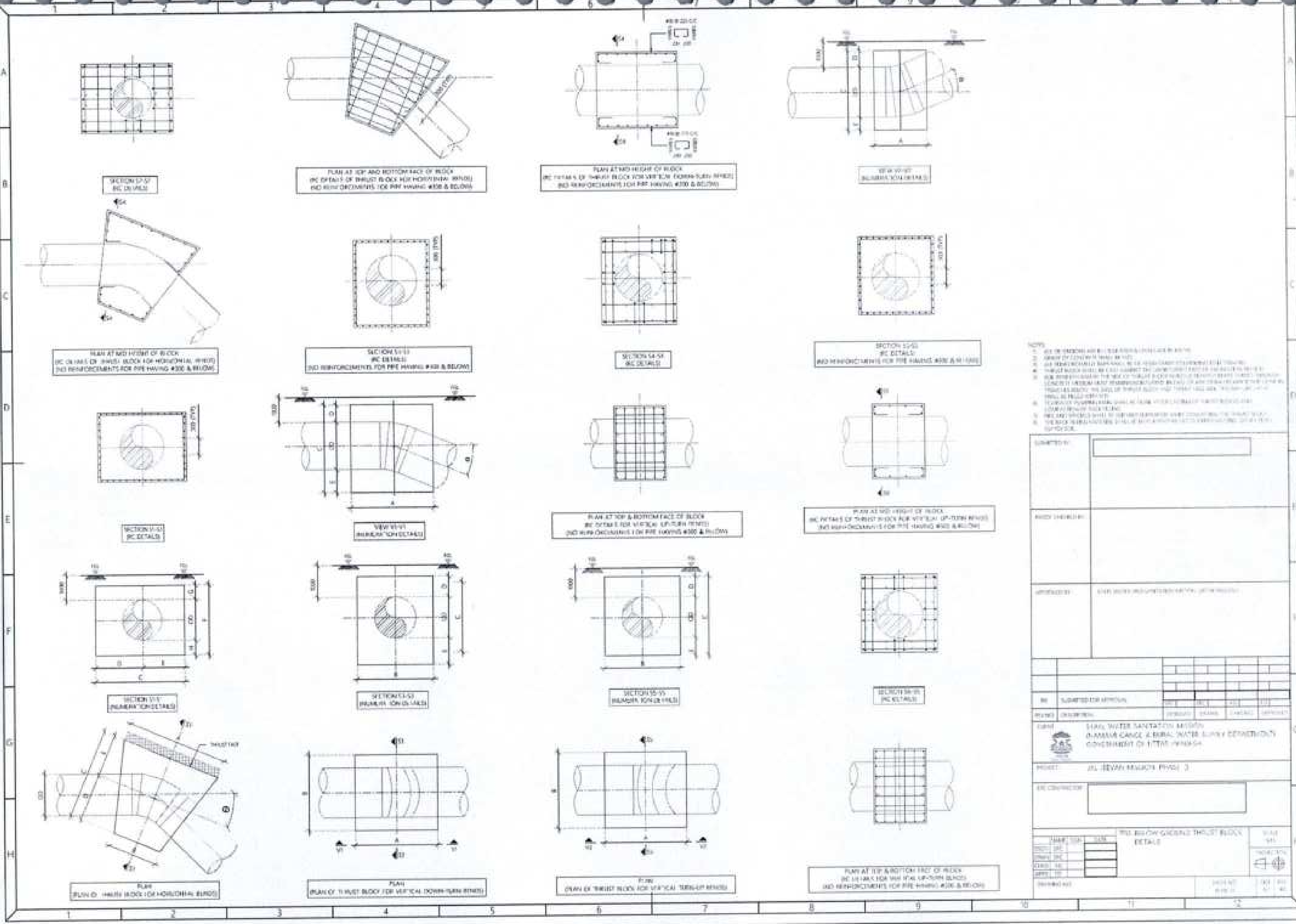


STATE WATER SANITATION MISSION
NAMAMI GANGE & RURAL WATER SUPPLY DEPARTMENTS
GOVERNMENT OF UTTAR PRADESH

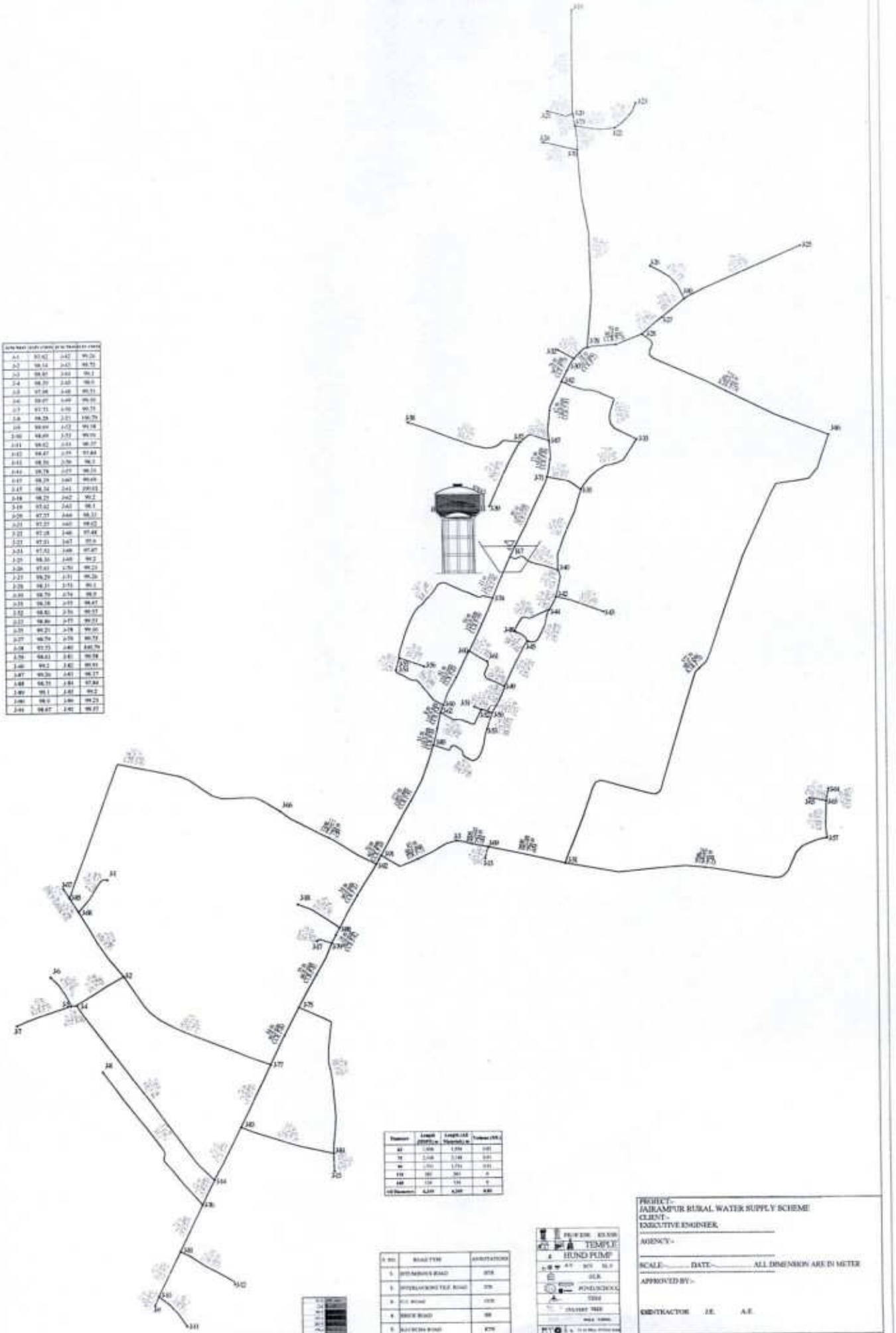
PROJECT: JAL JEEVAN MISSION PHASE 2

DRAWING FOR STAFF QUARTER
PLAN, ELEVATION & SECTION

R0 SUBMITTED FOR APPROVAL


SECTION S7-S7 (RC DETAILS)
PLAN AT TOP AND BOTTOM FACE OF BLOCK (RC DETAILS OF THRUST BLOCK FOR HORIZONTAL BENDS) (NO REINFORCEMENTS FOR PIPE HAVING ø300 & BELOW)
PLAN AT MID HEIGHT OF BLOCK (RC DETAILS OF THRUST BLOCK FOR VERTICAL DOWN-TURN BENDS) (NO REINFORCEMENTS FOR PIPE HAVING ø300 & BELOW)
PLAN AT MID HEIGHT OF BLOCK (RC DETAILS OF THRUST BLOCK FOR HORIZONTAL BENDS) (NO REINFORCEMENTS FOR PIPE HAVING ø300 & BELOW)
SECTION S3-S3 (RC DETAILS) (NO REINFORCEMENTS FOR PIPE HAVING ø300 & BELOW)
SECTION S4-S4 (RC DETAILS)
SECTION S5-S5 (RC DETAILS) (NO REINFORCEMENTS FOR PIPE HAVING ø300 & BELOW)
SECTION S1-S1 (RC DETAILS)
PLAN AT TOP & BOTTOM FACE OF BLOCK (RC DETAILS FOR VERTICAL UP-TURN BENDS) (NO REINFORCEMENTS FOR PIPE HAVING ø300 & BELOW)
PLAN AT MID HEIGHT OF BLOCK (RC DETAILS OF THRUST BLOCK FOR VERTICAL UP-TURN BENDS) (NO REINFORCEMENTS FOR PIPE HAVING ø300 & BELOW)
SECTION S1-S1 (NUMERATION DETAILS)
SECTION S3-S3 (NUMERATION DETAILS)
SECTION S5-S5 (NUMERATION DETAILS)
SECTION S6-S6 (RC DETAILS)
THRUST FACE
PLAN (PLAN OF THRUST BLOCK FOR HORIZONTAL BENDS)
PLAN (PLAN OF THRUST BLOCK FOR VERTICAL DOWN-TURN BENDS)
PLAN (PLAN OF THRUST BLOCK FOR VERTICAL TURN-UP BENDS)
PLAN AT TOP & BOTTOM FACE OF BLOCK (RC DETAILS FOR VERTICAL UP-TURN BENDS) (NO REINFORCEMENTS FOR PIPE HAVING ø300 & BELOW)
NOTES
SUBMITTED BY
R0 SUBMITTED FOR APPROVAL
REVISED DESCRIPTION
CLIENT
STATE WATER SANITATION MISSION
NAMAMI GANGE & RURAL WATER SUPPLY DEPARTMENT
GOVERNMENT OF UTTAR PRADESH
PROJECT JAL JEEVAN MISSION PHASE 3
EPC CONTRACTOR
TYP. BELOW GROUND THRUST BLOCK DETAILS
DRAWING NO.

JAIRAMPUR RURAL WATER SUPPLY SCHEME BLOCK GAURA DISTRICT PRATAPGARH



PROJECT:-
JAIRAMPUR RURAL WATER SUPPLY SCHEME
CLIENT:-
EXECUTIVE ENGINEER,
AGENCY:-
SCALE:- DATE:- ALL DIMENSION ARE IN METER
APPROVED BY:-
CONTRACTOR J.E. A.E.