

CONTRACT NO.

GUJARAT WATER SUPPLY & SEWERAGE BOARD

GANDHINAGAR

(A WHOLLY OWNED GOVERNMENT OF GUJARAT UNDERTAKING)



**“Working Survey, Design & Construction of Intake Well with Approach Bridge, Providing, Supplying, Lowering, Laying and Jointing various dia. of DI-K9/MS Rising Main Pipelines, RCC Sump, Pump House, Staff Quarter, Compound Wall, Supplying and erecting Pumping Machinery Including all Electro-Mechanical-Instrumentation and SCADA Works at Various HWs to SHWs under Water Supply Scheme Based on Bhadbhut Barrage (RHS) for Industries (GIDC) and Rural Areas of Bharuch and Vadodara Districts with 10 Years of Comprehensive O&M of entire scope of work. Dist.: Bharuch.”**

**Estimated Cost: - Rs. ₹ 8,28,08,62,369.00**

**VOLUME – II D**

**TECHNICAL DATA SHEET**

**Chief Engineer  
Gujarat Water Supply & Sewerage Board  
Surat  
Zone 6**

### **PREAMBLE TO DATA SHEET**

1. The Levels given in the Appendix to Bid and drawings are as per the Data available with GWSSB. As the Working survey is included in scope of the work of contractor, agency shall carry out working survey along the route.
2. The Agency shall have to confirm both the levels and layout of the Head Works as per the requirement of the inter-related Structures and design accordingly. No Extra payment shall be made by the Department to the Agency for the extra excavation or for the raised structure above Ground Level.
3. The levels given in the documents are tentative as per the selected site presently surveyed. In case of shifting of the Head Works is to be necessary due to any reason, the Agency shall be bound to carry out all the works as per the new site and the design is to be carried out accordingly without any extra claims.
4. The erection & installing of Pumping Machinery includes the Piping and Cabling considering the Pump House size mentioned in the Tender. Any change in the pump house size shall not affect the Pumping Machinery Cost. No extra payment shall be made to the Agency due to increase in the Piping, Cabling or any other accessories related to the Pumping Machinery due to the increase in the size of Pump House.
5. The Pump House shall be provided with the Electric fittings with minimum required illumination with the lighting fixtures, Piping, wiring and other accessories.
6. For Construction of Civil Structures all the data are to be obtained by the agency and accordingly the structural design shall be prepared & to be got approved by GWSSB.

**Signature of Bidder**

**Executive Engineer  
P.H, Works Division  
Bharuch**

## SECTION- 1: BRIEF DESCRIPTION OF WORK

The main scope of works/ services to be done/ provided by the contractor under this bid shall be as under.

### A LYING/ INSTALLATION OF MATERIAL ISSUED BY

DEPAR

TMENT

: NIL

2

### 1. PROCUREMENT, SUPPLY & LAYING OF PIPELINE

Procurement, supplying, laying, testing and commissioning of following pipelines:

- a) Pipe line with valves, fixtures, fastening, appurtenances, accessories etc.

Pipe line details					
Sr. no	Dia(mm)	Thickness	Length(m)	Material	Section
1	1422.00	12.5 mm	25007	MS	Pro. GWSSB Intake to Tapping 2
2	600.00		107	DI K-9	Tapping 2 to Sudiora WTP
3	1219.00	10.00 mm	23798	MS	Tapping 2 to Tapping 3
4	813.00	7.1 mm	107	M.S	Tapping 3 To Jambusar Existing Raw Water Pipe Line
5	1067.00	8.8 mm	637	MS	1. Tapping 3 to Tapping 4 2. Tapping 4 To Pro Sump for Vadodara & Palej
6	700.00		372	DI K-9	1. Tapping 4 To Pro. Palej WTP Inlet 2. Vadodara & Palej Sump to Palej WTP
7	2641.60	18 mm	26863	MS	1. Pro. GIDC Intake to Tapping 1 2. Tapping 1 to Rahiyad GIDC Pond
8	500.00		9545	DI K-9	Tapping 1 to Pakhajan WTP



**2. DESIGN AND CONTRUCTION OF CIVIL STRUCTURES**

Designing and construction of following items as per Contractor's own design complete.

Sr. No.	Description	Quantity
1	Constructing Intake Well with Approach Bridge	As per price bid
2	Constructing Under Ground Sump	As per price bid
3	Constructing Pump House with Panel Room	As per price bid
4	Constructing Approach Road	As per price bid
5	Constructing Compound Wall	As per Price bid
6	Constructing Staff Quarters	As per Price bid
7	Constructing Security Cabin	As per Price bid
8	Constructing Office	As per Price bid

**3. ELECTRO-MECHANICAL WORKS**

Designing, procuring, erection & Commissioning of Pumping machinery & allied works

Details							
Sr.No	Description	Type	Working + Stand By	Capacity in KW	Pumping Hours	Discharge m3/h	Pump Head in Meter
1	Bharuch GWSSB Intake Well to Palej H/W	VT	4+2	560	22	1700	85
2	Pro. Sump at Palej to Pro. Palej WTP	VT	2+2	55	22	781	16
3	Bharuch Intake Well to Rahiyad GIDC	VT	8+4	710	22	3719	48

1. Intake Structure with Approach Bridge 813 MLD with 95 mt length of Bridge at Vadava		
Sr. No	PARTICULARS	PARAMETER/ REQUIREMENT
1.	<b>GENERAL</b>	
1.1	Item	Intake Structure with Pump room of size 30 m x 21 m Rectangular & 95 m long Approach bridge and bank protection work. (Detail as per price bid)
1.2	Type	Sinking (suitable as per site) type with cofferdam - based Intake Structure with RCC Framed Pump House on Top & Approach Bridge.
1.3	Location	Village- Vadva , Taluka-Bharuch, Dist. Bharuch
	Tentative Lat:	21°41'19.90"N
	Tentative Long:	72°52'18.51"E
1.4	Design Discharge	813 MLD throughout the year
1.5	Intake well Size	Minimum Size 30 m x 21 m
1.6	Depth of intake well below bottom of pump room floor level	As per approved Design
1.7	Length of Approach Bridge	Not less than 95 mt.
1.8	Height of Pump House	12 m from Pump floor Level to top Slab
2	<b>DESIGN DATA</b>	
2.1	Control Levels	
	a) Average bed level (RBL)	As mentioned in indicative drawing, the average River bed level is -1.50 m RL, however the contractor has to undertake bathymetric and field investigation survey and propose the design accordingly.
	b) Bottom of structure	Min. 10 mt below River bed level (As mentioned in indicative drawing, however the contractor has to undertake Soil investigation survey, assess the hydrological parameters and propose the design accordingly.)
	c)H.F.L.	As defined by Irrigation department according to the hydrological parameters and the contractor has to propose the design accordingly.
	d)Pump House Floor Level	Minimum 2.0 M above HFL
2.2	SBC at site	Contractor has to carry out SBC report for design purpose. Minimum 5 boreholes within foundation area
2.3	Seismic Zone	as per latest revision of IS:1893
2.4	Water Density	9.81 kN/Cu.m
3	<b>DESIGN REQUIREMENTS</b>	
3.1	Standard Codes	<p>Relevant IRC-78-2014 or latest revision and Indian/ International standard on Intake structure &amp; pile driving.</p> <p>(1) IS 3370, Part-1 to 4, 1995 or latest revised.</p> <p>(2) I.S. 456 - 2000 or latest revised.</p> <p>(3) I.S. 1893 - 2000 - 1984 or latest Revised.</p> <p>(4) I.S. 875, Part-1 to 3, 1987 or latest Revised.</p> <p>(5) IRC 78-2014 or latest</p>

		(6) IRC 45 latest (7) IRC 6 Latest (8) IS 15310(2003) or latest revised (9) IS 10262-2009 or latest revised (10) IS 13920-1993 or latest revised
3.2	Grade of concrete	M-30 for Pile or as specified for various components along with suitable corrosion resistant admixture.
3.3	Grade of Steel	Only CRS Fe-500D steel to be used.
3.4	Foundation	The foundation shall be designed for actual S.B.C. or load carrying capacity of strata confirmed by soil testing for the intake well and superstructure.
3.5	Diameter of pile	As per approved design
3.6	Slab for pump Room floor level	Minimum of 200 mm thickness (or as per approved design)
3.7	Top Slab for pump House only	Minimum of 200 mm Thickness (or as per approved design)
3.8	Clear cover	Foundation-60mm Vertical Walls, beams, slabs-40 mm
3.9	Minimum Reinforcement for all members	Design requirements as set out in relevant IS codes in respect of steel shall be fully Satisfied.
3.10	Column	As per approved design
	Beam	As per approved design
	Bottom Floor and vertical wall	As per approved design
	Top Slab	As per approved design
3.11	Clear cover	Column braces, Beams, Slabs – 40 mm Other element as per latest IS code
<b>4.0</b>	<b>Finishing work</b>	
4.1	Plaster	Water proofing
4.2	Flooring	1. Flooring in pump house shall be of polish Kota stone of 25mm thick over cement mortar of 20mm (Average) thick in 1:6 (1 Cement: 6 coarse sand) as per Engineer-In-Direction. 2. Flooring in panel room shall be of polish Kota stone of 25mm thick over cement mortar of 20mm (Average) thick in 1:6 (1 Cement: 6 coarse sand) and solvent free insulating coating above kota stone as per IS 15652 as per Engineer-In-Direction. 3. Flooring in SCADA room/ office room shall be vitrified tiles as per the Engineer-In-Charge
4.4	Colour	As approved by Engineer-in-Charge
4.5	Outside plaster	20mm thk sand face plaster
4.6	Inside plaster with water proofing	20mm thk cement plaster Finishing wall with water proofing cement
4.7	Railing	SS/Aluminium railing
4.8	Rolling Shutter	MS laths

4.9	Window	2 tracks sliding Aluminium Anodized Window having extruded aluminium colour Anodized section frame wt. 1.2 kg/m with 5 mm thick transparent Glass with all fixtures and fastening. Polished Granite stone on sill, vertical jambs and Head Jambs. The window includes outside protective iron grill with opening to protect pigeon entry inside the pump house as per instruction of E-I-C. Minimum size of window is to be kept 1500mm x 1200mm. Exhaust fan to be mounted with outside bend pipe with screen on the pump house wall, as per instruction of E-I-C.
4.10	Thickness of liner	Mild steel liner with min 6 mm thickness
4.11	Number of Piles for intake well	As per approved design



## Data Sheet for Approach Bridge for 813 MLD Intake well

Sr.No	PARTICULARS	PARAMETER/REQUIREMENT
<b>1</b>	<b>GENERAL</b>	
1.1	Location	Village- Vadva , Taluka-Bharuch, Dist. Bharuch
1.2	Length of Approach Bridge	Not less than 95 m.
1.3	Width of Approach Bridge	Minimum 10 m
1.4	Floor Level of Approach bridge	The floor level of the bridge shall be above HFL+2.0m at the proposed Site.
<b>2</b>	<b>DESIGN DATA</b>	
<b>2.1</b>	Control Levels	
	a) Average bed level (RBL)	As mentioned in indicative drawing, the average River bed level is -1.50 m RL, however the contractor has to undertake bathymetric and field investigation survey and propose the design accordingly.
	b) Bottom of structure	The contractor has to undertake Soil investigation survey, assess the hydrological parameters and propose the design accordingly.
	c)H.F.L.	As defined by Irrigation department according to the hydrological parameters and the contractor has to propose the design accordingly.
2.2	Live Load on for pipe floor	Minimum 1000 kg/m <sup>2</sup> or as per actual
2.3	Live load on Bridge	Minimum 1500 kg/m <sup>2</sup> + wheel load or as per actual
2.4	Concentrated load	10kN at any point
2.5	Type of structure	RCC Structure
2.6	SBC	Contractor has to carry out SBC report for design purpose. Minimum 5 boreholes.
<b>3</b>	<b>DESIGN REQUIREMENT</b>	
3.1	Grade of concrete	M-30 (Minimum)
3.2	Grade of Steel	CRS Fe-500D steel to be used
	Foundation	The foundation shall be designed for actual S.B.C. or load carrying capacity of strata confirmed by soil testing for the intake well and superstructure.
	Diameter of pile	As per approved design
3.3	Standard Codes	Relevant IRC-78-2014 or latest revision and Indian/ International standard on Intake structure & pile driving. IS 3370, Part-1 to 4, 1995 or latest revised. (2) I.S. 456 - 2000 or latest revised. (3) I.S. 1893 - 2000 - 1984 or latest Revised. (4) I.S. 875, Part-1 to 3, 1987 or latest Revised. (5) IRC 78-2014 or latest (6) IRC 45 latest (7) IRC 6 Latest (8) IS 15310(2003) or latest revised (9) IS 10262-2009 or latest revised (10) IS 13920-1993 or latest revised
3.4	Pier	As per approved Design.
3.5	Pier cap	As per approved Design.

Data Sheet for Approach Bridge for 813 MLD Intake well		
Sr.No	PARTICULARS	PARAMETER/REQUIREMENT
3.8	Deck Slab	As per approved Design.
3.9	Clear cover	Foundation-60mm, Vertical Walls, beams, slabs-40mm & Other element as per latest IS code.
3.10	Minimum reinforcement for all members	Design requirements as set out in relevant IS codes in respect of all Reinforcements shall be strictly followed.
4.10	Thickness of liner	Mild steel liner with min 6 mm thickness
4.11	Number of Piles for Approach bridge	As per approved design
4.13	Span between two adjacent piers	Maximum 15 mt
4.14	Number of piles consisting a pier	As per approved design
<b>4.0</b>	<b>Finishing work</b>	
4.4	Painting	As approved by Engineer-in-Charge
11	Railing	Providing and fixing 25mm X 5.2mm SS/Aluminium moulded railing with three horizontal rows and posts of angels of size 65mm X 65mm X 8mm RCC 150 mm and 1.15-meter height and placed at 1.85mt c/c including painting two coats and anchorage in CC etc completed

1. Intake Structure with Approach Bridge 182 MLD with 145 mt length of Bridge at Vadava		
Sr. No	PARTICULARS	PARAMETER/ REQUIREMENT
1.	GENERAL	
1.1	Item	Intake Structure with Pump room of size circular having 18 mt dia with 145 m long Approach bridge and bank protection work. (Detail as per price bid)
1.2	Type	Sinking (suitable as per site) type with cofferdam - based Intake Structure with RCC Framed Pump House on Top & Approach Bridge.
1.3	Location	Village- Vadva , Taluka-Bharuch, Dist. Bharuch
	Tentative Lat:	21°41'17.99"N
	Tentative Long:	72°52'23.07"E
1.4	Design Discharge	182 MLD throughout the year
1.5	Intake well Size	Minimum Dia. 18 mt.
1.6	Depth of intake well below bottom of pump room floor level	As per approved Design
1.7	Length of Approach Bridge	Not less than 145 mt.
1.8	Height of Pump House	12 m from Pump floor Level to top Slab
2	DESIGN DATA	
2.1	Control Levels	
	a) Average bed level (RBL)	As mentioned in indicative drawing, the average River bed level is -1.50 m RL, however the contractor has to undertake bathymetric and field investigation survey and propose the design accordingly.
	b) Bottom of structure	Min. 10 mt below River bed level (As mentioned in indicative drawing, however the contractor has to undertake Soil investigation survey, assess the hydrological parameters and propose the design accordingly.)
	c)H.F.L.	As defined by Irrigation department according to the hydrological parameters and the contractor has to propose the design accordingly.
	d)Pump House Floor Level	Minimum 2.0 M above HFL
2.2	SBC at site	Contractor has to carry out SBC report for design purpose. Minimum 5 boreholes within foundation area
2.3	Seismic Zone	as per latest revision of IS:1893
2.4	Water Density	9.81 kN/Cu.m
3	DESIGN REQUIREMENTS	
3.1	Standard Codes	<p>Relevant IRC-78-2014 or latest revision and Indian/ International standard on Intake structure &amp; pile driving.</p> <ol style="list-style-type: none"> <li>1. IS 3370, Part-1 to 4, 1995 or latest revised.</li> <li>2. I.S. 456 - 2000 or latest revised.</li> <li>3. I.S. 1893 - 2000 - 1984 or latest Revised.</li> <li>4. I.S. 875, Part-1 to 3, 1987 or latest Revised.</li> <li>5. IRC 78-2014 or latest</li> </ol>

		6. IRC 45 latest 7. IRC 6 Latest 8. IS 15310(2003) or latest revised 9. IS 10262-2009 or latest revised 10. IS 13920-1993 or latest revised
3.2	Grade of concrete	M-30 for Pile or as specified for various components along with suitable corrosion resistant admixture.
3.3	Grade of Steel	Only CRS Fe-500D steel to be used.
3.4	Foundation	The foundation shall be designed for actual S.B.C. or load carrying capacity of strata confirmed by soil testing for the intake well and superstructure.
3.5	Diameter of pile	As per approved design
3.6	Slab for pump Room floor level	Minimum of 200 mm thickness (or as per approved design)
3.7	Top Slab for pump House only	Minimum of 200 mm Thickness (or as per approved design)
3.8	Clear cover	Foundation-60mm Vertical Walls, beams, slabs-40 mm
3.9	Minimum Reinforcement for all members	Design requirements as set out in relevant IS codes in respect of steel shall be fully Satisfied.
3.10	Column	As per approved design
	Beam	As per approved design
	Bottom Floor and vertical wall	As per approved design
	Top Slab	As per approved design
3.11	Clear cover	Column braces, Beams, Slabs – 40 mm Other element as per latest IS code
<b>4.0</b>	<b>Finishing work</b>	
4.1	Plaster	Water proofing
4.2	Flooring	1. Flooring in pump house shall be of polish Kota stone of 25mm thick over cement mortar of 20mm (Average) thick in 1:6 (1 Cement: 6 coarse sand) as per Engineer-In-Direction. 2. Flooring in panel room shall be of polish Kota stone of 25mm thick over cement mortar of 20mm (Average) thick in 1:6 (1 Cement: 6 coarse sand) and solvent free insulating coating above kota stone as per IS 15652 as per Engineer-In-Direction. 3. Flooring in SCADA room/ office room shall be vitrified tiles as per the Engineer-In-Charge
4.4	Colour	As approved by Engineer-in-Charge
4.5	Outside plaster	20mm thk sand face plaster
4.6	Inside plaster with water proofing	20mm thk cement plaster Finishing wall with water proofing cement
4.7	Railing	SS/Aluminium railing
4.8	Rolling Shutter	MS laths

4.9	Window	2 tracks sliding Aluminium Anodized Window having extruded aluminium colour Anodized section frame wt. 1.2 kg/m with 5 mm thick transparent Glass with all fixtures and fastening. Polished Granite stone on sill, vertical jambs and Head Jambs. The window includes outside protective iron grill with opening to protect pigeon entry inside the pump house as per instruction of E-I-C. Minimum size of window is to be kept 1500mm x 1200mm. Exhaust fan to be mounted with outside bend pipe with screen on the pump house wall, as per instruction of E-I-C.
4.10	Thickness of liner	Mild steel liner with min 6 mm thickness
4.11	Number of Piles for intake well	As per approved design

Data Sheet for Approach Bridge 182 MLD Intake well		
Sr.No	PARTICULARS	PARAMETER/REQUIREMENT
<b>1</b>	<b>GENERAL</b>	
1.1	Location	Village- Vadva , Taluka-Bharuch, Dist. Bharuch
1.2	Length of Approach Bridge	Not less than 145 m.
1.3	Width of Approach Bridge	Minimum 7 m
1.4	Floor Level of Approach bridge	The floor level of the bridge shall be above HFL+2.0m at the proposed Site.
<b>2</b>	<b>DESIGN DATA</b>	
	Control Levels	
	a) Average bed level (RBL)	As mentioned in indicative drawing, the average River bed level is -1.50 m RL, however the contractor has to undertake bathymetric and field investigation survey and propose the design accordingly.
	b) Bottom of structure	The contractor has to undertake Soil investigation survey, assess the hydrological parameters and propose the design accordingly.
	c)H.F.L.	As defined by Irrigation department according to the hydrological parameters and the contractor has to propose the design accordingly.
2.1	Live Load on Floor Level	Minimum 1000 kg/m <sup>2</sup> or as per actual
2.2	Live load for accessible roof	Minimum 1500 kg/m <sup>2</sup> + wheel load or as per actual
2.3	Concentrated load	10kN at any point
2.4	Type of structure	RCC Structure
2.5	SBC	Contractor has to carry out SBC report for design purpose. Minimum 5 boreholes.
<b>3</b>	<b>DESIGN REQUIREMENT</b>	
3.1	Grade of concrete	M-30 (Minimum)
3.2	Grade of Steel	CRS Fe-500D steel to be used
	Foundation	The foundation shall be designed for actual S.B.C. or load carrying capacity of strata confirmed by soil testing for the intake well and superstructure.
	Diameter of pile	As per approved design
3.3	Standard Codes	Relevant IRC-78-2014 or latest revision and Indian/ International standard on Intake structure & pile driving. (1) IS 3370, Part-1 to 4, 1995 or latest revised. (12) I.S. 456 - 2000 or latest revised. (13) I.S. 1893 - 2000 - 1984 or latest Revised. (14) I.S. 875, Part-1 to 3, 1987 or latest Revised. (15) IRC 78-2014 or latest (16) IRC 45 latest (17) IRC 6 Latest (18) IS 15310(2003) or latest revised (19) IS 10262-2009 or latest revised IS 13920-1993 or latest revised
3.4	Pier	As per approved Design.
3.5	Pier cap	As per approved Design.
3.8	Deck Slab	As per approved Design.
3.9	Clear cover	Foundation-60mm, Vertical Walls, beams, slabs-40mm & Other element as

Data Sheet for Approach Bridge 182 MLD Intake well		
Sr.No	PARTICULARS	PARAMETER/REQUIREMENT
		per latest IS code.
3.10	Minimum reinforcement for all members	Design requirements as set out in relevant IS codes in respect of all Reinforcements shall be strictly followed.
4.10	Thickness of liner	Mild steel liner with min 6 mm thickness
4.11	Number of Piles for Approach bridge	As per approved design
4.13	Span between two adjacent piers	Maximum 15 mt
4.14	Number of piles consisting a pier	As per approved design
<b>4.0</b>	<b>Finishing work</b>	
4.4	Painting	As approved by Engineer-in-Charge
11	Railing	Providing and fixing 25mm X 5.2mm SS/Aluminium moulded railing with three horizontal rows and posts of angels of size 65mm X 65mm X 8mm RCC 150 mm and 1.15-meter height and placed at 1.85mt c/c including painting two coats and anchorage in CC etc completed

Data Sheet for Combined Panel Room at Vadva Intake well		
Sr.No	PARTICULARS	PARAMETER/REQUIREMENT
<b>1</b>	<b>GENERAL</b>	
1.1	Location	Village- Vadva , Taluka-Bharuch, Dist. Bharuch
		The arrangement shall be such that suction pipe, pump-sets, delivery pipe including all the valves and accessories shall be accommodated in pump house having above mentioned space. The control panel room, office, SCADA room and toilet/WC shall be constructed. The size of these rooms shall be enough to accommodate all electrical & instrumentation equipment as per norms and approved by E-I-C. Note: In case increase in pump house size due to larger size of pumping machinery, no extra payment shall be given to the contractor.
1.3	Plinth level	Plinth level of Panel Room should be minimum 2.0 m above HFL.
1.4	Height	Height will be calculated from Plinth Level/maintenance floor level to bottom of beam of ceiling slab.
1.5	Carpet area (Sq. mt)	As per BOQ
<b>2</b>	<b>DESIGN DATA</b>	
2.1	Live Load on Floor Level	1000 kg/m <sup>2</sup>
2.2	Live load for accessible roof	150 kg/m <sup>2</sup>
2.3	Type of structure	RCC Framed Structure
2.4	SBC	To be carried out by Agency
<b>3</b>	<b>DESIGN REQUIREMENT</b>	
3.1	Grade of concrete	M-30 (Minimum)
3.2	Grade of Steel	CRS Fe-500 steel to be used
3.3	Standard Codes	Relevant IRC-78-2014 or latest revision and Indian/ International standard on Intake structure & pile driving. 1. IS 3370, Part-1 to 4, 1995 or latest revised. 2. I.S. 456 - 2000 or latest revised. 3. I.S. 1893 - 2000 - 1984 or latest Revised. 4. I.S. 875, Part-1 to 3, 1987 or latest Revised. 5. IRC 78-2014 or latest 6. IRC 45 latest 7. IRC 6 Latest 8. IS 15310(2003) or latest revised 9. IS 10262-2009 or latest revised 10. IS 13920-1993 or latest revised
3.4	Column	As per approved Design.
3.5	Beam	As per approved Design.
3.6	Bottom slab of PS	As per approved Design.
3.7	pump Floor	As per approved Design.
3.8	Top Slab	As per approved Design.
3.9	Clear cover	Foundation-60mm, Vertical Walls, beams, slabs-40mm & Other element as per latest IS code.



Data Sheet for Combined Panel Room at Vadva Intake well		
Sr.No	PARTICULARS	PARAMETER/REQUIREMENT
3.10	Minimum reinforcement for all members	Design requirements as set out in relevant IS codes in respect of all Reinforcements shall be strictly followed.
<b>4.0</b>	<b>Finishing work</b>	
4.1	Plaster	Water proofing
4.4	Colour	As approved by Engineer-in-Charge
4.5	Outside plaster	20mm thk sand face plaster
4.6	Inside plaster with water proofing	20mm thk cement plaster Finishing wall with water proofing cement
4.7	Railing	SS/Aluminium railing
4.8	Rolling Shutter	MS laths
5	Windows and Ventilation	2 tracks sliding Aluminium Anodized Window having extruded aluminium colour Anodized section frame wt. 1.2 kg/m with 5 mm thick transparent Glass with all fixtures and fastening. Polished Granite stone on sill, vertical jambs and Head Jambs. The window includes outside protective iron grill with opening to protect pigeon entry inside the pump house as per instruction of E-I-C. Minimum size of window is to be kept 1500mm x 1200mm. Exhaust fan to be mounted with outside bend pipe with screen on the pump house wall, as per instruction of E-I-C.
6	Flooring	1. Flooring in pump house shall be of polish Kota stone of 25mm thick over cement mortar of 20mm (Average) thick in 1:6 (1 Cement: 6 coarse sand) as per Engineer-In-Direction. 2. Flooring in panel room shall be of polish Kota stone of 25mm thick over cement mortar of 20mm (Average) thick in 1:6 (1 Cement: 6 coarse sand) and solvent free insulating coating above kota stone as per IS 15652 as per Engineer-In-Direction. 3. Flooring in SCADA room/ office room shall be vitrified tiles as per the Engineer-In-Charge
7	Parapet/Terrace	Minimum 230 mm thick 1 mt high parapet with inside and outside plastering has to be provided. China mosaic has to be provided on terrace.
8	Sills, Vertical Jambs and Head Jambs for Door, windows and ventilation	Should be of Polish Granite stone of minimum 12 mm to 15 mm thick.
9	Rain Water spout	Minimum 10 nos. (or as per requirement) of Rain water spout has to be provided on terrace of PVC pipe of 90mm dia. and up to disposal point at ground level.
10	Staircase	RCC Staircase (Riser -150mm & tread -300mm) minimum width 1200mm.
11	Railing	Providing and fixing 25mm X 5.2mm SS/Aluminium moulded railing with three horizontal rows and posts of angels of size 65mm X 65mm X 8mm RCC 150 mm and 1.15-meter height and placed at 1.85mt c/c including painting two

Data Sheet for Combined Panel Room at Vadva Intake well		
Sr.No	PARTICULARS	PARAMETER/REQUIREMENT
		coats and anchorage in CC etc completed
12	Partition wall	The partition wall to be constructed as per the Engineer-In-charge instruction.
13	Toilet block	Men and women toilet block shall be provided including plumbing, sanitary, tiles, door with door closer, etc in the pump house as per the Engineer-In-Charge instruction.

Data Sheet for Raw Water Sump cum Pump House at Palej H/W		
Sr.No	PARTICULARS	PARAMETER/REQUIREMENT
<b>1</b>	<b>GENERAL</b>	
1.1	Item	Raw Water Sump and Pump House above Sump Top Slab (Pump House Size minimum 40m X 12 m)
1.2	Type	Rectangle shape/as per Site Condition - Sump
1.3	Capacity	13 ML
1.4	Location	Palej
<b>2</b>	<b>DESIGN DATA</b>	
2.1	Control Levels	
	a) Average ground level (GL)	As per the site condition (Contractor has to carry out Contour survey)
2.2	SBC at site	Contractor has to carry out test for SBC at proposed location for design purpose with minimum 5 boreholes within the foundation area. The SBC test shall be carried out by NABL accredited lab.
2.3	Water Table	The contractor has to Propose the design considering the Ground water table up to existing ground level.
2.4	Seismic Zone	as per latest revision of IS:1893
2.5	Water Density	9.81kN/M <sup>3</sup>
<b>3</b>	<b>DESIGN REQUIREMENT</b>	
3.1	Standard Codes	(1) I.S. 3370, Part-1 to 4, 1965 or latest revised. (2) I.S. 456-2000 or latest revised. (3) I.S. 1893-2002, Part-1 to 5 or latest revised. (4) I.S. 875, Part - 1 to 5, 1987 or latest revised. (5) I.S. 10262 - 2009 or latest revised. (6) I.S. 13920 - 1993 or latest revised.
3.4	Grade of concrete	M30 (Minimum)
3.5	Grade of Steel	Only CRS Fe-500D steel to be used
3.6	Minimum Reinforcement	Design requires elements asset out in relevant codes in respect of steel shall be fully satisfied.
3.7	Water Density	9.81kN/M <sup>3</sup>
3.8	Live load on Pump Floor Level	Minimum 1000 kg/m <sup>2</sup> or as per actual
3.9	Foundation	The foundation shall be designed for actual S.B.C. or load carrying capacity (for pile) of strata confirmed by soil testing.
3.10	Container / vertical Wall	Minimum of 230mm thickness.
3.11	Top Slab of sump	The Slab shall be designed considering pump House Proposed above the sump and the dead load, live load, static and vibration load of the pumping machineries to be installed under this project as well as considering future load of pumping machineries that is to be installed in future for Vadodara Section.
3.12	Bottom raft of	Minimum of 250 mm thickness

Data Sheet for Raw Water Sump cum Pump House at Palej H/W		
Sr.No	PARTICULARS	PARAMETER/REQUIREMENT
	Sump	
3.13	Top Beam (at GL level)	As per approved design
3.14	Middle level beam	As per approved design
3.15	GL of sump	As per the site condition
3.16	FSL of sump	As per approved design
3.17.	Top of sump wall	As per approved design
3.18	Column	As per Approved Design
3.19	Beam	As per Approved Design
3.20	Bottom Floor	As per Approved Design
3.21	Top Slab of pump House	As per Approved Design
3.22	Clear cover	Foundation - 60mm, Vertical Walls, beams, slabs - 45mm/IS 456 2000 other elements as per latest IS code
3.23	Dia. of Pipe	Only D.I/MS pipe shall be used as per relevant IS code. The Dimensions of Inlet, Outlet, Overflow & Washout pipes are to be considered as per design for a maximum velocity constrain of 1.5 m/s.
3.24	Length of pipes	From free board level to duck foot bend minimum 5.0 meter along ground after edge of outer (vertically) and face of the structure (Horizontally).
3.25	Size of Butterfly Valves (IS-13095) & Sluice Valve as per IS 14846	Same size for Outlet & Washout pipe total 2 No of valves for Each RCC Sump. For More than 300 mm dia. Butterfly valve shall be provided instead of SV.
3.26	Minimum Reinforcement for all members	Design requirements as set out in relevant IS codes in respect to all reinforcements shall be strictly followed.
3.27	Painting	For Exterior weather proof exterior emulsion paint (Two coat) on primer coat of approved brand and of required shade of wall Surface to give an even shade after thoroughly brushing the surfaces clean of all grease, dirt, loose pieces of scales.
3.28	Accessories	Level indicator for sump.
3.29	Railing	Providing and fixing 25mm X 5.2mm SS/Aluminium moulded railing with three horizontal rows and posts of angels of size 65mm X 65mm X 8mm RCC 150 mm and 1.15-meter height and placed at 1.85mt c/c including painting two coats and anchorage in CC etc completed
3.30	Staircase	RCC Staircase (Raiser -150mm & trade -300mm) minimum width 1200mm. Cover – minimum 30mm inside the sump. Stair case provided from Top of sump to Bottom of sump with staircase cabin, Ground level to top of pump house as per instruction of Engineer-In- Charge.

Data Sheet for Raw Water Sump cum Pump House at Palej H/W		
Sr.No	PARTICULARS	PARAMETER/REQUIREMENT
3.31	Manholes	Necessary manholes to be provided on top of sump slab as per the Engineer-In-Charge.

<b>DATA SHEET FOR Staff Quarter</b>		
<b>Sr. No.</b>	<b>DETAILS</b>	<b>Parameter / Requirement</b>
<b>1.0</b>	<b>GENERAL</b>	
1.1	Location/ Size (tentative)/ Carpet area of the Pump House (Sq. mtr)	1. 2 Nos. at Intake well at Village- Vadva , Taluka- Bharuch, Dist. Bharuch 2. 1 Nos. at Palej H/W - Village-Palej, Taluka- Bharuch, Dist. Bharuch As per BOQ
1.2	Type	RCC framed structure with brick masonry wall
1.3	Height of Staff Quarter above Floor Level to Bottom beam of ceiling (m)	<b>Structure up to 3.60 m</b>
<b>2.0</b>	<b>Design Data</b>	
<b>2.1</b>	<b>Control levels</b>	
	<b>Avg. Ground Levels</b>	<b>As per Site or Design</b>
2.2	SBC At site	Contractor Shall carry out SBC for Design Purpose
2.3	Water table	To be decided on basis of soil investigation.
2.4	Seismic	As per latest revision of IS:1893
2.5	Water Density	9.81 kN/cum
2.6	Plinth level of Staff Quarter	Avg. G.L. + 2 Mt. Ht.
<b>3</b>	<b>Design Requirement</b>	
<b>3.1</b>	<b>Standard Codes</b>	(1) I.S. 3370, Part-1 to 4, 1965 or latest revised. (2) I.S. 456-2000 or latest revised. (3) I.S. 1893-2002, Part-1 to 5 or latest revised. (4) I.S. 875, Part - 1 to 5, 1987 or latest revised. (5) I.S. 10262 - 2009 or latest revised. (6) I.S. 13920 - 1993 or latest revised.
<b>3.2</b>	<b>Foundation</b>	The foundation shall be designed for actual S.B.C. or load carrying capacity (for pile) of strata confirmed by soil testing.
3.3	Grade of concrete of Foundation	M20
3.4	Grade of Steel	TMT FE- 500D steel to be used
3.5	Water Density	9.81 kN/Cu.m
3.7	Column	As per Approved Design
3.8	Beam	As per Approved Design

3.9	Bottom Floor	As per Approved Design
3.10	Top Slab	As per Approved Design
3.11	Clear cover	As per IS Code
3.12	Flooring and Skirting	
	Living/Dining/Kitchen/Balcony	Providing and laying double charge vitrified tiles by 600 mm X 600 mm with 8 mm thick in C.M. 1:3 (1-cement:3-fine sand) to give overall thickness of 50 mm finishing with flush pointing in white cement.
	Lobby/Corridor	
	Staircase	For staircase portion chequered terrazzo tiles to be provided.
	Kitchen Platform	Black granite marble with min 20 mm thickness including moulding of corner and edges.
	Wash Basin Area/W.C/Bath	For W.C and bath area the glazed floor tiles of 6 mm thick with mat finishing / non slippery surface matching with wall tiles.
3.13	Wall Tiling	
	Kitchen	Providing and laying glazed glossy tiles of 12-inch x 18-inch with 6 mm thick on 10mm thick cement plaster 1:3 (1-cement: 3-fine sand) and jointed with cement slurry. Tiles will be of full wall height.
	Wash Basin Area/W.C/Bath	
3.14	Plastering	
	External Plastering	Providing 12mm thick cement plaster in single coat on single or half brick walls for interior plastering, 15mm thick cement plaster in single coat on single or half brick walls for External plastering upto full height of structure and finished even and smooth in, 8mm thick for Slab. (i) Cement mortar 1:4 (1-cement:4-sand)
	Internal Plastering	
	Bottom of RCC slab	
3.15	Painting	
	External paint	For External surface weatherproof exterior emulsion paint (Two coat) on primer coat of approved brand and of required shade of wall Surface to give an even shade after thoroughly brushing the surfaces clean of all grease, dirt, loose pieces of scales.  For internal surface Interior emulsion paint (Two coat) on primer coat of approved brand and of required shade of wall Surface to give an even shade after thoroughly brushing the surfaces clean of all grease, dirt, loose pieces of scales.
	Internal paint (Wall & Ceiling)	
3.16	Doors	
	Main Door	35 mm thick water proofing flush door with 1.0 mm thick Veneer with polish on both side with teak wood frame 150 mm x 100 mm
	Internal Door	35 mm thick water proofing flush door with 1.0 mm thick Veneer with polish on both side with polished granite frame
	Fixtures & fastening	Stainless Steel Fixtures & Fastening
3.17	Windows	
	Window frame/Shutter/Fixtures and Fastening	2 tracks or 3 tracks sliding Aluminium Anodized Window having extruded aluminium colour Anodized section frame  wt. 1.2 kg/m with 5 mm thick transparent Glass with all fixtures and fastening.

		Granite stone on sill level and 2 verticals Sides of the window.
3.18	<b>Railing</b>	
	Staircase & Balcony	All railing and angle post with MS material with min. 5 mm FRP Coating to be provided as per instruction of Engineer in charge. Providing and fixing MS railing with three horizontal rows having top rail of 40 mm (ID) X 3.2 mm thick, other 2 rails of 25 mm (ID) X 3.2 mm thick and vertical posts of MS Angle 75 x 75x 6 mm thick at 2 mt c/c, height of 1.0 mt from finish floor level and anchorage in solid floor with all necessary MS fixtures etc. completed.
3.19	<b>Parapet</b>	
	Terrace	Parapet on the terrace shall be 1.0 m above the finished terrace level in brick work masonry. No coping shall be provided. Plastering shall be done to the parapet with slope of top inside. China mosaic has to be provided on terrace.
3.20	<b>Sanitary &amp; Water Supply System</b>	
	W.C Pan	White / colour Orissa pan with flush cock and European pan with flushing tank
	Wash Basin	White vitreous China flat back wash basin of Minimum 550 mm x 450 mm size with one CP Stainless Steel pillar tap, ISI mark of approved quality/ Counter Wash basin with granite with all accessories like waste coupling, bottle trap etc. Complete
	Toilet fixtures	Bib tap for hot water, Bib tap for cold water, European WC with Flushing tank, Flush cock with push, Wall mixture with shower, Health faucet, Nahni Trap as required no., pillar cock, towel rack, soap dish, angle cock
	PVC Pipes	Single stack system 110/90mm PVC pipes Including all PVC fittings as per approved Plumbing design, ISI mark of approved quality
	Pipe connecting house Manhole and service manhole	SW pipe of 150mm dia.
	Internal Water supply	UPVC composite pressure pipes and fittings Confirming to IS code, as per approved design
	External Water Supply	UPVC/GI composite pressure pipes and fittings Confirming to IS code, as per approved design. External water supply and drainage line shall be fitted on clamps fixed at suitable distance to keep pipes away from walls
	Painting of GI/SCI pipes Fittings	Ready mixed oil paint over steel primer ISI mark as per instruction of engineer in charge but it has to be approved by GWIL
	Overhead tank	Overhead tank (LDPE) on each unit shall be as per



		approved quality. Minimum 2000 litres capacity.
	Soak Pit	As per approved design
3.21	<b>Miscellaneous</b>	
	Rainwater Harvesting	Efficient Rainwater harvesting network/system to be laid / installed
	Landscape	Environment friendly material (green) to be Used as far as possible. Good landscape is to be provided with Setting areas. Necessary signage boards of required size as instructed.

Data Sheet for RCC Compound Wall with M.S. Gate		
Sr.No	DETAILS	PARAMETER/REQUIREMENT
<b>1</b>	<b>GENERAL</b>	
1.1	Location/Size (tentative)/Length & Height	Compound Wall (Location-Palej H/W)
1.2	Type	RCC compound with RCC foundation, columns, wall and coping, plastered and finished with waterproof cement paint. Fencing with MS angle posts and barbed wire.
<b>2</b>	<b>DESIGN DATA</b>	
2.1	Avg. Ground Levels	As per actual site condition and Approved Design.
2.2	SBC At site	Contractor shall carry out SBC for Design Purpose. The SBC test shall be carried out by NABL accredited lab.
2.3	Water table	To be decided on basis of soil investigation.
2.4	Seismic	As per latest revision of IS:1893
2.5	Water Density	9.81 kn/cum (for design reference if required)
2.6	Plinth level of Compound Wall	As per Approved Design
<b>3</b>	<b>DESIGN REQUIREMENT</b>	
3.1	Standard Codes	(1) I.S. 3370, Part-1 to 4, 1965 or latest revised. (2) I.S. 456-2000 or latest revised. (3) I.S. 1893-2002, Part-1 to 5 or latest revised. (4) I.S. 875, Part - 1 to 5, 1987 or latest revised. (5) I.S. 10262 - 2009 or latest revised. (6) I.S. 13920 - 1993 or latest revised.
3.2	Foundation	The foundation shall be designed for actual SBC of soil strata confirmed by SBC Report The total Depth shall not be less than 1.35 m, as per relevant IS Code.
3.3	Grade of concrete	M20 for all concrete work.
3.4	Grade of Steel	As per approved Design.
3.5	Water Density	9.81kN/M3
3.6	Column	As per approved Design.
3.7	Beam	As per approved Design.
3.8	Clear Cover	As per approved Design.
3.9	Plaster	20mm thk sand face plaster
3.10	Colour	Two coats waterproof cement paint (exterior) of approved brand
3.11	Minimum Reinforcement	As per IS codes;
3.12	Fencing	1.20 m high fencing with 2.0 m long MS angle posts (40x40x6 mm), painted with 3 coats, fixed at 2.5 m c/c with 5 horizontal & 2 diagonal GI barbed wires (9.38 kg/100 m), posts embedded in CC 1:5:10 block (0.5x0.5x0.5 m)
3.13	Compound Wall Brick Work	Not applicable
3.14	Coping	RCC coping (M-20) at top of wall, min. 100 mm thick
3.15	M.S. Gate	Minimum size of Main Gate (5-meter Length x 2.5-meter Height) and Minimum size of Wicket Gate (1.5-meter Length x 1.5-meter Height) or as directed by Engineer In Charge

Data Sheet for RCC frame structure and B.B. Masonry Compound Wall with M.S. Gate		
Sr.No	DETAILS	PARAMETER/REQUIREMENT
<b>1</b>	<b>GENERAL</b>	
1.1	Location/Size (tentative)/Length & Height	Compound Wall (Location-Palej HW and Vadva Intake well)
1.2	Type	Compound wall comprising B.B. Masonry in C.M. 1:3 with R.C.C. columns M-20 at 3.0 m c/c & R.C.C. foundation, footing, columns, beams and coping in M-20 grade with 20 mm thick Cement plaster and finished with waterproof cement paint. Fencing with MS angle posts and barbed wire
<b>2</b>	<b>DESIGN DATA</b>	
2.1	Avg. Ground Levels	As per actual site condition and Approved Design.
2.2	SBC At site	Contractor shall carry out SBC for Design Purpose. The SBC test shall be carried out by NABL accredited lab.
2.3	Water table	To be decided on basis of soil investigation.
2.4	Seismic	Zone-III
2.5	Water Density	9.81 kn/cum (for design reference if required)
2.6	Plinth level of Compound Wall	As per Approved Design
<b>3</b>	<b>DESIGN REQUIREMENT</b>	
3.1	Standard Codes	(1) I.S. 3370, Part-1 to 4, 1965 or latest revised. (2) I.S. 456-2000 or latest revised. (3) I.S. 1893-2002, Part-1 to 5 or latest revised. (4) I.S. 875, Part - 1 to 5, 1987 or latest revised. (5) I.S. 10262 - 2009 or latest revised. (6) I.S. 13920 - 1993 or latest revised.
3.2	Foundation	The foundation shall be designed for actual SBC of soil strata confirmed by SBC Report The total Depth shall not be less than 1.35 m, as per relevant IS Code.
3.3	Grade of concrete	M20 for all concrete work.
3.4	Grade of Steel	As per approved Design.
3.5	Water Density	9.81kN/M3
3.6	Column	As per approved Design.
3.7	Beam	As per approved Design.
3.8	Clear Cover	As per approved Design.
3.9	Plaster	20mm thk sand face plaster
3.10	Colour	Two coats waterproof cement paint (exterior) of approved brand
3.11	Minimum Reinforcement	As per IS codes;
3.12	Fencing	1.20 m high fencing with 2.0 m long MS angle posts (40x40x6 mm), painted with 3 coats, fixed at 2.5 m c/c with 5 horizontal & 2 diagonal GI barbed wires (9.38 kg/100 m), posts embedded in CC 1:5:10 block (0.5x0.5x0.5 m)
3.13	Compound Wall Brick Work	As per approved Design.
3.14	Coping	RCC coping (M-20) at top of wall, min. 100 mm thick
3.15	M.S. Gate	Minimum size of Main Gate (5-meter Length x 3-meter Height) and Minimum size of Wicket Gate (1.5-meter Length x 1.5-meter Height) or as

Data Sheet for RCC Compound Wall with M.S. Gate		
Sr.No	DETAILS	PARAMETER/REQUIREMENT
		directed by Engineer In Charge

Data Sheet for Security cabin		
Sr.No	PARTICULARS	PARAMETER/REQUIREMENT
<b>1</b>	<b>GENERAL</b>	
1.1	Location	Village- Vadva , And Plaej H/W
1.2	Plinth level	Plinth level of Security cabin should be minimum 2.0 m above HFL.
1.3	Height	Height will be calculated from Plinth Level/maintenance floor level to bottom of beam of ceiling slab.
1.4	Carpet area (Sq. mt)	As per BOQ
<b>2</b>	<b>DESIGN DATA</b>	
2.1	Live Load on Floor Level	As per deisgn
2.2	Live load for accessible roof	As per deisgn
2.3	Type of structure	RCC Structure with masonry
2.4	SBC	To be carried out by Agency
<b>3</b>	<b>DESIGN REQUIREMTNT</b>	
3.1	Grade of concrete	M-20 (Minimum)
3.2	Grade of Steel	TMT Fe-500D steel to be used
3.3	Standard Codes	(1) I.S. 3370, Part-1 to 4, 1965 or latest revised. (2) I.S. 456-2000 or latest revised. (3) I.S. 1893-2002, Part-1 to 5 or latest revised. (4) I.S. 875, Part - 1 to 5, 1987 or latest revised. (5) I.S. 10262 - 2009 or latest revised. (6) I.S. 13920 - 1993 or latest revised.
3.4	Column	As per approved Design.
3.5	Beam	As per approved Design.
3.6	Bottom slab of PS	As per approved Design.
3.7	pump Floor	As per approved Design.
3.8	Top Slab	As per approved Design.
3.9	Clear cover	Foundation-60mm, Vertical Walls, beams, slabs-40mm & Other element as per latest IS code.
3.10	Minimum reinforcement for all members	Design requirements as set out in relevant IS codes in respect of all Reinforcements shall be strictly followed.
<b>4.0</b>	<b>Finishing work</b>	
4.1	Plaster	Water proofing
4.2	Colour	As approved by Engineer-in-Charge
4.3	Outside plaster	20mm thk sand face plaster

Data Sheet for Security cabin		
Sr.No	PARTICULARS	PARAMETER/REQUIREMENT
4.4	Inside plaster with water proofing	20mm thk cement plaster Finishing wall with water proofing cement
4.5	Railing	SS/Aluminium railing
5	Windows and Ventilation	2 tracks sliding Aluminium Anodized Window having extruded aluminium colour Anodized section frame wt. 1.2 kg/m with 5 mm thick transparent Glass with all fixtures and fastening. Polished Granite stone on sill, vertical jambs and Head Jambs. The window includes outside protective iron grill with opening to protect pigeon entry inside the pump house as per instruction of E-I-C. Minimum size of window is to be kept 1500mm x 1200mm. Exhaust fan to be mounted with outside bend pipe with screen on the pump house wall, as per instruction of E-I-C.
6	Flooring	1. Flooring in pump house shall be of polish Kota stone of 25mm thick over cement mortar of 20mm (Average) thick in 1:6 (1 Cement: 6 coarse sand) as per Engineer-In-Direction. 2. Flooring in panel room shall be of polish Kota stone of 25mm thick over cement mortar of 20mm (Average) thick in 1:6 (1 Cement: 6 coarse sand) and solvent free insulating coating above kota stone as per IS 15652 as per Engineer-In-Direction. 3. Flooring in SCADA room/ office room shall be vitrified tiles as per the Engineer-In-Charge
7	Parapet/Terrace	Minimum 230 mm thick 1 mt high parapet with inside and outside plastering has to be provided. China mosaic has to be provided on terrace.
8	Sills, Vertical Jambs and Head Jambs for Door, windows and ventilation	Should be of Polish Granite stone of minimum 12 mm to 15 mm thick.
9	Rain Water spout	Minimum 10 nos. (or as per requirement) of Rain water spout has to be provided on terrace of PVC pipe of 90mm dia. and up to disposal point at ground level.
10	Railing	Providing and fixing 25mm X 5.2mm SS/Aluminium moulded railing with three horizontal rows and posts of angels of size 65mm X 65mm X 8mm RCC 150 mm and 1.15-meter height and placed at 1.85mt c/c including painting two coats and anchorage in CC etc completed