Government of West Bengal
Irrigation & Waterways Directorate
Office of the Executive Engineer
Metropolitan Drainage Mechanical Division
Jalasampad Bhawan (4th floor), Salt Lake City, Kolkata-91
Telephone No-03323345768, Email Id: ee-metromecdvn@wbiwd.gov.in

EoI No.: WBIW/EE/MDMD/EoI-04/2018-19

NOTICE INVITING

EXPRESSION OF INTEREST (EoI)

For

Supply, installation, testing and commissioning including trial run and one (1) year successful operation and maintenance(with spares) of (water lubricated) vertical turbine mixed / axial flow pump sets four (04) nos. 50 cusec with allied electrical (HT & LT) and mechanical works complete for the proposed dumdum park pumping station at the confluence of cantonment khal and Bagjola khal , dist- 24 PGS(N) ,West bengal .

Government of West Bengal
Irrigation & Waterways Directorate
Office of the Executive Engineer
Metropolitan Drainage Mechanical Division
Jalasampad Bhawan (4th floor), Salt Lake City, Kolkata-91
Telephone No-03323345768, Email Id: ee-metromecdvn@wbiwd.gov.in

EoI No.: WBIW/EE/MDMD/EoI-04/2018-19

NOTICE INVITING EoI FOR FOR MOST SUITABLE TECHNICAL SPECIFICATIONS, BOQ AND BUDGETARY QUOTES

Offline bids are hereby invited by the Executive Engineer, Metropolitan Drainage Mechanical Division, Irrigation & Waterways Directorate on behalf of the Irrigation & Waterways Department of West Bengal through single stage offline sealed bid for obtaining most suitable Methodology, Technical specifications, BOQ and Budgetary quotes from all interested bidders/agencies/contractors within the country having Original Equipment Manufacturer of V.T. Pump Pre-Qualification (eligibility) credential for execution of works of similar nature and financial capabilities. The technical bid and the financial bid will determine the final selection and acceptance of price schedule, items of work, ToR, Specifications and even scope of work for framing of a DPR of the project mentioned later.

The participants may submit their bid with all necessary documents along with the covering letter duly signed by an authorized signatory **on or before 16.11.2018 by 15.00 Hrs** at the following address:

Office of the Executive Engineer
Metropolitan Drainage Mechanical Division
Jalasampad Bhawan (4th floor), Salt Lake City, Kolkata-91
Telephone No-03323345768, Email Id: ee-metromechdvn.wbiwd@gov.in

CONTENTS

SECTION – I

NOTICE INVITING EXPRESSION OF INTEREST (EoI)

EoI No.: WBIW/EE/*MDMD*/EoI - 04/2018-19; Dated 12.10.2018

Subject: Supply, installation, testing and commissioning including trial run and one (1) year successful operation and maintenance(with spares) of (water lubricated) vertical turbine mixed / axial flow pump sets four (04) nos. 50 cusec with allied electrical (HT & LT) and mechanical works complete for the proposed dumdum park pumping station at the confluence of cantonment khal and Bagjola khal , dist- 24 PGS(N) ,West bengal .

Government of West Bengal
Irrigation & Waterways Directorate
Office of the Executive Engineer
Metropolitan Drainage Mechanical Division
Jalasampad Bhawan (4th floor), Salt Lake City, Kolkata-91
Telephone No-03323345768, Email Id: ee-metromechdvn.wbiwd@gov.in

Offline Expression of Interests (EoIs) are invited by **Executive Engineer, Metropolitan Drainage Mechanical Division, Irrigation & Waterways Directorate** from eligible registered firms for obtaining **Methodology, Specifications, BOQ and (Proposed) Budgetary Quotes** for **Supply, installation, testing and commissioning including trial run and one (1) year successful operation and maintenance(with spares) of (water lubricated) vertical turbine mixed / axial flow pump sets four (04) nos. 50 cusec with allied electrical (HT & LT) and mechanical works complete for the proposed dumdum park pumping station at the confluence of cantonment khal and Bagjola khal , dist- 24 PGS(N) ,West bengal .**

1.	EoI Document	The EoI document can be downloaded from **www.wbiwd.gov.in** from 12.10.2018 onwards
2	Prebid meeting date & time	On 30.10.2018 at 2:30PM , Office chamber of Superintending Engineer, Mechanical & Electrical circle, 6th floor, Jalasampad Bhavan, Salt Lake. Kol-91
2.	Last date and time for bid Submission	**16.11.2018 at 15:00 Hrs. (Hard copy or thrugh e-mail)**
3.	Bid Security	**NIL**
For any queries , bidder may contact this office before submission of offline bid at 033-23345768 , E-mail : ee-metromecdvn@wbiwd.gov.in		

SECTION - II

1.0 INTRODUCTION TO THE PROJECT

It is experienced from past few year that a vast area adjoining of B.S.T. plant and Cantonment khal were inundated for a substantial period during rainy season. It is also observed that the gravity flow of cantonment khal is inadequate due to higher H.W.L/H-F.L of Bagjola Khal and compounding with tidal flooding at Bagjola Khal. To get relieve of the inhabit ants of that area, it is proposed for a lifting drainage pumping station at Dumdum park, Dist.24 Pgs (N). During non monsoon period i.e. October to June, gravity flows are sufficient to remove the drainage water from cantonment canal. But the pumping is required for monsoon period i.e., June to October, at the time of flood flow or back water from storm run off. This canal carries high volume of drainage water with municipal debris, fibers and silts.

1.1 LOCATION

The proposed Pumping Station is located at the outfall of cantonment khal at Dumdum park , Kolkata, Dist- 24 PGS(N) ,West Bengal.

1.2 OBJECTIVE

Objective of setting up the proposed Pumping Station is to provide intended extent of relief to the command areas of the proposed Pumping Station from water logging. This will lead to significant improvement of environment quality in the area as also the economic improvement of the community. Construction of Pumping Station of adequate capacity at out fall locations of the canals to reduce the frequency and extent of flooding thereby improving the level of service provided by the canals.

2.0 SALIENT DESIGN DATA(S) OF THE PUMPING STATION

2.1 Civil & Hydraulic Data

Sl No	Particulars	Data
1.2.1	(a) inlet arrangement	
1.2.2	Canal Bed Level at inlet to the sump	-0.81 M. (U/S of canal)
1.2.3	H.W.L. (suction side)	+1.905 M(GTS)
1.2.4	(b) Hydraulic Parameter of Pumping Station	

1.2.5	Pump Floor Level	+6.0 M(GTS)
1.2.6		
1.2.7		
1.2.8	Sump Bottom Level	-2.5 M(GTS)
1.2.9	Canal Bed Level at delivery side	-0.40 M(GTS)
1.2.10	(c) Outlet arrangement	
1.2.11	C.L. of Discharge pipe(above H.W.L.)	+4.0 M(GTS)

2.2 V.T. Pump Design

Sl No	Particulars	Data
01	Service	Suitable for pumping solid bearing liquid such as wastewater, industrial discharge, storm or canal drainage etc.
02	Type	Axial/ Mixed Flow Vertical
04	Duty	Continuous
05	Location	Indoor
06	Design Capacity	5100 M^3/Hr
07	Nos. Required	4
08	Head in Mtr	TDH (maximum) = 5.95m
09	Speed	<=600 r.p.m.
10	Min Bowl efficiency required at design capacity,%	85
13	Nos. of pumps working in parallel	
14	Range of Operation	Between 70% and 130% of rated capacity
16	Design & Constructional feature	As per Technical Specification
17	Material of Construction	Column pipe- CI FG260 IS210, Impeller- Duplex stainless steel ASTM 890 Gr CD4MCU, Line shaft- SS ASTMA 276-316
18	Supply of accessories and service	As per Technical Specification
19	Tests and Inspection	As per Technical Specification

2.3 BRIEF SCOPE OF THE PROJECT :

The scope of work under this estimate includes the Supply, installation, testing and commissioning including trial run and one (1) year successful operation and maintenance(with spares) of (water lubricated) vertical turbine mixed / axial flow pump sets four (04) nos. 50 cusec with allied electrical (HT & LT) and mechanical works complete for the proposed dumdum park pumping station at the confluence of cantonment khal and Bagjola khal , dist- 24 PGS(N) ,West bengal .

The works include all Mechanical, electrical, instrumentation, control and other related work as per as details scope of this estimate. The works are to be executed as per technical specification enclosed a separate part of this estimate. The part of specification shall be read in conjunction with other parts such as specifications, drawings and appendices which provide further information and details.

The contractor shall confirm of having visited site and collected and verified the data relating to site condition. The contractor acknowledges that any failure to acquaint itself with all such data and information shall not relieve its responsibility. The contractor shall be responsible for overall verification of equipment under the scope of work eg. Make, Model, specifications and responsible for detailed design of mechanical and electrical works of the proposed pumping station. Compliances with these specifications does not limit the responsibility of the contractor for the overall performance of the pumping station. Contractor can offer changes in design for better performance. Justification of such changes shall be provided by the contractor. such changes are subject to approval by E.I.C.

2.0 ELIGIBILITY CRITERIA/PRE-QUALIFICATION

While submitting the proposal, the bidder shall ensure that the bidder meets the conditions of eligibility as described below:

Sl. No.	**Eligibility criteria**	**Capability Assessment Documents**
1.	Should be registered in India	• IT Return • GST No. (If applicable)
2.	Should be a original equipment manufacturer of VT Pumps	Authorization of manufacturer, if any

4.	Technical Credentials	• It is desirable to firm have experience in similar nature of works in drainage / lifting water pumping station • Completion certificate, If any

4.0 INSTRUCTIONS TO BIDDERS

Submission of Application

The EoI document can be downloaded from www.wbiwd.gov.in from 12.10.2018 onwards. **Last date & time of submission of bid manually in drop box at office of Executive Engineer , Metropolitan Drainage Mechanical Division, is on 16.11.2018 till 15:00 Hours (IST).**

No processing fee or bid security (EMD) is required during submission of the bid.

The applicant bidders/contractors are advised to carefully read all the 'Terms & Conditions' contained in this EoI. They should particularly go through the minimum desired Pre-qualification (PQ) works credential & financial eligibility criteria and satisfy them for all the mandatory eligibility requirements. Bidders desirous of participating in the EoI and should submit bids only if they fulfill the minimum PQ eligibility criteria and are in possession of all the required PQ Credential documents "in original"

This EoI is not an agreement and is neither an offer nor invitation by 'The Authority' to the prospective Bidders or any other person to allot the project. The information contained in this EoI or subsequently provided to Bidder, whether verbally or in documentary or any other form by or on behalf of the 'Authority' or any of its employees or advisors, is provided to Bidder on the terms and conditions set out in this EoI and such other terms and conditions subject to which such information is provided. The purpose of this EoI is to provide interested parties with information that may be useful to them in making their financial offers (Bids) pursuant to this EoI. This EoI includes statements, which reflect various assumptions and assessments arrived at by the 'Authority' in relation to the Project. Such assumptions, assessments and statements do not purport to contain all the information that each Bidder may require. This EoI may not be appropriate for all persons, and it is not possible for the 'Authority', its employees or advisors to consider the objectives, financial situation and particular needs of each party who reads or uses this EoI. The assumptions, assessments, statements and information contained in the Bidding Documents, especially the Project Report/data may not be complete, accurate, adequate or correct. Each Bidder should, therefore, conduct its own investigations and analysis and should check the accuracy, adequacy, correctness, reliability and completeness of the assumptions, assessments, statements and information contained in this EOI and obtain independent advice from appropriate sources.

Information provided in this EoI to the Bidder(s) is on a wide range of matters, some of which may depend upon interpretation of law. The information given is not intended to be an exhaustive account of statutory requirements and should not be regarded as a complete or authoritative statement of law. The 'Authority' accepts no responsibility for the accuracy or otherwise for any interpretation or opinion on law expressed herein.

The 'Authority', its employees and advisors make no representation or warranty and shall have no liability to any person, including any Applicant or Bidder under any law, statute, rules or regulations or tort, principles of restitution or unjust enrichment or otherwise for any loss, damages, cost or expense which may arise from or be incurred or suffered on account of anything contained in this EoI or otherwise, including the accuracy, adequacy, correctness, completeness or reliability of the EoI and any assessment, assumption, statement or information contained therein or deemed to form part of this EoI or arising in any way for participation in this Bid Stage.

The 'Authority' also accepts no liability of any nature whether resulting from negligence or otherwise howsoever caused arising from reliance of any Bidder upon the statements contained in this EoI.

The 'Authority' may in its absolute discretion, but without being under any obligation to do so, update, amend or supplement the information, assessment or assumptions contained in this EoI.

The issue of this EoI does not imply that the 'Authority' is bound to select a Bidder or to appoint the Selected Bidder/Consortium or Contractor, as the case may be, for the Project and the 'Authority' reserves the right to reject all or any of the Bidders or Bids without assigning any reason whatsoever.

The Bidder shall bear all its costs associated with or relating to the preparation and submission of their Bid including but not limited to preparation, documentation, scanning uploading, expenses associated with any demonstrations or presentations which may be required by the 'Authority' or any other costs incurred in connection with or relating to its Bid. All such costs and expenses will remain with the Bidder and the 'Authority' shall not be liable in any manner whatsoever for the same or for any other costs or other expenses incurred by a Bidder in preparation or submission of the e-Bid, regardless of the conduct or outcome of the e-Bidding Process.

I&WD reserve the right to verify all statements, information and documents submitted by the applicant in response to the EoI Document. Failure of the I&WD to undertake such verification shall not relieve the applicant of its obligations or liabilities hereunder nor will it affect any rights of I&WD there under.

The EoI document shall be submitted by the bidder duly signed on each page of the document. In case the proposal is submitted on the document downloaded from official website, the applicant shall be responsible for its accuracy and correctness as per the version uploaded by I&WD and shall ensure that there are no changes caused in the content of the downloaded document. In case of any discrepancy between the downloaded or photocopied

version of the EoI document and the original EoI document issued by the I&WD, the latter shall prevail.

The right to suspend the short-listing process or part of the process to accept or reject any or all applications at any stage of the process and / or to modify the process or any part thereof at any time without assigning any reason therefore is reserved by I&WD without any obligation or liability whatsoever.

The bid document should be sealed in single envelope marked with the address, Name of work and EoI notice No., Last Date and Time of submission, Date and time of opening, name and address of the applicant.

The bid document should contain the following documents attached as annexure:

1. Cover Letter (as per Annexure-A/1)
2. Details of Representative from Bidder/Lead Member of Consortium (as per Annexure-A/2)
3. Technical Credentials of the Bidder and / or Consortium (Form-1)
4. Approach and Methodology being adopted by the Bidder and / or Consortium (Form-2)
5. BOQ details with Estimated cost in item rate (as per Form-3)

If the envelope is not sealed and marked as instructed above, this office assumes no responsibility for the misplacement or premature opening of the contents of the Proposal submitted. This office is not responsible for the non-receipt or delayed receipt of bid document send through courier or post.

Note: -

The envelope shall contain EoI document, signed copy of budgetary quotes along with Annexure in the prescribed format.

The Proposal shall be made in the Forms specified in this EoI Document. Any attachment to such Forms must be provided on separate sheets of paper and only information that is directly relevant should be provided. This may include photocopies of the relevant pages of printed documents.

EoIs received by this office after the specified time on the due date shall not be eligible for consideration and shall be summarily rejected.

Executive Engineer is not bound to accept any EoI and reserve the right to accept or reject any EoI, and reserve the right to annul the selection process and reject all EoI at any time prior to the award of the selection without assigning any reason(s) whatever and without thereby incurring any liability towards the affected participant(s) on this ground.

5.0 SCOPE OF THE WORK

The Basic scope covers the design, manufacturing, supply and inspection, testing, delivery, installation and commissioning of 04 nos. 50 cusec VT pump for the proposed pumping station at Dumdum park, Kolkata with bell mouth, column assembly, discharge elbow, motor stool, thrust bearing , non reversing device & lubricating system .

Each Vertical Turbine pump shall be capable of developing the required total head at rated capacity for continuous operation at the required total head at low water level in the sump. The pump will be required to work without parallel operation satisfactorily over the head requirements as per system resistance curves. Supply and installation of E.O.T. crane of 15 MT, MS Gratings, Bore well with submersible pump and centrifugal pump for cooling and lubrication purpose are also in the scope of work.

The design, drawing, manufacture, fabrication, erection, testing/ inspection of 11 KV indoor substation shall be carried out strictly as per Indian Electricity Rules , Latest BIS code of practices and prior approval of Directorate of Electricity , Govt of West Bengal.

Supply, installation, testing, commissioning of 1 nos. power transformer (1250 KVA, 11/415 V , ONAN) , Consumer 1 panel ACB at Sub Station (433 V), 1 set LT panel at Pump House ,Capacitor Bank , HT &LT Cabling , Earthing, , Internal illumination and allied electrical works ,Lightening conductor, instrumentation and communication system, Batter bank with charges also in the scope of work.

6.0 DECLARATION

I/We have completely read and hereby accept the scope of work, requirements, terms & conditions.

Signature of bidders authorised

Representative with seal:

Full address:

SECTION - III

ANNEXURE – A/1

Cover letter for Expression of Interest

To,
The Executive Engineer
Metropolitan Drainage Mechanical Division,
Jalasampad Bhawan (4th floor), Salt Lake City, Kolkata-91
Telephone No-03323345768, Email Id: ee-metromechdvn.wbiwd@gov.in
I & WD, Govt. of West Bengal

Sub: Submission of bid for obtaining Methodology, Technical Specification, BOQ and Budgetary Quote for the proposed: Supply, installation, testing and commissioning including trial run and one (1) year successful operation and maintenance(with spares) of (water lubricated) vertical turbine mixed / axial flow pump sets four (04) nos. 50 cusec with allied electrical (HT & LT) and mechanical works complete for the proposed dumdum park pumping station at the confluence of cantonment khal and Bagjola khal , dist- 24 PGS(N) ,West bengal .

Dear Sir,

In response to the Invitation for Expressions of Interest (EoI) published on _____ bearing Ref. No. _____ "Supply, installation, testing and commissioning including trial run and one (1) year successful operation and maintenance(with spares) of (water lubricated) vertical turbine mixed / axial flow pump sets four (04) nos. 50 cusec with allied electrical (HT & LT) and mechanical works complete for the proposed dumdum park pumping station at the confluence of cantonment khal and Bagjola khal , dist- 24 PGS(N) ,West bengal .''

I / We acknowledge that Executive Engineer will be relying on the information provided in the Bid and the documents accompanying the Bid for recommendation of the most suitable Methodology, Technical Specification, BOQ and Budgetary quotes for the aforesaid Project, and we certify that all information provided therein is true and correct; nothing has been omitted which renders such information misleading; and all documents accompanying the Bid are true copies of their respective originals.

I / We shall make available to the Executive Engineer any additional information it may find necessary or require to supplement or authenticate the Bid.

I / We acknowledge the right of the Executive Engineer to reject our Bid without assigning any reason or otherwise and hereby waive, to the fullest extent permitted by applicable law, our right to challenge the same on any account whatsoever.
I / We declare that:

a) I / We have examined and have no reservations to the Bidding Documents, including any Addendum issued by the Authority; and
b) I / We do not have any conflict of interest in accordance with the EoI document; and

I / We understand that you may cancel the Bidding Process at any time and that you are neither bound to accept any Bid that you may receive nor to invite the Bidders to Bid for the Project, without incurring any liability to the Bidders.

In the event of my / our being declared as the Recommended Bidder, I / we agree to enter into an Agreement in accordance with the documents that has been provided to me / us. We agree not to seek any changes in the aforesaid documents and agree to abide by the same.

I / We agree and understand that the Bid is subject to the provisions of the Bidding Documents. In no case, I / we shall have any claim or right of whatsoever nature if the Project / Agreement is not awarded to me / us or our Bid is not opened or rejected.

The estimated budgetary price has been quoted by me / us after taking into consideration all the terms and conditions stated in the EoI documents, our own estimates of costs including all direct and indirect tax liabilities and after a careful assessment of the site and all the conditions that may affect the project cost and implementation of the project.

I / We agree and undertake to abide by all the terms and conditions of the EoI document.

In witness thereof, I / we submit this Bid under and in accordance with the terms of the EoI documents.

Yours faithfully,

(Signature, Name & Designation of the Authorized Signatory)

Date:

Place:

Name & Seal of Bidder

ANNEXURE – A/2

Details of Representative from Bidder/Lead Member of Consortium

Part A : General Information of Bidding Companies/Agency		
1	Name of the Company/Agency	
2	Type of Organization	
3	Address of the registered office of the company/Agency	
4	Year incorporated	
5	Address for communication	
6	Contact person: Name Designation Phone No. Fax No. Mobile No. Email address	
	General Information Subsidiary and Associated Companies (wherever applicable):	
1	Name of the company	
2	Address of the registered office of the company/Agency	
3	Nature of Business	
4	Brief description of company (not more than 100 words)	
5	Any other information the bidder would like to include:	
Part B - Details of GST		
1	GST Registration No.	
2	LUT No. for zero rated supply	

ANNEXURE-B/1

(Form-1)

Technical Credentials of the Bidder and / or Consortium

Name of Client (End User) :	
Name of the Work :	
Nature of Work :	
Description of services performed by the company :	
Project Location :	
Name, e-mail ID, telephone no. and fax no. of client's	
Project Cost (Rs. in lakh)	
Start date and finish date of the services (month and year):	
Brief description of the Work:	

Notes:

- Use separate sheet for each Eligible Assignment.

ANNEXURE-B/2

(Form-2)

DESCRIPTION OF APPROACH AND METHODOLOGY, RESPONDING TO THE EOI SCOPE

A description of the approach, methodology and work plan for performing the assignment, including a detailed description of the proposed methodology and staffing for the assignment.

- ***Technical Approach and Methodology.***{Please explain your understanding of the objectives of the assignment as outlined in the scope mentioned in the Expression of Interest (EoI) document, the technical approach, and the methodology you would adopt for implementing the tasks to deliver the expected output(s), and the degree of detail of such output. Please do not repeat/copy the EoI in here.}

APPENDIX-1

QUOTED BID PRICE IN EOI

Schedule of work of the Project: **Supply ,installation, testing and commissioning including trial run and one year successful operation and maintenance of external water lubricated Vertical turbine pump sets of four(04) nos. 50 cusec with electro-mechanical installation complete for the proposed Dumdum Park Pumping Station at the confluence of Cantoment khal and Bagjola Khal, Dist. North 24pgs.**

Sl. No	Description of work as per preliminary assessment	Qnty.	Unit	Description of work proposed by the bidder (for budget quotes)	Quantity (for budget quotes)	Unit (for budget quotes)	Rate (Rs.) (budget quotes)	Amount (Rs). (budget quotes)
1	Supply, delivery, storing at site, installation, testing & commissioning of vertically suspended wetpit installation, axial/mixed flow, non pull out type, continuous rating VT pump complete with bowl assembly, column pipe assembly, discharge tee, base plate, motor stool, thrust bearing assembly etc. and all accessories conforming to the latest revision of IS 1710/IS 5120 and Hydraulic Institute standard USA and shall be designed to be protected against reverse direction of rotation suitable for following duties and conforming to detailed specification and enclosed G.A. drawing including two coats of painting with approved paint . Pump should be suitable for pumping solid bearing liquid such as wastewater, industrial discharge, storm or canal drainage etc. a) Pump capacity - 5100 M^3/Hr (each) b) TDH (maximum) = 5.95 (as per preliminary calculation) c) Maximum static head = 4.30 m. (as per preliminary calculation) d) Column pipe dia. = 900 mm (as per preliminary calculation) e) Motor speed <= 600 rpm (as per preliminary calculation) f) Lubcrication & cooling = external clear water g) Bowl efficiency = 85% (Minimum) h) Sump data : sump floor level - (-)2.50 M, C/L of delivery pipe - (+)4.0 M, pump house floor level- (+)6.0M, sump bay width- 2400mm i) Delivery below pump house floor level (The enclosed G.A.drawing, actual site condition and all preliminary	4	set					

2	Supply, delivery, storing at site, installation, testing & commissioning of 125KW (as per preliminary calculation) screen protected drip proof (SPDP) squirrel cage vertical flange mounting induction motor, F class insulation and temparature rise limited to B class, suitable to operate on 415V, 3ph, 50Hz AC supply with voltage variation of ± 10% and frequency variation of ±3%, synchronous speed 600 r.p.m(10 pole) suitable for S 1 duty, direct coupling with the vertically suspended pump (capacity: 5100 M^3/Hr) and as per latest version of IS 325, IS 4722, IEC 60034 and other relevent IS specification to meet the power requrement of the pump with 95% efficiency. (Motor rating to be verified by the bidder keeping in sufficient factor of safety as per site condition). Make- ABB/Jyoti/Marathon /CGL /Siemens/Kirlosker	4	set
3	Supply, delivery, storing at site, installation, testing & commissioning of C.I.D.F delivery pipes with flange and fittings complete with all accessories as per specication including jointing conforming to rhe latest revision of IS : 1710, IS : 5120, IS: 1537 & IS:1538. Straight pipe of 900 mm. dia. & 3000 mm. long(approx.) (one piece not exceeding 2.5m)	4	set
4	Supply, delivery, storing at site, installation, testing & commissioning of double acting automatic air relirf valve of nominal size 100mm as per IS 14845 with isolating mitre bevel geared sluice valve as per IS 14846 complete of material body & top cover- CI, IS 210 FG 260, internal fittings- bronze IS 318 LTB 2, hardware in contact with water- SS 304 and as per following specification. Working Pressure Body/seat - 7 / 5 kg/cm^2 Design Pressure Body/seat - 18 / 12 kg/cm^2 Testing as per IS 14846	4	set
5	Supply, delivery, storing at site, installation, testing & commissioning of 900mm. dia. C.I. Single flange,swing type double hung flap valve with pressure rating as per specific standard (Body, flap Cast iron, IS:210, FG:260, Body & disc set: stainless steel, AISI 304, Hinge pin: Stainless steel AISI 410), flange standard IS 1538, leakage as per IS 13349 class 3 and as per specificaton - Rated flow - 5100 M^3/Hr Velocity at rated flow - 2.228 m/sec	4	set

6	Supply, delivery, storing at site, installation, testing & commissioning of lubrication water pump horizontal, single/multi-stage, 6m³ per hour capacity, fitted with 2.2 KW motor 23 mtr. Head contineous rating centrifugal pump for lubrication and cooling system of approved brand complete squirrel cage induction motor with base plate, coupling etc.along with suction, delivery pipe with all fittings, non-return valve, sluice valves and all accessories for suction from water reservoir, striner and allied equipments all as per approved design and drawing.	2	set
7	Supplying, fitting and fixing of cooling & lubricating water G.I. pipe line of TATA make with all necessary accessories, specials viz. socket, bend, tee, union, cross, elbo, nipple, longscrew, reducing socket, reducing tee, short piece etc. fitted with holder bats clamps, including cutting pipes, making threads, fitting, fixing etc. complete in all respect including cost of all necessary fittings as required,jointing materials and two coats of painting with approved paint in any position above ground.		
7.1	50 mm dia. medium quality	40	p/mtr
7.1	25 mm dia. medium quality	30	p/mtr
8	Supply, Installation, testing & commissioning of pressure gauge meter for cooling & lubricating water pipeline completer with all accessories and suitable class of enclosure, including all sundries, fixtures as required as per specification and direction of E.I.C.	8	set
9	Supplying, fitting and fixing Peet's valve fullway gunmetal standard pattern best quality of approved brand bearing I.S.I. marking with fittings (tested to 21 kg per sq. cm.)		
9.1	50 mm dia	4	nos
9.2	25 mm dia	8	nos
10	Supply, delivery, storing at site, installation, testing & commissioning of trashrack/ bar screen/ grating conformong to relevent IS codes (IS:11388, IS:800, IS:2062) fabricated with structural steel sections such as ms flat, channels, angles etc. including cost of materials, machinary, labour, cutting, aliging, welding as per approved drawing including transportation charges as per direction of E.I.C. Material should be hot dip galvanized MS. All the steel materials should be of SAIL / TATA steel make	10700	p/kg

11	**Electrically operated monorail crane with supporting MS structure for trashrack lifting lowering** Supply, delivery, storing at site, installation, testing & commissioning of 5 M.T. capacity monorail EOT crane having both hoisting and LT motion electrical. The crane shall be suitable for outdoor operation as per IS: 807, IS: 3177 and IS: 3938 or equivalent at its latest revision for long travel length of 14000 mm and lift 8500mm. This work also includes design, manufacture supply & fixing of MS long travel monorail with supporting MS structure to be fit on the existing concrete floor and power feeding arrangement along the longitudinal travel of the crane comprising of 4 line PVC shrouded type GI conductor with supporting brackets. The crane should be marked with safe working load (SWL) and the purpose for which they are intended, the down shop conductors should be fully insulated shrouded bas bar type, including all sundries as per direction of E.I.C.	2	set
12	**Semi EOT crane inside pump house** Supply, delivery, storing at site, installation, testing & commissioning of 15 M.T. capacity single girder semi EOT crane having hoisting motion electrical and CT and LT motion manual to be operated from floor by hand chain. The crane shall be suitable for Class II (M-5) duty, indoor operation as per IS: 807, IS: 3177 and IS: 3938 or equivalent at its latest revision for span length(cross travel) of 7000 mm and lift 6500mm. This work also includes manufacture supply & fixing of MS long travel girder with square rail with sole plate and holding down bolts to be fitted on the existing concrete beam for the LT motion of (approx.) 12100 mm length and maximum gap between two concrete beam 3m (approx.) and power feeding arrangement along the longitudinal travel of the crane comprising of 4 line PVC shrouded type GI conductor with supporting brackets. The crane should be marked with safe working load (SWL) and the purpose for which they are intended, the down shop conductors should be fully insulated shrouded bas bar type, including all sundries as per direction of E.I.C.	1	set

13	Sinking of 200 mm. dia. (8") well x 180 m depth (approx) with 30 M strainer.		
	Labour for drilling perfectly vertical bore hole of specified dia. For a specified depth below ground level in alluvial soil strata by mud rotary rig drilling as required to suit the site condition as per direction of E.I.C. Including use of own rigs and its accessories, tools & plants and consumables etc. for lowering of finished bore suitable for lowering of 200 mm. dia. GI/PVC pipes for housing, fitted with socket and with or without well screen as per necessity for the soft, medium, hard and boulder formation (GI/PVC casing pipes of required by the contractor to protect collapse of over burden portion) including lowering and withdrawing of casing pipe after drilling 200 mm. to 450 mm. dia. in over burden portion.	1	p/job
	Supply of all pipes material and labour and T & P for lowerin the GI/PVC pipes with or without slotted pipes as per the necessity from ground level and fitted and fixed up in perfectly vertical position, including cutting and threading ofpipe and slotted pipwe and fixing all joints, materials etc. complete and keeping the top of the casing pipe threaded including plugging tube wells to prevent entry of foreign materials from the obove excluding the cost of fittings and materials.		
	Cleaning and developing the production well using thir own compressor continuously worked till clear and adequate discharge in obtained from the tube well including supply and use of all necessary equipments and labour as nper direction of E.I.C.		
	Supply all labours, T & P for packing the bore with washed gravel (Size P - 6) around the pipes in good quality including cost of gravel etc. complete as per direction of E.I.C.		
	Supplying all materiasls, labour and T & P and grouting with cement slurry for sanitrary sealing around the GI casing pipe up to 3 mtrs. Below ground level including cost of cement all complete as per direction of E.I.C.		

14	Supply, delivery, installation (Bore hole installation) and testing at site of 11 m^3 per hour capacity, 50 m head, continuous rating vertical submersible pump conforming to IS : 8034- 2002 and coupled with 3.7kw, 3 phase, 415 volt, induction motor conforming to IS 9283 - 1995 of approved brand along with NRV and required quantity of 1 x 3 x 4 sq. mm. PVC submersible cable along with required length of G.I./PVC pipe with necessary fittings for connecting pump delivery from under ground well to overhead reservoir. Supply and delivery fittings including sundries, fixtures as required as per direction of E.I.C.	1	p/job
15	Carriyng out CFD analysis of the sump as per design and drawing , based on details of pump being offered at reputed educational institute/ laboratory with prior approval of E.I.C. and to provide suitable arrangement of flow guides, buffers, splitters etc. at the sump to achive smooth pump operation free from vortex, pre rotation, swirl etc.	1	p/job

Electrical components

16	SITC of 12 KV, 630 Amps single Panel with 12 KV, 630 Amps 25/26.2 KA VCB switchgear along with Panel top moounted P.T. as per enclosed specification. **RATING: 630A** **BUSBAR 630A COPPER (25KA for 3sec) - 1no** **A: MOVING PORTION:** A1: 11KV, 630A, 25KA for 3sec VCB - 1no A2: VCB Enclosure + 1250A Copper connections - 1no A3: 630A PVC sleeved Copper Bus Bars -1no **B: CT AND PT DETAILS:** B1: 2 Core CT: CTR:150/1A+1A - 3nos CORE 1: For metering, class-0.5, 15Va CORE 2: For Protection, Class-5P10, 15VA B2: 3 Nos 1Phase PTR:11KV/v3/110V/v3, Cl. 1 50VA (Panel top mounted PT) (Drawout type) - 1no **C: BREAKER PANEL INDICATION LAMPS:** C1: BREAKER ON/OFF/Trip circuit Healthy/ Spring charge indication/	1	set

C2: R-Ph./ Y-Ph./ B-Ph. -3nos

D: SWITCHES AND OTHER ACCESSORIES:

D1: DC ON/ OFF Switch- 1no

D2: AC ON/ OFF Switch-1no

D3: Auxiliary contactor (2NO + 2NC) - 1no

D4: Heater with heater switch & thermostat -2nos

D5: Cubicle illumination lamp-1

D6: 15A, 230V, 3 pin plug & socket and MCB -1no

D7: Local Remote Switch -1no

D8: T-N-C Switch -1no

D9: Mech. On-OFF push button -1no

D10: TTB -1no

D11: Buzzer- 1no

E: METERS & TRANSDUCERS:

E1: Ammeter with selector switch -1no

E2: Voltmeter with selector switch- 1no

E3: Digital MFM (Model: EM6400, CI-1.0 SCHNEIDER MAKE)- 1no

F: RELAYS

F1: Numerical relay communicable on MODBUS protocol MICOM P 127- 1no

F2: Mastertrip lockout relay VAJH 13 (86)- 1no

F3: Electromechanical type DC fail relay VAA21 -1no

F4: Electromechanical type Trip circuit Supervision Relay (VAX31)- 1no

PT should be drawout type & Power pack unit must be provided for tripping circuit

Cable entry box both side (Incomer & Outgoing) suitable for 3C X 240 sq. mm XLPE 11KV grade cable.

17	Supply, delivery, storing at site,installation, testing & commissioning of 1250 KVA, 11KV /433V**,** 3 phase, 50HZ Δ/λ, Dyn 11 outdoor ONAN type **transformer** in IP 55 enclosure with copper windings, OFF load tap changing arrangement in steps of + 1-2.5% & - 7.5%, having HT cable end boxes with cable gland plate suitable for terminating 11KV ,3C x 240 sqmm XLPE/ ARMD, AL cables for primary side and 1.1KV, 6 x 3C x 400 sqmm. XLPE/ARMD, AL cables on the secondary side, three channel temperature scanner for continuous monitoring of the windings , with supply of all associated materials and accessories like oil conservator, silica gel breather, mounting channels bolts ,nuts washers, screw, clamps, painting, earthing etc.and confirming to IS- 1180 (Level-1) and as per specification as laid down in the contract complete in all respect as required at site including construction of required size CC pedestal. Make- Schneider/ KEC /CGL/ABB.	1	set
18	**LT PANEL AT PUMP HOUSE** Supply, delivery, storing at site, installation, testing & commissioning of 415V (35MVA) TPN floor mounting free standing LTpanel made of min. 2mm thick sheet steel and stiffened by angle iron frame as necessary extensible on either side totally enclosed, dust and vermin proof, self supported, free standing unit with base channel, multi tier, compartmentalised cubicle, front access type construction with details of feeders as given below. LT panel shall be suitable for 500/415VAC 50HZ, 3-phase and neutral system.Panels shall be treated with seven tanks process before painting with two coats of epoxy paint over two coats of epoxy primer all of approved shade complete with front operated incoming and outgoing switchgears, cablealleys, provision for cable entries from top and bottom, necessary meters, internal wiring with1.1KV, copper wire (2.5 sq.mm) protection HRC fuse etc terminal blocks, selector switches, inter connection with insulated(1.1KVgrade) colour coded copper conductor cable, gland plates, earth bus of copper, lifting bolts, level inscriptions, earth connections etc and supply of all necessary accessories all complete and mending good the damages as required. Make- Note:All works are to be done in accordance with I.E.rules and regulation and as per direction of Engineer-in-charge.GA drawing for each panel has to be get approved by the engineer-in-charge before **(A) I**	1	set

(ii) 1-set (3 Nos in each set) 15VA, 2000/5A, CL-1 for metering CTs

(iii) 1-set cable termination box suitable for 6 nos x 3½ C x 400 sq. mm., 1.1KV, XLPE /A, AL cable

(iv) 1-set 0-2000/3000A AC flush mounting digital ammeter with selector switch.

(v) 1-set 0-500V flush mounted digital voltmeter with selector switch

(vi) 1-set ON/OFF/TRIP/TRIP CIRCUIT HEALTHY lamps and push

(vii) 1-set R/Y/B phase indication lamps

(viii) 1-set TRIP/NEUTRAL/CLOSE selector switch

(ix) Earth bus-bar and all other accessories complete

(x) Annunciator unit. 8W

(xi) 1-set Multi Function Meter

(B) Bus-Bars

1-Set TPN, 500/415V, 2000A, 50Hz, 35 MVA continuous rated copper bus-bar with insulating sleeves

(C) Outgoing

(i) 5 nos-400A TPN 500/415V, AC 50KA breaking capacity MCCB microprocessor based. Fully Automatic Star Delta Starter (FASD) for operation of 125KW pump motor having 3nos. 300A, 415V, TP AC 3 contactors and timer 0-30 sec CT operated thermal O/L relay having suitable setting range with single phase preventor MN-12-L, ON/OFF/TRIP lamps, START/STOP push buttons, 0-500A, CT operated digital ammeter with 500/5A class-1 CTS and selector switch, local/remote selector switch, temperature scaner (Masibus/Minilec make), completely wired up to the terminals (for 4 nos VT pump & 01 no spare)

(ii) 5 nos- 100A TPN 500/415V MCCB with breaking capacity of 50 KA including 0-100A CL-1 digital ammeter with 60/5A class-1 CTs and selector switch and ON/OFF/TRIP indication light complete (1 no for EOT crane, 1 nos for LDB, 1 nos for PDB, 2 nos spare).

(D) Earth bus-bar

Continuous earth bus ba rof 50 x 6mm G.I. flat running continuous through out the length of the switch board with earthing terminals.

19	**Cooling/lubrication pump & submersible pump starter.** Supply and fitting fixing of wall mounted cubicle panel board fabricated with 2mm MS CRC sheet complete with powder coated paint, copper busbar with all accessories. 1 Nos-100A TPN 500/415V, AC 50KA breaking capacity MCCB microprocessor based with all other accessories complete including 415V, 2nos DOL starter for operation of 02 nos 2.2KW cooling/lubrication pump motor and 1no Submesiable Pump controller Starter MUG-15 fully automatic star-detta starter (L&T make) for 01no submersible pump having 1 no contactor 32A, CT operated thermal O/L relay having setting range 4-6.3A with, single phase preventor, ON/OFF/TRIP lamps, START/STOP push buttons, 0-500A, CT operated digital ammeter with 500/5A class-1 CTS and selector switch, local/remote selector switch, completely wired up to the terminals (2 nos. 2.2 KW	1	set
20	**Capacitor Bank** Supply, delivery and storing at site, erection, testing & commissioning of capacitor bank of 40KVAR or suitable rating to reach improve power factor near to 1, delta connected double dielectric heavy duty Metalised poly propylene -Heavy duty (MPP-H) power factor correction capacitor 415V AC, 3ph, 50Hz, as per IS:13340 & IEC specification to be connected directly in parallel with the 125 KW motor terminals including supply and installation of Reactor/ Inductor coil against each module. Including supply of 16G well ventilated, Powder coated MS enclosure of appropriate size and duly painted. Note:Capacitor should be able to with stand a 110% of rated voltage and 130% of rated current. Make- EPCOS/Unistar/L&T)	4	set
21	**HT CABLING** Make- GLOSTER/NICCO/UNISTAR Supplying and laying of HT cable of 11 KV grade 3 core 240 Sq. mm XLPE armoured Aluminum cable in excavated cable trench, erected cable tray, pipes and masonary trench, through under ground as and where necessary as per I E Rule/PWD Schedule.	30	RM
22	Supply and fixing of XLPE 11KV HT end termination joints (heat shrinkable type) for 3C x 240sq.mm cable including supplying all jointing materials, compound end socket, tool tackles, crimping machine and labour charges etc. **(Roychem/Frontech make)** a) Indoor termination	3	Set

23 **LT CABLING** Make- GLOSTER/NICCO/UNISTAR

Supplying and laying of following sizes of 1.1KV grade XLPE insulated armored aluminum cable in excavated trenches, erected cable tray, pipes and masonary trench through under ground etc. as and where required as follows:

3½-C 400 Sqmm XLPE/A Al Cable.	240	R/M
3-C 240 Sqmm XLPE/A Al Cable.	160	R/M
3½-C 50 Sqmm XLPE/A Al Cable.	100	R/M
4-C 25 Sqmm XLPE/A AL Cable.	100	R/M
3C X 10 Sqmm XLPE/A AL Cable.	150	R/M
7C X 2.5 Sqmm XLPE/A Cu Cable.	100	R/M
14C X 2.5 Sqmm XLPE/A Cu Cable.	100	R/M
2C × 10 Sqmm XLPE/A AL Cable.	200	R/M

24 Supply of following gauge GI earth wire and laying in proper places as per specification.

6 G	50	R/M
8 G	50	R/M
12 G	50	R/M

25 Supplying and fixing of compression type brass cable gland and finishing the cable ends of XLPE/A aluminum cable by crimping with cable sockets, including tapes etc including supplying coppercable sockets all joints materials and making connection including earthing as per approved practice as follows (As per PWD schedule of electrical works)

3½-C 400 Sqmm XLPE/A Al Cable.	12	set
3-C 240 Sqmm XLPE/A Al Cable.	16	set
3½-C 50 Sqmm XLPE/A Al Cable.	4	set
4-C 25 Sqmm XLPE/A AL Cable.	6	set
3C X 10 Sqmm XLPE/A AL Cable.	12	set
7C X 2.5 Sqmm XLPE/A Cu Cable.	10	set
14C X 2.5 Sqmm XLPE/A Cu Cable.	16	set
2C × 10 Sqmm XLPE/A AL Cable.	10	set

26	**Cable tray**		
	Supplying and installation at site perforated Galvanised Iron Cable tray of following sizes.[Mode of measurement for bends,tees, cross members, reducer etc., 20% extra to be added on running metre length of cable tray]	60	R/M
	375 mm x 2.0 mm x 50 mm		
27	Supply, delivery, storing at site & installation of fabricated ladder type cable tray made from 50 x 50 x 6mm M.S.angle and 25 x 6mm M.S.flat at 300mm intervals with drilled holes with necessary supports, clamps, bolts, nuts, washers, screws, and all other accessories painting earthing complete.		
	450 mm wide	50	R/M
28.0	**Earthing station and accessories**		
28.1	Supplying and installation of all materials necessary for Boring earthing pits 300mm dia and supply and fixing of pipe earth electrode with 80mm dia G.I (M) pipe(IS-1239) 3.0 M long having 12mm dia holes on its length driven to an average depth of 3.65M below the ground level including supply and fixing1no.65 mm x 8 mm G.I.steel tape 4M long 25mmdia x 150mm long galvanised double bolts double nuts and washer including s/f 80mm diaGI pipe protection of 3.0M length to be filled with bitumen partly underground level and partly above ground levelincludingS/FofG.Ireducer,bolts,double nuts,double washers & restoring the surface duly rammed.Also providing necessary masonry inspection pit on the top of the earth electrode having overall size 550 X 550 X 475mm deep below GL complete with CBW (1:6)of 125cmwidth duly plastered with cement mortar (1:6) (inside), S/F CI hinged inspection cover of size 300 X 300 mm (approx) in cement concrete of depth 100 mm and treating the soil of the earth pit with salt & charcoal or coke.	10	Set
28.2	Do-as above with G.I. plate of 610 × 610 × 10mm size & others as per IS- 3043/PWD SOR etc. for Transformer. Neutral connection.	2	Set

29	Supplying and fixing of hot dipped **GI strip of** following sizes, for connecting the neutral of transformer / earth bus bars to earth electrode including supply and fixing 50 mm x 6 mm galvanised steel tapes as per IS with 3 mm thick GI space bar saddle at an interval of 500 mm on wall having clearance of25 mm from wall as necessary for earth connection complete with GI bolts, nuts, washer etc as required for tapping, where required, floor chipping embedding the strip and mending good the damages with cement concrete (1:2:4)-1/4" down stone chips to be used and neat cement finish, for body earthing of sub-station equipment.For under ground portion the GI tape shall be painted with anti-corrosive bituminous paint and the rate shall include excavation, refilling and ramming of earth. Depth of the trench minimum 300 mm.		
	(i) 65 x 8 mm	100	RM
	(ii) 50 x 6 mm	100	RM
	(iii) 40 x 6 mm	50	RM
	(iv) 25 x 6 mm	50	RM
30	Supplying and fixing of 5.0 kg capacity **fire extinguishers** (Dry chemical type) to be fitted in wall with suitable bracket including cutting,chipping and mending good the damages.	6	Each
31	Supplying and fixing 9 lts. Capacity MS fire bucket coloured red.	6	Each
32	Supplying and fixing of **shock treatment chart** duly framed with glass on wall with necessary screws.	2	Each
33	Supplying and fixing of 250 mm x 250 mm x 2 mm thick **danger boards** with screws.	8	Each
34	Supplying and delivery high high voltage tested electrical rubber mat size (1mte x 2 mtr) and thickness 25 mm at site.	4	Each
35	Supplying and fixing of **First Aid Box** with all items as required by rule on MS Bracket including mending good the damages.	1	Set

DISTRIBUTION BOARDS

36	Supplying and installation off 500V 8 way TPN MCB double door type Distribution board with incoming isolator and outgoing MCBs including separate TPN copper busbars,earth busbar setc.suitable for single and multiple pole MCBs complete with all inter connection in manufacturers MS (IP 44) enclosure suitable for flushed fitted in wall,danger board and all other accessories including supplying of all accessories, earthing, painting etc.and comprising the following: Note: MCBs shall be 10 KA short circuit rating (min). Make- Anchor/Legrand/ Havells. 8 way -TPN Distribution Board (Legrand: 1No - Incoming 125A 4 Pole MCB 9 Nos - 32 A SP MCBs 3 Nos.-16 A SP MCBs Complete set as stated above	2	Set
37	Supplying and Fixing following Indoor Industrial High bay lumminaires on top of masonary structure by 3 Nos. 10 mm dia. x 87 mm long rag bolts, nuts & double washers complete either 37 mm x 10 mm MS flat support/or by other means as required. (BY325P LED100S CW PSE GR FG WB PB)	4	Each
38	Supplying and Fixing GI water proof looping cable box having hinged GI Top Cover having 4 mm thick with rubber gasket lining, railway type mechanical locking arrangement, earthing terminal with lug etc. of the following sizes as indicated below, Comprising of 3-way connector, screws etc. after dismantling the damaged looping cable box etc. where necy. incl. painting. a)150x150x100mm.	4	Each
39	Supplying & Fixing only 4'(ft) LED light BN 108C LED 20S PSU CDL, WH, Philips make or equivalent) fitting complete with all accessories directly on wall/ceiling by screws etc.	20	Each
40	Supplying and fixing double-door SPN MCB Distribution Board with IP-42/43 protection, concealed in wall after cutting the wall & mending good the damages to original finish incl. Inter connection with suitable size of copper wire and neutral link & provision for earthing		

41	Supplying and fixing 240/415 V MCB Isolator on din rail of existing DBs and necessary connection. 40A, DP Isolator(Siemens Make)	2	Each
42	Supplying and fixing 240 V MCB of Breaking capacity 10kA & C characteristics on din rail of existing DBs and necessary connection (6-32A) SP MCB (Siemens Make)	32	Each
43	Distribution wiring in 2 x 22/0.3 (1.5 sqmm) single core stranded 'FR' PVC insulated & unsheathed copper wire (Brand approved by EIC) in 20mm size PVC rigid conduit 'FR' (Precision make), with 1x22/0.3 (1.5 sqmm) single core stranded 'FR' PVC insulated & unsheathed copper wire for ECC, to light/fan/call bell points with Piano Key type switch fixed on MS CRC sheet metal (16 SWG) switch board cum JB on wall complete with 2 no. suitable size “Ph & N” copper bar incl. bakelite/Perspex (wall matching color) top cover 3 mm thick and incl. 175mmx100mmx65mm inspection box, making earthing attachment, painting the MS box and mending good the damages to original finish		
	Average run 8 mtr	30	Point
44	Distribution wiring in 1.1 KV grade 22/0.3 (1.5 sqmm) single core stranded 'FR' PVC insulated & unsheathed copper wire (Brand approved by EIC) in 20mm size PVC rigid conduit 'FR' (Precision make), with 1.1 KV grade 1 x 22/0.3 (1.5 sqmm) single core stranded 'FR' PVC insulated & unsheathed copper wire as ECC, to 5A 3 pin flush type plug socket & Piano Key type switch fixed on MS CRC sheet metal (16 SWG) switch board cum JB on wall incl. bakelite/Perspex (wall matching color) top cover 3 mm thick and incl. painting the MS box and mending good the damages to original finish		
	On Board	6	Point
45	Supplying and fixing 5 in 1 combined power plug unit with box (20A and 10A) Anchor make shutter type with necessery screw/ nuts, bolts with washer PVC wire etc. as required on wall.	6	nos

46	Distribution wiring in 1.1 KV single core stranded 'FR' PVC insulated & unsheathed copper wire (Brand approved by EIC) in 20mm size PVC rigid conduit 'FR' (Precision make) incl. necy. fittings as required 2 x 36/0.3 (2.5 sqmm) + 1 x 22/0.3 (1.5 sqmm) ECC	200	RM
47	Supply and fixing following ceiling fan complete with blades, canopy, fork, rubber bush etc. incl. S & F connecting wire for down rod upto 30 cm. incl. painting the rod with approved paint and making necy. connection as required by 2X1.5 sqmm. flexible copper wire. i) Ceiling fan size 1200 mm sweep (Crompton Greaves make)	4	each
48	Suply & fixing of single phase 200-250V AC Exhaust Fan of sweep dia 300mm	12	nos
49	Supplying and Fixing following outdoor luminaires or MV light fitting complete with all accessories to be fixed /projected from the wall of the building incl. making holes/providing clamping arrangement & necy. GI reducer as required. S&F 40 mm GI pipe (ISI-Medium) quality 1.5 mts. average length having suitable bend S&F necy. length of 1.5 sq.mm PVC insulated single core stranded annealed copper wire and making connections as required and mending good damages to wall incl. painting etc. (Type-BRP409 LED 065CW HEMRFGSI PSU GR, Philips make or equivalent)	12	Each
50	Supplying and Fixing GI water proof looping cable box having hinged GI Top Cover having 4 mm thick with rubber gasket lining, railway type mechanical locking arrangement, earthing terminal with lug etc. of the following sizes as indicated below, Comprising of one 250 V, 15 A Kit-Kat fuse unit, one NL on porcelain insulator etc. and housing the same in pole muffing incl. addition and alteration to the existing CC muffing (6:3:1) after dismantling the damaged looping cable box etc. where necy. incl. painting. a) 250 x 250 x 100mm.	12	Each

51	S & F Lightning conductor Air-terminals made of 15 mm dia 1500 mm long GI pipe (ISI Medium) having five prongs of 4 SWG GI (Hot Dip) wire at top with 85 mm dia 6 mm thick GI base plate at bottom incl. necessary holes etc. duly grouted on the parapet etc. in CC mortar (4:2:1).	4	nos
52	Supply & Fixing 7/10 SWG GI (Hot Dip) stranded wire for Horizontal run on the parapet/roof/wall with GI saddles spaced not exceeding 1100 mm apart incl. mending good the damages to building works.	70	mtr
53	Supplying & fixing medium gauge GI Pipe (ISI-Medium) Protection with necessary fittings and jointing metarials as required, 65 mm dia	12	mtr
54	Supplying swaged and welded steel Tubular pole (4 10-SP-28 ; length 9 mtr ; as per IS -2317-1980) (Calcutta Poles & Tube Co.)	6	per Set
55	Erection of Single Steel tubular pole of length as given below with / without sole plate & cap etc. in CC foundation (Proportion and dimension indicated below), having 600x600x150 mm thick CC (4:2:1) base block below sole plate/pole with hard jhama metal including CC (6:3:1) muffing 0.30 mts. dia and 0.30 mts. above ground level including 3mm thick neat cemented finish and GI earth bolt after making drilled holes etc. on pole & carriage of pole up to 1.6 Km from store to work-site including filling up the excvated earth pit with shifted soil and ramming properly. (a) Upto 9.0 mtr. Size 0.6 x 0.6 x 1.70 mts.	6	per Set
56	Extra on items 1 above, for providing CC (6:3:1) base block (around the pole) dimension 0.60x0.60x0.76 mt. above ground level, neatly cemented finish (3 mm thick), at the base pole (in lieu of CC muffing) suitable for alkathene/ polythene pipe entry as directed for street light wiring, incl. S & F 25cm x 25 cm x 10cm GI Loop box, 16SWG & incl. drilled hole in pole.	6	per Item

57	Supplying and Fixing following outdoor luminaires or MV light fitting complete with all accessories to be fixed /projected from the wall of the building incl. making holes/providing clamping arrangement & necy. GI reducer as required. S&F 40 mm GI pipe (ISI-Medium) quality 1.5 mts. average length having suitable bend S&F necy. length of 1.5 sq.mm PVC insulated single core stranded annealed copper wire and making connections as required and mending good damages to wall incl. painting etc. (Type-BRP409 LED 065CW HEMRFGSI PSU GR, Philips make or equivalent)	10	Each
58	Supplying and laying 2-core, 10 Sq.mm. Al. armoured cable (Gloster /Havell's) in underground trench 460 mm wide x 760 mm average depth, with brick protection on the top of the cable with 8 (eight) Nos. bricks per meter, including filling the space between the brick & cable and also the trench with shifted soil, leveling up and restoring surface	100	mtr
59	Supply and fixing compression type gland complete with brass gland, brass ring & rubber ring for dust & moisture proof entry of XLPE/PVC armourred cables as below:- For 2 Core 10 Sq.mm Cable	6	Nos
60	Finishing the end of following XLPE/PVC insulated armoured cables by crimping method including S&F solderless sockets (Dowles make),tapes anticorrosive paste and jointing materials:- For 2 Core 10 Sq.mm Cable	6	set
61	Supplying and fixing 100 A, FN 100 TPN SFU in SS Enclosure Main Switch (L & T Make) on flat iron frame/angle iron frame on wall.	1	Each
62	Painting of Steel Tubular Pole of lengths and no. of coats of paint, as given below with ready mixed paint/ primer of approved make, and brand incl. preparation of surface by sand paper/ emery paper, cleaning etc. for receiving fresh coat of paint. (a) Up to 9.0 mtr. long pole (i) 1st coat of aluminium paint over 1 coat of RO priming.	6	Per pole
	(ii) 2nd coat of aluminium paint over 1st coat.	6	Per pole

GOVERNMENT OF WEST BENGAL
IRRIGATION & WATERWAYS DIRECTORATE
CENTRAL DESIGN OFFICE
JALASAMPAD BHAWAN , SALT LAKE ,
KOLKATA - 700091

PROPOSED SLUICE ALONG WITH ADJACENT PUMP HOUSE AT OUTFALL OF CANTONMENT KHAL UNDER CANALS DIVISION.

GENERAL ARRANGEMENT DRAWING

DRG. NO. -	FILE NO.- S-3/195	DATE-
821/2/6/S/18		11.07.2018

S. MANNA DRAWN BY			
(A. KANJILAL) HEAD D/MAN	S A HAKIM ASSISTANT DIRECTOR CENTRAL DESIGN OFFICE	AMIYA BERA DEPUTY DIRECTOR CENTRAL DESIGN OFFICE	T . R. BARUA DIRECTOR CENTRAL DESIGN OFFICE

SHEET. - 1/6 TOTAL SHEET. - 6

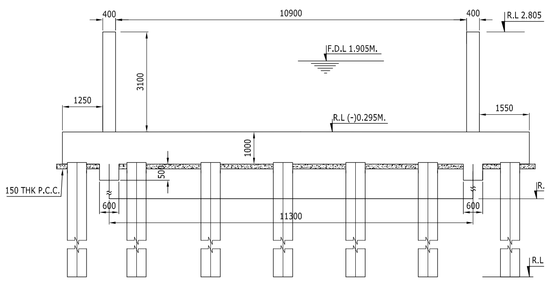
REFERENCE:- 1. MEMO NO. 2449 DT. 11.07.14 OF S.E./ EASTERN CIRCLE
2.MEMO NO.3395 DT.10-11-14 OF S.E./ EASTERN CIRCLE
3. MEMO NO. 293-1FC(TW-O/IFC-4M-19/2004 DT. 25.11.14 OF DEPUTY SECRETARY TO CE(D&R)
4.THIS OFFICE MEMO NO.S3-195/1127 DT.26-8-16

REVISION MADE	SIGNATURE				
	DRAUGHTSMAN C.D.O.	ASSISTANT DIRECTOR C.D.O.	DEPUTY DIRECTOR C.D.O.	DIRECTOR C.D.O.	

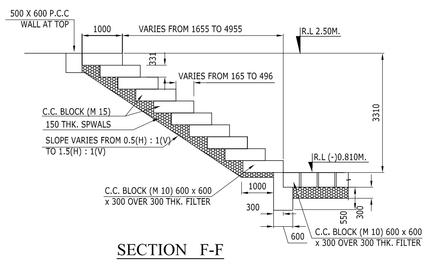
CANTONMENT KHAL		UPPER BAGJOLA KHAL	
1. DISCHARGE	= 9.37 CUMEC.	1. DISCHARGE	= NOT SUPPLIED
2. D. B. L	= (-) 0.810M.	2. D. B. L	= (-) 0.395M.
3. F. D. L	= 1.905 M.	3. F. D. L	= 1.890 M.
4. H. F. L	= NOT SUPPLIED	4. H. F. L	= NOT SUPPLIED
5. BED WIDTH	= 8.60 M.	5. BED WIDTH	= 20.00 M.

NOTES :

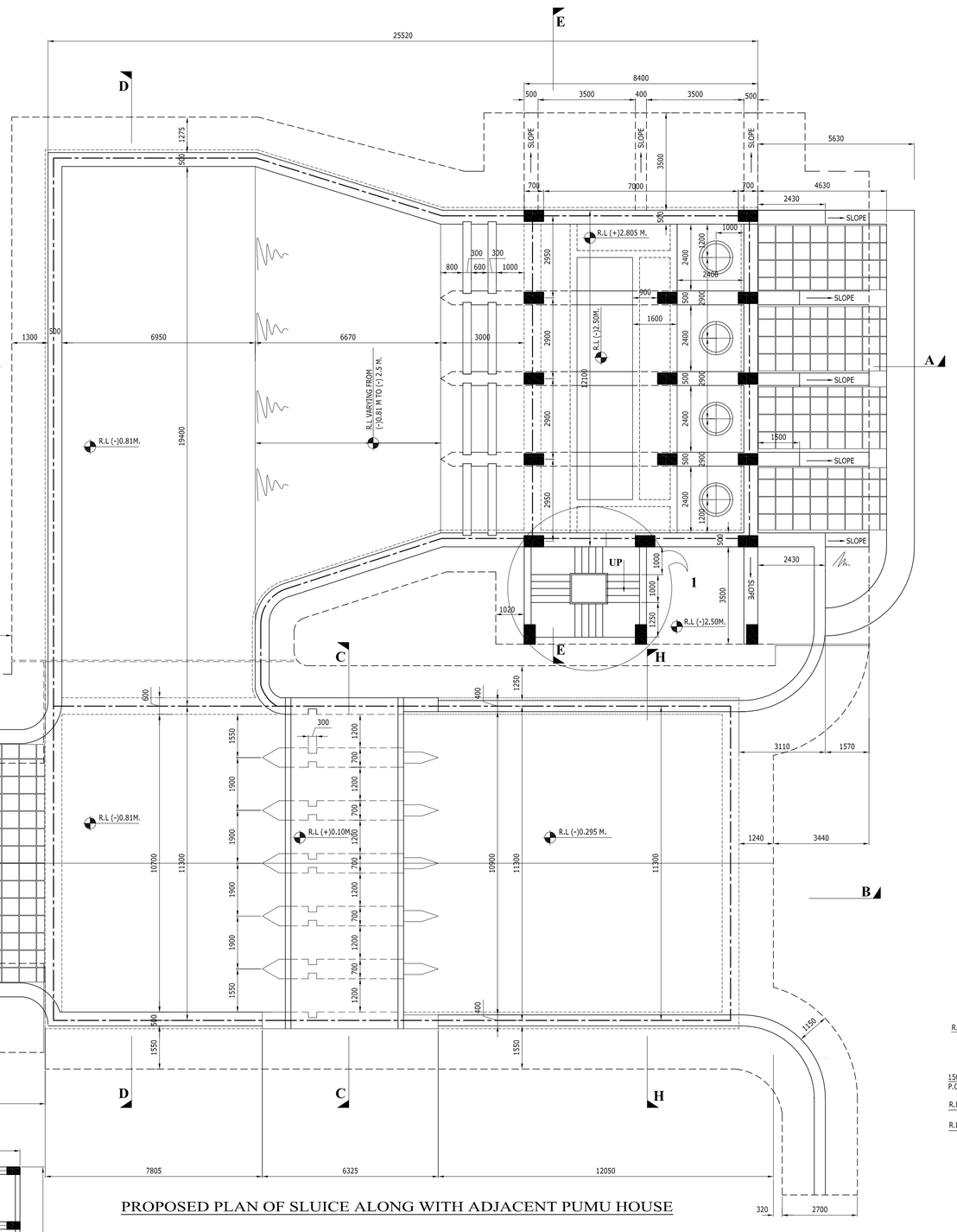
1. ALL DIMENSIONS ARE IN MM AND LEVELS ARE IN METER UNLESS OTHERWISE NOTED .
2. ALL THE P.C.C WORK BE OF VOLUMETRIC MIX OF 1:2:4
3. **USE OF PLASTISIZER IN ALL CONCRETE WORK IS A MUST.**
4. ANY CONCRETE WORK LEFT INCOMPLETE FOR MORE THAN 30 MINUTES. MUST BE RESTARTED USING A COATING OF CEMENT SLURY MIXED WITH SIKA LATEX OR SIMILAR TYPE OF ADMIXTURE ON THE SURFACE OF THE CONCRETE SO LEFT INCOMPLETE . PRIOR TO CASTING THE CAP BEAM. THE PILE TOP MUST BE COTED BY A LAYER OF SIKA HI-BOND OR SIMILER TYPE ADMIXTURE. THIS SHOULD BE DONE STRICTLY PRIOR TO TAKING UP THE WORK IN CONTINUTION OF THE CONSTRUCTION OF WHICH 28 DAYS STRENGTH HAS ALREADY BEEN ACHIEVED.
5. CLEAR COVER FOR R.C.C. BORED PILE WILL BE 75 MM.
6. REINFORCING STEEL BE OF GRADE OF Fe - 415 HYSD BAR AS PER IS 1786 LATEST OF INDIAN STANDERED MAKE .
7. PILES ARE OF CUST -IN-SITU BORED D.M.C PILE OF 600 MM DIA , CONCRETE GRADE M-35 DESIGN FOR CAPACITY OF 46 TON CUBES OF STRUCTURAL CONCRETE BE TAKEN AND RECORDS BE KEPT FOR FUTURE REFERENCE, COPY OF WHICH MAY ALSO BE SENT TO THIS OFFICE.
8. CEMENT SHUOLD BE OF INDIAN STANDERED MAKE WITH INTIAL AND FINAL SETTING TIME SHOULD NOT BE LESS THAN 30 MIN.AND MORE THAN 600 MIN. RESPECTIVELY AND THERE SHOULD NOT BE ANY FALSE SET WHILE CONCRITING.
9. THE CUT OFF LEVEL AND TERMINATION LEVEL OF PILE IS SHOWN IN THE DRAWING. HOWEVER A DUMMY LENGTH OF 1.00 M, TO BE MADE ABOVE CUT OFF LEVEL OF ALL PILES WHICH IS TO BE CHIPPED OUT AND THE SURFACE SHOULD BE LEFT ROUGH AS FER AS POSSIBLE. MANUAL CHIPPING MAY BE PERMITTED AFTER THREE DAYS OF PILE CUSTING WHILE PNEUMATIC TOOLS FOR CHIPPING SHALL NOT BE USED BEFORE SEVEN DAYS AFTER PILE CASTING.
10. ROUTINE TEST BY MAINTAINED LOAD METHOD MAY BE MADE ON AT LEAST SIX PILES , WITH A TEST LOAD OF 1.5 x 46 = 69 TON WITH MEXIMUM SETTLEMENT OF TEST LOADING IN POSITION BEING NOT EXCEEDING 12 MM.
11. QUALITY CONTROLLING, MIX PROPORTIONING, PLACING OF CONCRETE , CURING AND ALL SUCH ACTIVITIES SHOULD STRICTLY BE FOLLOWED AS PER I.S 456 - 2000 AND OTHER B.I.S REFERRED IN IT.
12. DONOT SCALE ANY DIMENTION , ONLY WRITTEN DIMENSION ARE TO BE TAKEN IN CASE OF OMMISSION OR DISCREPANCY REFFER TO THE DESIGN OFFICE.



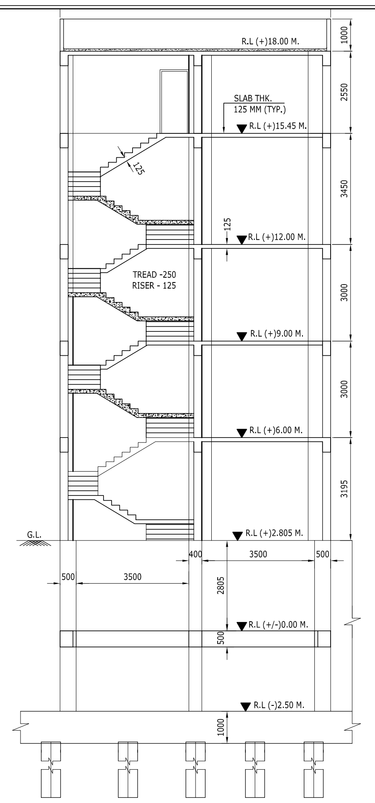
SECTION H-H



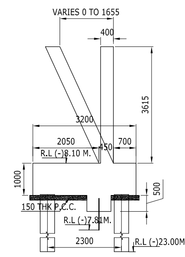
SECTION F-F



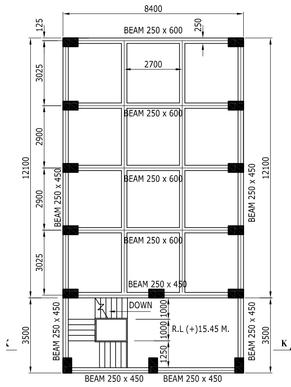
PROPOSED PLAN OF SLUICE ALONG WITH ADJACENT PUMU HOUSE



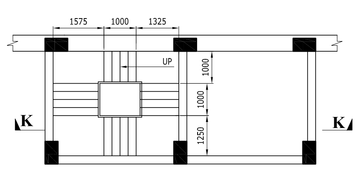
SECTION. K-K



SECTION G-G

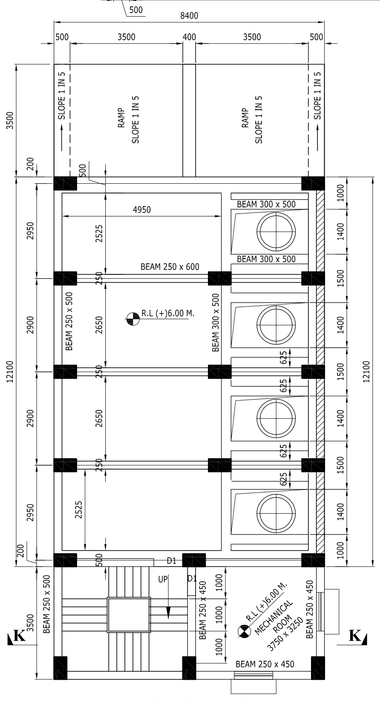


PLAN AT LEVEL (+)15.45 M

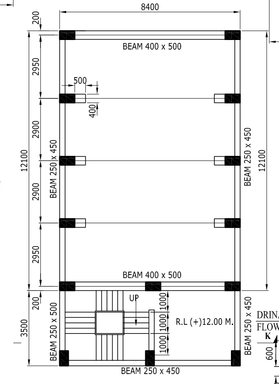


DETAIL -1

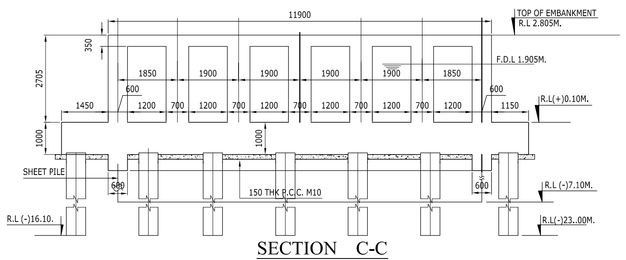
SECTION A-A



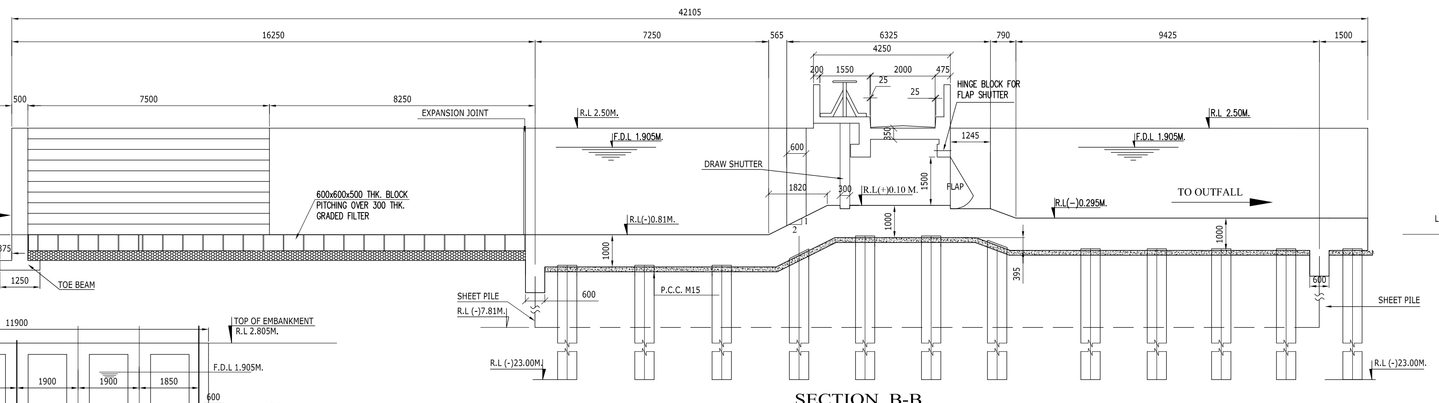
PLAN AT LEVEL (+)6.00 M



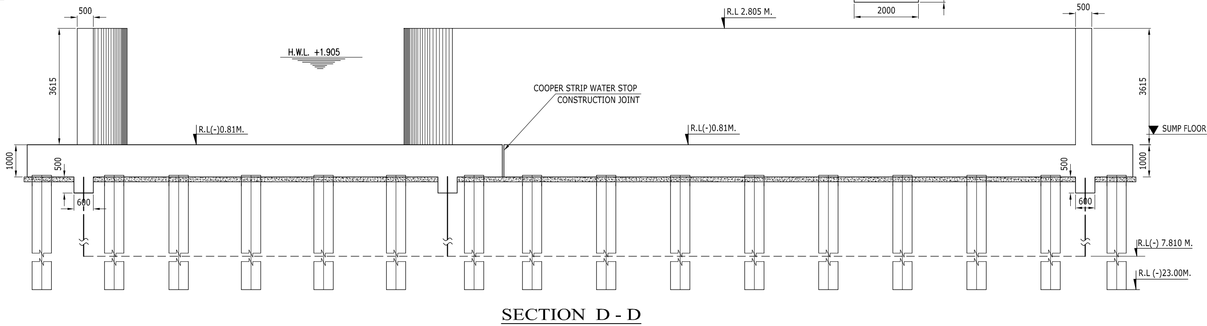
PLAN AT LEVEL (+)12.00 M



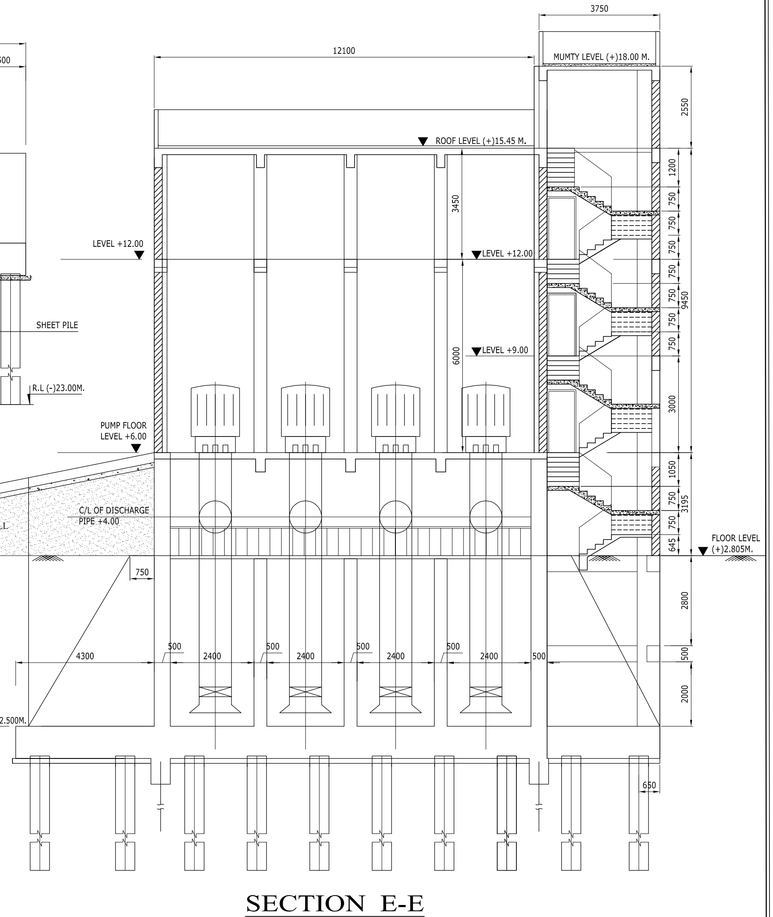
SECTION C-C



SECTION B-B



SECTION D - D



SECTION E-E