SCHEDULE OF TENDER

Tender No.	IREL/Udyogamandal/25-26/37099
CPP Tender No.	2025_IREL_254950_2
Date of publishing of Tender document in IREL and CPP portal	08-12-2025 Interested agencies may view and download the Tender document containing the detailed terms & conditions, free of cost from the website https://www.etenders.gov.in/eprocure/app and https://www.irel.co.in. The bids are to be submitted as per procedure given in this Tender document.
Name of Work	Fabrication, supply, erection including all structural & accessories, inspection, testing, and commissioning of all specified equipment & accessories related to Process, Mechanical, Civil and Electrical & Instrumentation along with integration of existing plant for capacity augmentation of HPRE plant.
Type of Tender	Open Tender, Single Stage Two Bid System Two cover System
Tendering Mode: CPP Portal	Public tender (Two cover System) □ Pre-Qualification & Technical Bid □ Financial Bid
Estimated Cost	Rs.18,56,43,727/- (Excluding GST) Rs.21,90,59,598/- (Including GST)
Earnest Money Deposit (EMD)	Rs.37,12,875/- (**This being a works contract, EMD amount to be remitted including MSE bidders**)
~~**Pre-Bid meeting**~~	~~19-11-2025, 11.00 Hrs, at IREL, RED, Udyogamandal~~
Date & time of Starting of bid	08-12-2025,13:00 Hrs.
Bid Submission start date	08-12-2025,13:00 Hrs.
Date of closing of bid for submission of Bids	15-12-2025,10:30 Hrs.
Date & time of opening of Cover 1	16-12-2025,11:00 Hrs.
Date & time of opening of Financial Bid	Shall be informed separately to the eligible bidders
Declaration of Successful Bidder	To be decided
Issuance of Letter of Intent (LoI)/Work order	To be decided
Validity of tender	90 days from bid due date
SD/PBG	5% of the contract value excluding GST.
Contact details of tender inviting authority	HoD (Purchase) IREL (India) Limited, R E Division, Udyogamandal – 683 501, KERALA E-mail: purchase-red@irel.co.in Ph. No. 0484-2545199

DISCLAIMER

The information contained in this tender document (the **"TENDER"**) or subsequently provided to Bidder(s), whether verbally or in documentary or any other form, by or on behalf of IREL or any of its employees, is provided to Bidder(s) on the terms and conditions set out in this TENDER and such other terms and conditions subject to which such information is provided. The information provided is only for the information and reference of the Bidders.

This TENDER is not an agreement and is neither an offer by IREL to the prospective Bidder(s) or any other person. The purpose of this TENDER is to provide interested parties with information that may be useful to them in the formulation of their bid for participation in this TENDER. This TENDER includes statements, which reflect various assumptions and assessments arrived at by IREL in relation to the tender work. Such assumptions, assessments and statements do not purport to contain all the information that each Bidder may require. This TENDER may not be appropriate for all persons, and it is not possible for IREL, or its employees to consider the investment objectives, financial situation and particular needs of each party who reads or uses this TENDER. The assumptions, assessments, statements and information contained in this TENDER 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 TENDER and obtain independent advice from appropriate sources.

Information provided in this TENDER 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. IREL accepts no responsibility for the accuracy or otherwise for any interpretation or opinion on law expressed herein.

IREL, its employees and consultant make no representation or warranty and shall have no liability to any person, including any Bidder, under any law, statute, rules or regulations, 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 TENDER or otherwise, including the accuracy, adequacy, correctness, completeness or reliability of the TENDER and any assessment, assumption, statement or information contained therein or deemed to form part of this TENDER or arising in any way with qualification of Bidders for participation in the Bidding Process. IREL 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 TENDER. IREL 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 TENDER.

The issue of this TENDER does not imply that IREL is bound to select and short-list qualified Bids for Price Bid stage or to appoint the Selected Bidder for the intended work, and IREL reserves the right to reject all or any of the Bids without assigning any reasons whatsoever.

The Bidder shall bear all its costs associated with or relating to the preparation and submission of its Bid including but not limited to preparation, copying, postage, delivery fees, expenses associated with any demonstrations or presentations which may be required by IREL or any other costs incurred in connection with or relating to its Bid. All such costs and expenses will remain with the Bidder and IREL 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 Bid, regardless of the conduct or outcome of the Bidding Process.

TABLE OF CONTENTS:

GENERAL INSTRUCTIONS TO BIDDERS

I. GENERAL

1) Bidder should take into account any corrigendum published on the tender document before submitting their bids.
2) Please go through the tender advertisement and the tender document carefully to understand the documents required to be submitted as part of the bid. Please note the number of covers in which the bid documents have to be submitted, the number of documents - including the names and content of each of the document that need to be submitted. Any deviations from these may lead to rejection of the bid.
3) Bidder, in advance, should get ready the bid documents to be submitted as indicated in the tender document / schedule and generally, they can be in PDF / XLS / RAR / DWF/JPG formats. Bid documents may be scanned with 100 dpi with black and white option which helps in reducing size of the scanned document.
4) All documents attached with the Bid Qualification Cum Techno Commercial Bid, price bid and all corrigenda issued shall form the part of the tender.

II. PREPARATION AND SUBMISSION OF BIDS

1) The tender bids duly filled in all aspects and uploaded at CPP Portal on or before the scheduled time and date as mentioned in the tender enquiry will be considered for evaluation.
2) Bidder should log into the site well in advance for bid submission so that they can upload the bid in time i.e., on or before the bid submission time. Bidder will be responsible for any delay due to other issues.
3) The Bids shall be prepared in two parts viz. PQ cum Technical Bid (Part-I) and Price Bid (Part-II). The bidder has to digitally sign and upload the required bid documents one by one as indicated in the tender document.
4) Technical Bid will be opened at the first instance and evaluated by IREL's concerned authority. In the second stage, financial bids of only the technically eligible offers will be opened for further evaluation and ranking before awarding the contract.

   PQ cum Techno-commercial bid (Part -I)

   It contains documents in support of eligibility criteria, self-attested tender document and any other document specifically specified in this tender document.

   Part -II shall contain Price Bid (to be submitted electronically).

   This part shall contain only Schedule of prices duly filled in as per the Bid Proposal Schedules. No physical submission of hard copy is permitted.

5) The uploaded tender documents become readable only after the tender opening by the authorized bid openers.

III. METHOD OF SELECTION:

Part-I of the bid will be evaluated and bidders meeting the PQ criteria and other tender conditions will be qualified as eligible bidders for opening of the price bids. The price bids opened subsequently will be scrutinized for responsiveness and IREL shall consider placement of order on the qualified bidder, whose offer shall be overall lowest. However, IREL reserves the right to accept or reject all or any tender without assigning any reasons and does not bind itself to accept the lowest offer.

Note:

To assist in the examination of documents submitted by the bidder in support of eligibility criteria (PQ), IREL may, at its discretion, ask the Bidder for clarification of its bid. The request for clarification and the response shall be in writing and no change in the price or substance of the bid shall be sought, offered or permitted.

IV SPECIAL TERMS AND CONDITIONS

1.0 SITE VISIT:

Prior to quoting rates, the bidders are advised to visit the site on any working days at our specified visiting hours with the permission of Engineer concerned /Purchase Dept. The bidders are also advised to study the labour supply/availability, trade union practices and labour rates prevailing at Udyogamandal.

2.0 EFFECT AND VALIDITY OF BID:

2.1 The submission of any bid connected with these documents and specifications shall constitute an agreement that the bidder shall have no cause of action or claim against IREL for rejection of his bid.

2.2 The bid shall be valid for a period of 90 days from bid due date.

3.0 RIGHT TO REJECT THE TENDER:

3.1 IREL reserves the right to reject any tenders whatsoever without assigning any reason thereof.

3.2 IREL reserves the right to modify/ add/ reduce the scope, either in whole or in part any of the clauses mentioned herein without assigning any reason thereof.

3.3 Further IREL, in its sole discretion and without incurring any obligation or liability, reserves the right, at any time to;

a. Suspend and/ or cancel the Bidding Process and/ or amend and/ or supplement the Bidding Process or modify the dates or other terms and conditions relating thereto;

b. Consult with any Bidder in order to receive clarification or further information;

c. Pre-qualify or not to pre-qualify any Bidder and/ or to consult with any Bidder in order to receive clarification or further information;

d. Retain any information and/ or evidence submitted to IREL by, on behalf of, and/ or in relation to any Bidder; and/ or

e. Independently verify, disqualify, reject and/ or accept any and all submissions or other information and/ or evidence submitted by or on behalf of any Bidder.

It shall be deemed that by submitting the Bid, the Bidder agrees and releases IREL, its employees, agents and advisers, irrevocably, unconditionally, fully and finally from any and all liability for claims, losses, damages, costs, expenses or liabilities in any way related to or arising from the exercise of any rights and/ or performance of any obligations hereunder and the Bidding Documents, pursuant hereto, and/ or in connection with the Bidding Process, to the fullest extent permitted by applicable law, and waives any and all rights and/ or claims it may have in this respect, whether actual or contingent, whether present or in future.

4.0 INTEGRITY PACT (IP): (Applicable for all tenders of estimated value above Rs. 10 crore)

Integrity Pact is a pact between IREL (as a purchaser) on one hand and the bidder on the other hand stating that the two parties are committed to each other regarding ensuring transparency and fair dealings in this procurement activity. Submission of Integrity Pact document is mandatory for this tender. The bidders are advised to submit and upload the Integrity Pact document along with their offer, digitally signed mentioning the tender no. and date. as per prescribed format in Annexure-XII, failing which their offer will not be considered.
In case of breach of conditions mentioned in the Integrity pact action as per rule 175 (2) of GFR will be initiated.

In terms of the Integrity Pact, the Independent External Monitor(s) (IEMs) nominated for this tender are as follows:

S.No.	Name of IEM	Address	E-mail ID
1	Dr. M Malakondaiah, IPS (Retd.)	156, Prashasan Nagar, Jubilee Hills, Road No. 72, Hyderabad - 500110 Mobile : 7330960888	Email: mannam1958@gmail.com
2	Shri Lalit Chandra Trivedi, IRMS (Retd.)	701, Premium Tower-IV, Shalimar Township, Indore – 452 010 (MP) Mobile : 9967567679	Email: lctrivedi61@gmail.com

5.0 PRICES:

Tenders offering firm prices are only acceptable to us. Firm Price shall be quoted as per the price schedule for delivery at designated works. GST as applicable is to be considered as per the Price Schedule of the tender document.

6.0 TENDER RATES:

a) The rates quoted in the price schedule shall be in Indian rupees only. The quoted rates shall be firm throughout the period of Contract including extension of time, if any.

b) If the bidder submits abnormally low bid in combination with other elements of the bid which raises material concern as to the capability of the bidder to perform the contract at the offered price, the bidder shall be asked to provide detailed price analysis of the bid in relation to the scope, schedule allocation of risk and responsibilities and any other requirements of the bid documents. If the bidder fails to demonstrate its capability to deliver the contract at the offered price the price bid shall be considered un-responsive.

c) Organization is the final authority to judge the tender called items and has every power - to accept or reject the same without assigning any reasons.

7.0 **RXIL (TReDS) PLATFORM**

IREL is registered with RXIL (TReDS) platform. MSE bidders are requested to get registered with RXIL (TReDS) platform to avail the facility as per the GOI guidelines.

IREL (India) Limited is onboard with TReDS platform of M/s RXIL for facilitating Bill Discounting for MSME's.

As per DPE/7(4)/2007-Fin dt 21/08/2020, it is mandatory to get all the MSME vendors registered on the platform.

Vendors can get themselves registered at: *https://onboarding.rxil.in/customerapp/home.*

The registration fees of MSMEs on TReDS Platform is Free of Cost as per the new guidelines provided by SIDBI.

For any registration queries, vendors may please contact,

RXIL Relationship manager Mr. Satyajeet Jathar: +91 99201 00784 / +91 9004100784 ***email:*** satyajeet.jathar@rxil.in
RXIL Relationship manager Mr Kirti musale: +91 90048 17501 ***email:*** kirti.musale@rxil.in

DTX - KreDX Platform Private Limited (the 5th TReDX Platform) – Registration Number-COL75X754M2W
Prathamesh Varose: +91 -8600273564 email: prathamesh.varose@kredx.com
Jason Chongtham: +91 -9600063327 email: jason@kredx.com

M1xchange
a. Registration Number –BUYER00047728
b. Contact Person: Mr. Ankit K. Singh, 9800250394, email: ankit.singh@m1xchnage.com

Invoicemart
a. Entity ID/Registration Number- 1000036436
b. Contact Person: Mr. Amith Dutta, 8600179668, email: Amit1.Dutta@invoicemart.com

C2treds (C2FO)
a. Registration Number: B0320250094
b. Contact Person: Ms. Monalisa, 9220407665, email: monalisa.das@c2treds.com

IREL (India) Limited Unit Administrator Mr. V A Anil Kumar: +91 9443482644 ***email: purchase-red@irel.co.in***

8.0 **MAKE IN INDIA**

For this procurement, Public Procurement (Preference to Make in India). Order 2017 dated 15.06.2017, 28.05.2018 & 29.05.2019 and subsequent Orders issued by the respective Nodal Ministry shall be applicable. The bidder to provide certificate for minimum 50% and 20% local content required for qualifying Class 1 Local Supplier. The bidder to provide needful certificate as a proof.

The 'Class-I local supplier'/ 'Class-II local supplier' at the time of tender, shall submit the document indicating the percentage of local content and provide self-certification that the item offered meets the local content requirement for 'Class-I local supplier'/ 'Class-II local supplier', as the case may be. Also the document shall be submitted mentioning the details of the location(s) at which the local value addition is made.

In cases of procurement for a value in excess of Rs. 10 crores, the 'Class-I local supplier'/ 'Class-II local supplier' shall submit a certificate from the statutory auditor or cost auditor of the company (in the case of companies) or from a practicing cost accountant or practicing chartered accountant (in respect of suppliers other than companies) giving the percentage of local content.

9.0 RESTRICTION ON PROCUREMENT FROM A BIDDER OF A COUNTRY WHICH SHARES A LAND BORDER WITH INDIA (AS PER GOI GUIDELINES AMENDED FROM TIME TO TIME)

The bidder shall submit the certificate as per Annexure-IX.

10.0 IREL reserves the right to increase or decrease the quantity to be ordered up to 25 percent of bid quantity at the time of placement of contract. IREL also reserves the right to increase the ordered quantity by up to 25% of the contracted quantity during the currency of the contract at contracted rates. Bidders are bound to accept the orders accordingly.

11.0 EARNEST MONEY DEPOSIT (EMD)/ BID SECURITY

11.1 Earnest Money Deposit (EMD) is a deposit received from the tenderers in token of their earnestness in submitting their offer to undertake the supplies/works/services/consultancy contracts and conclude a contract if entrusted to them on the basis of their tender. **The offers received from tenderers without EMD and/or tender cost shall be summarily rejected except where an exemption is provided in the tender.**

11.2 EMD is to be remitted by way of 'Insurance Surety Bonds' or 'account payee demand draft' or 'fixed deposit receipt' or 'bankers cheque' or 'Bank Guarantee from any scheduled commercial Banks' or "online payment' in favour of IREL. The payment details to be informed to Purchase Department well in advance enabling verification of receipt of the amount.

11.3 Government Body/Public Sector Undertakings may be exempted from payment of EMD with the approval of Competent Authority.

11.4 EMD amount in rupee value is to be mentioned as a fixed amount in the tender and not as a percentage of the estimated cost and no interest is payable on the EMD.

11.5 This being a work contract, relaxation/benefits covered under MSE orders 2012 is not available for MSEs/Startups and subsequent orders.

11.6 EMD is liable to be forfeited if:

a. The tenderer changes the terms and conditions or prices or withdraw his quotation subsequent to the date of opening/ The tenderer impairs or derogates from the tender in any respect within the period of validity of the tender

b. The tenderer fails to accept the order when placed or fails to commence supplies/works/services after accepting the order.

c. In case bidder submits false/fabricated documents.

d. d) In case bidder fails to submit SD as stipulated in the tender.

11.7 EMD may be adjusted against security deposit / performance security of the successful bidder. EMD of the unsuccessful bidders shall be returned to them at the earliest after expiry of the final bid validity

period and latest by the 30th day after the award of the contract. Bid security shall be refunded to the successful bidder on receipt of performance security. However, in case of two stage bidding/ 2or 3 envelope bidding, EMD of unsuccessful bidders during first stage i.e. technical evaluation etc. shall be returned within 30 days of declaration of result of first stage i.e. technical evaluation etc.

11.8 In case where the EMD is provided in form of BG in the prescribed format to be attached with the tender, the BG shall be obtained from a scheduled commercial Bank with validity of 45 days beyond final bid validity period.

12.0 SECURITY DEPOSIT (PERFORMANCE SECURITY) OR PERFORMANCE BANK GUARANTEE:

12.1 Security deposit (SD) shall be uniformly levied @ 5% of contract value (excluding Taxes) towards satisfactory completion of the order/works as under:

a) For works contract valued more than Rs.2 lakhs. b) For supply & service contract valued more than Rs.5 lakhs.

Performance Security is to be furnished by a specified date (generally 14 (fourteen) days after notification of the award) and it should remain valid for a period of 60 (sixty) days beyond the date of completion of all contractual obligations of the supplier/ contractor, including warranty obligations/ defect liability period (DLP).

In exceptional cases waiver of SD shall be approved by Competent Authority after recording the reasons for such waiver.

12.2 Submission of SD/PBG, if called for in the tender can also be paid through Insurance "Surety Bonds" or "account payee demand draft" or "fixed deposit receipt from a Scheduled Commercial bank" or "Bank Guarantee issued/ confirmed from any Scheduled Commercial Banks in India" or online payment to be confirmed sharing Unique Transaction Reference (UTR) to the tender inviting authority as called for in tender. In case of GTE tenders, the performance security should be in the same currency as the contract and must conform to Uniform Rules for Demand Guarantees (URDG 758) – an international convention regulating international securities. In case of JV, the BG towards performance security shall be provided by all the partners in proportion to their participation in the project. Bank Guarantees towards Bid Security/ Security Deposit/ PBG issued by Nationalized Banks/ Scheduled Commercial Banks (other than Cooperative Banks) only acceptable.

12.3 In exceptional cases of work contracts, the approving authority may consider Recovering balance SD (in addition to EMD if it is given not in BG form) amount from 1st running bill of the contractor which shall be specifically mentioned in the tender document itself.

12.4 EMD/ Bid Security may be adjusted towards SD. However, if EMD is submitted in the form of Bank Guarantee, fresh Bank Guarantee in the prescribed formator demand draft/ bankers cheque is to be submitted towards SD.

12.5 BG format for security deposit is attached.

12.6 The SD shall not bear any interest and is liable to be forfeited forunsatisfactory completion or on abandonment of the supply/ work order.

Additional amount of SD due to enhancement in scope of work is also to beobtained.

13.0 RETENTION MONEY

13.1 Where in a contract, payment is made on progressive billing of work executed, 5% of the bill value shall be retained at the time of making payment towards rectification/defective work made a s retention money.

13.2 The total SD and retention money together towards performance guarantee shall not exceed 10% of the contract value.

14.0 REFUND OF SD AND RETENTION MONEY

14.1 Before releasing SD or retention money in respect of supplies/works, a "No Due Certificate" shall be issued by EIC/OIC duly countersigned by head of the department after ensuring that no amounts are recoverable from the supplier/contractor.

14.2 EIC/OIC shall recommend release of SD and retention money after compliance by the contractor towards guarantee/warranty/performance guarantee & other related clauses as stipulated in the purchase/work order and on submission of formal claim by contractor.

14.3 On receipt of "no dues certificate" from EIC/OIC, SD or retention money retained in the form of B.G and / or any form shall be refunded at the earliest, if the contractor is not liable to pay any money to IREL (India) Limited under any other contract.

15.0 FORFEITURE OF SD & RETENTION MONEY

The SD & retention money shall stand forfeited in favor of IREL (India) Limited, without any further notice to the contractor in the following circumstances:

In case of any failure whatsoever on the part of the contractor at any time during performance of his part of the contract including the extended periods of contract, where notice is given and time for rectification allowed.

If the contractor indulges at any time in any subletting/sub -contracting of any portion of the work without approval of IREL (India) Limited.

16.0 REQUIRED DOCUMENTS TO BE SUBMITTED ALONGWITH TECHNO-COMMERCIAL BID.

S. No.	Description	Up-loaded Yes /No
1	DOCUMENTS AS PER PRE-QUALIFICATION CRITERIA (Annexure – I).	
2	DULY FILLED, SIGNED AND SEAL AFFIXED IREL TENDER DOCUMENTS (Annexure – II to XV).	
3	COPY OF GST & PAN CERTIFICATES.	
4	ANY OTHER DOCUMENTS AS PER TENDER CONDITIONS.	
5	PRE- Contract Integrity Pack- Annexure-XI	
6	Secrecy Agreement- Annexure-XII	
7	Solvency Certificate – Annexure-XV	

17.0 CONTACT PERSON OF TENDERING AUTHORITY IREL (INDIA) LIMITED, R E DIVISION, UDYOGAMANDAL, KERALA.

Purpose	Name	E-mail ID	Contact No.
For Technical Specification / Scope of work related query	Shri. Mohd Jeeshan Deputy Manager-Technical (Production)	production-red@irel.co.in mohdjeeshan@irel.co.in	91 7736435198
	Shri.Tara Singh Mehta, DM-Technical (Production)	tara.singhmehta@irel.co.in production-red@irel.co.in	91 8077292062
For Bid/tender related query	Shri. VA Anil Kumar DGM-Technical (Purchase)	purchase-red@irel.co.in	9443482644
	Shri. P Mohan Deputy Officer (Purchase)		0484-2545199
For Consignment / Goods Transportation related query	Shri. Sanjaykumar Vind SM-Technical (Stores)	stores-red@irel.co.in	91 8301997625
For Payment/refund related query	Shri. Gautam Samui, DGM-Finance (Costing & Financial Vetting)	finance-red@irel.co.in	0484-2546909

PRE-QUALIFICATION CRITERIA (PQC)

Only competent bidders with sound technical and financial capability meeting the pre- qualification criteria stated hereunder shall be prequalified for the work. The bidder shall take single point responsibility for execution of the complete work within the plant area as specified in the tender document. No consortium will be allowed for bidding.

Only offers from bidders meeting the specified PQ criteria shall be considered for Techno-Commercial Evaluation. Bidder shall submit the following documents as proof for PQ Criteria:

1.0 TECHNICAL CRITERIA

1.1 The bidder should possess experience of having successfully completed similar work as given below during last 07 years ending October 2025 to any Govt. Organization / PSU / CPSU/reputed private organization/Industry.
SIMILAR WORK MEANS:

FABRICATION & INSTALLATION OF PROCESS EQUIPMENT LIKE TANKS/REACTOR/VESSEL ETC. ALONGWITH ELECTRIFICATION OF EQUIPMENT AND RELATED CIVIL RCC STRUCTURES WORK."

The bidder shall have completed above similar work of values (Ex. GST) as described below:

I. One work order of minimum value INR 14.85 Cr

or

II. Two work orders of minimum value INR 9.28 Cr each

or

III. Three work orders of minimum value INR 7.42 Cr each

1.2 Copies of all the work orders shall be submitted along with the corresponding Work Completion certificate as well as Final Tax invoice copy as the proof of successful completion of the Work.

2.0 FINANCIAL CRITERIA

2.1 The average annual turnover of the bidder during the last three consecutive financial years i.e. 2024-25, 2023-24 and 2022-23 shall be at least INR 5.57 Cr.

2.2 The bidder shall submit documents like Audited Balance Sheet and Profit & Loss statement etc. for last three consecutive financial years 2024-25, 2023-24 and 2022-23 as proof of the average annual turnover. If the Audited Balance Sheet and Profit & Loss statement are prepared in foreign currency, exchange rate as on tender e-publishing date shall be taken for calculation of average annual turnover in INR (₹).The bidder has to submit all the three year documents for obtaining the average Turnover, if document for any financial year is not submitted, the bid will be rejected.

2.3 Net worth of the bidder should be positive during the last three preceding financial years i.e. 2024-25, 2023-24 and 2022-23. The bidder shall submit the documentary proof such as audited balance sheet and P&L account etc. for the same. Positive networth shall be submitted for all the three financial years. If the document for positive networth is not submitted for all the three financial years the bid will be rejected.

2.4 FINANCIAL SOUNDNESS CERTIFICATE: The bidder shall submit solvency certificate from a Nationalized or scheduled Bank for a value not less than INR 5.57 Cr, issued as on or after the date of e-publishing of tender. Prescribed format for solvency certificate is attached.

Note:

Only offers from bidders meeting the specified PQ criteria shall be considered for Techno-Commercial Evaluation. Bidder shall submit the following documents as proof for PQ Criteria:

1) Copy of qualifying work order for such work with work order number and date indicating the scope of work and value completed with all relevant technical and other details.

2) Completion certificate from the client indicating satisfactory completion (Showing the value of work) towards the work order of such project submitted above as proof.

3.0 SITE VISIT

3.1 As work involves certain specialized equipment, integration of the new equipment with existing circuits and better understanding of site conditions, site visit prior to participate in the bid is mandatory and the proof of the site visit by bidder or its representative shall be submitted along with the bid documents. The bid shall not be considered for evaluation without submission of site visit proof.

3.2 Bidders are required to submit their respective Bids after visiting the work site and ascertaining for themselves the site conditions, location, surroundings, climate, availability of power, water and other utilities for construction, access to site, handling and storage of materials, weather data, applicable laws and regulations, labor practices prevailing in industrial belt of Udyogamanadal area and any other matter considered relevant by them.

Annexure-II

SPECIAL CONDITIONS OF CONTRACT (SCOC)

1.0 INTRODUCTION

IREL (India) Limited, the erstwhile Indian Rare Earths Limited was incorporated on August 18,1950, with its first unit Rare Earths Division (RED), Aluva, in Kerala. It became a full-fledged Government of India Undertaking under the administrative control of Department of Atomic Energy (DAE) in year 1963 and took over companies engaged in mining and separation of Atomic Minerals in southern part of the country at Chavara, Kerala and the other at Manavalakurichi (MK), Tamilnadu. IREL commissioned its largest flagship Mining & Mineral separation unit Orissa Sands Complex (OSCOM) at Chatrapur, Odisha in 1986. Presently IREL has established plant capacity of about 10 lakhs tons per annum of minerals processing to produce processed minerals i.e. Ilmenite, Rutile, Zircon, Sillimanite and Garnet. IREL has also set up a Rare Earths Extraction Plant at Odisha to produce about 11,000 ton of Rare Earth Concentrate in terms of RE Chloride and associated products. A RE refining plant at RED, Aluva is operational to produce separated High Pure Rare Earths Oxide. IREL has also established a Rare Earth Metal and Titanium Theme Park in Bhopal, Madhya Pradesh. IREL is a profit-making CPSE since 1997-98 with its sales turnover reaching a peak exceeding Rs.20248.97 million in 2023-24, with an export component of about Rs.9625.82 million. IREL is also in the process of facilitating setting up of industries in the value chain of minerals and rare earths, besides expanding its existing mineral producing capacities. IREL has in house R&D division at Kollam, Kerala to support mineral and chemical operation and Corporate Office at Mumbai, Maharashtra.
Rare Earth Division of IREL at RED, Aluva is presently processing Mixed Rare Earth Chloride and producing high pure Rare Earths Oxides of Lanthanum, Cerium, Neodymium/Praseodymium, Samarium, Gadolinium, Yttrium and Dysprosium.

Currently IREL, Rare Earth Division, Udyogamandal is operating HPRE plant at 50% capacity and intends to augment the HPRE plant to 100% capacity utilization (processing of 5000 TPA RECL bulk) which include fabrication, supply, installation, commissioning & performance testing of various equipment like CS/MSFRP tanks, Centrifuge, flash mixer (FRP), pipes & fittings, pumps, agitators, motors, hoists, flow meters, electrification of equipment including MCC panel, cable, construction of underground RCC tanks at ETP, covering shed for tank's area, working platform structure for tanks, centrifuge etc. complete in all respects and integration with existing plant including dismantling of existing diesel tanks (MS) & obtaining PESO license for changing diesel storage tank as per bill of quantities (BOQ), scope of work, technical specifications and approved drawings.

2.0 SCOPE OF WORK

The scope of work envisaged under this contract shall include but not limited to the following:

2.1 (A) Fabrication, supply, installation, commissioning & performance testing of various equipment like MSFRP tanks, Centrifuge, flash mixer (FRP), pipes & fittings, pumps, agitators, motors, hoists, flow meters, electrification of equipment including cabling & MCC panel, (B) Construction of underground RCC tanks at ETP, structural steel shed for tank's area, working platform for tanks & equipment, etc. complete in all respects (C) integration with existing plant as per bill of quantities (BOQ), scope of work, technical specifications and approved drawings.

2.2 Dismantling of existing diesel tanks (MS) & obtaining PESO license for changing diesel storage tank as per scope of work and BOQ.

The brief description of the works are as follows:

2.3 Submission of equipment drawings, fabrication, supply, erection including all structural & accessories, inspection, testing, integration with existing plant and commissioning of all specified equipment & accessories related to Process, Mechanical, Civil and Electrical & Instrumentation as per attached detailed scope of work, details of work, technical specification, approved drawings and Bill of Quantities (BOQ).

2.4 Commissioning of the equipment and integration with existing plant.

2.5 Necessary statutory clearance from PESO: Party has to obtain license on the behalf of IREL to dismantle existing two 115 m^3 MS tanks and permission to storage of HSD in the existing 20m^3 capacity tank.

2.6 The intent of this document is to furnish the required details for enabling the bidder to submit their most competitive offer within stipulated time frame as per scope of work & technical specification described in this tender.

2.7 Overall work consists of four types of work i. e. Process, Civil, Mechanical and Electrical & Instrumentation. The detail of works are attached in Annexure 1, 2, 3 & 4.

PROCESS WORKS:

The work includes as follows:

2.8 Submission of detailed engineering drawings of the tanks, flash mixer & centrifuge.

2.9 Dismantling of existing one no. of conical bottom CS/MS FRP tank (18 m^3 capacity) and two nos. of flat bottom MS tanks (115 m^3 capacity each).

2.10 Party has to obtain license on the behalf of IREL to dismantle existing two 115 m^3 MS tanks and permission to storage of HSD in the existing 20m^3 capacity tank. Contractor has to carry out all the works related to changing the diesel storage tank like piping, pump relocation, civil work, if any. Party has to ensure that the full diesel storage and pumping system is streamlined.

2.11 Preparation & Submission of drawing of process equipment, approval of drawings by IREL, RED. Fabrication as per technical specification & approved drawing, surface preparation & painting, inspection, Supply, testing, installation, commissioning, performance testing and integration with existing plant of thirteen (13) nos. of conical bottom CS/MS FRP tanks (2 nos. of 30 m^3 with MSFRP grid plate, 4 nos. of 30 m^3, 6 nos. of 60 m^3 and 1 no. of 1.5 m^3) with agitator, motor, Agitator-Motor-Tank support bridge, Tank cover plate, Tank support leg, etc. and all required accessories as per the technical specification attached in annexure-I.

2.12 Design, fabrication, inspection, supply, erection, commissioning and performance testing of a vertical basket, bottom discharge Centrifuge of 350-400 Kg/cycle slurry filtration capacity along with its accessories as per the attached technical specifications, detailed scope of work, details of the work and bill of quantities.

2.13 Fabrication, supply and commissioning of FRP flash mixer as per approved drawing and technical specification attached in annexure-1.

2.14 Supply, installation and commissioning of UV spectrophotometer as per attached technical specification along with latest computer system.

CIVIL WORKS:

The work includes as follows:

The bidder's scope shall broadly include construction of all civil, structural & finishing works related to structural steel sheds in various locations inside factory premises and construction of RCC underground collection pit, foundations which includes earth work, plain &

reinforced cement concrete, reinforcement, scaffolding, formwork, masonry work, floor finishing, skirting, plastering, painting, structural steel fabrication & erection, PVC roofing, side cladding, chemical resistant polyurethane screed lining, providing WPC doors, supply & fixing Aluminum, UPVC windows, FRP lining inside collection pit etc., as well as supply of all materials, consumables, labour, tools and plants, transportation and storage, sample testing etc., all complete as per BOQ, specifications and drawings.

In addition to above the bidder's scope shall also cover submission of details / brochures / technical write ups / manufacturer's test certificates and field test results etc, as applicable, along with source of supplies for the bought out items pertaining to his scope of supplies and execution for the following . IREL shall provide only conceptual drawings. The detailing for following specialized items shall be arranged by the contractor himself –

a) Detailed engineering drawings, design, construction & architectural drawings for the work.
b) Bar bending schedule of reinforcement steel in each site.
c) Fabrication & erection details of steel structure.
d) Shuttering details including propping, scaffolding etc.
e) Certified Concrete mix designs from technical institutes such as IITs or equivalent NABL accredited laboratory along with lab and field trial details.

ELECTRICAL & INSTRUMENTATION WORKS:

The work includes as follows:

2.15 Submission of detailed drawing, approval of drawings by IREL, RED for the electrical cable work including cable tray route etc.

2.16 Submission of detailed drawing (GA, SLD and BOM) for the MCC panels, approval of drawings by IREL, RED.

2.17 Design, Supply, Installation, Testing and Commissioning of MCC panel as per the given specification.

2.18 Supply of MS structural materials and fabrication of cable tray supports, PDB & LDB fixing frames, light fixing frames, Exhaust fan fixing frames etc.

2.19 Supply, laying and commissioning of magnetic flow meters, variable area flow meters, radar level transmitters, control valves etc.

MECHANICAL WORKS:

The work includes as follows:

2.20 Submission of detailed drawing for the (a) HDPE piping works including pipe rack for the identified Tanks and Equipment. (b) Working Platform and allied MS mechanical structures.

2.21 Supply of HDPE Pipes & Fittings and Laying of Piping System including PP Ball Valves, CS Gate Valves and Rubber Lined Diaphragm valves.

2.22 Supply, Fabrication & Erection of MS Working Platform structures along with wooden Chequered board for all Process Tanks and Equipment.

2.23 Supply of MS Structural Steel and Fabrication of Structures for installation of Electric Hoist, EOT Crane, Tube Axial Fans and Centrifuge.

2.24 Supply, Installation & Commissioning of Equipment like Pumps, Electric Hoist, Tube Axial Fans and EOT Crane.

2.25 Supply of Chemical Resistant Epoxy Paint and Primer and carrying out painting works for all MS Structures.

2.26 Installation of Wooden Chequered Board in all working platforms.

2.27 Supply and Installation of FRP Duct with dampers in the existing vapor blowers.

Detailed scope of work, technical specification and tentative drawings related to individual works i.e. Process, Civil, Electrical & Instrumentation and Mechanical is attached as Annexure- 1,2,3,4 respectively.

3.0 OTHERS TERMS & CONDITIONS:

3.1 The entire work is planned to be executed at different independent location. The Contractor shall depute adequate manpower (skilled, semiskilled & unskilled) to carry out the work in all the work fronts for timely completion of works. IREL reserves the right to increase or decrease the workmen requirement based on the work front

3.2 The Contractor shall depute one SPOC, one Safety Supervisor, one mechanical supervisor and two civil supervisors to carry out the work in the operating plant in a safe manner as per the Rules and Guidelines issued by the IREL's Safety Department.

3.3 The Supervisor & workers engaged under this Contract shall supervise/work only under this Work Order only and he shall not be allowed to supervise/work any other Work order in other locations inside the plant premises. The Supervisor and the workmen if found working in the areas other than allocated under this contract, shall be send out of the IREL's premises and penalty shall be imposed to the contractor as per the penalty clause.

3.4 The SPOC along with the Supervisors shall report to EIC daily at 8:00am for job allocation in various plants. The SPOC shall coordinate with EIC to execute the work in safe manner without affecting the process operation/ requirement. The SPOC further has to report and brief to EIC at the end of the day about the progress of the work.

3.5 Depending on the requirement of the work as per the instruction of EIC, contractor shall have to depute additional workers as and when required. The contractor shall depute the workmen on all working days (except Sunday, public holidays etc.) from 8:00am to 4:00pm. The working time will be extended as per the site requirement and instruction of the EIC in order to complete the work in time. The contractor can depute their work force on Sunday, public holidays depends on the requirement, on prior permission/approval from the EIC.

3.6 The SPOC has to maintain daily attendance register for the Supervisor and workmen reporting for duty. The SPOC shall also maintain Hindrance register on daily basis. The contractor should avoid changing the workforce deputed under this contract frequently/ daily to ensure safety, security and timely completion of work.

3.7 The contract shall maintain log book/measurement register mentioned the supply and execution part of the work on daily basis and the same has to be signed by SPOC and countersigned by EIC. Progressive bill shall be released based on the measurement register.

3.8 All the stated works are to be carried out while the plant is in operation. SPOC/concerned Supervisor shall take clearance for isolation of equipment/pipe lines etc. from EIC before commencement of the work.

3.9 Any material/works not mentioned in the details of the work but required for the successful completion of the entire work shall be under the scope of contractor.

3.10 The Contractor shall during the progress of the work, provide, erect and maintain at his own expenses all necessary temporary workshops, stores, consumables, offices, etc. required for the proper and efficient execution of the work. The planning, setting and erection of these buildings shall have the approval of the Engineer and the Contractor shall at all times keep them tidy and in a clean and sanitary condition to the entire satisfaction of the Engineer.

4.0 SAFETY, SUPERVISION & HOUSEKEEPING:

4.1 The Supervisors and Workmen engaged by the Contractor for the work shall undergo 1 day Safety Training conducted by company's safety department before the commencement of the field work.

4.2 The contractor is fully responsible for carrying out the work in a safe manner. Successful contractor has to carry out the work with utmost care and as per the rules laid down by IREL safety department.

4.3 Safety permit for working at heights and hazardous areas must be obtained on daily basis prior to starting of the work. Every effort must be taken to ensure that normal production should not be affected due to the works carried out under this contract.

4.4 The work must be carried out under close supervision and without causing any damage/hindrance to the existing structure or equipment and other activities in the surrounding areas.

4.5 The work spot shall be cleared of the waste materials /debris on daily basis. On completion of the work all working implements, scaffoldings, excess materials, etc., if any must be removed from site immediately.

4.6 Proper covering should be provided to prevent any foreign impurities from contaminating other tanks/products by covering the nearby tank/equipment by tarpaulin or any other arrangement.

4.7 The contractor has to ensure proper ventilation and illumination on tanks/equipment before starting the allocated works in plants.

4.8 The Contractor must provide Personal Protective Equipment for their workmen suitable for the working environment and also as per the advice of the Safety-in-charge/Engineer-in-charge. All tools & tackles and working implements such as ladders, welding machines, gas cutting machines, drilling machines, angle grinder, welding mirrors, extension boards, scaffolding materials, etc. shall be shown to safety department for competent person approval before executing the work. The list of tools & tackles and working implements approved by safety Department shall be submitted to the EIC.

4.9 The scaffolding used for height work shall be of Mild steel tubular type with base plate, boards and necessary bracings and working platform must be provided with hand rails. Materials used must be of good quality and strength. Safety net shall be provided wherever the work is carried out at height of more than 3 metres. Also, safety net shall be provided below the working platform of the scaffolding while work is being carried out at height. Double lanyard safety belt shall be used while working at height and the hook shall be clamped at different locations on the lifeline/ rigid structures.

4.10 Electrical extension boards are to be fitted with safety devices like ELCB/RCCB, MCB, etc. Each power tool shall be supplied through individual plug sockets. Electrical power shall be tapped through ISI marked industrial socket. Flexible cable used shall be of FRLS type with adequate current carrying capacity for the loads to be connected. Poor insulated cables and too many joints on the cable shall be avoided.

4.11 Flash back arrestors shall be provided in both the torch side and the cylinder side of all gas cutting equipment. Gas cylinders used for cutting and welding operations shall be mounted on the trolley.

5.0 VARIATION OF QUANTITY:

Quantities stated are approximate. The contractor must be willing to accept any variation in individual item quantities and the unit quoted rates shall remain unchanged. The company reserves the right to cancel any part of the work if the same is not required at the time of implementation of the work. The contractor has to quote as per Price Schedule/BOQ.

6.0 Qualification & Experience:

6.1 Single Point of Contact (SPOC)-BE/ B-Tech in (Civil/Mechanical/Chemical) Engineering with minimum 5 years of experience in executing/ handling projects in any industry.

6.2 Work Supervisor (Civil)-Degree in Civil Engineering with min. 3 year experience/ Diploma in Civil Engineering with min. 5 year experience in Civil Works in any industries.

6.3 Work Supervisor (Mechanical)-Degree in Mechanical Engineering with min. 3 year experience/ Diploma in Mechanical Engineering with min. 5 year experience in mechanical maintenance of chemical industries.

6.4 Safety Supervisor-Degree in Fire & Safety with min. 3 year experience/ Diploma in Fire & Safety with min. 5 year experience in Chemical industries.

6.5 Painter- Person with minimum 5 year experience in Painting of equipment and Civil structures works in any industry.

6.6 Welder/Fabricator/Electrician- ITI Passed (Welder/Fabricator/Fitter/Sheet Metal/Electrical Trade) with min. 2 year experience OR person with 5 year experience in arc welding, gas welding and gas cutting works connected with fabrication / mechanical maintenance works/ electrical maintenance works in any industry

6.7 Fitter/Rigger- ITI Passed (Fitter/Rigger Trade) with min. 2 year exp. In mechanical maintenance of any industries with multi craft skills OR person with minimum 5 years' experience in fabrication / mechanical maintenance works of any industry with multi craft skill like fitting, welding, gas cutting and rigging.

7.0 Contractor's Scope of Supply:

As per the Annexure - 1,2, 3 &4

8.0 IREL's Scope of Supply:

Water and electricity will be provided at single point on free of cost. However contract shall make own arrangement for using the same following the safety regulation followed in IREL.

9.0 PENALTY FOR NON-COMPLIANCE

In order to ensure 100% compliance of safety related regulations and procedures and non-use of PPE, penalty will be imposed on the contractor for not adhering to safety rules & regulations as detailed below in table. The contractor must endeavor to avoid penalty by encouraging, motivating and making their employees aware about all the Safety regulations.

S. No.	Safety violation	Penalty
1	Non-use of PPE like Safety Helmet, Safety shoes, Face shield, Mask & Goggles.	Rs. 250 per day/item/person
2	Hot work without proper permit/clearance	Rs. 1000 per occasion
3	Non-use of ELCB, use of non-standard/damaged Switch boards, poor cable joint, laying wire/ cables on roads, electrical job by incompetent person, use of more than 24V power in confined space	Rs. 500 per item / day
4	Working at height without safety belt, using nonstandard scaffolding and not arranging fall protection arrangement	Rs. 500 per case/day
5	Handling of compressed gas cylinders without trolley, jubilee clips, double gauge regulator & improper storage& handling	Rs. 200 per item/day
6	Non-deployment of safety supervisor responsible for safety at work site	Rs. 3000 per day
7	Non- deployment of work supervisor responsible for execution of work at site.	Rs. 3000 per day

10.0 PAYMENT TERMS

Advance payment shall not be made under any circumstances. Payment will be made only on actual quantity of work executed as per BOQ, scope of work, approved drawings and technical specification etc. as specified below

Payment term	**Civil, Structural and Electrical & Instrumentation (Execution Part)**	**Equipment / Machinery and Electrical panel etc. (Supply part)**
On supply / progress of work	80% of running bill based on progress of work along with 100% GST value	70% of BoQ value on completion of supply along with 100% GST value
Erection and commissioning	5% of the BoQ value	10% of the BoQ value
Integrated commissioning	5% of the BoQ value	10% of the BoQ value
Final acceptance	10% of BoQ shall be released against submission of 10% PBG of the contract value on completion of guarantee period. However, SD will be released after completion of the contract.	

10.1 All the bills subject to statutory deductions and to be certified by EIC. Payment will be made within 30 days of bill certification.

10.2 The 10% PBG will be released after 12 months of defect liability period.

11.0 GUARANTEE

Guarantee period shall be 12 months from date of completion of work in all respect for quality of material supplied and workmanship (except UV Spectrophotometer. For UV Spectrophotometer guarantee shall be 36 months from date of installation.). If the material / equipment etc. which is supplied/installed/constructed proves to be defective or fails to meet the performance specified, the contractor has to repair, replace, or correct and made functional as per technical requirement at no additional cost to the IREL.

12.0 PERIOD OF CONTRACT

12.1 The work shall be completed in all respects within a period of Nine (09) months from the date of acceptance of order and this shall be reckoned as the zero date of the Contract. Date of acceptance of order means seven days from the release of order date.

12.2 The successful bidder shall submit detailed schedule of activities to EIC within 10 days from the acceptance of order to ensure timely completion of work.

12.3 The contractor shall appoint a SPOC (Specific point of contact) who will represent the contractor and shall be responsible for all activities under the scope of work, within 10 days of acceptance of order.

12.4 All the equipment, facilities and associated structures to be supplied by the qualified bidder shall be freshly acquired and new only. No used/ old equipment/ facilities or any item is accepted as part of this supply. In case, it is found at a later stage during execution of this project or operation of the plant that the equipment/parts of the equipment/ facilities supplied by the selected bidder were used/old, IREL may have the right to reject that equipment/ facility or portion/ part of the facility(s) and the selected bidder need to replace the same with new ones at its own cost as per mutually agreed timelines.

13.0 ENGINEERING INCHARGE

13.1 Shri Mohd Jeeshan, Deputy Manager – Technical (Production) will be the Engineer-in-Charge for this work.

Shri Tara Singth Mehta, Deputy Manager – Technical (Production) will coordinate the process related works with the EIC, Shri. Anurag Pandey, Deputy Manager-Technical (Mechanical Maintenance) will coordinate mechanical works with EIC, Shri. K Sankaralingam, Manager-Technical (Civil) will coordinate civil works with EIC and Shri K A Joshy, Managaer-Technical (Electrical) will coordinate Electrical & Instrumentation works with EIC for completion of the works.

~~**14.0 PRE-BID MEETING**~~

~~14.1 The pre bid meeting shall be conducted on **19.11.2025** as online/offline at IREL, RED, Udyogamandal. Online details will be send to the party based on the response through mail to IREL.~~

~~14.2 Purpose of pre bid is to invite clarifications (if any) from the interested experienced agencies regarding the Minimum technical specifications, Scope of work, other terms & conditions related to this tender. Also, to know the site condition and labor practice followed at Eloor industrial belt before submitting the quote.~~

ANNEXURE-1

PROCESS WORKS

DETAILED SCOPE OF WORK, TECHNICAL SPECIFICATION AND TENTATIVE DRAWINGS RELATED TO PROCESS WORKS:

1.0 SCOPE OF WORK

The scope of work includes but not limited to the following:

1.1 The scope includes dismantling of existing one no. of conical bottom CS/MS FRP tank (18 m^3) and two nos. of flat bottom MS tanks (115 m^3 each) with all accessories as identified by EIC.

1.2 Party has to obtain license on the behalf of IREL to dismantle existing two 115 m^3 MS tanks and permission to storage of HSD in the existing 20m^3 capacity tank. Contractor has to carry out all the works related to changing the diesel storage tank like piping, pump relocation, civil work, if any. Party has to ensure that the full diesel storage and pumping system is streamlined.

1.3 Fabrication, supply, unloading at site, erection and commissioning of thirteen (13) nos. of conical bottom CS/MS FRP tanks along with agitator, motor, Agitator-Motor-Tanks bridge, MS Tank cover plate, Tank Support leg, etc. for 2 nos. of 30 m^3 with MSFRP grid plate, 4 nos. of 30 m^3, 6 nos. of 60 m^3 and 1 no. of 1.5 m^3 and all required accessories as per scope of work, technical specifications and requirements detailed below.

1.4 Design, fabrication, supply, unloading at site, erection, commissioning and performance testing of a vertical basket, bottom discharge type Centrifuge (MoC-SS 316) of 350-400 Kg/cycle discharge capacity including all accessories, Hydraulic power pack, electrical accessories, instruments and M.C.C./Control Panel with control/on-off valves, etc. and fabrication of MS platform for placing the Centrifuge and its feed tank as per the technical specification, scope of work, detail of the work and approved drawings.

1.5 Fabrication, supply and commissioning of FRP flash mixer as per approved drawing and technical specification, detail of the work attached.

1.6 Supply and installation of UV spectrophotometer of Microprocessor based UV/VIS Spectrophotometer (True Double beam UV visible Spectrophotometer sealed & quartz coated with Czerny-Turner monochromatic) along with required software and computer as per attached technical specification.

2.0 DETAILS OF WORK

2.1 The fabrication drawings and tank leg foundation drawings are to be submitted by the contractor. Party has to commence the fabrication work only after approval of drawing by IREL.

2.2 Party shall dismantle the existing one number of MSFRP tank (18 m^3) with accessories and two numbers of flat bottom MS tanks (115 m^3) with concrete foundation tanks as per instruction of EIC.

2.3 Party has to obtain license on the behalf of IREL to dismantle existing two 115 m^3 MS tanks and permission to storage of HSD in the existing 20m^3 capacity tank. Contractor has to carry out all the works related to changing the diesel storage tank like piping, pump relocation, civil work, if any. Party has to ensure that the full diesel storage and pumping system is streamlined.

2.4 Fabrication of all MS tanks in segments as appropriate as per site condition to fix at the place. Fabrication will be as per technical specification and approved drawings. The technical requirements and drawings provided in the tender are only indicative and not descriptive and the contractor shall ensure that the whole system supplied is complete in all respects for the smooth operation of the plant and should be suitable for the rated performance.

2.5 All materials including MS sheet required for fabrication, erection and commissioning will be under the contractor's scope.

2.6 Supply of fabricated MS tanks with all accessories such as agitator complete with housing bridge, motor, reduction gear, grid plates and supports bearings, bearing housing, couplings, leg and leg supports with base plates, etc.

2.7 Dismantling of existing tanks with all accessories such as agitator complete with housing bridge, motor, reduction gear, bearings, bearing housing, couplings, lug and leg supports with base plates, etc. and shifting the same at designated place as per instruction of EIC.

2.8 Opening of all flanges, pipes, fittings, electrical connections, instrument connections, asbestos sheets etc. and cutting of tank platforms, supports, and foundations if any required for dismantling the existing tank.

2.9 FRP lining of 13 new fabricated tanks as per the specification.

2.10 Erection of 13 nos. of MSFRP tanks with all accessories such as agitator complete with housing bridge, motor, reduction gear, bearings, bearing housing, couplings, lug and leg supports with base plates, etc.

2.11 In Two nos. of 30 m^3tanks for dissolution area MSFRP grid plate to be fixed inside middle of tanks as per approved drawing.

2.12 All the pipes and cables used for the above work shall be supported by pipe rack and cable rack as per the instruction of EIC.

2.13 Any other works required for erection of the tank such as civil foundation, civil structures, tank platform, connected pipelines to the tanks etc., removal of electrical connection, instrumentation works etc. is under the scope of the contractor.

2.14 Any civil, mechanical, electrical works which are not mentioned in the scope of work but required for dismantling & shifting of the existing tanks, erection and commissioning of the new tanks is under the scope of the contractor.

2.15 Contractor shall provide consumable materials, Cranes, JCB, Hydra, Earth moving equipment, ladders, platforms, temporary supports and other necessary facilities required for the handling and erection of the equipment supplied under the Contract.

2.16 Unless otherwise provided in the Contract, the contractor shall arrange all construction / erection equipment/vehicle, welding equipment, erection and lifting tools and tackles, instruments and appliances required for the fabrication and erection work.

2.17 Contractor shall provide all the material, scaffolding, tools and machineries, vehicles required for cutting of existing tank foundation and for providing new foundation. Any work related to cutting of existing tank foundation and for providing new foundation is under contractor's scope.

2.18 The project being Turn-key in nature, party has to carry out all the works including mechanical, electrical, civil works, etc. associated with this work but not mentioned in the tender.

2.19 Commissioning and performance testing of the tank. Contractor representative must be present during performance testing.

2.20 Contractor has to supply all the necessary tools and tackles, scaffoldings, temporary supports, welding machine and electrodes, gas cutting machine with gas cylinders, HDPE welding mirrors, MS nuts and bolts of HDPE flanges and valves, grinders etc. required for fabrication, erection and commissioning.

2.21 The warranty shall be for material, workmanship and performance for a period of 12 months from the date of commissioning except UV spectrophotometer. For UV spectrophotometer warrantee shall be 36 months from the date of installation.

2.22 Any material/works not mentioned in the details of the work but required for the successful completion and commissioning of the entire work shall be under the scope of contractor.

2.23 All Safety Equipment and PPEs, etc., and all other materials required for the work has to be brought by the contractor.

3.0 TECHNICAL SPECIFICATIONS FOR MILD STEEL (CS/MS) TANK AND ACCESSORIES

3.1 The tanks and agitator assemblies shall be designed and fabricated as per latest standards as well as in accordance with good engineering practice.

3.2 MATERIALS OF CONSTRUCTION (MoC): All materials, equipment used in the contract shall be new. The steel material used for manufacture shall be of tested quality and shall confirm to the specification indicated in the data sheets. Re rolled sheet shall not be used for fabrication. Material test certificate shall be produced by the contractor at the time of supply.
Preferred make of steel/MS sheets: SAIL/Essar/Jindal/Vizag/Tata steel

3.3 Circumferential reinforcement using ISA 75x75x6 shall be provided at the top, bottom and centre of the tanks as per tentative drawings and shall be fully welded. The top reinforcement angle can be used as flange for fixing cover plates by providing bolt holes of 16mm diameter at a gap of 600mm along the circumference. Lug and leg supports minimum 6 sets adequately stiffened with gusset plates shall be provided by maintaining the indicated ground clearance mentioned in drawings.

3.4 The tank shell shall be adequately stiffened and provided with reinforcement pads wherever required. Covers shall be of separate segments for easy removal. Lifting lugs have to be suitably provided. Baffles shall be provided with suitable gusset plates

3.5 The nozzle flanges shall be fabricated out of mild steel plates conforming to IS: 2062. The flanges shall be slip on type with flat face having dimensions to ANSI-B.16.5, Class 150 rating. All nozzle projections shall be 150 mm unless otherwise indicated in vessel data sheets. In case where it is brazed with the channel support, it should be minimum 150 mm above the channel support.

3.6 Tentative nozzle schedule is indicated in the tank data sheet. Final size, numbers and orientation will be furnished at the time of approval of fabrication drawings. All the nozzles and flange face have to be lined with 5mm thick FRP.

3.7 The Contractor shall assemble the driving units and give mechanical running test. All agitators shall be statically and dynamically balanced.

3.8 The thrust bearings used in agitator assemblies shall be suitable for the load and housed in adequately designed bearing housings.

3.9 The agitator length should be designed such a way that in the event of replacement of agitator, shaft with agitator blade can be taken out without removing the lantern stool, bearing housing with top sub shaft and gear motor assembly, and to be fitted back without disturbing the above mentioned parts.

3.10 Manual Metal Arc welding process shall be employed using ISI approved electrodes in accordance with IS: 814.

3.11 Welding shall not be done on surfaces which are wet or exposed to main or excessive draft. Surfaces to be welded shall be free from paint, rust, oil, grease, dust or any other contamination.

3.12 Welds shall be cleaned between passes to remove all traces of slag and flux before successive beads or layers are deposited. The welds shall be ground smooth and flush on the side to be FRP lined.

3.13 FRP LINING

3.13.1 The fabricated tanks, grid plates, supports and agitator assemblies shall be internally lined with fibre glass reinforced plastic in Bisphenol resin as specified below. The tanks shall be lined

internally covering all contact surfaces and agitator shaft, blades, baffles and gusset plates shall be lined all around up to the bearing housing. The welds on the surface to be lined shall be ground smooth and flush.

3.13.2 The surfaces shall be thoroughly cleaned with the help of solvent suitably and sand blasted to grade S.A2.5 prior to FRP lining.

3.13.3 The FRP lining shall be done with five layers of chopped strand mat of 450 gm/sq. m. and 1 layer of surface mat in Bisphenol resin on tank inner surfaces, nozzles and cover plate inside surfaces. The FRP lining thickness shall be minimum 5 mm. Air traps shall be avoided at all joints & corners of the tank.

3.13.4 The lined surfaces of the vessel and agitators shall be reasonably smooth and without any crevices.

3.13.5 The lined surfaces shall have gel coat smooth finish. Sufficient time interval for drying may be provided between application of subsequent layers of resin, chopped strand mat and surface mat.

3.14 DATA SHEET

3.14.1 The tank with agitator-motor assembly units is to be supplied as per the data sheet and approved drawings.

3.15 PAINTING

3.15.1 Paints shall be applied in accordance with manufacturer's recommendation as supplemented by this specification. The work shall generally follow IS: 1477 (Part II). Prior to applying finish painting, damaged and defective shop coats shall be touched up with same type of paint as used for shop coat. The work shall include removal of the damaged paint work, surface preparation of all exposed area either due to damage of shop coat or due to site fabrication work and application of paint. If in the opinion of IREL, or his authorized representative, the damage to the shop coat is extensive, and then instead of spot touch up, one overall coat of primer shall be applied for each shop coat, after cleaning. Surfaces which have not been shop coated but require to be painted shall be given the necessary surface preparation and prime coats at site. Surface cleaning: All external surfaces of tank (not coming in contact with process fluid) shall be cleaned of loose substance and foreign material e.g. Dirt, rust, scale, oil grease, welding flux etc.

3.15.2 Painting: tank has to be painted with- one coat of rust convertor. After drying the tank is to be given a coat of chemical resistant epoxy primer. Then minimum two coat of chemical resistant epoxy paint of dark grey colour after the erection/ assembly of structures and equipment at plant site.

3.15.3 Measurement of painting thickness: The DFT (dry film thickness) shall be 105µm (micron) after full coat painting. The contractor shall arrange DFT meter and paint thickness has to be measured at site with EIC, and if found less it has to be painted to attain the final 105µm (micron) DFT.

3.15.4 Preferred makes:

FRP-Resin:	Naptha/ Golden/ Ecmas/ Mechemco.
Glass mat:	Binani/ OCV reinforcements/Saint Gobain
Paint:	Nerolac,/ Asian Paint,/Shalimar,/ Berger,

3.16 AGITATOR/MOTOR OF THE TANKS

3.16.1 Squirrel cage Induction Motors with Enclosure, TEFC conforming to protection IP 55 Horizontal Foot Mounted (B3), continuously rated (S1) suitable for operation on 415+/- 10%

V, 50Hz+/- 5% AC 3 Phase supply, 20 HP, 15 HP, 5 HP, 1440 rpm, IE-3 Class, Ambient 50°C, Class "F" insulation with temperature rise limited to Class "B" altitude less than 1000 m above mos.. Performance Efficiency values are conforming to IS12615/IS/IEC 60034 with its latest amendments.

3.16.2 **Preferred make:**

Motor: Crompton Greaves / Siemens / Kirloskar /Bharatbijlee/ABB
Gear: Premier Gears (Formerly Radicon) / Shanti /Elecon / Allroyd / Power build
Bearings: SKF /NTN/TIMKEN.
Coupling: Love-Joy or equivalent

3.17 INSPECTION AND TESTING

3.17.1 IREL reserves the right to inspect the tanks after/during fabrication and/or after FRP lining at contractor's site.

3.17.2 The manufacturer shall conduct all tests required to ensure that the equipment furnished shall conform to the requirements of the applicable codes and submit the test reports to IREL. All dimensions and nozzles shall be as per approved drawings. All materials used in the contract shall be of the makes mentioned.

3.17.3 Hydraulic test: After completion of fabrication work, party shall fill water upto 90% of the tank cylindrical height and will check for leakage. Necessary modification/repair shall be done to arrest any leakage, if any at no extra cost to IREL.

3.17.4 The tanks after FRP lining shall be subject to the following tests:
Thickness test: Thickness of FRP lining by thickness meter/measurement of cut sample at random points as instructed by EIC.
Spark test: After the lining work spark test at the rate of 4KV/mm shall be conducted by the Contractor. Contractor shall arrange spark test equipment for carry out spark test and necessary repair/modification shall be done by the Contractor at no extra cost to IREL.

3.17.5 After the agitator and grid plate assemblies are installed on the tanks, they shall be mechanical run tested for smooth operation. The agitator shall be run for a minimum of 8 hours' time with tank full of water up to working level. There should be no abnormal vibration, noise, wobbling and heating of bearing housing, gear or motor.

3.17.6 The Contractor's representative must be present during the performance trials. Any defects noticed must be rectified by providing suitable modifications or additional provisions for smooth and reliable operation. On satisfactory completion of the performance test as stipulated above, the tank and accessories will be accepted by IREL.

3.17.7 **List of preferred materials:**

1.	Reinforcement:	SAIL/TATA/VIZAG/ESSAR/JSW
2.	Rust Remover:	FOSROC/BASF/SIKA
3.	Rebar anchoring mortar:	Master flow 935 of BASF or equivalent FOSROC/SIKA/HILTI
4.	Epoxy zinc rich primer:	FOSROC/BASF/SIKA
5.	Epoxy bonding compound:	BASF/FOSROC/SIKA/PIDILITE
6.	Acrylic curing compound:	Masterkure181 of BASF make or equivalent FOSROC/SIKA
7.	Non shrinkage grouting mortar:	Fosroc GP or equivalent BASF / SIKA

4.0 TECHNICAL SPECIFICATIONS FOR CENTRIFUGE (MOC-SS316) OF 350-400 KG/BATCH DISCHARGE CAPACITY AND ACCESSORIES

4.1 GENERAL DESCRIPTION OF CENTRIFUGING SYSTEM: Centrifuge is required for separating the solids from Cerous carbonate slurry. Cerous carbonate slurry will be continuously pumped to a 1.5 m^3 MSFRP overhead tank kept at +5 to +6 meter elevation at the site for feeding to the Centrifuge kept at +2.5 to +3 meter elevation working platform in the same site. Feeding, spinning, washing, dewatering/spinning, scraping and cake discharging operations in the Centrifuge in a single/ multiple cycle(s) shall be automatic through PLC system along with manual control provision for each operation separately. Centrifuged cake from a single discharge point will be collected into HDPE Jumbo bags placed at ground level through discharge chute end at +1.5 to
+1.7 meter level. Filtrate & washings from the Centrifuge will be diverted to the existing effluent collection pit through a slurry settling tank or can be recycled to process through level controlled pump. A schematic Flow diagram of the arrangement and Equipment layout drawing of the site indicating the position of the above Centrifuge and Tanks is attached for reference.

4.2 TECHNICAL REQUIREMENTS

4.2.1 The specification covers the technical requirements for vertical basket bottom discharge Centrifuge of 350-400 Kg/cycle discharge capacity including accessories, Hydraulic power pack, electrical accessories, instruments and M.C.C./Control Panel with control/on-off valves etc. The Centrifuge with all accessories shall be erected at +2.5m to +3m level as indicated in the attached Equipment layout drawing.

4.2.2 The Centrifuge & accessories indicated in the 'Bill of quantities(BoQ)/Price Schedule' shall be designed for continuous operation based on the results of the trials with feed sample and in accordance with the details furnished in the Data sheets of Feed & Product attached and within the available space indicated in the Equipment layout drawing. The required humidity of filtered cake shall be approx. 30-40%.

4.2.3 The Centrifuge supplied shall be of vertical basket bottom discharge type of minimum 1.25-1.5 m diameter and having approximate operating speed of 900 RPM suitable for continuous and automatic operation without impairing performance and physical damages due to wear and tear for centrifuging of wet Ce carbonate cake.

4.2.4 The housing shell, basket, scrapper blade, machine cover and all contact parts of Centrifuge shall be made of SS-316 construction. The housing shell bottom plate, foundation plate and leg supports shall be fabricated with MS and lined with 1.6 mm thick SS 304. The filter bag shall be made of PP and Shaft of EN- 24.

4.2.5 After procuring the Stainless steel sheets for fabrication, the Supplier shall submit the bills (from Vendor) for verification by IREL.

4.2.6 As we are planning to erect the Centrifuge at +2.5-3m Elevation of the building on MS structural platform, details of the MS structural elements including leg supports and total weight of supports required for withstanding the static and dynamic load of the Centrifuge shall be informed to IREL. This is to facilitate to fabricate and erect MS platform for placing the Centrifuge.

4.2.7 Design of the Centrifuge shall be completed and detailed Dimension drawings, details of MS structural elements and total weight of the structural platform required as indicated above for placing centrifuge, civil foundation drawings of Centrifuge and accessories and Bills including material test certificates shall be submitted. The Supplier shall start fabrication only after obtaining approval from IREL. Any shop work done prior to approval of drawings will be at

the risk of the Supplier.

4.2.8 The Centrifuge supplied shall be capable of automatic continuous operation through PLC mounted in Control Panel for feeding, spinning, washing, spinning, scraping and cake discharging operations as per the cycle time indicated in the Offer. Supply and erection of all control/on-off valves required for above cycle of operations are in the scope of Supplier.

4.2.9 The housing shall consist of a horizontal base plate with welded housing walls, intermediate bottom & bearing hub. The housing shall have two bolted inspection openings with blind covers and one tangential filtrate outlet. A uniform wide oval opening shall be provided at the bottom for product discharge.

4.2.10 The shaft is guided on roller bearings.

4.2.11 Purging pipes shall be provided at the base of the machine.

4.2.12 Lubrication pipes with grease nipples are to be provided for lubrication of bearings and shaft seals during operation.

4.2.13 A sealing unit consisting of 3 piece sealing lips shall be provided for sealing against process area.

4.2.14 Basket for bottom discharge shall be of welded construction, basket bottom provided with openings and basket bottom and hub shall be connected with ribs.

4.2.15 The basket bottom & hub shall be cast in a single piece. Basket shell thickness is suitably selected to ensure double safety reserve against break point of the material. Basket shall be statically & dynamically balanced.

4.2.16 The top cover shall be hydraulically operated, half open able lid made with SS 316.

4.2.17 Feed pipe and wash pipe of suitable size with nozzles shall be provided on the top cover.

4.2.18 Hydraulically operated scrapping device with full width scrapping blade covering basket height shall be provided. The movement of the scrapping device (swinging action) shall be limited by adjustable mechanical end stops as well as by proximity switches. Vertical movement of the scrapper shall be provided by another hydraulic cylinder operated from the same power pack.

4.2.19 Hydraulic power pack including oil tank, motor and accumulator, pressure regulating valve, pressure relief valve and filter shall be provided for the hydraulic cylinder for scrapper.

4.2.20 Rinsing facility shall be provided for sight and light glass on housing cover, housing bottom and space between basket hub and bearing sleeve.

4.2.21 Speed monitoring device is provided for indication of rotational speed and is connected to motor control system.

4.2.22 The Supplier shall provide all electrical accessories and instruments in a M.C.C./Control Panel made of MS sheet (1.5mm - 2mm thickness) of dust proof enclosure, self-supporting modular construction as per relevant standards for easy, safe and automatic operation of the Centrifuge. In addition, the required field instruments shall also be provided by the Supplier.

4.2.23 Necessary safety systems including flow/pressure indicators with interlocks & alarms shall be provided.

4.2.24 Electrical & Instrumentation cabling including electrification and providing instruments are within the scope of the Supplier. IREL will provide power supply up to PCC only, which is located at an approximate distance of 25 m from the area of Centrifuge. Hence cabling and connected works from PCC are in the scope of the Supplier.

4.2.25 Guards are to be provided to all moving parts & machineries.

4.2.26 Cables shall be laid on MS trays painted with two coats of epoxy zinc chromate primer and three coats of epoxy painting.

4.2.27 The Supplier shall make civil foundation drawings of equipment and will consider for construction of concrete foundations.

4.2.28 The equipment shall be for proven design by way of actual field operation without any difficulty or problem whatsoever. As such the manufacturing technicalities to achieve high engineering quality and performance guarantee for compliance with this specification shall be

the prime responsibility of the Supplier.

4.2.29 The design, manufacture, identification of material and testing of the equipment covered in this specification shall comply with the latest editions of the relevant Bureau of Indian Standards. In cases where suitable Indian Standards are not available, generally accepted codes and practices shall be adopted.

4.3. PREFERRED MAKES OF ITEMS

Electric motors:	Crompton Greaves / Kirloskar / Bharat Bijlee / ABB/ Siemens Electric accessories in Control Panel: Siemens / L&T /Snihieder
VFD:	ABB make, model 380
Power cables:	Polycab / KEI / Fenolux
Main Panel:	Rittal , BCH or Equivalent
Hydraulic System:	YUKEN / Polyhydron / SPICA / SLEW
PLC and its accessories:	Siemens / Allen Bradly / Schneider
HMI:	Siemens / Allen Bradly / Schneider
Feed Sensor (Level Switch):	Siemens / ABB/SICK
Vibration Sensor:	ACD Machine Control or equivalent
Proximity Switch:	Pepperl-Fuchs /SICK / Bently Nevada
Control Valve (on-off):	Aira /Pneucon / Bray
Instrument cables:	Lapp /Helukable /KEI /Belden

4.4 DRAWINGS/DOCUMENTS TO BE SUBMITTED BY THE CONTRACTOR

4.4.1 Bills of Stainless steel (SS 316) for fabrication of Centrifuge & components including material test certificates

4.4.2 Two copies of Dimension drawings of Centrifuge & accessories

4.4.3 Details of MS structural elements and total weight of the structural platform required for placing Centrifuge and accessories.

4.4.4 Two copies of Civil foundation drawings of Centrifuge and its components

4.4.5 The Supplier shall start fabrication only after obtaining approval from IREL. Any shop work done prior to approval of drawings will be at the risk of the Supplier.

4.4.6 The Supplier/Contractor shall be responsible for any discrepancies, errors or omissions in the drawings and other particulars supplied by him, whether such particulars and drawings have been approved by IREL or not. The Contractor shall pay for any extra cost due to any alteration of the works necessitated by reason of any discrepancy, error or omission in the drawings and particulars supplied by the Contractor. If the Contractor fails to make such alterations, IREL may do so at the risk and cost of the Contractor.

4.4.7 The Centrifuge and accessories will be inspected and tested by IREL at the Supplier's site and the Supplier must ensure normal working of the system. The Centrifuge and components shall be mechanical run tested for smooth operation for a minimum period of four hours without wobbling, undue noise and heating of motors. The Supplier shall carry out any change or modifications as pointed out by IREL representative during inspection at no extra cost.

4.5 ERECTION & PERFORMANCE TESTING

4.5.1 The Supplier has to undertake erection of the Centrifuge & accessories supplied by him as per the approved drawings, specifications or bills of materials. This shall include the complete erection supplied under the Contract including aligning, levelling of equipment, starting up and operating the Equipment to meet specified performance guarantee and handing over the equipment to IREL.

4.5.2 The Supplier shall make arrangement to draw electricity and water to the erection site from selected locations at site where electricity and power shall be provided by IREL at such terms and conditions as stipulated in the Contract.

4.5.3 The Supplier shall provide consumable materials, Cranes, ladders, platforms, temporary supports and other necessary facilities required for the handling and erection of the equipment supplied under the Contract.

4.5.4 Unless otherwise provided in the Contract, the Supplier shall arrange all construction / erection equipment/vehicle, welding equipment, erection and lifting tools and tackles, instruments and appliances required for the erection work, as well as equipment, tools and tackles for the transportation to site of erection of all equipment supplied under the Contract.

4.5.5 The Supplier shall provide necessary supervisory personnel, staff, skilled and unskilled labor, including electrical personnel with approved license as per Indian Electricity Rules 1956 as amended from time to time, to ensure that the whole of the erection work is completed in all respect within the period specified in the Contract. The Supplier shall ensure, when local laws require, the concerned employees obtain and hold certificates of competency for their work from the competent authority.

4.5.6 On completion of the erection work, the Supplier shall promptly notify IREL the proposed date of the commencement of the start-up operations.

4.6 PERFORMANCE GUARANTEE TEST

4.6.1 The Supplier shall be responsible for carrying out performance tests on the equipment supplied by him and/or procured by IREL as indicated in the Technical specifications covered in this Tender document, in the presence of IREL representative. This responsibility shall rest with the Supplier regardless of whether the erection has been carried out by him or any other agency.

4.6.2 The Centrifuge and accessories must be performance tested at IREL site and the Supplier must ensure normal working of the system. The following shall be ensured as part of performance testing:-

4.6.3 The Centrifuge and components shall be mechanical run tested for smooth operation for a minimum period of four hours without wobbling, undue noise and heating of motors and uninterrupted flow of centrifuged cake from the Centrifuge.

4.6.4 The Centrifuge and components shall be continuously operated for about eight hours with feed slurry and approx. 30-40% humidity shall be consistently obtained for the centrifuged product.

4.6.5 The Supplier's representative must be present during the performance trials. Any defects noticed must be rectified by providing suitable modifications or additional provisions for smooth and reliable operation.

4.6.6 On satisfactory completion of the performance tests as stipulated above, the Centrifuge & accessories will be accepted by IREL.

4.6.7 The date of acceptance of the Centrifuge & accessories shall be considered as the date of satisfactory completion of the performance tests.

4.7 SAFETY & HOUSEKEEPING

It is the sole responsibility of the Supplier to carry out the work in an utmost safe manner. Successful Supplier will have to carry out erection and performance testing of Centrifuge as per the rules laid down by IREL Safety section. Necessary safety work permit has to be taken before starting the site work. The work spot shall be maintained neat and clean on daily basis. The debris generated during the course of erection must be shifted to the scrap yard situated within 300 m radius from the work site in consultation with the Engineer-in-charge. If such waste is not removed, the expenses incurred for the waste removal will be deducted from the Supplier's bill.

5.0 TECHNICAL SPECIFICATION FOR UV SPECTROPHOTOMETER

UV-VIS Spectrophotometer Specifications: Microprocessor based UV/VIS Spectrophotometer (True Double beam UV visible Spectrophotometer sealed & quartz coated with Czerny-Turner monochromatic).

Wavelength range	: 190 - 900nm
Scan Speed	: Selectable (Medium/Slow/Fast)
Wavelength Accuracy	: ± 0.1nm at 656.1nm & 0.3nm for entire range
Wavelength Scan Rate	: 4000 to 2nm/min and 6nm/min with interval of
0.05nm Wavelength Slew Rate	: 14000 nm/min
Wavelength Reproducibility	: ≤ 0.5nm
Spectral Bandwidth	: Continuous changeable slit from 0.1 – 5 nm
Photometric Mode	: Transmittance, Absorbance, Energy Concentration
Photometric range	: -4A ~ 4A
Photometric Accuracy	: ±0.002Abs (0-0.5Abs); ±0.004Abs (0.5-1.0Abs); ±0.3% T (0- 100%T)
Wavelength Repeatability	: ±0.05nm
Wavelength Reproducibility	: 0.001A (0 -0.5A)
Photometric Noise	: <0.00005A at 500nm (RMS) slit 1nm.
Baseline Flatness	: ±0.0005A/h at 500nm, after warm-up
Baseline Stability	: 0.0005A/h (500nm,0Abs),1hr warm-up
Stray light	: ≤0.01% T (220nm Nal, 340nm NaNo2)
Detector	: Photo Multiplier Tube
Light source	: Tungsten Halogen and Deuterium arc lamps
PC Interface	: RS232/USB
Operational modes	: Photometric, quantitative, Spectrum scan, Kinetics, DNA and Protein.
Software	: UV-VIS ANALYST software adds functions such as GLP/GMP/Pharmacopoeia protocol.
One pair	: 10mm Quartz Cell
Warranty	: 36 months
Preferred make	: SHIMAZDU
Specification of computer	: CPU i7, Windows 11, 16 GB RAM, 1 TB ROM, 64 bit with monitor, keyboards and mouse with all allied accessories including UPS, monitor 24 inch.

6.0 TECHNICAL SPECIFICATION FOR FRP FLASH MIXER:

6.1 The work includes Fabrication, supply & installation of FRP Flash mixer for effluent treatment at ETP along with stand and platform structure & accessories as per approved drawing and specification.

6.2 Supply and installation of two nos. of 1HP motors and agitators.

6.3 Details of dimensions and layout shall be as per attached drawing.

6.4 MOC shall be FRP with Bisphenol resin of 10 mm Thick shell.

6.5 Contractor should provide structural support to hold FRP flash mixer settler, agitator motor unit.

6.6 Preferred make

Electric motors:	Crompton Greaves / Kirloskar / Bharat Bijlee / ABB
Reinforcement:	SAIL/TATA/VIZAG/ESSAR/JSW
FRP- Resin:	Naptha/ Golden/ Ecmas/ Mechemco.
Glass mat:	Binani/ OCV reinforcements/Saint Gobain

7.0 TECHNICAL DATA SHEETS

7.1 60 M3 CAPACITY CONICAL BOTTOM MSFRP TANK

1	Type	Vertical cylindrical with conical bottom complete with cover plate and supports
2	Capacity	60 m^3
3	Quantity	6 Numbers
4	Inside Diameter	3.99 m
5	Vertical height	4.50 m
6	Conical height	0.995 m
7	Specific gravity	Slurry Mixture: 1.20 to 1.60; Liquid: 0.997-1.40; Solid: 2.6-2.7.
8	Nature of slurry / solution to be handled	Acidic in nature
9	Operating conditions	Ambient temperature and Atmospheric pressure
10	Design Temp./Pressure	55-degree C / hydrostatic
11	Material of Construction (M.o.C) & other details	
a	Shell, Top Cover and Bottom	MS confirming IS 2062 with FRP lining and FRP Feed tray/hopper and grid on the top cover
b	Internals	MS confirming IS 2062 with inside 5 mm thick FRP
c	Baffles	MS confirming IS 2062 inside with 5mm thick FRP, 6 nos., 4000 mm x 200 mm
d	Nozzles	8 Nos., MS confirming IS: 1239 inside with 5mm thick FRP lining
e	Gaskets	Flexible PVC
f	Bridge & leg supports	Minimum ISMC 250
12	**Plate thickness**	
a.	Conical	10 mm
b.	Shell	8 mm
c.	Top cover	6 mm
13	**Agitator**	MS confirming IS 2062 with 8 mm thick FRP lining
a.	Type	Paddle type
b.	Drive Motor power requirement / RPM	**20 HP/1440 RPM**
c.	Gear ratio	**70:1**
d.	M.o.C, paddle	MS confirming IS 2062, dia 2500 mm, 100 mm x 10 mm
f.	M.o.C, Shaft	Pipe 6" ,schedule 80 FRP lined
g.	Coupling-Gear to Agitator	Rigid

7.2 30 M3 CAPACITY CONICAL BOTTOM MSFRP TANK

1	Type	Vertical cylindrical with conical bottom complete with cover plate and supports.
2	Capacity	30 m^3
3	Quantity	4 No.
4	Inside Diameter	3.2 m
5	Vertical height	3.35 m
6	Conical height	0.850 m
7	Specific gravity	Slurry Mixture: 1.20 to 1.60; Liquid: 0.997-1.40; Solid: 2.6-2.7.
8	Nature of slurry / solution to be handled	Acidic in nature
9	Operating conditions	Ambient temperature and Atmospheric pressure
10	Design Temp./Pressure	55-degree C / hydrostatic
11	Material of Construction (M.o.C) & other details	
a	Shell, Top Cover and Bottom	MS confirming IS 2062 with FRP lining as per specification with FRP Feed tray/hopper and grid on the top cover.
b	Internals	MS confirming IS 2062 with inside 5 mm thick FRP
c	Baffles	MS confirming IS 2062 with inside 5mm thick FRP, 4 nos., 2700 mm x 150 mm
d	Nozzles	6 Nos., MS confirming IS: 1239 with inside 5mm thick FRP lining
e	Gaskets	Flexible PVC
f	Bridge & leg supports	Minimum ISMC 200
12	**Plate thickness**	
a.	Conical	8 mm
b.	Shell	6 mm
c.	Top cover	6 mm
13	**Agitator**	MS confirming IS 2062 with 8 mm thick FRP lining
a.	Type	Standard disc type agitator 950 mm dia
b.	Drive Motor power requirement / RPM	**15 HP/1440 RPM**
c.	Gear ratio	**20:1**
d.	M.o.C, Impeller	MS confirming IS 2062 with 8mm thick FRP lining
f.	M.o.C, Shaft	EN8 with 8mm thick FRP lining
g.	Coupling-Gear to Agitator	Rigid

7.3 30 M3 CAPACITY CONICAL BOTTOM MSFRP TANK (WITH GRIDS)

1.	Type	Vertical cylindrical with conical bottom complete with cover plate and supports.

2	Capacity	30 m^3
3	Quantity	2 Nos.
4	Inside Diameter	3.2 m
5.	Vertical height	3.35 m
6.	Conical height	0.850 m
7	Nature of slurry / solution to be handled	Acidic in nature (Normality 0.05 to 1.0 N), density-1.0 to 1.8 g/cc
8	Operating conditions	Ambient temperature and Atmospheric pressure
9	Design Temp./Pressure	55-degree C / hydrostatic
10	Material of Construction(M.o.C) & other details	
a	Shell, Top Cover and Bottom	MS as per IS2062+FRP lining as per specification with FRP Feed tray/hopper and grid on the top cover as per the attached drawings.
b	Internals	MS as per IS 2062 + inside 5 mm thick FRP
c	Grid Plates	150*150 mm opening, 25 mm CS/MS rod , FRP lined with minimum 6 mm thick 4 nos.
d	Vertical & Horizontal grid plate supports	Structural provision with horizontal (75 mmx75 mmx8 mm MS angle) and vertical support with(75 mmx75 mmx8 mm MS angle), FRP lined with minimum 5 mm thick
e	Nozzles	6 Nos., MS as per IS2062+inside 5mm thick FRP lining as per the attached drawings
f	Gaskets	Flexible PVC
g	Bridge &Supports	MS as per IS 2062 or latest IS Standards
11	**Plate thickness**	
a.	Conical	8 mm
b.	Shell	6 mm
c.	Top cover	6 mm
12	**Agitator**	MS as per IS2062+ 8 mm thick FRP lining
a.	Type	Standard 45° two stage pitched blade impeller, Three blades per stage as per the attached drawings.
b.	Drive Motor power requirement / RPM	**20 HP/1440 RPM**
c.	Gear ratio	**20:1**
d.	M.o.C, Impeller	MS as per IS2062+ 8 mm thick FRP lining
f.	M.o.C, Shaft	EN8 +8mm thick FRP lining
g.	Coupling-Gear to Agitator	Rigid

7.4 1.5 M3 CAPACITY CONICAL BOTTOM MSFRP TANK

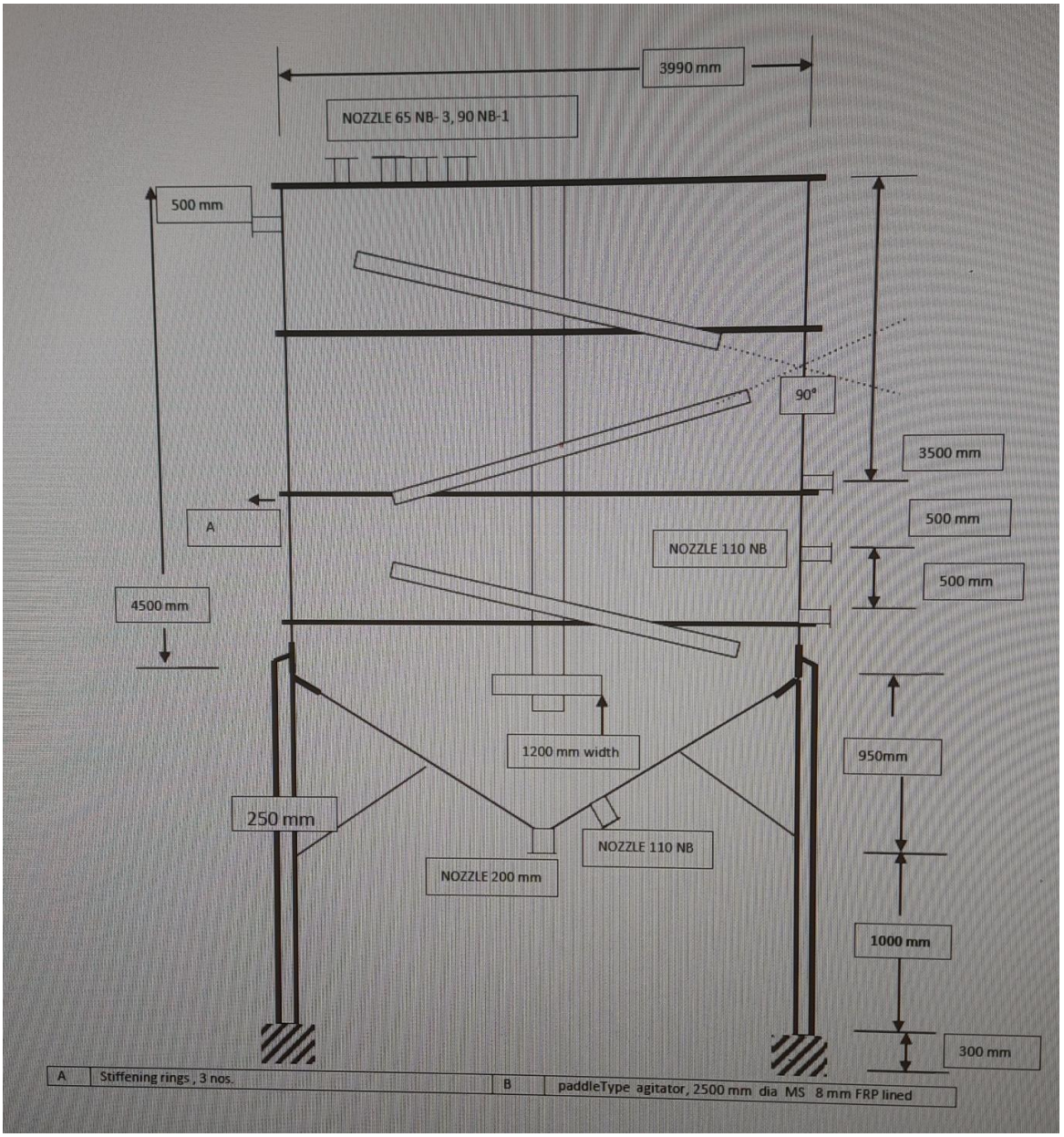
1.	Type	Vertical cylindrical with conical bottom complete with cover plate and supports.
2	Capacity	1.5 m^3
3	Quantity	1 Nos.
4	Inside Diameter	1.2 m
5.	Vertical height	1.2 m
6.	Conical height	0.350 m
7	Nature of slurry / solution to be handled	Slurry Mixture: 1.20 to 1.60; Liquid: 0.997-1.40; Solid: 2.6-2.7
8	Operating conditions	Ambient temperature and Atmospheric pressure
9	Design Temp./Pressure	55-degree C / hydrostatic
10	Material of Construction(M.o.C) & other details	
a	Shell, Top Cover and Bottom	MS confirming IS 2062 with FRP lining as per specification with FRP Feed tray/hopper and grid on the top cover.
b	Internals	MS confirming IS 2062 with inside 5 mm thick FRP
d	Baffles	MS as per IS 2062 + inside 5mm thick FRP, 4 nos.
e	Nozzles	3 Nos. of 75 mm sizes on top cover plate of tank, 01 bottom and 01 side bottom (90 mm) of tank , MS as per IS2062+inside 5mm thick FRP lining as per the attached drawings
f	Gaskets	Flexible PVC
g	Bridge &Supports	Minimum ISMC 150
11	**Plate thickness**	
a.	Conical	8 mm
b.	Shell	6 mm
c.	Top cover	6 mm
12	**Agitator**	MS as per IS2062+8 mm thick FRP lining
a.	Type	Standard 45° two stage pitched blade impeller, Three blades per stage as per the attached drawings.
b.	Drive Motor power requirement / RPM	**5 HP / 1440 RPM**
c.	Gear ratio	**20:1**
d.	M.o.C, Impeller	CS as per IS2062+ 8 mm thick FRP lining
f.	M.o.C, Shaft	EN8 +8mm thick FRP lining
g.	Coupling-Gear to Agitator	Rigid

7.5 CENTRIFUGE 350-400 kg/hr CAPACITY (SS-316)

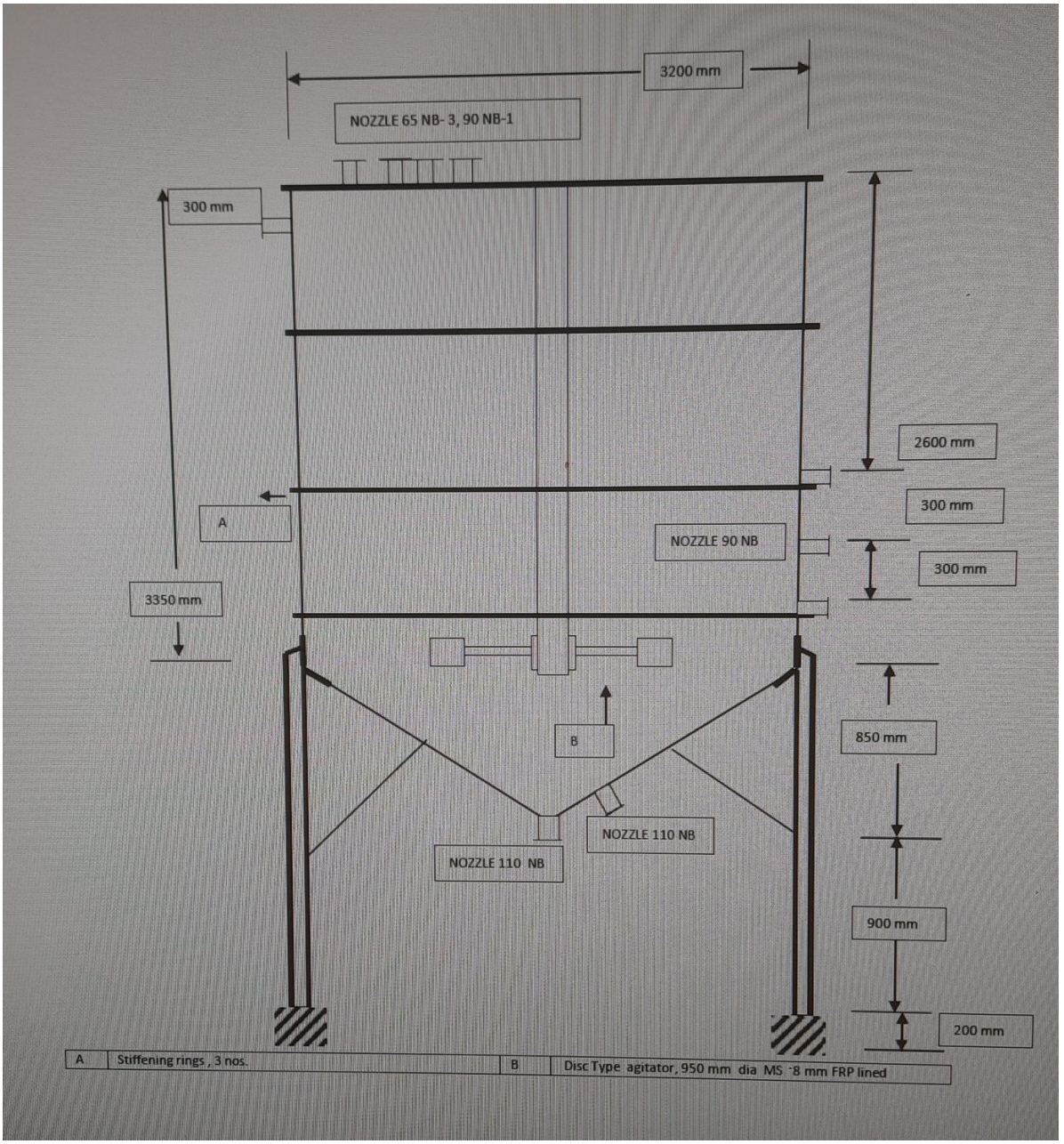
S. No.	Particulars	Details
1	Product to be centrifuged	Cerous carbonate precipitated with Sodium Carbonate/bicarbonate solution
2	Composition of Feed slurry	10-20% weight/vol. of solids
3	Production rate on wet basis (Centrifuged cake) proposed	350-400 Kg/cycle containing about 30-40% humidity
4	Particle size distribution	•10% product diameter is below 8 to 10 microns •50% product diameter is below 20 to 30 microns •98% product diameter is below 50 to 60 microns Mean diameter : 25 microns
5	Bulk density of Product	Loose without tappings : 0.7 to 0.9 g/cc With 250 tappings 1 to 1.2 g/cc
6	Filtrate analysis	Solid content - 250 ppm PH-7 to 7.5 Specific gravity - 1.02
7	Chemical composition of Product	Cerous carbonate wet cake $Ce_2(CO_3)_3$
i.	Ce2O3/ TREO	40-50%
ii.	Humidity	30-40%

8 TENTATIVE DRAWINGS FOR REFERENCE

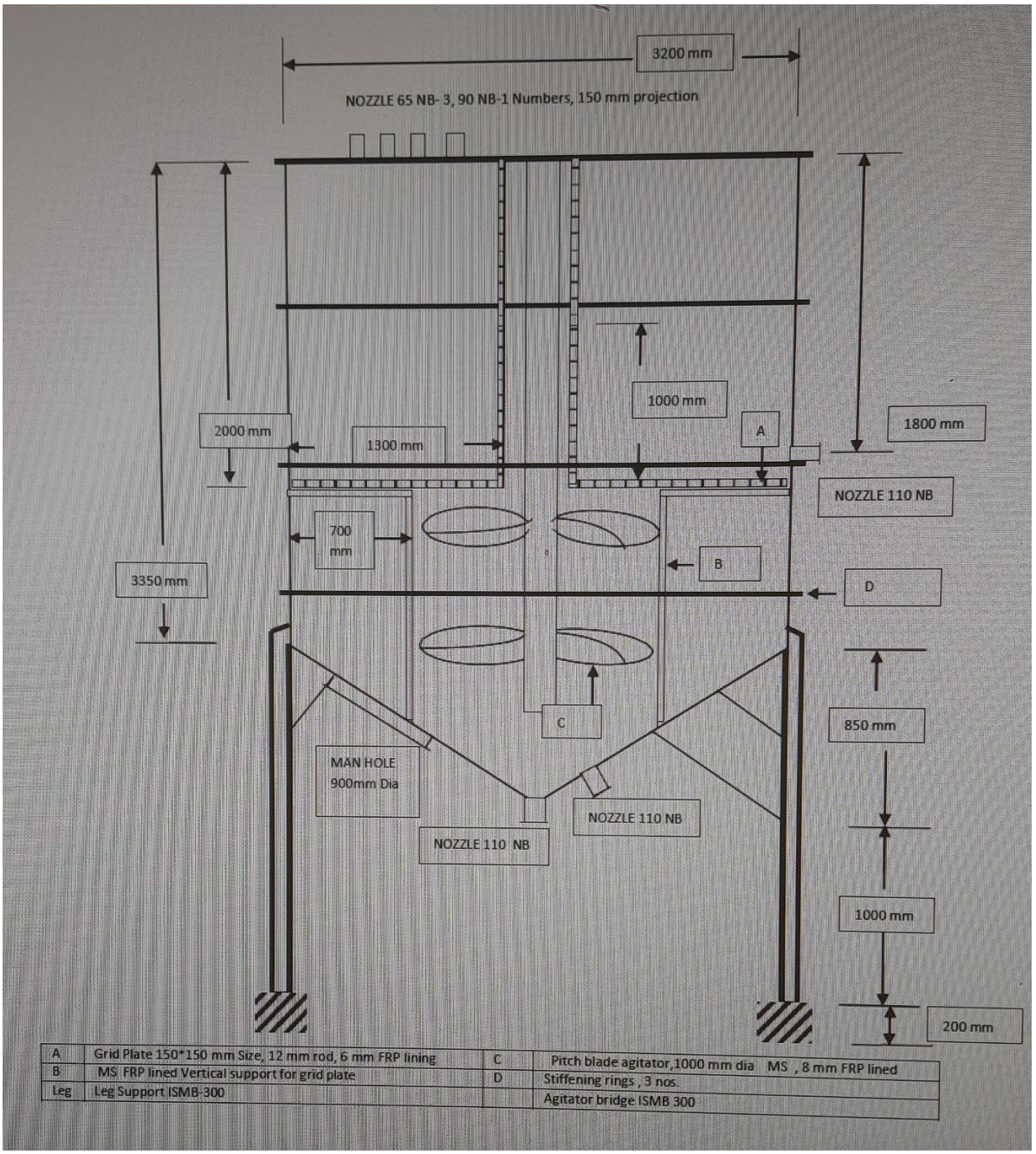
8.1 60 M3 CAPACITY CONICAL BOTTOM MSFRP TANK



8.2 30 M3 CAPACITY CONICAL BOTTOM MSFRP TANK

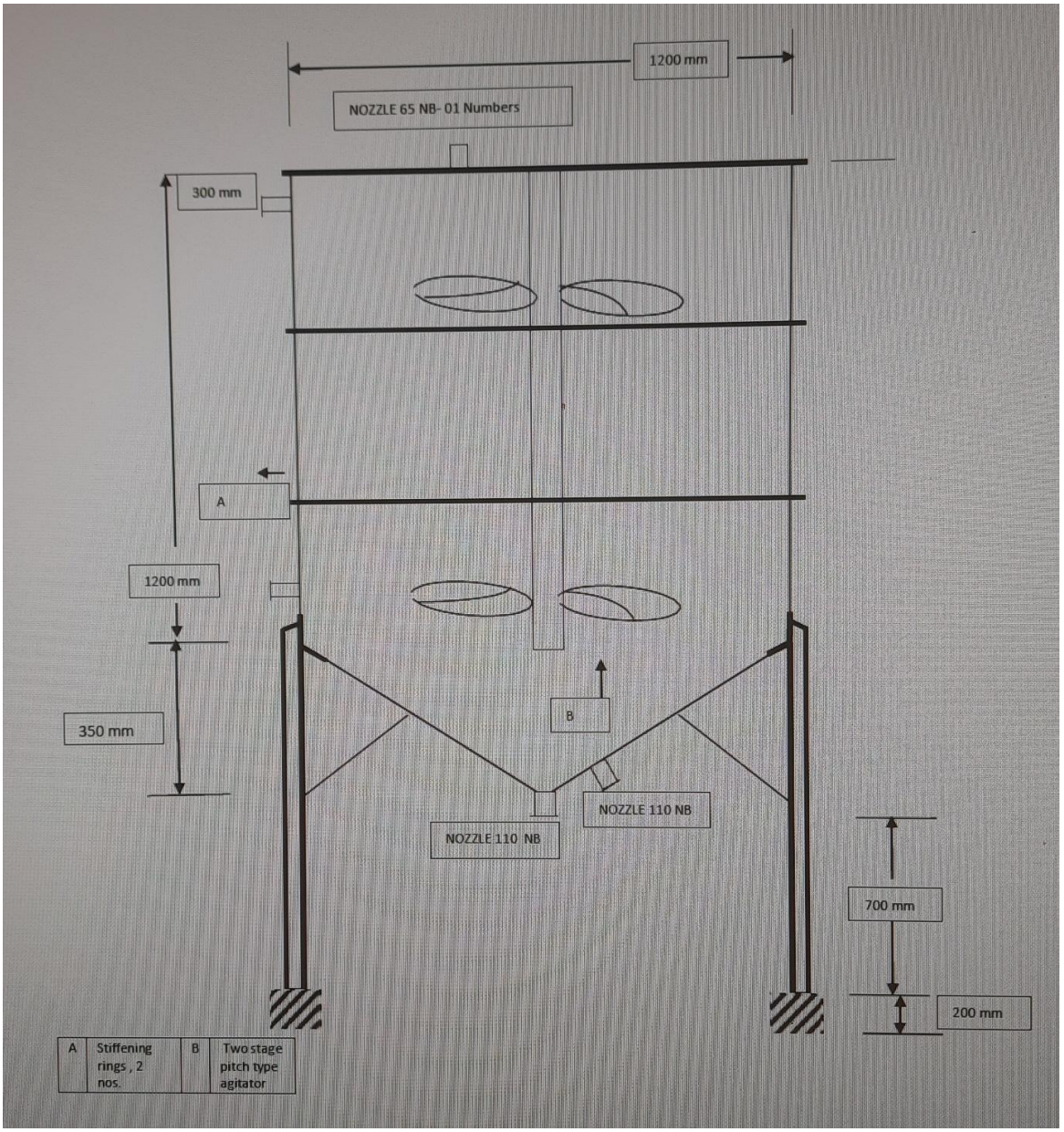


8.3 30 M3 CAPACITY CONICAL BOTTOM MSFRP TANK (WITH GRIDS)

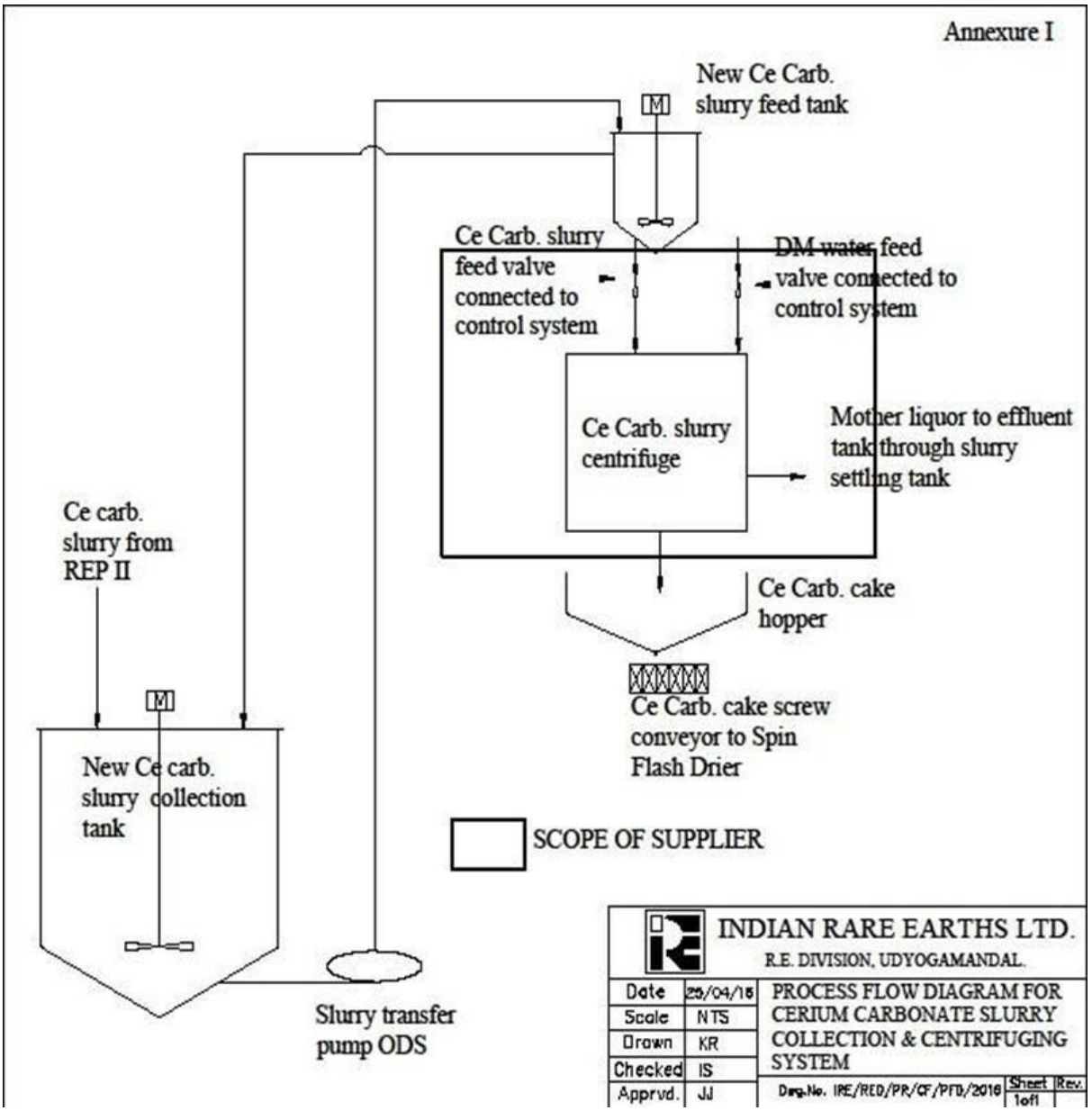


A	Grid Plate 150*150 mm Size, 12 mm rod, 6 mm FRP lining	C	Pitch blade agitator,1000 mm dia MS , 8 mm FRP lined
B	MS FRP lined Vertical support for grid plate	D	Stiffening rings , 3 nos.
Leg	Leg Support ISMB-300		Agitator bridge ISMB 300

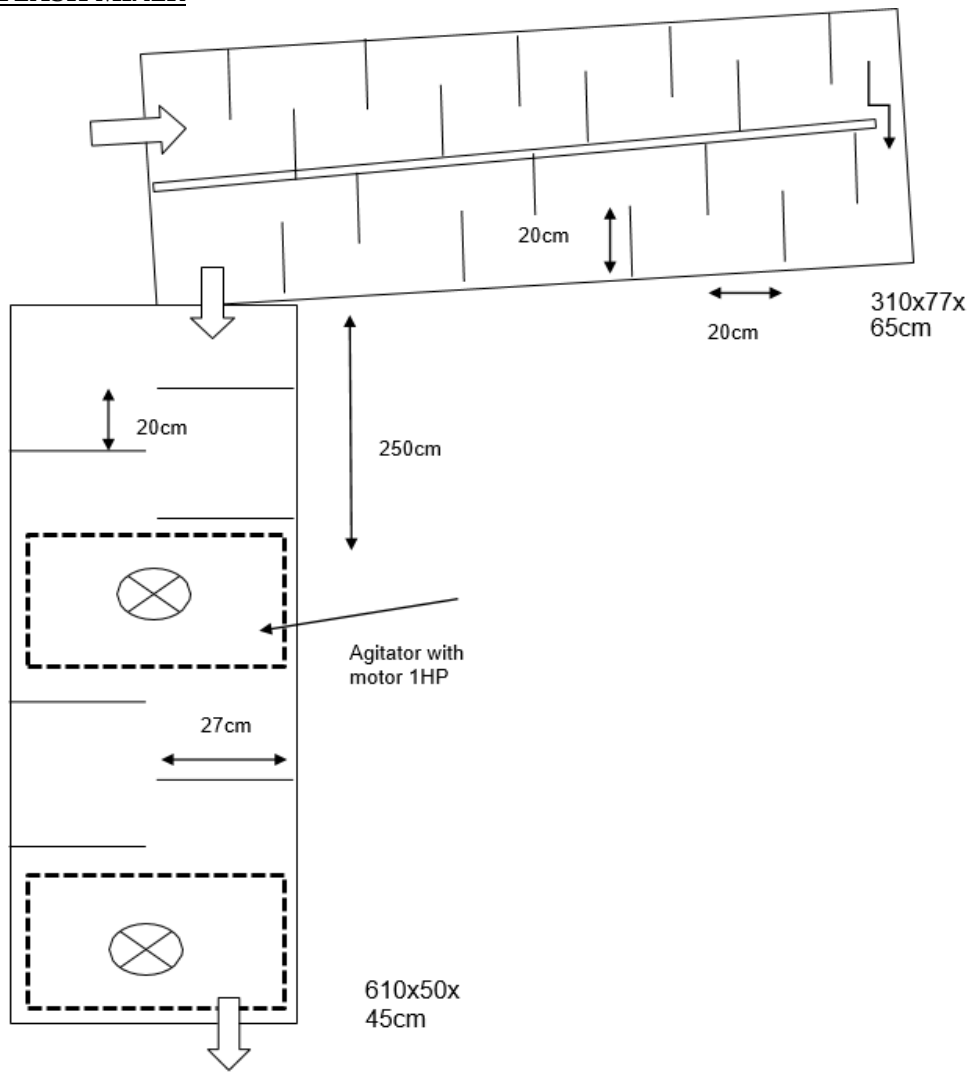
8.4 1.5 M3 CAPACITY CONICAL BOTTOM MSFRP TANK



8.5 CENTRIFUGE 350-400 kg/hr CAPACITY (SS-316)



8.6 FRP FLASH MIXER



ANNEXURE-2

CIVIL WORKS

DETAILED SCOPE OF WORK, TECHNICAL SPECIFICATION AND TENTATIVE DRAWINGS RELATED TO CIVIL WORKS:

SCOPE OF THE WORK

The brief description of the civil work are as follows,

The bidder's scope shall broadly include construction of all civil, structural & finishing works related to structural steel sheds in various locations inside factory premises and construction of RCC underground collection pit, foundations which includes earth work, plain & reinforced cement concrete, reinforcement, scaffolding, formwork, masonry work, floor finishing, skirting, plastering, painting, structural steel fabrication & erection, PVC roofing, side cladding, chemical resistant polyurethane screed lining, providing WPC doors, supply & fixing Aluminum, UPVC windows, FRP lining inside collection pit etc., as well as supply of all materials, consumables, labour, tools and plants, transportation and storage, sample testing etc., all complete as per BOQ, specifications and drawings.

In addition to above the bidder's scope shall also cover submission of details / brochures / technical write ups / manufacturer's test certificates and field test results etc, as applicable, along with source of supplies for the bought out items pertaining to his scope of supplies and execution for the following . IREL shall provide only conceptual drawings. The detailing for following specialized items shall be arranged by the contractor himself –

f) Detailed engineering drawings, design, construction & architectural drawings for the work.
g) Bar bending schedule of reinforcement steel in each site.
h) Fabrication & erection details of steel structure.
i) Shuttering details including propping, scaffolding etc.
j) Certified Concrete mix designs from technical institutes such as IITs or equivalent NABL accredited laboratory along with lab and field trial details.

TECHNICAL SPECIFICATION OF CIVIL WORKS AS FOLLOWS,

PART – A – PREPARATION OF DETAILED ENGINEERING DRAWING & DESIGN BASIS REPORT

1.1 Submission of detailed engineering / working drawings and structural designs calculations with applicable loads coming on the structure for construction of Structural steel shed, RCC foundations for MS tanks in various capacity in different locations inside factory premises and construction of RCC underground treated effluent collection pit of size 30m length, 3.60m width, 4.0m depth (approx.) 400cum capacity two compartments (200 m^3 capacity each) near ETP. All designs shall be certified by a Chartered Structural Engineer and a detailed design basis report shall be prepared based on the all input loads, in accordance with the latest revisions of the relevant Indian Standard (IS) codes submitted to Engineer-in charge & obtain GFC(Good for Construction) approval before commencement of the work. In addition to that, all the working drawings & design calculations shall be vetted by SERC / NIT/ IIT / CUSAT/ Government Engineering Colleges.

PART- B DEMOLTION OF RCC STRUCTURE, TANK FOUNDATION, FLOOR, MS STRUCTURAL

1.2 Demolition of RCC structures such as floor slabs, old foundations, roads, columns, beams, slabs, and all other concrete elements shall be carried out using a chain-driven excavator with suitable capacity and low-vibration breaker / crusher unit suit to existing site condition without damaging the nearby structures. The concrete shall be broken into small pieces, and re-bars shall be cut with angle grinder or gas cutter. The accumulated concrete waste shall be shifted to the designated location as directed by the EIC, within 1000 m inside the factory premises.

1.3 Demolition of RCC portal frames structure (old acid tank structure) and underground pedestal / foundation near existing Clarifloclulator shall be carried out using diamond wire / wall saws machines, diamond wire saws for horizontal slicing and diamond wall saws for vertical slicing to cut the structure into

small pieces. The equipment shall be engaged of suitable diameter diamond wheel saw and sufficient capacity to suit the existing site conditions. The reinforcement shall be cut using angle grinders or gas cutters. The entire demolition work shall be carried out without damaging the adjacent structures. The accumulated concrete waste shall be shifted to the designated location, as directed by the EIC, within 1000 m inside the factory premises.

1.4 Engaging concrete cutter 2 feet dia 60cm (approx.) wherever required for cutting floor at all levels before commencement of dismantling of concrete structure using diamond wheel saw suit to existing site condition for cutting of RCC slab/floor of 200 to 300mm thickness including necessary scaffolding, working platform, labour charges etc. to carry out the complete work.

1.5 Dismantling and removal of concrete, rubble soling/masonry, brick masonry, etc., shall be carried out using electrically portable heavy-duty concrete breaker machines, jack hammers or manually, including cutting of reinforcement bars using angle grinders or gas cutters. The concrete waste accumulated during demolition shall be placed at the designated location, as directed by the EIC, within 1000 m inside the factory premises.

1.6 Dismantling and removal of all types of existing roof sheets (Asbestos Cement, metallic, FRP, polycarbonate, PVC sheets) used in roofing and side cladding, including ridges and roof bolts, screws etc., shall be removed by using all necessary tools, equipment and scaffolding. The removed sheets shall be stacked at the location directed by the EIC, within 1000 m inside the factory premises. No extra cost shall be payable for shifting the roof sheets.

1.7 Dismantling and removal of existing FRP (Fiber Reinforced Plastic) / UPVC rainwater gutters and PVC down take pipes, including all necessary supports, clamps, brackets, and accessories, shall be carried out without causing any damage to the nearby surrounding structures. The removed materials shall be stacked at the location directed by the EIC, within 1000 m inside the factory premises.

1.8 Dismantling of MS steel structures at various locations at all levels as directed by the EIC such as columns, beams, trusses, purlins, bracing, plates, brackets, bolts, etc., shall be carried out using gas cutters, cutting wheel machineries and necessary scaffolding and working platforms. Additionally, wall-fixed plates, channel sections, I-sections projecting from walls and bolts shall also be cut & to be removed. The dismantled steel shall be weighed on a weighing bridge and disposed of at the scrap yard or at the designated location as directed by the EIC within 1000 m inside the factory premises.

PART - C - CONSTRUCTION OF RCC FOUNDATIONS, UNDERGROUND COLLECTION PIT

1.9 Earthwork excavation for underground effluent collection pits, tank foundations, columns, plinth beams etc., up to a depth of 5 m (approximately) from the ground level, shall be carried out by mechanical means. This includes removing all earth, scraps, boulders, rubble, bushes, roots etc., dewatering by providing precast well rings at nearby corners, fixing suitably sized automatic submersible pumps and pumping out groundwater. The work also includes shoring, strutting the sides of the excavation to prevent land sliding during the monsoon. The contractor shall backfill around structures only after the structural elements have attained adequate strength. The backfill material shall be thoroughly compacted in each layers of approximately 300 mm thickness to achieve a maximum dry density.

1.10 Providing 5 mm thick profile steel sheet piles of approved type and section where proposed location of underground collection pit around peripheral of wall . The sheet piles shall be driven to a minimum depth of 6 m, top supports shall be provided using ISMB 200 / ISMB 300 beams support, along with vertical support etc. Additionally, horizontal and cross bracing shall also be installed at the top to ensure adequate retaining capacity against earth pressure & nearby structure loads.

1.11 Providing and laying Granular Sub Base (GSB) of approximately 200 mm thickness over the existing excavated surface, including levelling and consolidation to form a compact surface by watering and compacting with vibratory rollers, and properly consolidating the layer, complete as per standard specifications and as directed by the Engineer-in-Charge. Measurement shall be taken for the compacted layer based on the actual thickness at site. Supply quantity will not be considered for payment.

1.12 Providing PCC 1:3:6 mix for foundations (raft / isolated footing) , plinth beams, floors, beams, columns, roads etc., at various locations as directed by the EIC, using either machine mixing or hand mixing with 40-

20 mm down-grade broken stone aggregate, M-sand, cement, etc. Before placing the concrete, the surface should be thoroughly cleaned of slurry and the existing earth should be rammed and well compacted. The side shuttering should be properly aligned and necessary curing shall be performed after concreting.

1.13 Providing and laying a polythene sheet of 200 micron (800 gauge) thickness in a single piece covering the full width of the effluent collection pit, with proper overlaps of approximately 30 cm, complete as directed by the Engineer-in-Charge. Measurement shall be taken only for the laid area, excluding overlaps.

1.14 Supply and fixing of high-yield strength deformed (HYSD) Fe500 grade reinforcement, including cutting to the required size, bending, placing in position, and binding with 18/20 gauge black/GI tying wire. All reinforcement shall be inspected by the EIC before concreting. Defective, brittle, excessively rusted, or burnt bars shall be removed. Cracked ends of bars shall be cut out. No work shall commence without the EIC's approval of the bar bending schedule. Manufacturer's Test Certificates shall be provided for each lot of supply. Prior to starting bar bending work, the Contractor shall prepare a bar bending schedule based on the EIC-approved reinforcement drawings. The Contractor shall provide approved types of supports to maintain the bars in position, ensuring the required spacing and correct concrete cover to the reinforcement, as specified on the drawings. Cover blocks of the required shape and size, MS chairs, and spacer bars shall be used to ensure accurate positioning of reinforcement. Tensile strength test of reinforcement of diameter 10mm to 32mm dia atleast 1 no in each size of bar for every 20ton materials shall be carried out in NABL accredited Laboratory & test report shall be submitted to Engineer-in-charge.

1.15 Anchoring of new reinforcement bars in RCC columns, beams, and slabs wherever required, using pure epoxy resin anchoring mortar (MasterFlow 935 of BASF or equivalent of FOSROC/SIKA/HILTI), with holes drilled to the appropriate diameter to ensure proper bonding with the existing concrete, complete in all respects. The rate shall include the cost of epoxy resin anchoring mortar, labour charges, cost/hire charges of tools, scaffolding, machinery, and all other implements required to carry out the work. After completion of the anchoring work, each anchor shall be checked and verified by the site-in-charge, and measurements shall be recorded only after such verification.

1.16 Providing & laying Ready Mix Concrete for foundation, columns, beams, floors (M30 Grade design mix as per relevant IS code) with minimum cement content of 380 kg/m^3 using OPC 53 grade cement, 20mm-12mm downgraded broken stones, m-sand. The work also includes proper planning of concrete supply, pump locations, line layout, placing sequence and the entire pumping operation shall be made before execution of concrete work in each occasion. The pump should locate near to the placing area as practicable, and the entire surrounding area shall have adequate bearing strength to support concrete delivery pipes. Lines from pump to the placing area shall be laid with minimum bends. For large placing areas, alternate lines should be installed for rapid connection when required. Standby power and pumping equipment should be provided to replace initial equipment, if any breakdown occurs. The placing rate should be estimated so that concrete can be ordered at an appropriate delivery rate. As a final check, the pump should be started and operated without concrete to be certain that all moving parts are operating properly. A grout mortar should be pumped into the lines to provide lubrication for the concrete, but this mortar shall not be used in the placement. When the form is nearly full, and there is enough concrete in the line to complete the placement, the pump shall be stopped and a go-devil (ball) inserted and shall be forced through the line by water/air under pressure to clean it out. The go-devil should be stopped at a safe distance from the end of the line so that the water in the line will not spill into the placement area. At the end of placing operation, the line shall be cleaned in the reverse direction. The concrete shall be mechanically vibrated, consolidated and cured, with materials of approved quality. The scope includes the cost, conveyance, lead, lift of all materials, labor, etc. Before placing the concrete, any debris present in the reinforcement shall be cleared. Slump cone test for workability of concrete and casting of cubes required numbers for compressive strength shall be carried out as per relevant IS codes.

1.17 Providing and laying RCC M25 grade concrete for drain, sump, screed concrete, lintel sunshade etc., with a minimum cement content of 350 kg/m^3. The concrete shall be produced using 20 mm and 10 mm downgraded crushed stone aggregates, machine-mixed or ready-mixed, mechanically vibrated, properly consolidated, and adequately cured. The work shall include the use of quality materials as approved, and shall cover all costs of materials, conveyance, lead, lift, labour etc. Before placing the concrete, all debris within the reinforcement shall be thoroughly removed. Slump and cube tests shall be conducted during concreting as per standard specifications.

1.18 Providing centering & shuttering of approved quality for all RCC works shall conform to the shape, lines and dimensions, strong enough to withstand the dead and live loads and forces caused by ramming and vibrations of concrete and other incidental loads, imposed upon it during and after casting of concrete and shall be sufficiently tight to prevent loss of cement slurry from the concrete. It shall be made sufficiently rigid by using adequate number of ties and braces, screw jacks or hard board wedges wherever required shall be provided to prevent any settlement in the form work either before or during placing of concrete. The arrangement and alignment of formwork shall be got approved by the Engineer-in-charge (EIC) prior to concreting. However this shall not relieve the contractor from his responsibility for proper work and safety. All joints and holes in the formwork shall be caulked with jute cloth or other approved materials to the satisfaction of the EIC.

1.19 Providing two coats of coal tar epoxy paint of approved brand & shade, application as per manufacturer's recommendations for the exterior wall and basement of underground collection pit after proper surface preparation.

1.20 Providing and finishing concrete floor surface using power trowel machine to achieve a smooth finish, hard, and proper level. The work includes operating the machine over freshly laid concrete after initial setting time, as per the manufacturer's recommendation and site conditions. The process may involve multiple passes using floater and finish blades to ensure proper compaction and surface finish. The rate includes all labor, tools, equipment, fuel, and operator charges for the trowel machine, including edge finishing manually where machine access is restricted, and protection of finished surfaces as per the direction of the Engineer-in-Charge.

1.21 Providing masonry work using solid concrete blocks of standard sizes 30 cm × 20 cm × 15 cm or 30 cm × 20 cm × 10 cm in the superstructure above plinth level up to the proposed height as directed by the Engineer-in-Charge, in cement mortar 1:5 (1 cement: 5 coarse sand), including raking out joints, finishing to proper lines and levels, chipping the existing floor concrete surface for proper bonding, curing, and all other incidental works, complete at all levels.

1.22 Providing plastering in cement mortar 1:4, 12 mm average thickness, on new and existing masonry surfaces wherever required, including mixing and application of mortar, finishing the surface to a smooth and even level, and completing all work as directed by the Engineer-in-Charge.

1.23 Supplying & sealing the junction of RCC & PCC works with cold applied bituminous caulking compound with mineral fillers (tarplastic of STP or equivalent) at, 75-100 mm wide, 20 mm thick approx, surfaces to make it leak proof.

1.24 Supplying water proofing compound of approved make for mixing in cement mortar as per manufacturer recommendation and as directed by EIC, including cost & conveyance of material, labour charges etc.

1.25 Fabrication, supply and fixing fully furnished pre hung solid wood WPC doors, Aluminium windows casement / fixed with frame of required size after removal of the existing wooden doors/windows/ventilators from the masonry wall without damaging the structure as directed by EIC. The outer frame shall be fixed rigidly into the masonry wall using suitable fasteners at regular intervals and plastering all edges and corners, damaged area, gaps shall be filled by suitable silicon sealant.

1.26 Fabrication, supply & fixing of UPVC windows fixing using screws/anchor bolts, handle, beading to air tight closure etc. The gaps between the masonry wall and window shall be sealed with weather resistant silicon sealant.

1.27 Providing and fixing good quality vitrified tiles, 8mm thick double charged, anti-skid, anti-strain and scratch resistant at all levels, over the existing cement flooring and slab, approved design, shade and finish, laying over the existing masonry surface after chipping, cleaning, fixing using suitable tile adhesive with spacers, filling the joints with epoxy grout.

1.28 Supply & painting interior surface of buildings including masonry walls, RCC columns, beams, ceiling etc., as directed by Engineer in charge, prepared & applied as per manufacturer's recommendation with one coat of epoxy primer (dual pack) and two coats of epoxy finish paint (dual pack-light shade, chemical resistant suitable for masonry surface application) after proper surface preparation which includes removing of any loose old paint layer, dirt, grease etc., using sand/emery paper/wire brush, scrubbing with water wherever required, cleaning using cotton waste and disposing the debris within a distance of

750m inside the company premises. Successive coat of paint shall be applied only after hard drying of the previous coat.

1.29 Supply and painting of the exterior surface of the buildings which includes masonry walls, RCC columns, beams, sunshade, roof gutter, jally and other masonry surface etc., with one coat of water based primer and 2 coats of polyurethane (PU) water based finish paint for smooth finish and better appearance suitable for exterior application, after proper surface preparation such as removing of loose old paint layer, dirt, grease etc., using sand/emery paper/wire brush/buffing machine, washing the surface with high pressure water jet pump at all levels, cleaning using cotton waste and disposing the debris within a distance of 750m inside the company premises. Successive coat of paint shall be applied only after hard drying of the previous coat.

Coverage of materials (paint items) shall be calculated as follows – Water based primer & Polyurethane finish paint (exterior) - 10m^2/litre/coat, High build epoxy primer & epoxy chemical resistant finish paint (interior) - 7m^2/litre/coat, coal tar epoxy paint - 5m^2/litre of actual area painted.

1.30 Providing heavy duty Polyurethane (PU) screed lining, 5mm average thick, over the existing concrete floor area using approved brand & shade of materials, laid as per manufacturer recommendations, after proper surface preparation which includes grinding the floor making anchor grooves 100 mm from around the peripheral walls, 20sqm areas for a size of 6 mm x 6 mm (width and depth) , remove any loose plaster, dirt, grease, surface contamination, laitance completely and priming with suitable primer 24 hrs dry. Thereafter a screed lining with approved shade & finish shall be applied in required thickness. The debris generated while cleaning shall be disposed at our disposal/scrap yard within a distance of 1000m inside the company premises.

1.31 Supply & fixing of PVC/rubber water stopper bars, 150 mm wide and 6mm thick in all construction joints. In addition, shear keys shall be provided at construction joints to prevent any leakage. The top surface of construction joints shall be kept/made rough for proper bonding between new & previously laid concrete surface. Cement grouting shall be given at all joints before pouring the concrete.

PART - D - STRUCTURAL STEEL SHED, PVC ROOFING

1.32 Supply, providing, fabricating, and erection of MS steel structural members such as columns, beams, trusses, purlins, cross bracing between columns & wind bracing in truss, side cladding, gusset plates, stiffeners, louver brackets, built-up section, monkey ladders, staircase etc., using standard sections of beams, channels, angles, flats and plates with welded or bolted connections at all heights and levels. The work includes cutting, welding, jointing and grinding, surface preparation thoroughly clean the surface using a cup brush fitted with an angle grinder and painted with one coat of epoxy primer (zinc phosphate/red oxide) followed by two coats of high-build epoxy finish paint. The rate shall include the cost of all materials, labour, necessary scaffolding, working platforms, suitable capacity cranes for erection of structural members and all other incidental works, complete as directed by the Engineer-in-Charge. Manufacturer's Test Certificates shall be provided for each lot of materials procured for fabrication work. The overall coating of painting which includes one coat of epoxy primer, 2 coats of epoxy finish paint shall be minimum shall be 105µm (micron).The contractor shall arrange DFT meter / Elcometer and paint thickness has to be measured at site with EIC, and if found less it has to be painted to attain the final 105µm (micron) DFT

1.33 Providing, fabricating and fixing intermediate sag rods between roof purlins to minimize sagging and lateral movement, including the supply of high-tensile steel rods of specified diameter (typically 20 mm or as per drawing), threading at both ends and providing nuts, washers as required. The rods shall be installed in proper line, alignment as per approved structural drawings, specifications, and as directed by the Engineer-in-Charge.

1.34 Supplying, providing, laying and fixing of industrial profile PVC roof sheet 1.90mm thick white colour, (overall width of 1063mm and crest height of 40mm with centre to centre crest of 250mm), fixing with suitable size aluminium alloy mill finish cyclonic / storm washer on crest of sheet profile, SS304 self-tapping screws, FRP flats on joints and apply weather proof silicon joint sealant to make the roof leak

proof,to suit the existing M.S. angle/channel, purlin, in required shape/length etc. to suit for existing site conditions and roof setup as per standard specification and as directed by Engineer-in-charge.

1.35 Supply, laying & fixing UPVC gutter with suitable accessories for valley gutter just below the edge of roof sheet, providing sufficient slope towards both ends, application of weather resistant silicon sealant for leak proof.

1.36 Supply & fixing PVC pipe of 140mm dia or nearest, 4Kg/cm^2 pressure rating for rain water down take from roof gutter, side cladding (roof sheet) including suitable specials such as bends, tees, elbows etc., required for the work suit to site setup, placing at site in position using GI threaded rod of minimum dia 7mm, sliding rail on both side of flange of MS column, U clamps at 1.0m center to center, bolts, nuts with washer, necessary jointing to proof leak, slopping to drain etc., accessories for the roof set-up and sealing them, necessary anchoring, clamping, grouting to the masonry structure after removal of damaged down take pipes etc., all required for the completion of work and as directed by Engineer-in-charge with prior approval for all fittings.

1.37 Supply & and fixing MS bolts & nut, washer plate of 25-32mm dia with 800mm length & about 175mm thread for RCC foundations as per the spacing given in the drawing or as directed by Engineer-in-charge. Suitable templates have to be made & fix before concreting to keep the spacing of foundation bolts in proper line & levels.

1.38 Providing Non shrinkage grouting cementitious grout of 50 mm thick at top of column footing / foundation and finished smooth with trowel using approved make & grade of material..

1.39 Supply & fixing 600mm dia powder coated aluminium wind driven turbo roof extractor with variable angle-elbow, laying with FRP base suitable to same profile of PVC roof sheets. The rate shall include cost & conveyance of all materials & labour charges, working platforms, scaffolding arrangements etc required for completion of the work.

PART – E PROVIDING FRP LINING INSIDE COLLECTION PIT

1.40 To provide FRP lining inside the collection pit (2 compartments) with partition walls and beams using three or more layers of chopped strand mating of minimum thickness 3.0mm and one layer of surface matting in Bisphenol resin. The work includes FRP lining of all the sides, partitions, beams, strut beams of the pit. Additional layer of chopped strand matting (of required GSM) may be used, if the total thickness of lining is found to be less than the minimum requirement specified in the Inspection & testing clause given below.

1.41 The cleaning/surface preparation shall be done prior to the FRP lining to remove all dust, loose particles etc. The surface preparation must be approved by the engineer-in-charge before the lining work is started. The approval w.r.t surface preparation will be communicated to the contractor/in-charge verbally at the site only. No written intimation will be given unless the contractor makes special request for the same. The cleaned surface must be given an initial coat of bisphenol resin and further lining can be done only after the curing (setting) of this coating.

1.42 It is the responsibility of the contractor to pump out any rain water in the collection pit before starting of the work and also temporary covering of the sides from any further rain water ingress, if required, during the progress of work. The pump including necessary hoses, tarpaulins for covering the sides etc., are to be brought by the contractor. The interior surface of the collection pit (wherever FRP lining has to be done) shall be thoroughly cleaned of all dirt, debris, loose mortar etc., dried and scrubbed to expose the virgin material for proper bonding of the FRP to the existing concrete/plastered surface. During lining with chopped strand matting, only one layer must be provided at a time and subsequent layers shall be provided only after complete setting/curing of the previous layer. The same procedure shall be followed during the lining of all the three layers and the surface layer. All the joints & corners must be provided with an overlap of minimum 100mm width, one additional layer, at least 600 mm width on all corners vertically & horizontally.

1.43 After the completion of each layer, the engineer-in-charge must be informed and obtained for the beginning of the subsequent layer. The sanction to commence the next layer will be communicated to the contractor/in-charge verbally at the site only.

1.44 No pigments shall be used for the lining work and it must be provided in the natural colour of FRP.

1.45 The contractor must use only resins and chopped strand mats supplied/manufactured by our approved list of make/suppliers given tender document. They may purchase the same directly from the manufacturer or from the authorized stockists/local dealers. The contractor shall furnish copies of bills in proof of purchase of resins and mats required for this work. The resin shall be brought only in sealed cans and the contractor shall maintain a register for material entry into company premises duly attested by the Engineer-in-Charge/Security section of IREL. Manufacturer's Test Certificates shall be provided for each lot of materials procured for FRP Lining work.

1.46 Glass Fibre mat: The material of Glass fiber chopped strand mat (CSM) shall be compatible with bisphenol resin & conform to BS3496:1973 and shall have the properties as per relevant IS/BS/ASTM/European standards.

1.47 Resin: Bisphenol A resin with suitable percentage of catalyst, accelerator and promoter as specified by the resin manufacturer may be used. The resin systems used must have the minimum properties as per relevant IS/ BS/ASTM/EN standards.

SL No	Parameter	Requirement
1.	Min. Lining thickness	3 mm
2.	Glass fiber mat (Chopped strand mat)	3 LAYERS OF CSM 450 GSM
3.	Fibre to resin ratio	1:2
4.	Resin	Bisphenol A
5.	Filler	NO FILLER
6.	Pigment	NO PIGMENT
7.	Final resin coat	0.25 mm

2.0 LIST OF MATERIALS OF APPROVED BRAND/ MANUFACTURERS

1	Cement	ULTRA TECH, ACC, MALABAR, GUJ. AMBUJA, BIRLA, CHETTINADU, RAMCO, JSW, COROMONDAL, ZUARI, DALMIA & INDIA CEMENTS
2	Ready Mix Concrete	ULTRA TECH/ ACC/ RMC READY MIX INDIA PVT LTD /PRISM / NEPTUNE / RDC OR EQUIVALENT HAVING IN-HOUSE TESTING LAB FACILITY
3	Reinforcement (HYSD) bar & Structural Steel	SAIL / TATA / TISCO / VIZAG / RINL / JINDAL / JSW / ESSAR
4	Welding Electrodes	ESAB / ADOR / D&H / L&T / STANVAC
5	Paint & Primer	ASIAN/BERGER/NEROLAC/ SHALIMAR
6	Fasteners (SS self-tapping screws) / Storm Washers (OKRON)	EJOT/KLIMAS/ROOFIX
7	PVC Roof sheet	PALRAM MAKE - PALRUF BRAND/BRETT MARTIN/KY POLICA
8	UPVC Gutter	AQUASTAR / EUROGUARD / SUPREME
9	PVC pipes	ASTRAL / FINOLEX / SUPREME
10	Screed & Coating material	SIKA / BASF/ ARDEX ENDURA / FOSROC/ FLOWCRETE / STP TREMCO
11	Rebar anchoring mortar	RE-500 of HILTI or equivalent FOSROC /SIKA

12	Bisphenol Resin (for FRP lining)	NAPHTHA RESINS / GOLDEN RESINS / ECMAS RESINS / MECHEMO
13	Glass fibre mat / veil (for FRP lining)	BINANI / SAINT GOBAIN / OWENS CORNING
14	Water proofing Compound	FOSROC / SIKA / PIDILITE / ARDEX ENDURA / STP / BASF
15	Floor Tiles	KAJARIA/NITCO/SOMANY/JHONSON
16	Joint fillers and tile adhesive	LATICRETE/KERAKOLL/MAPEI
17	Wooden Door	FERO/FENESTA/MIKASA
18	Door closer	GEZE / DORMA / OZONE
19	Aluminium Window (Profile)	TOSTEM / DORFEN / ETERNIA / HINDALCO
20	UPVC Window	FENESTA / PROMINANCE / ELGI
21	Wind driven turbo roof extractor	SUTHA VENTILATING SYSTEMS / MUKTHA ENGINEERS / VAYUVENT

3.0 OTHER TERMS & CONDITIONS

3.1 The volume of concrete shall be considered as per actual site measurement. Supply quantity as per delivery note of ready mix concrete will not be considered for measurement. Higher side tolerance in any case will not be considered for payment, site measurement as per approved construction drawing will be considered for arriving quantity as per actually executed at site.

3.2 For works where no specification is laid down in the Contract as aforesaid, such works shall be carried out in accordance with the specifications decided by the Engineer-in-Charge.

3.3 The contractor is responsible to rectify site constraints found during the execution of work such as pipe racks, pipe lines, cable trays, electrical cables etc., shall be carried out in consultation with the Engineer-in-charge.

3.4 Finally clearing away of all rubbish surplus materials, plant, etc, on completion of the work and dressing and leveling off and restoring the site to a tidy condition prior to handing over the work to the Engineer-in-Charge or his authorized assistant and also its maintenance until so taken over.

3.5 Any materials brought to the site of work, or any work done by the Contractor but rejected by the Engineer-in-Charge as being not up to the specifications shall in the case of materials supplied be then and there removed from or broken up at the site of work, and in the case of work done be dismantled or rectified at the expense of the contractors as may be ordered by the Engineer-in-charge.

3.6 The theoretical consumption of cement, reinforcement steel and structural steel required for the work will be calculated on the basis of approved drawings / joint site measurements. In the case of Cement, the theoretical consumption shall be decided by the Engineer as per CPWD specification and his decision in this regard shall be final and binding on the Contractor. Reinforcement and structural steel shall be measured by weight in tones. The weight will be arrived at by multiplying the used length by the sectional weight. Standard hooks, cranks, bends and authorised laps, chairs, separator pieces etc. specified in drawing or instructed by engineer as required shall be measured and paid for. No payment shall be made for binding wires, spacer block etc. required for keeping the steel in position unless otherwise specified in the contract. No extra payment will be made for modification of already embedded reinforcement, if required due to faulty fabrication or placement.

3.7 Materials will be accounted only for permanent works and not for making templates, other temporary works, enabling works etc. and the same shall not be taken into account for purpose of material reconciliation for billable items. The coefficients for theoretical consumption of material shall be as per CPWD specifications.

3.8 The contractor shall bear all other costs including the lifting, carting to works site form contractor's stores, custody and handling etc. and all other expenditure will be made by the contractor.

3.9 All steel shall be accounted in available lengths / shapes and no claims for extra payment on account of receipt of non-standard lengths/shapes will be entertained. For the purpose of billing and accounting only linear measurement will be taken and weight will be calculated as per the IS code -coefficient. The difference in unit weight as per IS code and actual if any shall be to the contractor's account and contractor shall quote the rates for corresponding item to take care of such difference.

3.10 The theoretical weight of each bag of cement will be considered as 50 kg per Bag. No claim whatsoever shall be entertained on this. The weight of each consignment at suitable capacity of weighbridge, nearest to the plant shall be ensured, if required and ascertained by IREL.

3.11 The Contractor shall maintain good stores for storing the cement, reinforcement, steel and other bought out items. The flooring of the storage house, the clearance of cement bags from the side walls etc., shall be as per the instructions of the Engineer-in-charge

3.12 The Contractor will have to submit their design mix as per scope of work & technical specification for different grades of concrete keeping in view the requirements stipulated in IS: 456, specifically regarding slump and water cement ratio, specific gravity of materials brought to site as analysed in the NABL accredited laboratories. For other than above designated mix Concrete items, the coefficients for consumption of cement shall be adopted as per CPWD practice. The theoretical consumption of cement thus worked out shall be binding upon the Contractor for reconciliation of materials.

3.13 All work shall be done strictly according to technical specifications & scope of work specified in the tender document and as per latest applicable CPWD specifications / latest BIS Codes. In the event of any item not finding a place in CPWD.specification or in BIS codes, the matter will be referred to the Engineer-in-charge for decision. The decision of EIC shall be final regarding the specifications to be adopted. All Standards, codes, Technical Specifications, Codes of Practice referred to shall be of the latest editions including all applicable official amendments and revisions.

3.14 All the works shall be carried out in accordance with drawings, specifications, description of item in schedule of quantities or as per the direction of Engineer-in-charge to his full satisfaction. If the substitution of any approved / specified material and make, due to its non – availability, with an alternative one, becomes necessary, the bidder must get specific approval of the same before placing order for purchase of materials.

3.15 Providing and operating necessary measuring and testing devices and materials are included in the Contractor's scope of work. The quoted price shall be inclusive of the cost of all such tests, which are required to ensure achievement of the specified quality. No separate payment for testing shall be made.

3.16 All finished work must be truly vertical & horizontal or in any other plane as specified. The rates quoted by the agency must include the cost for taking necessary measures to achieve it.

3.17 Any scaffolding used shall be of double vertical supports and no portion of scaffolding shall touch the wall surface.

3.18 The workmanship should be best available and of a high standard. Use of special trade's men in all aspects of the work may be done. Contractor shall maintain uniform quality and consistency in workmanship throughout.

3.19 Any work not conforming to specifications or workmanship shall be rejected and the same shall be rectified or removed and replaced with work of the required standard of workmanship at no extra cost to the employer.

3.20 Rates quoted for the items shall be valid for carrying out the item of work at any and / or all floor heights of the building.

3.21 No workmen below 18 years will be permitted to work. For all hazardous works experienced personnel shall only be engaged.

3.22 The whole responsibility for supervision of the work and the workers employed by the contractor shall rest with the contractor. The contractor shall nominate minimum one experienced & qualified site engineer & one supervisor for civil work at site all throughout the execution period. Such supervisor shall be authorized to act as Lead supervisor for the work and shall be authorized to act on behalf of the contractor, to accept notices under the contract and carryout the instructions of IREL (India) Limited from time to time.

3.23 IREL (India) Limited may ask to change/delete the person not found suitable for the work at any point of time. For any addition and deletion of the working person, prior permission from IREL (India) Limited shall be taken.

3.24 Contractor's all workmen and supervisor shall conduct himself in an orderly manner with the staff working in the department of IREL. Contractor and the personnel they have engaged for the execution of the contract shall abide by all the Safety & security rules and regulations of IREL (India) Limited. Contractor shall give the list of persons who shall be deployed at site like Site in-charge, supervisors, foreman, mason, fitters, welders, workers, etc. with their address and age proof well in advance. All such persons shall be subject to security check by security officials of IREL (India) Limited. The contractor shall obtain necessary Entry passes from concerned officials of IREL (India) Limited Security Wing prior to their deployment. Contractor shall ensure that no unauthorized persons are entering the work site except authorized workmen and supervisor.

3.25 Contractor shall adhere to all security procedures, checks and practices of IREL (India) Limited with regards all personnel engaged, all equipment, consumables, tools and tackles brought inside and taken out from the work site/s.

3.26 The contractor and his person shall maintain absolute integrity in carrying out the work and in case of any act detrimental to the interest of the company IREL (India) Limited, the contract shall be terminated.

3.27 Any specifications given in this document shall be supplementary to the specifications contained in the CPWD specifications, where at variance, these particular specifications shall take precedence over the provisions in the CPWD Specifications & IS codes of practice.

3.28 The bidder shall inspect and examine the site and its surroundings and satisfy themselves before submitting their bids as to the nature of the site (so far as its practicable), mechanism/equipment/safety precautions they may require and in general shall themselves obtain all necessary information as to risks, contingencies and other circumstances which may influences or effect their bid. The bidder shall be responsible for arranging and maintaining at his own cost all materials, mechanism, equipment, tools and plants, electricity access, safety and other facilities for workers, safety requirements and all other service required for work unless otherwise specifically provided for in the bid documents. Submission of a bid by a bidder implies that he has made himself aware of the scope of the work to be done and prevailing conditions and local conditions and other factors.

3.29 The bidder can inspect the site on any working days at our specified visiting hours with the permission of Engineer-in charge or concerned Section/Purchase Dept. The bidders are also advised to study the labour supply/availability, trade union practices and labour rates prevailing at Industrial belt of Udyogamandal.

3.30 The SPOC & supervisor must thoroughly understand all the traces entailed and be constantly in attendance, while the men are at work. Any directions, explanations, instructions or notices given by IREL Officer to such SPOC shall be deemed to be given to the Contractor and shall be binding. The Engineer should be able to read, write and speak English and will be responsible for ensuring safety of workers during execution.

4.0 INSPECTION & TESTING

4.1 Cube testing shall be carried out during the progress of the work to ascertain the quality of work. The number of concrete cubes to be tested shall be as per IS: 456. However, in case of ready-mix concrete confirming to IS: 4926, the number of cubes to be tested shall be as per the provisions in the standard. The

concrete cubes shall be casted at site as per relevant IS standard and tested at approved laboratories (CUSAT, BUREAU VERITAS or any other NABL accredited lab etc., with prior intimation to / permission of EIC) on 28th day from the day of casting of the cubes. The laboratory test results shall be tabulated and furnished to Engineer in charge (EIC). The EIC will pass the concrete if average strength of the specimens meets the requirement specified in the relevant IS codes. In addition to this, the contractor may provide test certificate from the RMC manufacturer, if instructed. The transportation & testing charges shall be borne by the contractor.

4.2 If any portion of the works fails to pass the tests, test of the said portion shall, if required by the Engineer-in-Charge or by you, be repeated within a reasonable time on the same terms and conditions and all reasonable expenses for the repetition of the tests shall be borne by you or deducted from the amount due to you. In lieu of repeat cube test, you shall arrange of core testing as per relevant IS standards.

4.3 Concrete of each grade shall be liable to be rejected if it is porous or honeycombed, its placing has been interrupted without providing a proper construction joint, reinforcement has been displaced beyond the tolerances specified or construction tolerance have not been met. However, the hardened concrete may be accepted after carrying out suitable remedial measures to the satisfaction to the Engineer-in-charge.

4.4 Curing shall be carried out after the completion of concrete, next day by providing necessary bund to stagnation /pond of water for 14 days minimum.

4.5 The contractor must repair all the patches, free of cost, to original thickness of FRP lining once the quality of the lining is approved by the Engineer-in-charge. It is the duty of the contractor to arrange necessary tools & workmen for cutting the sample pieces at the instruction of the Engineer-in-charge.

4.6 Magnetic Particle Testing shall be carried out on welded joints and ferromagnetic materials to detect surface and near-surface defects such as cracks and porosity. The testing shall conform to IS 3703, IS 822, and ASTM E709 or their latest revisions. Magnetizing equipment shall be of approved portable type, using AC or DC current as required. Surfaces shall be clean and free from rust, paint, oil, or grease before testing. Magnetization shall be applied in two directions to ensure complete coverage, and magnetic particles—dry or wet, fluorescent or non-fluorescent—shall be applied as per the approved method. A minimum of 10% of total welds or as directed by the Engineer-in-Charge shall be tested. Acceptance criteria shall follow IS 3703 or AWS D1.1, and defective welds shall be repaired and re-tested at no extra cost. Testing shall be conducted by qualified ASNT Level II personnel, and all results with weld identification, type of defect, and acceptance status shall be recorded and submitted for approval. All instruments shall be properly calibrated and testing carried out under safe working conditions with necessary PPE.

4.7 Dye Penetration Test shall be carryout on welding joints of minimum 10% of total welds or as directed by Engineer-in-charge. The testing shall conform to IS 3658 or their latest revisions & acceptance criteria shall confirm to IS 11732. The test procedure involves surface preparation which includes clean the weld surface thoroughly to remove all dirt, grease, rust, or other contaminants using a cleaner or solvent. The surface must be dry before proceeding and apply a liquid penetrant evenly to the surface. Allow a specific "penetrant dwell time" (e.g., 10 to 30 minutes, depending on the product and application) for the penetrant to soak into any cracks or flaws. After the dwell time, carefully remove the excess penetrant from the surface. Use a lint-free cloth, and if necessary, a cleaner to wipe away the remaining traces. Be careful not to wash the penetrant out of the discontinuities. Apply a thin, even coat of developer to the test area. The developer acts like a blotter, drawing the penetrant out of any surface defects. A developer dwell time (e.g., 10 to 60 minutes) is required for the indications to become visible. Inspect the surface under appropriate lighting (visible or UV, depending on the penetrant type). Discontinuities will appear as colored lines or patterns on the white developer background. Evaluate the indications based on established acceptance criteria. A report should be prepared after the evaluation.

4.8 All structural steel material used in the works shall conform to IS 2062 and general fabrication & erection procedure shall be followed as per relevant Indian standards code of practice. Test certificates from the manufacturer in each batch of materials brought by supplier shall be submitted to Engineer-in-charge. Any material failing to meet the specified requirements shall be rejected and replaced at no extra cost to the Department.

4.0 TENTATIVE GA DRAWINGS

4.1 General Notes

NOTES:-

1. All dimensions are in mm, unless noted otherwise.
2. The height of structure/levels shown in the drawing are approximate measurements.
3. The fabrication & erection of structural steel sections shall be carried out suitable to the existing site conditions and as directed by engineer-in-charge.
4. All site constraints such as FRP duct, pipe rack,cable tray shall be re-routed or modified as per site condition & requirement for the proposed work for erection of MS structural columns.
5. The bidder shall inspect the proposed site before quoting.
6. The detailed drawing shall be prepared by the bidder as per site conditions and as directed by EIC.
7. The structural steel sections/size of members shown is tentative drawing.the successful bidder have to check as suits to site condition after preparing detailed structural drawing as directed by EIC.

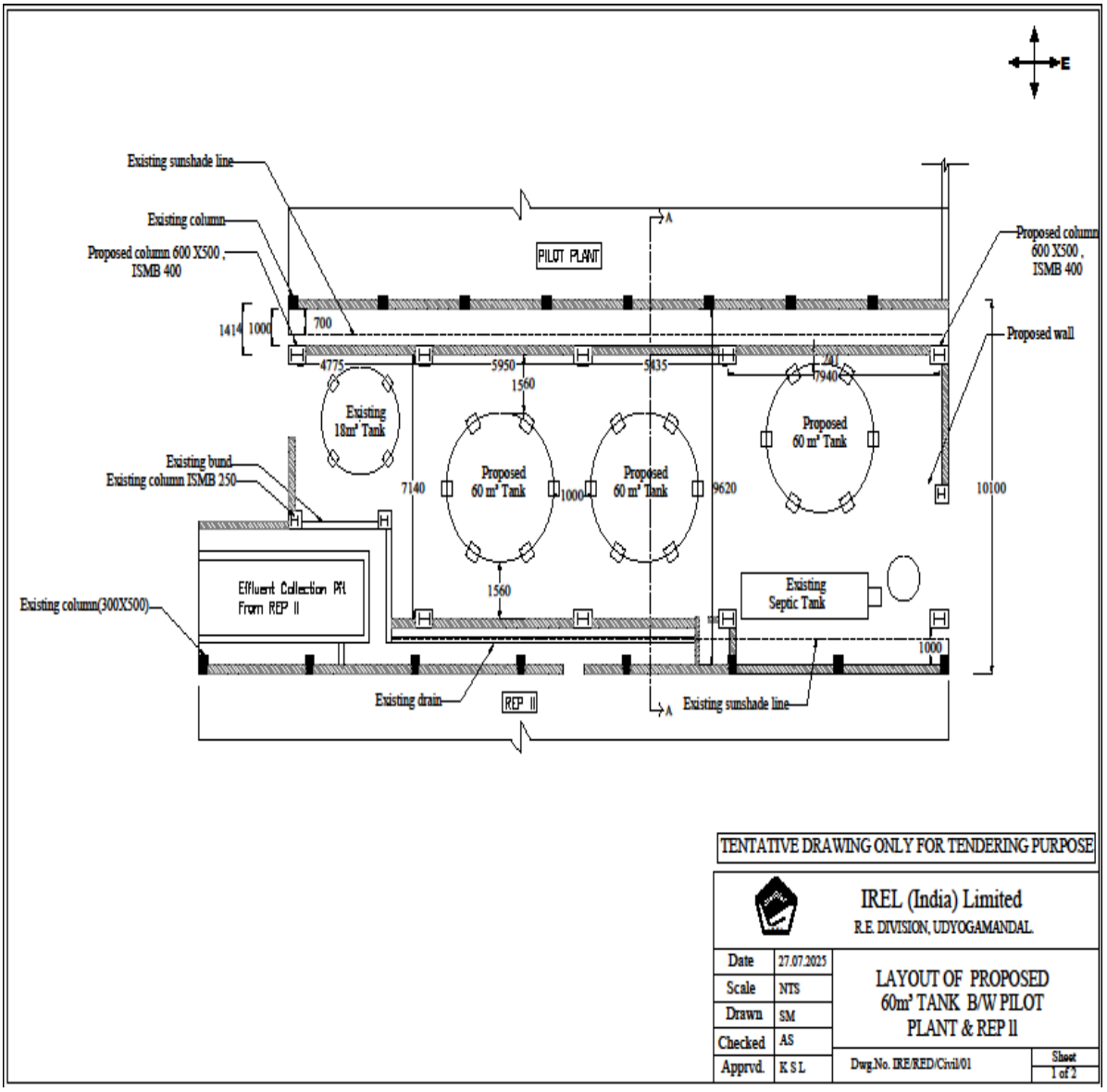
GENERAL NOTES & TECHNICAL NOTES:-

1. Grade Of Concrete :
   M30 (Design Mix) minimum cement content - 380kg/m³
2. Grade Of Steel :
   FE 500 - HYSD TMT bars as per ISI
3. Any discrepancy found in these drawing should be brought the consultant engineer notie before execution.
4. Do not cast any R.C.C work unless it is checked and confirmed by site engineer.
5. Design of propping , shuttering and concrete mix is contractor or site person responsibility.
6. Clear cover for reinforcement shall be as follows:

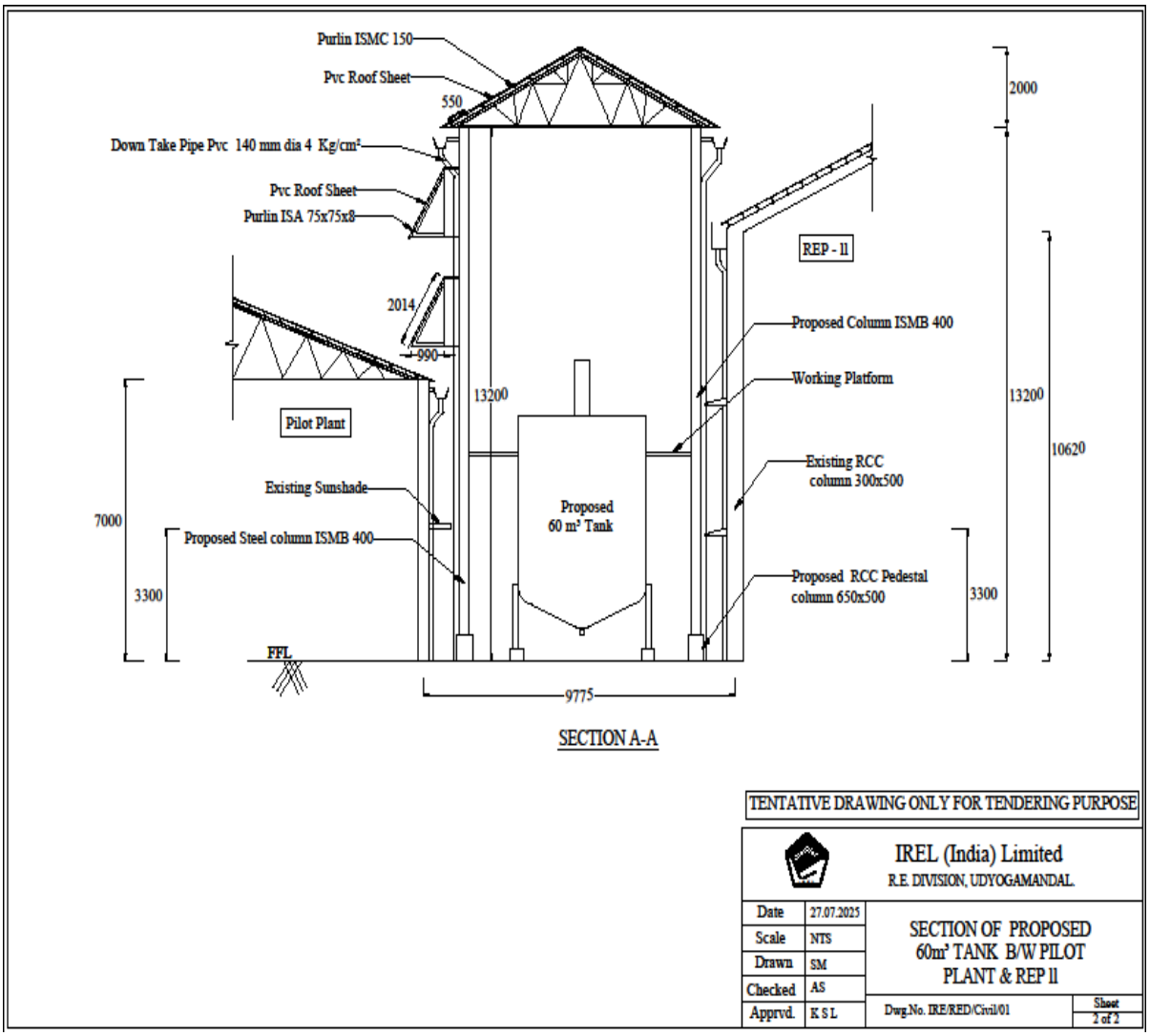
STRUCTURAL ELEMENTS	COVER (in mm)
Grade / plinth beam	25 mm
Column	40 mm
Wall	240 mm
Tie beam	25 mm
Cover Slab	25 mm

7. Do not scale the drawing refer figured dimensions
8. Lapping or anchorage length
   A. Beam - 50 X Dia Of Bar
   B. Column - 40 X Dia Of Bar

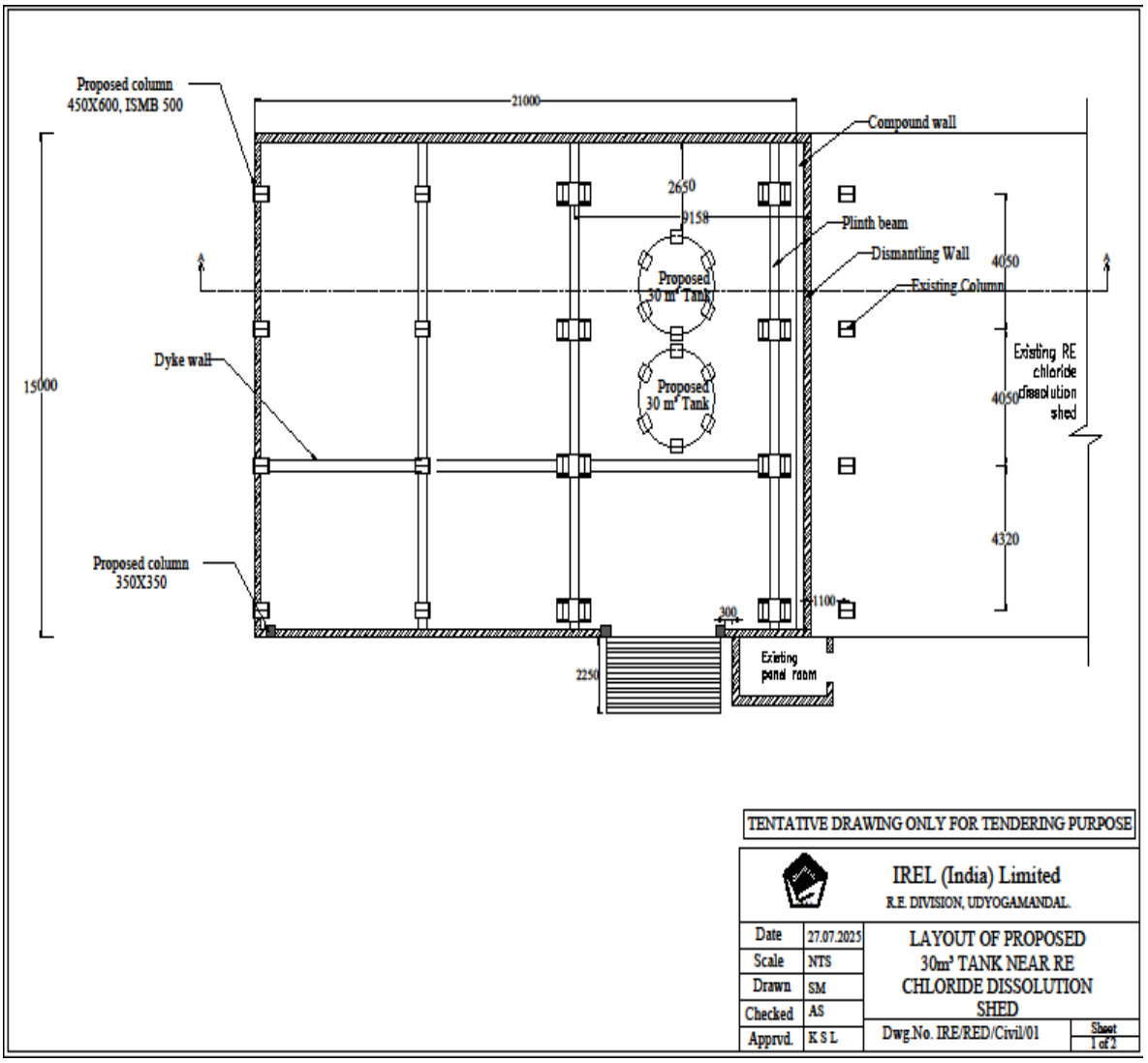
4.2 **Layout of proposed 60 m3 tank between pilot plant and REP2**



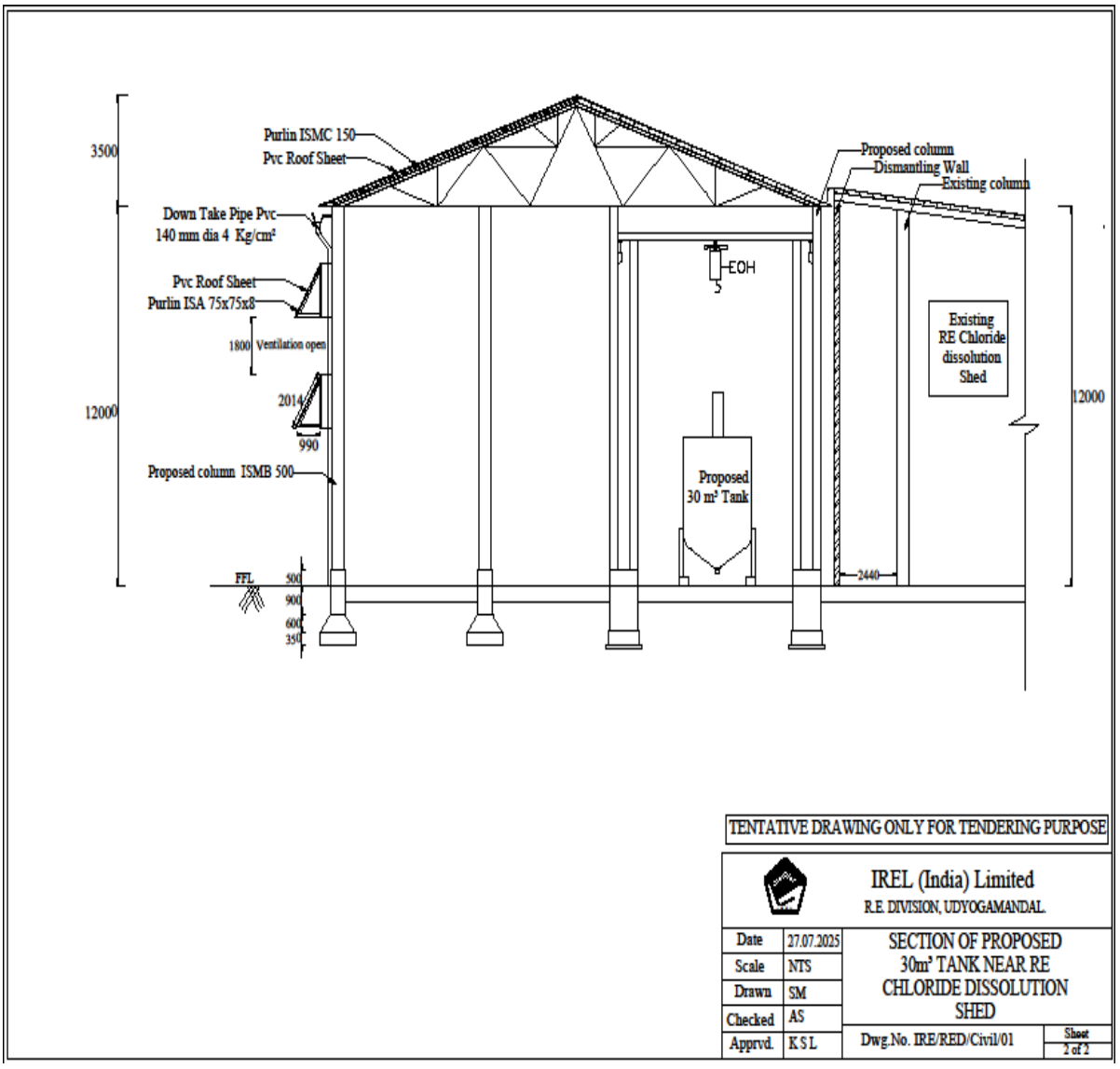
4.3 **Section of proposed 60 m3 tank between pilot plant and REP2**



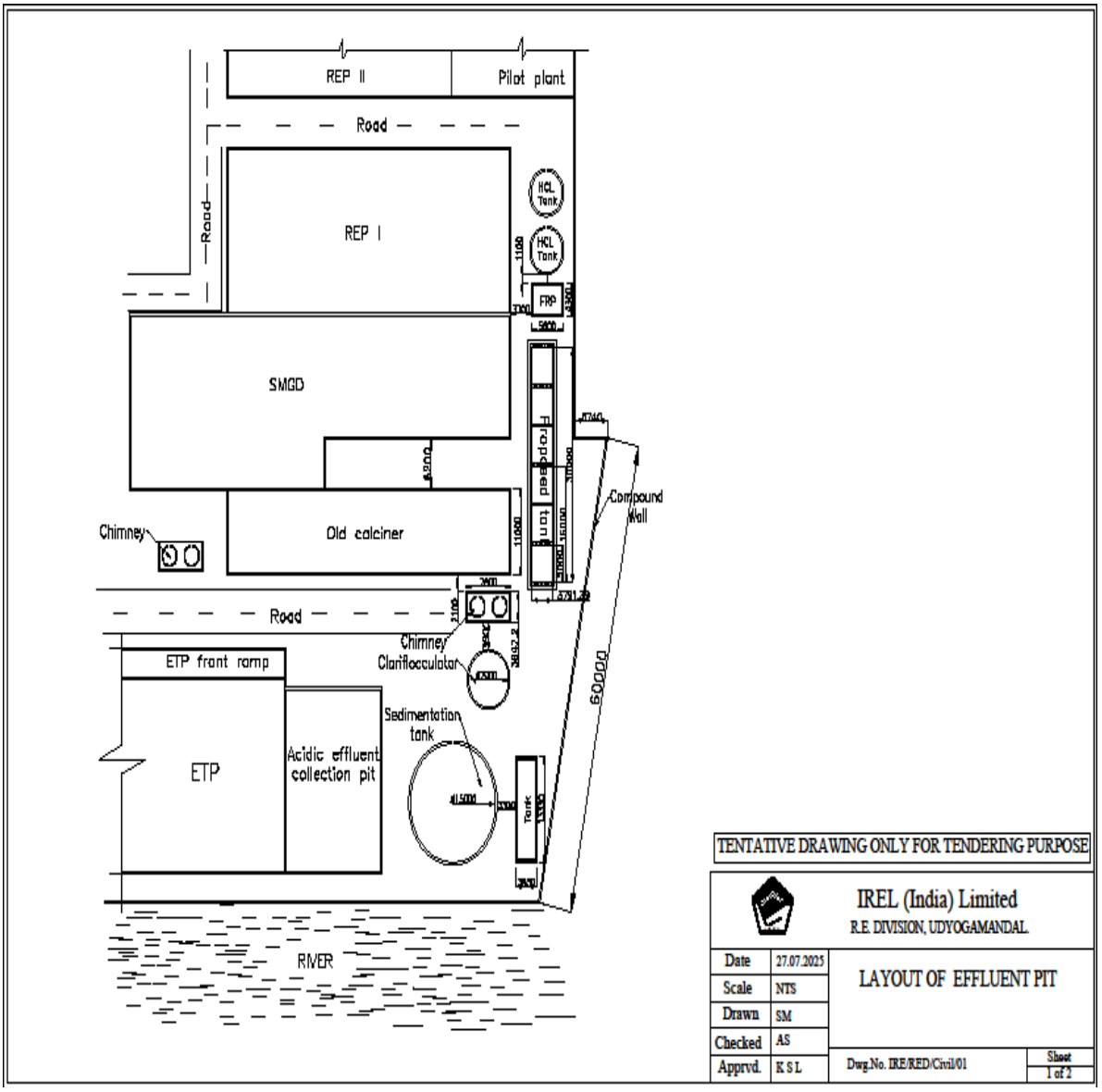
4.4 **Layout of proposed 30 m3 tank near RE chloride dissolution shed**



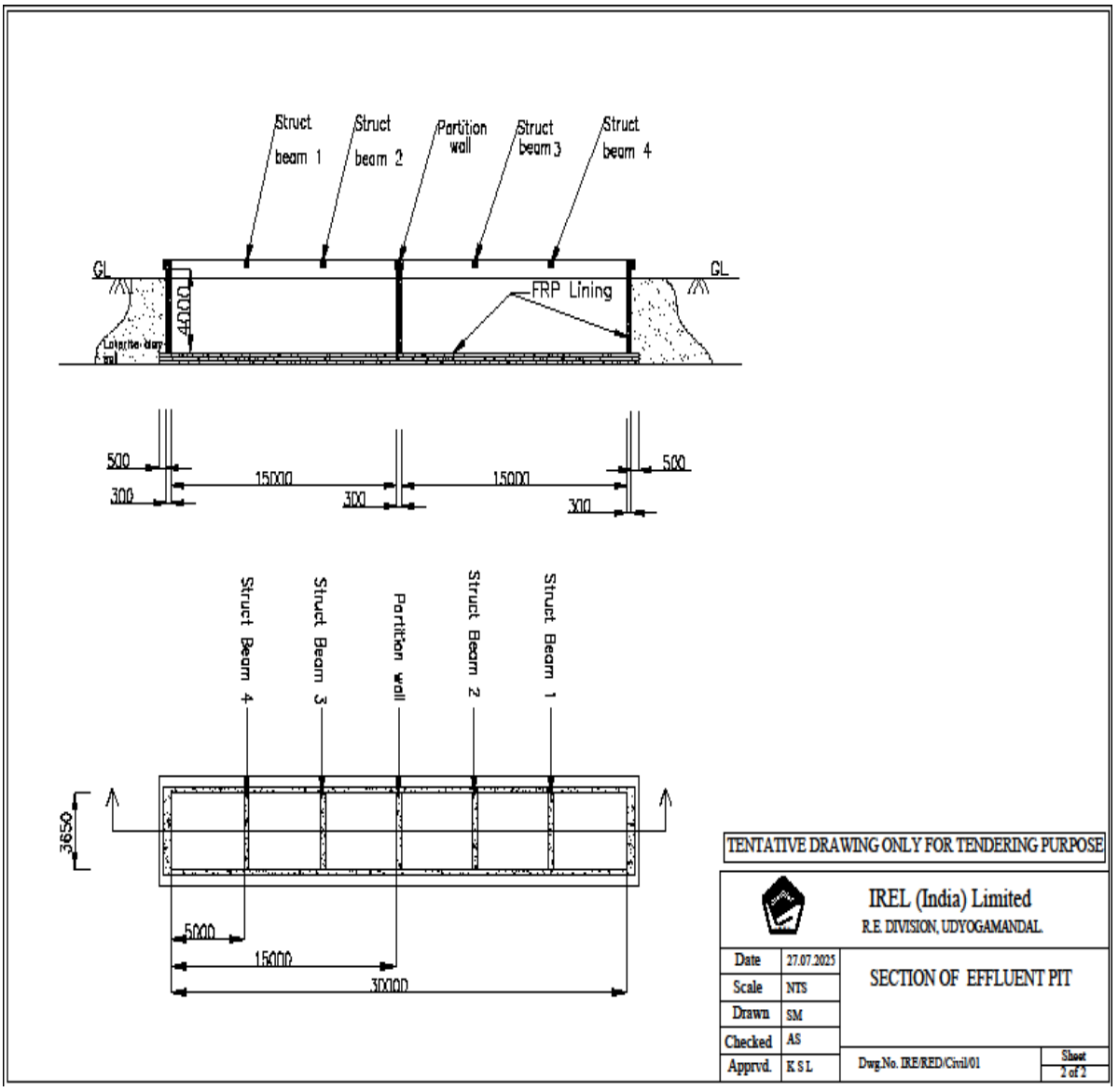
4.5 **Section of proposed 30 m3 tank near RE chloride dissolution shed**



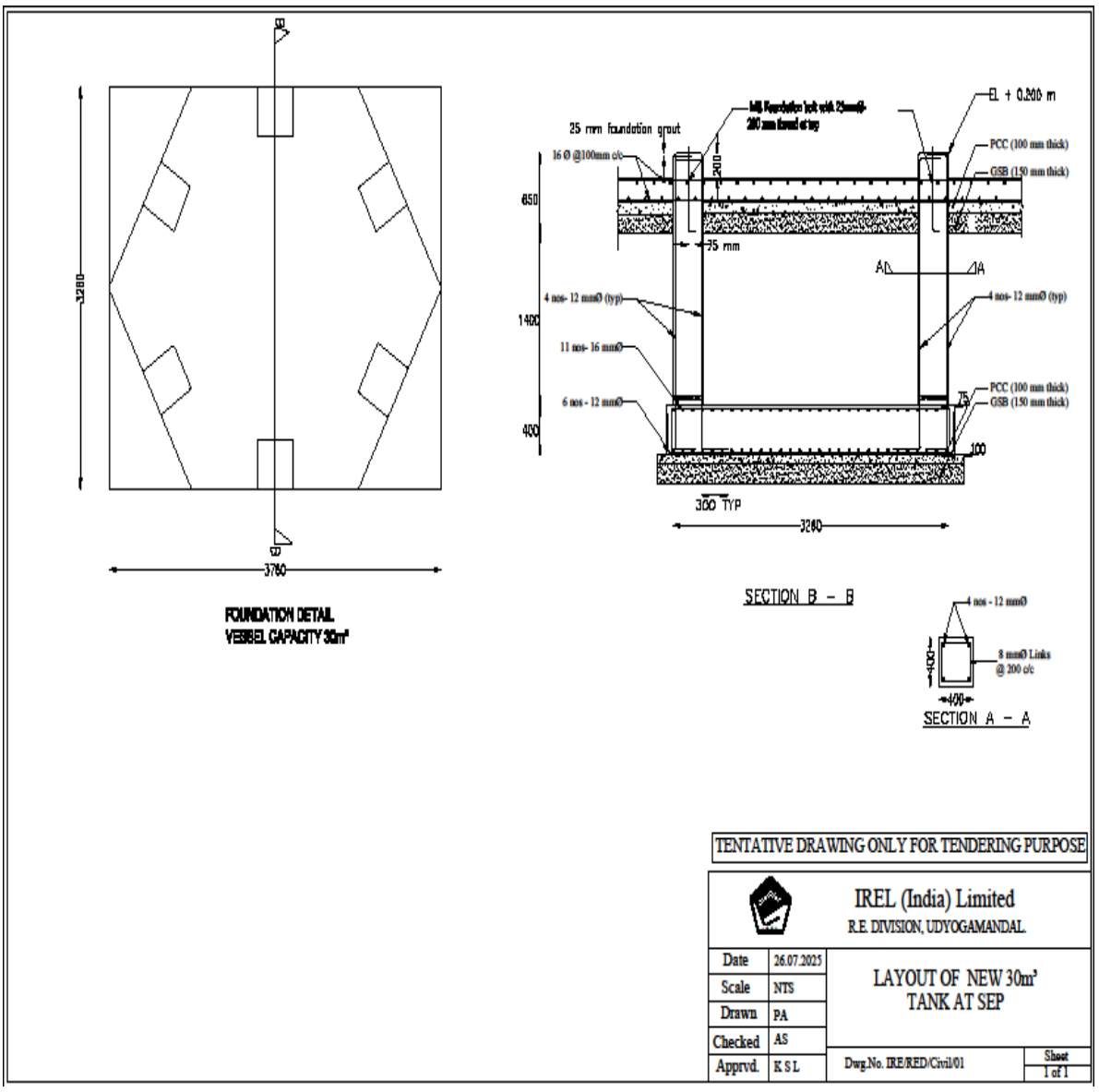
4.6 **Layout of post treatment effluent collection pit**



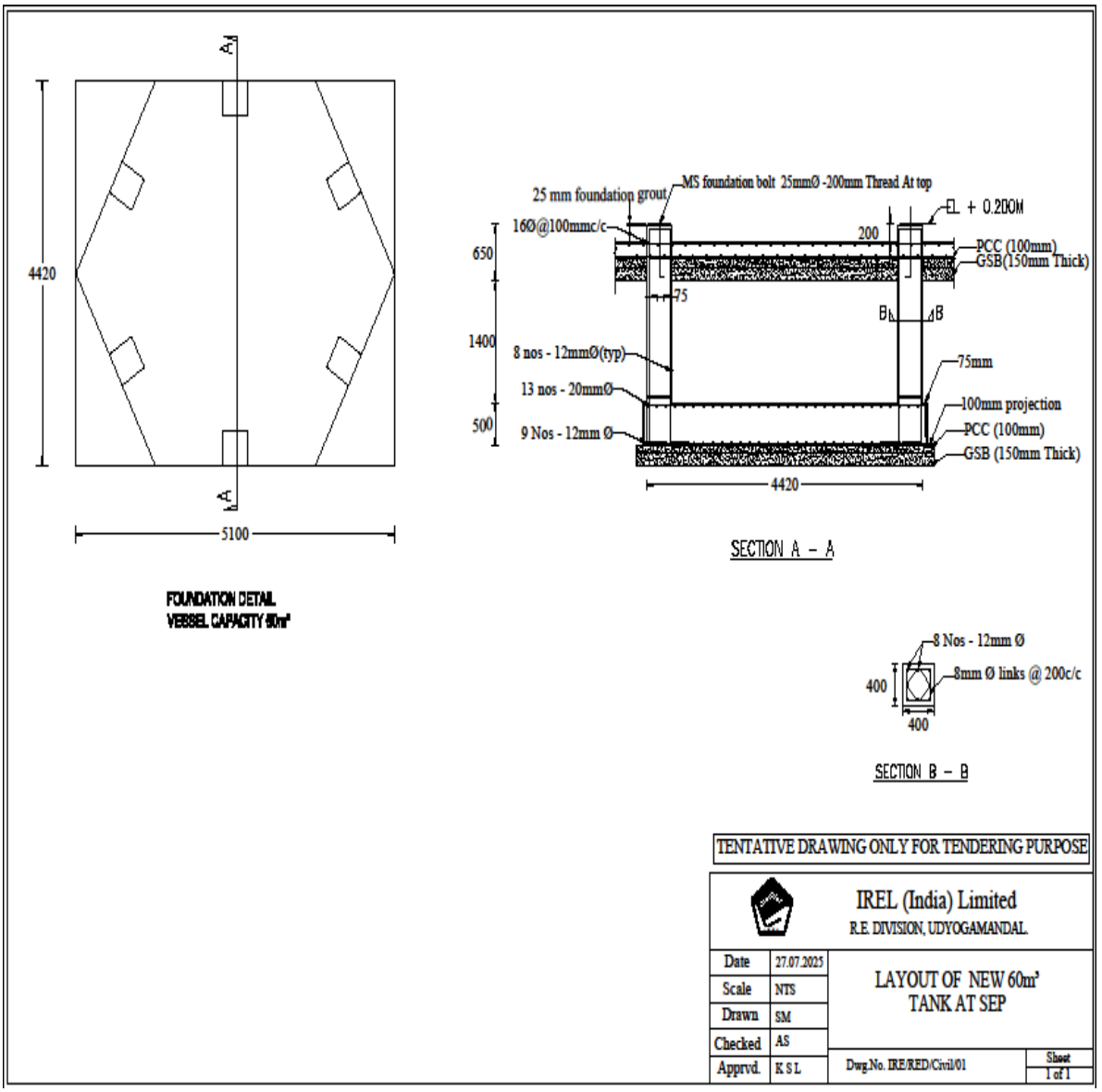
4.7 **Section of post treatment effluent collection pit**



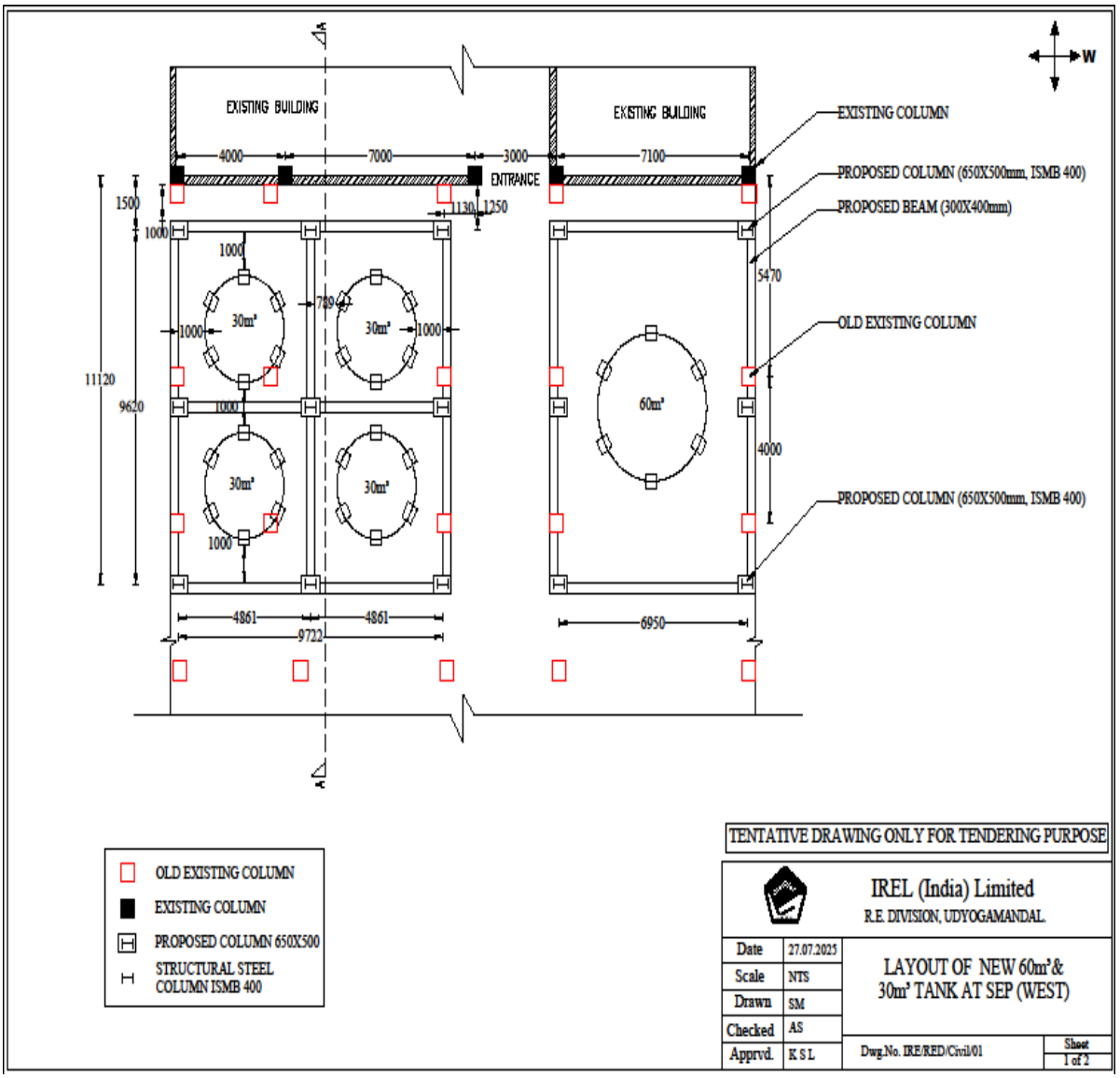
4.8 **Layout of 30 m3 tank at SEP**



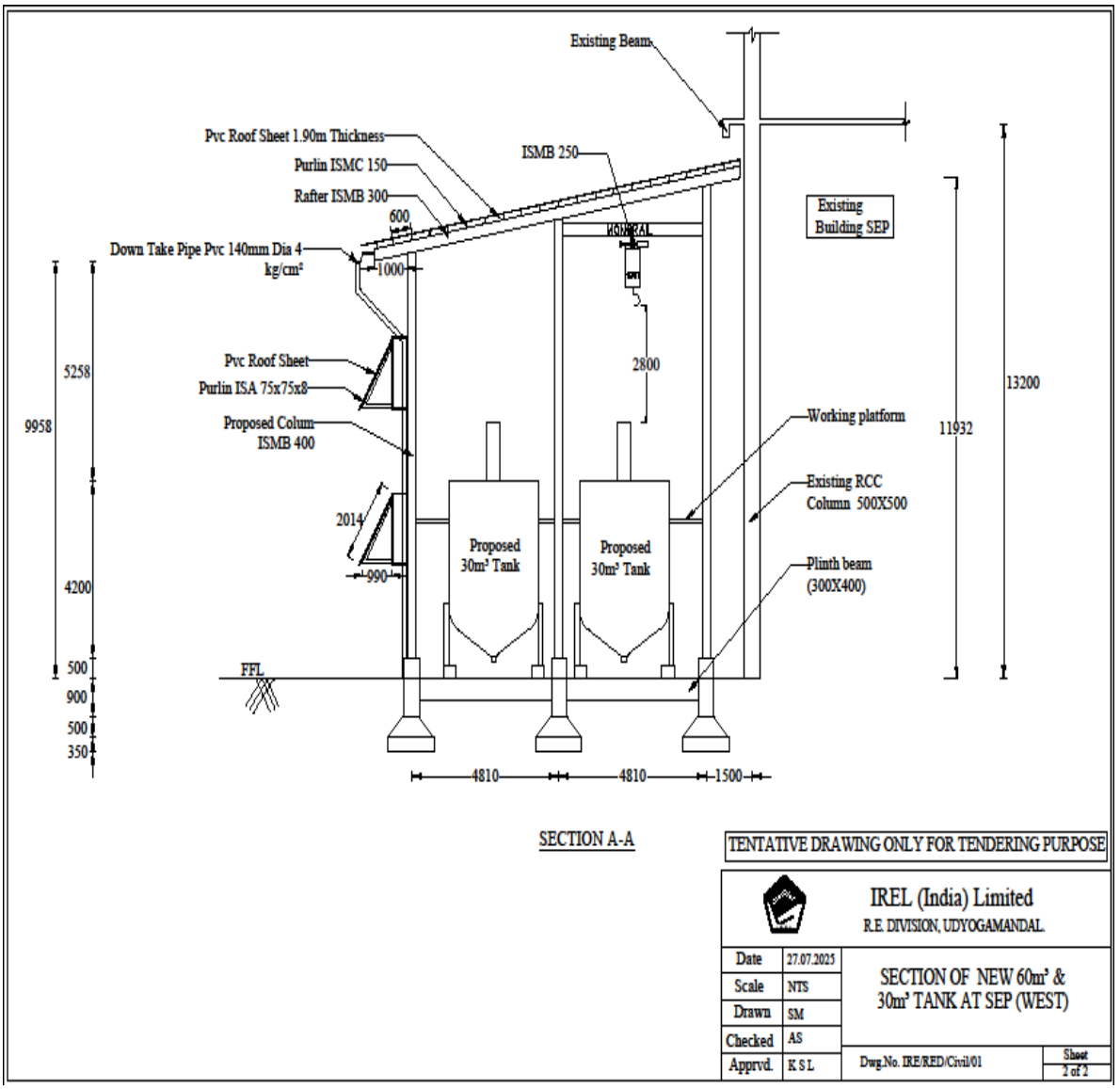
4.9 **Layout of 60 m3 tank at SEP**



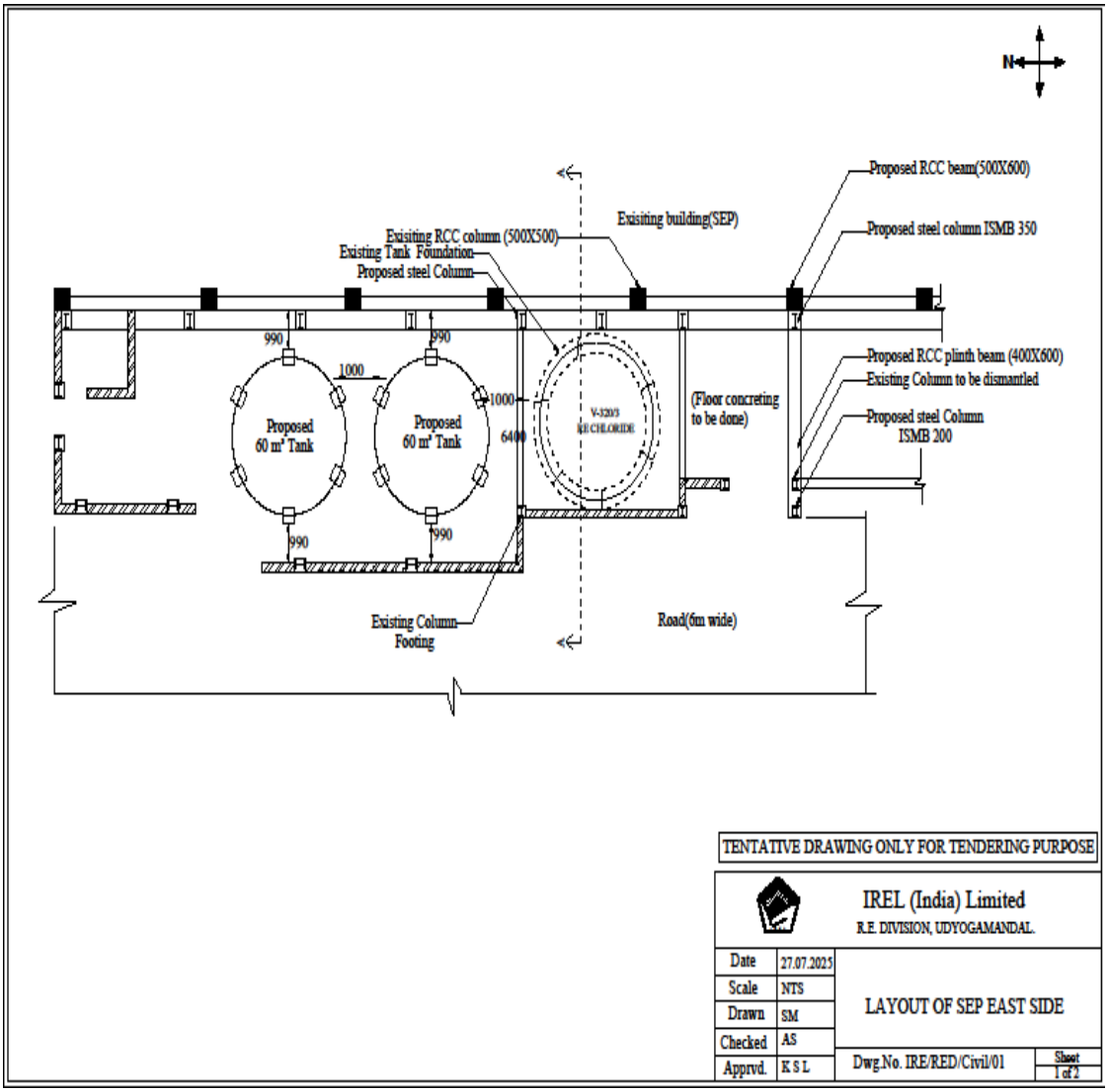
4.10 **Layout of 60 m3 and 30 m3 tank at SEP West side**



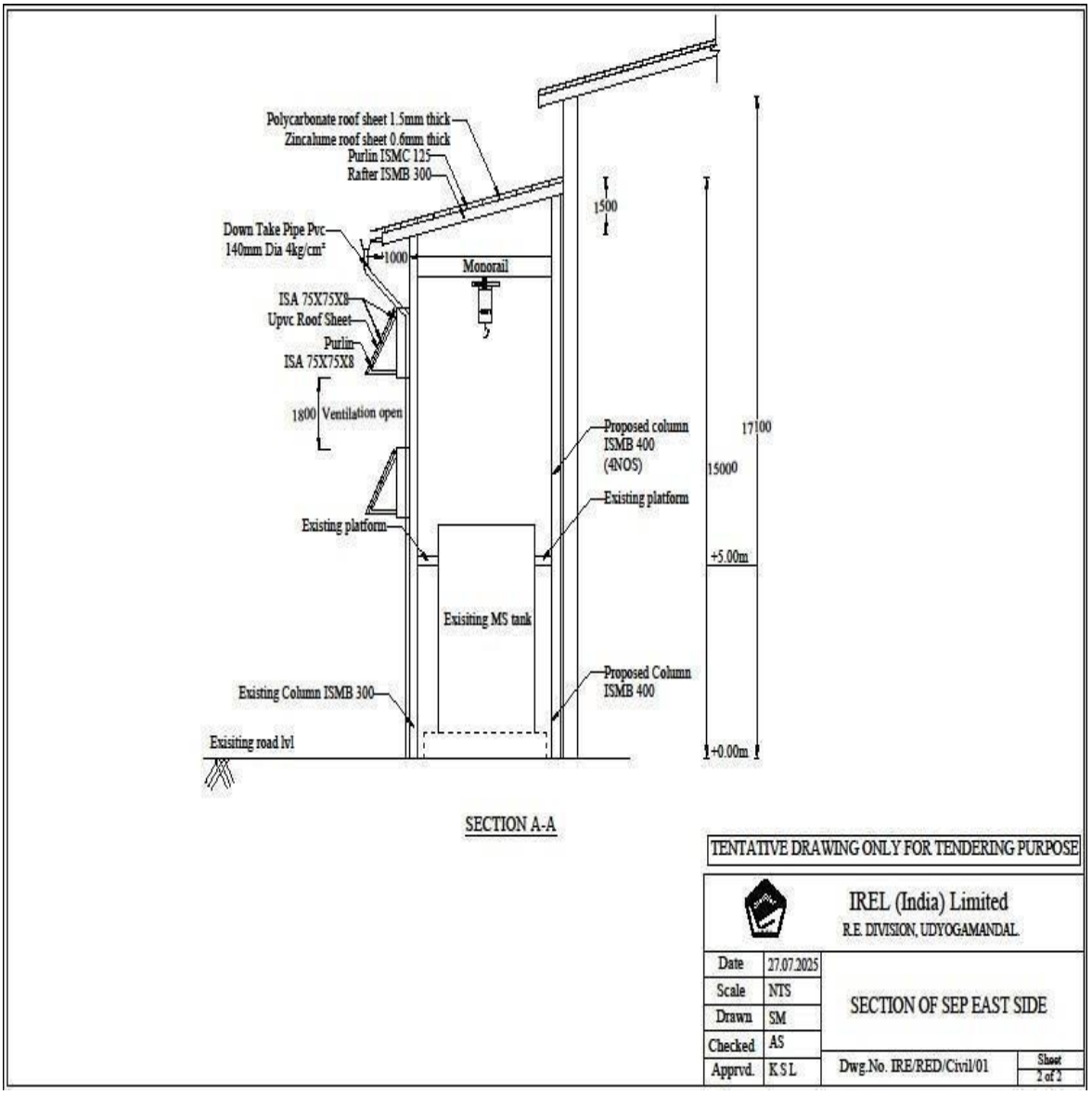
4.11 **Section of 60 m3 and 30 m3 tank at SEP West side**



4.12 **Layout of SEP East side**



4.13 **Section of SEP East side**



ANNEXURE-3

ELECTRICAL & INSTRUMENTATION WORKS

DETAILED SCOPE OF WORK, TECHNICAL SPECIFICATION AND TENTATIVE DRAWINGS RELATED TO ELECTRICAL & INSTRUMENTATION WORKS:

1.0 SCOPE OF WORK

Electrification & Instrumentation work includes but not limited to the following:

1.1 Design, Supply, Installation, Testing and Commissioning of MCC panel as per the given specification.
1.2 Supply Installation and commissioning of 12 Way PDB.
1.3 Supply Installation and commissioning of 18 Way LDB.
1.4 Supply, Laying, dressing, termination of 3.5C x 185 Sq.mm Al conductor armoured Cable.
1.5 Supply, Laying, dressing, termination of 3.5C x 70 Sq.mm Al conductor armoured Cable.
1.6 Supply, Laying, dressing, termination of 4C x 45 Sq.mm Cu conductor armoured Cable.
1.7 Supply, Laying, dressing, termination of 4C x 2.5 Sq.mm Cu conductor armoured Cable.
1.8 Supply, Laying, dressing, termination of 4C x 1.5 Sq.mm Cu conductor armoured Cable.
1.9 Supply, Laying, dressing, termination of 12 pair, 1 Sq.mm Cu conductor armoured instrumentation cable.
1.10 Supply, Laying, dressing, termination of 2 pair, 1 Sq.mm Cu conductor armoured instrumentation cable.
1.11 Supply, Laying, dressing, termination of 12 core, 1 Sq.mm Cu conductor armoured instrumentation cable.
1.12 Supply, Laying, dressing, termination of earth strip/insulated earth wire.
1.13 Supply and installation of LED Street light fittings.
1.14 Supply and installation of heavy-duty exhaust fans
1.15 Supply and fixing of FRP ladder type cable tray.
1.16 Supply of MS structural materials and fabrication of cable tray supports, PDB&LDB fixing frames light fixing frames, Exhaust fan fixing frames etc.
1.17 Supply and installation of 4 x 4 junction box (Weather proof, polycarbonate box) along with each light fixings frames & exhaust fan.
1.18 Supply, laying and commissioning of magnetic flow meters, variable area flow meters, radar level transmitters, control values etc.

2.0 TECHNICAL SPECIFICATIONS

2.1 MCC PANELS

Design, manufacture, wiring, testing, inspection, packing & delivery to working site at IREL, RED, Udyogamandal of required electrical equipment as mentioned in this tender, erection and commissioning of the supplied equipment and as per the scope of work and technical specification mentioned below:

2.1.1 **SCOPE OF SUPPLY**

The scope of supply includes design, manufacture, wiring, testing, inspection, packing & delivery to working site at IREL, RED, Udyogamandal of two Nos. of MCC/VFD panels as per the technical specification and respective bill of material as

(A) Panel No. 1 MCC – RECl3 Neutralization Tanks

(B) Panel No. 2 MCC - Iron Elimination Tanks

(C) Panel No. 3 MCC – RECl3 Dissolution tanks

2.1.2 **SERVICE CONDITIONS**

All the item supplied against this specification shall be suitable for satisfactory operation under the following climatic conditions. Location Udyogamandal, Kochi, Kerala Maximum ambient air temperature 50°C Minimum ambient air temperature 15°C Maximum Relative Humidity 91% at 22 degree Celsius Atmosphere Highly corrosive, acidic& alkaline.

2.1.3 **SYSTEM PARTICULARS**

- Nominal System Voltage : 415 V
- Number of Phases : 3 phases, 4 wire system
- Frequency : 50 Hz
- Voltage Variation : +/-10-%
- Frequency Variation : +/-3%
- Earthing: Solidly grounded

2.1.4 **DESIGN AND FABRICATION CRITERIA**

- De-rating factor : As per site condition
- Ingress Protection : Minimum IP 54
- Short circuit current : 36 kA
- Control circuit and display voltage : 240V, 50Hz, AC
- Fuse and Overload relay : Type -2 Coordination
- Cable entry as specified in the drawings
- Due to the site constrains, the overall dimensions of the panels and components of the panels shall be restricted to the indicative dimension given in the GA drawing.

2.2 <u>DESCRIPTION OF PANEL MATERIAL</u>

2.2.1 The panel shall be non-draw type, Indoor application, Floor mounting rigid free-standing type.

2.2.2 The panels shall be of metal enclosed, free standing, cubicle type, compartmentalized, single front execution, front and rear accessible as required (having individual cubical for each incoming, bus coupler and outgoing feeder), totally enclosed, dust and vermin proof, floor mounting type. All the sheet steel members and parts of the panel board shall be fully fabricated and painted as per Rittal/BCH standards only.

2.2.3 The Panels shall be designed to ensure maximum safety during operation, inspection, connection of cables, relocation of outgoing circuits and maintenance with bus bar systems energized and without taking any special precautions. Finger protection plate shall be provided at all devices and components to prevent accidental direct contact with live parts. Phase protection barrier for SDFs, MCCBs etc shall be provided. Door interlock and defeat feature shall be provided for SDFs. Power termination at cable chamber shall be shrouded. Adequate means shall be provided to prevent shorting of power and / or control terminals due to accidental dropping of maintenance tools etc. inside the switchboard. Checking and removal of components shall be possible without disturbing adjacent compartment. All identical equipment and corresponding parts shall be fully interchangeable. Mechanical inter locking shall be provided for doors of cubicles having incoming/outing feeder such that door can be opened only if feeder is OFF.

2.2.4 The Panels shall be provided with integral base frame of 75x6mm channel for each shipping section. The panel integral base frame shall be suitable for tack welding. All hardwires shall be corrosion resistant. All joints and connections of the panel members shall be made of stainless-steel bolts, nuts and washers, secured against loosening. Suitable removable type eyebolts/ lifting hooks shall be provided for lifting of the panel/ for shipping purpose. These eyebolts/ lifting hooks, when removed shall not leave any opening in the panels.

2.2.5 Metal sheet shall be provided between two adjacent vertical panels running up to the full useful height of panel may be for adjacent cubicles, between feeder compartment, between bus bar chamber and another compartment.

2.2.6 All cable termination compartment/cable alley shall have adequate width and length for glanding, neat arrangement and termination of total number and size of cable mentioned in the specification/data sheet and shall have free access for cable termination. The same shall be approved before manufacturing. Cable chambers shall be provided with suitable hinged doors. Barrier plates shall be provided between individual compartment and cable alley. This barrier plates shall be provided with opening for power and control connections and it shall be possible to safely carryout maintenance work on cable connection to any one circuit in the cable alley with bus bar and adjacent live circuit. Removable undrilled gland plates shall be provided for termination of cables.

2.2.7 Unused compartments if any in the panel shall be fully equipped with hinged door and shall be suitable for mounting power and control components.

2.2.8 Separate connectors of adequate size shall be provided for terminating power and control cables. Power cable terminations shall be properly shrouded.

2.3 PAINTING

2.3.1 All the surface shall be made free from all imperfections before undertaking the painting process. All the parts shall be thoroughly cleaned and degreased to remove mill scale, rust, grease and dirt by giving full surface treatment and painted as per Rittal/BCH standards. The overall outside of panel shall be over coated with corrosion retardant clear coat. Panel finish shall be free from imperfections like pinholes, orange peels, runoff paint etc. The painting shall be suitably rated for 1000Hrs spray test. Painting test certificate shall be provided along with the supply of panels to the site.

2.3.2 All unpainted mild steel pats shall be zinc passivated or cadmium plated or suitably treated to prevent rust formation. If these parts are moving elements, then they shall be greased.

2.4 GASKETS

All joints between different sections and the switchboard, openings, covers, and doors shall be provided with heavy duty neoprene gaskets around the perimeters so as to make the complete switchboards completely dust and vermin proof.

2.5 BUS BARS

2.5.1 Main bus bar shall be of Copper material, house in separate compartment. The bus bar shall be made of high conductivity, electrolytic grade Copper, suitable for carrying continuous rated current and short circuit current 50kA for 1 sec., without overheating and, PVC sleeved, air insulated, and of adequate size, current density to be considered as 1.2Amp/sq.mm for operation on 3 phases, 4 wires, 440 V, 50 Hz. AC supply system, as per IS 345-1963 with amendment till date. The bus bars shall be supported on insulators made of non-hygroscopic, non-inflammable material with tracking index equal to or more than that defined in Indian standards, and at close intervals to prevent bus bar sag and to effectively withstand electromagnetic & dynamic stresses in the event of a short circuit. Bus bar support design should ensure free thermal expansion. Minimum clearance to be maintained for enclosed indoor air insulated bus bars working at system voltage up to 600 V shall be as follows:

Phase to earth -	20 mm
Phase to phase -	25 mm

2.5.2 Clearance between terminals at components shall be as per applicable individual standards for

components. Adequate bus bar and bus bar chamber sizes for temperature rise withstand shall be considered as per IS.

2.5.3 Bus Bar size for Phase and Neutral shall be as specified in the drawings (Copper).

2.5.4 The main bus bars shall have uniform current ratings throughout their length. In the case of TPN S/G, removable neutral links shall be provided on feeders to permit isolation of the neutral bus bar. Both horizontal and vertical bus bars, bus joints and supports shall be capable of withstanding dynamic and thermal stress of the specified short circuit current. All the bus bars and interconnections shall be insulated with heat shrunk PVC sleeves of 1100V grade. Red yellow and blue shall be used for phase bus bars and black color shall be used for neutral bus bar. Removable type shrouds shall be provided for all joints and tap off points to prevent accidental contact and danger to personal. Vertical and horizontal bus bar shall be of same rating .Bus bar connections shall be adequately supported to ensure proper connection of cables. Proper shrouding with insulated sheets shall be provided for ease of connection and disconnection of cable.

2.5.5 Auxiliary bus bar if any, for control, interlock, indication and metering shall be arranged separately with perforated sheet steel / insulating material.

2.5.6 The current rating as defined for panels and component in data sheet are for design ambient temperature at site conditions and for being inside the cubicle at fully loaded condition. The supplier shall suitably de-rate the normal rating to suit the above condition.

2.6 CONNECTIONS

2.6.1 Connections to the bus bars shall be made by drilling holes. However, no holes shall be left in the bus bars. The bolts & nuts used for connections to bus bars shall be of stainless steel. For tapping of connections from bus bars suitable size copper links/bus bar link with PVC sleeves shall be used. The tapping from bus bars to different feeders shall be taken from different points. For all outgoing cables, cable alleys of suitable sizes as required for proper cable connections/ lying inside the panel, shall be provided. Hinged type covers shall be provided for the cable ally portion on all sides.

2.6.2 Panels shall have removable gland plates for Cable entry from the top side of the panel. The voltage and current leads should be segregated and clamped separately.

2.6.7 Suitable FRP/Polycarbonate shrouding shall be provided for live parts. FRP/SMC/Poly-carbonate partition plates shall be provided between the feeder boxes and the bus bar chambers, in order to avoid, falling down of any nuts/bolts into the bus bar chambers while carrying out maintenance of the feeder components. The panels shall be extensible in design.

2.7 EARTHING

2.7.1 The minimum earth bus size shall be 25x3 mm copper.

2.7.2 All sections shall be connected to a tinned copper earth bus bar running throughout the length of the panels.

2.7.3 All doors and movable parts shall be earthed, using flexible copper connections, to the earthed fixed frame of the switch board.

2.7.4 Two independent Earthing points shall be provided outside the panel near bottom/Top to connect the Earthing bus bar to the plant Earthing. All Earthing points inside the Switch Board shall be interconnected to these Earthing points with suitable size copper conductor.

2.7.5 All non-current carrying metallic parts of the mounted equipment shall be earthed.

2.8 NAME PLATE LABELS

2.8.1 Nameplates designation of the starter as specified in the drawing shall be affixed prominently on the panel.

2.8.2 All components whether mounted inside the panel or on the door shall be permanently and clearly labelled with reference number and / or letter of their function. (Rating of fuse shall form a part of the fuse designation). All labels shall be non-corrodible, laminated plastic, with white letters on black background. Labels shall be clearly indicating feeder No, Switch &fuse rating, Equipment description, KW/HP/Ampere, Cable &Bus Size, Type of starting etc.

2.8.3 Caution board shall be provided at suitable locations. Danger labels for bus bar chamber shall be provided.

3.0 DOCUMENT/DRAWINGS SUBMISSION

Typical GA and SLD drawings for the panel is attached for reference. You shall submit the following drawing for approval before starting the fabrication work of the panel. Panel fabrication shall be started only after the approval of drawing by IREL, RED

3.1 Single line drawing of MCC

3.2 Layout of MCC

3.3 Power and control wiring diagram of one chamber/segment

3.4 Bill of materials

4.0 APPROVALS, INSPECTION, TESTING, AND ACCEPTANCE

Contractor/panels Integrator should have type tested their panels (PCC/MCC/VFD/Control panels) under IEC-61439/IS 8623 at any NABL approved Lab. Copy of Type test certificate shall be enclosed along with the technical bid. During fabrication, the panels shall be subjected to inspection, if required by the IREL, RED. All routine and acceptance tests shall be carried out at Contractor's/panel integrator's site/work place under his care and expense. Acceptance test shall be as follows:

4.1 **Stage Inspection after fabrication but before powder coated painting (Optional):** General visual check and dimensional check shall be carried out. This shall cover measurement of overall dimensions, location, number etc.

4.2 Pre-delivery inspection (Optional)

4.3 Verification for make of components, wires/cables, Bus bars, interconnecting leads, clearance spacing between bus bars, neutral bus, Earth bus, Hardware etc.

4.4 Insulation resistance (Megger test)

4.5 High voltage withstand test.

4.6 Provision for external cable termination shall be checked.

4.7 All control circuits, interlocks circuits Power circuits.

4.8 Operation of switches, starters, Panel meters Indicators etc.

4.9 For equipment brought from sub-suppliers, certified test reports of test carried out at manufactures work shall be submitted. Normally all routine test as specified in the relevant standard shall be conducted by the sub-supplier at his works.

4.10 The panels and its component shall conform to Indian Electricity Rules & relevant I.S. and in accordance with Local statutory requirements.

4.11 Copies of test certificate shall be furnished by the supplier after completion of all tests. The certificates shall be produced along with the supply.

4.12 The painting of the entire panels shall be suitably rated for 1000Hrs spray test. Painting test certificate shall be provided along with the supply of panels to the site.

5.0 STANDARD MAKE OF SWITCH GEARS

5.1 The rating of the panel shall be strictly as per the SLD & GA drawings attached.

5.2 The equipment shall comply with the latest applicable Indian Standards/IEC specification & all requirements of the local Authorities.

5.3 General requirement of switch gear and control gear: - IS 4237 and IS 13947 or its latest amendment.

5.4 Equipment meeting the requirements of any other authoritative standards which ensure equal or better quality than the standards mentioned above shall also be acceptable.

5.5 Standard make of the switchgears shall be as follows

5.5.1 Panel No. 1 MCC – RECl3 Neutralization Tanks

S. No.	Description	Qty	Make
	INCOMER		
1	Panel enclosure. (minimum dimension of enclosure shall be 2100mm x 2200mm x 300mm)	1 No	Rittal/BCH
2	400A 36KA 4P MCCB Thermal Mag. Type O/L & S/C Releases + 4P Spreader + Extender Rom +1c/O Aux Contact + Tac	1 No	L&T/Siemens/Schneider
3	CT 400/5A CL-1 15VA	3 No	KALPA/Rishab/Reputed
4	3Ph, Digital multi-function meter	1 No	L&T/Siemens/Rishab
5	3Ph, 4 wire digital Energy Meter – 5A, 230V AC	1 No	L&T/Siemens/Rishab
6	RYB Indication Lamps 230V AC LED	1 Set	L&T/Siemens/Schneider
7	ON/OFF/TRIP Indication Lamps 230V AC LED	1 Set	L&T/Siemens/Schneider
8	6A, 3P, 10KA C-curve MCB	2 No	L&T/Siemens/Schneider
9	Neutral Link	2 No	Reputed
	OUTGOINGS		
10	160A 36KA 4P MCCB Thermal Mag. Type O/L & S/C Releases + 4P Spreader + Extender Rom +1C/O Aux Contact + 1C/O Trip Contact.	2 No	L&T/Siemens/Schneider
11	63A TPN SFU	2 No	L&T/Siemens/Schneider
12	32A, TPN, SFU	16 No	L&T/Siemens/Schneider
13	40A HRC Fuse	6 No	L&T/Siemens/Schneider
14	32A HRC Fuse	21 No	L&T/Siemens/Schneider
15	18A HRC Fuse	27 No	L&T/Siemens/Schneider
16	32A, 3P, Power contactor with coil voltage 240V AC (Main-Star-Delta)	23 No	L&T/Siemens/Schneider
17	18A, 3P, Power contactor with coil voltage 240V AC	9 No	L&T/Siemens/Schneider
18	16-44A Motor protection relay	2 No	L&T/Siemens/Schneider
19	8-22A Motor Protection relay		
20	4-11A Motor Protection relay	9 No	L&T/Siemens/Schneider
21	Add on Block 2NO + 2NC (Suitable for 32A Contactor)	23 No	L&T/Siemens/Schneider
22	Add on Block 2NO + 2NC (Suitable for 18A Contactor)	9 No	L&T/Siemens/Schneider
23	Star-Delta Timer	7 No	L&T/Siemens/Schneider
24	Start push button with 1 NO element	18 No	L&T/Siemens/Schneider
25	Stop push button with 1 NC element	18 No	L&T/Siemens/Schneider
26	6A, 1P, 10KA C-curve MCB	18 No	L&T/Siemens/Schneider
27	Neutral Link	18 No	Reputed
28	ON/OFF/TRIP Indication Lamps 230V AC LED	20 Set	L&T/Siemens/Schneider

5.5.2 Panel No. 2 MCC - Iron Elimination Tanks

S. No.	Description	Qty	Make
	INCOMER		
1	Panel enclosure. (minimum dimension of enclosure shall be 2100mm x 2200mm x 300mm)	1 No	Rittal/BCH
2	400A 36KA 4P MCCB Thermal Mag. Type O/L & S/C Releases + 4P Spreader + Extender Rom +1c/O Aux Contact + Tac	1 No	L&T/Siemens/Schneider
3	CT 400/5A CL-1 15VA	3 No	KALPA/Rishab/Reputed
4	3Ph, Digital multi-function meter	1 No	L&T/Siemens/Rishab
5	3Ph, 4 wire digital Energy Meter – 5A, 230V AC	1 No	L&T/Siemens/Rishab
6	RYB Indication Lamps 230V AC LED	1 Set	L&T/Siemens/Schneider
7	ON/OFF/TRIP Indication Lamps 230V AC LED	1 Set	L&T/Siemens/Schneider
8	6A, 3P, 10KA C-curve MCB	2 No	L&T/Siemens/Schneider
9	Neutral Link	2 No	Reputed
	OUTGOINGS		
10	125A 36KA 4P MCCB Thermal Mag. Type O/L & S/C Releases + 4P Spreader + Extender Rom +1C/O Aux Contact + 1C/O Trip Contact.	3 No	L&T/Siemens/Schneider
11	63A TPN SFU	4 No	L&T/Siemens/Schneider
12	32A, TPN, SFU	8 No	L&T/Siemens/Schneider
13	40A HRC Fuse	12 No	L&T/Siemens/Schneider
14	32A HRC Fuse	29(9+ No	L&T/Siemens/Schneider
15	18A HRC Fuse	15 No	L&T/Siemens/Schneider
16	32A, 3P, Power contactor with coil voltage 240V AC (Main-Star- Delta)	15 No	L&T/Siemens/Schneider
17	18A, 3P, Power contactor with coil voltage 240V AC	5 No	L&T/Siemens/Schneider
18	16-44A Motor protection relay	4 No	L&T/Siemens/Schneider
19	8-22A Motor Protection relay	3 No	L&T/Siemens/Schneider
20	4-11A Motor Protection relay	5 No	L&T/Siemens/Schneider
21	Add on Block 2NO + 2NC (Suitable for 32A Contactor)	15 No	L&T/Siemens/Schneider
22	Add on Block 2NO + 2NC (Suitable for 18A Contactor)	5 No	L&T/Siemens/Schneider
23	Star-Delta Timer	4 No	L&T/Siemens/Schneider
24	Start push button with 1 NO element	12 No	L&T/Siemens/Schneider
25	Stop push button with 1 NC element	12 No	L&T/Siemens/Schneider
26	6A, 1P, 10KA C-curve MCB	15 No	L&T/Siemens/Schneider
27	Neutral Link	15 No	Reputed
28	ON/OFF/TRIP Indication Lamps 230V AC LED	15 Set	L&T/Siemens/Schneider

5.5.3 Panel No. 3 MCC – RECl3 Dissolution tanks

S. No.	Description	Qty	Make
	INCOMER		
1	Panel enclosure. (minimum dimension of enclosure shall be 2100mm x 2200mm x 300mm)	1 No	Rittal/BCH
2	1250A 36KA 4P MCCB Thermal Mag. Type O/L & S/C Releases + 4P Spreader + Extender Rom +1c/O Aux Contact + Tac	1 No	L&T/Siemens/Schneider
3	CT 125/5A CL-1 15VA	3 No	KALPA/Rishab/Reputed
4	3Ph, Digital multi-function meter	1 No	L&T/Siemens/Rishab
5	3Ph, 4 wire digital Energy Meter – 5A, 230V AC	1 No	L&T/Siemens/Rishab
6	RYB Indication Lamps 230V AC LED	1 Set	L&T/Siemens/Schneider
7	ON/OFF/TRIP Indication Lamps 230V AC LED	1 Set	L&T/Siemens/Schneider
8	6A, 3P, 10KA C-curve MCB	2 No	L&T/Siemens/Schneider
9	Neutral Link	2 No	Reputed
	OUTGOINGS		
10	63A TPN SFU	3 No	L&T/Siemens/Schneider
11	32A, TPN, SFU	4 No	L&T/Siemens/Schneider
12	40A HRC Fuse		
13	32A HRC Fuse	6 No	L&T/Siemens/Schneider
14	18A HRC Fuse	6 No	L&T/Siemens/Schneider
15	32A, 3P, Power contactor with coil voltage 240V AC (Main- Star- Delta)	11 No	L&T/Siemens/Schneider
16	18A, 3P, Power contactor with coil voltage 240V AC	2 No	L&T/Siemens/Schneider
17	16-44A Motor protection relay	3 No	L&T/Siemens/Schneider
18	8-22A Motor Protection relay	2 No	L&T/Siemens/Schneider
19	4-11A Motor Protection relay	2 No	L&T/Siemens/Schneider
20	Add on Block 2NO + 2NC (Suitable for 32A Contactor)	11 No	L&T/Siemens/Schneider
21	Add on Block 2NO + 2NC (Suitable for 18A Contactor)	2 No	L&T/Siemens/Schneider
22	Star-Delta Timer	3 No	L&T/Siemens/Schneider
23	Start push button with 1 NO element	7 No	L&T/Siemens/Schneider
24	Stop push button with 1 NC element	7 No	L&T/Siemens/Schneider
25	6A, 1P, 10KA C-curve MCB	7 No	L&T/Siemens/Schneider
26	Neutral Link	7 No	Reputed
27	ON/OFF/TRIP Indication Lamps 230V AC LED	7 Set	L&T/Siemens/Schneider

NOTE:

1. Control circuit Isolation shall by means of MCB of suitable capacity.
2. Control wiring shall be done with 1.5 Sq.mm, copper conductor, FRLS wire.
3. Contractors with 240V AC coil supply of suitable capacity shall be used for starters.
4. All the three contracts used in the Star – Delta starter shall be of same capacity.
5. Any switchgears/components not mentioned here but required for the completion of the panels shall be added and quoted accordingly.
6. All starters shall be provided with remote/local selector switch provisions.
7. Terminals/connectors shall be provided for the remote ON/OFF switch.
8. Connecting lead wire for the outgoing feeders shall be selected one rating higher than the standard rated wires.

5.6 PERFORMANCE GUARANTEE

You shall guarantee the switch gears and all other materials fitted inside/on the panel (the panels as a whole) for a minimum period of 12 months from the date of commissioning at site.The supplier shall further guarantee that during the guarantee period, he shall repair/replace the defective component on free of cost.

6.0 TECHNICAL SPECIFICATIONS FOR PDB

Vertical TPN DB with 4P MCB isolator and RCCB 63A. Outgoing 12+12+12, 12 way, pre-wired, IP- 54, conforming to 8623-1/IEC 61439-1. Incomer MCB&RCCB 63A, 4P and Outgoing MCBs 4P, 4A shall also be supplied along with the DB.

7.0 TECHNICAL SPECIFICATIONS FOR LDB

Vertical SPN DB with 4P MCB isolator and RCCB 63A. Outgoing 6A MCBs, 18 way, pre-wired, IP 54, conforming to 8623-1/IEC 61439-1. Incomer MCB&RCCB 63A, 2P and Outgoing MCBs 4P, 6A shall also be supplied along with the DB.

8.0 TECHNICAL SPECIFICATIONS FOR CABLES & ACCESSORIES

8.1 POWER CABLES

(1) 3.5C x 185Sq. mm. multi stranded Al conductor, XLPE insulated, PVC inner sheathed, GI steel wire armoured, Overall PVC insulated, 1.1KV graded, cable as per IS 7098. Make: Ploycab,
Finolex, KEI, Lapp, RPG, Mancab

(2) 3.5C x 70Sq. mm. multi stranded Al conductor, XLPE insulated, PVC inner sheathed, GI steel wire armoured, Overall PVC insulated, 1.1KV graded, cable as per IS 7098. Make: Ploycab,
Finolex, KEI, Lapp, RPG, Mancab

(3) 4C x 4 Sq. mm. multi stranded Cu conductor, XLPE insulated, PVC inner sheathed, GI steel wire armoured, Overall PVC insulated, 1.1KV graded, cable as per IS 7098. Make: Ploycab, Finolex,
KEI, Lapp, RPG, Mancab

(4) 4C x 2.5 Sq. mm. multi stranded Cu conductor, XLPE insulated, PVC inner sheathed, GI steel wire armoured, Overall PVC insulated, 1.1KV graded, cable as per IS 7098. Make: Ploycab,
Finolex, KEI, Lapp, RPG, Mancab

(5) 4C x 1.5 Sq. mm. multi stranded Cu conductor, XLPE insulated, PVC inner sheathed, GI steel wire armoured, Overall PVC insulated, 1.1KV graded, cable as per IS 7098. Make: Ploycab,
Finolex, KEI, Lapp, RPG, Mancab
(Special Condition: Each meter length shall be marked on the outer surface of the cable along with the ISI marking. Cable shall be supplied in single length)

8.2 **CABLE GLANDS (REPUTED MAKE)**

(1) Single compression, Brass material, cable gland suitable for 3.5C x 185 Sq.mm Al conductor XLPE Armoured Cable (50 mm size).

(2) Single compression, Brass material, cable gland suitable for 3.5C x 70 Sq.mm Al conductor XLPE Armoured Cable (32 mm size).

(3) Single compression Brass material, cable gland suitable for 4C x 4 Sq.mm Cu conductor XLPE Armoured Cable (22 mm size).

(4) Single compression Brass material, cable gland suitable for 4C x 2.5 Sq.mm Cu conductor XLPE Armoured Cable (19 mm size).

(5) Single compression Brass material, cable gland suitable for 4C x 1.5 Sq.mm Cu conductor XLPE Armoured Cable (16 mm size).

8.3 **CRIMPING SOCKET. (REPUTED MAKE)**

(1) 185 Sq.mm Aluminium material PAM type Crimping socket

(2) 90 Sq.mm Aluminium material PAM type Crimping socket

(3) 70 Sq.mm Aluminium material PAM type Crimping socket.

(4) 35 Sq.mm Aluminium material PAM type Crimping socket

(5) 4 Sq.mm Copper material PAM Type crimping Socket

(6) 2.5 Sq.mm Copper material PAM Type crimping Socket

(7) 1.5 Sq.mm Copper material PAM Type crimping Socket

(8) 1 Sq.mm Copper material PAM Type crimping Socket.

8.4 **EARTH STRIP & EARTH WIRE (COPPER)**

(1) 25mm x 3mm earth strip copper – 200 Mtr (One role should have a minimum length of 50 Mtr each.)

(2) Earth wire 4 Sq.mm copper – 2000mtr. (Single core, cu conductor, PVC Insulated Green colour. One role should have a minimum length of 180-200Mtr each.)

9.0 TECHNICAL SPECIFICATIONS FOR LED STREET LIGHTS

S. No.	Description	Requirement
01	Wattage	30W to 35W
02	Type	Pole Mount LED street Light (35mm dia.)
03	Body/Housing	Pressure die cast Aluminum alloy housing
04	IP standard	IP66
05	Drive efficiency	85% (minimum)
06	LED Efficiency	120Lumen per watt (minimum)
07	System efficiency	110Lumen per watt (minimum)
08	Surge Protection (Internal)	4KV (minimum)
09	Power factor	0.95 lag (minimum)
10	CRI	70 (minimum)
11	CCT	5700K (minimum)
12	LM 79 Complied	Yes
13	LM 80 Complied	Yes
14	RoHs Complied	Yes
15	Make	Phlips, Bajaj, Osram, Wipro, Crompton, LT

10.0 TECHNICAL SPECIFICATION FOR FIRE RETARDANT FRP LADDER TYPE CABLE TRAY

Material of Tray : Corrosion Resistant Fire Retardant Isopthalic Resin Various Types of Glass Fibres. Glass Content > 60%

Length of Cable Tray	: 2000/3000mm
Width of cable Tray	: 300 mm
Depth of cable Tray	: 75 mm
Thickness of Cable Tray	: 4 mm
Side Runner	: C-channel of 75x30x4mm
Rungs	: Square Hollow Tube Of 25x25x4 mm without Holes
Spacing of Rungs	: 300 mm C/C
Fixing of Rungs to Side runner	: By Thermoplastic
Plug. Support Span	: 1.5 meter
Allowable Loading	: For 300 MM Width 45 Kg/meter (Load test certificate shall be provided along with supply else FRP tray shall be rejected)
Concentrated Load	: 70 Kg at Centre of Span. (Load test certificate shall be provided along with supply else FRP tray shall be rejected)
Coupler plate	: FRP Coupler Plate with SS-304 fasteners – (2 Coupler Plate with 8 set SS- 304 fasteners shall Be Included for Each Cable Tray
Colour	: Grey

Note: Load test certificate shall be (Allowable load and concentrated load) provided along with the supply of material.

11.0 TECHNICAL SPECIFICATIONS FOR EXHAUST FANS

Three phase, 415V, 50 Hz, 1400 RPM, 450mm (18 "), Heavy duty exhaust fans confirm to IS 2312 standards. Make: Almonard, Crompton, Havels, Bajaj

12.0 TECHNICAL SPECIFICATION FOR JUNCTION BOX

(1) 100 x 100 mm junction box

Thermoplastic Polycarbonate, Chemical resistant, Fire retardant, shock proof, IP65 ingress protection, rust proof, dust proof water proof, corrosion proof 4 x 4 Polycarbonate box, Anti corrosive, IP65 Model DM9020 with cable connector and also have internally embedded gaskets confirmed to IP65 (IEC 60529) with terminal blocks of suitable size and quantity of Phoenix/Elmak or equivalent make fitted in c type din rail. Hensel make.

(2) 300 x 300 x 210 mm Junction Box

The junction box shall be thermoplastic, polycarbonate, Chemical resistant, Fire retardant with transparent hinged lid, shock proof, IP65 ingress protection, rust proof, dust proof water proof, corrosion proof and also have internally embedded gaskets confirmed to IP65 (IEC 60529) of size 300 x 300 x 210 mm sizewith terminal blocks of suitable size and quantity of Phoenix /Elmak make fitted in c type din rail. Make Hensel

(3) Polycarbonate Cable Gland

All cable gland shall be thermoplastic polycarbonate and compression type. The cable gland

shall be dust and water proof. The cable gland size shall be suitable for cable sizes mention in BOM. The cable gland shall be threaded, IP66 with one piece of sealing ring and lock nut. Make Hensel

13.0 TECHNICAL SPECIFICATION FOR MAGNETIC FLOW METER (0-6000 L/HR)

Transmitter	
Type	Smart Microprocessor based Remote Field Mounted
Excitation type	Pulsed DC
Display	Required, LCD backlit, alphanumeric
Range	User Configurable, **0 – 6000 l/h**
Accuracy	+/- 0.3%
Repeatability	0.1% of MV
Output 1	Analog Output, 4-20 mA DC, HART compatible
Output 2	Pulse Output
Maximum Load Impedance	<500 mOhms
Power Supply	110VAC, 50 Hz
Display Language	English
Display shall include	a) Actual flow rate; forward and reverse
	b) Flow units: m^3/hr, configurable through front panel keypad
	c) Totalizer (non-volatile) with Reset facility
	d) Totalizer units: m^3; liters
	e) Status / error messages
	f) Empty Pipe Detection
Calibration facility	Required through front panel keypad and HART communicator
Auto zero Correction	Required
Configuration	Required through front panel keypad and HART communicator
Memory	Nonvolatile EEPROM
Self-Diagnostics	Required
Cable entry	1/2 NPTF
Housing	Die Cast Aluminum/SS box
Enclosure	Weather proof to IP 65
Mounting	On 2" Pipe
Mounting Accessories	Brackets, Fasteners, Washers and U clamps to be supplied
M.O.C. for Mounting Accessories	SS304
Sensor	
Fluid / State	Water, Ammonium Sulphate / Liquid
Pressure (Nor/Max)	3 / 7 in kg/cm^2g
Working Temp. (Nor/Max)	35 / 50 in deg.C
Flange to flange distance	200mm
End connection	Flanged, RF
Size/Pressure Rating	**DN15**, PN40
Body-Flange Material	SS304
Electrode Material	Tantalum
Liner Material	PTFE (2-3 mm thick) or better suited for the process fluid

Grounding/Earthing rings	Required, SS316
Housing	Die Cast Aluminum/SS box
Hydrostatic test pressure	1.5 times Maximum Working Pressure
Painting	As per manufacturer's standard
Maximum Distance between flow tube and transmitter	20 m
Armoured Interconnection cables for Coil Supply and Signal	20 meters to be supplied
Interchangeability of flow tube & transmitter	Required
Instrument details	To be punched on SS plate mounted on flow tube and transmitter
Make	Krohne, Emerson and Siemens
Model	Vendor to specify

14.0 TECHNICAL SPECIFICATION FOR VARIABLE AREA FLOW METER (DIGITAL ROTAMETER)

S. No.	Section	Parameter	Requirement
1	Identification	Purpose	DM WATER AND SOLVENT
2	Sensor/Meter	Type	Metal Tube Variable area flow meter (Digital Rotameter)
3		Function	To measure and monitor the flow of solutions locally
4		Accuracy	Class 1.6% As per VDI/VDE code 3513
5		Meter Size	DN 15
6		End Connection	½" ASME
7		Indication	Via Magnetic Coupling
8		Indicator Housing	Die Cast Aluminium powder coated or Polyester coated Alumiminum
9		Measuring Cone	PTFE
10		Flange - MOC	SS 316L
10		Float - MOC	PTFE
12		Maximum Operating Pressure	As per flange standard
13		Range ability	1:10
14		Scale	Analog Angular
15		Mounting	Vertical. Flow patterns from Bottom to Top
16		Installation Length	250 mm
17		Ingress Protection	IP 68
18		Power Supply	24 V DC -2 wire
19		Output	4-20 mA and HART
20		Area Clasification	Non Hazardous
21		Calibration	3 point
22		Flow range	0-15000LPH
23		Cable Entry	M20 X 1.5
24	Environment	Max Pressure	10KG/ CM2
25		Operating temperature	Ambient
26		Relative Humidity	Less than 99 % non-condensing
27		Application	Indoor
28	General	Certificate	CE & IP68 Factory Calibrated Calibration Certificate Standard test & Guarantee Certificate
29		Make	Krohne, Emerson and Siemens
30		Model	Vendor to specify
31		Warranty/ Guarantee	One Year
32		Calibration	Variable Area Flow Meter (Digital Rotameter) should be factory calibrated and calibration certificate shall be provided along with the supply of item.

15.0 TECHNICAL SPECIFICATION OF RADAR LEVEL TRANSMITTER

S. No.	Section	Parameter	Requirement
1	Identification	TAG Number	Nitric acid - URP
2		Tank/Equipment	Nitrate Collection tank
3		Service	URP
4	Sensor & Transmitter	Radar Type	FMCW, W-Band, Continuous, Non-contact type
5		Function	Indicate locally and Transmit
6		Antenna	Rod type PTEF Lens without extension
7		Frequency	80 G Hz
8		Beam Angle	10° (Maximum)
9		Accuracy	+/- 3mm or better
10		Range	0.25 to 10 meter
11		Calibration	Through Push bottoms on Transmitter or HART
12		Antenna Material	PEEK, PTFE, SS316L or PFA
13		Antenna Encapsulation	PEEK/PVDF/PTFE/PFA
14		Meter Housing	Die Cast Aluminum powder coated or Polyester coated Alumiminum
15		Process Seal	FKM/VITON/PTFE/PFA
16		Process Connection	3'' Flange, ANSI 150 lb
17		Flange MOC	Stainless Steel with PEEK, PTFE or PFA Flaring
18		Wetted part lining	PEEK, PTFE or PFA
19		Ingress Protection	IP 67
20		Power Supply	Loop powered, 24 V DC
21		Output	4-20 mA and HART
22		Response time	Less than 3 sec
23		Display	LCD with backlit
24		Cable Entry	M20 X 1.5
25		Instrument Installation	Top Mounting
26		Application	Outdoor
27	Environment	Max. Temp at flange	150 Deg C
28		Operating temperature	Ambient
29		Relative Humidity	Less than 99 % non-condensing
30		Operating Pressure	Ambient
31	General	Certificate	CE & IP67
32		Make	Krohne, Emerson and Siemens
33		Model	Vendor to Specify
34		Warranty/ Guarantee	One Year
35		Calibration	Radar level transmitter sensor should be factory calibrated and calibration certificate shall be provided along with the supply of item.

16.0 TECHNICAL SPECIFICATION FOR INSTRUMENTATION CONTROL CABLE

Cables: PVC insulated, PVC sheathed, Copper conductor, Armoured, overall shielded control cable suitable for 1100 volts grade as per is–1554 part – i, 1988.			
1	Conductor	Conductor	High conductivity electrolytic grade Annealed,Tinned Copper Conductor As Per IS- 8130, 1984/ BS 6360
2		Size	24 Pair x 1Sq mm, 12Pair x 1Sq mm, 12 Core x 1Sq mm & 1 Pair x 1 sq. mm
3		Resistance	As per IS: 8130/ 1984
4		Strands/Dia	7 strands/0.43mm
5		Persulphate Test	For Tinning as per IS: 10810 (Pt-1)/1984
6	Insulation	Material Insulation	Extruded PVC Type 'C' 85°C as per IS 58318/1984.
7		Thickness (Nom)	0.8 mm, As per IS: 1554 (Pt-1)/1988
8		Finish	Visual check of smoothness
9		Colours	As per IS: 1544(Pt-1)/1988
10		Colour Code	Red and Black for Pair Cable
11		Volume resistively	For insulation resistance as per IS: 5831/1984
12		Tensile strength &	As per IS: 5831/1984
13		Thermal Stability	As per IS: 5831/1984
14		Material	Extruded Fire Retardant, Low Smoke, PVC type ST-2 having physical properties as per IS 5831
15		Oxygen Index	30 (min) at room temp.
16		Temperature Index	250 °C (min) at Oxygen Index of 21
17		Flammability Test	As per IEC 332 Part-1 and Part-3
18		Corrosivity of combustion gases	pH-index> 4.3, Electrolytic Conductivity as per IEC 754-2
20	Inner & Outer Sheath	Thickness	As per IS: 1554 (Pt-1)/1988
22		Size/Dia	As per IS: 3975/1988
23		Tensile strength &	As per IS: 3975/1988
24		Resistively	As per IS: 3975/1988
25		Coverage	100 %
26		Overlapping	25 %
27	Electrical Property	Maximum DC resistance	12.1 ohm/Km As per IS: 1554 (Pt-1)/1988
28		Min Insulation Resistance at 200C	100 M ohm/Km
29		Mutual Capacitance	BS 5308 Part-I
30		L/R Ration of adjacent cores/pairs	BS 5308 Part-I
31		Drain Wire Resistance at	30 ohm/Km
32		High Voltage	1 KV for 1 Minute
33	General	Testing and Dimension of the Cables	IS: 1554 Part-I, BS 6469/BS 6346
34		Identification	Printing in numerals at an interval of 250 mm on
35	Make	LAPP/HELUKABLE/TKD	

17.0 TECHNICAL SPECIFICATION FOR SQUIRREL CAGE INDUCTION MOTORS

415V, 50Hz, 3 Phase, TEFC, Class 'F' insulation, Class 'B' temperature rise, Continuous duty, IE-3, IP- 55, Cast Iron frame, Flange/Base Mounting, Standard frame size, Squirrel cage induction motor, confirm to IS:12615/IEC 60034-1

Preferred Make: Crompton, Kirloskar, ABB, Bharat Bijilee.
Warranty: 12 Months from the date of acceptance of supply.

18.0 Technical specification for shut off valve

SHUT OFF PNEUMATIC GLOBE VALVE(PTFE/ PFA LINED) FOR HCL				
Technical Specification	1.	Design		ASME B16-34
	2.	Valve Size		63 mm
	3.	Process line size		63 mm
	4.	Rating		ANSI 150#
	5.	End Connection		Flanged
	6.	Valve Flow Type		2- way
	7.	Normal flow rate		3000 lph
	8.	Maximum Flow rare		6000 lph
	9.	Required Cv		Vendor to Specify
	10.	Leakage Class		FCI-70-2 (ANSI B 16.104)
	11.	Characteristics		On-off
	12.	Valve Position Type		Fail-to-Close (Normally Close)
	13.	Air Supply		20-35 Psig (1.4-2.5 kg/cm2)
	14.	Air Connection		¼'' or ½'' NPT/standard
	15.	Inlet Pressure		5 Kg/cm2
	16.	Outlet Pressure		Vendor to specify
	17.	Max. Differential Pressure		Vendor to specify
	18.	Spring Ranges		3-15 psi
	19.	Hand Wheel		Yes (Side mounted)
Body & Material of Construction	20.	Body Material		Carbon Steel with PFA/PTFE liner
	21.	Lining Material		PTFE/PFA
	22.	Flexible Bellow		PTFE
	23.	Plug, Seat Ring		Carbon-filled PTFE or Glass Filled PTFE
	24.	Gland Packing		PTFE V Ring
	25.	Bushings		Stainless Steel/vendor to specify
	26.	Lining Thickness		3 mm
	27.	Bonnet		Standard
	28.	Trim Designs		Top Guided Contoured/Disc
	29.	Actuator Type		Diaphragm
	30.	Diaphragm Material		Nitrile/Neoprene
	31	Dimension: Length, Width, Height & Weigh		Standard
Accessories	32	Solenoid Valve		Complete solenoid system operating with 240V AC
	33	Limit Switch		As per required
General	34	Environment	Humidity	95% RH
	35		Operating Temperature	Ambient
	36	Warranty		One Year
	37	Manufacturer		Pneucon, ARCA VALVE or MIL

SHUT OFF PNEUMATIC GLOBE VALVE FOR DM WATER:				
Technical Specification		Design		ASME B16-34
	2.	Valve Size		50 mm
	3.	Process line size		50 mm
		Rating		ANSI 150#
	4.	End Connection		Flanged
	5.	Valve Flow Type		2- way
	6.	Normal flow rate		15,000 lph
	7.	Maximum Flow rare		30,000 lph
	8.	Required Cv		Vendor to Specify
	9.	Leakage Class		FCI-70-2 (ANSI B 16.104)
	10.	Characteristics		On-off
	11.	Valve Position Type		Fail-to-Close (Normally Close)
	12.	Air Supply		20-35 Psig (1.4-2.5 kg/cm2)
	13.	Air Connection		¼'' or ½'' NPT/standard
	14.	Inlet Pressure		5 Kg/cm2
	15.	Outlet Pressure		Vendor to specify
	16.	Max. Differential Pressure		Vendor to specify
	17.	Spring Ranges		3-15 psi
	18.	Hand Wheel		Yes (Side mounted)
Body & Material of Construction	19.	Body Material		Carbon Steel
	20.	Lining Material		Not Applicable
	21.	Flexible Bellow		Vendor to specify
	22.	Plug, Seat Ring		Vendor to specify
	23.	Gland Packing		PTFE V Ring
	24.	Bushings		Stainless Steel
	25.	Bonnet		Standard
	26.	Trim Designs		Top Guided Contoured/ Equivalent
	27.	Actuator Type		Diaphragm
	28.	Diaphragm Material		Nitrile/Neoprene
	29.	Dimension: Length, Width, Height & Weigh		Standard
Accessories	30	Solenoid Valve		Complete solenoid system operating with 240V AC
	31	Limit Switch		As per required
General	32	Environment	Humidity	95% RH
	33		Operating Temperature	Ambient
	34	Warranty		One Year
	35	Manufacturer		Pneucon, ARCA VALVE or MIL

Note: DEVIATION FROM SPECIFICATION

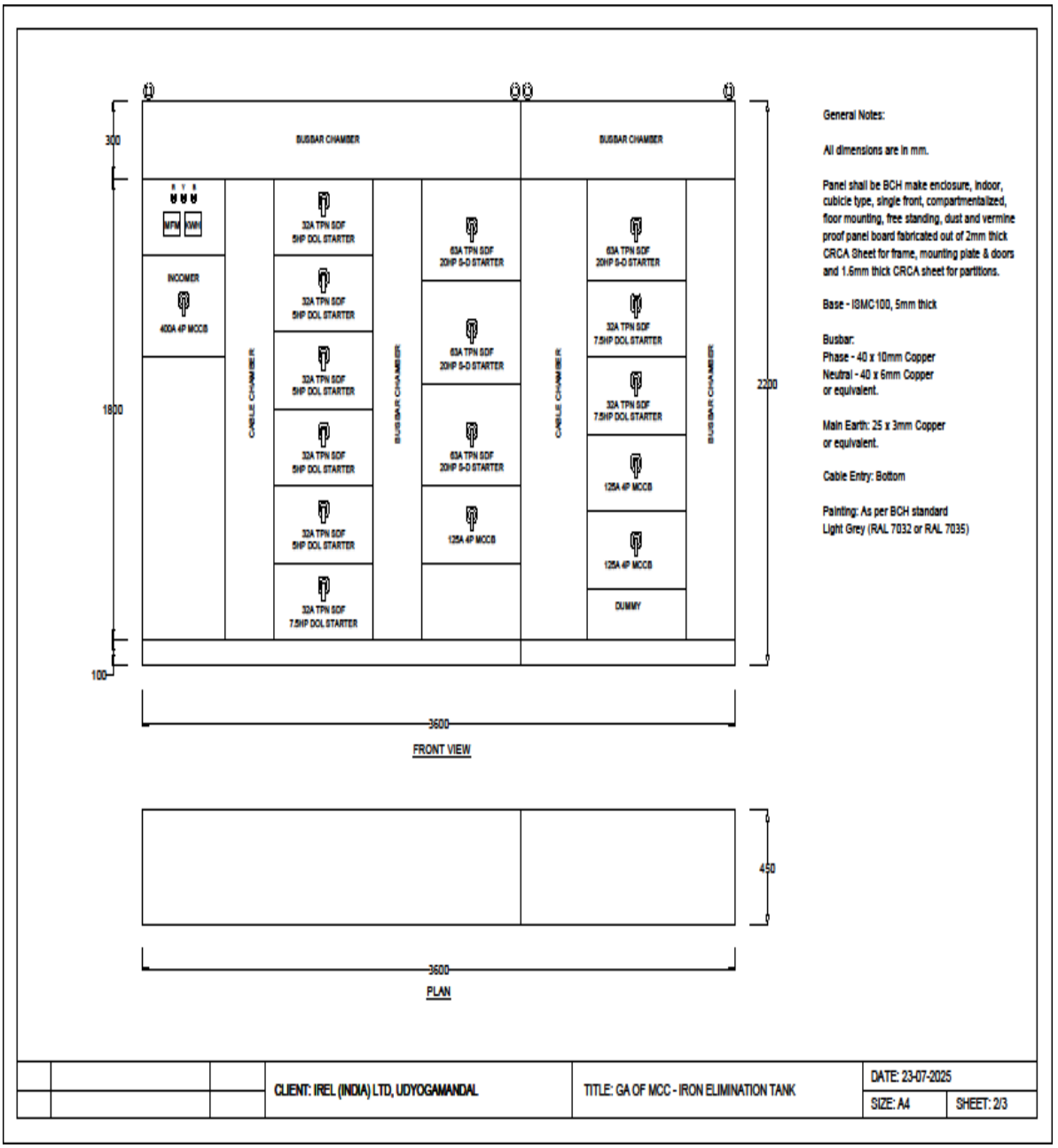
1. No deviation to this specification is accepted. If any deviation is found in the offer, it will result into rejection of the offer out rightly. However IREL, RED has the right to accept minor deviations, if any, which is at the sole discretion of IREL, RED.

2. The Deviations, if any, has to be clearly mentioned in a Technical Deviation statement form. In the absence of this, it would be deemed that all the specifications and conditions mentioned herein are acceptable to the bidder.

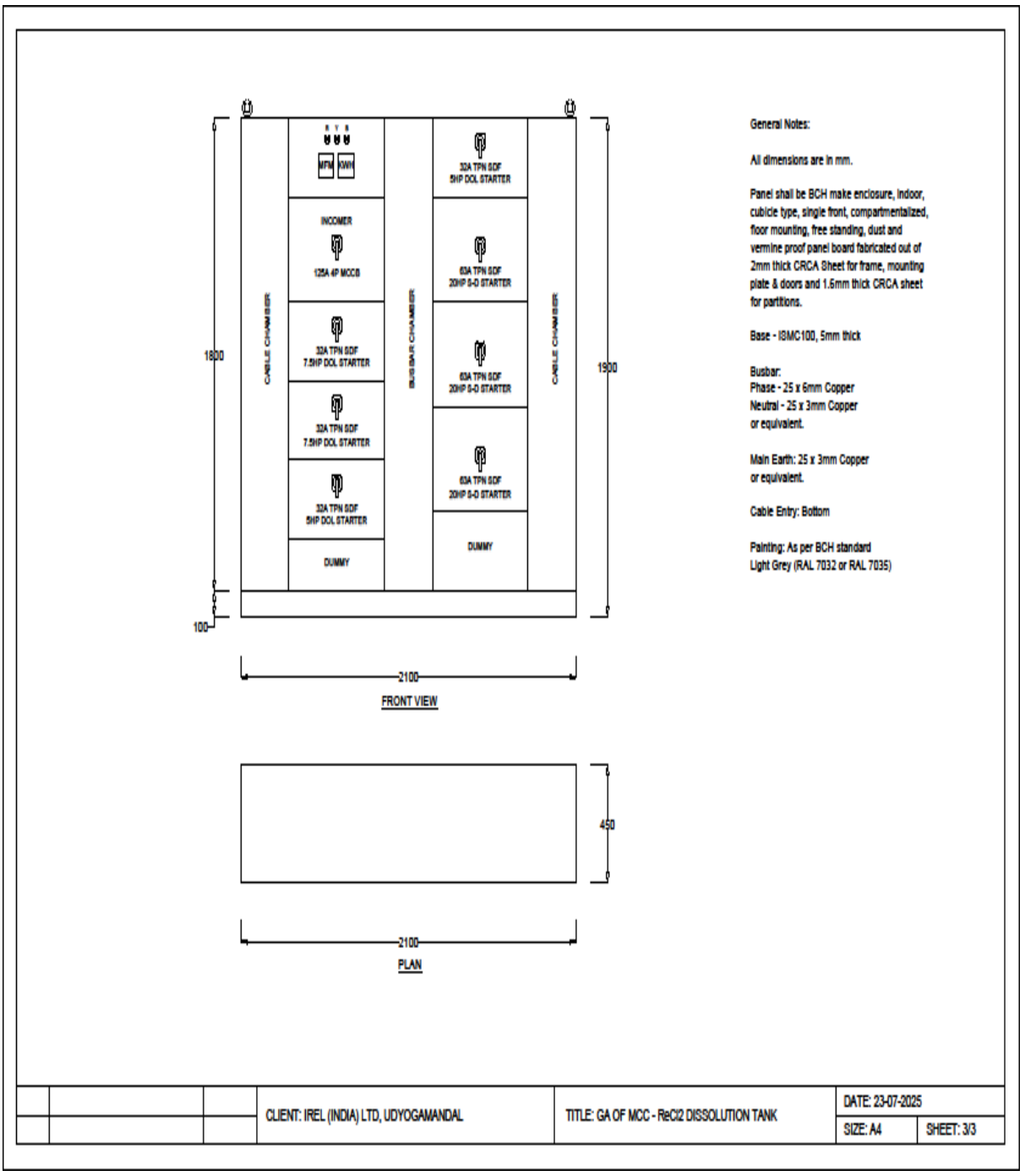
18.0 Any material/works not mentioned in the details of the work but required for the successful completion and commissioning of the entire work shall be under the scope of contractor. All Safety Equipment and PPEs, etc., and all other materials required for the work has to be brought by the contractor.

18.0 TENTATIVE REFERENCE GA DRAWINGS ATTACHED BELOW

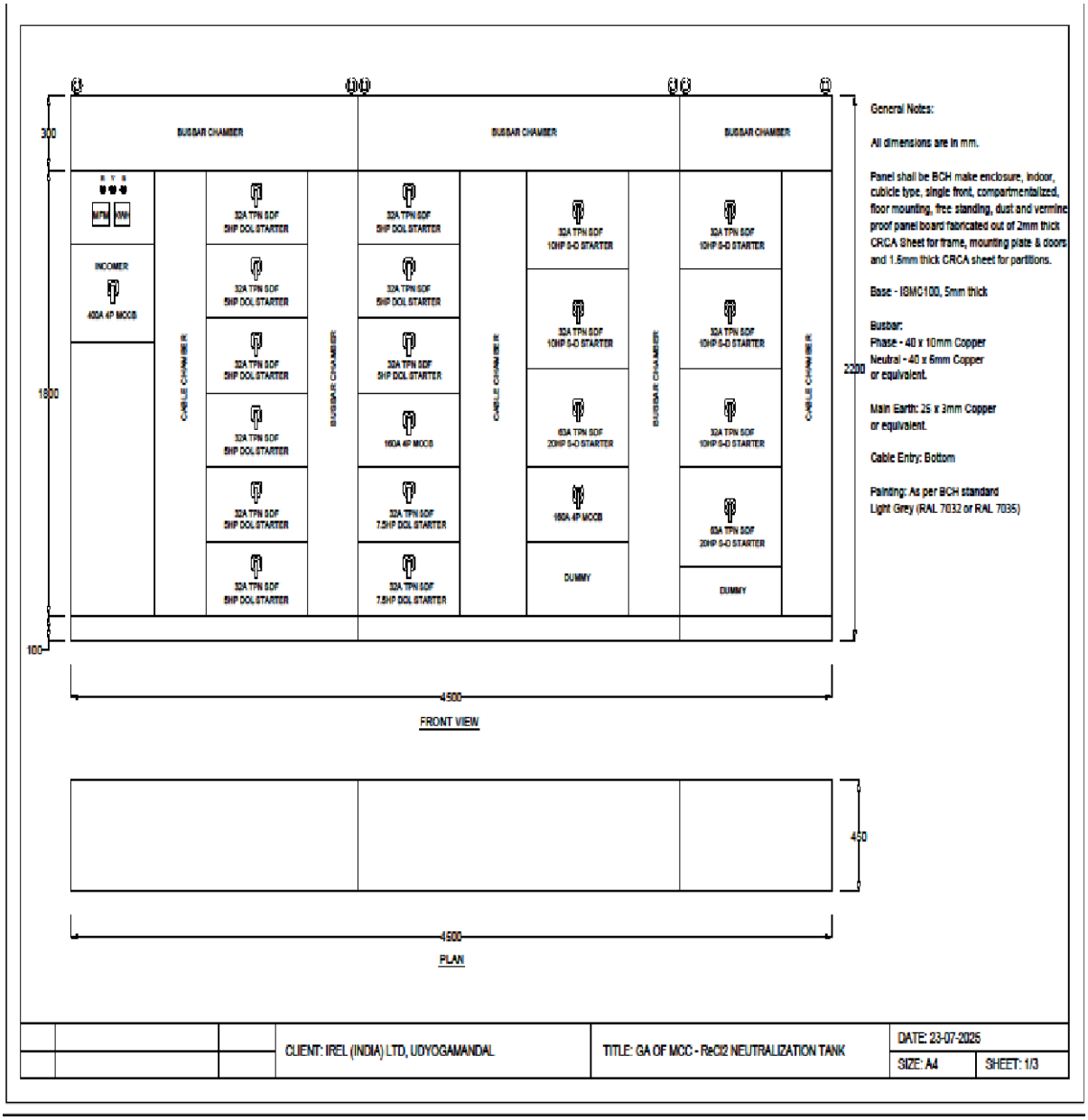
18.1 GA of MCC-Iron Elimination tank



18.2 GA of MCC-RECl3 dissolution tank



18.3 GA of MCC-2nd strip neutralization tank



ANNEXURE-4

MECHANICAL WORKS

DETAILED SCOPE OF WORK, TECHNICAL SPECIFICATION AND TENTATIVE DRAWINGS RELATED TO MECHANICAL WORKS:

1.0 **SCOPE OF WORKS**

Scope of work related to mechanical include but not limited to the following:

1.1 Supply, Installation & Commissioning of Equipment like Pumps, Electric Hoist, Tube Axial Fans and EOT Crane.

1.2 Working Platform: Supply of MS Structural Steel along with Fabrication and Erection of Working Platform for all Process Tanks, Pipe Supports and Equipment.

1.3 Structures for Equipment: Supply of MS Structural Steel and Fabrication of Structures for installation of Electric Hoist, EOT Crane, Tube Axial Fans and Centrifuge.

1.4 Piping System: Supply & Laying of HDPE Pipes with fittings including PP Ball valves, CS gate valves and Rubber Lined Diaphragm Valves with proper MS Supports and Pipe Trays.

1.5 Supply and Installation of Wooden Chequered Board in all working platforms.

1.6 Supply and Installation of FRP Duct with dampers in the existing Vapor Blowers.

1.7 Painting: Supply of Chemical Resistant Epoxy Paint and Primer and carrying out painting works for all newly erected MS Structures.

2.0 DETAILS OF WORKS

2.1 Contractor has to Supply, Installation and Commissioning the Centrifugal pumps, Submersible Pumps and ODS Pumps as per the Technical Specification. The Pumps shall be supplied along with the motors of appropriate capacity in assembled condition along with motor, MS structural foundation, Coupling Guards, etc.

2.2 Contractor has to Supply and Installation EOT Crane and Electric Hoists along with all the accessories, MS support structures, platform, etc. and ensure successful commissioning for the same at the designated location as per the approved drawings, technical specification, details of the work and EIC instruction. The EOT Cranes and Electric Hoists shall be installed by giving arrangements for the stay wire and rollers in order to avoid sagging of the electrical control cables during the operation.

2.3 The Contractor has to Supply, Installation and Commissioning of Tube Axial fans along with the duct at the location designated by the EIC. Any civil work involved for the installation of the Tube Axial Fans shall be under the scope of the Contractor. Further, the contractor has to fabricate the FRP duct with required dampers and connect all the newly installed Process tanks with the existing main ducts connected to the Blowers as per the Technical Specification and instruction of the EIC.

2.4 All HDPE Pipelines and Fittings are to be supplied and laid according to the approved Drawing and Process Flow Diagram. All the HDPE pipelines and Valves are to be properly supported with fixed and permanent MS Supports and Pipe Trays as per the instruction of EIC. Pipe shall not be laid in sagging condition. Wherever required the

HDPE pipeline shall be routed through pipe racks and pipe supports. As per the site requirement and EIC's instruction adequate slope shall be provided while laying the pipelines. HDPE pipelines and Fittings along with PP Ball valves, CS Gate Valves and Rubber Lined Diaphragm valves shall be under the scope of the Contractor.

2.5 Contractor has to make arrangement for providing MS Pipeline of Compressed Air to the Solenoid Valve of the ODS Pump along with silencer and allied equipment of appropriate size and length as per the site condition and the instruction of EIC.

2.6 Flexible Transparent PVC sheet of 3mm thickness shall be used for cutting the gaskets for joining HDPE Flanges of various sizes by the contractor. Flexible transparent PVC sheets shall be under the scope of the contractor.

2.7 MS Structural Working Platforms, Support structures and Platform supports shall be fabricated and erected for all the newly installed MSFRP tanks and Equipment like Centrifuge, Tube Axial Fans, Electric Hoist, Flash mixers and EOT cranes as per the instructions of EIC suiting to the site conditions. MS working platform shall be fabricated and erected along with the staircases, hand rails and toe guards as per the instruction of EIC. All MS Structural steel required for the work shall be under the scope of the contractor. Welding Electrodes used for fabrication of Tanks and Structures shall be of the make: ESAB/ ADOR/Oerlikon/ D&H/ Stanvac/ L & T.

2.8 Wooden Chequered Board of 18mm thickness shall be fixed on the MS Structural as working Platform. Party has to cut the Wooden Chequered Board as per the site condition and platform area. Wooden Chequered Board shall be fastened firmly on the working platform. Joint of the Wooden Chequered Board shall be at the same level and should be without any uneven surface, to avoid tripping and falling. Fasteners used shall not project over the Wooden Chequered Board. Supply of Wooden Chequered Board is under the Scope of the contractor. The Contractor has to ensure the gap of 1-2 inch in between tank and the working platform while fixing wooden Chequered board, so that any overflow from the tank will not be spilled on the working platform.

2.9 The fabrication of platforms shall be of welded construction. Welds shall be cleaned between passes to remove all traces of slag and before successive beads or layers are deposited. Fabrication of MS structural shall be carried out in accordance with latest relevant IS codes.

2.10 Any obstructions such as pipe trays, cable trays, pipes, slabs, etc. hindering the erection of Platform structures shall be rectified by the contractor in consultation with the EIC to ensure timely completion of the work.

2.11 The newly fabricated MS Working Platform structures, Platform Supports, Handrails, Toe guards, Pipe Trays and all other MS structures are to be painted with one coat of chemical resistant epoxy primer and two coats of chemical resistant epoxy paint of Eau-De-Nil colour after surface preparation. Cleaning of steel structural shall be done using angle grinder with cup brush arrangement wherever required as per instruction of the EIC. All Chemical Resistant Paints and Primers shall be under the scope of the contractor.

2.12 Cutting and removing unwanted pipe lines, structures, RCC Slabs, parapet walls, dyke walls, etc. for installation of the pipelines suiting to the site condition if required. Pump installation/ relocation have to be done as per requirement and as per the instruction of EIC.

2.13 Contractor has to fabricate Monorail Structure and install Electric hoist on the Monorail as per the instruction of EIC. Electric Hoist cable shall be supported by the cable carrier to avoid sagging. Electric hoist and Cable carrier shall be in the scope of the contractor. The contractor has to provide the working platform suiting to the site condition for the Electric Hoist as per the instruction of EIC.

2.14 The Contractor has to place the wooden Chequered Board in a way that grooves should be perpendicular to the walkway in order to avoid slipping.

2.15 The Contractor has to install 3 nos. of Tube Axial Fan at the location specified by the EIC. The Tube Axial Fans shall be connected with the duct as per the Technical Specification in Clause 5.0 of SCOC. All newly installed Tanks/ Process vessels shall also be connected with the existing Vapour Blower ducts as per the instruction of EIC.

3.0 SCOPE OF CONTRACTOR

3.1 EOT Crane, Electric Hoist with Trolley, Centrifugal pumps, Submersible Pumps, ODS pumps and Tube Axial Fans.

3.2 HDPE Pipes and Fittings, PP Ball valves, CS Gate Valves, MS Steel Structures (for Tube Axial Fan, Electric hoist, EOT Crane, Pumps, Working Platforms, Pipe Racks, HDPE pipeline, Valve supports, etc.), Wooden Chequered Boards 18mm, 3mm Flexible Transparent PVC Sheets for gasket, etc.

3.3 Tools such as HDPE Welding Mirrors, Welding machine, Cutting set, Painting brush, Drilling Machines, etc. Epoxy Chemical resistant Primers & Finish Paints (Light Grey & Light Green Eau- De-Nil), Welding Electrodes (shall be of the Makes: ESAB/ ADOR/Oerlikon/ D&H/ Stanvac/ L & T), Fasteners, Anchor Bolts, Lifting Tools and tackles, all consumables required for the work, Chain blocks, shackles, rope, ladder, labour, cable carrier for electric hoist, Scaffoldings, etc.

3.4 Any material/works not mentioned in the details of the work but required for the successful completion and commissioning of the entire work, such as the works like installation of: EOT, Electric Hoist, Tube Axial Fans, ODS pumps, Centrifugal pumps, Process Tanks, etc. shall be under the scope of contractor.

3.5 All Safety Equipment and PPEs, etc., and all other materials required for the work has to be brought by the contractor.

4.0 SCOPE OF THE IREL

Electricity and Water will be provided from a single point by IREL free of cost. The contractor has to make his own arrangements to utilize the same by following safety regulations practiced in IREL.

5.0 TECHNICAL SPECIFICATIONS

S. No.	Item Description	Technical Specification	Preferred Makes
1	Centrifugal Pump	Discharge-15m^3/hr Head- 21m Impeller MOC- GFRPP (Semi open) Volute Casing and casing Cover- GFRPP Mechanical Seal-Teflon Bellow type with Hastelloy springs Rotary and Stationary (GFT vs Ceramic), Shaft Sleeve- Ceramic Shaft- SS316 Motor (HP)- 5HP, RPM-2900 Performance Test Certificate Warranty Certificate with 1 year from the date of commissioning.	Pump-Antico Motor- Kirloskar/Siemens /CGL/ Bharat Bijlee/ABB
2	Centrifugal Pump	Discharge- 20m^3/hr Head-30m Impeller MOC- GFRPP (Semi open) Volute Casing and casing Cover- GFRPP Mechanical Seal-Teflon Bellow type with Hastelloy springs Rotary and Stationary (GFT vs Ceramic), Shaft Sleeve- Ceramic Shaft- SS316 Motor (HP)- 10HP, RPM-2900 Performance Test Certificate Warranty Certificate with 1 year from the date of commissioning.	Pump-Antico Motor- Kirloskar/Siemens /CGL/ Bharat Bijlee/ABB
3	ODS Pump	Size- 4 inch Discharge- 14m^3/hr With Suction and Discharge Check Valves, Solenoid Valves, Rubber Lined suitable to handle acidic slurry, Silencers, etc. Performance Test Certificate Warranty Certificate with 1 year from the date of commissioning	-
4	Non-Metallic Vertical Sump pump/Semi-Submersible Pump	Discharge- 12m^3/hr Head- 15m Pump length-750mm MOC casing-Poly Propylene MOC Impeller- UHMW Pump Shaft MOC- SS316 Motor (HP)- 3HP, RPM-2900, Liquid to handle: Alkaline/ Acidic, Suction/ Delivery- 40mm/40mm with strainer, Coupling Flexible spacer Coupling, Sealless and Glandless. Performance Test Certificate Warranty Certificate with 1 year from the date of commissioning	Diaflow/ Bhagwati/ Orbit Motor- Kirloskar/ Siemens/CGL / Bharat Bijlee/ ABB
5	Submersible Pump	Three phase, 11KW/ 15HP sewage dewatering submersible Pump. Delivery 150mm, Cast Iron Casing, Cast Iron Impeller, SS Shaft Suitable for 8 meters to 18 meters head, 4920 LPM to 280 LPM discharge. Performance Test Certificate Warranty Certificate with 1 year from the date of commissioning	Kirloskar/ Grundfos/ Warman

6	Electric Hoist with trolley	Capacity- 2Tons Lift- 20m No. of Rope Falls: 2Rope Diameter:10mm Hoist Brake: Electromagnetic AC Disc Brake Suitable for ISMB 300 Integrated motor with gearbox, hoist confirming to IS 3938-2005, Rope confirming to IS 2266, Performance Test Certificate Warranty Certificate with 1 year from the date of commissioning.	INDEF/Swift / Brady & Morris
7	EOT Crane	Type of Crane: EOT (Single Girder) Safe Working Load (Capacity): 2 Ton. Span of The Crane: 15mtrs (approx). Lift: 20 Mtrs. Bay Length (Lt): 18Mtrs (approx). Crane Bridge: Single Girder as Per IS-3177/807 Duty Class of Crane Bridge: Class II Duty, Indoor Type Crane Operation: From Floor Through Independent Pendant Switch. Design/Class: As per IS-3177/807/MS- FEM-2M No. of Rope Falls: 2 Rope Diameter: 10mm Hoist Brake: Electromagnetic AC Disc Brake Integrated motor with gearbox, hoist confirming to IS 3938-2005, Rope confirming to IS 2266, Performance Test Certificate Warranty Certificate with 1 year from the date of commissioning	INDEF/Swift / Brady & Morris
8	Tube Axial Fan	Flow rate- 25,000m^3/hr Static Pressure- 20mm WC Impeller- Cast Aluminum Aero-Foil adjustable pitch blades, Galvanized and detachable Hub plate of 4mm thickness, Motor-5HP, 1440RPM,TEFC, 3Phase, Class F Insulation, Casing-3.15mm thick MS with Hot dip Galvanizing, Direct Driven.	Motor- Kirloskar/ Siemens/ CGL/ Bharat Bijlee/ ABB
9	Carbon Steel Gate Valves	CS gate valves of size 150mm as per IS 14846, Class 150. Material Test Certificate. Warranty Certificate with 1 year from the date of commissioning	Leader/Kartar / L&T/ Kirloskar
10	Polypropylene Ball Valve	Flanged Ends, Hole Drilling confirming to ANSI B 16.5 standards, Three piece constructions with bolted body, Both ends of bolts must be capped with PP nut Caps, operated by lever/ handle with quarter turn stopper. Body & Ball: Virgin PP Ball Seat: PTFE Stem: PP reinforced with MS Body Seal: PTFE Gasket Handle: MS Covered with PP Leak tested at 10 Kg/cm^2	Hindustan/CPI/ Parth/Parixit/ Nirmala/UNP Polyvalves/ Classic/ DPP

11	Rubber Lined Diaphragm Valves	Cast Iron Hard Rubber Lined, Body Bonnet Assembled, Straight Bore type Diaphragm Valve Size (DN) 100mm Body: Grey Cast iron Body Lining: Hard Rubber Lined (Ebonite) Lining Thickness: 3.5mm-4.5mm Bonnet: Grey Cast Iron, Epoxy Painted Diaphragm: Neoprene (Suitable for 33% HCl Solution) Spindle: Carbon Steel Grade SAE 1018 End Connection: Flanged (Flat face) drilled to suit: ANSI 16.5 Class 150 10 Method of Operation: Manual Rising Hand Wheel 11 Hand Wheel: Grey Cast Iron 12 FF Standard: ANSI B 16.10	Saunders
12	MS Structural Steel (Structures to be used as per site condition)	As per IS 2062:2011 or latest. Material test certificate shall be submitted	Jindal/ TATA/ SAIL/ VIZAG/ ESSAR
13	Chemical Resistant Epoxy Paint and Primer	Chemical resistant Epoxy Primer IS14506 Red Oxide & Finish Paint as per IS14209. Paint should have minimum 6 month self- life. Material test certificate shall be submitted.	Berger/Asian Paints/ Stanvac/ Nerolac
14	HDPE Pipelines	IS 4984: 1995 or latest, PN10, Material Grade PE 80 – In straight length of 5 to 6 m. Material test certificate shall be submitted	Kodoor/ Sangir/ASVA/ Keerthi
15	HDPE Fittings	IS 8008, 1976, PN 10, Material Grade PE 80, For Flanges Hole drilling suiting to ANSI B 16.5 Standards. Material test certificate shall be submitted	Kodoor/ Sangir/ASVA/ Keerthi
16	Wooden Chequered Board	18mm thick of size of approx 1.25mx2.5m, resistant to acid, alkali, solvent and moisture. Moisture-resistant core with sealed edges to prevent water/ moisture ingress. **Surface Finish**: Laminated or coated with chemical- resistant overlay like melamine or phenolic resin. Density approx 680Kg/m^3. High screw-holding capacity and resistance to splitting. Load Capacity– 2KN/sq.m.	Western India Plywood
17	FRP Ducts for Tube Axial fans and Fume Exhaust Ducts	6mm thick, FRP, in Isophthalic Resin, Blue colour pigment coating for Tube Axial fan duct and Grey Colour for Exhaust duct.	As per specification

BILL OF QUANTITIES (BOQ) / PRICE SCHEDULE			
Sl. No.	**DESCRIPTION OF WORK**	**QTY**	**UNIT**
PROCESS WORKS (As Detailed in Scope of Work 2.0 and Detail of Work in Annexure-1)			
1	Dismantling of existing 2 nos. 115 M3 MS tanks with glass wool insulation, 1 no. 18 M3 MSFRP tank with all accessories. Cutting of tank platform & associated structures, removal of asbestos sheets if required for dismantling of the existing tanks and shifting of all dismantled items at the designated place within 500 meter. Opening of all flanges, pipes, fittings, electrical connections, instrument connections and any other works as per detailed scope of work and requirement for dismantling the existing tanks.	3	Nos.
2	Fabrication and supply of 60 M3 MS conical bottom tanks with agitator along with all accessories. Erection and FRP lining, installation & commissioning with all accessories as per detailed scope of work, technical specification and approved drawing.	6	Nos.
3	Fabrication and supply of 30 M3 MS conical bottom tanks with agitator along with all accessories. Erection and FRP lining, installation & commissioning with all accessories as per scope of work, attached technical sheet and approved drawing	4	Nos.
4	Fabrication and supply of 30 M3 MS conical bottom tanks with grid plates, agitator along with all accessories. Erection and FRP lining, installation & commissioning with all accessories as per scope of work, attached technical sheet and approved drawing	2	Nos.
5	Fabrication and supply of 1.5 M3 MS conical bottom tanks with agitator along with all accessories. Erection and FRP lining, installation & commissioning with all accessories as per detailed scope of work, technical specification and approved drawing.	1	Nos.
6	Supply, installation, commissioning and performance testing of ODS pump 4" size as per attached technical specification and scope of work.	2	Nos.
7	Design, Fabrication, Inspection, Supply, Transportation, unloading at site, Erection, Installation, commissioning & Performance testing of Vertical bottom discharge type automatic Centrifuge of discharge capacity 350-400 Kg/batch for Cerrous carbonate with accessories including Hydraulic Power Pack, electrical accessories, Instruments with PLC system, Control valves complete with cabling, electrification etc. complete in all respect as per attached detailed scope of work and technical specification.	1	No.
8	Fabrication, supply & installation of FRP Flash mixer of 30 m3/hr capacity for effluent treatment at ETP as per attached technical specification and scope of work.	1	No.
9	Supply and installation of Microprocessor based UV/VIS Spectrophotometer (True Double beam UV visible Spectrophotometer sealed & quartz coated with Czerny- Turner monochromatic) as per technical specification along with required software and computer.	1	No.
10	Obtaining PESO license for dismantling existing diesel storage tank and changing to new diesel storage tank.	1	LS
CIVIL WORKS			
PART A – Detailed Engineering drawings & Design			

	Submission of design basis report with detailed calculation using relevant software such as ETABS , STAAD.Pro, SAP etc and submission of providing detailed construction drawings, structural, reinforcement drawings, foundation details, , tanks & equipment foundation drawings etc., as per latest relevant IS codes and certified by chartered structural Engineer. All the drawings, design basis report & calculations shall be vetted by any IIT/NIT/SERC/Govt Engineering college.		
11	60 cum MS tank foundation	1	No.
12	30 cum MS tank foundation	1	No.
13	Construction of Lean to shed b/w Nd Pr godown & SEP	250	m^2
14	Construction of Lean to shed at Northern side b/w REP-II & SEP	100	m^2
15	Construction of structural steel shed b/w pilot plant & REP-II	275	m^2
16	Construction of RE Chloride storage cum dissolution shed.	250	m^2
17	Construction of underground treated effluent collection pit	150	m^2
PART B – Dismantling of existing RCC foundation, flooring, MS roof structural etc.			
18	Demolishing RCC structures such as floor slabs, old tank / equipment foundation, roads, columns, beams, slabs etc., any other RCC concrete elements at all levels & heights manually or by mechanical means using a chain-driven excavator machine / jaw crusher into small pieces; cutting of re-bars using a grinder or gas cutter; and dismantling using an electrically operated low-vibration breaker machine, ensuring no damage to adjacent buildings or structure or process vessels. The work includes labour charges and the transportation/shifting of concrete debris from the work site to a designated disposal area within 1000m of the factory premises as directed EIC. The rate shall include the hire charge of all machineries, tools & equipment's, excavator, tipper, JCB vehicles, gas cutting, scaffoldings & platforms, transportation of waste, labour charges etc., to carryout complete work.	260	m^3
19	Demolition of RCC portal frame structure, underground structures etc., using electrically operated diamond wire saws for horizontal slicing and diamond wall saws for vertical slicing to cut the structure into small pieces. The equipment used shall be of suitable diameter and sufficient capacity to suit existing site conditions. Cutting of re-bars shall be carried out using a grinder or gas cutter. After cutting & removal of big pieces, dismantling into small pieces shall be done using an electrically operated low-vibration breaker machine, ensuring no damage to nearby structures. It includes labour charges and the transportation/shifting of concrete debris from the work site to a designated disposal area within 1000m of the factory premises, as directed by the Engineer-in-Charge (EIC). *The rate shall include the hire charge of all machineries involved, scaffoldings, working platform, hydra cranes, tipper, JCB vehicles and tools required for the work, gas cutting set, transportation of waste, labour charges etc., to carryout complete work.*	130	m^3
20	Engaging concrete cutter 2 feet dia (approx) using diamond wheel suit to existing site condition for cutting of RCC slab/floor, roads (concrete & bitumen) of 200 to 300mm thickness including necessary scaffolding, platform, labour charges etc to carry out the complete work. *The rate shall include the hire charge of machineries, vehicles and tools & equipments required for the work, gas cutting set, transportation of waste, labour charges etc., to carryout complete work.*	500	Rm
21	Dismantling, chipping, removal of plain cement concrete / rubble masonry / soling / brick masonry etc., using portable heavy duty concrete breaker	55	m^3

	machine/ jag hammer or manually including cutting of re-bars using grinder/gas cutter & removing of all debris generated. The waste generated during the work shall be shifted to location shown by EIC, dumping, levelling as directed by EIC within a distance of 1000m inside factory premises. *The rate shall include the hire charge of breaker machines, tools & equipment's, scaffoldings & platforms, gas cutting set, transportation of waste, labour charges etc., to carryout complete work.*		
22	Dismantling and removing existing all type of roof sheets (Asbestos Cement, metallic ,FRP, Polycarbonate sheets ,PVC) roofing & cladding including ridges & roof bolts, screws using all necessary tools, equipment, scaffolding as directed by Engineer-in-charge. *The rates shall include labour charges for dismantling, scaffoldings, working platforms, tools & equipments, transporting the dismantled material to designated location as directed by EIC etc., to carryout complete work.*	1200	m^2
23	Dismantling and removal of existing FRP (Fiber Reinforced Plastic) / UPVC rainwater gutter, including all necessary supports, clamps, brackets and accessories without damage to the surrounding structure. The removed material shall be stacked as directed or disposed in scrap yard, designated location as directed by EIC *The rate shall include labour charges, hire charges of tools & equipments, scaffoldings & working platforms for the work etc., for completion of the work in all aspects.*	75	Rm
24	Dismantling of MS structural by appropriate cutting method (cold cutting/gas cutting etc.) The work includes cutting, removing of MS structural like columns, beam, rafters, purlins, bracings, platform, staircase, etc. and dismantled items shall be cut below 4.0m length, to be weighed in our weigh bridge before dispose in to scrap yard, complete as directed by Engineer-in-Charge. *The rate shall include labour charges, hire charges of tools & machineries, vehicles required for the work, scaffoldings, working platform etc. for completion of the work in all respects*	25	t
PART C – Construction of RCC foundation, underground collection pit, structural steel shed, PVC roofing etc.			
25	Earthwork excavation for tank foundation, columns, effluent collection pit by mechanical means & as directed, in all classes of soil up to a depth of about 5 m from the existing ground level & as required to suit site conditions including removing all waste materials, vegetation, trees, scraps etc., which comes in proposed area, strutting, shoring wherever required to prevent sliding of soil, bailing out ground water from any depth required for the work without fail & pumping to temporarily made earthen pits or wells in all four corners to be specially made for collection of ground water within a distance of 500m, dressing, ramming the bottom of excavated level, making the surface suitable for concreting, shifting of excavated soil from the site and then bringing back the same partly for refilling purpose at required places up to the top level of pit as directed in multiple layers including consolidating each layer by watering, ramming using vibratory rollers, disposing off all waste material/ excess earth within a distance of 1000m & levelling properly as directed by EIC etc., complete. (No extra quantity for working space more than 30 cm from the edge of PCC will be measured and paid.)	2000	m^3
26	Providing MS sheet piles with a 5mm profile and 55cm width and at a depth of 6m. The sheet piles will be supported with horizontal ISMB 200 or ISMB 300 beams at the top and vertical support will be provided with mechanical equipment such as the chain driven excavator of suitable capacity and back hoe loaders. Additionally, horizontal bracing and cross bracing will be installed at the top to ensure retaining capacity against earth pressure.	120	Rm

	The rate includes labor charges, hire charges all type of mechanical equipment & machineries and scaffolding, working platforms to carry out the complete work."		
27	Providing and laying GSB 200mm thick (approx) over the existing surface as directed by EIC including levelling and consolidation to form a compact surface by pouring water, compacting with vibratory rollers and well consolidated properly etc., complete as per standard specification and as per the direction of Engineer-in-charge. Measurement will be taken for compacted layer by actual thickness at site. Supply quantity will not be considered for payment. *The rate shall include cost & conveyance of material, labour charges, tools & machineries required etc., to carry out the complete work.*	260	m^3
28	Providing and laying in position plain cement concrete of mix 1:3:6 (1 part cement, 3 parts coarse sand, and 6 parts graded broken stone aggregate of 40–20 mm nominal size) for tank foundations, columns, plinths or other locations as directed by the EIC, after ramming the existing earth, well compacted, with side shuttering, and finished smooth to a fair face at all levels, including curing, etc., complete. *The rate shall include the cost of all materials including cement, labour charges, mixing, laying, cleaning, lead and lift of all materials and cost of tools, etc., to carry out the complete work.*	200	m^3
29	Providing and laying a polythene sheet of 200 micron (800 gauge) thickness as a single piece to the full width of the proposed treated effluent collection pit, with proper overlaps of approximately 30 cm. Measurement will be taken for the laid area only, excluding overlaps. *The rate shall include the cost of all materials, laying charges, labour, tools and equipment, consumables, etc., to carry out the complete work.*	250	m^2
30	Supply and laying of reinforcement high-yield strength deformed (HYSD) bars of Fe 500 grade, including cutting to required sizes, bending, placing in position, and binding with 18/20 gauge black annealed or GI tying wire. This includes lead and lift of reinforcement to the site, and laying as directed by the Engineer-in-Charge. The weight of steel bars shall be taken as per the relevant IS standards, and the steel should be weighed on a weighbridge before entering the plant. The rates shall include labour charges, cost of reinforcement, binding wire, tools, scaffolding, tools & equipment's etc., for carrying out the complete work.	82	t
	Anchoring of new re-bars in the existing RCC columns, beams & slab wherever required or location as directed by EIC using pure epoxy resin anchoring mortar (Master flow 935 of BASF/SIKA or equivalent FOSROC/HILTI) with appropriate diameter of drilling of holes required for proper bonding into the concrete etc., complete. *The rate shall include cost of epoxy resin anchoring mortar, labour charges, cost/hire charges of tools, machineries & other working implements etc., to carry out the complete work.*		
31	8 mm dia bar - drilling length of 100-120mm	250	Nos.
	10 mm dia bar - drilling length of 100-120mm		
	12 mm dia bar - drilling length of 120-140mm		
	16 mm dia bar - drilling length of 160-180mm		
32	Providing & laying of Reinforced Cement Concrete RCC for raft foundation, footings, columns, beams, slabs, floors, all proposed RCC elements (M30 Grade as per IS 456) with minimum cement content of 380 kg/m^3 of concrete by using 20-12 mm downgraded stones, machine mixed, mechanically vibrated, consolidated, curing, including usage of quality material as approved, cost, conveyance, lead, lift of all materials, labour, necessary scaffolding etc. and depth below (-6m), and above (+3m) excluding cost of formwork and reinforcement work which will be paid separately under relevant item. Wherever possible Ready Mix Concrete shall be carried out at required places	685	m^3

	as directed by Engineer-in-charge with prior approval. *The rate shall include labour charges, cost & conveyance of all materials, scaffolding & working platform, concrete pump & pipes etc. for carrying out the complete work.*		
33	Providing & laying of Reinforced Cement Concrete RCC (M-25 Grade as per IS 456) for pit/sump, dyke wall, floor screed concrete etc., with a minimum cement content of 350 kg/m3 of concrete by using 20-10 mm downgraded stones, machine mixed, mechanically vibrated, consolidated, curing, including usage of quality material as approved, cost, conveyance, lead, lift of all materials, labour, necessary scaffolding etc., but excluding cost of formwork and reinforcement work which will be paid separately under relevant item. Wherever possible Ready Mix Concrete may be carried out at required places as directed by Engineer-in- charge with prior approval. *The rate shall include labour charges, cost of all materials including cement, M-sand, concrete pump & pipes, drum mixer, scaffolding / platform work for carrying out the complete work.*	40	m^3
34	Providing shuttering/formwork using plywood with sufficient wooden runners or MS sheets, with adequate strength to withstand the all type of load, by providing props, supports, or span supports during compaction of concrete with a mechanical vibrator for RCC structure such as raft foundation, walls, beams, columns, footings, tank foundation etc,. The gap / joints between the MS shutters or Plywoods shall be sealed with suitable to prevent leakage of cement slurry while pouring concrete. *The rate shall include labour charges for fixing, all types of shuttering materials, and removal of formwork after use, rental charges or cost of materials, transportation, etc., required for the complete work.*	2000	m^2
35	Providing masonry work using solid concrete block of standard size of 30cm x 20cm x 15cm / 30cm x 20cm x 10cm in superstructure above plinth level upto floor 'V' level in cement mortar 1:5 (1 Cement: 5 coarse sand) including raking out joints, finishing to proper lines & levels, chipping the existing floor concrete surface for necessary bonding, curing etc., complete at all levels. *The rates shall include cost of all materials, labour charges, tools, cleaning, lead & lift of all materials, mixing, scaffolding & platforms etc., for carrying out the complete work.*	110	m^3
36	Providing Plastering in CM 1:4, 12 mm thick average in new and existing masonry structure wherever required, mixing & application of mortar, finishing smooth, proper line & level all required for completion of work as directed by EIC. *The rates shall include cost of all materials, labour charges, tools, cleaning, lead & lift of all materials, mixing, scaffolding etc., for carrying out the complete work.*	2000	m^2
37	Supply, fabrication & erection of MS structural supports such as columns, rafters, tie beams, purlins, wind bracing, cross bracing, roof supports, side cladding angles, louvers, supporting cleats, stiffeners, battens, joint plates, monkey ladder, staircase and other supports using all type of structural steel sections such as angles, beams, channels, plates or built-up sections, etc., for providing new structural steel shed with roofing which includes straightening, cutting, fixing in position, bolting, welding at required places upon site condition etc. for carrying out the complete work. The MS roof structural shall be painted with one coat of high build epoxy primer & two coats of chemical resistant epoxy finish paint after thorough cleaning / surface preparation using wire brush/scrapper/chisel and buffing with steel brush cup type fitted in angle grinder. *The rate shall include labour charges & cost of all materials, hire charges of tools & machineries, suitable capacity cranes required for erection work, consumables etc., scaffolding charges, working platforms, safety tools and appliances, , ties etc., for carrying out the complete work.*	128	t
	Providing high-tensile MS rods of 20mm dia for intermediate sag rods between roof purlins with threading of 100mm at both ends, to reduce sagging and lateral movement of MS purlins, including supply of specified, providing nuts,	3	t

38	washers. The rods shall be fixed in position with proper line, alignment and as per approved structural drawings and specifications. *The rate shall include labour charges, cost & conveyance of materials, tools & equipment, scaffolding & working platforms, safety tools, consumables etc. for carrying out the complete work.*		
39	Supply, providing, laying and fixing of industrial profile PVC roof sheet 1.9mm thick white colour, (overall width of 1063mm and crest height of 40mm with centre to centre crest of 250mm),fixing with suitable size aluminum alloy mill finish cyclonic / storm washer on crest of sheet profile, SS304 self-tapping screws, FRP flats on joints and apply weather proof silicon joint sealant to make the roof leak proof, to suit the existing M.S angle/channel purlin, in required shape/length etc. to suit for existing site conditions and roof setup as per standard specification and as directed by Engineer-in-charge. *The rate shall include labour charges, cost & conveyance of all materials including scaffolding charges, staging, working platform, hire charges of tools, equipment and machineries etc. for carrying out the complete work.*	2400	m^2
40	Supply and installation of UPVC gutter of size of about 320X250mm of length 3m each for diverting rainwater from roof and a weight 3kg per meter with a holding capacity of 52 liter/metre as directed by Engineer In-charge. Gutter shall be laid with sufficient slope (1 in 50 to 1 in 100 suitable to the site set-up) from the starting end to discharge end. The work also include supply & fixing accessories such as UPVC coated GI clamp @ 45- 60cm c/c spacing welding MS purlin to proper line, fitting the Joint clamp suitably by weather resistant grade sealant and make leak proof etc., as per manufacturer recommendations & as directed EIC to complete. *The rate shall include labour charges, cost & conveyance of all materials, scaffolding charges, staging, working platform, etc. for carrying out the complete work.*	150	Rm
41	Supply & fixing PVC pipe of 140mm dia or nearest, 4 kg/cm^2 pressure rating for rain water down take from roof gutter through side cladding sheet, barge board (roof sheet) including suitable specials such as bends, tees, elbows etc., required for the work suit to site setup, placing at site in position using GI threaded rod of minimum dia 7mm, sliding rail on both side of flange of MS columns, U clamps, bolts, nuts with washer @ 1.0m spacing c/c, necessary jointing to leak proof, slopping to drain etc., accessories for the roof set-up and sealing them, necessary anchoring, clamping, grouting to the masonry structure after removal of damaged down take pipes if any required etc., all required for the completion of work and as directed by Engineer-in-Charge with prior approval for all fittings. *The rate shall include labour charges, cost & conveyance of all materials including cement, scaffolding charges, staging, solvents, working platform, etc. for carrying out the complete work.*	200	Rm
42	Supply & fixing MS bolts & nut of 25-32mm dia for RCC tank foundations, columns with washer plate with 800mm length & about 175mm thread as per the spacing given in detailed engineering drawing or as directed by Engineer In Charge. Suitable templates have to be made & fix before concreting to keep the spacing of foundation bolts in proper line & levels. *The rate shall include cost & conveyance of all materials & labour charges for fixing etc. required for complete work.*	3.6	t
43	Providing non-shrinkage cementitious grout 50 mm thick at the top of column footings/ tank foundations or at locations as directed by the Engineer-in-Charge (EIC), and finishing the surface smoothly with a trowel smooth using approved make and grade of material. *The rate shall include the cost & conveyance of all materials, labour charges, scaffolding, tools, and equipment required for completing the work in all respects.*	100	m^2
	Providing and applying paint on the exterior surfaces of the proposed locations as directed by the Engineer-in-Charge (EIC), including masonry walls, RCC columns, beams, sunshades, roof slabs, and other areas within the factory premises. The work shall comprise one coat of water-based primer and two	2500	m^2

44	coats of PU (polyurethane) water-based finish paint suitable for exterior application, to achieve a smooth finish and improved appearance. Proper surface preparation shall be carried out prior to painting, including the removal of loose old paint layers, dirt, grease, etc., using sandpaper, emery paper, wire brush, or buffing machine; washing the surface with a high-pressure water jet at all levels; cleaning with cotton waste; and disposing of debris within a distance of 1000m inside the company premises. Successive coats of paint shall be applied only after 4–6 hours of hard drying of the previous coat. *The rate shall include the cost & conveyance of all materials, labour charges, scaffolding, working platforms, sander machine painting tools such as brushes, wire brushes, jet pumps, and all tools and machinery required for the complete execution of the work. (The required quantity of paint and primer, as per the technical specifications, shall be supplied by the department and utilized at site as needed.)*		
45	Supply and applying paint on the interior surfaces of the proposed locations as directed by the Engineer-in-Charge (EIC), including masonry walls, RCC columns, beams, ceilings, and roof slabs. The work shall be carried out as per the manufacturer's recommendations, consisting of one coat of epoxy primer (dual pack) and two coats of epoxy finish paint (dual pack, light shade, chemical-resistant, and suitable for masonry surface application). Proper surface preparation shall be done prior to painting, including the removal of any loose old paint layers, dirt, grease, etc., using sandpaper, emery paper, or wire brush; scrubbing with water wherever required; cleaning with cotton waste; and disposing of the debris within a distance of 950 m inside the company premises. Successive coats of paint shall be applied only after 4–6 hours of hard drying of the previous coat. The make and colour shade shall be approved by the EIC before commencement of work. *The rate shall include the cost & conveyance of all paint materials, labour charges, scaffolding, working platforms, painting brushes, sander machine, wire brushes, crack fillers, and all tools and equipment necessary to complete the work in all respects.*	2150	m^2
46	Providing and finishing the concrete floor surface at the proposed locations as directed by the Engineer-in-Charge (EIC), using a power trowel machine to achieve a smooth finish, proper line & level. The work includes operating the machine over freshly laid concrete after the initial setting, in accordance with the manufacturer's recommendations and site conditions. The process may involve multiple passes using float and finish blades to ensure proper compaction and a uniform surface finish. *The rate shall include all labour, tools, equipment, fuel, and operator charges for the trowel machine, as well as manual edge finishing where machine access is restricted, and protection of the finished surface as directed by the Engineer-in-Charge.*	350	m^2
47	Providing & applying 2 coats of coal tar epoxy paint in underground collection pit using approved brand & shade, application as per manufacturer's recommendations including cost & conveyance of all materials, labour, necessary scaffolding, working platform, staging etc., for the exterior wall & basement (plastering) surface after proper surface preparation such as removing of dirt, grease etc., using sand/emery paper/wire brush/buffing machine, cleaning using cotton waste etc. Before application of painting the surface shall be completely dry and there should not be any dampness in wall & basement. Successive coat of paint shall be applied only after hard drying of the previous coat. *The rate shall include all labour, material cost, tools & equipment , scaffolding , working platforms, cleaning, etc.to carry out the complete work.*	840	m^2
48	Providing & laying PVC/rubber water stopper 150 mm wide, 6 mm thick at all construction joints, fixing in proper line & level, including cost, conveyance of materials, labour etc., complete. *The rate include labour & material charges, tool & equipment's, scaffoldings & platforms etc. required for completing the work in all respects.*	300	Rm
49	Supplying water proofing compound of approved make for mixing in cement mortar as per manufacturer recommendation and as directed by EIC, including	1500	Kg

	cost & conveyance of material, labour charges etc. *The rate shall include labour & material charges, tool & equipment's, scaffoldings & working platforms etc. required for completing the work in all respects.*		
50	Providing FRP Lining with three layers or more chopped strand matting of 450 grams/m^2 (GSM) in bisphenol resin to minimum thickness of 3.0mm and One layer of surface matting after proper surface preparation including application of one coat of resin before laying of first layer of glass fiber mat. *The rate include labour & material charges, tool & equipment's, scaffoldings & platforms required for completing the work in all respects.*	650	m^2
51	Providing & sealing with 'cold applied bituminous caulking compound with mineral fillers' (tar plastic of STP or equivalent) at junction of RCC & PCC works, 75-100 mm wide, 20 mm thick approx, surfaces to leak proof including cost, conveyance, labour etc., complete. *The rate include labour & material charges, tool & equipment's, scaffoldings & platforms required for completing the work in all respects.*	100	Rm
52	Providing heavy duty PU screed lining, 5mm average thick, over the existing concrete floor area using approved brand & shade of materials as per manufacturer recommendations, after proper surface preparation which includes grinding the floor, making anchor grooves 100 mm from all round walls, 20sqm areas for a size of 6 mm x 6 mm (width and depth), remove any loose plaster, dirt, grease, surface contamination, laitance completely and priming with suitable primer 24 hrs dry. The debris generated while cleaning shall be disposed at our disposal/scrap yard within a distance of 950m inside the company premises. The rate shall include cost & conveyance of all materials, labour charges, hire charges of tools & machineries required for the work etc., for carrying out the complete work.	950	m^2
53	Supply and fix 600 mm diameter powder-coated aluminium wind-driven turbo roof extractor, installed on the roof using an FRP base matching the profile of the 2 mm thick roofing sheet. The work includes providing a variable-angle elbow fixing with self-tapping screws, and applying weather-resistant silicone sealant to ensure watertight installation. *The rate shall include the cost & conveyance of roof extractor, all other materials, labour charges, scaffolding, staging, working platforms, tools, and consumables required for the complete execution of the work.*	35	Nos
54	Fabrication, supply, and fixing of powder-coated aluminium casement/fixed windows having an outer frame size of approximately 60 mm × 50 mm with a thickness of 1.6 mm (or nearest available section). The width of each shutter shall be 60 cm or equally divided to suit the existing opening size. The shutter section shall be approximately 80 mm × 60 mm with a thickness of 1.6 mm (or nearest available section), fitted with heavy-duty ball-bearing hinges and 5 mm thick toughened glass (clear or tinted).The windows shall be fixed in position using screws or anchor bolts, complete with handles, beading for airtight closure using EPDM gaskets, etc., and installed at locations directed by the Engineer-in-Charge (EIC) for newly proposed location or existing openings after cutting and removing old wooden windows and frames. The gap between the masonry wall and window frame shall be sealed with weather-resistant silicone sealant. The colour of the powder coating shall be approved by the Engineer-in-charge prior to fabrication. *The rate shall include the cost of all materials, labour, fabrication and supply, dismantling, and fixing charges, as well as all tools and consumables required for the complete execution of the work. The size of casement windows shall vary from width 1.2 m to 1.8m and height 1.2m to 1.4 m.*	40	m^2
	Fabrication, supply & fixing of UPVC window (casement) of outer frame size 60mm x 60mm (approx), thickness-1.1mm or nearest, width of shutter- 60cm or equally divide the existing opening length, heavy duty rail/track, 5mm thick	35	m^2

55	clear toughened glass, fixing the windows using screws/anchor bolts, handle, beading to air tight closure using EPDM gasket etc. and placing at site suitable for the existing opening. The gaps between the masonry wall and window shall be sealed with weather resistant silicon sealant. The colour shall be got approved from Engineer-in-charge before fabrication. *The rate shall include cost of all materials & labour, supply, fabrication, scaffolding, working platforms & fixing charges etc., for carrying out the complete work.*		
56	Supply & fixing fully furnished pre hung WPC door for operator & office rooms, both side plain vertical grain with matching PVC wrapped WPC jamb of 100mm x 45mm width with front side architrave back side trackers. Thickness of door of 35mm thick with 4 side edges PVC lipping/lock hole boring (using mortise lock)/Hinge rebate cutting (4Nos)/Extruded core filling, including premium quality hardware fittings ball bearing hinges, tower bolts, door closer, locks with handles and other accessories. The colour and design shall be got approved before commencement of work. The door size varies from Width – 0.9m to 1.2m, Height – 2.0m - 2.15m. *The rate shall include cost of all materials & labour, fabrication, supply, dismantling of old wooden doors & fixing charges etc., for carrying out the complete work.*	8	Nos
57	Providing & fixing good quality vitrified tiles of 600mmx600mm or 600mmx1200mm, 8mm thickness double charged, anti-skid, anti-strain & scratch resistant at all levels, over the existing cement flooring, concrete slab, approved design, shade & finish, laying with tile adhesive after chipping and surface preparation / cleaning thoroughly using scrubber machine to remove the stains, dust, grease etc., providing spacers between the tile joints 4mm and filling the gap using suitable epoxy joint fillers. The tiles must be fixed using suitable tile adhesive with minimum 4mm thickness using notch trowel as per manufacturer recommendation. The sample tile, design & shade pattern shall be got approved from EIC before commencement of work. *The rate shall include cost of all materials, labour charges, hire charges for tools, vehicles, machineries required for the work, transportation, unloading, leading & laying charges etc., for carrying out the complete work.*	100	m^2
58	Engaging a core cutting machine for making holes of 25 mm to 200 mm diameter cores using a diamond core cutter machine to a depth of 300 to 500mm for drainage holes, pipelines, cable lines, down-take pipes, etc., in masonry structure (RCC/Brick/Rubble), at all levels as directed by the Engineer-in-Charge (EIC). The gaps shall be sealed using high-strength foundation grout, and the joints shall be provided with FRP lining as directed by the Engineer-in-Charge.	15	Nos
ELECTRICAL AND INSTRUMENTATION WORKS			
Supply part (As Detailed in Scope of Work 2.0 and Detail of Work in Annexure 3)			
	Design, Fabrication, testing and Supply, of Rittal/BCH make MCC panel having capacity:	Quantity	Unit
59	**MCC – ReCl3 Neutralization Tanks:** 4P, 400A, MCCB as incomer, 20HP Star-Delta starter - 2 No. with 63A SFU Isolator & suitably rated fuse, 10HP star-delta starter – 5 No. with 63A SFU Isolator & suitably rated fuse, 7.5 HP DOL starter – 2 No with 32A SFU Isolator & suitably rated fuse, 5HP DOL starter 9 Nos. with 32A SFU Isolator & suitably rated fuse and 4P, 160A MCCB – 2Nos as outgoing with Energy meter, Multi-Function Meter, Indication lamps, CTs, Neutral Links and other required accessories. (Detailed specification as per annexure-3 clause No.2).	1	No.
60	**MCC - Iron Elimination Tanks:** 4P, 400A, MCCB as incomer, 20HP Star-Delta starter -4 No. with 63A SFU Isolator & suitably rated fuse, 7.5 HP DOL starter – 3 No with 32A SFU Isolator & suitably rated fuse, 5HP DOL starter - 5Nos. with 32A SFU Isolator & suitably rated fuse and 4P, 125A MCCB – 3 No.as outgoing with Energy meter, Multi- Function Meter, Indication lamps, CTs, Neutral Links and other	1	No.

	required accessories. (Detailed specification as per annexure-3 clause No.2).		
61	**MCC – ReCl3 Dissolution tanks:** 4P, 125A, MCCB as incomer, 20HP Star-Delta starter -2 No, 7.5 HP DOL starter – 2 No, 5HP DOL starter – 2No as outgoing with Energy meter, Multi-Function Meter, Indication lamps, CTs, Neutral Links and other required accessories. (Detailed specification as per annexure-3 clause No.2).	1	No.
62	Supply of 12 Way PDB with 125A MCCB as incomer and 32 A MCBs as outgoing (Detailed specification as per annexure-3 clause No.7).	2	No.
63	Supply of 18 Way LDB with 63A, 2P ELCB as incomer and 6 A MCBs as outgoing (Detailed specification as per annexure-3 clause No.6).	2	No.
64	Supply of 3.5C x 185 Sq.mm Al conductor XLPE Armoured Cable (Detailed specification as per annexure-3 clause No.8).	60	Mtr.
65	Supply of 3.5C x 70 Sq.mm Al conductor XLPE Armoured Cable (Detailed specification as per annexure-3 clause No.8).	80	Mtr.
66	Supply of 4C x 4 Sq.mm Cu conductor XLPE Armoured Cable (Detailed specification as per annexure-3 clause No.8).	1630	Mtr.
67	Supply of 4C x 2.5 Sq.mm Cu conductor XLPE Armoured Cable (Detailed specification as per annexure-3 clause No.8).	920	Mtr.
68	Supply of 4C x 1.5 Sq.mm Cu conductor XLPE Armoured Cable (Detailed specification as per annexure-3 clause No.8).	2830	Mtr.
69	Supply of Single compression cable gland suitable for 3.5C x185 Sq.mm Al conductor XLPE Armoured Cable (50 mm size) (Detailed specification as per annexure-3 clause No.8.2).	2	No.
70	Supply of Single compression cable gland suitable for 3.5C x 70 Sq.mm Al conductor XLPE Armoured Cable (32 mm size)) (Detailed specification as per annexure-3 clause No.8.2).	2	No.
71	Supply of Single compression cable gland suitable for 4C x 4 Sq.mm Cu conductor XLPE Armoured Cable (22 mm size)) (Detailed specification as per annexure-3 clause No.8.2).	50	No.
72	Supply of Single compression cable gland suitable for 4C x 2.5 Sq.mm Cu conductor XLPE Armoured Cable (19 mm size)) (Detailed specification as per annexure-3 clause No.8.2).	36	No.
73	Supply of Single compression cable gland suitable for 4C x 1.5 Sq.mm Cu conductor XLPE Armoured Cable (16 mm size)) (Detailed specification as per annexure-3 clause No.8.2).	160	No.
74	Supply of Al crimping socket (185 Sq.mm) (Detailed specification as per annexure-3 clause No.8.3).	6	No.
75	Supply of Al crimping socket (90 Sq.mm) (Detailed specification as per annexure-3 clause No.8.3).	2	No.
76	Supply of Al crimping socket (70 Sq.mm) (Detailed specification as per annexure-3 clause No.8.3).	6	No.
77	Supply of Al crimping socket (35 Sq.mm) (Detailed specification as per annexure-3 clause No.8.3).	2	No.
78	Supply of Cu crimping socket (4 Sq.mm) (Detailed specification as per annexure-3 clause No.8.3).	240	No.
79	Supply of Cu crimping socket (2.5 Sq.mm) (Detailed specification as per annexure-3 clause No.8.3).	168	No.
80	Supply of Cu crimping socket (1.5 Sq.mm) (Detailed specification as per annexure-3 clause No.8.3).	560	No.
81	Supply of Cu crimping socket (1 Sq.mm) (Detailed specification as per annexure-3 clause No.8.3).	300	No.
82	Supply of earth strip 25 x 3mm (Detailed specification as per annexure-3 clause No.8.4).	200	Mtr.
83	Supply of earth strip 4 Sq. mm insulated copper wire (Detailed specification as per annexure-3 clause No.8.4).	2000	Mtr.
84	Supply of LED lights. (Detailed specification as per annexure-3 clause No.9).	35	No.

85	Supply of FRP cable Tray (Detailed specification as per annexure-3 clause No.10).	1021	Mtr.
86	Supply of M S Flat 40 x 6 mm.	500	Kg
87	Supply of M S Angle 40 x 40 x 6 mm.	2500	Kg
88	Supply of 30 mm heavy duty MS Pipe.	250	Kg
89	Supply of 450mm heavy duty exhaust fan (Detailed specification as per annexure-3 clause No.11).	15	No.
90	Supply of 90 x 90 mm anticorrosive PVC junction Box (Detailed specification as per annexure-3 clause No.12).	50	No.
91	Supply of magnetic flow meter (Detailed specification as per annexure-3 clause No.13).	4	No.
92	Supply of variable area flow meter (Detailed specification as per annexure-3 clause No.14).	2	No.
93	Supply of Radar Level Transmitter (Detailed specification as per annexure-3 clause No.15).	2	No.
94	Supply of 12 pair control cable (Detailed specification as per annexure-3 clause No.16).	500	Mtr.
95	Supply of 12 core control cable (Detailed specification as per annexure-3 clause No.16).	500	Mtr.
96	Supply of 2 pair control cable (Detailed specification as per annexure-3 clause No.62).	1500	Mtr.
97	Supply of PVC gland (PG gland) suitable for 12 pair control cable (Detailed specification as per annexure-3 clause No.12).	6	No.
98	Supply of PVC gland (PG gland) suitable for 12 core control cable (Detailed specification as per annexure-3 clause No.12).	6	No.
99	Supply of PVC gland (PG gland) suitable for 2 pair control cable (Detailed specification as per annexure-3 clause No.12).	32	No.
100	Supply of 300 x 300 x 210 mm Junction Box (Detailed specification as per annexure-3 clause No.12).	6	No.
101	Supply of instrumentation shut off valve (Specification as per site conditions)	6	No.
102	Supply of Induction Motor 20 HP, 1500RPM Synchronous speed, Flange Mount (Detailed specification as per annexure-3 clause No.17).	6	No.
103	Supply of Induction Motor 20 HP, 1000RPM Synchronous speed, Base Mount (Detailed specification as per annexure-3 clause No.17).	2	No.
104	Supply of Induction Motor 20 HP, 1000RPM Synchronous speed, Flange Mount (Detailed specification as per annexure-3 clause No.17).	2	No.
105	Supply of Induction Motor 15 HP, 1500RPM Synchronous speed, Flange Mount (Detailed specification as per annexure-3 clause No.17).	4	No.
106	Supply of Induction Motor 15 HP, 1500RPM Synchronous speed, base Mount (as per Annexure-10)	3	No.
107	Supply of Induction Motor 10 HP, 1500RPM Synchronous speed, base Mount (Detailed specification as per annexure-3 clause No.17).	5	No.
108	Supply of Induction Motor 7.5 HP, 3000RPM Synchronous speed, base Mount (Detailed specification as per annexure-3 clause No.17).	4	No.
109	Supply of Induction Motor 7.5 HP, 1500RPM Synchronous speed, base Mount (Detailed specification as per annexure-3 clause No.17).	4	No.
110	Supply of Induction Motor 5 HP, 3000RPM Synchronous speed, flange Mount (Detailed specification as per annexure-3 clause No.17).	12	No.
111	Supply of Induction Motor 5 HP, 3000RPM Synchronous speed, base Mount (Detailed specification as per annexure-3 clause No.17).	10	No.
112	Supply of Induction Motor 3HP, 300RPM Synchronous speed, flange Mount (Detailed specification as per annexure-3 clause No.17).	6	No.
113	Supply of Induction Motor 3 HP, 3000RPM Synchronous speed, base Mount (Detailed specification as per annexure-3 clause No.17).	6	No.

114	Supply of Induction Motor 2 HP, 3000RPM Synchronous speed, base Mount (Detailed specification as per annexure-3 clause No.17).	10	No.
115	Supply of Induction Motor 1 HP, 3000RPM Synchronous speed, base Mount (Detailed specification as per annexure-3 clause No.17).	6	No.
116	Supply of Induction Motor 1 HP, 1500RPM Synchronous speed, base Mount (Detailed specification as per annexure-3 clause No.17).	6	No.
ERECTION PART			
117	Installation and Commissioning of Rittal/BCH make MCC panel having size :4500mm x 2200mm x 450mm MCC - $ReCl_2$ Neutralization Tanks	1	No
118	Installation and Commissioning of Rittal/BCH make MCC panel having size : 3600mm x 2200mm x 450mm MCC - Iron Elimination Tanks	1	No
119	Installation and Commissioning of Rittal/BCH make MCC panel having size :2100mm x 1900mm x 450mm MCC – $ReCl_2$ Dissolution tanks	1	No
120	Installation and commissioning of 12 Way PDB with 125A MCCB as incomer and 32 A MCBs as outgoing.	2	No.
121	Supply Installation and commissioning of 18 Way LDB with 63A, 4P ELCB as incomer and 6 A MCBs as outgoing.	2	No.
122	Fabrication of cable tray supports, light fixing supports, exhaust fan fixing supports, DB fixing frames etc. of suitable dimensions and as per site equirement.	3250	Kg.
123	Surface preparation and painting of cable tray supports, light fixing supports, exhaust fan fixing supports, DB fixing frames etc.	500	Sq. Mtr
124	Laying/fixing of FRP cable tray.	1021	Mtr.
125	Laying and dressing of 3.5C x 185 Sq.mm Al conductor Armoured Cable	60	Mtr.
126	Laying and dressing of 3.5C x 70 Sq.mm Al conductor Armoured Cable	80	Mtr.
127	Laying and dressing of 4C x 4 Sq.mm Cu conductor Armoured Cable	1630	Mtr.
128	Laying and dressing of 4C x 2.5 Sq.mm Cu conductor Armoured Cable	920	Mtr.
129	Laying and dressing of 4C x 1.5 Sq.mm Cu conductor Armoured Cable	2830	Mtr.
130	Termination of 3.5C x 185 Sq.mm Al conductor XLPE Armoured Cable	2	No.
131	Termination of 3.5C x 70 Sq.mm Al conductor XLPE Armoured Cable	2	No.
132	Termination of 4C x 4 Sq.mm Cu conductor XLPE Armoured Cable	60	No.
133	Termination of 4C x 2.5 Sq.mm Cu conductor XLPE Armoured Cable	46	No.
134	Termination of 4C x 1.5 Sq.mm Cu conductor XLPE Armoured Cable	196	No.
135	Installation and charging of LED light points	35	No.
136	Fixing and installation of Installation 90 x 90 mm anticorrosive PVC junction Box	50	No.
137	Fixing and installation of Heavy duty exhaust fans	15	No.
138	Laying and termination 25 x 3 mm earth copper strip	200	Mtr.
139	Laying and termination 4 Sq. mm earth copper wire.	2000	Mtr.
140	Laying and dressing of 12 pair 1 Sq.mm Control armoured cable.	500	Mtr.
141	Laying and dressing of 12 core 1 Sq.mm Control armoured cable.	500	Mtr.
142	Laying and dressing of 1 pair 1 Sq.mm Control armoured cable.	1500	Mtr.
143	Termination of 12 pair 1 Sq.mm Control armoured cable.	6	No.

144	Termination of 12 core 1 Sq.mm Control armoured cable.	6	No.
145	Termination of 12 pair 1 Sq.mm Control armoured cable.	32	No.
146	Installation of shut of valve	6	No.
MECHANICAL WORKS (As Detailed in Scope of Work 2.0 and Detail of Work in Annexure 4)			
147	Supply of MS Structural Steel confirming to IS 2062:2011 or latest such as Angles, I-Beams, Channels, Flats, etc. and MS Pipes confirming to IS1239 to be supplied as per the site requirement and instruction of EIC.	100	MT
148	Supply of HDPE Pipe 40mm OD, IS 4984:1995 or latest, PN10, Material Grade PE 80- In straight length of 5 to 6 metres along with the HDPE Fittings.	200	Mtr
149	Supply of HDPE Pipe 50mm OD, IS 4984:1995 or latest, PN10, Material Grade PE 80- In straight length of 5 to 6 metres along with the HDPE Fittings.	100	Mtr
150	Supply of HDPE Pipe 63mm OD, IS 4984:1995 or latest, PN10, Material Grade PE 80- In straight length of 5 to 6 metres along with the HDPE Fittings.	1200	Mtr
151	Supply of Pipe HDPE 75mm OD, IS 4984:1995 or latest, PN10, Material Grade PE 80- In straight length of 5 to 6 metres along with the HDPE Fittings.	425	Mtr
152	Supply of Pipe HDPE 90mm OD, IS 4984:1995 or latest, PN10, Material Grade PE 80- In straight length of 5 to 6 metres along with the HDPE Fittings.	400	Mtr
153	Supply of Pipe HDPE 150mm OD, IS 4984:1995 or latest, PN10, Material Grade PE 80- In straight length of 5 to 6 metres along with the HDPE Fittings.	175	Mtr
154	Supply of PP Ball Valve 32mm, as per attached Technical specification	20	Nos.
155	Supply of PP Ball Valve 40mm, as per attached Technical specification	21	Nos.
156	Supply of PP Ball Valve 50mm, as per attached Technical specification	75	Nos.
157	Supply of PP Ball Valve 65mm, as per attached Technical specification	30	Nos.
158	Supply of PP Ball Valve 80mm, as per attached Technical specification	46	Nos.
159	Supply of PP Ball Valve 100mm, as per attached Technical specification	54	Nos.
160	Supply of Carbon Steel Gate Valve, 6 inch, as per attached Technical specification	5	Nos.
161	Supply of Non-Metallic Horizontal Centrifugal Pump of Capacity: 15cu.m./hr, Head: 21m as per attached Technical Specification.	4	Nos.
162	Supply of Non-Metallic Horizontal Centrifugal Pump of Capacity: 20cu.m./hr, Head: 30m as per attached Technical Specification.	2	Nos.
163	Supply of 4" ODS pump as per attached Technical Specification.	2	Nos.
164	Supply of Non Metallic Vertical Sump Pump as per attached Technical Specification.	2	Nos.
165	Supply of Cast Iron Submersible Pump as per attached Technical Specification.	2	Nos.
166	Supply of 2Ton Wire Rope Electric hoist with Trolley as per attached Technical Specification	1	No.
167	Supply of 2Ton Wire Rope EOT Crane as per attached Technical Specification.	1	No.
168	Supply of Chemical Resistant Wooden Chequered Board of 18mm thick as per attached technical Specification.	500	Sq. mtr.
169	Supply of Tube Axial Fan with Duct as per attached Technical Specification.	3	Nos.
170	Supply of FRP Duct in Isophthalic resin, 5mm thick for fume exhaust.	200	Mtr
171	Supply of Rubber Lined Diaphragm Valve of size 4 inch	15	Nos.
172	Fabrication, Erection and Painting of MS Working Platform and Structures for Monorail for installation of Electric Hoist and EOT Crane, Centrifuge, Tanks, Tube Axial Fans along with step ladders, handrails, etc. Fabrication,	100	MT

	Erection and Painting of Pipe Tray, Support structures for Pipes and Valves as per the Details of the work.		
173	Laying of HDPE pipelines and fittings along with valves on the Pipe racks as per the process layout and details of the work.	2500	RM
174	Fixing PP Ball Valves and Cast Iron Gate Valves as per the process layout.	250	Nos.
175	Installation and Commissioning of Centrifugal Pumps, ODS pumps, Submersible pumps, Vertical Sump Pump and Electric hoists as per the Process Layout.	14	Nos.
176	Installation and Commissioning of EOT crane of 2 ton capacity.	1	No.
177	Installation and Commissioning of 3 nos. of Tube Axial Fan along with the ducts as per the sit condition and as per the instruction of EIC.	3	Nos.
178	Installation of Exhaust Duct FRP lined from newly installed MSFRP tanks to the existing Main FRP Duct.	200	Mtr.
179	Fixing of Wooden Chequered Board in the newly fabricated MS Working Platform.	500	Sq. mtr.
180	Installation of Rubber Lined Diaphragm Valve of size 4 inch	15	Nos.

Note: -

1. **Bidder has to quote the basic rate in Rs. and the GST in % separately as per price schedule attached. If GST in % is not entered/quoted, it will be considered as inclusive of GST.**
2. **Overall lowest will be considered as L1.**

GENERAL CONDITIONS OF CONTRACT (GCOC)

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GENERAL CONDITIONS OF CONTRACT (GCOC)

1.0 Definitions:

In the contract (as hereinafter defined), the following 'words' and 'Definitions' expression shall have the meaning hereby assigned to them except where the context otherwise requires:

a) "Employer" means IREL (India) Limited (IREL) having its registered office at Plot No. 1207, Veer Savarkar Marg, Near Siddhi Vinayak Temple, Prabhadevi, Mumbai- 400028. The term Employer includes successors, assigns of IREL.

b) "Contractor" means the person or persons, firm or company whose tender has been accepted by the Employer and includes the Contractors' personal representatives, successors and permitted assignees.

c) "Engineer" means the representative of IREL or the other Engineer appointed from time to time by the Employer and notified in writing to the contractor to act as Engineer for the purposes of the contract in place of the said representative.

d) "Engineer's Representative" means any resident engineer or assistant of the Engineer or any other employee or agent appointed from time to time by the Employer or the Engineer to perform the duties set forth in Clause 1.5 hereof and whose authority shall be notified in writing to the Contractor by the Engineer.

e) "Work" shall mean and include all works specified or setforth and required in and by the specifications, drawing and schedule hereto annexed or to be implied therefrom or incidental thereto or to be hereafter specified or required in such explanatory instructions and drawings (being in conformity with the original specification, drawing and schedule) and also such additional instructions and drawings not in conformity as aforesaid as shall from time to time, during the progress of the work hereby contracted for, be supplied by the Employer.

f) "Contract" means the Invitation to tender, Instructions to Tenderers, General Conditions of Contract, Special. Conditions of Contract, Specifications, Drawings. Tender Schedule showing approximate quantities, quoted rates and amount against each item, Time Schedule, Letter of Intent/Award, Tender and Contract agreement.

g) "Contract Price" means:

In the case of Lump sum Contracts, the price payable to the Contractor as mentioned in the Contract for each line item. Price is fixed & firm during the entire duration of contract subject to price reduction clause in case of delay in performance; however, price is subject to price variation clause as per special conditions of contract, if any.

In the case of Item Rate Contracts, Rates by the item rates quoted by the tenderer and accepted by the Company for the various items.

h) "Constructional Plant" means all appliances or things of whatsoever nature as required or about the execution, completion or maintenance of the Works or, Temporary Works (as hereafter defined) but does not include materials or other things intended to form or forming part of the permanent work or temporary housing, hutting, offices & Stores etc.

i) "Temporary Works" means all temporary works of every kind required in or about the execution, completion or maintenance of the works.

j) "Drawings" means the drawings referred to in the Specification and any modification of such drawings approved in writing by the Engineer and such other drawings as may from time to time be furnished or approved in writing by the Engineer.

k) "Site "means the lands and other places envisaged by the Employer where the Works are to be executed or carried out.

l) "Letter of Intent" is an intimation by a letter to tenderer that tender has been accepted in accordance with the provisions contained in that letter.

m) "Approved" means approved in writing including subsequent written confirmation of previous verbal approval and "approval" means approval in writing including aforesaid.

1.2 **Singular & Plural** : Words importing the singular only also include the plural and vice versa where the context requires.

1.3 **Clause Headings or Marginal notes**: The Clause headings or marginal notes in these General Conditions shall not be deemed to be part thereof or be taken into consideration in the interpretation or construction thereof or of the contract.

1.4 **Specification**: The term "Specification" shall mean schedules, detailed designs, statements of technical data, performance characteristics and all such particulars mentioned as such in the contract. In the absence of any specific specifications issued by the Employer, the specifications issued by the BIS will apply.

1.5 ENGINEER-IN-CHARGE:

The Engineer-in-charge shall represent and act on behalf of IREL at all times during the currency of the all notices, instructions, orders, certificates, approvals and all other communications under this Contract shall be given by the Engineer-in-charge, except as herein otherwise provided.

The Engineer-in-charge shall have authority for

- General supervision, follow up of supply and direction of the Works
- Direction to stop the Works whenever such stoppage may be necessary to ensure the proper execution of the works
- To reject all Works and Materials which do not conform to the contract specifications. The Engineer-in-charge shall have no authority to relieve the CONTRACTOR of any of hisduties or obligations under the contract nor except as expressly provided here-in-under or elsewhere in the Contract to order any work involving delay or any extra payment by IRELor to make any variation of or in the Works.

2.0 **ASSIGNMENT AND SUB-LETTING**

2.1 The Contractor shall not assign the Contract or any part thereof or any benefit or interest therein or thereunder (other than a charge in favour of the Contractor's Bankers of any money due or to become due under this Contract) without the prior written consent of Employer.

2.2 The Contractor shall not sub-let the whole or part of the Works except where otherwise provided by the Contract, and even then only with the prior written consent of the Employer and such Consent if given shall not relieve the Contractor from any liability or obligation under the contract and he shall be responsible for the acts, defaults and neglects of any Sub-contractor, his agents, servants or workmen as fully as if they were the acts, defaults or neglects of the Contractor, his agents, servants or workmen Provided always that the provision of labour on a piecework basis shall not be deemed to be a sub- letting under this clause.

2.3 CONTRACTOR shall supervise and direct the work of all SUB-CONTRACTORS and shall be responsible for co-coordinating their work. If CONTRACTOR fails to correct, or commence to correct and execute the correction with due diligence of deficient or defective work performed by any SUB-CONTRACTOR within reasonable time (provided it doesn't materially impact safe operation of plant), after receipt by CONTRACTOR of a notice from EMPLOYER with respect thereto. EMPLOYER may (but shall not be obligated to), after seven days following receipt by CONTRACTOR of an additional notice, and without prejudice to any other right or remedy take all reasonable steps to remedy such defective or deficient work at risk and cost of CONTRACTOR.

2.4 **CONTRACTOR** shall require all SUB-CONTRACTORS to perform in accordance with the relevant requirements of the CONTRACT including FINAL PROPOSAL, all APPLICABLE LAWS and APPLICABLE PERMITS, Prudent Utility Practice, Good Engineering Practices, the requirements of the NIT, and all Warranties of SUB-CONTRACTORS/SUBVENDORS and Manufacturers and

all insurance policies relating to the PLANT or the WORK.

2.5 CONTRACTOR shall be solely responsible for paying each SUB-CONTRACTOR and anyother person to whom any amount is due from CONTRACTOR for services, equipment, construction equipment, materials or supplies otherwise related to the PLANT or the WORK.

2.6 CONTRACTOR shall take all reasonable steps and actions to ensure that such services, equipment, construction equipment, materials and supplies and the like have been or will be received, inspected and approved and that such services have been or will be properlyperformed.

2.7 EMPLOYER shall not be deemed by virtue of the CONTRACT to have any contractual obligation to or relationship with any SUB-CONTRACTOR.

3.0 EXTENT OF CONTRACT:

The Contract comprises the construction, completion and maintenance of the works and except in so far as the contract otherwise provides, the provision of all labour, materials, constructional plant, temporary works and everything whether of a temporary or permanent nature required in and for such construction, completion and maintenance.

4.0 CONTRACT DOCUMENTS:

4.1 **CUSTODY OF DRAWINGS:**

The drawings shall remain in the sole custody of the Engineer but two copies thereof shall be furnished to the Contractor free of cost. The Contractor shall provide and make at his own expense any further copies required by him. On the completion of the contract, the Contractor shall return to the Engineer all drawings provided under the contract, The Contractor shall give adequate notice in writing to the Engineer or Engineer's representative, of any further drawings or specifications that may be required for the execution of the works or otherwise under the contract.

4.2 **ONE COPY OF DRAWINGS TO BE KEPT ON SITE:**

One copy of the drawings furnished to the Contractor as aforesaid shall be kept by the Contractor on the site and the same shall at all reasonable time be available for inspection and use by the Engineer and the Engineer's representative and by any otherperson authorised by the Engineer in writing.

4.3 **FURTHER DRAWINGS AND INSTRUCTION**:

The Engineer shall have full power and authority to supply to the Contractor from time to time during the progress of the works such further drawings and instructions as shall be necessary for the purpose of the proper and adequate execution and maintenance of the works and the Contractor shall carry out and be bound by the same.

5.0 **CONTRACT AGREEMENT:**

The Contractor shall enter into and execute a Contract Agreement in the form annexed hereto within the specified time in Letter of Intent/ Award and in default there of the earnest money paid by the Contractor shall be forfeited and acceptance of his Tender shall be considered as withdrawn. The cost of the stamp fee of the agreement is to be borne and paid by the Contractor.

6.0 **MODIFICATIONS IN CONTRACT**:

All modifications leading to changes in the CONTRACT with respect to technical or commercial aspects including terms of completion period shall be considered valid only when amendment to the CONTRACT is issued by the Employer.

The modification or amendment of the CONTRACT for an adjustment in the CONTRACT PRICE and/ or COMPLETION DATE in accordance with the applicable provision of the CONTRACT, if any, shall be subject to mutual agreement.

IREL shall not be bound by any printed conditions or provisions in the CONTRACTOR's bid forms or acknowledgement of CONTRACT and other documents which support to impose any condition at variance with or supplemental to CONTRACT.

7.0 **USE OF CONTRACT DOCUMENTS AND INFORMATION:**

7.1 The CONTRACTOR shall not, without the IREL's prior written consent, disclose the CONTRACT or any provision thereof, or any specification, plan, drawing, pattern, sample or information furnished by or on behalf of the IREL in connection therewith, to any person other than a person employed by the CONTRACTOR in the performance of the CONTRACT. Disclosure to any such employed person shall be made in confidence and shall extend only so far as may be necessary for purpose of such performance.

7.2 The CONTRACTOR shall not without the IREL's prior written consent, make use of any document or information enumerated in Clause 7.1 except for purpose of performing the CONTRACT.

7.3 Any document other than CONTRACT, itself, enumerated in Clause 7.1 shall remain the property of the IREL and shall be returned (all copies) to the IREL on completion of the CONTRACTOR's performance under the CONTRACT, if so required by the IREL.

7.4 **CONTRACTOR TO INFORM HIMSELF FULLY:**

The CONTRACTOR in fixing his rate shall for all purpose whatsoever reason may be, deemed to have himself independently obtained all necessary information for the purpose of preparing his tender and his tender as accepted shall be deemed to have taken into account all contingencies as may arise due to such information or lack of same. The correctness of the details, given in the Tender Document to help the CONTRACTOR to make up the tender is not guaranteed.

The CONTRACTOR shall be deemed to have examined the CONTRACT DOCUMENTS, to have generally obtained his own information in all matters whatsoever that might affect the carrying out of the works at the schedules rates and to have satisfied himself to the sufficiency of his tender. Any error in description of quantity or omission there from shall not vitiate the CONTRACT or release the CONTRACTOR from executing the work comprised in the CONTRACT according to DRAWINGS and SPECIFICATIONS at the scheduled rates. He is deemed to have known the scope, nature and magnitude of the WORKS and the requirements of materials and labour involved etc., and as to what all works he has to complete in accordance with the CONTRACT documents whatever be the defects, omissions or errors that may be found in the DOCUMENTS. The CONTRACTOR shall be deemed to have visited surroundings, to have satisfied himself to the nature of all existing structures, if any, and also as to the nature and the conditions of the Railways, Roads, Bridges and Culverts, means of transport and communication, whether by land, water or air, and as to possible interruptions thereto and the access and egress from the site, to have made enquiries, examined and satisfied himself as to the sites for obtaining sand, stones, bricks and other materials, the sites for disposal of surplus materials, the available accommodation as to whatever required, depots and such other buildings as may be necessary for executing and completing the works, to have made local independent enquiries as to the sub-soil, subsoil water and variations thereof, storms, prevailing winds, climatic conditions and all other similar matters affecting these works. He is deemed to have acquainted himself as to his liability of payment of Government Taxes, Customs duty and other charges, levies etc.
Any neglect or omission or failure on the part of the CONTRACTOR in obtaining necessary and reliable information upon the foregoing or any other matters affecting the CONTRACT shall not relieve him

from any risks or liabilities or the entire responsibility from completion of the works at the scheduled rates and times in strict accordance with the CONTRACT.

It is, therefore, expected that should the CONTRACTOR have any doubt as to the meaning of any portion of the CONTRACT DOCUMENT, he shall set forth the particulars thereof in writing to IREL in duplicate, before submission of tender. IREL may provide such clarification as may be necessary in writing to CONTRACTOR, such clarifications as provided by IREL shall form part of CONTRACT DOCUMENTS.

No verbal agreement or inference from conversation with any effect or employee of the IREL before, during or after the execution of the CONTRACT AGREEMENT shall in any way affect or modify and of the terms or obligations herein contained. Any change in layout due to site conditions or technological requirement shall be binding on the CONTRACTOR and no extra claim on this account shall be entertained.

7.5 **GENERAL INFORMATION:**

a) **Location of Site:** The proposed location of Project site is defined in the Special Conditionsof Contract.

b) **Access by Road:** CONTRACTOR, if necessary, shall build other temporary access roads to the actual siteof construction for his own work at his own cost. The CONTRACTOR shall be required to permit the use of the roads so constructed by him for vehicles of any other parties who may be engaged on the project site. The CONTRACTOR shall also facilitate the construction of the permanent roads should the construction there of start while he is engaged on this work. He shall make allowance in his tender for any inconvenience he anticipates on such account. Non-availability of access roads, railway siding and railway wagons for the use of the CONTRACTOR shall in no case condone any delay in the execution of WORK nor be the cause for any claim for compensation against the EMPLOYER.

c) **Scope of Work:** The scope of WORK is defined in the Technical Part of the tender document. The CONTRACTOR shall provide all necessary materials, equipment, labour etc. for the execution and maintenance of the WORK till completion unless otherwise mentioned in the Tender Document.

d) **Water Supply:** Contractor will have to make his own arrangements for supply of water to his labour camps and for works. All pumping installations, pipe network and distribution system will have to be carried out by the Contractor at his own risk and cost. Alternatively, IREL at his discretion may endeavour to provide water to the Contractor at its source of supply provided the Contractor makes arrangement for pipe networks from source of supply and such distribution pipe network shall have prior approval of the Engineer-in- Charge so as not to interfere with the layout and progress of the other construction works. In such case, the rate for water shall be deducted from the running account bills (Subjectto rate of deduction specially mentioned in the tender, if any). However, IREL does not guarantee the supply of water and this does not relive the contractor of his responsibility in making his own arrangement and for the timely completion of various work as stipulated.

e) **Power Supply:** Subject to availability, IREL will supply power at 400/440 V at only one point at the nearest sub-station, from where the CONTRACTOR will make his own arrangement for temporary distribution. The point of supply will not be more than 500 m away from the CONTRACTOR'S premises. All the works will be done as per the applicable regulations and passed by the ENGINEER- IN-CHARGE. The temporary line will be removed forthwith after the completion of work or if there is any hindrance caused to the other works due to the alignment of these lines, the CONTRACTOR will re-route or remove the temporary lines at his own cost. The CONTRACTOR at his cost will also provide suitable electric meters, fuses, switches, etc. for purposes of payment to IREL which should be in the custody and control of the IREL. The cost of power supply shall be payable to IREL every month for Construction Works which would be deducted from the running account bills (subject to rate of deduction specifically mentioned in the tender, if any). IREL shall not, however, guarantee the supply of electricity nor have any liability in respect thereof. No claim for compensation for any failure or

short supply of electricity will be admissible.

It shall be the responsibility of the CONTRACTOR to provide and maintain the complete installation on the load side of the supply with due regard to safety requirement at site. All cabling, equipment, installations etc. shall comply in all respects with the latest statutory requirements and safety provisions, i.e., as per the Central/State Electricity Acts and Rulesetc. The CONTRACTOR will ensure that his equipment and Electrical Wiring etc., are installed, modified, maintained by a licensed Electrician/Supervisor. A test certificate is to be produced to the ENGINEER-IN-CHARGE for his approval, before power is made available.

At all times, IEA regulations shall be followed failing which the IREL has a right to disconnect the power supply without any reference to the CONTRACTOR. No claim shall be entertained for such disconnection by the ENGINEER-IN-CHARGE. Power supply will be reconnected only after production of fresh certificate from authorized electrical supervisors.

The IREL is not liable for any loss or damage to the CONTRACTOR's equipment as a result of variation in voltage or frequency or interruption in power supply or other loss to the CONTRACTOR arising therefrom.

The total requirement of power shall be indicated by the tenderer along with his tender.

7.6 **STANDARDS:**

The goods and services supplied under this CONTRACT shall conform to the standards mentioned in the technical specifications and when no applicable standard is mentioned, CONTRACTOR shall follow best engineering practices.

7.7 **PRIORITY OF CONTRACT DOCUMENTS**:

Except if and the extent otherwise provided by the Contract, the provisions of the General Conditions of Contract and Special Conditions shall prevail over those of any other documents forming part of the CONTRACT. Several documents forming the CONTRACT are to be taken as mutually explanatory of one another, but in case of ambiguities or discrepancies the same shall be explained and adjusted by the ENGINEER-IN-CHARGE who shall thereupon issue to the Contractor instructions thereon and in such event, unless otherwise provided in the Contract, the priority of the documents forming the Contract shallbe as follows :

1. The Contract Agreement;
2. The Letter of Acceptance;
3. The Instructions to Bidders(ITB);
4. Special Conditions of Contract (SCC);
5. General Conditions of Contract (GCC)
6. Any other document forming part of the Contract.

Works shown in the DRAWING but not mentioned in the SPECIFICATIONS or described in the SPECIFICATIONS without being shown in the DRAWINGS shall nevertheless be deemed to be included in the same manner as if they had been specifically shown upon the DRAWINGS and described in the SPECIFICATIONS.

7.8 **SPECIAL CONDITIONS OF CONTRACT:**

Special Conditions of Contract shall be read in conjunction with the General Conditions of Contract, specification of Work, Drawings and any other documents forming part of this CONTRACT wherever the context so requires. Notwithstanding the sub-division of the documents into these separate sections and volumes, every part of each shall be deemed to be

supplementary to and complementary of every other part and shall be read with and into the CONTRACT so far as it may be practicable to do so.

Where any portion of the General Conditions of Contract is repugnant to or at variance with any provisions of the Special Conditions of Contract, unless a different intention appears, the provisions of the Special Conditions of Contract shall be deemed to over-ride the provisions of the General Conditions of Contract and shall to the extent of such repugnancy, or variations, prevail.

8.0 **PATENT INFRINGEMENT**:

8.1 CONTRACTOR shall at all times, indemnify and keep indemnified IREL against all claims or suits and defend, at its own cost, any suit or action brought against IREL and hold IRELfree and harmless against all costs of such claims or suits which may be made against IREL in respect of any infringement of any rights protected by patent, copyright, trademarks, and trade secrets to the extent that such claim, suit, or action is a result of the use of CONTRACTOR's technical Information for the construction, maintenance, and operation of PLANT and the use of CONTRACTOR's and/or any other process, licenser's processes used in PLANT. IREL shall pass on all claims made against it to CONTRACTOR for settlement.

8.2 CONTRACTOR declares that to the best of his knowledge and belief the use of CONTRACTOR's Technical Information for the construction, maintenance, and operation of PLANT and the use of CONTRACTOR's processes used in PLANT will not infringe any valid patent rights of a third party. However, if at any time such infringement arises, CONTRACTOR agrees to keep IREL indemnified and harmless against such claims and costs thereof and make arrangements that will allow IREL to continue the operation of PLANT.

8.3 IREL shall promptly advise CONTRACTOR in writing of any claim of infringement or any action for infringement of patents brought against it by a third party and based upon the use of CONTRACTOR's Technical Information. If such use is in accordance with instructions given in writing by CONTRACTOR, CONTRACTOR shall undertake the defence, or assist IREL in the defence, of the claim or suit up to final judgment or settlement.

8.4 CONTRACTOR shall undertake the defence on behalf of IREL and shall have sole chargeand direction of the defence, and shall bear all costs related thereto. CONTRACTOR shall further hold IREL harmless from any damages or other sums that may become payable by IREL under a final judgment or settlement. However, IREL shall render to CONTRACTOR all reasonable assistance that may be required by CONTRACTOR in the defence, and shall have the right to be represented therein by advisory counsel of its ownselection and at its own expense.

8.5 In addition to the measures specified in Clause-8.4, CONTRACTOR may further, at its option, however, in reasonable consultation with IREL, seek to abate the alleged infringement by modification of PLANT or its operation without adversely affecting the performance and/or secure for IREL immunity from suit for infringement. In such case, CONTRACTOR shall bear/ reimburse IREL all costs related to the said modification and to the said immunity.

8.6 In the event that IREL is legally restrained from operating PLANT on account of any infringement action or suit, CONTRACTOR shall take all possible actions to assist IREL to operate and use PLANT, is so far his area of operation is concerned.

8.7 Neither CONTRACTOR nor IREL shall settle or compromise any suit or action without the written consent of the other, if settlement or compromise obliges the other to make any payment or part with any property or assume any obligations or surrender any rights or to be subjected to any injunction by reason of such settlement or compromise.

9.0 INDEMNITIES:

9.1 **INDEMNIFICATION FOR LIABILITIES:**

9.1.1 CONTRACTOR INDEMNIFICATION FOR LIABILITIES:

To the fullest extent permitted by Law, CONTRACTOR assumes liability for and agrees to indemnify, protect, save and hold harmless IREL from and against any and all Liabilities (including, any strict liability), arising out of acts or omissions of CONTRACTOR or its personnel or its agents in the performance of its obligations under the CONTRACT causing bodily injury, sickness, disease or

death, damage to or loss of any property, and whether or not involving damage to WORKS or SITE that may be imposed on, suffered or incurred by or asserted against IREL and in any way relating to or arising out of

9.1.1.1 WORK, any EQUIPMENT

9.1.1.2 the presence, discharge, treatment, storage, transportation, disposal, escape or release of any Hazardous Substance, or the threat thereof, at, to or from SITE after commencement of work (any hazardous substance already existing at SITE before commencement of WORK excluded)

9.1.1.3 The performance of WORK, or as a result of personal injuries (including wrongful death);

9.1.1.4 the violation by CONTRACTOR or any SUB-CONTRACTOR/ VENDOR of any Government Approval or applicable Law;

9.1.1.5 Any breach of CONTRACT with any SUB-CONTRACTOR/VENDOR, provided, however, that CONTRACTOR shall not be required under this Clause to indemnify IREL for any liability arising out of or resulting from events or circumstances occurring or existing after PRELIMINARY ACCEPTANCE OF PLANT except where the liability arises from an act or omission of CONTRACTOR or any SUB- CONTRACTOR/VENDOR or any other Person directly or indirectly employed by either of them or anyone for whose acts either of them may be liable that was a contributory cause of such liability.

9.1.2 CONTRACTOR INDEMNIFICATION FOR TAXES:

It is specifically understood that CONTRACTOR hereby accepts and assumes exclusive liability for and save and hold IREL harmless from and against of all Taxes arising from the performance of WORK, and all such Taxes shall be deemed to be included in CONTRACT PRICE, except for GST. GST at applicable rate is payable extra. Seller need to prepare E-Invoice under GST and submit monthly/ quarterly GST Return as per GST Rules. Failure to submit GST Return on time as per GST Rules may result into deductionof GST while processing Bills.

9.1.3 INDEMNIFICATION BY SUB-CONTRACTOR/VENDOR:

CONTRACTOR shall obtain from each SUB-CONTRACTOR/VENDOR, which is an affiliate, and shall use all reasonable efforts to obtain from each SUB-CONTRACTOR/ VENDOR, an indemnification materially similar in form and substance to Clause-9.1.1 and Clause-9.1.2 of which the IREL shall be named as beneficiary.

9.1.4 PAYMENT OF AMOUNTS UNDER THIS CLAUSE:

Except to the extent covered by insurance, all amounts payable and due by CONTRACTOR to IREL under this Clause shall be deducted from CONTRACT PRICE or any other amounts owed by IREL to CONTRACTOR here under. If such amounts payable by IREL to CONTRACTOR are less than the amounts payable and due by CONTRACTOR under this Clause, CONTRACTOR shall be liable to IREL for such excess and shall pay such amount to IREL immediately upon demand.

9.1.5 PERMITS AND CERTIFICATES:

CONTRACTOR shall procure, at its expense, all necessary permits, certificates and licences required by virtue of all applicable laws, regulations, ordinances and other rules in force at the place where any of the works is to be performed, and CONTRACTOR further agrees to hold IREL harmless from liability or penalty which might be imposed by reason of any asserted or established violation of such laws, regulations, ordinances or other rule. IREL shall provide the necessary permits for CONTRACTOR's personnel to undertake any work in India in connection with CONTRACT.

9.1.6 MECHANICS LIEN:

CONTRACTOR agrees to indemnify and hold harmless IREL against all labourer's material, men's and/or mechanics liens arising from its work, and shall keep the premises of IREL free from all such claims, liens and encumbrances.

10.0 WORK TO BE TO THE SATISFACTION OF ENGINEER:

The Contractor shall execute, complete and maintain the Works in strict accordance with the contract, to the satisfaction of the Engineer and shall comply with and adhere strictly to the Engineer's instructions and direction on any matter (whether mentioned in the Contract or not). The Contractor shall take instructions and directions only from the Engineer or from the Engineer's representative on any matter touching or concerning theWorks.

11.0 **PROGRAMME TO BE FURNISHED:**

As soon as practicable after the acceptance of his tender, the Contractor shall, if required,submit to the Engineer for his approval a programme showing the order of procedure and the method in which he proposes to carry out Works and shall whenever required by the Engineer or Engineer's representative furnish for his information particulars in writing of the Contractor's arrangement for the carrying out of the Works and of the constructional plant and temporary Works which the Contractor intends to supply, use or construct as the case may be. The submission to and approval by the Engineer or Engineer's representative of such programme or the furnishing of such particulars shall not relieve the Contractor of any of his duties or responsibilities under the Contract.

12.0 Contractors Superintendence:

The Contractor shall give and provide all necessary superintendence during the executionof the works and as long thereafter as the Engineer may consider necessary for the proper fulfilling of the Contractor's Obligation under the contract. The Contractor or one of his competent and authorised agent approved of in writing by the Engineer (which approval may at any time be withdrawn) is to be constantly on the Works and shall give his whole time to the superintendence of the same. If such approval shall be withdrawn by the Engineer, the Contractor shall as soon as is practicable (having regard to the requirement of replacing him as here-in-after mentioned) after receiving written notice of such withdrawal, remove the agent from the Site and shall not thereafter employ him again on the Site in any capacity and shall replace him by another agent approved by the Engineer, Such authorised agent shall receive on behalf of the Contractor directions and instructionsfrom the Engineer or (subject to the limitations of Clause 2 hereof) the Engineer's representative.

13.0 CONTRACTOR'S EMPLOYEE:

The Contractor shall provide and employ on the Site in connection with execution and maintenance of the Works.

(a) Only such technical assistants and other staff as are skilled and experienced in their respective callings and such sub-agents, foreman and loading hands as are competent to give proper

supervision to the work they are required to supervise and

(b) Such skilled, semi-skilled and unskilled labour as is necessary for the proper and timely execution and maintenance of the Works.

13.1 The Engineer shall be at liberty to object to and require the Contractor to remove forthwith from the Works any person employed by the Contractor in or about the execution or maintenance of the Works who in the opinion of the Engineer misconducts himself or incompetent or negligent in the proper performance of his duties or whose employment is other-wise considered by the Engineer to be undesirable and such person shall not be again employed upon the Works without the written permission of the Engineer. Any person so removed from the Works shall be replaced without delay by a competent substitute approved by the Engineer.

14.0 EXTRA SUPERVISION ON WORK:

If in the opinion the Engineer, due progress is not made with the work in accordance with the contract, and or the execution thereof becomes contrary to specifications, and/or bad work is executed and/or bad materials are used or supplied by the Contractor, and/or any directions given by the Engineer are not properly complied with or attended to, the Engineer may if he considers it necessary or proper for the execution of the work in accordance with the contract, of which his certificate in writing will be sufficient evidence order the employment of extra supervising staff to supervise the work and the expenses of the employment including the salary of the supervising staff shall be provided by the Contractor, provided that the Engineer shall give to the Contractor not less than 7 days previous notice in writing of intention to exercise his power.

f) specifically mentioned in the tender, if any). However, IREL does not guarantee the supply of water and this does not relieve the Contractor of his responsibility in making his own arrangement and for the timely completion of the various works as stipulated.

g) **Power Supply:** Subject to availability, IREL will supply power at 400/440 V at only one point at the nearest sub-station, from where the CONTRACTOR will make his own arrangement for temporary distribution. The point of supply will not be more than 500 m away from the CONTRACTOR'S premises. All the works will be done as per the applicable regulations and passed by the ENGINEER-IN-CHARGE. The temporary line will be removed forthwith after the completion of work or if there is any hindrance caused to the other works due to the alignment of these lines, the CONTRACTOR will re-route or remove the temporary lines at his own cost. The CONTRACTOR at his cost will also provide suitable electric meters, fuses, switches, etc. for purposes of payment to IREL which should be in the custody and control of the IREL. The cost of power supply shall be payable to IREL every month for Construction Works which would be deducted from the running account bills (subject to rate of deduction specifically mentioned in the tender, if any). IREL shall not, however, guarantee the supply of electricity nor have any liability in respect thereof. No claim for compensation for any failure or short supply of electricity willbe admissible.

It shall be the responsibility of the CONTRACTOR to provide and maintain the complete installation on the load side of the supply with due regard to safety requirement at site. All cabling, equipment, installations etc. shall comply in all respects with the latest statutory requirements and safety provisions, i.e., as per the Central/State Electricity Acts and Rulesetc. The CONTRACTOR will ensure that his equipment and Electrical Wiring etc., are installed, modified, maintained by a licensed Electrician/Supervisor. A test certificate is to be produced to the ENGINEER-IN-CHARGE for his approval, before power is made available.

At all times, IEA regulations shall be followed failing which the IREL has a right to disconnect the power supply without any reference to the CONTRACTOR. No claim shall be entertained for such disconnection by the ENGINEER-IN-CHARGE. Power supply will be reconnected only after production of fresh certificate from authorized electrical supervisors.

The IREL is not liable for any loss or damage to the CONTRACTOR's equipment as a result of variation in voltage or frequency or interruption in power supply or other loss to the CONTRACTOR arising therefrom.

The total requirement of power shall be indicated by the tenderer along with his tender.

14.0 **SETTING-OUT OF THE WORKS**:

The Contractor shall be responsible for the true and proper setting out of the Works and the correctness of the position levels, dimensions and alignment of all parts of the Works and for the provision of all necessary instrument appliances and labour in connection therewith. If at any time during the progress of the works, any error shall appear or arise in the position, levels, dimensions or alignment of any part of the Works, the Contractor on being required so to do by the Engineer or Engineers representative shall at his own expense rectify such error to the satisfaction of the Engineer or Engineer's representative unless such error is based on incorrect data supplied in writing by the Engineer or the Engineer's representative in which case the expense of rectifying the same shall be borne by the Employer. The checking of any setting out or of any line or level by the Engineer or the Engineer's representative shall not in any way relieve the Contractor of his responsibility for the correctness thereof and the Contractor shall carefully protect and preserve all bench marks, site rails, pegs and other things used in setting out the works.

15.0 **USE OF EXPLOSIVES:**

Explosives shall not be used on the work by the contractor without the permission in writing of the Engineer and then only in the manner and to the extent to which he has prescribed. Where explosives are used, the same shall be stored in a special magazine to be provided by and at the cost of the Contractor, who shall be liable for all damages, loss or injury to any person or property & shall be responsible for complying with all the Statutoryobligations in these respects.

16.0 **CARE OF WORKS:**

The Contractor shall in connection with the Works provide and maintain at his own cost all lights, guards, fencing and watching when and where necessary or required by the Engineer or Engineer's representative or by a duly constituted authority for the protection of the Works or for the safety and convenience of the Public or others.

16.1 From the commencement to the completion of the Works, the Contractor shall take full responsibility or the care thereof and of all Temporary Works and in case any damage, loss or injury shall happen to the Works or to any part thereof or to any temporary Works from any cause whatsoever (save and except the excepted risks as defined in sub-clause (2) of the clause) shall at his own cost repair and make good the same so that at completion the Works shall be in good order and condition and in conformity in every respect with the requirements of the Contract and the Engineer's instructions. In the event of any such damage, loss or injury happening from any of the excepted risks the Contractor shall if and to the extent required by the contractor shall also be liable for any damage to the Works occasioned by him in the course of any operations carried out by him for the purpose of complying with his obligations under Clause 58 hereof.

16.2 **EXCEPTED RISKS:**

The "excepted risks" mentioned in Sub-clause (1) above are war hostilities (whether war be declared or not), invasion act of foreign enemies, rebellion, revolution, insurrection of military or usurped power, civil war or (otherwise than among the Contractor's own employees) riot, commotion or disorder or any such operation of the forces of nature as responsible foresight and ability on the part of Contractor could not foresee or reasonably provide against (all of which are herein collectively referred to as "the excepted risks".)

17.0 **USE OF LAND & BUILDINGS**

(a) Wherever any land or building belonging to IREL is allotted to the Contractor, the Contractor shall return vacant possession of the same land/building in good condition to IREL after the completion of works as soon as the contract is over/terminated, failing which IREL would be entitled to withhold

the payment of the security deposit and/or final bill in addition to any other action which the IREL may like to take for getting the vacantpossession of the land or building as aforesaid.

(b) The Contractor should obtain the prior approval of the competent authority for construction of purely temporary shed. The Contractor should submit written application accompanied by layout plan for construction of such temporary shed. Any modification/alteration if deemed necessary thereafter, should be done with prior approval of the competent authority.

(c) The Contractor shall have to pay licence fee for the area occupied as per rates fixed by the Management of IREL from time to time.

(d) The permission for such temporary shed will be accorded only for the purpose of work as awarded to such Contractor and the temporary shed so constructed should be dismantled within 15 days from the date of completion of the maintenance work and restore the possession of vacant land in the original condition or in a condition acceptable to the Management of IREL. In case of any difficulty, the Contractor may obtain specific approval of the competent authority which may not be extended more than a period of one month in any case.

In case of failure of the Contractor to dismantle the temporary shed and hand over the vacant possession of the premises, the department shall be compelled to dismantle the temporary shed so constructed at the risk and cost of the contractor without prejudice to any other action which may be taken including recovery of damages as per rates fixed by IREL for the unauthorised occupation of the shed/ premises beyond the permitted period.

(e) The Contractor should use such premises/shed for such purpose incidental to such awarded work and not as otherwise. It shall be the liability of the contractor to ensure that this occupation of the premises/shed does not provide to be of nuisance to the residents in the vicinity. The Contractor shall also not sublet the premises to any other party.

18.0 DAMAGES TO PERSONS AND PROPERTY:

18.1 The Contractor shall (except if and so far as the Specification provided otherwise) indemnify and keep indemnified the IREL against all losses and claims for injuries or damages to any person or any property whatsoever which may arise out of or in consequence of the construction and maintenance of the works and against all claims, demands, proceedings, damages, costs charges and expenses whatsoever in respect of or in relation thereto. Provided always that nothing hereby contained shall be deemed to render the Contractor liable for or in respect of or to indemnify the IREL against any compensation or damages for or with respect to:

(a) The permanent use or occupation of land by the works or any part thereof (save as herein -after provided) surface or other damage as aforesaid i.e. surface or other damage caused by contract works in the normal course.

(b) The right of the IREL to construct the Works or any part thereof on over under in or through any land.

(c) Interference whether temporary or permanent with any right to light, air, way or water or other easement or quasi-easement which is unavoidable result of the construction of the Works in accordance with the Contract.

Provided further that for the purposes of this clause, the expression "the land" shall be deemed to be limited to the area defined in the specification as shown on the drawings in which land crops, trees and structures will be disturbed or damaged as an inevitable consequence of the carrying out of the Works.

19.0 ACCIDENT OR INJURY TO WORKMEN:

(a) The employer shall not be liable for or in respect of any damages or compensation payable as per or otherwise in respect of or in consequence of any accident or injury to any workmen or other persons in the employment of the Contractor or any Sub-Contractor and the Contractor shall indemnify and keep indemnified the Employer against all such damages and compensation and against all claims, demands, proceedings, cost, charges and expenses whatsoever in respect thereofin relation there to.

(b) The Contractor shall forthwith report all accidents and injuries as a result of his contractual work to the employer or his representative.

20.0 WORKMEN'S COMPENSATION ACT:

The Contractor shall at all times indemnify the Employer against all claims for compensation under the provision of the Workmen's Compensation Act, 1923 (VIII of 1923) or any other law for the time being in force by or in respect of any workmen employedby the Contractor in carrying out the contract and against all costs and expenses incurred by the employer in connection therewith and (without prejudice to any other means of recovery) the employer shall be entitled to deduct from any money due or to become due to the Contractor (whether under this contract or any other contract) all moneys paid or payable by the Employer by way of compensation aforesaid or for costs or expenses in connection with any claim thereto and the Contractor shall abide by the decision of the Employer as to the sum payable by the Contract, under the provision of this clause.

21.0 GIVING OF NOTICE AND PAYMENT OF FEES:

21.1 The Contractor shall give, all notices and pay all fees required to be given or paid to any Central or State, Statute, Ordinance or other Law or any rule, Regulation or Bye-Law of local or other duly constituted authority in relation to the execution of the Works or of any temporary works and by the rules and regulations of all public bodies whose property or rights are affected or may be affected in any way by the works or any Temporary Works.

21.2 COMPLIANCE WITH STATUTES REGULATIONS ETC.:

The Contractor shall conform in all respects with the provision of any such statute, ordinance, or Law as aforesaid and the rules, Regulations or Bye-laws of any local or other duly constituted authority which may be applicable to the Works or to any Temporary Works and with such rules and regulations of public bodies as aforesaid and shall keep the employer indemnify against all penalties and liability of every kind for breach of any such Statute, Ordinance, Law, Rules, Regulation or Bye-laws.

22.0 FOSSILS ETC.

All fossils, coins, articles, value of antiquity and structures and other remains or things of geological or archaeological interest discovered on the site of the works shall as between the employer and the Contractor be deemed to be the absolute property of the Employer and the Contractor shall take reasonable precautions to prevent, his workmen or any other persons from removing or damaging any such article or thing and shall immediately upon discovery thereof and before removal acquaint the Engineers representative of such discovery and carry out at the expense of the employer the engineer's Representative's orders as to the disposal, removal or otherwise of the same.

24.(a) PATENT RIGHTS & ROYALTIES:

The Contractor shall save harmless and indemnify the Employer from and against all claims and proceeding for or on account of infringement of any patent rights, designs trade-mark or name or other protected rights in respect of any Constructional plant, machine, work or material used for or in connection with the Works or Temporary Works of any of them and from and against all claims, demands, proceeding, damages, cost, charges and expenses whatsoever in respect thereof or in relation there to.

(b) Except where otherwise specified, the Contractor shall pay all tollage and other royalties, rent and other payments or compensation (if any) for getting stone, sand, gravel, clay or other materials required for the Works or temporary Works or any of them.

25.0 INTERFERENCES WITH TRAFFIC ADJOINING PROPERTIES.

All operations necessary for the execution of the Works and for the construction of any Temporary works shall so far as compliance with the requirements of the Contract permits be carried on so as not to interfere unnecessarily or improperly with the Public convenience or the access to use and occupation of public or private roads and footpaths or to or properties whether in the possession of

the Employer's Workmen or of any other person and Contractor shall save harmless and indemnify employer in respect of all claims, demands, proceeding, damages, costs, charges and expenses whatsoever arisingout of or in relation to any such matters.

26.(a) EXTRAORDINARY TRAFFIC:

The Contractor shall use every reasonable means to prevent any of the highways and bridges communicating with or on the routes to the site from being damaged or injured by any traffic of the Contractor or any of his Sub-Contractors and in particular shall select routes, choose and use vehicles and restrict and distribute loads so that any such extraordinary traffic as will inevitably arise from the moving of plant and material from and to the site shall be limited as far as reasonably possible and so that no unnecessary damage or injury may be occasioned to such highways and bridges. For any damage caused by the breach hereof, the Contractor shall be solely responsible.

(b) WATERBORNE TRAFFIC:

Where the nature of the works is such as to require the use by the Contractor of water borne transport, the fore going provisions of this clause shall be construed as though "highway" included a dock, deck, sea wall, or other structure related to a water-way and "vehicles" included craft and shall have effect accordingly.

27.0 OPPORTUNITIES FOR OTHER CONTRACTORS:

The Contractor shall in accordance with the requirements of the Engineer afford all reasonable opportunities for carrying out their work to any other contractors employed by the Employer and their workmen and to the workmen of the Employer and of any other duly constituted authorities who may be employed in the execution on or near the site of any work not included in the Contract or of any Contract which the Employer may enter into in connection with or ancillary to the works.

28.0 SUPPLY OF PLANT, MATERIAL AND LABOUR:

Except where otherwise specified the Contractor shall at his own expense supply and provide all the Constructional Plant, Temporary Works, materials both for temporary and for permanent Works, labour (including the supervision thereof), transport to or from the Site and in and about the Works and other things of every kind required for the constructions, completion and maintenance of the Works.

29.0 DELAY IN OBTAINING MATERIALS BY THE EMPLOYER:

If the Employer has undertaken to supply materials specified in the special conditions at rates stated therein, the Contractor shall keep himself in touch with the day-to-day positionregarding the supply of materials from the Engineer and so adjust the progress of the work that their labour may not remain idle nor may there be any other claim due to or arising from delay if any, in obtaining the materials. It should be clearly understood that no claim whatsoever shall be entertained by the Employer on account of delay in supplying materials.

30.0 SITE CLEARANCE ON COMPLETION OF WORK:

On the completion of the work all rubbish, debris, vats tanks, materials, and temporary structures of any sort or kind used for the purpose of or connected with its construction are to be removed by the Contractor and all pits and excavations filled up and the site handed over in a tidy and workman like condition and no final payment in settlement of the account for the said work shall be held to be due or shall be made to the Contractor, till such site clearance shall have been effected by him, and such clearance may be made by the Engineer, at the expense of the Contractor in the event of his failure to comply with this provision within 7 days after receiving notice in writing from the Engineer to that effect. If it becomes necessary for the Engineer to have the site cleared as indicated above at the expense of the Contractor, the Employer shall under no circumstances, be held liable for any losses or damages to such of Contractor's property as may be on such site due to such removal there from

which removal may be effected by means of public sale of such materials and property or in such way as seems fit and most convenient to the Engineer.

31.0 RETURN OF SURPLUS MATERIALS:

Notwithstanding anything contained to the contrary anywhere in this contract, wherever any materials for the execution of the contract are procured with the assistance of the Employer either by issue from Employer's stocks or purchase made under orders or permits or licenses issued by the Employer, the Contractor shall use the said materials economically and solely for the purpose of the contract and not dispose of them without the permission of the Employer, and if required by the Engineer shall return to the Employer all surplus or unserviceable materials that may be left with the Contractor after the completion of the contract or at its termination, for any reason whatsoever on being paid or credited such price as the Engineer shall determine, having due regard to initial cost and the condition of the materials at the time of such return thereof. The price to be allowed to the Contractor, however, shall not exceed the amount charged to him excluding the storage charge if any. The decision of the Engineer shall be final and conclusive. In the event of breach of the aforesaid condition, the Contractor shall in addition to making himself liable of action for contravention of the terms of the licences or permit and/or for criminal breach of trust) be liable to the Employer for payment of all moneys, advantages or profit resulting or which in the usual course would have resulted to him by reason of such breach.

WORK MATERIAL AND PLANT

32.0 **QUALITY OF MATERIAL & WORKMANSHIP AND TESTS:**

All materials and workmanship shall be of the respective kinds described in the Contract and in accordance with the Engineer's instructions and shall be subjected from time to time to such tests as the Engineer may direct at the place of manufacture or fabrication or on the Site or at all or any of such places. The Contractor shall provide such assistance, instruments, machines, labour and materials as are normally required for examining, measuring and testing any work and the quality, quantity or weight of any material used and shall supply samples of materials before incorporation in the Works for testing as maybe selected and required by the Engineer.

Cost of samples: All samples shall be supplied by the Contractor at his cost.

Cost of tests: The cost of making any test in performance of his works shall be borne by the Contractor.

Cost of tests not provided for:

If any test is ordered by the Engineer which is either,

a. not so intended or provided or
b. is not so particularised for or
c. though so intended or provided for is ordered by the Engineer to be carried by an independent person at any place other than the Site or the place of manufacture or fabrication of the materials tested. Then the cost of such test shall be borne by the Contractor if the test shows the workmanship of materials not to be in accordance with the provisions of the Contract or the Engineer's instructions but otherwise by the Employer.

33.0 ACCESS TO SITE:

The Employer/Engineer and any person authorised by him shall at all times have access to the Works and to the Site and to all workshops and places where work is being prepared or where materials, manufactured articles or machinery are being obtained for the Works and the Contractor shall afford every facility for and every assistance in or in obtaining theright to such access.

34.0 INSPECTION, TESTING AND EXPEDITING:

34.1 The EMPLOYER or his representatives shall have their right to inspect and/or to test the goods to conform to the specifications laid down in the CONTRACT. The SPECIAL CONDITIONS OF CONTRACT and/ or the TECHNICAL SPECIFICATIONS shall specify what inspections and test the EMPLOYER requires and where they are to be conducted. The EMPLOYER shall notify the CONTRACTOR in writing of the identity of any other representatives retained for this purpose. Expediting by EMPLOYER's representative in no way relieves the CONTRACTOR of his obligation under the terms and conditions of this CONTRACT.

34.2 The inspections and tests may be conducted on the premises of the CONTRACTOR or his SUB-CONTRACTOR at point of completion and/or at the good's final destination. When conducted on the premises of the CONTRACTOR or his SUB-CONTRACTOR, all reasonable facilities and assistances including access to drawings and production data shall be furnished to the inspector at no charge to the EMPLOYER.

34.3 CONTRACTOR shall be held responsible for any possible delay in the approval or testing phase as well as for any possible delay in the remittance of necessary certificates. Delay on the part of the Inspection institutions will not be considered a case of 'Force Majeure'.

34.4 Participation or presence of EMPLOYER or their representatives at any tests or their failure to be present at or to witness any tests to be undertaken pursuant here to shall not in any way or manner relieve or release the CONTRACTOR from any of its warranties, guarantees or other obligations under the CONTRACT.

34.5 Copies of all test results/report of the tests shall be furnished promptly by the CONTRACTOR to EMPLOYER.

35.1 EXAMINATION OF WORK BEFORE COVERING UP:

No work shall be covered up or put out of view without the approval of the Engineer or the Engineer's representative and the Contractor shall afford full opportunity for the Engineer or the Engineer's representative to examine and measure any work which is about to be covered up or put out of view and to examine foundations before permanent work is over, any such work or foundations is or are ready or about to be ready for examination and the Engineer's representative shall without unreasonable delay unless he considers it unnecessary and advises the Contractor accordingly attend for the purpose of examiningand measuring such work or of examining such foundations.

35.2 UNCOVERING & MAKING OPENINGS:

The Contractor shall uncover any part or parts of the Works or make opening in or through same as the Engineer may from time to time direct and shall reinstate and make good such part or parts to the satisfaction of the Engineer. If any such part or parts have been covered up or put out of view after compliance with the requirements of subclause(l) of this Clause and are found to be executed in accordance with the Contract, the expenses of uncovering making opening in or through reinstating and making good the same shall be borne by the Employer but in any other case all such expenses shall be borne by the Contractor and shall be recoverable from him by the Employer or may be deducted by theEmployer from any moneys due or which may become due to the Contractor.

36.0 **REMOVAL OF IMPROPER WORK & MATERIALS:**

The Engineer shall during the progress of the Works have power to order in writing from time to time:

(a) the removal from the Site within such time or times as may be specified in the order of any materials which in the opinion of the Engineer are not in accordance with the contract,

(b) the substitution of proper and suitable materials and

(c) the removal and proper re-execution (not withstanding any previous test there of or interim

payment there for) of any work which in respect of materials of workmanship is not in the opinion of the Engineer in accordance with the contract.

37.0 **DEFAULT OF CONTRACTOR IN COMPLIANCE**:

In case of default on the part of the Contractor in carrying out such order, the employer shall be entitled to employ and pay other persons to carry out the same and all expenses consequent thereon or incidental thereto shall be borne by the Contractor and shall be recoverable from him by the Employer or may be deducted by the Employer from any moneys due or which may become due to the Contractor.

38.0 **SUSPENSION OF WORK:**

The Contractor shall on the written order of the Engineer suspend the progress of the works or any part thereof for such time or times and in such manner as the Engineer may consider necessary and shall during such suspension properly protect and secure the work so far as is necessary in the opinion of Engineer. Provided that the Contractor shall not be entitled to recover any such extra cost unless he gives notice in writing of his intention to claim to the Engineer within 28 days of the Engineer's order. The Engineer shall settle and determine the extra payment to be made to the Contractor in respect of such claim as the Engineer shall consider reasonable.

39.0 **SUSPENSION LASTING MORE THAN 90 DAYS:**

If the progress of the works or any part thereof is suspended on the written order of the Engineer for more than 90 days, the Contractor may serve a written notice on the Engineer requiring permission within 28 days from the receipt thereof to proceed with the works or that part thereof in regard to which progress is suspended and if such permission is not granted within that time the Contractor by a further written notice so served may (but is not bound to) elect to treat the suspension where it affects part only of the Works as an omission of such part under Clause 62 thereof or where it affects the whole Works as an abandonment of the Contract by the Employer.

40.0 ISSUE OF OTHER MATERIALS FROM IREL STORES:

(i) Use of additional items:

If the Engineer directs the use of additional items of IREL stores in the work, the Contractor is bound to comply with such directions. The recovery rate for such stores shall be fixed by the Engineer.

(ii) Recovery Rates:

In addition to the above, other materials from IREL stores can be supplied subject to availability if the Engineer is satisfied as to the necessity for such issues. Recovery rates for the materials so issued shall be IREL issue rates plus 12% plusGST as may be in force from time to time.

(iii) Handling Conveyance etc:

All handling, conveyance, etc. from place of issue to the worksite of the Contractor are to be borne by the Contractor and the rates quoted in the Tender Schedule cover these.

(iv) Proper accounting:

AII materials issued to the Contractor whether free of cost or on cost recoverable basis shall be properly accounted for. Any loss or damage to the stores issued by IREL will be debited to the Contractor at the IREL issue rates plus 20% plus GSTas may be in force from time to time.

(vi) Excess/misuse:

Steel drawn in excess or misused will be charged at 100% overissue/recovery rates as stipulated in the contract.

(vii) Surplus stock:

No claim will be entertained for non-supply or delay in supply of any or all the abovestores.

(viii) Except Steel, materials issued to the Contractor on recovery basis shall not normally be taken back.

In case of steel and materials issued free, the surplus stock will be taken back at the stipulated rates of issue, provided they are returned in good condition. In case of steel, rebate at full rates will be made only if the pieces are returned in length not less than 6M. Shorter pieces in the range of 4M to 6M length will be taken back @ 50% of the issue rates. The materials shall be returned at IREL stores and all expenses towards conveyance, handling, weighing, sorting, etc. shall be at Contractor's accounts. As regards to the conditions of the materials to be returned, the decision of the Engineer shall be final and binding on the Contractor. The norms prevalent for consumption in respect of Steel shall apply forcalculating the consumption of these materials for recovery.

COMMENCEMENT TIME AND DELAYS

41.0 **COMMENCEMENT OF WORK:**

The Contractor shall commence the works on site within the period as mentioned in the contract and shall proceed with the same with due expedition and without delay.

42.0 **WAY LEAVES ETC.:**

The Contractor shall bear all expenses and charges for special or temporary way leaves required by him in connection with access to the Site. The Contractor shall also provide at his own cost any additional accommodation outside the Site required by him for the purposes of the works, except when otherwise specifically agreed and provided for.

43.0 TIME FOR COMPLETION:

Subject to any requirement in the Contract as to completion of any portion of the works before completion of the whole of the works, it shall be completed within the time stated in the LOI/Award Letter/Agreement.

44.0 **EXTENSION OF TIME FOR COMPLETION:**

Should the amount of extra or additional work of any kind or other special circumstances of any kind whatsoever which may occur be such as fairly to entitle the contractor to an extension of time for the completion of the work, the Engineer shall determine the amount of such extension. Provided that the Engineer as not bound to take in to account any extra or additional work or other special circumstances unless the Contractor has within 14 daysafter such work has been commenced on such circumstances have arisen or as soon thereafter as is practicable, delivered to the Engineer's representative full and detailed particulars of any claim to extension of time to which he may consider himself entitled in order that such claim may be investigated at the time.

44.1 **TIME EXTENSION OF CONTRACT:**

The CONTRACTOR shall promptly notify the ENGINEER-IN-CHARGE any event or conditions which might delay the completion of work in accordance with the approved schedule and the steps being taken to remedy such situation.

44.2 If the Work is delayed at any time in the commencement or during the progress of the WORK by any act, delay or neglect solely attributable to IREL or his employees, or by anyother contractor utilised by the IREL or by FORCE MAJEURE conditions, the time of completion shall be extended by IREL (without levy of Mutually Agreed Damages) in writing for a reasonable period as may be mutually agreed upon, at the time of closure of contract. The CONTRACTOR shall, immediately on occurrence of such special circumstances but not later than 14 working days, bring to the knowledge of IREL throughwritten application for any such delay as mentioned above.

44.3 IREL shall have the right to suspend the WORK in whole or in part for such time as may be necessary in order that WORKS shall be well and properly executed. In such events, suitable extension of time shall be granted to CONTRACTOR.

45.0 **NO NIGHT OR SUNDAY WORK:**

Subject to any provision to the contrary contained in the contract, none of the permanent work shall save as hereinafter provided be carried on during the night or on Sundays (if locally recognised as days of rest) or their locally recognised equivalent without the permission in writing of the Engineer's representative save when the work is unavoidable or absolutely necessary for the saving of life or property or for the safety of the Works in which case the Contractor shall immediately advise the Engineer's representative. Provided always that the provisions of this Clause shall not be applicable in the-case of any work which it is customary to carry out by rotary or double shifts.

46.0 **RATE OF PROGRESS:**

The whole of the materials, plant and labour to be provided by the Contractor and the mode, manner and speed of execution and maintenance of the work are to be of a kind and conducted in a manner to the satisfaction of the Engineer. Should the rate of progress of the works or any part thereof be at any time in the opinion of the Engineer too slow to ensure the completion of the works by the prescribed time or extended time for completion the Engineer shall so notify the Contractor in writing and the Contractor shall thereupon take such steps as the contractor may think necessary and the Engineer may approve to expedite progress so as to complete the works by the prescribed time or extended time for completion. If the work is not being carried on by day and by night and the Contractor shall request permission to work by night as well as by then if the Engineer shall grant such permission, the Contractor shall not be entitled to any additional payment for so doing but if such permission shall be refused and there shall be no equivalent practicable method of expediting the progress of the work, the time for completion shall be extended by such period as is solely attributable to such refusal. All work at night shall be carried out without unreasonable noise and disturbance. The Contractor shall indemnify the Employer from and against any liability for damages on account of noise or other disturbance created while or in carrying out the work and from and against all claims, demands, proceedings, costs, charges and expenses whatsoever in regard or in relation to such liability.

47.0 LIQUIDATED DAMGES FOR DELAYED EXECUTION OF CONTRACT:

Subject to Article -48, if the CONTRACTOR fails to deliver any or all of the GOODS or performance of the services within the time period(s) specified in the CONTRACT, the EMPLOYER shall, without prejudice to his other remedies under the CONTRACT, levy Liquidated damages from the CONTRACT PRICE, a sum calculated on the basis of the CONTRACT PRICE, including subsequent modifications.

Deductions shall apply as per following formula:

For repair works costing up to Rs. Ten lakhs (Rs 10,00,000/-) : One percent (1%) of the contract value per week subject to a maximum of ten percent (10%) of contract value

For all other works :

Half percent (0.5%) of the contract value per week of delay subject to a maximum of ten percent (10%) of contract value.

47.1 EMPLOYER may deduct the amount so payable by CONTRACTOR, from any amount falling due to the CONTRACTOR or by recovery against the Performance Guarantee. Both CONTRACTOR and EMPLOYER agree that the above percentages of price reduction are genuine pre-estimates of the loss/damage which the EMPLOYER would have suffered on account of delay/breach on the part of the CONTRACTOR and the said amount will be payable on demand without there being any proof of the actual loss/or damage caused by such breach/delay. A decision of the EMPLOYER in the matter of applicability of price reduction shall be final and binding.

48.0 FORCE MAJEURE:

48.1 Force majeure is an event beyond the control of contractor and not involving the contractor's fault or negligence and which is not foreseeable. Such events may include, but are not restricted to acts of the purchaser/contractor either in its sovereign or contractual capacity, wars or revolution, hostility, acts of public enemy, civil commotion, floods, explosions, epidemics, quarantine restrictions, strikes,

lockouts and freight embargoes or any other event which IREL may deem fit to consider so. The decision aboutforce majeure shall rest with IREL which shall be final and binding.

48.2 If there is delay in performance or other failures by the contractor to perform obligations under its contract due to event of a Force Majeure, the supplier/contractor shall not be held responsible for such delays/failures.

48.3 If a Force Majeure situation arises, the contractor shall promptly notify the purchaser in writing of such conditions and the cause thereof within fifteen days of occurrence of such event. Unless otherwise directed by the EMPLOYER in writing, the CONTRACTOR shall continue to perform its obligations under the contract as far as reasonable/practical and shall seek all reasonable alternative means for performance not prevented by the Force Majeure event.

48.4 If the performance in whole or in part or any obligation under this contract is prevented or delayed by any reason of Force Majeure for a period of exceeding 120 days, IREL may at its option terminate the contract without any financial repercussion on either side.

49.0 CERTIFICATE OF COMPLETION OF WORK:

As soon as in the opinion of the Engineer the works shall have been substantially completed and shall have satisfactorily passed any final test that may be prescribed by the Contract, the Engineer shall on receiving a written undertaking by the Contractor to finish any outstanding work during the period of Maintenance issue a Certificate of completion in respect of the works and the Period of Maintenance of the works shall commence from the date of such certificate. Provided that the Engineer may give such a certificate with respect to any part of the works before the completion of the whole of the work and shall upon the written application of the contractor give such certificate with respect to any substantial part of the works, which has been both completed to the satisfaction of the Engineer and occupied or used by the employer and when any such certificate is given in respect of a part of the works such part shall be considered as completed and the Period of Maintenance of such part shall commence from the date of such certificate. Provided also that a Certificate of Completion given in accordance with the foregoing provision of any part of the works occupied and use as aforesaid shall not be deemed to certify completion of any round or surfaces requiring reinstatement unless such certificate shall expressly so state.

50.0 MAINTENANCE AND DEFECTS:

50.1 **DEFINITION OF PERIOD OF MAINTENANCE:**

In these conditions, the expression "Period of Maintenance" shall be either 12 (Twelve) months or any other period if specifically specified in the special conditions of this contract, and calculated from the date of completion of the works certified by the Engineer in accordance with Clause 49 hereof or in the event of more than one certificate having been issued by the Engineer Under the said Clause from the respective dates so certified and in relation to the Period of maintenance, the expression “the works” shall be construed accordingly.

50.2 EXECUTION OF WORKS OF REPAIR ETC.:

To the intent that the works shall at or as soon as practicable after the expiration of the period of Maintenance be delivered up to the Employer in as good and perfect a condition (fair wear and tear expected) to the satisfaction of the Engineer as that in which they were at commencement of the Period of Maintenance, contractor shall execute all such work of repair, amendment, reconstruction, rectification and making good of defects, imperfections, shrinkages or other faults as may be required of the Contractor in writing by the Engineer during the Period of Maintenance or within fourteen days after its expiration as a result of an inspection made by or on behalf of the Engineer prior to its expiration.

50.3 COST OF EXECUTION OF WORKS OF REPAIR ETC.:

All such work shall be carried out by the Contractor at his own expense if the necessity thereof shall in the opinion of the Engineer be due to the use of materials or workmanship not in accordance with

the Contract or to neglect or failure on the part of the Contractor to comply with any obligation expressed or implied on the Contractor's part under the Contract. If in the opinion of the Engineer such necessity shall be due to any other cause, the value of such work shall be ascertained and paid for as if it was an additional work.

50.4 REMEDY ON CONTRACTOR'S FAILURE TO CARRY OUT:

If the Contractor shall fail to do any such work as aforesaid required by the Engineer, the Employer shall be entitled to carry out such work by his own workmen or by other Contractors, and if such work is the work which the Contractor should have carried out at his own cost, Employer shall be entitled to recover from the Contractor the cost thereof or may deduct the same from any moneys due or that may become due to the Contractor.

51.0 CONTRACTOR TO SEARCH:

The Contractor shall if required by the Engineer in writing search or the cause of any defect in perfection or fault under the directions of the Engineer. Unless such defect, imperfection or fault shall be one for which the Contractor is liable under the contract, the cost of the work carried out by the Contractor in searching as aforesaid shall be borne by the Employer. But if such defect, imperfection or fault shall be one for which the Contractor is liable as aforesaid the cost of the work carried out in searching as aforesaid shall be borne by the Contractor and he shall in such case repair, rectify and make good such defect, imperfection or fault at his own expense in accordance with the provisions of Clause 50 hereof.

52.0 ALTERATIONS, ADDITIONS AND OMISSIONS:

52.1 **VARIATIONS**

The Engineer shall make any variation from quality or quantity of the works or any part there of that may in his opinion be necessary and for that purpose or if for any other reason it shall in his opinion be desirable he have power to order the Contractor to do and the Contractor shall do any of the following:

(a) increase or decrease the quantity of any works included in the contract.

(b) omit any such work

(c) change the character or quality or kind of any such work

(d) change the levels, lines position and dimensions of any part of works and

(e) execute additional work of any kind necessary for the completion of the works and no such variation in any way vitiate or invalidate the contract but the value (if any) of all such variations shall be taken into account in ascertaining the amount of thecontract price.

52.2 No such variation shall be made by the Contractor without an order in writing of the Engineer. Provided that no order in writing shall be required for increase or decrease in the quantity of any work where such increase or decrease is not the result of an order given under this Clause but is the result of the quantities exceeding or being less than those stated in the Tender Schedule. Provided also that if for any reason the Engineer shall consider it desirable to give any such order verbally, the contractor shall comply with such order and any confirmation in writing of such verbal order given by the Engineer whether before or after the carrying out of the order shall be deemed to be an order in writing within the meaning of this clause.

53.1 VALUATION OF VARIATIONS:

The 'Engineer shall determine the amount (if any) to be added to or deducted from the sum named in the Tender in respect of any extra or additional work done or work omitted by his order. All such work shall be valued at the rates set out in the Contract, if in the opinion of the Engineer the same shall be applicable. If the Contract shall not contain any rates applicable to the extra or additional work then reasonable prices shall be fixed by theEngineer.

53.2 POWER OF ENGINEER TO FIX RATES:

Provided that if the nature of amount of any omission or addition relative to the nature or amount of the whole of the contract work or to any part thereof shall be such that in the opinion of the Engineer

the rate or price contained in the contract for any item of the work is by reason of such omission or additions rendered unreasonable or inapplicable, the Engineer shall fix such other rate or price as in the circumstances he shall think reasonableand proper.

Provided also that no increase of the Contract Price under sub-clause (1) of this clause on variation of rate or price under sub-clause (2) of this clause shall be made unless as soon after that date of the order as is practicable and in the case of extra or additional work before the commencement of the work or as soon thereafter as is practicable notice shallhave been given in writing.

(a) by the Contractor to the Engineer of his intention to claim extra payment or a variedrate or.

(b) by the Engineer to the Contractor of his intention to vary a rate or price as the casemay be.

53.3 CLAIMS:

The Contractor shall send to the Engineer's representative once in every month an account giving particulars (as full and detailed as possible) of all claims for any additional expenses to which the Contractor may consider himself entitled and of all extra or additional work ordered by the Engineer which he has executed during the preceding month and no claim for payment for any such work will be considered which has not been included in such particulars. Provided always that the Engineer, shall be entitled to authorise payment to be made for any such work notwithstanding the Contractor's failure to comply with this condition, if the contractor has at the earliest practicable opportunity notified the Engineer that he intends to make a claim for such work.

53.4 EXTRA ITEM:

Any extra item arising during the execution of work due to any reason shall be paid for based on the sanctioned schedule of rates or rates derived therefrom. The percentage quoted by the tenderer shall be applied to the rate arrived at from the schedule of rates or rates derived therefrom. In case the rates cannot be derived from the Schedule of rates or the quoted rates, CPWD norms shall be followed for determination of rates. Analysis of rates on the basis of field observations shall be considered if schedule of rates/CPWD norms are not available. The rates given in the schedule are complete for labour and materials including all leads, lifts, royalty etc. except otherwise stated in the items. No extra claim on account of these item shall be entertained.

54.0 PROPERTY IN MATERIALS:

54.1 If the specification or estimate of the work provides for use of any special description of materials to be supplied from the Engineer's store, or if it is required that the Contractor shall use certain stores to be provided by the Engineer (such materials and stores, and Plants and the prices to be charged therefore, as here-in-after mentioned being so far as practicable for the convenience of the Contractor but not so as in any way to control the meaning or effect of this contract specified in the schedule or memorandum hereto annexed), the Contractor shall be supplied with such materials and stores as required from time to time to be used by him for the purposes of the contract only, this being calculated out from specifications, drawing etc. and the value of the full quantity of materials and stores so supplied at the rates specified in the said schedule or memorandum may be set off or deducted from any sums then due, or thereafter to become due to the Contractor under the contract, or otherwise, or against or from the security deposit or the proceeds of sale there of if the same is held in Government securities, the same or a sufficient portion there of being in this case to fulfil the purpose. All materials supplied to the Contractor shall remain in the absolute property of Employer and shall not on any account be removed from the site of the work and shall at all times be open to inspection by the Engineer.

Any such materials unused and in perfectly good condition at the time of the completion of determination of the contract shall be returned to the Engineer store. If by a notice in writing under his hand he shall so require but the Contractor shall not be entitled to return any such materials unless with such consent and shall have no claim for compensation on account of any such materials so supplied to him as aforesaid during being unused byhim or for any wastage in or damages to any such materials.

54.2 **MATERIALS OBTAINED FROM DISMANTLEMENT & EXCAVATION ETC:** Contractors in the course of their works, should understand that all material (e.g. store and other materials obtained in the work of dismantling, excavation, etc. will be considered Employer's property) and issued to the Contractor (if they require the same for their own use) at rates approved by him. If these materials are not required by them they will bedisposed off to the best advantage of Employer.

54.3 RELICS, GOLD, SILVER FOUND IN OR UPON THE SITE:
All gold, silver, oil and other minerals of any description and precious stones, coins, treasures, relics, antiquities and other similar things which shall be found in or upon the site shall be the property of the Employer, and the Contractor shall duly preserve the same to the satisfaction of Employer and shall, from time to time deliver the same to such person or persons as the Employer may appoint to receive the same.

55.0 NO APPROVAL BY VESTING:
The operation of the Clause numbered 62 shall not be deemed to imply any approval by the Engineer of the materials or other matters referred to therein nor shall it prevent the rejection of any such materials at any time by the Engineer.

MEASUREMENT

56.0 **QUANTITIES:**
The quantities set out in the Tender Schedule are the approximate estimated quantities ofthe work but they are not to be taken as the actual and correct quantities of the works to be executed by the Contractor in fulfilment of his obligations under the Contract. Any item may be omitted or altered and no claim for compensation will be entertained on this account or for any variation however substantial it may be in the Tender Schedule.

57.0 WORKS TO BE MEASURED:
The Engineer shall except as otherwise stated ascertain and determine by measurement the value in accordance with the Contract of work done in accordance with the contract. He shall when he requires any part or parts of the Works to be measured give notice to the Contractor's authorised agent or representative who shall forthwith attend or send a qualified agent to assist the Engineer or the Engineer's representative in making such measurement and shall furnish all particulars required by either of them. Should the Contractor not attend or neglect or omit to send such agent then the measurement made by the Engineer or approved by him shall be taken to be the correct measurement of the work. For the purpose of measuring such permanent work as is to be measured by record drawings, the Engineer's representative shall prepare record drawing month by month of such work and the Contractor as and when called upon to do so in writing shall within 14 days attend to examine and agree such record drawings, with the Engineer's representative and shall sign the same when so agreed and if the Contractor does not so attend to examine and agree any such record drawings they shall be taken to be correct. If after examination of such record drawings the Contractor does not agree the same or does not sign the same as agreed, they shall nevertheless be taken to be correct unless the Contractor shall within 14 days of such examination lodge with the Engineer's representative for decision by the Engineer's notice in writing of the respects in which such record drawings are claimed by him to be incorrect. The Contractor shall be paid for the quantities resulting from measurement of the executed work.

58.0 MODE OF MEASUREMENT FOR CIVIL WORKS:
The mode of measurement shall be as per Indian Standard 1200 latest, subject to the following:

(a) In case the mode of measurement is not covered by the said Indian Standard for a particular item, the method of measurement shall be as per CPWD specificationsfor that item only.

(b) Wherever a particular mode of measurement is specified in the description of the item in the tender schedule/special conditions, the same shall only apply.

(c) In case of dispute regarding mode of measurement, the decision of the Engineer shall be final and

binding on the Contractor.

59.0 PAYMENT FOR WORK DONE

59.1.1 100% payment against bills for the work done (Subject to the required deductions) shall be made to the Contractor based on detailed measurements and certification of bills by the Engineer.

59.1.2 **ON ACCOUNT PAYMENT:** Bills shall be prepared and submitted by the Contractor. Joint measurements shall be taken continuously and need not be connected with billing stage. Based on these joint measurements recorded in the register, the Contractor shall submit the bills in both soft and hard copies (three copies) in the prescribed format along with the detailed measurements item wise. All the pages of the measurement sheets shall be serially machine numbered and signed by the Contractor. The bills along with measurement sheet shall be computer generated and also suitably programmed for effecting the necessary corrections easily. The bills shall be accompanied with necessary documents such as abstract of quantities, variation statements, reconciliation of materials, part rate statements indicating the extent of work done, statement of secured advance claimed and fulfilling other statutory obligations such as ESI / PF / Insurance / labour licence etc. Payment against bills for the work done (Subject to necessary deductions) will be made after the verification and certification by the Engineer of the bill submitted by theContractor.

59.1.3 **COMPLETION CERTIFICATE:** The Works shall be deemed to have been completed in all respects on the day the Engineer certifies that the works have been so completed in accordance with this Contract, takes over the completed Works and issues a certificate to that effect. The Defect Liability Period will start from the said date of completion / handingover of the work.

59.1.4 **FINAL PAYMENTS:** Based on the measurement of Work performed, the Contractor shall submit his final bill for the Works within 3 months of completion of work. The bill shall be based only on Works as measured and at accepted tender rates including rates for any additional or extra work which might have been approved by the Company. All deductions due under the Contract shall be incorporated. The final bill shall be accompanied by:

A) A copy of the Completion Certificate issued by the Engineer.

B) No Claim Certificate" in the prescribed form or a list of claims if any, not included in the final bill with full details.

The Engineer shall examine and certify the final bill for payment after satisfying that the Works have been satisfactorily completed and that all properties, works and things removed or disturbed or damaged in consequence of the Work have been properly replaced and made good and all expenses and demands incurred or made by or on the Company or in respect of any damage or loss by, from or consequence of the Works havebeen satisfied, all materials have been returned and the site cleared.

59.1.5 SECURED ADVANCE:

75% payment against bills as Secured Advance on the cost of all non-perishable materials brought by the Contractor to Site for use in the Works (excluding chargeable materials issued by the Company) as assessed and approved by the Engineer may be paid, provided the materials confirm to the specifications of the contract an accepted by the Engineer. These materials shall be pledged by the Contractor to the Company. All the Secured Advance allowed will be deducted while making payment of any bill for the work done and a fresh Secured Advance on the materials remaining then at Site will be paid along with the same bill.

59.1.6 BILL TO BE SUBMITTED MONTHLY:

A bill shall be submitted by the Contractor each month on or before the date by the Engineer for all work executed in the previous month and the Engineer shall take or cause to be taken the requisite measurement for the purpose of having the same verified and the claim, as far as admissible, adjusted if possible, before the expiry of ten days from the presentation of the bill. If the Contractor does not submit the bill within the time fixed as aforesaid, the Engineer may depute his representative to

measure up the said work in the presence of the Contractor, whose counter signature to the measurement list will be sufficient warrant, and the Engineer may prepare a bill from such list which shall be bindingon the Contractor in all respects.

59.2 BILLS TO BE ON PRINTED FORMS:

The Contractor shall submit all bills on the printed forms to be had on application at the office of the Engineer and the charges in the bills shall always be entered at the rates specified in the tender in the case of any extra work ordered in pursuance of these conditions and not mentioned or provided for in the tender at the rates herein after providedfor such work.

Invoice must contain Contractor's GST Registration number, PAN, Bank detail of Contractor, GST Registration number of IREL Factory/ Office, HSN/SAC Code for servicerendered.

59.3 RETENTION MONEY (IF PROVIDED FOR SUBMISSION IN THE TENDER):

As and by way of additional security from every progressive on account bill of the Contractor, prescribed percent of the value of the work executed shall be deducted as Retention money and kept as security deposit until the total of the amount so deducted plus the initial security (including the Earnest money) already deposited will equal the prescribed security.

59.5 SET-OFF:

(a) Any sum of money due and payable to the Contractor (including security deposit returnable to him) may be appropriated/ retained/ withheld and/or set off by the Employer or Government against any claim of the Employer or Government or such other person or persons for the payment of a sum of money arising out of or under this contract or other contracts made by Contractor with the employer or Govt. or such other person or persons.

(b) The Employer will be at liberty to recoup any damage/loss suffered as a result of any action on the part of the Contractor.

59.6 DEDUCTIONS FROM CONTRACT PRICE:

All costs, damages or expenses which the EMPLOYER may have paid for which, under the CONTRACT, the CONTRACTOR is liable, will be claimed by the EMPLOYER. All suchclaims shall be billed by the EMPLOYER to the CONTRACTOR regularly as and when they fall due. Such claims shall be paid by the CONTRACTOR within fifteen days of the receipt of the corresponding bills and if not paid by the CONTRACTOR within the said period, the EMPLOYER may then deduct the amount from any bill due or becoming due by him to the CONTRACTOR under the CONTRACT or may be recovered by action of law or otherwise, if the CONTRACTOR fails to satisfy the EMPLOYER of such claims.

59.7 TAXES APPLICABLE TO CONTRACTOR'S MANPOWER, TURNOVER, EQUIPMENTETC.

The CONTRACTOR shall be solely responsible for all taxes that may be levied on the CONTRACTOR's turnover & profit or on the earnings of any of his employees or personnelengaged by him and shall hold the EMPLOYER indemnified and harmless against any claims that may be made against the EMPLOYER in this behalf. The EMPLOYER does not undertake any responsibility whatsoever regarding any taxes levied on CONTRACTOR and/or his personnel by Centre/ State/ Local Authorities.

59.8 DEDUCTION OF INCOME TAX AT SOURCE:

Income Tax on the gross amount billed will be deducted from Contractor's bills as per Section 194 (C) of the Income Tax Act. In case of contract for consultancy or professional services Tax deduction at source as per Section 194 J. will be carried out

59.9 **OVER PAYMENTS / UNDER PAYMENTS DETECTED DURING TECHNICAL AUDIT:**

The Company reserves the right to carry out post-payment audit and technical examination of the running/ final bill including all supporting vouchers etc. The Company also reserves the right to propose recoveries detected by CVC (Central Vigilance Commission) based on their audit and

observations of works / bills etc. The Company further reserves the right to enforce recovery of any over payment when detected, notwithstanding the fact the amount of running / final bill may be included by one of the parties as an item of dispute before an arbitrator appointed and notwithstanding the fact that the amount of running / final bill figures in the arbitration award.

If as a result of such audit and technical examination any over payment is discovered in respect of any work done by the Contractor under the contract, the Company from the Contractor shall recover it, or if any under payment is discovered, the amount shall be duly paid to the Contractor by the Company.

60.0 APPROVAL BY MAINTENANCE CERTIFICATE:

No certificate other than the maintenance certificate referred to in **clause 61** here of shall be deemed to constitute approval of any work or other matter in respect of which it is issued or shall be taken as admission of the due performance of the contract or any part here of or of the accuracy of any claim or demand made by the contractor or of additional or varied work having been ordered by the Engineer nor shall any other certificate conclude or prejudice any of the powers of the Engineer.

61.1 MAINTENANCE CERTIFICATE:

The contract shall not be considered as completed until a maintenance certificate shall have been signed by the Engineer and delivered to the Employer stating that the Works have been completed and maintained to his satisfaction. The maintenance certificate will be given by the Engineer twenty - eight days after the expiration of the Period of maintenance (or if different Periods of maintenance shall become applicable to different parts of Works the expiration of the latest such period) or as soon thereafter as any works ordered during such Period pursuant to **Clause 50 and 51** hereof shall have been completed to the satisfaction of the Engineer and full effect given to this Clause notwithstanding any previous entry on the Works of taking possession, working or using thereof or any part thereof by the Employer.

61.2 CESSATION OF EMPLOYER'S LIABILITY

The Employer shall not be liable to the Contractor for any matter or thing arising out of or in connection with the Contract or the execution of the Works Unless the Contractor shall have made a claim in writing in respect thereof before the giving of the maintenance certificate under this Clause.

61.3 UNFULFILLED OBLIGATION:

Notwithstanding the issue of the Maintenance certificate the Contractor and (subject to sub - clause (2) of this clause) the Employer shall remain liable for the fulfilment of any obligation incurred under the provisions of the Contract prior to the issue of the Maintenance Certificate which remains un-performed at the time such certificate is issued and for the purpose of determining the nature and extent of any such obligation, the contract shall be deemed to remain in force between the parties hereto.

62.0 URGENT REPAIRS:

If by reason of any accident or failure or other event occurring to in or in connection with the works or any part thereof either during the execution of the works or during the Period of Maintenances, any remedial or other work or repair shall in the opinion of the Engineer or the Engineer's representative be urgently necessary for security and the Contractor is unable or un-willing at once to do such work or repair, the Employer may by his own or other workmen to such work or repair as the Engineer or the Engineer's representative may consider necessary. If the work or repair so done by the Employer is work which in the opinion of the Engineer the Contractor was liable to do at his own expense under the contract, all cost and charges properly incurred by the Employer in so doing shall on demand be paid by the Contractor to the employer or may be deducted by the employer from any moneys due or which may become due to the Contractor. Provided always that the Engineer or the Engineer's representative (as the case may be) shall, as soon after the occurrence of any such emergency as may be reasonably practicable notify the Contractor thereof in writing.

63.0 RESOLUTION OF DISPUTES/ ARBITRATION:

63.1 The EMPLOYER and the CONTRACTOR shall make every effort to resolve amicably by direct informal, good faith negotiations any disagreement or dispute arising between them under or in connection with the Contract.

63.2 If, after thirty days from the commencement of such informal, good faith negotiations, the EMPLOYER and the CONTRACTOR have been unable to resolve the disagreement or dispute, the same shall be referred for resolution as per the formal mechanism as specified hereunder shall be applicable.

63.3 LEGAL CONSTRUCTION: The Contract shall be, in all respects be construed and operated as an Indian Contract and in accordance with Indian Laws as in force for the timebeing.

63.4 ARBITRATION:

a) All disputes and differences of any kind whatsoever arising out of or in connection with the contract or carrying out of the works (whether during the course of works or after their completion and whether before or after determination, abandonment or breach of contract) shall be referred to and settled by the person authorized and notified in writing by IREL who shall state his decision in writing. Such a decision may be in the form of a final certificate or otherwise and shall be made within a period of 30 days from the date ofreceipt of such reference to them.

b) If the CONTRACTOR is dissatisfied with the decision of such authorized person, then he may within 30 days of receipt of such decision send a written appeal to PURCHASER, represented by the Chairman and Managing Director at the registered office, Mumbai for the same to be referred to Arbitration by a Sole Arbitrator to be appointed by mutual consent and after due approval of CMD, IREL. The Arbitration proceedings shall be conducted as per the provisions of the Arbitration and Conciliation Act, 1996. It is made clear that this Arbitration Clause shall be applicable to any and all disputes and differences between the Parties arising out of and/or relating to this CONTRACT and the Parties shall be bound to refer the same to arbitration in accordance with the procedure contemplated herein.

c) If the period of 30 days under Clause (b) has expired at any stage, stipulated in the preceding paras without any response from the CONTRACTOR before such expiry, the CONTRACTOR is deemed to have communicated his satisfaction to the decision of IRELat the relevant stage and all his rights of further appeal or as the case may be, adjudicationare deemed to have been waived once and for all.

d) The seat of arbitration will be at Mumbai and the language thereof shallbe English.

e) Notwithstanding the invocation, commencement and/or pendency any dispute resolution proceedings under this Clause 63 including arbitration under Clause 63.4, the CONTRACTOR shall continue to be bound by the provisions of the CONTRACT, if not terminated by the EMPLOYER, and shall be obligated to discharge its obligations under the CONTRACT including continuation of the WORK under the CONTRACT.

f) The CONTRACTOR shall not in any way delay or default or cause to delay or default the carrying out of the works by reason of the fact that any matter has been agreed to be referred to and / or referred to dispute resolution under Clause 63 including Arbitration under Clause 63.4.

63.5 JURISDICTION:

The courts only shall, subject to Arbitration Clause, have exclusive jurisdiction to deal with and decide any matter arising out of this contract.

64.0 ACTS OF PARLIAMENT, LOCAL AND OTHER AUTHORITIES AND BYE-LAWS:

64.1 **COMPLYING WITH REGULATIONS:**

64.1.1 Throughout the execution of the WORK, the CONTRACTOR shall comply with the requirements of all applicable laws and regulations, bye-laws or orders made there under and to the requirements of public, municipal and other authorities in any way affecting or applicable to the work. IREL shall, when requested by the CONTRACTOR, give all reasonable assistance to the CONTRACTOR in obtaining information concerning local conditions.

64.1.2 Before making any departure from the specification or drawings which may be necessary to conform to such requirements, the CONTRACTOR shall give the IREL written notice specifying the departure proposed to be made and the reason for making it and applying for instructions thereon. If the CONTRACTOR does not receive such instructions within thirty (30) days, he shall conform to those requirements and inform the IREL accordingly.

64.1.3 The Contractor shall remain liable for the payments of all wages or other money to his employees or labourers under the Minimum Wages Act, Payment of Wages Act, Employees Liability Act, Workmen's Compensation Act, PF and ESI Act or any other enactments and rules made applicable from time to time. The Contractor shall also comply with the provisions of the Apprenticeship Act, Contract Labour Regulation and Abolition) Act and the Rules and Orders issued there under from time to time. The Contractor shall be liable to pay the wages directly to the workmen employed by him on the Works.

64.1.4 It is obligatory on the part of the Contractor to forward the declaration forms to the ESI authorities for issue of ESIC numbers, make timely contribution towards ESI and PF in accordance with the provisions of relevant acts from time to time in respect of labour engaged by him for all the works executed in the Company. The Contractor should contact the jurisdictional ESI and PF authorities and ensure to observe all formalities such as maintenance of muster rolls, opening of identification cards, making remittance etc. The Contractors / firms / establishments shall remit the PF and ESI contributions in their respective codes. However, in such cases, copies of muster roll, wage register, ESI / PF remittance, copies of the returns shall be furnished to the Engineer for verification and records while preferring bills.

64.1.5 The Contractor shall ensure compliance of any other laws, bye-laws, Acts. Statues, Rules & Regulations framed there under as appreciable in relation to its employees/workmen and establishments in mandatorily, even though not explicitly mentioned here. It shall be the responsibility of the Contractor to get itself acquainted about them adequately.

65.0 BREACH OF TERMS, SUSPENSION AND TERMINATION:

65.1.1 **BREACH OF TERMS:**

Breach of any of the terms of the Contract, the EMPLOYER shall be entitled, without prejudice to any and all other remedies available to it, without incurring any liability what- so-ever, to fore-bear from doing such acts or fulfilling such obligations as are to be done or fulfilled by it here under until the CONTRACTOR on terms herein makes good the saidbreach;

65.2 SUSPENSION:

65.2.1 IREL may suspend the Works in whole or in part at any time by giving the CONTRACTOR a notice in writing, if the CONTRACTOR shall be in breach of this Contract or shall fail to perform any of its obligations under this Contract, including the carrying out of the Works; provided that such notice of suspension (i) shall specify the nature of the breach or failure, and (ii) shall provide an opportunity to the CONTRACTOR to remedy such breach or failure within a period not exceeding 30 (thirty) days after receipt by the CONTRACTOR of such notice of suspension.

65.2.2 On receiving the notice of suspension from IREL, the CONTRACTOR shall stop all such work, which IREL has directed to be suspended with immediate effect. IREL may at any time cancel the suspension notice for all or any part of suspended work by giving written notice to the

CONTRACTOR specifying the part of work to be resumed and the effective date of suspension withdrawal. The CONTRACTOR shall resume the suspended work on immediately upon receipt of such withdrawal of suspension notice. In the event of suspension of work, IREL shall not be liable to the CONTRACTOR for any damage and loss.

65.3 TEMPORARY SUSPENSION:

65.3.1 IREL may at any time temporarily suspend the progress of work being performed under the Contract or any part thereof by notice in writing to the CONTRACTOR. All the work so suspended shall be resumed by the CONTRACTOR and extended as assessed and deemed fit by IREL.

65.3.2 IREL will not pay the CONTRACTOR for any work, which is performed during such an interval of suspension, and IREL shall not be liable to the CONTRACTOR for any damages or loss caused by such suspension of work.

65.4 EVENT OF DEFAULT:

Event of Default means the CONTRACTOR Event of Default or IREL Event of Default or both as the context may admit or require.

65.4.1 CONTRACTOR EVENT OF DEFAULT:

Any of the following events shall constitute an event of default by the CONTRACTOR ("CONTRACTOR Event of Default");

a. the CONTRACTOR fails to remedy any breach hereof or any failure in the performance of its obligations hereunder, as specified in a notice of suspension pursuant to Sub-clause 65.2 hereinabove, within 30 (thirty) days of receipt of such notice of suspension or within such further period as IREL may have subsequently granted in writing;

b. The CONTRACTOR fails to commence the Works;

c. The CONTRACTOR fails to ensure that Works Completion Date of the Plant is achieved as per schedule mentioned in the contract/ agreement;

d. Any representation made or warranties given by the CONTRACTOR under this Contract is found to be false or misleading;

e. The transfer, pursuant to law of either (a) the rights and/or obligations of the CONTRACTOR under the Contract, or (b) all or material part of the CONTRACTOR; except where such transfer in the reasonable opinion of IREL does not affect the ability of the CONTRACTOR to perform, and the CONTRACTOR has the financial and technical capability to perform. its material obligations under the Contract;

f. The CONTRACTOR suspends or abandons the Works without prior consent of IREL, provided that the CONTRACTOR shall be deemed not to have suspended/ abandoned operation if such suspension/ abandonment was (i) as a result of Force Majeure Event and is only for the period such Force Majeure is continuing, or (ii) is on account of a breach of its obligations under the Contract by IREL;

g. the CONTRACTOR becomes insolvent or bankrupt or enters into any agreement with its creditors for relief of debt or take advantage of any law for the benefit of debtors or goes into liquidation or receivership whether compulsory or voluntary;

h. the CONTRACTOR fails to comply with any final decision reached as a result of arbitration proceedings pursuant to Clause 63 hereof;

i. the CONTRACTOR submits to IREL a statement which has a material effect on the rights, obligations or interests of IREL and which the CONTRACTOR knows to be false;

j. any document, information, data or statement submitted by the CONTRACTOR in its Bid, based on which the CONTRACTOR was considered eligible or successful, is found to be false, incorrect or misleading; or

k. The CONTRACTOR repudiates the Contract or otherwise evidences an intention not to be bound by the Contract.

65.4.2 IREL EVENT OF DEFAULT:

The following events shall constitute events of default by IREL ("**IREL Event of Default"),** unless any such IREL Event of Default has occurred as a result of CONTRACTOR Event of Default or due to a Force Majeure Event:

a. IREL is in breach of the Contract and has failed to cure such breach within sixty (60) days of receipt of notice in that behalf from the CONTRACTOR;

b. IREL repudiates the Contract or otherwise evidences an intention not to be bound by thisContract;

c. Any representation made or warranties given by IREL under the Contract is found to be false or misleading.

65.5 RECOURSE TO EVENT OF DEFAULT:

65.5.1 In case of an event of default, the following recourse is available to IREL and the CONTRACTOR or both as the situation may warrant:

a. In case of occurrence of Event of Default mentioned in Sub-clause a and Sub-clause b of Clause 65.4.1, the CONTRACTOR shall have an option to ask for extension from IREL specifying the conditions that have restricted the CONTRACTOR to complete the tasks in stipulated time. However, IREL's decision on said matter shall stand final as the case maybe;

b. In case of occurrence of any other Event of Default in Clause 65.4.1, IREL shall be entitled to terminate this CONTRACT as per Clause 65.6 herein.

c. In case of occurrence of Event of Default mentioned in Sub-clause 65.4.2, the CONTRACTOR shall have an option to seek Termination of this Contract. In seeking the Termination of the Contract, CONTRACTOR would have to clearly demonstrate that the Event of Default has occurred despite all possible steps taken by CONTRACTOR to avoid Termination. The Parties shall mutually decide the modalities of Termination.

65.6 TERMINATION DUE TO CONTRACTOR EVENT OF DEFAULT:

65.6.1 Without prejudice to any other right or remedy which IREL may have in respect thereof under the Contract, upon the occurrence of an CONTRACTOR Event of Default, IREL shall be entitled to terminate the Contract by issuing a Termination Notice (the **"Termination Notice"**) to the CONTRACTOR, provided that before issuing the Termination Notice, IREL shall by a notice in writing inform the CONTRACTOR of its intention to issue the Termination Notice (the "**Preliminary Notice**"). In case the underlying breach/default is not resolved within a period of sixty (60) days from the date of the Preliminary Notice, IREL shall be entitled, to terminate the Contract by issuing the Termination Notice.

65.6.2 Upon termination of the Contract by notice of either Party to the other pursuant to Sub- clauses 65.5.1 b or 65.5.1 c hereof, the CONTRACTOR shall, immediately upon dispatch or receipt of such notice, take all necessary steps to bring the Works to a close in a prompt and orderly manner and shall make every reasonable effort to keep expenditures for this purpose to a minimum.

65.7 PAYMENT UPON TERMINATION:

65.7.1 Upon termination of this Contract pursuant to Sub-clauses 65.5.1 c hereof, IREL shall make the following payments to the CONTRACTOR (after offsetting against these payments any amount that may be due from the CONTRACTOR to IREL):

Remuneration pursuant to Schedule of rates hereof for Works satisfactorily performed prior to the date of termination;

65.8 DISPUTES ABOUT EVENTS OF TERMINATION:

65.8.1 If either Party disputes whether an event specified in Sub-clause 65.4.1 or in Sub-clause 65.4.2 hereof has occurred, such Party may, within 30 (thirty) days after receipt of notice of termination from the other Party, refer the matter to arbitration pursuant to Sub-clause hereof.

66.0 LIMITATION OF LIABILITY:

Notwithstanding anything contrary contained herein, the aggregate total liability of Contractor under the Contract or otherwise shall be limited to 100% of contract price. However, neither party shall be liable to the other party for any indirect and consequential damages, loss of profits or loss of production.

67.0 METHOD OF BLACKLISTING VENDORS:

67.1 Any failure by the vendor (CONTRACTOR) to supply/execute the contract as per order may result in blacklisting of vendor by the authority competent to conclude the contract. The blacklisted vendor shall not be considered for a minimum period of one year from thedate of black listing.

67.2 Further, the competent authority may blacklist the bidder, if the bidder changes bid either techno-commercial and / or price or withdraw his bid after receipt of the same and during the validity period of bid.

67.3 Further, the vendor (CONTRACTOR) shall be banned from doing any business with IREL in case of :

a. If security considerations including question of loyalty to the state so warrant.

b. If the proprietor of the firm, its partner or representative is convicted by a court of law following prosecution for offences relating to business dealings.

- If there is strong justification for believing that the proprietor or employee or representative of the CONTRACTOR has been guilty of malpractice such as bribery, corruption, fraud, substitution of tenders, interpolation, misrepresentation, evasion or habitual default in payment of any tax levied by law, etc.

67.4 An order for ban/ suspension passed for a certain specified period shall be deemed to have been automatically revoked on expiry of that specified period and it will not be necessary to issue a specific formal order of revocation, except that an order of uspension/ban passed on account of doubtful loyalty or security consideration shall continue to remain in force until it is specifically revoked.

67.5 An order of ban on grounds of conviction by Court of Law may be revoked if, in respect of the same facts, the accused has been wholly acquitted by a court of law.

68.0 SECRECY

The CONTRACTOR shall not at any time during the pendency of the contract or there after disclose any information furnished to them by IREL or any drawings, designs, reports and other documents and information prepared by the Contractor for this contract, without the prior written approval of IREL except in so far as such disclosure is necessary for the performance of the Contractor's work and service hereunder.

69.0 LABOUR:

a) In respect of all labour directly or indirectly employed by the Contractor, Labour Rules, on the work, it shall be the bounden duty of the Contractor to abide by and to strictly comply with all labour legislations, as may be applicable, enacted by the parliament or by the State Legislature and the rules/regulations framed thereunder by the Central or State Government or Local Authorities providing for the conditions of employment protection of health, Sanitary arrangements, wages, provident fund, gratuity, welfare, and safety of workmen. These rules and statutory obligations shall be deemed to be part of the Contract. Instructions issued by the Employer in this behalf from time to time shall be equally binding on the contractor& the Contractor shall observe them stringently.

(b) In the event of the Contractor failing to discharge his obligations imposed upon him by or under any statute as aforesaid, the employer shall be entitled to rescind the Contract.at the sole risk and cost of the Contractor and/or recover from him the amount of loss sustained by the Employer.

(c) It is advisable for the Contractor to properly and fully acquaint himself with all the legislations as

applicable to his workmen and the work under this contract or in connection herewith, so as to preclude the possibility of infringement and noncompliance thereof and to make it easy for him to observe clause 69 without any deviation.

(d) The Contractor shall maintain records, registers in respect of workers employed by him as required under various statutes and or prescribed by the Employer, shallissue attendance cards to each worker and shall produce the same for inspection on demand to the authorities under statutes or to the authorised representatives of the Employer.

(e) All payments of whatever nature to be made by the Contractor to his workmen shall be made in the presence of an authorised representative of Employer and Employer's representative shall sign the acquaintance in token of having witnessed the payment, as prescribed under law.

(f) The first R.A. bill of the Contractor shall be released only after HRM (Welfare Section) gives clearance regarding compliance of all statutory provisions by the contractor. Final bill of the Contractor shall be cleared only when a clearance certificate is issued by the Contractor from an authority declared for the purpose by the Employer, that the claims of workmen in respect of wages, workmen's compensation, statutory payments etc. have been paid by Contractor to his workmen in full and subject to fulfilment of other conditions of Contract. Labour Rules etc.

(g) The Contractor shall be entirely responsible for safe and good conduct of his employees during the period of his contract. The Contractor shall also ensure, that no safety rules/instructions are violated by him or his workmen. The Contractor shall maintain his machineries and tools for work in safe condition and shall presentthe same for checking whenever called by Employer/ his representatives.

(h) It shall be binding on the part of the Contractor to familiarise himself and be governed by all statutes such as Mines Act 1952, Rules and Regulations including amendments made thereunder, if any, applicable for the work, Indian Electricity Act. 1910 and Indian Electricity Rules 1956 including amendments, if any. applicable for the work.

(i) The Contractor shall provide and ensure proper use of safety appliances by his workmen throughout the course of their employment.

(j) The Contractor in fulfilment of his statutory obligations imposed by or under various Labour Laws, will among other things:

i) Arrange to provide cool and wholesome drinking water at appointed place/places near work site. The container of water shall be in hygienic condition.

ii) Implement the Employees Provident Fund Scheme or Produce exemption certificate from Regional Provident Fund Commissioner if they are so exempted Otherwise, bills for the work will be released withholding 10% from such sums or as decided by the Management from time to time till such time they implement the scheme or produce exemption certificate from the Regional Provident Fund Commissioner. The Contractors are further required to indemnify Employer against any loss or damage, whatsoever, that may be suffered by Employer as a result of any claim. damage or penalties for any failure or non-compliance on their (Contractor's) part with the provisions of the aforesaid Act and Scheme framed thereunder.

(k) The Contractor shall arrange to get his workmen trained under Mines Vocational Rules-1966 at the Training Department of the Company and shall pay all statutory allowances for such training to his workmen under training. The Contractor shall ensure the proper use of safety appliances by his workmen throughout the courseof their employment.

70.0 RETURNS OF LABOUR:

(a) The Contractor shall if required by the Engineer deliver to the Engineer's representative or at his office a return in detail in such from and at such intervals as the Engineer may prescribe showing the numbers of the labour from time to time employed by the contractor on the Site.

71.0 LABOUR LICENCE:

(a) The Contractor shall have to obtain a licence from Asstt. Labour Commissioner (Licensing Authority) within 15 days from the award of the Contract under Contract Labour (Regulation and Abolition) Act. 1970 and shall have to comply with all the provisions of the Act and Rules framed thereunder and shall ensure that no violations are pointed out by the Authorities under the Act.

(b) The RA Bills of the contract shall not be released until the licence for the number of labour employed under Contract Labour(Regulation and Abolition)Act, 1970 has been produced by the Contractor to

the office of the employer. Whenever the number is increased, the Contractor shall arrange to get such changes incorporated in the licence.

(c) The Contractor shall make payment to their workmen in the presence of authorised representative of the Employer only, and obtain the required certificate regarding witnessing of payments.

72.0 WOMEN LABOUR:

The working hours of women labour employed by the Contractor/ tenderer shall conform to the relevant labour acts in force. They shall not be detained after 7,00 PM and employed before 6.00 AM and in no case employed during the night time.

73.0 EMPLOYMENT OF CHILDREN:

No child below the age of 18 years shall be employed. If children/young persons in the work premises are employed contravening the provision of the Factories Act, 1948 and rules framed thereunder, their agreement/ contract is liable to cancellation and/or termination without any compensation or notice.

74.0 ENTRY PASS:

All representatives and workers of Contractor shall possess the Entry Pass issued from the Security Deptt. and concerned Officer/Engineer shall have the right to refuse the Entrypasses to any worker or representative of the Contractor without assigning any reason. Permission to enter the Plant to any representative or worker of the Contractor may be suspended or withdrawn at any time by the Security Deptt. or concerned Officer/Engineer without assigning any reason. The Contractor(s) shall ensure that any gate pass issued to their workmen or representatives by authorities are not misused by the unauthorised persons for entry in the plant area/in specified area inside the plant.

75.0 SAFE CUSTODY OF ENTRY PASS:

The Contractor shall be governed by the following provisions for enforcing safe custody and proper use of gate passes that may be issued to him for entry into the Plant area:

(a) it shall amount breach of rules and regulations regarding entry into a prohibited place by Contractors in case any entry passes issued on their demand are found to be misused by any unauthorised person (s).

(b) It shall also amount to breach of terms of the contract for which the employer reserves the right to terminate the contract at any stage at the risk and cost of theContractor.

(c) Final payment would be made to the Contractor only after all the passes issued by the Security Department are surrendered to the Security Department for cancellation for which 'No Demand Certificate' should be obtained.

(d) In case of passes lost/ not surrendered for any reason an amount as fixed shall be levied as penalty before final payments are cleared or as amended from time to time. No Dues Certificate will not be issued unless all the statutory payments to contract labour including retrenchment benefits, gratuity etc. are paid and a copy of full and final payment Muster Roll duly witnessed by the nominee of employer is submitted to Welfare Dept. by the contractor The Contractor may be debarred in case he is found that he is not complying with the statutory provisions.

76.0 LIABILITY FOR ACCIDENTS AND DAMAGES:

76.1 The CONTRACTOR shall be responsible for loss or damage to the PLANT and provide new equipment and machineries in lieu of equipment/machineries lost/ damaged beyond repairs, free of cost until the PLANT is handed over after successful completion of performance guarantee test run.

Notwithstanding the provisions in the CONTRACT, the CONTRACTOR shall not be responsible for any loss or damage to the PLANT or any part thereof if and to the extent that such loss or damage is not covered by insurance coverage such as War risk, provided the same is general exclusion of the policy of the EAR insurance. War Risks shall mean any of the following events occurring within India: War, hostilities, warlike operations (whether a state of war be declared or not), invasion, act of foreign enemy, civil war, rebellion, terrorism, revolution, insurrection, mutiny, usurpation of civil or military government, conspiracy, riot, civil commotion, mine, bomb, shell, grenade or other projectile, missile, munitions or explosive of war.

76.2 The CONTRACTOR shall indemnify the IREL in respect of all damage or injury to any person or to any property (other than property forming part of the Work) and against all actions, suits, claims, demands, costs, charges and expenses arising in connection therewith which shall have been occasioned by the negligence of the CONTRACTOR or any SUB-CONTRACTOR, or by defective design (other than a design made, furnished or specified by the IREL and which the CONTRACTOR has disclaimed responsibility in writing within a reasonable time after receipt of the IREL's instructions), material or workmanship, any breach of the CONTRACTOR's obligations.

77.0 SAFETY CLAUSES:

Before commencement of the work, the Contractor will give an undertaking in writing that they would abide by the safety Rules and Regulations laid down by the organisation rigorously and any deviation from this would make them liable for action.

(a) SAFETY CLEARANCE:

Along with contract document and job instructions from the contracting department, the Contractor will come to Safety & Training Deptt. where he will be further briefed and Contractor's Safety Management Policy will be explained. The Contractor will not be permitted to start the job without getting a written safety clearance from Safety & Training Deptt.

(b) SHUTDOWNS

The contracting department would take necessary shutdowns wherever there are hazards of gases, electricity, moving machinery, etc. The Contractor shall ensure that the shutdowns/ clearance are taken before sending workers in such locations.

(c) WORK AT HEIGHT

Whenever work at height is involved Contractor should obtain passes to work at height for these persons who will be required to work at height from Safety & Training Deptt.

(d) INJURY TO WORKMEN

The Contractor after preliminary examination at PHC may take his injured workmen to his own Doctor with a permission from the Doctor at PHC at his own risk giving an undertaking to that effect in writing to the Doctor. He will, however, have to keep S&T Deptt. informed about the nature of the injury and the period for which the injured person is off duty on account of injury.

(e) RESPONSIBILITY FOR ACCIDENTS

The Contractor shall be fully, responsible for accidents caused due to his or his agent's or workmen's negligence or carelessness in regard to the observance of the safety requirements and shall be liable to pay compensation for injuries and delay work dueto these accidents.

(f) PRECAUTIONS & SUPERVISION:

The Contractor shall take all safety precautions and provide adequate supervision in order to do the job safely and without damage to equipment.

(g) SAFETY CODE

The Contractors shall strictly follow the IREL Safety Code and also the instructions issued by the Safety & Training Deptt. from time to time. Before starting the work, the Contractor shall meet the safety Officer and get himself familiar with the safety measures to be taken during the execution of the job. The contractor shall be personally responsible for the safety of his workmen and shall be liable for prosecutionin case of any accident.

(h) OTHER ACTS RULES ETC.

Notwithstanding the above clauses, there is nothing in these conditions to exempt the Contractor from the operations of any other Act or Rule in force in the Republic of India.

(i) FAILURE TO OBSERVE SAFETY RULES:
Failure to observe the safety rules will make the Contractor liable to penalty by way of suspension of work, fine and termination of contract.

(j) SAFE USE OF VEHICLES:
It will be entirely the responsibility of the Contractor to ensure that the vehicles are not driven with so high speed or in so reckless or rash manner as to cause accident or prove to be potential threat to the safety of the traffic. Where the speed limits have been fixed, they will be strictly adhered to by the Contractor's drivers who will also adhere to slow and safe driving inside the Plant and Township Area. Failure to complywith the above may result in termination of the contract.

(k) THEFT ETC.
Similarly, if a driver or any staff of the Contractor is caught in theft case or in any unauthorised movement of materials or in the activity which is punishable under the law or not authorised by the Plant, the Contractor will bear the full responsibility for the loss and other consequences which may result to the Plant due to such illegal/ unauthorised acts besides the action to terminate the contract by the Plant.

(l) COMPENSATION :
In case of accident or injury or damages caused by the Contractor's vehicle or staff to any person or property, the financial responsibility to compensate be borne solely by the Contractor and this amount may, at the discretion of the competent authority of IREL, be recovered from the bills or Security or other deposits of the Contractor.

(m) PRECAUTIONS FOR VEHICULAR TRAFFIC:
Suitable safety precautions must be taken by the Contractor for his vehicular traffic at the level crossing/roads inside the Plant/ Township area. Contractors would be using those roads on their own risk and responsibility without any liability on the part of IRELManagement.

78.0 INSURANCE:

78.1 GENERAL:
CONTRACTOR shall at his own expense arrange, secure and maintain insurance with reputed insurance companies to the satisfaction of the EMPLOYER as follows:

CONTRACTOR at his cost shall arrange, secure and maintain insurance as may be necessary and to its full value for all such amounts to protect the WORKS in progress from time to time and the interest of EMPLOYER against all risks as detailed herein. The form and the limit of such insurance, as defined here in together with the under works thereof in each case should be as acceptable to the EMPLOYER. However, irrespective of work acceptance the responsibility to maintain adequate insurance coverage at all times during the period of CONTRACT shall be that of CONTRACTOR alone. CONTRACTOR's failure in this regard shall not relieve him of any of his responsibilities and obligations under CONTRACT.

Any loss or damage to the equipment, during ocean transportation, port/custom clearance,inland and port handling, inland transportation, storage, erection and commissioning till such time the WORK is taken over by EMPLOYER, shall be to the account of CONTRACTOR.
CONTRACTOR shall be responsible for preferring of all claims and make good for the damage or loss by way of repairs and/or replacement of the parts of the Work damaged or lost. CONTRACTOR shall provide the EMPLOYER with a copy of all insurance policies and documents taken out by him in pursuance of the CONTRACT. Such copies of document shall be submitted to the EMPLOYER immediately upon the CONTRACTOR having taken such insurance coverage. CONTRACTOR shall also inform the EMPLOYER at least 60(Sixty) days in advance regarding the expiry, cancellation

and/or changes in any of such documents and ensure revalidation/renewal etc., as may be necessary well in time.

Statutory clearances, if any, in respect of foreign supply required for the purpose of replacement of equipment lost in transit and/or during erection, shall be made available by the EMPLOYER. CONTRACTOR shall, however, be responsible for obtaining requisite licences, port clearances and other formalities relating to such import. The risks that are to be covered under the insurance shall include, but not be limited to the loss or damage in handling, transit, theft, pilferage, riot, civil commotion, weather conditions, accidents of all kinds, fire, war risk (during ocean transportation only) etc. The scope of such insurance shall cover the entire value of supplies of equipments, plants and materials to be importedfrom time to time.

All costs on account of insurance liabilities covered under CONTRACT will be to CONTRACTOR's account and will be included in VALUE OF CONTRACT. However, the EMPLOYER may from time to time, during the currency of the CONTRACT, ask the CONTRACTOR in writing to limit the insurance coverage risk and in such a case, the parties to the CONTRACT will agree for a mutual settlement, for reduction in VALUE OF CONTRACT to the extent of reduced premium amounts.

78.2 CONTRACTOR as far as possible shall cover insurance with Indian Insurance Companies, including marine Insurance during ocean transportation.

i) EMPLOYEES' STATE INSURANCE ACT:

The CONTRACTOR agrees to and does hereby accept full and exclusive liability for the compliance with all obligations imposed by the Employees' State Insurance Act 1948 and the CONTRACTOR further agrees to defend, indemnify and hold EMPLOYER harmless for any liability or penalty which may be imposed by the Central, State or Local authority by reason of any asserted violation by CONTRACTOR or SUB-CONTRACTOR of the Employees' State Insurance Act, 1948, and also from all claims, suits or proceeding that may be brought against the EMPLOYER arising under, growing out of or by reasons of the work provided for by this CONTRACTOR, by third parties or by Central or State Government authority or any political sub- division thereof.

The CONTRACTOR agrees to fill in with the Employee's State Insurance Corporation, the Declaration Forms, and all forms which may be required in respect of the CONTRACTOR's or SUB-CONTRACTOR's employees, who are employed in the WORK provided for or those covered by ESI from time to time under the Contract. The CONTRACTOR shall deduct and secure the agreement of the SUB- CONTRACTOR to deduct the employee's contribution as per the first schedule of the Employee's State Insurance Act from wages and affix the Employees Contribution Card at wages payment intervals. The CONTRACTOR shall remit and secure the agreement of SUB-CONTRACTOR to remit to the State Bank of India, Employee's State Insurance Corporation Account, the Employee's contribution as required by the Act. The CONTRACTOR agrees to maintain all cards and Records as required under the Act in respect of employees and payments and the CONTRACTOR shall secure the agreement of the SUB- CONTRACTOR to maintain such records. Any expenses incurred for the contributions, making contributions or maintaining records shall be to the CONTRACTOR's or SUB-CONTRACTOR's account.

The EMPLOYER shall retain such sum as may be necessary from the total VALUE OF CONTRACT until the CONTRACTOR shall furnish satisfactory proof that all contributions as required by the Employees' State Insurance Act, 1948, have been paid. This will be pending on the CONTRACTOR when the ESI Act is extended to the place of work.

ii) **WORKMEN COMPENSATION AND EMPLOYER'S LIABILITY INSURANCE:** Insurance shall be effected for all the CONTRACTOR's employees engaged in the performance of this CONTRACT. If any of the work is sublet, the CONTRACTOR shall require the SUB-CONTRACTOR to provide workman's compensation and employer's liability insurance for the latter's employees if such employees are not covered under theCONTRACTOR's Insurance.

iii) TRANSIT INSURANCE:

In respect of all items to be transported by the CONTRACTOR to the SITE of WORK, the cost of transit insurance should be borne by the CONTRACTOR and the quoted price shall be inclusive of this cost.

iv) COMPREHENSIVE AUTOMOBILE INSURANCE:

This insurance shall be in such a form as to protect the Contractor against all claims for injuries, disability, disease and death to members of public including EMPLOYER's men and damage to the property of others arising from the use of motor vehicles during on or off the `site' operations, irrespective of the Employership of such vehicles.

v) COMPREHENSIVE GENERAL LIABILITY INSURANCE:

a) This insurance shall protect the Contractor against all claims arising from injuries, disabilities, disease or death of member of public or damage to property of others due to any act or omission on the part of the Contractor, his agents, his employees, his representatives and Sub-Contractor's or from riots, strikes and civil commotion.

b) Contractor shall take suitable Group Personal Accident Insurance Cover for taking care of injury, damage or any other risks in respect of his Engineers and other Supervisory staff who are not covered under Employees' State Insurance Act.

c) The policy shall cover third party liability. The third party liability shall cover the loss/ disablement of human life (person not belonging to the Contractor) and also cover the risk of damage to others materials/ equipment/ properties during construction, erection and commissioning at site. The value of third party liability for compensation for loss of human life or partial/full disablement shall be of required statutory value but not less than Rs. 2 lakhs per death, Rs. 1.5 lakhs per full disablement and Rs. 1 lakh per partial disablement and shall nevertheless cover such compensation as may be awarded by Court by Law in India and cover for damage to others' equipment/ property as approved by the Purchaser. However, third party risk shall be maximum to Rs. 10 (ten) lakhs to death.

d) The Contractor shall also arrange suitable insurance to cover damage, loss, accidents, risks etc., in respect of all his plant, equipments and machinery, erection tools & tackles and all other temporary attachments brought by him at site to execute the work.

e) The Contractor shall take out insurance policy in the joint name of EMPLOYER and Contractor from one or more nationalised insurance company from any branchoffice at Project site.

f) Any such insurance requirements as are hereby established as the minimum policies and coverages which Contractor must secure and keep in force must be complied with, Contractor shall at all times be free to obtain additional or increasedcoverages at Contractor's sole expenses.

vi) ANY OTHER INSURANCE REQUIRED UNDER LAW OR REGULATIONS OR BYEMPLOYER:

CONTRACTOR shall also carry and maintain any and all other insurance(s) which he may be required under any law or regulation from time to time without any extra cost to EMPLOYER. He shall also carry and maintain any other insurance which may be required by the EMPLOYER.

79.0 General

79.1 In the event that terms and conditions stipulated in the General Conditions of Contract should deviate from terms and conditions stipulated in the Contract, the latter shall prevail.

79.2 LOSSES DUE TO NON-COMPLIANCE OF INSTRUCTIONS:

Losses or damages occurring to the EMPLOYER owing to the CONTRACTOR's failure to adhere to any of the instructions given by the EMPLOYER in connection with the contract execution shall be recoverable from the CONTRACTOR.

79.3 RECOVERY OF SUMS DUE:

All costs, damages or expenses which the EMPLOYER may have paid, for which under the CONTRACT CONTRACTOR is liable, may be recovered by the EMPLOYER (he is hereby irrevocably authorized to do so) from any money due to or becoming due to the CONTRACTOR under this Contract or other Contracts and/or may be recovered by action at law or otherwise. If the same due to the CONTRACTOR be not sufficient to recover the recoverable amount, the CONTRACTOR shall pay to the EMPLOYER, on demand, the balance amount.

79.4 PAYMENTS, ETC. NOT TO AFFECT RIGHTS OF THE EMPLOYER:

No sum paid on account by the EMPLOYER nor any extension of the date for completion granted by the EMPLOYER shall affect or prejudice the rights of the EMPLOYER against the CONTRACTOR or relieve the CONTRACTOR of his obligation for the due fulfilment of the CONTRACT.

79.5 CUT-OFF DATES:

No claims or correspondence on this Contract shall be entertained by the EMPLOYER/Consultant after 90 days after expiry of the performance guarantee (from thedate of final extension, if any).

79.6 PARAGRAPH HEADING:

The paragraph heading in these conditions shall not affect the construction thereof.

80.0 **RISK PURCHASE CLAUSE**

After award of the contract, if the tenderer fails to execute the work as per tender or at any time repudiates the order, IREL (India) Limited has the right to forfeit and invoke the security deposit and execute the order from other agencies at the risk and cost of the tenderer. The cost difference between the alternative arrangements and total contract value will be recovered from the tenderer along with other incidental charges. In case of execution of order through alternative sources and if price is lower, no benefit on this account will be passed on to the tenderer.

Annexure-V

ETHICS IN TENDERING & OTHER BUSINESS DEALINGS"

Dear Sir,

IREL (INDIA) LIMITED, a Government of India undertaking under the administrative control of Department of Atomic Energy is doing its business as per the rules and regulation of the Public Sector Undertaking and other statutory agencies. The business is done in an ethical, rational & impartial manner with good corporate governance.

In our endeavour to be more transparent in our dealings and to support our ideology all Vendors, Customers and Business Partners are requested not to provide any gift and / or inducement to any of our employees for securing / being granted favour in dealings with our Company. In assurance of your commitment to the aforesaid, it will be highly appreciated if you fill up, sign and abide by the attached undertakings.

Report of any gifts and / or inducements sought by any employee of the company should be immediately reported to any one of the following:

Chairman & Managing Director IREL (India) Limited 1207, V.S. Marg, Prabhadevi Mumbai 400 028. Ph: 022-24225778 E-mail:cmd@irel.co.in	Chief Vigilance Officer IREL (India) Limited 1207, V.S. Marg, Prabhadevi Mumbai 400 028. Ph: 022-24221068 E-mail:cvo@co.gov.in

We assure you that complaints if any made by you on the subject will be kept confidential and fair investigation will be conducted and appropriate action will be taken. Similarly, we except your commitment to the undertaking and its violation will have consequences as per prevailing rule of the Company.

Thanking you,

For IREL (India)

Limited Sd/-
Name V A Anil Kumar

Designation Deputy Manager- (Technical (Purchase

Annexure-VI

UNDERTAKING TO BE SUBMITTED BY BIDDERS FOR ADOPTING ETHICAL PRACTICES

Date:

IREL (India) Limited
1207, V.S. Marg, Prabhadevi
Mumbai 400 028.

I / We ..... am / are a Vendor / Customer of IREL(India) Limited
(now onwards to be referred as
Company). I / We agree and undertake:
Not to provide any gift and / or inducement to any employee of the Company in connection with securing / being granted favour (s) in my / our dealings with the Corporate office of the company and / or its any field units namely MK, Chavara, OSCOM, RED & IRERC.

To immediately report any gift and / or inducement sought by any employee of the Company granting favour(s) to me / us in my / our dealings with the Company and / or its field units.

Signature……
……
Name……
……..
Title……
……

Name of the Company and Address (with Seal)……

Annexure - VII

EMD DECLARATION

I have furnished a sum of Rs. ……/- (Rupees……only) towards EMD vide NEFT/RTGS/BG No…… dated……..

Place: Signature of tenderer:

Full Address:

IREL Bank Details

Name of Bank	State Bank of India, Udyogamandal Branch, Udyogamandal
Account Type	Current Account
Name of beneficiary	**IREL(India) Limited**
Account Number	**57017844321**
IFSC Code	**SBIN0070158**
MICR Code	**682002926**

Details of payment to be uploaded as attachment during tender submission and the same shall be e-mailed to: purchase-red@irel.co.in

Email should contain the following details

1) Name of the Company.
2) Your E-mail ID and Contact Details including full postal Address.
3) EMD & TDC Amount.

Transaction ID with details of bank and branch

Annexure-VIII

DECLARATION – NON-BLACKLISTING

(To be submitted by an Authorized Signatory on the company's original letter head with signature and seal) To,

CM -Technical (Purchase)
IREL (India) Limited
R E Division, Udyogamandal – 683 501
KERALA

Sir,

In response to the Bid Ref No.: _____ dated _____ 2023, I/We hereby declare that presently our agency has not been declared ineligible or black listed for corrupt & fraudulent practices either indefinitely or for a particular period of time by any State Govt./ Central Govt./PSU/Government of India Society on the date of bid submission.

If this declaration is found to be incorrect then without prejudice to any other action that may be taken, my/ our bid if any, to the extent accepted may be cancelled.

Thanking you,

Yours faithfully,

Name of the agency: -
Authorized Signatory: -
Seal of the Organization: -

Date:

Place:

Annexure-IX

Annexure to Bid Form: Eligibility Declarations

Tender Document No.

Tender Title:

Bidder's Name:

Bidder's Reference No. Date:

Restrictions on procurement from Bidders from a country or countries, or a class of countries under Rule 144 (xi) of the General financial Rules 2017.

"I/We have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India: and solemnly certify that we are not from such a country or, if from such a country, has been registered with the Competent Authority. I hereby certify that this bidder fulfills all requirements in this regard and is eligible to be considered.

Penalties for false or misleading declarations:

We hereby confirm that the particulars given above are factually correct and nothing is concealed and also undertake to advise any future changes to the above details. We understood that any wrong or misleading self-declaration by us would be violation of Code of integrity and would attract penalties as mentioned in this tender document, including debarment.

(Signature of the Bidder, with Official Seal)

Annexure – X

CONTRACTOR ENROLMENT/ REGISTRATION FORM

1. NAME :

2. ADDRESS :

3. E-MAIL/ MOBILE :

4. INSURANCE DETAILS :

ESI No.	Name of Insurance Company	Policy No.	Valid	Type of Policy	No. of persons covered

5. LABOUR LICENSE DETAILS:

Labour License No.	Address of Licensing Office	License Issuance Authority	Date of Expiry	Maximum No. of Laboure's as per License

SIGNATURE OF CONTRACTOR

PRE-CONTRACT INTEGRITY PACT

General

This pre-bid pre-contract Agreement (hereinafter the Integrity Pact) is made on …… day of the month of …… year …….. between IREL (India) Limited (hereinafter called the "BUYER" which expression shall mean and include, unless the context otherwise requires, his successors in office and assigns) of the First Part and M/s. …… ……. (hereinafter called the "BIDDER / Seller" which expression shall mean and include, unless the context otherwise requires, his successors and permitted assigns) of the Second Part.

WHEREAS the BUYER proposes to procure (Name of the Stores / Equipment / Item) and the BIDDER/Seller is will to offer / has offered the stores and

WHEREAS the BIDDER is a private company / public company / Government undertaking / partnership / registered export agency, constituted in accordance with the relevant law in the matter and the BUYER is a PSU.

NOW, THEREFORE,
To avoid all forms of corruption by following a system that is fair, transparent and free from any influence / prejudiced dealings prior to, during and subsequent to the currency of the contract to be entered into with a view to:-

Enabling the BUYER to obtain the desired said stores/equipment at a competitive price in conformity with the defined specifications by avoiding the high cost and the distortionary Impact of corruption on public procurement, and

Enabling BIDDERS to abstain from bribing or indulging in any corrupt practice in order to secure the contract by providing assurance to them that their competitors will also abstain from bribing and other corrupt practices and the BUYER will commit to prevent corruption, in any form, by its officials by following transparent procedures.

The parties hereto hereby agree to enter into this Integrity Pact and agree as follows:
Commitments of the BUYER

- The BUYER undertakes that no official of the BUYER, connected directly or indirectly with the contract, will demand, take a promise for or accept, directly or through intermediaries, any bribe, consideration, gift, reward, favour or any material or immediate benefit or any other advantage from the BIDDER, either for themselves or for any person, organization or third party to the contract in exchange for an advantage in the bidding process, bid evaluation, contracting or implementation process related to the contract.
- The BUYER will, during the pre-contract stage, treat all BIDDERS alike, and will provide to all BIDDERS the same information and will not ;provide any such information to any particular BIDDER which could afford an advantage to that particular BIDDER in comparison to other BIDDERS
- All the officials of the BUYER will report to the appropriate Government office any attempted or completed breaches of the above commitments as well as any substantial suspicion of such a breach.

- In case any such preceding misconduct on the part of such official(s) is reported by the BIDDER to the BUYER will full and verifiable facts and the same is prima facie found to be correct by the BUYER, necessary disciplinary proceedings, or any other action as deemed fit, including criminal proceedings may be initiated by the BUYER and such a person shall be debarred from further dealings related to the contract process. In such a case while an enquiry is being conducted by the BUYER the proceedings under the contract would not be stalled.

Commitments of BIDDERS

The BIDDER commit itself to take all measures necessary to prevent corrupt practices, unfair means and illegal activities during any stage of its bid or during any pre-contract or post-contract stage in order to secure the contract or in furtherance to secure it and in particular commit itself to the followings:-

3.1. The BIDDER will not offer, directly or through intermediaries, any bribe, gift, consideration, reward, favour, any material or immaterial benefit or other advantage, commission, fees, brokerage or inducement to any official of the BUYER, connected directly or indirectly with the bidding process, or to any person, organization or third party related to the contract in exchange for any advantage in the bidding, evaluation, contracting and implementation of the contract.

3.2 The BIDDER further undertakes that it has not given, offered or promised to give, directly or indirectly any bribe, gift, consideration, reward, favour, any material or immaterial benefit or other advantage, commission, fees, brokerage or inducement to any official of the BUYER or otherwise in procuring the Contract or forbearing to do or having done any act in relation to the obtaining or execution of the contract or any other contract for showing or forbearing to show favour or disfavor to any person in relation to the contract or any other contract.

3.3 The BIDDER further confirms and declares to the BUYER that the BIDDER has not engaged any individual or firm or company whether Indian or foreign to intercede, facilitate or in any way to recommend to the BUYER or any of its functionaries, whether officially or unofficially to the award of the contract to the BIDDER, nor has any amount been paid, promised or intended to be paid to any such individual, firm or company in respect of any such intercession, facilitation or recommendation.

3.4 The BIDDER, either while presenting the bid or during pre-contract negotiations or before signing the contract, shall disclose any payments he has made, is committed to or intends to make to officials of the BUYER or their family members, agents, brokers or any other intermediaries in connection with the contract and the details of services agreed upon for such payments.

3.5 The BIDDER will not collude with other parties interested in the contract to impair the transparency, fairness and progress of the bidding process, bid evaluation, contracting and implementation of the contract.

3.6 The BIDDER will not accept any advantage in exchange for any corrupt practice, unfair means and illegal activities.

3.7 The BIDDER shall not use improperly, for purposes of competition or personal gain, or pass on to others, any information provided by the BUYER as part of the business relationship, regarding plans, technical proposals and business details, including information contained in any electronic data carrier. The BIDDER also undertakes to exercise due and adequate care lest any such information is divulged.

3.8 The BIDDER commits to refrain from giving any complaint directly or through any other manner without supporting it with full and verifiable facts.

3.9 The BIDDER shall not instigate or cause to instigate any third person to commit any of the actions mentioned above.

3.10 If the BIDDER or any employee of the BIDDER or any person acting on behalf of the BIDDER, either directly or indirectly, is a relative of any of the officers of the BUYER, or alternatively, if any relative of an officer of the BUYER has financial interest/stake in the BIDDER's firm, the same shall be disclosed by the BIDDER at the time of fill of tender.

The term 'relative' for this purpose would be as defined in Section 6 of the Companies Act 1956

3.11 The BIDDER shall not lend to or borrow any money from or enter into any monetary dealings or transactions, directly or indirectly, with any employee of the BUYER.

4.0 **Previous Transgression**:

4.1 The BIDDER declares that no previous transgression occurred in the last three years immediately before signing of this Integrity Pact, with any other company in any country in respect of any corrupt practices envisaged hereunder or with any Public Sector Enterprise in India or any Government Department in India that could justify BIDDER's exclusion from the tender process.

4.2 The BIDDER agrees that if it makes incorrect statement on this subject, BIDDER can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.

5 Earnest Money (Security Deposit)

5.1 While submitting commercial bid, the BIDDER shall deposit an amount _____ (to be specified in RFP) as Earnest Money / Security Deposit, with the BUYER through any of the following instruments:

(i) Bank Draft or a Pay order in favour of _____

(ii) A confirmed guarantee by an Indian Nationalized Bank, promising payment of the guaranteed sum to the BUYER on demand within three working days without any demur whatsoever and without seeking any reasons whatsoever. The demand for payment by the BUYER shall be treated as conclusive proof of payment.

(iii) Any other mode or through any other instrument (to be specified by the RFP).

5.2 The Earnest Money / Security Deposit shall be valid upto complete conclusion of the contractual obligations to the complete satisfaction of both the BIDDER and the BUYER.

5.3 In case of the successful BIDDER a clause would also be incorporated in the Article pertaining to Performance Bond in the Purchase Contract that the provisions of Sanctions for Violation shall be applicable for forfeiture of Performance Bond in case of a decision by the BUYER to forfeit the same without assigning any reason for imposing sanction for violation of this Pact.

5.4 No interest shall be payable by the BUYER to the BIDDER on Earnest Money / Security Deposit for the period of its currency.

6. **Sanctions for Violations**

6.1 Any breach of the aforesaid provisions by the BIDDER or any one employed by it or acting on its behalf (whether with or without the knowledge of the BIDDER) shall entitle the BUYER to take all or any one of the followings actions, wherever required:-

(i) To immediately call off the pre contract negotiations without assigning any reason or giving any compensation to the BIDDER. However, the proceedings with the other BIDDER(s) would continue.

(ii) The Earnest Money Deposit (in pre-contract stage) and/or Security Deposit / Performance Bond (after the contract is signed) shall stand forfeited either fully or partially, as decided by the BUYER and the BUYER shall not be required to assign any reason therefore.

(iii) To immediately cancel the contract, if already signed, without giving any compensation to the BIDDER.

(iv) To recover all sums already paid by the BUYER, and in case of an Indian BIDDER with interest thereon at 2% higher than the prevailing Prime Lending Rate of State Bank of India, while in case of BIDDER from a country other than India with interest thereon at 2% higher the LIBOR. If any outstanding payment is due to the BIDDER from the BUYER in connection with any other contract for any other stores, such outstanding payment could also be utilized to recover the aforesaid sum and interest.

(v) To encash the advance bank guarantee and performance bond / warranty bond, if furnished by the BIDDER, in order to recover the payments, already made by the BUYER, along with interest.

(vi) To cancel all or any other Contracts with BIDDER. The BIDDER shall be liable to pay compensation for any loss or damage to the BUYER resulting from such cancellation / rescission and the BUYER shall be entitled to deduct the amount so payable from the money(s) due to the BIDDER.

(vii) To debar the BIDDER from participating in future bidding processes of IREL (India) Limited for a minimum period of five years, which may be further extended at the discretion of the IREL.

(viii) To recover all sums paid in violation of this Pact by BIDDER(s) to any middleman or agent or broker with a view to securing the contract.

(ix) In cases where irrevocable Letters of Credit have been received in respect of any contract signed by the BUYER with the BIDDER, the same shall not be opened.

(x) Forfeiture of Performance Bond in case of a decision by the BUYER to forfeit the same without assigning any reason for imposing sanction for violation of this Pact.

6.2 The BUYER will be entitled to take all or any of the actions mentioned at Para 6.1 (i) to (x) of this Pact also on the Commission by the BIDDER or any one employed by it or acting on its behalf (whether with or without the knowledge of the BIDDER), of an offence as defined in Chapter IX of the Indian Penal code, 1860 or Prevention of Corruption Act, 1988 or any other statute enacted for prevention of corruption.

6.3 The decision of the BUYER to the effect that a breach of the provisions of this Pact has been committed by the BIDDER shall be final and conclusive on the BIDDER. However, the BIDDER can approach the Independent Monitor(s) appointed for the purposes of this Pact.

7 Independent External Monitors

7.1 The BUYER has appointed Independent Monitors (hereinafter referred to as Monitors) for this Pact in consultation with the Central Vigilance Commission

Dr. M. Malakondaiah, IPS (Retd) 156, Prashasan Nagar, Jubilee Hills, Road No. 72, Hyderabad - 500110 Mobile : 7330960888 Email : mannam1958@gmail.com	Shri Lalit Chandra Trivedi, IRMS (Retd) 701, Premium Tower-IV, Shalimar Township, Indore – 452 010 (MP) Mobile : 9967567679 Email : lctrivedi61@gmail.com

7.2 The task of the Monitors shall be to review independently and objectively, whether and to what extent the parties comply with the obligations under this Pact.

7.3 The Monitors shall not be subject to instructions by the representatives of the parties and perform their functions neutrally and independently.

7.4 Both the parties accept that the Monitors have the right to access all the documents relating to the project/procurement, including minutes of meetings.

7.5 As soon as the Monitor notices, or has reason to believe, a violation of this Pact, he will so inform the Authority designated by the BUYER.

7.6 The BIDDER(s) accepts that the Monitor has the right to access without restriction to all Project documentation of the BUYER including that provided by the BIDDER. The BIDDER will also grant the Monitor upon his request and demonstration of a valid interest, unrestricted and unconditional access to his project documentation. The same is applicable to Subcontractors. The Monitor shall be under contractual obligation to treat the information and documents of the BIDDER/Subcontractor(s) with confidentiality.

7.7 The BUYER will provide to the Monitor sufficient information about all meetings among the parties related to the Project provided such meetings could have an impact on the contractual relations between the parties. The parties will offer to the Monitor the option to participate in such meetings.

7.8 The Monitor will submit a written report to the designated Authority of BUYER with 8 to 10 weeks from the date of reference or intimation to him by the BUYER/BIDDER and, should the occasion arise, submit proposals for correcting problematic situations.

8 Facilitation of Investigation

In case of any allegation of violation of any provision of this Pact or payment of commission, the BUYER or its agencies shall be entitled to examine all the documents including the Books of Accounts of the BIDDER and the BIDDER shall provide necessary information and documents in English and shall extend all possible help for the purpose of such examination.

9 Law and Place of Jurisdiction

This pact is subject to Indian Law. The place of performance and jurisdiction is the seat of the BUYER.

10 **Other Legal Actions**

The actions stipulated in this Integrity Pact are without prejudice to any other legal action that may follow in accordance with the provisions of the extant law in force relating to any civil or criminal proceedings.

11 **Validity**

11.1 The validity of this Integrity Pact shall be from date of its signing and upto the complete execution of the contract to the satisfaction of both the BUYER and the BIDDER/Seller, including warranty period, whichever is later. In case BIDDER is unsuccessful, this Integrity Pact shall expire after six months from the date of signing of the contract.

11.2 Should one or several provisions of this Pact turn out to be invalid, the remainder of this Pact shall remain valid. In this case, the parties will strive to come to an agreement to their original intensions.

12 The Parties hereby sign this Integrity Pact at _____ on_____.

BUYER	BIDDER
Signature Name of the Officer Designation	
Witness	Witness
1 _____	1 _____
2	2

Annexure – XII

SECRECY AGREEMENT

THIS AGREEMENT, made and entered into this ___th day of _____, 20- - by and between IREL (India) Limited, a company incorporated under Indian Companies Act having its registered office at Plot No.1207, , Opp. to Siddhivinayak Temple, Veer Savarkar Marg, Prabhadevi, Mumbai – 400 028, India (hereinafter called "IREL") on one part and _, a company duly incorporated under....., with its registered office.....(hereinafter called _____) includes its successors and permitted assigns, on
the other part.

WITNESSETH :

WHEREAS:

A. IREL intends to purchase _____from _____(Name of the company).

B. _____(Name of the company) intends to produce _____at their project in _____(Name of the place) and intend to sell the same to IREL.

C. The parties, therefore, intend to enter into an MoU and subsequently an agreement for the sale and purchase of _____.

NOW, THEREFORE, in consideration of the premises and the mutual covenants herein contained, the parties hereto agree as follows:

1. The term "Confidential Information" means:

(1) All details supplied by IREL/ (Name of the company) on technical, commercial and other information and data on the Process.

(2) All details supplied by IREL/ (Name of the company) on technical, commercial and other information and data relating to the products.

2 Each party hereto shall keep secret and confidential any and all Confidential information it receives from any other party or parties hereto under this Agreement and shall not use such Confidential Information for any purposes except for the said tender purpose hereunder. The obligations under this Article shall not apply to any information or data that:

(i) at the time of its disclosure hereunder is in the public domain,

(ii) after disclosure hereunder becomes part of the public domain by publication or otherwise through no fault of the party to whom such information or data is disclosed hereunder ("Receiving party") (but only after it is published or otherwise becomes part of the public domain),

(iii) the Receiving Party can show in its possession at the time of disclosure hereunder and which the Receiving party, without breach or any obligation is free to disclose to others, or

(iv) was received by the Receiving Party after the time of disclosure by a party hereto ("Disclosing Party") hereunder from a third party who did not acquire it, directly or indirectly, from the Disclosing Party under an obligation of confidence and which the Receiving party, without breach of any obligation, is free to disclose to others.

For the purpose of this Article 2, information or data which is specific, e.g., those on operating conditions or equipment, shall not be deemed to be within the foregoing exceptions merely because it is embraced by general information or data in the public domain or in the possession of Receiving Party. In addition, any combination of features shall not be deemed to be within the foregoing exceptions merely because individual features are in the public domain or in the possession of the Receiving Party, but only if the combination itself and its principle of operation are in the public domain or in the possession of the Receiving Party.

3 The Receiving Party shall limit the access to the Confidential Information received hereunder to its directors, officers and employees, who (i) need to have access with such Confidential Information, (ii) have been informed of the confidential nature thereof and (iii) have agreed to undertake the obligations of non-disclosure and non-use of such Confidential Information.

4 Upon request of IREL, …….(name of the party) shall, free of charge, promptly return to IREL all the Confidential information received from IREL hereunder.

5 Each party hereto shall not, without the other party's prior express written consents, disclose or allow the disclosure of the existence of this Agreement.

6 It is mutually understood and agreed that no license or other rights are granted to any party hereto under this Agreement, by implication or otherwise, for any of the patents or patents applications of any other party hereto or as to any information and data disclosed by any other party or parties hereto under this Agreement.

7 None of the parties may assign its rights or obligations hereunder without the prior written consent of the other parties.

8 The obligation of non-disclosure and non-use of the Confidential information under this Agreement shall remain in effect for five (5) years after the date hereof and shall terminate upon lapse of said five (5) years.

9 This Agreement shall be governed by and construed in accordance with Indian laws.

10 Each party hereto acknowledges and agrees that monetary damages for any breach or threat of breach of this Agreement are inadequate. Each party hereto shall, therefore, be entitled to seek and obtain temporary and injunctive relief for any breach or threat of breach of this Agreement relating to its Confidential Information, in addition to any other remedy.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed in duplicate by their duly authorized representatives on the day and year first above written. The original shall remain with IREL and the duplicate with ……(name of the party).

1. For _____Witness:

(Name) 1.
Designation

2.

2. For IREL (India) Ltd.

Witness:

(Name) 1.
Designation

2.

VENDOR UP-DATION DETAILS				
Sl #	**Organisation Details**			
1	Name			
2	Address Type (Sales office address / Office Address / warehouse Address / Factory Address)			
	Building /House Number			
	Area/Street Name			
	City			
	State			
	Pin Code			
	Contact Details	Ph No:		
		Mobile No.		
		Email:		
3	Vendor Type (Domestic / Import)			
4	Ownership Information (Private Limited Company/ One Person Company/ Limited Liability Partnership/ Partnership Firm / Proprietorship/ Co-Operative Society/ Trust/ Others).			
5	Nature Of Business (Manufacturer/ Dealer/ Trader/ Distributor/ Stockiest/ Channel Partner/ Indian Sales Office/ Subsidiary of Registered foreign supplier/ Indian Agents/ Service Provider)			
6	Whether Approved By Any Central Government/State Government/ Public Sector Undertakings /Reputed Private Organisations for similar items, for which registration is sought.			
7	PAN No.	Copy of the same may be attached.		
8	GSTIN ID			
9	Audited copies of P&L for the last three FY			
10	Valid MSE Udyam registration certificate, if any.		Yes	No
11	MSE ownership details.			
12	ISO Certification if any			
13	Registered in GEM Portal		Yes	No
14	MSE to confirm if they are registered from TReDs platform		Yes	No
15	Whether supplier/Service Provider is a Start-Up Enterprise. If yes provide the details.			
16	Whether she Company is under Litigation/Arbitration cases during last 5		Yes	No

	years?		
17	Whether company has been delisted/debarred from business with any PSU in India, and the reasons thereof?		
18	**Bank Details**		
	Name of bank:		
	Name of Bank Branch:		
	City/Place:		
	Account Number:		
	Account Type:		
	IFSC Code:		
	MICR Code:		
	Swift Code		
	Self-attested or Bank attested Bank details on Company letterhead or cancelled cheque		
	Current year Solvency Certificate		

Annexure-XIV

PROFORMA FOR BANK GUARANTEE FOR EARNEST MONEY DEPOSIT

In accordance with Notice Inviting Tender (NIT) No._____ Dated _____ for the work of _____ (herein after referred to as "the said Works") for Rs._____ (Rupees_____ only), under RED unit of M/s IREL (India) Limited, a company incorporated under Indian Companies Act, having its registered office at Plot No.1207, ECIL building, Opp. to Siddhivinayak Temple, Veer Savarkar Marg, Prabhadevi, Mumbai – 400028, India (herein after referred to as IREL), M/s _____ Address _____[Herein after referred to as Contractor (s)] wish /wishes to participate in the said tender and a Bank Guarantee for the sum of Rs._____(in words) valid for a period of _____days (in words) is required to be submitted by the Bidder towards the Bid Security.

We the _____Bank (hereinafter called the said Bank) do hereby undertake to pay to IREL, the sum of Rs. _____ (Rupees _____ only) by reason of the said tenderer's failure to enter into an agreement of contract on intimation of acceptance of his tender and/or to commence the contract works and/or failure to deposit the security deposit within the stipulated period as per the terms and conditions relating to and/or governing the contract and/or specified in the Notice Inviting Tender (NIT). We also agree that any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this Guarantee. We also agree that notwithstanding any dispute or difference or any litigation in respect of or arising from the said contract and/or the acceptance of the tender of the tenderer afore stated by IREL including the question as to the tenability of the claim of the IREL for forfeiting the Earnest Money being the Bank Guarantee herein, we shall forthwith pay the said amount to IREL on demand being made as aforesaid.

We _____ Bank further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for entering into an Agreement of contract and that it shall continue to be enforceable till all the dues of the IREL under the terms and conditions of the NIT for the work have been fully paid and its claims satisfied or discharged or till IREL certifies, that the terms and conditions of the NIT have been fully and properly carried out by the said tenderer and accordingly discharges the guarantee.

We _____Bank further agree with the IREL that the IREL shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the NIT and/or terms and conditions governing the contract or to extend the time of validity of the offer from the said tenderer from time to time or to postpone for any time or from time to any of the powers exercisable by the IREL against the said tenderer and to forbear or enforce any of the terms and conditions of the NIT and we shall not be relieved from our liability hereunder by reason of any such variation, or extension being granted to the said tenderer or for any forbearance, act or omission on the part of the IREL or any indulgence by the IREL to the said tenderer or by any such matter or thing whatsoever which under the law relating to surety/guarantee would but for this provision have effect of so relieving us.

We _____Bank do hereby further agree that any change in the Constitution of the said tenderer or the Bank will not affect the validity of this guarantee.

We _____Bank lastly undertake not to revoke this guarantee during its currency except with the previous consent of the IREL in writing.

Notwithstanding anything to the contrary contained herein before :

(i) Our Liability under this.. Bank Guarantee shall not exceed and restricted to Rs..... (in words)

(ii) (ii) This Bank Guarantee shall be valid upto ....., unless extended on demand.

(iii) (iii) The bank is liable to pay the guaranteed amount or any part thereof under this bank Guarantee only if IREL serve a written claim or demand on or before ..... (Three months from the expiry of Guarantee period)

Dated the _____day of _____20—

_____Bank

(Signature with name in Block letters with designation,

Attorney as per power of Attorney No._____dt. _____)

Bank's Common seal

Solvency Certificate Format

[Bank Letterhead]
[Bank Name]
[Branch Address]
Phone: [Branch Contact Number]
Email: [Branch Email]

Date: [DD/MM/YYYY]
Certificate No.: [Unique Reference Number]

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Mr./Ms./M/s. [Client Name]**, having their registered office at **[Client Address]**, is maintaining a banking relationship with us since **[Year]** and is known to us as a respectable customer.

Based on the financial records and dealings with our bank, we certify that the said client is solvent to the extent of **₹ [Amount in figures] (Rupees [Amount in words])** as on date. This certificate is issued at the specific request of the customer for the purpose of **participation in tendering process**.

This certificate is issued without any guarantee or responsibility on the part of the bank or its officials.

For [Bank Name]
Authorized Signatory
(Name & Designation)
(Signature & Seal)