



Bharat Heavy Electricals Limited
(A Government of India Undertaking)
Boiler Auxiliaries Plant
Ranipet-632406

Ref No. S012300033

WORKS CONTRACT MANAGEMENT

NOTICE INVITING e-TENDER	
Tender Notice No	S012300033, Dt. 30.12.2023
Nature of work	Engaging testing agency for Gas, Solid, Slurry, Liquid Testing during Initial Performance Evaluation Test, FGD Plant Operation Optimization Phase and Performance Guarantee(PG) test of Maitree Unit#1 & 2 FGD (2x660MW)
Type of tender	Open tender (Two part bid).
Period of contract	One Year from the date of PO
Earnest Money Deposit (EMD) Amount	Rs. 2,00,000/- (MSE & Start bidders are exempted from remittance of EMD)
Tender download start date	30.12.2023
Last date & Time for Receipt of the Tender	04.01.2024 by 11:00 hrs.
Date of Technical bid Opening	04.01.2024 from 16:00 hrs.
<i>(Please obtain updated information from the e-Procurement portal about the latest applicable dates & other changes if any in the tender contents)</i>	
Date of Price Bid Opening	Bidders whose technical bids are found acceptable will be intimated separately about the status of their offers and the date of opening of Price Bid/ RA.
Submission of Tender	Online submission through BHEL eProcurement Portal website: https://eprocurebhel.co.in/nicgep/app
Tender Opening	Online through e-Procurement Portal
Note:	
1. The Tender documents can be down loaded from BHEL eProcurement Portal website: https://eprocurebhel.co.in/nicgep/app and also BHEL website (https://www.bhel.com/tenders).	
2. BHEL, Ranipet reserves the right to accept or reject any or all tenders without assigning any reasons whatsoever.	
3. All corrigenda, addenda, amendments, clarifications etc. to tender specification will be hosted in the web pages (https://eprocurebhel.co.in/nicgep/app) only.	
4. Bidders shall keep themselves updated with all such developments.	
5. BHEL Ranipet reserves the right to reject any offer on the basis of unsatisfactory performance of the bidder in any ongoing job or any similar job in the past.	
6. BHEL will finalize the contract through reverse auction.	
7. Contract will be awarded to single party on lumpsum basis only.	

Note: - 1) Tenderer should sign and affix seal in all the pages of this tender document and in all supporting documents.

Yours faithfully,
for and on behalf of BHEL.,
Deputy Manager /WCM

We hereby accepted above
(signature & seal of bidder)



Bharat Heavy Electricals Limited
(A Government of India Undertaking)
Boiler Auxiliaries Plant
Ranipet-632406

Ref No. S012300033

Instructions to Bidder

1. Earnest Money Deposit (EMD) amount: Rs. 2,00,000/-

MSE & Start-Ups bidders are exempted from remittance of EMD.

The EMD may be accepted only in the following forms:

- (i) Cash deposit as permissible under the extant Income Tax Act (before tender opening)
- (ii) Electronic Fund Transfer credited in BHEL account (before tender opening)
- (iii) Banker's cheque/ Pay order/ Demand draft, in favour of BHEL (along with offer)
- (iv) Fixed Deposit Receipt (FDR) issued by Scheduled Banks/ Public Financial Institutions as defined in the Companies Act (FDR should be in the name of the Contractor, a/c BHEL)
- (v) Insurance Surety Bonds

In addition to above, the EMD amount in excess of Rs Two lakh may also be accepted in the form of Bank Guarantee from scheduled bank. The Bank Guarantee in such cases shall be valid for at least six months.

Bidders registered as MSE (UDYAM) are exempted from paying EMD subject to submission of valid Registration document along with Tender. These bidders can avail EMD Waiver benefits only if they submit self-attested copy of UDYAM certificate.

EMD shall not carry any interest.

FDR- The bank should certify on it that the deposit can be withdrawn only on the demand or with the sanction of the pledgee. For release of EMD, the FDR will be released in favour of bidder by the Buyer after making endorsement on the back of the FDR duly signed and stamped along with covering letter.

Bidder has to upload scanned copy / Banker's cheque / proof of the DD /FDR/ along with bid and has to ensure delivery of hardcopy to the Buyer within 10 days of Bid End date / Bid Opening date.

2. SECURITY DEPOSIT (EMD)

The total amount of Security Deposit should not be less than five percent (5%) of the contract value. EMD of the successful tenderer shall be converted and adjusted towards the required amount of Security Deposit.

Modes of deposit:

The balance amount to make up the required Security Deposit of the contract value may be accepted in the following forms:

- (i) Cash (as permissible under the extant Income Tax Act)

We hereby accepted above
(signature & seal of bidder)



Bharat Heavy Electricals Limited
(A Government of India Undertaking)
Boiler Auxiliaries Plant
Ranipet-632406

Ref No. S012300033

- (ii) Local cheques of Scheduled Banks (subject to realization)/ Pay Order/Demand Draft/ Electronic Fund Transfer in favour of BHEL
- (iii) Bank Guarantee from Scheduled Banks/ Public Financial Institutions as defined in the Companies Act. The Bank Guarantee format should have the approval of BHEL
- (iv) Fixed Deposit Receipt issued by Scheduled Banks/ Public Financial Institutions as defined in the Companies Act (FDR should be in the name of the Contractor, a/c BHEL)
- (v) Securities available from Indian Post offices such as National Savings Certificates, Kisan Vikas Patras etc. (held in the name of Contractor furnishing the security and duly endorsed/ hypothecated/ pledged, as applicable, in favour of BHEL)
- (vi) Insurance Surety Bonds

(Note: BHEL will not be liable or responsible in any manner for the collection of interest or renewal of the documents or in any other matter connected therewith)

At least 50% of the required Security Deposit, including the EMD, should be collected before start of the work. Balance of the Security Deposit can be collected by deducting 10% of the gross amount progressively from each of the running bills of the Contractor till the total amount of the required Security Deposit is collected.

In case of delay in submission of performance security, enhanced performance security which would include interest (Repo rate + 4%) for the delayed period, shall be submitted by the bidder.

If the value of work done at any time exceeds the contract value, the amount of Security Deposit shall be correspondingly enhanced and the additional Security Deposit shall be immediately deposited by the Contractor or recovered from payment/s due to the Contractor.

The recoveries made from running bills (cash deduction towards balance SD amount) can be released against submission of equivalent Bank Guarantee in acceptable form, but only once, before completion of work, with the approval of the authority competent to award the work.

3. **Bidders have to submit their offers through BHEL NIC portal only.**
4. The Bharat Heavy Electricals Limited, reserves the right to reject any or all the tenders received or accept any tender or part thereof without assigning any reason there for.
5. Should a tenderer or a contractor has a relative or in the case of a firm or company of contractors, any of its shareholders or shareholder's relative, employed in Bharat Heavy Electricals Limited, the authority inviting tenders shall be informed of this fact at the time of submission of the offer, failing which the offer may be disqualified or if such fact subsequently come to light, the contract may be cancelled.
6. BHEL employees and their dependents are NOT eligible to submit their offer against this contract. Even if they submit out of ignorance, the offer shall be disqualified.
7. If the contractor deliberately, gives wrong information in his tender or creates conditions favourable for the acceptance of his tender, Bharat heavy Electricals Limited reserves the right to reject such tender at any stage.

We hereby accepted above
(signature & seal of bidder)



Bharat Heavy Electricals Limited
(A Government of India Undertaking)
Boiler Auxiliaries Plant
Ranipet-632406

Ref No. S012300033

8. Canvassing in any form in connection with the tender is strictly prohibited and the tenders submitted by the contractors who resort to canvassing will be liable for rejection.
9. The tender documents must be signed physically / digitally by Director / Partner of the Firm or by the person holding the Power of Attorney on behalf of the Firm concerned. In the latter case, a copy of Power of Attorney, duly attested by a Notary Public must accompany the tender.
10. The tender schedule, and the tender shall be deemed to form an integral part of the contract to be entered into for this work.
11. Tender can be cancelled at any stage due to unavoidable circumstances.
12. The evaluation currency for this tender shall be INR.
13. Multiple Bids: -

The bidder in his own interest shall submit only one bid. If a bidder submits multiple bids, all the bids are liable for rejection. Bids shall be considered "Multiple" in the following circumstances:

- a) Two bids by the same party
- b) If one bidder is the affiliate of another bidder.

For the purpose of this clause "Affiliate" shall mean with respect to any person, any other person that directly or indirectly, controls, is controlled by, or is under direct or indirect common control with, such person, or is a director/ member/ office/ employee of such person or of any person who would otherwise qualify as an affiliate of such person pursuant to this definition.

"Person" for the purposes of this definition shall mean any natural person, individual, corporation, limited partnership, co-operative, general partnership, joint stock company, joint venture, association, company, trust bank, trust company, land trust, business trust, corporate body or other organization, whether or not a legal entity.

14. Offers of the Contractors/Suppliers, against whom, any unit of BHEL had initiated process for "Suspension of Business Dealings" or already done will summarily be rejected.
15. If at any stage, the document(s) submitted by contractor is/are found incorrect/ false/ manipulated, the necessary action will be taken by BHEL against contractor as per the "Guidelines for suspension of Business dealings".
16. **Suspension of Business dealings with Suppliers:**

Any supplier against whom action has been initiated under "suspension of business dealings with suppliers" are not qualified to participate in this tender. Before submitting offer, prospective bidders are advised to visit our web-site www.bhel.com / supplier registration to familiarize themselves with BHEL's policy and procedures of Suspension of Business Dealings with Suppliers. Submission of offer shall be deemed to be evidence of the Bidder to have read and understood the above said policy.

17. **Treatment of Debarment / Under-performing Vendors:**

We hereby accepted above
(signature & seal of bidder)



Bharat Heavy Electricals Limited
(A Government of India Undertaking)
Boiler Auxiliaries Plant
Ranipet-632406

Ref No. S012300033

- Any supplier who has been put on “Debarment” from having business dealings with BHEL, Ranipet or any other unit of BHEL shall not submit their offer against this tender. If any such offers are received they would be summarily rejected and sent back. During the processing of tender, if any unit of BHEL puts a supplier on “Debarment” then further processing of the offer will not be taken up and in case an order is placed, BHEL, Ranipet may resort at their discretion to cancel the PO either fully or partially.
18. In quoting the rates, the tenderers are advised to take into account of all the factors including any fluctuations in the market rates etc. No claim shall be entertained on this account after acceptance of the tender or during the currency of the contract.
19. **QUOTING: The tenderer should quote the total lump sum price for the entire contract scope. Percentage allocation against each rate schedule is provided in price bid (refer BOQ) for your quoting purpose. Individual schedule rates so derived based on the total lump sum price shall be deemed to be the contract rate for all purpose.**
20. **The price quoted for this tender must be inclusive of all taxes and duties and GST.**
21. **Evaluation of financial bid will be done on exclusive of GST (Cost to BHEL).**
22. **Reverse Auction:** “BHEL shall be resorting to Reverse Auction (RA) (Guidelines as available on www.bhel.com) for this tender. RA shall be conducted among the techno-commercially qualified bidders.

Price bids of all techno-commercially qualified bidders shall be opened and same shall be considered for RA. In case any bidder(s) do(es) not participate in online Reverse Auction, their sealed envelope price bid along with applicable loading, if any, shall be considered for ranking.”

(<https://bhel.com/guidelines-reverse-auction-2021>)

23. The rates quoted in the tender shall remain valid for a period of three months from the date of technical bid opening for acceptance by BHEL. No unsolicited revision in the tender offer shall be entertained after opening of tenders and till expiry of the validity period.
24. Any deviation to this tender terms & conditions and schedules of this tender will lead to total rejection of the offer submitted.
25. The bidders shall closely pursue all the clauses and specifications indicated in the tender documents before quoting. Should the bidder have any doubt the meanings of any portion of the tender specification or find discrepancies or omission in the drawings or the tender documents issued are in complete or shall require clarification on any of the technical aspect, scope of work etc., he shall at once contact the authority inviting the tender for clarification before the submission of the tender.
26. Before tendering, the bidders are advised to inspect the site of work and the environments and be well acquainted with the actual working and other prevalent conditions, facilities available, position of material and labour. No claim will be entertained later, on the ground of lack of knowledge.

We hereby accepted above
(signature & seal of bidder)



Bharat Heavy Electricals Limited
(A Government of India Undertaking)
Boiler Auxiliaries Plant
Ranipet-632406

Ref No. S012300033

27. In the event of expiry or in capacitance of a tenderer after submission of the tender, BHEL may at their discretion cancel their offer/quotation.
28. The tenderers can visit BHEL on working days during office working hours for any clarifications before submitting their offer.
29. **The price bid shall be evaluated as a package. The contract will be finalized based on the overall LOWEST value and will be awarded to single bidder only.**
30. **"Taxpayers with ₹ 5 CRORE PLUS turnover in any financial year from 2017-18 shall issue e-invoices w.e.f 1st August 2023".**
31. **Clause in case of Tie: Clause in case of Tie:**
"In the course of evaluation, if more than one bidder happens to occupy L-1 status, effective L-1 will be decided by soliciting discounts from the respective L-1 bidders. In case more than one bidder happens to occupy L-1 status even after soliciting discounts, L-1 bidder shall be decided by a toss / draw of lots, in the presence of the respective L-1 bidder(s) or their representative(s) - If available, otherwise the same procedures will be carried out to arrive for L1 ranking) Ranking will be done accordingly. BHEL's decision in such situations shall be final and binding."
32. BHEL reserves the right to reject any tender on the basis of unsatisfactory performance of the bidder in any ongoing job or any similar job in the past.
33. Possession of PF registration number is not mandatory. However, the successful tenderer has to register with PF authorities and furnish the registration number before first Running Account Bill.
34. Incomplete offers shall become liable for rejection.
35. All entries in the tender documents should be in one ink. Erasures and over-writings are not permitted. All correspondences and insertions should be duly signed by the tenderers concerned.
36. **Tenderer has to put sign and seal at the bottom right side in all the pages of tender documents.**
37. **The tenderer should fill and sign the "checklist of this Tender document" which forms part of the technical bid.**
38. Conditional tenders, tender containing absurd rates and amounts, tenders which are incomplete or otherwise considered defective and tenders not in acceptance with the tender conditions laid down by the Accepting Officer, are liable for rejection.
39. If a tenderer expires after submission of his offer, the Bharat Heavy Electricals Ltd., may be at their discretion to reject such offer.
40. BHEL reserves the right to negotiate with L1 bidder.
41. Tenderers shall not increase their quoted rates in case BHEL negotiate for reduction of rates, such negotiations shall not amount to cancellation or withdrawn of the original offer and the rates originally quoted shall be binding on the tenderers for a period of three months from the date of opening of tenders.
42. The tenderer should be present if called for negotiation. In case, the tenderer's authorized person is attending the negotiation such person should have the authorization letter and he should be capable of taking spot decisions.

We hereby accepted above
(signature & seal of bidder)



Bharat Heavy Electricals Limited
(A Government of India Undertaking)
Boiler Auxiliaries Plant
Ranipet-632406

Ref No. S012300033

43. **MSE/Start-up CLAUSE: - MSE/ Start-up bidders can avail the intended benefits only if they select MSE preference option in GeM portal and also submit attested copies of UDYAM Certificate {MSE (Micro/Small) bidders} or Start-up certificate recognized by Department for Promotion of Industry & Internal Trade (Start-up bidders), along with the offer. Non submission of such documents will lead to consideration of their bid at par with other bidders. No benefit shall be applicable for this enquiry if required documents are not submitted before price bid opening.**
44. Discrepancy in “words” & “Figures”:
- a) If, in the price structure quoted for the required goods/services/works, there is discrepancy between the unit price and the total price (which is obtained by multiplying the unit price by the quantity), the unit price shall prevail and the total price corrected accordingly, unless in the opinion of the purchaser there is an obvious misplacement of the decimal point in the unit price, in which case the total price as quoted shall govern and the unit price corrected accordingly.
 - b) If there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected; and
 - c) If there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail subject of (a) and (b) above.
 - d) If there is such discrepancy in an offer, the same shall be conveyed to the bidder with target date up to which the bidder has to send his acceptance on the above lines and if the bidder does not agree to the decision of the purchaser, the bid is liable to be ignored.
45. The tenderers are requested to bear in mind the entire operations involved, and the conditions during currency of the contract, and request for rate revision of any kind will not be entertained.
46. BHEL will not be bound by any Power of Attorney granted by the tenderer or on their behalf or changes in the composition of the firm made subsequent to the execution of the contract. They may, however, recognize such power of attorney and changes after obtaining proper legal advice, the cost of which will be chargeable to the contractor concerned.
47. The general and special conditions of contract are complementary to each other and where there is a conflict, the special conditions shall prevail. In regard to matters not covered by the General or Special Conditions of Contract, those contained in the specifications approved by BHEL shall apply.
48. The “GENERAL CONDITIONS, INSTRUCTIONS TO BIDDERS AND SPECIAL CONDITIONS OF CONTRACT” shall be deemed to form an integral part of contract for the work to be entered into.
49. If a ring formation is suspected, BHEL may reject all offers or retender or call new sources who have not been contacted or responded against this tender.
50. BHEL reserves the right to accept or reject the lowest or any other tender or accept or reject any part of such tender without assigning any reasons therefor.
51. All the information as called for in the various clauses and annexure of tender specification should be furnished. The details so furnished should be complete in all respects and as per the formats prescribed in the Tender specification (Statutory

We hereby accepted above
(signature & seal of bidder)



Bharat Heavy Electricals Limited
(A Government of India Undertaking)
Boiler Auxiliaries Plant
Ranipet-632406

Ref No. S012300033

- requirement of Contract). The bidder may have to produce original documents for verification, if so decided by BHEL.
52. Offers received with any deviation or without relevant information are liable to be rejected.
53. **AGREEMENT:** The tenderer after award of work by BHEL through letter of intent/PO shall execute an agreement in the form and the manner as specified by BHEL on non-judicial stamp paper of value not less than Rs.100.00. The cost of stamp paper will be borne by contractor.
54. **STAMPING THE AGREEMENT:** The expenses of completing and stamping the agreement are borne by the contractor.
55. For any tender related clarifications contact 04172-283043/284101. Email Id: arunkumarc@bhel.in and gowthaman@bhel.in.
56. For scope of work /BOQ related queries contact 04172-284243/4066. Email Id: yuvarajr@bhel.in and sashi@bhel.in.
57. **WCM is arranging this contract as a nodal agency. Execution of work, Bill Certification, Bill passing, Payment, Penalty, Contract closing etc., is the responsibility of end user.**

We hereby accepted above
(signature & seal of bidder)



Bharat Heavy Electricals Limited
(A Government of India Undertaking)
Boiler Auxiliaries Plant
Ranipet-632406

Ref No. S012300033

PRE-QUALIFICATION REQUIREMENT

An essential qualification requirement of the contractor for tender submission shall be as under:

1. Financial Pre-Qualification Requirement (PQR):

Bidder must satisfy the following Financial Pre-Qualification Requirement (PQR) for participation in the tender:

- i. An average annual financial turnover of the contractor during the last 3 years ending on 31st Mar 2023 should be at least Rs. 21.39 Lakhs and the bidder should submit audited balance sheet and Profit & Loss Account for the last three years (2020-2021, 2021-2022 & 2022-2023), duly certified by chartered accountant/auditor.
- ii. The bidder should possess experience of having successfully completed similar works during last 7 years ending last day of month previous to the one in which application are invited should be either of the following: -
 - a. Three similar completed works each costing not less than the amount equal to **₹28.52 Lakhs** excluding GST.
 - (OR)
 - b. Two similar completed works each costing not less than the amount equal to **₹35.65 Lakhs** excluding GST.
 - (OR)
 - c. One similar completed work costing not less than the amount equal to **₹57.04 Lakhs** excluding GST.

Similar works means 'contract for flue gas testing or limestone testing or gypsum testing or slurry testing or water testing or any combination thereof for power plant or any industrial application'.

Similar works means 'contract for flue gas testing or limestone testing or gypsum testing or slurry testing or water testing or any combination thereof for power plant or any industrial application'.

Preference to MSE and Start-ups

MSE (Micro/Small) bidders and all start-ups recognized by Department for Promotion of Industry & Internal Trade are exempted from prior experience and prior turnover subject to meeting of quality and technical specifications **as per Annexure-1**.

Documents Required: Udyam registration certificate (For MSE)

Certificate from Department for Promotion of Industry & Internal Trade (For start-ups).

We hereby accepted above
(signature & seal of bidder)



Bharat Heavy Electricals Limited
(A Government of India Undertaking)
Boiler Auxiliaries Plant
Ranipet-632406

Ref No. S012300033

ANNEXURE -1

Technical Pre-Qualification Requirement (PQR):

An essential Technical Pre-Qualification Requirement (PQR) for participation in the tender shall be as under:

- a) Bidder must possess following testing equipment or functionally equivalent equipment as a minimum requirement for the successful performance of the contract.

1. Gas meter
2. S-type pitot tube
3. Dry Air Oven
4. Portable SO₂ gas analyser
5. Analytical balance

Documentary Evidence Required

Bidder must submit latest calibration certificate for at least 4 types of the testing equipment listed above from certified lab/OEM as documentary evidence to qualify in this tender. Calibration certificate should contain bidder's name. Calibration certificate date should not be older than three years on NIT date and it should not be later than NIT date.

No other documentary evidence can be accepted.

(and)

- b) Bidder must submit testing procedure and sample test reports for all the following measurement item along with bid: -

1. Flue Gas SO₂ concentration measurement by titration method
2. Flue Gas O₂, CO₂, H₂O concentration measurement.
3. Limestone Composition Analysis
4. Total S and Total SO₃ concentration measurement in Gypsum
5. Total CO₃, Total SO₃, Liquid SO₃, Liquid Cl concentration measurement in Gypsum Slurry

Non submission of testing procedure and sample test reports for any of the above measurement item will lead to disqualification.

(and)

- c) In addition, bidder shall submit following letter of undertaking on their letter head duly signed.

We hereby accepted above
(signature & seal of bidder)



Bharat Heavy Electricals Limited
(A Government of India Undertaking)
Boiler Auxiliaries Plant
Ranipet-632406

Ref No. S012300033

Letter of undertaking

Bidder confirm that “Testing team members are conversant with sampling method/ procedures, testing standards / methods /procedures, etc., required for successful performance of contract and are capable of testing the sample at site in accordance with the specified testing standards using the testing equipment, preparation & submission of testing reports with relevant calculations. Testing team members are sufficiently familiar with the test operating requirements to operate the testing equipment accordingly”.

We hereby accepted above
(signature & seal of bidder)



Bharat Heavy Electricals Limited
(A Government of India Undertaking)
Boiler Auxiliaries Plant
Ranipet-632406

Ref No. S012300033

PAYMENT TERMS

Payments for the works completed shall be paid based on the invoice raised by the contractor and BHEL Engineer's certification.

Payment will be made within a period of 45 days for MSE & 90 days for Non-MSE and others from the date of submission of invoice along with all the enclosures as called for by BHEL.

Payment will be made only through e-payment (through Electronic Fund Transfer (EFT / RTGS) only after deducting Bank charges as per BHEL terms of payment indicated below.

1. 100% payment for completed works after completion of each testing phase and submission of test report for all measurement items.
2. Income tax will be recovered as per rules.
3. IGST will be reimbursed on producing proof of payment of IGST/ Filing of returns as per GST Law.

Documents to be submitted for processing the invoice:

1. Submission of test report for all measurement items.
2. Work completion certificate by BHEL Engineer.
3. Invoice in triplicate.
4. Proof for GST Remittance.
5. Copy of GST Return filed for earlier month / Quarter as the case may be as per GST Law.
6. Proof for remittance of PF & ESI for workmen for the month.

We hereby accepted above
(signature & seal of bidder)



Bharat Heavy Electricals Limited
(A Government of India Undertaking)
Boiler Auxiliaries Plant
Ranipet-632406

Ref No. S012300033

PENALTY TERMS

If contractor on any day defaulted / delayed sampling or testing of 'flue gas or solid or slurry or liquid' as defined under scope of work due to reasons attributable to contractor which results in delay in the completion of work under the contract, BHEL shall have the right to impose Liquidated Damage/Penalty at the rate of 1.1 times the daily unit rate quoted (under sl. No. 2 of BOQ) for each of day default / delay subject to a maximum of 10% of the contract value.

Contract Value for this purpose, shall be the final executed value exclusive of supplementary / Additional Items.

We hereby accepted above
(signature & seal of bidder)



Special Terms and Conditions of the Contract

1. The testing activity of Unit#2 will start only after completion of the testing activity of Unit#1.
2. Supervision: The agency must deploy a supervisor and a safety steward who would control the activities of the workers and execute the job with proper guidance, safety and interact with BHEL/Customer properly in a well-behaved manner.
3. The work shall not be sub-contracted / delegated.
4. **Statutory Obligations: The agency shall maintain all necessary statutory obligations required for law of the land. BHEL shall be in no way responsible if the agency is found defaulter in any such above case.**
5. Safety Compliances: The agency shall deploy skilled workers for such type of work ensuring safety PPEs with proper induction and permit.
6. Insurance: Necessary Workmen Insurance must be available with the agency to cover the workers in case of any incident/accident.
7. Gate Pass: The agency has to enrol for proper gate pass as per prevailing system at 2x660 MW Maitree site, Bangladesh.
8. Work carried out by BHEL on overlapping areas shall not be included in the claim and any deviations to this will be viewed seriously and treated as a violation to the contract.
9. The minimum safety equipment's as required to be provided by the contractor. The contractor has to follow the site Safety Rules and Regulations as stipulated from time to time would be followed strictly.
10. The contractor has to pay the wages to their workers through worker's Bank account only.

11. **GST: -**

Registration & GST Rate:

- a) Bidder should indicate GSTIN No. (Copy of GST registration to be enclosed) and PAN No. (copy of PAN to be enclosed).
- b) Tender will be considered/ accepted, if & only if the vendor has a valid GST Registration No.
- c) Central Tax/ State Tax/ Integrated Tax/ Union Territory tax to be quoted as extra in %.
- d) Bidders to ensure correct applicability of Central Tax/ State Tax/ Integrated Tax/ Union Territory tax based on the Inter / Intra state movement Supply of goods and provision services or both.

Invoicing & Payment:

- a) The Tax Invoice for supply of Goods & Services should be raised as per the provision of GST Act & Rules and must compulsorily mention the following: -
 - i. BHEL GSTIN: 33AAACB4146P2ZL.
 - ii. HSN Code or Service Accounting Code for supply of goods or services.
 - iii. Name & address of supplier
 - iv. GSTIN of Supplier
 - v. Consecutive Serial Number & date of issue

We hereby accepted above
(signature & seal of bidder)



Bharat Heavy Electricals Limited
(A Government of India Undertaking)
Boiler Auxiliaries Plant
Ranipet-632406

Ref No. S012300033

- vi. Description of goods or services
 - vii. Total value of supply
 - viii. Taxable value of supply
 - ix. Tax Rate – Central Tax & State Tax or Integrated Tax, Cess
 - x. Amount of Tax charged
 - xi. Place of supply
 - xii. Address of delivery if different from place of supply
 - xiii. Signature of authorized signatory
- b) Reimbursement of GST to the vendor is contingent upon complying with the following condition by the service provider: -
- i. Uploading the onward GST Return (GSTR-1) in GSTN Network portal within the statutory time period.
 - ii. Discharging the GST tax liability to the Government.
 - iii. Submission of Tax Invoice to BHEL.
 - iv. Submission of proof of payment of GST to BHEL.
 - v. Availing of Input Tax Credit by BHEL.

Input tax credit:

- a) In case GST credit is delayed/ denied to BHEL, due to non/delayed receipt of goods and/or services and/or tax invoice or expiry of timeline prescribed in GST Law for availing such ITC, or any other reason not attributable to BHEL, GST amount shall be recoverable from Vendor along with interest & penalty levied/ leviable.
- b) In case vendor delays declaring such invoice in his return and GST credit availed by BHEL is denied or reversed subsequently as per GST law, GST amount paid by BHEL towards such ITC reversal as per GST law shall be recoverable from vendor/contractor along with interest & penalty levied/ leviable on BHEL.
- c) In case of discrepancy in the data uploaded by supplier in the GSTN portal or in case of any incomplete work/service, then BHEL will not be able to avail the tax credit and will notify the supplier of the same. Supplier has to rectify the data discrepancy in the GSTN portal or issue credit note (details to be uploaded in GSTN portal).
- d) For any such delay in availing of tax credit for reasons attributable to vendor (as mentioned above), interest as per the GST Act & Rules, along with penalty, if any will be deducted for the delayed period i.e. from the month of receipt till the month tax credit is availed, from the running bills.

Penalty for Non-compliance of GST Act:

Penalty amount so determined along with GST if applicable thereon shall be recovered from the contractor.

Anti-profiteering Measure:

Any reduction in rate of Tax on any supply of goods or services or the benefit of input tax credit shall be passed on to the recipient by way of commensurate reduction in prices.

Other Provisions:

- a) All the terms & conditions of the contract with respect to Taxes & Duties are subject to the new taxation laws introduced from time to time (e.g., GST). The

We hereby accepted above
(signature & seal of bidder)



Bharat Heavy Electricals Limited
(A Government of India Undertaking)
Boiler Auxiliaries Plant
Ranipet-632406

Ref No. S012300033

terms & conditions will be modified in accordance with the provisions of new laws (e.g., GST).

- b) In case any changes in taxes and duties as per Gov. Notification (including GST), the same shall be applicable from time to time.
 - c) If the Contractor is not registered for any statutory obligation and not liable there to, then a declaration shall be submitted along with offer that they are within the threshold limit.
 - d) If any changes in GST (statutory variation) will be to the account of BHEL. But if the variation is effective during the delayed/extended period of execution for reasons attributable to the vendor, the same shall be borne by the contractor only. The required compliance under relevant statute shall be carried out.
12. WCM is arranging this contract as a nodal agency. Execution of work, Bill Certification, Bill passing, Payment, Penalty, Contract closing etc. is the responsibility of end user.
 13. BHEL reserves the right to reduce the contract period (pre-close the contract), with 30 days' notice period depends on the requirement / without assigning any reason. Security Deposit will be refunded, if the contract is pre-closed for non-requirement by BHEL.
 14. The contractor's responsibility for this contract shall commence from the date of issue of order of acceptance of his tender.
 15. BHEL will not bound by any power of Attorney granted by the tenderer or changes in the composition of the firm made subsequent to the execution of the contract. They may, however, recognize such power of attorney and changes after obtaining proper legal advice, the cost of which will be chargeable to the contract concerned.
 16. Words imparting the singular number shall have deemed to include the plural number and vice versa where the context so require.
 17. The expenses for completing and stamping the agreement shall be to the contractor's account.
 18. The general and special conditions of contract are complementary to each other and where they are in conflict, the special conditions shall prevail. In regard to matters not covered by the General or Special conditions of contract, those contained in the specifications approved by BHEL, shall apply.
 19. The "GENERAL CONDITIONS OF CONTRACT" and "SPECIAL CONDITIONS OF THE CONTRACT" shall be deemed to form an integral part of contract for the work to be entered into.
 20. Contractor should employ only persons having sound health and not above the age of 60 years, and not below the age of 18 years.
 21. The Contractor agrees that no claim for interest or damages will be entertained or be payable by BHEL in respect of any money or balances or amounts of whatsoever nature which may be lying with BHEL owing to any disputes or differences between the parties irrespective of whether the same is decided by any authority to be paid or returned to the Contractor."
 22. Certificate by the executing department that all statutory requirements (if applicable) including PF, ESI, Minimum wages, Insurance, GST, etc. are complied with by the Contractor. This should be duly backed by the relevant documents".
 23. The contractor shall provide their employees with Personal Protective Equipment (whatever is applicable) and shall comply all safety regulations under Factories Act. It

We hereby accepted above
(signature & seal of bidder)



Bharat Heavy Electricals Limited
(A Government of India Undertaking)
Boiler Auxiliaries Plant
Ranipet-632406

Ref No. S012300033

is the responsibility of the contractor not only to provide the work force with such safety equipment at their cost as may be considered necessary for the execution of the work but also to ensure their wearing the above safety appliances. BHEL/Site Safety Rules and Regulations as stipulated from time to time would be strictly followed by the contractor.

24. BHEL will not be responsible for any consequences arising out of any violation of rules or acts by the contractor. If BHEL is liable to pay any such amount due to violation of the relevant laws by the contractor the amount so paid would be recovered from the contractor or adjusted from his pending bills.
25. The Contractor shall conform to the provisions of any statute relating to the work and regulations and By-laws of any local authority. The Contractor shall be bound to give all notices required by statute regulations or By-Laws as aforesaid and to pay all fees and taxes payable to any authority in respect thereof.
26. The liability for any compensation on account of injury sustained by an employee of the contractor will be exclusively that of the contractor.
27. BHEL will not bound by any power of Attorney granted by the tenderer or changes in the composition of the firm made subsequent to the execution of the contract. They may, however, recognize such power of attorney and changes after obtaining proper legal advice, the cost of which will be chargeable to the contract concerned.
28. The Contractor agrees that no claim for interest or damages will be entertained or be payable by BHEL in respect of any money or balances or amounts of whatsoever nature which may be lying with BHEL owing to any disputes or differences between the parties irrespective of whether the same is decided by any authority to be paid or returned to the Contractor.
29. In case of any loss to Bharat Heavy Electricals Limited, caused due to stoppage of work without sufficient reason or damage to any equipment or components or any property thereof, due to the negligence and carelessness of the contractor's men, the responsibility shall rest with the contractor. The actual cost of the loss or damage together with the overhead will be recovered from the contractor's bill. The decision of BHEL regarding the cost of loss as well as the extent of cost of damage shall be final and conclusive.
30. Any damage to BHEL materials due to rough and faulty handling by the contractor's men will have to be made good by the contractor to BHEL. Similarly, if any damage caused to BHEL equipment/ installation, property of third party in the course of work by the contractor's men, the same shall be made good by the contractor.
31. "The Contractor shall be liable for the loss or damage to such property from whatever cause, including but not limited to theft, fire, destruction or damage of property due to reasons beyond the control of the Contractor, happening while such property is in the possession or under the control of the Contractor, their employees, workmen or agents or any other person connected with the Contractor."
32. BHEL will not be responsible for any consequences arising out of any violation of rules or acts by the contractor. If BHEL is liable to pay any such amount due to violation of the relevant laws by the contractor the amount so paid would be recovered from the contractor or adjusted from his pending bills.

We hereby accepted above
(signature & seal of bidder)



33. COMPENSATION TO CONTRACT WORKERS:

BHEL shall recover the amount of compensation paid to victim(s) by BHEL towards loss of life / permanent disability due to an accident which is attributable to the negligence of contractor, agency or firm or any of its employees as detailed below.

- i) **Victim:** Any person who suffers permanent disablement or dies in an accident as defined below.
- ii) **Accident:** Any death or permanent disability resulting solely and directly from any unintended and unforeseen injurious occurrence caused during the manufacturing/ operation and works incidental thereto at BHEL factories / offices and precincts thereof, project execution, erection and commissioning, services, repairs and maintenance, trouble shooting, serving, overhaul, renovation and retrofitting, trial operation, performance guarantee testing undertaken by the company or during any works / during working at BHEL Units / Townships and premises / Project Sites.
- iii) **Compensation in respect of each of the victims:**
 - a) In the event of death or permanent disability resulting from Loss of both limbs:
Rs.10,00,000/- (Rs. Ten Lakh)
 - b) In the event of other permanent disability: **Rs.7,00,000/- (Rs. Seven Lakh)**
- iv) **Permanent Disablement:** A disablement that is classified as a permanent total disablement under the proviso to Section 2 (I) of the Employee's Compensation Act, 1923."

The compensation details are provided at:

<http://intranet.bhel.in/HR%20Circulars/HR%20Circular%20No.%20016%20OF%202018.pdf>

We hereby accepted above
(signature & seal of bidder)



General Conditions of Contract

1. DEFINITION: -

In these General Conditions of Contract, the following terms shall have the meaning hereby assigned to them, except where the context otherwise requires: -

- a) The "Contract" means, the documents forming the tender and acceptance thereof, together with all the documents referred to therein including general and special conditions to contract. All these documents as applicable taken together shall be deemed to form one contract and shall be complementary to one another.
- b) The "Work" means, the work described in the tender documents in individual work-orders as may be issued from time to time to the contractor by the officer-in charge with in the power conferred upon him including all notified or additional items of works and obligations to be carried out as required for the performance of contract.
- c) The "Contractor" means, the individual firm or company whether incorporated or not, undertaking the work and shall include the legal personal representatives of such individuals or the persons composing the firm or company or the successors of the form or company and the permitted assigns of such individual or firm or company.
- d) "The officer-in charge" means, the office deputed by the AGM/WCM to supervise the work or part of the work.
- e) "Approved" and "Directed" means, the approval or direction of AGM/WCM, or person deputed by him for the particular purposes.
- f) "BHARAT HEAVY ELECTRICAL LIMITED" (herein after referred to as BHEL) shall mean the Board of Directors, Chairman, Executive Director, General Manager or other administrative office of the said company including AGM/WCM authorized to invite tenders and enter into contract for works on behalf of the company.
- g) The "Contract sum" means, the sum accepted or the sum calculated in accordance with the prices accepted in tender and / or the contract rates as payable to the contractor for the execution of work during the currency of the contract.
- h) A "week" means, seven days, without regard to the number of hours worked or not worked in any day in that week.
- i) A "day" means, the day of 24 hours (Twenty-Four) irrespective of the number of hours worked or not worked in that day.
- j) A "working day" means, any day other than that prescribed by the NEGOTIABLE INSTRUMENTS ACT as being a holiday, and consists of the number

We hereby accepted above
(signature & seal of bidder)



Bharat Heavy Electricals Limited
(A Government of India Undertaking)
Boiler Auxiliaries Plant
Ranipet-632406

Ref No. S012300033

of hours of labour as commonly recognized by good employers in the trade in the district where the work is carried out or as laid down in the BHEL regulation.

2. **HEADING TO THE CONTRACT CONDITIONS:** -

The heading to these conditions shall not affect the interpretations thereof.

3. **WORK TO BE CARRIED OUT:** -

The contract shall, include all labour, materials, tools, plant, equipment, transport etc. which may be required for the execution of work. The contractor will be deemed to have satisfied himself as to the nature of the site, local facilities of access and all matters affecting the execution of work. No extra charges consequent on any misunderstanding in these respects or otherwise will be allowed.

4. **DEVIATIONS:** -

The contractor shall not carry out any work not covered by schedule except in the pursuance of the written instructions of AGM/WCM. No such work shall be valid unless the same has been specifically confirmed and accepted by the BHEL in writing and incorporated in the contract.

5. **OCTROI AND OTHER DUTIES:** -

All charges on account of octroi terminal or sales tax or other duties on materials obtained for the work shall be borne by the contractor.

6. **PLANT AND EQUIPMENT:** -

The contractor shall at his own expense, supply all tools, plant and equipment (herein after referred to as T&P) required for the execution of the contract.

7. **ASSIGNMENT OF TRANSFER OF CONTRACT:** -

The contractor shall not without the prior written approval of the BHEL, assign or transfer the contract or any part thereof, or any share, or interest thereon to any other persons. No sum of money which may become payable under the contract shall be payable to any person, other than the contractor unless the prior written approval of the BHEL to the assignment or transfer of such money is given.

8. **SUB-CONTRACT:** -

The contractor shall not sub-let any portion of the contract without the prior written approval of the BHEL.

9. **COMPLIANCE TO REGULATIONS AND BYE-LAWS:** -

The contractor shall confirm to the provisions of any statute relating to the work and regulations and bye-laws of any local authority. The contractor shall be bound to give all notices required by statute regulations or by-laws as aforesaid and to pay all fees and taxes payable to any authority in respect thereof.

10. **SECURITY DEPOSIT:** -

SECURITY DEPOSIT shall be collected from the successful tenderer. The total amount of security deposit will be 5% of the contract value.

We hereby accepted above
(signature & seal of bidder)



Bharat Heavy Electricals Limited
(A Government of India Undertaking)
Boiler Auxiliaries Plant
Ranipet-632406

Ref No. S012300033

Mode of Deposit:

- Cash (as permissible under the extant Income Tax Act)
- Local cheques of Scheduled Banks (subject to realization)/ Pay Order/ Demand Draft/ Electronic Fund Transfer in favour of BHEL.

Following are the steps for online submission of Security Deposit-

(i) Pay online (SBI Collect)

- Visit <https://www.onlinesbi.sbi/sbicollect/icollecthome.htm>
- Select "Tamilnadu" in "filter by state"
- Select category as "PSU-PUBLIC SECTOR UNDERTAKING"
- Search as "BHEL BAP RANIPET" in the search bar.
- Select "BHEL BAP RANIPET"
- Select "Security Deposit of Vendor" in the drop down menu under "Select Payment Category"
- Now Fill in the required details and ensure correctness of data filled. Ensure that you are entering correct enquiry/tender number and other details correctly.
- Make payment for SD as required in tender after entering the details.

(ii) Bidders can pay "Security Deposit" through online on below account:

NAME OF BANK	STATE BANK OF INDIA
BANK BRANCH ADDRESS	STATE BANK OF INDIA BHEL PROJECT BRANCH MUKUNDARAYA PURAM BHEL TOWNSHIP RANIPET-632406
ACCOUNT NO	10664849171
MICR CODE	632002003
IFSC CODE	SBIN0007013
SWIFT CODE	SBININBB450

- Bank Guarantee from Scheduled Banks/ Public Financial Institutions as defined in the Companies Act. The Bank Guarantee format should have the approval of BHEL
- Fixed Deposit Receipt issued by Scheduled Banks/ Public Financial Institutions as defined in the Companies Act (FDR should be in the name of the Contractor, a/c BHEL)
- Securities available from Indian Post offices such as National Savings Certificates, Kisan Vikas Patras etc. (held in the name of Contractor furnishing the security and duly endorsed/ hypothecated/ pledged, as applicable, in favour of BHEL)

We hereby accepted above
(signature & seal of bidder)



Bharat Heavy Electricals Limited
(A Government of India Undertaking)
Boiler Auxiliaries Plant
Ranipet-632406

Ref No. S012300033

f. Insurance Surety Bonds

(Note: BHEL will not be liable or responsible in any manner for the collection of interest or renewal of the documents or in any other matter connected therewith)

At least 50% of the required Security Deposit, should be collected before start of the work. Balance of the Security Deposit can be collected by deducting 10% of the gross amount progressively from each of the running bills of the Contractor till the total amount of the required Security Deposit is collected.

In case of delay in submission of performance security, enhanced performance security which would include interest (Repo rate + 4%) for the delayed period, shall be submitted by the bidder.

If the value of work done at any time exceeds the contract value, the amount of Security Deposit shall be correspondingly enhanced and the additional Security Deposit shall be immediately deposited by the Contractor or recovered from payment/s due to the Contractor.

The recoveries made from running bills (cash deduction towards balance SD amount) can be released against submission of equivalent Bank Guarantee in acceptable form, but only once, before completion of work, with the approval of the authority competent to award the work.

Security deposit shall not carry any interest.

11. Security deposit shall be refunded only after successful completion of the contract to BHEL's satisfaction and presents an absolute "No Demand Certificate" in the prescribed form and returns properties belonging to BHEL handed over, lent or hired by him for carrying out the said works, Security Deposit will be released to the Contractor after deducting all cost of expenses or other amounts that are to be paid to BHEL under this or other contracts entered into with the Contractor. It may be noted that in no case the Security Deposit shall be refunded/released prior to passing of final bill.
12. Should a tenderer or a contractor has a relative or in the case of a firm or company of contractors, any of its shareholders or shareholder's relative, employed in Bharat Heavy Electricals Ltd, the authority inviting tenders shall be informed of this fact at the time of submission of the offer, failing which the offer may be disqualified or if such fact subsequently come to light, the contract may be cancelled.
13. BHEL shall not be responsible for any loss of securities, due to liquidation for any other reasons, what-so-ever or any depreciation in the value of the securities while in their charge or for any loss of interest there on.
14. All compensation or other sums of money payable by the Contractor to BHEL under the terms of this contract or under any other contract with BHEL may be deducted

We hereby accepted above
(signature & seal of bidder)



Bharat Heavy Electricals Limited
(A Government of India Undertaking)
Boiler Auxiliaries Plant
Ranipet-632406

Ref No. S012300033

from the Security Deposit or realised by the sale of the securities or from the interest arising therefrom or from any sums which may be due or may become due to the contractor by BHEL and in the event of this Security Deposit being deducted by reason of such deductions or sale, as aforesaid, the Contractor shall within 7 days thereafter, make good in cash or in securities endorsed as aforesaid, any sum by which the Security Deposit has been reduced.

15. ORDERS UNDER THE CONTRACT: -

All orders, notices etc. to be given under the contract shall be in writing, type-script or printed and if sent by registered post to the address given in the tender of the contract, shall be deemed to have been served on the date, when in the ordinary course they would have been delivered to him.

16. CONTRACTOR'S SUPERVISION: -

The contractor shall either himself supervise the execution of the contract or shall appoint a complement agent acceptable to the AGM/WCM to act in his stead. Orders given to the contractor's agent shall be considered to have the same force as if they have been given to the contractor himself. The contractor or his accredited agent shall attend when required without making any claim for doing so, either the office of the AGM/WCM or the OFFICE-IN CHARGE, to received instructions.

17. The AGM/WCM shall have full powers and without assigning any reason, required the contractor to immediately cease to employ in connection with this contract, any agent, servant or employee where continued employment is in his opinion undesirable. The contractor shall not be allowed any compensation on this account.

18. LABOUR: -

The contractor shall remain liable for the payment of all wages or other moneys to his work people or employees under the payment of wages act 1936, Employees Liability Act 1938, Workmen Compensation Act 1923 or any other Act or enactment, relating thereto and rules framed, thereunder from time to time.

19. PRECAUTIONS UNDER RISK: -

The contractor shall be responsible for providing at his own expense for all precautions to prevent loss or damage from any and all risks and to minimize the amount of any such loss or damage and for the necessary steps to be taken for the said purposes.

20. DAMAGE & LOSS TO PRIVATE PROPOERTY & INJURY TO WORKMEN: -

The contractor shall at his own expenses reinstate and make good to the satisfaction of the AGM/WCM and pay compensation for any injury, loss or damage occurred to any property or rights whatever including property and rights of BHEL (or agents) servants or employee of BHEL, the injury loss or damage arising out of or in any way in connection with the execution or purported execution of the contract and further

We hereby accepted above
(signature & seal of bidder)



Bharat Heavy Electricals Limited
(A Government of India Undertaking)
Boiler Auxiliaries Plant
Ranipet-632406

Ref No. S012300033

the contractor shall indemnify, the BHEL against all claims enforceable against BHEL (or any agent, servant or employee of BHEL) or which would be so enforceable against BHEL where BHEL is a private person, in respect of any such injury (including injury resulting I death) loss or damage to any person whomsoever or property including all claims which may arise under the workmen's compensation act or otherwise.

21. LAWS GOVERNING THE CONTRACT: -

The contract shall be governed by the India laws for time being in force.

22. CANCELLATION OF CONTRACT FOR CORRUPT ACTS: -

BHEL, whose decision shall be final and conclusive, shall without prejudice to any other right or remedy which shall have accrued shall accrue thereafter to BHEL cancel the contract in any if the following cases and the contractor shall be liable to make payment to BHEL for any loss or damage resulting from any such cancellation to the same extend as provided in the case of cancellation for default.

If the contractor shall: -

- a) Offer or give or agree to give to any person in BHEL service any gift or consideration of any kind, as an inducement or reward for doing or for bearing to do or for having done or for borne to do any act, in relation to the obtaining or execution of this or any other contract for BHEL service.

(OR)

- b) enter in to a contract with BHEL in connection with which commission has been paid or agreed to be paid by him or with his knowledge, unless the particulars of any such commission and the terms of payment thereof have previously been disclosed in writing to BHEL.

(OR)

- c) obtain a contract with BHEL as a result of ring tendering or by non-bonfire methods of competitive tendering, without first disclosing the fact in writing to BHEL.

23. RISK PURCHASE CLAUSE AS PER BHEL SOP DT. 10.10.2017: -

If the contractor fails to carry out the specified works as per the contract scope of work within the timeframe as directed by AGM/WCM or his authorized officials and continues in that state after a reasonable notice from AGM/WCM or his authorized officials, BHEL reserves the right to have the work done by any means at the Contractor's risk and expenses provided always that in the event of the cost of the work so done (as certified by authorized officials of User department which is final and conclusive) being less than the contract cost, the advantage shall accrue to the BHEL and if the cost exceeds the money due to Contractor under the contract, the Contractor shall either pay the excess amount ordered by AGM/WCM or the same shall be recovered from the Contractor by other means.

We hereby accepted above
(signature & seal of bidder)



Bharat Heavy Electricals Limited
(A Government of India Undertaking)
Boiler Auxiliaries Plant
Ranipet-632406

Ref No. S012300033

24. CANCELLATION OF CONTRACT FOR INSOLVENCY ASSIGNMENT OF TRANSFER OR

SUBLETTING OF CONTRACT: -

BHEL, without prejudice to any other right or remedy, which shall have accrued or shall accrue thereafter to BHEL shall cancel the contract in any of the following cases:

If the contractor,

- a) being an individual or if a firm any partner thereof shall at any time be adjudged bankrupt or have a receiving order for administration of his estate, made against him or shall take any proceedings for liquidation or composition under any bankruptcy Act or assignment of his effects of composition or arrangement for the benefit of his creditors or purport to do so, or if any application made under any Bankruptcy Act for the time being in force for the sequestration of his estate or if a trust deed be granted by him on behalf of his creditors

(OR)

- b) being a Company, shall pass a resolution or the Court shall make an order for the liquidation of its affairs, or a receiver or Manager on-behalf of the debenture holders shall be appointed or circumstances shall arise which entitle the Court or debenture holders to appoint a receiver or Manager,

(OR)

- c) Assigns, Transfers, Sub-lets or attempts to assign, transfer or sub-let any portion of the work without the prior written approval of the BHEL.
- d) Whenever BHEL exercise the authority to cancel the contract under this conditions, BHEL may have the work done by any means at the Contractor's risks and expenses provided always that in the event of the cost of the work so done (as certified by concerned executive of User department which is final and conclusive) being less than the contract cost, the advantage shall accrue to the BHEL and if the cost exceeds the money due to Contractor under the contract, the Contractor shall either pay the excess amount ordered by AGM/WCM or the same shall be recovered from the Contractor by other means.
- e) In case BHEL carries-out the work under the provisions of this condition the cost to be taken into account in determining the excess cost to be charged to the Contractor under this condition shall consist of the cost of the materials, hire charges of tools and plants and/or labour provided by the BHEL with an addition of such percentage to cover superintendence and establishment charges as may be decided by the AGM/WCM whose decision shall be final and conclusive.

25. CANCELLATION OF CONTRACT IN PART OR FULL FOR CONTRACTOR'S DEFAULT: -

If the contractor,

We hereby accepted above
(signature & seal of bidder)



Bharat Heavy Electricals Limited
(A Government of India Undertaking)
Boiler Auxiliaries Plant
Ranipet-632406

Ref No. S012300033

- a) makes default in carrying out the work as directed and continues in that state after a reasonable notice from AGM/WCM or his authorised representative.
- b) fails to comply with any of the Terms and Conditions of the contract or after reasonable notice in writing with orders properly issued thereunder.
- c) BHEL, may without prejudice to any other right or remedy which shall have accrued or shall accrue thereafter to BHEL CANCEL the contract as whole or in part thereof or only such work order or items of work in default from the contract. Whenever BHEL exercise the authority to cancel the contract as whole or part under this condition BHEL may complete the work at the contractor's risk and cost (as certified by concerned executive of User department which is final and conclusive) being less than the contract cost, the advantage shall accrue to the BHEL. If the cost exceeds the moneys due to the Contractor under this contract the Contractor shall either pay the excess amount ordered by AGM/WCM or the same shall be recovered from the Contractor by other means. In case the BHEL carries out the work or any part thereof under the provisions of the conditions the cost to be taken into account in determining the excess cost to be charged to the Contractor under this condition shall consist of the cost of the materials, hire charges of tools and plant and/or labour provided by the BHEL with an addition of such percentage to cover the superintendence and establishment charges as may be decided by the AGM/WCM whose decision shall be final and conclusive.

26. TERMINATION OF CONTRACT ON THE DEATH OF CONTRACTOR: -

Without prejudice to any of the rights or remedies under this contract, if the Contractor dies, or if the firm is dissolved or the company is liquidated BHEL shall have the option of terminating the contract without compensation to the Contractor.

27. SPECIAL POWER TO TERMINATION: -

If at any time after the award of contract, BHEL shall for any reason whatsoever not require whole or any part of the work to be carried out the AGM/WCM shall give notice in writing of the fact to the Contractor who shall have no claim to any payment of compensation or otherwise howsoever on account of any profit or advantage which he might have derived from the execution of the work in full but which he did not derive in consequence of the fore-closing of the work.

"If any employee/labourer working in the contract is found involved in corruption activities, the contract will be terminated and the contractor will be banned for applying for any future contract for 3 years."

28. RECOVERY FROM CONTRACTOR: -

We hereby accepted above
(signature & seal of bidder)



Bharat Heavy Electricals Limited
(A Government of India Undertaking)
Boiler Auxiliaries Plant
Ranipet-632406

Ref No. S012300033

Whenever under the contract, any sum of money, shall be recoverable from or payable by the Contractors, the same may be deducted from or any sum then due or which at any time thereafter may become due to Contractor under the contract or under any other contract with BHEL or from his Security Deposit or he shall pay the claim on demand.

29. BREACH OF CONTRACT, REMEDIES AND TERMINATION:

In case of breach of contract, wherever the value of security instruments like performance bank guarantee available with BHEL against the said contract is at least 10% of the contract value, the same be encashed. In case the value of the security instruments available is less than 10% of the contract value, the balance amount be recovered from other financial remedies (i.e. available bills of the contractor, retention amount, etc. with BHEL) or legal remedies be pursued. The balance scope shall be got done independently without Risk & Cost of the failed supplier/ contractor. Further, levy of liquidated damages, debarment, termination, de-scoping, short-closure, etc., shall be applied as per provisions of the contract.

30. POST TECHNICAL AUDIT OF WORK AND BILLS: -

BHEL reserves the right to carry out the post-payment Audit and technical examination of the work and final bill including all supporting vouchers, abstracts etc., and enforce recovery of any sum becoming due as a result thereof in the manner provided in the presiding sub-paragraphs. However, no such recovery shall be enforced after three years of passing the final bill.

31. SIGNING OF CONTRACT: -

Each contract document shall be signed by the Contractor with his usual signature. Contract by partnership of Hindu Joint Family firm, may be signed in the FIRM'S name by one of the Partners or the Karta or Manager as the case may be or by any other duly authorised representative followed by the name and designation of the persons so signing. Contracts by a Company shall be signed with the name of the Company by a person authorised in this behalf and a power of attorney or other satisfactory proof showing that the persons signing the Contract documents on behalf of the Company is duly authorised to do so, shall accompany the contract.

32. FORCE MAJEURE CLAUSE: -

If, at any time during the continuance of this Contract the performance in whole or in part by either party of any obligations under this Contract shall be prevented or delayed by reason of any War, Hostile acts of the public enemy Civil Commotion, Epidemics, or Acts of God (Floods, Storm/Cyclone, Hurricane, Earth Quake etc.) then provided notice of happening of any such event is given by either party to other within 7 days from the date of occurrence therefore neither party shall by reason of such event be entitled to terminate this Contract nor shall either party have any claim for damages against the other in respect of such non-performance and delay in performance under the contract shall be resumed as soon as practicable after such event has come to an end or ceased to exist. If the performance in whole or part of

We hereby accepted above
(signature & seal of bidder)



Bharat Heavy Electricals Limited
(A Government of India Undertaking)
Boiler Auxiliaries Plant
Ranipet-632406

Ref No. S012300033

any obligation under this Contract is prevented or delayed by reason of any such event, claims for extension of time shall be granted for periods considered reasonable by the AGM/WCM subject to prompt notification by the contractor.

33. ARBITRATION: -

All disputes between the parties to the contract, arising out of or relating to the contract, other than those for which the decision of the AGM/WCM or Accepting Officer or any other person is by the contract expressed to be final and conclusive. All disputes between the parties to the Contract, arising out of or relation to the Contract shall after written notice by either party to the Contract to the other party be referred and resolved by an Arbitrator nominated by the Unit Head of BHEL, Ranipet.

Unless the parties otherwise agree, such reference shall not take place until after the completion, alleged completion or abandonment of the work of the determination of the contract. The venue of Arbitration shall be such a place or places as may be fixed by the Arbitrator in his sole discretion. The award of the Arbitrator shall be final, conclusive and binding on both parties to the contract. Subject to the above, Courts at Ranipet alone shall have exclusive jurisdiction of any matter arising in connection with this Agreement.

34. Arbitration and Jurisdiction:

a) The jurisdiction for any arbitration/settlement of contractual/ legal issues between contractee and contractor, shall only be at the court of Ranipet. Any dispute between BHEL and the Contractor arising out of or in connection with this Contract, other than those for which BHEL decision is final, shall be referred to arbitration by a sole arbitrator to be appointed by BHEL, BAP Ranipet.

b) The place of Arbitration shall be Ranipet, Tamil Nadu. The arbitrator may hold meetings for convenience at such places as per his discretion.

c) The award of the Arbitrator shall be final, conclusive and binding on both parties to the contract

d) Subject to the above, the courts at Ranipet alone have the jurisdiction to decide any dispute arising out of or in respect of the Contract."

35. CHANGE IN CONSTITUTION OF FIRM: Changes in constitution of firm whenever it is made after submission of application or during currency of the contract, the existing firm has to duly inform the proposed changes to contracting department of BHEL at the appropriate time before the changes in the constitution are made. In case the absence of any such information BHEL is not responsible for the consequences arising out of the absence or suppression of information and the issue / dispute arising out of these changes and the firm is responsible for settling the issue or dispute among themselves (Partners etc.) or with the bankers or with any third party. Under the above circumstances when dispute arises and the firm does not inform the change in the constitution of the firm BHEL has the right for suspending or terminating the contract.

36. FRAUD PREVENTION POLICY: -

We hereby accepted above
(signature & seal of bidder)



Bharat Heavy Electricals Limited
(A Government of India Undertaking)
Boiler Auxiliaries Plant
Ranipet-632406

Ref No. S012300033

The Bidder along with its associate/ collaborators/ sub-contractors/ sub-vendors/ consultants/ service providers shall strictly adhere to BHEL Fraud Prevention Policy displayed on BHEL website <http://www.bhel.com> and shall immediately bring to the notice of BHEL Management about any fraud or suspected fraud as soon as it comes to their notice.

37. **SECURITY OF CONFIDENTIAL INFORMATION:** The Contractor undertakes and agrees that he/it will not disclose or reveal in part or full the proprietary/confidential information, which terms shall mean and include patents, trademarks, service marks, registered designs, copyright, design rights, know-how, confidential information, trade and business names and any other similar protected information of BHEL received during negotiation or currency of the contract to any third party or governmental authorities without written permission from BHEL. In the event of termination or expiry of the contract, the contractor shall return all proprietary/confidential information to BHEL. This clause shall survive termination or expiry of the contract.

All the input details: transmittals and sample drawings supplied for preparation of drawings are confidential information of BHEL for specific purpose only. The contractor shall never pass on / part with the information to anybody and shall maintain the secrecy of the information. As soon as the bills are certified by BHEL, all the relevant drawing files shall be erased from PCs and shall not be made use under any circumstances.

BHEL reserves the right to initiate appropriate action including legal proceeds / termination of contract, recovery of damages, penalties etc., if the contractor is found guilty / wrong usage of the documents given by BHEL for any unauthorised activity.

38. **SETOFF CLAUSE:** -

"BHEL shall have the right to recover any money which in the sole opinion of BHEL is due from the Contractor from any money due to the Contractor under this Contract or any other contract or from the Security Deposit furnished by the Contractor under this Contract or any other contract. "

39. Notwithstanding anything to the contrary, including, but not limited to, provisions relating to extension of time and compensation/ or delay, time shall be the essence of the contract.
40. "Where the Contractor (whether a proprietorship, partnership, company, Hindus Undivided Family or otherwise) commits a default or breaches the Contract and the proprietor/ partner/director/ member of such entity is also a proprietor/ partner/ director/ member of another entity that is registered with BHEL (in Ranipet or any other unit of BHEL), BHEL shall have the right to recover losses due to the default or breach, whether direct, indirect or consequential, either from the defaulting/ breaching entity or the other said entity or both. Such right shall also include the right to encash any security (in any form such as but not limited to bank guarantee, demand draft, FD, etc.) _ furnished by either or both entities. Without limiting the applicability

We hereby accepted above
(signature & seal of bidder)



Bharat Heavy Electricals Limited
(A Government of India Undertaking)
Boiler Auxiliaries Plant
Ranipet-632406

Ref No. S012300033

of the foregoing, it shall not be a defence to the other said entity for enforcement of such a right that:

- (a) both entities are legally distinct/ separate entities, or
- (b) the management of the entity/ partners/ directors/ members of such other entity were not aware that the proprietor/ partner/ director/ member of the defaulting/ breaching entity was also a proprietor/ partner/ director/ member of the other said entity."

41. The Successful Tenderer shall agree to the following conditions:

Contractor shall indemnify and keep indemnified BHEL, its other contractors and/or sub-contractors and its/their employees from all actions, proceedings, suits, claims, demands, liabilities, damages, losses, costs, charges, expenses judgments and fines arising out of or in the course of, or caused by the execution of work under the Contract or other obligations hereunder directly or indirectly associated herewith which may arise due to:

- i) breach of law by the Contractor, or any of its sub-contractor, or any of their respective employees.
- ii) negligence or wilful default by the Contractor, or any of its sub-contractor, or any of their respective employees.
- iii) failure by Contractor to proceed with Project in accordance with the determinations, instructions and clarifications of Company pending disagreement, dispute, protest, request for arbitration/ court proceedings.
- iv) loss of property or death of any employee of BHEL or of its other contractors/ sub-contractors.

The above shall be without prejudice to any other remedy that may be available to BHEL whether as per law, contract, equity or otherwise. The quantum of work/ nature of work to be carried out by the hired crane will be decided by BHEL from time to time and the availability of the combination of work.

- 42.** All statutory requirements under Minimum Wages Act, 1948, Factories Act 1948, Workmen Compensation Act 1923, Employees Provident Fund and Miscellaneous Provisions Act, 1952, Payment of Gratuity Act 1972, Employee State Insurance Act 1948, Contract Labour (R&A) Act 1970, Payment of Bonus Act 1965, Income Tax Act, Service Tax Act and all other applicable Acts shall be complied with by the Contractor.
- 43. MOTOR VEHICLE ACT:** The contractor should comply the relevant Motor Vehicle Act and other statutory requirement, if applicable.
- 44.** Contractor shall comply with all statutory requirements, rules, regulations, notifications in relation to employment of his employees issued from time to time by the concerned authorities.
- 45.** Contractor shall indemnify BHEL against all claims and losses under various Labour Laws, statutes or any civil or criminal law in connection with employees deployed by him.
- 46.** Contractor wherever applicable shall maintain proper records prescribed by the concerned statutory authorities and provides a copy of the same to BHEL.

We hereby accepted above
(signature & seal of bidder)



Bharat Heavy Electricals Limited
(A Government of India Undertaking)
Boiler Auxiliaries Plant
Ranipet-632406

Ref No. S012300033

47. Contractor shall furnish proper returns to the concerned statutory authorities and provide a copy of the same to BHEL.
48. No interest shall be payable by BHEL on Security Deposit/ or any money due to the Contractor by BHEL.
49. Time is the essence of contract and hence any delay in Execution of contract will attract penal action by BHEL by deduction of such amounts as may be fixed by BHEL as compensation for the delay of work. This is without prejudice to conditions of contract mentioned elsewhere regarding deduction for taking alternative action / cancellation of contract.
50. **BHEL shall recover the amount of compensation paid to victim(s)** by BHEL towards loss of life/permanent disability due to an accident which is attributable to the negligence of contractor, agency or firm or any of its employees as detailed below. a). Victim: Any person who suffers permanent disablement or dies in an accident as defined below. b). Accident: Any death or permanent disability resulting solely and directly from any unintended and unforeseen injurious occurrence caused during the manufacturing/operation and works incidental thereto at BHEL factories/offices and precincts thereof, project execution, erection and commissioning, services, repairs and maintenance, trouble shooting, serving, overhaul, renovation and retrofitting, trial operation, performance guarantee testing undertaken by the company or during any works/ during working at BHEL units/officers/townships and premises/ project sites. c). Compensation in respect of each of the victims: (i) In the event of death or permanent disability resulting from Loss of both limbs: **Rs.10,00,000/-** (Rs. Ten lakh) (ii) In the event of other permanent disability: **Rs.7,00,000/-** (Rs. Seven lakh) d). Permanent Disablement: A disablement that is classified as a permanent total disablement under the proviso to section 2 (I) of the Employee's Compensation Act, 1923.
51. For every month, the contractor shall prepare & submit bill in the succeeding month within one week from the date of certification of quantity by user dept.
52. Any billing related query, clarification, document requirement, etc. shall be resolved in one go by the Contractor within one week from the date of intimation.
53. **SUBMISSION OF BILLS BY CONTRACTOR:** - The Contractor at the end of each month shall submit a bill in triplicate detailing the various items of work done during the month supported by the requisitions issued from time to time. The Contractor shall, once in every month, submit to the concerned executive of User department. separately details of his claims for the work done by him up to and including the previous month which are not covered by his contract agreement in any of the following respects:
- a. Deviation from the items provided in the contract documents.
- b. Extra items / new items of work.

We hereby accepted above
(signature & seal of bidder)



Bharat Heavy Electricals Limited
(A Government of India Undertaking)
Boiler Auxiliaries Plant
Ranipet-632406

Ref No. S012300033

c. Items in-respect of which rates have not been settled. He should in addition furnish a clear certificate to the effect that the claims submitted by him as aforesaid cover all his claims and that no further claims shall be raised by him in respect of the work done up to and including the period under report.

54. **PAYMENT OF BILLS:** - All payments to be made to the Contractor, under this contract shall be by "CHEQUE" crossed "A/C PAYEE ONLY" OR by NEFT / RTGS payment within a reasonable time after the certification of bills by the authorized officials of BHEL.

55. **SUSPENSION OF BUSINESS DEALINGS:** -

The bidder along with its associate / collaborators / sub-vendors / consultants / service providers shall strictly adhere to "Guidelines for Suspension of Business Dealings with Suppliers/ Contractors" (ref: AA/MM/SB/01 Rev: 02 amdt. 03, Dt. 15.03.2023) displayed on BHEL website [\(http://www.bhel.com\)](http://www.bhel.com).
(<https://www.bhel.com/guidelines-suspension-business-dealings-supplierscontractors>)

56. **BHEL reserves the right to reduce the contract period (pre-close the contract), with 30 days' notice period depends on the requirement / without assigning any reason. Security Deposit will be refunded, if the contract is pre-closed for non-requirement by BHEL.**

57. In case of breach of any or whole of the above terms and conditions by the contractor BHEL will have the liberty to cancel the registration and contract either in part or in full and entrust in part or in full of the work to any contractor and the contractor shall be liable to pay extra cost involved in the execution of cancelled part of the contract.

58. **CONFLICT OF INTEREST:** "A bidder shall not have conflict of interest with other bidders. Such conflict of interest can lead to anti-competitive practices to the detriment of procuring Entity's interests. The bidder found to have a conflict of interest shall be disqualified. A bidder may be considered to have a conflict of interest with one or more parties in this bidding process, if:

- a) they have controlling partner (S) in common; **or**
- b) they receive or have received any direct or indirect subsidy/ financial stake from any of them; **or**
- c) they have the same legal representative/agent for purposes of this bid; **or**
- d) they have relationship with each other, directly or through common third parties, that puts them in a position to have access to information about or influence on the bid of another Bidder; **or**
- e) Bidder participates in more than one bid in this bidding process. Participation by a bidder in more than one Bid will result in the disqualification of all bids in which the parties are involved. However, this does not limit the inclusion of the components/ sub-assembly/ Assemblies from one bidding manufacturer in more than one bid; **or**
- f) In cases of agents quoting in offshore procurements, on behalf of their principles manufacturers, one agent cannot represent two manufacturers or quote on

We hereby accepted above
(signature & seal of bidder)



Bharat Heavy Electricals Limited
(A Government of India Undertaking)
Boiler Auxiliaries Plant
Ranipet-632406

Ref No. S012300033

their behalf in a particular tender enquiry. One manufacturer can also authorise only one bid from the followings:

- (i) The principle manufacturer directly or through one Indian agent on his behalf; and
 - (ii) Indian/ foreign agent on behalf only one principle **Or**
- g) A Bidder or any of its affiliates participated as a consultant in the preparation of the design or technical specifications of the contract that is the subject of the Bid; **or**
- h) In case of a holding company having more than one independently manufacturing units, or more than one unit having common business ownership/ management, only one unit should quote. Similar restrictions would apply to closely related sister companies. Bidders must proactively declare such sister/ common business/ management units in same/ similar line of business.

We hereby accepted above
(signature & seal of bidder)



Bharat Heavy Electricals Limited
(A Government of India Undertaking)
Boiler Auxiliaries Plant
Ranipet-632406

Ref No. S012300033

CHECK LIST

(to be filled by Bidder)

Sl. No.	Description	To be filled by bidder
1	Name of the Tenderer	
2	Address for Communication	
3	Email Cell Phone Fax	
4	Whether the firm is individual firm or Sole proprietorship firm or partnership firm or Hindu undivided Family or association of persons or Private Limited company or Public Limited company or any other please specify	
5	Whether the contractor has registered his workmen under employees State Insurance Act. If so, the Registration No./ Enrolment Number may be furnished. (Photo copy is to be enclosed)	
6	PAN no and documentary proof (Photo copy has to be enclosed)	
7	The GST heads under which the enlisting person registered with GST Authorities and copy of GST registration certificate has to be enclosed.	
8	Whether the contractor has registered his workmen under Employees Provident Fund and Miscellaneous Provisions Act. (Photo copy is to be enclosed)	
9	Applicable GST quoted Note: Please refer clause no. 7 (page no. 1) of Special conditions of contract regarding GST.	Central tax@ _____% State tax @ _____% Integrated tax@ _____% Union territory tax@ _____%
10	MSE Details (if applicable) (along with UDYAM registration certificate)	
11	Start-up Details (if applicable) (Certificate from Department for Promotion of Industry & Internal Trade)	
12	SAC Code for the service (Mandatory)	

We hereby accepted above
(signature & seal of bidder)



Bharat Heavy Electricals Limited
(A Government of India Undertaking)
Boiler Auxiliaries Plant
Ranipet-632406

Ref No. S012300033

DECLARATION

I/We M/s.
have read and clearly understood all the Terms and conditions in Tender Schedule of **Ref. No. S012300033** and accordingly accept the same without any deviation what so ever.

- I/ We unconditionally agree to all the tender conditions and that no new conditions are imposed by us in the technical / price bid. I understand that in the event of imposing any condition in the technical / price bid by me/we, such condition would be ignored by BHEL and only the Tender conditions and price bid will be considered for the purpose of evaluation”
- I/ We confirm that none of our group concern or affiliates etc., appears on the list of banned firms / companies by BHEL (list available on www.bhel.com) nor any of the Director / Partner / proprietor of bidder / such group concern or affiliate etc. are involved with such company.
- I/ We also declare that, we have not been suspended or black listed or issued with Show Cause Notice by BHEL- Ranipet or any other BHEL Unit.
- I/ We confirm that other than us, none of our group concerns or affiliates etc. are participating in the tender either directly or indirectly through any other agency under same proprietor /common director(s) / common partner(s).
- I/ We confirm that if any of the above statement / information furnished by us in this tender is found to be false/ fake at any stage of tender evaluation or during execution of contract, apart from disqualification to participate further in the present tender, BHEL will have the right to initiate appropriate action including legal proceedings / termination of contract, recovery of damages, penalties etc. as may be deemed fit.
- I/We declare that none of the proprietors/directors/ partners are guilty by any court of law for criminal activity/ offences involving moral turpitude in relation to business dealings
- I / We, do hereby declare that there is no case with the Police/Court/Regulatory authorities against the proprietor/firm/partner/director pursuant to a charge sheet framed/filed. Also I/We have not been suspended / delisted / blacklisted by any other Govt. Department/ Ministry /Public Sector Undertaking/ Autonomous Body/Financial institution/Court. We also certify that either our firm or none of the proprietors/directors/ partners are involved in any scam or disciplinary proceedings settled or pending adjudication pursuant to a charge sheet framed/filed.

We hereby accepted above
(signature & seal of bidder)



Bharat Heavy Electricals Limited
(A Government of India Undertaking)
Boiler Auxiliaries Plant
Ranipet-632406

Ref No. S012300033

BILL OF QUANTITY

S No	Description of the work	Unit	Quantity (a)	Rate per Unit (b)	% Weightage of each item amount w.r.t total amount (excluding GST) (c)
1	Gas Testing at Inlet & Outlet Duct as per Annexure III and BHEL technical specification	LOT*	6	=(c)/(a)	53.2671% * (d)
2	Solid, Slurry & Liquid Testing as per Annexure III and BHEL technical specification	DAY**	36	=(c)/(a)	9.9098% * (d)
3	Mobilization of testing team members as per BHEL technical specification	LOT*	6	=(c)/(a)	6.7690% * (d)
4	Demobilization of testing team members as per BHEL technical specification	LOT*	6	=(c)/(a)	6.7690% * (d)
5	Mobilization of Testing Equipment as per BHEL technical specification	LOT*	6	=(c)/(a)	11.6426% * (d)
6	Demobilization of Testing Equipment as per BHEL technical specification	LOT*	6	=(c)/(a)	11.6426% * (d)
Cost for providing the Testing Services for Unit#1 & 2 FGD of Maitree TPS (excluding GST)					77.6999% * (e)
7	Idle charges	Day	30	=(c)/(a)	22.3001% * (e)
8	Total Lump sum rate for providing the Testing Services for Unit#1 & 2 FGD of Maitree TPS including mobilization of qualified testing team and testing equipment, sampling, testing, analysis, preparation and submission of reports for 'Gas, Solid, Slurry and Liquid' testing, demobilization of testing team and testing equipment after the work is completed for all three testing phases, etc., as per the scope of work specified in BHEL technical specification (excluding GST)				To be quoted in NIC portal excluding GST
					(e)

Applicable GST% _____

We hereby accepted above
(signature & seal of bidder)



Bharat Heavy Electricals Limited
(A Government of India Undertaking)
Boiler Auxiliaries Plant
Ranipet-632406

Ref No. S012300033

Note.

1. * LOT means testing phase i.e.
Initial Performance Evaluation Test: 1 Lot
FGD Plant Operation Optimization Phase: 1 Lot
PG Test: 1 Lot
2. ** Initial Performance Evaluation Test: 7 Days
FGD Plant Operation Optimization Phase: 7 Days
PG Test: 6 Days

The following points shall be taken note while quoting: -

1. If GST is applicable, then the rate of GST shall be quoted while submitting the bid. The GST amount paid by the contractor shall be fully reimbursed by BHEL on submission of proof of remittance challan and uploading the details in GSTN network within the statutory time period.
2. Individual item rates for the above schedules will be arrived based on the lumpsum amount quoted by the bidder & % percentage weightage indicated against each schedule. Individual schedule rates so derived based on the total lumpsum price shall be deemed to be the contract rate for all purpose.
3. PPE to be given (under contractor's scope) to all contract employees and must be ensured employees are working with PPE only.
4. Contractor has to provide the Group Personal Accidental Insurance policy covering all employees to be engaged by the contractor under this contract for the following
 - a) In the event of death or permanent disability resulting from loss of both limbs Rs.10.00 Lakhs (Rupees Ten Lakhs).
 - b) In the event of other permanent disability Rs.7.00 Lakhs (Rupees Seven lakhs)
5. Payment shall be made for the actual quantities of work executed at the unit rate arrived as per sl.no.2.
6. Price quoted shall be firm throughout the contract period and in case of extension period also.
7. All statutory requirements of works contract to be met with.
8. At the end of completion, the contract may be extended on mutual agreement.
9. Quantity mentioned above are tentative only and based on work requirement and instruction of BHEL if testing and sampling services are required beyond the schedule Qty/Days, bidder to execute the testing and payment shall be made on actual execution basis.

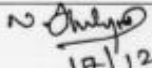

We hereby accepted above
(signature & seal of bidder)



Bharat Heavy Electricals Limited
(A Government of India Undertaking)
Boiler Auxiliaries Plant
Ranipet-632406

Ref No. S012300033

BHEL RANIPET BANK DETAILS

SECTION- 3 BANK AND PAYMENT MANDATE (Enclose supporting for the detail provided below)	
PAYMENT MODE (NEFT / RTGS /ECS/ CHEQUE)	RTGS
NAME OF BENEFICIARY	BHEL/BAP/RANIPET
NAME OF BANK	STATE BANK OF INDIA
BANK BRANCH ADDRESS	STATE BANK OF INDIA BHEL PROJECT BRANCH MUKUNDARAYA PURAM BHEL TOWNSHIP RANIPET-632406
ACCOUNT TYPE (SAVINGS, CURRENT, CASH CREDIT, ETC)	CASH CREDIT (CC)
ACCOUNT NO	10664849171
MICR CODE (9 DIGIT MICR CODE AS APPEARING ON CHEQUE LEAF) (EXAMPLE 110240157)	632002003
IFSC CODE (11 DIGIT IFSC CODE OF THE BANK BRANCH) (EXAMPLE HDFC0001374)	SBIN0007013
DECLARATION I/WE, HEREBY DECLARE THAT THE PARTICULARS GIVEN ABOVE ARE CORRECT AND COMPLETE. IN CASE THE TRANSACTION IS DELAYED OR NOT EFFECTED AT ALL FOR REASONS OF INCOMPLETE OR INCORRECT INFORMATION AND FOR REASONS BEYOND THE CONTROL OF NBPPL, I/WE WOULD NOT HOLD, NBPPL RESPONSIBLE. I/WE DECLARE THAT, WHENEVER THERE IS A CHANGE IN THE ABOVE DETAILS, I/WE SHALL FURNISH THE FORM AFRESH.	
SIGNATURE :  NAME : 18/12/2015 DESIGNATION : DATE : N. THALAPATHY Sr. Accounts Officer COMPANY SEAL : BHEL/BAP/ RANIPET	VERIFIED THE ABOVE DETAILS For STATE BANK OF INDIA  (SIGNATURE OF BANKER) BHEL Project, MUK. PURAM SEAL OF THE BANKER L. KUMAR K-7346

We hereby accepted above
(signature & seal of bidder)



Bharat Heavy Electricals Limited
(A Government of India Undertaking)
Boiler Auxiliaries Plant
Ranipet-632406

Ref No. S012300033



ACCEPTANCE FOR ELECTRONIC FUND TRANSFER / RTGS TRANSFER

01	NAME & ADDRESS OF THE SUPPLIER / VENDOR PHONE NO. WITH STD CODE	PAN NO. <input type="text"/>
02	VENDOR CODE (as in WORK ORDER)	<input type="text"/>
03	Details of Bank Account:	
A)	NAME & ADDRESS OF THE BANK (WITH PIN CODE)	<input type="text"/>
B)	BANK TELEPHONE NUMBER (WITH STD CODE)	<input type="text"/>
C)	BANK BRANCH CODE:	<input type="text"/>
D)	MICR CODE	<input type="text"/>
E)	ACCOUNT NUMBER	<input type="text"/>
F)	TYPE OF ACCOUNT	CURRENT / OD / CASH CREDIT
G)	VENDOR NAME AS PER BANK RECORDS	<input type="text"/>
H)	BANK BRANCH RTGS IFSC CODE	<input type="text"/>
I)	BANK BRANCH NEFT IFSC CODE	<input type="text"/>
J)	VENDOR'S EMAIL ID (give two ids)	<input type="text"/> <input type="text"/>
K)	NAME OF AUTHORISED SIGNATORY	<input type="text"/>

CERTIFICATE

I / We hereby agree to receive the payments due from BHARAT HEAVY ELECTRICALS LIMITED, RANIPET by the National Electronic Funds Transfer and/or RTGS Transfer mode by credit to my / our above mentioned Bank Account. I / We also agree that payments made to the above mentioned Account is a valid discharge of the liability of Bharat Heavy Electricals Limited, Ranipet. I / we also agree to bear the applicable Bank Charges for the above mode of transfer.

AUTHORISED SIGNATORY OF VENDOR WITH SEAL

Banker's Certification

We confirm that we are enabled for receiving RTGS and NEFT credits and we further confirm that the account number of _____

_____ (name of account holder), the signature of the authorized signatory and the MICR and IFSC codes of our Branch mentioned above are correct.

PLACE:

DATE:

(Manager / Officer's
Signature Under Bank stamp)
Authorisation No. _____

Note: This EFT Form is to be submitted duly filled in manually in all fields and duly signed by Authorised Signatory and certified by Banker.

We hereby accepted above
(signature & seal of bidder)



Bharat Heavy Electricals Limited
(A Government of India Undertaking)
Boiler Auxiliaries Plant
Ranipet-632406

Ref No. S012300033

PRICE BID FORMAT IN E-PROCUREMENT PORTAL

[Validate](#) [Print](#) [Help](#) [Item Wise BoQ](#)

Tender Inviting Authority: BHEL BAP Ranipet

Name of Work : Engaging testing agency for Gas, Solid, Slurry, Liquid Testing during Initial Performance Evaluation Test, FGD Plant Operation Optimization Phase and Performance Guarantee(PG) test of Maitree Unit#1 & 2 FGD (2x660MW)

Tender Notice No: S012300033, Dt. 30.12.2023

Name of the Bidder/ Bidding Firm / Company :	
--	--

PRICE SCHEDULE

(This BOQ template must not be modified/replaced by the bidder and the same should be uploaded after filling the relevent columns, else the bidder is liable to be rejected for this tender. Bidders are allowed to enter the Bidder Name and Values only)

NUMBER #	TEXT #	NUMBER #	TEXT #	TEXT #	NUMBER #	NUMBER	NUMBER #	NUMBER #	TEXT #
Sl. No.	Item Description	Quantity	Units	Quoted Currency	Total Lump sum Amount by the Bidder excluding GST in INR Rs. P	GST (IGST , SGST+CGST) IN %	TOTAL AMOUNT Without Taxes in Rs. P	TOTAL AMOUNT With Taxes in Rs. P	TOTAL AMOUNT In Words
1	2	4	5	12	13	16	53	54	55
1	Engaging testing agency for Gas, Solid, Slurry, Liquid Testing during Initial Performance Evaluation Test, FGD Plant Operation Optimization Phase and Performance Guarantee(PG) test of Maitree Unit#1 & 2 FGD (2x660MW)(Total Lump sum cost for all schedules as per BOQ)	1	UNIT	INR			0.00	0.00	INR Zero Only
Total in Figures							0.00	0.00	INR Zero Only
Quoted Rate in Words		INR Zero Only							

We hereby accepted above
(signature & seal of bidder)

TECHNICAL SPECIFICATION

FOR

**TESTING OF FLUE GAS, SOLIDS, SLURRY &
LIQUIDS FOR UNIT #1 & 2 FGD AT
BIFPCL MAITREE 2 X 660 MW STPP**

CONFIDENTIAL

CUSTOMER : BIFPCL
PROJECT : MAITREE 2 x 660 MW STPP
APPLICATION : FLUE GAS DESULPHURIZATION SYSTEM







BHARAT HEAVY ELECTRICALS LIMITED
(A GOVT OF INDIA UNDERTAKING)
Flue Gas Desulphurization Group
Ranipet



TECHNICAL SPECIFICATION FOR TESTING OF FLUE GAS, SOLIDS,
SLURRY & LIQUIDS FOR UNIT #1 & 2 FGD AT MAITREE 2 X 660 MW STPP

TECHNICAL SPECIFICATION FOR TESTING OF FLUE GAS, SOLIDS, SLURRY &
LIQUIDS FOR UNIT #1 & 2 FGD AT MAITREE 2X660MW STPP

Department	Prepared	Checked	Approved
FGD	 Kabilash K M Manager-FGD	 Sashi Kumar O Sr. Manager-FGD	 Chandrasekhara Rao AGM-FGD
		 Kumuda Ballav Padhi AGM-FGD-STRUCTRE (SA&DDR),CFD	
Revision – 00 Dated 29.12.2023		COMMENTS :	

This document is intended solely for the purpose of bidding against this specification and may not be transferred, reproduced, or otherwise utilized for any purposes other than those expressly specified.



**TECHNICAL SPECIFICATION FOR TESTING OF FLUE GAS, SOLIDS,
SLURRY & LIQUIDS FOR UNIT #1 & 2 FGD AT MAITREE 2 X 660 MW STPP**

1.0 PROJECT INFORMATION

S.No.	Title	Description
1.	Name of the Project	Maitree Super Thermal Power Project (MSTPP)
2.	Owner	M/s BIFPCL (BANGLADESH-INDIA FRIENDSHIP POWER COMPANY (PVT.) LIMITED), Bangladesh
3.	Address	Upazila: Rampal; Division: Khulna; District: Bagerhat, Bangladesh. The site is located about 23 km southward of Khulna City and 14 km north of Mongla Port.
4.	Installed Capacity	2 x 660 MW
5.	Nearest Railway station	36 km from Khulna Junction Rly Stn
6.	Nearest City	23 km southward of Khulna City
7.	Nearest Airport	105 km from Domestic Airport Jessore 263 km from International Airport Dhaka



TECHNICAL SPECIFICATION FOR TESTING OF FLUE GAS, SOLIDS, SLURRY & LIQUIDS FOR UNIT #1 & 2 FGD AT MAITREE 2 X 660 MW STPP

2.0	SCOPE OF WORK
2.1	Wet Limestone Flue Gas Desulphurization (FGD) system is a FGD system process in which a flue gas containing Sulphur oxides is scrubbed with Limestone slurry to produce clean gas free from Sulphur oxides. As a byproduct of the Wet Limestone FGD process, gypsum is also produced.
2.2	<p>Scope under this tender specification covers sample collection from sampling points, On site testing, Outside lab testing (wherever applicable), analysis of flue gas, limestone, limestone slurry, Gypsum slurry, Gypsum cake, Waste Water, Process water as per referred standard /approved procedure/drawings during Initial Performance Evaluation Test, FGD Plant Operation Optimization Phase and Performance Guarantee (PG) testing, submission of test results, reports to BHEL/MHI for evaluation and tuning of FGD plant operation and to achieve acceptance criteria/guaranteed values for Unit #1 & 2 FGD of Maitree 2x660MW STPP. The scope of work is divided into three testing phases for each unit and is as follows.</p> <ol style="list-style-type: none"> 1. Gas, Solid, Slurry and Liquid testing during Initial Performance Evaluation Test 2. Gas, Solid, Slurry and Liquid testing during FGD Plant Operation Optimization Phase (if required) 3. Gas, Solid, Slurry and Liquid testing during PG Test <p>The above testing phases will have to be initially completed for Unit-1 and afterwards for Unit-2.</p>
2.4	<p>Scope of work for Unit #1 & 2 includes, but is not limited to, the following activities during the initial performance evaluation test, FGD Plant Operation optimization phase (if required) and PG test.</p> <ul style="list-style-type: none"> • Deployment of a qualified testing team with adequate personnel to Site • Deployment of testing equipment* to Site • Reagents and chemicals required for testing as per the testing standard shall be in the scope of bidder • Sampling of Flue gas, Limestone Slurry, Gypsum Slurry, Gypsum cake, Waste Water, Process Water, Limestone from the designated sampling points • Preparation of laboratory samples • On site testing - Analysis of prepared samples at FGD Maitree Site using testing equipment as per the testing standard mentioned in Annexure - I • Outside Lab testing (wherever applicable) as per the testing standard mentioned in Annexure - I • Preparation and submission of log sheets and test reports as per approved format to BHEL and MHI. • Resampling and retesting as necessary for Optimization/fine tuning of FGD plant operation and achieve acceptance criteria for PG test. • Mobilization / demobilization of testing team members and testing equipment as instructed by BHEL <p>* Testing equipment shall mean to include but not limited to sampling equipment, testing equipment, testing instrument, tools, chemicals, reagents or any other consumables, laboratory</p>

This document is intended solely for the purpose of bidding against this specification and may not be transferred, reproduced, or otherwise utilized for any purposes other than those expressly specified.



TECHNICAL SPECIFICATION FOR TESTING OF FLUE GAS, SOLIDS, SLURRY & LIQUIDS FOR UNIT #1 & 2 FGD AT MAITREE 2 X 660 MW STPP

	apparatus, deionized water, office / lab furniture or any other item as necessary for testing as per the testing standard mentioned in Annexure - I .
2.4	Measurement Items for Analysis: The list of measurement items for analysis and its applicable testing standard is mentioned at Annexure-I .
2.5	Measurement Point & Reference value for testing is mentioned at Annexure-II .
2.6	Schedule for each testing phase is mentioned at Annexure-III . The bidder is required to submit a quotation for the complete scope of work specified in tender specification. Submitting a partial quotation or omitting any scope of work from the tender specification is not acceptable.
2.7	Testing of Sample
2.7.1	<p>Testing Personnel:</p> <p>Testing team members shall be conversant with sampling method/procedures, testing standards/methods/procedures, etc., and shall be capable of testing the sample at site in accordance with the specified testing standards using the testing equipment, preparation & submission of testing reports. Testing team members shall be sufficiently familiar with the test operating requirements to operate the testing equipment accordingly.</p> <p>Sample to be tested is to be collected from the respective sampling point of FGD system in the presence of BHEL/BIFPCL official and the sample shall be prepared for testing along with Reagent/chemical as required. Testing of sample is to be done in the presence of BHEL official as per the testing standard given in tender specification and records are to be maintained.</p>
2.8	<p>PG test procedure submitted to BIFPCL is enclosed for reference as Annexure-V.</p> <p>Contractor to submit the detailed test procedures for each measurement item for our review and acceptance after award of contract.</p>
2.9	Contractor shall strictly follow Methods of analysis as per BHEL requirement. Any deviation is not acceptable.
2.10	Before the start of the testing, Contractor has to submit the calibration certificate of all the instruments / equipment deployed for the testing purpose and shall submit expiry date/shelf life certificate for reagents / chemicals to be used during the testing. In case of expiry of calibration of instruments / equipment and shelf life of reagents / chemicals, contractor has to arrange the same without any additional cost to BHEL.
2.11	<p>Testing/analysis for measurement items marked with an asterisk (*) in Annexure-I must be carried out on-site only. Testing/analysis for other measurement items may be carried out through off-site lab.</p> <p>Contractor to submit the list of tests to be conducted through offsite / third party lab along with time limit for reports. BHEL decision shall be final and binding on the contractor for offsite / third party lab testing.</p>
2.12	Testing team shall be deployed in shifts on all days including Sundays and holidays as per the job requirement/instruction of BHEL Engineer. No extra claim shall be entertained for Sundays and holidays. No overtime shall be payable. Measurement will be carried out in early Morning/evening/Night based on plant operation. Proper precautionary arrangement to be taken care by contractor.

This document is intended solely for the purpose of bidding against this specification and may not be transferred, reproduced, or otherwise utilized for any purposes other than those expressly specified.



TECHNICAL SPECIFICATION FOR TESTING OF FLUE GAS, SOLIDS, SLURRY & LIQUIDS FOR UNIT #1 & 2 FGD AT MAITREE 2 X 660 MW STPP

	<p>Testing team shall consist of minimum:</p> <ul style="list-style-type: none"> □ 6 persons <p><u>Note.</u> SO₂ measurement in the inlet duct & the outlet duct will be carried out simultaneously. The contractor is responsible for ensuring that an adequate number of testing team members are available for this measurement.</p>
2.13	<p>Detail of Sampling Points in FGD plant for Unit #1 & 2:</p> <ul style="list-style-type: none"> • FGD Inlet Duct - 6 nos. sampling nozzle of 150 NB and top of duct @ 10 mtr. elevation (Approx.), Inlet Duct Size- 4.4mX21.1m • FGD Outlet Duct – 4 nos. sampling nozzle of 150 NB and top of duct @ 35 mtr. elevation (Approx.), Outlet Duct Size- 7.66 m Dia. • Flue gas measurements to be taken include 30 grid points in the inlet duct and 24 grid points in the outlet duct, respectively. If the number of grid point measurement is reduced during gas measurement by BIFPCL/BHEL, then contractor shall reduce the invoicing amount according to unit rate quoted in Annexure C. • Absorber (Gypsum) Slurry - 2 nozzles of 50 NB @ 11 mtr. elevation • Gypsum Cake sample shall be taken from Vacuum Belt Filter Discharge Chute in Gypsum Dewatering Building. • Limestone - Solid pieces of Size <120 mm shall be taken from Limestone Belt feeder Outlet Discharge in Ball Mill Area • Limestone Slurry - 2 Nozzles of 50NB will be provided @ 3 mtr. elevation near Limestone Slurry Feed Pump Area • Process Water - The same will be provided @ 0 mtr. elevation near Process Water Pump. • Waste Water - The same will be provided @ 0 mtr. elevation near Waste Water Pump. <p>Bidder shall visit site before submission of offer to familiarize themselves with sampling location.</p>
2.14	<p>Sampling points mentioned above is for information purpose and tentative only. There may be variation in sampling points during actual execution or as per drawings.</p>
2.15	<p>Testing charges shall be inclusive of charges for sampling, preparation of samples for testing, analysis of prepared samples at FGD Maitree Site using testing equipment, cost of chemicals, reagents or any other consumables used, off-site/third party lab testing, preparation and submission of log sheets and test reports, etc.</p> <p>In addition, testing charges shall be inclusive of charges for manpower, boarding, lodging, local transportation, testing equipment usage by testing team members, and the associated costs involved in activities mentioned in 2.16. etc.</p> <p>Testing charge shall be included in bid price.</p>
2.16	<p>Contractor shall ensure all their workforce have the necessary visas and work permits (if applicable) to legally work in Bangladesh. This process may involve coordination with the Bangladesh embassy or consulate. Contractor shall understand and comply with the local regulations and laws governing foreign businesses and contractors working in Bangladesh. Contractor shall ensure compliance with Bangladesh tax regulations and financial reporting requirements. Contractor shall adhere to local safety standards and regulations to ensure the well-being of employees and compliance with occupational health and safety laws. Contractor shall be aware of and adhere to customs and import regulations when transporting equipment or materials across borders. Contractor shall obtain any necessary permits or approvals</p>

This document is intended solely for the purpose of bidding against this specification and may not be transferred, reproduced, or otherwise utilized for any purposes other than those expressly specified.



TECHNICAL SPECIFICATION FOR TESTING OF FLUE GAS, SOLIDS, SLURRY & LIQUIDS FOR UNIT #1 & 2 FGD AT MAITREE 2 X 660 MW STPP

	required by local authorities for the specific activities being undertaken. Contractor may hire custom clearing agents in India & Bangladesh and prefer material movement through land border (Benapole & Petrapole) for smooth material movement.
2.17	Contractor shall attend meeting with BHEL / BIFPCL whenever required. Charges for attending the meeting shall be included in the bid price.
2.18	Any scaffolding with necessary pulley arrangement required for gas/solid/slurry/liquid sampling probes shall be in the contractor scope. Unskilled manpower for any shifting of testing equipment at site shall also be in the contractor's scope.
2.19	Contractor shall follow prevailing Covid protocols/SOPs as well as requirement of quarantine as applicable on their cost.
2.20	<p>All safety precautions must be taken by the contractor. At work, Contractor's personnel must wear all personal protection equipment. In case, it is observed that the contractor is violating any safety norms or any of his working practice is detrimental to the safety of men or machine, a penalty per occasion is liable to be imposed on each occasion. This imposition of penalty shall be resorted to in case the contractor fails to improve the conditions even after he has been cautioned by Engineer-in-charge. PPEs (Safety helmets, Safety shoes, Safety goggles, dust masks, earplugs, Safety belts, Safety Harness, hand gloves, etc. as required to complete a job safely) must be arranged by the contractor at their cost. Bid price shall be inclusive of the same. Overall responsibility for safe working, watch & ward lies with the contractor. BHEL in no way shall be responsible for any loss of life or any injury caused to any of the Contractor's personnel while executing the above work at site premises.</p> <p>In case any accident / fatal injury is occurred, the penalty imposed by customer M/s BIFPCL shall be recovered from contractor.</p>
2.21	Contractor shall be responsible for security of their equipment in the plant or during movement at site.
2.22	After completion of work, contractor must submit all log sheets/reports/ protocols in original to BHEL within 1 week.
2.23	Any other items not specified in tender specification, but required to perform the testing shall be included in bidder's scope.
2.24	Charges for complete scope of work mentioned in tender specification shall be included in bid price.
2.25	In case of any contradiction in tender clauses, most stringent clause will prevail.
2.26	Contractor should submit log sheets and test reports as per approved format to BHEL before raising any invoice.
	Notes:
1.	Bidders should visit site and acquire full knowledge and information about site conditions and work. The bidder must visit site to acquaint themselves with the conditions prevailing at site and in and around the plant premises, together with all statutory, obligatory, mandatory requirements of various authorities before submission of bid.
2.	Contractor shall arrange work permit and gate-passes for their manpower as per BHEL norms. Labour license to be taken if applicable.

This document is intended solely for the purpose of bidding against this specification and may not be transferred, reproduced, or otherwise utilized for any purposes other than those expressly specified.



**TECHNICAL SPECIFICATION FOR TESTING OF FLUE GAS, SOLIDS,
SLURRY & LIQUIDS FOR UNIT #1 & 2 FGD AT MAITREE 2 X 660 MW STPP**

2.1	All the Staff/Workers deputed for the Job should have Insurance Cover and strict safety measures of BIFPCL have to be followed at site.
2.2	Monthly Wage sheet (if applicable) and Strict PF (provident fund) compliance shall be submitted by the contractor to get the HR/IR clearance from BIFPCL before release of payment.
2.3	On issue of the LOI, contractor shall contact the BHEL for further instructions. Contractor have to submit the detailed plan for testing work and submission time of corresponding reports for BHEL approval. There shall be joint agreement for work plan between BHEL and contractor before commencement of work.
3.0	FACILITIES AND AMENITIES TO BE ARRANGED BY CONTRACTOR
3.0.1	Contractor shall make his own arrangement for accommodation of his staff / testing team members. If opted by contractor, BIFPCL may provide accommodation at their Guest House on chargeable basis subject to availability. Bid price shall be inclusive of accommodation charges including boarding. No separate claim for accommodation/boarding charges shall be entertained.
3.0.2	Contractor shall make his own arrangement for transport of his staff / testing team members from residence / hotel / guest house to site and back. Bid price shall be inclusive of transportation charges. No separate claim for transportation charges shall be entertained.
3.0.3	Required space near to the work spot will be provided for storing of materials and testing equipment but erection of temporary covering/cordoning is the responsibility of contractor only. Contractor shall be responsible for watch & ward and safe custody of his testing equipment at site.
3.0.4	Mobilization of testing team members and testing equipment to site and demobilization of testing team members and testing equipment from site after work is over shall be in contractor's scope for each of three testing phases. Scope of Mobilization and demobilization of the testing team members shall cover but not limited to the following aspects: <ul style="list-style-type: none"> • To & fro Travel including Visa Fees • Local transportation • Boarding & lodging • Manpower charges • Obtaining gate passes for testing team members from BIFPCL • Undergoing medical & fitness assessment at BIFPCL Hospital, and obtaining medical & fitness certificate / clearance for testing team members from BIFPCL (if any) • Induction training <p>Normally it takes about 1-2 working days for getting gate pass, medical & fitness certificate / clearance from BIFPCL and for completing Induction training. In case if it takes longer to obtain gate pass or medical & fitness certificate / clearance from BIFPCL, the all associated cost for extra days shall be borne by contractor without any additional cost to BHEL.</p>



TECHNICAL SPECIFICATION FOR TESTING OF FLUE GAS, SOLIDS, SLURRY & LIQUIDS FOR UNIT #1 & 2 FGD AT MAITREE 2 X 660 MW STPP

	<p>Charges for coordination for gate pass, medical / fitness assessment, testing equipment idle charge, etc., during the period of obtaining gate passes, medical checks & fitness assessments and Induction training shall also be included in the bid price.</p> <p>Expenditure for any Visa breaks for their own team members has to be borne by contractor. Visa breaks is not part of the scope of Mobilization and Demobilization of the testing team members and will not be paid separately.</p> <p>Scope of Testing Equipment mobilization and demobilization shall cover but not limited to the following aspects:</p> <ul style="list-style-type: none"> • Handling and transportation of testing equipment (including loading & unloading) from contractor's premises to site and vice versa • Setting up and dismantling the laboratory infrastructure within a porta cabin, including any associated costs. • Insurance (transit, storage, handling, etc.,) cover for testing equipment • Customs and import regulations when transporting equipment or materials across borders. <p>Meaning for Testing equipment shall be as defined elsewhere in specification. Charges for mobilization / demobilization of testing team members and charges for testing equipment mobilization / demobilization for all three phases of testing of Unit-1 & 2 shall be considered collectively for bid evaluation.</p>
3.0.5	Charges for manpower, boarding, lodging, To & fro Travel including Visa fees, local transportation, testing equipment usage charge, testing equipment idle charge, etc., spanning from the moment of intimation to mobilize the testing team members and testing equipment to the site, until their return to the contractor's premises back after the testing shall be included in bid price. No separate claim for these charges will be entertained.
4.0	FACILITIES AND AMENITIES TO BE PROVIDED BY BHEL
4.1	BHEL shall provide two porta cabins (10x3x5.5 m) for office and on site testing purpose on free of cost basis. However, all the office and lab furniture shall be in scope of bidder.
4.2	BHEL shall provide Electricity (Power Supply) and Tap water Supply in Porta cabins
5.0	COMMENCEMENT OF CONTRACT, REGULAR CONTRACT PERIOD & FORECLOSING
5.1	<p>Zero Date shall be LOA/LOI date.</p> <p>Within 5 days after Order placement, Contractor shall furnish Valid Passport & Vaccination certificates of all testing team members, BHEL will arrange invitation letter from Bangladesh Embassy for obtaining visa.</p> <p>BHEL will inform the contractor about the scheduled test start date for Initial Performance Evaluation Test 15 days prior to the start of testing. Contractor shall obtain Visa for minimum 3 months validity for all team members and is required to plan and mobilize his testing team members / testing equipment to site so as to start the testing on the scheduled test start date.</p> <p>Testing shall start on scheduled start date only even if contractor is ready for testing at earlier date after mobilization of resources and obtaining gate pass / medical clearance from BIFPCL. Charges for waiting period (including manpower, boarding, lodging, local transportation,</p>



**TECHNICAL SPECIFICATION FOR TESTING OF FLUE GAS, SOLIDS,
SLURRY & LIQUIDS FOR UNIT #1 & 2 FGD AT MAITREE 2 X 660 MW STPP**

	testing equipment idle charges, etc.,) shall not be entertained for early readiness of contractor at site before the scheduled test start date.
5.2	<p>Tentative Testing schedule for Unit#1 & 2:</p> <ol style="list-style-type: none"> 1. Initial Performance Evaluation Test (Unit-1) <ul style="list-style-type: none"> ❖ Start: Will be intimated later by BHEL ❖ End: 7th day 2. FGD Plant Operation Optimization Phase (Unit-1) <ul style="list-style-type: none"> ❖ Start: Will be intimated later by BHEL if required ❖ End: Either by the 7th day or upon BHEL's instruction to cease testing whichever is earlier 3. PG testing (Unit-1) <ul style="list-style-type: none"> ❖ Start: Will be intimated later by BHEL ❖ End: 4th day 4. Initial Performance Evaluation Test (Unit-2) <ul style="list-style-type: none"> ❖ Start: Will be intimated later by BHEL ❖ End: 7th day 5. FGD Plant Operation Optimization Phase (Unit-2) <ul style="list-style-type: none"> ❖ Start: Will be intimated later by BHEL if required ❖ End: Either by the 7th day or upon BHEL's instruction to cease testing whichever is earlier 6. PG testing (Unit-2): <ul style="list-style-type: none"> ❖ Start: Will be intimated later by BHEL ❖ End: 4th day <p>Start date is counted as first day.</p> <p>Testing phases from S.No.1 to 6 will proceed sequentially.</p>
5.3	Starting date for each testing phase will be informed later progressively by BHEL.
5.4	<p>At first, Contractor has to perform Gas, Solid, Slurry & Liquid testing for initial performance evaluation test as per the schedule given in Annexure III of tender.</p> <p>If the results from the initial performance evaluation test are satisfactory, BHEL will inform contractor that FGD Plant Operation Optimization Phase Testing is not required. However, if any adjustments or improvements in FGD plant operation are necessary to meet guarantee values, BHEL will inform contractor to perform gas testing or 'solid, slurry & liquid' testing or both during FGD Plant Operation Optimization Phase.</p> <p>Normally FGD Plant Operation Optimization Phase consists of 7 days. Solid, Slurry & liquid testing (if required by BHEL) shall be performed by contractor during FGD Plant Operation Optimization Phase as per the schedule given in Annexure III of tender. However, based on FGD plant performance, BHEL may inform contractor to stop the solid, slurry & liquid testing at any time during FGD Plant Operation Optimization Phase. In such case, BHEL will make payments based on the actual testing days utilized only for 'solid, slurry & liquid' testing.</p> <p>At last, contractor has to perform Gas, Solid, Slurry & Liquid testing for PG test as per the schedule given in Annexure III of tender</p>



**TECHNICAL SPECIFICATION FOR TESTING OF FLUE GAS, SOLIDS,
SLURRY & LIQUIDS FOR UNIT #1 & 2 FGD AT MAITREE 2 X 660 MW STPP**

5.5	Testing for Initial Performance Evaluation Test, FGD Plant Operation Optimization Phase and PG Testing shall commence only after confirmation from BHEL.
5.6	<p>If the next testing phase does not commence the day after the completion of the previous testing phase due to no fault of contractor, the Contractor is required to wait up to five days before demobilizing their testing team members / testing equipment from the site, subject to permission from BHEL. Charges for waiting period up to five days (including manpower, boarding, lodging, local transportation, testing equipment idle charges, etc.,) for each testing phase shall be included in bid price and shall be not be paid separately.</p> <p>Beyond five days, if BHEL instructs contractor to extend the stay, the Contractor shall extend the stay and contractor will be compensated for idle charges (inclusive of manpower, boarding, lodging, local transportation, testing equipment idle charges, etc.,) at the unit rate as quoted by bidder in the price schedule for each day of extended stay.</p> <p>30 days of idle charges will be considered for bid evaluation purpose. However, payment will be based on actual no. of days of extended stay.</p> <p>In case, BHEL instructs contractor to demobilize their testing team members / testing equipment from the site, contractor shall demobilize promptly. In such case, BHEL will inform the contractor about the scheduled test start date for next testing phase 15 days prior to the start of testing. Contractor is required to plan and mobilize his testing team members / testing equipment to site so as to start the testing on the scheduled test start date.</p> <p>Testing shall start only on scheduled start date, even if contractor is ready for testing at earlier date after mobilization of resources and obtaining gate pass / medical clearance from BIFPCL. Charges for any waiting period (including manpower, boarding, lodging, local transportation, testing equipment idle charges, etc.,) shall not be entertained for early readiness of contractor at site before the scheduled test start date.</p> <p>If it is decided to demobilize the testing equipment, contractor has to demobilize all the testing equipment completely. Demobilization of part of testing equipment is not allowed.</p> <p>After PG testing of Unit#2 is over, contractor shall demobilize his testing team members and testing equipment completely from site after permission from BHEL. Contractor shall not leave any item brought by him at site after PG test of Unit#2 is completed. Overall responsibility for watch & ward lies with the contractor and BHEL is not responsible for any loss.</p> <p>Charges for demobilization or remobilization of testing team members / testing equipment will be paid only if demobilization or remobilization has actually taken place.</p>
5.7	Contractor shall demobilize his testing team members and testing equipment from site only after permission from BHEL.
5.8	Unit rate for each of measurement item shall be provided by contractor in Annexure-C . If there is repeat testing for any of measurement item due to no fault of contractor or testing for any of measurement item is required additionally, BHEL will inform contractor and contractor has to perform the testing for additional measurement item at unit rate quoted in Annexure-C .
5.9	If resample/retesting has to be done due to fault of contractor, then same shall be done by contractor without any additional cost to BHEL.

This document is intended solely for the purpose of bidding against this specification and may not be transferred, reproduced, or otherwise utilized for any purposes other than those expressly specified.



**TECHNICAL SPECIFICATION FOR TESTING OF FLUE GAS, SOLIDS,
SLURRY & LIQUIDS FOR UNIT #1 & 2 FGD AT MAITREE 2 X 660 MW STPP**

5.10	If there is a requirement of additional testing service during the contract period with or without need for mobilization / demobilization as the case may be, BHEL will inform the contractor and contractor has to perform additional testing services at unit rate quoted in Annexure-B .
5.11	Contract Period: 12 Months from zero date
5.12	BHEL reserves the right of fore-closing the contract within the contract period with 15 days advance notice without assigning any reason and no payment will be made for the period after fore-closure
6.0	DOCUMENT TO BE SUBMITTED ALONG WITH OFFER
6.1	All pages of tender specification duly signed by bidder
6.2	Supporting document for meeting the tender pre-qualification requirement.
6.3	Bidder have to submit the detailed plan for testing work including details of organization structure of testing team, no. of testing team members, etc.,
6.4	List of tests to be conducted through offsite / third party lab
6.5	List of testing equipment to be mobilized for performance of the work
7.0	DOCUMENT TO BE SUBMITTED AFTER AWARD OF CONTRACT
7.1	Contractor have to submit the detailed plan for testing work including details of organization structure of testing team, no. of testing team members, etc., along with submission time of corresponding reports for BHEL approval.
7.2	Contractor have to submit the detailed test procedures for each measurement item for our review and acceptance after award of contract.
7.3	Before the start of the testing, Contractor has to submit the calibration certificate of all the instruments / equipment deployed for the testing purpose and shall submit expiry date/shelf life certificate for reagents / chemicals to be used during the testing.
7.4	An analysis report for measurement items marked with an asterisk (*) in Annexure-I is required next day following the sample collection.
7.5	After completion of work, contractor must submit all log sheets/reports/ protocols in original to BHEL within 1 week.
7.6	Contractor have to submit material inward gate pass copy from site security for all the testing equipment brought to site.
7.7	Contractor have to submit material outward gate pass copy from site security for all the testing equipment brought to site.



**TECHNICAL SPECIFICATION FOR TESTING OF FLUE GAS, SOLIDS,
SLURRY & LIQUIDS FOR UNIT #1 & 2 FGD AT MAITREE 2 X 660 MW STPP**

Annexure-I

Details of Measurement Item and Testing / Analysis Standard

Measuring location	Nozzle No.	Measurement Item	Testing/ Analysis Standard	Reference Standard	Instruments	Method
Flue gas at FGD Plant Inlet	G-1	*Gas flow rate (velocity)	EPA Method 1 & 2	ASME PTC 40	Pitot tube	Sampling and Velocity Traverses for Stationary Sources & Determination of stack gas velocity and volumetric flow rate
		*Gas temperature			Thermocouple	
		*Pressure			U-Tube water manometer	
		*H ₂ O	EPA Method 4		Moisture absorption tube	Determination of Moisture content in Stack Gases
		*O ₂	EPA Method 3		Orsat analysis	Gas analysis for the determination of dry molecular weight
		*CO ₂	EPA Method 3		Orsat analysis	Gas analysis for the determination of dry molecular weight
		*SO ₂	EPA Method 6 / Method 6C		Titration analysis / Instrumental Analysis	Determination of sulfur dioxide emissions from stationary sources
		HCl	EPA Method 26		Titration analysis	Determination of hydrogen halide and halogen emissions from stationary sources non isokinetic method
		HF	EPA Method 26		Absorptiometry method	Determination of hydrogen halide and halogen emissions from

This document is intended solely for the purpose of bidding against this specification and may not be transferred, reproduced, or otherwise utilized for any purposes other than those expressly specified.



**TECHNICAL SPECIFICATION FOR TESTING OF FLUE GAS, SOLIDS,
SLURRY & LIQUIDS FOR UNIT #1 & 2 FGD AT MAITREE 2 X 660 MW STPP**

<u>Annexure-I</u> <u>Details of Measurement Item and Testing / Analysis Standard</u>						
Measuring location	Nozzle No.	Measurement Item	Testing/ Analysis Standard	Reference Standard	Instruments	Method
						stationary sources non isokinetic method
		SO ₃	EPA Method 8		Titration analysis	Determination of sulfuric acid and sulfur dioxide emissions from stationary sources

This document is intended solely for the purpose of bidding against this specification and may not be transferred, reproduced, or otherwise utilized for any purposes other than those expressly specified.



**TECHNICAL SPECIFICATION FOR TESTING OF FLUE GAS, SOLIDS,
SLURRY & LIQUIDS FOR UNIT #1 & 2 FGD AT MAITREE 2 X 660 MW STPP**

Annexure-I

Details of Measurement Item and Testing / Analysis Standard

Measuring location	Nozzle No.	Measurement Item	Testing/ Analysis Standard	Reference Standard	Instruments	Method
Flue gas at FGD Plant Outlet	G-2	*Gas flow rate (velocity)	EPA Method 1 & 2	ASME PTC 40	Pitot tube	Sampling and Velocity Traverses for Stationary Sources & Determination of stack gas velocity and volumetric flow rate
		*Gas temperature			Thermocouple	
		*Pressure			U-Tube water manometer	
		*H ₂ O	EPA Method 4		Moisture absorption tube	Determination of moisture content in stack gases
		*O ₂	EPA Method 3		Orsat analysis	Gas analysis for the determination of dry molecular weight
		*CO ₂	EPA Method 3		Orsat analysis	Gas analysis for the determination of dry molecular weight
		*SO ₂	EPA Method 6		Titration analysis	Determination of sulfur dioxide emissions from stationary sources
		HCl	EPA Method 26		Titration analysis	Determination of hydrogen halide and halogen emissions from stationary sources non isokinetic method
		HF	EPA Method 26		Absorptiometry method	Determination of hydrogen halide and halogen emissions from stationary sources non isokinetic method
		SO ₃	EPA Method 8		Titration analysis	Determination of sulfuric acid and sulfur dioxide emissions from stationary sources

This document is intended solely for the purpose of bidding against this specification and may not be transferred, reproduced, or otherwise utilized for any purposes other than those expressly specified.



**TECHNICAL SPECIFICATION FOR TESTING OF FLUE GAS, SOLIDS,
SLURRY & LIQUIDS FOR UNIT #1 & 2 FGD AT MAITREE 2 X 660 MW STPP**

Annexure-I

Details of Measurement Item and Testing / Analysis Standard

Measuring location	Nozzle No.	Measurement Item	Testing / Analysis Standard	Remarks	Method
Absorber slurry	L-1	Sampling method			
		*pH	EPRI C1		
		*Temperature	EPRI C1		
		*Density	EPRI CS-3612 D2 or ASTM		
		*Suspended solids (SS)	EPRI CS-3612 F or ASTM		
		*To-CO3 (CO2)	EPRI CS-3612 N1 or ASTM		
		*To-SO3	EPRI CS-3612 M2 or ASTM		
		*I-SO3	EPRI CS-3612 M2 or ASTM		
		*To-Ca	EPRI CS-3612 J3 or ASTM		
		*I-Cl	EPRI Method I3		
		I-F	EPRI Method I3		
		To Mg	EPRI CS-3612 J3 or ASTM		
		I-Mg	EPRI CS-3612 J2 or ASTM		
		*To-S	EPRI CS-3612 L or ASTM		
		I-Ca	EPRI CS-3612 J2 or ASTM		
		I-Mn	EPRI CS-3612 H1 or ASTM		
By-product Gypsum	L-2	Calculation of composition	Refer to Appendix A		
		Preparation	ASTM C471, 4		
		*To-Ca	EPRI CS-3612 J3 or ASTM C471		
		*To-CO3 (CO2)	EPRI CS-3612 N1 or ASTM C471		
		*To-S	EPRI CS-3612 L or ASTM C471		
		*To-SO3	EPRI CS-3612 M2 or ASTM C471		
		*To-Mg	EPRI CS-3612 J3 or ASTM C471		

This document is intended solely for the purpose of bidding against this specification and may not be transferred, reproduced, or otherwise utilized for any purposes other than those expressly specified.



**TECHNICAL SPECIFICATION FOR TESTING OF FLUE GAS, SOLIDS,
SLURRY & LIQUIDS FOR UNIT #1 & 2 FGD AT MAITREE 2 X 660 MW STPP**

Annexure-I

Details of Measurement Item and Testing / Analysis Standard

Measuring location	Nozzle No.	Measurement Item	Testing / Analysis Standard	Remarks	Method
		*SiO ₂ +Acid insolubles	ASTM C471, 10		
		*Moisture	ASTM C471, 7		
		*pH	ASTM C471		
		*Cl	ASTM C471, 15		
		*Whiteness	-		
Limestone	L-3	*To-Ca	JIS R9011, 8 or EPRI CS-3612 H1 or J1 or ASTM C1271		
		*To-S	JIS R9011, 8 or EPRI CS-3612		
		*To-Mg	JIS R9011, 8 or EPRI CS-3612 H1 or J1 or ASTM C1271		
		*SiO ₂ +Acid insolubles	ASTM C471, 10 or ASTM C1271		
		SiO ₂	-		
		Dolomite	-		X-ray diffraction
		*Whiteness	-		
Limestone slurry	L-4	*pH	EPRI C1		
		*Temperature	EPRI C1		
		*Density	EPRI CS-3612 or ASTM		
		*Suspended solids (SS)	EPRI CS-3612 or ASTM		
		*Particle size	EPRI CS-3612 or ASTM		% passing through 325 mesh
Process water	L-5	*pH	EPRI CS-3612 or ASTM		
		*Temperature	EPRI CS-3612 or ASTM		
		Suspended solids (SS)	EPRI CS-3612 or ASTM		
		I-Ca	EPRI CS-3612 or ASTM		
		I-Cl	EPRI CS-3612 or ASTM		

This document is intended solely for the purpose of bidding against this specification and may not be transferred, reproduced, or otherwise utilized for any purposes other than those expressly specified.



**TECHNICAL SPECIFICATION FOR TESTING OF FLUE GAS, SOLIDS,
SLURRY & LIQUIDS FOR UNIT #1 & 2 FGD AT MAITREE 2 X 660 MW STPP**

Annexure-I

Details of Measurement Item and Testing / Analysis Standard

Measuring location	Nozzle No.	Measurement Item	Testing / Analysis Standard	Remarks	Method
Waste Water	L-7	*Suspended solids (SS)	EPRI CS-3612 F or ASTM		
		*I-CI	EPRI Method I3		

Note.

An analysis report for measurement items marked with an asterisk (*) is required next day following the sample collection. Based on the report, adjustments to plant operation parameters must be undertaken by BHEL to meet the guaranteed values.



TECHNICAL SPECIFICATION FOR TESTING OF FLUE GAS, SOLIDS, SLURRY & LIQUIDS FOR UNIT #1 & 2 FGD AT MAITREE 2 X 660 MW STPP

Annexure-II

Measurement Point and Reference Value

Boiler Condition		VWO			
Measuring Location	Nozzle No.	Measurement Item	Number of Measurement Points		Design Value / Typical Value
Flue Gas at FGD Plant Inlet	G-1	Gas Flow Rate, Temp	30	■	32,77,007 m3/hr, 150 deg C
		Pressure	1	□	200 mmH2O(g)
		H2O	1	□	9.01 vol%
		O2, CO2	1	□	4.78 vol%, 13.19 vol%
		SO2	30	■	726 ppm(d)
		HCL	1	□	58 ppm(d)
		HF	1	□	11 ppm(d)
		SO3	1	□	3 ppm(d)
Flue Gas at FGD Plant Outlet	G-2	Gas Flow Rate, Temp	24	■	27,30,422 m3/hr, 61.3 deg C
		Pressure	1	□	40 mmH2O(g)
		H2O	1	□	15.16 vol%
		O2, CO2	1	□	4.47 vol%, 12.32 vol%
		SO2	24	■	73 ppm(d)
		HCL	1	□	0 ppm(d)
		HF	1	□	0 ppm(d)
		SO3	1	□	3 ppm(d)
Absorber Slurry	L-1	pH, Temp, Density, SS	◆		5.3, 54.7 deg C, 1211 kg/m3, 30 wt%
		To-CO3, To-SO3, I-SO3	◆		I-SO3: 1.90 mmol/l
		To-Ca, I-Cl, I-F, To-Mg, I-Mg	◆		94.87 mmol/l, 512.9 mmol/l, 0.87 mmol/l, 152 mmol/l, 148 mmol/l
		To-S, I-Ca, I-Mn	◆		I-Mn: 0.39 mmol/l

This document is intended solely for the purpose of bidding against this specification and may not be transferred, reproduced, or otherwise utilized for any purposes other than those expressly specified.



**TECHNICAL SPECIFICATION FOR TESTING OF FLUE GAS, SOLIDS,
SLURRY & LIQUIDS FOR UNIT #1 & 2 FGD AT MAITREE 2 X 660 MW STPP**

Annexure-II

Measurement Point and Reference Value

Boiler Condition		VWO		
Measuring Location	Nozzle No.	Measurement Item	Number of Measurement Points	Design Value / Typical Value
By-product Gypsum	L-2	To-Ca, To-Co ₃ , To-S, To-SO ₃ , To-Mg, Moisture	◆	Moisture: 10 wt%
		Cl, pH, SiO ₂ +Acid insoluble	◆	200 ppm, 5.3, ~5-15 wt%-d
Limestone	L-3	To-Ca, To-S, To-Mg, SiO ₂ +Acid Insoluble	◆	95% wt% as CaCO ₃ , <0.03 wt%, 0.9-3 wt% as MgCO ₃ , ~2-3 wt%
		Dolomite	◆	-
Limestone Slurry	L-4	pH, Temp, Density, SS	◆	6.4-7.4, 36.9 deg C, 1219 kg/m ³ , 30wt%
		Particle Size	◆	90% through 325 mesh
Process Water	L-5	pH, Temp, SS	◆	6.4-7.4, 36.9 deg C
		I-Ca, I-Cl	◆	45 ppm, 270 ppm
Waste Water	L-7	SS, I-Cl	◆	3 wt%, <30000 ppm

- All measurement grid point
- Representative grid point
- ◆ 1 Sample



**TECHNICAL SPECIFICATION FOR TESTING OF FLUE GAS, SOLIDS,
SLURRY & LIQUIDS FOR UNIT #1 & 2 FGD AT MAITREE 2 X 660 MW STPP**

Annexure-III

INITIAL PERFORMANCE EVALUATION TEST - SCHEDULE FOR GAS TESTING

Description				A. Initial Performance Evaluation Test						
Measuring Location	Nozzle No.	Measurement Item	Number of Measurement Points (Refer to Fig. 1-2, Fig. 1-3)	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Flue Gas at FGD Plant Inlet	G-1	Gas Flow Rate	30	-	■	-	-	-	-	-
		Temp	30	-	■	-	-	-	-	-
		Pressure	1	-	□	-	-	-	-	-
		H2O	1	-	□	-	-	-	-	-
		O2	1	-	□	-	-	-	-	-
		CO2	1	-	□	-	-	-	-	-
		SO2	30	-	-	■	-	-	-	-
		HCL	1	-	-	□	-	-	-	-
		HF	1	-	-	□	-	-	-	-
		SO3	1	-	-	□	-	-	-	-
Flue Gas at FGD Plant Outlet	G-2	Gas Flow Rate	24	-	■	-	-	-	-	-
		Temp	24	-	■	-	-	-	-	-
		Pressure	1	-	□	-	-	-	-	-
		H2O	1	-	□	-	-	-	-	-
		O2	1	-	□	-	-	-	-	-
		CO2	1	-	□	-	-	-	-	-
		SO2	24	-	-	■	-	-	-	-
		HCL	1	-	-	□	-	-	-	-
		HF	1	-	-	□	-	-	-	-
		SO3	1	-	-	□	-	-	-	-

- All measurement grid point
- Representative grid point
- Not applicable

Note. The above timeline is indicative and shall change based on grid availability / front readiness. However, testing of all measurement items shall be completed within 7 days.



**TECHNICAL SPECIFICATION FOR TESTING OF FLUE GAS, SOLIDS,
SLURRY & LIQUIDS FOR UNIT #1 & 2 FGD AT MAITREE 2 X 660 MW STPP**

Annexure-III

FGD PLANT OPERATION OPTIMIZATION PHASE - SCHEDULE FOR GAS TESTING

Description				B. FGD Plant Operation Optimization Phase						
Measuring Location	Nozzle No.	Measurement Item	Number of Measurement Points (Refer to Fig. 1-2, Fig. 1-3)	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Flue Gas at FGD Plant Inlet	G-1	Gas Flow Rate	30	-	■	-	-	-	-	-
		Temp	30	-	■	-	-	-	-	-
		Pressure	1	-	□	-	-	-	-	-
		H2O	1	-	□	-	-	-	-	-
		O2	1	-	□	-	-	-	-	-
		CO2	1	-	□	-	-	-	-	-
		SO2	30	-	-	■	-	-	-	-
		HCL	1	-	-	□	-	-	-	-
		HF	1	-	-	□	-	-	-	-
		SO3	1	-	-	□	-	-	-	-
Flue Gas at FGD Plant Outlet	G-2	Gas Flow Rate	24	-	■	-	-	-	-	-
		Temp	24	-	■	-	-	-	-	-
		Pressure	1	-	□	-	-	-	-	-
		H2O	1	-	□	-	-	-	-	-
		O2	1	-	□	-	-	-	-	-
		CO2	1	-	□	-	-	-	-	-
		SO2	24	-	-	■	-	-	-	-
		HCL	1	-	-	□	-	-	-	-
		HF	1	-	-	□	-	-	-	-
		SO3	1	-	-	□	-	-	-	-

- All measurement grid point
- Representative grid point
- Not applicable

Note. The above timeline is indicative and shall change based on grid availability / front readiness. However, testing of all measurement items shall be completed within 7 days.

This document is intended solely for the purpose of bidding against this specification and may not be transferred, reproduced, or otherwise utilized for any purposes other than those expressly specified.



**TECHNICAL SPECIFICATION FOR TESTING OF FLUE GAS, SOLIDS,
SLURRY & LIQUIDS FOR UNIT #1 & 2 FGD AT MAITREE 2 X 660 MW STPP**

Annexure-III

PERFORMANCE GUARANTEE TEST - SCHEDULE FOR GAS TESTING

Description				C. Performance Guarantee (PG) Test			
Measuring Location	Nozzle No.	Measurement Item	Number of Measurement Points (Refer to Fig. 1-2, Fig. 1-3)	1 st Day	2 nd Day	3 rd Day	4 th Day
Flue Gas at FGD Plant Inlet	G-1	Gas Flow Rate	30	-	■	-	-
		Temp	30	-	■	-	-
		Pressure	1	-	□	-	-
		H2O	1	-	□	-	-
		O2	1	-	□	-	-
		CO2	1	-	□	-	-
		SO2	30	-	-	■	-
		HCL	1	-	-	□	-
		HF	1	-	-	□	-
		SO3	1	-	-	□	-
Flue Gas at FGD Plant Outlet	G-2	Gas Flow Rate	24	-	■	-	-
		Temp	24	-	■	-	-
		Pressure	1	-	□	-	-
		H2O	1	-	□	-	-
		O2	1	-	□	-	-
		CO2	1	-	□	-	-
		SO2	24	-	-	■	-
		HCL	1	-	-	□	-
		HF	1	-	-	□	-
		SO3	1	-	-	□	-

- All measurement grid point
- Representative grid point
- Not applicable

Note. The above timeline is indicative and shall change based on grid availability / front readiness. However, testing of all measurement items shall be completed within 4 days.

This document is intended solely for the purpose of bidding against this specification and may not be transferred, reproduced, or otherwise utilized for any purposes other than those expressly specified.



**TECHNICAL SPECIFICATION FOR TESTING OF FLUE GAS, SOLIDS,
SLURRY & LIQUIDS FOR UNIT #1 & 2 FGD AT MAITREE 2 X 660 MW STPP**

Annexure-III

**INITIAL PERFORMANCE EVALUATION TEST
SCHEDULE FOR SOLID, SLURRY & LIQUID TESTING**

Measurement Item		D. Initial Performance Evaluation Test						
Test (Nozzle No.)		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
1 Absorber slurry (L-1)								
pH, Temp, Density, SS		X	X	X	X	X	X	X
To-CO ₃ , To-SO ₃ , I-SO ₃		X	X	X	X	X	X	X
To-Ca, I-Cl,		X	X	X	X	X	X	X
I-F, To-Mg, I-Mg,		X	-	-	X	-	-	-
To-S,		X	X	X	X	X	X	X
I-Ca, I-Mn		X	-	-	X	-	-	-
2 Limestone Slurry (L-4)								
pH, Temp,		X	X	X	X	X	X	X
Density, SS		X	X	X	X	X	X	X
3 Waste Water (L-7)								
SS, I-Cl		X	X	X	X	X	X	X
4 Gypsum (L-2)								
Moisture		X	X	X	X	X	X	X
Whiteness		X	X	X	X	X	X	X
5 Limestone Slurry (L-4)								
Particle Size		X	-	-	X	-	-	-
6 Limestone (L-3)								
To-Ca, To-S, To-Mg, SiO ₂		X	-	-	X	-	-	-
SiO ₂ +Acid Insoluble		X	-	-	X	-	-	-
Dolomite		X	-	-	X	-	-	-
Whiteness		X	X	X	X	X	X	X
7 Gypsum (L-2)								
To-Ca, To-CO ₃ , To-S, To-SO ₃		X	-	X	-	X	-	X
To-Mg		X	-	X	-	X	-	X
Cl, pH, SiO ₂ +Acid insoluble		X	-	X	-	X	-	X
8 Process Water (L-5)								
pH, Temp, SS		X	-	-	-	-	-	-
I-Cl, COD		X	-	-	-	-	-	-
I-Ca		X	-	-	-	-	-	-

X : Test required for single sample
 XXX : Test required for 3 samples. Each sample is taken at different time of the day
 - : Not applicable



**TECHNICAL SPECIFICATION FOR TESTING OF FLUE GAS, SOLIDS,
SLURRY & LIQUIDS FOR UNIT #1 & 2 FGD AT MAITREE 2 X 660 MW STPP**

Annexure-III

**FGD PLANT OPERATION OPTIMIZATION PHASE
SCHEDULE FOR SOLID, SLURRY & LIQUID TESTING**

		E. FGD Plant Operation Optimization Phase						
	Test (Nozzle No.)	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
1	Absorber slurry (L-1)							
	pH, Temp, Density, SS	X	X	X	X	X	X	X
	To-CO ₃ , To-SO ₃ , I-SO ₃	X	X	X	X	X	X	X
	To-Ca, I-Cl,	X	X	X	X	X	X	X
	I-F, To-Mg, I-Mg,	X	-	-	X	-	-	-
	To-S,	X	X	X	X	X	X	X
	I-Ca, I-Mn	X	-	-	X	-	-	-
2	Limestone Slurry (L-4)							
	pH, Temp,	X	X	X	X	X	X	X
	Density, SS	X	X	X	X	X	X	X
3	Waste Water (L-7)							
	SS, I-Cl	X	X	X	X	X	X	X
4	Gypsum (L-2)							
	Moisture	X	X	X	X	X	X	X
	Whiteness	X	X	X	X	X	X	X
5	Limestone Slurry (L-4)							
	Particle Size	X	-	-	X	-	-	-
6	Limestone (L-3)							
	To-Ca, To-S, To-Mg, SiO ₂	X	-	-	X	-	-	-
	SiO ₂ +Acid Insoluble	X	-	-	X	-	-	-
	Dolomite	X	-	-	X	-	-	-
	Whiteness	X	X	X	X	X	X	X
7	Gypsum (L-2)							
	To-Ca, To-CO ₃ , To-S, To-SO ₃	X	-	X	-	X	-	X
	To-Mg	X	-	X	-	X	-	X
	Cl, pH, SiO ₂ +Acid insoluble	X	-	X	-	X	-	X
8	Process Water (L-5)							
	pH, Temp, SS	X	-	-	-	-	-	-
	I-Cl, COD	X	-	-	-	-	-	-
	I-Ca	X	-	-	-	-	-	-

X : Test required for single sample
 XXX : Test required for 3 samples. Each sample is taken at different time of the day
 - : Not applicable



**TECHNICAL SPECIFICATION FOR TESTING OF FLUE GAS, SOLIDS,
SLURRY & LIQUIDS FOR UNIT #1 & 2 FGD AT MAITREE 2 X 660 MW STPP**

Annexure-III

**PERFORMANCE GUARANTEE TEST
SCHEDULE FOR SOLID, SLURRY & LIQUID TESTING**

	Test (Nozzle No.)	F. PG Test			
		Day 1	Day 2	Day 3	Day 4
1	Absorber slurry (L-1)				
	pH, Temp, Density, SS	X	X	X	X
	To-CO ₃ , To-SO ₃ , I-SO ₃	X	X	X	X
	To-Ca, I-Cl,	-	-	X	-
	I-F, To-Mg, I-Mg,	-	-	X	-
	To-S,	-	-	X	-
	I-Ca, I-Mn	-	-	X	-
2	Limestone Slurry (L-4)				
	pH, Temp	X	X	XXX	-
	Density, SS	X	X	XXX	-
3	Waste Water (L-7)				
	SS, I-Cl	-	X	-	-
4	Gypsum (L-2)				
	Moisture	X	X	XXX	-
	Whiteness	X	X	XXX	-
5	Limestone Slurry (L-4)				
	Particle Size	X	-	-	-
6	Limestone (L-3)				
	To-Ca, To-S, To-Mg, SiO ₂	X	X	-	-
	SiO ₂ +Acid Insoluble	X	X	-	-
	Dolomite	X	X	-	-
	Whiteness	X	X	XXX	-
7	Gypsum (L-2)				
	To-Ca, To-CO ₃ , To-S, To-SO ₃	X	X	XXX	-
	To-Mg	X	X	XXX	-
	Cl, pH, SiO ₂ +Acid insoluble	X	X	XXX	-
8	Process Water (L-5)				
	pH, Temp, SS	X	-	-	-
	I-Cl, COD	X	-	-	-
	I-Ca	X	-	-	-

X : Test required for single sample
 XXX : Test required for 3 samples. Each sample is taken at different time of the day
 - : Not applicable



**TECHNICAL SPECIFICATION FOR TESTING OF FLUE GAS, SOLIDS,
SLURRY & LIQUIDS FOR UNIT #1 & 2 FGD AT MAITREE 2 X 660 MW STPP**

Annexure-IV

NOT USED



**TECHNICAL SPECIFICATION FOR TESTING OF FLUE GAS, SOLIDS,
SLURRY & LIQUIDS FOR UNIT #1 & 2 FGD AT MAITREE 2 X 660 MW STPP**

Annexure-V

PG Test Procedure- BIFPCL Maitree 2x660MW



**TECHNICAL SPECIFICATION FOR TESTING OF FLUE GAS, SOLIDS,
SLURRY & LIQUIDS FOR UNIT #1 & 2 FGD AT MAITREE 2 X 660 MW STPP**

Rate Schedule

Annexure-A

Sl. No	DESCRIPTION OF WORK	Total Amount in Rupees (In figures and words)
1.	Total Lumpsum rate for providing the Testing Services for Unit#1 &2 FGD of Maitree 2x660 MW TPS including mobilization of qualified testing team & testing equipment, sampling, testing, analysis, preparation and submission of reports for 'Gas, Solid, Slurry & Liquid' testing, demobilization of testing team & testing equipment after the work is completed for all three testing phases as per the scope of work specified in BHEL tender specifications.	X
2	Idle Charges for 30 days	X

Notes:

1. Rate quoted shall be inclusive of all applicable taxes & duties
2. Payment of the lump sum rate of Testing Services quoted under Annexure A shall be paid as per item-wise rate breakup given in Annexure B.
3. Evaluation will be done considering the Idle charges for 30 days as total cost to BHEL however, Idle Charges will be paid based on the actuals duly certified by BHEL officials.



**TECHNICAL SPECIFICATION FOR TESTING OF FLUE GAS, SOLIDS,
SLURRY & LIQUIDS FOR UNIT #1 & 2 FGD AT MAITREE 2 X 660 MW STPP**

Annexure-B- BOQ FOR TESTING SERVICES

Sl. No.	DESCRIPTION OF WORK	UOM (A)	Qty (B)	Unit Rate (C)	Total Price (D) = (B) x (C)	Remarks
1.	Lumpsum rate for Gas Testing at Inlet and Outlet ducts (G1/G2) as per Annexure III and tender specification	Lot	6			For Unit-1: Initial performance evaluation test – 1 Lot FGD Plant Operation Optimization Phase – 1 Lot PG test – 1 Lot For Unit-2: Initial performance evaluation test – 1 Lot FGD Plant Operation Optimization Phase – 1 Lot PG test – 1 Lot
2.	Lumpsum rate for Solid, Slurry & Liquid testing as per Annexure III and tender specification	Days	36			For Unit-1: Initial performance evaluation test – 7 days FGD Plant Operation Optimization Phase – 7 days PG test – 4 days For Unit-2: Initial performance evaluation test – 7 days FGD Plant Operation Optimization Phase – 7 days PG test – 4 days
3.	Lumpsum rate for Mobilization/Re-mobilization of testing team members as per tender specification	Lot	6			For Unit-1: Initial performance evaluation test – 1 Lot FGD Plant Operation Optimization Phase – 1 Lot PG test – 1 Lot For Unit-2: Initial performance evaluation test – 1 Lot FGD Plant Operation Optimization Phase – 1 Lot PG test – 1 Lot
4.	Lumpsum rate for Demobilization of testing team members as per tender specification	Lot	6			For Unit-1: Initial performance evaluation test – 1 Lot FGD Plant Operation Optimization Phase – 1 Lot PG test – 1 Lot

This document is intended solely for the purpose of bidding against this specification and may not be transferred, reproduced, or otherwise utilized for any purposes other than those expressly specified.



**TECHNICAL SPECIFICATION FOR TESTING OF FLUE GAS, SOLIDS,
SLURRY & LIQUIDS FOR UNIT #1 & 2 FGD AT MAITREE 2 X 660 MW STPP**

						For Unit-2: Initial performance evaluation test – 1 Lot FGD Plant Operation Optimization Phase – 1 Lot PG test – 1 Lot
5.	Lumpsum rate for Mobilization/Re-mobilization of Testing Equipment as per tender specification	Lot	6			For Unit-1: Initial performance evaluation test – 1 Lot FGD Plant Operation Optimization Phase – 1 Lot PG test – 1 Lot For Unit-2: Initial performance evaluation test – 1 Lot FGD Plant Operation Optimization Phase – 1 Lot PG test – 1 Lot
6.	Lumpsum rate for Demobilization of Testing Equipment as per tender specification	Lot	6			For Unit-1: Initial performance evaluation test – 1 Lot FGD Plant Operation Optimization Phase – 1 Lot PG test – 1 Lot For Unit-2: Initial performance evaluation test – 1 Lot FGD Plant Operation Optimization Phase – 1 Lot PG test – 1 Lot
7.	Idle charges as per tender specification	Days	30			
8.	Grand Total					

Note.

1. Unit rate shall remain firm throughout the contract period.
2. Grand total value provided at sl. no.8, column no.(D) in the table above should match with lumpsum rate quoted in Annexure-A

This document is intended solely for the purpose of bidding against this specification and may not be transferred, reproduced, or otherwise utilized for any purposes other than those expressly specified.



**TECHNICAL SPECIFICATION FOR TESTING OF FLUE GAS, SOLIDS,
SLURRY & LIQUIDS FOR UNIT #1 & 2 FGD AT MAITREE 2 X 660 MW STPP**

Annexure-C

Unit Rate Schedule

No.	Measurement Item	Qty(Q)	UOM	Unit Rate	Remarks
A-1	Flue Gas at FGD Inlet (G-1)				
i	Gas flow rate	1	Point		
ii	Temp	1	Point		
iii	Pressure	1	Point		
iv	H2O	1	Point		
v	O2	1	Point		
vi	CO2	1	Point		
vii	SO2	1	Point		
viii	HCl	1	Point		
ix	HF	1	Point		
x	SO3	1	Point		
A-2	Flue Gas at FGD Outlet (G-2)				
i	Gas flow rate	1	Point		
ii	Temp	1	Point		
lii	Pressure	1	Point		
iv	H2O	1	Point		
v	O2	1	Point		
vi	CO2	1	Point		
vii	SO2	1	Point		
viii	HCl	1	Point		
ix	HF	1	Point		
x	SO3	1	Point		
B-1	Absorber Slurry (L-1)				
i	pH	1	Sample		
ii	Temp	1	Sample		
iii	Density	1	Sample		
iv	SS	1	Sample		
v	To-CO3	1	Sample		
vi	To-SO3	1	Sample		
vii	L-SO3	1	Sample		
viii	To-Ca	1	Sample		
ix	I-Cl	1	Sample		
x	I-F	1	Sample		
xi	To-Mg	1	Sample		
xii	I-Mg	1	Sample		

This document is intended solely for the purpose of bidding against this specification and may not be transferred, reproduced, or otherwise utilized for any purposes other than those expressly specified.



**TECHNICAL SPECIFICATION FOR TESTING OF FLUE GAS, SOLIDS,
SLURRY & LIQUIDS FOR UNIT #1 & 2 FGD AT MAITREE 2 X 660 MW STPP**

No.	Measurement Item	Qty(Q)	UOM	Unit Rate	Remarks
xiii	To-S	1	Sample		
xiv	I-Ca	1	Sample		
xv	I-Mn	1	Sample		
B-2	Limestone Slurry (L-4)				
i.	pH	1	Sample		
ii.	Temp	1	Sample		
iii.	Density	1	Sample		
iv.	SS	1	Sample		
B-3	Waste Water (L-7)				
i.	SS	1	Sample		
ii.	I-Cl	1	Sample		
B-4	Gypsum(L-2)				
i.	Moisture	1	Sample		
ii.	Whiteness	1	Sample		
B-5	Limestone Slurry (L-4)				
i.	Particle Size	1	Sample		
B-6	Limestone (L-3)				
i.	To-Ca	1	Sample		
ii.	To-S	1	Sample		
iii.	To-Mg	1	Sample		
iv.	SiO ₂				
v.	SiO ₂ + Acid Insoluble	1	Sample		
vi.	Dolomite	1	Sample		
vii.	Whiteness	1	Sample		
B-7	Gypsum (L-2)				
i.	To-Ca	1	Sample		
ii.	To-CO ₃	1	Sample		
iii.	To-S	1	Sample		
iv.	To-SO ₃	1	Sample		
v.	To-Mg	1	Sample		
vi.	Cl	1	Sample		
vii.	pH	1	Sample		
viii.	SiO ₂ +Acid Insoluble	1	Sample		
B-8	Process Water (L-5)				
i.	pH	1	Sample		
ii.	Temp	1	Sample		

This document is intended solely for the purpose of bidding against this specification and may not be transferred, reproduced, or otherwise utilized for any purposes other than those expressly specified.



**TECHNICAL SPECIFICATION FOR TESTING OF FLUE GAS, SOLIDS,
SLURRY & LIQUIDS FOR UNIT #1 & 2 FGD AT MAITREE 2 X 660 MW STPP**

No.	Measurement Item	Qty(Q)	UOM	Unit Rate	Remarks
iii.	SS	1	Sample		
iv.	I-Cl	1	Sample		
v.	COD	1	Sample		
vi.	I-Ca	1	Sample		

Notes:

1. Unit rate for each of measurement item shall be provided by bidder in **Annexure-C**. If there is repeat testing for any of measurement item due to no fault of contractor or testing for any of measurement item is required additionally, BHEL will inform contractor and contractor has to perform the testing for additional measurement item at unit rate quoted in **Annexure-C**.
2. Unit rate shall remain firm throughout the contract period.

1. General

1.1 Purpose of this document

This document covers the performance test procedure of FGD plant for Maitree Super Thermal Power Station.

1.2 Guarantee

The performance test will be carried out so as to prove that the measured values of the guaranteed items are satisfactory in the specified operating conditions of the guarantee values stipulated in the Contract.

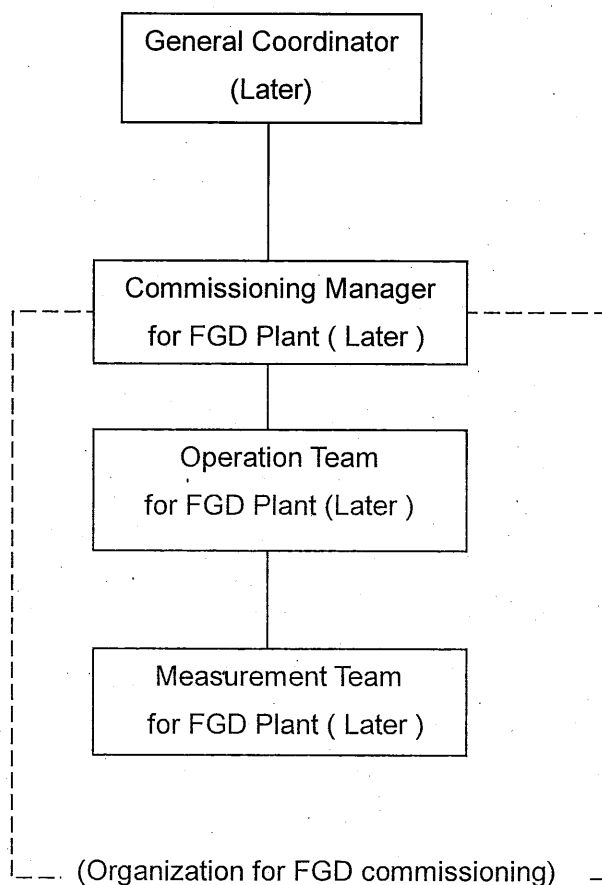
1.3 Codes and Standards

Sampling and analysis during the performance test is carried out in accordance with the standards as shown in Table 2-1 and 2-2 "Measurement Items of Analysis"

1.4 Organization for Performance Test

The performance test will be carried out by commissioning organization below. Sampling and analysis during the performance test including preparation will be carried out by Analysis Company as shown below.

Structure of organization during Performance Test is as follows;



2. Preparation of Performance Test

- (1) The boiler load shall be adjusted by Owner in accordance with the time schedule shown in Tables 1-1 and 1-2 Performance Test Schedule.
- (2) Limestone specified in contract shall be supplied by Owner.
- (3) Utilities required for FGD will be made available
- (4) BHEL will use laboratory and apparatus (desk for analysis etc.) and pure water as shown in Table-4 Items required for Performance test for analysis.
- (5) Installation of measurement and test equipment at the FGD.

3. Performance Test Schedule and conditions

3.1 Operating Conditions

When the gas conditions at the performance test are different from the guaranteed conditions, the measured values are corrected by using the correction curve and evaluated to confirm if the FGD plant meets the guaranteed values.

Quality of Limestone used for the test shall be within the range as specified in Contract.

Satisfactory working of the equipment shall be verified before, during and after the runs. Equipment which is not operating properly should be identified and the possible effects should be considered. In case of all units failure including stand-by, the parties shall agree in writing to either suspend the testing until corrective actions are taken, or continue the test adding in the test report the effect of the malfunctioning equipment on the test.

3.2 Test Schedule

The performance test schedule is shown in Tables 1-1 and 1-2 "Performance Test Schedule".

3.3 Measurement Items

The Performance test will be carried out by measuring the items shown in Tables 2-1 and 2-2 "Measurement Items of Analysis".

3.4 Measuring and Sampling Points

Measuring Point for gas are shown in Figures 1-1~1.3.

Sampling and measuring points for Gypsum Slurry, Product Gypsum, Limestone, Limestone Slurry, Process water are shown in Figure 2.1~2.5.

3.5 Measurement, Sampling and Analysis

The sampling and analysis methods are shown in Table 2-1 and 2-2 “Measurement Items of Analysis”.

(1) Method of Measurement

-For Performance Test

According to measurement method in contract, standards indicated in the contract are used for measurement method for performance test.

(2) Measurement location for gas measurement

Measurement location is decided based on the following concept,

-FGD Inlet measurement

Gas measurement of FGD inlet is measured at downstream of ID fan Outlet (G-1).

-FGD Outlet measurement

Gas measurement of FGD outlet is measured at upstream of stack (G-2).

3.6 Verification for prior to Performance Test

In order to verify the condition of FGD Plant prior to each test condition, contractor confirms whether the indication value of following instrument is in the range as specified in Contract with Owner before 30 minutes of each test. The confirmation schedule is shown in Table 1-1

Confirmation parameter	Temporary/Permanent	Instrument Number	Range
FGD inlet Gas Flow Rate	Temporary Instrument		(*1)
FGD inlet Gas Temperature	Permanent Instrument	01/02HTD01CT001/003 (FGD Inlet)	(*1)
FGD inlet Gas Pressure	Permanent Instrument	01/02HTD01CP001 (FGD Inlet)	(*1)
FGD inlet O2 Concentration	Temporary Instrument		(*1)
FGD inlet SO2 Concentration	Permanent Instrument	01/02HTD01CQ001 (FGD Inlet)	(*1)
FGD inlet Particulate Matter	Temporary Instrument		(*1)

Note (*1): The value is within the range as specified in contract.

4. Guarantee Items and Measuring/Calculation Methods

4.1 FGD Outlet SO₂ Emission

SO₂ concentration of inlet gas (G-1) and SO₂ concentration of outlet gas (G-2) is measured at all grid points in the inlet and outlet duct respectively in accordance with measurement method stipulated in the contract.

To be measured at 100% MCR DC

4.2 Limestone Consumption

The Slurry Samples will be taken from the Limestone Slurry Feed Pump Outlet (L-4).

Average Limestone Consumption (t/h) = Average Flow of 01/02HTK05CF001
(m³/h) x Slurry Density (as per slurry analysis) (t/m³) x
Slurry Concentration (as per slurry analysis) (wt.%)

To be measured at 100% MCR DC

4.3 Auxiliary Power Consumption

Power consumption of FGD System will be measured during 24 hours. The result will be determined by the time average of total power consumption. To be measured at 100%,80%,60% & 50% MCR DC operating conditions.

4.4 Gypsum Quality

The Gypsum Samples will be taken from Vacuum Belt Filter outlet (L-2)

To be measured at 100% MCR DC

4.5 Noise

Each equipment noise level shall be measured by sound pressure measurement device during performance test stage.

Note: The following conditions is taken into account:

At 1 m horizontal distance from equipment/enclosures and 1.5 m above operation floor.

Periodic or discontinuous noise, such as valve blow is not included in the guarantee.

Background noise is discounted as well as sound reflection of parallel operation equipment is discounted because distance between each equipment is very close.

The noise data during pre-commissioning (solo-run) is used as performance test data if background noise cannot be erased.

Table - Guarantee Schedule

A	Acceptance Guarantees	Guarantee Value
1.	Outlet SO ₂ Emission	≤200 mg/Nm ³ @6%O ₂ Dry
2.	Gypsum Purity @ guarantee point condition a) Purity of Gypsum b) Chloride content c) Moisture Content d) Whiteness	≥95% Max 200 ppm Max 10 wt% Not more than 10% worse than added Limestone
3.	Noise a) Wet ball mill b) Other equipment	90 dBA 85 dBA
B	Special Guarantees A	Guarantee Value
1.	Limestone consumption of FGD system @ 100% MCR	5825 kg/hr per unit
2.	Auxiliary Power Consumption @ 100%, 80%, 60%, 50% MCR	8048 kW for 2 boiler units @100% MCR 8048 kW for 2 boiler units @80% MCR 6554 kW for 2 boiler units @60% MCR 6521 kW for 2 boiler units @50% MCR
C	Special Guarantees B	Guarantee Value
1.	Availability of Plant	

5. EVALUATION METHODOLOGY OF MEASUREMENT

Evaluation method of measurement for performance test is provided as follows,

5.1 NUMBER OF TEST RUNS

No.	Flue gas condition		Number of run
	SO ₂ load	Boiler load	
1 st test	Design coal (1,900 mg/Nm ³)	FGD Guarantee Point -100% MCR DC	One run

For detail, refer to Table 2.0 Measurement item and Schedule of performance Test for FGD plant

5.1.1 TEST RUN DURATION

Parameter Measured	Test Run Duration	No. of test run	Remarks
FGD Inlet SO ₂	3~4 hrs	One	(30 nos. of samples are taken during test run)
FGD Outlet SO ₂	3~4 hrs	One	(24 nos. of samples are taken during test run)
FGD Inlet Gas Flow	3~4 hrs	One	(30 nos. of samples are taken during test run)
FGD Outlet Gas Flow	3~4 hrs	One	(24 nos. of samples are taken during test run)
Limestone consumption	8 hours	One	Average value over 8 hours
Limestone Sample	Once daily	One	
Limestone Slurry	8 hrs (3 samples taken) 1 st Sample @ 0 hour 2 nd Sample @ 4 hours 3 rd Sample @ 8 hours	One	Average value of three samples
By-product-Gypsum	8 hrs (3 samples taken) 1 st Sample @ 0 hour 2 nd Sample @ 4 hours 3 rd Sample @ 8 hours	One	Average value of three samples
Power consumption	24 hours	One	24 hours average value

5.2 EVALUATION OF TEST RESULT

Evaluation of test result, the values is determined as follow

Measurement item	Evaluation of test result
Gas measurement	As per third party gas measurement company report
Normal operation power consumption	Average value over 24 hours
Limestone consumption	Average value over 8 hours
Limestone and limestone slurry	Average value of three samples
By-product gypsum	Average value of three samples

The result will be evaluated from all the test run of performance test.

6. Instrument Certification

6.1 Plant Instrument

Contractor will submit the corresponding certificates of all the plant instruments involved in the test prior to the test.

Certificates according to PTC 40, the instruments comply with the Quality Guarantee.

For the rest of the plant instrument, the corresponding factory calibration certificates of all plant instruments involved in the test will be submitted to Owner before the test.

6.2 Temporary Instrument

The corresponding certificates of all temporary instruments involved in the test is submitted to Owner.

6.3 Measurement / analysis performed by third party

For measurement / analysis performed by third party, the corresponding official report of each measurement /analysis will be submitted to Owner after the test in order to approve the test report.

7. Accuracy of Test Equipment and Test Uncertainty

Regarding accuracy of test equipment and test uncertainty, it will be informed to Owner before Performance Test.

8. Isolation Valve

Prior to performance test, contractor will confirm whether isolation valves for FGD Plant are opened or closed properly as shown in Table 5 Isolation Valve List.

9. Submission of Performance Test Report

After the Performance Test, contractor will issue the test report to Owner.

Contractor will issue the Preliminary test result will be issued within 7 days after the performance test. Contractor will issue the final test report within 1 month after the performance test.

The following contents will be included in the report.

A) Preliminary test results:

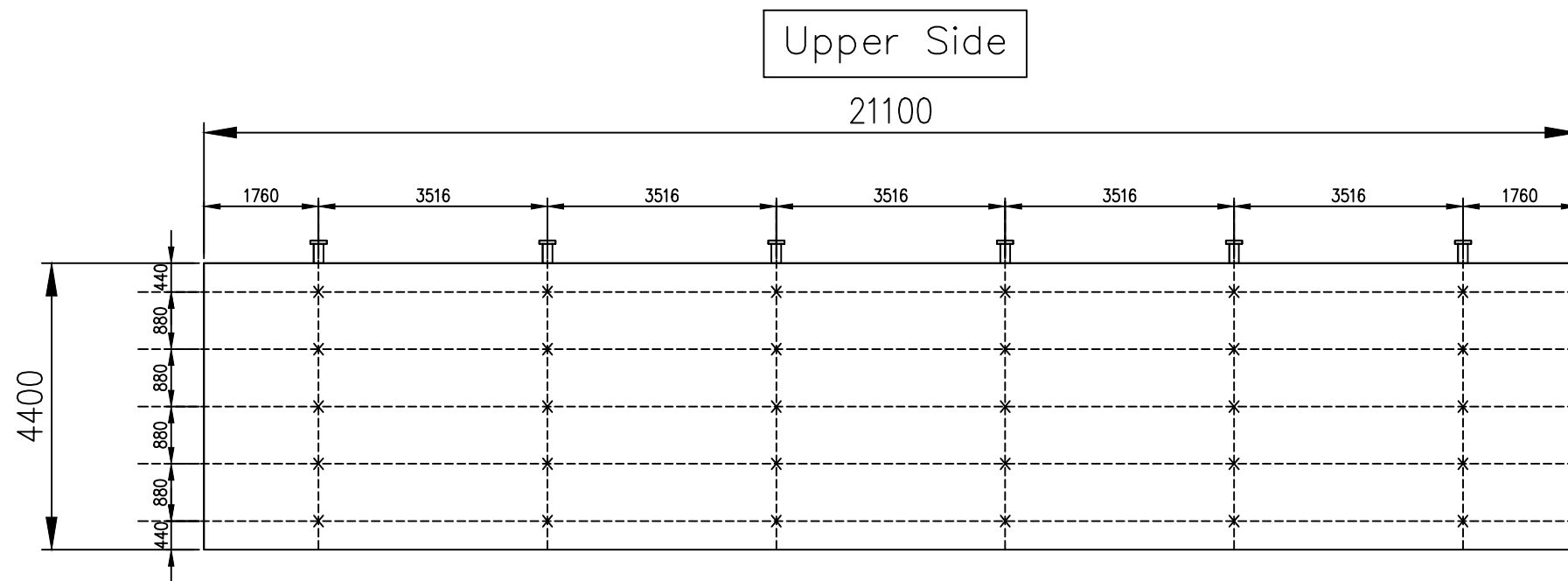
1. Executive Summary
2. Test Results

B) Final Test Report:

1. Executive Summary
2. Object of the Test
3. Acceptance Criteria
4. Test Execution
(Representatives, Procedure, Schedule, Stability conditions, Operating conditions, Instrumentation, Calculations)
5. Test Results
6. Test Analysis
(Stability conditions, Operating conditions, Instrumentation, Calculations, Test Uncertainty)
7. Conclusions
8. Annexes
(Data records for verification of stability conditions, Data records for performance calculations, copies of manual data sheets, results of laboratories and third parties analysis and measurements, Calibration Certificates)

Fig.1–2 Measuring Point for Gas

Measurement Location G–1: FGD INLET MEASUREMENT



Unit : mm

XSampling Point

Fig.1–3 Measuring Point for Gas

Measurement Location G–2: FGD OUTLET MEASUREMENT

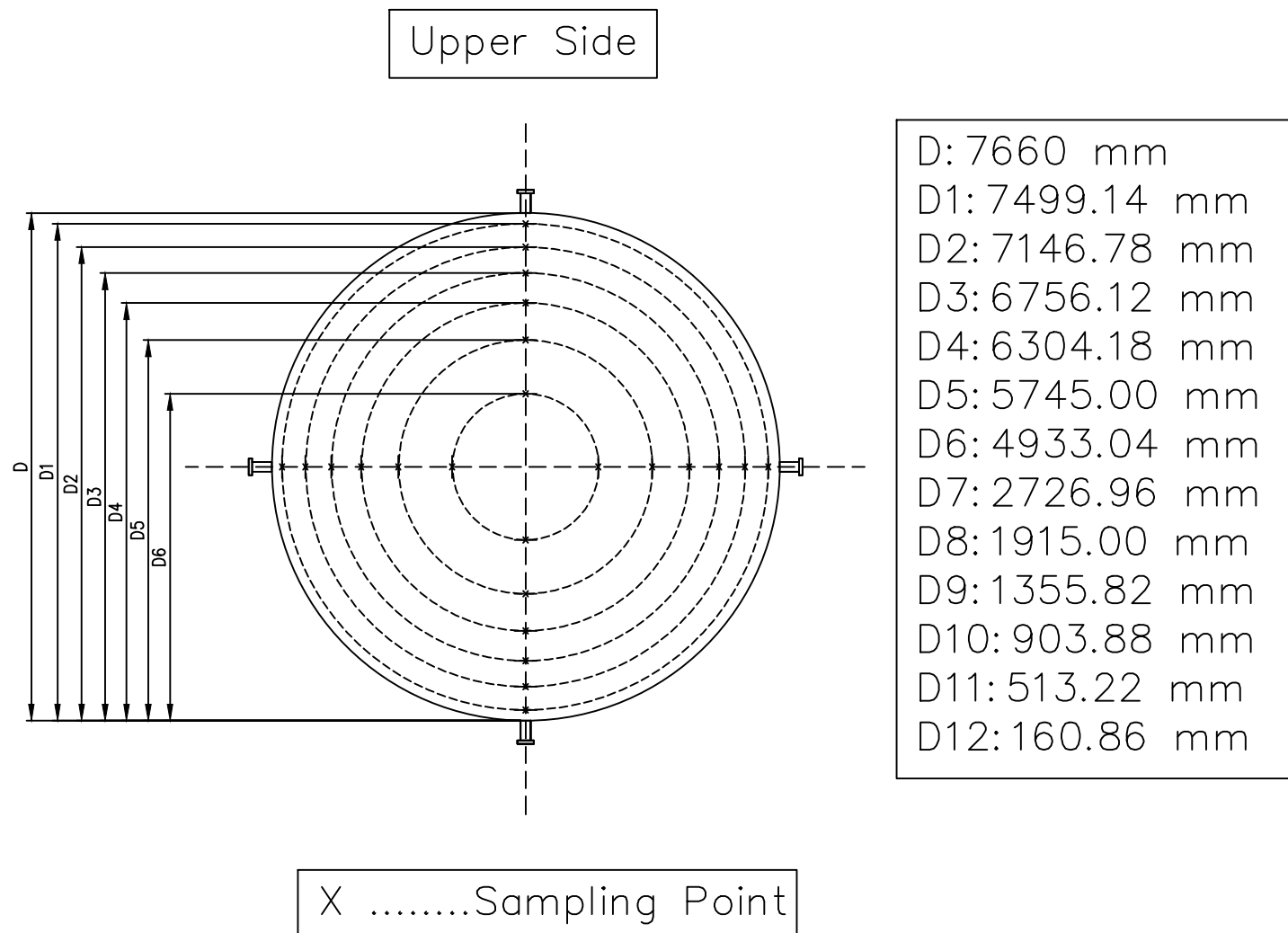


Fig 1-1 Measuring Point for Gas

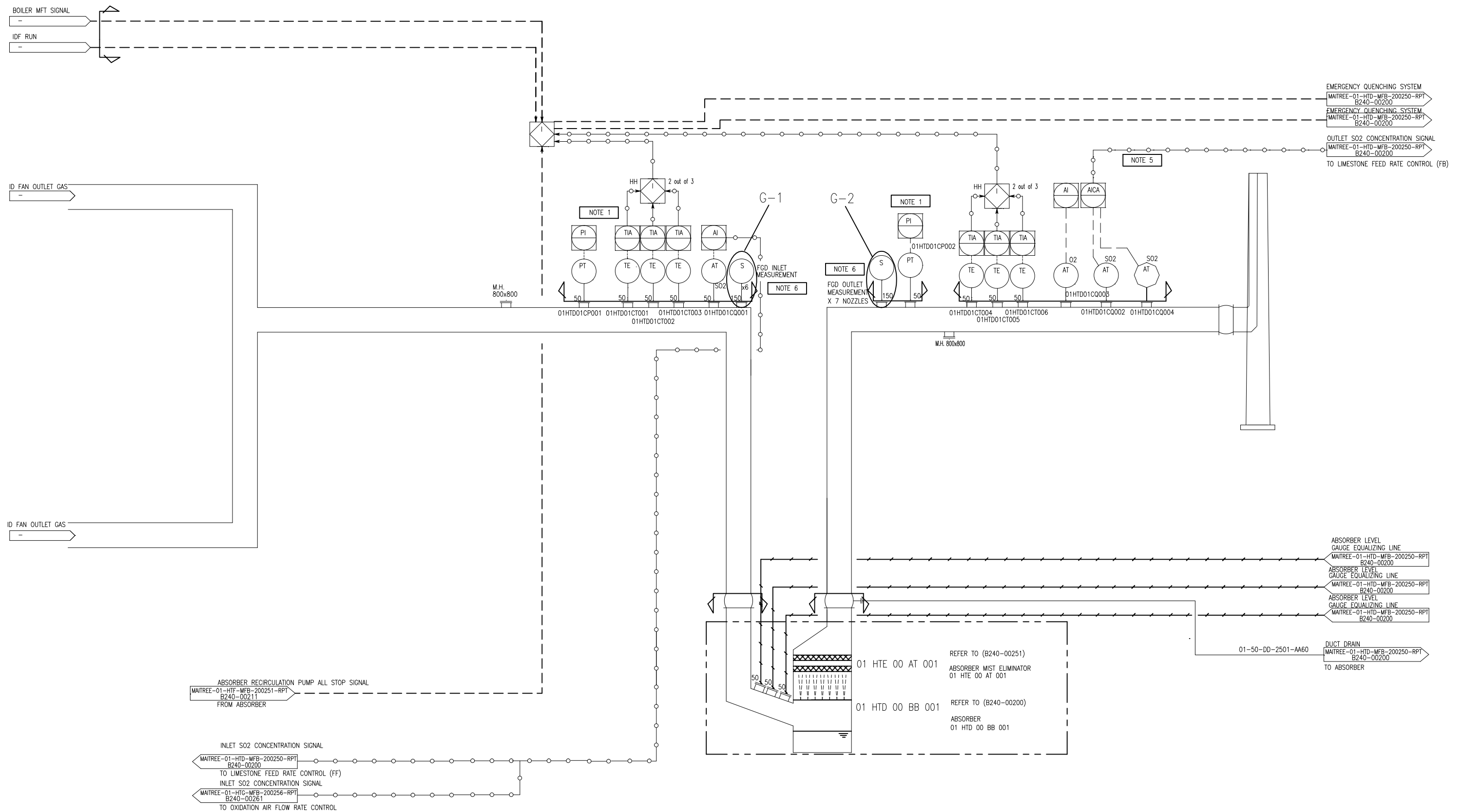


Fig 2.1 Sampling Point (Gypsum Slurry)

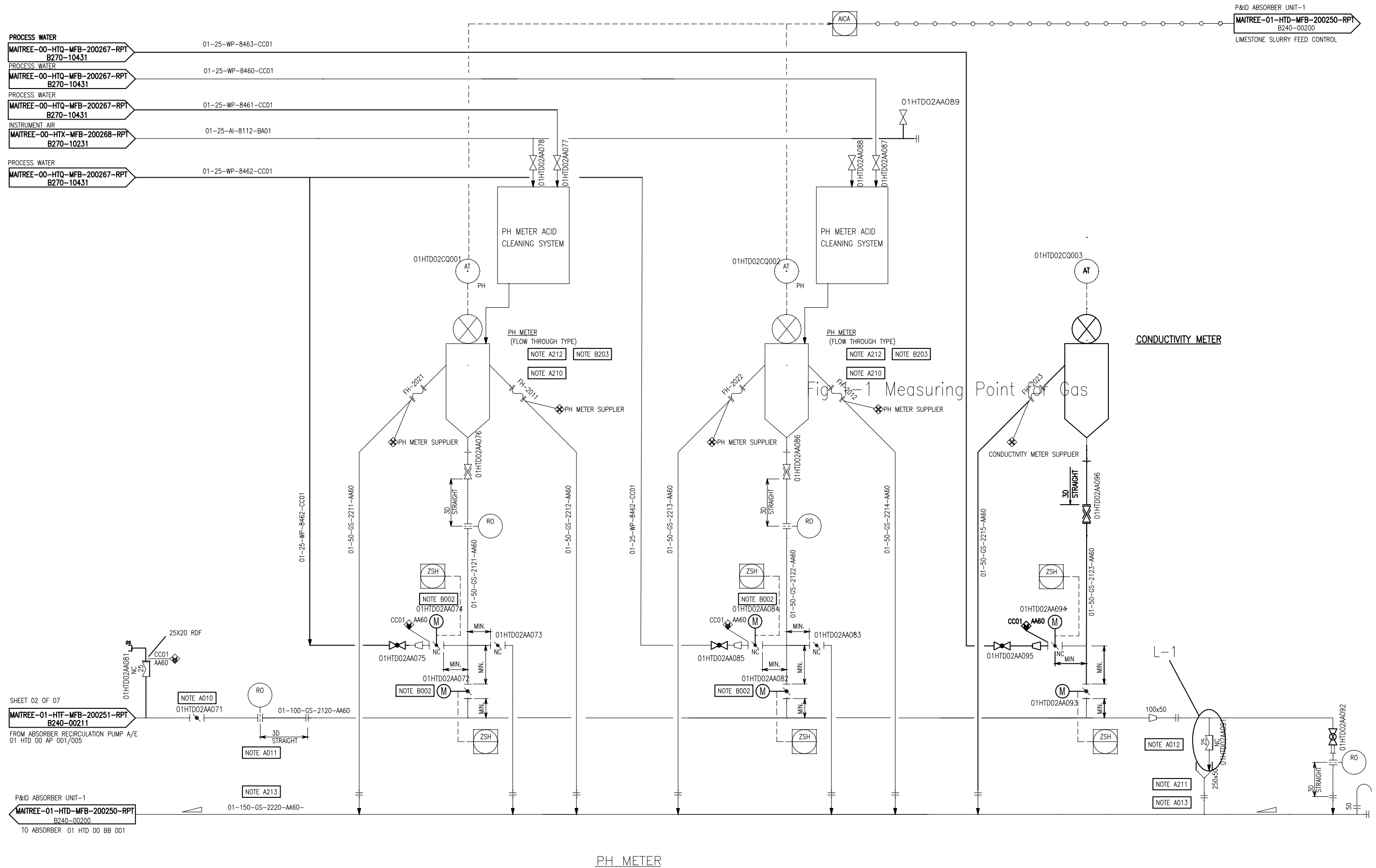


Fig 2.2 Sampling Point (Gypsum)

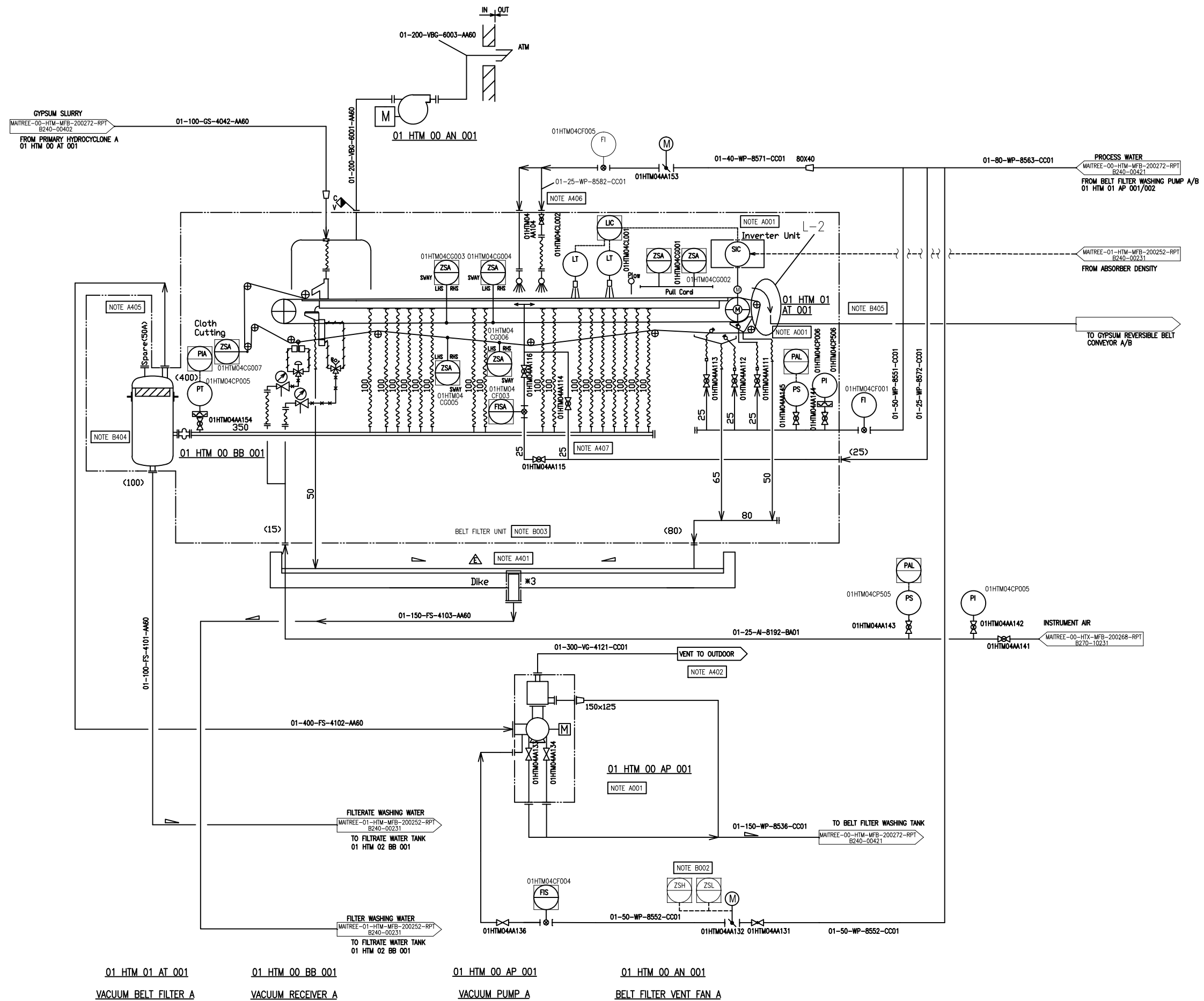


Fig 2.3 Sampling Point (Limestone)

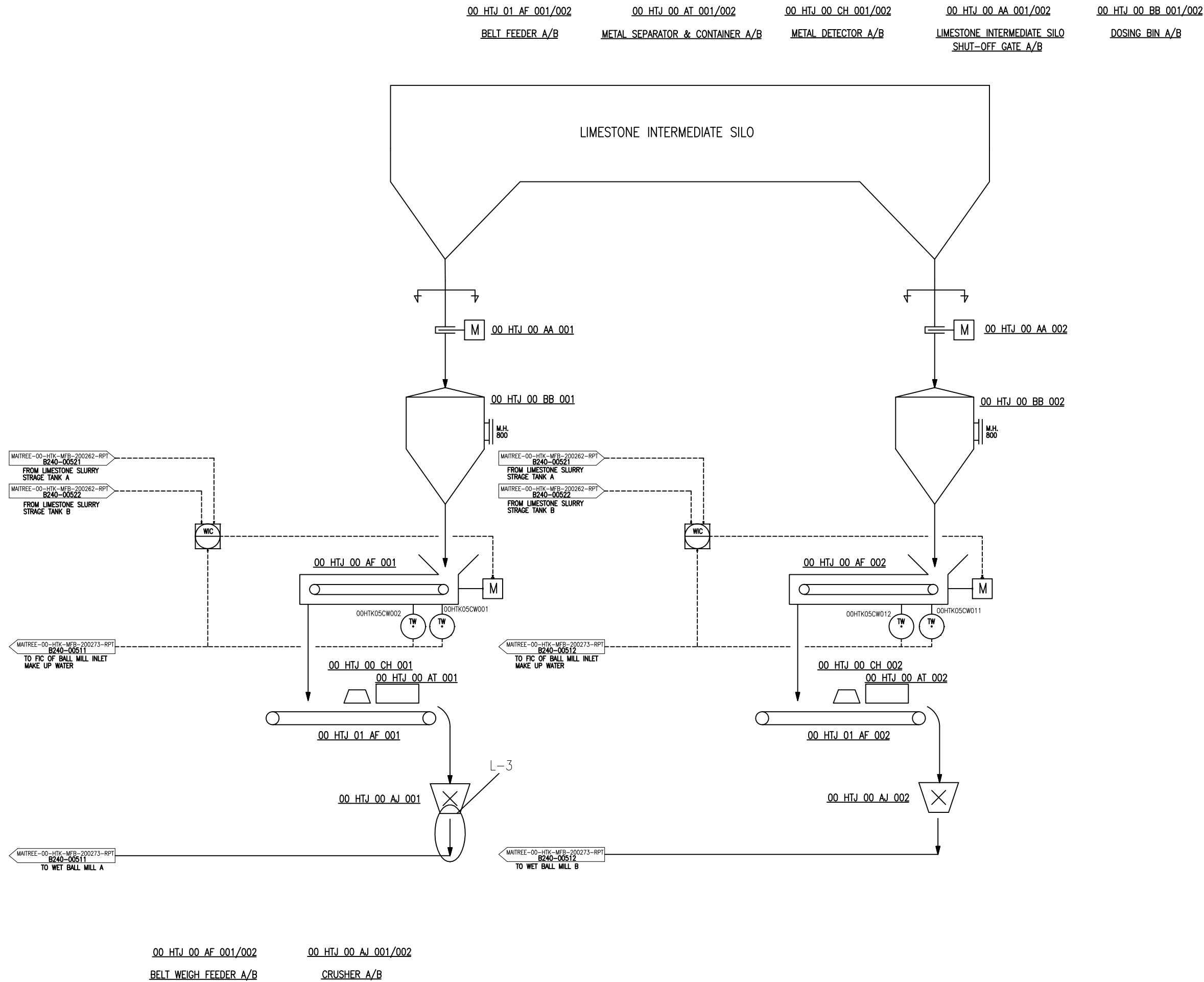


Fig 2.4 Sampling Point (Limestone Slurry)

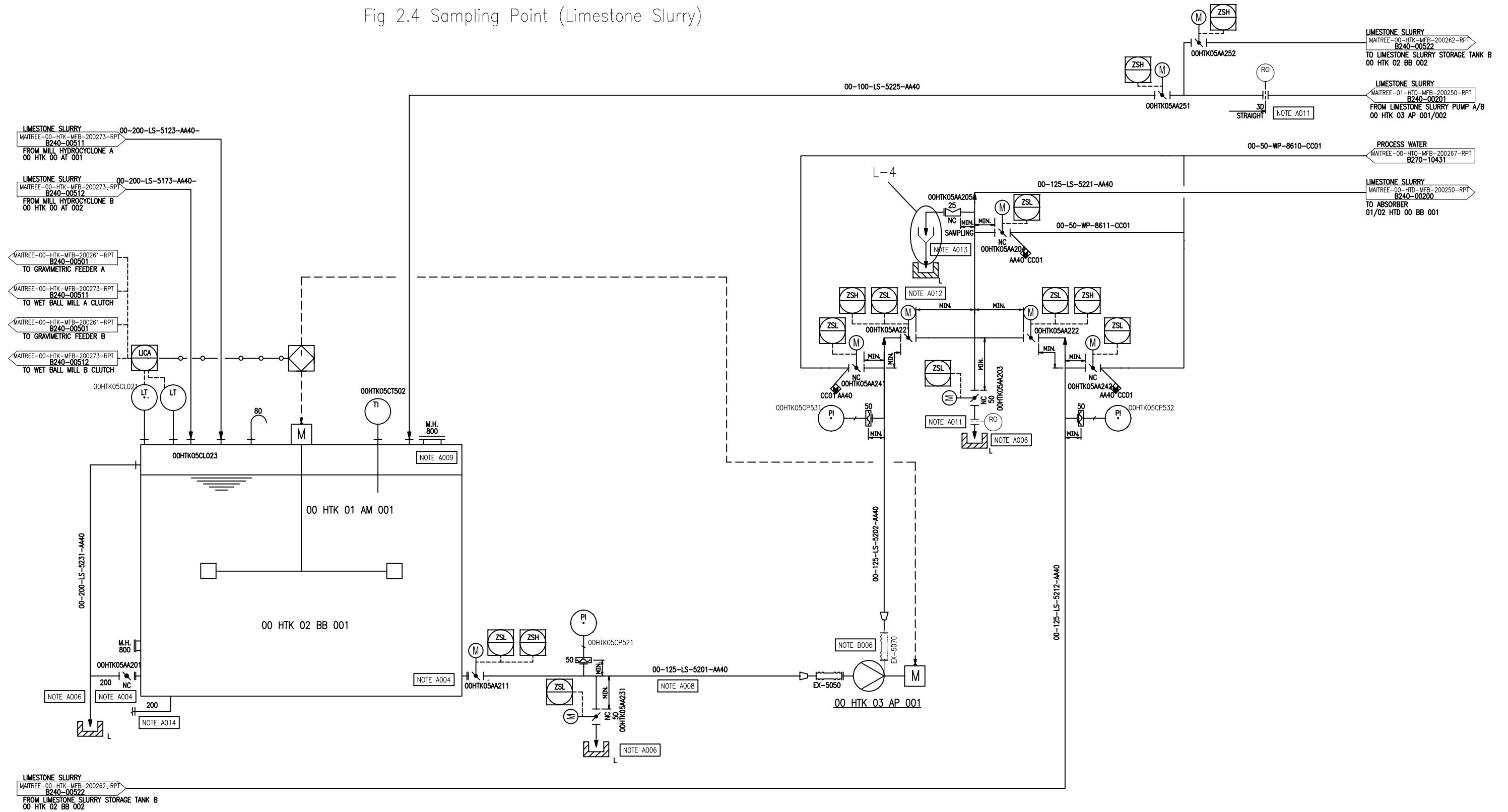
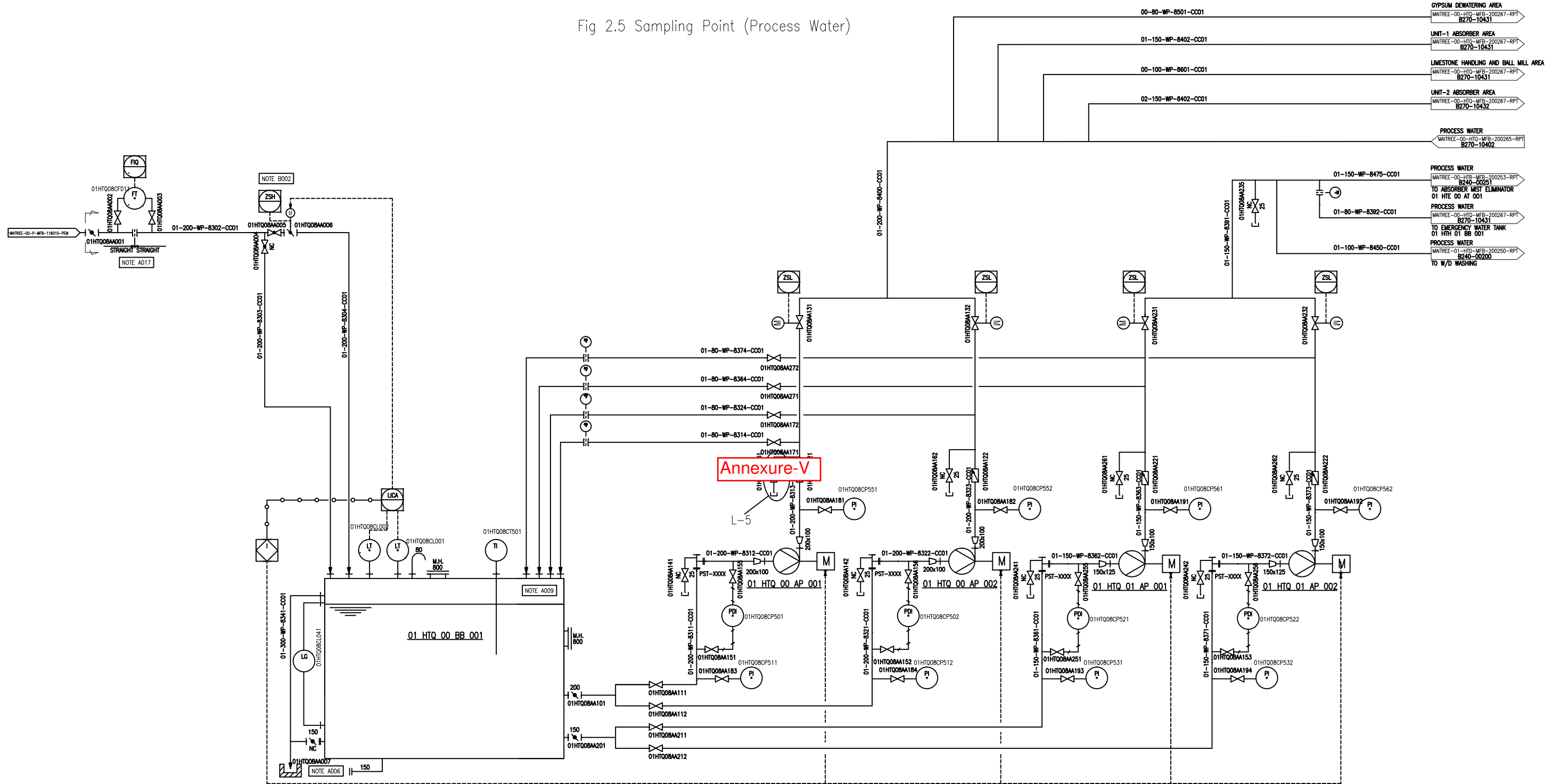


Fig 2.5 Sampling Point (Process Water)

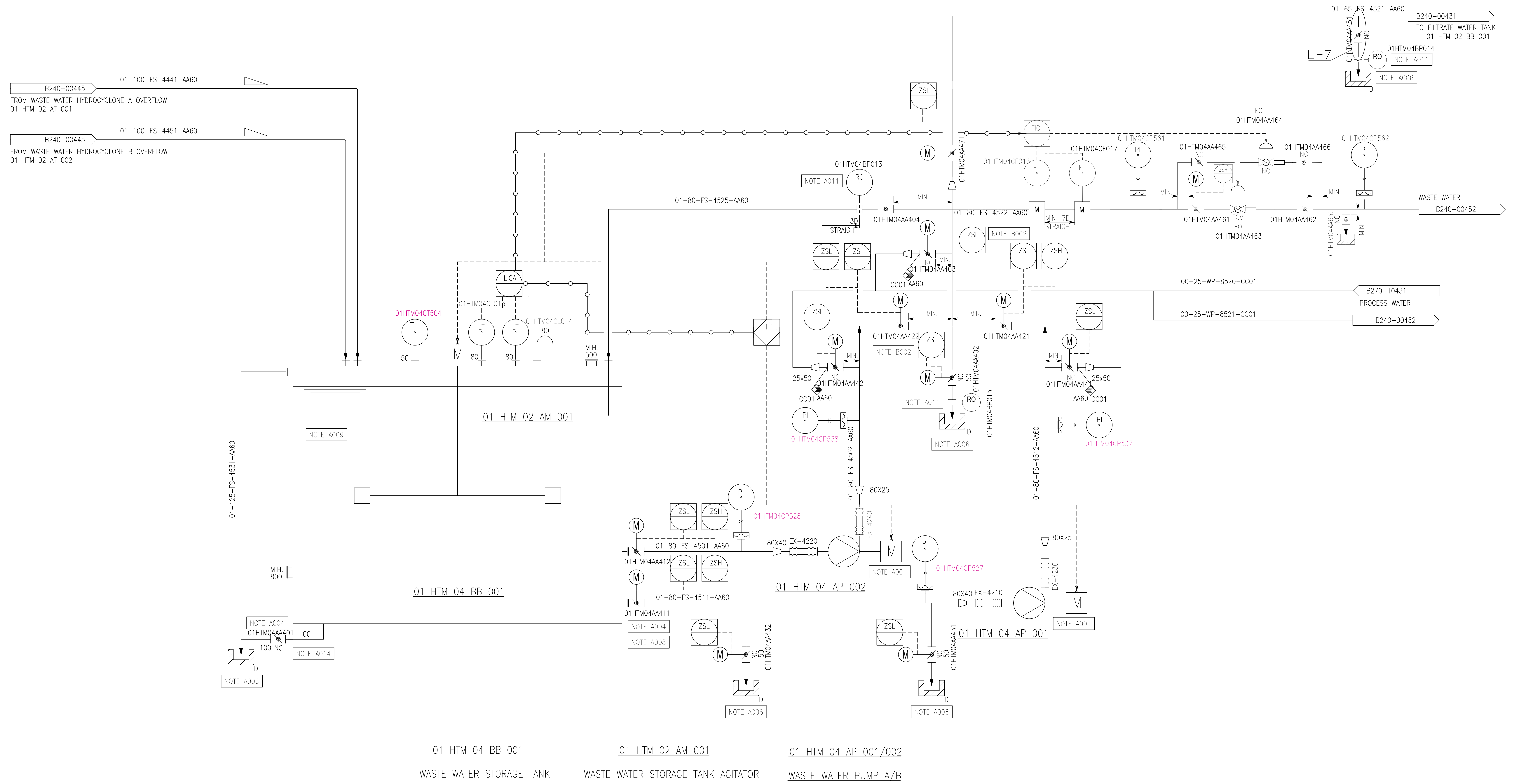


01 HTQ 00 BB 001
PROCESS WATER TANK

01 HTQ 00 AP 001/002
PROCESS WATER PUMP A/B

01 HTQ 01 AP 001/002
ME WASH & EMERGENCY QUENCH PUMP A/B

Fig 2.6 Sampling point (Waste Water)





भारत हेवी इलेक्ट्रिकल्स लिमिटेड

(भारत सरकार का उपक्रम)

BHARAT HEAVY ELECTRICALS LIMITED

(A Govt. of India Undertaking)

HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SUB- CONTRACTORS FOR 2x660MW MAITREE SUPER THERMAL POWER PROJECT

DOCUMENT NO; HSEP:14-MAITREE: VENDOR DATE:05.05.16

HSE DEPARTMENT

Plot No. 9/1, Block-DJ, Sector-II, Salt Lake, Kolkata – 700 091

Phone no. 033-23398049, Web : www.jantermanter.com



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

POWER SECTOR-EASTERN REGION

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 1 of 90

SPECIAL NOTES

- ❖ **This document supersedes section-IX of SCC or any such HSE related document in the tender**
 - ❖ This document is a living document and subject to changes as many times as desired by BHEL and customer, BIFPCL and project consultant Fichtner GmbH. Any cost implication shall be absorbed by the contractor.
 - ❖ This project is a highly eco-sensitive project. There will be regular assessment of impact of the site activities on ecology. The contractors shall be obligated to take corrective actions, if any, as advised by BHEL/ Customer/ any Statutory body.
 - ❖ The contractor shall ensure that only persons with required competence and sound health are engaged at the site. No deviation shall be allowed. The person and the contractor shall be in possession of relevant documents in support of competence and health condition for producing before BHEL for verification, whenever demanded.
 - ❖ It may take minimum 2 days for finishing health check-up and induction training before a gate-pass/ ID is issued. In a day, maximum 30 persons can be given induction training. Mobilization shall be planned accordingly
 - ❖ Method statement and Job Safety Analysis shall be carried out for all hazardous jobs and critical lifts
 - ❖ As the site is located in an area which is prone to adverse weather condition, the contractors shall have infrastructure for fast evacuation of people
 - ❖ Contractor for Boiler-1, Chimney-1 and Cooling Tower-1 shall provide one double-mounted siren at a height covering a dia of about 2KM for alerting site workers in case of emergency.
 - ❖ The following basic instruments shall be available with contractors HSE team if their job involves:
 - Height work: Binoculars
 - Confined space work: Oxy-meter
 - Night work: Lux meter, Torch light
 - Checking of ELCBs: ELCB tester
 - Checking of earthing: Megger
- Apart from these, DB meter, Alcohol Breath analyzer, and other HSE promotional items shall be made available by the contractors as and when demanded by BHEL.
- ❖ Well-equipped sick room shall be set up and ambulance shall be made available by specific contractors as provided for in the work order of certain packages. However, the operational expenses can be shared by those contractors who will avail services of these facilities.



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 2 of 90

POWER SECTOR-EASTERN REGION

INDEX

Sr. No.	Description	Page No.
1.0	PURPOSE	5
2.0	SCOPE	5
3.0	OBJECTIVES	5
4.0	HEALTH, SAFETY & ENVIRONMENT POLICY	6
5.0	TERMS & DEFINITIONS	7
6.0	HSE ORGANIZATION	8
6.1	QUALIFICATION FOR HSE PERSONNEL	8
6.2	RESPONSIBILITIES	9
7.0	PLANNING BY SUBCONTRACTOR	10
7.1	MOBILISATION OF MACHINERY/EQUIPMENT/TOOLS	11
7.2	MOBILISATION OF MANPOWER BY SUBCONTRACTOR	11
7.3	PROVISION OF PPEs	11
7.4	ARRANGEMENT OF INFRASTRUCTURE	13
8.0	HSE TRAINING & AWARENESS	17
8.1	HSE INDUCTION TRAINING	17
8.2	HSE TOOLBOX TALK	17
8.3	TRAINING ON HEIGHT WORK	18
8.4	HSE TRAINING DURING PROJECT EXECUTION	18



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 3 of 90

POWER SECTOR-EASTERN REGION

8.5	HSE PROMOTION-SIGNAGE, POSTERS, COMPETITION, AWARDS ETC	19
9.0	HSE COMMUNICATION	19
9.1	INCIDENT REPORTING, INVESTIGATION & RECORDS	19
9.2	HSE EVENT REPORTING	20
10.0	OPERATIONAL CONTROL	20
10.1	HSE ACTIVITIES	21
10.2	WORK PERMIT SYSTEM	21
10.3	SAFETY DURING WORK EXECUTION	22
10.3.1	POWER SUPPLY & UPKEEP OF INSTALLATION	22
10.3.2	QUALIFIED AND UNQUALIFIED WORKERS	23
11.0	LIFTING OPERATION	24
12.0	FIRE PREVENTION, PROTECTION AND PREPAREDNESS	30
13.0	RADIOGRAPHY	31
14.0	CONFINED SPACE ENTRY	31
15.0	WELDING & GAS CUTTING OPERATIONS	33
16.0	COMPRESSED GAS	34
17.0	WORK AT HEIGHT	35
18.0	SCAFFOLDS	36
18.1	SAFE USE OF LADDERS	39
18.2	PRECAUTIONS AGAINST THE FALL OF MATERIALS & PERSONS AND COLLAPSE OF STRUCTURES	40



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 4 of 90

POWER SECTOR-EASTERN REGION

18.3	SAFETY NETS	41
19.0	SAFETY IN JETTY CONSTRUCTIONS	42
20.0	NIGHT SHIFT OPERATIONS	43
21.0	CONTROL OF MOVEMENTS AND USE OF HAZARDOUS SUBSTANCES AND CHEMICALS	44
22.0	CHEMICAL CLEANING	44
23.0	USE OF HAND TOOLS AND POWER OPERATED TOOLS	45
24.0	START-UP, COMMISSIONING AND TESTING	47
25.0	DEMOLITION WORK	47
26.0	EXCAVATION	48
27.0	ENVIRONMENTAL CONTROL	48
28.0	HOUSEKEEPING	49
29.0	WASTE MANAGEMENT	50
30.0	WORK VEHICLES	52
31.0	EMERGENCY PREPAREDNESS AND RESPONSE	52
32.0	HSE INSPECTION	63
33.0	HSE PERFORMANCE AND HSE PENALTIES	65
34.0	OTHER REQUIREMENTS	68
35.0	HSE AUDIT/INSPECTION	69
36.0	MONTHLY HSE REVIEW MEETING	69
37.0	FORMATS USED	69



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 5 of 90

POWER SECTOR-EASTERN REGION

1.0 PURPOSE

- 1.1 The purpose of this HSE Plan is to provide for the systematic identification, evaluation, prevention and control of general workplace hazards, specific job hazards, potential hazards and environmental impacts that may arise from foreseeable conditions during installation and servicing of industrial projects and power plants.
- 1.2 This document shall be followed by BHEL's subcontractors at all installation and servicing sites. In case customer specific documents are to be implemented, this document will be followed in conjunction with customer specific documents.
- 1.3 Although every effort has been made to make the procedures and guidelines in line with statutory requirements, in case of any discrepancy relevant statutory guidelines or EHSS contract requirements must be followed of which the most stringent shall apply
- 1.4 In case the customer has any specific requirement, the same is to be fulfilled.
- 1.5 We will promote and maintain a safe, healthy and environmentally compliant workplace for all employees, contractors, visitors and any others that may be affected by construction activities, and strive for a "GOAL of ZERO REPORTABLE INCIDENTS" on the project.

2.0 SCOPE

The document is applicable for installation and commissioning of 2x660MW SETS as per the relevant contractual obligations, and provides the minimum HSE requirements to be followed at the project site and labour colony. As an item of note, this HSE Plan is considered a living document and will be revised as/if necessary to ensure that contractual and regulatory compliance requirements are met during the performance of work on the project

3.0 OBJECTIVES

The HSE Plan reflects that BHEL places high priority upon the Occupational Health, Safety and Environment at workplaces.

- Ensure the Health and Safety of all persons at work site is not adversely affected by the work.
- Ensure protection of environment of the work site.
- Comply at all times with the relevant statutory and contractual HSE requirements.
- Provide trained, experienced and competent personnel. Ensure medically fit personnel only are engaged at work.
- Provide and maintain plant, places and systems of work that are safe and without risk to health and the environment.
- Provide all personnel with adequate information, instruction, training and supervision.
- Effectively control, co-ordinate and monitor the activities of all personnel on the Project sites including subcontractors in respects of HSE.
- Establish effective communication on HSE matters with all relevant parties involved in the Project works.
- Ensure that all work planning takes into account all persons that may be affected by the work.
- Ensure fitness testing of all T&Ps/Lifting appliances like cranes, chain pulley blocks etc. are to be certified by competent authority.
- Ensure timely provision of resources to facilitate effective implementation of HSE requirements.
- Ensure continual improvements in HSE performance
- Ensure conservation of resources and reduction of wastage.



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 6 of 90

POWER SECTOR-EASTERN REGION

- Capture the data of all incidents including near misses, process deviation etc. Investigate and analyze the same to find out the root cause.
- Ensure timely implementation of correction, corrective action and preventive action.

3.1 Goals and Targets -

- To achieve "Zero Fatal Incident at Site"
- 100% compliance of all legal/statutory requirements related to EHS.
- 100% Health, Safety and Environmental Induction training attendance for all employees and sub-contractors.
- 100% High Risk activities to be carried out only after approved Method Statement, HIRA/JSA and Permit to Work are implemented.
- 100% PPEs compliance in high & medium risk activities.
- 100% incident reporting, recording and reviewing for corrective & preventive actions.
- A monthly review shall be scheduled and conducted to assess HSE program compliance and to close any recognized gaps to improve safety management and incident prevention.

4.0 BHEL POWER SECTOR HEALTH, SAFETY & ENVIRONMENT POLICY

Power Sector HSE Policy

We, at BHEL Power Sector, reaffirm our belief that the Health and Safety of our stakeholders and conservation of Environment is of utmost importance and takes precedence in all our business decisions. In pursuit of this belief and commitment, we strive to:

- ✓ Ensure total compliance with applicable legislation, regulations and other requirements concerning Occupational Health, Safety and Environment.
- ✓ Ensure continual improvement in the Occupational Health, Safety and Environment Management System performance.
- ✓ Enhance Occupational Health, Safety and Environment awareness amongst employees, customers and suppliers by proactive communication and training.
- ✓ Review periodically and improve Occupational Health, Safety and Environment Management System to ensure its continuing suitability, adequacy and effectiveness in a continuously changing business environment.
- ✓ Develop a culture of safety through active leadership and provide appropriate training at all levels to enable employees to fulfill their Health, Safety and Environmental obligations.
- ✓ Incorporate appropriate Occupational Health, Safety and Environmental criteria into business decisions for selection of plant, technology and services as well as appointment of key personnel.
- ✓ Ensure availability at all times of appropriate resources to fully implement the Occupational Health, Safety and Environmental policy of the company.

This policy will be communicated to all employees and made available to interested parties.

Sd/-

Director (Power)



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 7 of 90

POWER SECTOR-EASTERN REGION

5.0 TERMS AND DEFINITIONS

5.1 DEFINITIONS

5.1.1 INCIDENT

Work- related event(s) in which an injury or ill health (regardless of severity) or fatality occurred, or could have occurred.

5.1.2 NEAR MISS

An incident where no ill health, injury, damage or other loss occurs, but it had a potential to cause, is referred to as "Near-Miss".

5.1.3 MAN-HOUR WORKED

The total number of employee hours worked by all employees including subcontractors working in the premises. It includes managerial, supervisory, professional, technical, clerical and other workers including contract labours. Man-hours worked shall be calculated from the payroll or time clock recorded including overtime. When this is not feasible, the same shall be estimated by multiplying the total man-days worked for the period covered by the number of hours worked per day. The total number of workdays for a period is the sum of the number of men at work on each day of period. If the daily hours vary from department to department separate estimate shall be made for each department and the result added together.

5.1.4 FIRST AID CASES

First Aid includes:

- Visit to a physician or a licensed health care professional solely for observation or counselling
- Conduct of diagnostic procedures like X rays, blood test including the prescription medications used solely for diagnostic purposes (e.g. eye drops to dilate eyes)
- Using a non-prescription medicine at non-prescription strength (for medication available in both prescription and non-prescription form as recommendation by a physician or other licensed health care professional to use a non-prescription medication at prescription strength is considered medical treatment for record keeping purposes);
- Administering tetanus immunizations (other immunizations, such as Hepatitis B vaccine or rabies vaccine, are considered medical treatment);
- Cleaning, flushing or soaking wounds on the surface of the skin;
- Using wound coverings such as bandages, Band-Aids TM, gauze pads, etc.; or using butterfly bandages or Steri-Strips TM (other wound closing devices such as sutures, staples, etc., are considered medical treatment);
- Using hot or cold therapy;
- Using any non-rigid means of support, such as elastic bandages, wraps, non-rigid back belts, etc. (devices with rigid stays or other systems designed to immobilize parts of the body are considered medical treatment for record-keeping purposes);
- Using temporary immobilization devices while transporting an accident victim (e.g., splints, slings, neck collars, back boards, etc.).
- Drilling of a fingernail or toenail to relieve pressure, or draining fluid from a blister;
- Using eye patches;
- Removing foreign bodies from the eye using only irrigation or a cotton swab;
- Removing splinters or foreign material from areas other than the eye by irrigation, tweezers, cotton swabs or other simple means;
- Using finger guards;



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 8 of 90

POWER SECTOR-EASTERN REGION

- Using massages (physical therapy or chiropractic treatment are considered medical treatment for recordkeeping purposes); or
- Drinking fluids for relief of heat stress.

No other treatments are considered first aid.

5.1.5 INJURY OTHER THAN FIRST-AID: (As per Chapter VII, Rule 69 of Bangladesh Labour Rules, 2015)

Notice to be given of any accident When any accident occurs in an establishment causing loss of life or bodily injury, or an accidental explosion, ignition, outbreak of fire or irruption of water or fumes occurs, the employer shall give notice of the occurrence to the Inspector within following 3 (three) working days [:]

Provided that the factory authority shall, immediately after the occurrence of such incident, inform the matter to the Government, Fire Service, Directorate of Inspection of Factories and Establishments, Police Station, and if required, the nearby hospital or government-private medical service establishment, through telephone, mobile phone, SMS or fax, in order to take immediate necessary action to minimize potential damages or bring the situation under control.]

Fatal incident and Serious Incident:

If the victim dies in the incident, it will be treated as a fatal incident.

In this case the injured person is likely to be disable for more than 20 days to perform his duty, it will be treated as Serious Incident. In these cases, the intimation will be made as described above.

Minor Incident: (As per Chapter VII, Rule 70 of Bangladesh Labour Rules, 2015)

Where an accident mentioned above causes bodily injury resulting the compulsory absence from work of the person injured for a period exceeding 48 (forty-eight) hours, but not exceeding 20days. The management will inform the concerned statutory authority within 7 days in form-27 under rule 69/1/(A), (B) and (C) of Bangladesh Labour Rules, 2015.

6.0 HSE ORGANISATION


Number of HSE officers:

The subcontractor must deploy one HSE officer for every 500 workers or part thereof in each package. If there are more than one HSE officer, one shall be designated as head/HSE. No Of HSE stewards shall be one for every 100 workers deployed

Deployment: The subcontractor should deploy sufficient HSE officers and HSE-steward/supervisor, as per requirement given above, since initial stage and add more in proportion to the added strength in work force. Any delay in deployment of HSE Officer will attract a penalty of BNR.40,000/- per man month for the delayed period.

6.1 QUALIFICATION FOR HSE PERSONNEL


Sl.no	Designation	Minimum Qualification	Experience
1	Safety officer (Construction Agency)	Degree or Diploma in Engineering with diploma in Industrial Safety with construction safety as one of the subjects. If Degree/Diploma in safety is from India, it must be recognized by AICTE/SCTE&VT. NEBOSH IGC /IOSH diploma also acceptable	Minimum two years for degree holder and five years for diploma holder in the field of Construction of power plant/ major industries

	HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)	Doc no.: HSEP: 14-MAITREE:VENDOR
		REV: 00
	POWER SECTOR-EASTERN REGION	Date: 05.05.16
		Page: 9 of 90

6.2 RESPONSIBILITIES

6.2.1 SITE IN -CHARGE OF SUBCONTRACTOR

- Shall engage qualified safety officer(s) as per clause 6.1
- Shall adhere to the rules and regulations mentioned in this code, practice very strictly in his area of work in consultation with his concerned engineer and the safety coordinator.
- Shall screen all workmen for health and competence requirement before engaging for the job and periodically thereafter as required.
- Shall not engage any employee below 18 years.
- Shall arrange for all necessary PPEs like safety helmets, belts, full body harness, shoes, face shield, hand gloves etc. before starting the job. Shall ensure that no working men/women carry excessive weight more than stipulated in Factory Rule Regulation R57.
- Shall ensure that all T&Ps engaged are tested for fitness and have valid certificates from competent authorities.
- Shall ensure that provisions stipulated in contract Labour Regulation Act 1970, Chapter V C.9, canteen, rest rooms/washing facilities to contracted employees at site.
- Shall adhere to the instructions laid down in Operation Control Procedures (OCPs) available with the site management.
- Shall ensure that person working above 2.0 meter should use Safety Harness tied to a life line/stable structure.
- Shall ensure that materials are not thrown from height. Cautions to be exercised to prevent fall of material from height.
- Shall report all incidents (Fatal/Major/Minor/Near Miss) to the Site engineer /HSE officer of BHEL.
- Shall ensure that Horseplay is strictly forbidden.
- Shall ensure that adequate illumination is arranged during night work.
- Shall ensure that all personnel working under subcontractor are working safely and do not create any Hazard to self and to others.
- Shall ensure display of adequate signage/posters on HSE.
- Shall ensure that mobile phone is not used by workers while working.
- Shall ensure conductance of HSE audit, mock drill, medical camps, induction training and training on HSE at site.
- Shall ensure full co-operation during HQ/External /Customer HSE audits.
- Shall ensure submission of look-ahead plan for procurement of HSE equipment's and PPEs as per work schedule.
- Shall ensure good housekeeping.
- Shall ensure adequate valid fire extinguishers are provided at the work site.
- Shall ensure availability of sufficient number of toilets /restrooms and adequate drinking water at work site and labour colony.
- Shall ensure adequate emergency preparedness.
- Shall be member of site HSE committee and attend all meetings of the committee

	HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)	Doc no.: HSEP: 14-MAITREE:VENDOR
		REV: 00
	POWER SECTOR-EASTERN REGION	Date: 05.05.16
		Page: 10 of 90

6.2.2 HEALTH, SAFETY AND ENVIRONMENT OFFICER OF SUBCONTRACTOR

- Carry out safety inspection of Work Area, Work Method, Men, Machine & Material, P&M and other tools and tackles.
- Facilitate inclusion of safety elements into Work Method Statement.
- Highlight the requirements of safety through Tool-box / other meetings.
- Help concerned HOS to prepare Job Specific instructions for critical jobs.
- Conduct investigation of all incident/dangerous occurrences & recommend appropriate safety measures.
- Advice & co-ordinate for implementation of HSE permit systems, OCPs & MPs.
- Convene HSE meeting & minute the proceeding for circulation & follow-up action.
- Plan procurement of PPE & Safety devices and inspect their healthiness.
- Report to PS Region/HQ on all matters pertaining to status of safety and promotional program at site level.
- Facilitate administration of First Aid
- Facilitate screening of workmen and safety induction.
- Conduct fire Drill and facilitate emergency preparedness
- Design campaigns, competitions & other special emphasis programs to promote safety in the workplace.
- Apprise PS– Region on safety related problems.
- Notify site personnel non-conformance to safety norms observed during site visits / site inspections.
- Recommend to Site In charge, immediate discontinuance of work until rectification, of such situations warranting immediate action in view of imminent danger to life or property or environment.
- To decline acceptance of such PPE / safety equipment that do not conform to specified requirements.
- Encourage raising Near Miss Report on safety along with, improvement initiatives on safety.
- Shall work as interface between various agencies such customer, package-in-charges, subcontractors on HSE matters

7.0 PLANNING BY SUBCONTRACTOR

7.1 MOBILISATION OF MACHINERY/EQUIPMENT/TOOLS BY SUBCONTRACTOR

- As a measure to ensure that machinery, equipment and tools being mobilized to the construction site are fit for purpose and are maintained in safe operating condition and complies with legislative and owner requirement. A documented daily prior to use inspection checklist shall be completed by the end user and periodic inspection shall be arranged by in-house competent authority for acceptance as applicable. All Tools & Plants shall be certified by a third party COMPETENT person before these are put to use [as per Rule 60, 75 and schedule 3 of Bangladesh Labor Rules](#). As far as possible, this certification shall be made available to site HSE function by the contractor before entry into the site. The certification shall be renewed annually, otherwise, the item shall be withdrawn from the work area. [The fitness of T&Ps shall be monitored by site HSE quarterly and alert/ reminder issued to the concerned agency and BHEL package in-charge.](#)
- The machinery and equipment to be embraced for this purpose shall include but not limited to the following:
 - Mobile cranes.



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

POWER SECTOR-EASTERN REGION

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 11 of 90

- Side Booms.
 - Grinding machine.
 - Drilling machine.
 - Air compressors.
 - Welding machine.
 - Generator sets.
 - Dump Trucks.
 - Excavators.
 - Dozers
 - Grit Blasting Equipment.
 - Hand and power tools.
- Subcontractor shall notify the engineer, of his intention to bring on to site any equipment or any container, with liquid or gaseous fuel or other substance which may create a hazard. The Engineer shall have the right to prescribe the condition under which such equipment or container may be handled and used during the performance of the works and the subcontractor shall strictly adhere to such instructions. The Engineer shall have the right to inspect any construction tool and to forbid its use, if in his opinion it is unsafe. No claim due to such prohibition will be entertained.

7.2 MOBILIZATION OF MANPOWER BY SUBCONTRACTOR

- As a measure to ensure that manpower being mobilized to the construction site is fit and competent for safe working, screening arrangement shall be made by the sub-contractors to fulfill contractual as well as legislative requirement.
- Examination of medical fitness shall be conducted through qualified medical professional for all workers to be deployed (pre-employment). Post-employment medical check-up shall be done for persons engaged in hazardous jobs at a regular interval as per legislations.
- Ensure that the regulatory requirements of excessive weight limit (to carry/lift/ move weights beyond prescribed limits) for male and female workers are complied with.
- Appropriate accommodation to be arranged for all workmen in hygienic condition.

7.3 PROVISION OF PPEs

- Personnel Protective Equipment (PPEs), in adequate numbers, will be made available at site & their regular use by all concerned will be ensured. PPE details shall be maintained as per Form-23
- The following matrix recommends usage of minimum PPEs against the respective job.

Sl. No	Type of work	PPEs
1	Concrete and asphalt mixing	Nose mask, hand glove, apron and gum boot
2	Welders/Grinders/ Gas cutters	Welding/face screen, apron, hand gloves, nose mask and ear muffs if noise level exceeds 90dB. Helmet fitted with welding shield is preferred for welders
3	Stone/ concrete breakers	Ear muffs, safety goggles, hand gloves
4	Electrical Work	Rubber hand glove, Electrical Resistance shoes, Apron
5	Insulation Work	Respiratory mask, Hand gloves, safety goggles
6	Work at height	Double lanyard full body harness, Fall arrestor (specific cases)
7	Grit/Sand blasting	Blast suit, blast helmet, respirator, leather gloves



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 12 of 90

POWER SECTOR-EASTERN REGION

8	Painting	Plastic gloves, Respirators (particularly for spray painting)
9	Radiography	As per BARC guidelines

The PPEs and other related safety equipments shall conform to the relevant indian or equivalent European or American standards as below:

BS EN 397-2012	Industrial Safety Helmets.
BS EN 60903:2003	Insulating material gloves for electrical purposes.
BS EN 374-3: 2003	Protective Gloves- Chemical Penetration
BS EN 388:2003	Protective Gloves- Mechanical Risks
BS EN 407: 2004	Protective Gloves- heat and fire
BS EN 420:2003	Gloves- general requirement
BS EN-20345	Industrial safety footwear
BS EN 166:2002	Eye protectors.
BS EN 352-1 & 2:2002	Ear Muff & Ear Plug
BS EN 175:1997	Eye & Face protection during welding
BS EN 361:2002	Fall Arrest Full Body Harness
BS EN 360:2002	Retractable type fall arresters
BS EN 795:2012	Lifeline System
BS EN 358;1999	Work Resistant Harness
BS EN 813:2008	Seat harness
BS EN 1498+ others	Rescue Harness+ other items of a rescue kit
BS EN 353:2002	Detachable fall arrester
BS EN 149: 2001	Filtering Half masks tp protect against particles
BS EN 471:2003	High Visibility Clothing

The list is not exhaustive. The safety officer may demand additional PPEs based on specific requirement.

- Where workers are employed in sewers and manholes, which are in use, the subcontractor shall ensure that the manhole covers are opened and ventilated at least for an hour before the workers are allowed to get into manhole, and the manholes so opened shall be cordoned off with suitable railing and provided with warning signals or boards to prevent incident to the public
- The visitors shall also use Reflective Vests, Helmet and any other PPEs as deemed appropriate for the area of work.

Colour scheme for Helmets:

- Workmen: Yellow
- Safety staff: Green or white with green band
- Electrician: Red
- Others including visitors: White



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 13 of 90

POWER SECTOR-EASTERN REGION

- All the PPEs shall be checked for its quality before issue and the same shall be periodically checked. The users shall be advised to check the PPEs themselves for any defect before putting on. The defective ones shall be repaired/ replaced.
 - The issuing agency shall maintain register for issue and receipt of PPEs.
 - The Helmets shall have logo or name (abbreviation of agency name permitted) affixed or printed on the front.
 - The body harnesses shall be serial numbered.
- In case, contractor fails to provide PPEs in time, BHEL/Customer may provide the same and the cost as deemed appropriate by BHEL/Customer shall be debited

7.4 ARRANGEMENT OF INFRASTRUCTURE

7.4.1 DRINKING WATER


- Adequate drinking water shall be provided and maintained at suitable places at different elevations.
- Chilled water shall be made available from 1st April to 30th Sep of the year
- Container should be labeled as “ Drinking Water”
- Cleaning of the storage tank shall be ensured at least once in 1 month indicating date of cleaning and next due date. Mild cleaning detergents as used for cleaning vessels shall be applied and scrubbers (3M or equivalent) shall be used for removing scales and deposits on the inside surface. The tank shall be thoroughly cleaned with potable water only before it is refilled.
- Employees should use their own cup for collecting water-no cup shall be shared
- Potability of water should be tested as per standard at least once in every quarter as per Rule 50(5) of Bangladesh Labour Rules, 2015.
- Apart from above, those who are engaged in work producing significant heat , shall be served saline water or Sarbat at the rate of 2litres perday
- Storage of drinking water shall be min 6M away from any toilet and washroom

7.4.2 WASHING FACILITIES (As per Chapter VIII, Rule 86 of Bangladesh Labour Rules, 2015)

- In every workplace, adequate and suitable facilities for washing shall be provided and maintained.
- Separate and adequate cleaning facilities shall be provided for the use of male and female workers. Such facilities shall be conveniently accessible and shall be kept in clean and hygienic condition and dully illuminated for night use.
- Overalls shall be supplied by the subcontractor to the workmen and adequate facilities shall be provided to enable the painters and other workers to wash during the cessation of work.
- If water used for washing is not potable, it shall be marked “Do Not Drink” in English and Bangla

7.4.3 LATRINES AND URINALS (As per Chapter V, Rule 51, Schedule II of Bangladesh Labour Rules, 2015)

- Latrines and urinals shall be provided in every work place based on strength of workmen at the rate of one toilet seat and one urinal for every 50 female workmen and that for every 60 male workmen
- Urinals shall also be provided at different elevations.
- They shall be adequately illuminated and shall be maintained in a clean and hygienic condition at all times, by appointing designated person.
- Separate facilities shall be provided for the use of male and female worker if any.
- Hand-wash facility shall be provided

	HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)	Doc no.: HSEP: 14-MAITREE:VENDOR
		REV: 00
	POWER SECTOR-EASTERN REGION	Date: 05.05.16
		Page: 14 of 90

7.4.4 PROVISION OF SHELTER DURING REST

Proper Shed & Shelter shall be provided for rest during break::

7.4.5 MEDICAL FACILITIES (Sharing with other sub-contractors at site is permitted)

7.4.5.1 Sick Room (As per rule 77) (As stipulated in the contract)

- A Sick room shall be ensured/identified at site with basic facilities as per subrule 77(5) for handling medical emergencies. The sick room can be run independently or jointly developed on proportionate sharing basis with permission from BHEL. It shall be equipped with one rigid stretcher, one foldable stretcher, one rescue basket stretcher, a wheel chair, at least 2 beds with separator and all basic facilities that a doctor needs for basic health check-up and quick referral including those listed in sub-rule 77(5) of Bangladesh Labour Rules,2015
- A qualified medical professional, not less than a Degree in Medical Science (Allopathy) as recognized in Bangladesh , shall be deployed at the sick room along with sufficient support staff
- Medical waste shall be disposed as per prevailing legislation
- Ambulance, **as stipulated in the contract**, shall be made available at the site along with a trained driver and shall be equipped with at least an Oxygen cylinder along with dispensation system, first-aid box, a portable ABC type fire extinguisher.

7.4.5.2 FIRST AIDER

- Must have a competence certificate in First-aid issued by Bangladesh Red Cross Society/ Bangladesh St Johns Ambulance/ any other agency which is recognised by the Govt of Bangladesh
- Ensure availability of **one** Qualified First-aider throughout the working hours for every 150 workmen engaged as per clause 89 of Bangladesh Labour Law
- Every injury shall be treated, recorded and reported.
- Refresher course on first aid shall be conducted as necessary.
- List of Qualified first aiders and their contact numbers should be displayed at conspicuous places.

7.4.5.3 FIRST AID BOX (as per rule 76(2) of Bangladesh Labour Rules.2015))

- The subcontractor shall provide necessary first aid facilities. At every work place first aid facilities shall be provided and maintained.
- The first aid box shall be kept by first aider who shall always be readily available during the working hours of the work place. His name and contact no to be displayed on the box.
- The first aid boxes should be placed at various elevations so as to make them available within the reach and at the quickest possible time.
- The first aid box shall be distinctly marked with a Green Cross on white background.
- Details of contents of first aid box is given in Annexure No. 01
- Monthly inspection of First Aid Box shall be carried out by the owner as per format no. HSEP:14-F01
- The subcontractor should conduct periodical first –aid classes to keep his supervisor and Engineers properly trained for attending to any emergency.



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 15 of 90

POWER SECTOR-EASTERN REGION

7.4.5.4 HEALTH CHECK UP

The persons engaged at the site shall undergo mandatory health checkup from a qualified doctor as per the **format no. HSEP:13-F03 and Health Record 31-A** before induction. The persons engaged in the following works shall undergo health checkup at least once in a year:

- Height workers
- Drivers/crane operators/riggers
- Confined space workers
- Shot/sand blaster
- Welding and Gas cutting personnel

7.4.6 PROVISION OF CANTEEN FACILITY

- Canteen facilities shall be provided for the workmen of the project inside the project site.
- Proper cleaning and hygienic condition shall be maintained.
- Proper care should be taken to prevent biological contamination.
- Adequate drinking water should be available at canteen.
- Fire extinguisher shall be provided inside canteen.
- Regular health check-up and medication to the canteen workers shall be ensured.

7.4.7 PROVISION OF ACCOMODATION/LABOUR COLONY

- The subcontractor shall arrange for the accommodation of workmen at nearby houses or by making a labour colony.
- Regular housekeeping of the labour colony shall be ensured.
- Proper sanitation and hygienic conditions shall be maintained and inspected once in a month.
- Adequate number of toilet facilities with water for workers as per norms to be provided. There must be separate toilet for women workers. Drinking water and electricity to be provided at the labour colony.
- Potable water shall be tested once in six months as per IS10500.
- MSDS of LPG shall be put up prominently. This shall be included in the induction training as well.
- The labour colony shall be appropriately secure so that only authorized persons have access to it.
- First aid facility shall be provided in the labour camp under the administration of trained first aiders.
- Common kitchen facilities to be ensured and cooking inside the room to be avoided. The canteen should be maintained in hygienic condition.
- No. of occupants in room rooms to be as per the standards practice.
- Awareness training shall be organized for the workers regarding fire safety, safe use of LPG, Health & Hygiene, and electrical safety etc. on monthly basis.
- Adequate drainage and approach roads to be done.
- Perimeter fencing, security and main gate entrance shall be established and maintained.
- Monthly inspection to be done to ensure the compliance and for opportunity of improvement.
- Workers shall not be transported in open vehicles i.e. trailers, truck beds etc within project boundaries which includes the labor colony.

7.4.8 PROVISION OF EMERGENCY VEHICLE (in addition to Ambulance)

Generally one vehicle (4 wheeler) is identified by each major package holder (sub-agency). Minor package holders are permitted to have a tie-up with major package holder



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 16 of 90

POWER SECTOR-EASTERN REGION

7.4.9 PEST CONTROL

Regular pest control should be carried out at all offices, mainly laboratories, canteen, labour colony and stores

7.4.10 GENERAL DISCIPLINE:

Workmen under influence of liquor or drug or any other intoxication shall not be permitted to work and sent out of the work area. Workmen shall not be permitted to smoke in work area. None shall be permitted to carry any arms or firearms. The workmen shall report to work on time and follow supervisor's instruction. Use of cell phone particularly in hazardous jobs shall be discouraged like height work, crane operation etc. Horseplay, willful violation of rules shall be dealt with suitable disciplinary action including suspension and termination. They shall be subjected to physical frisking or alcohol/drug test at random by security and security shall be authorized to take appropriate disciplinary action against any delinquent employee like throwing out of the gate for the day and so on. If any such employee returns to work, he shall be put through induction training once again.


7.4.11 SCRAPYARD

- In consultation with customer, scrap yard shall be developed to store metal scrap, wooden scrap, waste, hazardous waste.
- Scrap/Waste shall be segregated as Bio-degradable and non-bio-degradable and stored separately.

7.4.12 ILLUMINATION (to be reviewed)

- Adequate and suitable light shall be provided at all work places & their approaches including passage ways as per IS: 3646 (Part-II) or as per Bangladesh standard. Some recommended values are given below:

S. No.	Location	Illumination (Lux)
A. Construction Area		
1.	Outdoor areas like store yards, entrance and exit roads	20
2.	Platforms	50
3.	Entrances, corridors and stairs	100
4.	General illumination of work area	150
5.	Rough work like fabrication, assembly of major items	150
6.	Medium work like assembly of small machined parts rough measurements etc.	300
7.	Fine work like precision assembly, precision measurements etc.	700
8.	Sheet metal works	200
9.	Electrical and instrument labs	450
B. Office		
1.	Outdoor area like entrance and exit roads	20
2.	Entrance halls	150
3.	Corridors and lift cars	70
4.	Lift landing	150
5.	Stairs	100
6.	Office rooms, conference rooms, library reading tables	300
7.	Drawing table	450
8.	Manual telephone exchange	200

	HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)	Doc no.: HSEP: 14-MAITREE:VENDOR
		REV: 00
	POWER SECTOR-EASTERN REGION	Date: 05.05.16
		Page: 17 of 90

- Lamp (hand held) shall not be powered by mains supply but either by 24V or dry cells.
- Lamps shall be protected by suitable guards where necessary to prevent danger, in case of breakage of lamp.
- Emergency lighting provision for night work shall be made to minimise danger in case of main supply failure.

If the subcontractor fails to take appropriate safety precautions or to provide necessary safety devices and equipment or to carry out instructions issued by the authorized BHEL official, BHEL shall have the right to take corrective steps at the risk and cost of the subcontractor

8.0 HSE TRAINING& AWARENESS (Trainer, venue and infrastructure shall be decided by site HSE team headed by BHEL site HSE head). Cost shall be borne by respective contractor alone or on sharing basis on case-to-case basis.

8.1 HSE INDUCTION TRAINING


All persons entering into project site shall be given HSE induction training by the HSE officer of BHEL /subcontractor before being assigned to work.

In-house induction training subjects shall include but not limited to:

- Briefing of the Project details.
- Safety objectives and targets.
- Site HSE rules.
- Site HSE hazards and aspects.
- First aid facility.
- Emergency Contact No.
- Incident reporting.
- Fire prevention and emergency response.
- Rules to be followed in the labour colony (if applicable)
- Proper safety wear & gear must be issued to all the workers being registered for the induction (i.e., Shoes/Helmets/Goggles/Leg guard/Apron etc.)
- They must arrive fully dressed in safety wear & gear to attend the induction.
- Any one failing to conform to this safety wear& gear requirement shall not qualify to attend.
- On completing attending subcontractor's in-house HSE induction, each employee shall sign an induction training form (format no. HSEP:14-F03) to declare that he had understood the content and shall abide to follow and comply with safe work practices. They may only then be qualified to be issued with a personal I.D. card, for access to the work site.

8.2 HSE TOOLBOX TALK

- HSE tool Box talk shall be conducted by frontline foreman/supervisor of subcontractor to specific work groups prior to the start of work. The agenda shall consist of the followings:
 - Details of the job being intended for immediate execution.
 - The relevant hazards and risks involved in executing the job and their control and mitigating measures.
 - Specific site condition to be considered while executing the job like high temperature, humidity, unfavorable weather etc.
 - Recent non-compliances observed.
 - Appreciation of good work done by any person.
 - Any doubt clearing session at the end.
- Record of Tool box talk shall be maintained as per format no. HSEP:14-F04

	HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)	Doc no.: HSEP: 14-MAITREE:VENDOR
		REV: 00
	POWER SECTOR-EASTERN REGION	Date: 05.05.16
		Page: 18 of 90

- Tool box talk to be conducted at least once a week for the specific work.

8.2.1 PRE JOB BRIEFING

- A separate documented daily pre job briefing must be conducted at the actual job/work site location with the supervisor and work crew, to cover working environment/conditions, safe work practices for the activities to be carried out, required PPE and review of the work package, JSA and permit requirements. Each crew member and the supervisor will sign-off on the pre job briefing form, and form will be submitted to the HSE department at the end of each shift

8.3 TRAINING ON HEIGHT WORK

Training on height work (3m and above from ground) shall be imparted to all workers working at height by in-house/external faculty at least twice in a year. Fall protection training must involve as much hands-on activity with the equipment as possible. The training shall include following topics:

- Fall hazards associated with the elevated work.
- Elements of the fall protection systems utilized
- Requirement for 100% tie-off when working at or above 6' or 2m.
- Body Harnesses of at least a five-point configuration shall be used in all fall arrest systems. The harness Deering shall have a minimum tensile strength of 5,000 pounds (22.2 kN).
- Fall protection equipment used. Use of PPEs – Harness proper fit, storage and compulsory tie-off of body harness to a firm support/life-line or anchorage point).
- Anchorage selection used for attachment of personal fall arrest systems shall be capable of supporting at least 5,000 pounds (22.2 kN) per employee attached, determined by a competent person.
- Use of fall arrester (shock absorbing lanyard), retractable fall arrester, life line, safety nets etc.
- Safe climbing through monkey ladders.
- Maintenance and Inspection of PPEs.(Daily/periodical)-color coding
- Medical fitness requirements.
- Mock drill on rescue at height.
- Dos & Don'ts during height work. For the workers & staff passed through the vertigo test, an additional sticker for height pass to be issued. This is applicable for those who are supposed to work or inspecting in BTG area, etc.

8.4 HSE TRAINING DURING PROJECT EXECUTION

- Other HSE training shall be arranged by BHEL/sub-contractor as per the need of the project execution and recommendation of HSE committee of site.
- The topics of the HSE training shall be as follows but not limited to:
 - Hazards identification and risk analysis (HIRA)
 - Work Permit System
 - Incident investigation and reporting
 - Fire fighting
 - First aid
 - T & Ps fitness and operation
 - Electrical safety
 - Welding, NDE & Radiological safety
 - Storage, preservation & material handling.



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 19 of 90

POWER SECTOR-EASTERN REGION

- A matrix shall be maintained to keep an up-to-date record of attendance of training sessions carried out.
- Skill labour (like fitter, electrician, rigger, scaffolder, carpenter etc.) will pass through the trade test (written and practical) conducted at site by the respective engineer & EHS officer. A pass sticker of qualified person to be marked on their ID Card/Gate Pass.

8.4.1 HSE Induction for Visitors: No visitors are allowed to visit the construction site without safety induction, mandatory PPEs, and designated escort.

8.4.2 Safety Induction for all (Staff/engineers/sub-Contractors officials/supervisors): It is compulsory to provide safety induction and briefing about the site HSE management systems, requirements and individual's roles & responsibility to carry out the activities in safe manner, before deploying them.

8.5 HSE PROMOTION-SIGNAGE, POSTERS, COMPETITION, AWARDS ETC

8.5.1 Display of HSE posters and banners

- Site shall arrange appropriate posters, banners, slogans in local/Hindi/English languages at work place

8.5.2 Display of HSE signage as per [Safety signages will be as per BS 5378 safety signs & Colors and BS 5499 graphical symbols & signs](#)

- Appropriate HSE signage shall be displayed at the work area to aware workmen and passersby about the work going on and do's and don'ts to be followed

8.5.3 Competition on HSE and award

- Site will arrange different competition (slogan, poster, essay etc.) on HSE time to time (Safety day, BHEL day, World Environment Day etc.) and winners will be suitably awarded. Monthly Safety Day shall be celebrated every month preferably on a fixed date or day at the site jointly by all the contractors as a promotional measure on cost sharing basis

9.0 HSE COMMUNICATION

9.1 INCIDENT INVESTIGATION, REPORTING AND RECORDS:

Every incident including near-misses or injury of any kind and at any level of severity shall be immediately reported by the contractor's workmen in their work area to the safety officer/ HSE coordinator, site engineer or RCM. The site HSE co-ordinator shall be the nodal person for this purpose.

For any reportable injury to any employee or to the contractor's workmen, the safety officer/ HSE-coordinator shall report the incident in incident/ incident report, to CUSTOMER

In the case of serious injury requiring hospitalization or fatality, communication shall be made to customer through telecom immediately with submission of incident report within 24 hrs and detail investigation report may be forwarded in INCIDENT INVESTIGATION REPORT FORMAT within seven days.

Investigations into all reportable incidents shall be conducted using accepted Root Cause Analysis (RCA) methodology cause and effect, 5 why's, etc, to determine the Physical, Human and Latent Root Causes for these type accident/incidents. However, it is recommended to conduct preliminary investigations into all other incidents as a proactive measure.



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 20 of 90

POWER SECTOR-EASTERN REGION

Every contractor shall maintain record of incidents / incidents at site, and shall be available for inspection by representatives of statutory agencies / officials visiting site from BHEL/customer The Safety Officer/ HSE coordinator shall maintain these records.

26.1 Incident Investigation Procedure:

The purpose of the investigation procedure is to find out root cause of accidents / incidents & not to find out faults, so as to avoid recurrences, in future and share lessons learned.

RCM shall constitute a committee of at-least 2 site engineers within 24 hours of such incidents. The investigation shall aim at finding out the basic unsafe acts / conditions that have caused the incidents. Immediately after all appropriate emergency measures, first aid and damage containment measures have been taken, every effort shall be made by the committee to:

- Preserve physical evidence
- Take photographs
- Take statement from incident victim(s) and eyewitnesses and anyone who may have knowledge of possible cause(s) of incidents

The committee shall also recommend corrective measures to prevent recurrence of similar incidents

25.2 Initial Incident Response:

In the event of an accident/incident, the supervisor and employees at the work site must:

- Stop work and make the work area safe (mitigate or remove the exposure to the hazard)
- Provide first aid and activate "Emergency Medical Services" and other emergency services, e.g. fire or police, as required,
- Ensure the injured worker is transported to "Emergency Medical Services" for medical attention if necessary,
- Secure the site to ensure the protection of employees and the public and to aid with the investigation,
- Report the incident immediately to the local Site In-Charge.

26.3 Incident Investigation Report:

The investigation committee on completion of the all investigations shall prepare and submit the report to the RCM. The report shall also include corrective measures with assigned responsibility to be taken at site to prevent similar incidents in future. The RCM shall forward the copy of the investigation report to BHEL

9.2 HSE EVENT REPORTING

- Important HSE events like HSE training, Medical camp etc. organized at site shall be reported to BHEL site management in detail with photographs for publication in different in-house magazines
- Celebration of important days like National Safety Day, World Environment Day etc. shall also be reported as mentioned above.

10.0 OPERATIONAL CONTROL

All applicable OCPs (Operational control procedures) will be followed by subcontractor as per BHEL instructions. This will be done as part of normal scope of work. List of such OCPs is given below. In case any other OCP is found to be applicable during the execution of work at site, then subcontractor will follow this as well, within quoted rate. These OCPs (applicable ones) will be made available to subcontractor during work execution at site. However for reference purpose, these are kept with Safety Officer of BHEL



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

POWER SECTOR-EASTERN REGION

Date: 05.05.16

Page: 21 of 90

at the Power Sector Regional HQ, or available in downloadable format in the website, which may be refereed by subcontractor, if they so desire.

LIST OF OCPs

Safe handling of chemicals	Safety in use of cranes	Hydraulic test
Electrical safety	Storage and handling of gas cylinders	Spray insulation
Energy conservation	Manual arc welding	Trial run of rotary equipment
Safe welding and gas cutting operation	Safe use of helmets	Stress relieving
Fire safety	Good house keeping	Material preservation
Safety in use of hand tools	Working at height	Cable laying/tray work
First aid	Safe excavation	Transformer charging
Food safety at canteen	Safe filling of hydrogen in cylinder	Electrical maintenance
Illumination	Vehicle maintenance	Safe handling of battery system
Handling and erection of heavy metals	Safe radiography	Computer operation
Safe acid cleaning	Waste disposal	Storage in open yard
Safe alkali boil out	Working at night	For sanitary maintenance
Safe oil flushing	Blasting	Batching
Steam blowing	DG set	Piling rig operation
Safe working in confined area	Handling & storage of mineral wool	Gas distribution test
Safe operation of passenger lift, material hoists & cages	Drilling, reaming and grinding(machining)	Cleaning of hot well / de-aerator
Electro-resistance heating	Compressor operation	O&M of control of AC plant & system
Air compressor	Passivation	Safe Loading of Unit
Safe EDTA Cleaning	Safe Chemical cleaning of Pre boiler system	Safe Boiler Light up
Safe Rolling and Synchronization		

10.1 HSE ACTIVITIES

While planning for any activity the following documents shall be referred for infrastructural requirements to establish control measures: Only specific portion of the following documents may be shared as reference at discretion of BHEL.

- 1) HSE Procedure for Register of OHS Hazards and Risks
- 2) HSE Procedure for Register of Environmental Aspects and Impacts
- 3) HSE Procedure for Register of Regulations
- 4) Operational Control Procedures
- 5) HSE Procedure for Emergency Preparedness and Response Plan
- 6) Contract documents

10.2 WORK PERMIT SYSTEM

- The following activities shall come under Work Permit System
- a The following activities shall come under Work Permit System
 - a. Height working
 - b. Hot work in general and at height including handling of hazardous substance viz, Acetylene, Oxygen and LPG
 - c. Confined space



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 22 of 90

POWER SECTOR-EASTERN REGION

- d. Radiography
 - e. Hazardous Energy Control (lockout/tagout)
 - f. Excavation and Trenching
 - g. Heavy lifting exceeding 50Metric Tonne
 - h. Handling of Hazardous Substances- Diesel, Caustic Soda, Citric Acid/EDTA, Thinner, Battery Acid, Oil-based paint, Lubricants, Transformer oil.
- Refer Annexure 05 for Work permit formats.
- Permit applicant shall apply for general work permit and other permits as referenced above of particular work activity at particular location before starting of the work with Method Statement and HIRA/Job Hazard Analysis.
 - Permit signatory shall check that all the control measures necessary for the activity are in place and issue the permit to the permit holder.
 - Permit holder shall implement and maintain all control measures during the period of permit .He will close the permit after completion of the work. The closed permit shall be archived in HSE Department of site.

10.3 SAFETY DURING WORK EXECUTION

Respective OCPS are to be followed and adherence to the same would be contractually binding

10.3.1 Power supply & upkeep of installation -

- Only persons licensed to Govt of State shall maintain and operate power installations.
- All distribution boxes shall be locked and the key controlled by site management of concerned contractor.
- Electrical appliance shall have proper earthing and for appliances equal to & more than 415V shall have two separate earthing (as per IS-3043-1987)
- All electrical supply shall be provided through ELCB of 30mA sensitivity.
- The working condition and sensitivity of ELCB shall be checked periodically.
- All fuses and fuse wires shall be of standard size and rating.
- All power supplies through cables shall be underground or overhead with height > 3mtrs.

The following guidelines are to be considered the absolute minimum requirements to be supplemented by requirements of all applicable codes and standards for such work; Wiring and Branch Circuits Must be protected by a proper amperage over-current device such as a HRC fuse or circuit breaker. Such installations must be located so as to prevent physical damage to the wire conductors & panels.

- Portable electric lights used in wet or potentially wet locations must be either low voltage type (24 volts or less) or protected by a GFI (ground fault interrupter).
- Must be visually checked before each use and periodically while in use to assure their original integrity is maintained. Cords with cuts, breaks, deep abrasions, etc. shall be taken out of service immediately. Repairs to extension cords shall only be performed by qualified/ licensed electricians.
- Must not be allowed to lie in wet or potentially wet areas.
- Every electric line or cable of unknown origin that is discovered or exposed during a digging, drilling, probing, or similar operation is to be considered as energized and life threatening. The senior company employee on the site will ensure that all necessary safety precautions are taken in order to isolate the line from all workers and the public. Such precautions may include halting the operation if appropriate. The senior company employee on the site is to then contact the proper authorities to have the line identified and either confirmed to be abandoned and/or made safe for continuing the work.



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 23 of 90

POWER SECTOR-EASTERN REGION

- Any and all underground lines that are discovered or become severed must be considered energized on both sides, and be treated accordingly.
- In general, equipment or machinery being moved or transported must maintain minimum clearances of 25 ft to all power lines.
- TAG IN/ TAG OUT must be in force in Switch Room and all Distribution Boxes for live power line. The authorized person's name and contact no shall be displayed
- Ensure "double insulated" three - core cables and three pin connectors are used and are properly ground "all insulated" types, all electrical tools and appliances must be manufactured for industrial use.
- All connections shall be electrically and mechanically sound and properly insulated. Taped joints are not permitted. Connections to socket outlets must be made with proper plugs.
- Splices in electrical cords are not permitted. Repairs must be made at the socket connection and retain the same mechanical and dielectric condition of the original connection.
- Damaged or defective electric tools, equipment and extension cords, etc must not be used and shall be tagged out of service, removed from the work area and taken back to stores.
- Only licensed electricians are authorized to repair and work on electrical equipment. Tampering with electric tools or equipment by others could result in termination.
- Temporary electric cabling should be elevated 2.2 meters above the floor/ground or covered for protection. It must be kept clear of walkways and other locations where it may be exposed to damage or create a tripping hazard.
- Energized wiring in junction boxes, circuit breaker panels and similar places must be covered and locked at all times.
- Areas with live high voltage wires or terminals must be barricaded against entry and warning signs posted Danger – High Voltage and Authorized Personnel Only.
- Personnel should never work on energized equipment, deenergizing (lockout/tagout) the equipment is always the first requirement.
- The lockout and tagout procedure will be used when testing or working on, or around, energized installation.
- Working around energized equipment should never be done alone. A second electrician must always be available for assistance.
- If lockout/tagout of the work is infeasible (must be demonstrated), work on energized electrical circuits must be approved by the Site In-charge. All safety precautions necessary must be taken, PPE use must be evaluated per the exposure and used, i.e high/low voltage gloves, insulated shoes, overcoats/aprons, faceshields, and other protective equipment like insulated tools, blankets, mats, etc. must be used.
- The welding machines earth leads shall be properly fixed without loose contacts. The earth cable only has to be used. No steel members shall be used as earth leads.
- Electrical crews must be qualified for the equipment and tools they work on, including being trained in Cardio-Pulmonary Resuscitation (CPR) methods and First Aid for rendering help in the event of electric shock.

10.3.2 Qualified and Unqualified Workers (Electrical Works):

Basic electrical safety knowledge is a major concern. It is critical that only qualified workers be allowed to perform this work. Therefore only those persons that are both qualified and authorized may install, fabricate, repair, test, calibrate or modify electrical or electronic wiring, devices, parts, systems or equipment.

Qualified Person:

One who is trained and wiremen licensed to Govt as per Rule 58(9) of Bangladesh Labor Rules and familiar with the construction, operation and safety hazards of the equipment upon which they are permitted to work.



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

POWER SECTOR-EASTERN REGION

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 24 of 90

- Qualified persons are intended to be only those who are well acquainted/experienced with and thoroughly conversant in the electric equipment and electrical hazards involved with work being performed.
- Only qualified persons may be permitted to work on or near exposed energized parts. Such persons are required to have been trained in three specific areas:
 - Qualified persons must be capable of working safely on energized circuits;
 - Must be familiar with the proper use of special precautionary techniques and procedures based on equipment and exposure; and
 - Must be familiar with required personal protective equipment, insulating and shielding materials, and insulated tools.
- Qualified persons are expected to be able to evaluate unknown situations and adjust their activities in such a way that only safe work practices are used. Such behavior is the responsibility of the qualified person.
- It is possible and likely for an individual to be 'qualified' with regard to certain equipment in the work place, and unqualified on other equipment they must note their limitation and stop work if not qualified on what equipment they were to work on.
- An employee who is undergoing on-the-job training, who, in the course of such training, has demonstrated an ability to perform duties safely at his or her level of training, and who is under the direct supervision of a qualified person is considered to be a qualified person for the performance of those duties. The process must be documented as proof.

11.0 Lifting Operations:

All the cranes and lifting tools & tackles shall be inspected on daily basis and as well as formal monthly by expert and as per the law third party for annual certification. These shall be tested and certificates of fitness shall be obtained from 3rd party govt approved competent agency before deploying at site and later periodically (As per Rule 60 and 75, Schedule 3 of Bangladesh Labour Rules). The last date of Third Party Inspection and the next Due date shall be conspicuously displayed on all cranes. A copy of certificate shall be pasted on operators cabin of all the lifting equipment. The record shall be maintained in Form-24

The manufacturer's instruction for maintenance shall also be followed. All safety measures shall be followed. All tools tackles, lifting appliances; material-handling equipment etc used by the contractor shall be of safe design and construction. The operators, slingers and signalers shall be qualified as per IS 13367 (part-1):2003 "Safe use of cranes- code of practices". There shall be a person responsible for co-ordination

11.1 Personnel Lifts (Man-Basket): (To be treated as a T&P item)

A Personnel Man-Basket permit shall be completed prior to lifting any people, along with a rigging plan. Man-basket shall be used where access through ladders or scaffolding is not feasible. Man-baskets shall be designed and engineered by a manufacturer (job made man-baskets are not allowed, unless designed and tested by a certified engineer), and built robust with MS Angles and flats or plates or channels only. Guard rails top and mid, must be in place and screened-in to avoid material from falling out of basket. The factor of safety shall be 200%. It shall have a door with double latches and shall open inside. Anchor points shall be identified within the man-basket. The man-basket shall be thoroughly inspected and load tested and a trial run performed without personnel before being put to job. It shall be treated as a lifting tool and shall undergo same certification cycle and inspection as other lifting equipments. An additional sling of required lifting capacity shall be fixed to the man-basket main lifting point and attached to the crane above the ball or block. While lifting man-basket, the crane shall maintain a uniform speed of lift without any swing. Once man-basket reaches the destination, the lift brakes shall be locked as long as the basket remains at that point. The same care shall be taken in its descent. As for hanging man-basket, the same shall be hung off a rigid structure with help U-shaped handle welded to man-basket. This shall be tested once in a year by a competent person.



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

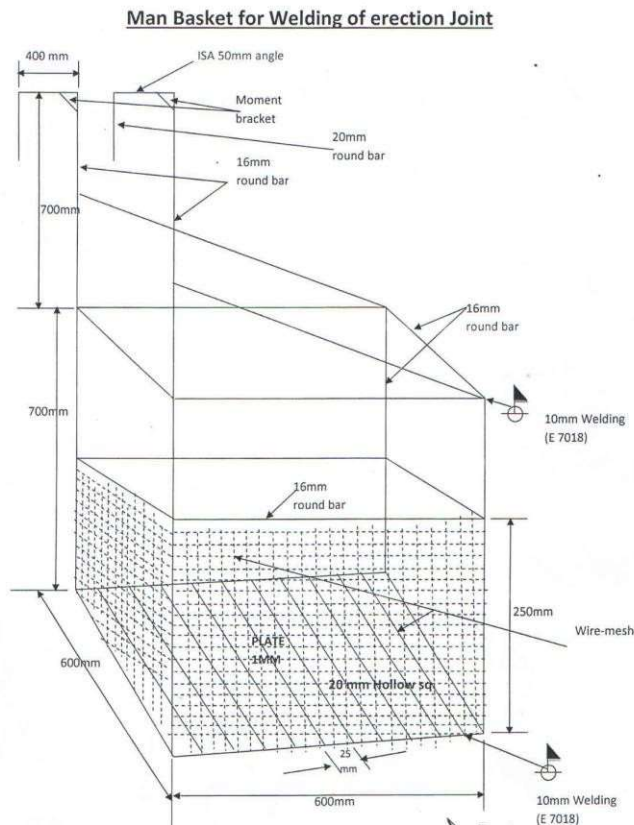
POWER SECTOR-EASTERN REGION

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 25 of 90



11.2 CRANES AND HOISTING EQUIPMENTS:

This procedure provides the guidelines to ensure proper rigging and lifting activities are accomplished safely and in accordance with applicable specifications, codes, and regulations.

- On every crane or piece of hoisting equipment notices of all rated load capacities, recommended operating speeds, and any hazard warnings or special instructions shall be conspicuously posted. All instructions and warning shall be visible from the equipment operator's station.
- Cranes shall have an Anti Two-block safety device installed
- All mobile cranes shall have overload and backup alarms
- Load angle indicators and limit switch

All areas within swing radius of cranes that are potentially accessible by pedestrian, vehicular, or equipment movement shall be barricaded to prevent anyone or any vehicle or equipment from being struck by the crane or hoisting equipment, or its load(s).

- No part of the lifting equipment or its load shall be within the distance as specified in the Indian Electricity Act from an energised power line
- Cranes shall have annual certified third party inspection and be inspected before use by the operator. Any defects shall be corrected before use. Logs of crane inspection shall be kept with the crane.
- Make certain that the rigging personnel, material, and equipment have the necessary capabilities for the job and are in safe condition.



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

POWER SECTOR-EASTERN REGION

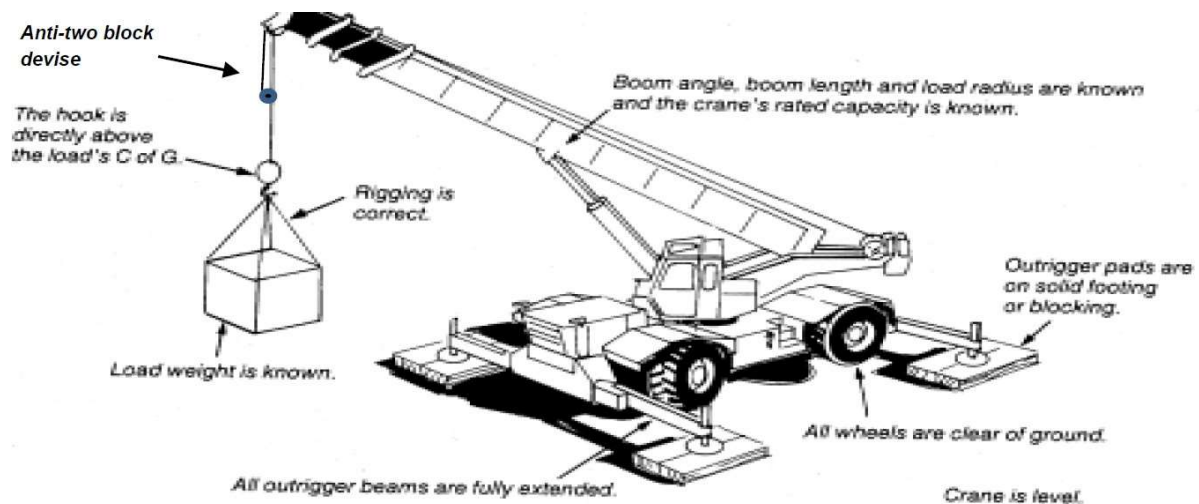
Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 26 of 90

- Communicate with person(s) directly responsible for accomplishing the work and / or work area to establish requirements/responsibilities and make certain that all preparatory work is complete.
- Mats/Pads must be used on all lifting equipment, equipped with outriggers.
- Pick and carry must have the load secured to the rig in front.
- Proper crane setup:



11..2.1 Safe Rigging Practices:

- Review the planned operation and requirements with the operator and rigging crew.
- Ensure a pre-lift meeting is conducted with crane operator, tagline operator, signal personnel, and Safety Manager.
- Designate a qualified person from the rigging crew to observe clearance of the equipment and give timely warning for all operations where it is difficult for the operator to maintain the desire clearance by visual means.
- Clear the lift area of all unnecessary personnel.

11.2.2 The following are rules for safe rigging:

- Use loops, thimbles and corner pads to prevent damage to slings when used around corners or on cutting edges.
- Never allow wire rope to lie on the ground for any length of time or on rusty steel or near solvents, chemicals or corrosive substances.
- Slings must not be pulled from between or under loads with load resting on the sling.
- Keep all rope away from flame cutting or welding operations.
- Never use rope as sling material.
- Never wrap a wire rope completely around a hook.
- Do not bend wire rope near any attached fitting.



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 27 of 90

POWER SECTOR-EASTERN REGION

- The sling must be selected to suite the most heavily loaded leg rather than the total weight when using multi-legged sling to lift loads in which one end is heavier than the other.
- When using 3 and 4 legged sling configurations, any two legs must be capable of supporting the entire load.
- Where possible, wire rope choker hitches must include a shackle with the eye around the shackle pin to prevent breaking wires of the choke. The choker hitch must be "snugged down" prior to lifting, not after tension is applied.
- Unless authorized by the hook manufacturer when more than two rope eyes are placed over a hook, install a shackle, pin resting in the hook, and place the rope eyes in the bowl of the shackle.
- Properly rig all loads to prevent dislodgment of any part.
- Use guide ropes or tag lines to prevent the rotation or uncontrolled motion of the load when necessary.
- Loads must be safely landed and properly blocked before being unhooked and unslung. Tag lines must not be used in situations that jeopardize the safety of the lift.
- Lifting beams must be plainly marked with their weight and designed working load and must only be used in the manner for which they were designed.
- The hoist rope or chain must never be wrapped around the load. The load must be attached to the hook by slings or other rigging devices that are adequate for the load being lifted.
- Multiple part lines must not be twisted around each other.
- The hook must be brought over the center of gravity of load before the lift is started.
- If there has been a slack rope condition, determine that the rope is properly seated on the drum and in the sheaves prior to lifting.
- Keep hands away from pinch points as the slack is being taken up.
- Leather gloves are recommended when handling wire rope.
- Avoid impact loading caused by sudden jerking when lifting or lowering. Lift the load gradually until the slack is eliminated.
- Never ride on a load that is suspended.
- Avoid allowing the load to be carried over the heads of any personnel.
- Never work under a suspended load until the load has been adequately supported from the floor and all conditions have been approved by the supervisor in charge of the operation.
- Never leave a load suspended unless emergency evacuation is required.
- Never make temporary repairs to sling.
- The capacity of a sling is determined by its angle, construction, type of hitch and size.
- Never lift loads with one leg of a multi-leg sling until the unused legs are made secure.
- Never point load a hook unless it is especially designed and rated for such use.
- Make certain that the load is broken free before lifting and that all legs are taking the load.
- When using two or more slings on a load make certain all slings are made from the same materials.
- Lower the loads on to adequate blocking to prevent damage to the slings.
- Materials and equipment being hoisted must be loaded and secured to prevent any movement which could create a hazard in transit.
- The weight of the hook, load block and any material handling devices must be included when determining crane capacity.
- Operator must have clear sight of loads being picked up or put down by crane. Tag lines will be used to control the loads. Loads must not be touched by hand while placing/ moving.



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 28 of 90

POWER SECTOR-EASTERN REGION

11.2.3 Synthetic Slings

The following are rules for safe use of synthetic slings:

- Synthetic slings must be marked to show the rated capacity for each type of hitch and type of web material.
- Nylon web slings must not be used where fumes, vapors, sprays or mists or liquids of acids or phenolic are present. Web slings with aluminum fittings must apply in this category.

11.2.3.1 Synthetic web slings must be removed from service and destroyed if any of the following conditions are present:

- Acid or caustic burns
- Melting or charring of any part of the sling surface
- Snags, punctures tears or cuts
- Broken stitches
- Distortion of fittings
- Synthetic web slings of polyester or nylon must not be used at or come in contact with temperatures in excess of 82°C
- Polypropylene web slings must not be used at or come in contact with temperatures in excess of 93°C
- Insulated hooks must be tested yearly to insure insulation integrity to at least manufacturer's specifications.

11.2.4 Wire Rope Slings must be removed from service and destroyed if any of the following conditions are present:

- In (10) randomly distributed wires broken in one (1) rope lay, or five (5) broken wires in one (1) strand in one (1) rope lay.
- Wear or scraping of one-third the original diameter of outside wires.
- Kinking, crushing, bird caging or any other damage resulting in distortion of the wire rope structure such as:
- Evidence of heat damage.
- End attachments that are cracked, deformed worn.
- Corrosion of the rope or end attachments.

11.2.5 Metal mesh slings must be immediately removed from service if any of the following conditions are present:

- A broken weld or broken brazed joint along the sling edge.
- Reduction in wire diameter of 25 percent due to abrasion or 15 percent due to corrosion.
- Lack of flexibility due to distortion or corrosion.
- Synthetic web slings must be removed from service and destroyed if any of the following conditions are present:
- Acid or caustic burns
- Melting or charring of any part of the sling service
- Snags, punctures, tears or cuts
- Broken stitches
- Distortion of fittings



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 29 of 90

POWER SECTOR-EASTERN REGION

11.2.6 Requirements of Plate Clamps:

- The rated load of the plate clamp must be marked on the main structure.
- Care must be taken to make certain the load is correctly distributed for the plate clamp being used.
- Do not allow load or plate clamp to come into contact with any obstruction.
- The plate clamp must not be used for side pulls or sliding the load.
- When lifting stainless steel or special alloys, ensure plate clamp is designed for use on the specific metal.

11.2.7 Crane operators must follow the followings:

- Pass an annual Operator's Physical examination
- Carry a valid experience certificate from the previous employers

11.2.8 Colour Coding Procedure

- Inspections and tests shall be documented by means of color coding which shall verify that inspections or testing are current and that all receptacles, portable Power tools, Lifting Tools & Tackles have been inspected and tested as required. The color codes used on the project shall be:

GREEN	BLUE	YELLOW	RED
January February March	April May June	July August September	October November December

- The cycle of colors shall be Quarterly. The color code tape / Sticker shall be clearly visible to designate the period for which the inspections and tests were conducted.
- Following the initial inspection the equipment must be color-coded quarterly as per color-coding instructions that will be issued by the CONTRACTOR.
- Fire extinguisher with the current month color-coding inspection sticker must be provided and secured in the platform.
- All slings shall be regularly inspected in accordance with the requirement of the project for frequent and periodic inspections and removed from the job site if they fail to meet the minimum requirements of the project.
- The CONTRACTOR'S SFO shall ensure that all PPE is inspected prior to its issue. He is to ensure all SUBCONTRACTOR personnel are using safe and proper PPE equipment. Regular inspections on the PPE shall be carried out and personnel not adhering to those inspections shall be removed immediately from the SITE.
- A five (10) day interval period shall be given into each monthly color code change. During this five (10) day period either color shall be acceptable.



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

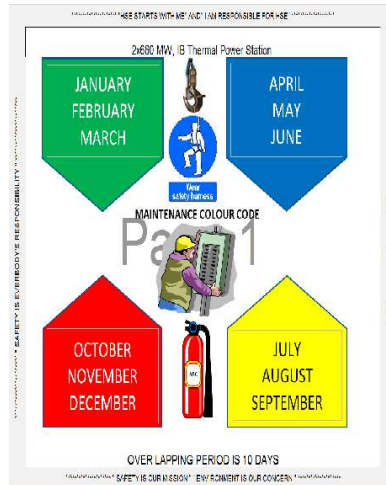
POWER SECTOR-EASTERN REGION

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 30 of 90



12.0 Fire prevention, protection & preparedness -

The Fire Prevention, Protection and Preparedness Program is an integral part of the overall HSE Program. Effort and consideration must be given to safety, life and potential for delays in construction schedules and plant startup, as well as protection of property on a given project.

The purpose of which is to prevent -

- Inception of fire
- Loss of life or personal injury
- Loss of Property
- Interruption of operations

Site-in-charge / Safety Officer will make periodical review of the site Fire Protection, Prevention Preparedness Programme, Site conditions and available fire protection equipment. It is very imperative that the Sub-contractors along with BHEL to establish good contact with Local fire station for availability of Fire tender in case of emergencies, in addition to their own fire equipment.

Fire Protection, Prevention and Preparedness Inspections - The Contractor /Sub-Contractor will be required to make frequent fire prevention inspections of his work site and operating facilities. Deficiencies will be corrected at once.

- Area where Hot work activities are carried out (Gas cutting / Welding/ any other spark producing work) above a working spot, a GI / fire-resistant non-asbestos sheet or suitable material shall be placed to prevent the fall of hot sparks. A bucket of water shall be kept nearby while doing hot work
- Hot work shall be preferably carried out in a designated area with a standing Hot Work Permit, to be renewed monthly. The designated area shall have fire extinguishers.
- Any hot work outside designated area shall require a Hot Work permit and fire watch.

No flammable material shall be stored within 35 feet from any fire load.

- Necessary fire extinguishers shall be kept at accessible area as per the chart below:
- The record of Fire safety training and Fire drill shall be maintained in Form-22 and 22(A)



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)





POWER SECTOR-EASTERN REGION

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 31 of 90

Fire Extinguisher Chart						
Extinguisher		Type of Fire				
Colour	Type	Solids (wood, paper, cloth, etc)	Flammable Liquids	Flammable Gasses	Electrical Equipment	Cooking Oils & Fats
	Water	✓ Yes	✗ No	✗ No	✗ No	✗ No
	Foam	✓ Yes	✓ Yes	✗ No	✗ No	✓ Yes
	Dry Powder	✓ Yes	✓ Yes	✓ Yes	✓ Yes	✗ No
	Carbon Dioxide (CO2)	✗ No	✓ Yes	✗ No	✓ Yes	✓ Yes

- Emergency telephone number to be displayed at all conspicuous places.

General flammable material storage requirements:

- All flammable material shall be stored in deigned areas and/or in flammable storage cabinets, as necessary.
- Fire extinguishers shall be located near by and have unobstructed access.

13.0 RADIOGRAPHY: Wherever the process requires examination by radiography,

- BHEL /contractor shall use approved radiography contractors for the work on site.
- Site radiography shall be carried out after advance notification to the HSE officer and client personnel. All radiography on the site shall be subject to receipt of client/BHEL work permit and shall normally be performed outside of normal working hours. No ionising radiation sources shall be left unsupervised whilst on site.
- A minimum of 2 qualified persons from the radiography contractor are required for each activity involving ionising radiation. Adequate warning signs shall be posted on barriers and the work area shall be marked off at a safe distance with tape or hard barricades prior to starting radiography by concerned job sub-contractor.
- All personal executing radiography operations shall carry calibrated radiation monitoring devices at all times.
- The storage of radioactive sources on the site is prohibited, they shall be present only for the time required to complete the work. Whilst not in use, radiation sources and their container shall be secured in a safe location with adequate warning signs displayed as per AERB guidelines.

14.0 Confined Space Entry:

A confined space must have an opening of minimum dimension of 40.65cm X 30.65cm if shape is rectangular or oval and dia of 40.65cm if shape is round.



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 32 of 90

POWER SECTOR-EASTERN REGION

A hazard assessment must be completed prior to any entry into a confined space. The hazard assessment must identify the sequence of work to be performed in the confined space, the specific hazards known or anticipated, and the control measures to be implemented to eliminate or reduce each of the hazards to an acceptable level. No entry must be permitted until the hazard assessment has been reviewed and discussed by all persons engaged in the activity. Personnel who enter confined spaces must be trained per role e.g. entrant (worker), confined space supervisor & attendant, and must be informed of known or potential hazards associated with the confined spaces to be entered. Number of persons entering shall be kept at minimum. All confined spaces must be inventoried at site and kept on file. Confined spaces must be posted at the entrance with similar type wording "DANGER - Do Not Enter – Confined Space - Permit Required".



Once a hazard assessment is completed the Contractors/Subcontractors requirements are:

- All confined space activities must be reviewed with the Contractor's Safety Manager prior to commencement of the work. Confined space permits are required as part of the entry process.
- Prior to entering the confined space, the area must be completely controlled to prevent the entry of any unauthorized individual, hazardous substances, or materials, which would threaten the safety of the entrants and the stability of the space. All energy sources, including stored or residual energy, must be isolated and/or blanked, and locked out.
- All shall be given a pep-talk by the concerned supervisor giving details of the jobs to be performed, hazards and risks associated and mitigation measures. The persons shall be provided with all necessary PPEs including respiratory masks, if necessary.
- The confined space must be monitored prior to one entering the identified area. Then periodic atmospheric testing must take place throughout the entry, especially after breaks or work interruptions during the entry. Continuous monitoring is preferable, and may be necessary in certain situations. Monitoring results must be documented on the entry permit with the initials of the individual conducting the testing.
- Contractors/Subcontractors must complete a Confined Space Permit before permitting workers to enter the space. This document must be reviewed and approved via a signature by the entry supervisor. The content of the completed permit must be reviewed with the entrants before entering the space and posted at the confined space entrance.
- A proper and accessible means of exit and exit shall be ensured before entry.
- The space shall be illuminated with 24V lamps only
- All gas cylinders/welding machines shall be preferably kept outside the confined space. Even cutting torches/ electrode holders shall be kept outside, when not in use, if possible.
- All electrical equipments shall be connected to ELCB
- The confined space must have an attendant monitoring the activities within the space. This individual must be in constant communication with work crew inside the space. The attendant must know who is inside the space, that must



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

POWER SECTOR-EASTERN REGION

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 33 of 90

be documented. The attendant must not have any other responsibilities than monitoring the space. He/she may not enter the space to perform rescue unless relieved of the duties as an attendant.

- Adequate ventilation must be provided to establish and maintain a stable atmospheric environment. Air circulation shall be ensured. Fumes/dusts generated inside shall be extracted. Ventilation systems must be designed for use in confined spaces.
- Any space 5' or more in depth must have a mechanical retrieval system. This system must be designed for the retrieval of human, and must not be used for equipment purposes. Workers inside the space must wear full body harnesses, and must be connected to the retrieval system.
- Rescue procedures must be established prior to any entry. The local fire department must be contracted prior to entry if they will be the primary source of rescue.
- All individuals involved in the confined space activities must be trained, including hands-on experience with the safety equipment involved. Documentation of the required training must be available prior to the start of any confined space work activities.
- The confined space shall be cleared off all cables, machines, cylinders, materials at the end of the day's work as far as possible.

Once the confined space work has been completed, the entry permit must be cancelled. A copy of the cancelled permit must be given to the HSE Manager

15.0 Welding and Gas Cutting Operations

- When possible, items to be welded, cut, heated, etc. shall be moved to a safe location free of combustible or flammable material. If this is not possible, then all combustibles/flammables that can be removed from the area shall be removed within a 35 foot circumference and a positive means of confining arcs and sparks generated by the process shall be taken and additional person(s) shall be stationed as fire watch for the area(s) still exposed, along with obtaining the Hot Work Permit as applicable.
- Appropriate fire-fighting equipment is to be available in close proximity of any welding and gas cutting operations at all times.
- Drums, tanks, and similar containers that have contained flammable or toxic material shall not be welded, cut, or heated until they have been made safe by water filling, thorough cleansing, or similar accepted practices. The container shall also be ventilated during the welding, cutting, or heating process.
- Proper ventilation is required for any welding or torch operations performed in a confined space.
- Any welding or gas cutting operations performed on metals of toxic compounds or coating such as zinc, stainless steel, lead, cadmium, chromium, and beryllium shall be properly ventilated and/or proper respiratory protection shall be worn by any person that could be exposed to fumes, vapors, and gasses created by the welding and gas cutting processes.
- Wherever it is practical, all arc welding operations shall be shielded to prevent direct light rays or sparks from contacting persons in the vicinity or from reaching areas normally used to travel through or into the vicinity. Where this is not practical, persons who shall be in the area are to use proper eye and skin protection. Other persons who are not participating in the welding or gas cutting operations are not to be allowed into the hazard zone.
- Welders and other employees who are exposed to arc welding radiation shall wear suitable clothing and protective apparel to prevent burns and other types of ultraviolet radiation damage to the skin.
- Arc welding machines shall be shut down when being moved or when they are not in continuous use.
- Electrode holders left unattended shall have electrodes removed and shall not be left where they might contact



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

POWER SECTOR-EASTERN REGION

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 34 of 90

employees or conducting objects.

- Arc welding power supply cable shall be of proper rating and material, e.g. copper.
- Welders shall guard against allowing materials adjacent to or behind them to reflect radiation back toward them or towards others in the area. Reflected radiation can cause skin burns and eye flash burns.
- Compressed gas cylinders shall always be secured from tipping or falling, whether in use, in storage or in transit. The cylinders shall always be secured upright, except during times when actually being hoisted or carried.
- Valve caps shall be in place when cylinders are not in use. Valve caps shall never be used for lifting the cylinder vertically.
- Regulators shall be removed when cylinders are not in use or are in transit, unless the cylinder is firmly secured on a special carrier designed for this purpose.
- Cylinders being transported by a powered vehicle shall be secured in an upright position. Gas cylinders are not allowed to be used in man-basket when occupied.
- Cylinders containing oxygen or fuel gasses shall not be taken into confined spaces.
- Oxygen cylinders shall be stored a minimum of (6) meters from fuel gas cylinders or shall have an approved firewall between them.
- Torches shall only be lit by approved strikers; never with matches, cigarette lighters, or hot work.
- While carrying out job at height, the sparks or molten slag shall be prevented from falling down by putting a fire-resistant (non-asbestos) sheet or even MS Sheet. If such can not be provided, the passage of falling sparks or molten slag shall be barricaded till ground floor and any cable/ tubes/ any other objects interfering in the passage shall either be removed or covered with Fire-resistant sheet or M S Sheet.

16.0 COMPRESSED GAS :

- All cylinder valves shall be closed when any work is finished and when any cylinders are empty or being moved.
- Valve protection caps shall be placed and secured properly before gas cylinders are transported, moved or stored.
- Compressed gas cylinders shall be secured in an upright position with chain or other appropriate means.
- All cylinders shall be kept at a safe distance from welding or cutting operations or shielded from safe.
- All cylinders shall be placed where they cannot become part of the electrical circuit.
- Oxygen and acetylene shall not be stored together.
- Oxygen and fuel gas regulators, hoses and associated equipment shall not be altered and shall be in proper working order while in use.
- Compressed air can be extremely dangerous if allowed to penetrate the skin. As such, the use of compressed air to clean off yourself or other workers shall be strictly prohibited.



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

POWER SECTOR-EASTERN REGION

Date: 05.05.16

Page: 35 of 90

17.0 WORK AT HEIGHT: All work at height above 3meter above ground level without complete platforms, handrails and other related fall protection shall require a work permit in the prescribed form. This shall require approval by the competent authority. The HSE officer of sub-contractors and subsequently BHEL shall follow the checklist religiously by physically verifying the condition of the work area before recommending for approval.

Whenever a fall hazard or other exposure exists for working at heights more than 3m, the nature and scope of work will be evaluated for conditions and environmental factors before selecting the appropriate fall protection system (active, passive or a combination of measures, as appropriate). A personnel fall protection system must include:

- The only permissible personal fall arrest system is an industry approved safety harness. Employees can use positioning belts with two-D ring attachment points as long as they are used in conjunction with a safety harness. Safety harnesses must be secured to an overhead object of substantial capacity capable of supporting five thousand pounds. In order to accomplish this and ensure 100% protection, the worker may need to use two lanyards. The primary lanyard is never unhooked until the secondary lanyard is secure.
- The type of work and the environment conditions determine lanyard and lifeline selection. If welding, chemical cleaning that may damage lanyards, connectors or lifelines, sandblasting, etc., either protect the components or use more appropriate type of system. Lanyards and lifelines must incorporate, or be used with, an appropriate deceleration (shock absorbing) device. Deceleration devices include rope grabs, rip-stitch lanyards, specially woven lanyards, tearing, or deforming lanyards, automatic self-retracting lifelines and lanyards which dissipate or limit the energy imposed on the employee during fall arrest. Once in use, the system's effectiveness is to be monitored. In some cases, a program for cleaning and maintaining the system may be necessary. Lanyard and lifelines must use locking snap hooks only and under no circumstances must two lanyard snap hooks be connected.

Minimum Requirements:

Prior to the start of work at elevation, the HSE Manager involved with the work must meet with the work supervisor to review the scope of work, and must review all the possible fall hazards and effective safety responses. The evaluation/analysis must be documented and kept on file and on site by the HSE Manager.

The procedures for the safety response to identified fall hazards developed and rescue plans by must be reviewed with all individuals exposed to the hazards.

The HSE Manager must establish an inspection process of fall protection systems. Some equipment requires documented inspections by its manufacture on a regular schedule. This equipment must have evidence of the inspection and re-certification process on it. This information must be reviewed before the equipment is actually used. Individuals must visually inspect the fall protection equipment before each use. Failure to complete this inspection process could result in serious injury or death.

Immediately remove from service any fall protection equipment that is identified as defective, damaged, or has been subjected to an impact. Damaged fall protective equipment must be destroyed to prevent re-use and not be discarded into trash containers, as the worn or damaged equipment could be unintentionally re-used.

Aerial lifting devices, excluding scissors lifts require the use of full body harnesses and lanyards in any elevated position.

All lifelines in general are to be made of min 8mm dia steel rope and tied to columns with 3 clamps at each end. Wherever columns are not available to tie the lifelines, the vertical posts are to be provided after carrying out drop-



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 36 of 90

POWER SECTOR-EASTERN REGION

load test initially.

18.0 SCAFFOLDS: (As per IS 3696 or any international standard)

The safe and efficient erection, use, dismantling, and storage of scaffolds, ladders and elevated work platforms are considered important objectives in maintaining a safe work environment. This procedure provides the guidelines for erection, use, dismantlement, and storage of scaffolding and elevated work platforms.

There is no such thing as a temporary scaffold. All scaffolds must be erected and maintained to conformed standard. The Scaffold Tagging defines satisfactory, incomplete or defective scaffolds.

Management must ensure or have each worker who performs work while on a scaffold trained by a person qualified in the subject matter to recognize the hazards associated with the type of scaffold being used and to understand the procedures to control or minimize those hazards.

All employees must be competent for the type of scaffolding work they are undertaking and should have received appropriate training relevant to the system they are working on.

- All scaffolds shall be erected / dismantled by scaffolding crew under direct supervision of **competent scaffolding supervisors**.
- All scaffolds shall be capable of supporting 4 times maximum intended load and erected on sound, rigid footing, capable of carrying the maximum intended load without settling or displacement. Bamboo scaffolding is not permitted for use on site.
- Guard rails and toe boards shall be installed on all open sides and ends of platforms more than (2) meters above ground or floor

Scaffold planks must be at least 5 cm x 25 cm (2" x 10") full thickness lumber scaffold grade or better.

- Scaffold planks shall not span distances greater than 2.5 meters (8 feet).

Scaffold planks shall extend over end supports not less than 6 inches nor more than 12 inches and be secured to the scaffold. Scaffolding and accessories with defective parts shall be immediately repaired or replaced.

- All scaffolding must be a minimum of two planks wide. No one may work from a single plank.
- Scaffold planks must be inspected before use. Planks that have been damaged must be removed from the site.
- Access ladders must be provided for each scaffold. Climbing the end frames is prohibited unless the design incorporates an approved ladder.
- Adequate mudsills or other rigid footing capable of withstanding the maximum intended load must be provided.
- Scaffolds more the 6 meters (20 feet) in height must be tied to the building or structure at intervals which do not exceed 4 meters (13 feet) vertically and 6 meters (20 feet) horizontally.
- Do not overload scaffolds. Material should be brought up as needed. Scaffolding must not be loaded in



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 37 of 90

POWER SECTOR-EASTERN REGION

excess of its rated capacity.

- Barrels, boxes, kegs, blocks or similar unstable object must never be used as work platforms or to support scaffold.
- Where persons must work under or pass under a scaffold then a 18 gauge wire mesh screen must be installed between the toe board and guard rail.
- Employees exposed to overhead hazards while working on a scaffold will be protected by 5 cm (2") thick planks.
- Wooden/bamboo ladders shall not be allowed at any cost. Ladder's rungs shall be fitted /welded properly. Before every use the rungs should be checked for safe use.
- The platform should have permanent hand rail and mid rail with Toe board without fail.
- All platforms are to be tightly planked for the full width of the scaffold, except as may be necessary for entrance openings. Platforms shall be secured in place.
- On suspension scaffolds designed for a working load of 500 pounds, no more than two workers are permitted to work on the scaffold simultaneously. On suspension scaffolds with a working load of 750 pounds, no more than three workers are permitted on the scaffold simultaneously. Each employee on the scaffold shall use an approved safety harness attached to an independent lifeline. The lifeline is to be securely attached to substantial members of the structure (not the scaffold itself) or to securely rigged lines, which shall safely suspend a worker in event of a fall.

Suspension Scaffold

- Suspended scaffolds are platforms suspended by ropes, or other non-rigid means, from an overhead structure.
- Requirements for use are to be preapproved by HSE Head, under a specific Permit to Work.

Rolling Scaffolds

- The height of rolling scaffolds shall not exceed three times the minimum base dimension.
- The minimum base dimension of rolling scaffold will be 1.25 meters (4 feet).
- Adequate help must be provided when moving a rolling scaffold.
- Secure or remove all loose materials, equipment and tools before moving a rolling scaffold.
- No one is permitted to ride a rolling scaffold when it is being moved. Castor brakes must be locked - on when the scaffold is not being moved.

Typical Scaffold Designs

Tube & Coupler Scaffold –



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

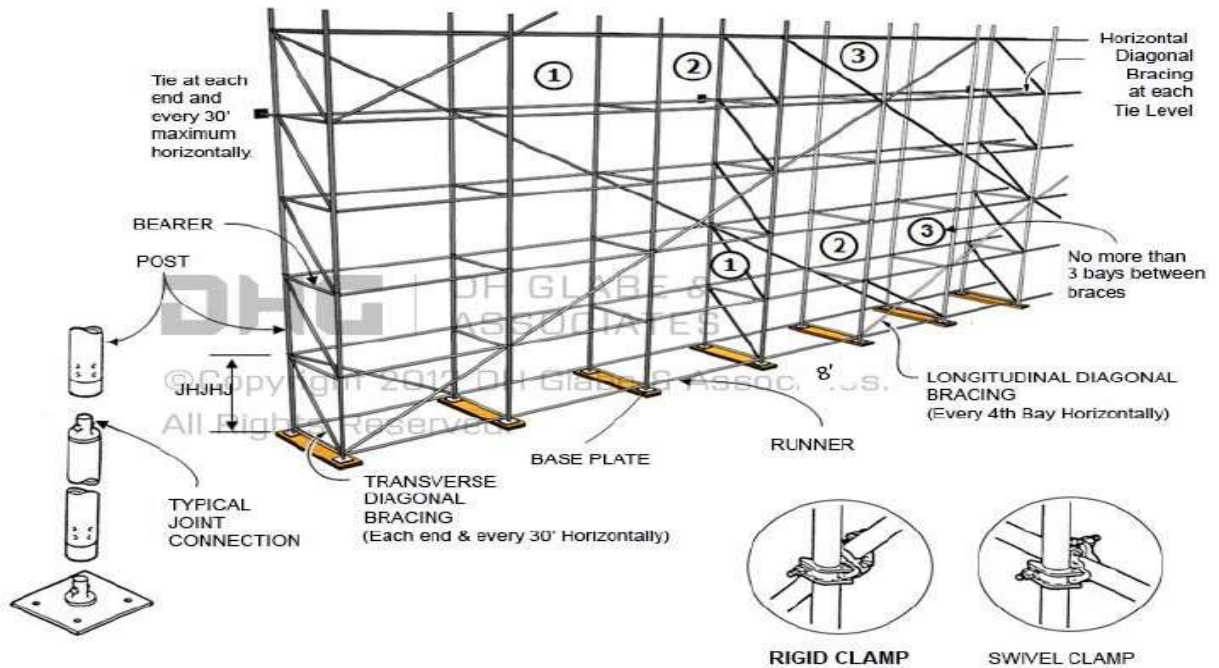
Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

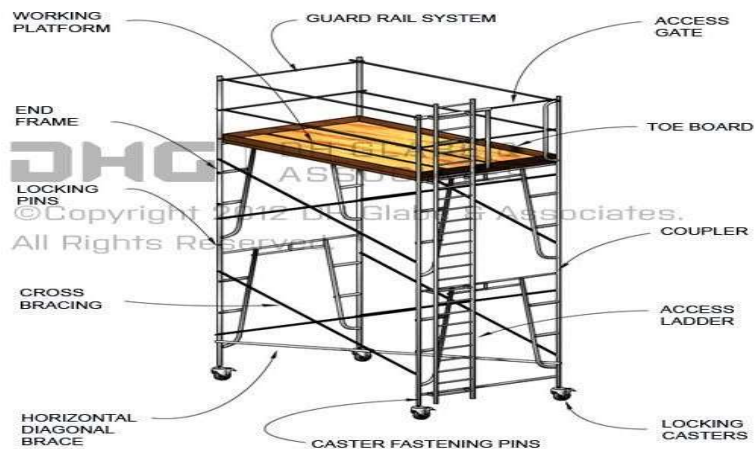
Date: 05.05.16

Page: 38 of 90

POWER SECTOR-EASTERN REGION



Rolling Scaffold –



Scaffold Tagging:

Scaffolds being erected, modified or dismantled must be tagged as suitable for use. The scaffolds can only be accessed by those involved with the process.

- GREEN scaffold tag- shall be fixed when scaffold is complete and safe for use, signed and dated by the **scaffolding competent person** daily.



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

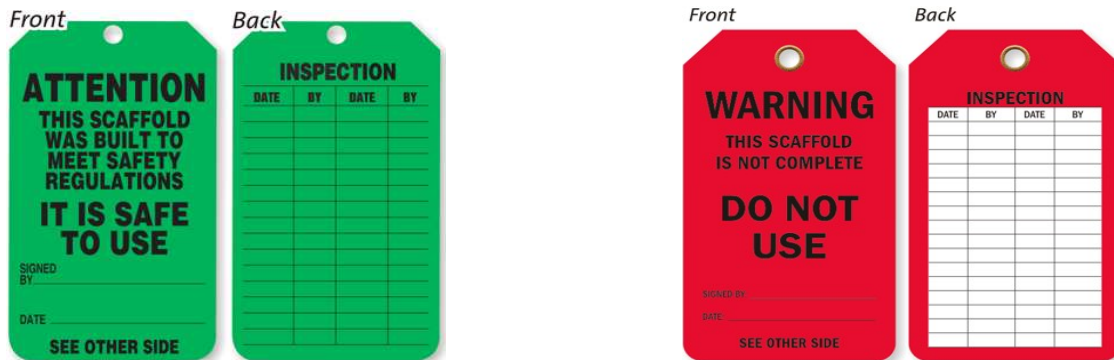
POWER SECTOR-EASTERN REGION

Date: 05.05.16

Page: 39 of 90

- RED scaffold tag – to be fixed if scaffold is in some way defective and cannot be used or is still under erection.

Examples of scaffold tags:



18.1SAFE USE OF LADDERS.

- ❖ Fall protection is required when working on a ladder above 2 meters and when climbing above nearby guardrails.
- ❖ Ladders must be inspected prior to use and by a competent person quarterly, with documentation.
- ❖ Use portable ladders for height up to 4 M only
- ❖ Provide fixed ladders for height above 4 M
- ❖ Place the ladder at an angle of 75 degrees (approx) from the horizontal (1:4)
- ❖ Extend ladder at least 1 M above the top landing
- ❖ Secure top and bottom of the ladder firmly to prevent displacement- anti skid lining at the bottom
- ❖ Ensure that the width of the ladder is not less than 300 mm and distance between rungs is not more than 300 mm
- ❖ Provide landings of minimum size 600 x 600 mm at intervals not more than 6 M for fixed ladders. Check the ladders daily for any defects
- ❖ Ensure that the areas around base and top of the ladder are clear. Getting on and off the ladder is more hazardous than using it. Use a mudsill if the ladder is to rest on soft, loose or rough soil
- ❖ Do not use ladders of conducting material near power lines, and only use ladders near powerline or other energize system with exposed parts if they are confirmed locked-out and de-energized.



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

POWER SECTOR-EASTERN REGION

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

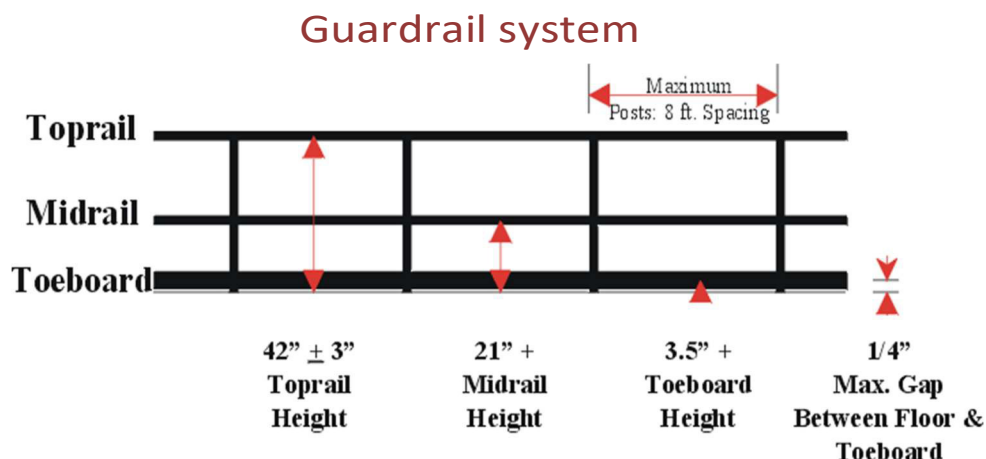
Date: 05.05.16

Page: 40 of 90

- ❖ Stand no higher than the fourth rung from the top for carrying out any job standing on a ladder.
- ❖ Never reach out from a ladder to perform work where your belt buckle protrude past the ladder rung.
- ❖ Always face the ladder while climbing up or down
- ❖ Maintain three point contact while climbing up or down a ladder i.e. two hands and one foot or two feet and one hand on the ladder at all the times.
- ❖ Avoid climbing up or down a ladder while carrying anything in hands. Lift tools, equipment and materials with a rope.
- ❖ Work from portable and extension ladders near guarrail where fall expouse exisit over the guardrail regardless of height, and above 2.0 mtr. heights from the working/walking surface will require the use of personal fall arrest equipment.

18.2 Precautions against the fall of materials and persons and collapse of structures

- ❖ Adequate precautions should be taken such as the provision of fencing, or barriers to protect any person who might be injured by the fall of materials, or tools or equipment being raised or lowered. Cradle may be used for lifting materials - however this shall be made of MS angles and flats only and duly certified by the HSE officer. Operators may also use designed containers for lifting small tools.
- ❖ Guardrails (including scaffolding) erected over/adjacent working areas must have the guardrails screened (opening < 0.5), to prevent material from falling outside the platform/decking.
- ❖ Guardrails must be able to withstand a 200 pound force exerted in any one direction.
- ❖ Where necessary to prevent danger, guys, stays or supports should be used or other effective precautions should be taken to prevent the collapse of structures or parts of structures that are being erected, maintained, repaired, dismantled or demolished.
- ❖ All openings through which workers are liable to fall should be kept effectively covered or fenced and indicated in the most appropriate manner.
- ❖ As far as practicable, guard-rails and toe-boards in accordance with Indian laws and regulations as depicted below:





HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 41 of 90

POWER SECTOR-EASTERN REGION

- ❖ Guardrails shall be provided to protect workers from falling from elevated work places. The rails are generally made of MS pipes of suitable dia. Rebar shall not be used for any handrails, ladder or cover purpose. Wherever the guard-rails and toe-boards cannot be provided:

- (a) adequate safety nets or safety sheets shall be erected and maintained; or
- (b) adequate safety harnesses shall be provided and used and or
- (c) adequate fall arrestor shall be provided and used.

As mentioned under PPE clause, all these PPEs shall be defect free and regularly inspected for any defect. The full body safety harness shall have double lanyard only with max 1.8m length.

The monkey ladders shall have sufficient fall arrestors. Adequate lifelines of 8mm steel wire rope shall be provided across the work area.

The HSE officer shall recommend appropriate PPEs after analysing hazards and risks involved.

18.3 Safety Nets:

- ❖ All safety net systems shall meet the requirements of Indian Standard (IS: 5175)
- ❖ Safety net mesh openings shall have a maximum size of 6 inches x 6 inches and be secured at each crossing to prevent elongation of the opening. All nets must meet IS: 5175 standard.
- ❖ Safety nets must be installed with sufficient clearance to prevent contact with the surface or structures under them
- ❖ Safety nets shall be installed as close as possible to the working level but in no case more than 25 feet below the working level.
- ❖ The safety nets shall extend out at least 8 ft. from the side of the open edge.
- ❖ Material, equipment and other items that fall into the net are to be promptly removed.
- ❖ Safety nets are to be inspected before use and then daily for wear or damage caused by falling materials.
- ❖ Safety net installation shall be inspected by a competent person.
- ❖ Safety nets must be installed below the working decks of the super structure for protection from falls of personnel and material.
- ❖ Safety nets and safety net installations must be drop-tested at the jobsite:
 - After initial installation and before being used.
 - Whenever relocated.
 - After major repair.
 - At 6-month intervals if left in one place.
- ❖ The drop test consists of a 400 pound bag of sand 28-32 inches in diameter dropped into the net from the highest surface at which employees are exposed to fall hazards, but not from less than 42 inches above that level.
- ❖ When the employer can demonstrate that it is unreasonable to perform the drop-test described above, the employer or a designated competent person shall certify that the net and net installation have sufficient clearance and impact absorption by preparing a certification record prior to the net being used as a fall protection system. The certification must include:
 - Identification of the net and net installation.
 - Date that it was determined that the net and net installation were in compliance.
 - Signature of the person making the determination and certification.



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

POWER SECTOR-EASTERN REGION

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 42 of 90

19.0 SAFETY IN JETTY CONSTRUCTION:

A jetty is to be constructed close to the power plant site over a river. The construction activity involves deployment of cranes and other lifting appliances – a few may be mounted on vessels.

Prior to taking up job at the identified space, a HIRA shall be prepared and corrective measures shall be prepared by an expert group. This shall be shared with the subcontractor/gang to be deployed for the job through meeting/TBM as well as proper documentations.

- The safety rules as described in clause 12.0 shall be followed for all safety appliances. However, the operators shall be certified specifically for operating the lifting appliances mounted on the vessels by the owner of the vessels or the lifting supervisor of the agency.
- The lifting appliances on vessels shall be fixed and securely anchored
- Lifting appliances/ mobile plant shall be kept away from dangerous locations such as openings, edges close to water.
- The operation zone shall be clearly demarcated and properly fenced off.

19.1 SAFE USE OF LIFE JACKETS AND BUOYANCY AIDS:

- Lifejackets/buoyancy aids should be provided to and worn by workers with risk of falling into water.
- Lifejackets/buoyancy aids should conform to BS EN ISO 12402-1, 2, 3 or 4, or other equivalent international standards according to working conditions
- Lifejackets should be thoroughly checked by the user before each use.



Efficient state:
Green

Maintenance Record



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

POWER SECTOR-EASTERN REGION

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 43 of 90

- A lifebuoy with sufficient lifeline (not less than 30 meters) shall be provided and the locations of the lifebuoys shall be at less than 50 metre intervals along the edges of places where work is being carried out overside or in exposed position on vessels where there is a reasonably foreseeable risk of falling or being washed overboard. To avoid any delays to rescue operations, lifebuoys shall be tightly tied to the posts.



- The lifejacket/ buoyancy aid shall preferably be provided with a whistle and/ or a self-activating light (for night work) in order to aid locating the wearer and facilitating rescue.
- The lifejackets /buoyancy aids shall be inspected and checked periodically by a competent person.



- The life jackets/ buoyancy aids shall be properly maintained in a good serviceable condition according to the manufacturer's instructions.
- All inflatable life jackets shall be serviced by an authorized person/agent at least once a year.

19.2 WORKING AT HEIGHT

- Suitable guard-rails and toe-boards shall be installed at edges. Openings shall be properly covered where persons are liable to fall from height, to land surfaces or into water.
- Suitable working platforms, with suitable guard-rails and toe-boards, shall be provided for work at height. Safe means of access and egress shall be provided for the working platform.
- Safety harnesses with continuous and effective anchorage system shall be provided when it is impracticable to provide a suitable working platform, access and egress and safe place of work.
- Access and egress shall be sufficiently illuminated and free from any obstructions, openings, projections in order to avoid any slip, trip and fall.

20.0 NIGHT SHIFT OPERATION:

Night shift operation shall be avoided to the extent possible, so shall be any complicated or heavy job. However, prior administrative approval shall be obtained from BHEL for such operation. The following shall be ensured:

- Adequate illumination along access, work area and egress



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 44 of 90

POWER SECTOR-EASTERN REGION

- ii. Supervision
- iii. Issue of strict instruction to workmen not to stray away from the work area and earmarked approach
- iv. Non-deployment of women workforce
- v. Non-deployment of fatigued workforce
- vi. Vacating the area immediately on completion of the job
- vii. informing first-aid facility and ambulance in advance

21.0 CONTROL OF MOVEMENTS AND USE OF HAZARDOUS SUBSTANCES AND CHEMICALS:

- ❖ The hazardous substances and chemicals shall be stored in a cool, well ventilated, dry and covered space with restricted entry only
- ❖ The loading, unloading, issue and use of these materials shall be strictly in accordance with the Material Safety Data Sheet (MSDS) and under strict supervision. Every supply shall accompany a MSDS as per standard purchase order clause.
- ❖ The site HSE team shall maintain MSDS of all these items and the same shall be shared with the stores or the user as and when required.
- ❖ Each container shall be labeled.
- ❖ The stores shall check the expiry date of perishable chemicals while receiving and store in such a fashion so as to follow First-in-first-out queue.
- ❖ There shall be enough space for movement of material and people in the stores.
- ❖ Containment shall be provided so as to arrest spillage from spreading.
- ❖ There shall be sufficient fire extinguishers and sand buckets in the stores and at point of use. In case of any spillage, dry sand shall be put on the spill and soaked sand shall be disposed as per the procedure for hazardous waste.
- ❖ There shall be provision of water preferably flowing one and a face shower at stores and point of use
- ❖ The persons handling these items shall strictly wear appropriate PPEs like leather gloves, apron, shield etc

22.0 CHEMICAL CLEANING: The chemicals have to be handled as instructed in MSDS. Only authorized person(s) shall be engaged for this job under strict supervision. The waste chemicals shall be drained out to a suitable storage provision and disposed off as per the relevant procedure. The area shall be barricaded while carrying out cleaning operation so as to prevent any unauthorized entry. Once the operation is completed, the surplus material along with the containers shall be returned to stores or scrap yard, as the case may be. The users shall use all appropriate PPEs and shall have water and sand for handling any incidental spillage or splash etc. The area shall be left completely clean before removing barricades.

22.1 PAINTING

Requirements provide a detailed procedure to be implemented by all concerned employees and sub-contractors involved in painting activities.

Significant Environmental Hazards:

- Chemical hazard due to inhalation of lead fumes (lead containing paint)
- Chemical hazard due to inhalation of VOC's from painting operations
- VOC's from painting and coating operation
- Disposal of paints and coats drums

Control Procedure for Painting:

- Chemical products used in painting and coating operation shall have proper MSDS sheet in place. Whenever any doubt arise with respect to handling and safety point of view it should be accessed to all concerned.
- Toxic substances and hazards relate the toxic chemicals shall be identified.
- Proper PPE shall be used including plastic gloves appropriate overall etc.,
- Arrangement for cleaning of spillage shall be ensured



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 45 of 90

POWER SECTOR-EASTERN REGION

- In case of nauseating feeling by any one immediate action shall be taken
- Only trained workers shall be allowed and proper training should be imparted to the works.
- Exposure limits of the toxic substances shall be checked before starting the work and nobody shall be allowed to carry the work beyond the permissible limit.
- Ventilation or exhaust facility shall be provided at place where painting and coating operations are carried out.
- Overalls shall be supplied by the contractors/subcontractors to the workmen and adequate facilities shall be provided to enable the painters to wash at the cessation of work.
- Smoking, open flames or sources of ignition shall not be allowed in places where paints and other flammable substances are stored.
- A caution board in national /regional language "smoking strictly prohibited" shall be displayed in the vicinity.
- Suitable fire extinguishers/sand buckets shall be kept available at places where flammable paints are stored, handled or used.
- In case of indoor painting or painting in confined spaces, exhaust ventilating shall be provided. If adequate ventilation is not provided a proper respirator shall be provided and used by persons who are trained and fit tested.
- The VOC's from painting and coating operations shall not exceed the permissible level of CPCB/ SPCB norms. The paints and coats must be selected as per the guidelines.
- Workers shall thoroughly wash their hands and feet before leaving the work.

23.0 SAFETY IN THE USE OF HAND TOOLS AND POWER-OPERATED TOOLS

23.1 General provisions

- All hands and power tools and similar equipment, shall be maintained in safe condition.
- When power operated tools are designed to accommodate guards, they shall be equipped
- with such guards, when in use;
- Belts, gears, shafts, pulleys, sprockets, spindles, drums, fly wheels, chains and other reciprocating, rotating or moving parts of the equipment shall be similarly guarded;
- Personnel using hand and power tools and exposed to the hazard of falling, flying, abrasive, and splashing objects, or exposed to harmful dusts, fumes, mists, vapours, or gases shall be provided with the particular personal protective equipment necessary to protect them from the hazards;
- All hand-held powered platen sanders, grinders, grinders with wheels of 5 cm or less, routers, planers, laminate trimmers, nibblers, shears, scroll saws and jigsaws with blade shanks of 0.5 cm wide or less shall be equipped with only a positive on-off control.
- All hand-held powered drills, tappers, fastener drivers, horizontal, vertical or angle grinders with wheels greater than 5 cm in diameter, disc sanders, belt sanders, reciprocating saws, saber saws and other operating powered tools shall be equipped with a momentary contact on control provided that turnoff can be accomplished by a single motion of the same finger or fingers that turn it on.

23.2 Hand Tools

- The contractor shall not issue or permit the use of unsafe hand tools;
- Wrenches including adjustable pipe end and socket wrenches shall not be used when saws are sprung to the point that slippage occurs;
- Impact tools such as drift pins, wedges and chisels shall be kept free of mushroomed heads;
- The wooden handles of tools shall be kept free of splinters or cracks and shall be kept tight on the tools.

23.3 Power operated tools

- Electric power operated tools shall be either of the approved double-insulated type or shall be grounded;
- The use of electric cords for hoisting or lowering loads shall not be permitted;



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 46 of 90

POWER SECTOR-EASTERN REGION

- iii. Pneumatic power tools shall be secured to the hose or whip by some positive means to prevent the tool from becoming incidentally disconnected;
- iv. Safety clips or retainers shall be securely installed or maintained on pneumatic impact (percussion) tools to prevent attachments from being incidentally expelled;
- v. All pneumatically riveting machine staplers and other similar equipment provided with automatic fastener feed, which operate at more than 7 kg/cm² pressure at the tool a safety device on the muzzle to prevent the tool from ejecting the fasteners unless the muzzle is in contact with the work surface;
- vi. Compressed air shall not be used for cleaning purposes except when the pressure is reduced to less than 2 kg/cm² and that too with effective chip guarding. The 2 kg/cm² pressure requirement does not apply to concrete form, mill scale and similar cleaning purposes;
- vii. The manufacturer's safe operating for hoses, pipes, valves, filters and other fittings shall not be exceeded;
- viii. Only personnel who has been trained in the operation of the particular tool shall be allowed to operate power-actuated tools;
- ix. The tool shall be tested each day before loading to see that the safety devices are in proper working condition. The method of testing shall be accordance with the manufacturer's recommended procedure;
- x. Any tool found not in proper working order, or that which develops a defect during use, shall be immediately removed from service and not used until properly repaired;
- xi. Tools shall not be loaded until just prior to the intended firing time. Neither loaded nor empty tools are to be pointed at any other person. Hands shall be kept clear of the open barrel end;
- xii. Loaded tools shall not be left unattended;
- xiii. Fasteners shall not be driven into very hard or brittle materials including, but not limited to, cast iron, glazed tiles, surface hardened steel, glass block, live rock, face brick or hollow tiles;
- xiv. Driving into materials that can be easily penetrated shall be avoided unless backed by a
- xv. substance that will prevent the pin or fastener from passing completely through and creating a flying missile hazard on the other side;
- xvi. No fastener shall be driven into a palled area caused by an unsatisfactory fastening;
- xvii. Only non-sparking tools shall be used in an explosive or flammable atmosphere;
- xviii. All tools shall be used with the correct shield, guard or attachment as recommended by thee manufacturer.

23.4 Abrasive wheels and tools

- i. All grinding machines shall be supplied with sufficient power to maintain the spindle speed at safe levels under all conditions of normal operation;
- ii. Grinding machines shall be equipped with suitable safety guards;
- iii. The maximum angular exposure of the grinding wheel periphery and sides shall not be more than 90°, except that when the work requires contact with the wheel below the horizontal plane of the spindle, the angular exposure shall not exceed 120°. In either case, the exposure shall begin not more than 8.650 above the horizontal plane of the spindle. Safety guards shall be strong enough to withstand the bursting of the wheel;
- iv. Floor and bench-mounted grinders shall be work-rests, which shall be rigidly supported and readily adjustable. Such work-rests shall be kept at a distance not to exceed 5 mm from the surface of the wheel;
- v. Cup type wheels used for external grinding shall be protected by either revolving cup guard or a band type guard;
- vi. When safety guards are required, they shall be mounted as to maintain proper alignment with the wheel and the guard and the guard and its fastening shall be adequate strength to retain the fragments of the wheel in case of incidental breakage. The maximum angular exposure of the grinding wheel periphery and sides shall not exceed 180°;
- vii. Portable abrasive wheel used for internal grinding shall be provided with suitable safety flanges;
- viii. When safety flanges are required, they shall be used only with wheels designed to fit the
- ix. flanges. Only safety flanges, of a type and design and properly assembled so as to ensure that the pieces of the wheel will be retained in case of incidental breakage, shall be used;



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 47 of 90

POWER SECTOR-EASTERN REGION

- x. All abrasive wheels shall be closely inspected and ring tested before mounting to ensure that they are free from cracks or defects;
- xi. Grinding wheels shall fit freely on the spindle and shall not be forced on. The spindle nut shall be tightened only enough to hold the wheel in place;
- xii. All employees using abrasive wheels shall be protected by suitable eye protection equipment.

23.5 Woodworking tools

- i. All fixed power driven woodworking tools shall be provided with a disconnect switch that can either be locked or tagged in the **off-position**;
- ii. The operating speed shall be attached or otherwise permanently marked on all circular saws over 0.5 m in diameter or operating at over 3000 peripheral rpm. Any saw so marked shall not be operated at a speed other than that marked on the blade. When a marked saw is retensioned for a different speed, the marking shall be corrected to show the new speed;
- iii. Automatic feeding devices shall be installed on machines wherever the nature of the work will permit. Feeder attachments shall have the feed rolls or other moving parts covered or guarded so as to protect the operator from hazardous points;
- iv. All portable power driven circular saws shall be equipped with guards above and below the base plate or shoe. The upper guard shall cover the saw to the depth of the teeth, except for the minimum arc required to permit the base to be tilted for bevel cuts. The lower guard shall cover the saw to the depth of the teeth, except for the minimum arc required to allow proper retraction and contact with the work. When the tool is withdrawn from the work, the lower guard shall automatically and instantly return to the covering position.

23.6 Defective tools to be tagged out for maintenance, as **DEFECTIVE, DO NOT USE**, and sent to tool/store room for repair or to be discarded.

24.0 START UP, COMMISSIONING AND TESTING:

There are various activities involved prior to commissioning- the major ones are -Hydraulic Test, Steam Blowing, Charging of transformers, Boiler Light Up, Rolling and Synchronisation and Full loading of unit.

These activities shall be personally supervised by the site executive along with the commissioning engineer. The readiness of upstream and downstream system shall be ensured before taking up. These shall be handled strictly by the authorised persons only and the team shall be suitably briefed about the activity including hazards & risks involved and control plan by the concerned executive-in-charge before start. Entry of persons to the area of activity shall be suitably restricted and the emergency functions like Ambulance, first aid centre and Fire station shall be intimated about the plan well in advance. Tag-in/ Tag-out shall be in place while charging transformer and whenever necessary. Electricians with valid wiremen license only shall be permitted to work on power lines. The area and the passage shall be adequately illuminated.

25.0 DEMOLITION WORK

Before any demolition work is commenced and also during the process of the work the following shall be ensured:

- All roads and open areas adjacent to the work site shall either be closed or suitably protected.
- No electric cable or apparatus which is liable to be a source of danger nor a cable or an apparatus used by the operator shall remain electrically charged.
- All practical steps shall be taken to prevent danger to persons employed from the risks of fire or explosion or flooding. No floor, roof or other part of the building shall be so overloaded with debris or materials as to render them unsafe.



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 48 of 90

POWER SECTOR-EASTERN REGION

26.0 EXCAVATION

Wherever there is open excavation in ground, they shall be fenced off by suitable railing and danger signals installed at night so as to prevent persons slipping into the excavations. All safety precautions shall be taken for foundation and other excavation marks as per IS-3764. Any excavation above 2m shall be considered as hazardous job.

27.0 ENVIRONMENTAL CONTROL

Environment protection has always been given prime importance by BHEL. Environmental damage is a major concern of the principal contractor and every effort shall be made, to have effective control measures in place to avoid pollution of Air, Water and Land and associated life. Chlorofluorocarbons such as carbon tetrachloride and trichloroethylene shall not be used. Waste disposal shall be done in accordance with the guidelines laid down in the project specification.

Any chemical including solvents and paints, required for construction shall be stored in designated bonded areas around the site as per MSDS.

In the event of any spillage, the principle is to recover as much material as possible before it enters drainage system and to take all possible action to prevent spilled materials from running off the site. BHEL shall use appropriate MSDS for clean-up technique

All contractors shall be responsible for the cleanliness of their own areas and must not pollute the ground, air and water.

BHEL shall ensure that noise levels generated by plant or machinery are as low as reasonably practicable. Where the contractor anticipates the generation of excessive noise levels from his operations the contractor shall inform to Construction manager of BHEL accordingly so that reasonable & practicable precautions can be taken to protect other persons who may be affected.

27.1 Water Supply and Wastewater Discharge Requirement

- Source of water is provided by client from the existing system.
- Wastage of water to be controlled by monitoring the required water for construction & domestic use and actual consumed.
- No contaminated water to be discharged in the storm water drain confirming the standard parameters before discharge. Proper approval to be taken if applicable as per [Bangladesh Environmental Standards](#)

27.2 Storm water runoff Management

- Expansion of existing plant, no existing drainage systems will be disturbed and damaged.
- No construction waste water to be discharged in the existing storm water drain or newly construction storm water drains.

27.3 Noise Mitigation

High noise is harmful to the human health and it can cause impairment if exposed for long duration at regular intervals, and also cause disruption in nearby communities.

- Noise monitoring shall be carried out in all construction locations periodically.
- Use of silent DG is allowed at site during construction.
- Low noise generation equipment's to be preferred
- Acoustic enclosure to be used in case noise level is high for particular equipment or system.
- Work areas where noise levels exceed the 85db shall be posted as hearing protection required.
- Use of PPEs / ear plug/ear muff for personnel entering into high noise area.
- Activities generation High noise will be planned in day shift.



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 49 of 90

POWER SECTOR-EASTERN REGION

Noise Level Chart (As per Bangladesh Environmental Standards)

Parameter	Night Noise level dBA	Daytime Noise Level dBA
At 1-meter from each piece of equipment	85	85
At Property boundary	70	70

27.4 Air pollution Control


- Water sprinkling on road for suppression of fugitive dust to be done regularly.
- Startup and commissioning activities to be planned for compliance with contract, regulatory and permit requirements..(As per Bangladesh Environmental Standards)
- Required monitoring to be done in the respective work location as applicable.

27.5 Land and Water Resource Protection

- Only prior approved land by CUSTOMER to be used during construction work.
- Contract clauses to be followed
- All hazardous substances will be stored with proper containment facilities to avoid any release into the water system, causing land/water contamination.

28.0 HOUSEKEEPING

- Keeping the work area clean/ free from debris, removed scaffoldings, scraps, insulation/sheeting wastage /cut pieces, temporary structures, packing woods etc. will be in the scope of the subcontractor. Such cleanings has to be done by subcontractor within quoted rate, on daily basis by an identified group. If such activity is not carried out by subcontractor / BHEL is not satisfied, then BHEL may get it done by other agency and actual cost along with BHEL overheads will be deducted from contractor's bill. Such decisions of BHEL shall be binding on the subcontractor
- Proper housekeeping to be maintained at work place and the following are to be taken care of on daily basis:
 - ❖ All surplus earth and debris are removed/disposed off from the working areas to identified locations.
 - ❖ Unused/Surplus cables, steel items and steel scrap lying scattered at different places/elevation within the working areas are removed to identified locations.
 - ❖ All wooden scrap, empty wooden cable drums and other combustible packing materials, shall be removed from workplace to identified locations. Sufficient waste bins shall be provided at
 - ❖ Different work places for easy collection of scrap/waste. Scrap chute shall be installed to remove scrap from high location.
 - ❖ Access and egress (stair case, gangways, ladders etc.) path should be free from all scrap and other hindrances.
 - ❖ Workmen shall be educated through tool box talk about the importance of housekeeping and encourage not to litter.
 - ❖ Labour camp area shall be kept clear and materials like pipes, steel, sand, concrete, chips and bricks, etc. shall not be allowed in the camp to obstruct free movement of men and machineries.
 - ❖ Fabricated steel structures, pipes & piping materials shall be stacked properly.
 - ❖ No parking of trucks/trolleys, cranes and trailers etc. shall be allowed in the camp, which may obstruct the traffic movement as well as below LT/HT power line.
 - ❖ Utmost care shall be taken to ensure over all cleanliness and proper upkeep of the working areas
 - ❖ The paint and thinner and other chemical containers (filled, partly used and empty) shall be carefully stored, used and tracked. All empty containers shall be removed after getting punctured/lid removed and deformed to the scrap yard. The partial used one shall either be returned to store or carefully kept at a corner much away from any hot work or source of fire.

	HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)	Doc no.: HSEP: 14-MAITREE:VENDOR
		REV: 00
	POWER SECTOR-EASTERN REGION	Date: 05.05.16
		Page: 50 of 90

29.0 WASTE MANAGEMENT

There are operations on construction projects that may create hazardous waste, which would require handling, storage, transferring, and transporting. Therefore, hazardous waste guidelines apply for Hazardous Waste Planning:

29.1 Minimum Requirements:

- Contractors must designate a Material Manager who is responsible for checking delivered materials as potential hazardous waste and informing the Contractor's Safety Manager.
- Contractors who create, may be expected to create or could accidentally create a material that could be classified to be hazardous waste must provide Disposal number (or equivalent) and other pertinent information on file.
- All hazardous waste or waste which could be considered hazardous waste, as determined by the methodology and definitions from environmental regulators must be stored and collected in special areas and properly disposed of by the Contractor.
- No waste haulers, disposers, recyclers, or scavengers will be allowed on the site without the permission of the owner. It will be the responsibility of the Contractor to provide copies of all licenses, permits, and authorizations to the.
- No waste may be removed from the site by any person without the authorization of the Contractor. No waste may be brought onto the site and disposed of using the Contractor's systems or facilities.
- Burning of waste, if not used for generating energy, shall be generally prohibited

29.2 General Requirements

- For non-hazardous waste disposal. Receptacles e.g., dumpsters, etc. must be placed around the site for collection of waste materials. No material is to be abandoned on the site.
- Dumpsters will be inspected frequently, and any potentially hazardous material or waste will be removed from the dumpster and placed in the appropriate storage area at the expense of the responsible Contractor.

29.3 Definitions

- Solid Waste - Any garbage, refuse, sludge, or any other waste material which is not an "excluded waste."
 - The following solid wastes are not hazardous wastes unless otherwise designated as such by local authorities:
 - Fly ash waste, bottom ash waste, slag waste, and flue gas emission control waste generated primarily from the combustion of coal or other fossil fuels
 - Drilling fluids, produced waters, and other wastes associated with the exploration, development, or production of crude oil, natural gas, or geothermal energy.
- Other Waste Material - Any solid, liquid, semi-solid, or contained gaseous material, resulting from industrial, commercial, mining or agricultural operations which are discarded. This is usually an incidental by-product of the operation. Discarded material must be treated as follows:
 - Disposed of, and not used, reused, reclaimed, or recycled
 - Burned or incinerated, except where the material is being burned as a fuel for the purpose of recovering usable energy
 - Physically, chemically, or biologically treated (other than burned or incinerated) in lieu of or prior to being disposed of.



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 51 of 90

- Excluded Waste - Materials that are not solid wastes. The following materials are not solid wastes for the purpose of this part:
 - Domestic sewage ("Domestic sewage" means untreated sanitary wastes that pass through a sewer system.)
 - Any mixture of domestic sewage and other wastes that passes through a sewer system to a publicly-owned treatment works for treatment
 - Industrial wastewater discharges that are point source discharges.

29.4 Treatment - Any method, technique, or process, including neutralization, designed to change the physical, chemical, or biological character or composition of any hazardous waste to neutralize such waste, to recover energy or material resources from the waste, or to render such waste non-hazardous.

29.5 Improper Disposal - The discharge, deposit, injection, dumping, spilling, leaking, or placing of any solid waste or hazardous waste into the environment.

29.6 Temporary Storage - The holding of a hazardous waste for a period less than 90 days, at the end of which the hazardous waste is properly disposed of.

29.7 BINS AT WORK PLACE

- Sufficient rubbish bins shall be provided close to workplaces.
- Bins should be painted yellow and numbered.
- Sufficient nos. of drip trays shall be provided to collect oil and grease.
- Sufficient qty. of broomsticks with handle shall be provided.
- Adequate strength of employees should be deployed to ensure daily monitoring and service for waste management.

29.8 STORAGE AND COLLECTION

- Different types of rubbish/waste should be collected and stored separately.
- Paper, oily rags, smoking material, flammable, metal pieces should be collected in separate bins with close fitting lids.
- Rubbish should not be left or allowed to accumulate on construction and other work places.
- Do not burn construction rubbish near working site.

29.9 SEGREGATION

- Earmark the scrap area for different types of waste.
- Store wastes away from building.
- Oil spill absorbed by non-combustible absorbent should be kept in separate bin.
- Clinical and first aid waste stored and incinerated separately.

29.10 DISPOSAL

- Sufficient containers and scrap disposal area should be allocated.
- All scrap bin and containers should be conveniently located.



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 52 of 90

POWER SECTOR-EASTERN REGION

- Provide self-closing containers for flammable/spontaneously combustible material.
- Keep drainage channels free from choking.
- Make schedule for collection and disposal of waste.

29.11 WARNING AND SIGNS

- Appropriate sign to be displayed at scrap storage area
- No toxic, corrosive or flammable substance to be discarded into public sewage system.
- Waste disposal shall be in accordance with best practice.
- Comply with all the requirements of Pollution Control Board (PCB) for storage and disposal of hazardous waste.

30.0 WORK VEHICLES (Limited to contractual provision)

Work vehicle shall be as safe stable efficient and roadworthy as private vehicles on public roads. Site management shall ensure that drivers are minimum 18 years of age, physically fit, suitably qualified and trained for the equipment they are operating. All vehicle e.g. heavy motor vehicle forklift trucks dump trucks mobile cranes shall ensure that the work equipment conforms to the following:

- A high level of stability.
- Equipped with backup alarms.
- A safe means of access/egress.
- Suitable and effective service and parking brakes.
- Windscreens with wipers and external mirrors giving optimum all round visibility.
- Provision of horn, vehicle lights, reflectors, reversing lights, reversing alarms.
- Provision of seat belts.
- Guards on dangerous parts.
- Driver protection - to prevent injury from overturning and from falling objects/materials.
- Driver protection from adverse weather.
- No vehicle shall be parked below HT/LT power lines.
- Valid Pollution Under Control certification for all vehicles

30.1 TRANSPORTATION OF PERSONNEL AND MATERIALS BY VEHICLES

- All drivers shall hold a valid driving License for the class of vehicle to be driven and be registered as an authorized BHEL driver with the Administration Department.
 - Securing of the load shall be by established and approved methods, i.e. chains with patented tightening equipment for steel/heavy loads. Sharp corners on loads shall be avoided when employing ropes for securing.
 - All overhangs shall be made clearly visible and restricted to acceptable limits
 - Load shall be checked before moving off and after traveling a suitable distance.
 - On no account is construction site to be blocked by parked vehicles Drivers of vehicles shall only stop or park in the areas designate by the stringing foreman.
 - Warning signs shall be displayed during transportation of material.
- All vehicles used by BHEL shall be in worthy condition and in conformance to the Land Transport requirement

31.0 EMERGENCY PREPAREDNESS AND RESPONSE Preferably to be maintained jointly by all stake-holders in the project) (A separate document titled "Emergency Preparedness and Response Plan bearing document no HSEP:EPRP:MAITREE is to be read along with this plan)Emergency preparedness and response plan requirements are to protect worker life and health, and to safeguard property used and stored on the project. This plan



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

POWER SECTOR-EASTERN REGION

Date: 05.05.16

Page: 53 of 90

is prepared in anticipation of an emergency to prevent losses to any Incident. This plan describes how the organization identifies, respond to and review emergency situations.

This plan covers fire, medical and other environmental incidents. It aims at controlling the emergency and generally mitigating the adverse effects of a major Incident. This plan is applicable to all activities carried at all BHEL project sites. Determination of hazard potential and identification and assessment of hazards is the first part in emergency planning. This requires systematic study of the site / plant to identify emergencies that can occur.

31.1 Definition:

A major emergency can be defined as an Incident that has potential to cause serious injury or loss of life. It may cause extensive property damage and adversely affect the environment as a whole.

31.2 Emergency scenarios and General Guidelines:

Various scenarios that are anticipated to cause emergency at BGRESL site are discussed in brief along with guidelines.

- Personal injuries:

In spite of putting best efforts some technical failure or human error may lead to personal injury at site. Guidelines are given below when personnel injuries happen:

- Contact medical center over phone/cell/radio;
- Contact security control room over phone/cell/radio;
- Contact HR/Admin department over phone/cell/radio;
- Tell your location nature of injury or near miss incident;
- Inform site safety department;
- Provide First Aid treatment if properly trained person is available, otherwise take the injured person to Medical center if practical; or
- Stay with the injured person until medical assistant arrives.

- In case of fire:

- Shout "fire fire";
- Inform the persons nearby. Contact Fire Center and give your location and other details as warranted and act very calmly and swiftly. Then contact security and safety department once in a safe location;
- Try to put out the fire by using available portable fire extinguisher if trained and fire is in incipient stage only, otherwise let firefighting personnel tend to it;
- Do not make any attempt to collect your belonging;
- Get out and away from the area immediately and walk do not run. Follow shortest escape route and assemble at assembly point; and
- Under no circumstance put your precious life at risk.

- Mishaps involving failures of crane, structures, equipment and vehicular incidents, etc., can also lead to an Emergency situation on construction sites. Guidelines for actions to be taken in case of such situations are as:

- Inform immediate authority and also inform security and safety departments.
- Try to assist in rescue personnel involved only if safe to do so;
- Cordon off the area to prevent entry of personnel in affected area;
- Security shall ensure movement in affected area in coordination with Section/Site In-charge.



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 54 of 90

POWER SECTOR-EASTERN REGION

- Fire/Security service departments responding to affected area to contain and control the situation;
- All other personnel not involved in mitigation operation shall be directed to assembly point; and
- Contractor/ sub-contractor management shall ensure that their workmen are away from emergency site, not gathering around location of emergency.

- Toxic leakage from nearby live units can also lead to emergency situation at construction site. Guidelines for actions to be taken are as:
 - Inform immediate authority and also inform security and safety departments;
 - Evacuate all the personnel from the area immediately depending upon the wind direction to safest assembly point;
 - Call for help from fire and medical by phone/Cell/radio;
 - Arrange transport for any victims to medical Centre; and
 - Do not panic, act swiftly, do not run and proceed as per advice of emergency services.

- Bomb threat, sabotage, riot etc., also may lead to emergency situation at construction site. Such situation shall be dealt by HR/Admin and security department with the advice of Site In-charge.
 - Notification to the owner and authorizes to follow immediately.

- Natural calamities like earthquake, cyclone, and flood like situation can also lead to emergency situation at construction site. Site In-charge will act with required diligent and directive received from Concerned State Government, Corporate office and Owner.

- High Angle rescue -
 - First arrival. The first arriving HSE Officer should assume command after arriving on the scene;
 - HSE Officer should secure a witness as soon as possible after arriving on scene. This will help in identifying the problem and locating the victim;
 - Locate the victim to determine nature of injuries if any and report to Medical for response as needed.
 - Administer first aid to the victim as necessary;
 - Rescue team to use proper rescue kit / equipment to reach the victim;
 - Personnel manbasket or arial lift may be used to reach the vitim if applicable;
 - Assess the hazards. HSE Officer to identify all potential hazards and assist rescuers.
 - The HSE Officer will be responsible for securing those hazards or making all members aware of those hazards.
 - HSE Officer shall be made aware of the specific emergency action plans once the emergency response team arrives.
 - The HSE Officer shall also be responsible for assuring that all safety procedures are adhered to.

31.3 Communication system

An important key to effective emergency response is an effective communication system. At BHEL, site telephone, mobile and radios will be used for communication during emergency.

- Whosoever is observing any emergency shall inform about emergency to:
 - HR/Admin department
 - HSE-Head /Officers /
 - Medical and Security department
 - Fire department,



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

POWER SECTOR-EASTERN REGION

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

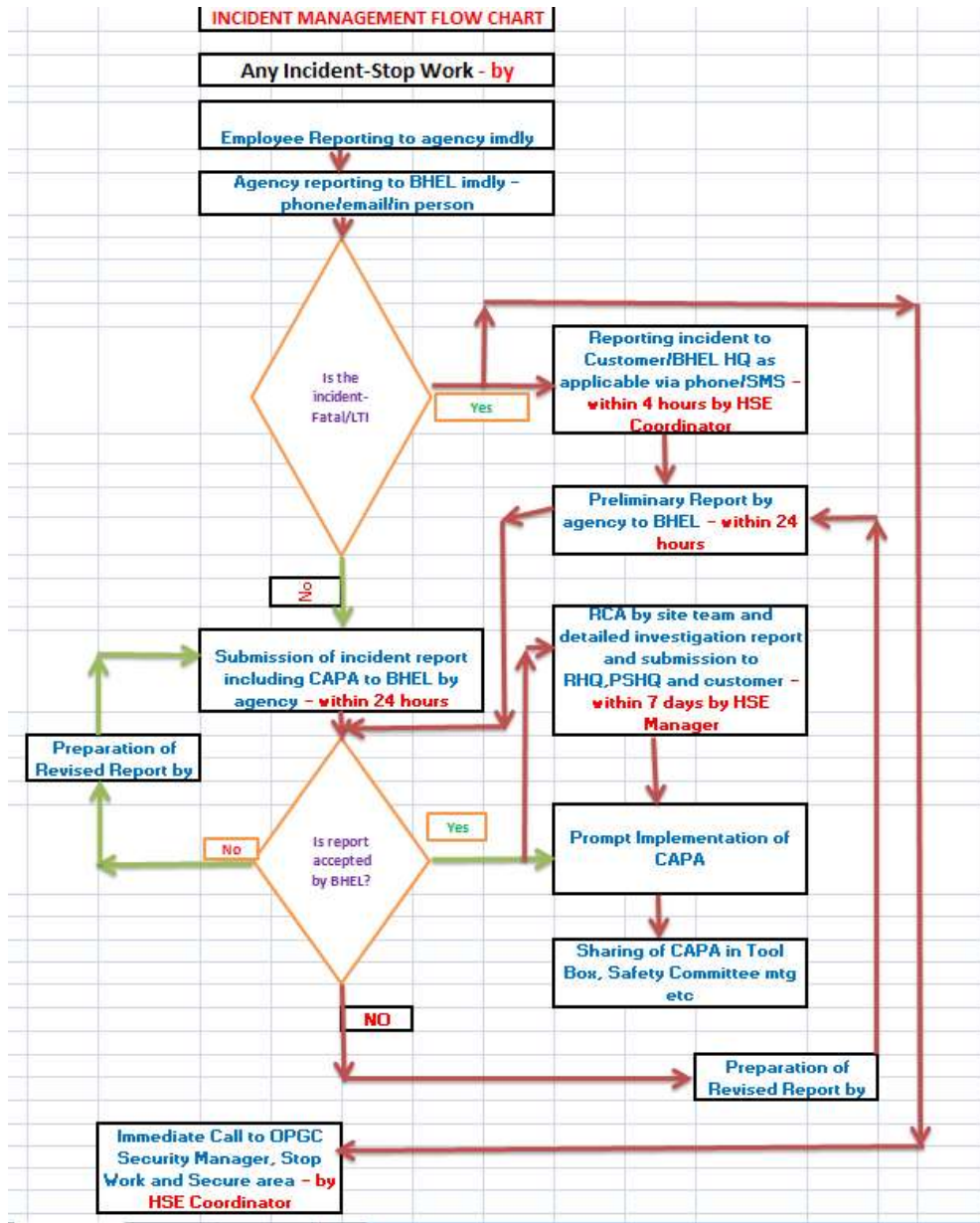
Date: 05.05.16

Page: 55 of 90

- BHEL Site/Section In-charge

- BHEL Section In-charge will confirm the information with emergency services and also inform the Regional Manager as well as sub-contractors Site In-charge.

31.4 Communication matrix shall be as:





HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

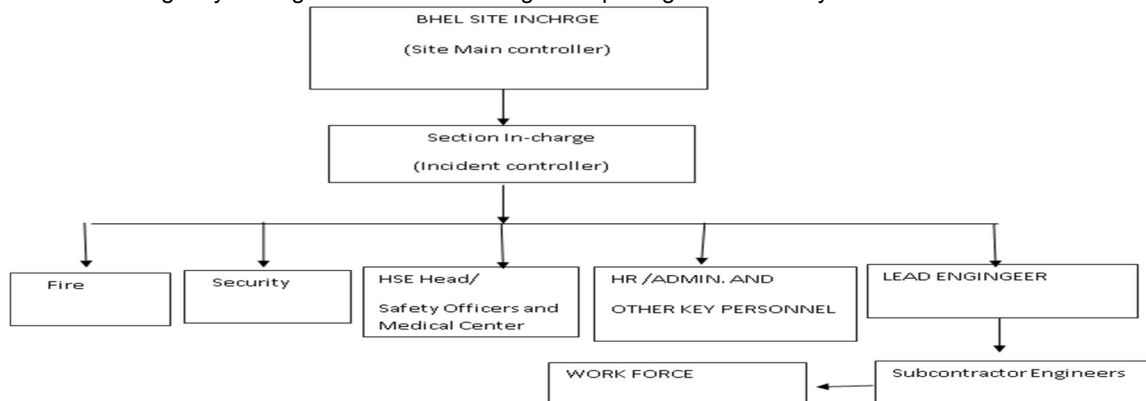
Date: 05.05.16

Page: 56 of 90

POWER SECTOR-EASTERN REGION

31.5 Emergency Organization -

An emergency organization establishment is based on nature of emergency at BHEL site. The matrix for the Emergency Management Team showing the reporting of various key members is as:



31.6 List of Key Personnel -

Sl. No.	Name	Designation	Telephone Number	Mobile number

31.7 Emergency Control Center -

For the coordination with emergency situations at BHEL site Site In-charge office shall operate as an Emergency Control Room. Site Main Controller (Site In-charge) will coordinate from this Emergency Control Room. Control Room shall be equipped with all necessary communication devices necessary to manage particular emergencies.

31.8 Emergency Drills -

The site HSE Manager and Emergency and Rescue Teams must participate in regular emergency drills of various types. The intervals between such drills must not exceed three months. The records of the drills must be prepared and kept on site for review by the Owner and site Management. The records must be reviewed during regularly scheduled project HSE Committee meetings.

- After each drill, a formal, documented debriefing must be conducted to discuss areas of improvement and an Action Plan developed with Responsible Person and Anticipated Completion Dates describing improvements to be implemented.



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 57 of 90

POWER SECTOR-EASTERN REGION

31.9 Roles & Responsibility -

Responsibility of Site In-charge (Site Main Controller):

- Immediately on receiving message regarding emergency will proceed to their cabin and fill their role as Main Controller and activate the Emergency Control Room and Emergency Management Team.
- Take strategic and technical decisions in line with the incident scenario to mitigate the cause of emergency.
- Provide leadership and guidance to the Emergency Management Team.
- As soon an emergency call is received they shall inform respective Section In-charge.
- Call for available resources Fire, Medical, Security as needed based on emergency situation.
- Stay in contact with Section In-charge for coordination efforts of resources and evacuation of personnel.
- Ensure head count is conducted and received.
- Notify Owner representative of situation and plan.

Responsibility of Section In-charge (Area Controller):

- If not at the location, once notified of an emergency will proceed to the area and act as an incident controller if safe or as appropriate based on the nature of emergency.
- Will be overall in-charge of the area situation in consultation with emergency responding offices and mobilized resources in coordination with Main Controller.
- Will assess the situation and take necessary action to control the emergency and give necessary instruction to site personnel as necessary and appropriate.
- Will evaluate if fire emergency and attempt to extinguish if safe and in incipient stage and assist injured as applicable.
- Shall instruct the sub-contractors and ensure that all non-essential employees are moved to safe assembly point and organize head count.
- Ensure safe exvacuation of site personnel to safe assembly point in coordination with Main Controller.
- Shall keep in contact with Main Controller keep them informed about site situation and seek directives for mitigation of emergency.
- Communicate with shift Fire Officer of fire condition and rescue measures.
- Communicate with shift Security Officer assist in barricading the affected area.
- Communicate with shift Medical for transporting of casualties, if any.

Fire officer /shift Fire in charge:

- Respond to the emergency call with fire crew in first turn out. Report to Incident controller at site of emergency.
- Decide line of control action in consultation with Section In-charge/Incident Controller for firefighting and other control actions including evacuation of trapped personnel.
- Deploy auxiliary fire squad for assisting fire crew.
- Ensure safety of the crew members
- Keep in constant contact with Emergency Control Room and Team.

Security officer / In charge:



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 58 of 90

POWER SECTOR-EASTERN REGION

- Instruct and deploy security personnel at security posts/gates and around the affected area.
- Communicate with the auxiliary fire squad at emergency site immediately on receiving emergency call to ensure their mobilization.
- Cordon off the affected area and guide traffic /emergency vehicles and manage crowd control by dispersing unnecessary persons from the area.
- Ensure vigilance at security posts /gates and be in contact with area manager and other members connected with firefighting or rescue operation.
- Mobilize for evacuation of personnel to safe locations/assemble point.

Medical Center:


- Upon receiving notification of an emergency, anticipate the casualties and prepare accordingly as per medical response plan. Inform Medical Staff and nearest Hospital in advance.
- Dispatch ambulance to incident site along with necessary staff.
- Provide medical treatment/first aid as necessary.

HR/Admin and HSE Teams:

- Coordinate with Main Controller and all other Emergency Management Team members and Government agencies as per requirement.
- Identify appropriate Assembly Points at project site, provide directions and marked areas clearly.
- Assist with arrangement of necessary PPE and use of.
- Support the Emergency Management Team as directed and/or necessary based on situation.

31.10 General Requirements:

- Emergency preparedness and response capability of site shall be developed as per Emergency Preparedness and Response plan issued by Regional HQ
- Availability of adequate number of first aiders and fire warden shall be ensured with BHEL and its sub-contractors
- Assembly point shall be earmarked and access to the same from different location shall be shown in consultation with the owner
- Fire exit shall be identified and pathway shall be clear for emergency escape.
- Appropriate type and number of fire extinguisher shall be deployed as per Fire extinguisher deployment plan and validity shall be ensured periodically through inspection
- Adequate number of first aid boxes shall be strategically placed at different work places to cater emergency need. Holder of the first aid box shall be identified on the box itself who will have the responsibility to maintain the same.
- First aid center shall be developed at site with trained medical personnel and ambulance
- Emergency contact numbers (format given in EPRP) of the site shall be displayed at prominent locations.
- Tie up with fire brigade shall be done in case customer is not having fire station.
- Tie up with hospital shall be done in case customer is not having hospital.
- Emergency Organization group shall be formed at site.
- Mock drill shall be conducted on different emergencies periodically (every three months) to find out gaps in emergency preparedness and taking necessary corrective action

	HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)	Doc no.: HSEP: 14-MAITREE:VENDOR
		REV: 00
	POWER SECTOR-EASTERN REGION	Date: 05.05.16
		Page: 59 of 90

31.11 WEATHER SEVERITY PLAN

A. OBJECTIVE AND SCOPE:

considering the over all monsoon and wind speed in the area the emergencies like cyclone and flood shall be considered from safety point of view during project work.

Warning/alerts issued by Bangladesh Meteorological department shall be acted upon by appropriate measures. These alerts are mostly conveyed to District Administration which in turn passes on to the owner of the project i.e. BIFPCL in this case. BIFPCL shall convey such alert to contractors. and coordinate appropriate response. Such alert is transmitted over Radio and TV channels also. However, contractors shall also remain alert to w3eather conditions and share with BHEL and fellow contractors any input received. Contractors shall actively participate in the Emergency Response activities

This safety plan provides procedure to be followed during emergency due to flood and cyclone for the period of entire project work with respect:

- To give clear guidance as to the actions that must be implemented.
- To inform employees what to do in an Emergency Scenario.
- To establish an emergency response and communications procedure.

B. RESPONSIBILITIES

RCM or his assignee shall coordinate with various departments in charge and supervisors, who will execute the alert procedures in their assigned areas. The coordination shall be in line with directives received from the Client/consultants.

C. CYCLONE

In the event of CYCLONE, alert warning is in three parts. The alert will be issued by BHEL Site Manager.

The actions required during cyclone/Rough Weather:

- Check and assist subcontractors in cleanup. Pick up all loose and unused material of respective supervisor's area
- Check tie-down arrangement is proper for all temporary structure, cranes and tall objects etc.
- Tie to secure all gas cylinders to avoid displacement and unsafe conditions which could be due to wind pressure.
- Secure portable electricity generating sets and other equipments, pumps, hoses etc.
- Make preparation for removal of water logging.
- Take review of work activity and make preparation for removal of equipments and material from all areas.
- Isolate/Turn off all electrical power from the main panel/switches. Secure and anchor panels properly.
- Recheck anchorage/tie of all temporary structures/sheds, tall objects, cranes, rigs, scaffolds etc to avoid toppling due to wind force.
- Cranes boom shall be either locked or lowered the booms as reasonably & practicably and rigs to safe position for the safety point of view.
- Group up all trash barrels, wooden pallets, forms; wooden decks etc. and anchor properly.
- Welding machines, air compressors, and such equipments are to be grouped together and secured to the stable objects. Welding leads, electrical cables, hoses are to be rolled up and secured properly.
- Set on site vehicles on high ground in the site area with brakes set firmly.
- Anchor all tanks, vessels, gas cylinders that may be moved by high wind and water.



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

POWER SECTOR-EASTERN REGION

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 60 of 90

- Evacuate job site.

D. PERSONNEL EVACUATION:

Personnel Evacuation will be required if predicted wind speed and storm surge heights are beyond acceptable limits as per the guidelines of BHEL management.

Special cyclone shelter shall be arranged in consultation with BHEL management. This shelter shall be equipped with first aid kit and emergency kit containing torch, sufficient batteries, jackets, emergency treatment manual. The map of escape routes and other site specific instructions of emergency situations shall be prominently displayed in the shelter.

Once the warning received from Client/Consultant, the emergency response team shall evacuate and transport all personnel involved in the project to the cyclone shelter.

Cyclone may followed by the calm "EYE" be aware of it. If the wind suddenly drops, don't assume the cyclone is over. Violent wind may resume from the opposite side direction. Wait for the official "All clear Signal".

After the cyclone do not go outside until officially communicated about safe situation outside. Use recommended routes for returning. Do not panic or rush while returning.

Checking of gas leaks and wellbeing of electrical appliances is essential before leaving the site.

Listen to local radio for official warning and advice. The site manager shall also obtain updates from client/consultants/metrological departments and communicate to the personnel on project site.

E. MONSOON:

During monsoon following precautions needs to be considered.

- **Excavation:** Inspect all excavations and protect from collapsing or subsidence. Clear all excavated material.
- **Storm water drains:** Check all storm water drains ahead of monsoon for any blockage etc. Identify way for draining out water collected in the site. If required, temporary drains should be prepared for draining out accumulated water in site. The sufficient number of dewatering pumps should be available for the purpose and logged water shall be pumped to nearest drain by dewatering pumps.
- **Access Routes:** Identify access routes to the site in case of flood. Sand should be available to spread over slippery surface.
- **Electrical Supply:** Beforehand check earthing of electrical panels and electrical cables for joints, cracks, insulation failure etc. Keep additional stock of electrical cables and plug tops for replacement of damaged one or to energize dewatering pumps. Do not keep electrical cables/welding cables on the ground but route them above head level. Do not use welding / DB sheds as shelters. All electrical equipment shall be equipped with ELCBs/RCCBs.
- **Power Cable route demarking:** cable route shall be demarked by either by temporary or permanent.
- **Scaffolding:** Check all scaffolds for stability after heavy rain/storm.



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

POWER SECTOR-EASTERN REGION

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 61 of 90

- **Work restrictions:** Do not perform any height work, electrical work and rigging activities during rain. Lower the crane boom to avoid striking of lightning.
- **Vehicular movement:** Instruct the vehicle operators about following safety precautions during monsoon in daily tool box meeting, Slippery surface and road conditions, Speed limit, Wind shield wiper, Fog light, break condition is proper, break light is in proper condition & functioning. Not to take vehicle in loose soil.
 - **Lightening protection:** Boiler structure shall be facilitated with thunder protecting equipment.
 - **Workmen shed construction:** workmen rest shed shall be constructed in robust way. RCC pillar shall be used instead of brick pillar. It shall be facilitated with lightning arrestor as per site resource. However if the rest room is nearby high mast light. Lighting arrestor may or may not be provided.
 - **Field Training Programme on Lightening/Thunder: Dos or Dos not.**

F. SAFETY PRECAUTIONS FOR SNAKE MENACE:

Preventive Measures –

- ③ Remove vegetations around the site
- ③ Pour Carbolic acid around site boundaries in regular intervals to keep away poisonous snakes. . In summer and rainy season, frequency will be once a month and in other seasons, it will be once a quarter. It may be noted that as the location of the project is on a sand bed, there is almost no wild growths. Hence, Snake menace may not of significant severity and scale.

Precautions to avoid snake bite –

- ③ Avoid stepping out in the dark, especially during monsoon without safety shoes and torch.
- ③ Before wearing shoes, check inside the shoes for any snake/insect hiding inside. Similarly before lifting any material with hand lying on ground for long time, look for snake/insect handling inside. Wear leather hand gloves. Always check inside gunny bags, cartons, boxes before putting your hand in side or lifting them.
- ③ Be aware of your surroundings at all time. Never sit or step over obstacles without looking carefully. Never go near bushes for natural calls.
- ③ Don't chase snakes as they become aggressive. Never try to hit a snake or try to catch it, where there is one, there are likely others.
- ③ Never handle a snake, even if you think it is dead.

Symptoms of Snake Bite –

- ③ A pair of punctured mark, severe pain, Redness & swelling around bitten area
- ③ Victim gets nausea, vomiting sensation, sweating, disturbed breathing and increased salivation.

Actions required in case of snake bite –

- ③ Reassure the victim
- ③ Immobilize the bitten body part without compression.
- ③ Get the patient to hospital as fast as safely possible



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 62 of 90

POWER SECTOR-EASTERN REGION

- ③ Tell the doctor any of the symptoms appearing on the way to the hospital.

Snakebite Emergency: DO's and DON'Ts

Do's:

- ③ Avoid yourself and victim from the risk of second bite.
- ③ Remove tight clothing, shoes, watch or ring near bitten area before swelling starts. Calm the victim. Tell victim that virtually all snakebites are successfully treated. Panic can increase the danger to the victim by inducing rapid heartbeat.
- ③ Clean / disinfect bite area thoroughly, apply hard direct pressure with gauze pad over bite area, soak gauze pad with Betadine if possible before application and strap pad tightly in place with adhesive tape
- ③ Wrap affected extremity with 2" – 3" elastic bandaging as tightly as one would for sprain, keep the affected extremity positioned at or as close to heart level as possible and immobilize affected extremity; use a splint if possible.
- ③ Get medical attention as soon as possible
- ③ Ensure the availability of anti venom serum in the hospital.

Don'ts:

- ③ Do not bleed the wound, cut or increase bite marks or put ice on the bite
- ③ Do not eat or drink anything and engage in strenuous physical activity
- ③ Do not apply oral suction to bite
- ③ Do not take alcoholic beverage or any self medication
- ③ Do not apply cold / hot packs or burn wound
- ③ Do not delay seeking medical attention
- ③ Do not remove dressings/elastic wrap until at hospital

G. EMERGENCY CONTACT LIST:

Following emergency contact numbers shall be available / displayed at site and updated regularly.

Emergency Contact Numbers

(Contact numbers to be filled by Site Management)

Client		
	Project Manager	
	Plant Safety Manager	
	OPGC Fire Services	
	Medical and Ambulance Services	
	ADMIN-OPGC	
	Security- OPGC	



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 63 of 90

POWER SECTOR-EASTERN REGION

BHEL

	RCM	
	Safety Manager	
	HSE COORDINATOR	
	HR-ADMIN	
SUB-CONTRACTOR		
	RCM	
	Project Manager	
	Safety Manager	
	Ambulance	
	HR-ADMIN	
Emergency Services		
	Near Hospital	
	Near Fire Station	
	Ambulance Service	
	Police Station	

32.0 HSE INSPECTION

Inspection on HSE for different activities being carried out at site shall be done to ensure compliance to HSEMS requirements. The subcontractor shall maintain and ensure necessary safety measures as required for inspection and tests HV test, Pneumatic test, Hydraulic test, Spring test, Bend test etc as applicable, to enable inspection agency for performing Inspection. If any test equipment is found not complying with proper safety requirements then the Inspection Agency may withhold inspection, till such time the desired safety requirements are met.

32.1 DAILY HSE CHECKS

Both the Site Supervisors and safety officer of Subcontractor are to conduct daily site Safety inspection around work activities and premises to ensure that work methods and the sites are maintained to an acceptable standard. The following are to form the common subjects of a daily safety inspection:



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 64 of 90

POWER SECTOR-EASTERN REGION

- Personal Safety wears & gear compliance.
- Complying with site safety rules and permit-to-work (PTW).
- Positions and postures of workers.
- Use of tools and equipment etc. by the workers.
- The inspection should be carried out just when work starts in beginning of the day, during peak activities period of the day and just before the day's work ends.

32.2 INSPECTION OF PPE

- PPEs shall be inspected by HSE officer at random once in a week as per format no. HSEP:14-F06 for its compliance to standard and compliance to use and any adverse observation shall be recorded in the PPE register.
- The applicable PPEs for carrying out particular activities are listed below.

32.3 INSPECTION OF T&Ps

- A master list of T&Ps shall be maintained by each subcontractor.
- All T&Ps being used at site shall be inspected by HSE officer once in a month as per format no. HSEP:14-F07 for its healthiness and maintenance.
- The T&Ps which require third party inspection shall be checked for its validity during inspection. The third party test certificate should be accompanied with a copy of the concerned competent person's valid qualification record.
- The validity of T&P shall be monitored as per "Status of T&Ps" format no. HSEP:14-F08

32.4 INSPECTION OF CRANES AND WINCHES

- Cranes and winches shall be inspected by the operator through a daily checklist for its safe condition (as provided by the equipment manufacturer) before first use of the day.
- Cranes and Winches shall be inspected by HSE officer once in a month as per format no. HSEP:14-F09 for healthiness, maintenance and validity of third party inspection.
- The date of third party inspection and next due date shall be painted on cranes and winches.
- The operators/drivers shall be authorized by sub-contractor based on their competency and experience and shall carry the I-card.

32.5 INSPECTION ON HEIGHT WORKING

- Inspection on height working shall be conducted daily by supervisors before start of work to ensure safe working condition including provision of
 - Fall arrestor
 - Lifelines
 - Safety nets
 - Fencing and barricading
 - Warning signage
 - Covering of opening
 - Proper scaffolding with access and egress.
 - Illumination
- Inspection on height working shall be conducted once in a week by HSE officer as per format no. HSEP:14-F10.



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

POWER SECTOR-EASTERN REGION

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 65 of 90

- Medical fitness of height worker shall be ensured.
- Height working shall not be allowed during adverse weather.

32.6 INSPECTION ON WELDING AND GAS CUTTING OPERATION

- Supervisor shall ensure that no flammable items are available in near vicinity during welding and gas cutting activity.
- Gas cylinders shall be kept upright.
- Use of Flash back arrestor shall be ensured at both ends.
- Inspection during welding and gas cutting operations shall be carried out by HSE officer once a month as per format no. HSEP:14-F11.
- Use of fire blanket to be ensured to avoid falling of splatters during welding or gas cutting operation at height.
- Availability of fire extinguisher at vicinity shall be ensured.

32.7 INSPECTION ON ELECTRICAL INSTALLATION / APPLIANCES

- Ensure proper earthing in electrical installation
- Use ELCB at electrical booth
- Electrical installation shall be properly covered at top where required
- Use appropriate PPEs while working
- Use portable electrical light < 24 V in confined space and potentially wet area.
- Monthly inspection shall be carried out as per format no. HSEP:14-F12.

32.8 INSPECTION OF ELEVATOR

- Elevators shall be inspected by concerned supervisors once in a week as per format no. HSEP:14-F13.
- All elevators shall be inspected by competent person and validity shall be ensured.
- The date of third party inspection and next due date shall be painted on elevator.

33.0 HSE PERFORMANCE EVALUATION:

HSE performance of the subcontractor shall be monitored as per the following parameters: (For each contract-wise package). PERIODICITY: RA Bill period

Sl. No.	Parameters of measurement	Ref Clauses	Weightage	Actual
1	Availability of safety officers at site – absence up to 15% permissible. Score proportionately gets reduced with higher rate of absence. Availability to be reckoned from start date of manpower mobilisation	7.0,7.1	10	
2	Attendance by the safety officer and site CM (as applicable) in the meeting convened by BHEL	7.2.1 and 7.2.2	5	
3	Level of compliance w.r.t decisions taken in previous meetings/audit/inspection/as reported.	32.0,35.0,36.0	5	
4	Timely submission of monthly report on safety in the prescribed format		3	
5	Timely reporting any incident including near-miss to BHEL /Customer/statutory authority(if required) and submission of investigation report of all LTIs/ Major Property Loss incident and HSE events	10.0	10	



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 66 of 90

POWER SECTOR-EASTERN REGION

6	Degree of PPE compliance, Fall protection arrangements and safety net coverage	8.3, 19.2, 19.3	15	
7	Level of compliance w.r.t safety rules	11.0 to 26.0	25	
8	Availability of proper first-aid facility, ambulance, hygienic labour colony and other adequate labor welfare initiatives, conducting of health check-up as per BOCW requirements	8.4	6	
9	Conducting induction training, skill training, tool box meeting, mock-drills, HSE Promotion, Emergency Preparedness and Response. Participation in BHEL training also counted	9.0, 31.0	6	
10	Level of House-keeping, Environmental Control	27.0, 28.0, 29.0	10	
11	Level of general illumination	8.4.11	5	
A	TOTAL Obtained		100	

Penalty score:

- For each fatality: -10
- For each Major Incident: -07

NET TOTAL score will be arrived after deducting penalty score from Total score.

33.1 HSE PENALTIES/ REWARDS (Performance Related)

- Suitable HSE reward system shall be developed at site level to promote HSE compliance amongst workmen.
- To decide HSE reward performance towards HSE shall be evaluated for workmen and it shall be awarded regularly in public gathering.
- If safety record of the subcontractor in execution of the awarded job is to the satisfaction of safety department of BHEL, issue of an appropriate certificate to recognize the safety performance of the subcontractor may be considered by BHEL after completion of the job.

33.2 PENALTIES AGAINST SPECIFIC NON-COMPLIANCE WITH HSE RULES/ INCIDENTS: (To be operated in addition to any other deduction on unsatisfactory HSE performance under relevant clause in the contract)

S. No	Nature of Non - Compliance	Penalty in BTK	Remarks
1.	Not wearing safety helmet/ safety shoes/ welding shield	250	Per lapse/ Person/ day
2.	Not wearing double lanyard full body harness while working at height (> 2 metres) or not anchoring to lifeline/ not providing fall arrestor/ safety net Using defective or non-standard or uninspected scaffolding/ scaffolding not properly supported Using defective ladders/ drums for work at height	1000	Per Person/ lapse/day or per lapse/day
3.	Not wearing gloves/ goggle/earplug/nose mask/ apron	250	Per lapse/ Person/ day
4.	Not using 24 V supply for lighting in confined spaces	500	Per occasion



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 67 of 90

POWER SECTOR-EASTERN REGION

5.	Improper earthing of welding & Other electrical machines and DBs/ no ELCB/ no rubber mat/ not properly covered/ person without valid wireman license/ no Tag in-Tag out	500	Per lapse/ Machine
6.	Electrical plug not used for connection/ loose insertion	200	Per connection
7.	Using damaged slings or not slinging properly/ damaged hooks/ slings without any identification mark/	1000	Per event Per T&P
8.	Use of lifting equipments including cage or man-basket without having valid Test certificate / without SLI display	5000	Per equipment
9.	Using frayed/ broken welding cables / not using double insulation electrical cable	500	Per machine
10.	Non removal of scrap from work areas and shift to scrap yard/ not providing bins/ improper house keeping	1000	Per location
11.	Lifting cylinders without cage or rolling of cylinders	500	Per occasion
12.	Gas cutting without flash back arrestor at both ends	200	Per machine
13.	Gas cutting at height without sheet below/ barricade at level below (Spark falling from height)	500	Per event
14.	Not having valid driving license for the type of vehicle/ T&P/operator identification card/ rash driving or operation/ not having safety devices like reverse horn & light/ overload switch	500	Per driver / operator
15.	Not providing proper barricades / signage/ unauthorized excavation or barricading	500	Per location per day
16.	Not keeping filled gas cylinders vertically/ mix-up of cylinders/ using broken or damaged manifold/ using domestic LPG cylinder	500	Per occasion
17.	Activity carried out without valid safety work permit	1000	Per occasion
18.	Not carrying out mandatory health check up/ not maintaining First aid box/ centre properly	1000	Per occasion
19.	Non reporting of incident in time / completion of CAPA in time	1000	Per occasion
20.	Non-display of emergency numbers/ non-availability of sufficient fire-extinguishers/ insufficient display of safety posters/ insufficient initiative for safety promotion like TBM	1000	Per occasion



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

POWER SECTOR-EASTERN REGION

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 68 of 90

- If principal customer or statutory and regulatory bodies impose penalty on ground of statutory non-compliance or non-compliance of HSE rules by the subcontractor or any incident of any nature including fatality or permanent disability, the same shall be passed on to the subcontractor with appropriate overhead
- The penalty amount shall be recovered from subcontractors from the RA Bill, otherwise Final bill.
- The list of non-compliances is not exhaustive. The site CM has liberty to impose a penalty for any other non-compliance and incidents of any nature including fatality and permanent disability.

340 OTHER REQUIREMENTS

- In case of any delay in completion of a job due to mishaps attributable to lapses by the subcontractor, BHEL shall have the right to recover cost of such delay from the payments due to the subcontractor, after notifying the subcontractor suitably.
- If the subcontractor fails to improve the standards of safety in its operation to the satisfaction of BHEL after being given reasonable opportunity to do so and/or if the subcontractor fails to take appropriate safety precautions or to provide necessary safety devices and equipment or to carry out instruction regarding safety issued by BHEL, BHEL shall have the right to take corrective steps at the risk and cost of the subcontractor after giving a notice of not less than 7 days indicating the steps that would be taken by BHEL.
- If the subcontractor succeeds in carrying out its job in time without any fatal or disabling injury incident and without any damage to property BHEL may, at its sole discretion, favorably consider to reward the subcontractor suitably for the performance.
- In case of any damage to property due to lapses by the subcontractor, BHEL shall have the right to recover the cost of such damages from the subcontractor after holding an appropriate enquiry.
- The subcontractor shall take all measures at the sites of the work to protect all persons from incidents and shall be bound to bear the expenses of defense of every suit, action or other proceeding of law that may be brought by any persons for injury sustained or death owing to neglect of the above precautions and to pay any such persons such compensation or which may with the consent of the subcontractor be paid to compromise any claim by any such person, should such claim proceeding be filed against BHEL, the subcontractor hereby agrees to indemnify BHEL against the same.
- The subcontractor shall not employ men below the age of 18 years and women on the work of painting with products containing lead in any form. Wherever men above the age of 18 are employed on the work of lead painting, overalls shall be supplied by the subcontractor to the workmen and adequate facilities shall be provided to enable the working painters to wash during the cessation of work.
- The subcontractor shall notify BHEL of his intention to bring to site any equipment or material which may create hazard.
- BHEL shall have the right to prescribe the conditions under which such equipment or materials may be handled and the subcontractor shall adhere to such instructions.
- BHEL may prohibit the use of any construction machinery, which according to the organization is unsafe. No claim for compensation due to such prohibition will be entertained by BHEL.



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 69 of 90

POWER SECTOR-EASTERN REGION

35.0 HSE AUDIT/INSPECTION

- Regular HSE Audit/inspection shall be carried out by Subcontractor as per Site HSE audit calendar.
- HSE checklist(**Annexure 02**) shall be used for carrying out audit/inspection and report shall be submitted to BHEL site mangement
- All non-conformities and observations on HSE identified during internal or external HSE audit shall be disposed off by site in a time bound manner and reported back the implementation status
- Corrective action and Preventive action on HSE issues raised by certification body issued by Regional HQs shall be implemented by site and reported to Site management.

36.0 MONTHLY HSE REVIEW MEETING

- Site shall hold HSE review meeting every month to discuss and resolve HSE issues of site and improve HSE performance. It will also discuss the incidents occurred since previous meeting, its root cause and Corrective action and Preventive action. The agenda is given below:
 - Implementation of earlier MOM
 - HSE performance
 - HSE inspection
 - HSE audit and CAPA
 - HSE training
 - Health check-up camp
 - HSE planning for the erection and commissioning and installation activities in the coming month
 - HSE reward and promotional activities
- The meeting shall be chaired by Construction Manager, convened by HSE coordinator and attended by all HOS, Site In charge of Subcontractors and HSE officer of Subcontractors. MOM on the discussion will be circulated to the concerned for implementation.

37.0 FORMATS USED (Details available in Annexure-04) (subject to revisions any time during the contract)

SL. No.	Format Name	Format No.	Rev No.
01	Inspection of First Aid Box	HSEP:14-F01:MAITREE	00
02	Health Check Up	FORM-26	00
03	HSE Induction Training	HSEP:14-F03	00
04	Tool Box Talk	HSEP:14-F04	00
05	MONTHLY HSE REPORT AND HSE INDICES	HSEP:14-F05	00
06	Inspection of PPE	HSEP:14-F06	00



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 70 of 90

POWER SECTOR-EASTERN REGION

07	Inspection of T&Ps	HSEP:14-F07	00
08	Status of T&Ps	FORM-24	00
09	Inspection of Cranes and Winches	HSEP:14-F09	00
10	Inspection on Height Working	HSEP:14-F10	00
11	Inspection on Welding & Gas Cutting	HSEP:14-F11	00
12	Inspection on Electrical Installation	HSEP:14-F12	00
13	Inspection on Elevator	HSEP:14-F13	00
14	Hse Performance and Penalty	HSEP:14-F14	00
15	incident / property damage /fire incident report	HSEP:14-F15	00
16	Crane operators Identification cum Authorization	HSEP:14-F16	
17	List of T&P	FORM-24	00
18	WORK PERMIT- EXCAVATION (DEEP)	HSEP:14-F18	00
19	WORK PERMIT- RADIATION	HSEP:14-F19	00
20	WORK PERMIT- CONFINED SPACE	HSEP:14-F20	00
21	WORK PERMIT- WORK-AT-HEIGHT (ABOVE 1.8M)	HSEP:14-F21	00



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

POWER SECTOR-EASTERN REGION

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 71 of 90

36.0 ANNEXURES

ANNEXURE 01

As per Rule 76(2):

(1) The first-aid box shall be distinctively marked with a GREEN Cross and shall contain the following items, namely:

(a) For establishments in which the number of contract labour employed does not exceed fifty, each first aid box shall contain the following equipment:

(i)	6 small sterilized dressings
(ii)	3 medium size sterilized dressings
(iii)	3 large size sterilized dressings
(iv)	6 pieces of sterilized eye pads in separate sealed packets.
(v)	6 roller bandages 10 cm wide.
(vi)	6 roller bandages 5 cm wide.
(vii)	One tourniquet
(viii)	A supply of suitable splints
(ix)	Three packets of safety pins.
(x)	Kidney tray.
(xi)	3 large sterilized burn dressings.
(xii)	1 (30ml) bottle containing a two percent alcoholic solution of iodine
(xiii)	1 (30 ml) bottle containing Sal volatile having the dose and mode of administration indicated on the label
(xiv)	1 snake bite lancet
(xv)	1 (30gms) bottle of potassium permanganate crystals.
(xvi)	1 pair scissors
(xvii)	A bottle containing 100 tablets (each of 5 grains) of aspirin
(xviii)	Ointment for burns
(xix)	A bottle of suitable surgical anti-septic solution
(xx)	3 packets of ORS

(2) Adequate arrangement shall be made for immediate recoupment of the equipment when necessary.



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 72 of 90

POWER SECTOR-EASTERN REGION

ANNEXURE 02**HSE AUDIT/INSPECTION CHECKLIST CUM COMPLIANCE REPORT**

PROJECT: _____

SUBCONTRACTOR: _____

DATE : _____

OWNER : _____

INSPECTION BY: _____

Note : write 'NA' wherever the items is not applicable

Item	Y e s	N o	Remarks	Action
<u>HOUSEKEEPING</u>				
Waste containers provided and used				
Passageways and walkways clear				
General neatness of working area				
Other				
<u>PERSONNEL PROTECTIVE EQUIPMENTS</u>				
Goggles; shields				
Face protection				
Hearing protection				
Respiratory masks etc.				
Safety belts				
Other				
<u>EXCAVATIONS / OPENINGS</u>				
Openings properly covered or barricaded				
Excavations shored				
Excavations barricaded				
Overnight lighting provided				
Other				
<u>WELDING, CUTTING</u>				
Gas cylinders chained upright				
Cable and hoses not obstructing				
Fire extinguisher (s) accessible				
Others				
<u>SCAFFOLDING</u>				
Fully decked platforms				
Guard and intermediate rails in place				
Toe boards in place				
Adequate shoring				
Adequate access				
Others				
<u>LADDER</u>				
Extension side rails 1 m above				
Top of landing				
Properly secured				
Angle + 70° from horizontal				



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 73 of 90

POWER SECTOR-EASTERN REGION

Other				
HOISTS, CRANES AND DERRICKS				
Condition of cables and sheaf OK				
Condition of slings, chains, hooks OK				
Inspection & maintenance log maintained				
Outriggers used				
Signals observed and understood				
Qualified operators				
Others				
MACHINERY, TOOLS & EQUIPMENT				
Proper instruction				
Safety devices				
Proper cords				
Inspection and maintenance				
Other				
VEHICLE AND TRAFFIC				
Rules and regulations observed				
Inspection and maintenance				
Licensed drivers				
Other				
TEMPORARY FACILITIES				
Emergency instructions posted				
Fire extinguishers provided				
Fire-aid equipment available				
General neatness				
Others				
FIRE PREVENTION				
Personnel instructed				
Fire extinguishers checked				
No smoking in prohibited areas.				
Hydrants				
Clearance				
Others				
ELECTRICAL				
Proper wiring				
ELCB's provided				
Ground fault circuit interrupters				
Protection against damage				
Prevention of tripping hazards				
Other				
HANDLING & STORAGE OF MATERIALS				
Properly stored or stacked				
Passageways clear				
Other				
FLAMMABLE GASES AND LIQUIDS				
Containers clearly identified				
Proper storage				
Fire extinguisher nearby				
Other				



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 74 of 90

POWER SECTOR-EASTERN REGION

WORKING AT HEIGHT

Safety nets

Safety belts

Safety helmets

Anchoring of safety belt to the life line rope

ENVIRONMENT

Lubricant waste/engine oils properly dispose.

Waste from Canteen, offices, sanitation etc.
disposed properly.Disposal of surplus earth, stripping materials,
expired batteries, oily rags and combustible
materials done properly.**HEALTH CHECKS**

Hygienic conditions at labor camps O.K.

Availability of first-aid facilities

Proper sanitation at site, office & labor camps.

Arrangement of medical facilities.

Measures for dealing with illness.

Availability of potable drinking water for workmen &
staff.



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 75 of 90

POWER SECTOR-EASTERN REGION



Bharat Heavy Electricals Ltd
Power Sector- Eastern Region

HSEP:13-F04**Date:****PROJECT: _____****(TO BE SUBMITTED IN TRIPLICATES)****EXCAVATION WORK PERMIT**

Sl No:

- I. Name of the work:
- II. Name of Contractor:
- III. Exact location of work and item for excavation:
- IV. Duration of work: From _____ to _____
- V. Type of excavation: Manual/ by Excavator
- VI. Dimension of excavation:

The following items have been checked and compliance shall be ensured during the currency of the permit:

item	Done
1. Checked for underground pipe/power cable	
2. Proper illumination provided (for night work)	
3. Plan/drawing available and checked (sloping, shoring provided). Safety of any adjacent structure taken care of.	
4. Access/Egress ensured (in case of manual)	
5. Equipment operator skill checked	



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 76 of 90

POWER SECTOR-EASTERN REGION

6. Area cordoned off, signage put up

7. Appropriate PPEs provided

The following persons are permitted to work for the duration mentioned herein:

Date		No of persons allowed	Time Duration	
From	To		From	To

List of persons to be maintained by contractor separately

Sign of Initiator (Sub-contractor)

Sign of Recommender

Sign of Approver

Work completed/stopped/area cleared at _____ on _____

The permit stands closed on _____

Sign of BHEL HSE team



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 77 of 90

POWER SECTOR-EASTERN REGION



Bharat Heavy Electricals Ltd

HSEP:13-F05

Power Sector- Eastern Region

Date:

PROJECT: _____

(TO BE SUBMITTED IN TRIPLICATES)

RADIATION WORK PERMIT

Sl No:

- I. Name of the work:
- II. Name of Contractor:
- III. Exact location of work and item for radiography:
- IV. Duration of work: From _____ to _____
- V. Name of Radiography agency and its authorised supervisor:

The following items have been checked and compliance shall be ensured during the currency of the permit:

item	Done
1. Safety regulations as per BARC/AERB ensured while source in use/transit/stores	
2. Proper illumination provided	
3. Area cordoned off	
4. Appropriate PPEs provided	



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 78 of 90

POWER SECTOR-EASTERN REGION

The following persons are permitted to work for the duration mentioned herein:

Date		No of persons allowed	Time Duration	
From	To		From	To

List of persons to be maintained by contractor separately

Sign of Initiator (Sub-contractor)

Sign of Recommender

Sign of Approver

Work completed/stopped/area cleared at _____on_____

The permit stands closed on _____

Sign of BHEL HSE team



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 79 of 90

POWER SECTOR-EASTERN REGION



Bharat Heavy Electricals Ltd

HSEP:13-F06

Power Sector- Eastern Region

Date:

PROJECT: _____

(TO BE SUBMITTED IN TRIPLICATES)

CONFINED SPACE WORK PERMIT

Sl No:

I. Name of the work:

II. Name of Contractor:

III. Exact location of work:

1. Condition check of target space:

Condition	Y/N	NR
8. Isolated from air/ water/ steam/ gas/ power/radiation source		
9. Thoroughly cleaned/washed		
10. Adequately cooled		
11. Proper illumination provided		
12. Manways open & ventilated		

2. Protection measures:

Measure	Y/N	NR
1. Handlamp is of 24V		
2. Operators wearing recommended PPEs- gloves/ clothing/ear plug/ muff/ safety harness/lifeline/ goggles /face shield		



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 80 of 90

POWER SECTOR-EASTERN REGION

3. Operators wearing special devices –
dust/gas/airline mask, communication equipment,
personal gas alarm

4. Attendant with SCBA/Air mask

5. Rescue equipment/ team deployed

6. Fire fighting equipment close-by

The following persons are permitted to enter the confined space to work for the duration mentioned herein:

Date(s)	No of persons allowed	Name of persons allowed	Duration	
			From	To

Sign of Initiator (Sub-contractor)

Sign of Recommender

Sign of Approver

Work completed/stopped/area cleared at _____ on _____

The permit stands closed on _____

Sign of BHEL HSE team



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 81 of 90

POWER SECTOR-EASTERN REGION



Bharat Heavy Electricals Ltd

HSEP:13-F07

Power Sector- Eastern Region

Date:

PROJECT: _____

(TO BE SUBMITTED IN TRIPLICATES)

WORK-AT-HEIGHT PERMIT

Sl No:

- I. Name of the work:
- II. Name of Contractor:
- III. Exact location of work:

Sl.	Description of the point to be checked	Pl tick (✓) if it is OK
1.	Whether the manpower of the Gang engaged is having adequate number and skill required for the said activity?	
2.	Whether Supervisor has been engaged for this activity?	
3.	Whether following PPEs have been provided to all workers? Full body Harness, Safety Shoe, Helmet	
4.	Whether Lifelines tied with solid anchorage above 1 M level from the job?	
5.	Whether Tool-Box meeting carried out and Hazard related to the said job and safety precaution to be taken told to workers?	
6.	Whether Fall arrestor fixed where staircase is not available for access to job?	
7.	Whether Scaffold/Platform/Place for job is strong enough, has easy access and is safe for the job? Is the Space sufficient for doing work? Whether Safety Net has been fixed?	
8.	Whether all Lifting T&Ps and Tackles have valid Fitness Certificates? Whether Lubrication is Ok? Whether these are free from any defect when visually checked before use?	
9.	Pl ensure that none of the workers of the Gang has Vertigo or High or Very Low Blood Pressure. (Health register to be referred)	



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 82 of 90

POWER SECTOR-EASTERN REGION

The following persons are permitted to work for the duration mentioned herein:

Date	No of persons allowed	Time Duration
From To		From To

List of persons to be maintained by contractor separately

Sign of Initiator (Sub-contractor)

Sign of Recommender

Sign of Approver

Work completed/stopped/area cleared at _____on____

The permit stands closed on_____

Sign of BHEL HSE team



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 83 of 90

POWER SECTOR-EASTERN REGION

HSEP:13-F09



Bharat Heavy Electricals Limited Power Sector Eastern Region

INCIDENT (PERSONAL INJURY / PROPERTY DAMAGE) REPORT

(This report is to be sent within 24 hours directly to GM/Q &S/PS-HQ, , Noida with copy to MR(HSE)/PSER in respect of all incidents in addition to immediate Fax/ Telegraphic intimation of fatalities and major damages including fires.)

1	NAME OF SITE		3	ACTIVITY AREA	
2	SCOPE OF WORK		4	NAME OF CONTRACTOR	
			5	NAME & DESIGNATION OF BHEL ACTIVITY I/C	
6	DATE & TIME OF INCIDENT		7	DATE RESUMED	
8	NO. OF WORK-DAYS LOST BY VICTIM (If duty not resumed, give estimated figure)				
9	NO. OF MANHOURS LOST BY OTHERS				
10	PERSONAL DETAILS OF INJURED AND / OR DETAILS OF MATERIALS / EQUIPMENT / PROPERTY DAMAGED				
NAME		NAME OF MATERIAL / EQUIPMENT / PROPERTY			
PERIOD OF EMPLOYMENT					
AGE	YRS	SEX	MALE/FEMALE	ESTIMATED COST	ACTUAL COST
MARITAL STATUS		SINGLE / MARRIED			
OCCUPATION		NATURE OF DAMAGE			
PART OF BODY INJURED					
NATURE OF INJURY					
AGENCY (OBJECT / EQUIPMENT / SUBSTANCE) MOST RESPONSIBLE FOR CAUSING INCIDENT / INJURY / DAMAGE					
12	PERSON (NAME & DESIGNATION) WITH MOST CONTROL OVER AGENCY (OBJECT / EQUIPMENT / SUBSTANCE) CAUSING INCIDENT INJURY / DAMAGE				
13	DESCRIBE CLEARLY HOW THE INCIDENT OCCURRED AND IF THE VICTIM WAS WEARING THE APPROPRIATE PPEs. (USE ADDI SHEET, IF REQUIRED).				



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 84 of 90

POWER SECTOR-EASTERN REGION

ANALYSIS

14 WHAT ACTS AND / OR CONDITIONS CONTRIBUTED
MOST DIRECTLY TO THIS INCIDENT

15 WHAT ARE THE BASIC REASON FOR THE EXISTENCE
OF THESE ACTS AND / OR CONDITION ?

16 WHAT CORRECTIVE ACTIONS HAVE BEEN TAKEN
TO PREVENT INCIDENT RECURRENCE ?

DATE :

SIGNATURE OF SITE HSE COORDINATOR

17 COMMENTS OF HEAD / SOX

DATE:

SIGNATURE OF HEAD/SOX



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 85 of 90

POWER SECTOR-EASTERN REGION



BHARAT HEAVY ELECTRICALS LIMITED HSEP:13-F10 POWER SECTOR: EASTERN REGION

INVESTIGATION REPORT FROM PROJECT SITE :

INCIDENT(FATAL/SERIOUS INJURY/PROPERTY DAMAGE/FIRE)

DATE :

Instructions

This report is to be sent within seven days to GM/Q&S/PS-HQ and RHQ Safety Department, in respect of incident requiring investigation by a committee.

Report date	Incident Date	Incident Time	Incident Type	
Name of Site :				
Scope of work :				
Name & Designation of BHEL Package I/C				
Name of Contractor :				
Incident Location :				
Victim(s) Information				
Name	Designation	Age	Sex	Address



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 86 of 90

POWER SECTOR-EASTERN REGION

Witness Information

Name

Address

1 Describe, how the incident took place (Attach separate sheets, diagrams, and photographs, if possible.)

2 Description of Injury (Attach medical report as applicable)

3 Describe property and equipment damaged in the incident and extent of damage.

4 Describe any personal protective equipment used and other safety equipment that were in place.

5 Describe any perceived actual or possible safety violations in the area of incident.



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 87 of 90

POWER SECTOR-EASTERN REGION

6 Describe events and conditions immediately before the incident.

7 Are these conditions still in existence?

8 Were any unsafe actions performed by the victim or by others or were any safety rules violated that caused/ contributed to the incident.

9 Describe steps taken to secure the area.



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 88 of 90

POWER SECTOR-EASTERN REGION

10 Describe measures to be taken to prevent similar recurrences.

11 Any other information

Prepared by

Name

Designation

Signature

Date

Submitted to:

- 1 Construction Manager
- 2 RHQ: Safety Department
- 3 GM/Q&S/PS-HQ



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 89 of 90

POWER SECTOR-EASTERN REGION



POWER SECTOR TOOL-BOX TALK

FORMAT NO: HSEP:13-F11

REV NO.: 00

PAGE NO. 01 OF 01

Name of Site :

Sub-Contractors Name :

Date :

Topic:

Attendance Sheet

Name	Signature	Remarks

Signature of Site I/C of Subcontractor :



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE SUB-CONTRACTORS (MAITREE PROJECT)

Doc no.: HSEP: 14-MAITREE:VENDOR

REV: 00

Date: 05.05.16

Page: 90 of 90

POWER SECTOR-EASTERN REGION

RECORD OF REVISION

CLAUSE No.	Rev No.	Brief of Revision	Date
All	00	New plan introduced	05.04.17