BHARAT HEAVY ELECTRICALS LIMITED
(A Govt. Of India Undertaking)
POWER SECTOR, EASTERN REGION
BHEL BHAWAN, PLOT NO. DJ-9/1 , SECTOR II ,
SALT LAKE CITY, KOLKATA, WEST BENGAL, INDIA
Phone : 033-23216130-31,033-23216130 FAX : 033-23211960

NOTICE INVITING TENDER (NIT)

OFFERS are invited from *REPUTED AND EXPERIENCED LOCAL BIDDERS* (meeting pre-qualification criteria as mentioned) through E-PROCUREMENT PORTAL https://eprocurebhel.co.in ONLY for the subject job by the undersigned on behalf of Bharat Heavy Electricals Limited as per the tender document. Issue/ forwarding intimation regarding tender to any bidder shall not construe that the bidder is considered to be qualified. Following points relevant to the tender may please be noted and complied with.

Salient Features of NIT

SL NO	ISSUE	DESCRIPTION	
i	**E-TENDER NUMBER**	**PSER:PUR:PMX:380(IV):054 (ENQ:21:PP:0015:PUR:67) DATE: 01/12/2021**	
ii	**Broad Scope of job**	**SUPPLY OF FABRICATED STRUCTURAL STEEL MATERIAL (2991 MT) INCLUDING PAINTING, TRANSPORTATION AT SITE ETC. FOR FGD SYSTEM PKG ETC OF 3X660 MW NORTH KARANPURA STPP, JHARKHAND.**	
iii	**DETAILS OF TENDER DOCUMENT**		
a)	PART – B	GENERAL CONDITIONS OF CONTRACT (GCC)	**Applicable**
b)	VOLUME-IC	TECHNICAL CONDITIONS OF CONTRACT (SUPPLY)	**Applicable**
c)	PART – F	GENERAL TERMS & CONDITIONS OF REVERSE AUCTION	**Applicable**
d)	VOLUME-III	VOLUME-III, PRICE SCHEDULE and UNPRICE SCHEDULE	**Applicable**
e)	PART – H	FORMS AND PROCEDURES ETC.	**Applicable**
iv	**ISSUE OF TENDER DOCUMENTS**	***a)*Online through e-procurement platform at** https://eprocurebhel.co.in/ ***b)*in BHEL website (www.bhel.com, CPP Portal): For tender view purpose only.** **START DATE: 01/12/2021**	**a) Applicable** **b) Applicable**
v	**DUE DATE & TIME OF OFFER SUBMISSION**	**Date: 13/12/2021, Time: 14-00 Hrs.** **(Offer to be submitted online only through e-procurement platform at** https://eprocurebhel.co.in/	**Applicable**
vi	**TECHNO-COMMERCIAL BID OPENING OF TENDER**	**Date: 13/12/2021, Time: 16-30 Hrs.** **(online only through e-procurement platform at** https://eprocurebhel.co.in/**, participating bidders may witness the same online only)**	**Applicable**
vii	**CURRENCY**	**INDIAN RUPEES (INR)**	**Applicable**
viii	**EMD AMOUNT**	NIL	Not Applicable
ix	**COST OF TENDER**	-	Not Applicable
x	**LAST DATE FOR SEEKING CLARIFICATION**	**Date: 09/12/2021 (UP TO 12:00 Hrs.)**	**Applicable**
xi	**SCHEDULE OF Pre Bid Discussion (PBD)**	Not Applicable (In case BHEL decides to conduct PBD, date, time & venue of PBD will be intimated suitably thru TCN).	Not Applicable
xii	**INTEGRITY PACT & DETAILS OF INDEPENDENT EXTERNAL MONITOR (IEM)**	IP SHALL BE APPLICABLE. DETAILS OF IEM: Refer Clause No 34.0 below	**Applicable**
xiii	**Latest updates**	**Latest updates on the important dates, Amendments, Correspondences, Corrigenda, Clarifications, Changes, Errata, Modifications, Revisions, etc to Tender Specifications will be hosted in BHEL webpage (www.bhel.com →Tender Notifications →View Corrigendums & CPP portal →Tender Notice & E-PROCUREMENT PORTAL https://eprocurebhel.co.in)** and not in the newspapers**. Bidders to keep themselves updated with all such information.**	**Shall be intimated to bidder**

1. The offer shall be submitted as per the instructions of tender document. Only One set of tender document (**in original, downloaded from website**) signed by authorised company rep. of bidder and stamped on each page shall be submitted as detailed further, as given below. Bidders to note specifically that all pages of tender document, including these NIT pages etc. appearing in the website for this particular tender shall be submitted by them (after signing/stamping on each page) as a part of their offer. **Price shall not be mentioned by them anywhere in the techno-commercial portion of offer. Price shall be mentioned in the relevant price schedule only and to be submitted in e-procurement portal/platform in the form and manner mentioned in tender.**

   For E-Procurement Assistance & Training, NIC PORTAL Helpdesk Contacts as per following: -
   For any technical related queries please call at 24x7 Help Desk Number
   0120-4001 002, 0120-4200 462, 0120-4001 006, 0120-6277 787

   Email Support
   Address: A) For any Issues or Clarifications relating to the published tenders, bidders are requested to contact the respective Tender Inviting Authority
   Technical - support-eproc@nic.in

   For any difficulty in downloading the tender from internet website, they should contact this office (Dy. Manager, Purchase or DGM, Purchase Phone no. 033-23398222/8221). No alteration/changes by bidders is permitted in the tender/NIT appeared in the website.
2. Successful bidder shall have to submit additional set of tender/sign on tender document provided by BHEL, if so decided by BHEL.
3. This is an e-tender floated online through our E-Procurement Site https://eprocurebhel.co.in. The bidder should respond by submitting their offer online only in our e-Procurement platform at https://eprocurebhel.co.in. Offers are invited in two-parts only. No Hard copy bid or bids through email/ fax shall be accepted. Bids are invited in two parts & shall be submitted as described below:

OFFER DESCRIPTION	DOCUMENTS TO BE UPLOADED & MODALITY OF UPLOADING
TECHNICAL OFFER	1. Scanned copy of Covering letter of offer (To be attached in **Attachment** section) 2. Scanned copy of Entire tender documents signed & stamped in each page by authorized representative of the bidder except price bid (To be attached in **Attachment** section). 3. Scanned copy of Techno-Commercial Offer (To be attached in **Attachment** section) 4. Duly filled all annexures except price & unpriced format (To be attached in **Attachment** section). 5. Copy of records notes of Pre-Bid Conference, if applicable/ pre-bid MOM. (To be attached in **Attachment** section) 6. Copy of Tender change notice (TCN), if applicable (To be attached in **Attachment** section) 7. All supporting documents/ Annexures etc. as applicable (To be attached in **Attachment** section). 8. **No deviation certificate** in bidder's letterhead as per format given in Tender (To be attached in **Attachment** section).
PRE-QUALIFICATION PART	9. Pre-qualifying documents with all credentials as per tender. (To be attached in PQ **Attachment** section)
UNPRICED PRICE BID	10. Price schedule –Unpriced but mentioning only quoted / unquoted against each item as per tender.
PRICE BID	11. Duly filled in Price Schedule as per tender. Any other document uploaded in the price bid, apart from tendered Price schedule, shall not be taken into cognizance for evaluation of offer.

4. **EARNEST MONEY DEPOSIT (EMD) –** Not applicable,

SPECIAL NOTE:

A) **Your offer & documents submitted with the offer shall be signed and stamped in each page by your authorized representative. No overwriting/correction in tender documents by bidders shall be allowed. However if correction is unavoidable, the same may be signed by authorized signatory.**

B) **All documents/annexure submitted with the offer shall be properly annexed and placed in respective places of the offer as per enclosure list mentioned in the covering letter. BHEL shall not be responsible for any missing documents.**

5. No deviation with respect to tender clauses and no additional clauses/ suggestions/clarification in Techno-commercial bid/Price bid shall normally be considered by BHEL. Bidders are requested to positively comply with the same. Offers with deviation are liable for rejection.
6. BHEL reserves the right to accept or reject any or all offer without assigning any reasons thereof. BHEL also

reserve the right to cancel the offer wholly or partly without assigning any reason thereof. BHEL also reserve the right to split/part award the job. Also BHEL shall not entertain any correspondence from bidders in this matter (except for the refund of EMD).

7. Bidders are free to visit the site and study the prevailing site condition including law & order etc. before quoting (if applicable). They may also consult this office before submitting their offers, for any clarifications regarding scope of work, facilities available at sites or on terms and conditions. No additional claim shall be entertained by BHEL in future, on account of non-acquaintance of site/machine conditions at the time of bidding.
8. For any clarification on the tender document, you may seek the same in writing or through e-procurement portal/platform as per specified format within the last date of seeking clarification as per tender. BHEL shall not be responsible for receipt of queries after due date of seeking clarification due to postal delay, and receipt of any query after due date shall not be entertained.
9. BHEL may decide holding Pre-bid Discussion [PBD] with all intending bidders. On such communication from BHEL, the bidder shall ensure participation for the same at the appointed time, date and place as may be decided by BHEL. Outcome of PBD (if any) shall also form part of tender.
10. In case of absence of any queries from bidder(s), their quoted price will be PRESUMED to be final and complete with reference to the tender documents (including Tender change notes (TCNs), clarifications, corrigendum issued by BHEL, if any). Bidders are requested to study the tender documents in detail and prepare their queries/clarifications accordingly. All such queries / clarifications shall be cleared/replied by BHEL. Such clarification letters, corrigendum and/or Tender change notes (TCNs), if issued by BHEL, shall form part of tender document.
11. In the event of any conflict between requirement of any clause of this specification/ documents /drawings /data sheets etc. or requirements of different codes/ standards specified/ contradictions between any two clauses of tender document, the same to be brought to the knowledge of BHEL by bidders in writing for clarification before due date of seeking clarification, otherwise, more stringent requirement as may be interpreted by BHEL shall prevail and shall be binding on you. Any typing error/missing pages/other clerical errors in the tender documents, noticed by you must be pointed out before submission of offer, or else, BHEL's interpretation shall prevail & binding on you.
12. Unless specifically mentioned otherwise, bidder's quoted price shall deemed to be in compliance with tender including PBD.
13. Tender document containing above mentioned volumes shall be signed & stamped in all pages including this covering letter. Price bid shall be furnished in the specified format enclosed with the tender. Any additional copy, if required, may be taken by photocopying from the tender document given in the web.
14. **The Bidder has to satisfy the Pre-Qualifying Requirements stipulated for this Tender in order to be qualified. The Price Bids of only those bidders will be opened, who will qualify for the subject job on the basis of pre-qualification evaluation & Techno-Commercial bids etc. BHEL reserves the right to reject the bidders with unsatisfactory past performance in the execution of a contract. BHEL's decision in this regard shall be final & binding.**
15. The bidder shall submit documents in support of possession of 'Pre-Qualifying Requirements" duly self-certified and stamped by the authorized signatory, indexed and properly linked in the format for PQR. In case BHEL requires any other documents/proofs, these shall be submitted immediately (if applicable).
16. **The bidder may have to produce original document for verification if so decided by BHEL.**
17. While BHEL reserves the right to open the price bid of the offers in camera, the date & time to open the tender opening shall be intimated to the bidders in case BHEL decides it to be 'Public opening' and in such a case, one authorized representative of the bidder shall be allowed to attend.
18. Validity of the offer shall be for SIX (06) MONTHS from the due date of offer submission (including extension, if any).
19. Bidders are required to submit their BEST price as per tender Price Schedule format in e-procurement portal/platform in the form & manner as mentioned in tender.
20. Price Bids shall be evaluated in the manner as prescribed in Price Schedule. However, Unit Rates shall also be furnished if applicable in the Price Schedule.
21. **Bid should be free from correction, overwriting, using corrective fluid, etc. Any interlineation, cutting, erasure or overwriting shall be valid only if they are attested under full signature(s) of person(s) signing the bid else bid shall be liable for rejection.**
22. Taxes and duties shall be as per TCC of the tender. Statutory variation of taxes and duties (plus or minus) in accordance with Govt. Notifications to the account of BHEL. Any imposition of new / additional Duty / Tax at the time of supply shall be borne by BHEL.
23. ***"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."

24. Bidders are requested to note that the accepted / agreed tender terms (technical, commercial or on Reverse Auction) in their original offer cannot be altered / withdrawn by their own during the processing of tender.

25. Unsolicited discounts received after opening of techno commercial bid shall not be considered for evaluation. However, if the party who has submitted the unsolicited discount/rebate becomes the L-1 party, then the awarded price shall be after considering the discount.

26. **"The offers of the bidders who are on the banned list as also the offer of the bidders, who engage the services of the banned firms, shall be rejected. The list of banned firms is available on BHEL web site www.bhel.com".**

i. Integrity commitment, performance of the contract and punitive action thereof:

a) Commitment by BHEL:

BHEL commits to take all measures necessary to prevent corruption in connection with the tender process and execution of the contract. BHEL will during the tender process treat all Bidder(s) in a transparent and fair manner, and with equity.

b) Commitment by Bidder/ Supplier/ Contractor:

b.i) The bidder/ supplier/ contractor commit to take all measures to prevent corruption and will not directly or indirectly influence any decision or benefit which he is not legally entitled to nor will act or omit in any manner which tantamount to an offence punishable under any provision of the Indian Penal Code, 1860 or any other law in force in India.

b.ii) The bidder/ supplier/ contractor will, when presenting his bid, disclose any and all payments he has made, and is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract and shall adhere to relevant guidelines issued from time to time by Govt. of India/ BHEL.

b.iii) The bidder/ supplier/ contractor will perform/ execute the contract as per the contract terms & conditions and will not default without any reasonable cause, which causes loss of business/ money/ reputation, to BHEL.

If any bidder/ supplier/ contractor during pre-tendering/ tendering/ post tendering/ award/ execution/ post-execution stage includes in mal-practices, cheating, bribery, fraud or and other misconduct or formation of cartel so as to influence the bidding process or influence the price or acts or omits in any manner which tantamount to an offence punishable under any provision of the Indian Penal code, 1860 or any other law in force in India, then, action may be taken against such bidder/ supplier/ contractor as per extant guidelines of the company available on www.bhel.com and/ or under applicable legal provisions.

27. **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.**

28. Suspension of Business dealings: BHEL reserves the right to take action against contractors who fail to perform or indulge in malpractices, by suspending business dealings with them as detailed in Annexure-VII.

29. "MSE suppliers can avail the intended benefits in respect of the procurements related to the Goods and Services only (Definition of Goods and Services as enumerated by Govt. of India vide Office Memorandum F. No. 21(8)/2011-MA dtd. 09/11/2016 office of AS & DC, MSME) if they submit along with the offer, attested copies of either Udyam Registration Certificate or EM II certificate having deemed validity (five years from the date of issue of acknowledgement in EM II) or valid NSIC certificate or Udyog Aadhar Memorandum (UAM) & Acknowledgement or EM II certificate along with attested copy of a CA certificate (Format enclosed at Annexure – V where deemed validity of EM II certificate of five years has expired) applicable for the relevant financial year (latest audited). Date to be reckoned for determining the deemed validity will be the date of bid opening (Part 1 in case of two part bid). 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 any deficiency in the above required documents are not submitted before price bid opening. If the tender is to be submitted through e-procurement portal, then the above required documents are to be uploaded on the portal. Documents should be notarized or attested by a Gazetted officer."
Any Bidder falling under MSME category, shall furnish the following details & submit documentary evidence/Govt. Certificate etc. in support of the same along with their techno-commercial offer: -

Type under MSME	SC/ST owned	Others
Micro		
Small		
Medium		

Note: - If the bidder does not furnish the above, offer shall be processed construing that the bidder is not falling under MSME category.

30. Indian suppliers, falling under the purview of Public procurement (preference to make in India) order 2017 by Govt. of India, vide order no. P-45021/2/2017-B.E.-II dated 15th June, 2017 & all subsequent clarifications can avail the intended benefits, as per provisions of the order subject to minimum local content shall be 50%, margin of Purchase preference shall be 20% & modality of preference to make in India shall be as per aforesaid order.

31. "For this procurement, the local content to categorize a supplier as a Class-I local supplier/ Class-II local supplier/ Non-Local supplier and purchase preference to Class-I local supplier, is as defined in Public Procurement (Preference to Make in India), Order 2017 dated 04-06-2020 issued by DPIIT. In case of subsequent orders issued by the Nodal Ministry, changing the definition of local content for the items of the NIT, the same shall be applicable even if issued after issue of this NIT, but before opening of Part-II bids against this NIT".
Duly filled & signed Annexure-III (Format for local content), as applicable, to be submitted by bidders along with their techno-commercial offer.

32. **GeMAR and PTS Report ID: GEM/GARPTS/02112021/FU2198SCZ37T, Date – 02/11/2021**

33. The GeM Seller ID shall be mandatory before placement of order / award of contract for goods and services to the successful bidder(s).

34. **Integrity Pact (IP) –**

(a) IP is a tool to ensure that activities and transactions between the Company and its Bidders/ Contractors are handled in a fair, transparent and corruption free manner. Following Independent External Monitors (IEMs) on the present panel have been appointed by BHEL with the approval of CVC to oversee implementation of IP in BHEL.

Sl	IEM	Email
1.	Shri Arun Chandra Verma, IPS (Retd.)	acverma1@gmail.com
2.	Shri Virendra Bahadur Singh, IPS (Retd.)	vbsinghips@gmail.com

(b) The IP as enclosed with the tender is to be submitted (duly signed by authorized signatory) along with techno-commercial bid (Part-I, in case of two/three part bid). Only those bidders who have entered into such an IP with BHEL would be competent to participate in the bidding. In other words, entering into this Pact would be a preliminary qualification.

(c) Please refer Section-8 of IP for Role and Responsibilities of IEMs. In case of any complaint arising out of the tendering process, the matter may be referred to any of the above IEM(s). All correspondence with the IEMs shall be done through email only.

Note:
No routine correspondence shall be addressed to the IEM (phone/ post/ email) regarding the clarifications, time extensions or any other administrative queries, etc. on the tender issued. All such clarification/ issues shall be addressed directly to the tender issuing (procurement) department's officials whose contact details are provided below:

Details of contact person(s):

Name	Mr. Abhijit De	Mr. Anuruddha Sarkar
Dept.	Purchase Dept., BHEL PSER, Kolkata	Purchase Dept., BHEL PSER, Kolkata
Address	DJ-9/1, Sector – II, Salt Lake, Kolkata – 700091	DJ-9/1, Sector – II, Salt Lake, Kolkata – 700091
Phone	033-2339 8222	033-2339 8221
Email	abhijitd@bhel.in	a_sarkar@bhel.in

35. 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 the L-1 status even after soliciting discounts, the 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).
Ranking will be done accordingly. BHEL's decision in such situations shall be final and binding

36. This procurement is being made at Risk and Cost of an existing contractor/ supplier whose 'balance work' is being withdrawn/terminated and the existing contractor/ supplier shall not be eligible to quote in this tender.
Existing Contractor/Supplier will include:
i). In case existing contractor/supplier is The Sole Proprietorship Firm, any Sole Proprietorship Firm owned by same Sole Proprietor.

ii). In case existing contractor/supplier is The Partnership Firm, any firm comprising of same partners/ some of the same partners (but not including any new partner); or sole proprietorship firm owned by any partner(s) as a sole proprietor.

37. **Order of Precedence**

In the event of any ambiguity or conflict between the Tender Documents, the order of precedence shall be in the order below:

a) Amendments/Clarifications/Corrigenda/Errata etc issued in respect of the tender documents by BHEL
b) Notice Inviting Tender (NIT)
c) Price Bid/Schedule – Volume-III
d) TECHNICAL CONDITIONS OF CONTRACT (TCC)
e) General Conditions of Contract (GCC) - PART-B
f) Forms and Procedures – PART- H

for BHARAT HEAVY ELECTRICALS LTD.

Dy Manager (Purchase)

Agency	Contact details	
BHEL, PSER, Kolkata	Address	BHARAT HEAVY ELECTRICALS LIMITED, POWER SECTOR – EASTERN REGION 2ND FLOOR, BLOCK-DJ, PLOT- 9/1, SECTOR, SALT LAKE CITY, KOLKATA – 700 091
	Phone no.	033-23398222, 23398221, 23211690
	FAX no.	033-23211960
	E-mail ID	**abhijitd@bhel.in, a_sarkar@bhel.in, bsandipan@bhel.in**
NIC E-PROCUREMENT PORTAL	**For E-Procurement Assistance & Training, NIC PORTAL Helpdesk Contacts as per following: -** For any technical related queries please call at 24 x 7 Help Desk Number 0120-4001 002, 0120-4200 462, 0120-4001 005, 0120-6277 787 Email Support Address: A) For any Issues or Clarifications relating to the published tenders, bidders are requested to contact the respective Tender Inviting Authority Technical - support-eproc@nic.in	

Enclosure:

01. ANNEXURE-I: Pre Qualifying Criteria.
02. ANNEXURE-II : No Deviation Certificate
03. ANNEXURE-III: Format for Self Certification regarding Local content (LC) for Product/ Services/ Works
04. ANNEXURE-IV: CERTIFICATE (regarding bidder from a country which shares a land border with India)
05. ANNEXURE-V: Certificate by Chartered Accountant
06. ANNEXURE-VI: Format for seeking clarification
07. ANNEXURE-VII: Suspension of business dealing with Suppliers/Contractors
08. ANNEXURE-VIII: Declaration for Relation in BHEL
09. ANNEXURE-IX: Declaration of the Bidders
10. ANNEXURE-X: Declaration regarding related firms and their area of activities
11. ANNEXURE-A: Check List
12. ANNEXURE-B: General Terms & conditions for Reverse Auction.
13. Integrity Pact Agreement Format (Separate).
14. Other Tender documents as per this NIT.

PRE QUALIFICATION CRITERIA

JOB	**"SUPPLY OF FABRICATED STRUCTURAL STEEL MATERIAL (2991 MT) INCLUDING PAINTING, TRANSPORTATION AT SITE ETC. FOR FGD SYSTEM PKG ETC OF 3X660 MW NORTH KARANPURA STPP, JHARKHAND."**
TENDER NO	**PSER:PUR:PMX:380(IV):054 (ENQ:21:PP:0015:PUR:67) DATE: 01/12/2021**

A. FINANCIAL CRITERIA

1(a) BIDDER SHOULD HAVE AVERAGE MINIMUM ANNUAL FINANCIAL TURNOVER INR 3.0 Cr (Rs. THREE CRORE ONLY) DURING LAST 03 (THREE) CONSECUTIVE FINANCIAL YEARS 2017-18, 2018-19 & 2019-20 OR THREE (03) CONSECUTIVE FINANCIAL YEARS 2018-19, 2019-20 & 2020-21.

AUDITED BALANCE SHEET AND PROFIT & LOSS ACCOUNT OF THE COMPANY FOR LAST 3 (THREE) FINANCIAL YEARS, ENDING ON 31.03.2021 NEED TO BE SUBMITTED IN SUPPORT OF ABOVE.

1(b) IN CASE AUDITED BALANCE SHEET AND PROFIT & LOSS ACCOUNT HAS NOT BEEN SUBMITTED FOR ALL THREE YEARS INDICATED ABOVE THEN THE APPLICABLE FINANCIAL AUDITED STATEMENTS SUBMITTED BY THE BIDDERS AGAINST THE REQUISITE THREE YEARS WILL BE AVERAGED FOR THREE YEARS.

1(c) IF FINANCIAL STATEMENTS ARE NOT REQUIRED TO BE AUDITED STATUTORILY, THEN INSTEAD OF AUDITED FINANCIAL STATEMENTS, FINANCIAL STATEMENTS ARE REQUIRED TO BE CERTIFIED BY CHARTERED ACCOUNTANT.

B. TECHNICAL CRITERIA

BIDDER SHOULD HAVE PREVIOUS EXPERIENCE OF SUPPLYING FABRICATED STRUCTURAL STEEL MATERIAL OF MINIMUM QUANTITY OF 890 MT TO GOVT./PSU/REPUTED ORGANISATION IN LAST THREE YEARS AS ON LAST DATE OF BID SUBMISSION.

BIDDER SHALL HAVE TO SUBMIT RELEVANT DOCUMENTS IN SUPPORT OF THE SAME.

C. INDIAN BIDDERS SHOULD HAVE VALID PERMANENT ACCOUNT NUMBER (PAN).

GENERAL CLAUSE:

a. CONSORTIUM BIDDING/JV BIDDING IS NOT ALLOWED.

b. IN CASE THE JOB IS UNDER EXECUTION/ ONGOING JOB, THE VALUE OF EXECUTED PORTION OF THE JOB SHALL AT LEAST CORRESPOND TO THE RESPECTIVE VALUES SPECIFIED ABOVE EVEN IF THE CONTRACT HAS NOT BEEN COMPLETED OR CLOSED.

c. AFTER SATISFACTORY FULFILLMENT OF ALL ABOVE CRITERIA, OFFER SHALL BE CONSIDERED FOR FURTHER EVALUATION & PARTICIPATION AS PER NIT & ALL OTHER TERMS OF TENDER SUBJECT TO BHEL ASSESSMENT OF VENDOR'S QUALITY MANAGEMENT SYSTEM, MANUFACTURING AND TESTING FACILITIES.

d. THE SUPPLIED QUANTITY MAY BE CONSIDERED AGAINST SINGLE/MULTIPLE PO TO MEET THE ABOVE PQ REQUIREMENT.

FORMAT FOR NO DEVIATION CERTIFICATE

(To be submitted in the bidder's letter head)

To,
BHARAT HEAVY ELECTRICALS LIMITED,
Power Sector - Eastern Region,
Plot no 9/1, DJ Block, Sector – II, Salt Lake City,
Kolkata – 700 091

SUB	NO DEVIATION CERTIFICATE.	
JOB	**SUPPLY OF FABRICATED STRUCTURAL STEEL MATERIAL (2991 MT) INCLUDING PAINTING, TRANSPORTATION AT SITE ETC. FOR FGD SYSTEM PKG ETC OF 3X660 MW NORTH KARANPURA STPP, JHARKHAND.**	
REF	1.0	TENDER NO. PSER:PUR:PMX:380(IV):054 (ENQ:21:PP:0015:PUR:67) DATE: 01/12/2021
	2.0	ALL OTHER PERTINENT ISSUES TILL DATE.

Dear Sir/Madam,

With reference to above tender, this is to confirm you that we have gone through each and every terms and conditions mentioned in the enquiry (Terms and Conditions) and we offer our unqualified acceptance of the same. This is also to confirm that as per tender conditions, we have visited site before submission of our offer and noted the job content & site conditions etc.

We also confirm that we have not changed/modified the tender documents as appeared in the website/newspapers and in case of observance at any stage, it shall be treated as null and void.
We hereby confirm that we have not taken any deviation from tender clauses together with other references as enumerated in the above referred NIT and confirm our acceptance to reverse auctioning process and we hereby convey our unqualified acceptance to all terms and conditions as stipulated in the tender and NIT.

It is also confirmed that the price has been quoted in the format received with the enquiry. We confirm that, we do not have any objections to splitting the quantity among the different bidders by BHEL and price shall remain firm till the completion supply of full ordered quantity.

Any deviation found subsequently at any time during execution of order shall be treated null and void.

Thanking you,

Yours faithfully,

(Signature, date & seal of authorized
representative of the bidder)

ANNEXURE-III

DECLARATION REGARDING MINIMUM LOCAL CONTENT IN LINE WITH REVISED PUBLIC PROCUREMENT (PREFERENCE TO MAKE IN INDIA), ORDER 2017 DATED 04TH JUNE, 2020 AND SUBSEQUENT ORDER(S)

(To be typed and submitted in the Letter Head of the Entity/Firm providing certificate as applicable)

To,

(Write Name & Address of Officer of BHEL inviting the Tender)

Dear Sir,

Sub: Declaration reg. minimum local content in line with Public Procurement (Preference to Make in India), Order 2017-Revision, dated 04th June, 2020 and subsequent order(s).

Ref : 1) NIT/Tender Specification No: PSER:PUR:PMX:380(IV):054 (ENQ:21:PP:0015:PUR:67) DATE: 01/12/2021,
2) All other pertinent issues till date

We hereby certify that the items/works/services offered by…… *(specify the name of the organization here)* has a local content of _____ % and this meets the local content requirement for **'Class-I local supplier' / 'Class II local supplier' **** as defined in Public Procurement (Preference to Make in India), Order 2017-Revision dated 04.06.2020 issued by DPIIT and subsequent order(s).

The details of the location(s) at which the local value addition is made are as follows:

1. _____ 2. _____

3. _____ 4. _____

…
…
…

Thanking you,
Yours faithfully,

(Signature, Date & Seal of Authorized Signatory of the Bidder)

** - *Strike out whichever is not applicable.*

Note:

1. Bidders to note that above format Duly filled & signed by authorized signatory, shall be submitted along with the techno-commercial offer.
2. In case the bidder's quoted value is in excess of Rs.10 crores, the authorised signatory for this declaration shall necessarily be the statutory auditor or cost auditor of the company (in case of companies) or a practising cost accountant or practicing chartered accountant (in respect of suppliers other than companies)
3. In the event of false declaration, actions as per the above order and as per BHEL Guidelines shall be initiated against the bidder.

ANNEXURE-IV

DECLARATION REGARDING COMPLIANCE TO RESTRICTIONS UNDER RULE 144 (xi) OF GFR 2017

(To be submitted in the bidder's letter head)

To,

(*Write Name & Address of Officer of BHEL inviting the Tender*)

Dear Sir,

Sub: Declaration regarding compliance to Restrictions under Rule 144 (xi) of GFR 2017

Ref: 1) NIT/Tender Specification No: PSER:PUR:PMX:380(IV):054 (ENQ:21:PP:0015:PUR:67) DATE: 01/12/2021,
2) All other pertinent issues till date

"I have read the tender clauses pertaining to Department of Expenditure's (DoE) Public Procurement Division Order (Public procurement no 1, 2 & 3 vide ref. F.No.6/18/2019-PPD dated 23.07.2020 & 24.7.2020) regarding restrictions on procurement from a bidder of a country which shares a land border with India. I hereby certify that _____ (specify the name of the organization here) is *not from such a country or, if from such a country, has been registered with the Competent Authority. I hereby certify that we fulfill all requirements in this regard and is eligible to be considered. [Where applicable, evidence of valid registration by the Competent Authority shall be attached]".*

Thanking you,
Yours faithfully,

(Signature, Date & Seal of Authorized Signatory of the Bidder)

Note: Bidders to note that in case above certification given by a bidder, whose bid is accepted, is found to be false, then this would be a ground for immediate termination and for taking further action in accordance with law and as per BHEL guidelines.

ANNEXURE-V

Certificate by Chartered Accountant on letter head

This is to Certify that M/s ....., (hereinafter referred to as 'company') having its registered office at ..... is registered under MSMED Act 2006, (Entrepreneur Memorandum(Part-II) / UAM / Udyam Registration No..... dtd:....., Category: ..... (Micro/Small). (Copy enclosed).

Further verified from the Books of Accounts that the investment of the company as per the latest audited financial year..... as per MSMED Act 2006 is as follows:

1. **For Manufacturing Enterprises:** Investment in plant and machinery (i.e. original cost excluding land and building and the items specified by the Ministry of Small Scale Industries vide its notification No.S.0.1722(E) dated October 5, 2006:

   Rs ..... Lacs

2. **For Service Enterprises:** Investment in equipment (original cost excluding land and building and furniture, fittings and other items not directly related to the service rendered or as may be notified under the MSMED Act, 2006:

   Rs ..... Lacs

3. ***For Enterprises (having EM-Part-II / UAM):*** *Investment in plant and machinery or equipment is Rs.....……. Lacs and turnover is Rs. .....…….Lacs {as notified in MSME notification no. S.O. 2119 (E) dated 26-06-2020}.*

4. ***For Enterprises (Udyam, registered under Udyam Registration Portal):*** *Investment in plant and machinery or equipment is Rs.....Lacs and turnover is Rs.....Lacs {as notified in MSME notification no. S.O. 2119 (E) dated 26-06-2020}.*

(Strike off whichever is not applicable)

The above investment of Rs.....Lacs is within permissible limit of Rs.....Lacs for .....Micro/Small (Strike off which is not applicable) Category under MSMED Act 2006.

Or

The company has been graduated from its original category {Micro/Small) (Strike off which is not applicable) and the date of graduation of such enterprise from its original category is ..... (dd/mm/yyyy) which is within the period of 3 years from the date of graduation of such enterprise from its original category as notified vide S.O. No. 3322(E) dated 01.11.2013 published in the gazette notification dated 04.11.2013 by Ministry of MSME.

Date:

(Signature)

Name-

Membership number –

Seal of Chartered Accountant

ANNEXURE-VI

FORMAT FOR SEEKING CLARIFICATION

Job	**SUPPLY OF FABRICATED STRUCTURAL STEEL MATERIAL (2991 MT) INCLUDING PAINTING, TRANSPORTATION AT SITE ETC. FOR FGD SYSTEM PKG ETC OF 3X660 MW NORTH KARANPURA STPP, JHARKHAND.**			
Tender No	**PSER:PUR:PMX:380(IV):054 (ENQ:21:PP:0015:PUR:67) DATE: 01/12/2021**			
Sl. no	**Reference clause of tender document**	**Existing provision**	**Bidder's query**	**BHEL's clarification**

ANNEXURE-VII

SUSPENSION OF BUSINESS DEALINGS WITH SUPPLIERS/ CONTRACTORS

1.0	**Suspension of Business dealings with Suppliers/ Contractors**
1.1	BHEL reserves the right to take action against Suppliers/ Contractors who fail to perform or indulge in malpractices, by suspending business dealings with them.
1.2	Suspension of business dealings with Suppliers/ Contractors could be in the form of following: -- **a) Hold within the unit for specific item(s)/ material category(ies)/ type of work(s) for one year.** **b) Hold within the unit for all item(s)/ material category(ies)/ type of work(s) for two years** **c) Banning across BHEL for all items/ material category(ies)/ type of work(s) for three years.** The Supplier may be either put on hold or banned, as detailed hereinafter on the basis of one or more of the category wise reasons as enumerated hereunder.
1.3	**Hold within the unit for a specific item(s)/ material category(ies)/ type of work(s) shall be imposed in the following cases, if** i) In the last three consecutive supplies of a specific material category, average quality rating, as provided in the supplier performance rating (SPR) as per SEARP, falls below 80% of the quality weightage. This is irrespective of supplies against PO(s) having single/ multiple delivery schedules. Note: Not applicable in cases for erection works of Power Sector Regions, where separate guidelines for evaluation of capacity of bidders is being followed. ii) Two consecutive delays, for reasons of delay attributed to the Supplier, in execution of the contracts where delay occurred is such that a) prescribed maximum LD time limits of the contracts is exceeded or b) delay period has equaled/ exceeded half the original delivery period specified in the contracts whichever among the above is earlier. iii) a) Overall SPR (Supplier Performance Rating) in that particular Unit in line with SEARP falls below 60% of the specific material category. b) Bids of contractors (in PS-MSX portal) shall not be considered (if average score of last six months falls 60% or below as per guidelines for evaluation of capacity of bidders formula). Note: – for (b), No specific period of hold shall be applicable. iv) Supplier works are under strike/ lockout for a period of more than three months. **Hold within the unit for all item(s)/material category(ies)/ type of work(s) shall be put in the following cases, if** i) Supplier tampers with tendering procedure affecting ordering process. ii) Supplier has misused BHEL documents/ drawings/ technical information or has breached the confidentiality agreement with BHEL. iii) after placement of order, Supplier fails to execute the contract. iv) within warranty period as per contract, Supplier continues to supply low/ less/ non-performing equipment/ services, repetitive failures, remains non-responsive. v) Wherever risk purchase clause (amounting to more than 5% of contract value) has been invoked. vi) After price bid opening but before placement of order, Supplier withdraws his offer or varies it in any manner within the validity period.
1.4	**Banning across BHEL shall be imposed in following cases, if**
1.4.1	i) Supplier is found to be responsible for submitting fake/ false/ forged documents, certificates, or information or misrepresentation/ wilful suppression of facts, or has resorted to unethical, illegal means or has forged BHEL documents, certificates etc. for securing business, meeting PQR or for enlistment in BHEL or with customers other than BHEL. ii) In spite of warnings, the Supplier persistently violates or circumvents the provisions of labour laws/ regulations/ rules or other statutory requirements. iii) Supplier is found to be involved in cartel formation or in any other act so as to influence the bidding process or influence the price. iv) The Supplier has indulged in malpractices or misconduct such as bribery, corruption and fraud, pilferage, coercion etc. v) The Supplier is found guilty by any court of law for criminal activity/ offences involving moral turpitude in relation to business dealings. vi) Supplier is found to have obtained any internal information/ documentation of BHEL by unauthorized means. vii) The foreign Principals along with the representing Agent shall be banned together if information submitted by them about their precise relationship, commission/ remuneration etc. payable/ receivable and other particulars as asked by BHEL, as per the extant guidelines regarding dealing with Agents of Foreign Suppliers is found false/ incorrect, at any stage. viii) Supplier has substituted, damaged, failed to return, or unauthorizedly disposed off free issue materials/ tools etc. of BHEL.
1.4.2	A Supplier can also be banned with the approval of Director (E, R&D) provided a direction to this effect has been received from the administrative ministry of the Government.

Note: Above shall be applicable along with Guidelines for "Suspension of Business dealings with Suppliers/ Contractors" available in BHEL website http://www.bhel.com. These shall form part of tender documents.

ANNEXURE-VIII

DECLARATION FOR RELATION IN BHEL

(To be typed and submitted in the Letter Head of the Company/Firm of Bidder failing which the offer of Bidder is liable to be summarily rejected)

To,

(Write Name & Address of Officer of BHEL inviting the Tender)

Dear Sir,

Sub: **Declaration for relation in BHEL**

Ref: 1) NIT/Tender Specification No: **PSER:PUR:PMX:380(IV):054 (ENQ:21:PP:0015:PUR:67) DATE: 01/12/2021**,

I/We hereby submit the following information pertaining to relation/relatives of Proprietor/Partner(s)/Director(s) employed in BHEL.

Tick (√) any one as applicable:

1. The Proprietor, Partner(s), Director(s) of our Company/Firm DO NOT have any relation or relatives employed in BHEL

OR

2. The Proprietor, Partner(s), or Director(s) of our Company/Firm HAVE relation/relatives employed in BHEL and their particulars are as below:

(i)

(ii)

Signature of the Authorized Signatory

Note:

1. Attach separate sheet, if necessary.
2. If BHEL Management comes to know at a later date that the information furnished by the Bidder is false, BHEL reserves the right to take suitable against the Bidder/Contractor.

DECLARATION OF THE BIDDERS

Job: SUPPLY OF FABRICATED STRUCTURAL STEEL MATERIAL (2991 MT) INCLUDING PAINTING, TRANSPORTATION AT SITE ETC. FOR FGD SYSTEM PKG ETC OF 3X660 MW NORTH KARANPURA STPP, JHARKHAND.

01. I, ……...hereby certify that all the information and date furnished by me with regard to this Tender No. **PSER:PUR:PMX:380(IV):054 (ENQ:21:PP:0015:PUR:67) DATE: 01/12/2021** are true and complete to the best of my knowledge.

02. I have gone through the tender specifications, scope of work, terms and conditions mentioned in Annexure as well as General and Special conditions of contract and various stipulations in detail and agree to abide by them and comply with the requirements and intent of specifications.

03. I also certify that there have been no deviations from the tender requirements in the bid submitted against this tender.

04. I further certify that I am duly authorized representative of the under mentioned tenderer and hold a valid power of attorney to this effect, a copy of which is enclosed.

Signature:

Name :

Date :

Designation:

Seal:

Tenderers Name and address

Enclosed: Power of Attorney

DECLARATION

Date: ----------

Job: "SUPPLY OF FABRICATED STRUCTURAL STEEL MATERIAL (2991 MT) INCLUDING PAINTING, TRANSPORTATION AT SITE ETC. FOR FGD SYSTEM PKG ETC OF 3X660 MW NORTH KARANPURA STPP, JHARKHAND".

E-Tender No.: PSER:PUR:PMX:380(IV):054 (ENQ:21:PP:0015:PUR:67) DATE: 01/12/2021

To: ----------
Address: BHEL, ----------

Email: ----------

Sub: **Details of related firms and their area of activities**

Dear Sir/Madam,

Please find below details of firms owned by our family members that are doing business/registered for same item with BHEL, ----------(NA, if not applicable)

1	Material Category/ Work Description	
	Name of Firm	
	Address of Firm	
	Nature of Business	
	Name of Family Member	
	Relationship	
2	Material Category/ Work Description	
	Name of Firm	
	Address of Firm	
	Nature of Business	
	Name of Family Member	
	Relationship	
…		

Note: I certify that the above information is true and I agree for penal action from BHEL in case any of the above information furnished is found to be false.

Regards,

(----------)

From: M/s----------
Supplier Code: ----------
Address: ----------

ANNEXURE - A

CHECK LIST

NOTE:- Tenderers are required to fill in the following details and no column should be left blank

1	Name and Address of the Tenderer	
2	Details about type of the Firm/Company	
3.a	Details of Contact person for this Tender	Name : Mr/Ms Designation: Telephone No: Mobile No: Email ID: Fax No:
3.b	Details of alternate Contact person for this Tender	Name : Mr/Ms Designation: Telephone No: Mobile No: Email ID: Fax No:
4	EMD DETAILS	DD No: Date : Bank : Amount: Please tick (√) whichever applicable:- ONE TIME EMD / ONLY FOR THIS TENDER
5	Validity of Offer	TO BE VALID FOR 90 DAYS FROM DUE DATE

		APPLICABILITY(BY BHEL)	ENCLOSED BY BIDDER
6	Whether the format for compliance with **PRE QUALIFICATION CRITERIA** (ANNEXURE-I) is understood and filled with proper supporting documents referenced in the specified format	Applicable	YES / NO
7	Audited profit and Loss Account for the last three years	Applicable/Not Applicable	YES/NO
8	Copy of PAN Card	Applicable	YES/NO
9	Whether all pages of the Tender documents including annexures, appendices etc are read understood and signed	Applicable/Not Applicable	YES/NO
10	Integrity Pact	Applicable	YES/NO
11	Declaration of the Bidders	Applicable	YES/NO
12	No Deviation Certificate	Applicable	YES/NO
13	Declaration for relation in BHEL	Applicable	YES/NO
14	Declaration regarding Minimum Local Content	Applicable	YES/NO
15	Declaration regarding compliance to restrictions under Rule 144 (xi) of GFR 2017 (regarding bidder from a country which shares a land border with India)	Applicable	YES/NO
16	Declaration regarding MSE	Applicable/Not Applicable	YES/NO
17	Non Disclosure Certificate	Applicable/Not Applicable	YES/NO
18	Declaration regarding related firms and their area of activities	Applicable	YES/NO
19	Bank Account Details for E-Payment	Applicable/Not Applicable	YES/NO
20	Capacity Evaluation of Bidder for current Tender	Applicable/Not Applicable	YES/NO
21	Power of Attorney for Submission of Tender/Signing Contract Agreement	Applicable/Not Applicable	YES/NO

NOTE: STRIKE OFF 'YES' OR 'NO', AS APPLICABLE. TENDER NOT ACCOMPANIED BY THE PRESCRIBED **ABOVE APPLICABLE DOCUMENTS** ARE LIABLE TO BE SUMMARILY REJECTED.

DATE :

AUTHORISED SIGNATORY
(With Name, Designation and Company seal)

PART - F

GENERAL TERMS & CONDITIONS OF REVERSE AUCTION

Against this enquiry for the subject item/ system with detailed scope of supply/service as per tender specifications, BHEL shall be resorting to "REVERSE AUCTION PROCEDURE" i.e. ON LINE BIDDING (THROUGH A SERVICE PROVIDER). The philosophy followed for reverse auction shall be English Reverse (No ties).

1. For the proposed reverse auction, technically and commercially acceptable bidders only shall be eligible to participate.

2. *Price bids of all techno-commercially qualified bidders shall be opened and same shall be considered for RA.*

3. BHEL will engage the services of a service provider who will provide all necessary training and assistance before commencement of on line bidding on internet.

4. In case of reverse auction, BHEL will inform the bidders the details of Service Provider to enable them to contact & get trained for participation in the reverse auction.

5. Business rules like event date, time, bid decrement, extension etc. also will be communicated through service provider for compliance.

6. Bidders have to fax /e-mail the Compliance form (annexure III) before start of Reverse auction. Without this, the bidder will not be eligible to participate in the event.

7. In line with the NIT terms, BHEL will provide the calculation sheet (e.g., EXCEL sheet) which will help to arrive at "Total Cost to BHEL" which is inclusive of all cost elements in line with terms & conditions of the tender for each of the bidder to enable them to fill-in the price and keep it ready for keying in during the Auction.

8. Reverse auction will be conducted on scheduled date & time.

9. At the end of Reverse Auction event, the lowest bidder value will be known on auction portal.

10. The lowest bidder has to fax/e-mail the duly signed and filled-in prescribed format for price breakup including that of line items, if required, (Annexure VI) as provided on case-to-case basis to Service provider within two working days of Auction without fail.

11. *Bidders shall be required to read the "Terms and Conditions" section of the auctions site of Service provider, using the Login IDs and passwords given to them by the service provider before reverse auction event. Bidders should acquaint themselves of the "Business Rules of Reverse Auction", which will be communicated before the Reverse Auction.*

12. The Bidder shall not divulge either his Bids or any other exclusive details of BHEL to any other party. If the Bidder or any of his representatives are found to be involved in Price manipulation/ cartel formation of any kind, directly or indirectly by communicating with other bidders, action as per extant BHEL guidelines for suspension of business dealings (as available on www.bhel.com), shall be initiated by BHEL and the results of the RA scrapped/ aborted.

13. *Reverse Auction will be conducted if two or more bidders are techno-commercially qualified. In case of two or three qualified bidders, there shall be no elimination of H1 bidder (whose quote is highest in sealed envelope price bid). In case of four qualified bidders, the H1 bidder shall be eliminated whereas in case of five qualified bidders, H1 & H2 bidders shall be eliminated. However, in case of six or more qualified bidders are available, RA would be conducted amongst first 50% of the bidders arranged in the order of prices from lowest to highest. Number of bidders eligible for participating in RA would be rounded off to next higher integer value if number of qualified bidders is odd (e.g. if 7 bids are qualified, then RA will be conducted amongst lowest four bidders). However, there will be no elimination of qualified bidders who are MSE or qualifying under PPP-MII, Order 2017, irrespective of the number of bidders qualifying techno-commercially.*

    In case of multiple H1 bidders, all H1 bidders (excluding MSEs and bidders qualifying under PPP-MII, Order 2017) shall be removed provided minimum two bidders remain in fray, else no H1 removal.

PART – B: GENERAL CONDITIONS OF CONTRACT (GCC)

SL. NO.	BHEL STANDARD TERMS	Bidder's confirmation	Remarks
1.	Our requirement will be used at **BHEL-PSER's FGD package of 3X660 MW NORTH KARANPURA STPP, JHARKHAND** Techno-commercial & Pre-Q bids shall be opened first & afterwards price bid shall be opened for qualified bidder(s), who have qualified in Techno-commercial & Pre-Q bids. Tenders will be received up to **14.00 Hours** on the said due date. **If the vendor submits offer i.e. Technical & Price bid together in single attachment, the offer shall be liable for rejection.** **Price should be submitted as per tender format only & uploaded in the price section.** Note: In order to maintain sanctity of the tender system, it is advised that one Agent cannot represent two suppliers or quote on their behalf in a particular tender. In the tender, either one agent on behalf of the principal/OEM or Principal/OEM itself can bid but both cannot bid simultaneously for same item/product.		
2.	If any vendor sought to quote through their agents "They have to inform to BHEL in advance, before opening date. Otherwise the offer will be treated as Unsolicited Offer and same will not be opened".		
3.	BHEL keeps its right to **reject / load** any offer which is having deviations to BHEL Specifications, Standard Terms & Conditions. All the bidders shall submit their offers only by filling the original BHEL tender documents. No other offer will be entertained. In case of Technical-Cum-Commercial bid, copy of the price bid has to be used to indicate commercial terms without price.		
4.	The equipment offered shall be strictly conforming to the specification and for complete unit.		
5.	No offer for individual accessories or part machinery will be accepted.		
6.	**PAYMENT TERMS:** **Shall be as per TCC of tender. No advance shall be paid. Payment shall be paid in INR only.**		
7.	**WARRANTY/GUARANTEE: As specified in TCC OF TENDER.**		
8.	**DELIVERY TERMS: As specified in TCC OF TENDER.**		
9.	**DISCOUNTS:** Discounts offered by the vendor in price shall not be entertained by BHEL. The vendor should factor in his discount in the price offer only. In-spite of the same, if a discount is offered by the bidder, the same shall not be considered for evaluation of the offer, but purchase order shall be issued on bidder's final discounted price.		
10.	**LIQUIDATED DAMAGE/PENALTY CLAUSE:** As specified in TCC OF TENDER.		
11.	**a. SECURITY DEPOSIT BANK GUARANTEE(SDBG): Not Applicable** **b. PERFORMANCE BANK GUARANTEE (PBG): As per TCC**		
12.	The sealed tenders super scribing tender number and due date should be **addressed to:** **Deputy Manager/Purchase, Bharat Heavy Electricals Limited, PSER, BHEL BHAWAN, DJ-9/1, SALT LAKE, SECTOR-II, KOLKATA - 700 091, India**.	Not Applicable	
13.	**INSPECTION:** **As specified in TCC OF TENDER.**		
14.	**CONSIGNEE DETAILS OF THE EQUIPMENT :-** **As specified in TCC OF TENDER.** All documents / correspondences must bear the Tender no. / Purchase Order No. & Date.		
15.	The manufacturing **progress** will have to be furnished to us periodically in the form and manner required by us.		

16.	Supplier must submit with their offer list of customers (with their full address and their purchase reference number) to whom they have supplied similar machine in the past five years. The year of supply should also be indicated.		
17.	The quotation should be valid at least for a period of **NINETY (90) DAYS** from the tender due date of submission (extended, if any). Price Variation Clause will not be entertained.		
18.	**FORCE MAJEURE :** The vendor shall be subject to force majeure clause defined as under : This force majeure is herein defined as any cause which is beyond the control of the tenderer which they would not have foreseen or with a reasonable amount of diligence could not have foreseen and which subsequently affect the performance of the contract such as SRCC (strike riot and civil commotion), earthquake, flood, acts of god, acts of any government, domestic or foreign including but not limited to war. The tenderer shall not be liable for delay in performing his obligation resulting from any force majeure clause as referred to and/or defined above. The date of completion will be subject to hereinafter provided be extended by a reasonable time even though such cause may occur after tenderer's performance of his obligation has been delayed for other causes.		
19.	**ARBITRATION & CONCILIATION**		
19.1	**ARBITRATION :**		
19.1.1	Except as provided elsewhere in this Contract, in case Parties are unable to reach amicable settlement (whether by Conciliation to be conducted as provided in Clause 19.2 herein below or otherwise) in respect of any dispute or difference; arising out of the formation, breach, termination, validity or execution of the Contract; or, the respective rights and liabilities of the Parties; or, in relation to interpretation of any provision of the Contract; or. in any manner touching upon the Contract (hereinafter referred to as the 'Dispute'), then, either Party may, commence arbitration in respect of such Dispute by issuance of a notice in terms of section 21 of the Arbitration & Conciliation Act, 1996 (hereinafter referred to as the 'Notice'). The Notice shall contain the particulars of all claims to be referred to arbitration in sufficient detail and shall also indicate the monetary amount of such claim. The arbitration shall be conducted by a sole arbitrator to be appointed by the Head of the BHEL Power Sector Region issuing the Contract within 60 days of receipt of the complete Notice. The language of arbitration shall be English. The Arbitrator shall pass a reasoned award. Subject as aforesaid, the provisions of Arbitration and Conciliation Act 1996 (India) or statutory modifications or re-enactments thereof and the rules made thereunder as in force from time to time shall apply to the arbitration proceedings under this clause. The seat of arbitration shall be Kolkata (the place from where the contract is Issued). The Contract shall be governed by and be construed as per provisions of the laws of India. Subject to this provision 19.1.1 regarding ARBITRATION, the principal civil court exercising ordinary civil jurisdiction over the area where the seat of arbitration is located shall have exclusive jurisdiction over any DISPUTE to the exclusion of any other court.		
19.1.2	In case of Contract with Public Sector Enterprise (PSE) or a Government Department, the following shall be applicable: In the event of any dispute or difference relating to the interpretation and application of the provisions of commercial contract(s) between Central Public Sector Enterprises (CPSEs)/ Port Trusts inter se and also between CPSEs and Government Departments/Organizations (excluding disputes concerning Railways, Income Tax, Customs & Excise Departments), such dispute or difference shall be taken up by either party for resolution through AMRCD (Administrative Mechanism for Resolution of CPSEs Disputes) as mentioned in DPE OM No. 4(1)/2013-DPE(GM)/FTS-1835 dated 22-05-2018 as amended from time to time.		
19.1.3	The cost of arbitration shall initially be borne equally by the Parties subject to the final allocation thereof as per the award/order passed by the		

	Arbitrator.		
19.1.4	Notwithstanding the existence of any dispute or differences and/or reference for the arbitration, the Contractor shall proceed with and continue without hindrance the performance of its obligations under this Contract with due diligence and expedition in a professional manner unless the dispute inter-alia relates to cancellation, termination or short-closure of the Contract by BHEL.		
19.2	**CONCILIATION:** If at any time (whether before, during or after the arbitral or judicial proceedings), any Disputes (which term shall mean and include any dispute, difference, question or disagreement arising in connection with construction, meaning, operation effect, interpretation or breach of the agreement, contract), which the Parties are unable to settle mutually, arise inter-se the Parties, the same may, be referred by either party to Conciliation to be conducted through Independent Experts Committee (IEC) to be appointed by competent authority of BHEL from the BHEL Panel of Conciliators. Notes: 1. No serving or a retired employee of BHEL/Administrative Ministry of BHEL shall be included in the BHEL Panel of Conciliators. 2. Any other person(s) can be appointed as Conciliator(s) who is/are mutually agreeable to both the parties from outside the BHEL Panel of Conciliators. The proceedings of Conciliation shall broadly be governed by Part-III of the Arbitration and Conciliation Act 1996 or any statutory modification thereof and as provided in Procedure 2.3 to this GCC (as available in www.bhel.com)). The Procedure 2.3 together with its Formats (as available in www.bhel.com) will be treated as if the same is part and parcel hereof and shall be as effectual as if set out herein in this GCC. The Contractor hereby agrees that BHEL may make any amendments or modifications to the provisions stipulated in the Procedure 2.3 (as available in www.bhel.com)) to this GCC from time to time and confirms that it shall be bound by such amended or modified provisions of the Procedure 2.3 (as available in www.bhel.com)) with effect from the date as intimated by BHEL to it.		
19.3	**No Interest payable to Contractor** Notwithstanding anything to the contrary contained in any other document comprising in the Contract, no interest shall be payable by BHEL to Contractor on any moneys or balances including but not limited to the Security Deposit, EMD, Retention Money, RA Bills or the Final Bill, or any amount withheld and/or appropriated by BHEL etc., which becomes or as the case may be, is adjudged to be due from BHEL to Contractor whether under the Contract or otherwise.		
20.	**JURISDICTION :** All disputes or differences arising out of or in connection with the Purchase Order shall be subject to the exclusive jurisdiction of Courts (pecuniary or territorial) viz Commercial Court Rajarhat/ District Court Barasat (24 PGN North) as the case may be and Calcutta High Court at Kolkata		
21.	**RIGHTS OF BHEL:** **(A)** To withdraw any portion of work/supply and/or to restrict / alter the quantum of work/supply as indicated in the contract during the progress of work/supply and get it done through other agency and/or to suit BHEL's commitment to its customer or in case BHEL decides to advance the date of completion due to other emergency reasons / BHEL's obligation to its customer. **(B)** To terminate the contract or withdraw portion of work/supply and get it done through other agency, at the risk and cost of the contractor after due notice of a period of 14 days' by BHEL in any of the following cases: i) Contractor/Supplier's poor progress of the work vis-à-vis execution timeline as stipulated in the Contract, backlog attributable to contractor/supplier including unexecuted portion of work/supply does not appear to be executable within balance available (#) period considering its performance of execution. ii) Withdrawal from or abandonment of the work by contractor before completion of the work as per contract.		

iii) Non-completion of work/Non-supply by the Contractor / Supplier within scheduled completion/delivery period as per Contract or as extended from time to time, for the reasons attributable to the contractor/supplier.

iv) Termination of Contract on account of any other reason (s) attributable to Contractor/Supplier.

v) Assignment, transfer, subletting of Contract without BHEL's written permission resulting in termination of contract or part thereof by BHEL.

vi) Non-compliance to any contractual condition or any other default attributable to Contractor/ Supplier.

(#) In-case inputs from BHEL/Customer are likely to be delayed or are actually delayed, this delay may also be taken into account while considering balance period available for execution of Contract.

(C) Risk & Cost Amount against Balance Work:

Risk & Cost amount against balance work shall be calculated as follows:

Risk & Cost Amount= [(A-B) + (A x H/100)]

Where,

A= Value of Balance scope of Work/Supply (*) as per rates of new contract

B= Value of Balance scope of Work/Suppy (*) as per rates of old contract being paid to the contractor / supplier at the time of termination of contract i.e. inclusive of PVC & ORC, if any.

H = Overhead Factor to be taken as 5

In case (A-B) is less than 0 (zero), value of (A-B) shall be taken as 0 (zero).

(*) Balance scope of work / supply (in case of termination of contract):

Difference of Contract Quantities and Executed Quantities as on the date of issue of Letter for 'Termination of Contract', shall be taken as balance scope of Work / Supply for calculating risk & cost amount. Contract quantities are the quantities as per original contract. If, Contract has been amended, quantities as per amended Contract shall be considered as Contract Quantities.

Items for which total quantities to be executed have exceeded the Contract Quantities based on drawings issued to contractor from time to time till issue of Termination letter, then for these items total Quantities as per issued drawings would be deemed to be contract quantities.

Substitute / extra items whose rates have already been approved would form part of contract quantities for this purpose. Substitute / extra items which have been executed but rates have not been approved, would also form part of contract quantities for this purpose and rates of such items shall be determined in line with contractual provisions.

However, increase in quantities on account of additional scope in new tender shall not be considered for this purpose.

NOTE: In-case portion of work is being withdrawn, contract quantities pertaining to portion of work withdrawn shall be considered as 'Balance scope of work / supply' for calculating Risk & Cost amount.

(D) LD against delay in executed work/ supply in case of Termination of Contract :

LD against delay in executed be work / supply shall calculated in line with LD clause as per GCC/SCC/TCC/Special note/any other annexure of tender document (in compliance with order of precedence), for the delay attributable to contractor / supplier. For this purpose, contract value shall be taken as Executed Value of work / supply for the purpose of limiting the maximum LD value.

Method for calculation of "LD against delay in executed work / supply" is given below.

i) Let the time period from scheduled date of start of work till termination of contract excluding the period of Hold (if any) not attributable to contractor / supplier = T1

ii) Let the value of executed work / supply till the time of termination of contract= X

iii) Let the Total Executable Value of work / supply for which inputs/fronts were made available to contractor / supplier and were planned for execution till termination of contract = Y

iv) Delay in executed work / supply attributable to contractor/supplier i.e. T2=[1-(X/Y)] x T1

v) LD shall be calculated in line with LD clause [as per GCC/SCC/TCC/Special note/any other annexure of tender document (in compliance with order of precedence)] of the Contract for the delay attributable to contractor / supplier taking "X" as Contract Value and "T2" as period of delay attributable to contractor/ supplier.

(E) Recoveries arising out of Risk & Cost and LD or any other recoveries due from Contractor.

Following sequence shall be applicable for recoveries from contractor / supplier on whom risk & cost has been invoked, after informing the contractor / supplier of the total proposed recovery :

	a) Dues available in the form of Bills payable to contractor / supplier, SD, BGs against the same contract. b) Demand notice for deposit of balance recovery amount shall be sent to contractor/ supplier, if funds are insufficient to effect complete recovery against dues indicated in (a) above. c) If contractor / supplier fails to deposit the balance amount to be recovered within the period as prescribed in demand notice, following action shall be taken for balance recovery: i) Dues payable to contractor / supplier against other contracts in the same Region / Unit shall be considered for recovery. ii) If recovery cannot be made out of dues payable to the contractor / supplier as above, balance amount to be recovered, shall be informed to other Regions/Units for making recovery from the Unpaid Bills/Running Bills/SD/BGs/Final Bills of contractor / supplier. iii) In-case recoveries are not possible with any of the above available options, Legal action shall be initiated for recovery against contractor / supplier.		
22.	**LOADING FACTORS FOR DEVIATION TO BHEL STANDARD TERMS & CONDITIONS**		
i)	Bank Guarantee: Non submission of 10% BG (if applicable) will attract 10% loading on the offers.		
ii)	**Penalty Clause**: Non acceptance of penalty clause will attract maximum 10% loading on the offer and accordingly proportionate percentage will be loaded for accepting less percentage of penalty clause. Ex: If the supplier has accepted for maximum 5% penalty clause, then balance 5% will be loaded.		
iii)	For all other Terms & Conditions, if the offer is not confirming to the same, BHEL at its discretion shall load the same and the loading pattern shall be intimated to the bidders before price bid opening. However BHEL reserves the right to cancel a bid in case of non-acceptance of any terms and conditions finally arrived before price bid opening.		
23	**Note**: The offers not complying the above Terms & Conditions will not be accepted.		

Note:

01. In case of any conflict / inconsistency in any clause of the tender or between various sections of the tender, bidder should bring the same in writing to BHEL for clarification before submission of the bid, failing which the most stringent interpretation of the clause in favour of BHEL shall be adopted and the same shall be binding to the bidder.
02. Any deviation sought by the bidder should be indicated in the techno-commercial offer.
03. ***Bidder should write "accepted" in the column "Bidder's confirmation" for each clause, if the conditions are agreeable or else should write the deviations sought in "Bidder's Deviation(if any)" column. Offers with deviation are liable for rejection.***
04. If any clause left blank, shall be presumed that the clause is accepted by the bidder.

SIGNATURE OF THE BIDDER WITH SEAL AND DATE

PRICE SCHEDULE (UNPRICED) - VOLUME-III

PLEASE REFER

E-PROCUREMENT PORTAL https://eprocurebhel.co.in

PRICE SCHEDULE - VOLUME-III

PLEASE REFER

E-PROCUREMENT PORTAL https://eprocurebhel.co.in

ABOVE TO BE READ ALONG WITH SCHEDULE-2 (WEIGHTAGE) OF PRICE SCHEDULE (VOLUME-III)

VOLUME-III, PRICE SCHEDULE, REV-00

JOB: SUPPLY OF FABRICATED STRUCTURAL STEEL MATERIAL (2991 MT) INCLUDING PAINTING, TRANSPORTATION AT SITE ETC. FOR FGD SYSTEM PKG ETC OF 3X660 MW NORTH KARANPURA STPP, JHARKHAND.

E-TENDER NO.: PSER:PUR:PMX:380(IV):054 (ENQ:21:PP:0015:PUR:67) DATE: 01/12/2021

PREAMBLE

SL. NO.	DESCRIPTION
1.0	This preamble forms part of tender document and schedule of items. The tenderer should read this preamble carefully before filling in rates for various items. Clauses under this preamble shall be read in conjunction with various volumes of tender and other tender sections as applicable and shall have precedence over any contrary statement mentioned anywhere in this document.
2.0	The job shall be carried out strictly as per specifications, description of the items in these schedule and / or engineer's instructions. Drawings enclosed with the tender are only preliminary and for tender purposes and giving some idea of the job involved. The job is to be executed as per drawings & documents, which shall be furnished during execution.
3.0	Items of job provided in this schedule but not covered in this specification shall be executed strictly as per instruction of the engineer.
4.0	Unless specifically mentioned otherwise in the tender document, the tenderer shall quote for the finished items and shall provide for the complete cost towards power, fuel, tools, tackles, equipment, constructional plants, temporary works, labour, dismantling of all temporary piping, structures, valves, pumps, tanks & other misc. equipment, strengthening of roads/culverts/bridges etc. including arranging all clearances etc. required for carrying out different activities & tests, materials, levies, transport, layout, repairs, rectification, maintenance till handing over, supervisions, colonies, shops, establishments, overheads, profits and all incidental items not specifically mentioned but reasonably implied and necessary to complete the job according to the complete tender document and this schedule.
5.0	The quantities of the various items mentioned in this schedule of items are approximate, based on very preliminary information and may vary to any extent or be deleted altogether. The quoted rates of each item will remain firm throughout the period of execution including extension, for reasons whatsoever, as long as variation in the total value of job executed under any part of this contract including extra items, if any but excluding any price variation remains, within plus minus thirty percent (± 30%) of the awarded price as per LOI.
6.0	Prior written approval of BHEL shall be sought by the contractor in case quantity variation of any item crosses +50% (plus fifty percent) limit during execution, an approval to be obtained before execution of further quantity for this item.
7.0	In case Sealed /Paper Price Bids are opened for finalisation of the tender, for any Item Rate/BOQ based contract, possibility of variation of quantity/ addition/deletion of items cannot be ruled out. Under such circumstances, after execution of job, if it is observed that standing as L-1 is changed based on actual quantity executed, the bidder shall give suitable rebate to maintain standing as L-1. Since this aspect can be assessed at the end of execution, necessary adjustment will be effected at the end of execution in final bill. This condition shall not be applicable where the tender is finalised through Reverse Auction.
8.0	BHEL reserve the right to rationalize the rates, quoted by L-1 bidder against unit rate items and/ or other optional items with respect to item-wise lowest rates (amongst the participating bidders), before placement of order.
9.0	Rates shall be quoted in figures and in words in clear legible writing. No overwriting is allowed. All scoring and cancellations should be countersigned and in case of illegibility the interpretation of engineer shall be final. All entries shall be in English language.
10.0	All jobs item wise shall be measured upon completion and paid for at the rates quoted and accepted as per BHEL approved payment schedule/billing break-up.
11.0	The tender shall be deemed to have visited site and made himself aware of all the site conditions, studied the specifications and details of job to the done within the time schedule attached and to have acquainted himself of the conditions prevailing at site.
12.0	No splitting of the job is envisaged. Decision of BHEL in this regard shall be final and binding to the bidders.
13.0	Bidders are not allowed to alter the Price Schedule format including item description, quantity etc. and the offer is liable for rejection if the bidders submit their prices in Price Schedules modified by them. BHEL reserves the right to reject the offers of bidders who submit offers in Price Formats which are modiified/altered by them. Also putting any comments instead of rates/price in the designated column of the rate schedule shall make the offer liable for rejection.
14.0	BHEL decision shall be final and binding on the contractor regarding clarification of items in the schedule with respect to the other sections/volumes of the contract.
15.0	No interest, whatsoever, shall be payable by BHEL on the security deposit, any bank guarantee submitted or any amount due to successful bidder/contractor.
16.0	Size and weights of various items are mentioned in the attached BOQ cum rate/price schedule for reference purpose only & these shall not be taken into consideration for quoting/calculating amount in the rate schedule. These shall be utilised as per relevant sections of tender.
17.0	Bidder's Total price for supply of fabricated structural steel material shall be considered for evaluation unless stated otherwise.

VOLUME-III, PRICE SCHEDULE, REV-00

JOB: SUPPLY OF FABRICATED STRUCTURAL STEEL MATERIAL (2991 MT) INCLUDING PAINTING, TRANSPORTATION AT SITE ETC. FOR FGD SYSTEM PKG ETC OF 3X660 MW NORTH KARANPURA STPP, JHARKHAND.

E-TENDER NO.: PSER:PUR:PMX:380(IV):054 (ENQ:21:PP:0015:PUR:67) DATE: 01/12/2021

SCH-1:TOTAL PRICE

SL. NO.	DESCRIPTION OF EQUIPMENT/ITEM	PRICE SCHEDULE REF	TOTAL PRICE (IN INR)
1.0	TOTAL PRICE FOR "SUPPLY OF FABRICATED STRUCTURAL STEEL MATERIAL (2991 MT) INCLUDING PAINTING, TRANSPORTATION AT SITE ETC. FOR FGD SYSTEM PKG ETC OF 3X660 MW NORTH KARANPURA STPP, JHARKHAND". DETAILS AS ENUMERATED IN THE TENDER.	SCH 2 - BREAK UP OF TOTAL PRICE	TO BE FILLED ONLINE ONLY

NOTE:-

1.0	Bidder shall quote total price for SCH-1 Part only at Sl No. 1 above. All other amounts / rates of each item of job in respective schedules / parts will be derived based on allocated percentages. As such, any uncalled figure/ amount noted at any other place / schedule of Volume-III will not be reckoned & will stand null & void.
2.0	Bidder to note that total price at Sl No. 1 above shall be considered for evaluation & awarding. As such, total price should be complete in all respect for the full scope defined and considering all terms and conditions.
3.0	Bidder's quoted total price of SCH-1 at Sl. No 1 above, shall be apportioned into amount of various items of job based on allocated percentages against respective item, in respective schedules / parts. As such, bidder shall not indicate / quote any amount / rate in these schedules / parts and any amount / rate quoted against any item shall not be taken into cognizance / account and offer may be liable for rejection.
4.0	Based on the itemwise percentage allocations, the amount for the individual items of the Bill of Quantity shall be arrived at. The rates of individual items shall be derived from the amount against each items and its quantity after rounding off to upto 2 decimal places. However, RA bill payment shall be done after rounding off the gross amount to two decimal points. Any adjustment, if required, due to such methodology, will be effected / adjusted in final bill.
5.0	Bidders to note that this is an item rate contract. Payment shall be made for the actual quantities of job executed at the unit rate arrived at as per Sl No.4.0 above.
6.0	Any item as per scope of job, if not included in the price quoted above and shown separately will not be taken cognizance of and the offer shall be liable for rejection.
7.0	Price format shall not be changed by bidder in any case and it may lead to cancellation of their offer.
8.0	The TOTAL QUOTED PRICE shall be excluding GST but including transportation charges on FOR site basis.
9.0	The quantity of items may vary during execution mainly due to actual requirement etc. The unit rates work out from the overall amount quoted & accepted by BHEL shall be considered and no separate unit rates shall be allowed. Unit rates shall be valid throughout the contract period.

VOLUME-III, PRICE SCHEDULE, REV-00

JOB: SUPPLY OF FABRICATED STRUCTURAL STEEL MATERIAL (2991 MT) INCLUDING PAINTING, TRANSPORTATION AT SITE ETC. FOR FGD SYSTEM PKG ETC OF 3X660 MW NORTH KARANPURA STPP, JHARKHAND.

E-TENDER NO.: PSER:PUR:PMX:380(IV):054 (ENQ:21:PP:0015:PUR:67) DATE: 01/12/2021

SCH-2 : (WEIGHTAGE) BREAK-UP OF TOTAL PRICE

SL. NO.	DESCRIPTION OF WORK	UOM	QTY.	WEIGHTAGE FOR TOTAL PRICE OF EACH ITEM
B2301	**Supply, fabrication (shop fabricated in customer approved shop as per specification), transportation from work shop to site & unloading at site of structural steel with mild steel (E250)** rolled section / built up section / combination of both (shop connections (factory fabricated) will be welded type and field connections will generally be bolted type unless otherwise specified) conforming to IS:2062 and technical specification, pipes conforming to IS:1161/ IS:1239, chequered plate conforming to IS: 3052, mild steel rounds, monorails, stays, safety chains, ladders, MS grating etc. in columns, beams, gantry girders, bunkers, silos, hoppers, roof trusses, portals, laced purlins, space frames, hangers, struts, monorails, galleries, stiffeners, wall beams, sheeting runners, brackets, stub columns, bracings, cleats, trestles, base plates, splice plates, chequered plate flooring, decking and seal plates, steel frame grid over false ceiling, walkway platforms, ladders, stairs, stringers, treads, landings, hand-rails etc., including blast cleaning, application of primer, intermidiate & finish paint as mentioned below and as given in specification connection design & preparation of fabrication drgs, fabrication, straightening, cutting, bending, rolling, grinding, machining, drilling, welding, electrodes and other consumables, alignment, (weight of welds not payable.), assembly, edge preparation, preheating (min preheat and interpass temperature of 20° C for welding over 20 mm and upto 40 mm & 66° C for welding over 40 mm and upto 63 mm & 110° C for thickness over 63 mm & use of low hydrogen/ radiogenic electrodes), post heating, testing of welders, inspection of welds, visual inspection, non destructive and special testing, rectification and correction of defective welding works, production test plate, inspection and testing, erection scheme, protection against damage in transit, stability of structures, installation of temporary structures, setting column bases, rectification, dismantling and removal of all temporary structures (weight of temporary structures not payable) etc all complete as per techniical specification. **-Blast cleaning** for making surface conforming to Sa 2 ½ finish of ISO 8501-1 with surface profile 40-60 Micron and providing with two component moisture curing zinc (ethyl) silicate **primer coat** (having minimum 80% of metallic Zinc content in dry film, solid by volume minimum 60% ±2%) of minimum 70 micron DFT, including other associate works etc all complete. The primer coat shall be applied in shop immediately after blast cleaning by airless spray technique. Zinc dust composition and properties shall be Type-II as per ASTM D520-00. **- Providing and applying Intermediate coat** of two component polyamide cured epoxy with MIO Content (containing lamellar MIO minimum 30% on pigment, solid by volume minimum 80% ±2%) of minimum 100 micron DFT. This coat shall be applied in shop after an interval of minimum 24 hours (from the application of primer coat) by airless spray technique etc. all complete as per specification **- Providing and applying Finish Coat** of two pack aliphatic Isocyanate cured acrylic finish paint (solid by volume minimum 55% ±2%) with Gloss retention (SSPC Paint Spec No 36, ASTM D 4587, D 2244, D 523) of Level 2 (after minimum 1000 hours exposure, Gloss loss less than 30 and colour change less than 2.0 ΔE) and minimum 70 micron DFT etc. all complete as per specification. This coat shall be applied at shop after an interval of minimum 10 hours and within six (6) months (from the completion of Intermediate coat), Colour and shade of the coat shall be as approved by the BHEL.	MT	2613	0.85575392

C2301	**Supply, fabrication (shop fabricated in customer approved shop as per specification), transportation from work shop to site & unloading at site of structural steel with high strength steel (E350)** rolled section / built up section / combination of both (shop connections (factory fabricated) will be welded type and field connections will generally be bolted type unless otherwise specified) conforming to IS:2062 and technical specification, pipes conforming to IS:1161/ IS:1239, chequered plate conforming to IS: 3052, mild steel rounds, monorails, stays, safety chains, ladders, MS grating etc. in columns, beams, gantry girders, bunkers, silos, hoppers, roof trusses, portals, laced purlins, space frames, hangers, struts, monorails, galleries, stiffeners, wall beams, sheeting runners, brackets, stub columns, bracings, cleats, trestles, base plates, splice plates, chequered plate flooring, decking and seal plates, steel frame grid over false ceiling, walkway platforms, ladders, stairs, stringers, treads, landings, hand-rails etc. including blast cleaning, application of primer, intermidiate & finish paint as mentioned below and as given in specification connection design & preparation of fabrication drgs, fabrication, straightening, cutting, bending, rolling, grinding, machining, drilling, welding, electrodes and other consumables, alignment, (weight of welds not payable), assembly, edge preparation, preheating (min preheat and interpass temperature of 120-140o C for welding over 20 mm thickness use of low hydrogen/ radiogenic electrodes), post heating, testing of welders, inspection of welds, visual inspection, non destructive and special testing, rectification and correction of defective welding works, production test plate, inspection and testing, erection scheme, protection against damage in transit, stability of structures, installation of temporary structures, setting column bases, rectification, dismantling and removal of all temporary structures (weight of temporary structures not payable), etc all complete as per technical specification. (Rolled sections, etc. of E250 grade welded to main member of E350 for cleats, grout pipes etc. shall also be measured in this item alongwith E350 grade steel.) -**Blast cleaning** for making surface conforming to Sa 2 ½ finish of ISO 8501-1 with surface profile 40-60 Micron and providing with two component moisture curing zinc (ethyl) silicate **primer coat** (having minimum 80% of metallic Zinc content in dry film, solid by volume minimum 60% ±2%) of minimum 70 micron DFT, including other associate works etc all complete. The primer coat shall be applied in shop immediately after blast cleaning by airless spray technique. Zinc dust composition and properties shall be Type-II as per ASTM D520-00. **- Providing and applying Intermediate coat** of two component polyamide cured epoxy with MIO Content (containing lamellar MIO minimum 30% on pigment, solid by volume minimum 80% ±2%) of minimum 100 micron DFT. This coat shall be applied in shop after an interval of minimum 24 hours (from the application of primer coat) by airless spray technique etc. all complete as per specification **- Providing and applying Finish Coat** of two pack aliphatic Isocyanate cured acrylic finish paint (solid by volume minimum 55% ±2%) with Gloss retention (SSPC Paint Spec No 36, ASTM D 4587, D 2244, D 523) of Level 2 (after minimum 1000 hours exposure, Gloss loss less than 30 and colour change less than 2.0 ΔE) and minimum 70 micron DFT etc. all complete as per specification. This coat shall be applied at shop after an interval of minimum 10 hours and within six (6) months (from the completion of Intermediate coat), Colour and shade of the coat shall be as approved by the BHEL.	MT	378	0.13181497
B2302	Appointment of a seperate agency, approved by BHEL, for preparing detailed drawing based on input drawing provided by BHEL, review and approval of fabrication drgs, in consultation with BHEL.	MT	1225	0.01243111
TOTAL				1.00000000

Note:

1 Above total price is exclusive of GST but inclusive of transportation charges on FOR site basis.

PART-H:

FORMS AND PROCEDURES

F-01

RTGS FORMAT

Form for getting payment through RTGS (Real Time Gross Settlement)

01. NAME OF VENDOR:
02. ADDRESS:
03. VENDOR'S BANK A/C NAME:
04. VENDOR'S BANK A/C NO.:
05. NAME OF BANK:
06. NAME OF BRANCH:
07. BRANCH PH. NO.:
08. CITY:
09. IFSC CODE OF THE BRANCH:

THE CHARGES IF ANY FOR PAYMENT THROUGH RTGS MAY BE RECOVERED FROM THE BILL SUBMITTED BY US.

SIGNATURE OF AUTHORISED REPRESENTATIVE OF VENDOR WITH DATE & SEAL

CONFIRMATION BY BANKER WITH OFFICE SEAL

Note: Incorrect information will create accounting complications and payment will be delayed.

F-02

VENDOR DETAILS

1. **Name & address of the vendor/company:**

2. **PAN No. of the vendor/company (scan copy of PAN Card):**

3. **Contact Person for the vendor/company:**

4. **Mobile number & E-mail of the contact person:**

5. **VAT / TIN:**

5. **CST:**

SIGNATURE OF THE BIDDER WITH DATE & SEAL

F-03

FORMAT FOR DETAILS OF BIDDER

NAME OF BIDDER	
FAX NO.	
Registration Number*	
Name of Partners / Directors	
Bidder Type Indian/ Foreign*	
City*	
State*	
Country*	
Postal Code*	
PAN/TAN Number*	
Company's Establishment Year	
Company's Nature of Business*	
Company's Legal Status* {limited company/ undertaking/joint venture/partnership/other}	
Company Category* {micro unit as per MSME/small unit as per MSME/medium unit as per MSME/Ancillary unit/project affected person of this company/ssi/ other}	
Enter Company's Contact Person Details Title(Mr. / Mrs. / Ms. / Dr. / Shri)*	
Contact Name*	
Date Of Birth*	
Correspondence Email* (Correspondence Email ID can be same as your Login ID. All the mail correspondence will be sent only to the Correspondence Email ID.)	
Designation	
Phone*	
Mobile*	

SIGNATURE OF THE BIDDER WITH DATE & SEAL

ANNEXURE-C

State wise GST Registration nos.		
Sl. No.	**State / UT**	**GST Reg. No.**
1	Andhra Pradesh	37AAACB4146P7Z8
2	Assam	18AAACB4146P1ZE
3	Bihar	10AAACB4146P1ZU
4	Chandigarh	04AAACB4146P1ZN
5	Chattishgarh	22AAACB4146P1ZP
6	Daman & Diu	25AAACB4146P1ZJ
7	Delhi	07AAACB4146P1ZH
8	Gujarat	24AAACB4146P1ZL
9	Haryana	06AAACB4146P1ZJ
10	HP	02AAACB4146P1ZR
11	Jharkhand	20AAACB4146P5ZP
12	Karnataka	29AAACB4146P1ZB
13	Kerala	32AAACB4146P1ZO
14	Maharashtra	27AAACB4146P1ZF
15	MP	23AAACB4146P1ZN
16	Punjab	03AAACB4146P2ZO
17	Rajasthan	08AAACB4146P1ZF
18	Tamil Nadu	33AAACB4146P2ZL
19	Telangana	36AAACB4146P1ZG
20	Tripura	16AAACB4146P1ZI
21	UP	09AAACB4146P2ZC
22	Uttarakhand	05AAACB4146P1ZL
23	West Bengal	19AAACB4146P1ZC
24	Mizoram	15AAACB4146P1ZK
25	Orissa	21AAACB4146P1ZR
26	Arunachal Pradesh	12AAACB4146P1ZQ

BANK GUARANTEE FOR PERFORMANCE SECURITY

Bank Guarantee No:

Date:

To

NAME

& ADDRESSES OF THE BENEFICIARY

Dear Sirs,

In consideration of the Bharat Heavy Electricals Limited (hereinafter referred to as the 'Employer' which expression shall unless repugnant to the context or meaning thereof, include its successors and permitted assigns) incorporated under the Companies Act, 1956 and having its registered office at BHEL House, Siri Fort, Asiad, New Delhi – 110049 through its Unit at Bharat Heavy Electricals Limited, Power Sector Eastern Region, BHEL Bhawan, Plot No 9/1, DJ Block, Sector-II, Salt lake City, Kolkata – 700091 having awarded to (Name of the Vendor / Contractor / Supplier) having its registered office at_____[1] hereinafter referred to as the 'Contractor/Supplier', which expression shall unless repugnant to the context or meaning thereof, include its successors and permitted assigns), a contract Ref No……dated ……[2] valued at Rs……[2] (Rupees ----------)for <Nature of Work>[3] (hereinafter called the 'Contract') and the Contractor having agreed to provide a Contract Performance Guarantee, equivalent to ……% (…. Percent) of the said value of the Contract to the Employer for the faithful performance of the Contract,

we, ……, (hereinafter referred to as the Bank), having registered/Head office at ……. and inter alia a branch at …… being the Guarantor under this Guarantee, hereby, irrevocably and unconditionally undertake to forthwith and immediately pay to the Employer a maximum amount Rs ---------- (Rupees ----------)[4] without any demur, immediately on a demand from the Employer, .
Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs. _____ _____.

We undertake to pay to the Employer any money so demanded notwithstanding any dispute or disputes raised by the Contractor/ Supplier in any suit or proceeding pending before any Court or Tribunal relating thereto our liability under this present being absolute and unequivocal.

The payment so made by us under this Guarantee shall be a valid discharge of our liability for payment thereunder and the contractors/supplier shall have no claim against us for making such payment.

We the ……bank further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said Contract and that it shall continue to be enforceable till all the dues of the Employer under or by virtue of the said Contract have been fully paid and its claims satisfied or discharged.

We …….. BANK further agree with the Employer that the Employer shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Contract or to extend time of performance by the said Contractor/Supplier from time to time or to postpone for any time or from time to time any of the powers exercisable by the Employer against the said Contractor/Supplier and to forbear or enforce any of the terms and conditions relating to the said Agreement and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said Contractor/Supplier or for any forbearance, act or omission on the part of the Employer or any indulgence by the Employer to the said Contractor/Supplier or by any such matter or thing whatsoever which under the law relating to sureties would but for this provision have effect of so relieving us.

The Bank also agrees that the Employer at its option shall be entitled to enforce this Guarantee against the Bank as a principal debtor, in the first instance without proceeding against the Contractor and notwithstanding any security or other guarantee that the Employer may have in relation to the Contractor's liabilities.

This Guarantee shall remain in force upto and including…….. [5] and shall be extended from time to time for such period as may be desired by Employer.
This Guarantee shall not be determined or affected by liquidation or winding up, dissolution or change of constitution or insolvency of the Contractor/Supplier but shall in all respects and for all purposes be binding and operative until payment of all money payable to the Employer in terms thereof.

Unless a demand or claim under this guarantee is made on us in writing on or before the ……[6] (3 months more than the present date of validity of Bank Guarantee) we shall be discharged from all liabilities under this guarantee thereafter.

We, …… BANK lastly undertake not to revoke this guarantee during its currency except with the previous consent of the Employer in writing.
Notwithstanding anything to the contrary contained hereinabove:

a) The liability of the Bank under this Guarantee shall not exceed…… [7]

b) This Guarantee shall be valid up to …….[8]

c) Unless the Bank is served a written claim or demand on or before _____[9] (3 months more than the present date of validity of Bank Guarantee) all rights under this guarantee shall be forfeited and the Bank shall be relieved and discharged from all liabilities under this guarantee irrespective of whether or not the original bank guarantee is returned to the Bank.

We, _____ Bank, have power to issue this Guarantee under law and the undersigned as a duly authorized person has full powers to sign this Guarantee on behalf of the Bank.

Any claim or dispute arising under the terms of this document shall only be enforced or settled in the courts of at Kolkata only.

For and on behalf of

(Name of the Bank)

Dated…….

Place of Issue…….

[1] *NAME AND ADDRESS OF THE VENDOR /CONTRACTOR / SUPPLIER.*

[2] *DETAILS ABOUT THE NOTICE OF AWARD/CONTRACT REFERENCE*

[3] *PROJECT/SUPPLY DETAILS*

[4] *BG AMOUNT IN FIGURES AND WORDS*

[5] *VALIDITY DATE*

[6] *DATE OF EXPIRY OF CLAIM PERIOD*

[7] *BG AMOUNT IN FIGURES AND WORDS.*

[8] *VALIDITY DATE*

[9] *DATE OF EXPIRY OF CLAIM PERIOD*

Note:

1. **Units are advised that expiry of claim period may be kept 2/3 months after validity date.**
2. **In Case of Bank Guarantees submitted by Foreign Vendors-**
   a. **From Nationalized/Public Sector / Private Sector/ Foreign Banks (BG issued by Branches in India)** can be accepted subject to the condition that the Bank Guarantee should be enforceable in the town/city or at nearest branch where the Unit is located i.e. Demand can be presented at the Branch located in the town/city or at nearest branch where the Unit is located.

b. From Foreign Banks (wherein Foreign Vendors intend to provide BG from local branch of the Vendor country's Bank)

b.1 In such cases, in the Tender Enquiry/ Contract itself, it may be clearly specified that Bank Guarantee issued by **any of the Consortium Banks only** will be accepted by BHEL. As such, Foreign Vendor needs to make necessary arrangements for issuance of Counter- Guarantee by Foreign Bank in favour of the Indian Bank (BHEL's Consortium Bank). It is advisable that all charges for issuance of Bank Guarantee/ counter- Guarantee should be borne by the Foreign Vendor. The tender stipulation should clearly specify these requirements.

b.2 **In case, Foreign Vendors intend to provide BG from** Overseas Branch of our Consortium Bank (e.g. if a BG is to be issued by SBI Frankfurt), the same is acceptable. However, the procedure at **sl.no. b.1** will required to be followed.

b.3 The BG issued may preferably be subject to Uniform Rules for Demand Guarantees (URDG) 758 (as amended from time to time). In case, of Foreign Vendors, the BG Format provided to them should clearly specify the same.

b.4 The BG should clearly specify that the demand or other document can be presented in electronic form.

List of Consortium Banks *			
	Nationalised Banks		**Nationalised Banks**
1	Allahabad bank	19	Vijaya Bank
2	Andhra bank		**Public Sector Banks**
3	Bank of Baroda	20	IDBI
4	Canara Bank		**Foreign banks**
5	Corporation bank	21	CITI Bank N.A
6	Central bank	22	Deutsche Bank AG
7	Indian Bank	23	The Hongkong and Shanghai Banking Corporation Limited
8	Indian Oversea Bank	24	Standard Chartered Bank
9	Oriental bank of Commerce	25	J P Morgan
10	Punjab National Bank		
11	Punjab & Sindh Bank		**Private banks**
12	State Bank of India	26	Axis Bank
13	State Bank of Hyderabad	27	The Federal Bank Limited
14	Syndicate Bank	28	HDFC
15	State Bank of Travancore	29	Kotak Mahindra Bank
16	UCO Bank	30	ICICI
17	Union Bank of India	31	Indusind Bank
18	United Bank of India	32	Yes Bank

* wef 22.03.2016

Form for getting payment through RTGS (Real Time Gross Settlement)

01.	Name of Vendor	BHARAT HEAVY ELECTRICALS LTD.
02.	Address	~~BHEL~~ BHEL HOUSE, SIRI FORT, N.DELHI
03.	Vendors Bank A/c Name	BHARAT HEAVY ELECTRICALS LTD.
04.	Vendors Bank A/c No.	11107800029
05.	Name of Bank	STATE BANK OF INDIA
06.	Name of Branch	COMMERCIAL BR., SALT LAKE, SECTOR-V KOLKATA
07.	Branch Phone No.	033-23575666
08.	City	KOLKATA
09.	IFSC Code of the Branch	SBIN 0004289

The charges if any for payment through RTGS may be recovered from the Bill submitted by us.

Signature of Authorised Representative of Vendor with office seal

के. के. कोआरी / K. K. Coari
उप महाप्रबंधक (वित्त) / Dy. General Manager (Fin)
बी. एच. ई. एल. : पी.एस.ई.आर : कोलकाता - 700 091
BHEL : PSER / Kolkata-700 091

Confirmation by Banker with office seal

State Bank of India ★ Commercial Branch ★ SALT LAKE 4289

Note : Incorrect information will create Accounting complications and payment will be delayed

These Technical conditions for SUPPLY OF FABRICATED STRUCTURAL STEEL MATERIAL INCLUDING PAINTING, TRANSPORTATION AT SITE ETC. FOR FGD SYSTEM PKG ETC OF 3X660 MW NORTH KARANPURA STPP, JHARKHAND shall be construed as part of tender document and shall be read along with other volumes of tender, i.e. general conditions of contract (GCC), Volume-III etc and in case of any conflict or inconsistency, the provision of the TCC, "Volume- IC" shall prevail.
All the tender clauses are individually applicable for respective package unless specifically mentioned separately/differently, as applicable.

CLAUSE NO	DESCRIPTION
	NAME OF JOB
1.0	The scope covers supply of fabricated structural steel materials including painting, transportation at BHEL NKSTPP Site-Jharkhand for **FGD Package etc. at 3x660 MW North Karanpura STPP, Jharkhand.**
2.0	**BROAD SCOPE OF JOB**
2.1	The scope of supply job under this contract covers procurement of raw material from customer approved supplier and supply of customer approved shop pre-fabricated structural steel finished structures, fabrication and transportation to North Karanpura FGD Project site, LIME STORAGE SYSTEM (LSS) AND GYPSUM STORAGE SYSTEM (GSS), MISC. ALLIED STRUCTURAL ITEM ETC. of Unit No. # 1, 2, 3 of 3x660 MW NORTH KARANPURA, Jharkhand Project. Scope of supply of Pre-Fabricated Structural Steel Items of FGD, LSS & GSS system shall include but not limited to the following: Truck Hopper Super Structure Framing and Roofing, FGD Control Room Building, MCC Building. Ball Mill Building & Lime Stone Storage Building, Transfer Point (TP's), Conveyor and trestle. Gypsum Dewatering Building, Crusher House (CR Building), Gypsum Storage Shed. Pent House. Misc. Pump & Equipment Shed. Flue Duct and Pipe Line Duct Support. Pipe & Cable Trestles, Air & Water pipe line Support structure. Limestone Storage Silo. Misc. Structures, etc.
2.2	While some portion of Structures, mainly auxiliary support, small beam & inserts, shear key's etc are planned to be fabricated at site, rest of the Structures listed above are expected to be supplied as pre- fabricated product through BHEL/NTPC approved shop following the approved manufacturing quality plan and transport to site. Basic Design Drawing will be provided by BHEL Engineering group.
3.0	**Supply of fabricated structures :**
3.1	The job is to be carried out under the scope of these specifications is broadly as under:
3.2	Preparation of detailed drawings, bill of materials, material codification, obtaining approvals from BHEL Project Engineering Management / NTPC.
3.3	Joint design calculations and all other general and special requirements, including appointment of a separate agency for the above job, approved by BHEL for review. The successful bidder will tie up with structural design reviewing agency with the approval of BHEL for review of the prepared drawing, BOM, calculation etc (as mentioned in clause 3.2) prior to submission to BHEL for final review and approval by BHEL/NTPC.
3.4	Approval of fabrication drawings from BHEL Project Engineering Management / NTPC. (Approval of fabrication drawing does not relieve the bidder from the responsibility of its correctness and accuracy). BHEL shall provide some approved detailed drawings as per BOQ where detailing and reviewing is not required.
3.5	All the steel structures (excluding auxiliary support, small beam & inserts, shear key's) need to be fabricated in an established factory, transported to site NKSTPP and the factory referred shall be in operation for the last two years from the date of techno-commercial bid opening.
3.6	Material required for the fabrication job (excluding auxiliary support, small beam & inserts, shear keys with allied Stainless Steel liners which are to be fabricated at site) for the scope i.e. Chq. Plates/MS plates, Flats/ beams/ channel/, angles etc. (rolled sections), etc. have to be arranged by the bidder within his quoted price.
3.7	Supply of finished materials at site to be as per BOQ of scope of supply job.
3.8	Unloading and Receipt of structural steel raw materials from vehicles of supplier using bidder's own T & P and manpower at bidder's facilities / workshop/ factory, stacking, stock keeping, watch & ward etc.
3.9	Fabrication, welding, destructive, non-destructive and any other tests as per approved QP /FQP/ BHEL/NTPC requirement.

3.10	Steel sections shall be blast cleaned for making surface conforming to Sa 2 ½ finish of ISO 8501-1 with surface profile 40-60 Micron and provided Primer coat on steel sections with two component moisture curing zinc (ethyl) silicate primer coat (having minimum 80% of metallic Zinc content in dry film, solid by volume minimum 60% ±2%) of minimum 70 micron DFT, including touch-up painting, etc all complete. The primer coat shall be applied in shop immediately after blast cleaning by airless spray technique. Zinc dust composition and properties shall be Type-II as per ASTM D520-00 complete as per specification, drawings and instructions of the Engineer. OR Steel sections shall be blast cleaned for making surface conforming to Sa 2 ½ finish of ISO 8501-1 and provided with epoxy resin based zinc phosphate primer in coats of minimum 50 micron (DFT) at shop and 50 micron (DFT) after erection, including touch-up painting, mist coat, additional water sprinkling etc all complete.
3.11	The primer coat shall be applied in shop / workshop/ factory immediately after shot blast cleaning using copper slag media by Airless spray technique on structural steel made from mild steel conforming to IS:2062, pipes conforming to IS:1161/IS:1239, chequered plate conforming to IS:3052 and mild steel rounds involving rolled sections (including mild steel rounds), built up sections fabricated out of plates, rolled sections and combination of plates and rolled sections, in columns, beams, junction towers, trestles, conveyor galleries, gantry girders, bunkers, silos, hoppers, roof trusses, portals, laced purlins, space frames, shear connectors, hangers, struts, monorails, galleries, stiffeners, wall beams, sheeting runners, brackets, stub columns, bracings, cleats, trestles, base plates, splice plates, gratings, chequered plate flooring, decking and seal plates, diaphragm, steel frame grid over false ceiling, walkway platforms, ladders, stairs, stringers, treads, landings, hand-rails, toeplates, MS Rungs, insert plates, edge angles - embedments, lugs, posts, stays, louvers, lacings, gusset plates, safety chains for walkways adjacent to crane girders etc.
3.12	Straightening, making cutting plan, cutting, bending, rolling, grinding, drilling, bolting, temporary pre assembly- full length column height (Trial assembly), edge preparation, preheating (min preheat and inter-pass temperature of 20 degree C for welding over 20 mm and upto 40 mm & 66 degree C for welding over 40 mm and upto 63 mm & 110 degree C for thickness over 63 mm & use of low hydrogen/ radiogenic electrodes), post heating, testing of welders, inspection of welds, visual inspection, non-destructive and special testing, rectification and correction of defective welding works, production test plate, inspection and testing as per erection scheme.
3.13	Intermediate coat (applying with airless spray technique) of two component polyamide cured epoxy with MIO Content (containing lamellar MIO minimum 30% on pigment, solid by volume minimum 80% ±2%) of minimum 100-micron DFT. This coat shall be applied in shop after an interval of minimum 24 hours (from the application of primer coat) by airless spray technique including protection and cleaning, scaffolding etc. all complete as per specification for all structures. Intermediate coat paints shall be from same manufacturer and the paints shall have compatibility with one another.
3.14	Finish Coat of two pack aliphatic Isocyanate cured acrylic finish paint (solid by volume minimum 55% ±2%) with Gloss retention (SSPC Paint Spec No 36, ASTM D 4587, D 2244, D 523) of Level 2 (after minimum 1000 hours' exposure, Gloss loss less than 30 and colour change less than 2.0 ΔE) and minimum 70 micron DFT including protection and cleaning, scaffolding, touch up painting etc. all complete as per specification for all structures. This coat shall be applied at shop after an interval of minimum 10 hours and within six (6) months (from the completion of Intermediate coat), Colour and shade of the coat shall be as approved by BHEL / NTPC.
3.15	The total thickness of finished product at workshop (Primer 70 microns + Intermediate Coat 100 microns + Finish Coat 70 microns = 240 microns).
3.16	Delivering finished products from factory to NTPC North Karanpura Project.
3.17	Trial Pre assembly activity will be at bidder shop or at site as required by BHEL/NTPC by using bidders T&P in his own cost, no separate cost will be paid for Trial Pre assembly activity. Bidders may quote considering all such hidden activity as extra in their rate price. BHEL may visit for inspecting the Trial Pre assembly activity.
3.18	BHEL/NTPC may visit fabrication shop for checking eligibility/competency of shop. Approval from NTPC is required before start the fabrication job. In any discrepancy bidder shall be complied as per BHEL/NTPC requirement at any stage of job.
3.19	Bidder/Bidder's agency must be possessing established fabrication work shop / factory equipped with all kinds of T & P's and other necessary requirement for supply of finished material as per specification at their own cost Tentative requirement of Factory is stipulated in **Annexure -A**. All other equipments and T&Ps (if required) for supply of finished material, shall be arranged by Fabricator.

3.20	Inspection of finished product will be conducted as per customer BHEL/NTPC requirement as mentioned in customer approved Quality Plan.
3.21	Detailed Technical specification for the job is attached vide NTPC "Contract Agreement Volume-D, Book 1 of 4 and Volume-D, Book 3 of 4". Bidder is requested to refer relevant applicable portion.
4.0	**Specific conditions for Supply of Fabricated Structures**
4.1	After receipt of Purchase Order, Bidder shall discuss with project manager / construction manager of BHEL regarding starting of structural fabrication job. The successful bidder will tie up with approved detailers of BHEL/NTPC for preparation of detailed fabrication drawing, BOM preparation, submission of same to BHEL and getting approval from BHEL/NTPC. Appointed Detailers by the successful bidder will co-ordinate with BHEL-PSER/ISG/PEM/NTPC for approval of drawing and also interact with BHEL for day to day routine co-ordination for any clarification during fabrication. On receipt of approval of detailed drawings, successful bidder will start fabrication job in customer approved "FABRICATION WORKSHOP / FACTORY" in line with approved drawings, specifications and quality plan. Bidder shall mobilize further resources at workshop as per requirement to commence the job of fabrication, testing, shot blasting, painting etc. to match schedule of the project. BHEL shall provide some approved detailed drawings as per BOQ where detailing and reviewing is not required.
4.2	Material required for the entire job for the completion of entire scope Chq. Plates/MS plates, Flats/ beams/ channel/, angles etc. (rolled sections), Stainless steel liner, bolts, nuts, washers etc. have to be arranged by the bidder. The total quantity of steel required for the job will be calculated from the approved fabrication drawings including laps, chairs and lugs. In case any such sectional weights are not available in the above documents, the manufacturer recommendation / BHEL Engineer instruction/Indian Standard Code recommendation shall be binding. BHEL reserves the right to reject any material not found satisfactory.
4.3	The bidder shall procure raw material / components / sub-assemblies only from BHEL / NTPC approved vendors namely from SAIL, RINL or JINDAL or others NTPC approved list for NKSTPP directly and shall be backed up with required correlated test certificates. In case of procurement from Sole Selling Agents / Authorized Dealers of these suppliers, supporting correlated test certificates of manufacture shall be furnished. In the absence of such certificates, tests as per the governing specifications shall be arranged in independent test house / laboratory approved by BHEL / NTPC for NKSTPP Project by the bidder at his own cost.
4.4	The bidder shall abide fully by all the clauses of Shop inspection and tests covered in the Technical Specification, attached with this tender. BHEL reserves the right to consider any stage of inspection / test as a "Hold Point", beyond which job shall not proceed without acceptance of that stage.
4.5	The minimum Inspection / Testing requirements shall conform to relevant codes / standards as well as Statutory Regulations applicable, whether or not specifically mentioned in the specification, in addition to those normally carried out by the bidder.
4.6	Unless the Inspection / Test is waived, the inspection agency shall attend the Inspection / Test within 15 days of the date of receipt of notice from the bidder, failing which the bidder may proceed with the Inspection / Test and shall forward duly certified copies of the Inspection / Test Reports. After successful completion of the Inspection / Test or receipt of bidder's Test reports mentioned above, the Inspection agency (BHEL/ NTPC/TPIA of BHEL or NTPC shall issue the acceptance certificate within 15 days. Wherever Customer / Consultant "Hold Points" are indicated in the approved Quality Plan an additional 10 days' notice shall be given for Inspection / Testing.
4.7	Before sending written notice to the Inspection Agency, the bidder's own inspection staff should have fully inspected / tested the item. If the visit of the Inspection Agency proves to be futile on account of the item not being ready for inspection / Testing or the same being rejected for reasons which could otherwise, have been detected during bidder's own Inspection / Test, the cost incurred by Inspection Agency on such visits shall be borne by the bidder.
4.8	Approval or passing of Inspection / Test and thereby issue of the acceptance Certificates or waive of Inspection by the Inspection Agency shall not relieve the bidder of his responsibilities and obligations under the contract and also shall not bind BHEL to accept the item should it, on further tests after receipt at destination, erection / commissioning be found not complying with the Contract.
4.9	All necessary documents such as test reports, test certificates, test curves, stress relieving charts, radio graphic films and other non-destructive tests, copies of the welding procedure, welder qualification certificates and other documents in support of adherence to Quality plan shall be furnished to the Inspection agency. The Quality Assurance document consisting of certified copies of all of the above complied sequentially by the bidder shall be sent to BHEL prior to dispatch.
4.10	In the event of inspection revealing poor quality of goods, BHEL shall be at liberty to specify additional Inspection / Test, required ascertaining bidder's compliance with the equipment specification.
4.11	All welding shall be carried out in accordance with applicable codes or approved equal. Welding

	procedure and Welder's qualification shall be got approved. Welding consumables etc used, shall be approved by the BHEL/NTPC. Approved methods of radiographic, ultrasonic or other non-destructive testing as applicable shall be used for the welding of critical components / assembly.
4.12	None of the item shall be dispatched without the receipt of "Quality Surveillance Note" from the Inspection Agency as well as the written approval in the form of Material Dispatch Clearance Certificate (MDCC) unless specifically agreed.
4.13	All supplied fabricated structures shall be marked with clearly identifiable erection mark numbers as shown in the fabrication/ detailed drawings. This will be duly verified at site during material receipt based on which MRC shall be prepared.
4.14	To address any mismatch during erection stage, the successful bidder shall deploy a technical person on continuous basis at site for proper co-ordination with various agencies so that problem is attended / rectified without any time gap.
5.0	**Material Despatch Clearance Certificate (MDCC)** for Supply of Fabricated Structures to be issued by customer/BHEL before supply of finished material.
5.1	When the tests have been satisfactorily completed at the Seller/Bidder's workshop, the Inspection Agency shall issue a certificate to that effect within fifteen (15) days after completion of tests, but if the tests were not witnessed by the Inspection Agency or his representative, the certificate would be issued within fifteen (15) days of the receipt of the test certificates by the Inspection Agency. BHEL /NTPC will issue MDCC to the bidder based on the physical inspection/QS Note/Report/Manufacturer's Test certificate for raw materials with COC (Certificate of conformance) by the bidder.
5.2	Bidder will not dispatch any material before issue of MDCC by BHEL /NTPC.
5.3	The satisfactory completion of these tests or the issue of MDCC, shall not bind BHEL / NTPC to accept the supply/equipment, should it, on further tests after erection, be found not to comply with the contract provisions.
5.4	For all category item (Cat –I, II & III), MDCC shall be issued by BHEL/NTPC and it is the responsibility of bidder to collect MDCC from them, and original MDCC shall be attached with Invoice by bidder for claiming payment from BHEL.
6.0	**MATERIAL RECEIPT CERTIFICATE for Supply of Fabricated Structures** The bidder shall arrange Material Receipt Certificate (MRC) at project site, duly signed by the BHEL/ NTPC Site Engineer, after receipt of the material at site and after it's physical verification.
7.0	**SHORTAGES/DAMAGES for Supply of Fabricated Structures** Any shortages or damages during transit, transportation shall be made good by the bidder at his risk and costs, to meet the project schedule. In case of faults/discrepancies in any material, component, sub-assembly, assembly, etc., the same shall be supplied/ replenished free of cost to enable the equipment to be put in service. Shortages in some cases shall also be replenished free of cost.
8.0	**QUALITY PLAN for Supply of Fabricated Structures**
8.1	The Quality Plan is a document, which presents in a tabular form the Quality control checks exercised by the bidder during the various stages of manufacture and dispatch in order to meet the requirements of this specification. This plan details, step by step, the operations, components and characteristics being controlled, method of exercising such controls, the importance (criticality) of the control (critical major or minor) with respect to the functioning of the item the extent to which the controls are exercised (100% samples, one per heat, etc.). Acceptance norms for the characteristics, method of maintaining records thereof as a proof of having exercised the control successfully, the agency responsible for performing and witnessing the checks and for verifying the records thereof.
8.2	The bidders shall furnish the Quality Plan for approval from BHEL / NTPC. In case the Standard Quality plans are included in tender specification, the bidder shall furnish his Quality Plan strictly in line with the same.
8.3	Copies of Bidder's/Bidder's Collaborators catalogues/drawings/ standards/ specifications/ procedures etc. as mentioned in reference document of the Quality Plan shall be furnished for approval.
8.4	In the Quality Plan, the bidder shall give in detail, the quality control checks exercised by him during the various stages of manufacture such as: a. All bought out items and incoming material checks carried out at sources and on receipt. b. Process of manufacture i.e. welding, heat treatment etc. c. Manufacture of various components, sub-assemblies and assembly. d. Final Inspection and Testing including Performance Test at shop e. Surface preparation and painting f. Packing, Marking and Despatch. g. Proper Loading on transporting vehicle to reach safely to site.
9.0	**Inspection Agency for Supply of Fabricated Structures:** Inspection of packages shall be carried out by agency as per below Inspection category of packages: 1. Cat I:- Inspection shall be done jointly by NTPC, BHEL & bidder. 2. Cat-II:- Inspection shall be done by BHEL & Successful bidder.

	3. Cat-III:- Certificate of Compliance shall be furnished by bidder. Please note, for Cat I & II items BHEL reserve the right to carry inspection by themselves or through nominated third party. For Inspection agency of various items, bidder may refer to Quality Plan. Bidder to raise all inspection calls in BHEL online portal http://cqir.bhel.in only. The nominated TPIA for subject inspection shall be intimated to successful bidder separately.
10.0	**Consignee Address for Supply of Fabricated Structures:**
10.1	Details of the Consignee for supply of the fabricated structures shall be intimated by BHEL Site/PMX later during execution.
11.0	**TERMS OF PAYMENT FOR FABRICATED STRUCTURAL STEEL SUPPLY:**
11.1	90% of basic price of materials supplied against receipt of material at site on pro-rata basis as per approved billing schedule. Documents (required sets) required, as applicable, for such payment are as follows.
11.2	Invoice / excisable invoice in original.
11.3	LR / RR (consignee copy).
11.4	Packing list.
11.5	BHEL / customer MDCC enclosing QS note, inspection & test certificate, wherever applicable.
11.6	Copy of letter, addressed to insurance company intimating dispatch.
11.7	Material Receipt Certificate (MRC) will be issued after receipt of materials and its physical verification at site on pro-rata basis. Collection of MRC from the site and its submission for claiming the payment shall be bidder's responsibility.
11.8	Guarantee Certificate
11.9	BHEL Site at their discretion, may further split up the above percentages and effect payment to suit the site condition, cash flow requirement and according to the progress of job.
11.10	5% of the basic price shall be released after completion of Erection and Alignment of respective supplied structures at BHEL site.
11.11	Balance 5% amount shall be retained towards 'Performance Guarantee for Material/Workmanship' and shall become refundable after expiry of Guarantee period, provided all the defects noticed during the guarantee period have been rectified to the satisfaction of BHEL Site Engineer/BHEL Construction Manager, and after deducting all expenses/other amounts due to BHEL under the contract/other contracts entered into by BHEL with them. This portion of the retention amount can be released on commencement of the Guarantee period, on submission of equivalent Bank Guarantee.
11.12	GST portion of invoice shall be released only upon - (i) such invoice appearing in GSTR-2A of BHEL on filing of valid returns by vendor as per GST law within timeline prescribed for availing ITC by BHEL, and (ii) Receipt of goods / services and Tax invoice by BHEL, and (iii) Confirmation of payment of GST thereon by vendor on GSTN portal.
11.13	Paying Authority shall be Construction Manager, BHEL, North Karanpura Site.
12.0	**CONTRACT EXTENSION**
12.1	If the completion of job as detailed in these specification gets delayed beyond the end of contract period then depending on the balance job left out, BHEL at its discretion may / may not extend the contract.
12.2	A joint program shall be drawn for the job to be completed during the extended contract period. Review of the program and record of shortfall as described earlier shall be done during the extended period.
12.3	The part of extension attributable to the bidder, if any, in total contract extension shall be exhausted first i.e., immediately after end of contract period. This shall be followed by the extension on account of force majeure conditions, if any, and lastly on account of BHEL.
12.4	Any other service, although not specifically called for but required for a contract of the size and nature indicated in the specification.
13.0	**SECURITY DEPOSIT (SD) - Not applicable**
14.0	**TRANSIT INSURANCE**
14.1	BHEL shall arrange comprehensive MCE (marine cum erection) Insurance Policy for total project supply & services including balance of plant package covering transit risks & loss, destruction or damage during handling at site, storage, civil jobs, erection, testing and commissioning up to trial operation completion of each unit including theft, sabotage, fire, lightning and other natural calamities.
14.2	Bidder shall timely intimate despatches to the underwriter failing which the bidder shall be held responsible for the loss/damage/theft of materials during transit The name of the underwriter and Policy No. shall be intimated in due course of time.
14.3	Bidder shall report to BHEL in writing any damages to equipment/components on receipt, storing and during withdrawal of the materials from stores, in transit to site and unloading at site till trial operation completion. The above report shall be as prescribed by BHEL site management. Any consequential loss arising out of non-compliance of this stipulation will be borne by bidder.

14.4	The bidder shall be responsible for timely submission of loss/ damage/ theft to the underwriter, assistance in lodging & settlement of claim for losses/ damages/ theft/ lodging of FIR with police. Any consequential loss arising out of non-compliance of this stipulation will be borne by bidder.
14.5	The bidder will take necessary precautions/ due care to protect the material at project site, while in their custody from any damage/ loss till the same is handed over to BHEL/ owner at project site. For lodging/ processing of insurance claim, the bidder will submit necessary documents. BHEL reserve the right to decide recourse to recovery of loss from the bidder or otherwise in case the damage/ loss are due to negligence/ carelessness on the part of the bidder. Such cases will be analysed/ reviewed by a committee, comprising of members from BHEL's different functions, for taking final course of action. In case of theft of material under bidder's custody, the same shall be reported to police by the bidder immediately and copy of FIR and subsequently police investigation report shall be submitted to BHEL/ owner for taking up with insurance. However, this will not relieve the bidder of his contractual obligation for the materials in their custody. Decision of BHEL in this regard shall be binding on bidder.
14.6	While BHEL will take up suitably with underwriter for lodging & settlement of claim for losses/ damages/ theft/ lodging, the differential amount between amount claimed & settled by underwriter will be analysed / reviewed by a committee, comprising of members from BHEL's different functions, for taking final decision. Decision of BHEL in this regard shall be binding on bidder.
14.7	In case the claim is summarily rejected by the underwriters due to WILFUL NEGLIGENCE of the bidder and bidder's failure to replenish the items lost/damaged, the entire cost of repair/ replacement will be recovered from bidder.
14.8	It will be responsibility of bidder to replenish the items lost/ damaged in time without hampering the schedule of job and without waiting for settlement of insurance claim. Amount received from the underwriters on settlement of insurance claim shall be passed on to the bidder as and when available.
14.9	Other conditions of Insurance shall be as per relevant clause of GCC.
15.0	**COMPLETION PERIOD**
15.1	SUPPLY COMPLTION PERIOD; Total pre-fabricated structural steel Supply to erection site NKSTPP pertaining to FGD, Lime Storage System (LSS), Gypsum Storage System (GSS) and all other structures etc to be completed by **06 Months (Six Month)** from Date of LOI.
15.2	The job under the scope of contract will be deemed to be completed in all respects only when all the components are erected and trial runs, testing and commissioning of all individual equipment including trial operations of each units with full load are conducted and handed over to customer. The decision of BHEL shall be final and binding on the bidder.
15.3	Fabrication schedule / sequence shall be furnished by bidder before start of fabrication job showing fabrication of at least 500MT Per month. Delivery of the fabricated structures to start within 30 days from the date of LOI. Fabrication schedule shall be submitted within 07 days from the date of LOI to BHEL for approval. BHEL has right to change this fabrication schedule at any stage as they required.
16.0	**SUPPLY SCHEDULE**
16.1	Bidder shall plan activities accordingly to match the completion period.
16.2	A bar chart showing of various milestones to be submitted by the bidder within 07 days from date of LOI to BHEL PMX/ Site Construction Manager, BHEL site for approval.
17.0	**TAXES AND DUTIES**
17.1	All taxes excluding GST & BOCW Cess (as specified elsewhere in the tender) but including, Charges, Royalties, any State or Central Levy and other taxes for materials if any obtained for the work and for execution of the contract shall be borne by successful bidder and shall not be payable extra by BHEL. Any increase of above at any stage during execution of contract, including extension of the contract, shall have to be borne by successful bidder contractor. Bidder's quoted/ accepted rates/ price shall be inclusive of all such requirements.
17.2	GST along with Cess (as applicable) legally leviable & payable by successful bidder as per GST Law shall be paid by BHEL, extra. Hence, bidder shall not include GST along with Cess (as applicable) in their quoted rates/ price.
17.3	Successful bidder shall furnish proof of GST registration with GSTN Portal covering the services under this contract. Registration should also bear endorsement for the premises from where the billing shall be done by successful bidder on BHEL for this project / work.
17.4	Since GST on output will be paid by BHEL separately as enumerated above, bidder's your quoted rates / price should be after considering the Input Credit under GST law at bidder's end.
17.5	TDS under Income Tax Act shall be deducted as per prevailing IT rules from the bills.
17.6	TDS under GST shall be deducted as per prevailing GST rules from the bills.
17.7.1	You may collect TCS under section 206C(1H) of Income Tax Act, 1961 if applicable.
17.7.2	In case, you collect TCS under section 206C(1H) of Income Tax Act, 1961, following compliance is

	required
17.7.2.1	TAN and PAN of vendor should appear in all invoices/claims. Copy of TAN /TCS registration is to be submitted.
17.7.2.2	Amount of TCS and Assessable value on which TCS has been calculated should be specified clearly in the invoice
17.7.2.3	You shall be required to submit certificate of TCS in Form no. 27D within 15 days from the due date for furnishing the statement of tax collected at the source.
17.7.3	In case, you do not collect TCS under section 206C(1H) of Income Tax Act, 1961, following declaration is to be submitted alongwith each invoice: - "I/We hereby declare that I/We are not required to collect TCS under section 206C(1H) of Income Tax Act,1961, on this bill.
17.7.4	In event of failure to comply with the provisions of the Act, or proper certificate not issued, or if tax collected but not remitted to the Government, or for any other reason and thereby causing loss to BHEL, the same shall be recoverable from the vendor with applicable interest.
17.7.5	You shall comply with all statutory amendment/notifications in this respect.
17.8	Bidder shall note that GST Tax Invoice complying with GST Invoice Rules (Section 31 of GST Act & Rules referred thereunder) wherein the 'Bill To' details shall encompass following. BHEL GSTN – 20AAACB4146P5ZP. Name - BHARAT HEAVY ELECTRICALS LIMITED Address - Shall be intimated later. Specific details of BHEL GSTN, Name and Address as stated above, have been specified elsewhere in the tender.
17.9	Successful bidder to intimate immediately on the day of removal of goods (in case of any supply of goods) to BHEL along with all relevant details and send a scanned copy of Tax Invoice to BHEL through following communication mode for enabling BHEL to meet its GST related compliances. Portal address and Email address – Shall be intimated later. Specific details of above shall be intimated to successful bidder by BHEL at appropriate juncture.
17.10	In case of delay in submission of above mentioned documents on the date of despatch, BHEL may incur penalty/ interest for not adhering to Invoicing Rules under GST Law. The same will be liable to be recovered from successful bidder, in case such delay is not attributable to BHEL.
17.11	In case of raising any Supplementary Tax Invoice (Debit / Credit Note), successful bidder shall issue the same containing all the details as referred to in Section 34 read with Section 31 of GST Act & Rules referred there under.
17.12	Successful bidder shall comply with the Time Limit prescribed under the GST Law and rules thereof for raising of the Tax Invoice. If any supply of goods is applicable, successful bidder shall also ensure prompt delivery of goods after despatch.
17.13	Bidder shall note that in case GST credit is delayed / denied to BHEL due to delayed / non receipt of goods and / or Tax Invoice or expiry of the timeline prescribed in GST Law for availing such ITC, or any other reasons, not attributable to BHEL, GST amount shall be recoverable from successful bidder along with interest levied/ leviable on BHEL, as the case may be.
17.14	Successful bidder shall upload the invoices raised on BHEL in GSTR-1 within the prescribed time as given in the GST Act, and the same shall be available to BHEL in FORM GSTR-2A/2B electronically through the common portal. Bidder shall note that in case of delay in declaring such invoice in your 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.
17.15	Way Bill: Successful bidder to arrange for way bill / e-waybill for any transfer of goods for the execution of the contract. Successful bidder has to make their own arrangement at their cost for completing the formalities, if required, with Issuing Authorities, for bringing materials, plants & machinery at site for execution of the works under this contract, Road Permit / Way Bill, if required, shall be arranged by successful bidder and BHEL will not supply any Road Permit/ Way Bill for this purpose.
17.16	Any new taxes & duties, if imposed subsequent to due date of offer submission as per NIT & TCN, by statutory authority during contract period (including extension, if the same is not attributable to you), shall be reimbursed by BHEL on production of relevant supporting document to the satisfaction of BHEL. However, you shall obtain prior approval from BHEL before depositing new taxes and duties.
17.17	Benefits and / or abolition of all existing taxes must be passed on to BHEL against new taxes, if any, proposed to be introduced at a later date.
17.18	Other than above, no taxes & duties are payable.
18.0	**PRICE VARIATION COMPENSATION (PVC)**
18.1	In order to take care of variation in cost of execution of work on either side, due to variation in the index of STEEL, Price Variation Formula as described herein shall be applicable. PVC is applicable from the date of Purchase Order and during the extension period as well (if any), subject to other conditions as described in this section. 70% component of Contract Value (Unit Rate) shall be permitted to be adjusted for variation in relevant Steel indices during execution of work. The remaining 30% shall be treated as fixed component.

	Payment/recovery due to variation in index shall be determined on the basis of the following notional formula without any initial absorption, in respect of the identified component i.e. STEEL $P = 0.70 \times R \times (X_N - Xo) / Xo$ Where P = Amount to be paid/recovered due to variation in the Index of Steel R = Value of Supply done for the billing month (Excluding Taxes and Duties if payable extra) X_N = Revised Index No for Steel for the billing month under consideration. This index shall be average of indices of 03 previous consecutive months. Xo= Index no for Steel on the Base date. Base date shall be calendar month of the latest date of submission of Tender.
18.2	Indices shall be as per the 'MONTHLY WHOLE SALE PRICE INDEX' for the Commodity: MILD STEEL: LONG PRODUCTS Commodity Code: 1314040000, published by Office of Economic Adviser, Ministry of Commerce and Industry, Government of India. (Website: http://eaindustry.nic.in/home.asp). Revisions, if any, in the index or commodity will be re adjusted accordingly. In case, the contract gets extended beyond the contract period, for reasons attributable to the Fabricator, PVC shall not be provided for the extended period. In case, the contract gets extended beyond the contract period, for reasons not attributable to the Fabricator, PVC shall be provided as stipulated in the notional formula. In case, the contract gets extended beyond the contract period, for reasons attributable to the Fabricator and the Customer, the percentage of delay not attributable to Fabricator shall be considered for PVC derivation. PVC shall be provided as stipulated in the notional formula.
18.2.1	a. PVC shall not be payable for the Supplementary/Additional Items, Extra works. However, PVC will be payable for items executed under quantity variation of BOQ items under originally awarded contract. b. Price Variation bills shall be claimed Monthly by the successful Fabricator c. Price Variation amount payable/recoverable shall be regulated as follows: i. PVC shall be worked out on the basis of indices applicable for the respective month in which work is done. ii. The total amount of PVC shall not exceed 15% of the cumulatively executed contract value. Executed contract value for this purpose is exclusive of PVC, Supplementary/ Additional Items and Extra works except extra items due to quantity variation.
19.0	**ORC (OVER RUN COMPENSATION)**
19.1	ORC is not applicable for this contract.
20.0	**GUARANTEE PERIOD**
20.1	The bidder shall warrant that the fabrications comply fully with the drawings and other technical conditions specified by BHEL. If the fabrications are found defective/mismatch owing to faulty supply/workmanship/incomplete job within a period of Twelve months from the date of dispatch of last consignment, the bidder shall do the necessary repair/rework/rectification or replace the defective items free of cost (including repair materials). In case bidder fails to repair the defective items or replace the defective items within the time specified by BHEL, BHEL may proceed to undertake the repairs of such defective jobs at bidder's risk and cost without prejudice to any other rights and recover the same from SD/ other dues.
21.0	**LIQUIDATED DAMAGES (LD)**
21.1	LD shall be 0.5% of basic value of undelivered portion per week of delay as per approved fabrication schedule or part thereof subject to a maximum of 10% of the total Contract value (i.e. excluding elements of taxes). In case of LD recovery, the applicable GST shall also be recovered from vendor. For this purpose, the period of delay shall be the delay attributable to the Fabricator for the completion of job as per contract. Contract value for this purpose, shall be the final executed value exclusive of Extra Works, Supplementary/Additional Items and PVC (if any).
22.0	**COMMUNICATION** The bidder shall be responsible for arranging all communication facilities at office. The bidder's office/work shop must have facilities of communications like Fax, E-mail, and telephone with STD facility etc for time to time communication with BHEL/NTPC.
23.0	**ENGINEERING SERVICES** As part of the overall project management activity, the bidder shall be responsible for proper engineering and coordination activities during various phases of execution of the contract. The bidder shall identify one Engineering Manager with whom BHEL will interact on all matters on coordination between BHEL and the contactors. The Engineering Manager shall be the single point contact person on behalf of the bidder and shall be responsible for all engineering co ordination.
24.0	**EXTENSION OF TIME FOR COMPLETION**

24.1	If the completion of job as detailed in the scope of job gets delayed beyond the contract/ completion period, the bidder shall request for an extension of the contract and BHEL at its discretion may extend the contract.
24.2	Based on the reviews jointly signed, the scope balance at the end of original contract period less the backlog attributable to the bidder shall be quantified, and the number of months of 'Time extension' required for completion of the same shall be jointly worked out. Within this period of 'Time extension', the bidder is bound to complete the portion of backlog attributable to the bidder. Any further 'Time extension' or 'Time extensions' at the end of the previous extension shall be worked out similarly.
24.3	However, if any 'Time extension' is granted to the bidder to facilitate continuation of job and completion of contract, due to backlog attributable to the bidder alone, then it shall be without prejudice to the rights of BHEL to impose penalty/ LD for the delays attributable to the bidder in addition to any other actions BHEL may wish to take at the risk and cost of bidder.
24.4	A joint programme shall be drawn for the balance amount of job to be completed during the period of 'Time Extension'. Review of the programme and record of shortfall shall be done.
24.5	At the end of total job completion as certified by BHEL engineer, and upon analysis of the total delay, the portion of time extensions attributable to (i) bidder, (ii) Force majeure conditions, and (iii) BHEL, shall be worked out and shall be considered to be exhausted in the same order. The total period of time extensions shall be the sum of (i), (ii) and (iii) above and shall be equal to period between the scheduled date of completion and the actual date of completion of contract. LD shall be imposed/ levied for the portion of time extensions attributable to bidder and recoverable from the dues payable to the bidder.
25.0	**OTHER TERMS**
25.1	WELDING, RADIOGRAPHY AND OTHER NON-DESTRUCTIVE TESTING, POST WELD HEAT TREATMENT
25.1.1	THE SCOPE OF WORK INVOLVES GOOD QUALITY WELDING, NDT CHECKS, POST WELD HEAT TREATMENT ETC. CONTRACTOR'S PERSONNEL ENGAGED SHOULD HAVE ADEQUATE QUALIFICATION ON THE ABOVE WORKS.
25.1.2	THE METHOD OF WELDING WILL BE INDICATED IN THE DETAILED DRAWING/DOCUMENTS. BHEL ENGINEER WILL HAVE THE OPTION OF CHANGING THE METHOD OF WELDING AS PER PROJECT REQUIREMENT.
25.1.3	BEFORE ANY WELDER IS ENGAGED ON WORK, HE SHALL BE TESTED AND QUALIFIED BY BHEL/ CUSTOMER, THOUGH THEY MAY POSSESS THE PREVIOUS CERTIFICATE. BHEL RESERVES THE RIGHT TO REJECT ANY WELDER WITHOUT ASSIGNING ANY REASON. ALL THE EXPENDITURE IN TESTING/QUALIFICATION OF THE CONTRACTOR'S WELDER SHALL BE BORNE BY CONTRACTOR.
25.1.4	UNSATISFACTORY AND CONTINUOUS POOR PERFORMANCE MAY RESULT IN DISCONTINUATION OF CONCERNED WELDER.
25.1.5	THE WELDED SURFACE SHALL BE CLEANED OF SLAG AND PAINTED WITH PRIMER PAINT TO PREVENT RUSTING, CORROSION. FOR THESE CONSUMABLES LIKE PAINT /PRIMER ETC WILL BE IN THE CONTRACTOR'S SCOPE.
25.1.6	WELDING ELECTRODES HAVE TO BE STORED IN ENCLOSURES HAVING TEMPERATURE AND HUMIDITY CONTROL ARRANGEMENTS. THIS ENCLOSURE SHALL MEET BHEL SPECIFICATIONS.
25.1.7	WELDING ELECTRODES, PRIOR TO THEIR USE, CALL FOR BAKING FOR SPECIFIED PERIOD AND WILL HAVE TO BE HELD AT SPECIFIED TEMPERATURE FOR SPECIFIED PERIOD. ALSO, DURING EXECUTION, THE WELDING ELECTRODES HAVE TO BE CARRIED IN PORTABLE OVENS
24.2	HEAT TREATMENT
24.2.1	FOR THE PURPOSE OF TEMPERATURE RECORDING OF STRESS RELIEVING PROCESS, THERMOCOUPLES HAVE TO BE ATTACHED TO THE WELD JOINT. THE NUMBER OF TEMPERATURE MEASURING POINTS AND LOCATIONS SHALL BE AS PER THE STANDARDS OF BHEL. THERMOCOUPLES HAVE TO BE ATTACHED USING CAPACITOR DISCHARGE TYPE PORTABLE THERMOCOUPLE ATTACHMENT UNIT. CONTRACTOR SHALL ARRANGE SUFFICIENT NUMBER OF THERMOCOUPLE ATTACHMENT UNITS.
24.2.2	CONTRACTOR SHOULD PROVIDE TEMPERATURE INDICATOR / TEMPERATURE RECORDER FOR MEASURING TEMPERATURE DURING PRE-HEATING FOR WELDING OR FOR CONTROLLING TEMPERATURE OF METAL FOR HOT CORRECTION ETC. THE TEMPERATURE RECORDERS SHOULD BE PREFERABLY OF SOLID STATE TYPE.
24.2.3	HEAT TREATMENT MAY REQUIRE TO BE CARRIED OUT AT ANY TIME (DAY OR NIGHT) TO ENSURE THE CONTINUITY OF THE PROCESS. THE CONTRACTOR SHALL MAKE ALL NECESSARY ARRANGEMENTS INCLUDING LABOURER REQUIRED FOR THE SAME AS PER DIRECTIONS OF BHEL.
24.2.4	IN CERTAIN CASES ONLY THE PRE-HEATING OF WELD JOINTS MAY BE CALLED FOR.
24.2.5	FOR WELD JOINTS OF HEAVY STRUCTURAL SECTIONS, IF HEAT TREATMENT IS REQUIRED, THE SAME SHALL BE CARRIED OUT AS PART OF THE WORK.
24.2.6	CHECKING EFFECTIVENESS OF STRESS RELIEVING BY HARDNESS TESTS (BY DIGITAL HARDNESS TESTER OR OTHER APPROVED TEST METHODS AS PER BHEL ENGINEER'S INSTRUCTION) INCLUDING NECESSARY TESTING EQUIPMENTS IS WITHIN THE SCOPE OF THE WORK / SPECIFICATION.
24.2.7	PREHEATING, INTER-PASS HEATING, POST WELD HEATING AND STRESS RELIEVING AFTER WELDING ARE PART OF SCOPE OF WORK AND SHALL BE PERFORMED BY THE CONTRACTOR IN ACCORDANCE WITH BHEL ENGINEER'S INSTRUCTIONS. WHERE THE ELECTRIC RESISTANCE HEATING METHOD IS ADOPTED CONTRACTOR SHALL MAKE ALL ARRANGEMENT INCLUDING HEATING EQUIPMENT WITH AUTOMATIC RECORDING DEVICES, ALL HEATING ELEMENTS, THERMOCOUPLES AND ATTACHMENT

	UNITS, GRAPH SHEETS, THERMAL CHALKS, & INSULATING MATERIALS LIKE MINERAL WOOL, ASBESTOS CLOTH, CERAMIC BEADS, ASBESTOS ROPES ETC, REQUIRED FOR ALL HEATING AND STRESS RELIEVING WORKS.
24.2.8	ALL THE RECORDED GRAPHS FOR HEAT TREATMENT SHALL BE HANDED OVER TO BHEL/ IBR AUTHORITIES AND DUE CLEARANCES OBTAINED.
24.2.9	RESULTS OF THESE PROCESSES SHALL BE VERIFIED/ VALIDATED AS PER REQUIREMENTS OF BHEL / CLIENT.
24.3	PRESERVATION & PROTECTION OF COMPONENTS
24.3.1	AT ALL STAGES OF WORK, EQUIPMENTS / MATERIALS IN THE CUSTODY OF CONTRACTOR WILL HAVE TO BE PRESERVED AS PER RELEVANT MATERIAL IS CODES.
24.4	ALL OTHER RELEVANT TERMS & CONDITIONS OF THIS SPECIFICATION (TECHNICAL PART) INDICATED IN THE TCC SHALL BE APPLICABLE UNLESS OTHERWISE SPECIFIED IN THIS DOCUMENT. TECHNICAL SPECIFICATION OF OUR CUSTOMER (NTPC) MAY BE FOLLOWED ON ANY CASE RAISED BY CUSTOMER DURING EXECUTION. THE ISSUE TO BE COMPLIES WITH BIDDER. RECTIFICATION TO BE DONE AT SITE BY BIDDER IF IT IS FOUND ANY MISMATCH OR DEVIATE FROM APPROVED DRAWING DURING ERECTION OF STRUCTURE OTHERWISE DEBIT ACCEPTANCE SHALL BE GRANTED BY BIDDER.
24.5	THE QUOTED RATES SHALL REMAIN FIRM IRRESPECTIVE OF ANY VARIATIONS IN THE INDIVIDUAL QUANTITIES. NO COMPENSATION BECOMES PAYABLE IN CASE THE VARIATION OF THE FINAL EXECUTED CONTRACT VALUE IS WITHIN THE LIMITS OF PLUS (+) OR MINUS (-) 30% OF AWARDED CONTRACT VALUE.
24.6	ALL OTHER TERM & CONDITIONS OF THIS SPECIFICATION SHALL BE GOVERNED BY THE PERTINENT PROVISIONS OF GCC & OTHER VOLUMES OF THIS TENDER, AS APPLICABLE.

ANNEXURE-A

Tentative requirement for FACTORY for Fabrication of Steel Structures		
S. No	**Characteristic**	**Check List**
1.	**License**	A. Availability of factory registration License , GST Registration etc.
2.	**Quality management**	A. Availability of work instruction/procedures for critical activities & its implementations.
3.	**Raw material control**	A. Incoming raw material acceptance -MTC review records available B. Availability of material correlation/identification procedures & its implementations by hard punching/by record keeping/painting etc C. Storage/stacking of raw material-in organized manner or elevated platform with proper identification
4.	**Material handling**	A. Availability of EOT crane/ Gantry Crane of required capacity to handle maximum Load required for movement. B. Availability of gantry cranes/Hydra/other handling equipment's capable to handle proposed heaviest component(if required other than EOT crane)
5.	**Handling of weld consumables**	A. Availability of calibrated baking oven, holding oven & portable ovens (in sufficient quantities) B. Proper storage of weld consumables or racks & other controlled conditions C. Weld consumables handling: Issue/return of electrodes from store properly documented/recorded.
6.	**Welding qualification**	A. Availability of qualified WPS & PQR B. Availability of sufficient no of qualified welders C. Availability of welder performance monitoring/defect rate monitoring systems
7.	**Machinery**	A. Availability of sufficient no of SAW welding machines B. Availability of sufficient number of GTAW welding machines C. Availability of sufficient number of welding machinery-SMAW/GTAW/FCAE etc. D. Availability of CNC plasma/torch cutting machines/profile cutting machines E. Availability of PUG/Gas cutting machines F. Availability of radial drilling machine-capacity matching to proposed thickness & size of component G. Availability of weld edge preparation/bevel end cutting machines
8.	**Spare/Inspection Area**	A. Availability of said levelled floor for trial assembly adequate for proposed size of components with required material handling capacity
9.	**NDT/HEAT treatment/hydr/leak test facility**	A. Availability of sufficient size covered shed with concrete platform for fabrication activities B. Availability of beam straightening machine C. Availability of DPT/MPI facility-in house /outsourced to other agency D. Availability of RT facility-in house/outsourced (as applicable) E. Availability of UT facility-in house/outsourced (however done inside vendors own works) F. Availability of RT film viewer/dark room, densitometer, reference photograph etc. if RT is done
10.	**Professional qualification/quality manpower**	A. Availability of qualified & experience manpower for quality B. availability of qualified welding inspectors C. Availability of DP/MPT Level II qualified personal D. Availability of RT level II qualified personal if applicable E. Availability of UT level II qualified personal if required
11.	**Testing facility**	A. Availability of in house/outsourced testing facilities for chemical testing by spectro/ PMI B. Availability of in house/outsourced testing facilities like UTS, % elongation/bend/impact testing /hardness etc. C. Availability of calibrated tape/laser beam instruments to measure long column length for proto /assembly/ D. Availability of calibrated weld gauge, vernier, micrometer & measuring instruments
12.	**Surface cleaning & painting**	A. Availability of covered shot/grit blasting facility with air compressor, mechanism to segregate fine shot (sievers) shots/grits re-collection mechanism, surface compactor/surface roughness meter etc. B. Availability of in house painting facility (separate covered area) airless gun for painting etc. C. Availability of in house testing facility, paint thickness & paint adhesion

Annexure-1

INTEGRITY PACT

Between

Bharat Heavy Electricals Ltd. (BHEL), a company registered under the Companies Act 1956 and having its registered office at "BHEL House", Siri Fort, New Delhi - 110049 (India) hereinafter referred to as "The Principal", which expression unless repugnant to the context or meaning hereof shall include its successors or assigns of the ONE PART

and

_____, (description of the party along with address), hereinafter referred to as "The Bidder/ Contractor" which expression unless repugnant to the context or meaning hereof shall include its successors or assigns of the OTHER PART

Preamble

The Principal intends to award, under laid-down organizational procedures, contract/s for

_____

_____

_____ . The Principal values full compliance with all relevant laws of the land, rules and regulations, and the principles of economic use of resources, and of fairness and transparency in its relations with its Bidder(s)/ Contractor(s).

In order to achieve these goals, the Principal will appoint Independent External Monitor(s), who will monitor the tender process and the execution of the contract for compliance with the principles mentioned above.

Section 1- Commitments of the Principal

1.1 The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles:-

1.1.1 No employee of the Principal, personally or through family members, will in connection with the tender for, or the execution of a contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.

1.1.2 The Principal will, during the tender process treat all Bidder(s) with equity and reason. The Principal will in particular, before and during the tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential/ additional information through which the Bidder(s) could obtain an advantage in relation to the tender process or the contract execution.

1.1.3 The Principal will exclude from the process all known prejudiced persons.

1.2 If the Principal obtains information on the conduct of any of its employees which is a penal offence under the Indian Penal Code 1860 and Prevention of Corruption Act 1988 or any other statutory penal enactment, or if there be a substantive suspicion in this regard, the Principal will inform its Vigilance Office and in addition can initiate disciplinary actions:

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Section 2 - Commitments of the Bidder(s)/ Contractor(s)

2.1 The Bidder(s)/ Contractor(s) commit himself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the tender process and during the contract execution.

2.1.1 The Bidder(s)/ Contractor(s) will not, directly or through any other person or firm, offer, promise or give to the Principal or to any of the Principal's employees involved in the tender process or the execution of the contract or to any third person any material, immaterial or any other benefit which he/ she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the tender process or during the execution of the contract.

2.1.2 The Bidder(s)/ Contractor(s) will not enter with other Bidder(s) into any illegal or undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.

2.1.3 The Bidder(s)/ Contractor(s) will not commit any penal offence under the relevant Indian Penal Code (IPC) and Prevention of Corruption Act; further the Bidder(s)/ Contractor(s) will not use improperly, for purposes of competition or personal gain, or pass on to others, any information or document provided by the Principal as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.

2.1.4 Foreign Bidder(s)/ Contractor(s) shall disclose the name and address of agents and representatives in India and Indian Bidder(s)/ Contractor(s) to disclose their foreign principals or associates. The Bidder(s)/ Contractor(s) will, when presenting his bid, disclose any and all payments he has made, and is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract.

2.2 The Bidder(s)/ Contractor(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.

2.3 The Bidder(s)/ Contractor(s) shall not approach the Courts while representing the matters to IEMs and will await their decision in the matter.

Section 3 - Disqualification from tender process and exclusion from future contracts

If the Bidder(s)/ Contractor(s), before award or during execution has committed a transgression through a violation of Section 2 above, or acts in any other manner such as to put his reliability or credibility in question, the Principal is entitled to disqualify the Bidder(s)/ Contractor(s) from the tender process or take action as per the separate "Guidelines on Banning of Business dealings with Suppliers/ Contractors", framed by the Principal.

Section 4 - Compensation for Damages

4.1 If the Principal has disqualified the Bidder from the tender process prior to the award according to Section 3, the Principal is entitled to demand and recover the damages equivalent Earnest Money Deposit/ Bid Security.

4.2 If the Principal has terminated the contract according to Section 3, or if the Principal is entitled to terminate the contract according to section 3, the Principal shall be entitled to

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demand and recover from the Contractor liquidated damages equivalent to 5% of the contract value or the amount equivalent to Security Deposit/ Performance Bank Guarantee, whichever is higher.

Section 5 - Previous Transgression

5.1 The Bidder declares that no previous transgressions occurred in the last 3 years with any other company in any country conforming to the anti-corruption approach or with any other Public Sector Enterprise in India that could justify his exclusion from the tender process.

5.2 If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.

Section 6 - Equal treatment of all Bidders/ Contractors / Sub-contractors

6.1 The Principal will enter into agreements with identical conditions as this one with all Bidders and Contractors. In case of sub-contracting, the Principal contractor shall be responsible for the adoption of IP by his sub-contractors and shall continue to remain responsible for any default by his sub-contractors.

6.2 The Principal will disqualify from the tender process all bidders who do not sign this pact or violate its provisions.

Section 7 - Criminal Charges against violating Bidders/ Contractors /Subcontractors

If the Principal obtains knowledge of conduct of a Bidder, Contractor or Subcontractor, or of an employee or a representative or an associate of a Bidder, Contractor or Subcontractor which constitutes corruption, or if the Principal has substantive suspicion in this regard, the Principal will inform the Vigilance Office.

Section 8 - Independent External Monitor(s)

8.1 The Principal appoints competent and credible Independent External Monitor for this Pact. The task of the Monitor is to review independently and objectively, whether and to what extent the parties comply with the obligations under this agreement.

8.2 The Monitor is not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. He reports to the CMD, BHEL.

8.3 The Bidder(s)/ Contractor(s) accepts that the Monitor has the right to access without restriction to all contract documentation of the Principal including that provided by the Bidder(s)/ Contractor(s). The Bidder(s)/ Contractor(s) will grant the monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his contract documentation. The same is applicable to Sub-contractor(s). The Monitor is under contractual obligation to treat the information and documents of the Bidder(s)/ Contractor(s) / Sub-contractor(s) with confidentiality in line with Non- disclosure agreement.

8.4 The Principal will provide to the Monitor sufficient information about all meetings among the parties related to the contract provided such meetings could have an impact on the contractual relations between the Principal and the Contractor. The parties offer to the Monitor the option to participate in such meetings.

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8.5 The role of IEMs is advisory, would not be legally binding and it is restricted to resolving issues raised by an intending bidder regarding any aspect of the tender which allegedly restricts competition or bias towards some bidders. At the same time, it must be understood that IEMs are not consultants to the Management. Their role is independent in nature and the advice once tendered would not be subject to review at the request of the organization.

8.6 For ensuring the desired transparency and objectivity in dealing with the complaints arising out of any tendering process, the matter should be examined by the full panel of IEMs jointly as far as possible, who would look into the records, conduct an investigation, and submit their joint recommendations to the Management.

8.7 The IEMs would examine all complaints received by them and give their recommendations/ views to CMD, BHEL, at the earliest. They may also send their report directly to the CVO and the Commission, in case of suspicion of serious irregularities requiring legal/ administrative action. IEMs will tender their advice on the complaints within 10 days as far as possible.

8.8 The CMD, BHEL shall decide the compensation to be paid to the Monitor and its terms and conditions.

8.9 IEM should examine the process integrity, they are not expected to concern themselves with fixing of responsibility of officers. Complaints alleging mala fide on the part of any officer of the organization should be looked into by the CVO of the concerned organisation.

8.10 If the Monitor has reported to the CMD, BHEL, a substantiated suspicion of an offence under relevant Indian Penal Code/ Prevention of Corruption Act, and the CMD, BHEL has not, within reasonable time, taken visible action to proceed against such offence or reported it to the Vigilance Office, the Monitor may also transmit this information directly to the Central Vigilance Commissioner, Government of India.

8.11 The number of Independent External Monitor(s) shall be decided by the CMD, BHEL.

8.12 The word `Monitor' would include both singular and plural.

Section 9 - Pact Duration

9.1 This Pact shall be operative from the date IP is signed by both the parties till the final completion of contract for successful bidder and for all other bidders 6 months after the contract has been awarded. Issues like warranty / guarantee etc. should be outside the purview of IEMs.

9.2 If any claim is made/ lodged during currency of IP, the same shall be binding and continue to be valid despite the lapse of this pact as specified above, unless it is discharged/ determined by the CMD, BHEL.

Section 10 - Other Provisions

10.1 This agreement is subject to Indian Laws and jurisdiction shall be registered office of the Principal, i.e. New Delhi.

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10.2 Changes and supplements as well as termination notices need to be made in writing. Side agreements have not been made.

10.3 If the Contractor is a partnership or a consortium, this agreement must be signed by all partners or consortium members.

10.4 Should one or several provisions of this agreement turn out to be invalid, the remainder of this agreement remains valid. In this case, the parties will strive to come to an agreement to their original intentions.

10.5 Only those bidders / contractors who have entered into this agreement with the Principal would be competent to participate in the bidding. In other words, entering into this agreement would be a preliminary qualification.

Abhijit De

For & On behalf of the Principal

अभिजित दे / Abhijit De
उप प्रबंधक (क्रय) / Dy. Manager (Purchase)
बी. एच. ई. एल. / पी.एस.ई.आर / BHEL / PSER
डी जे-9/1, सॉल्ट लेक / DJ-9/1, SALT LAKE
कोलकाता-700 091/ KOLKATA-700 091

(Office Seal)

Place KOLKATA

Date 01.12.2021

Witness:

(Name & Address)

अनुरुद्ध सरकार / Anuruddha Sarkar
उप महाप्रबंधक (क्रय) / Dy. General Manager (Purchase)
बी. एच. ई. एल. / पी.एस.ई.आर / BHEL / PSER
डी ज-9/1, सॉल्ट लेक सिटी / DJ-9/1, SALT LAKE CITY
कोलकाता-700 091

For & On behalf of the Bidder/ Contractor

(Office Seal)

Witness:

(Name & Address)

CONTRACT AGREEMENT

BETWEEN

NTPC LIMITED

AND

BHARAT HEAVY ELECTRICALS LIMITED

FOR

FGD PACKAGE

FOR

NORTH KARANPURA STPP (3X660 MW)

Common for
FIRST CONTRACT & SECOND CONTRACT

CONTRACT NO: CS-4410-109-2-FC-COA-6695

CONTRACT NO: CS-4410-109-2-SC-COA-6696

VOLUME – D

BOOK 1 OF 4

SECTION-VI PART– A AND SECTION-VI PART– B (SUB SECTION-I-M) OF TECHNICAL SPECIFICATIONS FOR FGD PACKAGE FOR NORTH KARANPURA STPP (3X660 MW)

NTPC Limited

(A Government of India Enterprise)

एनटीपीसी NTPC

NORTH KARANPURA SUPER THERMAL POWER PROJECT (3x660MW)

PART – A

TECHNICAL SPECIFICATIONS

SECTION – VI

FOR

FLUE GAS DESULPHURISATION (FGD) SYSTEM PACKAGE

Bharat Heavy Electricals Limited * BHEL * Power Sector Marketing

BIDDING DOCUMENT NO.: CS-4410-109-2

NTPC Limited

(A Government of India Enterprise)

NORTH KARANPURA SUPER THERMAL POWER PROJECT (3x660MW)

PART - A

TECHNICAL SPECIFICATIONS

SECTION – VI

FOR

FLUE GAS DESULPHURISATION (FGD) SYSTEM PACKAGE

BIDDING DOCUMENT NO.: CS-4410-109-2

(This document is meant for the exclusive purpose of bidding against this Package and shall not be transferred, reproduced or otherwise used for purposes other than that for which it is specifically issued).

Bharat Heavy Electricals Limited Power Sector Marketing BHEL

PART - A

Bharat Heavy Electricals Limited
Power Sector Marketing
BHEL

SUB-SECTION-II

PROJECT INFORMATION

Bharat Heavy Electricals Limited
Power Sector Marketing
BHEL

CLAUSE NO.	PROJECT INFORMATION

1.00.00 **BACKGROUND**

North Karanpura Super Thermal Power Project (3x660 MW), a pit head coal based thermal power project, is located in Hazaribagh and Chatra districts of Jharkhand State. Basic inputs i.e. coal, water and land have already been tied up. The project is proposed for the States & Union Territories of Northern, Western and Eastern Regions and the State of Jharkhand.

The capacity of the project is 1980 MW comprising of three (3) units of 660 MW each.

1.01.00 **Location and Approach**

The power project is proposed to be located near Tandwa town in Chatra districts in the state of Jharkhand on Hazaribagh-Chatra State highway at a distance of about 50 kms from Hazaribagh city. The nearest commercial airport is Ranchi at a distance of 100 kms from project site. The nearest railhead Khalari Railway Station on Ranchi-Garhwa section of Eastern Railways is about 25 kms from project site.

Major rail/road distances from the project site are as under:

City		Distance Approx. (kms)
Ranchi	:	80
Khalari	:	25

The site is located near Tandwa town having latitude and longitude of about 23o 50' N to 23º 52' N and 84o 59' E to 85º 2' E respectively. The Vicinity Plan of the project is placed at **Annexure-I.**

Further to the information given in this sub-section, Bidders are also advised to visit the project site and collect data on local site conditions.

1.02.00 **Land**

The plant layout was readjusted and total land requirement was reduced from 2330 acres to about 970 acres. Out of 2277 acres of land the plant, ash dyke and transit camp is being suitably adjusted. No additional land is envisaged to be acquired in plant area. About 15 acres of land is envisaged to be acquired in Hazaribagh city for Township. Commissioner, Chatra vide dated 25.05.1999 and 14.06.2000 has given in-principle clearance for NKSTPP.

1.03.00 **Water**

Make up water requirement for this project would be about 20 cusec. Make up water requirement shall be met by raw water reservoir. Intake water pumps shall pump water to reservoir during the rainy season only from Garhi barrage.

1.04.00 **Fuel (Coal)**

1.04.01 **Coal Requirement, Availability and Linkage**

Coal requirement for the project is estimated as 10.60 Million Tonne/Annum (MTPA), considering a GCV of 3800 kcal/kg. Ministry of Coal vide letter dated 21.10.99 accorded inprinciple coal linkage of 10.00 MTPA subject to ratification by Standing Linkage Committee-Long Term (SLC (LT)), of MOC. SLC (LT) in its meeting held on 15.12.2000 firmed up the

CLAUSE NO.	PROJECT INFORMATION
	coal linkage of 10.24 MTPA for the project. Subsequently, the coal linkage was withdrawn by SLC (LT) in its meeting held on 22/23.10.08. Cabinet Committee on Investment (GOI) in its meeting on 20.02.13 decided in-principle to restore the original coal linkage granted to NKSTPP (i.e. from Magadh Coal Block) with the stipulation that the coal supply will commence during the 13th Five Year Plan. Ministry of Power has already taken up the matter of coal linkage restoration with Ministry of Coal vide dated 12.04.2013.
1.04.02	**Coal Transportation** Coal from Magadh block of North Karanpura Coalfields is proposed to be transported to the project site through conveyor belt system. Parallel double stream Conventional troughed conveyors of 3000 MTPH rated capacity are envisaged for external coal handling plant. It is proposed to have one internal coal handling plant of 3000 MTPH rated capacity.
1.05.00	**Meteorological Data** Important meteorological data from nearest observatory at Hazaribag is placed at Annexure-II.
1.06.00	**Plant Water Scheme** The Plant water scheme is described below.
1.06.01	**Equipment Cooling Water (ECW) System (Unit Auxiliaries)** All plant auxiliaries shall be cooled by De-mineralized water (DM) in a closed circuit. The primary circuit DM water shall be cooled through heat exchangers by Circulating Water tapped from CW system in a closed secondary circuit. The hot secondary circuit cooling water shall be cooled in the cooling towers and shall be returned back to the system.
1.06.02	**Ash Water System** It is proposed to have HCSD (High concentration Slurry Disposal) system for combined fly ash and bottom ash. No recirculation of ash water from ash disposal area is envisaged.
1.06.03	**Other Miscellaneous Water Systems** (a) The service water shall be taken from clarified water tank of Pretreatment plant. Service water (wash water) collected from various areas shall be treated using oil water separators, tube settlers, coal settling pits etc. as per requirement and treated water from liquid effluent treatment plant shall be recycled back to the service water system for re-use. (b) The drinking water requirement of the plant shall be provided from water treatment plant. (c) Steam Cycle make-up water, makeup to the primary circuit of ECW (unit auxiliaries) system, boiler fill water and makeup to the hydrogen generation plant shall be provided from Demineralising plant. (d) The quality of Raw water is enclosed with this sub-section as Annexure-III.

CLAUSE NO.	PROJECT INFORMATION
1.07.00	**Criteria for Earthquake Resistant Design of Structures and Equipment** All power plant structures and equipment, including plant auxiliary structures and equipment shall be designed for seismic forces as given in the Part - B of this section.
1.08.00	**Criteria for Wind Resistant Design of Structures and Equipment** All structures and equipment of the power plant, including plant auxiliary structures and equipment, shall be designed for wind forces as given as given in Part B of this section.

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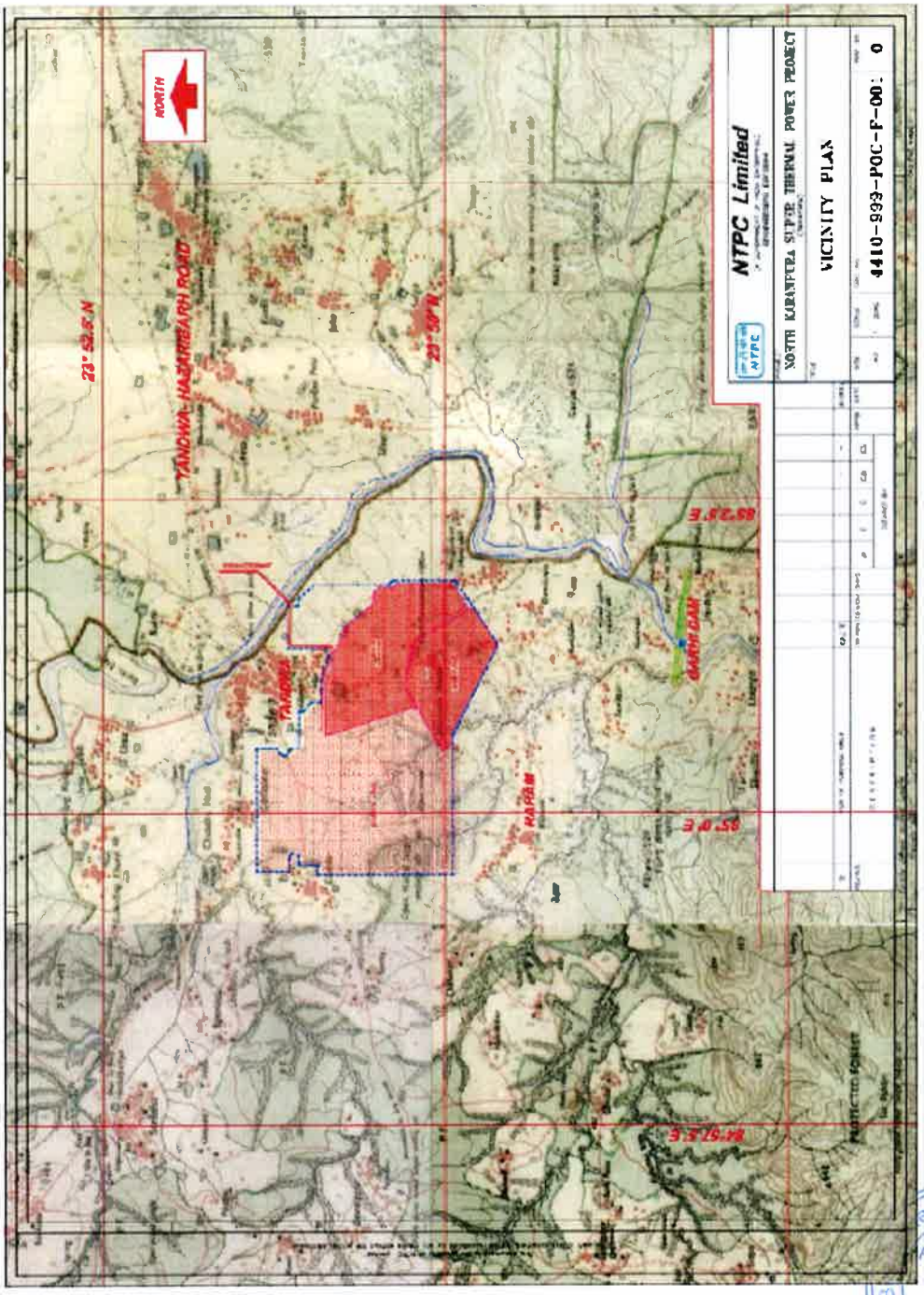
CLAUSE NO.	PROJECT INFORMATION	

ANNEXURE – I

VICINITY PLAN



Heavy Electricals Limited
Power Sector Marketing
BHEL

CLAUSE NO.	PROJECT INFORMATION	

ANNEXURE – II

CLIMATOLOGICAL TABLE

CLIMATOLOGICAL TABLE

Hazaribagh

1951 से 1980 तक के आंकड़ों पर आधारित
BASED ON OBSERVATIONS FROM 1951 TO 1980

STATION LEVEL PRESSURE	DRY BULB	WET BULB	DAILY MAX	DAILY MIN	HIGHEST IN THE MONTH	LOWEST IN THE MONTH	HIGHEST	DATE AND YEAR	LOWEST	DATE AND YEAR	RELATIVE HUMIDITY	VAPOUR PRESSURE	ALL CLOUDS	LOW CLOUDS	MONTHLY TOTAL	NO OF RAINY DAYS	TOTAL IN WETTEST MONTH WITH YEAR	TOTAL IN DRIEST MONTH WITH YEAR	HEAVIEST FALL IN 24 HOURS	DATE AND YEAR
	AIR TEMPERATURE						EXTREMES				HUMIDITY		CLOUD AMOUNT		RAINFALL					
	MEAN																			
947.8	14.7	10.9	22.6	9.3	26.7	4.6	30.8	31 1951	0.9	07 1960	62	10.4	1.4	0.5	23.5	1.7	113.0 1970	0.0	68.1	05 1945
944.5	18.0	12.0	25.7	12.0	30.5	6.9	33.8	22 1967	1.7	08 1974	52	10.3	1.1	0.4	16.2	1.4	117.3 1967	0.6	60.5	22 1967
942.5	17.9	12.3	25.7	12.0	30.5	6.9	33.8	22 1967	1.7	08 1974	52	10.3	1.1	0.4	16.2	1.4	117.3 1967	0.6	60.5	22 1967
944.0	23.4	15.0	30.8	18.8	35.6	11.4	38.9	27 1962	5.7	04 1956	39	10.8	1.5	0.3	18.4	1.7	194.3 1980	0.0	44.2	24 1946
940.6	27.8	18.3	35.7	21.3	39.3	18.4	41.7	22 1958	10.6	01 1965	36	13.3	1.8	0.3	17.0	1.4	81.4 1952	0.0	40.5	22 1952
941.0	28.6	18.2	35.7	21.3	39.3	18.4	41.7	22 1958	10.6	01 1965	36	13.3	1.8	0.3	43.4	2.9	187.2 1955	0.0	84.1	27 1957
937.0	30.7	21.1	37.8	24.0	41.5	19.9	43.9	18 1957	15.6	22 1957	43	18.1	2.5	0.3	17.1	9.2	774.5 1961	0.8	248.2	24 1961
933.4	28.4	21.3	34.1	24.1	40.1	21.0	46.6	14 1973	18.2	02 1975	57	25.0	5.3	1.8	310.0	16.2	653.2 1980	80.8 1961	237.7	30 1953
933.1	25.4	23.8	29.5	23.0	33.2	21.4	35.6	08 1975	19.3	12 1975	56	26.2	6.5	3.8	320.1	16.2	704.1 1943	63.8 1956	198.1	17 1956
930.5	28.4	24.1	29.1	22.7	31.5	21.3	34.2	03 1972	20.0	29 1967	60	26.1	6.4	3.5	280.9	11.8	530.9 1966	42.7 1966	167.4	28 1963
934.5	25.2	22.7	29.0	22.2	31.5	20.4	33.3	24 1960	17.8	29 1950	65	25.8	5.1	2.9	86.8	4.1	374.8 1943	0.0	148.4	24 1963
931.6	26.4	24.3	29.4	18.9	31.3	14.3	34.0	04 1966	9.7	12 1972	56	21.4	2.4	1.2	5.5	0.4	180.0 1924	0.0	85.0	06 1924
938.2	25	21.1	29.0	22.0	31.5	20.4	33.3	24 1960	17.8	29 1950	80	14.3	1.2	0.4	5.2	0.4	61.3 1965	0.0	35.4	13 1965
935.1	25.6	21.5	29.0	22.0	31.5	20.4	33.3	24 1960	17.8	29 1950	56	14.2	1.9	0.5						
942.6	23.9	20.4	28.5	18.9	31.3	14.3	34.0	04 1966	9.7	12 1972	73	21.4	2.4	1.2						
940.6	24.9	20.7									56	21.3	2.9	1.3						
947.0	20.2	15.5	25.8	13.3	28.3	9.0	31.7	01 1966	4.4	25 1970	80	14.3	1.2	0.4						
943.9	21.4	16.0									56	14.2	1.9	0.5						
946.2	15.7	11.8	23.1	9.3	26.2	5.1	29.4	20 1950	0.5	24 1961	82	11.1	1.1	0.2						
945.1	16.7	12.1									52	11.1	1.2	0.2						
941.1	23.2	18.3	28.3	18.1	41.9	3.6	45.5		0.5		53	16.2	3.0	1.3	1277.9	67.2	2140.0 1924	739.8 1956	248.2 1961	
938.0	25.9	19.1									55	17.7	3.3	1.5						
28	27	27	27	28	27	28	43		0.5		53				1277.9	67.2				
28	28	28									27	27	29	23	29	28	30	30	30	23
28											28	27	30	22						

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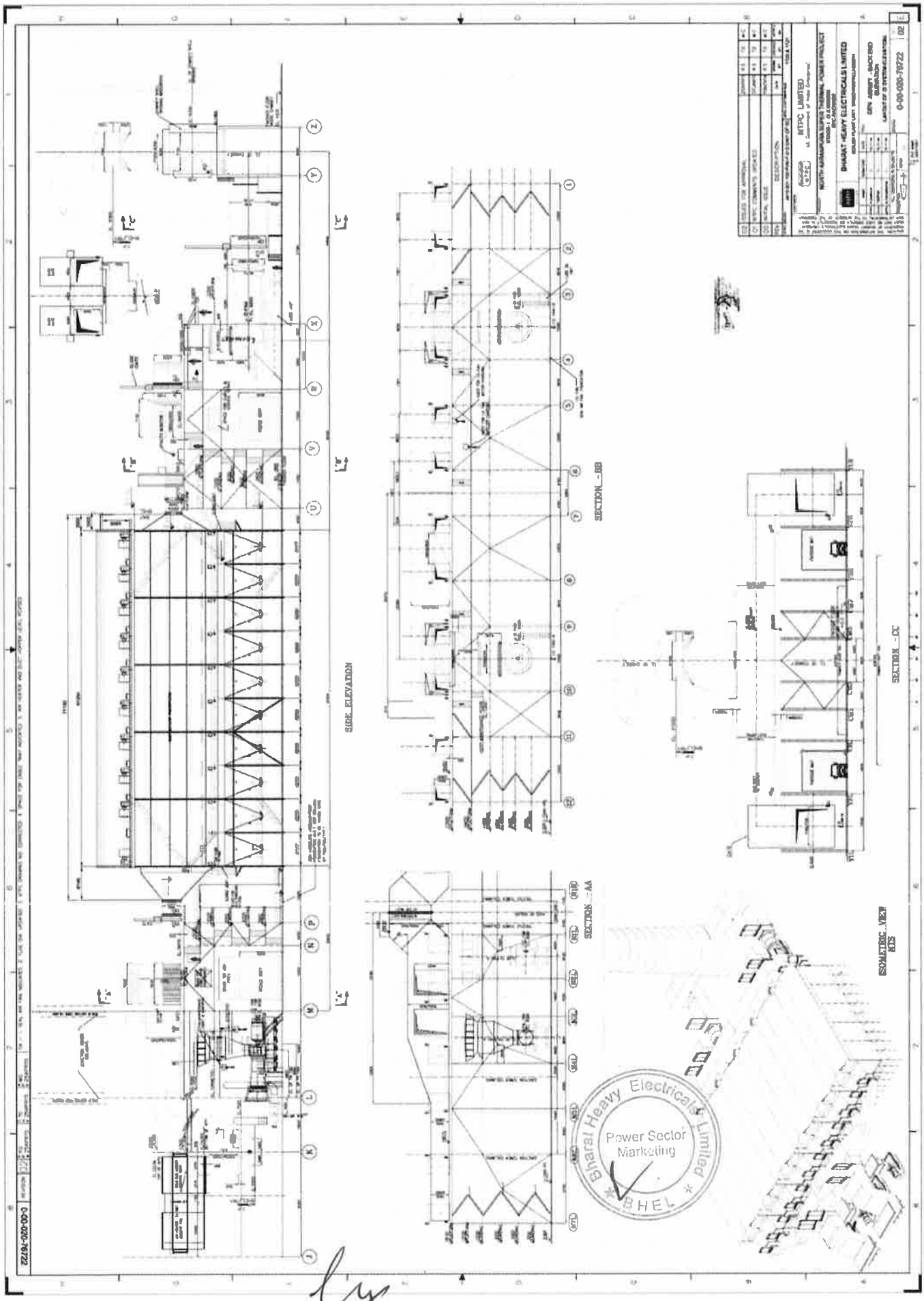

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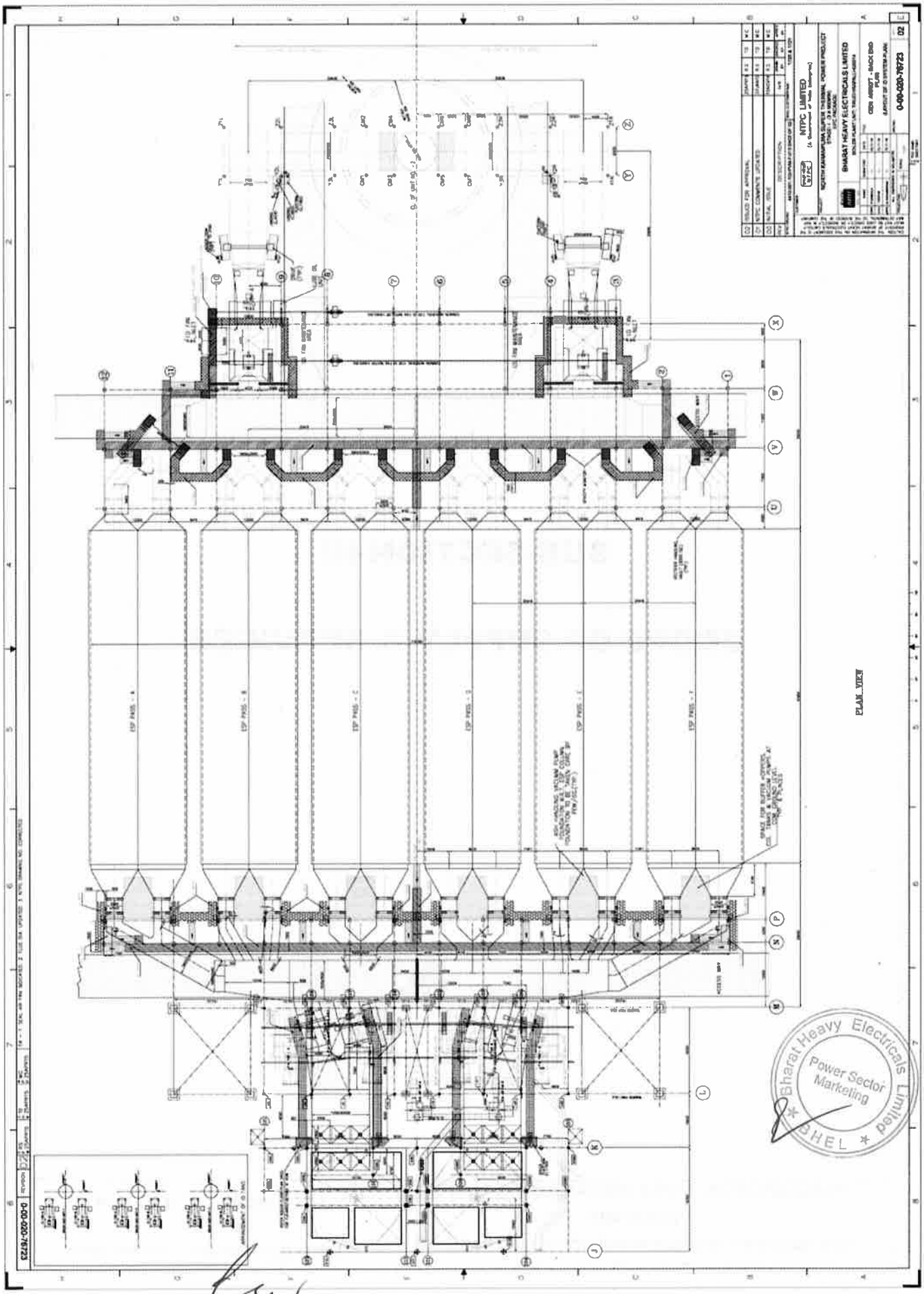
NTPC LIMITED
BHARAT HEAVY ELECTRICALS LIMITED
PLAN VIEW
Bharat Heavy Electricals Limited
Power Sector Marketing
BHEL

SUB-SECTION-III

SCOPE OF SUPPLY & SERVICES

Bharat Heavy Electricals Limited
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BHEL

SUB-SECTION-IIID

CIVIL WORKS

Bharat Heavy Electricals Limited
Power Sector Marketing
BHEL

CLAUSE NO.	SCOPE OF SUPPLY & SERVICES

1.00.00 SCOPE OF CIVIL WORKS

Scope of Bidder shall include all ~~Civil~~, Structural, ~~Architectural~~ works including ~~underground facilities like drainage, sewerage, trenches, earthing mat/ grounding~~ associated with complete Flue gas desulfurization (FGD) package covering but not be limited to the following:

a) Truck hopper ~~(if applicable)~~

b) Limestone storage hopper with shed

c) Transfer points, Conveyor Galleries & Tunnels

d) Crusher House

e) Ball Mill Foundation

f) Ball Mill building

g) FGD Control Room building, MCC Buildings

h) Gypsum dewatering building

i) Gypsum storage shed

j) Pent house

k) ~~Chimney including elevator, electrical works, aviation obstruction lighting~~

l) ~~Absorber Tower foundations~~

m) ~~Tank Foundations~~

n) ~~Pump & Fan Foundations~~

o) ~~Transformer foundations including Fencing, Paving etc.~~

p) Pipe and cable Trestles

q) ~~Site levelling in Lime & Gypsum Handling area, as shown in tender drawing.~~

r) ~~Roads Lime & Gypsum Handling area, as shown in tender drawing.~~

s) ~~Fencing in Lime & Gypsum Handling area, as shown in tender drawing~~

t) ~~Storm water drainage network for all areas in bidder's scope and its connection with the nearest owner's drain.~~

u) ~~Sewerage network for all buildings and facilities and connection with the nearest owner's sewerage system.~~

Bharat Heavy Electricals Limited Power Sector Marketing BHEL

CLAUSE NO.	SCOPE OF SUPPLY & SERVICES

v) ~~Paving in entire FGD absorber area and parking block of Lime & Gypsum Handling area.~~

w) Any other miscellaneous building or facility required for FGD system.

The work to be performed under this specification consists of providing all labour, materials, construction equipment, tools and plant, scaffolding, supplies, transportation, all incidental items not shown or specified, but reasonably implied or necessary for successful completion of the work including Bidder's supervision and in strict accordance with the drawings and specifications. The nature of work shall generally involve ~~earthwork in excavation & deep underground excavation, extensive de-watering, shoring and strutting, sheet piling, back filling around completed structures and plinth protection, paving , disposal of surplus excavated materials, piling, concreting including reinforcement and form work, brick work,~~ fabrication ~~and erection~~ of structural / miscellaneous steel works, ~~inserts, architectural items & finishes such as plastering, painting, flooring, doors, windows & ventilators, glass and glazing, rolling shutters etc., permanently colour coated profiled steel sheeting, anchor bolts, R. C. C. trenches with covers, laying and testing of water pipes, sanitation, water supply, drainage, damp proofing, water proofing~~ and other ancillary items.

The work shall have to be carried out both below and above ground level and shall be involving, basements, equipment foundations, grounding, slabs, beams, columns, footings, rafts, walls, steel frames, brick walls, stairs, trenches, pits, access roads, culverts, trestles, finishes, false ceiling and complete architectural works, etc.

Analysis, design and preparation of construction drawings for all structure/facilities under the scope of this package and getting the same approved from the owner.

Uniform Finished ground level (FGL) in FGD absorber area shall be made available by the owner at a level specified in "Layout plan of FGD system". Refer Tender drawing no. 4410-999-POC-F-001.

Terminal points for site levelling, roads, drainage network & fencing shall be as indicated in "Layout plan of FGD system". Refer Tender drawing no. 4410-999-POC-F-001.

2.00.00 CONSTRUCTION FACILITIES

The following are also in the Bidder's scope of work:

1. Providing drinking and service water for Bidder's labour, staff and other personnel working for Bidder at the work site and in his staff/ labour colony. He shall install necessary bore wells with associated pumping or water tankers and treatment facilities to supply quality water as per standards.

2. Developing temporary staff colony and labour colony along with fencing etc. Land if required shall be arranged by the Bidder himself.

Bharat Heavy Electricals Limited Power Sector Marketing BHEL

CLAUSE NO.	SCOPE OF SUPPLY & SERVICES

However space required for bidder's office, storage, pre assembly and fabrication areas shall be provided by owner free of charge within the plant premises.

The area to be allocated to the Bidder shall be discussed & finalized with the bidder after the award, keeping in view the availability of free space & similar requirement of other agencies.

3. Providing all arrangements for distribution of construction power at various locations as per his requirements from the supply point of Owner.

4. Providing all arrangements for the supply of construction water including bore-wells, water tankers etc.

5. Providing temporary construction office, construction stores (open / covered), workshops, material / field testing laboratory, any other temporary buildings

6. Providing all construction equipment, labour and materials. The Bidder shall provide all the tools and tackles required for the work.

7. Development of the pre-assembly and storage yard with fencing, drainage, internal roads, boulder soling, etc.

8. Approach road to project site is available. Further, Owner intends to construct the roads as per the layout shown in the General Layout plan in a progressive manner. Some of these roads may not be available to the bidder for his use. Similarly the drainage network for the plant site being constructed by the owner may not be available to full extent. The bidder shall plan his work within the plant area considering the above constraints of roads and drains. Access roads to his work sites, offices, stores, preassembly / fabrication yard, etc. as required for providing approach/access for men, materials, equipment, cranes, trailor, construction/erection activities etc., what so ever are required by the bidder, shall be constructed and maintained by the bidder. Bidder shall provide permanent access to all facilities/ structures from the nearby existing roads of the owner. Roads shall be in concrete (M-35 grade) as per IRC standards, with minimum thickness of pavement (PQC) as 250mm. Width of all such roads shall be 7.5M concrete pavement.

9. Area lighting at the construction / erection site, pre-assembly and storage yard, office areas and labour / staff colony.

10. Providing all necessary fire-fighting devices / equipment / fire tender etc. required during the project execution stage. He shall maintain all such equipment / devices in proper working conditions throughout the period of work.

11. Providing first aid facilities at the construction / erection sites, workshops, laboratories, pre-assembly and storage yard and other places of work as per the requirement.

12. The Bidder shall arrange skilled / semiskilled / unskilled manpower from local source(s) as far as available in this country. He shall also arrange supervisory staff for quality execution of all works in his scope.

CLAUSE NO.	SCOPE OF SUPPLY & SERVICES

13. **Bidder's office, store, workshop, laboratory or any other temporary buildings:**

The Bidder shall adopt pre-engineered/ pre-fabricated constructions made of steel with single / double skin, insulated for un-insulated roof and wall coverings (fabricated out of permanently color coated metal sheets) for his site office, covered store workshop, laboratory or any other temporary buildings. Alternatively, bidder can adopt readymade `Portacabin' or similar construction. Bidder shall ensure that all such constructions are well-engineered, neatly constructed and overall present a pleasing look. The above requirements shall be applicable to his sub-vendors also and bidder shall be responsible for enforcing the same on his sub-vendors.

Any other type of construction if proposed by the bidder shall be subject to approval of the owner. However, such construction shall be based on proper design and shall have aesthetic look.

14. **Use of ash and ash based products:**

In line with Gazette Notification on Ash Utilization issued by MOEF and its amendment thereafter, Bidder shall use ash and ash based products in construction of his offices, stores, staff quarters and labour huts etc. He shall furnish a compliance report along with all details of use of ash and ash based products along with each bill. The above requirements shall be applicable to his sub-vendors also and Bidder shall be responsible for enforcing the same on his sub-vendors.

15. **Repair & Maintenance Facilities by the Bidder:**

Bidder shall establish/set up at site suitable repair facilities for construction plant, equipment and machinery (like cranes, hydra, forklifts, welding equipments, etc.) He will also make arrangements/tie up with manufacturers/ suppliers of such construction plant, equipment & machinery, for periodic overhaul/maintenance and for major breakdown, if any. He shall also keep adequate stock of spares at site for various construction plant, equipment and machinery to meet day to day requirements as recommended by the equipment manufacturer/suppliers or as instructed by the Engineer. Bidder shall deploy dedicated qualified, full time mechanical/electrical foreman/supervisors for manning the repair facilities as specified above.

Bharat Heavy Electricals Limited Power Sector Marketing BHEL

CONTRACT AGREEMENT

BETWEEN

NTPC LIMITED

AND

BHARAT HEAVY ELECTRICALS LIMITED

FOR

FGD PACKAGE

FOR

NORTH KARANPURA STPP (3X660 MW)

Common for
FIRST CONTRACT & SECOND CONTRACT

CONTRACT NO: CS-4410-109-2-FC-COA-6695

CONTRACT NO: CS-4410-109-2-SC-COA-6696

VOLUME – D

BOOK 3 OF 4

SECTION-VI PART B ((SUB-SECTION-III-C), (SUB-SECTION-IV-D), (SUB-SECTION-V-Q) AND (SUB-SECTION-VI))

SUB-SECTION-IV-D

CIVIL WORKS

CLAUSE NO.	TECHNICAL REQUIREMENTS
1.00.00	**GENERAL**
1.01.00	This section of the bidding document deals mainly with the technical specification for the design and preparation of detailed drawings, getting the design and drawings approved by the Employer, fabrication, erection and construction of the necessary civil, structural and architectural works associated with the FGD package for **North Karanpura STPP (3x660 MW).** The work ~~shall have to be carried out both below and above ground level and shall be~~ involving, ~~basements, equipment foundations, grounding, slabs, beams, columns, footings, rafts, walls, steel frames, brick walls,~~ stairs, ~~trenches, pits, access roads, culverts~~, trestles, ~~silos, sumps~~, Limestone storage hopper & shed, Crusher House, Transfer points, Conveyor Galleries, ~~Tunnels~~, Gypsum storage shed, ~~Chimney~~, Gypsum dewatering building, Ball Mill building, FGD control room building, ~~Tank Foundations~~, ~~absorber tower foundation~~, ~~transformer foundation~~, MCC Building, ~~finishes, complete architectural aspects, drainage, sanitation, water supply (from terminal points to various buildings/facilities)~~ and all other civil, structural and architectural works associated with the complete FGD package.
1.02.00	The specifications are intended for the general description of the work, quality and workmanship. The specifications are not, however, intended to cover minutest details and the work shall be executed according to the relevant latest Indian Standard Codes / I. R. S. / I. R. C. specifications. In absence of the above, the work shall be executed according to the best prevailing local Public Works Department practices or to the recommendations of relevant American and British Standards or to the instructions of the Engineer. Some of the relevent I. S. Codes to be followed is mentioned in the Technical Specifications. The Contractor is expected to get clarified on any doubts about the specifications, etc. before bidding, in writing with the Employer in respect of interpretation of any portions of this document.
1.03.00	Bidder or his agencies engaged as detailer for fabrication drawings should have the experience of detailing for power plant structures or steel plant or Industrial structures like Petro/ Chemical/ Refinery/ Cement/FGD Plant/Coal Handling Plant/Ash Handling Plant etc. The designer responsible for preparation of scope drawings shall review and approve the fabrication drawings prepared by the detailer before releasing them for fabrication.
2.00.00	**Sub QR for Civil Works:**
2.01.00	Bidder or its agency should have in past executed civil and structural works for 500 MW or higher capacity coal based/Lignite based power plant including earthwork in filling involving mechanical compaction and cutting in hard rock, foundations, Bulk material handling plant involving underground storage hopper and underground tunnels.
2.02.00	Bidder can engage more than one agency, in case the Bidder itself is not able to meet the requirement at 2.01.00. The agency being engaged for a particular work should have in the past executed such works of 500 MW or higher capacity plant.

Bharat Heavy Electricals Limited Power Sector Marketing BHEL

CLAUSE NO.	TECHNICAL REQUIREMENTS
2.03.00	For Chimney, Bidder or its agency should have in the past built at least one (1) reinforced concrete chimney of minimum 100m height.
2.04.00	In case Bidder or its agency do not meet the requirements at 2.01.00 and the Bidder proposes to engage agency (ies) for civil & structural works on work volume basis (except for Chimney), Bidder or its agency (ies) should have executed such works in the past and the annual rate of execution in the reference works should not be less than eighty percent (80%) of the asking rate of such works, (structural steel fabrication & erection, RCC, earthwork in filling involving mechanical compaction and cutting in hard rock, RCC in underground storage hopper and underground tunnels) for which it is being engaged. Successful Bidder shall finalize the agency (ies) for each work in consultation with Engineer-in-charge at site before engaging them.
	Design agency for Civil & Steel Structural Works:
2.05.00	Bidder or its agency (ies) should have carried out the design and detailed engineering of following works: (i) Civil & Structural works associated with at least one bulk material handling plant for 500 MW or higher capacity coal based/Lignite based power plant. (ii) For Chimney, Bidder or its design agency (ies) should have carried out design & detailed engineering of at least one reinforced concrete chimney with steel flues, of minimum 100m height. (iii) Machine foundations such as Mill foundations/ Block foundations.
2.06.00	Bidder can engage more than one agency (of repute), in case the Bidder itself is not able to meet the requirement at 2.05.00. The design agency (ies) proposed by the Bidder shall be subject to Employer's approval.
3.00.00	**Work Description**
3.01.00	**Truck Hopper, Limestone Storage hopper and Underground Tunnel** Truck Hopper shall consist of underground portion, which shall be of R. C. C. with structural steel shed covered with permanently Colour coated profiled steel sheets. Limestone storage hopper shall be of RCC with structural steel shed covered with permanently Colour coated profiled steel sheets. The structural arrangement to be adopted for the design and construction of Limestone Storage hopper shall essentially consist of R. C. C. frames spaced at approx. 3.0M centers with R. C. C. wall panels on the sides and R. C. C. raft at the bottom, fixed to the frames. Minimum thickness of R. C. C. raft at bottom shall be 600

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	mm. Minimum thickness of RCC side walls shall be 600 mm at bottom and 300 mm at top. The vertical and inclined portion of hopper shall be provided with 50 mm thick guniting (shotcreting). Details of shotcreting have been given elsewhere in this specification. Expansion joints shall be provided at a maximum distance of 40m. 600 mm wide water stop fabricated with 22G copper plate with bitumen board fillers and polysulphide sealing compound as specified elsewhere shall be used as expansion joint material. Floor shall be provided with cross slope not flatter than 1 in 50 towards side drains. Side drains shall be sloped towards sump where sump pumps as specified elsewhere, shall be provided. The slope of side drains shall not be flatter than 1 in 400. Side drains and sump shall have removable type steel grating cover. Water proofing / Damp proofing of under ground Truck hopper, Limestone Storage hopper, tunnels and underground (i. e. basement) portion of transfer houses shall be done by providing the following treatments: Chemical injection grouting for inner faces (details as specified elsewhere). Polymer modified cementitious coating on earth side face as per the following : (1) On the outer surface of walls, frames and roof slabs coming in contact with earth, polymer modified cementitious coating in two layers as specified and as per manufacturer's specifications shall be provided directly on the concrete surface. (2) 50 mm thick P. C. C. (1 : 2 : 4 with 10 mm nominal size stone aggregates) shall be provided under the raft i.e. over the lean concrete, followed by polymer modified cementitious coating in two layers (slurry mix application) as per manufacturer's specification. 50 mm thick P. C. C. (1 : 2 : 4) with 10 mm nominal size stone aggregates shall then be laid over the polymer modified cementitious coating before laying the raft. Truck hopper and its gratings shall be designed for movement of front end loader/ bulldozer over them. Bull dozer weight shall be considered as about 35T. The gratings shall be built of min. 200x28mm thick flats in main direction and min.100mm x 20mm thick in secondary direction. No painting/galvanization shall be provided in gratings. However, two coats of Red oxide Primer to be provided immediately after fabrication. Plinth protection along with drains shall be provided along the Hopper complex. However, 5m wide paving shall also be provided around machinery hatches. Earth pressure to be considered for design shall be due to earth pressure at rest (Ko) condition only. Earth pressure due to surcharge intensity of Uniformly Distributed Load (U. D. L) of intensity 2 T / Sq. M. shall be considered in the design. A minimum safety factor of 1.2 against uplift due to ground water shall be ensured during execution and after execution, considering dead weight of the structure to be

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	0.9 times only, ground water table to be taken at adjoining formation level and soil wedge angle of not more than 15 degrees. Also, FOS against uplift, to be taken as 1.0, considering the dead wt. of structure and soil resting on side projections if any in the vertical plane. Inclined wedge action of soil shall not be considered in this case. Wherever, slope of tunnel exceeds 10°, R. C. C. steps shall be provided for the entire width of each walkway.
3.02.00	**Overhead / Ground Conveyor Galleries and Trestles** Overhead conveyors shall be located in a suitably enclosed gallery of structural steel. The overhead gallery shall consist of two vertical latticed girders having rigid jointed portal frame at both ends. Cross beams at floor level supporting conveyor stringer beams shall be made of single rolled steel beam or single channel section (ISMB or ISMC) or plate girder. Horizontal bracings are to be provided at top & bottom plan of the gallery (latticed girders shall be braced together in plan at the top and bottom). Common end portal frame shall not be used for adjacent conveyor spans. Roof truss shall be provided at upper node points of latticed girders to form an enclosure. Contractor can also use tubular steel sections for roof truss only of conveyor galleries. The tubular steel section shall be of circular/rectangular/square shape. The circular steel tube shall conform to IS 1161 and rectangular/square steel sections shall conform to IS 4923. The steel structures using tubular sections shall be designed and fabricated as per IS 806 – "Code of Practice for use of steel tubes in general building construction." and EN 1993-1-8:2005. The maximum span of overhead gallery shall be limited to 25 meters unless higher span is required due to site conditions, which shall be subject to approval of the Engineer. The gallery should as far as possible be erected as a box section keeping all the vertical and horizontal bracing tied in proper position. The gallery should be checked for all erection stresses that are likely to develop during handling and erection and if required, temporary strengthening of gallery members during erection shall be made. Seal plates under the conveyor galleries shall be provided in such a way that complete gallery bottom shall form a leak proof floor. The ground conveyors shall be located in suitably enclosed gallery of structural steel consisting of rigid portal frames spaced at regular intervals and suitably braced. Plinth protection along with drains shall be routed along the ground conveyors. For double stream conveyor gallery, two side and one central walkway of width 800 mm and 1100 mm respectively shall be provided. The width of two side walkways for single stream conveyor gallery shall be 800 mm and 1100 mm respectively. Both sides of central and side walkways shall be provided with pipe handrails all along the conveyor gallery. Hand railing should not be supported on conveyor supporting stringers. The walkways shall be chequered plate construction with anti - skid arrangement. The anti - skid arrangement will consist of welding of 10 mm square steel bars at a maximum spacing of 500 mm along the length of the gallery. Where the slope of walkway is more than 10°, chequered plate steps with nosing and toe guard shall be provided. The floor of conveyor gallery all along the gallery length, shall be provided with minimum 12 gauge thick seal plates and other drainage arrangements as specified elsewhere

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Conveyor gallery shall have permanently colour coated steel sheet covers on roof and both sides. However in roof, a panel of minimum 1.5 m x 1.5 m area at about 6.0 m center shall be provided with translucent sheets of polycarbonate material for natural lighting. A continuous slit opening of 500 mm shall be provided on both sides just below the roof sheeting. Adequate provision of windows shall be kept on both sides of conveyor gallery as appended in Mechanical Section (Belt conveyor system). Windows shall be provided with wire mesh as specified elsewhere in this specification.

Cross - over with chequered plate platform and ladder for crossing over the conveyors shall be provided at approximately every 100 M intervals of conveyor. Crossover shall preferably be located over four-legged rigid trestle location.

For railway tracks passing below overhead conveyor gallery and along conveyors, the railway clearances both underground as well as over ground shall have to be adhered to for design, execution and erection of foundations, trestles, galleries etc., so that movement of locomotives and wagons is not hampered in any way during execution and afterwards. However at the location where the overhead conveyor gallery crosses road / rail line, minimum clearance of 8.0m above the road crest / rail top shall be provided.

For calculation of material load on moving conveyor, a multiplication factor 1.6 shall be used to take care of inertia force, casual over burden and impact factor etc.

Thus material load per unit length of each moving conveyor shall be

$$1.6 \times \frac{\text{Rated capacity of conveyor system}}{\text{Conveyor Belt Speed}} \times F$$

Where, F = 1700/1400 for lime & 1250/900 for gypsum

It should be noted that for structural design, unit weight of lime shall be assumed as 1700 Kgs. / Cu. M. instead of 1400 Kgs. / Cu. M., unit weight of gypsum shall be assumed as 1250 Kgs. / Cu. M. instead of 900 Kgs. / Cu. M. considered for system sizing purpose. Conveyor Gallery structure shall be designed considering both conveyors operating simultaneously.

Conveyor gallery and supporting trestles located between transfer houses / buildings shall be arranged in any one of the following ways.

a) All gallery supporting trestles shall be four legged type only. One end of each gallery span shall be hinged to the supporting trestle and the other end shall

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	be slide type. Slide type support shall be with P. T. F. E. bearings to allow both rotation & longitudinal movements. b) In between transfer houses / buildings, four legged trestles shall be placed at a maximum interval of 90 metres. The arrangement shall be such so as to ensure that force in the longitudinal direction (i. e. along the conveyor length) of conveyor gallery of length not more than 90 m is transferred to any four legged trestle. In the space between each successive four legged trestles, two legged trestles shall be provided at regular intervals. The end supports resting on the four-legged trestle can have either ends hinged or one hinge and the other on slide type depending on the arrangements. Slide type support shall be with P. T. F. E. bearings to allow both rotation & longitudinal movements. End of conveyor gallery which will be supported over transfer house, shall be so detailed that only vertical reaction is transferred from conveyor gallery and no horizontal force in longitudinal direction is transferred from conveyor gallery to transfer house structure and vice - versa. For trestles and trestle foundations for conveyor galleries located adjacent to existing structures, over ground and under ground facilities, location and details of these trestles and foundations shall have to be decided such that there is no interference both underground as well as over ground with existing structures and facilities. Trestle columns / ground conveyor portal column base shall be kept 300 mm higher than the existing ground level.
3.03.00	**Transfer Houses** The over ground portion of the transfer house shall be framed structure of structural steel work with permanently colour coated profiled steel sheet side cladding (from lowest working floor level till top) and R. C. C. floors comprising of RCC slab over profiled metal deck sheets (to be used as permanent shuttering) over structural beams. Shear anchor studs shall be provided through metal deck at regular interval on all top flange/flange plate of structural beams. However, the lower portion of side cladding, at ground, for a minimum height of 0.9 m above the finished floor level shall be one brick thick wall plastered on both side. In some areas like MCC floors etc., one brick thick wall cladding shall be provided. Brick wall cladding shall be supported on encased wall beams and suitably anchored to adjoining columns and beams. Contractor shall have option to use tubular steel sections for roof truss only. Vertical bracings shall be provided only on four sides along the periphery. Grade slab with 0.9m height one brick thick wall plastered on both side at periphery shall be provided for all transfer houses. Adequate steel doors and windows for proper natural lighting and ventilation shall be provided. In addition to steel windows, panels of suitable size to suit the architectural treatment and made of translucent sheets of polycarbonate material shall also be provided on the side cladding for natural lighting. The roof of Transfer points shall be provided with pre-fabricated insulated metal sandwich panels. Composition of Insulated Metal Sandwich Panels shall be as described elsewhere in the Technical Specification. Adequate slope shall be provided for quick drainage of rain water.

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3.04.00	**Crusher House** The crusher house shall be framed structure of structural steel work with permanently colour coated profiled steel sheet side cladding. However, panels of suitable size to suit the architectural treatment and made of translucent sheets of polycarbonate material shall also be provided on the side cladding for natural lighting. The lower portion of side cladding, at ground, for a height of minimum 0.9m above the finished floor level shall be of one brick thick wall plastered on both faces. Floors shall be of R. C. C. slab over profiled metal deck sheets (to be used as permanent shuttering) over structural beams. Shear anchor studs shall be provided through metal deck at regular interval on all top flange/flange plate of structural beams. Within this building cubicles are to be provided for resting room of operators and these shall be constructed with one brick thick brickwork having both sides plastered and roof slab. Adequate steel doors and windows for natural lighting and ventilation shall be provided. Contractor shall have option to use tubular steel sections for roof truss only . Vertical bracings shall be provided only on four sides along the periphery. The roof of Crusher house shall be provided with pre-fabricated insulated metal sandwich panels. Composition of Insulated Metal Sandwich Panels shall be as described elsewhere in the Technical Specification. Adequate slope shall be provided for quick drainage of rain water. Crushers shall be supported on R. C. C. deck, which in turn will rest on suitable vibration isolation system consisting of springs and dampers. This R. C. C. deck shall be isolated from the floor. However, the vibration isolation system consisting of springs and dampers may rest on main building framework. Detailed specification of vibration isolation system including the unbalanced force, frequency and amplitude criteria and other design requirements are appended elsewhere in this specification
3.05.00	**Control building, M. C. C. Buildings** These shall be steel or RCC framed building with R. C. C. roof and floor. For steel framed building roof /floor shall comprise of RCC slab over profiled metal deck sheets (to be used as permanent shuttering only) over structural beams. Cladding shall be of brickwork/concrete blockwork with plastering on both sides. Roof shall be provided with roof water proofing treatment, as specified elsewhere in the Technical specification. Suitable arrangement shall be provided so as to prevent ingress of water into the cable trenches inside the building from cable entry locations. All air - conditioned areas, shall be provided with the suspended permanently colour coated aluminium false ceiling system (details specified elsewhere) with under deck insulation. Adequate aluminium doors and windows shall be provided for natural lighting, ventilation and view. All windows in air conditioned rooms shall have hermetically sealed double glazing.
3.06.00	**Pent House** These shall be of R. C. C. framed structures with columns, beams, slabs and foundations etc. Cladding shall be of brickwork with plastering on both sides. Roof

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	shall be provided with roof water proofing treatment as specified elsewhere. Adequate nos. of steel doors and windows shall be provided for natural lighting and ventilation.
3.07.00	**Gypsum Storage Shed** The Gypsum storage shed shall be RCC framed structure with structural steel work shed with permanently colour coated profiled steel sheet roof and side cladding, grade slab and RCC foundations etc. Roof shall be provided with troughed profile permanently colour coated sheet with adequate slope for quick drainage of rain water.
3.08.00	**Toilets** Toilet with potable water line facilities shall be provided in each of the following locations: (a.) In all M. C. C. Rooms (b.) Control Building
3.09.00	**Staircases, Gratings, Handrails** All floors of transfer points/crusher houses and other facility buildings shall be accessible through staircase. All staircases of Transfer points and crusher house shall be of steel. Cage ladders (min. 450mm wide) shall be provided for access to roof of penthouses, single storey mcc rooms & mumty. All Stairs shall be minimum 1200 mm wide, maximum rise should not be more than 180 mm and minimum tread with 250 mm. Numbers and arrangement (including enclosures etc.) of stair cases shall be such as to meet the fire safety requirement as per guide lines of statutory regulatory bodies. For steel staircases , Stringers shall be of rolled steel channel (minimum ISMC 250) and tread shall be of steel gratings. Out side stairs to transfer points/crusher house shall be open type. Minimum 50 x 50 x 6 mm size angles with lugs shall be provided as edge protection for treads of stairs in underground TP's All gratings shall be electro forged types. Minimum thickness of the grating shall be 40 mm for indoor installation and 32 mm for outdoor installation. However, at entry or road crossing point's minimum thickness of grating shall be 40 mm The opening size shall not be more than 30mmx100mm. The minimum thickness of the main bearing bar shall be 6 mm or as per design requirement whichever is higher. All gratings shall be designed for minimum imposed load of 500Kgs. / Sq. M. If actual expected load is more than the specified load, then actual load is to be considered. All gratings shall be hot dip galvanized at the rate of 610 g. per sq.m. after surface preparation by means of blast cleaning/ acid pickling. Minimum 1000 mm high hand railing shall be provided around all openings, projections / balconies, walkways, platforms, Stairs, etc. All handrails and ladder Pipes shall be 32 mm nominal bore MS Pipes (medium class) as per IS:1161. Handrails shall have top and middle rails at a height of 1000 mm and 500 mm and the vertical post spacing shall not exceed 1.50 M, with provision of kick Plates (100 mm high and 6 mm thick). All handrails and ladders shall be galvanised at the rate of 610 Gms / Sq. M as per IS:4736.

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3.10.00	**Trenches** All trenches for cables or any other underground facility as detailed out elsewhere shall be of R. C. C. Cable trenches shall be provided with pre - cast R. C. C. covers / chequered plate cover. Cable trenches as well as pre - cast covers shall be provided with edge protection angles and lifting hooks. All embedments / block outs as required and specified elsewhere in these specifications shall be provided. Proper drainage arrangement shall be provided. Trench pre - cast cover weight shall not be more than 65 Kgs. Trench covers near entry or at road crossings shall be designed for 10 T wheel load at centre. Pre - cast covers shall be designed for central point load of 75 Kgs. R. C. C. cable trenches shall be filled with sand after erection of cables, up to top level and covered with pre - cast R. C. C. covers. For cable trenches outside buildings, top level shall be 200 mm above G. L and sand filling shall be overlaid with 50 thk. PCC. Minimum 50 x 50 x 6 mm size angles with lugs shall be provided as edge protection all around cut outs / openings in floor slabs, edges of drains supporting grating/precast RCC covers, edges of R. C. C. trenches supporting pre - cast covers, supported edges of pre - cast cover
3.11.00	**Cable gallery/trestles** Cable galleries/trestles shall be made of structural steel. The contractor can use either rolled sections or tubular steel sections. The tubular steel section shall be of circular/rectangular/square shape. The circular steel tube shall conform to IS:1161 and rectangular/square steel sections shall confirm to IS:4923. The steel structures using tubular sections shall be designed and fabricated as per IS:806 – "Code of Practice for use of steel tubes in general building construction." and **EN 1993-1-8:2005**.
3.12.00 **3.12.01**	**Transformer Foundation** Foundations of transformers shall be designed for seismic and wind loads in addition to other applicable loads. Block foundations shall be provided for the main transformer block. The oil soak pit, if provided, shall be filled with gravel of size 40mm. The volume of the soak pit shall be sufficient to store complete oil of the transformer/reactor along with 10 minutes of fire water considering only 40% of the volume as available voids between gravel filling. However, in case a separate oil collection tank is provided for the transformer/reactor, oil soak pit of volume equivalent to one-third (1/3) the oil volume of transformer/reactor shall be provided around transformer/reactor. The oil collection tank, in such cases, shall be designed for an effective capacity of complete oil of the transformer along with 10 minutes of fire water. The oil soak pit shall also be provided with a sump at the corner to allow drainage of water/oil from the soak pit. Arrangement for moving the transformer into place using rail cum road, jacking pads and pulling blocks including inserts, as required, shall be provided along with the transformer/ reactor foundations.

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	RCC Firewall shall also be provided between the transformers wherever required. 300 mm thick PCC M20 encasement all around the Pylon supports inside soak pit for fire fighting system shall be provided up to top of gravel filling. Coarse aggregate filling inside the transformer oil soak pit shall be carried out only after construction/erection of Pylon supports and PCC encasement.
3.12.02	**Fencing** Fencing with toe wall and steel gates shall be provided around the transformers. Fencing shall comprise of PVC coated GI chain link fencing of minimum 8G (including PVC coating) of mesh size 75 mm and of height 2.4 m above the toe wall. The diameter of the steel wire for chain link fence (excluding PVC coating) shall not be less than 12G. Fence posts shall be of pre – cast R. C. C. of minimum M20 grade. All corner posts will have two stay posts and every tenth post will have transverse stay post. Suitable R. C. C. foundation for the post and stays shall be provided based on prevailing soil conditions. Gates shall be sturdy with locking provisions. Toe walls of brick masonry shall be provided between fence posts all along the run of the fence with suitable foundation. Toe wall shall be minimum 200 mm above the formation level with 50 mm thick P. C. C. coping (1: 1. 5: 3) and shall extend minimum 300 mm below the formation level. Toe wall shall be plastered on both sides and painted with two coats of cement paint of approved colour and shade. Toe wall shall be provided with weep holes at suitable spacing
3.13.00	**Booster Fan Foundation** Booster Fan foundations shall be RCC block foundation directly resting on virgin soil/ pile below Ground level. The vertical faces of this block foundation shall be isolated from adjacent footings by providing minimum 100mm thick polystyrene board of type-1 conforming to IS: 4671 with density 20 Kg/cum sandwiched between the vertical face of block foundation and 230 thick brick wall all round.
3.14.00	**~~CHIMNEY~~**
3.14.01	**Salient Features** Single-flue or multi-flue chimney(s) shall be provided. Chimney shall be of reinforced concrete construction. There shall be one flue (liner) for each unit. The flue gas emission point shall be minimum 150 meters above the plant grade level. The chimney shell (windshield) shall be constructed using slip form shuttering. Internal platforms of steel structure shall be provided for enabling access to various elevations of the chimney and to provide support to the flue liners. Spacing of internal platforms shall not exceed 45.0 M. The platform beams shall be supported on concrete shell using suitable load bearing arrangement in the recesses provided for the purpose. The platform beams getting supported in the chimney shell shall have complete bearing support within the thickness of shell at that location and shall in no case be supported completely/partially on corbels/ brackets from the shell. "Through openings" in shell if provided to facilitate erection of platform beams shall be closed with cast-in-situ RCC closure wall on the external face of the shell. Necessary dowel bars shall be provided in the shell during construction for this purpose. Openings in the concrete shell for flue duct entry, access door & truck entry door at ground level,

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	Filling upto the specified formation level shall extend at least 2.0m beyond the outside face of boundary wall/fence. Thereafter, it shall be finished at a suitable slope (not steeper than 1 Vertical:2 Horizontal) and provided with good quality dry stone pitching minimum 300mm thick for slope upto level difference of 3m. If the level difference is more than 3m, the stone pitching shall be provided with RCC bands with suitable design and benching.
11.00.00	**FENCING** Fencing with toe wall and steel gates shall be provided around the gypsum storage area , lime storage area , gypsum dewatering area , truck hopper and associated areas . Fencing shall comprise of PVC coated GI chain link fencing of minimum 8G (including PVC coating) of mesh size 75 mm and of height 2.4 m above the toe wall. The diameter of the steel wire for chain link fence (excluding PVC coating) shall not be less than 12G. All Fence posts shall be of 75 x 75 x 6 MS angles spaced at 2.5 m c/c distance. All corner posts will have two stay posts and every tenth post will have transverse stay post. Suitable R. C. C. foundation for the post and stays shall be provided based on prevailing soil conditions. Gates shall be sturdy with locking provisions. Toe walls of brick masonry shall be provided between fence posts all along the run of the fence with suitable foundation. Toe wall shall be minimum 200 mm above the formation level with 50 mm thick P. C. C. coping (1: 2. 4) and shall extend minimum 300 mm below the formation level. Toe wall shall be plastered on both sides and painted with two coats of cement paint of approved colour and shade. Toe wall shall be provided with weep holes at suitable spacing.
12.00.00	**ROADS** All roads shall be of rigid pavements unless otherwise specified. The design of rigid pavement shall be carried out as per IRC: 58. The effects of design wheel load, maximum tyre inflation pressures, tyre contact area for the vehicle, traffic loads, environmental factors such as temperature changes in the pavement, other factors, like impact, load repetitions, etc., are to be taken. Detailed plate load tests to determine the modulus of sub grade reaction "K" shall be carried out as per the procedure outlined in IS: 1888. The design traffic load shall be a minimum value of 4 million standard axles. The road shall be designed for 30 years of life and considering a minimum traffic growth rate of 1 per cent per annum. The concrete pavement for roads shall be minimum 250 mm thick slab. The road construction including its shoulders, base, sub base and concrete pavement shall be as per IRC standards. IRC: 58 shall be followed for the pavement design and IRC: 15 shall be followed for the construction of the concrete pavement. The road base shall be with minimum 150 mm thick dry lean concrete over granular sub base. Dry lean concrete shall be laid by a mechanical paver and compacted by vibratory rollers. Concrete pavement of the road shall be done with fully mechanized paver fitted with electronic sensors for construction techniques. Dry lean concrete

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	shall be minimum M10 grade and concrete pavement slab shall be minimum M35 grade concrete. The finished top (crest) of all roads shall be 350 mm above the surrounding finished ground level. The sub grade under all roads and its shoulders shall be compacted to achieve 95 per cent or more of Standard Proctor's Density MDD using mechanical means. Cutting / extending / rerouting / remaking of existing roads including associated works to maintain continuity of road system / network shall also be carried out. All culverts and RCC bridges at crossings of all roads / rail tracks / facilities with drains / nallahs / channels / roads / rail tracks / pipes / other facilities, etc. are to be designed and constructed. Unless otherwise specified, all roads shall be double lane roads. The road section should be as per drawing no. 4410-999-POC-F-001.
13.00.00	**GATE ALONG BOUNDARY WALL:** The gates shall be provided at the entry and exit of truck movement road gates in Bidder's Scope are as identified in Drawing No.: 4410-999-POC-F-001. The gate shall comprise of two mild steel double panelled openable shutter of minimum 7.75 m clear width and minimum height of 3.0m from top of road. The gate shall be complete with fabricated hinges, MS aldrops with locking arrangement, tempered steel pivot, guide track of MS tee, bronze aluminum ball bearing, castor wheel etc. All gates shall be given anti-corrosive treatment in three coats. The structural steel shall confirm to IS: 2062 (latest) and all other relevant IS codes. Beside the each gate one room of size not less than 3m X 3m shall be provided for security guards. The room shall be made of brick/ RCC and with RCC roof. In addition to the room, one toilet block shall also be provided.
14.00.00	**LIME & GYPSUM HANDLING AND ASSOCIATED BUILDINGS STORM WATER DRAINAGE SYSTEM** Storm water drain shall be designed taking into account the finished ground levels of the plant area, drainage pattern, intensity of rainfall, etc with a return period of 50 years. These values shall be based on rainfall intensity of 90mm/hr. All RCC drains shall be either RCC Cast-in-Situ or RCC Pre-cast drains. The minimum grade of concrete shall be M25 for RCC Cast-In-Situ drains and M30 for RCC Pre-cast drains. The maximum velocity for RCC open drains shall be limited to 1.8 metre per second. However, minimum velocity of 0.6 metre per second for self - cleansing shall be ensured. Bed slope not milder than 1 in 1000 shall be provided. Open RCC rectangular section, unless required otherwise due to functioned requirement, shall be provided for all drains. The thickness of side walls and bottom slab of RCC drains shall be minimum 150mm or as per design considerations

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19.00.00	**Fabrication** All steel structures shall be fabricated in factory, transported and erected at site. All factory fabricated structures shall have bolted field connections. Chimney flue liners can either be fabricated at factory in segments, transported and welded at site before erection or fabricated at site. For Chimney flue liners, to prevent flue gas leakages, the applicable field joints shall necessarily be welded.
20.00.00	**Electrodes**
20.01.00	The electrodes used for welding shall be of suitable type and size depending upon specifications of the parent material, the method of welding, the position of welding and quality of welds desired. Only low hydrogen electrodes shall be used for welding of medium / high tensile steel and for mild steel plate thickness above 20 mm.
20.02.00	All low hydrogen electrodes shall be baked and stored before use as per manufacturer's recommendation. The electrodes shall be re-baked at 250°C - 300°C for one hour and later on cooled in the same oven to 100° C. It shall be transferred to a holding oven maintained at 60°C - 70°C. The electrodes shall be drawn from this oven for use.
20.03.00	Where coated electrodes are used they shall meet the requirements of IS: 814 and relevant ASME - Sec. II. Covering shall be heavy to withstand normal conditions of handling and storage.
20.04.00	Only those electrodes that give radiographic quality welds shall be used for welds, which are subjected to radiographic testing.
20.05.00	Where bare electrodes are used these shall correspond to specification of the parent material. The type of flux-wire combination for submerged arc welding shall conform to the requirements of F-60 class of AWSA-5-17-69 and IS: 3613. The electrodes shall be stored properly and the flux shall be baked before use in an oven in accordance with the manufacturer's requirements as stipulated.
20.06.00	The contractor shall take specific approval of the weld for the various electrodes proposed to be used on the works before any welding is started.
20.07.00	**Edge Preparation for Welding** Suitable edge as per weld joint detail shall be prepared either by machines or by automatic gas cutting. All edges cut by flame shall be ground before they are welded.
20.08.00	**Pre Heating and Post Heating** Mild steel and medium / high tensile steel plates thicker than 20mm, will require Pre-Heating of the parent plate prior to welding as mentioned in Table - 1 for mild steel and Table - 2 for medium / high tensile steel, however, higher pre heat temperature may be required as per approved welding procedure and it shall be followed. In welding materials of unequal thickness, the thicker part shall be taken for this purpose. Base metal shall be preheated, not withstanding provisions of IS: 9595 to the temperature given in Table - 1 for mild steel and Table - 2 for medium / high tensile

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steel, prior to welding or tack welding. When base metal not otherwise required to be pre heated is at a temperature below 0°C it shall be pre heated to atleast 20°C., prior to tack welding or welding. Pre heating shall bring the surface of the base metal to the specified pre heat and this temperature shall be maintained as minimum inter-pass temperature welding is in progress.

TABLE - 1
MINIMUM PREHEAT AND INTERPASS TEMPERATURE FOR WELDING MILD STEEL

Thickness of thicker part at Point of welding	Welding Using	
	Low hydrogen electrode or submerged arc welding	Other than low hydrogen electrode
Upto and including 20mm	None	None
Over 20mm and up to and including 40mm	20°C	Not allowed
Over 40mm and up to and including 63mm	66°C	Not allowed
Over 63mm	110°C	Not allowed

Note: Type of electrode and the preheating requirements for welding shall be as per approved welding procedure.

TABLE - 2
MINIMUM PREHEAT AND INTERPASS TEMPERATURE FOR WELDING MEDIUM / HIGH TENSILE STEEL

Thickness of thicker part at Point of welding	Welding Using	
	Low hydrogen electrode or submerged arc welding	Other than low hydrogen electrode
Upto and including 20mm	None	Not Allowed
Over 20mm	120oC - 140°C	Not Allowed

Note : Type of electrode and the preheating requirements for welding of medium and high tensile steel shall be as per approved welding procedure.

20.09.00 Pre heating may be applied by external flame which is non-carbonizing like LPG, by electric resistance or electric induction process such that uniform heating of the surface extending up to a distance of four times the thickness of the plate on either side of the welded joint is obtained.

CLAUSE NO.	TECHNICAL REQUIREMENTS
20.10.00	Thermo-chalk, thermo-couple or other approved methods shall be used for measuring the plate temperature.
20.11.00	All butt welds with plates thicker than 50mm and all site butt welds of main framing beam supporting the bunker shall require post weld heat treatment as per procedure given in AWS D-1.1. Post heating shall be done up to 600oC and rate of application shall be 200oC per hour.
20.12.00	The post heat temperature shall be maintained for 60 minutes per 2.5cm thickness. For maintaining slow and uniform cooling, asbestos pads shall be used for covering the heated areas.
21.00.00	**Paving, Drainage and Sewage** RCC paving of minimum 150 mm thick with M25 grade concrete, over an underbed as specified herein shall be provided. RCC paving shall be designed as rigid reinforced concrete pavement for the crane/ vehicular/ equipment movement loads which the paving has to bear. The under bed for paving shall consist of preparation and consolidation of sub-grade to the required level, laying of stone soling of 200mm compacted thick for normal duty paving with 63 mm and down aggregate with interstices filled with selected moorum followed by 75 mm thick 1:4:8 PCC (1 part cement, 4 parts sand and 8 parts stone aggregate) with 40 mm nominal size aggregate. Paving areas shall be provided with the metallic hardener floor finish as specified elsewhere in the specification. 2.5 m wide paving with metallic hardener around periphery of all sumps and underground tanks shall be provided. Suitable drains shall be provided to dispose off storm water as well as floor wash of the FGD area block. The paving shall be provided with slope of 1:500 to dispose the surface water/wash water to the nearest drain. Sewer lines (Cast Iron), interconnected by sewer manholes (RCC) at regular intervals (not exceeding 30 meter centre to centre) shall be provided to dispose off sewage from FGD area to the nearest available manhole of the owner. The plant storm water drainage shall be designed taking into account the finished grade levels of the plant area, drainage pattern, intensity of rainfall, etc., The storm water drainage shall cater to storm water run off resulting from one hour rainfall intensity, with a return period of 50 years. The value of minimum rainfall intensity shall be taken as 75mm/hr. The maximum velocity for pipe drains and open drains shall be limited to 2.4m/sec and 1.8 m/sec. respectively. However, minimum velocity of 0.6m/sec. for self-cleansing shall be ensured. Bed slope not milder than 1 in 1000 shall be provided. The open drains shall be open rectangular drains of RCC unless required otherwise due to functional requirement. RC box culverts shall be provided at rail, road or other crossings. Sewers shall be designed for a minimum self-cleansing velocity of 0.75m/sec and the maximum velocity shall not exceed 2.4m/sec.

CLAUSE NO.	TECHNICAL REQUIREMENTS
22.00.00	**Statutory Requirements** Bidder shall comply with all the applicable statutory rules pertaining to Factories Act, Fire Safety Rules at Tariff Advisory Committee. Water Act for pollution control, Explosives Act, etc. Provisions of safety, health and welfare according to Factories Act shall be complied with. These shall include provision of continuous walkways along the crane - girder level on both sides of building, comfortable approach to EOT crane cabin, railing, fire escape, locker room for workmen, pantry, toilets, rest room etc. Provisions for fire proof doors, number of staircases, fire separation wall, lath plastering/encasing the structural members (in fire prone areas), type of glazing etc. shall be made according to the recommendations of Tarrif Advisory Committee. Statutory clearances and norms of State Pollution Control Board shall be followed. Bidder shall obtain approval of Civil/Architectural drawings from concerned authorities before taking up the construction work.
23.00.00	**INSPECTION, TESTING AND QUALITY CONTROL** Sampling and testing of major items of civil works viz. earthwork, concreting, structural steel work (including welding), piling, sheeting, etc. shall be carried out in accordance with the requirements of this specification. Wherever nothing is specified relevant Indian Standards shall be followed. In absence of Indian Standard equivalent International Standards may be used. The Bidder shall submit and finalise a detailed field Quality Assurance Programme before starting of the construction work according to the requirement of this specification. This shall include frequency of sampling and testing, nature/type of test, method of test, setting of a testing laboratory, arrangement of testing apparatus/equipment, deployment of qualified/experienced manpower, preparation of format for record, Field Quality Plan, etc. Tests shall be done in the field and/or at a laboratory approved by the Engineer. The Bidder shall furnish the test certificate from the manufacturer's of various materials to be used in the construction.
24.00.00	**CONCRETE** All R. C. C. works to the done under this specification, unless specified otherwise shall be design mix concrete. Minimum grade of concrete for various structures shall be as follows: a.) M25 - For all underground / sub-structural/ super-structure R. C. C. work. b.) M30- For Block Foundation c) M35- For spring supported RCC deck

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CLAUSE NO.	TECHNICAL REQUIREMENTS
	(b.) Wherever required minimum 1000 high hand railing with 32 NB M.S. pipes medium class as per IS : 1239 shall be provided, with toe & knee rail and toe guard plate, around all floor / roof openings, around periphery of Neutralisation Pit, projections of balconies, walkways, platforms, steel staircase etc.
	(c.) However for RCC staircases in structures, buildings and facilities, railings with 20 mm square MS bar balustrades with suitable anti corrosive paint of approved colour MS flats for knee & toe guard with 50mm Ø NB MS pipe hand rail at top shall be provided.
	(d.) All air conditioned areas / common corridors shall be provided with false ceiling constructed from 15 mm mineral Fibre Board in tile form of 600x600mm with supporting system as per manufacture guidelines. 50 mm thick mineral wool insulation (conforming to IS : 8183) shall be provided with as under deck insulation). Additional hangers and height adjustment clips shall be provided for return air grills, light fixtures, Air conditioning ducts etc. Minimum headroom below false ceiling shall be 3.0 m.
	(e.) Under - deck insulation shall be provided on the ceiling (underside of roof slab) and underside of floor slab of air - conditioned areas depending upon the functional / air - conditioning requirements. The under - deck insulation shall consist of 50 mm thick mineral wool insulation conforming to IS : 8183 backed with 0.05 mm thick aluminium foil & 24 G x 25 mm mesh wire netting and shall be fixed to ceiling with 24 G wire ties and suitable fixing arrangements.
	(f.) Parapets, chajjas, window / door heads, architectural facias, fins etc., shall be provided with drip course in cement mortar (1 : 3).
	(g.) 150mm thick fillets at junction of roof slab / chajja slab and parapet / vertical walls shall be provided with cast - in - situ cement concrete 1 : 2 : 4 nominal mix, followed by 12 mm thick cement sand plaster (1 : 4).
	(h.) Suitable provision shall be made for fixing of ceiling fans in office areas of different structures, buildings and facilities.
31.00.00	**CORROSION PROTECTION**
31.01.00	GENERAL
	(a) All Steel structures shall be provided with painting as given in the specification. Further, painting system shall also meet the requirements of Corrosivity category C3 (durability High) as per ISO 12944.
	Painting system for steel surfaces embedded in Concrete is given separately.
	(b) All Painting shall be done as per technical specification. Painting scheme shall be submitted by the bidder for approval of employer.
	(c) All steel structures shall be designed by following basic design criteria in ISO 12944 Part 3. However, where it is not feasible to follow the design criteria given in ISO 12944 Part 3 where the steel surface are inaccessible for application of protective coating, corrosion allowance of 1.5 mm shall be kept in thickness(over the design thickness) of structural steel members.
	d) Painting scheme shall be resubmitted by the Bidder for approval of employer.
31.02.00	PAINTING OF STEEL SURFACES EMBEDDED IN CONCRETE:

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CLAUSE NO.	TECHNICAL REQUIREMENTS
	a) For the portion of Steel surfaces embedded in Concrete, the surface shall be prepared by Manual Cleaning and provided with Primer Coat of Chlorinated Rubber based Zinc Phosphate Primer of Minimum 50 Micron Dry Film Thickness (DFT). b) All threaded and other surfaces of foundation bolts and its materials, insulation pins, Anchor channels, sleeves, etc. shall be coated with temporary rust preventive fluid and during execution of civil works, the dried film of coating shall be removed using organic solvents.
31.03.00	PAINTING OF STEEL SURFACES (OTHER THAN THOSE EMBEDDED IN CONCRETE)
	a) All steel surfaces shall be provided with two component moisture curing zinc (ethyl) silicate primer coat (having minimum 80% of metallic Zinc content in dry film, solid by volume minimum 60% ±2%) of minimum 70 micron DFT to be applied over blast cleaned surface conforming to Sa 2 ½ finish of ISO 8501-1 with surface profile 40-60 Micron. The primer coat shall be applied in shop immediately after blast cleaning by airless spray technique. Zinc dust composition and properties shall be Type-II as per ASTM D520-00. b) Primer coat shall be followed with the application of Intermediate coat of two component polyamide cured epoxy with MIO Content (containing lamellar MIO minimum 30% on pigment, solid by volume minimum 80% ±2%) of minimum 100 micron DFT. This coat shall be applied in shop after an interval of minimum 24 hours (from the application of primer coat) by airless spray technique. c) Intermediate coat shall be followed with the application of finish coat of two-pack aliphatic Isocyanate cured acrylic finish paint (solid by volume minimum 55% ±2%) with Gloss retention (SSPC Paint Spec No 36, ASTM D 4587, D 2244, D 523) of Level 2 (after minimum 1000 hours exposure, Gloss loss less than 30 and colour change less than 2.0 ΔE) and minimum 70 micron DFT. This coat shall be applied shop after an interval of minimum 10 hours and within six (6) months (from the completion of Intermediate coat), Colour and shade of the coat shall be as approved by the Employer. Notes: 1. For Primer, high quality surface preparation is necessary and good amount of moisture is required for proper curing. Below 70 % relative humidity, curing time may go up to 7 days or more. In such a case additional water sprinkling may be ensured for completion of curing. Additionally Inorganic zinc silicate cannot be recoated; even with itself. Typically it should be used when coating bare steel surface for first time. 2. The most frequent problem associated when top coating Primer is bubbling/pin holing especially with non-weathered zinc silicate coatings. To a great extent, this bubbling of finish paint can be eliminated by applying a mist coat of intermediate/topcoat as the first pass of the product, allow the bubbles to subside and then apply a full coat, as required. 3. In case top coating of zinc silicate with epoxy/polyurethane coatings, is expected to be delayed, it is advisable to use a suitable tie coat to avoid formation of white rust. However, if white rust forms then clean the surface with high pressure water, dry and apply the subsequent coats as required. 4. Touch up paintings on damaged areas: Surface preparation by manual tools, wire brush/ emery paper etc. Minimum 6 inches peripheral area, adjoining to damaged area to be covered. If metal surface is exposed, it is to be painted

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CLAUSE NO.	TECHNICAL REQUIREMENTS
	with Zinc rich epoxy (70 micron) or suitable primer with existing paint scheme. If primer is intact, intermediate & top coat to be done with specified DFT in scheme.
31.04.00	**COATING FOR MILD STEEL PARTS IN CONTACT WITH WATER.** a) All mild Steel parts coming in contact with water or water vapour shall be hot dip galvanised. The Minimum Coating of Zinc shall be 610 Gms / Sq. M. for galvanised Structures and shall comply with IS: 4759 and other relevant Codes. Galvanising shall be checked and tested in accordance with IS: 2629. b) The galvanising shall be followed by the application of an etching Primer and dipping in black bitumen in accordance with BS: 3416, unless otherwise specified.
31.05.00	**Gratings** All gratings shall be blast cleaned to Sa 2 ½ finish or cleaned by acid pickling as per ISO 8501-1 and shall be hot dip galvanized at the rate of 610 Gms / Sq. M.
31.06.00	**Hand Railings and Ladders** All Mild steel handrails and ladders shall be galvanised at the rate of 610 Gms / Sq. as per IS: 4736. However, Stainless steel handrails shall be provided as specified in General Architectural Specification clause 9.0.0.
31.07.00	**Sea Worthiness** All Steel Sections and fabricated Structures, which are required to be transported on sea, shall be provided with anti corrosive Paint before shipment to take care of sea worthiness.
31.08.00	**For Reinforced Concrete Work.** i) The protection for concrete sub-structure shall be provided based on aggressiveness of the soil, chemical analysis of soil/sub-soil water and presence of harmful chemicals/salts. ii) The protection to super structure shall depend on exposure condition and degree of atmospheric corrosion. This shall require use of dense and durable concrete, control of water cement ratio, increase in clear cover, use of special type of cement and reinforcement, etc., coating of concrete surface, etc., Bidder shall furnish the details of corrosion protection measures.
32.00.00	**Miscellaneous**
32.01.00	Ordinary form work shall be used in roofs and floor slabs in transfer houses, footings, pedestals, cable trenches, pits etc., Plywood form work shall be used for all over ground exposed work like columns, beams, floors and ceilings in control room and M. C. C. buildings.
32.02.00	Monorail girders and fixtures shall be provided for monorails at the locations as required and as described elsewhere in these specifications or drawings. Monorail openings in the walls shall be provided with steel frame doors preferably sliding type or otherwise open able inside, access platforms and ladders.

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CLAUSE NO.	TECHNICAL REQUIREMENTS
39.00.00	**MATERIALS**
39.01.00	**For Civil, Structural and Architectural works** Employer will not supply any material. All materials including cement, reinforcement steel and structural steel, whatsoever required for execution and completion of the entire scope of work covered under this specification shall be arranged by the contractor at his own cost. All materials procured by the contractor shall meet the quality requirements specified in this specification. The contractor shall keep sufficient stock of cement and steel at site at any point of time when the work is in progress excluding what has been already incorporated in the works, so that any disruption / delay in availability of these materials during procurement will not affect the progress of work at site. The minimum quantity of such materials in stock at site shall not be less then the Requirement of one (1) month in case of Cement and Requirement of two (2) Consecutive months in case of Steel.
39.02.00	**Structural steel** Structural Steel (including embedded Steel) shall be straight, sound, free from twists, cracks, flaw, laminations and all other defects. Structural steel shall comprise of mild steel, medium strength steel and high tensile steel as specified below.
39.02.01	**Mild Steel** a) Rolled sections shall be of grade designation E250, Quality A/BR, Semi-killed/ killed conforming to IS 2062. All steel plates shall be of Grade designation E250, Quality BR (fully killed), conforming to IS 2062 and shall be tested for impact resistance at room temperature. Plates beyond 12mm thickness and up to 40mm thickness shall be normalized rolled. Plates beyond 40mm thickness shall be vacuum degassed & furnace normalised and shall also be 100% ultrasonically tested as per ASTM –A578 level B-S2. b) Pipes shall conform to IS 1161. c) Hollow (square and rectangular) steel sections shall be hot formed conforming to IS: 4923 and shall be of minimum Grade Yst 240. d) Chequered plate shall conform to IS 3502 and shall be minimum 6 mm thick excluding projection. Steel for chequered plate shall conform to grade E250A semi killed of IS: 2062 or equivalent grade conforming to ASTM & BS standards only.
39.02.02	**Medium and High Tensile Steel** Rolled Sections and plates shall be of grade designation E350 or higher, Quality B0 (Fully killed), conforming to IS 2062. Plates beyond 12mm thickness and up to 40mm thickness shall be normalized rolled. Plates beyond 40mm thickness shall be vacuum degassed & furnace normalised and shall also be 100% ultrasonically tested as per ASTM –A578 level B-S2.
39.03.00	Fly ash based Portland pozzolona cement conforming to IS: 1489 Part - I shall preferably be used. However, the contractor may use other types of cements conforming to IS: 269, IS: 8112, IS: 12269, & IS: 455.

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CLAUSE NO.	TECHNICAL REQUIREMENTS
39.04.00	**Reinforcement steel shall conform to:** a) Mild steel bars of grade I of IS: 432 Part – I or grade A of IS: 2062. b) High yield strength deformed TMT steel bars of grade Fe-500 having minimum elongation of 14.5 % or Fe-500D, and conforming to other requirements of IS 1786.
40.00.00	**CODES AND STANDARDS** All standards, specifications, acts and code of practice referred to herein shall be the latest editions including all applicable official amendments and revisions. Other Indian, foreign Codes and Standards not listed here but referred to elsewhere within this specification shall also be deemed to be part of this list. In case of conflict between this specification and those (IS standards, codes etc.) referred to herein, the former shall prevail. Some of the relevant Indian standards, Acts and Codes applicable to this section of the specification are listed below

IS : 383	Specification for coarse and fine aggregates from natural sources for Concrete.
IS : 432	Specification for mild steel and medium tensile steel bars and hard drawn steel wire for concrete reinforcement.
IS : 456	Code of practice for plain and reinforced concrete.
IS : 458	Specification for concrete pipes.
IS : 516	Method of test for strength of concrete.
IS : 800	Code of practice for use of structural steel in general building construction.
IS : 814	Specification for covered electrodes for metal arc welding for weld steel.
IS : 816	Code of practice for use of metal arc welding for general construction.
IS : 817	Code of practice for training and testing of metal arc welders.
IS : 875 (Pt. I to V)	Code of practice for design loads other than earthquake) for buildings and structures.
IS : 1038	Steel doors, windows and ventilators.

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CLAUSE NO.	TECHNICAL REQUIREMENTS	
	IS : 1172	Basic requirements for water supply, drainage and sanitation.
	IS : 1361	Steel windows for industrial buildings.
	IS : 1786	Specification for high strength deformed steel bars and wires for concrete reinforcement.
	IS : 1892	Code of practice for subsurface investigation for foundation.
	IS : 1893	Criteria for earthquake resistant design of structures.
	IS : 1904	Code of practice for design and construction of foundations in soils; general requirements.
	IS : 1905	Code of practice for structural safety of buildings - Masonry walls.
	IS : 1948	Specification for aluminium doors, windows and ventilators.
	IS : 2062	Steel for general structural purposes.
	IS : 2131	Method of standard penetration test for soils.
	IS : 2212	Code of practice for brickwork.
	IS : 2645	Specification for Integral cement water proofing compounds.
	IS:2720 (Part-II, IV TO VIII, XIV, XXI, XXIII, XXIV, XXVII TO XXIX, XL)	Methods of test for soils - determination for water content etc code of practice for earth work on canals.
	IS : 2911	Code of practice for design and construction of pile foundations.
	(Part-1/Sec.1)	Driven cast in situ concrete piles.
	(Part-1/Sec.2)	Bored cast-in-situ concrete piles.
	(Part-IV)	Load test on piles.
	IS : 2974 (Part - I TO V)	Code of practice for design and construction of machine foundations.
	IS : 3370 (Part I to IV)	Code of practice for concrete structures for the storage of liquids.
	IS : 3658	Code of practice for liquid penetrant flaw detection.
	IS : 3664	Code of practice for ultra sonic testing by pulse echo method.

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CLAUSE NO.	TECHNICAL REQUIREMENTS
	IS : 4326 — Code of practice for earthquake resistant design and construction of buildings. IS : 4990 — Specification for plywood for concrete shuttering work. IS : 5624 — Specification for foundation bolts. IS : 7215 — Tolerances for fabrication steel structures. IS : 8112 — Specification for 43 grade Ordinary Portland Cement. IS : 9103 — Specification for admixtures for concrete. IS : 9595 — Code of procedure of manual metal arc welding of mild steel. IS : 10262 — Recommended guidelines for concrete mix design. IS : 13311 — Method of non - destructive testing of concrete. IS : 13755 — Dust pressed ceramic tiles with water absorption of 3%, E6% (Group B11a) ASTM 898 -89 — Standard guide for use of high solid content, cold liquid-applied elastomeric water proofing membrane for use with separate wearing course. AS/NZS 2728 — Pre finished / pre painted sheet metal product for interior / exterior building applications – Performance requirements. AS : 1365 — Standards for steel manufacturing. AS : 1397 — A steel sheet & strip – hot – dipped-zinc-coated or Aluminium-Zinc coated. AS : 3566 — Self drilling screws for building and construction industry. IRC : 37 — Guidelines for the design of flexible pavements. - — Manual on sewerage and sewage treatment (Published by CPH & EEO) As updated. Indian Explosives Act. 1940 as updated.

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SUB-SECTION-V-Q

QUALITY ASSURANCE

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CIVIL WORKS

SUB-SECTION-V-QD1

CIVIL WORKS

Clause No	QUALITY ASSURANCE PROGRAMME

SAMPLING, TESTING AND QUALITY ASSURANCE FOR CIVIL WORKS

1.0.0 INTRODUCTION

1.1.0 This part of the specification covers the sampling, testing and quality assurance requirement (including construction tolerances and acceptance criteria) for all civil and structural works covered in this specification including excavation and filling, cast in situ concrete and allied works, fabrication and erection of structural steel works, masonry / sheeting and allied works, finishing items etc.

1.2.0 This part of the technical specification shall be read in conjunction with other Parts of the technical specifications, general technical requirements & erection conditions of the contract. Wherever IS code or standards have been referred they shall be the latest revisions.

1.3.0 All tests required for all materials (bought by Contractor) and workmanship shall be done / got done by the contractor at his own cost. The rate for respective items of work or price shall include the cost for all works, activities, equipment, instrument, personnel, material etc. whatsoever associated to comply with sampling, testing and quality assurance requirement including construction tolerances and acceptance criteria and as specified in subsequent clauses of this part.

1.4.0 The Contractor shall provide the facilities whatsoever required and also bear the cost for all sampling, testing and quality assurance in the field and in the laboratory. The Contractor shall carry out all sampling and testing in accordance with the relevant Indian standards and / or international standards and this technical specification. Where no specific testing procedure is mentioned, the tests shall be carried out as per the best prevalent engineering practices and to the directions of the Engineer. All sampling shall be done in the presence of the Engineer or his authorised representative. The Contractor shall establish the QA&QC laboratory at site and all field tests shall be done in the presence of the Engineer and / or his authorised representative. The tests which cannot be carried out in the field laboratory shall be done at a laboratory of repute such as CSMRS, NCBM, IITs, National Test House, Kolkata etc. as agreed by the Engineer. The test samples for such test shall be jointly selected and sealed by the engineer and thereafter these shall be sent to the concerned laboratory through the covering letter signed by FQA representative of the engineer. The cost of transportation and other associative cost including the test charges shall be borne by the contractor. These cost shall deemed to be included in the respective item of work in the contract. If the Engineer desires to witness such tests at laboratory, Contractor shall arrange to conduct the test in his presence.

1.5.0 The recommendations and suitability of material for concreting and other building materials like brick, cement, aggregates etc., shall be ascertained by contractor prior to start of work.

Preliminary evaluation of aggregate and its evaluation for potential alkali-aggregate reactivity as per following scope of work shall be done:-

Clause No	QUALITY ASSURANCE PROGRAMME
	A. Evaluation of Aggregates: I. To carry out different tests on coarse aggregate sample i.e. specific gravity, water absorption, sieve analysis, deleterious material; soundness, crushing value, impact value, abrasion value, elongation index and flakiness index, as per IS: 2386. II. To carry out different tests on fine aggregate sample i.e. specific gravity, water absorption, sieve analysis soundness, deleterious material, silt content, clay content and organic impurities as per IS: 2386. III. To prepare evaluation report based on test results of I) and ii) above and to advise regarding suitability of fine and coarse aggregates. B. Evaluation of Aggregates for Potential Alkali-Aggregate Reactivity: Evaluation for Potential Alkali-Aggregate reactivity as per following scope of work: I. To carry out petrographic analysis and accelerated Mortar bar Test on aggregate samples (1N NaOH at 80 deg. Centigrade for 14 days as per ASTM 1260, or the method established/ developed by CSMRS for 22days test. II. To prepare a report based on test results of I) above and to advise regarding suitability of aggregates and further testing required if any. The contractor shall initiate the action with regard to the above mentioned evaluation of aggregates and other building material, so as to ensure timely completion of these tests thereby not affecting any project work. All records shall be submitted, unless specified otherwise, as per the format developed by the Contractor and approved by the Engineer.
1.6.0	The Contractor shall enclose a comprehensive list of bought out items (BOIs) envisaged in the contract for carrying out fabrication/ manufacturing/ erection/ construction/ commissioning activities, procurement of forged, cast, semi-finished and finished components/equipment etc and shall indicate the names of reputed manufacturers for each of them in their bid proposal. The items envisaged by the Contractor to be procured from these manufacturers shall meet the specification requirement. An indicative list of major bought out items (not exhaustive) for civil works is enclosed at **Annexure-I**, for which the contractor shall submit the requisite details / lists of manufacturer's in their bid proposal.
1.7.0	The list of manufacturers / sub-vendors of each of the BOIs identified / indicated by the Contractor shall be discussed / reviewed by the NTPC during post bid discussions and the list of proposed manufacturers / sub-vendors for each of the BOI shall be agreed/ approved. The list of manufacturers for all the BOIs envisaged in contract shall be included in the bid proposal and the same shall be discussed for finalization during the post bid discussions before placement of award. Where the manufacturers are placed in "DR" (Details required) category, the details of the manufacturers / sub-vendors placed in the "DR" category shall be submitted to the NTPC for approval within the period agreed at the time of post bid discussions. The Contractor's proposal shall include vendor's site facilities, expertise, facilities established at the respective works, the process capability, process stabilization, QC systems followed, experience list, etc. along with his own technical evaluation for identified sub-Contractors proposed. The formats for furnishing above details

Clause No	QUALITY ASSURANCE PROGRAMME
	shall be given to the Contractor at post bid discussion stage. Monthly progress reports on sub-Contractor detail submission / approval shall be furnished on format no. QS-01-QAI-P-02/F1. The NTPC shall furnish other relevant formats for information/ clarification for manufacturers / sub-vendors approval to the Contractor at the time of post bid discussions (Main supplier's evaluation report Format No: QA-01-QAI-P-04/F1-R0 and Sub supplier questionnaire Format no: QA-01-QAI-P-04/F2-R0). Such manufacturers / sub-vendors approval shall not relieve the Contractor from any obligation, duty or responsibility under the contract.
1.8.0	Structural steel and Reinforcement steel supply if in the scope of the contractor shall be procured from Main Steel Producers enlisted by NTPC from time to time. Currently, Main Steel Producers enlisted by NTPC are SAIL, JSW Steel Ltd, Jindal Steel & Power, Tata steel Ltd. (for Reinforcement steel/TMT bars), RINL (for long products/Rolled sections and Reinforcement steel/TMT bars), Essar Steel India Ltd. (for Flat products/ Steel Plates), Electrosteel steel Ltd. (for Reinforcement steel/TMT bars) and Monnet Ispat and Energy Ltd. (for long products/Rolled sections and Reinforcement steel/TMT bars). Subsequently, if any new Main Steel Producer/s are enlisted, they may also be considered for procurement during execution of the contract if proposed by the Contractor.
1.9.0	The Field Quality Plans shall detail out all the equipment, the quality practices and procedures etc. to be followed by the Contractor's "Site Quality Control Organisation", during various stages of site activities starting from receipt of materials/equipment at site. The contractor shall furnish complete QA & QC programme (QAP) for the work envisaged which may include the following:- • The organisation structure for the management and implementation of the proposed Quality Assurance Programme. • Documentation Control System • The procedure for procurement of materials and source inspection. • System for site controls including process controls. • Control of non-conforming items and systems for corrective action • Inspection and test procedures for site activities • System for indication and appraisal of inspection status • System for maintenance of records • System for handling, storage and delivery. • Quality Plan detailing out quality practices and procedures, relevant standards and acceptance levels for all types of work under the scope of this contract. The Contractor shall appoint a dedicated, experienced and competent quality management representative on site, preferably directly reporting to the Project Manager, supported by experienced personnel, to ensure the effective implementation of the approved quality assurance programme.

Clause No	QUALITY ASSURANCE PROGRAMME
	The onsite quality management representative shall have the organisational freedom and authority to implement the requirements of these quality assurance arrangements, free from commercial and programme restraints. The QA & QC setup of the contractor shall consist of qualified and experienced engineers, with their supporting staff. The QA&QC set up in addition to requisite mechanical & electrical engineers shall consist sufficient graduate civil engineers & supervisors to take care of quality assurance activities of both site & laboratory. An indicative QA & QC organization chart is attached at **Annexure-III**. The deployment of man power for QA & QC set up shall be affected on the basis of agreed manpower deployment schedule, which shall be prepared by the contractor based on the L-2 network and the same shall be submitted to the Engineer-in-charge for acceptance. Based on the schedule of work agreed with the Engineer-in-charge and the approved FQP, the Contractor shall prepare a schedule of tests and submit them to the Engineer-in-charge and organise to carry out the tests as scheduled/ agreed. The QA&QC laboratory shall have all necessary equipment, instruments and shall be managed by a qualified / experienced person. An indicative list of test equipment is attached at **Annexure-II**. All these testing equipment shall be provided by the contractor at his own cost. The contractor shall maintain the equipment in good working condition along with valid calibration certificates, for the duration of the contract. Any other equipment though required for testing but not listed in the equipment list shall be provided / arranged by the contractor at his own cost. QA&QC laboratory building shall be constructed by the Contractor at their own cost. The laboratory building shall be constructed and installed with the appropriate facilities. Temperature and humidity controls shall be available wherever necessary during testing of samples.
1.10.0	The contractor shall prepare and obtain approval of the Owner of the Field Quality Plan (FQP) well before the start of the work. This FQP shall cover for all the items / activities covered in the contract/schedule of items and required for completion of the work.
1.11.0	All materials / components and equipment covered under the scope of work which are to be manufactured at shop/ factory of the vendor/subvendor shall be covered under a comprehensive quality assurance programme. The detailed quality plan for manufacturing shall be drawn up by the contractor and will be submitted to the owner for approval in the prescribed format for manufacturing quality plan. Manufacturing Quality Plan (MQP) shall detail out all the components and equipment, various test/inspection, to be carried out as per the requirements of this specification and standards mentioned therein. The quality practices and procedures followed by Bidder's/Sub-Bidder's/ sub-supplier's Quality Control Organization shall include , the relevant reference documents and standards, acceptance norms, inspection documents raised etc., during all stages of material procurement, manufacture, assembly and final testing / performance testing . The quality plan shall be submitted in electronic media e.g. CD or E-mail in addition to hard copy, for review and approval. After approval the same shall be finally submitted in compiled form on CD.

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Clause No	QUALITY ASSURANCE PROGRAMME
1.12.0	The contractor shall store and handle the materials as per the requirements of the relevant standards at his own cost.
1.13.0	All the equipment shall be duly calibrated by NABL/ NPL accredited laboratories/accreditation agencies.
1.14.0	The Contractor shall submit to the NTPC Field Welding Schedule for field welding activities in the format No.: QS-01-CQA-W11/F1, this format shall be furnished to the Contractor at pre-award stage. The field-welding schedule shall be submitted to the NTPC along with all supporting documents, like welding procedures, heat treatment procedures, NDT procedures etc. at least ninety days before schedule start of erection work at site. The Contractor shall submit Welding Procedure Specification (WPS) in the format No: QS-01-QAI-W-06/F1 for NTPC approval/ acceptance, this format shall be furnished to the Contractor during post bid discussion stage. All welding and brazing shall be carried out as per procedure drawn and qualified in accordance with requirements of ASME Section IX/BS-4870 or other International equivalent standard acceptable to the NTPC. All welding/brazing procedures shall be submitted to the NTPC or its authorized representative for approval prior to carrying out the welding/brazing. All brazers, welders and welding operators employed on any part of the contract either in the Contractor's/ sub-Contractor's works or at site or elsewhere shall be qualified as per AWSD1.1/ASME Section-IX or BS-4871 or other equivalent International Standards acceptable to the NTPC. Welding procedure qualification and Welder qualification test results shall be furnished to the NTPC for approval. However, where required by the NTPC, tests shall be conducted in presence of NTPC/authorized representative. No welding shall be carried out on cast iron components for repair. All the heat treatment results shall be recorded on time temperature charts and verified with recommended regimes. All Non-destructive examination shall be performed in accordance with written procedures as per International Standards and as mentioned elsewhere in the technical specification; The NDT operator shall be qualified as per SNT-TC-IA (of the American Society of non-destructive examination). NDT shall be recorded in a report, which includes details of methods and equipment used, result/evaluation, job data and identification of personnel employed and details of co-relation of the test report with the job. The records of RT (Films) and UT (inspection records or printed reports if possible) shall be documented and produced to NTPC.
1.15.0	The Contractor shall associate themselves with the reputed specialized blasting agency such as CMRI, NIRM for trials blasts, design blasts, blasting pattern, monitoring of blast during the blasting operations at site. The blasting operation

Clause No	QUALITY ASSURANCE PROGRAMME

shall remain in charge of a responsible, competent, authorized and experienced supervisor (Man-In-Charge) and thoroughly acquainted workmen. All blasting work shall be done as per approved blasting scheme/ design/ pattern in line with the technical specification requirements and all statutory laws, rules, regulations, relevant standards pertaining to the acquisition, transport, storage, handling along with use of explosives shall be strictly followed by the Contractor.

The Contractor shall install and operate equipments (such as tri-axial seismograph) for continuous monitoring and control of blast induced vibrations, noise level/ air pressure, dust, silica and noxious gases during all blasting operations in line with the Technical Specification requirements in association with the specialized blasting agency.

The contractor shall submit the un-priced copy of the award on the specialized blasting agencies to NTPC, highlighting the scope of services/ work awarded to them by contractor. The services of such specialized blasting agency shall be available through out the period in which the blasting work is undertaken at site.

1.16.0 **ASSOCIATED DOCUMENT FOR QUALITY ASSURANCE PROGRAMME:**

i. Field Quality Plan Format No.: QS-01-QAI-P-09/F2-R1
ii. Indicative list of Field Quality Laboratory and Survey equipment list (Annexure-II)
iii. Indicative QA&QC Manpower requirements (Annexure-III)
iv. Indicative Field Quality Plan for Civil Works (Annexure-IV)
v. Indicative Field Quality Plan for Structural Steel Works (Annexure-V)
vi. Manufacturing Quality Plan Format No.: QS-01-QAI-P-09/F1-R1
vii. Status of items requiring Quality Plan and sub supplier approval. Format No.: QS-01-QAI-P-02/F1-R0
viii. List of items requiring quality plan and sub supplier approval. Format No.: QS-01-QAI-P-01/F3-R0
ix. Field Welding Schedule Format No.: QS-01-CQA-W-11/F1-R0
x. Welding Procedure Specification (WPS) Format No.: QS-01-QAI-W-06/F1-R0
xi. Main supplier's evaluation report Format No: QA-01-QAI-P-04/F1-R2
xii. Sub supplier questionnaire Format no: QA-01-QAI-P-04/F2-R1

(Note: The field quality plan attached is indicative and the contractor shall prepare the field Quality plan covering the entire scope of work in the contract and submit the same to corporate QA for acceptance/approval. However any addition or deletion in the scope of work, during detailed engineering shall be accordingly added/ deducted from the Field Quality Plan)

2.0.0 GENERAL QA REQUIREMENTS

2.1.0 **STORAGE AND HANDLING OF COMMON BUILDING MATERIALS**

All materials shall be stacked and stored by the Contractor as per IS-4082 and as per the requirements specified in NTPC Technical Specification.

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Clause No	QUALITY ASSURANCE PROGRAMME

TOLERANCES

	Description of Item/ Structural Element		Max (mm)	Min (mm)
6.	Deviation from specified dimensions of cross-section of columns and beams		+12	-6
7.	Alignment of holding down bolts without sleeves		+1.5	-1.5
8.	Alignment of holding down bolts with sleeves		+5	-5
9.	Level of holding down bolt assemblies		+10	-10
10.	Embedded Parts (in any direction).		+5	-5
11.	Level of embedment for equipment support		+1.5	0
12.	Level of embedment for other embedded parts		+5	-5
13.	Centers of pockets or holes with greatest lateral dimension not exceeding 150mm		+10	-10
14.	Variation in steps • Riser • Tread		 +1.5 +3.0	 -1.5 -3.0
	Pre- Cast Concrete			
15.	Length:	+/- 0.1 percent	+/- 5	+ 10
16.	Straightness or Bow	1/750 of the length	+/- 5	+/- 10
17.	Cross-sectional dimensions	+/- 3 mm or +/- 0.1 percent whichever is greater		
18.	Squareness:	When considering the squareness of the corner the length of the two adjacent sides being checked shall be taken as the base line. The shorter side shall not vary in length from the perpendicular by more than 5 mm.		
19.	Flatness:	The maximum deviation from a 1.5m straight edge placed in any position on a nominal plant surface shall not exceed 5 mm.		
	Placing of reinforcement and for cover (Cover blocks shall be of same grade of concrete in which these would be embedded)		Clause 12.3.1 and 12.3.2 of IS 456	
	Formwork		Clause 9.6 of IS 14687 and 11.1 of IS 456	
	Batching		Clause 10.2.2 of IS 456	

2.5.0 STRUCTURAL STEEL WORK

For structural steel works provisions of technical specifications and IS: 800 shall apply. A detailed methodology for structural steel works shall be submitted by the contractor to NTPC for approval. The methodology may require change / modification based on the site conditions, for which suitable revisions shall be submitted.

The contractor shall submit the welding procedures specification (WPS), heat treatment procedures, NDT procedures etc. at least ninety days before scheduled start of erection work at site. All welding and brazing shall be submitted to the NTPC

Clause No	QUALITY ASSURANCE PROGRAMME

and carried out as per procedure drawn and qualified in accordance with requirements of ASME Section IX/BS-4870 or other International equivalent standard acceptable to the NTPC.

All brazers, welders and welding operators employed on any part of the contract either in the contractor's / sub-contractor's works or at site or elsewhere shall be qualified as per AWSD1.1/ASME Section-IX or BS-4871 or other equivalent International Standards acceptable to the NTPC.

The records of welding procedure qualification and welder qualification test results shall be furnished to the NTPC for approval. However, where required by the NTPC, the tests shall be conducted in presence of NTPC / authorized representative.

No welding shall be carried out on cast iron components for repair. All the heat treatment results shall be recorded on time temperature charts and verified with recommended regimes.

All Non-destructive examination shall be performed in accordance with written procedures as per International Standards and as mentioned elsewhere in the technical specification. The NDT operator shall be qualified as per SNT-TC-IA (of the American Society of non-destructive examination). NDT shall be recorded in a report, which includes details of methods and equipment used, result/evaluation, job data and identification of personnel employed and details of co-relation of the test report with the job. The records of RT (Films) and UT (inspection records or printed reports if possible) shall be documented and produced to NTPC.

Low hydrogen electrode (AWS E-7018) for welding of High/Medium tensile steel, for M.S (IS 2062 Gr. A/Gr. B, IS 8500) sections thickness above 20mm shall be used. Preheating and Post weld heat treatment requirements shall be complied as specified in the technical specification / approved WPS.

The requirements of pre-heating shall be

Thickness of thickest part at the area of welding / heat affected zone	Welding using other than low hydrogen welding electrodes IS 2062	Welding using low hydrogen welding electrodes or submerged arc welding IS 2062
Upto 20 mm (including)	None	None
Over 20 mm to 40 mm (including)	Not allowed	200 C
Over 40 mm to 63 mm (including)	Not allowed	660 C
Over 63 mm	Not allowed	1100 C

The following tests / checks shall be carried out for structural steel works

SL. NO.	TESTS / CHECKS	QUANTUM / STANDARD
	Physical and chemical properties of material if supply in the scope of contractor	As per relevant codes, review of correlated mill test certificates or check testing in absence of MTC
	Ultrasonic test on plates above 40mm	As per ASTM A435

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Clause No	QUALITY ASSURANCE PROGRAMME

SL. NO.	TESTS / CHECKS	QUANTUM / STANDARD
	Welding procedure & welders qualification test	AWSD1.1/ASME Section-IX or BS-4871 or other equivalent International Standards
Fillet Weld		
	Macro-etch examination on production test coupons for main fillet welds	Minimum one joint per built up beams, columns and crane girder etc.
	Tension member of crane girder	Dye penetration test on 25% weld length
	All other fillet welds	DPT on 5% of weld length with minimum 300mm at each location
Butt Weld		
	DPT	100% after back gouging on all butt welds
	Mechanical testing of production test coupons	Minimum one joint per built up beam, column and crane girder.
	Radiography test on butt welds (In case of failure of any welds in SPOT/RT or UT the % of retesting shall be doubled at that particular location. Acceptance criteria of NDT on welds shall be as per AWS D1.1. Wherever RT is not feasible UT to be carried out with the approval of the engineer)	100% RT on butt welds of tension flange (bottom flange) of crane girders 10% RT weld length of each welder on butt welds,
	Ultrasonic testing on full penetration welds (other than butt welds)	100% UT on the web to flange joint of crane girder 10% UT on other full penetration joints
	Control assembly check in shop before erection	1st and further every 10th set of identical structure
	Dimensional tolerances during fabrication and erection	as per IS-7215 and IS-12843
	Surface Preparation and Paint thickness	SA 2 1/2 , By elcometer random after each coat, each member

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Clause No	QUALITY ASSURANCE PROGRAMME
2.6.0	**PAINTING WORKS** Painting works shall be carried out as per the provisions of technical specifications. A detailed methodology for painting works shall be submitted by the contractor to NTPC for approval. The methodology may require change / modification based on the site conditions, for which suitable revisions shall be submitted. The methodology for painting works shall broadly contain the source of approved brand of paints, shot / sand blasting as specified, minimum acceptable size of shot used for blasting, application of primer, intermediate coat and final coat, experience of applicator, etc. testing of painting work and acceptance checks for final clearance.
2.7.0	**SHEETING WORKS** All bought out items shall be procured from the manufacturer's approved by engineer and tested as per relevant IS Codes/ Specification. Raw material of colour coated sheets shall meet the chemical & physical properties as per relevant standards / codes referred in the approved data sheet. It shall be tested for colour match, bare metal thickness, weight of Z/AZ coating, thickness of painting system, reverse impact, T-Bend adhesion, scratch resistance, salt spray test for 1000 Hrs and any other test / properties as specified in the technical specifications. Colour coated sheets shall be marked with video jet printing at the interval not more than 2m bearing manufacturer's name, date and time of manufacturing. Fasteners shall also be tested for 1000 hrs salt spray test as per the requirement of technical specifications. Bonded Mineral Wool Insulation shall meet the requirements of thickness, density, thermal Conductivity, all other tests as per the technical specifications and IS-8183. For sheet installation no gas cut opening shall be allowed at the site, whenever opening is specified these shall be properly cut in the factory and shall be filled with lipping / flashing for true shape / dimension etc. The sheets/ packets shall be stacked neatly clear off the ground at an angle to the ground, over a base pallet to provide drainage. Water / moisture should not be allowed to stagnate on surface, or in between layers. This can damage the coating, and cause corrosion.

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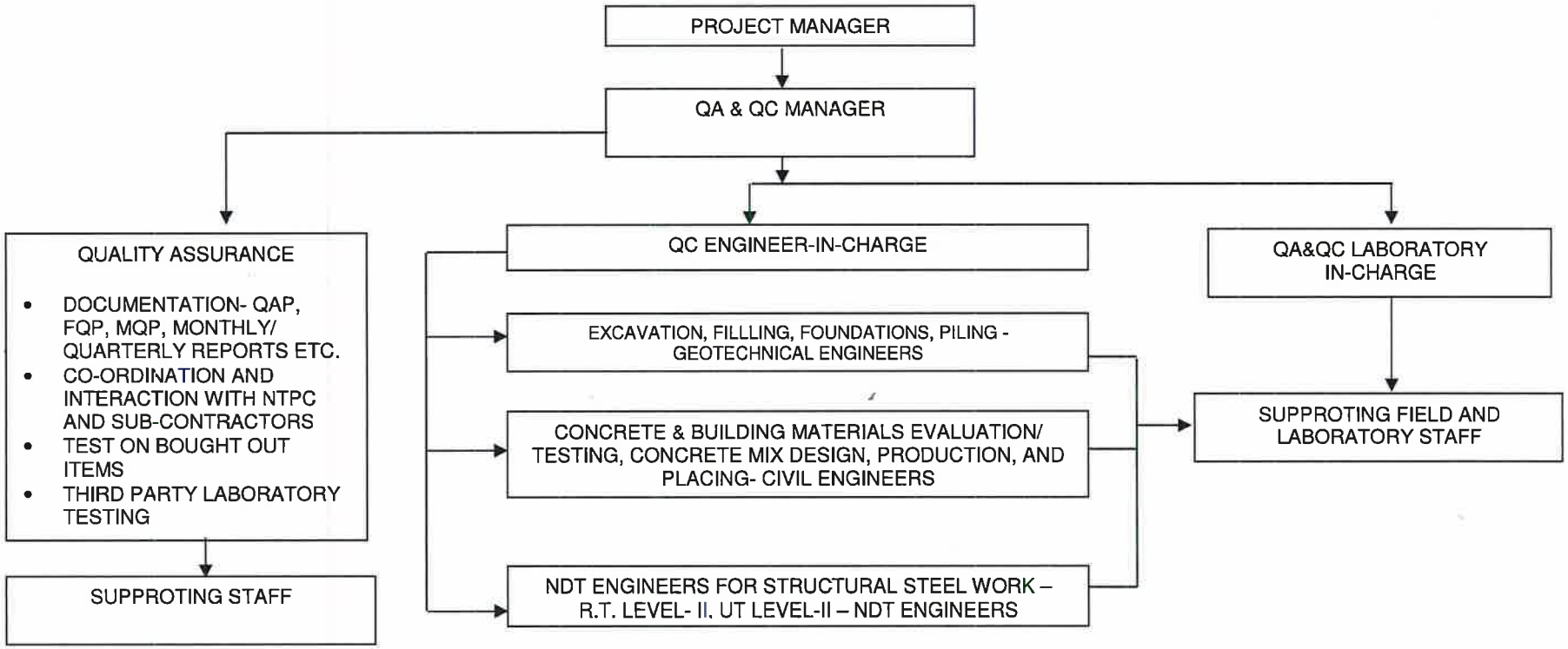
Annexure – III

INDICATIVE FIELD QA & QC MANPOWER STRUCTURE



NOTE:

1. The above organization setup is minimum, however their deployment shall be as per the agreed deployment schedule. The contractor shall prepare a manpower deployment schedule in line with the finalized work plan and the same shall be submitted to the engineer-in charge for acceptance/ approval.
2. The contractor shall mobilize the QA& QC manpower in line with the finalized manpower deployment schedule and shall ensure their availability well in advance (15 days approx.) of the beginning of the concerned activity/ work.
3. The contractor shall further mobilize required number of skilled & supporting staff and additional resources, if any to meet the work schedule.

LOGO	SUPPLIERS NAME AND ADDRESS:	INDICATIVE FIELD QUALITY PLAN									ANNEXURE- V
		ITEM : STRUCTURAL STEEL WORK		QP NO. :		2	PROJECT:	North Karanpura STPP (3X660)			
				REV. NO .:		0	PACKAGE:	FLUE GAS DESULPHURISATION SYSTEM PACKAGE			
		SUB-SYSTEM : FABRICATION & ERECTION		DATE :			CONTRACT NO.				
				PAGE :			MAIN CONTRACTOR				
Sl. No	Activity and operation	Characteristics / instruments		Class# of check	Type of Check	Quantum Of check	Reference Document	Acceptance Norms	Format of Record		Remarks
1	2	3		4	5	6	7	8	9	D*	10
1.00	MATERIALS										
i		Structural steel procured from NTPC approved sources-Mechanical (YS, UTS, Elg, UT if specified),,and Chemical properties (CE as per IS)		A	Review	For each batch of each section delivered at site	Technical Specification and Construction Drawings, IS 2062		SR	√	Correlated MTC shall be verified. In the event of non submission of MTC , sample shall be selected by FQA for testing
2.00	FIT-UP										
2.01		Marking and Cutting	As agreed / required	B	Visual & Measurement	Each plate/ Section	Tech Specs and Const. Drawings/ Approved cutting plan		SR		
2.02		Match markings for trial assembled components	As agreed / required	B	Physical	Each fit-up	Tech Specs and Const. Drawings		SR		
2.03		Weld Fit Up	As agreed / required	B	Physical	Each fit-up	Tech Specs and Const. Drawings		SR	√	Edge Preparation/ Gap/ Alignment
3.00	PRE HEATING (wherever applicable)										
3.01		Pre-Heating Temperature	As agreed / required	B	Measurement	Each pre-heating	Tech Specs and Const. Drawings, Approved WPS		SR	√	
3.02		Post Weld Heat Treatment (PWHT), if required	As agreed / required	A	Time & Temperature	Each PWHT	Tech Specs and Const. Drawings, Approved WPS		SR	√	
4.00	WELDING REQUIREMENTS										
4.01		PQR and Welder's Qualification	As agreed / required	A	Physical	Each welder	Approved WPS/ PQR, AWS-D1.1/ASME IX, Tech Specs and Const. Drawings		Test Report	√	
4.02		Welding consumables	As agreed / required	B	Physical	Random in each shift	Approved WPS/ Owner Rationalized list of Electrodes.		SR	√	
4.03		Sequence of welding	As agreed / required	B	Physical	Random in each shift	Tech Specs and Const. Drawings, Agreed scheme		SR		
4.04		Removal/ grinding of temporary attachments	As agreed / required	B	Measurement	All cleats/ attachments	Tech Specs and Const. Drawings, IS-7215/Approved Drg.		SR		
4.05		Completeness after welding-Dimensions/ distortion	As agreed / required	B	Visual	Each structure component	Tech Specs and Const. Drawings		SR		
5.00	NON DESTRUCTIVE AND DESTRUCTIVE TESTING										
5.01	Fillet Welds										
5.01.01		Visual	As required/ agreed	B	Visual/ Measurement	Each welded joint	As per technical specifications and construction drawings		SR		As per requirement of Owner Engineer
5.01.02		Macro-Etch Examination	As required/ agreed	B	Physical	Main fillet weld with min one joint per built up beam, columns and crane girders	As per technical specifications and construction drawings		SR	√	

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LOGO	SUPPLIERS NAME AND ADDRESS:	INDICATIVE FIELD QUALITY PLAN									ANNEXURE- V
		ITEM : STRUCTURAL STEEL WORK		QP NO. :		2	PROJECT:	North Karanpura STPP (3X660)			
				REV. NO .:		0	PACKAGE:	FLUE GAS DESULPHURISATION SYSTEM PACKAGE			
		SUB-SYSTEM : FABRICATION & ERECTION		DATE :			CONTRACT NO.				
				PAGE :			MAIN CONTRACTOR				
Sl. No	Activity and operation	Characteristics / instruments		Class# of check	Type of Check	Quantum Of check	Reference Document	Acceptance Norms	Format of Record		Remarks
1	2	3		4	5	6	7	8	9	D*	10
5.01.03		Dye Penetration Test (DPT)	As required/ agreed	B	Physical	25% weld length of tension member of crane girder- For crane girder 5% of Weld length with min. 300mm at each location - Except Crane Girder, for all other Fillet Welds	As per technical specifications and construction drawings		SR	√	
5.02	**Butt Welds**										
5.02.01		Visual	As required/ agreed	B	Visual	Random in each shift	As per technical specifications and construction drawings		SR		
5.02.02		Dye Penetration Test	As required/ agreed	B	Physical	100% DPT after back gouging on all butt welds except for coal bunker bins 10% DPT after back gouging-For coal bunker bins	As per technical specifications and construction drawings		SR		All butt welds to be back gouged before DPT
5.02.03		Mechanical testing on production test coupons	As required/ agreed	A	Physical	Min. one joint per built up beams, coloums and crane girder.	As per technical specifications and construction drawings		SR	√	Test on production test coupons
5.02.04		Radiography Test (RT)	As required/ agreed	A	Physical	100% RT on butt welds of tension flange (bottom flange) of crane girders 5% spot RT on butt welds / at inaccessible locations UT on butt welds- For coal bunker bins 10% RT weld length of each welder on butt welds, except for crane girders and coal bunk	As per technical specifications and construction drawings		SR	√	In case of failure of any welds in SPOT/RT or UT the % of retesting shall be doubled at that particular location. Acceptance criteria of NDT on welds shall be as per AWS D1.1. Wherever RT is not feasible UT to be carried out with the approval of the Engineer
5.03	**Full Penetration Welds (Other than butt welds)**										

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LOGO	SUPPLIERS NAME AND ADDRESS:	INDICATIVE FIELD QUALITY PLAN									ANNEXURE- V
		ITEM : STRUCTURAL STEEL WORK		QP NO. :		2	PROJECT:	North Karanpura STPP (3X660)			
				REV. NO .:		0	PACKAGE:	FLUE GAS DESULPHURISATION SYSTEM PACKAGE			
		SUB-SYSTEM : FABRICATION & ERECTION		DATE :			CONTRACT NO.				
				PAGE :			MAIN CONTRACTOR				
Sl. No	Activity and operation	Characteristics / instruments		Class# of check	Type of Check	Quantum Of check	Reference Document	Acceptance Norms	Format of Record	D*	Remarks
1	2	3		4	5	6	7	8	9		10
5.03.01		Ultrasonic Testing (UT)	As required/ agreed	A	Physical	100% UT on the web to flange joint of crane girder 10% UT on other full penetration joints	As per technical specifications and construction drawings		IR	√	In case of failure of any welds in SPOT/RT or UT the % of retesting shall be doubled at that particular loaction. Acceptance criteria of NDT on welds shall be as per AWS D1.1.
5.04	NON DESTRUCTIVE AND DESTRUCTIVE TESTING FOR CHIMNEY STEEL LINER										
i		Visual examination	As required/ agreed	B	Visual	100%	As per technical specifications and construction drawings, IS 822, AWS D 1.1		SR	√	As per requirement of NTPC Engineer
ii		DPT	As required/ agreed	B	Physical	100%	As per technical specifications and construction drawings, IS 822, AWS D 1.1		IR	√	
iii		RT	As required/ agreed	A	Physical	10% FOR SHOP BUTT WELD AND 15% FOR SITE BUTT WELDS	As per technical specifications and construction drawings, IS 822, AWS D 1.1				
6.00	FOUNDATION CHECKS										
6.01		Dimensions and levels	As agreed / required	B	Physical/ Measurement	Each Foundation	Tech Specs and Const. Drawings		SR	√	Shape, lines (including diagonal checks)
		Foundation Bolts (materials)	As agreed / required	A	Physical and MTC Review	Once for each lot of delivery	Tech Specs and Const. Drawings		SR/MTC	√	Foundation bolts shall conform to IS:5624 and property class shall be 4.6 as per IS:1367 (Part-3).
6.02		Foundation Bolts and Embedments	As agreed / required	B	Physical/ Measurement	Each Foundation	Tech Specs and Const. Drawings		SR	√	Measurement of Verticality, Levels, pitch distance
7.00	PRE-ASSEMBLY CHECKS										
7.01		Punch Erection marks and match marks on members	As agreed / required	B	Visual/ Physical	Each structural member	Tech Specs and Const. Drawings				Markings for - Assembly designation, Part number, Weight, Any other important identifications.
7.02		Pre-assembly as per match mark	As agreed / required	B	Visual/ Physical	Each structural member	Tech Specs and Const. Drawings				
7.03		Camber, sweep and total length after trial assembly of structure.	As agreed / required	B	Visual/ Physical	Each structural member	Tech Specs and Const. Drawings		SR	√	
7.04		Control assembly check at shop	As agreed / required	B	Visual/ Physical	Every first and tenth set of identical structure	Tech Specs and Const. Drawings				
8.00	ERECTION CHECKS										
8.01		Alignment, slopes, level, tolerances of erected member	As agreed / required	B	Measurement	Each structural member	Tech Specs and Const. Drawings		SR	√	

Bharat Heavy Electricals Limited * Power Sector Building

LOGO	SUPPLIERS NAME AND ADDRESS:	INDICATIVE FIELD QUALITY PLAN					ANNEXURE- V			
		ITEM : STRUCTURAL STEEL WORK		QP NO. :		2	PROJECT:	North Karanpura STPP (3X660)		
				REV. NO .:		0	PACKAGE:	FLUE GAS DESULPHURISATION SYSTEM PACKAGE		
		SUB-SYSTEM : FABRICATION & ERECTION		DATE :			CONTRACT NO.			
				PAGE :			MAIN CONTRACTOR			
Sl. No	Activity and operation	Characteristics / instruments		Class# of check	Type of Check	Quantum Of check	Reference Document	Acceptance Norms	Format of Record	Remarks
1	2	3		4	5	6	7	8	9	D*	10
8.02		Tightening of bolts including foundation bolts with lock nuts	As agreed / required	B	Visual/ Physical	Each structural member	Tech Specs and Const. Drawings		SR	√	
8.03		Acceptance of erected structure	As agreed / required	B	Visual/ Physical	Each erected structure	Tech Specs and Const. Drawings, IS 7215 and IS 12843		SR	√	
9.00	INSTALLATION AND ALIGNMENT OF STEEL LINER										
i		Submission of Installation/ Erection Scheme/ methodology for all structures	-	B	Approval	Once prior to erection of each structure	Approved drawings and Technical Specifications		SR	√	
ii		Check for Erection Marks	-	B	Visual	100%	Approved drawings and Technical		SR		
iii		Check for Installation of Steel Liners	As required	B	Visual/ Acceptance	100%	Approved drawings and Technical Specifications		SR		
iv		Check for Site Joints	As required	B	Visual/ Acceptance	100%	Approved drawings and Technical Specifications		SR		
v		Check for Installation of Inlet Transition Ducts	As required	B	Visual/ Acceptance	100%	Approved drawings and Technical Specifications		SR		
vi		Check for Installation of Insulations and Expansion Compensators	As required	B	Visual, Physical, Acceptance	100%	Approved drawings and Technical Specifications		SR		Each layer of expansion Compensator tobe checked at shop for thickness, unit weight, tensile strength & elongation along with temp. withstandability for composite joints
vii		Ensure the Erection of all steel structures along with permissible tolerances and their acceptance	As required	B	Visual/ Acceptance	100%	Approved drawings and Technical Specifications		SR		
viii		Check and approval for Dismantling, Modification and Re-erection, if required for any reason	As required	B	Visual/ Acceptance	100%	Approved drawings and Technical Specifications		SR		
10.00	PAINTING SYSTEM										
10.01		Painting Materials and accessories	As agreed / required	A	Review of MTC	Each batch of delivery	Tech Specs and Const. Drawings		SR/MTC	√	Mfr. s T.C. shall be correlated with the consignment received.
10.02		Surface prepration	As agreed / required	B	Physical /visual	Random in each shift	Tech Specs and Const. Drawings, Relevant code/ standards		SR	√	
10.03		DFT of paint - Over steel surface	As agreed / required	B	Physical	Each surface at random	Tech Specs and Const. Drawings		SR	√	
10.04		Acceptance of painted surfaces	As agreed / required	B	Physical	Each surface at random	Tech Specs and Const. Drawings		SR		
11.00	PERMANENT BOLTS AND NUTS AND WASHERS										
11.01		Material	As agreed / required	A	Physical and MTC Review	Once for each lot of delivery	Tech Specs and Const. Drawings		SR/MTC	√	All bolts for connections shall be conforming to IS: 12427 and of property class 5.6 as per IS:1367 (Part 3). Nuts shall conform to IS:1363 (Part 3) of property class 5
11.02		Contact surfaces before bolting	As agreed / required	B	Physical	Random before asembly for bolting	Tech Specs and Const. Drawings, IS 4000		SR		

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LOGO	SUPPLIERS NAME AND ADDRESS:	INDICATIVE FIELD QUALITY PLAN					ANNEXURE- V			
		ITEM : STRUCTURAL STEEL WORK		QP NO. :		2	PROJECT:	North Karanpura STPP (3X660)		
				REV. NO .:		0	PACKAGE:	FLUE GAS DESULPHURISATION SYSTEM PACKAGE		
		SUB-SYSTEM : FABRICATION & ERECTION		DATE :			CONTRACT NO.			
				PAGE :			MAIN CONTRACTOR			
Sl. No	Activity and operation	Characteristics / instruments		Class# of check	Type of Check	Quantum Of check	Reference Document	Acceptance Norms	Format of Record	D*	Remarks
1	2	3		4	5	6	7	8	9		10
11.03		Inspection of the assembled bolts	As agreed / required	B	Physical	Randomly in each shift for assembeled bolts	Tech Specs and Const. Drawings, IS 4000		SR		
11.04		Tensioning	As agreed / required	B	Physical	Randomly during snug tight test and after full tensinoning	Tech Specs and Const. Drawings, IS 4000		SR	√	
11.05		Acceptance of installed bolts	As agreed / required	B	Physical	Each bolt	Tech Specs and Const. Drawings		SR		
12.00	STAINLESS STEEL HAND RAILS										
12.01		Material	As agreed / required	A	Physical/MTC Review(In case procured by contractor)	Once for each lot of delivery	Tech Specs and Const. Drawings		SR/MTC	√	Also check grade of steel
12.02		DPT for welding	As agreed / required	A	Physical	Random for each fabrication	AWS D1.1 / Tech Specs and Const. Drawings		SR/LB	√	WPS shall be submited for Owner approval , electrodes used shall be as specified in WPS
12.03		Acceptance of stainless steel hand rails	As agreed / required	B	Physical	Each installation	Tech Specs and Const. Drawings		SR		
13.00	PTFE SLIDING BEARINGS AND ELASTOMERIC BEARINGS										
13.01		Material from approved source	As agreed / required	A	Physical and MTC Review	Once for each lot of delivery	Tech Specs and Const. Drawings		SR/MTC	√	
13.02		Acceptance of installation of bearings	As agreed / required	B	Physical	Each installation	Tech Specs and Const. Drawings		SR		
		LEGEND: D * Records, indentified with "Tick" (√) shall be essentially included by supplier in QA documentation.					For Owner USE	DOC. NO.:	REV: 0		
		Legend to be used: Class # : A = Critical, B=Major, C=Minor; SR, TR, MTC, LB									
Manufacturer/ Sub-supplier	Main-supplier	Categorization Witnessing & Accepting (As per Owner QA&I System) Category 'A' FQA Engineer in association with Executing Engineer, Category 'B' Executing Engineer, Category 'C' Executing Engineer ;SR = Site Register , TR= Test Report,MfrTC = Manufacturer's Test Certificate									
Signature		This document shall be read in conjunction with Owner Tech. Specifications, BOQ, Drawings						REVIEWED BY	APPROVED BY		APPROVAL SEAL

Bharat Heavy Electricals Limited BHEL Power Sector Marketing

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