निविदा आमंत्रण सूचना
NOTICE INVITING TENDER (NIT)

Enquiry No- 77/25/6075/SEE **Date -15-Jul-25**

BHEL invites offers from reputed engineering service provider as per following terms and conditions -

1. Tender Type	**Open Tender (Domestic-Indian)**		
2. Package	**Civil Engineering Service for non-plant buildings/ structures**		
3. Project	**FRAME WORK AGREEMENT (Rate Contract)**		
4. Executing Agency	**BHEL-PEM**		
5. Mode of Enquiry	**E - PROCUREMENT**		
6. Nature of Package (Divisible/Non-Divisible)	**Divisible**		
7. Numbers of Part bid	**2-Part bid (Techno-commercial and Price bid)**		
8. Due Date & Time	**For offer submission**	**25.07.2025**	12:00 IST
	For P-1 bid opening	**25.07.2025**	16:00 IST
9. Earnest Money Deposit (EMD)	Not Applicable	EMD Amount	NA
10. Tender Cost	NIL		
11. Eligibility of Local engineering service provider as per MII	Min 50% - Class-I Local engineering service provider		
12. Technical Scope	As per Technical specification No: PE-TS-RC-600-C001		
13. Pre-bid Clarification	Engineering service provider to contact BHEL-PEM (over phone/ mail/ visit-BHEL-PEM) for any clarification (Technical or Commercial) at least 05 days before the due date of Tender opening & get it clarified well before the due date, so that offers by the engineering service providers may be submitted within the due date & time.		
14. Prequalification Requirements	Financial PQR- NA	Technical PQR- YES	
15. Delivery Schedule:			
A. Civil Engineering Services	a) Time for completion of all works / services shall be 12 months from the date of award of work for project specific Orders placed against the rate contract. b) Engineering Service provider to depute its Designer to BHEL office in Noida as and when required by BHEL, within 7 days of intimation from BHEL engineering. c) Procedure/Schedule for Submission of Drawings / Documents shall be as per Clause no 7 (submission procedure) of Technical Specification, PE-TS-RC-600-C001.		

Notes:

a. Time for completion of all works / services shall be 12 months from the date of award of work. Engineering Service provider to depute its Designer to BHEL office in Noida as and when required by BHEL. Procedure/Schedule for Submission of Drawings / Documents shall be as per Clause no 7 (submission

procedure) of Technical Specification, PE-TS-RC-600-C001.

b. Drawings /documents submission/re-submission schedule shall be as per Technical specification (PE-TS-RC-600-C001) which shall be used for progress monitoring purpose and required course correction, if any.
c. The delivery date specified is for completion of the deliveries. Deliveries to start progressively so as to meet the completion schedule.
d. The delivery conditions specified are for contractual purposes. However, to meet project requirement, BHEL may ask for early deliveries without any compensation thereof.

2.0 Validity of contract placed on basis of Framework Agreement (Rate Contract) for individual projects (PO rates, terms and conditions):

Engineering Service provider has to complete activities as per the delivery time mentioned above. However, due to unavoidable circumstances where there is delay in providing inputs/ clearances from the Buyer (inputs, engineering approvals, deputing engineer and/or any hold put by the Buyer for whatever reasons during execution of contract etc.) delivery time extension is admissible as per point no.3 below. In such situation it shall be obligatory on part of the Engineering Service provider to execute the contract at PO rates, terms and conditions provided inputs/ clearances have been accorded within validity of contract. Validity period for activities shall be as defined below: -

1 Validity of the contract including quantity variation:

Contract shall be valid for 12 months from the PO date. However, delay at Engineering Service provider's end (if any) shall be added to the validity period and contract validity shall get extended by the delay period at Engineering Service provider's end.

For example: Original Delivery period for main supply: A (in days)

Delay at Engineering Service provider's end: B (in days beyond "A" days)

Contract validity: C+B (in days)

Engineering Service provider to note that B is the Engineering Service provider delay days beyond original contractual delivery period for Civil Engineering Services /extended delivery period owing to time taken by BHEL.

2 Execution of the contract quantities released beyond contract validity period shall be decided on mutual consent basis at PO rates, terms and conditions.

3.0 Delivery Extension: Extension of contractual delivery time:

Delivery time mentioned in the NIT includes Engineering completion time (time for drawing/document submission/resubmission by the vendor and review/approval of the same by the BHEL/End customer). Due diligence is to be observed by the vendor to ensure timely completion of engineering services.

During the execution of the contract, time loss occurred owing to the reason attributable to BHEL besides force majeure shall be considered for delivery time extension to the vendor as given below: -

i. Any Delay in providing comments/ approval on Primary drawing/documents beyond the stipulated time as specified in NIT.
ii. Time Loss in approval of the drawing/document as a result of increase in the iteration not attributable to the vendor (i.e. resubmission owing to end customer comments) as certified by BHEL. Time extension equivalent to the resubmission time noted in the tech. spec and consequential increase in the approval time in lieu of increase in iteration shall be applicable. However, for incomplete re- submission time loss shall be in vendor

account.

iii. Delay in providing engineering input/material by BHEL.

iv. Any hold put by BHEL for whatever reasons during execution of contract (within contract validity period), time extension equivalent to hold period shall be admissible.

Note: Extension in delivery period if any with or without imposition of LD shall be considered after detailed delay analysis based on provisions given above. However, no delay analysis will be applicable if supply is completed within delivery schedule as specified in Purchase order.

3.1 Time for completion of all works / services shall be 12 months from the date of award of work.
Engineering service provider to depute its Designer to BHEL office in Noida as and when required within seven days from intimation by BHEL.
Procedure/Schedule for Submission of Drawings / Documents shall be as per Clause no 7 (submission procedure) of Technical Specification, PE-TS-RC-600-C001. The delivery date specified is for completion of the deliveries. Deliveries to start progressively so as to meet the completion schedule. The delivery conditions specified are for contractual purposes. However, to meet project requirement, the Buyer may ask for early deliveries without any compensation thereof.

Engineering input drawings will be finalized progressively based on availability of inputs hence, list of applicable drawings for buildings in Sr. No 5 of technical specification will be finalized during detailed engineering stage.

16. Liquidated Damages (LD):

a) Liquidated Damages (civil engineering services)
Buyer reserve rights to recover from the civil engineering service provider, as agreed liquidated damages and not by way of penalty, a sum equivalent to half (½) percent value corresponding to undelivered milestones (as defined in Table-3 of specification) of respective building/ structure/Main Gate complex excluding GST, per week or part thereof, subject to a maximum of ten (10) percent of the total contract price of that building/ structure/Main Gate complex excluding GST, if the civil engineering service provider fails to submit milestone as per submission schedule given in table-1 of specification.

b) Liquidated Damages (visit to BHEL office at NOIDA)
For delay visit of civil engineering service provider to BHEL office at NOIDA, LD @ ½% of the total contract value for visits (excluding GST) per week or part thereof shall be applicable per visit, subject to maximum of 10% of total contract value for the visits. LD on visit to BHEL office at NOIDA shall be applicable if the civil engineering service provider fails to visit BHEL office at NOIDA within 7 days of intimation by BHEL engineering.

Notes:
1.Total LD (civil engineering services + visit to BHEL office at NOIDA) shall be limited to 10% of cumulative total contract value (civil engineering services + visit to BHEL office at NOIDA) excluding GST.
2.Bidder's task would be considered complete only when they meet the milestone requirement by due date. In case any milestone as per Table-1 gets delayed then applicable LD will be levied on value of undelivered milestones.
3.Delay analysis of milestone shall include delay in first submission as well as resubmission of respective milestone as per Table-1.
Above LD clause shall prevail over the LD clause of GCC Rev07.

17. Validity of offer shall be as per Clause no. 7 (Instruction to Engineering service provider) of GCC Rev 07.

18. PVC (Price Variation Clause) : NA

19. Integrity Pact Applicability	Yes, Following Independent External Monitors (IEMs) have been appointed by BHEL - Shri Bishwamitra Pandey, IRAS (Retd.) (iem2@bhel.in) Shri Mukesh Mittal, IRS (Retd.) (iem3@bhel.in)

20. Tender Evaluation - Price will be finalized through RA. The evaluation currency for this tender shall be INR. Evaluation will be done on overall L1 (Total Package Price excluding taxes) basis .

In the course of evaluation, if more than one Engineering service provider happens to occupy L-1 status, effective L-1 will be decided by soliciting discounts from the respective L-1 Engineering service provider.

In case more than one Engineering service provider happens to occupy the L-1 status even after soliciting discounts, the L-1 Engineering service provider shall be decided by a toss/ draw of lots, in the presence of the respective L-1 Engineering service provider (s) or their representative(s). Ranking will be done accordingly. BHEL's decision in such situations shall be final & binding.

21. Payment terms:

A) Payment term for Civil Engineering Services:

Payment for respective building (s) shall be released on pro rata basis as per weightage given in Table - 3 of Technical specification against certification by Buyer's Engineering (for completion of activity) on submission of bills.

B) **Payment terms for visit:**

100 % Payment shall be released after completion of activity on certification by buyer's Engg.(MOM signed between BHEL & Civil engineering Service provider) and submission of invoice.

Notes:

1) Payments to Supplier's shall be released only after: -

a) Supplier has declared such invoice in GSTR-1as per the relevant GST Act. b) The tax component charged by the Supplier in the invoice matches with the details uploaded by the Supplier in GSTR-1and GST liability is discharged through GSTR 3B.

In case, any GST credit is delayed/denied to the Buyer due to non/delayed receipt of goods and/or tax invoice or expiry to timeline prescribed in the relevant GST Act for availing such ITC, or any other reasons not attributable to the Buyer, tax amount shall be recovered from the Supplier along with interest levied/ leviable on the Buyer.

2) Payment will be released within days as mentioned below after submission of complete documents:

a. 90 days for non MSME as per MSMED Act

b. 45 days for vendors qualified and registered as Micro and Small Enterprises MSEs as per MSMED Act

c. 60 days for vendors qualified as Medium Enterprises as per MSMED Act."

3) The supplier shall ensure submission of complete documents along with the bill. In case of incomplete documents, the bill shall be rejected, and next due date shall start from the date of closure of discrepancy by the Supplier.

22. GST shall be payable extra at actual as per the HSN code finalized for the items during detailed BBU.

23. Reverse Auction:

BHEL shall be resorting to Reverse Auction (RA) (Guidelines for Reverse Auction – 2024, as available on www.bhel.com on "Supplier registration page") for this tender. RA shall be conducted among all the Techno-Commercially qualified Engineering service provider.

Price Bids of all the Techno-Commercially qualified Engineering service provider shall be opened and same shall be considered as initial bids of Engineering service providers in RA. In case any Engineering service provider (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.

"The Engineering service provider has to quote the Single Price (i.e. Total Cost to BHEL) in Reverse Auction. Prices are to be as per tender scope excluding GST.	
24. Engineering service providers to note that this is an Open Tender enquiry & Reverse Auction participation shall be subject to following condition: a) Qualifying Technical Pre-Qualification Requirement. b) Techno-Commercial acceptance of offer by BHEL-PEM.	
25. Breach of contract, Remedies and Termination (Tenderer to note that this clause will supersede any clause regarding recovery amount from Tenderer due to Breach on contract mentioned anywhere in GCC Rev07 and its Corrigendum)	In case of Breach of Contract, BHEL shall recover 10% of the contract value from the Engineering service providers using following instruments: (i) Encashment of security instruments like EMD, Performance Security with executing agency (PEM) against the said contract. (ii) Balance amount (if value of security instruments is less than 10% of the contract value) from other Financial remedies i.e. available bills of the Engineering service providers, retention amount etc. with executing agency (PEM). (iii) Balance amount from security instruments like EMD, Performance Security and other Financial remedies i.e. available bills of the Engineering service providers, retention amount etc. with other units of BHEL. (iv) If recovery is not possible then legal remedies shall be pursued. However, Engineering service providers shall continue performance of the Order/ Contract, under all circumstances, to the extent not cancelled.
26. Engineering service providers are requested to refer clause no 26.0 (Make in India) of instructions to Engineering service providers of GCC Rev 07. Further, following shall be taken into consideration for submitting bids by Engineering service providers: • For this procurement, the local content to categorize a Engineering service provider as a Class I local Engineering service providers is as defined in Public Procurement (Preference to Make In India), Order 2017 dated 19.07.2024 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 the issue of the NIT, the same shall be applicable even if issued after the issue of tis NIT, but before opening of Part-II bids against the NIT. • Minimum Local Content prescribed for **Civil Engineering Service for non-plant buildings/ structures** package by Nodal Ministry is 50% and hence for this procurement, as per Public Procurement (preference to make in India), order 2017 dtd. 15.06.17, 28.05.18, 29.05.19, 16.09.20 & 19.07.24 and subsequent orders issued by the nodal ministry, this package is reserved for Class-I Local Engineering service providers having Minimum local Content of 50%. • Engineering service providers are requested to go through the above-mentioned orders and submit their adherence to Public Procurement (preference to make in India), order 2017 dtd. 15.06.17, 28.05.18, 29.05.19, 16.09.20 & 19.07.24 and subsequent orders. • Local Content Certificate (Make in India Certificate) shall be essentially submitted by Engineering service provider along with their offer as per clause no. 09 of Public Procurement (Preference to Make in India) order 2017 dated 19.07.2024	
27. Bidders to note that: a) Evaluation is proposed on basic price excluding GST. b) Engineering Service providers to mention applicable GST rate on (total basic price) in the specified cells of price schedule. However, may please note that GST shall not be considered in evaluation. c) Rest of the prices shall be derived by BHEL in line with allocation fixed for each item. There is formula applied in price schedule form available in e-procurement portal. As soon as bidder fills the cells for unit Ex works and	

GST percentage, rest values for e.g. unit ex works –remaining items and total ex works – item wise and Total price including GST–will be filled automatically. Bidders can also validate and cross check the same by using Check Formula button.

d) For better clarity to the bidders where value is to be filled is kept open in price form at e-procurement portal and for other columns it will be locked which shall be derived by BHEL as per allocation fixed against each item.

e) Incomplete offer shall be summarily rejected.

f) This tender is issued by BHEL PEM for Framework Agreement (Rate Contract) of Consultancy for Architectural, Civil & Structural works of non-plant buildings. Following shall be made part of NIT:
As and when requirement arises, the concerned Purchase Groups will place order directly on the Engineering Service provider against the Framework Agreement (Rate Contract).

g) The drawings/ documents submission & approval, submission of invoices, processing and release of payment after supply of material, contractual dispute & commercial matters shall be dealt as per Framework Agreement (Rate Contract) contract terms & conditions directly by Purchase Department which has placed work order against the Rate Contract.

28. Purchase preference to MSE Vendor: Yes.

29. Framework Agreement (Rate Contract) Order Splitting

a) Framework Agreement (Rate contract) is proposed for Two (02) years from placement of Framework Agreement (Rate contract) Purchase Order with a provision for further extension after review on mutual consent.

b) Framework Agreement (Rate contract) is proposed to be done with 3 Engineering Service providers in ratio of 45:30:25 value wise at L1 bidder's rates F for this package. Details of splitting modality shall be as given below.

c) GOI circular dated 18.05.2023 for Concurrent application of Public Procurement Policy for Micro and Small Enterprises Order, 2012 and Public Procurement (Preference to Make in India) Order,2017 shall be applicable for order splitting (in the ratio of 45:30:25) and order finalization.

d) L1 Rates shall be counteroffered to all techno-commercially qualified Service provider and order splitting in ratio of 45:30:25 shall be done in line with GOI circular dated 18.05.2023 for Concurrent application of Public Procurement Policy for Micro and Small Enterprises Order, 2012 and Public Procurement (Preference to Make in India) Order,2017.

e) In case acceptance of counteroffer is received from more than two Service provider then acceptance shall be considered as per FINAL Reverse Auction Ranking (as applicable).

f) In case acceptance of counteroffer is received from only one Service provider then splitting shall be done in the ratio of 70:30 between L1 vendor and the Service provider who accepts L1 vendor rates.

g) If none of the bidder accepts counter-offered L1 rates, then contract shall be awarded to L1 vendor for 100% value.

h) Framework Agreement (Rate Contract) will be finalized on total lump sum basis instead of item wise evaluation so that the complete requirement against one project is not split amongst various Engineering Service providers to minimize operational difficulty.

30. GOI circular dated 18.05.2023 for Concurrent application of Public Procurement Policy for Micro and Small Enterprises Order, 2012 and Public Procurement (Preference to Make in India) Order,2017 shall be applicable for order splitting and order finalization.

31. The quantities indicated in the tender are tentative quantities. No minimum quantity is guaranteed by BHEL.

32. Overall (%) quantity variation: Quantity variation shall be applicable as (+)30% of the contract value.

33. Tentative quantity for the package required for prospective projects (refer Cl No. 4 of Technical specification PE-TS-RC-600-C001) is made part of tender enquiry.

34. Engineering service providers shall Quote for the entire Scope. Partial scope is not acceptable.

35. Engineering service providers to ensure that Third party/ Customer issued certificates being submitted as proof of PQR qualification should have verifiable details of document/ certificate issuing authority such as name & designation of Issuing Authority and its organization contact number and e - mail Id etc. Offer of only those Engineering service providers shall be considered further, who meets the PQR criteria. Engineering service providers to furnish latest verification details for checking veracity of document(s) by BHEL. In case the same found not available, Purchaser has right to reject such document from evaluation. Format for the same is below: -

Sl. No.	Project Name	Customer Name, Contact Address, Phone No. & Email ID	Contract/ Order No.	Value of Contract/ Order	Brief of Work	Completion Date

36. Engineering service providers who fulfil Technical Pre-Qualification Requirement Criteria are eligible to participate in this tender. Bids of only those Engineering service providers shall be evaluated who meet the Technical Pre-Qualifying requirements.

37. All corrigenda, addenda, amendments, time extensions, clarifications, etc. to the tender will be hosted on BHEL website (www.bhel.com) & BHEL-PEM website (www.pem.bhel.com) and GePNIC portal. Engineering service providers should regularly visit websites to keep themselves updated.

38. GeM Seller ID shall be mandatory before placement of order/award of contract to the successful Engineering service providers.

39. Self-declarations/ Auditor's/ Accountant's Certificates submitted by the manufacturer/ Engineering service providers may be verified randomly by the committee constituted as per MoP Order 28-07-2020. In case of false documents/misrepresentation of the facts requisite action against such manufacturer/ Engineering service provider will be taken based on the recommendation of the Committee.

40. All Engineering service providers to declare that they will not enter into any illegal or undisclosed agreement or understanding, whether formal or informal with other Engineering service providers(s). 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.

In case, the Engineering service providers is found having indulged in above activities, suitable action shall be taken by BHEL as per extant policies/ guidelines.

41. The offers of the Engineering service providers who are under suspension as also the offers of the Engineering service providers, who engage the services of the firms debarred across BHEL, shall be rejected. The list of firms debarred across BHEL is available on BHEL web site www.bhel.com.

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

2 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 Engineering service provider(s) in a transparent and fair manner, and with equity.

3 Commitment by Suplier/ Engineering service provider / Contractor:

4 The Supplier/ Engineering service provider / contractor commits 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.

5 The Supplier/ Engineering service provider / 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.

6 The Supplier/ Engineering service provider / 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 Supplier/ Engineering service provider / contractor during pre-tendering/ tendering/ post tendering/ award/ execution/ post- execution stage indulges in malpractices, 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 Supplier/ Engineering service provider / contractor as per extant guidelines of the company available on www. bhel.com and/or under applicable legal provisions".

42. Conflict of Interest:

The bidders having conflict of interest shall not be eligible to participate in the tender process.

Bidders to furnish following declaration on letter head of their company duly signed & stamped by authorised representative.

QUOTE:

The bidder notes that a conflict of interest would said to have occurred in the tender process and execution of the resultant contract, in case of any of the following situations:

i) If its personnel have a close personal, financial, or business relationship with any personnel of BHEL who are directly or indirectly related to the procurement or execution process of the contract, which can affect the decision of BHEL directly or indirectly.

ii) The bidder (or his allied firm) provided services for the need assessment/ procurement planning of the Tender process in which it is participating;

iii) Procurement of goods/services directly from the manufacturers/ Engineering service provider shall be preferred. However, if the OEM/ Principal insists on engaging the services of an agent, such agent shall not be allowed to represent more than one manufacturer/ Engineering service provider in the same tender. Moreover, either the agent could bid on behalf of the manufacturer/ Engineering service provider or the manufacturer/ Engineering service provider could bid directly but not both. In case bids are received from both the manufacturer/ supplier and the agent, bid received from the agent shall be ignored. However, this shall not debar more than one Authorised distributor (with/ or without the OEM) from quoting equipment manufactured by an Original Equipment Manufacturer (OEM) in procurements under a Proprietary Article Certificate.

iv) A bidder participates in more than one bid in this tender process. Participation in any capacity by a Bidder (including the participation of a Bidder as a partner/ JV member or sub-contractor in another bid or vice-versa) in more than one bid shall result in the disqualification of all bids in which he is a party. However, this does not limit the participation of an entity as a sub-contractor in more than one bid if he is not bidding independently in his own name or as a member of a JV.

The Bidder declares that they have read and understood the above aspects, and the bidder confirms that such conflict of interest does not exist and undertakes that they will not enter into any illegal or undisclosed agreement or understanding, whether formal or informal with other Bidder{s), in this regard.

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. In case, the Bidder is found having indulged in above activities, the same will be considered as a violation of the tender conditions, and suitable action shall be taken by BHEL as per extant policies/ guidelines.

UNQUOTE

Any Bidder falling under MSE 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 MSE	*SC/ST Owned*	*Women Owned*	*Others (excluding SC/ST & Women Owned)*
Micro			
Small			

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

43.

44. All the above terms and conditions, post-bid agreements/MoMs (during Techno- Commercial evaluation) shall automatically become a part of the Order/Contract after its finalisation.

45. Engineering service providers to note that offers shall be submitted strictly in accordance with the requirements of tender documents. Engineering service providers shall upload their complete offer meeting the requirements of the tender documents on e-procurement portal https://eprocurebhel.co.in/nicgep/app.

Following documents need to be uploaded:

- **Offer forwarding/ covering letter with Un-price bid, Deviation Sheet (Cost of Withdrawal)**
- **Documents required for meeting Technical PQRs (Part of Tech. Spec.)**
- **Local Content Certificate in line with Make in India circular**
- **Land Border Certificate**
- **IP format.**
- **Price Bid on e-procurement portal - https://eprocurebhel.co.in/nicgep/app**

46. It shall be the responsibility of the Engineering service provider to ensure that the tender complete in all respects is uploaded on or before the due date and time. Incomplete/late offers shall not be considered.

47. All other correspondence thereof shall be addressed to the undersigned by name & designation and sent at the following address:

Seema Khatri / Sr. Manager– CMM **M/s Bharat Heavy Electricals Ltd.,** Project Engineering Management, Power Project Engineering Institute, HRD & ESI Complex, Plot No 25, Sector-16 A, Noida-201301 E-mail: seemakhatri@bhel.in Contact No.: 9818216691	**PK Gautam / AGM– CMM** **M/s Bharat Heavy Electricals Ltd.,** Project Engineering Management, Power Project Engineering Institute, HRD & ESI Complex, Plot No 25, Sector-16 A, Noida-201301 E-mail: pgautam@bhel.in Contact No.: 9958080692

48. Terms & Conditions: - The all other terms & conditions shall be as per enclosed Special Conditions of the Contract (copy enclosed), GCC Rev 07 & Corrigendum 01, Corrigendum 02 & Corrigendum 03 to GCC Rev-07 which is available on www.pem.bhel.com and other Terms and Conditions included in this Enquiry Letter.

49. Schedule of Pre-Bid discussion Date of Meeting: 21.07.25 Time :15:00 hrs Place: Bharat Heavy Electricals Limited, Power Sector - Project Engineering Management, 3rd Floor, BHEL Sadan, Plot No.25, Sector-16A, Noida-201301, Uttar Pradesh, India Interested bidders are requested to confirm their participation for Pre-Bid Discussion (PBD) meeting either by physical meeting at above mentioned place or through Video Conferencing (VC). VC Link is given below:

Through: Microsoft Teams Meeting ID **448 176 101 400** and Passcode **Uc3FV3bc.**

Note - In case you are not making an offer against this enquiry, you are requested to send a regret letter so as to reach us on or before the due date

Thanking You.
For and on behalf of BHEL

Seema Khatri
Sr. Manager/ CMM/ PEM Noida

Table-2: Price Schedule

FRAME WORK AGREEMENT FOR Civil Engineering Service for non-plant buildings/ structures

Price schedule for scope of work mentioned in clause no. 3 (a) & 3(b) of Technical specification.

Vendor Name:-

Item No.	Description	Unit	Quantity	Unit Price (Excluding GST) (Rs)	Total Price (Excluding GST) (Rs)	Applicable GST Rate @ __% (on "Total Ex-Works ")	GST (Rs)	TOTAL Price (Including GST) (Rs)
1	Preparation and submission of all Architectural, Civil & Structural drawings along with 3-D perspective views, analysis and design documents for RCC, steel and Hybrid framed buildings/structures (excluding main gate complex) including getting approval of the same from BHEL as per specification & as directed by engineer-in-charge.							
a	Total built up area of the building/structure up to 500 Sqm	SQM	4,000	#VALUE!	=(0.0739117603738087)*X		#VALUE!	#VALUE!
b	Total built up area of the building/structure exceeding 500 Sqm and up to 2500 Sqm	SQM	20,000	#VALUE!	=(0.305596701545555)*X		#VALUE!	#VALUE!
c	Total built up area of the building/structure exceeding 2500 Sqm and up to 8000 Sqm	SQM	36,000	#VALUE!	=(0.48131480493425)*X		#VALUE!	#VALUE!
2	Preparation and submission of all Architectural, Civil & Structural drawings along with 3-D perspective views, analysis and design documents for main gate complex including getting approval of the same from BHEL as per specification and as directed by engineer-in-charge.	EACH	6	#VALUE!	=(0.139176733146386)*X		#VALUE!	#VALUE!
	TOTAL PRICE IN Rs				X		#VALUE!	#VALUE!
3.1	Travel (To & fro) for visit to BHEL-PEM office at Noida as and when called by BHEL.	Man-visit	50	#VALUE!	=(0.358792484829551)*Y		#VALUE!	#VALUE!
3.2	Boarding/Lodging during visit at BHEL-PEM office, Noida as and when called by BHEL.	Man-Day	100	#VALUE!	=(0.641207515170449)*Y		#VALUE!	#VALUE!
	TOTAL PRICE IN Rs				Y		#VALUE!	#VALUE!
	TOTAL PRICE for Evaluation in Rs (Z=)				Z=X+Y		#VALUE!	#VALUE!

Notes:

1. Vendor has to quote only Total Value 'X' & Y. Based on this price, unit price shall be derived for all the items as per inbuilt formula.
2. Vendor has to fill data in cells highlighted in yellow only.
3. The percentage break-up of the rate quoted against "Item No. 1 and 2" of price schedule shall be as per Table 3 of Technical specification.
4. "Item No. 3.1 & 3.2" is applicable only for those bidders whose office establishment is outside Delhi & NCR region. If at a later stage, it is found that Delhi & NCR vendor has also quoted for the same then it will not be considered for evaluation and ordering.
5. Framework Agreement (Rate Contract) will be finalized on total lump sum basis [i.e.Total Price excluding GST (Z=X+Y)] instead of item wise evaluation.

COST OF WITHDRAWAL									
PROJECT:-						Framework Agreement (Rate Contract)			
PACKAGE :-						Consultancy for Architectural, Civil & Structural works of non-plant buildings			
TENDER ENQUIRY :-									
NAME OF THE BIDDER									
Sl. No.	Volume/ Section	Page No.	Clause No.	Technical Specification/Tender Document No	Complete Description of Deviation	Cost of withdrawal of deviation to be entered by the bidder in	Reference of price Schedule of which Cost of Withdrawal of Deviation is applicable	Nature of cost of withdrawal of deviation (Positive/Negative)	Reasons for quoting deviation
1	TECHNICAL DEVIATION								
1.01									
1.02									
1.03									
1.04									
1.05									
2	COMMERCIAL DEVIATION								
2.01									
2.02									
2.03									
2.04									
2.05									

Provide below details for recording your bid participation:

1.	PAN number:	
2.	Company Name:	
3.	Registered address:	
4.	Office address from where services shall be rendered:	
5.	Contact person name:	
6.	Contact person number:	
7.	Contact person email:	
8.	GeM Seller ID:	
9.	GSTIN:	
10.	Whether MSE supplier: If yes, Attach valid Udyam Certificate	(Y/N)

To be given on Letter head of Bidder

Ref: ……. Date: …….

To,

Bharat Heavy Electricals Limited

PEM, PPEI Building,

Plot No 25, Sector -16A

Noida (U.P)-201301

Reference:

Order no-F6/18/2019-PPD dated 23.07.2020 issued by Ministry of Finance.

Tender Enquiry No-……

Offer No-……..

Name of Package: …….

Dear Sir,

I have read the clause regarding restriction on procurement from a bidder of a country which shares a land border with India. I hereby certify that Company name, is not from such a country and is eligible to be considered.

Thanking You,

Yours faithfully,

(Company director seal and signature)

Format for Local Content Certificate as per MII order

Ref: …… Date: ……

To,

Bharat Heavy Electricals Limited

PEM, PPEI Building,

Plot No 25, Sector -16A

Noida (U.P)-201301

Reference: Tender Enquiry No-……

Name of Package: ……

Dear Sir,

We hereby certify that items of ……...(Package name)

for……(Project Name) offered by M/s ……(bidder's name)

having its works/office at …… has local content of ……%. Further,

it is also certified that the local content percentage (%) certified above is in line with definition of local content given in point no 2 of Public Procurement (Preference to Make in India), Order 2017- revision, having ref. no. P-45021/2/2017-PP(BE-II)-Part(4) Vol.II dated 04.06.2020 & 19.07.2024 an

M/s…….. qualifies as Class-I local supplier.

Further, cost of locally imported items (inclusive of taxes) sourced locally from resellers/ distributors

is Rs …… and cost of licence/royalty paid/technical expertise cost etc. source from outside of India

is Rs…….

Details of the location(s) at which the local value addition-

Yours very truly

……. (Signing Authority Name & Sign)

…… (Firm Name)

ANNEXURE– VIII (Rev 01)

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 _____(hereinafter referred to as "Contract"). 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 panel of Independent External Monitor(s) (IEMs), 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.

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. The Bidder(s)/ Contractor(s) commits himself to observe the following principles during 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 shall 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 , terminate the contract, if already awarded, exclude from future business dealings and/ 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 (s) from the tender process before award / order acceptance according to Section 3, the Principal is entitled to demand and recover the damages equivalent to Earnest Money Deposit/ Bid Security.

4.2 If the Principal is entitled to terminate the Contract according to Section 3, or terminates the Contract in application of Section 3 above , the Bidder(s)/ Contractor (s) transgression through a violation of Section 2 above shall be construed breach of contract and the Principal shall be entitled to demand and recover from the Contractor an amount equal to 5% of the contract value or the amount equivalent to Security Deposit/ Performance Bank Guarantee , whichever is higher, as damages, in addition to and without prejudice to its right to demand and recover compensation for any other loss or damages specified elsewhere in the contract.

Section 5 - Previous Transgression

5.1 The Bidder declares that no previous transgressions occurred in the last 3 (three) 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 or action can be taken as per the separate "Guidelines on Banning of Business dealings with Suppliers/ Contractors", framed by the Principal.

Section 6 - Equal treatment of all Bidder (s)/ Contractor (s) / Sub-contractor (s)

6.1 The Principal will enter into Integrity Pacts with identical conditions as this Integrity Pact with all Bidders and Contractors.

6.2 In case of Sub-contracting, the Principal Contractor shall take the responsibility of the adoption of Integrity Pact by the Sub-contractor(s) and ensure that all Sub-contractors also sign the Integrity Pact.

6.3 The Principal will disqualify from the tender process all Bidders who do not sign this Integrity 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 panel of Independent External Monitor (s) (IEMs) for this Integrity Pact. The task of the IEMs is to review independently and objectively, whether and to what extent the parties comply with the obligations under this Integrity Pact.

8.2 The IEMs are 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 IEMs shall be provided access to all documents/ records pertaining to the Contract, for which a complaint or issue is raised before them as and when warranted. However, the documents/records/information having National Security implications and those documents which have been classified as Secret/Top Secret are not to be disclosed.

8.4 The Principal will provide to the IEMs 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 IEMs the option to participate in such meetings.

8.5 The advisory role of IEMs is envisaged as that of a friend, philosopher and guide. The advice of IEMs would not be legally binding and it is restricted to resolving issues raised by a 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 or during execution of Contract, the matter should be examined by the full panel of IEMs jointly, 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 the CMD, BHEL at the earliest. They may also send their report directly to the CVO, in case of suspicion of serious irregularities requiring legal/ administrative action. Only in case of very serious issue having a specific, verifiable Vigilance angle, the matter should be reported directly to the Commission. IEMs will tender their advice on the complaints within 30 days.

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

8.9 IEMs 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 Principal should be looked into by the CVO of the Principal.

8.10 If the IEMs have 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 IEMs may also transmit this information directly to the Central Vigilance Commissioner, Government of India.

8.11 After award of work, the IEMs shall look into any issue relating to execution of Contract, if specifically raised before them. As an illustrative example, if a Contractor who has been awarded the Contract, during the execution of Contract, raises issue of delayed payment etc. before the IEMs, the same shall be examined by the panel of IEMs. Issues like warranty/ guarantee etc. shall be outside the purview of IEMs.

8.12 However, the IEMs may suggest systemic improvements to the management of the Principal, if considered necessary, to bring about transparency, equity and fairness in the system of procurement.

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

Section 9 - Pact Duration

9.1 This Integrity Pact shall be operative from the date this Integrity Pact 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. Any violation of the same would entail disqualification of the bidders and exclusion from future business dealings.

9.2 If any claim is made/ lodged during currency of this Integrity Pact, 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 Integrity Pact is subject to Indian Laws and exclusive jurisdiction shall be of the competent Courts as indicated in the Tender or Contract, as the case may be.

10.2 Changes and supplements as well as termination notices need to be made in writing.

10.3 If the Bidder(s)/ Contractor (s) is a partnership or a consortium or a joint venture, this Integrity Pact shall be signed by all partners of the partnership or joint venture or all consortium members.

10.4 Should one or several provisions of this Integrity Pact turn out to be invalid, the remainder of this Integrity Pact 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 Integrity Pact with the Principal would be competent to participate in the bidding. In other words, entering into this Integrity Pact would be a preliminary qualification.

10.6 In the event of any dispute between the Principal and Bidder(s)/ Contractor(s) relating to the Contract, in case, both the parties are agreeable, they may try to settle dispute through Mediation before the panel of IEMs in a time bound manner. In case, the dispute remains unresolved even after mediation by the panel of IEMs, either party may take further action as the terms & conditions of the Contract. The fees/expenses on dispute resolution through mediation shall be shared by both the parties. Further, the mediation proceedings shall be confidential in nature and the parties shall keep confidential all matters relating to the mediation proceedings including any settlement agreement arrived at between the parties as outcome of mediation. Any views expressed, suggestions, admissions or proposals etc. made by either party in the course of mediation shall not be relied upon or introduced as evidence in any further arbitral or judicial proceedings, whether or not such proceedings relate to the dispute that is the subject of mediation proceedings. Neither of the parties shall present IEMs as witness in any Alternative Dispute Resolution or judicial proceedings in respect of the dispute that was subject of mediation.

For & On behalf of the Principal

(Office Seal)

SEEMA KHATRI

Digitally signed by SEEMA KHATRI
DN: cn=SEEMA KHATRI, o=BHEL, ou=PEM, email=seemakhatri@bhel.in, c=IN
Date: 2025.07.15 10:10:12 +05'30'

For & On behalf of the Bidder/ Contractor

(Office Seal)

Place----------

Date----------

Witness: _____

(Name & Address) _____

Witness: _____

(Name & Address)_____

TECHNICAL SPECIFICATION OF FRAME WORK AGREEMENT FOR ARCHITECTURAL, CIVIL AND STRUCTURAL DESIGN ENGINEERING SERVICES FOR NON-PLANT BUILDINGS/STRUCTURES

BHARAT HEAVY ELECTRICALS LIMITED
PS-PEM, BHEL SADAN
Plot No. 25, Sector 16A
NOIDA, U.P. – 201301

1. INTRODUCTION

Bharat Heavy Electricals Limited (BHEL) - A Maharatna company, is a Government of India undertaking. BHEL is an integrated power plant equipment manufacturer and one of the largest engineering and manufacturing company of its kind in India engaged in the design, engineering, manufacture, construction, testing, erection and commissioning of power plants in the country and abroad.

Intent of this tender is to finalize a contract for providing architectural, civil and structural design engineering consultancy services for buildings/structures of Power Plant Project.

2. INSTRUCTIONS TO BIDDERS

The bidder shall visit BHEL PEM Noida office and acquire full knowledge and information that may be necessary for preparing the bid and entering into the contract. All costs for and associated with these visits shall be borne by the bidder.

All relevant information as may be necessary shall have to be obtained /collected by the bidder.

No claim will be entertained by BHEL on ground of lack of knowledge and the bidder's rates shall be deemed to have taken this into account.

3. SCOPE OF WORK:

The scope of work shall include the following:

a. Preparation and submission of all Architectural, Civil & Structural drawings along with 3-D perspective views, analysis and design documents for the buildings/structures including getting approval of the same from BHEL.

b. Visit to BHEL-PEM office at Noida within seven (07) days from intimation by BHEL.

Note: 1. Detailed scope of work is mentioned at clause no. 6 "GENERAL REQUIREMENTS"

2. For mode of measurement, refer clause no. 13.

4. LIST OF PROBABLE PROJECTS:

Sl. No.	Name of Project
i	2X800MW NTPC Singrauli STPP
ii	2X800MW DVC Koderma TPS
iii	2X660MW DVC Raghunathpur TPS
iv	1X800MW NTPC Sipat TPS
v	1x800 MW AUSC Korba TPS
vi	3X800MW MUNPL Meja TPP
vii	1X800MW GSECL Ukai TPS
viii	1X800MW SCCL Singareni TPS
ix	2X660MW MAHAGENCO Koradi TPS
x	1X660MW MPPGCL Satpura TPS
xi	1X660MW MPPGCL Amarkantak TPS
xii	2X660MW CSPGCL Korba West STPP
xiii	Any other project

5. LIST OF PROBABLE BUILDINGS/ STRUCTURES:

Sl. No.	Building/Structure
1	Service building
2	Admin building
3	Canteen building
4	Main gate complex including separate exit/entry gate for vehicle/pedestrian and security rooms
5	Fire station building including/excluding Smoke chamber, Drill tower and Fire tender building
6	Workshop
7	O & M Store
8	Primary Health Centre / Occupational Health Centre / First aid center
9	Parking shed
10	Chemical Lab
11	Safety control building
12	FQA building
13	Hydrogen generation building
14	Fuel oil pump house
15	Security/CISF building
16	O & M worker's shed
17	CST/Service/DM/Make-up/Fire/ACW water pump house
18	Utility building
19	Maintenance building
20	IT Building
21	Simulator Building

22	Auditorium
23	Any other building

6. GENERAL REQUIREMENTS:

Bidder should deploy resources with requisite skills and experience required for the job as specified under the contract. BHEL will have the right to ask for replacement of any person/persons who do not display adequate expertise and experience in the required field or any other reasons for the intended job. The replacement has to be to the satisfaction of BHEL.

Obtaining approval from "BHEL's Customer" is not included in the bidder's scope of work.

a. Preparation and submission of all Architectural, Civil & Structural drawings along with 3-D perspective views, analysis and design documents for the buildings/structures including getting approval of the same from BHEL.

(i) All Architectural drawings shall be prepared in coordination with all disciplines such as structure, MEP*, HVAC, lighting etc.

MEP*- Mechanical, electrical and plumbing

(ii) Architectural conceptual and detail plan, elevation & section drawings for Service, Canteen, Admin, Auditorium, Simulator, CISF, IT building and Main gate complex shall be submitted with at least three conceptual design alternatives including 3-D perspective views. After approval of conceptual design alternative and 3-D perspective view, further detailed drawings along with 3-D views shall be submitted for approval.

(iii) The bidder shall perform detailed engineering of buildings/structures under the scope of work and shall submit analysis, design & drawings ensuring compliance with "BHEL's Customer" technical specification, codes and standards as applicable. A typical "BHEL's Customer" technical specification is attached as Annexure-1 for bidding purposes only.

Project specific "BHEL's Customer" technical specification shall be provided along with the project specific work order during detailed engineering/award of work.

(iv) The bidder shall be responsible for getting approval from BHEL on design documents and drawings submitted by them. Any revisions required at any stage is also included in the scope of work.

(v) Founding levels and net safe bearing capacity/pile capacity, as applicable, shall be furnished to successful bidder during detailed engineering/award of work.

(vi) The analysis/design shall be done using STAAD.Pro, drawings shall be prepared in Auto Cad and 3-D perspective views shall be prepared in REVIT/3-D MAX. Design may be carried out using computer work sheets or by using suitable software programs, as mutually agreed and accepted by BHEL. Analysis, Design calculations, Drawings and 3-D perspective views shall be submitted in both pdf and editable format (word/excel/AutoCAD/REVIT/3-D MAX/STAAD.Pro etc. in latest version) to BHEL.

(vii) The scope of work includes submission of designs and drawings of sub structure & super structure including architectural plans, elevations, sections, 3-D perspective views, false ceiling details, basic interiors, flooring patterns, general arrangements, reinforcement details, grade slabs with equipment foundations, plumbing network & building drainage details etc. Preparation of design reports and static analysis shall also be under the scope of bidder. Preparation of Bar Bending Schedule (BBS) of reinforcement and detailed fabrication drawings are excluded from the bidder's scope.

(viii) Bidder is expected to bring to the notice of BHEL any aspect of "BHEL's Customer" technical specification, which is at variance with codal provisions and standard practice, for BHEL to consider the same and give a decision before bidder proceeds with engineering.

(ix) Bidder shall participate in technical discussions with BHEL for approval of drawings/documents to meet the project schedule requirement.

(x) Bidder shall review & revise the already approved design / drawings and/or include the substitution in steel sections depending upon material availability, unforeseen site condition and project time schedule requirements. These may have to be resorted even after approval of drawings, without any extra cost to BHEL.

(xi) The bidder shall make efforts and ensure optimum design of structures leading to saving in cost and saving in completion time of the project, meeting "BHEL's Customer" technical requirements, relevant to Indian standard, national building code (NBC Latest revision) & good engineering practice, ease of construction and execution.

(xii) Bidder shall be fully responsible for the adequacy and completion of the design and detailing of building/structure in scope of work. Approval from BHEL doesn't relieve the bidder of his responsibility for design, safety and performance of the structure as per customer specification requirement.

(xiii) All work under this specification shall, unless otherwise specified, conform to the requirements of the latest revision of relevant Indian Standards. In case any particular aspect of the work is not specifically covered by any Indian Standard specification, any other standard practice, as may be specified by the BHEL shall be followed.

(xiv) All information, drawings, classified documents provided by BHEL to bidder for the purpose of carrying out engineering work shall remain the property of BHEL and shall be returned to BHEL on completion of the project. All information generated during the execution of the project, such as details, designs, drawings and documents by bidder shall be exclusive property of BHEL and its Intellectual property rights shall be that of BHEL. BHEL shall have full right to use these in any manner suitable to BHEL business requirements.

(xv) Each drawing shall contain required section wise/size wise structural steel quantity /concrete quantity/reinforcement quantity/number of piles. Further, building-wise bill of quantity for all architectural, structural & civil items shall also be prepared and furnished to BHEL.

b. Visit to BHEL-PEM office at Noida as and when required.

(i) The bidder shall visit BHEL-PEM office, Noida as required. The payment for visit from bidder's office to BHEL-PEM office, Noida shall only be applicable to those bidders, whose office establishment is outside Delhi & NCR region.

(ii) During visits, bidder shall depute concerned officials to resolve technical issues. Deputed official shall be responsible for participation in technical discussions, providing technical assistance for getting approval on submitted drawing/documents etc.

7. SUBMISSION PROCEDURE:

(i) The submission schedule of drawings/documents shall be as per Table- 1

Table-1

FOR RCC FRAMED BUILDINGS (Service, Admin, IT, Canteen, Simulator, Auditorium, Security (CISF) Building and Main gate complex)		
Item No.	**Milestone**	**Submission Schedule for each building**
1	Preparation and submission of Architectural conceptual drawings with at least three alternatives along with 3-D views.	Within 15 calendar days after receipt of relevant inputs from BHEL.
2	Preparation and submission of detailed Architectural plan, elevation and section drawings.	Within 10 Calendar days after approval of item No. 1.
3	Preparation and submission of balance detailed Architectural drawings.	Within 10 Calendar days after approval of item No. 2.
4	Preparation and submission of Civil & Structural drawings for sub structures along with analysis and design documents.	Within 10 Calendar days after approval of item No. 1.
5	Preparation and submission of Civil & Structural drawings for super structures along with design documents.	Within 15 Calendar days after approval of item No. 4.
6	Preparation and submission of 3-D perspective views of buildings/structures	Within 10 Calendar days after approval of item No. 2.
FOR BALANCE RCC, STEEL FRAMED AND HYBRID* BUILDINGS		
1	Preparation and submission of detailed Architectural plan, elevation and section drawings.	Within 10 calendar days after receipt of relevant inputs from BHEL.
2	Preparation and submission of balance detailed Architectural drawings.	Within 10 Calendar days after approval of item No. 1.
3	Preparation and submission of Civil & Structural drawings for sub structures along with analysis and design documents.	Within 10 Calendar days after approval of item No. 1.
4	Preparation and submission of Civil & Structural drawings for super structures along with design documents.	Within 15 Calendar days after approval of item No. 3.
5	Preparation and submission of 3-D perspective views of buildings/structures	Within 10 Calendar days after approval of item No. 1.

NOTE: The bidder shall resubmit all the revised drawings/documents to BHEL after incorporating comments of BHEL within 05 calendar days.

HYBRID* - RCC framed structure having steel beam/roof truss, with or without metal deck and RCC/metal sheet roof.

(ii) Bidder shall submit the drawings/documents in soft copies (Editable format) as per the schedule. Bidder shall re-submit the drawings/documents after incorporating BHEL comments.

(iii) Each drawing and documents under the scope shall bear the signature of designer, checker and approver and bidder shall ensure the correctness of the same is line with BHEL's customer technical specification, plant layout, coordinates & codal stipulation etc. before submission to BHEL for review and approval.

(iv) Drawings should be reviewed and checked by the bidder in terms of its completeness, compliance with codes, applicable standards, project specification, regulatory requirements, interface, data adequacy and relevance with respect to engineering schedule prior to submission to BHEL. The bidder shall do the complete engineering including interfacing and integration of all required services, equipment, systems & facilities etc.

(v) The work under the scope of this contract is deemed to be completed in all respects, only when all the works are carried out as per satisfaction of BHEL.

(vi) Total time for completion of all Architectural, Civil & Structural drawings along with 3-D perspective views, analysis and design documents shall be twelve (12) month from the date of award of work. All relevant data/inputs shall be furnished by BHEL to bidder within three (03) month from date of award of work.

(vii) Drawings and documents shall be submitted in the format as indicated below:

Civil, Structural, Architectural Drawings	Soft Copy (AutoCAD)
	Soft Copy (pdf)
Designs/ Documents	Soft Copy (MS Excel/MS Word)
	Soft Copy (PDF)
Analysis /Design Models	Soft Copy (STAAD software input & output file)
3-D Perspective views	Revit/3-D MAX (Soft copy)

All soft copies shall be transmitted by bidder through E-mail or any other platform required during detail engineering.

8. GUARANTEE

The works/ services rendered by the bidder shall be guaranteed as per the relevant IS codes/guidelines of relevant statutory bodies. The bidder shall be responsible for the design adequacy of structures/facilities. The submission /approval of drawings/documents does not absolve the responsibility of the consultant.

9. CONFIDENTIALITY

The empaneled bidder and their personnel will not, either during the term or after expiration of this contract, disclose any proprietary or confidential information relating to the services, contract or business or operations of BHEL or its clients without the prior written consent of BHEL.

10. RESPONSIBILITIES FOR ACCURACY OF DESIGN DRAWINGS

The bidder shall be responsible for the accuracy of the designs, drawings, quantities, fabrication details and estimates prepared by him as a part of the project. He shall indemnify BHEL against any inaccuracy in the work, which might surface out at the time of ground implementation of the project.

In such an eventuality, the bidder will be responsible to correct the drawings including re-investigations etc. as required without any extra cost implication on BHEL.

11. Deleted

12. Deleted

13. MODE OF MEASUREMENT:

a. Preparation and submission of all Architectural, Civil &Structural drawings along with 3-D perspective views, analysis and design documents for the buildings/structures including getting approval of the same from BHEL.

(i) The size of building shall be measured from total built area. The size of the building shall be considered by measuring the floor coverage (i.e. outer to outer profile/ dimensions of the building in Square meter (Sqm) at finished floor level. The areas include the internal open to sky, atrium, entire central core including entire staircase mumty, lift machine room, staircase and lift core with in the structure, stilt parking and porch. The height of building shall be measured from top of finished floor level of ground floor to the top of concrete of roof level (excluding parapet)/top of steel of the building. The area calculation for measurements excludes the external components such as sunshade on doors/windows/ventilators, rolling shutters, balconies, terrace, plinth protection, open staircase, elevation features, pipe encasing, shafts, overhead water tank etc.

14. PRICE SCHEDULE:

The bidder shall submit the rate in the price schedule as per Table 2.

Table-2: Price Schedule

FRAME WORK
Price schedule for scope of work mentioned in clause no.3 (a) & 3(b) of Technical specification.
Vendor Name: -

Price schedule for scope of work mentioned in clause no. 3 (a)

Item No.	Description	Unit	Quantity	Unit Price (Excluding GST) (Rs)	Total Price (Excluding GST) (Rs)	Applicable GST Rate @ _% (on "Total Ex-Works ")	GST (Rs)	Total Price (Including GST) (Rs)
1	Preparation and submission of all Architectural, Civil & Structural drawings							

	along with 3-D perspective views, analysis and design documents for RCC, steel and Hybrid framed buildings/structures (excluding main gate complex) including getting approval of the same from BHEL as per specification & as directed by engineer-in-charge.							
a	Total built up area of the building/structure up to 500 Sqm	SQM	4,000					
b	Total built up area of the building/structure exceeding 500 Sqm and up to 2500 Sqm	SQM	20,000					
c	Total built up area of the building/structure exceeding 2500 Sqm and up to 8000 Sqm	SQM	36,000					
2	Preparation and submission of all Architectural, Civil & Structural drawings along with 3-D perspective views, analysis and design documents for main gate complex including getting approval of the same from BHEL as per specification and as directed by engineer-in-charge.	EACH	06					
	TOTAL PRICE IN Rs				X			

Price schedule for scope of work mentioned in clause no. 3 (b)

Item No.	Description	Unit	Quantity	Unit Price (Excluding GST) (Rs)	Total Price (Excluding GST) (Rs)	Applicable GST Rate @ _% (on "Total Ex-Works ")	GST (Rs)	Total Price (Including GST) (Rs)
3.1	Travel (To & fro) for visit to BHEL-PEM office at Noida as and when called by BHEL.	Man-visit	50					

3.2	Boarding/Lodging during visit at BHEL-PEM office, Noida as and when called by BHEL.	Man-Day	100					
	TOTAL PRICE IN Rs				**Y=**			
	TOTAL PRICE for Evaluation in Rs (Z=)				**X+Y**			

Notes:

1. Vendor has to quote only Total Value 'X' & Y. Based on this price, unit price shall be derived for all the items as per inbuilt formula.
2. Vendor has to fill data in cells highlighted in yellow only.
3. The percentage break-up of the rate quoted against “Item No. 1 and 2” of price schedule shall be as per Table 3 of Technical specification.
4. "Item No. 3.1 & 3.2" is applicable only for those bidders whose office establishment is outside Delhi & NCR region. If at a later stage, it is found that Delhi & NCR vendor has also quoted for the same then it will not be considered for evaluation.
5. Framework Agreement (Rate Contract) will be finalized on total lump sum basis [i.e. Total Price excluding GST (Z=X+Y)] instead of item wise evaluation.

Table -3: Payment schedule

S.NO	BUILDING/STRUCTURE	WEIGHTAGE IN (%)
	A. FOR RCC FRAMED BUILDINGS (Service, Admin, IT, Canteen, Simulator, Auditorium, Security (CISF) Building and Main gate complex)	
1	Approval of Architectural conceptual drawings with at least three alternatives along with 3-D views.	15
2	Approval of detailed Architectural plan, elevation and section drawings.	10
3	Approval of balance detailed Architectural drawings.	15
4	Approval of all Civil & Structural drawings for sub structures along with analysis and design documents.	25
5	Approval of all Civil & Structural drawings for super structures along with design documents.	25
6	Approval of all 3-D perspective views of buildings/structures.	10
	Total	100
	B. FOR BALANCE RCC, STEEL FRAMED AND HYBRID BUILDINGS	
1	Approval of detailed Architectural plan, elevation and section drawings.	20
2	Approval of balance detailed Architectural drawings.	20
3	Approval of all Civil & Structural drawings for sub structures along with analysis and design documents.	25
4	Approval of all Civil & Structural drawings for super structures along with design documents.	25
5	Approval of all 3-D perspective views of buildings/structures.	10
	Total	100

Note: For price schedule of “A” & “B” except Main gate complex, please refer Item No.1 of table 2 and for main gate complex refer Item No. 2 of table 2.

Annexure-I

1.0 Salient Features & Design Concept:

This section of specification covers salient features and design concepts of Civil, Structural and architectural works pertaining to Power Plant components as detailed below.

1.1. Architectural Concepts &Design:

a) All the Architectural design works shall be carried out by professionally qualified Architects having adequate experience (minimum five years) in the design and detailing of architectural work of power plant buildings. Bidder may have in-house Architects with the required experience for the above or engage Architect Consultant having similar experience.

b) Power plant buildings shall be architecturally treated, based on functional requirements, in such a way that they retain the desired scale, and present a pleasing composition of mass and void. The overall impact of the buildings shall be one of aesthetically unified architectural treatment having a comprehendible scale, blending colour scheme with the surroundings.

c) All buildings and structures shall be architecturally treated in such a way to complete harmony with the main plant building, surrounding structures and environment. Due considerations shall be given to orientation, landscape design, and interior design. All finishes for floors, walls, ceiling, structural elements, partitions for offices and industrial areas shall be suitable for their aesthetics, durability and functional requirements and shall include the latest building material& technology. Consideration shall be given for achieving standardization & fast track construction.

d) Overall colour scheme of the buildings shall be designed judiciously and in a comprehensive manner considering the mass and void of buildings, its facade, equipment, exposed structural elements, piping, trestles, bus ducts, and other service elements. Architectural design of all power plant buildings shall be suitable for installation of photovoltaic panel on rooftop for renewable energy purpose.

e) For adequate light and ventilation, National Building Code recommendations shall be followed. All buildings having height more than 4.0 m shall have fixed glazed ventilators.

f) Architectural design of all Power Plant Building shall be suitable for installation of solar photovoltaic panels on roof tops.

g) All the buildings shall be architecturally designed to meet the National Building Code requirement & Fire Safety Regulations.

h) All public buildings shall be designed incorporating the provision of barrier free environment for physically disabled persons.

i) All control room shall be provided with air lock lobby.

j) Minimum 1000 mm high (from floor/ roof level) hand railing shall be provided around all floor/roof openings, projections/balconies, walkways, platforms, steel

stairs, etc., wherever the height of the building is more than 12m, railing height shall be 1.2m. All handrails and ladder pipes (except at operating floors) shall be 32 mm nominal bore MS pipes (medium class) conforming to IS: 1161 and shall be finished with suitable paint. All rungs and ladders shall be finished with suitable paint. The spacing of vertical posts shall be maximum 1500mm. Two number of horizontal rails shall be provided including the top member. In addition, toe guard/ kick plate of min size 100x6th shall be provided above the floor level.

k) All floors of Service building, Administration Building, Gate Complex shall also be provided with SS handrailing. Height of the handrail shall be 1000 mm /1200mm in accordance with the preceding para. For SS handrail 32NB/50NB/60NB (polished) stainless steel pipe shall be provided.

l) The spacing of vertical posts shall not be more than 1500mm. Two number of horizontal rails shall be provided including the top member. SS Toe guard, knee guard and kick plate shall be provided above the floor level. The SS railing in service building and Administration Building shall have Glazed railing system with laminated Toughened glass panels.

m) All stairs shall have a maximum riser height of 150 mm and a minimum tread width of 300 mm. Minimum clear width of stair shall be 1500 mm unless specified otherwise. The width of staircase shall meet the National Building Code requirements.

n) All buildings having metal cladding shall be provided with 1-meter high brick wall at ground floor level. All buildings having metal cladding shall be provided with a 150 mm high RCC toe kerb (on upper floor) at the edge of the floor along the metal cladding. 1000 mm/ 1200 mm high hand railing shall be provided on this RCC kerb, wherever required from the safety point of view.

o) In all buildings, structures, suitable arrangement for draining out water collected from equipment blowdowns, leakages, floor washings, firefighting, etc., shall be provided for each floor. All the drains shall be suitably covered with grating or precast RCC panels.

p) RCC steps / staircase shall be provided for main entrance of all RCC construction buildings.

q) Parapet, Chajjas 450 / 600 mm over window and 600 mm door heads, 900 mm over rolling shutters, architectural facia, projections, etc., shall be provided with drip course in cement sand mortar 1:3.

r) All fire exits shall be painted with fire resistant paint P.O red/signal red colour shade which shall not be used anywhere except to indicate emergency or safety measure. Fire safety norms shall be followed as per National Building Codes and fire safety requirements for providing fire exits, escape stairs and firefighting equipment. In detailing of all buildings, fire safety requirements conforming to IS: 1641 and IS:1642 shall be followed.

s) Ramps & Lifts for physically challenged persons shall be provided for barrier free access to the Service buildings, Administration building, gate complex etc.

t) For main Power House Building and Boiler Structure the staircase, Riser shall be Maximum 175 mm and Tread shall be minimum 275 mm and the width of staircase shall be minimum 1200 mm.

u) Wherever the area of building at any floor is more than 500 sq.m. Minimum two no of staircase shall be provided.

1.2 Water Supply and Sanitation

Roof water tanks of adequate capacities depending on the number of users and 8 hours requirement shall be provided for each building and pump house. Polyethylene water storage tanks conforming to IS:12701 shall be used. The tanks shall be complete with all fittings including lid, float valve, stop cock, vent pipe, etc.

Chlorinated Polyvinyl Chloride (CPVC) pipes, confirming to IS 15778, having thermal stability for hot & cold-water supply including all CPVC plain & brass threaded fittings shall be used for internal piping works for service water and potable water supply. For installation of CPVC pipes guidelines as stipulated in Clause No. 18.9, CPWD specifications shall be followed.

UPVC (conforming to IS:13592) shall be used for sanitary works above ground level.

All Buildings shall be designed with Toilets as per NBC norms.

All buildings shall have minimum one toilet block each. The facilities provided in the toilet block shall depend on the number of users. However, minimum facilities to be provided shall be as stipulated in subsequent clause. IS:1172 shall be followed for working out the basic requirements for water supply, drainage and sanitation. In addition, IS:2064 and IS:2065 shall also be followed.

1.3 Each Toilet block shall have the following minimum facilities unless specified.

a) All the fittings shall be of Chromium plated brass (fancy decorative type).

b) One number wall mounted coloured glazed vitreous China European water closet and dual flushing valve system, water faucet, health Faucet toilet paper holder as per IS:2556

c) One number colour glazed ceramic oval shaped wash basin 450x 550 mm (approx.) mounted over under the counter with 18mm thick granite bevelled edge counter fitted with photo-voltaic control system for water controls, bottle trap as per IS:2556.

d) For common toilets, number of washbasins shall be as per requirement. However, for Pump Houses the same shall be provided without photo voltaic control system for water control.

e) For Male Toilets Urinal as per requirements, with all fittings with photovoltaic control flushing system as per IS: 2556.

f) One number looking mirror 600 x 900 x 6 mm edge mounted with teak beading / SS studs and minimum 12 mm thick plywood backing, one number stainless towel rail 600 x 20 mm, one number liquid soap dispenser per wash basin.

g) One toilet with required facilities shall be provided for physically challenged persons as per National Building Code requirements at Ground floor of Main Power House Building and at each floor of Service Building, at each floor of Administration Building, at Gate complex and at Construction Office.

h) Janitor Space & space for drinking water cooler.

i) Electric operated hand dryer with photo voltaic control.

j) The pantry shall consist of one number stainless steel pantry sink, as per IS:13983, of size 610 x 510 mm, bowl depth 200 mm with drain board of at least 450 mm length with coupling , CP bottle trap, hot and cold water mixer, one number geyser of 25 litres capacity, with inlet and out-let connections, one number overhead water storage tank, as per IS : 12701 and of minimum 500 litres capacity, complete with float valve, overflow drainage pipe arrangement, CPVC concealed water sup-ply pipe of minimum 12 mm diameter, CPVC sanitary pipe (with lead joints) of minimum 75 mm diameter, floor trap with Stainless Steel grating, inlet and outlet connections for supply and drainage, with all bends, tees, junctions, sockets, etc., as are necessary for the commissioning and efficient functioning of the pantry (all sanitary fittings shall be heavy duty chrome plated brass, unless noted otherwise).

k) One number of pantry shall be provided in Buildings having Control Room, at each floor of Service Building, and at each floor of Administration Building.

l) Laboratory sink shall be of white vitreous china of size 600x400x200 mm conforming to IS: 2556 (Part-5) with single 15 mm C.P. brass pillar taps with elbow operated levers ISI Marked.

m) In addition, adequate number of portable toilet units with adequate plumbing and sanitary arrangement, shall be provided during construction stage for workers.

n) Adequate number of toilet units with adequate necessary plumbing and sanitary arrangement, shall be provided for workers (O&M workers).

o) For common toilets at each floor of Service building, and Administration building toilet cubicles shall be provided. Restroom Cubicle (of following standard dimension which includes 600mm door size width) self-supporting 12mm thick compact laminates made out of, urea free, thermosetting phenolic resins treated Kraft papers as core material and Amino plastic resin treated decor papers on the finish surface, conforming to latest and applicable IS: 2046-1995, EN 438:2016 and NEMA LD3-2005 quality standards with Antivirus, Antibacterial and Antifungal properties (conforming to ISO 21702:2019, JIS Z2801:2010 and ASTM G21-2015 standards respectively) to fulfil the applicable requirements of indoor air quality certifications for Greengard-Gold standards. This also includes providing and fixing in position necessary hardware made out of Stainless steel (Grade 316) as per manufacturer's specifications & Architects instructions like (1) Door Knob, (2) Spring Loaded Hinges (3) Slide Bolt with Occupancy indicators, (4) Coat hook (5) U-Channels, (6) Adjustable foot (Mid Panel Mounted or Divider Setback Leg) (7) Top rail with T and L Corner connector (8) Rubber noise deafening tape, (9) Screws & wall Plugs. The top fitting should consist brushed finish round top rail which will get fixed with pilasters with panel tube holder, 'L'

corner bend (connected with top rail) will be used on the corner of cubicle in absence of brick wall and 'T' Connector in T junctions, Wall Bracket fixing is used only on the wall which will hold the top rail. All screws also will of 316 Grade in stainless steel.

p) All pilasters are supported by Metal Leg [Straight Leg made out either only SS Brush finish or With SS with black powder coated / Set Back Leg with Zinc casted black powder coated. The base of the stainless-steel bottom will be anchored to the floor with a clearance height upto 150mm. A Toilet Cubicle shall have approximate dimension of 2025mm Height x 1000mm Width x 1500mm Depth. All the necessary fittings shall be provided to make the system complete. Matching urinal partitions shall also be provided in the toilet where cubicles are provided.

2.0 Grade slab of buildings at ground floor:

In all buildings including main plant building, the ground floor slab shall consist of minimum 150mm thick RCC M25 grade base slab over an under bed as specified below. The under bed for ground floor slab shall consist of 75mm thick 1:4:8 PCC on stone soling of 200mm compacted thick with 63 mm and down aggregate with interstices filled with well graded selected sand/ moorum/ non-expansive soil on compacted and dressed sub - grade. Reinforcement for the slab shall consist of minimum 8mm diameter bars @ 200 mm c/c at top & bottom of the slab in both directions. However, at passages, unloading & maintenance bays, stone soiling of minimum 400mm thick and minimum 10mm diameter bars @ 200 mm c/c at top and bottom in both directions shall be provided. Further, top surface of ground floor slabs shall be finished with 50mm thick metallic hardener topping.

3.0 Transformer Foundation

Foundations of transformers shall be designed for seismic and wind loads in addition to other applicable loads. Solid RCC block foundation shall be provided for the main transformer block. Alternatively, transformer shall be supported on a RCC foundation comprising of common raft for rail supporting walls up to rail-cum-road along with pedestals for jacking pad, roller lock etc. Tie beams connecting roller lock pedestals at rail level shall also be provided. Common raft/solid RCC block shall be supported on soil or pile based on requirement specified elsewhe5.09re in the specification. Oil soak pit / oil water separation pit for transformer shall be provided as envisaged elsewhere in the specification. The oil soak pit shall be provided for each transformer and shall be filled with gravel of size 40mm. The volume of the soak pit shall be sufficient to store one-third (1/3) of the oil volume of transformer/reactor considering only 40% of the volume as available voids between gravel filling. The oil soak pit shall also be provided with a sump at the corner to allow drainage of water/oil from the soak pit. Oil soak pits sump of individual transformers shall be connected to common oil retention /oil water separation pit through hume pipes and manholes. Separate common oil retention pit/oil water separation pit shall be provided for a group of transformers in transformer yard area of each generation unit of plant. The Oil-water Separation pit shall be designed for an effective capacity of complete oil of one transformer having highest volume of oil along with 10 minutes of firewater. For calculating effective capacity of oil-water separation pit, effective depth excluding 200 mm freeboard below invert level of inlet pipe shall be considered. Plan area and depth

of oil-water separation pit shall be decided based on above consideration. Oil-water Separation pit shall be provided with five separate chambers interconnected by pipes. First chamber shall be for collecting oil-water mix from transformers' soak pits in case of fire. After entering into first chamber, oil being the lighter in density floats above the water. The water from lower elevation flows in to subsequent chambers interconnected through galvanized MS pipes. The accumulated oil in the first chamber to be pumped out for subsequent usage or disposal. Water collected in the last chamber to be pumped out for subsequent disposal after treatment. Invert level of inlet Hume pipes (of NP-3 grade and adequate capacity), carrying oil and water from transformers soak pits, shall be designed for gravity flow. Freeboard of 200 mm shall be provided below the invert level of inlet pipes. Invert levels of interconnecting pipes of subsequent chambers shall be decided accordingly. 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. 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 firefighting system shall be provided up to top of gravel filling. However, the supply and erection of Pylon supports with anchor fasteners for HVW spray system are not under the scope of this package. Coarse aggregate filling inside the transformer oil soak pit shall be carried out only after construction/erection of Pylon supports and PCC encasement.

4.0 Service Building

4.1 Salient Features

This building shall be an RCC structure having RCC frame with RCC floors and roof slab. For the building, floor-to-floor height shall be as per architectural features. A connecting corridor with MPH building shall be provided at operating floor level. The building walls shall comprise aerated concrete blocks from ground floor to roof level. The grade of concrete for RCC frame (including foundation) shall be M25. Plant road of approx. 12 m width shall pass through the building. Building up to minimum 8 m height shall have no floor in 12 m width for road opening.

4.2 Architectural Features

This building shall be five storied (Ground + 4 stories above) and shall be provided with floor area of 3500 Sqm (excluding stilt parking) with RCC framed structure. Autoclave Aerated Concrete Block masonry wall shall be provided for the full height of the building for both external and internal walls. Floor-to floor height shall be minimum 4.25m. A connecting corridor with Main Power House building shall be provided at operating floor level. The floor of the connecting corridor shall have vitrified ceramic tiles flooring, stainless steel hand rail & fixed structural gazing with reflective toughened glass. The connecting corridor shall have double skin Aluminium Composite Panel (ACP) cladding & insulated metal sheet sloped roof. Hermetically sealed double glazing with toughened glass shall be provided for external glazing. A minimum 70 mm margin for floor finish to be kept for providing of metallic raceway. This building shall provide offices for Operation staff, Conference room for minimum 50 persons, meeting room with minimum 10-person capacity at each floor, C&I Laboratory, Exhibition Hall, VIP Lounge etc.

This will be fully airconditioned building with adequate provision of toilets, pantry, cabins for senior executives and separate rooms for executives, supervisors etc. Lift structure with RCC lift pits shall be located inside the service building. Separate common toilet facilities shall be provided for ladies and gents in each floor with toilet cubicles. One toilet shall be provided for persons with disabilities on each floor. Attached toilets shall be provided with cabin of senior executive's cabin and conference rooms. 2 nos of staircases and 2 nos of lifts with adequate capacity shall be provided. One store room shall be provided. Covered parking space for 10 nos. cars shall be provided. Covered parking shall be of RCC construction. Open parking space for 40nos. cars &70 nos. scooters shall be provided. Minimum 23 sq.m./car (including circulation area) and 5 sq.m./Scooter (including circulation area) shall be considered for working out parking space. The service building shall be fully IT enabled. 300x40 mm Stainless Steel Raceway with standard length 2500 mm single compartment trunking raceways made from 14 gauge (minimum) Stainless Steel sheet including fasteners, floor support, connectors, bends cross-way, earthing stud for fixing etc. complete as per requirement, drawings and instructions of EIC shall be laid under floors of service building for IT enablement. 350x350x50 mm Junction boxes of Stainless-Steel sheet with cover plate for raceways shall also be provided. Solar PV panel of 17% efficiency shall be provided on roof of service building. External finishing shall be of Aluminium Composite panel, GRG Panels, HPL (High Pressure Laminates), Structural Glazing in combination. The service building shall have minimum 12 number cabins with attached toilet for senior officials. The Service building shall be designed keeping in mind the Green building features, such as Bio climatic Architecture including shading, daylighting, efficient envelop design, orientation with respect to sun path and wind pattern etc., to ensure that building is climatically responsive and consumes less energy. The outer shell of the building shall have double wall having 250 mm thick inner wall and 125 mm thick outer wall with a gap of 450mm. There shall be covered Atrium of area minimum 150 Sqm. The atrium cover shall be in Dome shape and shall be finished with Multiwall Poly carbonate sheet of minimum 10 mm thickness having U-Value – 3.2W/m²K, Light Transmission < 65%, U.V. resistant, Fire rated. The multiwall sheet shall be supported with fixed to powder coated aluminium extruded framing including fabrication and erection of steel structural framing to obtain the required shape, with adequate provision for expansion including all fittings, anchoring accessories, fixtures, joint sealing with EPDM gaskets to make the complete structure water proof, fitting & fixing the complete Roof Light Structure to RCC/Steel structural member etc. complete. The building shall have terracing at different levels. Glass canopy with Supporting SS structure (18 m x 6 m approximately) shall be provided at Entrance of the building.

4.3 Design Concept

This building shall be analysed & designed as RCC framed structure considering loads & load combinations mentioned in clause 6.2.0. Loads due to Solar PV panels also to be considered on roof slab of the building. Use of shear walls can be made in the building, in case peripheral road of BTG block is to be routed through the building. The design of RCC structure, foundations & slabs shall be carried out as per provisions of IS 456.

5.0 Fuel Oil Handling system

The civil works are to be provided for following fuel oil handling system areas as mentioned below:

a) Fuel Oil pressurizing pump house.

b) Foundation and dyke wall and all associated works for LDO tanks.

c) Pedestals and foundations to support the interconnecting piping between LDO tanks to the pressurizing pumps as well as piping from tanker unloading area to the Unloading pump house and further on to the LDO tank.

d) Oil water separator pit.

5.1 Fuel Oil Pressurising Pump House

This building shall be a single storeyed framed superstructure with RCC columns, structural steel roof truss (with rafter and tie level plan bracings), purlins and roof slab. The roof slab shall comprise minimum 40 mm thick (above the crest of metal deck sheet) RCC slab supported on profiled metal deck sheet connected through shear anchor studs. Waterproofing of Roof slab shall be done as per architectural specifications. The building shall be completely covered with minimum 230mm thick brick wall with provisions for fire proof doors, windows, rolling shutters. The basement RCC slab and RCC wall shall be designed as for uplift and external surcharge load as per the design criteria specified elsewhere. All pump foundations shall be designed for both static and dynamic loading. The building shall have separate enclosures for the control room and the switchgear room. All rainwater down comers shall be concealed with brick wall. The minimum floor area of this building shall be as per the equipment layout plan of the bidder/ EPC contractor.

5.2 Design Concept:

The grade of concrete shall be M 25 for all columns, beams, footing and slabs. The building shall be designed as per IS: 456, IS 800, IS 1893, IS 13920 (for ductility detailing).

5.3 Architectural Features of Fuel Oil Handling Buildings

Spaces for Pump Rooms, MCC Rooms, Control Rooms etc. shall be provided as per functional requirement. One Toilet block with drinking water facility shall be provided in each building. External finishing shall be of Premium Acrylic Smooth Paint with Silicone additives over suitable primer of water proof cement.

6.0 Main Gate Complex

The Gate Complex shall comprise two (2) mild steel vehicle entry gates of minimum 8.0m width and height 3.0m and shall be electrically operated. Minimum one room for security personnel shall be located at each end of the gates. Two (2) separate mild steel pedestrian gates minimum 3.0m high and 3.0m wide shall be provided at each end. Gate Complex shall include State Industrial Security Forces (SISF) building. The SISF Building shall be a two (2) storied RCC super structure with office complex in ground floor & first floor. The building shall be constructed with 250mm thick brick wall with provisions for doors, windows &

ventilators. The first floor shall also have a viewing gallery. The floor area and architectural details shall be as per the Arch spec. mentioned hereafter in this Specification.

6.1 Design Concept:

The SISF building shall be designed as moment resisting sway frame in both orthogonal directions and shall be designed as per IS: 456, IS: 1893 and IS: 13920 (for seismic ductility requirement) and as per design criteria mentioned hereafter in this specification.

6.2 Architectural Features

The SISF Building shall be 2-storied building. It shall be of RCC Frame structure & brick masonry. The floor area of this building shall be minimum 700 sq m The Gate Complex shall have sufficient no: of guards rooms to regulate movement of men and material and overall security, using latest modern technology like turnstile type/ boom type access control with magnetic cards and close circuit TV sets, computerized time and security office, etc shall be made. For any other gate provided for entry or exit, provision for a suitable small security hut/shed shall be made. Space provision for SISF personal staff, time office including time machine, reception, lounge, Arms store, Detention Room, Conference room, Toilets and pantry shall be provided as per functional requirement including toilets for Ladies, Gents, physically handicapped. The provision for covered parking shall be made for 20 nos. Cars (23 sq.m./car including driveway) and 20 nos. Scooters (5 sq.m./Scooter). In addition to above, provision for space for open parking for 5 trucks, &20 cycles shall be made. External finishing shall be of Premium Acrylic Smooth Paint with silicone additives & Aluminium Composite Panel combination.

7.0 Fire Station Building

7.1 Salient Features

The Fire Station Shed shall be a RCC framed superstructure. The building shall be designed as per the latest guidelines of IS:456, IS 1893 & IS 13920(for seismic ductility requirement). Approach shall be provided from front as well as back to the nearest road.

7.2 Architectural Features

It shall be of RCC Frame structure & Brick masonry. The building shall be provided with minimum area 200 sq. m (for 3 fire tenders) with minimum clear height of 6.0m above FFL required to accommodate Fire tenders. The number of fire tenders shall be provided as per CISF norms. The number of fire tenders/ equipment shall be provided as given in elsewhere in specifications. External finish shall be Premium Acrylic Smooth Paint with Silicone additives.

8.0 Administration (Admin) Building

8.1 Salient Features

The Administration Building shall be a multi–storied RCC frame superstructure. The building shall have an RCC Lift structure accommodating the Lifts. The structural framing plan and elevations shall be based on the architectural concept

to be developed by the bidder. The minimum thickness of Lift Superstructure RCC Wall shall be 230mm.

8.2 Design Concept

The building shall be designed as moment resisting RCC sway frame in both the orthogonal directions. For general design guidelines IS 456 shall be followed and for ductile detailing (against seismic load) IS: 13920 shall be followed.

8.3 Architectural Features

This building shall be five storeyed (G+4 stories above) and area 4500 sq.m. with RCC Frame structure& Autoclave Aerated Concrete Block masonry. Floor-to-floor height shall be minimum 4.50m.

The building shall be designed based on Tender drawing of Administration Building. It shall have features of local architecture. Hermetically sealed double glazing with toughened Glass to be provided for external glazing.

There shall be provisions for Exhibition Hall, Conference Room for 50 persons, Canteen for 30 persons, Bank, Bank ATM space, meeting room of 10-person capacity at each floor, AHU, MCC Room, First Aid Centre, Library, offices. Separate common toilet facilities shall be provided for ladies and gents in each floor with toilet cubicles. One toilet shall be provided for physically handicapped at each floor. The building shall have provision of attached toilet with the cabin for senior executives (minimum10 no.). 2Nos Lifts and minimum 2Nos stairs shall be provided. Lift shaft shall be of R.C.C wall.

Covered parking space for 25 nos. cars shall be provided. Covered parking shall be of RCC construction. Open parking space for 40 nos. cars & 75 nos. scooters shall be provided. Minimum 23 sq.m./car (including circulation area) and 5 sq.m./Scooter (including circulation area) shall be considered for working out parking space.

The Admin building shall be fully IT enabled. 300x40 mm GI Raceway with standard length 2500 mm single compartment trunking raceways made from 14 gauge (minimum) pre-galvanised sheet including fasteners, floor support, connectors, bends cross-way, earthing stud for fixing etc. complete as per requirement, drawings and instructions of EIC shall be laid under floors of service building for IT enablement. 350x350x50 mm Junction boxes of pre-galvanised sheet with cover plate for raceways shall also be provided. Minimum 70mm Floor finish margin shall be kept for installing metallic raceways.

The rain water down comers shall be provided as per General architectural specification. The rain water down comers shall be suitably concealed by the external wall enclosure. Structural Glazing shall have hermetically sealed double glazing. Windows on south side shall have Building Integrated Photovoltaic Cell as Glazing. The glazing area shall be increased accordingly for proper lighting. External finish shall be combination of HPL (High pressure laminates) & aluminium composite panel.

The Administration building shall be designed keeping in mind the Green building features, such as Bio climatic Architecture including shading, daylighting, efficient

envelop design, orientation with respect to sun path and wind pattern etc., to ensure that building is climatically responsive and consumes less energy.

The outer shell of the building shall have double wall having 250 mm thick inner wall and 125 mm thick outer wall with a gap of 450mm. There shall be covered Atrium of area minimum 150 Sqm. The atrium cover shall be in Dome shape and shall be finished with Multiwall Poly carbonate sheet of minimum 10 mm thickness having UValue– 3.2W/m²K, Light Transmission < 65%, U.V. resistant, Fire rated. The multiwall sheet shall be supported with fixed to powder coated aluminium extruded framing including fabrication and erection of steel structural framing to obtain the required shape, with adequate provision for expansion including all fittings, anchoring accessories, fixtures, joint sealing with EPDM gaskets to make the complete structure water proof, fitting & fixing the complete Roof Light Structure to RCC/Steel structural member etc. complete. The building shall have terracing at different levels. Glass canopy with Supporting SS structure (18 m x 6 m approximately) shall be provided at Entrance of the building.

9.0 O&M Store Building

9.1 Salient Features:

The scope of work of the Bidder shall be design & construction of all Civil, Structural and Architectural, water supply, plumbing & sanitary works of the O&M store building including supply of all materials.

The Permanent store Building shall comprise the following:

a) Heavy Material Storage Hall

The Heavy Material storage Hall shall have a Single Bay framed superstructure

with RCC/Structural steel columns and structural steel roof truss and purlins supporting pitched roof. The roofing of the Heavy Material store shall be permanently colour coated insulated sandwiched metal sheet. An EOT crane shall be provided with chequered plate walkways at both ends inside the bay of the Heavy Storage Hall. The capacity of the EOT crane shall be 30MT. The clear height up to the bottom of roof truss of the Heavy material storage hall shall be finalized based on equipment/spare to be handled.

b) Light Material Storage Hall

The Light Material Storage Hall with 3 tier Rack system shall have a Single Bay framed superstructure with RCC/Structural steel columns and structural steel roof truss and purlins supporting pitched roof. The roofing of light material store shall be permanently colour coated insulated sandwiched metal sheet. The light material store shall be fully covered with external brick wall of 250mm thickness with provision for doors, windows, rolling shutters as per architectural concept.

c) General Light Material Storage Hall

The General Light Material Store shall be RCC structure with cast in situ RCC beams & slabs. The RCC building shall be two storied and all beam column joints shall be designed and detailed for adequate ductility.

d) Office Complex

Office complex of this store shall be a single storeyed RCC building.

9.2 Architectural Features

Total Floor area of the Permanent store building shall be 3000sqm.

The minimum clear floor area of Heavy material storage hall shall be approximately 20% of the total area of the Permanent store with bay width of 15m and clear floor height of 12.0 m. Heavy material store shall have column free space for easy movement of materials. The Heavy Material storage hall shall be fully covered with external brick wall of 250mm thickness with provisions for doors, windows, rolling shutters as per architectural concept.

The minimum clear floor area of Light Material Storage Hall (with 3 tier storage) shall be approximately 33% of the total floor area of the Permanent Store. The height of the Light Material Storage Hall (with 3 tier rack system) from ground floor slab to bottom of roof truss shall be 10.0m. Other part of building shall have Light Material storage of two storeyed with floor area of 600 sq.m. at each floor and clear height of 3.5m. A part of light material store shall have facility for storing electronic equipment / instruments. This particular area shall be air-conditioned for dust proof environment.

The General Light Material Store shall be two storied building, completely covered with one brick thick (minimum 230 mm) brickwork, doors, windows & rolling shutters. The plan of the building shall be rectangular in shape with minimum floor area of approximately 20% of the total floor area of the Permanent Store.

The area of the office complex building shall be approximately 17% of the total floor area of the Permanent Store, with clear height of 4.0m. The external Wall shall be 250mm thick brick wall with provisions for doors and windows. The central office shall be provided for management and monitoring the stored materials. Adequate space shall be kept for loading unloading of materials. Office shall space for Supervisor/In-Charge room, general office cum record-documentation area, toilets, pantry, etc. shall be provided as per requirement.

All the above mentioned four buildings shall be interconnected by means of a covered passage 5.0m wide.

External finish shall be of Premium Acrylic Smooth Paint with Silicone additives.

10.0 Workshop Building

The O&M Workshop Building shall be a two bay fully covered building. The two bays shall comprise of workshop bay and office complex bay. The minimum span of workshop bay shall be 25m with RCC columns, structural steel roof truss and 40mm thick RCC roof slab supported on troughed permanently colour coated metal decking sheet and purlins. Roof water proofing shall be applied on roof slab as per details specified elsewhere in this specification. The Gantry girder for the EOT crane in the workshop building shall be structural steel plate girder supported on RCC corbels at column locations. The gantry girder shall be complete with chequered plate walkways (at both sides) and the cage ladder.

The adjacent Office Complex bay shall have RCC superstructure. The minimum bay width shall be 6.50m.

10.1 Architectural Features:

The building shall be fully covered with brick wall masonry. provision of doors, windows & Rolling shutters shall be included based on architectural detailed drawing to be developed by the bidder. The rainwater down comers shall be provided at every column location and they shall be suitably connected to the building surface drain.

The minimum operating floor area for the workshop bay shall be 25mX110m. The overall area of the building shall be 3400 sq.m The minimum head room of workshop bay shall be evaluated by the bidder based on approved EOT Crane Clearance diagram and crane rail level.

The office complex shall preferably be 6.50mX110m in plan area. The office complex shall preferably be made 2 storied for adequate space for operating personnel, MCC room, stores, Laboratories, Toilets, Conference room & Tool room. The floor to floor/ roof clear height shall be 4.50m.

11.0 Parking

30 nos. of open car parking and 70 nos. of open scooter parking shall be provided in addition to all other parking requirements specified with buildings.

12.0 FQA Building

FQA building shall be RCC construction of single or double storey. Total area shall be decided based on the requirements based in QA chapter, however, minimum area shall not be less than 800 Sqm. Apart from space required to accommodate and operate all the equipments mentioned in the equipment list, office space for 5 executives, one meeting room, spectroscope room, NDT lab, storage room, welding booth, welding simulator area, platforms for instruments/equipments, ladies and gents toilets, space for water cooler and pantry has to be provided as per specifications mentioned elsewhere in the technical specifications.

13.0 Safety Control Room

Safety control room shall be a single storyed RCC framed building of minimum area 60sqm with clear height of 4.5meter to accommodate equipment and personals as mentioned in C&I chapter for 24X7 operation. Additionally, it shall have ladies and gents toilet, space for water cooler and Pantry.

14.0 Shed for Construction Workers And O&M Workers

RCC framed structure with truss roof provided with insulated sheeting catering to 20. No of workers each (approximately 29 m x7.5m area) with common rest room, cooking area, drinking water facility, toilet, and bathing area along with covered verandah for easy approach to facilities. The shed should be well ventilated. Minimum 06 nos of Sheds shall constructed. The sheds shall be constructed at onset of the project. The sheds shall be scattered as per work locations and suitably located in GLP.

External finishes shall be Premium smooth Exterior Paint with silicone additives.

15.0 Worker's Accommodation Buildings

Worker's Accommodation shall be provided as per NBC requirement and Local factory act. The building design shall be as per Tender Drawing. It shall have Brick wall around the Kitchen, Toilet, bathroom and washing area. It shall have Aerated Concrete panel wall with steel structure having sandwich panel roof sheeting.

16.0 Safety Park

Safety Park shall be one story building and as per input drawing.

17.0 Primary Health Centre and Creche

Primary health centre shall be a single storyed RCC framed building of minimum area of 300 sqm comprising of Doctor's chambers (3 no.) , wards ,Pharmacy, check-up room, Emergency Ward, Waiting area, common toilets, Nurse station, first aid room office, creche or any other requirement that is necessary as per prevailing norms for complete functioning of the building.

18.a Hydrogen Generation Plant Building

This building shall be RCC Frame structure with brick masonry. This building falls under hazardous building category. Hydrogen generation plant shall be fenced with provision of gate as per clause 8.05.00 all around the single lane road surrounding the building to prevent unauthorized ingress or egress

18.b Canteen Building

Salient Features

The Canteen Building shall be a RCC framed superstructure with large span roof system. The building shall be designed as per the latest guidelines of IS:456, IS 1893 & IS 13920(for seismic ductility requirement)

Architectural Features

This building shall be of RCC Frame structure& Autoclave Aerated Concrete Block masonry. The area of building shall be 1100 sq.m.

The building shall have entrance lobby, dining hall for staff, dining room for executives, pantry, kitchen, office, stores, wash areas, rest room for kitchen staff, toilets, etc.

External finish shall be of Premium Acrylic Smooth Paint with Silicone additives.

There shall be separate service road and entrance for supply of cooking materials and garbage disposal.

19.0 Design Criteria

19.1 The design criteria given herein is applicable for all sub-structure, super-structure works/ buildings/ facilities and various other works included in the scope of the Bidder.

19.2 Structures shall be designed for the most critical combinations of dead loads, imposed loads, equipment loads, crane loads, piping loads (static, friction and dynamic), earth pressure & surcharge loads, hydrostatic & hydrodynamic loads, wind loads, seismic loads and temperature loads. In addition, Erection loads, loads and forces developed due to differential settlement shall also be considered.

19.3 All the buildings shall have framed super structure. If the superstructure of building is a steel structure, the framed superstructure shall be moment resisting sway frame in the lateral direction and axially braced in the orthogonal direction. For columns having depth of 1000mm & above, the longitudinal bracings shall comprise a pair of members (spaced) with spacing equal to the column depth. Columns having depth less than 1000mm may have bracing in single plane and at the centre line of column. In both the cases (single bracing or pair of bracing) detailing shall be adequate to restrain the entire column cross-section including both the flanges. Only where axial bracing to one vertical plane is to be waived due to functional requirement, columns in that vertical plane may be allowed to undergo biaxial bending. Beam column joints shall be detailed as per seismic resistant joint with adequate ductility.

All 2-legged structural steel trestles shall be completely braced in the vertical plane. All 4-legged structural steel trestles shall be completely braced in all four vertical planes. In addition, specified horizontal planes shall be completely braced to provide stiffness against torsional sway.

If the superstructure is RCC structure, the superstructure shall be moment resisting sway frame in both orthogonal direction and all the members shall be designed for biaxial bending. Design of RCC structures shall be done as per IS 456. Detailing for ductility shall be followed as per guidelines of IS13920 to be effective against seismic load. Design of liquid retaining structures shall be done as per IS 3370.

19.4 Buildings may have either RCC or structural steel framework as mentioned in the specification.

19.5 All buildings having RCC framing shall have masonry cladding of minimum one masonry unit thickness (not less than 225 mm.) on exterior face.

20.0 Civil Design Concepts

20.1 Individual members of the frame shall be designed for the worst combination of forces such as bending moment, axial force, shear force, torsion, etc.,

20.2 The different load combinations shall be taken as per IS: 875 (Part-5) and other relevant IS Codes.

a) Wind and seismic forces shall not be considered to act simultaneously.

b) Permissible stresses for different load combinations shall be taken as per

relevant IS and IRS codes.

c) For checking against uplift / tension case, 90% of Dead Loads with no Imposed Loads shall be considered along with other Loads.

d) The Structures shall be Designed for most unfavourable Combination of Dead Loads, Imposed Loads, Equipment Loads, Piping / Cables / Ducts Loads, Wind / Seismic Loads, Temperature Loads, Ash Loads, and other applicable Loads without exceeding the Permissible Stresses. No reduction in equipment loads, piping loads, ash loads and loads due to other permanent facilities shall be considered for calculation of seismic.

20.3 Design of steel structures shall be done as per provisions of IS:800: 2007 (Limit state design) and other relevant IS standards including National Building Code (2016). For design of coal bins and loading hopper IS:9178 (part I to III) shall be followed.

20.4 Shop connections will be welded type and all field connections will be bolted. Field permanent bolts wherever provided will be high tensile bolts of property class 8.8 (min) as per 1367 for all major connections. However, nominal connections in the field like purlins, stairs, wall beams will be done by means of M.S. black bolts of grade 4.6 conforming to IS-1367. The bolted joints will be designed for friction grip or bearing type. For friction grip type connections, bolts will be tightened to develop the required pretension during their installation.

20.5 For bolted Connection, IS 4000, IS: 3757, IS: 6623 and IS: 6649 shall be followed. IS 814, IS 816, IS: 1024, IS 4353 and IS: 9595 shall be followed for welding of structures.

21.0 Design Criteria for Foundation

The founding depth / cut off level of piles shall be decided based on functional requirement. Where structural steel columns are envisaged, the bottom of the base plate shall be kept suitably below the paving level such that the top level of the gusset plate and foundation bolt remain at least 200 mm below the top level of paving except for Boiler Structure, Bunker Building Columns, TP & Trestle Columns, ESP Control Building Columns for which the requirement of levels for bottom of base plates is specified elsewhere in this specification. Further the gusset plate and foundation bolts are to be encased in concrete up to the top of the paving level. For outdoor structural steel columns, about 300 mm height of steel columns above the top of paving level shall be provided with at least 125 mm thick encasement with minimum reinforcement to prevent corrosion of the steel columns from surface water

21.1 Open Foundations

For foundations, the minimum founding depth and the minimum size of foundation shall be as per foundation system and geotechnical data specified in the foundation chapter include hereafter in this specification.

For open foundations, the total permissible settlement shall be as per the criteria furnished under the foundation system specified elsewhere in this specification. The sizing of foundation, design criteria & clear cover shall conform to IS:1904, IS:456 and other relevant Indian codes. However minimum 0.12% of reinforcement shall be provided on the top face of the foundation concrete on either direction and minimum percentage of reinforcement both in case of bottom face and also for tension face of foundation shall be same as that stipulated for beam as per IS:456.

21.2 Pile Foundations

Minimum centre to centre spacing of the piles shall be as per IS: 2911. Incase single piles are used, these piles are to be interconnected with tie beams along both orthogonal directions perpendicular to each other.

Minimum penetration of piles into Pilecap shall be 75 mm and clear cover to the main reinforcement at the bottom face of the pile cap shall be 100 mm. Structural design of pile cap and reinforcement shall conform to IS:2911 and IS:456. However minimum 0.12% of cross section of the pile cap shall be provided on the top face of the pile cap along two orthogonal directions and minimum percentage of reinforcement at bottom face of pile cap shall be same as that stipulated for beam as per IS:456.

22.0 Corrosion Protection

(a) All Steel structures shall be provided with painting system as mention below in this specification for the corrosivity category as mentioned in Part A IID Civil Works. Painting system for steel surfaces embedded in Concrete is given separately.

(b) All Painting shall be done as per Technical Specification Painting scheme shall submitted by the Bidder.

(c) All steel structures shall be designed by following basic design considerations in ISO 12944 Part 3. Where steel is fully accessible for cleaning and repainting and where it is feasible to follow design criteria given in ISO 12944 part 3, minimum thicknesses of structural members shall be as follows

Structural Sections	Minimum thickness	Minimum Flange thickness	Minimum Web thickness
Plates	6		
Built up Sections		6	6
Angle sections	6		
ISMB /ISMC		6	4.5
NPB/ WPB		6	4.5
RHS/SHS/ Tubular Sections	4		
All dimensions in mm			

All dimensions in mm Where steel surfaces are inaccessible for cleaning and repainting (such as back to back sections, lap joints etc.) or where it is not feasible to follow design criteria given in ISO 12944 part 3, corrosion allowance of 1.5 mm shall be kept in thickness (over the design thickness or minimum thickness specified above, whichever is more). The minimum thickness consideration shall apply for both web and flange.

However minimum gusset plate thicknesses shall be followed as mentioned elsewhere in the specification and minimum angle section to be used is ISA 50x50x6. Ends of tubular sections to be effectively sealed at both ends. Also tubular handrail thicknesses will be as governed by mentioned clauses in the spec

Minimum thickness of tubular/ hollow steel sections conforming to IS 4923 shall be 4.0 mm, provided the ends of such steel sections are effectively sealed unless higher thickness is specified elsewhere for specific structure.

23.0 Concrete

a) Concrete work shall be of grade as per IS 456. Mix design concrete shall be used for all areas other than lean concrete work and plain cement concrete where nominal/volume mix can be permitted. Design mix shall be carried out as per IS10262. Specific approval of the Engineer shall be obtained regarding degree of quality control to be adopted for design mix.

b) Minimum grade of reinforced cement concrete for all foundations shall be M25 unless noted otherwise. Minimum grade of concrete for other structures/areas (other than machine foundations) shall be M25 for all superstructure and substructure unless noted otherwise elsewhere in this specification.

c) The minimum grades of concrete for different machine foundations and some of other important structural members shall be as specified in Annexure AC-1 Minimum grade of concrete for structures not mentioned above shall be as mentioned elsewhere in the relevant clauses of the technical specifications.

d) Higher grade of concrete than specified above may be used at the discretion of the Bidder.

e) Unless otherwise specified, 20mm and down aggregates shall be used for all structural concrete works. However, 40mm and down aggregates may also be used under special conditions for mass concreting in foundation.

f) For thin concrete sections such as roof slab over profiled metal deck sheets, 12mm and down coarse aggregates shall be used for coarse aggregates.

g) Minimum 75mm thick lean concrete M-7.5 shall be provided below all other underground structures, foundations, trenches, etc., to provide a base for construction.

24.0 Fabrication & Erection of Steel Structures

Steel structures which are to be fabricated in factory shall have bolted field connection. Steel structure which are to be fabricated at site can have bolted field connections or welded connection. The fabrication shall be done as per fabrication drawing which would clearly indicate various details of joints to be welded, type of weld, length and size of weld and bolt details.

Before dispatching the fabricated structural members to site, it shall be ensured that all parts in the assembly fit accurately together by carrying out pre-assembly of fabricated structural members having bolted field joints, in the factory.

All steelwork before and after manufacturing shall be smooth, straight and free of deformations, cracks, twists and burrs. All steelwork shall be cut and fabricated to a tolerance of ± 1.5 mm in its length and location of matching bolt holes for field connections.

Note:

I. Fabrication facilities (like cutting, welding, NDT, shot blasting, painting, Storage & Preservation, lifting, drilling and handling etc.) including qualified & experienced manpower shall be at par with factory.

II. Quality checks presently envisaged in MQP shall be tied up in FQP.

III. Inspection will be carried out by FQA / Site QA.

25.0 Reinforcement Steel

Reinforcement steel shall be of high strength deformed TMT steel bars of grade Fe-415/Fe- 500/Fe 500D/Fe550D and shall conform to IS 1786 and IS 13920. However, minimum elongation shall be 14.5%.

Quote

25.1 Steel reinforcement shall comply with all of the following:

a) Elongation shall be at least 14.5 percent,

b) Ratio of ultimate stress to 0.2 percent proof stress shall not exceed 1.25,

c) Ratio of ultimate stress to 0.2 percent proof stress shall be at least 1.15, and

d) Steel shall be only of strength grades with minimum 0.2 percent proof stress of 415 MPa, 500 MPa or 550 MPa, in addition to other requirements of IS 1786.'

25.2 The actual 0.2 percent proof stress of steel bars based on tensile test must not exceed their characteristic 0.2 percent proof stress by more than 20 percent.

Unquote

Mild steel and medium tensile steel bars shall conform to Grade A of IS:432-Part 1 and hard drawn steel wire shall confirm to IS:432-Part II. Welded wire fabric shall conform to IS 1566.

26.0 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.

26.1 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 and minimum thickness shall be 4 mm.

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.

26.2 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.

Technical Pre-Qualification Requirement

MINIMUM ELIGIBILITY CRITERIA:

The bidders should meet the following minimum eligibility/qualifying criteria:

Work experience

(A) Bidder should have successfully completed similar work for any one of the following in last 7 (seven) years from latest date of bid submission.

a. Three similar works each of value not less than 41.6 lakh

OR

b. Two similar works each of value not less than 52.0 lakh

OR

c. One similar work each of value not less than 83.2 lakh

(B) Bidder should have at least five (05) AutoCAD, three (03) STAAD.Pro and one (01) REVIT/3-D MAX software licenses (latest version).

Explanatory Notes

(i) "Similar works" shall mean providing "Architectural and Civil" or "Architectural and Structural" design for industrial building or commercial building or high-rise residential building having height > 15m.

(ii) The bidder should submit documentary proofs in support of the criteria mentioned in Sl. No. A & B above.