T E N D E R S P E C I F I C A T I O N

NO: BHE/PW/PUR/SKT-CHIMNEY/908

CONSTRUCTION OF TWIN FLUE RCC CHIMNEY OF HEIGHT 220M WITH BRICK LINERS USING SLIPFORM SHUTTERING EQUIPMENT ETC

AT

SIKKA THERMAL POWER STATION (EXPANSION PROJECT)
GUJARAT STATE ELECTRICITY CORPORATION LIMITED
SIKKA, DISTT. JAMNAGAR (GUJARAT)

TECHNICAL BID - VOLUME- I

TENDER SPECIFICATIONS CONSISTS OF:

- **Notice Inviting Tender**
- **Volume 1 A - Technical Conditions of Contract,**
- **Volume 1 B - Special conditions of Contract,**
- **Volume 1 C - General conditions of Contract**
- **Volume 1 D - Forms & Procedures**

Bharat Heavy Electricals Limited
(*A Government of India Undertaking*)
Power Sector - Western Region
345-Kingsway, Nagpur-440001

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GUJARAT STATE ELECTRICITY CORPORATION LIMITED
SIKKA, DISTT. JAMNAGAR (GUJARAT)

EARNEST MONEY DEPOSIT: Refer Notice Inviting Tender

LAST DATE FOR TENDER SUBMISSION . Refer Notice Inviting Tender

THESE TENDER SPECIFICATION DOCUMENTS CONTAINING VOLUME-I AND VOLUME- III ARE ISSUED TO:

M/s. ……

……

PLEASE NOTE:
THESE TENDER SPECS DOCUMENTS ARE NOT TRANSFERABLE.

For Bharat Heavy Electricals Limited

DY. GENERAL MANAGER (Purchase)
Place: Nagpur
Date :

908

NOTICE INVITING TENDER

Bharat Heavy Electricals Limited

Ref: NO: BHE/PW/PUR/SKT-CHIMNEY/908 Dt: 13/09/2011

NOTICE INVITING TENDER (NIT)

NOTE: BIDDER MAY DOWNLOAD FROM WEB SITES OR PURCHASE TENDERS FROM THIS OFFICE ALSO

==========

To

Dear Sir/Madam

Sub : NOTICE INVITING TENDER

Sealed offers in two part bid system are invited from reputed & experienced bidders (meeting PRE QUALIFICATION CRITERIA as mentioned in Annexure-I) for the subject job by the undersigned on the behalf of BHARAT HEAVY ELECTRICALS LIMITED as per the tender document. Following points relevant to the tender may please be noted and complied with.

1.0 Salient Features of NIT

SL NO	ISSUE	DESCRIPTION	
i	**TENDER NUMBER**	**BHE/PW/PUR/SKT-CHIMNEY/908**	
ii	**Broad Scope of job**	**CONSTRUCTION OF TWIN FLUE RCC CHIMNEY OF HEIGHT 220M WITH BRICK LINERS USING SLIPFORM SHUTTERING EQUIPMENT ETC AT SIKKA THERMAL POWER STATION (EXPANSION PROJECT) GUJARAT STATE ELECTRICITY CORPORATION LIMITED SIKKA, DISTT. JAMNAGAR (GUJARAT).**	
iii	**DETAILS OF TENDER DOCUMENT**		
a	Volume-IA	*Technical Conditions of Contract (TCC) consisting of Scope of work, Technical Specification, Drawings, Procedures, Bill of Quantities, Terms of payment, etc*	*Applicable*
b	Volume-IB	*Special Conditions of Contract (SCC)*	*Applicable*
c	Volume-IC	*General Conditions of Contract (GCC)*	*Applicable*
d	Volume-ID	*Forms and Procedures*	*Applicable*

e	Volume-III	*Price Schedule (Absolute value).*	*Applicable*
iv	**Issue of Tender Documents**	***1. Sale from BHEL PS Regional office at :*** ***Start : 13/09/ 2011*** ***Closes: 27/09/2011 , Time :17.00 Hrs*** **2. From BHEL website (www.bhel.com)** Tender documents can however be downloaded from website till due date of submission	*Applicable*
v	**DUE DATE & TIME OF OFFER SUBMISSION**	***Date :28 /9/ 2011 , Time :15.00Hrs*** ***Place :***	*Applicable*
vi	**OPENING OF TENDER**	***1 hours after the latest due date and time of Offer submission*** *Notes:* *(1) In case the due date of opening of tender becomes a non-working day, tenders shall be opened on next working day at the same time.* *(2) Bidder may depute representative to witness the opening of tender*	*Applicable*
vii	**EMD AMOUNT**	*Rs 2,00,000/- (Rupees Two Lakhs Only)*	*Applicable*
viii	**COST OF TENDER**	*Rs 2000/-.*	*Applicable*
ix	**LAST DATE FOR SEEKING CLARIFICATION**	*Date: (Atleast 5 days before the due date of offer submission)* *Along with soft version also, addressing to undersigned & to others as per contact address given below*	*Applicable*
x	**SCHEDULE OF Pre Bid Discussion (PBD)**	*Date : Not applicable.*	*Not applicable.*
xi	**INTEGRITY PACT & DETAILS OF INDEPENDENT EXTERNAL MONITOR (IEM)**	Shri J M Lyngdoh, IAS (Retd.) Plot No. 144-145, Pragati Resort, Proddator Village & P.O., Shankarpally Road, Rangareddy Distt. (AP)- 500 033	*Applicable*
xii	**Latest updates**	Latest updates on the important dates, Amendments, Correspondences, Corrigenda, Clarifications, Changes, Errata, Modifications, Revisions, etc to Tender Specifications will be hosted in BHEL webpage (www.bhel.com --->Tender Notifications →View Corrigendums) **and not in the newspapers**. Bidders to keep themselves updated with all such	

		information	

2.0 The offer shall be submitted as per the instructions of tender document and as detailed in this NIT. Bidders to note specifically that all pages of tender document, including these NIT pages of this particular tender together with subsequent correspondences shall be submitted by them, duly signed & stamped on each page, as part of offer. **Rates/Price including discounts/rebates, if any, mentioned anywhere/in any form in the techno-commercial offer other than the Price Bid, shall not be entertained.**

3.0 Unless specifically stated otherwise, bidder shall remit cost of tender and courier charges if applicable, in the form of Demand Draft drawn in favour of Bharat Heavy Electricals Ltd, payable at Power Sector Regional HQ at Nagpur issuing the Tender, along with techno-commercial offer. Bidder may also choose to deposit the Tender document cost by cash at the Cash Office as stated above against sl no iv of 1, on any working day; and in such case copy of Cash receipt is to be enclosed with the Techno Commercial offer. Sale of tender Documents shall not take place on National Holidays, holidays declared by Central or State Governments and BHEL PS HQ at NAgpur, Sundays and second/ last Saturdays

4.0 Unless specifically stated otherwise, bidder shall deposit EMD through Demand Draft/Pay Order in favour of Bharat Heavy Electricals Ltd, payable at Nagpur. For other details and for 'One Time EMD' please refer General Conditions of Contract.

5.0 **Procedure for Submission of Tenders**: The Tenderers must submit their Tenders to Officer inviting Tender, as detailed below:

- PART-I consisting of 'PART-I A (Techno Commercial Bid)' & 'PART-I B (EMD/COST of TENDER)' in two separate sealed and superscribed envelopes (ENVELOPE-I & ENVELOPE-II)
- PART-II (Price Bid) – in sealed and superscribed envelope (ENVELOPE-III)

6.0 The contents for ENVELOPES and the superscription for each sealed cover/Envelope are as given below. **(All pages to be signed and stamped)**

Sl no	Description	Remarks
	Part-I A	
	ENVELOPE – I superscribed as : PART-I (TECHNO COMMERCIAL BID) TENDER NO : NAME OF WORK : PROJECT: DUE DATE OF SUBMISSION: **CONTAINING THE FOLLOWING**:-	
i.	Covering letter/Offer forwarding letter of Tenderer.	
ii.	Duly filled-in `No Deviation Certificate' as per prescribed format to be placed after document under sl no (i) above. **Note:** a. In case of any deviation, the same should be submitted separately for technical & commercial	

	parts, indicating respective clauses of tender against which deviation is taken by bidder. The list of such deviation shall be placed after document under sl no (i) above. It shall be specifically noted that deviation recorded elsewhere shall not be entertained. b. BHEL reserves the right to accept/reject the deviations without assigning any reasons, and BHEL decision is final and binding. i). In case of acceptance of the deviations, appropriate loading shall be done by BHEL ii). In case of unacceptable deviations, BHEL reserves the right to reject the tender	
iii.	Supporting documents/ annexure/ schedules/ drawing etc as required in line with Pre-Qualification criteria. It shall be specifically noted that all documents as per above shall be indexed properly and credential certificates issued by clients shall distinctly bear the name of organization, contact ph no, FAX no, etc.	
iv.	All Amendments/Correspondences/Corrigenda/Clarifications /Changes/ Errata etc pertinent to this NIT.	
v.	Integrity Pact Agreement (Duly signed by the authorized signatory)	If applicable
vi.	Duly filled-in annexures, formats etc as required under this Tender Specification/NIT	
vii.	Notice inviting Tender (NIT)	
viii.	Volume – I A : Technical Conditions of Contract (TCC) consisting of Scope of work, Technical Specification, Drawings, Procedures, Bill of Quantities, Terms of payment, etc	
ix.	Volume – I B : Special Conditions of Contract (SCC)	
x.	Volume – I C : General Conditions of Contract (GCC)	
xi.	Volume – I D : Forms & Procedures	
xii.	Volume – III (UNPRICED – without disclosing rates/price, but mentioning only 'QUOTED' or 'UNQUOTED' against each item	
xiii.	Any other details preferred by bidder with proper indexing.	

	PART-I B	
	ENVELOPE – II superscribed as: PART-I (EMD/COST of TENDER) TENDER NO : NAME OF WORK : PROJECT: DUE DATE OF SUBMISSION:	

	CONTAINING THE FOLLOWING:-	
i.	1. Earnest Money Deposit (EMD) in the form as indicated in this Tender **OR** Documentary evidence for 'One Time EMD' with the Power Sector Region of BHEL floating the Tender 2. Cost of Tender (Demand Draft or copy of Cash Receipt as the case may be)	

	PART-II	
	PRICE BID consisting of the following shall be enclosed	
	ENVELOPE-III superscribed as: PART-II (PRICE BID) TENDER NO : NAME OF WORK : PROJECT: DUE DATE OF SUBMISSION: **CONTAINING THE FOLLOWING**	
i	Covering letter/Offer forwarding letter of Tenderer enclosed in Part-I	
ii	Volume III – PRICE BID (Duly Filled in Schedule of Rates – rate/price to be entered in words as well as figures)	

	OUTER COVER	
	ENVELOPE-IV (MAIN ENVELOPE / OUTER ENVELOPE) superscribed as: TECHNO-COMMERCIAL BID, PRICE BID & EMD TENDER NO: NAME OF WORK: PROJECT: DUE DATE OF SUBMISSION: **CONTAINING THE FOLLOWING:**	
i	o Envelopes I o Envelopes II o Envelopes III	

SPECIAL NOTE : All documents/ annexures submitted with the offer shall be properly annexed and placed in respective places of the offer as per enclosure list mentioned in the covering letter. BHEL shall not be responsible for any missing documents.

7.0 No Deviation with respect to tender clauses and no additional clauses/ suggestions/ in Techno-commercial bid/ Price bid shall normally be considered by BHEL. Bidders are requested to positively comply with the same.

8.0 BHEL reserves the right to accept or reject any or all Offers without assigning any reasons thereof. BHEL also reserves the right to cancel the Tender wholly or partly without assigning any reason thereof. Also BHEL shall not entertain any correspondence from bidders in this matter (except for the refund of EMD).

9.0 Assessment of Capacity of Bidders:

Bidders capacity for executing the job under tender shall be assessed as per the following:

I. **Assigning Weightages (A) for Similar Jobs Under-Execution**: Weightages shall be worked out and assigned based on the average number of Similar Works under execution including works yet to be commenced by the agency, in the following manner:

i). Number of Similar Jobs
- a) No. of jobs in BHEL, PSER : Say 'J'
- b) No. of jobs in BHEL, PSSR : Say 'K'
- c) No. of jobs in BHEL, PSWR : Say 'L'
- d) No. of jobs in BHEL, PSNR : Say 'M'
- e) No. of jobs with other customers* : Say 'N' (*: Other than BHEL PSER, PSSR, PSWR & PSNR)
- f) Average No. of Jobs is 'P'= (J+K+L+M+N) divided by 5

ii) Weightage "A" assigned to bidders based on Average Number of jobs "P";
- a) If 'P' = 0-1, "A" will be equal to '3'
- b) If 'P' = 2-3, "A" will be equal to '2'
- c) If 'P' = 4-5, "A" will be equal to '1'
- d) If 'P' is Above 5, "A" will be equal to '0'

II. **Weightage "B" for Quarterly Performance Reports of Vendors**: This shall be based on the averages of the net weighted score obtained by the bidder for the jobs under execution (excluding works not commenced) for the quarter previous to the last quarter reckoned from the date of latest due date of submission, in all four Regions i.e BHEL PSER, PSSR, PSWR & PSNR, in the following manner.

i). Ratings by Power Sector Region:
- a) PS ER's Rating 'R**e**r' = ($X_1 + X_2 + .. + X_n$) divided by n
- b) PS WR's Rating 'R**w**r' = ($X_1 + X_2 + .. + X_n$) divided by n
- c) PS SR's Rating 'R**s**r' = ($X_1 + X_2 + .. + X_n$) divided by n
- d) PS NR's Rating 'Rnr' = ($X_1 + X_2 + .. + X_n$) divided by n
- e) **Over all Power Sector Region Rating** 'R_{BHEL}'= (R**e**r+ R**w**r+ R**s**r+ R**n**r) divided by 4

(where "X_1, X_2, X_3,…X_n" is the net weighted score obtained by the bidder as per the "Evaluation of Contractor Performance (Quarterly)" against the various contracts 'n' under execution in the respective Region).

ii) Weightage "B" assigned to bidders based on Overall Power Sector Rating **(R_{BHEL}):**

a) If **R_{BHEL}** is 80% and above, "B" will be equal to '6'
b) If **R_{BHEL}** is > 70% < 80%, "B" will be equal to '5'
c) If **R_{BHEL}** is > 60% < 70%, "B" will be equal to '4'
d) If **R_{BHEL}** is = < 60%, "B" will be equal to '0'

III. Evaluation of Bidders capacity to execute the job under tender: shall be based on the sum of scores obtained in 'A' and 'B', as below:

a) 6 or above : Considered 'Qualified' for the job under tender
b) Less than 6: Considered 'NOT Qualified' for the job under tender

IV. **Explanatory note**:

a) Similar work means GTG,GTG,BOILER or Turbine or Civil or Electrical or CI, etc irrespective of rating of Plant
b) Quarter shall be as per the quarter defined in the "Evaluation of Contractor performance (Quarterly)". For contracts where annexed Quarterly Evaluation performance was not part of the contract, 'Quarterly Performance Reports' previous to the last quarter reckoned from the date of latest due date of submission, given by the respective project site against the contract will be the basis for evaluation.

c) Vendors who are not executing any jobs presently in the Region and first timers to the Region, may be considered subject to satisfying all other tender conditions

d) 'Under execution' shall mean works in progress upto GTG,GTG,BOILER Steam Blowing (for GTG,GTG,BOILER and Auxilliaries) or Synchronisation (for all other jobs including Civil) shall be considered.

10.0 Since the job shall be executed at site**,** bidders must visit site/ work area and study the job content, facilities available, availability of materials, prevailing site conditions including law & order situation etc before quoting for this tender. They may also consult this office before submitting their offers, for any clarifications regarding scope of work, facilities available at sites or on terms and conditions. No additional claim shall be entertained by BHEL in future, on account of non-acquaintance of above.

11.0 For any clarification on the tender document, the bidder may seek the same in writing or through e-mail, as per specified format, within the scheduled date for seeking clarification, from the office of the undersigned. BHEL shall not be responsible for receipt of queries after due date of seeking clarification due to

postal delay or any other delays. Any clarification / query received after last date for seeking clarification may not be normally entertained by BHEL and no time extension will be given.

12.0 BHEL may decide holding pre-bid discussion [PBD] with all intending bidders as per date indicated in the NIT. The bidder shall ensure participation for the same at the appointed time, date and place as may be decided by BHEL. Bidders shall plan their visit accordingly. The outcome of pre-bid discussion (PBD) shall also form part of tender.

13.0 In the event of any conflict between requirement of any clause of this specification/ documents/drawings/data sheets etc or requirements of different codes/standards specified, the same to be brought to the knowledge of BHEL in writing for clarification before due date of seeking clarification (whichever is applicable), otherwise, interpretation by BHEL shall prevail. Any typing error/missing pages/ other clerical errors in the tender documents, noticed must be pointed out before pre-bid meeting/submission of offer, else BHEL's interpretation shall prevail.

14.0 Unless specifically mentioned otherwise, bidder's quoted price shall deemed to be in compliance with tender including PBD.

15.0 Bidders shall submit Integrity Pact Agreement (Duly signed by authorized signatory who signs in the offer), **if applicable**, along with techno-commercial bid. This pact shall be considered as a preliminary qualification for further participation. **The names and other details of Independent External Monitor (IEM) for the subject tender is as given at point (xi) of 1 above.**

16.0 The Bidder has to satisfy the Pre Qualifying Requirements stipulated for this Tender in order to be qualified. The Price Bids of only those bidders will be opened who will be qualified for the subject job on the basis of pre-qualification evaluation/ techno-commercial bids, approval/ acceptance of customer (as applicable), etc. and date of opening of price bids shall be intimated to only such bidders.

17.0 In case BHEL decides on a `Public Opening', the date & time of opening of the sealed PRICE BID shall be intimated to the qualified bidders and in such a case, bidder may depute one authorised representative to witness the price bid opening. BHEL reserves the right to open 'in-camera' the 'PRICE BID' of any or all Unsuccessful/Disqualified bidders under intimation to the respective bidders.

18.0 Validity of the offer shall be for **six months** from the latest due date of offer submission (including extension, if any) or specified otherwise in SCC of tender.

19.0 BHEL reserves the right to decide the successful bidder on the basis of Reverse Auction process. In such case all qualified bidders will be intimated regarding procedure/ modality for Reverse Auction process prior to Reverse Auction and price will be decided as per the rules for Reverse Auction. .

However, if reverse auction process is unsuccessful as defined in the RA rules/procedures, or for whatsoever reason, then the sealed 'PRICE BIDs' will be opened for deciding the successful bidder. BHEL's decision in this regard will be

final and binding on bidder.

20.0 On submission of offer, further consideration will be subject to compliance to tender & qualifying requirement and customer's acceptance, as applicable.

21.0 In case the bidder is an "Indian Agent of Foreign Principals", 'Agency agreement has to be submitted along with Bid, detailing the role of the agent along with the terms of payment for agency commission in INR, along with supporting documents.

22.0 The bidders shall not enter into any undisclosed M.O.U. or any understanding amongst themselves with respect to tender.

23.0 In case Consortium Bidding is allowed as per Pre Qualifying Requirement, then Prime Bidder and Consortium Partner shall enter into Consortium Agreement. Validity period of Consortium Agreement shall be 6 months after which the same can be re validated.

'Stand alone' bidder cannot become a '**prime bidder' or a 'consortium bidder' in a consortium bidding**. Prime bidder shall neither be a consortium partner to other prime bidder nor take any other consortium partners. However, consortium partner may enter into consortium agreement with other prime bidders. In case of non compliance, consortium bids of such Prime bidders will be rejected. .

24.0 The bidder shall submit documents in support of possession of 'Qualifying Requirements" duly self certified and stamped by the authorized signatory, indexed and properly linked in the format for PQR. In case BHEL requires any other documents/proofs, these shall be submitted immediately.

25.0 The bidder may have to produce original document for verification if so decided by BHEL.

26.0 Order of Precedence

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

a. Amendments/Clarifications/Corrigenda/Errata etc issued in respect of the tender documents by BHEL
b. Notice Inviting Tender (NIT)
c. Price Bid
d. Technical Conditions of Contract (TCC)—Volume-1A
e. Special Conditions of Contract (SCC) —Volume-1B
f. General Conditions of Contract (GCC) —Volume-1C
g. Forms and Procedures —Volume-1D

for BHARAT HEAVY ELECTRICALS LTD

DGM / Purchase

Enclosure

01. Annexure-1: Pre Qualifying criteria.
02. Annexure-2: Check List .

03. Annexure-3: Integrity Pact
04. Annexure-4: Important Information
05 Other Tender documents as per this NIT.

ANNEXURE - 1

PRE QUALIFYING CRITERIA

JOB	**CONSTRUCTION OF TWIN FLUE RCC CHIMNEY OF HEIGHT 220M WITH BRICK LINERS USING SLIPFORM SHUTTERING EQUIPMENT ETC AT SIKKA THERMAL POWER STATION (EXPANSION PROJECT) GUJARAT STATE ELECTRICITY CORPORATION LIMITED SIKKA, DISTT. JAMNAGAR (GUJARAT).**
TENDER NO	**BHE/PW/PUR/SKT-CHIMNEY/908**

SL NO	PRE QUALIFICATION CRITERIA	Bidders claim in respect of fulfilling the PQR Criteria	
		Name and Description of qualifying criteria (Bidder Should Fill Up the Details in this column for PQR)	Page no of supporting document of bidders offer
A	Submission of Integrity Pact duly signed (if applicable)	**APPLICABLE**	
B	Assessment of Capacity of Bidder to execute the work as per sl no 9 of NIT	APPLICABLE	
C	**Technical** Vendor should have constructed at least One RCC Chimney single, twin or multi flue with brick liners /steel liners using slip form shuttering technique of minimum 150M height or of more height independently including electrical works, aviation lights, lightening protection system etc complete in a single work order.		
D.1	**Financial TURNOVER** Bidders must have achieved an average annual financial turnover (Audited) of **Rs 1050 Lakhs** or more over last three Financial Years (FY) i.e 2008-2009, 2009-2010, 2010-2011 or for 2007-08, 2008-2009, 2009-2010 if audited Annual Accounts for FY 2010-11 are not audited		

D.2	NETWORTH Net worth of the Bidder based on the latest Audited Accounts as furnished for 'D1' above should be positive		
D.3	PROFIT Bidder must have earned cash profit in any one of the three Financial Years as applicable in the last three years defined in 'D1 above above based on latest Audited Accounts.		
E	Approval of Customer (if applicable) Note: Names of bidders who stand qualified after compliance of criteria A to D shall be forwarded to customer for their approval. Price bid of only those bidders shall be opened who are approved by customer.	APPLICABLE	
F	Consortium criteria (if applicable)	NOT APPLICABLE	
	Explanatory Notes for QR 'A' 1. The word 'executed' means the bidder should have achieved the criteria specified in the QR even if the total contract has not been completed or closed 2. Bidder to submit Audited Balance Sheet and Profit and Loss Account for the respective years as given above along with all annexure **3. BIDDER SHOULD ESSENTIALLY MEET ALL THE PQR (i.e. POR- C, D1,D2,D3 & E) AS ABOVE TO GET QUALIFIED AGAINST THIS TENDER**		

BIDDER SHALL SUBMIT ABOVE PRE-QUALIFICATION CRITERIA FORMAT, DULY FILLED-IN, SPECIFYING RESPECTIVE ANNEXURE NUMBER AGAINST EACH CRITERIA AND FURNISH RELEVANT DOCUMENT IN THE RESPECTIVE ANNEXURES IN THEIR OFFER along with copies of Work Orders, Work Completion certificates, Audited profit and Loss Account for the last three years and other related documents as per PQR & tender specification..

ANNEXURE - 2

CHECK LIST

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

1	Name and Address of the Tenderer	
2	Details about type of the Firm/Company	
3	Details of Contact person for this Tender	Name : Mr/Ms Designation: Telephone No: Mobile No: Fax No:
4	EMD DETAILS	DD No: Date : Bank : Amount: Please tick (√) whichever applicable:- ONE TIME EMD / ONLY FOR THIS TENDER

		APPLICABILITY	BIDDER REPLY
6	Whether the format for compliance with **PRE QUALIFICATION CRITERIA** (ANNEXURE-I) is understood and filled with proper supporting documents referenced in the specified format	Applicable	YES / NO
7	Audited profit and Loss Account for the last three years submitted	Applicable	YES/NO
8	Copy of PAN Card submitted	Applicable	YES/NO
9	Whether all pages of the Tender documents including annexures, appendices etc are read understood and signed	Applicable	YES/NO
10	Integrity Pact	**Applicable**	YES/NO
11	Declaration by Authorised Signatory submitted	Applicable	YES/NO
12	No Deviation Certificate submitted	Applicable	YES/NO
13	Declaration confirming knowledge about Site Conditions submitted	Applicable	YES/NO
14	Declaration for relation in BHEL submitted	Applicable	YES/NO
15	Non Disclosure Certificate submitted	Applicable	YES/NO

16	Bank Account Details for E-Payment submitted	Applicable	YES/NO
17	Capacity Evaluation of Bidder for current Tender	Applicable	YES/NO
18	**Tie Ups / Consortium Agreement against this tender**	**Not Applicable for this tender**	-------
19	Power of Attorney for Submission of Tender/Signing Contract Agreement submitted	Applicable	YES/NO
20	Analysis of Unit rates submitted	Applicable	YES/NO

NOTE : STRIKE OFF 'YES' OR 'NO', AS APPLICABLE

DATE : **AUTHORISED SIGNATORY**

(With Name, Designation and Company seal)

ANNEXURE - 3

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 of meaning hereof shall include its successors or assigns of the ONE PART

And

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

Preamble

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

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

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

Section 1 - Commitments of the Principal

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

1.1.1 No employee of the Principal, personally or through family members, will in connection with the tender for, or the execution of a contract, demand, take a promise for or accept, for itself 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. He commits himself to observe the following principles during his participation in the tender process and during the contract execution.

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

2.1.2 The bidder(s)/ Contractors(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 IPC/PC 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 The Bidders (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.

Section 3 – Disqualification from tender process and execution from future contracts

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

Section 4 – Compensation for Damages

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

4.2 If the Principal has terminated the contract according to Section 3, or if the Principal is entitled to terminate the contract according to Section 3, the Principal shall be entitled to demand and recover from the Contractor liquidated damages equivalent to 5% of the contract value or the amount equivalent to Security Deposit/ Performance Bank Guarantee, whichever is higher.

Section 5 – Previous Transgression

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

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

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

6.1 The Bidder(s)/ Contractor(s) undertake(s) to obtain from his sub-contractors a commitment consistent with this Integrity Pact and report Compliance to the Principal. This commitment shall be taken only from those sub-contractors whose contract value is more than 20% of Bidder's/ Contractor's contract value with the Principal. The Bidder(s)/Contractor(s) shall continue to remain responsible for any default by his Sub-contractor(s).

6.2 The Principal will enter into agreements with identical conditions as this one with all Bidders and Contractors.

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

Section -7 Criminal Charges against violating Bidders/ Contractors/ Sub-contractors

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

Section – 8 Independent External Monitor(s)

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

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

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

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

8.5 As soon as the Monitor notices, or believes to notice, a violation of this agreement, he will so inform the Management of the Principal and request the Management to discontinue or take corrective action, or heal the situation, or to take other relevant action. The Monitor can in this regard submit non-binding recommendations. Beyond this, the Monitor has no right to demand from the parties that they act in a specific manner, refrain from action or tolerate action.

8.6 The Monitor will submit a written report to the CMD, BHEL within 8 to 10 weeks from the date of reference or intimation to him by the Principal and, should the occasion arise, submit proposals for correcting problematic situations.

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

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

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

8.10 The word 'Monitor' would include both singular and plural.

Section 9 – Pact Duration

9.1 This Pact begins and shall be binding on and from the submission of bid(s) by bidder(s). It expires for the Contractor 12 months after the last payment under the respective contract and for all other Bidders 6 months after the contract has been awarded.

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

Section 10 – Other Provisions

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

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

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

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

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

For & On Behalf of the Principal	For & On Behalf of the Bidder/ Contractor
(Office Seal)	(Office Seal)

ANNEXURE - 4

IMPORTANT INFORMATION

1. PRICE VARIATION COMPENSATION

Refer Clause 2.17 of Volume I C 'General Conditions of Contract' (Price Variation Compensation): For the purpose of calculating PVC, following 'Commodities shall be reckoned for the respective categories:

Category	Commodity to be Used for PVC Calculation
Electrode	**Welding Rod**(Individual Commodity)
High Speed Diesel	**High Speed Diesel** (Individual Commodity)
Cement	**Grey cement** (Individual Commodity)
Structural & Reinforcement Steel	**a1. Iron & semis** (Group Item)
Materials (Other than Cement & Steel)	**All Commodities**(Group Item)

2. INTEREST BEARING RECOVERABLE ADVANCE

Refer Clause 2.13 of Volume I C 'General Conditions of Contract' (Interest Bearing Recoverable Advance): Following additional points shall be noted:

- **Bank Guarantee towards 'Interest Bearing Advance' shall be atleast 110% of the advance so as to enable recovery of not only principle amount but also the interest portion, if so required.**
- **'Interest Bearing Recoverable Advance' shall not be paid in less than two installments. Contractor shall establish the utilization of advance drawn before the release of next installment.**

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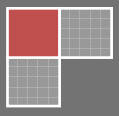
TECHNICAL CONDITIONS OF CONTRACT (TCC)

BHARAT HEAVY ELECTRICALS LIMITED



TECHNICAL CONDITIONS OF CONTRACT (TCC)
CONTENTS

Other Documents forming part of Volume IA ' Technical Specification'

- **Technical Specification NO. PE-TS-281-620-C001, VOLUME – II : Detailed Scope of Work (292 Pages Uploaded as file titled Vol II-908)**
- **Technical Specification NO. PE-TS-Q11-503-A-001, VOLUME – IIB for Stack & Pinion type Stack Elevator (24 Pages)**

INTRODUCTION

2X250 MW Sikka TPS – Extension units 3 & 4 is being set up by Gujarat State Electricity Corporation Limited (GSECL) at Sikka in the district of Jamnagar, Gujarat, India.

The Bidder shall acquaint himself by a visit to the site, if felt necessary, with the conditions prevailing at site before submission of the bid. The information given here in under is for general guidance and shall not be contractually binding on BHEL/ Owner. All relevant site data/information as may be necessary shall have to be obtained /collected by the Bidder.

APPROACH TO SITE

Location:

In Sikka, Jamnagar district, Latitude 22^{O} 26' N & Longitude 69^{O} 49' E.

The site is surrounded by villages Mungai, Sikka, Gagva & Nanikkhavri of Jamnagar District of Gujarat state.

Access by Road:
It is connected to State Highway (SH-25) by a 5 Km long road through Sikka village.

Access by Railways:
Jamnagar – Okha broad-gauge section is passing at a distance of 12 Km form Sikka.

Nearest Airport:

Jamnagar

Nearest Seaport:

Okha & Navalakhinare located 140 Km & 130 Km respectively from the site.

Other Salient Information:

1.	Owner	M/s GSECL
2.	Owner Consultant	M/s TCE, Bangalore
3.	Project Title	2x250 MW Sikka TPS Extension Units # 3 & 4
4.	Location	12 km from SIKKA, District - Jamnagar Gujarat
5.	Nearest Railway Stn.	Sikka

6. Ambient Air Temperature
   a. Maximum 42 Deg.C
   b. Minimum 8 Deg.C
7. Relative Humidity
   a. Maximum 100%
   b. Minimum 21%
8. Rainfall
   a. Average annual 650 mm
   b. Maximum 900 mm
   c. Minimum 400 mm
9. Wind Data
   a. Basic wind speed at 10m height 50 m/sec
   b. Wind pressure As per IS: 875 Part III

10. Seismic Zone Zone IV as per IS: 1893-2002

2.0 SCOPE OF WORK

2.0.1

The scope of work to be performed under this package consists of construction of one twin flue brick lined RCC Chimney of 220M Height with **Slip-form** system, including designing, supplying, erection and commissioning of 1 no. Rack and pinion type stack elevator with necessary foundations from ground floor up to top of chimney with landing at various platform levels complete as per specifications and drawings, internal/external platforms, railings, Insulation, Ash Hoppers, Str. Steel Stair Case and ladders, complete Internal/external Electrical Works & Air Aviation Obstruction Lighting Systems, earthing, paving, flooring, drains etc. **but excluding Piling (which shall be done by other agency)** for 2X250MW SIKKA Thermal Power Station, Expansion Project, Unit 3 & 4, Gujarat State Electricity Corporation Limited At Distt – Jamnagar, Gujarat.

Refer Technical Specification NO. PE-TS-281-620-C001, VOLUME – II for Detailed Scope of Work and Technical Specification NO. PE-TS-Q11-503-A-001, VOLUME – IIB for Stack & Pinion type Stack Elevator.

2.0.2 Technical Condition Of Contract

1) Details of The Items In " Schedule of Quantities (SOQ) / Bill of Quantities (BOQ) " shall be read in conjunction with the corresponding specifications, drawings and other various requirements stipulated in various sections of bid documents. The rates quoted shall be inclusive of all the requirements.

2) The work shall be carried out as per construction drawings, specifications, BOQ and instruction of the site engineers. Drawings enclosed with these documents are only indicative giving some idea of the type of work involved. The layout, sizes and details of the building, structures and foundations shown in tender drawings may vary to a large extent during actual construction. Final drawings will be issued progressively during the execution of the work.

3) Items of work provided in this BOQ but not covered in the specifications shall be executed strictly as per instructions of the engineer.

4) Unless specifically mentioned otherwise in the contract, the bidder shall quote his rates for the finished items and shall provide for the complete cost towards fuel, tools, tackle, equipment, constructional plant , temporary works, labour materials, levies , taxes , transport, layout, repairs, rectification, maintenance till handing over, supervision, shops, establishments, services , temporary roads, revenue expenses,

5) Providing all incidental items not shown or specified but reasonably implied or necessary for the successful completion of the work in accordance with contract.

6) The rate shall also be inclusive of carrying out topography survey of site to establish levels and coordinates at suitable intervals, form existing grid levels and coordinates furnished by the owner, establish bench marks, setting out the location and levels of the proposed structures, constructions and making references , pillars and other identification marks etc. No separate payment will be made towards the same.

7) The quantities of the various items mentioned in the schedule are approximate and may vary up to any extent or be deleted altogether. The overall variation in contract value on execution shall be dealt as per GCC. Contractor has to obtain prior approval of BHEL/Customer before procurement of bought out items/ building materials including Cement.

8) In case of any discrepancy between BOQ, relevant drawing and/or specifications clarification shall be sought at tender stage itself. Otherwise it shall be assumed that the bidder has quoted for the more stringent requirement.

9) Contractor shall mobilize sufficient number of excavation machine/ Poclain/ JCB, dumpers, concrete mixer machine, vibrators, slip-form shuttering & scaffolding materials for RCC chimney, winches, concrete pumps (if required) considering height of the chimney along with quality control lab. equipments at site for successful completion of job in time.

2.0.3REINFORCED CONCRETE RAFT FOUNDATION

1) Earthwork in excavation and backfilling, in foundation.
2) Ready Mix Reinforced Concrete work/RCC work produced in batching plant/mini batching plant and conveyed to site through transit mixer/concrete pumps etc both above and below ground level including but not limited to foundation ground floor slab, shell, hopper and platforms.
3) Sand & ballast filling underground slab.
4) Brick lining and insulation work in the chimney.
5) Miscellaneous metal works (Structural works/SS works as per relevant BOQ) for ladders, doors, equipment hatch, liner hatch, personal access, frames at various opening cap and miscellaneous fixtures.
6) Painting of concrete below & above ground and metal surfaces as per specification including all materials, scaffoldings & tools and plants.
7) Galvanizing of metal components (Structural components) wherever needed.
8) Electrical work in lightening protection and lightning and other related works for complete construction of twin flue RCC chimney.
9) Maintenance of chimney for **a specified period.**

10) CI CAP, MS ladders, hood access hatch, louvers, bird screens, hood drain basin covers, handrail.

11) External & Internal works

12) Earthwork in excavation and backfilling, in foundation

Scope: This specification covers excavation in all types of soil, soft and decomposed rock not required blasting and rocks requiring blasting, shoring, dewatering, filling around foundations and to grade, compaction of fills and approaches, protective fencing, lighting etc. relevant to structures and locations covered under the scope of this contract.

The work to be provided for by the Contractor, unless specified otherwise, shall include but not be limited to the following:

(a) Furnish all labour, supervision services including as required under statutory labour regulations, materials, scaffolding, equipment, tools and plants, transportation, etc. required for the work.

(b) Prepare and submit working drawings showing the approaches, slopes, berms, shoring, sumps for dewatering, including drains and outfall for drainage, space for temporary stacking of soils, disposal area, fencing etc. and all other details as may be required by the Engineer.

(c) To carry out sampling and testing and submit to the Engineer, results of soil compaction tests if required by the Engineer to assess the degree of compaction.

(d) Construction, maintenance and removal after completion of Magazine of proper capacity as well as design for strong or explosive required for blasting work to be carried out under the scope of this tender.

13) Ready mix Cement Concrete /Cement Concrete (Plain & Reinforced):

Scope: This specification covers all the requirements, described hereinafter for general use of Plain and Ready mix Cement Concrete/Cement Concrete work in Structures and locations, cast-in-situ or precast shall include all incidental items of work not shown or specified but reasonably implied or necessary for the completion of the work. Special requirements for structures such as reinforced concrete chimney etc. have been covered under the respective specifications. Those specifications shall be used in conjunction with this specification.

IS: 456-2000 (latest version) shall form a part of this specification and shall be complied with unless permitted otherwise. For any particular aspect not covered by this Code, appropriate IS-Code, specifications and/or replacement by any International code of practice as may be specified by the Engineer shall be followed**. All codes and standards shall conform to its latest revisions.**

The work to be provided by the Contractor, unless otherwise specified shall include but not be limited to the following.

(a) Furnish all labour, supervision, services including facilities as may be required under statutory labour regulations, materials, forms templates, supports, scaffolds,

approaches, aids, construction equipment tools and plants, transportations, etc. required for the work.

(b) Prepare detailed drawings and Bar bending Schedules for reinforcement bars showing the positions and details of spacers, supports, chairs, hangers etc.

(c) Prepare working drawings of formworks, scaffolds, supports etc.

(d) Prepare shop drawings for various inserts, anchors, anchor bolts, pipe sleeves, embedment, hangers, openings, frames etc.

(e) Prepare detailed drawings of supports, templates, hangers, etc. required for installation of various embedment like inserts, anchor bolts, pipe sleeves, , frames, joint seals frames, openings etc. As decided by the Engineer some or all of the drawings & schedules prepared under item (b) to (e) will have to be submitted for approval.

(f) Submit for approval detailed schemes of all operations required for executing the work e.g. material handling, Concrete mixing, Placement of concrete, Compaction, curing services, approaches etc.

(g) Design and submit for approval concrete mix design required to be adopted on the job.

(h) Furnish samples and submit for approval results of test of various properties of the following:

(i) The various ingredients of concrete

(ii) Concrete

(iii) Embedment

(iv) Joint seals

(i) Provide all incidentals item not shown or specified in particular but reasonably implied or necessary for successful completion of the work in accordance with the drawings and specifications.

(j) For supply of certain materials normally manufactured by the specialist firms, the Contractor may have to produce, if directed by the Engineer, a guarantee in approved proforma for satisfactory performance for a reasonable period as may be specified, binding the manufactures and the Contractor, jointly and severally.

Anything not covered in this scope of work, shall be referred to detailed technical specification and shall be superseded by technical specification volume-II.

14) The works to be performed under this contract consist of providing all labourer, supervision, material, scaffolding, construction equipments, tools and plants, temporary works, supplies including POL, transportation and all incidental items not shown or specified but reasonably implied or necessary for the proper completion of work in all respects. Testing of all materials, concrete, earthwork other allied works, preparation of

bar bending schedules on the basis of construction drawings, preparation of fabrication drawings etc. are included on the rates of items of work.

15) Fabrication and erection of structural steel work involving rolled section, sections fabricated out of plates chequered/ electroforged grating hand rails, primer and final painting for all steel structural works including supply of HSFG Bolts if any, low hydrogen quality electrodes for welding, non destructive testing etc. Complete as per Quality Plan/Customer requirements including preparation of detailed fabrication drawing.

16) The area of work shall be cleared of all vegetation, rubbish and other objectionable matter and materials remove shall be burnt or otherwise disposed of as directed by the Engineer-in-Charge. No separate payment for these operations shall be made. The cost of all these operations shall be deemed to have been included in the unit rates rendered for the different items under bill of quantities.

17) All the work areas shall be adequately flood lighted to the satisfaction of the Engineer-in-Charge when the work is in progress during the night shifts.

18) The unit rates shall include all material equipment, fixtures, labour construction plant, temporary works and everything whether of permanent or temporary nature necessary for the completion of job in all respects.

19) The unit rates quoted for various items of B.O.Q shall include all the stipulations mentioned in Section C and technical specifications under Section D and nothing extra over B.O.Q rates shall be payable.

20) Design drawings showing enough details for the construction as per the specification shall be furnished to the contractor in a phased manner as far as possible.

21) Materials to Used for This Project & With respect To This Contract, Please Refer, Section – C "specific technical requirements. For civil works and also the technical specification under Section – D., Volume –II & IIB.

<u>BHEL Will Supply Following Material (A & B) Free Of Cost:</u>

A. TMT Rebar: - TMT rebar/mild reinforcement steel as mentioned in relevant BOQ shall be provided by BHEL at free of cost. Successful bidder has to draw TMT re-bars/mild reinforcement steel from BHEL stores/Storage yard including transportation and return of excess steel/scrap to BHEL stores/yard etc. including all T&P like trailer/truck and labour etc. complete.

B. Structural steel: All structural steel like chequered plates/plates, rolled sections as mentioned in relevant BOQs shall be provided by BHEL at free of cost. Successful

bidder has to draw structural steel from BHEL stores/Storage yard including transportation and return of excess steel/scrap to BHEL stores/yard etc. including all T&P like trailer/truck and labour etc. complete. Bidders have to quote their rate excluding cost of Strl Steel for referred items.

Bidder's Scope of Supply:-

(A) Cement, all Electrical Items, earthing materials, misc. Steel, Nuts & Bolts etc complete for successful completion of chimney. (i.e. All materials except TMT & Structural steel as mentioned in A & B above is in contractors scope)

2.0.4 USE OF READYMIX/ PREMIX CONCRETE:

Contractors are supposed to use ready mix/premix concrete, produced from their own batching plant for each and every grade of concrete with minimum cement content as explained elsewhere with the approval of BHEL**. However** contractor shall be permitted to go for the use of conventional method of producing concrete for small qty of PCC.

The contractor shall install his mini batching plant, batching plant, arrange all T&P like concrete pump, transit mixers etc., at the location provided by customer/BHEL and the land required for this shall be provided by customer. Rate quoted shall be inclusive of this factor.

1) It will be the responsibility of contractor to arrange for un-interrupted movement of the concrete transit mixture through the passage gate during the concreting through batching plant to avoid anti deterioration of quality of concrete. The contractor shall obtain advance permit/ gate passes, permission from the customer in this regard. Any loss of material or concrete mix etc., due to any problem during transit of such pre-mix concrete shall entirely be on contractor's account and BHEL shall not be responsible for such loss in any manner.

2) All bought out items shall be purchased from only the vendors approved by BHEL/consultant/GSECL. List of such approved vendors is appended with these specifications. The list may undergo revisions from time to time. Therefore, the contractor shall ascertain currency of approval in respect of any vendor from whom he is likely to source any item.

2.0.5 STRUCTURAL WORKS

The work involves:

1) Supply of Structural Material From Approved Manufacturers As Furnished Below: - BHEL shall procure str. Steel from following approved manufacturers and issue to successful bidders at free of cost:

Steel: (Both Reinforcement & Structural Steel)

(i) M/S SAIL
(II) M/S TISCO
(III) M/S JINDAL
(IV) M/S RINL

Fabrication and erection of structural steel including all interfacing work and miscellaneous work. The nature of work shall include stairs, steps, ladders, handrails, floor gratings, chequered plate work, platforms and all other structures required for successful completion of the chimney.

The material shall be purchased directly from manufactures or any authorised dealer/stockist of the above manufacturers and available brand from above can be used on prior approval from BHEL contractor as indicated elsewhere in the tender specification shall arrange manufacturers' test certificate and other test report for materials procured by them.

2) Supply, fabrication and erection of MS pipes, handrails as per drawing and specifications. Bidder has to procure pipes for handrails.

3) Supply of high tensile bolts, Mild Steel Bolts, Nuts, Plain/Taper and Spring Washers, all Electrodes Required for Shop and Fieldwork.

4) Shop and final painting as per technical specification after properly cleaning the steel surfaces. All steel structural have to be cleaned with **Sand Blasting** / **Shot Blasting** prior to application of primer and paint. Compressor, hose pipe, sand and other misc. items are in the scope of successful bidders. Painting brush, paints, primer and all other consumables, and all other arrangements including those required for surface preparation shall be the contractor's responsibility.

5) Grouting under stanchion bases as per specifications. Base grouting will have to be done only for structural work carried out by the contractor.

2.06 WELDING

1) Welding shall be done by the qualified welders. Welder's test to be conducted at site in presence of BHEL/BHEL's customer. Process qualification if required shall be arranged by contractor. All samples for the welder's qualification test shall be arranged by contractor. Quoted rate shall be inclusive of all the expenditure towards testing of welders for destructive and non-destructive test, testing and approval of welders etc., complete. All welded joints shall be subject to the acceptance of BHEL engineer. All the welded joints shall be cleaned of slag etc., and painted with primer to prevent corrosion at no extra cost towards this. ***For this, contractor shall supply primer, which shall be as per the BHEL/GSEC specification. Welding rods/electrodes shall be as per BHEL spec. prior approval shall be sought from BHEL for purchase of suitable electrodes.***

2.0.7 GENERAL

1) The drawings enclosed with this tender are intended to give the tenderer a general idea of the type and extent of work involved. The drawings are as such only indicative and not to be construed as the exact construction drawings. The work shall be executed as per the "AFC" drawing (**a**pproved **f**or **c**onstruction) supplied by BHEL from time to time (2 sets) in phased manner.

2) All equipments shall be handled very carefully to prevent any damage or loss. The material from the contractor's storage yard shall be moved to the actual site of erection/ location at the appropriate time as per the direction of BHEL engineer so as to avoid damage/loss of such material, congestion at site.

3) Materials shall be stacked neatly, preserved and stored in the contractor's shed and work areas in an orderly manner.

4) Should the contractor or his workmen or servants break, deface, injure or destroy any part of a building, road, kerbs, fence, enclosures, water pipes, cables, drains, electric or telephone posts or wires, trees or any other property, or to any part of erected equipments and stored components etc., the contractor shall make the same good at his own expense or in default, the BHEL site engineer may cause the same to be made good by other agency or by other means and deduct the expense with BHEL overhead (of which the site engineer's decision is final) from any sums that may be then or at any time thereafter become due to the contractor or from his security deposit or any other money due.

5) The work has to be executed with the constraints like rain, insufficient space, improper approach roads etc., and in conjunction with numerous other operations at site. The contractor and his personnel shall cooperate with other personnel/contractor, coordinating his work with others and proceed in a manner that shall not delay or hinder the progress of work as a whole.

6) The contractor should satisfy BHEL that an accident risk insurance policy in respect of his employees as per workmen compensation act, is taken before starting of the work and also satisfy BHEL that the policy is kept in force till the contract is completed.

7) Recoveries will be made from contractor's bills for any liability accrued to BHEL/mpseb for the accidents and refund of the same shall be considered later, after the claim is fully settled by insurance authorities.

8) The contractor shall submit survey report/performance report of the tools and plants deployed by him and being utilised on the work under the scope. These survey reports/performance reports are to be obtained by contractor from the customer of BHEL/insurance authorities and submitted to BHEL at no extra cost.

9) In case, any additional expenditure is/to be incurred in work during execution arising out of the faulty execution of such work by the contractor, the same shall be borne by the contractor.

2.0.8 ALSO INCLUDED IN THE SCOPE

Unless otherwise specified, the work to be provided for by the contractor for the items as mentioned in the "schedule of items"/ rate schedule shall include but not be limited to the following:

1) Furnishing all labour, materials, supervisors, construction plants, equipment, supplies, transport to and from the site, fuel, electricity, compressed air, water, transit and storage insurance and all other incidental items and temporary works not shown or specified but reasonably implied or necessary for the proper completion, maintenance and handing over of the work, except in accordance with the stipulations laid down in the contract documents and additional stipulations as may be provided by the engineer during the course of works.

2) Furnishing manufacturer's test certificates and laboratory report in respect of the products used or intended to be used, if called for in the specifications or if so desired by the engineer. Approval of these manufacturer's test certificates shall be obtained mandatorily from BHEL prior to use of respective materials which otherwise may render these materials liable for rejection.

3) Furnishing samples of all materials required by the engineer for testing/inspection and approval for use in the works. The samples may be retained by the engineer for final incorporation in the works.

4) Giving all notices, paying all fees, taxes etc. In accordance with the General & Special Conditions of Contract, those are required for all work.

5) Arranging manufacturer's supervision for items of work done as per manufacturers' specification when so specified.

6) Carrying out topographic survey of the entire plot and establish levels and co-ordinates at suitable intervals from existing grid levels and co-ordinates furnished by the owner establish bench marks, setting out the location and levels of proposed structures, construction and marking of reference pillars and other identification works etc. The contractor shall provide the owner/BHEL such assistance, instruments, machines, labour and materials as are normally required for examining, measuring and testing any work and the quality, weight or quantity of any material used.

7) Providing all incidental items not shown or specified but reasonably implied or necessary for the successful completion of the work in accordance with contract.

8) Liasioning with and obtaining all applicable clearance from concerned authority (if any) for the portion of work executed under these specifications shall be the responsibility of the contractor. BHEL will provide only the technical assistance like furnishing technical information etc. In this regard. All statutory fees paid in this regard shall be borne by the successful bidder including all arrangements and expenses.

9) **Work by others**: no work under this specification will be provided by any agency other than the contractor unless specifically mentioned elsewhere in the contract.

2.0.9 OTHER IMPORTANT TERMS AND CONDITIONS

1) The scope of work under this contract is deemed to be complete only when so certified by the engineer in charge of BHEL.

2) Contractor shall display 'Danger Boards' as per instruction of BHEL/ Customer as Per Requirement.

3) Contractor shall not be allowed to bring any inflammable material inside the plant. However, for absolute requirement of these materials, contractor shall have to take advance permission/approval from BHEL/CUSTOMER and shall store in proper place following adequate safety measures and shall put banner/board danger/ inflammable /highly inflammable/no smoking' as per the requirement of BHEL/customer.

4) Contractor shall provide sufficient quantities of fire hydrant (water, sand) and fire extinguishers at safe/accessible distance while carrying out hot work. Contractor shall deploy his trained persons for operation of such safety equipment.

2.0.10 Ground Water Table**: Work area has to be made dry by pumping ground water and hence bidder has to arrange dewatering pump/special dewatering system (if required) during excavation/PCC/and particularly during concrete pour.**

2.0.11 The work though not specifically mentioned either in the drawings or in the tender specification but are needed to complete the RCC Twin Flue Chimney With Brick Lined in totality as per project/system requirement & instruction of Engineer are also in the scope of this contract & to be completed to the entire satisfaction, for which the payment shall be released as per the respective item rate of Rate Schedule. **If the item is not available in the rate schedule, extra item shall be derived in following manner:-**

2.0.12 **The detailed drawings and specifications will form part of the tender documents. BHEL reserves the right to modify/alter the tender drawings, if necessary during the actual execution at site.**

2.0.13 **Specification for Civil works for Twin Flue RCC Chimney:**

Technical Specification NO. PE-TS-281-620-C001, VOLUME – II for Detailed Scope of Work and Technical Specification NO. PE-TS-Q11-503-A-001, VOLUME – IIB for Stack & Pinion type stack elevator for respective works, issued separately.

2.0.14 **Blasting**: only controlled blasting shall be permitted for excavation of rock. However contractor may also go for any other proven method for excavation of rock with approval of BHEL/GSECL. Measurement of hard rock shall be done on stock measurement basis less 30% for voids. Stones so generated from the work shall be disposed-off/reuse in the work as per the direction of BHEL. **Contractor shall arrange for necessary permission from concern department for storage & usage of explosives as per relevant procedure/law enforced in that area.**

2.0.15 **Labour licence, PF registration, witnessing of labour wages, regular PF remittances of workmen & obtaining certificate in prescribed proforma from welfare officer BHEL/GSECL, obtaining gate passes of workmen etc is mandatory for the contractor**.

2.1 Other Related Activities:

1. **Draw Construction Power & Water from Customer's given Point at one location inside the plant including all materials.**
2. **Taking delivery of reinforcement bars, Structural steel and other free issued materials from BHEL stores including loading, transportation and unloading, stacking, preservation etc. at site.**

2.2 Field Quality Assurance:

The contractor shall be responsible for day-to-day quality checks of concrete and other building materials during the progress of work. All quality records and log sheets shall be maintained as per the requirement of BHEL/BHEL'S customer and as per field quality plan approved by **BHEL/GPPCL**. For this, contractor shall either establish their own field quality lab or have tie-up with approved lab by BHEL in/outside of the plant.

2.3 Reconciliation of steel issued by BHEL (free of cost):

2.4 MATERIAL

1) **Steel like (structural, reinforcement bars and 40mm dia. MS round earthing rod/ GI flats) as specified in relevant BOQ shall be issued at free of cost by BHEL for use in the work covered in this contract from BHEL stores/store yard**. The contractor shall collect these materials from BHEL stores/store yard at specified places at his own cost and store the same at the work site or in his stores as per standard norms. Materials issued will be used only for construction of permanent works.

2) BHEL reserves the right to recover from the contractor any loss arising out of damage/ theft or any other causes or during verification/stacking or at any time under the custody of the contractor.

3) The contractor shall take care of material issued by BHEL and shall protect the same from damage and weathering. Contractor shall construct waterproof cement store (**capacity minimum 3000 bags**) for storing and stacking of cement **procured by the contractor**.

Design & drawing required for storage of cement shall be prepared by the vendor and shall be approved by BHEL's site in-charge before taking up for the construction work.

4) The contractor shall in no case be entitled for any compensation on account of any delay in supply or non-supply thereof for all or any such materials. However in case of non-availability of any specific section(s) which delays the completion of work, such cases shall be recorded separately during the joint review meeting at site and the shall be considered for time extension of contract.

5) No material shall be issued to the contractor except as those indicated and mentioned above i.e structural steel, reinforcement and MS round earthing rod/GI flats as specified in relevant BOQ. Contractor will have to make his own arrangement at his own cost for procurement of any other materials except as mentioned above, as required for the works and of such quality as acceptable to BHEL.

6) The contractor shall maintain proper store account for all the BHEL issued materials and shall give **Three (03) copies of monthly-computerized reconciliation statement** of such account to the BHEL. BHEL Engineer's certification for the reconciliation of steel shall be final. The detailed reconciliation (dia. Wise or as required) shall be done **at least once in six months (06) or before submission of final bill which comes earlier**.

7) Contractor shall also carryout in complete association with BHEL, the material management functions and execution like day-to-day update of materials, issued to contractor, accounting for surplus/scrap material returned etc. These functions shall also be carried out through computerized system utilizing suitable software. Contractor shall engage experienced software personnel to associate on dedicated basis for efficient discharge of the same in time.

8) The contractor shall solely be responsible for the safety & security of material after it is handed over and issued to contractor by the BHEL.

9) BHEL issued materials, shall not be under any circumstances whatsoever, and shall be taken out of the project site unless otherwise permitted by BHEL for outside job.

2.5Follow up & handling of Materials issued by BHEL:

1) BHEL will place Purchase Order (P.O) on the manufactures for procurement of structural steel, reinforcement bars, SS steel and Earthing rods etc as specified in BOQ and successful bidders will provide all necessary supports for follow up/chase up with manufactures/supplies/vendors for speedy delivery of materials at site including posting a concerned person(s) for short duration at manufactures factory within their quoted rates.

2) Steel like (structural, reinforcement and MS round earthing rod/ GI flats) as specified in relevant BOQ shall be issued at free of cost by BHEL for use in the work covered in this contract

from BHEL stores/storage yard. As per the approved drawings contractor shall furnish their section wise requirement well in advance.

3) Materials shall be issued by BHEL based on the weighment basis/linear measurements & sectional weight and payment shall also be done in similar way. However on specific request of the contractor **"as a special case to expedite the job"** the consignment received at BHEL stores can directly be diverted to the work site following issuance procedure of BHEL. Such direct issues shall be as per the Chelan/document/LR received with the consignment. Contractor at their cost in such cases shall do unloading of materials from lorry.

4) It would be the responsibility of the contractor to keep in constant contact with BHEL site to find out the delivery status, arrival of the consignments and arrange for escort to accompany the truck/ trailer for transportation of above materials by BHEL's supplier, if necessary.

5) All materials issued by BHEL shall be stacked, stored above ground level **by use of concrete or wooden sleepers. No materials shall remain on ground at any time**. All concrete or wooden sleepers required for stacking the materials shall be arranged by contractor (successful bidder of this package) at his own cost within the quoted rates. All other equipments like winches, D-Shackles, slings of various sizes, max puller, pulley blocks, jacks, trucks, trailors etc. Required for such handling of steel from BHEL stores/storage yard etc. Shall be arranged by contractor within quoted/accepted rates.

6) The contractor shall take delivery of the materials from the designated place within the project premises at his own cost and store the same at his stores as per standard norms. Open land for such purposes shall be provided by BHEL on free of cost basis. Temporary barbed wire fencing of the open storage yard is to be done by the contractor and is included under the scope of his work. Contractor shall also remove grass, bushes, trees etc wherever required off the land provided to him and shall make proper continuous up keeping of the open yard /land by removing grass, bushes trees etc and same is included under the scope of his work & No extra payment shall be made to the contractor in this regard. The bidder shall make complete arrangement of necessary security personnel's to safeguard all such materials in his custody. Materials issued will be used only for construction of permanent works. The contractor shall take care of material issued by BHEL and shall protect the same from theft, damage and weathering. Excessive rusting of steel in custody of agency/contractor must be avoided. **In case, due to any cause attributable to the contractor, such rusting of steel occur rendering the same unusable, then such quantity of steel shall be recovered from the interim payment at the penal rate specified in the tender.**

2.6 Issue of BHEL Materials

a) Issue of steel: -

The steel shall be issued to the contractor on the following basis:

(A)	Structural Steel, MS Flats , MS Plates/ Chequered Plates etc	Weighment Basis (unit – MT) / Linear Measurement (section wt. As per relevant IS code).

(B)	Reinforcement Steel	Weighment basis (unit – MT)/ linear and earthing rod (MS round). Measurement (section wt. As per relevant IS code)

b) All the steel (structural, reinforcement, earthing ms rod, MS/GI flats) issued by the BHEL shall be properly accounted for. The total quantity of steel required for the work will be calculated from the approved bar bending schedule, fabrication drawings, approved laps, chairs and lugs. The measurement for payment as well as for accounting shall be based on linear measurements and the sectional weight as indicated in the following IS specifications.

Sl.no	IS code (s)	Description
1	IS: 808-1964	Beams, channels and angles.
2	IS: 1730-1961	Plates, sheets and strips.
3	IS:1732- 1971/IS-1786	Rounds including deformed high yield strength bars/TMT rebar.

c) In case any such sectional weights are not available in the above documents, the manufacturer recommendation shall be binding. The steel issued to the contractor shall be mainly in standard length and sections as received from the supplier.

d) However, the contractor shall be bound to accept the steel in length as available in the project stores no claims for extra payment because of issue of non-standard length will be entertained. In case MS flats as required in the fabrication of structures are not available, the contractor shall cut such width out of the available MS plates to make flats at no extra cost till such material is available and procured by BHEL.

e) The contractor shall satisfy himself of the quality and quantity of the materials at the time of taking delivery from BHEL stores/storage yard. No claims whatsoever will be entertained by BHEL because of quality or quantity after the contractor takes the materials from BHEL stores/storage yard.

f) The contractor shall submit to the engineer, a statement indicating estimated quantity of steel required during a quarter at least two months in advance of the quarter. In addition, the contractor shall also furnish the **estimated requirement of steel during a month by the third week of the previous month indicating his requirement.** Following shall be limit for the maximum quantity of BHEL issue materials that would be with the contractor at any point of time when work is in progress (excluding what has already been incorporated in the works).

Sl. No.	Issue of materials	Max. Qty in contractor's store.
1	Reinforcement steel & Earthing rod 40mm. MS Round.	Requirement of one month
2	Structural steel	Requirement of one month

g) Bidders to ensure that no lamination materials are taken over by them from BHEL stores. Fabrication wastage, if any due to above, shall not be compensated by BHEL.

h) Bidder to note that all fasteners like MS/HT/HSFG bolts/Nuts, Lock Nuts, Washers etc shall be supplied by the bidder as per relevant items of BOQ.

i) Bidder to note that cement and steel required for their enabling job like store/site office etc shall be arranged at his own cost.

2.7 Return of Materials:
Return of steel:-

a) All surplus steel and all wastage materials will be taken back on weighment basis. However linear measurements shall also be acceptable for unused/ full size materials.

b) Surplus, unused and un-tampered steel shall be sorted section-wise and returned separately for a place directed by BHEL/engineer within the project area, return of such materials will not be entitled to any handling and incidental charges.

c) All wastage / scrap (including melting scrap, wastage, and unusable scrap) shall be returned item wise to the stores and a receipt obtained for material accounting purposes. Return of such material will not be entitled to any additional cost due handling and transportation and incidental charge.

d) All scrap for reinforcement (cut pieces) shall be returned separately.

e) All scrap for structural steel including melting scrap shall be returned separately.

2.8 Steel Consumption and Wastage:-

a) Structural steel, reinforcement and earthing rod 40 mm MS round steel, GI flats consumption and wastage.

1) The theoretical consumption of various sections and/or diameter of reinforcement and earthing MS round/GI flats, rails shall be based on approved construction drawing and bar bending schedule. Weight shall be calculated considering/based on linear measurements and the sectional weights as per Indian standards. No extra cost shall be payable to the contractor for any deviation in weights for the different procedures adopted for issue and calculation of the **theoretical consumption including rolling tolerances**. However if rolling margins

exceeds the limit stipulated in IS codes, the same shall be considered for reconciliation purpose.

I) Actual consumption = Issue – Surplus (unused).
II) Surplus = Un-tampered and unused qty. of steel returned by the contractor to BHEL store along-with relevant documents.
III) Wastage = Actual consumption – Theoretical consumption.

b)Wastage of reinforcement steel

Allowable wastage: - plus five percentage (+5%) of the theoretical consumption shall be considered as allowable wastage for both reinforcement steel as well as earthing rod/flats. Wastage is further classified as cut pieces/serviceable scrap (pieces of reinforcement steel/GI strip/40mm dia. MS earth rod of lengths 3 m and above. Both serviceable & unserviceable shall be accounted separately.

Sl. No.	Reinforcement steel & earthing rod 40 mm MS round	Basis of issue & Penal recovery
R-1	Theoretical consumption (without considering wastage and scrap or loss)	Free
R-2	Wastage limited to plus five percent (+5%) of aforesaid theoretical Consumption (R-1) towards allowable Wastage (cut pieces plus scrap to be Returned to BHEL).	Free
R-3	Wastage beyond five percent (+5%) of the theoretical consumption above (R-1). (Cut pieces plus scrap to be returned to BHEL).	Penal Rate

c) Wastage of structural steel:

Allowable wastage: - plus five percentage (+5%) of the theoretical consumption shall be considered as allowable wastage for both structural steel as well as ms plates. Wastage as further classified as cut pieces/serviceable scrap (pieces of rolled section lengths 3 m and above, ms plate 1.0 m² and above with minimum width 200 mm) and scrap/unserviceable (less than above) measured as per actual weighment basis. Invisible wastage (loss of materials due to gas cutting, straightening of edges etc) shall be limited to 0.5% (zero point five percent) of theoretical consumption and shall be considered for reconciliation purposes only. But this Invisible wastage shall be considered to be included in allowable wastage (i.e. Five percent).

Sl. No.	Structural Steel & MS plats , Rolled section, plates & SS liner etc	Basis of issue & Penal recovery
S-1	Theoretical consumption (without	Free

	considering wastage and scrap or loss)	
S-2	Wastage limited to plus five percent (+5%) of aforesaid theoretical Consumption (S-1) towards allowable Wastage (cut pieces plus scrap to be Returned to BHEL).	Free
S-3	Wastage beyond five percent (+5%) of the theoretical consumption above (S-1). (Cut pieces plus scrap to be returned to BHEL).	Penal Rate

2.9 Reconciliation of BHEL Issued Materials: -

1) The contractor shall submit a reconciliation statement of steel issued to them with each RA bill. BHEL engineer's certification will be final on this matter.

2) At the time of submission of bill(s), the contractor shall properly account for the material issued to him as specified herein to the satisfaction of BHEL certifying that the balance materials are available with contractor's custody at site.

3) At the time of submission of bills by the contractor, if it is noticed by BHEL that the wastage is high and calls recovery at the penal rate, then BHEL will proceed for recovery for the excess wastage as per penal recovery rates as specified.

4) The approved drawings/bar bending schedules are to be considered for the purpose of reconciliation of materials.

2.10 Recovery of Material:-

- **If wastage exceeds the specified limit, the recovery of excess wastage shall be made from monthly r/a bill at the penal rate.**

- **Penal Rate of Materials**

Sl.No	Description	UOM	Penal Rate (in Rs)
A	Reinforcement steel and earthing rod etc.	MT	**55, 000/-**
B	Structural steel		
1	Chqd. Plates/MS plates	MT	**60, 000/-**
2	Flats/ Beams/ Channel/ Angles etc. (rolled sections).	MT	**60, 000/-**

2.11 Procurement of Materials By Successful Contractors And Testing:

a) Material required for the entire job (other than issued by BHEL as explained above) like cement, sand, aggregates, windows, doors, ventilators, rolling shutter, sanitary fixtures, painting & finishing material, stop-log gates, travelling screen, electrical fittings and wiring material and all other material required for the completion of entire scope, bolts & nuts,

HSFG/HT bolts have to be arranged by the contractor, excepting those specifically indicated as BHEL scope of supply. BHEL reserves the right to reject any material not found satisfactory.

b) Contractor shall produce manufacturer's test certificate for cement for every batch of manufacturing along with each consignment brought to the site. Cement shall be procured from fresh stock only. Apart from the above, it shall be the responsibility of contractor to get the testing of cement, or any other materials procured from outside laboratory approved by **BHEL/GSECL** to ascertain the quality if insisted by BHEL/BHEL's customer.

c) Rate quoted shall be inclusive of all such contingencies and no additional payment shall be made on this account. For this purpose, sample shall be collected at site in presence of BHEL/BHEL customer's representative. The variation in price of all the plant materials supplied by the contractor shall be subject to the relevant price variation clause.

2.12 Note:

Bidders are requested to specifically note the following:

a) *Bidders are requested to have pre-bid visit/ inspection of site to make them fully acquainted with the site situation & nature of job. No claim shall be entertained at later date on account of non-familiarization of site condition. Bidders may fix up their site visit in consultation with construction manager BHEL site office SIKKA. Name, address & contact point of site is as below:*

SHRI S.K.KULSHRESHTA (CONSTRUCTION MANAGER)
BHEL SITE OFFICE – 2X250 MW GSECL, SIKKA, GUJARAT.

E-MAIL ID: skk@bhelpswr.co.in

Sl.No	Description PART I	Scope / to be taken care by		*Remarks*
		BHEL	**Bidder**	
3.1	***ESTABLISHMENT***			
3.1.1	***FOR CONSTRUCTION PURPOSE:***			
a	Open space for office (as per availability)	Yes		Location will be finalized after joint survey with owner
b	Open space for storage (as per availability)	Yes		Location will be finalized after joint survey with owner
c	Construction of bidder's office, canteen and storage building including supply of materials and other services		Yes	
d	Bidder's all office equipments, office / store / canteen consumables		Yes	
e	Canteen facilities for the bidder's staff, supervisors and engineers etc		Yes	
f	Fire fighting equipments like buckets, extinguishers etc		Yes	
g	Fencing of storage area, office, canteen etc of the bidder		Yes	
3.1.2	***FOR LIVING PURPOSES OF THE BIDDER***		Yes	
a	Open space for labour colony (as per availability)		Yes	Contractor has to make his own arrangements for space, shelter and transportation of labours as per their requirement.
b	Labour Colony with internal roads, sanitation, complying with statutory requirements		Yes	
3.2.0	***ELECTRICITY***			

Sl.No	Description PART I	Scope / to be taken care by		Remarks
		BHEL	Bidder	
3.2.1	***Electricity for construction purposes 3 Phase*** *415/440 V* ***(To be specified whether chargeable or free)***			
a	Single point source	Yes		Free. At a distance of 500m from site (distance is only estimated, It may vary up to any extent depending on site condition). In case of power failure due to maintenance or any reason, contractor shall have to arrange the same at his own expenses through DG set etc. to ensure progress of work.
b	Further distribution including all materials, Energy Meter, Protection devices and its service		Yes	
c	Duties and deposits including statutory clearances if applicable		Yes	
3.2.2	***Electricity for the office, stores, canteen etc of the bidder***.			Contractor has to make his own arrangement.
a	Single point source		Yes	
b	Further distribution including all materials, Energy Meter, Protection devices and its service		Yes	

Sl.No	Description PART I	Scope / to be taken care by		Remarks
		BHEL	Bidder	
c	Duties and deposits including statutory clearances if applicable		Yes	
3.2.3	***Electricity for living accommodation of the bidder's staff, engineers, supervisors etc***		Yes	Contractor has to make his own arrangement.
a	Single point source		Yes	
b	Further distribution including all materials, Energy Meter, Protection devices and its service		Yes	
c	Duties and deposits including statutory clearances if applicable		Yes	
3.3.0	***WATER SUPPLY***			
3.3.1	***For construction purposes: (to be specified whether chargeable or free)***			
a	Making the water available at single point	**yes**		Free, At a distance of 500M from site. In Case of non-availability of construction water due to Maintenance or any reason from customer point, contractor shall have to arrange construction water at his own expenses.
b	Further distribution as per the requirement of work including supply of materials and execution		Yes	

Sl.No	Description PART I	Scope / to be taken care by		Remarks
		BHEL	Bidder	
3.3.2	***Water supply for bidder's office, stores, canteen etc***		Yes	
a	Making the water available at single point			Contractor has to make his own arrangement.
b	Further distribution as per the requirement of work including supply of materials and execution		Yes	
3.3.3	***Water supply for Living Purpose***		Yes	Contractor has to make his own arrangement.
a	Making the water available at single point		Yes	
b	Further distribution as per the requirement of work including supply of materials and execution		Yes	
3.4.0	***LIGHTING***			
a	For construction work (supply of all the necessary materials) 1. At office/storage area 2. At the preassembly area 3. At the construction site /area		Yes	
b	For construction work (execution of the lighting work/ arrangements) 1. At office/storage area 2. At the preassembly area 3 At the construction site /area		Yes	

Sl.No	Description PART I	Scope / to be taken care by		Remarks
		BHEL	Bidder	
c	Providing the necessary consumables like bulbs, switches, etc during the course of project work		Yes	
d	Lighting for the living purposes of the bidder at the colony / quarters		Yes	
3.5.0	***COMMUNICATION FACILITIES FOR SITE OPERATIONS OF THE BIDDER***			
a	Téléphone, fax, internet, intranet, e-mail etc		Yes	
3.6.0	***COMPRESSED AIR wherever required for the work***		Yes	
3.7.0	***Demobilization of all the above facilities***		**YES**	
3.8.0	***TRANSPORTATION***			
a	For site personnel of the bidder		Yes	
b	For bidder's equipments and consumables (T&P, Consumables etc)		Yes	

Sl.No	Description PART II ***3.9.0 ERECTION FACILITIES***	Scope / to be taken care by		Remarks
		BHEL	Bidder	
3.9.1	Engineering works for construction:			NOT APPLICABLE

Sl.No	Description **PART II** ***3.9.0 ERECTION FACILITIES***	Scope / to be taken care by		*Remarks*
		BHEL	**Bidder**	
a	Providing the erection/constructions drawings for all the equipments covered under this scope	Yes		**For Details Pl refer Chapter-IX-**
b	Drawings for construction methods	Yes	Yes	In consultation with BHEL
c	As-built drawings – where ever deviations observed and executed and also based on the decisions taken at site-example – routing of small bore pipes		Yes	Changes are to be marked in drawing & handover to BHEL on completion of work.
d	Shipping lists etc for reference and planning the activities			NOT APPLICABLE
e	Preparation of site erection schedules and other input requirements		Yes	In consultation with BHEL
f	Review of performance and revision of site erection schedules in order to achieve the end dates and other commitments	Yes	Yes	In consultation with BHEL
g	Weekly erection schedules based on Sl No. e		Yes	In consultation with BHEL
h	Daily erection / work plan based on Sl No. g		Yes	In consultation with BHEL

Sl.No	Description **PART II** ***3.9.0 ERECTION FACILITIES***	Scope / to be taken care by		*Remarks*
		BHEL	**Bidder**	
i	Periodic visit of the senior official of the bidder to site to review the progress so that works are completed as per schedule. It is suggested this review by the senior official of the bidder should be done once in every two months.		Yes	
j	Preparation of preassembly bay			NOT APPLICABLE
k	Laying of racks for gantry crane if provided by BHEL or brought by the contractor/bidder himself			NOT APPLICABLE
L	Arranging the materials required for preassembly			NOT APPLICABLE

A: TOOL & PLANTS

SN	DESCRIPTION
1	

A) T &Ps FOR STRUCTURAL WORKS

SL.No.	Major T&P items	Qty
1	Hydra (8 / 10 T Cap.)	02Nos.
2	Drill M/C NW 10	20Nos.
3	Welding m/c	20Nos.
4	GRINDING MACHINE	25Nos.
5	Pug cutting m/c	02Nos.
6	HAND CUTTING SET	25Nos
7	STATIONERY OVEN	01No.
8	PORTABLE OVEN	06Nos.
9	Chain pulley of different capacity	10Nos.
10	ELECTRIC WINCH OF DIFFERENT CAPACITY	04Nos.
11	DG SET OF 250KVA	01No.
12	HAND WINCH 5T CAP.	04Nos.
13	SCREW JACK	06Nos.
14	15T/20T TRACTOR & TRAILOR	O2Nos.
15	AIR COMPRESSOR OF REQD CAPACITY FOR SAND/SHOT BLASTING	02Nos.
16	Radiography sources	01No.
B)T & Ps FOR CIVIL WORKS		
17 18	SLIPFORM SHUTTERING WITH ALL ACCESSORIES LIKE HYD. JACKS OF REQUIRED CAPACITY, JACKING RODS, POWER PACK SYS., OPTICAL CENTERING ETC. COMPLETE	01 SET
19	Automatic Batching Plant (30 Cum/Hr)	01No.
20	Mini batching plant immediate required for PCC works	01No.
21	Transit mixer	04Nos.
22	Concrete Pump (30 Cum/Hr min capacity & lift 70M)	02Nos.
23	Air Compressor	01No.
24	Wagon drill machine	02Nos.
25	Self priming Dewatering pump 5 HP (Diesel/Electric)	02Nos.
26	Submersible Dewatering pump 5 HP	02Nos..
27	Submersible Dewatering pump 10HP	01No.
28	Self priming Dewatering pump 10 HP	02Nos..
29	Sludge Pump – Submersible	02Nos..
30	High lift Curing pump for Chimney shell	02Nos.

SN	DESCRIPTION

31	Hydraulic Excavator /Poclain with rock breaker attachment (mule/rock breaker as per requirements)	01No
32	Hydraulic Excavator /Poclain	01No..
33	JCB	01No...
34	Ply Shuttering board with adequate supporting structure – 2500 Sqm. (Old steel shuttering plates will not be allowed).	As per requirement.
35	Ply shuttering board with adequate supporting arrangement – another 1500 Sqm. (Old steel shuttering plates will not be allowed).	As per requirement
36	Dumper	03Nos.
37	Reinforcement bending machine	01No.
38	Reinforcement cutting machine	01Nos.
39	RM MS scaffolding pipe	20000RM
40	Power driven earth rammer	02Nos.
41	Vibromax (earth compacter)	01No.
42	a) Compression testing machine (200 T cap.)	01No.
43	b) Other civil lab equipment	Within 30 days.
44	a) 03 Nos. Electric Winch with hoist	Within 75 days.
45	b) Balance winches as per requirement	
46	Total Station	01No.
47	Auto level & staff	01No.
48	DG set (250KVA)	01No.
	or	
	DG set (125 KVA)	02 nos.
49	Concrete Cube Moulds	72Nos.
50	Hydra Crane	02Nos.
51	02 Nos. Trailors/tractor	02Nos.
52	Road Roller	01No.

(c) CIVIL WORKS - FIELD QUALITY LAB EQUIPMENTS –

(a) Automatic compression testing machine(2000KN) – 1no
(b) Cube moulds(150mm size) –36 nos
(c) Slump cone with tamping rod – 02no
(d) Sieves of different sizes for fine & coarse aggregate testing – 1 set
(e) Core cutter test apparatus – 05sets
(f) Oven (capacity 120ltr, range – 250c) – 1no

SN	DESCRIPTION
	(g) Moisture container(steel/aluminum) – 06nos (h) Rapid moisture meter – 02nos (i) Vicat apparatus with plungers for cement testing – 1set (j) Cube moulds (70mm size) – 06nos (k) Physical balance – 02no. (l) Automatic vibration m/c – 01 no. (m) Jars – 4 nos. **Bidder must submit T&P deployment plan inclusive of above T&Ps .**

B: <u>MEASURING AND MONITORING DEVISES (MMD):</u>

AS PER REQUIREMENT TO BE FINALIZED AT SITE.

NOTE:

This above list is only indicative and neither exhaustive nor limiting. Quantities indicated above are only the minimum required. Contractor shall deploy all necessary T&P to meet the schedules & as prescribed by **BHEL engineer** and required for completion of work.

BHEL WILL NOT PROVIDE ANY T & P's FOR THIS WORK

6.1 TIME SCHEDULE & MOBILIZATION

6.1.1 INITIAL MOBILIZATION AND TENTATIVE SCHEDULE

Contractor shall reach site, make his site establishment and be ready to commence the work **within two weeks from the date of fax Letter of Intent** or as per directions of Construction Manager/ Project Manager of BHEL.

6.1.2 CONTRACT PERIOD AND SCHEDULE FOR COMPLETION

The contractor has to mobilize their T & Ps like excavators and other equipments, material, resources and work force in such a manner that the entire work of the subject package is completed within **24 (Twenty four months**) from the **Date of Start (DOS),** however **The Twenty months** contract period is further divided in milestones for review & monitoring of progress:

Sl. No.	Activity	Period From Date Of Start (DOS)
01	Completion of full mobilisation, excavation, PCC, raft foundation completion, slip form assembly & erection completion.	From 0 To End of 5th Month
02	Shell concreting (75%- approx.) to be completed, Prep. of detailed Fab. Drawings for intermediate floor beams, fabrication of floor beams & stair case (60%)	from 6th to 10th months
03	Balance shell concreting (25%) to be completed, fabrication of remaining floor beam & stair case (40%), erection of all floor beam & staircase 100% completion.	From 11th to 15th month
04	Construction of brick flue liners for both the flue	from 16th to 20th months
05	Completion of electrical works and all misc. Works viz. Final painting, all works completion including erection, commissioning and statutory clearance, PG tests for chimney elevator etc. Complete & handed over to BHEL/GSECL.	from 21st to 24th months

6.1.3

IN ORDER TO MEET ABOVE SCHEDULE AND OTHER INTERMEDIATE TARGETS/ACTIVITIES AS SET **BY BHEL ENGINEER IN CHARGE** AT SITE & TO MEET CUSTOMER REQUIREMENTS/PROJECT SCHEDULE, CONTRACTOR SHALL ARRANGE ALL NECESSARY RESOURCES AND WORK FORCE IN CONSULTATION WITH BHEL ENGINEER AT SITE TO UNDERTAKE WORKS CONCURRENTLY IN ALL POSSIBLE FRONTS AS MADE AVAILABLE TO CONTRACTOR.

CONTRACTOR SHALL NOTE THAT INDIVIDUAL MILESTONES AS ABOVE SHALL BE ACHIEVED AS PER SCHEDULE FURNISHED ABOVE. **THE DATE OF START OF FIRST EXCAVATION SHALL BE RECKONED AS THE START OF CONTRACT PERIOD FOR THIS PURPOSE.**

7.00 TERMS OF PAYMENT

7.0.1
THE CONTRACTOR SHALL SUBMIT HIS MONTHLY ON ACCOUNT BILLS WITH ALL THE DETAILS REQUIRED BY BHEL ON SPECIFIED DATE EVERY MONTH COVERING PROGRESS OF WORK IN ALL RESPECTS AND AREAS FROM THE 25TH OF PREVIOUS CALENDAR MONTH TO 24TH OF THE CURRENT MONTH.

7.0.2
GENERAL CONDITIONS OF CONTRACT SHALL BE REFERRED TO AS REGARDS MODE OF PAYMENT, AND MEASUREMENT OF THE WORK COMPLETED.

7.0.3
RELEASE OF PAYMENT IN EACH RUNNING BILL WILL BE RESTRICTED TO **95% OF THE VALUE OF WORK ADMITTED**, AS PER THE PERCENTAGE BREAK-UP FOR THE STAGE OF WORK COMPLETION STIPULATED VIDE CLAUSES HEREINAFTER.

THE 5% RETENTION AMOUNT SHALL BE RELEASED AS PER GCC CLAUSE NO. 2.22. THE WORKMANSHIP GUARANTEE PERIOD FOR THIS CONTRACT SHALL BE **12 MONTHS FROM THE DATE OF COMPLETION** OF ENTIRE WORK AS CERTIFIED BY BHEL

7.0.4
THE PAYMENT FOR RUNNING BILLS WILL NORMALLY BE RELEASED WITHIN AROUND 30 DAYS OF SUBMISSION OF RUNNING BILL WITH MEASUREMENT SHEETS. CONTRACTOR SHALL MAKE HIS OWN ARRANGEMENT FOR MAKING PAYMENT OF IMPENDING LABOUR WAGES AND OTHER DUES IN THE MEANWHILE.

7.0.5
BHEL WILL RELEASE PAYMENT THROUGH **ELECTRONIC FUND TRANSFER (EFT)/**RTGS. IN ORDER TO IMPLEMENT THIS SYSTEM, THE FOLLOWING DETAILS ARE TO BE FURNISHED BY THE CONTRACTOR PERTAINING TO HIS BANK ACCOUNTS WHERE PROCEEDS WILL BE TRANSFERRED THROUGH **BHEL'S BANKER:**

Name of the Company
Name of Bank
Name of Bank Branch
City/Place
Account Number
Account type
IFSC code of the Bank Branch
MICR Code of the Bank Branch

BHEL MAY ALSO CHOOSE TO RELEASE PAYMENT BY OTHER ALTERNATIVE MODES AS SUITABLE.

7.0.6 PROGRESSIVE PAYMENT FOR CIVIL, STRUCTURAL AND ARCHITECTURAL WORK.

THE PERCENTAGE OF PAYMENT FOR PROGRESSIVE COMPLETION OF WORK IN VARIOUS CATEGORIES OF WORK SHALL BE AS UNDER:

7.0.7 CIVIL AND ARCHITECTURAL WORK

100% OF ITEM RATE ON PRORATA BASIS AGAINST MONTHLY RA BILLS.

7.0.8 STRUCTURAL WORK

1. 100% OF ITEM RATE ON PRORATA BASIS AGAINST MONTHLY RA BILLS AS FOLLOWS.

2. AS PER SCHEDULE OF RATE FOR ITEM NO **12 (i)** shall **be further bifurcated as below:**

a. ON COMPLETION OF FABRICATION, SURFACE PREPARATION & APPLICATION OF ONE COAT OF PRIMER PAINT - 60% OF THE QUOTED RATE.
b. ON COMPLETION OF ERECTION , ALIGNMENT & WELDING AND FINAL FINISH PAINTING ---
40% OF THE QUOTED RATE.

7.0.9 EXTRA/ADDITIONAL ITEMS OF WORK:-

As Per GCC.

. 8.0 TAXES, DUTIES, LEVIES (Rev 01 dated 15/03/2011)

8.1.1
The contractor shall pay all (save the specific exclusions as enumerated in this contract) taxes, fees, license charges, deposits, duties, tools, royalty, commissions or other charges which may be levied on the input goods & services consumed and output goods & services delivered in course of his operations in executing the contract. In case BHEL is forced to pay any of such taxes, BHEL shall have the right to recover the same from his bills or otherwise as deemed fit. **(i.e. rate quoted by bidder shall be inclusive of all Taxes and Duties except VAT/WCT and Service Tax).**

However, provisions regarding Service Tax and Value Added Tax (VAT) on output services and goods shall be as per following clauses.

8.1.2 Service Tax & Cess on Service Tax

Service Tax and Cess on Service Tax as applicable on Services are excluded from contractor's scope; therefore **contractor's price/rates shall be exclusive of Service Tax and Cess on Services**. In case, it becomes mandatory for the contractor under provisions of relevant act/law to collect the Service Tax & Cess from BHEL and pay the same to the concerned tax authorities, such applicable amount will be paid by BHEL at the prevailing Service Tax Rate (presently 10.3 %) on the admitted bill value.

Contractor shall submit to BHEL documentary evidence of Service Tax registration certificate specifying name of services covered under this contract. Contractor shall submit serially numbered Service Tax and Cess Invoice, signed by him or a person authorized by him in respect of taxable service provided, and shall contain the following, namely,

I. The name, address and the registration number of the contractor,
II. The name and address of the party receiving taxable service,
III. Description, classification and value of taxable service provided and,
IV. The service tax payable thereon.

All the Four conditions shall be fulfilled in the invoice before release of service tax payment.

Wherever, more than one route/option are available for discharge of service tax liability under a particular service, (e.g. "works contract Service"), contractor shall obtain prior written consent from BHEL site before billing the amount towards Service Tax.

8.1.3 VAT (Sales Tax /WCT)

As regards Value Added Tax (VAT) on transfer of property in goods involved in Works Contract (previously known as Works Contract Tax) applicable as per local laws, **the price quoted by the contractor shall be exclusive of the same**. Where such taxes are required to be paid by the contractor, this will be reimbursed on production of proof of payment made to the authorities by the Contractor. In any case the Contractor shall register himself with the respective Sales Tax authorities of the state and submit proof of such registration to BHEL along with the first RA

bill. The contractor has to take all necessary steps to minimize tax on input goods by purchasing the materials from any registered dealer of the concerned state only. In case contractor opts for composition, it will be with the prior express consent of BHEL. Deduction of tax at source shall be made as per the provisions of law unless otherwise found exempted. In case tax is deducted at source as per the provisions of law, this is to be construed as an advance tax paid by the contractor and no reimbursement thereof will be made unless specifically agreed to.

8.1.4 Modalities of Tax Incidence on BHEL

Wherever the relevant tax laws permit more than one option or methodology for discharging the liability of tax/levy/duty, BHEL will have the right to adopt the appropriate one considering the amount of tax liability on BHEL/Client as well as procedural simplicity with regard to assessment of the liability. The option chosen by BHEL shall be binding on the Contractor for discharging the obligation of BHEL in respect of the tax liability to the Contractor.

8.1.5 New Taxes/Levies

In case the Government imposes any new levy/tax on the output service/ goods/work after award of the contract, the same shall be reimbursed by BHEL at actual.

In case any new tax/levy/duty etc. becomes applicable after the date of Bidder's offer, the Bidder/Contractor must convey its impact on his price duly substantiated by documentary evidence in support of the same before opening of Price Bid. Claim for any such impact after opening the Price Bid will not be considered by BHEL for reimbursement of tax or reassessment of offer.

No reimbursement/recovery on account of increase/reduction in the rate of taxes, levies, duties etc. on input goods/services/work shall be made. Such impact shall be taken care of by the Price Variation/Adjustment Clause (PVC) if any. In case PVC is not applicable for the contract, Bidder has to make his own assessment of the impact of future variation if any, in rates of taxes/duties/ levies etc. in his price bid.

8.1.6 Submission of Periodical Reports

Contractor shall submit periodical reports in respect of following aspects of operation:

1) Consumption of welding electrodes and gases
2) Consumption of construction power
3) Manpower reports
4) Daily and Monthly Progress reports
5) Field calibration reports

BHEL at site will inform formats for these reports.

8.1.7 It is the responsibility of the contractor to arrange gate pass for all his employees, T&P etc. Necessary coordination with customer officials is the responsibility of the contractor. Contractor to follow all the procedures laid down by the customer for making gate passes. Where permitted, by customer/ BHEL, to work beyond normal working hours, the contractor shall arrange necessary work permit for working beyond normal working hours

8.2 BUILDING & OTHER CONSTRUCTION WORKERS (REGULATION OF EMPLOYMENT AND CONDITIONS OF SERVICE) ACT, 1996 (BOCW Act) AND RULES OF 1998 READ WITH BUILDING & OTHER CONSTRUCTION WORKERS CESS Act, 1996 & CESS RULES, 1998.

In case any portion of work involves execution through building or construction workers, then compliance to the above titled Acts shall be ensured by the contractor and contractor shall obtain license and deposit the cess under the Act. In the circumstances it may be ensured as under:-

i. It shall be the sole responsibility of the contractor in the capacity of employer to forthwith (within a period of 15 days from the award of work) apply for a licence to the Competent Authority under the BOCW Act and obtain proper certificate thereof by specifying the scope of its work. It shall also be responsibility of the contractor to furnish a copy of such certificate of licence / permission to BHEL within a period of one month from the date of award of contract.

ii. It shall be the sole responsibility of the contractor as employer to ensure compliance of all the statutory obligations under these act and rules including that of payment / deposit of 1% cess on the extant of work involving building or construction workers engaged by the contractor within a period of one month from the receipt of payment.

iii. It shall be the responsibility of the sub-contractor to furnish the receipts / challans towards deposit of the cess together with the number, name and other details of beneficiaries (building workers) engaged by the sub-contractor during the preceding month.

iv. It shall be the absolute responsibility of the sub-contractor to make payment of all statutory payments & compensations to its workers including

FOLLOWING DRAWINGS ARE ENCLOSED WITH THE TENDER.

SL. NO	TITLE	DRAWING NO.	REV
1.	Chimney General Arrangement	PE-DG-281-620-C001	R3
2.	Chimney GA Foundation Starter Bars	PE-DG-281-620-C002	R1
3.	Chimney RC Details of Raft	PE-DG-281-620-C003	R1

NOTE: Attached at the end of this document.

Appendix A:
Tentative Manpower Requirement

1. Project manager – with adequate experience in Industrial Foundation, Building & Structural Works, Power Plant Civil & Structural Works and construction of chimney. He must have clear idea about slip-form technology.
2. Experienced Civil Engineers – 4 heads
3. Experienced Foreman / Supervisors - 3 heads
4. Planning & Billing Engineer – 02 heads
5. Stores, Gate Pass – 02 heads
6. Accounts & Administration- 01no
7. Quality Control Engineer – 1 head
8. Safety Engineer – 1no
9. Surveyor – 02 head capable to handle total station
10. Operator, Licensed Electrician, Mechanic - As per requirement
11. Experienced Carpenters & Helpers – lot for similar nature of work
12. Experienced Bar Benders & Helpers – lot for similar nature of work
13. Security Guards (Round The Clock) – As per requirement

SECTION - C
SUB SECTION – A6

STACK ELEVATORS

1. SYSTEM DESCRIPTION

1.1 The Rack and pinion type stack elevator is required for installation inside multi-flue or outside single flue chimney. The stack Elevator is normally used for the movement of the maintenance personnel and for materials such as refractory bricks, etc. for maintenance of chimney.

2. SCOPE OF SUPPLY AND SERVICES

2.1 The scope of supply and services covered under the specification are broadly described below:

2.1.1 One No. Rack and Pinion type stack elevator complete with all other accessories and associated steel work.

2.1.2 Drive motor and control panel for Stack elevator

2.1.3 Control Panel

2.1.4 Equipment earthing

2.1.5 All power and control cables, trailing cables

2.1.6 Limit switches

2.1.7 Over speed governor

2.1.8 Alarm push button in the cage connected to battery operated alarm at elevator base.

2.1.9 Reverse phase relay connected to prevent operation of the cab with improper phase rotation or failure in any phase of power supply.

2.1.10 Continuous duty electrical torque motor recoil cable reels or cable trolley or any equivalent arrangement to maintain electrical power service to all electrical components of the elevator for complete travel of stack elevator.

2.1.11 One auxiliary panel shall be provided and mounted on the graded level enclosure equipped with a main ON-OFF selector switch, main contactor, breaker, relays, control transformer and fuses, tone frequency transmitter or equivalent arrangement, , terminal blocks and all other accessories required for normal operation of the elevator.

2.1.12 One main control panel shall be furnished and mounted on top of the cab. Panel shall be in enclosure equipped with necessary equipment like rectifier, battery charger charger, tone frequency receiver, contactors, breakers, control transformer and fuses, thermal overload relays, and all other equipment and accessories required for normal operation of the elevator.

2.1.13 Cab shall be controlled by semi automatic floor selection control system. Cab shall be furnished with 240 V grounding receptacle, emergency alarm push button with normally open contact, indicating light, limit switches, and all other necessary control devices required to ensure safe and continuous cab operation. One trailing cable shall connect the main control panel to aux. Panel at ground level. Cable shall supply the cab necessary power supply requirements. Cable guides shall be installed at every 6 m intervals to avoid entanglement of this cable. Control signal between the aux. Panel at ground level, the main control panel on the cab and the landings shall be provided

with tone frequency receiver or any other equivalent arrangement by trailing control cable.

2.1.14 Each landing assembly shall include a limit switch and push button control station installed and wired to a landing junction box.

2.1.15 All power cable and race way shall be provided and installed by the bidder for interconnection of the main control panel, auxiliary panel and landing junction boxes. Trailing cables shall be as per relevant IS/IEC standard.

2.1.16 Bidder shall provide, install and connect a system equipment ground to owner's chimney grounding system. Equipment grounding system shall electrically connect panels and junction boxes which contain electrical devices, motors and elevator platform and structures. Raceway system shall not be considered as an equipment ground.

2.1.17 All enclosures containing electrical devices shall be provided with 240 V, single phase heaters with adjustable thermostat control.

2.1.18 Cab shall be equipped with a 240 V AC interior light and duplex outlet.

2.1.19 Cable accessories as required to install the cables in bidder's scope shall be provided by the bidders.

2.1.20 Complete erection, testing and commissioning including all erection materials, consumables and other tools and tackles required for erection along with commissioning spares.

2.1.21 All inserts, anchor bolts, sleeves, anchoring steel and any other items required to complete the job satisfactorily shall be in bidder's scope.

2.1.22 First fill of lubricant and consumables shall be in bidder's scope.

2.1.23 Satisfactory running and maintenance of elevator for a continuous period of 30 days including training of owner's operators.

2.1.24 Supply of One complete set of special maintenance tools and tackles shall be in bidder's scope.

2.1.25 Any other equipment or accessories not specified, but required for the satisfactory operation of chimney elevator shall be in bidder's scope.

2.1.26 Recommended spares including instrumentation for 3 years of normal operation of stack elevator. (List to be furnished by the bidder and for which order shall be placed separately by owner as per their requirements)

3. SPECIFIC REQUIREMENTS

3.1 The equipment supplied, erected and commissioned shall meet the technical requirements of respective Section –D and Data Sheet-A.

3.2 Bidder shall note that all QP and Field quality plans shall be subject to purchaser's approval.

3.3 All equipment offered shall have suitable provision of termination and connection of power and control cables inclusive of cable boxes, lugs and glands, etc.

3.4 All the equipment shall be suitable for the power supply fault level and other climatic conditions as indicated in project information.

3.5 The bidder shall guarantee the rating and performance parameters of the system/equipment offered in accordance with specification requirements.

3.6 It is the responsibility of bidder to arrange license for operation of chimney elevator from statutory body of that area before handing over.

3.7 Bidder shall furnish deviation (clause wise) in the deviation schedule. In absence of dully filled deviation list, it will be presumed that offer is exactly in line with the technical specification.

3.8 Bidder shall furnish duly filled data sheet –B alongwith the offer. In absence of same, offer shall be treated as incomplete.

3.9 Bidder shall offer the stack elevator considering prevailing statutory and regulatory requirements of project location.

3.10 Bidder shall indicate degree of protection of various electrical equipment in the offer.

3.11 Makes of all bought out items shall subject to purchaser's approval after award of contract.

3.12 All drawings/documents shall subject to purchaser's approval after award of contract.

1	Designation Elevator	:	Rack and Pinion type Stack
2	Type of loading	:	Passenger/goods
3	Quantity	:	As per project requirement
4	Carrying Capacity	:	Didder to decide
5	Operating Speed	:	40 m/min (Approx)
6	Dimension of lift and lift well/cut out	:	As per IS:3534
7	No. of landings	:	To suit project requirement
8	Total vertical travel	:	To suit the chimney height
9	Electrical power supply system	:	415 V, 3 ph, 4 wire, 50 Hz
10	Other accessories	:	As required

SECTION - D
SUB-SECTION – A6

STACK ELEVATOR

1. DESIGN AND CONSTRUCTION

1.1 Stack Elevator - General

1.1.1 The stack elevator including mechanical and electrical components shall be installed outside/inside Single flue/ multi flue chimney. Since chimney is a free standing structure, deflection of chimney top is expected during the normal operation, so the design of the elevator shall be in such a way that the elevator operation will be safe even with the expected maximum deflection of the chimney structure. The stack elevator shall lift a pay load as indicated against rated load as mentioned in Data sheet-A or its nearest as per manufacturer's present standard in addition to the weight of the car and its accessories and shall travel at a rated speed as indicated in the data sheet-A. Travel of the elevator car, number of landings and levels shall be as per Data sheet-A attached to this section.

1.1.2 Stack elevator mechanical and electrical operating devices and trailing cable shall be designed for operation indoors/out door with dusty and high humidity conditions and shall operate equally well in any ambient temperature encountered in the site conditions. Additionally, all mechanical and electrical components of the elevator shall be designed to withstand without damage a temperature of 100^{o}C when the elevator is not operating.

1.1.3 Cage earthing shall be done through trailing cable.

1.1.4 Stack elevator shall be attached to the chimney shell using expansion type anchor bolts drilled in to chimney shell. Elevator shall be capable of operating from the ground floor to the top platform with intermediate stops at all platforms. Landing for elevator parking shall be one (1) metre above the stack ground floor. Suitable concrete/brick steps leading to the landing for entry to cabin shall also be provided,

1.1.5 The stack elevator shall be designed in line with recommendations contained in the latest editions of the applicable codes and standards.

1.2 Equipment Specification

1.2.1 Enclosures

i. A three-sided enclosure with one access door shall be provided at graded level. At each platform landing above graded level, a one sided enclosure with access door shall be provided. Enclosures shall be fabricated from tubular steel and expanded metal or wire mesh, 2.1 m high and one coat of epoxy primer coated. Enclosure access doors shall be electrically and mechanically interlocked so that they remain closed and locked except when the Cab is at the landing. Doors shall be bi-parting and swinging type.

ii. Base of three-sided enclosure shall be securely anchored to the grade level floor slab using expansion type anchors.

1.2.2 Mast

i. Mast shall be provided in sections approximately 1.52 m in lengths considering of tubular sections and/or structural shapes welded together to form a frame work to which the rack is bolted. Mast shall be securely anchored to the concrete chimney walls.

1.2.3 Cab

i. Cab frame shall be fabricated from tubular steel and enclosed with expanded metal or wire mesh.

ii. Cab floor shall be of skid resistant glass fibre reinforced plywood or approved equal. Cab shall be attached to a framed structure and form integral part with the drive mechanism located atop the cab.

Framed structure shall include guide rollers and safety hooks to ensure positive engagement of the rack and pinion to prevent cab disengagement in case of roller failure.

1.2.4 Buffers

i. Sufficient numbers of buffers of spring loaded/hydraulic type shall be fitted below the cab. The buffers shall be capable of stopping the cab without permanent damage or deformation to themselves or any other part of the equipment. The number of buffers shall be so fixed as to ensure proper sharing of impact loads by all of them.

1.2.5 Drive unit and safety Device

i. Drive unit located on the top of the cab shall be complete with Ac squirrel cage induction motor, reduction gear, drive pinion and an over speed governor. Drive unit shall incorporate an electric disc brake and an external manual brake release. The brake on the electric motor will be of the electromagnetic single disc self-adjusting type with the mechanical compression spring being held off by the electromagnet.

ii. The hoist shall be provided with a centrifugal brake to prevent accidental tripping of safety device when the cage shall be taken to the ground by gravity in case of power failure.

1.2.6 Power and Control

i. All electrical components furnished with the elevator shall be completely wired, energised and checked. Necessary power distribution arrangement shall be provided by the contractor to feed the electrical power to the elevator.

ii. All electrical control devices shall be in enclosures. Equipment furnished shall also include the following:

a) Momentary contact push button for raise lower control.

b) Reversing combination motor starter with a moulded case circuit breaker for the motor. Starter shall be equipped with three thermal overload relays for motor protection. Operating handle for the combination starter circuit breaker shall be accessible from inside the cab and shall also serve as an emergency stop switch.

c) Electrical and mechanical interlocks on cab access door and landing level enclosure doors.

d) Over travel protection, emergency stop push button, over speed governors.

e) All electrical and mechanical interlocks on cab access door and landing level enclosure doors, phase reversal protection shall be provided.

f) An alarm push button shall be provided in the cage connected to a battery-operated alarm at the elevator base. Simultaneous alarm shall also sound at the plant control room in the event of any fault in the stack elevator for which one potential free contact shall be provided in each elevator for audiovisual alarm in PCR for “Stack Elevator fault” indication.

g) Reverse phase relay connected to prevent operation of the cab with improper phase rotation or failure in any phase in the power supply.

h) Continuous duty electric torque motor recoil cable reels as required to maintain electrical power service to all elevator electrical components throughout the limits of travel.

i) One auxiliary panel shall be furnished and mounted on the grade level enclosure. Panel shall be equipped with a main ‘ON-OFF’ isolating switch, main contactor, relays, control transformer and fuses, tone frequency

transfer, terminal blocks and all other accessories required for normal operation of the elevator.

j) One main control panel shall be furnished and mounted on the top of the cab. Panel shall be equipped with necessary, equipped like rectifier, battery, charger, tone frequency receiver, contactors, MCBs, control transformer and fuses, thermal overload relays, and all other equipment and accessories required for normal operation of the elevator.

k) Control cabinets shall be sheet steel enclosed and shall be dust, weather and vermin proof. Sheet steel used shall be cold rolled and at least 2.0 mm thick and properly braced to prevent wobbling. Degree of protection of the control cabinets shall be IP-52 as per IS:2147. Control cabinets shall be provided with hinged door(s) with padlocking arrangement. All doors, removable covers and plates shall be gasketed all around with neoprene gaskets, louvers, when provided, shall have screeners and filters. The screens shall be of fine wire mesh made of brass or GI wire. Suitable cable gland plate shall be supplied fitted on to this gland plate. All cable glands shall be screwed on type and made of brass.

l) Each motor to be controlled from the control cabinet shall be provided with 3 pole isolating switch. HRC fuses, contactors of AC4 duty class with thermal overload relays with single phasing preventer and other equipment required for satisfactory control motor. The isolating switch and contractor shall be rated at least 20% more than the connected motor full load current. Motors of 0.2 KW and above shall be rated for 415 V 3 Phase and below 0.2 KW will be 240 V single phase supply.

m) The controllers and resistors for motors shall conform to IS-8544 (latest edition) and IS-2959 (latest edition) and shall be continuously rated for 150% full load current of the motor. Switches shall be hand operated, air breaker heavy duty, quick make, quick break type conforming to IS-4064. The rating of switch shall be so chosen as to get complete protection by associated O/L relay or fuse under all normal / abnormal conditions such as full load, overload, locked rotor, short circuit. The incoming power supply isolating switch shall be inter-locked with the control cabinet door so as to prevent opening of the door when the switch is closed. Device for bypassing the door interlock shall also be provided. Switch handle shall have provision for locking in both fully open and fully closed positions.

n) All fuses shall be of the HRC cartridge type mounted on plug in type of fuse base having a prospective current rating of not less than 80 KA. Fuses shall be provided with visible operation indicators to show that they have operated. All accessible live connections shall be adequately shrouded and it shall be possible to change fuses with the circuit alive without danger of contact with live metal.

o) Contractor shall provide dry type transformers with class B insulation for control power supply, lighting and space heating. Control supply will be 240 V AC. Transformer for control supply shall be provided with a control tap at 110 V, which will be earthed. Power and control supply to individual drives and users shall be distributed with separate isolating switches and primary and secondary fuses.

p) All push buttons shall be of push to actuate type having 2 “NO” and 2 “NC” self reset contacts. They shall be provided with integral escutcheon on plate engraved with their functions. Push button contacts shall be rated for 5 Amp at 415 V AC and 1 Amp. Inductive breaking at 250 V, DC. Mushroom type emergency push button to open the main contactor shall be provided in the operator’s cabin and two on the bridge platform within easy

reach indicating lamps shall be of the filament type and low watt consumption lamps shall be provided with series resistors.

q) Strip type space heaters of adequate capacity shall be provided inside in each cabinet.

r) Control cabinets shall be supplied completely wired. All wiring shall be carried out with 650 V grade PVC insulated, stranded conductors. Power circuits shall be wired with stranded aluminum conductors of adequate sizes to suit the rated circuit shall be wired with stranded copper conductors of sizes not small than 1.5 Sq.mm. Control circuits shall be isolated from power circuits.

s) Cab shall be controlled by a semi-automatic floor selection control system. Cab shall be furnished with 240 Volt grounding type receptacle, emergency alarm push button with a normally open contact rated 0.5 ampere at 220 VDC volts, indicating light, limit switches, and all other necessary control devices required to ensure safe and continuous cab operation. One trailing cable shall connect the cab main control panel to the auxiliary panel at ground level. Cable shall supply the cab with all power requirements. Cable guides shall be installed at every 6 metres to avoid entanglement of this cable. Control signals between the auxiliary panel at ground level and the main control panel on the cab. Will be provided with the tone frequency receiver. However control and interlocks from the landings shall be connected to the auxiliary panels located at ground level through fixed armoured cables. The power and control cables and training power cables shall be FRLS type.

t) Each landing assembly shall include a limit switch for door interlock and push button control station installed and wired to a landing junction box.

u) Cable trolley with cable guides for recoil of cable on to cable reel to maintain electrical power service to all elevator components through out the limits of travel.

v) Contractor shall furnish, install, and connect a system equipment ground to the Owner's existing chimney ground system. System equipment ground shall electrically connect panels and junction boxes, which contain electrical devices, motors, and elevator platforms and support structure. Raceway system shall not be considered as an equipment ground.

w) All enclosures containing electrical devices shall be provided with 240 Volt, single-phase space heaters with adjustable thermostat control.

x) All power cables and race way shall be furnished and installed by the Contractor for interconnection of the main control panel, auxiliary panel and landing junction boxes etc. Conductors included in the cable shall be as required to energise all electrical equipment furnished with the elevator. Transmission of alarm signals is done by means of tone frequency equipment. Hence communication conductors are not required.

1.2.7 Electric Motor

i. Elevator drive motor shall be squirrel-cage induction type designed and fabricated to conform to the requirements indicated below.

ii. Motor shall be designed for operation at the required speed: 415 Volts, 3 phase, 50 hertz. And shall be suitable for full voltage starting, S4 duty class as per IS-4722 with CDF of 25% and maximum number of 120 starts per hour in 55 Deg. C ambient temperature. Motor shall be tested at the factory to determine that it is free from electrical or mechanical defects.

1.2.8 Raceway

i. General

a) Complete raceway system for the elevator shall be furnished and installed in accordance with this section and the Contractor's shop drawings as reviewed and accepted by the Engineer-in-Charge. The Contractor shall provide drawings for acceptance showing the routing of conduit and wiring for the control circuits associated with the elevator.

b) Raceway system is defined to include conduit and all related materials and devices required to support, secure and provide a complete system for support and protection of electrical cable and wiring.

ii. Materials

a) Raceway shall be rigid galvanized steel conduit, provided in accordance with IS-1653 (latest edition).

b) Steel conduit, couplings, and elbows shall be hot-dip galvanized rigid mild steel. Each length of threaded conduit shall be complete with a coupling on one end and a thread protector on the other. Thread protector shall have sufficient mechanical strength to protect the threads during normal handling and storage. Flexible conduits shall be plastic jacketed, liquid tight galvanized steel.

c) Galvanised iron or galvanized cast steel fittings shall be used with galvanized steel conduit. Fittings installed outdoors or in damp locations shall be sealed and gasketted. Outdoor fittings shall be of heavy cast construction.

1.2.9 PVC Insulated FRLS Cable

i. Materials

a) Electrical part of this specification shall be referred for FRLS cable. Unless specified otherwise, Contractor shall submit to the Engineer-in-Charge four copies of the manufacturer's test report on each cable furnished. Conductor accessories including terminal materials like glands, lugs etc. makers, tying materials and cable support shall be furnished and installed. Wire termination materials for conductors 10 Sq. mm and larger shall be pressure or bolted type. Terminals for conductors smaller than 10 Sq. mm shall be an insulated pressure connection in the shape of a ring.

ii. Installation

a) Power and control cable shall be routed as required by the drawings. Cables pulled into the wrong conduit or cut too short shall be replaced. Cables removed from one conduit shall not be installed in another conduit.

1.2.10 Earthing

i. General

a) Earthing system furnished and installed and include a complete earthing system for the elevator. Earthing equipment and materials shall be furnished and installed in accordance with the reference codes and standards these specification and the contractor's shop drawings as reviewed and accepted by the Engineer-in-Charge.

ii. Materials

a) The earthing of all electrical items being supplied by the Bidder shall be in his scope. For earthing the various equipment, conductor sizes shall be as listed below:

- MCCs Motor above 90 KW : 50 x 6 Sq.mm G.I. flat
- Motors above 30 KW, upto 75 KW and lighting panel/ control panels/auxiliary panels : 25 x 6 Sq. mm G.I. flat
- Motor above 5 KW upto 30 KW : 25 x 3 mm G.I. flat
- Motors upto 5 KW and misc. : 8 SWG GI wire
- Small item like conduits,
- Junction boxes etc..

SUB-SECTION - A6

STACK ELEVATORS

1.01.00 **ELEVATOR PARTICULARS**

i) Load Carrying Capacity in Kg
ii) Type of loading for which the stack elevator is designed
iii) Type of stack elevator
iv) Rated Load in Kg
v) Speed in metre/minute
vi) Chimney height in metre
vii) Total travel height in metre
viii) No. of floors to be served
ix) Elevations of the floors to be served
x) Method of control
xi) Details of indicators and control
xii) Weight of cab complete without load in Kg
xiii) Weight of hoist cab in Kg
xiv) Efficiency of Elevator

1.02.00 GROUND ENCLOSURE

i) Size of the enclosure (Length x breadth x height)
ii) Material of construction
iii) Size of landing entrance
iv) Method of door operation
v) Electrical & mechanical interlocking Of the door provided.
vi) Method of fixing enclosure to chimney
vii) Any other details not covered above

1.03.00 LANDING ENCLOSURES

viii) Size of the enclosure

(Length x breadth x height)

ix) Material of construction

x) Size of landing entrance

xi) Method of door operation

xii) Electrical & mechanical interlocking
Of the door provided.

xiii) Method of fixing enclosure

xiv) Any other details not covered above

1.04.00 MAST

i) Material of mast

ii) Section of mast

iii) Size of each piece of mast

iv) Method of fixing of mast

v) Type of mast

1.05.0 CAB

i) Internal size
(Length x breadth x height)

ii) Material of construction

iii) Type of floor

iv) Size of the cab door

v) Method of operation of cab door

vi) Electrical & mechanical interlocking provided

vii) Escape hatch, electrically interlocked

viii) Guide roller and safety hooks provided

ix) Arrangement of light/fan inside the cab.

x) Indicators & controls inside the cab.

1.06.00 ELEVATOR DRIVE UNIT

i) Location of drive unit

ii) Name of components of drive unit

1.07.00 DETAILS OF ELECTRIC MOTOR

i) Manufacturer

ii) Equipment driven by motor

iii) Type

iv) Frame size, type & designation

v) Maximum load considered for Sizing of motor

vi) Margin considered for sizing motor

vii) Rated power in KW

viii) Service factor

ix) Speed in rpm

x) Rated voltage in V

xi) Current at rated voltage

- Full load
- Locked rotor

xii) Insulation class

xiii) Type of bearing and type of lubricant

xiv) Space heater rating

xv) Duration considered for specified Ambient temperature

xvi) Applicable standard to which motor conforms

xvii) Degree of protection

xviii) Efficiency at rated output

xix) Power factor

xx) Type of mounting

1.08.00 DETAILS OF REDUCTION GEAR

Name of Bidder / Vendor						
Project						
Revision No.	0	1	2	3	4	5
Signature of Bidder / Vendor / Authorised Representative						
Date						

i) Make
ii) Material of the gears and hardness in BHN
iii) Type of gear
iv) Gear ratio
v) Gear power transmitted
vi) Input and output speed

1.09.0 DETAILS OF DRIVE AND PINION

i) Material
ii) Hardness
iii) Fixing arrangement

1.10.0 DETAILS OF RACK

i) Material
ii) Hardness
iii) Fixing arrangement

1.11.00 SAFETY DEVICE

i) Make
ii) Type of safety device
iii) Speed at which the safety device
Come into action
iv) Method operation
v) Other details
vi) Remote control for testing
The safety device

1.12.00 BRAKES

i) Manufacturer
ii) Types of brakes provided
iii) Method of operation
iv) Interlocking if any
v) Electromagnetic brake and external
Manual brake release
vi) Degree of protection

1.13.00 CENTRIFUGAL BRAKE

i) Make
ii) Details
iii) Remote control for testing
The safety device provided.
iv) Any other details of drive unit
Not covered above.

1.14.00 BUFFERS

i) No. and location of the buffers provided
ii) Type of buffers
iii) If the buffers are spring type
Furnish the following:

- Diameter of the spring in mm
- Max. Compression under extreme cond.
- No. of spring coil
- Sectional dimension
- Material of spring
- Compression /unit load

1.15.00 POWER CABLES Fixed Trailing

Name of Bidder / Vendor						
Project						
Revision No.	0	1	2	3	4	5
Signature of Bidder / Vendor / Authorised Representative						
Date						

i) Manufacturer
ii) Type and material
iii) Rated voltage
iv) Rated current
v) Type of insulation
vi) No. of strands
vii) No. of cores
viii) Short circuit current rating
ix) Resistance per 1000 metres
x) Applicable standards

1.16.00 CONTROL CABLES

xi) Manufacturer
xii) Type and material
xiii) Rated voltage
xiv) Rated current
xv) Type of insulation
xvi) No. of strands
xvii) No. of cores
xviii) Short circuit current rating
xix) Resistance per 1000 metres
xx) Applicable standards

1.17.00 CONDUITS/ACCESSORIES AND FITTINGS

i) Material
ii) Manufacturer
iii) Applicable standard

1.18.00 CONTACTORS

i) Make

ii) Type

iii) Applicable standards

iv) No. of poles

v) Rated voltage

vi) Rated frequency

vii) Rated current

viii) Closing coil

- Rated voltage
- Current consumption
- Power consumption in KW
- Insulation class for electromagnet

ix) Rated duty

- Rated insulation category
- No. of operations per hour
- Rated breaking capacity
- Rated making capacity
- Short time rating in sec

ix) Limits of operation

- Supply voltage variations (%)
- Supply frequency variations (%)
- Drop out voltage (%)
- Min. pick up voltage (%)

x) Thermal overload relay setting range available

xi) Auxiliary contacts

- Numbers
- Current rating (Make and break)

xi) Rated utilization category as per IS 2459

xii) Max. recommended back up HRC fuse size

1.19.00 FUSES

i) Make

ii) Type

iii) Continuous current

iv) Rated voltage

v) Rated frequency

vi) Rupturing capacity

vii) Mounting details

viii) Fixing and removing arrangement

ix) Visual indication for fuses

x) Applicable standards

1.20.00 INDICATING LAMPS

i) Make

ii) Type

iii) Rated voltage

iv) Rated power consumption in Watt

v) Permissible voltage variation

vi) Series resistance provided

1.21.00 PUSH BUTTONS

i) Make

ii) Type

iii) Rating

- Voltage
- Continuous current

iv) No. of aux. Contacts
- Normally open
- Normally closed

v) Contact rating

vi) Colours

vii) Mounting arrangement

1.22.00 OVER TRAVEL LIMIT SWITCH

i) Make

ii) Type

iii) Material of contacts

iv) Contact rating

v) Numbers furnished

1.23.00 CONTROL TRANSFORMER

i) Make

ii) Type

iii) Output rating (VA)

iv) Ratio

v) Class of insulation

vi) Max. temp rise of winding over
Specified ambient temperature.

vii) One minute power frequency test voltage

viii) Applicable standards

1.24.00 CIRCUIT BREAKER AND ISOLATOR

i) Make

ii) Type

iii) Current rating in amps

iv) Interruption duty

v) Max. breaking capacity

vi) Operating voltage of tripping and closing coils

vii) Max. permissible variation of operating voltage

1.25.00 RACEWAY

i) Raceway as per specification

ii) Material of

- Indoor fittings
- Outdoor fittings
- Raceway support
- Junction boxes

1.26.0 EARTHING

i) Earthing conductor

- Size
- Material

ii) Material of earthing cable

iii) Clamps. Bolts, washers, nuts and another Hardware of iron steel are galvanized.

1.27.00 MOTOR STARTER

i) Make & Size

ii) Rating]

iii) Mechanically latched type

iv) Single phase prevention feature provided

v) Degree of protection

1.28.00 DETAILS OF CONTROL PANELS

i) No. of panels

ii) Type of enclosures (Degree of protection)

iii) Thickness of sheet metal

iv) Painting

- Colour
- Finish

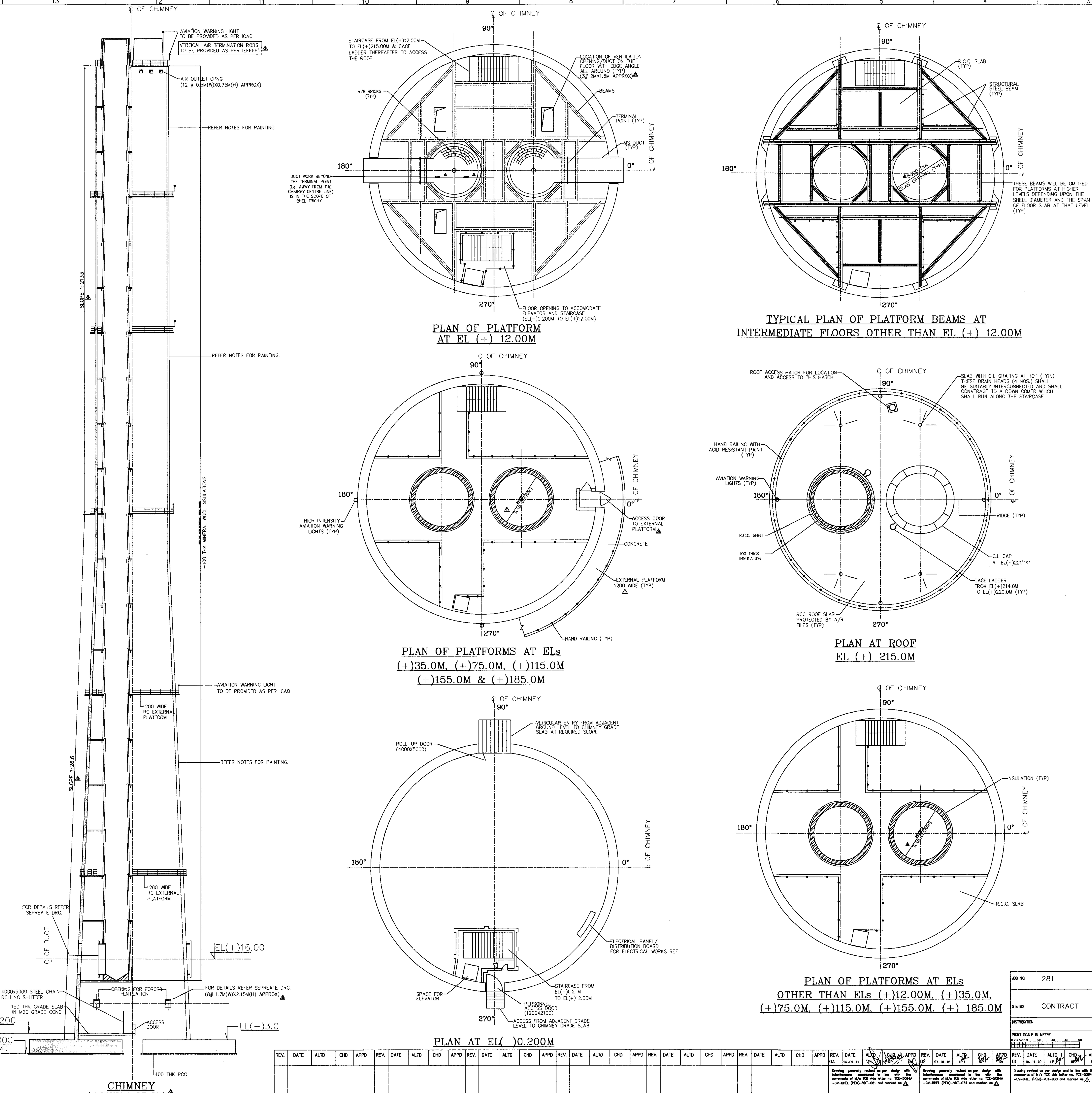
v) Cable entry

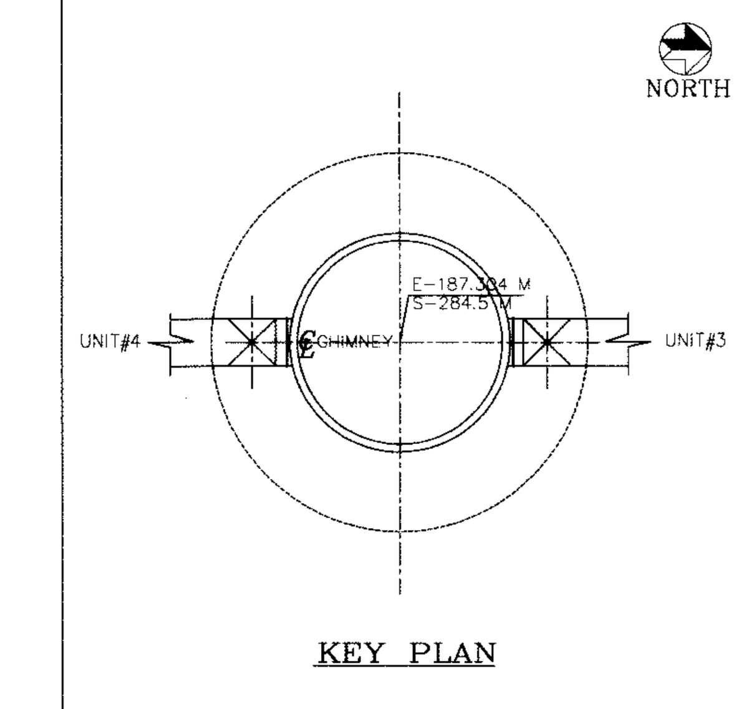
vi) Manufacturer

Name of Bidder / Vendor						
Project						
Revision No.	0	1	2	3	4	5
Signature of Bidder / Vendor / Authorised Representative						
Date						

FIRST ANGLE PROJECTION

ALL DIMENSIONS ARE IN MM





OUTSIDE DIAMETER OF SHELL	THICKNESS	ELEVATION
15500	425	EL 215.000
15525	437	EL 205.000
15550	450	EL 195.000
15575	462	EL 185.000
15600	475	EL 175.000
15625	487	EL 165.000
15650	500	EL 155.000
15675	512	EL 145.000
15700	525	EL 135.000
15725	537	EL 125.000
15750	550	EL 115.000
16544	592	EL 105.000
17338	633	EL 95.000
18131	675	EL 85.000
18925	717	EL 75.000
19719	758	EL 65.000
20513	800	EL 55.000
21306	842	EL 45.000
22100	883	EL 35.000
22894	925	EL 25.000
23571	925	EL 16.000
24323	925	EL 6.000
24789	925	EL(-)0.200
25000	925	EL(-)3.000

BHEL-PROJECT ENGINEERING MANAGEMENT(CIVIL)
THIS DRAWING MARKED(✓) IS RELEASED FOR
☑ COMMENTS/APPROVAL
☐ PLANNING/INFORMATION
☐ CONSTRUCTION
STAMP ALL PREVIOUS REVISION AS SUPERSEDED
NAME: MP — ISSUED BY
SIGNATURE
DATE: 14/02/2011

REFERENCE DRGS:-

S.NO.	DRG. NO.	TITLE
1.	PE-DG-281-620-C002	G.A. OF FOUNDATION AND DETAILS OF STARTER BARS
2.	PE-DG-281-620-C003	RC DETAILS OF FOUNDATION
3.	PE-DG-281-620-C004	SHELL PROFILE & MAIN REINF. DETAILS.

NOTES:-

1. ALL DIMENSIONS ARE IN MM AND LEVELS ARE IN M.(DIMENSIONS NOT TO BE SCALED)
2. THIS DRG. SHOWS THE FINALLY DESIGNED GEOMETRIC & GENERAL ARRANGEMENT OF THE CHIMNEY CONFORMING TO IS:4998-1992.
3. THIS DRAWING IS TO BE READ IN CONJUCTION WITH CONTRACT TERMS AND SPECIFICATION
4. EL. ±0.00 CORRESPONDS TO R.L. 10.50 M CORRESPONDS TO FFL OF POWER HOUSE.
5. REINFORCED CONCRETE WORK SHALL BE DONE IN FOLLOWING GRADES :-
   - (i) FOUNDATION M - 35
   - (ii) SUPER STRUCTURE M - 30
   - (iii) GRADE SLAB M - 30
6. A.R. BRICK SHALL CONFORM TO CLASS - II OF IS:4860
7. THIS DRG. SHALL BE READ IN CONJUNCTION WITH CONTRACT TERMS AND SPECIFICATIONS.
8. PAINTING :- FOLLOWING SHALL BE THE PAINTING SCHEDULE AS PER THE APPROVED DESIGN MEMORANDUM FOR CHIMNEY (DOC. NO-PE-DC-281-620-C001/R3)

ITEM	PAINT SPECFN.	COLOUR
(i) ENTIRE FINISHED INTERNAL CONCRETE SURFACES OF SHELL INCLUDING CORBELS (BEFORE PLACING OF INSULATION/ REFRACTORY) AND TOP 5M OF OUTSIDE CONCRETE SURFACE INCLUDING HORIZONTAL SURFACE OF PLATFORM.	ACID AND HEAT RESISTANT PAINT (BITUMINOUS PAINT CONFORMING TO IS:158 OF TOTAL DRY FILM THICKNESS-150 Microns	BLACK
(ii) TOP 50.0 M OF EXTERNAL SURFACES OF SHELL INCLUDING EXPOSED REINSHED, PLATFORMS, CATLADDER .	ACID AND HEAT RESISTANT PAINT (POLY URETHANE PAINT CONFORMING TO RELAVENT IS CODE)	ALTERNATE BAND OF SIGNAL RED & BRIGHT WHITE
(iii) ALL REMAINING EXTERNAL CONCRETE SURFACES .	SYTHETIC ENAMEL PAINT CONFORMING TO IS: 5410	-do-
(iv) ALL REMAINING EXTERNAL STEEL SURACES (HAND RAILING, LADDER DOOR FRAMES etc.)	TWO COATS OF RED OXIDE (IS:2074) WITH TWO COATS OF SYNTHETIC ENAMEL PAINT (IS:2932 & IS:2933)	AS PER DETAILS.

TCE CONSULTING ENGINEERS LTD.
DOCUMENT REVIEW STATUS
Drawing approved as submitted. Proceed with fabrication/Construction.
Drawing approved subject to comments noted. Proceed with fabrication/construction considering our comments.
17/02/2011

REV.	DATE	ALTD	CHD	APPD
01	04-11-10	LP	MP	RK

Drawing revised as per design and in line with the comments of M/s TCE vide letter no. TCE-5064A-CV-BHEL (PEM)-VDT-030 and marked as △

Drawing revised as per design with comments considered in line with the comments of M/s TCE vide letter no. TCE-5064A-CV-BHEL (PEM)-VDT-074 and marked as △

JOB NO. 281

STATUS CONTRACT

DISTRIBUTION

PRINT SCALE IN METRE 0 2 4 6 8 10 20 30 40 50

OWNER: GUJARAT STATE ELECTRICITY CORPORATION LTD.

PROJECT: 2 X 250 MW SIKKA THERMAL POWER PROJECT (EXTENSION UNITS 3 & 4) DIST. JAMNAGAR

CONSULTANTS: TCE CONSULTING ENGINEERS LIMITED

BHARAT HEAVY ELECTRICALS LTD
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
NEW DELHI

DEPT CODE C

	NAME	SIGN	DATE
DRN	DSR	-sd-	24.07.2009
DESN	AT/LP	-sd-	21.07.2009
CHD	MP	-sd-	25.07.2009
APPD	RK	-sd-	26.07.2009

TITLE: CHIMNEY
GENERAL ARRANGEMENT

CIVIL | ELEC | C&I | MSE | MAX | DEPT. | SIGN | DATE

SCALE 1:300

DRAWING NO. PE-DG-281-620-C001

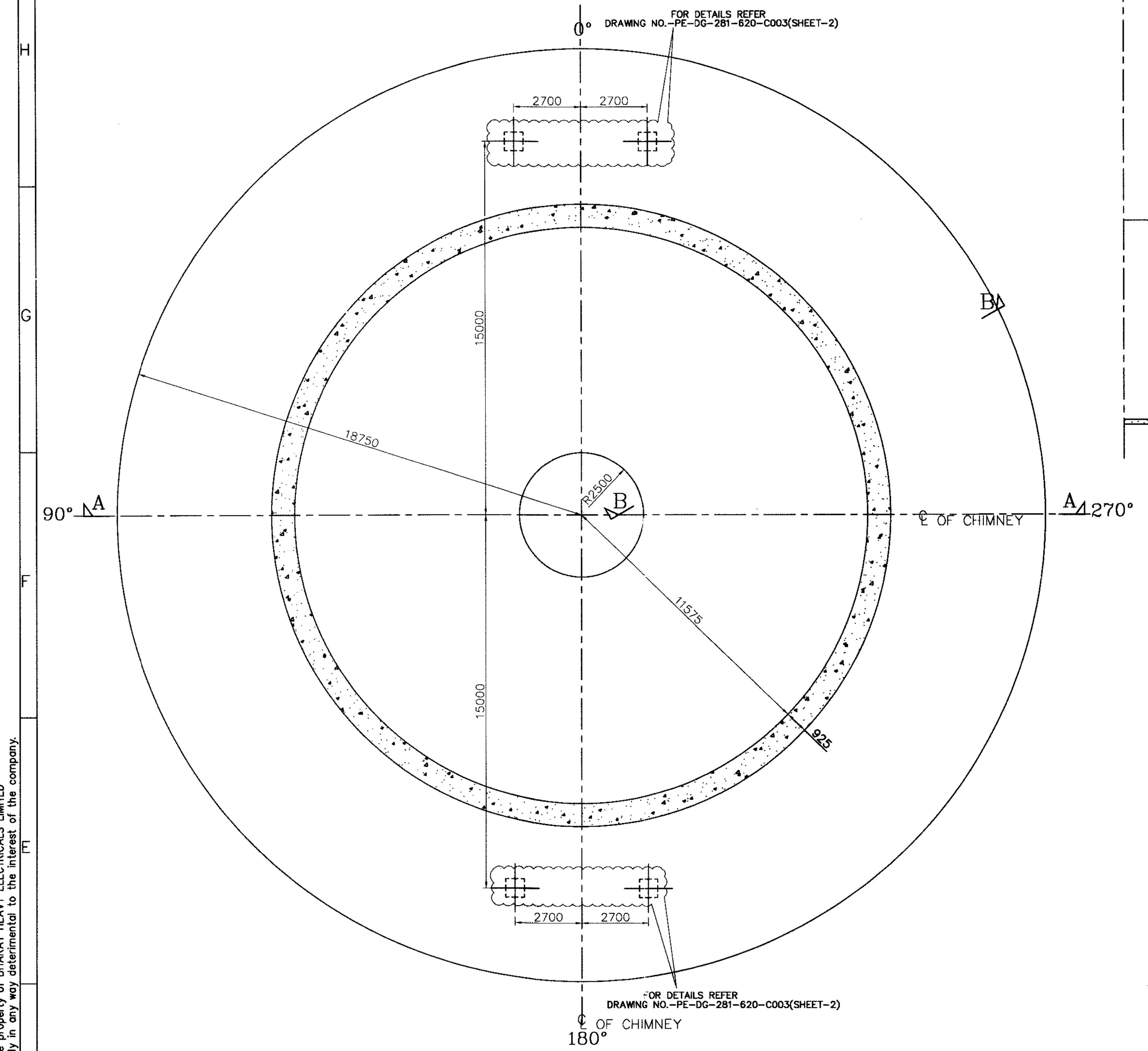
SHEET 1 OF 1 REV. 3

Feb 14, 2011 - 5:03pm
FORMAT SIZE A0

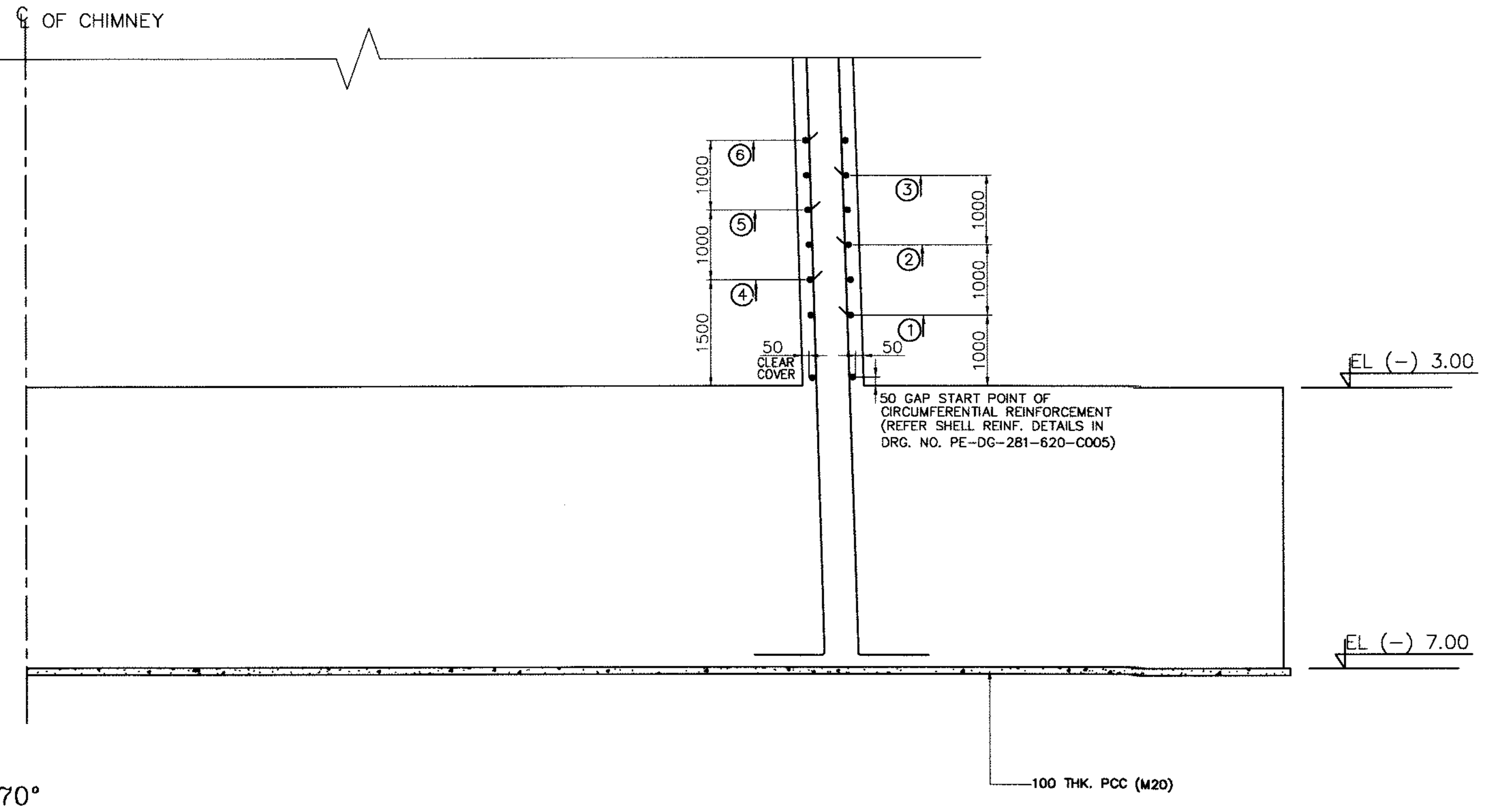
FIRST ANGLE PRJECTION

ALL DIMENSIONS ARE IN MM

DRAWING NO. PE-DG-281-620-C003



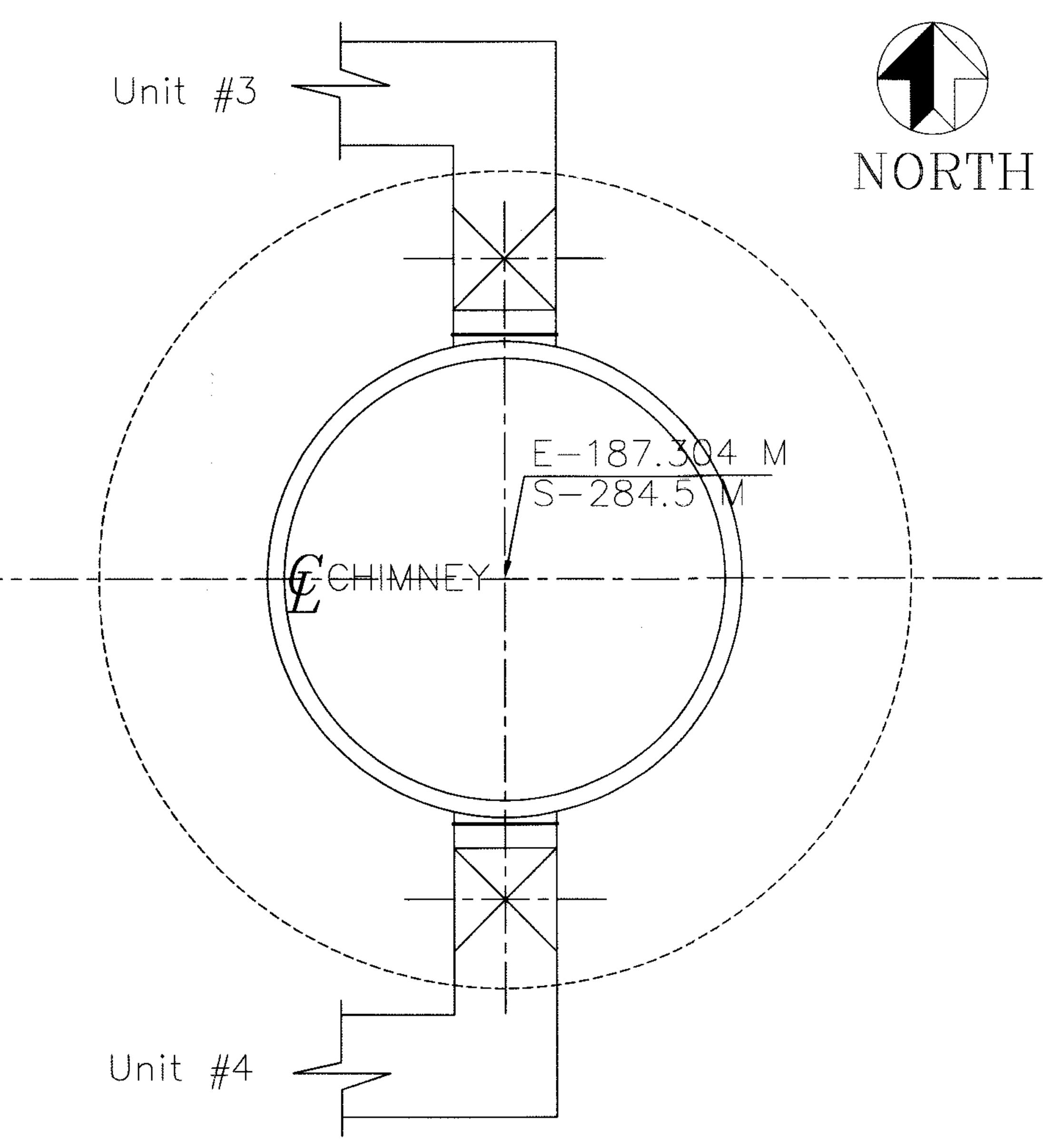
FOUNDATION PLAN



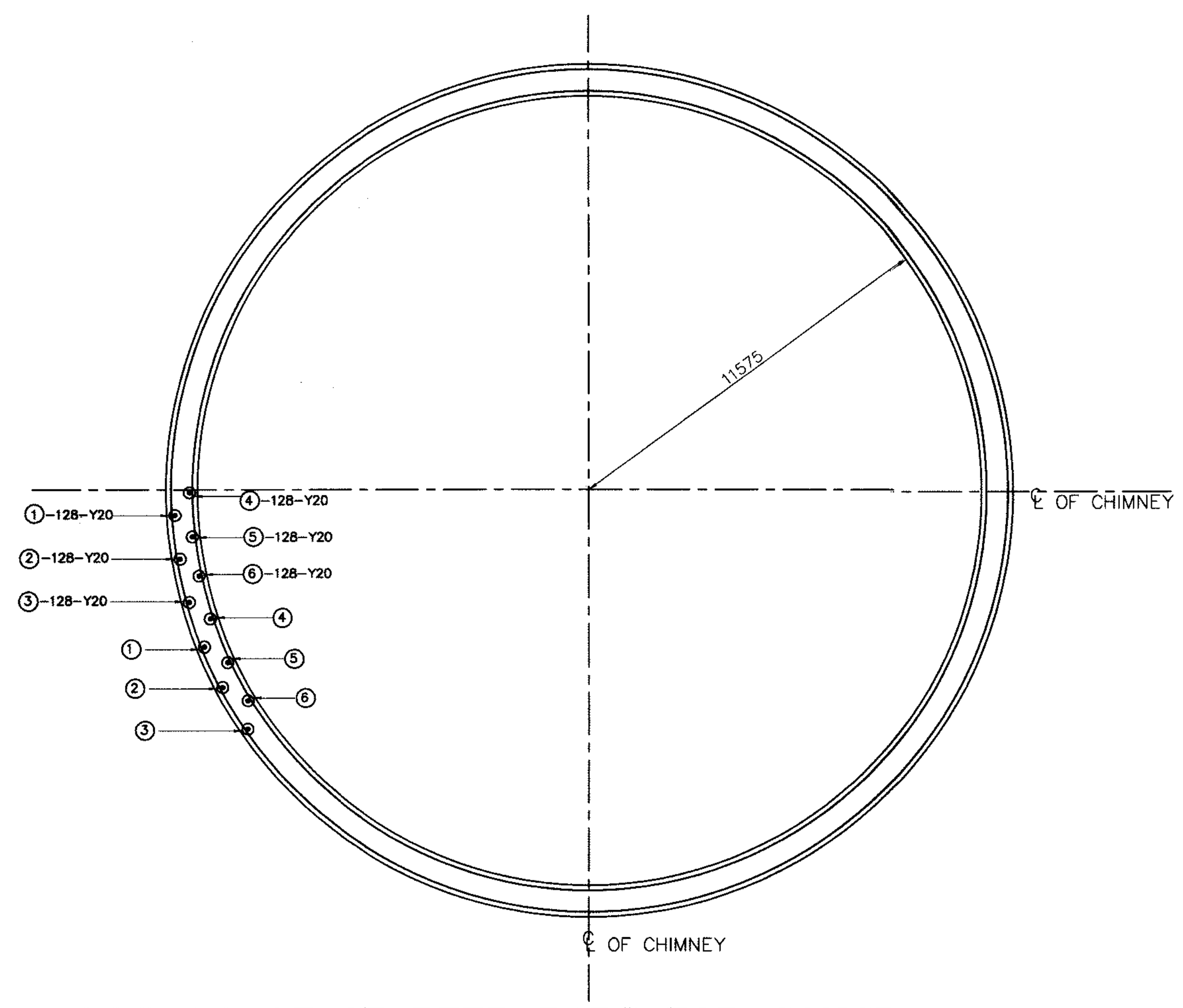
SECTION B-B

SHOWING ARRANGEMENT OF DOWELS IN CHIMNEY SHELL

(NOTE - CLEAR COVER TO CIRCUMFERENTIAL DOWELS AT INSIDE FACE AND AT OUTSIDE FACE OF SHELL IS 50mm.)

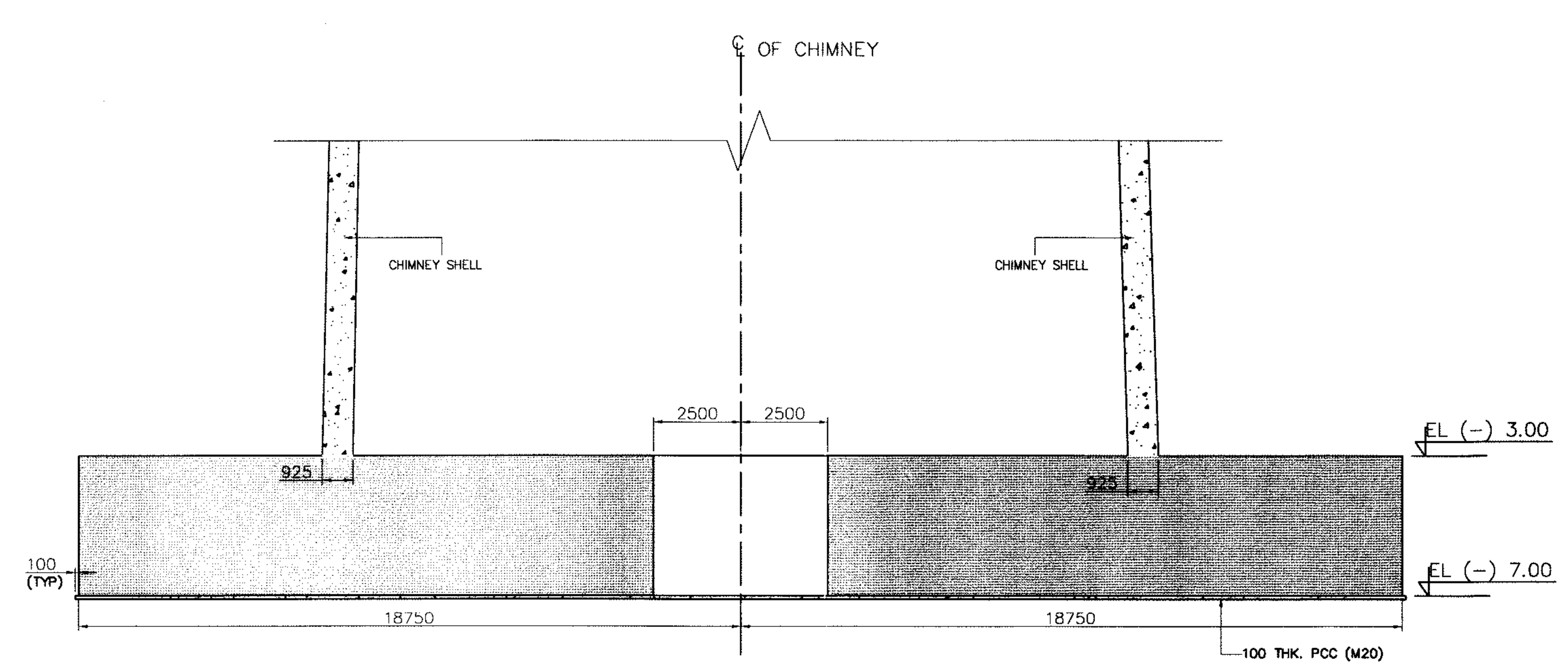


KEY PLAN



DETAILS OF STARTER BARS FOR CONCRETE SHELL

(NOTE:- NUMBER OF BARS SHOWN AGAINST EACH BAR MARK IS TO BE UNIFORMLY DISTRIBUTED ALONG FULL CIRCLE)



SECTION A-A

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS/ELEVATIONS ARE IN METRES.
2. EL ± 0.000 CORRESPONDS TO RL (+)10.5 M.
3. ADEQUATE NUMBER OF STRONG CHAIRS SHALL BE PROVIDED TO ACCURATELY PLACE THE REINFORCEMENT AND MAINTAIN THEM IN CORRECT POSITION DURING PLACING AND COMPACTION OF CONCRETE.
4. LAPS SHOWN ARE INDICATIVE AND SHALL BE STAGGERED.
5. MINIMUM CLEAR COVER TO MAIN REINFORCEMENT SHALL BE AS FOLLOWS :-
   (a). SIDES = 50 mm.
   (b). TOP = 75 mm.
   (C). BOTTOM = 100 mm.
6. APPROPRIATE MIX DESIGN SHALL BE FOLLOWED FOR CONCRETING OF FOUNDATION.
7. REINFORCED CONCRETE FOR FOUNDATION RAFT SHALL BE GRADE M35 AND FOR CHIMNEY SHELL SHALL BE GRADE M30 CONFORMING TO IS: 456-2000.
8. REINFORCEMENT BARS SHALL BE CRS BARS OF GRADE Fe500 CONFORMING TO IS: 1786 UNLESS NOTED OTHERWISE.
9. IF ANY LOOSE SOIL POCKETS OR BLACK COTTON SOIL OR ABUNDANT WELL IS FOUND BELOW THE FOUNDING LEVEL, THE SAME SHALL BE REMOVED AND FILLED WITH PCC OF GRADE M20. (△1)
10. FOR GENERAL ARRANGEMENT OF CHIMNEY REFER APPROVED DRAWING NO. PE-DG-281-620-C001.
11. FOR REINFORCEMENT DETAILS OF FOUNDATION REFER APPROVED DRG. NO. PE-DG-281-620-C003.
12. THE EXCAVATION SHALL BE CARRIED OUT WITH PROPER DEWATERING ARRANGEMENTS. GROUND WATER LEVEL SHALL BE MAINTAINED AT LEAST 200 MM. BELOW THE BOTTOM OF EXCAVATION.
13. ADEQUATE SHEETING & SHORING SHALL BE PROVIDED AS REQUIRED TO PROTECT THE SIDES OF EXCAVATION UNTIL THEY ARE BACK FILLED.
14. MUD MAT AS SHOWN SHALL BE OF PCC OF GRADE M20 WITH MAXIMUM SIZE OF COARSE AGGREGATE NOT EXCEEDING 20 MM.
15. PCC SHALL BE DONE IMMEDIATELY AFTER COMPLETION OF FOUNDATION EXCAVATION.
16. GROUND CONDUCTORS FOR EARTHING & LIGHTING PROTECTION SHALL BE LAID BELOW GROUND LEVEL AS INDICATED IN THE SPECIFICATIONS & THE APPROVED ELECTRICAL DRAWINGS.
17. ALL MATERIAL, QUALITY TESTING, STORAGE, FORM WORK, CONCRETE MIXING, PLACEMENT OF REINFORCEMENT & CONCRETE, WORKMANSHIP, SAFETY, ETC. SHALL CONFORM TO IS: 456 & THE TECHNICAL SPECIFICATIONS.
18. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH CONTRACT TERMS AND THE TECHNICAL SPECIFICATIONS.

ENGG REF DWG

1. GENERAL ARRANGEMENT ------------------------------ PE-DG-281-620-C001

CONST REF DWG

1. SHELL PROFILE & MAIN REINFORCEMENT DETAIL ------------ PE-DG-281-620-C005

LEGEND

VERTICAL BARS:- (1) 110-Y25
- BAR MARK
- NUMBER OF BARS
- DIA OF BARS (mm.)

TCE CONSULTING ENGINEERS LTD. — DOCUMENT REVIEW STATUS — 17/02/2011

BHEL-PROJECT ENGINEERING MANAGEMENT (CIVIL)

THIS DRAWING IS RELEASED FOR COMMENTS/APPROVAL

STAMP ALL PREVIOUS REVISION AS SUPERSEDED

ISSUED BY	
NAME	MP
SIGNATURE	Sd/-
DATE	14/02/2011

REV.	DATE	ALTD	CHD	APPD
1	14.02.2011	LP	MP	RK

REVISED AS PER TCE'S COMMENTS RECEIVED VIDE TRANSMITTAL NO. TCE-5064A-CV-BHEL (PEM)-VDT-085 DATED 03-02-2011 & MKD AS △1

JOB NO.	281
STATUS	CONTRACT
DISTRIBUTION	
PRINT SCALE IN METRE	0 2 4 6 8 10 20 30 40 50

OWNER: GSECL GUJARAT STATE ELECTRICITY CORPORATION LTD.

PROJECT: 2 X 250 MW SIKKA THERMAL POWER PROJECT (EXTENSION UNITS 3 & 4) DIST. JAMNAGAR

CONSULTANTS: TCE CONSULTING ENGINEERS LTD, BANGALORE

BHARAT HEAVY ELECTRICALS LTD
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
NEW DELHI

DEPT CODE: C

	NAME	SIGN	DATE
DRN	DRS	-sd-	06.01.2011
DESN	LP	-sd-	03.01.2011
CHD	MP	-sd-	07.01.2011
APPD	RK	-sd-	10.01.2011

TITLE: CHIMNEY
GA OF FOUNDATION AND DETAILS OF STARTER BARS

	CIVIL	ELEC	C&I	MSE	MAX	DEPT.	SCALE 1:125
						SIGN / DATE	

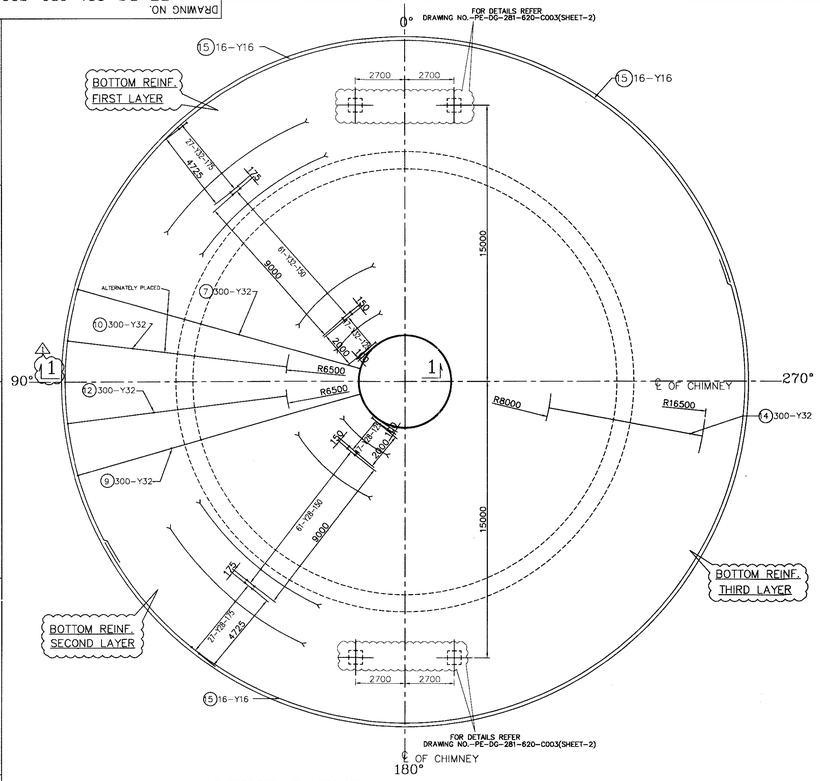
DRAWING NO. PE-DG-281-620-C002

SHEET 1 OF 1 REV. 1

Jan 04, 2005 - 11:47am

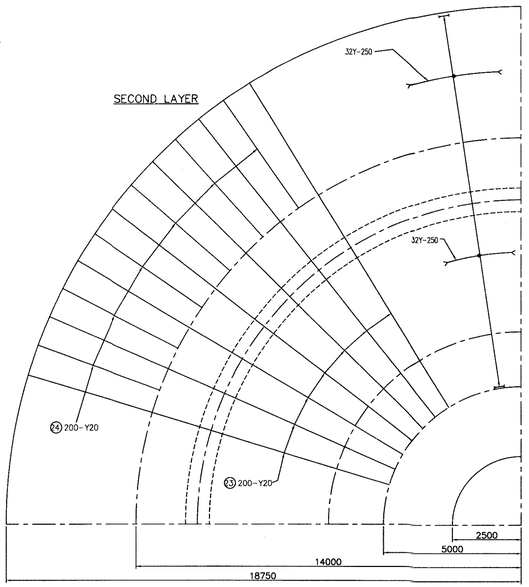
FORMAT SIZE A1

DRAWING NO. PE-DG-281-620-C003



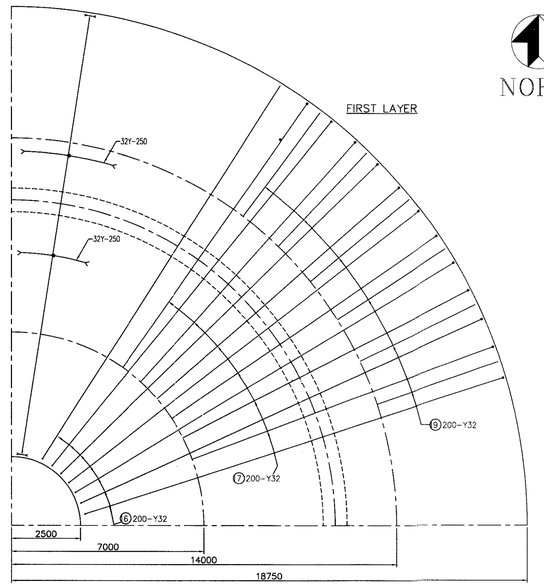
REINFORCEMENT DET OF CHIMNEY RAFT

(SHEAR RENF NOT SHOWN FOR CLARITY)
(WINDSHIELD RENF NOT SHOWN FOR CLARITY)
(CIRCUMFERENTIAL RENF SHALL BE PROVIDED WITH MIN NO. OF LAPS AND THE LAPS SHALL BE STAGGERED)
(ALL RADIAL BARS SHALL BE EQUALLY SPACED)



PLAN SHOWING TOP REINFORCEMENT IN SECOND LAYER

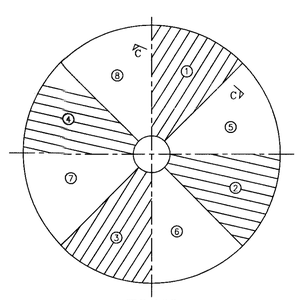
(NOTE : NUMBER OF BARS SHOWN AGAINST EACH BAR MARK IS TO BE UNIFORMLY DISTRIBUTED ALONG FULL CIRCLE)



PLAN SHOWING TOP REINFORCEMENT IN FIREST LAYER

(NOTE : NUMBER OF BARS SHOWN AGAINST EACH BAR MARK IS TO BE UNIFORMLY DISTRIBUTED ALONG FULL CIRCLE)

NORTH



PLAN

SHOWING SEQUENCE OF FOUNDATION CONCRETE SUGGESTIVE

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS/ELEVATIONS IN METRES.
2. EL ± 0.000 CORRESPONDS TO RL 10.5 M.
3. ADEQUATE NUMBER OF STRONG CHAIRS SHALL BE PROVIDED TO ACCURATELY PLACE THE REINFORCEMENT AND MAINTAIN THEM IN CORRECT POSITION DURING PLACING AND COMPACTING OF CONCRETE.
4. LAPS SHOWN ARE INDICATIVE AND SHALL BE STAGGERED.
5. MINIMUM CLEAR COVER TO MAIN REINFORCEMENT SHALL BE AS FOLLOWS :-
   (a). SIDES = 50 mm.
   (b). TOP = 75 mm.
   (C). BOTTOM = 100 mm.
6. APPROPRIATE MIX DESIGN SHALL BE FOLLOWED FOR CONCRETING OF FOUNDATION.
7. FOR PILE REINFORCEMENT EMBEDMENT DETAILS REFER DWG NO.-PE-DG-281-620-C002(SH-A)
8. FOR OTHER NOTES REFER DWG NO PE-DG-281-620-C001.

ENGG REF DWG

1. GENERAL ARRANGEMENT ---------- PE-DG-281-620-C001

CONST REF DWG

1. G.A. OF FOUNDATION AND DETAILS OF STARTER BARS ---------- PE-DG-281-620-C002
2. SHELL PROFILE & MAIN REINFORCEMENT DETAIL ---------- PE-DG-281-620-C004

BILL OF MATERIAL	
MATERIAL	QUANTITY
CONCRETE M35	4350 Cum.
PCC	150 Cum.
REINFORCEMENT	425 MT(approx.)

SECTION C-C

SHOWING CONSTRUCTION JOINT DETAIL

(TOP AND BOTTOM REINFORCEMENT BARS ARE NOT SHOWN FOR CLARITY)

SECT 1-1

DETAIL OF LINKS

DETAIL - 1

DETAILS OF SHEAR KEY (ALROUND)

TYP QUADRANT SHOWING SHEAR RENF.

BHEL-PROJECT ENGINEERING MANAGEMENT (CIVIL)	
THIS DRAWING IS RELEASED FOR COMMENTS/APPROVAL	
STAMP ALL PREVIOUS REVISION AS SUPERSEDED	
ISSUED BY	
NAME	MP
SIGNATURE	Sd/-
DATE	14/02/2011

LEGEND

1 — 110-Y25 — DIA OF BARS (MM)
NUMBER OF BARS
BAR MARK
32Y-250 — BAR SPACING(MM)
DIA OF BARS (MM.)

REV.	DATE	ALTD	CHD	APPD
01	14.02.11	L.P.	M.P.	R.K.

REVISED AS PER TCE'S COMMENTS RECEIVED VIDE TRANSMITTAL NO. TCE-5064A-CV-BHEL (PEM)-VOT-085 DATED 03-02-2011 & MKD AS △1

JOB NO.	281
STATUS	CONTRACT
DISTRIBUTION	
PRINT SCALE IN METRE	0 2 4 6 8 10 20 30 40 50

OWNER: GSECL GUJARAT STATE ELECTRICITY CORPORATION LTD.

PROJECT: 2 X 250 MW SIKKA THERMAL POWER PROJECT (EXTENSION UNITS 3 & 4) DIST. JAMNAGAR

CONSULTANTS: TCE CONSULTING ENGINEERS LTD, BANGALORE

BHARAT HEAVY ELECTRICALS LTD
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
NEW DELHI

DEPT CODE		NAME	SIGN	DATE
C	DRN	DRS	-sd-	06.01.2011
	DESN	LP	-sd-	03.01.2011
	CHD	MP	-sd-	07.01.2011
	APPD	RK	-sd-	10.01.2011

TITLE: CHIMNEY
REINFORCEMENT DETAILS OF CHIMNEY RAFT

CIVIL	ELEC	C&I	MSE	MAX	DEPT.	SCALE 1:125
					SIGN	
					DATE	

DRAWING NO. PE-DG-281-620-C003

SHEET 1 OF 2 REV. 1

Jan 04, 2005 - 11:47am
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