

RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LIMITED
SURATGARH SUPERCRITICAL TPS , STAGE –V,(UNIT 7 & 8)
(2X660 MW)

**TECHNICAL SPECIFICATIONS
FOR
PROOF CHECKING Of DESIGN**

SPECIFICATION NO. PE-TS-392-600-C002



BHARAT HEAVY ELECTRICALS LIMITED
Project Engineering Management
PPEI BUILDING, HRD & ESI COMPLEX
Plot No. 25, Sector 16A
NOIDA, U.P. – 201301
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PROJECT ENGINEERING MANAGEMENT

(CIVIL ENGINEERING DEPARTMENT)

CALCULATION SUMMARY SHEET



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Job No.	:	392	
Document No.	:	PE-TS-392-600-C002	
Building / System	:	PROOF CHECKING OF DESIGN	Sheet 3 - 15
Subject	:	TECHNICAL SPECIFICATIONS FOR PROOF CHECKING OF DESIGN	

Rev. No.	Particulars	Prepared By	Chkd. By	Apprd. By	Remarks
0	Name	PRAYANK	AK	AKS	
	Sign	<i>Prayank</i>	<i>AK</i>	<i>AKS</i>	
	Date	22-7-13	22-7-13	22-7-13	
1	Name				
	Sign				
	Date				
2	Name				
	Sign				
	Date				

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SECTION 'A'

SCOPE OF WORK



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SCOPE OF WORK SHALL INCLUDE THE FOLLOWING:-

1. Proof checking of structural design and connection for following structures submitted by BHEL:

- a. Design of TG Foundation including review of NDT test results submitted by BHEL for TG column and Deck slab after construction.
- b. Design and connection for Power House Building Main structural Framework.
- c. Design and connection of Mill/Bunker building main structural frame work including design of bunkers.
- d. Design of 275 m High RCC chimney.
- e. Design of Natural Draft Cooling Tower.

2. Issue of report for adequacy of design submitted by BHEL for structures mentioned in S. No.1 :



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SECTION 'B'

PROJECT INFORMATION



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PROJECT INFORMATION

OWNER	RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LTD, JAIPUR
CONSULTANT	TATA CONSULTING ENGINEERS LTD., BANGLORE
NAME OF PROJECT	2X660 MW SURATGARH TPS (UNIT 7&8)
Site Location	PRABAT NAGAR, SURATGARH, SRIGANGANAGAR DISTRICT, RAJASTHAN LATITUDE: 29 DEG. 10 MIN. N LONGITUDE: 74 DEG. 01 MIN. E ELEVATION ABOVE MEAN SEA LEVEL: 186M (APPROX.)
Climatic Conditions:	
Temperature : Monthly Basis	
Mean of Daily Max Mean of Daily Min	32.8 ° C (In the month of May) 17.6 ° C (In the month of Jan)
Temperature : Annual Basis	
Mean of Daily Max Mean of Daily Min	32.3 ° C 19.6 ° C
Highest Temp Recorded	50 ° C
Lowest Temp Recorded	(-) 2.8 ° C
Relative Humidity	Varies between 21% AND 81%
Annual Average Rainfall	312mm
Rain fall Intensity for design of Storm Water Drains	40mm/hr
Wind Load : Calculations for wind effect shall be in accordance with IS 875-4987 (Part-3) taking into account the following:	a) Basic Wind Speed =47m/sec b) Factor K1= 1.07 c) Category of terrain = Category 2 d) K3- as per IS 875
Seismic Data	a) Zone- II b) Design and design coefficient shall be based on IS 1893:2002



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SECTION 'C'

SPECIFIC TECHNICAL REQUIREMENTS



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1. General :

- 1.01. Vendor shall conduct proof checking of structures/ building mentioned in scope of work and issue a report for design adequacy of structures.
- 1.02. Following drawings, documents and analysis files shall be submitted by BHEL to facilitate proof checking of design.
- I. Static and dynamic analysis of TG deck. (Refer Annexure-A.1 for list of documents)
 - II. GA and RC detail of TG Deck (Refer Annexure-A.2 for list of Drawings) .
 - III. Test results of NDT of TG column and deck slab after construction for review.
 - IV. Analysis file e.g. Staad file of main frame of Power House Building or any other word/ Excel file used for calculation. (Refer Annexure-B.1 for list of documents).
 - V. Main frame drawings of Power House Building, Bunker and Bunker supporting frame (Refer Annexure-B.2 for list of Drawing).
 - VI. Design of Bunker and bunker supporting girder. (Refer Annexure-C.1 for list of documents).
 - VII. GA of bunker (Refer Annexure-C.2 for list of Drawings).
 - VIII. GA and RC detail of Chimney (Refer Annexure-D.1 & D1.2 for list of documents and drawings respectively).
 - IX. GA and RC detail of Natural Draft Cooling Tower (NDCT) (Refer Annexure-E.1 & E.2 for list of documents and drawings respectively).
- 1.03. The list of drawings/documents furnished in Annexure- A to Annexure-E are indicative only. Any other drawings and document required for completeness of proof checking of structures mentioned in Cl. No-1 of Section –A shall also be reviewed by proof checking agency.

2. Procedure for Submission of documents and proof checking of design :

- 2.01. BHEL shall submit the design document/ drawings mentioned in cl no 1.02 in the soft format only. However, NDT test shall be conducted by BHEL after completion of TG foundation and BHEL shall furnish NDT test results for review.
- 2.02. On receipt of drawings/ documents/analysis file from BHEL, Vendor shall take maximum of two weeks' time to furnish their comments through emails to BHEL for incorporation.
- 2.03. BHEL shall revise drawings/documents/analysis file based on comments furnished and submit the same for final approval. Accordingly vendor shall issue a report for adequacy of structural design submitted by BHEL in soft as well as in hard copy .

3. Documents to be submitted by vendor

- i. Soft copy of report for adequacy of structural design of structures/building as per scope.
- ii. 5 Hard copy of report for adequacy of structural design of structures/building as per scope.



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4. Price Schedule:

The vendor shall furnish a break up of price schedule for proof checking of design submitted by BHEL as per proposed format indicated in Table-1 of Annexure- F.

The vendor shall also furnish schedule of charges for visit to BHEL office in Delhi/Noida, Visit to site at Suratgarh/ Customer office in Jaipur/ customer consultant's office in Bangalore as per proposed format indicated in Table-2 of Annexure-F. Unit of visit shall be considered as 3 days or part thereof as per Table-2 of Annexure-F.

5. Terms of Payment :

80 % Lump sum price	On first review report of proof checking on pro rata basis.
20 % Lump sum price	On issue of final report for adequacy of structural design submitted by BHEL on pro rata basis.

The billing schedule submitted by the vendor shall be subjected to approval by BHEL for facilitating pro-rata payments.

6. Validity of Contract :

The fees and other rates shall remain firm up to 31st Dec 2015. If the contract has to be extended beyond the stipulated period due to reasons beyond the control of vendor, then the balance lump sum fees and other rates will be escalated at mutually agreed rates.



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Annexure-A

List of Documents/ Drawings provided by BHEL for proof checking of Design of TG deck

A.1 List of documents

S. No.	Document No.	Title
1	PE-DC-392-613-C001	T.G. FOUNDATION : DYNAMIC ANALYSIS
2	PE-DC-392-613-C002	T.G. FOUNDATION : STATIC ANALYSIS
3	PE-DC-392-613-C003	T.G. FOUNDATION : DESIGN OF T.G. DECK GIRDERS

A.2 List of drawings

S. No.	Drawing No.	Title
1	PE-DG-392-613-C001	T.G. FDN -GA OF SUB-STRUCTURE RAFT
2	PE-DG-392-613-C002	T.G. FDN -G.A. OF SUB-STRUCTURE RAFT SECTION
3	PE-DG-392-613-C003	T.G FDN-REINFORCEMENT DETAILS OF SUBSTRUCTURE UP TO(+ -) 0.0 M
4	PE-DG-392-613-C007	T.G FDN.-GA OF TOP DECK: PLAN OF TOP DECK
5	PE-DG-392-613-C008	T.G FDN.-GA OF TOP DECK: EMBEDMENT AT BOTTOM OF DECK
6	PE-DG-392-613-C009	T.G FDN.-GA OF TOP DECK: SECTIONS
7	PE-DG-392-613-C012 to C019	T.G FDN.-R.C DETAIL OF TOP DECK



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Annexure-B

List of Documents/ Drawings provided by BHEL for proof checking of Design and connection of
Power House Building Main Structural Framework

B.1 List of documents

S. No.	Document No.	Title
1	PE-DC-392-612-C001	PH BLDG. - ANALYSIS AND DESIGN OF MAIN FRAME
2	PE-DC-392-612-C004	PH BLDG. -DESIGN OF GANTRY GIRDERS

B.2 List of drawings

S. No.	Drawing No.	Title
1	PE-DG-392-612-C001	PH BLDG. - STRUCTURAL FRAMING ALONG A ROW
2	PE-DG-392-612-C002	PH BLDG. - STRUCTURAL FRAMING ALONG B ROW
3	PE-DG-392-612-C003	PH BLDG. - STRUCTURAL FRAMING ALONG C ROW
4	PE-DG-392-612-C004	PH BLDG. - STRUCTURAL FRAMING ALONG D & E/A ROW
5	PE-DG-392-612-C006	PH BLDG. - DETAILS OF ROOF TRUSS.
6	PE-DG-392-612-C007	PH BLDG. -GA AND DETAILS OF GANTRY GIRDERS
7	PE-DG-392-612-C012	PH BLDG. - DETAILS OF GABLE END COLUMNS
8	PE-DG-392-612-C009	PH BLDG.-DETAILS OF INTERMEDIATE COLUMNS



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Annexure-C

List of Documents/ Drawings provided by BHEL for proof checking of Design of Bunker and Bunker supporting Girders

C.1 List of documents

S. No.	Document No.	Title
1	PE-DC-392-616-C001	MILL & BUNKER BAY - DESIGN OF BUNKER & SUPPORTING GIRDERS

C.2 List of drawings

S. No.	Drawing No.	Title
1	PE-DG-392-616-C013	BUNKER BAY - G.A. OF BUNKERS & SUPPORTING DETAILS
2	PE-DG-392-616-C014	BUNKER BAY - DETAILS OF BUNKERS & SUPPORTING DETAILS



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Annexure-D

List of Documents/ Drawings provided by BHEL for proof checking of Design of Chimney

D.1 List of documents

S. No.	Document No.	Title
1	PE-DC-392-620-C001	CHIMNEY: DESIGN OF MAIN SHELL
2	PE-DC-392-620-C002	CHIMNEY: DESIGN OF CHIMNEY FOUNDATION
3		

D.2 List of drawings

S. No.	Drawing No.	Title
1	PE-DG-392-620-C001	GENERAL ARRANGEMENT
2	PE-DG-392-620-C002	G.A. OF FOUNDATION & DETAIL OF STARTER BARS
3	PE-DG-392-620-C003	REINFORCEMENT DETAILS OF FOUNDATION
4	PE-DG-392-620-C004	SHUTTERING & R.C. DETAILS OF CHIMNEY SHELL
5	PE-DG-392-620-C005	DETAILS OF SHELL OPENINGS
6	PE-DG-392-620-C006	DETAILS OF EXTRA REINFORCEMENT AROUND OPENINGS



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Annexure-E

List of Documents/ Drawings provided by BHEL for proof checking of Design of NDCT

E.1 List of documents

S. No.	Document No.	Title
1	xxx	Finite Element Analysis of Ring beam, Raker Column Pedestals , Raker Columns and shell

E.2 List of drawings

S. No.	Drawing No.	Title
		RC Details of Foundation - Ring Beam
1	xxx	RC Details of Foundation - Ring Beam
2	xxx	RC Details of Column pedestal
3	xxx	RC Details of Raker Column
4	xxx	RC Details of Vertical Reinforcement in Shell



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Annexure-F

Proposed format for Price Schedule

Table-1

S. No.	Scope of Work	Total Amount (In Rupees)
4.1	a. Proof checking of Design of TG Foundation	
	b. Review of NDT test results submitted by BHEL for TG column and Deck slab after construction.	
4.2	Design and connection for Power House Building Main structural Framework.	
4.3	Design and connection of Mill/Bunker building main structural frame work including design of bunkers.	
4.4	Design of 275 m High RCC Chimney	
4.5	Design of Natural Draft Cooling Tower (NDCT)	
	Total	
	Service Tax	
	Grand Total	

Table-2

S. No.	Scope of Work	Estimated No of visit		Total Amount (In Rupees)
1	Outstation visit to BHEL offices in Delhi/Noida	02	Travel Cost	
			Boarding/Lodging/Local Conveyance (per day)	
2	Visit to site at Suratgarh/ Customer office in Jaipur/ customer consultant's office in Bangalore	03	Travel Cost	
			Boarding/Lodging/Local Conveyance (per day)	
			Total	
			Service Tax	
			Grand Total	

Rate to include all expenses of the vendor with no other expenses to be borne by BHEL.