
 BHEL PEM	Technical Specification for Preparation of Structural Steel Detailed Fabrication Drawings	Specification Number: PE-TS-520-612-C001
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1 X 800 MW SIPAT SUPER THERMAL POWER PROJECT

Technical Specification for

Preparation of Detailed Fabrication Drawings of Structural Steel Works

Bharat Heavy Electricals Limited
Project Engineering Management, Noida
(A Government of India Undertaking)


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Project Title	:	1 X 800 MW SIPAT SUPER THERMAL POWER PROJECT - Preparation of Detailed Fabrication Drawings of Structural Steel Works
Job No.	:	520
Document No.	:	PE-TS-520-612-001
Subject	:	Technical Specifications for Preparation of Detailed Fabrication Drawings of Structural Steel Works

Rev. No.	Particulars	Prepared By	Checked By	Reviewed By	Approved By	Remarks
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	Sign.					
	Designation	Sr. Manager	PE (DGM)	SH-4 (Sr. DGM)	DH (AGM)	
	Date					

REFERENCES:-

1. Document No. PE-TS-520-612-002 ---- Technical Prequalifying Requirements for Preparation of Detailed Fabrication Drawings of Structural Steel Works

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1. GENERAL

This specification covers preparation of detailed fabrication drawings required for fabrication and erection of steel structures in 1 x 800 MW Sipat Super Thermal Power Plant project in Chhattisgarh State. Steel structures shall have bolted field connections, unless noted otherwise.

2. Scope of Work:

The scope of work shall include but not be limited to following.

- a. Preparation and submission of 3D model and detailed fabrication drawings using TEKLA 3D software for the buildings/structures mentioned elsewhere in the specification. The scope also includes obtaining approval of the drawings from BHEL. BHEL shall furnish the engineering drawings as the input to the bidder, including revision in case of change of input.
- b. Visit to BHEL office in Noida/Project Site at Sipat as and when required.

3. Buildings/Structures

A broad list of buildings/structures for which detailed fabrication drawings are to be prepared is indicated in Annexure-A. However, bidder shall have to prepare the drawings for any other buildings/structures as required for completion of work.


4. Technical Requirements

a. Preparation and submission of detailed fabrication drawings:

Preparation and submission of detailed fabrication drawings shall include/meet the following.

1. Design of joints/connections shall be submitted to BHEL. The design shall be by Limit State method conforming to IS 800.
2. Preparation of 3D model, and submission of editable 3D model with complete Tekla folder to BHEL for review/approval. On review, BHEL comments if any shall be incorporated.
3. Furnishing consolidated quantity to BHEL for initiation of procurement of material in advance.
4. Erection marking drawings and detailed fabrication drawings shall necessarily be extracted from approved 3D model and submitted to BHEL in pdf format and editable soft format. These drawings shall include bill of materials and material codification as well.
5. The work shall conform to specification/IS Codes/relevant standards.

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6. The software shall be genuine, validated and latest version.
7. The drawing template to be adopted shall be approved by BHEL.
8. BHEL's clarifications/queries if any shall be immediately resolved.
9. Any modification/correction in the approved drawing as required.
10. The section wise net weight of steel including diameter wise bolt assembly shall be mentioned in the drawing which shall be measured for the purpose of payment. This weight shall include all the steel sections and connections shown in the drawing. Monthly report of these quantities for the drawings submitted / released shall be furnished by the bidder.


b. Bidder shall visit BHEL PEM, Noida/Sipat site for official purposes as and when called by BHEL.

5. Codes & Standards

All work under this specification shall, unless otherwise specified, conform to the requirements of the latest revision and/or replacements of the following or any other relevant Indian Standards. In case any particular aspect of the work is not specifically covered by any Indian Standard specification, any other standard practice, as may be specified by the Engineer shall be followed.

- IS : 226 - Structural steel (Standard Quality)
- IS : 800 - Code of Practice for general construction in steel.
- IS : 806 - Code of practice for use of steel tubes in general building construction.
- IS : 808 - Rolled steel beams, channels, and angle sections
- IS : 813 - Scheme of symbols for welding
- IS : 814 - Covered electrodes for metal arc welding of structural steel
- IS : 815 - Classification and coding of covered electrodes for metal arc welding of structural steels.
- IS : 816 - Code of practice for use of metal arc welding for general construction in mild steel
- IS : 817 - Code of practice for training and testing metal arc welders
- IS : 818 - Code of practice for safety and health requirements in electric and gas welding and cutting operations
- IS : 822 - Code of practice for inspection of welds
- IS : 919 - Recommendations for limits and fits for Engineering
- IS : 961 - Structural Steel (High Tensile)
- IS : 1161 - Steel Tubes for structural purposes
- IS : 1200 - Method of measurement of steelwork and ironwork (Part 8)
- IS : 1363 - Black hexagon bolts, nuts and lock nuts (dia. 6 to 30 mm) and black hexagon screws (dia 6 to 24 mm)
- IS : 1364 - Precision and semi-precision hexagon bolts, screws, nuts and locknuts (dia, range 6 to 39 mm)
- IS : 1367 - Technical supply conditions for threaded fasteners

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- IS : 1442 - Covered electrodes for the metal are welding of high tensile structural steel
- IS : 1608 - Method for tensile testing of steel products other than sheet strip, wire and tube
- IS : 1730 - Dimensions for steel plate, sheet, and strip for structural and general engineering purposes.
- IS : 1731 - Dimensions for steel flats for structural and general engineering purposes
- IS : 1852 - Rolling and cutting tolerances for hot-rolled steel products
- IS : 1977 - Structural steel (ordinary quality) St-42-0
- IS : 2062 - Steel for General Structural Purposes
- IS : 2074 - Ready mixed paint, red oxide Zinc chromate priming
- IS : 2595 - Code of Practice for Radiographic Testing
- IS : 2629 - Recommended practice for Hot-Dip Galvanizing of Iron and Steel
- IS : 3757 - High strength structural bolts
- IS : 4000 - High Strength Bolts in steel Structures
- IS : 4759 - Specifications for Hot-Dip Zinc Coatings on Structural Steel and other allied products
- IS : 7205 - Safety Code for Erection of Structural Steelwork
- IS : 7215 - Tolerances for fabrication of steel structures
- IS : 7280 - Bare wire electrodes for submerged arc welding of structural steels.
- IS : 9595 - Recommendations for metal arc welding of carbon and carbon manganese steel.


6. Procedure for Submission of Drawings / Documents

- a. BHEL shall provide input data in soft format in the form of STAAD files, civil engineering drawings in pdf format, sketches, etc.
- b. Submission schedule of 3D model and detailed fabrication drawings shall be as follows.
 - Submission of 3D model corresponding to the input data furnished by BHEL with connections and its design shall be within 15 calendar days after receipt of engineering drawings/inputs.
 - Submission of revised model shall be within 5 calendar days after receipt of comments.
 - Submission of erection marking and detailed fabrication drawings shall be within 5 calendar days after approval of 3D model.
 - Resolutions/clarifications on the queries raised by BHEL shall be within 2 calendar days after receipt of queries.

7. Secrecy/ Confidentiality

All information including engineering inputs etc shall remain property of BHEL. All information generated by the bidder during the execution of the project such as designs, drawings, documents and 3D model etc shall be exclusive property of BHEL and its intellectual property rights shall be of BHEL. BHEL shall have full right to use these deliverables in any manner suitable to BHEL business requirements. Bidder shall sign non-disclosure agreement as required by BHEL in this respect.

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8. Time Schedule

Time for completion of all works / services shall be 18 months from the date of award of work.

ANNEXURE-A : LIST OF BUILDINGS/STRUCTURES

SI No	Building/Structures	Tentative Weight (MT)
1	Main Power House + CCR	11060
2	Mill & Bunker Bay	6530
3	Pipe & Cable Racks	2290
4	TG Platform	145
5	Integrated Ball Mill building with Day Silo	990
6	Gypsum dewatering building	865
7	Covered Steel Shed	510
8	CW System	275
9	ETP-UF RO Shed	365
10	DM Plant Building	340
11	CHP-WWTP, Chem dosing, chem house & filter press	300
12	Compressor house	185
13	Workers' rest room	155
14	Service water PH+Clarified water PH+CST PH+DM PH	125
15	Misc MCCs	140
16	PT Plant facilities	30
17	Parking sheds	55
18	FOPH	45
19	First aid centre with creche	45
20	CLO2 Bldg	15
21	DG sets	15

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SI No	Building/Structures	Tentative Weight (MT)
22	Chimney steel platform & staircase	330
	Total	24810

The list of buildings and the weight mentioned are tentative. Bidder shall have to prepare the drawings for any other buildings/structures as required for completion of work. Actual weight will be derived post completion of respective drawings.