
 BHEL PEM	Technical Specification for Preparation of Structural Steel Detailed Fabrication Drawings	Specification Number: PE-TS-519-612-C001
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2x800MW DVC KODERMA THERMAL POWER STATION PHASE-II

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)

ISSUED BY BHEL PEM NOIDA		Page 1 of 8
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 BHEL PEM	Technical Specification for Preparation of Structural Steel Detailed Fabrication Drawings	Specification Number: PE-TS-519-612-C001
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Project Title	: 2x800MW DVC KODERMA THERMAL POWER STATION PHASE-II - Preparation of Detailed Fabrication Drawings of Structural Steel Works
Job No.	: 519
Document No.	: PE-TS-519-612-001
Subject	: Technical Specifications for Preparation of Detailed Fabrication Drawings of Structural Steel Works

Rev. No.	Particulars	Prepared By	Checked By	Approved By	Remarks
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	Sign.				
	Designation	Manager	PE (DGM)	SH-1 (AGM)	
	Date				

REFERENCES :-

1. Document PE-TS-519-612-C002 ---- Technical Prequalifying Requirements for Preparation of Detailed Fabrication Drawings of Structural Steel Works

 BHEL PEM	Technical Specification for Preparation of Structural Steel Detailed Fabrication Drawings	Specification Number: PE-TS-519-612-C001
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1. INTRODUCTION

Fabrication drawings of structural steel works are prepared based on engineering drawings and are used to manufacture, procure, fabricate, erection etc. for structural steel work.

2. GENERAL


This specification covers preparation of detailed fabrication drawings required for fabrication and erection of steel structures in 2x800MW DVC KODERMA THERMAL POWER STATION PHASE-II in Jharkhand State. Steel structures shall have bolted field connections, unless noted otherwise.

3. SCOPE OF WORK:

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

- a. Preparation and submission of 3D model with connections and detailed fabrication drawings using TEKLA software. 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. This work shall include/meet the following:
 - i) Design of joints/connections shall be submitted to BHEL. The design shall be by Limit State method conforming to IS 800.
 - ii) Preparation of 3D model, and submission of editable 3D model with complete Tekla folder to BHEL for review/approval. BHEL comments, if any, shall be incorporated.
 - iii) Furnishing consolidated quantity to BHEL for initiation of procurement of material in advance.
 - iv) 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.
- b. Extraction and submission of detailed fabrication drawings from 3D model provided by BHEL using Tekla software. BHEL shall furnish the TEKLA 3D model of structures along with connections as input to the bidder, including revision. This work shall include/meet the following:
 - i) Review of 3D model with connections provided by BHEL and furnishing observations to BHEL with respect to completeness and any deficiency in the model for extraction of detailed fabrication drawings.
 - ii) Furnishing consolidated quantity to BHEL for initiation of procurement of material in advance.

ISSUED BY BHEL PEM NOIDA		Page 3 of 8
-----------------------------	--	-------------

 BHEL PEM	Technical Specification for Preparation of Structural Steel Detailed Fabrication Drawings	Specification Number: PE-TS-519-612-C001
--	--	---

- iii) Erection marking drawings and detailed fabrication drawings shall necessarily be extracted from the provided 3D model with connections and submitted to BHEL in pdf format and editable soft format.
- iv) Any modification/correction in the approved drawing, as required by BHEL.
- c. Visit to BHEL office in Noida as and when called by BHEL.

4. BUILDINGS/STRUCTURES

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

5. TECHNICAL REQUIREMENTS


- i. The work shall conform to specification/IS Codes/relevant standards.
- ii. The software shall be genuine, validated and latest version.
- iii. The drawing template to be adopted shall be approved by BHEL.
- iv. BHEL's clarifications/queries if any shall be immediately resolved.
- v. Any modification/correction in the approved drawing/model, as required by BHEL.
- vi. 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.
- vii. Tekla structures model shall be shared between BHEL and successful bidder using Tekla Model Sharing (Cloud technology).

6. 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.

ISSUED BY BHEL PEM NOIDA		Page 4 of 8
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 BHEL PEM	Technical Specification for Preparation of Structural Steel Detailed Fabrication Drawings	Specification Number: PE-TS-519-612-C001
--	--	---

- 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
- IS : 1442 - Covered electrodes for the metal arc 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.


7. Procedure for Submission of Drawings / Documents

a) Procedure for Submission of Drawings / Documents for scope of work as per CI

No. 3(a):

- i. BHEL shall provide input in soft format in the form of STAAD files, civil engineering drawings in pdf format, sketches etc.

ISSUED BY BHEL PEM NOIDA		Page 5 of 8
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 BHEL PEM	Technical Specification for Preparation of Structural Steel Detailed Fabrication Drawings	Specification Number: PE-TS-519-612-C001
--	--	---

ii. Submission schedule of 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 from BHEL.
- 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.

b) Procedure for Submission of Drawings / Documents for scope of work as per CI No. 3(b):

- BHEL shall provide 3D model of structures along with connections in TEKLA.
- Submission schedule of detailed fabrication drawings shall be as follows:
 - Furnishing observations on 3D model within 5 calendar days after receipt of the same from BHEL.
 - Submission of erection marking and detailed fabrication drawings shall be within 5 calendar days after finalization of 3D model.
 - Resolutions/clarifications on the queries raised by BHEL shall be within 2 calendar days after receipt of queries.


8. 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.

9. Time Schedule

Time for completion of all works / services shall be 24 months from the date of award of work.


ISSUED BY BHEL PEM NOIDA		Page 6 of 8
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 BHEL PEM	Technical Specification for Preparation of Structural Steel Detailed Fabrication Drawings	Specification Number: PE-TS-519-612-C001
--	--	---

ANNEXURE-A: LIST OF BUILDINGS/STRUCTURES

Sl. No.	Buildings/Structures
1	Main Power House including Common Control Room
2	Mill & Bunker Bay
3	Pipe & Cable Racks
4	TG Platform
5	Ball Mill building & Day Silo Structure
6	Gypsum dewatering building
7	CW System
8	ETP-UF RO Shed
9	DM Plant Building
10	CHP-WWTP, Chem dosing, chem house & filter press
11	Compressor house
12	Shed for Construction Workers and O & M workers
13	Service water PH + Clarified water PH + CST PH + DM PH
14	Pump Houses (FOPH, RWPH. RC oxidation Pump House, Other misc Pump Houses etc)
15	CLO2 Bldg
16	O & M store, Maintenance bldg
17	Chimney steel platform & staircase
18	Any other Steel Building

The list of buildings is tentative. Bidder shall have to prepare the drawings for any other buildings/structures as required for completion of work.

 BHEL PEM	Technical Specification for Preparation of Structural Steel Detailed Fabrication Drawings	Specification Number: PE-TS-519-612-C001
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Price Schedule Format					
NAME OF PROJECT:		2x800MW DVC KODERMA TPS PHASE-II			
NAME OF PACKAGE: Preparation of Detailed Fabrication Drawings of Structural Steel Works		Enquiry No.:			
TECHNICAL SPECIFICATION No:		PE-TS-519-612-C001			
Sl. No.	DESCRIPTION	UNIT	QTY	Unit Ex-Works Price (INR)	Total Ex-Works Price (INR)
			A	B	C=A*B
1	Preparation and submission of 3D model and detailed fabrication drawings using TEKLA software all complete as per specification and as directed by the engineer in charge.	MT	7,300		
2	Extraction and submission of detailed fabrication drawings from 3D model provided by BHEL using TEKLA software all complete as per specification and as directed by the engineer-in-charge.	MT	24,000	Refer Note	
3(a)	Travel (To & fro) for visit to BHEL-PEM office at Noida as and when called by BHEL.	Man-visit	10		
3(b)	Boarding/Lodging during visit at BHEL-PEM office, Noida as and when called by BHEL.	Man-Days	20		
	Grand Total				

Note: Bidder shall quote unit price in the highlighted cell only, Unit price for sl. no 2 shall be considered as 60% of the unit price quoted in sl. no 1.