1X800 MW YAMUNANAGAR DCRTPP

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)

Project Title	:	1X800 MW YAMUNANAGAR DCRTPP- Preparation of Detailed Fabrication Drawings of Structural Steel Works
Job No.	:	510
Document No.	:	PE-TS-510-612-001
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 (Sr. Mgr)	SH-4 (Sr.DGM)	
	Date				

REFERENCES: -

1. Document PE-TS-510-612-C002 ---- Technical Prequalifying Requirements for Preparation of Detailed Fabrication Drawings of Structural Steel Works

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 1X800 MW DCRTPP in Yamuna Nagar, Haryana. Steel structures shall have welded 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.

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.

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 l locknuts (dia, range 6 to 39 mm)
IS : 1367 - Technical supply conditions for threaded fasteners
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.

7. Procedure for Submission of Drawings / Documents

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

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 Cl No. 3(b):

i. BHEL shall provide 3D model of structures along with connections in TEKLA.

ii. 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.

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	Day Silo supporting structure
6	CW System
7	Fuel oil pump house
8	Clarified cum fire water pump house
9	Ammonia storage building
10	Compressor house
11	Air Washer Room
12	Pump Houses (Fuel Oil, Raw Water, Rain Water Harvesting & other misc Pump Houses)
13	ETP-UF RO Shed
14	Parking Sheds
15	Chimney steel platform & staircase
16	Any other Steel Building & Misc. structures

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

Price Schedule Format

NAME OF PROJECT:		1X800 MW YAMUNANAGAR DCRTPP			
NAME OF PACKAGE: Preparation of Detailed Fabrication Drawings of Structural Steel Works		**Enquiry No.:**			
TECHNICAL SPECIFICATION No:		**PE-TS-510-612-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	14,000		
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	1200	Refer Note	
3(a)	Travel (To & fro) for visit to BHEL-PEM office at Noida as and when called by BHEL.	Man-visit	5		
3(b)	Boarding/Lodging during visit at BHEL-PEM office, Noida as and when called by BHEL.	Man-Days	10		
	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.