

KARNATAKA POWER TRANSMISSION CORPORATION LIMITED

SECTION - STRUCTURES

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1.0 GENERAL

- 1.1 The scope of specification covers fabrication, protoassembly, supply & erection of galvanized steel structure of towers, girders & equipments structure. Towers, girders, support structure shall be lattice/tubular type structure fabricated from structural steel conforming to IS:2062 (latest). Single line diagrams are provided for lattice type towers/ girders/lightning mass. Bidder has to develop the structural drawing for the same based on the single- line diagrams and switchyard diagram. Based on the switchyard requirements like live- point height, phase to phase dimension and weight, dimensions of the equipment / post insulators, the supporting structures are to be designed by the successful bidder, which shall be approved by the owner. Lattice type structures are proposed for all equipments and tubular type is proposed for post insulators.

The scope shall include all types of bolts, nuts, hangers shackles, clamps step bolts, inserts in concrete , gusset plates, equipment mounting bolts, structure earthing bolts, foundation bolts, spring washers, fixing plates, angles & bolts for structure mounted or ground mounted marshalling boxes AC/DC Marshalling box & equipment control cabinets and any other item as required to complete the job.

The connection of all structures to their foundations shall be by base plates embedded anchor/ foundation bolts. All steel structures & anchor/ foundation bolts shall be fully galvanized. The weight of the zinc coating shall be atleast 610gms/sqm for anchor/ foundation bolts & for structural members. One additional nut shall be provided below the base plate, which may be used for the purpose of leveling.

1.2 Lighting/Lightning masts

The lighting/Lightning masts shall be fabricated as per owner's design and fabrication drawings lighting masts shall be provided with the structural steel ladder. The ladder shall be provided with protection rings. Platform shall be provided for mounting of lighting fixtures. The platform shall also have protection railing. Floor of the platform shall be made out of chequered plates of suitable thickness.

1.3 DESIGN DRAWINGS, BILL OF MATERIALS AND DOCUMENTS

The towers beams and lightning/Lighting masts shall be fabricated as per the single line diagrams furnished. In the part 1 of Technical specifications, only the single line diagrams enclosed.

In respect of support (mounting) structures, the bidder has to quote as per their own designs. Successful bidder has to furnish the design/ drawings based on the equipments to be supplied, heights to be maintained which shall be approved by owner. Only after getting the due approval of the owner the fabrication work shall be taken up.

- 1.3.2 The fabrication drawing and Bill Of Materials(BOM) in respect of towers and beams shall be developed by the bidder based on the single-line diagram furnished. In case of support structures the bidder has to develop the fabrication drawing and the BOM based on the inputs from switchyard drawings and parameters of the equipment to be supplied.

FABRICATION OF STEEL:

The contractor shall bear the expenditure at all stage on account of loading unloading transportation and other miscellaneous expenses and losses and damages for all materials up to the fabrication yard shop and there-after to the erection site including all other expenses till the erection of work has been completed and accepted. The unit rates shall be deemed to be inclusive of all such incidental expenses and nothing extra shall be payable on any account in this regard.

The fabrication and erection shall be carried out generally in accordance with IS: 802 (latest). A reference however may be made to IS: 800(latest) in case of non-stipulation of some particular provision in IS: 802 (latest). All materials shall be completely shop fabricated furnished with proper connection material & erection marks for ready assembly in the field.

1.5 ASSEMBLY:

- i) The component parts shall be assembled in such a manner that they are neither twisted nor otherwise damaged & shall be so prepared that the specified champher, if any, is provided. In order to minimize distortion in member the component parts shall be positioned by using the clamps, clips, dogs, jigs & other suitable means & fasteners (bolts & welds) shall be placed in a balanced pattern. If the individual components are to be bolted paralleled & tapered, drifts shall be used to align the part so that the bolts can be accurately positioned.
- ii) Proto type assemblies of towers, beams & lightening masts shall be trial assembled keeping in view the actual site conditions, before erection, in the fabrication shop & shall be inspected & approved by owner before mass fabrication. Necessary match marks shall be

made on these components in the shop before disassembly & dispatching,

1.6 BOLTING

- i) Every bolt shall be provided with a spring washer under the nut so that no part of the threaded portion of the bolt is within the thickness of the parts bolted together.
- ii) All steel items, bolts, nuts & washers shall be hot dip galvanized.
- iii) 2% extra nuts & bolts shall be supplied for erection-

1.7 WELDING:

The work shall be done as per approved fabrication drawing which clearly indicate various details of joints to be welded, type of weld, length & size of weld, whether shop or site weld. Symbols for welding on erection & shop drawings shall be according to IS: 813. Efforts shall be made to reduce site welding so as to avoid improper welding due to constructional difficulties.

1.8 FOUNDATION BOLTS:

- 1.8.1 Foundation bolts for the towers & equipment supporting structures & elsewhere shall be embedded in first stage concrete while the foundation is cast. The contractor shall ensure the proper alignment of these bolts to match the holes in the base plate.
- 1.8.2 The contractor shall be responsible for the correct alignment & leveling of all steelwork on site to ensure that the towers/ structures are plumb.
- 1.8.3 All foundation bolts for lattice structure, pipe structure are to be supplied by the contractor.
- 1.8.4 All foundation bolts shall be fully galvanized so as to achieve 0.61 Kgper.sq m. of zinc coating as per specifications

1.9 STABILITY OF STRUCTURE:

The supplier shall be responsible for the stability of the structure at all stages of its erection at site & take all necessary by the additions of temporary bracing's & giving equipment & their operations.

1.10 GROUTING:

The method of grouting the column base shall be subject to

approval of owner & shall be such as to ensure a complete uniform contact over the whole area of the steel base. The contractor will be fully responsible for the grouting operations.

1.11 GALVANIZING:

1.11.1 All structural steel works & single pipe supports shall be galvanized after fabrication as per IS:2629(latest) IS:4759 (latest).

1.11.2 Zinc required for galvanizing shall have to be arranged by the manufacturer. Purity of zinc to be used shall be 99.5% as per IS:209 (latest revision)

1.11.3 The contractor shall be required to make arrangement for frequent inspection by the owner as well as continuous inspection by a resident representative of the owner, if so desired for fabrication work.

1.12 INSPECTION BEFORE DISPATCH:

Each part of the fabricated steelwork shall be inspected certified by the owner or his authorized representative as satisfactory before it is dispatched to the erection site. Such certification shall not relieve the contractor of his responsibility regarding adequacy& completeness of fabrication.

1.13 TEST CERTIFICATE:

Copies of all test certificates relating to materials procured by the contractor for the works shall be forwarded to the owner.

1.14 ERECTION:

The contractor should arrange his own erection plant & equipment, welding set, tools &tackles, scaffolding, trestles equipment's etc-, & any other accessories & ancillaries required for the work. The erection work shall be started after concrete has acquired its full strength i.e, 14 days . The members shall not be subjected to any undue stress, damage to steel or galvanizing during erection.

1.15 SAFETY PRECAUTIONS:

The contractor shall strictly follow at all stages of fabrication, transportation & erection of steel structures, raw materials & other tools & Tackles, the stipulation contained in Indian Standard Code for erection for structural steel work as per IS: 7205. (Latest revision).

