

**BHARAT HEAVY ELECTRICALS LTD.
(TRANSMISSION BUSINESS GROUP)**

TERMS AND CONDITIONS FOR INDIGENOUS TENDER ENQUIRY

This Format is to be submitted in original duly signed by bidder. Deviation, if any, is to be brought out clearly in Schedule of Commercial Deviation giving clause-wise deviation. Any condition / clarification / deviation mentioned elsewhere may not be accepted.

Sr. No.	Standard Terms & Conditions	Enquiry No.- 255E325 Dated- 18.02.16
1.	<p>INSTRUCTION TO BIDDERS:</p> <p>a) Quotations are invited for the items mentioned in the enquiry.</p> <p>b) The tenders are invited and evaluated online through e-Procurement System. The bidder shall submit his response through bid submission to the tender on e-Procurement platform at https://bheleps.buyjunction.in.</p> <p>Foreign and indigenous vendors participating through open tenders/limited tender (Through E-procurement system) will necessarily have to buy Class-III digital certificates (DSCs) issued by certifying agencies in India.</p> <p>Procedure of getting obtaining DCSs can be down loaded from Important Links on link http://www.bhel.com/tender/tender_home.php or may be obtain from concern executive through email request.</p> <p>Successful bidder shall be responsible for completion of the contract in all respects. Techno commercial offers shall be opened through the E-Procurement portal. However this tender may be finalized through online Reverse Auction. Bidders are request to quote their most competitive prices through the online e-procurement portal / system.</p> <p>In case of any difficulty in operating the E-Tendering System, please call up our developer's Help Desk m Junction Services Ltd. at 033-6601 1717 or BHEL representative. Please ensure the submission of your most competitive offer before the due date in the E-Tendering Portal to avoid last minute hustle.</p> <p>c) The same shall be opened at 02.30 PM on the same day. Tenders received late may be rejected. Bids shall be submitted as per E-procurement system. Any other mode of submission of offer against aforesaid enquiry will not be entertained</p> <p>d) For any technical clarification please contact :</p> <p>Shri A.K. Meena, Sr. Manager (TBEM) BHARAT HEAVY ELECTRICALS LIMITED TRANSMISSION BUSINESS GROUP TOWER A, 5TH FLOOR, ADVANT NAVIS IT BUSINESS PARK, PLOT NO-7, SECTOR-142, EXPRESSWAY NOIDA, NOIDA-201305,</p>	

Sr. No.	Standard Terms & Conditions	Enquiry No.- 255E325 Dated- 18.02.16
	<p>DISTT- GAUTAM BUDH NAGAR, UP, INDIA Phone : 0120 – 6748545 E-mail : akmeena@bhel.in</p> <p><u>For any Commercial clarification, please contact:</u></p> <p>SH. S.C. SHIVHARE, SR. MGR.(TBMM) BHARAT HEAVY ELECTRICALS LIMITED TRANSMISSION BUSINESS GROUP TOWER A, 5TH FLOOR, ADVANT NAVIS IT BUSINESS PARK, PLOT NO-7, SECTOR-142, EXPRESSWAY NOIDA, NOIDA-201305, DISTT- GAUTAM BUDH NAGAR, UP, INDIA Phone : 0120-6748473 / 0120-6748471 Email: shashirai@bhel.in / scshivhare@bhel.in / a.kumar@bhel.in</p> <p>e) Price bid should contain only rates / prices, otherwise bid shall be liable for rejection.</p> <p>f) Price bid submitted along with the bid shall remain valid up to validity of offer. Unsolicited Supplementary / Revised price bid submitted during validity period of offer, unless asked by BHEL, shall not be considered. Withdrawal of quotation by the bidder, at any stage after its opening, may entail blacklisting of vendor.</p> <p>g) Enquiry condition for where the scope against this tender includes Installation and Commissioning of the equipment / material:</p> <p>There will be separate contract awarded for Supply portion and Site execution portion. For Supply portion Commercial Terms and Conditions mentioned herein shall be applicable & for Site execution portion Terms and Conditions for Installation services shall be applicable. However, any breach in either of the contracts shall be deemed as the breach of other contract also.</p>	
2.	<p>PRICES:</p> <p>A. The prices to be quoted are on FIRM basis</p> <p>B. The prices shall be on domestic basis.</p> <p>C. The prices are to be quoted on Ex-works basis. The break-up of prices shall be as under : -</p> <p>a) Ex-works Price: Ex-Works price including packing & forwarding Charges.</p> <p>b) Excise Duty: Extra as applicable to be quoted as percentage in both un-price bid and price bid.</p> <p>c) Sales Tax: ST / VAT / CST (against C form) as applicable to be quoted extra as percentage in un-priced and price bid. In case of inter-state sale-in-transit supplier/vendor will have to provide E1/E2 form.</p> <p>d) Entry tax / Octroi Charges: Any Entry tax / Octroi applicable at destination /</p>	

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	<p>destination state shall be paid extra on proof of such payment.</p> <p>e) Freight & Insurance: Freight and Transit Insurance for door delivery up to destination/site is to be quoted.</p> <p>Note: The purchase order shall be placed on Ex-works basis.</p> <p>“BHEL reserves the right to go for Reverse Auction (RA) instead of opening the sealed envelope price bid, submitted by the bidder. This will be decided after techno-commercial evaluation. All bidders to give their acceptance for participation in RA. Non-acceptance to participate in RA may result in non-consideration of their bids, in case BHEL decides to go for RA.</p> <p>In case BHEL decides to go for Reverse Auction, only those bidders who have given their acceptance to participate in RA will be allowed to participate in the Reverse Auction. Those bidders who have given their acceptance to participate in Reverse Auction will have to necessarily submit ‘online sealed bid’ in the Reverse Auction. Non-submission of ‘online sealed bid’ by the bidder will be considered as tampering of the tender process and will invite action by BHEL as per extant guidelines in vogue.”</p> <p>Further to above clause, please refer attached Annexure II for Terms & Conditions Of Reverse Auction Page 1 & 2)</p>	
3.	<p>TERMS OF PAYMENT:</p> <p>a) 100% payment along with taxes, duties, Freight & Insurance within 60 days (45 days for MSE Vendor) from the date of receipt of complete invoice in TBG, BHEL with following documents in 3 sets (Original + 2 copies).</p> <ul style="list-style-type: none"> • LR duly endorsed in the name of Customer by BHEL-Site • Material Receipt certificate issued by Site as per attached format • Excise invoice (where ED re-imburement is required) • Packing List (Case-wise) • Copy of Performance Bank Guarantee • Transit insurance Certificate from insurance Comp or intimation of Transit Insurance duly endorsed by insurance Comp. • MICC issued by BHEL • Guarantee Certificate <p>b) <u>Terms of payment for Type test charges:</u> 100% payment with taxes and duties on acceptance of test reports by BHEL on certification by BHEL engineering within 60 days from the date of receipt of clear invoice.</p>	
4.	<p>INTEREST LIABILITY: In case of any delay in payment due to any reason, BHEL shall not pay any interest on delayed payment.</p>	

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5.	<p>GUARANTEE: The equipment / material shall be guaranteed for 18 months from the date of delivery or 12 months from the date of commissioning, whichever is earlier. The defective material / component shall be replaced free of cost at site.</p>	
6.	<p>PERFORMANCE BANK GUARANTEE: Supplier shall submit BG within 30 Days of P.O. placement for a value of 2% of Ex-works value of Purchase Order Rev-0 and valid for a period of 18 months + 3 months claim period (i.e. Total 21 months) from the date of last delivery. Further BG shall be released only after ensuring submission of documents as per clause 3.5 of Technical specification (Final Engineering Documentation).</p>	
7.	<p>FINAL ENGINEERING DOCUMENTATION: Final Engineering Documentation as called in the specification is to be submitted within 3 months from the date of dispatch of material. Bank Guarantee pertaining to Purchase Order shall be released only after certification of documents submission as per Clause No. 3.5 of Tech Spec No. TB 370-618-006-RLS (STR) Rev 02.</p>	
8.	<p>INSPECTION: BHEL / customer / Third party shall inspect equipment / material before despatch. Stage inspection during manufacturing may also be carried out. Material to be despatched only after getting Despatch Clearance from BHEL. Supplier shall send inspection call on prescribed format only, with an advance notice of 15 days. Vendor shall forward all inspection and test reports for issue of MICC by BHEL. Road Permit Form request should also be given along with Inspection call.</p>	
9.	<p>DESPATCH DOCUMENTS: Following despatch documents are to be immediately sent to purchaser on despatch:</p> <ul style="list-style-type: none"> • Copy of LR • Packing List (Case-wise) • Insurance Certificate • Guarantee Certificate 	
10.	<p>DELIVERY PERIOD: Bidder to specify the delivery period in weeks from the date of LOI / PO in the Activity Schedule Format enclosed with enquiry. Time for conduction of type test, if required, is to be separately indicated. Note: LR date or Invoice date whichever is later shall be considered as delivery date.</p>	
11.	<p>DELAYED DELIVERY: In case of delay in execution of order beyond the lot wise contractual delivery, an amount of ½ % of total Ex-Works Value of Delayed Lot per week or part there-of subject to maximum of 10% Ex-Works Value of Delayed Lot will be levied.</p>	
12.	<p>VALIDITY: The offer shall be valid for 120 days from the due date of opening.</p>	

Sr. No.	Standard Terms & Conditions	Enquiry No.- 255E325 Dated- 18.02.16
13.	QUANTITY VARIATION: As per Technical Specification TB-370-618-006-RLS (STR) Rev 02	
14.	ACCEPTANCE / REJECTION OF TENDER: BHEL reserves the right to reject in full or part, any or all tender without assigning any reason thereof. BHEL also reserves right to vary the quantities mentioned in the tender.	
15.	EVALUATION: Comparative statement shall be prepared based on total quantity basis unless otherwise indicated in the enquiry. Evaluation of offers shall be done on the basis of delivered cost to BHEL.	
16.	DEVIATION: The bids having deviation(s) w.r.t. tender are liable for rejection. However, BHEL, at its discretion, may load the prices for evaluation of offer as per Loading Criteria for identified deviations mentioned in clause No. 26.	
17.	ARBITRATION: All cases of disputes emanating from and relating to this contract shall be referred to the sole arbitration of Unit Head / GM, BHEL or any other person nominated by him (including an employee of BHEL, even though he had to deal with the matter relating to this contract in any manner) to act as sole arbitrator. The arbitration shall be in accordance with 'The Arbitration and Conciliation Act 1996' and the rules there under as amended from time to time. The arbitrator shall give a reasoned award. The decision of the arbitrator shall be final & binding upon both the parties. The venue of arbitration shall be Delhi.	
18.	LEGAL SETTLEMENT: Subject to clause 17 hereinabove this contract shall be subject to exclusive jurisdiction of courts at Delhi.	
19.	SUBCONTRACTING : In case further subcontracting of BHEL order or part thereof is envisaged by supplier, the same can be done after written permission is obtained from BHEL. However it shall not absolve the supplier of the responsibility of fulfilling BHEL purchase order requirements.	
20.	RISK PURCHASE : In case the successful bidder fails to supply or fails to comply with the terms & conditions of the purchase order, BHEL reserves the right to source such material/ component / equipment/ system from any other agency at the risk and cost to BHEL of the successful bidder.	
21.	ADJUSTMENT OF RECOVERY : Any amount payable by the supplier under any of the condition of this contract shall be liable to be adjusted against any amount payable to the supplier under any other works / contract awarded to him by any BHEL unit. This is without prejudice to any other action as may be deemed fit by BHEL.	
22.	FORCE MAJEURE CONDITION : If by reason of war, civil commotion, act of god, Government restrictions, strike, lockout	

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	which are not in control of supplier the deliveries are delayed, supplier shall not be held responsible.	
23.	TECHNICAL SPECIFICATION : TB-370-618-006-RLS (STR) Rev 02	
24.	QUALITY PLAN : For Projects from PGCIL & NTPC, the standard QAP of G.I. Lattice Structures of respective customer would be applicable. For other projects supplier to take confirmation from BHEL regarding applicability of quality plan.	
25.	<p>LOADING CRITERIA FOR DEVIATIONS TAKEN BY BIDDER ON:</p> <p><u>25.1.TERMS OF PAYMENT:</u></p> <p>If a bidder asks for payment within specified no. of days from the date of receipt of invoice with complete documents as per “Terms of Payment” at sr. No. 3 above, loading to be done as follows:</p> <ul style="list-style-type: none"> a) Base rate of SBI (as applicable on the date of techno commercial bid opening) + 6 % shall be considered for loading for the period of relaxation sought by the bidder. b) 60 days - No loading <p><u>25.2. DELAYED DELIVERY / PENALTY DUE TO DELAYED DELIVERY:</u></p> <p>Loading for not accepting this clause / accepting only on un delivered portion shall be the maximum amount specified in this clause.</p>	
26.	<p>Pre- Qualification Criteria:</p> <p>The vendor should have successfully fabricated, PROTO tested and supplied the lattice structure of towers, beams & equipment support structures for switchyard or transmission line of 220 kV rating or above voltage class to any Public Sector Enterprises or state government utility or multinational company. To be eligible, the following documentary evidence is to be submitted by the vendor:</p> <ul style="list-style-type: none"> i) Dispatch clearance certificate/MICC/CIP/MDCC issued to vendor by the Public enterprises or state government utility or multinational companies. 	
27.	<p>Extra Instructions :</p> <p>Vendor has to submit credentials along with offer for approval to Customer (APGENCO). Consideration of offer/ Order placement shall be subject to customer (APGENCO) approval.</p>	

ACTIVITY SCHEDULE FOR SUPPLY OF G. I. LATTICE STRUCTURE-

TRANSMISSION LINE

ENQUIRY NO.- 255E325

Dated:- 18.02.16

SL. NO.	ACTIVITY	TIME ALLOTTED [in weeks]	CUMULATIVE TIME FROM RECEIPT OF INPUTS FROM BHEL [in weeks]	SCOPE
1.	DRAWING SUBMISSION/RESUBMIS SION AS REQUIRED			BY SUPPLIER
2.	DRAWING APPROVAL			BHEL SCOPE
3.	MANUFACTURING OF PROTO			BY SUPPLIER
4.	PROTO INSPECTION			BHEL SCOPE
5.	PROTO CORRECTED DRAWINGS SUBMISSION & BOM'S FOR APPROVAL			BY SUPPLIER
6.	APPROVAL OF PROTO CORRECTED DRAWINGS & BOM'S			BHEL SCOPE
7.	MASS PRODUCTION			BY SUPPLIER
8.	INSPECTION			BHEL SCOPE
9.	ISSUE OF MICC			BHEL SCOPE
10.	DESPATCH			BY SUPPLIER

1. Inspection call to be issued 2 weeks in advance.
2. Supplier must ensure the completeness and correctness of the requisite documents before submission for approval. Delay in approval on account of incomplete / inadequate information shall be the responsibility of supplier.
3. Inspection call should be given in the prescribed format only. Inspection calls not in the prescribed format shall not be entertained.
4. Qty to be offered for inspection should be in accordance within Delivery-schedule – lot. BHEL reserves the right not to entertain multiple inspection calls for a Delivery – lot and delay on this account shall be the responsibility of Supplier.

Signature & Seal of

Supplier

Date:

SCHEDULE OF COMMERCIAL DEVIATION

ENQUIRY NO. -255E325

DATED- 18.02.16

Ref: TBMM/GILS-TRANSMISSION LINE / RAYALSEEMA

This Format is to be submitted in original duly signed by bidder.

The following are the deviations/variations/exceptions from the Terms and Conditions :-

SL. NO.	CLAUSE NO. OF TERMS AND CONDITIONS	STATEMENT OF DEVIATION

In case, this schedule is not submitted, it will be presumed that the equipment /material to be supplied under this contract is deemed to be in compliance with the Terms and Conditions.

If there is NIL deviation, even then the format to be filled as NIL DEVIATION.

Note : Continuation Sheets of like size and format may be used as per the Bidder's Requirement and shall be annexed to this schedule.

Place :
Date :

Signature of the authorised representative of

Bidder's name :.....
Designation:.....
Company Seal:.....

SCHEDULE OF TECHNICAL DEVIATION

ENQUIRY NO- 255E325

DATED- 18.02.16

Ref: TBMM/GILS-TRANSMISSION LINE / RAYALSEEMA

This Format is to be submitted in original duly signed by bidder.

The following are the deviations/variations/exceptions from the Terms and Conditions :-

SL. NO.	CLAUSE NO. OF TERMS AND CONDITIONS	STATEMENT OF DEVIATION

In case, this schedule is not submitted, it will be presumed that the equipment /material to be supplied under this contract is deemed to be in compliance with the Terms and Conditions.

If there is NIL deviation,even then the format to be filled as NIL DEVIATION.

Note : Continuation Sheets of like size and format may be used as per the Bidder's Requirement and shall be annexed to this schedule.

Place :
Date :

Signature of the authorised representative of

Bidder's name :.....
Designation:.....
Company Seal:.....

PROJECT :- APGENCO RAYALSEEMA
ITEM:- LATTICE STRUCTURE (TRANSMISSION LINE)

SCHEDULE OF PRICE
Enquiry No 255E 325 Date:- 18.02.2016

SL. NO.	DESCRIPTION OF ITEM (As per Tech Spec. TB 370 618 006-RLS (STR) Rev -02)	UNIT	QUANTITY	UNIT PRICE EX. WORKS (Rs.)	TOTAL EX. WORKS (Rs.)	UNIT FREIGHT & INSURANCE UP TO SITE (Rs.)	TOTAL FREIGHT & INSURANCE UP TO SITE (Rs.)	ED @.....% OF COL 6 (Rs.)	CST/VAT/ST @.....% OF COL 6 + COL 9 (Rs.) AGAINST FORM "C"	F.O.R. DESTINATION PRICE (Rs.) COL (6+8+9+10)
1	2	3	4	5	6	7	8	9	10	11
1	Preparation of shop drawings based on fabrication drawings (Line diagram) provided by BHEL, fabrication of 400 KV line towers, proto assembly, submission of proto corrected drawings/BOMs, mass fabrication, galvanising, inspection and supply of lattice type galvanized steel structures including stub assembly. (Zinc coating 610 gms/sq.m)	-	-							
a	Mild Steel (Galvanized)	MT	120							
2	Supply of MS templates made of channels,angles etc.	MT	2.5							
TOTAL COST TO BHEL (TOTAL EX-WORKS + TOTAL ED+ TOTAL CST + TOTAL F & I)										

NOTE:

1. PLEASE NOTE THAT UNPRICED COPY OF PRICE BID (i.e. WITH ALL PRICES BLANKED) SHALL BE FURNISHED ALONG WITH TECHNO-COMMERCIAL BID.
2. REQUIRED COPIES OF FORMAT BE MADE & DETAILS MAY BE ANNEXED.
3. THE PRICES MUST BE QUOTED IN THE PRESCRIBED UNIT ONLY.
4. SALES TAX RATE AS APPLICABLE FOR SPECIFIED DESTINATION SHALL BE QUOTED. IN CASE OF CST, RATE AGAINST "C" FORM SHALL BE QUOTED.
5. IN CASE OF VARIED ED SLAB RATES, CONFIRM YOUR OPTION FOR "X" OR "Y". (STRIKE OFF WHICH IS NOT APPLICABLE)
IF NO OPTION IS MENTIONED "X" SHALL BE TAKEN.

6. THE VENDORS MUST INDICATE THE APPLICABLE TARIFF NOS. UNDER WHICH ED AND / OR CST WOULD BE PAID BY THEM TO THE TAX AUTHORITIES.
7. IF A VENDOR SUBMITS AN OFFER WITH REDUCED ED AND OR CST APPLICABLE THAN NORMALLY PAID ON SUCH ITEMS, THEY SHOULD SUBMIT NECESSARY DOCUMENTARY PROOF FOR THE SAME.
"X" THE MAXIMUM ED SLAB RATE BE CONSIDERED FOR PRICE COMPARISON. IN THE EVENT OF ORDER ED AT ACTUAL BE PAID.
"Y" THE QUOTED ED RATE BE CONSIDERED FOR PRICE COMPARISON. IN THE EVENT OF ORDER ED AT ACTUAL RATE LIMITED TO QUOTED RATE BE PAID.

SIGNATURE & SEAL OF TENDERER



BHARAT HEAVY ELECTRICALS LIMITED
TRANSMISSION BUSINESS GROUP
MATERIAL RECEIPT CERTIFICATE

- a) Site:
- b) LR No. with date:
- c) Vehicle no.:
- d) Date of receipt of material at site:
- e) Supplier:
- f) Material details (as mentioned below):

S.no.	Item Description	Type of Packages	Unit (MT/KM/NO.)	Qty as per packing list	Qty Received	Remarks

Other Remarks:

Signature with date: _____

Name & Designation: _____
(With Seal)

Terms & Conditions of Reverse Auction

Against this enquiry for the subject item/ system with detailed scope of supply as per enquiry specifications, BHEL may resort to "REVERSE AUCTION PROCEDURE" i.e., ON LINE BIDDING (THROUGH A SERVICE PROVIDER). The philosophy followed for reverse auction shall be English Reverse (No ties).

1. For the proposed reverse auction, technically and commercially acceptable bidders only shall be eligible to participate.
2. Those bidders who have given their acceptance for Reverse Auction (quoted against this tender enquiry) will have to necessarily submit 'online sealed bid' in the Reverse Auction. Non-submission of 'online sealed bid' by the bidder for any of the eligible items for which techno-commercially qualified, will be considered as tampering of the tender process and will invite action by BHEL as per extant guidelines in vogue.
3. BHEL will engage the services of a service provider who will provide all necessary training and assistance before commencement of on line bidding on internet.
4. In case of reverse auction, BHEL will inform the bidders the details of Service Provider to enable them to contact & get trained.
5. Business rules like event date, time, bid decrement, extension etc. also will be communicated through service provider for compliance.
6. Bidders have to fax the Compliance form (annexure IV) before start of Reverse auction. Without this, the bidder will not be eligible to participate in the event.
7. In line with the NIT terms, BHEL will provide the calculation sheet (e.g., EXCEL sheet) which will help to arrive at "Total Cost to BHEL" like Packing & forwarding charges, Taxes and Duties, Freight charges, Insurance, Service Tax for Services and loading factors (for non-compliance to BHEL standard Commercial terms & conditions) for each of the bidder to enable them to fill-in the price and keep it ready for keying in during the Auction.
8. Reverse auction will be conducted on scheduled date & time.
9. At the end of Reverse Auction event, the lowest bidder value will be known on auction portal.

10. The lowest bidder has to fax/e-mail the duly signed and filled-in prescribed format for price breakup including that of line items, if required, (Annexure VII) as provided on case-to-case basis to Service provider within two working days of Auction without fail.
11. In case BHEL decides not to go for Reverse Auction procedure for this tender enquiry, the Price bids and price impacts, if any, already submitted and available with BHEL shall be opened as per BHEL's standard practice.
12. Bidders shall be required to read the "Terms and Conditions" section of the auctions site of Service provider, using the Login IDs and passwords given to them by the service provider before reverse auction event. Bidders should acquaint themselves of the 'Business Rules of Reverse Auction', which will be communicated before the Reverse Auction.
13. If the Bidder or any of his representatives are found to be involved in Price manipulation/ cartel formation of any kind, directly or indirectly by communicating with other bidders, action *as per extant BHEL guidelines*, shall be initiated by BHEL and the results of the RA scrapped/ aborted.
14. The Bidder shall not divulge either his Bids or any other exclusive details of BHEL to any other party.
15. In case BHEL decides to go for reverse auction, the H1 bidder (whose quote is highest in online sealed bid) may not be allowed to participate in further RA process.

Certificate by Chartered Accountant on letter head

This is to Certify that M/S
(hereinafter referred to as 'company') having its registered office at
..... is registered under MSMED Act 2006, (Entrepreneur
Memorandum No (Part-II) dtd:.....,
Category: (Micro/Small)). (Copy enclosed).

Further verified from the Books of Accounts that the investment of the company as on
date..... as per MSMED Act 2006 is as follows:

1. **For Manufacturing Enterprises:** Investment in plant and machinery (i.e. original cost
excluding land and building and the items specified by the Ministry of Small Scale Industries vide its
notification No.S.O.1722(E) dated October 5, 2006 :
Rs.....Lacs
2. **For Service Enterprises:** Investment in equipment (original cost excluding land and building and
furniture, fittings and other items not directly related to the service rendered or as may be notified under the MSMED
Act, 2006:
Rs.....Lacs

The above investment of Rs.....Lacs is within permissible limit of
Rs.....Lacs forMicro / Small (Strike off which is not applicable)
Category under MSMED Act 2006.

Date:

(Signature)

Name -

Membership number -

Seal of Chartered Accountant





BHARAT HEAVY ELECTRICALS LIMITED
TRANSMISSION PROJECTS ENGINEERING MANAGEMENT
NEW DELHI

DOCUMENT No.	TB-370-618-006-RLS(STR)		Rev 02	Prepared	Checked	Approved	
	TITLE GI LATTICE STRUCTURES FOR TRANSMISSION LINE	TECHNICAL SPECIFICATION		NAME	AKM	DKM	NSR
		SIGN	-sd-	-sd-	-sd-		
		DATE	24.06.15	24.06.15	24.06.15		
		GROUP	TBEM				
W.O. No	83001						
CUSTOMER/CONSULTANT	APGENCO						
PROJECT	220KV D/C TRANSMISSION LINE AT RAYALSEEMA THERMAL POWER PLANT FOR STAGE-IV, UNIT#6						
<u>Contents:</u>							
Section No.	Description					No of Pages	
SECTION-1	SCOPE, SPECIFIC TECHNICAL REQUIREMENTS and QUANTITIES					01	
SECTION-2	STANDARD SPECIFICATION (GI STRUCTURE)					07	
SECTION-3	PROJECT DETAILS AND GENERAL SPECIFICATION					02	
SECTION-4	GUARANTEED TECHNICAL PARTICULARS (Not Applicable)					
SECTION-5	MANUFACTURING QUALITY PLANS						
SECTION-6	CHECK LIST					01	
02	12-02-16	AKM	AKM	NSR	Separate Spec for GI Hardware sent as per TBMM comments dtd. 12-02-16		
01	04-02-16	AKM	AKM	NSR	Package separated for supply of towers as decided on 04-02-16		
Rev	Date	Altered	Checked	Approved			
Distribution				To			
				Copies			

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 This must not be used directly or indirectly in anyway detrimental to the interest of the company.

SECTION – 1

SCOPE, SPECIFIC TECHNICAL REQUIREMENTS & QUANTITIES

1.1 SCOPE

The scope of this specification is to specify all details required by a supplier for preparation detailed fabrication drawings (structure assembly drawings), fabrication, destructive testing, proto assembly, galvanising and supply of galvanized steel structures for 220kv transmission lines Rayalseema being executed by BHEL on turnkey basis for APGENCO.

The detailed scope of work is preparation, submission and approval of detailed fabrication drawings (structure assembly drawings), fabrication, galvanizing, proto-testing and supply of all type of transmission line towers including stub assembly and stub templates made of channels, angles, etc., base plates, stiffener plates and other such items required to complete the job including all fixtures, such as nuts, bolts, step bolts and washers. However, detailed and accurate bill of quantities for nuts, bolts, step bolts and washers shall be given by the supplier in the drawings submitted by him. The detailed structure assembly drawing shall be prepared based on input/line sketches provided by BHEL.

1.2 SPECIFIC TECHNICAL REQUIREMENTS

The specific technical requirements shall be as per Standard Technical Specification (Refer Section 2).

1.3 QUANTITIES

The quantities indicated are tentative & it may change to any extent during detailed engineering at contract stage.

S.No	Item description	Unit	Quantity	Rate	Amount
1	Preparation of shop drawings based on fabrication drawings (Line diagram) provided by BHEL, fabrication of 400 kV line towers, submission of proto corrected drawings/BOMs, mass fabrication, galvanizing, inspection and supply of lattice type galvanized steel structures including stub assembly. (Zinc coating 610 gms/sqm)				
a	Mild steel (Galvanized)	MT	120		
2	Supply of MS stub templates made of channels, angles etc.	MT	2.5		

SECTION – 2
(GI LATTICE STRUCTURE)

2.0 GENERAL

This section covers the standard technical specification for GI Structures.

2.1 STEEL MATERIAL

Mild Steel (MS) and High Tensile (HT) Steel materials shall be tested quality and shall conform to IS:2062. Steel material (Both HT and MS) should be procured from Customer approved source.

Steel shall not be pitted and should be free from scales and rust. If the rolled section and plates are bent or distorted, bend or distortion shall normally be removed by the cold treatment. Straightening under hot stage shall be resorted to only under specific permission from BHEL. If any rolling defects viz., laminations, cracks etc. are discovered in the steel during the processing, it is to be rejected.

TOLERANCE:

The dimensional and weight tolerances for rolled shapes shall be in accordance with IS:1852-1991.

No rolled or fabricated member shall deviate from straightness by more than 1/1000 of the axial length or 10mm which ever is smaller.

2.2 FABRICATION

GENERAL:

All the workmanship and finish shall be of the best quality and shall conform to the best approved method of fabrication. All materials shall be finished straight and shall be machined true and square where so specified. All holes and edges shall be free of burrs. Shearing and cropping shall be neatly and accurately done and all portions of work exposed to view shall be neatly finished. Material at the shops shall be kept clean and protected from weather.

The fabrication of galvanized steel structures shall be carried out generally in accordance with IS:802 part. II, IS:800-1984. All materials shall be completely shop fabricated. Normally, butt splices shall be used. The components constituting the joint shall have a total strength greater than the heavier of the members connected. Lap splices may be used for connecting members of unequal sizes. The inside angle of lap splice shall be grounded at the heel to fit the fillet of the outside angle. The splices shall develop full strength of the members connected through bolts. Butt as well as lap splices shall be made as close to the main panel points as possible.

Joints shall be so designed and detailed as to avoid eccentricity as far as possible. However, where joints are such that the elimination of gusset plates would result into eccentric joints, gusset plates and spacer plates may be used in conformity with modern practices.

The use of filler in the connections shall be avoided as far as possible. The diagonal members in tension may be connected entirely to the gusset plate where necessary to

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avoid the use of fillers. Each diagonal shall be in one piece without splices or center gussets, and it shall be connected at the point of intersection by one or more bolts.

The gap between the ends of two connected members in butt joints shall not be more than 6 mm and less than 4mm.

The tower structure members shall be accurately fabricated to bolt together easily at site without any undue strain on them or the bolts.

Drain holes shall be provided at all points where pockets or depressions are likely to hold water.

For designing of towers , preferably rationalized steel sections shall be used. During execution of the project, if any particular section is not available same shall be substituted by higher section at no extra cost to owner and the same shall be borne by the bidder. However design approval for such substitution shall be obtained from owner before substation.

STRAIGHTENING:

For rolled steel material, if straightening or flattening is necessary, it shall be done by methods that will not injure the materials.

CUTTING:

Cutting may be affected by chopping, cropping, sawing or machine flame cutting. Sheared or cropped edges shall be dressed to a neat workmanlike finish and shall be free from distortion and burrs.

PUNCHING AND DRILLING:

Holes in members may be punched full size through material not over 12mm thick. Holes must be cleaned of burrs and ragged edges. Drilled holes shall be preferred. Holes made by drilling shall also be cleaned of burrs and ragged edges. Where several parts are to be drilled, they shall be first assembled, tightly clamped together and drilled through.

Punched holes must be square with plates and the walls of the holes shall be parallel. The following maximum allowance in accuracy of punched holes is permissible:

- i) Holes must be perfectly circular and no tolerance in this respect is permissible.
- ii) The maximum allowable difference in diameter of the holes on the two sides of plates or angle is 0.8 mm, i.e. the allowable taper in punched holes should not exceed 0.8 mm in diameter.
- iii) Holes must be square with the plates. Holes at angle or slant shall not be permitted.

The minimum spacing of bolts and edge distances shall be as given below:

Bolt	Minimum Diameter	Maximum edge distance		
		Bolt Spacing	Hole center To rolled Edge	Hole center to cut/ flame edge

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(mm)	(mm)	(mm)	(mm)
16	40	20	23

WELDING:

The work shall be done as per approved fabrication drawings, qualified welding procedure specifications (WPS) and by qualified welders. Procedure qualification records (PQR) shall be maintained. Electrodes for shielded arc manual welds shall comply with the requirements of IS:814 - 1991. All welds shall be free from defects like blow holes, slag inclusions, lack of penetration, under cutting, cracks etc. All welds shall be cleaned of all slag or flux before galvanizing.

MARKING OF MEMBERS FOR IDENTIFICATION.

All members shall be marked for identification during erection. This mark shall correspond to distinguishing marks on approved erection drawings and shall be legibly painted and stamped on. The erection mark shall be stamped with a metal dye with figures at least 16 mm high and to such optimum depth as to be clearly visible, even after a member is galvanized. All erection marks shall be on outer surface of all sections and near one end, but clear of bolt holes. Marking shall be so stamped that they are easily discernible when sorting out members. The stamped marking shall be encircled boldly by a distinguishable paint to facilitate easy location.

Erection marks on like pieces shall be in identical locations. Members having lengths of 3.0 M or more shall have the erection mark at both ends.

PROTOTYPE ASSEMBLY:

Towers shall be trial assembled at shop before galvanizing i.e. prototype assembly keeping in view the actual site condition prior to dispatch to testing station/erection sites. The prototype assembly of each structure shall be got approved from BHEL/Customer as directed. Necessary match marks shall be made on each components before dismantling the prototype assembly and galvanizing. Any error shall be rectified at the expense of the contractor.

No extra charge on account of erecting the assemblies or getting them inspected will be permissible. It is however to be mentioned that the responsibility for proper fitting of various members for the erection of the structure in the field will rest with the supplier and any discrepancy found at the time of erection will have to be rectified by the contractor at his cost.

2.3 GALVANISING:

All structural steel works shall be hot dip galvanized after fabrication. Galvanizing of each members shall be carried out in one complete immersion and double dipping shall not be permitted.

Zinc required for galvanizing will have to be arranged for by the Contractor. Purity of zinc to be used for galvanizing shall be 99.5% as per IS:209-1992.

All burrs and irregular edges shall be ground smooth before galvanizing.

After all shop work is complete, all structural materials shall be punched with the Erection Mark and be hot dip galvanized. Before galvanizing the steel section shall thoroughly be cleaned of any paint, grease, rust, scale, acid/ alkali or such other foreign matters as are

likely to interfere with the galvanizing process or with the quality and durability of the zinc coating. Pickling shall be carefully done and shall be proper.

Minimum weight of zinc coating shall be 610gms/sqm. However, higher coating may be provided as per requirement.

The galvanized surface shall consist of a continuous and uniformly thick coating of zinc, firmly adhering to the surface of steel. The finished surface shall be clean and smooth and shall be free from defects like discolored patches, bare spots, unevenness of coating, spelter which is loosely attached to the steel, globules, spiky deposits, blistered surface flaking or peeling off, etc. The presence of any of these defects noticed on visual or microscopic inspection shall render the material liable to rejection.

There shall be no flaking or loosening when struck squarely with a chisel faced hammer. The galvanized steel member shall withstand minimum four one minute dips in copper sulphate solution as per IS: 2633 - 1986.

When the steel section is removed from the galvanizing kettle excess spelter shall be removed by 'bumping'. The processes known as 'wiping' or 'scrapping' shall not be used for this purpose.

Defects in certain members indicating presence of impurities in the galvanizing bath in quantities larger than that permitted by the specification, or lack of quality control in any manner in the galvanizing plant shall render the entire production in the relevant shift liable to rejection.

All the galvanized structural steel members and accessories shall be treated with sodium dichromate or an approved equivalent solution after galvanizing, so as to prevent white storage stains.

If the galvanizing of any member is damaged, BHEL shall be shown of the extent of damage and if so directed the galvanizing may have to be redone in the similar manner as stated above at no extra cost.

Contractor shall also furnish sufficient quantity of appropriate paint, free of cost, for repairing galvanized surfaces damaged in transit, and minor modifications done at site during erection.

Galvanizing tests shall be made from time to time on as many samples as may be considered necessary. The supplier shall supply all samples and equipment and carry out the tests without any extra cost.

2.4 INSPECTION OF MATERIALS

GENERAL:

Contractor shall give notice to BHEL/ Customer in advance for inspection of materials. All rejected material shall be promptly removed from the shop and replaced with new material for BHEL/ Customer approval/ inspection. The fact that certain material has been accepted at Contractor's shop shall not invalidate final rejection at site by BHEL/ Customer if it fails to be in proper condition or has fabrication inaccuracies which prevent proper assembly. No materials shall be painted, galvanized or dispatched to site without the inspection and approval by BHEL/ Customer unless such inspection is waived off in writing by BHEL/ Customer.

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Shop inspection by BHEL/ Customer, for submission of test certificates and acceptance there of by BHEL// Customer shall not relieve contractor from the responsibility of furnishing material conforming to the requirements of these specifications, nor shall it invalidate any claim which BHEL/ Customer may make because of defective or unsatisfactory material and workmanship.

Contractor shall provide all the testing and inspection services and facilities for shop work. For fabrication work carried out in the field the standard of supervision and quality control shall be maintained as in shop fabricated work. The inspection and testing shall be conducted in a manner satisfactory to BHEL/ Customer.

The supplier shall submit QP (Quality Plan) detailing each stage of manufacturing i.e. raw-material , in process and final inspection for approval by BHEL/Customer in the prescribed format. The final Quality plan shall approved by BHEL/ Customer

MATERIAL TESTING

If mill test reports are not available for any steel materials the same shall be got tested by the contractor and demonstrate conformity with the relevant specification to the full satisfaction of BHEL/ Customer. The cost of such tests shall be borne by the contractor.

DIMENSIONS AND WORKMANSHIP:

The Structural Steel members shall be inspected at all stages of fabrication and assembly to verify that dimensions, tolerances, alignment and surface finish, are in accordance with the requirements shown in Contractor's approved shop drawings.

INSPECTION OF TEST FAILURE:

In the event of any failure of structural steel members to meet an inspection or test requirement, contractor shall inform BHEL/ Customer and must obtain permission from the BHEL/ Customer before repair is undertaken. The quality control procedures to be allowed to ensure satisfactory repair shall be subject to approval by BHEL/ Customer.

2.5 PACKING TRANSPORTATION AND DELIVERY

After completion of final inspection and marking, the fabricated galvanized structural items shall be packed and loaded for transportation.

Packing must be adequate to protect items against bending and any mechanical injuries and damage to galvanized film during loading and unloading. As far as possible, like member should be bundled together and tied.

Proper lifting devices shall be used for loading at shop and unloading at site in order to protect items against bending, mechanical injuries and damage to galvanized film.

Loading, transporting and unloading shall be done in compliance with transportation rules.

Slender and projected parts shall be braced properly with additional spacer steel bars, spacer wood etc, before loading for transportation, to protect against bending or any other damages during transportation.

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If certain parts cannot be transported in the lengths stipulated in the design drawing, the position and type of additional splice joints shall be got approved from BHEL/ Customer.

Items must be carefully loaded and tied up properly to prevent bending, falling etc. during transportation.

The small parts such as plates, gussets, cleats etc. shall be securely tied with the wire, and packed in wooden boxes and properly identified.

As far as possible the delivery of fabricated galvanized structural steel shall be as per the order stipulated by BHEL/ Customer and to suit the erection sequence.

Contractor shall make good/ replace at his own cost any damage occurred during loading, transporting, unloading and stacking of fabricated galvanized steel structures as directed by BHEL/ Customer. No extra payment on this account shall be entertained under any circumstances.

2.6 APPLICABLE STANDARDS

Unless otherwise specified, materials, and workmanship shall conform to the following standards of their latest editions:

- | | | | |
|----|---|-----|---|
| 1. | IS : 209 | - | Zinc Ingot. |
| 2. | IS : 228 | - | Method of chemical analysis of pig iron, cast iron, plain carbon and low alloy steel. |
| 3. | IS : 406 | - | Methods of analysis of zinc (Spelter). |
| 4. | IS : 800 | - | Code of practice for general construction. |
| 5. | IS : 802 - Part1 -
Part1/Sec.2
- Part 2
- Part 3 | - - | Code of Practice for use of structural in over head Transmission line towers. |
| 6. | IS : 806 | - | Code of practice for use of steel tubes in general building construction. |
| 7. | IS : 808 | - | Dimensions for hot rolled steel beam, column, channel and angle sections. |
| 8. | IS : 814 | - | Covered electrodes for manual metal arc welding of carbon and carbon manganese steel. |
| 9. | IS : 816 | - | Code of Practice for use of metal arc welding for general construction in mild steel. |

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- | | | |
|-----|-----------|---|
| 10. | IS : 817 | - Code of practice for training & testing of Metal Arc welders. |
| 11. | IS : 1161 | - Steel tubes for structural purposes. |
| 12. | IS : 1599 | - Method of bend test |
| 13. | IS : 1608 | - Method of tensile testing of steel products. |
| 14. | IS : 1852 | - Rolling and cutting tolerances for hot rolled steel products. |
| 15. | IS : 1978 | - Line pipe |
| 16. | IS : 2062 | - Steel for general structural purposes. |
| 17. | IS : 2074 | - Ready Mixed Paint, air drying red oxide zinc, chrome, priming. |
| 18. | IS : 2629 | - Recommended practice for hot dipped galvanising on Iron & Steel. |
| 19. | IS : 2633 | - Methods for testing uniformity of coating on zinc coated articles. |
| 20. | IS : 3502 | - Steel chequered plates. |
| 21. | IS : 4759 | - Hot dip zinc coating on structural steel and other allied products. |
| 22. | IS : 6745 | - Method for determination of mass of zinc coating on zinc coated iron and steel articles |
| 23. | IS : 8500 | - Specification for micro-alloyed structural steel |

SECTION - 3

PROJECT DETAILS AND GENERAL SPECIFICATIONS

3.0 GENERAL

This section stipulates the General Technical Requirements under the contract and will form an integral part of the Technical Specification.

The provisions under this section are intended to supplement general requirements for the materials, equipment and services covered under other sections and is not exclusive. However in case of conflict between the requirements specified in this section and requirements specified under other sections, the requirements specified under respective sections shall hold good.

3.1 QUALIFYING REQUIREMENT

The contractor shall have adequate galvanizing facilities to galvanize the longest single steel member of 7.5m length in one dip.

All structural assembly drawings shall be prepared in Auto Cad 2008 or Later.

3.2 SITE INFORMATION

SL.NO.	DESCRIPTION	
3.2.1	PROJECT INFORMATION	
	a) Customer	APGENCO, Hyderabad
	b) Project	1x600MW Rayalseema TPP, Stage-IV, Unit-6, 400/220kV Switchyard
	c) Project location	V V Reddy Nagar, Post-Karamala Distt- Kadappa, 480km from Hyderabad 350km from Channai
	d) Transport facilities Nearest Railway Station/Gauge Distance from Railway Station	Nearest rail head is Muddnur (10km from site)
	e) Access roads	

3.3 STANDARDS

All materials shall comply in all respect with the requirement of the latest edition of the relevant codes as listed in Section 2.

3.4 UNIT

Metric (System International) units of measurements shall be used in all drawings.

3.5 DRAWINGS, BILL OF MATERIALS AND CDs

At each stage following set of fabrication drawings/Bill of materials shall be submitted.

- | | | |
|-----|----------------------|----------|
| i) | Fabrication Drawings | : 4 sets |
| ii) | Bill of Materials | : 4 sets |

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After final approval of proto –type assembly of structures, the drawings shall be updated as per proto and marked “PROTO CORRECTED”. The following sets of fabrication drawings/shop drawings/bill of materials/CDs shall be submitted for distribution:

- | | | |
|------|----------------------|----------|
| i) | Fabrication Drawings | : 1 set |
| ii) | Shop Drawings | : 1 set |
| ii) | Bill Of Materials | : 1 set |
| iii) | CDs | : 2 sets |

3.6 CATEGORIES OF APPROVAL

CATEGORY I This means that the documents/drawings is approved.

CATEGORY II This means that the document/drawing is approved with comments i.e, some corrections are required but the contractor can go ahead with the manufacture after incorporating comments.

CATEGORY III This means that the document/drawing is not approved i.e major revisions are required and the contractor can not proceed with the manufacture.

3.7 ERRORS

Any error in fabrication work preventing proper assembly and fitting up of parts in the field, shall be classified as defective workmanship. All changes incurred by BHEL either directly or indirectly because of this shall be deducted from the amount due to the contractor.

3.8 PURCHASE ORDER NUMBER

The P.O No. shall be mentioned on all documents and drawings.

SECTION – 5

MANUFACTURING QUALITY PLAN

- 5.1** Material shall be inspected in accordance to the QP duly approved by BHEL/Customer

SECTION-6

**CHECK LIST FOR INFORMATION TO BE FURNISHED WITH OFFER
RETURN THIS CHECKLIST AS PART OF THE OFFER DULY SIGNED**

The offer may not be considered if the following information and this Checklist are not enclosed with the Offer.

**BHEL ENQUIRY. NO:
BIDDER:OFFER REFERENCE:**

6.1 Deviations

Tick

YES

NO

If yes,

S.No.	Deviation	Clause No.
1		
2		
3		
4		

(Signature & Seal of Bidder)