NOTICE INVITING TENDER

Tender Enquiry No.: TE-FP-14-15-W-26 **Date: 18.10.2014**

BHEL-Fabrication Plant, Jagdishpur invites sealed bid in two part bid system (Part-I: Techno-commercial Bid; Part II: Price Bid) for following work from experienced and financially sound bidder who fulfill the qualifying criteria contained in the enclosed tender document**:**

1. **Description of work**: Works Contract for Fabrication & assembly of Column as per scope of work at fabrication plant, Jagdishpur
2. **Quantum of work:** **Approx. 72,000 Kgs. Qty. variation shall be +/- 10%**
3. **Duration of Contract:** Three months from the date of award of contract or date of issue of material whichever is later.
4. **Cost of tender Document:** ₹ 500/-
5. **EMD Amount:** ₹ 20,000/-
6. **Due Date and Time for Submission of Bid:** **10.11.2014** (2:30 PM)
7. **Due Date and Time for Opening of Techno-Commercial Bid**: **10.11.2014** (3:00 PM)
8. **BHEL** reserve the right to accept or reject any of the bid/all bids or cancel/withdraw the invitation for bid without assigning any reason whatsoever and in such case no bidder/intending bidders shall have any claim arising out of such action by BHEL.
9. **BHEL** can accept/reject any or all tenders fully or partly, reduce/increase quantum of work without assigning any reasons thereof.
10. **Address for submission and opening of Tender:**
    Tender Box- Administrative Building
    Centralised Stamping Unit & Fabrication Plant, BHEL
    Industrial Area Jagdishpur
    Distt. Amethi- 227817 (U.P.) INDIA

Enclosures to Tender Enquiry:
1. Section-I: General Terms and Conditions
2. Section-II: Special Terms and Conditions
3. Section-III: Price Bid format

Note:
1. The contractors may personally visit the work place to understand the scope of work before submitting their bids.
2. For relevant details please visit our website “www.bhel.com”. All subsequent corrigendum/amendment shall be published only on website and not in press. Hence, bidders are advised to always be in touch with our said website until the tender is finally opened.

SECTION I

GENERAL TERMS AND CONDITIONS

1. DEFINITIONS:

The following terms and expressions shall have the meaning hereby assigned to them, except where the context otherwise requires:

1.1 'BHEL' shall mean Bharat Heavy Electricals Limited, a Company registered under the Indian Companies Act, 1956 with its Registered Office at BHEL House, Siri Fort, New Delhi, Pin-110049 through its office at CSU & FP-Jagdishpur or its authorized Officers or its Engineers or other employees authorized to deal with any matters with which these persons are concerned on its behalf.

1.2 'CONTRACTOR' or 'FIRM' shall mean the individual, firm or Company who is enlisted with BHEL for providing the services and shall include their executors, administrators, successors and permitted assigns.

1.3 'CONTRACT' or 'CONTRACT DOCUMENT' shall mean and include guidelines and declarations of the registration, the General Terms & Conditions and Statutory Compliances, schedules of quantities, accepted appendices of rates, if any, technical specifications, special specifications, if any, Letter of Intent, agreement & the work order, issued by BHEL. Any conditions or terms stipulated by the bidder in the tender documents or subsequent letters shall not form part of the contract unless specifically accepted in writing by BHEL and incorporated in the work order.

1.4 'TENDER DOCUMENTS' shall mean Instruction to Tenderers, General Terms & Conditions, Special Terms & Conditions, Tender Specifications including drawings and all other documents issued to the bidder against invitation of bid.

1.5 'LETTER OF INTENT' shall mean the intimation by a letter / email / fax to the bidder that the tender has been accepted in accordance with provision contained in that letter. The responsibility of the contractor commences from the date of issue of this letter and all the terms and conditions of contract are applicable from this date.

1.6 'APPROVED, DIRECTED or INSTRUCTED' shall mean approved, directed or instructed by BHEL Shop Engineer / Shop- in-charge/ Concerned authorities.

1.7 **'**WORK' or 'CONTRACT WORK' shall mean and include the work to be done in relevant work category by the firm or as specified in the Tender documents.

2. OFFICIAL SECRET ACT :

The contractor shall give an undertaking under the official secret Act for maintaining secrecy of the drawings, documents or other records connected with the work given to them. The contractor shall return all the drawings/documents given to them.

3. MODE OF COMMUNICATIONS:

Generally, all communications, references etc. shall be delivered through email, fax or given to the authorized supervisor. It will be undertaken that the contractor has read and understood the message, within three days of the delivery, even if they have not received / not opened/ having technical problems on their side. Contractor shall communicate their change of authorized supervisor, email address in advance.

4. SECURITIES:

4.1 EARNEST MONEY DEPOSIT (EMD):

4.1.1 Offer should be accompanied with Earnest Money as specified in NIT through in the form of Demand Draft (DD). The DD shall be drawn in favor of "Bharat Heavy Electricals Limited" payable at Ind. Area Jagdishpur. The EMD shall not carry any interest.

4.1.2 The EMD of the successful bidder will be retained towards part of Security Deposit.

4.1.3 In case of unsuccessful bidder, the EMD will be refunded after finalization of the tender.

4.1.4 BHEL reserves the right of forfeiture of EMD, in case the successful bidder who:

a. After opening of tender revokes/ withdraws his tender within the validity period or revises/ alters his earlier quoted rates/ conditions.
b. Fails to communicate unqualified acceptance of Letter of Intent with in one week from the date of issue of letter of intent.
c. Fails to submit 50% of the total security deposit before start of work.
d. Fails to submit the work as may be indicated in the Letter of Intent.

4.2 SECURITY DEPOSIT (SD):

4.2.1 Upon acceptance of tender, the successful bidder must deposit the required amount of Security Deposit (SD) after adjusting the amount of Earnest Money duly deposited with the tender, within the time specified in the letter of intent for satisfactory completion of work.

4.2.2 The total amount of Security Deposit shall be as follows:

a. In the of work costing upto Rs.10 Lakh: 10%

b. Above Rs.10 lakhs upto Rs. 50 Lakhs: 1 Lakh + 7.5% of the amount exceeding Rs. 10 Lakhs.

c. Above Rs.50 lakhs: Rs.4 Lakhs+5% of the amount exceeding Rs.50 Lakhs.

4.2.3 The full or 50 % Security Deposit calculated as above shall be deposited with in one week from the date of issue of letter of intent/order but before the start of work in any of the following forms:

a. Demand Draft in favor of "Bharat Heavy Electricals Limited" payable at SBI, IGFCC Jagdishpur.

b. Bank Guarantee in the prescribed Performa of BHEL. Bank Guarantee from any one of the consortium banks of BHEL. Validity of the Bank Guarantee furnished towards Security Deposit shall be valid up to the period of completion of work as stipulated in the letter of intent plus 2 months claim period and the same will be kept valid by proper renewal till the satisfactory completion of the Guarantee Period. All charges for establishing and amending the BGs, if necessary, shall be to Contractor's account.

c. Fixed Deposit Receipt issued by Scheduled Banks/ Public Financial Institutions as defined in the Companies Act. The FDR should be in the name of the contractor, A/C BHEL, duly discharged on the back.

4.2.3 If contractor has submitted 50 % of SD, Balance shall be recovered from running @ 10% of the value of each running bill commencing from first running bill itself till the full Security Deposit made up.

4.2.4 If the value of the work done at any time exceeds the accepted Contract Value, the Security Deposit shall be correspondingly enhanced and the extra Security Deposit shall be immediately deposited by the Contractor otherwise it shall be recovered from payments due to him. Failure to deposit the security Deposit within the stipulated time may lead to forfeiture of EMD and cancellation of the award of work. BHEL reserves the right of forfeiture of Security Deposit in addition to other claims and penalties in the event of Contractor's failure to fulfill any of the contractual obligations or in the event of termination of contract as per terms and conditions of the contract.

4.2.5 If the contractor fully performs and complete the works in all respect to the entire satisfaction of BHEL and returns properties belonging to BHEL taken, borrowed or hired by him for carrying out the said work, the full amount of Security Deposit will be released to the contractor after deducting all costs, expenses and other amounts that are to be paid to BHEL under this or other contracts entered into with the Contractor/ released prior to passing of final bill.

5. SUBMISSION OF OFFFER / TENDER:

5.1. The bid is invited in either two part or single part as specified in NIT. In case of two part bid system offer shall be submitted as per following:

5.1.1. Part I: Techno commercial Bid: Techno commercial bid should be filled as per **FORMAT-1** to this section and should contain documents in the same order as listed there.

5.1.2 Part II (Price) Bid: Price bid should contain only Price Offer to be submitted strictly as per **FORMAT-2** of Price Schedule given in the tender document (Refer Section III). The Price Bid not submitted as per Price Schedule may not be considered.

5.1.3. Part I and Part II Bids should be put in separately sealed envelopes and each envelope must be marked clearly as "Techno commercial Bid" or "Price Bid" as the case may be. NIT Number and bidder's name & address should also be clearly mentioned on these envelopes. These two envelopes must be put in a bigger envelope and sealed properly. Top of the outer cover/envelop should contain following information:

a. Tender Enquiry No. & Title of Work
b. Bid Opening date & time
c. Address/Venue of Bid Submission
d. Bidder's Name & Address

Technical bid and price bid should be submitted in separate sealed envelopes. In case the bids are found in one single envelope then the "bids" are liable to be rejected.

5.1.4. In case of single part bid system, Techno-commercial bid and price bid should be submitted in single sealed envelope.

5.1.5 All papers/documents should be ink signed and rubber stamped by the bidder.

5.2 The bidder shall quote the rates in English Language using international numerals. These rates shall be entered in figures as well as in words. For the purpose of the tender, the metric system of units shall be used.

5.3 All entries in the tender shall either be typed or be written in ink. Overwriting or cutting is not

acceptable.

5.4 The tender shall be submitted on or before the time & date specified in NIT & shall be dropped into tender box as specified in NIT.

5.5 Tenders can be submitted personally/courier/post. The tenders received after the due date and time of submission will be rejected.

5.6 Tenders shall be opened by authorized officers of BHEL at the above mentioned address at the time and date specified in the NIT in the presence of such of those bidders or their authorized representative who may like to be present.

5.7 The offers should be strictly in accordance with the tender specifications & General Instructions to the bidder. Should the bidder require any clarification on the tender specification, or is interested in offering any deviation from the tender specification, he shall contact the authority inviting the tender for clarification before submission of the tender. No deviation w.r.t. terms & conditions of the tender are acceptable.

5.8 If there are varying or conflicting provisions made in any one document forming part of the contract, the Accepting Authority shall be the deciding authority with regard to the intention of the document.

5.9 Before tendering, the bidder is advised to inspect the site of work and the environments and be acquainted with the actual working and other prevalent conditions, facilities available etc. No claim will be entertained later on grounds of lack of knowledge.

5.10 Validity of Offers: The offer should be valid at least for a period of **90 days** from the date of opening of tender. In case Bharat Heavy Electricals Limited (BHEL) calls for negotiations, such negotiations shall not amount to cancellation or withdrawal of the original offer, which shall be binding, on the bidder. All expenses for attending such negotiations are to be borne by the bidder.

5.11 The acceptance of tender will rest with BHEL which does not bind itself to accept the lowest tender or any tender and reserves to itself full rights to reject any or all the tenders.

5.12 Conditional and unsigned tenders, tenders containing absurd or unworkable rates and amounts, tenders which are incomplete or otherwise considered defective and tenders not in accordance with the tender conditions, specifications, etc., are liable to be rejected.

5.13 If the bidder deliberately gives wrong information in his tender, BHEL reserves the right to reject such tender at any stage or to cancel the contract, if awarded and forfeit the Earnest Money / Security Deposit / any other moneys due.

5.14 Canvassing in any form in connection with the tender is strictly prohibited and the tenders submitted by the Bidder who resorts to canvassing are liable to be rejected.

5.15 In case of non-conformities/errors/discrepancies are observed between the quoted prices in figures and that in words, following guidelines shall be followed:

(a) If, in the price structure quoted for the required goods / services / works, there is discrepancy between the unit price and the total price (which is obtained by multiplying the unit price by the quantity), the unit price shall prevail and the total price corrected accordingly. Unless in the opinion of the purchaser there is an obvious misplacement of the decimal point in the unit price, in which case the total price as quoted shall govern and the unit price corrected accordingly.
(b) If there is an error in a total corresponding to the addition or subtraction of subtotals, the

subtotals shall prevail and the total shall be corrected and

(c) If there is a discrepancy between words and figures, the amount in words shall prevail unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail subject of (a) and (b) above.

(d) If there is such discrepancy in an offer the same shall be conveyed to the bidder with target date upto which the bidder has to send his acceptance on the above lines and if the bidder does not agree to the decision of the purchaser, the bid is liable to be ignored.

5.16 BHEL reserve the right to accept or reject any of the bid/all bids or cancel/withdraw the invitation for bid without assigning any reason whatsoever and in such case no bidder/intending bidders shall have any claim arising out of such action by BHEL.

5.17 BHEL can accept/reject any or all tenders fully or partly, reduce/increase quantum of work without assigning any reasons thereof.

6. SIGNING OF TENDER DOCEMENTS

The tenderer shall furnish following, duly enclosing documents relating thereto:-

a) Authorized signatory shall be the person holding 'power of attorney' on behalf of the firm/company/bidder-concerned authorized/empowered to act on behalf for the specific purpose.

b) Power of Attorney: An attested copy of the Power of Attorney, in case an individual other than the sole proprietor signs the tender shall be submitted along with the tenders.

c) In case of an Individual, full name, address, place & nature of business and license relating to.

d) In case of Partnership Firms: The names of all the partners and their address. A copy of the partnership deed/instrument of partnership duly certified by the Notary Public shall be enclosed. The tender must be signed by all the partners of the firm or by the managing partner who has power to do.

BHEL will not be bound by any other power of attorney granted or the change in composition of the firm made after the execution of the contract agreement. They may, however, recognize such power of attorney or change in status only after legal advice.

7. PRICE SCHEDULE (PRICE BID):

7.1 Rate should be quoted strictly as per prescribed Price Schedule.

7.2 The rate quoted by bidder is inclusive of all duties, taxes, fees, octroi, and other levies material, labor etc. except Service Tax which shall be reimbursed to the contractor on actual against documentary proof.

7.3 Prices shall remain firm and no variation what so ever shall be allowed. The bidder is required to take into consideration of cost of wages, material and equipments, PPEs, uniform, shoes and other consumables and their price fluctuations in the prices of these after the submission of bid and during the period of contract before submission of bid.

8. EVALUATION OF OFFERS

8.1 Technical-cum-Commercial Bid (Part-I) shall be opened first on due date specified in NIT.

8.2 The bidders shall be evaluated as per qualifying requirements mentioned in the tender

documents.

8.3 Price Bid (Part-II) shall be opened only of Technical-cum-Commercial qualified bidder.

8.4 The bidder shall submit complete price of the package. Total price of the package (Price Schedule) shall be compared for purpose of arriving at L1.

8.5 Evaluation of the offer will be strictly based on the information submitted by the bidder. In view of this the bidder is requested to go through tender document carefully and furnish all details clearly. Missing information may not be asked by BHEL.

8.6 In case of tie between two or more than two bidders for L1 price. Bids shall be called for discount on price offered in sealed envelope from all the L1 bidders.

8.7 BHEL reserve the right to split the work in two or more vendors, if required. If not specified, total work in full shall be ordered on a single party i.e. L-1 bidder.

8.8 BHEL reserves its right to negotiate with the Bidder and/ or go for Reverse Auction (RA).

9. REVERSE AUCTION:

9.1 BHEL may go for Reverse Auction (on line bidding on Internet) instead of opening the submitted sealed price bid. The decision to go for Reverse Auction will be taken after techno-commercial evaluation. Only technically and commercially acceptable bidders shall be eligible to participate in reverse auction. Information and general terms and conditions governing RA shall be communicated to technically and commercially acceptable bidders.

9.2 In case BHEL decides not to go for Reverse Auction procedure for this tender enquiry, the Price bids already submitted and available with BHEL shall be opened as per BHEL's standard practice.

10. CONTRACT AGREEMENT

The successful bidder (Contractor) has to make an agreement with BHEL in the format prescribed by BHEL on Rs. 100/- Non-Judicial Stamp Paper at his own cost.

11. TERMS OF PAYMENT:

11.1 Payment shall be made, on the Nos. of Measurement units, successfully executed, by the Contractor. The contractor shall submit their clear & legible bills (in duplicate) on Monthly basis, duly verified by concerned BHEL staff. Each bill must be enclosed with work/ activity completion report duly signed by contractor & and BHEL representative (s).

11.2 All payments shall be released through electronic-pay mode only.

11.3 BHEL shall be releasing payments against the work order after deduction of income tax at source (TDS) as per requirement of income tax rules and BHEL will issue appropriate certificates in this regard.

11.4 Service tax, if applicable, shall be paid, as per Govt. rules, to the contractor against running actual, on documentary evidence. The Service tax shall be paid extra and over the quoted rate.

11.5 No interest shall be payable by BHEL on Earnest Money, Security Deposit or on any money due to the firm by BHEL.

11.6 Firm shall arrange his own finance for smooth execution of contract, wages payment, other statutory payments to his employees and all other agreed conditions.

11.7 Normally, payment shall be made within 45 days of receipt of bill at BHEL.

12. PENALTY :

For late completion of work, BHEL standard LD clause shall be applicable which is 0.5% per week for unexecuted portion of work subject to maximum 10% of work order value. Cost of rejection, as appropriate shall be recovered from contractor as compensation for defective job done resulting in rejection even after performing necessary rework.

13. SAFETY AND OCCUPATIONAL HEALTH:

The contractor has to assume full responsibility of the safety of the vehicles/ equipments, crew and to comply with the security/ safety regulations of BHEL and Government, as applicable, inside the BHEL factory. The contractor is required to keep and maintain first aid box at work place at his own cost.

14. FORCE MAJEURE:

Notwithstanding anything contained in this Contract, neither the Contractor and nor the BHEL shall be held responsible for total or partial non execution of any of the contractual obligations, should the obligation be made impossible due to concurrence of a Force Majeure which will include war, military operations of any nature, blockages, revolutions, insurrections, riots, civil commotion's, insurgency, sabotage, act of public enemy, acts of god, epidemics and act of Govt. over which the Suppler or BHEL has no control.

15. ARBITRATION:

All disputes arising in connection with the contract shall be settled by mutual consultation. If no agreement is reached the dispute shall be settled in accordance with Arbitration and conciliation Act, 1996 and the rules made there under. The dispute shall be referred for arbitration to any arbitrator to be appointed by the General Manager. The award of the arbitrator shall be final and binding on both the parties. The venue of the Arbitration shall be at Sultanpur, India. The Award to be given by the Arbitration shall be a speaking award. All questions, disputes, differences arising under, out of or in connection with this contract shall be to the exclusive jurisdiction of Sultanpur court.

16. RIGHTS OF BHEL :

BHEL reserves to itself, the following rights without entitling the Contractor to any compensation. Resorting to any, some, all of the actions like Contract termination, recovering the dues/ losses from the Security Deposit and the contract amount, forfeiting the Security Deposit, getting the work done through other agencies at the cost of the contractor, cancellation of registration, banning the business with BHEL etc., in any event of the followings:

a) Contractor's repeated poor performance, withdrawal from or abandonment of the work, except in force majeure conditions.

b) Serious lapse in performance, Persistence disregard of the BHEL instructions.

c) Insolvency of the contractor.

d) Assignment, transfer, subletting of the contract work without BHEL's written permission.

e) Non-fulfilment of any contractual obligations or obligations under the law.

17. ABANDONING OF WORK:

If the Contractor fails to perform/execute the work within time or fail to perform as per the specification prescribed in tender or acted in violation to prescribed terms and conditions, BHEL shall be entitled to terminate the Contract and take recourse to alternate source to get the work done at the risk and cost of the Contractor. In such case Contractor shall make good the loss to BHEL. BHEL shall be

entitled to recover the difference in cost, if any incurred by BHEL due to getting the work done from alternate source. However, in such case Contractor shall not be entitled for any gain.

18. TERMINATION

This contract may be terminated at any time without paying any compensation whatsoever to the Contractor in case of misbehaviour, disobedience, dishonesty, clandestine insolvency, any court order or any other related activities on their part or their failure to fulfil the terms and conditions of this contract or agreement.

BHEL reserves the right to terminate contract awarded for any contravention of statutory provision or any other reasons without assigning any explanation or notice to the contractor.

19. EXTENSION

The contract may be extended as per BHEL's policy on mutual agreement of BHEL and the contractor.

20. PREFERENCES FOR MSMEs:

Following preferences/benefits shall be given to MSEs in line with Public procurement policy for Micro and Small Enterprises (MSEs), 2012:

a. The tender documents shall be issued free of cost to MSEs.

b. MSEs are exempted from payment of Earnest Money Deposit (EMD).

c. In tender, Micro and Small Enterprises quoting within the price band of L1+15% shall be allowed to supply the requirement up to 20% of the tender quantity subject to condition that such Enterprises bring down their price to L1 price where L1 price is from other than a Micro and Small Enterprise. If L1 offer is from a Micro / Small Enterprise, this provision will not be applicable. In case more than one Micro and Small Enterprise is there within this span, the supply shall be shared proportionate to the tender quantity. (70:30 or 50:30:20 of the eligible quantity).

   Note: Special provision for Micro and small enterprises owned by SC or ST: -

   Sub target of 20% (i.e. 4% out of 20%) would be earmarked for procurement from Micro and Small Enterprises owned by the Scheduled Caste or Scheduled Tribe Entrepreneurs provided that in event of failure of such Micro and Small Enterprises to participate in the tender process or meet the tender requirements and the L1 price, the 4% sub-target for procurement ear-marked MSE owned by Scheduled Caste or Scheduled Tribe Entrepreneurs shall be met from other MSE Enterprises/s.

   MSE suppliers can avail the intended benefits only if they submit along with the offer, attested copies of either EM II certificate having deemed validity (five years from the date of issue of acknowledgement in EM II) or valid NSIC certificate or EM II certificate along with attested copy of a CA certificate (Format enclosed at Annexure -1 where deemed validity of EM II certificate of five years has expired) applicable for the relevant financial year (latest audited). Date to be reckoned for determining the deemed validity will be the date of bid opening (Part 1 in case of two part bid). Non submission of such documents will lead to consideration of their bid at par with other bidders. No benefit shall be applicable for this enquiry if any deficiency in the above required documents is not submitted before price bid opening. If the tender is to be submitted through e-procurement

portal, then the above required documents are to be uploaded on the portal. Documents should be notarized or attested by a Gazetted officer.

In case of any change in the MSE status of the Bidder, it shall be the responsibility of the Bidder to notify the change as a part of the Bid document. If at a later date it comes to the knowledge of BHEL, that the change in the status has not been intimated by the Bidder and the order is obtained under the premise of an MSE then BHEL would cancel the pending order against this tender and take necessary steps for suspension of the business dealing with the Bidder as per the procurement policy of BHEL.

In case after the bid opening it is seen that no MSE has become L1, then depending on the nature of the item, if it is not possible to split the tendered items / quantities on account of reasons like customer contract requirements of supplying one make for a given project or technical reasons like the tendered item being a system etc. then BHEL would not counter offer the L1 prices even though there may be MSE bidders within the +15% band of L1.

21. TERMS & CONDITIONS FOR CONTRACTORS FOR DEPLOYMENT OF CONTRACT LABORERS UNDER SERVICE OR WORKS CONTRACT

21.1 LABOUR LICENCE AND OTHER REQUIREMENTS

21.1.1 Contractor should possess Labour license in case of contractors working in BHEL CSU & FP Jagdishpur and deploying 20 or more labours on any day, from the Appropriate Government (Central Govt.) for carrying out the various activities mentioned in the contract document.

21.1.2 The contractor shall deploy such number of workers in the premises of BHEL CSU & FP Jagdishpur, as required for completion of the contract. The workers such deployed shall be his own workers.

21.1.3 In case the number of labour deployed by the contractor in premises of BHEL CSU & FP Jagdishpur exceeds the number of labour allowed in the license then the contractor shall immediately inform the HR and concerned department. The contractor shall also apply to the licensing officer in the region for amendment in the license within 7 days of exceeding the number of labours mentioned in the license.

21.1.4 Labour license and other requirement in case of contractors NOT working in BHEL CSU & FP Jagdishpur or has less than 20 workers on his rolls:

A) The contractor should possess valid labour license issued by any licensing authority if he has deployed 20 or more workers in any organization.

B) After being eligible to apply as above, if the contractor is awarded the contract then he should apply for Form-V from BHEL to obtain Labour License from Appropriate Government and submit the same within one month from the date of award of contract. Till then award will be treated as PROVISIONAL.

21.1.5 The contractor shall also have to submit copy of PAN card and latest IT return.

21.1.6 The contractor must possess Service Tax Registration number under relevant code head.

21.1.7 The contractor should possess VAT/TIN Number if material is supplied/consumed. The contractor should not be disqualified from bidding in case the contractor does not have TIN No. However, he shall have to produce TIN No. before opening of Price bid.

21.2 APPOINTMENT AND ENTRY IN FACTORY PREMISES

21.2.1 The contractor shall submit the following to HR through contracting department:

a. The details of the worker proposed to be deployed.

b. Police Verification Certificate by appropriate authority or Character certificate issued by District Magistrate's Office or Proof of remittance of fees for character certificate at District Magistrate's Office. Further he should submit the character certificate within 30 days failing which he will be discontinued.

c. Copy of employment card issued by contractor to his own worker.

21.2.2 After submission of documents as in Para 2.1, the contractor shall issue photo identity card to the labour and submit to HR department. This identity card shall be forwarded by HR department to BHEL Security, which shall then authorize the labour to enter the factory premises initially for a period of one month.

21.2.3 The photo identity card shall have to be revalidated in every three month on last working day of the month or any other date fixed to do so. In absence of such revalidation, duly forwarded by HR department, BHEL Security shall not allow any labour to enter the premises of BHEL CSU & FP Jagdishpur.

21.2.4 The contractor shall maintain a register of persons employed by him in the format prescribed under Rule 75 of Contract Labour (R&A) Central Rules.

21.3 BILLS PAYMENT, ATTENDANCE AND PAYMENT OF WAGES

21.3.1 The Contractor shall pay wages to all his Laborers as prescribed by the BHEL HR from time to time based on government norms.

21.3.2 In addition to minimum daily wages above, an **additional wage** has also to be paid by the Contractor to all his Laborers as per following rates as per BHEL guidelines:

Sl. No.	Type of Labour	Additional daily wage to be paid in (Rs.) as on date (22.05.2014)
1	Unskilled Worker (USW)	123.08
2	Semi-skilled Worker (SSW)	142.31
3	Skilled Worker (SW)	157.69
4	Highly Skilled Worker (HSW)	157.69

This additional amount will also attract all statutory deductions and payments.

21.3.3 Contractor shall ensure payment of wages as applicable on or before seventh day of each month.

21.3.4 Wages payment shall be made by Contractor to the Laborers through bank / cheque / cash in the presence of authorized BHEL representatives and shall maintain proper records of their timely disbursement. Contractor shall issue wages slips to his laborers.

21.3.5 The payment of wages to the workers shall not be subject to payment against the bills by BHEL.

21.3.6 The contractor shall submit bills to the contracting department by 8th of each month.

21.3.7 The contractor's bills should be accompanied with the following:-

a) Copy of Measurement Book entries / Statement of work done / work completion report by the Contractor duly verified by concerned BHEL representative(s).

b) Statement of Minimum Wages of labours deployed by him under the Service contract, PF/ESI no., statutory deductions etc., (Form XVII of Contract Labour (R&A) Rules)

c) PF and ESI challans for previous month-separate for concerned Service contract. Print of online challan along with list of contributing contract workers for ESI duly certified by the contractor.

d) Wage payment sheet for the bill period.

e) Statement of material supplied by the contractor, if any

f) Copy of Labour Licence if increase in no. of labours deployed against Work Order if applicable.

g) Copy of Challan of previous Service Tax paid.

21.3.8 The contractor shall remit the cheques favouring RPFC and ESI Office with the appropriate banks with such period as stipulated under relevant provisions. Last date for remittance of PF is 15th and that in case of ESI is 21st of each month.

21.4 PROVIDENT FUND (PF)

21.4.1 The Contractor should allot PF account number and get the nomination form, duly filled in, from each worker deployed by him at the time of joining.

21.4.2 In case the worker already has PF/pension account number, allotted to him, previously, then the contractor shall get the transfer form filled up at the time of joining and send to the office of concerned Regional Provident Fund Commissioner.

21.4.3 After termination of contract the contractor shall provide due assistance to the labour for withdrawal of PF/pension amount, when due.

21.4.4 The Contractor shall liaison with the PF officials to get the annual PF slips and distribute amongst his own workers. Security deposit shall be released only after submission of PF slips of workers.

21.4.5 PF CONTRIBUTION:

Employee's Contribution	Employer's Contribution
12.00%	13.61 %

21.4.6 The Contractor shall submit annual returns in Form-6A and Form 3A, prescribed under statutory EPF scheme, 1952, in respect of each worker deployed by him with a copy to HR.

21.5 EMPLOYEES STATE INSURANCE (ESI)

21.5.1 The Contractor should allot ESI account number and get the nomination form, duly filled in, from each labour deployed by him at the time of joining.

21.5.2 At the time of joining the contractor shall get the self/family registration form filled by the workers and submit to the local ESI office.

21.5.3 The contractor shall facilitate collection of issued ESI cards by his worker.

21.5.4 ESI CONTRIBUTION :-

Employee's Contribution	Employer Contribution

1.75%	4.75%

21.5.5 The Contractor shall submit annual returns in Form-6 prescribed under ESI Act, deployed by him with a copy to HR and finance department.

21.5.6 The Contractor shall produce the following Registers and forms as per Contract Labour (R & A) Rules 1971 for verification by the concerned BHEL Officer(s):

(a) Form XII - Register of contractors (Rule74)

(b) Form XIII - Register of Workmen employed by contractor (Rule 75)

(c) Form XIV - Employment Card issued by contractor (Rule 76)

(d) Form XVI - Muster Roll 78(1) (a) (i)

(e) Form XVII - Register of Wages (Rule 78 (1) (a) (i)

(f) Form XVIII - Register of wages-cum Muster Roll (in case of weekly Payment)

(g) Form XIX - Wage Slip (Rule 78)(1) (b)

(h) Form XX - Register of deduction for damages of loss (Rule (78)(1) (a) (ii)

(i) Form XXI - Register of fines (Rule 78) (1) (a) (ii)

(j) Form XXII - Register of advance (Rule 78) (1) (a) (ii)

(k) Form XXIII - Register of overtime (Rule 78) (1) (a) (iii)

(l) Form XXIV - Return to be sent by the contractor to licensing officer (Rule 82)

21.6 BONUS

The contractor shall be liable to pay statutory bonus under payment of Bonus Act, 1965

21.7 DISCIPLINE

21.7.1 The Contractor shall be responsible for the discipline of his own laborers deployed under the service contract. In case of any loss to the BHEL CSU & FP Jagdishpur on account of indiscipline of contract laborer then such loss shall be assessed and recovered from the running bills of the contractor or from the security deposit.

21.7.2 The contractor shall not employ any person who has not completed his 18 years of age and person who has attained 60 years of age.

21.7.3 The contractor, on advice of authorized BHEL official, shall immediately remove any person employed by him, who may in the opinion of such authorized BHEL official is involved in misconduct. Such person shall not be re-employed by the contractor without prior permission.

21.8 LEAVE WITH WAGES TO CONTRACT LABOUR

Guidelines as per UP factories Rules 1950 should be strictly observed with regard to crediting / availment of leave. Register as prescribed under the said Rules should be maintained by the contractor.

21.9 SAFETY OF OPERATION

The total safety of operation and laborers is Contractor's responsibility. Contractor should provide the following Personnel Protective Equipment (PPE) and Consumables, as applicable, to each laborer during execution of the contract, at his own cost:-

a) One pair of Uniform within two weeks of start of contract and one pair within next six months.
b) One safety helmet per annum, (within two weeks of start of contract)
c) One pair of safety shoes along with two pairs of socks per annum, (within two week of start of contract).
d) One pairs of leather hand gloves per week.
e) Two pairs of Ear plugs per month
f) Cora cloth / Cloth Waste 1/2 Mt. per month
g) One soap per month.
h) Any other relevant safety PPEs, if required.

Quantities mentioned above are minimum and may increase depending upon operation / job and contractor has to provide these items at his own cost. Each PPE items should follow BHEL Safety Engineering Standards. The contractor shall maintain a register for record of above items.

21.10 SUPERVISION OF CONTRACTOR LABORERS:

The contractor shall appoint one identified supervisor for monitoring and controlling of work and laborers. All issues regarding discipline at the works are to be supervisor's responsibility. The Contractor shall submit an authorization certificate to in name of his supervisor. No extra supervision charges shall be paid by BHEL.

21.11 CONTRACT LABOUR ACCIDENTS WHILE AT WORK:

In case of medical emergencies faced by contract worker at work, medical facilities in the interest of the well-being of the worker shall be provided by BHEL. The decision of the doctors attending the emergency shall be final and binding. The cost incurred shall be deducted from the bills of the contractor. The Contractor shall complete the ESI formalities and BHEL shall submit claim of reimbursement of medical expenses to ESI. The amount reimbursed by ESI shall be paid back to the contractor.

21.12 PROHIBITION ON INFLUENCING AND INTERFERING ON BEHALF OF CONTRACTOR:

The Contractor shall neither try to influence, chase or interfere into the working of BHEL officials nor engage BHEL employee or any other third person for the same. In case such incident does occur, it may lead to disqualification/debarring from the contract. Any contractor shall be debarred from consideration if any of his relations is working in the product/functional group in which the contract is being issued. Before issuing tender form to any contractor for limited tender enquiry a confirmation has to be given by contractor that none of his relations are working in that product/functional group."

21.13 GENERAL GUIDELINES TO CONTRACTOR:

21.13.1 The contractor will comply with all the provisions regarding licensing, welfare and health, procedures, maintenance of various records and registers etc., as provided under the contract Labour (Regulation & abolition) Act 1970, rules amendments, orders, notifications there under issued by the Appropriate Government from time to time. For non-compliance of any provisions, statutory compliance under law, the contractor shall be responsible for penalties levied by the appropriate authority under the Act. The contractor shall also be liable to comply with all other Labour and Industrial Laws and such other acts and Statutes (including Factories Act, Payment of Bonus Act, minimum wages Act, etc.,). Depositing of ESI, PF contribution as may be applicable is the responsibility of the contractor. For any default in compliance, the contractor shall be held responsible.

21.13.2 The Contractor shall compensate BHEL for any loss or damage to the plant/property, material of BHEL due to his workmen/representatives' negligence or otherwise during execution of work.

21.13.3 All the workers should be provided with uniform & identity cards by the contractors. The contractor has to provide a distinct uniform different from BHEL employees. The Uniform shall be kept in neat, tidy & wearable condition.

21.13.4 The contractor shall be responsible for the good conduct of his employees.

21.13.5 The contractor shall be responsible for all acts and omissions of their staff and liabilities arising out of the acts and omissions of such staff shall be borne by the contractor, BHEL shall in no way be responsible for any such acts, omissions or any liabilities arising there from.

21.13.6 The Contractor shall arrange necessary Insurance cover/Personal Accident Policy as applicable for their staff. If any accident/injury/loss/ occurs due to the operation of any equipments, to any other persons/public and the properties of BHEL/client/other agencies/third party, the contractor shall have to pay necessary compensation and other expense, so decided by the appropriate authorities/victims.

21.13.7 Only the authorized staff attached to the contracted work or representative nominated by the contractor shall be allowed entry inside the company's or any other premises during the period of contract.

21.13.8 The persons employed by the Contractor in respect of work will treated as the authorized representative(s) and shall also be held responsible along with the contractors, for any breach of the terms and conditions as provided in this contract.

21.13.9 If BHEL Executive feels that the persons deployed on job are not having required skill to perform the job, the contractor will have to replace those persons by adequately trained staff.

21.13.10 Accident occurred during the course of company's work should be reports by the Contractors to BHEL immediately and certainly not later than 24 hours. This should be followed by a detailed report from the contractor.

21.13.11 The Contractor will have to indemnify BHEL against:

(a) All claims for injury or damage to any person or property caused by his negligence of his employees whilst in BHEL premises.

(b) Observance of Labor & Industrial Laws, including regular remittance to EPF and ESI.

(c) All claims by way of compensation and all other types of unforeseen claims, which may arise in the period of contract.

(d) The Contractor will accept liability for compensation in accordance with the provision of the Indian Worker's Compensation Act, 1948, amendments thereafter and or other law for the time being in force for personal injury caused to any workmen by accident arising out of and in the course of this contract.

(e) The Contractor will indemnify the company against all payments by way of compensation or otherwise which the company may be called upon to make under the provisions of the said Acts to any workmen as aforesaid, and any cost incurred by the company in connection with any claim preferred by such workmen and or against all actions, claims and demand whatsoever in respect thereof or in respect of any loss, injury or damages whatsoever to any third person arising out or occasioned by the negligent, imperfect or improper performance of this contract by the Contractor, their workmen servants or agents.

(f) The Company shall not be held liable for any loss, damage or compensation to third parties arising from or in relation to transport operation done by the bidder, such loss, damage or compensation shall be reimbursed by the Contractor to the company together with the costs incurred by the company on any legal proceedings pertaining there to.

The Contractor will be required to submit Indemnity Bond in favor of BHEL on a Non Judicial Stamp paper of appropriate value.

****

ANNEXURE A

(to be made on Bidder's letter head)

DECLARATION SHEET

I / We hereby certify that, all the information and data furnished by me / us with regard to this Tender are true and complete to the best of my / our knowledge. I / We have gone through the specification, conditions and stipulations in detail and understand fully the scope of work and agree to comply with the requirement and intent of specification.

I/We, further certify that I/We am/are the duly authorized representative(s) of the under mentioned bidder and a valid power of attorney to this effect is also enclosed.

I/We, hereby declare that I/We shall treat the tender documents, drawings, specifications and other records connected with the work as secret / confidential and shall not communicate information / derived there from to any persons other than a person I/We am/are authorized to communicate the same or use the information in any manner prejudicial to the safety of the same.

I / We hereby also give our consent in acceptance of all terms and conditions of this tender without any deviation.

Date: **Name & Signature of the bidder**

(Seal)

ANNEXURE B

(to be made on Bidder's letter head)

CERTIFICATE OF DECLARATION CONFIRMING THE KNOWLEDGE OF SITE CONDITION

I/We hereby declare and confirm that we have visited the project site under the subject given in NIT and acquired full knowledge and information about the site conditions, wage structure, industrial climate and total work involved. We further confirm that the above information is true and correct and we will not raise any claim of any nature due to lack of knowledge of site condition.

Date:

Name & Signature of the bidder

(Seal)

ANNEXURE C

(to be made on Bidder's letter head)

TO WHOM SO EVER IT MAY CONCERN

This is to certify that our firm is not blacklisted / under hold from BHEL Jagdishpur or banned by any unit/region/office of BHEL.

This is to certify that we / our firm is not guilty by a Court of Law in India for any offence involving fraud, dishonesty and moral turpitude

Date: **(Signature of Authorized Signatory)**

ANNEXURE D

(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-11 .....dated: .....
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:

I. 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.I722(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

(Strike off whichever is not applicable)

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

Or

The company has been graduated from its original category (Micro/ Small) (Strike off which is not

applicable) and the date of graduation of such enterprise from its original category is ----------

----(dd/mm/yyyy) which is within the period of 3 years from the date of graduation of such enterprise from its original category as notified vide 5.0. No. 3322{E) dated 01.11.2013 published in the gazette notification dated 04.11.2013 by Ministry of MSME.

Date:

(Signature)

Name -

Membership number

Seal of Chartered Accountant

Format-1

TECHNICAL BID FORMAT

TABLE-I

Sl. No.	Description	Please Fill
1	Name of the Firm (Bidder)	
2	Address of the Firm (Registered Office)	
3	Name of Contact Person	
4	Contact Numbers	
5	Fax No., if any	
6	Email ID	

TABLE-2

Sl. No.	Description	YES / NO	Remarks
1	Earnest Money Deposit (EMD)		D.D. Number & Date……
2	Tender Document Cost, if applicable		D.D. Number & Date……
3	Signed and stamped copy of tender documents		Signed and stamped Copy of all pages (all sections) of BHEL tender documents to be enclosed as a token of acceptance of all terms and conditions of the tender
4	Un-Priced bid *(Price bid format without prices)*		Signed and stamped copy Blank price bid to be submitted
5	Documents against Qualifying Requirements		Signed and stamped copies of all documents as asked under qualifying criteria of the tender to be enclosed
6	Authorization for signing Tender Documents		Valid copy of power of attorney / authorized signatory to be enclosed as a proof of authorized representative of the firm
7	Signed and stamped copies of all Annexures		Signed and stamped Copies of all Annexures A, B, C & D (D if applicable) to be submitted on firm's letter head
8	Labour License Number		Copy of the License to be enclosed
9	PF Code Number		Copy of the Certificate to be enclosed
10	ESI Code Number		Copy of the Certificate to be enclosed
11	PAN Number		Copy of the PAN Card to be enclosed
12	Income Tax Return *(of last 3 yrs)*		Copy of the ITR to be enclosed
13	Service Tax Registration Number		Copy of the Certificate to be enclosed
14	Validity of Offer		90 days from the date of tender Opening

Please mention "NA" if not applicable.

I / We hereby certify that, all the information and data furnished above with regard to this Tender are true and complete to the best of my / our knowledge.

Date: **(Signature and Seal of Bidder)**

In case of registered contractors with BHEL FP, the contractor will only mention the number in above list.

SECTION II

SPECIAL TERMS AND CONDITIONS

(The 'Special Terms and Conditions' given hereunder supersede the relevant terms and conditions given in 'General Terms and Conditions')

A. QUALIFYING CRITERIA:

Sl. No.	Description of Qualifying requirement	Documentary Proof enclosed
1.	Experience of having successfully completed Fabrication and assembly of Boiler Columns during last 7 years ending last day of month previous to the one in which applications are invited should be any of the following: (a) Three completed/executed works each costing not less than the amount equal to Rs 3.79 Lakhs. OR (b) Two completed/executed works each costing not less than the amount equal to Rs 4.74 Lakhs. OR (c) One completed/executed work costing not less than the amount equal to Rs 7.59 Lakhs. Copies of order, completion certificate/Execution certificate/Inspection clearance report/equivalent document from the executing authority shall be enclosed along with technical bid.	Yes/No
2.	Average Annual Financial turnover during the last 3 years, ending 31st March of the previous financial year should be Rs 2.84 Lakhs. Audited balance sheet and Profit & loss account shall be submitted for last 3 years.	Yes/No

BHEL reserves the right to verify the documents submitted by bidder.

In case the Tenderers not fulfilling the above conditions, the offer is liable for rejection. The semi filled, incomplete Tender Documents will be rejected.

B. SCOPE OF WORK:

- The contractor shall be responsible for Fabrication & Assembly of Column at Fabrication Plant, Jagdishpur. For Fabrication of jobs to be completed following activities are included:

  I. Study of Drawings: BHEL will provide drawings of jobs to be completed. Contractor shall study the drawings and prepare sub assembly drawings, as required.

  II. Receipt of Material: Cutting of raw material shall be done by BHEL. However, small components which can be cut by PUG machines/Gas Cutting torches shall be done by contractor. Cut to size materials shall be received by contractor from BHEL Shop In-charge. Grinding/dressing/cleaning of flame cut components, maintaining dimensions as per drawing, if required shall be responsibility of contractor. All Bought Items shall be provided by BHEL.

  III. Preparation of material: All material preparation works e.g. Chamfering, grinding etc. except rolling/bending shall be done by contractor. Rolling/bending shall be in BHEL's Scope. However, assistance of manpower for rolling/Bending will be provided by contractor.

  IV. Assembly: Assembly of all prepared components as per drawing shall be done by contractor. The fitting, marking and tacking of components as per drawing shall be done by contractor. All assemblies shall be fabricated to our drawings and notes thereon. All stiffeners required during assembly to control the distortion will be arranged by the contractor at his own cost.

  V. Welding: Welding of all joints as per drawing shall be done by contractor. All welding shall be performed as per approved WPS provided by BHEL by qualified welders only. Contractor shall carryout the welding in such a manner that no distortion takes place. Due care shall be taken to control the distortion by suitably clamping the assembly during welding. The arcing on parent material and machined faces should be avoided strictly .Mostly welding will be done by Submerged arc welding Machine. Welders must have experience of working on SAW machine.

  VI. Dressing: Strict measures of quality control should be maintained throughout the work. The job should be free from spatters and undercuts. All dressing and cleaning shall have to be done to the satisfaction of Engineer In-charge/BHEL-QC.

- Raw material, electricity, gases available with BHEL shall be provided by BHEL free of cost. Contractor shall maintain records of the material and consumables issued by BHEL.
- Suitable machines / equipment such as welding machines(SMAW), grinding machines, Small portable drilling machines and their drill bits, PUG cutting machines, Gas cutting torches along with all their accessories and all other tools and tackles required for execution of job shall be arranged by Contractor. SAW Machine shall be provided by BHEL.
- All equipment required for warpage removal, fixture required for welding ,fit up, preparation of tracks required for SAW Machines shall be in the scope of the contractor however material required for preparation for above will be provided by BHEL.
- The job will be prepared in the tolerance as mentioned in SQP/ CQP (QWI NO: QCP002 REV.: 04 Dt. 08.12.20144) .The blue matching of each DU with other will be done by contractor during assembly. NTPC inspection is involved in this job so it must be within tolerance limit as specified in SQP, CQP and drawings.
- All the processes required i.e. pre heating and Stress Removal as per SQP and CQP (QWI NO: QCP002 REV.: 04 Dt. 08.12.20144) will be in contractors scope.
- All consumables like welding electrodes, grinding wheels, SAW wires etc. shall be arranged by BHEL. The electrodes and SAW wires shall be used as per drawing and WPS provided by BHEL.
- All nut, bolts, washers required for assembly shall be arranged by contractor.

- Contractor may be required to work in 3 – Shifts, Sundays and holidays also. Contractor shall appoint supervisors for all Shifts for co-ordination with BHEL. Contractor to arrange adequate work force of experienced welders and fitters who should have good knowledge of reading BHEL Drawings and execute the job as per requirement of BHEL.
- EOT crane shall be provided by BHEL free of cost; however, the assistance in operation of the same shall be the responsibility of contractor. In contingency, in order to meet the job requirement, any additional resources, if required shall be arranged by the contractor at their cost.
- Contractor to submit their internal inspection reports in appropriate format before offering the job for inspection by BHEL QC. Inspection at various stages during fabrication shall be done by BHEL - QC and proper record by Contractor shall be maintained.
- Completion schedule for fabrication & assembly of column will be as follows:

Job description	Total quantum of work (in MT)	Delivery Time
Plus Column	72	Within 3 months from the date of issue of material

- DPT at various stage of welding shall be done by contractor and submit the report. BHEL may witness the DPT and verify the reports submitted. DPT kit shall be provided by BHEL.
- RT/UT shall be carried out as per drawing requirement/QAP by BHEL. Re-work to be done, if required by BHEL QC without any charge.
- Inspection / clearance of fabricated assemblies by BHEL QC shall be Contractor's responsibility. Fabricated assemblies should not fail in post weld heat treatment and final testing as mentioned in drawing/QAP.
- Contractor shall start the work within 7 days from date of intimation given by BHEL.
- BHEL try to maintain the work flow on regular basis. However, BHEL shall not bind to provide work regularly.
- To keep fabrication areas clean by doing complete housekeeping daily in all shifts. This responsibility will be totally of the contractor & failure in same will entail suitable action against him.
- Contractor must deploy manpower as per shop requirement. In case of failure to deploy required manpower suitable action shall be taken and suitable deduction also will be made from bills.
- Contractor shall be responsible for loss of tools, instruments & as deemed fit recovery for loss/damage shall be made from contractor's bill.
- Contractor to provide safety appliance (personnel protection equipment) compulsory to their labour.
- The work shall be measured in terms of weight (Kilogram) for complete assembly cleared by BHEL- QC. The weight for payment shall be taken as per drawing only.
- The payment shall be made after fabrication of complete assemblies as per above scope of work & duly cleared by BHEL-QC on monthly basis.

****

C. BUSINESS/WORK DISTRIBUTION:

The Full Quantum i.e. 100 % quantum of work will be given to L-1 contractor.

D. Techno-commercial Deviation Sheet

TENDER ENQUIRY NO & DATE:

WORK DESCRIPTION:

DUE DATE OF OPENING:

Mention any deviation from Tender enquiry if any, else mention "No deviation ")

We hereby confirm that except for above, there are no other Deviation from all terms and conditions mentioned in Tender documents.

Signature of Authorized

Representative /Bidder

Name : Designation:

Date:

Name of Organization

SECTION III

PRICE BID FORMAT

FORMAT-2

NIT No.: …….

Bidder should quote price bid in following format only:-

PRICE BID FORMAT

ITEM	DESCRIPTION OF WORK	ESTIMATED QTY/ BOQ	RATE QUOTED (in Rs per Unit)	TOTAL AMOUNT (in Rs)
		A	B	C=A x B
1	Works contract for Fabrication & assembly of column as per scope of work at Fabrication plant, Jagdishpur	72,000 kgs.		

Column B & C to be filled by bidder

Total Amount (in words):_____

IMPORTANT:

1. Rates to be quoted in figures and words by the Contractor. There should not be any corrections in price bid contradictory to the above the offer will be liable for rejection.

2. The rate quoted should be kept **firm** during the execution of contract and no extra payment will be reimbursed to the contractor by BHEL. No increase in rate of DA / Wages hike shall be reimbursed to the Contractor. Contract shall anticipate such hike and quote in the tender.

3. Rate quoted above shall be inclusive of minimum wages as per govt. rules, **additional wages as per BHEL rules**, statutory requirements like PF & ESI, Uniform, shoes, PPEs, leaves/holiday wages, bonus, machinery charges, Consumable cost, supervision charges and all other charges as per scope of work exclusive of service tax. Service tax, if applicable shall be paid extra at actual.

4**. L-1 bidder shall be decided on the basis of Total Cost to BHEL**.

(Signature and Seal of bidder)

BHARAT HEAVY ELECTRICALS LIMITED
TIRUCHIRAPPALLI - 620 014
QUALITY ASSURANCE DEPARTMENT

AMENDMENT TO QUALITY WORK INSTRUCTIONS (QWI)

QWI NO: QCP002 REV.: 04 Dt. 08.12.2011

AMENDMENT SL NO: A1 DATE: 13.06.13

DESCRIPTION:

Clause No	The existing points	Amended as…	Basis for amendment
4.6	4.6 Post weld heat treatment Note-1: All fabricated components of P4 materials with any member above 16mm thickness, the entire assembly shall be Post weld heat treated. However when the size of fillet weld is less than 12mm PWHT is not required for non load carrying members..	4.6 Post weld heat treatment In respect of the fabricated components of P4 Materials , PWHT requirement of entire assembly is detailed in the tabulated columns.	CE M&P and collobarator practice.

Plate thick	Load carrying members (PWHT)		Non-Load carrying members (PWHT)	
	Fillet size >12mm	Fillet size =<12mm	Fillet size >12mm	Fillet size =<12mm
>16mm	YES	YES	YES	NO
16mm & below	NO	NO	NO	NO

NOTE	The above-mentioned changes will be incorporated in the relevant QWI during the next revision of the document.

Prepared by: A.Francis	Approved by: Bikramoditya Roy
Dt: 13-06-2013	Dt: 13-06-2013

BHARAT HEAVY ELECTRICAL LIMITED

TIRUCHIRAPALLI

QUALITY CONTROL PROCEDURE
For
Non Pressure parts **QCP:002/04**

Prepared by A.Francis Quality assurance	

Reviewed by	SIGNATURE
Engineering (Shri.V.Sridharan)	
Out sourcing (Shri.S.Mohanram)	
Quality control (Shri.Amitroy)	
Quality Assurance (Shri.Bikramodityaroy)	

Revision No	Date	Approved	Signature
00	01-04-1993	--SM/QA	--Sd--
01	01.01.1995	SM/QA	--Sd--
02	24.04.2004	SDGM/QA	--Sd--
03	10.06.2010	SM/QA	--Sd--
04	08.12.2011	DGM/QA	

ECORD OF REVISIONS

Rev No...	Clause No	Details of revision
00	--	This document consolidates all the general requirements and technical disciplines covered in the various previous
01	--	All amendments issued has been regularized and editorial correction made for better clarity. Scope of machining added in this document.
02		Editorial correction made for better clarity. Scope of machining added in this document.
03		Shaded clauses & Type of joints for base plates incorporated. Pwht temperature for P4 matl.revised.
04		**P91&92 Bar process requirements added (Shaded clauses)**

1.0 SCOPE

1.1 This procedure details out the process control and quality requirements for manufacture of Non Pressure Parts.

2.0 REFERENCE DOCUMENTS

2.1 AWS D.1.1, D1.6, IS 7215 and CE: M&P 5.11.1.1, 5.11.2.1 & 5.11.2.2 as guidelines.

3.0 MATERIALS

3.1 CLASSIFICATION OF MATERIALS (commonly used):

P No. Group	Specifications
P1 - Group 1 - SA 515 Gr 60.	Carbon steel IS 2062/**E250A & E250B**, IS 1239, IS 1161, A 36,
P1 - Group 2 -	H.Strength CS :SA105, SA 515 Gr 70, SA 299, SA 516 Gr 70,.
P4 - Alloy Steel	SA 387 Gr 11 & Gr 12, SA 182 Gr F 11 & F 12.
P5A – Gr 1(LAS),	SA 387 Gr 22 Cl.1 &Cl.2, SA 182 Gr F 22
P5B-Gr.1 (AS)	SA387 Gr5 Cl.1 & SA387 Gr9 CL.2
P15E Gr1	SA182F91, F92 , SA387 Gr.91,GR.92, SA335 P91, P92 SA213T91, T92, SA234WP91, WP92&SA336F91, F92
P6 -	SA 240-410,429
P8 - Stainless steel	SA 240 - 304 ,309,310, 316, 321, 347 & 253MA

Any other materials as specified in the drawings.

3.2 Raw materials used shall conform to the relevant specification as given in drawings and applicable TDC/PO. Any substitution of materials shall be done only with prior approval of engineering through applicable documents. Where subcontractors procure the raw materials, the same shall have valid test certificates.

3.3 Raw materials shall be free from visual defects like cracks, seams, laps, laminations,heavy pitting etc. When defects are noticed in visual inspection the same shall be confirmed using appropriate NDE techniques and repaired using applicable approved process .

3.4 All materials are procured with permitted dimensional tolerances of the material specifications and / or TDC. Wherever required, the raw materials shall be corrected prior to fabrication to achieve the required product tolerances.

3.5 Customer supplied materials are to be verified as per SP 0626.

3.6 The requirements of material traceability shall be as indicated in the respective drawings.

3.6.1 Product Attest "P" items indicated as in drawings are traceable to the test certificates and identified with material Specification, grade and melt number by stamping.

3.6.2 CERTIFIED items indicated as "C" in drawings are traceable to material Specification / grade only and identified by stamping / engraving / stenciling / painting.

3.6.3 Raw materials not covered by the above shall be identified by its W.O.No / material code / Specification / grade by painting / stenciling / engraving.

3.6.4 All subdeliveries shall be identified by its material code by painting or through name plates / tags.

3.7 When materials (including stock) are to be upgraded for special contract requirements QC shall ensure that the respective specification/ contract TDC (as applicable) are complied.

4.0 FABRICATION

4.1 MARKING, CUTTING AND PREPARATION

4.1.1 Raw material shall be marked and cut to size by shearing, machining, saw cutting , flame or plasma (for SS materials) cutting. Flame cut edges shall be cleaned to remove slag. Uneven edges shall be dressed by grinding. Gas cutting notches shall be filled up by grinding the notches smoothly for welding using compatible electrodes and ground before taking up for further fabrication.

4.1.2 Wherever raw materials supplied / available are not sufficient for the sizes required, the same can be built up using the splicing either by groove weld/fillet weld sufficient to hold the parts in place instructions given in the respective SQPs/ Drawings/DCN (Incl. Production Notes)

4.1.3 Layout for size and shape shall be marked before cutting (for other than CNC applications) The tolerance for marking shall be maintained within + 2mm unless otherwise specified. The diagonal difference shall be within 3 mm.

4.1.4 The markings shall be punched at convenient intervals and bordered with white paint.

4.1.5 Stainless Steel (SS) materials shall be cut using plasma cutting or shearing only. Any further dressing/ grinding of cut surfaces should be done with separate and clean abrasive wheels.

4.1.5.1 The cut edges should be smoothly ground.

4.1.5.2 Notches above 3 mm or 20 % 'T' shall be thoroughly cleaned and welded by using a qualified WPS and examined visually and by LPI . The repaired surfaces are to be cleaned to bright metal surface.

4.1.6 Clip / Cleat angles above 10mm thick used for beam connections which are sheared to length shall require heat treatment.

4.1.7 Heat treatment shall be done after shearing for P4 materials t>12.5mm and for P5 materials t>10mm.

4.1.8 Shearing /Flame/gas cutting is prohibited on Gr 91 and Grade 92 materials.

4.1.9 Use only bandsaw for cutting of Gr91&92 materials. However for plates use plasma/waterjet/bandsaw only

4.1.10 The requirements of preheat for gas cutting are as follows:

Carbon steel	t <= 50mm…….Nil
Carbon steel	t > 50mm……100 º C.min.
Alloy steel (P4)	t < =25mm…….Nil
Alloy steel (P4)	t > 25mm……..150 º C
Alloy steel (P5A,B Gr.1)	All ……150 º C
Stainless steel	……Not applicable……..

4.1.11 Stress relieving for gas cut edges shall be as follows.

Material	Thickness	Heat treatment cycle
P1	> 50 mm	600 º - 650 º C for 30 minutes . Furnace cool (Alternatively, the cut surface can be ground / machined upto 3 mm to remove HAZ)
P4	> 16 mm	650 º – 700 º C for 30 minutes . Furnace cool
P5	All	680 º - 730 º C for 30 minutes . Furnace cool
SS (plasma)	Any	Not required

4.1.11.1 For materials other than P5, P15E Gr 1(Grade 91) and Grade 92 this heat treatment may be clubbed with the final heat treatment of the product.

4.1.12 The prepared plates shall be visually inspected and repaired if required as per SIP:NP:06.

4.1.13 The raw materials after cutting shall be identified with relevant WO No., DU No., Part No. and Material Spec / Grade (transferred).

4.2 FORMING

4.2.1 Before forming , proper cutting plan (Drawing dimensions with process allowances) shall be prepared and cleared by the concerned agency. Forming shall be done using proper tooling free from damages. Method of forming and work centre shall be identified in OPS / relevant QWI refered in PO.

4.2.2 Built up (Forming) operations for Beams and columns shall be done done by suitable Fixtures,Machines ,WPS & other accessaries required for forming. All the Forming operations of sheets / plates shall be done by rolling / pressing. For shell formed components Circularity of rolled shells shall be checked using templates (of length > ¼ of ID).

4.2.3 Suitable nonmetallic padding shall be provided while forming of stainless steels to avoid contamination.

4.2.4 All formed /Built up components shall be checked for orientation, angle, and other dimensions as per drg. All formed parts shall have smooth finish and shall be free from bends, folds and sudden transitions.

4.2.5 Minimum thickness after forming shall be ensured whenever specified in drg.

4.2.6: **Forming of U-ROD(Gr 91 &92)**

4.2.6.1 Identify, mark and cut the rod using bandsaw to a length of equivalent to the arc length indicated in the drawing with two arm length(upto butt joint) +20mm .

4.2.6.2 Mark the centre of the rod with a heat resistant chalk to be visible after heating. For temperature and other details refer the SQP:NP:15(Latest)

4.2.6.3 Remove the “U”rod and air cool to room temperature .

4.2.6.4 Visually inspect the bend surface and check dimensions and ensure no surface imperfections.

4.2.6.5 Normalizing and tempering of "U"Rods to be done within 72 hours after pressing/bending operation.(Ref.SQP:NP:15(latest)

4.2.6 .6 Shot blast the "U"Rod to remove scaling and check the dimension. Conduct LPI/Wet MPI and ensure no surface indications.

4.2.6.7 Mark and cut the limbs of "U" rods such that the straight portion shall be as per drawing from the tangent point.

4.2.6.8 Edge prepare the "U"rod s for butt joint preparation as shown in the drawing by machining No gouging and grinding is allowed.

4.2.6.9 For Detailed operation of cold and hot forming of Gr 91 &Gr 92 materials refer SQP:NP:15(latest)

4.2.7 Threading of "U"Rods

4.2.7.1 Mark and cut the rods equivalent to the straight portions as shown in the drawings.

4.2.7.2 Threading to be done on one end of the rod to thread size as mentioned in the drawing/SQP: NP15(latest).

4.2.7.3 Edge prepare the other end of the rods by machining for butt welding as shown in the drawing.

4.2.8 Tolerances for formed components when not specified in drg. /SQP:NP15(latest).Shall be as follows

a) St.Length / Dia, Width & Height : + 1 mm/M, 5 mm Max
b) Verticality : 1 mm / M, 5 mm Max
c) Squareness : 1 mm / M of length / Dia
d) Straightness : 1 mm / M, 5 mm Max
e) Radius : ± 5 mm
f) Bend Angle : + 2º
g) Ovality : 1%
h) E.P Angle : + 5º / - 2.5º
i) Diagonal diff : 3 mm

4.3 WELDING

4.3.1 WELDING CONSUMABLES

4.3.1.1 Welding consumables conforming to the qualified welding procedures shall be used. However the following guide lines are provided.

4.3.1.2 Only Basic coated electrodes (E 7018) shall be used in the following cases:-

a. All Strength welds in ceiling girders, flange/web butt welds and in other beams, columns etc.
b. For all structural welds, or when thickness of any one member of the weld joint is > 12

mm (unless otherwise indicated in the drawings / Qualified WPS).
c. For welding of high tensile steels like BSEN 10025 E250A & B, SA299, SA515 Gr.70, SA516 Gr.70.

4.3.1.3 Rutile electrodes may be used for other weld joints.

4.3.1.4 All low hydrogen electrodes (EXX 16 & EXX 18) shall be dried in the baking oven at 250-300 deg.C for 2 hours and the electrodes shall be held at 120 deg.C until they are used.Electrodes shall not be re-baked more than once and use of elctrodes in wet condtion is prohibited.

4.3.1.5 All rutile electrodes (EXX 13) shall be dried at 120 deg. C for 1 hour min. and held at 120 deg.C till use.

4.3.1.6 Fluxes for SAW shall be dried at 250 deg.C for 1 hour min. before use. Height of flux bed while drying in pan or oven, shall not be more than 100mm.

4.3.1.7 Unless otherwise specified , SS consumable shall be baked as per Electrode manufacturer's recommendations and stored at 120 º - 150 º C until use.

4.3.1.8 The type of welds employed in the structural fabrications (Girders,Columns,Beams & Base plates etc) are identified in the annexure –A along with sketch for better clarity and under standing. For further details the fabricator can ref the engg.drg. no.3-35-110-00995/00

4.3.2 FIT UP

4.3.2.1 Proper fit up shall be ensured before welding as per Drawing. Tack welding or mechanical clampings shall be used to maintain the fit up requirements before and during welding.Bridge pieces used during fit up shall be of ferritic for ferritic materials and stainless for stainless steel materials. However for P15E Gr.1.(F91 & F92) prepare a fixture for fit-up of butt joint of 'U' rod with Straight rods.

4.3.2.2 Dimensions of the cross sections of groove welded joint shall be within the following tolerances w.r.t . drawing requirements:

	Root not back gouged	Root back gouged
1. Root face of joint(land)	± 2 mm	Not limited
2. Root opening of joint (with out backing)	± 2 mm	+ 2 mm - 3 mm
Root opening of joint* with backing)	+ 6 mm - 2 mm	Not Applicable
3. Groove angle of of joint	+ 10º - 5º	+ 10º - 5º

*(NOTE): Root opening wider than permitted by above tolerances but not greater than twice the thickness of the thinner part or 19mm,whichever is less may be corrected by edge buildup to acceptable dimensions prior to welding. Such build up edge shall be MPI / LPI checked.

4.3.2.3 For C. S. fillet welds, the parts shall be as close as practicable and gap shall be limited to 5 mm (If gap exceeds 2 mm, the leg of fillet shall be increased by the amount of gap but in no case shall exceed 4.8 mm). For thickness 75 mm and above gap up to 8 mm can be permitted provided suitable backing is used.

4.3.2.4 For S. S. fillet welds, the parts shall be as close as practicable. Gaps 2 mm and above upto 5mm are acceptable if the fillet size is increased by an amount equal to the gap.

4.3.2.4 Parts to be joined by butt welds shall be properly aligned. An offset not exceeding 10% of the thickness of the thinner part joined can be permitted, but in no case more than 3.2 mm, is permitted.

4.3.2.5 The types of weld joints indicated in the fabrication of structural components are identified with symbols in ANNEXUR -A & B .For further details refer the Engg standard drawing no.3-35-110-00995(Latest)

4.3.3 PRE HEATING

4.3.3.1 Pre heating requirements for welding shall be as per Clause 4.6.7 and controls shall be exercised as detailed below. No preheating is required for stainless steels.

4.3.3.2 Preheating shall be maintained during the entire process of welding.

4.3.3.3 Preheating is to be done using gas burner or induction / resistance heating. The temperature must be uniform and verified using thermal chalks or thermocouples prior to start of welding as well as during welding for a width of 't' (maximum) or (100)75 mm whichever is less.

4.3.3.4 Where interpass temperature control is required during welding, the temperature must be ensured using thermal chalks / thermocouples with recorder . Inter pass nitrogen / air cooling can be adopted to maintain inter pass temperature in case of stainless steels.

4.3.3.5 Wherever post heating is specified after welding, the preheating shall be continued till attaining the post heat temperature and maintained for the required time and cooled slowly by wrapping suitable insulating blankets like asbestos.

4.3.4 Welding shall be performed using qualified procedures and qualified personnel. Edge preparation and welding details shall be as per drawing.

4.3.5 For items to be manufactured at subcontractor's works (including away centre fabrication) , for requirements of procedure and personnel qualification SIP:NP: 07 (Latest) shall be followed.

4.3.6 When double bevel welding is adopted, back gouging and grinding is to be done. Back gouged groove shall be checked with PT / MT before welding from second side. However for P15E Gr.1.(F91 & F92) Only back grinding to be done after interstage PWHT.

4.3.7 Proper sequence of welding shall be adopted to minimise distortion. The distortion of the finished jobs, if any may be corrected by mechanical means / hot correction.

4.3.7.1 For welding of SS extreme care is to be taken in weld sequencing to minimize the weld distortion and shrinkage. For complex weldments a weld sequence instructions may be prepared by contractor prior to work commencement. Weld joints likely to have high shrinkage should be welded (with minimum restraints) before welding other joints providing allowance for shrinkage.For furher details ref.SQP:NP:20

4.3.7.2 While cutting long web plates suitable camber may be provided /required to compensate for the distorion during cutting and welding.

4.3.8 All butt welds of divider plate and guide vanes in ducts shall be flush ground inside.

4.3.9 The use of jigs and fixtures is recommended where ever practicable. Suitable allowances shall be provided for weld shrinkage. Proper sequence of welding shall be followed to control the distortion during welding.

4.3.10 All temporary attachments shall be welded with the required preheat. After their removal welded spots shall be ground flush and LPI checked.

4.3.11 Groove welds shall preferably be made with minimum reinforcement unless and otherwise specified in drawing / SQP. In case of butt welds, reinforcement shall not exceed 3.2 mm. and shall have gradual transition to the plane of the base material surface.

4.3.12 The surface of the welds shall be free from coarse ripples, overlaps, undercuts and abrupt ridges to avoid stress raisers.

4.3.13 Where parts of different thicknesses are welded or surface offset is more, the transition shall be made gradual by grinding / machining with 1: 2.5 taper.

4.3.14 Stray arcs shall be avoided to the extent possible. Arc spots if noticed shall be ground and checked by LPI / MPI. Thickness requirements shall be ensured after grinding.

4.3.15 Pre heating of Gr 91 &Gr 92 shall be 220 Deg.C .For other process parameters refer the applicable WPS.

4.4 WELD REPAIRS

4.4.1 Removal of defective weld / portions of the base material may be done by machining, grinding, chipping, gas cutting, oxygen gouging or carbon arc gouging. Defective portions of the weld shall be removed without substantial removal of sound base metal.

4.4.2 For under sized welds additional weld metal shall be deposited using an electrode preferably smaller than that used for making original weld limited to 4mm in diameter. The surfaces shall be cleaned thoroughly before deposition.

4.4.3 Defective welds/base metal shall be repaired by removing or/and rewelding as follows:

4.4.3.1 Overlap / excess weld metal shall be removed by grinding.

4.4.3.2 For excess concavity, crater, undersize & undercuts, deposit additional weld metal after cleaning the weld surface.

4.4.3.3 For Cracks in weld or base metal, ascertain the extent of crack by suitable NDE / acid etching, remove the crack to sound metal upto each end of the crack by arresting the ends for further propagation and reweld.

4.4.3.4 For weld porosity, slag inclusions & lack of fusion remove defective portions & reweld

4.5 HOT CORRECTION

4.5.1 Members which require hot correction are to be supported at suitable locations and mark the locations for heating.

4.5.2 Heat the locations marked by using neutral flame. Torches used for heating shall be moved continuously & uniformly over selected area to avoid localised over heating.

4.5.3 For Carbon steels the maximum temperature shall not exceed 650 º C and shall be ensured using thermal chalks / thermocouples.

For alloy steels P4 – 705º C , P5 – 735º C temperatures are to be maintained for hot corrections

4.5.3.1 For Austenitice stainless steels the maximum temperature shall not exceed 430 º C and shall be made known to inspection authorities . Otherwise , after hot correction solution annealing at 1050 – 1100 deg C is to be done.

4.5.3.2 For Ferritic/Martensitic/Duplex stainless steels the maximum temperature shall not exceed 315º C and shall be made known to inspection authorities . The temperature shall be ensured using thermal chalks / thermocouples.

4.5.4 Additional dead weights may be placed over the positive side of the bend depending upon the requirement to accelerate hot correction.

4.5.5 Allow for natural cooling. Accelerated cooling shall not be adopted. Remove the dead weights used after cooling.

4.5.6 Wherever the correction for distortion affects the weld joints, applicable NDE shall be repeated after the correction.

4.6 POST WELD HEAT TREATMENT (PWHT)

4.6.1 The process controls (temperature control and recording) for heat treatment shall cover the activities before, during and after heat treatment.

4.6.2 The weldment shall be cleaned to free of grease, oil etc. prior to heat treatment.

4.6.3 PWHT shall be done in a furnace or by local heating a band (including the entire weld and adjacent area of the base metal) .

4.6.4 The thermocouples and recording instruments shall be calibrated as per applicable standards and records maintained. The furnace shall have been qualified and calibrated.

4.6.5 All materials to be heat treated in furnace shall be loaded in such a way that they shall not be subjected to direct flame impingement. Jobs shall be preferably loaded on raised plat forms so that no material projects into the plane of burners. Alternatively flame deflectors may be provided in front of the burners to avoid direct flame impingement. Ensure loading of test coupons wherever applicable. The furnace temperature shall not exceed 315 º C at the time of loading material / weldment.

4.6.6 Number of thermocouples and their location shall be decided covering maximum and minimum thickness and covering all the zones. The temperature variation within 5 meters shall not exceed 140 º C during heating period (above 315 º C).

4.6.7 The **temperature requirements** for Pre heating, Post Weld Heat Treatment(PWHT) & temperatures are as below.(Unless otherwise specified.)

Material	Thickness	Pre heating	PWHT Temp.	Remarks
P1 Gr 1&2	t < 38	Nil	625 +/- 25 º C	a) For all butt welds in plate welded girders when t > 50mm.
	T= 39-62	100 º C		
	t> 63	150 º C		

P4 Gr 1&2	All	150	665 +/- 15 º C	a)All butt welds in tension member b)All fabricated components when t>16mm(Note1)
P5A Gr 1& P5BGr2	All	150 º C (Note2)	705+/- 25 º C	All welds (Note 3)
P15E Gr1	All	220 º C	760+/- 10 º C	After welding, cool to below 95 º C before PWHT. PWHT to be done within 72hrs after completion of welding .(Post heat as perWPS)
P8	300 type 400type	120 º C 205 º C	- -	

Note 1 All fabricated structural components of P4 materials with any member above 16mm thickness, the entire assembly shall be post weld heat treated. However when size of fillet weld is less than 12 mm, PWHT is not required for non load carrying members.

Note 2 All welds on P5 material shall be post heated at 250 º C for 2 hrs or 150 º C for 4 Hrs, immediately following welding.

Note 3 All welds of P5 material shall be post weld heat treated. In case where the size of fillet is less than 12 mm, PWHT is not required for non load carrying members.

4.6.7.1 The **soaking time** shall be as follows:

a. For P1 materials the soaking time shall be 1 hr/inch of thickness(t) (2.5 mts / mm) upto 2" and 2 hrs + 15 minutes for each additional inch for t > 2".
b. For P4 & P5 materials the soaking time shall be 1 hr/inch of thickness (2.5 mts / mm) upto 5" and 5 hrs + 15 minutes for each additional inch for t > 5".
c. For combination cycles mentioned above, calculate the minimum soaking time for individual components as 2.5 minutes/mm of the thickness of weld/material whichever is applicable. Soaking time selected for the cycle shall not exceed the limits given below:

Material	Thickness (mm)	Max. soaking time (minutes)
P1 (A,B,C), P4, P5A, P1 (A,B) + P4, P1C + P4, P1 + P3 P4 + P5A, P15E Gr1	Up to 25 mm	125
	26 - 50 mm	200
	51 - 80 mm	250
	81 - 150mm	375

4.6.7.2 Unless otherwise specified, in case of mixed loads of materials not covered under simulation HT, the following heat treatment temperatures shall be followed. In such cases, guidelines for soaking can be taken from Clause 4.6.9.

For components having butt joint between P1 & P4, or P3 & P4, the cycle shall be 630 - 670º C.

Where a component has a butt joint between P4 & P5A, the cycle shall be 680 - 710º . C.

Where a component has a butt joint between P1 & P3, the cycle shall be 620-660 º. C

For P1+P5A material combination, follow the WPS requirements

The following jobs shall not be combined in the same cycle during PWHT.

Separate jobs of P1 and P4 Separate jobs of P4 and P5

4.6.7.3 For PWHT of P15E Gr 1 (Grade 91) & Grade 92 materials, soaking time shall be 1 hour per/inch with minimum soaking of 1 hour . The hardness of the weld metal or heat affected zone after PWHT shall be within 181 BHN to 303 BHN.

4.6.8 The following rules shall apply to establish the thickness to be used in determining the soaking time for PWHT.

4.6.8.1 For Butt welds, the thickness shall be the thickness of the material at the weld. For bar stock, the thickness shall be the diameter.

4.6.8.2 For fillet welds, the thickness shall be the throat thickness. If a fillet weld is used in conjunction with a groove weld, the thickness shall be the greater of the depth of the groove or the throat thickness.

4.6.8.3 For partial penetration branch welds, the thickness shall be the depth of the groove prior to welding.

4.6.8.4 For repairs, thickness shall be the depth of the groove as prepared for repair welding.

4.6.8.5 For combination of different welds in a component, maximum thickness of weld shall govern.

4.6.9 Requirements of Rate of Heating (ROH) above loading temperature 315 º C and Rate of Cooling (ROC) are as given below. During heating and cooling, variation in temperature between thermocouples shall be 85 º C maximum, unless otherwise specified.

Thickness	ROH / ROC (Max) Above / upto 315 º C
Up to 25mm	220 º C / hour
26 - 50 mm	95 º C / hour
50 – 75 mm	70º C / hour
Above 75 mm	55 º C/hour
For S.S Matl	200 º C / hour min (Forced air cooling)
GR 91 &92	Furnace cooling upto 350 º C

4.6.10 In case of interruption during Heat treatment the following action has to be taken depending on the stage of occurrence:

Type of Heat treatment	Stage of interruption	Action
Annealing & stress relieving	Heating	Heat treat subsequently as specified
	Soaking	Heat treat subsequently for balance soaking
	Cooling	If the ROC during interruption period meets the specified rate, cool subsequently at required rate upto 400º C. Otherwise, reheat to the soaking temperature, hold for 15 minutes and then cool at the specified rate

Normalising(N) Tempering (T) &, Soln. annealing (S)	Heating	Heat treat subsequently as specified
	Soaking	Heat treat subsequently for full soaking(N,S) / Balance soaking (T)
	Cooling	Not applicable

4.6.11 Local heat treatment can be carried out by Resistance heating or Induction heating. For local heat treatment of weld joints, width of the heated band on either side of the weld must be at least 3 times the width of the weld groove of the thickest part or 3 times the highest section thickness, whichever is greater.

4.6.11.1 The width of the insulation band beyond the heating band shall be at least twice the total width of the heating band.

4.6.11.2 A minimum of three thermocouples shall be placed such that at least one is on the weldment and the other two on the base material on either side of the weldment.

4.6.11.3 The winding arrangement shall be established to attain the required temperature. The initial rate of heating shall be minimum such that it stabilises at the required rate of heating before reaching 400 deg C.

4.6.12 After heat treatment, the charts shall be correlated with the job and cleared by QC. The chart shall contain cycle no, Date, W.O and DU details. Temperature, ROH, ROC and soaking time shall be calculated, entered in the chart and signed off by QC.

4.6.13 Wherever applicable the test coupons shall be tested and reports obtained to complete the clearance of heat treatment operation.

5.0 NON-DESTRUCTIVE TESTING

5.1 The requirement of NDE, extent and type of examination shall be as per respective product SQP and / or CQP .Wherever product SQP is not existing the following requirements shall apply.

5.2 Visual inspection shall be performed as per SIP:NP:06

5.3 RADIOGRAPHY.

a. All Butt welds of Carbon steel for thickness t > 32mm
b. All butt welds of alloy steels for thickness t >12.0mm for P5 and T > 16mm for P4.
c. All butt welds in monorails.
d. SS butt welds of T > 16mm unless otherwise specified.

5.3.1 All radiographic films shall possess Firm code , RT agency, Cust. No, Part No, RT reference Number. and weld location reference number. The job shall be numbered with Radiograph number.

5.4 MPI / LPI BEFORE PWHT

a. All flame cut edges of Carbon steel for t >= 38 mm and alloy steels for t > 12mm.
b. All butt welds joining plate members in which one of the plate member is over 25 mm thick for Carbon steel and over 12 mm thick for alloy steel.
c. All fillet welds between tension flange and web.
d. All fillet welds joining plate members in which both the plate members are over 25 mm thick for Carbon steel and over 12 mm thick for alloy steel.
e. For all butt welds of CS & AS weld groove after back chipping prior to welding from

second side.
f. All main fillet welds for SS require LPI
g. MPI/LPI for all fillet welds & HAZ of SA387 Gr.22 materials after HT.

5.5 All NDE shall be carried out by qualified personnel as per BHEL NDT procedures. Where subcontractors use their own procedures for NDE the same shall have the approval of BHEL NDTL.

6.0 MACHINING

6.1 GENERAL

6.1.1 Ensure of raw material identification throughout the machining process. Traceability to the contract shall be ensured by stamping or marking / painting or by tags(WO No.and DU / Part no.)

6.1.2 Where the material identification is likely to be removed during cutting or machining , the transfer of material identification shall be ensured.

6.1.3 In case of components / part processed items received from Subcontracting / other shops, ensure the completeness and clearance by QC / Customer Inspector through Inspection Reports / OPS.

6.1.4 Proper care shall be taken during handling of materials at all stages of manufacture. Items stored in the shop floor shall be properly identified and preserved to prevent mixup and damages / rusting / warpages.

6.1.5 All Machined surfaces shall be properly protected and stored. Wherever long storage is envisaged, they shall be preserved with grease / rust preventive oils and protected suitably with polythene / gunny bag or plastic peel off coatings.

6.2 MARKING

6.2.1 The marking on machined components shall be in such a location which will not be detrimental to the surface finish requirements of the component.

6.2.2 Purpose of marking is to:

1. Ensure availability of machining allowance.
2. Identify locations for machining.
3. Provide reference for setting and inspection.

6.3 PROCESS CONTROLS

6.3.1 The following shall be ensured for selection of work centers, tools, jigs and fixtures:

a The work centre for machining shall be identified in OPS / loading sheet based on the process capability of the machine or Machine accuracy established to suit the tolerances.

b Test hardwares (Jigs, Fixtures and Templates) used as a means of inspection / process control shall have been qualified through first off trials and shall be regulated through valid number. The same shall be reflected in the OPS / loading sheet .

c Softwares used in case of CNC / NC machines shall have been validated through trials or inspection of similar components produced and accepted.

d All cutting tools shall have been ensured for its correctness before use. In case of regrinding of tools they shall be verified after regrinding.

6.3.2 The following shall be ensured before setting the job on the machine, during processing and after completion of machining:

a Ensure the verticality and flatness of the job after clamping by using the reference markings or dialing the surfaces. Ensure the adequacy of clamping.

b Ensure proper clamping of the correct tool in to the tool holders.

c After machining the machined surfaces shall be cleaned and all corners shall be deburred. After removing from the machine they shall be properly stored.

d Before starting reaming ensure proper material allowance for finish operation.

e During drilling, reaming and tapping the removal of chips shall be done periodically to prevent clogging of chips. For deep drilling ensure that run out and drill travel are verified in free condition and ensure proper clamping of the tools.

.4 INSPECTION

6.4.1 Ensure completeness of all final machining operations. Dimensional inspection shall be done with relevant drawings. Ensure use of calibrated instruments / gauges.

6.4.2 Unless otherwise specified in the drawing or SQP, the following tolerances can be used for untoleranced dimensions.

1.Linear Tolerance (:millimeters) - Medium

PERMISSIBLE DEVIATIONS FOR BASIC SIZE RANGE						
Up to 6	From 6 TO 30	from 30-120	From 120-400	From 400-1000	From 1000-2000	Above 2000
± 0.1	± 0.2	± 0.3	± 0.5	± 0.8	± 1.2	± 2.0

2. Angular Tolerance

a. Assembly characteristics ± 0.5º
b. Other characteristics ± 1º

7.0 FINAL INSPECTION

7.1 All dimension shall be inspected as per relevant drawings. Tolerances for fabricated items when not specified in drawings shall be as per clause 4.2.6.

8.0 CLEANING AND PAINTING

8.1 All the temporary cleats, bridge pieces shall be removed carefully so as to avoid damage to parent material. Temporary tack welds shall be ground smooth. Complete assembly shall be cleaned to remove mill scales, spatter, slag, rust, oil or grease.Surfaces shall be prepared and painted as per SIP:PP:22 (latest). Site EPs shall be applied with weldeable primer . All site EP shall be protected suitably from mechanical damage.

8.2 All temporary stiffeners / attachments used for transportation and handling that are removed after site assembly shall be painted with yellow paint.

8.3 Match marking and flow direction for applicable components shall be as per the respective product SQP./Drawing

8.4 The following details shall be clearly marked with relavant details by paint, bordered and covered by one coat of transparent varnish

Project Name :
Work order number , DU NO. Weight & Sub-contractor Name/Code:
Co mponent / Assly. Designation :

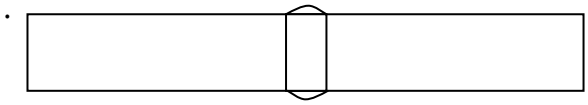
8.5 Tension flanges in girders are to be identified by hard punching indicating `TENSION FLANGE'

8.6 Apply grease on the threaded portion of "U"Rod and protect the threaded portion from damage with suitable plastic end caps.

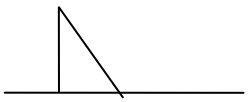
8.7 For subcontracted items the firm code shall be punched and bordered with white paint.

ANNEXURE - A

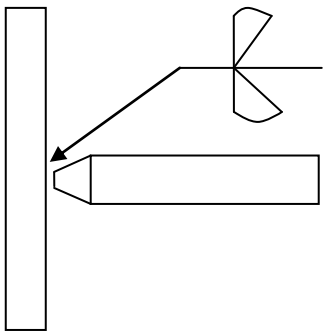
SQUARE BUTT WLED



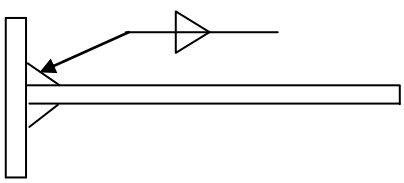
BEVEL WELD



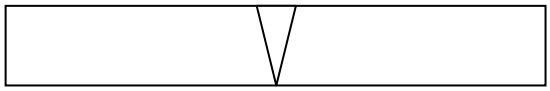
K WELD



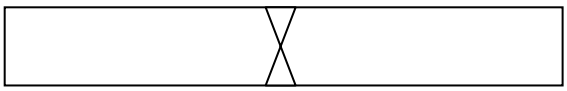
FILLET WLED



SINGLE V JOINT

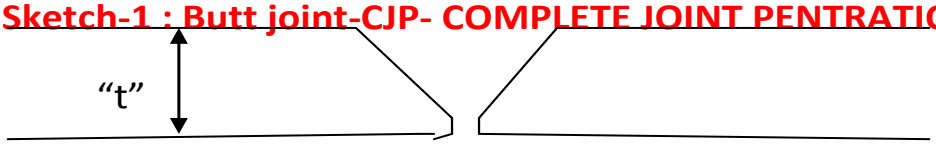


DOUBLE V JOINT



ANNEXURE-B

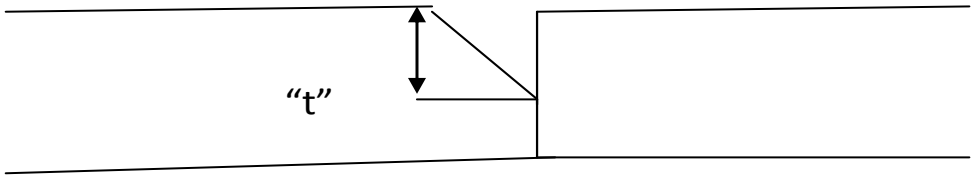
Sketch-1 : Butt joint-CJP- COMPLETE JOINT PENTRATION



Where "t" is base metal thickness . If "t" is > 50mm PWHT to be done.

If "t" is > 32mm RT to be done.

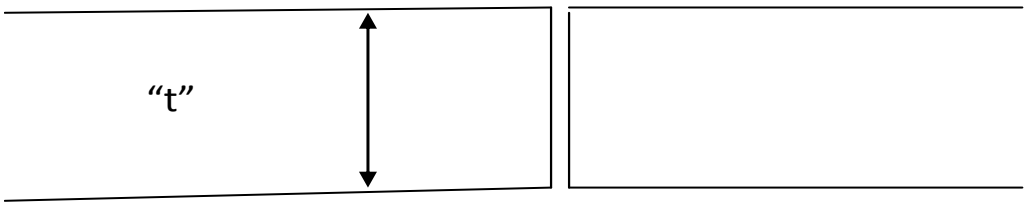
Sketch: 2 GROOVE Butt joint-PJP- PARTIAL JOINT PENTRATION



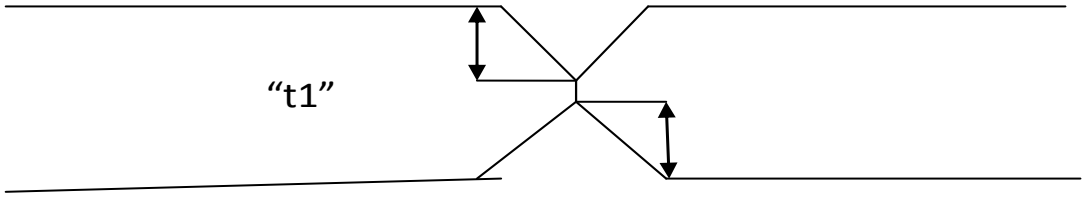
Where "t" is weld metal thickness. If weld depth is >50mm PWHT to be done

RT: is not applicable.

Sketch:3 - SQUARE BUTT JOINT PWHT & RT is not applicable in this case

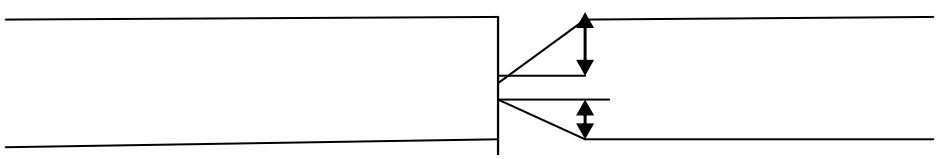


Sketch:4 - DOUBLE "V" GROOVE BUTT JOINT –PARTIAL PENTRATION JOINT



Where " t" is equal to t1+t2 . If "t" is > 50mm PWHT to be done. RT is not applicable

Sketch:5 – "K" **GROOVE WELD BUTT JOINT –PJP-PARTIAL PENTRATION JOINT**



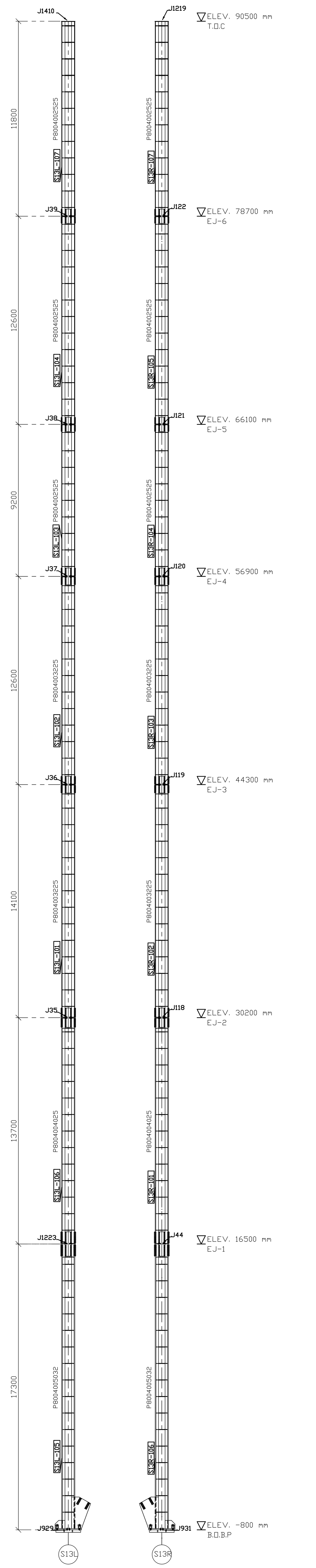
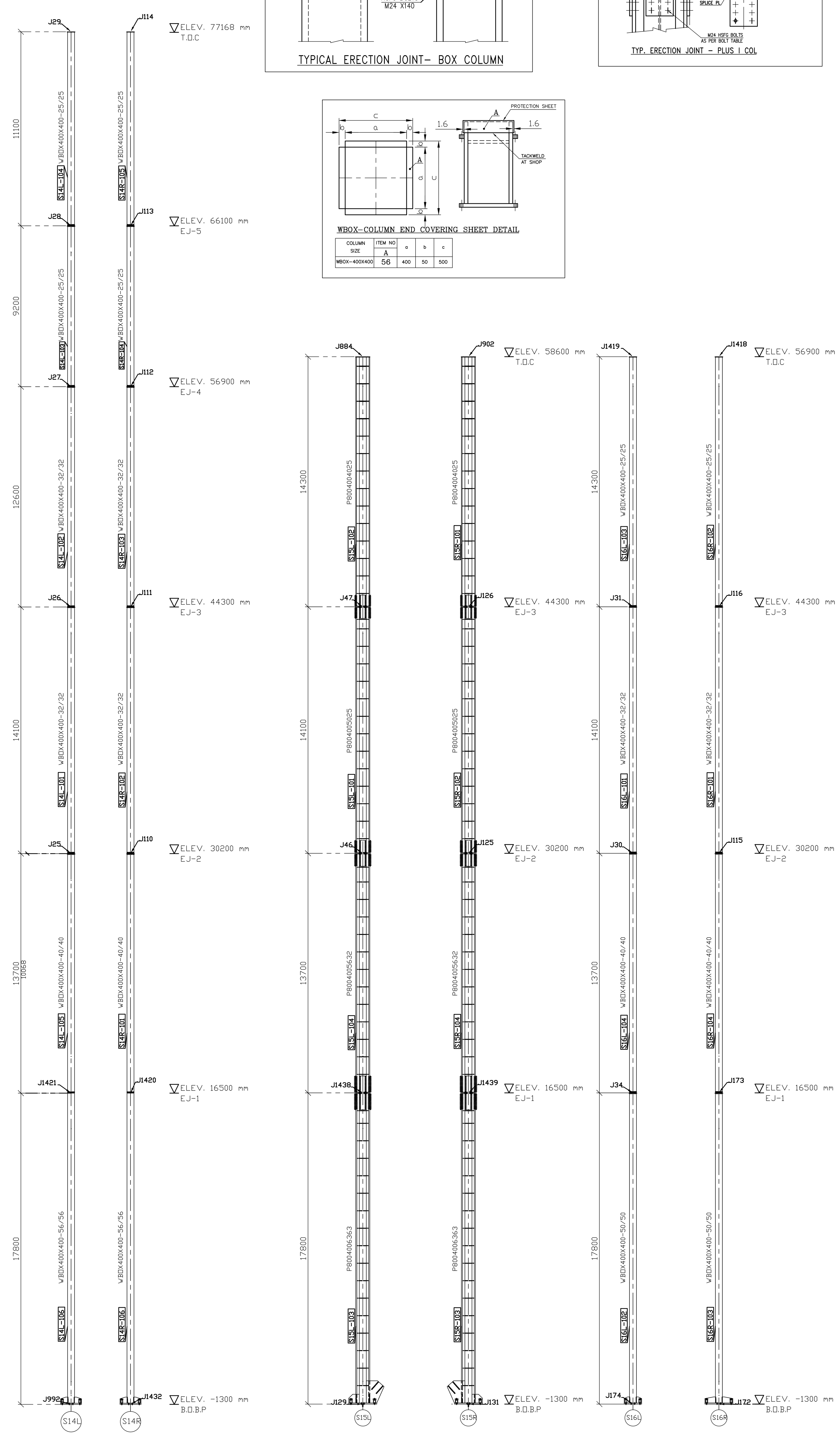
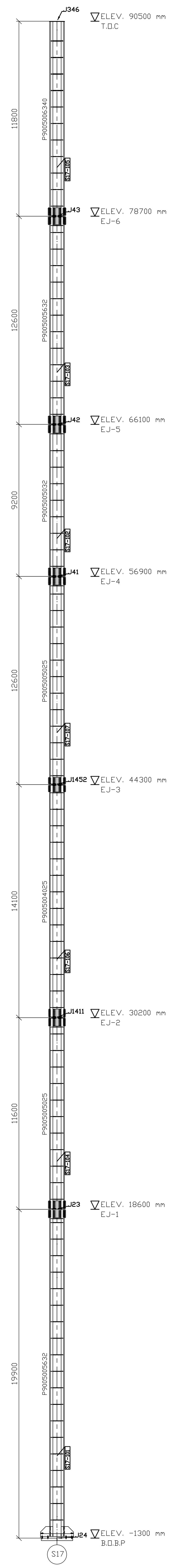
0-35-130-15185
DRAWING NO

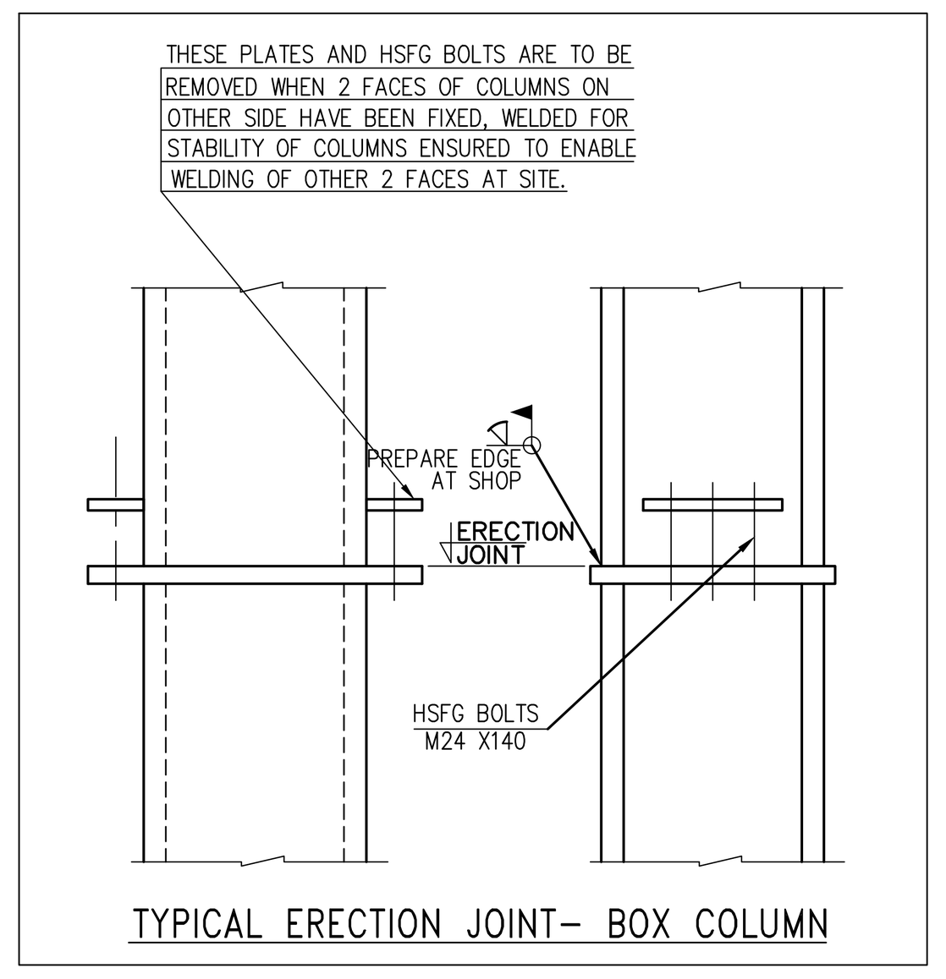
FOR TOLERANCES OF UNTOLERANCED DIMENSIONS DURING MANUFACTURE REFER PLANT STD. NO TP 023 0299

REQUIREMENT OF HSFG BOLTS & NUTS FOR WBOX-COLUMNS ERECTION JOINTS

RELEASED IN PG.MA 35-700

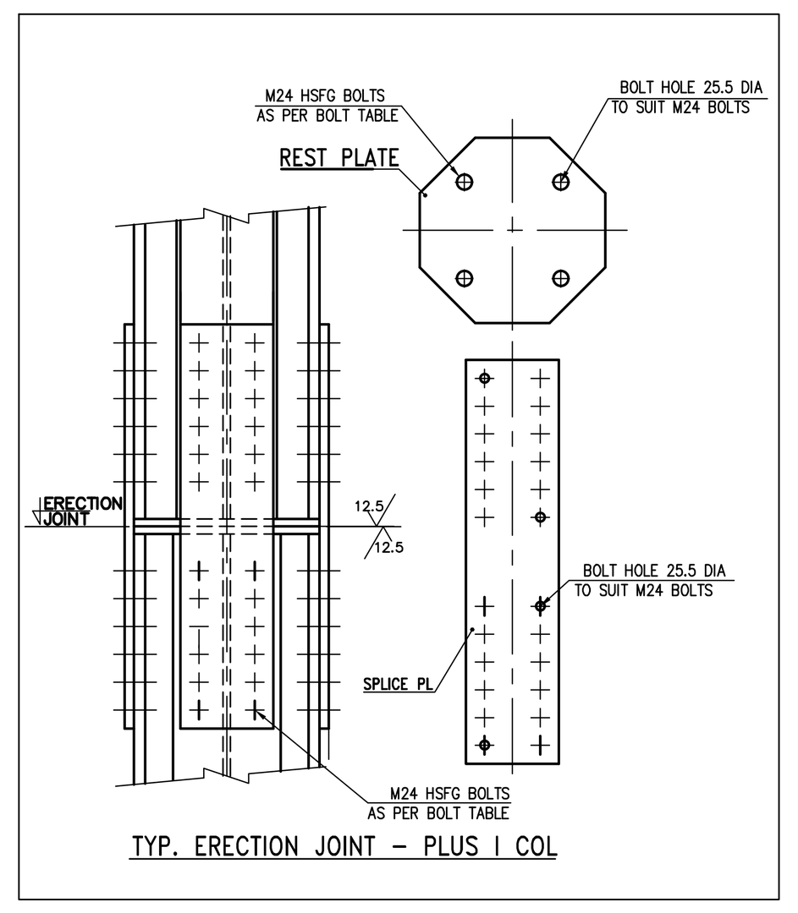
DESCRIPTION	QUANTITY
HSFG BOLT & NUT M24 X 150	180
HARDENED WASHER A 24	180

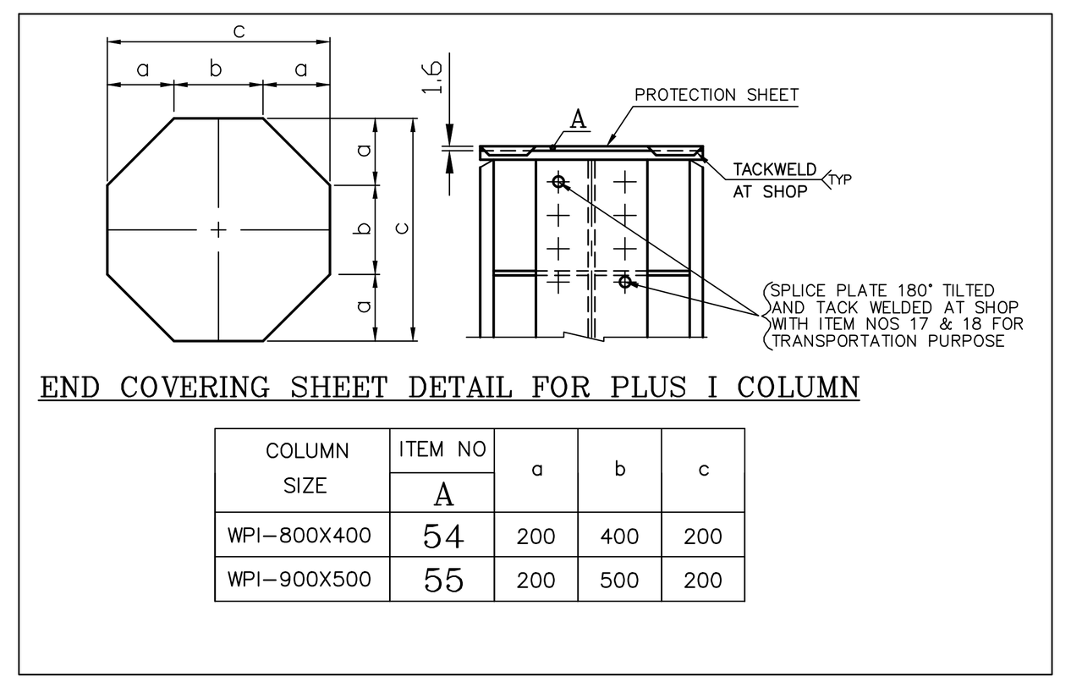






TYPICAL ERECTION JOINT- BOX COLUMN

WBOX-COLUMN END COVERING SHEET DETAIL

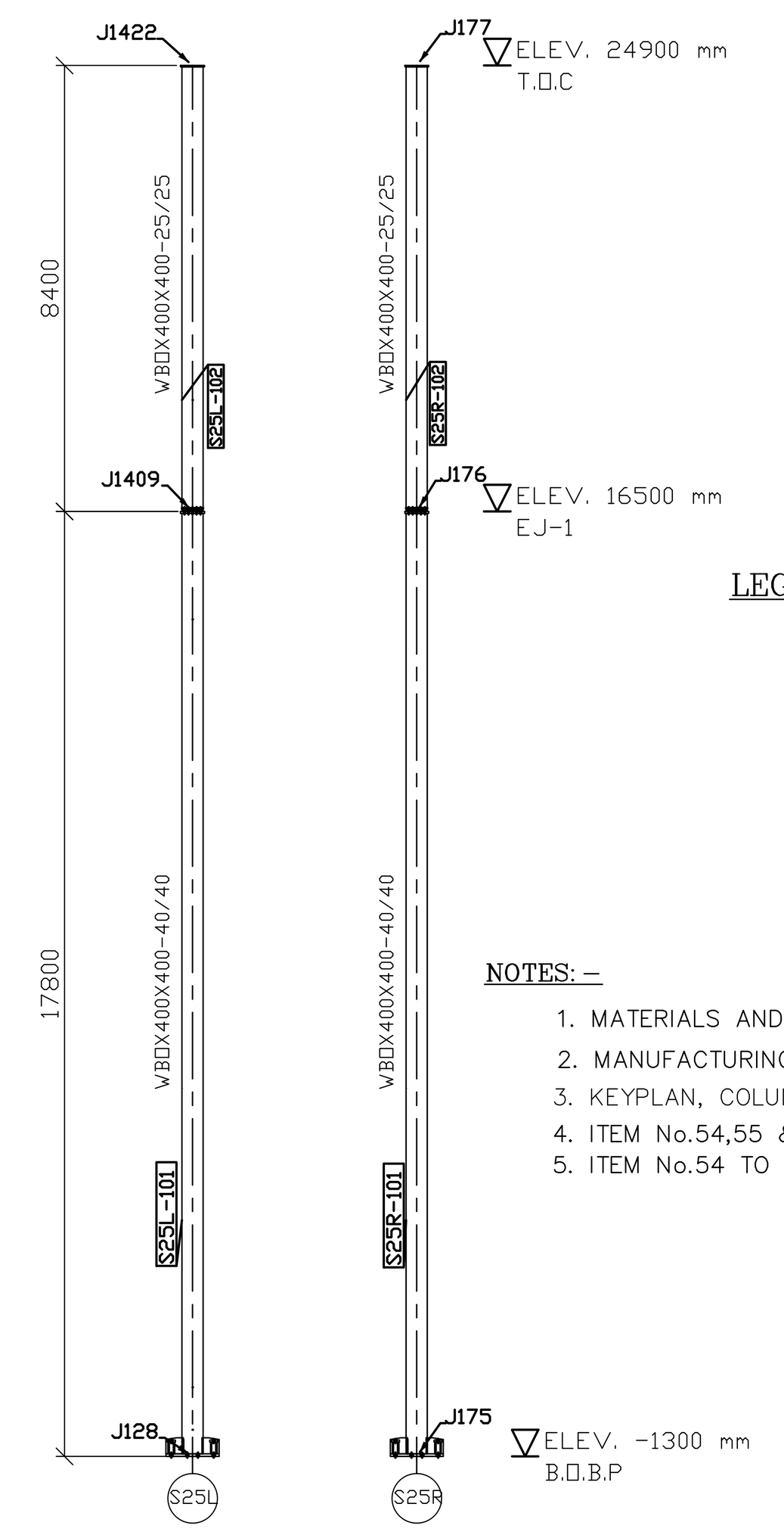

TYP. ERECTION JOINT - PLUS I COL


END COVERING SHEET DETAIL FOR PLUS I COLUMN

REQUIREMENTS OF HSFG BOLTS & NUTS FOR PLUSI COLUMNS ERECTION JOINT RELEASED IN PGMA 35-700

COLUMN	JT No.	BOTTOM		TOP		RES.PL.FIXING	
		BOLT SIZE	QTY	BOLT SIZE	QTY	BOLT SIZE	QTY
S13L	J1223	HSFG M24x130	72	HSFG M24x120	72	HSFG M24x120	4
S13L	J35	HSFG M24x110	56	HSFG M24x100	56	HSFG M24x110	4
S13L	J36	HSFG M24x100	48	HSFG M24x100	48	HSFG M24x100	4
S13L	J37	HSFG M24x90	48	HSFG M24x90	48	HSFG M24x100	4
S13L	J38	HSFG M24x90	40	HSFG M24x90	40	HSFG M24x100	4
S13L	J39	HSFG M24x90	40	HSFG M24x90	40	HSFG M24x100	4
S13R	J44	HSFG M24x130	72	HSFG M24x120	72	HSFG M24x120	4
S13R	J118	HSFG M24x110	56	HSFG M24x100	56	HSFG M24x110	4
S13R	J119	HSFG M24x100	48	HSFG M24x100	48	HSFG M24x100	4
S13R	J120	HSFG M24x90	48	HSFG M24x90	48	HSFG M24x100	4
S13R	J121	HSFG M24x90	40	HSFG M24x90	40	HSFG M24x100	4
S13R	J122	HSFG M24x90	40	HSFG M24x90	40	HSFG M24x100	4
S15L	J1438	HSFG M24x150	96	HSFG M24x150	96	HSFG M24x120	4
S15L	J46	HSFG M24x140	72	HSFG M24x140	72	HSFG M24x120	4
S15L	J47	HSFG M24x130	64	HSFG M24x120	64	HSFG M24x120	4
S15R	J1439	HSFG M24x160	96	HSFG M24x150	96	HSFG M24x120	4
S15R	J125	HSFG M24x140	72	HSFG M24x140	72	HSFG M24x120	4
S15R	J126	HSFG M24x130	64	HSFG M24x120	64	HSFG M24x120	4
S17	J23	HSFG M24x140	96	HSFG M24x140	96	HSFG M24x120	4
S17	J1411	HSFG M24x130	96	HSFG M24x120	96	HSFG M24x120	4
S17	J1452	HSFG M24x130	80	HSFG M24x140	80	HSFG M24x120	4
S17	J41	HSFG M24x140	96	HSFG M24x140	96	HSFG M24x120	4
S17	J42	HSFG M24x140	96	HSFG M24x150	96	HSFG M24x120	4
S17	J43	HSFG M24x150	96	HSFG M24x160	96	HSFG M24x120	4
HRDN WASHER A HSS-24						3360	

59	NUT HEX Gr.C M24			4130400024	No	0.110	192
58	BOLT HEX Gr.C M24X160			4122124160	No	0.669	112
57	BOLT HEX Gr.C M24X120			4122124120	No	0.526	80



LEGEND:-

- P - WELDED PLUS I.
- E.J. - ERECTION JOINT.
- WBOX - WELDED BOX
- T.O.C. - TOP OF COLUMN.
- BOBP. - BOTTOM OF BASE PLATE.
- HSFG. - HIGH STRENGTH FRICTION GRIP.

NOTES:-

1. MATERIALS AND OTHER REQUIREMENTS ARE GIVEN PER BOILER ONLY.
2. MANUFACTURING REQUIREMENTS SHALL BE AS PER RELEVANT QCP (LATEST REV.)
3. KEYPLAN, COLUMN DETAILS REFER DRAWING No. 0-35-110-15165.
4. ITEM No.54,55 & 56 ARE TO BE PAINTED WITH YELLOW COLOUR PAINT.
5. ITEM No.54 TO 59 ARE USED ONLY FOR TRANSPORTATION PURPOSE.

VARIANT NUMBER	ITEM NUMBER	DESCRIPTION	STD	DRAWING NUMBER	ITEM NO / VAR NO	MATERIAL CODE / MATERIAL SPECN	A/C/P	UNIT / DI	UNIT WEIGHT / QUANTITY	GS	ZONE
	56	C.S SHEETS 1.6 500x500				15011076 / IS531 Gr.D		No	3.140 / 36		
	55	C.S SHEETS 1.6 900x900				15011076 / IS531 Gr.D		No	10.174 / 12		
	54	C.S SHEETS 1.6 800X800				15011076 / IS531 Gr.D		No	8.038 / 36		
	53	TOP PIECE S25R-102		0-35-130-14128				No	2522.620 / 1		
	52	BOTTOM PIECE S25R-101		0-35-130-14127				No	8814.000 / 1		
	51	TOP PIECE S25L-102		0-35-130-14126				No	2522.620 / 1		
	50	BOTTOM PIECE S25L-101		0-35-130-14125				No	8814.000 / 1		
	49	TOP PIECE S17-105		0-35-130-14122				No	19243.958 / 1		
	48	SIXTH PIECE S17-103		0-35-130-14120				No	17764.628 / 1		
	47	FIFTH PIECE S17-102		0-35-130-14119				No	12400.584 / 1		
	46	FOURTH PIECE S17-107		0-35-130-14124				No	15410.462 / 1		
	45	THIRD PIECE S17-106		0-35-130-14123				No	14987.550 / 1		
	44	SECOND PIECE S17-104		0-35-130-14121				No	14390.748 / 1		
	43	BOTTOM PIECE S17-101		0-35-130-14118				No	30803.500 / 1		
	42	TOP PIECE S16R-102		0-35-130-14115				No	4259.430 / 1		
	41	THIRD PIECE S16R-101		0-35-130-14114				No	5286.770 / 1		
	40	SECOND PIECE S16R-104		0-35-130-14117				No	6278.010 / 1		
	39	BOTTOM PIECE S16R-103		0-35-130-14116				No	11645.444 / 1		
	38	TOP PIECE S16L-103		0-35-130-14112				No	4259.430 / 1		
	37	THIRD PIECE S16L-101		0-35-130-14110				No	5286.770 / 1		
	36	SECOND PIECE S16L-104		0-35-130-14113				No	6278.010 / 1		
	35	BOTTOM PIECE S16L-102		0-35-130-14111				No	10634.944 / 1		
	34	TOP PIECE S15R-101		0-35-130-14106				No	12754.580 / 1		
	33	THIRD PIECE S15R-102		0-35-130-14107				No	14316.026 / 1		
	32	SECOND PIECE S15R-104		0-35-130-14109				No	16280.196 / 1		
	31	BOTTOM PIECE S15R-103		0-35-130-14108				No	28532.268 / 1		
	30	TOP PIECE S15L-102		0-35-130-14103				No	12754.580 / 1		
	29	THIRD PIECE S15L-101		0-35-130-14102				No	14316.026 / 1		
	28	SECOND PIECE S15L-104		0-35-130-14105				No	16280.196 / 1		
	27	BOTTOM PIECE S15L-103		0-35-130-14104				No	28532.268 / 1		
	26	TOP PIECE S14R-105		0-35-130-14100				No	3317.430 / 1		
	25	FIFTH PIECE S14R-104		0-35-130-14099				No	2784.150 / 1		
	24	FOURTH PIECE S14R-103		0-35-130-14098				No	4732.160 / 1		
	23	THIRD PIECE S14R-102		0-35-130-14097				No	5286.770 / 1		
	22	SECOND PIECE S14R-101		0-35-130-14096				No	6278.010 / 1		
	21	BOTTOM PIECE S14R-106		0-35-130-14101				No	11965.558 / 1		
	20	TOP PIECE S14L-104		0-35-130-14093				No	3317.430 / 1		
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	18	FOURTH PIECE S14L-102		0-35-130-14091				No	4732.160 / 1		
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	15	BOTTOM PIECE S14L-106		0-35-130-14095				No	11965.558 / 1		
	14	TOP PIECE S13R-107		0-35-130-14089				No	8283.342 / 1		
	13	SIXTH PIECE S13R-105		0-35-130-14087				No	8587.860 / 1		
	12	FIFTH PIECE S13R-104		0-35-130-14086				No	6438.484 / 1		
	11	FOURTH PIECE S13R-103		0-35-130-14085				No	9741.780 / 1		
	10	THIRD PIECE S13R-102		0-35-130-14084				No	10869.044 / 1		
	09	SECOND PIECE S13R-101		0-35-130-14083				No	12190.602 / 1		
	08	BOTTOM PIECE S13R-106		0-35-130-14088				No	20767.080 / 1		
	07	TOP PIECE S13L-107		0-35-130-14082				No	8283.342 / 1		
	06	SIXTH PIECE S13L-104		0-35-130-14079				No	8587.860 / 1		
	05	FIFTH PIECE S13L-103		0-35-130-14078				No	6438.484 / 1		
	04	FOURTH PIECE S13L-102		0-35-130-14077				No	9741.780 / 1		
	03	THIRD PIECE S13L-101		0-35-130-14076				No	10869.044 / 1		
	02	SECOND PIECE S13L-106		0-35-130-14081				No	12190.602 / 1		
	01	BOTTOM PIECE S13L-105		0-35-130-14080				No	20767.080 / 1		

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT

Bharat Heavy Electricals Ltd
UNIT: HIGH PRESSURE BOILER PLANT
TIRUCHIRAPALLI - 620014
355-052

	NAME	SIGNATURE	DATE
DRN	Shamna Raj.P		25.12.2013
CHD	Jitendra/Mithlesh		26.12.2013
APPD	J.Somasundaram		26.12.2013

REV	DATE	ALTERED :
01		CHD & APPD :
ZONE		

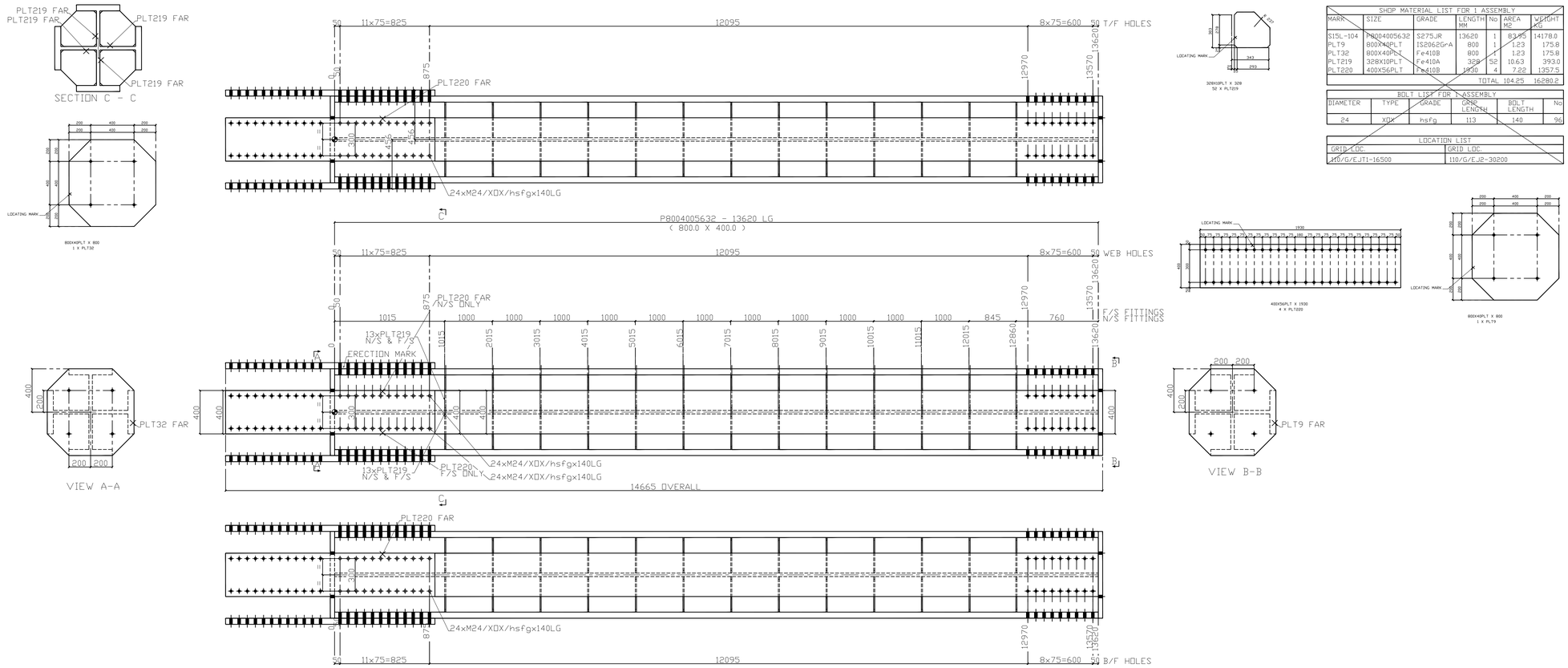
DEPT ST | CODE 122 | ALL DIMENSIONS ARE IN MM | PROJECTION | SCALE N.T.S | WEIGHT (Kg) 567280.398 | REF TO ASSY / OLD DWG

TITLE: COLUMN ASSEMBLY
S13L&R-S14L&R-S15L&R-S16L&R-S17-S25L&R

DRAWING NO : 0-35-130-15185 REV 00

DRAWING NO 0-35-130-14105

FOR TOLERANCES OF UNTOLERANCED DIMENSIONS DURING MANUFACTURE REFER PLANT STD NO TP 023 0299



SHOP MATERIAL LIST FOR 1 ASSEMBLY

MARK	SIZE	GRADE	LENGTH MM	No	AREA M2	WEIGHT KG
S15L-104	P8004005632	S275JR	13620	1	83.95	14178.0
PLT9	800X40PLT	IS2062GrA	800	1	1.23	175.8
PLT32	800X40PLT	Fe410B	800	1	1.23	175.8
PLT219	328X10PLT	Fe410A	328	52	10.63	393.0
PLT220	400X56PLT	Fe410B	1930	4	7.72	1357.5
			TOTAL		104.25	16280.2

BOLT LIST FOR 1 ASSEMBLY

DIAMETER	TYPE	GRADE	GRIP LENGTH	BOLT LENGTH	No
24	XOX	hsfg	113	140	96

LOCATION LIST

GRID LOC.	GRID LOC.
M0/G/EJT1-16500	110/G/EJ2-30200

NOTES
FOR ASSEMBLY DRG REFER PRINCIPLE DRG MENTIONED IN GMS

1 REQUIRED AS DRAWN MARKED S15L-104

TFLGA null
TFLGB null
BFLGA null
BFLGB null
GWEBA null
GWEBB null

ALL HOLES 26 mm DIAM UNO

VARIANT NUMBER	ITEM NUMBER	DESCRIPTION	STD	DRAWING NUMBER	ITEM NO	MATERIAL CODE	ASSY	UNIT	UNIT WEIGHT	GS	ZONE
					VAR NO	MATERIAL SPECN		QTY	QUANTITY		
	07	PLATE 56 400 X 1930		PLT220		15011216		No	339.375		
						IS2062Fe410B			4		
	06	PLATE 10 328 X 328		PLT219		15011098		No	7.558		
						IS2062Fe410A			52		
	05	PLATE 40 800 X 800		PLT32		15011184		No	175.800		
						IS2062Fe410B			1		
	04	PLATE 40 800 X 800		PLT9		15011184		No	175.800		
						IS2062Fe410B			1		
	03	PLATE 32 328 X 13620		PLTTWEB		15011130		No	1122.200		
						IS2062Fe410B			2		
	02	PLATE 32 688 X 13620		PLTIWEB		15011130		No	2353.880		
						IS2062Fe410B			1		
	01	PLATE 56 400 X 13620		PLTFL		15011216		No	2394.950		
						IS2062Fe410B			4		

CAUTION: The information on this drawing is the property of BHARAT HEAVY ELECTRICALS LIMITED. It must not be used directly or indirectly to the detriment of the company

TYPE OF PRODUCT
OR NAME OF
CUSTOMER/PROJECT

Bharat Heavy Electricals Ltd
UNIT: HIGH PRESSURE BOILER PLANT
TIRUCHIRAPALLI - 620014

	NAME	SIGNATURE	DATE
DRN	K.PRAKASH		14.08.2013
CHD	M.PADDU		14.08.2013
APPD	J.SOMU		14.08.2013

DEPT ST
CODE 122
ALL DIMENSIONS ARE IN MM
PROJECTION
SCALE
WEIGHT (Kg) 16280.196
REF TO ASSY / OLD DWG

TITLE
S15L-104

DRAWING NO : 0-35-130-14105
REV

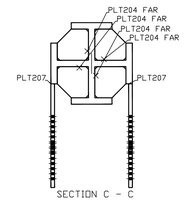
REV	DATE	ALTERED :
01		CHD & APPD :
ZONE		

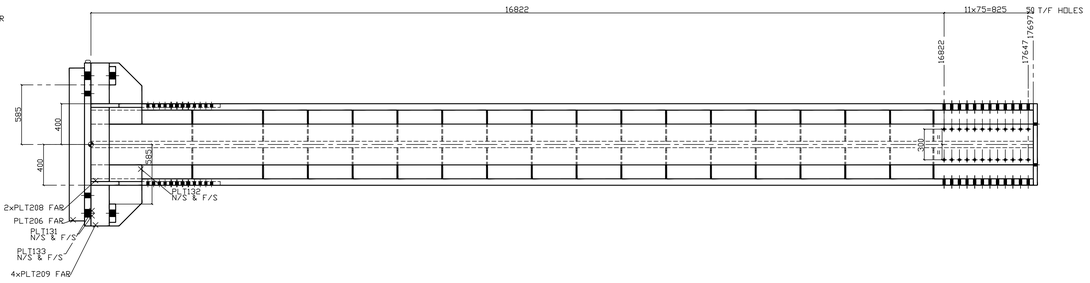
DRAWING NO 0-35-130-14104

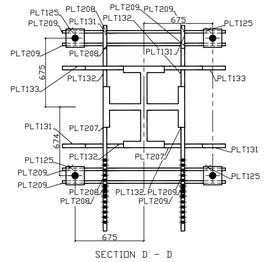
FOR TOLERANCES OF UNTOLERANCED DIMENSIONS DURING MANUFACTURE REFER PLANT STD. NO TP 023 0299

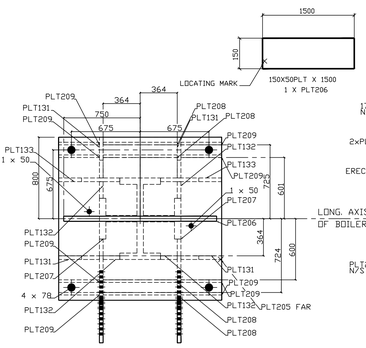
SHOP MATERIAL LIST FOR 1 ASSEMBLY						
MARK	SIZE	GRADE	LENGTH MM	No	AREA M2	WEIGHT KG
S15L-103	P8004006363	S275JR	17697	1	104.71	25249.7
PLT9	800X40PLT	IS2062GrA	800	1	1.23	175.8
PLT125	180X63PLT	IS2062GrA	180	4	0.44	64.1
PLT131	400X36PLT	IS2062GrA	500	4	1.64	197.5
PLT132	164X36PLT	IS2062GrA	500	4	0.85	92.7
PLT133	500X36PLT	IS2062GrA	600	2	1.25	155.3
PLT204	306X10PLT	Fe410A	306	68	12.04	443.1
PLT205	1600X63PLT	IS2062GrA	1600	1	5.52	1266.0
PLT206	150X50PLT	IS2062GrA	1500	1	0.61	88.3
PLT207	1018X36PLT	IS2062GrA	1268	2	4.42	583.9
PLT208	180X25PLT	IS2062GrA	728	4	1.23	102.9
PLT209	180X25PLT	IS2062GrA	400	8	1.38	113.0
			TOTAL	135.32		28532.2

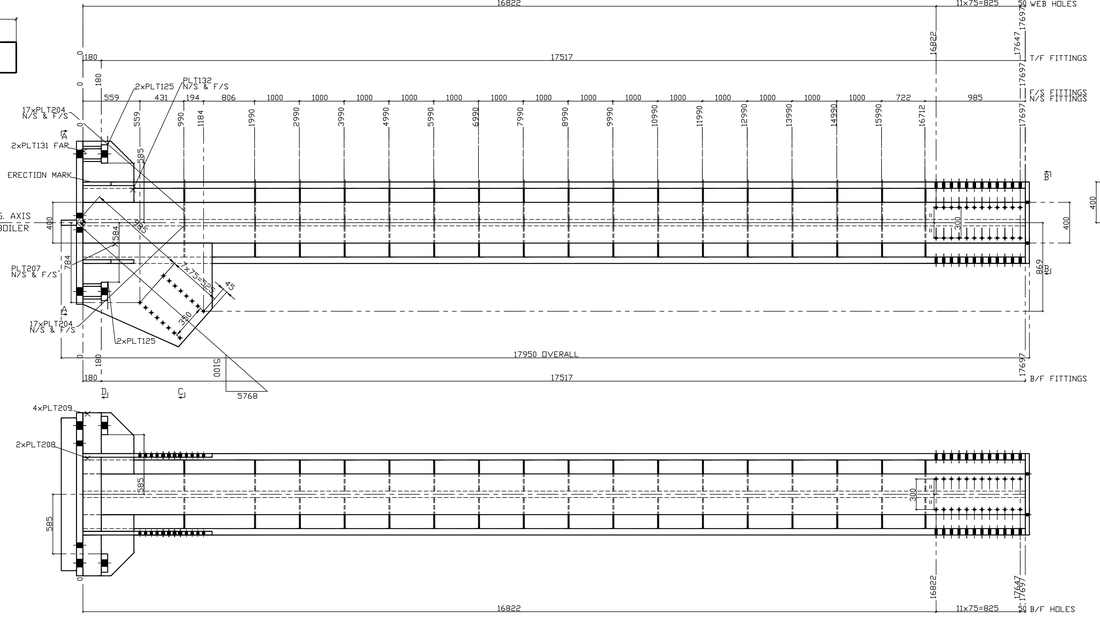
LOCATION LIST	
GRID LOC.	GRID LOC.
110/G/-1300	110/G/EJT1-16500

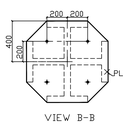


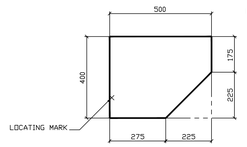


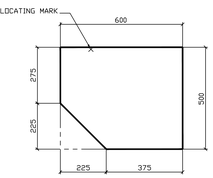


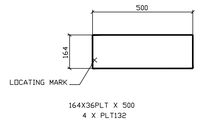


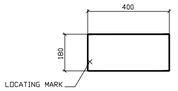


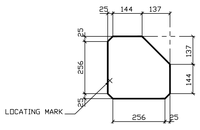


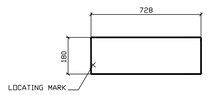


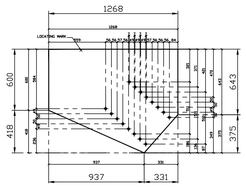


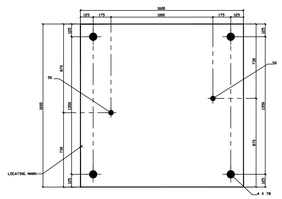


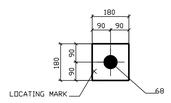












	ITEM NUMBER	DESCRIPTION	STD	DRAWING NUMBER	ITEM NO	MATERIAL CODE	ALOP	UNIT	UNIT WEIGHT	GS ZONE
					VAR NO	MATERIAL SPECN		DI	QUANTITY	
	14	PLATE 25 180 X 400	PLT209		15011081	No			14.125	
					IS2062Fe410B				8	
	13	PLATE 25 180 X 728	PLT208		15011081	No			25.725	
					IS2062Fe410B				4	
	12	PLATE 36 1018 X 1268	PLT207		15011124	No			291.950	
					IS2062Fe410B				2	
	11	PLATE 50 150 X 1500	PLT206		15011106	No			88.300	
					IS2062Fe410B				1	
	10	PLATE 63 1600 X 1600	PLT205		15011125	No			1266.000	
					IS2062Fe410B				1	
	09	PLATE 10 306 X 306	PLT204		15011098	No			6.516	
					IS2062Fe410A				68	
	08	PLATE 36 500 X 600	PLT133		15011124	No			77.650	
					IS2062Fe410B				2	
	07	PLATE 36 164 X 500	PLT132		15011124	No			23.175	
					IS2062Fe410B				4	
	06	PLATE 36 400 X 500	PLT131		15011124	No			49.375	
					IS2062Fe410B				4	
	05	PLATE 63 180 X 180	PLT125		15011125	No			16.025	
					IS2062Fe410B				4	
	04	PLATE 40 800 X 800	PLT9		15011184	No			175.800	
					IS2062Fe410B				1	
	03	PLATE 63 305.5 X 17697	PLTTWEB		15011125	No			2673.750	
					IS2062Fe410B				2	
	02	PLATE 63 674 X 17697	PLTIWEB		15011125	No			5898.880	
					IS2062Fe410B				1	
	01	PLATE 63 400 X 17697	PLTFL		15011125	No			3500.825	
					IS2062Fe410B				4	

NOTES
FOR ASSEMBLY DRG REFER PRINCIPLE DRG MENTIONED IN GMS

1 REQUIRED AS DRAWN MARKED S15L-103

TFLGA null
TFLGB null
BFLGA null
BFLGB null
GWEBA null
GWEBB null

ALL HOLES 26 mm DIAM UNO

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TYPE OF PRODUCT
OR NAME OF
CUSTOMER/PROJECT

Bharat Heavy Electricals Ltd
UNIT: HIGH PRESSURE BOILER PLANT
TIRUCHIRAPALLI - 620014
255-052

	NAME	SIGNATURE	DATE
DRN	K.PRAKASH		14.08.2013
CHD	M.PADDU		14.08.2013
APPD	J.SOMU		14.08.2013

REV	DATE	ALTERED M.PADMANABAN
01	24.12.2013	CHD & APPD : J.SOMU
ZONE		
F5		WORK POINT DIMENSION REVISED FOR TRIANGLE.

DEPT ST | ALL DIMENSIONS ARE IN MM | PROJECTION | SCALE | WEIGHT (Kg) 28532.268 | REF TO ASSY / OLD DWG

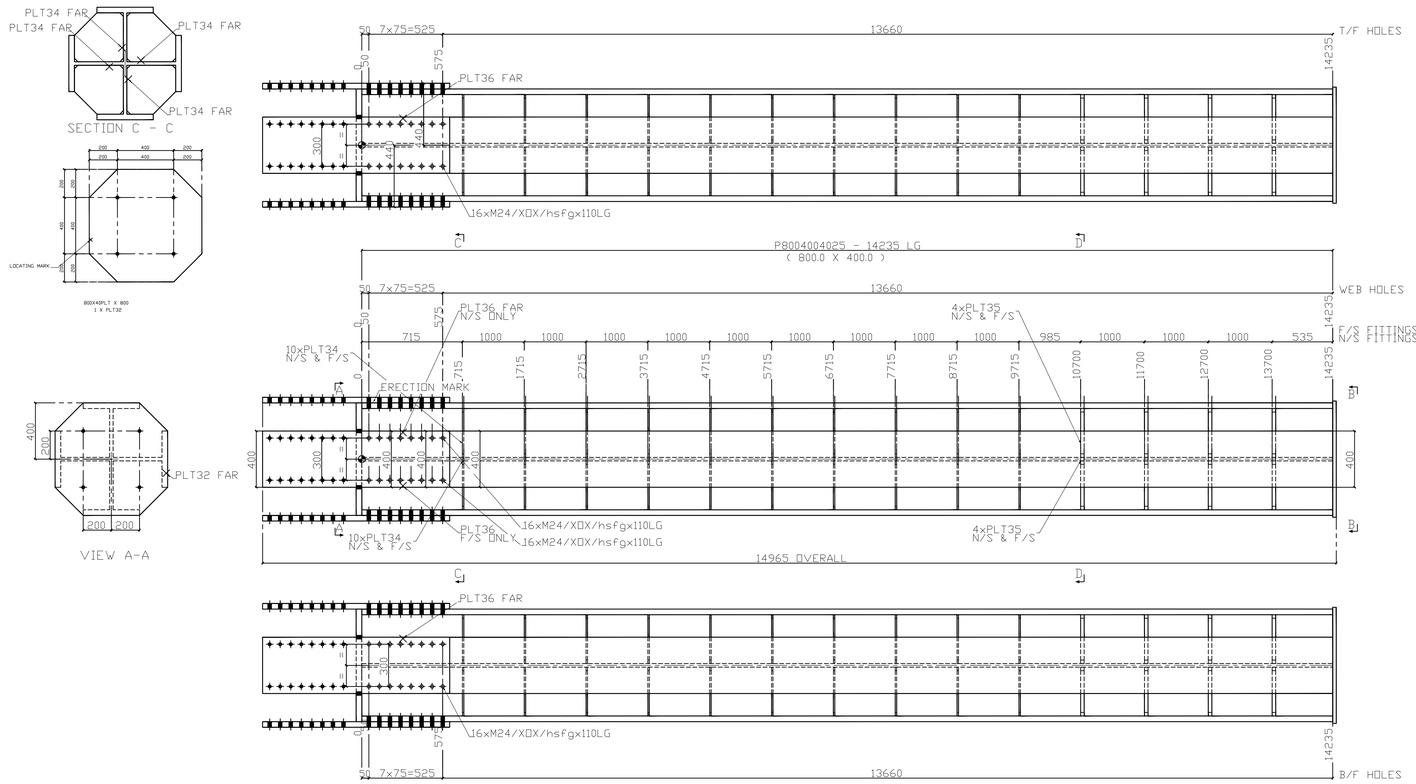
CODE 122

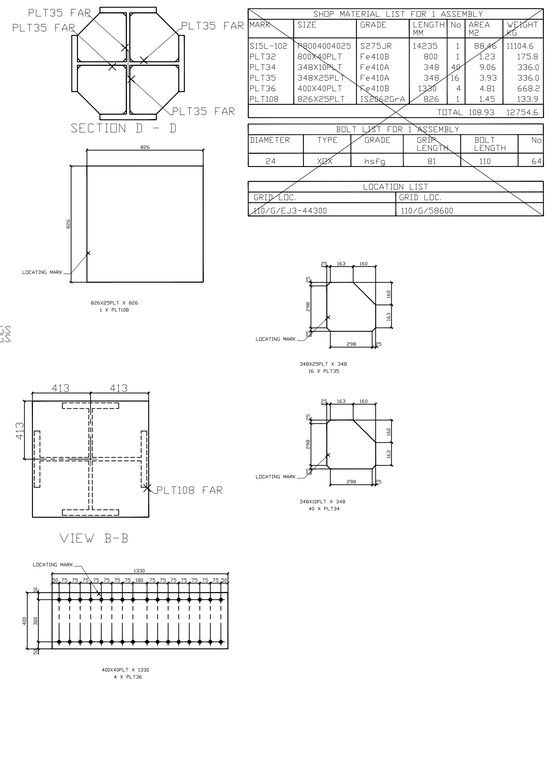
TITLE: S15L-103

DRAWING NO : 0-35-130-14104 | REV 01

DRAWING NO 0-35-130-14103

FOR TOLERANCES OF UNTOLERANCED DIMENSIONS DURING MANUFACTURE REFER PLANT STD NO TP 023 0299





SHOP MATERIAL LIST FOR 1 ASSEMBLY

MARK	SIZE	GRADE	LENGTH MM	No	AREA M2	WEIGHT KG
S15L-102	P8004004025	S275JR	14235	1	88.46	11104.6
PLT32	800X40PLT	Fe410B	800	1	1.23	175.8
PLT34	348X10PLT	Fe410A	348	40	9.06	336.0
PLT35	348X25PLT	Fe410A	348	16	3.93	336.0
PLT36	400X40PLT	Fe410B	1330	4	4.81	668.2
PLT108	826X25PLT	IS2062GrA	826	1	1.45	133.9
				TOTAL	108.93	12754.6

BOLT LIST FOR 1 ASSEMBLY

DIAMETER	TYPE	GRADE	GRIP LENGTH	BOLT LENGTH	No
24	XDX	hsfg	81	110	64

LOCATION LIST

GRID LOC.	GRID LOC.
110/G/EJ3-44300	110/G/58600

VARIANT NUMBER	ITEM NO	DESCRIPTION	STD	DRAWING NUMBER	ITEM NO / VAR NO	MATERIAL CODE / MATERIAL SPECN	KEY/P	UNIT	UNIT WEIGHT / QUANTITY	GS	ZONE
	08	PLATE 25 826 X 826		PLT108		15011081 IS2062Fe410B		No	133.900 1		
	07	PLATE 40 400 X 1330		PLT36		15011184 IS2062Fe410B		No	167.050 4		
	06	PLATE 25 348 X 348		PLT35		15011081 IS2062Fe410B		No	21.000 16		
	05	PLATE 10 348 X 348		PLT34		15011098 IS2062Fe410A		No	8.400 40		
	04	PLATE 40 800 X 800		PLT32		15011184 IS2062Fe410B		No	175.800 1		
	03	PLATE 25 347.5 X 14235		PLTTWEB		15011081 IS2062Fe410B		No	970.785 2		
	02	PLATE 25 720 X 14235		PLTIWEB		15011081 IS2062Fe410B		No	2011.410 1		
	01	PLATE 40 400 X 14235		PLTFL		15011184 IS2062Fe410B		No	1787.925 4		

NOTES
FOR ASSEMBLY DRG REFER PRINCIPLE DRG MENTIONED IN GMS

1 REQUIRED AS DRAWN MARKED S15L-102

TFLGA null
TFLGB null
BFLGA null
BFLGB null
GWEBA null
GWEBB null

ALL HOLES 26 mm DIAM UNO

REV	DATE	ALTERED :
01		CHD & APPD :
ZONE		

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TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT

Bharat Heavy Electricals Ltd
UNIT: HIGH PRESSURE BOILER PLANT
TIRUCHIRAPALLI - 620014
255-052

	NAME	SIGNATURE	DATE
DRN	K.PRAKASH		14.08.2013
CHD	M.PADDU		14.08.2013
APPD	J.SOMU		14.08.2013

DEPT ST | ALL DIMENSION ARE IN MM | PROJECTION | SCALE | WEIGHT (Kg) 12754.580 | REF TO ASSY / OLD DWG

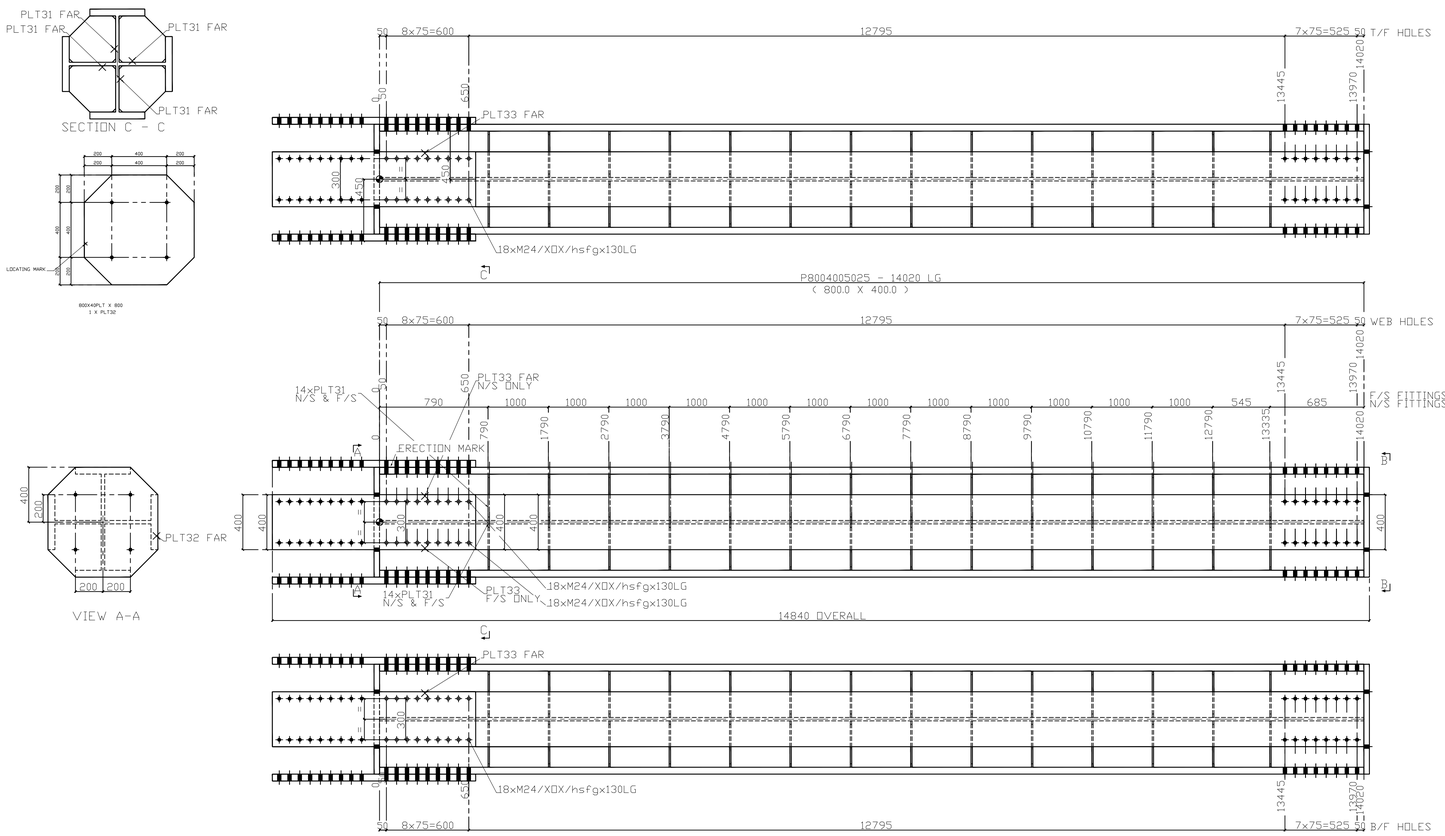
CODE 122

TITLE: S15L-102

DRAWING NO : 0-35-130-14103 | REV

DRAWING NO 0-35-130-14102

FOR TOLERANCES OF UNTOLERANCED DIMENSIONS DURING MANUFACTURE REFER PLANT STD NO TP 023 0299



SHOP MATERIAL LIST FOR 1 ASSEMBLY

MARK	SIZE	GRADE	LENGTH MM	No	AREA M2	WEIGHT KG
S15L-101	P8004005025	S275JR	14020	1	87.15	12587.8
PLT9	800X40PLT	IS2062GrA	800	1	1.23	175.8
PLT31	338X10PLT	Fe410A	338	56	12.07	447.2
PLT32	800X40PLT	Fe410B	800	1	1.23	175.8
PLT33	400X50PLT	Fe410B	1480	4	5.49	929.4
			TOTAL		107.17	14316.0

BOLT LIST FOR 1 ASSEMBLY

DIAMETER	TYPE	GRADE	GRIP LENGTH	BOLT LENGTH	No
24	XDX	hsfg	101	130	72

LOCATION LIST

GRID LOC.	GRID LOC.
MO/G/EJ2-30200	110/G/EJ3-44300

VARIANT NUMBER	ITEM NUMBER	DESCRIPTION	STD	DRAWING NUMBER	ITEM NO / VAR NO	MATERIAL CODE / MATERIAL SPECN	A/UP / DI	UNIT WEIGHT / QUANTITY	GS	ZONE
	07	PLATE 50 400 X 1480		PLT33		15011106 / IS2062Fe410B	No /	232.350 / 4		
	06	PLATE 40 800 X 800		PLT32		15011184 / IS2062Fe410B	No /	175.800 / 1		
	05	PLATE 10 338 X 338		PLT31		15011098 / IS2062Fe410A	No /	7.986 / 56		
	04	PLATE 40 800 X 800		PLT9		15011184 / IS2062Fe410B	No /	175.800 / 1		
	03	PLATE 25 337.5 X 14020		PLTTWEB		15011081 / IS2062Fe410B	No /	928.605 / 2		
	02	PLATE 25 700 X 14020		PLTIWEB		15011081 / IS2062Fe410B	No /	1926.000 / 1		
	01	PLATE 50 400 X 14020		PLTFL		15011106 / IS2062Fe410B	No /	2201.150 / 4		

NOTES
FOR ASSEMBLY DRG REFER PRINCIPLE DRG MENTIONED IN GMS

1 REQUIRED AS DRAWN MARKED S15L-101

TFLGA null
TFLGB null
BFLGA null
BFLGB null
GWEBA null
GWEBB null

ALL HOLES 26 mm DIAM UNO

REV	DATE	ALTERED :
01		CHD & APPD :

ZONE

CAUTION: The information on this drawing is the property of BHARAT HEAVY ELECTRICALS LIMITED. It must not be used directly or indirectly to the detriment of the company

TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT

Bharat Heavy Electricals Ltd
UNIT: HIGH PRESSURE BOILER PLANT
TIRUCHIRAPALLI - 620014

	NAME	SIGNATURE	DATE
DRN	K.PRAKASH		14.08.2013
CHD	M.PADDU		14.08.2013
APPD	J.SOMU		14.08.2013

DEPT ST
CODE 122
ALL DIMENSION ARE IN MM
PROJECTION
SCALE
WEIGHT (Kg) 14316.026
REF TO ASSY / OLD DWG

TITLE S15L-101

DRAWING NO : 0-35-130-14102 REV