



INVITATION TO TENDER

Ref.: OS/21-22/7906/BUNKERS/14/018

Date: 02.11.2021

Sub: Fabrication of Coal Bunkers against S.O. No. 7906 inside premises of BHEL-HPVP, Visakhapatnam

Dear Sir,

Sealed tenders are invited for the subject work in **two part bid** system from vendors who are experienced in fabrication of similar jobs subject to the following eligibility criteria:

1. ELIGIBILITY CRITERIA:

- 1.1** The bidder should have an experience of having successfully completed similar works i.e. Fabrication of Structural items during the last 7 years ending 31st Oct.'21.
Note: Work Order and Work Completion Certificate / any other relevant document from the customer shall be enclosed in support of successful and satisfactory completion of the work.
 - 1.2** Bidders shall also have to enclose the documents of Registration of Firm/ Factory License/ Certificate of Incorporation, EPF, ESI, PAN, GSTIN, Udyog Aadhar Memorandum (if registered with MSME), Startup Recognition Certificate (in case of Startup) etc.
 - 1.3** The works executed in the name of individual / firm of the tenderer will only be considered for eligibility criteria.
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2. LOCATION OF WORK SPOT:

- 2.1** The fabrication work is to be carried out inside the premises of BHEL – HPVP, Visakhapatnam.

3. VENDOR'S SCOPE OF WORK:

3.1 Fabrication of Coal Bunkers: 400 MT (approx.)

It may be noted that the weight indicated above is tentative only and may vary on both sides.

- 3.2** Complete Fabrication of Bunkers in segments which involves Marking, Cutting, Edge preparation, Drilling of holes wherever required, Assembly, Fit-up & Welding, NDT requirement as per QAP, fabrication of openings in Bunkers, Trial Assembly wherever required, Drilling / Punching of holes in SS Liner plates in Hopper portion of Bunkers, Fixing & welding of SS Liner plates, Plug welding of SS Liner plates to Hopper plate etc., as per relevant drawings / specifications, Surface Preparation by Power Tool / Grit blast cleaning, Application of total no. of coats of Paints as per Painting Schedule, relevant Drawings, QAP, WPS, NDE procedures, Standards & Specifications etc.
- 3.3** Collection & Transportation of Free issue raw materials like Plates, sheets, rolled sections, structural items, Paints, BOCs etc., from HPVP stores to fabrication yards, handing over of excess / balance materials at HPVP stores, Loading of finished items onto the trailer.
- 3.4** Shearing / Cutting, Drilling / Punching of holes in SS Liner plates in Hopper portion of Bunkers, Fixing & welding of SS Liner plates to Hopper plates, between SS Liner plates, Plug welding of SS Liner plates to Hopper plate etc., as per relevant drawings / specifications.
- 3.5** Rectification of Raw materials such as straightening etc., if any and trial assembly of Bunker segments as per Drawings and rectification of defects, if any attributable to vendors, found after handing over to Logistics dept.
- 3.6** NDT is to be carried out as per approved QAP / drawings.
- 3.7** The fabricated items shall strictly conform to the dimensions and tolerances indicated in the drawings. It must be ensured that correct dimensions and deviations, if any, are recorded properly and is made available to BHEL officials or their authorized agencies.
- 3.8** Surface Preparation by Power Tool / Grit blast cleaning, Application of total no. of coats of Paints as per Painting Schedule. **Paints shall be issued as Free Issue material by BHEL-HPVP.**

- 3.9 Free issue materials should be collected within 3 days from the date of intimation by Outsourcing without failure. Any delay beyond 3 days shall be considered for levying of LD.
- 3.10 In case of requirement of off-cut materials, the vendor shall have to arrange for Gas Cutting at BHEL Stores.
- 3.11 Submission of economic cutting plans for all plate materials and sections issued by BHEL and obtaining approval of competent authority is mandatory before taking up fabrication.
Wherever fabrication is done without proper approved cutting plans, any loss of materials arising due to the same will be recovered as per BHEL recovery rates.
- 3.12 No extra rates are applicable for the additional joints to be made in Plates / Rolled sections.
- 3.13 The work is to be executed as per the latest approved Drawings, Group Manufacturing Specification (GMS), Shipping List released for each PGMA, QAP, WPS, Standards & Specifications etc.
- 3.14 All indirect materials, consumables like electrodes, gases, grinding wheels etc. required for fabrication are in the scope of the Vendor.
- 3.15 Identification of all items shall be hard stamped by encircling with paint and stenciled in a specific format with details of Project name, Customer No., Work Order No., PGMA No., DU No., Qty., Weight, direction of gas flow and match marking etc., for identification and dispatch as per the instructions of the concerned. Completed job without proper identification will not be accepted by HPVP - Stores / Logistics.
- 3.16 Vendors shall have to return the excess / balance materials including off-cuts and total scrap available with them exclusive of process allowance & invisible wastage to HPVP Stores after material reconciliation but before submission of their final bill. In case the same are not returned by the vendors, Recovery shall be made as per BHEL Rates / MSTC rates plus applicable taxes, prevailing at the time of processing of the final bills.
- 3.17 Cranes of suitable capacity, Chains / Slings preferably Felt slings required for handling of all materials during Pre-fabrication, Fabrication, Trial assembly and Post fabrication during handing over to Logistics etc., are in the scope of vendor.
- 3.18 Qualified Engineers & Supervisors shall be deployed for proper co-ordination of the job. **Deployment of Qualified QC Engineer for monitoring of all Quality aspects of the job is a mandatory requirement.**
- 3.19 Welding is to be carried out by qualified welders only. Qualification of welders shall be carried out by the vendor at HPVP under supervision of BHEL / WT dept. at their own cost. However, Test Coupons shall be provided by BHEL as free issue.
- 3.20 Compressor and other machinery / equipments required for Blasting and Painting are to be arranged by the vendor at their cost. Blast Cleaning and Painting as per Painting Schedule **is to be carried out in a closed enclosure. Painting is to be carried out by Painters qualified by HPVP as per Doc. No. SIP:H:PP:22.** All the necessary tests like checking of Surface preparation with Profile Gauge, Tape adhesion, Elcho Meter for measuring DFT etc., required during the painting are to be carried out by the Vendor as per approved painting procedure and QAP/Specifications.
- 3.21 **All the Bed materials required for fabrication, Scaffolding materials like Pipes, Clamps, GI sheets etc. required for closed enclosure for blasting and painting of the items are to be arranged by the vendor at their cost.**
- 3.22 Any modification work due to revision of the drawings during fabrication is to be carried out by the vendor without any additional cost.
- 3.23 Sufficient Area lighting at the work place shall be arranged by the vendor at their cost.
- 3.24 Adequate facilities like welding equipments, baking oven, handling facilities and measuring instruments duly calibrated must be available with the vendor. All the above equipments must be under working condition and relevant documents for the same are to be made available for verification by BHEL - HPVP / TPI Officials or their authorized agents.
- 3.25 All the measuring instruments used for inspection and testing shall have valid calibration certificates from NABL Laboratory or traceable to national / international standards.
- 3.26 Loading of finished items onto the trailer and Handing over of the same to Logistics dept.

- 3.27 Vendors shall abide by all the rules and statutory regulations in force from time to time as per the Factories Act. It is their responsibility to ensure the safety of their workmen and fulfilling the ESI, PF and other relevant statutory regulations.
- 3.28 Power will be provided at one point by HPVP. However, Arrangement of Power Distribution Board with suitable capacity Switch Fuse unit as incomer, all outgoing with necessary safe trips like MCB, ELCB etc., as per the industrial safety norms and their installation, all outgoing cables from Distribution Board, termination at the distribution board, Working Area Lighting.
- 3.29 Though not mentioned specifically, any activity which is required for completion of the work is deemed to be included in the scope of work of bidders.

4. BHEL SCOPE:

BHEL – HPVP shall provide the following as free issue:

- 4.1 Supply of Drawings, GMS, QAP, Inspection Procedure, NDE Procedures, WPS, Painting Schedule etc.
- 4.2 CS Plates / SS Sheets as full / off-cuts as per requirement
- 4.3 Rolled Sections in running meters
- 4.4 Paints as per Painting Schedule
- 4.5 Area required for fabrication will be provided free of charge by BHEL. All other arrangements for site enabling including Jungle Clearance & Surface Levelling etc., if required, shall be done by the vendor only.
- 4.6 Power and Water shall be provided free of charge at one point but further distribution to the work location is to be carried out by the vendor. In case of power failure, the vendor shall have to make alternate arrangement for smooth functioning of the work without any extra cost to BHEL.

5. INSPECTION:

- 5.1 Inspection shall be carried out by M/s. BHEL-HPVP, Vizag / BHEL Authorized Inspection Agency / Customer as per approved QAP / Inspection procedure. Contractor shall have to offer for Stage wise and Final inspection as per approved QAP and obtain necessary stage wise & final clearances before proceeding for further operations.
- 5.2 Vendor shall be solely responsible for preparation and submission of all Inspection Reports & documents duly certified by Inspection Authority for the finished items.
- 5.3 All the documentation related to inspection clearance of M/s. BHEL / TPI / Customer, Generation of Inspection Reports, Preparation of Final Documents as per BHEL standard formats etc., are included in the scope of vendor and scanned copy as well as hard copy of the same is to be submitted to BHEL-QA.

6. DELIVERY:

Finished items along with inspection documents and all other certificates are to be handed over to HPVP-Logistics within **12 weeks** from the date of issue of First lot of Raw materials or **4 weeks** from the date of issue of last lot of materials whichever is later. The delivery period includes the time involved in collection of all raw materials, cutting plan approval, handing over of finished items at HPVP- Logistics.

Note: In case the delivery period offered by the vendor is more than the tender delivery, Price quoted by the bidder shall be loaded for additional period @1/2 % per week or part thereof for the purpose of evaluation of Bidder Status.

7. SITE MOBILISATION:

Successful bidders shall have to complete site mobilization within 10 days from the date of issue of sub-contract order along with Drawings and GMS.

8. PRICE:

- 8.1 The price shall be quoted **strictly** as per the Schedule of Rates enclosed at Annexure – I for the detailed scope of work and the quoted price shall be inclusive of all applicable taxes & duties **except GST**.
- 8.2 The prices shall be fixed & firm without any escalation during the entire period of contract and till completion of the work.
- 8.3 GST shall be reimbursable to the vendor as detailed in Clause - 8 and as per Annexure – GST.
- 8.4 Income tax will be deducted at applicable rates from RA & Final bills.

9. GOODS & SERVICES TAX (GST):

- 9.1 Bidders shall make a note of the following points of GST before submission of their offer:
- a) Vendors shall have to mention their GSTIN no. (15 Digits) in their Technical Bid. If any specific exemption is available, a declaration with due supporting documents need to be furnished for considering the offer.
 - b) Semi-finished goods are to be delivered by the Vendors in BHEL, HPVP premises within a maximum period of one year from the date of issue of the material, failing which the whole transaction will be considered as Supply & Sale and GST is required to be paid along with interest (calculated @ SBI Base Rate + 6%) along with penalty, if any, from the date of Challan on the whole value of materials. Hence vendors shall have to ensure that materials issued to them are returned within 365 days.
 - c) After fabrication, the vendors shall have to deliver the Semi - finished Goods by fulfilling the following formalities:
 - i) GST invoice should be raised by the vendors by paying GST on job work charges at applicable rates and by incorporating the HPVP GSTIN no. in the invoice for availing the reimbursement of GST from HPVP.
 - ii) The vendor shall also have to enter in their GST Return -1 (GSTR-1) the details of invoice raised for payment of GST so as to enable HPVP to avail input credit.

10. REVERSE AUCTION:

- 10.1 BHEL shall be resorting to Reverse Auction (RA) for this tender. RA shall be conducted among the techno-commercially qualified bidders. Business Rules for Reverse Auction are given at Annexure – V. Bidder may refer Guidelines for Reverse Auction available on our website, www.bhel.com → supplier registration → Guidelines for Reverse Auction 2021, before submission of their offer.
- 10.2 Sealed envelope / Electronic Price bids of all the techno-commercially qualified bidders shall be opened and the same shall be considered as initial bids of the bidders in RA. In case any bidder(s) do(es) not participate in online Reverse Auction, their sealed envelope / Electronic price bid along with applicable loading, if any, shall be considered for ranking.
- 10.3 BHEL will inform bidders the details of service provider who will provide business rules, all necessary training and assistance before commencement of online bidding. The bidders participating in the Reverse Auction shall have to necessarily submit '**Process Compliance Form**' (PCF) to the designated Service Provider.
- 10.4 Bidders are advised to read the 'Business Rules' (Annexure – V) indicating details of RA event carefully, before reverse auction event.

11. VALIDITY OF OFFER:

The offer shall be valid for a period of **3 months** from the date of Reverse Auction.

12. Other Terms & Conditions, whichever applicable, shall be as per Annexure – III enclosed.

13. RISK PURCHASE:

In case the contractor fails to execute the work within the scheduled time or due to any other reasons, BHEL - HPVP reserves the right to get the same completed through some other party at the risk & cost of the contractor and any additional expenditure incurred due to the same shall be charged to the contractor.

14. GENERAL:

- 14.1 The bidders shall study the Tender documents, Drawings, Quality Documents and all other relevant documents in detail for understanding the scope of work and the processes involved before submission of offer. Bidders shall get clarifications, if any, from concerned officials on the scope of work, clarifications related to welding or any other details of the tender document, over phone between 09:00 AM and 04:00 PM on any working day or through e-mail.
- 14.2 **Conditional / Partial Price Bids** and any other deviations to the tender terms & conditions are not acceptable and BHEL reserves the right to reject such offers without further correspondence. Bidders shall confirm their acceptance to all the terms & conditions of the tender enquiry in the Techno-commercial Bids and any deviations mentioned in the Price Bids shall not be considered for evaluation.

- 14.3 BHEL reserves the right to modify or cancel the tender enquiry at any stage without assigning any reasons thereof.
- 14.4 The General Terms & Conditions, if any, contradicting with the specific terms & conditions given in the tender, then specific terms & conditions shall only be considered.
15. The following documents shall form part of the tender enquiry:
- | | |
|---|------------------|
| i) Schedule of Rates | : Annexure – I |
| ii) List of Reference Drawings / Documents | : Annexure – II |
| iii) General Terms & Conditions | : Annexure – III |
| iv) Acceptance to tender terms & conditions | : Annexure – IV |
| v) Business Rules for Reverse Auction | : Annexure – V |
| vi) GST Compliance for Indigenous Suppliers | : Annexure – GST |
| vii) Approved QAP/ Inspection Procedure | |
| viii) Painting Schedule | |
16. **TENDER SUBMISSION (Through E – Mail only):**
- 16.1 Techno-commercial bids along with the tender document duly signed & stamped by the bidder on all pages and a covering letter on Company's Letter Head addressed to DGM (Outsourcing), BHEL-HPVP, Visakhapatnam shall be sent through an e-mail to the e-mail ID technicalbid-hpvp@bhel.in
- 16.2 **Tentative List of Man Power, Machinery, Tools & Tackles to be engaged by the vendor shall also be attached to the Techno-Commercial Bid.**
- 16.3 Price bid (i.e., Annexure – I) shall also be sent separately through e-mail to another e-mail ID pricebid-hpvp@bhel.in
- 16.4 Offers completed in all respects along with all the supporting documents shall be sent to the above e-mails only latest by 14.00 Hrs. on **16.11.2021** duly mentioning the Name of Work, Tender Ref. No. & Date and Technical Bid / Price Bid in the subject of the e-mail.
- Note: Don't mark CC and BCC while submitting your offer as the system is designed to reject such mails having more than one recipient. Max. file size of the attachment shall be 20 MB only. In case the file size is more, bidder can submit their offer through multiple mails within the due date and time.**
- 16.5 Bidders shall ensure correctness of the e-mail addresses while submitting their offer. There shall be no other e-mail address at the receiving end while submission of the above bids otherwise the system will reject such mails. Bidder shall be solely responsible for non-receiving of such mails at the above mentioned e-mail addresses and no communication in this regard will be entertained
- 16.6 **TENDERS RECEIVED AFTER THE DUE DATE & TIME ARE NOT ACCEPTABLE.**
- 16.7 **OFFERS SENT IN ANY OTHER FORM WILL BE TREATED AS INVALID AND WILL BE SUMMARILY REJECTED.**
17. **TENDER OPENING:**
- 17.1 Techno-commercial Bids will be opened at **14.00 Hrs** on **16.11.2021**. The bidders may depute their representatives at the time of opening of Technical bids.
- 17.2 After evaluation of the Techno-commercial Bids, intimation regarding date & procedure of conducting reverse auction shall be given by the service provider to all eligible techno-commercially qualified bidders through an e-mail in advance at an appropriate time.

For Bharat Heavy Electricals Limited,



SCHEDULE OF RATES

Ref: OS/21-22/7906/BUNKER/14/018

Date: 02.11.2021

Sub: Fabrication of Coal Bunkers against S.O. No. 7906 inside premises of BHEL-HPVP, Visakhapatnam

SL. No.	S.O. No.	Description of Item	Unit	Total Qty.	Unit Rate (Rs.)	Total Amount (Rs.)
		Fabrication of Bunkers in segments against S.O. No. 7906 inside HPVP premises with free issue materials. The job includes Marking, Cutting, Edge Preparation, Drilling of holes wherever required, Assembly, Welding, NDT requirements as per QAP, Trial Assembly wherever required, Drilling/Punching holes in SS Liner Plates in Hopper Portion of Bunkers, Fixing & Welding of SS Liner Plates as per relevant Drawings / Specifications, Surface Preparation by Power Tool / Grit Blast Cleaning and application of total no. of coats of Paints as per Painting Schedule, Inspection Procedure, WPS, NDE Procedures, Standards & Specifications etc. (All Consumables are in vendor's scope)				
1	7906	Bunkers in Segments - 4 Nos.	MT	370		
2	7906	Assembly / Fixing of SS Liner Plates in Hopper Portion of Bunkers	MT	30		
		TOTAL				
Total Amount in words:						

Notes :

- 1) **L1 Status will be evaluated on the Total Quoted Amount.**
- 2) The quantity and weights indicated above are tentative and may slightly vary on both sides depending upon the requirement at the time of ordering / execution. However, payment shall be made for the actual quantities & weights only.
- 3) The quoted price shall be inclusive of all applicable taxes & duties **except GST**. GST shall be reimbursable to the vendor as detailed in Clause – 8. Income tax shall be deducted at applicable rates from the vendor's bills.
- 4) The prices shall be fixed & firm without any escalation during the entire period of contract and till completion of the work.
- 5) Tenderer should quote the amount in figures & words. It may be noted that corrections, overwriting etc. are not allowed. If there is a discrepancy between amount in figures & words, 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. If there is an error in the total corresponding to the addition or subtraction of sub-totals, the sub-totals shall prevail and total shall be corrected accordingly.

In case of any mismatch between quoted rate and amount in figures, rate in figures shall be taken into consideration for further evaluation and processing.

Signature of the Bidder with Stamp

LIST OF REFERENCE DRAWINGS / DOCUMENTS

Sub: Fabrication of Coal Bunkers against S.O. No. 7906 inside premises of BHEL-HPVP, Visakhapatnam

Sl. No.	S.O. No.	Description of Work	Description of Drawings / Documents	Drawing / Document No.	Rev. No.	No. of Sheets
1			Key Plan of Column Bases of Bunker & ESP Inlet Duct supporting structure	0-00-281-U9501	0	1
2			Top Plan of Bunker	1-66-100-U0001	0	1
3			Bottom Plan of Bunker	1-66-100-U0002	0	1
4			Bunker Longitudinal Elevation	1-66-100-U0003	0	1
5			Bunker Transverse Elevation	1-66-100-U0004	0	1
6			Tripper Floor Support Beams	1-34-410-U0001	0	1
7			Inspection Procedure	IP-28812-M-07 (CHN)	0	10
8			Painting Schedule	PAINT-7906-DOC-00001/ Rev.01	2	10

Note : Documents indicated above are purely tentative and may be subject to revisions due to incorporation of comments of the approving authority. Hence, the approved drawings and documents issued to the vendor after ordering shall only be followed for execution & inspection of the job.

GENERAL TERMS & CONDITIONS**1. TECHNICAL DELIVERY CONDITIONS:**

The work should conform to the technical data given in our drawings, GMS, Shipping List Specifications, QAP, WPS etc.

2. PARTY'S SCOPE:

The scope of the party shall be as follows: -

- a) All welding equipments, baking oven, tools, jigs and fixtures, measuring instruments duly calibrated, handling facilities, testing facilities etc.
- b) All materials other than those mentioned under "Free Issue Materials", which are required for completion of the work.
- c) All consumables such as electrodes, gases, grinding wheels etc.

Note: Electrodes of specification mentioned in the drawings / WPS and of BHEL approved brands only shall be used and MTCs of the same shall be submitted to BHEL for verification before use.

3. REVISION OF DRAWINGS:

There may be minor changes in the drawings during execution. In such a case, party should accommodate the same without any extra claim.

4. WELDING QUALIFICATION: Qualification of required number of Welders is party's responsibility at their cost.**5. X-RAY:**

All welding shall be of X-ray quality where specified on drawings. Inspection would specify the quantum of X-ray based on drawings / code requirement. Party should strictly follow the WPS and QAP issued by BHEL during welding. Getting the welds radiographed and getting them cleared by inspection is the responsibility of the party.

6. RECTIFICATIONS / REJECTIONS:

Any rectification due to defective work, if required, shall be done by the party free of charge with a suitable technology approved before hand by BHEL in writing. The cost of material, if any used for rectification work / rejection work, will be estimated by BHEL and the same shall be debited to party's account. In case any rectification / rework is to be carried out due to defective material supplied by BHEL, the replacement material and consumables will be supplied by BHEL free of Cost.

7. SECURITY DEPOSIT:

Vendors shall have to submit a Bank Guarantee for **10%** of the order value towards Security Deposit and safe custody of free issue materials within 15 days from the date of intimation by Outsourcing dept. The BG shall be valid for the entire contract period with a claim period of 12 months. This Bank Guarantee shall be released to the contractor after completion of work and on acceptance of the same by BHEL.

Bidder agrees to submit performance security required for execution of the contract within the time period mentioned above. In case of delay in submission of performance security, enhanced performance security which would include interest (SBI rate + 6%) for the delayed period, shall be submitted by the bidder. Further, if performance security is not submitted till such time the first bill becomes due, the amount of performance security due shall be recovered as per terms defined in NIT/contract, from the bills along with due interest.

8. PERFORMANCE BANK GUARANTEE:

Vendors shall have to submit Performance Bank Guarantee (claim period of 12 months) for 10% of the order value covering for the defects liability period. If PBG is not submitted, 10% of the order value shall be deducted towards PBG from the final bill and shall be refundable after performance guarantee period, if no defects are found during this period.

9. RAW MATERIALS ISSUE:

Raw materials shall be issued with appropriate processing allowance and invisible wastage over the theoretical requirement of raw materials (**Plates, Sheets, Sections and Pipes**).

10. TRANSFER / RETURN OF LEFT OVER MATERIALS:

Party should maintain proper records for receipt & use of all free issue materials. The left over materials & scrap as per the material accounting statement shall be returned to HPVP stores along with finished job. Material Transfer Vouchers (MTV) from one order to another or from one vendor to another and Material Return Vouchers should be submitted immediately after transfer / return. The material reconciliation statement shall be submitted by the contractor after verification and certification by BHEL along with the final bill **within 30 days from the date of completion of work**. Otherwise, recovery for the balance materials shall be made from any of their pending bills without further intimation.

11. MATERIAL RECONCILIATION:

Orders issued to the vendors have to be completed in all respects including Material Accounting within a maximum of **180 days** from the **date of issue of the first material** from BHEL - HPVP stores.

Maximum of 0.5 % on the requirement of materials (**Plates, Sections and Pipes**) is admitted towards **process allowance and invisible wastage**.

Scrap quantity is permissible up to a **maximum of 1% on Structural (Beams, Channels, Angles, Rods, Pipes etc.), 2% on Sheets, 3% for Plates** on the theoretical requirement of materials.

If wastage and scrap is beyond the above limits, it should be fully justified with cutting diagrams etc. which are to be approved in advance by BHEL. **Otherwise, the cost of raw materials beyond approved limits will be recovered from the contractor as per BHEL recovery rates including applicable taxes & duties.**

Material reconciliation including return of balance materials, off-cuts is to be completed within 20 days from the date of completion of the order. The material reconciliation statement shall be submitted by the contractor after verification and certification by BHEL-HPVP along with the final bill **within 30 days from the date of completion of work**. Otherwise, recovery for the balance materials shall be made from any of their pending bills without further intimation,

Repeated occurrence of inordinate delays in returning and settling the material accounting will entail BHEL the right to terminate the contract forthwith or impose a temporary suspension on further loading at the discretion of BHEL.

12. SCRAP & OFF-CUT NORMS:

Sl. No.	Description	Scrap Size (in mm)	Off-Cut (in MM)
1.	CS/AS Sheets & Plates	Below 500 × 250	500 × 250 & above
2.	Rolled sections Rod, angles etc. (other than -tubes, pipes)	Below 1000	1000 & above
3.	Tubes & Pipes	Below 500	500 & above
4.	Universal column	Below 1000	1000 & Above
5.	SS Sheets & Plates	Below 500 × 250	500 × 250 & above
6.	SS Structural, Rods, Tubes, Pipes	Below 250	250 & above
7.	Non – ferrous: sheets & plates, rods & tubes	Below 500 × 250 (S & PL), Below 250 (Rods & Tubes)	500 × 250 & above, 250 & above
8.	Big size Scrap	(2500 & above) × (150 to 249)	-

13. INSPECTION:

Party shall contact our Quality Control Dept. for stages of inspection before commencement of job and should strictly follow the stages of inspection as per QAP.

14. WORKMANSHIP GUARANTEE:

The vendors should give workmanship guarantee for fabricated items for a period of 18 months from the date of last delivery of the order. Any defects due to incomplete work, faulty workmanship found in the fabricated items after delivery during the defects liability period shall be rectified / replaced by the vendor free of cost. Otherwise, the expenditure incurred towards the same will be recovered from the pending bills of vendors.

15. WORK PROGRESS:

The fabricator shall furnish a weekly report on the progress of work along with the status of availability of free issue materials and requirement of further materials, if any.

Outsourcing dept. personnel will visit vendor's works from time to time to assess and review the work progress. Free access shall be provided to BHEL or its inspection agency at all reasonable times of the day / night.

In case the progress is not satisfactory or supplies are delayed abnormally beyond the contractual delivery date, BHEL-HPVP, Visakhapatnam reserves the right to cancel the order in part or full or get the balance job in as is where is condition completed elsewhere by another agency at the risk and cost of Fabricator. The value of the work carried out by the party will be assessed by BHEL and the same shall be final. No compensation will be given to the fabricator in case of cancellation of order or diversion of balance job even if the jobs have been processed partly.

16. DELIVERY:

Finished items should be handed over to BHEL-HPVP on party's delivery challans along with Job completion certificate / Final Inspection Report from inspection agency / HPVP-QC department.

17. PENALTY:

If delivery exceeds the stipulated delivery schedule, penalty 1/2 % of the total value of order per week or part thereof subject to a maximum of 10% on the total value of the order will be levied. However, time taken for the following will not be considered as delay on the part of the Sub-Contractor.

- 1) Intermediate operations, if any, carried out by BHEL.
- 2) Waiting time for BHEL / Third party Inspection beyond a normal time of 3 days.

18. PAYMENT TERMS:

Payment shall be made against RA Bills within 45 days from the date of submission of Bill.

90% payment will be made after handing over of the finished equipments along with all inspection documents to HPVP shops / Logistics dept. / ADM site / Lova Garden site, duly inspected & cleared by Inspection authority. Balance 10% payment shall be made along with the Final Bill against completion of total order in all respects including documentation.

Vendors shall have to submit the bills in the formats specified by HPVP-Outsourcing and the bills submitted in the specified format along with necessary supporting documents are only admitted for processing. The following documents shall be submitted along with the Final Bill: -

1. No Claim Certificate from the contractor
2. No Dues Certificate from BHEL
3. Work Completion Certificate from BHEL
4. Material Reconciliation Statement submitted by the Contractor and certified by concerned authority of BHEL (if applicable)
5. Workmanship Guarantee certificate from the contractor

19. SECRECY:

All the documents of BHEL inclusive of Drawings, GMS and Standards made available to the fabricator should be kept in strict confidence and under no circumstance be made available to others or allow others to make use of them. Such documents shall be returned to BHEL on demand after completion of the job. This secrecy clause is binding on the employees of the fabricators also. Violation of the same may lead to suspension of business with the vendor and necessary legal action.

20. SUB-LETTING:

In general, sub-letting of jobs will not be permitted. But in special circumstances, this may be allowed. In such case, the party should obtain written approval from BHEL-HPVP, Visakhapatnam before sub-letting.

21. FACTORY RULES AND REGULATIONS:

Party shall abide by all the rules and statutory regulations in force from time to time as per factories act. It shall be party's responsibility to ensure the safety of their workmen and fulfilling the ESI, PF and other relevant statutory regulations.

22. SAFETY:

- a) Contractor shall adhere to safe construction practices, guard against hazardous & unsafe working conditions and shall comply with the safety rules of BHEL and local authorities. He shall maintain First Aid facilities for all his employees and labour. Contractor's responsibility includes supply of welder kit, all safety items such as safety belts, white and colour glasses, goggles, safety helmets, safety shoes etc.
- b) *Contractor and his employees shall follow all fire & safety, security regulations of BHEL.*

23. HOUSE KEEPING:

During execution of work, the contractor at all times keep the working place and storage area clean and free from accumulation of waste materials, rubbish etc.,

24. ACCIDENT / DAMAGE / CONDUCT ETC.:

Contractor will be held responsible for any disorderly conduct / misconduct, indiscipline, theft, smoking etc., on the part of his men. He will ensure summarily eviction of such men from his premises failing which BHEL would remove them from the factory on his responsibility. Any damage to and or loss of equipment, machinery, building etc., to BHEL or BHEL employees, visitors or other contractors resulting from his own or any of his men's negligence shall be liable to be made good by him. Contractor shall be solely responsible for any accident in which you or your men or your equipment may be involved during the execution of contract on account of any reason what so ever.

25. TERMINATION OF CONTRACT:

In the event of any failure on the part of the contractor, BHEL reserves the right to terminate the contract by giving a notice of 2 weeks for any of the following lapses and contractual violations: -

- a) Failure to make labour payments in time as per the rules
- b) Failure to progress the job according to the agreed schedule
- c) Failure to mobilize adequate man power, tools & tackles and consumables in time
- d) Failure to adhere to Quality Standards of BHEL
- e) Refused to co-operate with other agencies working in the same area
- f) Failure to resolve labour disputes like strikes etc., within 7 days of occurrence
- g) Failure to comply with statutory regulations applicable at BHEL

BHEL shall also be free to intervene and take necessary remedial measures. All costs incurred with interest and overheads shall be recovered from contractor by such foreclosing or off-loading any part of the contract work.

26. DISPUTES:

Head of BHEL- HPVP Unit will be the final authority for any disputes arising out of this contract. The disputes / arbitration / settlement of contractual or legal issues shall be under the Jurisdiction of Visakhapatnam Court.

- 27. For this procurement, Public Procurement (Preference to Make in India), Order 2017 dated 15.06.2017 & 28.05.2018 and subsequent Orders issued by the respective Nodal Ministry shall be applicable even if issued after issue of this NIT but before finalization of Contract / PO / WO against this NIT.

In the event of any Nodal Ministry prescribing higher or lower percentage of purchase preference and / or local content in respect of this procurement, same shall be applicable.

- 28. The Bidder declares that they will not enter into any illegal or undisclosed agreement or understanding, whether formal or informal with other Bidder(s). This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.

In case, the Bidder is found having indulged in above activities, suitable action shall be taken by BHEL as per extant policies/ guidelines.

Signature of the Bidder with Stamp

Acceptance to Tender Terms & Conditions

I / We hereby confirm that the Tender documents, Drawings, Quality documents etc. have been studied in detail and we have fully understood the scope of work.

I / We accept to all the Terms and Conditions of the Tender Enquiry and the prices quoted are in accordance with the same.

I / We give our acceptance to participate in reverse auction for this tender.

Tender documents **duly signed & stamped on all the pages** by the Owner / authorized representative of the bidder are attached herewith.

Signature of the Bidder with Stamp

BUSINESS RULES FOR REVERSE AUCTION (RA)

This has reference to tender no. **OS/21-22/7906/BUNKER/14/018, dated 02.11.2021**. BHEL shall finalize the Rates for **Fabrication of Coal Bunkers against S.O. No. 7906 inside premises of BHEL-HPVP, Visakhapatnam** through Reverse Auction mode. BHEL has made arrangement with an authorized Service provider (details will be shared before reverse auction) for conducting RA. Bidders should go through the instructions given below and submit acceptance of the same.

The technical & commercial terms are as per (a) BHEL Tender Enquiry No. **OS/21-22/7906/BUNKER/14/018, dated 02.11.2021**, (b) Bidders' technical & commercial bid (in case of two-part bid) and (c) subsequent correspondences between BHEL and the bidders, if any.

1. Procedure of Reverse Auctioning:

- i) Price bids of all techno-commercially qualified bidders shall be opened.
- ii) **Reverse Auction:** The 'bid decrement' will be decided by BHEL.
- iii) The lowest bidder in sealed envelope price bid shall be shown as current L1 automatically by the system and no acceptance of that price is required. System shall have the provision to indicate this bid as current L1.
- iv) Bidders by offering a minimum bid decrement or the multiples thereof can displace a standing lowest bid and become "L1" and this continues as an iterative process. However, no bidder shall be allowed to lower its bid below the current L1 by more than 5 decrements at one go.
- v) After the completion of the reverse auction, the Closing Price shall be available for further processing.
- vi) Wherever the evaluation is done on total cost basis, after Reverse Auction, prices of individual line items shall be reduced on pro-rata basis.

2. Schedule for reverse auction: The Reverse Auction schedule will be intimated to the eligible techno-commercially qualified bidders at a later stage.**3. Auction extension time:** If a bidder places a bid in the last 5 minutes of closing of the Reverse Auction and if that bid gets accepted, then the auction's duration shall get extended automatically for another 5 minutes, for the entire auction (i.e. for all the items in the auction), from the time that bid comes in. Please note that the auto-extension will take place only if a bid comes in those last 5 minutes and if that bid gets accepted as the lowest bid. If the bid does not get accepted as the lowest bid, the auto-extension will not take place even if that bid might have come in the last 5 minutes. In case, there is no bid in the last 5 minutes of closing of Reverse Auction, the auction shall get closed automatically without any extension. However, bidders are advised not to wait till the last minute or last few seconds to enter their bid during the auto-extension period to avoid complications related with internet connectivity, network problems, system crash down, power failure, etc.

The above process will continue till completion of Reverse Auction.

Complaints/ Grievances, if any, regarding denial of service or any related issue should be given in writing thru e-mail/ fax to M/s. {Service provider} with a copy to BHEL within 15 minutes prior to initial closing time of Reverse Auction.

4. Bid price: The Bidder has to quote the {.....} Price **except GST** but inclusive of Packing & Forwarding charges, all the routine & type tests as per tender scope, taxes, duties, freight and insurance as specified in tender document including loading (if indicated by BHEL due to deviations in technical/ commercial terms) for the Items specified. Details are as shown in Excel Sheet for calculation of total cost to BHEL (To be specified by Unit as per NIT conditions).**5. Bidding currency and unit of measurement:** Bidding will be conducted in **Indian Rupees per Unit** of the material as per the specifications mentioned in the tender.

In case of foreign currency bids, exchange rate (TT selling rate of State Bank of India) as on scheduled date of tender opening (Part-I bid) shall be considered for conversion in Indian Rupees. If the relevant day happens to be a Bank holiday, then the forex rate as on the previous bank (SBI) working day shall be taken.

6. **Validity of bids:** Price shall be valid for 3 months from the date of reverse auction. These shall not be subjected to any change whatsoever.
7. **Lowest bid of a bidder:** In case the bidder submits more than one bid, the lowest bid at the end of Reverse Auction will be considered as the bidder's final offer to execute the work.
8. Unique user IDs shall be used by bidders during bidding process. All bids made from the Login ID given to the bidders will be deemed to have been made by the bidders/ bidders' company.
9. **Post auction procedure:** BHEL will proceed with the Lowest Bid in the Reverse Auction for further processing.
10. Any commercial/ technical loading shall be separately intimated to respective bidders prior to RA. The excel sheet provided in this regard shall cover all these aspects. Commercial/ technical loading if any, shall be added by the respective bidder in its price during Reverse Auction.
Modalities of loading & de-loading shall be separately intimated to the bidders. The responsibility for correctness of total cost to BHEL shall lie with the bidders.
11. Reverse auction shall be conducted by BHEL (through M/s {Service Provider}), on pre-specified date, while the bidders shall be quoting from their own offices/ place of their choice. Internet connectivity shall have to be ensured by bidders themselves.

During the RA process if a bidder is not able to bid and requests for extension of time by FAX/ email/ phone then time extension of additional 15 minutes will be given by the service provider provided such requests come before 5 minutes of auction closing time. However, only one such request per bidder can be entertained.

In order to ward-off contingent situation of connectivity failure bidders are requested to make all the necessary arrangements/ alternatives whatever required so that they are able to circumvent such situation and still be able to participate in the reverse auction successfully. Failure of power or loss of connectivity at the premises of bidders during the Reverse auction cannot be the cause for not participating in the reverse auction. On account of this, the time for the auction cannot be extended and neither BHEL nor M/s. {Service provider} is responsible for such eventualities.

12. **Proxy bids:** Proxy bidding feature is a pro-bidder feature to safe guard the bidder's interest of any internet failure or to avoid last minute rush. The proxy feature allows bidders to place an automated bid in the system directly in an auction and bid without having to enter a new amount each time a competing bidder submits a new offer. The bid amount that a bidder enters is the minimum that the bidder is willing to offer. Here the software bids on behalf of the bidder. This obviates the need for the bidder participating in the bidding process until the proxy bid amount is decrementally reached by other bidders. When proxy bid amount is reached, the bidder (who has submitted the proxy bid) has an option to start participating in the bidding process.

The proxy amount is the minimum amount that the bidder is willing to offer. During the course of bidding, the bidder cannot delete or change the amount of a proxy bid.

Bids are submitted in decrements (decreasing bid amounts). The application automates proxy bidding by processing proxy bids automatically, according to the decrement that the auction originator originally established when creating the auction, submitting offers to the next bid decrement each time a competing bidder bids, regardless of the fact whether the competing bids are submitted as proxy or standard bids. However, it may please be noted that if a manual bid and proxy bid are submitted at the same instant manual bid will be recognized as the L1 at that instant.

In case of more than one proxy bid, the system shall bid till it crosses the threshold value of 'each lowest proxy bid' and thereafter allow the competition to decide the final L1 price.

Proxy bids are fed into the system directly by the respective bidders. As such this information is privy only to the respective bidder(s).

13. Bidders are advised to get fully trained and clear all their doubts such as refreshing of Screen, quantity being auctioned, tender value being auctioned etc. from M/s. {Service provider}.

14. M/s. {Service provider}, shall arrange to demonstrate/ train the bidder or bidder's nominated person(s), without any cost to bidders. M/s. {Service provider}, shall also explain the bidders, all the business rules related to the Reverse Auction. Bidders are required to submit their acceptance to the terms/ conditions/ modalities before participating in the Reverse Auction in the process compliance form as enclosed. Without this, the bidder will not be eligible to participate in the event.
15. Successful bidder shall be required to submit the final prices (L1) in prescribed format (Annexure – VI) for price breakup, quoted during the Reverse Auction, duly signed and stamped as token of acceptance without any new condition (other than those already agreed to before start of auction), after the completion of auction to M/s. {Service provider} besides BHEL within two working days of Auction without fail.
16. Any variation between the final bid value and that in the confirmatory signed price breakup document will be considered as tampering the tender process and will invite action by BHEL as per extant guidelines for suspension of business dealings (as available on www.bhel.com).
17. Bidders' bid will be taken as an offer to execute the work/ supplies the item as per enquiry no. **OS/21-22/7906/BUNKER/14/018, dated 02.11.2021**. Bids once made by the bidder, cannot be cancelled/ withdrawn and bidder shall be bound to execute the work as mentioned above at bidder's final bid price. Should bidder back out and not execute the contract as per the rates quoted, BHEL shall take action as per extant guidelines for suspension of business dealings (as available on www.bhel.com).
18. Bidders shall be able to view the following on their screen along with the necessary fields during Reverse Auction:
 - a. Leading (Running Lowest) Bid in the Auction (only total price of package)
 - b. Bid Placed by the bidder
 - c. Start Price
 - d. Decrement value
 - e. Rank of their own bid during bidding as well as at the close of auction.
19. BHEL's decision on award of contract shall be final and binding on all the Bidders.
20. BHEL reserves the right to extend, reschedule or cancel the Reverse Auction process at any time, before ordering, without assigning any reason, with intimation to bidders.
21. BHEL shall not have any liability to bidders for any interruption or delay in access to the site irrespective of the cause. In such cases, the decision of BHEL shall be binding on the bidders.
22. Other terms and conditions shall be as per bidder's techno-commercial offers and other correspondences, if any, till date.
23. If there is any clash between this business document and the FAQ available, if any, in the website of M/s. {Service provider}, the terms & conditions given in this business document will supersede the information contained in the FAQs. Any changes made by BHEL/ service provider (due to unforeseen contingencies) after the first posting shall be deemed to have been accepted if the bidder continues to access the portal after that time.
24. Bidder shall not divulge either his Bids or any other exclusive details of BHEL to any other party. If the Bidder or any of his representatives are found to be involved in Price manipulation/ cartel formation of any kind, directly or indirectly by communicating with other bidders, action *as per extant BHEL guidelines for suspension of business dealings (as available on www.bhel.com)*, shall be initiated by BHEL.

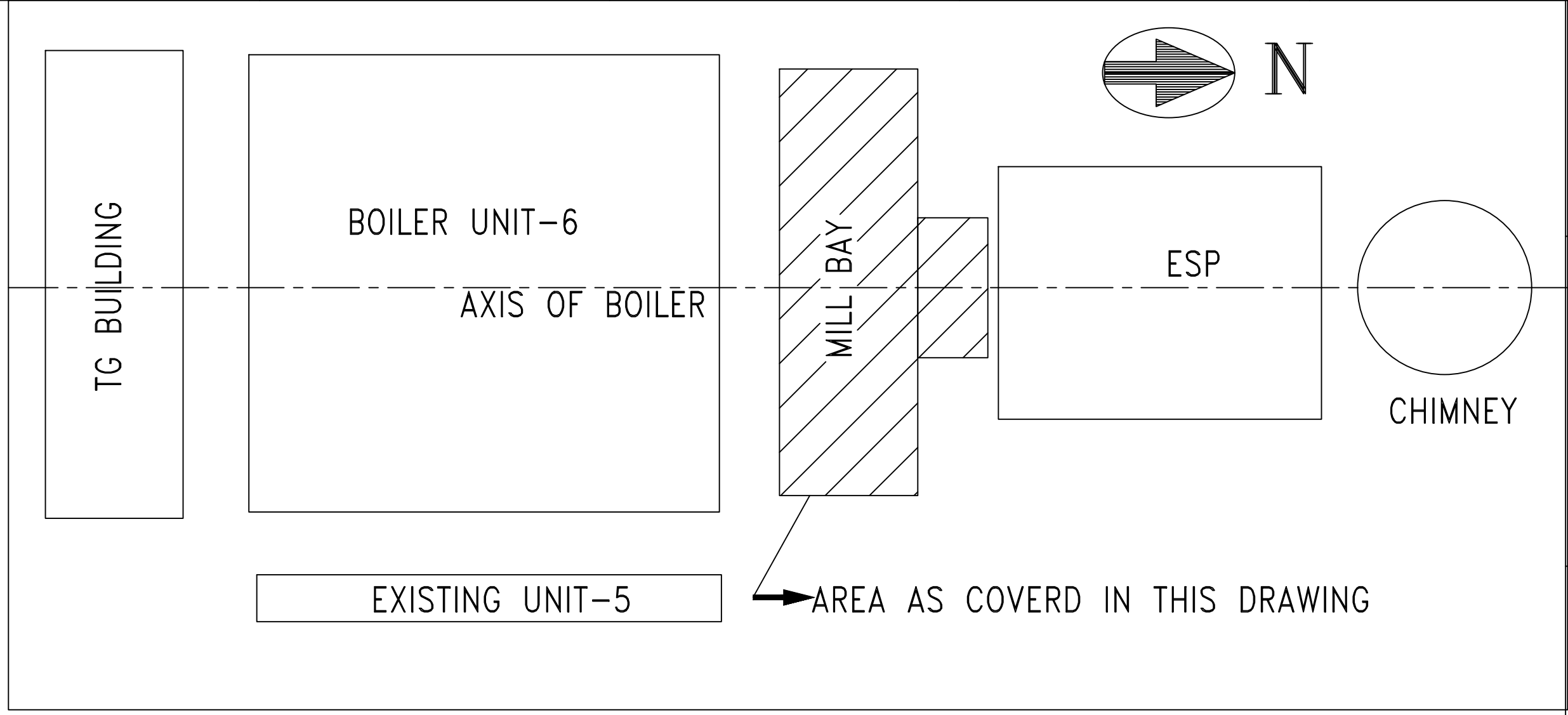
Signature of the Bidder with Stamp

GST COMPLIANCE FOR INDIGENOUS SUPPLIERS

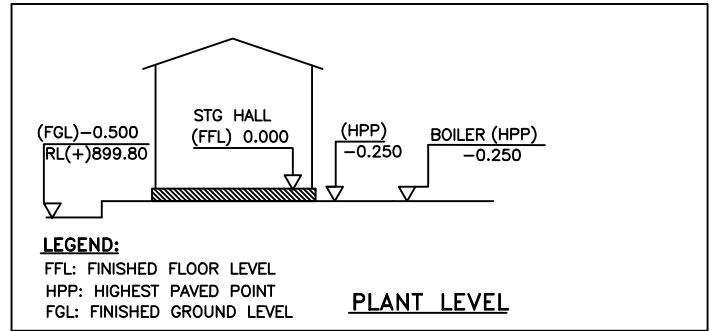
1. In Response to Tenders for Indigenous supplier will be entertained only if the vendor has a valid GSTIN which should be clearly mentioned in the offer. If any specific exemption is available, a declaration with due supporting documents need to be furnished for considering the offer.
2. Supplier shall mention their GSTIN in all their invoices and invoices shall be in the format as specified/prescribed under GST laws. Invoices shall necessarily contain Invoice number (in case of multiple numbering system is being followed for billing like SAP invoice no, commercial invoice no etc., then the Invoice No which is linked/uploaded in GSTN network shall be clearly indicated), item description as per PO, Quantity, Rate, Value, applicable taxes with nomenclature (like IGST, SGST, CGST & UTGST) separately, HSN/ SAC Code, etc.
3. All invoices shall bear the HSN Code for each item separately (Harmonized System of Nomenclature)/ SAC code (Services Accounting Code).
4. A declaration to the effect that all invoice particulars are/were uploaded in the GSTN network/ portal & all tax liability as per GST rules and regulations have been and will be discharged, shall be mentioned in the invoice. If not mentioned in the invoice, a separate declaration shall be submitted as per the requirement of BHEL.
5. All documents like Test Certificate, LR copy, Guarantee/Warranty certificate, work completion certificate, any other document mentioned in PO, shall be sent along with the vehicle/consignment where ever applicable. For all consignments received within the calendar month, input credit will be availed within that month in line with monthly returns filing cycle. In case of any discrepancy in the document or non-submission of documents mentioned in the PO, then BHEL will not be able to accept or account the material, in such case availing of tax credit will be deferred to next month or so.
6. In case of discrepancy in the data uploaded by supplier in the GSTN portal or in case of any shortages or rejection in the supply, then BHEL will not be able to avail the tax credit and will notify the supplier of the same. Supplier has to rectify the data discrepancy in the GSTN portal or issue credit note (details to be uploaded in GSTN portal) for the shortages or rejections in the suppliers, within the calendar month notified by BHEL.
7. For any such delay in availing of tax credit for reasons attributable to supplier (as mentioned above), interest (calculated @ SBI Base Rate + 6%) along with penalty if any will be deducted for the delayed period i.e. from the month of receipt till the month tax credit is availed, from the running bills.
8. Under GST regime, BHEL has to discharge GST liability on LD recovered from suppliers/contractors. Hence applicable GST shall also be recoverable from suppliers/contractors on LD amount. For this Debit note will be issued by BHEL indicating the respective supply invoice number.
9. This is to inform that GST portion of invoice, shall be released only upon Vendor declaring such invoice in his GSTR-1 and receipt of goods and Tax invoice by BHEL and Confirmation of payment of GST thereon by vendor on GSTN portal. Alternatively, BG of appropriate value may be obtained from vendor which shall be valid At least one month after the confirmation of date of payment of GST by vendor on GSTN portal and receipt of Tax invoice and receipt of goods, whichever is later. Above is subject to receipt of goods/service and tax invoice thereof along with vendor declaring invoice in his return and paying GST within timeline prescribed for availing ITC by BHEL.
10. That in case vendor delays Declaring such invoice in his return and GST credit availed by BHEL is denied or reversed subsequently as per GST law, GST amount paid by BHEL towards such ITC reversal as per GST law shall be recoverable from vendor/contractor along with interest levied/ leviable on BHEL.

Note: The above will be followed strictly for processing vendor payments to ensure GST Compliance.

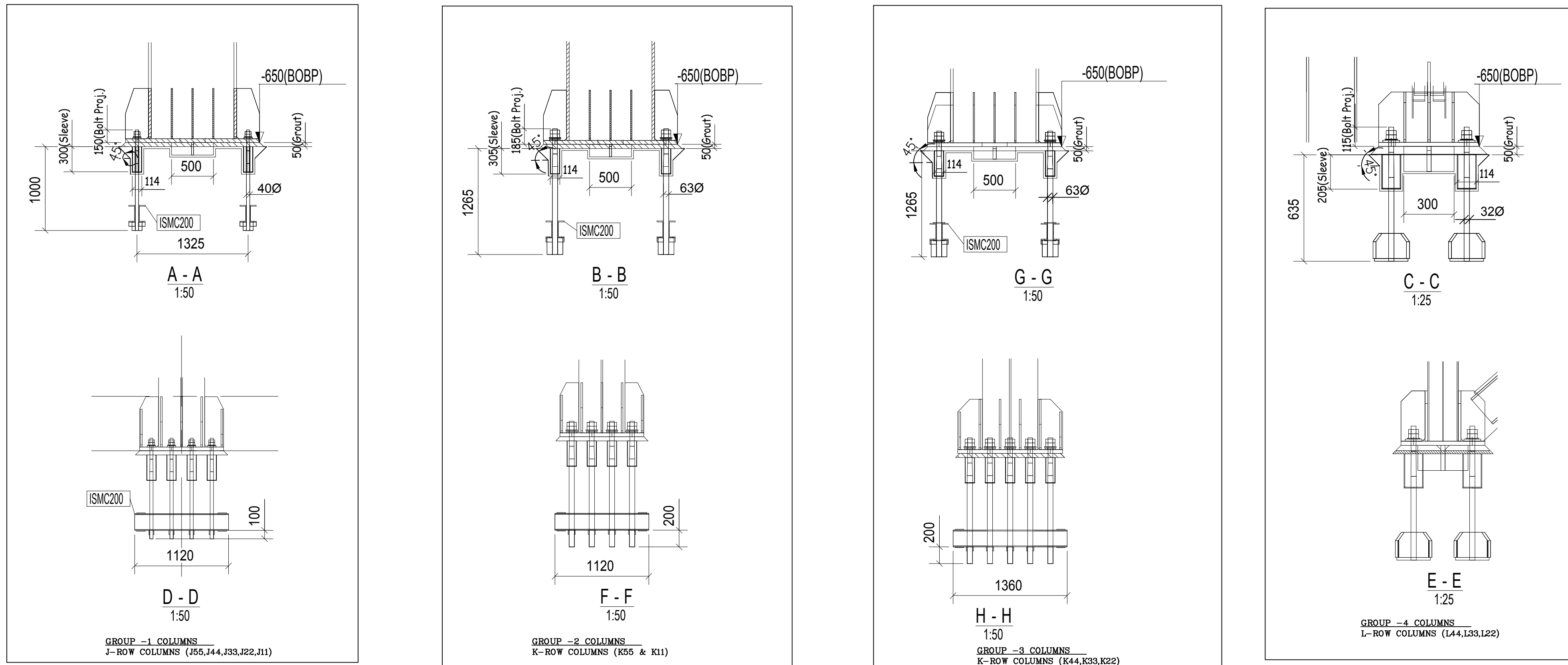
Signature of the Bidder with Stamp


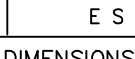


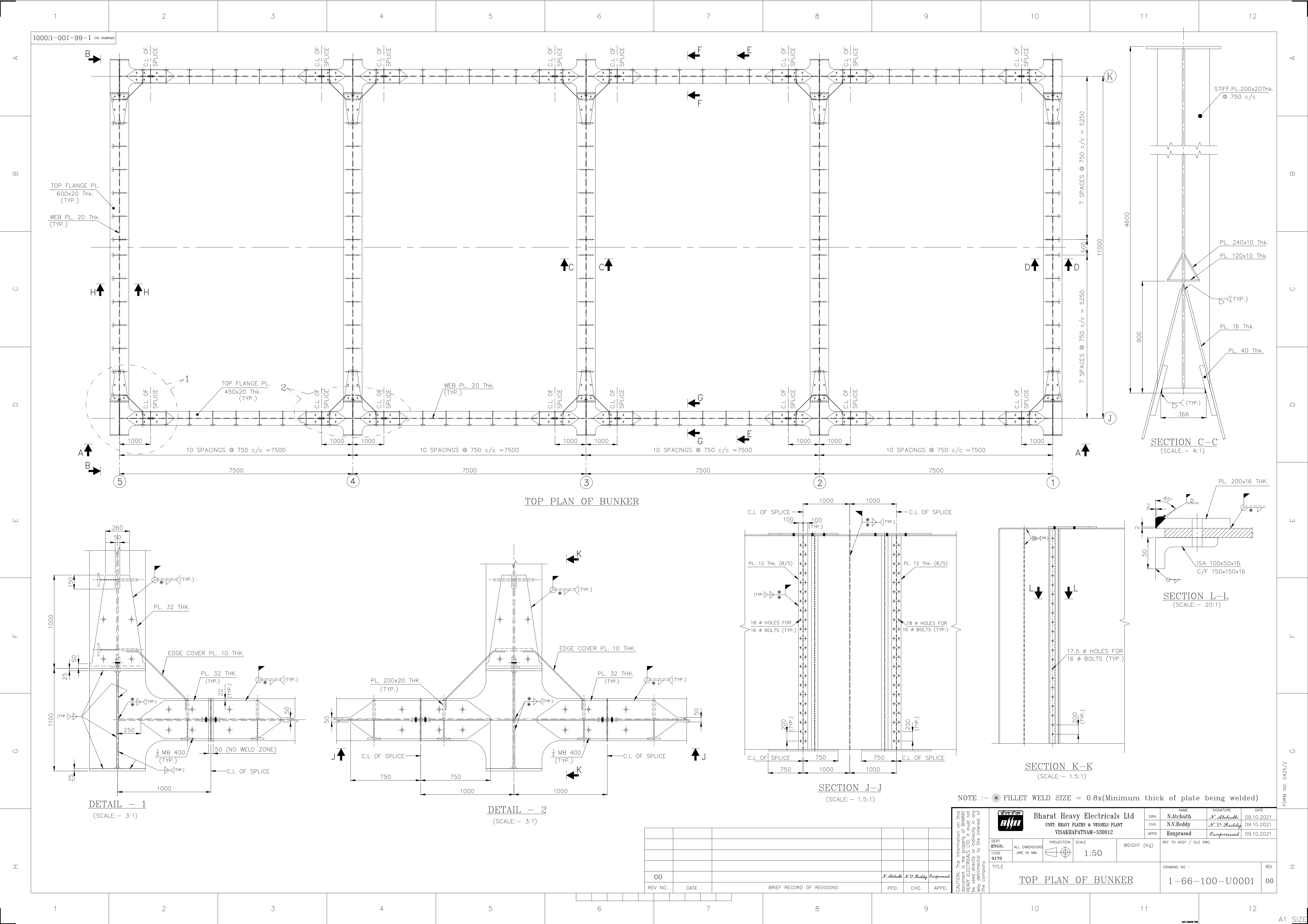
- ALL LOADS ARE IN METRIC TONS & DIMENSIONS ARE IN MILLIMETERS.
- THE SURCHARGE UNDER SEISMIC LOADING CONDITIONS ARE BASED ON 3D MODEL OF STRUCTURE WITH DYNAMIC ANALYSIS USING AVERAGE ACCELERATION SPECTRA FOR ZONE-4 WITH SOIL TYPE MEDIUM AS PER IS 1953.
- WIND LOAD IS AS PER IS 875 (PART-3) - 2015 WITH BASIC WIND SPEED $V_b = 50$ M/S, RISE COEFFICIENT $K_1 = 1.08$, TERRAIN CATEGORY - 3, WITH K2 VALUE BETWEEN 0.91 AND 1.136 AND TOPOGRAPHY FACTOR $K_3 = 1.00$
- ALLOWABLE BEARING PRESSURE UNDER COLUMN BASE PLATE IS CONSIDERED AS 75kg/Sq Cm.
- MILL AXIS IS CONSIDERED THE LONGITUDINAL AXIS OF THE BUNKER BAY COLUMNS.
- TRANSVERSE AXIS IS PARALLEL TO PLANT NORTH
- THE EMBEDDED PORTIONS OF THE COLUMN BETWEEN COLUMN BASE PLATE AND FINISHED FLOOR ARE TO BE PROPERLY ENCASED WITH PCC / RCC FOR ALL COLUMNS.
- TEMP. SPLATES SHALL BE USED (ISSUED IN PGMA 34-010) FOR MAINTAINING EXACT LOCATION AND VERTICAL ALIGNMENT OF FOUNDATION BOLTS.
- POCKETS FOR GROUTING ARE CIRCULAR AS SHOWN IN DETAILS (SLEEVE PIPES ARE ISSUED IN PGMA 34-010).
- REFER DRAWING NO. 0-00-281-U9506 FOR SUPPORT REACTIONS (NOT FOUNDATION LOADS) AT COLUMN BASES
1. GROUTING CONCRETE ARE IN ERECTION GROUP SCOPE.
- GRADE OF CONCRETE MIX USED FOR GROUTING SHALL BE ONE GRADE HIGHER THAN THE FOUNDATION CONCRETE. NON-SHRINK FRYE FLOW CEMENT OR ADMIXTURE SHALL BE USED FOR GROUTING.
- ENSURE PROPER COMPACTION AND CURING OF GROUT.
- ENSURE PROPER CONTACT BETWEEN GROUT MIX AND BOTTOM OF BASE PLATES.
5. COLUMN FOUNDATION SHALL BE DESIGNED FOR THE FOLLOWING CONDITIONS:-
 - A) THE FOUNDATION LOAD DATA CALCULATION AND THE DESIGN OF BUNKER SUPPORTING STRUCTURE SHALL NOT TAKE INTO ACCOUNT ANY DIFFERENTIAL FOUNDATION SETTLEMENT CRITERIA
 - B) HOWEVER, A DIFFERENTIAL SETTLEMENT WHICH SHALL BE RESTRICTED TO 1 mm 1000 OF SPAN BETWEEN TWO ADJACENT COLUMN OR 8 mm WHICHEVER IS LESS CAN BE TOLERATED BY STRUCTURE UNDER WORKING LOAD CONDITION.
 - C) SHIM PLATES ISSUED IN PGMA 34-010 ARE TO BE PLACED BELOW COLUMN FLANGE AS MUCH AS POSSIBLE AND ARE TO BE ADJUSTED FOR SHEAR LOCKS.
7. FOR GENERAL LAYOUT OF BOILER, REFER LAYOUT Dwg No. 0-0-022-U4222 (ELEVATION) & 0-0-022-U4223 (PLAN) CLEAR OR REMOVE THE RUST AND DUST OFF THE FOUNDATION MATERIALS (FOR FOUNDATION BOLTS)
8. THE FOUNDATION SHALL BE EMBEDDED INTO THE CONCRETE. THE PROJECTIONS OF FOUNDATION BOLT ABOVE CONCRETE LEVEL AS PER DRAWING REQUIREMENT, WHICH IS A CRITICAL DIMENSION.
9. THE SLEEVE PIPE ASSEMBLY ISSUED IS TO BE TACK WELDED AT APPROPRIATE LOCATION & ELEVATION WITH THE FOUNDATION BOLT AT SITE BEFORE EMBEDDING IN THE CONCRETE
1. THE BOTTOM OF BASE PLATE (B.O.B.P.) FOR ALL COLUMNS ARE KEPT AT -0.65M FROM FFL.
- AFTER INSERTING THE FOUNDATION BOLT IN THE STOP OF PAIR OF ANCHOR CHANNELS, THE FOUNDATION BOLTS ARE TO BE SUITABLY TURNED 50 TO 60 DEGREE TO BUTT AGAINST PLATES ALREADY AVAILABLE AS WELDED WITH ANCHOR CHANNEL, BEFORE CONCRETING.
- MAIN BENDING MOMENT IS ACTING AT MAIN COLUMNS SUPPORTING THE BUNKERS ABOVE MILL AXIS.
- DYNAMIC LOAD FOUNDATION(LIKE FAN FOUNDATIONS) TO BE ISOLATED FROM THE FOUNDATION OF STRUCTURAL COLUMNS.



BOBP : Bottom Of Base Plate
BOS : Bottom Of Steel
TOS : Top Of Steel
➡ : Mark at Column base location indicates Vertical Bracing Orientation



			CUSTOMER NUMBER : 7906																
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			CONSULTANT		D DASTUR M. N. DASTUR & COMPANY (P) LTD CONSULTING ENGINEERS, KOLKATA														
			PROJECT		INSTALLATION OF STEAM AND POWER PLANT FOR 5th STREAM ALUMINA REFINERY EXPANSION AT DAMANJODI, ODISHA UNDER PHASE-3 EXPANSION OF M&R COMPLEX 1X300 t/h : 69.5 kg/cm ² (g), 487°C														
					BHARAT HEAVY ELECTRICALS LIMITED, UNIT: HEAVY PLATES & VESSELS PLANT, VISAKHAPATNAM-530012														
REV.	DATE	ALTD :																	
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		<table><tr><td></td><td>NAME</td><td>DATE</td></tr><tr><td>DRN</td><td>M.chaitanya</td><td>07.10.21</td></tr><tr><td>CHD</td><td>N V redddy</td><td>07.10.21</td></tr><tr><td>APPD</td><td>E S N prasad</td><td>07.10.21</td></tr></table>			NAME	DATE	DRN	M.chaitanya	07.10.21	CHD	N V redddy	07.10.21	APPD	E S N prasad	07.10.21	<table><tr><td>TITLE</td></tr><tr><td>KEYPLAN OF COLUMN BASES OF BUNKER & ESP INLET DUCT SUPPORTING STRUCTURE SUPPORT REACTIONS</td></tr></table>		TITLE	KEYPLAN OF COLUMN BASES OF BUNKER & ESP INLET DUCT SUPPORTING STRUCTURE SUPPORT REACTIONS
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		ALL DIMENSIONS ARE IN MILLIMETERS 		DRG. No. 0-00-281-U9501															
		SCALE 1 : 75		REV. 00															

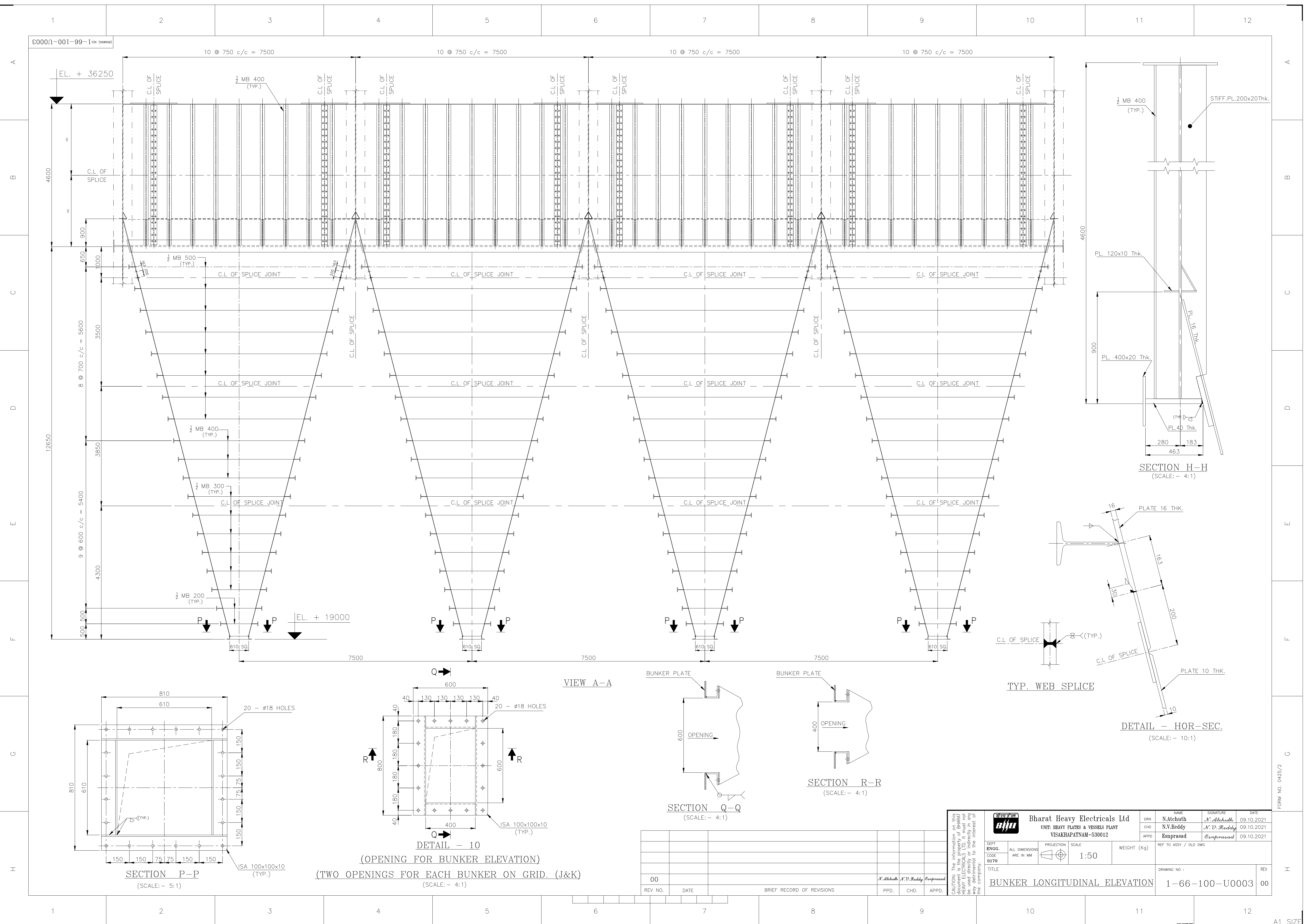


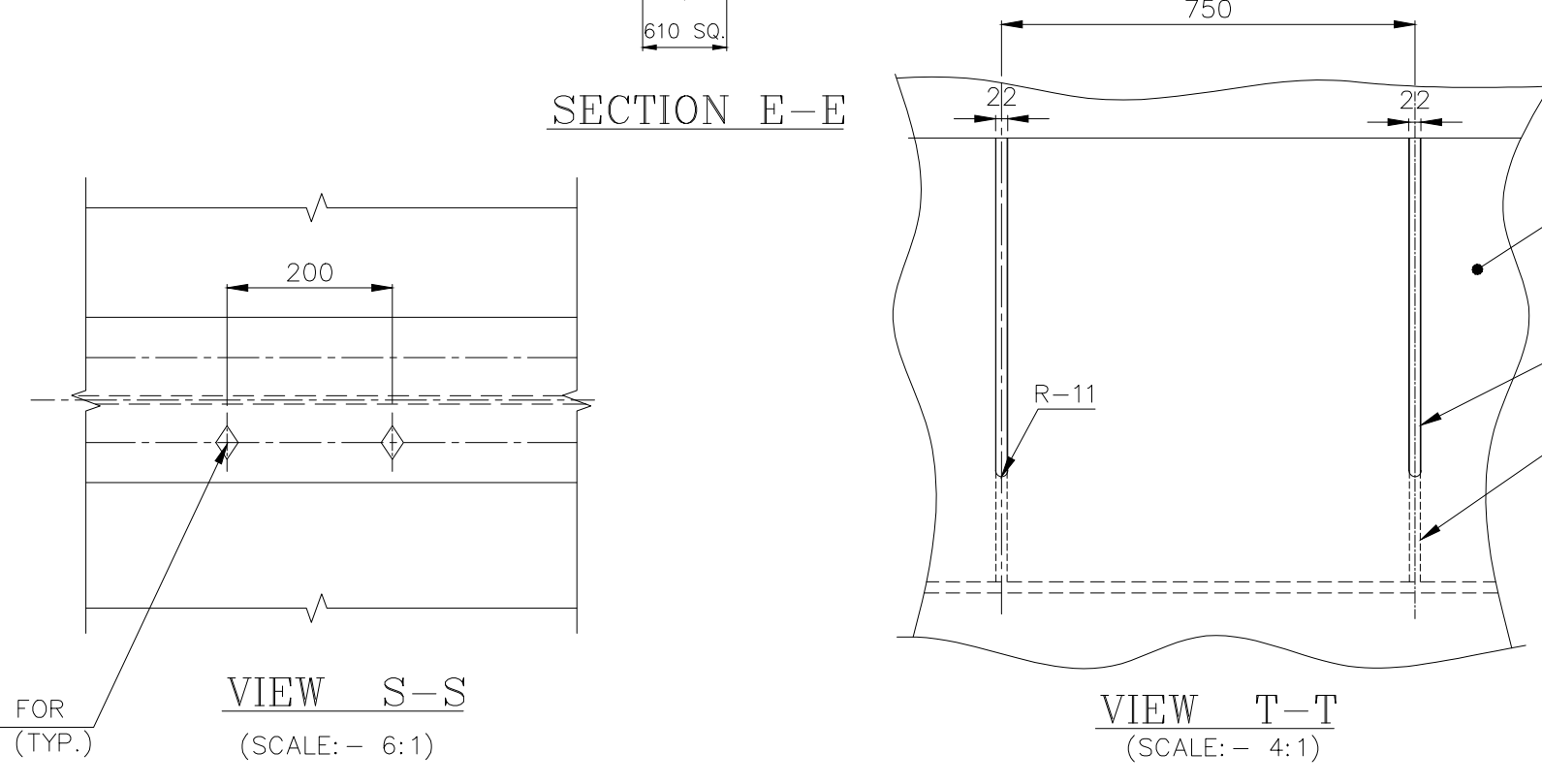
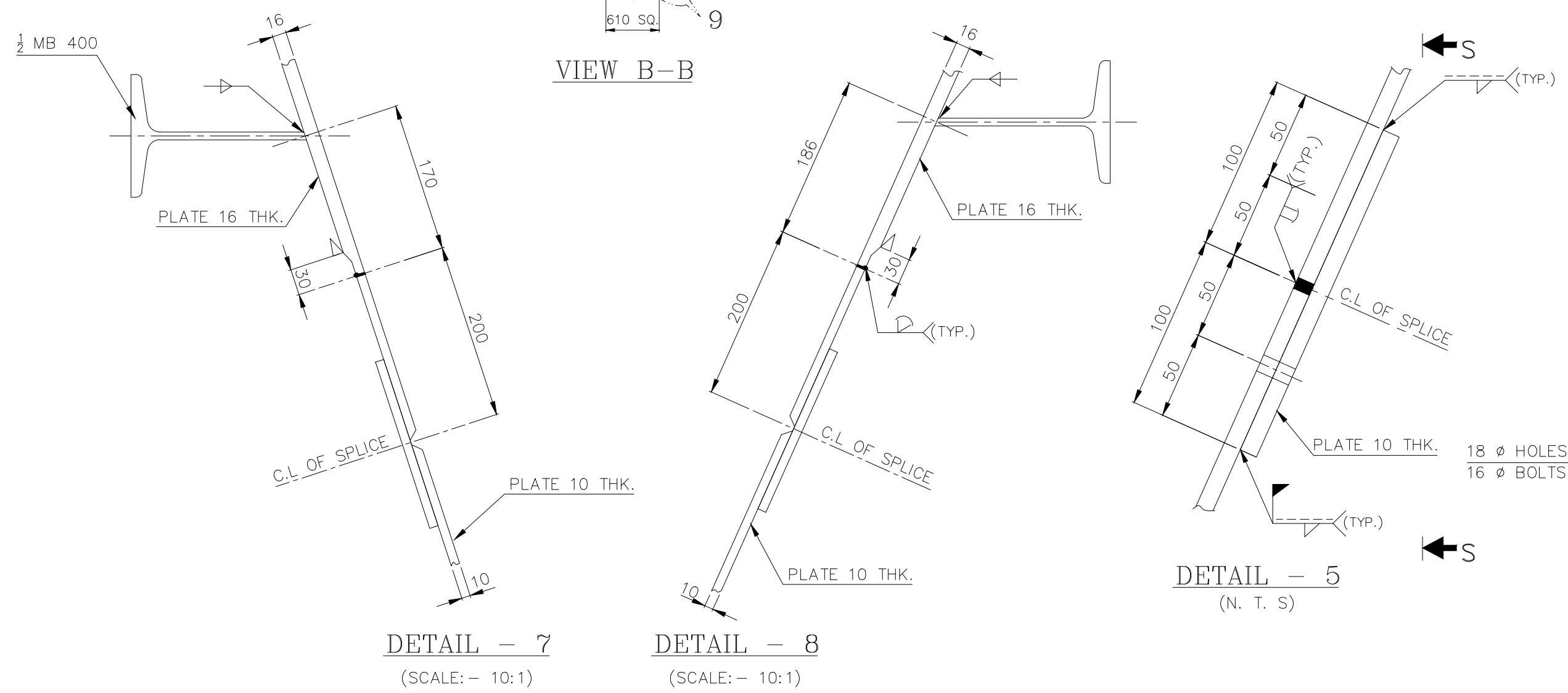
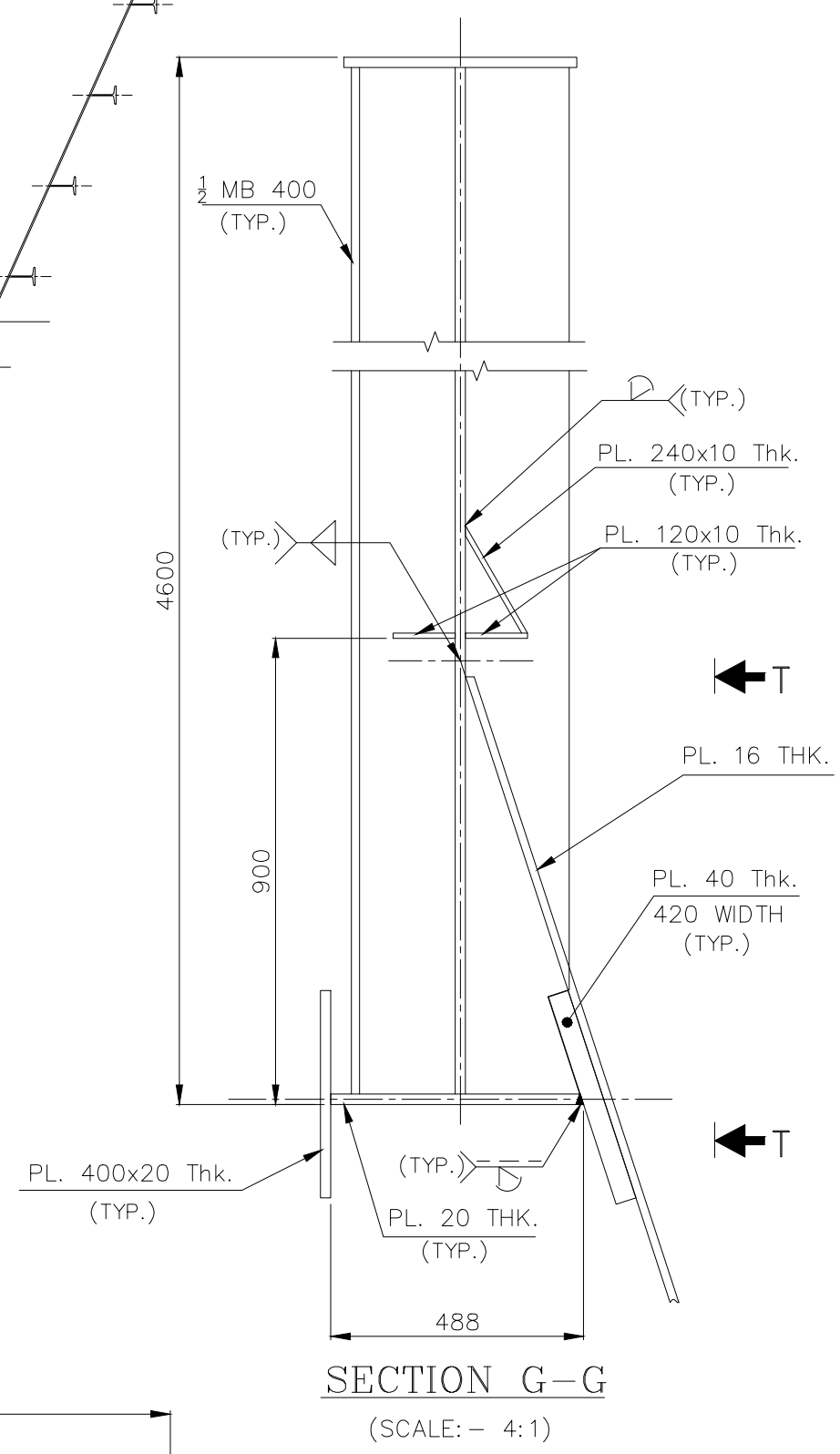
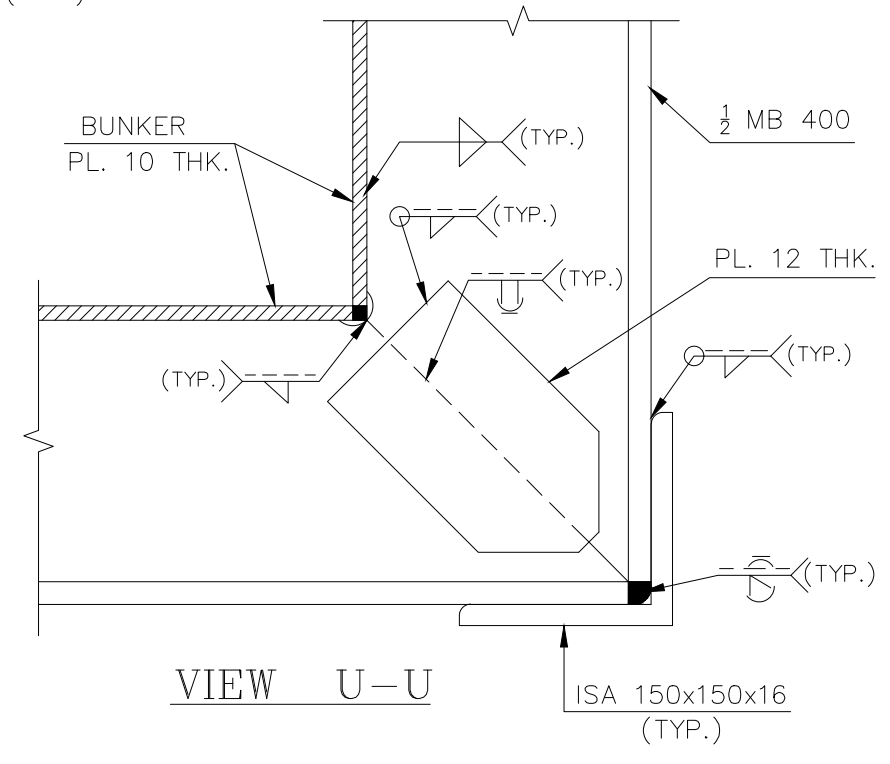
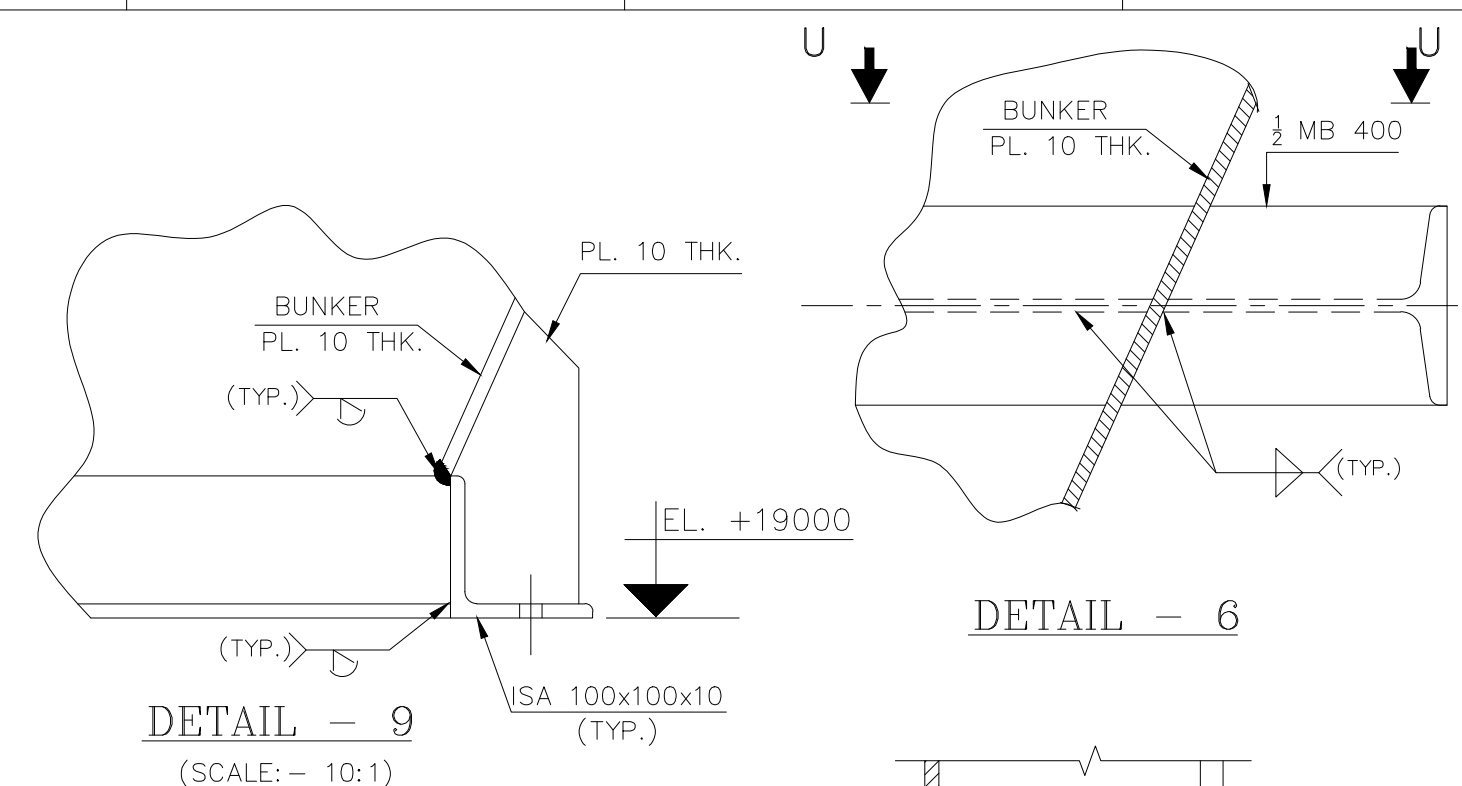
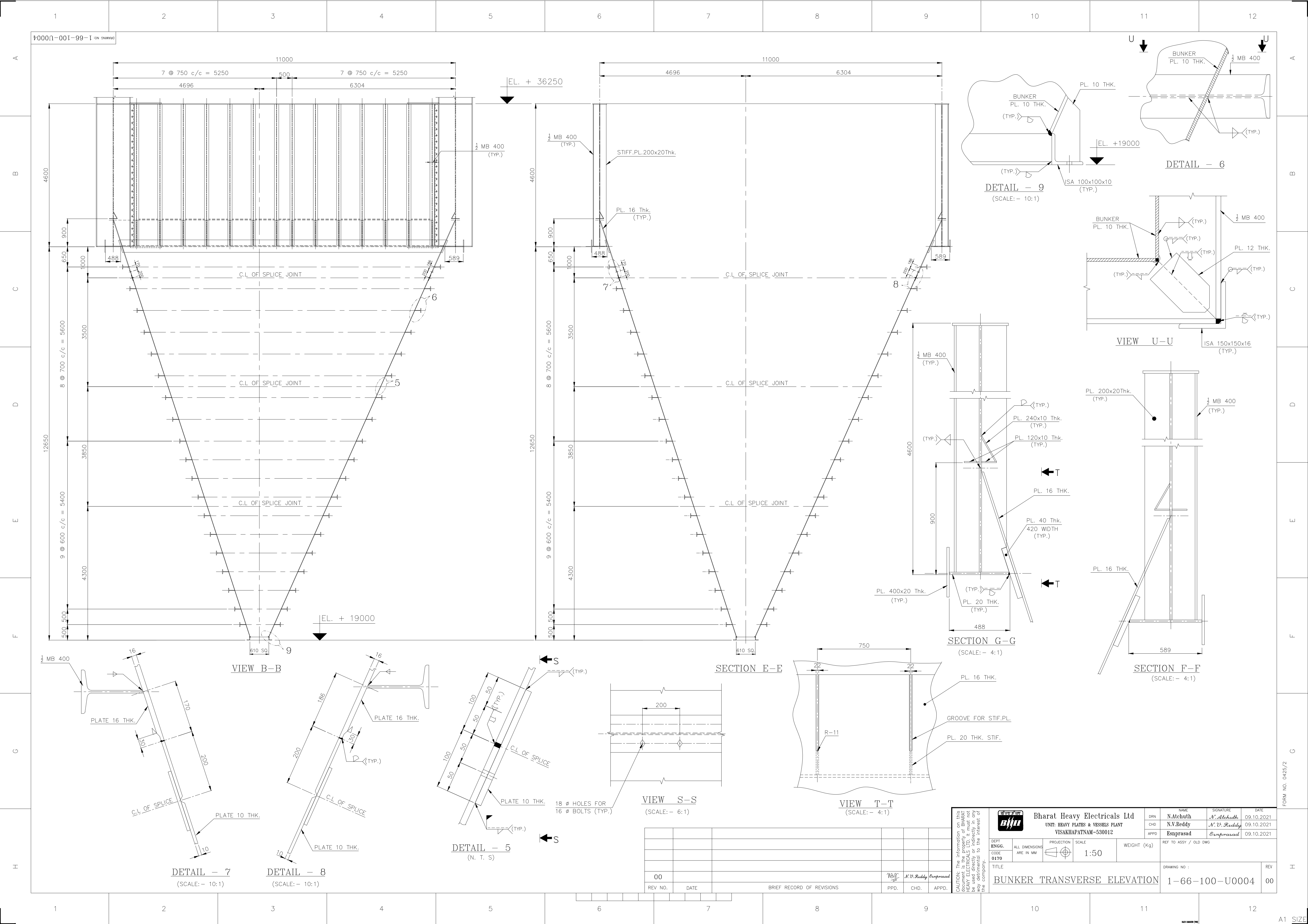
NOTE :- * FILLET WELD SIZE = 0.8x(Minimum thick of plate being welded)

DEPT. ENGG. CODE 0170		ALL DIMENSIONS ARE IN MM		PROJECTION SCALE 1:50		WEIGHT (Kg)		REF TO ASSY / OLD DWG	
Bharat Heavy Electricals Ltd UNIT: HEAVY PLATES & VESSELS PLANT VISAKHAPATNAM-530012		NAME N.V.Reddy N.V.Reddy Enmprasad		SIGNATURE N.V.Reddy N.V.Reddy Enmprasad		DATE 09.10.2021 09.10.2021 09.10.2021		DRAWING NO : 1-66-100-U0001	
TITLE TOP PLAN OF BUNKER		REV NO.		DATE		BRIEF RECORD OF REVISIONS		PPD. CHD. APPD.	

FORM NO. 0425/2

REV





DEPT. ENGG. CODE 0170		ALL DIMENSIONS ARE IN MM		PROJECTION SCALE 1:50		WEIGHT (Kg)		REF TO ASSY / OLD DWG	
NAME N.V.Reddy		SIGNATURE N.V.Reddy		DATE 09.10.2021		DRAWING NO :		REV	
APPD Enmprasad		SIGNATURE Enmprasad		DATE 09.10.2021		1-66-100-U0004		00	

REV NO.		DATE		BRIEF RECORD OF REVISIONS		PPD.		CHD.		APPD.	
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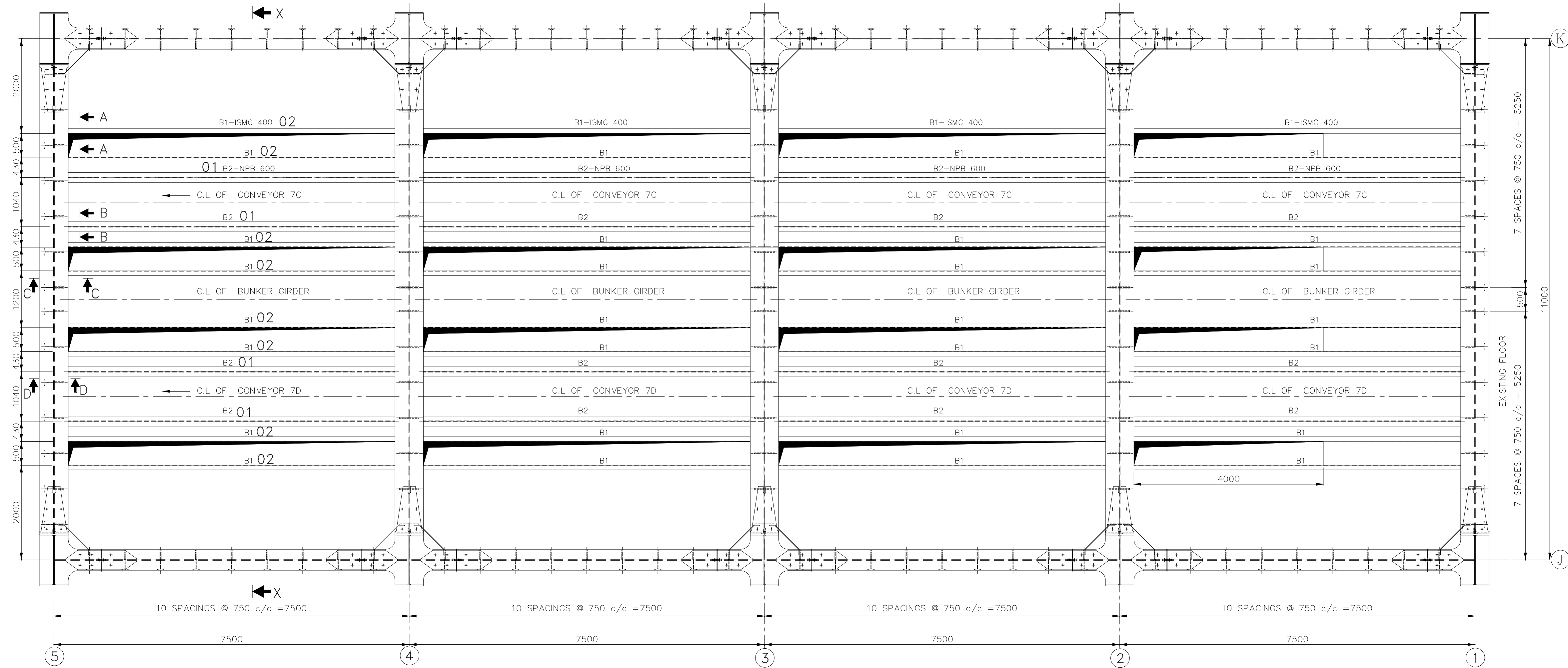
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TITLE BUNKER TRANSVERSE ELEVATION

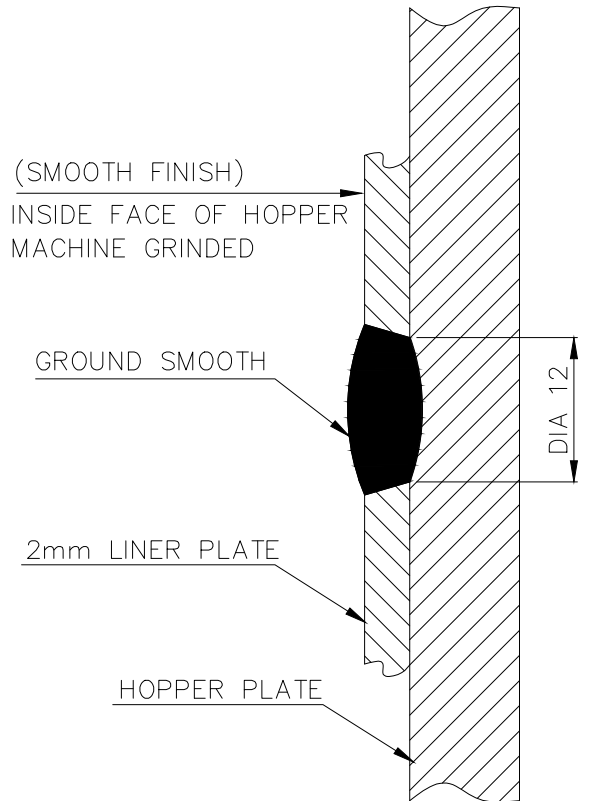
FORM NO. 0425/2

SIZE A1

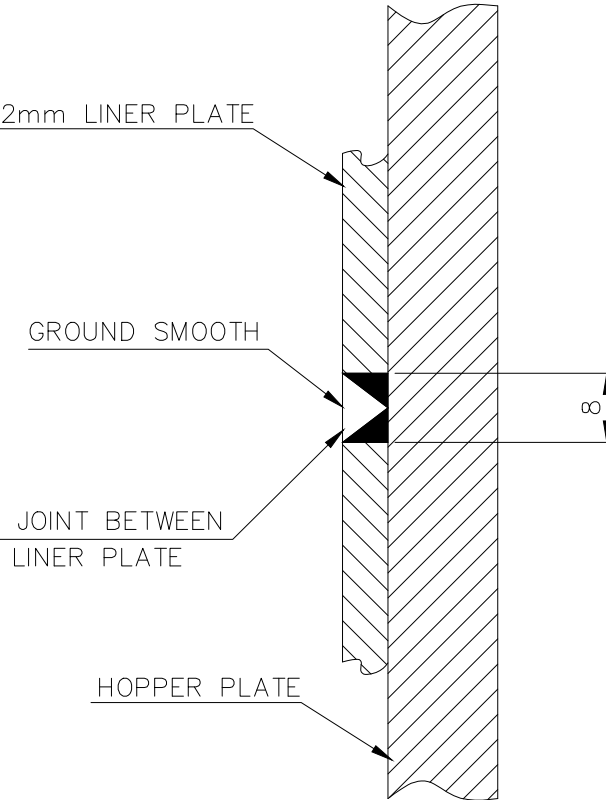
993001-028-03-1-ION CHINWANG



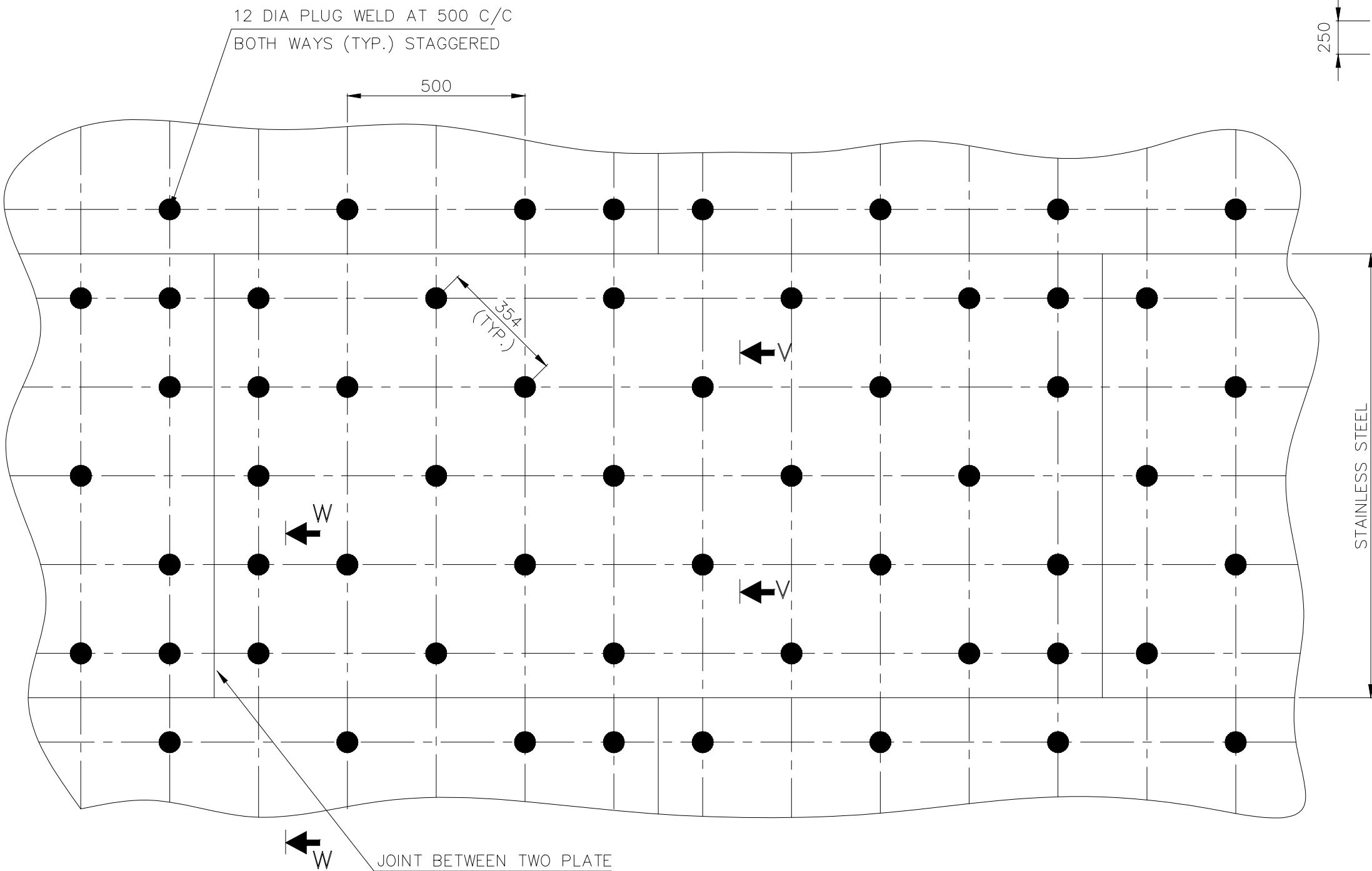
TOP PLAN OF OF OPENINGS AT EL. + 36250



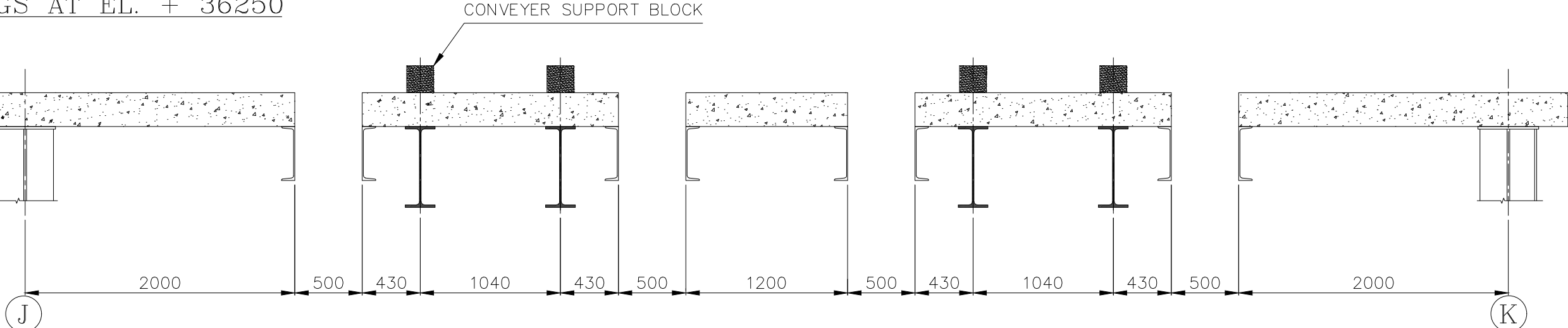
SECTION V-V



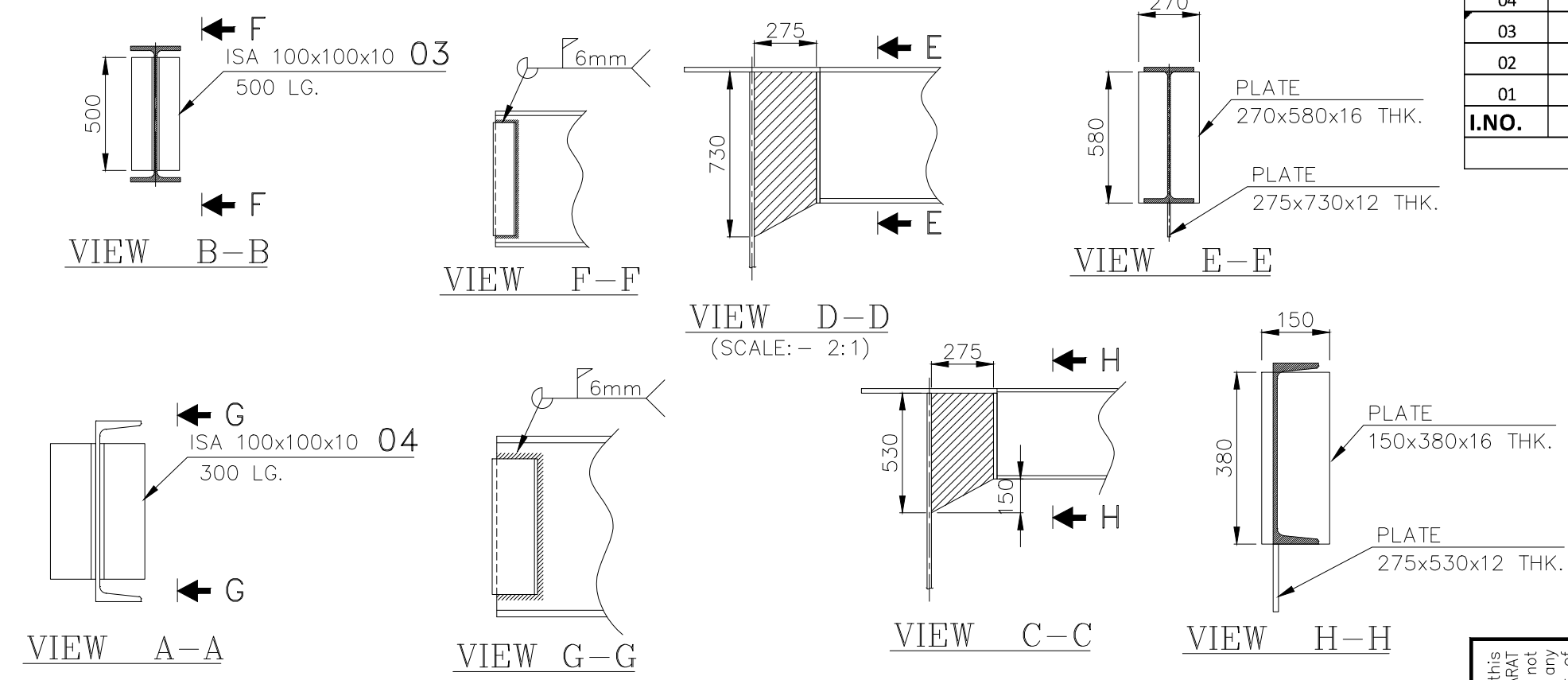
SECTION W-W



TYP. DETAIL OF FIXING SS LINER PLATE TO HOPPER PLATE
(SCALE: - 4:1)



SECTION X-X



I.NO.	SIZE	LENGTH	WIDTH	AREA	MI NO.	MATRL. SPECN.	QTY.	UNIT WT.	WT.
04	ISA 100x100x10	300			150130180000	IS:2062	128	4.47	572.16
03	ISA 100x100x10	500			150130180000	IS:2062	64	7.45	476.80
02	ISM 400	6900			150100260000	IS:2062	32	345.69	11062.08
01	NPB 600	6900			150090420000	IS:2062	16	844.56	13512.96
									25624.00

DEPT. ENGG.	ALL DIMENSIONS ARE IN MM	PROJECTION	SCALE	WEIGHT (Kg)	NAME	SIGNATURE	DATE
0170			1:50		N.Atchuth	N.V.Reddy	08.10.2021
TITILE				REF TO ASSY / OLD DWG			
Bharat Heavy Electricals Ltd UNIT: HEAVY PLATES & VESSELS PLANT VISAKHAPATNAM-530012				DRAWING NO : 1-34-410-U0001			
CAUTION: The information on this document is the property of Bharat Heavy Electricals Ltd. It is to be used directly or indirectly in any way detrimental to the interest of the company.				REV 00			

REV NO.	DATE	BRIEF RECORD OF REVISIONS	PPD.	CHD.	APPD.
00					

FORM NO. 0425/2

SIZE

Project	: 13.5 MW Co-Generation Power Plant, NALCO Damanjodi
Contractor's Name	: BHEL HP/P, Visakhapatnam (SO 7904)
Package Description	: BTG Package for steam and Power Plant for 5th stream Alumina Refinery expansion Project of M & R Complex at NALCO Damanjodi

IP No. & Rev. : IP-28312-M-07 (CHN) Rev. 0

General Note :-

- 1) Three sets of test certificates (2 sets hard & 1 set soft) duly verified and signed by the main Contractor shall be furnished.
- 2) IP number and revision status to be indicated by M.N.Dastur & Co. (P) Ltd.
- 3) Drawing approval authority shall be as per contract.
- 4) If quantity is in lot substantial quantity shall be offered for economy of inspection.
- 5) For Structural items average quantity shall be offered in 100 MT lot.
- 6) Attempt shall be exercised to furnish for all the items if the package in single lot.
- 7) Painting to be done after inspection or as approved Painting Specification. Spot Painting Certificate as per format FPA VIA shall be submitted. Unless otherwise specified, Painting Shall be as per Manufacturer Standard.
- 8) Vendor approved detail drawing shall be made available during inspection as required with Dasturco approved GMA drawing.
- 9) All measuring instruments used for our inspection and testing shall have valid calibration certificate from NABL laboratory or traceable to national/international standards.
- 10) Pumps, Fans, Blowers and Compressors Performance test shall be conducted for one per type/capacity and remaining quantities shall be Mechanical Run Tests.
- 11) All manual, pneumatic, electrical operated valves upto 100 NE size shall be checked based on review of documents and valve size 150 NB and above shall be witnessed.
- 12) For Pumps, Blowers & Agitators which are offered with their own electrical (Motors & Controls) same will be inspected / tested along with pumps and / relevant test certificates will be reviewed.
- 13) This IP is in compliance in place of COP 2511, COP 2511, COP 2512, COP 2513, COP 2514 & COP 2516 mentioned in BHEL/HPH/VPKashankantam ICP verified by M.N.DASTUR & COMPANY (P) LTD and sent via e-mail Dr. 22-01-2021

Abbreviation:-


M : Manufacturer C : Contractor D : M.N.Dastur & Company (P) Ltd. P : Perform W : Witness R : Document Review

Nkenneth
25.03.2021

अमिया कृष्ण मंडल/Amiya Kr Mandal
अपर महा प्रबन्धक (गुणता एवं बी ई)
Addl. General Manager (Quality & BE)
बीएचईएल, एचपीवीपी, विशाखपट्टणम-530 012
BHEL, HPVP, VISAKHAPATNAM-530 012

Signature of Client & Seal

Name: _____

 25.03.2021
Signature of Inspection Agency & Seal
Name: N. N. Dastur & Company (F) Ltd
S. Yuvaraj

INSPECTION PROCEDURE (IP) FOR MECHANICAL EQUIPMENT & STRUCTURES AT MANUFACTURERS' WORKS

Project: 18.5 MW Co-Generation Power Plant, NALCO Damanjodi
Contractor's Name: BHEL HPVP, Visakhapatnam (SO 7906)
Package Description: BTG Package for steam and Power Plant for 5th stream Alumina Refinery expansion
Project of M & R Complex at NALCO Damanjodi

Contract/P.O. No. / L.O.A. No.: NBC/MXP/SP/STRM5/STG/09 Dt. 19.11.2020
Contract Specification Reference: NALCO CGPP-3CA01-PWR-01
IP No. & Rev.: IP-2812-M-07 (CHN) Rev.0

List A - Test & Test Certificate Codes (Add additional Codes, if required)				List B - Documents (Add additional Codes, if required)			
Code		Tests & Test Certificates		Code		Documents	
1	Visual inspection	15	Spark test for Rubber Lining	B1	Approved GA drawing	B10	Painting Certificate
2	Dimensional Checks	16	Adhesion Test	B2	Information and other Reference drawings duly approved	B11	Conformity certificate
3	Fitter's Alignment	17	Performance Test (with Characteristic Curve)	B3	Fabrication drawings duly approved	B12	Match marking of site joints
4	Control Assembly Check	18	Mechanical Run Test (MRT)/No Load/Free Run Test	B4	Data Sheet	B13	IBR/Other Statutory Agency Certificate
5	Raw material-Physical test	19	Measurement of speed	B5	Bill of Materials	B15	Unpriced P.O. Copy
6	Raw material-Chemical test	20	Vibration, Noise & Temperature	B6	Manufacturer's Certificate	B16	List of Valve
7	Ultrasonic test	21	Rise Measurement	B7	Approved Billing Schedule		
8	Magnetic Particle Test	22	Pressure Test	B8	Welding Procedure Specification (WPS)		
9	Radiography Test	23	Leakage Test		Procedure Qualification Record (PQR)		
10	Dye Penetration Test	24	Load/Overload Test		Welding Operator Performance Qualification (WPO)		
11	Hardness Test	25	Static Balancing Test	B9	Calibrator Certificate of all measuring instruments and Gauges from NABL Lab or Traceable to National / International Standards		
12	Water & Dust Ingress Test	26	Dynamic Balancing Test				
13	Friction factor test	27	Operational & Functional Test				
14	Heat treatment/Stress Relieving	28					
		29					
		30					
		31					
		32					
		33					
		34					
		35					
		36					
		37					
		38					
		39					
		40					
		41					

General Note:-

- Three sets of test certificates (2 sets hard & 1 set soft) duly verified and signed by the main Contractor shall be furnished.
- IP number and revision status to be indicated by M.N. Dastur & Co. (P) Ltd.
- Drawing approval authority shall be as per contract.
- If quantity is in lot, substantial quantity shall be offered for economy of inspection.
- For Structural items average quantity shall be offered in 100 MT lot.
- Attempt shall be exercised to furnish IP for all the items if the package in single lot.
- Painting to be done after inspection as per approved Painting Specification. Stop Painting Certificate as per format FM-VIA shall be submitted. Unless otherwise specified, Painting shall be as per Manufacturer Standard.
- Vendor approved detail drawing shall be made available during inspection as required correlated with Dastur approved GA drawing.
- All measuring instruments used for our inspection and testing shall have valid calibration certificate from NABL laboratory or traceable to national/international standards.
- Pumps, Fans, Blowers and Compressors Performance test shall be conducted for one per type/model/capacity and remaining quantities shall be Mechanical Run Tested.
- All manual, pneumatic, electrical operated valves upto and 100 NB size shall be cleared based on review of documents and valve size 153 NB and above shall be witnessed.
- For Pumps, Blowers & Agitators which are offered with their own electric (Motor & Controls) same will be interpreted / tested along with pumps and relevant tests certificates will be reviewed.
- This IP is to be considered in place of CQP 2510, CQP 2511, CQP 2512, CQP 2513, CQP 2514 & CQP 2515 mentioned in BHEL/HPVP/Visakhapatnam ICP reviewed by M.N. DASTUR & COMPANY (P) LTD and sent via e-mail Dt. 22-01-2021.

Sl. No.	Contract/Billing Schedule/Item No.	Equipment / Item Description	Qty.	In-Process Inspection (Select from List A)			Final Inspection (Select from List A)			Acceptance Norm: (Indicate applicable Standards, Methods, Procedures & Documents)	Test Certificates & Documents to be submitted by Contractor (Select from List A&B)	Remarks/Sampling Plan, if any
				M	C	D	M	C	D			
4	97-090	Actuators for Dampers		1, 2 - P	---	---	1, 2 & 26 - F	1, 2 & 26 - W	---	B1 / B4 / B5 / B6	1, 2, 3, 6, 7, 10, 21, 27 & B10	1, 2 & 21 - Ref. Note-11
5	97-100	Control Valves & Trp Valves		1, 2, 5, 6, 7, 10 - P	---	---	1, 2 & 21 - F	1, 2 & 21 - W	1, 2 & 21 - W	B1 / B4 / B5 / B6	1, 2, 3, 6, 7, 10, 21, 27 & B10	1, 2 & 21 - Ref. Note-11
6	42-010	LFO Pump Set		1, 2, 5, 6, 7, 9, 10, 21, 25 - P	5, 6, 7, 9, 10, 21, 25 - R	25-R	1, 2, 17, 18, 19, 20, 21 & 29 - P	1, 2, 17, 18, 19, 20, 21 & 29 - W	---	B1 / B4 / B5 / B6	1, 2, 5, 6, 7, 9, 10, 17, 18, 19, 20, 21, 25, 27, 29 & B10	7, 9, 10 - NDT As applicable 17-Ref. Note 12 29 - applicable only if abnormal noise observed during Run Test 21- Shall be performed after strip test
7	42-020	HFO Pump Set		1, 2, 5, 6, 7, 9, 10, 21, 25 - P	5, 6, 7, 9, 10, 21, 25 - R	25-R	1, 2, 17, 18, 19, 20, 21 & 29 - P	1, 2, 17, 18, 19, 20, 21 & 29 - W	---	B1 / B4 / B5 / B6	1, 2, 5, 6, 7, 9, 10, 17, 18, 19, 20, 21, 25, 27, 29 & B10	7, 9, 10 - NDT As applicable 17-Ref. Note 12 29 - applicable only if abnormal noise observed during Run Test 21- Shall be performed after strip test
8	43-200	Scanner Air System		1, 2, 5, 6, 7, 9, 10, 21, 25 - P	5, 6, 7, 9, 10, 21, 25 - R	25-R	1, 2, 17, 18, 19, 20, 21 & 29 - P	1, 2, 17, 18, 19, 20, 21 & 29 - W	---	B1 / B4 / B5 / B6	1, 2, 5, 6, 7, 9, 10, 17, 18, 19, 20, 21, 25, 27, 29 & B10	7, 9, 10 - NDT As applicable 17-Ref. Note 12 29 - applicable only if abnormal noise observed during Run Test 21- Shall be performed after strip test
9	Ref Annexure-A	Non critical items as listed in Annexure-A		---	---	---	1, 2 - P	1, 2 - W	---	B1, B4, B5, B6, B7 (as applicable)	E11	Non critical items as listed in Annexure-A shall be cleared based on BHEL's Certificate of Conformity (COC)

Abbreviation:-

N : Manufacturer C : Contractor D : M.N. Dastur & Company (P) Ltd P : Perform W : Witness R : Document Review

25/03/2021

25/03/2021

वि. गोपी किशोर / P. GOPI KISHORE
प्रबंधक / Manager
गुणवत्ता आश्वासन / QA
बीएसईएन-एचपीवीपी / BHEL - HPVP
विशाखपट्टणम / VISAKHAPATNAM

अमिया कृष्ण मंडल/Amiya Kr Mandal
अपर महा प्रबन्धक (गुणता एवं बी ई)
Addl. General Manager (Quality & BE)
बीएसईएल, एचपीवीपी, विशाखपट्टणम-530 012
BHEL, HPVP, VISAKHAPATNAM-530 012

Name: Signature of Client & Seal

Signature of Inspection Agency & Seal
M.N. Dastur & Company (P) Ltd

S. Yuvaraj

**ANNEXURE-A TO MECHANICAL INSPECTION PROCEDURE (IP) NO.
IP-28812-M-07 (CHN) Rev.0**

Project : 18.5 MW Co-Generation Power Plant, NALCO Damanjodi
Contractor's Name : BHEL HPVP, Visakhapatnam (SO 7906)
Package Description : BTG Package for steam and Power Plant for 5th stream Alumina Refinery expansion Project of M & R Complex at NALCO Damanjodi
Contract/P.O. No. / L.O.A. No. : NBC/MMXP/SPP/STRM5/BTG/09 DT. 19.11.2020
I.P. No. : IP-28812-M-07 (CHN) Rev.0

SL. No.	PGMA	PGMA Item Description	Quantity	Remarks
List of Non Critical Mechanical items for ESP				
1	04-146	upper drum Sspn id 61-71	---	
2	04-997	Mandatory Spares	---	
3	07-401	Waterwall Suspension	---	
4	07-420	Downcomer Guides	---	
5	07-601	Pressure Seals	---	
6	07-989	Tools For Tube Expansion	---	
7	07-992	Imported Electrodes	---	
8	07-993	Cosumables & Erection Materials	---	
9	08-101	Furnace Upper Buckstay	---	
10	08-107	Furnace Lower Buckstay	---	
11	08-400	Furnace Guide	---	
12	08-900	Furnace Key Buckstay	---	
13	09-001	Seal Boxes For Furnace Opening	---	
14	09-002	Seal Boxes For Instrument Inserts	---	
15	09-003	Material For Instrument Inserts	---	
16	12-901	Sh Hngr. Suprts. Guides & Ties	---	
17	12-992	Imported Electrodes	---	
18	12-993	Consumables & Erection Materials	---	
19	18-001	Furnace Roof Skin Casing	---	
20	19-901	Eco. Supports & Suspensions	---	
21	19-903	Eco. Miscellaneous Components	---	
22	19-906	Eco Suprts For Lines & Links	---	
23	19-992	Imported Electrodes	---	
24	02-001	Long Retractable soot Blower T30 Mark	---	
25	02-004	Wall Box Non -Pressurised For Lrsb Mk-1	---	
26	20-201	Wall Deslagger Rw5e	---	
27	20-204	Wall Box Non Pressurised For Rw5e	---	
28	20-998	Special tools For Soot Blowers	---	
29	21-601	Sootblower Piping Supports	---	

[Signature]
25/03/2021

Signature of Contractor & Seal
Name: M/s. BHEL HPVP, Visakhapatnam

[Signature]
25/3/2021



Signature of Inspection Agency & Seal
Name: M.N. Dastur & Company (P) Ltd.

25.03.2021

S. Yuvaraj

पि. गोपी किशोर / P. GOPI KISHORE
प्रबंधक / Manager
गुणवत्ता आश्वासन / QA
बीएचईएल-एचपीवीपी / BHEL - HPVP
विशाखपट्टणम / VISAKHAPATNAM

अमिया कृष्ण मंडल/Amiya Kr Mandal
अपर महा प्रबन्धक (गुणवत्ता एवं बी ई)
Addl. General Manager (Quality & BE)
बीएचईएल, एचपीवीपी, विशाखपट्टणम-530 012
BHEL, HPVP, VISAKHAPATNAM-530 012

**ANNEXURE-A TO MECHANICAL INSPECTION PROCEDURE (IP) NO.
IP-28812-M-07 (CHN) Rev.0**

Project : 18.5 MW Co-Generation Power Plant, NALCO Damanjodi
Contractor's Name : BHEL HPVP, Visakhapatnam (SO 7906)
Package Description : BTG Package for steam and Power Plant for 5th stream Alumina Refinery expansion Project of M & R Complex at NALCO Damanjodi
Contract/P.O. No. / L.O.A. No. : NBC/MMXP/SPP/STRM5/BTG/09 DT. 19.11.2020
I.P. No. : IP-28812-M-07 (CHN) Rev.0

SL. No.	PGMA	PGMA Item Description	Quantity	Remarks
30	21-700	Bulked Bps Components For Sb Piping	---	
31	21-992	Imported Electrodes	---	
32	24-101	Boiler Trim Piping Supports	---	
33	24-120	Safety Valve Esc Pipe&Drain -NrH Blr	---	
34	24-125	Silencer Support-Safety Valves	---	
35	24-135	Sinc&Suprt-Starting Vent-NrH Blr	---	
36	24-185	Safety Valve /Erv Siencers(Bhel)	---	
37	24-346	Hangers and supports of main steam piping	---	
38	24-351	Hangers supports for Boiler filling Piping	---	
39	24-700	Bulked Bps Components For Trim Pipes	---	
40	24-955	Lapping Tools For Sv&Erv	---	
41	24-960	Lapping Tools For Conventional Valves	---	
42	24-991	Field Welding Schedule	---	
43	24-992	Imported Electrodes	---	
44	24-993	Consumable & Erection Materials	---	
45	24-994	Name Plates	---	
46	28-220	Doors	---	
47	30-103	Seal Plate Assy	---	
48	30-105	Furnace Bottom Enclosure Framing	---	
49	30-211	Furnace Rear Arch Enclosure Framing	---	
50	30-215	Main Boiler	---	
51	30-218	Furnace Roof	---	
52	30-228	Pent House	---	
53	31-010	Skin Casing Comps Welded To Pressure P	---	
54	31-104	Furnace Rear Arch Skin Casing	---	
55	31-108	Bank Tube Skin Casing	---	
56	32-010	Fixing Comp For Blr Pr Parts Insul	---	
57	32-110	Fixing Comp For Blr Mountings Insul	---	
58	32-120	Fixing Comp For Sb Pipes Insul	---	
59	32-310	Fixing Comp For Air Ducts Insul	---	
60	32-410	Fixing Comp For Ah And Gas Ducts Insul	---	
61	32-510	Fixing Comp For Id Ducts Insul	---	

[Signature]
 25/03/2021

Signature of Contractor & Seal
 Name: M/s. BHEL HPVP, Visakhapatnam

[Signature]
 25-03-2021



[Signature]
 25.03.2021

Signature of Inspection Agency & Seal
 Name: M.N. Dastur & Company (P) Ltd.

पि. गोपी किशोर / P. GOPI KISHORE
 प्रबंधक / Manager
 गुणवत्ता आश्वासन / QA
 बीएचईएन-एचपीवीपी / BHEL - HPVP
 विशाखपट्टणम / VISAKHAPATNAM

अमिया कृष्ण मंडल/Amiya Kr Mandal
 अपर महा प्रबन्धक (गुणता एवं बी ई)
 Addl. General Manager (Quality & BE)
 बीएचईएल, एचपीवीपी, विशाखपट्टणम-530 012
 BHEL, HPVP, VISAKHAPATNAM-530 012

S. Yuvaraj

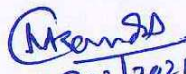
**ANNEXURE-A TO MECHANICAL INSPECTION PROCEDURE (IP) NO.
IP-28812-M-07 (CHN) Rev.0**

Project : 18.5 MW Co-Generation Power Plant, NALCO Damanjodi
Contractor's Name : BHEL HPVP, Visakhapatnam (SO 7906)
Package Description : BTG Package for steam and Power Plant for 5th stream Alumina Refinery expansion Project of M & R Complex at NALCO Damanjodi
Contract/P.O. No. / L.O.A. No. : NBC/MMXP/SPP/STRM5/BTG/09 DT. 19.11.2020
I.P. No. : IP-28812-M-07 (CHN) Rev.0

SL. No.	PGMA	PGMA Item Description	Quantity	Remarks
62	32-520	Fixing Comp For Fans And Ep Insul	---	
63	32-530	Fixing Comp For SCR	---	
64	33-021	Blr Pr Parts Mineral Wool	---	
65	33-121	Blr Mountings Mineral Wool	---	
66	33-126	Sb Pipes Mineral Wool	---	
67	33-201	Main Blr Formed Refractory Is8	---	
68	33-212	Main Blr Castable Refractory GrC	---	
69	33-321	Air Ducts Mineral Wool	---	
70	33-421	Air Heater And Gas Ducts Mineral Wool	---	
71	33-521	Id Ducts Mineral Wool	---	
72	33-526	Fans And Ep Mineral Wool	---	
73	33-531	SCR Mineral Wool	---	
74	33-970	Misc Eqpts Expanded Metal	---	
75	33-971	Misc Eqpts Woven Wire Cloth	---	
76	33-975	Misc Eqpts Sealing Compound	---	
77	34-010	Bunker Bay Foundaton Material	---	
78	34-110	Bunker Bay Front Columns	---	
79	34-120	Bunker Bay Rear Columns	---	
80	34-210	Bunker Bay Column Tie Beams	---	
81	34-310	Bunker Bay Equipment Support Beams	---	
82	34-410	Bunker Tripper Floor Support Beams	---	
83	34-420	Bunker Bay Mill Maintenance Floor Support Beams	---	
84	34-430	Bunker Bay Monorails	---	
85	34-510	Bunker Bay Vertical Bracing	---	
86	34-810	Floor Grills And Step Treads	---	
87	34-820	Stairs And Ladders	---	
88	34-850	Handrails	---	
89	34-390	Misc. Platforms And Traffic Items	---	
90	34-991	Erection Material	---	
91	35-010	Boiler Area Structural Foundaton Material	---	
92	35-140	Auxillary Column On Left Side	---	

 25/03/2021

Signature of Contractor & Seal
Name: M/s. BHEL HPVP, Visakhapatnam

 25/03/2021



Signature of Inspection Agency & Seal
Name: M.N. Dastur & Company (P) Ltd.

25.03.2021

वि. गोपी किशोर / P. GOPI KISHORE
प्रबंधक / Manager
गुणवत्ता आश्वासन / QA
बीएचईएन-एचपीवीपी / BHEL - HPVP
विशाखपट्टणम / VISAKHAPATNAM

अमिया कृष्ण मंडल/Amiya Kr Mandal
अपर महा प्रबन्धक (गुणता एवं बी ई)
Addl. General Manager (Quality & BE)
बीएचईएल, एचपीवीपी, विशाखपट्टणम-530 012
BHEL, HPVP, VISAKHAPATNAM-530 012

S. Yuvaraj

**ANNEXURE-A TO MECHANICAL INSPECTION PROCEDURE (IP) NO.
IP-28812-M-07 (CHN) Rev.0**

Project : 18.5 MW Co-Generation Power Plant, NALCO Damanjodi
Contractor's Name : BHEL HPVP, Visakhapatnam (SO 7906)
Package Description : BTG Package for steam and Power Plant for 5th stream Alumina Refinery expansion Project of M & R Complex at NALCO Damanjodi
Contract/P.O. No. / L.O.A. No. : NBC/MMXP/SPP/STRM5/BTG/09 DT. 19.11.2020
I.P. No. : IP-28812-M-07 (CHN) Rev.0

SL. No.	PGMA	PGMA Item Description	Quantity	Remarks
93	35-150	Auxillary Column On Right Side	---	
94	35-160	Misc. Main Columns	---	
95	35-210	Boiler Ceiling Girders-Fabricated	---	
96	35-220	Boiler Ceiling Girders-Rolled	---	
97	35-230	Boiler Ceiling Plan Bracings & Secondary Support Beams	---	
98	35-310	Main Brace Level 1	---	
99	35-320	Main Brace Level 2	---	
100	35-330	Main Brace Level 3	---	
101	35-340	Main Brace Level 4	---	
102	35-410	Scr Support Frames	---	
103	35-420	Raph Support Frames	---	
104	35-430	Landing Platforms Approach To Drum Level	---	
105	35-510	Front Grid Beams And Bracings	---	
106	35-520	Rear Grid Beams And Bracings	---	
107	35-530	Left And Right Grid Beams And Bracings	---	
108	35-540	Misc. Grid Beams And Bracings	---	
109	35-610	Boiler Roof Structure	---	
110	35-611	Boiler Clad Sheeting	---	
111	35-612	Rain Water Gutters And Down Take Pipes	---	
112	35-700	Fasteners	---	
113	35-810	Temporary Structure For Drum Erection	---	
114	35-811	Gratings For Landing Platforms To Approach Drum Platform	---	
115	35-820	Stairs From Ground To Drum Floor Level	---	
116	35-850	Handrails For Landings And Stairs	---	
117	35-991	Consumables And Erection Material	---	
118	36-210	Boiler Hopper Level Platform Supports	---	
119	36-220	Boiler Burner Level Platform Supports	---	
120	36-230	Raph Support Level Platform Supports	---	
121	36-240	Scr Support Level Platform Supports	---	
122	36-250	Boiler Drum Approach Platform Supports	---	
123	36-260	Scr Levels Approach Platform Supports	---	
124	36-390	Misc. Platform Supports	---	

[Signature]
25/03/2021

Signature of Contractor & Seal
Name: M/s. BHEL HPVP, Visakhapatnam

[Signature]
25.03.2021



[Signature]
25.03.2021

Signature of Inspection Agency & Seal
Name: M.N. Dastur & Company (P) Ltd.

पि. गोपी किशोर / P. GOPI KISHORE
प्रबंधक / Manager
गुणवत्ता आश्वासन / QA
बीएचईएन-एचपीवीपी / BHEL - HPVP
विशाखपट्टणम / VISAKHAPATNAM

अमिया कृष्ण मंडल/Amiya Kr Mandal
अपर महा प्रबन्धक (गुणता एवं बी ई)
Addl. General Manager (Quality & BE)
बीएचईएल, एचपीवीपी, विशाखपट्टणम-530 012
BHEL, HPVP, VISAKHAPATNAM-530 012

S. Yuvaraj

**ANNEXURE-A TO MECHANICAL INSPECTION PROCEDURE (IP) NO.
IP-28812-M-07 (CHN) Rev.0**

Project : 18.5 MW Co-Generation Power Plant, NALCO Damanjodi
Contractor's Name : BHEL HPVP, Visakhapatnam (SO 7906)
Package Description : BTG Package for steam and Power Plant for 5th stream Alumina Refinery expansion Project of M & R Complex at NALCO Damanjodi
Contract/P.O. No. / L.O.A. No. : NBC/MMXP/SPP/STRM5/BTG/09 DT. 19.11.2020
I. P. No. : IP-28812-M-07 (CHN) Rev.0

SL. No.	PGMA	PGMA Item Description	Quantity	Remarks
125	36-810	Floor Grills And Step Treads	---	
126	36-820	Platform Interconnecting Stairs & Ladders	---	
127	36-850	Handrails	---	
128	37-010	Blr Outer Casing Components	---	
129	37-810	Blr Outer Casing	---	
130	37-510	SCR Casing	---	
131	38-010	Foundation Material For Elevator Structure	---	
132	38-110	Elevator Columns	---	
133	38-210	Elevator Grids Beams And Bracings	---	
134	38-310	Elevator Car Guides And Openings	---	
135	38-410	Interconnection Platforms	---	
136	38-510	Elevator Machine Room & Motor Handling Mono Beam	---	
137	38-610	Clad Sheet Supports	---	
138	38-611	Elevator Clad Sheet	---	
139	39-010	Foundation Material For Fan Handling Structure	---	
140	39-110	Columns And Grid Members Between Boiler And Esp	---	
141	39-111	Columns And Grid Members Near Id Fan	---	
142	39-112	Columns And Grid Members Between Id Fan And Chimney	---	
143	39-210	Id Fan Suction Stack Support Beams And Guides	---	
144	39-301	Fan Approach Platforms	---	
145	39-302	Motor Hood Covering	---	
146	39-303	Monorail Beams For Fan Handling	---	
147	39-700	Fasteners	---	
148	39-810	Gratings	---	
149	39-820	Ladders	---	
150	39-850	Handrails	---	
151	39-991	Misc. Structures And Erection Material	---	
152	48-012	Rect Duct Bet F.D Fan And Airheater	---	
153	48-014	Expn Piecesbet F.D Fan And Airheater	---	
154	48-015	Supports etc bet F.D Fan And Airheater	---	

[Signature]
25/03/2021

Signature of Contractor & Seal
Name: M/s. BHEL HPVP, Visakhapatnam

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25/03/2021



[Signature]
25.03.2021

Signature of Inspection Agency & Seal
Name: M.N. Dastur & Company (P) Ltd.

पि. गोपी किशोर / P. GOPI KISHORE
प्रबंधक / Manager
गुणवत्ता आश्वासन / QA
बीएचईएन-एचपीवीपी / BHEL - HPVP
विशाखपट्टणम / VISAKHAPATNAM

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I.P. No. : IP-28812-M-07 (CHN) Rev.0

SL. No.	PGMA	PGMA Item Description	Quantity	Remarks
155	48-019	Foundation Materials	---	
156	48-112	Rect Ducts Pri Fan To Airheater Prisd	---	
157	48-114	Expn Piecespri Fan To Airheater Prisd	---	
158	48-115	Supports etc pri Fan To Airheater Prisd	---	
159	48-141	Seal Air Hag And Id Fan Outgate	---	
160	48-142	Rect Duct Coldairbus(Temp Air To Mill)	---	
161	48-144	Expn Pieces cold air bus(Temp Air To Mill)	---	
162	48-145	Supports etc cold air bus(Temp Air To Mill)	---	
163	48-200	Instrument Tappings On Ducting	---	
164	48-202	Rect Ducts air heater To Windboxduct	---	
165	48-204	Expn Pieces air heater To Windboxduct	---	
166	48-205	Supports etc air heater To Windboxduct	---	
167	48-207	Flowmeters For Secondary Air Flow	---	
168	48-212	Wind Box Connecting Ducts - Rectangular	---	
169	48-214	Expn Pieceswindbox Connecting Duct	---	
170	48-222	Rect Duct-Air heater Pri side to hot air B	---	
171	48-224	Expn Pieces air heater Pri side to hot air B	---	
172	48-225	Supports For Hot P.A (Ah To Hot Bus)	---	
173	48-232	Rect Ducts Hot Air Bus duct(Hotairtomill)	---	
174	48-234	Expn Pieces Hot Air Bus duct(Hotairtomill)	---	
175	48-382	Rect Ducts Economiser To Airheater2nop	---	
176	48-384	Expn Pieces Economiser To Airheater2nop	---	
177	48-385	Supports etc economiser To Airheater2nop	---	
178	48-432	Rect Duct Airheater Boiler Outlet-GAS	---	
179	48-434	Expn Pieces Airheater Boiler Outlet-GAS	---	
180	48-435	Supportsetc Airheater Boiler Outlet-GAS	---	
181	48-462	Rect Duct Boiler Outlet To Elec Precp	---	
182	48-464	Expn PIECES Boiler Outlet To Elec Precp	---	
183	48-465	Bof To Ep DUCTING Supports	---	
184	48-482	Rect Ducts-ELEC Prptr/M.S To Inddraftf	---	
185	48-484	Expn Pieces-ELEC Prptr/M.S To Inddraftf	---	
186	48-485	Supports etc ELEC Prptr/M.S To Inddraftf	---	
187	48-492	Rect Duct Ind Draft fan To Chinmey	---	

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25/03/2021

Signature of Contractor & Seal
Name: M/s. BHEL HPVP, Visakhapatnam

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25/03/2021



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Signature of Inspection Agency & Seal
Name: M.N. Dastur & Company (P) Ltd.

25.03.2021

पि. गोपी किशोर / P. GOPI KISHORE
प्रबंधक / Manager
गुणवत्ता आश्वासन / QA
बीएचईएन-एचपीवीपी / BHEL - HPVP
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अमिया कृष्ण मंडल/Amiya Kr Mandal
अपर महा प्रबन्धक (गुणता एवं बी ई)
Addl. General Manager (Quality & BE)
बीएचईएल, एचपीवीपी, विशाखपट्टणम-530 012
BHEL, HPVP, VISAKHAPATNAM-530 012

S. Yuvaraj

**ANNEXURE-A TO MECHANICAL INSPECTION PROCEDURE (IP) NO.
IP-28812-M-07 (CHN) Rev.0**

Project : 18.5 MW Co-Generation Power Plant, NALCO Damanjodi
Contractor's Name : BHEL HPVP, Visakhapatnam (SO 7906)
Package Description : BTG Package for steam and Power Plant for 5th stream Alumina Refinery expansion Project of M & R Complex at NALCO Damanjodi
Contract/P.O. No. / L.O.A. No. : NBC/MMXP/SPP/STRM5/BTG/09 DT. 19.11.2020
I.P. No. : IP-28812-M-07 (CHN) Rev.0

SL. No.	PGMA	PGMA Item Description	Quantity	Remarks
188	48-494	Expn Pieces Ind Draft fan To Chinmey	---	
189	48-495	I.D. System Duct Supports	---	
190	48-662	Rect DUCT hot Air bus To Mills	---	
191	48-665	Supports For hot Pa To Mills	---	
192	48-667	Venturi-Primary Air Flow	---	
193	48-535	SCR Ducting And Supports	---	
194	48-532	Eco To SCR Duct	---	
195	48-700	Bulked Bps Components	---	
196	48-993	Erection Materials	---	
197	48-392	Hot Gas Duct -BB Outlet to ECO inlet	---	
198	48-997	Mandatory Spares	---	
199	66-100	Bunker Hoppers	---	
200	66-200	Bunker Portion Above Hopper	---	
201	66-300	Bunker Hopper Inner Lining	---	
202	95-088	Flame scanners	---	
203	97-084	Stack Analysers	---	
204	97-088	Electronic Water Level Indicator	---	
205	97-282	Flow Nozzles, Flow Orifice	---	
206	97-298	Temp Elements (Thermocouples/RTDs)	---	
207	97-283	Mass Flow meters	---	
208	97-590	Erection Hardware	---	
209	97-591	Miscellaneous Instruments	---	
210	97-577	ERV control Equipment	---	
211	97-592	Tubing/piping/Fittings	---	

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25/03/2021

Signature of Contractor & Seal
Name: M/s. BHEL HPVP, Visakhapatnam

[Signature]
25.03.2021



[Signature]
25.03.2021

Signature of Inspection Agency & Seal
Name: M.N. Dastur & Company (P) Ltd.

पि. गोपी किशोर / P. GOPI KISHORE
प्रबंधक / Manager
गुणवत्ता आश्वासन / QA
बीएचईएन-एचपीवीपी / BHEL - HPVP
विशाखपट्टणम / VISAKHAPATNAM

अमिया कृष्ण मंडल / Amiya Kr Mandal
अपर महा प्रबन्धक (गुणता एवं बी ई)
Addl. General Manager (Quality & BE)
बीएचईएल, एचपीवीपी, विशाखपट्टणम-530 012
BHEL, HPVP, VISAKHAPATNAM-530 012

S. Yuvaraj

Project	: 18.5 MW Co-Generation Power Plant, NALCO Damanjodi
Contractor's Name	: BHEL HPVP, Visakhapatnam (SO 7906)
Package Description	: BTG Package for steam and Power Plant for 5th stream Alumina Refinery expansion Project of M & R Complex at NALCO Damanjodi
Contract/P.O. No. / L.O.A. No.	: NBC/MMXP/SP/STRM5/BTG/09 DT. 19.11.2020
I.P. No.	: IP-28812 M-07 (CHN) Rev 0

AJ 25/03/2021

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25.03.2021



25.03.2021

अमिया कृष्ण मंडल/Amiya Kr Mandal
अपर महा प्रबन्धक (गुणता एवं बी ई)
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BHEL, HPVP, VISAKHAPATNAM-530 012

Page 8 of 8

BHARAT HEAVY ELECTRICALS LIMITED
HPVP UNIT - VISAKHAPATNAM - 530012



M/S. NALCO DAMANJODI (Unit-6) 18.5 MW CGPP-1x300 TPH COAL FIRED BOILER
HPVP S.O. No. 7906
PAINTING SCHEDULE

Prepared by	Y. PRASANNA KUMAR Sr Manager/Engg.	Y. PRASANNA KUMAR Sr Manager/Engg.	Y. PRASANNA KUMAR Sr Manager/Engg.
Reviewed by	L RAJASEKHAR DGM /HT-Engg.	S.K BISWAS AGM /HOD/Engg	S.K BISWAS AGM /HOD/Engg
Approved by	S.K BISWAS AGM /HOD/Engg.	S.K BISWAS AGM /HOD/Engg	S.K BISWAS AGM /HOD/Engg
Rev No	00	01	02

**REVIEWED FOR
REFERENCE**

SIGNATURE: *K. R...*
 LETTER REF.: 28812-MD-PWR03-270A
 DATE: 16.09.2021
M. N. DASTUR & COMPANY (P) LTD
 KOLKATA

RECORD OF REVISIONS

Rev. No	Date	Details of revision	Remarks
00	24.04.2021	New. Painting specification shall be read in conjunction with Annexure-III of Standard painting scheme document no: SIP: H: PP :22, dated:04.08.2018.	
01	07.08.2021	Shade of the paint for structural items (For SI No's 3&4) have been added based on the M/S NALCO suggestion.	
02	21.08.2021	PG-MA's of 66-100,66-200&66-300 have been added in the SI No:3 for coal Bunker	

Nalco - Damanjodi – Painting schemes

Sl.No.	PGMA / Description	Surface Preparation & Surface Profile	Primer coat		Intermediate coat		Finish coat			Total DFT μm (min)
			Paint	No. of coats	Paint	No. of coats	Paint	No. of coats	Shade	
1 1a	Drum (Except Internals), Drum suspension 04-116,04-210 ,04-146	SSPC – SP3 Power tool cleaning	Red oxide Zinc Phosphate Primer to IS 12744 DFT=30 μm per coat	2	--	--	--	--	--	60
2 5	Drum internals 04-xxx	SSPC-SP1/ or SSPC – SP3 Solvent / Power Tool Cleaning	Rust Preventive Fluid to PR: CHEM: 09 – 04 DFT=25 μm per coat	1	--	--	--	--	--	25

Sl.No.	PGMA / Description	Surface Prepn &- Surface Profile		Primer coat		Intermediate coat		Finish coat			Total DFT µm (min)
				Paint	No. of coats	Paint	No. of coats	Paint	No. of coats	Shade	
3 1a	Buck stays, Boiler structures Galleries Stair-ways Walkways ID system structures, all the areas of Ducting except Hot air ducts &dampers, Piping and other components in Fuel firing area 08-101,08-107,08-400,08-900,19-901,21- 600,21-601,21-700,24-346, 35-410,35-420,35-430,35-510, 35-520,35- 610,35-611,35-612,35-700,35-810,35- 820,35-991,36-210, 36-220,36-230,36- 240,36-250,36-260,,36-390, 36-820,37- 010,37-810, 37-510,38-010,38-110,38- 210,38-310,38-410,38-510,38-610, 38- 611, 38-993,39-010,39-110, 39-111,39- 112,39-210,39-301,39-302,39-303, 39- 700,41-500,41-988,42-010,42-020,42-988, 43-004,43-005,43-104, 43-105,43-200,47- 141,47-143,47-149,48-012, 48-482,48- 484,48-485,48-492,48-494,48-495, 48- 535,48-532,48-700,48-993,48-392,48-997, 65-200,65-710,65-736,65-997,66-100,66- 200,66-300,67-200,67-204,67-272,67-276, 67-283,67-710,67-801,67-802,67-803,67- 997	SSPC-SP3/ Power Tool Cleaning		PVC copolymer based (or) synthetic enameling alkyd resin based paint with 30 DFT(At Shop)	2			PVC copolymer based (or) synthetic enameling alkyd resin based paint with 30 DFT(At Site)	2**	Smoke grey shade no. 692 of IS 5	120

Sl.No.	PGMA / Description	Surface Prepn &- Surface Profile	Primer coat		Intermediate coat		Finish coat			Total DFT µm (min)
			Paint	No. of coats	Paint	No. of coats	Paint	No. of coats	Shade	
4 30	Structures 34-010,34-110,34-120,34-210,34-310,34-410,34-420,34-430,34-510,35-110,35-120,35-130,35-140,35-150,35-160,35-210,35-220,35-230,35-310,35-320,35-330,35-340,35-530 & 35-540 SEE NOTES BELOW	SSPC – SP3 Power tool cleaning	Red oxide Zinc Phosphate Primer to IS 12744 DFT=30µm per coat	2			High build epoxy polyamide anamel paint to a DFT of 40µm / coat(At Site)	2**	(shade of the paint is Light Grey for 1 st coat) (shade of the paint is Smoke grey shade no. 692 of IS 5 for 2 nd coat)	100
5 2	Loose tubes, SH & Eco.coils, 11-xxx 19-xxx	SSPC – SP3 Power tool cleaning	Red oxide Zinc Phosphate Primer to IS 12744 DFT=30µm per coat	2	- -	--	--	--	--	60

6 3	WW, SH ,Eco Headers, SH & Eco lines & links Hot air ducts/dampers 05-137,05-147,05-155,05-175,06-400,06-611,06-631,06-637,06-647,06-651,06-655,06-997,07-101,07-200,07-201,07-211, 07-212,07-222,07-226,07-420, 07-401,07-601,07-993,07-997,10-174,10-178, 10-274,10-278, 12-803,12-850, 12-852,12-900,12-901, 12-993,12-997,18-001, 19-701,19-702,19-850,19-851,19-901,19-903,19-906,19-997,19-993,24-100,24-101,24-120,24-125,24-135,24-140,24-145,24-150,24-155,24-175,24-180,24-185,24-350,24-351,24-993,30-103,30-105,30-211,3-215,30-218,30-228,31-010,31-104,31-108,43-004,43-005,43-104,43-105,43-200,43-710	SSPC-SP3/ Power Tool Cleaning	Alkyd Base Red Oxide or Zinc phosphate pigments as Primer to IS 12744 DFT= 40 µm per coat	2	--	--	--	--	--	80
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**** : To be applied at site**

NOTE: ONLY SOME DUS OF THESE COMPONENTS UPTO 1 ST MBL SHALL BE APPLIED WITH THIS SPECIAL PAINT SYSTEM . FOR THE REST OF THE DUS, PAINT SYSTEM SPECIFIED IN SI.No. 3 SHALL BE APPLIED.

Sl.No.	PGMA / Description	Surface Prepn &- Surface Profile	Primer coat		Intermediat e coat		Finish coat			Total DFT µm (min)
			Paint	No. of coats	Paint	No. of coats	Paint	No. of coats	Shade	
7 3	32-010,32-110,32-120,32-310, 32-410,32-510,32-520,32-530,33- 975,35-993, 36-993,39-993,42-001,42-002,42- 005,42-010, 42-020,42-030,42-046,42-065,42- 070,42-120,42-128,42-150,42-152,42- 154,42-157,42-158,42-200,42-300,42- 358,42-700,42-710,42-858,42-988,42- 997,45-200,45-802, 45-805,45-858,45- 997,47-200,47-141,47-143,47-149,47- 710,47-858, 48-012,48-014,48-015,48-019,48- 112,48-114,48-115,48-141,48-142,48- 144,48-145,48-200,48-202,48-204,48- 205, 48-207,48-212,48-214, 48- 222,48-224,48-232,48-234,48-382,48- 384,48-385,48-432,48-434,48-435,48- 462,48-464,48-465, 48-662,48-664, 48-667,48-862,48-864,48-867,48-993, 95-088, 97-084,97-088,97-282,97- 298,97-283,97-590,97-090,97-100,97- 591,97-577,97-592 04-988,20-988,21-987,21-988, 24-987,24-988,24-989,41-988,42-988, 95-988	SSPC-SP3/ Power Tool Cleaning	Red Oxide Zinc phosphate Primer (Alkyd Base) to IS 12744 DFT= 30 µm per coat	2	--	--	Red Oxide Zinc phosphate Primer (Alkyd Base) to IS 12744 DFT= 30 µm per coat	2	--	105
8. 9	09-001,09-002,09-003,20-511,21-800, 21-825,21-850,24-420,24-425,24-435, 24-460,24-465,24-480,24-485,42-300, 42-358,97-195	SSPC-SP3/ Power Tool Cleaning	Heat resistant Aluminium paint to IS 13183 Gr. II	2	--	--	--	--	--	40

9 1a	Floor Grills, Hand Rails etc 34-810,34-850,35-811,35-820,35-850,36-810, 36-850,38-810,38-850,39-810,39-850, 39-850	SSPC-SP3/ Power Tool Cleaning	Red Oxide Zn PO4 Primer to IS 12744 DFT= 30 µm per coat	1	--	--	Synthetic Enamel to IS 2932	2**	Black	70
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PAINTING SCHEME FOR VALVES

Sl.No.	PGMA / Description	Surface Prepa- ration & Surface Profile	Primer coat		Intermediate coat		Finish coat			Total DFT µm (min)
			Paint	No. of coats	Paint	No. of coats	Paint	No. of coats	Shade	
10	Cast carbon steel valves Cast alloy steel valves All API valves, QCNRV, SV & SRV Silencers	SSPC-SP3/ Power Tool Cleaning	Heat resistant Alumimum paint to IS 13183 Gr. I	2	--	--	Heat resistant Alumimum paint to IS 13183 Gr. I	2	Aluminmum	80
	Forged valves	Phosphating	Coating weight 1500 mg per sq.ft.	--	--	--	--	--	--	--
	Soot Blower components 20-001,20-004,20-201,20-204,20-998	SSPC-SP6/ Comml. Blast Cleaning 35-50µm	Red oxide ZnPO4 Primer paint to IS 12744 DFT = 30 µm/coat	1	--	--	Syn. Enamel paint to IS 2932 DFT= 20µm per coat	2	Verdigris Green Shade No. 280 of IS5	70
	HP / LP system	SSPC-SP6/ Comml. Blast Cleaning 35-50µm	Heat Resistant Aluminium Paint to IS 13183 Gr.I	2	--	--	--	--	--	40

11	For CLH & VLH PGs 07,12,19,21,24,47,48 &80	Abrasive blast cleaning to Sa 2 ½ 35 50 microns	Alkyd Base Red Oxide or Zinc phosphate pigments as Primer to IS 12744 DFT= 40 µm per coat	2	--	--	-	-	Phirozi Blue Shade No. 176 of IS5	80
----	---	--	---	---	----	----	---	---	--	----

Painting Scheme – Details for procurement & application purposes

SL.No.	Generic nature of paint	Theoretical Covering Capacity Sq.m per Litre.	No. of pack	Volume solids, % (min)**	DFT in microns (min) per coat	Shade	Shade No. to IS5	Mode of appln.	Over coating interval, Hrs.
1	Inorganic zinc silicate coating (F9)	8	2	57	65	Phiroji Blue/ Required shade	176	Spray	12
2	Heat resistant Silicone Aluminium paint (F12)	15	1	-	18	--	--	Brush / Spray	24
3	Red oxide zinc phosphate primer paint as per IS 12744	10	1	As per IS 12744	30	Red Oxide	--	Brush / Spray	12
5	Epoxy zinc phosphate primer (P6)	8	1	49	15-20	Reqd. shade	Corrpd g- Shade no.	Brush / Spray	12
6	Temporary Rust preventive fluid to PR: CHE: 09 – 04	10	1	--	--	Amber	--	--	12
7	Epoxy high build coating (Polyamide cured epoxy resin medium suitably pigmented) F6B	10	2	57	30	Phiroji Blue	176	Spray	24
9	Acrylic Polyurethane finish paint (F2)	8	1	40	30	Phiroji Blue	176	Brush / Spray	12

10	Epoxy high build coating (Polyamide cured epoxy resin medium suitably pigmented) F6B	10	2	57		Light Orange	557	Spray/ Brush	12
11	Acrylic Polyurethane finish paint (F2)					Light Orange	557	Spray	24

Brush painting is accepted, if recommended by the Paint suppliers. The covering capacity of paints specified is only approximate. The paints and Rust Preventive fluid shall be procured from Customer's specific approved suppliers. ** Values are indicative.

NOTES:

1. Rust Preventive Coating should be given on HSFG Bolt threads.
2. Machined surfaces are to be applied with a coating of Temporary Rust Preventive oil.
3. All threaded and other surfaces of foundation bolts and its materials, insulation pins, Anchor channels, Sleeves shall be coated with Temporary Rust Preventive Fluid and during execution of civil works; the dried film of coating shall be removed using organic solvents.
4. All shade numbers are as per IS 5. Unless otherwise specified Colour / Shade of the finish coat shall be Smoke gray Shade No. 692 of IS 5.
5. PGMA's under Sub-Vendor items are not indicated. Please refer respective Engg. Document.
6. These Painting Schemes are valid for only Sale order No: 7906
07. No painting is required for Stainless Steel components.
08. Wherever inside surfaces of components under PGMA 48 – XXX, need protection till erection, two coats of Red-oxide zinc chrome primer paint to IS 12744 to a DFT of 60 microns shall be applied.
09. In components, wherever plates / sheets of thickness less than or equal to 5 mm and rods are used, power tool / hand tool cleaning to SSPC - SP3 / SP2 shall be followed and the painting shall be done as described in Scheme No: 05.
10. All PGMA's are deemed to have been included in relevant schemes. Any missing PGMA will be added to the relevant scheme, as and when required.