



INVITATION TO TENDER

Ref.: OS/22-23/7938/FH/14/013

Date: 15.11.2022

Sub: Fabrication of Feed Heater-1 against S.O. 7938 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, Piping / Coils during the last 7 years ending 31st Oct. 2022.
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 Aadhaar Memorandum/ Udyam Registration (if registered with MSME) 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:

Complete Fabrication of **Feed Heater -1 (approx. weight of 118 MT)** as per the drawings, Specifications & standards, Painting Schedule, QAP, WPS etc., which includes the following activities but not limited to the same:

- 3.1)** Fabrication of various equipments / items of **Feed Heater -1 (approx. weight of 118 MT)** which consists of Main Heater Shell Assembly, Economiser Shell Assembly including End Tube Sheets & Header Boxes, Radiant Coils, Economiser Coils, Smoke Stack, Hot Flue Gas Ducts, Heater Supporting Structure, Platforms & Ladders, Hand Rails & Posts, LP Gas Knock Out Drum etc. Heater is to be fabricated in modules as per Modularization philosophy.
- 3.2)** Fabrication of Stack from Plate fabricated pipe which includes Rolling, Assembly & Fit Up, Rerolling, Welding of L-seams, C-seams, RT etc.
- 3.3)** Fabrication and installation of Coils for Main Heater Assembly, Economiser and Assembly & Welding of Cross Overs including Radiography and fixing of Intermediate Tube sheets as per drawings & specifications.
- 3.4)** Fabrication of Flanges from plates, Foundation bolts and Pipe Clamps, S.S. Retainer Rings/Plates for Refractory / Insulation, S.S. Deflector Plates, etc., wherever required as per drawings & specifications.
- 3.5)** Fabrication, Assembly and Welding of Sleeves, Nozzles, Thermocouple Tappings and other Instrument Tappings etc., as per drawings and specifications.
- 3.6)** Fabrication & assembly of Doors, Peep Hole Assembly etc. as per drawings and specifications.
- 3.7)** Complete Fabrication of LP Gas KO drum as per drawings, specifications QAP, NDE procedures, WPS, Painting schedule etc.
- 3.8)** Fabrication of Ducts including instrument nozzles of specifications as per relevant drawings & specifications.

- 3.9) Fabrication of Heater & Stack supporting structure, Stair Tower with Landings, Platforms, Staircase, Ladders, Handrails etc., as per relevant drawings & specifications.
- 3.10) Surface preparation by Blast Cleaning to SA 2 1/2 and Application of total no. of coats of Paints as per Painting Schedule, Specifications and Standards excluding Final Finish coat.
Supply of all applicable Paints as per Painting Schedule from approved manufacturers is in vendor's scope. The Paint Manufacturer's certificates for the supply of paints shall be submitted to BHEL-HPVP before application.
- 3.11) **Hot Dip Galvanizing of Handrails** to 80 to 85 microns (approx. weight of 4 MT) as per latest revision of ISO 14713-2 / ISO 1461.
- 3.12) Collection of Raw materials & BOCs from HPVP stores and shifting of the same to site including unloading, handing over of finished structural items and loose items like fasteners, gaskets etc., to logistics dept. inside the plant and finished items / equipments at ADM site including loading onto the trailers at ADM site
- 3.13) **Section bending of structural items wherever required.**
- 3.14) Assistance for Refractory / Insulation Work like handling / shifting of sections / ducts to specified locations, rotation to facilitate insulation lining on the request of Insulation Contractor including deployment of required crane, tools & tackles.
- 3.15) Stiffening and Lifting arrangement for all fabricated items as per drawings & specifications.
- 3.16) NDT like DPT, MPT, Radiography, UT, PWHT, Hydro test of coils etc., shall be carried out as per approved drawings, QAP, Specifications and standards. NDT agency deployed by Vendor has to be approved by BHEL-HPVP before deployment.
- 3.17) Rectification of Raw materials such as straightening etc., if any and trial assembly after fabrication wherever required as per Drawings / QAP and rectification of defects, if any attributable to vendors, found after handing over to Logistics dept.
- 3.18) 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.
- 3.19) Free issue materials should be collected within 3 days from the date of intimation by Outsourcing without failure.
- 3.20) In case of requirement of off-cut materials, the vendor shall have to arrange for Gas Cutting & manpower at BHEL Stores.
- 3.21) Submission of economic cutting plans for all plate materials, Pipes, Tubes 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.
- 3.22) No extra rates are applicable for the additional joints to be made in Plates / Rolled sections / Pipes.
- 3.23) 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.
- 3.24) All indirect materials, consumables like electrodes, filler wires, gases, grinding wheels etc., required for fabrication are in the scope of the Vendor. The electrodes / filler wire shall be of BHEL approved makes only and the vendor shall submit the Batch Test Certificates to BHEL for verification before using on the job.
- 3.25) 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, 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.
- 3.26) 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.

- 3.27) Hydra crane of suitable capacity, Chains / Slings required for shifting, fabrication, loading & unloading etc., is in the scope of vendor. BHEL-HPVP will provide 75 MT crane where Hydra crane will not serve the purpose. One helper is to be deployed by vendor on daily basis for upkeep maintenance of 75 MT crane. **Non-deployment of Helper will attract deduction of Helper charges in RA Bills.**
- 3.28) Vendors should deploy Experienced & Qualified QC personnel for carrying out the inspection activities in coordination with BHEL QC inspector / TPIA. **Non-deployment will attract penalty at the rate decided by BHEL and same will be deducted in RA Bills.**
- 3.29) Vendors should deploy Qualified NDT personnel (Level III / Level II) at site for carrying out the NDT inspection activities in coordination with BHEL QC –NDT / TPIA. **Non-deployment will attract penalty at the rate decided by BHEL and same will be deducted in RA Bills.**
- 3.30) Vendors shall engage sufficient man power and resources for fabrication to meet HPVP delivery schedules and augmentation of manpower has to be done by Vendor as and when needed as per instructions of BHEL-HPVP to meet intermediate time lines. If the same is not done by vendor within the dates mutually discussed and agreed, BHEL will exercise the right to engage manpower at the risk and cost of the vendor.
- 3.31) 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 including all consumables. However, Test Coupons shall be provided by BHEL as free issue.
- 3.32) 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.** All the necessary tests like checking of Surface preparation with Profile Gauge, Tape adhesion, Galvanizing DFT for applicable items, Elcho Meter for measuring DFT etc., required during the painting are to be carried out by the Vendor as per approved Painting procedure, QAP, Specifications and standards.
- 3.33) All the Scaffolding materials like Pipes, Clamps, Jallies etc., for temporary platform works required during the complete course of the fabrication are to be arranged by the Vendor.
- 3.34) All the Temporary materials & Bed materials required for fabrication are to be arranged by the vendor at their cost.
- 3.35) Temporary shed for Painting: Temporary shed for Grit Blasting and painting is to be constructed by the Vendor at his own cost. Land required for the same will be provided inside the HPVP premises and development of the same construction of the shed to be done by the vendor. All Scaffolding materials like Pipes, Clamps, GI sheets etc., required for closed enclosure are to be arranged by Vendor. Painting of all the structural items, which are to be sent loose, to be done in this shed only. Transportation of the same from the fabrication yards to shed to be done by vendor.
- If the shed is not constructed by vendor within dates mutually discussed and agreed time, BHEL will exercise the right to execute the same at the risk and cost of the vendor.
- 3.36) Any modification work due to revision of the drawings during fabrication is to be carried out by the vendor without any additional cost.
- 3.37) Adequate facilities like welding equipments, baking ovens, holding ovens, Portable ovens, handling facilities like felt slings, metal slings, D-shackles etc., 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.
- 3.38) All the measuring instruments used for inspection and testing shall have valid calibration certificates from NABL Laboratory or traceable to national / international standards.
- 3.39) Loading of finished items onto the trailer and Handing over of the same to Logistics dept.
- 3.40) Gate passes for the entry of Manpower, Materials, Cranes, Trailers etc., inside the premises of BHEL-HPVP are to be taken care by the contractor.
- 3.41) 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.

- 3.42) Power will be provided at one point to the Vendor as Free Issue. 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, cabling for the distribution of Power & Working Area Lighting. Sufficient Area lighting at the work place shall be arranged by the vendor at their cost.
- 3.43) 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, NDE Procedures, WPS, Painting Schedule etc.
- 4.2) Raw materials like Plates (full / off-cuts), Pipes / Tubes, Round Bars, Rolled Sections / Structural items etc., and BOCs like Pipe Fittings, Flanges, Elbows, Fasteners, Gaskets etc., as per GMS from HPVP stores.
- 4.3) Application of Refractory / Insulation lining of equipments / items as per requirement.
- 4.4) One 75 MT crane along with operator shall be provided by BHEL free of charge for fabrication where Hydra crane will not serve the purpose. **However, Riggers required for handling the job shall be provided by the vendor.** Diesel for operation of 75 MT crane shall be Free Issue by BHEL. One helper is to be deployed by vendor on daily basis for upkeep maintenance of 75 MT crane.
- 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, security for safe custody of free issue materials 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. 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) Fabrication 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/ TPIA/ 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.

Note:

QAP enclosed with the tender document is tentative only and may be subject to revision due to incorporation of comments of the approving authority. Hence, the approved QAP issued to the vendor after ordering shall only be followed for execution and inspection of the job.

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 consignment of free issue materials or 6 weeks from the date of issue of Last consignment 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:

- a) 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.
- b) Vendor has to submit a detailed micro schedule immediately after the award of the job along with the resource deployment plan of machineries and manpower required for completion of the job to meet the Project delivery schedule. The schedule will be reviewed and approved by our projects and execution team. Periodic Monitoring of progress of fabrication activities will be done based on this mutually agreed and approved schedule and any shortfalls during the execution has to be made up by vendor with a catch up plan failing which penal action as deemed fit will be taken by BHEL.

- c) For intermediate operations of Refractory / Insulation vendor wherever applicable, the time period from the date of handing over to the date of taking over will be excluded from the delivery period for the purpose of computation of LD.

7. SITE MOBILISATION:

Successful bidders shall have to complete site mobilization within 7 days from the date of receipt of order or from the date of intimation for the same by BHEL whichever is later.

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 - 9 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 and Guidelines for Reverse Auction are 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) | QAP, Drawings, Painting Schedule etc. | |

16. TENDER SUBMISSION (Through E - Mail):

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 Price bid (i.e., Annexure – I) shall also be sent separately through e-mail to another e-mail ID pricebid-hpvp@bhel.in.

16.3 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 25.11.2022** 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.

16.4 **TENDERS RECEIVED AFTER THE DUE DATE & TIME ARE NOT ACCEPTABLE.**

16.5 **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 25.11.2022**. 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,

बाहू.वी.आर.राव/Y.V.R. RAO
उप महा प्रबन्धक (ओ एस)/Dy.GM (OS)
बीएचईएल, एचपीवीपी/BHEL-HPVP,
विशाखपट्टणम/VISAKHAPATNAM-530 012

[Signature]
15/11/22

SCHEDULE OF RATES

Ref : OS/22-23/7938/FH/14/013

Date : 15.11.2022

Sub: Fabrication of Feed Heater-1 against S.O. 7938 inside premises of BHEL-HPVP, Visakhapatnam

Sl. No	PGMA	Item Description	Qty.	Unit	Unit Rate (Rs.)	Total Amount (Rs.)
		Fabrication, Assembly & Welding, Radiography, Hydro Test, Shot blasting and Painting, Trial Assembly of various items of Feed Heater - 1 as per the drawings, QAP, WPS, Specifications & Standards and as per the detailed scope of work as mentioned in the tender. (All consumables & Paints are in the scope of the vendor)				
1	48-800	Main Heater Shell Assembly including fixing of Tube Sheets (Excl. Coils & Insulation)	20	MT		
2	48-810	Economiser Shell Assembly including fabrication & fixing of Tube Sheets (Excl. Coils & Insulation)	16	MT		
3	48-412	Stack from plate formed pipes including Rolling, Assembly & Fit-up, Re-rolling, L-seam Welding, C-seam fit-up, Welding & RT etc. (Size: OD 609.6 mm x THK: 9.53 mm)	5	MT		
4	48-412	Hot Flue Gas Ducts OD 273 x 4.19 thk. SA 312 TP 321 - 0.5 MT	160	Inch Dia		
5	35-110, 35-991	Heater Supporting Structure	27	MT		
6	36-310, 36-820	Platforms, Ladders	6	MT		
7	36-850	Hand Rails and Posts	4	MT		
8		Main Heater & Economiser Coils - Installation incl. insitu joints, Fabrication & NDT				
8.1	11-001	Main Heater Coils including Cross Overs (SA 106 Gr. B)	600	Inch Dia		
8.2	11-002	Economiser Coils including Cross Overs (SA 106 Gr. B)	288	Inch Dia		
8.3		Nozzle Joints - 12 Nos. (SA312 TP 321 to SA 106 Gr.B)	336	Inch Dia		
9	PV-010	LP Gas K.O. Drum	0.5	MT		
10		Flanges fabricated from plates, Foundation Bolts etc.	2	MT		
11		S.S. Retainer Rings / Plates for Refractory / Insulation	3	MT		
12		S.S. Deflector Plates	0.5	MT		
13		Galvanizing of Hand Rails and Posts	4	MT		
		TOTAL				
Total Amount in words:						

Notes :

- 1) **L1 status shall be evaluated based on the total quoted value.**
- 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 bidders are advised to go through all the drawings & documents before quoting the tender.
- 4) The evaluation currency for this tender shall be **INR**.
- 5) The quoted price shall be inclusive of all applicable taxes & duties **except GST**. GST shall be reimbursable to the vendor as detailed in Clause – 9. Income tax shall be deducted at applicable rates from the vendor's bills.
- 6) The prices shall be fixed & firm without any escalation during the entire period of contract and till completion of the work.
- 7) 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 mismatch between rate and amount in figures, rate in figures shall be taken into consideration for further evaluation and processing.

Signature of the Bidder with Stamp

Ref : OS/22-23/7938/FH/14/013

Date: 15.11.2022

Sub : Fabrication of Feed Heater-1 against S.O. 7938 inside premises of BHEL-HPVP, Visakhapatnam

LIST OF REFERENCE DRAWINGS / DOCUMENTS

Sl. No.	S.O. No.	Description of Work	Description of Drawings / Documents	Drawing / Document No.	Rev. No.	No. of Sheets
1	7933	Fab. of Reactor Charge Heater	GA of Fired Heater	B-0-00-00-00000 (Sheet 1 of 2 & 2 of 2)	0	2
2			Coil Assembly	1-11-001-U8018	0A	1
3			Coil Assembly-Economiser	1-11-002-U8019	0A	1
4			Details of Headers	1-11-002-U8020	0A	1
5			GA of Heater Supporting Structure-Elevations	1-35-110-U0181	1	1
6			GA of Heater Supporting Structure-Plans	1-35-110-U0182	1	1
7			Fab. details of Ladders	1-36-820-U0087	1	1
8			GA of Handrails	1-36-850-U0082	1	1
9			Hot Flue Gas Duct	1-48-412-U0087	A	1
10			Smoke Stack	1-48-412-U0088	2A	1
11			Main Heater Shell Assembly	1-48-800-U0079	1A	1
12			Main Heater Internals Fixing	1-48-800-U0085	0A	1
13			Economiser Shell Assembly	1-48-810-U6001	0A	1
14			LP Gas K.O. Drum	1-PV-010-U0005	0A	1
15			STD Details of Welds	2-35-110-U0064	0	1
16			Tube sheet of Econ.	2-48-810-U6001	0A	1
17			Manhole	2-48-810-U6002	0A	1
18			QAP	CQP 2533	0	2
19			Painting Schedule	4-4051-PAINT-SCH-001	A	1

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 in case of **HPVP ADM site** or **25%** of the material cost in case of Vendor works 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 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 / Owner

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 there of 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 for MSE (Micro & Small Enterprise), 60 days for Medium Enterprise and 90 days for non-MSEs 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. 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.

23. 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.*

24. 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.,

25. 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.

26. 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.

27. 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.

- 28.** 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.

- 29.** 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.

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 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/22-23/7938/FH/14/013, dated 15.11.2022**. BHEL shall finalise the Rates for **Fabrication of Feed Heater-1 against S.O. 7938 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/22-23/7938/FH/14/013, dated 15.11.2022**, (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 techno-commercially qualified bidders at a later stage.**3. Auction extension time:** If a bidder places a bid in the last {...} minutes of closing of the Reverse Auction and if that bid gets accepted, then the auction's duration shall get extended automatically for another {...} 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 {...} 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 {...} minutes. In case, there is no bid in the last {...} 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 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 90 days 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*}.

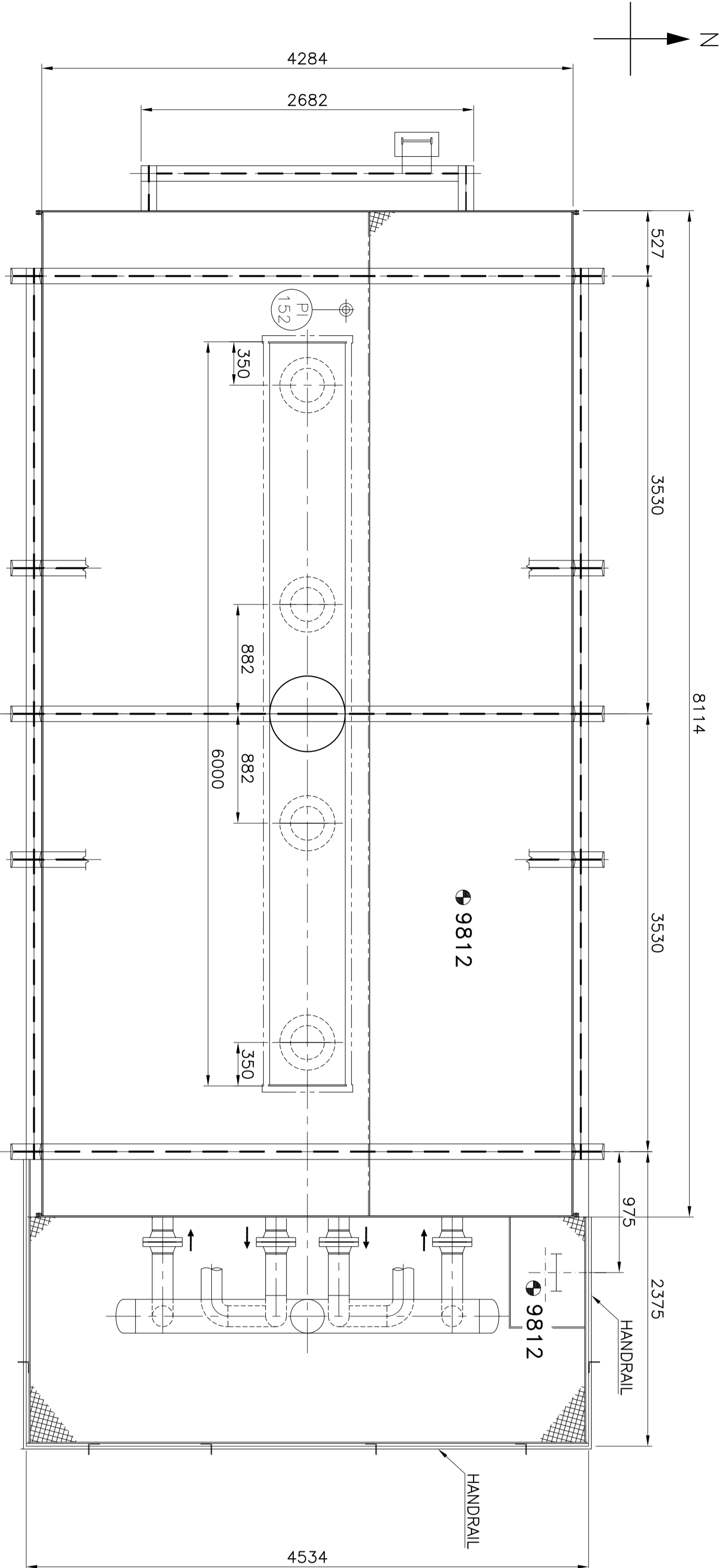
14. M/s. {*Service provider*}, shall arrange to demonstrate/ train the bidder or bidder's nominated person(s), without any cost to bidders. M/s. {*Service provider*}, shall also explain the bidders, all the business rules related to the Reverse Auction. Bidders are required to submit their acceptance 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/22-23/7938/FH/14/013, dated 15.11.2022**. 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

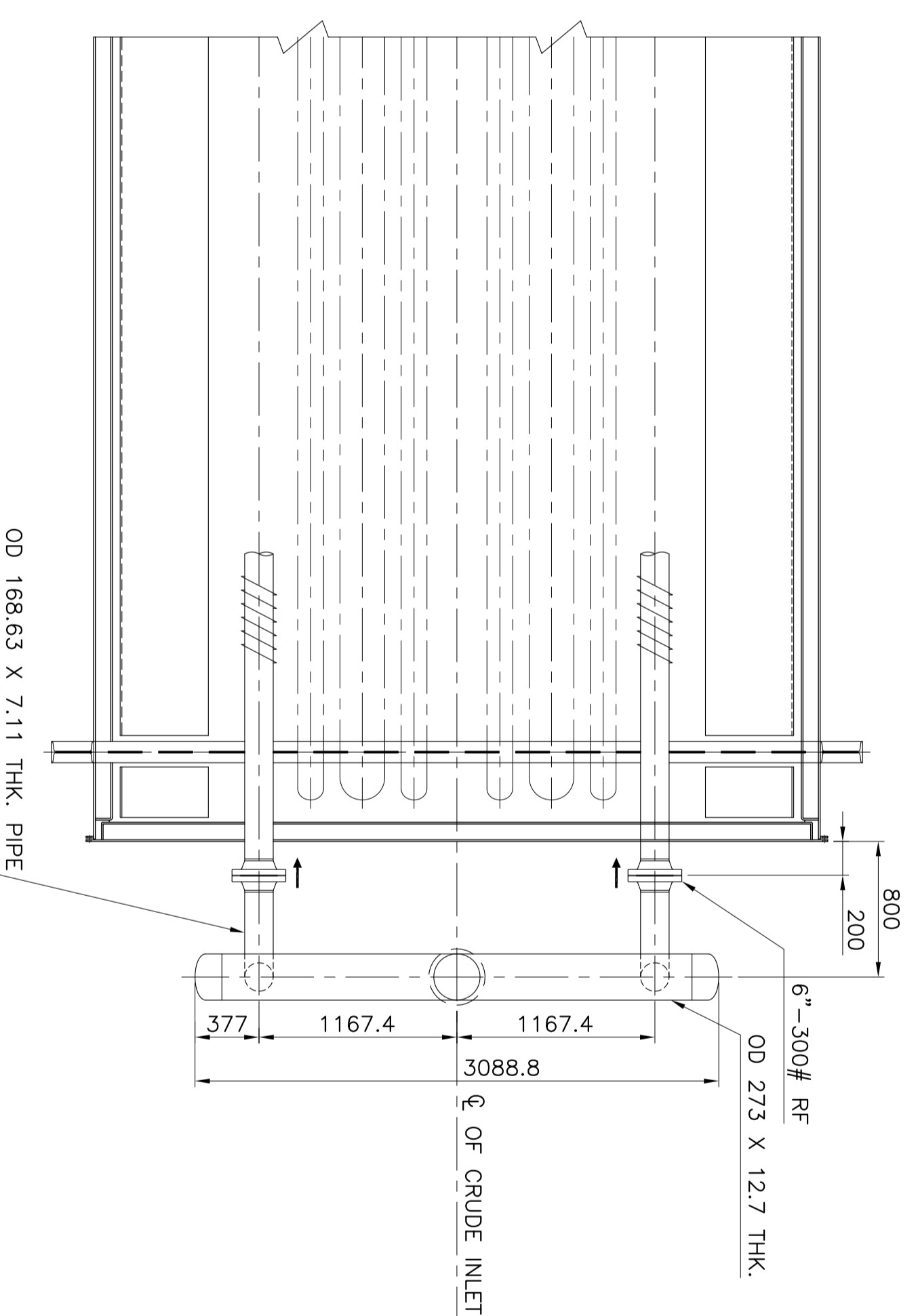
PROCEDURE FOR GST PAYMENT

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/Warrantee 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.

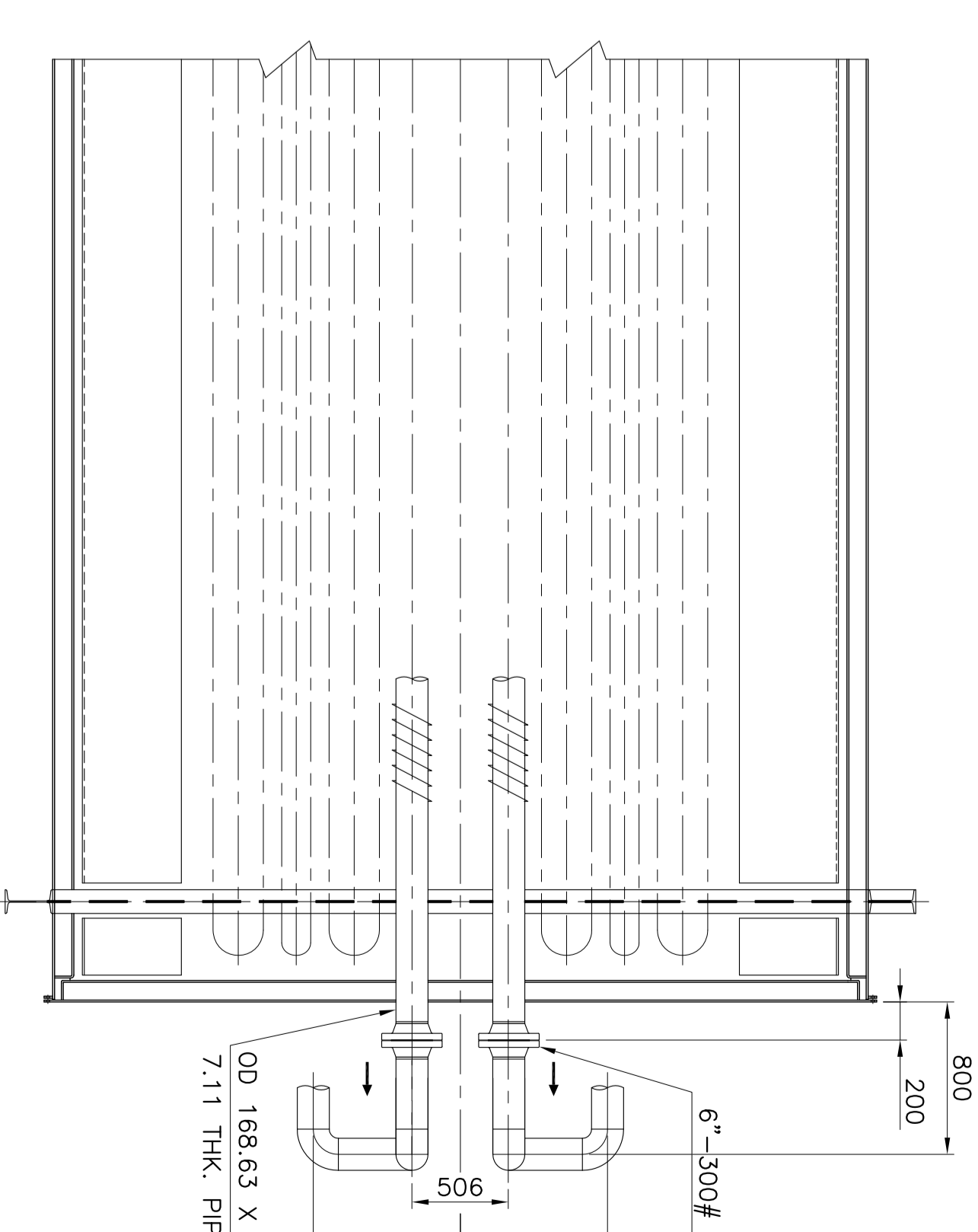
Note: The above will be followed strictly for processing vendor payments to ensure GST Compliance.



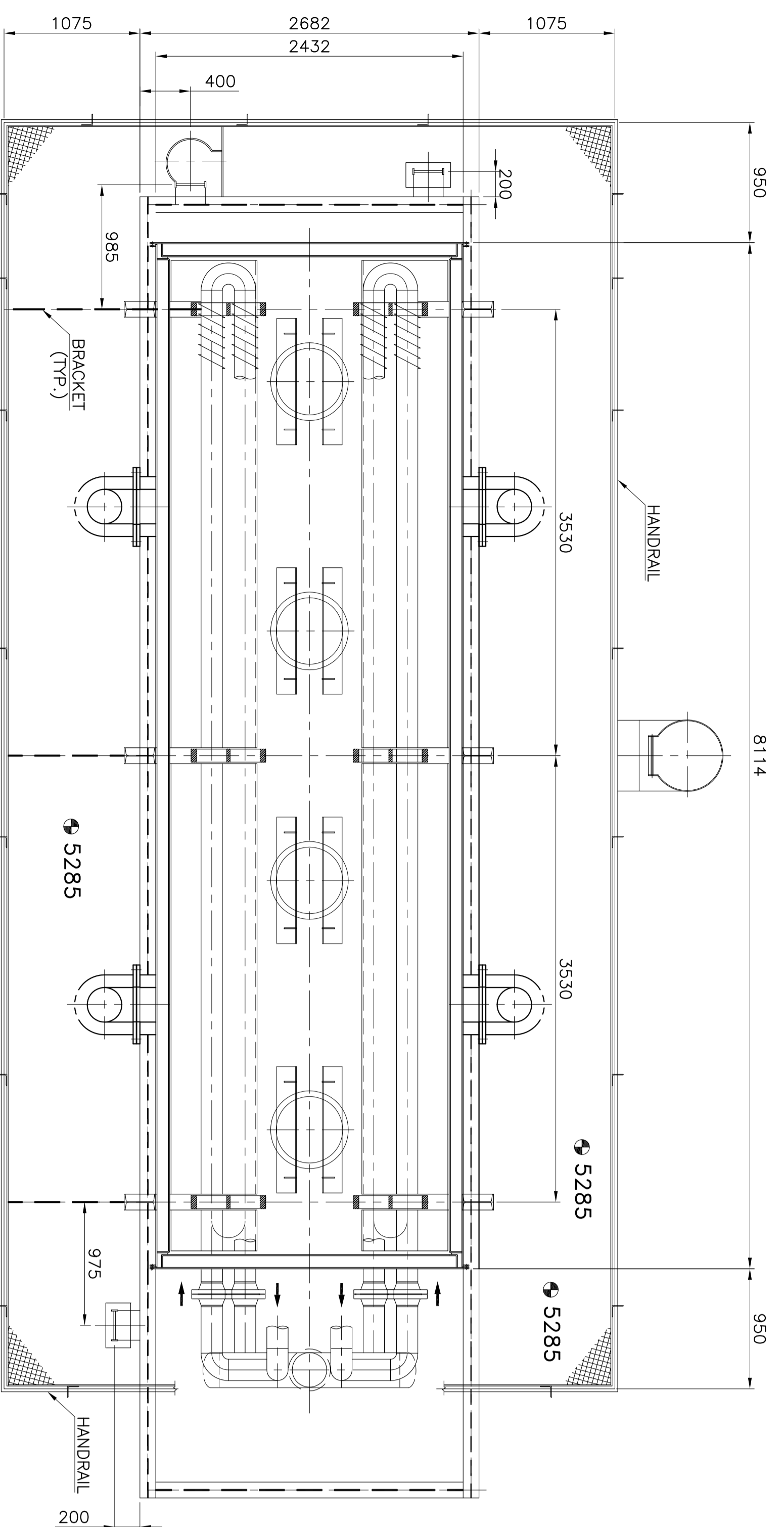
SECTION AA - PLAN AT 9812
(FROM SHIT. 1 OF 2)



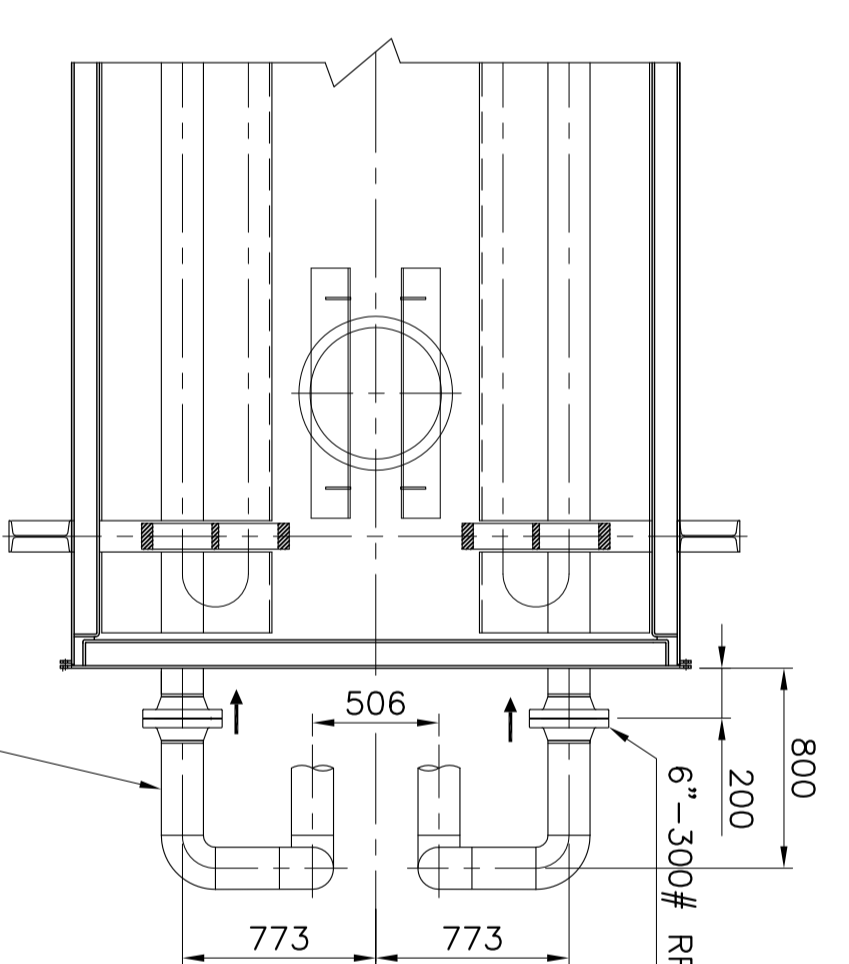
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(CRUDE INLET TO ECONOMISER COIL)



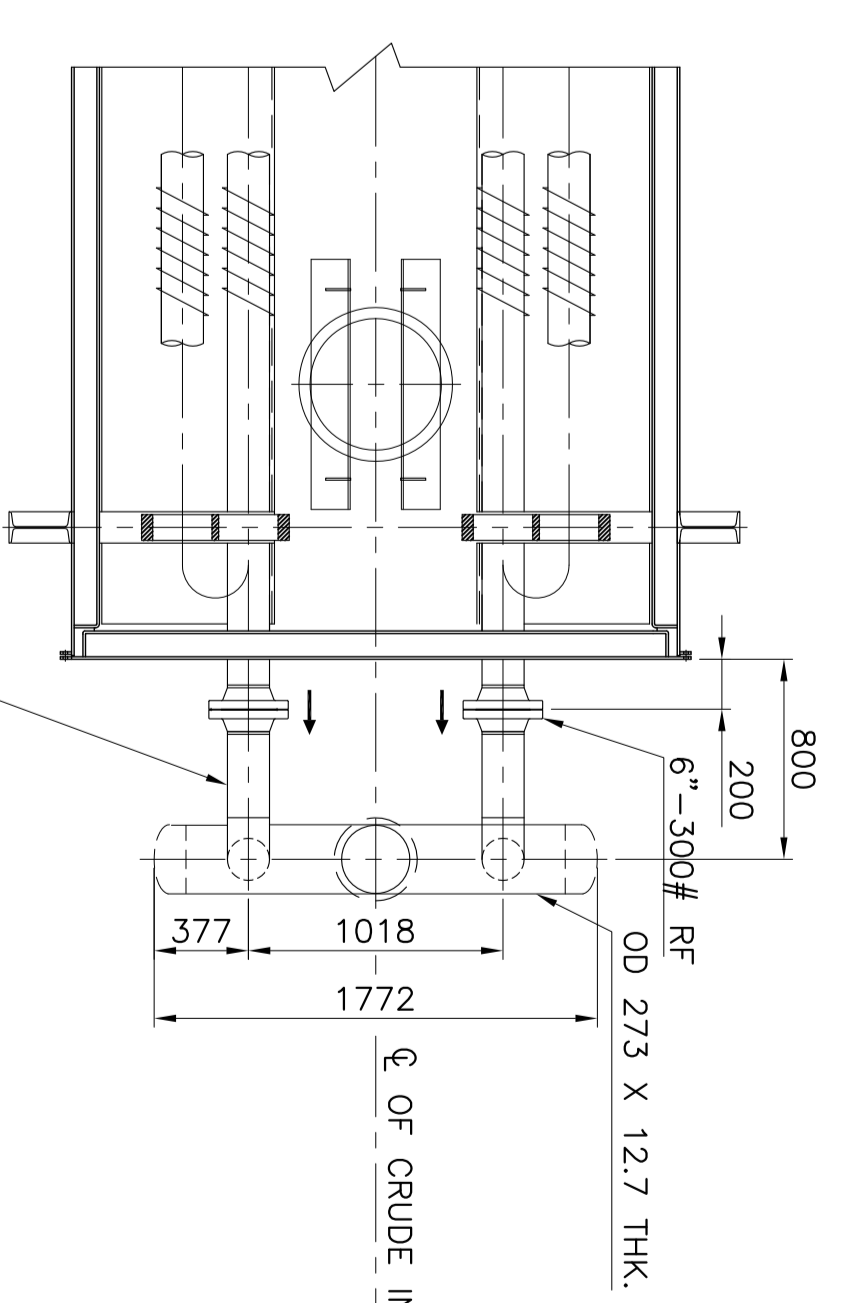
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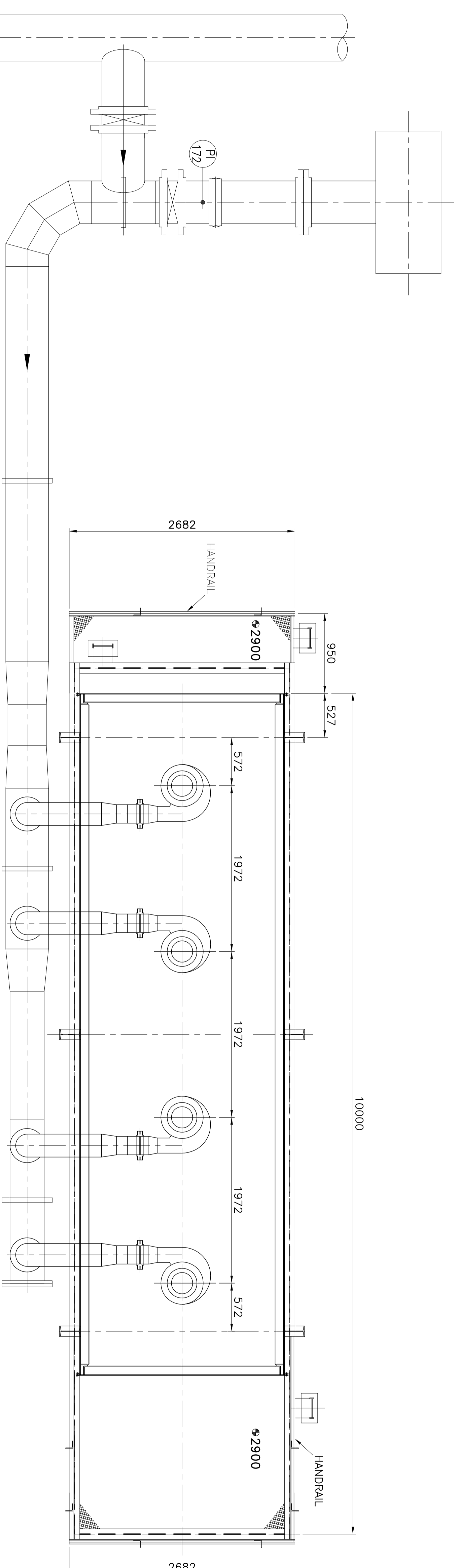
SECTION BB - PLAN AT 7519
(FROM SHIT. 1 OF 2)



SECTION - B1B1
(CRUDE INLET TO MAIN COIL FROM ECONOMISER COIL)



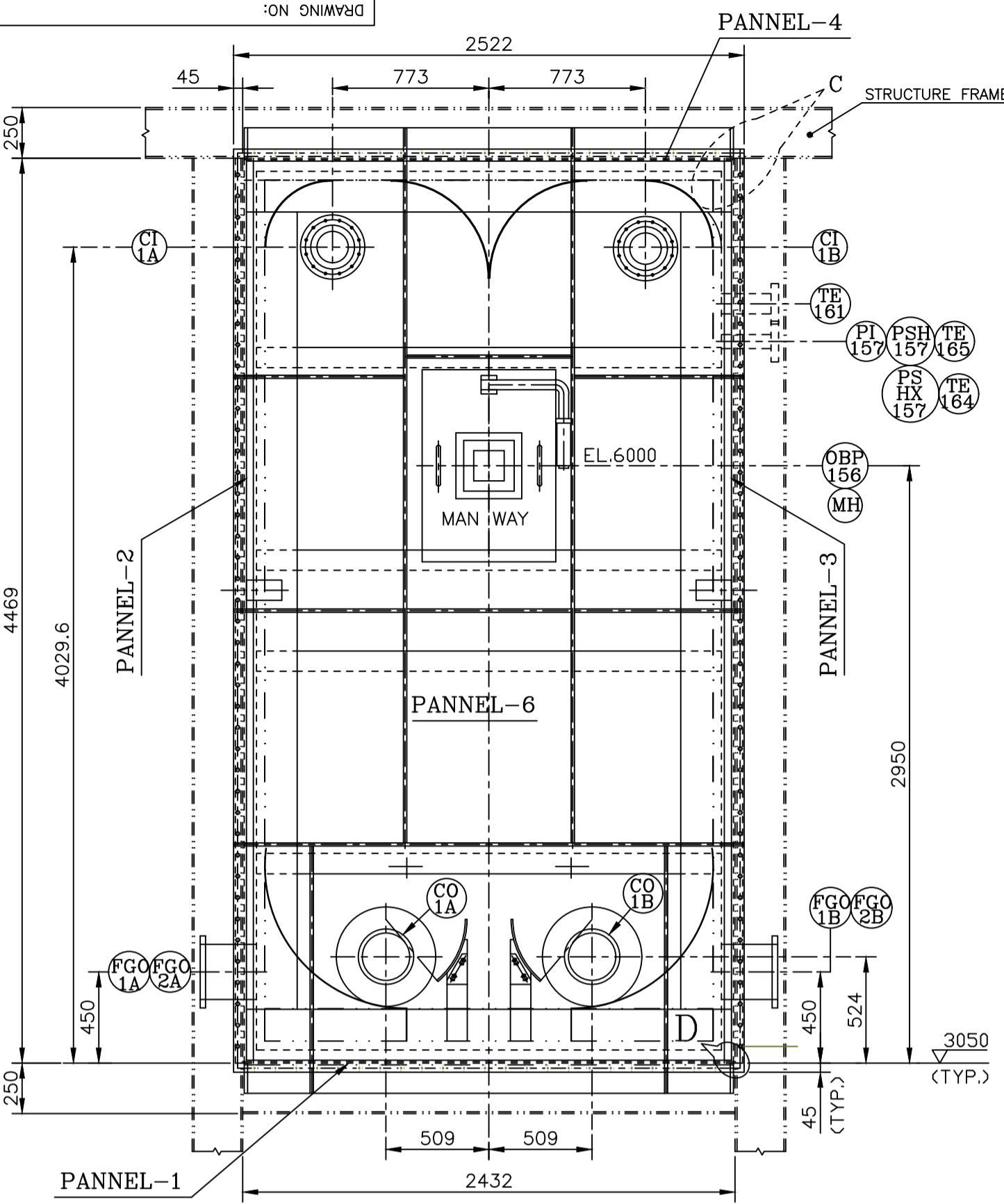
SECTION - B2B2
(CRUDE OUTLET FROM MAIN COIL)



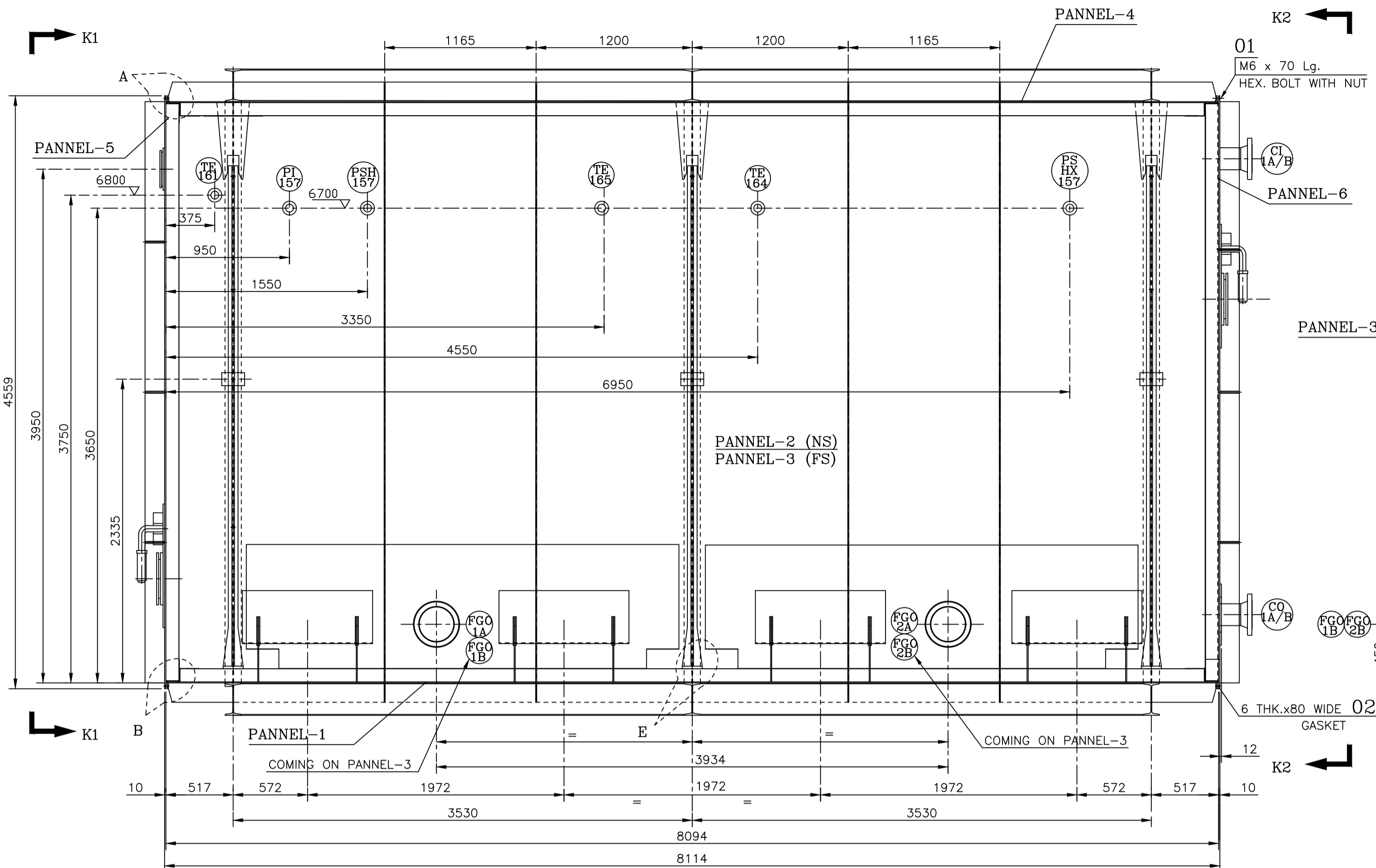
SECTION CC - PLAN AT 2900
(FROM SHIT. 1 OF 2)

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PROJECT	M/S OIL & NATURAL GAS COMMISSION DESALTER PLANT NAWAGAM
DRAWN	K. MUNIAVVA
CHECKED	
APPROVED	
DATE	
REV.	
SCALE	1:50
TITLE	BHARAT HEAVY ELECTRICALS LTD., Heavy Plates & Vessels Plant, Visakhapatnam-530012.
DRG No.	B-0-00-00-00000
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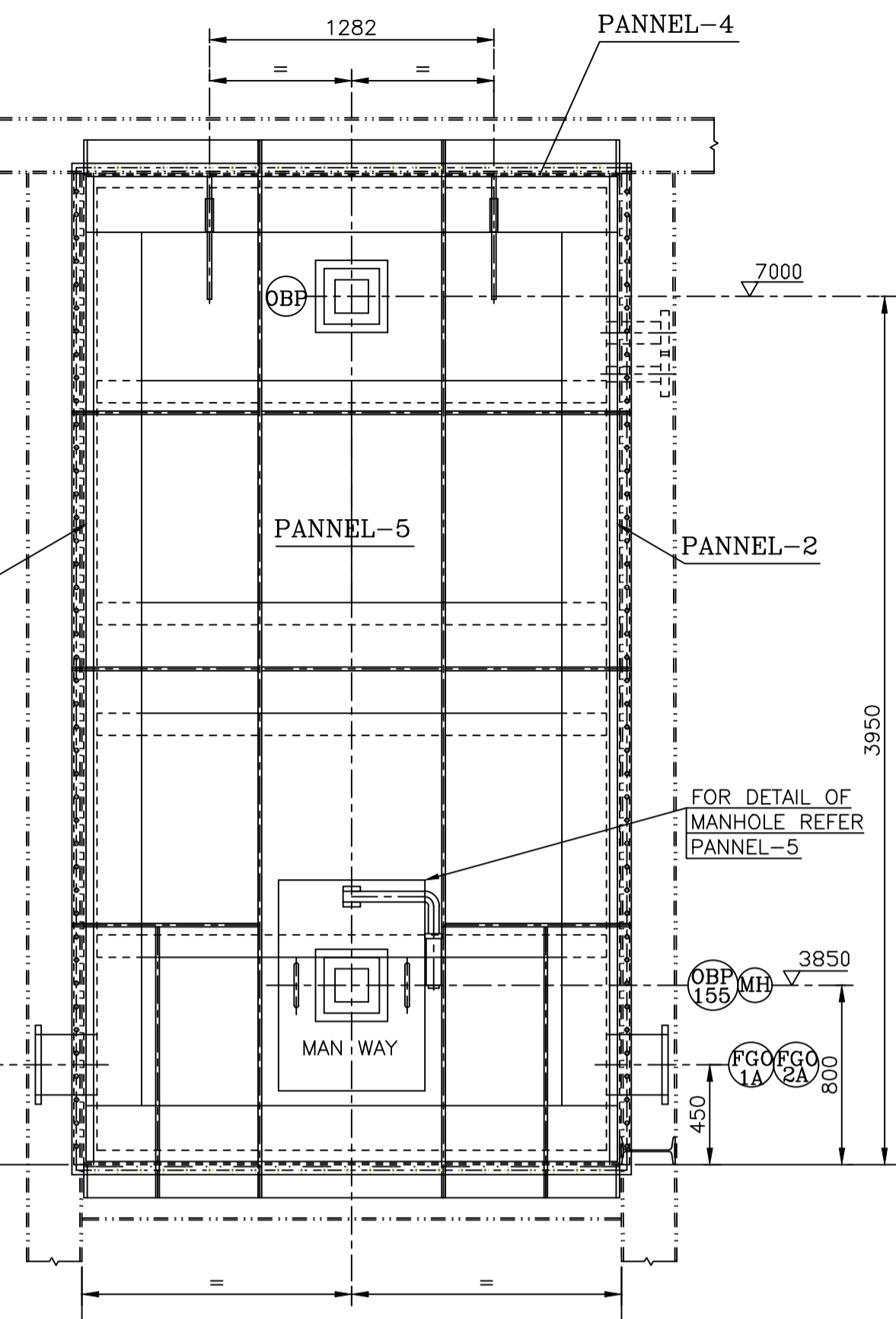
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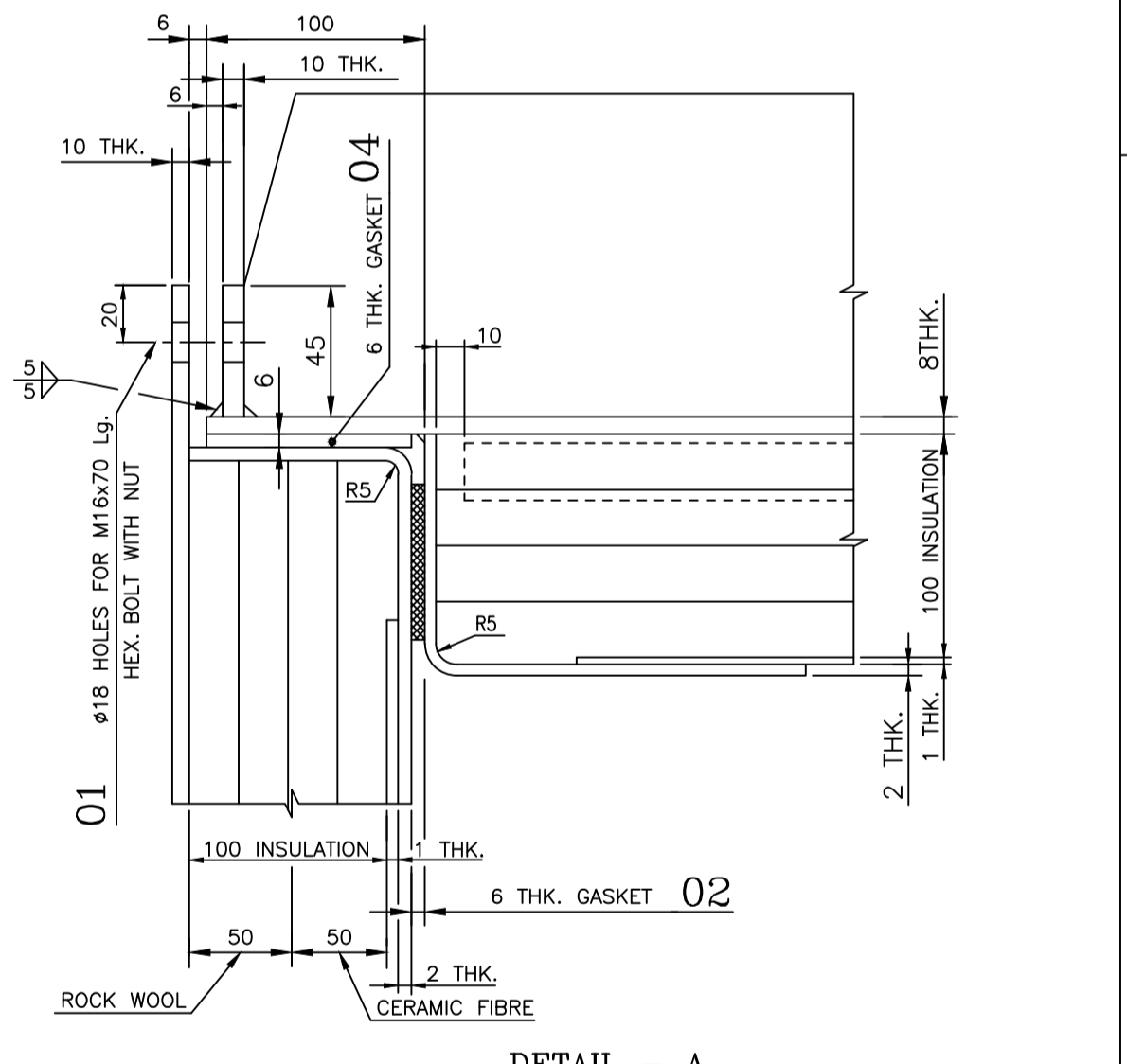
VIEW - K2 K2



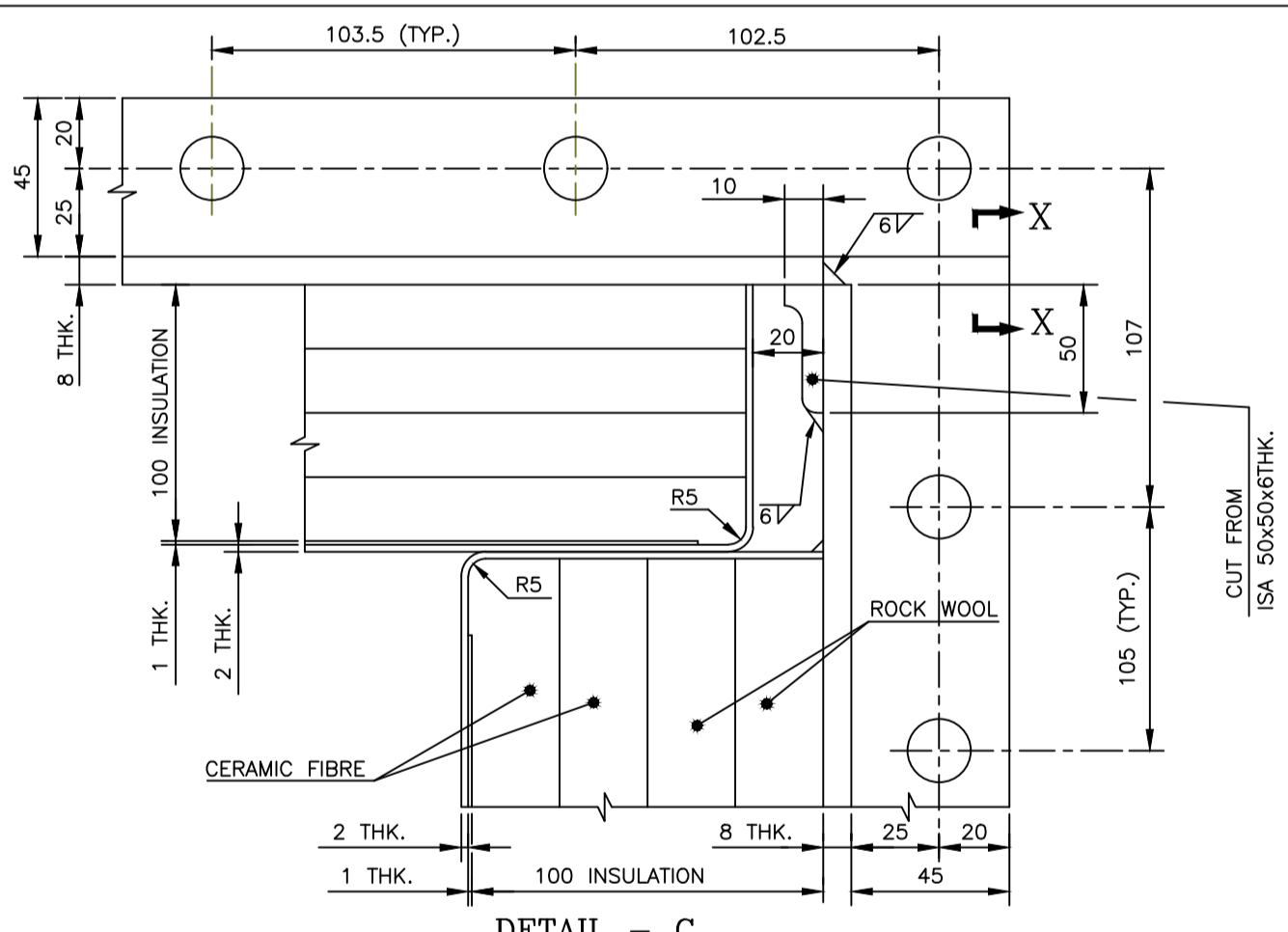
ELEVATION



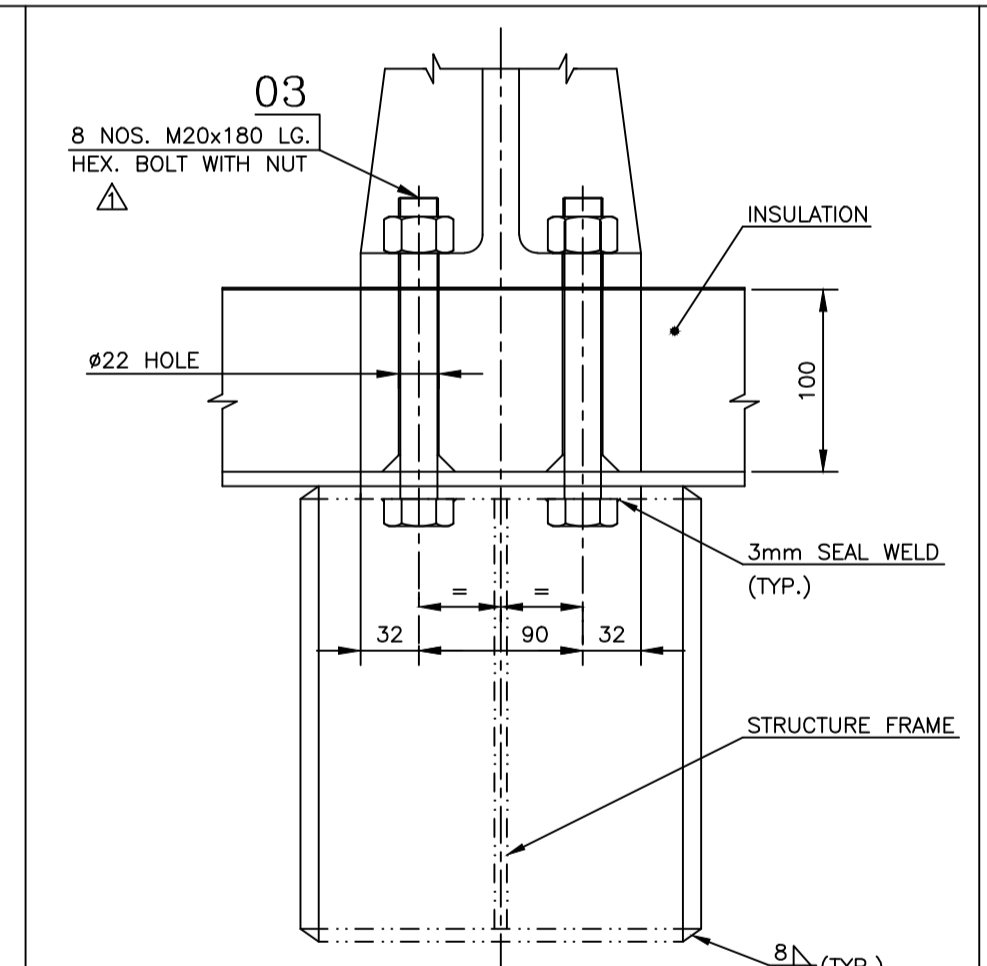
VIEW - K1 K1



DETAIL - A



DETAIL - C

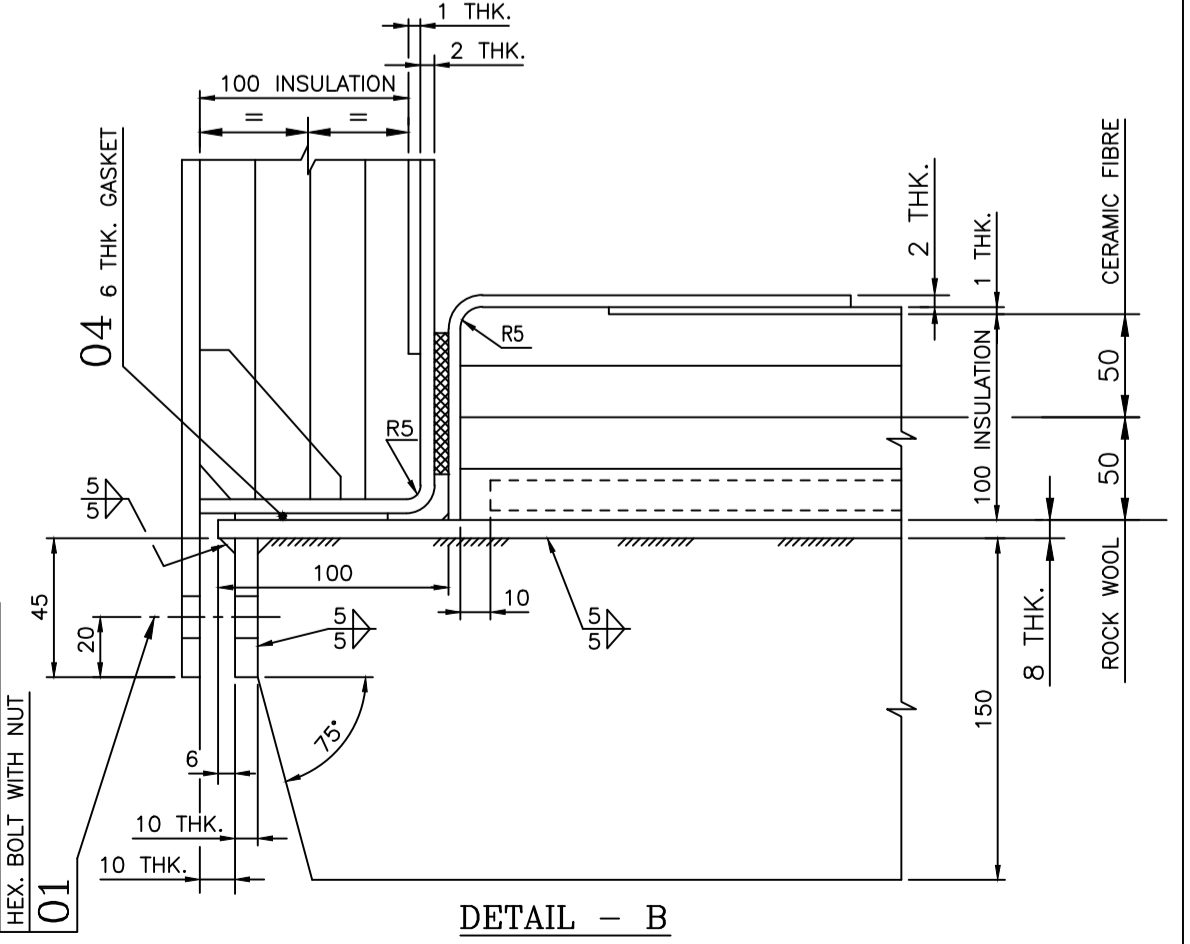


DETAIL - E

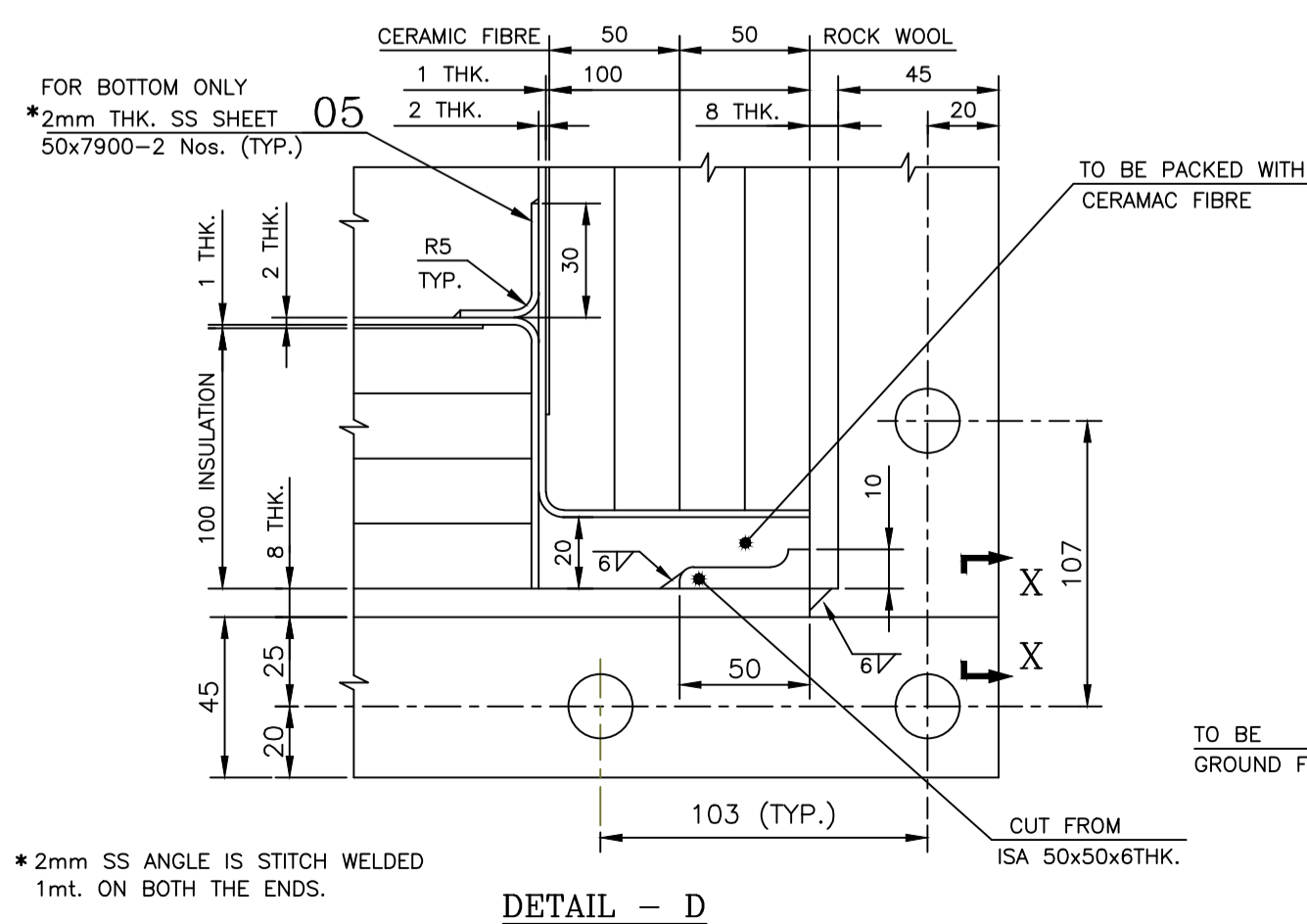
MARK NO.	QTY.	SERVICE	N.S.	O.D.	THK.	RATING	TYPE	FACE	REMARKS
FGO 2A/B	2	DUCT PIPE	14"/10"	355.6/273.0	6.35/4.19	-	PLATE RING	R.F	
FGO 1A/B	2	DUCT PIPE	14"/10"	355.6/273.0	6.35/4.19	-	PLATE RING	R.F	
CO 1A/B	2	CRUDE OUTLET	6"	168.3	7.11	300# ANSI	W.N.	R.F(SMOOTH)	COIL OUTLET
CI 1A/B	2	CRUDE INLET	6"	168.3	7.11	300# ANSI	W.N.	R.F(SMOOTH)	COIL INLET

NOZZLES

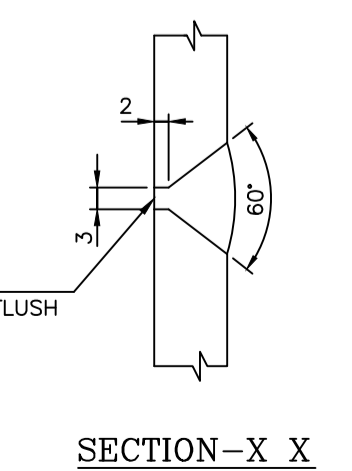
TABLE OF NOZZLES AND FLANGES



DETAIL - B



DETAIL - D



SECTION - X X

AS BUILT

VARIANT NUMBER	ITEM NUMBER	DESCRIPTION	STD	DRAWING NUMBER	ITEM NO	MATERIAL CODE	UNIT	UNIT WEIGHT
	11	MAIN HEATER INTERNALS FIXING ARRGT. FOR FGR HEATER		1-48-800-U0085		WELDMENT		1348.264
	10	DETAIL OF PANNEL-5 & 6		1-48-800-U0084		WELDMENT		3211.778
	09	DETAIL OF PANNEL-4		1-48-800-U0083		WELDMENT		2137.743
	08	DETAIL OF PANNEL-3		1-48-800-U0082		WELDMENT		3664.639
	07	DETAIL OF PANNEL-2		1-48-800-U0081		WELDMENT		3651.019
	06	DETAIL OF PANNEL-1		1-48-800-U0080		WELDMENT		2153.540
	05	SS SHEET FOR ASSLY. CORNER (BOTTOM) 2 THK. x 50 x 7900			159117780000			6.375
	04	PANNEL GASKET 6 THK. x 80 WIDE x 14000 (AS PER DRG.)			SA 240 TP 304			2
	03	TUBE SHEET FIXING BOLT & NUT M20 x 180 LG.			190057890000	C.F.GASKET		5.600
	02	PANNEL GASKET 6 THK. x 80 WIDE x 14000 (AS PER DRG.)			190016810000			0.158
	01	PANNEL FIXING BOLT & NUT M16 x 70 LG.			SS 304			48 SETS
					190057890000			5.600
					190018820000	C.F.GASKET		2
					190018820000			0.171
					IS:1367 CL4.6/IS:1367 CL4			268 SETS

M/s. OIL & NATURAL GAS CORPORATION LTD. - NAVAGAM
FGR HEATER

CUST. No. 4051

REV 1 DATE 3-5-2019 ALTD. K.K.R CHKD. S.K.M APPD. P.K.S

ZONE 1) BOLT LG. MATL. SPEC REVISED FOR ITEM No.03.

REV 1A DATE 16-11-2020 ALTD. T.R.K CHKD. S.K.M APPD. P.K.S

ZONE AS BUILT

DEPT ALL DIMENSIONS ARE IN MM PROJECTION SCALE 1:25, NTS WEIGHT (Kg) 16273.161 REF TO ASSY / OLD DWG SE PL-4014 01-A-003 1-48-800-A-00020

TITLE MAIN HEATER SHELL ASSEMBLY FOR FGR HEATER DRAWING NO: 1-48-800-U0079 REV 1A

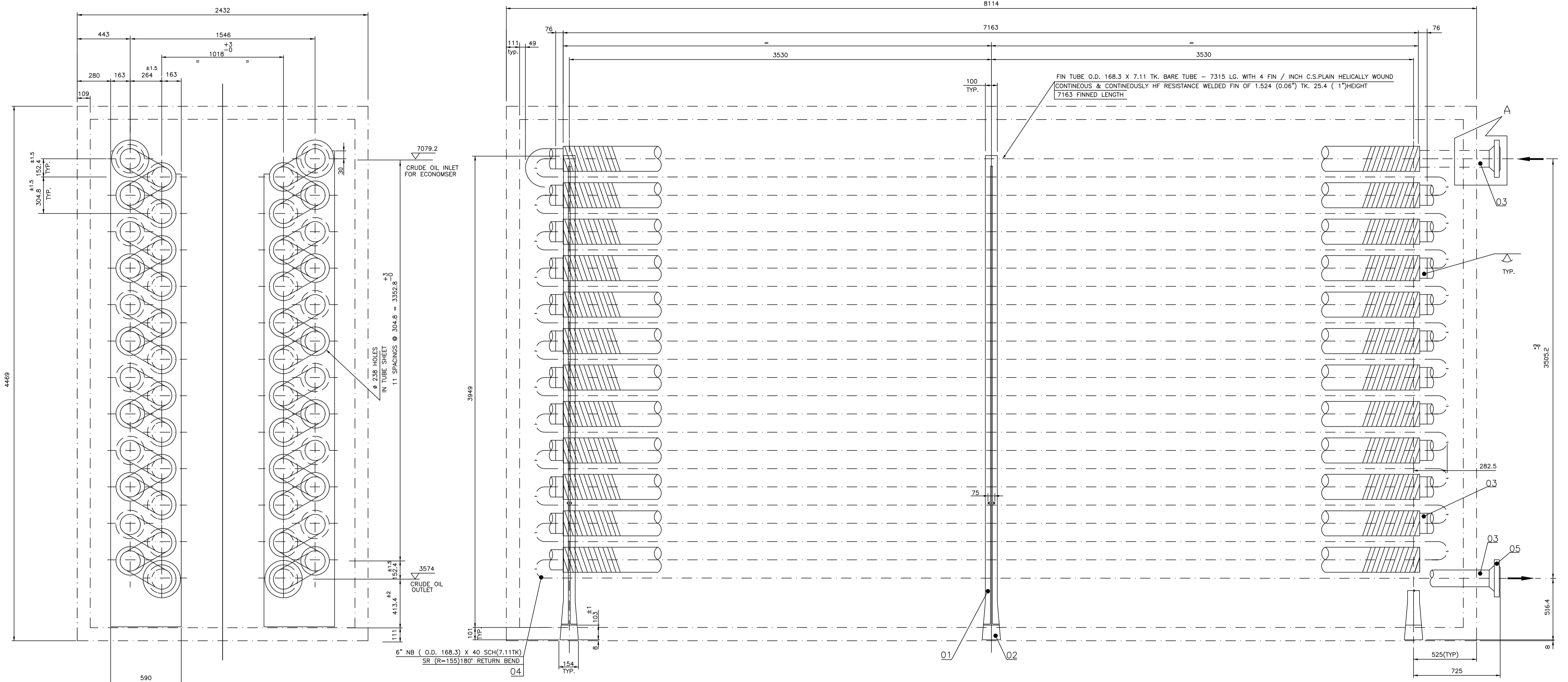
DRN K.H.Thomas / K.K.Rao DATE 20.02.2019

CHKD S.K.M DATE 20.02.2019

APPD P.K.S DATE 20.02.2019

FORM NO. 0425/2

A1 SIZE



DESIGN DATA

1. DESIGN CODE	: API (RP) 530
2. DESIGN PRESSURE Kg/cm ² (g)	: 17.0
3. DESIGN TEMPERATURE (°C)	: 325
4. HYD. TEST PRESSURE Kg/cm ² (g)	: 25.5
5. RADIOGRAPHY	: 100%
6. CORROSION ALLOWANCE	: 3.0 mm
7. HEAT TREATMENT	: NIL
8. TEST PRESSURE SUSTAINING PERIOD	: MINIMUM ONE HOUR

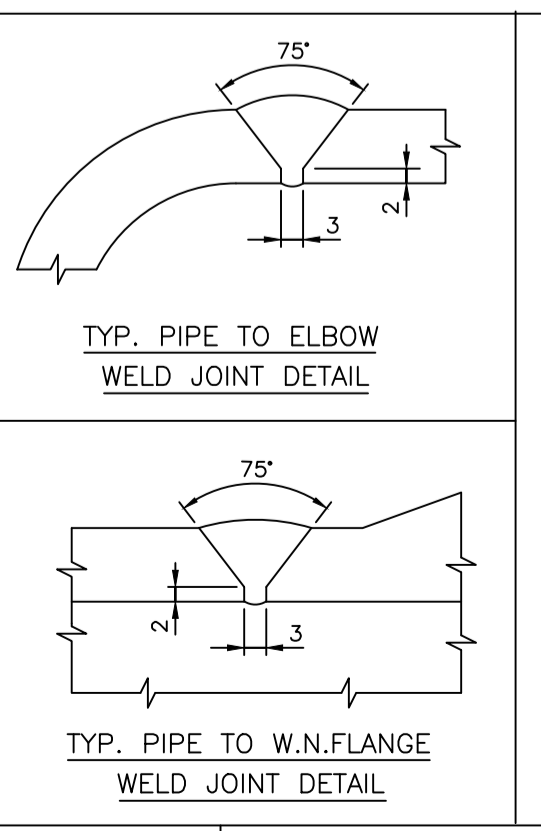
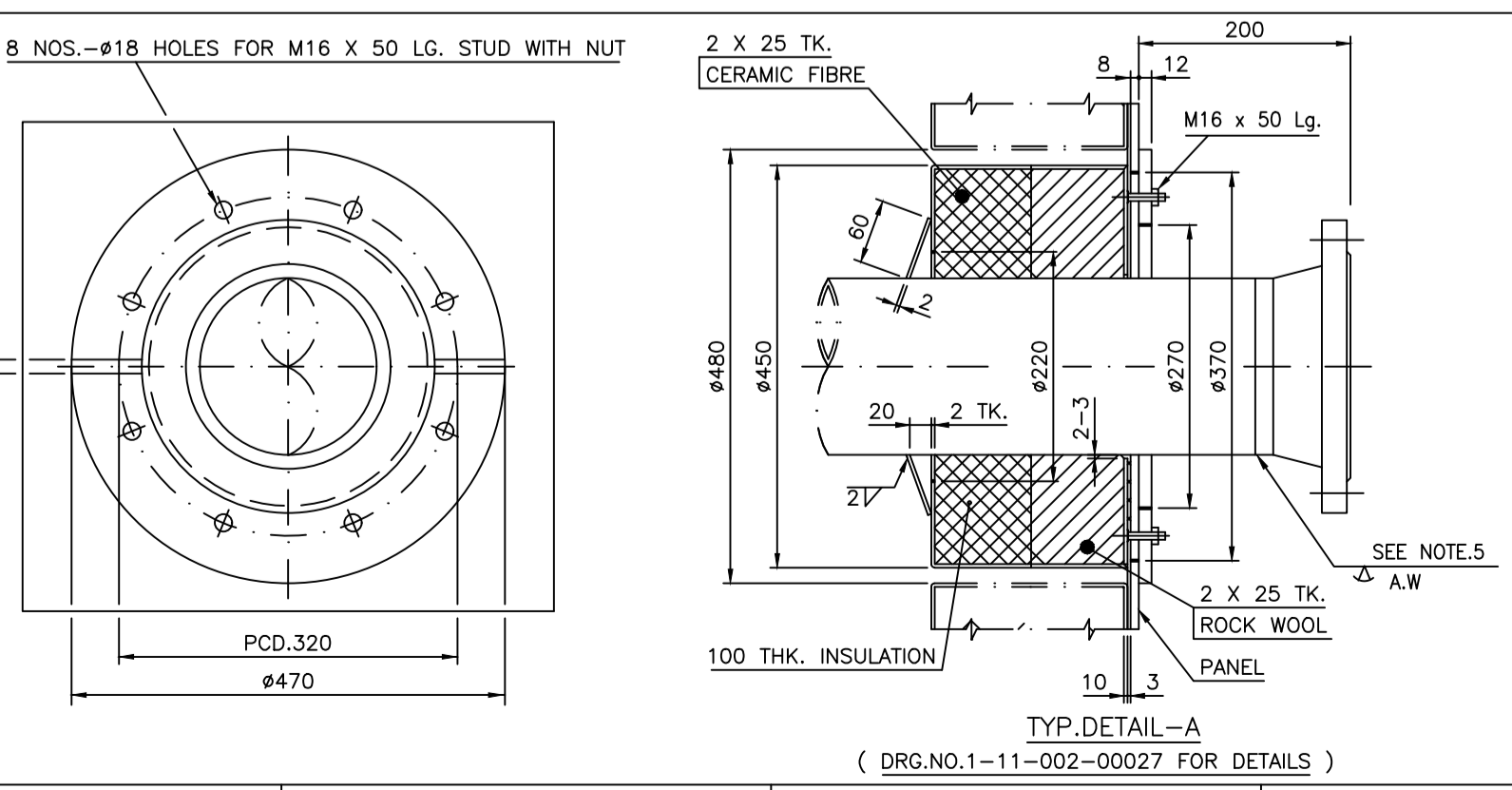
INSPECTION : BHEL

AS-BUILT

NOTES:-

- ALL BUTT WELDS ARE FULL PENETRATION WELDS.
- WELDING OF RETURN BENDS (P.NO.04) WITH FIN TUBES (P.NO.03) SHALL BE DONE AFTER ASSEMBLY THE TUBE WITH TUBE SHEETS LOADED IN THE ECONOMISER SHELL.
- THE SEALING ARRANGEMENT SHOWN DETAIL'A' SHALL BE WELDED ONLY AFTER TRAIL ASSEMBLED WITH COVER PANEL AND MATCH MARKED BEFORE HYDRAULIC TESTING.
- FLANGE RAISED FACE SHALL HAVE SMOOTH FINISH TO 125 AARH.
- FLANGE SHALL BE WELDED TO COIL AFTER INSERTING THE SEALING ARRANGEMENT IN TO THE COIL PIPE.
- A.W. INDICATES ASSEMBLY WELD.

VARIANT NUMBER	DESCRIPTION	STD	DRAWING NUMBER	ITEM NO	MATERIAL CODE	UNIT WEIGHT	QTY	ZONE
05	W.N.FLANGE 6"NB, 300 # RF				156113210000 SA 105	20.2	4	
04	SR 180° RETURN BEND 6"NBXSEC-40 (7.11TK.)				156570150000 SA 234 Gr.WPB	20.3	46	
03	FIN TUBE (FIN) 25.4 WIDE X 1.524 TK. FIN TUBE (BARE TUBE) OD.168.3 X 7.11 TK. X 7315LG.				156171147315 A 366 / EQUIVALENT 156171147315 A 106 Gr.B	4 206	44	
02	TUBE SUPPORT AS GIVEN IN DRG.NO.2-07-430-00001				A 297 Gr. HH	3		
01	TUBE SHEET AS GIVEN IN DRG.NO.2-07-430-00001				A 297 Gr. HH	3		



REV NO.	ZONE	DESCRIPTION	PPD.	CHD.	APPD.
01		AS-BUILT	P,J	KK	YPK

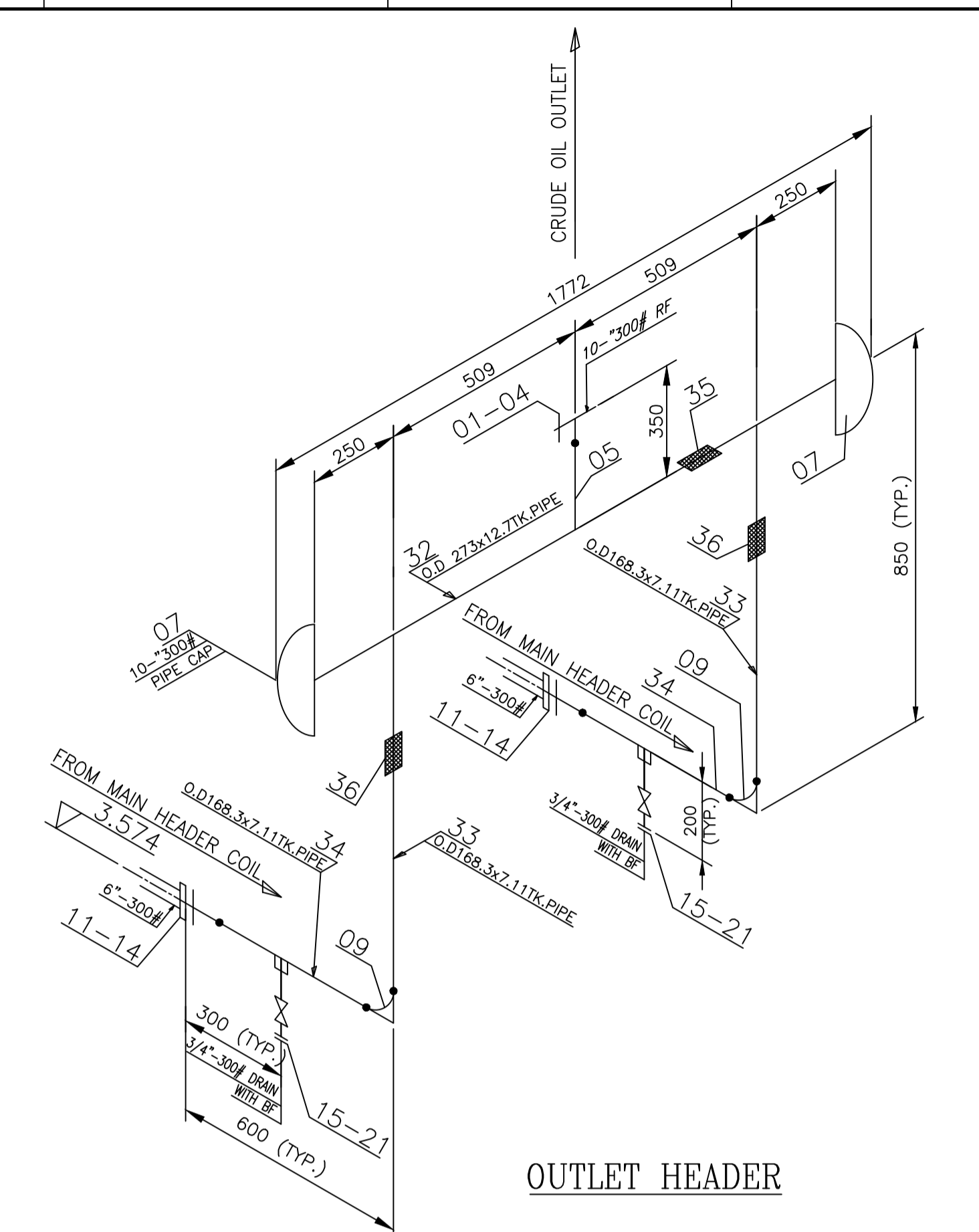
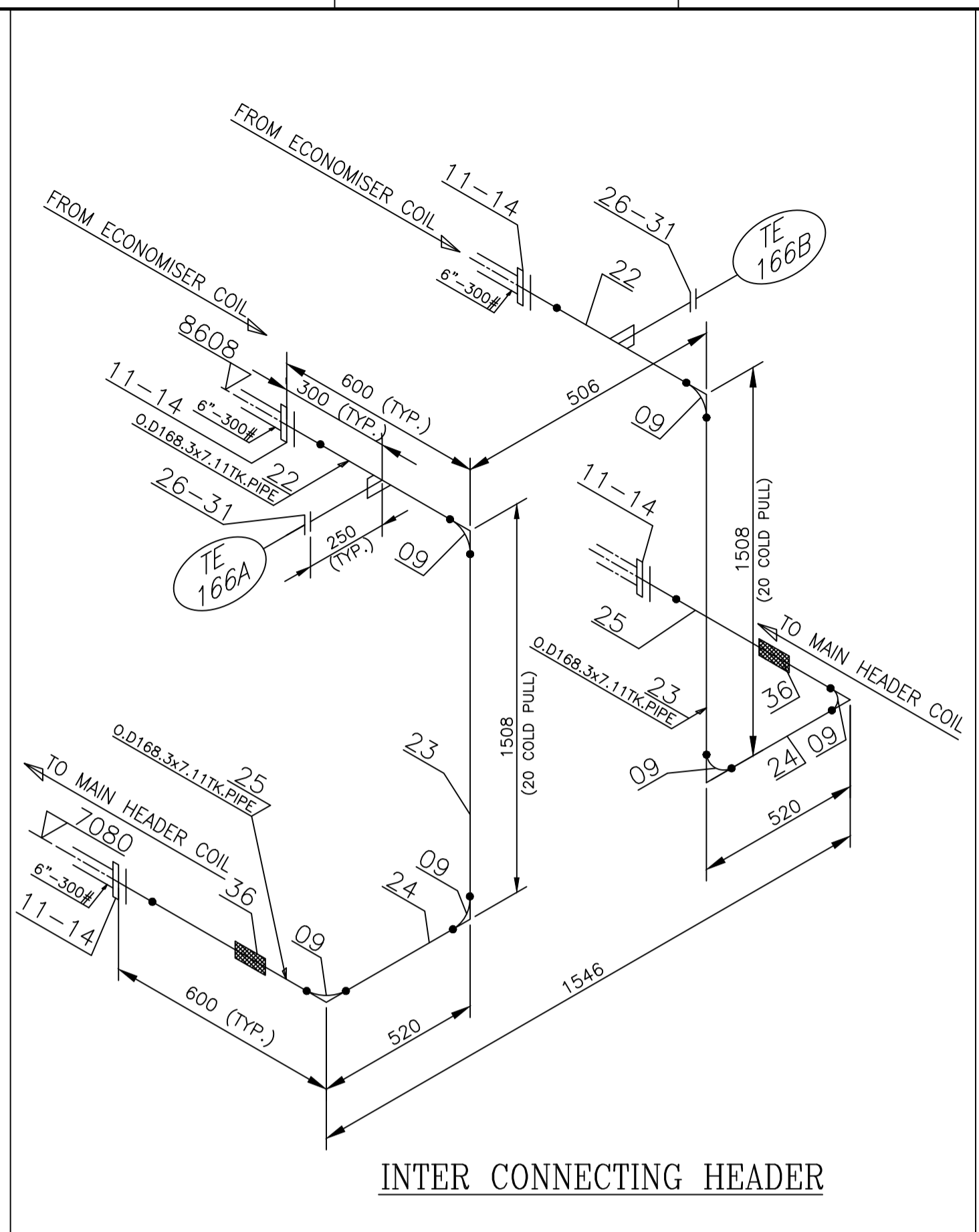
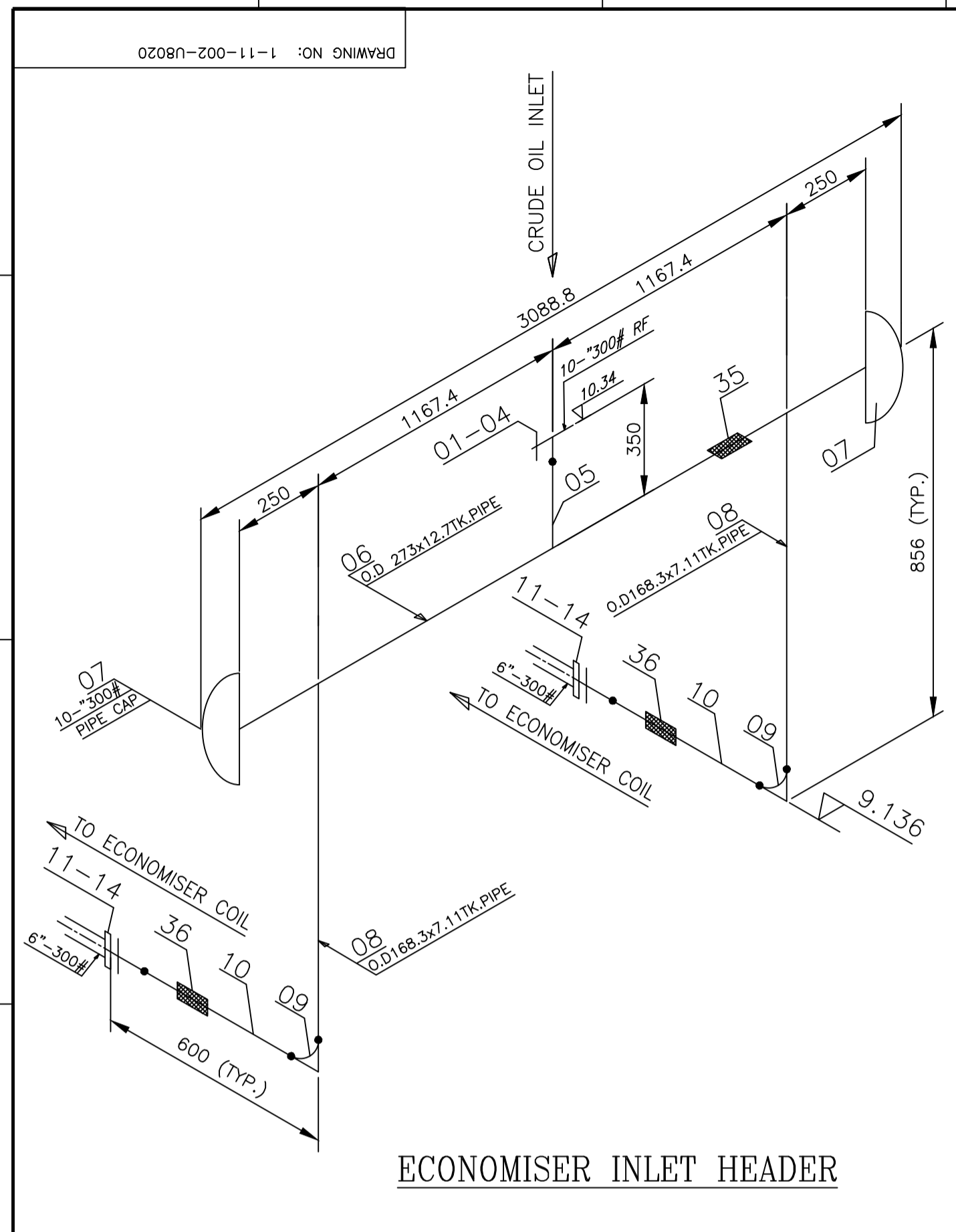
CAUTION: The information on this drawing is the property of Bharat Heavy Electricals Ltd. It shall not be used directly or indirectly in any way detrimental to the interest of the company.

Bharat Heavy Electricals Ltd
UNIT: HEAVY PLATES & VESSELS PLANT
VISAKHAPATNAM-530012

DRN	V.RAMESH BABU	DATE	28-02-2019
CHD	A.N.V.K.KISHORE	DATE	28-02-2019
APPD	Y.P.KUMAR	DATE	28-02-2019

DEPT: ALL DIMENSIONS ARE IN MM
PROJECTION: FIRST ANGLE
SCALE: N1:5
WEIGHT (Kg): REF TO ASSY / OLD DWG

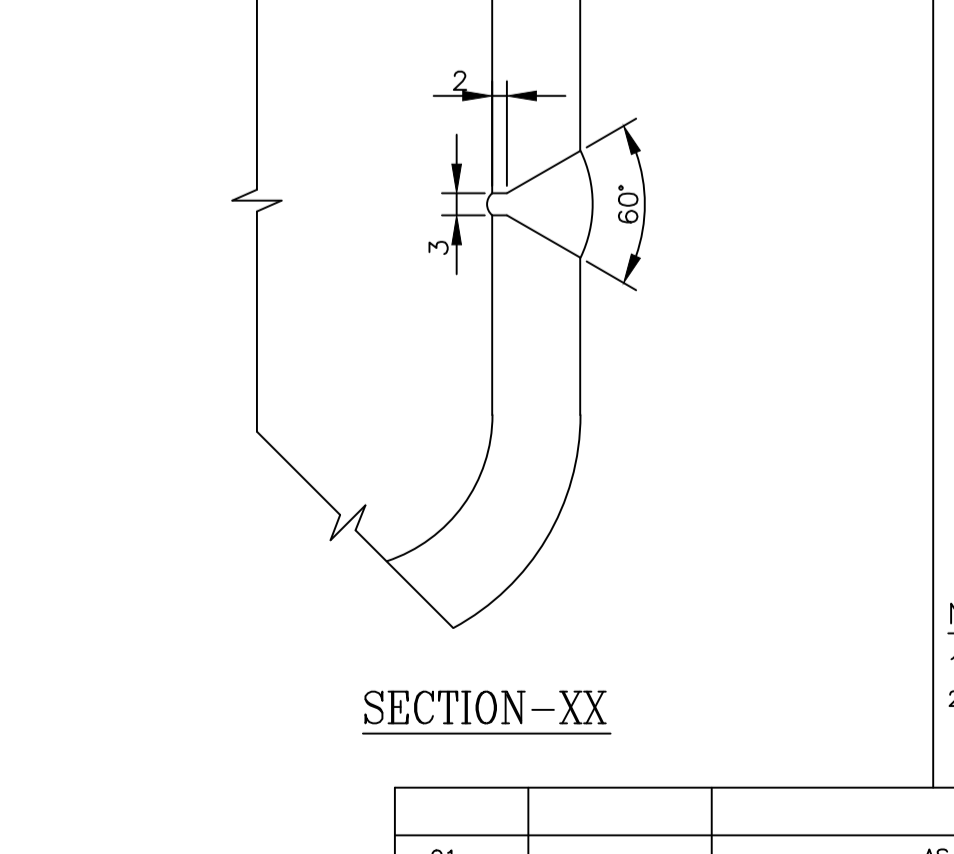
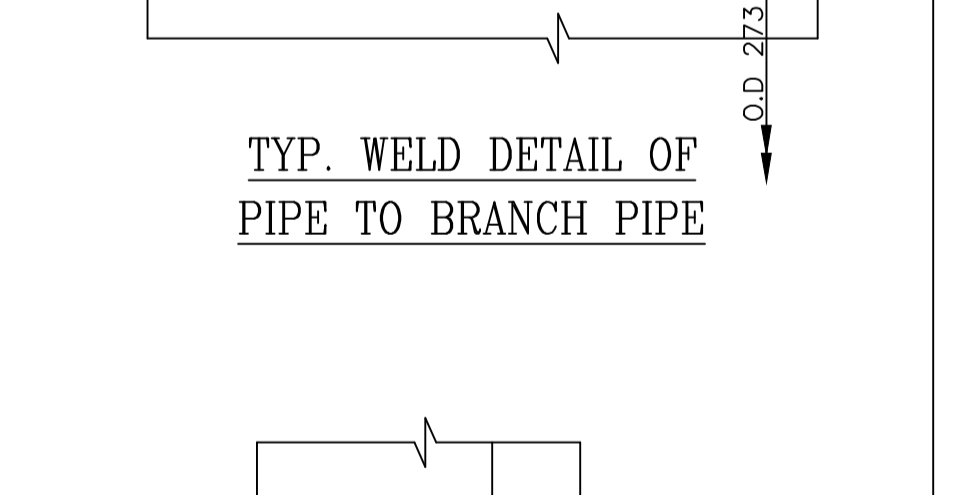
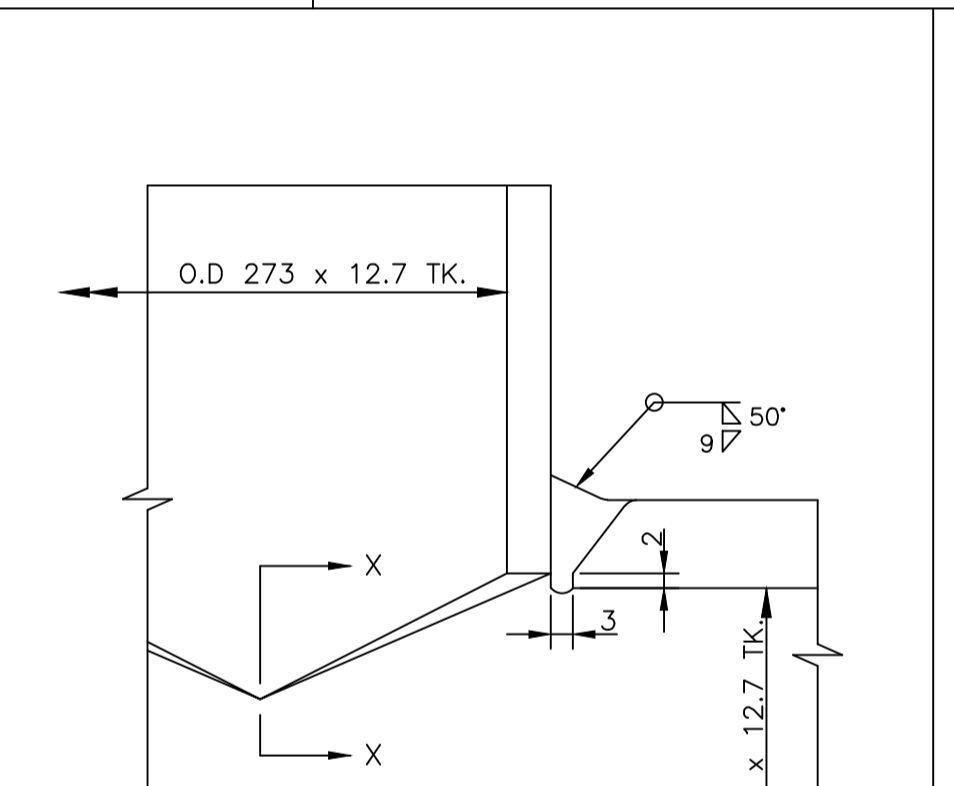
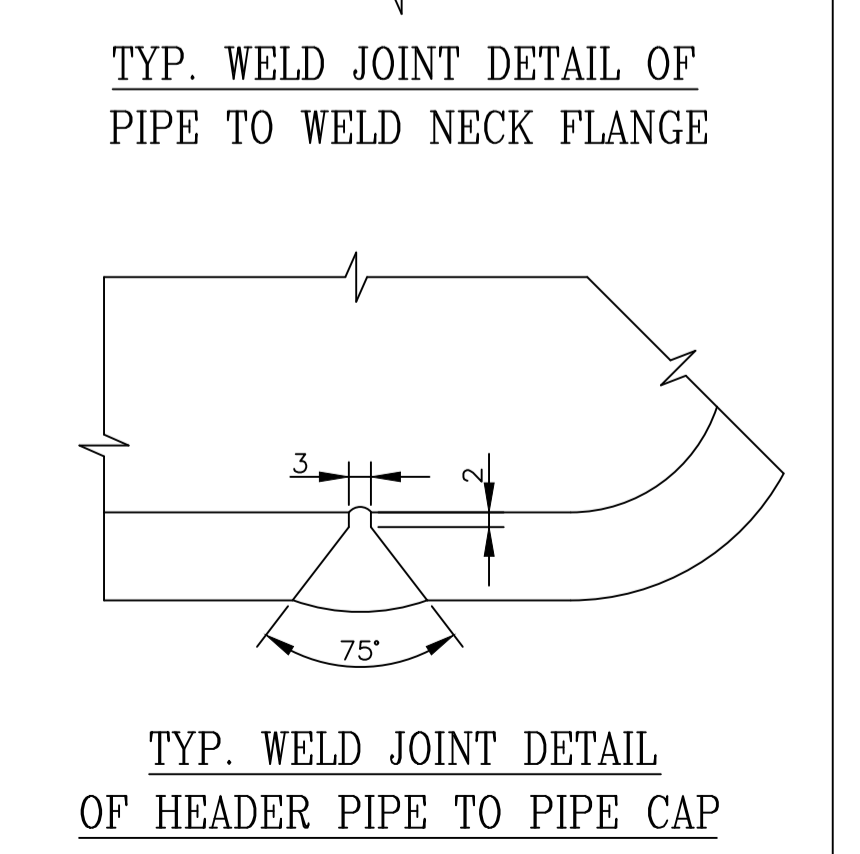
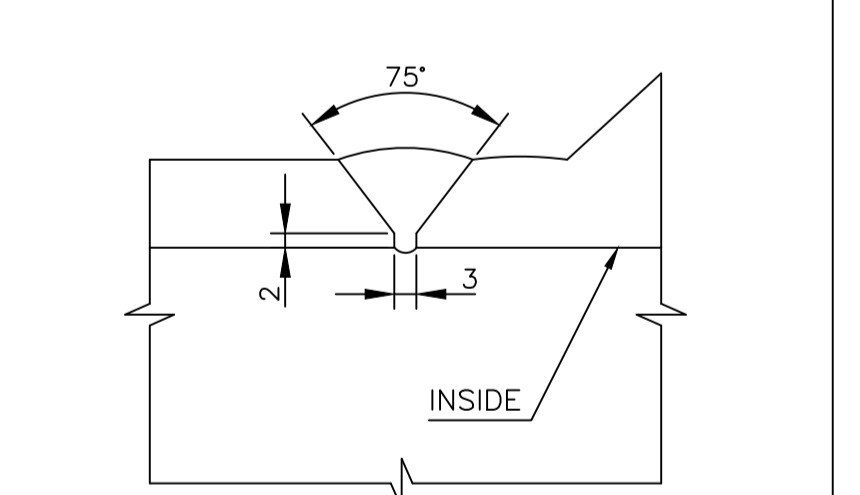
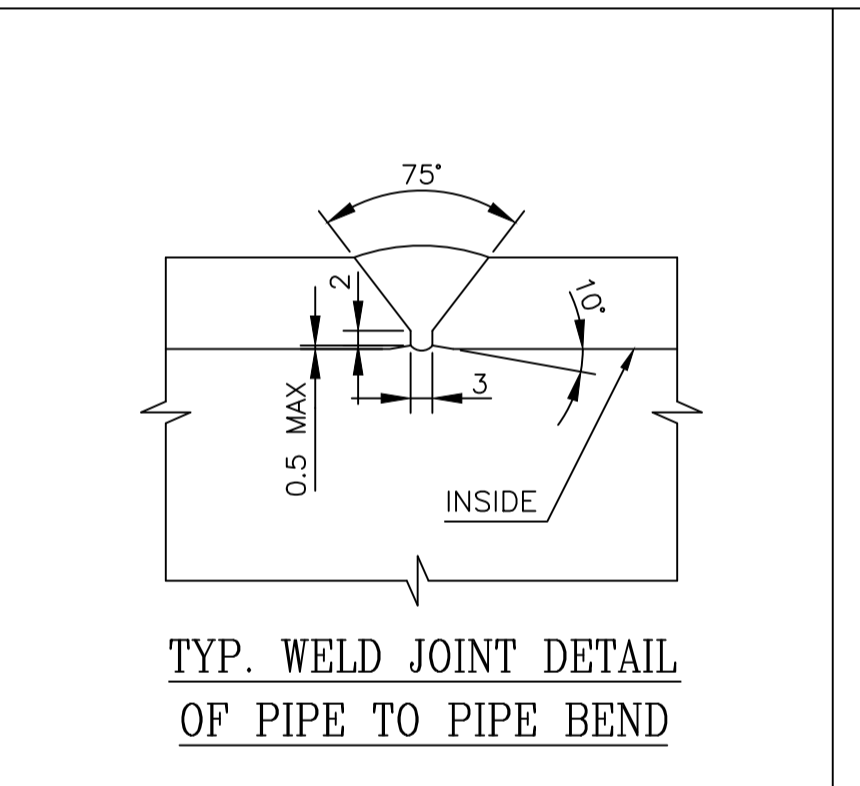
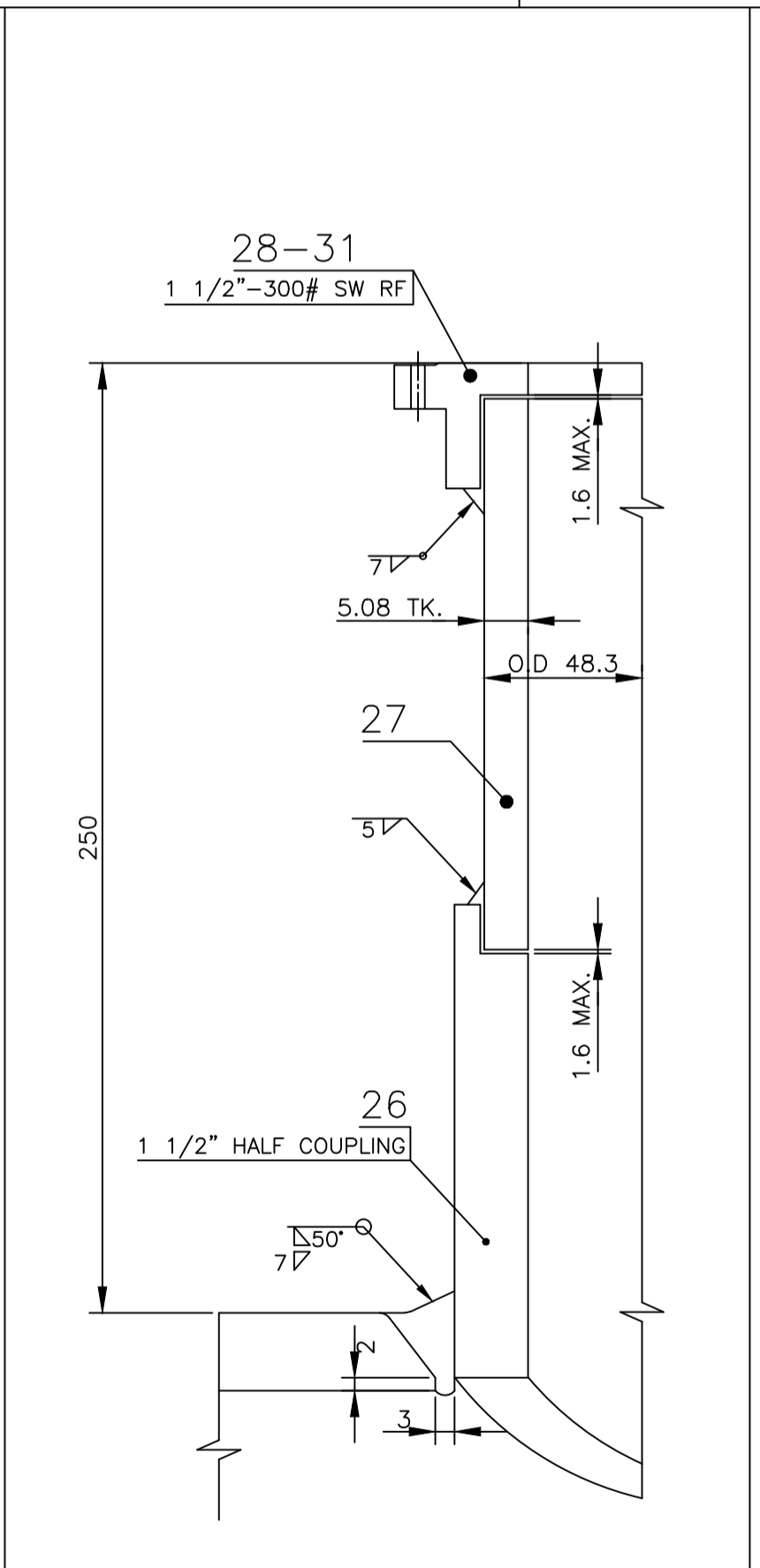
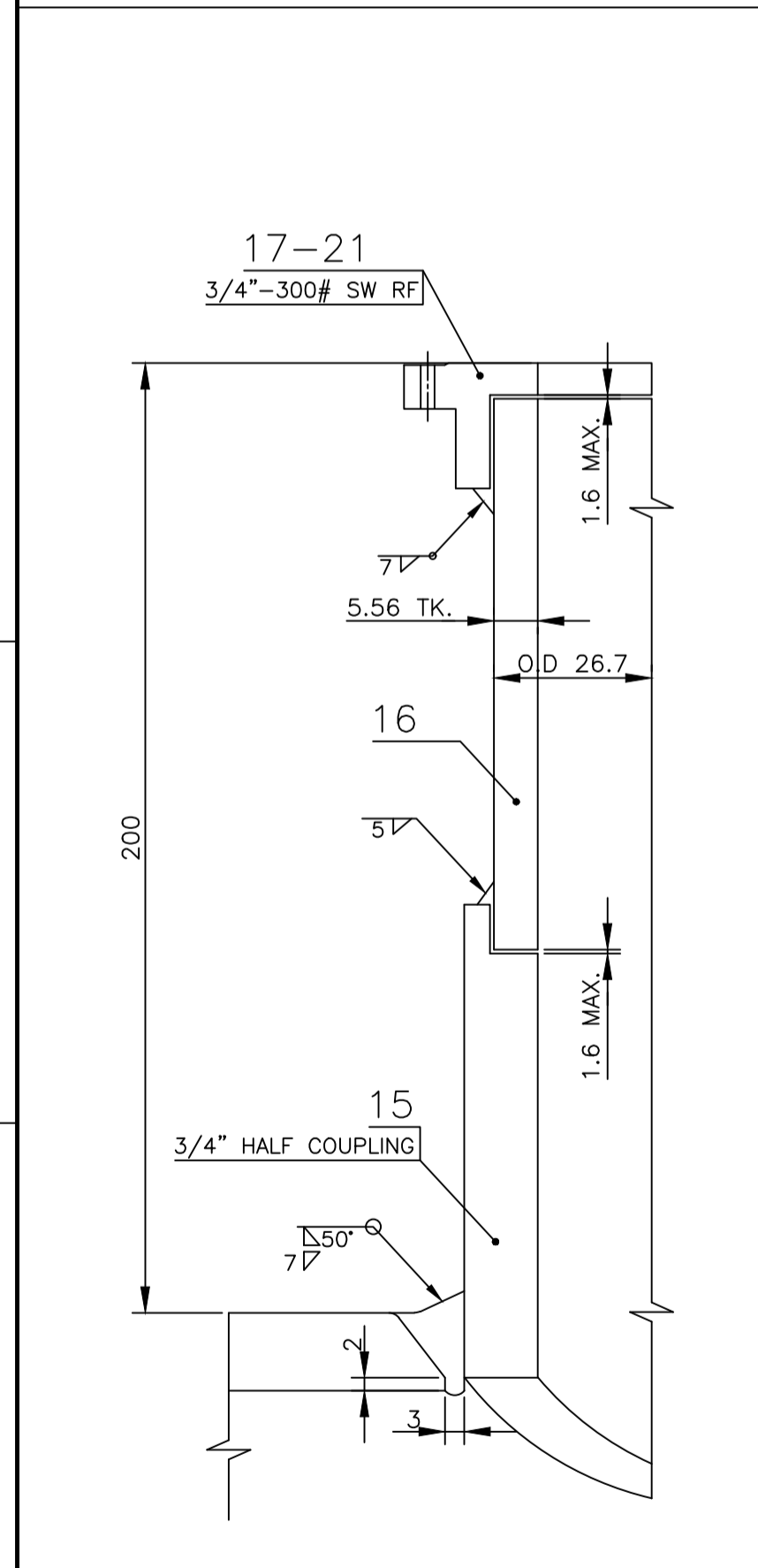
TITLE: COIL ASSEMBLY FOR FGR HEATER
DRAWING NO: 1-11-001-U818
REV: OA



DESIGN DATA :
 DESIGN PRESSURE : 17.0Kg/cm2(g)
 DESIGN TEMPERATURE : 125 °C
 HYDRO TEST PRESSURE : 25.5 Kg/cm2(g)
 RADIOGRAPHY : 100%
 CORROSION ALLOWANCE : 3.0 mm
 HEAT TREATMENT : NIL

AS-BUILT

ITEM NUMBER	DESCRIPTION	STD.	DRAWING NUMBER	ITEM NO. VAR NO.	MATERIAL CODE	A/C/P UNIT	UNIT WEIGHT	QUANTITY	ZONE
36	INSULATION 100 THK.				ROCK WOOL		AS RECD.		
35	INSULATION 100 THK.				ROCK WOOL		AS RECD.		
34	PIPE O.D.168.3 x 7.11 THK. x 600Lg.				150821590000		16.92		
33	PIPE O.D.168.3 x 7.11 THK. x 850Lg.				SA 106 Gr.B		23.97		
32	PIPE O.D.273 x 12.7 THK. x 1520Lg.				156051050000		123.88		
31	STUD WITH 2 NUTS 3/4" UNC (M20) x 90Lg.				SA 193 GR.7/SA 194 GR.8		0.28		
30	STUD WITH 2 NUTS 3/4" UNC (M20) x 90Lg.				SA 193 GR.7/SA 194 GR.8		0.28		
29	GASKET 1 1/2" x 300 #				591544580000		-		
28	S.W.FLANGE 1 1/2" x 300 #				156118470000		2.7		
27	PIPE O.D.48.3 x 5.08 THK. x 250Lg.				SA 106 Gr.B		1.35		
26	HALF COUPLING 1 1/2" x 300#				156210110000		0.8		
25	PIPE O.D.168.3 x 7.11 THK. x 600Lg.				SA 106 Gr.B		2		
24	PIPE O.D.168.3 x 7.11 THK. x 520Lg.				150821590000		14.66		
23	PIPE O.D.168.3 x 7.11 THK. x 1508Lg.				SA 106 Gr.B		42.52		
22	PIPE O.D.168.3 x 7.11 THK. x 600Lg.				150821590000		16.92		
21	BLIND FLANGE 3/4" x 300 #				156111420000		1.4		
20	NUTS 5/8" UNC (M18)				SA 105		2		
19	NUTS 5/8" UNC (M18) x 60Lg.				190017240000		0.02		
18	GASKET 3/4" x 300 #				SA 194 GR.8		8		
17	S.W.FLANGE 3/4" x 300 #				190254600000		0.25		
16	PIPE O.D.26.7 x 3.56 THK. x 200Lg.				SA 193 GR.7		4		
15	HALF COUPLING 3/4" x 300#				190053630000		-		
14	STUD WITH 2 NUTS 3/4" UNC (M20) x 125Lg.				SA 193 GR.7/SA 194 GR.8		0.46		
13	STUD WITH 2 NUTS 3/4" UNC (M20) x 125Lg.				SA 193 GR.7/SA 194 GR.8		0.46		
12	GASKET 6" x 300 #				591544720000		-		
11	W.N.FLANGE 6" x 300 #				SA 105		30.4		
10	PIPE O.D.168.3 x 7.11 THK. x 600Lg.				SA 106 Gr.B		16.92		
09	L.R.ELBOW O.D.168.3 x 7.11 THK.				156153400000		10.9		
08	PIPE O.D.168.3 x 7.11 THK. x 856Lg.				SA 234 Gr.B		10		
07	PIPE CAP 10"NB x SCH 60 x 12.7 THK.				150821590000		24.1		
06	HEADER PIPE O.D.273 x 12.7 THK. x 2835Lg.				SA 106 Gr.B		2		
05	HEADER PIPE O.D.273 x 12.7 THK. x 370Lg.				156230760000		9.07		
04	STUD WITH 2 NUTS 1" UNC (M27) x 155Lg.				SA 234 Gr.B		4		
03	STUD WITH 2 NUTS 1" UNC (M27) x 155Lg.				156051050000		231		
02	GASKET 10" x 300 #				SA 106 Gr.B		1		
01	W.N.FLANGE 10" x 300 #				156051050000		30.5		



NOTES :
 1. ALL BUT WELDS ARE FULL PENETRATION WELDS
 2. FLANGE RAISED FACE SHALL HAVE SMOOTH FINISH FOR 125 AARH

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Bharat Heavy Electricals Ltd
 UNIT: HEAVY PLATES & VESSELS PLANT
 VISAKHAPATNAM-530012

DRN: V.RAMESH BABU
 CHD: A.N.V.K.KISHORE
 APPD: Y.P.KUMAR

DATE: 28-02-2019
 DATE: 28-02-2019
 DATE: 28-02-2019

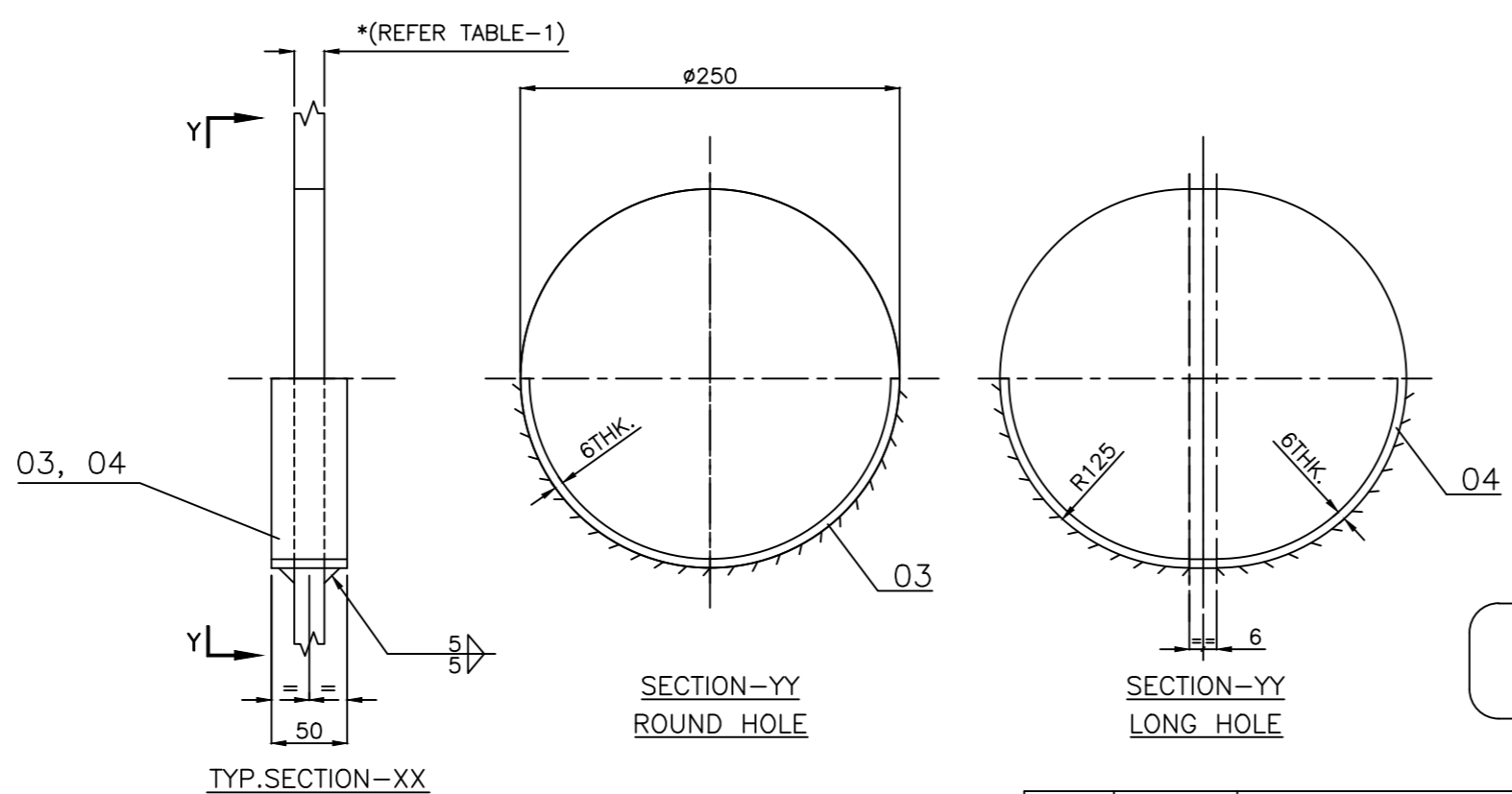
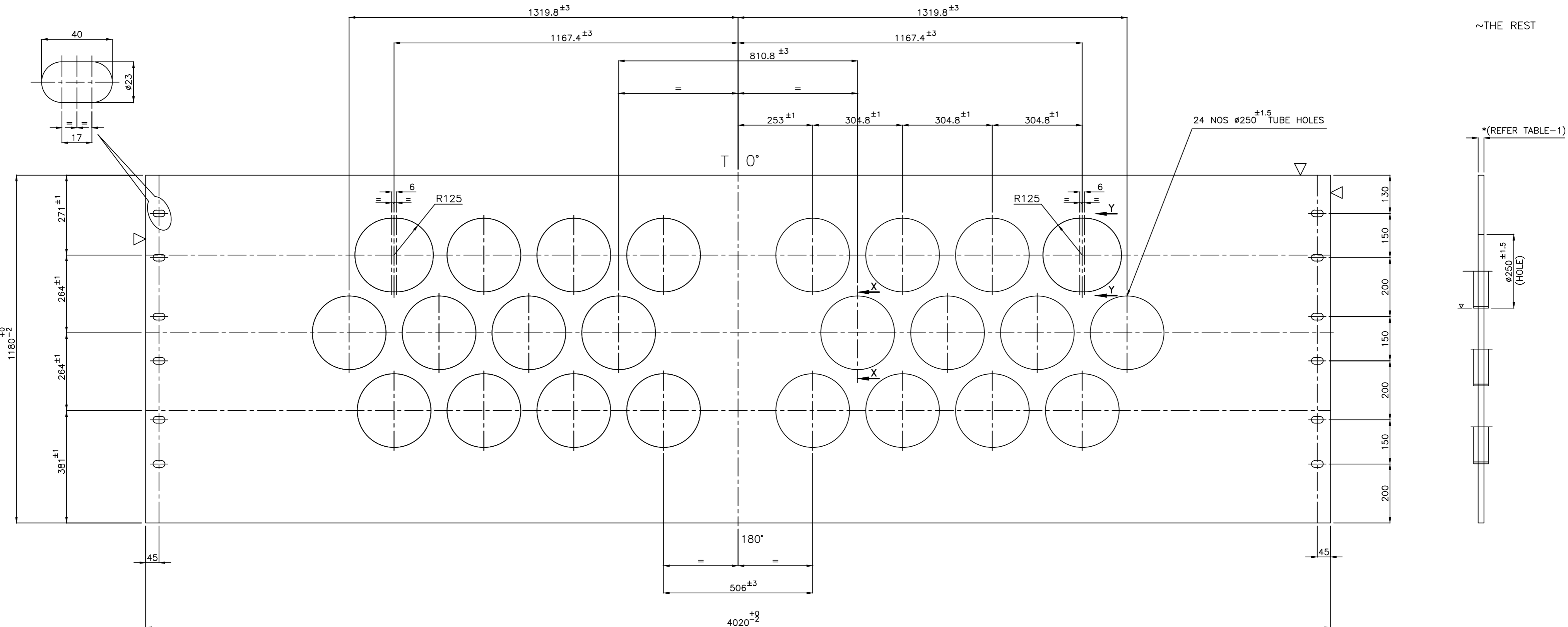
DEPT: ALL DIMENSIONS ARE IN MM
 PROJECTION: REF TO ASSY / OLD DWG
 SCALE: N.T.S.
 WEIGHT (Kg): 1331.98

REF TO ASSY / OLD DWG: SE PL-4014 01-A-021
 DRAWING NO.: 1-11-002-00021
 REV: OA

REV NO.	ZONE	AS-BUILT	BRIEF RECORD OF REVISIONS	P.P.D.	CHD.	Y.P.K.	APPD.
01							

FORM NO. 0425/2

A1 SIZE



NOTES :

1. DEBURR ALL TUBE HOLES AND SHARP EDGE ROUNDED OFF ALL SHARP CORNERS.
2. MATCH MARK 'T' DENOTES TOP AND SHALL BE PUNCHED AT 0° ORIENTATION.
3. THE OUTER EDGES ALL ROUND SHALL BE GROUND SMOOTH.

VARIANT NUMBER	ITEM NUMBER	DESCRIPTION	STD	DRAWING NUMBER	ITEM NO	MATERIAL CODE	A/C/S	UNIT WEIGHT	CS	ZONE
04	HALF SLEEVE 6 TK x 50 x 400					159420150000		0.94		
						SA 204 Gr. A/B		6		
03	HALF SLEEVE 6 TK x 50 x 393					159420150000		0.92		
						SA 204 Gr. A/B		66		
02	MIDDLE TUBE SHEET 40 TK x 1180 x 4020					159420230000		1489.49		
						SA 204 Gr. A/B		1		
01	END TUBE SHEETS 20 TK x 1180 x 4020					159420200000		744.74		
						SA 204 Gr. A/B		2		

AS-BUILT

REV NO.	ZONE	BRIEF RECORD OF REVISIONS	PPD.	CHD.	APPD.
01		AS-BUILT	P.J	KK	YPK

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Bharat Heavy Electricals Ltd
 UNIT: HEAVY PLATES & VESSELS PLANT
 VISAKHAPATNAM-530012

DRN: V.RAMESH BABU
 CHD: A.N.V.KRISHNA KISHORE
 APPD: Y.PRASADNA KUMAR

DATE: 28-02-2019
 DATE: 28-02-2019
 DATE: 28-02-2019

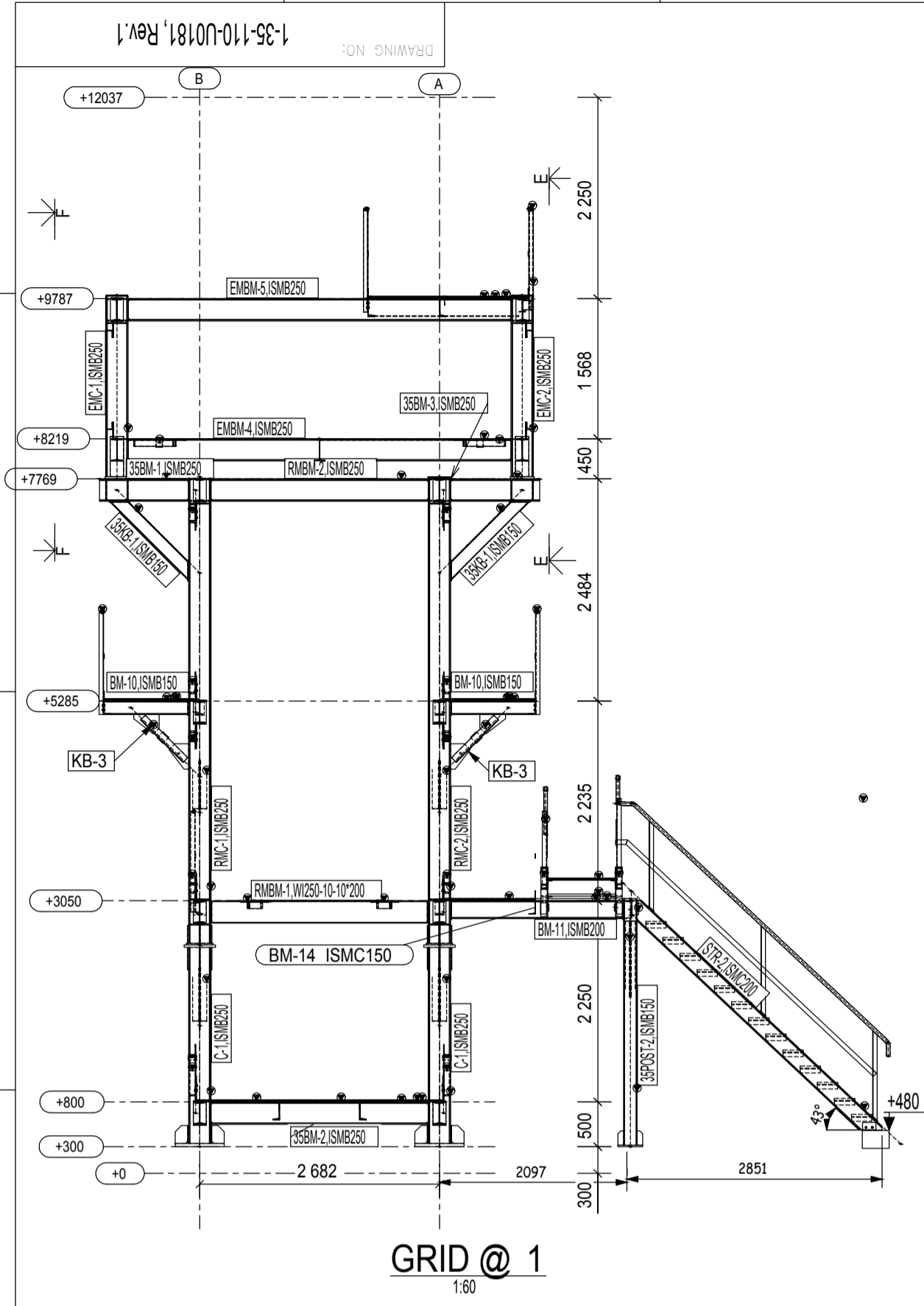
DEPT: ALL DIMENSIONS ARE IN MM
 PROJECTION: N.T.S
 SCALE: N.T.S
 WEIGHT (Kg): 3045.33

REF TO ASSY / OLD DWG: SE PL-4014 01-P-102

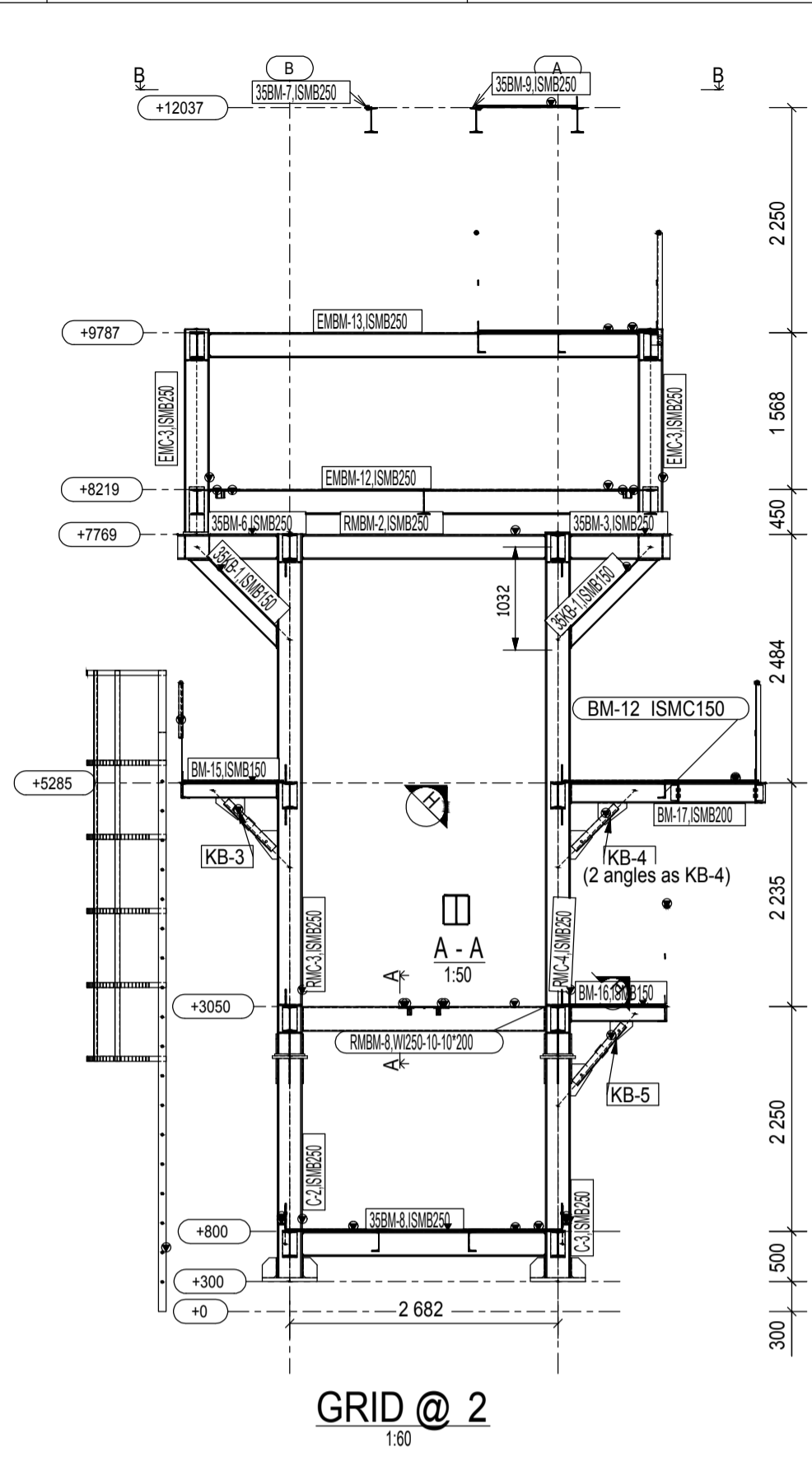
TITLE: TUBE SHEET OF ECONOMISER FOR FGR HEATER

DRAWING NO: 2-48-810-U6001
 REV: OA

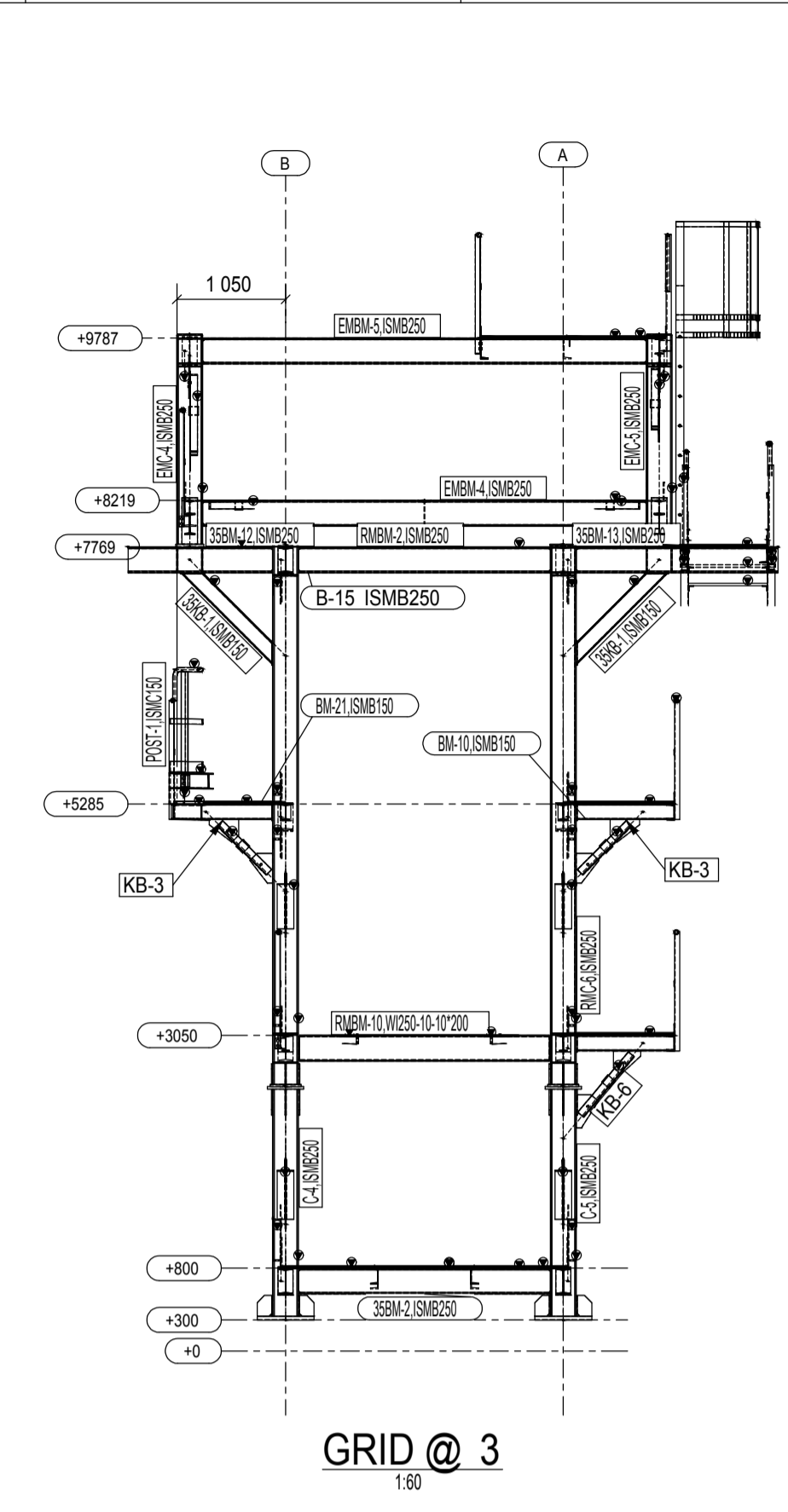
CUSTOMER NO.: 4051



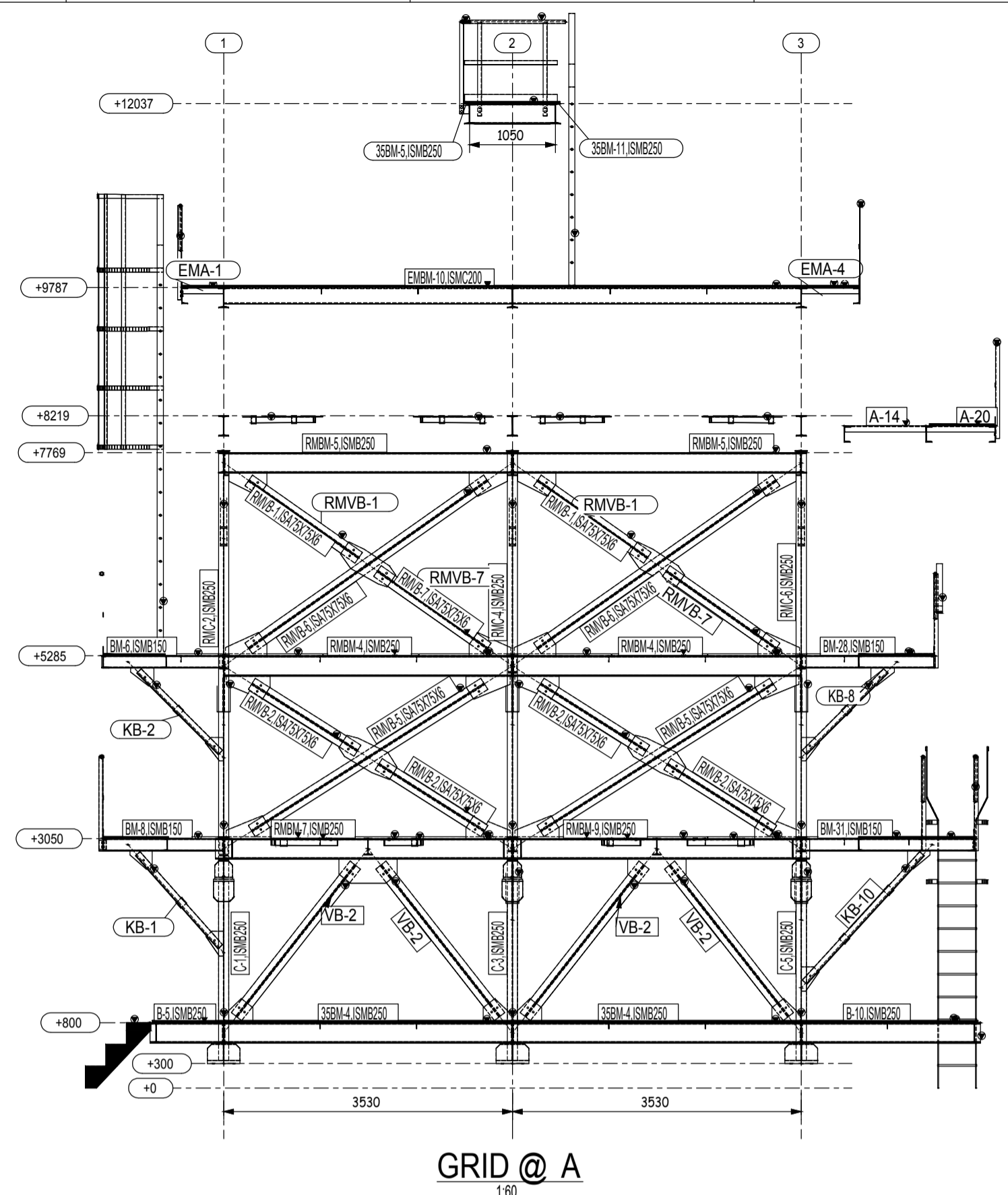
GRID @ 1
1:60



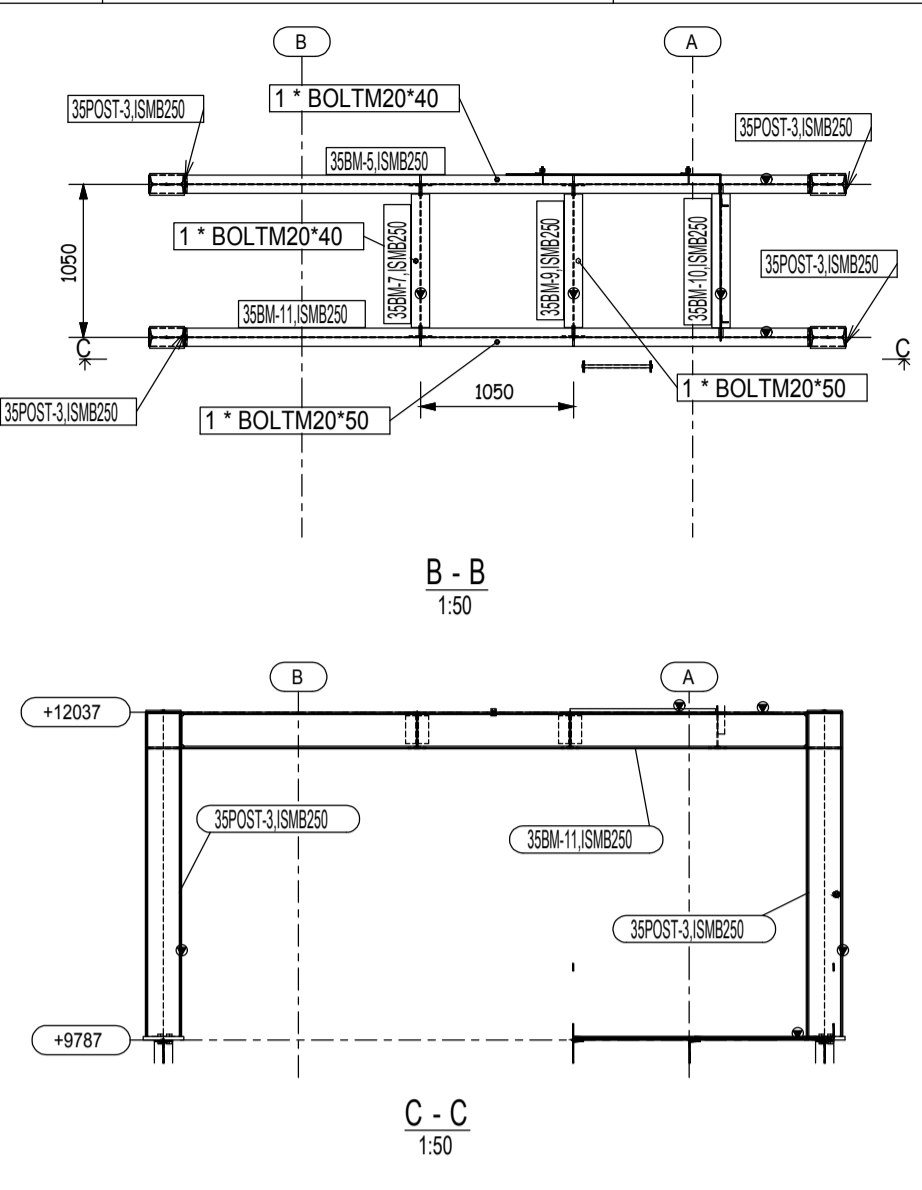
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GRID @ 3
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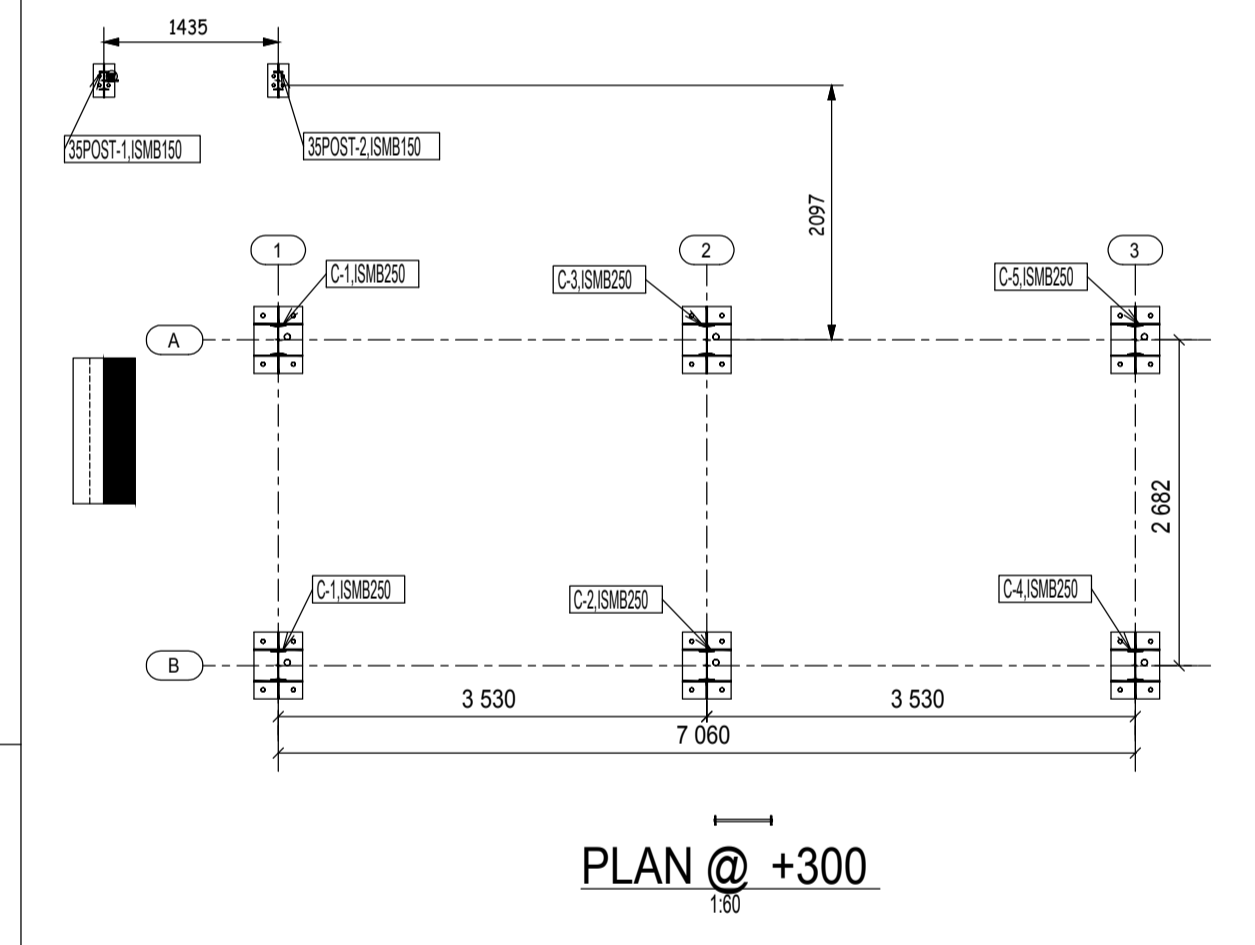


GRID @ A
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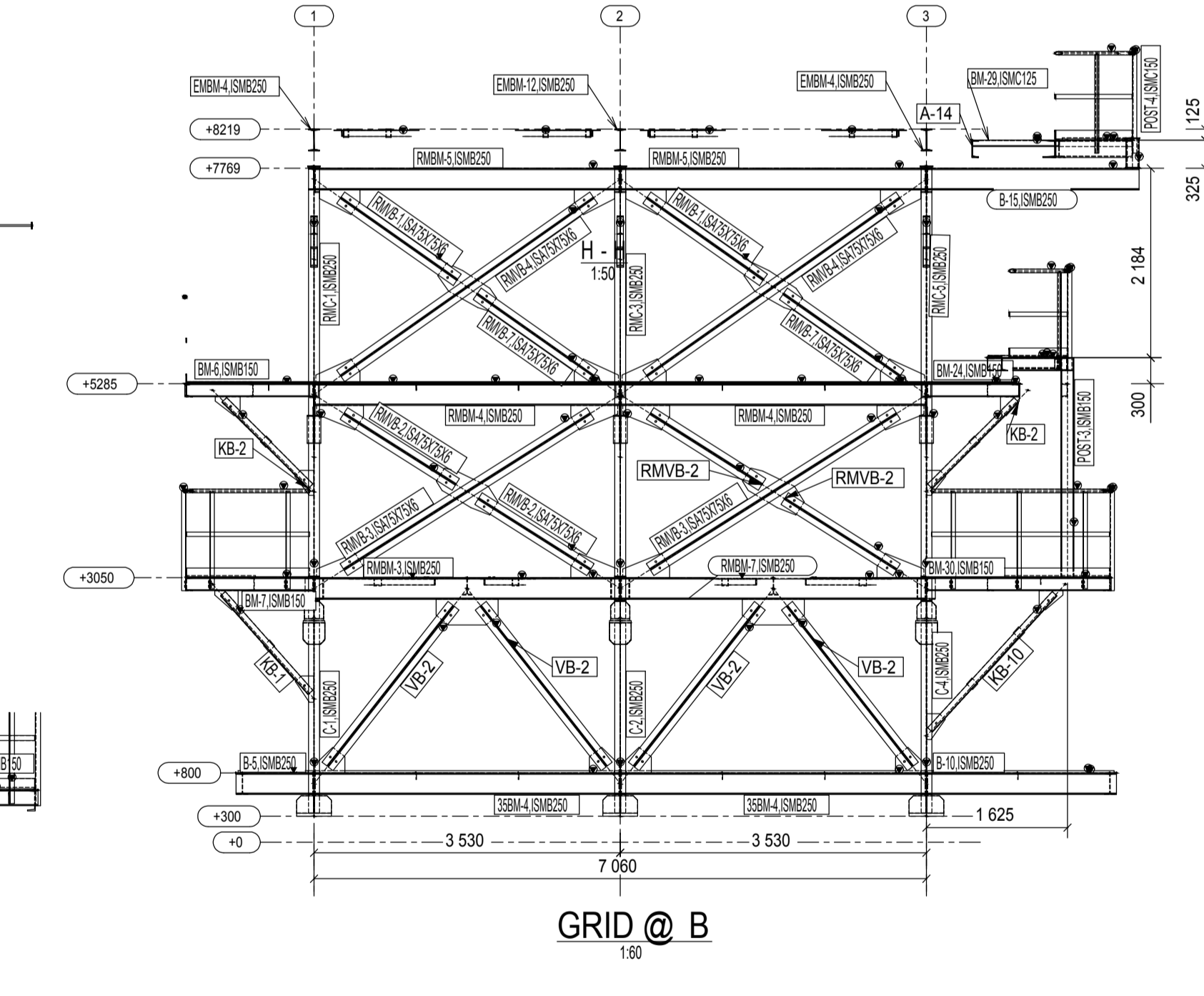


B - B
1:50

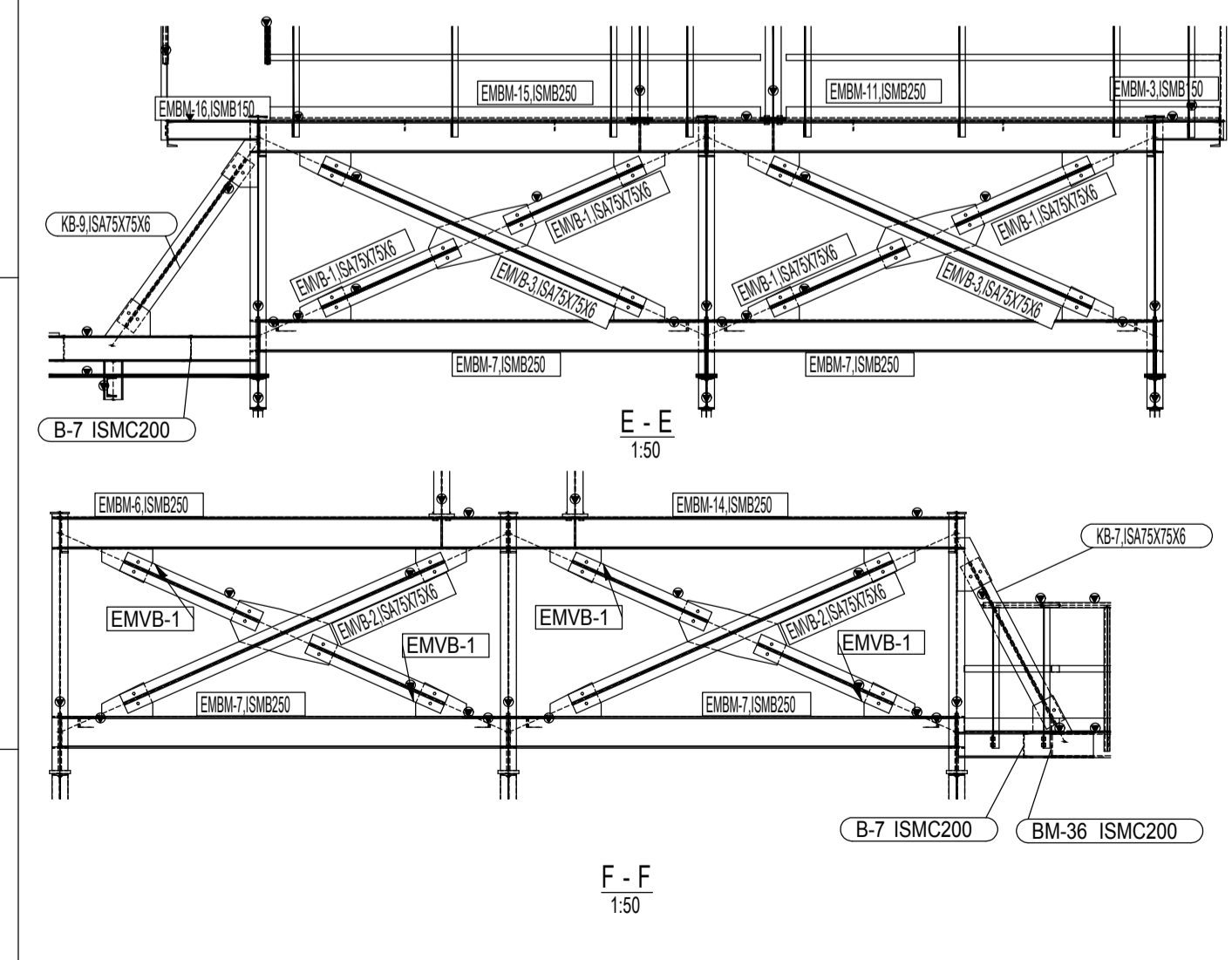
C - C
1:50



PLAN @ +300
1:30



GRID @ B
1:60



E - E
1:50

F - F
1:50

NOTE:
1. ALL BRACING MEMBERS ARE ISA75X75X6 U.N.O
2. REFER 2-35-110-00003 FOR WELD AND CONNECTION DETAILS

ITEM	PARTS INCLUDED	DRAWING NO	WEIGHT	QUANTITY
09	EM-25 TO EM-42, HANGER-1 & 2, KB-1 TO KB-6, POST-1 TO POST-4, A-20, B-1 TO B-16	1-36-310-00011		1
08	EM-1 TO EM-24, KB-7 TO KB-10, A-1 TO A-19	1-36-310-00010		1
07	RMC-5 TO RMC-6, RMVB-1 TO RMVB-3, RMVB-1 TO RMVB-7	1-35-110-00016		1
06	RMVB-9 TO RMVB-10, RMC-1 TO RMC-4	1-35-110-00015		1
05	RMVB-1 TO RMVB-8	1-35-110-00014		1
04	EMB-15 TO EMB-18, EMC-1 TO EMC-5, EMWB-1 TO EMWB-3	1-35-110-00013		1
03	EMA-1 TO EMA-4, EMMB-1 TO EMMB-14	1-35-110-00012		1
02	35POST-2, 3, C-1 TO C-5, VB-1, VB-2	1-35-110-00011		1
01	35BM-1 TO 35BM-13, 35KB-1, 35POST-1	1-35-110-00010		1

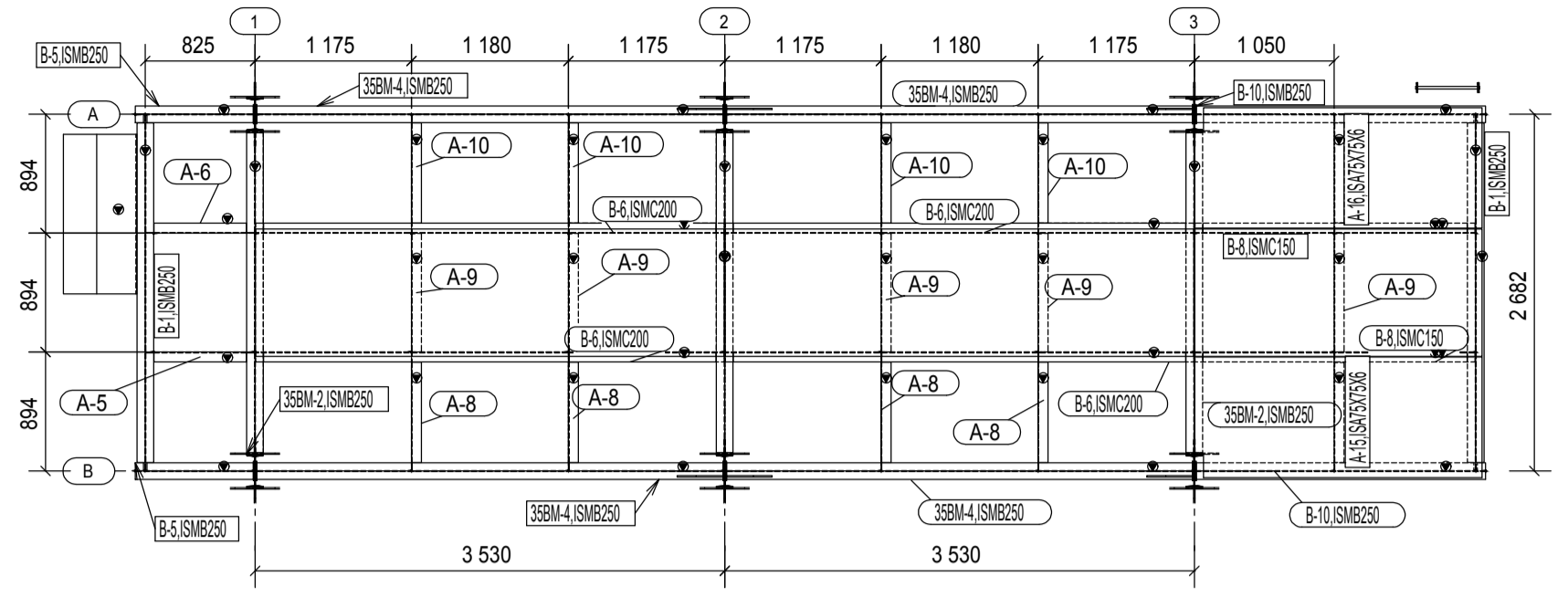
CUSTOMER		M/s.OIL AND NATURAL GAS CORPORATION LTD. DESALTER PLANT-NAVAGAM, AHMEDABAD	
PROJECT		Replacement of FGR heater for Desalter plant	
DRAWN		N.FRAKASH	
CHECKED		NV REDDY	
APPROVED		ESN PRASAD	
DATE		03.04.2017	
TITLE		G.A OF HEATER SUPPORTING STRUCTURE ELEVATION VIEWS	
SCALE		1:50 N.T.S.	
REV.		1	

1	08.7.20	THE DRAWINGS ARE SAME FOR CUSTOMER NOS. 4050 & 4051. THE SAME IS UPDATED IN THE DRAWING TITLE BLOCK	VNR	CHB	ESNP
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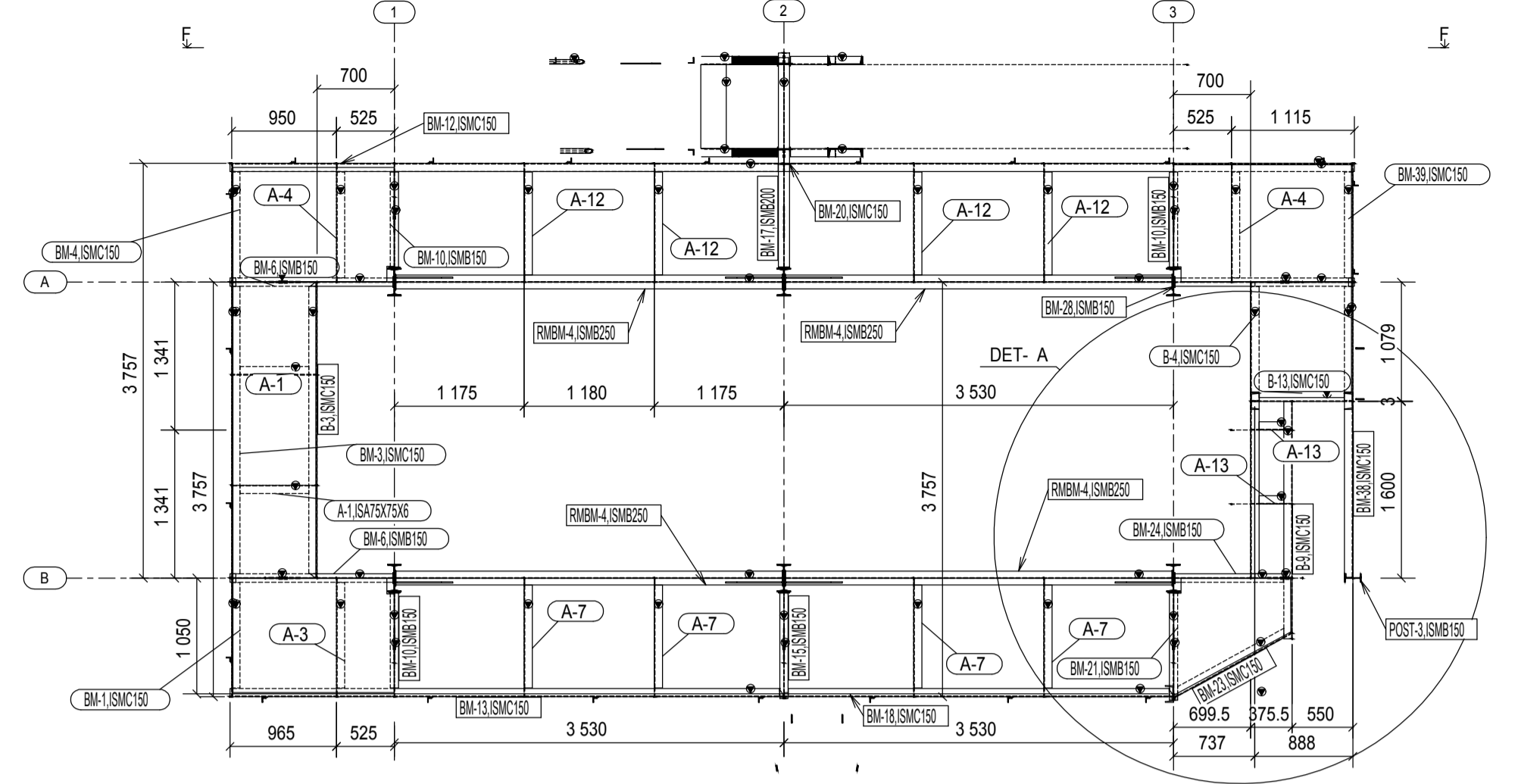
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FORM NO. 0425/2

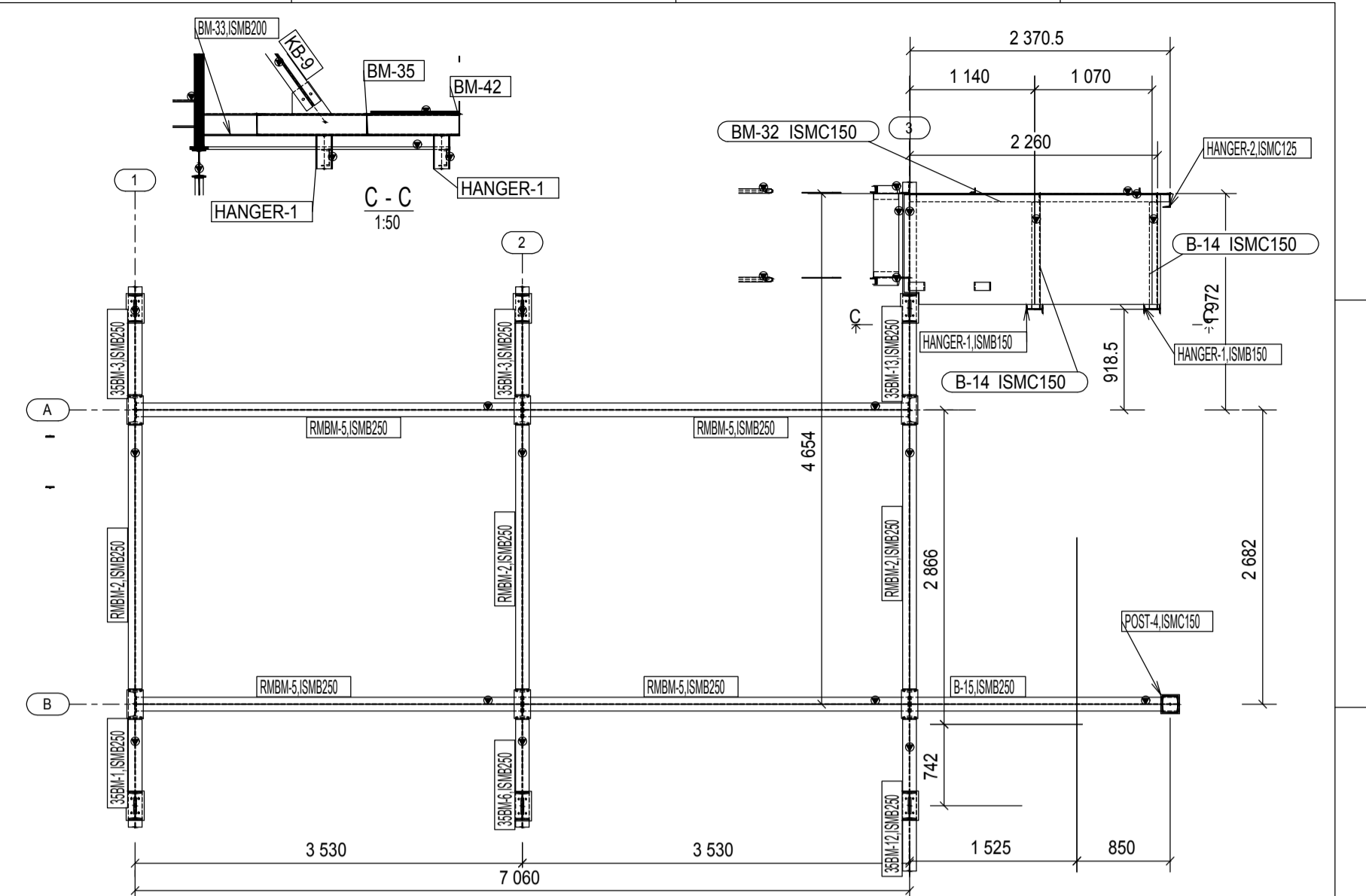
A1 SIZE



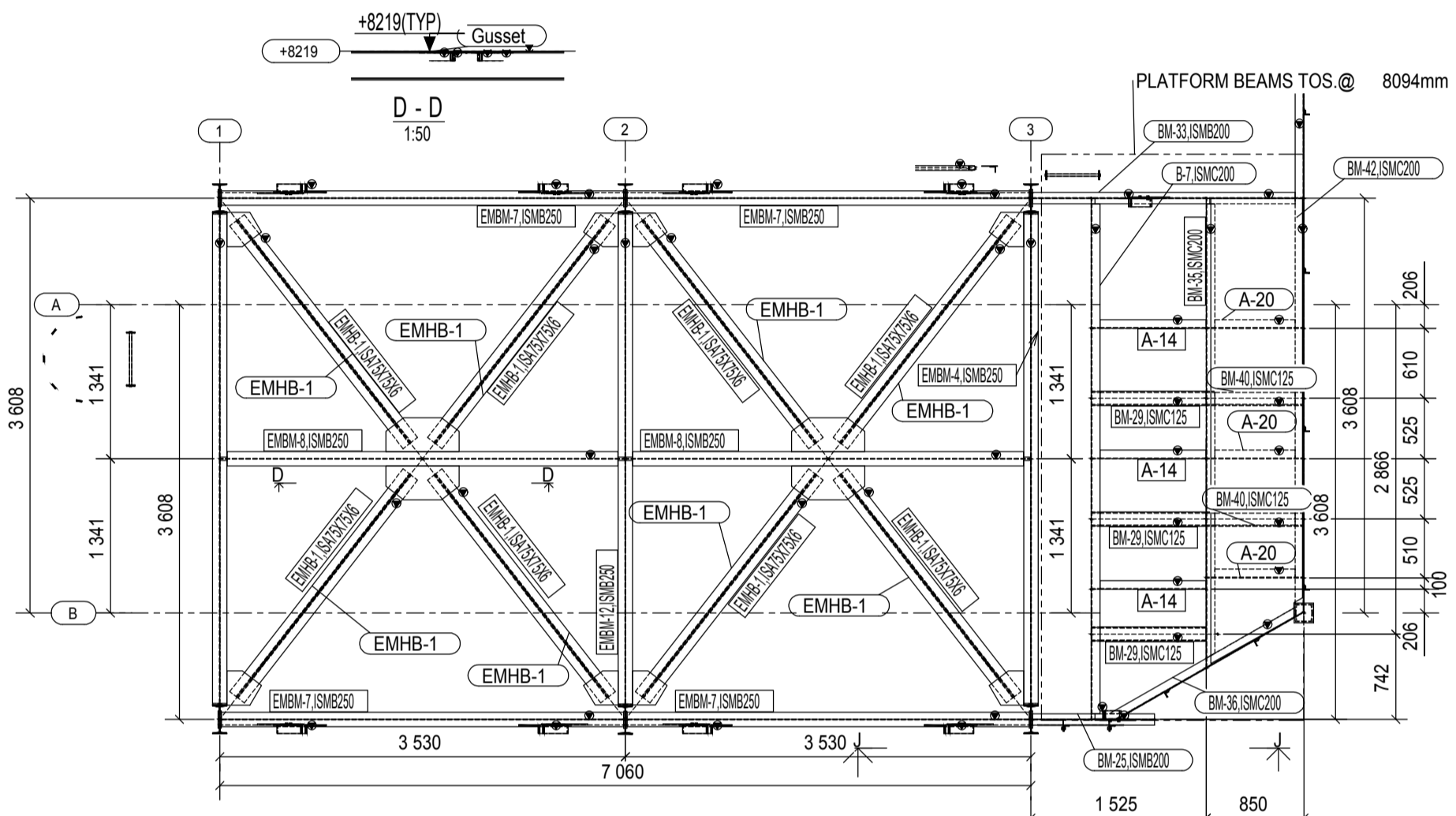
PLAN @ +800
 1:50



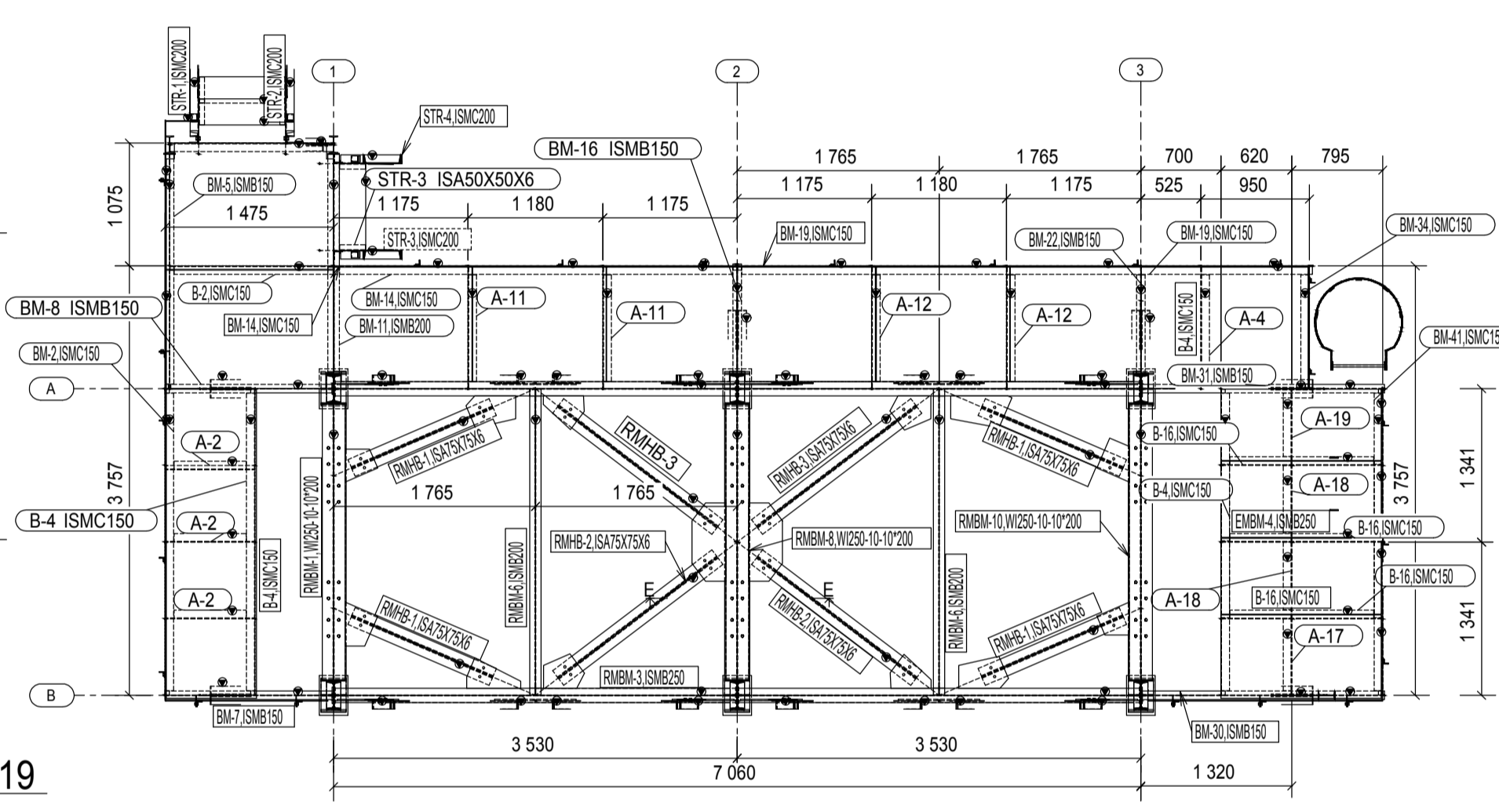
PLAN @ +5285
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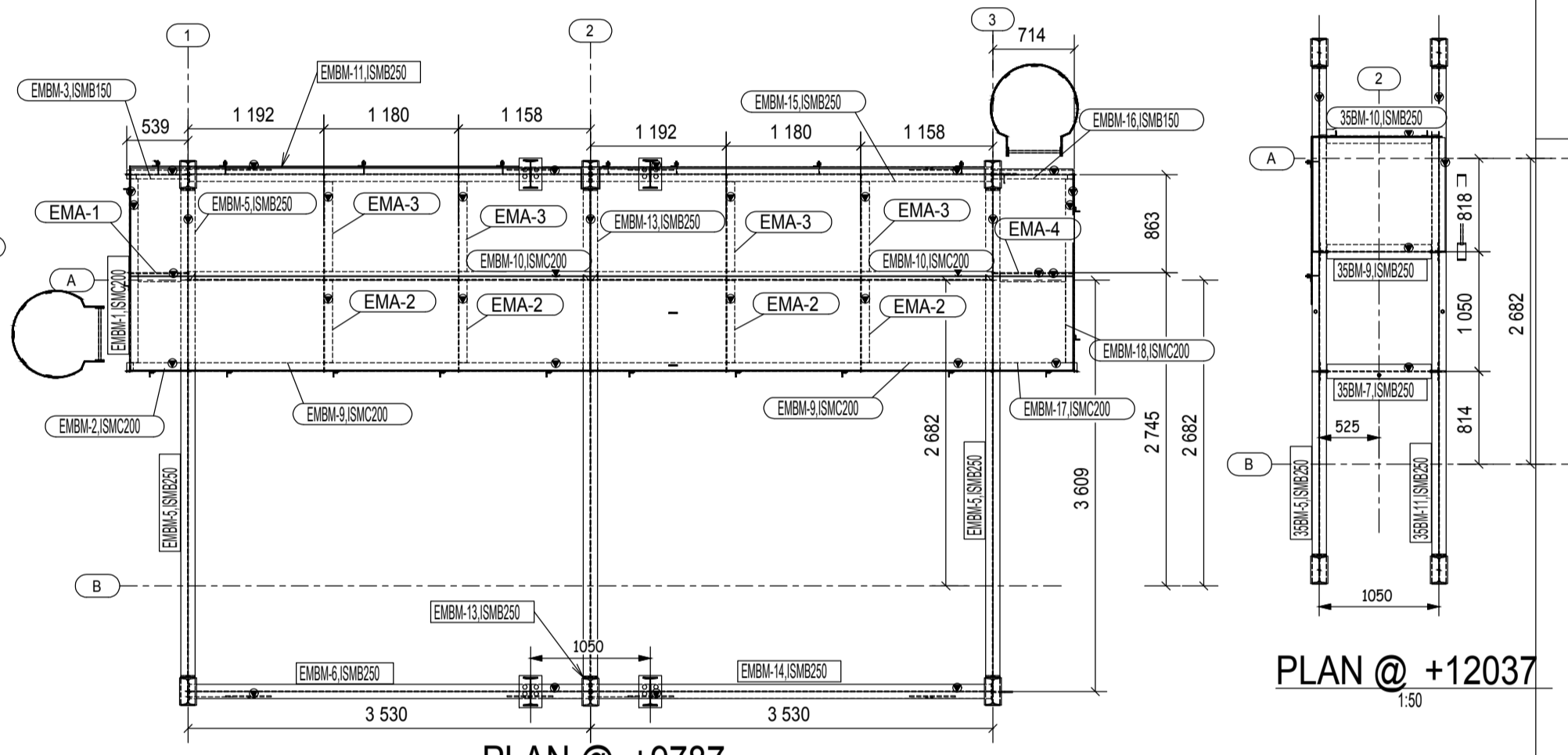
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PLAN @ +8219
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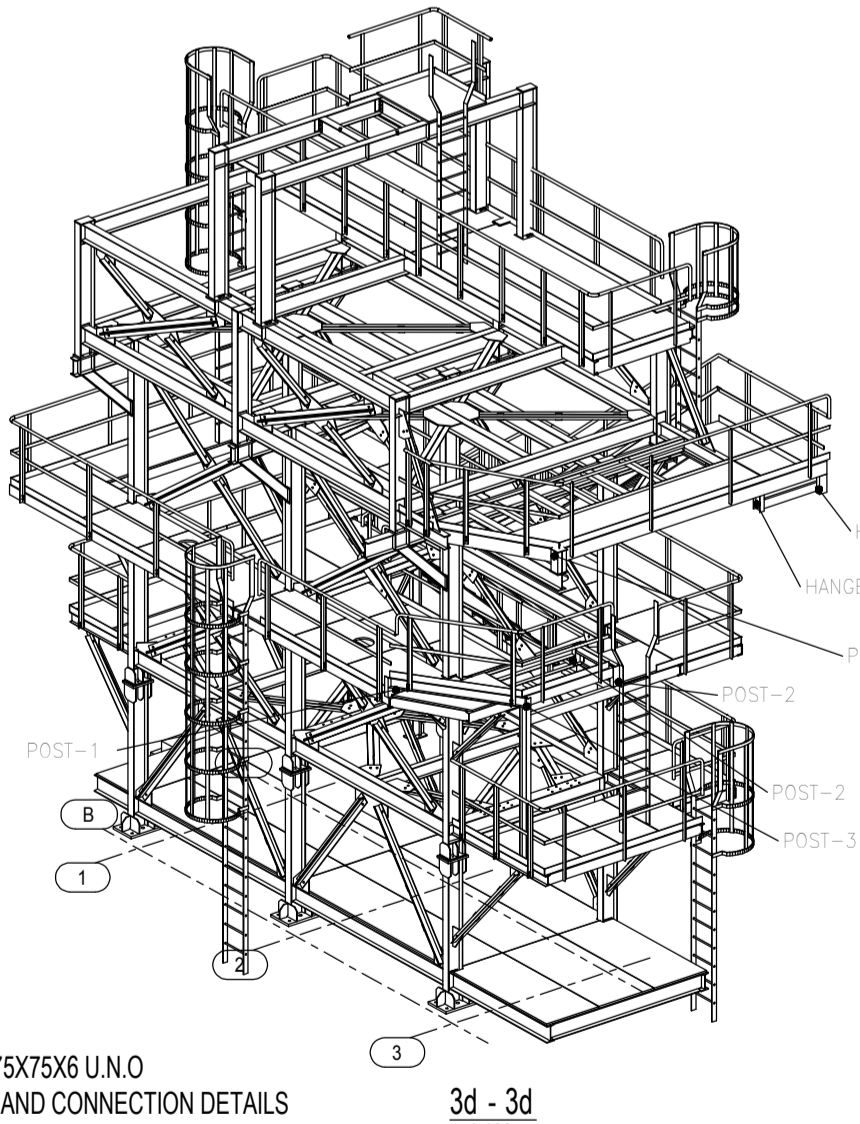
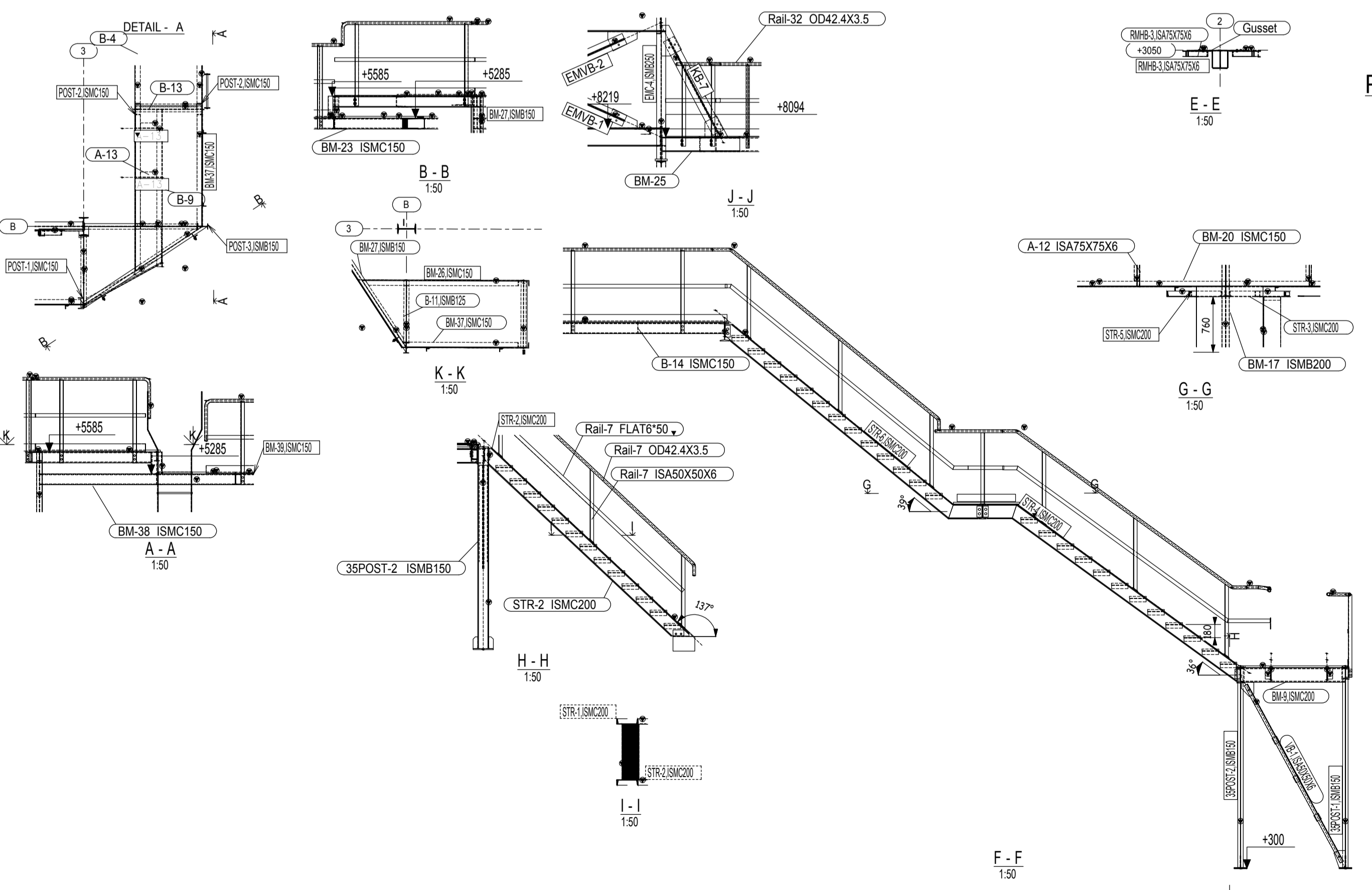


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PLAN @ +9787
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PLAN @ +12037
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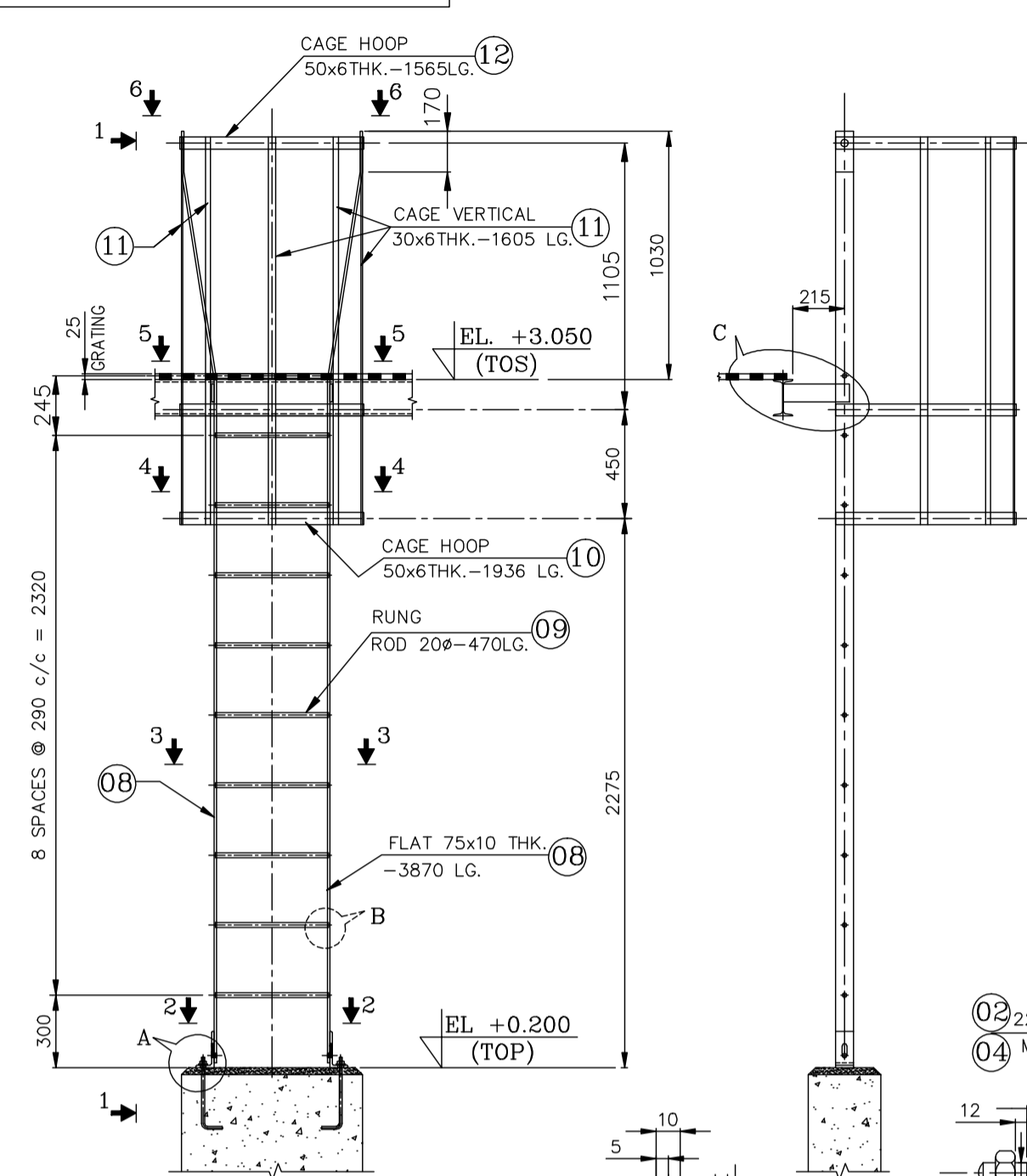


NOTE:
 1. ALL BRACING MEMBERS ARE ISA75X75X6 U.N.O
 2. REFER 2-35-110-00003 FOR WELD AND CONNECTION DETAILS

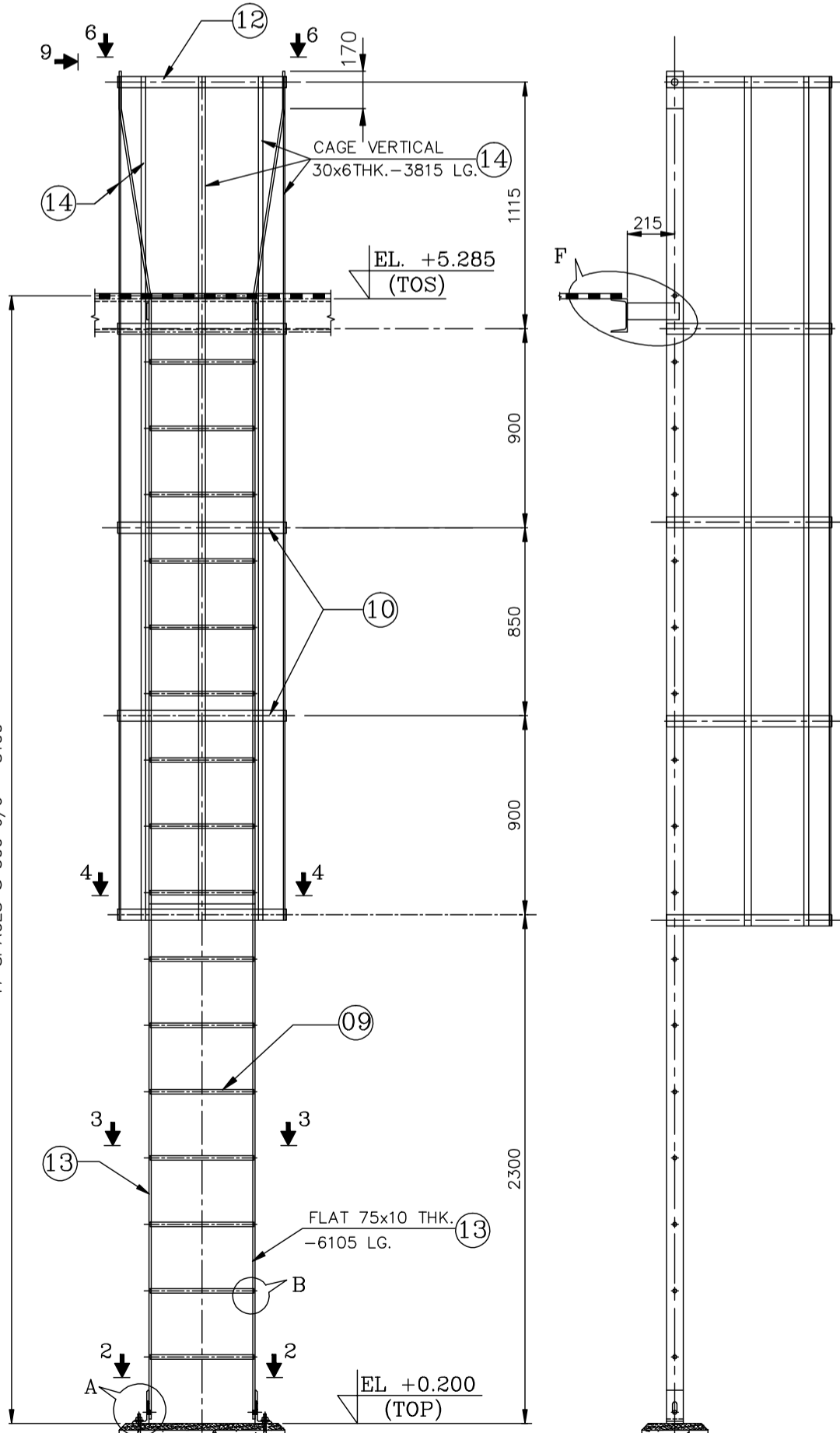
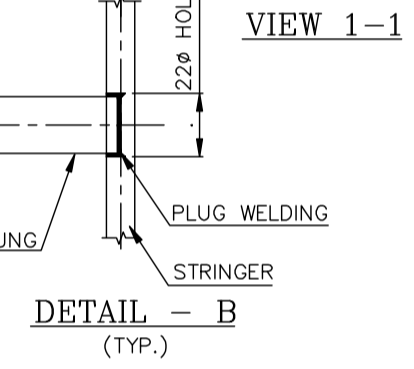
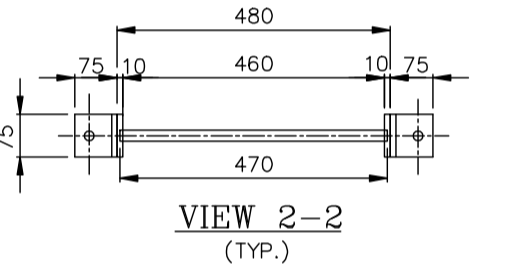
CUSTOMER No. 4050 & 4051

CUSTOMER	M/s.OIL AND NATURAL GAS CORPORATION LTD. DESALTER PLANT-NAVAGAM, AHMEDABAD
PROJECT	Replacement of FGR heater for Desalter plant
DRAWN	N.PRAKASH
CHECKED	N.V.REDDY
APPROVED	ESN PRASAD
DATE	03.04.2017
ALL DIMENSIONS ARE IN MILLIMETRES	
SCALE	1:50 N.T.S.
TITLE	BHARAT HEAVY ELECTRICALS LTD., PLATES & VESSELS PLANT UNIT, VISAKHAPATNAM-530012
TITLE	G.A OF HEATER SUPPORTING STRUCTURE PLAN VIEWS
REV.	1
1	28.7.20 THE DRAWINGS ARE SAME FOR CUSTOMER NOS. 4050 & 4051, THE SAME IS UPDATED IN THE DRAWING TITLE BLOCK

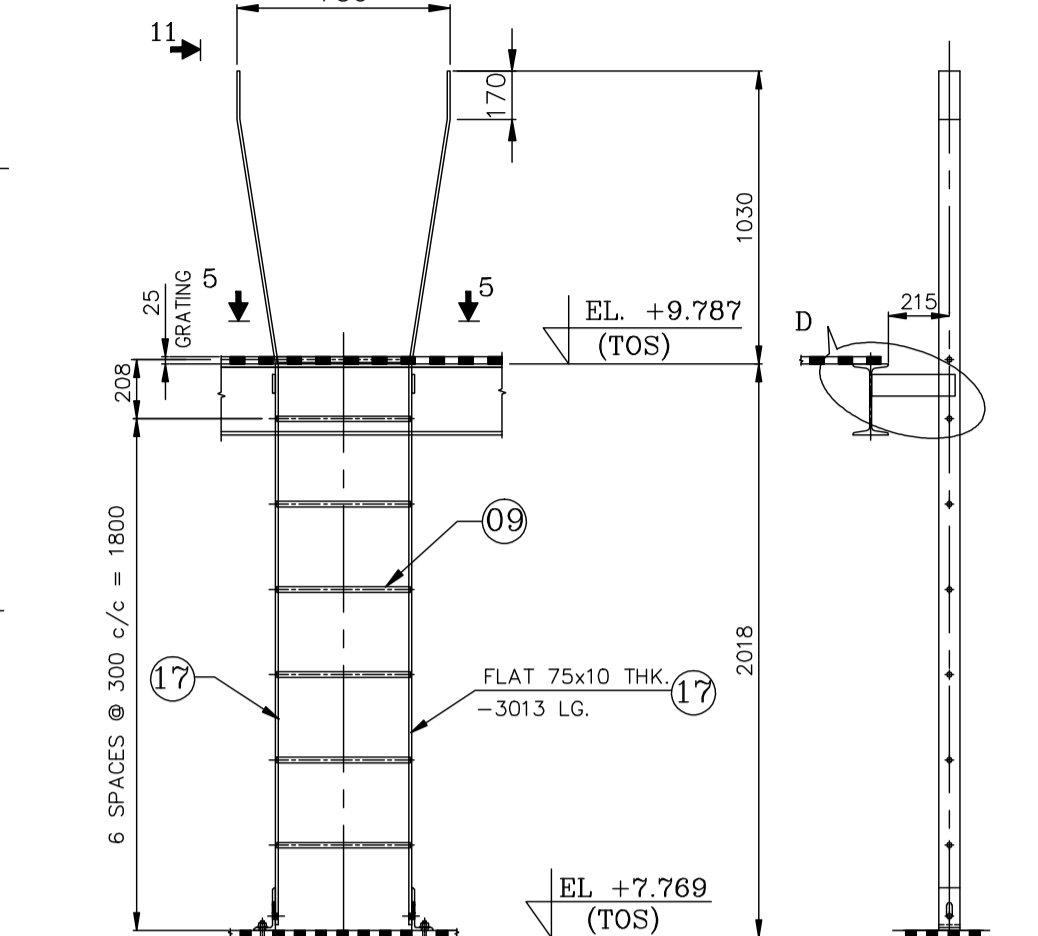
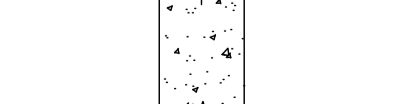
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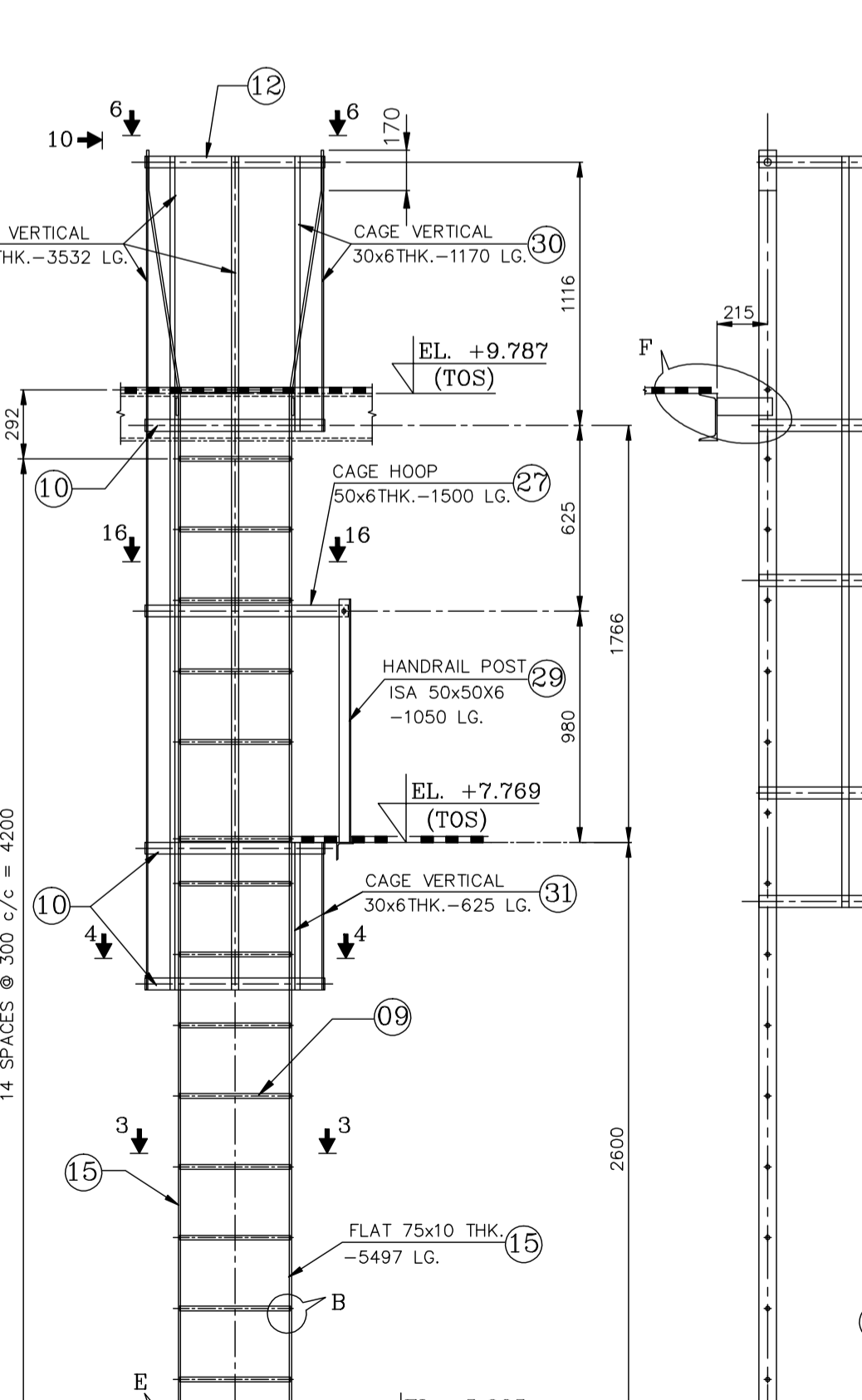
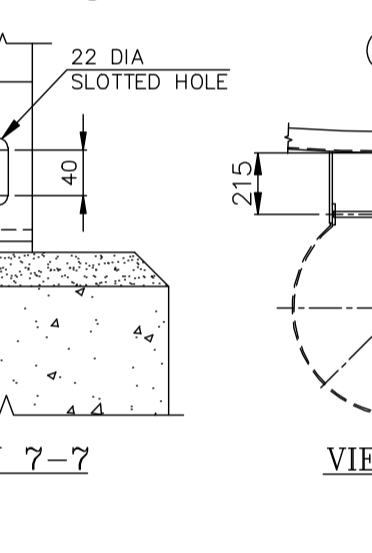
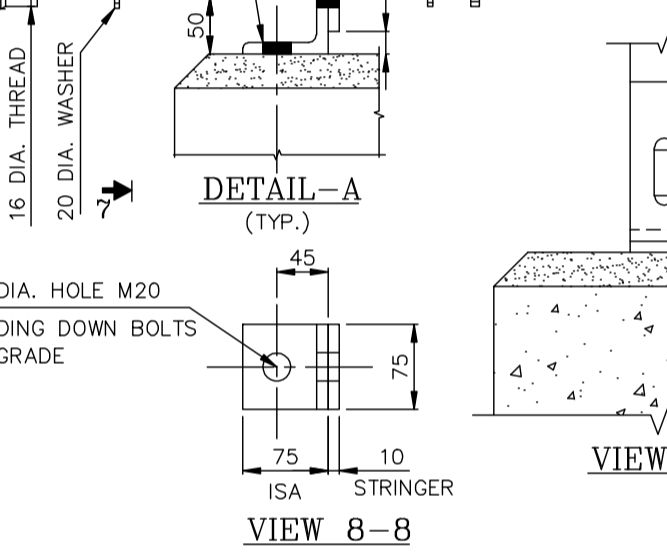
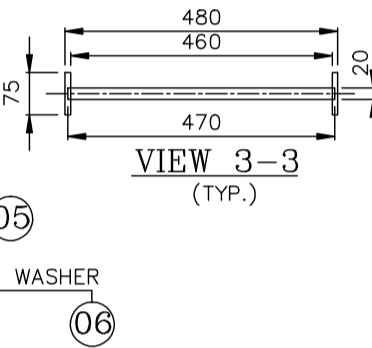
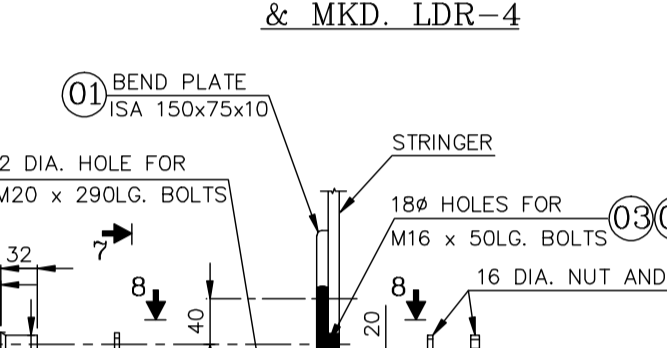
1NO. LADDER REQD. AS DRN. & MKD. LDR-1



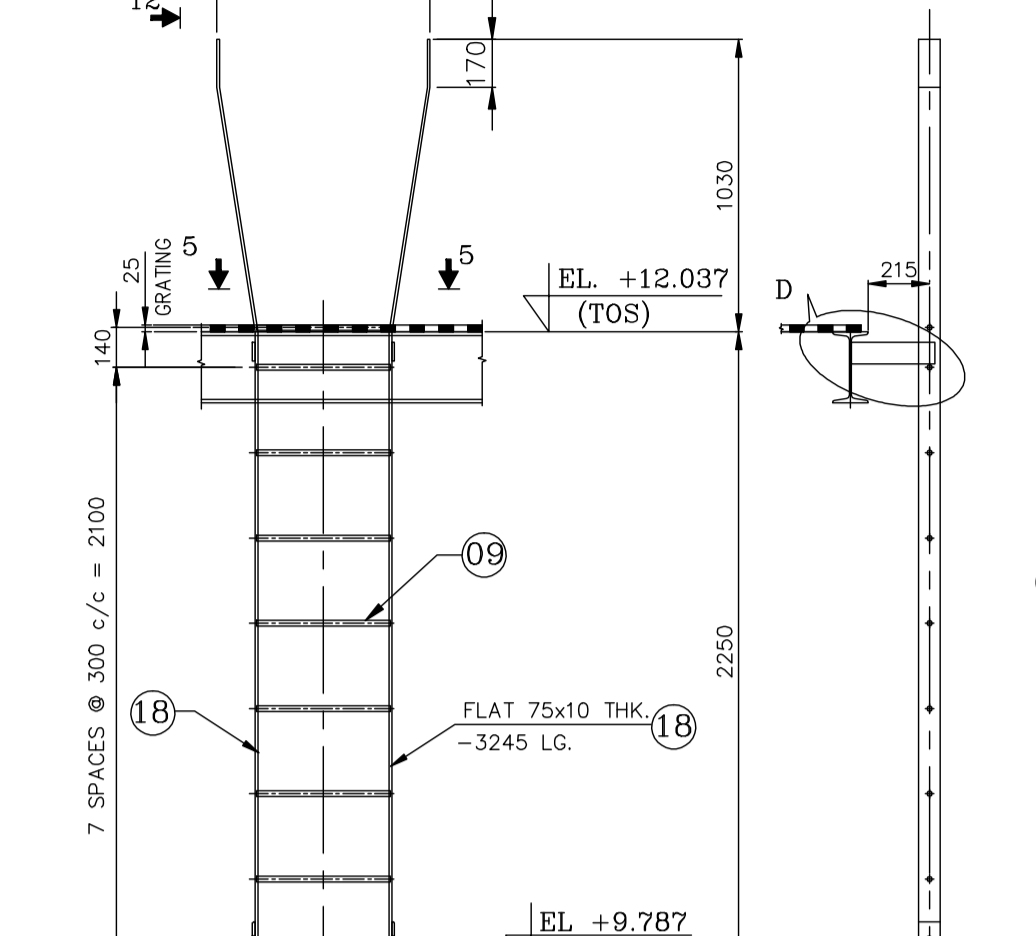
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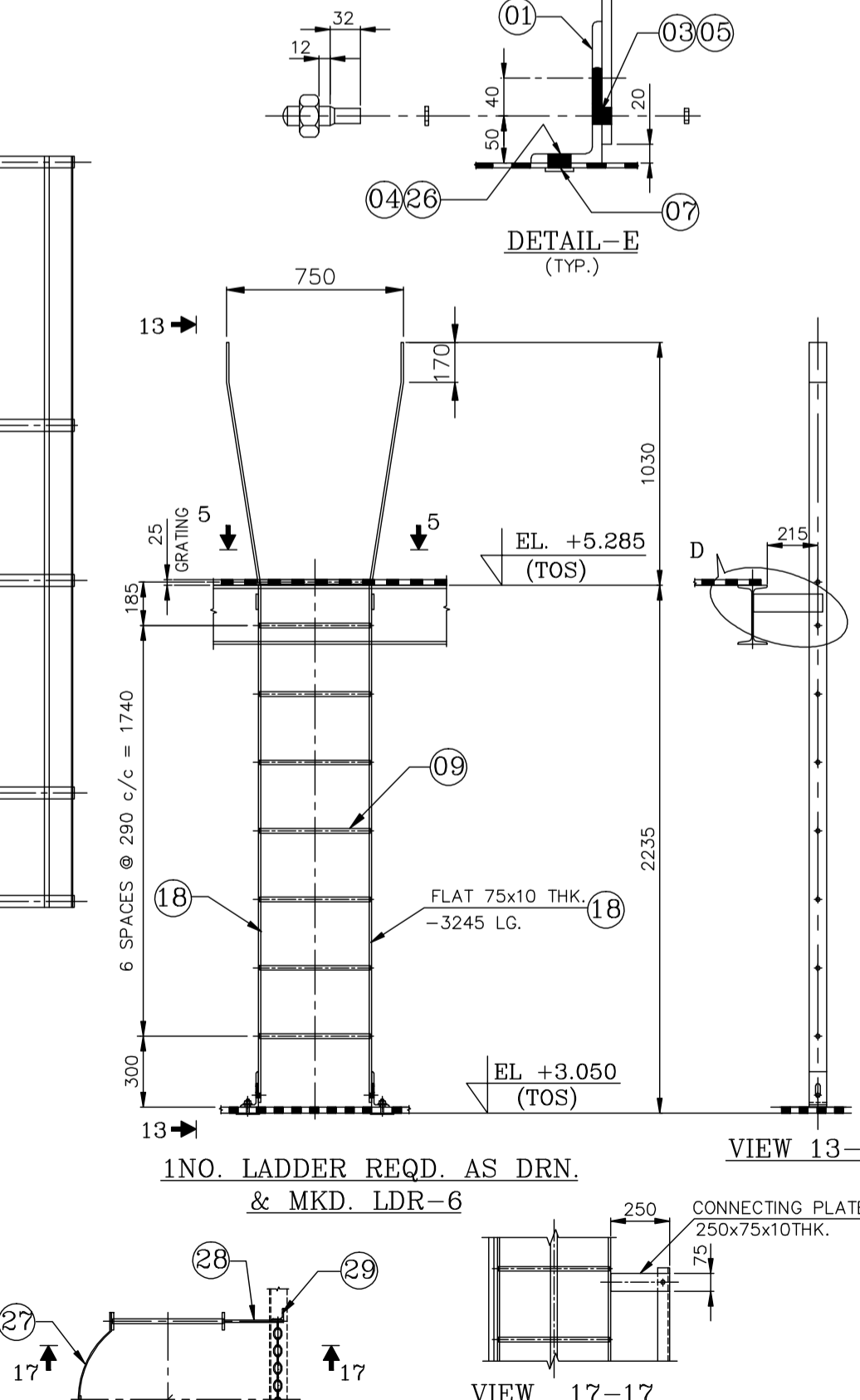
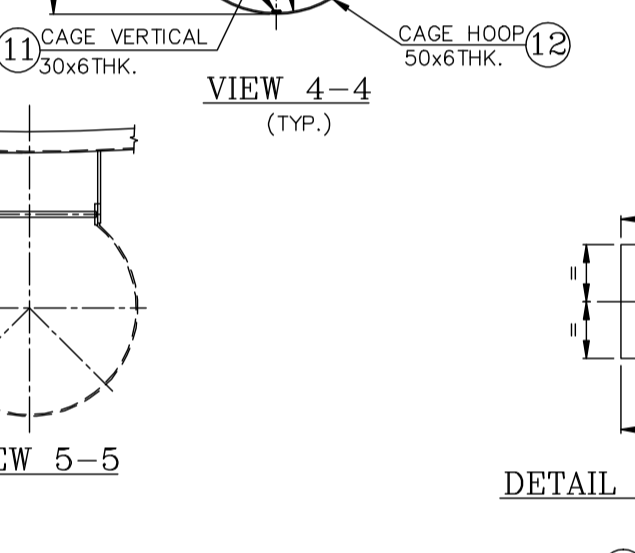
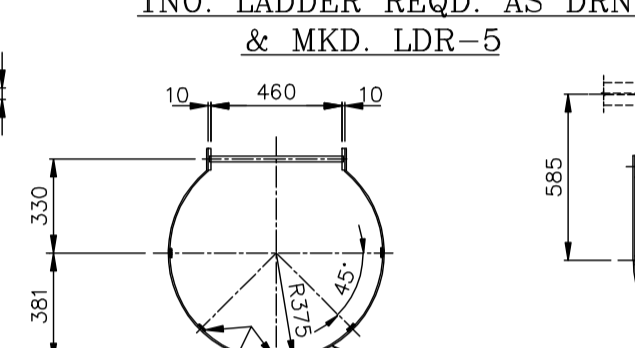
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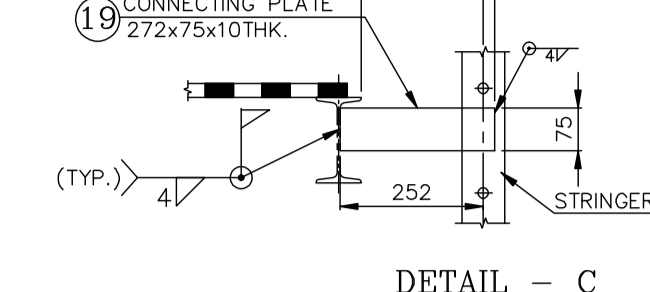
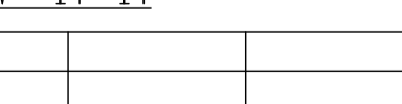
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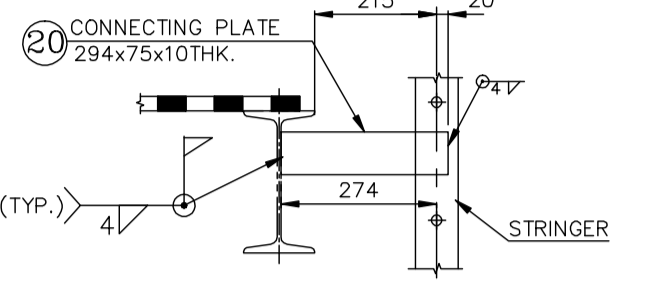
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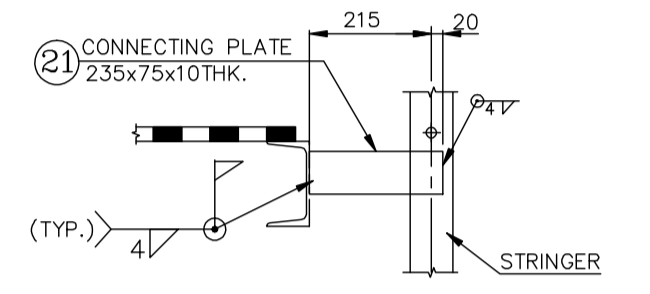
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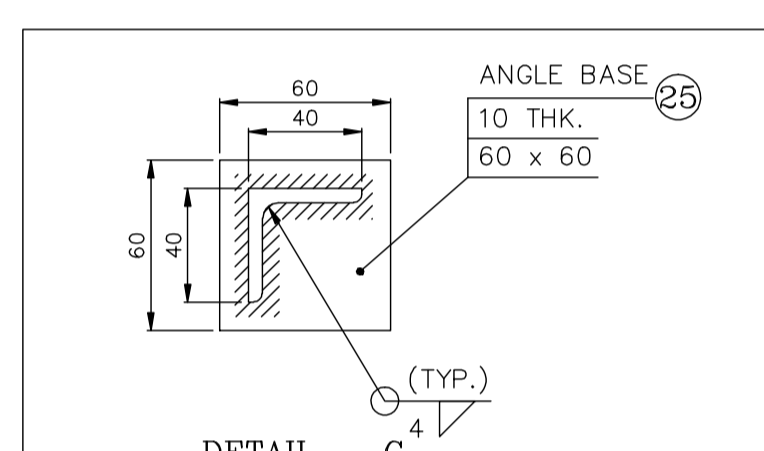
DETAIL - C



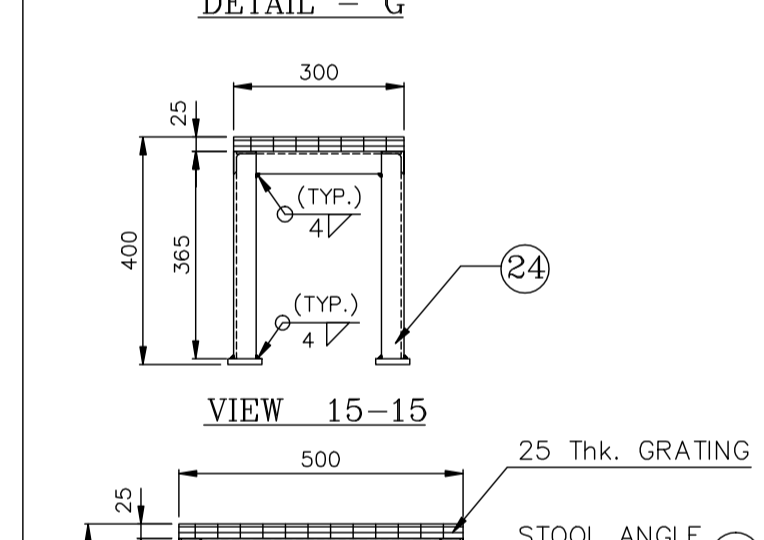
DETAIL - D



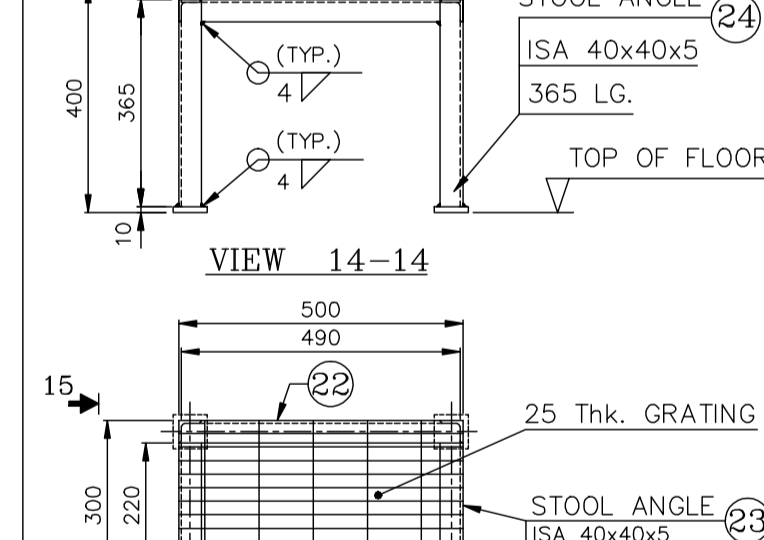
DETAIL - F



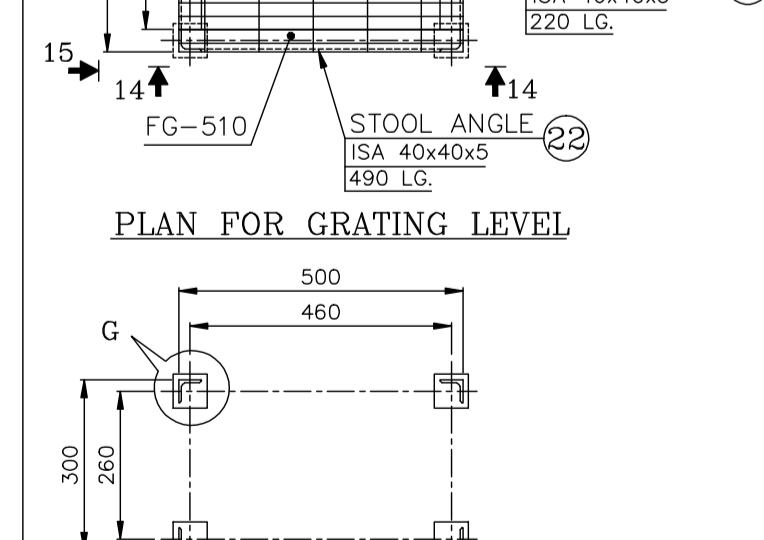
DETAIL - G



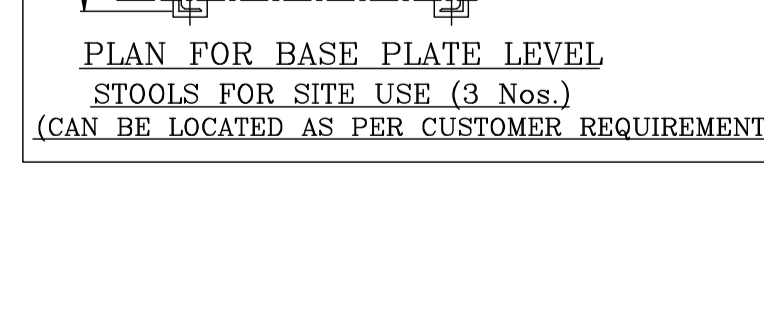
VIEW 15-15



VIEW 14-14



VIEW 17-17



PLAN FOR GRATING LEVEL

PLAN FOR BASE PLATE LEVEL STOOLS FOR SITE USE (3 Nos.) (CAN BE LOCATED AS PER CUSTOMER REQUIREMENT)

INO.	SIZE	LENGTH	WIDTH	AREA	MI NO.	MATRL. SPECN.	QTY.	UNIT WT.	WT.
32	MS CHAIN 5 mm DIA						1		
31	CAGE VERTICAL 30x6THK. FLAT	625			15 008 011 0000	IS:2062	2	1.47	2.94
30	CAGE VERTICAL 30x6THK. FLAT	1170			15 008 011 0000	IS:2062	2	2.76	5.51
29	ISA 50x50x6	1050			15 013 187 0000	IS:2062	2	4.73	9.45
28	CONNECTING PLATE 75x10	250			15 629 086 0000	IS:2062	1	1.47	1.47
27	CAGE HOOP 50x6THK. FLAT	1500			15 008 011 0000	IS:2062	1	3.53	3.53
26	M20 HEX. BOLT WITH NUT	55			19 001 95 20 0000	IS:136	8	0.83	6.64
25	PLATE 10	60	60		15 011 098 0000	IS:2062	12	78.5	3.39
24	ISA 40x40x5	365			15 013 187 0000	IS:2062	12	1.10	13.14
23	ISA 40x40x5	220			15 013 187 0000	IS:2062	6	0.66	3.96
22	ISA 40x40x5	490			15 013 187 0000	IS:2062	6	1.47	8.82
21	CONNECTING PLATE 75x10	235			15 629 086 0000	IS:2062	4	1.38	5.53
20	CONNECTING PLATE 75x10	294			15 629 086 0000	IS:2062	6	1.73	10.39
19	CONNECTING PLATE 75x10	272			15 629 086 0000	IS:2062	2	1.60	3.20
18	FLAT 75x10	3245			15 629 086 0000	IS:2062	4	19.10	76.42
17	FLAT 75x10	3013			15 629 086 0000	IS:2062	2	17.74	35.48
16	CAGE VERTICAL 30x6THK. FLAT	3532			15 008 011 0000	IS:2062	3	8.32	24.95
15	FLAT 75x10	5497			15 629 086 0000	IS:2062	2	32.36	64.73
14	CAGE VERTICAL 30x6THK. FLAT	3815			15 008 011 0000	IS:2062	5	8.98	44.92
13	FLAT 75x10	6105			15 629 086 0000	IS:2062	2	35.94	71.89
12	CAGE HOOP 50x6THK. FLAT	1565			15 008 011 0000	IS:2062	3	3.69	11.06
11	CAGE VERTICAL 30x6THK. FLAT	1605			15 629 086 0000	IS:2062	5	2.27	11.34
10	CAGE HOOP 50x6THK. FLAT	1936			15 008 011 0000	IS:2062	9	4.56	41.03
09	ROD 20φ	470			16 629 039 0000	IS:2062	65	1.16	75.46
08	FLAT 75x10	3870			15 629 086 0000	IS:2062	2	22.78	45.57
07	PLATE 6	100	100		15 011 092 0000	IS:2062	8	47.1	3.77
06	M16 HEX. NUT				18 930 001 6577	IS:136	12	0.03	0.36
05	A18 PUNCHED WASHER				15 647 311 0000	IS:136	12	0.0112	0.13
04	A22 PUNCHED WASHER				15 647 322 0000	IS:136	12	0.017	0.20
03	M16 HEX. BOLT	50			41 221 160 5000	IS:136	12	0.1095	1.31
02	M20 HEX. BOLT WITH NUT	290			19 002 207 0000	IS:136	4	0.83	3.32
01	BENT PL. 150x75x10	225	75		15 629 024 0000	IS:2062	12	1.32	15.90
TOTAL									605.82

- FOR LOCATION OF LADDERS REFER DRG. NOS. 1-35-110-00002
- ALL STRUCTURAL STEEL SHALL CONFORM TO IS:2062 Gr A/B.
- ALL FILLET WELDS ARE 4mm UNLESS OTHERWISE SPECIFIED.
- ALL THE COMPONENTS OF THE STRUCTURE SHALL BE STENCILLED WITH THEIR RESPECTIVE P.Nos./MATCH MARKS ALONG WITH DRG.NO.
- THE EXACT LENGTHS OF LADDERS ARE TO BE TAKEN FROM FULL SCALE SCALE LAY-OUT BEFORE FABRICATION.
- ALL BOLT HOLES ARE TO BE MATCH DRILLED.

CUST. No. 4050

M/s. OIL & NATURAL GAS CORPORATION LTD.-NAVAGAM
FGR HEATER

DEPT	ALL DIMENSIONS ARE IN MM	PROJECTION	SCALE 1:25	WEIGHT (Kg)	REF TO ASSY / OLD DWG
CODE			1:1 2:1	591.83	SE PL-4014 01-A-009

DRN	<i>N. Mohan</i>	21-07-2017
CHD	<i>N.V. Reddy</i>	21-07-2017
APPD	<i>B.S.N. Prasad</i>	21-07-2017

Bharat Heavy Electricals Ltd.
UNIT: HEAVY PLATES & VESSELS PLANT
VISAKHAPATNAM-530012

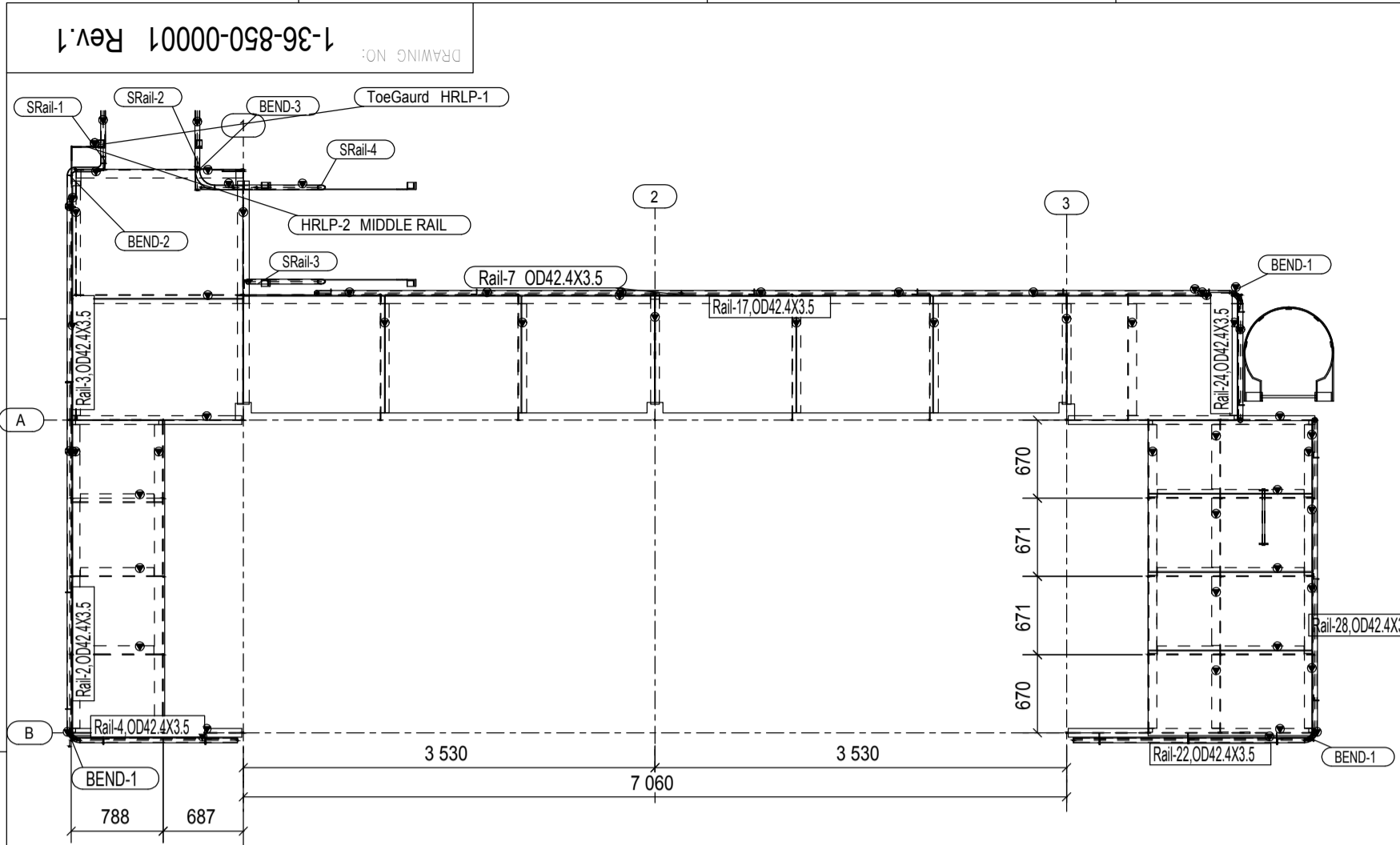
FAB. DETAILS OF LADDERS FOR HEATER & SPARE STOOLS

DRAWING NO: 1-36-820-00001
E-DWG. NO: 1-36-820-U0087

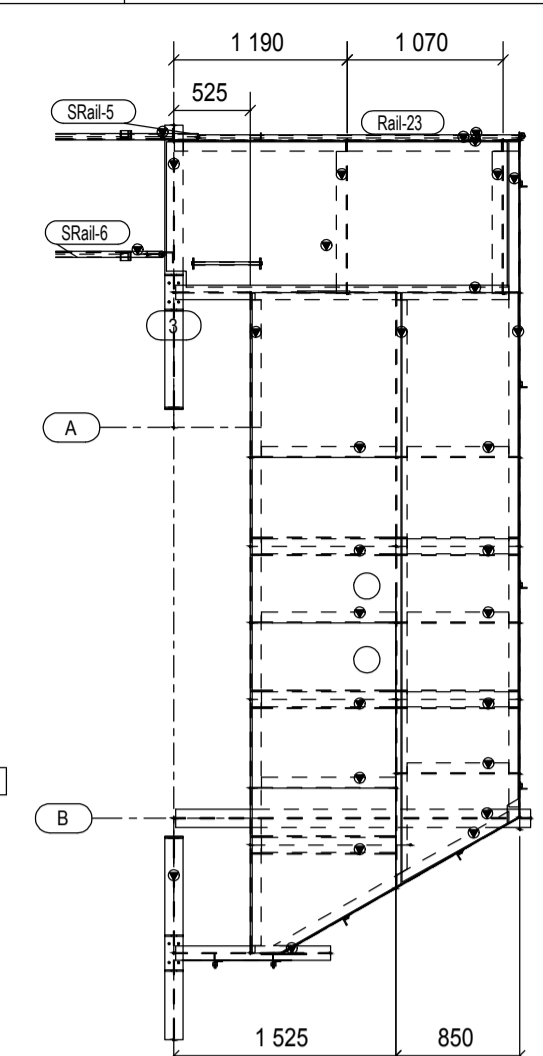
REV NO.	DATE	BRIEF RECORD OF REVISIONS	PPD.	CHD.	APPD.
1	31-08-2017	LDR-3 IS MODIFIED AND RELEASED FOR FABRICATION	<i>N. Mohan</i>	<i>N.V. Reddy</i>	<i>B.S.N. Prasad</i>
0	21-07-2017	RELEASED FOR FABRICATION	<i>N. Mohan</i>	<i>N.V. Reddy</i>	<i>B.S.N. Prasad</i>

FORM NO. 0425/2

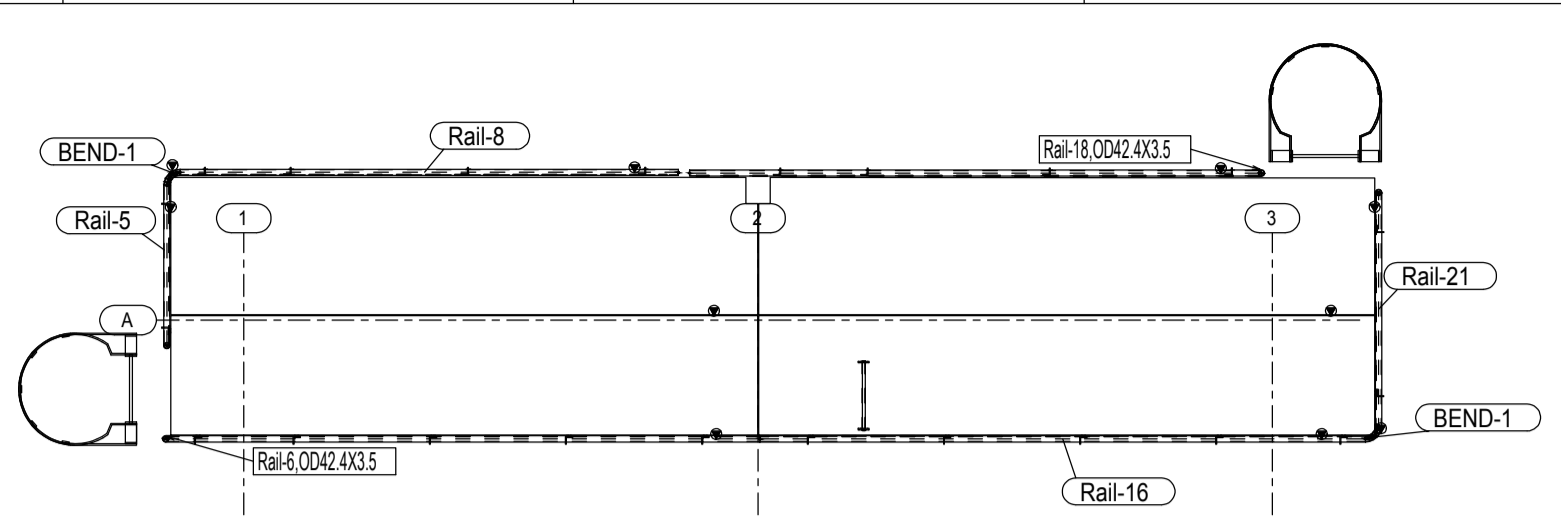
A1 SIZE



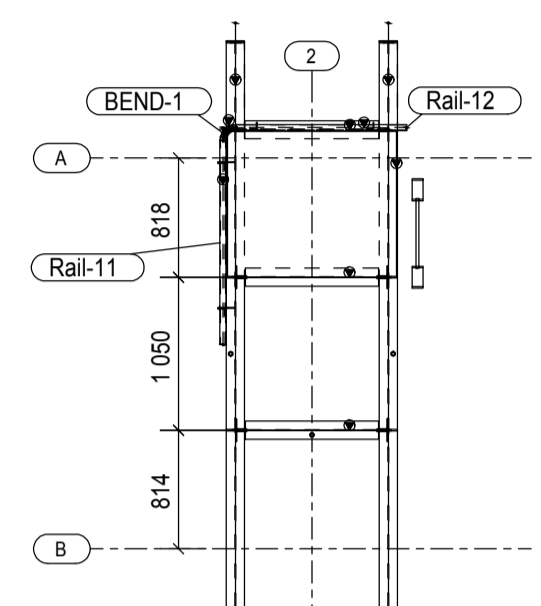
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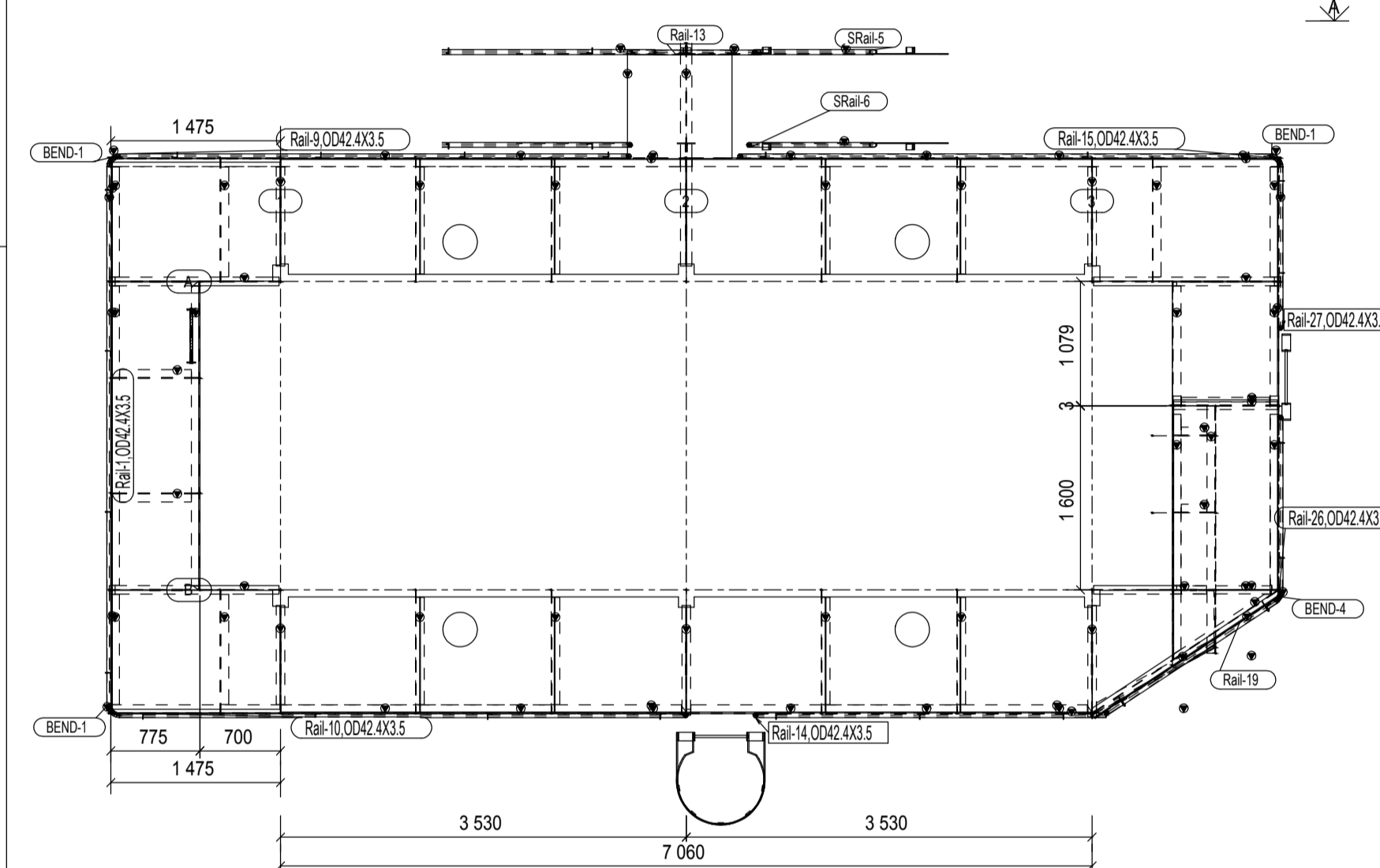
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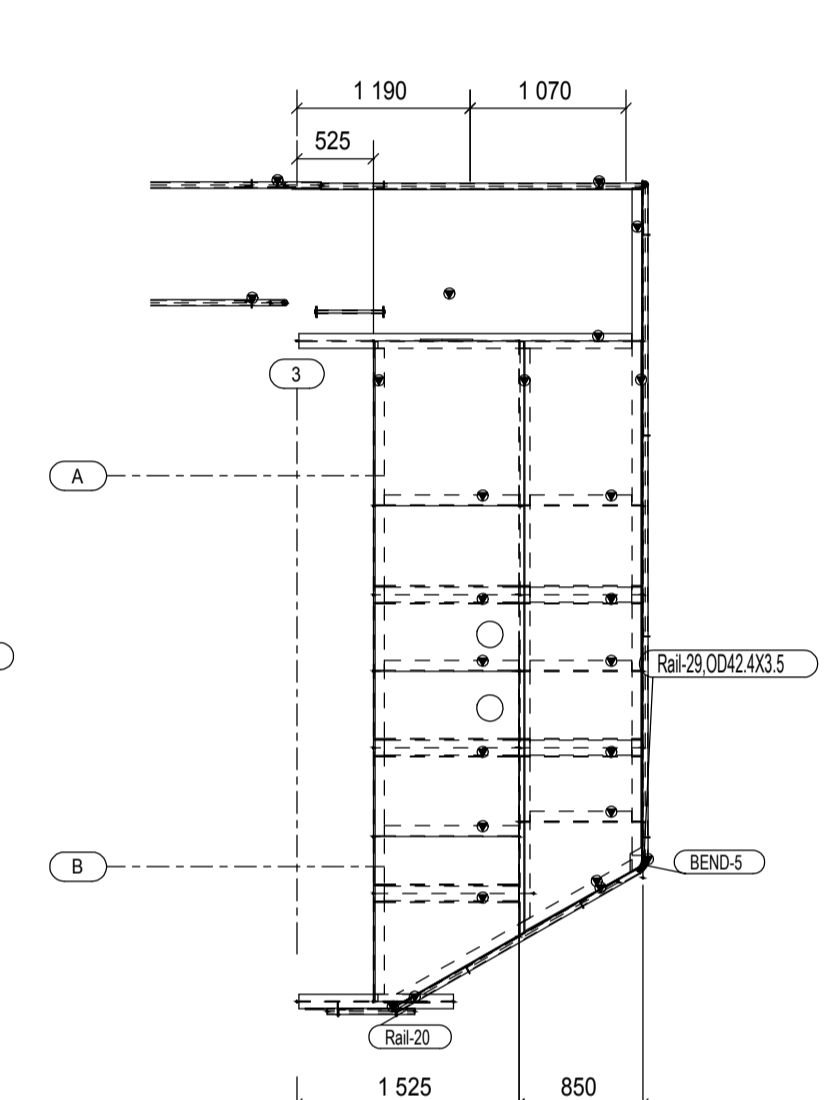
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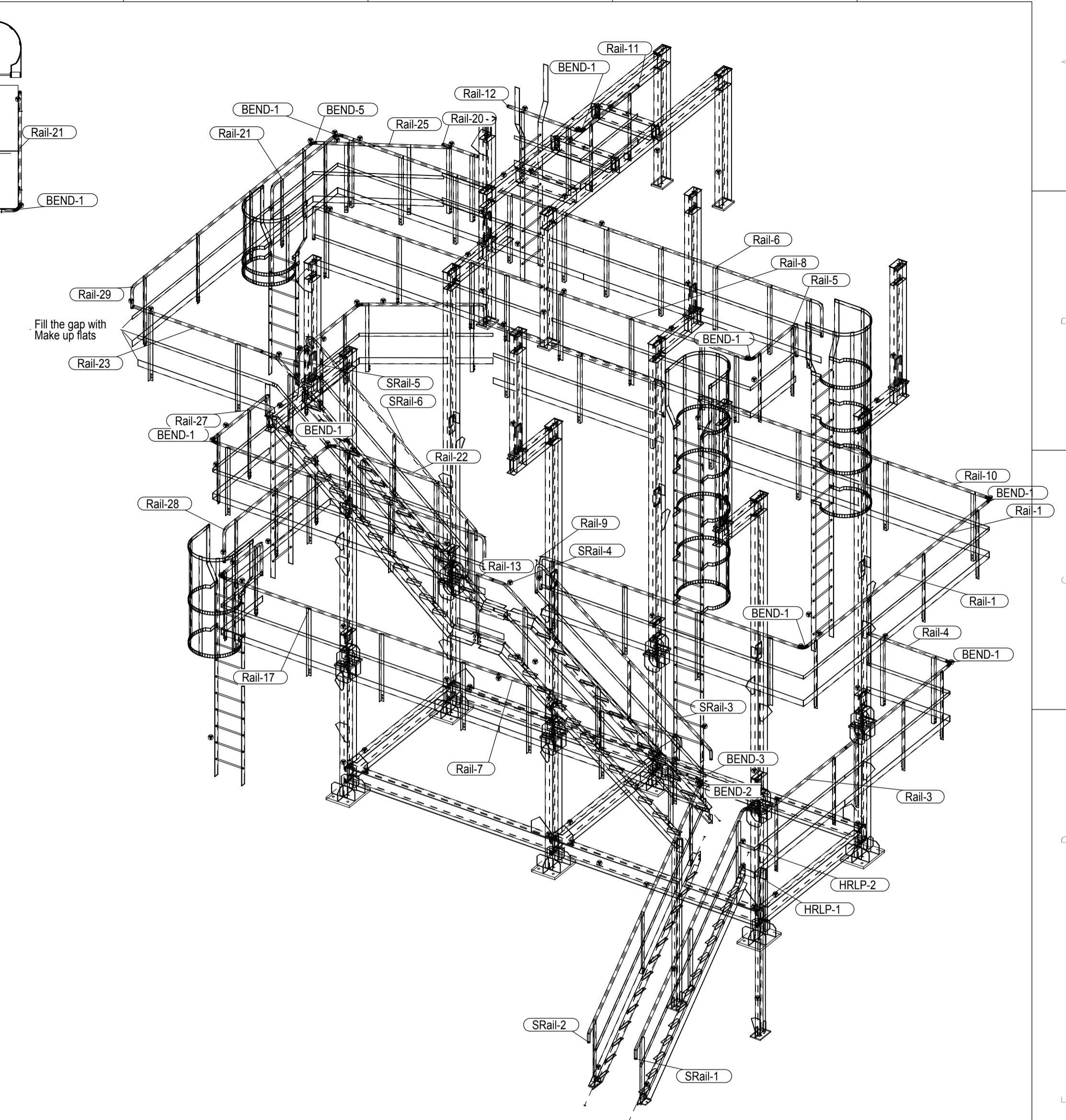
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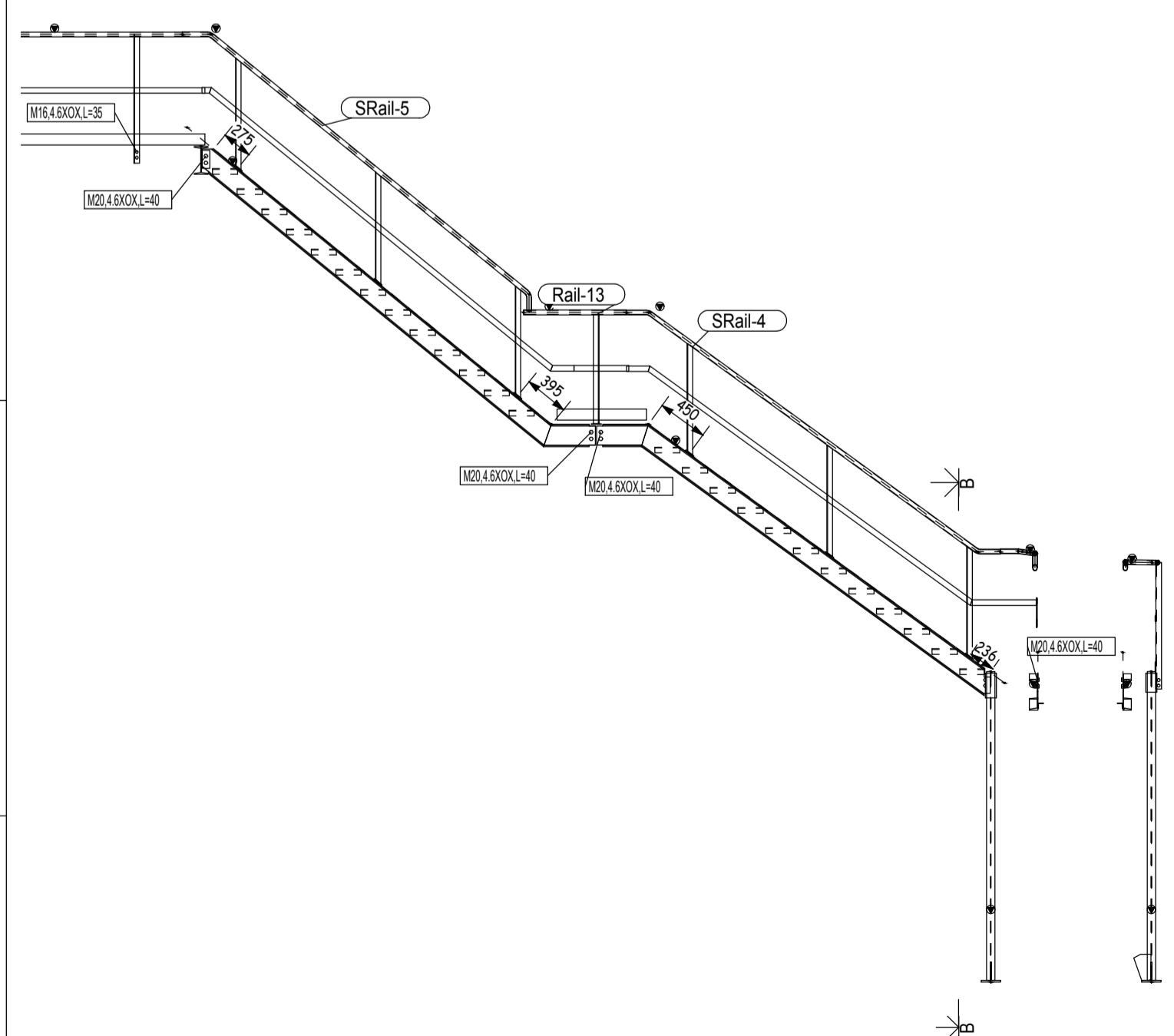
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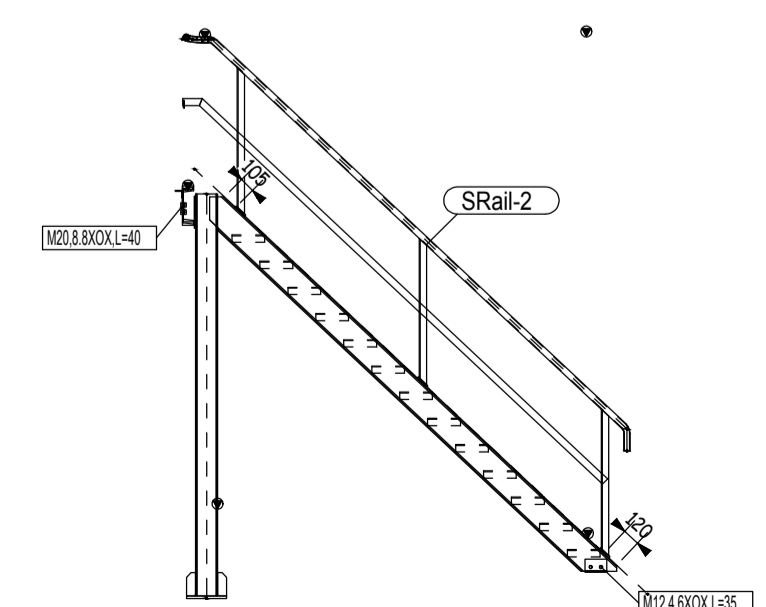
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1:50



3d
1:50



A - A
1:50



B - B
1:50

NOTE:

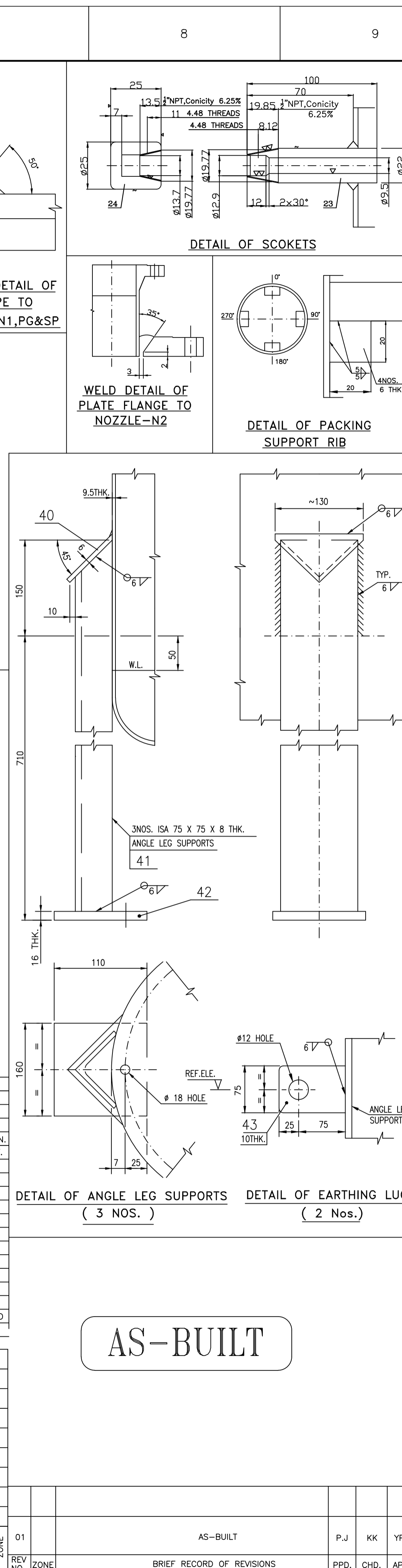
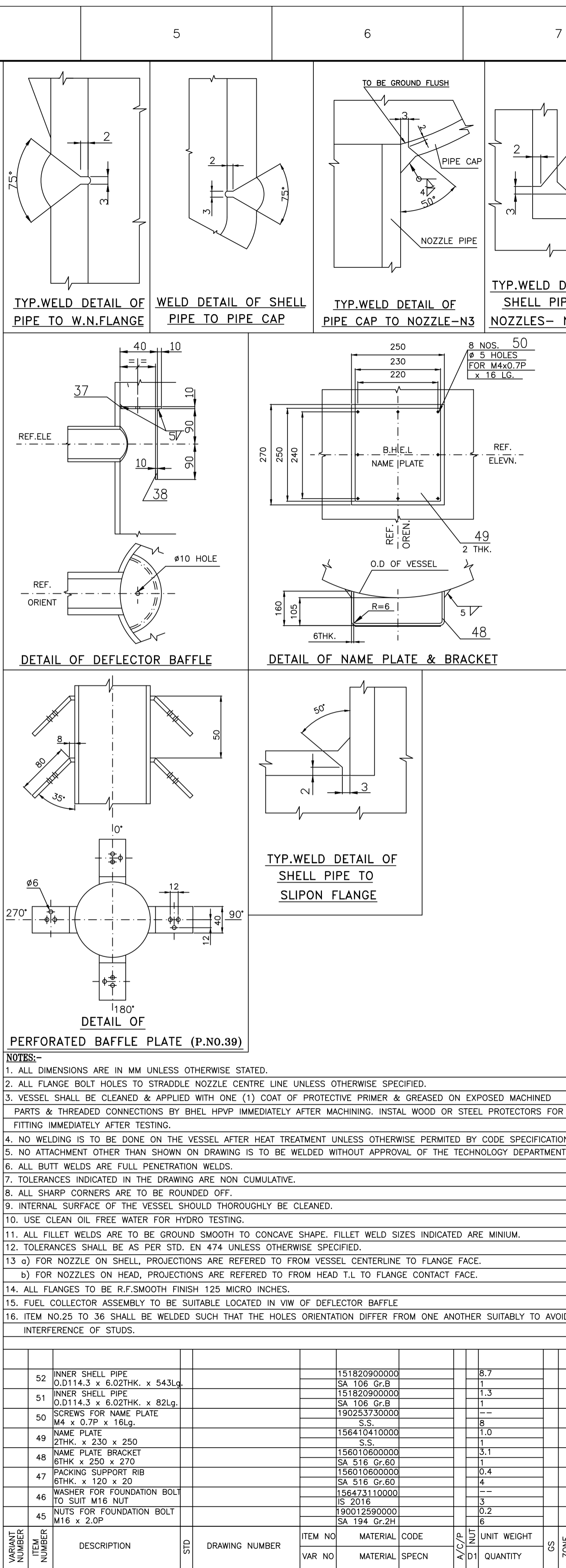
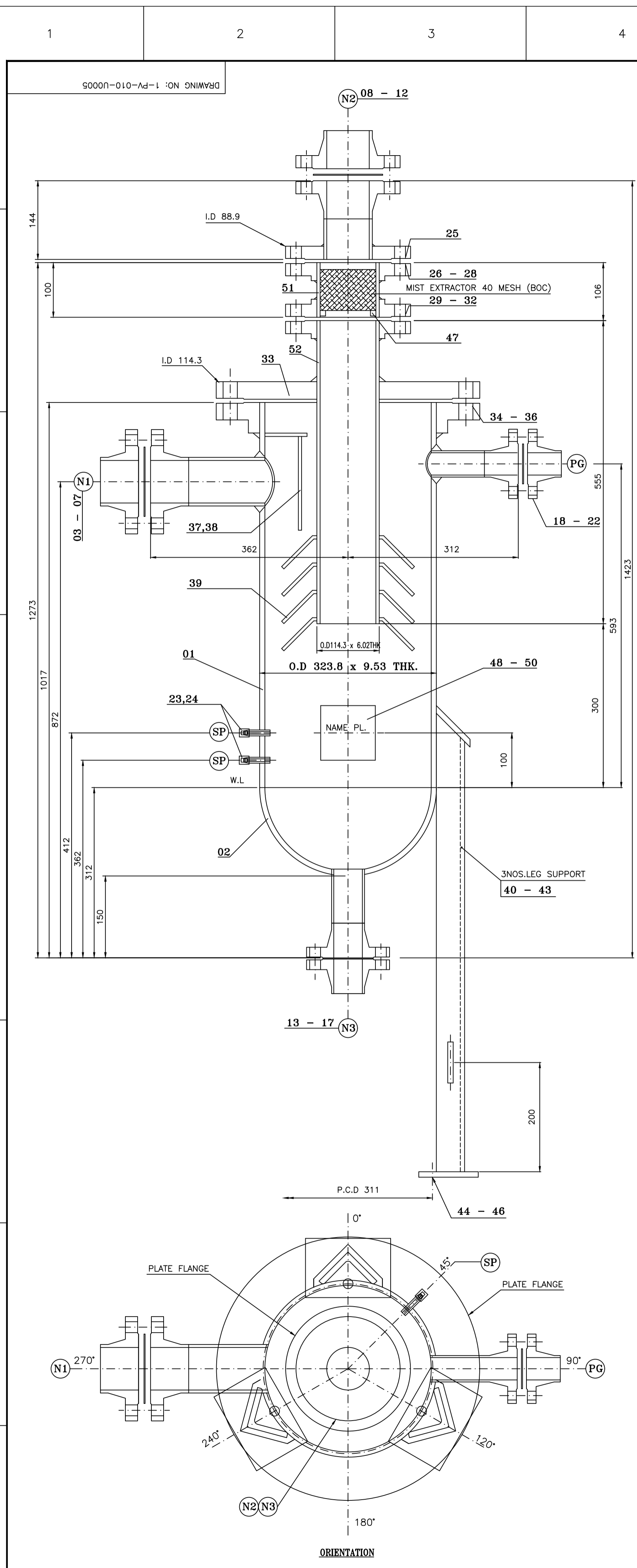
1	08.7.20	THE DRAWINGS ARE SAME FOR CUSTOMER NOS. 4050 & 4051, THE SAME IS UPDATED IN THE DRAWING TITLE BLOCK	VNR	CHD	ESNP
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CUSTOMER No. 4050 & 4051

CUSTOMER	M/s.OIL AND NATURAL GAS CORPORATION LTD. DESALTER PLANT-NAVAGAM, AHMEDABAD	
PROJECT	Replacement of FGR heater for Desalter plant	
	BHARAT HEAVY ELECTRICALS LTD., PLATES & VESSELS PLANT UNIT, VISAKHAPATNAM-530012	
DRAWN	N PRAKASH	TITLE
CHECKED	NV REDDY	G.A OF HAND RAILS
APPROVED	ESN PRASAD	
DATE	21.07.2017	
ALL DIMENSIONS ARE IN MILLIMETRES		
SCALE 1:50		REV.
N.T.S.		1
1-36-850-U0082		

FORM NO. 0425/2

A1 SIZE



DESIGN DATA									
FLUID HANDLED	FUEL GAS								
WORKING PRESSURE, KG/CM ² (g)	5.0								
DESIGN PRESSURE, KG/CM ² (g)	13.5								
TEST PRESSURE (HYD.), KG/CM ² (g)	17.5 (AT TOP)								
WORKING TEMPERATURE °C	---								
DESIGN TEMPERATURE °C	65								
CORROSION ALLOWANCE (mm)	3.0								
JOINT EFFICIENCY	0.85								
RADIOGRAPHY	SPOT / FULL								
INSULATION	---								
PW HEAT TREATMENT	---								
EMPTY WT. (kg)	~300								
SERVICE WT. (kg)	---								
CODE	ASME SEC VIII DIV-1 (2015)								
INSPECTION	B.H.E.L. / ONCC								

ITEM NO	DESCRIPTION	STD	DRAWING NUMBER	ITEM NO	MATERIAL CODE	A/C/F	UNIT WEIGHT	CS	ZONE
44	FOUNDATION BOLT D18 ROUND FOR M16 x 2.0P x 535Lg.			150043410000	SA 2062 Gr.A		0.8		
43	EARTHING LUG 10THK. x 75 x 100			156010620000	SA 516 Gr.60		0.6		
42	BASE PLATE 16THK. x 110 x 160			156010650000	SA 516 Gr.60		0.6		
41	LEG SUPPORTS ISA 75 x 75 x 8THK. x 860Lg.			156290210000	SA 516 Gr.60		5.8		
40	END COVER PLATE 6THK. x 80 x 130			156010600000	SA 516 Gr.60		3		
39	BAFFLES 6THK. x 40 x 80			156055340000	SA 516 Gr.60		2.4		
38	DEFLECTOR BAFFLE OR 84.15 x 11THK x 180Lg.			156010620000	SA 106 Gr.B		2.6		
37	DRUM FLANGE 10THK. x 50 x 145			156010620000	SA 516 Gr.60		0.8		
36	STUDS WITH NUTS 7/8" UNC x 114 Lg.			190014940000	SA 193 B7 /SA 194 Gr.2H		1.0		
35	SLIP ON FLANGE WITH R.F 300 NB x 150#			156114600000	SA 193 B7 /SA 194 Gr.2H		8 SETS		
34	GASKET FOR PLATE FLANGE 300 NB x 150#			190058080000	SA 105		29.0		
33	BLIND FLANGE WITH R.F 300 NB x 150#			156113400000	SA 105		49.9		
32	STUDS WITH NUTS 5/8" UNC x 89Lg.			189300016907	SA 193 B7 /SA 194 Gr.2H		1.0		
31	SLIP ON FLANGE WITH R.F 100 NB x 150#			156115100000	SA 193 B7 /SA 194 Gr.2H		8 SETS		
30	GASKET 100 NPS x 150#			190058080000	SA 105		1		
29	SLIP ON FLANGE WITH R.F 100 NB x 150#			156115100000	SA 105		3.0		
28	STUDS WITH NUTS 5/8" UNC x 89Lg.			189300016907	SA 193 B7 /SA 194 Gr.2H		1.0		
27	SLIP ON FLANGE WITH R.F 100 NB x 150#			156115100000	SA 105		5.9		
26	GASKET 100 NPS x 150#			190058080000	SA 105		1		
25	BLIND FLANGE WITH R.F 100 NB x 150#			156112230000	SA 105		7.7		
24	PLUG #25 x 25Lg.			156252120000	SA 105		0.4		
23	COUPLING #22 x 70Lg.			156212500000	SA 182 F 304		0.4		
22	STUDS WITH NUTS - PG 1/2" UNC x 105Lg.			190253000000	SA 193 B7 /SA 194 Gr.2H		0.4		
21	COMP.W.N FLANGE - PG 40NB x 150# W.N./R.F.			156111010000	SA 105		1.8		
20	GASKET - PG 40NB x 150#			190050020000	SS 304 SPW		1		
19	W.N.FLANGE - PG 40NB x 150# W.N./R.F.			156111010000	SA 105		1.8		
18	NOZZLE PIPE - PG OD48.3 x 3.7 THK. x 115Lg.			159824190000	SA 106 Gr.B		0.5		
17	STUDS WITH NUTS - N3 5/8" UNC x 95Lg.			190015760000	SA 193 B7 /SA 194 Gr.2H		1.5		
16	COMP.W.N FLANGE - N3 50NB x 150# W.N./R.F.			156111560000	SA 105		2.7		
15	GASKET - N3 50NB x 150#			190050050000	SS 304 SPW		1		
14	W.N.FLANGE - N3 50NB x 150# W.N./R.F.			156111560000	SA 105		2.7		
13	NOZZLE PIPE - N3 OD60.3 x 3.91 THK. x 100Lg.			151820300000	SA 106 Gr.B		2.7		
12	STUDS WITH NUTS - N2 5/8" UNC x 95Lg.			190015760000	SA 193 B7 /SA 194 Gr.2H		1.5		
11	COMP.W.N FLANGE - N2 80NB x 150# W.N./R.F.			156111820000	SA 105		4.5		
10	GASKET - N2 80NB x 150#			190054090000	SS 304 SPW		1		
09	W.N.FLANGE - N2 80NB x 150# W.N./R.F.			156111820000	SA 105		4.5		
08	NOZZLE PIPE - N2 OD88.9 x 5.5THK. x 80Lg.			151821280000	SA 106 Gr.B		1.5		
07	STUDS WITH NUTS - N1 5/8" UNC x 90Lg.			190015760000	SA 193 B7 /SA 194 Gr.2H		1.5		
06	COMP.W.N FLANGE - N1 80NB x 150# W.N./R.F.			156111820000	SA 105		4.5		
05	GASKET - N1 80NB x 150#			190054090000	SS 304 SPW		1		
04	W.N.FLANGE - N1 80NB x 150# W.N./R.F.			156111820000	SA 105		4.5		
03	NOZZLE PIPE - N1 OD88.9 x 5.5THK. x 150Lg.			151821280000	SA 106 Gr.B		1.7		
02	PIPE CAP OD32.8 x 10.3THK.			156230380000	SA 234 WPB		12.0		
01	SHELL PIPE OD32.8 x 9.53THK. x 705Lg.			150824280000	SA 106 Gr.B		52.0		

MARK NO.	QTY.	SERVICE	N.P.S./SCH.	O.D.	THK / SCH	CLASS	W.N./R.F.	TYPE / FACR	PAD SIZE WIDTH x THK.	PROF. OF NOZ. FROM COL. CL.
SP	2	SOCKET				1/2" NPT COUPLING WITH PLUG				
PG	1	PRESSURE GAUGE		1.5" (40)	3.7 / 40	150#	W.N./R.F.			
N3	1	DRAIN		2" (50)	60.3	3.91 / 40	150#	W.N./R.F.		
N2	1	OUTLET		3" (80)	88.9	5.5 / 40	150#	W.N./R.F.		
N1	1	INLET		3" (80)	88.9	5.5 / 40	150#	W.N./R.F.		

TABLE OF NOZZLES AND FLANGES									
NOZZLES	FLANGES AS PER ASME B16.5, 2013								
DRN	V.RAMESH BABU								
APPD	Y.PRASANNA KUMAR								

REVISION	NO.	ZONE	DESCRIPTION
01			AS-BUILT

MARK NO.	QTY.	SERVICE	N.P.S./SCH.	O.D.	THK / SCH	CLASS	W.N./R.F.	TYPE / FACR	PAD SIZE WIDTH x THK.	PROF. OF NOZ. FROM COL. CL.
SP	2	SOCKET				1/2" NPT COUPLING WITH PLUG				
PG	1	PRESSURE GAUGE		1.5" (40)	3.7 / 40	150#	W.N./R.F.			
N3	1	DRAIN		2" (50)	60.3	3.91 / 40	150#	W.N./R.F.		
N2	1	OUTLET		3" (80)	88.9	5.5 / 40	150#	W.N./R.F.		
N1	1	INLET		3" (80)	88.9	5.5 / 40	150#	W.N./R.F.		

AS-BUILT

Bharat Heavy Electricals Ltd
 UNIT: HEAVY PLATES & VESSELS PLANT
 VISAKHAPATNAM-530012

DRN: V.RAMESH BABU
 APPD: Y.PRASANNA KUMAR

DATE: 28-02-2019

REVISION: 01 AS-BUILT

SCALE: 1:1

WEIGHT (kg):

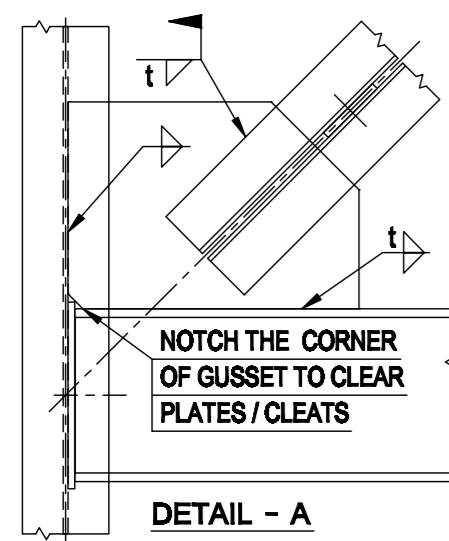
REF TO ASSY / OLD DWG:

DRAWING NO: 1-PV-010-U0005

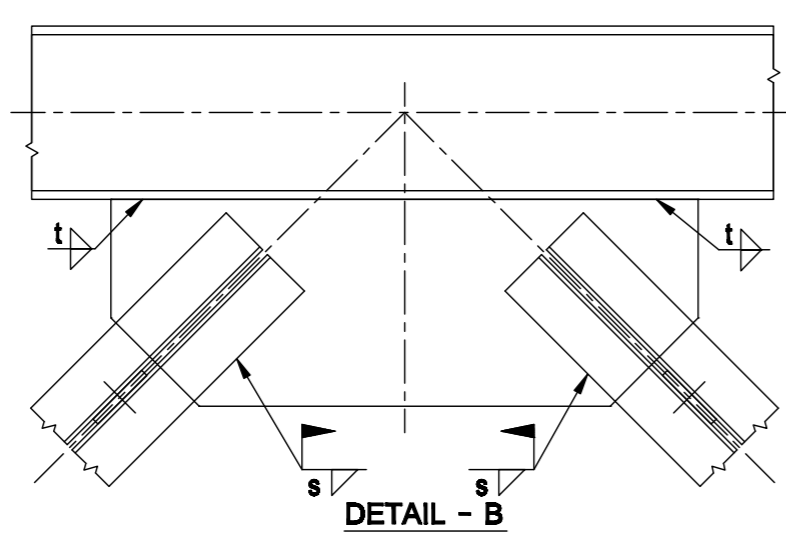
REV: OA

FORM NO. 0425/2

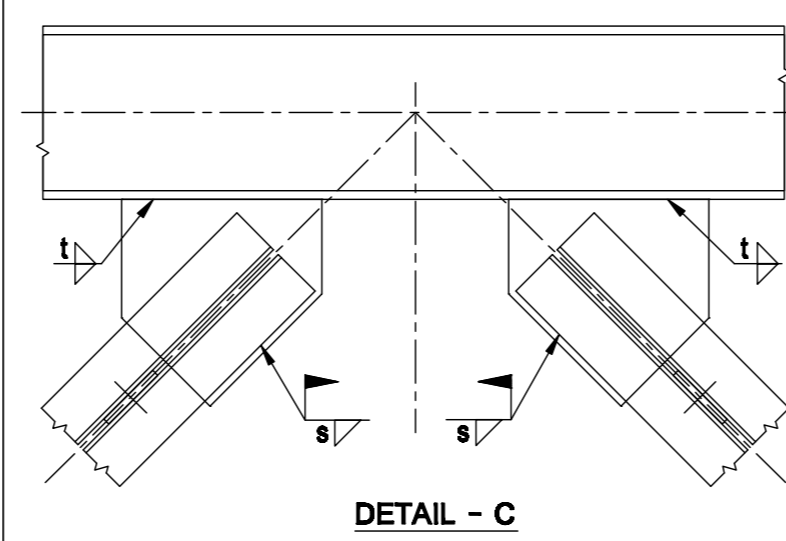
2-35-110-0003
DRAWING NO.



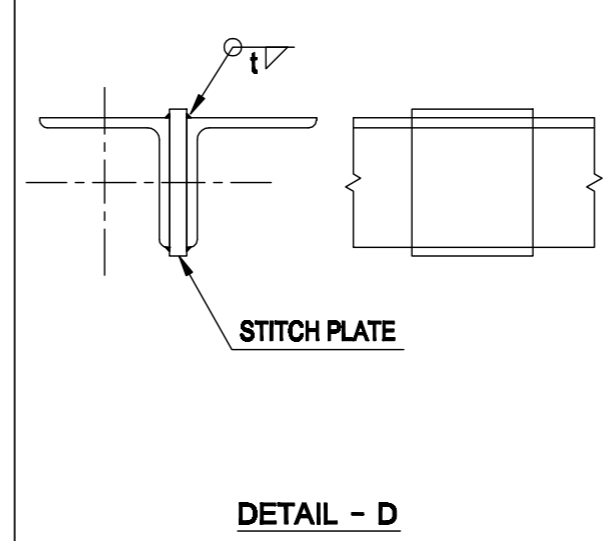
DETAIL - A



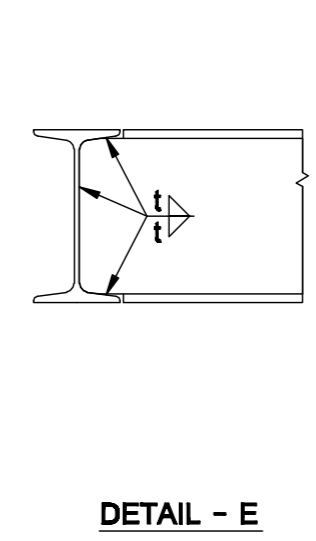
DETAIL - B



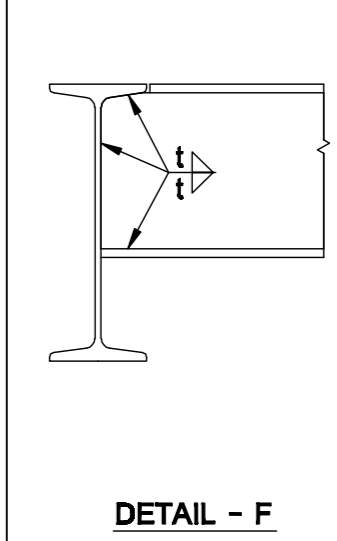
DETAIL - C



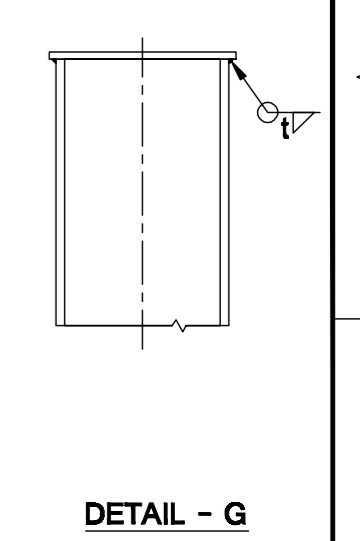
DETAIL - D



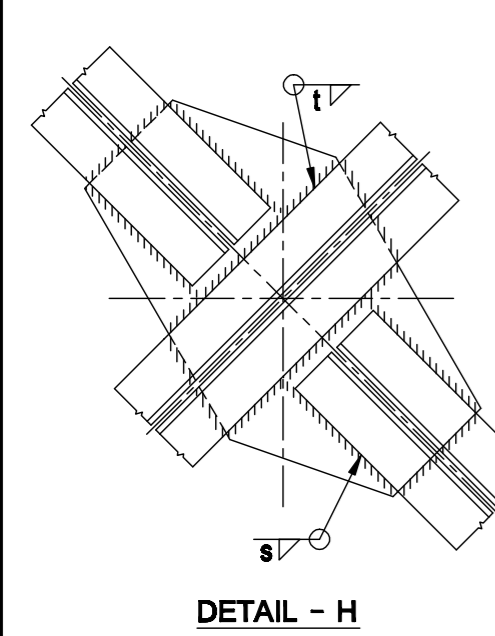
DETAIL - E



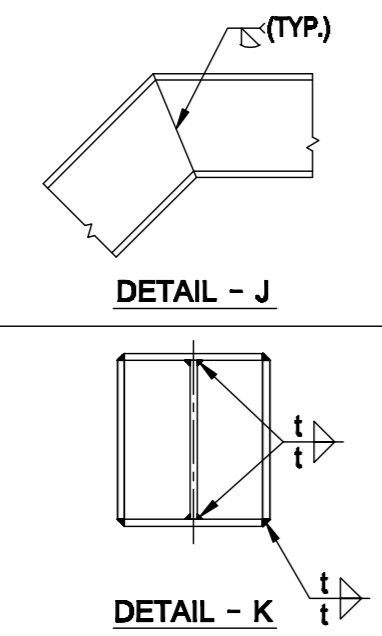
DETAIL - F



DETAIL - G

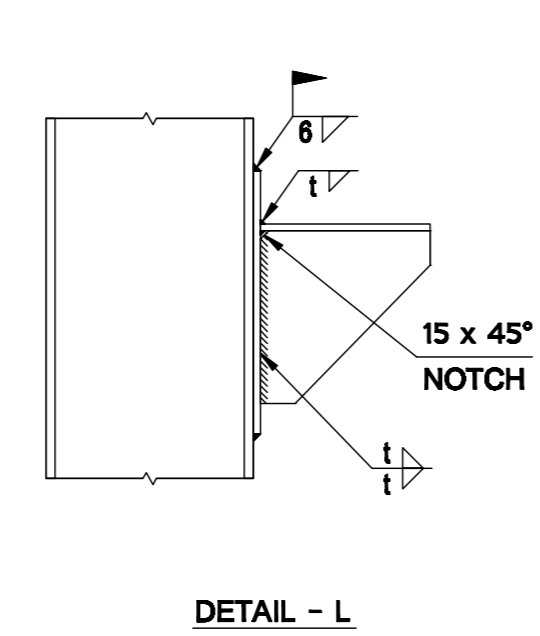


DETAIL - H

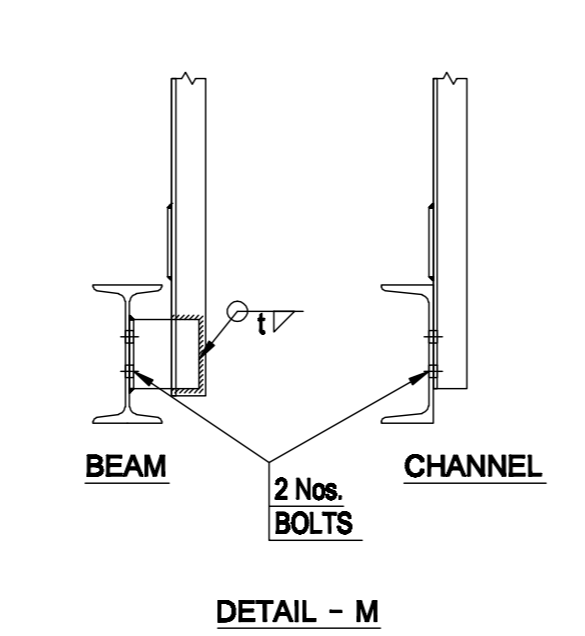


DETAIL - J

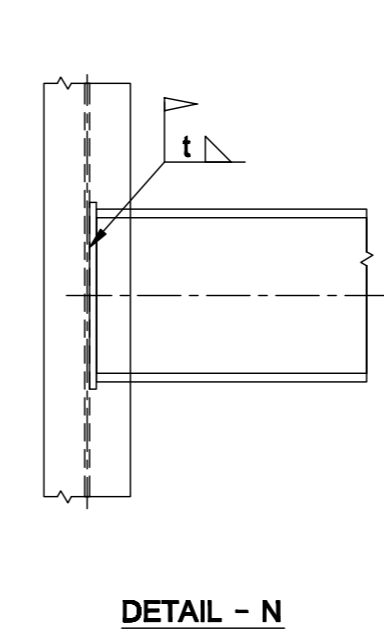
DETAIL - K



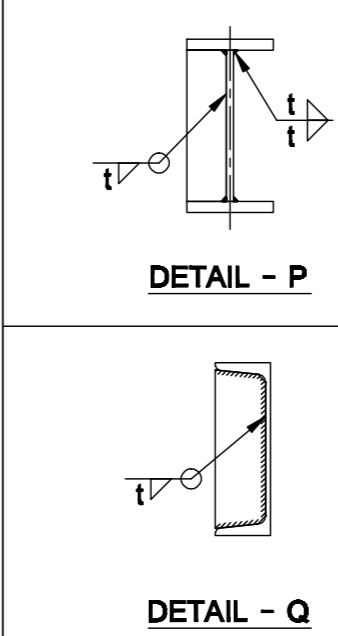
DETAIL - L



DETAIL - M

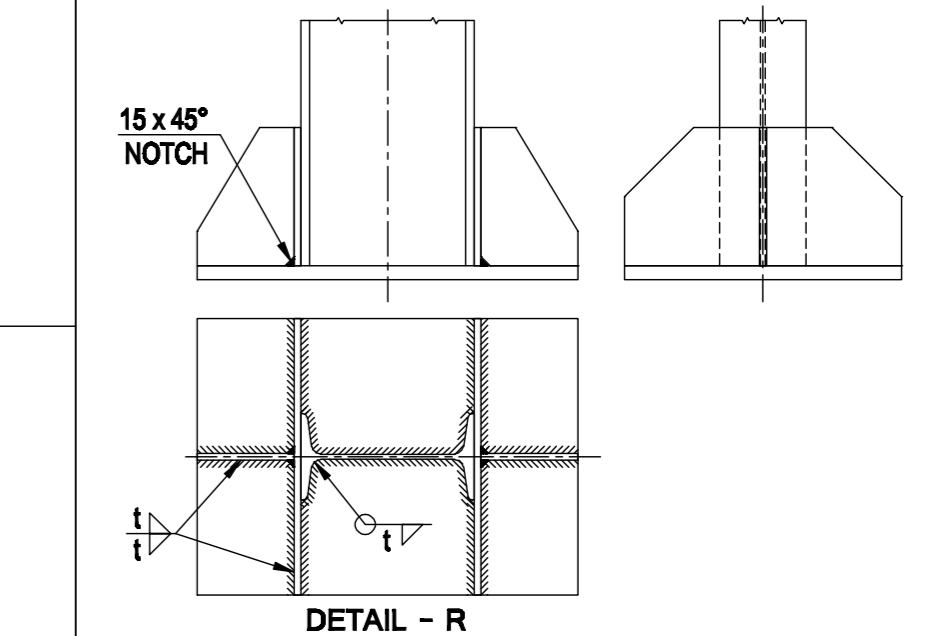


DETAIL - N

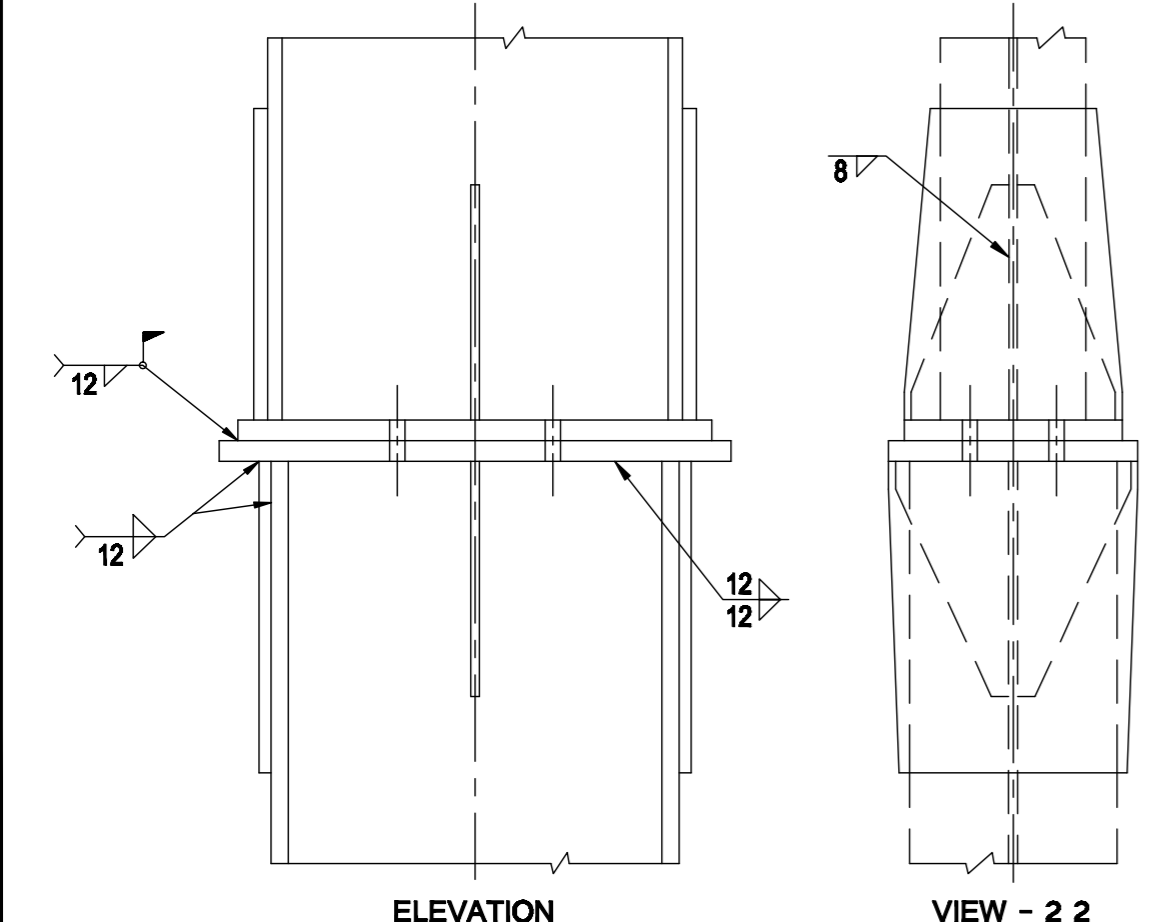


DETAIL - P

DETAIL - Q

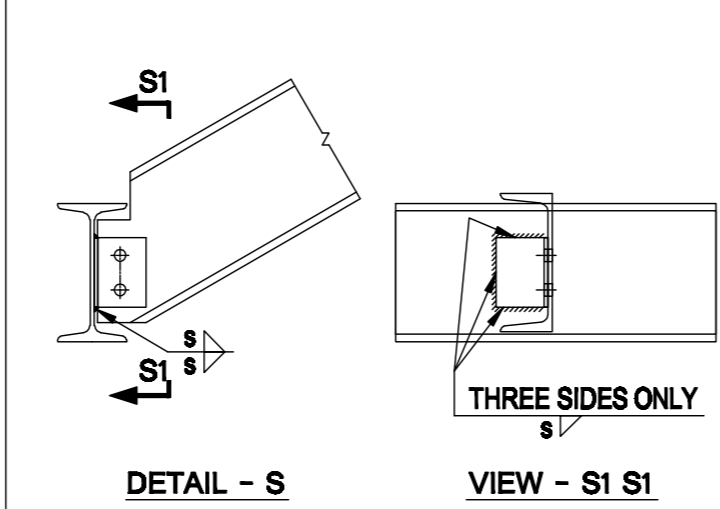


DETAIL - R



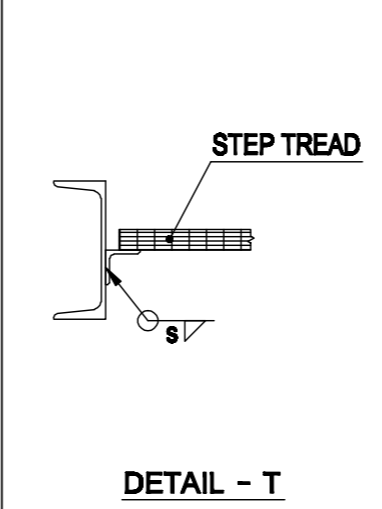
ELEVATION

VIEW - 2 2

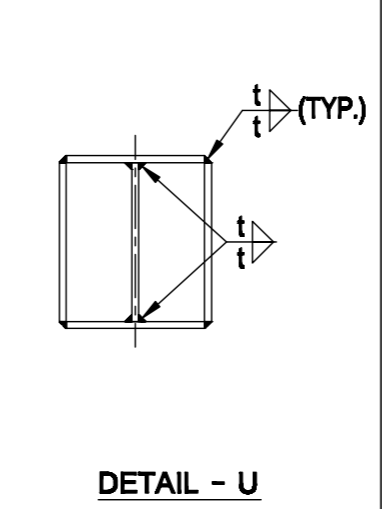


DETAIL - S

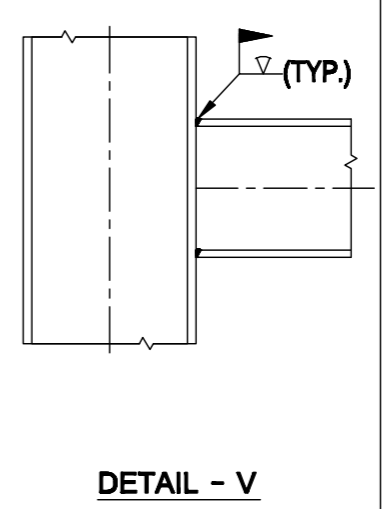
VIEW - S1 S1



DETAIL - T



DETAIL - U



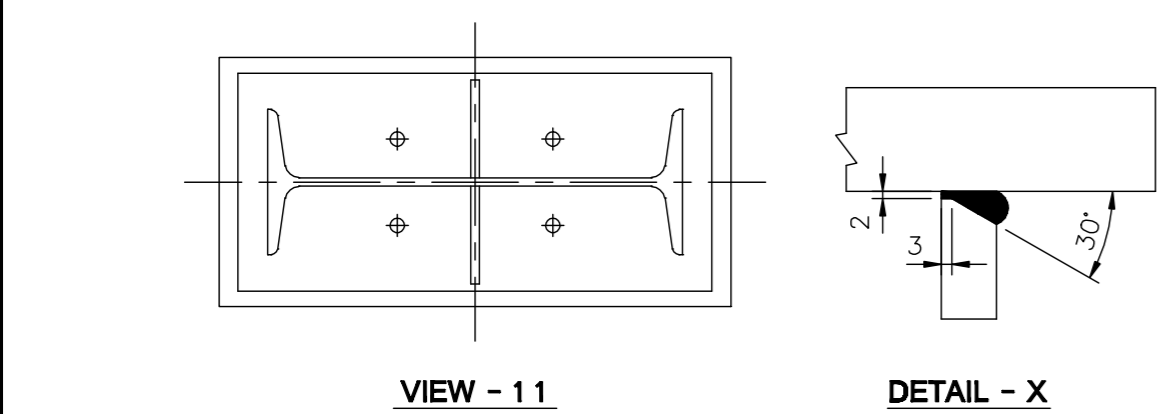
DETAIL - V

GUSSET PLATE THK. / STIFFENER PLATE THK. (mm)	WELD SIZE (t)
8	6
10	8
12	10
16	12
20	16

ANGLE CLEAT SIZE (mm)	WELD SIZE (t)
ISA 50 x 50 x 6	4
ISA 75 x 75 x 6	5
ISA 90 x 90 x 8	6
ISA 100 x 100 x 10	8
ISA 150 x 150 x 12	10

NOTES.

- ALL DIMENSIONS ARE IN mm.
- WELD SIZE FOR WEB LENGTH OF JOISTS AND WEB STIFFENER IS 6 mm (TYP.).
- SPLICE DESIGNED FOR FULL STRENGTH OF SMALLER JOIST SECTION.
- IN NO CASE THE SIZE OF WELD WOULD BE MORE THAN 0.8*(min. OF THK. PARTS BEING WELDED.)



VIEW - 11


DETAIL - X

REV NO.	ZONE	BRIEF RECORD OF REVISIONS	PPD.	CHD.	APPD.
1		RELEASED FOR FABRICATION.	Prakash	N.V.Reddy 15.03.2017	ESN Prasad 15.03.2017



CAUTION: The information on this document is the property of BHARAT HEAVY ELECTRICALS LTD. It must not be used directly or indirectly in any way detrimental to the interest of the company.

		Bharat Heavy Electricals Ltd UNIT: HEAVY PLATES & VESSELS PLANT VISAKHAPATNAM-530012		NAME N.Prakasa Rao	SIGNATURE 	DATE 10.03.2017	
DEPT ALL DIMENSIONS ARE IN MM	PROJECTION 	SCALE N.T.S.	WEIGHT (Kg) -	DRN N.VasudevReddy	DATE 10.03.2017	APPD ESN Prasad	DATE 10.03.2017
TITLE STANDARD DETAILS OF WELDS				REF TO ASSY / OLD DWG		DRAWING NO : 2-35-110-00003	REV 0
				e-DAWN DRG. NO. 2-35-110-U0064			

FORM NO. 0423/2 E

	MANUFACTURER'S NAME & ADDRESS	MANUFACTURING QUALITY PLAN						PROJECT: ONGC NAVAGAM			
	BHEL-VISAKHAPATNAM or Approved Sub-Contractors	ITEM: Feed Heater system	QP NO: CQP 2533 REV 00		Date: 08.11.2022		PAGE 1 of 2		PACKAGE: Feed Heater SO NO:7938 Customer Reference: AMD/MM/2022/965605 Dt. 08.08.2022 (Contract No:9010035092)		

SL No	COMPONENT & OPEARATION	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENTS	ACCEPTANCE NORMS	FORMAT OF RECORD		AGENCY			REMARKS
									D	M	C	N	
1	2	3	4	5	6	7	8	9					
1.0 RAW MATERIALS & BOUGHT OUT ITEMS													
1.1	Pipes & Tubes As applicable	Mechanical Chemical NDT as applicable	A	TC verification	100%	Material Specification as per Column 2, Internal TDC	Mfg TC/ Material Data Report	√	-	QC	V		
1.2	Flanges & Fittings As applicable	Mechanical Chemical NDT as applicable	A	TC verification	100%	Material Specification as per Column 2, Internal TDC	Mfg TC/ Material Data Report	√	-	QC	V		
1.3	Plates As applicable	Mechanical Chemical NDT as applicable	B	TC verification	100%	Material Specification as per Column 2, Internal TDC	Mfg TC As applicable		-	QC	V		
1.4	Other Materials as per respective material specification and BHEL Drawing						-			QC	-		Check on sample basis
2.0 INPROCESS INSPECTION													
2.1	Welding Qualification	Procedure Qualification	B	WPS Review	100%	ASME Sec IX as applicable	WPS PQR		P	QC	V		
2.2	Welder Qualification	Personnel Qualification	B	WQR Review	100%	AWS/IBR/IS (#)	WQR		P	QC	V	# As applicable	

Prepared by  P. Gopi Kishore Manager/QA	Reviewed & Approved By  A.K. Mandal AGM (Q&BE)	LEGEND:	Approved By																																							
		<table border="1"> <tr><td>A</td><td>Critical</td><td>N</td><td>ONGC</td></tr> <tr><td>B</td><td>Major</td><td>C</td><td>BHEL QC/ND/Authorized inspection agency</td></tr> <tr><td>TC</td><td>Test certificate</td><td>M</td><td>BHEL/Approved subcontractor</td></tr> <tr><td>QC</td><td>Quality Control</td><td>PQR</td><td>Procedure Qualification record</td></tr> <tr><td>P</td><td>Perform</td><td>WQR</td><td>Welder Qualification record</td></tr> <tr><td>W</td><td>Witness</td><td>AWS</td><td>American Welding society</td></tr> <tr><td>RT</td><td>Radiographic testing</td><td>PMI</td><td>Positive material identification</td></tr> <tr><td>HT</td><td>Heat treatment cycle</td><td>WPS</td><td>Welding procedure specification</td></tr> <tr><td>NDT</td><td>Nondestructive testing</td><td>TDC</td><td>Technical Delivery condition</td></tr> <tr><td>PT</td><td>Penetrant Testing</td><td>V</td><td>Verification of documents</td></tr> </table>	A	Critical	N	ONGC	B	Major	C	BHEL QC/ND/Authorized inspection agency	TC	Test certificate	M	BHEL/Approved subcontractor	QC	Quality Control	PQR	Procedure Qualification record	P	Perform	WQR	Welder Qualification record	W	Witness	AWS	American Welding society	RT	Radiographic testing	PMI	Positive material identification	HT	Heat treatment cycle	WPS	Welding procedure specification	NDT	Nondestructive testing	TDC	Technical Delivery condition	PT	Penetrant Testing	V	Verification of documents
A	Critical	N	ONGC																																							
B	Major	C	BHEL QC/ND/Authorized inspection agency																																							
TC	Test certificate	M	BHEL/Approved subcontractor																																							
QC	Quality Control	PQR	Procedure Qualification record																																							
P	Perform	WQR	Welder Qualification record																																							
W	Witness	AWS	American Welding society																																							
RT	Radiographic testing	PMI	Positive material identification																																							
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NDT	Nondestructive testing	TDC	Technical Delivery condition																																							
PT	Penetrant Testing	V	Verification of documents																																							
For clauses marked with ✓ (TICK) in column 'D', certificates shall be included in Documentation.																																										



MANUFACTURER'S NAME
& ADDRESS

**BHEL-VISAKHAPATNAM
or Approved Sub-
Contractors**

MANUFACTURING QUALITY PLAN

ITEM: Feed Heater system

QP NO: CQP 2533 REV 00

Date: 08.11.2022

PAGE 2 of 2

PROJECT: ONGC NAVAGAM

PACKAGE: Feed Heater

SO NO:7938

Customer Reference: AMD/MM/2022/965605

Dt. 08.08.2022


(Contract No:9010035092)

SL No	COMPONENT & OPEARATION	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENTS	ACCEPTANCE NORMS	FORMAT OF RECORD		AGENCY			REMARKS
									D	M	C	N	
1	2	3	4	5	6	7	8	9	D				
2.3	Edge preparation of pressure parts	Soundness	B	Visual	100%	Material specification		-		P	QC	-	
2.4	Fit up inspection	Weld angle, alignment, mismatch, root gap	B	Visual & Dimension	100%	BHEL Drawing		-		P	QC	-	
2.5	NDT for Welds												
2.5.A	Butt welds in piping	Soundness	B	RT	100%	API RP 530		RT Report	√	P	ND T	V*	*Verification of RT films
2.5.B	Root and final welds of all butt and fillet joints	Soundness	B	PT	100%	As per drawing		PT Report		P	QC	-	
2.6	PWHT as applicable	Temp Vs Time	B	Review	100 %	Drawing & HT Cycle		HT Chart		P	QC	-	
2.7	Hydro test	Soundness	B	Visual	100%	BHEL Drawing		Hydro test report		P	QC	W	
3.0	FINAL INSPECTION & TESTING												
3.1	Visual & Dimensional check	Visual & Dimensions	B	Visual, Measurement	100%	BHEL Drawing		Inspection Report	√	P	QC	W	
3.2	Identification & Painting	Stenciling, Cleanliness & PMI	B	Verification, Visual	100%	BHEL Drawing & Approved paint scheme		Painting report		P	QC	-	
3.3	Preservation & packing	Packing	B	Visual & Verification	100%	BHEL Drawing		-		P	QC	-	
3.4	Data Folder	Documents	B	Verification	100%	As applicable		Data folder			QC		

**BHARAT HEAVY ELECTRICALS LIMITED, HPVP UNIT, VISAKHAPATNAM
PAINTING SCHEDULE FOR FEED HEATER, ONGC, NAVAGAM (SO:4051)
DOCUMENT NO:4-4051-PAINT-SCH--001, REV: A**

S NO	DESCRIPTION	SURFACE PREPARATION & SURFACE PROFILE		PRIMER COAT		FINISH PAINT		Total DFT
		SA2 1/2 Blast cleaning to near white metal SSPC-SP-10	SA2 1/2 Blast cleaning to near white metal SSPC-SP-10	F-9 Two pack air drying self curing solvent based inorganic zinc silicate coating with minimum 80% zinc on dry fill and suitable to 250 degree centigrade	P6: One coat of self priming Epoxy phenolic primer.	F-12 Heat resistant silicon aluminium paint to IS13183 gr I suitable up to 250 degrees centigrade.	Two coats of epoxy phenolic coating.	
1	External surfaces of Heater main shell/Economiser shell/stack/flue gas piping, structural members in contact with hot surfaces	SA2 1/2 Blast cleaning to near white metal SSPC-SP-10	SA2 1/2 Blast cleaning to near white metal SSPC-SP-10	F-9 Two pack air drying self curing solvent based inorganic zinc silicate coating with minimum 80% zinc on dry fill and suitable to 250 degree centigrade	P6: One coat of self priming Epoxy phenolic primer.	F-12 Heat resistant silicon aluminium paint to IS13183 gr I suitable up to 250 degrees centigrade.	Two coats of epoxy phenolic coating.	2 coat 20µ DFT/coat (2x20 µ) 105-115 µ
2	Heater inside surfaces in contact with ceramic fibre blanket	SA2 1/2 Blast cleaning to near white metal SSPC-SP-10	SA2 1/2 Blast cleaning to near white metal SSPC-SP-10	F-9 Two pack air drying self curing solvent based inorganic zinc silicate coating with minimum 80% zinc on dry fill and suitable to 250 degree centigrade	P6: One coat of self priming Epoxy phenolic primer.	F-12 Heat resistant silicon aluminium paint to IS13183 gr I suitable up to 250 degrees centigrade.	Two coats of epoxy phenolic coating.	2 coats 75 µ DFT/coat 225 µ
3	All other steel works							
a)	Ladders, Rungs, Railing & Vertical posts	Power tool cleaning	Power tool cleaning	F-9 Two component inorganic zinc silicate coating with minimum 80% zinc on dry film and suitable to 400 degrees centigrade + P6: One coat of Epoxy zinc phosphate primer.	F9: One coat of inorganic zinc silicate primer	F6A: Two coats of epoxy high build paint. + F2: 1 coat of Acrylic Polyurethane finish paint	2 coats 100 µ DFT/coat + 1 coat 40 µ DFT/coat	345-355 µ
b)	Hand rail, middle rail, Toe plate,	SA2 1/2 Blast cleaning to near white metal SSPC-SP-10	SA2 1/2 Blast cleaning to near white metal SSPC-SP-10	F-9 Two component inorganic zinc silicate coating with minimum 80% zinc on dry film and suitable to 400 degrees centigrade + P6: One coat of Epoxy zinc phosphate primer.	F9: One coat of inorganic zinc silicate primer	F6A: Two coats of epoxy high build paint. + F2: 1 coat of Acrylic Polyurethane finish paint	2 coats 100 µ DFT/coat + 1 coat 40 µ DFT/coat	345-355 µ
c)	Steel columns, brackets, duct outside, beams, bracings	SA2 1/2 Blast cleaning to near white metal SSPC-SP-10	SA2 1/2 Blast cleaning to near white metal SSPC-SP-10	F-9 Two component inorganic zinc silicate coating with minimum 80% zinc on dry film and suitable to 400 degrees centigrade + P6: One coat of Epoxy zinc phosphate primer.	F9: One coat of inorganic zinc silicate primer	F6A: Two coats of epoxy high build paint. + F2: 1 coat of Acrylic Polyurethane finish paint	2 coats 100 µ DFT/coat + 1 coat 40 µ DFT/coat	345-355 µ
4)	Cold duct (In side)	SA2 1/2 Blast cleaning to near white metal SSPC-SP-10	SA2 1/2 Blast cleaning to near white metal SSPC-SP-10	F-9 Two component inorganic zinc silicate coating with minimum 80% zinc on dry film and suitable to 400 degrees centigrade + P6: One coat of Epoxy zinc phosphate primer.	F9: One coat of inorganic zinc silicate primer	F6A: Two coats of epoxy high build paint. + F2: 1 coat of Acrylic Polyurethane finish paint	2 coats 100 µ DFT/coat + 1 coat 40 µ DFT/coat	345-355 µ
<p>Notes: 1) All external insulated surfaces to be provided with primer coats only suitable for 400 degrees centigrade. 2) For fabricated box sections & construction of similar nature, primer coat shall be given inside the surface before fabrication. 3) ** SL No:2: Paint is in Refractory vendor scope.</p>								

Prepared by 

Checked by 

Approved by 

DESCRIPTION OF PAINTS:

F-12: Heat Resistance Silicone Aluminium Paint (upto 540 deg C)

F-9: Inorganic Zinc Silicate Coating

P-6: Epoxy Zinc Phosphate Primer

F-2: Acrylic Polyurethane finish paint

F-6A: Epoxy High Build Coating

F-2: Acrylic Polyurethane finish paint