Bharat Heavy Electricals Limited
Heavy Plates & Vessels Plant
Visakhapatnam ï 530 012
Andhra Pradesh, INDIA
PAN-AAACB4146P, GST-37AAACB4146P7Z8

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INVITATION TO TENDER

Ref : OS/19-20/7876/44/102 Date : 30.03.2020

Sub : **Fabrication of Air Receivers against S.O. 7876 at Vendor's works with free issue materials**

Dear Sir,

Sealed tenders are invited for the subject work in **two part bid** system from Vendors who are experienced in / capable of fabrication of pressure vessels.

ELIGIBILITY CRITERIA

1) Bidders must have an experience of executing similar works (i.e. Fabrication of Pressure Vessels**)** for a minimum of one project as on 29th Feb'2020. Bidders shall have to enclose relevant Work Orders, Work Completion Certificates etc. in support of the same.

2) Bidders shall have to enclose the documents of Registration of Firm, Udyog Aadhar, PAN & GSTIN.

3) The works executed in the name of individual / firm of the tenderer will only be considered for eligibility criteria.

1. LOCATION OF WORK SPOT :

The fabrication work is to be carried out **at Vendor's works**.

2. VENDOR'S SCOPE OF WORK :

- Details of the equipments to be fabricated are as follows :

Sl. No.	S.O. No.	Project Name	Description of Item	Quantity	Unit Wt.	Total Wt.
1.	7876	Vyasi Project	H.P. Air Receiver (PV-010)	01 No.	2.74 MT	2.75 MT
2.	7876	Vyasi Project	L.P. Air Receiver (PV-020)	01 No.	1.45 MT	1.45 MT
3.	7876	Vyasi Project	L.P. Air Receiver (PV-030)	01 No.	3.00 MT	3.00 MT
			Total	**03 Nos.**		**7.20 MT**

- Complete fabrication of the Air Receivers as per the Drawings, QAP, WPS, Painting Schedule, Standards & Specifications etc. given in annexure – II and it includes the following activities but not limited to the same :-
- Collection of all free issue materials and other components from HPVP Stores / Shops and transportation of the same to Vendor's works
- Fabrication involving various operations like marking, cutting, machining, drilling, rolling, assembly, fit-up, welding & dressing, DPT / LPI, Radiography, Hydro testing & DFT etc.
- NDT like DPT, MPI, RT, UT, DFT shall be carried out, wherever applicable, as per the approved ITP / QAP / NDE plan / Procedures / Standards & Specifications.
- Blasting & Painting as per the Drawings, Painting schedule, Product Standard - HT 00005. DFT checks are to be carried out by deploying required instruments as per the applicable standards / specifications / drawings.
- Transportation of the equipments from Vendor's works to HPVP Shops for SR and back to Vendor's works after SR
- Transportation of the finished equipments from Vendor's works to HPVP and Handing over to Logistics dept.
- Hydro testing of the complete equipment.
- Free issue items cleared by QC shall be collected within 3 days from the date of intimation without failure. Any delay beyond the 3 days shall be considered for levying of L.D.
- Hydra Crane, all Tools & Tackles, Consumables required for fabrication, unloading & loading

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- Qualified personnel shall be deployed for proper co-ordination of the job. All the QC related documents are to be prepared & submitted to BHEL (QC) / TPIA / Customer for stage wise inspection and final inspection clearances.
- Welding is to be carried out by qualified welders along with Production Test Coupons strictly as per relevant drawings, QAP / ITP & WPS.

  Welder's qualification is the responsibility of the Vendor. However, Test Pieces shall be provided by BHEL as free issue.
- Stenciling & Letter painting of Dispatch particulars in a prescribed / specified format.
- Any modification work due to revision of drawings during fabrication is to be carried out by the vendor without any extra cost.
- 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 vendors.

3. BHEL'S SCOPE : BHEL – HPVP shall provide the following as free issue :

- Applicable approved drawings, GMS**,** ITP / QAP, WPS, Painting Schedule, NDE Plan, Standard Procedures / Specifications etc.
- Plates in the form of Off-Cuts / Full Plates
- Pipes / Tubes, Bars, Rolled Sections in Running Metre
- Top & Bottom Dished Ends in formed condition
- Supply of Elliptical Nozzles for Eqpt. PV-010 in finished condition
- Welding Test Coupons shall be provided as free issue by BHEL.
- Stress Relieving of the equipments with Dished ends in welded condition
- BOCs like Blind Flanges, Fasteners, Gaskets etc. as per GMS
- Paints as per the requirement

4. INSPECTION :

Inspection shall be carried out by M/s. BHEL / BHEL Authorized Inspection Agency as per approved QAP.

Vendor's scope includes co-ordination with the inspection authority for Stage wise and Final Inspection and obtaining inspection clearance along with all necessary documentation, Generation of Inspection Reports / TPI Clearance / Customer Clearance / Preparation of Final Document etc.

5. DELIVERY :

Finished items along with all inspection documents and all other related certificates are to be handed over to HPVP Logistics as per the following schedule : -

Within 4 weeks from the date of issue of last consignment of free issue materials / components. However, the delivery period should meet the delivery schedules committed to the customer.

Note : For intermediate operations like SR, 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.

6. PRICE :

The price shall be quoted as per the Schedule of Rates enclosed at Annexure – I for the detailed scope of work of each item. The prices shall be fixed & firm without any escalation during the entire period of contract and till completion of the work.

The quoted price shall be inclusive of all applicable taxes & duties except GST and Income tax will be deducted at applicable rates from RA & Final bills. GST shall be reimbursable to the vendor as detailed in Clause – 7 and as per Annexure – GST.

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7. GOODS & SERVICES TAX (GST) :

Bidders shall make a note of the following points of GST before submission of their offer **:-**

- 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.
- 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 and 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.
- After fabrication, the vendors shall have to deliver the Semi - finished Goods by fulfilling the following formalities :-

  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.

  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

8. REVERSE AUCTION :

BHEL reserves the right to opt for Reverse Auction at its discretion instead of opening the price bids submitted in sealed envelope and any information regarding the reverse auction shall be decided after technical evaluation and shall be intimated to the bidders at appropriate time. The bidders are requested to give their acceptance for participation in RA. Non-acceptance to participate in RA may result in non-consideration of their bids in case BHEL decides to go for RA.

In case BHEL decides to go for RA, only those bidders who give their acceptance will be allowed to participate in RA and these bidders shall have to necessarily submit 'Online Sealed Bid' in the RA.
Non-submission of 'Online Sealed Bid' by the bidder will be considered as tampering of the tendering process and will invite action by BHEL as per extent guidelines in vogue.

9. 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.

10. Other Terms & Conditions shall be as per Annexure – III enclosed.

11. VALIDITY OF OFFER :

The offer shall be valid for a period of **3 months** from the last date for tender submission.

12. GENERAL :

- 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 offers. One complete set of drawings shall be made available in the office of DGM (Outsourcing) and the same shall be referred during working hours. Drawings, QAP, WPS etc. shall be sent to vendor's e-mail address.
- For any clarifications required on this tender document, scope of work etc., the bidders shall depute their authorized representatives to BHEL, Visakhapatnam with prior intimation for better understanding of the scope of work and getting clarifications from concerned authorities between 09:00 AM and 04:30 PM.

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- Bidders shall confirm their acceptance to all the terms & conditions of the tender enquiry. **Any deviations to the tender terms & conditions are not acceptable and BHEL reserves the right to reject such offers without further correspondence.**
- BHEL reserves the right to modify or cancel the tender enquiry at any stage without assigning any reasons thereof.

13. The following documents shall form part of the tender enquiry:

i) Schedule of Rates : Annexure – I
ii) List of Drawings & Documents : Annexure – II
(Drawings, QAP / ITP, Painting Schedule, Specifications, Standard Procedures, WPS etc. shall be sent by e-mail to vendor's e-mail address on request)
iii) General Terms & Conditions : Annexure – III
iv) Acceptance to tender terms & conditions : Annexure – IV
v) Reverse Auction Rules & Regulations : Annexure – V
vi) GST Compliance for Indigenous Suppliers : Annexure – GST

14. TENDER SUBMISSION :

Techno-commercial bids shall be submitted along with the **tender document duly signed by the bidder on all pages.** Techno-Commercial Bid and Price bid shall be placed in two separate envelopes and both shall be kept in another big envelope.

Tenders completed in all respects **along with a covering letter on Company's Letter Head shall be addressed to DGM (Outsourcing)** and shall be sent to or dropped in the **Outsourcing Tender Box, Reception counter, Admn. Building, BHEL - HPVP, Visakhapatnam, PIN – 530 012** so as to reach on or before 14.00 hrs. on **15.04.2020** duly super scribing the Subject, Tender Ref. No. and Technical / Price Bid on the envelopes.

Contact Information – Outsourcing Department : 0891 – 668 1332 / 1348 / 1358

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

Note : Offers sent in any other form will be treated as invalid and will be summarily rejected.

15. OPENING OF TENDERS :

Techno-commercial Bids will be opened on **15.04.2020 at 14.00 Hrs.** at Customer Cell, Admn. Building, BHEL - HPVP, Visakhapatnam. The price bid of the techno-commercially qualified bidders will be opened in presence of representatives of the bidders and the date & time of opening of price bids will be intimated later. The bidders may depute their representatives at the time of opening.

In case of opting for Reverse Auction, intimation shall be given to the qualified bidders in advance at appropriate time.

for Bharat Heavy Electricals Limited,

30/03/2020

(Y.V.R.Rao)
DGM(OS)

ANNEXURE - I

Schedule of Rates

Ref : OS/19-20/7876/44/102, dated 30.03.2020

Sub : Fabrication of Air Receivers against S.O. 7876 at Vendor's works with free issue materials

Sl. No.	S.O. No.	PGMA	Description of Work	Unit	Qty.	Unit Rate (in ₹)	Total Amount (in ₹)
1			Complete Fabrication of the Air Receivers including machining, radiography, blast cleaning & painting etc., as per the Drawings, Specifications, QAP & WPS including Collection of FIMs from HPVP stores / shops, transportation to Vendor's works, transportation of equipments from Vendor's works to Shops for SR and back to Vendor's works, Transportation & Handing over of the finished equipments to HPVP Logistics dept. etc. complete in all respects as per the detailed scope of work mentioned in the tender document.				
1.1	7876	PV-010	HP Air Receiver (1.6 Cu.M)	MT	2.75		
1.2		PV-020	LP Air Receiver (2 Cu.M)	MT	1.45		
1.3		PV-030	LP Air Receiver (6 Cu.M)	MT	3.00		
			TOTAL	MT	7.20		
Total Amount in Words :							

Notes :

1) **L1 shall be evaluated based on the quoted total value and there shall be no distribution of work.**

2) The quantity and weights indicated above are approximate and may slightly vary on both sides subject to revision or addition or deletion of drawings. However, payment shall be made for the actual weights as per the applicable drawings / BOM.

3) The prices shall be fixed & firm without any escalation during the entire period of contract and till completion of work.

4) The quoted price shall be inclusive of all applicable taxes & duties except GST and Income tax will be deducted from Vendor's bills at applicable rates. However, GST shall be reimbursed by BHEL on submission of proof of GST payment.

5) The bidders are advised to go through all the drawings & documents before quoting the tender.

6) BHEL reserves the right to go for Reverse auction as per the applicable guidelines instead of opening price bids.

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 any 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

ANNEXURE - II

LIST OF REFERENCE DRAWINGS & DOCUMENTS

Sub : Fabrication of Air Receivers against S.O. 7876 at Vendor's works with free issue materials

Ref : OS/19-20/7876/44/102, dated 30.03.2020

Sl. No.	S.O. No.	PGMA	Description of Drg. / Document	Drg. / Doc. No.	Rev. No.	No. of Sheets
01	7876	PV-010	**Welded Assembly of HP Air Receiver (1.6 Cu.M)**	**0-229-01-17603**	**0**	**1**
02			Man-Hole Cover Assembly	2-229-01-14801	0	1
03			Dome	3-229-01-14801	0	1
04			Cross Bar	3-229-01-14802	0	1
05			Base Plate	3-229-01-14803	0	1
06			Compensation Ring	3-229-01-14804	0	1
07			Elliptical Shell (in Halves)	3-229-01-14805	0	1
08			Bracket	4-220-01-02002	3	1
09			Pin	4-220-01-02003	3	1
10			Lever	4-220-01-49017	3	1
11			Stud	4-220-01-49027	3	1
12			Skirt Segment	4-229-01-14802	0	1
13			Rib	4-229-01-14803	0	1
14			Boss	4-229-01-14806	0	1
15			Cover Plate	4-229-01-14807	0	1
16			Bracket	4-229-01-14808	3	1
17			Boss	4-229-01-14815	0	1
18		PV-020	**Welded Assembly of LP Air Receiver (2 Cu.M)**	**0-229-10-19205**	**2**	**1**
19			Dome End	2-229-10-18901	1	1
20			Lifting Lug	3-229-10-18901	0	1
21			MS Flat-1	3-229-10-18902	0	1
22			Boss for Junction Block	3-229-10-18904	0	1
23			Base Flange	3-229-10-18905	0	1
24			Boss - 3/4"	4-229-10-18905	0	1
25			Boss - 3/8"	4-229-10-18906	0	1
26			Boss for Hand Hole	4-229-10-19203	0	1
27		PV-030	**Welded Assembly of LP Air Receiver (6 Cu.M)**	**0-229-10-18604**	**1**	**1**
28			Man-Hole Cover Assembly	2-220-01-49010	2	1
29			Lifting Lug	3-220-01-49031	4	1
30			Cross Bar for Pr. Receiver	3-220-01-49055	4	1
31			Bracket	4-220-01-02002	2	1
32			Pin	4-220-01-02003	1	1

Sl. No.	S.O. No.	PGMA	Description of Drg. / Document	Drg. / Doc. No.	Rev. No.	No. of Sheets
33	**7876**	**PV-030**	Bracket	4-220-01-49016	2	1
34			Lever	4-220-01-49017	2	1
35			Stud	4-220-01-49027	2	1
36			Cover Plate	4-229-01-49076	3	1
37			Boss - 3/8" for Pressure Gauge	4-229-01-14401	0	1
38	-	-	Quality Assurance Plan	QA/HT/1069	0	3
39				QA/HT/1070	0	3
40			Corporate Standard (Classification of Welds, Their Inspection, Testing & Acceptance)	AA0622101	3	12
41			Product Standard (Painting of Machined & Unmachined Surfaces of Water Turbines by Brushing)	HT 00005	0	8
42			Welding Procedure Specification			

Note : The drawings & documents mentioned above are indicative only and scope of work may vary as per actual detailed drawings /documents issued for fabrication.

ANNEXURE - III

Ref : **OS/19-20/7876/44/102** **Date : 30.03.2020**

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 ñFree Issue Materials", which are required for completion of the work.

c) All consumables such as electrodes, gases, grinding wheels etc.

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 partyôs 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 supplied 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/Fixed Deposit 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 materials within one week from the date of issue of Order. The BG/FD shall be valid for the contract period with a claim period of 3 months. This BG/FD shall be released to the contractor after completion of work and on acceptance of the same by BHEL / Owner and on submission of Performance BG 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 final bill.

8. 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).**

9. 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.

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10. 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 Structurals (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.

11. SCRAP & OFFCUT 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)	-

12. 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.

13. 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.

14. 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.

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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.

15. DELIVERY :

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

16. 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.

17. PAYMENT TERMS :

100% payment will be made against delivery of the finished items, duly inspected & cleared by Inspection authority along with all inspection documents, to Logistics dept. Payment shall be made within 45 days from the date of submission of RA Bill.

RA Bills are not allowed for orders of value less than Rs. 5 lakh. RA Bills are allowed for Order values of more than 5 lakh and in such cases, each RA bill value shall not be less than Rs. 5 lakh.

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

18. SECRECY :

All the documents of BHEL inclusive of Drawings, GMS, Standards and Procedures 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.

19. 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.

20. 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.

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21. **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. Contractorûs 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.*

22. **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.,

23. **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 menûs 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.

24. **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.

25. 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.

26. 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**.**

Signature of the Bidder with Stamp

ANNEXURE – IV

Ref : **OS/19-20/7876/44/102** **Date : 30.03.2020**

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 in case BHEL decides to opt for 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

ANNEXURE – V

Ref : **OS/19-20/7876/44/102** **Date : 30.03.2020**

GENERAL TERMS AND CONDITIONS OF RA (REVERSE AUCTION)

BHEL reserves the right to go for Reverse Auction (RA) (Guidelines as available on www.bhel.com) instead of opening the sealed envelope price bid, submitted by the bidder.

This will be decided after techno-commercial evaluation. Bidders have to give their acceptance with their offer for participation in RA. Non-acceptance to participate in RA may result in non ï consideration of their bids, in case BHEL decides to go for RA.

Those bidders who have given their acceptance to participate in Reverse Auction will have to necessarily submit ôProcess compliance formô(to the designated service provider) as well as óOnline sealed bidôin the Reverse Auction. Non-submission of ôProcess compliance formô or óOnline sealed bidô by the agreed bidder(s) will be considered as tampering of the tender process and will invite action by BHEL as per extant guidelines for suspension of the business dealings with suppliers/ contractors (as available on www.bhel.com).

The bidders have to necessarily submit online sealed bid less than or equal to their envelope sealed price bid already submitted to BHEL along with the offer. **The envelope sealed price bid of successful L1 bidder in RA, if conducted, shall also be opened after RA and the order will be placed on lower of the two bids (RA closing price & envelope sealed price) thus obtained. The bidder having submitted this offer specifically agrees to this condition and undertakes to execute the contract on thus awarded rates.**

If it is found that L1 bidder has quoted higher in online sealed bid in comparison to envelope sealed bid for any item(s), the bidder will be issued a warning letter to this effect. However, if the same bidder again defaults on this count in any subsequent tender in the unit, it will be considered as fraud and will invite action by BHEL as per extant guidelines for suspension of business dealings with suppliers / contractors (as available on ww.bhel.com).ò

As a reminder to the bidders, system will flash following message (**in RED Colour**) during the course of óonline sealed bidô

ñBidders to submit online sealed bid less than or equal to their envelope sealed bid already submitted to BHELò

Signature of the Bidder with Stamp

ANNEXURE - GST

GST COMPLIANCE FOR INDIGENOUS SUPPLIERS

1. In Response to Tenders for Indigenous supplier will be entertained only if the vendor has a valid GSTIN which should be clearly mentioned in the offer. If any specific exemption is available, a declaration with due supporting documents need to be furnished for considering the offer.
2. Supplier shall mention their GSTIN in all their invoices and invoices shall be in the format as specified/prescribed under GST laws. Invoices shall necessarily contain Invoice number (in case of multiple numbering system is being followed for billing like SAP invoice no, commercial invoice no etc., then the Invoice No which is linked/uploaded in GSTN network shall be clearly indicated), item description as per P0, 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.

Signature of the Bidder with Stamp

QUALITY ASSURANCE PLAN

PROJECT : VYASI HEP
NAME OF EQUIPMENT : H.P Compressed Air System

CLIENT: UJVN LTD
VENDOR : BHEL, BHOPAL
QA PLAN NO.: QA/HT/1070 REV. 00 Dtd. 30.12.2018

SR. NO.	ITEM /COMPONENTS & CHARACTERISTICS	NATURE OF CHECKS	QUANTUM OF CHECKS	REFERENCE DOCUMENTS / ACCEPTANCE NORMS	RECORD FORMAT	INSP. AGENCY			REMARKS
						Perform	Witness	Verify	
1	**H.P COMPRESSOR UNIT**								
a)	Make, Type & capacity	Visual	100%	Relevant standard/ Tech. spec./ Approved Drawing	TC	3/2	-	1	TC
b)	Routine Test	Test	-do-	-do-	TC	3/2	-	1	TC
2	**Pipes, Fitting, Pressure Reducer, Valves & Flange etc.**								
a)	Chemical Composition	Chemical	Sample/ Batch	-do-	TC	3/2	-	1	TC
b)	Mech. Strength	Mechanical	-do-	-do-	TC	3/2	-	1	TC
c)	Dimensional Check	Measurement	100%	-do-	TC	3/2	-	1	TC
d)	Pressure Test	Test	100%	-do-	TC	3/2	-	1	TC
e)	Functional Test of Values & Pressure Reducer	Test	100%	-do-	TC	3/2	-	1	TC
3	**MOTOR FOR HP COMPRESSOR**								
a)	Make, Type & rating	Visual	100%	-do-	TC	3/2	-	1	TC
b)	Routine test	Test	-do-	Relevant standard/ Tech. spec./ Approved Drawing/ IS:325	TC	3/2	-	1	TC
4	**PRESSURE GAUGES, TEMPERATURE GAUGES & SWITCHES**								
a)	Make, Type & calibration	Visual	-do-	Relevant standard/ Tech. spec./ Approved Drawing	TC	3/2	-	1	TC
5	**Air Filters**								
a)	Make, Type & rating	Visual	100%	-do-	TC	3/2	-	1	TC / CoC
b)	Mesh Size	Measurement	100%	-do-	TC	3/2	-	1	TC / CoC

Note: a. In 'Inspection Agency' column figure 1,2,or 3 to be filled. 1- will indicate 'UJVN', 2- will indicate 'BHEL/BHEL appointed TPIA' & 3- will indicate 'sub-supplier'.

b. In 'Remarks' column following abbreviations shall be used - RR-Review of Records, T.C. - Test Certificate/ Report Submission to 'UJVN', CoC- Certificate of Compliance & CHP - Customer Hold Point. c Test certificates shall be submitted at the time of final inspection.

Signature
UJVN (Customer)

Wali
30.12.18
(HTE)

Signature & Seal
(VENDORS Q.C. DEPT. OR REPRESENTATIVE)

APPROVED

Dy. General Manager (E&M Design-I)
UJVN Limited
Ganga Bhawan, Yamuna Colony.
Dehradun-248001

QUALITY ASSURANCE PLAN

PROJECT : VYASI HEP
NAME OF EQUIPMENT : H.P Compressed Air System

CLIENT: UJVN LTD
VENDOR : BHEL, BHOPAL
QA PLAN NO.: QA/HT/1070 REV. 00 Dtd. 30.12.2018

SR. NO.	ITEM /COMPONENTS & CHARACTERISTICS	NATURE OF CHECKS	QUANTUM OF CHECKS	REFERENCE DOCUMENTS / ACCEPTANCE NORMS	RECORD FORMAT	INSP. AGENCY			REMARKS
						Perform	Witness	Verify	
6	**H.P Air Dryer**								
6.1	**Fan & Motor**								
a)	Make, Type & Rating	Visual	-do-	-do	TC	3/2	-	1	TC
b)	Routine Test	Test	-do-	Relevant Standard/ Tech. Spec./ Approved Drawing/ IS: 11989	TC	3/2	-	1	TC
6.2	**Heating Element**								
a)	Make, Model & Capacity	Measurement	-do	Relevant Standard/ Tech. Spec./ Approved Drawing	TC	3/2	-	1	TC
7	**H.P AIR RECEIVER (PRESSURE VESSEL STEEL)**								
a)	Chemical composition	Chemical	Sample/Batch	Relevant Standard/ Tech. Spec./ Approved Drawing/ IS: 2825	TC	3/2	-	1	TC
b)	Mech. Strength	Mechanical	-do-	-do-	TC	3/2	-	1	TC
c)	NTD of plate	UT	100%	-do-	TC	3/2	-	1	TC
d)	NTD-Full Strength weld	DPT/RT	-do-	-do-	TC	3/2	-	1	TC
e)	Post weld stress relieving	Temp.Regulation	-do-	-do-	TC	3/2	-	1	TC
f)	Dimensional Check	Measurement	-do-	-do-	TC	3/2	-	1	TC
g)	Hydrostatic Test of Air Receiver	Test	-do-	Relevant Standard/ Tech. Spec./ Approved Drawing/ IS: 7938	TC	3/2	-	1	TC
h)	Painting- DFT	Measurement	-do-	Relevant Standard/ Tech. Spec./ Approved Drawing	TC	3/2	-	1	TC

Note: a. In 'Inspection Agency' column figure 1,2,or 3 to be filled. 1- will indicate 'UJVN', 2- will indicate 'BHEL/BHEL appointed TPIA' & 3- will indicate 'sub-supplier'.
b. In 'Remarks' column following abbreviations shall be used - RR-Review of Records, T.C. - Test Certificate/ Report Submission to 'UJVN', CoC- Certificate of Compliance & CHP - Customer Hold Point. c. Test certificates shall be submitted at the time of final inspection.

Signature
UJVN (Customer)

Wali
30.12.18
(HTE)

Aadhar 30/12/18
आधार शर्मा / AADHAR SHARMA
वरि. अभियंता (क्यू.डब्ल्यू.टी) / Sr. Engineer (QWT)
गुणता नियंत्रण–जल टरबाईन / Quality Control-WTM
बी.एच.ई.एल. भोपाल / BHEL, BHOPAL

Signature & Seal
(VENDOR'S REC. DEPUTY REPRESENTATIVE)

APPROVED

Dy. General Manager (E&M Design-I)
UJVN Limited
Ganga Bhawan, Yamuna Colony.
Dehradun-248001

QUALITY ASSURANCE PLAN

PROJECT : VYASI HEP

CLIENT: UJVN LTD
VENDOR : BHEL, BHOPAL

NAME OF EQUIPMENT : H.P Compressed Air System

QA PLAN NO.: QA/HT/1070 REV. 00 Dtd. 30.12.2018

SR. NO.	ITEM /COMPONENTS & CHARACTERISTICS	NATURE OF CHECKS	QUANTUM OF CHECKS	REFERENCE DOCUMENTS / ACCEPTANCE NORMS	RECORD FORMAT	INSP. AGENCY			REMARKS
						Perform	Witness	Verify	
8	H.P COMPRESSOR ASSEMBLY								
a)	Dimensional Check	Measurement	100%	'Relevant standard/ Tech. spec./ Approved Drawing	JIR	3/2	1	-	CHP
b)	Acceptance Test								
i)	Capacity (Free Air Delivery)	Measurement	-do-	-do-	JIR	3/2	1	-	CHP
ii)	Speed	-do-	-do-	-do-	JIR	3/2	1	-	CHP
iii)	Specific power consumption at full load	-do-	-do-	-do-	JIR	3/2	1	-	CHP
iv)	Noise Level	-do-	-do-	-do-	JIR	3/2	1	-	CHP
c)	Verification of Bill of Material	Visual	-do-	-do-	JIR	3/2	1	-	CHP
d)	Functional test	Test	-do-	-do-	JIR	3/2	1	-	CHP
e)	Painting & Preservation	Visual / Measurement	-do-	-do-	TC	3/2	-	1	TC

Note: a. In 'Inspection Agency' column figure 1 ,2 ,or 3 to be filled. 1- will indicate 'UJVN', 2- will indicate 'BHEL/BHEL appointed TPIA' & 3- will indicate 'sub-supplier'.
b. In 'Remarks' column following abbreviations shall be used - RR-Review of Records, T.C. - Test Certificate/ Report Submission to 'UJVN', CoC- Certificate of Compliance & CHP - Customer Hold Point. c. Test certificates shall be submitted at the time of final inspection.

Signature
UJVN (Customer)

Wali
30.12.18
(HTE)

Aadhar 3-1-19

Signature & Seal
(VENDORS QA DEPTT. OR REPRESENTATIVE)

आधार शर्मा / AADHAR SHARMA
वरि. अभियंता (यू.डब्ल्यू.ई.) / Sr. Engineer (QMT)
गुणता नियंत्रण–जल टरबाईन / Quality Control-WTM
बी.एच.ई.एल.,भोपाल / BHEL, BHOPAL

APPROVED

Dy. General Manager (E&M Design-I)
UJVN Limited
Ganga Bhawan, Yamuna Colony.
Dehradun-248001

QUALITY ASSURANCE PLAN

PROJECT : VYASI HEP

NAME OF EQUIPMENT : L.P Compressed Air System

CLIENT: UJVN LTD
VENDOR : BHEL, BHOPAL
QA PLAN NO.: QA/HT/1069 REV. 00 Dtd. 30.12.2018

SR. NO.	ITEM /COMPONENTS & CHARACTERISTICS	NATURE OF CHECKS	QUANTUM OF CHECKS	REFERENCE DOCUMENTS / ACCEPTANCE NORMS	RECORD FORMAT	INSP. AGENCY Perform	Witness	Verify	REMARKS
1	**L.P COMPRESSOR UNIT**								
a)	Make, Type & capacity	Visual	100%	Relevant standard/ Tech. spec./ Approved Drawing	TC	3/2	-	1	TC
b)	Routine Test	Test	-do-	-do-	TC	3/2	-	1	TC
2	**Hoses pipes**								
a)	Make & Size	Visual	100%	-do-	TC	3/2	-	1	TC
b)	Pressure Test	Test	100%	-do-	TC	3/2	-	1	TC
3	**Pipes, Fitting, Pressure Reducer, Valves & Flange etc**								
a)	Chemical Composition	Chemical	Sample/ Batch	-do-	TC	3/2	-	1	TC
b)	Mech. Strength	Mechanical	-do-	-do-	TC	3/2	-	1	TC
c)	Dimensional Check	Measurement	100%	-do-	TC	3/2	-	1	TC
d)	Pressure Test	Test	100%	-do-	TC	3/2	-	1	TC
e)	Functional Test of Valves & Pressure Reducer	Test	100%	-do-	TC	3/2	-	1	TC
4	**MOTOR FOR L.P COMPRESSOR**								
a)	Make, Type & rating	Visual	100%	-do-	TC	3/2	-	1	TC
b)	Routine test	Test	-do-	Relevant standard/ Tech. spec./ Approved Drawing/ IS:325	TC	3/2	-	1	TC
5	**PRESSURE GAUGES, TEMPERATURE GAUGES & SWITCHES**								
a)	Make, Type & calibration	Visual	-do-	Relevant standard/ Tech. spec./ Approved Drawing	TC	3/2	-	1	TC
6	**Air Filters**								
a)	Make, Type & rating	Visual	100%	-do-	TC	3/2	-	1	TC / CoC
b)	Mesh Size	Measurement	100%	-do-	TC	3/2	-	1	TC / CoC

Note: a. In 'Inspection Agency' column figure 1,2,or 3 to be filled. 1- will indicate 'UJVN', 2- will indicate 'BHEL/BHEL appointed TPIA' & 3- will indicate 'sub-supplier'.
b. In 'Remarks' column following abbreviations shall be used - RR-Review of Records, T.C. - Test Certificate/ Report Submission to 'UJVN', CoC- Certificate of Compliance & CHP - Customer Hold Point. c. Test certificates shall be submitted at the time of final inspection.

Signature
UJVN (Customer)

Wali
30-12-18
(HTE)

30/12/18
Signature (BHEL)
VENDORS QC DEPT. REPRESENTATIVE)

आधार शर्मा / AADHAR SHARMA
वरि. अभियंता (क्यू.डब्ल्यू.टी.) / Sr. Engr. (QWT)
गुणता नियंत्रण–जल टरबाईन / Quality Control-WT
बी.एच.ई.एल.,भोपाल / BHEL, BHOPAL

APPROVED
Dy. General Manager (E&M Design-I)
UJVN Limited
Ganga Bhawan, Yamuna Colony.
Dehradun-248001

QUALITY ASSURANCE PLAN

PROJECT : VYASI HEP

NAME OF EQUIPMENT : L.P Compressed Air System

CLIENT: UJVN LTD
VENDOR : BHEL, BHOPAL
QA PLAN NO.: QA/HT/1069 REV. 00 Dtd. 30.12.2018

SR. NO.	ITEM /COMPONENTS & CHARACTERISTICS	NATURE OF CHECKS	QUANTUM OF CHECKS	REFERENCE DOCUMENTS / ACCEPTANCE NORMS	RECORD FORMAT	INSP. AGENCY			REMARKS
						Perform	Witness	Verify	
7	**L.P Air Dryer**								
7.1	**Fan & Motor**								
a)	Make, Type & Rating	Visual	-do-	-do	TC	3/2	-	1	TC
b)	Routine Test	Test	-do-	Relevant Standard/ Tech. Spec./ Approved Drawing/ IS: 11989	TC	3/2	-	1	TC
7.2	**Heating Element**								
a)	Make, Model & Capacity	Measurement	-do	Relevant Standard/ Tech. Spec./ Approved Drawing	TC	3/2	-	1	TC
8	**L.P AIR RECEIVER (PRESSURE VESSEL STEEL)**								
a)	Chemical composition	Chemical	Sample/Batch	Relevent Standard/ Tech. Spec./ Approved Drawing/ IS: 2825	TC	3/2	-	1	TC
b)	Mech. Strength	Mechanical	-do-	-do-	TC	3/2	-	1	TC
c)	NTD of plate	UT	100%	-do-	TC	3/2	-	1	TC
d)	NTD-Full Strength weld	DPT/RT	-do-	-do-	TC	3/2	-	1	TC
e)	Post weld stress relieving	Temp.Regulation	-do-	-do-	TC	3/2	-	1	TC
f)	Dimensional Check	Measurement	-do-	-do-	TC	3/2	-	1	TC
g)	Hydrostatic Test of Air Receiver	Test	-do-	Relevant Standard/ Tech. Spec./ Approved Drawing/ IS: 7938	TC	3/2	-	1	TC
h)	Painting- DFT	Measurement	-do-	Relevant Standard/ Tech. Spec./ Approved Drawing	TC	3/2	-	1	TC

Note: a. In 'Inspection Agency' column figure 1,2,or 3 to be filled. 1- will indicate 'UJVN', 2- will indicate 'BHEL/BHEL appointed TPIA' & 3- will indicate 'sub-supplier'.
b. In 'Remarks' column following abbreviations shall be used - RR-Review of Records, T.C. - Test Certificate/ Report Submission to 'UJVN', CoC- Certificate of Compliance & CHP - Customer Hold Point. c. Test certificates shall be submitted at the time of final inspection.

Signature
UJVN (Customer)

Wali
30.12.18
(HTE)

Aadhar 30/12/18

Signature & Seal
(VENDORS Q.C. DEPT. OR REPRESENTATIVE)

आनंद शर्मा / ANAND SHARMA
वरि. अभियंता (क्यू.सी.डब्ल्यू.टी.) / Sr. Engineer (QWT)
गुणता नियंत्रण–जल टरबाईन / Quality Control-WTM
बी.एच.ई.एल. भोपाल / BHEL, BHOPAL

APPROVED

Dy. General Manager (E&M Design-I)
UJVN Limited
Ganga Bhawan, Yamuna Colony.
Dehradun-248001

QUALITY ASSURANCE PLAN

PROJECT : VYASI HEP

CLIENT: UJVN LTD
VENDOR : BHEL, BHOPAL

NAME OF EQUIPMENT : L.P Compressed Air System

QA PLAN NO.: QA/HT/1069 REV. 00 Dtd. 30.12.2018

SR. NO.	ITEM /COMPONENTS & CHARACTERISTICS	NATURE OF CHECKS	QUANTUM OF CHECKS	REFERENCE DOCUMENTS / ACCEPTANCE NORMS	RECORD FORMAT	INSP. AGENCY			REMARKS
						Perform	Witness	Verify	
9	L.P COMPRESSOR ASSEMBLY INCLUDING CONTROL PANEL								
a)	Dimensional Check	Measurement	100%	Relevant Standard/ Tech. Spec./ Approved Drawing	JIR	3/2	1	-	CHP
b)	Acceptance Test								
i)	Capacity (Free Air Delivery)	Measurement	-do-	-do-	JIR	3/2	1	-	CHP
ii)	Speed	-do-	-do-	-do-	JIR	3/2	1	-	CHP
iii)	Specific power consumption at full load	-do-	-do-	-do-	JIR	3/2	1	-	CHP
iv)	Noise Level	-do-	-do-	-do-	JIR	3/2	1	-	CHP
c)	Verification of Bill of Material	Visual	-do-	-do-	JIR	3/2	1	-	CHP
d)	Functional test	Test	-do-	-do-	JIR	3/2	1	-	CHP
e)	IR & HV test on control panel	Electrical	-do-	-do-	JIR	3/2	1	-	CHP
f)	Painting & Preservation	Visual / Measurement	-do-	-dn-	TC	3/2	-	1	TC

Note: a. In 'Inspection Agency'column figure 1,2,or 3 to be filled. 1- will indicate 'UJVN', 2- will indicate 'BHEL/BHEL appointed TPIA' & 3- will indicate 'sub-supplier'.
b. In 'Remarks' column following abbreviations shall be used - RR-Review of Records, T.C. - Test Certificate/ Report Submission to 'UJVN', CoC- Certificate of Compliance & CHP - Customer Hold Point. c. Test certificates shall be submitted at the time of final inspection.

Signature
UJVN (Customer)

Wali
30.12.18
(HTE)

Asalhan
3/1/18
(VENDORS QC DEPT. OR REPRESENTATIVE)

APPROVED

Dy. General Manager (E&M Design-I)
UJVN Limited
Ganga Bhawan, Yamuna Colony.
Dehradun-248001

CLASSIFICATION OF WELDS, THEIR INSPECTION, TESTING AND ACCEPTANCE

1.0 SCOPE

1.1 This standard defines four grades of welds in steels viz. grade-I, grade-II, grade-III and grade-IV that are carried out in BHEL. It also covers the inspection requirements, testing and acceptance standards for these grades of welds to ensure that quality welds are produced.

1.2 Welds occurring on products manufactured to any particular code of practice by contractual or statutory obligations shall follow welding, inspection, testing acceptance etc. as per the relevant codes.

1.3 The grade of welds shall be chosen and specified in the drawings based on considerations of weld joint efficiency and the type of joints.

2.0 CLASSIFICATION

2.1 GRADE-I

Grade-I shall apply to full penetration butt welds, full throat welds and corner welds for following applications.

a) Welds subjected to stresses more than 60% of yield point of the welded metal at working temperature.

OR

b) Structures subjected to highly dynamic or severe alternating stresses.

OR

c) Structures operating above 250°C or below 0°C

2.2 Grade-II

2.2.1 Grade-II shall apply to full penetration or partial penetration butt welds for following applications

a) Welds subjected to stresses between 40 to 60% of yield point of the welded metal at working temperature

OR

b) Structures subjected to dynamic or alternating stresses of medium intensity or severe static stresses.

OR

c) Structures operating above 150° C to 250° C

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2.2.2 Grade-II partial penetration welds are not desirable and shall only be used where stress concentration at the root of welds is not of in significance.

2.3 GRADE-III

2.3.1 Grade-III shall apply to full penetration or partial penetration butt welds and fillet welds for following applications

a) Welds subjected to stresses below 40% of yield point of the welded metal at working temperature.

OR

b) Structures subjected to light to medium static stresses and no dynamic loading is involved.

OR

c) Weld seams which are not possible to be checked for leaks by conventional methods of testing such as hydraulic testing etc.

2.4 Grade-IV

2.4.1 Grade-IV shall be specified for all general production welding of lightly stressed nature and for weld seams which can be checked by hydraulic testing for leaks.

2.5 Qualified welding procedure and welders shall be used for all grades of welds.

2.5.1 For the purpose of classification of welds a compound weld i.e. a combination of butt and fillet welds, shall be considered as butt weld.

2.5.2 Type of joints not covered in the standard shall be decided by the designer in consultation with welding technologist.

3.0 INSPECTION REQUIREMENTS

3.1 Table-1 indicates the inspection requirements during various stages of welding for each grade of weld.

Table-1 Inspection Requirements during various stages of welding

Requirement	Grade-I	Grade-II	Grade-III	Grade -IV
3.1.1 Type of joint	Stress relieved full penetration butt joints welded from both the sides or one side.	Stress relieved full penetration or partial penetration butt joints welded from both sides or one side.	Full penetration or partial penetration butt welds or fillet welds, welded from both the sides or one side.	All types of general production welds. Can be used for partial, full penetration fillet or butt welds, welded form both the sides or one side.
3.1.2 Weld joint Efficiency (Applicable for full Penetration butt Welds only)	1.00	0.85	0.70	0.55
3.1.3 Edge preparation before welding	(a) Weld preparation shall be made by machining/ flame cutting as called for in drg. The flame cut preparation shall be ground to about 1.5 mm to get bright smooth face. (b) Visual examination of weld preparation, supplemented by random dye penetrants testing and visual examination for fit up. In case of Steam Turbine Cylinders & Chest etc. 100 mm width to be radiographed as specified in relevant drawing. (c) Examine ultrasonically for lamination and harmful segregation in an area 75 mm deep along the edge preparation, if the visual or dye penetrant inspection reveals defect	(a) Weld preparation shall be made by flame cutting and grinding. (b) Visual examination of weld preparation and for fit up.	(a) Weld preparation shall be made by flame cutting and grinding. (b) Visual examination of weld preparation and for fit up.	(a) Weld preparation shall be made by flame cutting or grinding (b) Visual examination of weld preparation and fit up.

Requirement	Grade-I	Grade-II	Grade-III	Grade -IV
3.1.4 Back chipping of run in joints welded from both sides	(a) Back chipping shall be done. (b) 100% visual examination shall be carried out (magnifying glasses can be used) and supplemented by random dye penetrant test/magnetic particles test.	(a) Back chipping shall be done only in the case of full penetration welds. (b) 100% visual examination shall be carried out (magnifying glasses can be used) and supplemented by random dye penetrant test/magnetic particles test.	(a) Back chipping shall be done only in the case of full penetration welds. (b) 100% visual examination shall be carried out (magnifying glasses may be used). If considered necessary will be examined by dye penetrant/magnetic particles test.	(a) Back chipping not required.
3.2 On completion of butt welds	(a) 100% visual examination shall be carried out in the vicinity of welds for the strikers, undercuts, cleats, tacks & blended. The entire butt weld area & heat affected zone shall be dye penetrant/magnetic particles tested. (b) 25 to 100% of weld length shall be examined by radiographic/ultrasonic tests depending upon the product and customer requirement. Extent of percentage of testing shall be specified on the drawing by the designer. Weld to be radiographed need not be ground or otherwise smoothened for the purpose of radiographic test unless its surface irregularities or junction with base metal would interfere with the interpretation of weld defects observed in the radiographs.	(a) 100% visual examination shall be carried out in the vicinity of welds for arc strikes, undercuts, cleats, tacks & gouges & shall be ground and blended. The entire butt weld area & heat affected zone shall be dye penetrant/magnetic particles tested. (b) 10% of weld length shall be examined by radiographic/ ultrasonic tests depending on the product & customer requirement. Weld to be radiographed need not be ground or otherwise smoothened for the purpose of radiographic test unless its surface irregularities or junction with the base metal could cause objectionable weld defects to be observed in the radiographs.	(a) 100% visual examination shall be carried out in the vicinity of welds for arc strikes, undercuts, cleats, tacks & gouges & shall be ground and blended. The entire butt weld area shall be dye penetrant/magnetic particles tested. (b) Ultrasonic or radiographic testing is not required unless specified by customer/product needs.	(a) Weld shall be subjected to visual examination, only zones of doubt may be subjected to dye penetrant/magnetic particle testing.

Requirement	Grade-I	Grade-II	Grade-III	Grade -IV
As above	(c) Weld surface shall be ground smooth when tested by ultrasonic means. On either side where the probe has to traverse, the search surface should be free of weld spatter, dirt and loose scale so as to permit intimate contact with the surface.	(c) Weld surface shall be smooth when tested by ultrasonic means and sharp ripples on weld surface to be removed by grinding or chipping.	(c) Weld surface shall be ground smooth when tested by ultrasonic means and sharp ripples on weld surfaces to be removed by grinding or chipping.	
Note: Ultrasonic test or Radiographic test shall be carried out before heat treatment. For items subject to critical service conditions specified by the designers, ultrasonic/radiographic tests may be repeated after heat treatment.				
3.3 On completion of fillet welds	Not applicable, as fillet welds are not to be used for grade-I welds.	Not applicable, as fillet welds are not to be used for grade-II welds.	Quality of weld shall be assessed on the basis of; (a) Fit up of the joint (b) Visual appearance of the finished weld (c) Dye penetrant/magnetic particles inspection of the complete length of weld shall be carried out only in case of doubt. (d) Air testing shall be carried out if considered necessary.	Weld shall be subjected to visual examination and only zones of doubt may be subjected to dye penetrant/magnetic particle testing.

3.3.1 JOINT EFFICIENCY

a) The joint efficiency will be less by 5% of the specified joint efficiency, if the joint is welded from one side only.

b) The joint efficiency for un-stress relieved fabrication of grade-I and grade-II will be 5% less than the specified joint efficiency. For the other grades joint efficiency is given on the basis of joints without stress relieving.

3.3.2 ULTRASONIC/RADIOGRAPHIC EXAMINATION-EVALUATION AND RETESTS

a) In case the above examination reveals that the examined length of the weld is acceptable as per the standard, the entire representative length of the weld shall be considered acceptable.

b) In case this examination reveals that the examined weld is un-acceptable as per this standard the quantum of length of weld inspected adjacent to the defective region shall be doubled for radiographic/ultrasonic test. If the additional examination also shows that the weld is unacceptable the 100% radiographic/ultrasonic examination of all welds must follow, for acceptance or rejection.

c) If on examination of double the length it is found acceptable then the defective portion noticed earlier shall be rectified and retested for ultrasonic/ radiographic examination.

3.3.3 Welded joints will be subjected to hydraulic or other leak tests called for on the drawing.

3.3.4 Hydraulic tests if called for shall be carried out after stress relieving (if stress relieving is required).

4.0 ACCEPTANCE STANDARDS

4.1 Unacceptable defects in any grade of weld are detailed below and are dependent upon whether the joint being welded is a full penetration butt weld, partial penetration butt weld or a fillet weld. If these defects are not present then the welds are considered acceptable.

4.2 UNACCEPTABLE DEFECTS

Table 2, 3, 4, 5 below give unacceptable defects for grade-I, grade-II, grade-III & grade-IV welds respectively.

TABLE-2 UNACCEPTABLE DEFECTS FOR GRADE-I WELDS

Nature of defect	BUTT WELDS		FILLET WELDS
	Full Penetration	Partial Penetration	
Crack	Unacceptable		
Lack of fusion	Unacceptable		
Lack of Penetration	Unacceptable (a) If the individual slag line is greater than ⅓ T for T upto 56mm. 19mm for T above 56mm. OR (b) If the width of the individual slag line is greater than 1.6 mm for weld thickness upto 19mm. 2.4 mm for weld thickness from 19 mm to 56 mm. 3.2 mm for weld thickness above 56 mm.	Not applicable	Not applicable
Group of slag inclusion	Any group of slag inclusions in a line with an aggregate length greater than T in a length shorter than 12T is unacceptable, except when the distance between the successive imperfections exceeds 6L where L is the length of the longest imperfection in the group.		
Porosity	Porosity in excess of that shown in the ASME Sec VIII Div-1 appendix 8 is acceptable. The radial (through wall) nature of worm holes as to be considered in stringent level compared to porosity.		
Surface defects	Weld bead shall smoothly match the base metal. No undercut is acceptable.	Not applicable	Not applicable

POROSITY FOR GRADE-I WELDS OF STEAM TURBINE COMPONENTS ONLY

In case of grade-I welds of Steam Turbine components e.g. H.P & I.P. Cross under pipe welds and any other primary H.P or I.P. Steam Pipe welds, the porosity shall be adjudged as given below

a) The total area of porosity which when projected radially through the weld shall not exceed 0.025 cm^2/cm thickness of the weld in any square cm. of projected weld area (or shall not exceed 0.01 sq. inch per inch thickness of the weld, in any sq. inch of projected weld area). If it exceeds the weld is not acceptable.

b) Any single pore or gas hole having a diameter greater than those below shall be unacceptable

   1.6 mm for weld thickness upto and including 12 mm.

   2.4 mm for weld thickness over 12 mm upto and including 25 mm.

   4 mm for weld thickness over 25 mm upto and including 50mm.

   4.3 mm for weld thickness over 50 mm upto and including 75 mm.

   5.6 mm for weld thickness above 75 mm.

c) Aligned porosity shall be acceptable provided the summation of the diameters of the pores is not more than T in a length of 12T and each pore is separated by a distance atleast 6 times the diameter of the largest adjacent pore.

Surface defects: Welds with significant undercuts or overlaps which form a notch at the toes of the welds or abrupt ridges or valleys or excessive weld reinforcements are not acceptable.

Note: 'T' is the thickness of thinner plate being welded in mm.

TABLE-3 UNACCEPTABLE DEFECTS FOR GRADE-II WELDS

Nature of defect	BUTT WELDS		FILLET WELDS
	Full Penetration	Partial Penetration	
Crack	Unacceptable	Unacceptable	
Lack of fusion	Unacceptable	Unacceptable	
Individual slag line	Unacceptable if the individual slag line is longer than ⅔ T. The maximum length of acceptable imperfections shall be 19 mm. Any imperfection shorter than 6 mm shall be acceptable for any plate thickness.		
Group of slag inclusion	Any group of slag inclusion in line with an aggregate length greater than T, in a length of 6 T (or proportionately for weld length shorter than 6 T) is unacceptable when the distance between the successive imperfections exceeds 3 L, where 'L' is the length of longest imperfection in the group.		Not applicable
Porosity	Excessive porosity is unacceptable. It shall be assessed as per porosity chart given in ASME Sec VIII Div-1 Appendix 8.		
Surface defects	The undercut shall not exceed 0.5 mm for the thickness of plate upto and including 20 mm and 0.8 mm beyond 20 mm. The left out thickness after undercut shall not be however less than the minimum required thickness.		

TABLE-4 UNACCEPTABLE DEFECTS FOR GRADE-III WELDS

Nature of defect	BUTT WELDS		FILLET WELDS
	Full Penetration	Partial Penetration	
Crack	Unacceptable	Unacceptable	Unacceptable
Lack of fusion	Unacceptable	Unacceptable	Unacceptable
Lack of penetration	Unacceptable	Unacceptable	Unacceptable
Slag inclusion	Unacceptable if the individual slag line is longer than T. The maximum length of acceptable imperfection shall be 25 mm. Any imperfection shorter than 6 mm shall be acceptable for any plate thickness.		Unacceptable
Group of slag inclusion	Any group of slag inclusion in line with an aggregate length greater than T, in a length 4 T (or proportionately for weld length shorter than 4 T) is unacceptable except when the distance between the successive imperfections exceeds 3L where 'L' is the length of longest imperfection in the group.		
Porosity	Excessive porosity is unacceptable		
Surface defects	Weld with pronounced undercuts, overlaps or abrupt ridges or valleys are not acceptable		
Leg lengths	Not applicable	Not applicable	In case of fillet weld the variation in leg lengths shall not exceed 3 mm provided the shorter length conform to required min. leg lengths.

Reinforcement: Reinforcement below 1.5 mm & beyond 3 mm is not acceptable

TABLE-5 UNACCEPTABLE DEFECTS FOR GRADE-IV WELDS

Nature of defect	BUTT WELDS		FILLET WELDS
	Full Penetration	Partial Penetration	
Crack	Any crack visible on the surface will not be acceptable		
Lack of fusion	Not applicable		
Lack of penetration	Not applicable		
Slag inclusion	Not applicable		
Groups of slag inclusion	Not applicable		
Porosity	Excessive porosity exposed to surface is not acceptable		
Surface defects	Welds with excessive amount of pronounced undercuts, abrupt ridges or valleys and spatters shall not be acceptable		
Leg lengths	Not applicable	Not applicable	

Reinforcement: Reinforcement below 1.5 mm & beyond 3 mm is not acceptable

4.3 PERMISSIBLE DEFECTS IN PARTIAL PENETRATION AND FILLET WELDS

4.3.1 Permissible defects in Grade-II/III partial penetration Butt Welds

Defects not exceeding those permitted i.e. Table-3 for Grade-II and Table-4 for Grade-III partial penetration butt welds and defects at the root of a weld in an area that shall not extend further than 3 mm from the bottom of penetration, when examined by non-destructive means.

4.3.2 Permissible defects in GRADE-III Fillet Welds

Defects not exceeding those permitted in Table-4 for grade-III fillet welds and defects at the root of the weld not exceeding further than 1.5 mm from the junction of the plates when examined by non-destructive testing means.

5.0 Referred Standards

1) ASME Sec VIII Div-1

ISO / IEC :

IS :

PAINTING OF MACHINED AND UNMACHINED SURFACES OF WATER TURBINES BY BRUSHING

1. GENERAL:-

1.2 This standard details the processs to be followed in obtaining a protective coating on the machined as well as unmachined surfaces of Water Turbines.

2. MATERIALS:

2.1	High Build Black Coal Tar Epoxide Paint	– AA 56135
2.2	Oil Resistant Air Drying Synthetic Enamel	– AA 56132 (Jasmine Yellow)
2.3	Chemical Resistant Epoxide Priming Paint	– AA 56105
2.4	Chemical Resistant Epoxide Finishing Paint	– AA 56131
2.5	White Spirit Gr. 145/ 205	– AA 56701
2.6	Special Thinner for AA 56135 (HE 5043)	– AA 56709
2.7	Thinner for AA 56105 & AA 56131	– AA 56708
2.8	Xylole–Industrial Solvent Grade	– AA 56703
2.9	Stearic Acid Jelly	– BP 55192 (HE 1605)
2.10	Rust Preventive Hard Film Black (TRP)	– AA 55154
2.11	Latex Emulsion for Cement Wash	– Proprietary item of M/S Shalimar Paints
2.12	Polyvinyl Acetate Based Adhesive	– AA 55302

3. PREPARATION OF THE PAINTS :

3.1.1 Removal of the skin from the paint

Before application, any skin formed on the paint in the tin shall be carefully removed. Any settled pigment broken up and loosened, and the paint thoroughly stirred to ensure complete and uniform mixing of the constituents. Care shall be taken to avoid entraining air in to the paint while stirring. The paint shall be strained through a muslin cloth or 60 mesh sieve before use.

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3.1.2 Preparation of the paint AA 56135 (HE 5043)

This paint has a short pot life of 4 hours only.Hence it is important to note that only sufficient paint be mixed for immediate requirements and the paints be used within 4 hours from the completion of mixing of base and accelerator. Shortly before mixing and use, these shall be thoroughly stirred. The base and accelerator shall then be accurately mixed together in the following proportions.

Supplier	Base (by volume)	Accelerator
Asian Paints	4	1
Bombay Paints	4	1
Berger Paints	3	1
Shalimar Paints	1	1

The accelerator shall be added to the base slowly with continuous stirring. After the addition of all the accelerator, contents shall be stirred continuously until a uniform consistency is obtained. The mixing of paint can be done by hand or mechanical stirring.

3.1.3 Preparation of the paints to AA 56105 & AA 56131

Both these paints as supplied, consist of two separate ingredients; namely base and accelerator. Shortly before mixing and use, these shall be thoroughly stirred. The base and the accelerator shall be accurately mixed together in the proportions as given below for material supplied by different suppliers.

Supplier's Name	Paint Specification	Mixing Ratio in parts by Volume	
		Base	Accelerator
Shalimar Paints	x AA 56131	3	1
Berger Paints	x AA 56131	3	1
	x AA 56105	3	1
Alkali & Chemicals	x AA 56131	4	1
	x AA 56105	6	1
Goodlass Nerolac	x AA 56131	3	1
	x AA 56105	3	1
Garware Paints	x AA 56131	3	2
	x AA 56105	5	1
Asian Paints	x AA 56131	4	1
	x AA 56105	3	1

Accelerator should be added to the base and not the base to the accelerator. The paints shall be mixed with continuous stirring until a uniform consistency is obtained.

NOTE: After mixing these paints shall be used within 4 hours.

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3.2 Consistencies of the paint

The paints shall be used at the following consistencies measured in flow cup No. 4 under the normal shop temperature.

Paint	Consistency
i) Chemical Resistant Epoxide Priming Paint to AA 56105	30 to 50 secs
ii) Chemical Resistant Epoxide Finishing Paint to AA 56131	40 to 60 secs
iii) Oil Resistant, Air drying Synthetic Enamel to AA 56132	60 ± 5 secs
iv) High build Black Coal Tar Epoxide Paint to AA 56135 (HE 5043)	See note–1 below

Note:–1) For AA 56135 the maturing time for mixture of base and accelerator before actual use shall be 30 minutes. Thinning of AA 56135 (HE 5043) is not recommended. If there is problem in application of paint, TSD should be consulted.
The mixed paint shall be used within 4 hours.

2) Thinning of AA 56132 to be done by white spirit to AA 56701.

3) Thinning of AA 56131 & AA 56105 is to be done by its special thinner.

4 BRUSHING :

4.1 General

It is necessary that a full, uniform coat of paint to be applied, free from voids such as brush marks and pin holes, and from contamination such as dirt and dried paint left in brushes. Accordingly no paint shall be left in a brush at the end of a working shift, but instead the brushes shall be cleaned as follows:

4.2 Cleaning of Brushes.

In case of painting with AA 56132 cleaning of brush to be done by means of white spirit to AA 56701. In case of painting with AA 56135, cleaning of brush to be done by means of Xylole to AA 56703, while that with AA 56131/ AA 56105 cleaning is done by means of epoxy thinner.

Before the paint in the brush has dried, the bristles shall be "worked" in a small amount of white spirit to AA 56701/ Xylole to AA 56703/ epoxy thinner in a can. The bristles shall then be lifted clear from white spirit to AA 56701/ Xylole to AA 56703/ epoxy thinner, and the brush "twirled" by rolling the handle vigorously between the palms of the hands. This procedure shall be repeated until the brush shall be seen free from paint inside the head. The brush shall then be rinsed, with the same working as before, in a small amount of white spirit to AA 56701/ Xylole to AA 56703/ epoxy thinner and the excess thinner AA 56701/ AA 56703/ epoxy thinner finally removed either by vigorous "twirling" as before,or by blowing out with clean compressed air.

4.3 Use of brush

The brush shall be dipped into the prepared paint of brushing grade (clause 3.2 above) to a depth corresponding to about half the length of the bristles,and the brush then lightly squeezed out against the side of the container,so that the bristles are thoroughly wetted but not overloaded. The paint shall then be brushed on in all directions so as to cover completely

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5. SURFACE PREPARATION:

5.1 For Machined Surface

All machined surfaces shall be cleaned and degreased with white spirit to AA 56701, any rust or staining being carefully removed by abrasive paper of 220 No. and again cleaned with white spirit to AA 56701.

The surface shall then be thoroughly dried by a blast of air or dry cloth.

5.2 For Unmachined Surfaces.

5.2.1 Preparation shall be carried out after stress relieving, annealing and where necessary, after rough machining.

5.2.2.. All scale and corrosion residues shall be completely removed by shot blasting. The shot blasted surface shall conform to Grade SA 2.5 of Swedish standard SIS 055900. First coat of primer paint shall be applied within 24 hours of completion of shot blasting, to control on-set of corrosion on the surface. Before application of the paint, condition of the surface shall be visually examined. In case of any deficiency the surface shall be cleaned by suitable means (Wire brushing/ shot blasting.)

In rare cases of fabrications too large for the shot blast chamber, all plates etc. before welding shall be shot blasted.After welding they shall be treated with stearic acid jelly to BP 55192 as temporary protective within 24 hours. After stress relieving the soft scale formed on such large jobs shall be removed by wire brushing, welding scale by vacublast or by careful chipping and scrapping followed by wire brushing prior to painting within 24 hours of the cleaning.

5.2.3 The following sequence shall be followed for Air receivers. The inside surface of end bells shall be shot blasted before fabrication. All weld spatter shall be removed, the receivers stress relieved and the surfacess prepared by brushing with hand or mechanical wire brush.

5.2.4 Immediately prior to painting or treatment all dust, loose scale, rust shall be removed and degreasing done by using white spirit to AA 56701.

5.3 For Concrete Embedded Surfaces

All concrete embedded surfaces shall be treated with cement wash as below.

5.3.1 Oil and grease shall be removed by using white spirit to AA 56701. Thereafter all dust, loose scales, rust etc. shall be removed by sand/ shot blasting to Swedish Standard SIS 05500 Gr SA 2.5.

5.3.2 Cement wash shall be prepared by mixing 15 to 20 Kg of latex emulsion (2.11) or 30 Kg of Polyvinyl Acetate Based Adhesive (2.12) with 100 Kg of dry cement. In order to make the process easier cement shall be made into slurry by adding 40–50 litres of water and then latex emulsion or Polyvinyl Acetate Base Adhesive is added. This shall be applied to the surface by brush.

5.3.3 After 8 hours of application, water shall be sprinkled on the coated surface to facilitate curing of cement. Setting time for the cement wash is 24 hours.

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6. APPLICATION OF PAINTS:

6.1 The paints prepared as per Clause 3.1 and 3.2 shall be applied as shown in the schedule in Clause 6.4.

In case of machined surfaces the paint shall be applied immediately after the surface preparation as per Clause 5.1 while in case of unmachined surfaces the paint shall be applied within 6 hours of preparation of surfaces as per Clause 5.2. For unmachined surfaces in the event of more than six hours elapsing, before application of paint is done, the preparation as detailed in Clause 5.2 above shall be repeated in full.

6.2 Drying Time:

The following drying schedule should be followed after the application of the paints.

Paints	Drying Time
i) High Build Black Coal Tar Epoxide Paint to AA 56135	18 hours
ii) Oil Resistant, Air Drying Synthetic Enamel to AA 56132	16 hours
iii) Chemical Resistant Epoxide Priming paint to AA 56105	16 hours
iv) Chemical Resistant Epoxide Finishing paint to AA 56131	16 hours

6.3 Sanding:

Between any two successive coatings, immediately after the former coat of painting is dried as per Clause 6.2 sanding to be done on this coat by using water proof abrasive paper 220. The loose dust shall now be wiped off by a blast of air or dry clean cloth and then the later coat of paint be applied.

6.4 Schedule of paint Application

Description of surfaces	Category of paint	Typical Example	Preparation	Painting or Treatment
Machined surfaces Un_mated and not water immersed	A	Full return motion gear.	As detailed in para 5.1	Apply two coats of AA 56105 and 2 coats of AA 56131
Un-mated, water immersed machined surfaces	B	Discharge ring (Runner envelope), Francis runner, Top cover, Pivot ring, and liner faces.	As detailed in para 5.1	Apply two coats of AA 56105 follwed by 2 coats of AA 56135

6.4 contd.....

Description of surfaces	Category of paint	Typical Example	Preparation	Painting or Treatment
Direct water passages and other water immersed unmachined surfaces	C	Draft tube (internal), Guide Vane, Spiral Casing (internal), Stay ring (internal) Runner passages, Sph.& B.F.Valve bore, Foundation ring (internal), Pivot ring, Top cover (Part)	As detailed in para 5.2	Apply two coats of AA 56105 follwed by 2 coats of AA 56135
Un-mated surfaces in contact with oil	D	Main bearing housing oil sump interior, servo pistons, interior of governor servomotor and components, Kaplan hubs (internal).	As detailed in para 5.2	Apply two coats of AA 56132 (Jasmine yellow)
Note:- For the components which are in contact with oil no other paint is to be used.				
Concrete embedded surfaces	E	Draft tube (external), Foundation ring (external), Pit liner (external), Stay ring (external), Spiral casing, (external)	As detailed in para 5.3	Liberal application of Cement wash
All other unmachined surfaces	F	Pressure Receivers (external), Regulating Ring, Regulating gear, Sph.& B.F.Valve (external), Non Embedded Spiral Casing (external), Governor Servomotors and components	As detailed in para 5.2	Apply two coats of AA 56105 and 2 coats of AA 56131 (IS:5 Shade 631 Light Grey)

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6.4 contd.....

Description of surfaces	Category of paint	Typical Example	Preparation	Painting or Treatment
Mated Machined surfaces and polished metal	G	Pivot ring, Foundation ring, Top cover, Regulator ring, Stay ring Top and bottom faces and bore, Screw Threads, Guide Vane bedding faces, G.V. stem shaft journal.	As detailed in para 5.1	To be coated with liberal coat of rust preventive to AA 55154 to get jet black finish

Note: 1: Complete painting of the machines as per Clause 6 shall be done in the factory only. An extra coat of finishing paint can be applied at site if felt necessary by PPD.

Note 2: After receipt of machines at site, patch repair on any damaged area shall be done immediately with paint, temporary rust preventive as the case may be.

Note 3: In case of machines to be stored for prolonged period, a schedule of checking for paint damage after every six months shall be carrid out and damaged area if any shall be repainted.

Note 4: During despatch of a machine, suitable protection such as tarred felt, water proof paper or polythene sheet must be provided between machined surface and packing wood to avoid corrosion due to exudation of chemicals from wood.

Note 5: If any special thickness of AA 56135 (HE 5043) is required then more than 2 coats of AA 56135 (HE 5043) are required. The same to be mentioned on the drawing.

Note 6: The journal and other critical surfaces shall be finally wrapped with a soft metal sleeve for protection against mechanical damage.

Note 7: Customers be advised to repaint the machinery as soon as they notice that top coat of the paint has been damaged to avoid surface getting corroded. Repainting on corroded surface does not afford any protection unless rust is again thoroughly removed before repainting.

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6.5 Thickness of finished paint film

The thickness of dried paint film after 4 coats shall be as below, when measured by using a suitable instrument for non– destructive measurements of coats as detailed in IS: 6012 – 1971.

Category of paint	Thickness of finished paint film (Microns)
A & F	90 to 140
B & C	170 Min.

Note:–

In case specified thickness of paint film is not achieved then additional coats of finishing paint shall be applied.

6.6 Thickness of Cement wash:

Average built up thickness — 200 Microns Min.
(Dry film thickness)

Note:–

At some isolated areas lower thickness up to 15 % of average built up is allowed.

6.7 Adhesion by Tape Test (For C,D & F Category of Paint).

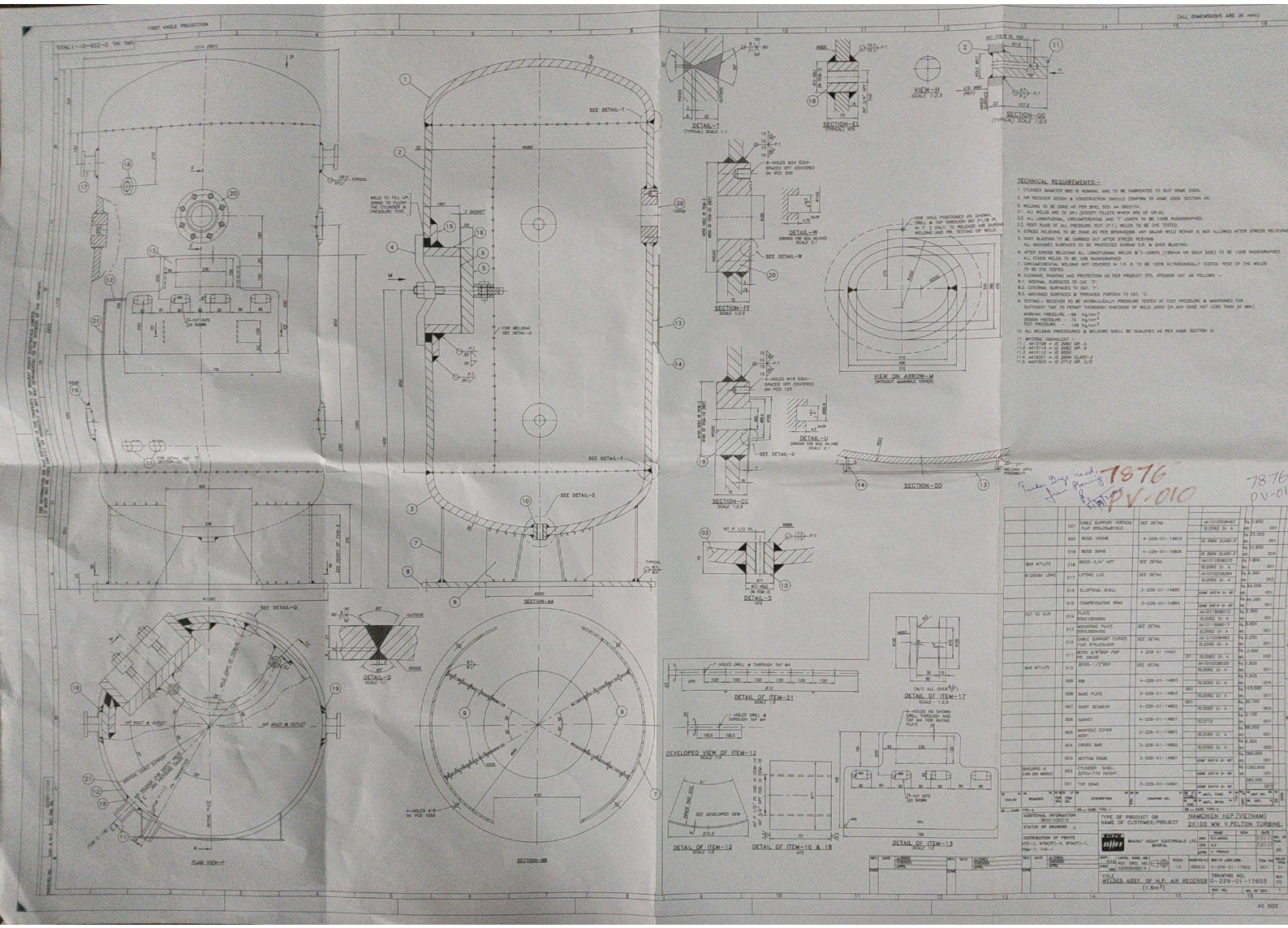
6.7.1 Adhesion By Tape Test

This test is carried out by applying & removing pressure sensitive adhesive tape over cuts made in the paint film to ensure that adhesion of paint film to metalic substrate is adequate.

The test shall be carried out generally in line with ASTM D 3359 except that Transparent Pressure Sensitive Adhesive Tape of 25 mm width, shall conform to IS : 2880 or should bear ISI mark.

Method A of ASTM D 3359 shall be followed in case thickness of film is greater than 125 microns & acceptance criterion shall be "4A" Viz trace peeling or removal along incisions, and method B of ASTM D 3359 shall be followed when thickness of paint film is between 50 to 125 microns and acceptance shall be "4B", viz small flakes of coating are detached at intersections, less than 5 % of the area is affected.

NOTE : This Product Standard is issued based on letter no. TSD/BM/400 dated 16/03/1994 of TSD & replaces Plant Standard no. BP 067 4180



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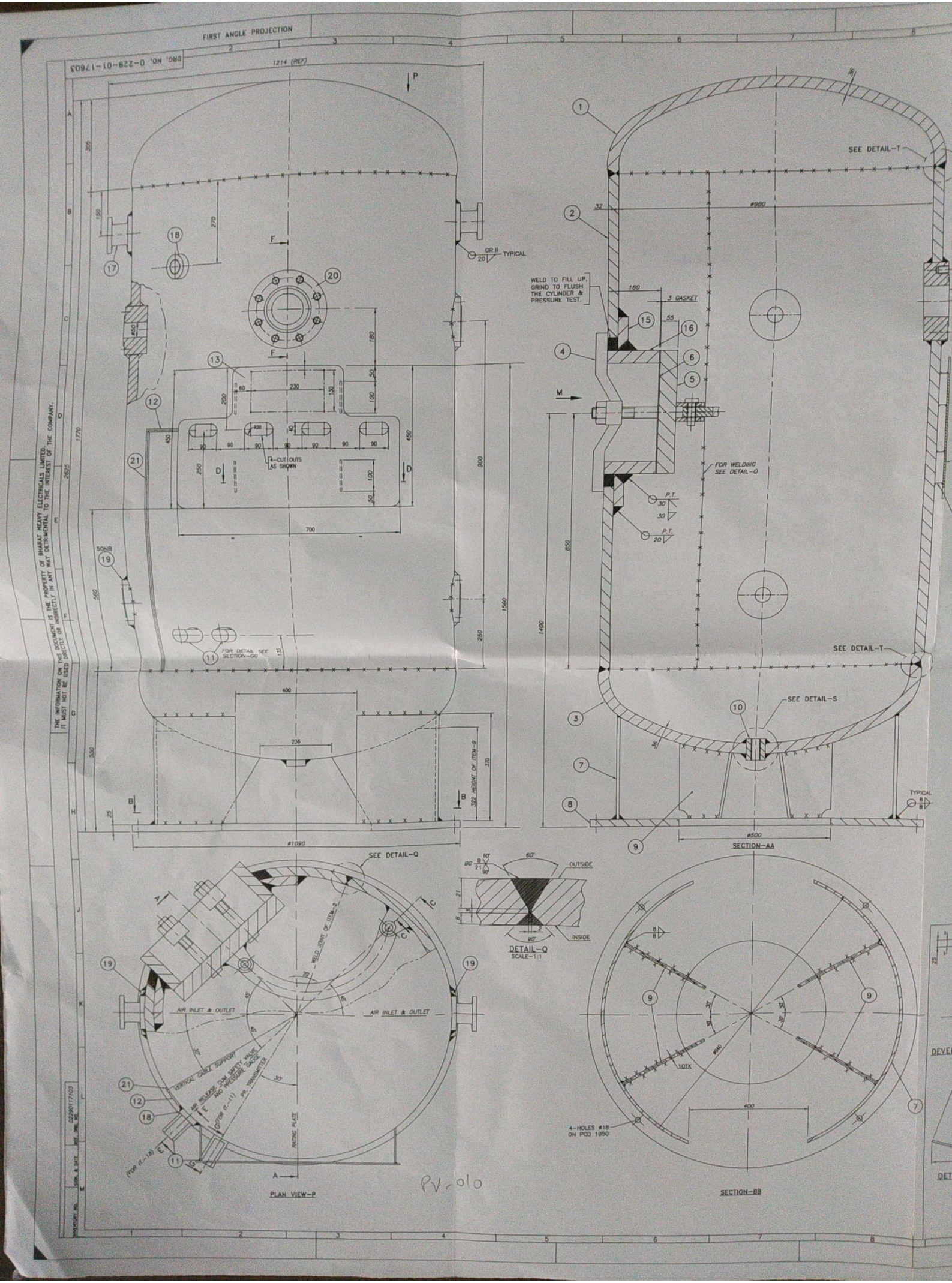

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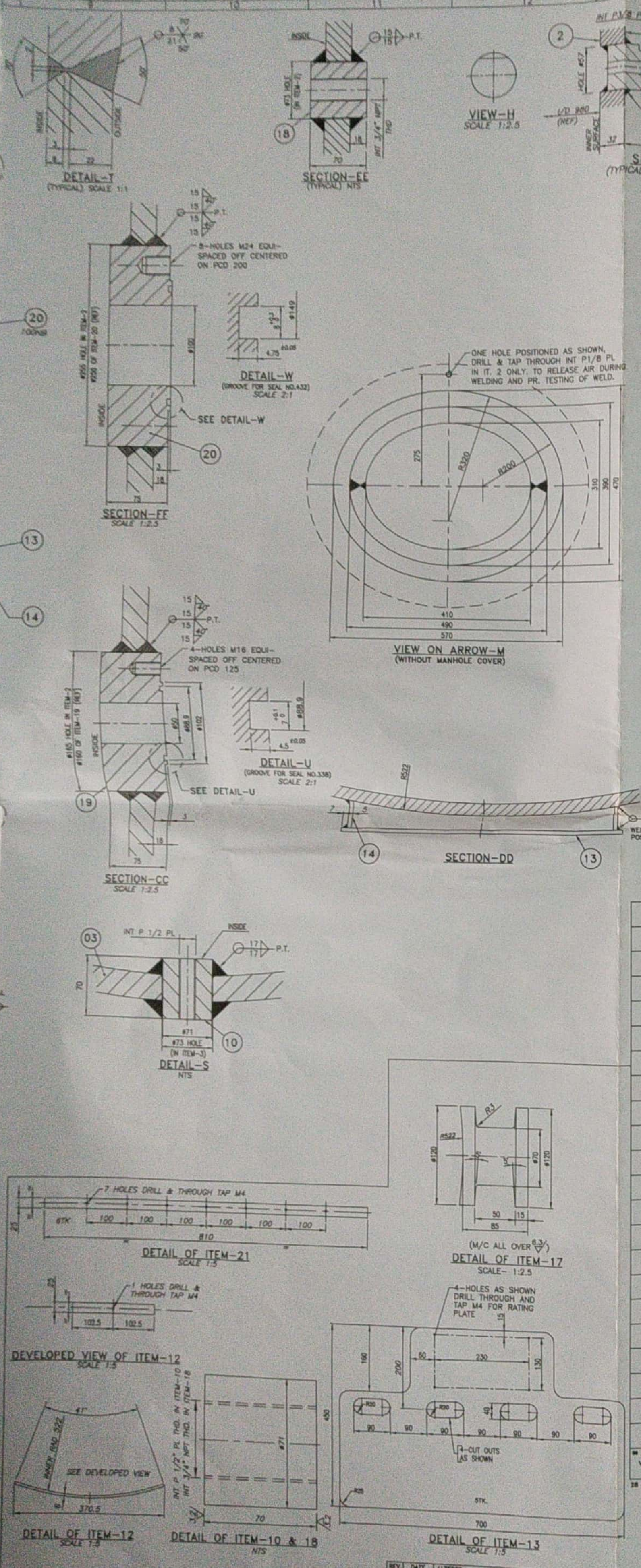
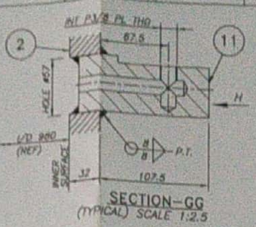
(ALL DIMENSIONS ARE IN mm)





TECHNICAL REQUIREMENTS:-

1. CYLINDER DIAMETER 980 IS NOMINAL AND TO BE FABRICATED TO SUIT DOME ENDS.
2. AIR RECEIVER DESIGN & CONSTRUCTION SHOULD CONFIRM TO ASME CODE SECTION VIII.
3. WELDING TO BE DONE AS PER BHEL STD. AA 0622101.
3.1. ALL WELDS ARE TO GR.I (EXCEPT FILLETS WHICH ARE OF GR.III).
3.2. ALL LONGITUDINAL, CIRCUMFERENTIAL AND 'T' JOINTS TO BE 100% RADIOGRAPHED.
3.3. ROOT RUNS OF ALL PRESSURE TEST (P.T.) WELDS TO BE DYE TESTED.
4. STRESS RELIEVING TO BE DONE AS PER BP0640299. ANY MAJOR WELD REPAIR IS NOT ALLOWED AFTER STRESS RELIEVING.
5. SHOT BLASTING TO BE CARRIED OUT AFTER STRESS REIEVING. ALL MACHINED SURFACES TO BE PROTECTED DURING S.R. & SHOT BLASTING.
6. AFTER STRESS RELIEVING ALL LONGITUDINAL WELDS & T-JOINTS (150mm ON EACH SIDE) TO BE 100% RADIOGRAPHED. ALL OTHER WELDS TO BE 10% RADIOGRAPHED
7. CIRCUMFERENTIAL WELDING NOT COVERED IN T.R. 6. TO BE 100% ULTRASONICALLY TESTED. REST OF THE WELDS TO BE DYE TESTED.
8. CLEANING, PAINTING AND PROTECTION AS PER PRODUCT STD. HT00005 CAT. AS FOLLOWS :-
8.1. INTERNAL SURFACES TO CAT. 'D'.
8.2. EXTERNAL SURFACES TO CAT. 'F'.
8.3. MACHINED SURFACES & THREADED PORTION TO CAT. 'G'.
9. TESTING:- RECEIVER TO BE HYDRAULICALLY PRESSURE TESTED AT TEST PRESSURE & MAINTAINED FOR SUFFICIENT TIME TO PERMIT THOROUGH CHECKING OF WELD JOINT (IN ANY CASE NOT LESS THAN 30 MIN.)
   WORKING PRESSURE - 66 Kg/cm^2
   DESIGN PRESSURE - 72 Kg/cm^2
   TEST PRESSURE - 108 Kg/cm^2
10. ALL WELDING PROCEDURES & WELDERS SHELL BE QUALIFIED AS PER ASME SECTION IX.

11. MATERIAL EQUIVALENT :-
11.1. AA10108 = IS 2062 GR. A
11.2. AA10119 = IS 2062 GR. B
11.3. AA10112 = IS 9550
11.4. AA19331 = IS 2004 CLASS-2
11.5. AA21503 = IS 2712 GR. 0/2

Tender Drgs recd. from Planning. 21/9/2020 7876 PV-010

7876 PV-010

VAR.00	REMARKS	VAR NO.	ITEM NO.	DESCRIPTION	STD.	DRAWING NO.	IT.NO. / VAR.	MATL. CODE / MATL. SPCN.	A/C	UNIT	UNIT WT. / QTY.	GS	ZONE
			021	CABLE SUPPORT VERTICAL FLAT 6TKx25x810LG		SEE DETAIL		AA1010308483 / IS:2062 Gr. A		Kg. / NO.	0.950 / 001		
			020	BOSS 100NB		4-229-01-14815		IS 2004 CLASS-2		Kg. / NO.	25.000 / 001		
			019	BOSS 50NB		4-229-01-14806		IS 2004 CLASS-2		Kg. / NO.	10.800 / 004		
	BAR ø71x70		018	BOSS-3/4" NPT		SEE DETAIL		AA1010208225 / IS:2062 Gr. A		Kg. / NO.	1.800 / 001		
	ø125X90 LONG		017	LIFTING LUG		SEE DETAIL		AA1010208284 / IS:2062 Gr. A		Kg. / NO.	4.300 / 002		
			016	ELLIPTICAL SHELL		3-229-01-14805		ASME SA516 Gr. 60		Kg. / NO.	64.000 / 001		
			015	COMPENSATING RING		3-229-01-14804		ASME SA516 Gr. 60		Kg. / NO.	45.000 / 001		
	CUT TO SUIT		014	PLATE 5TKX100X600				AA1011808013 / IS:2062 Gr. A		Kg. / NO.	2.300 / 001		
			013	MOUNTING PLATE 5TKX350X450		SEE DETAIL		AA1011808013 / IS:2062 Gr. A		Kg. / NO.	6.000 / 001		
			012	CABLE SUPPORT CURVED FLAT 6TKx25x205		SEE DETAIL		AA1010308483 / IS:2062 Gr. A		Kg. / NO.	0.250 / 001		
			011	BOSS 3/8"BSP FOR PR. GAUGE		4 229 01 14401	01	IS:2062 Gr. A		Kg. / NO.	2.500 / 002		
	BAR ø71x70		010	BOSS-1/2"BSP		SEE DETAIL		AA1010208225 / IS:2062 Gr. A		Kg. / NO.	1.500 / 001		
			009	RIB		4-229-01-14803		IS:2062 Gr. A		Kg. / NO.	7.500 / 004		
			008	BASE PLATE		3-229-01-14803	001	IS:2062 Gr. A		Kg. / NO.	143.000 / 001		
			007	SKIRT SEGMENT		4-229-01-14802	001	IS:2062 Gr. A		Kg. / NO.	30.700 / 002		
			006	GASKET		4-229-01-14801		IS:2712		Kg. / NO.	0.100 / 001		
			005	MANHOLE COVER ASSY.		2-229-01-14801		IS:2062 Gr. A		Kg. / NO.	89.000 / 001		
			004	CROSS BAR		3-229-01-14802		IS:2062 Gr. A		Kg. / NO.	5.300 / 002		
			003	BOTTOM DOME		3-229-01-14801		ASME SA516 Gr. 60		Kg. / NO.	385.000 / 001		
	DEVELOPED LG 3180 (ON MIDDLE)		002	CYLINDER SHELL 32TKx1770 HEIGHT				ASME SA516 Gr. 60		Kg. / NO.	1350.000 / 001		
			001	TOP DOME		3-229-01-14801		ASME SA516 Gr. 60			385.000 / 001		

28 — CARD TYPE-3 | 28 — CARD TYPE-1 | 28 — CARD TYPE-2

ADDITIONAL INFORMATION	38301X20310
STATUS OF DRAWING	U
DISTRIBUTION OF PRINTS	HTE-2, WTM(ST)-4, WTM(P)-1, FBM-7, THX-1
TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT	NAMCHIEN HEP.(VIETNAM) 2X100 MW V.PELTON TURBINE.
	BHARAT HEAVY ELECTRICALS LTD. BHOPAL
DRN	S.K.NANDA — 7.01.11
CKD	M.S — 7.01.11
APPO	K. PRASAD
NO. OF VAR.	00
DEPT.	H.T.E.
CODE	402
UNTOL. DIMS. GR. / REF. DRG. NO.	32000049014
SCALE	1:5
WEIGHT(K.G.)	2650.0
REF.TO ASSY.DRG.	0-229-01-17602
ITEM NO.	001
NO.OF ITEM	21
TITLE	WELDED ASSY. OF H.P. AIR RECEIVER (1.6m³)
DRAWING NO.	0-229-01-17603
REV.	00
SHT. NO. / NO. OF SHT.	1

REV.	DATE	ALTERED / CHECKED / APPD.	ZONE

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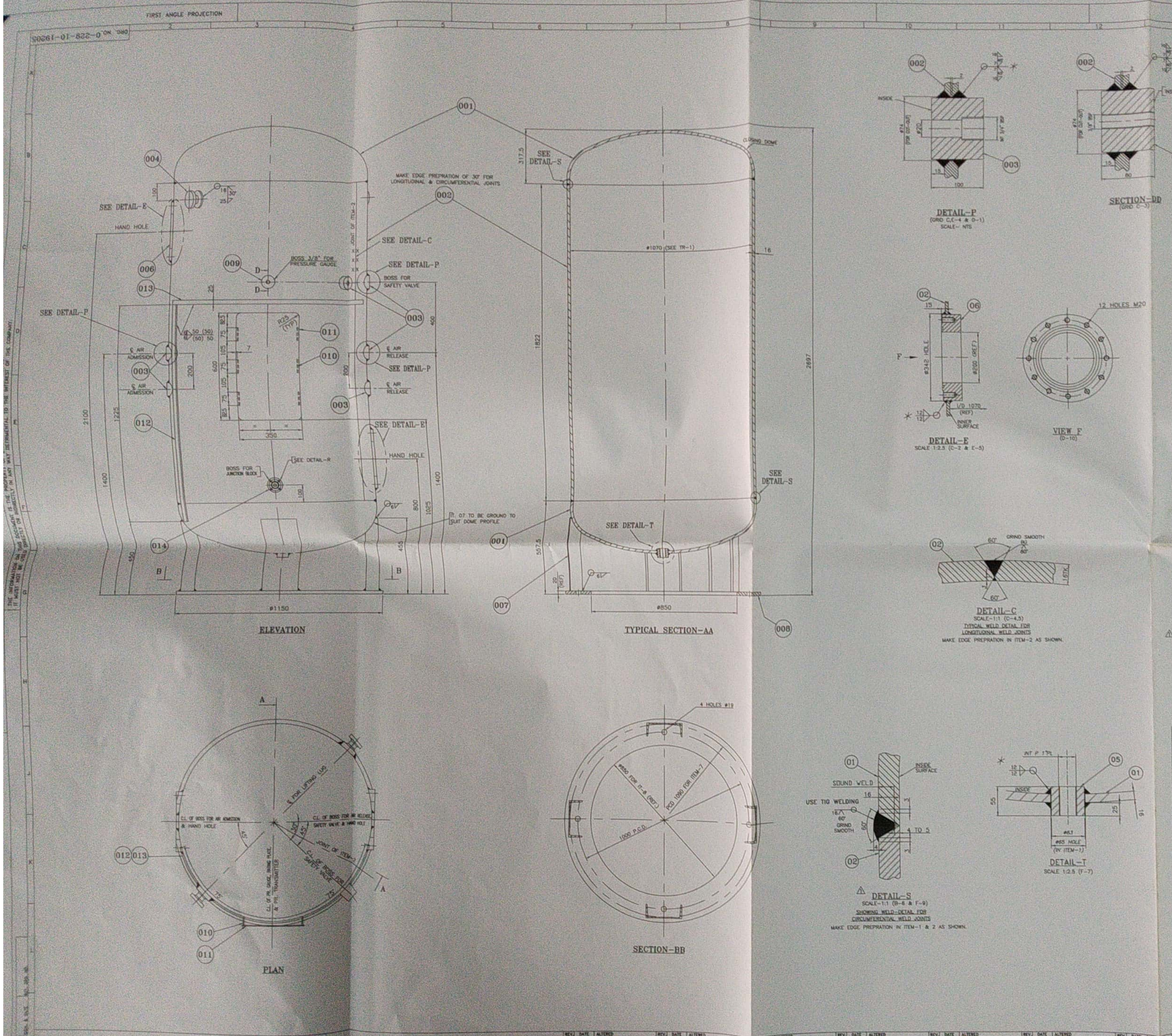

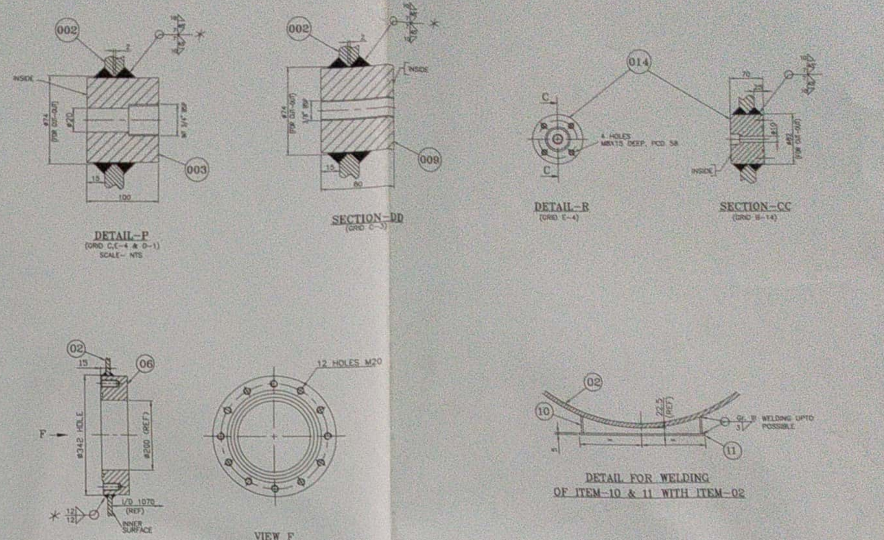

DETAIL FOR WELDING
OF ITEM–10 & 11 WITH ITEM–02

TECHNICAL REQUIREMENTS:–

1. CYLINDER DIAMETER 1650 IS NOMINAL AND TO BE FABRICATED TO SUIT DOME ENDS.
2. WELDING, IT'S COMPACTNESS, APPEARANCE, AIR TIGHTNESS, AT TEST PRESSURE SHOULD CONFORM TO ASME Sec.–IX.
3. HOLES IN DOME ITEM 3 AND CYLINDER ITEM 1 TO BE MADE IN WELDED ASSY.
4. CLOSING DOME AND REST OF WELDED ASSY. TO BE INDIVIDUALLY STRESS RELIEVED AS PER BP 0640299 & SAND BLASTED. NO MAJOR WELD REPAIR IS ALLOWED AFTER STESS RELIEVING, AFTER S.R. BOTH ITEMS ARE TO BE SHOT BLASTED FROM INSIDE AND OUTSIDE. ALL MACHINED SUFACES SHOULD BE SUITABLY PROTECTED DURING STRESS RELIEVING AND SHOT BLASTING.
5. (i) ROOT RUNS OF WELDING OF UPPER & LOWER DOME WITH CYLINDER ARE TO BE DONE BY T.I.G. PROCESS AND TESTED BY D.P.T.
(ii) ALL WELDS ARE TO GR.I OF CORP. STD. AA0622101 WITH 100% R.T. AS PER ASME SEC–VIII DIV–1 & 100% M.C.D. EXCEPT T.R.5 (iv) WELDING & FILLETS (WHICH ARE OF GR.III). NOT TO BE DONE AFTER S.R.
(iii) ROOT RUN OF WELDS MARKED * TO BE 100% DYE TESTED & FINAL WELD TO BE 100% M.C.D. TESTED. (UT NOR REQUIRED) (NOTE–TO AVOID MAJOR REPAIR AFTER STRESS RELIEVING SUPPLIER MAY PREFERABLY PERFORM N.D.T. BEFORE STRESS RELIEVING.)
△2 (iv) WELDING BETWEEN CLOSING DOME AND REST OF ASSY. TO BE DONE BY T.I.G. PROCESS. ROOT RUN TO BE DYE TESTED. CIRCUMFERENTIAL AND T–JOINTS TO BE 100% ULTRASONICALLY TESTED AS PER ASME SEC–VIII DIV–1 & DETAIL–S
6. COMPLETE WELDED ASSY. TO BE STRESS RELIEVED TO BP0640299. NO MAJOR WELD REPAIR IS ALLOWED AFTER STRESS RELIEVING. AFTER S.R., RECEIVER TO BE SHOT BLASTED FROM INSIDE AND OUTSIDE. ALL MACHINED SURFACES SHOULD BE SUITABLY PROTECTED DURING S.R. AND SHOT BLASTING.
7. ALL WELDING PROCEDURES AND WELDER SHALL BE QUALIFIED AS PER ASME SECTION IX.
8. CLEANING, PAINTING AND PROTECTION AS PER PROC. SPECN. HT00005 AND CAT. AS FOLLOWS.
8.1. INTERNAL SURFACES TO BE PAINTED TO CAT.– D.
8.2. MACHINED AND THREADRED SURFACES TO BE PROTECTED TO CAT.–'G'.
△1 8.3. EXTERNAL SURFACES TO BE PAINTED TO CAT.–'Y'. TOTAL THICKNESS OF PAINT SHALL BE 250μm MIN. SHADE– SKY BLUE RAL 5015
9. PRESSURE RECEIVER TO BE HYDRAULICALLY PRESSURE TESTED AT TEST PRESSURE OF 15 kg/sq.cm. AND THE SAME TO BE MAINTAINED FOR SUFFICIENT TIME TO PERMIT THOROUGH CHECKING OF WELD JOINTS (IN ANY CASE DURATION OF TESTING NOT TO BE LESS THAN 30 MINUTES)

WORKING PRESSURE – 7 Kg/sq.cm
DESIGN PRESSURE – 10 Kg/sq.cm
TEST PRESSURE – 15 Kg/sq.cm

7876
P.V-020

Tender dgs. recd. from Planning
21/11/20..

TAB.DO	REMARKS	VAR NO.	ITEM NO.	DESCRIPTION	DRAWING NO.	MATL. CODE / MATL. SPCN.	UNIT WT. (kg) / QTY. (No.)
			014	BOSS FOR JUNCTION BLOCK	3-229-10-18904	AA10108	2.200 / 001
	1600 lg CUT TO SUIT		013	M.S. FLAT–II	3-229-10-18903	AA10108	1.760 / 001
	1300 lg CUT TO SUIT		012	M.S. FLAT–I	3-229-10-18902	AA10108	1.450 / 001
	5 TK.		011	MOUNTING PLATE 350 X 600	———	AA1011808013 / AA10108	8.200 / 001
	5 TK		010	SUPPORT PLATE 75x47	———	AA1011808013 / AA10108	0.140 / 006
			009	BOSS 3/8"	4-229-10-18906	AA10108	1.76 / 001
			008	BASE FLANGE	3-229-10-18905	AA10108	73.80 / 001
	ISMC 200x75 x6.2x11.4x450		007	SUPPORTING LEG	———	AA1012708101 / AA10108	9.000 / 004
			006	BOSS FOR HAND HOLE	4-229-10-19203	AA10119	33.500 / 002
	⌀63X55		005	BOSS FOR DRAIN VALVE	TO BE PREMACHINED AS SHOWN	AA1010208209 / AA10108	1.200 / 001
			004	LIFTING LUG	3-229-10-18901	AA10108	4.200 / 002
			003	BOSS 3/4"	4-229-10-18905	AA10108	2.800 / 008
	1816X1822 X3411 LG		002	CYLINDER	———	ASTM A516 Gr60	785 / 001
	16 TK		001	DOME END	2-229-10-18901	ASTM A516 Gr60	190.00 / 002

CARD TYPE-3 · CARD TYPE-1 · CARD TYPE-2

ADDITIONAL INFORMATION	
STATUS OF DRAWING	
DISTRIBUTION OF PRINTS	HTE-2, WTM-5, FGM-7, THX-1
TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT	4x180 MW MANGDECHHU HEP
	BHARAT HEAVY ELECTRICALS LTD. BHOPAL
DRN.	SKM — 03.08.15
CKD.	AKB — 03.08.15
APPD.	JSH — 03.08.15
REV. 01	DATE 04.01.17 — T.R.–8.3 REVISED. SECTION–S MODIFIED. — ALTERED SKM, CHECKED AKB, APPD. AKB
REV. 02	DATE ..03.17 — T.R.–5(iv) REVISED. — ALTERED SKM, CHECKED AKB, APPD. AKB
DEPT.	HTE
CODE	402
REF. DRG. NO.	32000049014
SCALE	1:7.5
WEIGHT (kg)	1400
REF. TO ASSY. DRG.	0-229-10-19204
ITEM NO.	001
NO. OF ITEM	014
TITLE	WELDED ASSY. OF L.P AIR RECEIVER (2m³)
DRAWING NO.	0-229-10-19205
REV.	02
SHT. NO.	01
NO. OF SHT.	01

A0 SIZE

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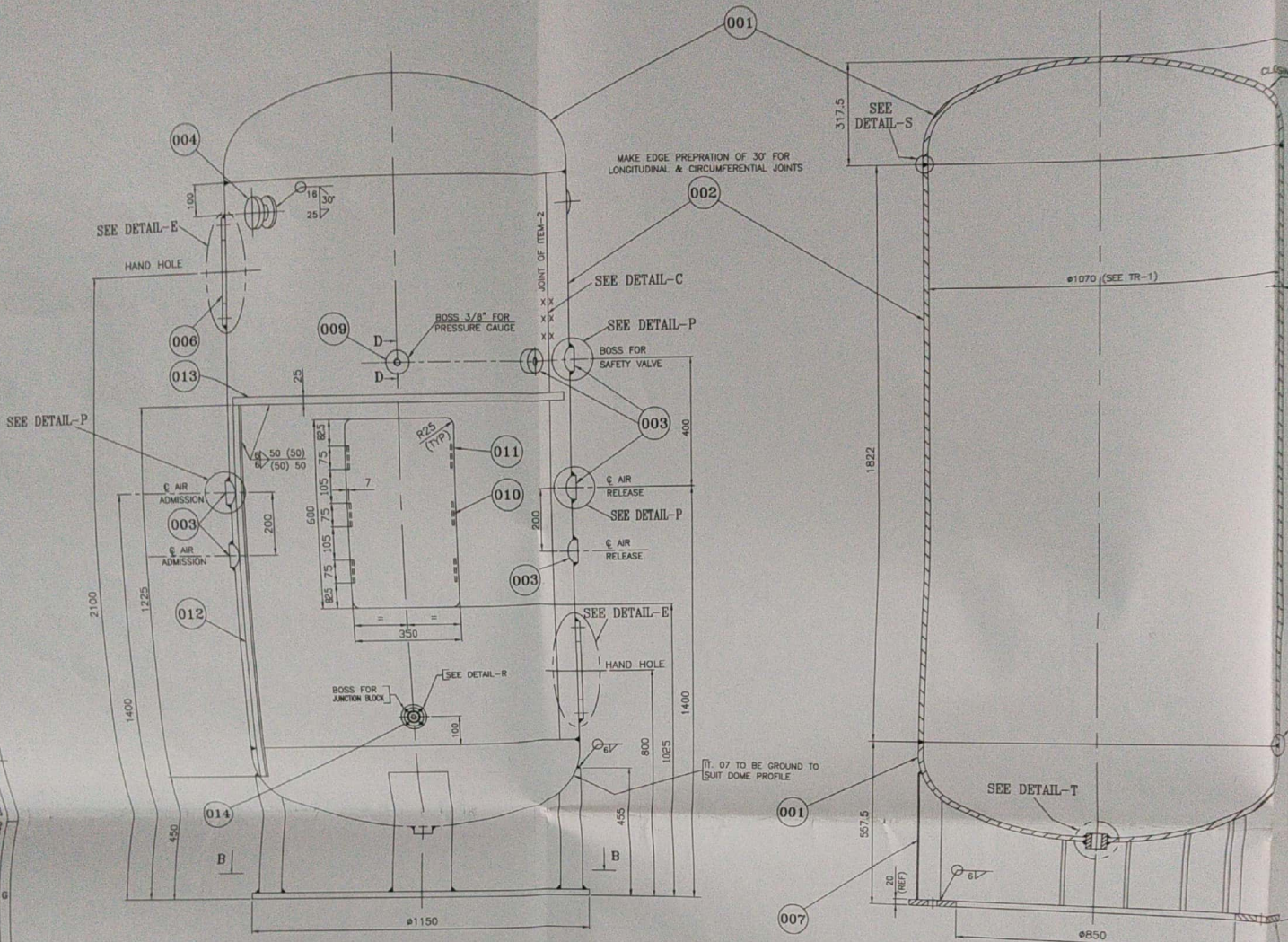
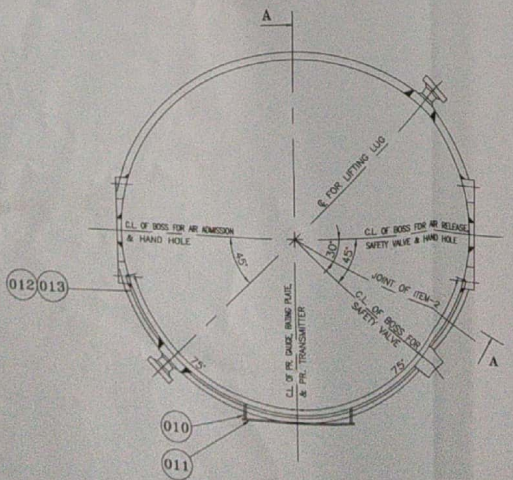
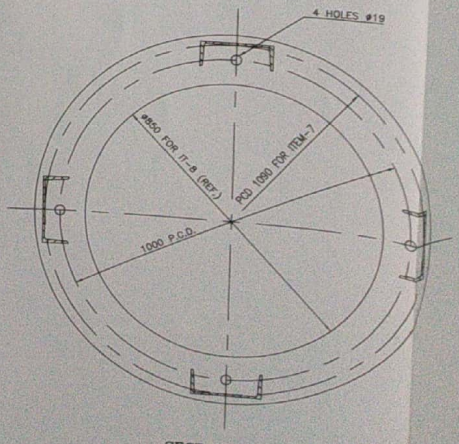
FIRST ANGLE PROJECTION

DRG. NO. 0-229-10-19206







PV-020

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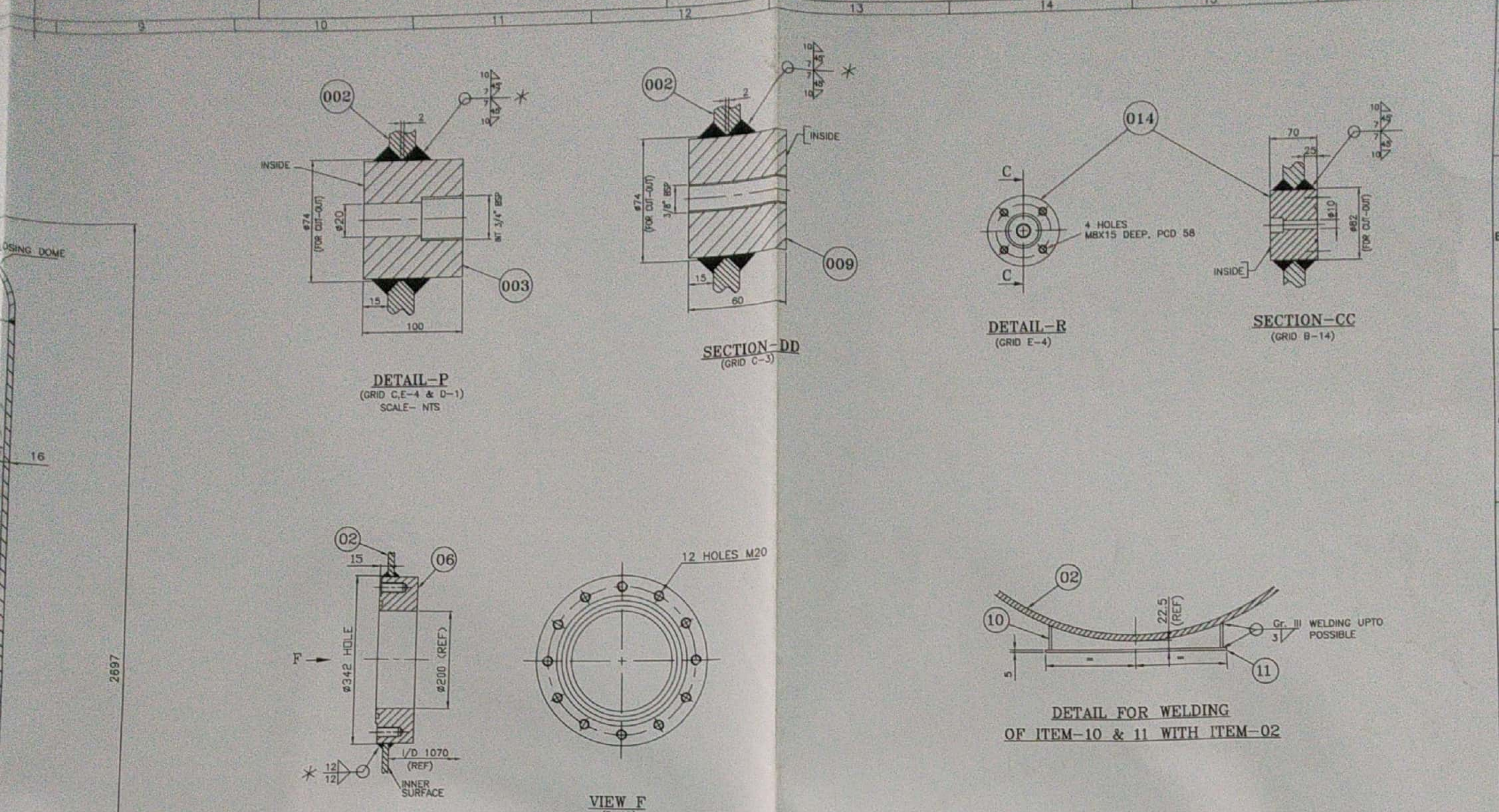
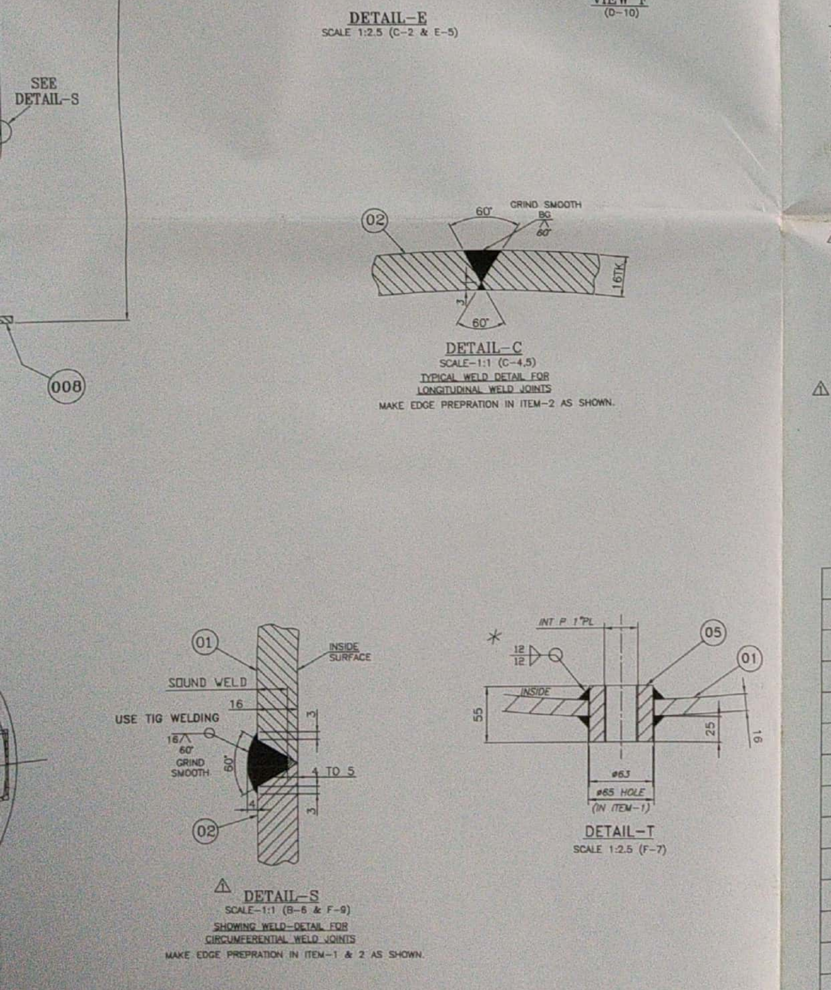
(ALL DIMENSIONS ARE IN mm)





TECHNICAL REQUIREMENTS:-

1. CYLINDER DIAMETER 1650 IS NOMINAL AND TO BE FABRICATED TO SUIT DOME ENDS.
2. WELDING, IT'S COMPACTNESS, APPEARANCE, AIR TIGHTNESS, AT TEST PRESSURE SHOULD CONFORM TO ASME Sec.-IX.
3. HOLES IN DOME ITEM 3 AND CYLINDER ITEM 1 TO BE MADE IN WELDED ASSY.
4. CLOSING DOME AND REST OF WELDED ASSY. TO BE INDIVIDUALLY STRESS RELIEVED AS PER BP 0640299 & SAND BLASTED. NO MAJOR WELD REPAIR IS ALLOWED AFTER STESS RELIEVING, AFTER S.R. BOTH ITEMS ARE TO BE SHOT BLASTED FROM INSIDE AND OUTSIDE. ALL MACHINED SUFACES SHOULD BE SUITABLY PROTECTED DURING STRESS RELIEVING AND SHOT BLASTING.
5. (i) ROOT RUNS OF WELDING OF UPPER & LOWER DOME WITH CYLINDER ARE TO BE DONE BY T.I.G. PROCESS AND TESTED BY D.P.T.
   (ii) ALL WELDS ARE TO GR.I OF CORP. STD. AA0622101 WITH 100% R.T. AS PER ASME SEC-VIII DIV-1 & 100% M.C.D. EXCEPT T.R.5 (iv) WELDING & FILLETS (WHICH ARE OF GR.III). NDT TO BE DONE AFTER S.R.
   (iii) ROOT RUN OF WELDS MARKED * TO BE 100% DYE TESTED & FINAL WELD TO BE 100% M.C.D. TESTED. (UT NOR REQUIRED) (NOTE-TO AVOID MAJOR REPAIR AFTER STRESS RELIEVING SUPPLIER MAY PREFERABLY PERFORM N.D.T. BEFORE STRESS RELIEVING.)
   △2 (iv) WELDING BETWEEN CLOSING DOME AND REST OF ASSY. TO BE DONE BY T.I.G. PROCESS. ROOT RUN TO BE DYE TESTED. CIRCUMFERENTIAL AND T-JOINTS TO BE 100% ULTRASONICALLY TESTED AS PER ASME SEC-VIII DIV-1 & DETAIL-S
6. COMPLETE WELDED ASSY. TO BE STRESS RELIEVED TO BP0640299. NO MAJOR WELD REPAIR IS ALLOWED AFTER STRESS RELIEVING. AFTER S.R., RECEIVER TO BE SHOT BLASTED FROM INSIDE AND OUTSIDE. ALL MACHINED SURFACES SHOULD BE SUITABLY PROTECTED DURING S.R. AND SHOT BLASTING.
7. ALL WELDING PROCEDURES AND WELDER SHALL BE QUALIFIED AS PER ASME SECTION IX.
8. CLEANING, PAINTING AND PROTECTION AS PER PROC. SPECN. HT00005 AND CAT. AS FOLLOWS.
8.1. INTERNAL SURFACES TO BE PAINTED TO CAT.- D.
8.2. MACHINED AND THREADRED SURFACES TO BE PROTECTED TO CAT.-'G'.
△1 8.3. EXTERNAL SURFACES TO BE PAINTED TO CAT.-'F'. TOTAL THICKNESS OF PAINT SHALL BE 250μm MIN. SHADE- SKY BLUE RAL 5015
9. PRESSURE RECEIVER TO BE HYDRAULICALLY PRESSURE TESTED AT TEST PRESSURE OF 15 kg/sq.cm. AND THE SAME TO BE MAINTAINED FOR SUFFICIENT TIME TO PERMIT THOROUGH CHECKING OF WELD JOINTS (IN ANY CASE DURATION OF TESTING NOT TO BE LESS THAN 30 MINUTES).

WORKING PRESSURE - 7 Kg/sq.cm
DESIGN PRESSURE - 10 Kg/sq.cm
TEST PRESSURE - 15 Kg/sq.cm

7876
P.V-020
21/7/2020

VAR.CO	REMARKS	VAR NO.	ITEM NO.	DESCRIPTION	STD.	DRAWING NO.	MATL. CODE / MATL. SPCN.	UNIT	UNIT WT. / QTY.
			014	BOSS FOR JUNCTION BLOCK		3-229-10-18904	AA10108	kg. / No.	2.200 / 001
	1600 lg CUT TO SUIT		013	M.S. FLAT-II		3-229-10-18903	AA10108	kg. / No.	1.760 / 001
	1300 lg CUT TO SUIT		012	M.S. FLAT-I		3-229-10-18902	AA10108	kg. / No.	1.450 / 001
	5 TK.		011	MOUNTING PLATE 350 X 600		———	AA1011808013 / AA10108	kg. / No.	8.200 / 001
	5 TK		010	SUPPORT PLATE 75x47		———	AA1011808013 / AA10108	kg. / No.	0.140 / 006
			009	BOSS 3/8"		4-229-10-18906	AA10108	kg. / No.	1.76 / 001
			008	BASE FLANGE		3-229-10-18905	AA10108	kg. / No.	73.80 / 001
	ISMC 200x75 x6.2x11.4x450		007	SUPPORTING LEG		———	AA1012708101 / AA10108	kg. / No.	9.000 / 004
			006	BOSS FOR HAND HOLE		4-229-10-19203	AA10119	kg. / No.	33.500 / 002
	ø63X55		005	BOSS FOR DRAIN VALVE		TO BE PREMACHINED AS SHOWN	AA1010208209 / AA10108	kg. / No.	1.200 / 001
			004	LIFTING LUG		3-229-10-18901	AA10108	kg. / No.	4.200 / 002
			003	BOSS 3/4"		4-229-10-18905	AA10108	kg. / No.	2.800 / 006
	16tkX1822 X3411 LG		002	CYLINDER		———	ASTM A516 Gr60	kg. / No.	785 / 001
	16 TK		001	DOME END		2-229-10-18901	ASTM A516 Gr60	kg. / No.	190.00 / 002

28 — CARD TYPE-3 | 28 — CARD TYPE-1 | 28 — CARD TYPE-2

ADDITIONAL INFORMATION	
STATUS OF DRAWING	
DISTRIBUTION OF PRINTS	HTE-2, WTM-5, FGM-7, THX-1
TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT	4x180 MW MANGDECHHU HEP

BHARAT HEAVY ELECTRICALS LTD. BHOPAL

	NAME	DATE
DRN	SKM	03.09.15
CKD	AKB	03.09.15
APPD	JSH	03.09.15

NO. OF VAR. —

REV.	DATE	ALTERED	CHECKED	APPD.	ZONE / REMARKS
01	04.01.17	SKM	AKB	AKB	- T.R.-8.3 REVISED. - SECTION-S MODIFIED.
02	10.03.17	SKM	AKB	AKB	T.R.-5(iv) REVISED.

DEPT.	CODE	UNTOL. DIMS. GR. REF. DRG. NO.	SCALE	WEIGHT(K.G.)	REF. TO ASSY. DRG.	ITEM NO.	NO. OF ITEM
HTE	402	32000049014	1:7.5	1400	0-229-10-19204	001	014

TITLE: WELDED ASSY. OF L.P AIR RECEIVER ($2m^3$)

DRAWING NO. 0-229-10-19205 REV. 02

SHT. NO. 01 NO. OF SHT. 01

A0 SIZE

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TECHNICAL REQUIREMENTS:-

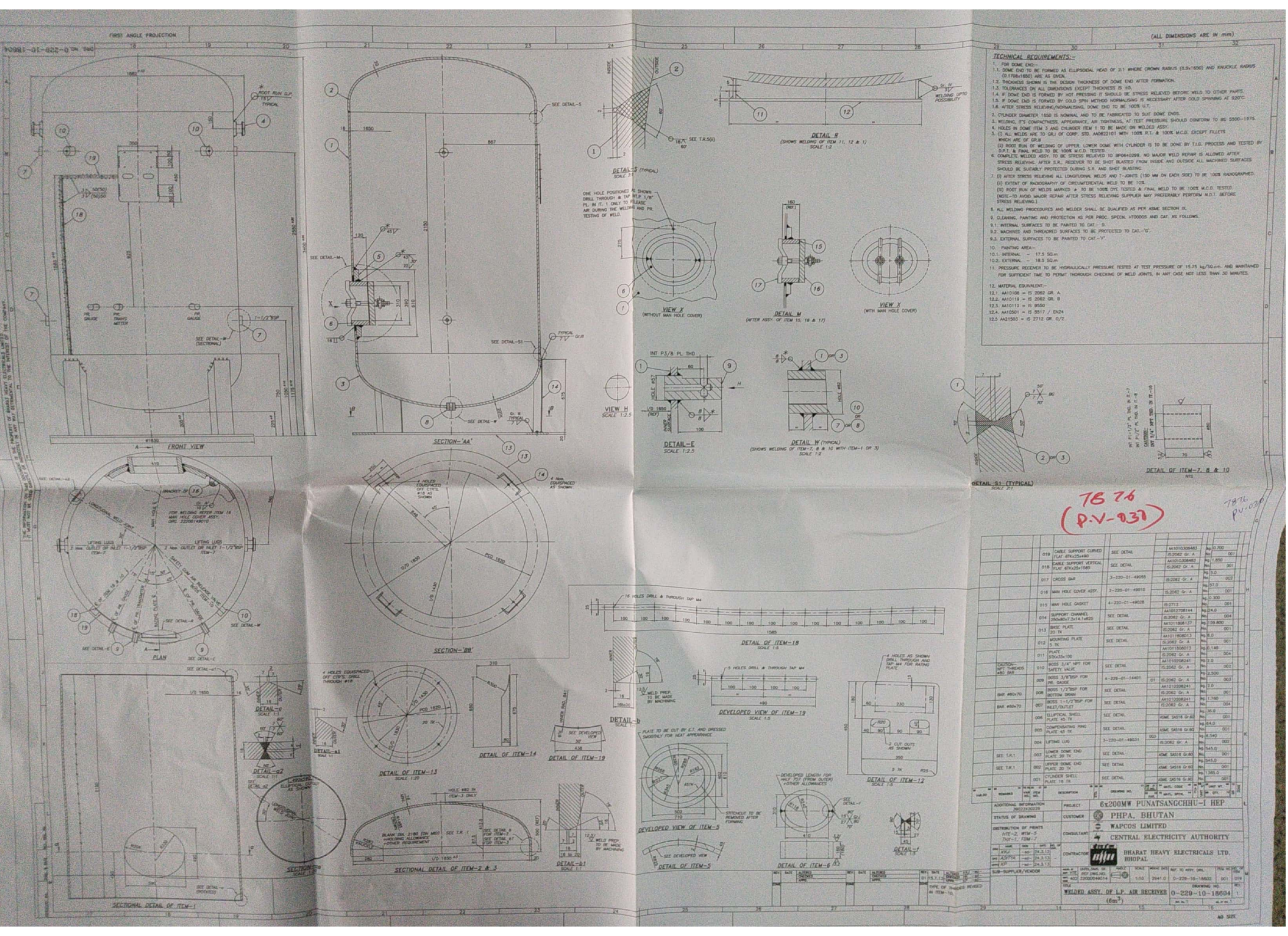
1. CYLINDER DIAMETER 1650 IS NOMINAL AND TO BE FABRICATED TO SUIT DOME ENDS.
2. WELDING, IT'S COMPACTNESS, APPEARANCE, AIR TIGHTNESS, AT TEST PRESSURE SHOULD CONFORM TO ASME Sec.-IX.
3. HOLES IN DOME ITEM 3 AND CYLINDER ITEM 1 TO BE MADE IN WELDED ASSY.
4. CLOSING DOME AND REST OF WELDED ASSY. TO BE INDIVIDUALLY STRESS RELIEVED AS PER BP 0640299 & SAND BLASTED. NO MAJOR WELD REPAIR IS ALLOWED AFTER STESS RELIEVING, AFTER S.R. BOTH ITEMS ARE TO BE SHOT BLASTED FROM INSIDE AND OUTSIDE. ALL MACHINED SUFACES SHOULD BE SUITABLY PROTECTED DURING STRESS RELIEVING AND SHOT BLASTING.
5. (i) ROOT RUNS OF WELDING OF UPPER & LOWER DOME WITH CYLINDER ARE TO BE DONE BY T.I.G. PROCESS AND TESTED BY D.P.T.
   (ii) ALL WELDS ARE TO GR.I OF CORP. STD. AA0622101 WITH 100% R.T. AS PER ASME SEC-VIII DIV-1 & 100% M.C.D. EXCEPT T.R.5 (iv) WELDING & FILLETS (WHICH ARE OF GR.III). NDT TO BE DONE AFTER S.R.
   (iii) ROOT RUN OF WELDS MARKED * TO BE 100% DYE TESTED & FINAL WELD TO BE 100% M.C.D. TESTED. (UT NOR REQUIRED) (NOTE-TO AVOID MAJOR REPAIR AFTER STRESS RELIEVING SUPPLIER MAY PREFERABLY PERFORM N.D.T. BEFORE STRESS RELIEVING.)
   ⚠2 (iv) WELDING BETWEEN CLOSING DOME AND REST OF ASSY. TO BE DONE BY T.I.G. PROCESS. ROOT RUN TO BE DYE TESTED. CIRCUMFERENTIAL AND T-JOINTS TO BE 100% ULTRASONICALLY TESTED AS PER ASME SEC-VIII DIV-1 & DETAIL-S
6. COMPLETE WELDED ASSY. TO BE STRESS RELIEVED TO BP0640299. NO MAJOR WELD REPAIR IS ALLOWED AFTER STRESS RELIEVING. AFTER S.R., RECEIVER TO BE SHOT BLASTED FROM INSIDE AND OUTSIDE. ALL MACHINED SURFACES SHOULD BE SUITABLY PROTECTED DURING S.R. AND SHOT BLASTING.
7. ALL WELDING PROCEDURES AND WELDER SHALL BE QUALIFIED AS PER ASME SECTION IX.
8. CLEANING, PAINTING AND PROTECTION AS PER PROC. SPECN. HT00005 AND CAT. AS FOLLOWS.
   8.1. INTERNAL SURFACES TO BE PAINTED TO CAT.- D.
   8.2. MACHINED AND THREADRED SURFACES TO BE PROTECTED TO CAT.-'G'.
   ⚠1 8.3. EXTERNAL SURFACES TO BE PAINTED TO CAT.-'F'. TOTAL THICKNESS OF PAINT SHALL BE 250µm MIN. SHADE- SKY BLUE RAL 5015
9. PRESSURE RECEIVER TO BE HYDRAULICALLY PRESSURE TESTED AT TEST PRESSURE OF 15 kg/sq.cm. AND THE SAME TO BE MAINTAINED FOR SUFFICIENT TIME TO PERMIT THOROUGH CHECKING OF WELD JOINTS (IN ANY CASE DURATION OF TESTING NOT TO BE LESS THAN 30 MINUTES).

WORKING PRESSURE	-	7	Kg/sq.cm
DESIGN PRESSURE	-	10	Kg/sq.cm
TEST PRESSURE	-	15	Kg/sq.cm

7876

Tender Dgs. No

Scanned with CamScanner



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FIRST ANGLE PROJECTION

DRG. NO. 0-229-10-18604

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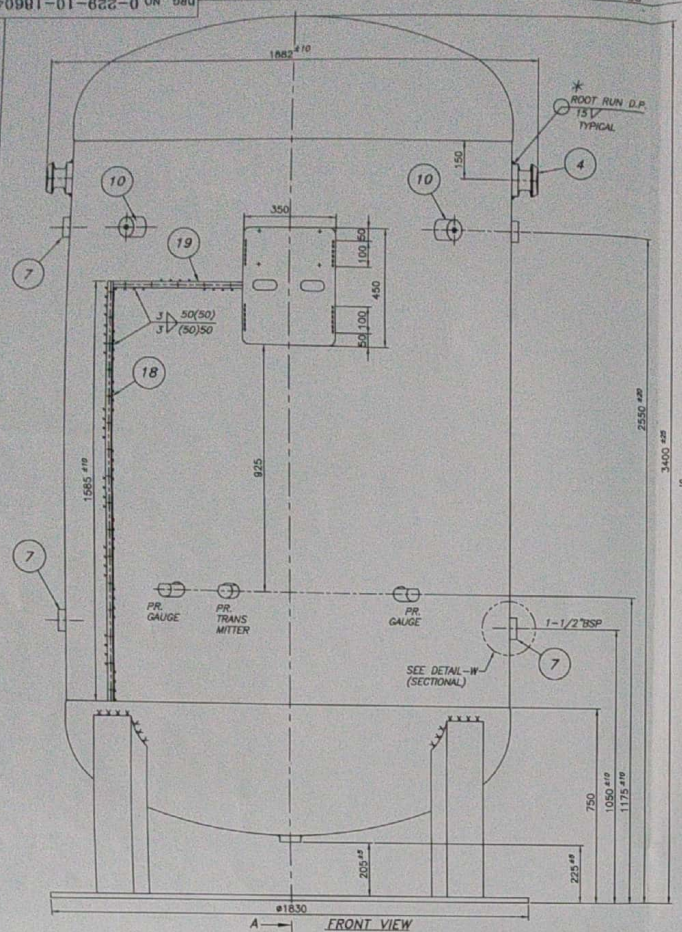

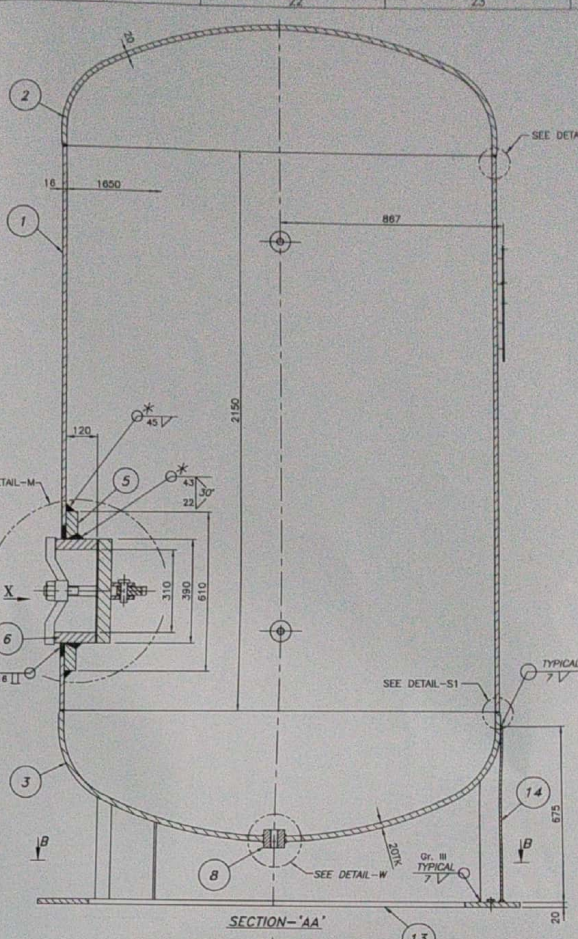

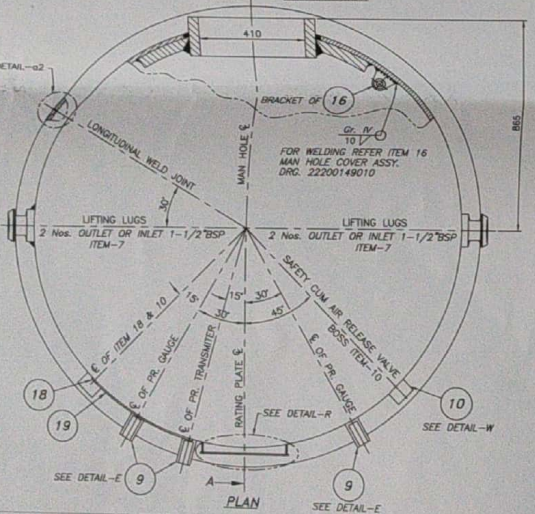

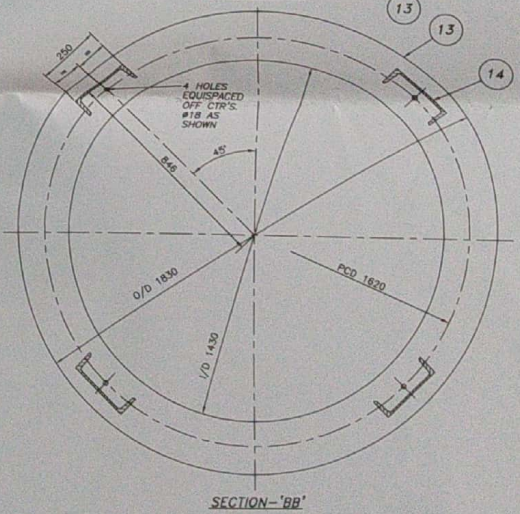

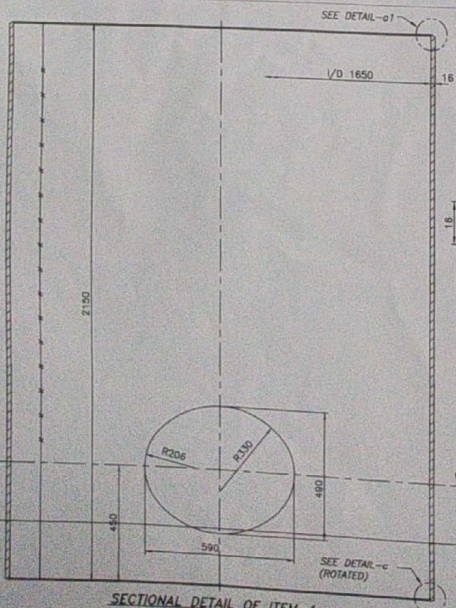

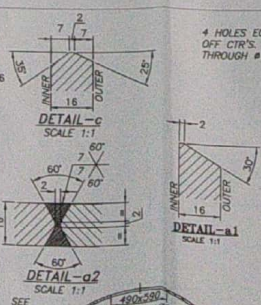

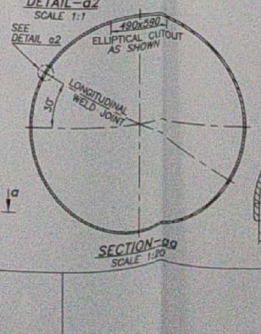

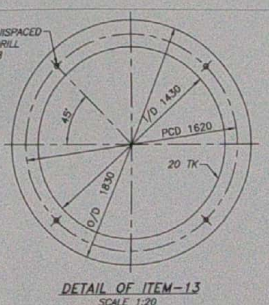

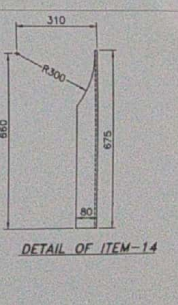

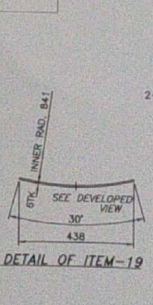

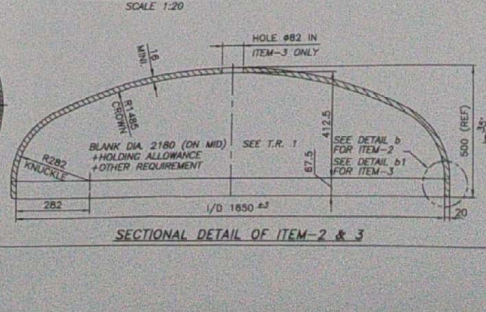

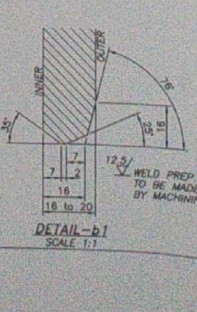

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(ALL DIMENSIONS ARE IN mm)

TECHNICAL REQUIREMENTS:-

1. FOR DOME END:-
1.1. DOME END TO BE FORMED AS ELLIPSOIDAL HEAD OF 2:1 WHERE CROWN RADIUS (0.9x1650) AND KNUCKLE RADIUS (0.170Bx1650) ARE AS GIVEN.
1.2. THICKNESS SHOWN IS THE DESIGN THICKNESS OF DOME END AFTER FORMATION.
1.3. TOLERANCES ON ALL DIMENSIONS EXCEPT THICKNESS IS ±5.
1.4. IF DOME END IS FORMED BY HOT PRESSING IT SHOULD BE STRESS RELIEVED BEFORE WELD TO OTHER PARTS.
1.5. IF DOME END IS FORMED BY COLD SPIN METHOD NORMALISING IS NECESSARY AFTER COLD SPINNING AT 920°C.
1.6. AFTER STRESS RELIEVING/NORMALISING, DOME END TO BE 100% U.T.
2. CYLINDER DIAMETER 1650 IS NOMINAL AND TO BE FABRICATED TO SUIT DOME ENDS.
3. WELDING, IT'S COMPACTNESS, APPEARANCE, AIR TIGHTNESS, AT TEST PRESSURE SHOULD CONFORM TO BS 5500-1975.
4. HOLES IN DOME ITEM 3 AND CYLINDER ITEM 1 TO BE MADE ON WELDED ASSY.
5. (i) ALL WELDS ARE TO GR.I OF CORP. STD. AA0622101 WITH 100% R.T. & 100% M.C.D. EXCEPT FILLETS WHICH ARE OF GR.III
(ii) ROOT RUN OF WELDING OF UPPER, LOWER DOME WITH CYLINDER IS TO BE DONE BY T.I.G. PROCESS AND TESTED BY D.P.T. & FINAL WELD TO BE 100% M.C.D. TESTED.
6. COMPLETE WELDED ASSY. TO BE STRESS RELIEVED TO BP0640299. NO MAJOR WELD REPAIR IS ALLOWED AFTER STRESS RELIEVING. AFTER S.R., RECEIVER TO BE SHOT BLASTED FROM INSIDE AND OUTSIDE. ALL MACHINED SURFACES SHOULD BE SUITABLY PROTECTED DURING S.R. AND SHOT BLASTING.
7. (i) AFTER STRESS RELIEVING ALL LONGITUDINAL WELDS AND T-JOINTS (150 MM ON EACH SIDE) TO BE 100% RADIOGRAPHED.
(ii) EXTENT OF RADIOGRAPHY OF CIRCUMFERENTIAL WELD TO BE 10%.
(iii) ROOT RUN OF WELDS MARKED ✱ TO BE 100% DYE TESTED & FINAL WELD TO BE 100% M.C.D. TESTED.
(NOTE-TO AVOID MAJOR REPAIR AFTER STRESS RELIEVING SUPPLIER MAY PREFERABLY PERFORM N.D.T. BEFORE STRESS RELIEVING.)
8. ALL WELDING PROCEDURES AND WELDER SHALL BE QUALIFIED AS PER ASME SECTION IX.
9. CLEANING, PAINTING AND PROTECTION AS PER PROC. SPECN. HT00005 AND CAT. AS FOLLOWS.
9.1. INTERNAL SURFACES TO BE PAINTED TO CAT.- D.
9.2. MACHINED AND THREADED SURFACES TO BE PROTECTED TO CAT.-'G'.
9.3. EXTERNAL SURFACES TO BE PAINTED TO CAT.-'F'.
10. PAINTING AREA:-
10.1. INTERNAL - 17.5 SQ.m
10.2. EXTERNAL - 18.5 SQ.m
11. PRESSURE RECEIVER TO BE HYDRAULICALLY PRESSURE TESTED AT TEST PRESSURE OF 15.75 kg/SQ.cm. AND MAINTAINED FOR SUFFICIENT TIME TO PERMIT THOROUGH CHECKING OF WELD JOINTS, IN ANY CASE NOT LESS THAN 30 MINUTES.
12. MATERIAL EQUIVALENT:-
12.1. AA10108 = IS 2062 GR. A.
12.2. AA10119 = IS 2062 GR. B
12.3. AA10112 = IS 9550
12.4. AA10501 = IS 5517 / EN24
12.5 AA21503 = IS 2712 GR. 0/2

DETAIL-S (TYPICAL) SCALE 1:1

DETAIL R (SHOWS WELDING OF ITEM 11, 12 & 1) SCALE 1:2

VIEW X (WITHOUT MAN HOLE COVER)

DETAIL M (AFTER ASSY. OF ITEM 15, 16 & 17)

VIEW X (WITH MAN HOLE COVER)

VIEW H SCALE 1:2.5

DETAIL-E SCALE 1:2.5

DETAIL W (TYPICAL) (SHOWS WELDING OF ITEM-7, 8 & 10 WITH ITEM-1 OR 3) SCALE 1:2

DETAIL S1 (TYPICAL) SCALE 2:1

DETAIL OF ITEM-7, 8 & 10 NTS

DETAIL OF ITEM-18 SCALE 1:5

DETAIL-b SCALE 1:1

DEVELOPED VIEW OF ITEM-19 SCALE 1:5

DETAIL OF ITEM-12 SCALE 1:5

DEVELOPED VIEW OF ITEM-5

DETAIL OF ITEM-5

DETAIL OF ITEM-6

DETAIL-1 SCALE 1:5

ITEM NO.	DESCRIPTION	DRAWING NO.	MATL. CODE	MATL. SPCN.	UNIT WT.	QTY.	REMARKS
019	CABLE SUPPORT CURVED FLAT 6TKx25x490	SEE DETAIL	AA1010306483	IS:2062 Gr. A	kg. 0.700	No. 001	
018	CABLE SUPPORT VERTICAL FLAT 6TKx25x1585	SEE DETAIL	AA1010308483	IS:2062 Gr. A	kg. 1.850	No. 001	
017	CROSS BAR	3-220-01-49055		IS:2062 Gr. A	kg. 5.0	No. 002	
016	MAN HOLE COVER ASSY.	2-220-01-49010		IS:2062 Gr. A	kg. 57.0	No. 001	
015	MAN HOLE GASKET	4-220-01-49028		IS:2712	kg. 0.300	No. 001	
014	SUPPORT CHANNEL 250x80x7.2x14.1x825	SEE DETAIL	AA1012708144	IS:2062 Gr. A	kg. 24.0	No. 004	
013	BASE PLATE 20 TK	SEE DETAIL	AA1011808137	IS:2062 Gr. A	kg. 159.800	No. 001	
012	MOUNTING PLATE 5 TK	SEE DETAIL	AA1011808013	IS:2062 Gr. A	kg. 6.0	No. 001	
011	PLATE 5TKx35x100		AA1011808013	IS:2062 Gr. A	kg. 0.140	No. 004	
010	BOSS 3/4" NPT FOR SAFETY VALVE	SEE DETAIL	AA1010208241	IS:2062 Gr. A	kg. 2.0	No. 002	CAUTION- NPT THREADS ø80 BAR
009	BOSS 3/8"BSP FOR PR. GAUGE	4-229-01-14401		IS:2062 Gr. A	kg. 2.500	No. 003	01
008	BOSS 1/2"BSP FOR BOTTOM DRAIN	SEE DETAIL	AA1010208241	IS:2062 Gr. A	kg. 2.0	No. 001	BAR ø80x70
007	BOSS 1-1/2"BSP FOR INLET/OUTLET	SEE DETAIL	AA1010208241	IS:2062 Gr. A	kg. 1.760	No. 004	BAR ø80x70
006	ELLIPTICAL SHELL PLATE 45 TK	SEE DETAIL		ASME SA516 Gr.60	kg. 36.0	No. 001	
005	COMPENSATING RING PLATE 45 TK	SEE DETAIL		ASME SA516 Gr.60	kg. 64.0	No. 001	
004	LIFTING LUG	3-220-01-49031		IS:2062 Gr. A	kg. 6.540	No. 002	003
003	LOWER DOME END PLATE 20 TK	SEE DETAIL		ASME SA516 Gr.60	kg. 545.0	No. 001	SEE T.R.1
002	UPPER DOME END PLATE 20 TK	SEE DETAIL		ASME SA516 Gr.60	kg. 545.0	No. 001	SEE T.R.1
001	CYLINDER SHELL PLATE 16 TK	SEE DETAIL		ASME SA516 Gr.60	kg. 1385.0	No. 001	

ADDITIONAL INFORMATION 39022X20229

STATUS OF DRAWING

DISTRIBUTION OF PRINTS HTE-2, WTM-5 THX-1, FBM-7

	NAME	SIGN	DATE	NO. OF DRN.
DRN	KKJ	-sd-	24.3.13	
CKD	ADITYA	-sd-	24.3.13	
APPD	KP	-sd-	24.3.13	

SUB-SUPPLIER/VENDOR

PROJECT: 6x200MW PUNATSANGCHHU-I HEP

CUSTOMER: PHPA, BHUTAN

CONSULTANT: WAPCOS LIMITED / CENTRAL ELECTRICITY AUTHORITY

CONTRACTOR: BHARAT HEAVY ELECTRICALS LTD. BHOPAL

ISSUED BY	UNITOL/DWG. GR.	ANGLE	SCALE	WEIGHT (KG)	REF. TO ASSY. DRG.	ITEM NO.	NO. OF ITEM
DEPT. HTE	REF.DWG.NO.		1:10	2941.0	0-229-10-18602	001	019
DEPT. 402	32000049014						

TITLE: WELDED ASSY. OF L.P. AIR RECEIVER (6m³)

DRAWING NO. 0-229-10-18604 REV. 1

REV.	DATE	ALTERED CHECKED APPD.	ZONE
01	15.7.13	KKJ -sd- HK -sd- KP -sd-	

TYPE OF THREADS REVISED IN ITEM-10.

AO SIZE

7876 (P.V-037)

7876 PV-030

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(ALL DIMENSIONS ARE IN mm)

29	30	31	32

TECHNICAL REQUIREMENTS:–

1. FOR DOME END:–
1.1. DOME END TO BE FORMED AS ELLIPSOIDAL HEAD OF 2:1 WHERE CROWN RADIUS (0.9x1650) AND KNUCKLE RADIUS (0.1708x1650) ARE AS GIVEN.
1.2. THICKNESS SHOWN IS THE DESIGN THICKNESS OF DOME END AFTER FORMATION.
1.3. TOLERANCES ON ALL DIMENSIONS EXCEPT THICKNESS IS ±5.
1.4. IF DOME END IS FORMED BY HOT PRESSING IT SHOULD BE STRESS RELIEVED BEFORE WELD TO OTHER PARTS.
1.5. IF DOME END IS FORMED BY COLD SPIN METHOD NORMALISING IS NECESSARY AFTER COLD SPINNING AT 920°C.
1.6. AFTER STRESS RELIEVING/NORMALISING, DOME END TO BE 100% U.T.

2. CYLINDER DIAMETER 1650 IS NOMINAL AND TO BE FABRICATED TO SUIT DOME ENDS.
3. WELDING, IT'S COMPACTNESS, APPEARANCE, AIR TIGHTNESS, AT TEST PRESSURE SHOULD CONFORM TO BS 5500–1975.
4. HOLES IN DOME ITEM 3 AND CYLINDER ITEM 1 TO BE MADE ON WELDED ASSY.
5. (i) ALL WELDS ARE TO GR.I OF CORP. STD. AA0622101 WITH 100% R.T. & 100% M.C.D. EXCEPT FILLETS WHICH ARE OF GR.III
(ii) ROOT RUN OF WELDING OF UPPER, LOWER DOME WITH CYLINDER IS TO BE DONE BY T.I.G. PROCESS AND TESTED BY D.P.T. & FINAL WELD TO BE 100% M.C.D. TESTED.
6. COMPLETE WELDED ASSY. TO BE STRESS RELIEVED TO BP0640299. NO MAJOR WELD REPAIR IS ALLOWED AFTER STRESS RELIEVING. AFTER S.R., RECEIVER TO BE SHOT BLASTED FROM INSIDE AND OUTSIDE ALL MACHINED SURFACES SHOULD BE SUITABLY PROTECTED DURING S.R. AND SHOT BLASTING.
7. (i) AFTER STRESS RELIEVING ALL LONGITUDINAL WELDS AND T–JOINTS (150 MM ON EACH SIDE) TO BE 100% RADIOGRAPHED.
(ii) EXTENT OF RADIOGRAPHY OF CIRCUMFERENTIAL WELD TO BE 10%.
(iii) ROOT RUN OF WELDS MARKED * TO BE 100% DYE TESTED & FINAL WELD TO BE 100% M.C.D. TESTED.
(NOTE–TO AVOID MAJOR REPAIR AFTER STRESS RELIEVING SUPPLIER MAY PREFERABLY PERFORM N.D.T. BEFORE STRESS RELIEVING.)
8. ALL WELDING PROCEDURES AND WELDER SHALL BE QUALIFIED AS PER ASME SECTION IX.
9. CLEANING, PAINTING AND PROTECTION AS PER PROC. SPECN. HT00005 AND CAT. AS FOLLOWS.
9.1. INTERNAL SURFACES TO BE PAINTED TO CAT.– D.
9.2. MACHINED AND THREADRED SURFACES TO BE PROTECTED TO CAT.–'G'.
9.3. EXTERNAL SURFACES TO BE PAINTED TO CAT.–'F'.
10. PAINTING AREA:–
10.1. INTERNAL – 17.5 SQ.m
10.2. EXTERNAL – 18.5 SQ.m
11. PRESSURE RECEIVER TO BE HYDRAULICALLY PRESSURE TESTED AT TEST PRESSURE OF 15.75 kg/SQ.cm. AND MAINTAINED FOR SUFFICIENT TIME TO PERMIT THOROUGH CHECKING OF WELD JOINTS, IN ANY CASE NOT LESS THAN 30 MINUTES.
12. MATERIAL EQUIVALENT:–
12.1. AA10108 = IS 2062 GR. A
12.2. AA10119 = IS 2062 GR. B
12.3. AA10112 = IS 9550
12.4. AA10501 = IS 5517 / EN24
12.5 AA21503 = IS 2712 GR. O/2

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Contact Person : Y.PRASANNA KUMAR / IJAZ M. REL DT : 11.12.2018 REREL DT: . . PRINT DT: 16.03.2020

	GROUP MANUFACTURING SPECIFICATION	PRINCIPLE DRG: 0-229-01-17603 DPN-NS-PG-MA : 001-1-PV-010 PGMA DESC : HP AIR RECEIVERS-1.6M3	RCI	NETWORK NUMBER 6004936	001/007 PAGE NUMBER	RVN '00'
CUST No. PROJ NAME	7876 AIR RECEIVERS FOR VYASI- BHEL-BHOPAL					

LINE	DAM	NRV	DU NO.	BOM	ITEM	DRAWING NUMBER / BPS CODE	RVN	VAR	DESCRIPTION	MATL CODE / MATL SPECN	AC	DUI	REV	UNIT	QTY / JOB NO	WT / JOB NO / FINISHED WT
010			*						HP AIR RECEIVERS-1.6 M3	----------		A			1.000	2737.544
020			*	01		0-229-01-17603	00	00	WELDED ASSEMBLY OF H .P AIR RECEIVER	----------		A			1.000	2737.544
030			001	01		0-229-01-17603	00	00	WELDED ASSEMBLY OF H .P AIR RECEIVER	----------		M		NO	1.000	2737.544
040			001	01	01	3-229-01-14801	00	00	TOP DOME PLATE 40MM 1330.00 X 1330.00	156010740000 ---------- SA516GR60	C			NO	1.000	385.000
050			001	01	02	0-229-01-17603	00	00	CYLLINDER PLATE 32MM 1790.00 X 3480.00	156010720000 ---------- SA516GR60	C			NO	1.000	1350.000
060			001	01	03	3-229-01-14801	00	00	BOTTOM DOME PLATE 40MM 1330.00 X 1330.00	156010740000 ---------- SA516GR60	C			NO	1.000	385.000
070			001	01	04	3-229-01-14802	00	00	CROSS BAR	----------		A		NO	2.000	10.500

Contact Person : Y.PRASANNA KUMAR / IJAZ M. REL DT : 11.12.2018 REREL DT: . . PRINT DT: 16.03.2020

	GROUP MANUFACTURING SPECIFICATION	PRINCIPLE DRG: 0-229-01-17603 DPN-NS-PG-MA : 001-1-PV-010 PGMA DESC : HP AIR RECEIVERS-1.6M3	RCI	NETWORK NUMBER 6004936	002/007 PAGE NUMBER	RVN '00'
CUST No. PROJ NAME	7876 AIR RECEIVERS FOR VYASI- BHEL-BHOPAL					

LINE	DAM	NRV	DU NO.	BOM	ITEM	DRAWING NUMBER / BPS CODE	RVN	VAR	DESCRIPTION	MATL CODE / MATL SPECN	AC	DUI	REV	UNIT	QTY / JOB NO	WT / JOB NO / FINISHED WT
010			001	02	01	3-229-01-14802	00	00	CROSS BAR PLATE 32 T HK. 74.00 X 210.00	156017010000 IS2062E250A	N			NO	4.000	8.000
020			001	02	02	3-229-01-14802	00	00	BOSS DIA 80 MM 50.00	156275490000 IS2062E250A	N			NO	2.000	2.500
030			001	01	05	2-229-01-14801	00	00	MAN HOLE COVER ASSLY			A		NO	1.000	100.232
040			001	03	01	4-229-01-14807	00	00	COVER PLATE PLATE 56MM 400.00 X 500.00	156016850000 IS2062GRB	C			NO	1.000	87.920
050			001	03	02	4-229-01-14808	00	00	BRACKET PLATE 20MM 80.00 X 95.00	150111500000 IS2062E250A(FE41	N			NO	2.000	1.600
060			001	03	03	2-229-01-14801	00	00	SPLIT PIN 2.5 X 32 L G STEEL	190254070000	N			NO	2.000	0.002
070			001	03	04	4-220-01-02002	02	00	BRACKET PLATE 20MM 80.00 X 90.00	150111500000 IS2062E250A(FE41	N			NO	2.000	1.600

Contact Person : Y.PRASANNA KUMAR / IJAZ M. REL DT : 11.12.2018 REREL DT: . . PRINT DT: 16.03.2020

	GROUP MANUFACTURING SPECIFICATION	PRINCIPLE DRG: 0-229-01-17603 DPN-NS-PG-MA : 001-1-PV-010 PGMA DESC : HP AIR RECEIVERS-1.6M3	RCI	NETWORK NUMBER 6004936	003/007 PAGE NUMBER	RVN '00'
CUST No. PROJ NAME	7876 AIR RECEIVERS FOR VYASI- BHEL-BHOPAL					

LINE	DAM	NRV	DU NO.	BOM	ITEM	DRAWING NUMBER / BPS CODE	RVN	VAR	DESCRIPTION	MATL CODE / MATL SPECN	AC	DUI	REV	UNIT	QTY / JOB NO	WT / JOB NO / FINISHED WT
010			001	03	05	4-220-01-02003	01	00	PIN ROUND 50MM 87.00	150040230000 IS2062FE410GRA	N			NO	2.000	0.800
020			001	03	06	4-220-01-49017	02	00	LEVER PLATE 25MM 190.00 X 600.00	156017000000 IS2062E250A	N			NO	1.000	3.780
030			001	03	07	4-220-01-49027	02	00	CS STUD+1HX NUT M36X 265LG DRG42200149027	190254360000 IS2062	N			SET	2.000	4.220
040			001	03	09	2-229-01-14801	00	00	C.S WASHER FOR M24 B OLT.25 ST	190254090000	N			NO	2.000	0.060
050			001	03	10	2-229-01-14801	00	00	BRIGHT STEEL ROUND B AR DIA45 IS9550-2001	156275460000 IS9550-2001	N			NO	2.000	0.250
060			001	01	06	4-229-01-14801	00	00	KEVLAR SHEET 3MM MED IUM PRESSURE OIL APP 390.00 X 490.00	190058060000 KEVLAR	N			NO	1.000	0.516
070			001	01	07	4-229-01-14802	00	01	SKIRT SEGMENT PLATE 10MM 380.00 X 1050.00	152110980000 IS2062E250A(FE41	N			NO	2.000	61.400

Contact Person : Y.PRASANNA KUMAR / IJAZ M. REL DT : 11.12.2018 REREL DT: . . PRINT DT: 16.03.2020

	GROUP MANUFACTURING SPECIFICATION	PRINCIPLE DRG: 0-229-01-17603 DPN-NS-PG-MA : 001-1-PV-010 PGMA DESC : HP AIR RECEIVERS-1.6M3	RCI	NETWORK NUMBER 6004936	004/007 PAGE NUMBER	RVN '00'

CUST No.	7876
PROJ NAME	AIR RECEIVERS FOR VYASI- BHEL-BHOPAL

LINE	DAM	NRV	DU NO.	BOM	ITEM	DRAWING NUMBER / BPS CODE	RVN	VAR	DESCRIPTION	MATL CODE / MATL SPECN	AC	DUI	REV	UNIT	QTY / JOB NO	WT / JOB NO / FINISHED WT
010			001	01	08	3-229-01-14803	00	01	BASE PLATE PLATE 25MM 1090.00 X 1090.00	156017000000 IS2062E250A	N			NO	1.000	143.000
020			001	01	09	4-229-01-14803	00	00	RIB PLATE 10 MM 322.00 X 341.00	152110980000 IS2062E250A(FE41	N			NO	4.000	30.000
030			001	01	10	0-229-01-17603	00	00	BOSS 1/2 " BSP ROUND 75 MM 70.00	156275300000 IS2062E250A	N			NO	1.000	1.500
040			001	01	11	4-229-01-14401	00	01	BOSS 3/8" BSP FOR PR . GUAGE 90.00	156275480000 IS2062E250A	N			NO	2.000	3.996
050			001	01	12	0-229-01-17603	00	00	CABLE SUPPORT CURVED .FLAT 6 X 25 25.00 X 205.00	156291120000 IS2062E250A	N			NO	1.000	0.250
060			001	01	13	0-229-01-17603	00	00	MOUNTING PLATE PLATE 5MM 350.00 X 450.00	150110290000 IS2062E250A(FE41	N			NO	1.000	6.000
070			001	01	14	0-229-01-17603	00	00	PLATE 5.00 MM 100.00 X 600.00	150110290000 IS2062E250A(FE41	C			NO	1.000	2.300

Contact Person : Y.PRASANNA KUMAR / IJAZ M. REL DT : 11.12.2018 REREL DT: . . PRINT DT: 16.03.2020

	GROUP MANUFACTURING SPECIFICATION	PRINCIPLE DRG: 0-229-01-17603 DPN-NS-PG-MA : 001-1-PV-010 PGMA DESC : HP AIR RECEIVERS-1.6M3	RCI	NETWORK NUMBER 6004936	005/007 PAGE NUMBER	RVN '00'
CUST No. PROJ NAME	7876 AIR RECEIVERS FOR VYASI- BHEL-BHOPAL					

LINE	DAM	NRV	DU NO.	BOM	ITEM	DRAWING NUMBER / BPS CODE	RVN	VAR	DESCRIPTION	MATL CODE / MATL SPECN	AC	DUI	REV	UNIT	QTY / JOB NO	WT / JOB NO / FINISHED WT
010			001	01	15	3-229-01-14804	00	00	COMPENSATING RING PLATE 32MM 610.00 X 710.00	156010720000 SA516GR60	C			NO	1.000	45.000
020			001	01	16	3-229-01-14805	00	00	ELLIPTICAL SHELL PLATE 45MM 180.00 X 1275.00	156010750000 SA516GR60	C			NO	1.000	64.000
030			001	01	17	0-229-01-17603	00	00	LIFTING LUG DIA 125 MM 90.00	156275330000 IS2062E250A	N			NO	2.000	8.600
040			001	01	18	0-229-01-17603	00	00	BOSS 3/4 " NPT DIA 75MM 70.00	156275300000 IS2062E250A	N			NO	1.000	1.800
050			001	01	19	4-229-01-14806	00	00	BOSS 50 NB	156275500100 IS2004GR2(20C8)	C			NO	4.000	43.200
060			001	01	20	4-229-01-14815	00	00	BOSS 100 NB	156275510100 IS2004GR2(20C8)	N			NO	1.000	35.600
070			001	01	21	0-229-01-17603	00	00	CABLE SUPT VERTICAL FLAT 6 X 25 25.00 X 810.00	156291120000 IS2062E250A	N			NO	1.000	0.950

Contact Person : Y.PRASANNA KUMAR / IJAZ M. REL DT : 11.12.2018 REREL DT: . . PRINT DT: 16.03.2020

	GROUP MANUFACTURING SPECIFICATION	PRINCIPLE DRG: 0-229-01-17603 DPN-NS-PG-MA : 001-1-PV-010 PGMA DESC : HP AIR RECEIVERS-1.6M3	RCI	NETWORK NUMBER 6004936	006/007 PAGE NUMBER	RVN '00'
CUST No. PROJ NAME	7876 AIR RECEIVERS FOR VYASI- BHEL-BHOPAL					

LINE	DAM	NRV	DU NO.	BOM	ITEM	DRAWING NUMBER / BPS CODE	RVN	VAR	DESCRIPTION	MATL CODE / MATL SPECN	AC	DUI	REV	UNIT	QTY / JOB NO	WT / JOB NO / FINISHED WT
010			001	01	22	0-229-01-17603	00	00	CR EPX REDOXIDE ZNPH OSPHTE PRIMR-AA56105	180030850000	N			L	10.000	20.000
020			001	01	23	0-229-01-17603	00	00	THINNER FOR CR EPXID E RO ZN PHOSPHATE PR	180020480000	N			L	1.000	2.000
030			001	01	24	0-229-01-17603	00	00	CR EPOXIDE FINISHING PAINT TDC: AA 56131	180051140000 AA 56131	N			L	10.000	11.000
040			001	01	25	0-229-01-17603	00	00	THINNER-CHEM RESISTN T EPXIDE FINISH IS:5	180020490000	N			L	1.000	2.000
050			001	01	26	0-229-01-17603	00	00	OIL RESIST AIRDRY SY N ENML PAINT AA56132	180051180000	N			L	10.000	20.000
060			001	01	27	0-229-01-17603	00	00	THINNER-OILRESIST AI RDRY SYNTIC ENML PNT	180020500000	N			L	1.000	2.000
070			001	01	28	0-229-01-17603	00	00	RUST PREVENTIVE HARD FILM BLACK AA 55154	180010100000 AA 55154	N			L	1.000	1.500

Contact Person : Y.PRASANNA KUMAR / IJAZ M. REL DT : 11.12.2018 REREL DT: . . PRINT DT: 16.03.2020

	GROUP MANUFACTURING SPECIFICATION	PRINCIPLE DRG: 0-229-01-17603 DPN-NS-PG-MA : 001-1-PV-010 PGMA DESC : HP AIR RECEIVERS-1.6M3	RCI	NETWORK NUMBER 6004936	007/007 PAGE NUMBER	RVN '00'
CUST No. PROJ NAME	7876 AIR RECEIVERS FOR VYASI- BHEL-BHOPAL					

LINE	DAM	NRV	DU NO.	BOM	ITEM	DRAWING NUMBER / BPS CODE	RVN	VAR	DESCRIPTION	MATL CODE / MATL SPECN	AC	DUI	REV	UNIT	QTY / JOB NO	WT / JOB NO / FINISHED WT
010			001	01	29	0-229-01-17603	00	00	THINNER FOR TEMP RUST PREVENTIVE BLACK	180020510000 ----------	N			L	0.100	0.200

Contact Person : Y.PRASANNA KUMAR / IJAZ M. REL DT : 10.01.2019 REREL DT: . . PRINT DT: 16.03.2020

	GROUP MANUFACTURING SPECIFICATION	PRINCIPLE DRG: 0-229-10-19205 DPN-NS-PG-MA : 003-1-PV-020 PGMA DESC : LP AIR RECEIVERS- 2M3	RCI	NETWORK NUMBER 6004938	001/004 PAGE NUMBER	RVN '00'
CUST No. PROJ NAME	7876 AIR RECEIVERS FOR VYASI- BHEL-BHOPAL					

LINE	DAM	NRV	DU NO.	BOM	ITEM	DRAWING NUMBER / BPS CODE	RVN	VAR	DESCRIPTION	MATL CODE / MATL SPECN	AC	DUI	REV	UNIT	QTY / JOB NO	WT / JOB NO / FINISHED WT
010			*						LP AIR RECEIVERS- 2M 3	----------		A			1.000	1443.110
020			*	01		0-229-10-19205	02	00	WELDED ASSLY OF L.P AIR RECEIVER 2 M3	----------		A			1.000	1443.110
030			001	01		0-229-10-19205	02	00	WELDED ASSLY OF L.P AIR RECEIVER	----------		M		NO	1.000	1443.110
040			001	01	01	2-229-10-18901	00	00	DOME END PLATE 18MM 1431.00 X 1431.00	156010660000 ---------- SA516GR60	C			NO	2.000	380.000
050			001	01	02	0-229-10-19205	02	00	CYLINDER PLATE 16MM 1842.00 X 3411.00	156010650000 ---------- SA516GR60	C			NO	1.000	785.000
060			001	01	03	4-229-10-18905	00	00	BOSS 3/4" DIA 75MM 100.00	156275300000 ---------- IS2062E250A	N			NO	6.000	16.800
070			001	01	04	3-229-10-18901	00	00	LIFTING LUG ROUND 100MM 100.00	156290580000 ---------- IS2062	N			NO	2.000	8.400

Contact Person : Y.PRASANNA KUMAR / IJAZ M. REL DT : 10.01.2019 REREL DT: . . PRINT DT: 16.03.2020

	GROUP MANUFACTURING SPECIFICATION	PRINCIPLE DRG: 0-229-10-19205 DPN-NS-PG-MA : 003-1-PV-020 PGMA DESC : LP AIR RECEIVERS- 2M3	RCI	NETWORK NUMBER 6004938	002/004 PAGE NUMBER	RVN '00'
CUST No. PROJ NAME	7876 AIR RECEIVERS FOR VYASI- BHEL-BHOPAL					

LINE	DAM	NRV	DU NO.	BOM	ITEM	DRAWING NUMBER / BPS CODE	RVN	VAR	DESCRIPTION	MATL CODE / MATL SPECN	AC	DUI	REV	UNIT	QTY / JOB NO	WT / JOB NO / FINISHED WT
010			001	01	05	0-229-10-19205	02	00	BOSS FOR DRAIN VALVE .DIA 63.0 MM 55.00	150041070000 IS2062FE410GRA	N			NO	1.000	1.200
020			001	01	06	4-229-10-19203	00	00	BOSS FOR HAND HOLE PLATE 80MM 355.00 X 355.00	156016920000 IS2062GRB	N			NO	2.000	67.000
030			001	01	07	0-229-10-19205	02	00	SUPPORTING LUG ISMC 200 450.00	150100380000 IS2062E250A(FE41	N			NO	4.000	36.000
040			001	01	08	3-229-10-18905	00	00	BASE FLANGE PLATE 20.0 MM 1150.00 X 1150.00	150111500000 IS2062E250A(FE41	N			NO	1.000	73.800
050			001	01	09	4-229-10-18906	00	00	BOSS 3/8" DIA 75 MM 60.00	156275300000 IS2062E250A	N			NO	1.000	1.760
060			001	01	10	0-229-10-19205	02	00	SUPPORT PLATE PLATE 5.00 MM 75.00 X 47.00	156018080000 ASMESAIS2062E250	N			NO	6.000	0.840
070			001	01	11	0-229-10-19205	02	00	MOUNTING PLATE PLATE 5.00 MM 350.00 X 600.00	156018080000 ASMESAIS2062E250	N			NO	1.000	8.200

Contact Person : Y.PRASANNA KUMAR / IJAZ M. REL DT : 10.01.2019 REREL DT: . . PRINT DT: 16.03.2020

	GROUP MANUFACTURING SPECIFICATION	PRINCIPLE DRG: 0-229-10-19205 DPN-NS-PG-MA : 003-1-PV-020 PGMA DESC : LP AIR RECEIVERS- 2M3	RCI	NETWORK NUMBER 6004938	003/004 PAGE NUMBER	RVN '00'

CUST No.	7876
PROJ NAME	AIR RECEIVERS FOR VYASI- BHEL-BHOPAL

LINE	DAM	NRV	DU NO.	BOM	ITEM	DRAWING NUMBER / BPS CODE	RVN	VAR	DESCRIPTION	MATL CODE / MATL SPECN	AC	DUI	REV	UNIT	QTY / JOB NO	WT / JOB NO / FINISHED WT
010			001	01	12	3-229-10-18902	00	00	M.S FLAT - 1 FLAT 25 X 6 1300.00	156290940000 IS2062	N			NO	1.000	1.450
020			001	01	13	3-229-10-18903	00	00	M.S FLAT - II FLAT 25 X 6 1600.00	156290940000 IS2062	N			NO	1.000	1.760
030			001	01	14	3-229-10-18904	0	0	BOSS FOR JUNCT BLOCK DIA 80 MM 70.00	156275490000 IS2062E250A	N			NO	1.000	2.200
040			001	01	15	0-229-10-19205	02	00	CR EPX REDOXIDE ZNPH OSPHTE PRIMR-AA56105	180030850000	N			L	10.000	20.000
050			001	01	16	0-229-10-19205	02	00	CR EPOXIDE FINISHING PAINT TDC: AA 56131	180051140000 AA 56131	N			L	10.000	11.000
060			001	01	17	0-229-10-19205	02	00	OIL RESIST AIRDRY SY N ENML PAINT AA56132	180051180000	N			L	10.000	20.000
070			001	01	18	0-229-10-19205	02	00	RUST PREVENTIVE HARD FILM BLACK AA 55154	180010100000 AA 55154	N			L	1.000	1.500

Contact Person : Y.PRASANNA KUMAR / IJAZ M. REL DT : 10.01.2019 REREL DT: . . PRINT DT: 16.03.2020

	GROUP MANUFACTURING SPECIFICATION	PRINCIPLE DRG: 0-229-10-19205 DPN-NS-PG-MA : 003-1-PV-020 PGMA DESC : LP AIR RECEIVERS- 2M3	RCI	NETWORK NUMBER 6004938	004/004 PAGE NUMBER	RVN '00'
CUST No. PROJ NAME	7876 AIR RECEIVERS FOR VYASI- BHEL-BHOPAL					

LINE	DAM	NRV	DU NO.	BOM	ITEM	DRAWING NUMBER / BPS CODE	RVN	VAR	DESCRIPTION	MATL CODE / MATL SPECN	AC	DUI	REV	UNIT	QTY / JOB NO	WT / JOB NO / FINISHED WT
010			001	01	19	0-229-10-19205	02	00	THINNER FOR CR EPXID E RO ZN PHOSPHATE PR	180020480000 ----------	N			L	1.000	2.000
020			001	01	20	0-229-10-19205	02	00	THINNER-CHEM RESISTN T EPXIDE FINISH IS:5	180020490000 ----------	N			L	1.000	2.000
030			001	01	21	0-229-10-19205	02	00	THINNER-OILRESIST AI RDRY SYNTIC ENML PNT	180020500000 ----------	N			L	1.000	2.000
040			001	01	22	0-229-10-19205	02	00	THINNER FOR TEMP RUS T PREVENTIVE BLACK	180020510000 ----------	N			L	0.100	0.200

Contact Person : Y.PRASANNA KUMAR / IJAZ M. REL DT : 11.01.2019 REREL DT: . . PRINT DT: 16.03.2020

	GROUP MANUFACTURING SPECIFICATION	PRINCIPLE DRG: 0-229-10-18604 DPN-NS-PG-MA : 005-1-PV-030 PGMA DESC : LP AIR RECEIVERS- 6M3	RCI	NETWORK NUMBER 6004940	001/006 PAGE NUMBER	RVN '00'
CUST No. PROJ NAME	7876 AIR RECEIVERS FOR VYASI- BHEL-BHOPAL					

LINE	DAM	NRV	DU NO.	BOM	ITEM	DRAWING NUMBER / BPS CODE	RVN	VAR	DESCRIPTION	MATL CODE / MATL SPECN	AC	DUI	REV	UNIT	QTY / JOB NO	WT / JOB NO / FINISHED WT
010			*						LP AIR RECEIVERS- 6M 3	----------		A			1.000	2996.967
020			*	01		0-229-10-18604	01	00	WELDED ASSLY OF L.P AIR RECEIVER	----------		A		NO	1.000	2996.967
030			001	01		0-229-10-18604	01	00	WELDED ASSLY OF L.P AIR RECEIVER	----------		M		NO	1.000	2996.967
040			001	01	01	0-229-10-18604	01	00	CYLLINDRICAL SHELL PLATE 16MM 2170.00 X 5235.00	156010650000 ---------- SA516GR60	C			NO	1.000	1385.000
050			001	01	02	0-229-10-18604	01	00	UPPER DOME END PLATE 20MM 2180.00 X 2180.00	156010670000 ---------- SA516GR60	C			NO	1.000	545.000
060			001	01	03	0-229-10-18604	01	00	LOWER DOME END PLATE 20MM 2180.00 X 2180.00	156010670000 ---------- SA516GR60	C			NO	1.000	545.000
070			001	01	04	0-229-10-18604	01	00	LIFTING LUG DIA 125MM 100.00	156275330000 ---------- IS2062E250A	N			NO	2.000	13.080

Contact Person : Y.PRASANNA KUMAR / IJAZ M. REL DT : 11.01.2019 REREL DT: . . PRINT DT: 16.03.2020

	GROUP MANUFACTURING SPECIFICATION	PRINCIPLE DRG: 0-229-10-18604 DPN-NS-PG-MA : 005-1-PV-030 PGMA DESC : LP AIR RECEIVERS- 6M3	RCI	NETWORK NUMBER 6004940	002/006 PAGE NUMBER	RVN '00'
CUST No. PROJ NAME	7876 AIR RECEIVERS FOR VYASI- BHEL-BHOPAL					

LINE	DAM	NRV	DU NO.	BOM	ITEM	DRAWING NUMBER / BPS CODE	RVN	VAR	DESCRIPTION	MATL CODE / MATL SPECN	AC	DUI	REV	UNIT	QTY / JOB NO	WT / JOB NO / FINISHED WT
010			001	01	05	0-229-10-18604	01	00	COMPENSATING RING PLATE 45MM 610.00 X 710.00	156010750000 SA516GR60	C			NO	1.000	64.000
020			001	01	06	0-229-10-18604	01	00	ELLIPTICAL SHELL PLATE 50MM 180.00 X 1288.00	156010950000 SA516GR70	C			NO	1.000	36.000
030			001	01	07	0-229-10-18604	01	00	BOSS 1-1/2" BSP DIA 80 MM 70.00	156275490000 IS2062E250A	N			NO	4.000	7.040
040			001	01	08	0-229-10-18604	01	00	BOSS 1/2" BSP DIA 80 MM 70.00	156275490000 IS2062E250A	N			NO	1.000	2.000
050			001	01	09	4-229-01-14401	00	01	BOSS 3/8" BSP DIA 60 MM 130.00	156275480000 IS2062E250A	N			NO	3.000	7.500
060			001	01	10	0-229-10-18604	01	00	BOSS 3/8" NPT DIA 60 MM 70.00	156275480000 IS2062E250A	N			NO	2.000	3.108
070			001	01	11	0-229-10-18604	01	00	PLATE PLATE 5.00 MM 35.00 X 100.00	156018080000 ASMESAIS2062E250	N			NO	4.000	0.560

Contact Person : Y.PRASANNA KUMAR / IJAZ M. REL DT : 11.01.2019 REREL DT: . . PRINT DT: 16.03.2020

	GROUP MANUFACTURING SPECIFICATION	PRINCIPLE DRG: 0-229-10-18604 DPN-NS-PG-MA : 005-1-PV-030 PGMA DESC : LP AIR RECEIVERS- 6M3	RCI	NETWORK NUMBER 6004940	003/006 PAGE NUMBER	RVN '00'
CUST No. PROJ NAME	7876 AIR RECEIVERS FOR VYASI- BHEL-BHOPAL					

LINE	DAM	NRV	DU NO.	BOM	ITEM	DRAWING NUMBER / BPS CODE	RVN	VAR	DESCRIPTION	MATL CODE / MATL SPECN	AC	DUI	REV	UNIT	QTY / JOB NO	WT / JOB NO / FINISHED WT
010			001	01	12	0-229-10-18604	01	00	MOUNTING PLATE PLATE 5.00 MM 350.00 X 450.00	156018080000 ASMESAIS2062E250	N			NO	1.000	6.000
020			001	01	13	0-229-10-18604	01	00	BASE PLATE PLATE 20.0 MM 1830.00 X 1830.00	156018120000 ASMESAIS2062E250	N			NO	1.000	159.800
030			001	01	14	0-229-10-18604	01	00	SUPPORT CHANNEL ISMC 250 825.00	150100110000 ASMESAIS2062E250	N			NO	4.000	96.000
040			001	01	15	4-220-01-49028	01	00	RUBBER BONDED CORKGA SKET3THK(APD) IS4253	190058050000	N			NO	1.000	0.300
050			001	01	16	3-220-01-49010	02	00	MANHOLE COVER ASSEMB LY		N	A		NO	1.000	56.552
060			001	02	01	4-220-01-49076	03	00	COVER PLATE PLATE 56MM 400.00 X 500.00	156010960000 SA516GR70	N			NO	1.000	43.000
070			001	02	02	4-220-01-49016	02	00	BRACKET PLATE 20.0 MM 80.00 X 90.00	150111500000 IS2062E250A(FE41	N			NO	2.000	1.600

Contact Person : Y.PRASANNA KUMAR / IJAZ M. REL DT : 11.01.2019 REREL DT: . . PRINT DT: 16.03.2020

	GROUP MANUFACTURING SPECIFICATION	PRINCIPLE DRG: 0-229-10-18604 DPN-NS-PG-MA : 005-1-PV-030 PGMA DESC : LP AIR RECEIVERS- 6M3	RCI	NETWORK NUMBER 6004940	004/006 PAGE NUMBER	RVN '00'
CUST No. PROJ NAME	7876 AIR RECEIVERS FOR VYASI- BHEL-BHOPAL					

LINE	DAM	NRV	DU NO.	BOM	ITEM	DRAWING NUMBER / BPS CODE	RVN	VAR	DESCRIPTION	MATL CODE / MATL SPECN	AC	DUI	REV	UNIT	QTY / JOB NO	WT / JOB NO / FINISHED WT
010			001	02	03	3-220-01-49010	02	00	SPLIT PIN 2.5 X 32LG STEEL	190254070000 ----------	N			NO	2.000	0.002
020			001	02	04	4-220-01-02002	03	00	BRACKET P LATE 20.0 MM 80.00 X 90.00	150111500000 ---------- IS2062E250A(FE41	N			NO	2.000	1.600
030			001	02	05	4-220-01-02003	03	00	PIN DIA 50.0 MM 90.00	150040230000 ---------- IS2062FE410GRA	N			NO	2.000	0.800
040			001	02	06	4-220-01-49017	03	00	LEVER PLATE 25 THK 190.00 X 600.00	156017000000 ---------- IS2062E250A	N			NO	1.000	5.000
050			001	02	07	4-220-01-49027	03	00	CS STUD+1HX NUT M36X 265LG DRG42200149027	190254360000 ---------- IS2062	N			SET	2.000	4.240
060			001	02	09	3-220-01-49010	02	00	C.S WASHER FOR M24 B OLT.25 ST	190254090000 ----------	N			NO	2.000	0.060
070			001	02	10	3-220-01-49010	02	00	BRIGHT STEEL ROUND B AR DIA45 IS9550-2001	156275460000 ---------- IS9550-2001	N			NO	2.000	0.250

Contact Person : Y.PRASANNA KUMAR / IJAZ M. REL DT : 11.01.2019 REREL DT: . . PRINT DT: 16.03.2020

	GROUP MANUFACTURING SPECIFICATION	PRINCIPLE DRG: 0-229-10-18604 DPN-NS-PG-MA : 005-1-PV-030 PGMA DESC : LP AIR RECEIVERS- 6M3	RCI	NETWORK NUMBER 6004940	005/006 PAGE NUMBER	RVN '00'
CUST No. PROJ NAME	7876 AIR RECEIVERS FOR VYASI- BHEL-BHOPAL					

LINE	DAM	NRV	DU NO.	BOM	ITEM	DRAWING NUMBER / BPS CODE	RVN	VAR	DESCRIPTION	MATL CODE / MATL SPECN	AC	DUI	REV	UNIT	QTY / JOB NO	WT / JOB NO / FINISHED WT
010			001	01	17	3-220-01-49055	04	00	CROSS BAR	----------	N	A		NO	2.000	8.900
020			001	03	01	3-220-01-49055	04	00	CROSS BAR P LATE 32MM 36.00 X 162.00	156010910000 ---------- SA516GR70	N			NO	4.000	6.400
030			001	03	02	3-220-01-49055	04	00	BOSS P LATE 50MM 80.00 X 80.00	156010950000 ---------- SA516GR70	N			NO	2.000	2.500
040			001	01	18	0-229-10-18604	01	00	CABLE SUPPORT VERTIC ALFLAT 25X6 1585.00	156290940000 ---------- IS2062	N			NO	1.000	1.850
050			001	01	19	0-229-10-18604	01	00	CABLE SUPPORT CURVED FLAT 25X6 490.00	156290940000 ---------- IS2062	N			NO	1.000	0.577
060			001	01	20	0-229-10-18604	01	00	CR EPX REDOXIDE ZNPH OSPHTE PRIMR-AA56105	180030850000 ----------	N			L	10.000	20.000
070			001	01	21	0-229-10-18604	01	00	CR EPOXIDE FINISHING PAINT TDC: AA 56131	180051140000 ---------- AA 56131	N			L	10.000	11.000

Contact Person : Y.PRASANNA KUMAR / IJAZ M. REL DT : 11.01.2019 REREL DT: . . PRINT DT: 16.03.2020

	GROUP MANUFACTURING SPECIFICATION	PRINCIPLE DRG: 0-229-10-18604 DPN-NS-PG-MA : 005-1-PV-030 PGMA DESC : LP AIR RECEIVERS- 6M3	RCI	NETWORK NUMBER 6004940	006/006 PAGE NUMBER	RVN '00'
CUST No. PROJ NAME	7876 AIR RECEIVERS FOR VYASI- BHEL-BHOPAL					

LINE	DAM	NRV	DU NO.	BOM	ITEM	DRAWING NUMBER / BPS CODE	RVN	VAR	DESCRIPTION	MATL CODE / MATL SPECN	AC	DUI	REV	UNIT	QTY / JOB NO	WT / JOB NO / FINISHED WT
010			001	01	22	0-229-10-18604	01	00	OIL RESIST AIRDRY SYN ENML PAINT AA56132	180051180000	N			L	10.000	20.000
020			001	01	23	0-229-10-18604	01	00	RUST PREVENTIVE HARD FILM BLACK AA 55154	180010100000 AA 55154	N			L	1.000	1.500
030			001	01	24	0-229-10-18604	01	00	THINNER FOR CR EPXIDE RO ZN PHOSPHATE PR	180020480000	N			L	1.000	2.000
040			001	01	25	0-229-10-18604	01	00	THINNER-CHEM RESISTNT EPXIDE FINISH IS:5	180020490000	N			L	1.000	2.000
050			001	01	26	0-229-10-18604	01	00	THINNER-OILRESIST AIRDRY SYNTIC ENML PNT	180020500000	N			L	1.000	2.000
060			001	01	27	0-229-10-18604	01	00	THINNER FOR TEMP RUST PREVENTIVE BLACK	180020510000	N			L	0.100	0.200