



INVITATION TO TENDER

Ref.: OS/21-22/2438/PVLG/16/021

Date: 02.12.2021

Sub: **Balance Fabrication of Solvent Storage Vessels against S.O. 2438 at Lovagarden site, Visakhapatnam for HPCL, Visakhapatnam project of M/s LTHE**

Dear Sir,

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

1. ELIGIBILITY CRITERIA:

- 1.1 Bidders must have an experience in execution of similar jobs i.e. Columns/Pressure Vessels for process industries in the past 7 Years as on 30.11.2021. Bidders shall enclose Work Order, Work Completion Certificate and all other relevant documents in support of their experience in execution of similar job for at least one project.
- 1.2 Bidders shall also have to enclose the documents of Registration of Firm/ Factory License/ Certificate of Incorporation, EPF, ESI, PAN, GSTIN, Udyog Aadhar Memorandum (if registered with MSME) etc.
- 1.3 The works executed in own name of the individual / firm of the tenderer will only be considered for eligibility criteria.

LOCATION OF WORK SPOT:

The fabrication work is to be carried out at Lovagarden Site (a Sea Front facility of BHEL - HPVP near Hindustan Shipyard Limited - OPF Site), Visakhapatnam, Andhra Pradesh.

2. VENDOR'S SCOPE OF WORK:

- 2.1 Details of the Vessels to be fabricated for HPCL, Visakhapatnam project of M/s LTHE are as follows:
Solvent Storage Vessels (SA 516 GR 70) - Tag Nos. 701-V-113 A & 113 B : 2 Nos. @ 120 MT each of ASME U-CODE Vessels.

Note:

- a) The above mentioned vessels are partly fabricated in HPVP shops and balance fabrication is outsourced to meet the delivery commitments made to the customer.*
- b) For Vessel wise details of scope of work, Annexure – II (A) to be referred. Vendor to visit HPVP shop for better understanding of scope of the balance works of these Vessels V-113 A and V-113 B.,*
- c) It may be noted that the weight indicated above is tentative and may vary on both sides due to revision in the drawings, if any.*

- 2.2 **For detailed scope of balance works of Vessels V-113 A & 113 B refer to Annexure –II a. However, scope of work in brief is as detailed below:**

Balance Fabrication of **Solvent Storage Vessels Tag Nos. 701-V-113A & 701-V-113B** with Free Issue Raw materials, BOC's, WIP items and Semi-Finished Items like Rolled Shells, fabricated components etc., which includes the activities like Marking, Cutting, Edge preparation, Assembly, Fit-up, Welding, NDT, Stage wise & Final inspection of shell segments, Fabrication of dished ends (Fit up, Assembly, Welding & NDT of Pressed Petals & Crown plates recd. from dished end vendor), Internals & External attachments like Nozzles, Manholes, Stiffener Rings, Saddles, RF Pads, Lifting trunions, Ladder Rungs, Earthing lugs, Vortex Breaker etc., Hydro-testing, Blasting and Painting as per the approved drawings, QAP / ITP, WPS, Procedures, Painting Schedule, Specifications & Standards etc. and it includes the following activities but not limited to the same:

- 2.3** Collection of all free issue raw materials, WIP Items and Semi-Finished Items like Rolled Shells, fabricated components, BOC's etc., from HPVP Shops & Stores and Transportation to Lovagarden site including unloading at site. **Transportation (ODC) of Formed Shell sections – 01 (Shell segments I to VI) and Shell section- 02 (Shell segments VII to XII) of Vessel V-113 A is included in the scope of the Vendor. Transportation of Rolled & formed shell segments I to XIII (13 Nos.) of Vessel V-113 B is also included in Vendor's scope.**
For detailed scope of balance works of Vessels V-113 A & 113 B refer to Annexure –II a.
- 2.4 C- Seam Welding of **Formed Shell sections – 01 (Shell segments I to VI)** with **Shell section- 02 (Shell segments VII to XII)** including all NDT, 100 % X-ray Radiography for Vessel Tag no. 703-V-113A.
- 2.5 L- Seam Welding (One No. per shell segment) of Shell Segments I to XIII (i.e. 13 Nos of L Seams) of Vessel Tag no. 703-V-113B.
- 2.6 All NDT including 100% X-ray Radiography of L- Seam Welding of Shell Segments I to XIII (i.e. 13 Nos of L Seams) of Vessel Tag no. 703-V-113B.
- 2.7 C- Seam Welding of Shell Segments I with II, II with III, III with IV, IV with V and V with VI (**i.e. Shell Section 01**) including all NDT & 100% X-ray Radiography of L- Seam Welding of Vessel Tag no. 703-V-113B.
- 2.8 C- Seam Welding of Shell Segments VI with VII, VII with VIII, VIII with IX, IX with X, X with XI, XI with XII and XII with XIII (**i.e. Shell Section 02**) including all NDT & 100% X-ray Radiography of L- Seam Welding of Vessel Tag no. 703-V-113B.
- 2.9 C- Seam Welding of **Shell Section-01** with **Shell Section-02** including NDT & 100% X-ray Radiography of Vessel Tag no. 703-V-113B.
- 2.10 Unloading of Loose Petals & Crowns of Dished ends (Two Nos. per each vessel) received from Dished End Vendor.
- 2.11 Forming of Dished ends which involves assembly of the Cold Formed Petals & Crown segments, Fit-up, Welding, NDT as per approved drawings along with Production Test Coupons as per approved QAP.
- 2.12 100% PT on Knuckle inside & outside including Welds and Weld Edge Preparation of Dished ends as per approved QAP.
- 2.13 Assembly, Fit-up, welding of L-seams and C-Seams of Shell sections wherever applicable and Shell sections with Dished Ends as per approved drawings, QAP along with Production Test Coupons.
- 2.14 100% WFMT (Wet Fluorescent Magnetic Particle Testing) on chipped back L-Seam & C-Seam welds of Dished Ends and Shell as per approved QAP.
- 2.15 100% DP Test of full Welds as per approved QAP.
- 2.16 Radiography Test of L-seam Welds, C-seam welds and Production Test coupons as per approved QAP.
- 2.17 100% UT of Complete Dished End as per SA578 Level-C.
- 2.18 PWHT of formed Dished Ends as per the drawings & QAP will be carried out by a separate Specialized Agency engaged by HPVP. However, any assistance required for Handling & Shifting of Dished ends, Welding of Thermocouples etc., as per the requirements of SR Agency are to be carried out by the vendor.
- 2.19 Profile of the rolled segments shall be maintained by temporary spiders / profile plates for which raw materials shall be arranged by BHEL.
- 2.20 Offering the job for stage wise inspection and obtaining stage wise inspection clearance, Final Inspection clearance from HPVP (QC) / TPIA / EIL as per approved QAP.
- 2.21 All NDT activities like DPT, MPT, RT, UT, etc., shall be carried out as per approved QAP/ drawings by NDT personnel qualified by BHEL as per BHEL Procedure No. BHEL: NDE: WPO1.
- 2.22 NDT agency engaged by fabrication contractors shall have to ensure that their NDE personnel are qualified by BHEL in advance before starting of the job.
- 2.23 Fabrication of Externals like Trailing Lugs, Stiffener Rings, Pipe supports, Earthling Lugs, Insulation & Platform cleats, Pipe Davit Assembly, Manhole Davit Assembly, Access Door, Lifting Trunnions, Sub-assemblies of Nozzles, RF Pads **including Rolling** , Insert Plates **including Rolling**, Base plate for fixing saddle, Base plate for Sliding saddle, Saddles including **Rolling of Wrapper plates**, Handgrip etc., and Assembly & Welding of the same with the Vessels as per the approved drawings including NDE as per approved QAP.
- 2.24 Fabrication of Internals like Vortex Breaker including Drilling of Holes on pipe, Ladder Rungs, Hand Grips, Internal Pipe & Guide Supports, Nozzle Internal Connections, Pipe Support Clips, etc., and Assembly & Welding of the same with the Vessels as per the approved drawings including NDE as per approved QAP.

- 2.25 Fabrication of Nozzle Sub-assemblies involving Fit up & Welding of C-seams of Pipes, Elbows, Flanges, Nozzles including DPT of Weld Edges, 100% WFMT prior to back welding of C- seam, 100% DPT of full weld, RT on C-seam welds and 100% RT for fabricated nozzles as per approved drawings & QAP.
- 2.26 Marking & opening of Nozzles and Access / Man way openings on Shell & Dished end as per approved drawings & QAP & NDE Procedure.
- 2.27 Fit up & Welding of Nozzles / Sub-Assemblies on Shell & Dished ends including DPT on Weld edges, 100% WFMT prior to back welding of seam, 100% DPT of full weld and 100% RT on Lip type nozzle welds as per approved drawings, QAP & NDE Procedure.
- 2.28 100% UT on the seam of Nozzle to Shell & Dished ends, if any as per approved QAP & NDE Procedure.
- 2.29 Fabrication of RF pads & Insert plates **including Rolling**, Assembly & Welding with the Vessel and Pneumatic Test as per approved drawings, QAP & NDE Procedure.
- 2.30 Fabrication of Wrapper Plates **including Rolling** & Saddles Assembly, Fit-up & Welding with the Vessel as per drawings including 100% DPT on welds, NDT as per approved QAP.
- 2.31 Testing of Water Samples at NABL approved laboratory for its suitability for Hydro test.
- 2.32 Hydro-testing of Vessel at Test pressure specified in the drawing followed by Draining, Drying & Cleaning. Water will be made available at one point and laying of necessary piping for filling has to be arranged by Vendor.
- 2.33 Arranging of all the accessories required for the Hydro-test like Filling Pump, Pressurizing Pump, Calibrated Pressure Gauges including fabrication of Stems for Fixing of Pressure Gauges, Non-Return Valves etc.
- 2.34 Spot PT after Hydro Testing of Vessels as per Approved QAP.
- 2.35 Surface preparation by Blast Cleaning to Specification SSPC-SP-10 and Coating of Primer & Finish Paints as per approved Painting Schedule. All tests like Salt Contamination Test, Profile Gauge Check, Tape Adhesion Test, Holiday Check, Peel-off Test etc., required as per Project Specifications and BHEL Painting Procedure No. **SIP:H:PP:22**, Rev.0. shall be carried out by a qualified agency for testing of painting and obtaining stage wise inspection clearance from HPVP (QC) / AIA / LTHE as per approved QAP.
- 2.36 Painting is to be carried out only by Painters qualified by HPVP as per standard format.
- 2.37 All the nozzle openings shall be closed with suitable steel blind covers. Raw materials will be supplied by BHEL.
- 2.38 Welding is to be carried out by ASME qualified welders only. Vendor shall arrange for Qualification of Welders at HPVP under the supervision of BHEL / WT dept. at their own cost. However, Test Coupons shall be provided by BHEL as free issue.
- 2.39 **All consumables like welding electrodes, filler wire, gases, grinding wheels etc., required** for fabrication are in the scope of the Vendor. The electrodes / filler wire shall be of BHEL / EIL approved makes only and the vendor shall submit the Batch Test Certificates to BHEL for verification before using on the job.
- 2.40 Experienced Site in charge and Qualified Engineers & Supervisors shall be deployed for proper co-ordination of the job.
- 2.41 Vendors should deploy Experienced & Qualified QC personnel (**Min. 2 Nos.**) for carrying out the inspection activities in coordination with BHEL QC inspector / TPIA / EIL. **Non-deployment will attract penalty @ rate decided by BHEL and same will be deducted in RA Bills.**
- 2.42 Vendors should deploy Qualified NDT personnel (Level III / Level II) (**Min. 02 Nos.**) at site for carrying out the NDT inspection activities in coordination with BHEL QC –NDT / TPIA / EIL. Vendors shall have to engage sufficient man power for fabrication to meet HPVP delivery schedules. **Non-deployment will attract penalty @rate decided by BHEL and same will be deducted in RA Bills.**
- 2.43 Vendor shall deploy sufficient no. of calibrated Welding machines, Main Ovens & Portable Ovens required for baking of electrodes etc., at site. All relevant documents shall also be made available for verification & approval by BHEL - HPVP (QC) / TPIA.

- 2.44 Vendor shall deploy suitable Hydra Cranes up to 20 T cap. for handling of the raw materials, shell segments required during the fabrication. **However, for heavy components other than which can't be handled by Hydra, BHEL will be deploying one no. of 75 T Crawler crane and one no. of 300 T Crawler Crane for handling of shell sections. Diesel required for the operation of BHEL cranes will be Free Issue by BHEL. However, transportation of the same from BHEL-HPVP to Lovagarden site has to be arranged by Vendor.**
- 2.45 Sufficient No. of Rollers & Idlers required for fabrication of Vessel have to be arranged by the vendor. **Non-deployment in specified time will attract penalty @rate decided by BHEL and same will be deducted in RA Bills.**
- 2.46 All Required tools & tackles like Measuring instruments like Tape, Fillet & Butt Weld Gauges, Plumb bobs with magnets, Thermal Chalks / Pyrometer, etc. shall be calibrated and valid calibration certificates must be presented, if required. All required lifting tools and Tackles like Slings, Felt slings, D-shackles, Turn buckles etc. are to be arranged by Vendor. Higher Capacity slings for handling of Shell sections will be supplied by HPVP.
- 2.47 All the Scaffolding materials like Pipes, Clamps, Jallies etc. for temporary platform works required during execution of fabrication are to arranged by the Vendor.**
- 2.48 Gate passes for the entry of Manpower, Materials, Cranes, Trailers etc. inside Lovagarden site are to be taken care by the contractor.
- 2.49 Equipment details shall be hard stamped by encircling with paint and stenciled in a specific format with details of Project name, Customer No., Work Order No., PGMA No., Weight etc., for identification and dispatch as per the instructions of the outsourcing department. Fixing of Name plate, punching as per the details given in the drawings and rub-off.
- 2.50 Any modification work due to revision of drawings during fabrication is to be carried out by the vendor without any extra cost.
- 2.51 Submission of economic cutting plans for the plate materials and approval shall be obtained from BHEL-HPVP before taking up the same. Wherever fabrication is done without proper approved cutting plans, any loss of materials arising due to the same will be recovered as per BHEL recovery rates.
- 2.52 Vendors shall have to return the excess / balance materials including off-cuts and total scrap available with the vendors exclusive of process allowance & invisible wastage to HPVP Stores after material reconciliation but before submission of their final bill. In case the same are not returned by the vendor, Recovery shall be made as per BHEL Rates / MSTC rates plus applicable taxes, prevailing at the time of processing of the final bills.
- 2.53 Though not mentioned specifically, any other activity which is required for completion of the work is deemed to be included in the scope of work of vendor

3. BHEL SCOPE:

The following are in the scope of BHEL – HPVP and shall be provided as free issue to the vendor.

For Vessel V-113 A

- 3.1 Marking, Cutting & Edge Preparation of all the plates required for formation of shell segments I to XIII of Vessel Tag no. 703-V-113A.
- 3.2 L-seam Welding of Plates for rolling into shell segments (for Shell Sections I to XIII) of Vessel Tag no. 703-V-113A (i.e. 13 Nos of L Seams).
- 3.3 Formation of Shell Segments I to XIII (13 Nos of Individual Shell Segments) of Vessel Tag no. 703-V-113A.
- 3.4 All NDT including 100% Radiography of L- Seam Welding of Shell Segments I to XIII of Vessel Tag no. 703-V-113A.
- 3.5 C- Seam Welding of Shell Segments I with II, II with III, III with IV, IV with V and V with VI (**i.e. Shell Section-01**) including all NDT & 100% Radiography of C- Seam Welding of Vessel Tag no. 703-V-113A.
- 3.6 C- Seam Welding of Shell Segments VII with VIII, VIII with IX, IX with X, X with XI, XI with XII and XII with XIII (**i.e. Shell Section-02**) including all NDT & 100% Radiography of C- Seam Welding of Vessel Tag no. 703-V-113A.

- 3.7 The vessel will be formed into two Shell sections-01 and 02 and will be handed over to Vendor and **Transportation of same to Lovagarden site is in Vendor's scope. Loading & Unloading to be arranged by the Vendor. However, BHEL-HPVP will supply necessary Higher Capacity Cranes as Free issue.**

For Vessel V-113 B

- 3.8 Marking, Cutting & Edge Preparation of all the plates required for formation of shell segments I to XIII of Vessel Tag no. 703-V-113B.
- 3.9 L-seam Welding of Plates for rolling into shell segments (for Shell Sections I to XIII) of Vessel Tag no. 703-V-113B i.e. 13 Nos of L Seams of Vessel Tag no. 703-V-113B.
- 3.10 Formation of Shell Segments I to XIII (13 Nos of Individual Shell Segments) of Vessel Tag no. 703-V-113B.

Common for both Vessels V-113 A & 113 B

- 3.11 Dished Ends in Crown & Petals form will be supplied in Loose by BHEL-HPVP.
- 3.12 Heat Treatment of Formed Dished Ends at BHEL-HPVP, Lova-Garden Site.
- 3.13 Drawings, GMS, QAP, WPS, Painting Schedule, applicable Standards & Specifications.
- 3.14 Rolled shells, Raw materials like Plates (full / off-cuts), Pipes / Tubes, Round Bars, Structural items, BOCs like Fittings, Nozzles, Flanges, Fasteners, Gaskets etc., as per GMS from HPVP stores.
- 3.15 Section bending wherever required.
- 3.16 Blind Flanges, Gaskets and Fasteners required for Hydro-test.
- 3.17 All Paints as per requirement.
- 3.18 Testing of Production Test Coupons in HPVP QC laboratory.
- 3.19 300 MT – 01 No. & 75 MT – 01 No. cranes along with operator will be provided by BHEL free of charge for fabrication. Maintenance of the crane including spares shall be in the scope of BHEL. However, Riggers required for handling the job has to be provided by the vendor. DG set will be provided as a Standby during power breakdown. However, experienced operator for DG set has to be arranged by the vendor.**
- 3.20 Diesel for operation of 300 MT & 75 MT cranes and also for DG set will be Free Issue by BHEL. However, transportation of same from BHEL-HPVP to Lovagarden site has to be arranged by Vendor.
- 3.21 Area required for fabrication, Site Office and Stores at Lovagarden site will be provided free of charge. Vendor to mobilize Office container preferably and temporary storage shed for storing their tools and tackles and also pipes, pipe fittings, gaskets, studs, bolts and Nuts etc. which are issued as FIM by BHEL.
- 3.22 Power & Water shall also be provided free of charge at one point inside the fabrication yard but further distribution to the desired location is in vendor's scope. However, Test for Suitability of the Water for the carrying out the HT is to be arranged by vendor at his cost.
- 3.23 Vendor's scope shall include arranging Distribution Boards with suitable capacity Switch Fuse units as incomer, all outgoing with necessary safe trips like MCB, ELCB etc., as per the industrial safety norms and their installation, all outgoing cables from Distribution Board, termination at the distribution board, Working Area Lighting.

4. INSPECTION:

- 4.1 Inspection shall be carried out by M/s. BHEL – Vizag / BHEL Authorized Inspection Agency (AIA) / LTHE / PMC / Customer as per approved QAP. Contractor shall have to offer for Stage wise and Final inspection as per approved QAP and obtain necessary stage wise & final clearances before proceeding for further operations.
- 4.2 Fabrication Vendor shall be solely responsible for preparation and submission of all Inspection Reports & documents duly certified by Inspection Authority along with the finished equipments.

5. DELIVERY:

- 5.1 Finished equipment along with inspection documents and all other certificates are to be handed over to HPVP within **3 months** from the date of issue of First consignment of free issue materials or **4 weeks** from the date of issue of Last consignment of materials, whichever is later. **Time schedule is very stringent and to be strictly adhered to.**

Note:

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

6. SITE MOBILISATION:

- 6.1 Successful bidders shall have to complete site mobilization within 7 days from the date of receipt of Order or from the date of intimation for the same by Outsourcing dept., whichever is later.

7. PRICE:

- 7.1 The price shall be quoted as per the Schedule of Rates enclosed at Annexure – I for the detailed scope of work of each item and the quoted price shall be inclusive of all applicable taxes & duties except GST.
- 7.2 The prices shall be fixed & firm without any escalation during the entire period of contract and till completion of the work.
- 7.3 GST shall be reimbursable to the vendor as detailed in Clause – 9 and as per Annexure – GST.
- 7.4 Income tax will be deducted at applicable rates from RA & Final bills.

8. PAYMENT TERMS:

- 8.1 Payment shall be made against RA Bills for **90% of the order value** for the following stages of fabrication of each equipment:
 - a) After Completion of L-Seams & C-seams of shell sections including NDE - 40%
 - b) After Completion of Hydro Testing - 20%
 - d) After Completion of Blasting & Painting - 15%
 - e) After completion of Loading of finished equipment - 15%
- 8.2 Balance 10% payment shall be made after completion of the job in all respects including material reconciliation and handing over of the balance materials & returnable items, if any and submission of total documentation to BHEL (QC).
- 8.3 The weights indicated in the tender are tentative and may be subject to increase or decrease after completion of detailed engineering. However, payment shall be made for the actual weights executed as per approved engineering drawings and documents.
- 8.4 This clause shall be read in conjunction with the clause 18.0 of Annexure – III i.e. General Terms & Conditions.

9. GOODS & SERVICES TAX (GST):

- 9.1 Bidders shall make a note of the following points of GST before submission of their offer:
 - a) Vendors registered under GST Act shall have to produce their GSTIN no. (15 Digits) in their Technical Bid in case their turnover exceeds 20.00 Lakhs. In case, any vendor is unregistered, they have to produce a certificate from Chartered Accountant that their turnover does not exceed Rs. 20.00 Lakhs.
 - b) Semi-finished goods are to be delivered by the Vendors in BHEL, HPVP premises within a maximum period of one year from the date of issue of the material, failing which the whole transaction will be considered as Supply and Sale and GST is required to be paid along with interest from the date of Challan on the whole value of materials. Hence vendors shall have to ensure that materials issued to them are returned within 365 days.
 - c) After fabrication, the vendors shall have to deliver the Semi - finished Goods by fulfilling the following formalities:
 - i) GST invoice should be raised by the vendors by paying GST on job work charges at applicable rates and by incorporating the HPVP GSTIN no. in the invoice for availing the reimbursement of GST from HPVP.

- ii) The vendor shall also have to enter in their GST Return -1 (GSTR-1) the details of invoice raised for payment of GST so as to enable HPVP to avail input credit.

10. REVERSE AUCTION:

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

12. 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.

13. VALIDITY OF OFFER:

The offer shall be valid for a period of **3 months** from the date of opening of Price Bids.

14. GENERAL:

- 14.1 The bidders shall study the Tender documents, Drawings, Quality Documents and all other relevant documents in detail for understanding the scope of work and the processes involved before submission of offer. Bidders shall get clarifications, if any, from concerned officials on the scope of work, clarifications related to welding or any other details of the tender document, over phone between 09:00 AM and 04:00 PM on any working day or through e-mail.
- 14.2 Drawings, QAP, Clarifications related to Welding, other reference documents etc., shall be sent to the bidder's e-mail address upon their written/e-mail request.
- 14.3 **Conditional / Partial Price Bids** and any other deviations to the tender terms & conditions are not acceptable and BHEL reserves the right to reject such offers without further correspondence. Bidders shall confirm their acceptance to all the terms & conditions of the tender enquiry in the Techno-commercial Bids and any deviations mentioned in the Price Bids shall not be considered.
- 14.4 BHEL reserves the right to modify or cancel the tender enquiry at any stage without assigning any reasons thereof.
- 14.5 The general terms & conditions, if any contradicting with the specific terms & conditions given in the tender, then specific terms & conditions shall only be considered.

15 The following documents shall form part of the tender enquiry:

- i) Schedule of Rates : Annexure – I
- ii) Details of WIP items including scope of work of BHEL-HPVP and Vendor against both the Vessels : Annexure – II (A)
- iii) List of Reference Drawings & Documents : Annexure – II (B)
- iv) General Terms & Conditions : Annexure – III
- v) Acceptance to tender terms & conditions : Annexure – IV
- vi) GST Compliance for Indigenous Suppliers : Annexure – GST
- vii) Applicable Drawings, Approved QAP, Painting Schedule etc., as per Annexure - II (B)


16 TENDER SUBMISSION (Through E – Mail only):

- 16.1 Techno-commercial bids along with the tender document duly signed & stamped by the bidder on all pages and a covering letter on Company's Letter Head addressed to DGM (Outsourcing), BHEL –HPVP, Visakhapatnam shall be sent through an e-mail to the e-mail ID technicalbid-hpvp@bhel.in
- 16.2 Tentative List of Man Power, Machinery, Tools & Tackles to be engaged by the vendor shall also be attached to the Techno-Commercial Bid.
- 16.3 Price bid (i.e., Annexure – I) shall also be sent separately through e-mail to another e-mail ID pricebid-hpvp@bhel.in
- 16.4 Offers completed in all respects along with all the supporting documents shall be sent to the above e-mails only latest by **14.00 Hrs.** on **11.12.2021** duly mentioning the Name of Work, Tender Ref. No. & Date and Technical Bid / Price Bid in the subject of the e-mail.
- Note: Do not mark CC and BCC while submitting your offer as the system is designed to reject such mails having more than one recipient. Max. file size of the attachment shall be 20 MB only. In case the file size is more, bidder can submit their offer through multiple mails within the due date and time.**
- Bidders shall ensure correctness of the e-mail addresses while submitting their offer. There shall be no other e-mail address at the receiving end while submission of the above bids otherwise the system will reject such mails. Bidder shall be solely responsible for non-receiving of such mails at the above mentioned e-mail addresses and no communication in this regard will be entertained.
- 16.5 TENDERS RECEIVED AFTER THE DUE DATE & TIME ARE NOT ACCEPTABLE.
- 16.6 OFFERS SENT IN ANY OTHER FORM WILL BE TREATED AS INVALID AND WILL BE SUMMARILY REJECTED.

17. TENDER OPENING:

- 17.1 Techno-commercial Bids will be opened at **14.00 Hrs.** on **11.12.2021**. The bidders may depute their representatives at the time of opening of Technical bids.
- 17.2 After evaluation of the Techno-commercial Bids, intimation regarding date & procedure of conducting reverse auction shall be given by the service provider to all the eligible techno-commercially qualified bidders through an e-mail in advance at an appropriate time.

For Bharat Heavy Electricals Limited,


(Y.V.R. Rao)
DGM (Outsourcing) 02/12/2021

SCHEDULE OF RATES

Ref : OS/21-22/2438/PVLG/16/021, dated 02.12.2021

Sub : Balance Fabrication of Solvent Storage Vessels against S.O. 2438 at Lovagarden site, Visakhapatnam for HPCL, Visakhapatnam project of M/s LTHE

Sl. No.	S.O. No.	Description of Work	Unit	Qty.	Unit Rate (in ₹)	Total Amount (in ₹)
		Balance Fabrication of Solvent Storage Vessels Tag Nos. 701-V-113A & 701-V-113B with Free Issue Raw materials, BOC's, WIP items and Semi-Finished Items like Rolled Shells, fabricated components etc., which includes the activities like Marking, Cutting, Edge preparation, Assembly, Fit-up, Welding, NDT, Stage wise & Final inspection of shell segments, Fabrication of dished ends (Fit up, Assembly, Welding & NDT of Pressed Petals & Crown plates recd. from dished end vendor), Internals & External attachments like Nozzles, Manholes, Stiffener Rings, Saddles, RF Pads, Lifting trunions, Ladder Rungs, Earthing lugs, Vortex Breaker etc., Hydro-testing, Blasting and Painting as per the approved drawings, QAP / ITP, WPS, Procedures, Painting Schedule, Specifications & Standards etc. Collection of FIMs, WIP items, Semi-finished items from HPVP stores / shops & transportation to Lovagarden site and Assistance in Loading of Vessels onto the trailers as per the detailed scope of work mentioned in the tender. (All consumables are in the scope of the vendor)				
1	2438	Solvent Storage Vessel (Tag No. 701-V-113A)	MT	120		
2	2438	Solvent Storage Vessel (Tag No. 701-V-113B)	MT	120		
Total Amount in Words :						

Notes :

- 1) 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.
- 2) The prices shall be fixed & firm without any escalation during the entire period of contract and till completion of work.
- 3) 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.
- 4) The bidders are advised to go through all the drawings & documents before quoting the tender.
- 5) Tenderer should quote the amount in figures & words. It may be noted that corrections, overwriting etc. are not allowed. If there is a discrepancy between amount in figures & words, the amount in words shall prevail unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail. If there is an error in the total corresponding to the addition or subtraction of sub-totals, the sub-totals shall prevail and total shall be corrected accordingly.

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

Signature of the Bidder with Stamp

Vessel wise details of Scope of work

Sub : Balance Fabrication of Solvent Storage Vessels against S.O. 2438 at Lovagarden site, Visakhapatnam for HPCL, Visakhapatnam project of M/s LTHE

Ref : OS/21-22/2438/PVLG/16/021, dated 02.12.2021

Sl. No.	S.O. No.	PGMA	Description of Item / Work	BHEL - HPVP Scope	Bidder's Scope
I	2438	PV-220	Solvent Storage Vessels (Tag Nos. 701-V-113A) - Approx. weight: 120 MT		
1			Shell Section	1) Marking, Cutting & Edge Preparation of all the plates required for formation of shell segments I to XIII. 2) Welding of Plates for rolling into shell segments (for Shell Sections I to XIII) 3) Formation of Shell Segments I to XIII (13 Nos of Individual Shell Segments) 4) L- Seam Welding of Shell Segments I to XIII (i.e. 13 Nos of L Seams) 5) 100% X-ray Radiography of L- Seam Welding of Shell Segments I to XIII 6) C- Seam Welding of Shell Segments I with II, II with III, III with IV, IV with V and V with VI (i.e. Shell Section 01) incl. 100% X-ray Radiography of L- Seam Welding & C-seam welding. 7) C- Seam Welding of Shell Segments VII with VIII, VIII with IX, IX with X, X with XI, XI with XII and XII with XIII (i.e. Shell Section 02) incl. 100% X-ray Radiography of L- Seam Welding & C-seam welding.	Shell section - 01 comprising of bare Shell Segments from I to VI and Shell Section-02 comprising of bare Shell Segments from VII to XIII with all L-seams and C-seams welded & NDT including 100% X-Ray completed will be handed over in TWO SECTIONS to Bidder by HPVP. Bidder has to arrange for ODC transportation of these Shell sections -01 & 02 to Lovagarden site to carry out further activities. Bidder to execute Assembly , Fit up & C-Seam Welding of Shell Section-01 with Shell Section-02 including NDT & 100% Radiography as per drawings, approved QAP.
2			Dished Ends	1) Dished Ends in Crown & Petals form will be supplied loose after Trail Assembly at Vendor works by HPVP. 2) Heat Treatment of Formed Dished Ends in the Furnace at Lovagarden Site.	1) Assembly & Fit up of Crowns & Petals for formation of Dished Ends, Welding of Petals to Petals , Welding of Petals to Crown, NDT etc as per QAP. 2) Assembly, Fit Up, Welding, NDT etc of formed Dished Ends with Shell section -01 and Shell section -02 .
3			Other works like Fab. of Nozzles, Saddles, Internal & External attachments, Hydrotesting, Blasting & Painting etc.		1) Remaining works required for complete fabrication of Vessel e.g. fabrication & assembly of Externals like Stiffener Rings, Platform & Pipe supports, Saddles, Lifting trunions, Ladder Rungs, Earthing lugs etc., Fabrication & assembly of Nozzles with Pipes and Pipe fittings , Manholes etc. , Fabrication & assembly of Internals like Hand Grip, Vortex Breaker etc., as per Drawings & specifications , NDT as per approved QAP. 2) All NDT activities like DPT, MPT, RT, UT, etc., as per drawings, approved QAP and NDE procedures. 3) Hydrotesting, Blasting & Painting as per drawings, approved QAP and Painting Schedule.

Sl. No.	S.O. No.	PGMA	Description of Item / Work	BHEL - HPVP Scope	Bidder's Scope
II	2438	PV-220	Solvent Storage Vessels (Tag No. 701-V-113B) - Approx. weight: 120 MT		
1			Shell Section	1) Marking, Cutting & Edge Preparation of all the plates required for formation of shell segments I to XIII	Bidder has to arrange for transportation of the Shell segments I to XIII (13 Nos.) to Lovagarden site to carry out further activities. 1) L- Seam Welding of Shell Segments I to XIII (i.e. 13 Nos of L Seams)
				2) Welding of Plates for rolling into shell segments (for Shell Segments I to XIII)	2) 100% X-ray Radiography of L- Seam Welding of Shell Segments I to XIII
				3) Rolling and Formation of Shell Segments I to XIII (13 Nos of Individual Shell Segments)	3) C- Seam Welding of Shell Segments I with II, II with III, III with IV, IV with V and V with VI (i.e. Formation of Shell Section 01) incl. all NDT & 100% X-ray Radiography of L- Seam Welding & C-seam welding as per approved Drawings , QAP. 4) C- Seam Welding of Shell Segments VII with VIII, VIII with IX, IX with X, X with XI, XI with XII and XII with XIII (i.e. Formation of Shell Section 02) incl. NDT & 100% X-ray Radiography of L- Seam Welding as per approved Drawings , QAP. 5) C- Seam Welding of Shell Section 01 with 02 incl. NDT & 100% X-ray Radiography of L- Seam Welding as per approved Drawings , QAP.
2			Dished Ends	1) Dished Ends in Crown & Petals form will be supplied by HPVP	1) Assembly & Fit up of Crowns & Petals for formation of Dished Ends, Welding of Petals to Petals , Welding of Petals to Crown, NDT etc as per QAP.
				2) Heat Treatment of Formed Dished Ends at Lova-Garden Site	2) Assembly, Fit Up, Welding, NDT etc of formed Dished Ends with Shell section -01 and Shell section -02 .
3			Other works like Fab. of Nozzles, Saddles, Internal & External attachments, Hydrotesting, Blasting & Painting etc.		1) Remaining works required for complete fabrication of Vessel e.g. fabrication & assembly of Externals like Stiffener Rings, Platform & Pipe supports, Saddles, Lifting truinions, Ladder Rungs, Earthing lugs etc., Fabrication & assembly of Nozzles with Pipes and Pipe fittings , Manholes etc. , Fabrication & assembly of Internals like Hand Grip, Vortex Breaker etc., as per Drawings & specifications , NDT as per approved QAP. 2) All NDT activities like DPT, MPT, RT, UT, etc., as per drawings, approved QAP and NDE procedures. 3) Hydrotesting, Blasting & Painting as per drawings, approved QAP and Painting Schedule.
Note: a) All Electrodes, Filler Wires etc., required for completion of balance works are in the scope of Vendor.					
b) The detailed scope of work for completion of balance fabrication works of the Vessels shall be as mentioned in the Tender.					

Ref : OS/21-22/2438/PVLG/16/021

Date: 02.12.2021

LIST OF REFERENCE DRAWINGS & DOCUMENTS

Sub : Balance Fabrication of Solvent Storage Vessels against S.O. 2438 at Lovagarden site, Visakhapatnam for HPCL, Visakhapatnam project of M/s LTHE

Sl. No.	S.O. No.	PGMA	Eqpt. Name	Description of Drawings / Documents	Drawing / Document No.	Rev. No.	No. of Sheets
01	2438	PV-220	Solvent Storage Vessels (Tag nos. 701-V-113A & 113B)	General Arrangement of Solvent Storage Vessels (Tag nos.701-V-113A/B)	1-PV-220-U0176	02	01
02				Assembly details of Solvent Storage Vessels (Tag nos.701-V-113A/B)	1-PV-220-U0177 (SHT. 1 & 2 OF 2)	01	02
03				Dished Ends	3-PV-220-U0303	00	01
04				QAP for Solvent Storage Vessels	8016-RUF-LT-504-QC-QD-BHEL (1) 02002	03	18

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

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

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

2. PARTY'S SCOPE:

The scope of the party shall be as follows: -

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

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

3. REVISION OF DRAWINGS:

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

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

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

6. RECTIFICATIONS / REJECTIONS:

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

7. SECURITY DEPOSIT:

Vendors shall have to submit a Bank Guarantee for **25%** of the material cost towards Security Deposit and safe custody of free issue materials within 15 days from the date of intimation by Outsourcing dept. The BG shall be valid for the entire contract period with a claim period of 12 months. This Bank Guarantee shall be released to the contractor after completion of work and on acceptance of the same by BHEL.

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

8. PERFORMANCE BANK GUARANTEE:

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

9. RAW MATERIALS ISSUE:

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

10. TRANSFER / RETURN OF LEFT OVER MATERIALS:

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

11. MATERIAL RECONCILIATION:

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

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

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

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

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

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

12. SCRAP & OFF-CUT NORMS:

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

13. INSPECTION:

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

14. WORKMANSHIP GUARANTEE:

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

15. WORK PROGRESS:

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

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

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

16. DELIVERY:

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

17. PENALTY:

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

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

18. PAYMENT TERMS:

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

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

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

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

19. SECURITY:

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

20. SUB-LETTING:

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

21. FACTORY RULES AND REGULATIONS:

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

22. SAFETY:

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

23. HOUSE KEEPING:

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

24. ACCIDENT / DAMAGE / CONDUCT ETC.:

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

25. TERMINATION OF CONTRACT:

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

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

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

26. DISPUTES:

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

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

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

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

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

Signature of the Bidder with Stamp

Acceptance to Tender Terms & Conditions

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

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

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

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

Signature of the Bidder with Stamp

BUSINESS RULES FOR REVERSE AUCTION (RA)

This has reference to tender no. **OS/21-22/2438/PVLG/16/021, dated 02.12.2021**. BHEL shall finalize the Rates for **Balance Fabrication of Solvent Storage Vessels against S.O. 2438 at Lovagarden site, Visakhapatnam for HPCL, Visakhapatnam project of M/s LTHE** through Reverse Auction mode. BHEL has made arrangement with an authorized Service provider (details will be shared before reverse auction) for conducting RA. Bidders should go through the instructions given below and submit acceptance of the same.

The technical & commercial terms are as per (a) BHEL Tender Enquiry No. **OS/21-22/2438/PVLG/16/021, dated 02.12.2021**, (b) Bidders' technical & commercial bid (in case of two-part bid) and (c) subsequent correspondences between BHEL and the bidders, if any.

1. Procedure of Reverse Auctioning:

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

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

The above process will continue till completion of Reverse Auction.

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

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

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

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

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

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

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

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

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

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

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

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

14. M/s. {Service provider}, shall arrange to demonstrate/ train the bidder or bidder's nominated person(s), without any cost to bidders. M/s. {Service provider}, shall also explain the bidders, all the business rules related to the Reverse Auction. Bidders are required to submit their acceptance to the terms/ conditions/ modalities before participating in the Reverse Auction in the process compliance form as enclosed. Without this, the bidder will not be eligible to participate in the event.
15. Successful bidder shall be required to submit the final prices (L1) in prescribed format (Annexure – VI) for price breakup, quoted during the Reverse Auction, duly signed and stamped as token of acceptance without any new condition (other than those already agreed to before start of auction), after the completion of auction to M/s. {Service provider} besides BHEL within two working days of Auction without fail.
16. Any variation between the final bid value and that in the confirmatory signed price breakup document will be considered as tampering the tender process and will invite action by BHEL as per extant guidelines for suspension of business dealings (as available on www.bhel.com).
17. Bidders' bid will be taken as an offer to execute the work/ supplies the item as per enquiry no. **OS/21-22/2438/PVLG/16/021, dated 02.12.2021**. Bids once made by the bidder, cannot be cancelled/ withdrawn and bidder shall be bound to execute the work as mentioned above at bidder's final bid price. Should bidder back out and not execute the contract as per the rates quoted, BHEL shall take action as per extant guidelines for suspension of business dealings (as available on www.bhel.com).
18. Bidders shall be able to view the following on their screen along with the necessary fields during Reverse Auction:
 - a. Leading (Running Lowest) Bid in the Auction (only total price of package)
 - b. Bid Placed by the bidder
 - c. Start Price
 - d. Decrement value
 - e. Rank of their own bid during bidding as well as at the close of auction.
19. BHEL's decision on award of contract shall be final and binding on all the Bidders.
20. BHEL reserves the right to extend, reschedule or cancel the Reverse Auction process at any time, before ordering, without assigning any reason, with intimation to bidders.
21. BHEL shall not have any liability to bidders for any interruption or delay in access to the site irrespective of the cause. In such cases, the decision of BHEL shall be binding on the bidders.
22. Other terms and conditions shall be as per bidder's techno-commercial offers and other correspondences, if any, till date.
23. If there is any clash between this business document and the FAQ available, if any, in the website of M/s. {Service provider}, the terms & conditions given in this business document will supersede the information contained in the FAQs. Any changes made by BHEL/ service provider (due to unforeseen contingencies) after the first posting shall be deemed to have been accepted if the bidder continues to access the portal after that time.
24. Bidder shall not divulge either his Bids or any other exclusive details of BHEL to any other party. If the Bidder or any of his representatives are found to be involved in Price manipulation/ cartel formation of any kind, directly or indirectly by communicating with other bidders, action *as per extant BHEL guidelines for suspension of business dealings (as available on www.bhel.com)*, shall be initiated by BHEL.

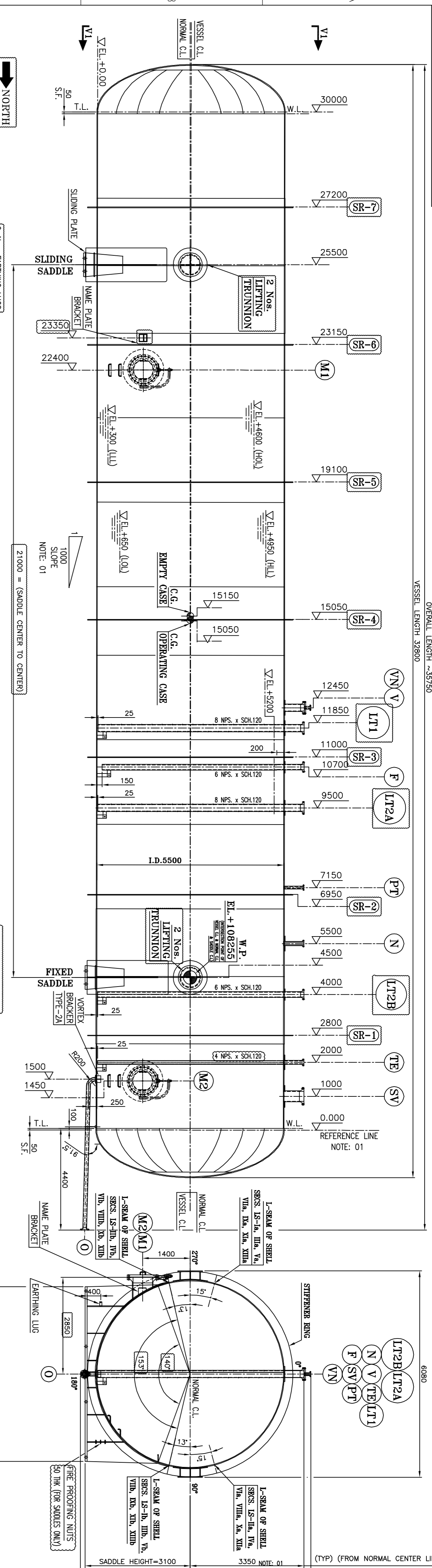
Signature of the Bidder with Stamp

GST COMPLIANCE FOR INDIGENOUS SUPPLIERS

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

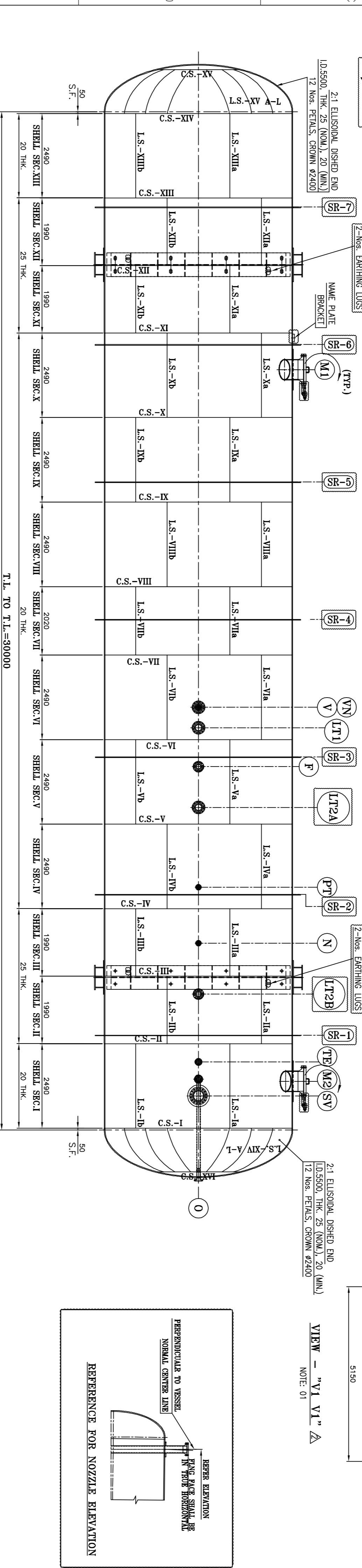
Note: The above will be followed strictly for processing vendor payments to ensure GST Compliance.

Signature of the Bidder with Stamp



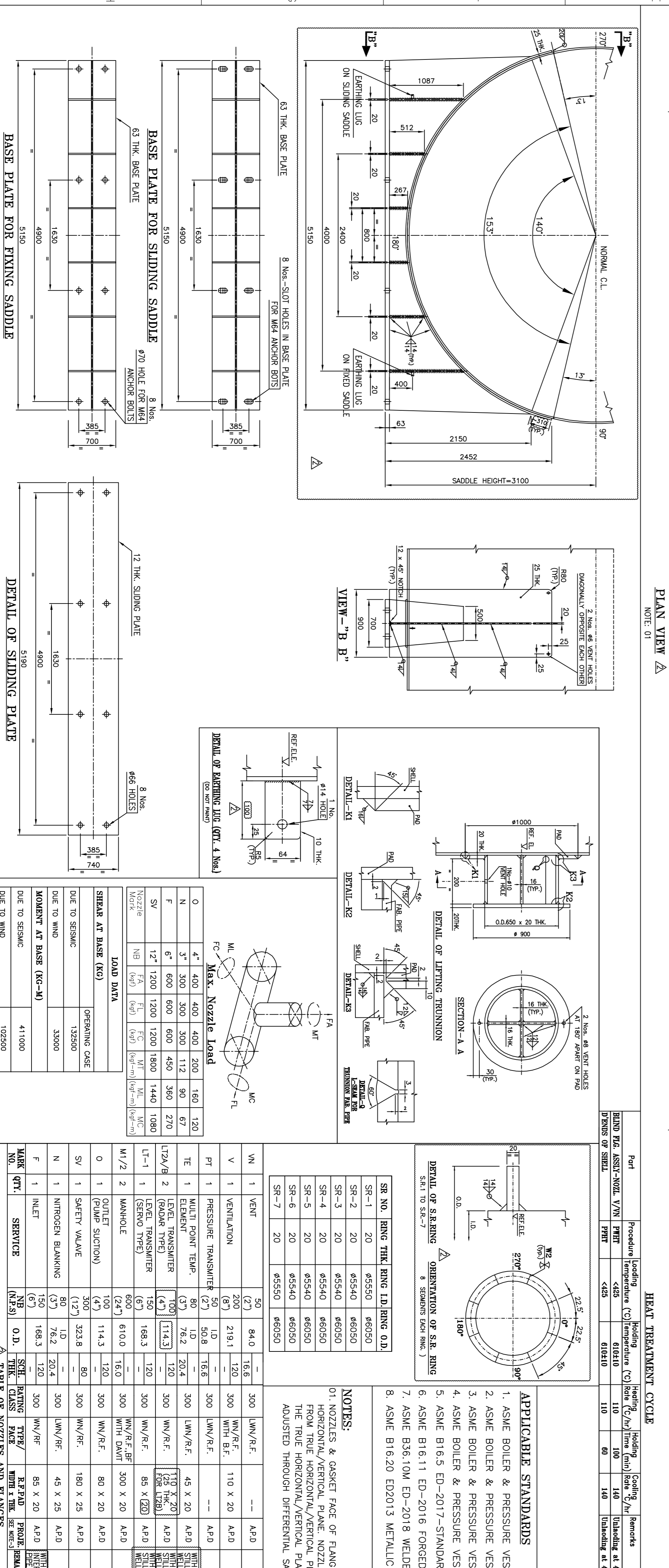
DESIGN DATA

DESIGN PRESSURE (INTERNAL) W_p (kg/cm ²) (g)	0.4903 (5) AT HIGHEST POINT
DESIGN PRESSURE (EXTERNAL) W_p (kg/cm ²) (g)	FV = 0.103 (1.055) AT 0°
MAXIMUM ALLOWABLE WORKING PRESSURE W_p (kg/cm ²) (g)	0.4903 (5)
MAXIMUM ALLOWABLE EXT. WORKING PRESSURE W_p (kg/cm ²) (g)	0.103 (1.055) AT 0°
DESIGN TEMPERATURE (°C) (MIN./MAX.)	119/119
OPERATING TEMPERATURE (°C)	0.2415 (2.5)
STEAM OUT CONDITION W_p (kg/cm ²) (g)	NA
MAXIMUM ALLOWABLE CORROSION ALLOWANCE (MMA) : (mm)	4.2
HOTTEST PRESSURE (kg/cm ²) (g) AS PER US 98	12.69 (AT SHIP)
HOTTEST PRESSURE (kg/cm ²) (g) AS PER US 99	5.5 (AT SHIP)
CORROSION ALLOWANCE mm	1.5 mm (1.5 mm) (INTERNAL)
CAPACITY (m ³)	756 (CALO (mm))
RODOSPECIFIC	NOT REQUIRED
IMPACT TESTING = EXEMPTED (AS PER USC-8610) (3)	
OTHER LOADINGS : YES AS PER US-2210 (1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12) (13) (14) (15) (16) (17) (18) (19) (20) (21) (22) (23) (24) (25) (26) (27) (28) (29) (30) (31) (32) (33) (34) (35) (36) (37) (38) (39) (40) (41) (42) (43) (44) (45) (46) (47) (48) (49) (50) (51) (52) (53) (54) (55) (56) (57) (58) (59) (60) (61) (62) (63) (64) (65) (66) (67) (68) (69) (70) (71) (72) (73) (74) (75) (76) (77) (78) (79) (80) (81) (82) (83) (84) (85) (86) (87) (88) (89) (90) (91) (92) (93) (94) (95) (96) (97) (98) (99) (100)	
INSULATION TYPE	NA
DENSITY OF FLUID kg/m ³	984-945
POST WELD HEAT TREATMENT	NOT REQUIRED
MINOR ALLOWABLE WORKING PRESSURE	45.0 (5 kg/cm ²)
NO CODE STAMP REQUIRED	YES
NO CODE STAMP REQUIRED	NO
ASME CERTIFICATION MARK	YES, "U" STAMP
NOZZLE LOAD DATA	APPLICABLE
SEISMIC ZONE-III, IMPORTANCE FACTOR-2, EQUIPMENT CATEGORY-4 & SITE SPECIFIC SEISMIC SPECTRA	NOT REQUIRED



REFERENCE DRAWING LIST

REF. DOCUMENT NUMBER	CLIENT DOCUMENT NO.	DRAWING / DOCUMENT TITLE	REV.
3-PV-220-00273	B016-RU-IT-504-MS-FD-BHEL(1)-03059	FOUNDATION TEMPLATE FOR SOLVENT STORAGE TANK(701-1-13A/B)	-
3-PV-220-00272	B016-RU-IT-504-MS-FD-BHEL(1)-03058	MADE PLATE DETAILS FOR SOLVENT STORAGE TANK(701-1-13A/B)	-
3-PV-220-00274	B016-RU-IT-504-MS-FD-BHEL(1)-03057	SCHEDULE OF MANHOLES & COMMISSURING SPACES (701-1-13A/B)	-
1-PV-220-00178	B016-RU-IT-504-MS-FD-BHEL(1)-03055	GENERAL NOTES FOR SOLVENT STORAGE TANK(701-1-13A/B)	-
2-PV-220-00061	B016-RU-IT-504-MS-FD-BHEL(1)-03052	TRANSPORTATION ARRANGEMENT DETAILS FOR SOLVENT STORAGE TANK(701-1-13A/B)	-
1-PV-220-00177	B016-RU-IT-504-MS-FD-BHEL(1)-03052	ASSEMBLY DETAILS OF SOLVENT STORAGE TANK(701-1-13A/B)	-
0-PV-220-00271	B016-RU-IT-504-MS-FD-BHEL(1)-03055	SHELL DEVELOPMENT OF SOLVENT STORAGE TANK(701-1-13A/B)	-
3-PV-220-00271	B016-RU-IT-504-MS-FD-BHEL(1)-03054	DETAILS OF MANWAY DWT FOR SOLVENT STORAGE TANK(701-1-13A/B)	-
PPV-498-04-20101	B016-RU-IT-504-MS-FD-BHEL(1)-03051	MECHANICAL DESIGN OF SOLVENT STORAGE TANK(701-1-13A/B)	-



HEAT TREATMENT CYCLE

Part	Procedure	Heating Temperature (°C)	Holding Temperature (°C)	Heating Rate (°C/hr)	Holding Time (min)	Cooling Rate (°C/hr)	Remarks
SR-1	SR-1	450	610	110	140	140	Underheat at 450°C
SR-2	SR-2	450	610	110	140	Underheat at 450°C	
SR-3	SR-3	450	610	110	140	Underheat at 450°C	
SR-4	SR-4	450	610	110	140	Underheat at 450°C	
SR-5	SR-5	450	610	110	140	Underheat at 450°C	
SR-6	SR-6	450	610	110	140	Underheat at 450°C	
SR-7	SR-7	450	610	110	140	Underheat at 450°C	

APPLICABLE STANDARDS

- ASME BOILER & PRESSURE VESSEL CODE SEC VIII DIV 1 : ED-2019
- ASME BOILER & PRESSURE VESSEL CODE SEC II PART A, C & D : ED-2019
- ASME BOILER & PRESSURE VESSEL CODE SEC V : ED-2019
- ASME BOILER & PRESSURE VESSEL CODE SEC IX ED-2019
- ASME B16.5 ED-2017 - STANDARD FOR PIPE FLANGES AND FLANGED FITTINGS.
- ASME B16.11 ED-2016 FORGED STEEL FITTINGS, SOCKET WELDED & THREADED
- ASME B36.10W ED-2018 WELDED AND SEAMLESS WROUGHT-STEEL PIPE
- ASME B16.20 ED2013 METALLIC GASKETS FOR PIPE FLANGES

NOTES:

- NOZZLES & GASKET FACE OF FLANGES SHALL BE PARALLEL TO THE TRUE HORIZONTAL/VERTICAL PLANE. NOZZLE PROJECTIONS SHALL BE MEASURED FROM THE TRUE HORIZONTAL/VERTICAL PLANE & SHALL BE PERPENDICULAR TO THE TRUE HORIZONTAL/VERTICAL PLANE. THE SLOPE SHALL BE SURTABLY ADJUSTED THROUGH DIFFERENTIAL SADDLE HEIGHTS.

LIST OF HODDS AS ON DATE

VN 1	VENT	50	84.0	16.6	300	WN/R.F.	A.F.D
V 1	VENTILATION	200	219.1	1.20	300	WN/B.F.	A.F.D
PT 1	PRESSURE TRANSDUCER (27)	50	50.8	16.6	300	WN/R.F.	A.F.D
TE 1	MULTI POINT TEMP.	80	1.0	20.4	300	WN/R.F.	A.F.D
TE 2	ELEMENT	100	114.3	16.0	300	WN/R.F.	A.F.D
TE 3	LEVEL TRANSDUCER (47)	100	114.3	16.0	300	WN/R.F.	A.F.D
TE 4	LEVEL TRANSDUCER (127)	100	114.3	16.0	300	WN/R.F.	A.F.D
TE 5	LEVEL TRANSDUCER (127)	100	114.3	16.0	300	WN/R.F.	A.F.D
TE 6	LEVEL TRANSDUCER (127)	100	114.3	16.0	300	WN/R.F.	A.F.D
TE 7	LEVEL TRANSDUCER (127)	100	114.3	16.0	300	WN/R.F.	A.F.D
TE 8	LEVEL TRANSDUCER (127)	100	114.3	16.0	300	WN/R.F.	A.F.D
TE 9	LEVEL TRANSDUCER (127)	100	114.3	16.0	300	WN/R.F.	A.F.D
TE 10	LEVEL TRANSDUCER (127)	100	114.3	16.0	300	WN/R.F.	A.F.D
TE 11	LEVEL TRANSDUCER (127)	100	114.3	16.0	300	WN/R.F.	A.F.D
TE 12	LEVEL TRANSDUCER (127)	100	114.3	16.0	300	WN/R.F.	A.F.D
TE 13	LEVEL TRANSDUCER (127)	100	114.3	16.0	300	WN/R.F.	A.F.D
TE 14	LEVEL TRANSDUCER (127)	100	114.3	16.0	300	WN/R.F.	A.F.D
TE 15	LEVEL TRANSDUCER (127)	100	114.3	16.0	300	WN/R.F.	A.F.D
TE 16	LEVEL TRANSDUCER (127)	100	114.3	16.0	300	WN/R.F.	A.F.D
TE 17	LEVEL TRANSDUCER (127)	100	114.3	16.0	300	WN/R.F.	A.F.D
TE 18	LEVEL TRANSDUCER (127)	100	114.3	16.0	300	WN/R.F.	A.F.D
TE 19	LEVEL TRANSDUCER (127)	100	114.3	16.0	300	WN/R.F.	A.F.D
TE 20	LEVEL TRANSDUCER (127)	100	114.3	16.0	300	WN/R.F.	A.F.D
TE 21	LEVEL TRANSDUCER (127)	100	114.3	16.0	300	WN/R.F.	A.F.D
TE 22	LEVEL TRANSDUCER (127)	100	114.3	16.0	300	WN/R.F.	A.F.D
TE 23	LEVEL TRANSDUCER (127)	100	114.3	16.0	300	WN/R.F.	A.F.D
TE 24	LEVEL TRANSDUCER (127)	100	114.3	16.0	300	WN/R.F.	A.F.D
TE 25	LEVEL TRANSDUCER (127)	100	114.3	16.0	300	WN/R.F.	A.F.D
TE 26	LEVEL TRANSDUCER (127)	100	114.3	16.0	300	WN/R.F.	A.F.D
TE 27	LEVEL TRANSDUCER (127)	100	114.3	16.0	300	WN/R.F.	A.F.D
TE 28	LEVEL TRANSDUCER (127)	100	114.3	16.0	300	WN/R.F.	A.F.D
TE 29	LEVEL TRANSDUCER (127)	100	114.3	16.0	300	WN/R.F.	A.F.D
TE 30	LEVEL TRANSDUCER (127)	100	114.3	16.0	300	WN/R.F.	A.F.D
TE 31	LEVEL TRANSDUCER (127)	100	114.3	16.0	300	WN/R.F.	A.F.D
TE 32	LEVEL TRANSDUCER (127)	100	114.3	16.0	300	WN/R.F.	A.F.D
TE 33	LEVEL TRANSDUCER (127)	100	114.3	16.0	300	WN/R.F.	A.F.D
TE 34	LEVEL TRANSDUCER (127)	100	114.3	16.0	300	WN/R.F.	A.F.D
TE 35	LEVEL TRANSDUCER (127)	100	114.3	16.0	300	WN/R.F.	A.F.D
TE 36	LEVEL TRANSDUCER (127)	100	114.3	16.0	300	WN/R.F.	A.F.D
TE 37	LEVEL TRANSDUCER (127)	100	114.3	16.0	300	WN/R.F.	A.F.D
TE 38	LEVEL TRANSDUCER (127)	100	114.3	16.0	300	WN/R.F.	A.F.D
TE 39	LEVEL TRANSDUCER (127)	100	114.3	16.0	300	WN/R.F.	A.F.D
TE 40	LEVEL TRANSDUCER (127)	100	114.3	16.0	300	WN/R.F.	A.F.D
TE 41	LEVEL TRANSDUCER (127)	100	114.3	16.0	300	WN/R.F.	A.F.D
TE 42	LEVEL TRANSDUCER (127)	100	114.3	16.0	300	WN/R.F.	A.F.D
TE 43	LEVEL TRANSDUCER (127)	100	114.3	16.0	300	WN/R.F.	A.F.D
TE 44	LEVEL TRANSDUCER (127)	100	114.3	16.0	300	WN/R.F.	A.F.D
TE 45	LEVEL TRANSDUCER (127)	100	114.3	16.0	300	WN/R.F.	A.F.D
TE 46	LEVEL TRANSDUCER (127)	100	114.3	16.0	300	WN/R.F.	A.F.D
TE 47	LEVEL TRANSDUCER (127)	100	114.3	16.0	300	WN/R.F.	A.F.D
TE 48	LEVEL TRANSDUCER (127)	100	114.3	16.0	300	WN/R.F.	A.F.D
TE 49	LEVEL TRANSDUCER (127)	100	114.3	16.0	300	WN/R.F.	A.F.D
TE 50	LEVEL TRANSDUCER (127)	100	114.3	16.0	300	WN/R.F.	A.F.D

GENERAL ARRANGEMENT OF SOLVENT STORAGE VESSEL

ITEM NO. 701-V-113A/B

DATE: 17.10.2020 11:40

DESIGNED BY: HJ ENGS.

CHECKED BY: HJ ENGS.

APPROVED BY: HJ ENGS.

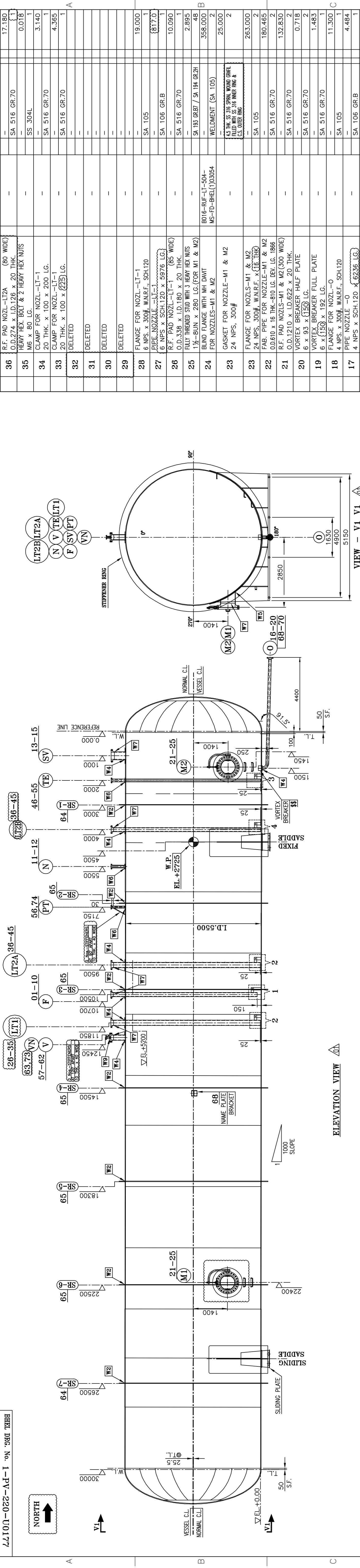
PROJECT NO.: B016-RU-LT-004-MS-CA-1

ITEM NO.: BHEL(1)-03051

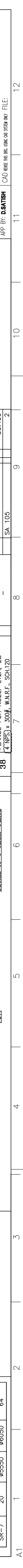
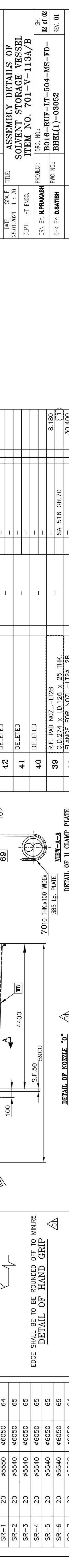
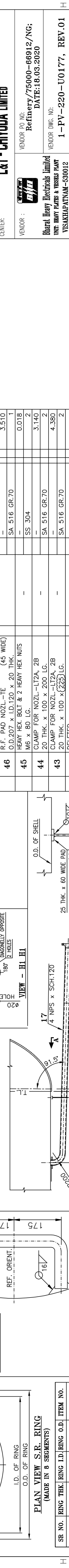
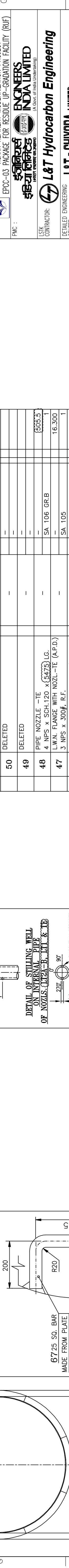
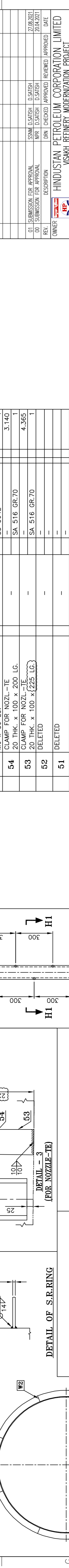
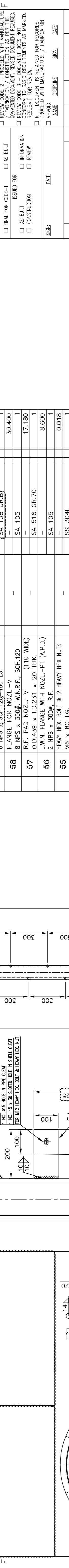
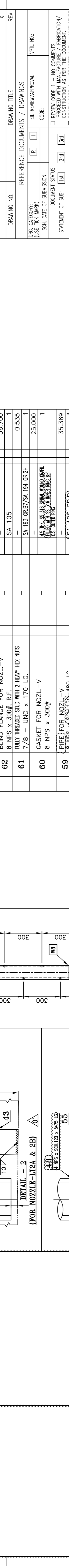
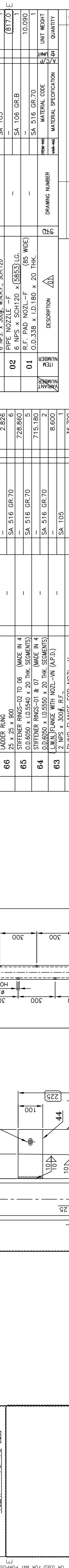
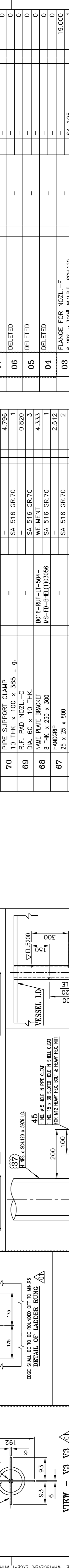
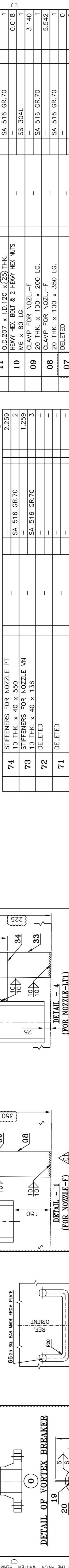
DATE: 17.10.2020 11:40

REVISIONS:

NO.	DESCRIPTION	DATE
01	ISSUED FOR CONSTRUCTION	17.10.2020
02	ISSUED FOR CONSTRUCTION	17.10.2020
03	ISSUED FOR CONSTRUCTION	17.10.2020
04	ISSUED FOR CONSTRUCTION	17.10.2020
05	ISSUED FOR CONSTRUCTION	17.10.2020
06	ISSUED FOR CONSTRUCTION	17.10.2020
07	ISSUED FOR CONSTRUCTION	17.10.2020
08	ISSUED FOR CONSTRUCTION	17.10.2020
09	ISSUED FOR CONSTRUCTION	17.10.2020
10	ISSUED FOR CONSTRUCTION	17.10.2020
11	ISSUED FOR CONSTRUCTION	17.10.2020
12	ISSUED FOR CONSTRUCTION	17.10.2020
13	ISSUED FOR CONSTRUCTION	17.10.2020
14	ISSUED FOR CONSTRUCTION	17.10.2020
15	ISSUED FOR CONSTRUCTION	17.10.2020
16	ISSUED FOR CONSTRUCTION	17.10.2020
17	ISSUED FOR CONSTRUCTION	17.10.2020
18	ISSUED FOR CONSTRUCTION	17.10.2020
19	ISSUED FOR CONSTRUCTION	17.10.2020
20	ISSUED FOR CONSTRUCTION	17.10.2020



ELEVATION VIEW
 \$\$\$ VORTEX BREAKER IS AS PER TYPE 2A OF EIL STD: 7-12-0019, REV/06



SR NO.	RING THK	RING I.D.	RING O.D.	ITEM NO.
SR-1	20	4550	46050	64
SR-2	20	4550	46050	65
SR-3	20	4550	46050	65
SR-4	20	4550	46050	65
SR-5	20	4550	46050	65
SR-6	20	4550	46050	65
SR-7	20	4550	46050	64

NO.	DESCRIPTION	QTY	UNIT	WEIGHT	MATERIAL SPECIFICATION
37	PIPE NOZZLE -IT2A, 2B 4 NPS x SCH.120 x 5976 LG.	2		42.019	SA 106 GR.B
36	R.F. PAD NOZL-IT2A (80 WIDE) O.D.274 x I.D.126 x 20 THK. W/ 2 HEAVY HEX NUTS	2		17.180	SA 516 GR.70
35	W/ 2 HEAVY HEX NUTS M6 x 80 LG.	4		0.016	SS 304L
34	CLAMP FOR NOZL-IT-1 20 THK x 100 x 200 LG.	1		3.140	SA 516 GR.70
33	CLAMP FOR NOZL-IT-1 20 THK x 100 x 225 LG.	1		4.365	SA 516 GR.70
32	DELETED				
31	DELETED				
30	DELETED				
29	DELETED				
28	FLANGE FOR NOZL-IT-1 6 NPS x 300# W.A.R.F., SCH.120	1		19.000	SA 105
27	PIPE NOZZLE -IT-1 6 NPS x SCH.120 x 5976 LG.	1		817.0	SA 106 GR.B
26	R.F. PAD NOZL-IT-1 (85 WIDE) O.D.338 x I.D.180 x 20 THK.	1		10.090	SA 516 GR.70
25	FULLY THREADED STD WITH 3 HEAVY HEX NUTS 1/2" BUN x 280 LG. (FOR M1 & M2)	48		2.895	SA 516 GR.70
24	BLIND FLANGE WITH MH DAWT FOR NOZZLES-M1 & M2	2		358.000	SA 193 GR.B7/ SA 194 GR.2H
23	GASKET FOR NOZZLE-M1 & M2 24 NPS, 300#	2		25.000	WELDMENT (SA 105) FILLED WITH SS 316 WET PNE & FLUOR POLYIMIDE
22	FLANGE FOR NOZLS-M1 & M2 24 NPS, 300# W.A.R.F., x 101.180 LG.	2		263.000	SA 105
21	FAB. PIPE FOR NOZZLE-M1 & M2 O.D.610 x I.D.310 LG. (E.V. 1866)	2		180.465	SA 516 GR.70
20	R.F. PAD NOZLS-M1 & M2 (300 WIDE) O.D.610 x I.D.310 LG. (FOR M1 & M2)	2		132.830	SA 516 GR.70
19	VORTEX BREAKER HALF PLATE 6 x 150 x 192 LG.	2		0.718	SA 516 GR.70
18	VORTEX BREAKER FULL PLATE 6 x 150 x 192 LG.	1		1.483	SA 516 GR.70
17	FLANGE FOR NOZL-O 4 NPS x 300# W.A.R.F., SCH.120	1		11.300	SA 105
16	R.F. PAD NOZL-O (80 WIDE) O.D.274 x I.D.126 x 20 THK.	1		7.476	SA 106 GR.B
15	FLANGE FOR NOZL-SV 12 NPS x 300# W.A.R.F., SCH.80	1		63.500	SA 105
14	PIPE NOZZLE -SV 12 NPS x SCH.80 x 485 LG.	1		58.762	SA 106 GR.B
13	R.F. PAD NOZL-SV (180 WIDE) O.D.684 x I.D.336 x 25 THK.	1		43.770	SA 516 GR.70
12	L.W.N. FLANGE WITH NOZL-N (A.P.D.) 3 NPS x 300# R.F.	1		16.300	SA 516 GR.70
11	R.F. PAD NOZL-N (45 WIDE) O.D.207 x I.D.120 x 25 THK.	1		4.380	SA 516 GR.70
10	HEAVY HEX BOLT & 2 HEAVY HEX NUTS M6 x 80 LG.	1		0.018	SS 304L
09	CLAMP FOR NOZL-F 20 THK x 100 x 200 LG.	1		3.140	SA 516 GR.70
08	CLAMP FOR NOZL-F 20 THK x 100 x 250 LG.	1		5.542	SA 516 GR.70
07	DELETED				
06	DELETED				
05	DELETED				
04	DELETED				
03	FLANGE FOR NOZL-F 6 NPS x 300# W.A.R.F., SCH.120	1		19.000	SA 105
02	PIPE NOZZLE -F 6 NPS x SCH.120 x 5976 LG.	1		817.0	SA 106 GR.B
01	R.F. PAD NOZL-F (85 WIDE) O.D.338 x I.D.180 x 20 THK.	1		10.090	SA 516 GR.70




DRAWING NO.	DRAWING TITLE	REV
		X
		Y
		Z

REV	DESCRIPTION	DATE
01	ISSUED FOR APPROVAL	21/08/2021
02	ISSUED FOR APPROVAL	20/04/2021
03	ISSUED FOR APPROVAL	20/04/2021
04	ISSUED FOR APPROVAL	20/04/2021
05	ISSUED FOR APPROVAL	20/04/2021
06	ISSUED FOR APPROVAL	20/04/2021
07	ISSUED FOR APPROVAL	20/04/2021
08	ISSUED FOR APPROVAL	20/04/2021
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12	ISSUED FOR APPROVAL	20/04/2021

 Residue Upgradation Facility (RUF) EPCC-3 Package for Visakh Refinery Modernization Project (VRMP)	 L&T Hydrocarbon Engineering L&T-CHIYODA LIMITED
 ENGINEERS INDIA LIMITED <small>A Group of India's Leading</small>	Rev. No.: 3 Page : 1 of 1
Title: INSPECTION & TEST PLAN (504-V-703, 504-V-807, 701-T-113 A/B) Doc. No.: B016-RUF-LT-504-QC-QD-BHEL (1)-02002	

OWNER	:	HINDUSTAN PETROLEUM CORPORATION LIMITED (HPCL)
PMC	:	ENGINEERS INDIA LIMITED, NEW DELHI (EIL)
UNIT	:	504
PMC JOB NO.	:	B016
EQUIPMENT DESCRIPTION	:	ODC Vessels (HOT OIL SURGE DRUM, HOT OIL BLOWDOWN DRUM, SOLVENT STORAGE TANK)
EQUIPMENT TAG	:	504-V-703, 504-V-807, 701-T-113 A/B
P. R. NO	:	B016-RUF-LT-504-MS-PR-0007
VENDOR NAME	:	BHARAT HEAVY ELECTRICALS LIMITED
VENDOR DOCUMENT NO.	:	CQP 2508

DOCUMENT SUBMISSION STATUS - LTHE/VENDOR	1.1.1.1 REVIEW STATUS		
	LTHE	EIL	
DOC. CATEGORY: (USE TICK MARK)	<input checked="" type="checkbox"/> REVIEW CODE 1 - NO COMMENTS. PROCEED WITH MANUFACTURE / FABRICATION / CONSTRUCTION AS PER THE DOCUMENT. <input type="checkbox"/> REVIEW CODE 2 - PROCEED WITH MANUFACTURE/FABRICATION/CONSTRUCTION AS PER COMMENTED DOCUMENT. REVISED DOCUMENT REQUIRED. <input type="checkbox"/> REVIEW CODE 3 - DOCUMENT DOES NOT CONFORM TO BASIC REQUIREMENTS AS MARKED. RESUBMIT FOR REVIEW <input type="checkbox"/> R- DOCUMENT IS RETAINED FOR RECORDS. PROCEED WITH MANUFACTURE / FABRICATION <input type="checkbox"/> V- VOID	<input type="checkbox"/> REVIEW CODE 1 - NO COMMENTS. PROCEED WITH MANUFACTURE / FABRICATION / CONSTRUCTION AS PER THE DOCUMENT. <input type="checkbox"/> REVIEW CODE 2 - PROCEED WITH MANUFACTURE/FABRICATION/CONSTRUCTION AS PER COMMENTED DOCUMENT. REVISED DOCUMENT REQUIRED. <input type="checkbox"/> REVIEW CODE 3 - DOCUMENT DOES NOT CONFORM TO BASIC REQUIREMENTS AS MARKED. RESUBMIT FOR REVIEW <input type="checkbox"/> R- DOCUMENT IS RETAINED FOR RECORDS. PROCEED WITH MANUFACTURE / FABRICATION <input type="checkbox"/> V- VOID	
ISSUED FOR			
REVIEW			
<input type="checkbox"/> INFORMATION			
<input type="checkbox"/> CONSTRUCTION			
<input type="checkbox"/> AS BUILT			
	DISCIPLINE	SIGN	DATE

Rev.	Description	Prepared By	Reviewed By	Approved By	Approved Date
3	Revised as Commented	P.G Kishore	A.K Mandal	A.K Mandal	30-12-2020
2	Revised as Commented	P.G Kishore	A.K Mandal	A.K Mandal	21-12-2020
1	Revised as Commented	P.G Kishore	A.K Mandal	A.K Mandal	10-11-2020
0	INSPECTION & TEST PLAN	P.G Kishore	A.K Mandal	A.K Mandal	14-10-2020

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All P0/PR requirements shall be fully covered

Approved

Reviewed & Approved with minor comments
 R.m. Jishi
 15-01-2021


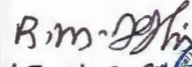

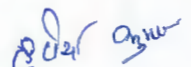






	MANUFACTURER'S NAME & ADDRESS BHEL-VISAKHAPATNAM or Approved Sub Contractor.	QUALITY ASSURANCE PLAN		Purchaser : L & T Hydrocarbon Engineering Ltd (LTHE), Vadodara Project Name: VRMP-Visakh Refinery Modernisation Project Customer : Hindustan Petroleum Corporation Limited- Visakhapatnam PMC : Engineers India Limited (EIL) EIL Job No. : B016-504 L & T Job No.& PO No.: RUFV & REFINERY/75000-66912/NG Dt.18-03-2020
		QAP NO: B016-RUF-LT-504-QC-QD-BHEL (1)-02002 Rev.3 Date : 30-12-2020 Page 1 of 17 BHEL SO: 2438; Internal CQP No: 2508		

Code of Construction: ASME Section VIII Div.1, Edition 2019 with "U" Stamping.

VESSEL with SKIRT		
Sl. No.	Item Description	Tag Number
1.	HOT OIL SURGE DRUM	504-V-703
VESSEL with BOOT and Saddle		
Sl. No.	Item Description	Tag Number
1.	HOT OIL BLOW DOWN DRUM	504-V-807
VESSEL with Saddle		
Sl. No.	Item Description	Tag Number
1.	SOLVENT STORAGE TANK	701-T-113 A/B


 P. Gopi Kishore Manager/QA/BHEL	 A.K. Mandal AGM/Q & BE/BHEL	 15-01-2021  TUV India	AI	 15/01/2021  LTHE	 EIL
Prepared By	Reviewed By	Approved			

	MANUFACTURER'S NAME & ADDRESS BHEL- VISAKHAPATNAM or Approved Sub Contractor.	QUALITY ASSURANCE PLAN			Purchaser : L & T Hydrocarbon Engineering Ltd (LTHE), Vadodara Project Name: VRMP-Visakh Refinery Modernisation Project Customer : Hindustan Petroleum Corporation Limited- Visakhapatnam PMC : Engineers India Limited (EIL) EIL Job No. : B016-504 L & T Job No.& PO No.: RUFV & REFINERY/75000-66912/NG Dt.18-03-2020		
		QAP NO: B016-RUF-LT-504-QC-QD-BHEL (1)-02002 Rev.3 Date : 30-12-2020 Page 2 of 17 BHEL SO: 2438; Internal CQP No: 2508					

S. No	Description	Type of Checks	Reference Documents and Acceptance Criteria	Format of Record	Inspection			EIL	Remarks
					M	TUV	AI		
1.0	Design & Drawings approval	Drawings & Design Calculations	ASME Sec VIII Div.1 Ed 2019 & PR Specifications	Drawings & Design Calculations	H	V	R		
2.0	ITP / QAP	Documents & Inspection Stages	ASME Sec VIII Div.1 Ed 2019 & other specifications as per approved General Assembly drawing	QAP	H	H	R		
3.0	Procedures								
3.1	Welding Procedure Specification & WPS/PQR/WPQ	Compliance to ASME Sec IX	ASME Sec VIII Div.1 & Sec IX and CLG and EIL specifications	WPS/PQR/WPQ	H	R/W	R		TPIA inspection envisaged for any new WPS or WPQ R- for old PQR W-New PQR to be qualified.




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S. No	Description	Type of Checks	Reference Documents and Acceptance Criteria	Format of Record	Inspection			EIL	Remarks
					M	TUV	AI		
3.2	All Manufacturing, Test Procedures a) NDT (UT/RT/MT/PT) b) NDE Plan c) Surface Preparation & Painting d) Hydro test e) Hardness test f) Heat Treatment	Procedure & Acceptance Criteria	ASME Sec VIII Div.1 Ed 2019 & other specifications as per approved General Assembly drawing	Procedure	H	R	R *		* Hydro test / NDE and Heat treatment for AI review.
3.2a	Heat Treatment procedure for Dend & Nozzle Assembly (as applicable)	Procedure & Acceptance Criteria	ASME Sec VIII Div.1 Ed 2019 & PR Specifications	Procedure	H	R	R		
4.0	Raw Materials								
4.1	Plates, Pipes, Fittings, Forgings, Fasteners, Gaskets etc., (as applicable) at sourcing locations.	PO., Approved Drawings	ASME Section II A, TDC & other specifications as per PR.	Test Certificates / Check test results	H	R	-		Raw materials will be inspected by BHEL appointed IPI/A.




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	MANUFACTURER'S NAME & ADDRESS BHEL- VISAKHAPATNAM or Approved Sub Contractor.	QUALITY ASSURANCE PLAN			Purchaser : L & T Hydrocarbon Engineering Ltd (LTHE), Vadodara Project Name: VRMP-Visakh Refinery Modernisation Project Customer : Hindustan Petroleum Corporation Limited- Visakhapatnam PMC : Engineers India Limited (EIL) EIL Job No. : B016-504 L & T Job No.& PO No.: RUFV & REFINERY/75000-66912/NG Dt.18-03-2020				
		QAP NO: B016-RUF-LT-504-QC-QD-BHEL (1)-02002 Rev.3 Date : 30-12-2020 Page 4 of 17 BHEL SO: 2438; Internal CQP No: 2508							
S. No	Description	Type of Checks	Reference Documents and Acceptance Criteria	Format of Record	Inspection			EIL	Remarks
					M	TUV	AI		

Raw Materials after receipt									
4.2 a)	All Pressure parts / Part attached to Pressure part (Plates & Pipes)	PO., Approved Drawings	ASME Section II A, UCS-23 & other specifications as per PR	Manufacturer Test Certificates / Check test results	H	H&	R		&-Material identification for Plates & Pipes (Pressure parts): Review of test certificates, markings, visual & dimensional inspection, identity correlation & transfer of identity for each tag & part no. This is to be followed by TPIA stamping.
4.2 b)	All Pressure parts / Part attached to Pressure part (Nozzle forgings & Flanges)	PO., Approved Drawings	ASME Section II A, UCS-23 & other specifications as per PR	Manufacturer Test Certificates / Check test results	H	W	R		
4.3	Non Pressure parts	PO., Approved Drawings	ASME Section II A & other specifications as per PR	Manufacturer Test Certificates / Check test results	H	R	-		
4.4	Welding Consumables	PO, TDC	ASME Section II C, CLG PVM-SU-4750-H & other specifications as per PR	Manufacturer Test Certificates	H	R	R		
4.5	Fasteners & Gaskets	PO, Drawings	ASME Section II A & other specifications as per PR	Manufacturer Test Certificates	H	W	R		PMI of AS, SS Material as applicable.




Order

	MANUFACTURER'S NAME & ADDRESS BHEL- VISAKHAPATNAM or Approved Sub Contractor.	QUALITY ASSURANCE PLAN			Purchaser : L & T Hydrocarbon Engineering Ltd (LTHE), Vadodara Project Name: VRMP-Visakh Refinery Modernisation Project Customer : Hindustan Petroleum Corporation Limited- Visakhapatnam PMC : Engineers India Limited (EIL) EIL Job No. : B016-504 L & T Job No.& PO No.: RUFV & REFINERY/75000-66912/NG Dt.18-03-2020				
		QAP NO: B016-RUF-LT-504-QC-QD-BHEL (1)-02002 Rev.3 Date : 30-12-2020 Page 5 of 17 BHEL SO: 2438; Internal CQP No: 2508							
S. No	Description	Type of Checks	Reference Documents and Acceptance Criteria	Format of Record	Inspection			EIL	Remarks
					M	TUV	AI		

Fabrication of Dished Ends and Tori Cone along with PTC as applicable									
5.0									
5.1	Transfer of Marking and Heat Number	Material Spec & Heat Number	Drawing & TDC, Material identification & transfer of marking procedure	Inspection Report	H	W	R		
5.2	Plate Marking, Cutting, Weld Edge Preparation	Dimensions	Drawing	Inspection Report	H	R	R		
5.3	DPT of Weld Edges & Fit Up Clearance for L-seam	Detection of flaws & Offset	Drawing	Inspection Report	H	RW	-		
5.4	Fit up & Welding of L-Seam along with PTC	weld geometry	ASME Sec VIII Div.1 & Drawing	Inspection Report	H	R	R/W		W by AI, when there is impact test requirement; Refer Note- 3
5.5	100% WFMT for back gouging prior to back welding of L-seam	Detection of flaws	ASME Sec VIII Div.1 & Drawing, ASME Sec V Article 7, MPI Procedure	Inspection Report	H	RW	-		Refer Note-1
5.6	DPT of Weld Edges & Fit Up Clearance for C-seam	Detection of flaws & Offset	Drawing	Inspection Report	H	RW	-		C-seam is applicable for Tori cone (as applicable)
5.7	Welding of C-Seam (in case, C-seam is applicable for any Tori cone)	weld geometry	ASME Sec VIII Div.1 & Drawing	Inspection Report	H	R	R		Refer Note-1 & 3



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		QAP NO: B016-RUF-LT-504-QC-QD-BHEL (1)-02002 Rev.3 Date : 30-12-2020 Page 6 of 17 BHEL SO: 2438; Internal CQP No: 2508							
S. No	Description	Type of Checks	Reference Documents and Acceptance Criteria	Format of Record	Inspection			EIL	Remarks
					M	TUV	AI		

5.8	100% WFMT for back gouging prior to back welding of C-seam (in case, C-seam is applicable for Tori cone)	Detection of flaws	ASME Sec VIII Div.1 & Drawing, ASME Sec V Article 7, MPI Procedure	Inspection Report	H	RW	-		Refer Note-1
5.9	Forming of Dished End and Tori cone (as applicable)	Dimensional & Template check	As per Drawing	Inspection Report	H	R	R		
5.10	Heat Treatment (along with PTC) for applicable Tag Nos.	Time & Temperature	ASME Sec VIII Div.1 & Drawing	HT Chart / Report	H	R	R		HT procedure duly approved to be followed.
5.11	100% PT on Knuckle inside & outside and Tori Cone (as applicable) including welds and WEP after forming & heat treatment	Detection of flaws	ASME Sec VIII Div.1 & Drawing, PT Procedure	Inspection Report	H	W	-		Along with Boot Dish end as per applicable tags
5.12	Weld Visual Inspection before RT	Weld Visual	ASME Sec VIII Div.1, UW-35	Inspection Report	H	H	W		
5.13	100% RT of weld after forming and heat treatment	Detection of flaws	ASME Sec VIII Div.1 & Drawing	RT Films / Records	H	R	R		
5.14	Hardness testing of Dénd (Parent Material & Weld area)	Hardness as applicable.	ASME Sec VIII Div.1 & PVM-SU-4750-H Cl. No. 14.3.9 c) & d)	Test report	H	RW	-		

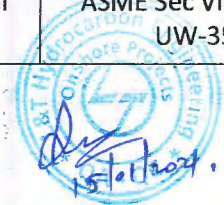


RASHMIN JOSHI



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		QAP NO: B016-RUF-LT-504-QC-QD-BHEL (1)-02002 Rev.3 Date : 30-12-2020 Page 7 of 17 BHEL SO: 2438; Internal CQP No: 2508							
S. No	Description	Type of Checks	Reference Documents and Acceptance Criteria	Format of Record	Inspection			EIL	Remarks
					M	TUV	AI		

5.15	Final Dimensions (minimum thickness, profile, roundness, ovality etc.,)	Visual & dimensional	ASME Sec VIII Div.1 & Drawing, UG-80, UG-81	Inspection Report	H	H\$	R		Along with Boot Dish end as per applicable tags; \$ -Trail Assembly & fit up in case of Crown & Petal construction, Tori cone
5.16	Test Coupon testing for applicable tags	Tensile Strength & Hardness as applicable.	ASME Sec VIII Div.1 & PVM-SU-4750-H Cl. No. 7.6 to 7.8	Test report	H	H	R#		Refer Note-4; R # for AI, if heat treatment is Normalising.
6.0	Fabrication of Main Shell / Boot along with PTC as applicable								
6.1	Plate Marking, Cutting, Weld Edge Preparation	Dimensions	Drawing	Inspection Report	H	R	R		
6.2	Shell rolling	Dimensions	Drawing	Inspection Report	H	-	-		
6.3	DPT of Weld Edges & Fit Up Clearance for L-seam	Detection of flaws & Offset	Drawing	Inspection Report	H	RW	-		
6.4	Fit up & Welding of L-Seam along with PTC	weld geometry	ASME Sec VIII Div.1 & Drawing	Inspection Report	H	RW	R/W		W by AI, when there is impact test requirement; Refer Note- 3
6.5	100% WFMT for back gouging prior to back welding of L-seam	Detection of flaws	ASME Sec VIII Div.1 & Drawing, ASME Sec V Article 7, MPI Procedure	Inspection Report	H	RW	-		Refer Note-1
6.6	Weld Visual Inspection before RT	Weld Visual	ASME Sec VIII Div.1, UW-35	Inspection Report	H	W	W		



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	MANUFACTURER'S NAME & ADDRESS BHEL- VISAKHAPATNAM or Approved Sub Contractor.	QUALITY ASSURANCE PLAN			Purchaser : L & T Hydrocarbon Engineering Ltd (LTHE), Vadodara Project Name: VRMP-Visakh Refinery Modernisation Project Customer : Hindustan Petroleum Corporation Limited- Visakhapatnam PMC : Engineers India Limited (EIL) EIL Job No. : B016-504 L & T Job No.& PO No.: RUFV & REFINERY/75000-66912/NG Dt.18-03-2020		
		QAP NO: B016-RUF-LT-504-QC-QD-BHEL (1)-02002 Rev.3 Date : 30-12-2020 Page 8 of 17 BHEL SO: 2438; Internal CQP No: 2508					

S. No	Description	Type of Checks	Reference Documents and Acceptance Criteria	Format of Record	Inspection			EIL	Remarks
					M	TUV	AI		
6.7	100% DPT of Full Weld	Detection of flaws	ASME Sec VIII Div.1 & Drawing, PT Procedure	Inspection Report	H	R	R		
6.8	RT on L-seam weld	Detection of flaws	ASME Sec VIII Div.1 & Drawing, UW-51	RT Films & Report	H	R	R		Refer Note-2
7.0	Shell to Shell Circular Seam fabrication								
7.1	Weld Edge Preparation	Dimensions	Drawing	Inspection Report	H	R	R		
7.2	DPT of Weld Edges & Fit Up Clearance for C-seam	Detection of flaws & Offset	Drawing	Inspection Report	H	RW	-		
7.3	Welding of C-Seam	weld geometry	ASME Sec VIII Div.1 & Drawing	Inspection Report	H	R	R		
7.4	100% WFMT for back gouging prior to back welding of C-seam	Detection of flaws	ASME Sec VIII Div.1 & Drawing, ASME Sec V Article 7, MPI Procedure	Inspection Report	H	RW	-		Refer Note-1
7.5	Weld Visual Inspection before RT	Weld Visual	ASME Sec VIII Div.1, UW-35	Inspection Report	H	W	W		
7.6	100% DPT of Full Weld	Detection of flaws	ASME Sec VIII Div.1 & Drawing, PT Procedure	Inspection Report	H	R	R		
7.7	RT on C-seam weld	Detection of flaws	ASME Sec VIII Div.1 & Drawing, UW-51	RT Films & Report	H	R	R		Refer Note-2



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	MANUFACTURER'S NAME & ADDRESS	QUALITY ASSURANCE PLAN		Purchaser : L & T Hydrocarbon Engineering Ltd (LTHE), Vadodara		
	BHEL-VISAKHAPATNAM or Approved Sub Contractor.	QAP NO: B016-RUF-LT-504-QC-QD-BHEL (1)-02002 Rev.3 Date : 30-12-2020 Page 9 of 17 BHEL SO: 2438; Internal CQP No: 2508	Project Name: VRMP-Visakh Refinery Modernisation Project Customer : Hindustan Petroleum Corporation Limited- Visakhapatnam PMC : Engineers India Limited (EIL) EIL Job No. : B016-504 L & T Job No.& PO No.: RUFV & REFINERY/75000-66912/NG Dt.18-03-2020			


S. No	Description	Type of Checks	Reference Documents and Acceptance Criteria	Format of Record	Inspection			EIL	Remarks
					M	TUV	AI		

8.0 Shell to Dished end / Shell to Boot / Boot Shell to Boot Dished end Circular Seam fabrication									
8.1	Weld Edge Preparation	Dimensions	Drawing	Inspection Report	H	R	R		
8.2	DPT of Weld Edges & Fit Up Clearance for C-seam	Detection of flaws & Offset	Drawing	Inspection Report	H	RW	-		
8.3	Welding of C-Seam	weld geometry	ASME Sec VIII Div.1 & Drawing	Inspection Report	H	R	R		
8.4	100% WFMT for back gouging prior to back welding of C-seam	Detection of flaws	ASME Sec VIII Div.1 & Drawing, ASME Sec V Article 7, MPI Procedure	Inspection Report	H	RW	-		Refer Note-1
8.5	Weld Visual Inspection before RT	Weld Visual	ASME Sec VIII Div.1, UW-35	Inspection Report	H	W	W		
8.6	100% DPT of Full Weld	Detection of flaws	ASME Sec VIII Div.1 & Drawing, PT Procedure	Inspection Report	H	R	R		
8.7	RT on C-seam weld	Detection of flaws	ASME Sec VIII Div.1 & Drawing, UW-51	RT Films & Report	H	R	R		Refer Note-2



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	MANUFACTURER'S NAME & ADDRESS BHEL- VISAKHAPATNAM or Approved Sub Contractor.	QUALITY ASSURANCE PLAN QAP NO: B016-RUF-LT-504-QC-QD-BHEL (1)-02002 Rev.3 Date : 30-12-2020 Page 10 of 17 BHEL SO: 2438; Internal CQP No: 2508			Purchaser : L & T Hydrocarbon Engineering Ltd (LTHE), Vadodara Project Name: VRMP-Visakh Refinery Modernisation Project Customer : Hindustan Petroleum Corporation Limited- Visakhapatnam PMC : Engineers India Limited (EIL) EIL Job No. : B016-504 L & T Job No.& PO No.: RUFV & REFINERY/75000-66912/NG Dt.18-03-2020				
	S. No	Description	Type of Checks	Reference Documents and Acceptance Criteria	Format of Record	Inspection M TUV AI			EIL

9.0	Fabrication of Nozzle Assemblies								
9.1	Weld Edge Preparation	Dimensions	Drawing	Inspection Report	H	R	R		
9.2	DPT of Weld Edges & Fit Up Clearance for C-seam	Detection of flaws & Offset	Drawing	Inspection Report	H	RW	-		
9.3	Welding of C-Seam of pipes /elbows / flanges / nozzle neck etc	weld geometry	ASME Sec VIII Div.1 & Drawing	Inspection Report	H	R	R		
9.4	100% WFMT prior to back welding of C-seam (In cases where root run is done by GTAW process because of access constraint / limitation in access to weld from both sides, WFMT will be done for root run)	Detection of flaws	ASME Sec VIII Div.1 & Drawing, ASME Sec V Article 7, MPI Procedure	Inspection Report	H	RW	-		Refer Note-1
9.5	Weld Visual Inspection before RT	Weld Visual	ASME Sec VIII Div.1, UW-35	Inspection Report	H	W	W		
9.6	100% DPT of Full Weld	Detection of flaws	ASME Sec VIII Div.1 & Drawing, PT Procedure	Inspection Report	H	R	R		
9.7	RT on C-seam weld	Detection of flaws	ASME Sec VIII Div.1 & Drawing, UW-51	RT Films & Reports	H	R	R		
9.8	100% RT for fabricated Nozzles, elbows etc., if made from plate	Detection of flaws	ASME Sec VIII Div.1 & Drawing, UW-51	RT Films & Report	H	R	R		



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	MANUFACTURER'S NAME & ADDRESS	QUALITY ASSURANCE PLAN			Purchaser : L & T Hydrocarbon Engineering Ltd (LTHE), Vadodara				
	BHEL-VISAKHAPATNAM or Approved Sub Contractor.	QAP NO: B016-RUF-LT-504-QC-QD-BHEL (1)-02002 Rev.3 Date : 30-12-2020 Page 11 of 17 BHEL SO: 2438; Internal CQP No: 2508				Project Name: VRMP-Visakh Refinery Modernisation Project Customer : Hindustan Petroleum Corporation Limited- Visakhapatnam PMC : Engineers India Limited (EIL) EIL Job No. : B016-504 L & T Job No.& PO No.: RUFV & REFINERY/75000-66912/NG Dt.18-03-2020			

S. No	Description	Type of Checks	Reference Documents and Acceptance Criteria	Format of Record	Inspection			EIL	Remarks
					M	TUV	AI		

Nozzle to Shell / Dished end / Boot / Boot Dished end fabrication									
10.0									
10.1	Marking, Cutting, Weld Edge Preparation of Openings for Nozzles on Shell, Dished ends, Boot, Boot Dished ends.	Dimensions	Drawing	Inspection Report	H	R	R		
10.2	DPT of Weld Edges & Fit Up Clearance	Detection of flaws & Offset	Drawing	Inspection Report	H	RW	-		
10.3	Welding of Seam	weld geometry	ASME Sec VIII Div.1 & Drawing	Inspection Report	H	R	R		
10.4	100% WFMT prior to back welding of seam (In cases where root run is done by GTAW process because of access constraint / limitation in access to weld from both sides, WFMT will be done for root run)	Detection of flaws	ASME Sec VIII Div.1 & Drawing, ASME Sec V Article 7, MPI Procedure	Inspection Report	H	RW	-		Refer Note-1
10.5	Weld Visual Inspection	Weld Visual	ASME Sec VIII Div.1, UW-35	Inspection Report	H	W	W		
10.6	100% DPT of Full Weld	Detection of flaws	ASME Sec VIII Div.1 & Drawing, PT Procedure	Inspection Report	H	R	R		




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	MANUFACTURER'S NAME & ADDRESS	QUALITY ASSURANCE PLAN			Purchaser : L & T Hydrocarbon Engineering Ltd (LTHE), Vadodara				
	BHEL-VISAKHAPATNAM or Approved Sub Contractor.	QAP NO: B016-RUF-LT-504-QC-QD-BHEL (1)-02002 Rev.3 Date : 30-12-2020 Page 12 of 17 BHEL SO: 2438; Internal CQP No: 2508				Project Name: VRMP-Visakh Refinery Modernisation Project Customer : Hindustan Petroleum Corporation Limited- Visakhapatnam PMC : Engineers India Limited (EIL) EIL Job No. : B016-504 L & T Job No.& PO No.: RUFV & REFINERY/75000-66912/NG Dt.18-03-2020			
S. No	Description	Type of Checks	Reference Documents and Acceptance Criteria	Format of Record	Inspection			EIL	Remarks
					M	TUV	AI		

10.7	100% RT on Lip type nozzle weld	Detection of flaws	ASME Sec VIII Div.1 & Drawing, UW-51	RT Films & Report	H	R	R		In case where such joint is specified in drawing
10.8	100% UT on Nozzles to Shell, Dished ends, Boot, Boot Dished end welds, before PWHT (if applicable)	Detection of flaws	Drawing	Inspection Report	H	W	-		
10.9	Pneumatic test on RF pads	Detection of leakage	Drawing	Inspection Report	H	W	-		As applicable
11.0	Fabrication of Internal & External attachments								
11.1	Welding of Internal & External attachments including insert plate (where applicable)	Location & Dimensions	Drawing	Inspection Report	H	-	-		
11.2	NDE for Internal & External attachment welds	Detection of flaws	Drawing	Inspection Report	H	-	-		Refer Note-5




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	MANUFACTURER'S NAME & ADDRESS BHEL- VISAKHAPATNAM or Approved Sub Contractor.	QUALITY ASSURANCE PLAN			Purchaser : L & T Hydrocarbon Engineering Ltd (LTHE), Vadodara Project Name: VRMP-Visakh Refinery Modernisation Project Customer : Hindustan Petroleum Corporation Limited- Visakhapatnam PMC : Engineers India Limited (EIL) EIL Job No. : B016-504 L & T Job No.& PO No.: RUFV & REFINERY/75000-66912/NG Dt.18-03-2020				
		QAP NO: B016-RUF-LT-504-QC-QD-BHEL (1)-02002 Rev.3 Date : 30-12-2020 Page 13 of 17 BHEL SO: 2438; Internal CQP No: 2508							
S. No	Description	Type of Checks	Reference Documents and Acceptance Criteria	Format of Record	Inspection			EIL	Remarks
					M	TUV	AI		

11.3	Assembly and Welding of coil to coil joints	Location & Dimensions	Drawing	Inspection Report	H	R	W		Refer Note-7
11.4	RT of coil to coil joints	Detection of flaws	ASME Sec VIII Div.1 & Drawing, UW-51	RT Films & Report	H	R	R		Refer Note-7
11.5	Hydro testing of coil assembly followed by drying & cleaning as applicable	No pressure drop or leakage	Drawing	Inspection Report	H	H	H@		Refer Note-7; @ H for AI for Hydrostatic test only.
11.6	Assembly and Welding of coil to nozzle hook-up joint.	Location & Dimensions	Drawing	Inspection Report	H	R	R		Refer Note-7
11.7	RT of coil to nozzle hook-up joint.	Detection of flaws	ASME Sec VIII Div.1 & Drawing, UW-51	RT Films & Report	H	R	R		Refer Note-7
11.8	Assembly and Welding of coil supporting arrangement to Vessel weld joints	Location & Dimensions	Drawing	Inspection Report	H	R	-		Refer Note-7
11.9	NDE of coil supporting arrangement to Vessel weld joints	Detection of flaws	Drawing	Inspection Report	H	-	-		Refer Note-5 & 7



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	MANUFACTURER'S NAME & ADDRESS BHEL- VISAKHAPATNAM or Approved Sub Contractor.	QUALITY ASSURANCE PLAN			Purchaser : L & T Hydrocarbon Engineering Ltd (LTHE), Vadodara Project Name: VRMP-Visakh Refinery Modernisation Project Customer : Hindustan Petroleum Corporation Limited- Visakhapatnam PMC : Engineers India Limited (EIL) EIL Job No. : B016-504 L & T Job No.& PO No.: RUFV & REFINERY/75000-66912/NG Dt.18-03-2020				
		QAP NO: B016-RUF-LT-504-QC-QD-BHEL (1)-02002 Rev.3 Date : 30-12-2020 Page 14 of 17 BHEL SO: 2438; Internal CQP No: 2508							
S. No	Description	Type of Checks	Reference Documents and Acceptance Criteria	Format of Record	Inspection			EIL	Remarks
					M	TUV	AI		

12.0	Saddle fabrication and Assembly for applicable tag numbers								
12.1	Fit up and Welding of Saddle, saddle with Vessel & Lug Supports	Offset & weld geometry	ASME Sec VIII Div.1 & Drawing	Inspection Report	H	R	-		As applicable
12.2	100% PT on welds	Detection of flaws	Drawing	Inspection Report	H	R	-		
12.3	Dimensional inspection of Saddle & Lug Supports	Dimensions	Drawing	Inspection Report	H	W	-		W-During Final Inspection
	Skirt fabrication and Assembly for applicable tag numbers								
12.4	Fit up and Welding of Skirt, Skirt with Vessel	Offset & weld geometry	ASME Sec VIII Div.1 & Drawing	Inspection Report	H	R	-		
12.5	100% PT on welds	Detection of flaws	Drawing	Inspection Report	H	R	-		
12.6	100% UT on skirt-to-vessel welds	Detection of flaws	ASME Sec VIII Div.1 & PVM-SU-4750-H Cl. No. 9.5.1	Inspection Report	H	R	-		Applicable for Tag Nos. 504-V-703; Refer Note-6
12.7	Dimensional inspection of Skirt	Dimensions	Drawing	Inspection Report	H	W	-		W-During Final Inspection



Other



MANUFACTURER'S
NAME & ADDRESS

BHEL-
VISAKHAPATNAM or
Approved Sub
Contractor.

QUALITY ASSURANCE PLAN

QAP NO: **B016-RUF-LT-504-QC-QD-BHEL (1)-02002**
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Purchaser : L & T Hydrocarbon Engineering Ltd (LTHE), Vadodara
Project Name: VRMP-Visakh Refinery Modernisation Project
Customer : Hindustan Petroleum Corporation Limited- Visakhapatnam
PMC : Engineers India Limited (EIL)
EIL Job No. : B016-504
L & T Job No.& PO No.: RUFV & REFINERY/75000-66912/NG Dt.18-03-2020

S. No	Description	Type of Checks	Reference Documents and Acceptance Criteria	Format of Record	Inspection			EIL	Remarks
					M	TUV	AI		

13.0	Review of PWHT Chart of Blind flange assemblies	Time & Temperature	ASME Sec VIII Div.1 & approved procedure	HT Chart	H	R	R		Applicable for Nozzle No. 11 A, 11 B, 11 C, 11 D, 11 E, 11 F of Tag No. 504-V-807.
14.0	Final Visual & Dimensional inspection after PWHT of applicable Blind flange assemblies	Dimensions & orientations	Drawing	Inspection Report	H	H	W		
15.0	Hardness testing of blind flange assembly after PWHT	Hardness as applicable.	ASME Sec VIII Div.1 & PVM-SU-4750-H Cl. No. 14.3.9 c) & d)	Test report	H	H	-		
16.0	Final Visual & Dimensional inspection	Dimensions & orientations	Drawing	Inspection Report	H	H	W		Complete Equipment Visual inspection of both Internal & External
17.0	Hydro static testing followed by drying & cleaning	No pressure drop or leakage	Drawing	Inspection Report	H	H	H@		@ H for AI for Hydrostatic test only.
18.0	Spot PT after Hydro testing	Detection of flaws	Drawing	Inspection Report	H	W	-		
19.0	Outside Surface Preparation (Blasted Surface Profile & Salt Contamination Tests)	Surface profile & salt contamination	Drawing & Approved procedure	Inspection Report	H	RW	-		
20.0	Painting	Visual & DFT etc	Drawing, Approved procedure	Inspection Report	H	RW	-		



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	BHEL-VISAKHAPATNAM or Approved Sub Contractor.	QAP NO: B016-RUF-LT-504-QC-QD-BHEL (1)-02002 Rev.3 Date : 30-12-2020 Page 16 of 17 BHEL SO: 2438; Internal CQP No: 2508			Project Name: VRMP-Visakh Refinery Modernisation Project Customer : Hindustan Petroleum Corporation Limited- Visakhapatnam PMC : Engineers India Limited (EIL) EIL Job No. : B016-504 L & T Job No.& PO No.: RUFV & REFINERY/75000-66912/NG Dt.18-03-2020			

S. No	Description	Type of Checks	Reference Documents and Acceptance Criteria	Format of Record	Inspection			EIL	Remarks
					M	TUV	AI		

21.0	Nozzles blanking & N2 filling (if specified in drawing)	Physical verification	Drawing	Inspection Report	H	W	-		
22.0	Verification of Name Plate	Verification as per drawing	Name plate drawing	Name Plate	H	R	H		
22.1	Stamping of ASME certification mar with "U" designation	Verification as per drawing	Name plate drawing	Name Plate	H	R	H		
20.0	Closing of NCRs (if any)	Closure of NCRs	PR, Drawing, Specification	Closure Reports	H	H	H		
21.0	Name plate fixing, punching and rub off	Visual	Drawing	Inspection Report	H	H	H		
22.0	Inspection of Mandatory & Commissioning spares	Physical Verification	Drawing & approved spares list (as applicable)	Inspection Report	H	H	-		
23.0	Manufacturer's Data Report & Final Documentation	Documentation	Drawings & ITP/QAP	MDR	H	R	H		
24.0	Issue of IRN & clearance for dispatch	Completeness	Drawing, Approved procedure	Inspection Release Note	H	H	-		



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	MANUFACTURER'S NAME & ADDRESS BHEL- VISAKHAPATNAM or Approved Sub Contractor.	QUALITY ASSURANCE PLAN QAP NO: B016-RUF-LT-504-QC-QD-BHEL (1)-02002 Rev.3 Date : 30-12-2020 Page 17 of 17 BHEL SO: 2438; Internal CQP No: 2508			Purchaser : L & T Hydrocarbon Engineering Ltd (LTHE), Vadodara Project Name: VRMP-Visakh Refinery Modernisation Project Customer : Hindustan Petroleum Corporation Limited- Visakhapatnam PMC : Engineers India Limited (EIL) EIL Job No. : B016-504 L & T Job No.& PO No.: RUFV & REFINERY/75000-66912/NG Dt.18-03-2020				
	S. No	Description	Type of Checks	Reference Documents and Acceptance Criteria	Format of Record	Inspection M TUV AI			EIL

DFT, Adhesion test and Holiday detection check shall be in line with B016-000-79-41-PL5-01 and shall be witnessed by TPIA

- 1) As per CLG Spec. PVM-SU-4750-H Clause No. 9.2, WFMT shall be performed for Category A, B, C & D butt-welded root areas and prior to back welding.
- 2) Extent of RT shall be in line to the approved drawing *and applicable details*
- 3) It is to be noted that wherever PTC is applicable, it will be as per Doc: B016-RUF-LT-504-QC-QD-BHEL (1)-02022.
- 4) As per PVM-SU-4750-H Cl. No. 7. 8: Production (vessel) test plates shall be subjected to the same thermal history expected for the finished vessel, including hot-forming, pre heat and PWHT.
- 5) As per PVM-SU-4750-H Cl. No. 9.5.2 & 9.5.3: Internal and external attachment welds, including those for lifting attachments when supplied, shall receive WFMT after grinding, if grinding is required. If vessel is subject to heat treatment, WFMT shall be performed after heat treatment. Surfaces from which temporary attachments have been removed shall receive WFMT after grinding.
- 6) As per PVM-SU-4750-H Cl. No. 9.5.1 b 2) : If impossible or impracticable to design so that UT can be applied, skirt-to-vessel welds shall receive WFMT after the root pass is completed and every third layer thereafter.
- 7) Applicable only for Tag Nos where Steam Coil / Coil is specified in drawing viz., Tag Nos.504-V-807.
- 8) As per PVM-SU-4750-H Cl. No. 14.3.9: Internal welds and HAZs shall be inspected after PWHT as follows:
 - a) Internal welds shall undergo WFMT for at least 1 inch (25 mm) on each side of the toe of the weld in accordance with ASME Code, Section V, Article 7.
 - b) Acceptance criteria shall be per ASME Code, Division 1, Appendix 6 (Division 2, paragraph 7.5.6).
 - c) Fluid-wetted pressure boundary and attachment welds shall be hardness tested and shall not exceed 200 BHN.
 - d) One hardness test shall be performed on each weld or each 10 linear feet (3 m) of weld, whichever is more frequent.

Legends:

P: Perform	Drawing : Approved Drawing	WPS: Welding procedure specification	DFT: Dry film thickness
A-Approval	Spec : Specification	WPQ; Welder performance Qualification	RT: Radiographic testing
W-Witness Point	IRN: Inspection release note issued by TUV	HT Chart: Heat Treatment chart	UT: Ultrasonic testing manual
RW: Random Witness	M-BHEL or BHEL approved sub-contractor	PR: Purchase Requisition	PT: Dye penetrant testing
H: Hold Point (to inform to concerned and proceed ahead only after their approval)	L-Seam: Longitudinal Seam welding, C-Seam: Circumferential Seam welding	TUV: TUV India Pvt Ltd., (Third party inspection agency appointed by M/s LTHE	MPI: Magnetic particle Inspection WFMT: Wet Fluorescent Magnetic Particle Test
V: Verification of reports/Procedures	R: Review Point		MPT: Magnetic particle testing



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15-01-2021

