

TENDER DOCUMENT

TENDER ENQUIRY NO: TE/543/KPD-MECH/ATA/2018

**“Procurement of Channel Head Gasket for Heat Exchangers
for ATA 2018”**

**FIELD MANAGER KUNNAR/KPD-TAY FIELD
(LOCAL PROCUREMENT)
OIL & GAS DEVELOPMENT COMPANY LIMITED**

BID SUBMISSION DATE: 30th May, 2018

OGDCL SALES TAX REGISTRATION NO. 07-02-2802-001-55

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OIL & GAS DEVELOPMENT COMPANY LIMITED

KUNNAR/ KPD-TAY FIELD/PLANT, TANDO JAM SINDH

NO: - TE/543/KPD-MECH/ATA/2018

SUBJECT: Procurement of Channel Head Gasket for Heat Exchangers for ATA 2018

NOTE: BIDDERS SHOULD ALSO REFER TO THE “MASTER SET OF TENDER DOCUMENTS” AVAILABLE AT OGDCL’S WEBSITE AT THE FOLLOWING ADDRESS:

<http://www.ogdcl.com/Tender/OpenTenders/Goods/>

Oil & Gas Development Company Limited (herein after referred to as the Purchaser) invites sealed bids from eligible Bidders for supply and delivery of goods, materials, equipment and/or services described in the schedule of requirement as Annexure “A” hereof.

The technical bid will be opened first on the date mentioned in SOR / Tender Notice. The financial bids of the technically qualified bidders will be opened publicly. Technical evaluation report will be published on OGDCL’s website before financial bid opening.

1. **INSTRUCTIONS TO BIDDERS:-**

- 1.1 Only the Bids of bona-fide buyers of Tender Document will be entertained. The Bidder shall bear all cost associated with the preparation and delivery of its Bid, and the Purchaser will in no case be responsible or liable for those costs.
- 1.2 In case of any doubt as to the meaning of any portion of the Specifications or other Terms and Conditions, Bidder may seek clarification of the same in writing, but not later than two weeks prior to deadline for submission of bid prescribed by the Purchaser.
- 1.3 At any time prior to the deadline for submission of Bids, a modification in bidding document in the form of an addendum may be issued in response to a clarification requested by a respective Bidder or even whenever the Purchaser considers it beneficial to issue such a clarification and/or amendment to all Bidders. Any clarification/amendment issued (in general) shall be addressed to all the prospective Bidder(s) who have purchased the Tender Document.
Bidders are required to submit their Bid, **Procurement of channel head gasket for heat exchangers for ATA-2018**
“CONFIDENTIAL” and Tender # TE/543/KPD-MECH/ATA/2018, “
- 1.4 The Purchaser does not take any responsibility for collecting the Bids from any Agency.
- 1.6 The Purchaser reserves the right to increase or decrease the quantities or may cancel any or all items shown in the Schedule of Requirement, without assigning any reason thereof.

- 1.7 The Purchaser Reserve the right to have the items inspected by its own representative, or by 3rd party at its own cost (if required).
- 1.8 It must be indicated in the offer that the quotation fully conforms to Technical Specifications and Terms and Conditions of the Tender.
- 1.9 The Purchaser reserves the right to accept or reject any Bid and to annul the bidding process and reject all the Bids at any time prior to award of Purchase Order without assigning any reason and without thereby incurring any liability to the affected bidder(s) or any obligation there under.
- 1.10 Unsolicited advice/clarifications and personal approaches by the Bidder at any stage of evaluation are strictly prohibited and shall lead to disqualification.
- 1.11 In the event that the Bidder submits an alternative Bid(s) whether in whole or against any of the items, a group or sub-group in addition to its Main Bid, the Bids must be marked as “Main Bid” and “Alternative Bid”. Alternative bid(s) which do not conform to the specifications, but meet the performance prescribed in, or the objectives of, the specifications may be submitted. However, only the Alternative Bid of the Bidder whose Main Bid is the lowest evaluated bid will be considered.
- 1.12 A Bidder, who wishes to have its Alternative Bid(s) considered on an equal basis with all other (Main) Bids, must submit a Bid Bond for each Alternative Bids, an Alternative Bid must be submitted in a sealed envelope clearly marked “Alternative Bid”, separate from the Main Bid.
- 1.13 The Bidder is expected to examine all instructions, forms, terms and specifications in the Bidding Documents. Failure to furnish all information required by the Bidding Documents or submission of a Bid not substantially responsive to Bidding Documents in every respect will result in the rejection of the Bid.
- 1.14 All prospective bidders are advised to read carefully all terms & conditions enunciated in the Tender Documents prior to filling / submission of their quotation.

2. **BID PRICES:**

- 2.1. Firm Bid Prices must be quoted as per format of schedule of requirement (SOR).
- 2.2. Bidding form Annexure-B & B-1 must also be duly filled-in, stamped and signed by authorized representative of Bidder.
- 2.3. Prices must be quoted in Pakistani currency inclusive of all taxes and duties, indicating unit price and total Bid prices. GST must be quoted separately along with copy of GST Certificate. Bids offering prices in foreign currency will be rejected. Conditional bid / bid having any prices adjustment formula will also be rejected.
- 2.4. Prices must be quoted including all charges like handling, loading, transportation and un-loading, Octroi and Zila Tax etc. for delivery of material at Purchaser’s stores located at **KUNNAR/KPD-TAY FIELD**.
- 2.5. Quoted price shall be **valid for 120 days** from the opening date of the Financial Bid.
- 2.6. Technical brochure/literature confirming Size, Brand & Country of Origin of quoted items/material must be attached with the Technical Bid (where deemed necessary).
- 2.7. Any quotation not confirming to Clause 2.1 to 2.6 shall be rejected without any right of appeal.

3. SEALING AND MARKING OF BIDS:

- 3.1. The Bidder shall furnish Technical & Financial bids in two separate sealed envelopes.
- 3.2. Technical Bids will be opened first.
- 3.3. Only Financial Bid of Technically responsive bidders will be opened publicly.
- 3.4. Financial Bids of technically non responsive bidders will be returned after award of Local Purchase Order to successful bidder(s).
- 3.5. The bid shall be submitted in a sealed envelope marked as under:

Field Manager / Incharge Maintenance

Kunnar/KPD-TAY Field

C/O TCS Office Tando Jam Hyderabad Sindh -Pakistan

Oil & Gas Development Company Limited.

Phone No. Direct: 92-22-2720752

Fax No. 022-2761410/ 022-2789410

E-mail: kunnar@ogdcl.com, icmaintknr@ogdcl.com

- 3.6. The envelope shall also bear the word “ CONFIDENTIAL” and following identifications:-
TENDER ENQUIRY NO: TE/543/KPD-MECH/ATA/2018
TECHNICAL/FINANCIAL BID(s) (INDICATE ONE ON EACH ENVELOPE)
- 3.7. If the envelope is not marked, as instructed above, the Purchaser will assume no responsibility for the misplacement or premature opening of Bid.

4. DEADLINE FOR SUBMISSION OF BIDS:

Sr.#	Tender Enquiry No.	Description	Bids Submission Date & Time	Bids Opening Date & Time
1	TE/543/KPD-MECH/ATA/2018	Procurement of Channel Head Gasket for Heat Exchangers for ATA 2018”	30.05.2018	30.05.2018
			10:00 HRS	10:30 HRS

All

Bids must be delivered/ dropped in the Office Field Manager / Incharge Maintenance Kunnar/KPD-TAY Field on or before the prescribed deadline of 10:00 hrs on above mentioned date.

5. LATE BIDS:

- 5.1. Any bid received by the Purchaser after the prescribed deadline for submission of bids will be rejected and returned un-opened to the bidder.

6. BID OPENING:

- 7.1. OGDCL will open the Technical/Financial Bid(s), in the presence of bidder's representative(s) who may choose to attend on date, time & location mentioned above.
- 7.2. The bidder's names, bid prices (with or without discount) including bid price modification and bid withdrawals, if any, and the submission of requisite Earnest Money will be announced at the time of Financial bid opening.
- 7.3 OGDCL will examine the bids to determine whether they are complete, no computational errors have been made, the required sureties have been furnished, documents have been properly signed, and the bids are generally in order.
- 7.4 Arithmetical errors found will be corrected as follows:
 - 7.4.1 Where there is a discrepancy between amount in figures and word, the amount in word will prevail.
 - 7.4.2. Where there is a discrepancy between the unit price and the total amount derive from the multiplication of the unit price and the quantity, the unit price as quoted will govern, unless there is an obvious gross arithmetical error in unit price, in which event, the extended amount quoted would prevail.
 - 7.4.3. In case the due date of bids opening falls on a holiday, the bids shall be opened on the next working day.

7. DETERMINATION OF RESPONSIVENESS:

- 7.1. After opening of the bids, the purchaser will determine whether each bid is substantially responsive to the requirements of the bidding documents.
- 7.2. For the purpose of this clause, a substantially responsive bid is one, which conforms to all the terms and conditions of the bidding documents without material deviation. A material deviation is one which means in-consistent with the bidding document, affects in any substantial way the scope, quality or prescribed delivery schedule or which limits in any substantial way, the purchaser's right or the bidder's obligation under the contract.
- 7.3. A bid determined to be a non-responsive will be rejected by the purchaser and shall not subsequently be made responsive by the bidder by correction of the non-conformity.
- 7.4. The purchaser may waive any minor deviation non-conformity or irregularity in a bid, which does not constitute a material deviation, provided that the waiver does not prejudice or affect the relative standing order of other bidder(s).
- 7.5. To assist in determining a bid's responsiveness the bidder may be asked for a clarification of his bid. The bidder is not permitted, however, to change bid price or substance of his bid.

8. ISSUANCE OF LOCAL PURCHASE ORDER (LPO):

- 8.1. The purchaser will issue the local purchase order to the successful bidder whose bid is determined to be technically responsive and financially lowest evaluated.
- 8.2. Terms & Conditions (General) of LPO are available at Annexure-E.

9. PERFORMANCE BOND:

- 9.1. The successful bidder will have to submit a performance bond in the shape of bank guarantee equal to 10% of total value of order exclusive of GST, from any schedule bank in Pakistan as per format attached at Annexure-F within 15 days of the receipt of Purchase Order.
- 9.2. In case the successful bidder fails to furnish performance bond as per clause 9.1, the firm shall be debarred from participation in any future tender of the purchaser in addition to the action taken against such bidder as per clause 3.5(b).
- 9.3. The purchaser reserves the right to check the authenticity of performance bond from the concerned Bank.

10. PAYMENT:

- 10.1. Progressive Payments will be made as per following payment milestones on the completion of works:
 - 10.1.1. 100 % after delivery of material & punch list clearance and provisional acceptance by OGDCL/ Engineering Consultant

11.DELIVERY SCHEDULE:

- 12.1 “” Against this tender is to be completed within 06-08 Weeks from the date of receipt of firm purchase/ work order.

12. EXTENSION IN THE DELIVERY / COMPLETION PERIOD:

- 12.1. Providing of the services shall be made by the supplier/contractor in accordance with the given delivery schedule in purchase/work order.
- 12.2. The supplier may claim extension of the time limits as set forth in the purchase order in case of:-
 - 12.2.1. Changes in Scope of Work or in the specifications of goods, material & equipment by the OGDCL.
 - 12.2.2. Delay in provision of clarifications regarding material, drawings and services by the OGDCL
 - 12.2.3. Force Majeure pursuant to clause 15.

- 12.3. Justified reasons subject to a written request high-lighting the same within a period of seven working days prior to expiry of delivery period mentioned in Purchase Order.
- 12.4. It should be noted that a request for extension in delivery/ completion period shall be considered only if the supplier/ contactor agrees in writing to pay any increase in taxes or any other charges levied by the government during the extended delivery period. OGDCL shall not bear any additional price increase during the extended period.
- 12.5. In case of extension in delivery period, the supplier/ contactor will extend validity of Performance Bond accordingly at his cost.
- 12.6. If the supplier/ contactor fails to supply/ complete the ordered services for any reason, within stipulated time, his Performance Bond with the purchaser shall be forfeited and material shall be purchased from elsewhere at his risk and cost.

13. PENALTY.

- 13.1. For failure to comply with delivery schedule of purchase order, penalty will be imposed on defaulting supplier as under:-
 - 13.1.1. @ 1 % of the cost of entire order (excluding GST) or of such items as remains unsupplied for every day up to maximum of 15% for 10 days exceeding the delivery period.
 - 13.1.2. If the material is not supplied even after paying penalty for 10 (ten) consecutive days. OGDCL reserves the right to cancel supply order and to obtain the required items from elsewhere at your risk and cost.
 - 13.1.3. In case suppliers fails to deliver the goods against order, the purchaser reserves the right to claim interest/financial charges from the supplier on the amount of advance paid to him as per terms/conditions of order for such a period the supplier has detained the amount of advance.

14. FORCE MAJEURE:

- 14.1. The supplier shall not be liable for penalty for delay in delivery of ordered goods, if, and to the extent delay in delivery or other failure to perform his obligation under the purchase order, of being the result of occurrence of Force Majeure i.e. causes such as natural calamities, war, civil disturbance, military action, fire as well as other circumstance proved to the satisfaction of the purchaser to be beyond the reasonable control of the supplier, which may impede the fulfillment of the obligations under the purchase order.
- 14.2. The supplier shall notify the purchaser promptly of the occurrence of Force Majeure and submit his case in writing within 07 days of such occurrence.
- 14.3. If any of the party is prevented to fulfill its assumed obligations by Force Majeure of constant duration of at least one month, the party shall meet for negotiation. If no satisfactory agreement is reached within a period of two months from the

commencement of the Force Majeure conditions, either party shall have the right to cancel the purchase order with immediate effect.

15. INSPECTION AND TEST:

- 15.1 The OGDCL's representative(s) shall have the right to inspect and/or test the goods to confirm their conformity with respect to specifications mentioned in the Purchase Order. The representative of Field Manager Kunnar/KPD-TAY Field will witness the inspection (where so required).
- 15.2. Should any inspected or tested goods fail to conform to the specifications the purchaser shall reject them and supplier shall replace the rejected goods. All costs incurred on such replacement shall be entirely born by the supplier.
- 15.3. Rejected material/ work shall be moved/ replaced by the supplier within 07 days from the receipt of letter/fax issued by the Field Manager Kunnar/KPD-TAY Field. The supplier shall be liable for the storage charges @ ½% (half percent) of the cost of rejected material on every day basis, if the same is not removed within seven days.
- 15.4. Acceptance/rejection of the material by 3rd party will be final and binding on both the parties.

16. WARRANTY:

- 16.1. The supplier/ contactor shall warrant that all supplied material/ Services under purchase order shall be according to specifications given in Purchase Order and approved drawings/design etc. Any deviation in material, drawing/design (where applicable) will be replaced by the Supplier/ Contactor at his cost.
- 16.2. OGDCL shall promptly notify the supplier in writing, of any claims arising under this warranty.
- 16.3. The supplier/ contactor will invariably provide warranty/guarantees

17. QUALIFICATION OF SELECTED BIDDERS:

- 17.1. OGDCL will determine to its satisfaction whether the bidder selected as having submitted the lowest evaluated, technically responsive bid qualifies to satisfactorily perform the order.
- 17.2. The determination will take into account the bidders financial, technical & production capabilities, availability of items ordered for. The bidder shall provide necessary documents as proof along with the bid.
- 17.3. Any affirmative determination will be a pre-requisite for award of the purchase order to the bidder. A negative determination will result in rejection of the bid.
- 17.4. OGDCL reserves the right at the time of award of order to increase or decrease to a reasonable extent in the quantity of goods specified in the Tender Document without any change in price or other terms and conditions.

18. LITIGATION CLAUSE:

18.1. without prejudice to other right of the Company, tenderers, their subcontractors and other suppliers shall be disqualified from participating in the bidding process if:

18.1.1. they are or have been at any time during the past five year, involve in litigation, arbitration or any other dispute or even that may in the opinion of the company, have material adverse effect on the Tender's ability to perform the Contract.

18.1.2. Its involvement in litigation is chronic.

18.1.3. Its past conduct or execution of works under contract has been poor.

19. You are encouraged to inform Managing Director & Head of Department on the following addresses/contacts, in case where any OGDCL employee ask for any type of favor whether monetary or in kind:-

DESIGNATION	ADDRESS	TEL #	FAX #	E. MAIL
Managing Director	OGDCL House	051-9209701	051-9209708	
Field Manager	Kunnar/KPD-TAY Field	022-2761401	022-2761410	kunnar@ogdcl.com

Field Manager / Incharge Maintenance

Kunnar/KPD-TAY Field

C/O TCS Tando Jam Hyderabad Sindh -Pakistan

Oil & Gas Development Company Limited.

Phone No. Direct: 92-22-2720752

Fax No. 022-2761410

E-mail: icmaintknr@ogdcl.com

**OIL AND GAS DEVELOPMENT COMPANY LIMITED
KUNNAR/KPD-TAY FIELD**

SCHEDULE OF REQUIREMENT

**TENDER ENQUIRY # TE/543/KPD-MECH/ATA/2018
Procurement of Channel Head Gasket for Heat Exchangers for ATA 2018**

Subject: Supply of Channel Head Gasket for Heat Exchangers

Sr No	Tag No.	Equipme nt	Part No	Drawing No.	Description	Manufacturer	Qty	Unit	Unit Rate (Rs)		Total Rs
									(Exc. of GST)	(Inc. of GST)	
1	E-4402/ E-5402	Inlet Gas Hot oil heater	21	A44-01- MEF-DWG- 15-04	Shell gasket (797 OD x 741 x 721 x 4.45 mm thickness spiral gasket as per attached drawing, inner ring is SA-240 316-L filling with flexible graphite)	Klinger/ Flexitallic	2	EA			
			22	A44-01- MEF-DWG- 15-04	Channel gasket (797 OD x 741 x 731 x Rib 10mm thick x 4,45mm thickness spiral gasket as per drawing, inner ring is of SA-240 316-L, filling with flexible graphite)	Klinger/ Flexitallic	2	EA			
2	E-4406 A/B & E-5406 A/B	Amine Regenera tor Reboiler	5	A44-01- MEF-DWG- 18-03	Channel Gasket (1808 OD x 1759 x 1732 x 10mm rib x 4.5mm thickness as per attached drawing. Material Graphite + SS 316-L, parts of the strip for 316 L filled with flexible graphite for the band the ring to enhance the wound pad)	Klinger/ Flexitallic	3	EA			

			7	A44-01-MEF-DWG-18-03	Shell Gasket (1808 OD x 1759 x 1732 x 4.5mm thickness as per attached drawing. Material Graphite + SS 316-L, parts of the strip for 316 L filled with flexible graphite for the band the ring to enhance the wound pad)	Klinger/ Flexitallic	3	EA			
3	E-4401/ E-5401	Inlet Gas trim cooler	22	A44-01-MEF-DWG-14-07	Shell gasket (1088 OD x 1038 x 1018 x 4.5 mm thickness spiral wound gasket as per attached drawing, Material: Graphite + SS 316-L)	Klinger/ Flexitallic	1	EA			
			24	A44-01-MEF-DWG-14-07	Channel gasket (1088 OD x 1038 x 1018mm x 10mm thick rib x 4.5 mm thickness spiral wound gasket as per attached drawing. Material: Graphite + SS 316-L)	Klinger/ Flexitallic	1	EA			
4	E-4403/ E-5403	Treated Gas Trim Cooler	22	A44-01-MEF-DWG-16-07	Shell Gasket (1016 OD x 966 x 946 x 4.5 mm thickness spiral wound gasket as per attached drawing. Material: Graphite + SS-316-L)	Klinger/ Flexitallic	1	EA			
			24	A44-01-MEF-DWG-16-07	Channel Gasket (1016 OD x 966 x 946 x rib 10 mm thick x 4.5 mm thickness spiral wound gasket as per attached drawing. Material: Graphite + SS-316-L)	Klinger/ Flexitallic	1	EA			
5	E-4405/ E-5405	Lean Amine Trim Cooler	2	A44-01-MEF-DWG-17-04	Channel Gasket (1274 OD x 1234 x 1219mm x rib 10mm thick x 4.5 mm thickness spiral wound gasket as per attached drawing.	Klinger/ Flexitallic	1	EA			

					Material: SS316L/ F.G)						
			3	A44-01-MEF-DWG-17-04	Shell Gasket (1274 OD x 1234 x 1219mm x 4,5 mm thickness spiral wound gasket as per attached drawing, Material: SS316L/ F.G)	Klinger/ Flexitallic	1	EA			
			11	A44-01-MEF-DWG-17-04	Floating Head Gasket (1211 OD x 1179 x 1175mm x 10mm rib x 4.5 mm thickness spiral wound gasket as per attached drawing. Material: SS316L/ F.G)	Klinger/ Flexitallic	1	EA			
			15	A44-01-MEF-DWG-17-04	Shell cover gasket (1375 OD x 1335 x 1321mm x 4,5 mm thickness spiral wound gasket as per attached drawing. Material: SS316L/ F.G)	Klinger/ Flexitallic	1	EA			
6	E-7101/ E-7201	Condensate Stabilization Reboiler	2	B71-01-MEF-DWG-14-05	Channel gasket (699 OD x 649 x 629mm x 10mm rib x 4.5 mm thickness spiral wound gasket as per attached drawing, Material: SS316L + Graphite)	Klinger/ Flexitallic	2	EA			
			3	B71-01-MEF-DWG-14-05	Shell gasket (699 OD x 649 x 629mm x 4,5 mm thickness spiral wound gasket as per attached drawing. Material: SS316L+Graphite)	Klinger/ Flexitallic	2	EA			
7	E-4505/ E-5505	De Ethanizer Reboiler	2	B45-01-MEF-DWG-11-05	Channel gasket (1033 OD x 983 x 963mm x 10mm rib x 4,5 mm thickness spiral wound gasket as per attached drawing. Material: SS304L + Expanded Graphite)	Klinger/ Flexitallic	1	EA			

			3	B45-01-MEF-DWG-11-05	Shell gasket (1033 OD x 983 x 963mm x 4,5 mm thickness spiral wound gasket as per attached drawing. Material: SS304L + Expanded Graphite)	Klinger/ Flexitallic	1	EA			
8	E-4507/ E-5507	De Butanizer Reboiler	2	B45-01-MEF-DWG-12-03	Channel gasket (776 OD x 736 x 716mm x 10mm rib x 4,5 mm thickness spiral wound gasket as per attached drawing. Material: S30408 + Graphite)	Klinger/ Flexitallic	2	EA			
			3	B45-01-MEF-DWG-12-03	Shell gasket (776 OD x 736 x 716mm x 4,5 mm thickness spiral wound gasket as per attached drawing. Material: S30408 + Graphite)	Klinger/ Flexitallic	2	EA			
9	E-4501/ E-5501	Regenera tion Gas pre heater	21	2307-E-4501/5501-ME-DW-30210 (sheet 1 of 4)	Channel gasket (841 OD x 759mm ID x 10 mm rib x 5 mm thickness kamprofile AISI 304, filled with graphite as per attached drawing)	Klinger/ Flexitallic	1	EA			
			23	2307-E-4501/5501-ME-DW-30210 (sheet 1 of 4)	Shell gasket (841 OD x 761 ID x 5 mm thickness kamprofile AISI 304, filled with graphite as per attached drawing.)	Klinger/ Flexitallic	1	EA			
			28	2307-E-4501/5501-ME-DW-30210 (sheet 1 of 4)	Shell cover gasket (1012 OD x 918mm ID x 5 mm thickness kamprofile AISI 304, filled with graphite as per attached drawing)	Klinger/ Flexitallic	1	EA			

			8	2307-E-4501/5501-ME-DW-30210 (sheet 3 of 4)	Floating head gasket (740 OD x 666mm ID x 5 mm thickness kamprofile AISI 304, filled with graphite as per attached drawing)	Klinger/ Flexitallic	1	EA			
10	E-4502/ E-5502	Molecular Sieve Regeneration Heater	21	2307-E-4502/5502-ME-DW-30240 (sheet 1 of 3)	Channel gasket (523 OD x 463 ID x 10mm rib x 5 mm thickness kamprofile AISI 304, filled with graphite as per attached drawing)	Klinger/ Flexitallic	1	EA			
			23	2307-E-4502/5502-ME-DW-30240 (sheet 1 of 3)	Shell gasket (523 OD x 465 ID x 5 mm thickness kamprofile AISI 304, filled with graphite as per attached drawing)	Klinger/ Flexitallic	1	EA			
11	E-4503/ E-5503	Feed Gas Cooler	23	2307-E-4503/5503-ME-DW-30270 (sheet 1 of 3)	Shell and Channel gasket (634 OD x 574 ID x 5 mm thickness kamprofile AISI 304, filled with graphite as per attached drawing)	Klinger/ Flexitallic	4	EA			

Note: Refer to mentioned drawings (attached) for detailed technical specifications. We have recommended FLEXITALLIC/ KLINGER as the OEM of gaskets, given that the gaskets are at critical equipment / item and should only be purchased from internationally recognized OEMs to ensure the quality / safety. However, from unknown suppliers, the gasket may fail and will lead to serious consequences on the asset safety.

OTHER TERMS AND CONDITIONS:

1. Successful Bidder will provide the material at Kunnar/KPD-TAY Site on FOR basis.
2. Defects, twists and deformation which may affect the tightness of the gasket are not allowed
3. Fabrication, inspection and acceptance shall comply with ASME B16.20 (Latest Edition)
4. Gasket Made should be of either KLINGER or FLEXITALLIC.
5. Material Testing Certificate is to be provided along with the delivery.
6. Inspection of the gasket would be carried out as per provided attached drawing.
7. The supplier may please asked to clear any ambiguity before wrong delivery.
8. Material should be delivered as per general specifications mentioned in the tender document.
9. The detailed Inspection of the delivered material will be carried out at site after delivery of material.
10. All the participating companies should have good experience in supply industrial material.
11. Delivery period within 8 to 10 weeks after placement of order.
12. Payment will be made through cross cheque after successful inspection of material at site.
13. Bidder will confirm that OEM Certificate will be provided along with the material.

ANNEXURE-A-1

GENERAL TERMS AND CONDITIONS:

- A. BIDS MUST BE SUBMITTED UNDER SINGLE STAGE TWO ENVELOPES BIDDING SYSTEM i.e. TECHNICAL & FINANCIAL BID SEALED SEPARATELY & IN SINGLE COVERING ENVELOPE ON DUE DATE.
- B. FINANCIAL BIDS OF ONLY TECHNICALLY RESPONSIVE BIDDERS WILL BE OPENED PUBLICLY.
- C. AFTER TENDER OPENING "TECHNICAL BIDS" WILL BE REVIEWED. THE BIDS WILL BE BROUGHT TECHNICALLY AT PAR BY SEEKING CLARIFICATIONS. THE BIDDERS WILL **NOT** BE ASKED FOR ANY PRICE CHANGE IN THEIR FINANCIAL BIDS DUE TO CERTAIN CLARIFICATIONS AND SUBSEQUENT CHANGE IN THEIR TECHNICAL PROPOSALS. THE BIDDERS WILL **NOT** BE ALLOWED TO SUBMIT SUPPLEMENTARY PRICE PROPOSALS IN A SEPARATE SEALED ENVELOPE TO MAKE IT A PART OF THE ALREADY SUBMITTED UNOPENED FINANCIAL BIDS AND TO ADJUST THEIR QUOTED PRICE SUBSEQUENTLY AFFECTED DUE TO CHANGE IN TECHNICAL PROPOSALS.
- D. SEALED FINANCIAL BIDS OF TECHNICALLY NON-RESPONSIVE BIDDERS WILL BE RETURNED UN-OPENED.
- E. OGDCL RESERVES THE RIGHT TO REJECT ANY OR ALL THE BIDS WITHOUT ASSIGNING ANY REASON.
- F. QUOTED PRICES MUST BE FIRM (INCLUSIVE OF GST, OTHER TAXES, AND DUTIES).
- G. OGDCL RESERVES THE RIGHT TO EVALUATE THE BID(S) EITHER ITEM-WISED OR FULL PASKAGE BASIS WITHOUT ASSIGNING ANY REASON. TO QOUTE COMPETITIVE PRICES FOR ALL OR ANY ITEMS ENABLE COMPANY TO DECIDE PURCHASE.
- H. THE MAXIMUM DELIVERY TIME FOR SUPPLY ITEMS IS EIGHT (08) WEEKS FROM THE DATE OF RECEIPT OF FIRM PURCHASE
- I. BIDDERS TO SUBMIT THEIR COMPANY PROFILES, EXPERIENCE OF SIMILAR SUPPLIES IN PAKISTAN ALONG WITH TECHNICAL BIDS

BIDDING FORM (TECHNICAL BID)

Oil & Gas Development Company Limited
Kunnar/KPD-TAY Field
C/O TCS office Tando JAM Distt Hyderabad

Gentlemen,

1. Having examined the Bidding Documents including the specifications, the receipt of which is hereby acknowledged, we the undersigned, offer to supply & deliver «Description» in conformity with drawings, specifications of goods and conditions of Tender Document.
2. We undertake, if our bid is accepted, to commence delivery within _____ days (Please specify days) from the date of receipt of your firm Purchase Order.
3. If our bid is accepted, we will provide the Performance Bond equal to 10% of the Purchase Order excluding GST, for due performance of the purchase order.
4. We agree to abide by all the terms & conditions of the tender for the period of _____ days (*Please specify days*) from the date fixed for receiving the same & it shall remain binding upon us and may be accepted at any time before the expiry of that period or any extension thereof agreed by us.
5. Until a formal Purchase Order is placed, this bid, together with your written acceptance thereof, shall constitute a binding contract between us. We understand that you are not bound to accept the lowest priced or any bid you may receive.

Dated this _____ day of _____ 200_____

(Signature)
(In the capacity of)

Duly authorized to sign Bid for and on behalf of _____

(Signature of Witness)

Name: - _____

Address:- _____

BID SUMMARY SHEET
TENDER NO. (TE/543/KPD-MECH/ATA/2018)
(TO BE ATTACHED WITH TECHNICAL BID)

1. Bidder Name _____
- a. Address, Phone & Fax No _____
- b. E-mail address _____
2. Manufacturer Name & _____
- a. Country of Origin: _____
- b. (Where required) _____
3. Items Quoted:(give serial no. only): _____
4. Price Validity: _____
5. Offered Delivery/ Completion Period: _____
6. GST Registration No. _____
7. Bidding Form (Annexure-B Attached with Technical Bid): Yes No
8. Bid Bond Attached with **TECHNICAL** Bid: Yes No
9. Any Deviation: _____

Signature _____

Name & Designation _____

BIDDING FORM (FINANCIAL BID)

Oil & Gas Development Company Limited
Kunnar/KPD-TAY Field
C/O TCS office Tando JAM Distt Hyderabad.

Gentlemen,

1. Having examined the Bidding Documents including the specifications, the receipt of which is hereby acknowledged, we the undersigned offer to supply & deliver «Description» in conformity with drawings, specifications of goods and conditions of Tender for the sum of Rs. _____ (Total bid amount in words) (inclusive of all taxes) or such other sum as may be ascertained in accordance with the said conditions.

2. Until a formal Purchase Order is placed, this bid, together with your written acceptance thereof, shall constitute a binding contract between us. We understand that you are not bound to accept the lowest priced or any bid you may receive.

Dated this _____ day of _____ 201____

(Signature)
(In the capacity of)

Duly authorized to sign Bid for and on behalf of _____

(Signature of Witness)

Name: - _____

Address: - _____

BID SUMMARY SHEET
TENDER NO. (TE/543/KPD-MECH/ATA/2018)
(TO BE ATTACHED WITH FINANCIAL BID)

1. Bidder Name _____
Address, Phone & Fax No _____
E-mail address _____
2. Manufacturer Name & _____
Country of Origin: _____
(Where required)
3. Items Quoted: (give serial no. only): _____

4. Price Validity: _____
5. Total FOR (Destination) Price (Without GST): Rs _____
6. Total FOR (Destination) Price (With GST): Rs _____
7. Amount of Bid Bond (without GST): Rs _____
8. Validity of Bid Bond (Expiry Date): _____
9. Offered Delivery Period: _____
10. Payment Terms: _____
11. GST _____ Registration _____ No. _____
12. Bidding Form (Annexure-B-1 attached with TECHNICAL bid): Yes No
13. Any Deviation: _____

Signature _____

Name & Designation _____

BANK GUARANTEE AS EARNEST MONEY

Guarantee # : _____
Date of Issue : _____
Date of Expiry : _____
Amount : _____

**Oil & Gas Development Company Limited
Kunnar/KPD-TAY Field
C/O TCS Office Tando JAM Distt Hyderabad**

In consideration of _____
Hereinafter called "THE BIDDER" HAVING SUBMITTED THE ACCOMPANYING Bid and
in consideration of value received from (the bidder above), we hereby agree to undertake as
follows:

1. To make unconditional payment of Rs. _____
(Rupees _____) up on your written
demand without further recourse, question or reference to the BIDDER or any other
person in the specified Bid after opening of the same for the validity thereof or if no such
period be specified, within 120 days after the said opening or if the Bidder, having been
notified of the acceptance of his bid by the Purchaser during the period of bid validity:
 - a) Fails or refuses to execute the Purchase Order in accordance with the instructions
to the Bidders, or
 - b) Fails or refuses to furnish Performance Bond in accordance with the instructions
to Bidders.
2. To accept written intimation(s) from you as conclusive and sufficient evidence of the
existence of a default or non-compliance as aforesaid on the part of the BIDDER and to
make payment accordingly within 03 (three) days of receipt of the written intimation.
3. No grant of time or other indulgence to or composition or arrangement with the Bidder in
respect of aforesaid Bid with or without notice to us shall affect this Guarantee and our
liabilities and commitments hereunder.
4. This guarantee shall be binding on us and our successors in interest and shall be
irrevocable.

(BANKER)

DECLARATION OF FEES, COMMISSION AND BROKERAGE ETC.
CERTIFICATE

Submitted to OGDCL with the reference to Purchase Order No. _____

Hereby declares its intention not to obtain or induce the procurement of any contract, right, interest, privileges or other obligation or benefit from Government of Pakistan or any administrative subdivision or agency thereof or any corrupt business practice.

Without limiting the generality of the foregoing, the Seller/ Supplier represents and warrants that it has fully declared the brokerage, commission, fees etc., paid or payable to anyone and not given or agreed to give and shall not be given or agree to give to anyone within or outside Pakistan either directly or indirectly through any national or juridical person, including its affiliate, agent, associate, broker, consultant, briber, finder's fee or kickback, whether described as consultant fee or otherwise, with the object of obtaining or including the procurement of a contract right, interest, privilege or other obligation or benefit in whatsoever form from GOP except that privilege or other obligation or benefit in whatsoever form from GOP except that which has been expressly declared pursuant hereto.

The Seller/ Supplier certifies that it has made and will make full disclosure of all agreement and arrangements with all persons in respect of or related to the transaction with GOP and has not taken any action or will not take any action to circumvent the above declaration, representation or warranty.

The Seller/ Supplier accepts full responsibility and strict liability for making any false declaration not making full disclosure, mis-representing facts or taking any action likely to defeat the purpose of this declaration, representation and warranty. It agrees that any contract, right interest, Privilege or other obligation or benefit obtained or procured as aforesaid shall, without prejudice to any other rights and remedies available to GOP under any law, contract or other instrument, be voidable at the option of GOP.

Notwithstanding any rights and remedies exercised by GOP in this regard, the Seller/ Supplier agrees to indemnify GOP for any loss or damage incurred by it on account of its corrupt business practices and further pay compensation to GOP in an amount equivalent to ten times the sum of any commission, gratification, bribe, finder's fee or kickback given by the Seller/ Supplier as aforesaid for the purpose of obtaining or inducing the procurement of any contract, right, interest, privilege or other obligation or benefit in whatsoever form from GOP.

For & On Behalf of
Seller/ Supplier



OIL & GAS DEVELOPMENT COMPANY LTD

Oil & Gas Development Company Limited
Kunnar/KPD-TAY Field,

C/O TCS Office Tando Jam Hyderabad Sindh-Pakistan

TEL: : 92 022-2761407
FAX: : 92 022-2761410
EMAIL: : icmaintknr@ogdcl.com

Web Site: www.ogdcl.com
GST No: 07-02-2802-001-55

LPO No : TE/543/KPD-MECH/ATA/2018

ISSUED ON : _____

M/s _____,

_____.

SUBJECT: LOCAL PURCHASE ORDER.

Dear Sir,

Ref your quotation dated _____ opened on _____ against our
Press Tender/Tender Enquiry/Fax Enquiry # PROC-L () _____
Dated _____ regarding procurement of _____.

We feel pleasure in placing an order on you for the supply of stores given below. Terms
and Conditions of supply are noted below and on reverse.

A/C CODE: _____

INDENT No. _____ DT. _____

FOR: (LOCATION _____) DEPARTMENT _____

S. NO.	DESCRIPTION	QTY	UNIT	INDEX NUMBER	UNIT RATE (RUPEES)		TOTAL (RUPEES)
					(EXCL OF GST)	(INCL OF GST)	
					(RUPEES ONLY)		
GRAND TOTAL:							
(INCLUSIVE OF % GST)							

TERMS & CONDITIONS:

- DELIVERY PLACE & PERIOD:** AT OUR _____ WITHIN _____ AFTER ISSUANCE OF LPO.
- PAYMENT CLAUSE:**
 - PAYMENT AFTER DELIVERY (OR)
 - PAYMENT AGAINST DELIVERY (OR)
 - _____ % ADVANCE PAYMENT AGAINST BANK GUARANTEE.
- PERFORMANCE BOND:** 10% PERFORMANCE BOND IN SHAPE OF BANK GUARANTEE AS PER CLAUSE # _____ OF TENDER DOCUMENTS MUST BE SUBMITTED WITHIN 10DAYS.
- INSPECTION:**
- PLEASE ACKNOWLEDGE RECEIPT OF THIS ORDER IMMEDIATELY ACKNOWLEDGEMENT AND/OR PERFORMANCE, PARTIAL OR COMPLETE, OF THIS PURCHASE ORDER SHALL CONSTITUTE THE SUPPLIER/SELLER'S ACCEPTANCE OF ALL TERMS AND CONDITIONS OF THIS PURCHASE ORDER WITHOUT REGARD TO AND IN SUPERSESSION OF ANY AND ALL PREVIOUS CORRESPONDENCE/ DOCUMENTATION BETWEEN THE PARTIES.

for **OIL & GAS DEVELOPMENT COMPANY LTD.**

GENERAL TERMS AND CONDITIONS

1. **GENERAL:** These terms and conditions shall form an integral part of this Local Purchase Order and both the Supplier/Seller and the Purchaser shall be bound by all the provisions contained hereunder.
2. **DELIVERY:**
 - a. The material strictly according to specification must be delivered through Delivery Challan in triplicate at the place and within the time mentioned in this order (on reverse) by you at your own expenses {excluding a grace period of 10 (Ten) days for postal delivery of this Purchase Order}.
 - b. Time is of the essence of this order.
3. **EXTENSION IN SUPPLY PERIOD:** Supply period may be extended in exception cases provided that;
 - a. Force Majeure case is established by the Supplier.
4. **INSPECTION:** All items of this order will be subject to acceptance/rejection by the Inspection Committee/3rd Party Inspector (if required), who will give its decision within 07 days of receipt of material. Rejected material shall be removed / replaced by the Supplier within 07 days from the date of receipt of letter/fax, issued by the Field Manager QP Gas Field. The Supplier will be liable to pay storage charges @ ½ % of the cost of rejected material on every day basis if the same is not removed within 07 days. After 10 days the penalty will be charged at the rate of 5% per day with the supplier's maximum liability under this clause not to exceed 15% of the total value of the Purchase Order.
5. **PENALTY:** For failure to comply with Delivery Clause, penalty shall be imposed on the Supplier as under:
 - a. @ ½ % of cost of entire order or such items as remain un-supplied for every day upto a maximum of 15% for 10 days exceeding the delivery period.
 - b. If the material is not supplied even after paying penalty for 10 (ten) consecutive days. OGDCL reserves the right to cancel the supply order and to obtain the required items from elsewhere at your risk and cost.
6. **DOCUMENTATION FOR PAYMENT:** Following documents must be provided after receipt of Local Purchase Order (LPO) and payment will be processed only after receipt of said certificates:
 - a. National Tax Number (NTN), General Sales Tax (GST) and Professional Tax Paid Certificates must be provided by the firm immediately after receipt of Local Purchase Order (LPO) and payment will be processed only after receipt of said certificates.
 - b. Commercial Invoice having NTN/CNIC Numbers
 - c. Sales Tax Invoice
 - d. Professional Tax Paid Certificate
 - e. Copy of valid Tax Exemption Certificate (if any)
 - f. Delivery Challan
7. **You are encouraged to inform the M.D. and Head of Deptt(s) on the following addresses/ contacts, in case where any OGDCL employee asks for any type of favour whether monetary or in kind:**

DESIGNATION	ADDRESS	TEL #	FAX #	E. MAIL
MANAGING DIRECTOR	OGDCL HOUSE, JINNAH AVENUE, ISLAMABAD	051- 9209701	051- 9209708	
I/C Mechanical Section	Kunnar/KPD-TAY Field	022-2720752	022-2761410	icmaintknr@ogdcl.com

8. **GOVERNING LAW:** This Local Purchase Order and any matter relating thereto shall be governed by the laws of Pakistan.
9. **WARRANTIES:** Supplier/Seller warrants that all goods, material, equipment or services furnished hereinabove will conform strictly to the Purchaser's specifications.
10. **TITLE:** Supplier/seller warrants that the goods, material, equipment shall be delivered free from any and all security interests, liens, encumbrances and claims of any nature.
11. **COMPLIANCE WITH LAWS:** Supplier/seller agrees to indemnify the Purchaser for any loss, damage or cost suffered by the Purchaser as a consequence of the Supplier/seller's failure, deliberate or otherwise, to comply with any applicable laws, rules, regulations or orders/directives of any public sector entity and/or Government.
12. **ARBITRATION:** Any dispute, difference or question arising out of or in respect of this Purchase Order shall be settled by arbitration in accordance with the Arbitration Act, 1940.
13. Acknowledge receipt of this order immediately.

BANK GUARANTEE AS PERFORMANCE BOND

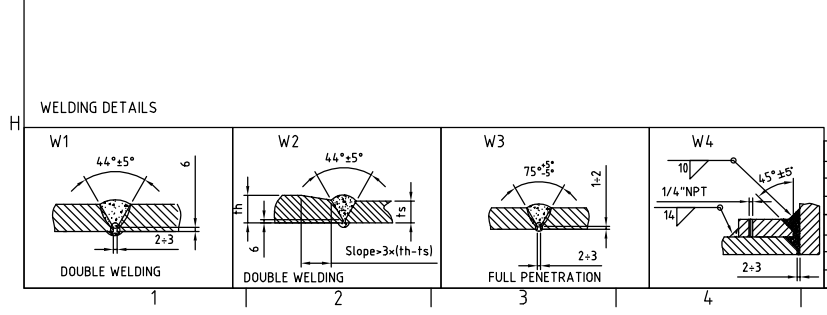
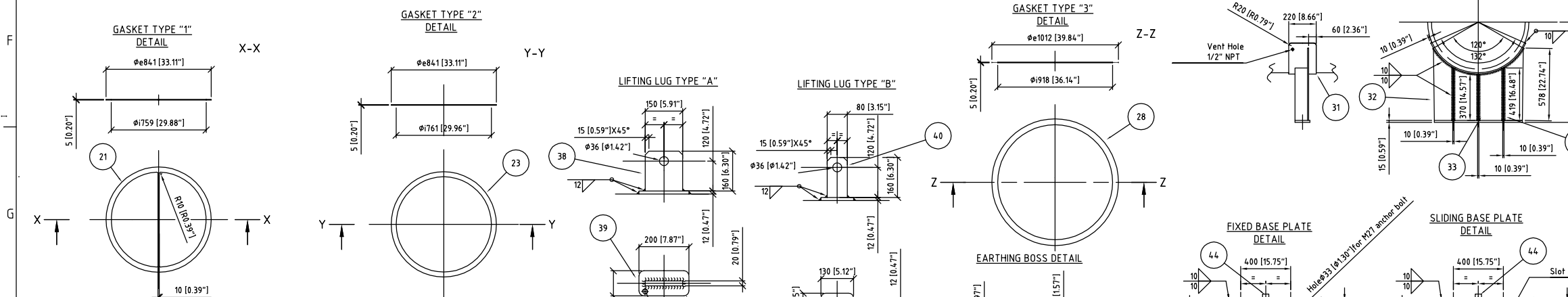
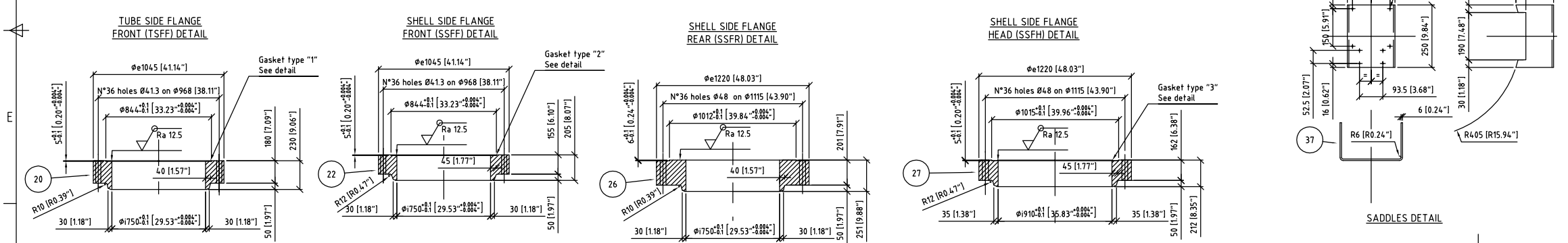
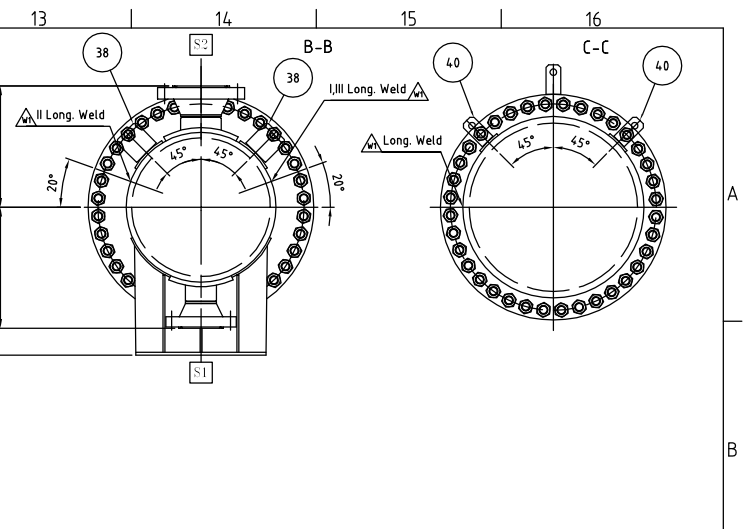
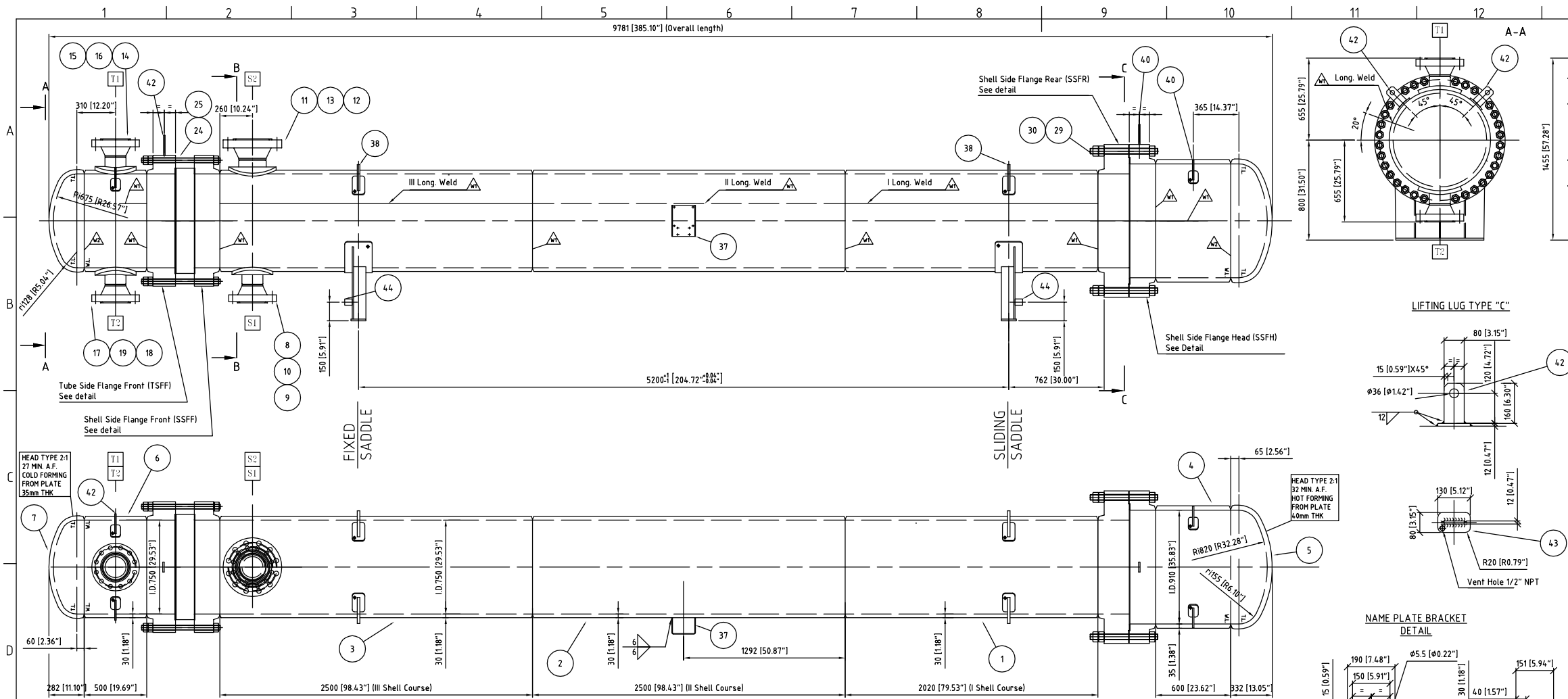
Guarantee # _____
Date of issue: - _____
Date of expiry:- _____
Amount: - _____

**Oil & Gas Development Company Limited
Kunnar/KPD-TAY Field
C/O TCS Office Tando JAM Distt Hyderabad.**

In consideration of your issuance of Local Purchase Order # // _____ dated _____ to M/s. _____ called supplier and in consideration for value received from supplier we (Please mention name of Bank) at the request of M/s. (Please mention name of supplier) hereby agree and undertake as:-

1. To make unconditional payments to you as called upon 5% of the value of the LPO (please mention amount of guarantee in words and figures) mentioned in the said LPO on your return demands without further recourse, question or reference to supplier or any other person in the event of default, non-performance or non-fulfillment by supplier of his obligations, liabilities, responsibilities under the said LPO which you shall be the soul judge.
2. to accept return intimation from you as conclusive and sufficient evidence of existence if a default or breach as aforesaid on the part of supplier and to make payment accordingly within 03 (Three) days of receipt thereof .
3. To keep this guarantee in full force from the date hereof until 30 (Thirty) days from the date of delivery of last consignment of material at given destination as per LPO.
4. To keep 50% amount of this guarantee enforce from the date hereof until 12 months from the date of delivery of last consignment of the material of at given destination as per LPO.
5. That no grant of time or other indulgence to, amendment in the terms of LPO by agreement between the parties or imposition or agreement with LPO in respect of the performance of this obligations under the said agreement, with or without notice to us shall in any manner discharged or otherwise affect this guarantee and our liabilities and commitments their under.
6. This guarantee shall be binding on us and our successor's interest and shall be irrevocable.
7. This guarantee shall not be affected by any change in the constitutions of the Guarantor Bank or the supplier.

(BANKER)



BOLT TENSION VALUE [KN]			
ITEM	NOMINAL DIAMETER	1ST. PASS	2ND. PASS
24	1 1/2	63	126
30	1 3/4	84	168

BOLT TORQUE VALUE [KNxm]			
ITEM	NOMINAL DIAMETER	1ST. PASS	2ND. PASS
24	1 1/2	0.5	1.0
30	1 3/4	0.7	1.4

CONNECTIONS										
TAG	NPS	RATING	FLANGES TYPE	FAC.	NECK THK.	NOZZLE SCH.	PAD WIDTHXTHK.	SERVICE	WELDING DETAIL	NOTES
S1	6	900#	WN	RJ	10.97	80	80X25	COLD GAS INLET	W3-W4	-
S2	6	900#	WN	RJ	12.7	80	80X25	COLD GAS OUTLET	W3-W4	-
T1	6	900#	WN	RJ	10.97	80S	80X30	HOT GAS INLET	W3-W4	-
T2	6	900#	WN	RJ	10.97	80S	80X30	HOT GAS OUTLET	W3-W4	-

Det.	Item	Qty	Description	Standard	Material	Impact	Cert.	Tolerance	Note
44	2	Earthing Boss	See Detail	AISI 304	-	-	-	-	-
43	3	Pad	130x80x12 thk.	SA240 304/304L	-	-	-	-	SA480 Dual Grade
42	3	Lifting Lug Type "C"	80X160X12 thk.	SA240 304/304L	-	-	-	-	SA480 Dual Grade
41	3	Pad	130x80x12 thk.	SA516 Gr.70N	-	-	-	-	SA20
40	3	Lifting Lug Type "B"	80X160X12 thk.	SA516 Gr.70N	-	-	-	-	SA20
39	4	Pad	100x200x12 thk.	SA516 Gr.70N	-	-	-	-	SA20
38	4	Lifting Lug Type "A"	150X160X20 thk.	SA516 Gr.70N	-	-	-	-	SA20
37	1	Name Plate Bracket	See Detail	SA516 Gr.70N	-	-	-	-	SA20
36	1	Sliding Base Plate	705x120x15 thk.	S275JR EN 10025	-	-	-	-	-
35	1	Fixed Base Plate	705x120x15 thk.	S275JR EN 10025	-	-	-	-	-
34	4	Rib	10x4.19x100	SA516 Gr.70N	-	-	-	-	-
33	2	Rib	10x3.70x100	SA516 Gr.70N	-	-	-	-	-
32	2	Plate	10x7.19x578	SA516 Gr.70N	-	-	-	-	-
31	2	Pad	220x94.5x10 thk.	SA516 Gr.70N	-	-	-	-	SA20
30	108	Nut	1 3/4, Thread 8UN-2B	SA194 Gr.2H	-	-	-	-	B1.1 Zinc Yellow Bichromated
29	36	Stud Bolt	1 3/4x540, Thread 8UN-2A	SA193 Gr.B7	-	-	-	-	B1.1 Zinc Yellow Bichromated
28	1	Gasket Type "3"	See Detail	Kamprufite NSI 304, filled with Graphite	-	-	-	-	m=2,y=27.6 MPa
27	1	Shell Side Flange Head (SSFH)	See Detail	SA350 LF2 CL1	-	-	-	-	See Detail
26	1	Shell Side Flange Rear (SSFR)	See Detail	SA350 LF2 CL1	-	-	-	-	See Detail
25	108	Nut	1 1/2, Thread 8UN-2B	SA194 Gr.2H	-	-	-	-	B1.1 Zinc Yellow Bichromated
24	36	Stud Bolt	1 1/2x530, Thread 8UN-2A	SA193 Gr.B7	-	-	-	-	B1.1 Zinc Yellow Bichromated
23	1	Gasket Type "2"	See Detail	Kamprufite NSI 304, filled with Graphite	-	-	-	-	m=2,y=27.6 MPa
22	1	Shell Side Flange Front (SSFF)	See Detail	SA350 LF2 CL1	-	-	-	-	See Detail
21	1	Gasket Type "1"	See Detail	Kamprufite NSI 304, filled with Graphite	-	-	-	-	m=2,y=27.6 MPa
20	1	Tube Side Flange Front (TSFF)	See Detail	SA182 F304/304L	-	-	-	-	See Detail
T2	19	1	Pad	80x30 thk.	SA240 304/304L	-	-	-	SA480 Dual Grade
T2	18	1	Nozzle	Øe168.3x10.97 thk.	SA312 TP304/304L	-	-	-	SA125X Dual Grade
T2	17	1	Flange	6" WN-RJ 900# neck thk. 19.97	SA182 F304/304L	-	-	-	SA16.5 Dual Grade
T1	16	1	Pad	80x30 thk.	SA240 304/304L	-	-	-	SA480 Dual Grade
T1	15	1	Nozzle	Øe168.3x10.97 thk.	SA312 TP304/304L	-	-	-	SA125X Dual Grade
T1	14	1	Flange	6" WN-RJ 900# neck thk. 19.97	SA182 F304/304L	-	-	-	SA16.5 Dual Grade
S2	13	1	Pad	80x25 thk.	SA516 Gr.70N	-	-	-	SA20
S2	12	1	Nozzle	Øe219.1x12.7 thk.	SA333 Gr.6	-	-	-	SA125X
S2	11	1	Flange	8" WN-RJ 900# neck thk. 12.7	SA350 LF2 CL1	-	-	-	SA16.5
S1	10	1	Pad	80x25 thk.	SA516 Gr.70N	-	-	-	SA20
S1	9	1	Nozzle	Øe168.3x10.97 thk.	SA333 Gr.6	-	-	-	SA125X
S1	8	1	Flange	6" WN-RJ 900# neck thk. 19.97	SA350 LF2 CL1	-	-	-	SA16.5
7	1	Front Head type 21	Ø750x35 thk.	SA240 304/304L	-	-	-	-	SA125X Dual Grade
6	1	Front Channel	30x500x2450	SA240 304/304L	-	-	-	-	SA480 Dual grade
5	1	Rear Head type 21	Ø750x40 thk.	SA516 Gr.70N	-	-	-	-	SA125X
4	1	Rear Channel	35x600x2969	SA516 Gr.70N	-	-	-	-	SA20
3	1	III Shell Course	30x2500x2450	SA516 Gr.70N	-	-	-	-	SA20
2	1	II Shell Course	30x2500x2450	SA516 Gr.70N	-	-	-	-	SA20
1	1	I Shell Course	30x2020x2450	SA516 Gr.70N	-	-	-	-	SA20

BOM

2 AS BUILT
 1 Revised as per BE comments
 0 14/05/14 Issued for Approval

SICC Sp.A. Rovigo
 Viale Porta Po, 89
 45100 ROVIGO (ITALY)
 Phone +390425403111
 Telefax +390425403177

Code: 14094E4501E55
 Scale: 1:40
 Sostituisce-Replaces: R1
 N. Dwg: 14094-2
 N. Rev: 2

REGENERATION GAS PRE-HEATER
 ITEMS: E-4501; E-5501
 CONSTRUCTION DRAWING

Date: 07/05/2014
 Designer: C. Cervellati
 Verifier: C. Cervellati

OIL & GAS DEVELOPMENT COMPANY Ltd
 TEL: 051 2623141 ISLAMABAD-PAKISTAN

ZISHAN ENGINEERS Ltd. (Pvt)
 TEL: (92-21) 34393045 KARACHI-PAKISTAN

Contract No. PROC-FC/CB/PROJ-522/767349/2013 Client Job N: 165-4

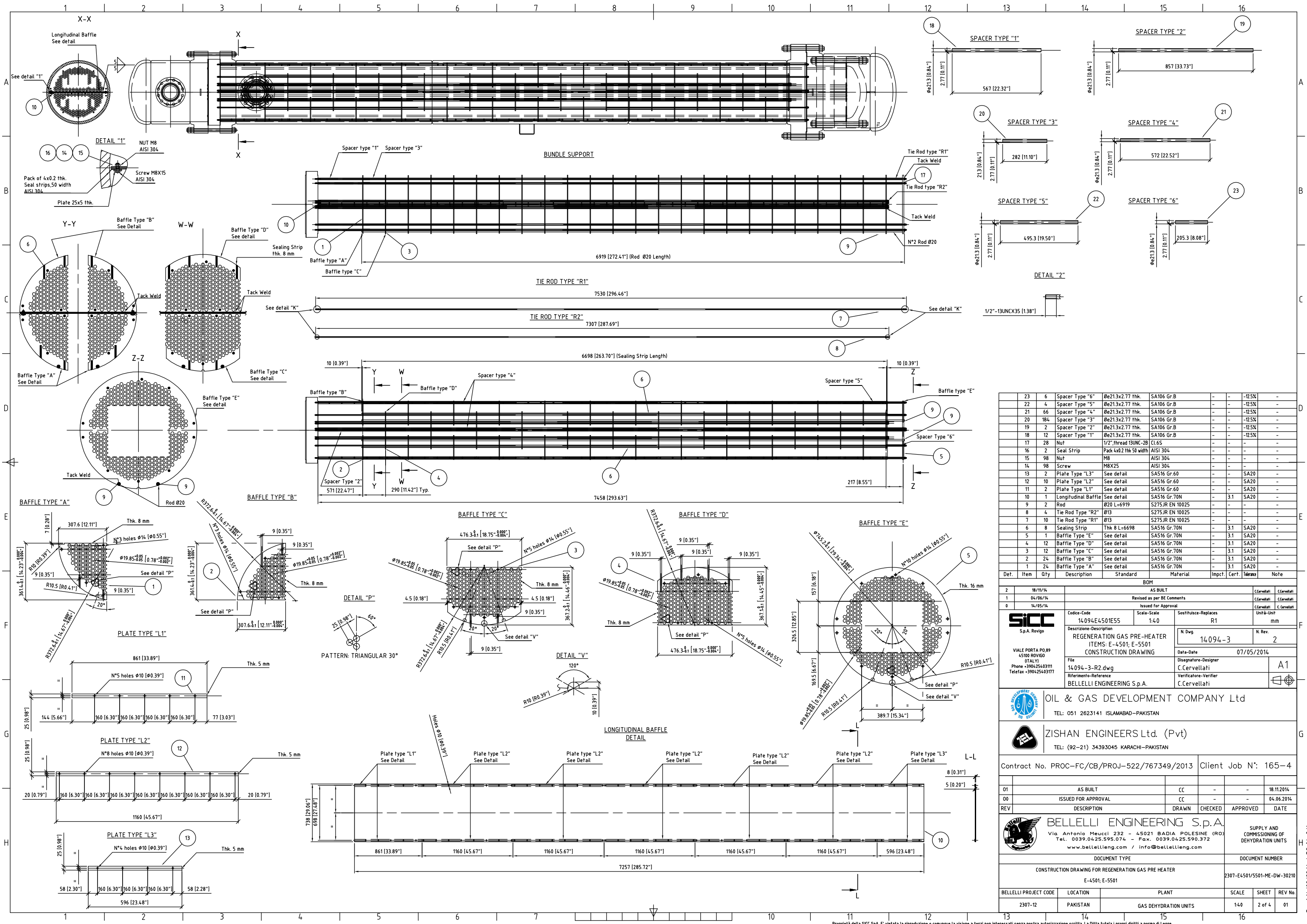
01	AS BUILT	CC	-	-	18.11.2014
00	ISSUED FOR APPROVAL	CC	-	-	04.06.2014
REV	DESCRIPTION	DRAWN	CHECKED	APPROVED	DATE

BELLELLI ENGINEERING S.p.A.
 Via Antonio Meucci 232 - 45021 BADIA POLESINE (RO)
 Tel. 0039.0425.595.074 - Fax. 0039.0425.590.372
 www.bellellieng.com / info@bellellieng.com

DOCUMENT TYPE: CONSTRUCTION DRAWING FOR REGENERATION GAS PRE HEATER
 E-4501; E-5501

SUPPLY AND COMMISSIONING OF DEHYDRATION UNITS
 DOCUMENT NUMBER: 2307-E4501/5501-ME-DW-30210

BELLELLI PROJECT CODE	LOCATION	PLANT	SCALE	SHEET	REV No.
2307-10311	PAKISTAN	GAS DEHYDRATION UNITS	1:40	1 of 4	01



Item	Qty	Description	Standard	Material	Impct.	Cert.	Tolerance	Note
23	6	Spacer Type "6"	Ø213x2.77 thk.	SA106 Gr.B	-	-	-12.5%	-
22	4	Spacer Type "5"	Ø213x2.77 thk.	SA106 Gr.B	-	-	-12.5%	-
21	66	Spacer Type "4"	Ø213x2.77 thk.	SA106 Gr.B	-	-	-12.5%	-
20	184	Spacer Type "3"	Ø213x2.77 thk.	SA106 Gr.B	-	-	-12.5%	-
19	2	Spacer Type "2"	Ø213x2.77 thk.	SA106 Gr.B	-	-	-12.5%	-
18	12	Spacer Type "1"	Ø213x2.77 thk.	SA106 Gr.B	-	-	-12.5%	-
17	28	Nut	1/2" thread 13UNC-2B	CL65	-	-	-	-
16	2	Seal Strip	Pack 4x0.2 thk 50 width	AISI 304	-	-	-	-
15	98	Nut	M8	AISI 304	-	-	-	-
14	98	Screw	M8x25	AISI 304	-	-	-	-
13	2	Plate Type "L3"	See detail	SA516 Gr.60	-	-	-	SA20
12	10	Plate Type "L2"	See detail	SA516 Gr.60	-	-	-	SA20
11	2	Plate Type "L1"	See detail	SA516 Gr.60	-	-	-	SA20
10	1	Longitudinal Baffle	See detail	SA516 Gr.70N	-	-	-	3.1 SA20
9	2	Rod	Ø20 L=6919	S275JR EN 10025	-	-	-	-
8	4	Tie Rod Type "R2"	Ø13	S275JR EN 10025	-	-	-	-
7	10	Tie Rod Type "R1"	Ø13	S275JR EN 10025	-	-	-	-
6	8	Sealing Strip	Thk 8 L=6698	SA516 Gr.70N	-	-	-	3.1 SA20
5	1	Baffle Type "E"	See detail	SA516 Gr.70N	-	-	-	3.1 SA20
4	12	Baffle Type "D"	See detail	SA516 Gr.70N	-	-	-	3.1 SA20
3	12	Baffle Type "C"	See detail	SA516 Gr.70N	-	-	-	3.1 SA20
2	24	Baffle Type "B"	See detail	SA516 Gr.70N	-	-	-	3.1 SA20
1	24	Baffle Type "A"	See detail	SA516 Gr.70N	-	-	-	3.1 SA20

BOM			
Det.	Item	Qty	Description
2	18/11/14		AS BUILT
1	04/06/14		Revised as per BE Comments
0	16/05/14		Issued for Approval

SICC Sp.A. Rovigo
 Codice-Code: 14094E4501E55
 Scale-Scale: 1:40
 Sostituisce-Replaces: R1
 Unità-Unit: mm
 Description-Description: REGENERATION GAS PRE-HEATER
 ITEMS: E-4501; E-5501
 Construction Drawing
 File: 14094-3-R2.dwg
 Designator-Designer: C.Cervellati
 Verificatore-Verifier: C.Cervellati
 Data-Date: 07/05/2014
 N. Dwg: 14094-3
 N. Rev: 2

OIL & GAS DEVELOPMENT COMPANY Ltd
 TEL: 051 2623141 ISLAMABAD-PAKISTAN

ZISHAN ENGINEERS Ltd. (Pvt)
 TEL: (92-21) 34393045 KARACHI-PAKISTAN

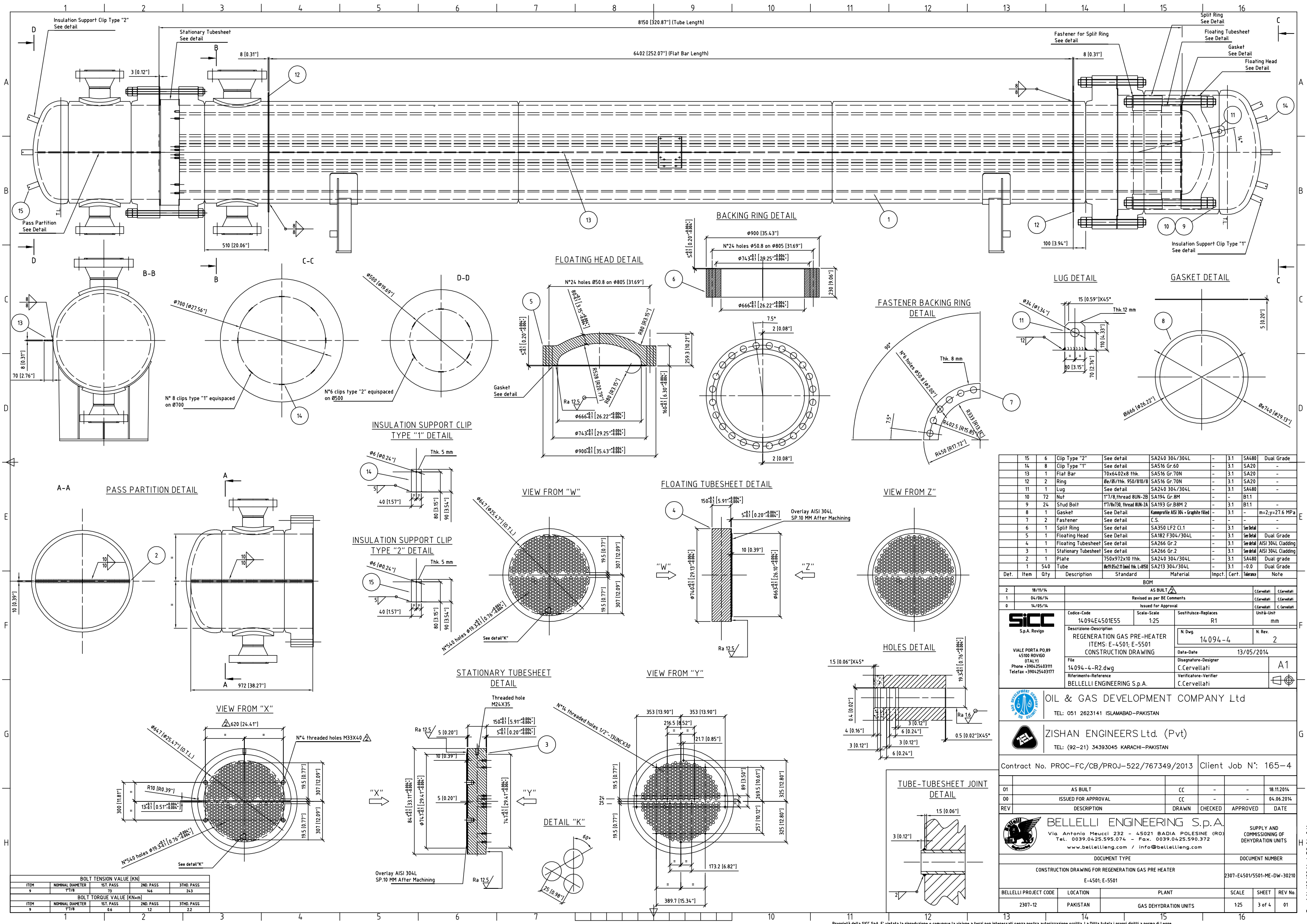
Contract No. PROC-FC/CB/PROJ-522/767349/2013 Client Job N': 165-4

01	AS BUILT	CC	-	-	18.11.2014
00	ISSUED FOR APPROVAL	CC	-	-	04.06.2014
REV	DESCRIPTION	DRAWN	CHECKED	APPROVED	DATE

BELLELLI ENGINEERING S.p.A.
 Via Antonio Meucci 232 - 45021 BADIA POLESINE (RO)
 Tel. 0039.0425.595.074 - Fax. 0039.0425.590.372
 www.bellellieng.com / info@bellellieng.com

SUPPLY AND COMMISSIONING OF DEHYDRATION UNITS

DOCUMENT TYPE		DOCUMENT NUMBER			
CONSTRUCTION DRAWING FOR REGENERATION GAS PRE HEATER		2307-E4501/5501-ME-DW-30210			
E-4501; E-5501					
BELLELLI PROJECT CODE	LOCATION	PLANT	SCALE	SHEET	REV No.
2307-12	PAKISTAN	GAS DEHYDRATION UNITS	1:40	2 of 4	01



Det.	Item	Qty	Description	Standard	Material	Impact	Cert.	Tolerance	Note
15	6	Clip Type "2"	See detail		SA240 304/304L	-	3.1	SA480	Dual Grade
14	8	Clip Type "1"	See detail		SA516 Gr.60	-	3.1	SA20	-
13	1	Flat Bar	70x64.02x8 thk.		SA516 Gr.70N	-	3.1	SA20	-
12	2	Ring	ØxØ/thk. 950/810/8		SA516 Gr.70N	-	3.1	SA20	-
11	1	Lug	See detail		SA240 304/304L	-	3.1	SA480	-
10	72	Nut	1"7/8 Thread 8UN-2B		SA193 Gr.B8M	-		B1.1	-
9	24	Stud Bolt	1"7/8x70 Thread 8UN-2A		SA193 Gr.B8M 2	-	3.1	B1.1	-
8	1	Gasket	See detail		Kamprite ASI 304 + Graphite filled	-	3.1	-	m=2;y=27.6 MPa
7	2	Fastener	See detail		C.S.	-			-
6	1	Split Ring	See detail		SA350 LF2 Cl.1	-	3.1	See Detail	-
5	1	Floating Head	See detail		SA182 F304/304L	-	3.1	See Detail	Dual Grade
4	1	Floating Tubesheet	See detail		SA266 Gr.2	-	3.1	See Detail	SAI 304L Cladding
3	1	Stationary Tubesheet	See detail		SA266 Gr.2	-	3.1	See Detail	SAI 304L Cladding
2	1	Plate	750x972x10 thk.		SA240 304/304L	-	3.1	SA480	Dual Grade
1	540	Tube	ØxØxL min thk. L=850		SA213 304/304L	-	3.1	-0.0	Dual Grade

AS BUILT		Scale		Sostituisce-Replaces	
18/11/14	14.094E4501E55	1:25	R1		
04/06/14	Revised as per BE Comments				
14/05/14	Issued for Approval				
SICC		Codice-Code		Unità-Unit	
S.p.A. Rovigo		14.094-4-R2.dwg		mm	
VIALE PORTA PO.89 45100 ROVIGO (ITALY) Phone +390425493111 Telefax +390425493177		Description-Description REGENERATION GAS PRE-HEATER ITEMS: E-4501; E-5501 CONSTRUCTION DRAWING		N. Dwg. N. Rev. 14.094-4 2	
		Data-Date 13/05/2014		Disegnatore-Designer C.Cervellati	
		Riferimento-Reference BELLELLI ENGINEERING S.p.A.		Verificatore-Verifier C.Cervellati	

OIL & GAS DEVELOPMENT COMPANY Ltd TEL: 051 2623141 ISLAMABAD-PAKISTAN	
ZISHAN ENGINEERS Ltd. (Pvt) TEL: (92-21) 34393045 KARACHI-PAKISTAN	
Contract No. PROC-FC/CB/PROJ-522/767349/2013	Client Job N': 165-4

REV	DESCRIPTION	DRAWN	CHECKED	APPROVED	DATE
01	AS BUILT	CC	-	-	18.11.2014
00	ISSUED FOR APPROVAL	CC	-	-	04.06.2014

BELLELLI ENGINEERING S.p.A.
 Via Antonio Meucci 232 - 45021 BADIA POLESINE (RO)
 Tel. 0039.0425.595.074 - Fax. 0039.0425.590.372
 www.bellellieng.com / info@bellellieng.com

DOCUMENT TYPE: CONSTRUCTION DRAWING FOR REGENERATION GAS PRE HEATER
 E-4501; E-5501
 DOCUMENT NUMBER: 2307-E4-501/ME-DW-30210

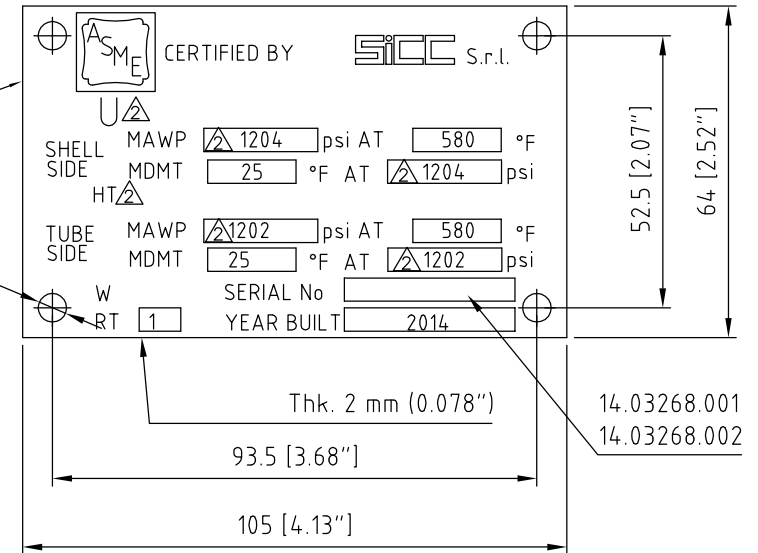
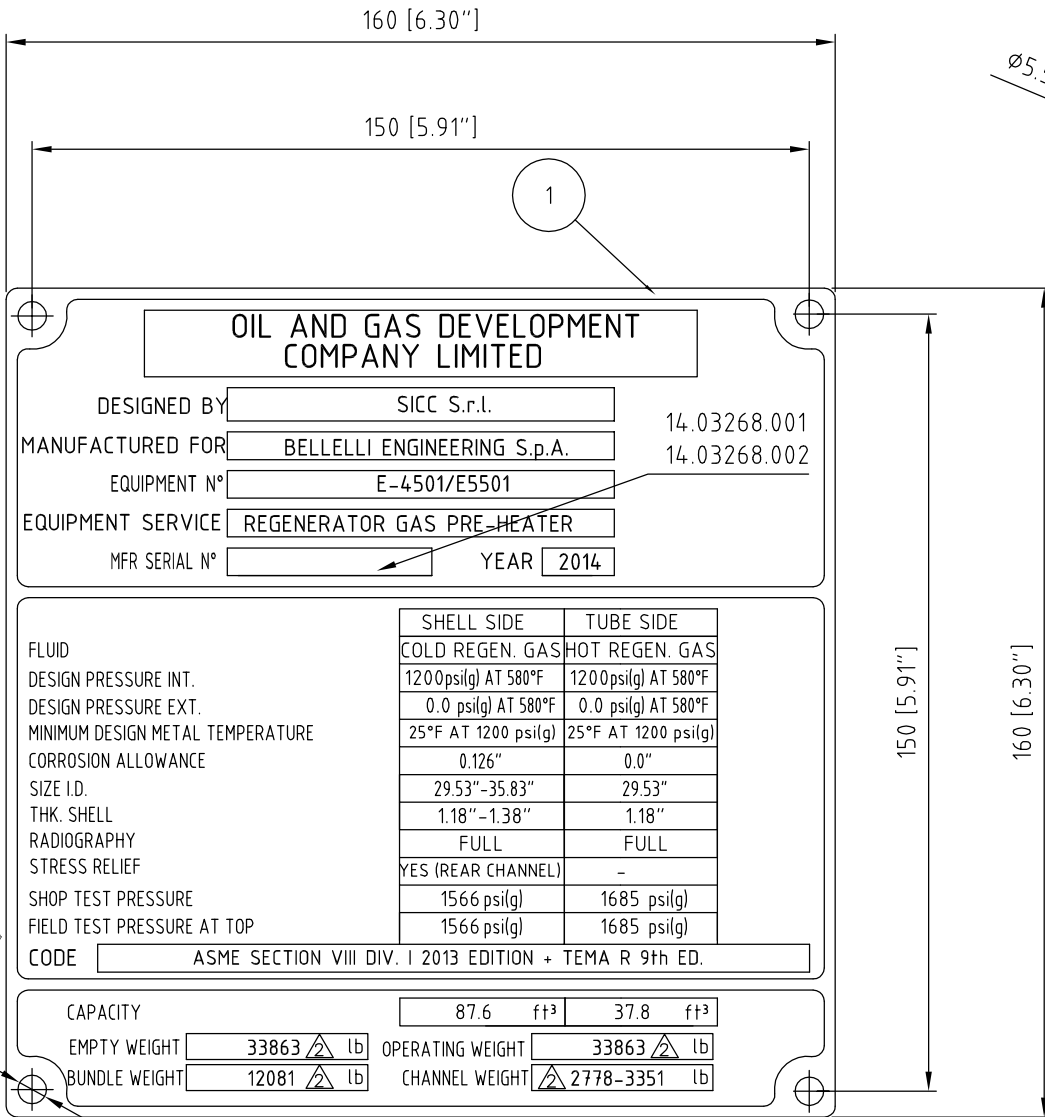
BELLELLI PROJECT CODE	LOCATION	PLANT	SCALE	SHEET	REV No.
2307-12	PAKISTAN	GAS DEHYDRATION UNITS	1:25	3 of 4	01

BOLT TENSION VALUE [KN]			
ITEM	NOMINAL DIAMETER	1ST. PASS	2ND. PASS
9	1"7/8	73	243

BOLT TORQUE VALUE [KN·m]			
ITEM	NOMINAL DIAMETER	1ST. PASS	3RD. PASS
9	1"7/8	6.6	2.2

CUSTOMER NAME PLATE DETAIL

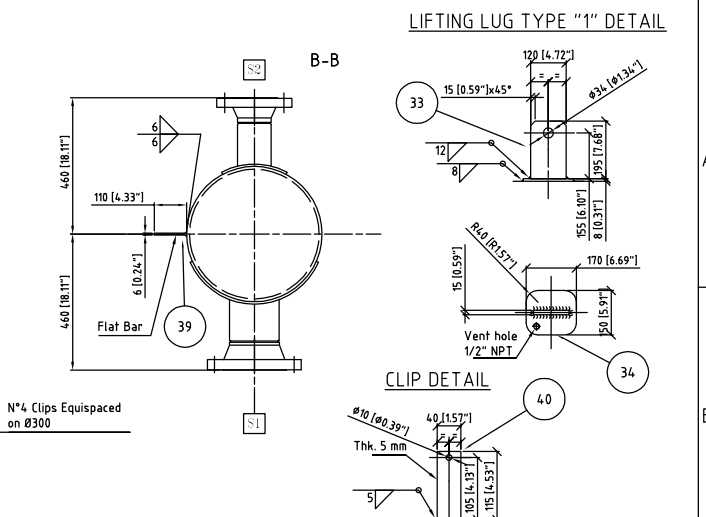
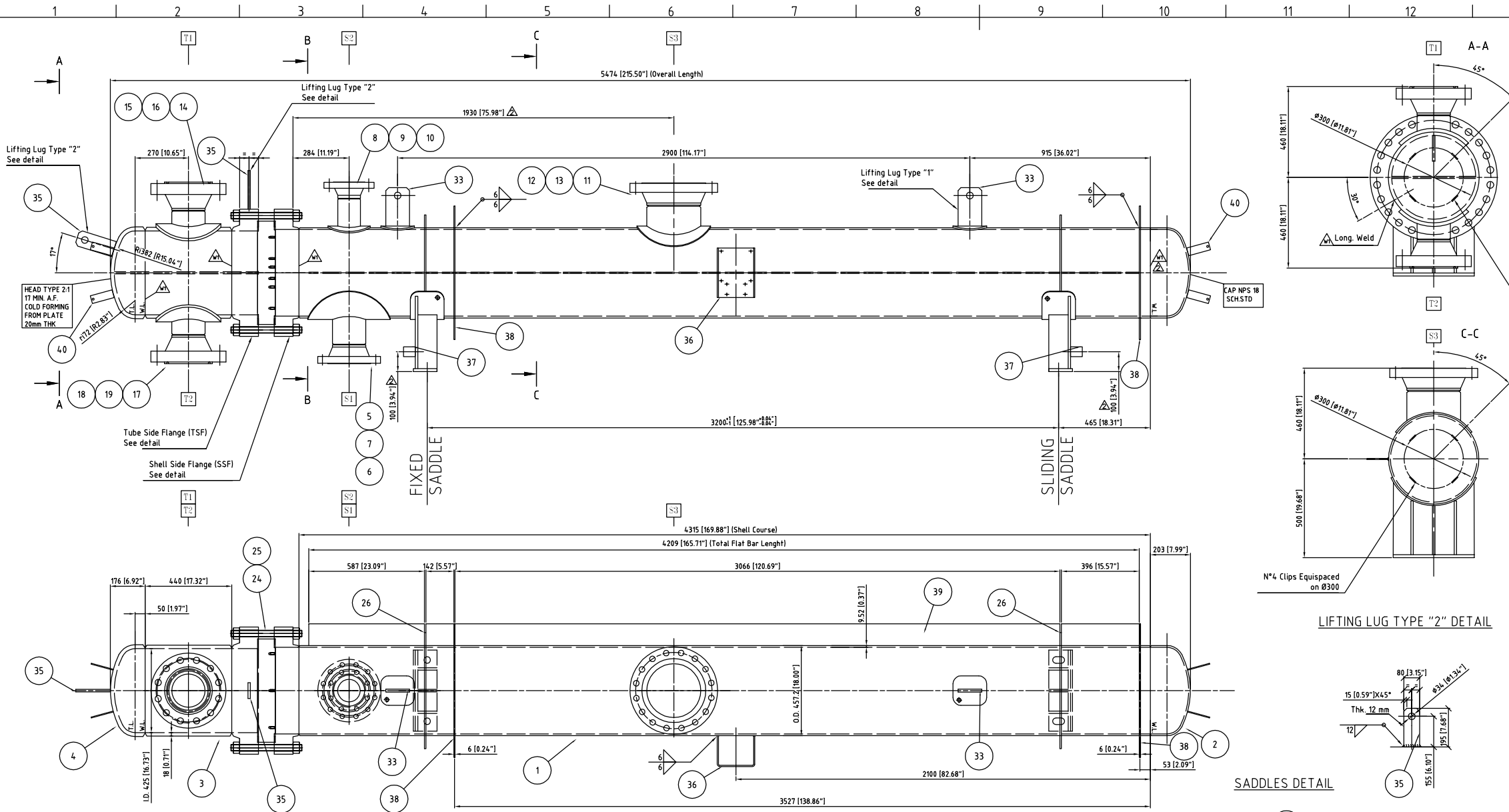
ASME NAME PLATE DETAIL



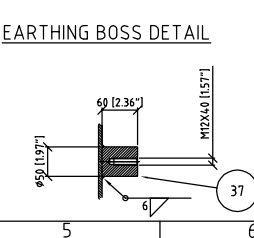
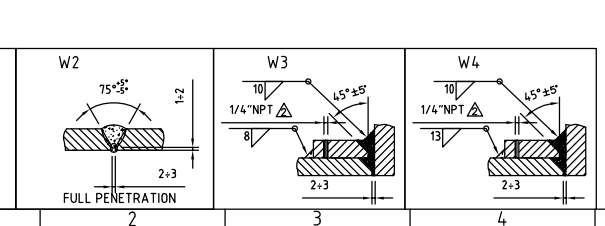
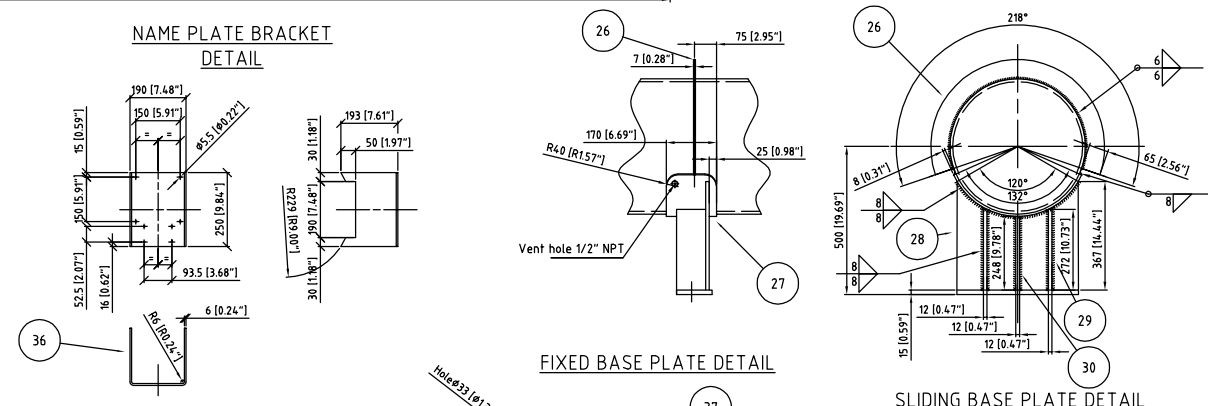
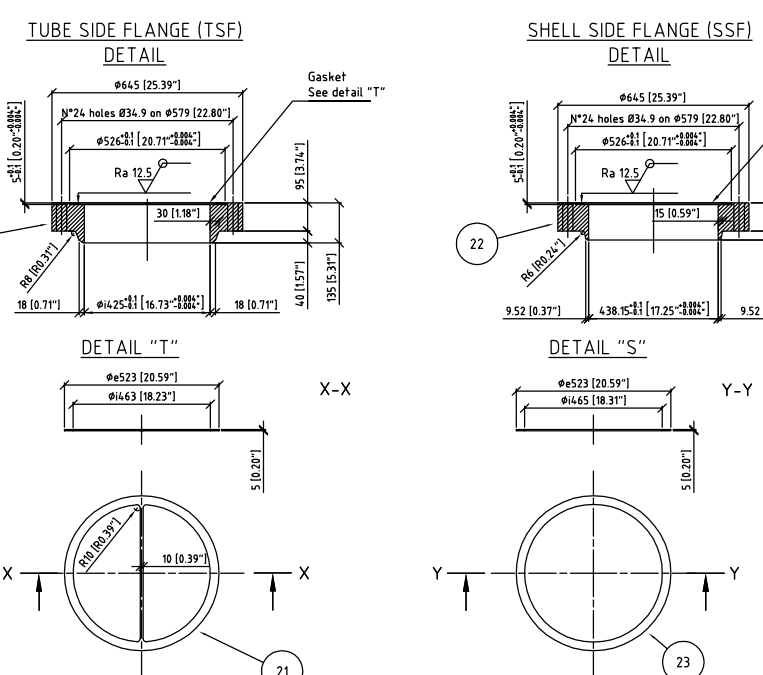
	SHELL SIDE	TUBE SIDE
FLUID	COLD REGEN. GAS	HOT REGEN. GAS
DESIGN PRESSURE INT.	1200 psi(g) AT 580°F	1200 psi(g) AT 580°F
DESIGN PRESSURE EXT.	0.0 psi(g) AT 580°F	0.0 psi(g) AT 580°F
MINIMUM DESIGN METAL TEMPERATURE	25°F AT 1200 psi(g)	25°F AT 1200 psi(g)
CORROSION ALLOWANCE	0.126"	0.0"
SIZE I.D.	29.53"-35.83"	29.53"
THK. SHELL	1.18"-1.38"	1.18"
RADIOGRAPHY	FULL	FULL
STRESS RELIEF	YES (REAR CHANNEL)	-
SHOP TEST PRESSURE	1566 psi(g)	1685 psi(g)
FIELD TEST PRESSURE AT TOP	1566 psi(g)	1685 psi(g)
CODE	ASME SECTION VIII DIV. I 2013 EDITION + TEMA R 9th ED.	

CAPACITY	87.6	ft ³	37.8	ft ³
EMPTY WEIGHT	33863	lb	33863	lb
BUNDLE WEIGHT	12081	lb	2778-3351	lb
OPERATING WEIGHT				
CHANNEL WEIGHT				

2	1	ASME name plate	See detail	ASME B31.3					
1	1	Customer name plate	See detail	ASME B31.3					
Det.	Item	Qty	Description	Standard	Material	Impact	Cert.	Minus	Note
Elenco parti									
-	-	-	AS BUILT						
2	1	1	Revised as per BE Comments						
1	1	1	Issue for Approval						
1	1	1	Scale: Scale	15	Seal/Plugs-Replaces	R1			
S.P.A. Revigo			Descrizione-Description	REGENERATOR GAS PRE-HEATER	ITEMS: E-4501/E5501				
VIALE PORTA PO.89 45100 ROVIGO ITALY			H. Dwg	14.094-5	R. Rev.	2			
			Date-Date	14/05/2014					
			File	14.094-5-R2.dwg	Disegnatore-Designer	C. Cervellati			A1
			Riferimento-Reference	Bellelli Engineering S.p.A.	Verificatore-Verifier	C. Cervellati			
OIL & GAS DEVELOPMENT COMPANY Ltd									
TEL: 051 2623141 ISLAMABAD-PAKISTAN									
ZISHAN ENGINEERS Ltd. (Pvt)									
TEL: (92-21) 34383045 KARACHI-PAKISTAN									
Contract No. PROC-FC/CB/PROJ-522/767349/2013					Client Job N': 165-4				
01	AS BUILT			CC	-	-	-	-	18.11.2014
02	ISSUED FOR APPROVAL			CC	-	-	-	-	04.06.2014
REV	DESCRIPTION	DRAWN	CHECKED	APPROVED	DATE				
BELLELLI ENGINEERING S.p.A.									
Via Antonio Meucci 232 - 45021 BADIA POLESINE (RO) Tel. 0039.04.25.595.074 - Fax. 0039.04.25.590.372 www.bellelliang.com / info@bellelliang.com									
SUPPLY AND COMMISSIONING OF DEHYDRATION UNITS									
DOCUMENT TYPE									
CONSTRUCTION FOR REGENERATION GAS PRE HEATER									
E-4501, E-5501									
2307-E4501/E5501-ME-0W-3020									
BELLELLI PROJECT CODE	LOCATION	PLANT			SCALE	SHEET	REV No.		
2307-12	PAKISTAN	GAS DEHYDRATION UNITS			15	4 of 4	01		



Def.	Item	Qty	Description	Standard	Material	Impact.	Cert.	Tolerance	Note
	40	8	Clip	See detail	SA516 Gr.70N	-	-	3.1	SA20
	39	1	Flat Bar	110x4.209x6 thk.	SA516 Gr.70N	-	-	3.1	SA20
	38	2	Insulation Support Ring	Øe/Øi/thk. 677/458/6	SA516 Gr.70N	-	-	3.1	SA20
	37	2	Earthing Boss	See detail	SA106 Gr.70N	-	-	-	-
	36	1	Name Plate Bracket	See detail	SA516 Gr.70N	-	-	3.1	SA20
	35	2	Lifting Lug Type "2"	80x195x12 thk.	SA516 Gr.70N	-	-	3.1	SA20
	34	2	Pad	150x170x8 thk.	SA516 Gr.70N	-	-	3.1	SA20
	33	2	Lifting Lug Type "1"	120x195x12 thk.	SA516 Gr.70N	-	-	-	SA20
	32	1	Sliding Base Plate	120x4.10x15 thk.	S275JR EN 10025	-	-	-	-
	31	1	Fixed Base Plate	120x4.10x15 thk.	S275JR EN 10025	-	-	-	-
	30	2	Rib	248x98x12 thk.	SA516 Gr.70N	-	-	-	SA20
	29	4	Rib	272x98x12 thk.	SA516 Gr.70N	-	-	-	SA20
	28	2	Plate	367x4.10x12 thk.	SA516 Gr.70N	-	-	-	SA20
	27	2	Pad	170x53x8 thk.	SA516 Gr.70N	-	-	3.1	SA20
	26	2	Stiffener Ring	Øe/Øi/thk. 581/457/12 thk.	SA516 Gr.70N	-	-	3.1	SA20
	25	48	Nut	1"1/4, Thread 8UN-2B	SA194 Gr.2H	-	-	-	B1.1 Zinc Yellow Bichromated
	24	24	Stud Bolt	1"1/4x360, thread 8UN-2A	SA193 Gr.B7	-	-	3.1	B1.1 Zinc Yellow Bichromated
	23	1	Gasket type "S"	See Detail	Kamproflon® ANSI 304, Graphite filled	-	-	3.1	m=2,y=27.6 MPa
	22	1	Shell Side Flange	See detail	SA105N	-	-	3.1	See detail
	21	1	Gasket type "T"	See Detail	Kamproflon® ANSI 304, Graphite filled	-	-	3.1	m=2,y=27.6 MPa
	20	1	Tube Side Flange	See detail	SA105N	-	-	3.1	See detail
T2	19	1	Pad	80x18 thk.	SA516 Gr.70N	-	-	3.1	SA20
T2	18	1	Nozzle	Øe168.3x10.97 thk.	SA106 Gr.B	-	-	3.1	-12.5%
T2	17	1	Flange	6" WN-RJ 9008 neck thk. 12.7	SA105N	-	-	3.1	B16.5
T1	16	1	Pad	80x18 thk.	SA516 Gr.70N	-	-	3.1	SA20
T1	15	1	Nozzle	Øe168.3x10.97 thk.	SA106 Gr.B	-	-	3.1	-12.5%
T1	14	1	Flange	6" WN-RJ 9008 neck thk. 12.7	SA105N	-	-	3.1	B16.5
S3	13	1	Pad	50x8 thk.	SA516 Gr.70N	-	-	3.1	SA20
S3	12	1	Nozzle	Øe273x12.7 thk.	SA106 Gr.B	-	-	3.1	-12.5%
S3	11	1	Flange	W WN-RF 3008 neck thk. 12.7	SA105N	-	-	3.1	B16.5
S2	10	1	Pad	50x8 thk.	SA516 Gr.70N	-	-	3.1	SA20
S2	9	1	Nozzle	Øe114.3x8.56 thk.	SA106 Gr.B	-	-	3.1	-12.5%
S2	8	1	Flange	L WN-RF 3008 neck thk. 12.7	SA105N	-	-	3.1	B16.5
S1	7	1	Pad	125x8 thk.	SA516 Gr.70N	-	-	3.1	SA20
S1	6	1	Nozzle	Øe168.3x10.97 thk.	SA106 Gr.B	-	-	3.1	-12.5%
S1	5	1	Flange	6" WN-RF 3008 neck thk. 12.7	SA105N	-	-	3.1	B16.5
	4	1	Head type 2.1	Øi4.25x20 thk.	SA516 Gr.70N	-	-	3.1	-3
	3	1	Channel	18x44x1392	SA516 Gr.70N	-	-	3.1	SA20
	2	1	Cap	Øe457.2x9.52 thk.	SA234 Gr.WPB	-	-	3.1	-12.5%
	1	1	Shell	Øe457.2x9.52 thk.	SA106 Gr.B	-	-	3.1	-12.5%



BOLT TENSION VALUE [KN]				
ITEM	NOMINAL DIAMETER	1ST. PASS	2ND. PASS	3THD. PASS
24	1"1/4	36	72	122

BOLT TORQUE VALUE [KN×m]				
ITEM	NOMINAL DIAMETER	1ST. PASS	2ND. PASS	3THD. PASS
24	1"1/4	0.2	0.4	0.7

CONNECTIONS										
TAG	NPS	RATING	FLANGES TYPE	FAC.	NECK THK.	NOZZLE SCH.	PAD WIDTHXTHK.	SERVICE	WELDING DETAILS	NOTES
S1	6	300#	WN	RF 125-250AARH	10.97	XS	125X8	THERMINOL 66 INLET	W2-W3	-
S2	4	300#	WN	RF 125-250AARH	8.56	XS	50X8	THERMINOL 66 OUTLET	W2-W3	-
S3	10	300#	WN	RF 125-250AARH	12.7	XS	50X8	RUPTURE DISK	W2-W3	-
T1	6	900#	WN	RJ	10.97	XS	80x18	DRY REGENERATION GAS INLET	W2-W4	-
T2	6	900#	WN	RJ	10.97	XS	80x18	DRY REGENERATION GAS OUTLET	W2-W4	-

SICC S.p.A. Rovigo

VIALE PORTA PO.89
45100 ROVIGO (ITALY)
Phone +39042549311
Telefax +39042549317

BELLELLI ENGINEERING S.p.A.
Via Antonio Meucci 232 - 45021 BADIO POLESINE (RO)
Tel. 0039.0425.595.074 - Fax. 0039.0425.590.372
www.bellellieng.com / info@bellellieng.com

Oil & Gas Development Company Ltd
TEL: 051 2623141 ISLAMABAD-PAKISTAN

ZISHAN ENGINEERS Ltd. (Pvt)
TEL: (92-21) 34393045 KARACHI-PAKISTAN

BELLELLI ENGINEERING S.p.A.
SUPPLY AND COMMISSIONING OF DEHYDRATION UNITS

Contract No. PROC-FC/CB/PROJ-522/767349/2013 Client Job N': 165-4

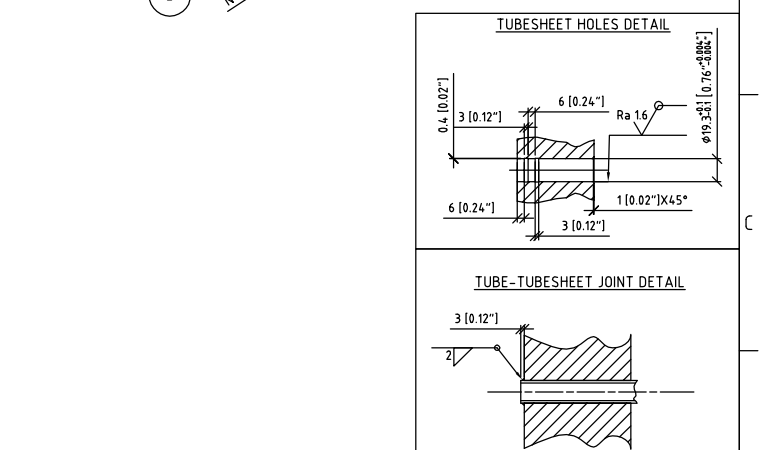
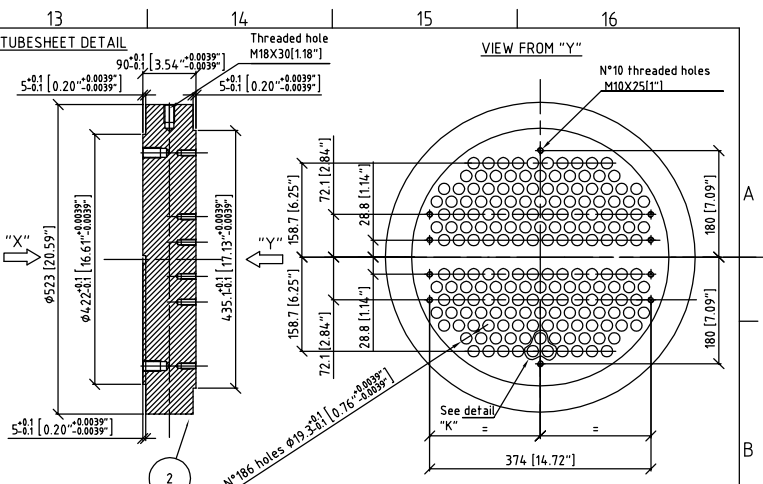
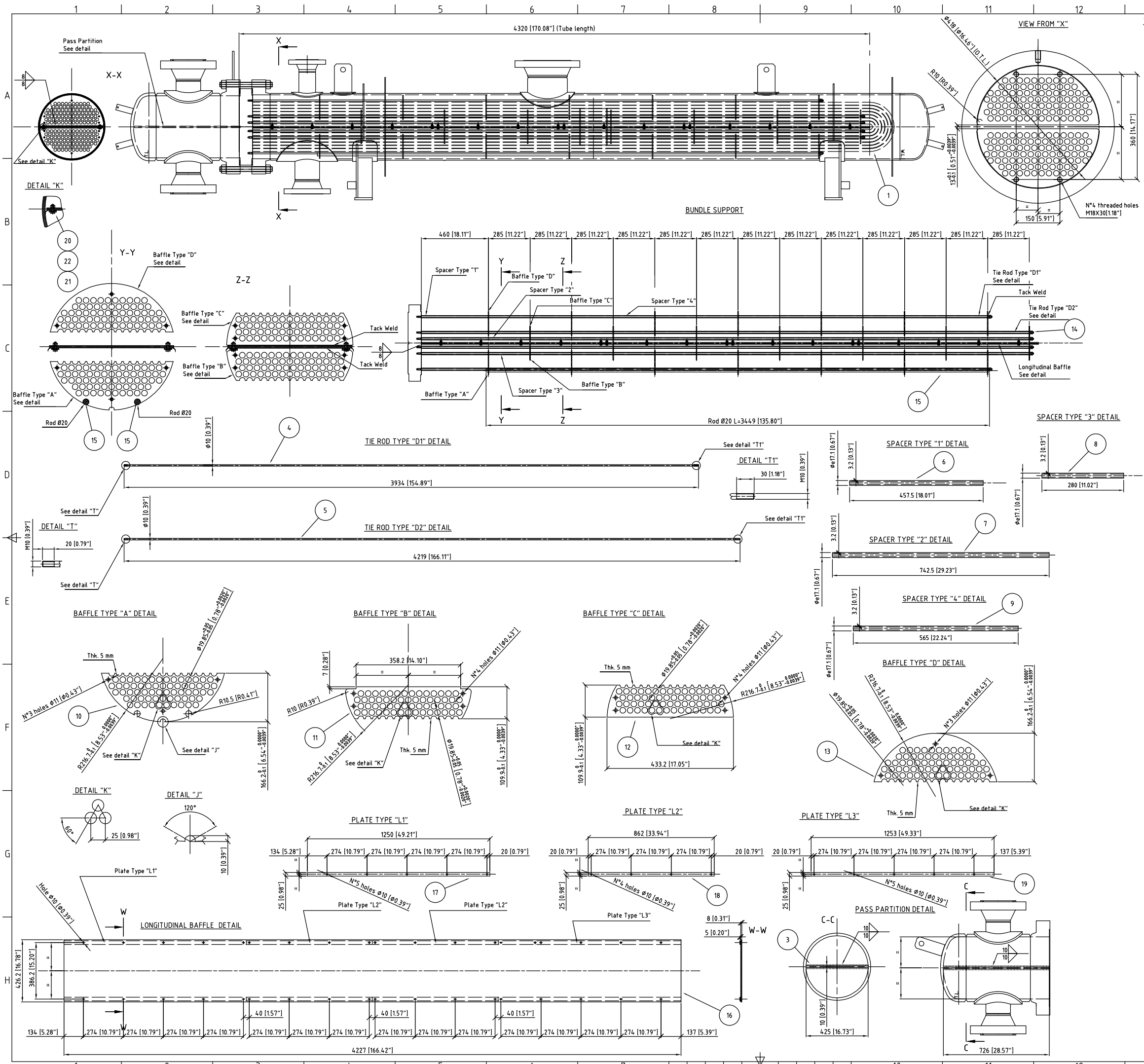
REV	DESCRIPTION	DRAWN	CHECKED	APPROVED	DATE
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00	ISSUED FOR APPROVAL	CC	-	-	09.06.2014

Contract No. PROC-FC/CB/PROJ-522/767349/2013 Client Job N': 165-4

Contract No. PROC-FC/CB/PROJ-522/767349/2013 Client Job N': 165-4

Contract No. PROC-FC/CB/PROJ-522/767349/2013 Client Job N': 165-4

Rev.1 14/09/99 Mod. Pd. 04-2/1



Det.	Item	Qty	Description	Standard	Material	Impact	Cert.	Tolerance	Note
22	2	Seal Strip	Pack 4x0.2 thk 50 width	AISI 304	-	-	-	-	-
21	36	Nut	M8	AISI 304	-	-	-	-	-
20	36	Screw	M8X25	AISI 304	-	-	-	-	-
19	2	Plate Type "L3"	Thk.5 See detail	SA516 GR.70N	-	-	-	-	SA20
18	4	Plate Type "L2"	Thk.5 See detail	SA516 GR.70N	-	-	-	-	SA20
17	2	Plate Type "L1"	Thk.5 See detail	SA516 GR.70N	-	-	-	-	SA20
16	1	Longitudinal Baffle	426x427x8 thk.	SA516 GR.70N	-	-	-	-	SA20
15	2	Rod	Ø20 L=344.9	S275JR EN 10025	-	-	-	-	-
14	20	Nut	M10	Cl.6S	-	-	-	-	-
13	7	Baffle Type "D"	See detail	SA516 GR.70N	-	-	-	-	See detail
12	7	Baffle Type "C"	See detail	SA516 GR.70N	-	-	-	-	See detail
11	7	Baffle Type "B"	See detail	SA516 GR.70N	-	-	-	-	See detail
10	7	Baffle Type "A"	See detail	SA516 GR.70N	-	-	-	-	See detail
9	36	Spacer Type "4"	See detail	SA106 Gr.B	-	-	-	-	-12.5%
8	52	Spacer Type "3"	See detail	SA106 Gr.B	-	-	-	-	-12.5%
7	4	Spacer Type "2"	See detail	SA106 Gr.B	-	-	-	-	-12.5%
6	6	Spacer Type "1"	See detail	SA106 Gr.B	-	-	-	-	-12.5%
5	8	Tie Rod Type "D2"	See detail	S275JR EN 10025	-	-	-	-	-
4	2	Tie Rod Type "D1"	See detail	S275JR EN 10025	-	-	-	-	-
3	1	Pass partition	425x726x10 thk.	SA516 GR.70N	-	-	-	-	SA20
2	1	Tubesheet	See detail	SA266 Gr.2	-	-	-	-	See detail
1	93	U-TUBE	Ø19.05x2.11 (avg.)	SA179	-	-	-	-	-12.5%

BOM			
2	AS BUILT	26/09/14	
1	Revised as per BE Comments	09/06/14	
0	Issued for Approval	27/05/14	

SICC S.p.A. Rovigo	Codice-Code 14.095E4502E55	Scale-Scale 1:25	Substitute-Replaces R1	Unit & Unit mm
VIALE PORTA PO.89 45100 ROVIGO (ITALY) Phone +39042549311 Telefax +39042549317	Description-Description MOLECULAR SIEVE REGENERATION HEATER ITEMS: E-4502; E-5502 CONSTRUCTION DRAWING	N. Dwg. 14.095-3	N. Rev. 2	Data-Date 26/05/2014
	File 14.095-3-R2.dwg	Designatore-Designer C.Cervellati		A1
	Riferimento-Reference BELLELLI ENGINEERING S.p.A.	Verificatore-Verifier C.Cervellati		

OIL & GAS DEVELOPMENT COMPANY Ltd
 TEL: 051 2623141 ISLAMABAD-PAKISTAN

ZISHAN ENGINEERS Ltd. (Pvt)
 TEL: (92-21) 34393045 KARACHI-PAKISTAN

Contract No. PROC-FC/CB/PROJ-522/767349/2013 Client Job N': 165-4

REV	DESCRIPTION	DRAWN	CHECKED	APPROVED	DATE
01	AS BUILT	CC	-	-	26.09.2014
00	ISSUED FOR APPROVAL	CC	-	-	09.06.2014

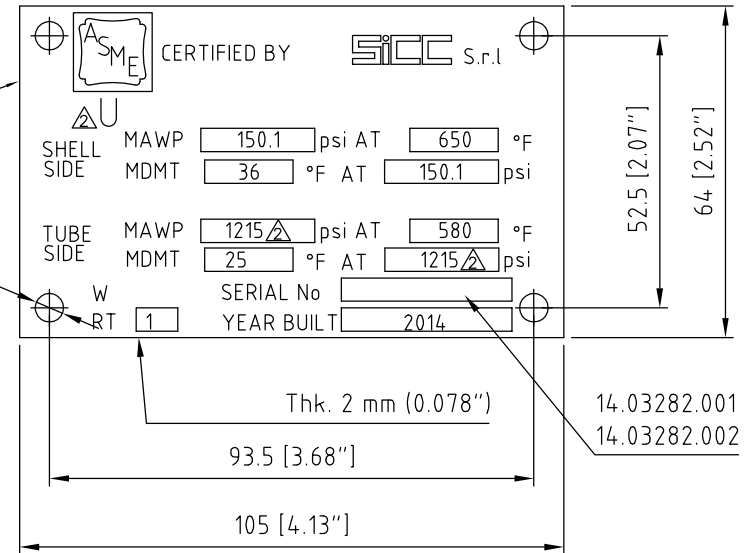
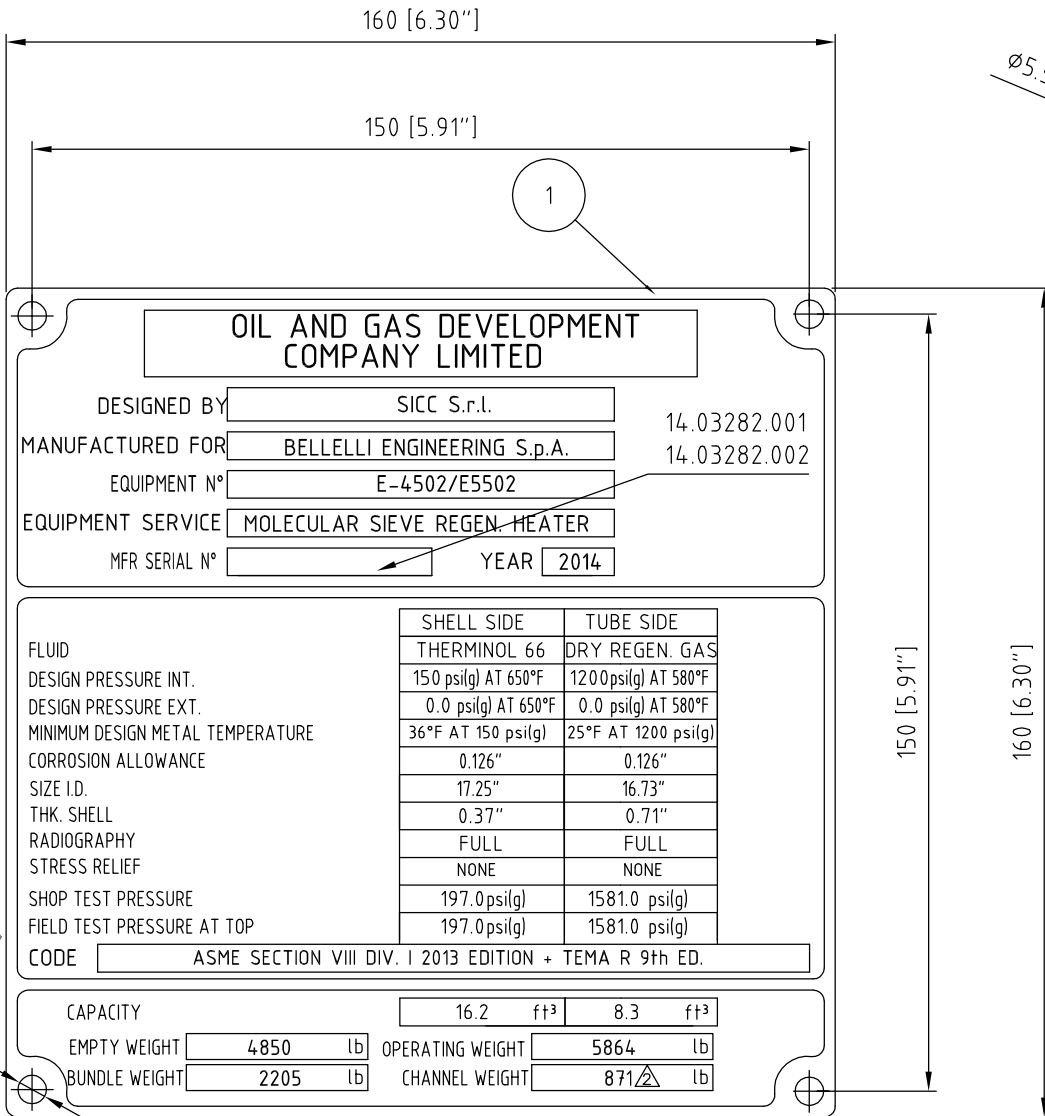
BELLELLI ENGINEERING S.p.A.
 Via Antonio Meucci 232 - 45021 BADIA POLESINE (RO)
 Tel. 0039.0425.595.074 - Fax. 0039.0425.590.372
 www.bellellieng.com / info@bellellieng.com

DOCUMENT TYPE	DOCUMENT NUMBER
CONSTRUCTION DRAWING FOR MOLECULAR SIEVE REGENERATION HEATER E-4502; E-5502	2307-E4502/5502-ME-DW-30240

BELLELLI PROJECT CODE	LOCATION	PLANT	SCALE	SHEET	REV No.
2307-12	PAKISTAN	GAS DEHYDRATION UNITS	1:25	2 of 3	01

CUSTOMER NAME PLATE DETAIL

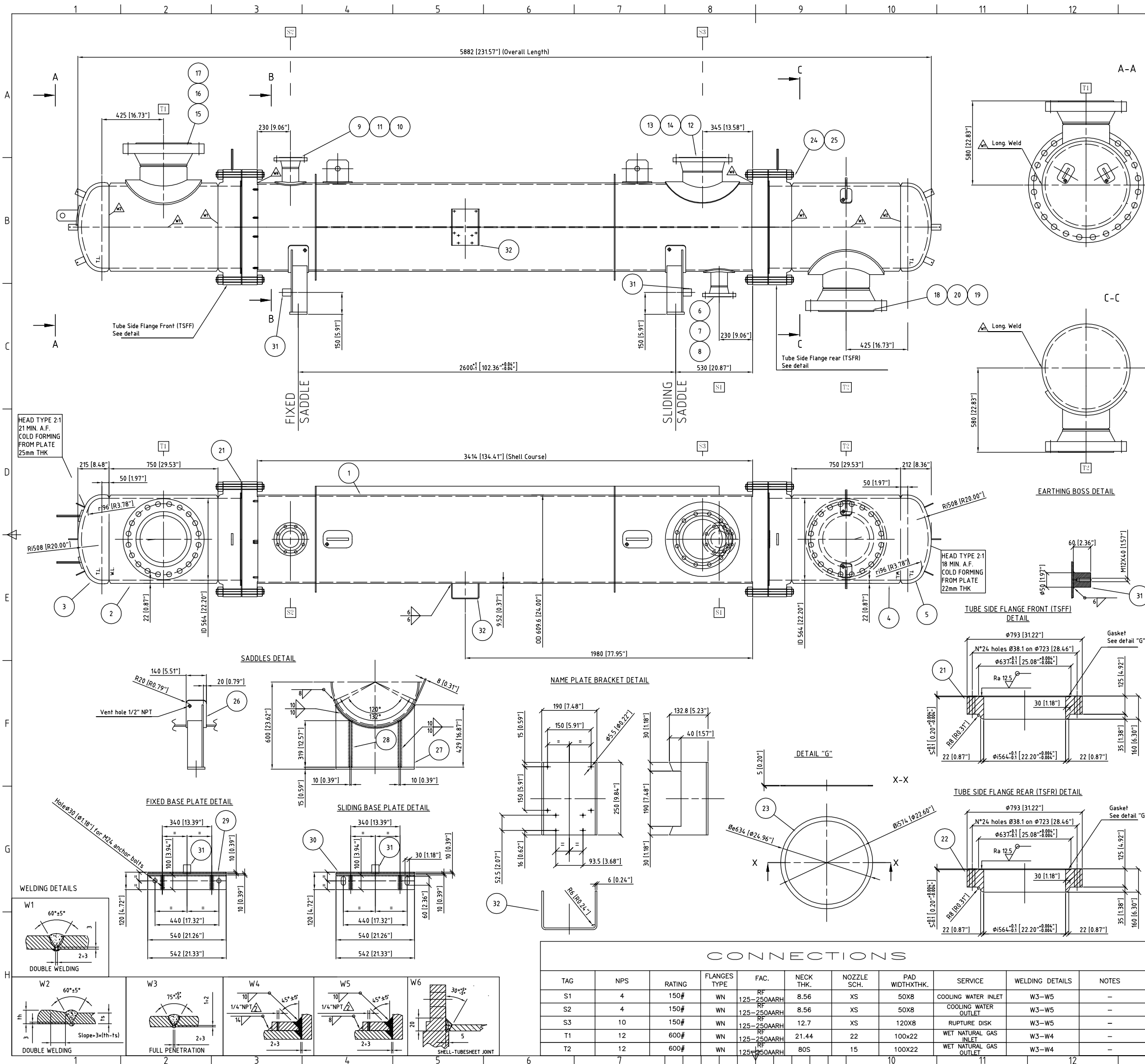
ASME NAME PLATE DETAIL



FLUID DESIGN PRESSURE INT. DESIGN PRESSURE EXT. MINIMUM DESIGN METAL TEMPERATURE CORROSION ALLOWANCE SIZE I.D. THK. SHELL RADIOGRAPHY STRESS RELIEF SHOP TEST PRESSURE FIELD TEST PRESSURE AT TOP CODE	SHELL SIDE	TUBE SIDE
	THERMINOL 66	DRY REGEN. GAS
	150 psi(g) AT 650°F	1200 psi(g) AT 580°F
	0.0 psi(g) AT 650°F	0.0 psi(g) AT 580°F
	36°F AT 150 psi(g)	25°F AT 1200 psi(g)
	0.126"	0.126"
	17.25"	16.73"
	0.37"	0.71"
	FULL	FULL
	NONE	NONE
197.0 psi(g)	1581.0 psi(g)	
197.0 psi(g)	1581.0 psi(g)	
ASME SECTION VIII DIV. 1 2013 EDITION + TEMA R 9th ED.		

CAPACITY	16.2	ft ³	8.3	ft ³
EMPTY WEIGHT	4850	lb	OPERATING WEIGHT	5864
BUNDLE WEIGHT	2205	lb	CHANNEL WEIGHT	871

2	1	ASME name plate	See detail	ASME B31.3					
1	1	Customer name plate	See detail	ASME B31.3					
Def.	Item	Qty	Description	Standard	Material	Impact	Cert.	Minors	Note
BOH									
2	26/09/14		AS BUILT						
1	09/06/14		Revised as per BE Comments						
1	27/05/14		Issue for Approval						
SICC S.p.A. Revigo VIALE PORTA PO,89 45100 ROVIGO (TV)A-171 Phone +39042543011 Telefax +39042543017		Code-Code Scale-Scale Seal/Seals-Replaces R1 mm	Description-Description MOLECULAR SIEVE REGENERATION HEATER ITEMS: E-4502/E5502 NAME PLATE	H. Dwg 14,095-4 R. Rev. 2	Date-Date 27/05/2014	Disapprove-Designer C. Cervellati Verify-Verifier C. Cervellati	A1		
OIL & GAS DEVELOPMENT COMPANY Ltd TEL: 051 2623141 ISLAMABAD-PAKISTAN									
ZISHAN ENGINEERS Ltd. (Pvt) TEL: (92-21) 34383045 KARACHI-PAKISTAN									
Contract No. PROC-FC/CB/PROJ-522/767349/2013					Client Job N': 165-4				
01			AS BUILT	CC	-	-	-	-	26.09.2014
02			ISSUED FOR APPROVAL	CC	-	-	-	-	09.06.2014
REV			DESCRIPTION	DRAWN	CHECKED	APPROVED			DATE
BELLELLI ENGINEERING S.p.A. Via Antonio Meucci 232 - 45021 BADIA POLESINE (RO) Tel. 0039.04.25.595.074 - Fax. 0039.04.25.590.372 www.belllieng.com / info@belllieng.com									
SUPPLY AND COMMISSIONING OF DEHYDRATION UNITS									
DOCUMENT TYPE CONSTRUCTION DRAWING FOR MOLECULAR SIEVE REGENERATION HEATER E-4502, E-5502									
DOCUMENT NUMBER 2307-E4502/5502-ME-DW-30244									
2307-12			PAKISTAN						
BELLELLI PROJECT CODE				LOCATION		PLANT		SCALE SHEET REV NO.	
2307-12				PAKISTAN		GAS DEHYDRATION UNITS		15 3 of 3 01	



BOLT TENSION VALUE [KN]				
ITEM	NOMINAL DIAMETER	1ST. PASS	2ND. PASS	3THD. PASS
24	1 3/8	38	76	128

BOLT TORQUE VALUE [KNxm]				
ITEM	NOMINAL DIAMETER	1ST. PASS	2ND. PASS	3THD. PASS
24	1 3/8	0.3	0.6	0.9

Def.	Item	Qty	Description	Standard	Material	Impct.	Cert.	Tolerance	Note
	32	1	Name Plate Bracket	See Detail	SA516 Gr.70N	-	3.1	SA20	-
	31	2	Earthing Boss	See Detail	AlSi 304	-	-	-	-
	30	1	Sliding Base Plate	120x540x15 thk.	S275JR EN 10025	-	-	-	-
	29	1	Fixed Base Plate	120x540x15 thk.	S275JR EN 10025	-	-	-	-
	28	4	Rib	319x100x10 thk.	SA516 Gr.70N	-	-	SA20	-
	27	2	Plate	429x542x10 thk.	SA516 Gr.70N	-	-	SA20	-
	26	2	Pad	140x712x8 thk.	SA516 Gr.70N	-	3.1	SA20	-
	25	96	Nut	1 3/8 Thread 8UN-2B	SA194 Gr.2H	-	-	B1.1	Znc Yellow Bichromated
	24	48	Stud Bolt	1 3/8 Thread 8UN-2A	SA193 Gr.B7	-	3.1	B1.1	Znc Yellow Bichromated
	23	2	Gasket	See Detail	Kamprofile AISI304-Graphite filled	-	3.1	-	m=2,y=27.6 MPa
	22	1	Tube Side Flange Rear (TSFR)	See detail	SA182 F304/304L	-	3.1	Swedish	Dual Grade
	21	1	Tube Side Flange Front (TSFF)	See detail	SA105N	-	3.1	Swedish	-
T2	20	1	Pad	100x22 thk.	SA240 304/304L	-	3.1	SA480	Dual Grade
T2	19	1	Nozzle	Ø324x15 thk.	SA240 304/304L	-	3.1	SA480	Dual Grade
T2	18	1	Flange	Ø273x12.7 thk.	SA182 F304/304L	-	3.1	B16.5	Dual grade
T1	17	1	Pad	100x22 thk.	SA516 Gr.70N	-	3.1	SA20	-
T1	16	1	Nozzle	Ø324x22 thk.	SA516 Gr.70N	-	3.1	SA20	-
T1	15	1	Flange	Ø273x12.7 thk.	SA105N	-	3.1	B16.5	-
S3	14	1	Pad	120x8 thk.	SA516 Gr.70N	-	3.1	SA20	-
S3	13	1	Nozzle	Ø273x12.7 thk.	SA106 Gr.B	-	3.1	-12.5K	-
S3	12	1	Flange	Ø273x12.7 thk.	SA105N	-	3.1	B16.5	-
S2	11	1	Pad	50x8 thk.	SA516 Gr.70N	-	3.1	SA20	-
S2	10	1	Nozzle	Ø114.3x8.56 thk.	SA106 Gr.B	-	3.1	-12.5K	-
S2	9	1	Flange	Ø114.3x8.56 thk.	SA105N	-	3.1	B16.5	-
S1	8	1	Pad	50x8 thk.	SA516 Gr.70N	-	3.1	SA20	-
S1	7	1	Nozzle	Ø114.3x8.56 thk.	SA106 Gr.B	-	3.1	-12.5K	-
S1	6	1	Flange	Ø114.3x8.56 thk.	SA105N	-	3.1	B16.5	-
	5	1	Rear Head Type 2:1	Ø564x22 thk.	SA240 304/304L	-	3.1	-L	Dual Grade
	4	1	Rear Channel	22x750x184.1	SA240 304/304L	-	3.1	SA480	Dual Grade
	3	1	Front Head Type 2:1	Ø564x25 thk.	SA516 Gr.70N	-	3.1	-L	-
	2	1	Front Channel	22x750x184.1	SA516 Gr.70N	-	3.1	SA20	-
	1	1	Shell Course	Ø609.6x9.52 thk. L-34W	SA106 Gr.B	-	3.1	-12.5K	-

BOM				
Def.	Item	Qty	Description	Note
-	-	-	-	-
2	26/09/14	-	AS BUILT	C.Cervellati C.Cervellati
1	06/06/14	-	Revised as per BE Comments	C.Cervellati C.Cervellati
0	16/05/14	-	Issued for Approval	C.Cervellati C.Cervellati

SICC Sp.A. Rovigo

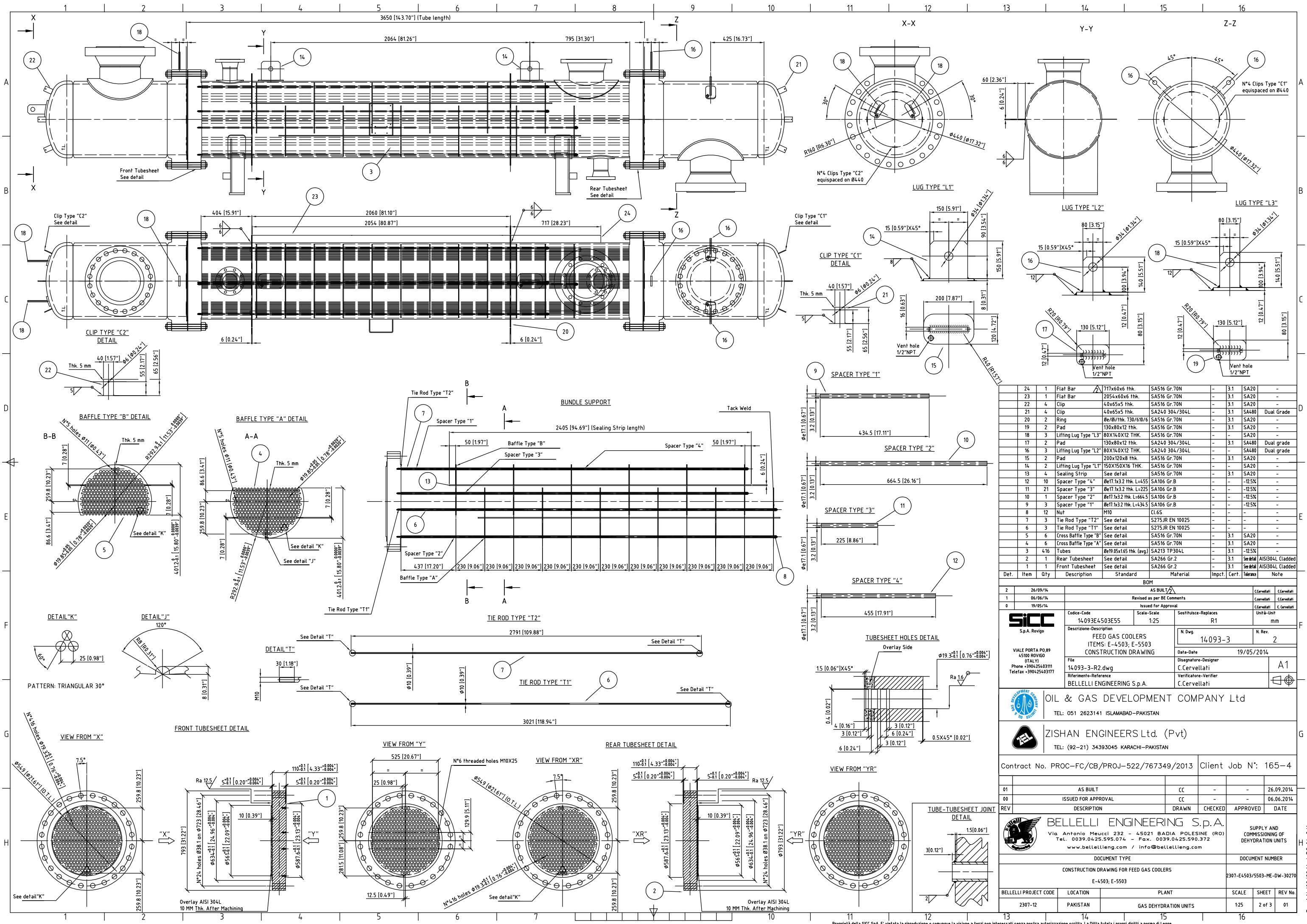
VIALE PORTA PO.89
45100 ROVIGO
(ITALY)
Phone +390425493111
Telefax +390425493177

Contract No. PROC-FC/CB/PROJ-522/767349/2013 Client Job N': 165-4

Oil & Gas Development Company Ltd
TEL: 051 2623141 ISLAMABAD-PAKISTAN

ZISHAN ENGINEERS Ltd. (Pvt)
TEL: (92-21) 34393045 KARACHI-PAKISTAN

CONNECTIONS										
TAG	NPS	RATING	FLANGES TYPE	FAC.	NECK THK.	NOZZLE SCH.	PAD WIDTHXTHK.	SERVICE	WELDING DETAILS	NOTES
S1	4	150#	WN	RF 125-250AARH	8.56	XS	50X8	COOLING WATER INLET	W3-W5	-
S2	4	150#	WN	RF 125-250AARH	8.56	XS	50X8	COOLING WATER OUTLET	W3-W5	-
S3	10	150#	WN	RF 125-250AARH	12.7	XS	120X8	RUPTURE DISK	W3-W5	-
T1	12	600#	WN	RF 125-250AARH	21.44	22	100x22	WET NATURAL GAS INLET	W3-W4	-
T2	12	600#	WN	RF 125-250AARH	80S	15	100x22	WET NATURAL GAS OUTLET	W3-W4	-



Det.	Item	Qty	Description	Standard	Material	Impct.	Cert.	Tolerance	Note
24	1	Flat Bar	717x60x6 thk.	SA516 Gr.70N	-	-	3.1	SA20	-
23	1	Flat Bar	2054x60x6 thk.	SA516 Gr.70N	-	-	3.1	SA20	-
22	4	Clip	40x65x5 thk.	SA516 Gr.70N	-	-	3.1	SA20	-
21	4	Clip	40x65x5 thk.	SA240 304/304L	-	-	3.1	SA480	Dual Grade
20	2	Ring	Ø8/Øthk. 730/610/6	SA516 Gr.70N	-	-	3.1	SA20	-
19	2	Pad	130x80x12 thk.	SA516 Gr.70N	-	-	3.1	SA20	-
18	3	Lifting Lug Type "L3"	80X140X12 THK.	SA516 Gr.70N	-	-	-	SA20	-
17	2	Pad	130x80x12 thk.	SA240 304/304L	-	-	3.1	SA480	Dual grade
16	3	Lifting Lug Type "L2"	80X140X12 THK.	SA240 304/304L	-	-	-	SA480	Dual grade
15	2	Pad	200x120x8 thk.	SA516 Gr.70N	-	-	3.1	SA20	-
14	2	Lifting Lug Type "L1"	150X150X16 THK.	SA516 Gr.70N	-	-	-	SA20	-
13	4	Sealing Strip	See detail	SA516 Gr.70N	-	-	3.1	SA20	-
12	10	Spacer Type "4"	Ø17.1x32 thk. L=455	SA106 Gr.B	-	-	-	-12.5%	-
11	21	Spacer Type "3"	Ø17.1x32 thk. L=225	SA106 Gr.B	-	-	-	-12.5%	-
10	1	Spacer Type "2"	Ø17.1x32 thk. L=664.5	SA106 Gr.B	-	-	-	-12.5%	-
9	3	Spacer Type "1"	Ø17.1x32 thk. L=434.5	SA106 Gr.B	-	-	-	-12.5%	-
8	12	Nut	M10	Cl.65	-	-	-	-	-
7	3	Tie Rod Type "T2"	See detail	S275JR EN 10025	-	-	-	-	-
6	3	Tie Rod Type "T1"	See detail	S275JR EN 10025	-	-	-	-	-
5	6	Cross Baffle Type "B"	See detail	SA516 Gr.70N	-	-	3.1	SA20	-
4	6	Cross Baffle Type "A"	See detail	SA516 Gr.70N	-	-	3.1	SA20	-
3	416	Tubes	Ø19.05x1.65 thk. (avg.)	SA213 TP304L	-	-	3.1	-12.5%	-
2	1	Rear Tubesheet	See detail	SA266 Gr.2	-	-	3.1	See detail	AISI304L Cladded
1	1	Front Tubesheet	See detail	SA266 Gr.2	-	-	3.1	See detail	AISI304L Cladded

AS BUILT		Revised as per BE Comments		Issued for Approval	
2	26/09/14	1	06/06/14	0	19/05/14
SICC		SICC		SICC	
Codice-Code		Scale-Scale		Sostituisce-Replaces	
14.093E4503E55		1:25		R1	
Descrizione-Description		ITEMS: E-4503; E-5503		N. Dwg.	
FEED GAS COOLERS		CONSTRUCTION DRAWING		14.093-3	
File		Data-Date		N. Rev.	
14.093-3-R2.dwg		19/05/2014		2	
Riferimento-Reference		Disegnatore-Designer		Verificatore-Verifier	
BELLELLI ENGINEERING S.p.A.		C.Cervellati		C.Cervellati	

OIL & GAS DEVELOPMENT COMPANY Ltd
 TEL: 051 2623141 ISLAMABAD-PAKISTAN

ZISHAN ENGINEERS Ltd. (Pvt)
 TEL: (92-21) 34393045 KARACHI-PAKISTAN

Contract No. PROC-FC/CB/PROJ-522/767349/2013 Client Job N°: 165-4

01	AS BUILT	CC	-	-	26.09.2014
00	ISSUED FOR APPROVAL	CC	-	-	06.06.2014
REV	DESCRIPTION	DRAWN	CHECKED	APPROVED	DATE

BELLELLI ENGINEERING S.p.A.
 Via Antonio Meucci 232 - 45021 BADIA POLESINE (RO)
 Tel. 0039.0425.595.074 - Fax. 0039.0425.590.372
 www.bellellieng.com / info@bellellieng.com

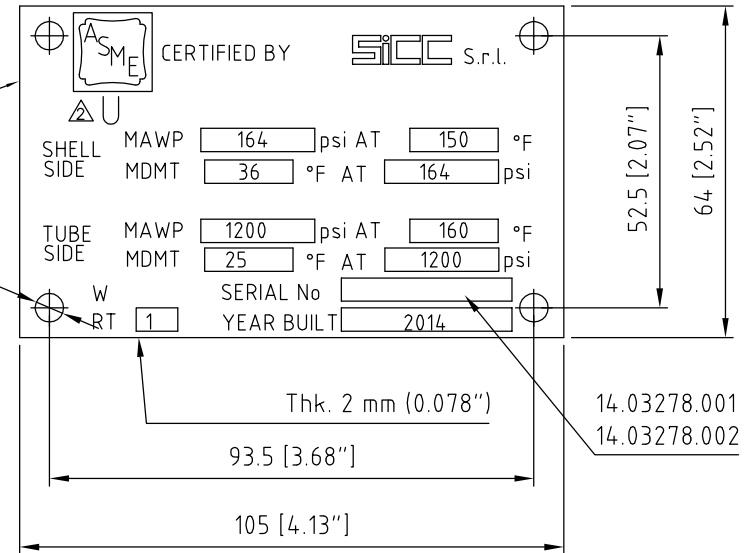
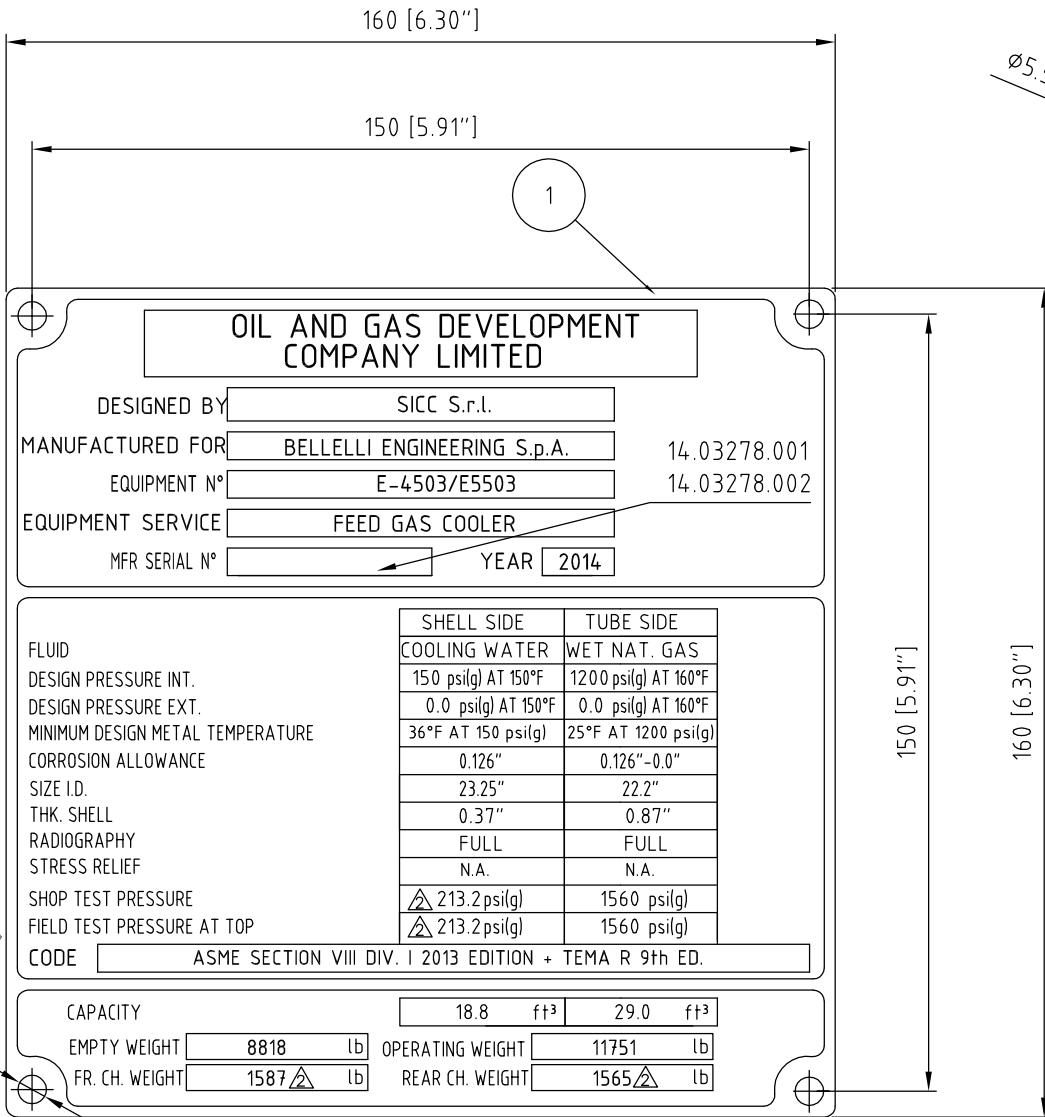
DOCUMENT TYPE: CONSTRUCTION DRAWING FOR FEED GAS COOLERS
 E-4503; E-5503

BELLELLI PROJECT CODE	LOCATION	PLANT	SCALE	SHEET	REV No.
2307-12	PAKISTAN	GAS DEHYDRATION UNITS	1:25	2 of 3	01

DOCUMENT NUMBER: 2307-E4503/5503-ME-DW-30270

CUSTOMER NAME PLATE DETAIL

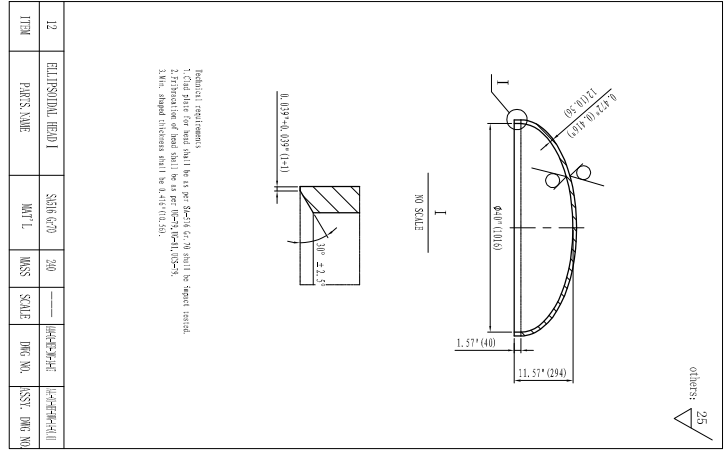
ASME NAME PLATE DETAIL



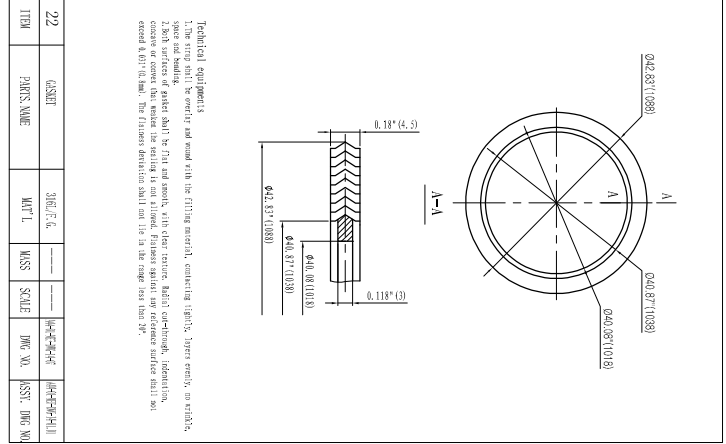
FLUID DESIGN PRESSURE INT. DESIGN PRESSURE EXT. MINIMUM DESIGN METAL TEMPERATURE CORROSION ALLOWANCE SIZE I.D. THK. SHELL RADIOGRAPHY STRESS RELIEF SHOP TEST PRESSURE FIELD TEST PRESSURE AT TOP CODE	SHELL SIDE	TUBE SIDE
	COOLING WATER	WET NAT. GAS
	150 psi(g) AT 150°F	1200 psi(g) AT 160°F
	0.0 psi(g) AT 150°F	0.0 psi(g) AT 160°F
	36°F AT 150 psi(g)	25°F AT 1200 psi(g)
	0.126"	0.126"-0.0"
	23.25"	22.2"
	0.37"	0.87"
	FULL	FULL
	N.A.	N.A.
ASME SECTION VIII DIV. 1 2013 EDITION + TEMA R 9th ED.		

CAPACITY	18.8	ft ³	29.0	ft ³	
EMPTY WEIGHT	8818	lb	OPERATING WEIGHT	11751	lb
FR. CH. WEIGHT	1587	lb	REAR CH. WEIGHT	1565	lb

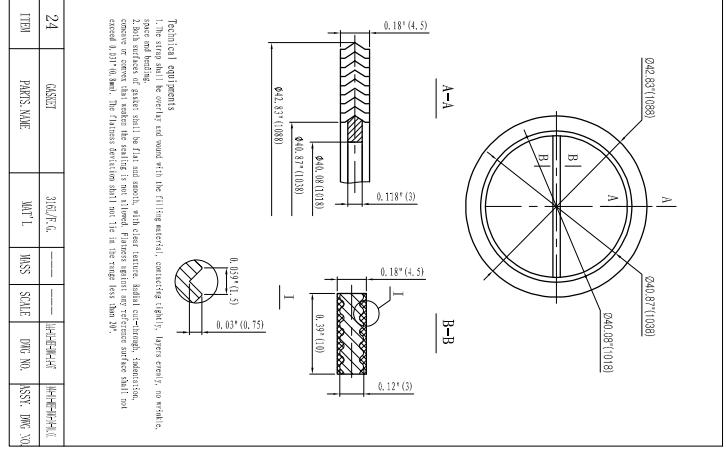
2	1	ASME name plate	See detail	ASME B31.3					
1	1	Customer name plate	See detail	AISI 316					
Def.	Item	Qty	Description	Standard	Material	Impact	Cert.	Minus	Note
BOH									
2	26/09/14		AS BULK						
1	06/06/14		Revised as per BE Comments						
1	05/05/14		Issue for Approval						
SICC		Code-Code	Scale-Scale	Seal/Seals-Replaces	Unit-Unit				
SICC		15	R1	mm					
VIALE PORTA PO.89 45100 ROVATO 07141/11		Description-Description FEED GAS COOLER ITEMS: E-4503/E5503 NAME PLATE		H. Dwg 14.093-4	R. Rev. 2				
Date-Date 19/05/2014		Disegnato-Designer C. Cervellati		A1					
Phone +39042543111 Telefax +39042543177		Riferimento-Reference Bellelli Engineering S.p.A.		Verificato-Verifier C. Cervellati					
OIL & GAS DEVELOPMENT COMPANY Ltd									
TEL: 051 2623141 ISLAMABAD-PAKISTAN									
ZISHAN ENGINEERS Ltd. (Pvt)									
TEL: (92-21) 34383045 KARACHI-PAKISTAN									
Contract No. PROC-FC/CB/PROJ-522/767349/2013					Client Job N': 165-4				
01	AS BUILT	CC	-	-	26.09.2014				
02	ISSUED FOR APPROVAL	CC	-	-	06.06.2014				
REV	DESCRIPTION	DRAWN	CHECKED	APPROVED	DATE				
Bellelli Engineering S.p.A.					SUPPLY AND COMMISSIONING OF DEHYDRATION UNITS				
Via Antonio Meucci 232 - 45021 BADIA POLESINE (RO) Tel. 0039.04.25.595.074 - Fax. 0039.04.25.590.372 www.bellellieng.com / info@bellellieng.com					DOCUMENT TYPE				
CONSTRUCTION DRAWING FOR FEED GAS COOLER E-4503, E-5503					DOCUMENT NUMBER 2307-E4503/5503-ME-0W-30274				
BELLELLI PROJECT CODE	LOCATION	PLANT		SCALE	SHEET	REV. NO.			
2307-12	PAKISTAN	GAS DEHYDRATION UNITS		15	3 of 3	01			



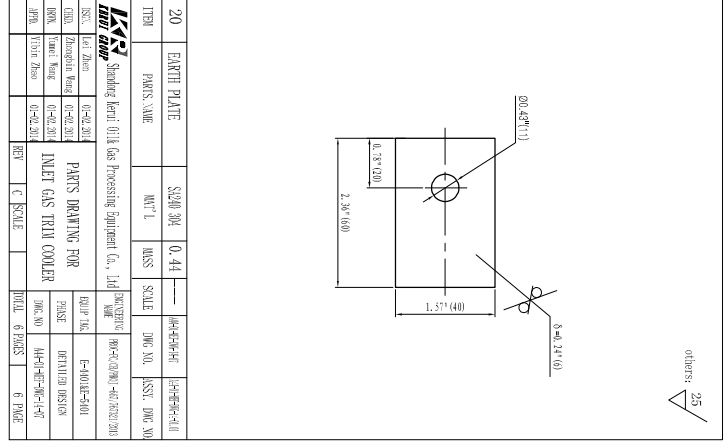
ITEM	12	ELLIPTICAL HEAD	SS304	300	1:1	1:1	1:1	1:1	1:1
PARTS NAME									



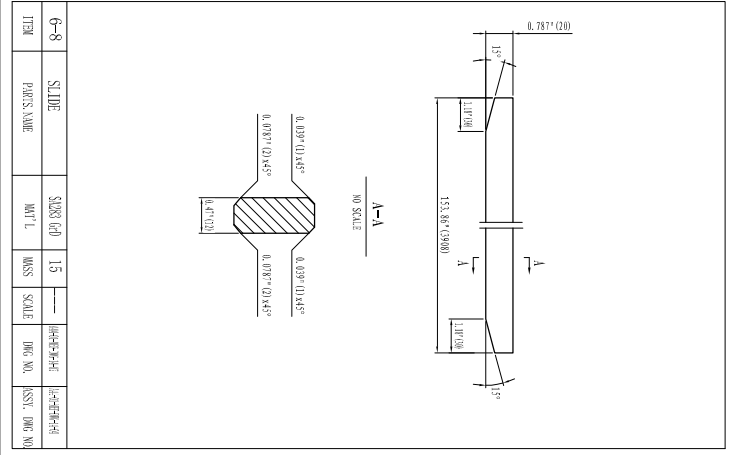
ITEM	4	FLANGE	SS304	300	1:1	1:1	1:1	1:1	1:1
PARTS NAME									



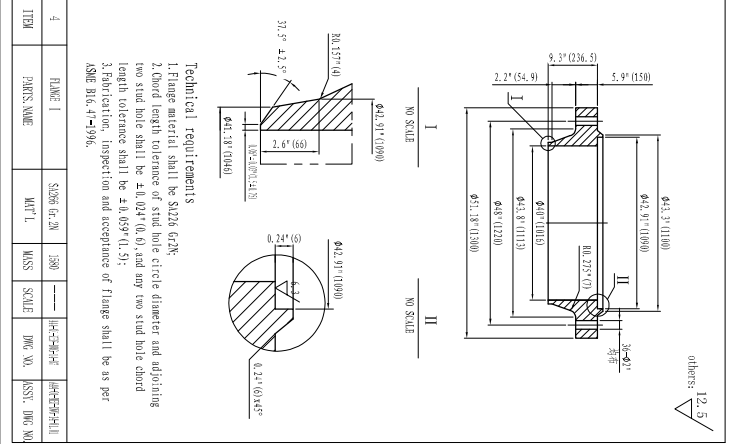
ITEM	22	FLANGE	SS304	300	1:1	1:1	1:1	1:1	1:1
PARTS NAME									



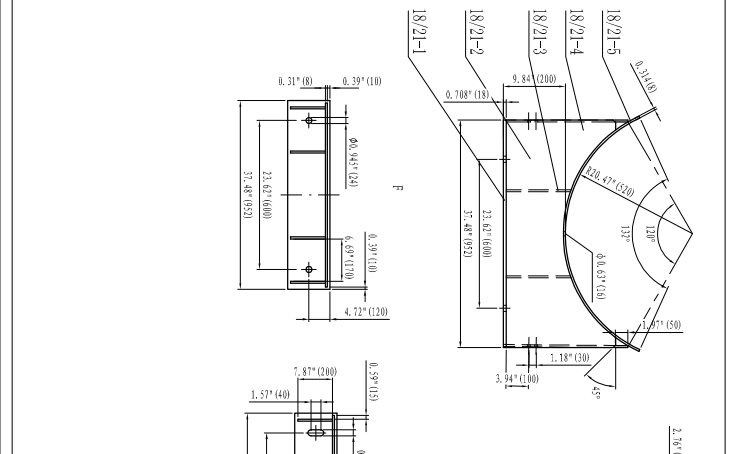
ITEM	24	INLET GAS TRAIN COOLER	SS304	300	1:1	1:1	1:1	1:1	1:1
PARTS NAME									



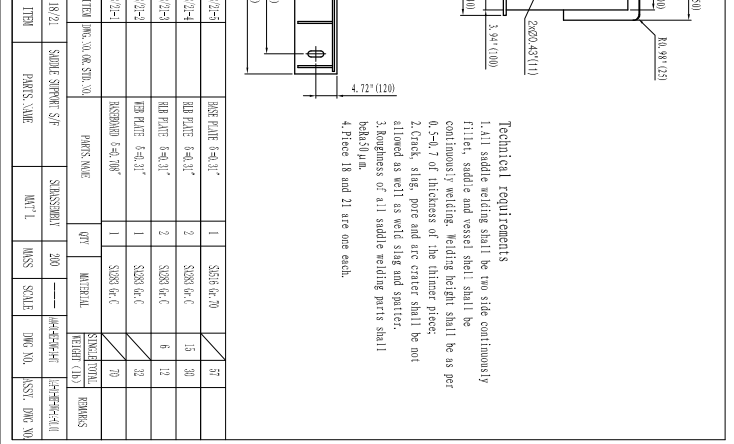
ITEM	18/21	SADDLE	SS304	300	1:1	1:1	1:1	1:1	1:1
PARTS NAME									



ITEM	18/21-1	18/21-2	18/21-3	18/21-4	18/21-5
PARTS NAME					



ITEM	18/21-1	18/21-2	18/21-3	18/21-4	18/21-5
PARTS NAME					



ITEM	18/21-1	18/21-2	18/21-3	18/21-4	18/21-5
PARTS NAME					

Technical requirements:
 1. Cold plate for head shall be as per SS304 G-30 shall be exact tested.
 2. Cold plate for head shall be as per SS304 G-30 shall be exact tested.
 3. All required dimensions shall be as per drawing.

Technical requirements:
 1. The ring shall be erected and round with the fitting material, connecting tightly, there exists no cracks.
 2. Both surfaces of saddle shall be flat and smooth, with clear texture. Radii, chamfers, identification, groove or convex that reduce the welding fit are allowed. Finest spherulitic refinement shall be used.
 3. All required dimensions shall be as per drawing.

Technical requirements:
 1. All saddle welding shall be two side continuously fillet, saddle and vessel shell shall be continuously welding. Welding height shall be as per 0.5-1.1 of thickness of the thinner piece.
 2. Check ring, pore and arc crater shall be not allowed as well as weld slag and spatter.
 3. Longness of all saddle welding parts shall be back to pm.
 4. Piece 18 and 21 are one each.

others: 25

others: 25

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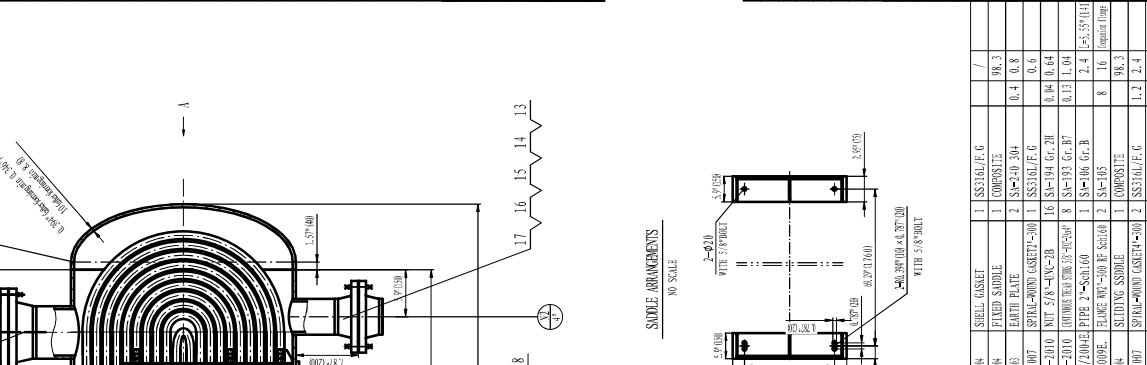
DESIGN DATA

DESIGN STANDARD	ASME SEC. VIII, DIV. 1, UG-110 & UG-111
CERTIFICATION MARK WITH U. DRUGHTER	YES
BY REGISTER	NO
ITEM CLASS	BEAR
DESIGN PARAMETER	TUBE
SERVICE	SHELL
DENSITY	167 lb/ft ³
HEAVY PROPERTY	GAS
WALY BODY MATERIAL	SA-516 Gr. 70
PIPE MATERIAL	SA-516 Gr. B
DESIGN TEMPERATURE	350 (C) / 662 (F)
OPERATING TEMPERATURE	350 (C) / 662 (F)
WMT AT PRESSURE	31.00 (AT 12.50 (8.82) (31.00 AT 1200 (8.276))
EMPIRICAL TEST TEMPERATURE	70 (C) / 158 (F)
OPERATING PRESSURE	50 (G) / 3.5 (MPa)
DESIGN PRESSURE	125 (G) / 8.62 (MPa)
MAX ALLOWABLE WORKING PRESSURE	125 (G) / 8.62 (MPa)
SUCTION SIDE CUTTING PRESSURE	125 (G) / 8.62 (MPa)
SHEET METAL MODEL	163 (G) / 11.2 (MPa)
HYDROSTATIC TEST PRESSURE	187 (G) / 13.3 (MPa)
JOINT EFFICIENCY	1
CORROSION ALLOWANCE	0.118 (3)
DISTANCE NUMBER	1
POST WELD HEAT TREATMENT	RT FULL/PH-51
MT OR PT	RT FULL/PH-51
TREATMENT AREA	628.40 (58.35)
TUBE SPEC.	1.50 (63.50) ID
JOINT SPEC. OF THE JOINT THRESHOLD	INTENSITY RED AND EXPANSION
TOTAL WEIGHT	42.8 (11.21)
SEISMIC ZONE	2A (0.15)
VESSEL WEIGHT	10380 (4662)
DESIGN SERVICE LIFE	YEAR
INSULATION THICKNESS	1.50 (63.50)

LIST OF NOZZLES

MARK SIZE	FLANGE OR BELL WELD	TYPE	SM. W. TR.	USE EX. W. TR.	DESCRIPTION	REMARK
N1 4"	300#	WN	RP	S4880	HOT OIL INLET	
N2 4"	300#	WN	RP	S4880	HOT OIL INLET	
N3 10"	600#	WN	RP	/	GAS INLET	
N4 10"	600#	WN	RP	/	GAS INLET	
N5 6"	300#	WN	RP	S4840	PSY	
N6 2"	300#	WN	RP	S4810	DRAIN	

ITEM	MARK SIZE	PARTS NAME	QTY	MATERIAL	WEIGHT (LB)	REMARKS
1	1/4"	SS316L/6 G	1	SS316L/6 G	98.3	
2	1/4"	COMPOSITE	1	COMPOSITE	0.4	
3	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	
4	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	
5	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	
6	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	
7	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	
8	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	
9	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	
10	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	
11	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	
12	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	
13	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	
14	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	
15	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	
16	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	
17	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	
18	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	
19	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	
20	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	
21	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	
22	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	
23	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	
24	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	
25	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	
26	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	
27	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	
28	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	
29	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	
30	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	
31	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	
32	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	



SHELL ORNAMENTS

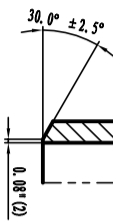
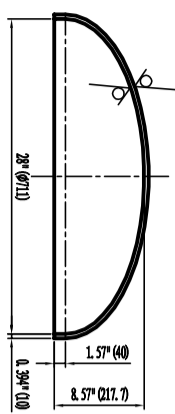
ITEM	MARK SIZE	PARTS NAME	QTY	MATERIAL	WEIGHT (LB)	REMARKS
1	1/4"	SS316L/6 G	1	SS316L/6 G	98.3	
2	1/4"	COMPOSITE	1	COMPOSITE	0.4	
3	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	
4	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	
5	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	
6	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	
7	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	
8	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	
9	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	
10	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	
11	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	
12	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	
13	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	
14	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	
15	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	
16	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	
17	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	
18	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	
19	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	
20	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	
21	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	
22	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	
23	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	
24	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	
25	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	
26	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	
27	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	

Technical Requirements

- The design, fabrication, inspection, test and acceptance shall comply with ASME Sec. VIII-1, (2010ED 2011.100) Rules for Construction of Pressure Vessels.
- Welding shall comply with ASME Sec. IX Qualification Standard for Welding and Brazing Procedures, Welders, Brazers, and Welding and Brazing Operators.
- Material requirements
 - Material should meet ASME SEC. II-2014. SA-516 (Gr. 70) base material of clad-steel should be used in normalized condition. Clad-steel should meet the requirement of SA516 with a bond quality of class 1 or above.
 - The equipment should meet the requirement of datashheet (44-01-PR-035-09) and specification (165-S-006-07).
- Category A, B welding joints shall be 100% RT tested as per ASME-V, Sec. Article 11 and results shall be as per ASME-VI, Sec. Division 1-1.
- Category C, D welding joints shall be 100% MT tested as per ASME-VI, Division Appendix 6 or 8.
- Tubes shall be SA-213 TP316L. Purchasing shall be as per SA-516-016. Over diameter shall be within ± 0.004 (0.25, 4 + 0.1mm) and thickness shall be 0.065 ± 0.013 (1.65mm ± 0.33mm).
- Welds of shell side shall be ground to be flush with base metal. Burr, welding spatter, heads and sharp edges shall be not allowed on surface.
- Welding joints between tube plates to tubes, header flange to tube plate overlay welding surface, clad plates' joints shall be PT tested.
- Test pressure ring or tools shall be shell side tested, examining welding joint of tube and tube sheet. After shell side pressure test, 0.35bar (5.05psi) helium leak test and one side hydrostatic test shall be conducted for welding joint of heat exchanger tube and tube plate.
- External shell conduct after manufacturing, Swiss Standards institute 05900 S.A.2.5 is qualified. SS shall conduct picking, CS shall paint antrax primer and finish coating, film thickness 100-150µm.
- Header shall be heat treated.
- Welding joints of tube side category A, B, C, D see part drawing.
- Header tag only shall be for header lifting.
- Category A, B and DN > 10" category C joints shall be 100% RT tested as per ASME V. Other Category C, D joints shall be per ASME VI-1 Appendix 8.

ITEM	MARK SIZE	PARTS NAME	QTY	MATERIAL	WEIGHT (LB)	REMARKS
26	1/4"	SS316L/6 G	1	SS316L/6 G	98.3	
27	1/4"	COMPOSITE	1	COMPOSITE	0.4	
28	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	
29	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	
30	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	
31	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	
32	1/4"	SS316L/6 G	1	SS316L/6 G	0.6	

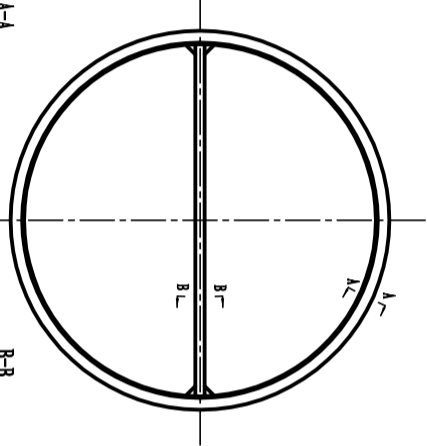
OTHERS: 12.5



- Technical requirements:
1. Material of head shall comply with general assembly drawing;
 2. Head minimum thickness after forming is 0.34 (8.6mm);
 3. Manufacturing, inspection and acceptance of head shall comply with: HG-79, HG-81 and CG-79;
 4. Head geometry, ID: 28 (711), tolerance: ± 0.25 (6.35)mm, distance between internal interfaces of head and sample plate counter-sinking: ≤ 0.34 (8.63)mm, concave: ≤ 0.173 (4.4mm), Total height: 8.57 (217.7)mm; tolerance: ± 0.05 (1.27)mm; thickness: ≤ 0.14 (3.55)mm;
 5. Tolerance of straight side is ± 0.05 (1.27)mm, gradient of straight side: inward < 0.04 (1.01)mm, outward ≤ 0.05 (1.27)mm, no longitudinal fold is allowed;
 6. Head is not allowed splines.

12	HEAD	HEAD (11) × 0.34 (8.6)	SA-516 Gr. 70	76.3	1:8	HA-4-HE-HE-5-9	HA-4-HE-HE-5-4-11	ASST. DWG. NO.
PARTS NO.	PARTS NAME	MATERIAL	MSSTD	SCALE	DRAW NO.	ASST. DWG. NO.		

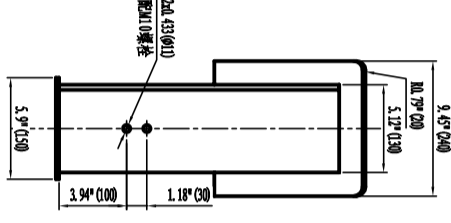
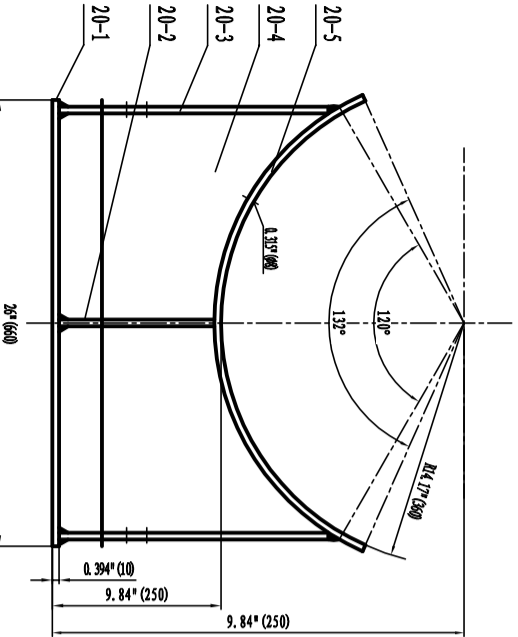
OTHERS: 12.5



- Technical requirements:
1. Type of gasket is spiral gasket, inner ring is SA-240 316L, filling with flexible graphite;
 2. Defects, twist, deformation which may affect the tightness of gasket are not allowed;
 3. Fabrication, inspection and acceptance shall comply with ASME B16.20-2007.

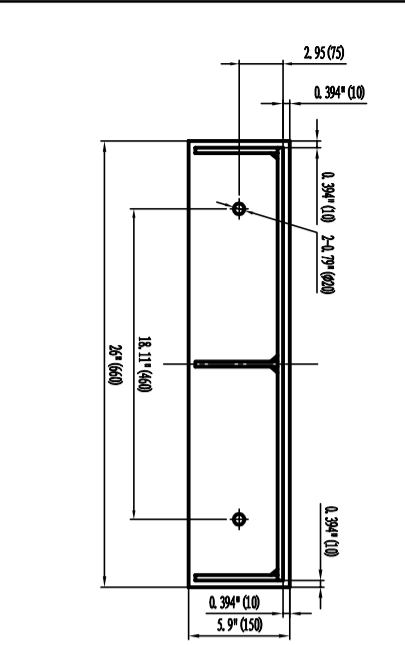
22	GASKET	S.S316L/R.G	/	1:8	HA-4-HE-HE-5-9	HA-4-HE-HE-5-4-11	ASST. DWG. NO.
PARTS NO.	PARTS NAME	MATERIAL	MSSTD	SCALE	DRAW NO.	ASST. DWG. NO.	

OTHERS: 12.5



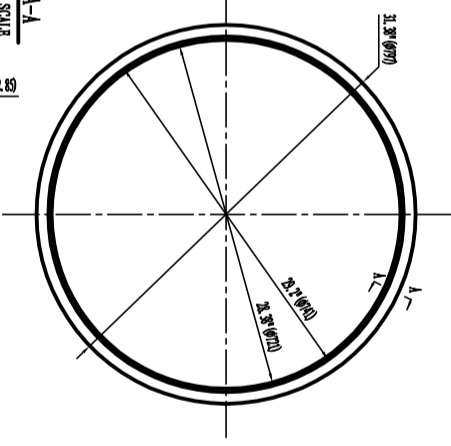
- Technical requirements:
1. Welding of saddle shall be continuous welding, fillet height is 0.276 (7mm);
 2. Not allowing surface crack, lack of penetration, non-fusion, surface pores, crater, slag and spatter etc.;
 3. Both end connected with web plate shall have a 1°45' beveling;
 4. Surrounding roughness of saddle parts is ≤ 3.2 (80);
 5. All the parts after saddle welding shall be steady.

20-5	鞍座	SA-516 Gr. 70	28.7
20-4	鞍座	SA-36	35.5
20-3	鞍座	SA-36	6.6 13.2
20-2	鞍座	SA-36	3.8
20-1	鞍座	SA-36	17.1



20-5	鞍座	SA-516 Gr. 70	28.7
20-4	鞍座	SA-36	35.5
20-3	鞍座	SA-36	6.6 13.2
20-2	鞍座	SA-36	3.8
20-1	鞍座	SA-36	17.1

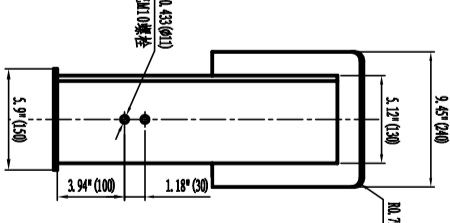
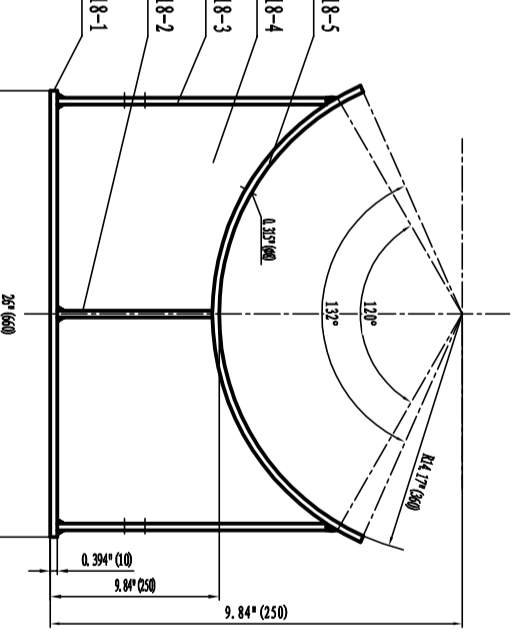
OTHERS: 12.5



- Technical requirements:
1. Type of gasket is spiral gasket, inner ring is SA-240 316L, filling with flexible graphite;
 2. Defects, twist, deformation which may affect the tightness of gasket are not allowed;
 3. Fabrication, inspection and acceptance shall comply with ASME B16.20-2007.

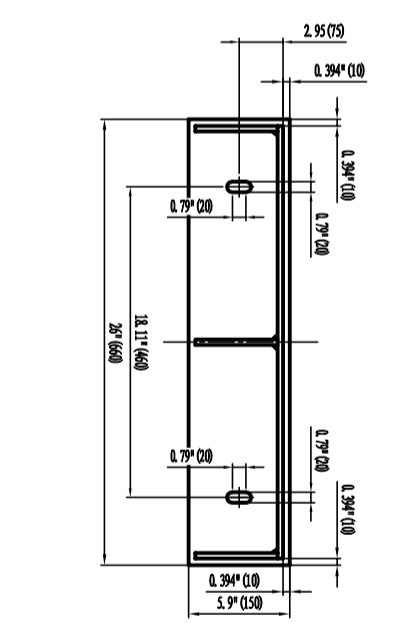
21	GASKET	S.S316L/R.G	/	1:8	HA-4-HE-HE-5-9	HA-4-HE-HE-5-4-11	ASST. DWG. NO.
PARTS NO.	PARTS NAME	MATERIAL	MSSTD	SCALE	DRAW NO.	ASST. DWG. NO.	

OTHERS: 12.5



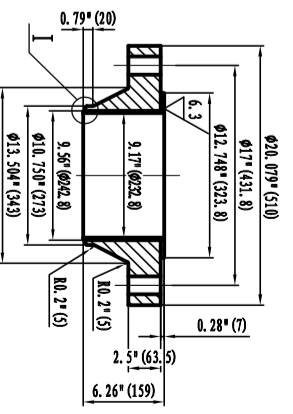
- Technical requirements:
1. Welding of saddle shall be continuous welding, fillet height is 0.276 (7mm);
 2. Not allowing surface crack, lack of penetration, non-fusion, surface pores, crater, slag and spatter etc.;
 3. Both end connected with web plate shall have a 1°45' beveling;
 4. Surrounding roughness of saddle parts is ≤ 3.2 (80);
 5. All the parts after saddle welding shall be steady.

18-5	鞍座	SA-516 Gr. 70	28.7
18-4	鞍座	SA-36	35.5
18-3	鞍座	SA-36	6.6 13.2
18-2	鞍座	SA-36	3.8
18-1	鞍座	SA-36	17.1



18-5	鞍座	SA-516 Gr. 70	28.7
18-4	鞍座	SA-36	35.5
18-3	鞍座	SA-36	6.6 13.2
18-2	鞍座	SA-36	3.8
18-1	鞍座	SA-36	17.1

OTHERS: 12.5



- Technical requirements:
1. Flange inner and outer material shall comply with ASME II and flange welding the surface before forging tube welding magnetic particle testing;
 2. SA-105 Forging S content is not more than 0.02%, and doing -20 C impact, magnetic particle testing;
 3. Manufacturing, inspection and acceptance shall comply with ASME B16.5/2007;
 4. Distance of distance between two bolts is ± 0.08 (2.03)mm;
 5. Flange welding according to the diagram, the surface layer shall be forming good, there should be no slag and other defects;
 6. All surface deposited shall be re tested as per ASME VI art. 1;
 7. Unilateral tolerance of mechanical processing surface as per ISO 2768-1/1999 level A dimension.

1-3	FLANGE	SA-105/SA-105/SA-105	184.8	1:8	HA-4-HE-HE-5-9	HA-4-HE-HE-5-4-11	ASST. DWG. NO.
PARTS NO.	PARTS NAME	MATERIAL	MSSTD	SCALE	DRAW NO.	ASST. DWG. NO.	

OTHERS: 12.5

BOARD: 25
OTHERS: 12.5

ITEM	NO.	QTY	REMARKS
18-5	鞍座	1	鞍座
18-4	鞍座	1	鞍座
18-3	鞍座	2	鞍座
18-2	鞍座	1	鞍座
18-1	鞍座	1	鞍座

BOARD: 25
OTHERS: 12.5

20-5	鞍座	SA-516 Gr. 70	28.7
20-4	鞍座	SA-36	35.5
20-3	鞍座	SA-36	6.6 13.2
20-2	鞍座	SA-36	3.8
20-1	鞍座	SA-36	17.1

BOARD: 25
OTHERS: 12.5

21	GASKET	S.S316L/R.G	/	1:8	HA-4-HE-HE-5-9	HA-4-HE-HE-5-4-11	ASST. DWG. NO.
PARTS NO.	PARTS NAME	MATERIAL	MSSTD	SCALE	DRAW NO.	ASST. DWG. NO.	

BOARD: 25
OTHERS: 12.5

1-3	FLANGE	SA-105/SA-105/SA-105	184.8	1:8	HA-4-HE-HE-5-9	HA-4-HE-HE-5-4-11	ASST. DWG. NO.
PARTS NO.	PARTS NAME	MATERIAL	MSSTD	SCALE	DRAW NO.	ASST. DWG. NO.	

BOARD: 25
OTHERS: 12.5

22	GASKET	S.S316L/R.G	/	1:8	HA-4-HE-HE-5-9	HA-4-HE-HE-5-4-11	ASST. DWG. NO.
PARTS NO.	PARTS NAME	MATERIAL	MSSTD	SCALE	DRAW NO.	ASST. DWG. NO.	

BOARD: 25
OTHERS: 12.5

20	鞍座	SA-516 Gr. 70	28.7
20-4	鞍座	SA-36	35.5
20-3	鞍座	SA-36	6.6 13.2
20-2	鞍座	SA-36	3.8
20-1	鞍座	SA-36	17.1

BOARD: 25
OTHERS: 12.5

21	GASKET	S.S316L/R.G	/	1:8	HA-4-HE-HE-5-9	HA-4-HE-HE-5-4-11	ASST. DWG. NO.
PARTS NO.	PARTS NAME	MATERIAL	MSSTD	SCALE	DRAW NO.	ASST. DWG. NO.	

BOARD: 25
OTHERS: 12.5

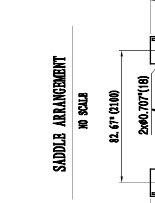
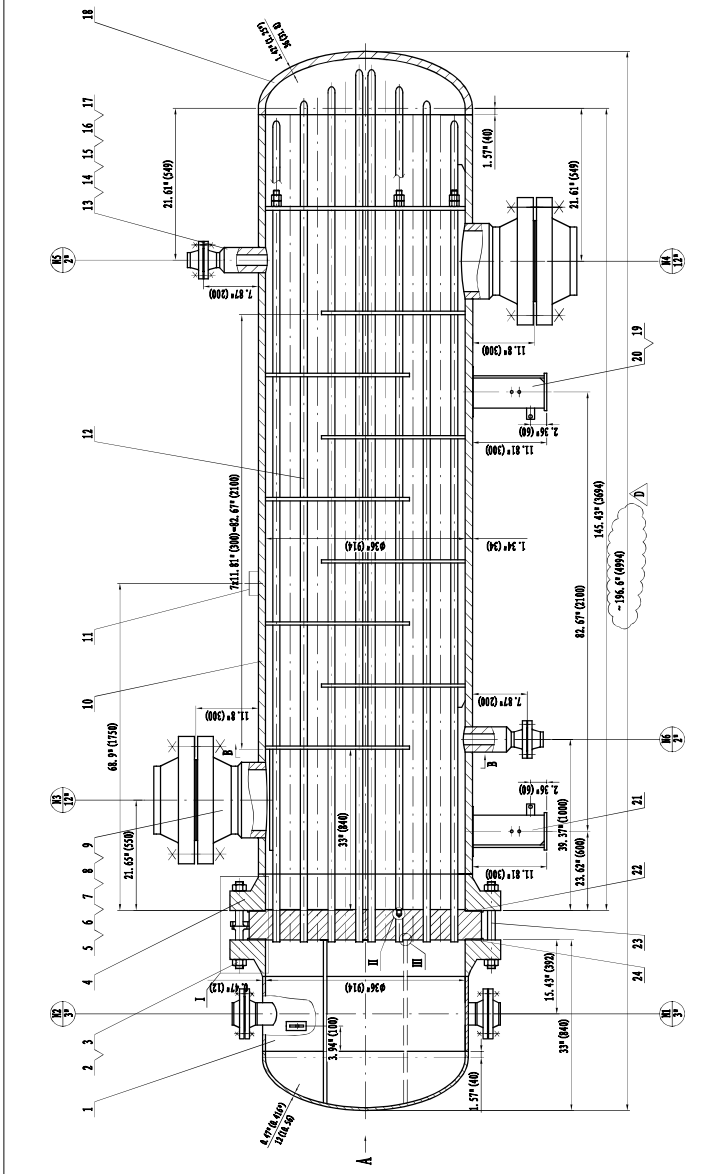
1-3	FLANGE	SA-105/SA-105/SA-105	184.8	1:8	HA-4-HE-HE-5-9	HA-4-HE-HE-5-4-11	ASST. DWG. NO.
PARTS NO.	PARTS NAME	MATERIAL	MSSTD	SCALE	DRAW NO.	ASST. DWG. NO.	

DESIGN DATA

DESIGN STANDARD	ASME CODE SEC. VIII DIV. 1, UNIFORM-BOLDED
CERTIFICATION MARK WITH U IDENTIFIER	YES
NO REGISTER	NO
TUBE CLASS	SA-191
DESIGN PARAMETER	SHELL
SERVICE	GAS
WATER	WATER
WATER (IN/OUT)	18" FT
WATER (TEMP)	62.5 (61.9) D
MATERIAL	SA-191
PIPE MATERIAL	SA-191/SA-191 GR. 70
OPERATING TEMPERATURE (IN/OUT)	F (C)
OPERATING PRESSURE	160 (66.9)
HYDROSTATIC TEST PRESSURE	240 (107.4)
DESIGN ALLOWABLE STRESS	150 (6.55)
DESIGN ALLOWABLE PRESSURE	150 (6.55)
SAFETY VALVE MODEL	150 (6.55)
HYDROSTATIC TEST PRESSURE	240 (107.4)
JOINT EFFICIENCY	1.0
CORROSION ALLOWANCE	0.188 (8)
DISTANCE NUMBER	1
POST HEAT TREATMENT	YES
RT OR PT	RT FULL/PT-51
TREATMENT AREA	FULL (C, D, E, F, APPENDIX B)
TUBE SPEC.	3/4" O.D. x 0.095" WALL THICK (ASME B31.1000)
IMPACT TESTING	INDUSTRIAL FIELD AND EXPANSION
TOTAL VOLUME	61.46 (1.74)
SEISMIC ZONE	2A (0.15)
DESIGN SERVICE LIFE	25
INSULATION THICKNESS	1/2"

LIST OF NOZZLE

NOZZLE NO.	NOZZLE TYPE	NOZZLE SIZE	NOZZLE DESCRIPTION	REMARK
1	RF	S680	WATER INLET	
2	RF	S680	WATER OUTLET	
3	RF	S680	GAS INLET	
4	RF	S680	GAS OUTLET	
5	RF	S680	VENT	
6	RF	S680	DRAIN OUTLET	

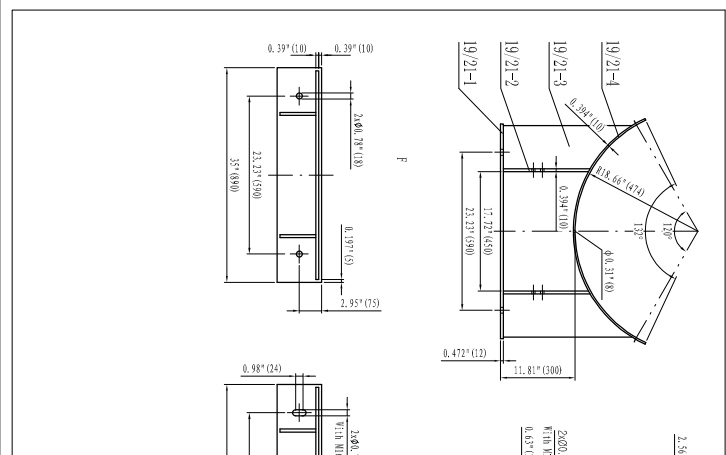
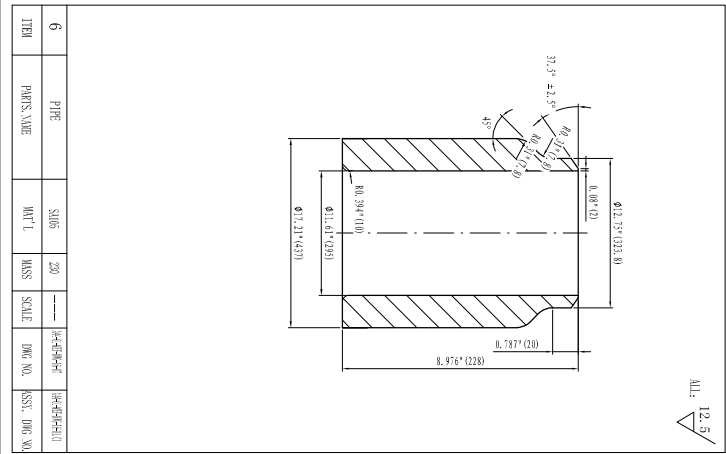
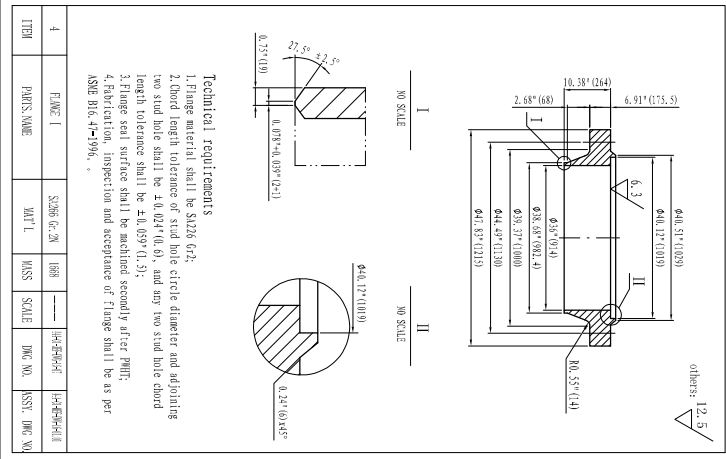


NO.	ITEM NAME	QTY	UNIT	SCALE	DATE	REVISION
1	CASSET	1	316L P.C.			
2	STD INETS 1 1/4" STD-316L-F	30	SA 191 Gr. 70	10.2	306	
3	CASSET	1	316L P.C.			
4	WELD SUPPORT S	1	316L P.C.	105.6		
5	FLANGE PLATE	2	S680 304	0.44	0.88	
6	WELD SUPPORT F	1	316L P.C.	105.6		
7	ELONGATIONAL HEAD I	1	S616 Gr. 70	0.12		
8	STD INETS 1 1/4" STD-316L-F	32	SA 191 Gr. 70	0.1	3.2	
9	WELD SUPPORT S	1	316L P.C.	105.6		
10	FLANGE WELD 2" STD-316L-F	4	SA 191	226	2044.8	COMPUTATION
11	FLANGE I	1	S680 Gr. 20	1669		
12	STD INETS 1 1/4" STD-316L-F	64	SA 191 Gr. 20	2.46	255.2	
13	WELD SUPPORT S	2	SA 191 Gr. 70	19.2	38.4	
14	CHANNEL	1	316L P.C.	2207		
15	STD INETS 1 1/4" STD-316L-F	1	316L P.C.	2207		
16	FLANGE WELD 2" STD-316L-F	4	SA 191	226	2044.8	COMPUTATION
17	FLANGE I	1	S680 Gr. 20	1669		
18	STD INETS 1 1/4" STD-316L-F	64	SA 191 Gr. 20	2.46	255.2	
19	WELD SUPPORT S	2	SA 191 Gr. 70	19.2	38.4	
20	CHANNEL	1	316L P.C.	2207		
21	STD INETS 1 1/4" STD-316L-F	1	316L P.C.	2207		
22	FLANGE WELD 2" STD-316L-F	4	SA 191	226	2044.8	COMPUTATION
23	FLANGE I	1	S680 Gr. 20	1669		
24	STD INETS 1 1/4" STD-316L-F	64	SA 191 Gr. 20	2.46	255.2	

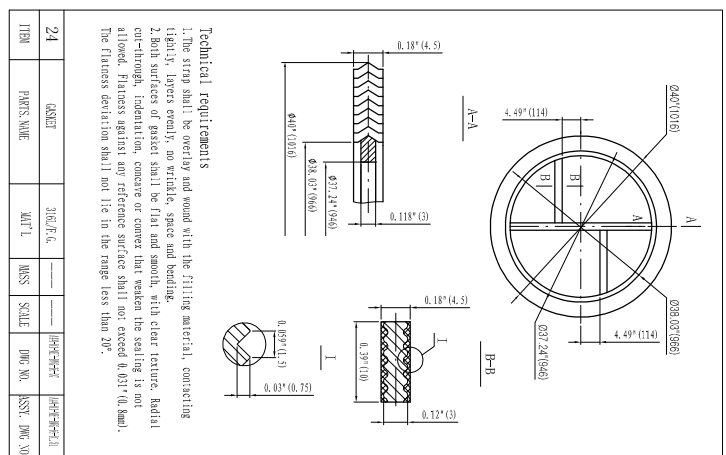
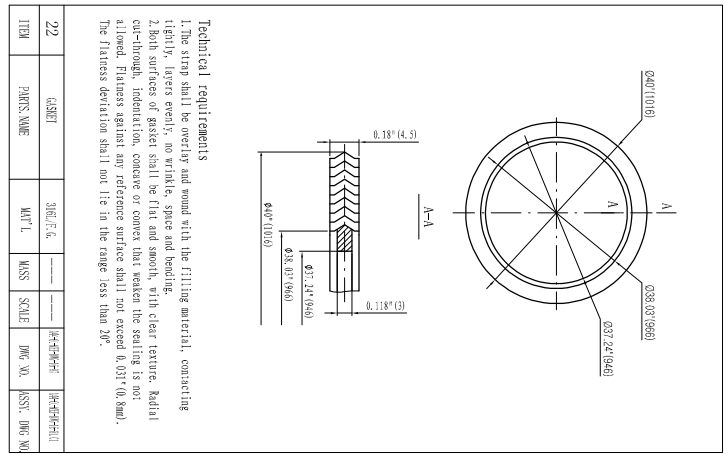
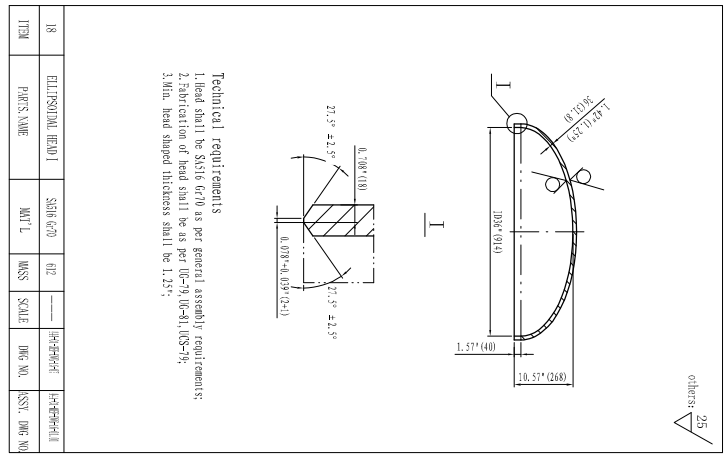
- Technical requirements**
- The design, fabrication, inspection, test and acceptance shall comply with ASME Sec. VIII-1 (2010) and (2011) and Rules for Construction of Pressure Vessels.
 - Materials shall comply with ASME Sec. II Part 9. Materials shall be certified to the appropriate specifications for ASME VIII-1. Welding rods, electrodes and filler metals shall be certified to the appropriate specifications for ASME VIII-1.
 - Welding shall comply with ASME Sec. IX. Welding shall be performed in accordance with the ASME VIII-1 Code, ASME VIII-1, Part 1, Subpart 1, and ASME VIII-1, Part 2, Subpart 2. Welding shall be performed in accordance with the ASME VIII-1 Code, ASME VIII-1, Part 1, Subpart 1, and ASME VIII-1, Part 2, Subpart 2. Welding shall be performed in accordance with the ASME VIII-1 Code, ASME VIII-1, Part 1, Subpart 1, and ASME VIII-1, Part 2, Subpart 2.
 - The equipment should meet the requirement of ASME B31.1 (2011) and (2012) and shall be as per ASME VIII-1 and ASME VIII-2.
 - All welding joints and filler welds shall be full penetrated. All fillet welding height shall be as per thickness of the thinner piece unless indicated. Category A, B weld joint internal surface of shell side shall be smooth.
 - Welding between tubes and plates shall be strength welding with light expansion by cap arc at least twice and end of joint of the first and the second shall be stagger 120°.
 - Welds on shell side inner surface shall be ground and shielded with bare metal. No butt, welding spatter, dents and sharp shall be allowed on surface.
 - Welding joint category A, B shall be 100% RT tested as per ASME-V Article 11 and results shall be as per ASME-VIII division I (1985).
 - Category C, D welding joints shall be 100% RT or PT tested as per ASME-VIII division I Appendix C or E.
 - Welding joints between plates and tubes shall be PT tested.
 - Test pressure ring or joints shall be shell side tested, containing welding joint of tube and tube sheet. After shell side pressure test, a 5-bar (0.725psi) helium test test and tube side hydrostatic test shall be conducted for welding joint of heat exchanger tube and tube plate.
 - Header shall be conducted heat treatment (NDE S106).
 - Header shall be conducted heat treatment (NDE S106).
 - Header shall be conducted heat treatment (NDE S106).
 - Header shall be conducted heat treatment (NDE S106).

GENERAL DRAWING FOR TREATED GAS TREAT COOLER

NO.	REVISION	DATE	BY	SCALE	SHEET NO.	TOTAL SHEETS
1		11.10			1	1



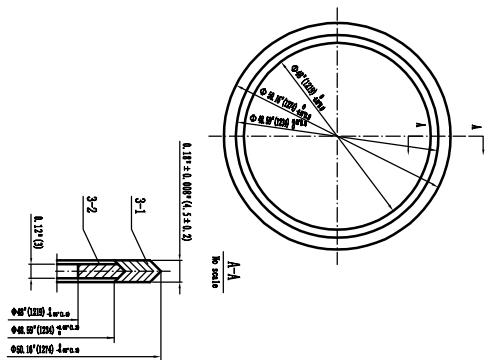
ITEM	PARTS NAME	MAT'L	QTY	MATERIAL	REMARKS
19/2-1	SADDLE SHOWER S/P	SS304	1	SA325 Gr.2	2x2
19/2-2	120 FLUE	SA325 Gr.2	1	SA325 Gr.2	4x3
19/2-3	120 FLUE	SA325 Gr.2	2	SA325 Gr.2	7
19/2-4	120 FLUE	SA325 Gr.2	1	SA325 Gr.2	20.5



ITEM	PARTS NAME	MAT'L	QTY	SCALE	DWG NO.	ISSU. DWG NO.
20	EMPTY PLATE	SS304	0.44	1:1	1000-100	1000-100

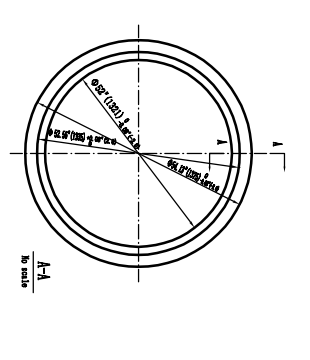
others: 25

Technical Requirements
1. Fabrication and acceptance of gasket shall be as per IS808 B 16.30-2007.



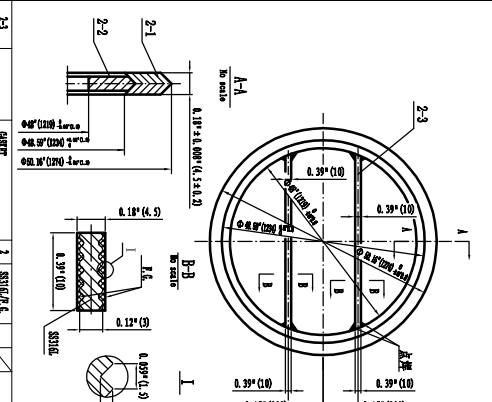
15-2	PLATE STEEL	1	SS316						
15-1	GASKET	1	SS316/7.6						
15-1	WELD								
15	ASSEMBLY								
15	WELD								

Technical Requirements
1. Fabrication and acceptance of gasket shall be as per IS808 B 16.30-2007.



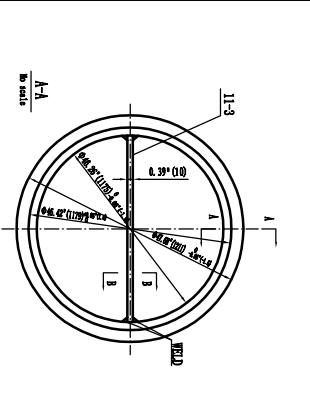
15-2	PLATE STEEL	1	SS316						
15-1	GASKET	1	SS316/7.6						
15-1	WELD								
15	ASSEMBLY								
15	WELD								

Technical Requirements
1. Fabrication and acceptance of gasket shall be as per IS808 B 16.30-2007.
2. Bolt and nuts and washers shall be heavy duty plain carbon, SS316 plate shall be as per IS808 II.



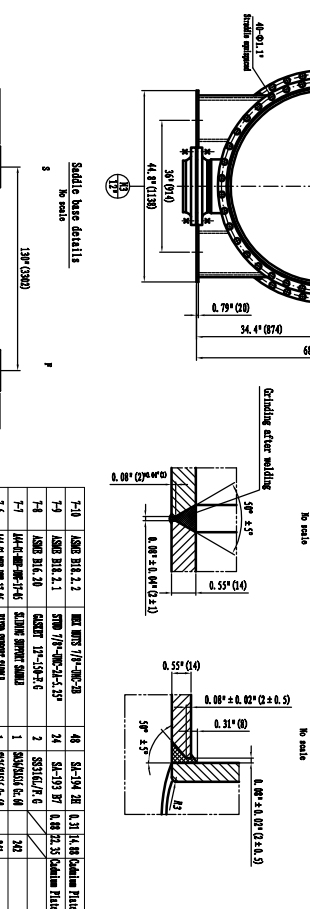
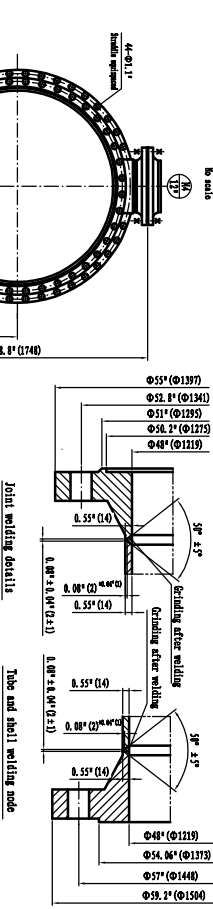
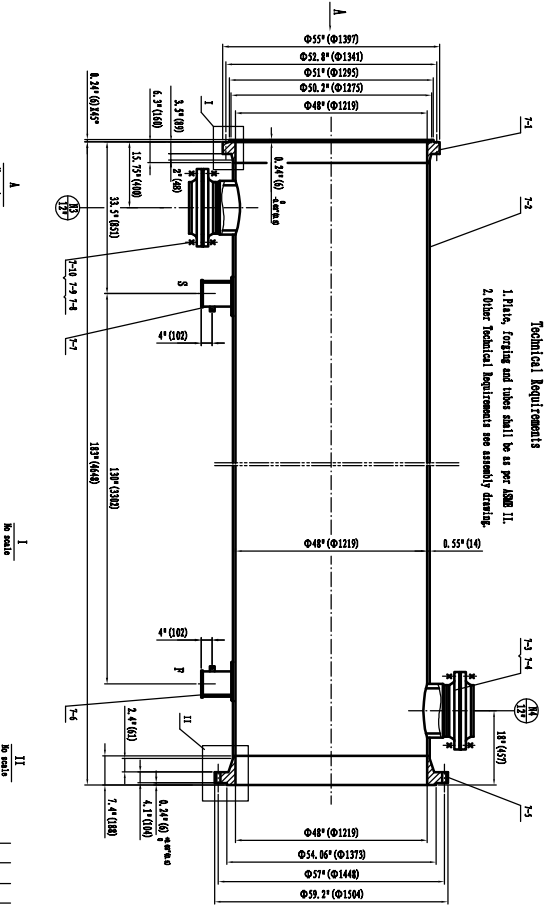
11-3	GASKET	2	SS316/7.6						
11-2	PLATE STEEL	1	SS316						
11-1	GASKET	1	SS316/7.6						
11-1	WELD								
11	ASSEMBLY								
11	WELD								

Technical Requirements
1. Fabrication and acceptance of gasket shall be as per IS808 B 16.30-2007.
2. Bolt and nuts and washers shall be heavy duty plain carbon, SS316 plate shall be as per IS808 II.

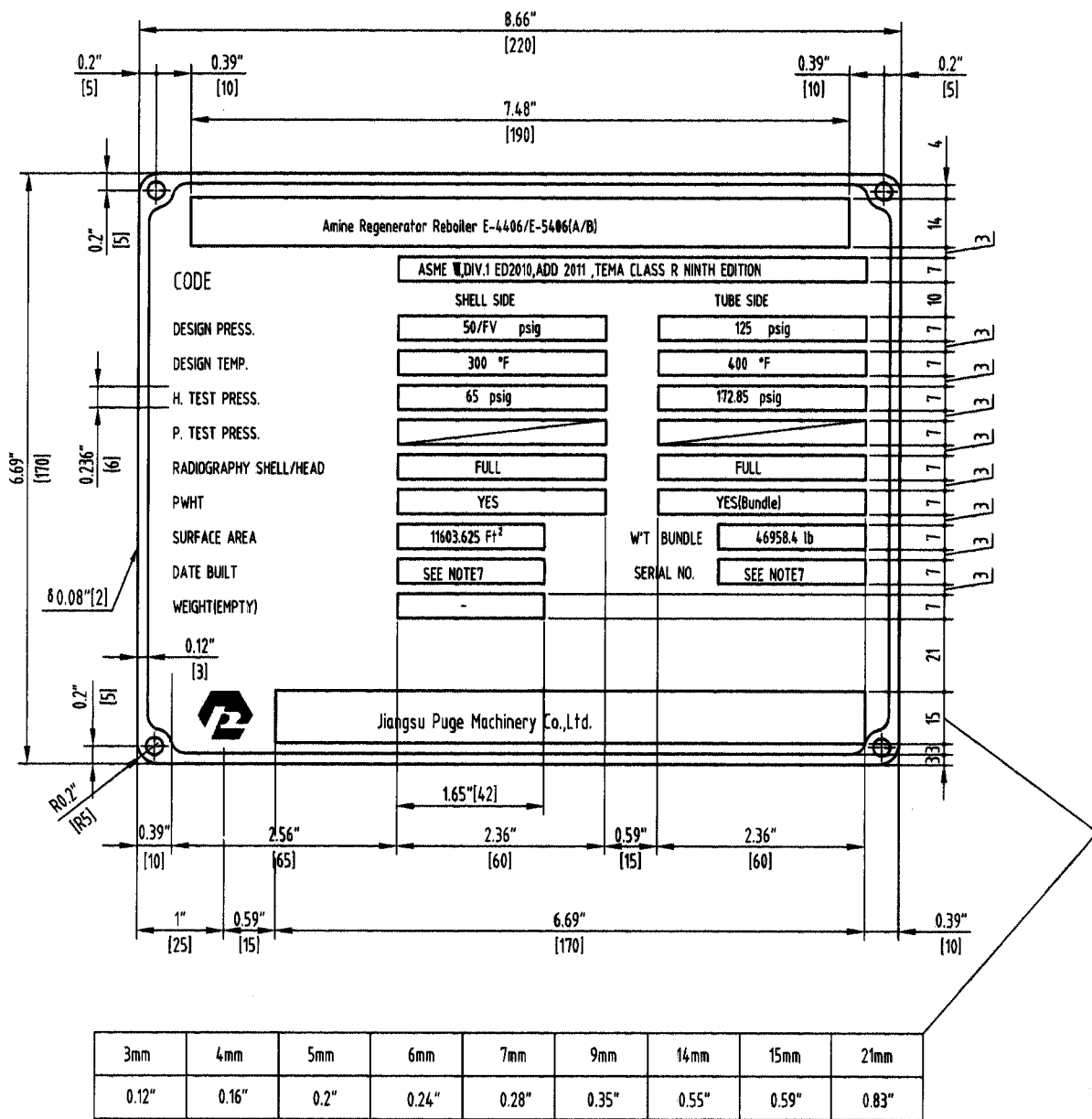


11-3	GASKET	1	SS316/7.6						
11-2	PLATE STEEL	1	SS316						
11-1	GASKET	1	SS316/7.6						
11-1	WELD								
11	ASSEMBLY								
11	WELD								

Technical Requirements
1. Plates, forging and tubes shall be as per IS808 II.
2. Other Technical Requirements see assembly drawing.



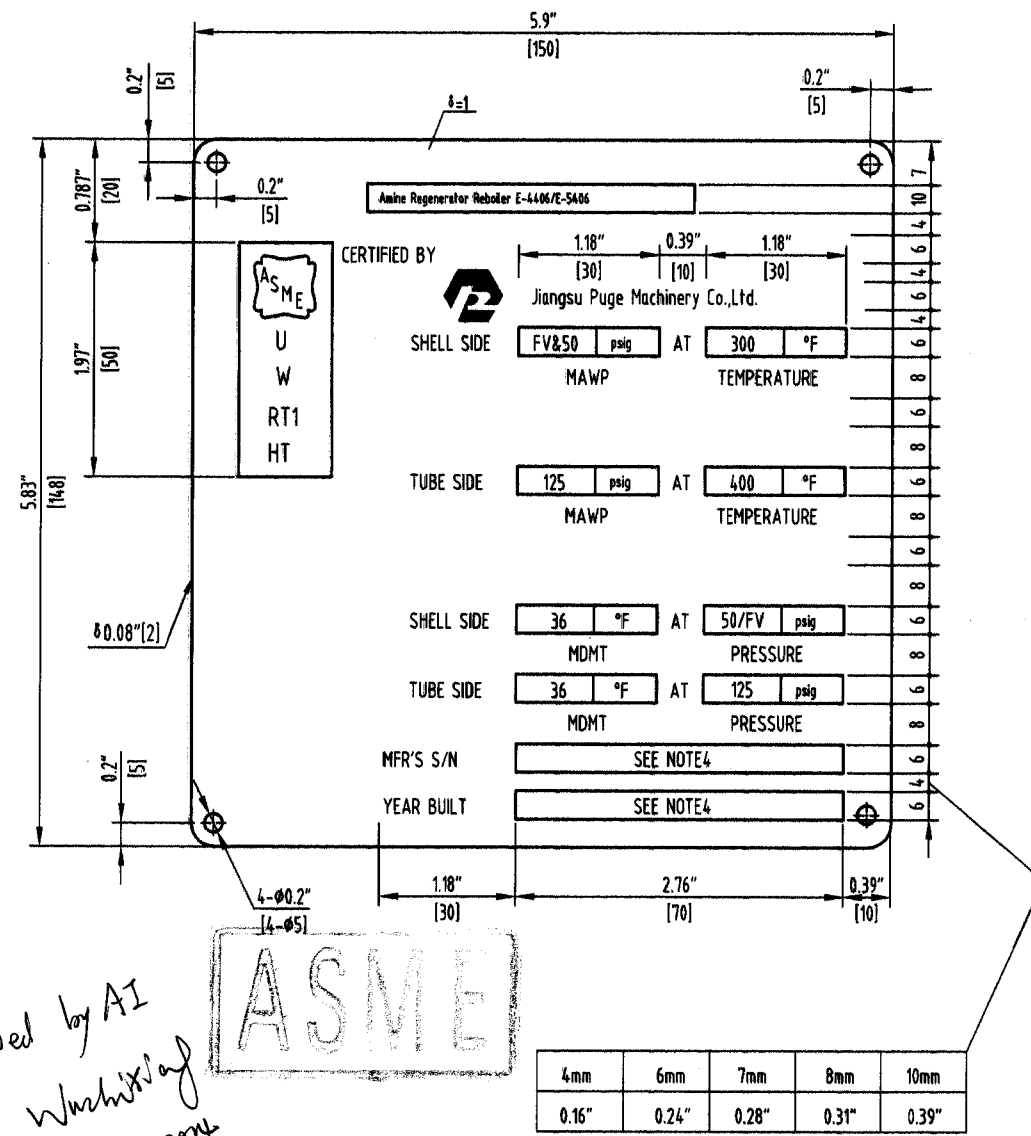
ITEM	DESCRIPTION	QUANTITY	MATERIAL	REMARKS
15-1	ASSEMBLY	1	SS316	
15-2	PLATE STEEL	1	SS316	
15-1	GASKET	1	SS316/7.6	
15-1	WELD			
11-3	GASKET	2	SS316/7.6	
11-2	PLATE STEEL	1	SS316	
11-1	GASKET	1	SS316/7.6	
11-1	WELD			
11	ASSEMBLY			
11	WELD			



TECHNICAL REQUIREMENT

1. ALL MARKS IN NAMEPLATE SHALL HIGHER THAN 0.197"(5mm).
2. DEPTH OF CHARACTERS IN NAMEPLATE SHALL BE 0.008"(0.2mm).
3. THE THIRD PARTY STAMP SHALL BE STAMPED WITH THE THIRD INSPECTOR.
4. THE OWNER EQUIPMENT NUMBER FILLED ACCORDING TO THE ACTUAL WHEN MANUFACTURING
5. ALL BLANKS SHALL BE FILLED BY THE MANUFACTURER.

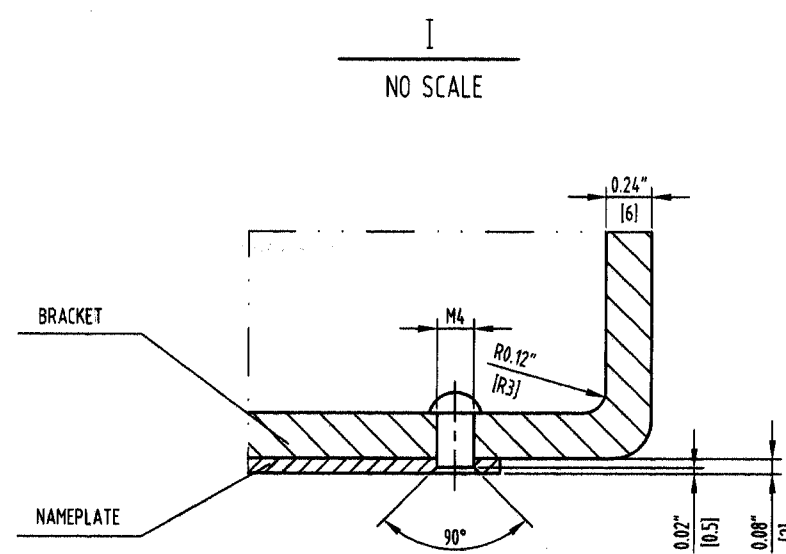
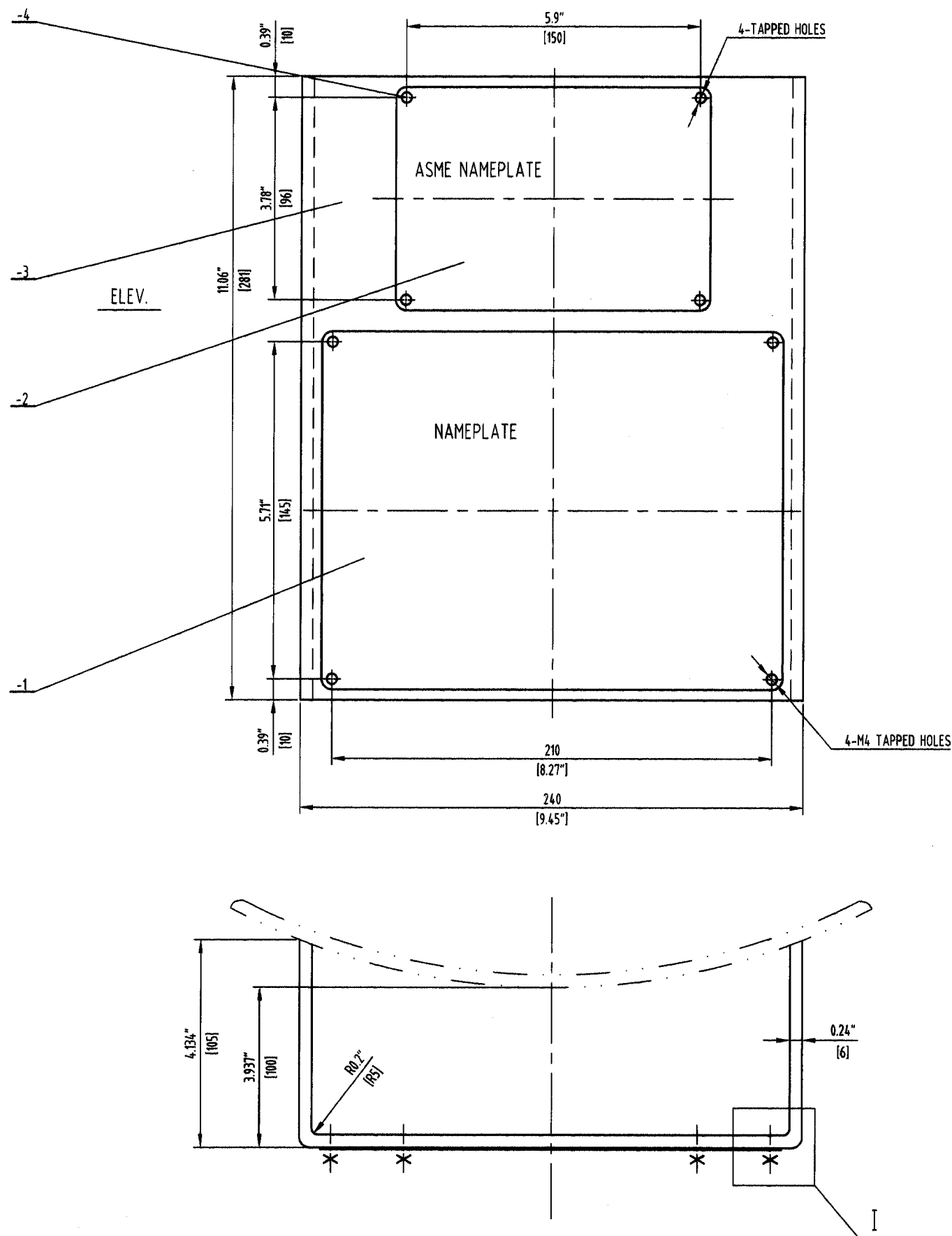
1-1	NAMEPLATE	SA-240 Gr.316L	1.32277	/	PGE13112-01	PGE13112-01
PARTS.NO	PARTS.NAME.	MAT'L	MASS(lb)	SCALE	DWG.NO	ASSY.DWG.NO



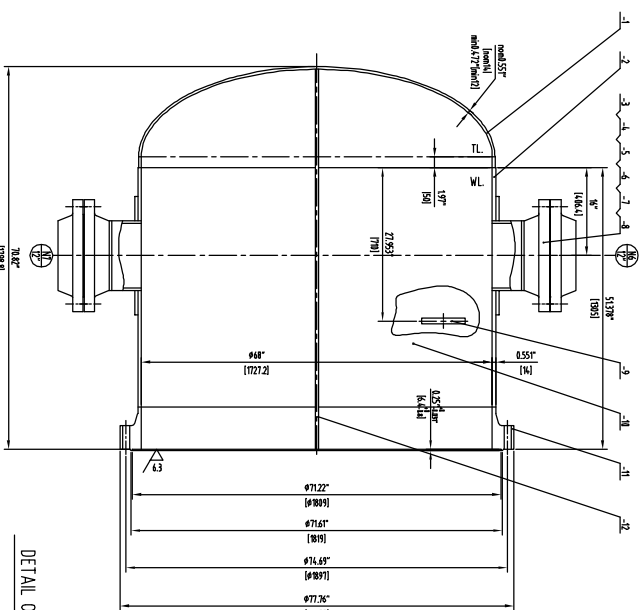
TECHNICAL REQUIREMENT

1. ALL MARKS IN NAMEPLATE SHALL HIGHER THAN 0.197"(5mm).
2. DEPTH OF CHARACTERS IN NAMEPLATE SHALL BE 0.008"(0.2mm).
3. THE THIRD PARTY STAMP SHALL BE STAMPED WITH THE THIRD INSPECTOR.
4. THE OWNER EQUIPMENT NUMBER FILLED ACCORDING TO THE ACTUAL WHEN MANUFACTURING
5. ALL BLANKS SHALL BE FILLED BY THE MANUFACTURER.

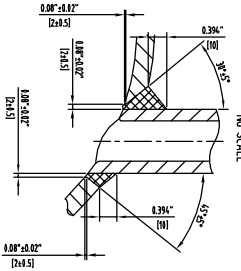
1-2	ASME NAMEPLATE	SA-240 Gr.316L	1.32277	/	PGE13112-01	PGE13112-01
PARTS.NO	PARTS.NAME.	MAT'L	MASS(lb)	SCALE	DWG.NO	ASSY.DWG.NO



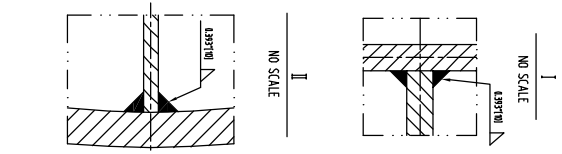
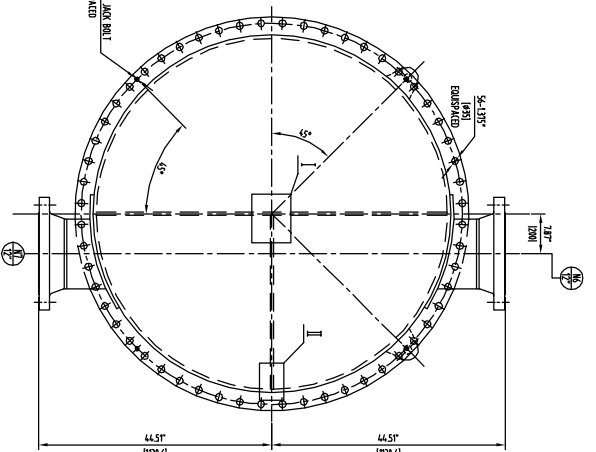
-4		RIVETS	6	304SS	/	/	
-3		BRACKET	1	SA-516 Gr.70		9.9208	
-2	PGE13112-01	ASME NAMEPLATE	1	SA-240 Gr.316L		1.32277	
-1	PGE13112-01	NAMEPLATE	1	SA-240 Gr.316L		1.32277	
PART	DWG.&STD.NO.	DESCRIPTION	QTY	MATERIAL	SINGLE WEIGHT (lb)	TOTAL WEIGHT (lb)	REMARK
1	NAMEPLATE & BRACKET	COMP.	13.2277	/	PGE13112-01	PGE13112-00	
PARTS.NO	PARTS.NAME.	MAT'L	MASS(lb)	SCALE	DWG.NO	ASSY.DWG.NO	
A	ISSUE FOR REVIEW	X.B	2014.2.14	W.H	2014.2.14	Z.Y.B	2014.2.14
REV	DESCRIPTION	DESD	DATE	CHKD.	DATE	APPD.	DATE
Project name: KPD-TAY Integrated Development Project Phase-II PROC-FC/CB/PROJ-667/767321/2013							
Document name						drawing no. PGE13112-01	
Equipment Nameplate Drawing for Amine Regenerator Reboiler (E-4406/E-5406 A/B)						Document no. A44-01-MEF-DWG-18-02	
Des.	Std.	Sign.	Pro.	Appr.	dra. mark	wei. (kg)	scale
Chk.	3.12	Pro.	Appr.				
Rev.		Appr.					
Date: 2014.3.6						sheet no. 2 of 7	
Rev. B							



DETAIL OF WELD NOZZLE
NO SCALE



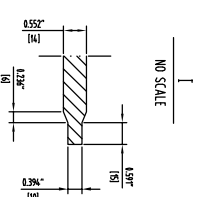
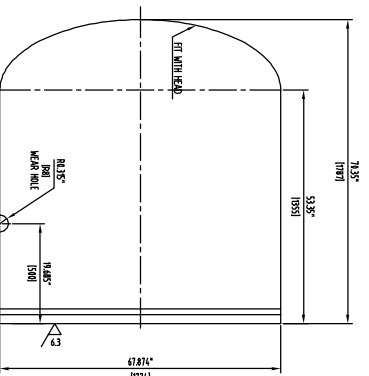
-12	PEC3112-02	PASS PARTITION I & ASSY	1	SAS56 GR.70	37394
-11	PEC3112-02	CHANNEL FLANGE	1	SAS26 GR.2	62A.3
-10	PEC3112-02	PASS PARTITION I & ASSY	1	SAS56 GR.70	15398



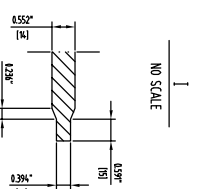
-9	PEC3112-05	LIFTING LUG	2	COMP.	4,4974,88849
-8	ASME B8.20-2007	SPRAG WOUND GASKET 12" X30 IN	2	GRAPHITE-SS316L	/
-7	ASME B8.21-2009	NUT 1.125" DIA	64	SAS34 GR.2H	/
-6	ASME B8.22-2010	BOLT 1.125" DIA X 1.148" (IN)	32	SAS33 GR.87	13,572, 154,326
-5	PEC3112-04	REINFORCEMENT & ASSY	2	SAS56 GR.70	371289, 74,678
-4	ASME B8.5-2009	FLANGE 12" X30 W/M/R-SS308S	4	SAS35	14,022, 286,244
-3		NOZZLE 12" X30 IN	2	SAS34 B	33,093, 64.4
-2		SHELL 108" DIA X 27" THICK	1	SAS56 GR.70	14,3462
-1		21" ELLIP HEAD & ASSY	1	SAS56 GR.70	14,3462
					83788
					WEIGHT (LB)
					REMARK
					L-4754(1088.4)

2-10	PASS PARTITION I	SAS56 GR.70	15398	/	PEC3112-02	PEC3112-02
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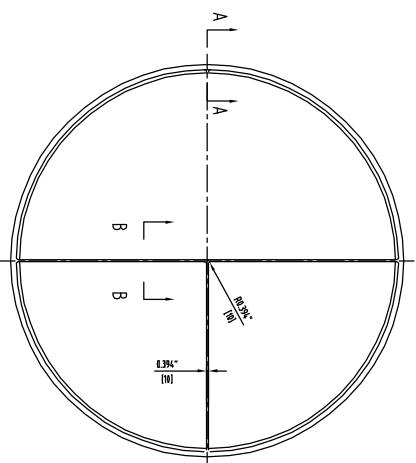
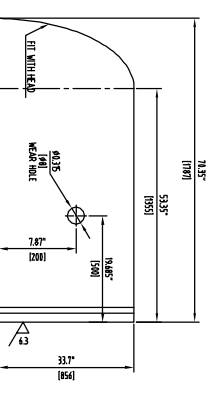
2-12	PASS PARTITION I	SAS56 GR.70	37394	/	PEC3112-02	PEC3112-02
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TECHNICAL REQUIREMENTS
DRAWING SEAL FACE AFTER WELDING WITH CHANNEL



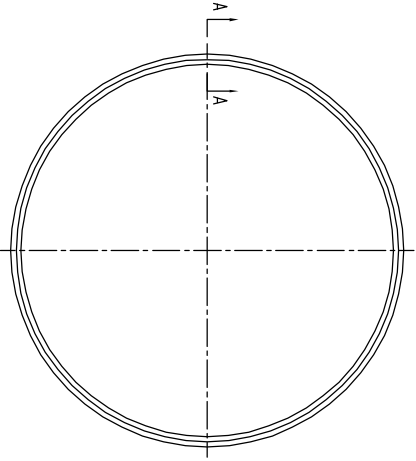
TECHNICAL REQUIREMENTS
DRAWING SEAL FACE AFTER WELDING WITH CHANNEL



A-A
NO SCALE



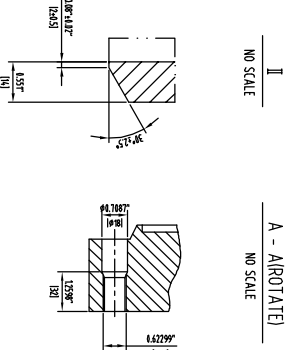
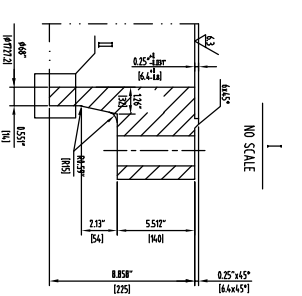
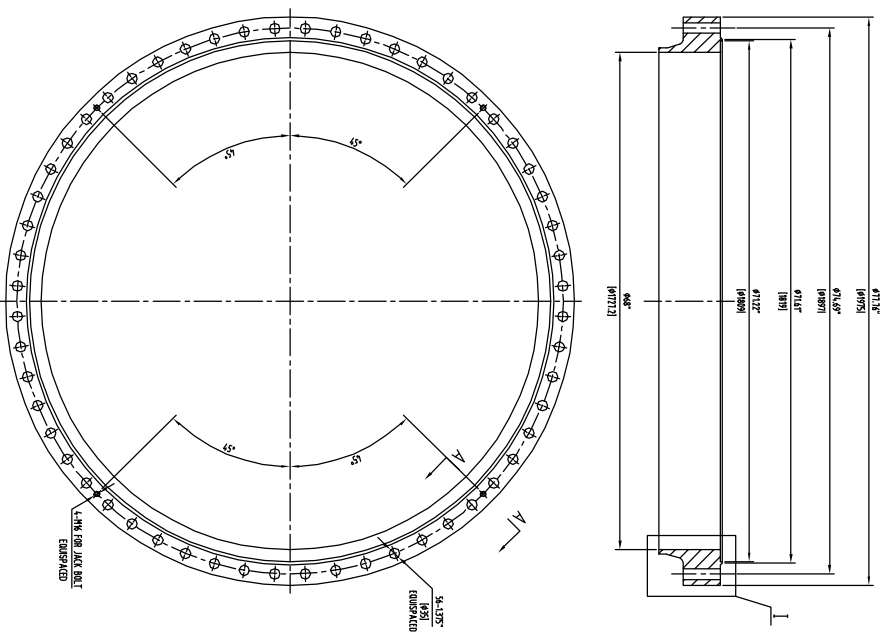
B-B
NO SCALE



A-A
NO SCALE



A-A
NO SCALE



TECHNICAL REQUIREMENTS
1. THE SEALING FACE AND SURFACE OF FLANGE SHALL NOT HAVE CRACKS AND OTHER DEFECTS WHICH MAY REDUCE THE STRENGTH OF FLANGE AND CONNECTION RELIABILITY.
2. THE ALLOWANCE OF R.C.D AND THE GROUND LENGTH BETWEEN TWO ADJACENT BOLT HOLES IS 4.028X1.44mm. THE GROUND LENGTH ALLOWANCE BETWEEN TWO ADJACENT BOLT HOLES IS 4.808X1.57mm.
3. UNLESS OTHERWISE NOTED, ALL TOLERANCES OF UNNOTATED DIMENSION SHALL BE ACCORDING TO ISO.
4. THE REST OF THE REQUIREMENTS IN ACCORDANCE WITH THE GENERAL LAYOUT.

5	GASKET 1	GRAPHITE-SS316L	/	/	PEC3112-02	PEC3112-00
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7	GASKET 2	GRAPHITE-SS316L	/	/	PEC3112-02	PEC3112-00
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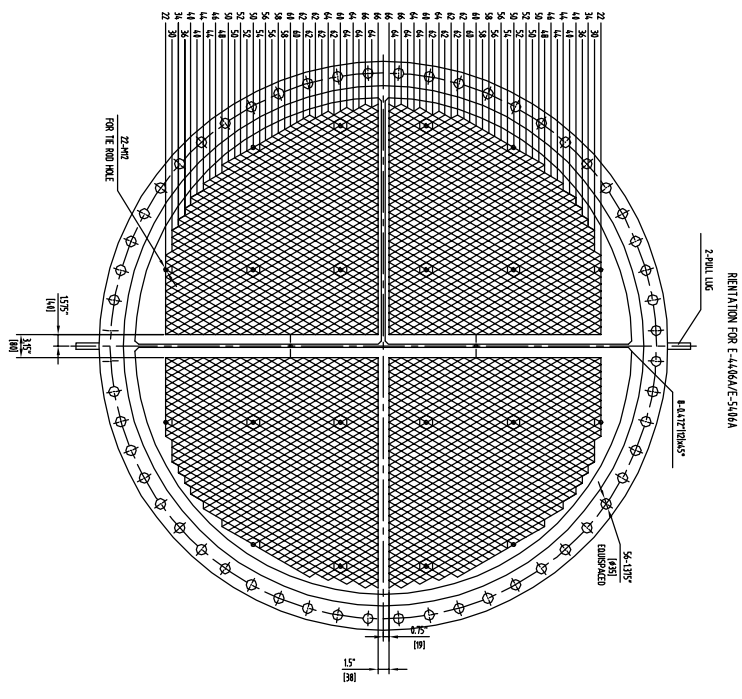
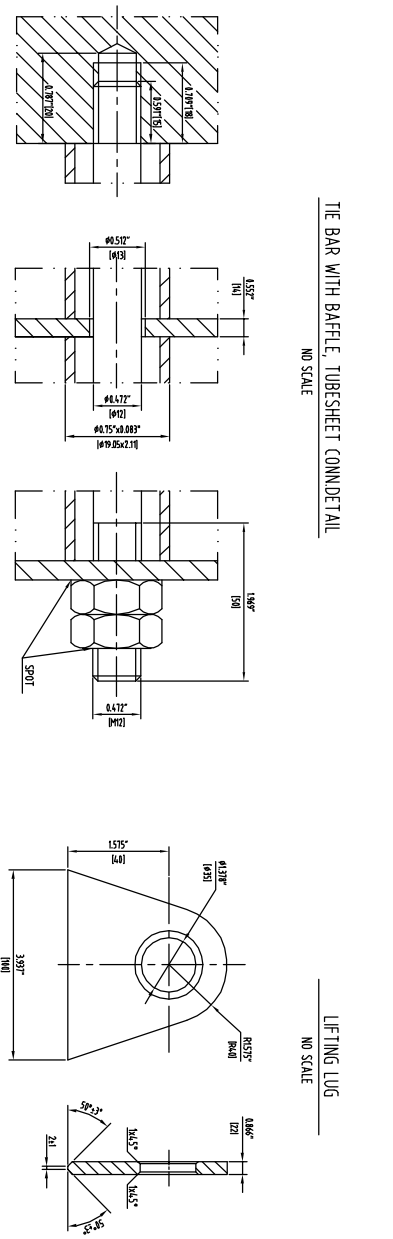
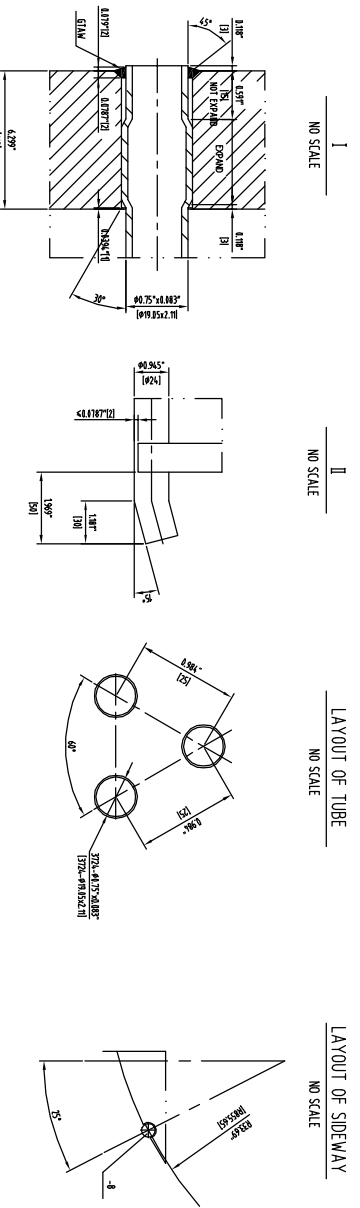
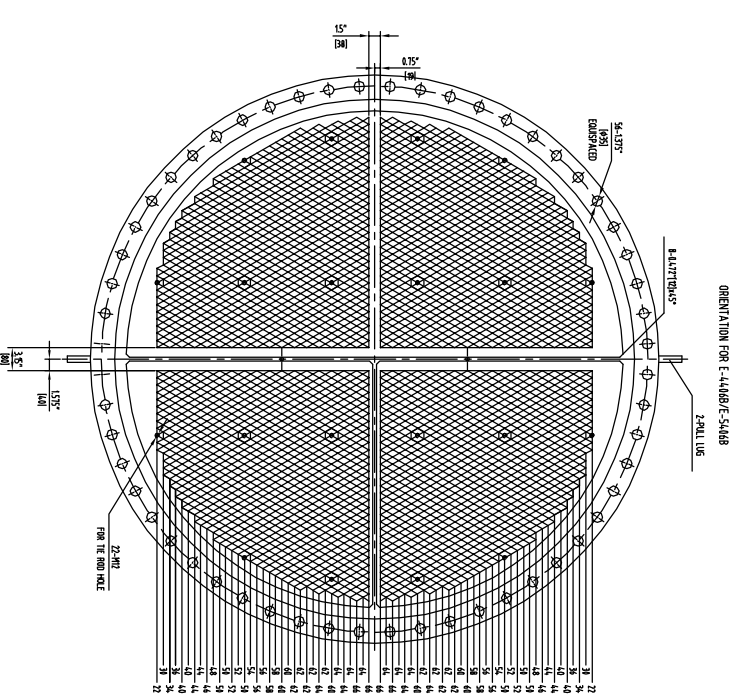
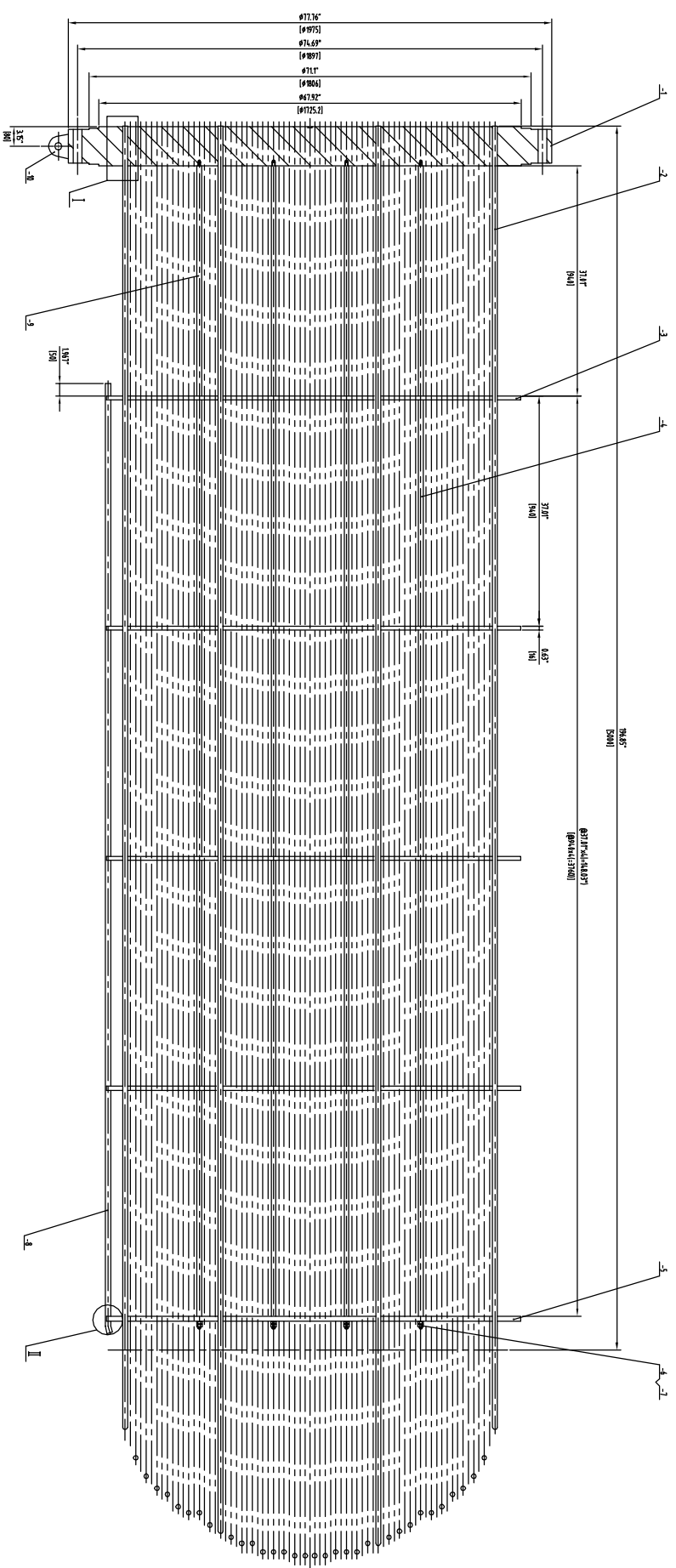
TECHNICAL REQUIREMENTS
1. THE MANUFACTURING OF THIS PRICE, EXAMINATION AND ACCEPTANCE ACCORDING TO ASME B8.20 STANDARD PERFORMANCE.
2. PARTS OF THE STEP FOR 30%, FILLED WITH FIBROUS GRAPHITE FOR THE BAND THE RING TO ENHANCE THE WOUND PAD.
3. EXCEPT NOTED, ALL FITS ARE RA3.0/RA1.

TECHNICAL REQUIREMENTS
1. THE MANUFACTURING OF THIS PRICE, EXAMINATION AND ACCEPTANCE ACCORDING TO ASME B8.20 STANDARD PERFORMANCE.
2. PARTS OF THE STEP FOR 30%, FILLED WITH FIBROUS GRAPHITE FOR THE BAND THE RING TO ENHANCE THE WOUND PAD.
3. EXCEPT NOTED, ALL FITS ARE RA3.0/RA1.

2-11	CHANNEL FLANGE	SAS26 GR.2	62A.3	/	PEC3112-02	PEC3112-02
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Part's Drawing for
Amine Regenerator Reheater
[E-446-F-5406 A/B]Drawing No. PE3112-02
Drawing No. ALL-Q1-ME-DWG-08-43

Jingsu Puge Machinery Co., Ltd.
Project name: AMINE Regenerator Development Project Phase 1 PRC-470000046710707013
Drawing No. PE3112-02
Drawing No. ALL-Q1-ME-DWG-08-43
Rev. A

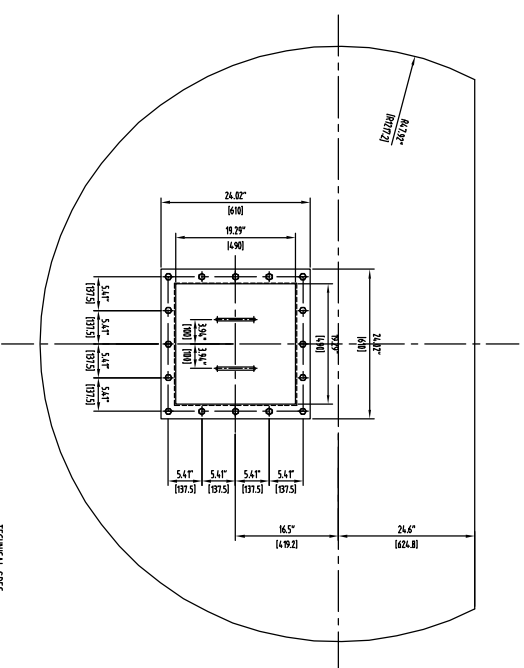
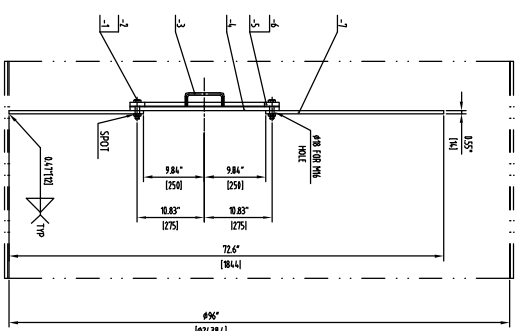


TECHNICAL REQUIREMENTS
 1. JOINTS TUBE-TO-TUBESHEET SHOULD BE STRENGTH WELDED AND LIGHTLY EXPANDED TO 499.3 IN ASME B 1.1
 2. JOINTS TUBE-TO-TUBESHEET SHOULD BE CONDUCTED BY A WIRE PT EXAMINATION ACCORDING TO 499.3 IN ASME B 1.1
 3. WELD LEAK TEST SHOULD BE DONE FOR JOINTS OF TUBE-TO-TUBESHEET
 4. BOLT NUTS OF FLANGES SHOULD STAY IN THE MASS OF VESSEL
 5. TUBE BUNDLE SHOULD BE HEAT TREATED AFTER WELDING
 6. OTHER REQUIREMENTS SET THE ASSEMBLY DRAWING

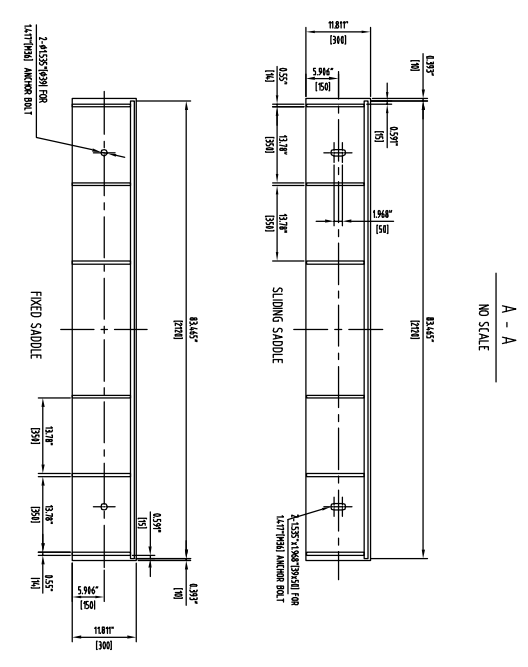
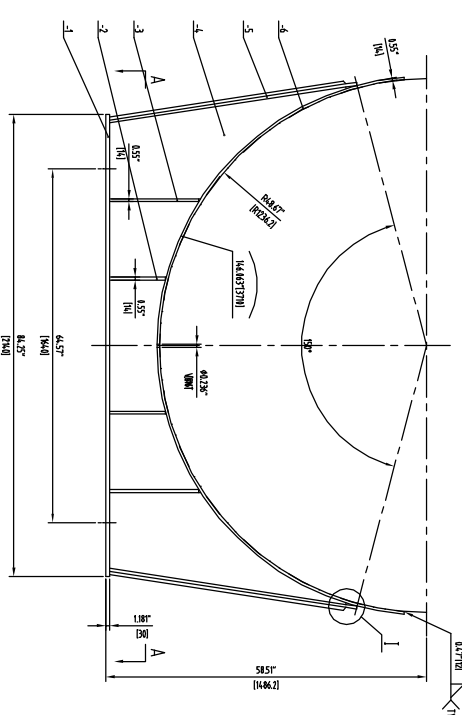
PART	DWG(S) STD NO	DESCRIPTION	QTY	MATERIAL	REMARK
-10	SEE DWG.	LIFTING LUG	2	S355RL	1.38093 648384
-9	SPACER 8.75x10.0837(10.052) IN		22	S423 TP304L	144 4418 L-37.017(94.0)
-8	SUPPORT 4.0x7.0(7.24)		2	S355RL	30.203 40.048 L-63.617(160.0)
-7	NUT M12		44	S355RL	/ /
-6	THE ROD 4.0x27.0(2)		22	S355RL	9.76 208.795 L-187.598(4.765)
-5	SPACER 2 8.4x7.0(2)		1	S423 TP304L	144 63.28 L-36.387(92.4)
-4	SPACER 8.75x10.0837(10.052) IN		88	S423 TP304L	144 63.28 L-36.387(92.4)
-3	SPACER 1 8.4x7.0(1)		4	S423 TP304L	302.55 109.94
-2	PERFORATED TUBE		1	S423 TP304L	409.84
-1	PERFORATED TUBESHEET		1	S405 TP304L	352.28
6	TUBE BUNDLE	COMP	46984	/	PERFORATED TUBESHEET

REV	DESCRIPTION	DESIGNER	CHECKER	DATE	APPROVED
A	ISSUE FOR REVIEW	X.B	B.H.2.H	21.8	B.H.2.H

Jiangsu Puje Machinery Co., Ltd.
 Project name: 11X Horizontal Development Project Phase 1 PRC-27020901471702019
 Drawing no: PCE1312-43
 Document no: ALL-01-ME-DWG-08-24
 Part's Drawing for
 Anne Repetitive Renoler
 (E-4446/E-5446 A/B)
 Date: 21.8
 Scale: 1:1
 Sheet no. 1 of 7
 Rev. A

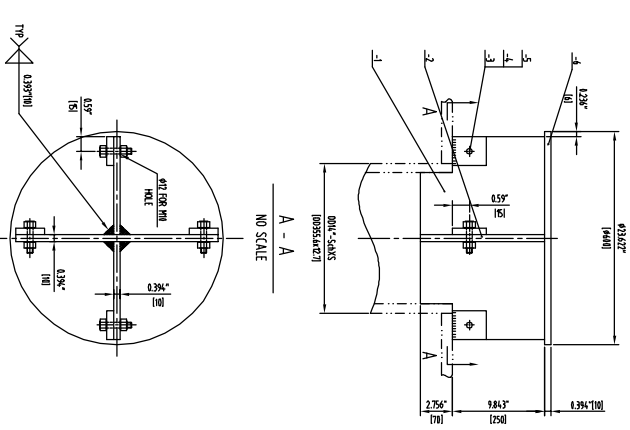
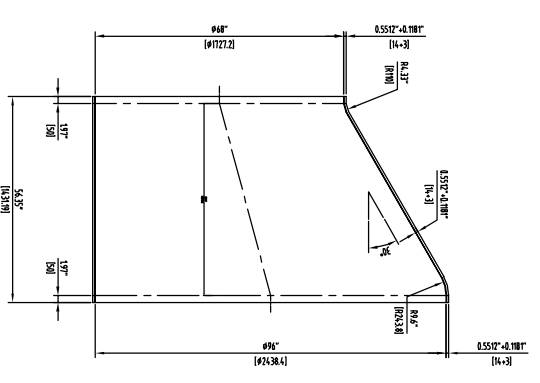
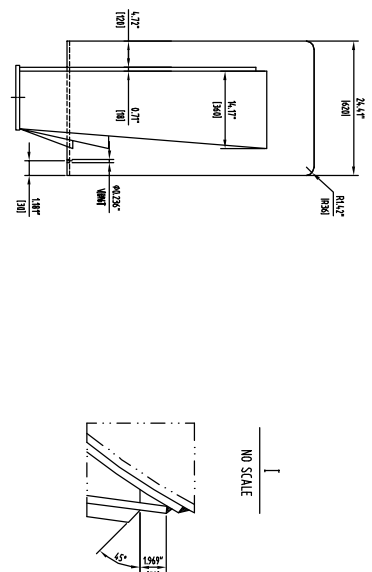


PARTS NO	PARTS NAME	MATL	MASS(Sib)	SCALE	DWGNO	ASSY DWGNO
1	WEIR	COMP.	180231	/	PEC312-05	PEC312-00
2	PLATE B-0.55T14	SA240 G-3HL	892.872	/		
3	GASKET B-4.118T13	PTFE	/			
4	PLATE B-0.53T16	SA240 G-3HL	44.974	/		
5	PLATE B-0.55T14	SA240 G-3HL	40.394	/		
6	SE DIMG	HANDLE	2	SS3HL	/	
7	ASME B18.2-200	NUT M16	16	SS3HL	/	
8	ASME B18.2-200	BOLT M16x2.75x110	16	SS3HL	/	
9	DWG&STDNO	DESCRIPTION	QTY	MATERIAL	SINGLE TOTAL WEIGHT (kg)	REMARK



PARTS NO	PARTS NAME	MATL	MASS(Sib)	SCALE	DWGNO	ASSY DWGNO
1	WEAR PLATE B-0.55T14	SA516 G-70	558.14	/	PEC312-05	PEC312-00
2	ROB B B-0.55T14	SA516 G-70	88.849	1:1		
3	ROB B B-0.7T18	SA516 G-70	40.055	/		
4	ROB B B-0.55T14	SA516 G-70	33.954	1:1		
5	ROB B B-0.55T14	SA516 G-70	19.972	1:1		
6	BASE PLATE B-4.118T13	SA516 G-70	355.679	/		
7	SLIDING/FIXED SADDLE	SA516 G-70	1619.37	/	PEC312-05	PEC312-00
8	DWG&STDNO	DESCRIPTION	QTY	MATERIAL	SINGLE TOTAL WEIGHT (kg)	REMARK

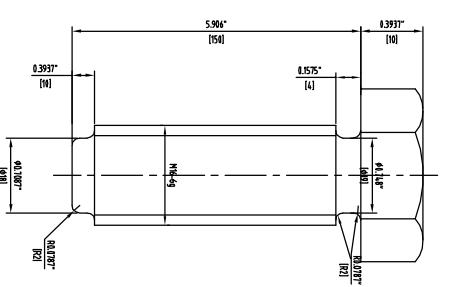
TECHNICAL REQUIREMENTS
 1 THE WELD FOR SADDLE BODY SHALL BE DOUBLE CONTINUOUS FILLET WELD THE WELDING BETWEEN THE SADDLE PLATE AND THE VESSEL SHELL SHALL BE CONTINUOUS.
 2 NO GRACK SLAG GAS HOLE AND GATER DEFECTS ETC. ON THE SURFACE OF THE WELDED SEAM AND NO REMAINING SLAG AND SPATTERS ALLOWED.
 3 THE SPOONING REQUIREMENTS FOR ALL WELDED PARTS OF SADDLE SHALL BE R25P4H.
 4 WHEN SADDLE IS WELDED, EVERY PARTS SHALL BE FLAT, NO CURV IS ALLOWED.



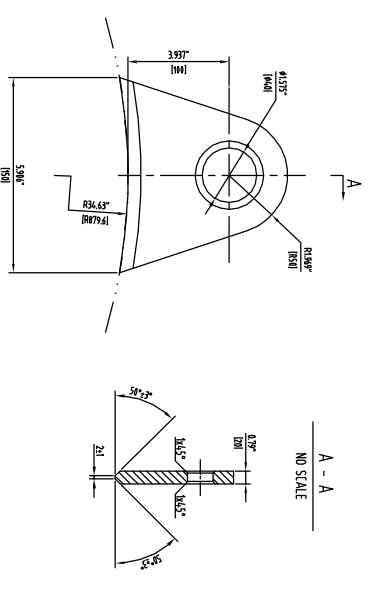
PARTS NO	PARTS NAME	MATL	MASS(Sib)	SCALE	DWGNO	ASSY DWGNO
9	OBLOUE CONE	SA516 G-70	2647.64	/	PEC312-05	PEC312-00
10	DWG&STDNO	DESCRIPTION	QTY	MATERIAL	SINGLE TOTAL WEIGHT (kg)	REMARK

PARTS NO	PARTS NAME	MATL	MASS(Sib)	SCALE	DWGNO	ASSY DWGNO
1	TOP PLATE B-4.39x-110	SA240 G-3HL	19.041	/		
2	PLATE B-0.53T16	SA240 G-3HL	/			
3	ASME B18.2-200	NUT M16	4	SS3HL	/	
4	ASME B18.2-200	BOLT M16x2.75x145	4	SS3HL	/	
5	PLATE B-0.53x-110	SA240 G-3HL	1	SS3HL	0.241	
6	PLATE B-0.53x-110	SA240 G-3HL	2	SS3HL	38.647	61.726
7	DWG&STDNO	DESCRIPTION	QTY	MATERIAL	SINGLE TOTAL WEIGHT (kg)	REMARK
8	VERTIX BARFLE	COMP.	209.139	/	PEC312-05	PEC312-00

PARTS NO	PARTS NAME	MATL	MASS(Sib)	SCALE	DWGNO	ASSY DWGNO
21	JACK BOLT	SS304	/	/	PEC312-05	PEC312-00
22	DWG&STDNO	DESCRIPTION	QTY	MATERIAL	SINGLE TOTAL WEIGHT (kg)	REMARK



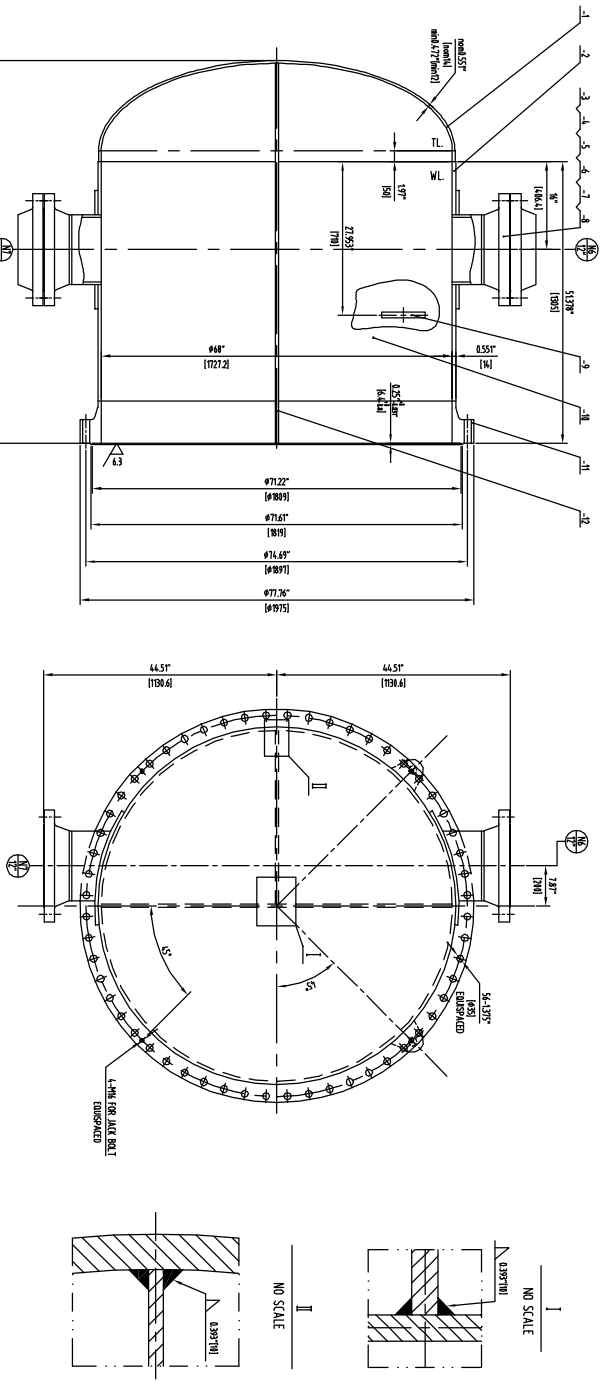
PARTS NO	PARTS NAME	MATL	MASS(Sib)	SCALE	DWGNO	ASSY DWGNO
29	LIFTING LUG	SA516 G-70	4.0294	/	PEC312-05	PEC312-02
30	DWG&STDNO	DESCRIPTION	QTY	MATERIAL	SINGLE TOTAL WEIGHT (kg)	REMARK



Project name: JYK Heavy Duty Development Project Phase 1 PRC-270000046710707013
 Drawing no: PEC312-05
 Document no: ALL-01-HE-DWG-8-36

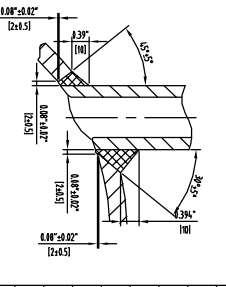
Part's Drawing for
 Amine Regenerator Reheater
 (E-4446-F-5406 A/B)

Issue No: 6 of 7
 Rev. A



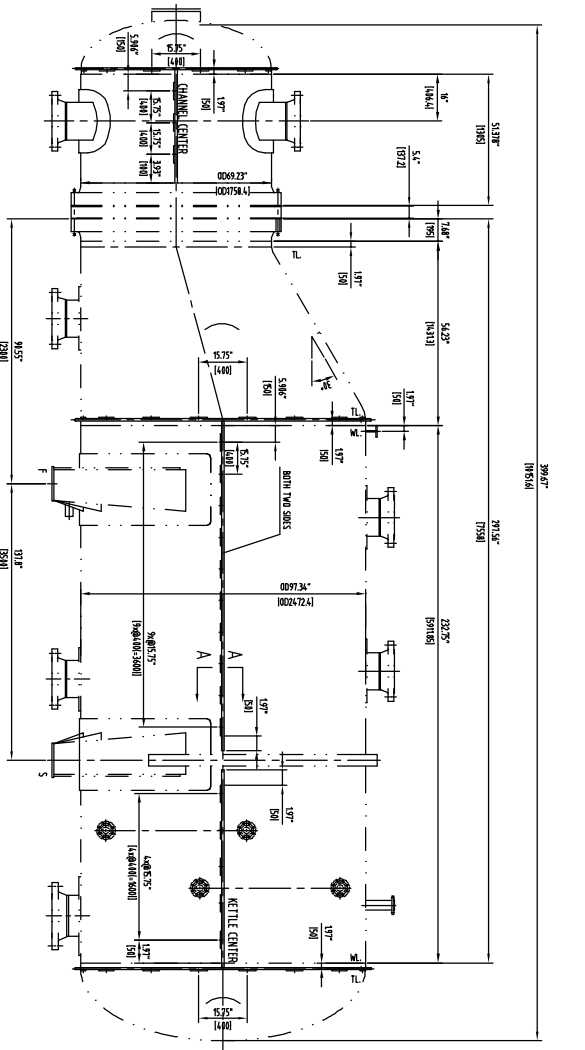
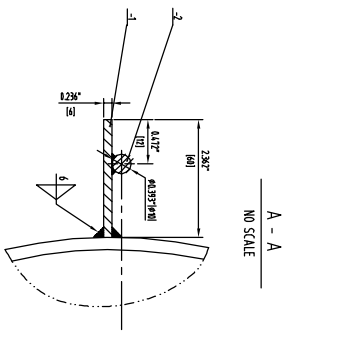
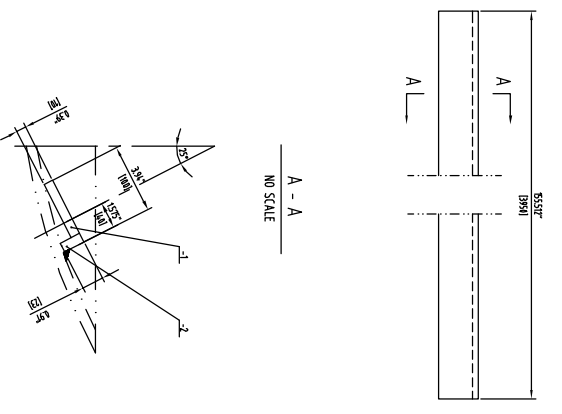
TECHNICAL REQUIREMENTS
 1. THE TYPE AND SIZE OF WELD JOINT SHALL BE IN ACCORDANCE WITH THE DRAWING. THE THROAT THICKNESS FOR ALL FILLET WELDS SHALL BE EQUAL TO THE THICKNESS OF THINNER PLATE.
 2. THE SCALING SURFACE OF FLANGE SHALL BE PERPENDICULAR TO THE AXIS OF SHELL. THE TOLERANCE IS ±0.05mm.
 3. LIFTING LUG USED AS LIFTING CHANNEL ONLY.
 4. FLANGE AND TIE BOX PROCESS DAMPER/GASKET SEAL FACE SHOULD BE SECONDARY PROCESSING. SPASST PARTITION SHOULD BE DOUBLE-ENDED WELDING. SINCE SCALING SURFACE STRUCTURE OF SZ SHALL BE FULL PENETRATION.
 5. THE REST OF THE REQUIREMENTS IN ACCORDANCE WITH THE ASSEMBLY DRAWING.
 6. THE REST OF THE REQUIREMENTS IN ACCORDANCE WITH THE ASSEMBLY DRAWING.
 7. NOZZLE ORIENTATION FOR E-COMMERCIAL-SAWA.

DETAIL OF WELD NOZZLE
NO SCALE

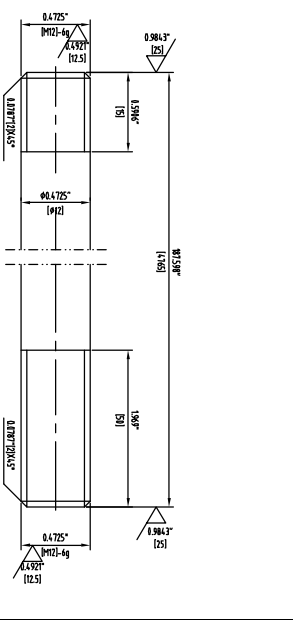


NO.	DESCRIPTION	QTY	COMP.	SCALE	DWGNO.	ASSY DWGNO.
-9	PEC3112-05 LIFTING LUG	2	COMP.	/	PEC3112-02	PEC3112-00
-8	ASME BR-2-2007 SPERAL-WOUND GASKET 72" X 90"	2	GRAPHITE-SS316L	/		
-7	ASME BR-2-2009 NUT 1/2"-8UNC	64	SA193 GR-2H	/		
-6	ASME BR-2-2010 BOLT 1/2"-8UNC L=1.47(IN)	32	SA193 GR-2H	/		
-5	PEC3112-06 RENEFORCMENT 8" X 55" (14)	2	SA438 GR-70	1:2	13027	16026
-4	ASME BR-2-2009 FLANGE 72" X 90" WW/RR-SS308S	4	SA438	1:2	14022	16026
-3	NOZZLE 72" X 90" WW/RR-SS308S	2	SA438	1:2	13029	16026
-2	SHELL 108" X 108" (77.71) X 55" (14)	1	SA438 GR-70	1	14362	1-425(11600) (4)
-1	21" ELLIP HEAD 8" X 55" (14)	1	SA438 GR-70	1	14368	83788
PART	DWG&STDNO	DESCRIPTION	QTY	MATERIAL	WEIGHT (kg)	REMARK
2	CHANNEL	COMP.	SA438	/	PEC3112-02	PEC3112-00

NO.	DESCRIPTION	QTY	MATERIAL	SCALE	DWGNO.	ASSY DWGNO.
-2	PLATE 8" X 55" (14)	1	SA438 GR-3BL	1:2	14361	
-1	PLATE 8" X 55" (14)	1	SA438 GR-3BL	1:2	14363	
PART	DWG&STDNO	DESCRIPTION	QTY	MATERIAL	SINGLE TOTAL WEIGHT (kg)	REMARK
7	GAGE RAIL	SA438 GR-3BL	1	/	PEC3112-06	PEC3112-00



NO.	DESCRIPTION	QTY	MATERIAL	SCALE	DWGNO.	ASSY DWGNO.
6-4	TIE ROD	SS316L	9.26	/	PEC3112-06	PEC3112-03



NO.	DESCRIPTION	QTY	MATERIAL	SCALE	DWGNO.	ASSY DWGNO.
-2	BAR 108" X 108" (77.71) X 55" (14)	1	SA438	1:2	14362	1-425(11600) (4)
-1	SUPPORT RAIL 108" X 108" (77.71) X 55" (14)	1	SA438 GR-70/3BL	0.43	14363	13 PEC-3112
PART	DWG&STDNO	DESCRIPTION	QTY	MATERIAL	SINGLE TOTAL WEIGHT (kg)	REMARK
18	INSULATION SUPPORT	COMP.	BR-3049	/	PEC3112-06	PEC3112-00

Jiangsu Puge Machinery Co., Ltd.

Part's Drawing for
 Anne Repeater Releaser
 (E-446F-5406 A/B)

Doc. No. PEC3112-06
 Date: 2023.12.26

Checked by: [Signature]
 Approved by: [Signature]



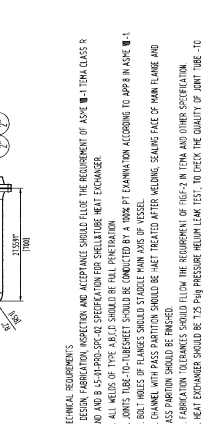
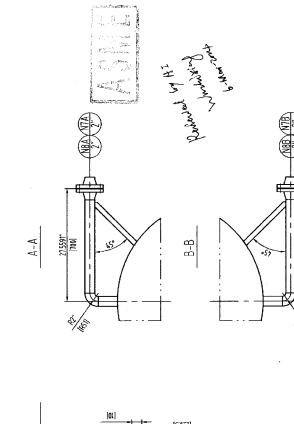
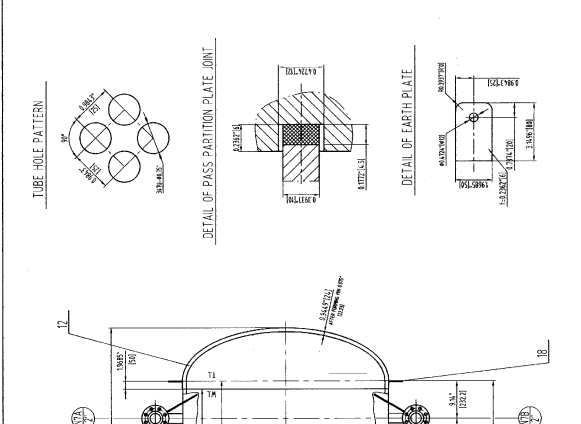
DESIGN SPECIFICATION

CODE ASME VIII DIV1 2010 EDITION 8 2011 ADD. 1 TEMA CLASS R NINTH EDITION

DESIGNER TYPE	SCALE	DATE	NO.	REGISTER	ASME CERTIFICATION MARK WITH U REGISTERED
FLUID	NON-LETHAL NON-PURIFIED				
FLUID PROPERTY					
WORKING TEMP. IN / OUT (°F)	250 / 250				
WORKING PRESS.	PSIG	450			
DESIGN TEMP.	(°F)	250			
DESIGN PRESS.	PSIG	600			
MIN. METAL TEMP.	(°F)	36			
MAP	PSIG	600			
CORR. ALLOW.	(INCH)	0.118			
JOINT EFF. (SHELL/HEAD)		1.0			
NUMBER OF PASSES		1			
PHWT	NO. TEST CHANNELS	1			
VESSEL IMPACT TEST	NO. TEST CHANNELS	1			
HYDRO. TEST PRESS.	PSIG	780			
GAS LEAKAGE TEST PRESS.	PSIG	150			
INSULATION (INCH)	3.937				
VOLUME	(CU FT)	786.1			
LIFE OF SERVICE	25 YEARS				
REQUIREMENT FOR AMPLIFICATION	SEE TECHNICAL SPEC				

ITEM	QTY	CLASS	CON. STD.	TYPE	FRAMING	SERVICES	PROVIDED BY
M1	1	C300	ASME B31.1-2009	MM	RF	S-209	WELDED BUTT WELD
M2	1	C300	ASME B31.1-2009	MM	RF	S-209	WELDED BUTT WELD
M3	1	C300	ASME B31.1-2009	MM	RF	S-209	WELDED BUTT WELD
M4	1	C300	ASME B31.1-2009	MM	RF	S-209	WELDED BUTT WELD
M5	1	C300	ASME B31.1-2009	MM	RF	S-209	WELDED BUTT WELD
M6	1	C300	ASME B31.1-2009	MM	RF	S-209	WELDED BUTT WELD
M7	1	C300	ASME B31.1-2009	MM	RF	S-209	WELDED BUTT WELD
M8	1	C300	ASME B31.1-2009	MM	RF	S-209	WELDED BUTT WELD
M9	1	C300	ASME B31.1-2009	MM	RF	S-209	WELDED BUTT WELD
M10	1	C300	ASME B31.1-2009	MM	RF	S-209	WELDED BUTT WELD
M11	1	C300	ASME B31.1-2009	MM	RF	S-209	WELDED BUTT WELD
M12	1	C300	ASME B31.1-2009	MM	RF	S-209	WELDED BUTT WELD

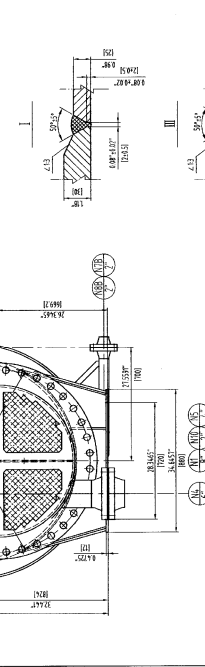
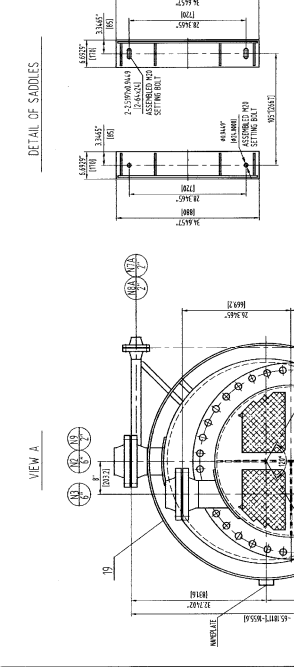
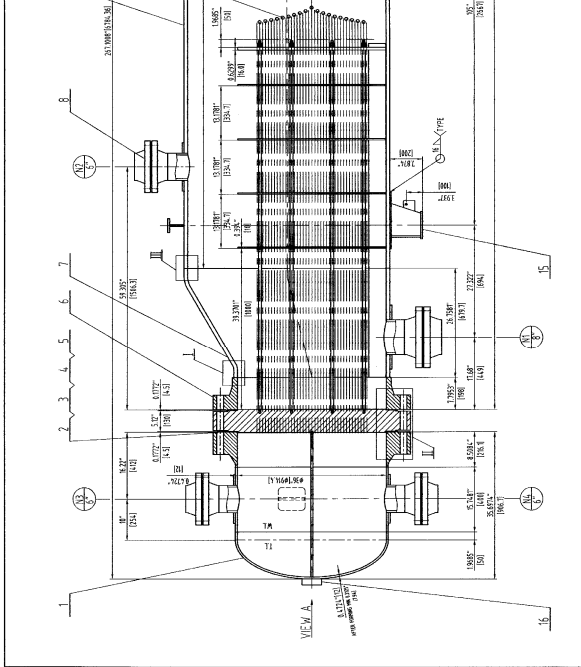
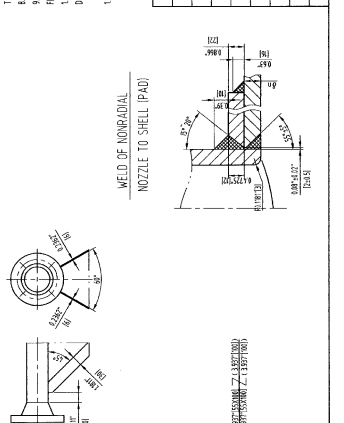
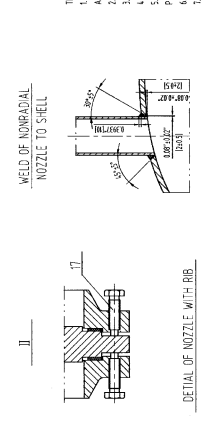
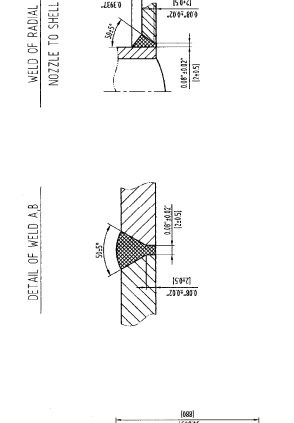
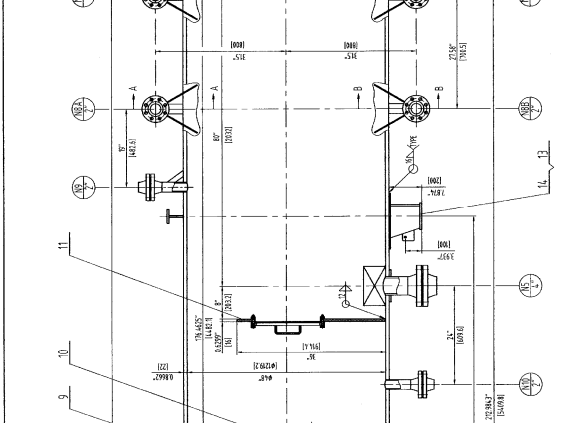
ITEM	QTY	DESCRIPTION	MATERIAL	WEIGHT (LBS)	REMARK
10	1	TUBE BUNDLE	1 COMP.	66316	
9	1	SHELL AND TUBESHEET WELD	1 SASS (DR. 7)	6635	
8	1	NOZZLE SUPPORT	1 COMP.	300	
7	1	NOZZLE SUPPORT	1 SASS (DR. 7)	1057	
6	1	CONE	1 SASS (DR. 7)	900	
5	1	SHIELD FLANGE	1 SASS (DR. 7)	1170	
4	1	FLANGE	1 SASS (DR. 7)	1170	
3	1	FLANGE	1 SASS (DR. 7)	1170	
2	1	FLANGE	1 SASS (DR. 7)	1170	
1	1	FLANGE	1 SASS (DR. 7)	1170	



TECHNICAL REQUIREMENTS

- DESIGN FABRICATION INSPECTION AND ACCEPTANCE SHALL FOLLOW THE REQUIREMENTS OF ASME VIII TEMA CLASS R AND AS 4-PAD-SP-40 SPECIFICATION FOR SHELLS, HEADS, AND NOZZLES.
- ALL WELDS OF THIS VESSEL SHALL BE FULL PENETRATION.
- JOINTS TUBE-TO-TUBESHEET SHALL BE COMPLETED BY A WORK P.T. EXAMINATION ACCORDING TO ASME VIII-1.
- BUT WELDS OF FLANGES SHALL BE FULL PENETRATION.
- CHANNELS WITH PASS PARTITION SHALL BE SHEET TREATED AFTER WELDING SEALING FACE OF MAIN FLANGE AND PASS PARTITION SHALL BE FINISHED.
- FOR ALL WELDS THE RESPONSIBILITY OF PROTECTING FROM CORROSION AND TUBING CORROSION.
- FLANGE EXCHANGERS SHOULD BE 1.75 PSIG PRESSURE HEAD LEAK TEST, TO CHECK THE QUALITY OF JOINT TUBE-TO-TUBESHEET.
- OUTSIDE OF EQUIPMENT SHOULD BE SANGRETTED TO SUSTAIN PAINT ACCORDING TO SPHANS 30M-24.
- INSTALL THE UPPER AND LOWER LEVEL GAUGE WITH TWO VERTICAL DISTANCE FROM THE CENTER TO THE OUTER FLANGE ALLOWABLE DEVIATION NOT GREATER THAN 0.018 INCH. DISTANCE BETWEEN NOZZLE CENTER TOLERANCE IS 0.0015 INCH. FLANGE FACE VERIFICATION ALLOWABLE TOLERANCE SHALL NOT BE GREATER THAN 0.018 INCH OF THE FLANGE OUTER DIAMETER.
- ACCORDING TO AS 301F AND US 301F IMPACT TEST FOR ALL MATERIALS OF THIS EQUIPMENT IS NOT REQUIRED.

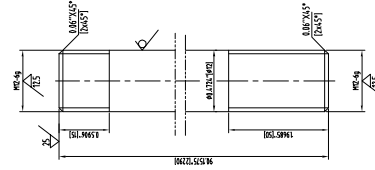
19	SEE DWG.	STIFFENER RING	1	SS304	31	1
18	SEE DWG.	INSULATION SUPPORT	1	SS304	31	1
17	SEE DWG.	MANIFOLD & BRACKET	1	SS304	31	1
16	SEE DWG.	FIXED SADDLE	2	304	0.1	0.8
15	SEE DWG.	EARTH LUG	1	COMP.	314	1
14	SEE DWG.	SLONG SADDLE	1	SS304	314	1
13	SEE DWG.	WELDING STIFFENER RING	1	SS304	314	1
12	SEE DWG.	WELDING STIFFENER RING	1	SS304	314	1
11	SEE DWG.	WELDING STIFFENER RING	1	SS304	314	1



ALLOWABLE NOZZLE LOADS FOR PRESSURE VESSEL

SYMBOL	FORCES (LBS)	MOMENT (IN-LB)	MR
FA	24481	24481	50016
FR	14682	27903	255428
FT	14682	27903	255428
FX	14682	27903	255428
FY	14682	27903	255428
FZ	14682	27903	255428
MA	14682	27903	255428
MB	14682	27903	255428
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ME	14682	27903	255428
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MU	14682	27903	255428
MV	14682	27903	255428
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MY	14682	27903	255428
MZ	14682	27903	255428

other

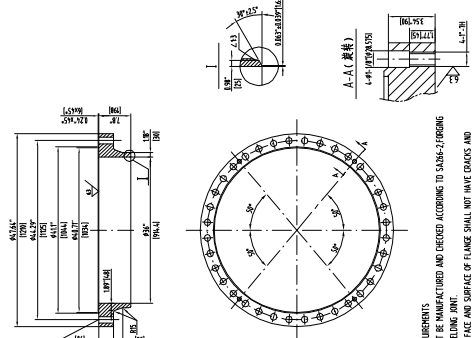


PARTS NO.	TE. ROD	SA36	4.48	/	PRECISE-HA	SCALE	MESH	UNIT	QTY	COMP.	MATL.	MASS	DMG. NO.	ASSY. DMG. NO.

TECHNICAL SPEC:
1. THE MANUFACTURING EXAMINATION AND ACCEPTANCE OF THIS PIECE SHOULD BE ACCORDING TO ASME B3.2

PARTS NO.	GASKET I	SEMI-FLANGED GASKET	/	/	PRECISE-HA	SCALE	MESH	UNIT	QTY	COMP.	MATL.	MASS	DMG. NO.	ASSY. DMG. NO.

other

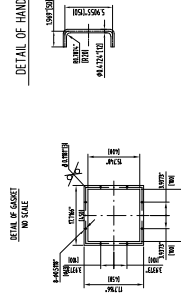
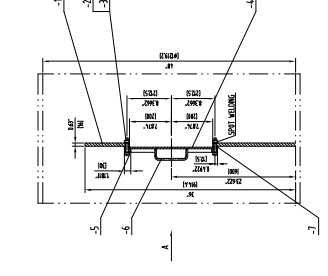


TECHNICAL REQUIREMENTS
 1. THE MANUFACTURING EXAMINATION AND ACCEPTANCE OF THIS PIECE SHOULD BE ACCORDING TO ASME B3.2
 2. THE SEAMING FACE AND SURFACE OF FLANGE SHALL NOT HAVE CRACKS AND OTHER DEFECTS WHICH MAY REDUCE THE STRENGTH OF FLANGE AND CONNECTION RELIABILITY.
 3. THE ALLOWANCE OF BLD AND THE CORROSION LENGTH BETWEEN TWO ADJACENT BOLT HOLES IS 1/4 INCH MAXIMUM. THE CORROSION LENGTH ALLOWANCE BETWEEN TWO ADJACENT BOLT HOLES IS 1/4 INCH MAXIMUM.
 4. THE CORROSION LENGTH ALLOWANCE BETWEEN TWO ADJACENT BOLT HOLES IS 1/4 INCH MAXIMUM.
 5. THE CORROSION LENGTH ALLOWANCE BETWEEN TWO ADJACENT BOLT HOLES IS 1/4 INCH MAXIMUM.
 6. THE CORROSION LENGTH ALLOWANCE BETWEEN TWO ADJACENT BOLT HOLES IS 1/4 INCH MAXIMUM.

PARTS NO.	SHELL FLANGE	SA36 GR2	960	/	PRECISE-HA	SCALE	MESH	UNIT	QTY	COMP.	MATL.	MASS	DMG. NO.	ASSY. DMG. NO.

TECHNICAL SPEC:
1. THE MANUFACTURING EXAMINATION AND ACCEPTANCE OF THIS PIECE SHOULD BE ACCORDING TO ASME B3.2

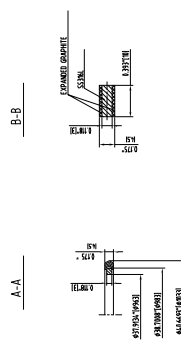
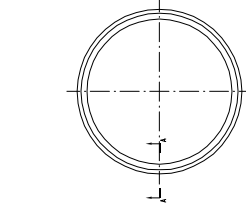
PARTS NO.	GASKET II	SEMI-FLANGED GASKET	/	/	PRECISE-HA	SCALE	MESH	UNIT	QTY	COMP.	MATL.	MASS	DMG. NO.	ASSY. DMG. NO.



TECHNICAL SPEC:
THIS PART NEED TO DO URBORNE LEAKAGE.

PARTS NO.	WER	COMP.	QTY	PRECISE-HA	SCALE	MESH	UNIT	QTY	COMP.	MATL.	MASS	DMG. NO.	ASSY. DMG. NO.

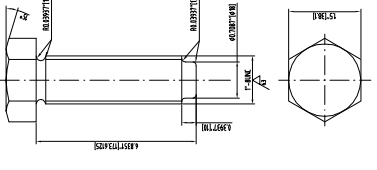
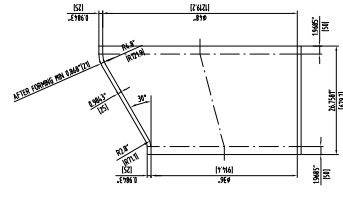
other



TECHNICAL SPEC:
1. THE MANUFACTURING EXAMINATION AND ACCEPTANCE OF THIS PIECE SHOULD BE ACCORDING TO ASME B3.2

PARTS NO.	GASKET I	SEMI-FLANGED GASKET	/	/	PRECISE-HA	SCALE	MESH	UNIT	QTY	COMP.	MATL.	MASS	DMG. NO.	ASSY. DMG. NO.

other



other

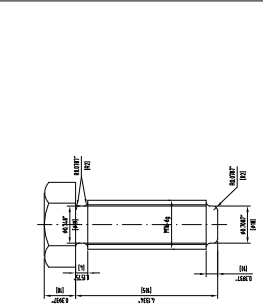
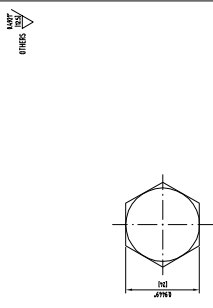
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PARTS NO.	WASHER	COMP.	QTY	PRECISE-HA	SCALE	MESH	UNIT	QTY	COMP.	MATL.	MASS	DMG. NO.	ASSY. DMG. NO.

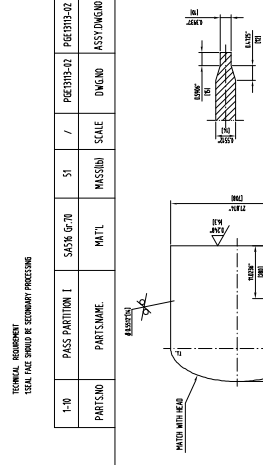
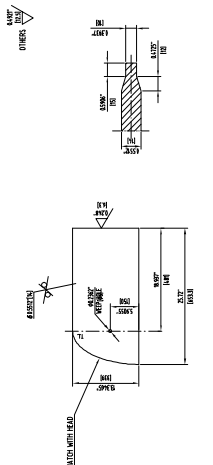
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PARTS NO.	WASHER	COMP.	QTY	PRECISE-HA	SCALE	MESH	UNIT	QTY	COMP.	MATL.	MASS	DMG. NO.	ASSY. DMG. NO.

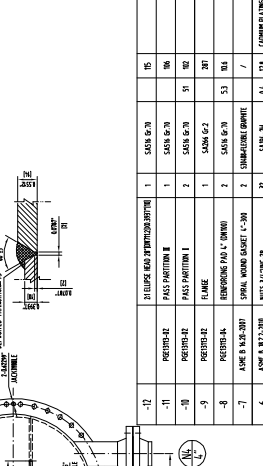
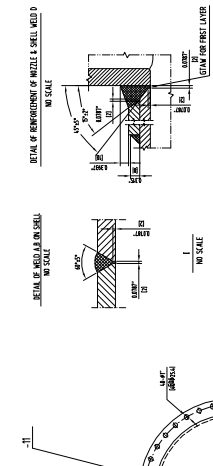
Jiangsu Puji Machinery Co., Ltd.
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 Drawing no: JAS-01-REF-JMGC-14-15
 Part Name: BE-TANKER REELER
 E-ASSEMBLY
 SHEET NO. 5 of 6
 DATE: 2023.07.10



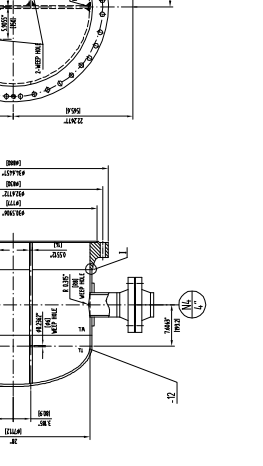
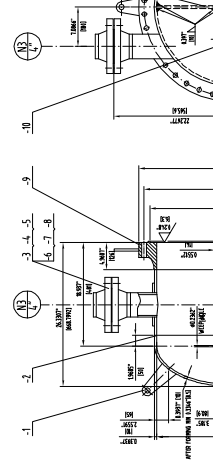
30	JACK BOLTS	304SS	/	/	PRE010-02	PRE010-00
PARTS NO	PARTS NAME	MATL	MASS(S)	SCALE	DWG NO	ASSY/DWG NO



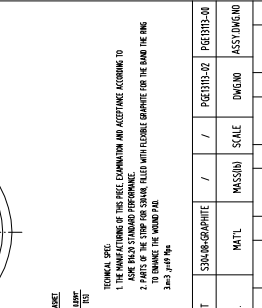
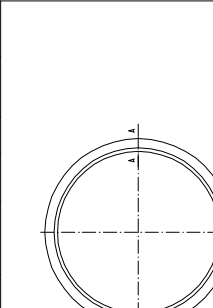
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PARTS NO	PARTS NAME	MATL	MASS(S)	SCALE	DWG NO	ASSY/DWG NO



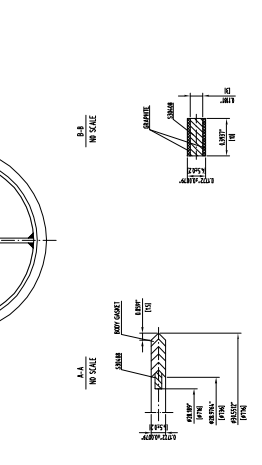
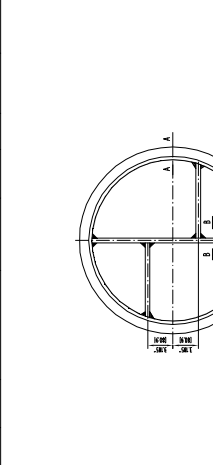
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PARTS NO	PARTS NAME	MATL	MASS(S)	SCALE	DWG NO	ASSY/DWG NO



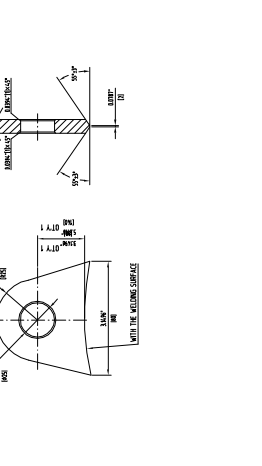
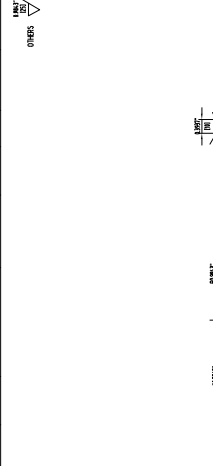
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PARTS NO	PARTS NAME	MATL	MASS(S)	SCALE	DWG NO	ASSY/DWG NO



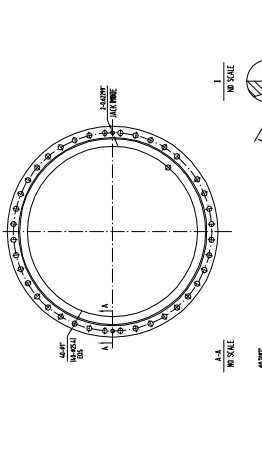
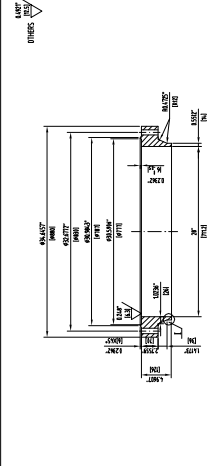
3	RIGHT GASKET	S3A00-GRAPHITE	/	/	PRE010-02	PRE010-00
PARTS NO	PARTS NAME	MATL	MASS(S)	SCALE	DWG NO	ASSY/DWG NO



2	LEFT GASKET	S3A00-GRAPHITE	/	/	PRE010-02	PRE010-00
PARTS NO	PARTS NAME	MATL	MASS(S)	SCALE	DWG NO	ASSY/DWG NO



1-14	LIFTING LUG	S458 G-70	/	/	PRE010-02	PRE010-00
PARTS NO	PARTS NAME	MATL	MASS(S)	SCALE	DWG NO	ASSY/DWG NO



1-9/10	FLANGE	S458 G-70	/	/	PRE010-02	PRE010-00
PARTS NO	PARTS NAME	MATL	MASS(S)	SCALE	DWG NO	ASSY/DWG NO

OTHER

OTHER

OTHER

TECHNICAL SPECIFICATION
 1. THE MANUFACTURING OF THIS FLANGE EXAMINATION AND ACCEPTANCE ACCORDING TO ASME B31.3 STANDARD PERFORMANCE.
 2. PARTS OF THE STOP FOR S3A00 FILLER WITH FIBERGLASS GRANITE FOR THE BAND THE RING TO ENHANCE THE WOUND FILL.
 3. 3.03 3.03 3.03

TECHNICAL SPECIFICATION
 1. THE MANUFACTURING OF THIS FLANGE EXAMINATION AND ACCEPTANCE ACCORDING TO ASME B31.3 STANDARD PERFORMANCE.
 2. PARTS OF THE STOP FOR S3A00 FILLER WITH FIBERGLASS GRANITE FOR THE BAND THE RING TO ENHANCE THE WOUND FILL.
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 2. PARTS OF THE STOP FOR S3A00 FILLER WITH FIBERGLASS GRANITE FOR THE BAND THE RING TO ENHANCE THE WOUND FILL.
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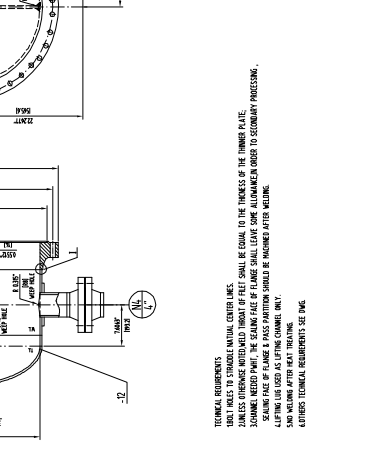
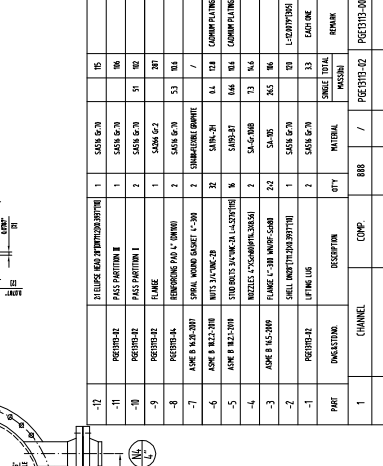
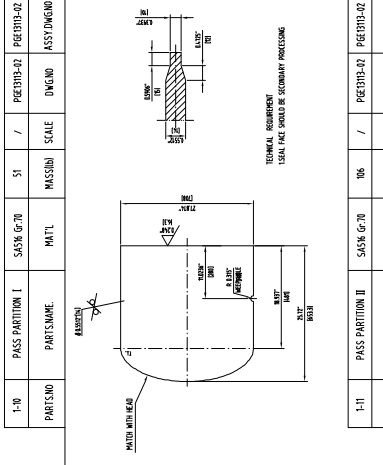
TECHNICAL SPECIFICATION
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 3. 3.03 3.03 3.03

1-10	PASS PARTITION I	S458 G-70	/	/	PRE010-02	PRE010-00
PARTS NO	PARTS NAME	MATL	MASS(S)	SCALE	DWG NO	ASSY/DWG NO

1-11	PASS PARTITION II	S458 G-70	/	/	PRE010-02	PRE010-00
PARTS NO	PARTS NAME	MATL	MASS(S)	SCALE	DWG NO	ASSY/DWG NO

1-12	FLANGE	S458 G-70	/	/	PRE010-02	PRE010-00
PARTS NO	PARTS NAME	MATL	MASS(S)	SCALE	DWG NO	ASSY/DWG NO



OTHER

OTHER

OTHER

TECHNICAL SPECIFICATION
 1. THE MANUFACTURING OF THIS FLANGE EXAMINATION AND ACCEPTANCE ACCORDING TO ASME B31.3 STANDARD PERFORMANCE.
 2. PARTS OF THE STOP FOR S3A00 FILLER WITH FIBERGLASS GRANITE FOR THE BAND THE RING TO ENHANCE THE WOUND FILL.
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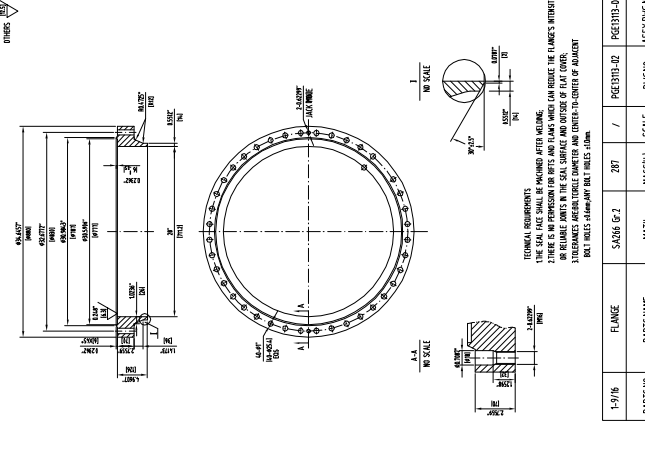
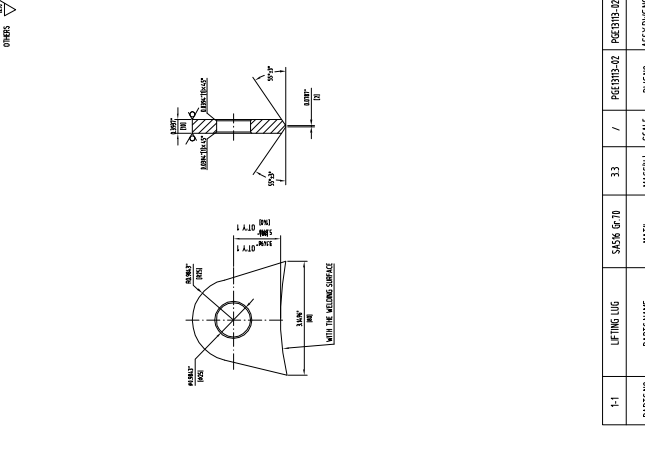
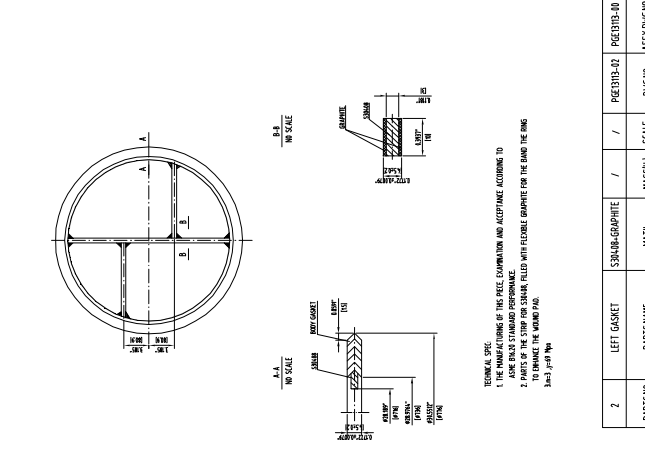
TECHNICAL SPECIFICATION
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 3. 3.03 3.03 3.03

3	RIGHT GASKET	S3A00-GRAPHITE	/	/	PRE010-02	PRE010-00
PARTS NO	PARTS NAME	MATL	MASS(S)	SCALE	DWG NO	ASSY/DWG NO

2	LEFT GASKET	S3A00-GRAPHITE	/	/	PRE010-02	PRE010-00
PARTS NO	PARTS NAME	MATL	MASS(S)	SCALE	DWG NO	ASSY/DWG NO

1-14	LIFTING LUG	S458 G-70	/	/	PRE010-02	PRE010-00
PARTS NO	PARTS NAME	MATL	MASS(S)	SCALE	DWG NO	ASSY/DWG NO



OTHER

OTHER

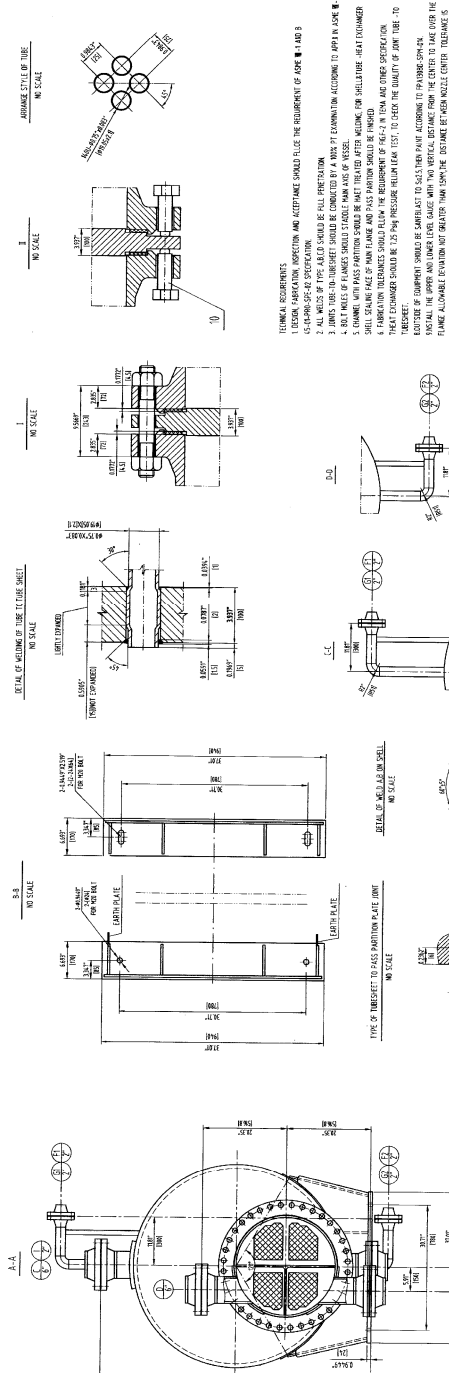
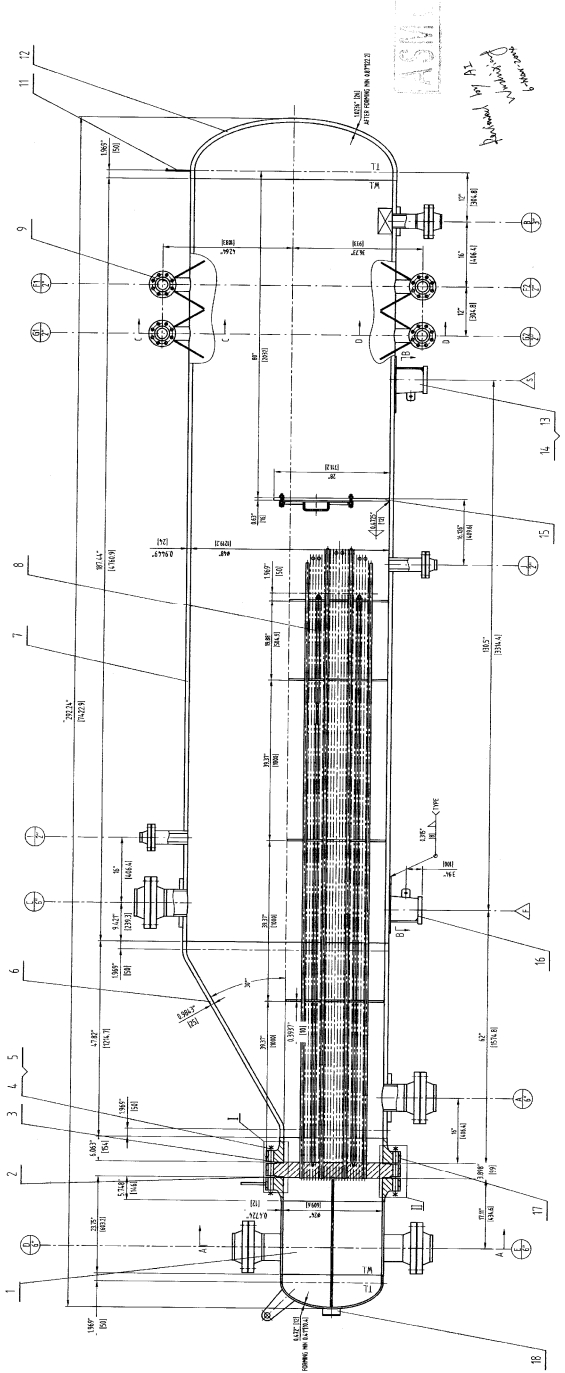
OTHER

DESIGN SPECIFICATION

CODE ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION

EXCHANGER TYPE	NON-HEATING	SHELL SIDE	TUBE SIDE	TYPE	STAMP	MAX. OPERATING PRESSURE WITH 1" EXCESSIVE
FLUID	NON-FLAMMABLE, NON-TOXIC, NON-CORROSIVE, NON-ABRASIVE, NON-IMPURE	HEAT EXCHANGER	HEAT EXCHANGER	TYPE	TYPE	MAX. OPERATING TEMPERATURE
DESIGN PRESS.	150 PSIG	DESIGN TEMP.	150 °F	DESIGN PRESS.	150 PSIG	DESIGN TEMP.
WELDING PROCESS	SAW	WELDING BEHAVIOR	SAW	WELDING BEHAVIOR	SAW	WELDING BEHAVIOR
DESIGN TEMP.	150 °F	CONNECTION OF SHEET TO SHELL	CONNECTION OF SHEET TO SHELL	CONNECTION OF SHEET TO SHELL	CONNECTION OF SHEET TO SHELL	CONNECTION OF SHEET TO SHELL
DESIGN PRESS.	150 PSIG	CONNECTION OF SHEET TO SHELL	CONNECTION OF SHEET TO SHELL	CONNECTION OF SHEET TO SHELL	CONNECTION OF SHEET TO SHELL	CONNECTION OF SHEET TO SHELL
WELDING PROCESS	SAW	WELDING BEHAVIOR	SAW	WELDING BEHAVIOR	SAW	WELDING BEHAVIOR
DESIGN TEMP.	150 °F	CONNECTION OF SHEET TO SHELL	CONNECTION OF SHEET TO SHELL	CONNECTION OF SHEET TO SHELL	CONNECTION OF SHEET TO SHELL	CONNECTION OF SHEET TO SHELL
DESIGN PRESS.	150 PSIG	CONNECTION OF SHEET TO SHELL	CONNECTION OF SHEET TO SHELL	CONNECTION OF SHEET TO SHELL	CONNECTION OF SHEET TO SHELL	CONNECTION OF SHEET TO SHELL

ITEM	DESCRIPTION	UNIT	QUANTITY	REMARKS
1	FLANGE	FLANGE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION
2	NOZZLE	NOZZLE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION
3	NOZZLE	NOZZLE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION
4	NOZZLE	NOZZLE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION
5	NOZZLE	NOZZLE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION
6	NOZZLE	NOZZLE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION
7	NOZZLE	NOZZLE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION
8	NOZZLE	NOZZLE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION
9	NOZZLE	NOZZLE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION
10	NOZZLE	NOZZLE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION
11	NOZZLE	NOZZLE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION
12	NOZZLE	NOZZLE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION
13	NOZZLE	NOZZLE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION
14	NOZZLE	NOZZLE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION
15	NOZZLE	NOZZLE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION
16	NOZZLE	NOZZLE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION
17	NOZZLE	NOZZLE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION
18	NOZZLE	NOZZLE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION
19	NOZZLE	NOZZLE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION
20	NOZZLE	NOZZLE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION



ALLOWABLE NOZZLE LOADS FOR PRESSURE VESSEL

SYMBOL	NPS	FORCE (lbf)		MOMENT (lbf-ft)	
		FA	FB	FR	FL
A.C.	6"	20158	21058	35045	41678
B	6"	88607	88607	70027	33716
FOLLOWER	2"	10553	10553	30545	10574
	2"	703	703	10716	4475
					389
					686.9

ITEM	DESCRIPTION	UNIT	QUANTITY	REMARKS
1	FLANGE	FLANGE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION
2	NOZZLE	NOZZLE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION
3	NOZZLE	NOZZLE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION
4	NOZZLE	NOZZLE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION
5	NOZZLE	NOZZLE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION
6	NOZZLE	NOZZLE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION
7	NOZZLE	NOZZLE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION
8	NOZZLE	NOZZLE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION
9	NOZZLE	NOZZLE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION
10	NOZZLE	NOZZLE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION
11	NOZZLE	NOZZLE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION
12	NOZZLE	NOZZLE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION
13	NOZZLE	NOZZLE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION
14	NOZZLE	NOZZLE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION
15	NOZZLE	NOZZLE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION
16	NOZZLE	NOZZLE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION
17	NOZZLE	NOZZLE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION
18	NOZZLE	NOZZLE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION
19	NOZZLE	NOZZLE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION
20	NOZZLE	NOZZLE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION

GENERAL NOTES:
 1. DESIGN TO ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION.
 2. ALL WELDS TO BE FULL PENETRATION.
 3. ALL WELDS TO BE WELDED BY A WELDER QUALIFIED TO WELD TO ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION.
 4. ALL WELDS TO BE WELDED BY A WELDER QUALIFIED TO WELD TO ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION.
 5. CHANNEL WITH PASS PARTITION SHOULD BE WELDED AFTER WELDING OF SHELL AND COVER.
 6. SHELL STAINING FROM FLAME AND PASS PARTITION SHOULD BE WELDED AFTER WELDING OF SHELL AND COVER.
 7. WELDING OF SHELL AND COVER SHOULD BE COMPLETED WITHIN 10 DAYS OF THE DATE OF THE SHELL AND COVER.
 8. WELDING OF SHELL AND COVER SHOULD BE COMPLETED WITHIN 10 DAYS OF THE DATE OF THE SHELL AND COVER.
 9. WELDING OF SHELL AND COVER SHOULD BE COMPLETED WITHIN 10 DAYS OF THE DATE OF THE SHELL AND COVER.
 10. WELDING OF SHELL AND COVER SHOULD BE COMPLETED WITHIN 10 DAYS OF THE DATE OF THE SHELL AND COVER.
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ITEM	DESCRIPTION	UNIT	QUANTITY	REMARKS
1	FLANGE	FLANGE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION
2	NOZZLE	NOZZLE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION
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4	NOZZLE	NOZZLE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION
5	NOZZLE	NOZZLE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION
6	NOZZLE	NOZZLE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION
7	NOZZLE	NOZZLE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION
8	NOZZLE	NOZZLE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION
9	NOZZLE	NOZZLE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION
10	NOZZLE	NOZZLE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION
11	NOZZLE	NOZZLE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION
12	NOZZLE	NOZZLE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION
13	NOZZLE	NOZZLE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION
14	NOZZLE	NOZZLE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION
15	NOZZLE	NOZZLE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION
16	NOZZLE	NOZZLE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION
17	NOZZLE	NOZZLE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION
18	NOZZLE	NOZZLE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION
19	NOZZLE	NOZZLE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION
20	NOZZLE	NOZZLE	1	ASME III DIV 1 EDITION 2017, TEMA CLASS R, NINTH EDITION

