



**LBC CALANDRIA****Material Required:**

SA-193-B7 / SA-194-2H, Spring Washers- Key Bellevilles, Inc.

**TUBESHEET FLANGES****A) 5/8" Bolt Size, Torque to 120 ft-lbs (60,000 psi)**

- 1) 72 each 11 studs 7" long
- 2) 144 each heavy hex nuts
- 3) 144 each flat washers
- 4) 216 each spring washers (three per bolt) , K1500-G-112

**Note:** Trim one flat washer that goes on the flange so that the washers will not interfere with the flange weld.

**NOZZLE Z****B) 7/8" Bolt Size, Torque to 320 ft-lbs (60,000 psi)**

- 1) 12 each 9 studs 6" long
- 2) 24 each heavy hex nuts
- 3) 24 each flat washers
- 4) 48 each spring washers (four per bolt) , K2000-J-150

**NOZZLE V****C) 1 1/8" Bolt Size, Torque to 710 ft-lbs (60,000 psi)**

- 1) 16 each 7 studs 8" long
- 2) 32 each heavy hex nuts
- 3) 32 each flat washers
- 4) 64 each spring washers (four per bolt) , K2500-L-187

**Note:** Trim one flat washer that goes on the flange so that the washers will not interfere with the flange hub.

**LBC CALANDRIA****Material Required:**

SA-193-B7 / SA-194-2H, Spring Washers- Key Bellevilles, Inc.

**TUBESHEET FLANGES****A) 5/8" Bolt Size, Torque to 120 ft-lbs (60,000 psi)**

- 1) 72 each 11 studs 7" long
- 2) 144 each heavy hex nuts
- 3) 144 each flat washers
- 4) 216 each spring washers (three per bolt), K1500-G-112

**Note:** Trim one flat washer that goes on the flange so that the washers will not interfere with the flange weld.

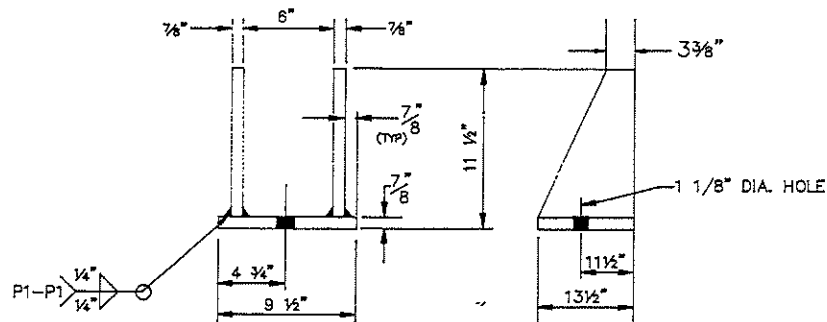
**NOZZLE Z****B) 7/8" Bolt Size, Torque to 320 ft-lbs (60,000 psi)**

- 1) 12 each 9 studs 6" long
- 2) 24 each heavy hex nuts
- 3) 24 each flat washers
- 4) 48 each spring washers (four per bolt), K2000-J-150

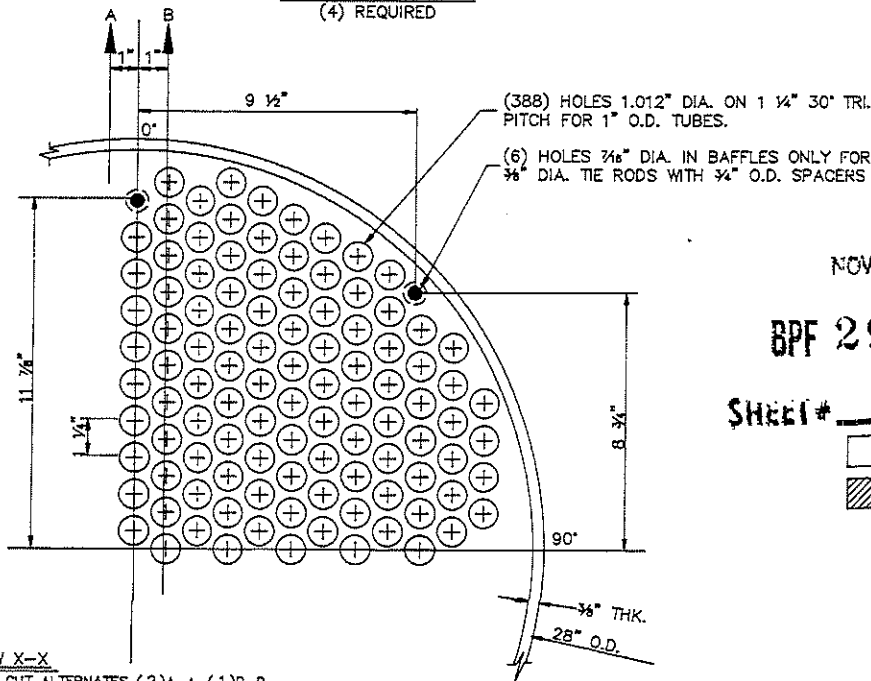
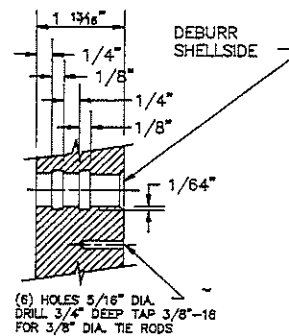
**NOZZLE V****C) 1 1/8" Bolt Size, Torque to 710 ft-lbs (60,000 psi)**

- 1) 16 each 7 studs 8" long
- 2) 32 each heavy hex nuts
- 3) 32 each flat washers
- 4) 64 each spring washers (four per bolt), K2500-L-187

**Note:** Trim one flat washer that goes on the flange so that the washers will not interfere with the flange hub.



SUPPORT DETAIL  
(4) REQUIRED



VIEW X-X  
BAFFLE CUT ALTERNATES (2) A-A, (1) B-B  
BAFFLE DIA.: 27.075"  
O.T.L.: 26.830"  
TUBEHOLE DIA. IN BAFFLES: 1 1/64"

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SHEET # 3

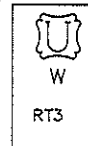
C.S.T'L  
316L S.S.T'L

FABRICATION RELEASE

FOR MECHANICAL CONFORMANCE  
TO DIMENSIONS & MATERIALS  
SPECIFIED

☒ APPROVED  
☒ APPROVED AS NOTED  
☐ NOT APPROVED

BY COMPANY DESIGNER  
DATE 11/27/89



NATIONAL BOARD NO. LATER  
CERTIFIED BY  
**SOUTHERN HEAT EXCHANGER CORP.**  
TUSCALOOSA, ALABAMA

SHELL SIDE  
MADP 75/F.V. PSI AT 300 F.  
MADT 15 F. AT 75/F.V. PSI  
TUBE SIDE  
MADP 75 PSI AT 300 F.  
MADT 15 F. AT 75 PSI

SHECO SER. NO. 89-021 YEAR 1989

CUST. ORDER LPBC-96110W

CUST. ITEM

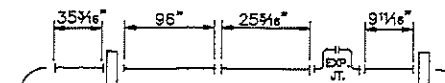
EN NO. 5116-7302-2 DUPONT INSP. INT'L

BEAUMONT, TX PROJ. NO. 6432



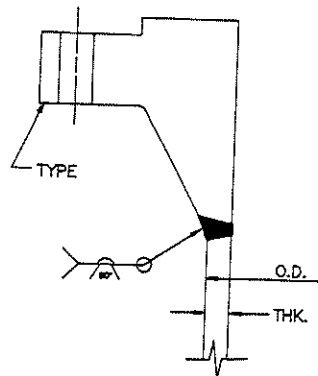
CAUTION

THE PRESSURE AND TEMPERATURES SHOWN ON THE S.H.E. NAMEPLATE  
RELATE ONLY TO THE PRESSURE RETENTION CAPABILITY OF THIS  
HEAT EXCHANGER. COMPONENTS OF THIS HEAT EXCHANGER HAVE  
BEEN DESIGNED FOR SPECIFIC OPERATING CONDITIONS. A CHANGE IN  
SERVICE OR DEVIATION FROM THE SPECIFIED OPERATING CONDITIONS  
REQUIRES THAT A MECHANICAL DESIGN CHECK BE MADE IN ORDER  
TO AVOID POSSIBLE DAMAGE TO THE HEAT EXCHANGER.



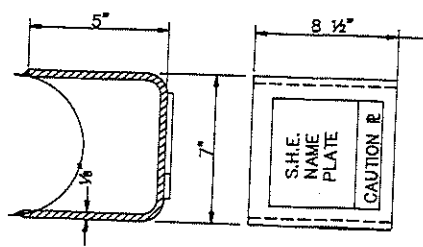
THEORETICAL COURSE LENGTH

|                                                 |           |                    |
|-------------------------------------------------|-----------|--------------------|
| CERTIFIED                                       | ENG.      |                    |
| CUSTOMER E.I. DUPONT DE NEMOURS & COMPANY, INC. |           |                    |
| CUSTOMER P.O. NO. LPBC-96110W                   |           |                    |
| ITEM NO. EN NO. 5116-7302-2                     |           | PROJ. NO. 6432     |
| PLANT BEAUMONT, TEXAS                           |           |                    |
| TEMA SIZE AND TYPE                              |           |                    |
| (1) 27-144 BEM LOW BOILER COLUMN CALANDRIA      |           |                    |
| SOUTHERN HEAT EXCHANGER CORP.                   |           |                    |
| P.O. BOX 030008 TUSCALOOSA, AL. 35403           |           |                    |
| DATE 02/08/89                                   | ORDER NO. | DWG. NO. SP-2083-1 |
| BY B. HUFF                                      | 89-021    | SHEET 3 OF 5       |



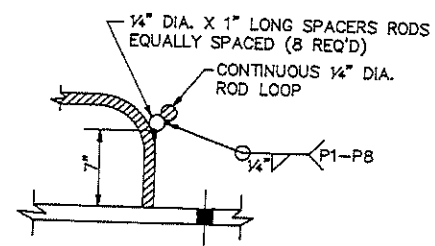
RFWN NOZZLE DETAIL

| S.H.E. MARK | TYPE    | O.D.   | THK.  | MAT'L  |
|-------------|---------|--------|-------|--------|
| S           | 8"-150# | 8 3/8" | .322" | C.ST'L |
| C2          | 2"-150# | 2 3/8" | .344" | C.ST'L |
| C           | 4"-150# | 4 1/2" | .337" | C.ST'L |



NAME PLATE BRACKET DETAIL

NOTE: NAME B MUST BE ATTACHED USING 304 S. ST'L DRIVE SCREWS.

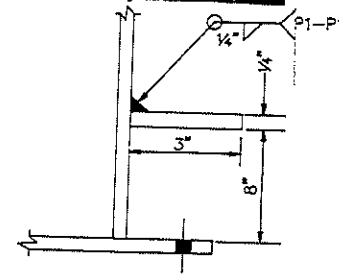


INSULATION SUPPORT TYPE A

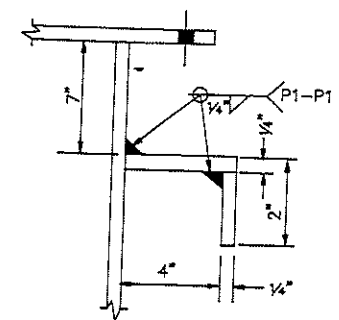
NOV 27 1989

BPF 296698

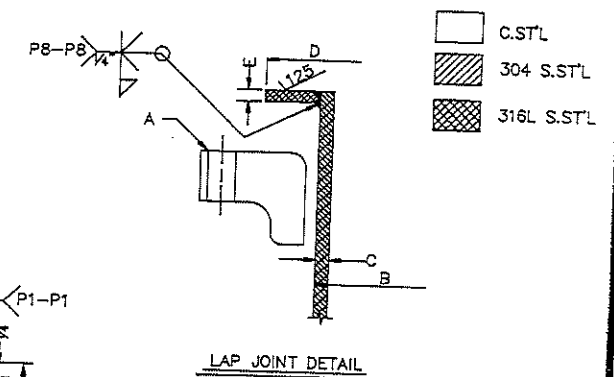
SHEET # 4



INSULATION SUPPORT TYPE C



INSULATION SUPPORT TYPE B



LAP JOINT DETAIL

| NOZZLE Z      |
|---------------|
| A 12"-150# LJ |
| B 12 3/4"     |
| C 18"         |
| D 15"         |
| E 1 1/2"      |

| NOZZLE V      |
|---------------|
| A 18"-150# LJ |
| B 18"         |
| C 1 1/2"      |
| D 21"         |
| E 1 1/2"      |

NOTE:  
INSULATION SUPPORTS WILL BE THE SAME MATERIAL TO WHICH IT IS ATTACHED.

FABRICATION RELEASE

FOR GENERAL CONSTRUCTION TO DIMENSIONS & SPECIFICATIONS

- ☒ APPROVED
- ☐ APPROVED AS NOTED
- ☐ NOT APPROVED

BY *W. McIn* 11/27

|                                              |                |
|----------------------------------------------|----------------|
| CERTIFIED                                    | ENG.           |
| CUSTOMER E.I. DUPONT NEMOURS & COMPANY, INC. |                |
| CUSTOMER P.O. NO. LPBC-96110W                |                |
| ITEM NO.                                     | PROJ. NO. 6432 |
| PLANT BEAUMONT, TEXAS                        |                |
| EN. NO. 5116-7302-2                          |                |
| ITEM SIZE AND TYPE                           |                |
| (1) 27-144 BEM LOW BOILER COLUMN CALANDRIA   |                |
| SOUTHERN HEAT EXCHANGER CORP.                |                |
| P.O. BOX 030008 TUSCALOOSA, AL. 35403        |                |
| DATE 02/08/89                                | ORDER NO.      |
| BY W. McIn                                   | 89-021         |
| DWG. NO. SP-2083-1                           |                |
| SHEET 4 OF 5                                 |                |

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Sheet #

2

28" O.D. X 1/4" NOM.  
THK. ASME ELLIP. HD.  
2:1 RATIO WITH 2" S.F.

PB-PB 1/4"  
P1-PB 1/4"  
P1-PB 1/4"

16 1/2" O.D. X 1/4" THK.  
25 1/2" R. DISHED ONLY  
HD. LOCATE @ NOZZLE Z

## FABRICATION RELEASE

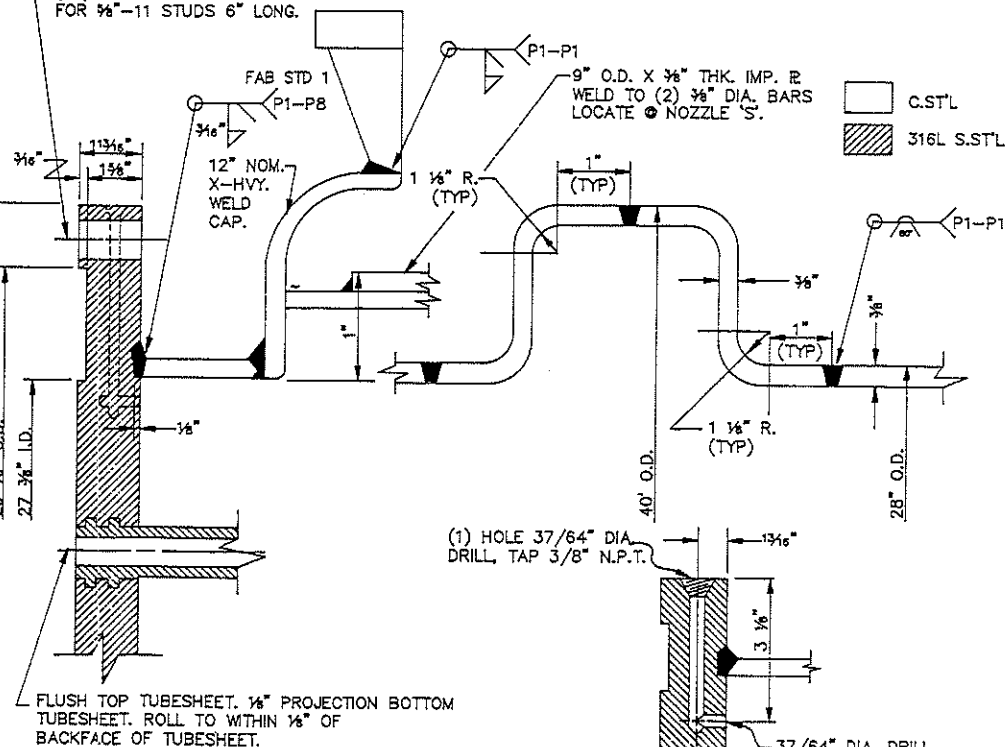
FOR GENERAL COMMENTS  
TO DIMENSIONS MATERIAL  
SPECIFIED

- ☒ APPROVED  
☒ APPROVED FOR  
☐ NOTED  
☐ NOT APPROVED

BY *mpj* / *ulb*  
DATE *11/27/89*

29 1/4" O.D. X 28 1/4" I.D. X 1/8" THK.  
KEVLAR  
GARLOCK 3001 GASKET PER DUPONT  
SPECIFICATION SU2A CODE G81.

(36) HOLES 3/4" DIA. ON 30 3/4" B.C.  
FOR 3/4"-11 STUDS 6" LONG.



FLUSH TOP TUBESHEET. 1/8" PROJECTION BOTTOM  
TUBESHEET. ROLL TO WITHIN 1/8" OF  
BACKFACE OF TUBESHEET.

(1) HOLE 37/64" DIA.  
DRILL, TAP 3/8" N.P.T.

## TUBESHEET VENT &amp; DRAIN DETAIL

## NOTES

- EST. WT. EARTH 7600# (9) FULL 12800# BOL:
- ALL BOLT HOLES STRADDLE NORMAL CENTERLINES.
- WOODEN COVERS ON ALL OPEN NOZZLES. (SEE NOTE 6)
- MAIN GASKET SURFACES.
- PAINT: SANDBLAST EXPOSED C.S.T.L. NEAR WHITE PER SSPC-SP-10. PRIME WITH (1) COAT DUPONT 347-Y-912 CANONIC INORGANIC ZINC-RICH COATING 2 TO 4 MILS D.F.T. TOP COAT WITH (1) COAT DUPONT 612-C706 HI HEAT-RESISTANT SILICONE ALUMINUM PAINT 1 MIL D.F.T. FOR A TOTAL D.F.T. OF 3 TO 5 MILS PER DUPONT SPEC 0811S.
- COAT ALL EXPOSED GASKET SURFACES WITH RUST VETO HEAVY. SEAL WITH CLOTH BACKED TAPE. COVER WITH WOODEN COVERS BOLTED IN PLACE WITH A FULL COMPLIMENT OF BLACK IRON BOLTS.
- ALL TUBES MUST BE TESTED AND INSPECTED PER DUPONT SPECIFICATION SW300M TYPE 1 CAT. III
- ALL S.S.T.L. MUST BE TESTED FOR THE PRESENCE OF MOLYBDENUM PER DUPONT SPEC. S62T.

## NON-PRESSURE PARTS

SUPPORTS SA-36  
BAFFLES / SUPPORTS SA-36  
TIE RODS / SPACERS C.S.T.L.  
PASS PARTITIONS NONE  
LIFT LUGS 316L S. S.T.L.  
UNIT LIFT LUGS SA-36  
REINFORCEMENT PAD 316L S. S.T.L.

## NOTES CONT'D.

R. EST. WT. FOR TOP BONNET: 900# / BOTTOM BONNET: 600#

CERTIFIED

ENG.

CUSTOMER E.I. DUPONT DE NEMOURS &amp; COMPANY, INC.

CUSTOMER P.O. NO. LPBC-96110W

ITEM NO. EN NO. 5116-7302-2

PROJ. NO. 6432

PLANT BEAUMONT, TEXAS

## TMA SIZE AND TYPE

(1) 27-144 BEM LOW BOILER COLUMN CALANDRIA

SOUTHERN HEAT EXCHANGER CORP.

P.O. BOX 030008 TUSCALOOSA, AL. 35403

DATE 02/08/89

ORDER NO.

DWG. NO. SP-2083-1

BY B. HUFF

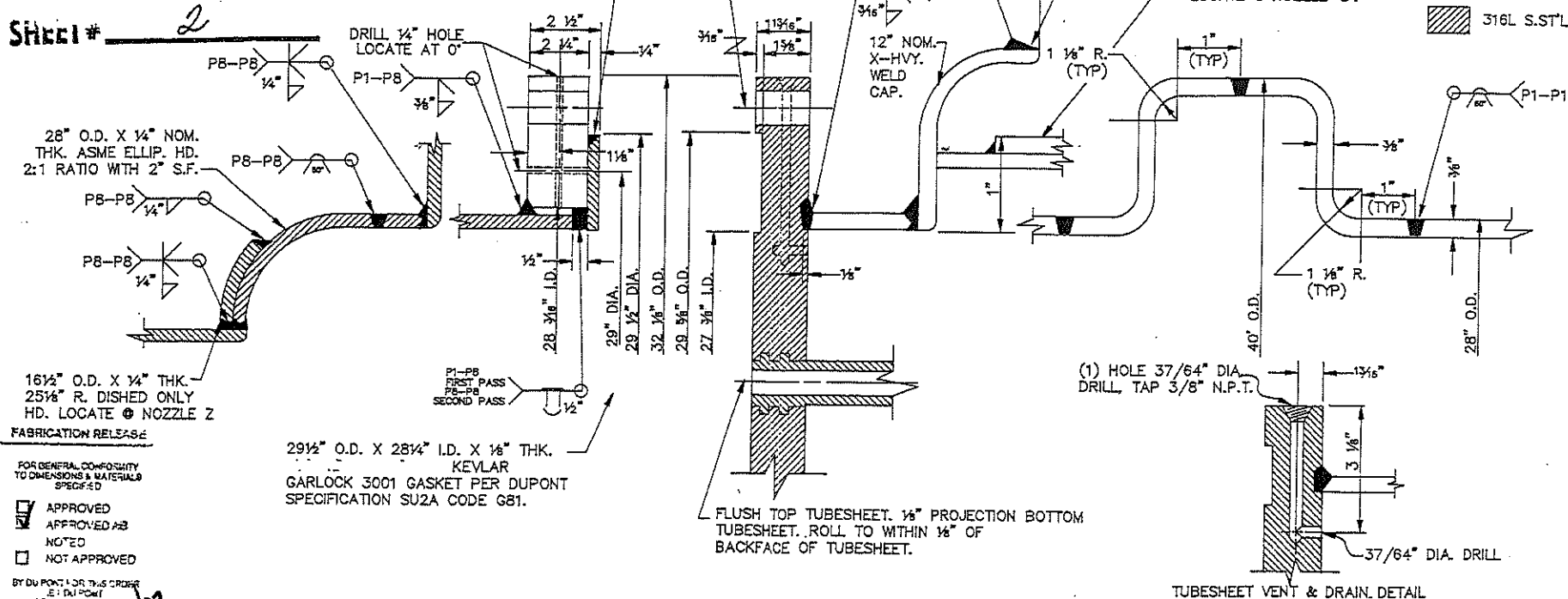
89-021

SHEET 2 OF 5

NOV 27 1989

BPF 296698

SHEET # 2



# FABRICATION RELEASE

FOR GENERAL CONFORMITY TO DIMENSIONS & MATERIALS SPECIFIED

APPROVED  
APPROVED AS NOTED  
NOT APPROVED

BY DUPONT FOR THIS ORDER  
E: DUPONT  
36 MEMPHIS & CO.

## NOTES

- EST. WT. 7600# (9) FULL: 12800#
- ALL BOLTS STRADDLE NORMAL CENTERLINES.
- WOODEN COVERS ON ALL OPEN NOZZLES. (SEE NOTE 6)
- MAIN GASKET SURFACES.
- PAINT: SANDBLAST EXPOSED C.S.T'L. NEAR WHITE PER SSPC-SP-10. PRIME WITH (1) COAT DUPONT 347-Y-912 GANION INORGANIC ZINC-RICH COATING 2 TO 4 MILS D.F.T. TOP COAT WITH (1) COAT DUPONT 612-C706 HI HEAT-RESISTANT SILICONE ALUMINUM PAINT 1 MIL D.F.T. FOR A TOTAL D.F.T. OF 3 TO 5 MILS PER DUPONT SPEC 6511S.
- COAT ALL EXPOSED GASKET SURFACES WITH RUST VETO HEAVY. SEAL WITH CLOTH BACKED TAPE. COVER WITH WOODEN COVERS BOLTED IN PLACE WITH A FULL COMPLIMENT OF BLACK IRON BOLTS.
- ALL TUBES MUST BE TESTED AND INSPECTED PER DUPONT SPECIFICATION SWS00M TYPE 1 CAT. III
- ALL S.S.T'L MUST BE TESTED FOR THE PRESENCE OF MOLYBDENUM PER DUPONT SPEC. 562T.

## NON-PRESSURE PARTS

SUPPORTS SA-36  
BAFFLES / SUPPORTS SA-36  
TIE RODS / SPACERS C.S.T'L  
PASS PARTITIONS NONE  
LIFT LUGS 316L S. ST'L  
UNIT LIFT LUGS SA-36  
REINFORCEMENT PAD 316L S. ST'L

## NOTES CONT'D.

9. EST. WT. FOR TOP BONNET: 900# / BOTTOM BONNET: 600#

CERTIFIED ENG.  
CUSTOMER E.I. DUPONT DE NEMOURS & COMPANY, INC.  
CUSTOMER P.O. NO. LPBC-96110W  
ITEM NO. EN NO. 5116-7302-2 PROJ. NO. 6432  
PLANT BEAUMONT, TEXAS

## TEMA SIZE AND TYPE

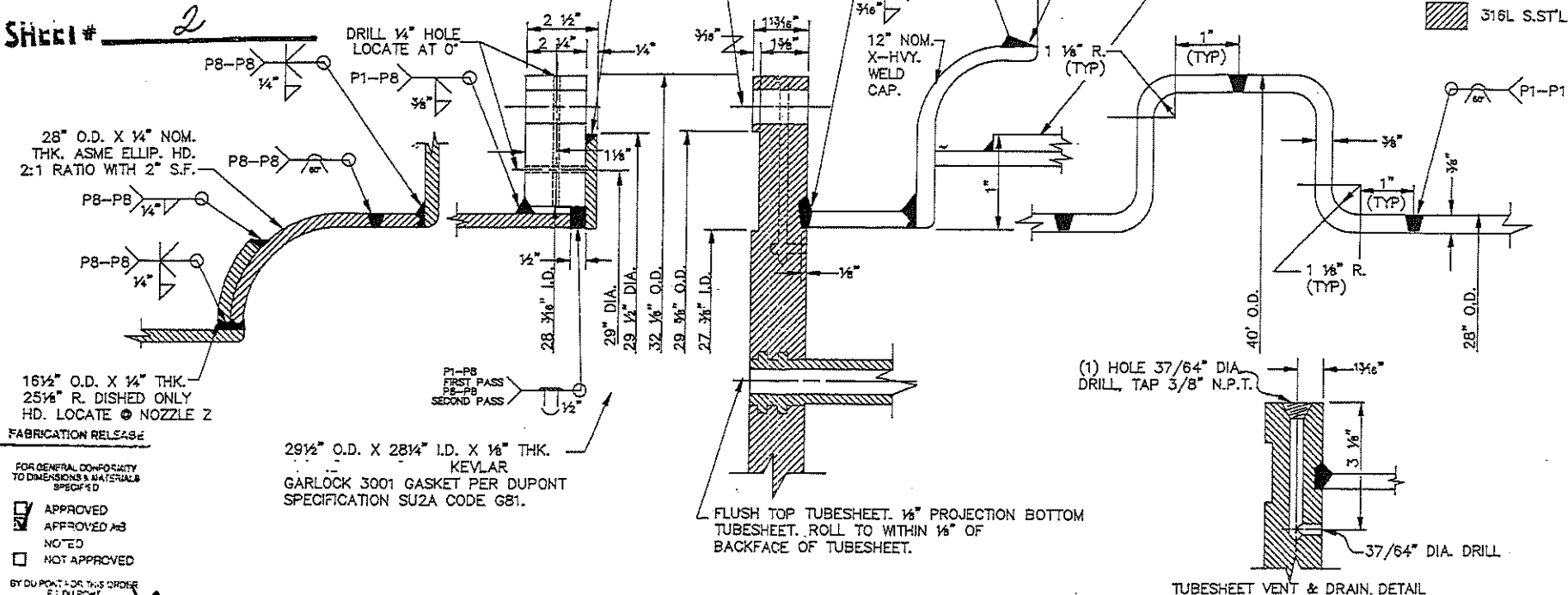
(1) 27-144 BEM LOW BOILER COLUMN CALANDRIA  
SOUTHERN HEAT EXCHANGER CORP.  
P.O. BOX 030008 TUSCALOOSA, AL. 35403

DATE 02/08/89 ORDER NO. DWG. NO. SP-2083-1  
BY B. HUFF 89-021 SHEET 2 OF 5

NOV 27 1989

BPF 296698

Sheet # 2



FABRICATION RELEASE

FOR GENERAL CONFORMITY  
TO DIMENSIONS & MATERIALS  
SPECIFIED

☒ APPROVED  
☐ APPROVED AS  
☐ NOTED  
☐ NOT APPROVED

BY DUPONT FOR THIS ORDER  
E: DUPONT  
75 NEWBOURNE AVE.

NOTES

- EST. WT. 7600# (9) FULL 12800# BOL: \_\_\_\_\_
- ALL BOLT CIRCLES STRADDLE NORMAL CENTERLINES.
- WOODEN COVERS ON ALL OPEN NOZZLES. (SEE NOTE 6)
- MAIN GASKET SURFACES.
- PAINT: SANDBLAST EXPOSED C.S.T'L NEAR WHITE PER SSPC-SF-10. PRIME WITH (1) COAT DUPONT 347-Y-912 GANION INORGANIC ZINC-RICH COATING 2 TO 4 MILS D.F.T. TOP COAT WITH (1) COAT DUPONT 612-G706 HI HEAT-RESISTANT SILICONE ALUMINUM PAINT 1 MIL D.F.T. FOR A TOTAL D.F.T. OF 3 TO 5 MILS PER DUPONT SPEC 6811S.
- COAT ALL EXPOSED GASKET SURFACES WITH RUST VETO HEAVY. SEAL WITH CLOTH BACKED TAPE. COVER WITH WOODEN COVERS BOLTED IN PLACE WITH A FULL COMPLIMENT OF BLACK IRON BOLTS.
- ALL TUBES MUST BE TESTED AND INSPECTED PER DUPONT SPECIFICATION SW300M TYPE 1 CAT. III
- ALL S.S.T'L MUST BE TESTED FOR THE PRESENCE OF MOLYBDENUM PER DUPONT SPEC. 562Y.

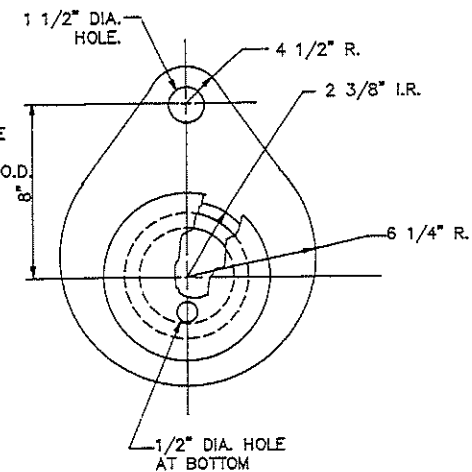
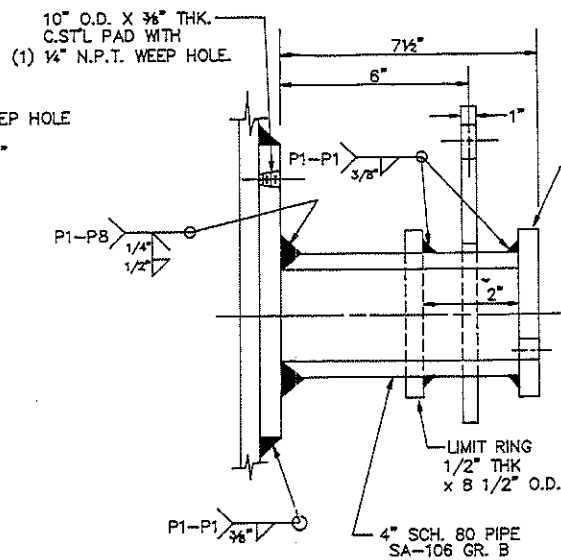
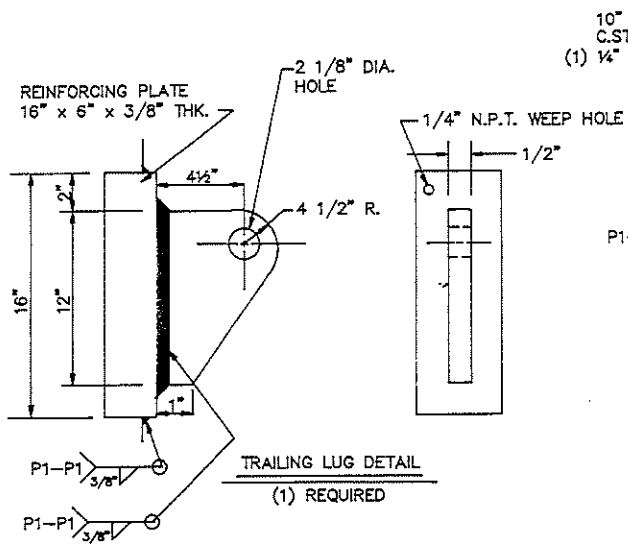
NON-PRESSURE PARTS

|                    |               |
|--------------------|---------------|
| SUPPORTS           | SA-36         |
| BAFFLES / SUPPORTS | SA-36         |
| TIE RODS / SPACERS | C.S.T'L       |
| PASS PARTITIONS    | NONE          |
| LIFT LUGS          | 316L S. S.T'L |
| UNIT LIFT LUGS     | SA-36         |
| REINFORCEMENT PAD  | 316L S. S.T'L |

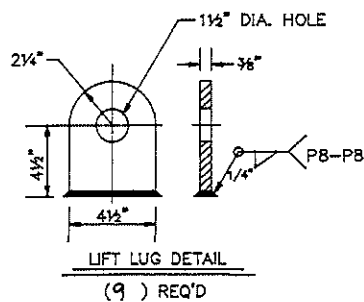
NOTES CONT'D.

9. EST. WT. FOR TOP BONNET: 900# / BOTTOM BONNET: 600#

|                                                 |                |
|-------------------------------------------------|----------------|
| CERTIFIED                                       | ENG.           |
| CUSTOMER E.I. DUPONT DE NEMOURS & COMPANY, INC. |                |
| CUSTOMER P.O. NO. LPBC-96110W                   |                |
| ITEM NO. EN NO. 5116-7302-2                     | PROJ. NO. 6432 |
| PLANT BEAUMONT, TEXAS                           |                |
| TEMA SIZE AND TYPE                              |                |
| (1) 27-144 BEM LOW BOILER COLUMN CALANDRIA      |                |
| SOUTHERN HEAT EXCHANGER CORP.                   |                |
| P.O. BOX 030008 TUSCALOOSA, AL. 35403           |                |
| DATE 02/08/89                                   | ORDER NO.      |
| BY: B. HUFF                                     | 89-021         |
| DWG. NO. SP-2083-1                              | SHEET 2 OF 5   |



TRUNNION DETAIL  
(2) REQUIRED



FABRICATION RELEASE

FOR GENERAL INFORMATION  
TO DIMENSIONS AND MATERIALS  
SPECIFICATIONS

- ☒ APPROVED  
☒ APPROVED AS  
NOTED  
☐ NOT APPROVED

BY DUPONT FOR THE OWNER  
P. J. JONES  
11/27

NOV 27 1989

☐ C.ST'L  
☒ 316L S.ST'L

BPF 296698

SHEET # 7

|                                            |                |                    |
|--------------------------------------------|----------------|--------------------|
| CERTIFIED                                  | ENG.           |                    |
| CUSTOMER E.I. DUPONT DENEMOURS & CO., INC. |                |                    |
| CUSTOMER P.O. NO. LPBC-96110W              |                |                    |
| ITEM NO. EN. NO. 5116-7302-2               | PROJ. NO. 6432 |                    |
| PLANT BEAUMONT, TEXAS                      |                |                    |
| TEMA SIZE AND TYPE                         |                |                    |
| (1) 27-144 BEM LOW BOILER COLUMN CALANDRIA |                |                    |
| SOUTHERN HEAT EXCHANGER CORP.              |                |                    |
| P.O. BOX 030008 TUSCALOOSA, AL 35403       |                |                    |
| DATE 11-11-89                              | ORDER NO.      | DWG. NO. SP-2083-1 |
| BY J. JONES                                | 89-021         | SHEET 5 OF 5       |

**PCR ACITON CHECKLIST**

TITLE: Gasket Changes on the LBC Calandria

DATE: 6/14/01

**THE FOLLOWING ITEMS MUST BE CONSIDERED FOR PERMANENT PCR'S**

| REQUIRED?                           |                                     | IF REQUIRED, COMPLETE?   |                                     | ITEM                                                         | IF NOT REQUIRED FOR START-UP |               |                |
|-------------------------------------|-------------------------------------|--------------------------|-------------------------------------|--------------------------------------------------------------|------------------------------|---------------|----------------|
| YES                                 | NO                                  | YES                      | NO                                  |                                                              | RESPONSIBILITY               | DATE REQUIRED | DATE COMPLETED |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | TURNAROUND-TAG PROCEDURES UPDATED                            |                              |               |                |
|                                     |                                     |                          |                                     | MARKUP PRINTS FORWARDED FOR UPDATE:                          |                              |               |                |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | a. P & I's                                                   | D. Vandorn                   | 10-15-01      |                |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | b. ELECTRICAL SCHEMATICS                                     |                              |               |                |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | c. LOOPS/SAMAS                                               |                              |               |                |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | d. MAPS                                                      |                              |               |                |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | e. MOTOR SCHEMATICS                                          |                              |               |                |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | f. HEAT TRACING ISOMETRICS                                   |                              |               |                |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | LOOP FILES UPDATED                                           |                              |               |                |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | REVERE FILES UPDATED                                         |                              |               |                |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | PIPE CODE/PROCESS - SERVICE INDEX CHANGES                    |                              |               |                |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | AREA SAFETY RULE OR PROCEDURE CHANGES                        |                              |               |                |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | MATERIAL SAFETY DATA SHEET MANUAL UPDATED                    |                              |               |                |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | ENVIRONMENTAL CONTROL ACTION PLAN UPDATED                    |                              |               |                |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | FUGITIVE EMISSION DATABASE UPDATED                           |                              |               |                |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | RELIEF DEVICE CALCULATIONS PLACED IN PHM FILE                |                              |               |                |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | ANALYTICAL PROCEDURE MANUAL UPDATED                          |                              |               |                |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | RAW MATERIAL SPECIFICATIONS UPDATED                          |                              |               |                |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | FINISHED PRODUCT SPECIFICATIONS UPDATED                      |                              |               |                |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | TECHNOLOGY MANUAL UPDATED                                    |                              |               |                |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | OPERATING PROCEDURE MANUAL UPDATED                           |                              |               |                |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | STARTUP/OPERATING/SHUTDOWN CHECKLISTS UPDATED                |                              |               |                |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | FIELD/CONTROL ROOM READING SHEETS UPDATED                    |                              |               |                |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | CONTROL LIMITS (SOCs) UPDATED                                |                              |               |                |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | INTERLOCK AND ALARM LISTS UPDATED                            |                              |               |                |
|                                     |                                     |                          |                                     | VENDOR INSTRUCTION MANUALS AND DRAWINGS FILED:               |                              |               |                |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | a. EQUIPMENT FILES UPDATED <i>See Test Brooks</i>            | M. VanDevender               | 10/15/01      |                |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | b. E/C FILES UPDATED                                         |                              |               |                |
| <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/>            | PREVENTATIVE MAINTENANCE PROGRAM CHANGES                     |                              |               |                |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | MAINTENANCE NOTIFIED OF CHANGES IN MATERIALS OF CONSTRUCTION | J. Brooks                    | 10/15/01      |                |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | COST VS CAPITAL DETERMINATION                                |                              |               |                |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | OTHER                                                        |                              |               |                |

ALL REQUIRED ITEMS HAVE BEEN COMPLETED -  
SIGNATURE: \_\_\_\_\_

(\*) ORIGINATOR

(\*) The Originator of the PCR is responsible for insuring that all applicable items are completed and signed off.

02/25/00 /lab

# TRIPLEX INC.

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BEAUMONT, TEXAS 77704

BEAUMONT@TRIPLEX-INC.COM

MCHOATE@TRIPLEX-INC.COM

PHONE:409-727-1671

FAX:409-722-3182

## FACSIMILE TRANSMITTAL SHEET

|               |                    |                                     |             |
|---------------|--------------------|-------------------------------------|-------------|
| TO:           | JEFF BROOKS        | FROM:                               | MIKE CHOATE |
| COMPANY:      | INEOS              | DATE:                               | 6-15-01     |
| FAX NUMBER:   | 749-3500           | TOTAL NO. OF PAGES INCLUDING COVER: | 1           |
| PHONE NUMBER: | 749-3450           | SENDER'S REFERENCE NUMBER:          |             |
| RE:           | GRAPHONICS GASKETS | YOUR REFERENCE NUMBER:              |             |

☐ URGENT ☒ FOR REVIEW ☐ PLEASE COMMENT ☒ PLEASE REPLY ☐ PLEASE RECYCLE

2 EACH 12" 150# 1/8" 316L GRAPHONIC GASKETS \$35.20 EACH

2 EACH 18" 150# 1/8" DITTO \$57.00 EACH

4 EACH 29-1/2" X 28-1/4" X 1/8" DITTO \$105.00 EACH

DELIVERY: 7-10 WORKING DAYS TO SHIP

FOB: SHIPPING POINT, PRICE FIRM FOR 30 DAYS



From: MEVX01::MEVX01::MRGATE::"A1::BOBBITDR" 5-1-1989 09:39:57.81  
To: MRGATE::"ENGG::DICKSJR"  
CC:  
Subj: RE: LBC Calandria Steam Traps

From: NAME: Douglas R. Bobbitt  
FUNG: C&P Memphis Plant  
TEL: 353-7415 <BOBBITDR AT A1 AT MEVX01>

To: NAME: VMSMail User DICKSJR <DICKSJR@ENGG@MRGATE>  
FORDDC AT A1 AT ENGG,  
NAME: Joe G. Cotton <COTTONJG AT A1 AT MEVX01>

I prefer recommendation 2.

## THERMAL RATING - SHELL AND TUBE HEAT EXCHANGERS

(Checked JKR)  
NATURAL CIRCULATION

F.A.A. No. 7302-2 Quantity 1 Cooler Condenser Vaporizer Heater  
 Project No. 6432 Plant BEAUMONT Rated by H.F. Hubkin Date 8/8/88

This is not a complete specification. See Standard Engineering Specification SE7E, "Shell and Tube Heat Exchanger Procurement Work Sheet" for additional information which must be furnished vendor.

## MATERIALS

Tubes: 316 L S/SLo Boiler Column  
REBOILER

## CONSTRUCTION

Type Name: Fixed tube sheet U-tube External floating head  
Internal floating head Kettle reboiler

Type Figure: SG1E Figure 2A 2B 2C 3A 3B 3C 3D 4A 4B 5A 5B 5C 5D 6A 6B 6C  
With Weir Without Weir

TEMA Type Designation: BEMPosition: Vertical Horizontal Inclined \_\_\_\_\_ degrees

Top (front) head: Bonnet Channel Cone Elbow  
 Bottom (rear) head: Bonnet Channel Baffle Funnel separator Cone  
Elbow Cover plate

Shell expansion joint: Required Not required

|                    | Tube Side                          | °C    | Shell Side                         | °C    |
|--------------------|------------------------------------|-------|------------------------------------|-------|
| Design temperature | _____                              | _____ | _____                              | _____ |
| Design pressure    | _____                              | psig  | _____                              | psig  |
| Fluid              | <u>Boiling liquid</u>              |       | <u>Boiling liquid Nonpulsating</u> |       |
|                    | <u>Gas</u> <u>Condensing vapor</u> |       | <u>Gas</u> <u>Condensing vapor</u> |       |

## SIZE

|                           |                   |                              |                                   |
|---------------------------|-------------------|------------------------------|-----------------------------------|
| No. shells per unit       | <u>1</u>          | Finned tube                  | _____ in.                         |
| No. tube passes per shell | <u>1</u>          | Tube OD                      | <u>7</u> in.                      |
| Outside area per shell    | <u>1220</u> sq ft | Tube wall thick.             | <u>.065</u> in.                   |
| Outside area per unit     | <u>1220</u> sq ft | Tube pitch                   | <u>1.25</u> in.                   |
| Nominal shell ID          | <u>29</u> in.     | Tube pattern                 | <u>Triangular</u> Rotated square  |
| No. tubes per shell       | <u>388</u>        |                              | Square                            |
| Tube length               | <u>12</u> ft      | Baffle pitch                 | <u>PROVIDE TUBE</u> in.           |
|                           |                   | Baffle cut                   | <u>SUPPORT</u> % of dia.          |
| Shell Type                | <u>E</u> F J      | Baffle type                  | <u>Segmental</u> Double Segmental |
|                           |                   | No. pairs of sealing devices | <u>NONE</u>                       |

## CONNECTIONS (Per SG1E Par. 20)

|                              |                   |                    |         |
|------------------------------|-------------------|--------------------|---------|
| <del>Process</del> top head  | _____ " inlet     | <u>18</u> " outlet | _____ " |
| <del>Steam</del> bottom head | <u>10</u> " inlet | _____ " outlet     | _____ " |
| Shell                        | <u>12</u> " inlet | <u>4</u> " outlet  | _____ " |

## PERFORMANCE PER UNIT

|                           | Tube Side             | Shell Side         |
|---------------------------|-----------------------|--------------------|
| Load                      | <u>8.61 MM Pcu/hr</u> | _____              |
| Fluid                     | <u>PROCESS</u>        | <u>STEAM</u>       |
| Total fluid in            | <u>203000</u> lb/hr   | <u>16900</u> lb/hr |
| Condensate out            | <u>156100</u> lb/hr   | <u>16900</u> lb/hr |
| Vapor out                 | <u>46900</u> lb/hr    | _____ lb/hr        |
| Inlet temperature         | <u>101.1</u> °C       | <u>143.3</u> °C    |
| Outlet temperature        | <u>101.1</u> °C       | <u>143.3</u> °C    |
| Normal operating pressure | <u>18.3</u> psig      | <u>4.3</u> psig    |
| Pressure drop             | _____ psi-mmHg        | _____ psi-mmHg     |

# THERM RATING - SHELL AND TUBE HEAT EXCHANGERS NATURAL CIRCULATION

F.A.A. No. 7302-2 Quantity 1 Cooler Condenser Vaporizer Heater  
 Project No. 6432 Plant BEAUMONT Rated by H.F. Hubkin Date 8/8/88 12-22-88

This is not a complete specification. See Standard Engineering Specification SGT-2, "Shell and Tube Heat Exchanger Procurement Work Sheet" for additional information which must be furnished vendor.

MATERIALS  
 Tubes: 316 L S/S

Lo Boiler Column  
REBOILER Calandria

## CONSTRUCTION

Type Name: Fixed tube sheet U-tube External floating head  
Internal floating head Kettle reboiler

Type Figure: SGLE Figure 2A 2B 2C 3A 3B 3C 3D 4A 4B 5A 5B 5C 5D 6A 6B 6C  
 With Weir Without Weir

TEMA Type Designation: BEM

Position: Vertical Horizontal Inclined \_\_\_\_\_ degrees

Top (feed) head: Bonnet Channel Cone Elbow  
 Bottom (return) head: Bonnet Channel Baffle Funnel separator Cone  
Elbow Cover plate

Shell expansion joint: Required Not required

| Tube Side                   |                                    | Shell Side                                |                                    |
|-----------------------------|------------------------------------|-------------------------------------------|------------------------------------|
| Design temperature _____ °C | _____ °C                           | _____ °C                                  | _____ °C                           |
| Design pressure _____ psig  | _____ psig                         | _____ psig                                | _____ psig                         |
| Fluid <u>Boiling liquid</u> | <u>Gas</u> <u>Condensing vapor</u> | <u>Boiling liquid</u> <u>Nonpulsating</u> | <u>Gas</u> <u>Condensing vapor</u> |

## SIZE

|                                          |                                               |
|------------------------------------------|-----------------------------------------------|
| No. shells per unit <u>1</u>             | Finned tube _____ in.                         |
| No. tube passes per shell <u>1</u>       | Tube OD _____ in.                             |
| Outside area per shell <u>1220</u> sq ft | Tube wall thick. <u>.065</u> in.              |
| Outside area per unit <u>1220</u> sq ft  | Tube pitch <u>1.25</u> in.                    |
| Nominal shell ID <u>29</u> in.           | Tube pattern <u>Triangular</u> Rotated square |
| No. tubes per shell <u>388</u>           | _____ Square                                  |
| Tube length <u>12</u> ft                 | Baffle pitch <u>PROVIDE TUBE</u> in.          |
|                                          | Baffle cut <u>SUPPOT</u> % of dia.            |
|                                          | Baffle type <u>Segmental</u> Double Segmental |
|                                          | No. pairs of sealing devices <u>NONE</u>      |

Shell Type E F J

## CONNECTIONS (Per SGT-2 Par. 20)

|                                        |                                             |
|----------------------------------------|---------------------------------------------|
| _____ top head _____ " inlet           | <u>18</u> " outlet _____ "                  |
| _____ bottom head <u>12.40</u> " inlet | _____ " outlet _____ "                      |
| Shell <u>8.12</u> " inlet              | <u>2</u> " outlet <u>2</u> " <u>BALANCE</u> |

## PERFORMANCE PER UNIT

|                           | Tube Side             | Shell Side         |
|---------------------------|-----------------------|--------------------|
| Load                      | <u>8.61 mm</u> Pcu/hr | _____              |
| Fluid                     | <u>PROCESS</u>        | <u>STEAM</u>       |
| Total fluid in            | <u>203000</u> lb/hr   | <u>16900</u> lb/hr |
| Condensate out            | <u>156100</u> lb/hr   | <u>16900</u> lb/hr |
| Vapor out                 | <u>46900</u> lb/hr    | _____ lb/hr        |
| Inlet temperature         | <u>101.1</u> °C       | <u>143.3</u> °C    |
| Outlet temperature        | <u>101.1</u> °C       | <u>143.3</u> °C    |
| Normal operating pressure | <u>18.3</u> psig      | <u>4.3</u> psig    |
| Pressure drop             | _____ psi-mmHg        | _____ psi-mmHg     |