

w/o 6097

| CODE STAMPS                                         |             | CERTIFIED BY          |          | FABRICATION INC. |  |
|-----------------------------------------------------|-------------|-----------------------|----------|------------------|--|
| P.O. BOX 7346 ODESSA, TEXAS 79760<br>(915) 362-9291 |             | M.A.W.P. 553/1201 PSI |          | AT 203/2351 °F   |  |
| M.D.M.T. 20 °F                                      |             | AT 553/1201 PSI       |          |                  |  |
| MFG. SER. NO. 02856                                 |             | YEAR 2006             |          |                  |  |
| HYDRO: 123/1351 PSI                                 | NOM. THICK  | TYPE                  | MATERIAL |                  |  |
| C.A.: 12                                            | SHELL 0.375 | PLATE                 | SAF-70   |                  |  |
|                                                     | HEADS 0.375 | 2.1                   | SAF-70   |                  |  |
| VESSEL DESCRIPTION 313 HEAD/BOTTOM EXCHANGER 12301A |             |                       |          |                  |  |
| CUSTOMER GIANT                                      |             |                       |          |                  |  |

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|-----------------------------------------------------|-------------|-----------------------|----------|------------------|--|
| P.O. BOX 7346 ODESSA, TEXAS 79760<br>(915) 362-9291 |             | M.A.W.P. 553/1201 PSI |          | AT 203/2351 °F   |  |
| M.D.M.T. 20 °F                                      |             | AT 553/1201 PSI       |          |                  |  |
| MFG. SER. NO. 02857                                 |             | YEAR 2006             |          |                  |  |
| HYDRO: 123/1351 PSI                                 | NOM. THICK  | TYPE                  | MATERIAL |                  |  |
| C.A.: 12                                            | SHELL 0.375 | PLATE                 | SAF-70   |                  |  |
|                                                     | HEADS 0.375 | 2.1                   | SAF-70   |                  |  |
| VESSEL DESCRIPTION 313 HEAD/BOTTOM EXCHANGER 12301A |             |                       |          |                  |  |
| CUSTOMER GIANT                                      |             |                       |          |                  |  |

FORM U-1 MANUFACTURER'S DATA REPORT FOR PRESSURE VESSELS  
As Required by the Provisions of the ASME Code Rules, Section VIII, Division 1

# 106457

1. Manufactured and certified by RAMA FABRICATION, INC., 2310 PROSPECT ODESSA, TEXAS 79762  
(Name and address of Manufacturer)

2. Manufactured for GIANT INDUSTRIES  
(Name and address of Purchaser)

Location of installation YORKTOWN, VA  
(Name and address)

4. Type: HORIZONTAL HEAT EXCHANGER 02856 - D-5860-V020 1135 2006  
(Horiz., vert., or sphere) (Tank, separator, jkt. vessel, heat exh., etc.) (Mfg's serial No.) (CRN) (Drawing No.) (Nat'l. Bd. No.) (Year built)

5. ASME Code, Section VIII, Div. 1 2004, 2005  
Edition and Addenda (date) Code Case No. Special Service per UG-120(d)

Items 6 - 11 incl. to be completed for single wall vessels, jackets of jacketed vessels, shell of heat exchangers, or chamber of multi-chamber vessels.

6. Shell (a) No. of course(s): 3 (b) Overall length (ft & in.): 21'-6 1/2"

| No. | Course(s)     |                   | Material<br>Spec./Grade or Type | Thickness |       | Long. Joint (Cat. A) |                  |      | Circum. Joint (Cat. A, B & C) |                  |      | Heat Treatment |      |
|-----|---------------|-------------------|---------------------------------|-----------|-------|----------------------|------------------|------|-------------------------------|------------------|------|----------------|------|
|     | Diameter, in. | Length (ft & in.) |                                 | Nom.      | Corr. | Type                 | Full, Spot, None | Eff. | Type                          | Full, Spot, None | Eff. | Temp.          | Time |
| 1   | 39" ID        | 7'-9 1/4"         | SA-516 Gr 70                    | .375"     | .125" | 1                    | FULL             | 1    | 1                             | FULL             | 1    | 1150           | 1    |
| 2   | 39" ID        | 10'-0"            | SA-516 Gr 70                    | .375"     | .125" | 1                    | FULL             | 1    | 1                             | FULL             | 1    | 1150           | 1    |
| 3   | 39" ID        | 8 5/8"            | SA-516 Gr70                     | .375"     | .125" | 1                    | FULL             | 1    | 1                             | FULL             | 1    | 1150           | 1    |

7. Heads: (a) SA-516 Gr70 (b)   
(Mat'l Spec. No., Grade or Type) H.T. - Time & Temp (Mat'l Spec. No., Grade or Type) H.T. - Time & Temp

|     | Location (Top, Bottom, Ends) | Thickness |       | Radius |         | Elliptical Ratio | Conical Apex Angle | Hemispherical Radius | Flat Diameter | Side to Pressure |         | Category A |                  |      |
|-----|------------------------------|-----------|-------|--------|---------|------------------|--------------------|----------------------|---------------|------------------|---------|------------|------------------|------|
|     |                              | Min.      | Corr. | Crown  | Knuckle |                  |                    |                      |               | Convex           | Concave | Type       | Full, Spot, None | Eff. |
| (a) | END                          | .250"     | .125" |        |         | 2:1              |                    |                      |               |                  |         | Full       | 1                |      |
| (b) |                              |           |       |        |         |                  |                    |                      |               |                  |         |            |                  |      |

If removable, bolts used (describe other fastening) Bonnet: 36 ea. 0.875" X 7.75" w/2 nuts ea. SA193-B7 & SA194-2H  
(Mat'l Spec. No., Grade, size, No.)

8. Type of jacket  Jacket closure   
(Describe as ogee & weld, bar, etc.)

If bar, give dimensions  If bolted, describe or sketch.

9. MAWP 55 psi at max. temp. 270 °F Min. design metal temp. -20 °F at 55 psi.  
(internal) (external) (internal) (external)

Impact test NO at test temperature of  °F  
(Indicate yes or no and the component(s) impact tested)

11. Hydro., ~~stitch~~, ~~stitch~~ test press.  Proof test

Items 12 and 13 to be completed for tube sections.

12. Tubesheet:       
Stationary (Mat'l Spec. No.) Dia., in. (subject to press.) Nom. thk., in. Corr. Allow., in. Attachment (welded or bolted)

Floating (Mat'l Spec. No.) Dia., in. Nom. thk., in. Corr. Allow., in. Attachment

13. Tubes:       
Mat'l Spec. No., Grade or Type O.D., in. Nom. thk., in. or gauge Number Type (Straight or U)

Items 14 - 18 incl. to be completed for inner chambers of jacketed vessels or channels of heat exchangers.

14. Shell (a) No. of course(s): 1 (b) Overall length (ft & in.):

| No. | Course(s)     |                   | Material<br>Spec./Grade or Type | Thickness |       | Long. Joint (Cat. A) |                  |      | Circum. Joint (Cat. A, B & C) |                  |      | Heat Treatment |      |
|-----|---------------|-------------------|---------------------------------|-----------|-------|----------------------|------------------|------|-------------------------------|------------------|------|----------------|------|
|     | Diameter, in. | Length (ft & in.) |                                 | Nom.      | Corr. | Type                 | Full, Spot, None | Eff. | Type                          | Full, Spot, None | Eff. | Temp.          | Time |
| 1   | 39" ID        | 11 1/2"           | SA-516 Gr 70                    | .375"     | .125" | 1                    | FULL             | 1    | 1                             | FULL             | 1    | 1150           | 1    |
| 2   |               |                   |                                 |           |       |                      |                  |      |                               |                  |      |                |      |
| 3   |               |                   |                                 |           |       |                      |                  |      |                               |                  |      |                |      |

15. Heads: (a) SA-105 (b)   
(Mat'l Spec. No., Grade or Type) H.T. - Time & Temp (Mat'l Spec. No., Grade or Type) H.T. - Time & Temp

|     | Location (Top, Bottom, Ends) | Thickness |       | Radius |         | Elliptical Ratio | Conical Apex Angle | Hemispherical Radius | Flat Diameter | Side to Pressure |         | Category A |                  |      |
|-----|------------------------------|-----------|-------|--------|---------|------------------|--------------------|----------------------|---------------|------------------|---------|------------|------------------|------|
|     |                              | Min.      | Corr. | Crown  | Knuckle |                  |                    |                      |               | Convex           | Concave | Type       | Full, Spot, None | Eff. |
| (a) | END                          | 3.6875"   | .125" |        |         |                  |                    |                      | 44.875"       |                  |         |            |                  |      |
| (b) |                              |           |       |        |         |                  |                    |                      |               |                  |         |            |                  |      |

If removable, bolts used (describe other fastening) Channel: 36 ea. .0875" X 9.75" w/2 nuts ea. SA193-B7 & SA194-2H  
(Mat'l Spec. No., Grade, Size, No.)

16. MAWP 120 psi at max. temp. 235 °F Min. design metal temp. -20 °F at 120 psi.  
(internal) (external) (internal) (external)

17. Impact test NO at test temperature of \_\_\_\_\_ °F  
(Indicate yes or no and the component(s) impact tested)

18. Hydro. ~~test~~ test press. 156 Proof test \_\_\_\_\_

19. Nozzles, inspection, and safety valve openings:

| Purpose (Inlet, Outlet, Drain, etc.) | No. | Diameter or Size | Flange Type | Material    |        | Nozzle Thickness |       | Reinforcement Material | How Attached |        | Location (Insp. Q) |
|--------------------------------------|-----|------------------|-------------|-------------|--------|------------------|-------|------------------------|--------------|--------|--------------------|
|                                      |     |                  |             | Nozzle      | Flange | Nom.             | Corr. |                        | Nozzle       | Flange |                    |
| Inlet/Outlet                         | 4   | 6" 150#          | RFWN        | SA-106 GR B | SA-105 | .280             | .125" | Inherent               | WELD         | WELD   | SHELL              |
| CC, Vent, Drain                      | 6   | 3/4"             | Cplg        | SA-105      | -      | 6000#            | .125" | Inherent               | -            | -      | SHELL/NOZ          |
| CC                                   | 4   | 1"               | Cplg        | SA-105      | -      | 6000#            | .125" | Inherent               | -            | -      | SHELL              |
|                                      |     |                  |             |             |        |                  |       |                        |              |        |                    |
|                                      |     |                  |             |             |        |                  |       |                        |              |        |                    |
|                                      |     |                  |             |             |        |                  |       |                        |              |        |                    |
|                                      |     |                  |             |             |        |                  |       |                        |              |        |                    |

20. Supports: Skirt NO Lugs \_\_\_\_\_ Legs 2 Others NA Attached WELD TO SHELL  
(Yes or No) (No.) (No.) (Describe) (Where and How)

21. Manufacturer's Partial Data Reports properly identified and signed by Commissioned Inspectors have been furnished for the following items of the report:  
(List the name of part, item number, mfg's. name and identifying number)

None

22. Remarks:

All Flanges are SA-105.

Vessel Exempt Per UG-20(f)

Relief Per UG-125 Non-Lethal Service

#### CERTIFICATE OF SHOP COMPLIANCE

We certify that the statements made in this report are correct and that all details of design, material, construction, and workmanship of this vessel conform to the ASME Code for Pressure Vessels, Section VIII, Division 1,  
U Certificate of Authorization No. 17,022 Expires 6/07/2008

Date 6/12/2006 Name RAMA FABRICATION, INC. Signed [Signature]  
(Manufacturer) (Representative)

#### CERTIFICATE OF SHOP INSPECTION

I, the undersigned, holding a valid commission issued by The National Board of Boiler and Pressure Vessel Inspectors and the State or Province of TX and employed by HSBCT of HARTFORD have inspected the pressure vessel described in this Manufacturer's Data Report on 6/12/2006, and state that, to the best of my knowledge and belief, the Manufacturer has constructed this pressure vessel in accordance with ASME Code, Section VIII, Division 1. By signing this certificate neither the Inspector nor his employer makes any warranty, expressed or implied, concerning the pressure vessel described in this Manufacturer's Data Report. Furthermore, neither the inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Date 6/12/2006 Signed [Signature] Commissions N.B. 12,612 A,B Texas 1723  
(Authorized Inspector) (Nat'l Board incl. endorsement, State, Province and No.)

#### CERTIFICATE OF FIELD ASSEMBLY COMPLIANCE

We certify that the statements on this report are correct and that the field assembly construction of all parts of this vessel conforms with the requirements of ASME Code, Section VIII, Division 1,  
U Certificate of Authorization No. \_\_\_\_\_ Expires \_\_\_\_\_

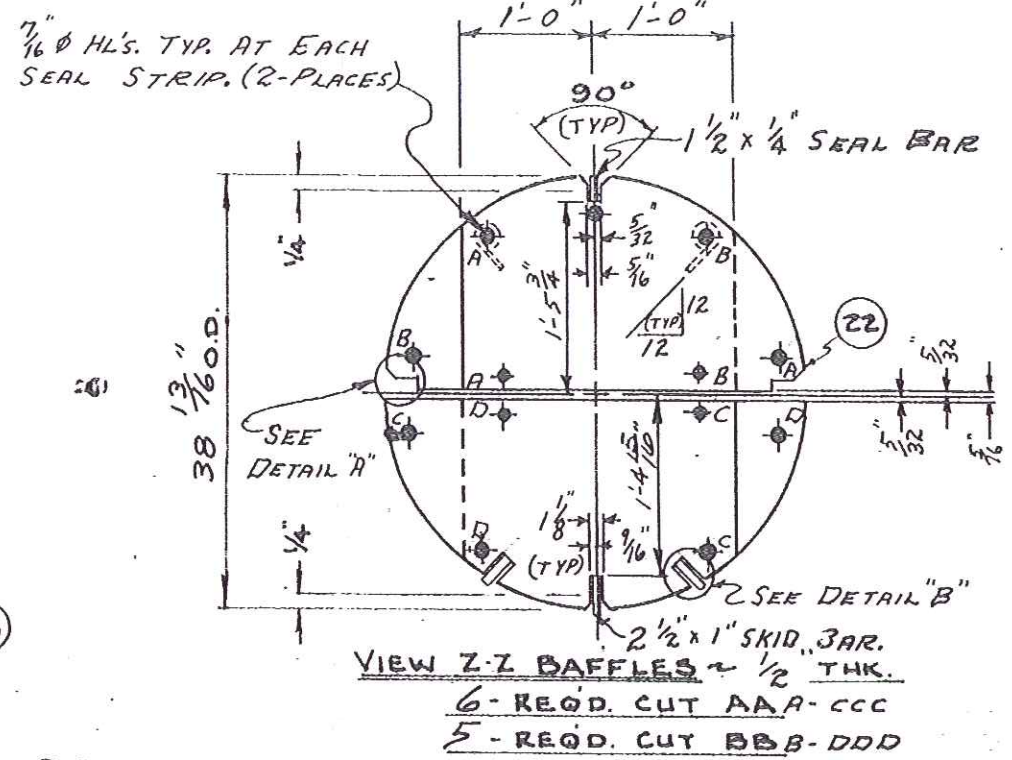
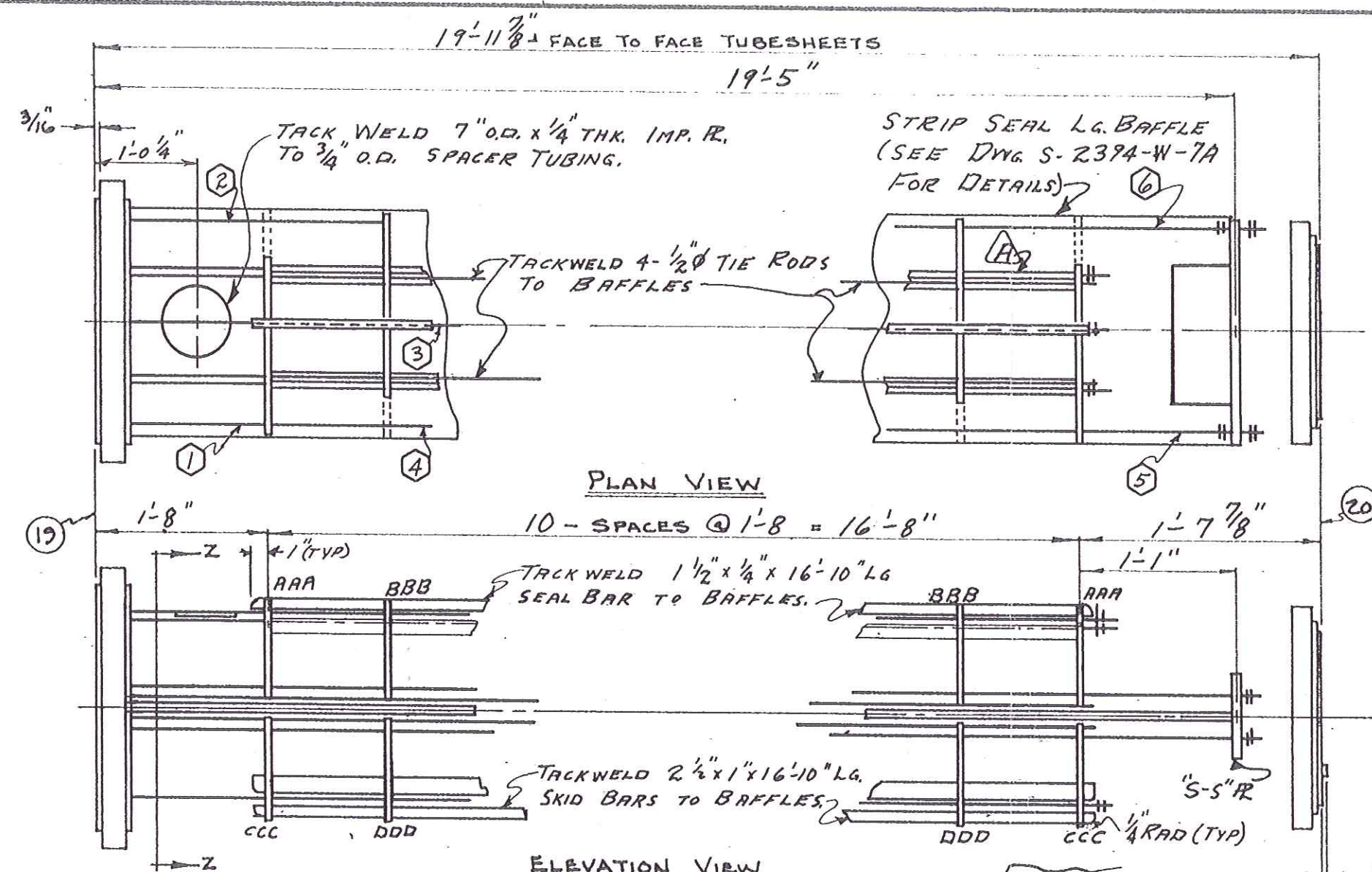
Date \_\_\_\_\_ Name \_\_\_\_\_ Signed \_\_\_\_\_  
(Assembler) (Representative)

#### CERTIFICATE OF FIELD ASSEMBLY INSPECTION

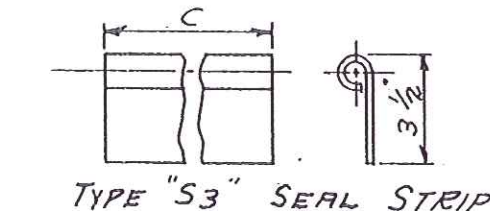
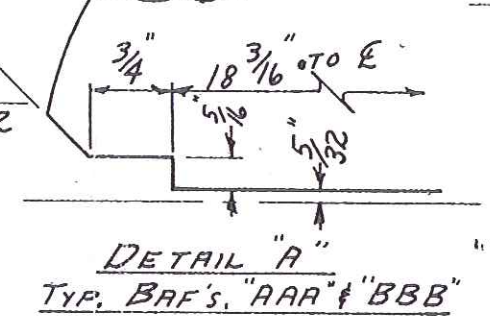
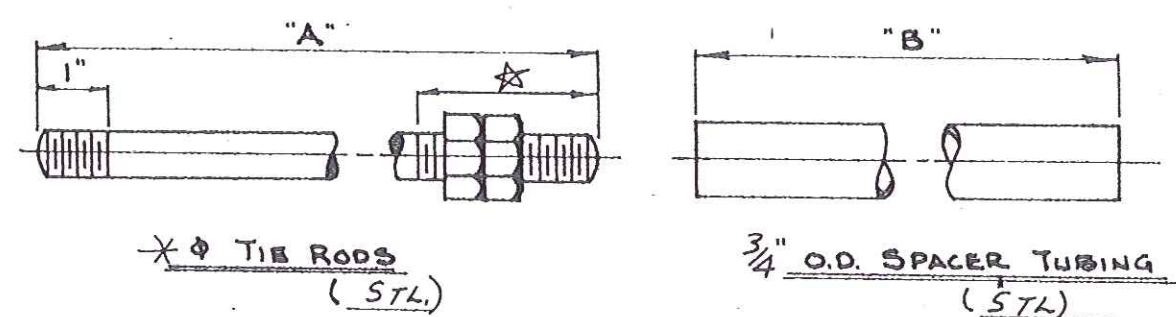
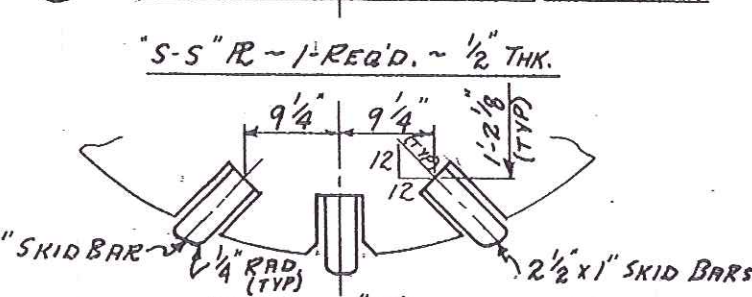
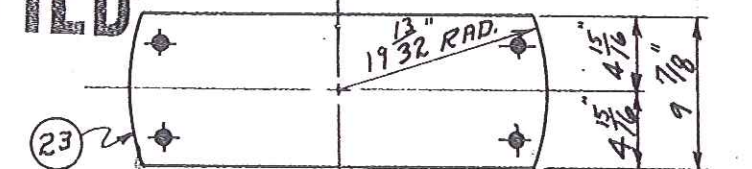
I, the undersigned, holding a valid commission issued by The National Board of Boiler and Pressure Vessel Inspectors and the State or Province of \_\_\_\_\_ and employed by \_\_\_\_\_ of \_\_\_\_\_ have compared the statements in this Manufacturer's Data Report with the described pressure vessel and state that parts referred to as data items \_\_\_\_\_, not included in the certificate of shop inspection, have been inspected by me and to the best of my knowledge and belief, the Manufacturer has constructed and assembled this pressure vessel in accordance with ASME Code, Section VIII, Division 1. The described vessel was inspected and subjected to a hydrostatic test of \_\_\_\_\_ psi. By signing this certificate neither the Inspector nor his employer makes any warranty, expressed or implied, concerning the pressure vessel described in this Manufacturer's Data Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Date \_\_\_\_\_ Signed \_\_\_\_\_ Commissions \_\_\_\_\_  
(Authorized Inspector) (Nat'l Board incl. endorsement, State, Province and No.)

129.7" 15.53%



**CERTIFIED**



| * REQ'D. | "A"          |
|----------|--------------|
| 1/2"     | 4 19'-5 1/4" |
| 1/2"     | 7 18'-4 1/4" |
| 3/8"     | 2 18'-4 1/4" |

(THD. 4-1" ONE END. ONLY)

★ THD. 4 TIE RODS 5" - 5 - - 2

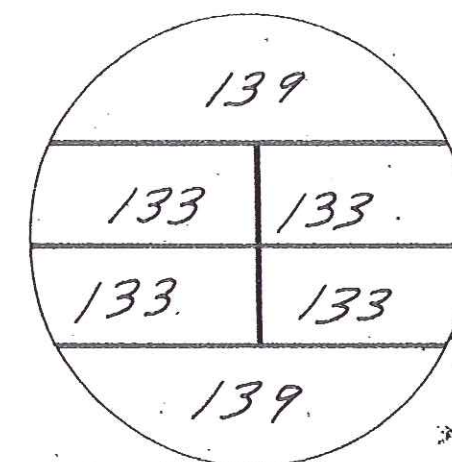
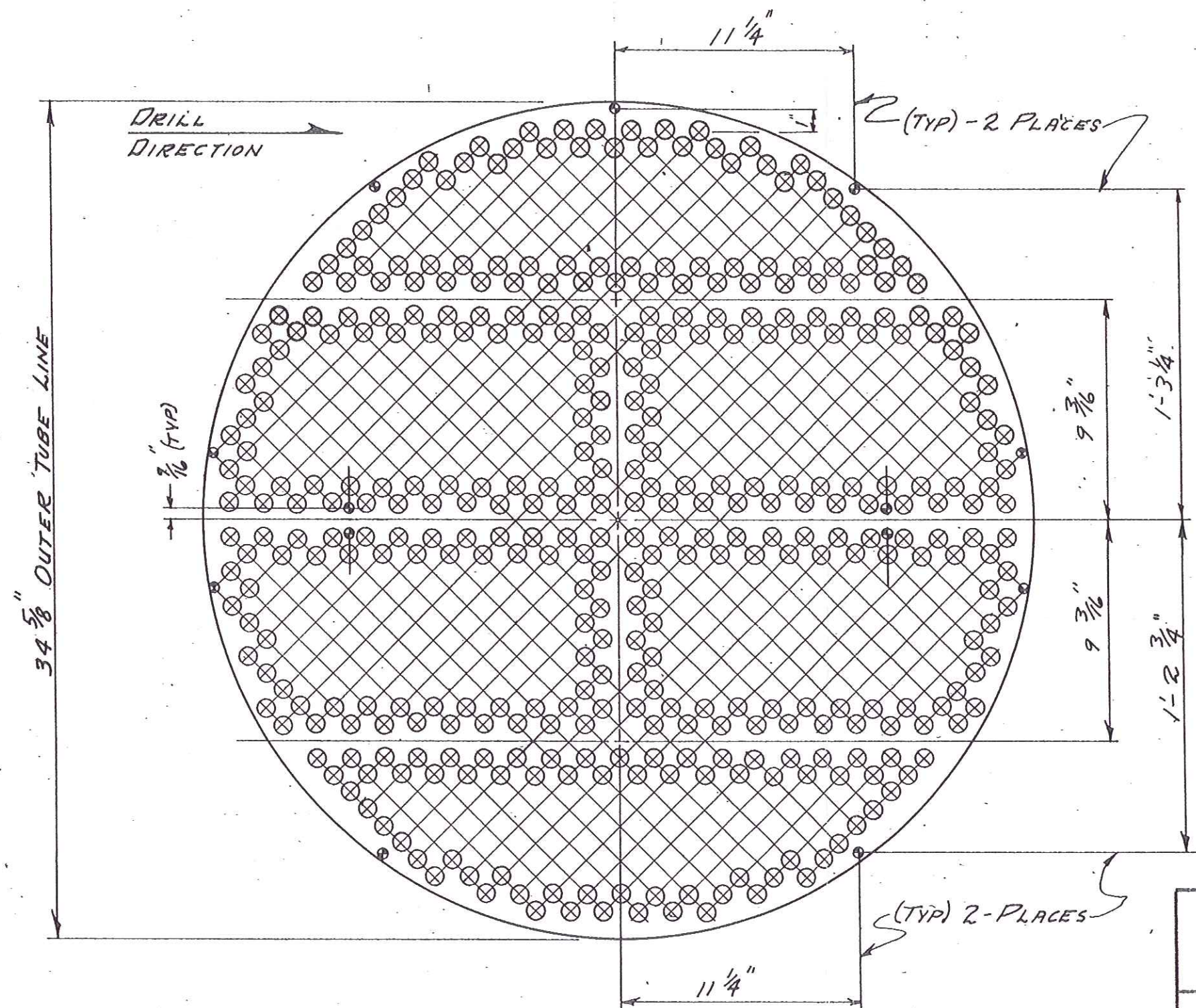
| REQ'D. | "B"       |
|--------|-----------|
| ① 7    | 1'-5 3/4" |
| ② 2    | 3'-1 3/4" |
| ③ 30   | 1'-7 1/2" |
| ④ 18   | 3'-3 1/2" |
| ⑤ 2    | 11"       |
| ⑥ 2    | 2'-7"     |

| REQ'D | "C"       |
|-------|-----------|
| 20    | 1'-7 1/2" |

RADIUS ALL CORNERS ON BAFFLES & "S-S" R.  
 DRILL TUBE HOLES 49/64" DIA. & DEBURR.  
 DRILL TIE ROD HOLES 9/16" FOR 1/2" & 7/16" FOR 3/8" Ø.

|                                   |               |          |            |
|-----------------------------------|---------------|----------|------------|
| <b>INDUSTRIAL FABRICATING CO.</b> |               |          |            |
| TULSA, OKLAHOMA                   |               |          |            |
| <b>BUNDLE DETAILS</b>             |               |          |            |
| SIZE: 39" x 20'                   |               |          |            |
| JOB: S-2394                       |               | 1-REQ'D. |            |
| DRAWN Joe                         | DATE 11-29-63 | CHECKED  | S-2394 W-7 |

106457  
 106458



TUBES PER PASS

### NOTES:

1. DRILL & REAM TUBE HOLES IN TUBE SHEETS TO  $0.760" \pm 0.002"$  O.D. FOR  $8'10" - 3/4"$  O.D. TUBES.
2. TUBE PITCH 1"  $\square$
3. 6 - PASS
4. SEE DWG. S-2394-W-5 FOR TUBE HOLE GROOVING DETAIL.

**CERTIFIED**

106457  
106458

INDUSTRIAL FABRICATING COMPANY

TULSA, OKLAHOMA

### TUBE LAYOUT

SIZE: 39"X20'

JOB: S-2394

1-REQD.

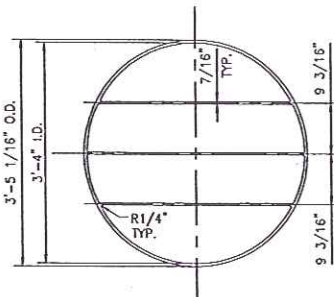
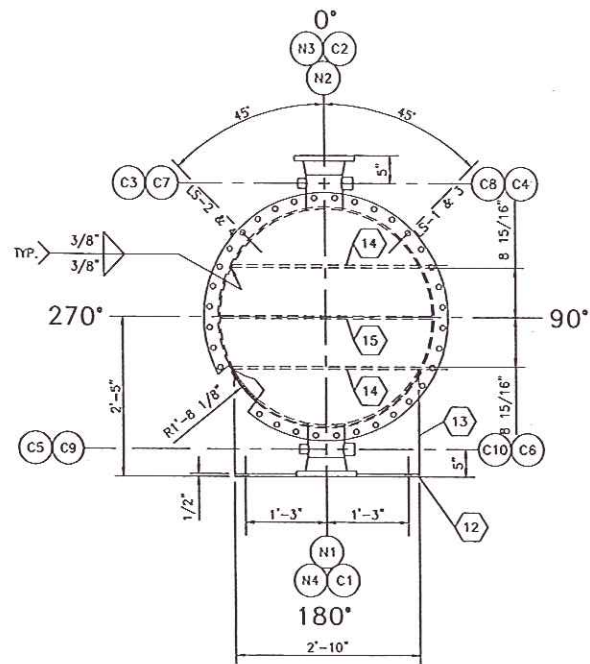
DWN. Joe DATE 11-26-63 CK

S-2394

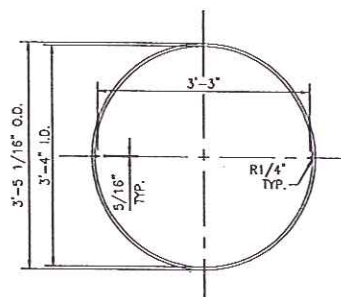
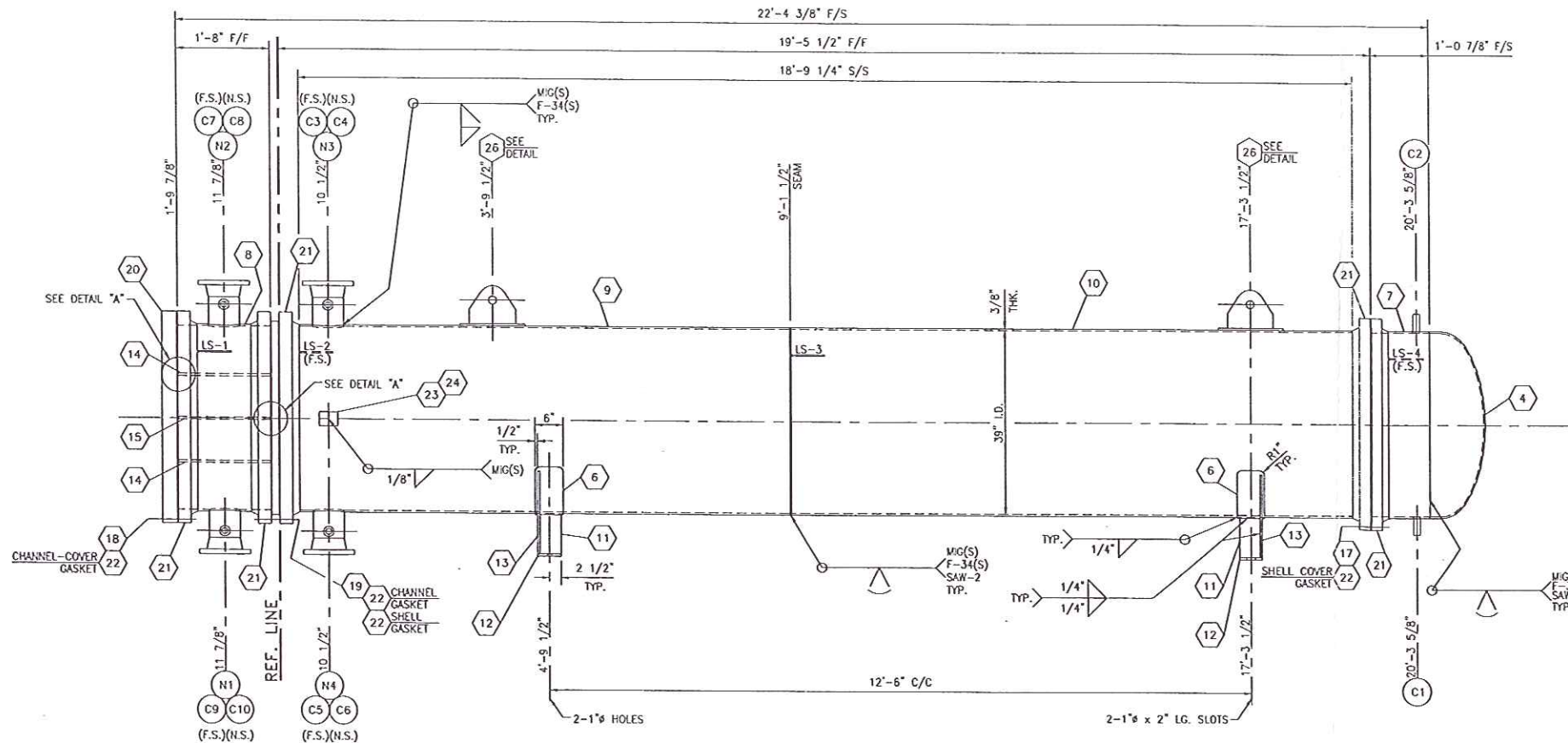
SCALE

W-6

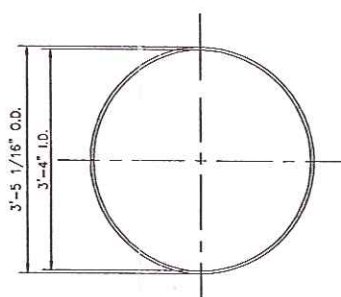
VIEW LOOKING @ SHELL SIDE OF #19 TUBE SHEET



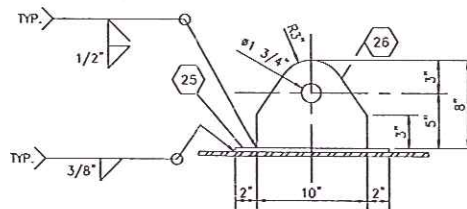
22 CHANNEL-COVER & CHANNEL GASKET DETAIL



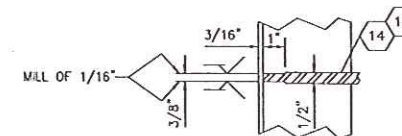
22 SHELL GASKET DETAIL



22 SHELL COVER GASKET DETAIL

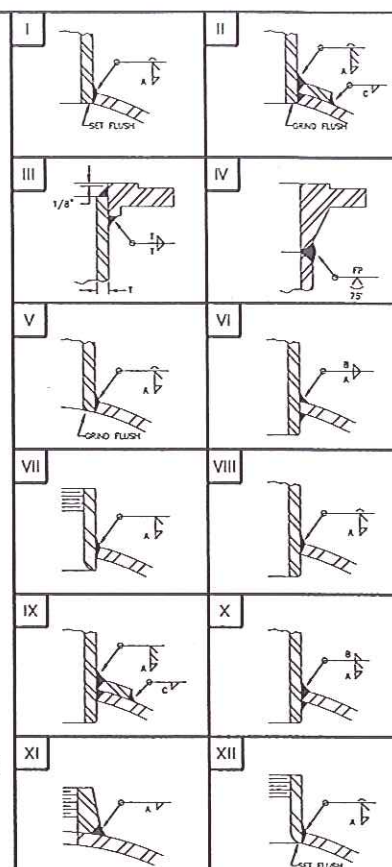


26 LIFT LUG DETAIL  
SCALE: 1 1/2"=1'-0"



DETAIL "A"  
SCALE: 3"=1'-0"

REVISED  
DATE: 05/09/06



NOTES:  
1. Flange bolt holes to straddle vessel centerlines unless otherwise noted.  
2. Drill & tap 1/4" telltale hole in reinforcing pad.  
3. Outside projection shown in the nozzle schedule is from the vessel O.D., unless otherwise noted.  
4. Inside projection shown in the nozzle schedule is minimum only.  
5. All tool dimensions are from the reference line.  
6. All nozzles shall be adequately protected and covered for shipment.  
7. Tube design pressure 120 psig @ 235°F  
Tube hydro pressure 156 psig

ISSUED FOR CONSTRUCTION  
DATE: 03/30/06  
BY: JOW

\* Heads must conform to UCS-79 and UCS-81, Section VIII, Div. 1 and Section II for materials. MTR's are required.  
\*\* All other materials UG-80, B3, Section VIII, Div. 1. MTR's and/or COC's are required.

| BILL OF MATERIAL |                                                          |                   |     |
|------------------|----------------------------------------------------------|-------------------|-----|
| QTY              | DESCRIPTION                                              | MATL              | QTY |
| 4                | 1 CPLG 0.75" x 6.000" x 4.000" LG.                       | SA105             | 4   |
| 2                | 2 CPLG 0.75" x 6.000" x 4.000" LG.                       | SA105             | 2   |
| 3                | 3 CPLG 1.00" x 6.000" x 4.000" LG.                       | SA105             | 3   |
| 4                | 4 HEAD 0.375" x 39.750" O.D. x 39.000" I.D. - 2:1        | SA105-70          | 4   |
| 5                | 5 PIPE 6.00" x 0.280" WALL x 6.7500" LG. SLS.            | SA105-8           | 5   |
| 6                | 6 PL. 0.250" x 44.00" x 6.00" ROLL TO 39.75" ID WEAR PL. | SA35              | 6   |
| 7                | 7 PL. 0.375" x 8.625" x 123.6875" LG. - ROLLED CYL.      | SA16-70           | 7   |
| 8                | 8 PL. 0.375" x 11.500" x 123.6875" LG. - ROLLED CYL.     | SA16-70           | 8   |
| 9                | 9 PL. 0.375" x 105.250" x 123.6875" LG. - ROLLED CYL.    | SA16-70           | 9   |
| 10               | 10 PL. 0.375" x 120.000" x 123.6875" LG. - ROLLED CYL.   | SA16-70           | 10  |
| 11               | 11 PL. 0.500" x 4.500" x 8.375" - SADDLE RIB             | SA36              | 11  |
| 12               | 12 PL. 0.500" x 34.000" x 5.000" - SADDLE BASE           | SA36              | 12  |
| 13               | 13 PL. 0.500" x 34.000" x 17.750" - SADDLE WEB           | SA36              | 13  |
| 14               | 14 PL. 0.500" x 34.125" x 19.625" - PL. SQ/REC           | SA36              | 14  |
| 15               | 15 PL. 0.500" x 39.000" x 19.625" - PL. SQ/REC           | SA36              | 15  |
| 16               | 16 RFWN 6.00" x 0.150" RF WELD NECK FLANGE x 0.280" WALL | SA105             | 16  |
| 17               | 17 STUD 0.875" x 7.75" LG. - 36 REQ/SET V/2 NUTS         | SA193-B7/SA194-2H | 17  |
| 18               | 18 STUD 0.875" x 8.50" LG. - 36 REQ/SET V/2 NUTS         | SA193-B7/SA194-2H | 18  |
| 19               | 19 STUD 0.875" x 9.75" LG. - 36 REQ/SET V/2 NUTS         | SA193-B7/SA194-2H | 19  |
| 20               | 20 BLIND CUST. - 39.00" - SEE DATASHEET                  |                   | 20  |
| 21               | 21 FLANGE CUST. - 39.00" - SEE DATASHEET                 |                   | 21  |
| 22               | 22 GSKT - 1/8" THK ARMED IRON JACKETED ASB. FILLED       |                   | 22  |
| 23               | 23 RAMA STD. CODE NAME PLT. W/ TEE TYPE BRACKET          | 304SS             | 23  |
| 24               | 24 PL. 0.125" x 3.000" x 4.000" - BRACKET                | SA36              | 24  |
| 25               | 25 PL. 0.375" x 14.000" x 6.000" - PL. SQ/REC            | SA16-70           | 25  |
| 26               | 26 PL. 1.000" x 10.000" x 8.000" - LIFT LUG              | SA16-70           | 26  |

| SPECIFICATIONS           |                                    |                          |                         |
|--------------------------|------------------------------------|--------------------------|-------------------------|
| YEAR BUILT               | 2006                               | TAG/MODEL NUMBER         | E601A                   |
| SERIAL NO.               | 02855                              | NATIONAL B.O. NO.        | 1135                    |
| DESIGN PRESSURE INTERNAL | 55 PSIG @ TEMP. -20/270 °F MIN/MAX | DESIGN PRESSURE EXTERNAL | PSIG @ TEMP. °F MIN/MAX |
| HYDRO PRESSURE INTERNAL  | 72 PSIG @ TEMP. °F MIN/MAX         | J.E. LONG SEAMS          | 100%                    |
| CORROSION ALLOWANCE      | .125                               | J.E. ROUNDED SEAMS       | 100%                    |
| RADIOGRAPHY              | RT-1 (FULL)                        | STRESS RELIEVE           | YES                     |
| FLANGE RATING            | 150                                | COUPLING RATING          | 6000                    |
| SHELL MATL. SPEC.        | SA16-70                            | HEAD MATL. SPEC.         | SA16-70                 |
| FLANGE MATL. SPEC.       | SA105                              | CPLG. MATL. SPEC.        | SA105                   |
| PIPE MATL. SPEC.         | SA105-B                            | BN FIT. MATL. SPEC.      | SA234-BP8               |
| REPAID MATL. SPEC.       | SA16-70                            | STRUC. MATL. SPEC.       | SA35                    |
| RF GSK. MATL. SPEC.      | 304 SS                             | FLG. STUD SPEC.          | SA193-B7                |
| RF GSK. MATL. SPEC.      |                                    | FLG. NUT SPEC.           | SA194-2H                |
| EMPTY WEIGHT             | 21,500 LBS.                        | FULL LIQUID WEIGHT       | 32,295 LBS              |
| RF GSK. DESC.            | 1/8" SPIRAL WOUND METAL/COUP.      |                          |                         |
| RF GSK. DESC.            |                                    |                          |                         |
| WELD PROCEDURE           | WQ(S), F-34(S), SAW-2              |                          |                         |
| INSULATION DESC.         | 3" HOT                             |                          |                         |
| INSPECTION BY            | HSD, CT & RAMA                     |                          |                         |
| CONSTRUCTION CODE        | ASME SEC. VIII DIV. 1 2005 ADDENDA |                          |                         |
| EXT. SURFACE TREATMENT   | PER CUSTOMER SPEC'S                |                          |                         |
| INT. SURFACE TREATMENT   |                                    |                          |                         |

UW RT-1 HT  
MFL. NO. 1135  
COPYED BY  
P.O. BOX 2246 OCESSA, TEXAS 77650  
(409) 341-9251  
RAMA FABRICATION, INC.  
DATE: 03/30/06  
BY: JOW

|      |     |              |      |        |      |      |       |          |         |          |        |                 |        |      |             |     |      |   |      |     |    |
|------|-----|--------------|------|--------|------|------|-------|----------|---------|----------|--------|-----------------|--------|------|-------------|-----|------|---|------|-----|----|
| N4   | 1   | OUTLET       | 6.00 | 0150   | RFWN | 6.06 | 0.280 | 6.7500   | SA106-B | -        | -      | -               | 9.1250 | IFIS | N           | V   | 1/4" | - | -    | 5   | 16 |
| N3   | 1   | INLET        | 6.00 | 0150   | RFWN | 6.06 | 0.280 | 6.7500   | SA106-B | -        | -      | -               | 9.1250 | IFIS | N           | V   | 1/4" | - | -    | 5   | 16 |
| N2   | 1   | OUTLET       | 6.00 | 0150   | RFWN | 6.06 | 0.280 | 6.7500   | SA106-B | -        | -      | -               | 9.1250 | IFIS | N           | V   | 1/4" | - | -    | 5   | 16 |
| N1   | 1   | INLET        | 6.00 | 0150   | RFWN | 6.06 | 0.280 | 6.7500   | SA106-B | -        | -      | -               | 9.1250 | IFIS | N           | V   | 1/4" | - | -    | 5   | 16 |
| C10  | 1   | SPARE W/PLUG | 1.00 | 6000   | CPLG | -    | -     | -        | SA105   | -        | -      | -               | YES    | SFIS | -           | XII | 1/4" | - | -    | -   | 3  |
| C9   | 1   | SPARE W/PLUG | 0.75 | 6000   | CPLG | -    | -     | -        | SA105   | -        | -      | -               | YES    | SFIS | -           | XII | 1/4" | - | -    | -   | 1  |
| C8   | 1   | SPARE W/PLUG | 1.00 | 6000   | CPLG | -    | -     | -        | SA105   | -        | -      | -               | YES    | SFIS | -           | XII | 1/4" | - | -    | -   | 3  |
| C7   | 1   | SPARE W/PLUG | 0.75 | 6000   | CPLG | -    | -     | -        | SA105   | -        | -      | -               | YES    | SFIS | -           | XII | 1/4" | - | -    | -   | 1  |
| C6   | 1   | SPARE W/PLUG | 1.00 | 6000   | CPLG | -    | -     | -        | SA105   | -        | -      | -               | YES    | SFIS | -           | XII | 1/4" | - | -    | -   | 3  |
| C5   | 1   | SPARE W/PLUG | 0.75 | 6000   | CPLG | -    | -     | -        | SA105   | -        | -      | -               | YES    | SFIS | -           | XII | 1/4" | - | -    | -   | 1  |
| C4   | 1   | SPARE W/PLUG | 1.00 | 6000   | CPLG | -    | -     | -        | SA105   | -        | -      | -               | YES    | SFIS | -           | XII | 1/4" | - | -    | -   | 3  |
| C3   | 1   | SPARE W/PLUG | 0.75 | 6000   | CPLG | -    | -     | -        | SA105   | -        | -      | -               | YES    | SFIS | -           | XII | 1/4" | - | -    | -   | 1  |
| C2   | 1   | VENT         | 0.75 | 6000   | CPLG | -    | -     | -        | SA105   | -        | -      | -               | YES    | SFIS | -           | XII | 1/4" | - | -    | -   | 2  |
| C1   | 1   | DRAIN        | 0.75 | 6000   | CPLG | -    | -     | -        | SA105   | -        | -      | -               | YES    | SFIS | -           | XII | 1/4" | - | -    | -   | 2  |
| MARK | NO. | SERVICE      | SIZE | RATING | TYPE | BORE | WALL  | LG. NECK | MAT'L.  | OD & THK | MAT'L. | REINFORCING PAD | O.S.   | I.S. | WELD DETAIL | A   | B    | C | PIPE | NOZ |    |

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RAMA FABRICATION, INC.  
SWS FEED/BOTTOM EXCHANGER (E601A)  
39" I.D. x 22'-4 3/8" F/S  
CUSTOMER: GIANT YORKTOWN REFINERY  
SCALE: 3/4"=1'-0" W.O. # 6097  
CUST. PO# QUOTE #  
DRAWN: JOW 03/13/06 Dwg. No.  
CHECK: PDV 03/30/06 D-5860-V020 1