

FORM U-2A MANUFACTURER'S PARTIAL DATA REPORT (ALTERNATIVE FORM)  
A Part of a Pressure Vessel Fabricated by One Manufacturer for Another Manufacturer  
As Required by the Provisions of the ASME Code Rules, Section VIII, Division 1

1. Manufactured and certified by OHMSTEDE INC., CORPUS CHRISTI PLANT 410 FLATO RD., CORPUS CHRISTI, TX 78405  
(Name and address of Manufacturer)  
Manufactured for AMOCO OIL CO., YORKTOWN, VIRGINIA  
(Name and address of Purchaser)  
3. Location of installation AMOCO OIL CO., YORKTOWN, VIRGINIA  
(Name and address)  
4. Type: HEAT EXCHANGER SHELL 552032 NONE  
(Description of vessel part (shell, two-piece head, tube bundle)) (Mfg's. serial No.) (CRM)  
NONE 552032 OHMSTEDE 1996  
(Nat'l. Bd. No.) (Drawing No.) (Drawing prepared by) (Year built)  
5. ASME Code, Section VIII, Div. 1 1992/A1994 NONE NONE  
(Edition and Addenda (date)) (Code Case No.) (Special Service per UG-120(d))  
6. Shell (a) No. of course(s): 2 (b) Overall length (ft & in.): 18'-10.688"

Course(s)			Material		Thickness		Long. Joint (Cat. A)			Circum. Joint (Cat. A, B, & C)			Heat Treatment	
No.	Diameter, in.	Length, ft & in.	Spec./Grade or Type	Nom.	Corr.	Type	Full, Spot, None	Eff.	Type	Full, Spot, None	Eff.	Temp.	Time	
1	25"	10'-0"	SA-516-70	.375	.125	1	SPOT	.85	1	SPOT	.85	NONE		
1	25"	8'-10.688"	SA-516-70	.375	.125	1	SPOT	.85	1	SPOT	.85	NONE		

7. Heads: (a) NONE (b) NONE  
(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, End)	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)														
(b)														

If removable, bolts used (describe other fastening) \_\_\_\_\_  
(Mat'l Spec. No., Grade, Size, No.)  
8. MAWP 75 N/A psi at max. temp. 650 N/A °F. Min. design metal temp. -20 °F at 75 psi.  
(Internal) (External) (Internal) (External)  
9. Impact test EXEMPT PER UG-20 (f)  
(Indicate year or no and the component(s) impact tested)  
10. Hydro., pneu., or comb. test press. NONE Proof test NONE  
11. Nozzles, inspection, and safety valve openings: (1) = SA-105

Purpose (Inlet, Outlet, Drain, etc.)	No.	Diameter or Size	Flange Type	Material		Nozzle Thickness		Reinforcement Material	How Attached		Location (Insp. Open.)
				Nozzle	Flange	Nom.	Corr.		Nozzle	Flange	
IN/OUT	2	6"-150#	RFLWN	(1)	(1)	.875	.125	INTEG	WLD	INTEG	SHELL

12. Supports: Skirt        Lugs        Legs        Others 2-SADDLES Attached WLD TO SHELL  
(Yes or no) (No.) (No.) (Describe) (Where and how)  
13. Remarks: SHELL ONLY FABRICATED BY OHMSTEDE. NO SHOP HYDROTEST PERFORMED.

CERTIFICATE OF SHOP/FIELD COMPLIANCE

We certify that the statements made in this report are correct and that all details of material, construction, and workmanship of this pressure vessel part conform to the ASME Code for Pressure Vessels, Section VIII, Division 1.

U Certificate of Authorization No. 20,206 Expires APRIL 19 19 97

Date 3-7-96 Name OHMSTEDE INC., CORPUS CHRISTI PLANT Signed [Signature]  
(Manufacturer) (Representative)

CERTIFICATE OF SHOP/FIELD INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and/or the State or Province of TEXAS and employed by COMMERCIAL UNION INSURANCE COMPANY of BOSTON, MASS have inspected the pressure vessel part described in this Manufacturer's Data Report on 3/1 19 96, and state that, to the best of my knowledge and belief, the Manufacturer has constructed this pressure vessel part 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 part 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 3/1/96 Signed [Signature] Commissions TX 1021  
(Authorized Inspector) (Nat'l Board incl. endorsement, State, Province and No.)



FORM U-2 MANUFACTURER'S PARTIAL DATA REPORT

A Part of a Pressure Vessel Fabricated by One Manufacturer for Another Manufacturer

As Required by the Provisions of the ASME Code Rules, Section VIII, Division 1

BD

1. Manufactured and certified by OHMSTEDE LTD., ST. GABRIEL PLANT, 4250 HIGHWAY 30 ST. GABRIEL, LOUISIANA 70776

(Name and address of Manufacturer)

Manufactured for GIANT YORKTOWN REFINERY 2201 GOODWIN NECK ROAD GRAFTON, VA 23692

(Name and address of Purchaser)

3. Location of installation GIANT YORKTOWN REFINERY 2201 GOODWIN NECK ROAD GRAFTON, VA 23692

(Name and address)

4. Type: TUBE BUNDLE 736882 -

(Description of vessel part (shell, two-piece head, tube bundle)) (Mfg's serial No.) (CRN)

2669 736882 OHMSTEDE LTD., ST. GABRIEL PLANT 2007

(Nat'l. Bd. No.) (Drawing No.) (Drawing prepared by) (Year built)

5. ASME Code, Section VIII, Div. 1 2004 EDITION, 2005 ADDENDA - -

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): - (b) Overall length ft & in.: -

Course(s)			Material		Thickness		Long. Joint (Cat. A)			Circum. Joint (Cat. A, B, & C)			Heat Treatment	
No.	Diameter, in.	Length ft & in.	Spec./Grade or Type		Nom.	Corr.	Type	Full, Spot, None	Eff.	Type	Full, Spot, None	Eff.	Temp.	Time
-	-	-	-		-	-	-	-	-	-	-	-	-	-
-	-	-	-		-	-	-	-	-	-	-	-	-	-
-	-	-	-		-	-	-	-	-	-	-	-	-	-

7. Heads: (a) - (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)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(b)	-	-	-	-	-	-	-	-	-	-	-	-	-	-

If removable, bolts used (describe other fastening) -

(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. AWP \* \* psi at max. temp. \* \* °F Min. design metal temp. \* °F at \* psi.

(internal) (external) (internal) (external)

10. Impact test NO PER UCS66(a).&UNF65 at test temperature of - °F

(Indicate yes or no and the component(s) impact tested)

11. Hydro., ~~proof, or~~ test press. - Proof test -

Items 12 and 13 to be completed for tube sections.

12. Tubesheet: SB-171C46400 24 3/4" 1 3/8" \*

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

SB-171C46400 24 3/4" 1 3/8" \*

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

13. Tubes: SB-111C71500 3/4" .0830" 460

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): - (b) Overall length (ft & in.): -

Course(s)			Material		Thickness		Long. Joint (Cat. A)			Circum. Joint (Cat. A, B, & C)			Heat Treatment	
No.	Diameter, in.	Length ft & in.	Spec./Grade or Type		Nom.	Corr.	Type	Full, Spot, None	Eff.	Type	Full, Spot, None	Eff.	Temp.	Time
-	-	-	-		-	-	-	-	-	-	-	-	-	-
-	-	-	-		-	-	-	-	-	-	-	-	-	-
-	-	-	-		-	-	-	-	-	-	-	-	-	-

[illegible]

16. MAWP  $\frac{*}{\text{(internal)}}$   $\frac{*}{\text{(external)}}$  psi at max. temp.  $\frac{*}{\text{(internal)}}$   $\frac{*}{\text{(external)}}$  °F Min. design metal temp.  $\frac{*}{\text{(internal)}}$  °F at  $\frac{*}{\text{(external)}}$  psi

18. Hydro., ~~press, 6# comb.~~ test press. 125 PSI Proof test                     

[illegible]

21. Remarks: -ITEM NO/S 9,12 & 16 CONT: \* DESIGNED BY OTHER, PRESSURES, TEMPERATURES AND CORROSION ALLOWANCE TO BE DETERMINED BY OWNER. FINAL HYDRO TO BE PERFORMED BY OWNER. BUNDLE OVERALL LENGTH 19'11 3/4".

ITEM# E-328B PO# P021457

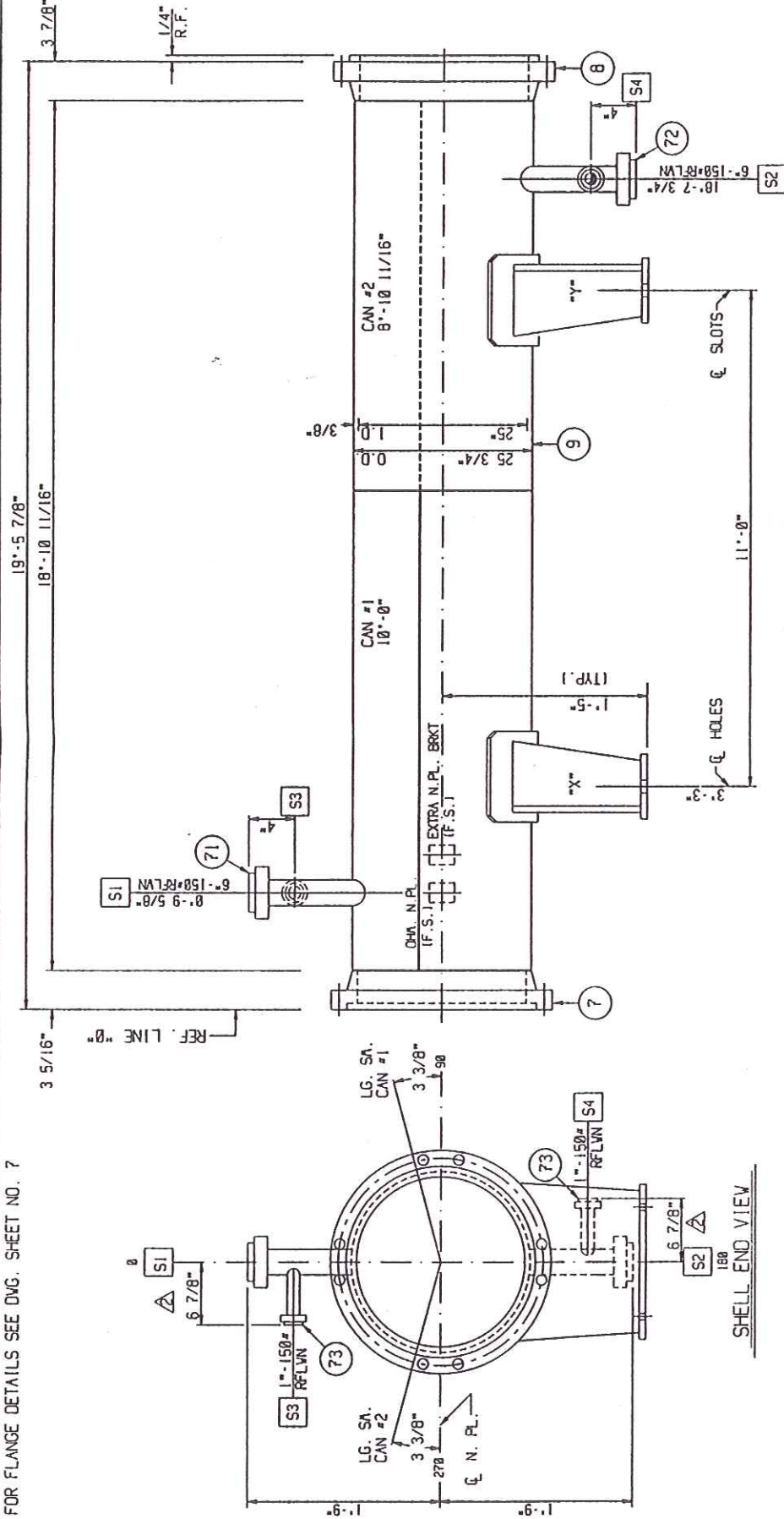
We certify that the statements made in this report are correct and that all details of material, construction, and workmanship of this pressure vessel part conform to the ASME Code for Pressure Vessels, Section VIII, Division 1.

## CERTIFICATE OF SHOP/FIELD INSPECTION

Date 3/2/07 Signed Robert Hall Commissions NB 13215A LA 1536  
(Authorized Inspector) (Nat'l Board incl. endorsement, State, Province and No.)



FOR FLANGE DETAILS SEE DWG. SHEET NO. 7



SHELL SIDE VIEW  
SHELL WT. = 2800#

SHELL END VIEW

NOTES:  
1) ALL BOLT HOLES TO STRADDLE CENTER LINES.  
2) FOR WELD & BEVEL DETAILS SEE DWG. SHEET NO. 8  
3) GRIND ALL INSIDE WELDS FLUSH.  
4) SPOT RADIOGRAPHY.

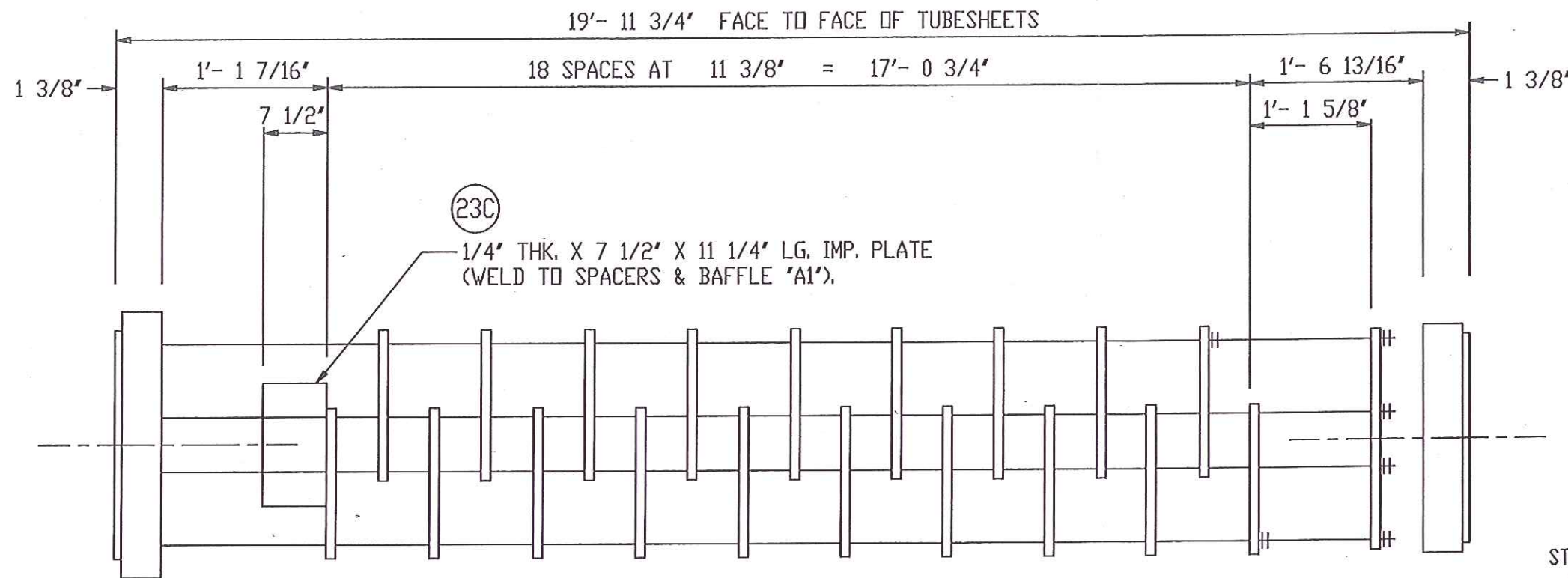
CUSTOMER: AMOCO OIL CO.  
P.O. NO.: 9540790  
ITEM NO.: E-328

NO.	REVISIONS	BY	CHK.	DATE	CHK.
1	REV. PER SHOP	J.C.	D.O.	2-23-96	
2	SHOP REL.	J.C.	D.O.	2-6-96	
3	FOR CUSTOMER APPROVAL	J.C.	D.O.	1-26-96	

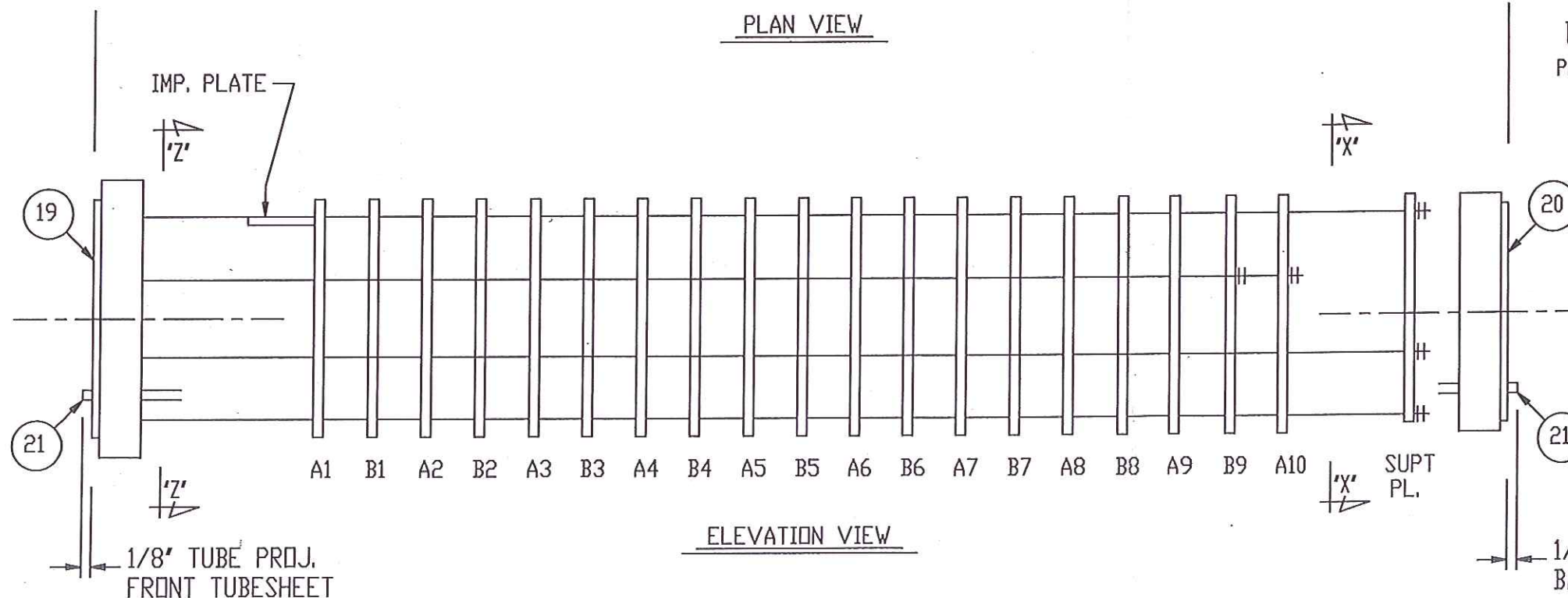
SHELL DETAILS

DRAWING NO. 552032  
SHEET NO. 3

OWASTEDE



PLAN VIEW



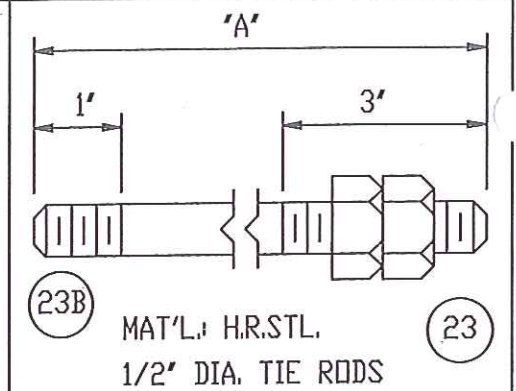
ELEVATION VIEW

△ SHOP NOTE 1  
STENCIL ON THE PERIPHERAL  
EDGE OF THE TUBESHEET

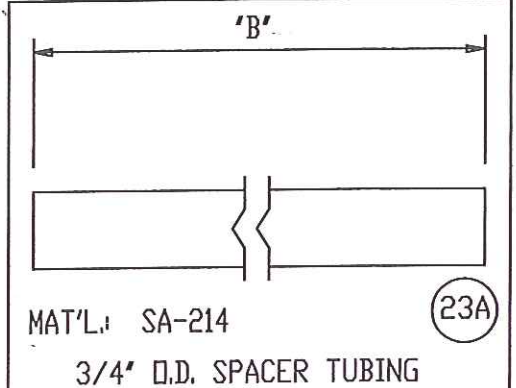
U  
PART  
CERTIFIED BY OHMSTEDE, LTD.  
ST. GABRIEL PLANT  
SERIAL NO. 736882  
2007

(460) TUBES, 3/4" O.D.  
X .0830" THK. (MW)  
X 20'- 0" LG.  
MAT'L: SB-111C71500

1/8" TUBE PROJ.  
BACK TUBESHEET



REQ'D.	'A'
6	19'- 6 1/2"
1	18'- 4 5/8"
1	17'- 5 1/4"



REQ'D.	'B'
11	1'- 1 7/16"
3	2'- 0 13/16"
72	11 3/16"
34	1'- 10 9/16"

NOTES:

- 1) SEE DWG. SHEET NO. 2 FOR SECTION AND VIEW DETAILS.
- 2) HYDROSTATIC TEST TUBESIDE AT 125 PSIG.
- 3) DESIGN BY OTHERS.
- 4) ASME CODE SECT. VIII, DIV.1, (STAMP: YES) △
- 5) ALL MACHINE SURFACES TO BE COATED WITH A READILY REMOVABLE RUST PREVENTATIVE.

CERTIFIED \_\_\_\_\_  
DATE \_\_\_\_\_

CERTIFIED AS BUILT				
1	REVISE AS NOTED	CR	GK	1-18-07
0	RELEASE FOR FAB.	TR	GK	1-15-07
NO.	REVISIONS	BY	CHK.	DATE CHK.

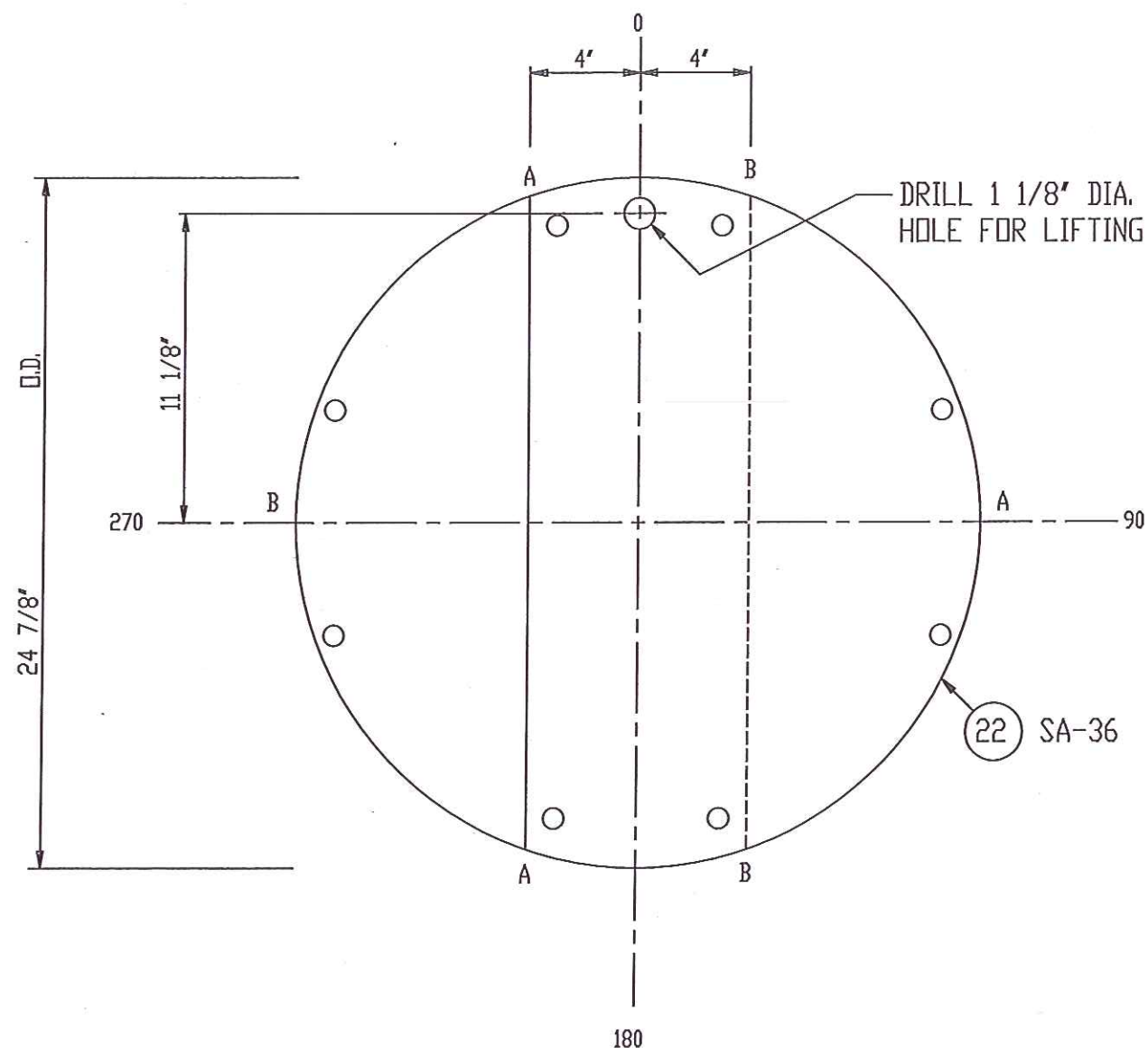
CUSTOMER: GIANT INDUSTRIES  
OHMSTEDE JOB NO.: 736882  
P. O. NO.: PO21457  
ITEM NO.: E-328 △

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BUNDLE DETAILS

OHMSTEDE Ltd. DRAWING NO. 736882-1





VIEW ZZ OF BAFFLES

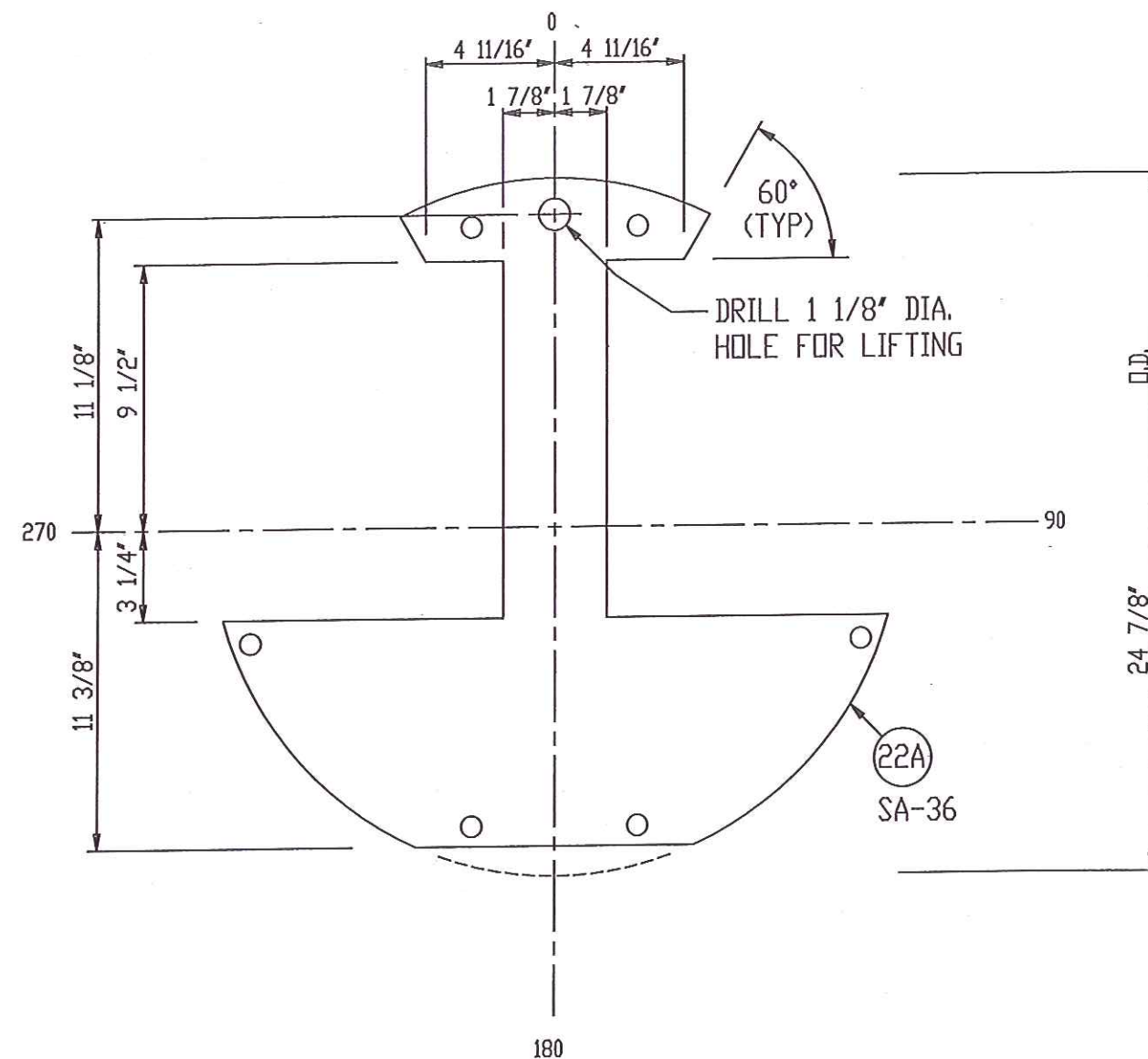
3/16" THK.

10 - REQ'D. CUT AAA

9 - REQ'D. CUT BBB

NOTES:

- 1) DRILL TUBE HOLES IN BAFFLES 25/32" DIA. & DEBURR.
- 2) DRILL TIE ROD HOLES 9/16" DIA.  
SEE TUBE LAYOUT FOR LOCATION.
- 3) RADIUS ALL CORNERS ON BAFFLE CUTS.
- 4) MACHINE O.D. OF BAFFLES TO 250 AARH.



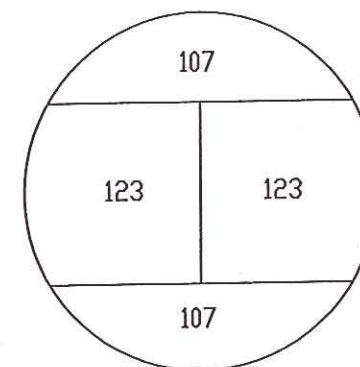
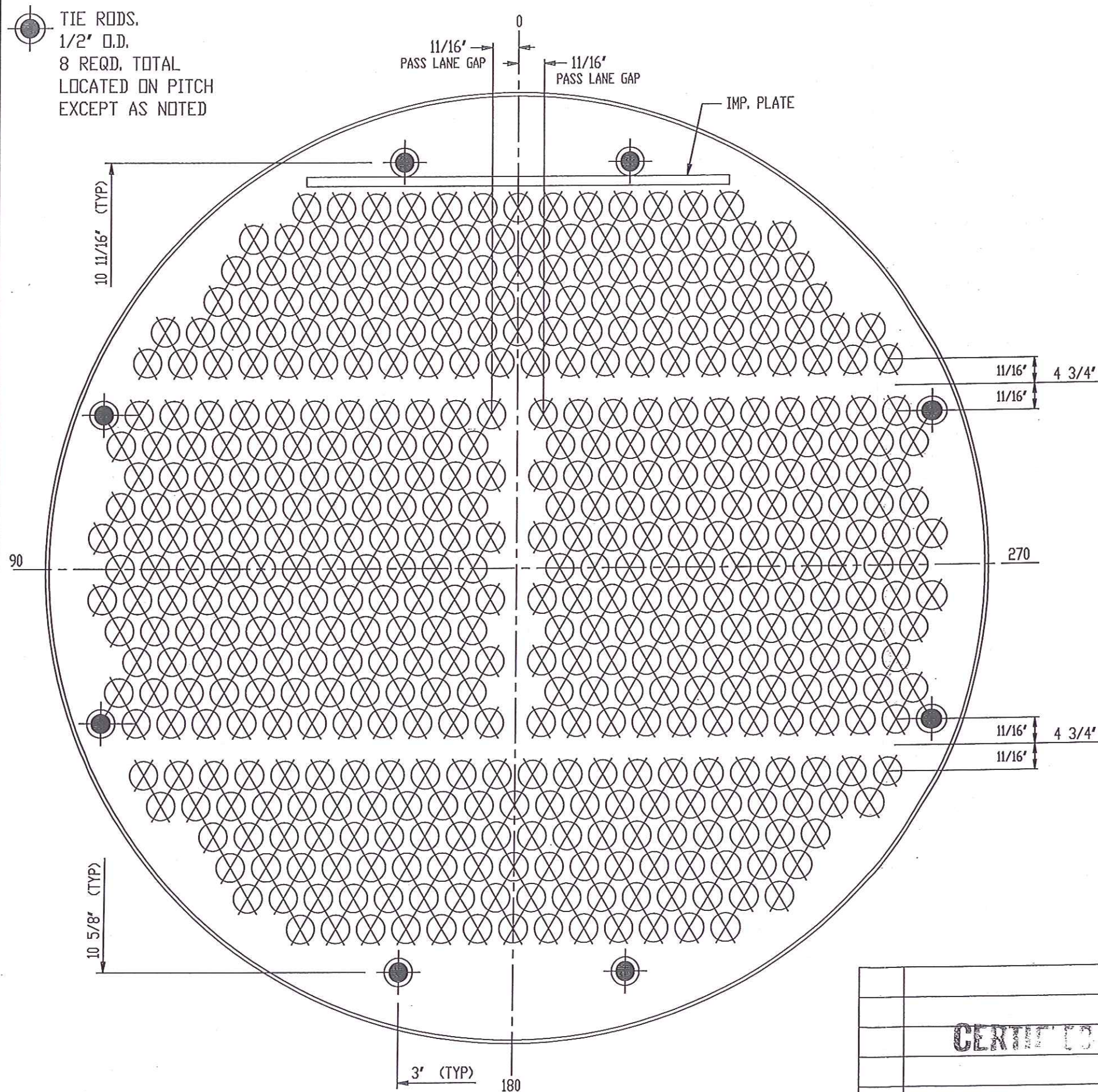
VIEW XX OF SUPT.PL.

3/8" THK.

1 - REQ'D.

<div style="border: 1px solid black; padding: 5px; text-align: center;"> <b>CERTIFIED COPY</b> </div>					CUSTOMER: GIANT INDUSTRIES	
					OHMSTEDE JOB NO.: 736882	
					P. O. NO. : P021457	
					ITEM NO. : E-328 Δ	
					COPYRIGHT 2001, OHMSTEDE LTD.	
1	REVISE AS NOTED	CR	GK	1-18-07	<b>BAFFLE DETAILS</b>	
0	RELEASE FOR FAB.	TR	GK	1-15-07		
NO.	REVISIONS	BY	CHK.	DATE CHK.	<b>OHMSTEDE Ltd.</b>	
					DRAWING NO. 736882-2	





TUBE DISTRIBUTION

NOTES:

- 1) DRILL AND REAM TUBE HOLES IN TUBESHEETS TO 0.7600"  $\pm$  .002" DIA. FOR 460 - 3/4" O.D. TUBES.
- 2) TUBE PITCH = 15/16" TRIANGLE.
- 3) NUMBER OF PASSES = 4
- 4) SEE DRAWING SHEET NO. 4 FOR TUBE HOLE GROOVING DETAILS.
- 5) BAFFLE O.D. = 24 7/8"
- 6) O.T.L. = 23 5/16"

VIEW LOOKING AT SHELL SIDE OF NO. 19 TUBESHEET

1	REVISE AS NOTED	CR	GK	1-18-07
0	RELEASE FOR FAB.	TR	GK	1-15-07
NO.	REVISIONS	BY	CHK.	DATE CHK.

CUSTOMER: GIANT INDUSTRIES  
OHMSTEDE JOB NO: 736882  
P. O. NO.: PD21457  
ITEM NO.: E-328  $\Delta$

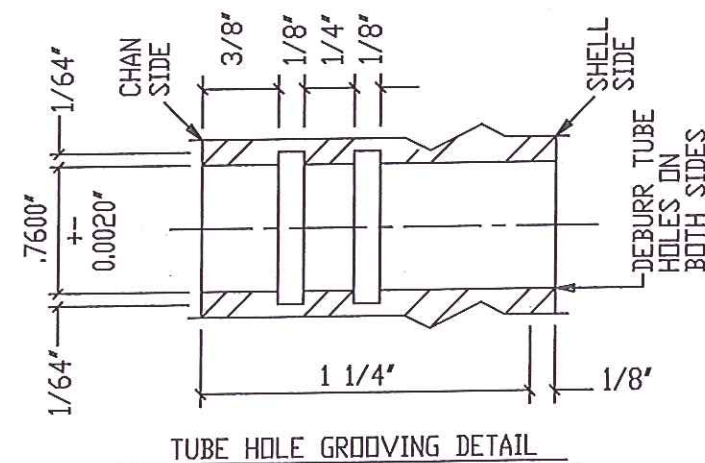
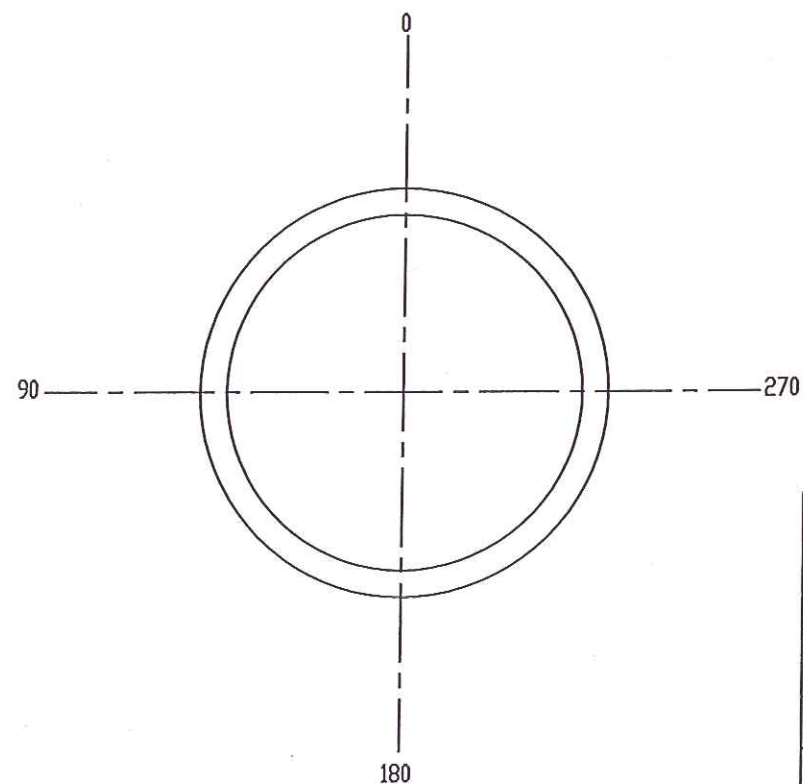
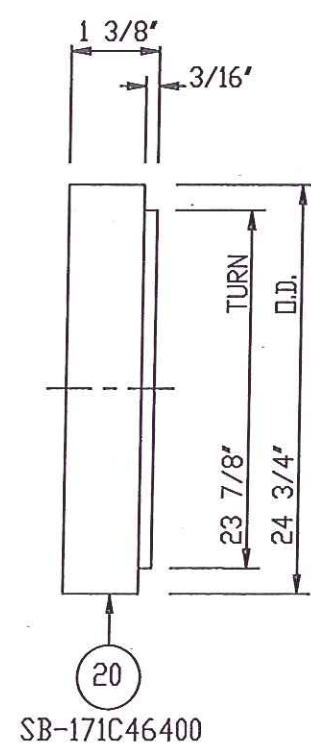
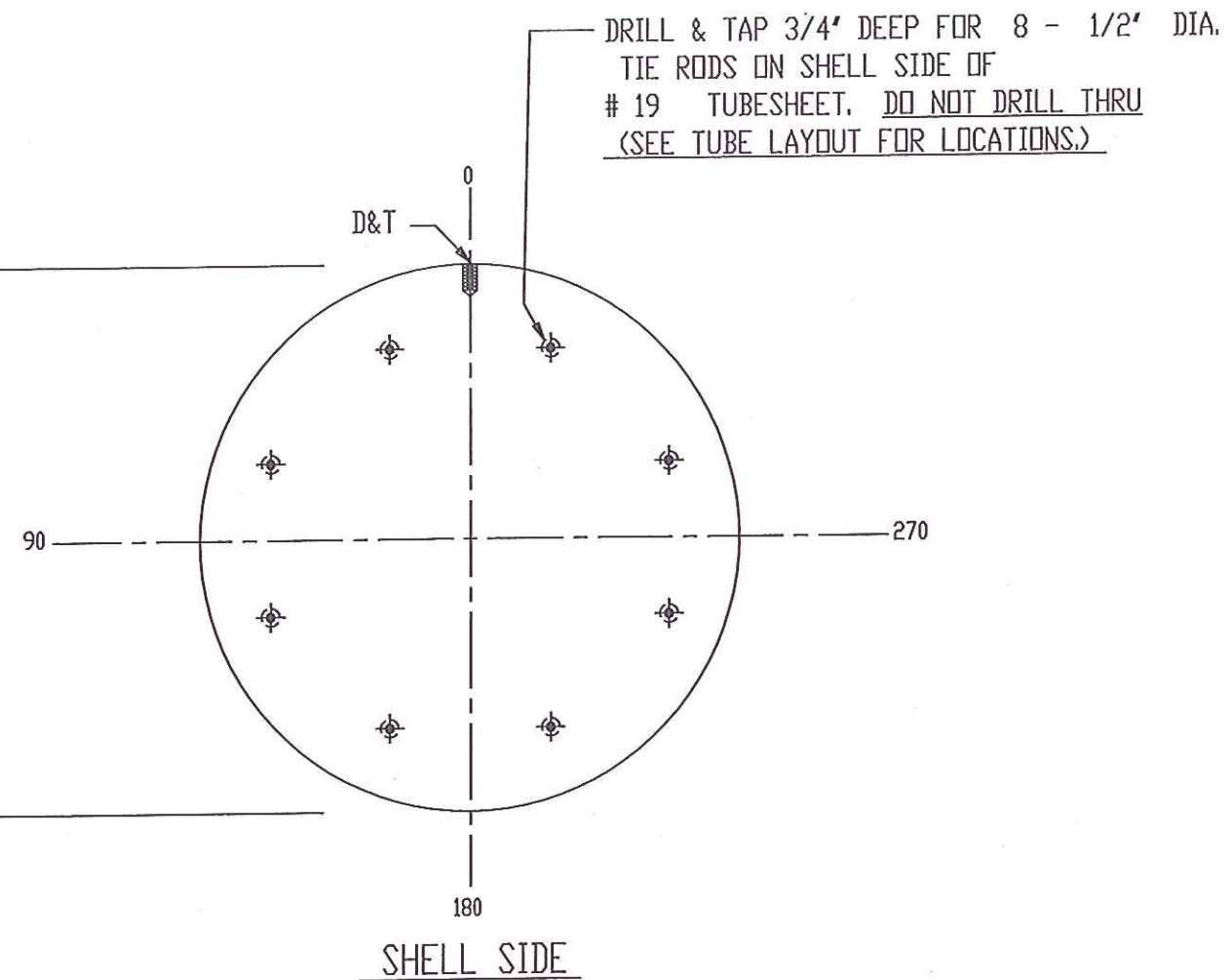
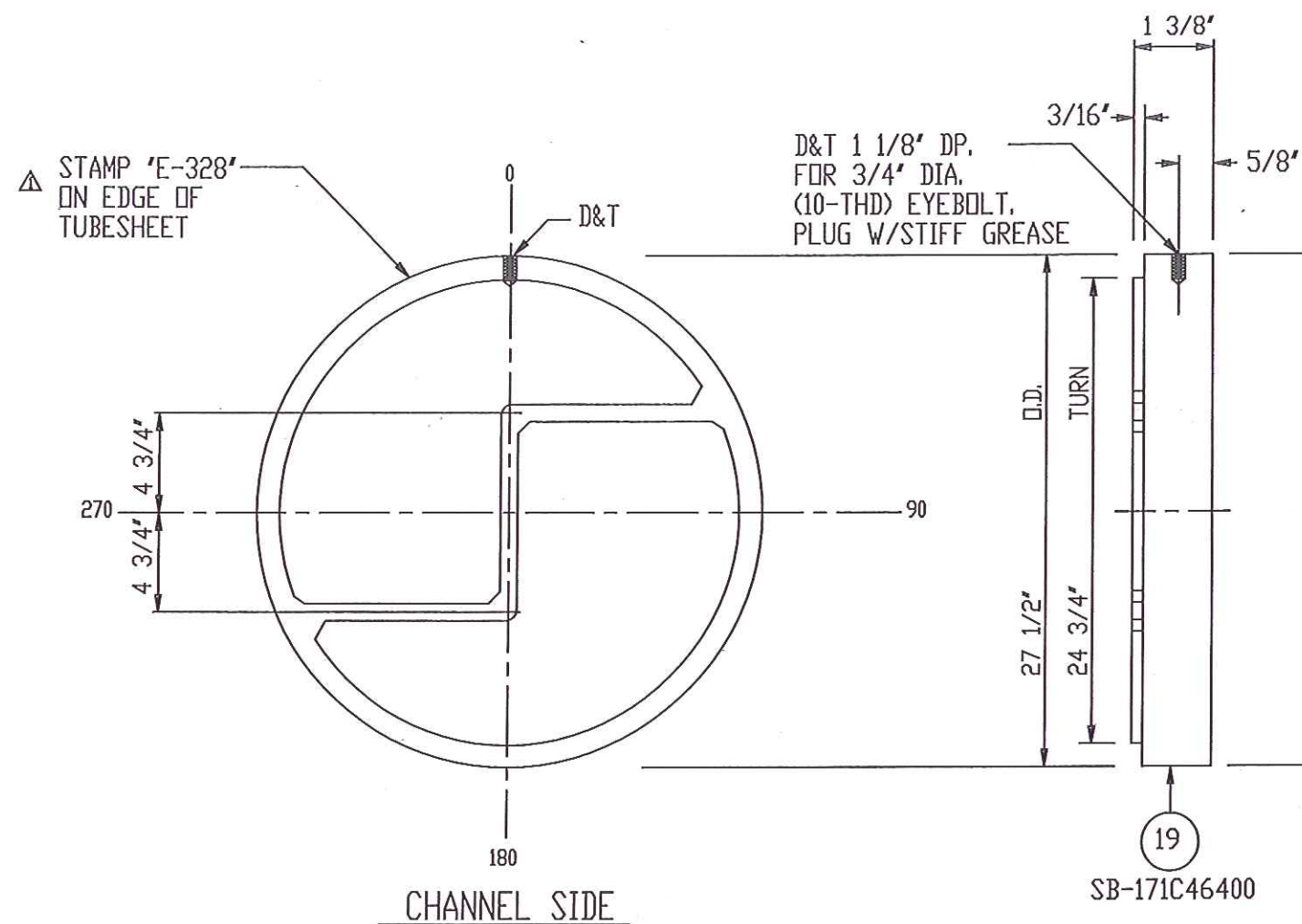
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TUBE LAYOUT

OHMSTEDE Ltd.

DRAWING NO.  
736882-2





#### NOTES:

- 1) MACHINE ALL GASKET SURFACES TO 125 AARH.
- 2) ALL PASS PLATE GROOVE WIDTHS TO BE 1/2" WIDE.
- 3) ALL PASS PLATE GROOVE JUNCTIONS TO BE NOTCHED 3/8" AT 45 Deg.

CERTIFIED AS BUILT				
NO.	REVISIONS	BY	CHK.	DATE CHK.
1	REVISE AS NOTED	CR	GK	1-18-07
0	RELEASE FOR FAB.	TR	GK	1-15-07

CUSTOMER: GIANT INDUSTRIES  
OHMSTEDE JOB NO: 736882  
P. O. NO. : PO21457  
ITEM NO. : E-328 Δ

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TUBESHEET DETAILS

OHMSTEDE Ltd.

DRAWING NO.  
736882-1