

FORM U-1 MANUFACTURERS' DATA REPORT FOR PRESSURE VESSELS
as required by the provisions of the ASME Code rules, Section VIII, Division 1

1. Manufactured and certified by HEAT TRANSFER EQUIPMENT COMPANY 1515 No. 93rd E. Ave. Tulsa, OK 74115
(name and address of manufacturer)

2. Manufactured for M.W. KELLOGG P.O. BOX 4557 HOUSTON, TX 77210-4557
(name and address of purchaser)

3. Location of installation TENNECO NGL CORP. LA PORTE, TX
(name and address)

4. Type: HORIZ. AET 91-2173-A 91-2173-A-1 1355 1991
(horiz. or vert., tank) (mfr's. serial no.) (CRN) (drawing no.) (Nat'l. Bd. no.) (year built)

5. The chemical and physical properties of all parts meet the requirements of material specifications of the ASME BOILER AND PRESSURE VESSEL CODE. The design, construction and workmanship conform to ASME Code, Section VIII, Division 1: 1989
(year)

1989 UG-20(f)
(addenda (Date)) (Code Case no.) (special service per UG-120(d))

Items 6-11 inclusive to be completed for single wall vessels, jackets of jacketed vessels, or shells of heat exchangers.

6. Shell: SA-516-70 7/16" 1/8" 2'-11" 23'-5 9/16"
(mat'l. (spec. no., grade)) (nom. thickness (in.)) (corr. allow. (in.)) (dia. ID (ft. & in.)) (length (overall) (ft. & in.))

7. Seams: DBL. BUTT SPOT 85 NONE DBL. BUTT SPOT 4
(long. (dbl., singl.)) (RT (spot or full)) (eff. (%)) (HT temp. (°F)) (time) (girth (dbl., singl.)) (RT (spot, partial, or full)) (no. of courses)

8. Heads: (a) SA-516-70 (b) _____
(mat'l. (spec. no., grade)) (mat'l. (spec. no., grade))

	Location (top, bottom, ends)	Minimum Thickness	Corrosion Allowance	Crown Radius	Knuckle Radius	Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Pressure (convex or concave)
(a)	END	3/8"	1/8"			2:1				CONCAVE
(b)										

If removable, bolts used (describe other fastenings): a) SA-193-B7 3/4" - 36 CH/SH SA-193-B7 3/4" - 44
(mat'l., spec. no., gr., size, no.)

9. Type of jacket: _____ Proof test: _____

10. Jacket closure: _____ If bar, give dimensions: _____
(describe as ogee & weld, bar, etc.)

11. MAWP: 155 at max. temp. 550 Min design metal temp.: 10 at 155 Hydro., pneu. or comb. test pressure: 312
(psi) (°F) (°F) (psi) (psi)

Items 12 and 13 to be completed for tube sections.

12. Tubesheets: SA-516-70 36 5/8" 2 1/8" 5/16" BOLTED
(stationary mat'l. (spec. no., gr.)) (dia. (in.) (subject to pressure)) (nom. thickness (in.)) (corr. allow. (in.)) (attachment (welded, bolted))

SA-516-70 31 1/4" 2 1/8" 5/16" BOLTED
(floating mat'l. (spec. no., gr.)) (dia. (in.)) (nom. thickness (in.)) (corr. allow. (in.)) (attachment)

13. Tubes: SA-214 1" .074" MIN 384 STRAIGHT
(mat'l. (spec. no., gr.)) (OD (in.)) (nom. thickness (in. or gauge)) (no.) (type (straight or U))

Items 14-17 inclusive to be completed for inner chambers of jacketed vessels or channels of heat exchangers.

14. Shell: SA-516-70 7/16" 1/8" 2'-11" 1'-4 1/8"
(mat'l. (spec. no., gr.)) (nom. thickness (in.)) (corr. allow. (in.)) (dia. ID (ft. & in.)) (length (overall) (ft. & in.))

15. Seams: DBL. BUTT SPOT 85 1125 1 HR DBL. BUTT SPOT 1
(long. (dbl., singl.)) (RT (spot or full)) (eff. (%)) (HT temp. (°F)) (time) (girth (dbl., singl.)) (RT (spot, partial, or full)) (no. of courses)

16. Heads: (a) SA-516-70 (b) SA-516-70
(mat'l. (spec. no., grade)) (mat'l. (spec. no., grade))

	Location (top, bottom, ends)	Minimum Thickness	Corrosion Allowance	Crown Radius	Knuckle Radius	Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Pressure (convex or concave)
(a)	END	2 11/16"	3/16"						36 5/8"	FLAT
(b)	FLTG HD	3/4"	1/4"					28"		CONVEX

If removable, bolts used (describe other fastenings): a) SA-193-B7 3/4" - 44 b) SA-193-B7 3/4" - 44
(mat'l., spec. no., gr., size, no.)

17. MAWP: 155 at max. temp. 550 Min design metal temp.: 10 at 155 Hydro., pneu. or comb. test pressure: 265
(psi) (°F) (°F) (psi) (psi)

18. Nozzles, inspection and safety valve openings:

19. Supports: Skirt NO Lugs Legs Other 2-SADDLES Attached WELDED TO SHELL
(yes or no) (no.) (no.) (describe) (where and how)

(name of part, item number, mfr's. name and identifying stamp)

ITEM NO.: 08E-102

Date 9-25-91 Name HEAT TRANSFER EQUIPMENT COMPANY
(manufacturer)

Signed Billy G. Walker
(representative)

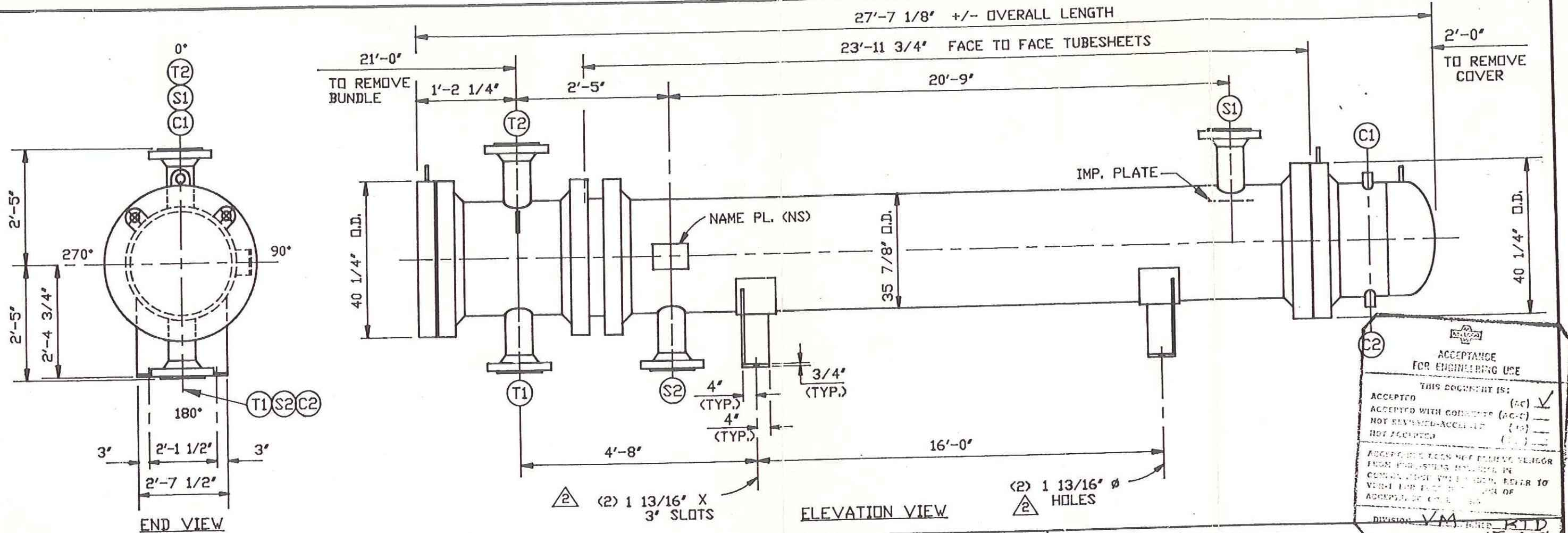
Date 9-25-91 Signed William J. Meadows Commissions 11150 OK # 646
(Authorized Inspector) (Nat'l. Bd. (incl. endorsements) state, prov. and no.)

Date _____ Name _____ Signed _____
(assembler that certified and constructed field assembly) (representative)

Date _____ Signed _____ Commissions _____
(Authorized Inspector) (Nat'l. Bd. (incl. endorsements) state, prov. and no.)

NATE BD. NO. 1355		HTE	
CERTIFIED BY			
HEAT TRANSFER EQUIPMENT			
USA OKLAHOMA			
W RT-3 PHT	R	M.P. TUBES 155	PSI AT 550
	M	M.P. SHELL 155	PSI AT 550
	M	DESIGN	10 °F AT 155 PSI
	M	TEMP. SHELL 10	°F AT 155 PSI
	S	NO. 191-2173-A	
1991			
	TUBES 233	PSI SHELL 233	PSI
	UW 03E-102	35-288	AET
	P.O. NO. 6636-0201-C210-01		
	SQ FT. 6241	EFF	
SERVICE DIB #3 TRIM COOLER			
SHOP TEST PRESSURES: SHELLSIDE = 312 PSI			
TUBESIDE = 265 PSI			

$\frac{110}{16 \overline{) 160}}$
 10
 70
 64
 160



ACCEPTANCE FOR ENGINEERING USE

THIS DOCUMENT IS:

ACCEPTED (AC) ☒
 ACCEPTED WITH COMMENTS (AC-C) ☐
 NOT REVIEWED-ACCEPTED (NRA) ☐
 NOT ACCEPTED (N) ☐

APPROPRIATE AGENCIES MUST BE ADVISED OF ANY CHANGES IN CONSTRUCTION OF THIS DRAWING. REFER TO VENDOR FOR FURTHER INFORMATION OF ACCEPTANCE OF CHANGES.

DIVISION **VM** **RTD**
 DATE **15 AUG 91**

GENERAL NOTES

- DESIGNED & CONSTRUCTED IN ACCORDANCE W/ A. SECT VIII, DIV 1, 1989 ED. & 1989 ADDENDA OF THE ASME BOILER & PRESSURE CODE & SO STAMPED WITH NATIONAL BOARD REGISTRATION. B. TEMA CLASS 'R' C. CUSTOMER SPECS: C41-1E-6636, 4-7TS-6636, 13-2S-6636 AND P42-1TS-6636
- ALL BOLT HOLES TO STRADDLE C'S.
- ALL GASKETS EXCEPT FLT.G. HD. TO BE 1/8" THK. SOFT IRON DOUBLE JACKETED NON ASBESTOS FILLED. FLT.G. HD. GASKET= 1/8" THK. SOFT IRON. (TWO SPARE SETS REQUIRED)
- SOLVENT CLEAN OUTSIDE PER SSPC-SP1, SAND BLAST PER SSPC-SP10 TO PRODUCE AN ANCHOR PROFILE OF 1 TO 2 MILS, THEN PRIME WITH INORGANIC ZINC (DIMECOTE 21-7) 2.5-3.5 MILS DFT. FOLLOWED WITH AN INTERMEDIATE COAT OF EPOXY AMERCOAT 385 (4.0-6.0 MILS DFT) AND A FINISH COAT OF ACRYLIC POLYURETHANE (AMERCOAT 450HS) 2.0-3.0 MILS DFT DOW MIST GRAY

NOZZLE DATA

MK.	DESCRIPTION	SERVICE
T1	8"-150#RF-WN	INLET
T2	8"-150#RF-WN	OUTLET
S1	16"-150#RF-WN	INLET
S2	14"-150#RF-WN	OUTLET
C1	1"-6000# CPLG.	VENT
C2	1"-6000# CPLG.	DRAIN

DESIGN DATA

	SHELL SIDE	TUBE SIDE
DES. PRESS.	155 PSI	150/FV PSI
TEST PRESS.	SEE BELOW	
DES. TEMP.	550 °F	550 °F
MIN. DESIGN	+10 °F	+10 °F
METAL TEMP.	@ 155 PSI	@ 155 PSI
C. A.	0.1250	0.1250
NO. PASSES	1	4
HEAT TREAT	NO	YES
RADIOGRAPHY	SPOT (RT-3)	SPOT (RT-3)
MAWP (H&C)	155 PSI	155 PSI
FIELD TEST	233 PSI	233 PSI
MAWP (N&C)	208 PSI	177 PSI
SHOP TEST	312 PSI	265 PSI

ALL CPLGS. TO BE PLUGGED.

NO INSULATION REQUIRED.

CUSTOMER: M.W.KELLOGG

DESTINATION: TENNECO NGL CORP. MTBE PROJECT

LA PORTE, TEXAS

P.O. 6636-02D1-C210-01

SERVICE: DIB #3 TRIM COOLER LOW-FIN (19 FINS/IN.)

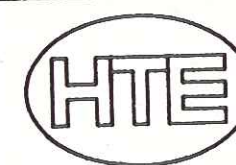
TUBES: 384-1 "ODx .074"(MIN) TUBES x24'-0 "LG. SA-214

SURF: 6241 FT²(EFF.) ITEM: 08E-102

SIZE: 35-288 SERIAL NO: 91-2173-A

TYPE: AET NO. REQ'D: 1

WT: DRY 21000.# WET 32500.# WT: BUNDLE 12250. #

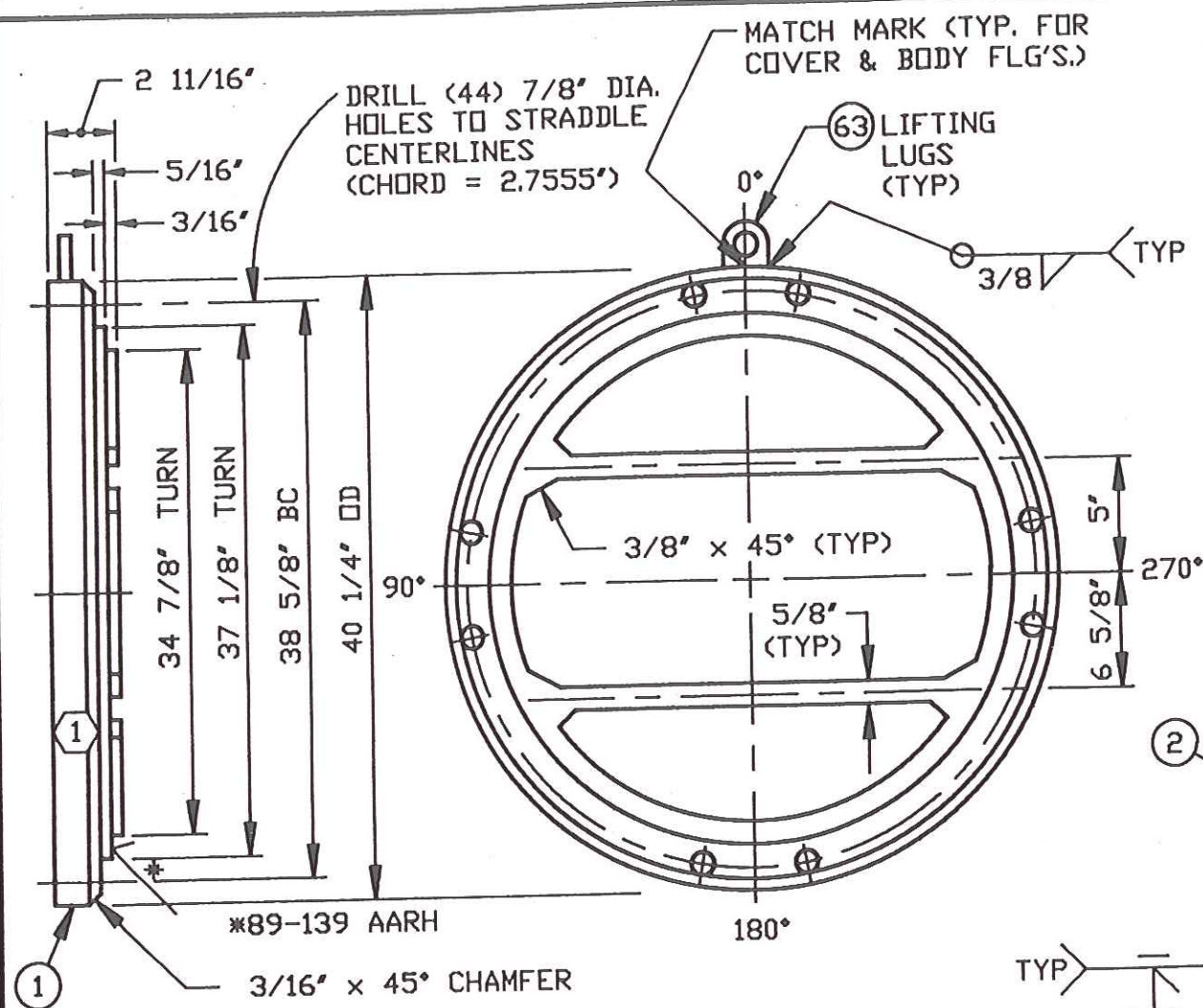


HEAT TRANSFER EQUIPMENT CO.
Tulsa, Oklahoma

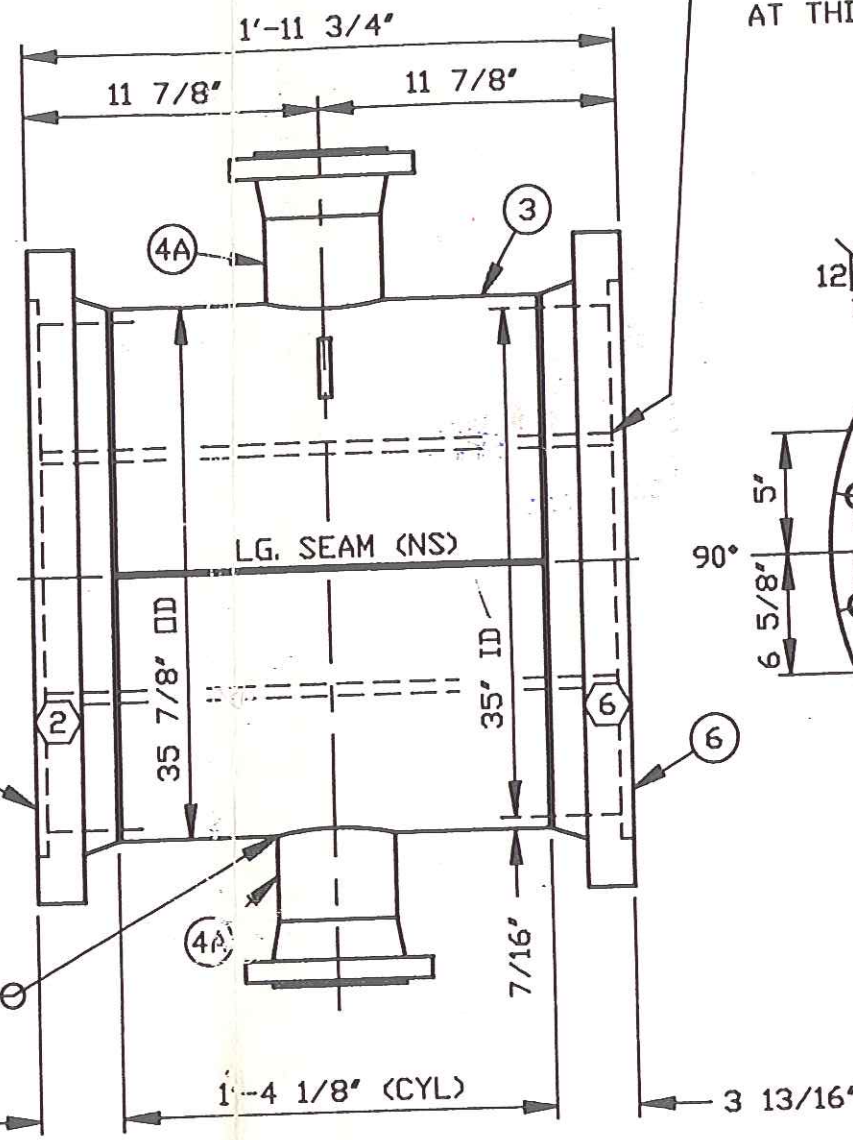
OUTLINE DIMENSIONAL DRAWING

Rev	Date	Description	By	DWN. FJC	CK. ldlb	APP.	DATE	DRAWING NO.	REV.
	4-11-91	REVISED PER CUST.	FJC	DATE 3-4-91	DATE 3-8-91	DATE 8-9-91		91-2173-A-1	
	6-14-91	REV.SUPPORTS	FJC	CERTIFIED CORRECT FOR FABRICATION BY					

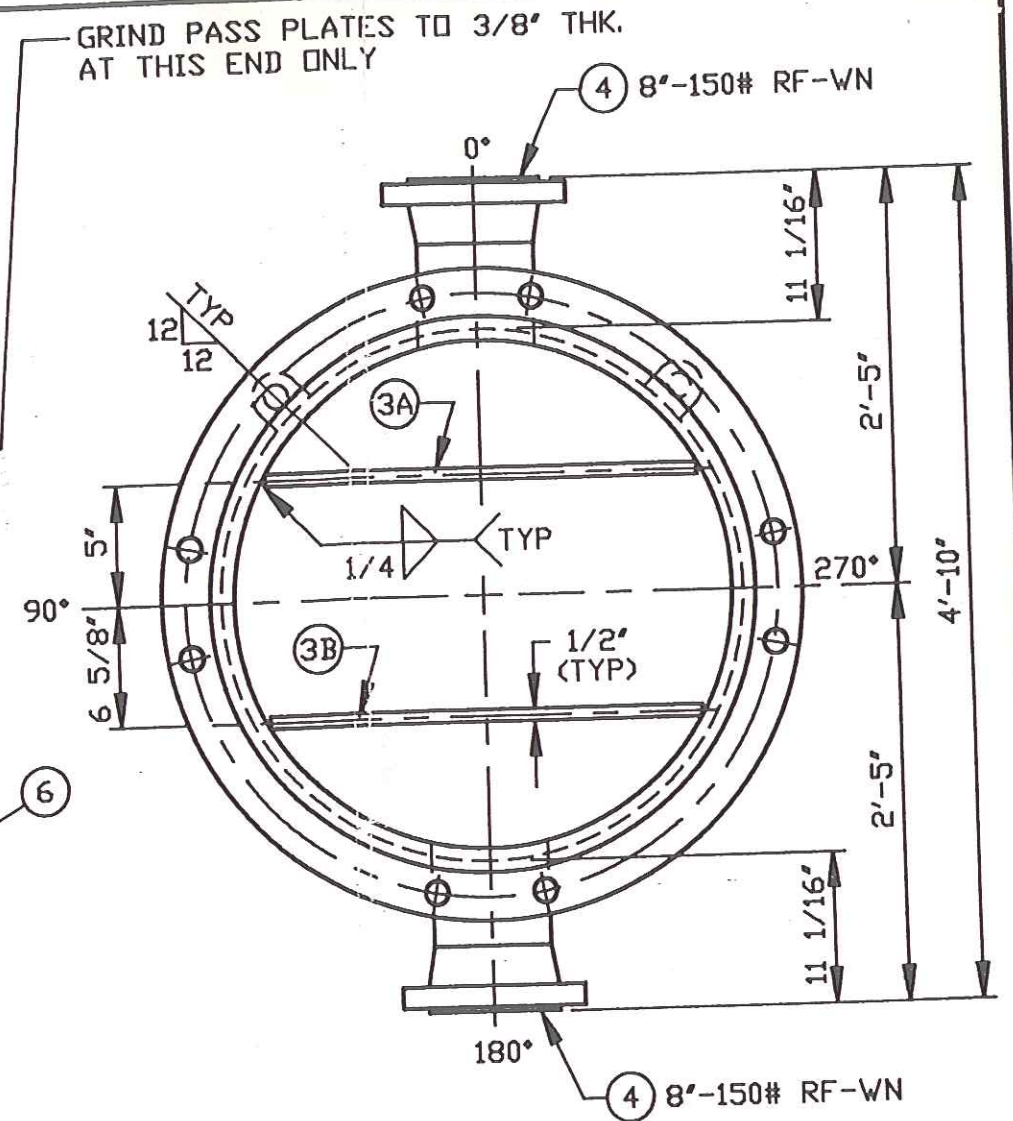
103353



CHANNEL COVER DETAIL



ELEVATION VIEW



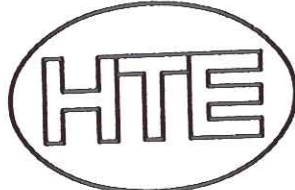
END VIEW

NOTES:

1. SPOT RADIOGRAPH.
2. 1/8" (MIN.) RAD. ON NOZ. I.D. @ CHAN. I.D.
3. GRIND ALL INSIDE WELDS SMOOTH AND FLUSH W/ CHAN I.D.
4. ALL BOLT HOLES TO STRADDLE CENTERLINES.
5. WELDING PROCEDURES: ASA-1-1.1 & SMA-1-1.1
6. SEE DWG. NO. 12 FOR BODY FLG. DETAILS.
7. SEE DWG. NO. 10 FOR LIFTING LUGS.
8. SEE DWG. NO. 13 FOR WELD DETAILS & GEN. NOTES.
9. SEE DWG. NO. 13 BLK. NO. 4 FOR LG. AND CIRC. SEAMS.
10. FINISH MACHINE FACE OF BODY FLGS. AFTER FINAL WELDING AND HEAT TREATMENT.
11. PASS PL. WELDS TO BE FULL PENETRATION FOR 1/2" MIN. FROM FACE OF BODY FLGS.
12. POST WELD HEAT TREAT AS FOLLOWS:
 - A. HEAT FROM 800° F TO 1125° F @ 400° F PER HOUR.
 - B. HOLD @ 1125° F ±25° F FOR 1 HOUR (MIN.).
 - C. COOL FROM 1125° F TO 800° F @ 500° F PER HOUR.
 - D. FURTHER COOLING IN STILL AIR.

ACCEPTANCE FOR ENGINEERING USE	
THIS DOCUMENT IS:	
ACCEPTED (AC)	☒
ACCEPTED WITH COMMENTS (AC-C)	☐
NOT REVIEWED-ACCEPTED (NR)	☐
NOT ACCEPTED (NAC)	☐
ACCEPTANCE DOES NOT RELIEVE VENDOR FROM FURNISHING MATERIAL IN COMPLIANCE WITH ORDER. REFER TO VENDOR FOR FULL DEFINITION OF ACCEPTANCE CONDITIONS.	
DIVISION VM	SIGNED RM
DATE 16 Aug 91	

TENNECO NGL CORP.
MTBE PROJECT
LAPORTE, TEXAS
ITEM NO. 08E-102
P.O. NO. 6636-02D1-C210-01



HEAT TRANSFER EQUIPMENT CO.
Tulsa, Oklahoma

CHANNEL DETAILS

Rev	Date	Description	By	DWN.	BM	CK.	APP.	DATE	REV.

DATE 7/24/91 DATE 8-9-91 DATE 8-9-91 91-2173-A-2 REV. 1



TENNECO NGL CORP.
MTBE PROJECT
LAPORTE, TEXAS
ITEM NO. 08E-102 ✓
P.O. NO. 6636-02D1-C210-01 ✓

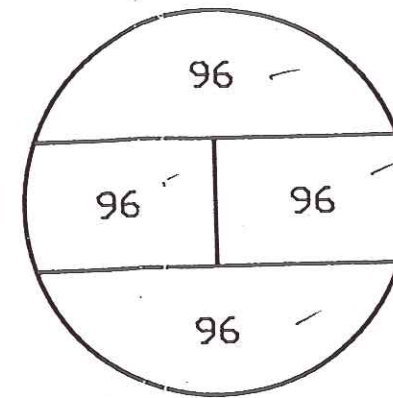
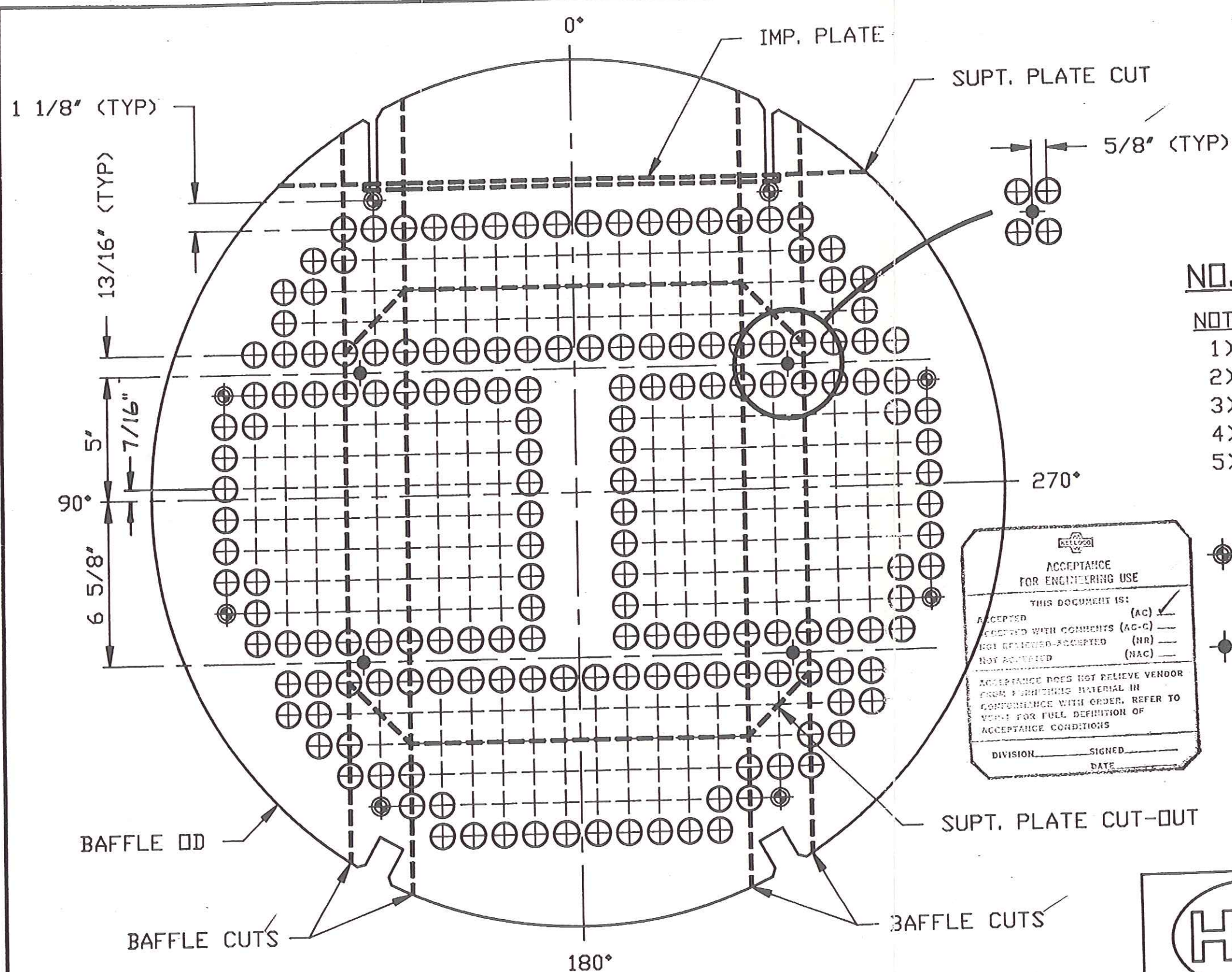
1. SPOT RADIOGRAPH.
2. 1/8" (MIN.) RAD. ON NOZ. I.D. @ SHELL I.D.
3. GRIND ALL INSIDE WELDS SMOOTH & FLUSH W/ SHELL I.D.
4. ALL BOLT HOLES TO STRADDLE CENTERLINES.
5. WELDING PROCEDURES: ASA-1-10 & SMA-1-10
6. SEE DWG. NO. 12 FOR BODY FLG. DETAILS.
7. SEE DWG. NO. 13 FOR WELD DETAILS & GEN. NOTES.
8. SEE DWG. NO. 13 BLK. NO. 4 FOR LG. AND CIRC. SEAMS.
9. SEE DWG. NO. 9 FOR SUPPORT DETAILS.
10. SEE DWG. NO. 10 FOR NAME PL. & BRK'T. DETAILS.
11. PLUG SHELL FOR DIA. BEFORE BUNDLE ASS'Y. W/ 2-DISCS,
THE SAME DIA. AS BAFFLES, SPACED 18" APART.

Rev	Date	Description	By	SHELL DETAILS			
				DWN.	BM	CK.	APP.
				DATE 7/25/91	DATE 8-9-91	DATE 8-9-91	91-2173-A-3
							REV. 



HEAT TRANSFER EQUIPMENT CO.
Tulsa, Oklahoma

SHELL DETAILS



NO. OF HOLES PER PASS

NOTES

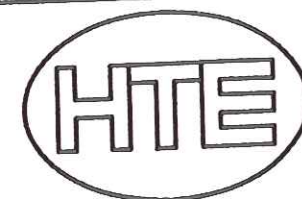
- 1) 384 - 1" OD TUBES
- 2) TUBE PITCH - 1 1/4" SQ
- 3) 30 5/8" OUTER TUBE LINE
- 4) 4 - PASS
- 5) SEE DWG. -6 FOR TUBE DRILLING, REAMING & RING GROOVING

DENOTES 8 - 1/2" Ø TIE RODS W/ 3/4" OD SPACERS

DENOTES 4 - 1/2" Ø SEAL RODS (RUN FROM FIRST TO LAST BAFFLE) (DO NOT DRILL IN TUBESHEETS)

ACCEPTANCE FOR ENGINEERING USE	
THIS DOCUMENT IS:	
ACCEPTED	(AC) ☒
ACCEPTED WITH COMMENTS	(AC-C) ☐
NOT REVIEWED-ACCEPTED	(NR) ☐
NOT ACCEPTED	(NAC) ☐
ACCEPTANCE DOES NOT RELIEVE VENDOR FROM FURNISHING MATERIAL IN CONFORMANCE WITH ORDER. REFER TO VENDOR FOR FULL DEFINITION OF ACCEPTANCE CONDITIONS	
DIVISION	SIGNED
DATE	DATE

TENNECO NGL CORP.
MTBE PROJECT
LAPORTE, TEXAS
ITEM NO. 08E-102
P.O. NO. 6636-02D1-C210-01



HEAT TRANSFER EQUIPMENT CO.
Tulsa, Oklahoma

VIEW LOOKING AT SHELL SIDE
OF #7 TUBESHEET

Rev	Date	Description	By

TUBE LAYOUT					REV.
DWN.	BM	CK.	APP.	DATE	91-2173-A-5
DATE 7/23/91	DATE 8-9-91	DATE 8-9-91	DATE 8-9-91	DATE 8-9-91	

B1

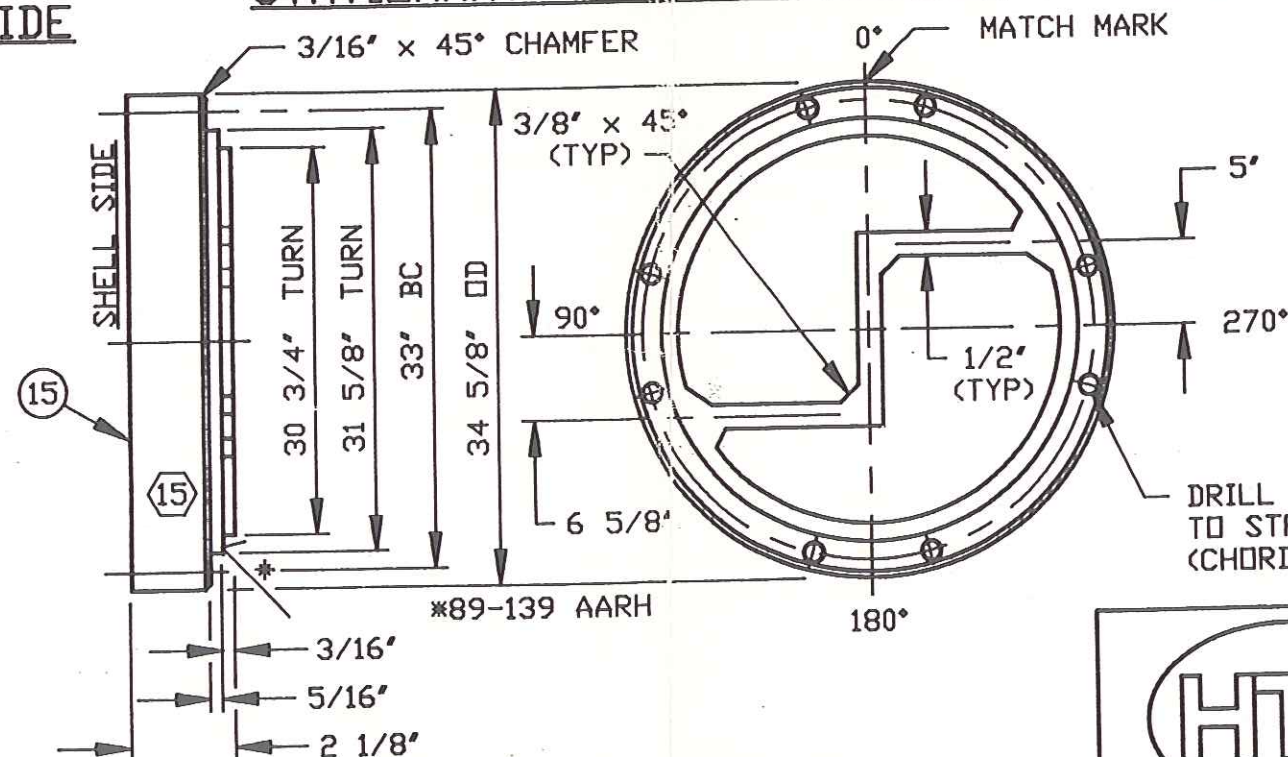
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 ACCEPTANCE
 FOR ENGINEERING USE
 THIS DOCUMENT IS: ☒ (AC) ☐ (AC-C) ☐ (HR) ☐ (NAC)
 ACCEPTED _____
 ACCEPTED WITH COMMENTS _____
 NOT REVIEWED-ACCEPTED _____
 NOT ACCEPTED _____
 ACCEPTANCE DOES NOT BELIEVE VENDOR
 FROM FURNISHING MATERIAL IN
 CONFORMANCE WITH ORDER. REFER TO
 VDR-1 FOR FULL DEFINITION OF
 ACCEPTANCE CONDITIONS
 DIVISION VM SIGNED RM
 DATE 16 Aug 91

— DRILL 3/4" DP FOR (3) 1/2" Ø
× 1 3/4" LG. GUIDE PINS ON
SHELL SIDE ONLY. DRIVE FIT
GUIDE PINS PART NO. 65.
GUIDE PINS PROJECT 1/32"
OUTSIDE TURN.

STATIONARY TUBE SHEET DETAIL

SHELL SIDE



- DRILL (44) 7/8"Ø HOLES
TO STRADDLE C'S
(CHORD = 2.3542')

TENNECO NGL CORP.
MTBE PROJECT
LAPORTE, TEXAS
ITEM NO. 08E-102 ✓
P.O. NO. 6636-02D1-C210-01

FLOATING TUBESHEET DETAIL

Rev	Date	Description	By
			/
			/
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HEAT TRANSFER EQUIPMENT CO.
Tulsa, Oklahoma

TUBESHEET DETAILS

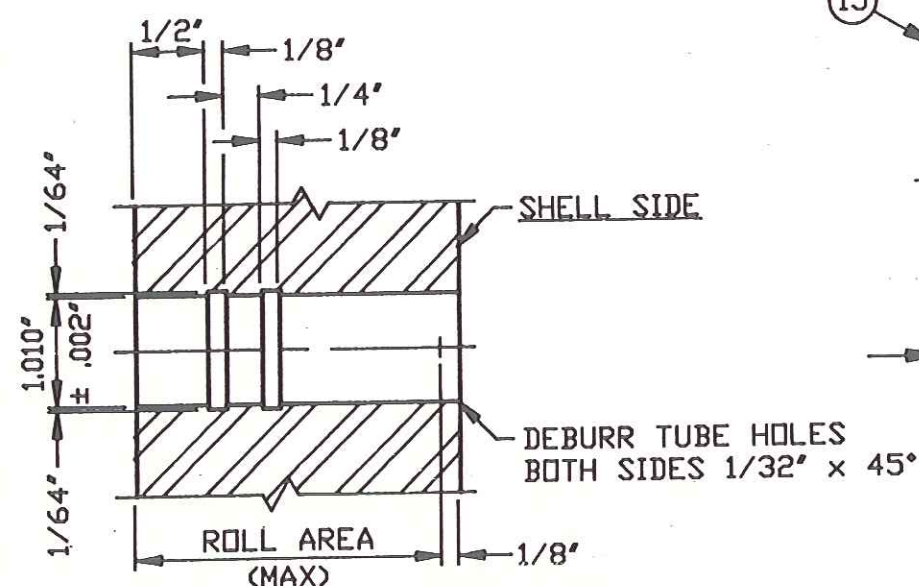
DWN.	BM	CK. <i>Sm</i>	APP. <i>RLK</i>
DATE 7/24/91	DATE 8-9-91	DATE 8-9-91	

91-2173-A-6

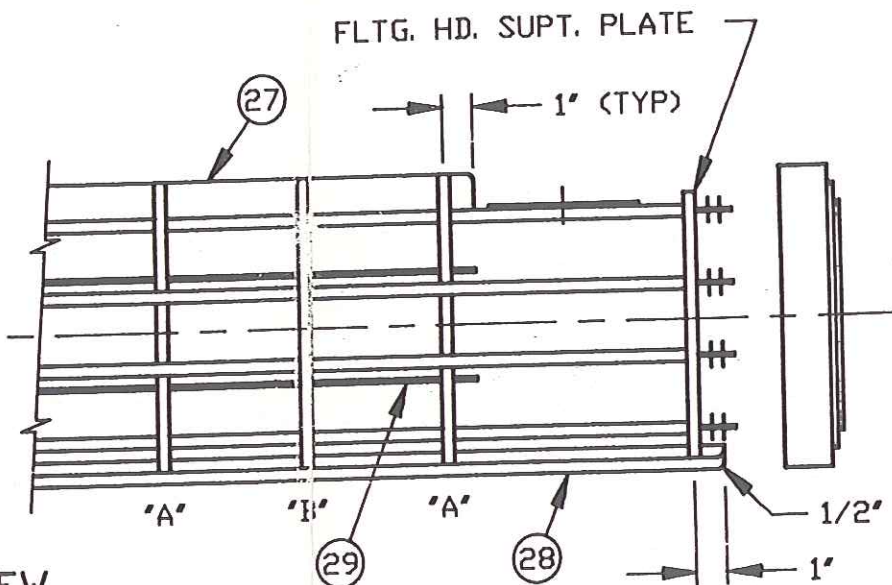
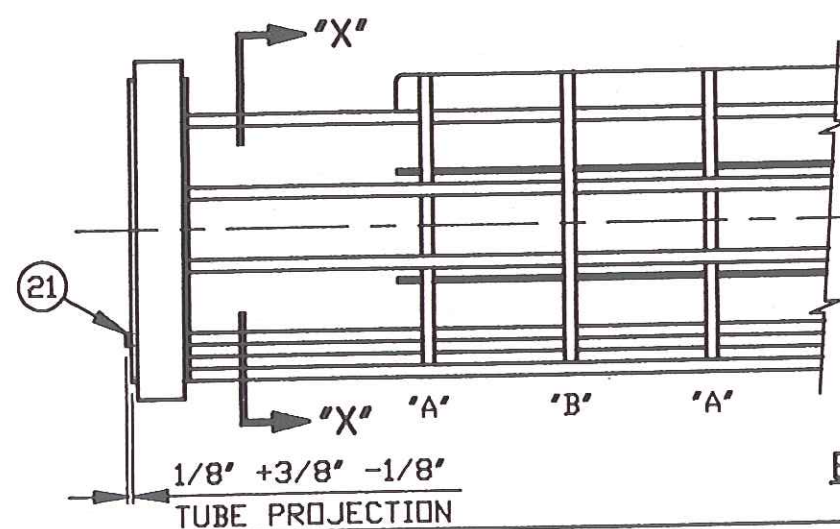
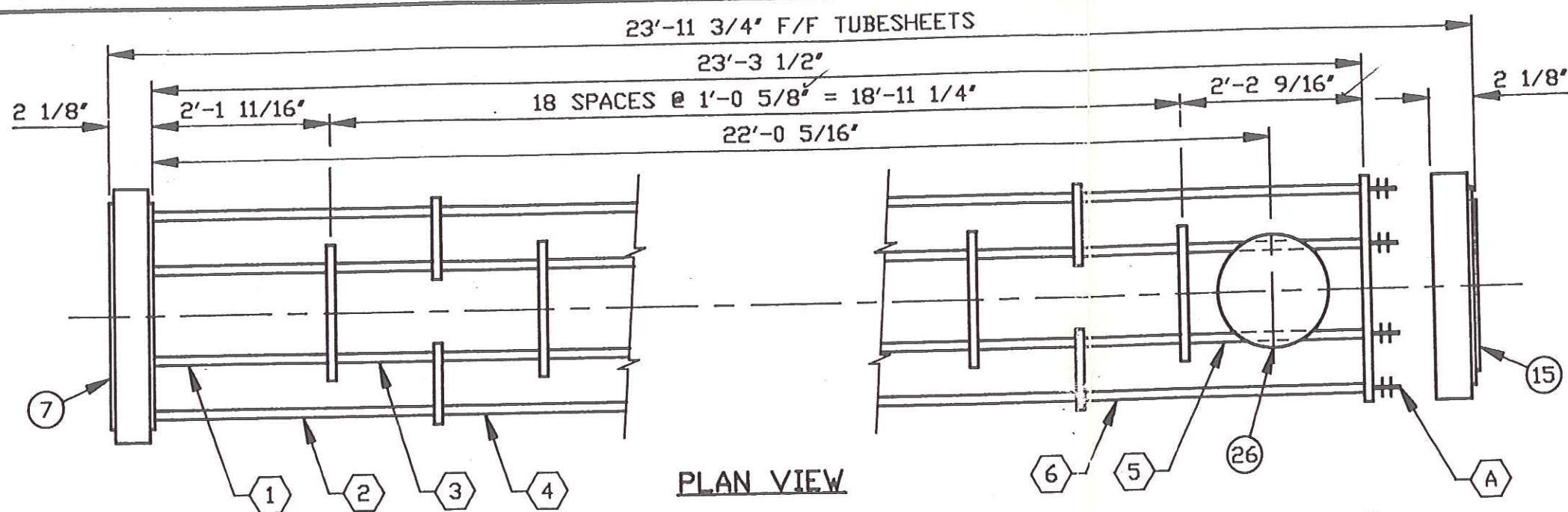
REV

RE
A

4



TUBE HOLE RING GROOVING DETAIL



NOTES

- SEE DWG. NO. 7A FOR BAFFLE DETAILS.
- PLUG SHELL FOR DIA. BEFORE BUNDLE ASS'Y. W/ TWO DISC'S, THE SAME DIA. AS BAFFLES, SPACED 18" APART.

(26) IMP. PLATE

- (1) 17"Ø x 1/4" THK.
(WELD TO SPACERS PRIOR TO TUBING) ✓

(27) SEAL BARS

- (2) 3" x 1/4" THK. x 19'-1 1/4" LG.
(TACK WELD TO EACH BAFFLE) ✓

(28) SKID BARS

- (2) 1 1/2" x 1" THK. x 23'-4 1/2" LG.
(WELD TO EACH BAFFLE AND TUBESHEET) ✓

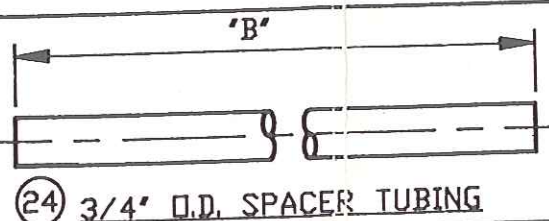
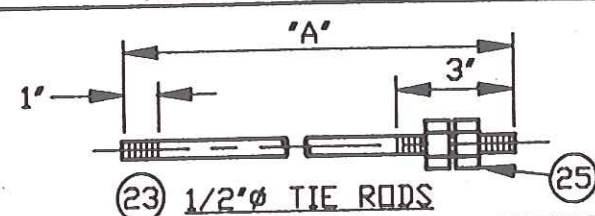
(29) SEAL RODS

- (4) 1/2"Ø x 19'-1 1/4" LG.
(TACK WELD TO EACH BAFFLE) ✓

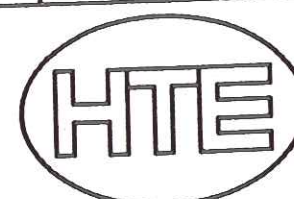
ACCEPTANCE FOR ENGINEERING USE	
THIS DOCUMENT IS:	
ACCEPTED	(AC) ✓
ACCEPTED WITH COMMENTS	(AC-C) ✓
NOT REVIEWED-ACCEPTED	(NR) ✓
NOT ACCEPTED	(NAC) ✓
ACCEPTANCE DOES NOT RELIEVE VENDOR FROM FURNISHING MATERIAL IN CONFORMANCE WITH ORDER. FOR FULL DEFINITION OF ACCEPTANCE CONDITIONS	
DIVISION	SIGNED
VIM	DATE 16 Aug 91

FENNECO NGL CORP.
MTBE PROJECT
LAPORTE, TEXAS
ITEM NO. 08E-102 ✓
P.O. NO. 6636-02D1-C210-01

Rev	Date	Description	By



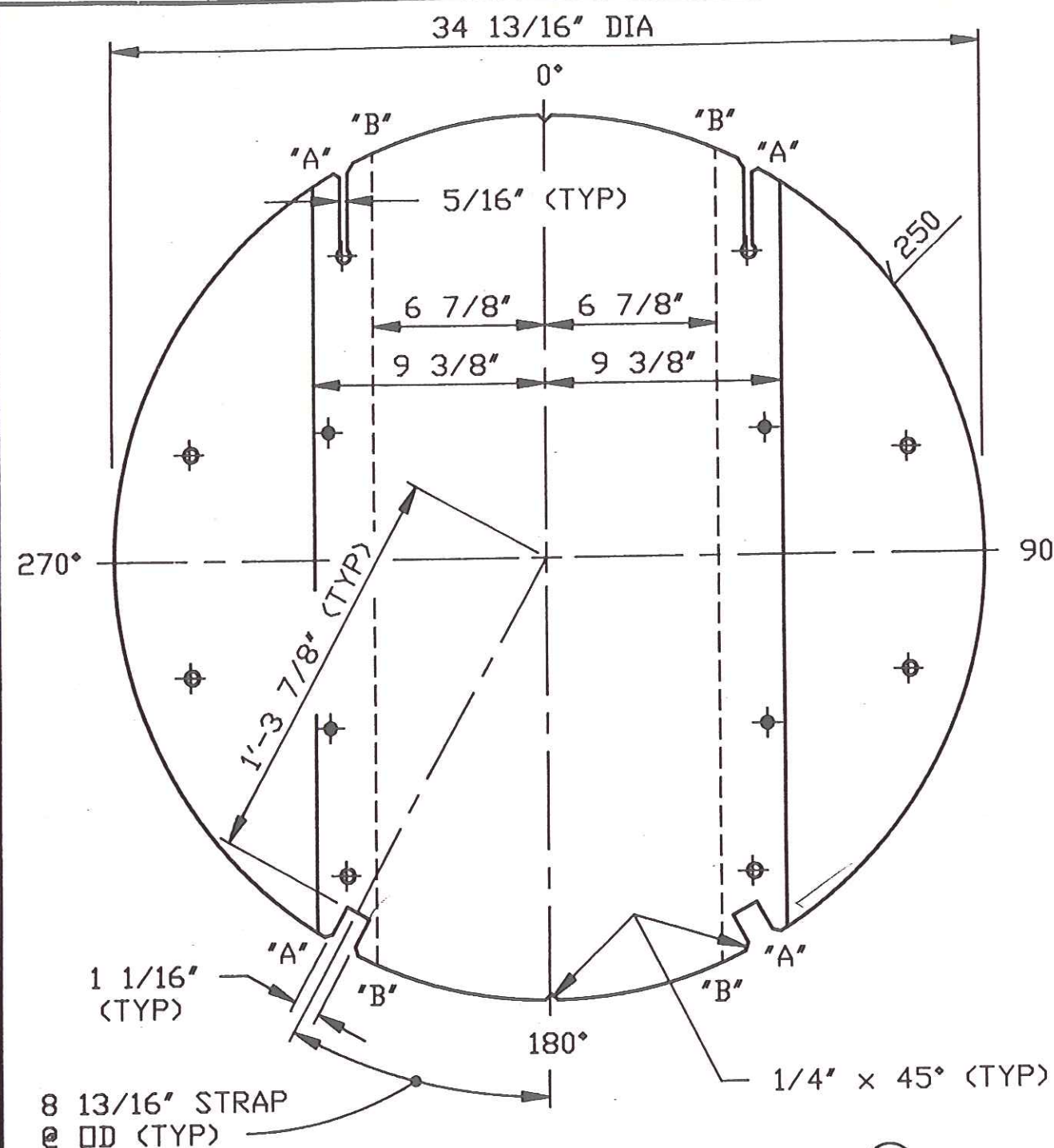
REQ'D.	"A"	REQ'D.	"A"	REQ'D.	"B"	REQ'D.	"B"
8	(A) 23'-6"			4	(1) 2'-1 1/2"		
				4	(2) 3'-2 1/8"		
				72	(3) 1'-0 1/4"		
				32	(4) 2'-0 7/8"		
				4	(5) 2'-2 1/16"		
				4	(6) 3'-2 11/16"		



HEAT TRANSFER EQUIPMENT CO.
Tulsa, Oklahoma

BUNDLE DETAILS

DWN. BM	CK. SM	APP. [Signature]	REV. [Signature]
DATE 7/23/91	DATE 8-9-91	DATE 8-9-91	91-2173-A-7 ✓



VIEW "X-X" OF BAFFLES (22)

10 - REQ'D. CUT A-A, A-A 3/8" THK. 9 - REQ'D. CUT B-B, B-B 3/8" THK.

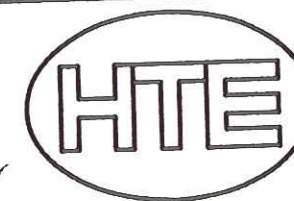
NOTES

- 1) DRILL TUBE HOLES 1 1/32" DIA. AND DEBURR.
- 2) DRILL TIE ROD HOLES 9/16" DIA.
- 3) RADIUS ALL CORNERS ON BAFFLE CUTS.
- 4) DRILL SEAL ROD HOLES 9/16" DIA.
- 5) SEE TUBE LAYOUT DWG. FOR LOCATION OF TIE RODS AND SEAL RODS.

BAFFLE CUT
43% AREA

Rev	Date	Description	By

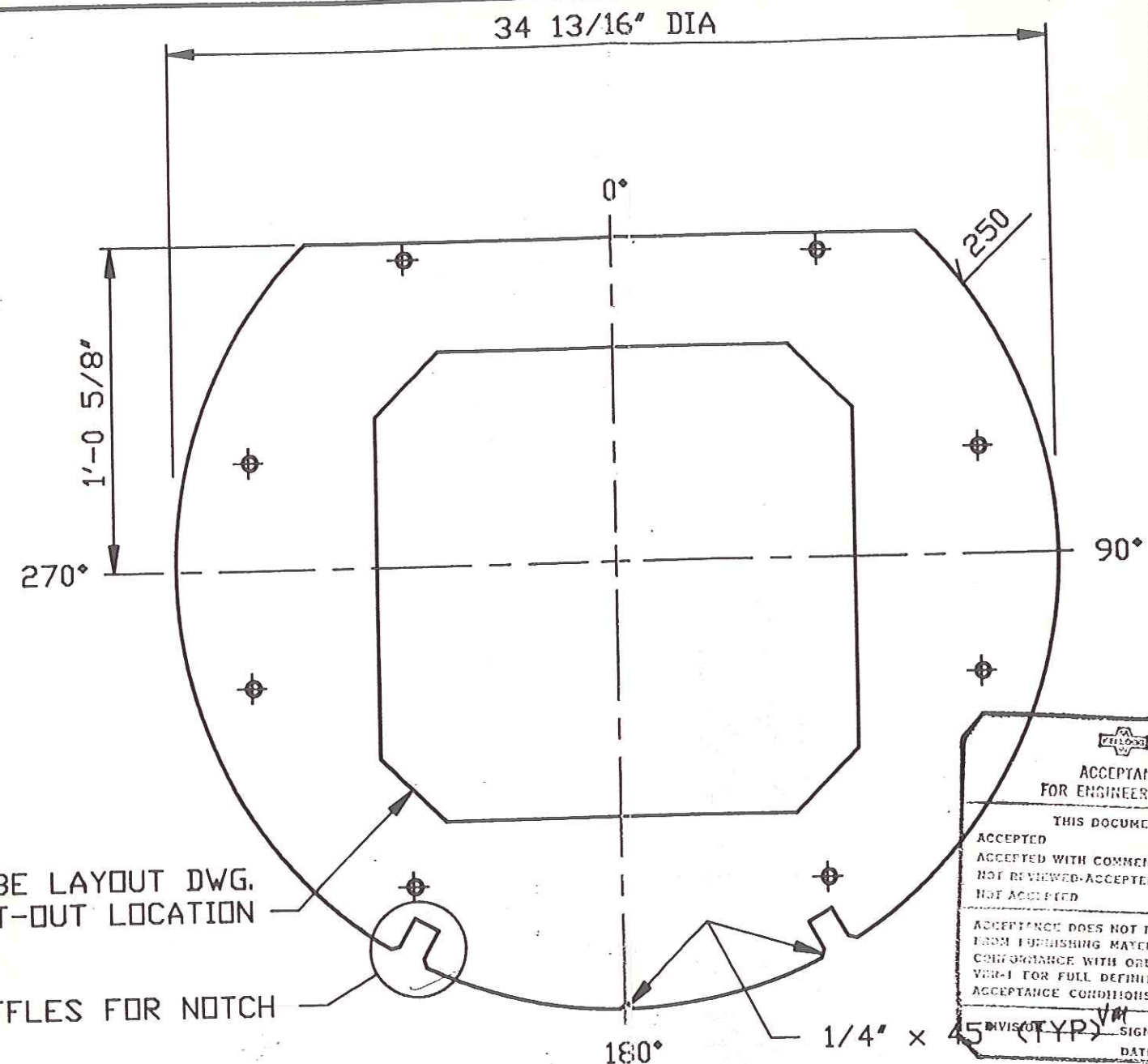
TENNECO NGL CORP.
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HEAT TRANSFER EQUIPMENT CO.
Tulsa, Oklahoma

BAFFLE DETAILS

DWN. BM	CK. <i>SM</i>	APP. <i>W</i>	91-2173-A-7A	REV. <i>1</i>
DATE 7/23/91	DATE 8-9-91	DATE 8-9-91		

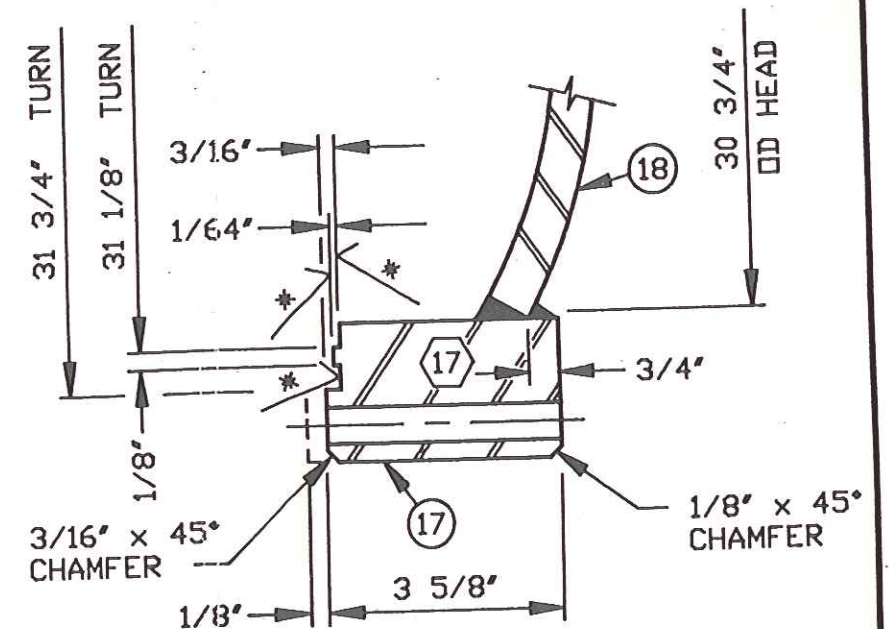
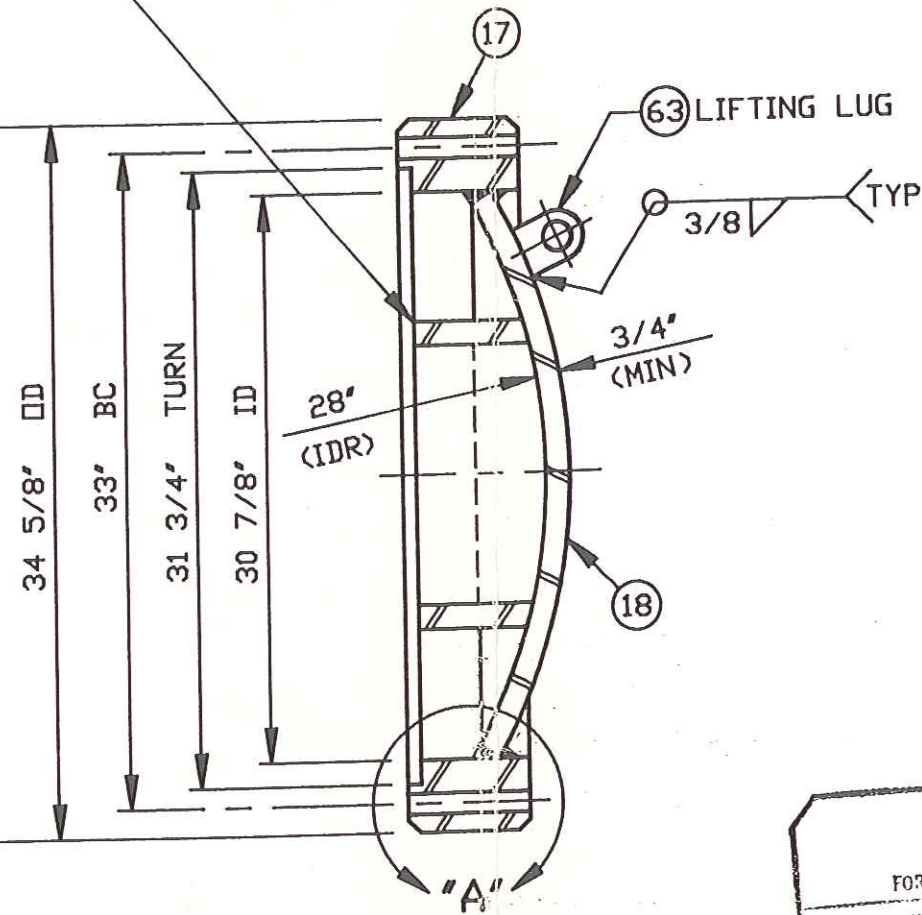
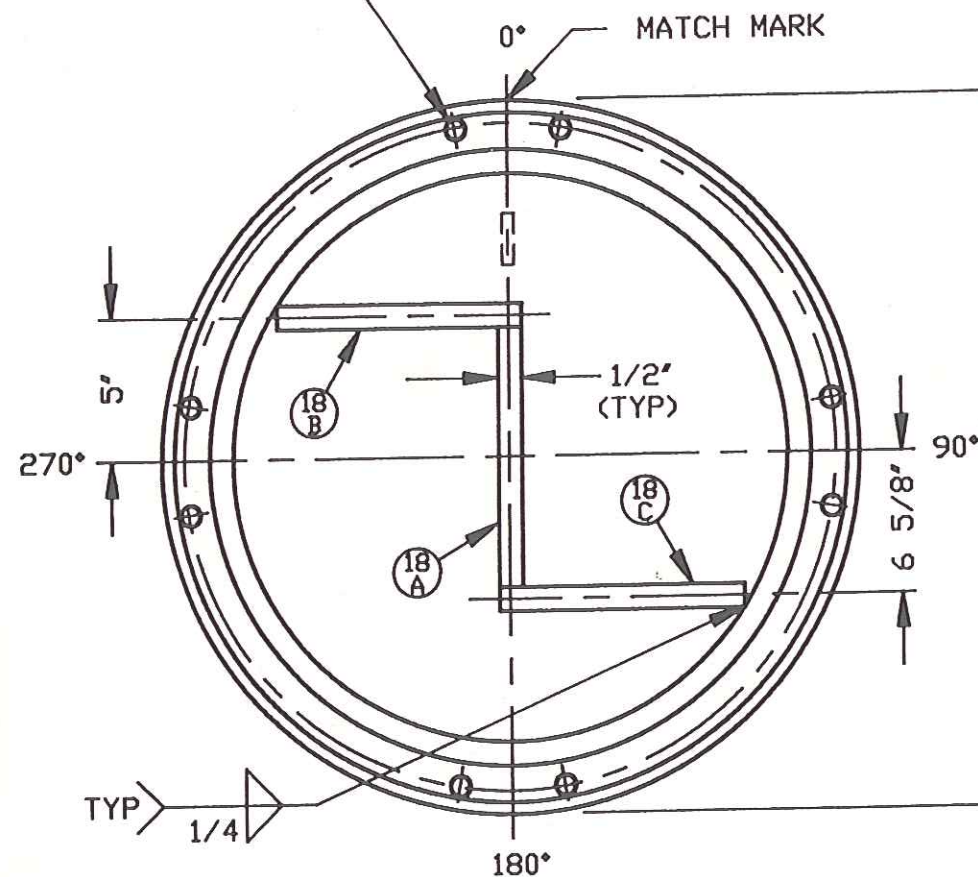


(22) A FLTG. HEAD SUP'T. PLATE DETAIL
1 - REQ'D. 5/8" THK.

ACCEPTANCE FOR ENGINEERING USE	
THIS DOCUMENT IS:	
ACCEPTED	(AC) ☒
ACCEPTED WITH COMMENTS	(AC-C) ☐
NOT REVIEWED-ACCEPTED	(NR) ☐
NOT ACCEPTED	(NAC) ☐
ACCEPTANCE DOES NOT RELIEVE VENDOR FROM FURNISHING MATERIAL IN CONFORMANCE WITH ORDER REFER TO VENDOR FOR FULL DEFINITION OF ACCEPTANCE CONDITIONS	
DESIGNED BY <i>W</i>	SIGNED <i>W</i>
DATE <i>10 Aug 91</i>	DATE <i>10 Aug 91</i>

DRILL (44) 7/8" ϕ HOLES
TO STRADDLE C'S
(CHORD = 2.3542')

GRIND PASS PLATES TO 3/8" THK.
AT THIS END ONLY



* 89-139 AARH

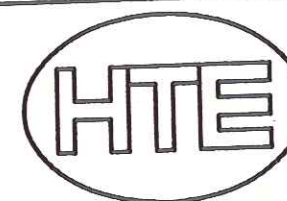
DETAIL "A"

ACCEPTANCE FOR ENGINEERING USE	
THIS DOCUMENT IS:	
ACCEPTED	(AC) ☒
ACCEPTED WITH COMMENTS	(AC-C) ☐
NOT REVIEWED-ACCEPTED	(NR) ☐
NOT ACCEPTED	(NAC) ☐
ACCEPTANCE DOES NOT RELIEVE VENDOR FROM FURNISHING MATERIAL IN CONFORMANCE WITH ORDER. REFER TO VDR-1 FOR FULL DEFINITION OF ACCEPTANCE CONDITIONS	
DIVISION <u>VI</u>	SIGNED <u>RM</u> DATE <u>16 AUG 91</u>

TENNECO NGL CORP.
MTBE PROJECT
LAPORTE, TEXAS
ITEM NO. 08E-102
P.O. NO. 6636-02D1-C210-01

NOTES:

1. ALL BOLT HOLES TO STRADDLE CENTERLINES.
2. WELDING PROCEDURES: ASA-1-1.1 & SMA-1-1.1
3. SEE DWG. NO. 10 FOR LIFTING LUG DETAIL.
4. SEE DWG. NO. 13 FOR GEN. NOTES.
5. PASS PL. WELDS TO BE FULL PENETRATION FOR 2" MIN. FROM FACE OF RING.
6. FINISH MACHINE FACE OF RING AFTER FINAL WELDING AND HEAT TREATMENT.
7. POST WELD HEAT TREAT AS FOLLOWS:
 - A. HEAT FROM 800° F TO 1125° F @ 400° F PER HOUR.
 - B. HOLD @ 1125° F $\pm$ 25° F FOR 1 HOUR (MIN.).
 - C. COOL FROM 1125° F TO 800° F @ 500° F PER HOUR.
 - D. FURTHER COOLING IN STILL AIR.



HEAT TRANSFER EQUIPMENT CO.
Tulsa, Oklahoma

FLOATING HEAD DETAILS

Rev	Date	Description	By	DWN.	BM	CK.	APP.	DATE	REV.

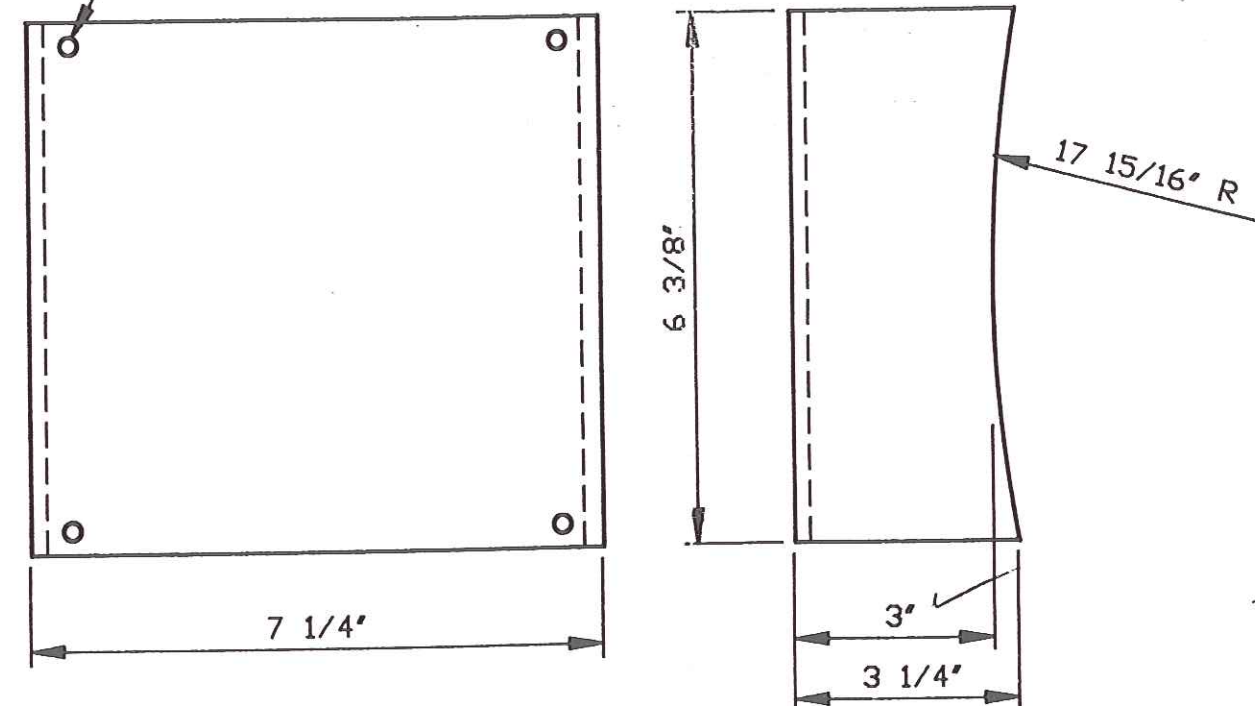
DWN. BM CK. SM APP. RM
DATE 7/24/91 DATE 8-9-91 DATE 8-9-91
91-2173-A-8

* TO BE ASSIGNED AT TIME OF SHIPMENT

RIVET EACH CORNER
TO BRACKET WITH
STN. STL. RIVETS

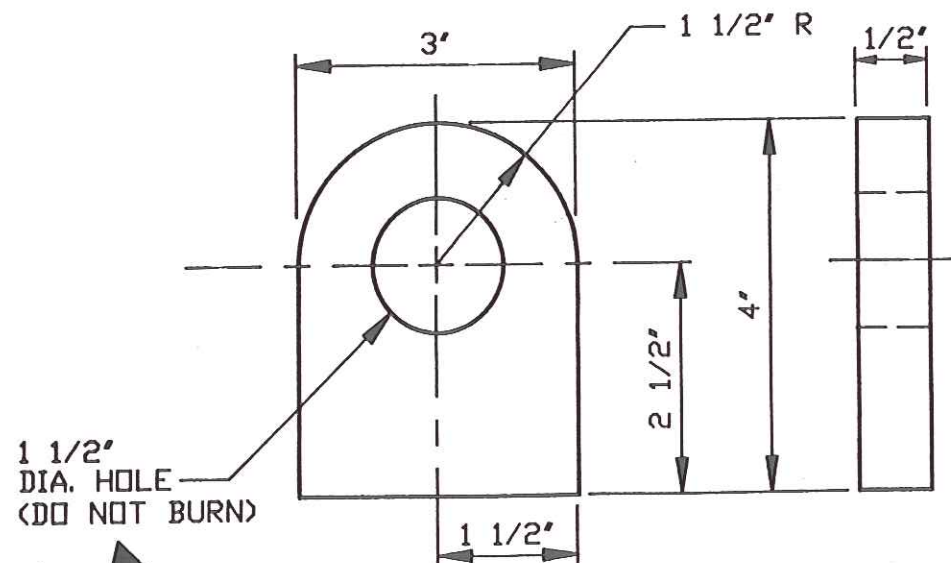
 W - RT-3 - PHT -	NAT'L. BD. NO. *		
	CERTIFIED BY HEAT TRANSFER EQUIPMENT CO. TULSA, OKLAHOMA		
	M.A.W.P. TUBES	155 ☒ P.S.I. AT 550 ☒ °F	
	M.A.W.P. SHELL	155 ☒ P.S.I. AT 550 ☒ °F	
	MIN. DESIGN TUBES	10 ☒ °F AT 155 ☒ P.S.I.	
	METAL TEMP. SHELL	10 ☒ °F AT 155 ☒ P.S.I.	
	SERIAL NO.	91-2173-A	
	YEAR	1991	
	TEST TUBES	233 ☒ P.S.I. SHELL 233 ☒ P.S.I.	
	ITEM	08E-102 SIZE 35-288 TYPE AET	
P.O. NO. 6636-02D1-C210-01			
SURF. SQ. FT. 6241 EFF			
SERVICE DIB #3 TRIM COOLER			
SHOP TEST PRESSURES: SHELLSIDE = 312 PSI			
TUBESIDE = 265 PSI			

DRILL HOLES TO MATCH
NAME PLATE



⑥1 NAME PLATE DETAIL

⑥2 NAME PLATE BRACKET DETAIL
3/16" THK.



⑥3 LIFTING LUG DETAIL
6 - REQ'D.

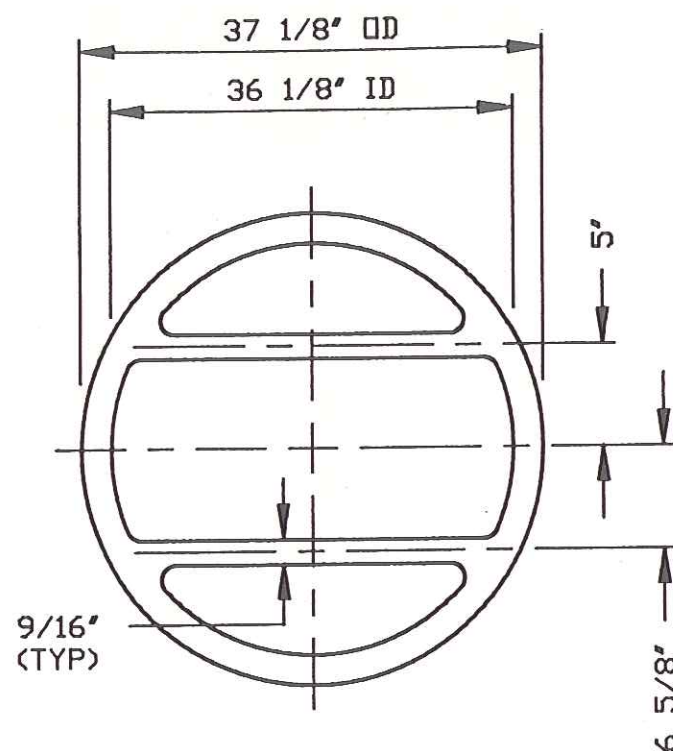
ACCEPTANCE FOR ENGINEERING USE	
THIS DOCUMENT IS:	
ACCEPTED	(AC) ☒
ACCEPTED WITH COMMENTS	(AC-C) ☐
NOT DEVELOPED/ACCEPTED	(ND) ☐
NOT ACCEPTED	(NAC) ☐
DO NOT SIGN IF YOU DO NOT BELIEVE THE CONTAINED MATERIAL IS CORRECTLY IDENTIFIED OR DERIVED FROM THE SOURCE OF ORIGIN. SIGNATURE DATE	
DIVISION	SIGNED <i>RM</i> DATE <i>10/26/91</i>

TENNECO NGL CORP.
MTBE PROJECT
LAPORTE, TEXAS
ITEM NO. 08E-102
P.O. NO. 6636-02D1-C210-01

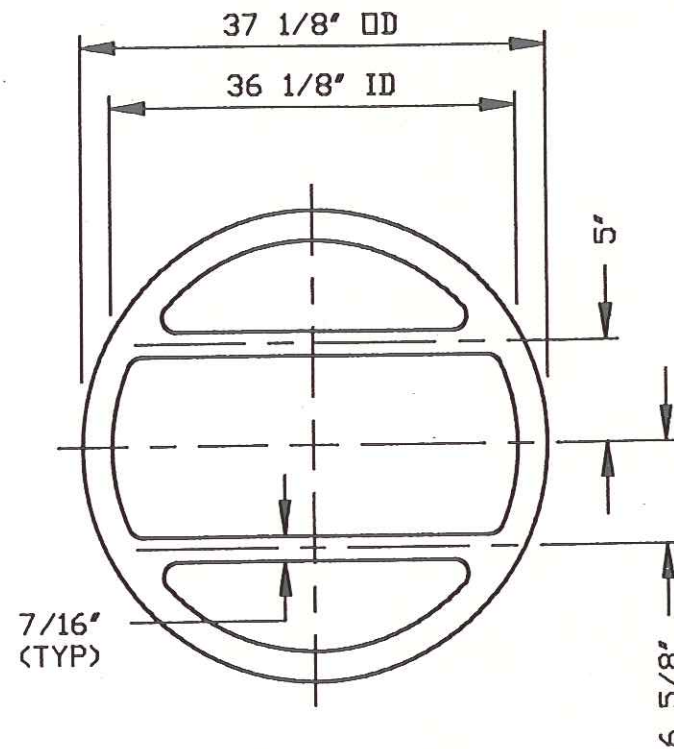
	HEAT TRANSFER EQUIPMENT CO. Tulsa, Oklahoma	
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Rev	Date	Description	By	NAMEPLATE DETAILS			
				DWN. BM	CK. SM	APP. <i>RM</i>	REV. <i>0</i>
				DATE 7/24/91	DATE 8-9-91	DATE 8-9-91	

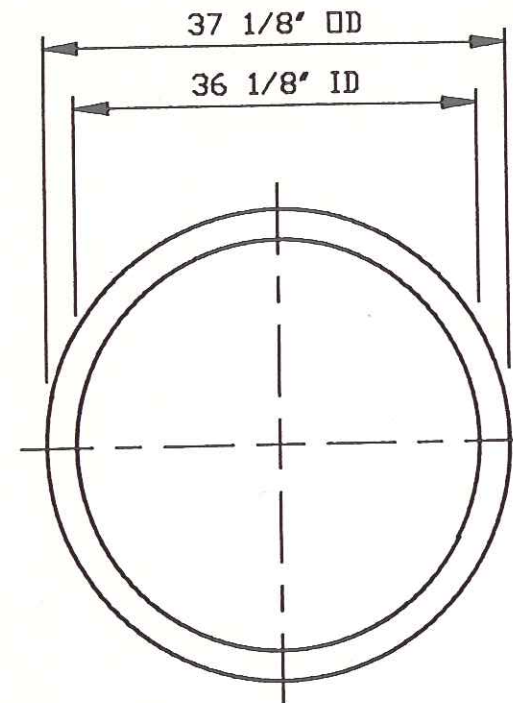
91-2173-A-10



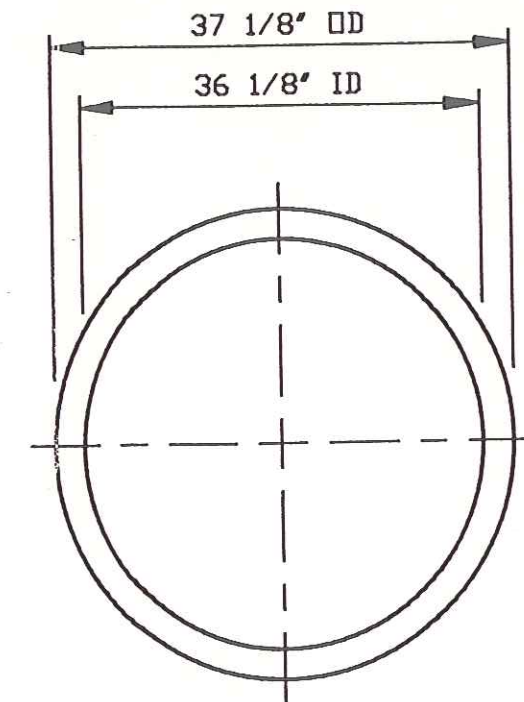
CHANNEL COVER GASKET
1/8" THK. SOFT IRON DBL. JACKETED
NON-ASBESTOS FILLED
(3) REQ'D.



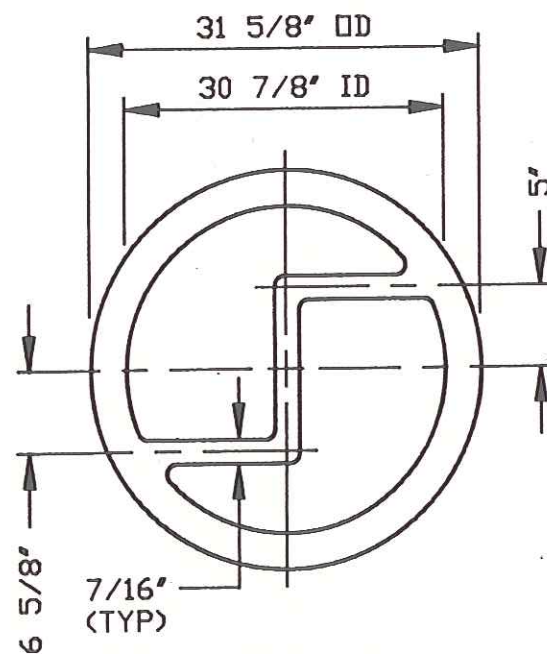
CHANNEL GASKET
1/8" THK. SOFT IRON DBL. JACKETED
NON-ASBESTOS FILLED
(3) REQ'D.



SHELL GASKET
1/8" THK. SOFT IRON DBL. JACKETED
NON-ASBESTOS FILLED
(3) REQ'D.



SHELL COVER GASKET
1/8" THK. SOFT IRON DBL. JACKETED
NON-ASBESTOS FILLED
(3) REQ'D.



FLTG. HEAD GASKET
1/8" THK. SOLID SOFT IRON
(3) REQ'D.

ACCEPTANCE
FOR ENGINEERING USE

THIS DOCUMENT IS:

ACCEPTED (AC) ☒

ACCEPTED WITH COMMENTS (AC-C) ☐

NOT RECOMMENDED (NR) ☐

NOT ACCEPTED (NA) ☐

DATE: 8-9-91

SIGNED: RM

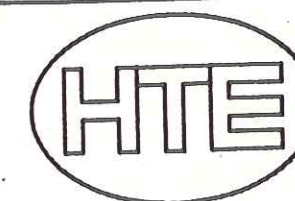
DIVISION: VM

DATE: 8-9-91

NOTES:

- (3) SETS OF GASKETS REQ'D. USE ONE SET IN EXCHANGER AND BOX SPARE SETS. STENCIL ON SHIPPING CONTAINER W/ 3" HIGH BLOCK LETTERS THE P.O. NO., ITEM NO. AND RECEIVING ADDRESS.
- ALL LAPS TO BE FAR SIDE.
- ALL RIB RADII TO BE 1/4".
- GASKET MATERIAL TO BE SUITABLE FOR 550° F.
- JACKETS TO BE ANNEALED.
- FLTG. HEAD GASKET MAX. BHN = 120.

TENNECO NGL CORP.
MTBE PROJECT
LAPORTE, TEXAS
ITEM NO. 08E-102
P.O. NO. 6636-02D1-C210-01

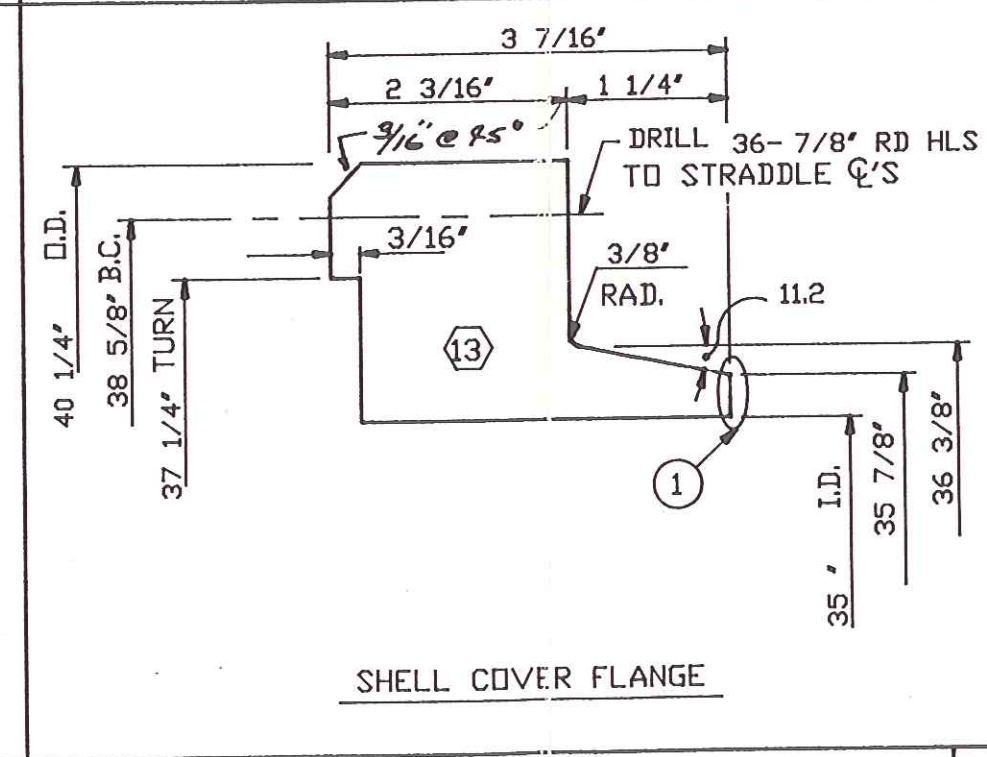
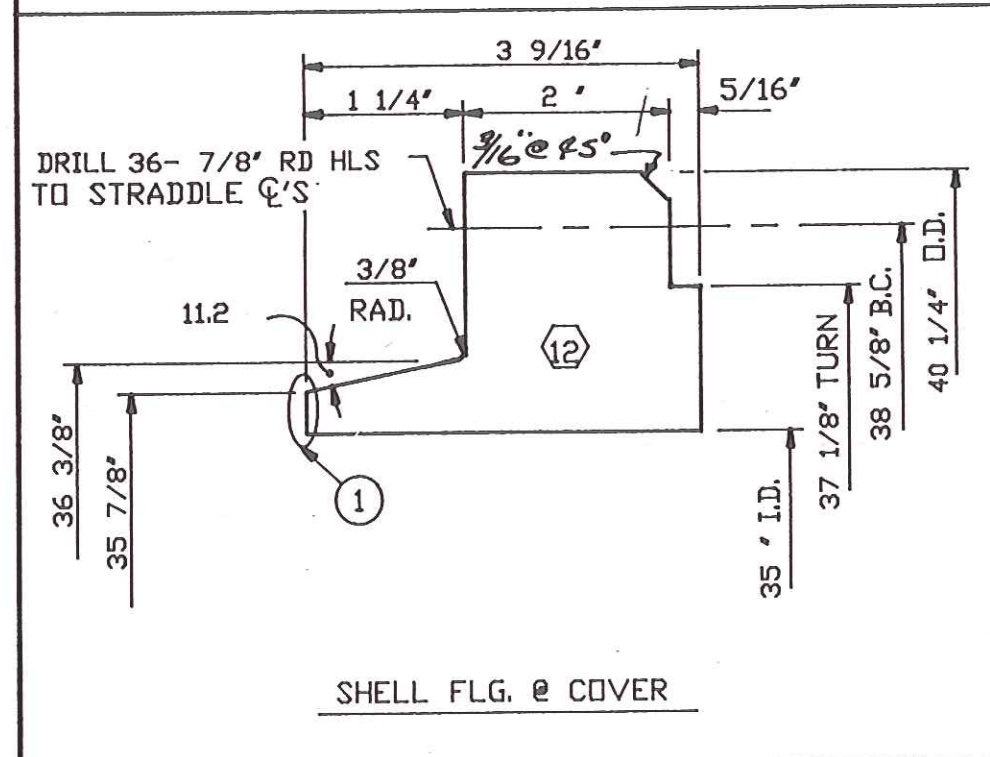
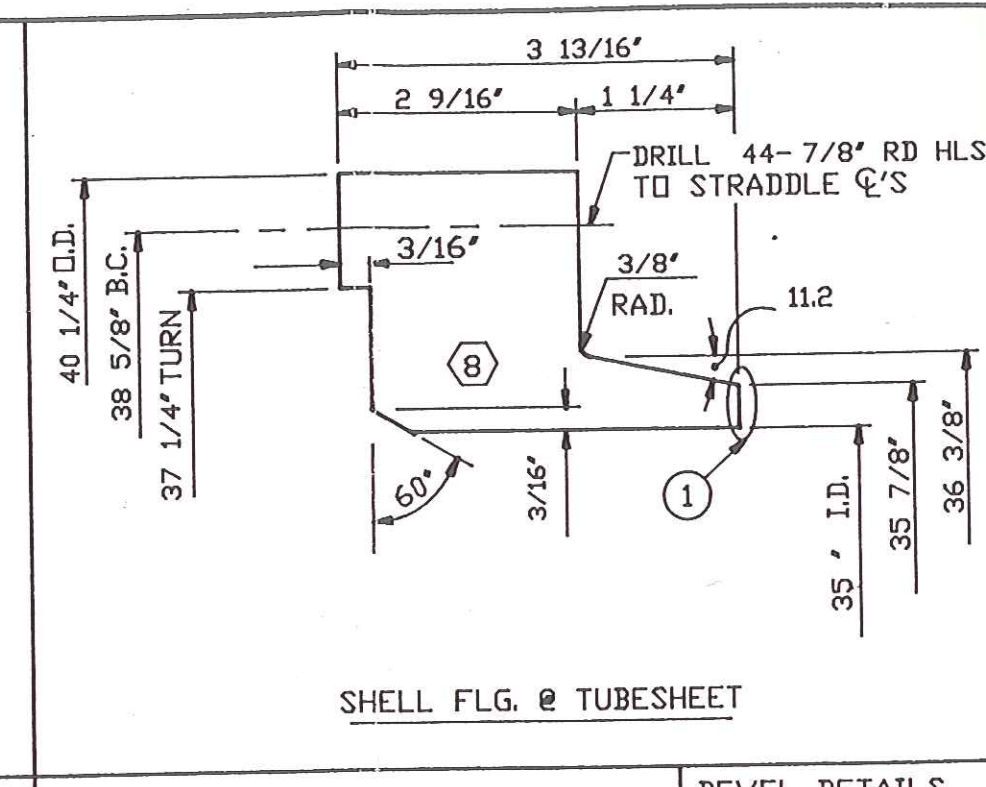
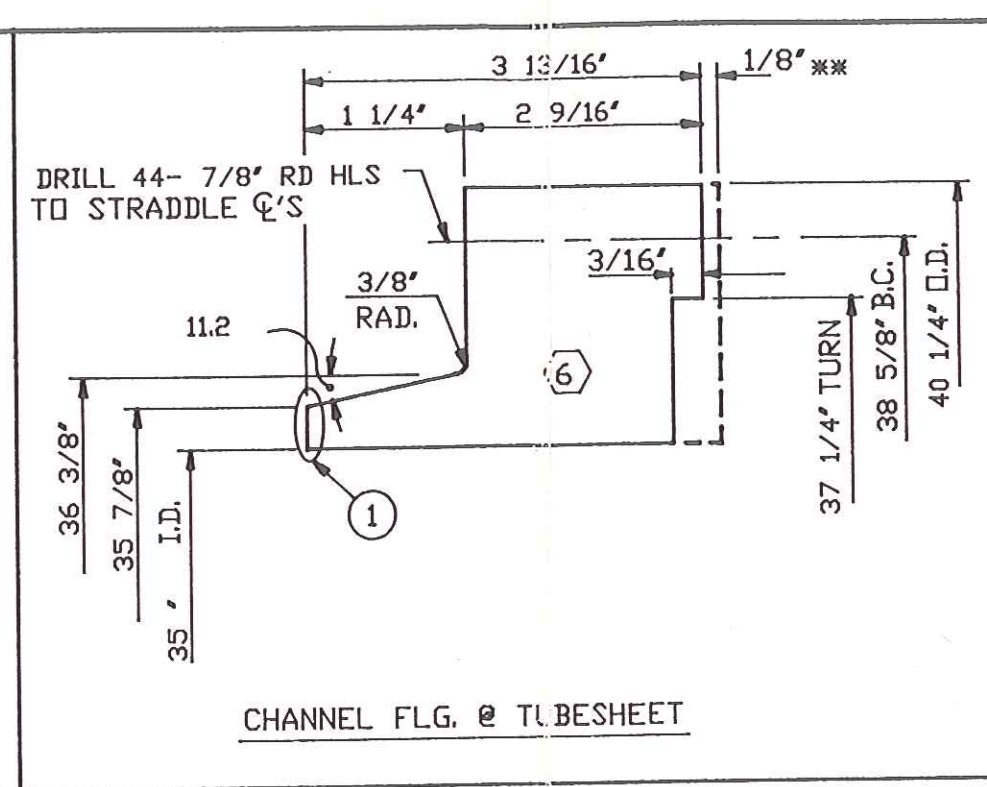
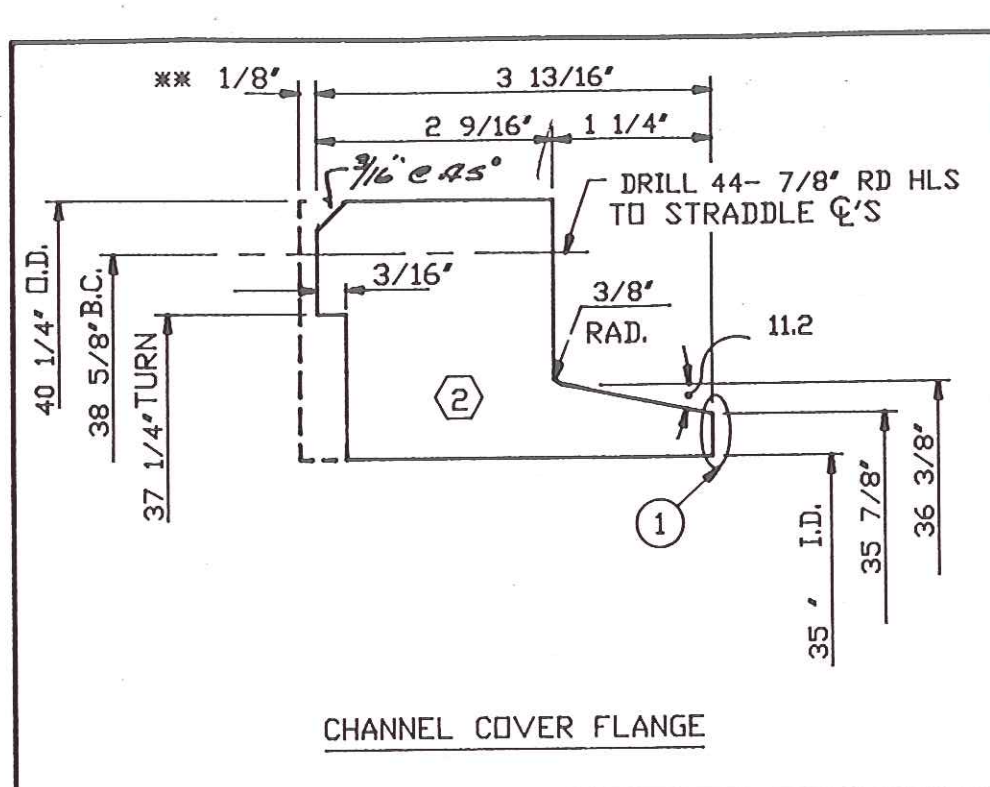


HEAT TRANSFER EQUIPMENT CO.
Tulsa, Oklahoma

Rev	Date	Description	By

GASKET DETAILS

DWN. BM	CK. SM	APP. RM	91-2173-A-11	REV. 11
DATE 7/24/91	DATE 8-9-91	DATE 8-9-91		



ACCEPTANCE FOR ENGINEERING USE

THIS DOCUMENT IS:

ACCEPTED ☒ (A)

ACCEPTED WITH COMMENTS (A-C) ☐

NOT REVIEWED-ACCEPTED (N) ☐

NOT ACCEPTED (R) ☐

ACCEPTANCE DOES NOT RELIEVE VENDOR FROM FURNISHING MATERIAL IN COMPLIANCE WITH ORDER, EITHER TO WHOLE OR PART, OR THE OBLIGATION OF ACCEPTANCE COMPLETION.

DIVISION VN SIGNED RM DATE 16 Aug 91

BEVEL DETAILS

TENNECO NGL CORP.
MTBE PROJECT
LAPORTE, TEXAS
ITEM NO. 08E-102
P.O. NO. 6636-02D1-C210-01

Rev	Date	Description	By

- NOTES:**
- 1) ONE EACH REQUIRED.
 - 2) GASKET CONTACT SURFACES TO BE 89-139 AARH. ALL OTHER SURFACES TO BE 230 AARH.
 - 3) ** ALLOW 1/8" EXTRA THICKNESS AT FACE OF FLANGE FOR FINISH MACHINE OF FACE AFTER HEAT TREAT AND/OR FINAL WELDING.

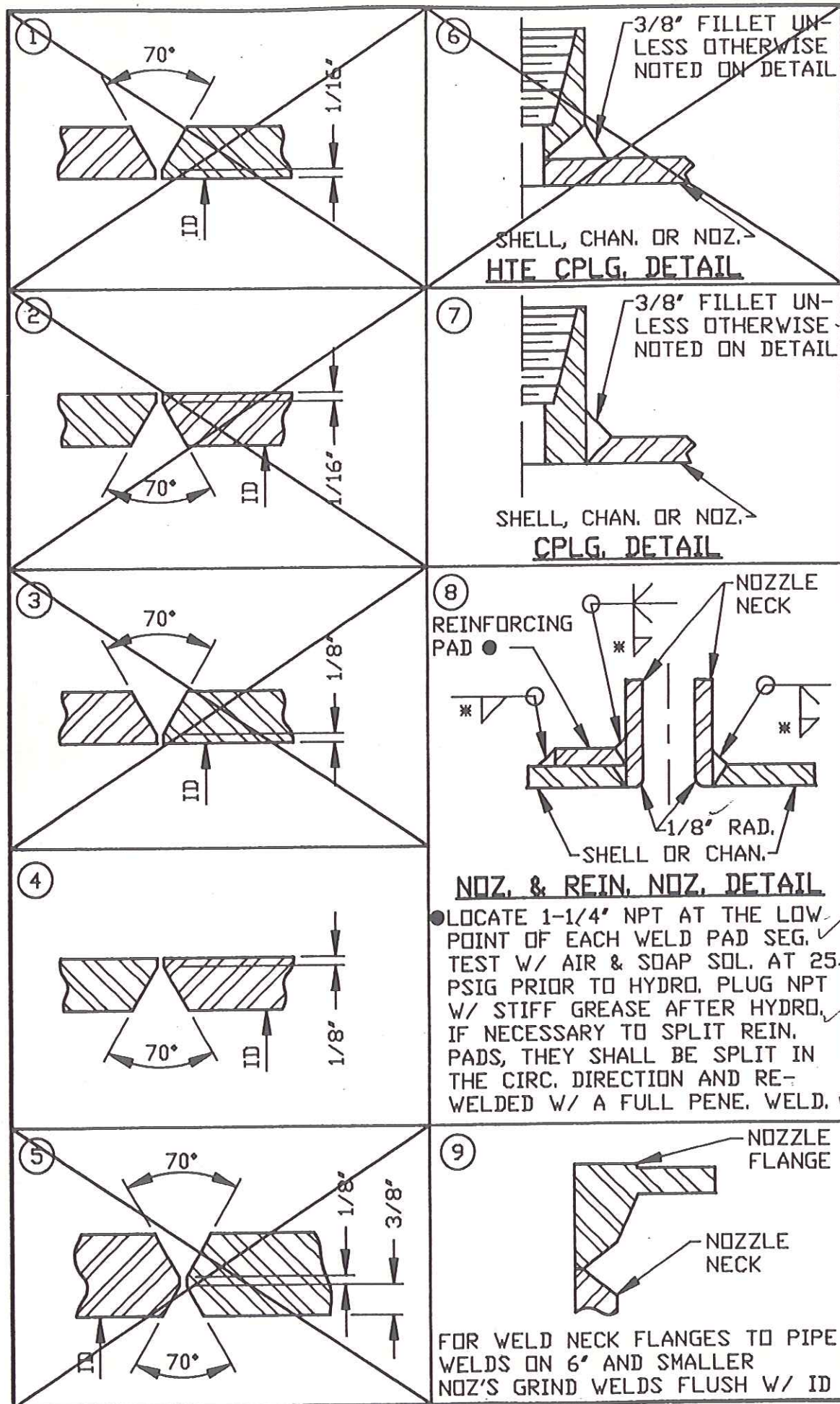
HEAT TRANSFER EQUIPMENT CO.
Tulsa, Oklahoma

FLANGE DETAILS

DWN. FJC	CK. <u>SPS</u>	APP. <u>RM</u>	91-2173-A-12
DATE 3-5-91	DATE 3-11-91	DATE 8-9-91	REV. <u>0</u>

B1

12



GENERAL NOTES

1. ALL BOLT HOLES TO STRADDLE CENTERLINES.
2. COAT ALL STUDS, NUTS AND MACHINED SURFACES WITH E.F. HOUGHTON CO. RUST-VETO NO. 342, EXXON CHEMICAL CO. RUST BAN NO. 326 OR AN APPROVED EQUAL.
3. HYDROTEST WATER TEMP. TO BE 70°F. MIN. HOLD HYDROTEST FOR (1) HOUR MIN. HYDROTEST CHART REQUIRED. BLOW DRY WITH AIR AFTER HYDROTEST.
4. COUPLING PLUGS TO BE SEALED WITH TETRAFLUORETHYLENE TAPE THREAD SEALANT.
5. STENCIL IN 3" HIGH BLOCK LETTERS THE ITEM NO., P.D. NO. AND RECEIVING ADDRESS ON THE OUTSIDE OF THE EXCHANGER.
6. NOZZLE ATTACHMENT WELDS SHALL BE EXAMINED BY MAGNETIC PARTICLE OR LIQUID PENETRANT EXAMINATION. EXAMINATION TO BE AFTER ANY POST WELD HEAT TREATMENT.
7. ARC STRIKE SURFACES AND SURFACES WHERE TEMPORARY ATTACHMENTS WERE REMOVED SHALL BE EXAMINED BY MAGNETIC PARTICLE OR LIQUID PENETRANT EXAMINATION.
8. ONE SPOT RADIOGRAPH TO BE TAKEN FROM EACH CHAN., SHELL AND SHELL COVER SECTION. SPOT RADIOGRAPHS TO BE IN ACCORDANCE WITH UW-51.
9. IF HEAT TREATED, PAINT STENCIL ON SIDE OF SHELL IN 3" HIGH LETTERS "WELDING OR BURNING ON THIS EXCHANGER IS PROHIBITED".
10. NOTIFY THE CUSTOMER TEN (10) DAYS IN ADVANCE OF START OF FABRICATION OR ASSEMBLY. TEN (10) DAYS NOTICE IS ALSO REQUIRED IN ADVANCE OF FINAL TEST AND/OR INSPECTION.

ACCEPTANCE FOR ENGINEERING USE	
THIS DOCUMENT IS:	
ACCEPTED	() ☒
ACCEPTED WITH COMMENTS ()	()
NOT REVIEWED-ACCEPTED	()
NOT ACCEPTED	()
APPROVED FOR CONSTRUCTION BY: <i>VM</i> <i>BM</i>	
DATE: <i>16 Aug 91</i>	

TENNECO NGL CORP.
MTBE PROJECT
LAPORTE, TEXAS
ITEM NO. 08E-102
P.D. NO. 6636-02D1-C210-01

* SEE DETAIL DRAWING FOR FILLET WELD SIZE



HEAT TRANSFER EQUIPMENT CO.
Tulsa, Oklahoma

Rev	Date	Description	By	WELD DETAILS AND GENERAL NOTES			
				DWN.	BM	CK. <i>Sm</i>	APP. <i>VM</i>
				DATE 7/25/91	DATE 8-9-91	DATE 8-9-91	REV. <i>13</i>

91-2173-A-13