

BILL OF MATERIAL			SIZE 27-144	TYPE BEM		
ITEM	QTY	ONE - REQ'D, DESCRIPTION OF ONE	MATERIAL	P.O. N°	WEIGHT	PRICE
1	582	3/4" O.D. x 16 BWG (AVG) WELDED STN. STL. TUBES x 12'-0" LG.	SA-249-TP 304			
2	1	R&W. CYL. 27" I.D. x 3/8" THK. x 11 3/4" LG. (R 8 3/4" x 3/8" x 11 7/8" LG) (BIS)	SA-515-70			
3	1	✓ ✓ 27 1/2" ID x 1/4" THK x 11'-8 7/8" LG. (R 11'-9 1/8" x 1/4" x 27 3/8" LG) *	SA-240-304			
4	2	28" O.D. x 3/8" THK. (Nom) 2:1 ELLIP. HDS. w/ 2" S.F.	SA-515-70			
5	2	(2x3) R's 32 1/8" O.D. x 1 1/2" THK (TUBESHEETS) (FIN. DIM.)	SA-240-304			
6	2	(5x8) TEMA FLGS. 32 1/8" O.D. x 27" I.D. x 3 5/8" THK.	SA-181-II			
7	2	6"-150# RF-WN FLGS (SCH. 80 BORE)	SA-181-I			
8	1	2"-150# LAP JOINT FLG	✓			
9	1	8"- ✓ ✓ ✓ ✓	✓			
10	1	12"- ✓ ✓ ✓ ✓	✓			
11	1	R 3 5/8" O.D. x 2 1/2" ID x 3/8" THK.	TP 304 STN. STL.			
12	1	R 10 5/8" O.D. x 8 3/4" ID x 1/2" THK.	✓ ✓			
13	1	R 15" O.D. x 12 7/8" ID x 1/2" THK.	✓ ✓			
14	1	R. 2 3/8" O.D. x SCH. 80S WALL STN. STL. PIPE x 9" LG	SA-312-TP 304			
15	1	R. 8 5/8" O.D. x ✓ 40S ✓ ✓ ✓ ✓ x 9 1/2" LG	✓			
16	1	R. 12 3/4" O.D. x 1/4" THK. R&W CYL. x 10 3/8" LG.	SA-240-304			
17	1	R 14" O.D. x 1/4" THK (IMP. R)	✓			
18	3	BAFFLE R's 14" x 3/8" THK. x 27 5/8" LG.	✓			
19	4	1/2" φ TIE RODS x 8'-0 1/8" LG (THRD. ONE-END 3/4")	TP 304 STN. STL.			
20	8	✓ ✓ ✓ ✓ x 10'-0 1/8" LG (✓ ✓ ✓ ✓)	✓			
21	3	3/4"-3000# PIPE CPLGS w/ STN. STL. PLUGS	SA-182-F 304			
22	2	R's 7" x 1/4" x 30 1/2" LG (SUPPORT SADDLES)	SA-240-304			
23	2	RCS 6" (SCH 80) SMLS. PIPE x 8" LG.	SA-53-B			
24	4	3/4"-3000# CPLGS. w/ STL. PLUGS	SA-105-I			
25	2	SUPPORT R's. 5" x 1/2" THK. x 2'-0" LG.	STL.			
26	2	✓ ✓ 4 1/2" x 1/2" THK. x 1'-0 1/4" LG.	✓			

CUSTOMER: CLARK OIL & REFINING CORP.

P.O. N°: 22875 *was Now 19-E-44R*

ITEM N°: E-43

* BEVEL OUTSIDE @ TUBESHEETS



SLAGLE MFG. CORP.

909 N
Wheeling Tulsa OK 74110

BILL OF MATERIAL

DRAWN BY: DAN

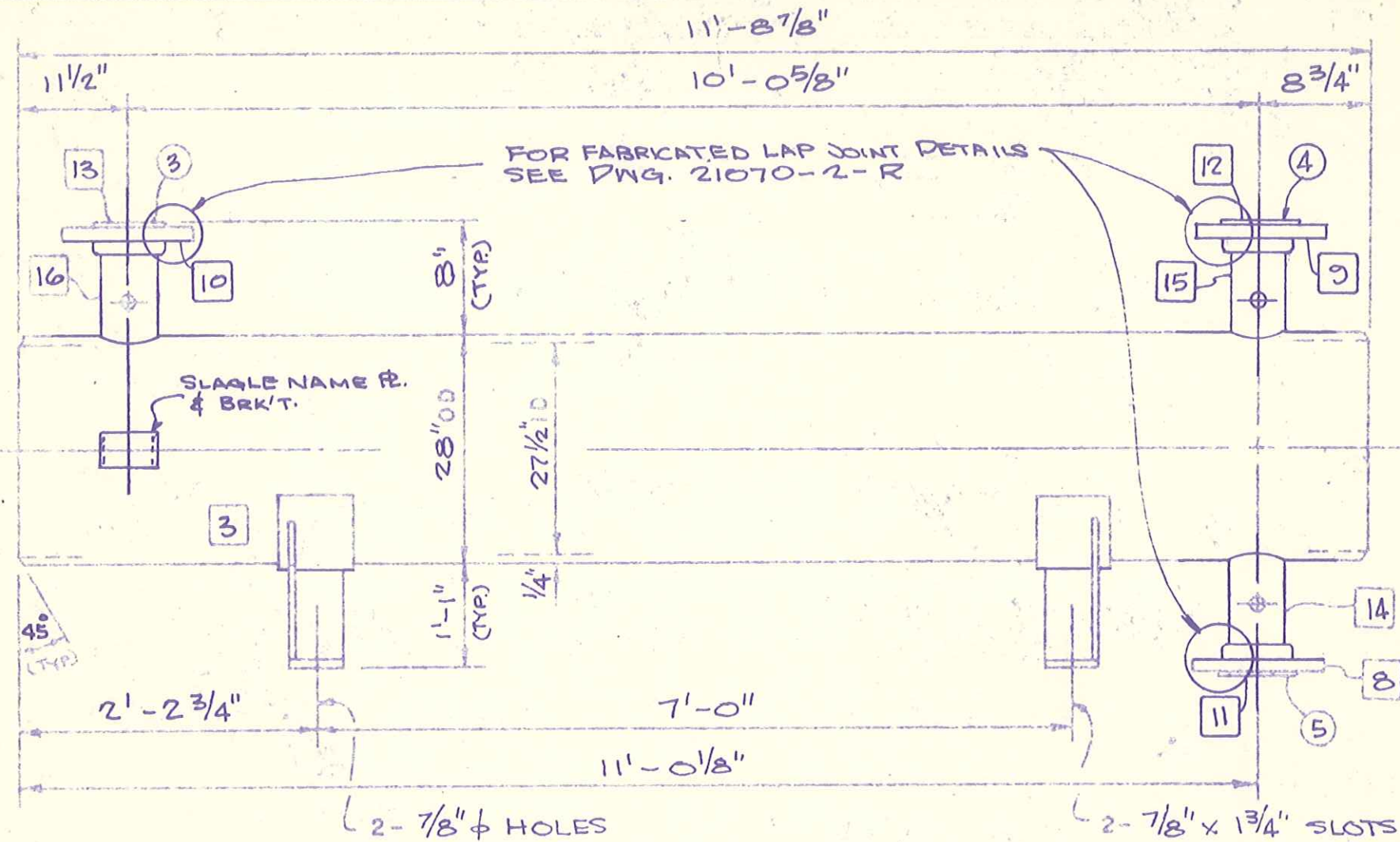
CHECKED BY: *MB*

918
584-2434
TELEX 49-2315

21070-Z-U₁

TYPE BEN

21070-2-U₂



ALL BOLT HOLES TO STRADDLE ϕ s

HEAT TREATMENT NONE

TUBE SHEET DETAIL ON DWG 21070-2-F1 & F2

SUPPORT DETAIL ON DWG 21070-2-P

CUSTOMER: CLARK OIL & REFINING CORP.

P.O. NO: 22875

ITEM NO: E-43

Mk	SIZE	SCH	CPLG	WELD PAD
3	12"-150 ^{lb} LAP JOINT	1/4" THK.	1-3/4"-3000#(NS)	NONE
4	8"-150 ^{lb} LAP JOINT	40S	1-3/4"-3000#(NS)	NONE
5	2"-150 ^{lb} LAP JOINT	80S	1-3/4"-3000#(NS)	NONE
6				



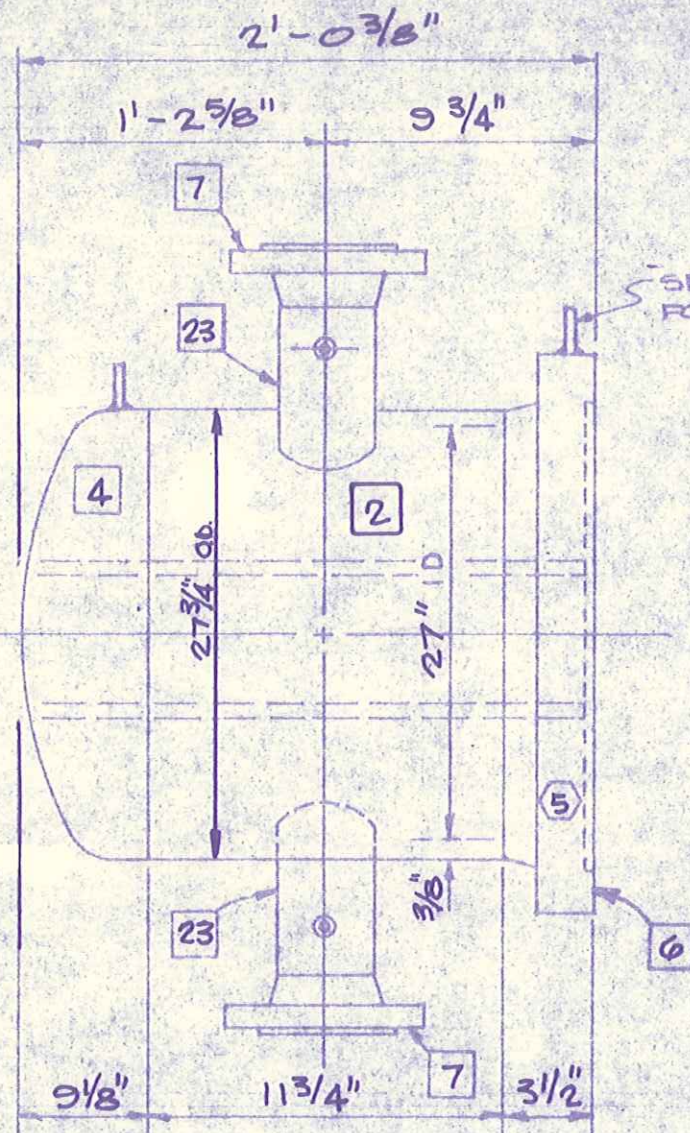
SLAGLE MFG. CORP.

SHELL DETAIL

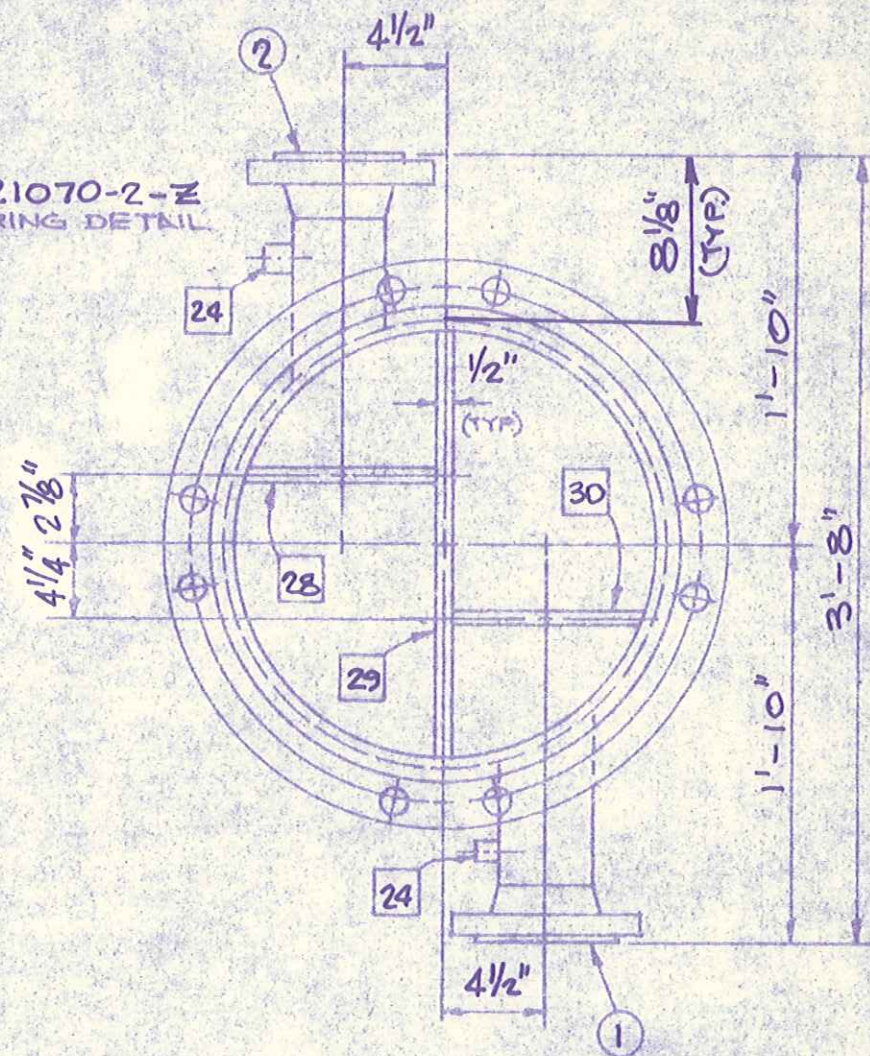
DRAWN BY: WAYNE

CHECKED BY: BILL

21070-2-B



SEE DWG. 21070-2-Z
FOR LIFTING RING DETAIL



ALL BOLT HOLES TO STRADDLE C:
HEAT TREATMENT NONE

FLANGE DETAIL ON DWG 21070-2-K

CUSTOMER: CLARK OIL & REFINING CORP.
P.O. No: 22875
ITEM No: E-43

MARK	SIZE	SCH	CPLG	PADS
①	6"-150# RF-WN	80	1-3/4" 3000# (NS)	NONE
②	6"-150# RF-WN	80	1-3/4" 3000# (NS)	NONE



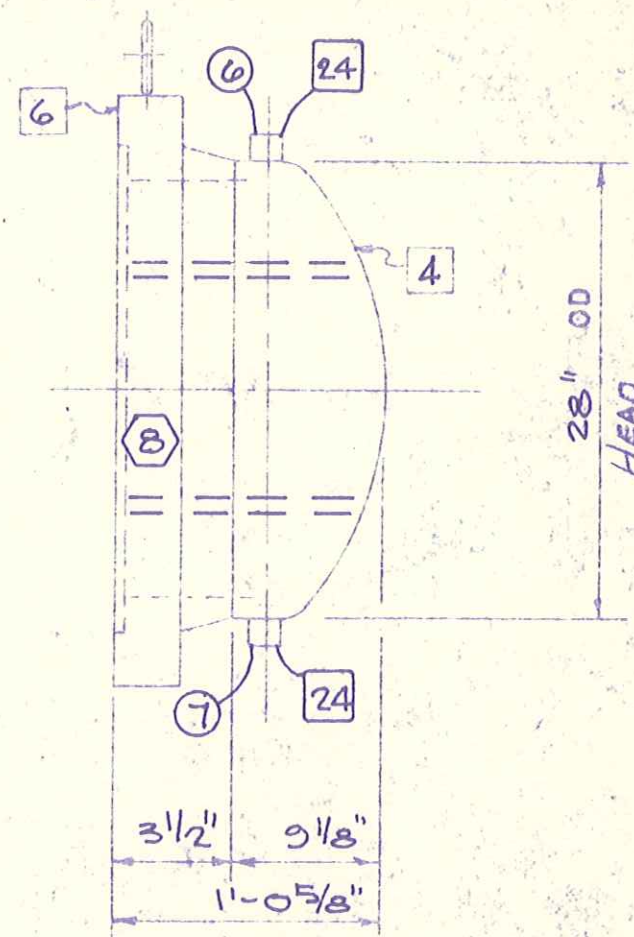
SLAGLE MFG. CORP.

CHANNEL DETAILS FRONT

DRAWN BY: WAYNE

CHECKED BY: *Bill*

21070-2-C₁



FLANGE DETAIL ON DWG 21070-2-K

IN.	SIZE	SCM	CPLG	WELD PAD
6	3/4"-3000 [#] CPLG.	—	—	—
7	3/4"-3000 [#] CPLG.	—	—	—



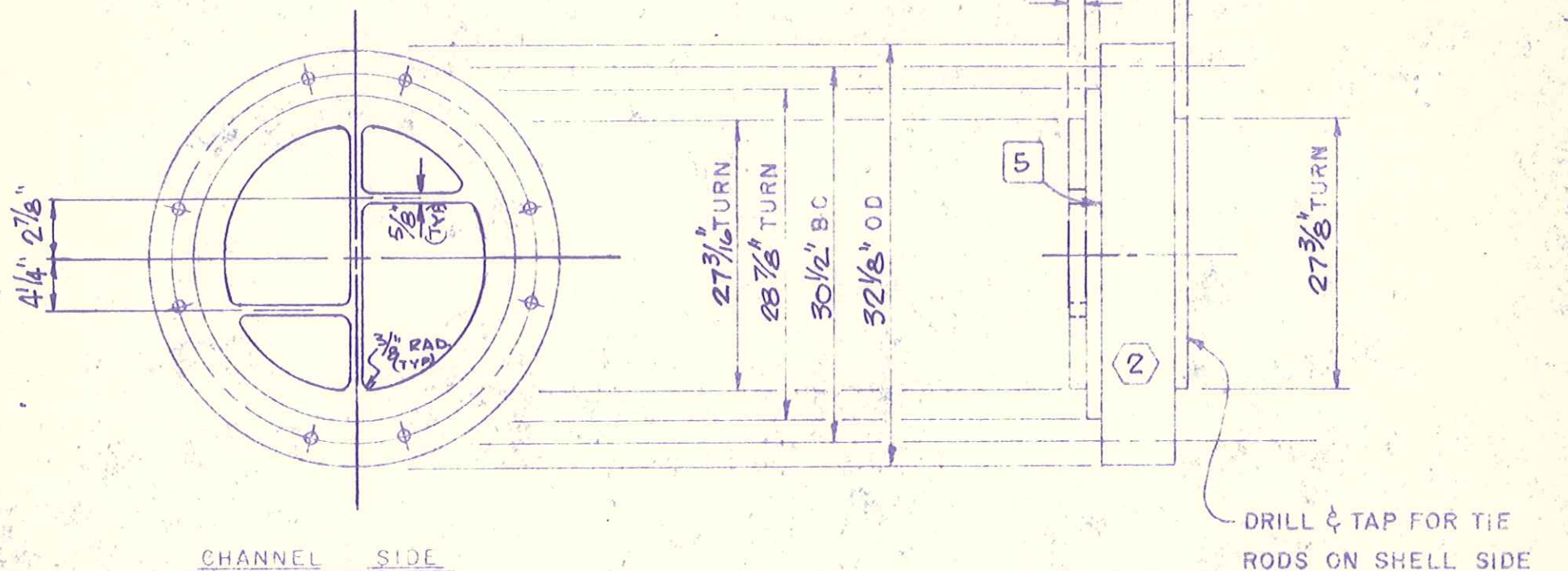
SLAGLE MFG. CORP.

BACK CHANNEL DETAIL

DRAWN BY: **WAYNE**

CHECKED BY: *[Signature]*

21070-2-C2



DRILL & TAP FOR TIE RODS ON SHELL SIDE OF FRONT TUBE SHEET ONLY!

MACHINE TO A 125 FINISH

SEE TUBE LAYOUT ON DWG 21070-2-H

DRILL & TAP TIE RODS 3/4" DEEP FOR 12 - 1/2" Φ

RING GROOVE TUBE HOLES PER DWG 21070-2-Z

DEBURR & CHAMFER TUBE HOLES

RESTAMP HEAT & SLAB NO AFTER MACHINING

DRILL BOLT HOLES 1/8" Φ FOR 28

CUSTOMER, CLARK OIL & REFINING CORP.
P.O. NO: 22875
ITEM NO: E-43



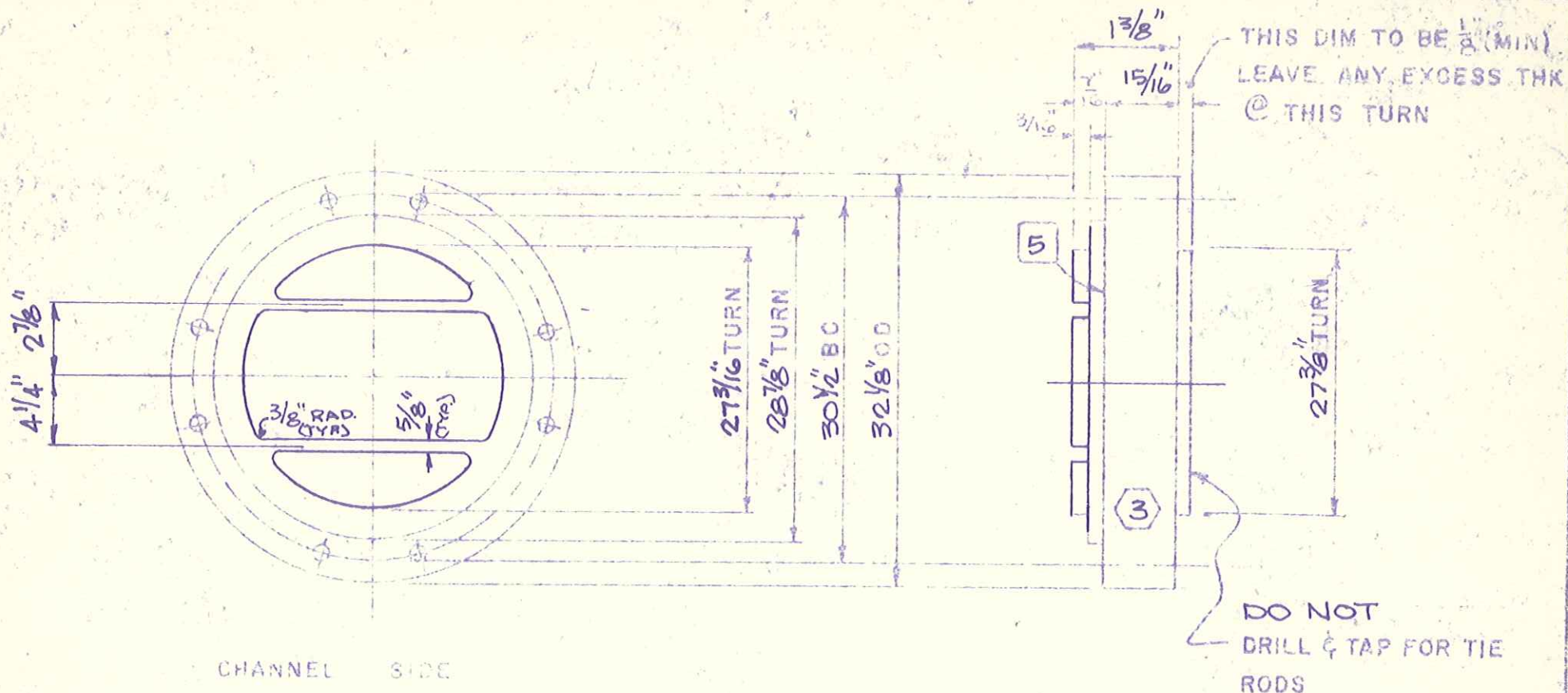
SLAGLE MFG. CORP.

FRONT TUBESHEET DETAIL

DRAWN BY: WAYNE

CHECKED BY: Bill

21070-2-F1



MACHINE TO A 125 FINISH

SEE TUBE LAYOUT ON DWG 21070-2-H

RING GROOVE TUBE HOLES PER DWG. 21070-2-Z

DEBURR & CHAMFER TUBE HOLES

RE-STAMP HEAT & SLAB NO AFTER MACHINING

DRILL BOLT HOLES $\frac{7}{8}"$ FOR 28

CUSTOMER: CLARK OIL & REFINING CORP

P.O. No: 22875

ITEM No: E-43



SLAGLE MFG. CORP.

BACK TUBE SHEET DETAIL

DRAWN BY: WAYNE

CHECKED BY: BIKK

21070-2-F₂

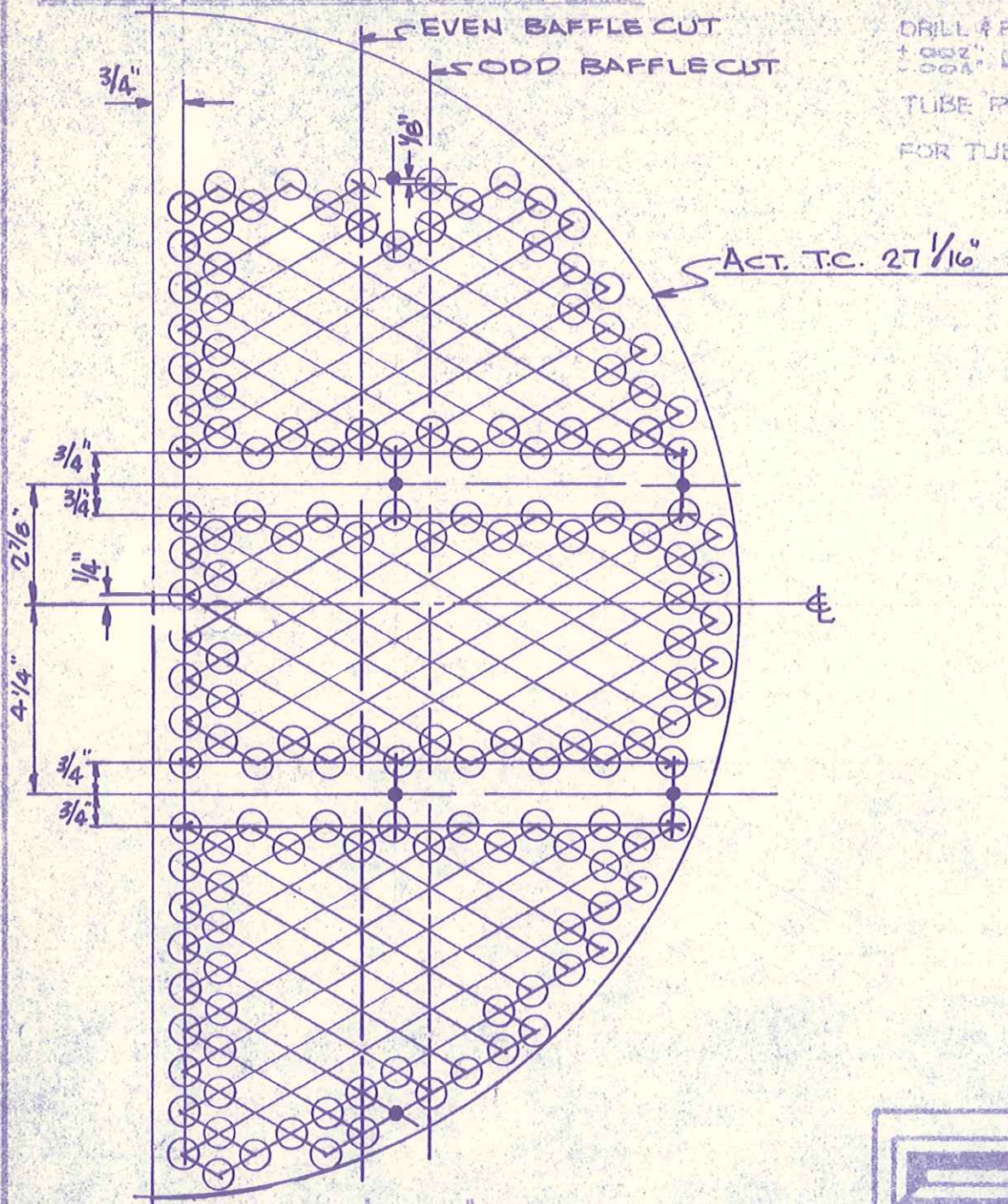
LAYOUT SYMMETRICAL ABOUT ϵ

NOTES:

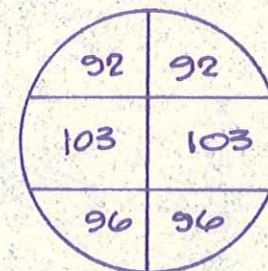
DRILL & REAM TUBE HOLES IN TUBESHEET TO $.760"$
 $\pm .002"$ DIA. FOR $582 - \frac{3}{4}"$ OD. TUBES

TUBE PITCH $\frac{15}{16}"$ TRI. ROT. - 6 PASS

FOR TUBE HOLE GROOVING SEE DNG. 21070-2-2



REFER TO DNG. 21070-2-1



NO. TUBES PER PASS

CUSTOMER: CLARK OIL & REFINING CORP.
 P.O. No: 22875
 ITEM No: E-43

● DENOTES TIE RODS



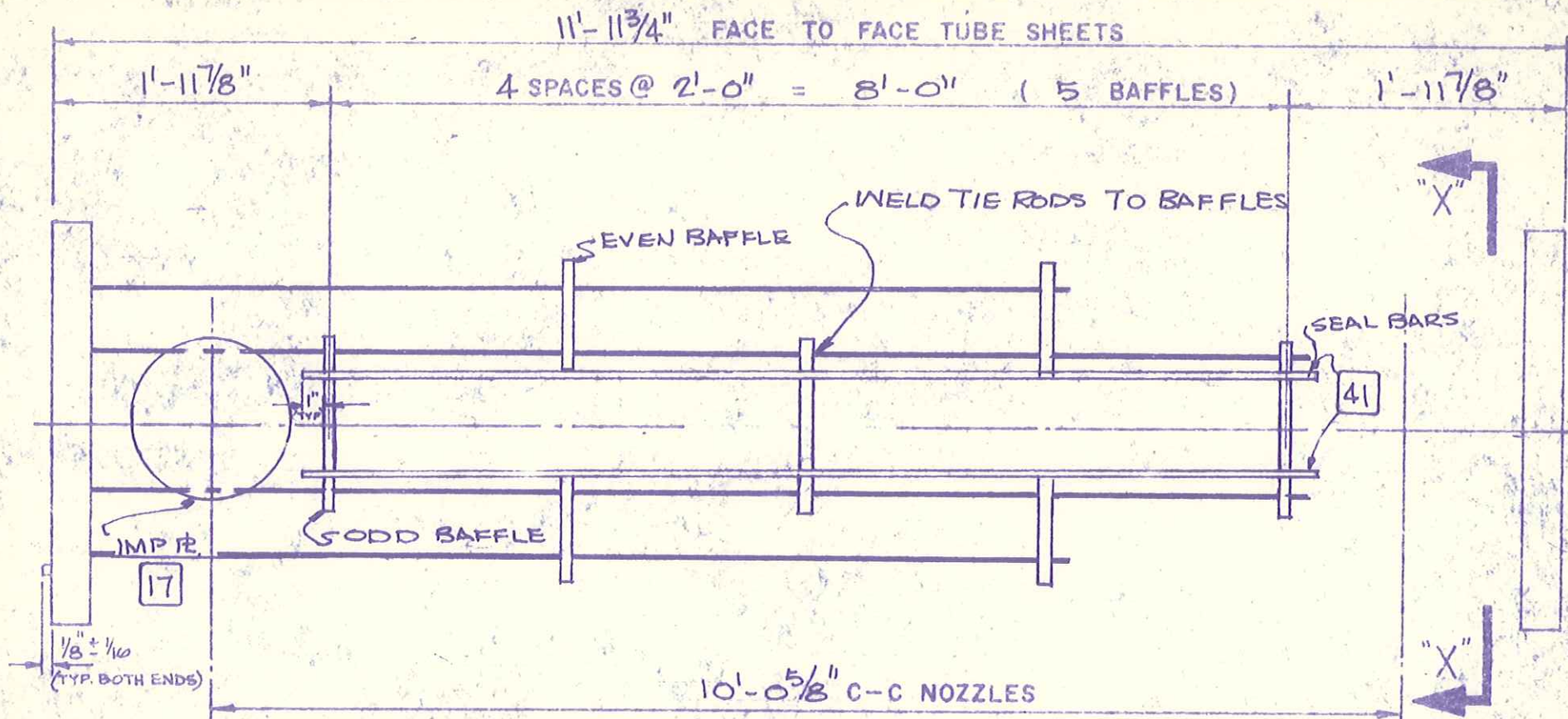
SLAGLE MFG. CORP.

TUBE LAYOUT

DRAWN BY: WAYNE

CHECKED BY: BILL

21070-2-H



PLAN VIEW

FOR BAFFLE DETAIL SEE DWG 21070-2-J

FOR TUBE SHEET DETAIL SEE DWG 21070-2-F₁ & F₂

HAVE FORMAN CHECK BUNDLE ARRANGEMENT

CUSTOMER = CLARK OIL & REFINING CORP.

P.O. No. 22875

ITEM No: E-43

TIE RODS & SPACERS

8 - 1/2" ϕ x 10'-0 1/8" LG TIE RODS

4 - 1/2" ϕ x 8'-0 1/8" ✓ ✓ ✓



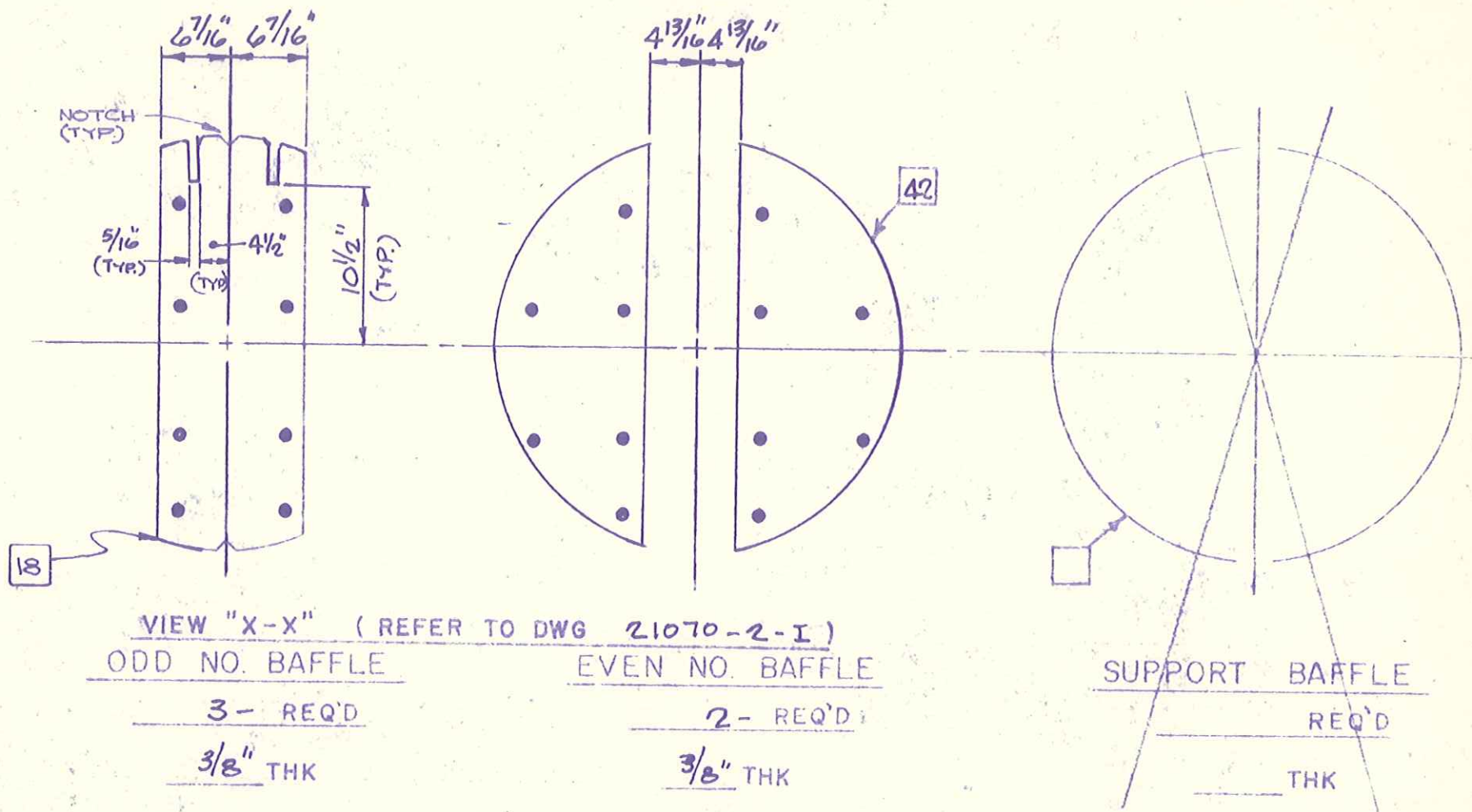
SLAGLE MFG. CORP.

BUNDLE ASSEMBLY

DRAWN BY: WAYNE

CHECKED BY: *Bue*

21070-2-I



FOR TUBE LAYOUT SEE DWG. 21070-2-H

DRILL TUBE HOLES 49/64" ϕ

DRILL TIE ROD HOLES 9/16" ϕ

MACHINE BAFFLES TO 27 5/16" O.D.

DEBURR ALL HOLES & RADIUS ALL CORNERS

CUSTOMER: CLARK OIL & REFINING CORP.
P.O. No: 22875
ITEM No: E-43



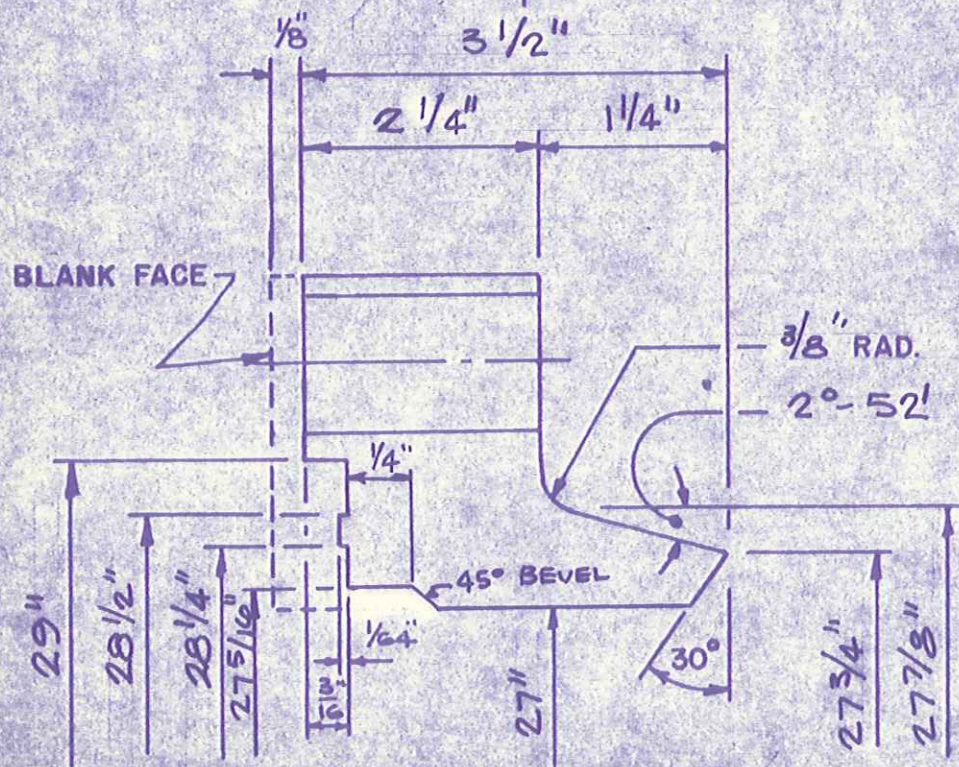
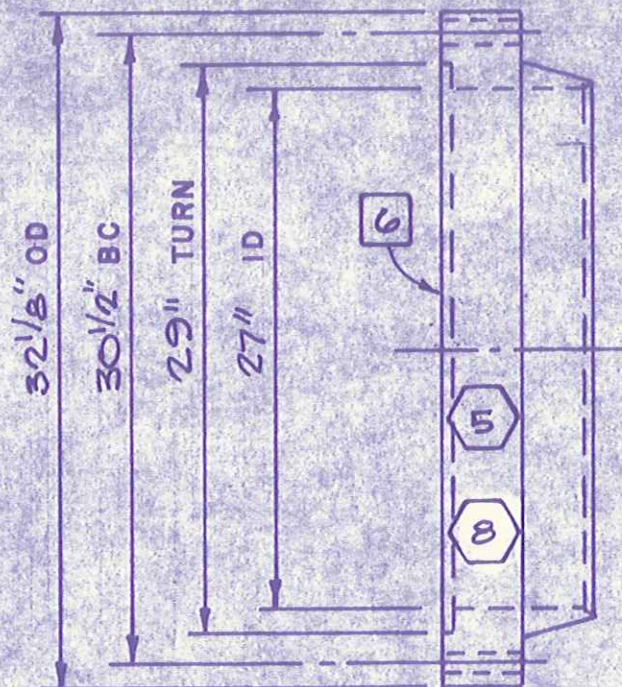
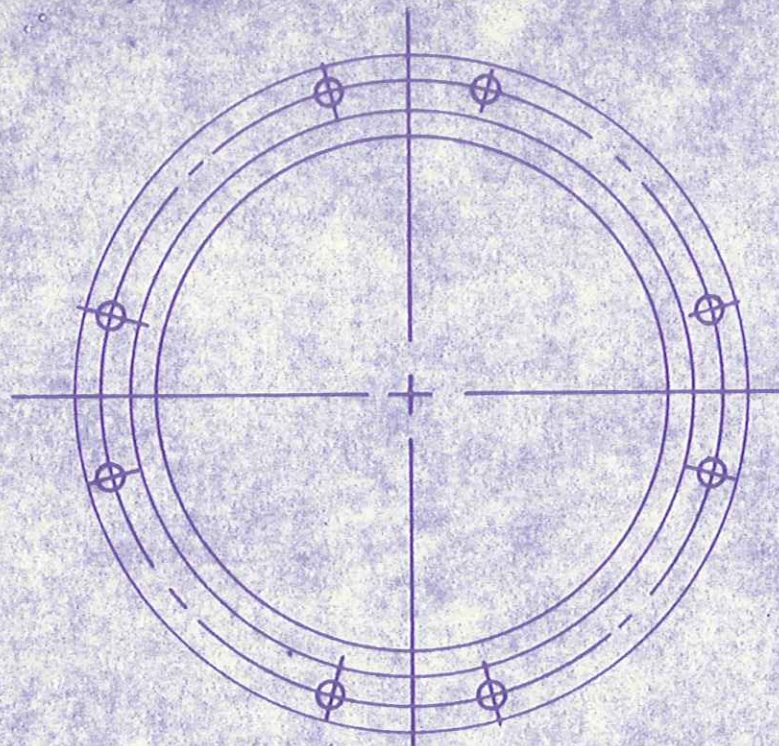
SLAGLE MFG. CORP.

BAFFLE DETAILS

DRAWN BY: WAYNE

CHECKED BY: Bue

21070-2-J



FLANGE MATERIAL TO BE ASTM SA-181-II
 BOLT HOLES: N° REQ'D 28 SIZE 7/8" ϕ
 MACHINE TO A 125 FINISH
TWO REQ'D ∇ BLANK FACE

CUSTOMER: CLARK OIL & REFINING CORP.
 P.O. N°: 22875
 ITEM N°: E-43



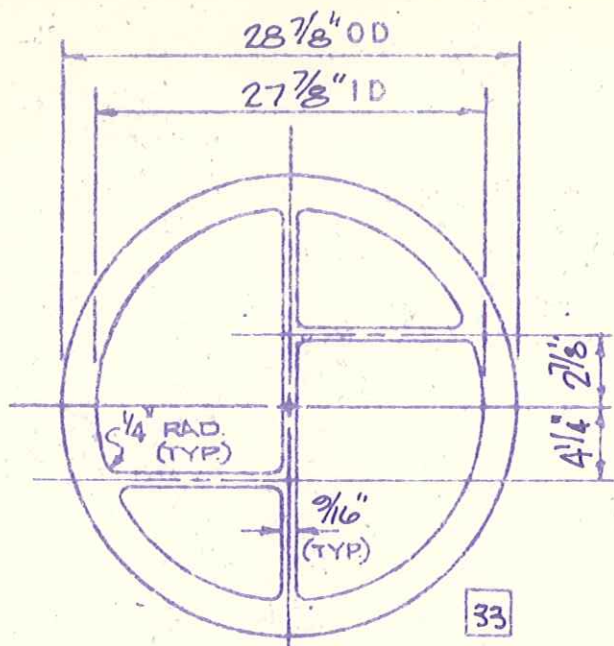
SLAGLE MFG. CORP.

FLANGE DETAIL

DRAWN BY: WAYNE

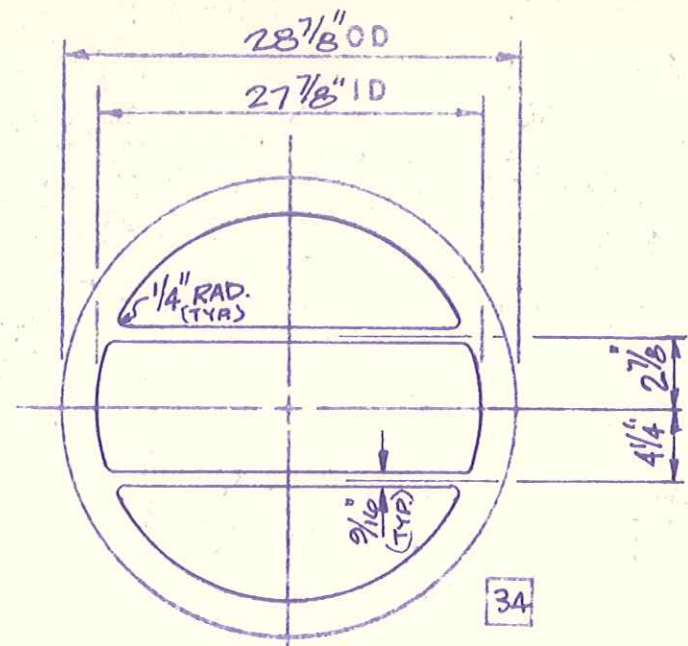
CHECKED BY:

21070-2-K



(LAP F.S.)
FRONT CHANNEL GASKET

1/8" THK. ARMCO IRON
JACKETED ASBESTOS FILLED
ONE - REQ'D.



BACK CHANNEL GASKET

1/8" THK. ARMCO IRON
JACKETED ASBESTOS FILLED
ONE - REQ'D.

STUDS & NUTS

- 35 56 - 3/4" ϕ (10 THD.) STUDS x 5" LG. SA-193-B7
- 36 112 - 3/4" (10 THD.) HEX NUTS SA-194-2H

CUSTOMER: CLARK OIL & REFINING CORP.
P.O. No: 22875
ITEM No: E-43

NOTE:

MATERIAL LISTED ABOVE FOR ONE EXCHANGER.
ONE EXCHANGER REQ'D.



SLAGLE MFG. CORP.	
GASKET DETAILS	
DRAWN BY: WAYNE	21070-2-0
CHECKED BY: <i>Bur</i>	



SLIDING SUPPORT
ONE REQ'D



21070-2-P

37



SLAGLE MFG. CORP.
TULSA, OKLA.



DIV. I
W

SERIAL NO. 21070-2 N.B. NO.

P.O. NO. 22875 ITEM NO. E-43

SIZE 27-144 TYPE BEM

SERVICE V-29 OXIDIZER CONDENSER

DESIGN PRESS. SHELL 50 PSIG TUBES 75 PSIG

DESIGN TEMP. SHELL 300 °F TUBES 150 °F

YEAR 1970



CUSTOMER: CLARK OIL & REFINING CORP.

P.O. No: 22875

ITEM No: E-43

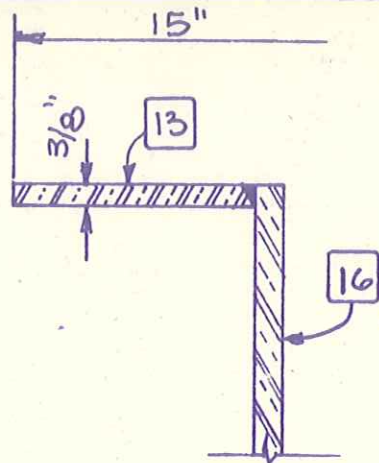


SLAGLE MFG. CORP.
NAME PLATE

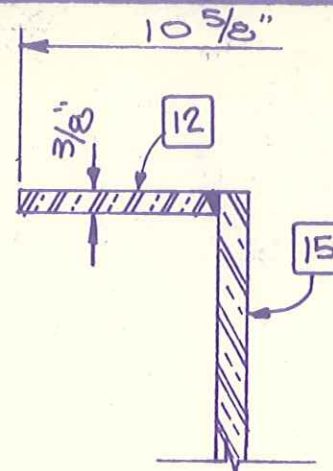
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CHECKED BY: BILL

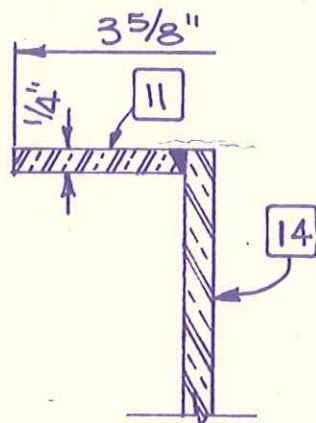
21070-2-Q



AFTER MACHINING DETAIL
 (3) 12"-150# L. J.



AFTER MACHINING DETAIL
 (4) 8"-150# L. J.



AFTER MACHINING DETAIL
 (5) 2"-150# L. J.



SLAGLE MFG. CORP.

FABRICATED LAP JOINT STUB ENDS

DRAWN BY: WAYNE

CHECKED BY: BILL

21070-2-R