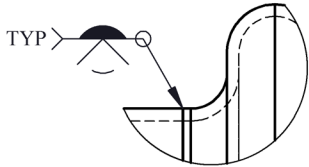
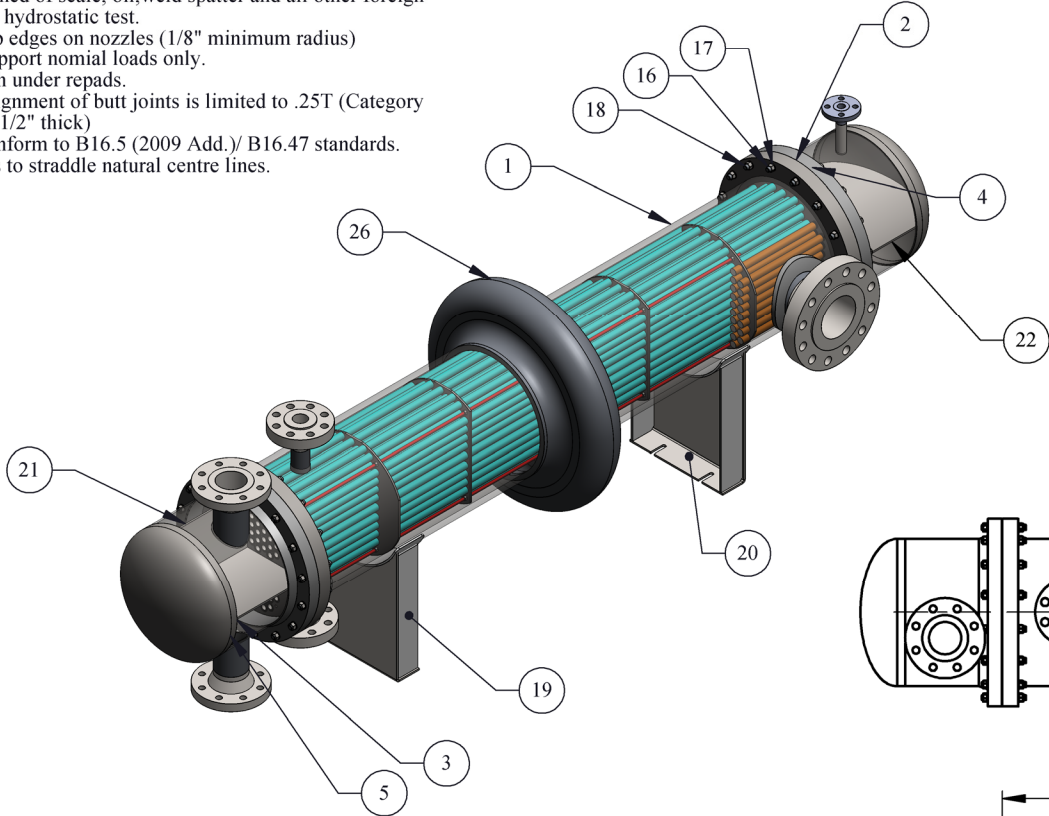
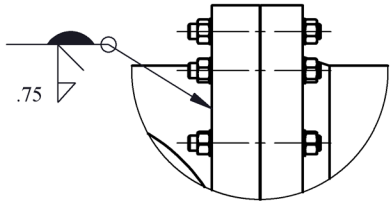


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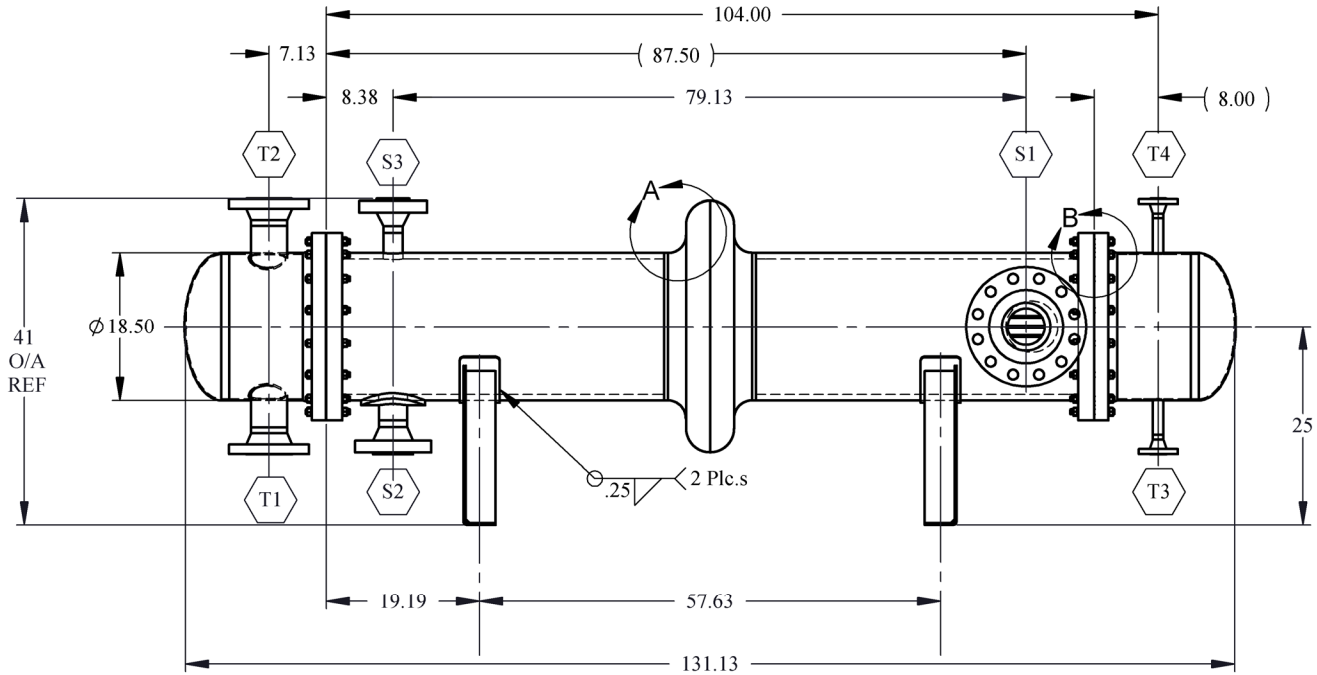
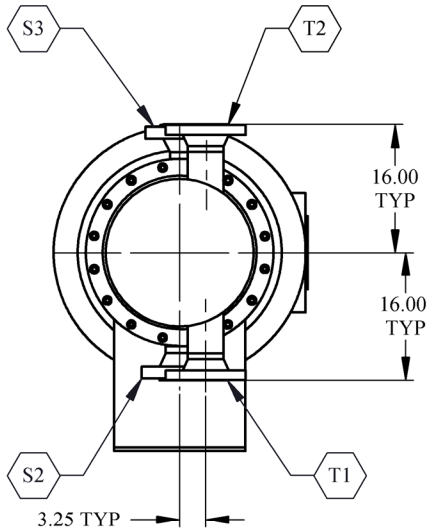
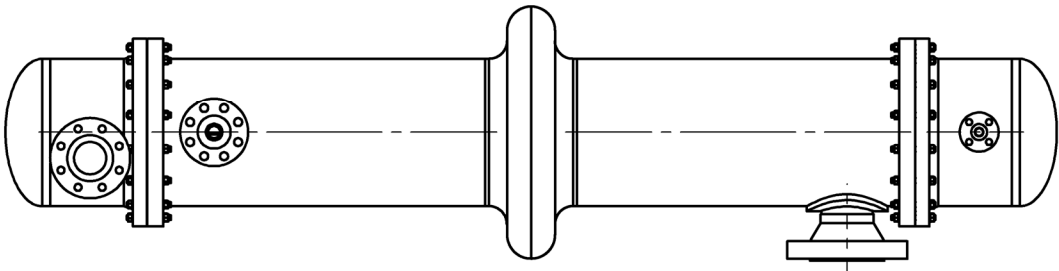
1. All dimensions in inches.
2. All welds shall be neat in appearance, free from slag and other defects.
3. Vessel to be cleaned of scale, oil, weld spatter and all other foreign material, prior to hydrostatic test.
4. Remove all sharp edges on nozzles (1/8" minimum radius)
5. All nozzles to support nominal loads only.
6. Grind welds flush under repads.
7. Maximum misalignment of butt joints is limited to .25T (Category A, B, C, D up to 1/2" thick)
8. All flanges to conform to B16.5 (2009 Add.)/ B16.47 standards.
9. Flange bolt holes to straddle natural centre lines.



DETAIL A
SCALE 1 : 12



DETAIL B
SCALE 1 : 8



NOZZLE SCHEDULE

NOZZLE					WELDS						FLANGES					BOM ITEM #
Mark	Size	Qty.	Sch	Service	Type	41	42	43	Int Proj	Ext Proj.	Type	CL	SB	F1	F2	
S1	6"	1	XXS	Steam In	UW-16.1 (q) mod	3/8"	1/2"	-		7.75"	RFWN	900	-	-	-	6, 10, 23
S2	3"	1	XXS	Cond. out	UW-16.1(q) mod	3/8"	1/2"	-		7.75"	RFWN	900	-	-	-	7, 13, 24
S3	2"	1	XXS	Vent	UW-16.1(c)	3/8"	-	-		7.75"	RFWN	900	-	-	-	8, 11
T1	4"	1	40	Inlet	UW-16.1(c)	1/4"	-	-		7.34"	RFWN	300	-	-	-	9, 12
T2	4"	1	40	Outlet	UW-16.1(c)	1/4"	-	-		7.34"	RFWN	300	-	-	-	9, 12
T3	1"	1	80	Drain	UW-16.1(c)	3/16"	-	-		7.75"	RFWN	300	-	-	-	27, 28
T4	1"	1	80	Vent	UW-16.1(c)	3/16"	-	-		7.75"	RFWN	300	-	-	-	27, 28

REVISIONS

REV.	REVISION HISTORY	DATE	DRW	CHK
0	Release	7/31/2012	JLL	LB

BILL OF MATERIALS

ITEM	QTY	DESCRIPTION	MATERIAL
1	1	Shell, 0.75 thk x 18.50 OD x 92.00 LG.	SA-516 Gr 70
2	2	Channel Flange, 18.13 ID x 23.50 OD	SA-105
3	1	Channel, 0.19 thk x 18.50 OD x 9.18 LG	SA-516 Gr 70
4	1	Channel, 0.19 thk x 18.50 OD x 9.18 LG	SA-516 Gr 70
5	2	2:1 S.E. Head, 0.19 thk x 18.50 OD x 1.00 S.F. (MAF= .168)	SA-516 Gr 70
6	1	Pipe - 6" Sch. XXS x 3.50 LG	SA-106-B
7	1	Pipe - 3" Sch. XXS x 4.50 LG	SA-106-B
8	1	Pipe - 2" Sch. XXS x 4.50 LG	SA-106-B
9	2	Pipe - 4" Sch. 40 x 5.75 LG	SA-106-B
10	1	RFWN Flange 6" CL. 900, Sch. XXS	SA-105
11	1	RFWN Flange 2" CL. 900, Sch. XXS	SA-105
12	2	RFWN Flange 4" CL. 300, Sch. 40	SA-105
13	1	RFWN Flange 3" CL. 900, Sch. XXS	SA-105
14	1	Gasket, Left - 0.13 thk (see detail)	Corrugated Metal
15	1	Gasket, Right - 0.13 thk (see detail)	Corrugated Metal
16	64	Nut, Hex, 5/8"-11 UNC, Heavy	SA-193 2H
17	64	Washer, Flat, Heavy - 5/8	Steel
18	32	Stud, 5/8" - 11 UNC x 5.50 LG	SA-193 B7
19	1	Left Saddle	See Assembly
20	1	Right Saddle	See Assembly
21	1	Right Partition, Cross Plates	SA-516 Gr 70
22	1	Left Partition, Horizontal Plate	SA-516 Gr 70
23	1	S1 Repad, 0.625 thk x 10.13 OD	SA-516 Gr 70
24	1	S2 Repad, 0.625 thk x 8.00 OD	SA-516 Gr 70
25	1	INTERNALS ASSEMBLY	See Assembly
26	1	Expansion Joint	SA-299 B
27	2	Pipe - Sch. 80, 1.00 NPS	SA-106 -B
28	2	RFWN Flange 1" CL. 300 Sch 80	SA-105

DESIGN DATA

Code	Design Code:	ASME VIII-1, 2010 ed, 2011 add	
	Seismic Code:	N/A	
	Wind Code:	N/A	
Design Conditions		SHELL	TUBE
	MAWP - Int / Ext:	1400 psi @ 650 °F	150 psi @ 650 °F
	MDMT:	-20 °F	
	Corrosion Allowance:	0.0625	0.0625 / 0 - Tubes
Examination	Impact Testing:	Exempt per UG-20(f)	
	Radiography:	RT1	
	PWHT:	None	
	Hydro Test:	1820 psi @ 70 °F	195 psi @ 70 °F
Service	Fluid:		
	Capacity:	7.88 cu.ft.	2.77 cu.ft. (Tubes)
	Weight - Empty:	4000 lbs	1200 lbs (Bundle)
	Weight - Operating:		



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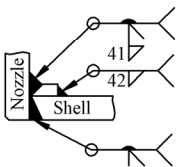


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Fax 519-880-9810

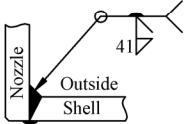
Hot Oil Heater - E101

Size B	Job ID PVE-4293	Drawing No. PVEdwg-4293-0.0 Heat Exchanger	Revision: 0
Scale 1:1	Material See BOM	Sheet 1 OF 7	

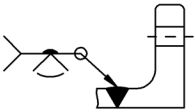
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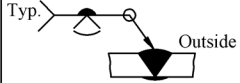
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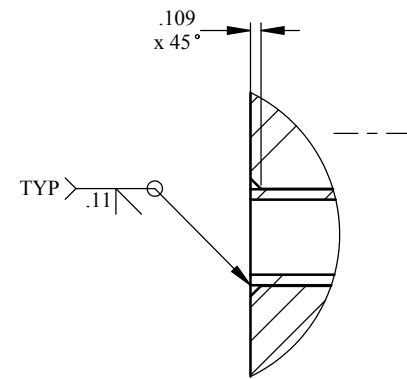
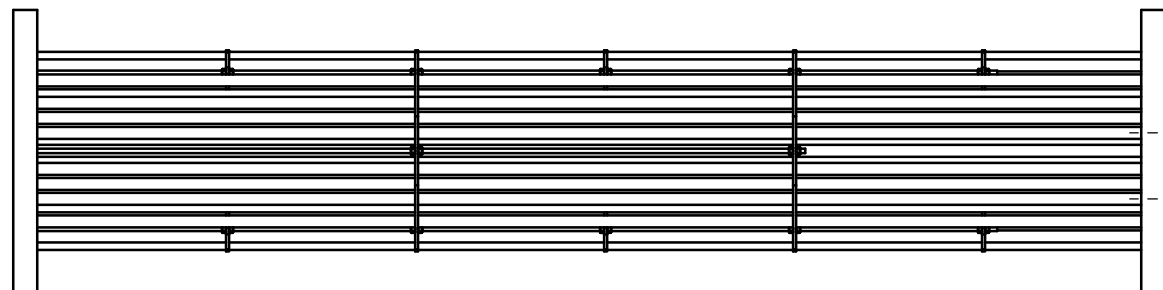
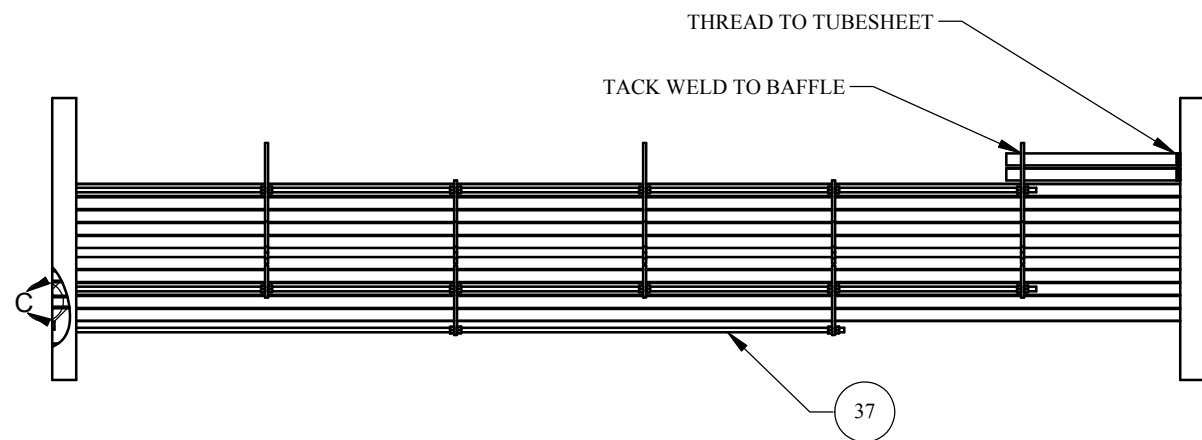
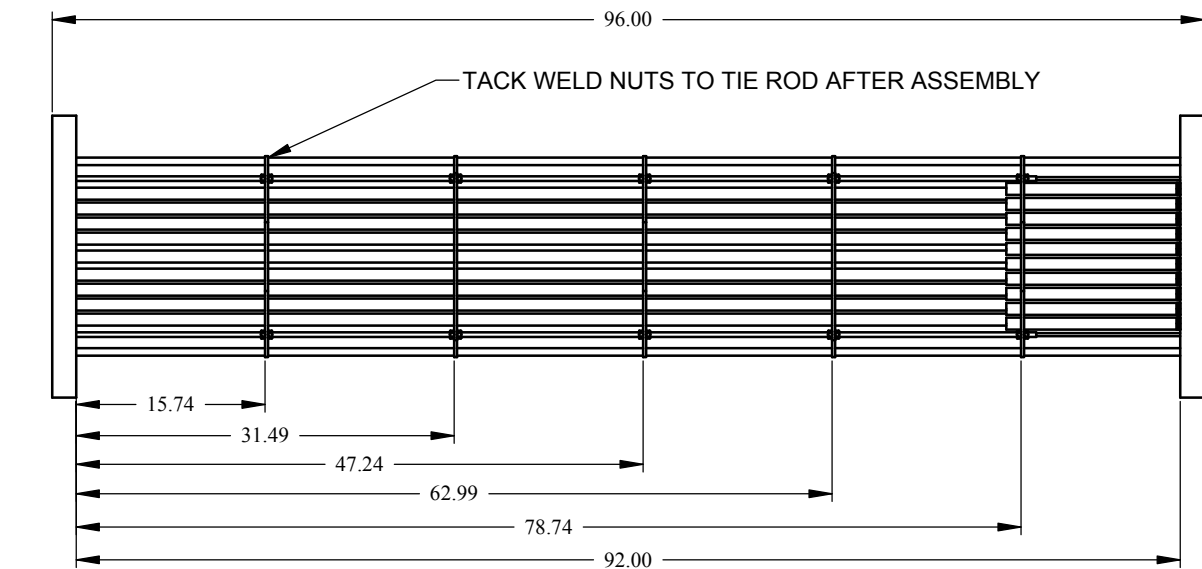
UW-16.1 (c)



Weld Neck Flange

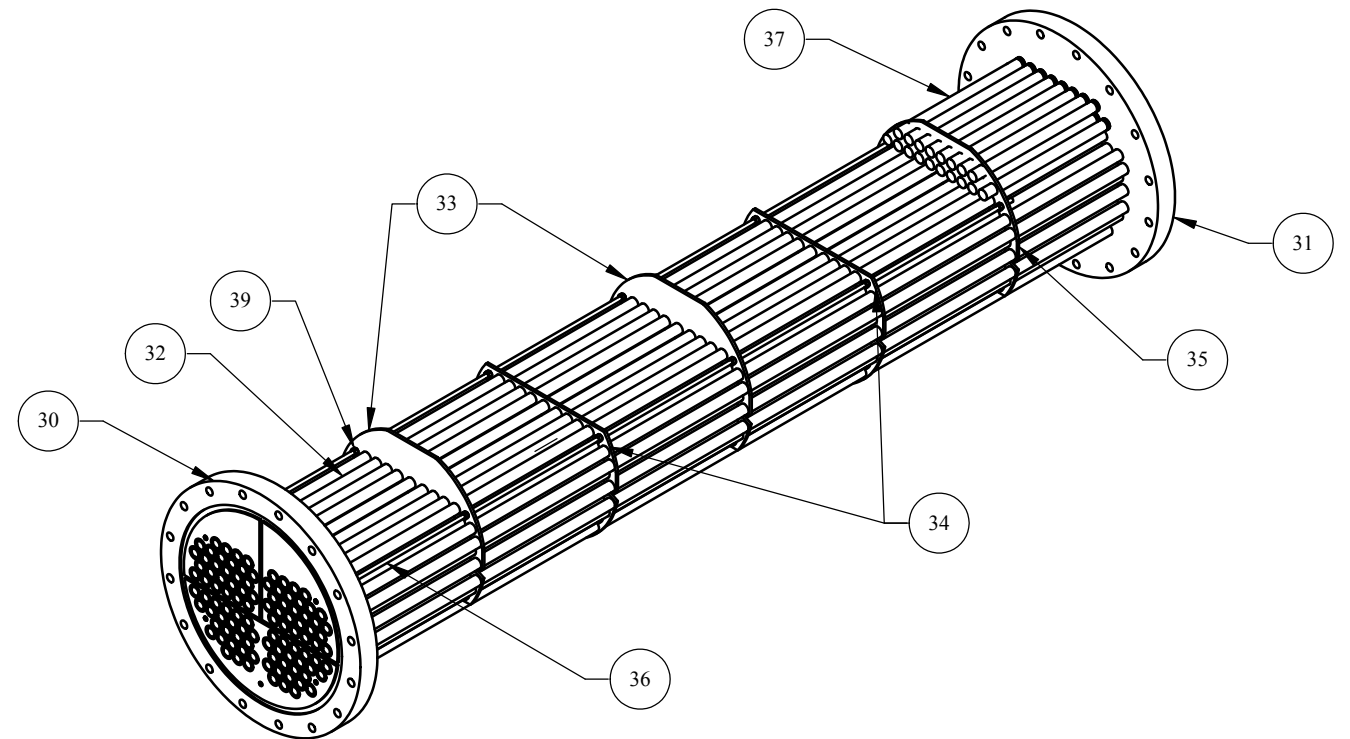


Typ. Circ. & Long Seam

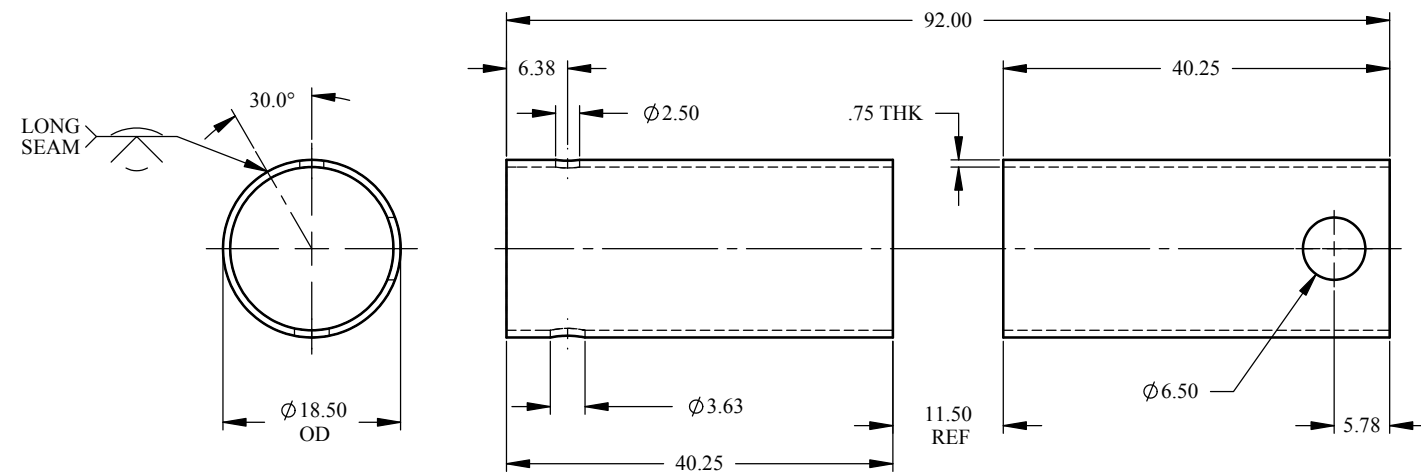


DETAIL C
SCALE 1 : 2

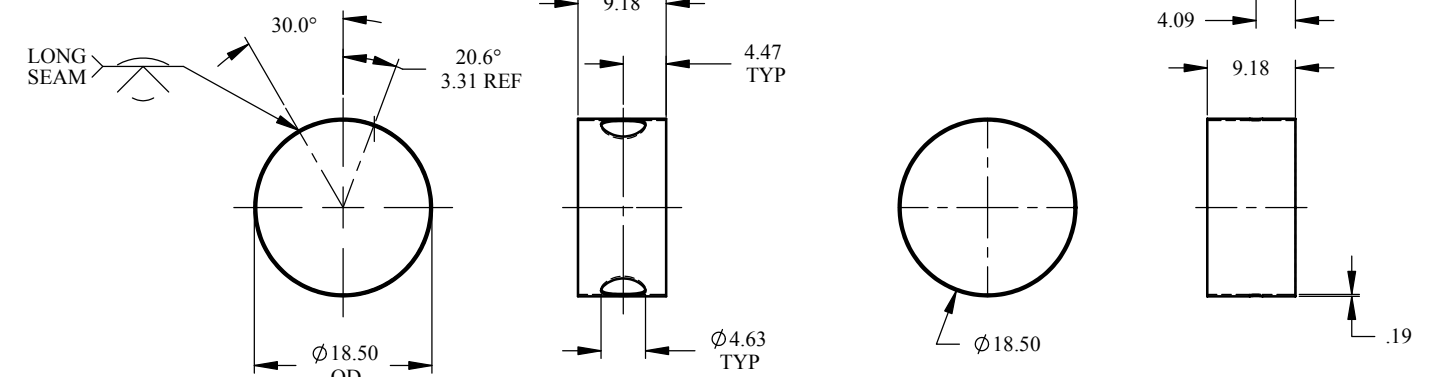
BILL OF MATERIALS			
ITEM	QTY	DESCRIPTION	MATERIAL
30	1	Left Tube Sheet, 2.00 thk x 23.50 OD	SA-516 Gr 70
31	1	Right Tube Sheet, 2.00 thk x 23.50 OD	SA-516 Gr 70
32	104	Tube, 1.000 x 0.11 THK x 96.00 Lg.	SA-178 Gr C
33	2	Baffle, 0.25 thk x 17.00 OD (SHAPED)	SA-516 Gr 70
34	2	Baffle, 0.25 thk x 17.00 OD (SHAPED)	SA-516 Gr 70
35	1	Baffle, 0.25 thk x 17.00 OD (SHAPED)	SA-516 Gr 70
36	4	Threaded Rod, 0.38 x 82.00 LG	SA-36
37	1	Threaded Rod, 0.38 x 66.00 LG	SA-36
38	18	Impingement Rod, 1.00 x 15.25 LG	SA-36
39	44	Nut, Hex - 3/8"-16 UNC	SA-193 2H
40	6	Dummy Tube, 1.000 x 0.11 THK	SA-178 Gr C



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		Pressure Vessel Engineering, Ltd. 120 Randall Drive, Suite B Waterloo, Ontario, Canada N2V 1C6	www.pveng.com info@pveng.com Tel. 519-880-9808 Fax 519-880-9810	
Title				
Internals Assembly				
Size B	Job ID PVE-4293	Drawing No. PVEdwg-4293-0.0 Heat Exchanger		Revision: 0
Scale 1:1	Material SEE BOM		Sheet 2 OF 7	
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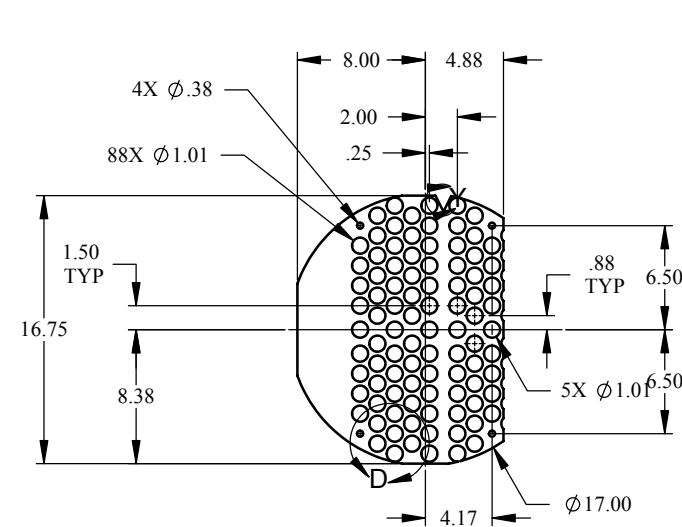
SHELL



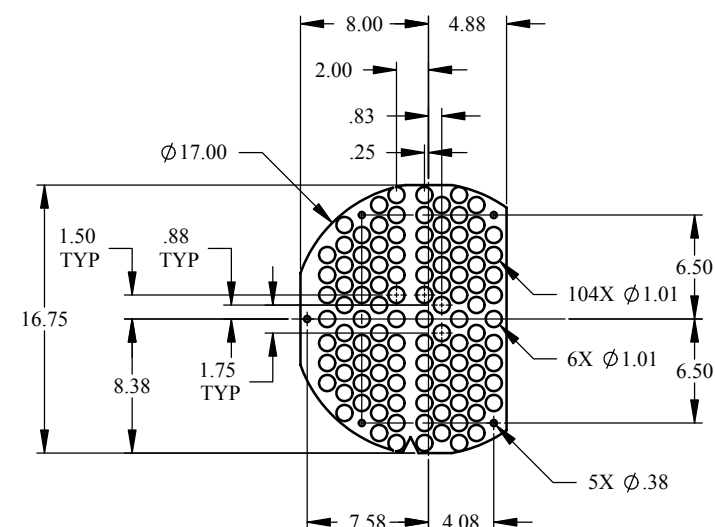
LEFT

RIGHT

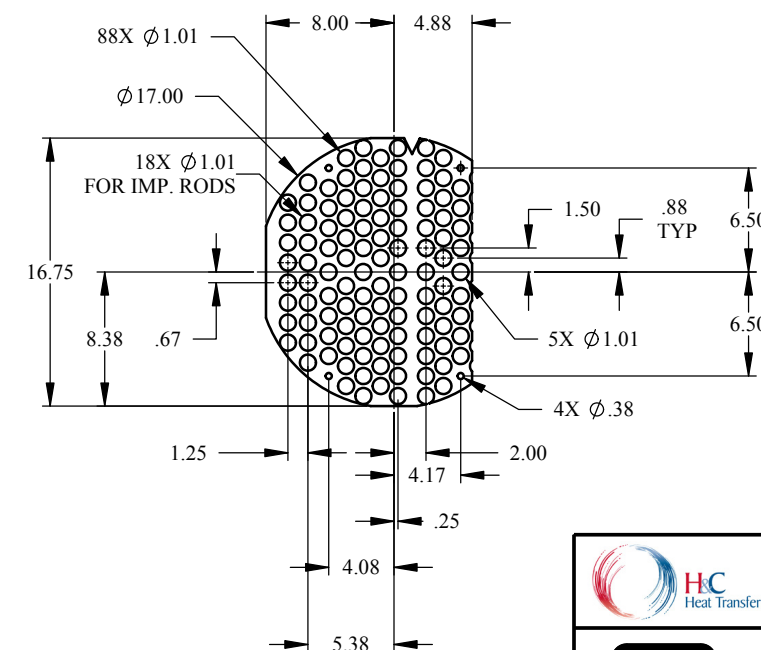
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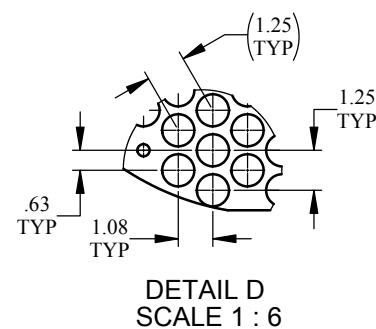
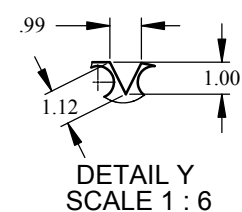
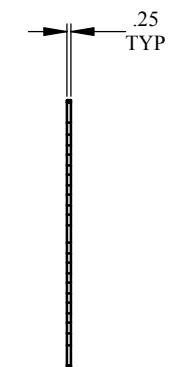
ITEM 33



ITEM 34



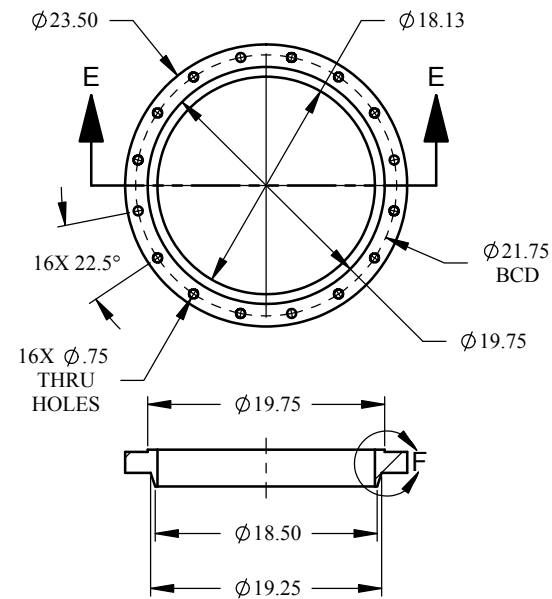
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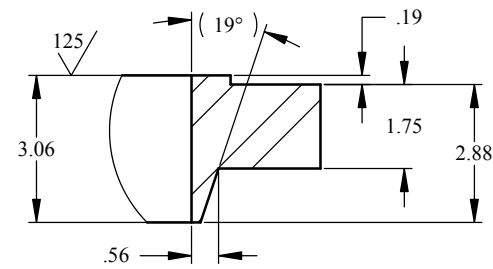
DETAIL D
SCALE 1 : 6

BAFFLES

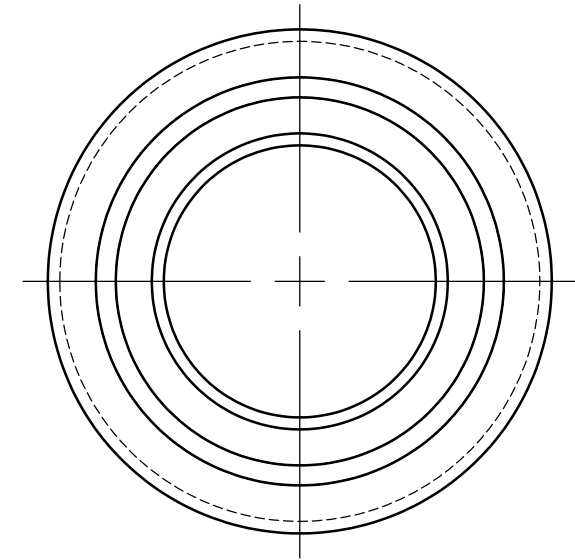
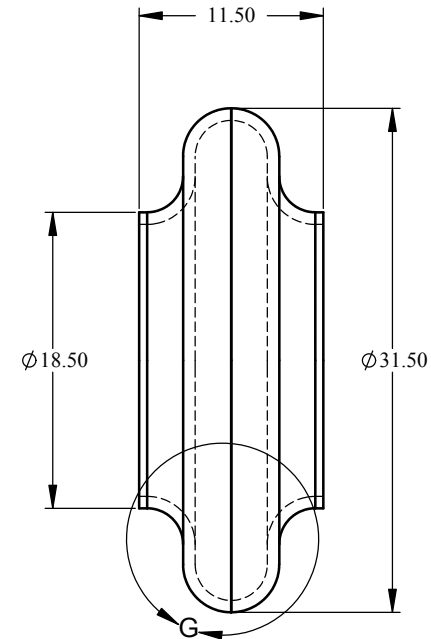
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Title			
Part Details			
Size B	Job ID PVE-4293	Drawing No. PVEdwg-4293-0.0 Heat Exchanger	Revision: 0
Scale 1:32	Material SEE BOM	Sheet 3 OF 7	
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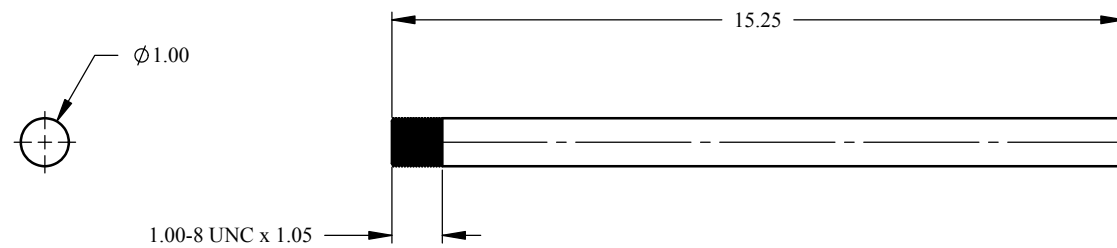
SECTION E-E
SCALE 1 : 16



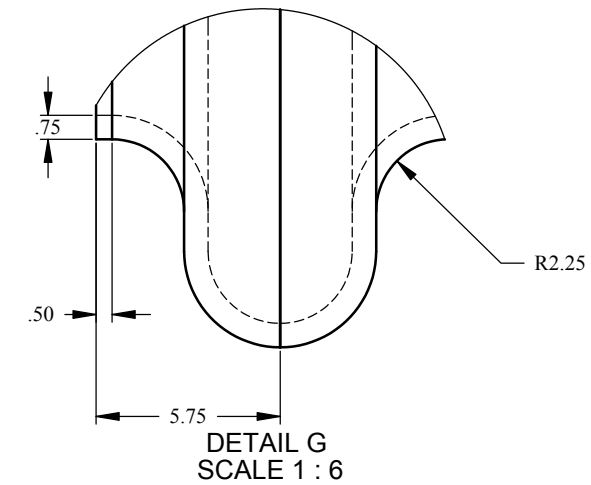
DETAIL F
SCALE 1 : 4



CHANNEL FLANGE

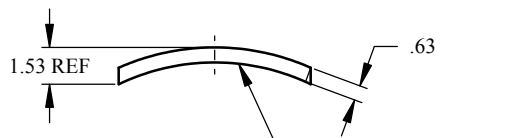


IMPINGEMENT ROD

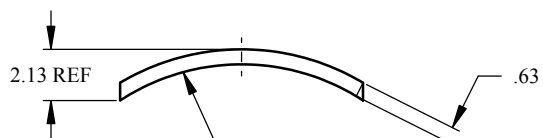
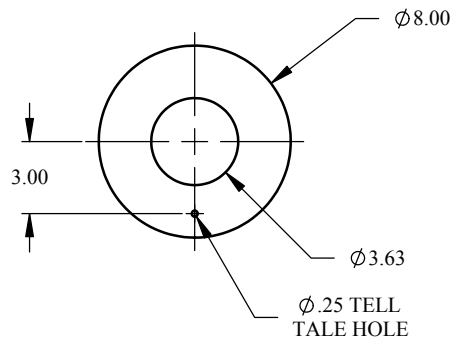


EXPANSION JOINT

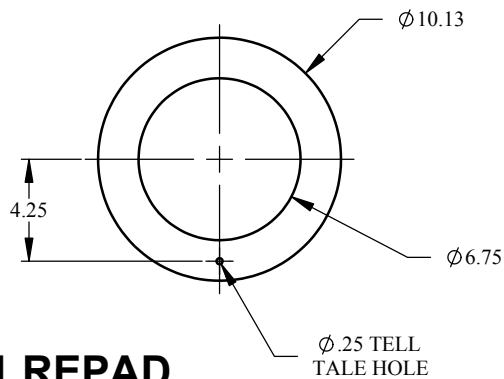
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Title			
Part Details			
Size B	Job ID PVE-4293	Drawing No. PVEdwg-4293-0.0 Heat Exchanger	Revision: 0
Scale 1:32	Material SEE BOM	Sheet 4 OF 7	
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ROLLED TO R9.25
INSIDE

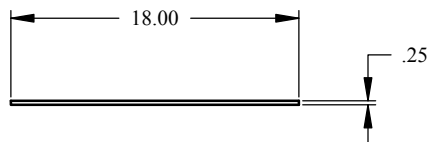
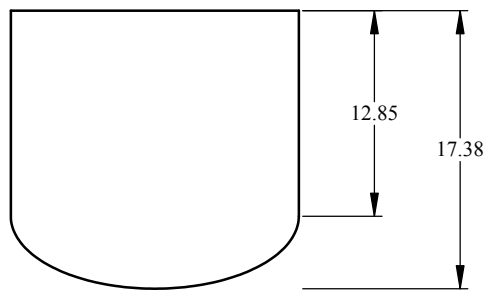


ROLLED TO R9.25
INSIDE

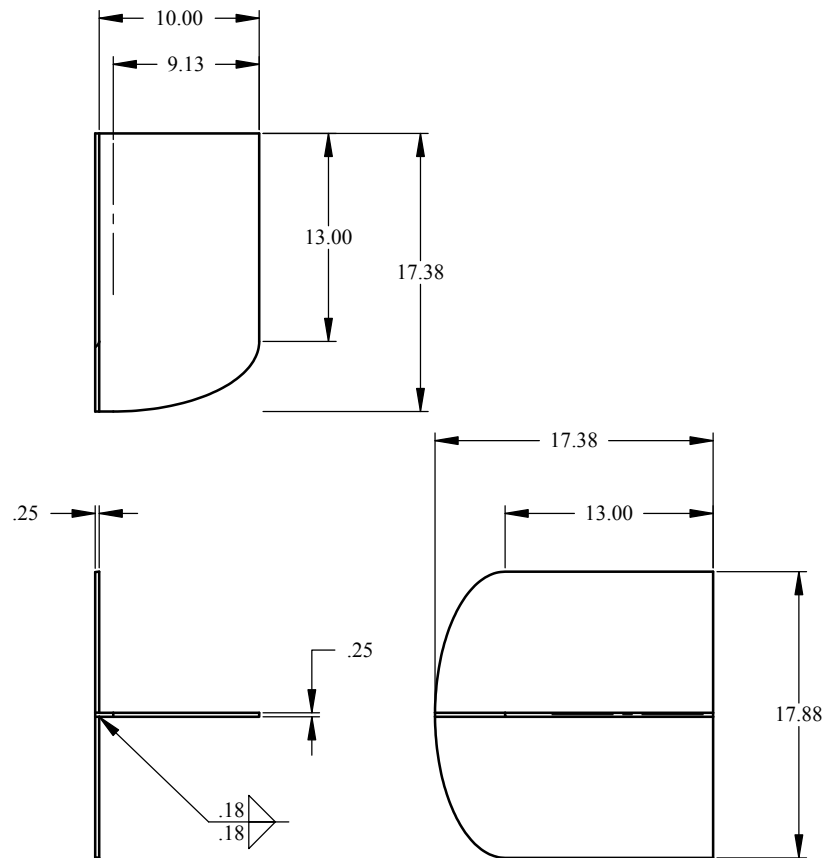


S2 REPAD

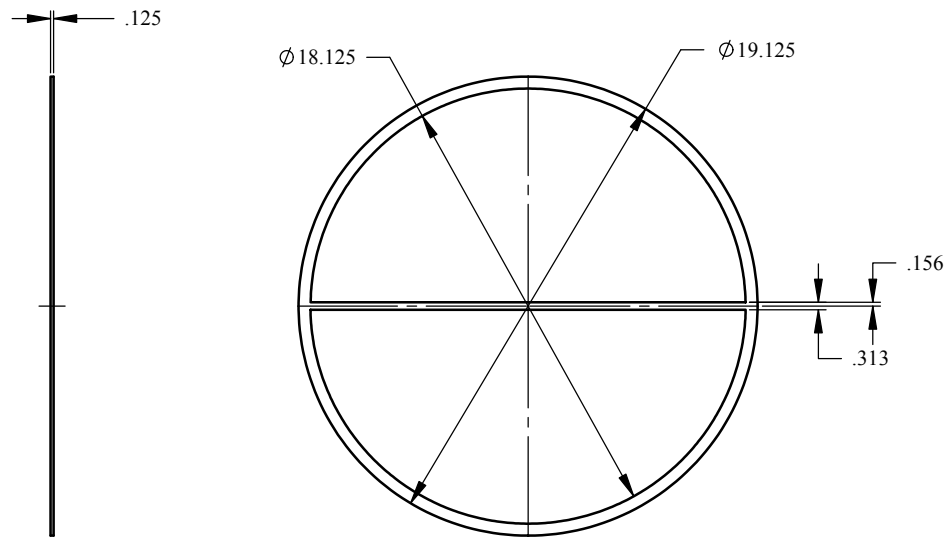
S1 REPAD



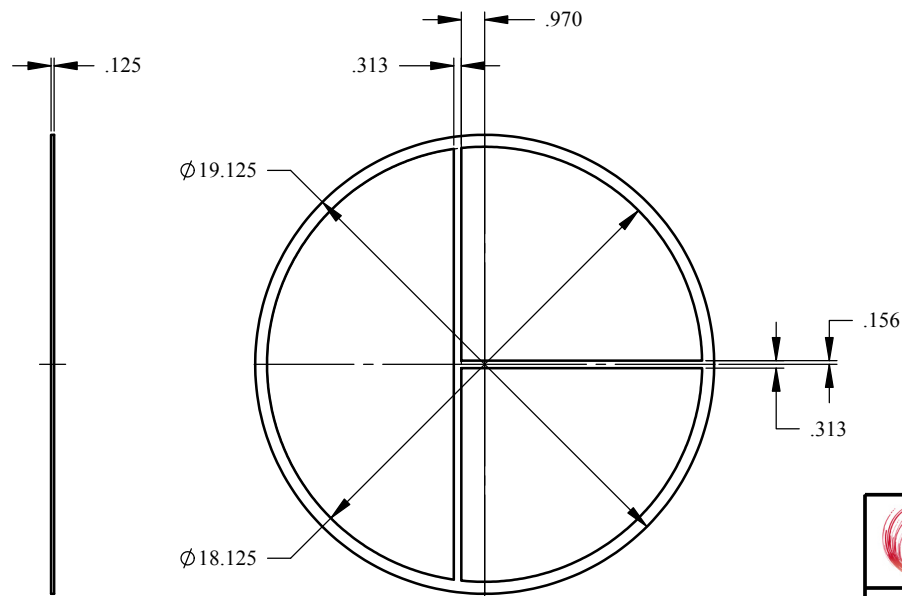
RIGHT PARTITION



LEFT PARTITION



GASKET, RIGHT



GASKET, LEFT

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Part Details					
Size B	Job ID PVE-4293	Drawing No. PVEdwg-4293-0.0 Heat Exchanger		Revision: 0	
Scale 1:32	Material SEE BOM			Sheet 5 OF 7	
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BILL OF MATERIALS

ITEM	QTY	DESCRIPTION	MATERIAL
40	1	Saddle Plate, 0.25 thk x 5.00 (Rolled)	SA-36
41	2	Saddle Rib, 0.25 thk x 3.75 x 18.94 LG	SA-36
42	1	Left Saddle Support, 0.25 thk x 16.40 x 20.00 (Formed)	SA-36

LEFT SADDLE

BILL OF MATERIALS

ITEM	QTY	DESCRIPTION	MATERIAL
40	1	Saddle Plate, 0.25 thk x 5.00 (Rolled)	SA-36
41	2	Saddle Rib, 0.25 thk x 3.75 x 18.94 LG	SA-36
43	1	Right Saddle Support, 0.25 thk x 16.40 x 20.00 (Formed)	SA-36

RIGHT SADDLE



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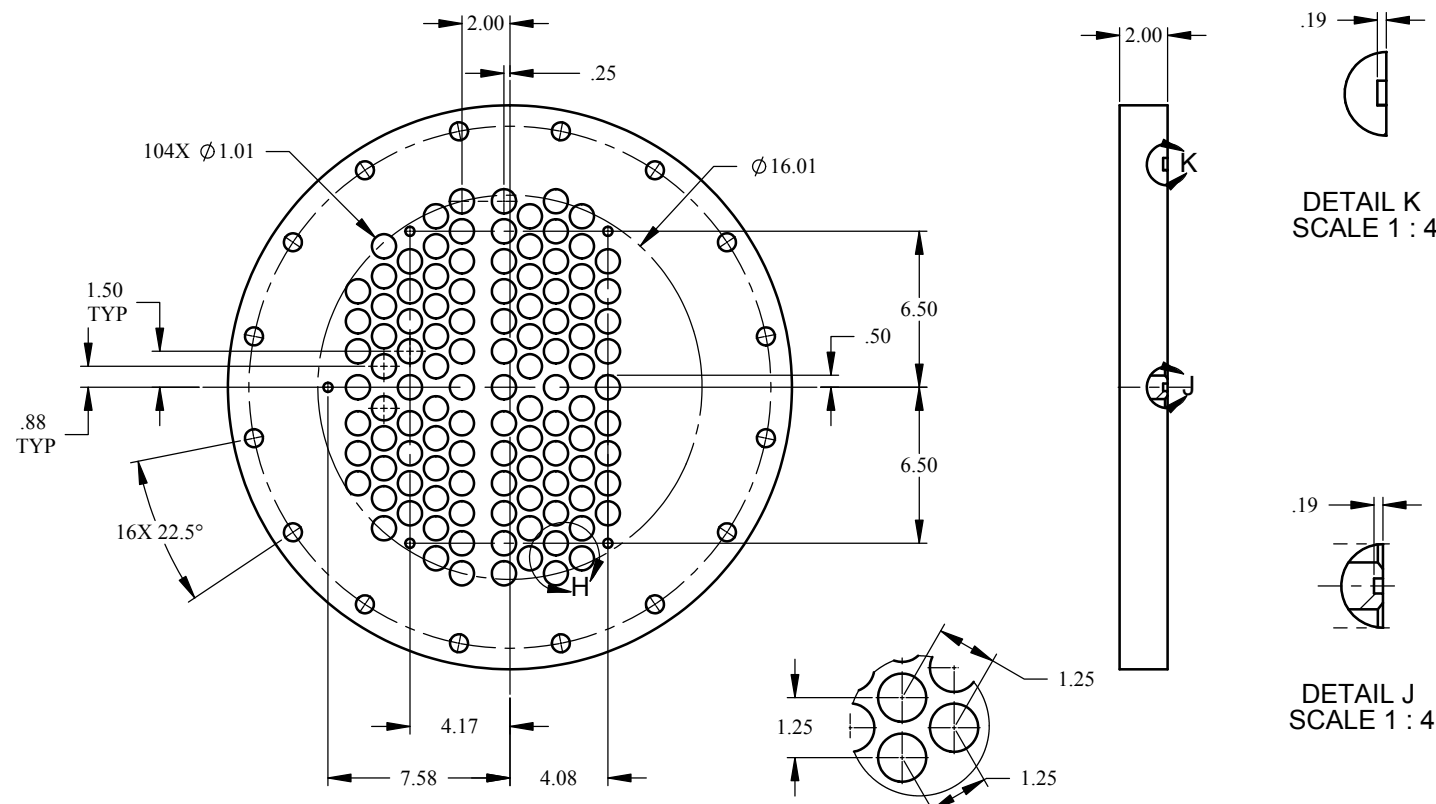
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Title

Saddle Assemblies

Size B	Job ID PVE-4293	Drawing No. PVEdwg-4293-0.0 Heat Exchanger	Revision: 0
Scale 1:32	Material SEE BOM	Sheet 6 OF 7	

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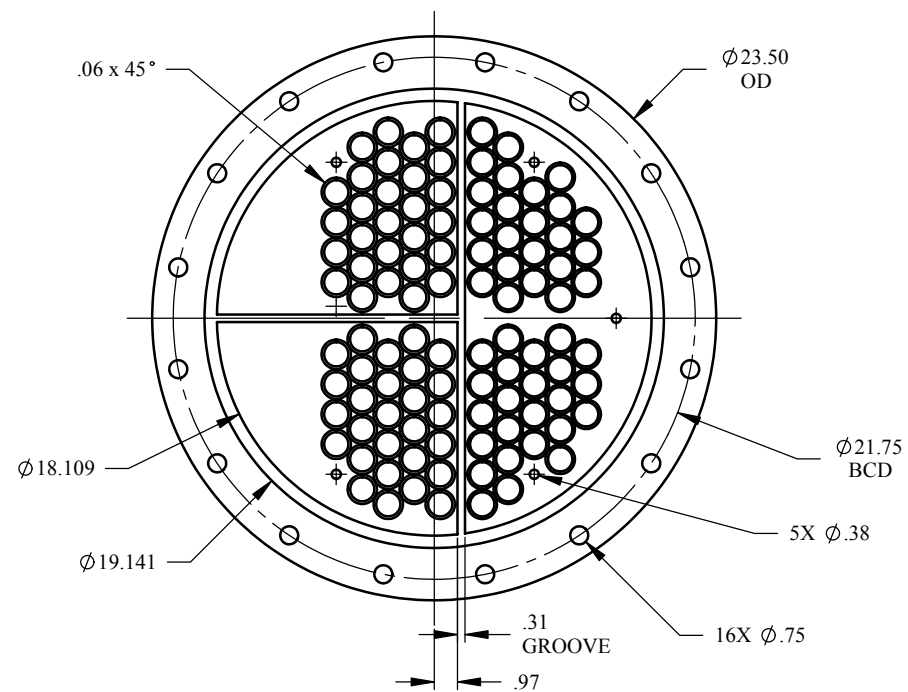
LEFT TUBESHEET

FRONT VIEW

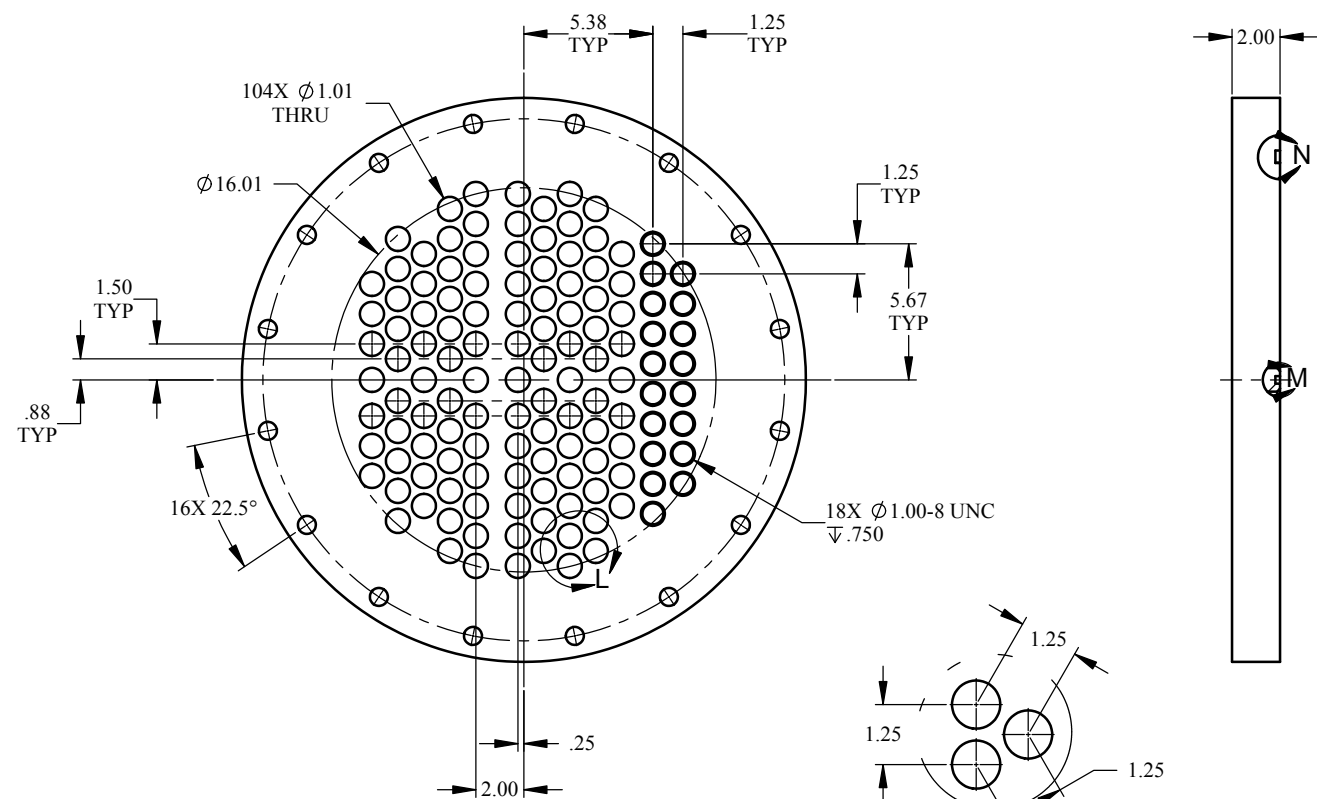
**DETAIL H
SCALE 1 : 4**

**DETAIL K
SCALE 1 : 4**

**DETAIL J
SCALE 1 : 4**



REAR VIEW



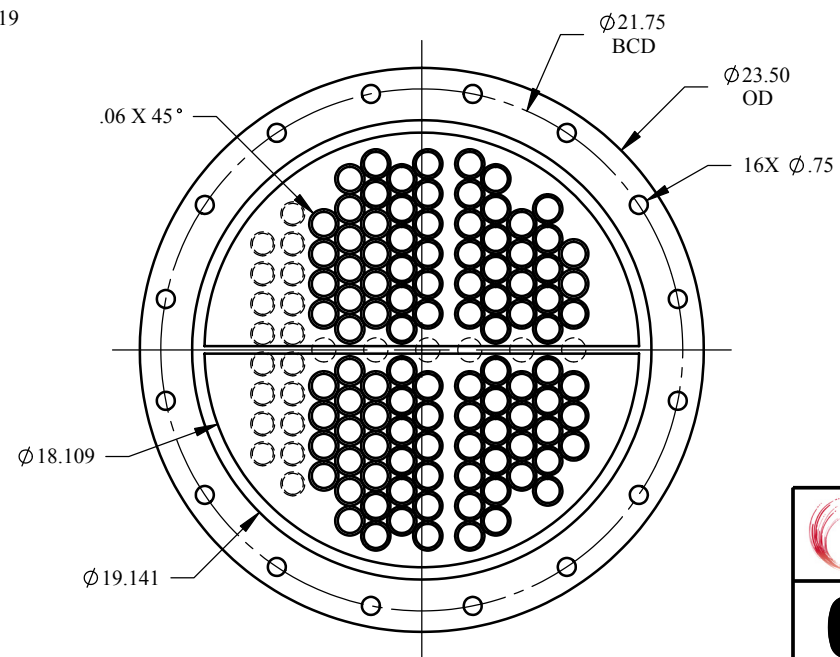
RIGHT TUBESHEET

FRONT VIEW

**DETAIL L
SCALE 1 : 4**

**DETAIL N
SCALE 1 : 4**

**DETAIL M
SCALE 1 : 4**



REAR VIEW

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Title					
Tubesheets					
Size B		Job ID PVE-4293		Drawing No. PVEdwg-4293-0.0 Heat Exchanger	
Scale 1:32		Material SEE BOM		Revision: 0	
Sheet 7 OF 7					
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