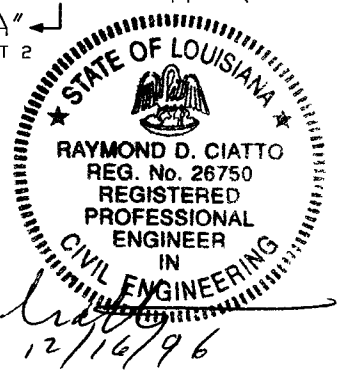
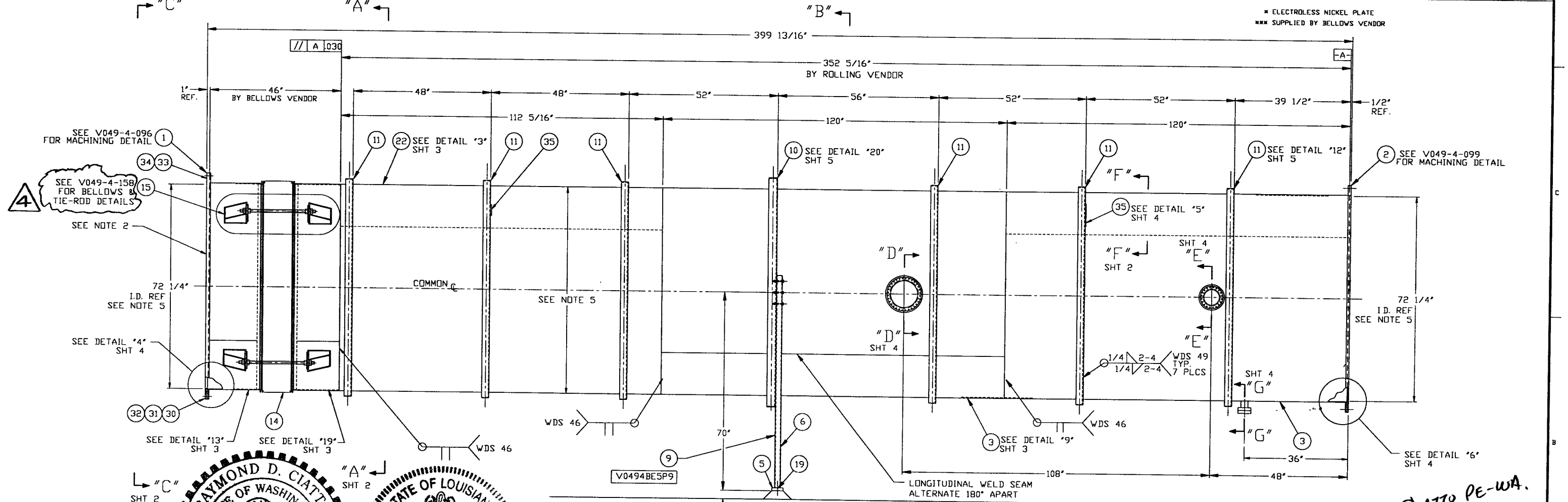


ITEM	PART NUMBER	SUFFIX	QTY	UM	DESCRIPTION
37	V049M314	3	1	EA	HALF NIPPLE, SST, 304L, CONFLAT, 4 1/2" O.D.
38	202557	3	1	EA	FLANGE, CONFLAT, BLANK, 4 1/2" OD
39	202558	3	1	EA	GASKET, COP COFH, CONFLAT, 4 1/2" OD
40	V049M776		8	EA	BOLT, 18-8 SST, HEX HD, 5/16-18 x 2 1/4 LG
41	V049M782		60	EA	NUT, SILICON BRZ, HEX 5/16-18
42	V049M785		120	EA	WASHER, FLAT, 5/16, 18-8 SST.

ITEM	PART NUMBER	SUFFIX	QTY	UM	DESCRIPTION
25	202549	3	1	EA	FLANGE, CONFLAT, BLANK, 12" OD, 304L SST
26	V049M777		20	EA	BOLT, HEX HD, 5/16-18 x 2 1/2" LG, 18-8 SST
27	V049M779		32	EA	BOLT, HEX HD, 5/16-18 x 3" LG, 18-8 SST
28	V049M263		3	EA	GASKET, COFH, CONFLAT, 8" OD
29	202552		3	EA	GASKET, COFH, CONFLAT, 12" OD
30	202678		3	EA	BOLT, SA193 B7, HEX, 7/8"-9 UNC X 4" LG.
31	202679		3	EA	NUT, SA194 2H, HEX, 7/8"-9 UNC
32	202581		3	EA	WASHER, STL, 1 3/4" OD X 15/16" ID X 1/4" THK.
33	V049M020		1	EA	O-RING, VITON, (PER SPEC V049-2-045)
34	V049M021		1	EA	O-RING, VITON, (PER SPEC V049-2-045)
35	V049M852		3	EA	BAR, 4" X 3/8" THK 304 SST
36					

ITEM	PART NUMBER	SUFFIX	QTY	UM	DESCRIPTION
13	V049M313	3	1	EA	HALF NIPPLE, SST, 304L, CONFLAT 8" O.D.
14	V0494BE5P1		1	EA	BELLOWS ASSY (PER SPEC V049-2-017)
15	***		4	EA	TIE-ROD ASSY (PER DWG V049-4-158)
16					
17	V049M753		3	EA	BOLT, 5/8-11 UNC X 3 1/2" LG, A325
18	V049M755		3	EA	NUT, 5/8-11 UNC, A325
19	***		3	EA	ANCHOR HILTI HVA 1"x8 1/4" EMBEDMENT
20	V049M773		3	EA	WASHER, L DCK, 5/8 A325
21					
22	V0494BE5P22		1	EA	SHELL, 304/304L SST, 1/4" THK
23	V0494061		1	EA	3/4" OD ELBOW X 2 3/4" O.D. CONFLAT FLANGE
24	V049M262		3	EA	FLANGE, CONFLAT, BLANK, 8" OD, 304L SST

ITEM	PART NUMBER	SUFFIX	QTY	UM	DESCRIPTION
1	V0494096		1	EA	FLANGE, GROOVED, 72 1/4" ID X 80" OD
2	V0494099		1	EA	FLANGE, FLAT FACED, 72 1/4" ID X 80" OD
3	V0494BE5P3		2	EA	SHELL, 304/304L SST, 1/4" THK
4	V049M921		1	EA	RING, SST 304, 11" ID x 16" O.D. x 1/2" THK
5			1	EA	BAR, A36, 6" X 1 3/8" THK
6			1	EA	TUBE STEEL (TS) 4" X 2" X 3/16" A500 GR B
7	V049M985		1	EA	RING, SST 304, 7" I.D. x 11" O.D. x 1/2" THK.
8					
9	V0494BE5P9		2	EA	SUPPORT ASSY.
10	V049M814		1	EA	SUPPORT RING, ANGLE, 4" X 4" X 1/4" 304 SST
11	V049M813		1	EA	SUPPORT RING, ANGLE, 2 1/2" X 2 1/2" X 1/4" 304 SST
12	V049M310		3	EA	HALF NIPPLE, SST, 304L, CONFLAT 12" O.D.



- 16. CONFLAT FLANGES ARE TO HAVE PROTECTIVE COVERS AT ALL TIMES DURING & AFTER MANUFACTURING.
- 15. STRUCTURAL STEEL FABRICATION TO BE IN ACCORDANCE WITH SPEC. V049-2-039.
- 14. EACH SHELL ASSEMBLY SET IS TO HAVE EACH OF THE PIECES MARKED WITH THE SAME SET NO. THE NUMBER IS TO BE MADE FROM THE DRAWING NO. PLUS A SEQUENTIAL NO, V0494BE5-A, B ETC.
- 13. PLATES PRIOR TO ROLLING MUST HAVE DIAGONAL CORNER TO CORNER DIMENSIONS WITHIN 1/16" OF EACH OTHER.
- 12. MACHINING & ROLLING PER SPEC V049-2-136.

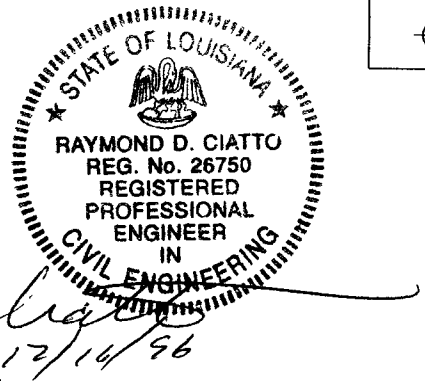
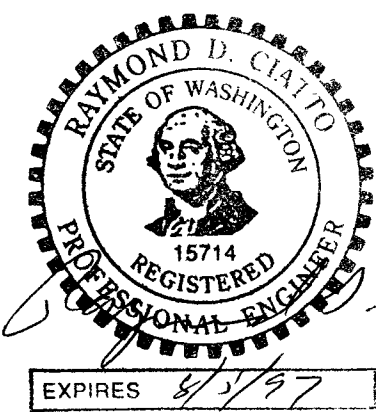
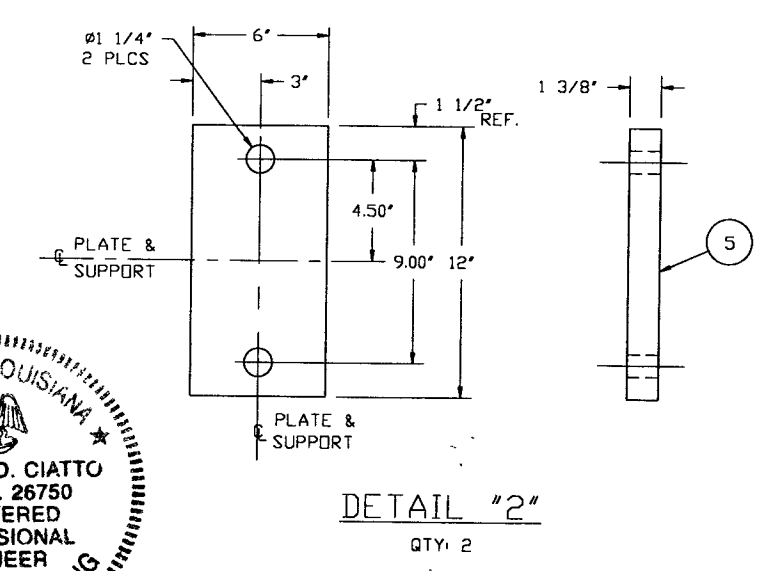
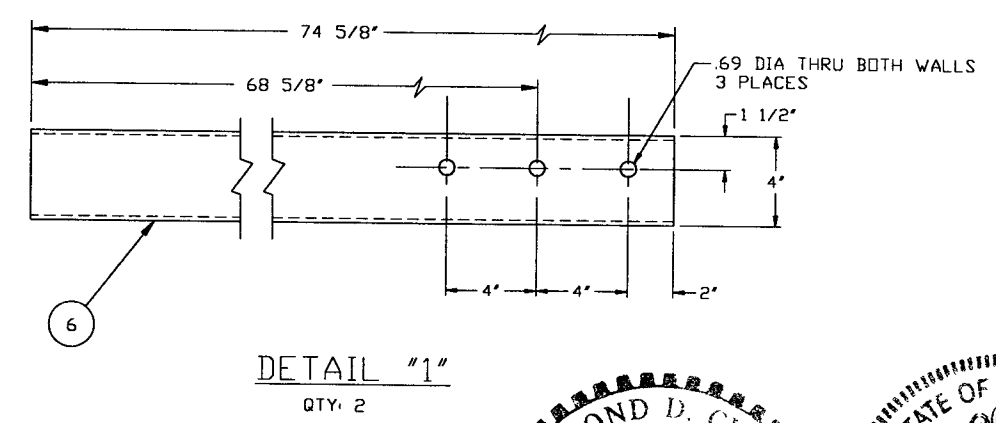
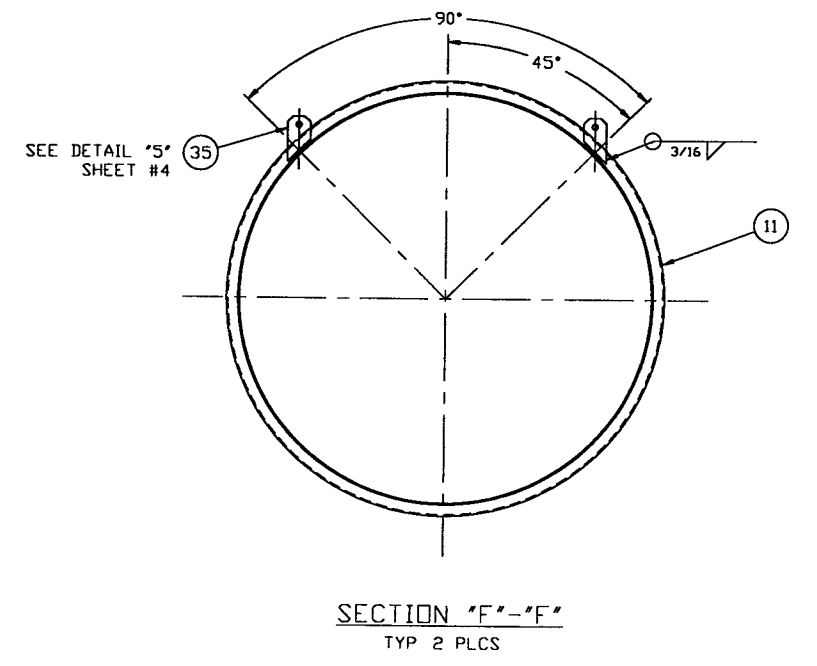
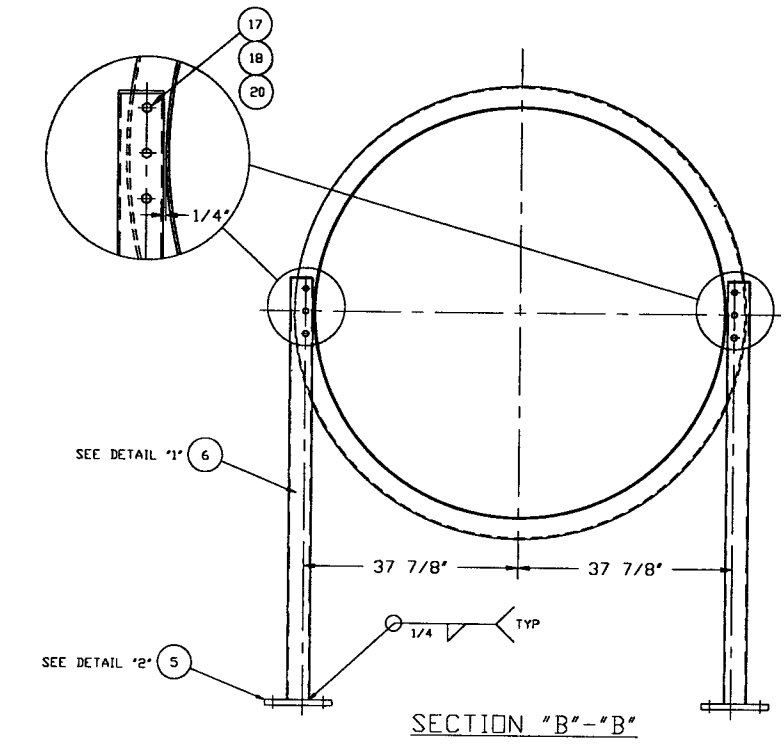
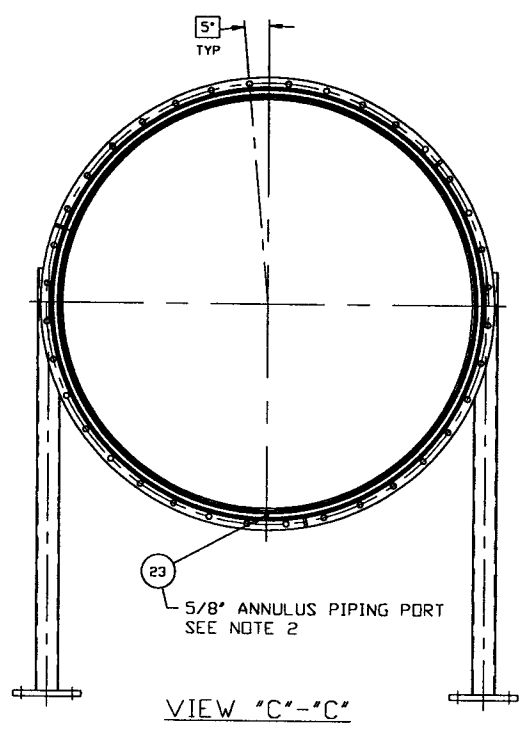
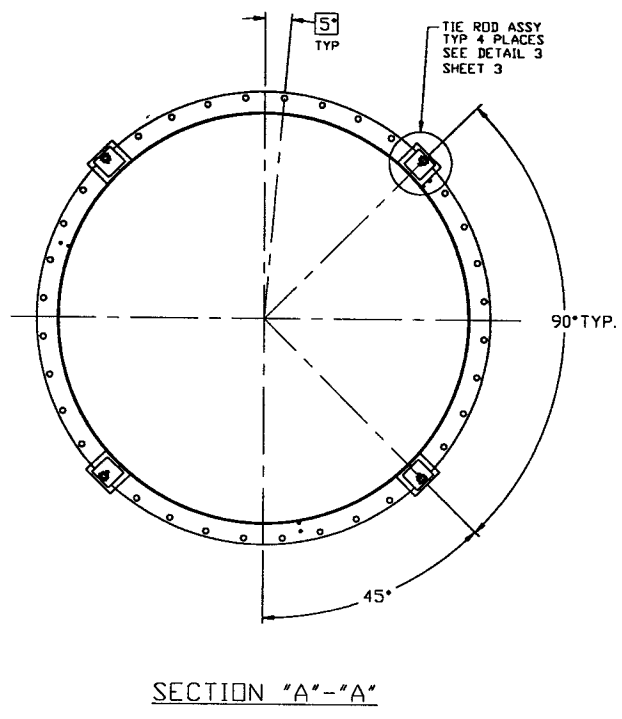
NOTES:

- 11. TIGHTEN TIE-ROD NUTS WITH BELLOWS IN 'FREE' POSITION TO 100 FT-LBS PRIOR TO LEAK TEST.
- 10. LEAK TEST & METHOD PER PSI SPEC: V049-2-014
- 9. CERTIFIED MANUFACTURER'S MATERIAL TEST REPORTS REQUIRED, AS NOTED.
- 8. BOLT HOLES OF ALL FLANGES TO STRADDLE VERTICAL CENTERLINE ±0.015.
- 7. CLEAN PER SPEC: V049-2-015
- 6. DO NOT USE CARBON STEEL BRUSHES OR BRUSHES CONTAMINATED WITH CARBON STEEL ON STAINLESS OR ALUMINUM MATERIAL.
- 5. THE CENTERLINES OF ALL SHELLS & FLANGES ARE TO LIE ON THE COMMON CENTERLINE WITHIN ±1/16"
- 4. SPOOL FABRICATION TO BE IN ACCORDANCE WITH SPEC. V049-2-097.
- 3. FOR FLANGE DETAILS SEE DWGS. V040-4-096 & V049-4-099
- 2. THIS FLANGE INCLUDES AN ANNULAR CHANNEL BETWEEN O-RINGS, MANIFOLD TO A SINGLE PUMPOUT PORT ON EACH CHAMBER, SEE DWG V049-4-061.
- 1. THE ROLLING VENDOR IS RESPONSIBLE FOR PRODUCING SHELL ASSEMBLY SETS WHICH STACK UP TO THE OVERALL DIMENSIONS NOTED AS 'BY ROLLING VENDOR'. APPROX. WEIGHT: 8247#

RAYMOND D. CIATTO PE-WA.

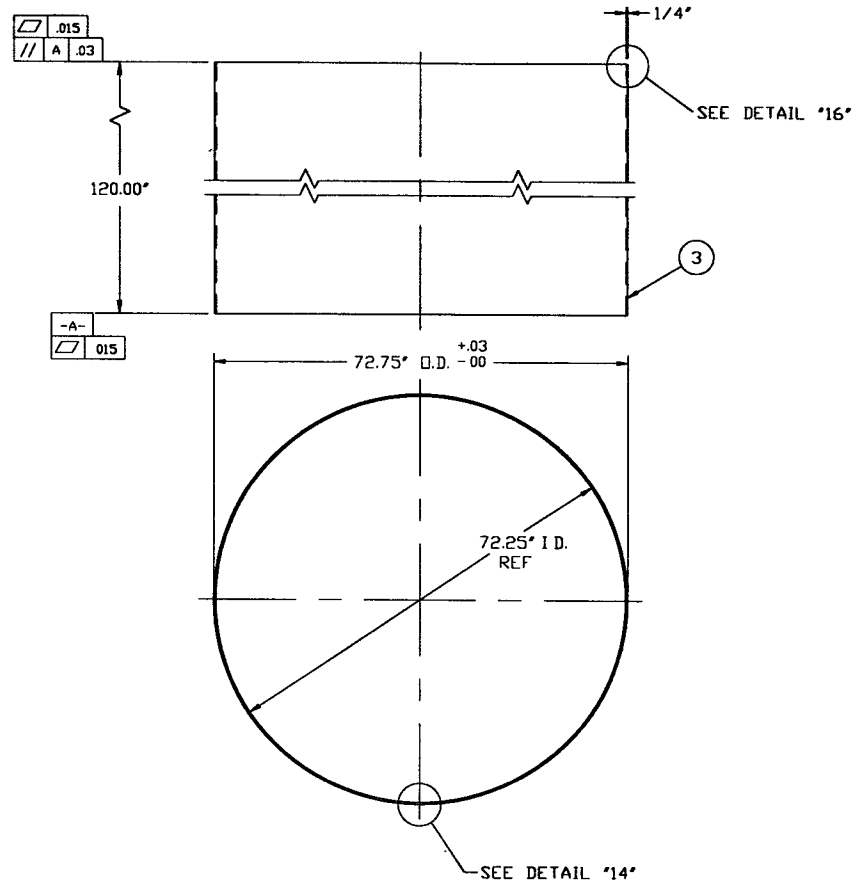
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PROPRIETARY AND CONFIDENTIAL				SYMBOL		CHARACTERISTIC		UNLESS OTHERWISE SPECIFIED		DIMENSIONS ARE IN INCHES		TOLERANCES		FRAC TIONAL ± .1		ANGULAR ± 30° BEND ± 2°		TWO PLACE DECIMAL ± .03		THREE PLACE DECIMAL ± .015		FINISHED SURFACE RMS		BREAK CORNERS IN		REMOVE ALL BURRS			
THIS DOCUMENT CONTAINS PROPRIETARY INFORMATION BELONGING TO PROCESS SYSTEMS INTERNATIONAL, INC. OR ITS AFFILIATES AND SHALL BE USED FOR THE PURPOSE FOR WHICH SUPPLIED. IT SHALL NOT BE REPRODUCED OR OTHERWISE USED, NOR SHALL SUCH INFORMATION BE FURNISHED IN WHOLE OR IN PART TO OTHERS EXCEPT IN ACCORDANCE WITH THE TERMS OF ANY AGREEMENT UNDER WHICH IT WAS SUPPLIED OR WITH THE PRIOR WRITTEN CONSENT OF PROCESS SYSTEMS INTERNATIONAL, INC. AND SHALL BE RETURNED UPON REQUEST.				DO NOT SCALE THIS DRAWING		USED ON:		NEXT ASS'Y:		ISSUED FOR FABRICATION		DESIGN UPDATE/SHELL ONLY		FABRICATION (SHELL ONLY)		DESIGN UPDATE/FABRICATION (BELLOWS ASSY. ONLY)		ISSUED FOR FDR		REV		DESCRIPTION		ISSUE DESCRIPTION		REV			
DWG. NO.	DESCRIPTION	DWG. NO.	DESCRIPTION	4	3	2	1	4	3	2	1	GS	RDC	REC	PV	11/22/96	0180	GS	RDC	REC	DA	10/1/96	0283	GS	RDC	REC	HA	04/29/96	0146
REFERENCE DRAWINGS				DWG. NO.		DESCRIPTION		DWG. NO.		DESCRIPTION		DWG. NO.		DESCRIPTION		DWG. NO.		DESCRIPTION		DWG. NO.		DESCRIPTION		DWG. NO.		DESCRIPTION			
SCALE 3/4" = 1'-0"				SHEET		1 OF 5		PROCESS SYSTEMS INTERNATIONAL, INC.		20 WALKUP DR. WESTBOROUGH, MASSACHUSETTS 01581 USA		SPOOL BE-5		72.25" ID x 72.25" ID		LIGO VACUUM EQUIPMENT		CAB FILE		V0494BE5/4BE5S1		DWG. NO.		V049-4-BE5		REV		4	

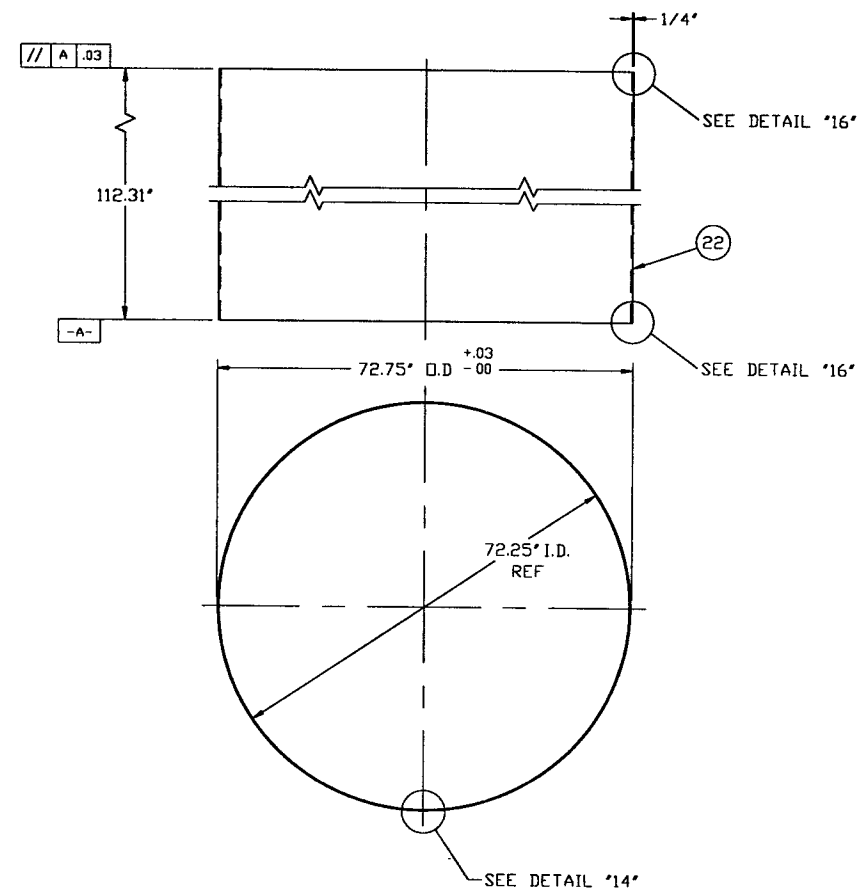


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SCALE 1/16 & 1/4	SHEET 2 OF 5		

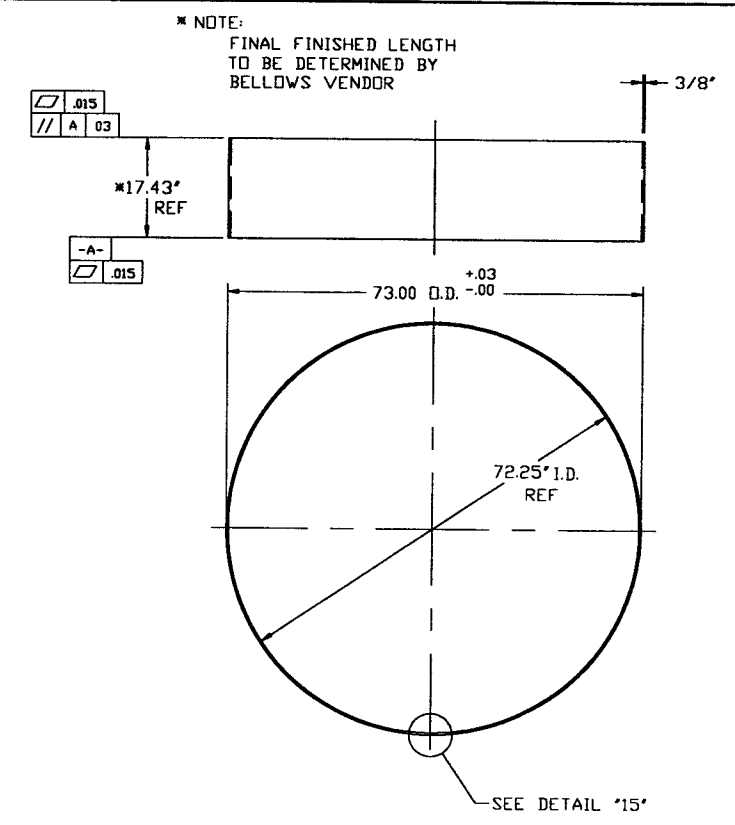
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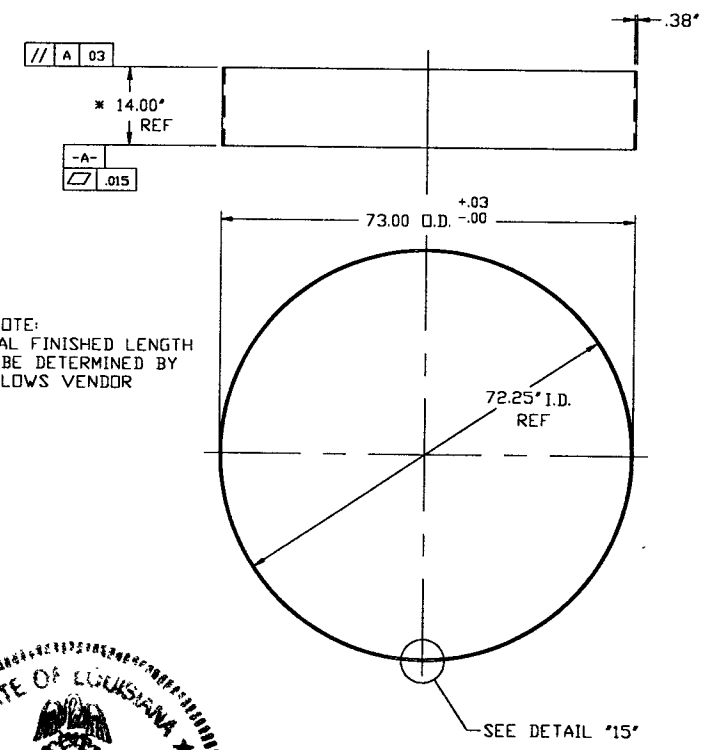
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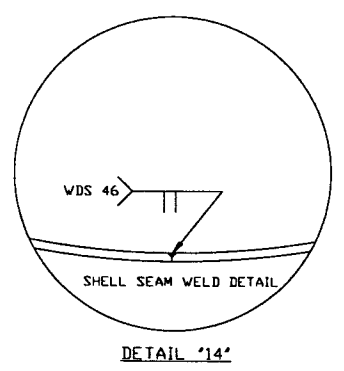
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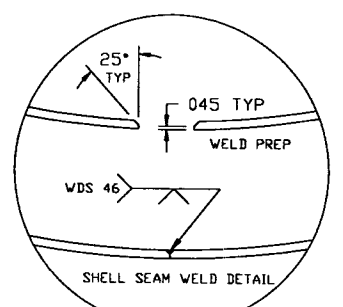
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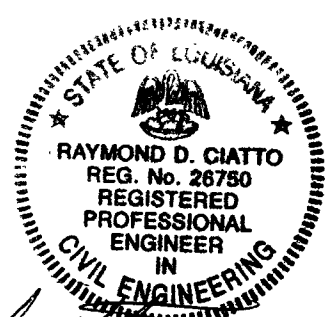
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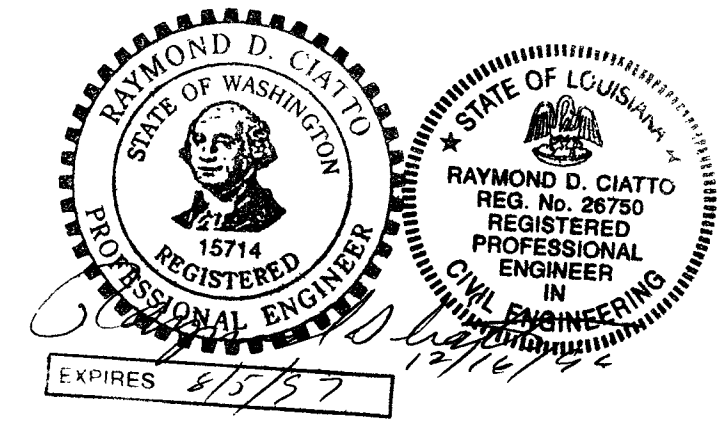
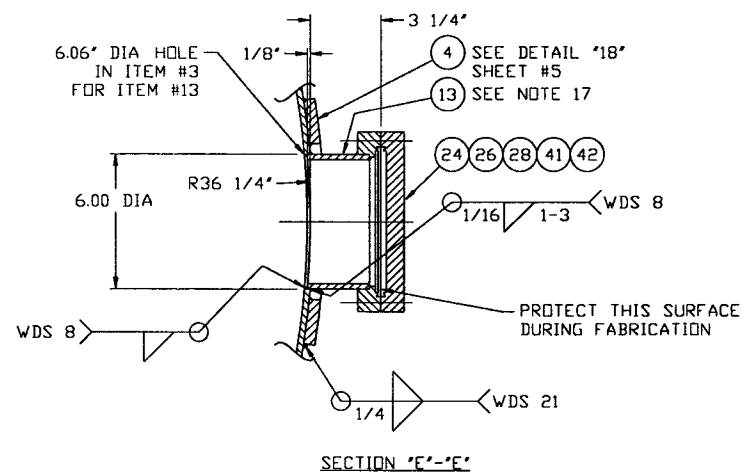
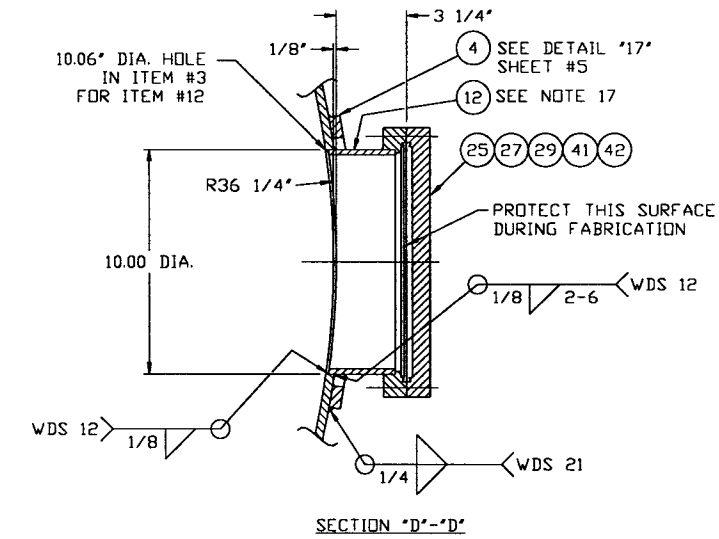
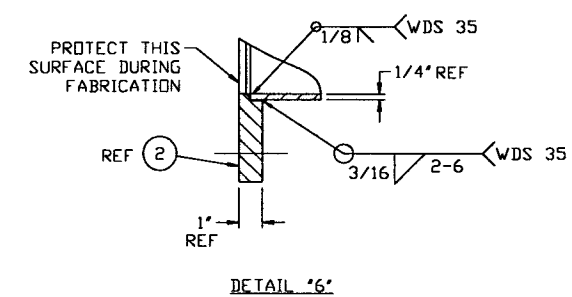
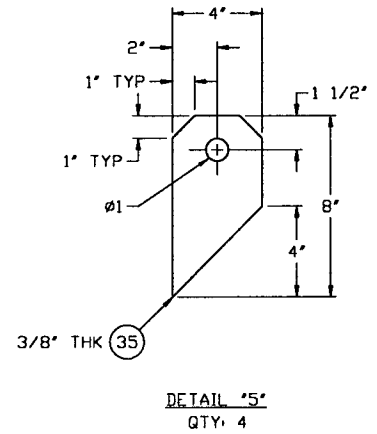
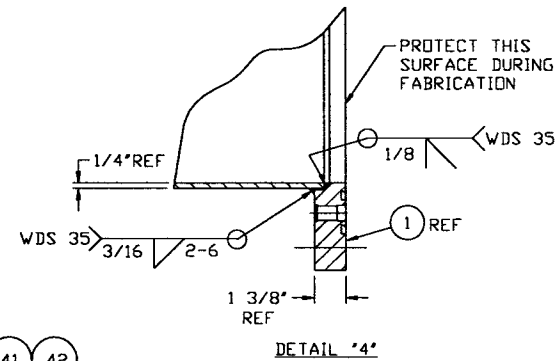
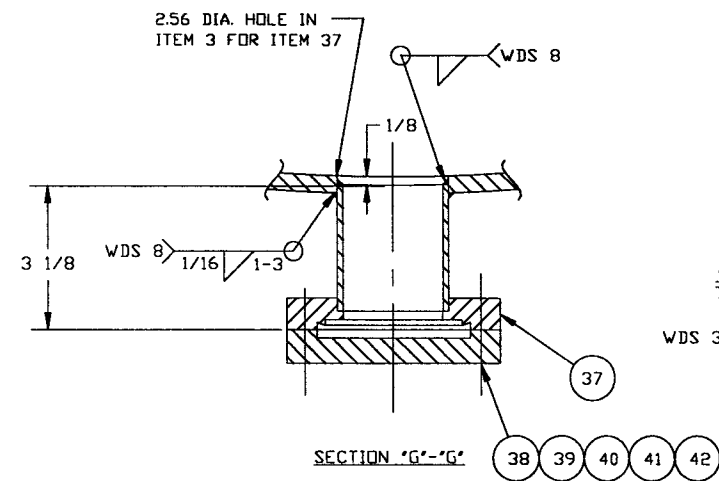
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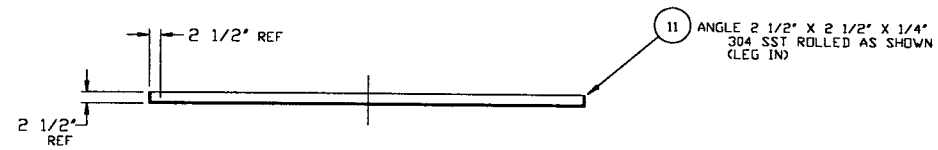
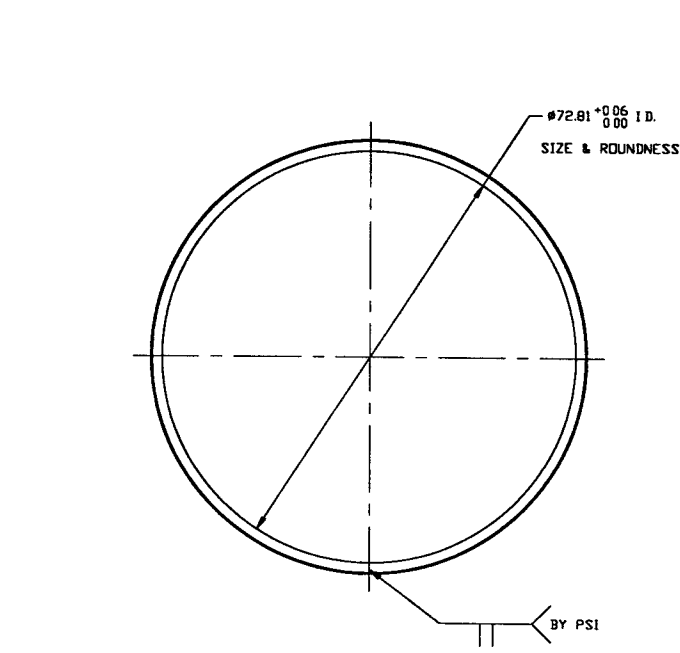


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SCALE 1/16	SHEET 3 OF 5		

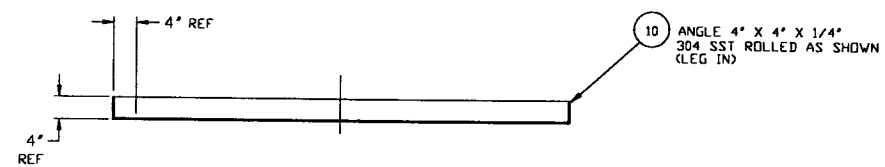
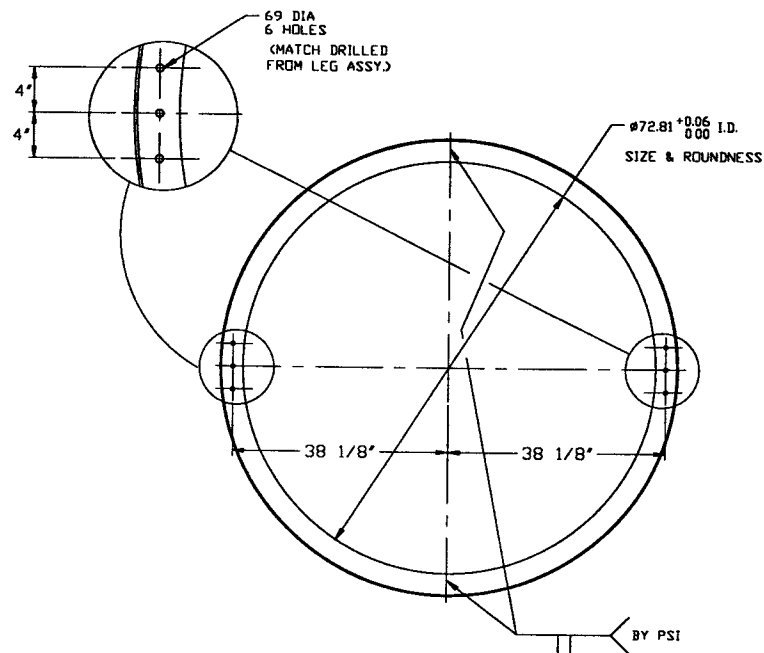


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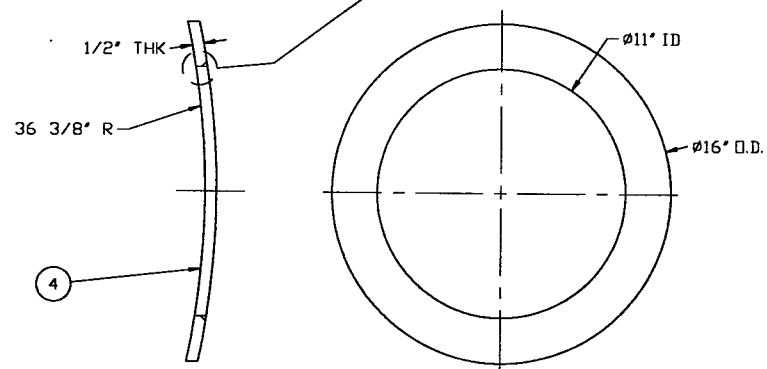
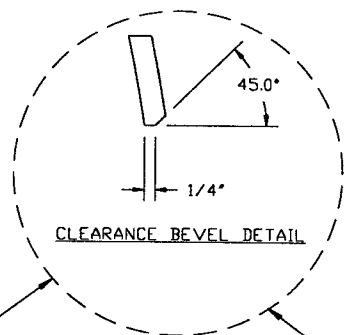
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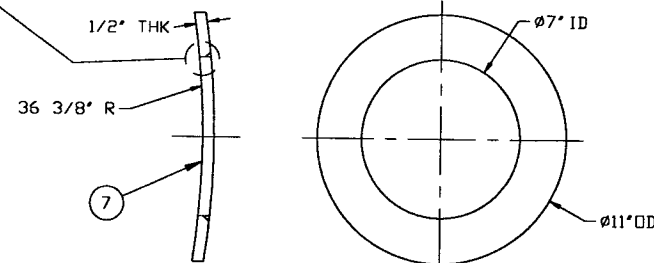
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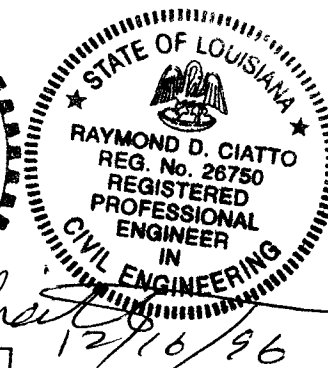
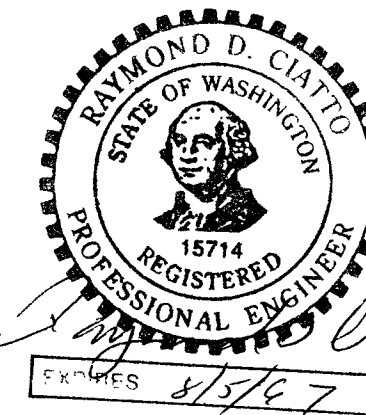
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QTY. 1



DETAIL '17'
QTY. 1



DETAIL '18'
QTY. 1



PROCESS SYSTEMS INTERNATIONAL INC. 20 WALKUP DR. WESTBOROUGH, MASSACHUSETTS 01581 USA			
SPOOL BE-5 72.25"ID x 72.25"ID LIGO VACUUM EQUIPMENT			
CAD FILE V0494BE5/4BE5S5	SIZE D	DWG. NO. V049-4-BE5	REV 4
SCALE 1/16 & 1/4	SHEET 5 OF 5		