

Vendor Name: Penticton Foundry Ltd.

MR #: ALB-000-MR-PI-000003

PO#: 1399742

CNRL PROJECT NUMBER: KI191025-JPM INPIT CELL 1

MOC #: 2019-JPP-001

Document Title: Detailed Fabrication Drawings

CNRL VP Number: JPP-300-H03-PI-000095-V

Vendor Document Number: H03

Vendor Document REV: Revision E

SDRL Code: H03

EQUIPMENT NUMBER: n/a

Total Number of Pages: 5



Canadian Natural Resources Limited

Albian - Oilsands Projects

VENDOR PRINT REVIEW STAMP

Submittal No. **002**

Permission to proceed does not constitute acceptance of design, details, calculations or analysis, test methods or materials developed or selected by Supplier and does not relieve Supplier from full compliance with contractual or other obligations

- ☐ 1. Accepted, proceed.
- ☒ 2. Proceed, incorporate comments and resubmit as final.
- ☐ 3. Do **NOT** proceed, revise and resubmit.
- ☐ 4. Proceed, review not required/completed.

Signature: **GP**

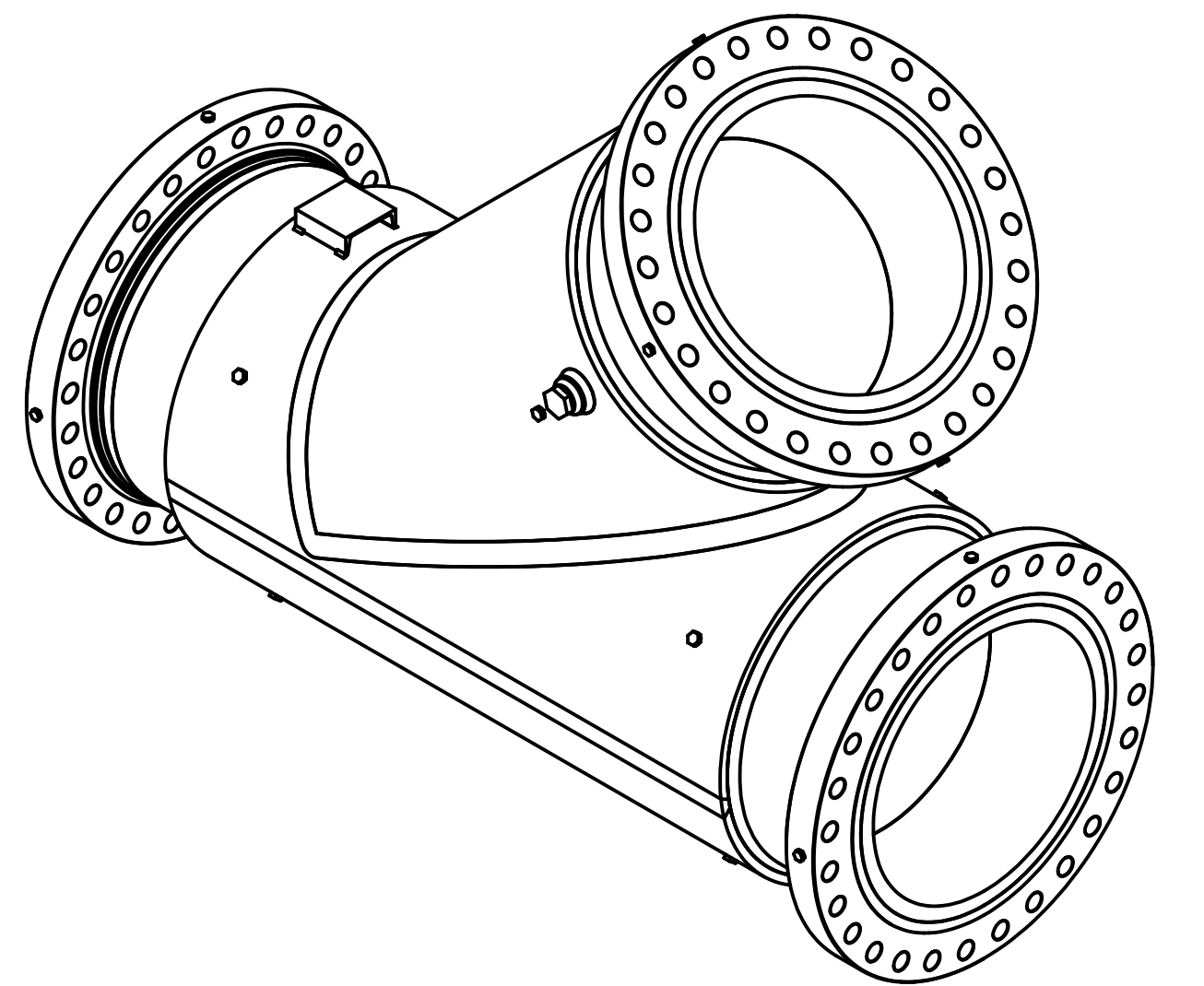
Date: **2020-02-06**

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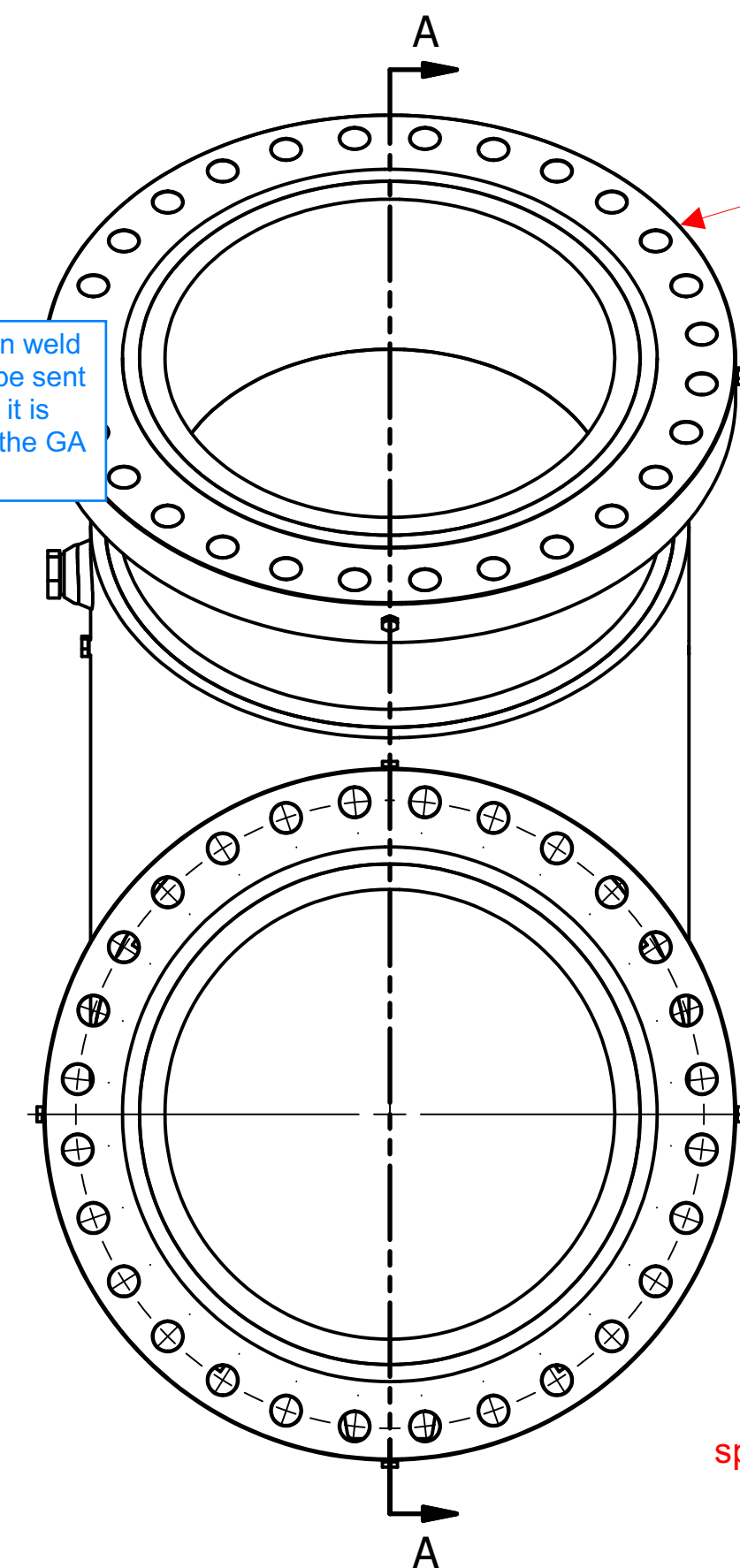
Annotated Drawing (28" x 28" x 45° HCWI Lateral) For Information Only	pg 3
General Assembly Drawing (28" x 28" x 45° HCWI Lateral) For Review.....	pg 4
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SECTION A-A

DETAIL D



Please specify surface finish (coated with? painted with? bare c/s?)



SECTION B-B

SECTION C-C

BILL OF MATERIAL			
ITEM	ITEM QTY	PART NUMBER	DESCRIPTION
1	1	A1-19037-100-01 Trunk shell	106 1/32" x 66 1/2" x 1 1/2" PLATE, A516 Gr.70N, ROLLED TO 35 1/4" OD
2	1	A1-19037-100-02 Branch shell	106 1/32" x 48 15/16" x 1 1/2" PLATE, A516 Gr.70N, ROLLED TO 35 1/4" OD
3	3	A1-19037-100-03 32in pipe	32" x 3/4" WALL x 10 17/32" PIPE, API 5L X52 PSL-2
4	3	A1-19037-100-04 28in CL300 RF flange - custom	28" CLASS 300 B16.47 Ser.A FFSO FLANGE, A105N, Ø28 7/8" BORE
5	1	A1-19037-100-05 HCWI lateral	26 1/2" ID x 2 1/4" WALL x 45" HCWI LATERAL, 19 1/2" x 51" x 51", ASTM A532 CLASS III TYPE A, LEVEL 2, PF#(TBD)
6	3	A1-19037-100-06 HCWI liner - pup	26 1/2" ID x 1 1/4" WALL x 12 1/2" HCWI LINER, ASTM A532 CLASS III TYPE A, LEVEL 2, PF#(TBD)
7	12	A1-19037-100-07 Trap rod	Ø3/8" x 4 7/16" ROUND BAR, A36
8	1	A1-19037-100-08 2in x 36in threadolet	2" x 36" CLASS 3000 THREADOLET, A105N
9	12	ANSI B18.3 - 1/2-13 UNC x 0.5	1/2"-NC x 1/2" FLAT POINT SOCKET HEAD SET SCREW, PLATED
10	1	ASME B16.11 Hex Head Plug 2	2"-NPT HEX HEAD PLUG, A105N
11	9	ASME B16.11 Hex Head Plug 3/4	3/4"-NPT HEX HEAD PLUG, A105N
12	12	ASME B16.11 Hex Head Plug 1/2	1/2"-NPT HEX HEAD PLUG, A105N
13	2	Tag mount - 6in	C6x8.2 x 6" [152mm], 44W

weld map shall be added in the fabrication drawings

REVISION HISTORY		
REV	DATE	DESCRIPTION
B	11/25/19	32" PIPE WAS PSL-1, ADDED "LEVEL 2" TO HCWI DESCRIPTIONS, UPDATED DESIGN DATA, ADDED TAG MOUNTS
A	11/14/19	ISSUED FOR REVIEW

Weld maps are a separate drawing that Alco issues for fabrication and that is included in the final ermb. It is not the drawing that is needed for approval however

specify WPS No.

specify WPS No. and weld size

Any calculation for these flanges?

Flange calculations will be provided in separate document

WPS shown on weld map and can be sent separately but it is not shown on the GA drawing

specify WPS No.

specify WPS No. and weld joint details

Add Surface finish of Item#4 and #6 in Bill of Material

FULL
PEN.

Addre

SIF Shall be provide



SIF stamped calculations provided and stamped engineered drawing will be provided once drawings are accepted for construction

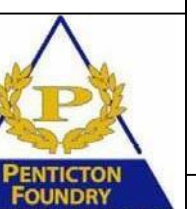
DESIGN CODE:	ASME B31.4, 2016
LINE CLASS:	USX
SERVICE:	COARSE TAILING SANDS
DESIGN PRESSURE:	4447 kPag (645 psig)
DESIGN TEMPERATURE:	93°C (199°F)
TEST PRESSURE:	4892 kPag (710 psig)
TEST TEMPERATURE:	15°C (59°F)
TEST DURATION:	30 MINUTES

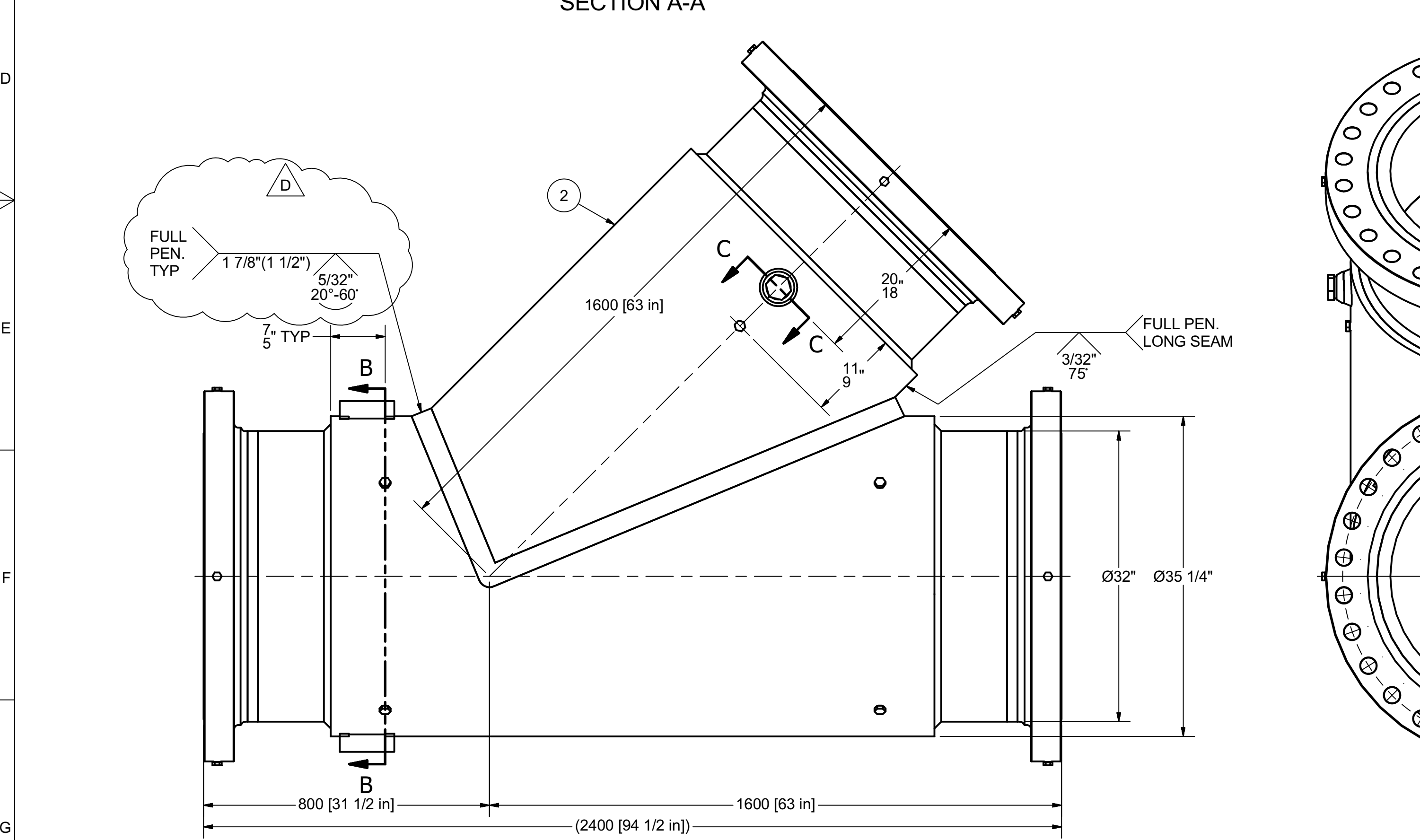
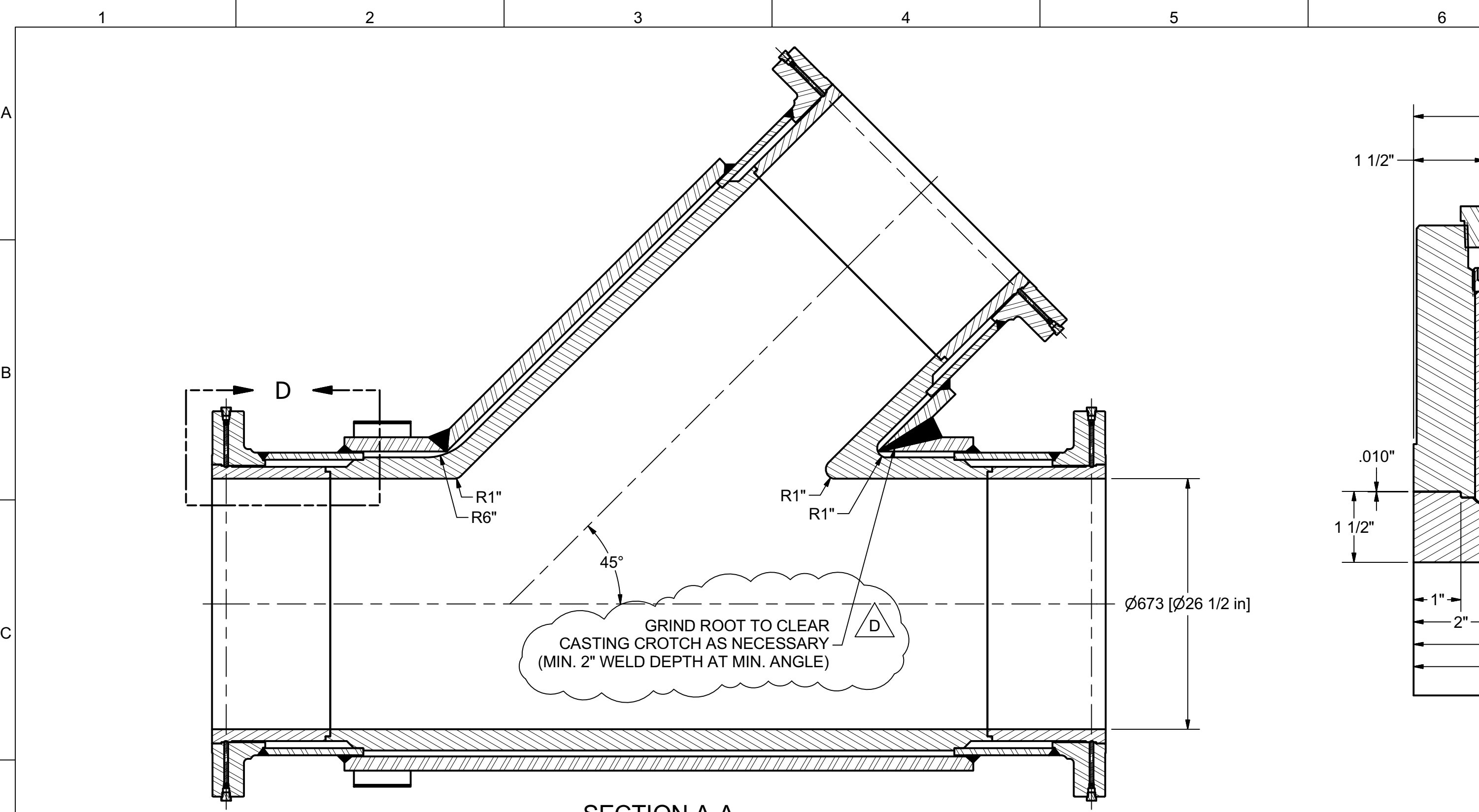
CNRL-OVR-STD-MC-00007 Shall follow

REFER TO DRAWING A1-00001-100-01 FOR
ALL GENERAL NOTES AND SPECIFICATIONS

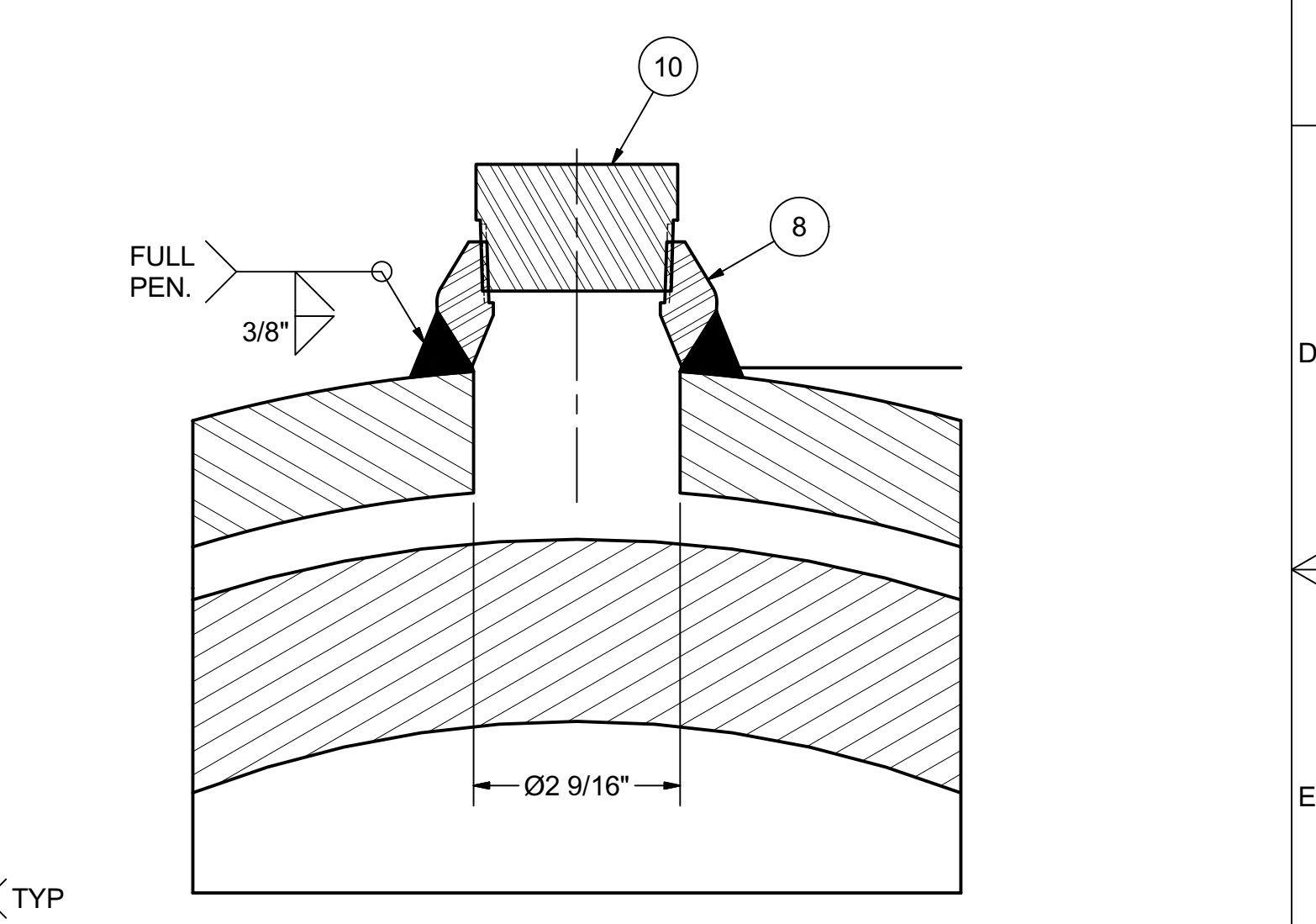
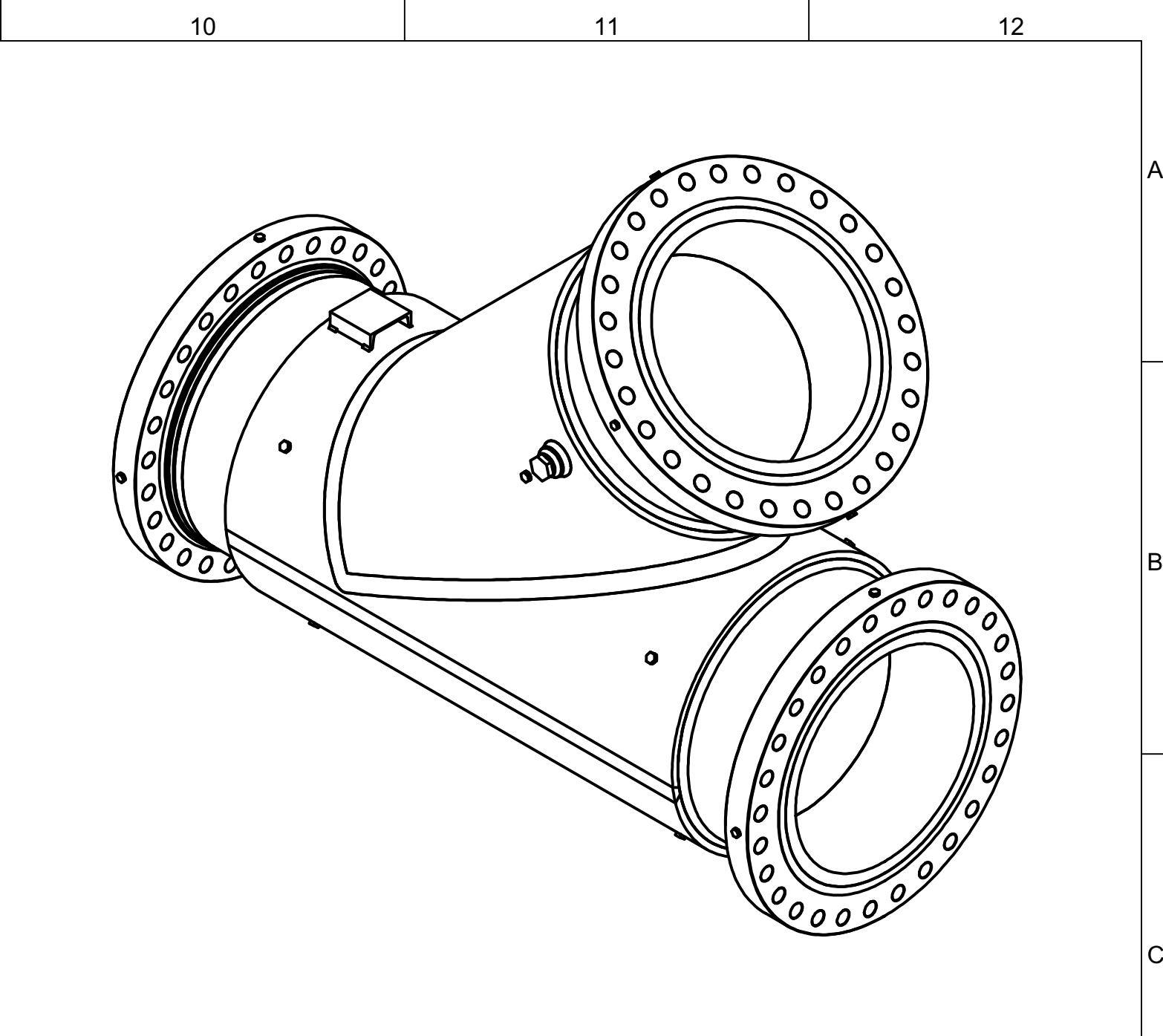
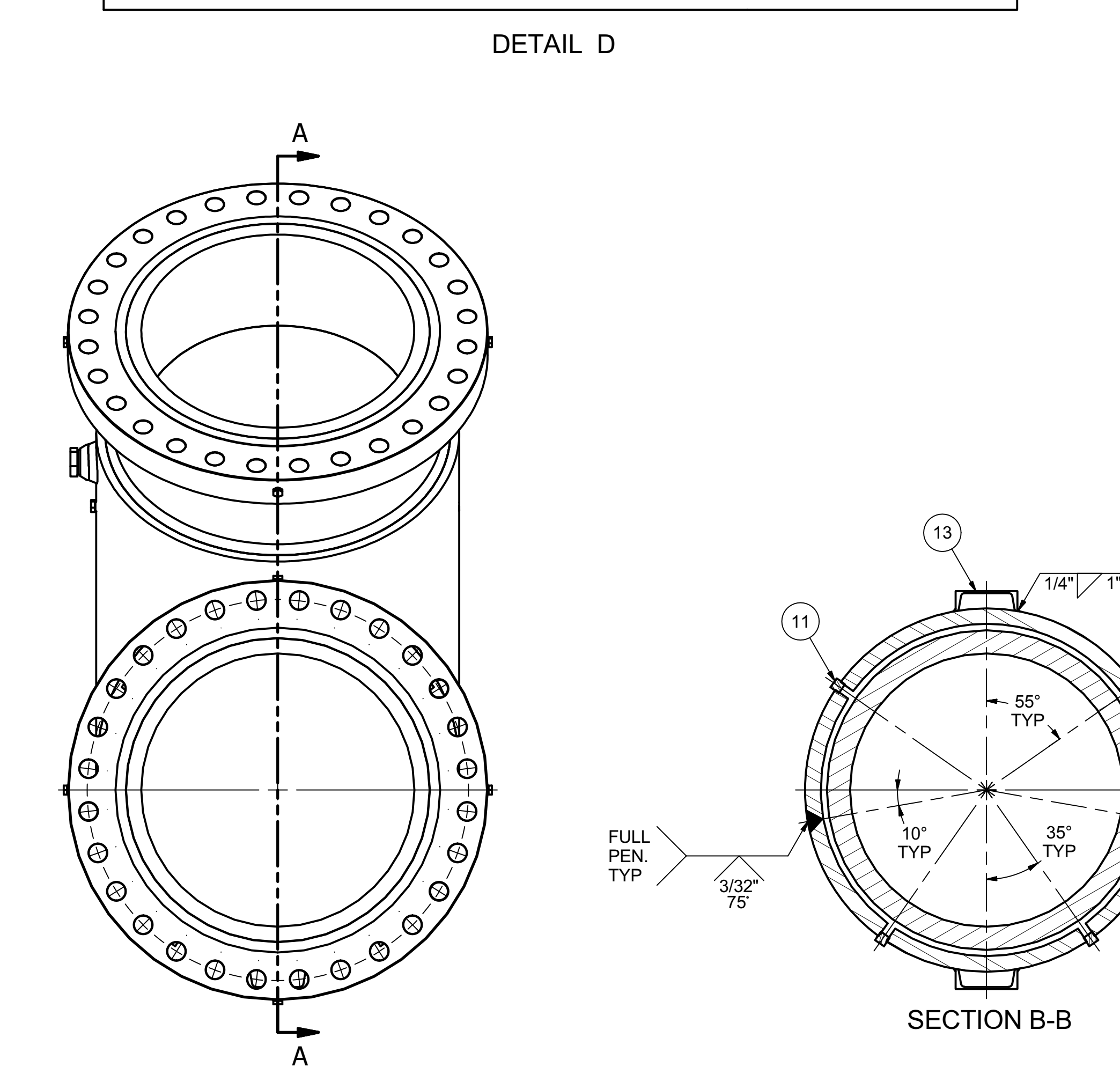
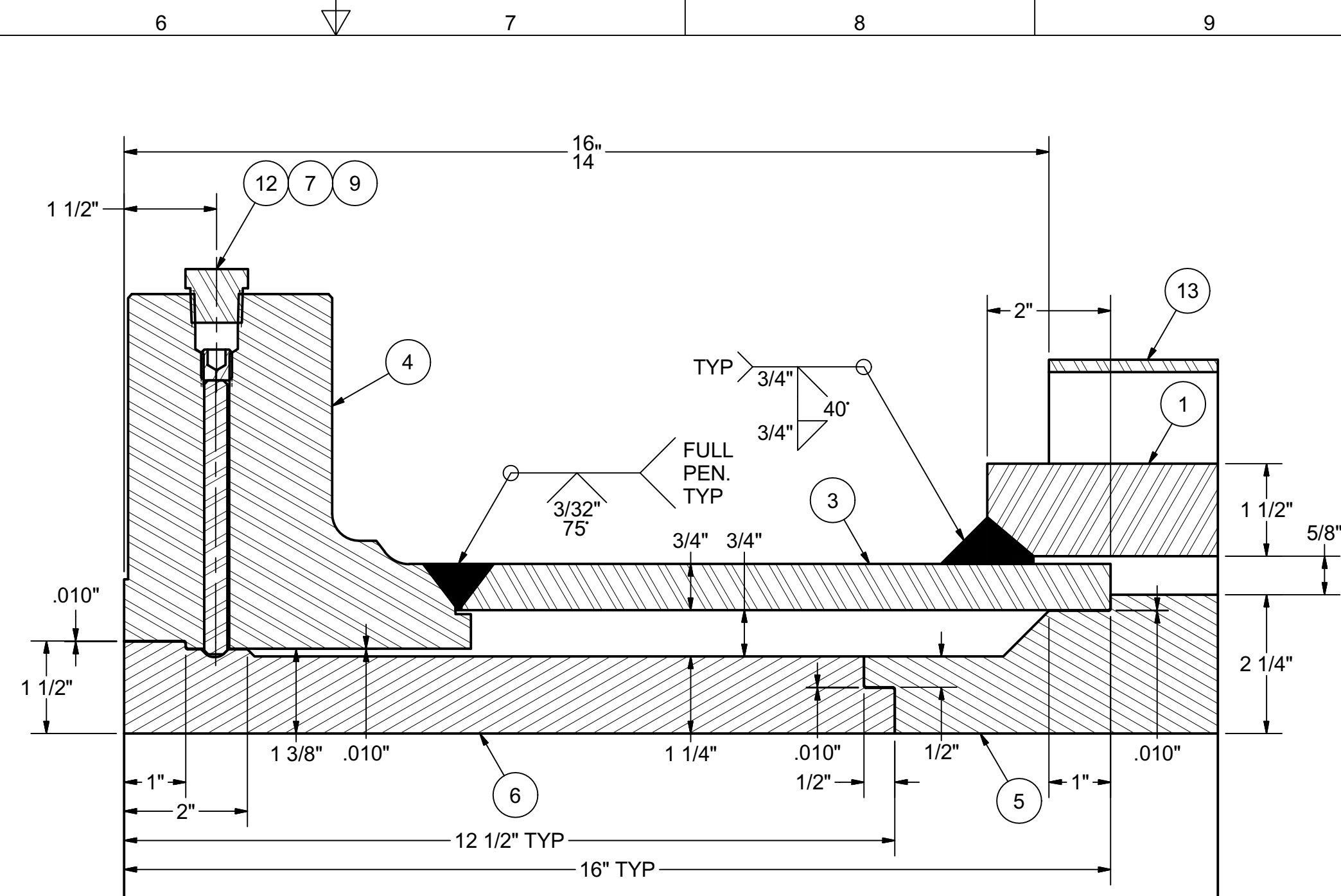
<p>THIS DOCUMENT CONTAINS NEITHER RECOMMENDATIONS NOR CONCLUSIONS OF THE NATIONAL BUREAU OF STANDARDS. IT IS THE PROPERTY OF THE NATIONAL BUREAU OF STANDARDS AND IS LOANED TO YOUR ORGANIZATION; IT AND ITS CONTENTS ARE NOT TO BE DISTRIBUTED OUTSIDE YOUR ORGANIZATION.</p>	<p>EST. WT. 13,020 lbs.</p>	<p>DO NOT SCALE</p>
	<p>UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN INCHES. BREAK ALL SHARP EDGES. 0.03125 IN. (3/64) 0.0625 IN. (1/16) 0.125 IN. (1/8) 0.1875 IN. (3/16) 0.25 IN. (1/4) 0.3125 IN. (5/16) 0.375 IN. (3/8) 0.5 IN. (1/2) 0.625 IN. (5/8) 0.75 IN. (3/4) 0.875 IN. (7/8) 1.0 IN. (1) 1.125 IN. (9/8) 1.25 IN. (5/4) 1.375 IN. (1 1/8) 1.5 IN. (1 1/2) 1.625 IN. (1 5/8) 1.75 IN. (1 3/4) 1.875 IN. (1 7/8) 2.0 IN. (2) 2.125 IN. (2 1/8) 2.25 IN. (2 1/4) 2.375 IN. (2 3/8) 2.5 IN. (2 1/2) 2.625 IN. (2 5/8) 2.75 IN. (2 3/4) 2.875 IN. (2 7/8) 3.0 IN. (3) 3.125 IN. (3 1/8) 3.25 IN. (3 1/4) 3.375 IN. (3 3/8) 3.5 IN. (3 1/2) 3.625 IN. (3 5/8) 3.75 IN. (3 3/4) 3.875 IN. (3 7/8) 4.0 IN. (4) 4.125 IN. (4 1/8) 4.25 IN. (4 1/4) 4.375 IN. (4 3/8) 4.5 IN. (4 1/2) 4.625 IN. (4 5/8) 4.75 IN. (4 3/4) 4.875 IN. (4 7/8) 5.0 IN. (5) 5.125 IN. (5 1/8) 5.25 IN. (5 1/4) 5.375 IN. (5 3/8) 5.5 IN. (5 1/2) 5.625 IN. (5 5/8) 5.75 IN. (5 3/4) 5.875 IN. (5 7/8) 6.0 IN. (6) 6.125 IN. (6 1/8) 6.25 IN. (6 1/4) 6.375 IN. (6 3/8) 6.5 IN. (6 1/2) 6.625 IN. (6 5/8) 6.75 IN. (6 3/4) 6.875 IN. (6 7/8) 7.0 IN. (7) 7.125 IN. (7 1/8) 7.25 IN. (7 1/4) 7.375 IN. (7 3/8) 7.5 IN. (7 1/2) 7.625 IN. (7 5/8) 7.75 IN. (7 3/4) 7.875 IN. (7 7/8) 8.0 IN. (8) 8.125 IN. (8 1/8) 8.25 IN. (8 1/4) 8.375 IN. (8 3/8) 8.5 IN. (8 1/2) 8.625 IN. (8 5/8) 8.75 IN. (8 3/4) 8.875 IN. (8 7/8) 9.0 IN. (9) 9.125 IN. (9 1/8) 9.25 IN. (9 1/4) 9.375 IN. (9 3/8) 9.5 IN. (9 1/2) 9.625 IN. (9 5/8) 9.75 IN. (9 3/4) 9.875 IN. (9 7/8) 10.0 IN. (10) 10.125 IN. (10 1/8) 10.25 IN. (10 1/4) 10.375 IN. (10 3/8) 10.5 IN. (10 1/2) 10.625 IN. (10 5/8) 10.75 IN. (10 3/4) 10.875 IN. (10 7/8) 11.0 IN. (11) 11.125 IN. (11 1/8) 11.25 IN. (11 1/4) 11.375 IN. (11 3/8) 11.5 IN. (11 1/2) 11.625 IN. (11 5/8) 11.75 IN. (11 3/4) 11.875 IN. (11 7/8) 12.0 IN. (12) 12.125 IN. (12 1/8) 12.25 IN. (12 1/4) 12.375 IN. (12 3/8) 12.5 IN. (12 1/2) 12.625 IN. (12 5/8) 12.75 IN. (12 3/4) 12.875 IN. (12 7/8) 13.0 IN. (13) 13.125 IN. (13 1/8) 13.25 IN. (13 1/4) 13.375 IN. (13 3/8) 13.5 IN. (13 1/2) 13.625 IN. (13 5/8) 13.75 IN. (13 3/4) 13.875 IN. (13 7/8) 14.0 IN. (14) 14.125 IN. (14 1/8) 14.25 IN. (14 1/4) 14.375 IN. (14 3/8) 14.5 IN. (14 1/2) 14.625 IN. (14 5/8) 14.75 IN. (14 3/4) 14.875 IN. (14 7/8) 15.0 IN. (15) 15.125 IN. (15 1/8) 15.25 IN. (15 1/4) 15.375 IN. (15 3/8) 15.5 IN. (15 1/2) 15.625 IN. (15 5/8) 15.75 IN. (15 3/4) 15.875 IN. (15 7/8) 16.0 IN. (16) 16.125 IN. (16 1/8) 16.25 IN. (16 1/4) 16.375 IN. (16 3/8) 16.5 IN. (16 1/2) 16.625 IN. (16 5/8) 16.75 IN. (16 3/4) 16.875 IN. (16 7/8) 17.0 IN. (17) 17.125 IN. (17 1/8) 17.25 IN. (17 1/4) 17.375 IN. (17 3/8) 17.5 IN. (17 1/2) 17.625 IN. (17 5/8) 17.75 IN. (17 3/4) 17.875 IN. (17 7/8) 18.0 IN. (18) 18.125 IN. (18 1/8) 18.25 IN. (18 1/4) 18.375 IN. (18 3/8) 18.5 IN. (18 1/2) 18.625 IN. (18 5/8) 18.75 IN. (18 3/4) 18.875 IN. (18 7/8) 19.0 IN. (19) 19.125 IN. (19 1/8) 19.25 IN. (19 1/4) 19.375 IN. (19 3/8) 19.5 IN. (19 1/2) 19.625 IN. (19 5/8) 19.75 IN. (19 3/4) 19.875 IN. (19 7/8) 20.0 IN. (20) 20.125 IN. (20 1/8) 20.25 IN. (20 1/4) 20.375 IN. (20 3/8) 20.5 IN. (20 1/2) 20.625 IN. (20 5/8) 20.75 IN. (20 3/4) 20.875 IN. (20 7/8) 21.0 IN. (21) 21.125 IN. (21 1/8) 21.25 IN. (21 1/4) 21.375 IN. (21 3/8) 21.5 IN. (21 1/2) 21.625 IN. (21 5/8) 21.75 IN. (21 3/4) 21.875 IN. (21 7/8) 22.0 IN. (22) 22.125 IN. (22 1/8) 22.25 IN. (22 1/4) 22.375 IN. (22 3/8) 22.5 IN. (22 1/2) 22.625 IN. (22 5/8) 22.75 IN. (22 3/4) 22.875 IN. (22 7/8) 23.0 IN. (23) 23.125 IN. (23 1/8) 23.25 IN. (23 1/4) 23.375 IN. (23 3/8) 23.5 IN. (23 1/2) 23.625 IN. (23 5/8) 23.75 IN. (23 3/4) 23.875 IN. (23 7/8) 24.0 IN. (24) 24.125 IN. (24 1/8) 24.25 IN. (24 1/4) 24.375 IN. (24 3/8) 24.5 IN. (24 1/2) 24.625 IN. (24 5/8) 24.75 IN. (24 3/4) 24.875 IN. (24 7/8) 25.0 IN. (25) 25.125 IN. (25 1/8) 25.25 IN. (25 1/4) 25.375 IN. (25 3/8) 25.5 IN. (25 1/2) 25.625 IN. (25 5/8) 25.75 IN. (25 3/4) 25.875 IN. (25 7/8) 26.0 IN. (26) 26.125 IN. (26 1/8) 26.25 IN. (26 1/4) 26.375 IN. (26 3/8) 26.5 IN. (26 1/2) 26.625 IN. (26 5/8) 26.75 IN. (26 3/4) 26.875 IN. (26 7/8) 27.0 IN. (27) 27.125 IN. (27 1/8) 27.25 IN. (27 1/4) 27.375 IN. (27 3/8) 27.5 IN. (27 1/2) 27.625 IN. (27 5/8) 27.75 IN. (27 3/4) 27.875 IN. (27 7/8) 28.0 IN. (28) 28.125 IN. (28 1/8) 28.25 IN. (28 1/4) 28.375 IN. (28 3/8) 28.5 IN. (28 1/2) 28.625 IN. (28 5/8) 28.75 IN. (28 3/4) 28.875 IN. (28 7/8) 29.0 IN. (29) 29.125 IN. (29 1/8) 29.25 IN. (29 1/4) 29.375 IN. (29 3/8) 29.5 IN. (29 1/2) 29.625 IN. (29 5/8) 29.75 IN. (29 3/4) 29.875 IN. (29 7/8) 30.0 IN. (30) 30.125 IN. (30 1/8) 30.25 IN. (30 1/4) 30.375 IN. (30 3/8) 30.5 IN. (30 1/2) 30.625 IN. (30 5/8) 30.75 IN. (30 3/4) 30.875 IN. (30 7/8) 31.0 IN. (31) 31.125 IN. (31 1/8) 31.25 IN. (31 1/4) 31.375 IN. (31 3/8) 31.5 IN. (31 1/2) 31.625 IN. (31 5/8) 31.75 IN. (31 3/4) 31.875 IN. (31 7/8) 32.0 IN. (32) 32.125 IN. (32 </p>	

  ALCO Industrial 2103 - B Street, Nisku, Alberta, Canada T9E 7Y9 Phone: (780) 451-6222 • Fax: (780) 452-4355		
TITLE <div style="text-align: center;"> <p>28" x 28" x 45° HCWI LATERAL</p> <p>CNUL ALBIAN</p> </div>		
PROJECT No.	REFERENCE	REV.
A1-19037	3-2-0218 Sht.4 OF 7	B
FILE NAME	SHEET	
A1-19037-100-00 28in lateral.idw	1 OF 1	





BILL OF MATERIAL			
ITEM	ITEM QTY	PART NUMBER	DESCRIPTION
1	1	A1-19037-100-01 Trunk shell	106 1/32" x 66 1/2" x 1 1/2" PLATE, A516 Gr.70N, ROLLED TO 35 1/4" OD
2	1	A1-19037-100-02 Branch shell	106 1/32" x 48 15/16" x 1 1/2" PLATE, A516 Gr.70N, ROLLED TO 35 1/4" OD
3	3	A1-19037-100-03 32in pipe	32" x 3/4" WALL x 10 17/32" PIPE, API 5L X52 PSL-2
4	3	A1-19037-100-04 28in CL300 RF flange - custom	28" CLASS 300 B16.47 Ser.A FFSO FLANGE, A105N, Ø28 7/8" BORE
5	1	A1-19037-100-05 HCWI lateral	26 1/2" ID x 2 1/4" WALL x 45° HCWI LATERAL, 19 1/2" x 51" x 51", ASTM A532 CLASS III TYPE A, LEVEL 2, PF# 503364
6	3	A1-19037-100-06 HCWI liner - pup	26 1/2" ID x 1 1/4" WALL x 12 1/2" HCWI LINER, ASTM A532 CLASS III TYPE A, LEVEL 2, PF# 503363
7	12	A1-19037-100-07 Trap rod	Ø3/8" x 4 7/16" ROUND BAR, A36
8	1	A1-19037-100-08 2in x 36in threadolet	2" x 36" CLASS 3000 THREADOLET, A105N
9	12	ANSI B18.3 - 1/2-13 UNC x 0.5	1/2"-NC x 1/2" FLAT POINT SOCKET HEAD SET SCREW, PLATED
10	1	ASME B16.11 Hex Head Plug 2	2"-NPT HEX HEAD PLUG, A105N
11	9	ASME B16.11 Hex Head Plug 3/4	3/4"-NPT HEX HEAD PLUG, A105N
12	12	ASME B16.11 Hex Head Plug 1/2	1/2"-NPT HEX HEAD PLUG, A105N
13	2	Tag mount - 6in	C6x8.2 x 6" [152mm], 44W



SIF (NPS 28)	
BRANCH IN PLANE	2.01
BRANCH OUT OF PLANE	2.71
RUN IN PLANE	2.81
RUN OUT OF PLANE	1.62

DESIGN CODE:	ASME B31.4, 2016
SERVICE:	COARSE TAILING SANDS
DESIGN PRESSURE:	4447 kPag (645 psig)
DESIGN TEMPERATURE:	93°C (199°F)
TEST PRESSURE:	4892 kPag (710 psig)
TEST TEMPERATURE:	15°C (59°F)
TEST DURATION:	4 HOURS

REVISION HISTORY		
REV	DATE	DESCRIPTION
E	1/16/20	ADD PF NUMBERS TO DESCRIPTIONS
D	1/10/20	UPDATED WELD SYMBOL, UPDATED NOTE, ADDED SIF TABLE
C	12/18/19	CHANGED HYDRO TO 4 HOURS
B	11/25/19	32" PIPE WAS PSL-1, ADDED "LEVEL 2" TO HCWI DESCRIPTIONS, UPDATED DESIGN DATA, ADDED TAG MOUNTS
A	11/14/19	ISSUED FOR REVIEW

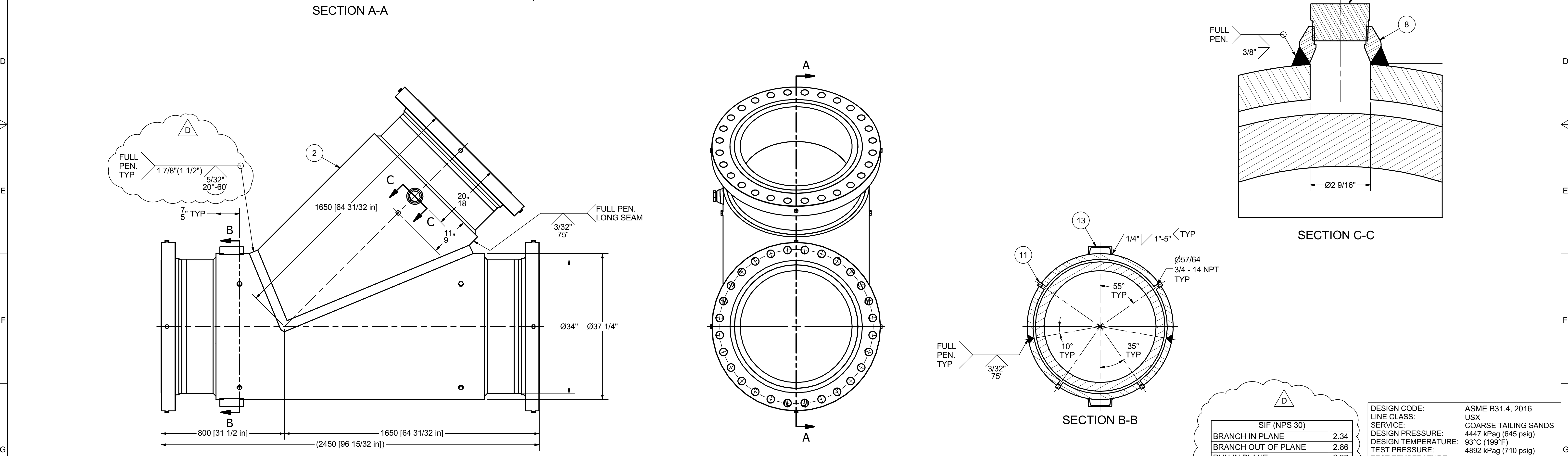
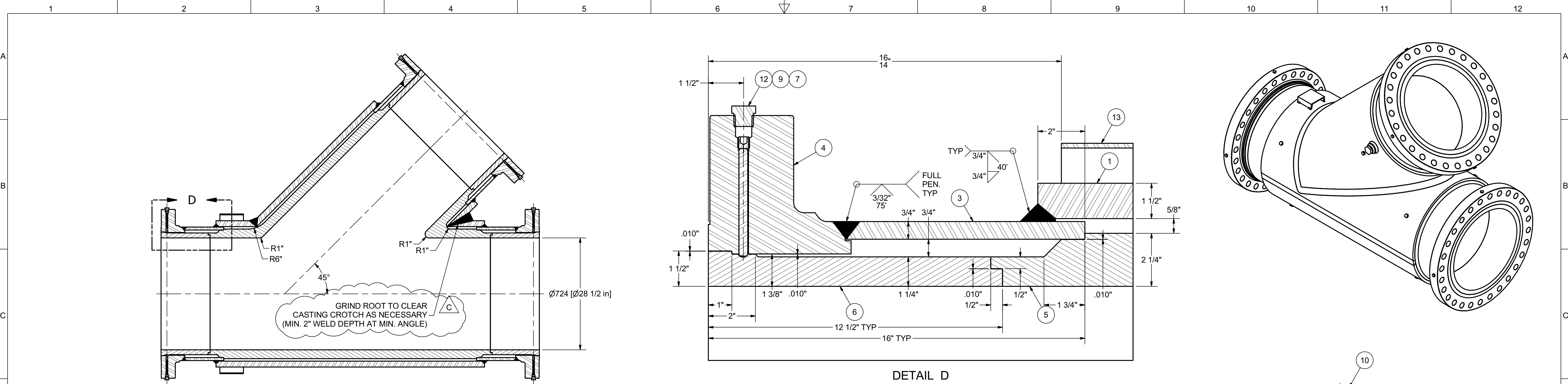
CNRL-OVR-STD-MC-00007 SHALL FOLLOW

REFER TO DRAWING A1-00001-100-01 FOR ALL GENERAL NOTES AND SPECIFICATIONS

EST. WT. 13,020 lbs.	DO NOT SCALE
UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN INCHES. BREAK ALL SHARP EDGES 0.1" RADIUS. PER ANSI Y14.5 STANDARD.	DRAWN BY: GVD DATE: 11/14/19
TOLERANCES: X = ± 1/16 X.X = ± .030 X.XX = ± .015 X.XXX = ± .005 ANGLES: ± 1/2°	CHECKED BY: KLS DATE: 1/16/20
125° FINISH ON ALL MACHINED SURFACES	APPROVED: BEM DATE: 1/16/20
	MATERIAL & HEAT TREAT

PROJECT No. A1-19037	REFERENCE 3-2-0218 Sht.4 OF 7	REV. E
FILE NAME A1-19037-100-00 28in lateral.idw		SHEET 1 OF 1

ALCO Industrial
2103 - 8 Street,
Nisku, Alberta, Canada T9E 7Y9
Phone: (780) 451-8222 • Fax: (780) 452-4355



ITEM		ITEM QTY		PART NUMBER		BILL OF MATERIAL		DESCRIPTION	
1	1	A1-19037-200-01	Trunk shell	112 5/16" x 68 15/32" x 1 1/2" PLATE, A516 Gr.70N, ROLLED TO 37 1/4" OD					
2	1	A1-19037-200-02	Branch shell	112 5/16" x 50 29/32" x 1 1/2" PLATE, A516 Gr.70N, ROLLED TO 37 1/4" OD					
3	3	A1-19037-200-03	34in pipe	34" x 3/4" WALL x 10 3/32" PIPE, API 5L X52 PSL-2					
4	3	A1-19037-200-04	30in CL300 RF flange - custom	30" CLASS 300 B16.47 Ser.A FFSO FLANGE, A105N, Ø31 1/4" BORE					
5	1	A1-19037-200-05	HCWI lateral	28 1/2" ID x 2 1/4" WALL x 45° HCWI LATERAL, 19 1/2" x 52 31/32" x 52 31/32", ASTM A532 CLASS III TYPE A, LEVEL 2, PF# 503369					
6	3	A1-19037-200-06	HCWI liner - pup	28 1/2" ID x 1 1/4" WALL x 12 1/2" HCWI LINER, ASTM A532 CLASS III TYPE A, LEVEL 2, PF# 503368					
7	12	A1-19037-200-07	Trap rod	Ø3/8" x 4 9/16" ROUND BAR, A36					
8	1	A1-19037-200-08	2in x 38in threadolet	2" x 36" CLASS 3000 THREADOLET, A105N					
9	12	ANSI B18.3 - 1/2-13 UNC x 0.5		1/2"-NC x 1/2" FLAT POINT SOCKET HEAD SET SCREW, PLATED					
10	1	ASME B16.11 Hex Head Plug 2		2"-NPT HEX HEAD PLUG, A105N					
11	10	ASME B16.11 Hex Head Plug 3/4		3/4"-NPT HEX HEAD PLUG, A105N					
12	12	ASME B16.11 Hex Head Plug 1/2		1/2"-NPT HEX HEAD PLUG, A105N					
13	2	Tag mount - 6in		C6x8.2 x 6" [152mm], 44W					

REVISION HISTORY

REV	DATE	DESCRIPTION	INITIALS
E	1/16/20	ADD PF NUMBERS TO PART DESCRIPTIONS, ITEM 1 WAS 69	JDS
D	1/10/20	UPDATED WELD SYMBOL, UPDATED NOTE, ADDED SIF TABLE	GVD
C	12/18/19	CHANGED HYDRO TO 4 HOURS	BEM
B	11/25/19	34" PIPE WAS PSL-1, ADDED "LEVEL 2" TO HCWI DESCRIPTIONS, UPDATED DESIGN DATA, ADDED TAG MOUNTS	GVD
A	11/14/19	ISSUED FOR REVIEW	GVD

DESIGN CODE:

LINE CLASS:

SERVICE:

DESIGN PRESSURE:

DESIGN TEMPERATURE:

TEST PRESSURE:

TEST TEMPERATURE:

TEST DURATION:

ASME B31.4, 2016

USX

COARSE TAILING SANDS

4447 kPag (645 psig)

93°C (199°F)

4892 kPag (710 psig)

15°C (59°F)

4 HOURS

DO NOT SCALE

DRAWN BY:

CHECKED BY:

APPROVED:

DATE:

DATE:

DATE:

GVD

KLS

BEM

11/14/19

1/16/20

1/16/20

ALCO

ALCO Industrial

2103 - 8 Street,

Nisku, Alberta, Canada T9E 7Y9

Phone: (780) 451-8222 • Fax: (780) 452-4355

TITLE

PROJECT No.

REFERENCE

REV.

30" x 30" x 45° HCWI LATERAL

A1-19037

3-2-0218 Sht 5 OF 7

E

CNUL ALBIAN

A1-19037-200-00 30in lateral.idw

1 OF 1

EST. WT. 14,270 lbs.

UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN INCHES. BREAK ALL SHARP EDGES 0.1" OR 0.04" RADI

TOLERANCES:

PER ANSI Y14.5 STANDARD:

X.XX = ±.010

X.XXX = ±.005

X.XXXX = ±.001

ANGLES = ±12°

125° FINISH ON ALL MACHINED SURFACES

CNRL-OVR-STD-MC-00007 SHALL FOLLOW

REFER TO DRAWING A1-00001-100-01 FOR ALL GENERAL NOTES AND SPECIFICATIONS

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Changemark History

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