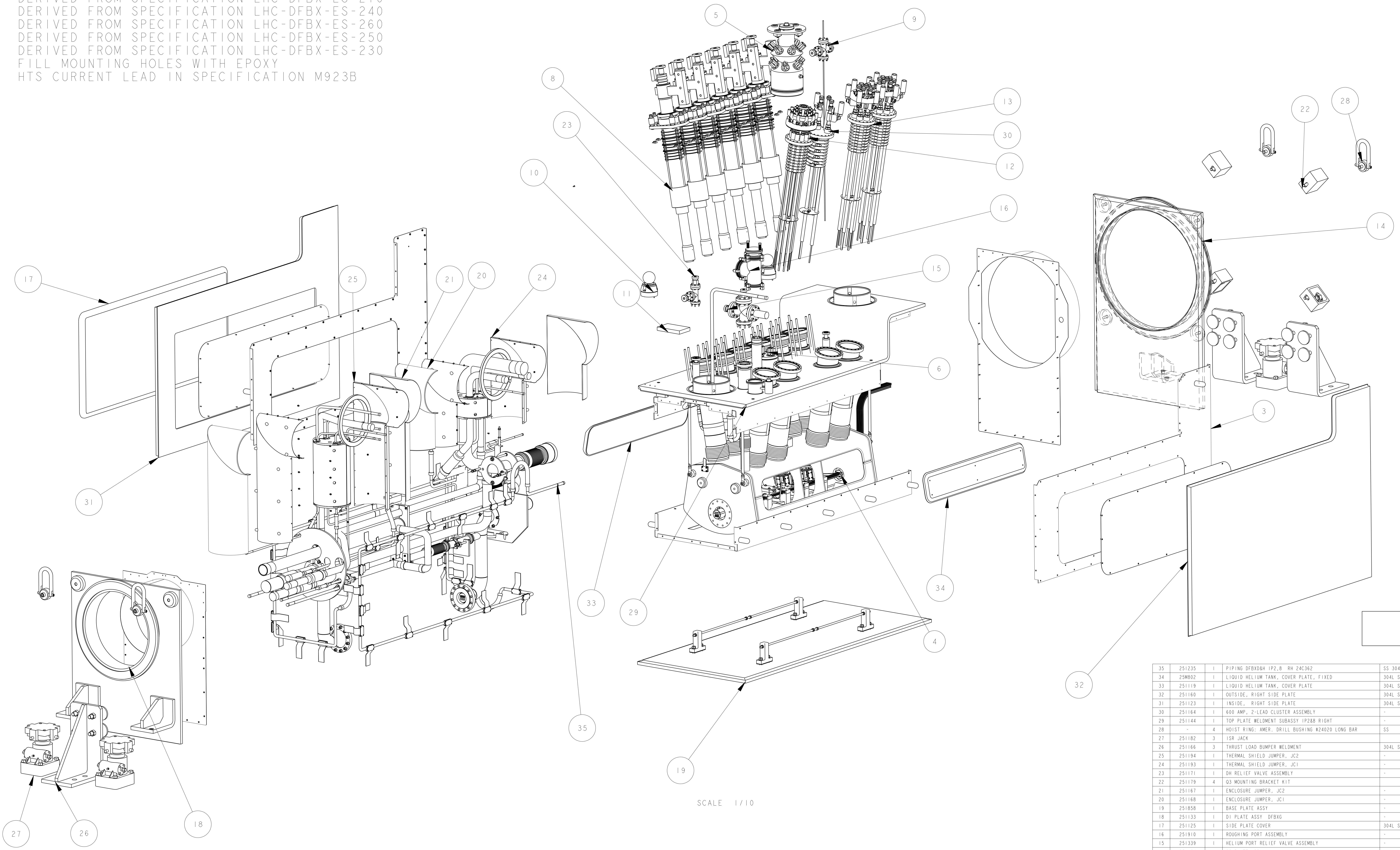


- NOTE:
1. DERIVED FROM SPECIFICATION LHC-DFBX-ES-100
  2. DERIVED FROM SPECIFICATION LHC-DFBX-ES-200
  3. DERIVED FROM SPECIFICATION LHC-DFBX-ES-210
  4. DERIVED FROM SPECIFICATION LHC-DFBX-ES-240
  5. DERIVED FROM SPECIFICATION LHC-DFBX-ES-260
  6. DERIVED FROM SPECIFICATION LHC-DFBX-ES-250
  7. DERIVED FROM SPECIFICATION LHC-DFBX-ES-230
  8. FILL MOUNTING HOLES WITH EPOXY
  9. HTS CURRENT LEAD IN SPECIFICATION M923B

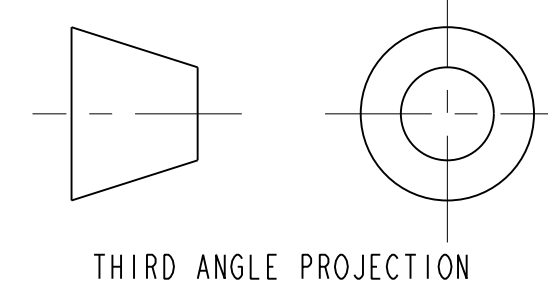


SCALE 1/10

11. SOLDER JOINT USING SN60PB40 SOLDER; ROSIN FLUX, USE SPLICE PLATE IF REQUIRED
12. CLOSEOUT WELD PROCEDURE TO BE APPROVED BY LBNL  
DISTORTION CONTROL IS ESSENTIAL, ROOT PASS GTAW, COVER PASSES GMAW, SMAW, FCGMAW.
13. WELD PROCEDURE TO BE APPROVED BY LBNL, USE GTAW PROCESS
14. BELLOWS TO BE WITHIN 0.03" OF FREE CONFIGURATION AFTER CLOSEOUT WELDING
15. DIMENSIONS FROM DFBX FLANGE FACE ON DI SIDE, ADD -2367.2 MM TO OBTAIN POSITION  
RELEATIVE TO DFBX COORDINATE SYSTEM
16. SHIM TANK SUPPORTS TO LIMIT STATIC DEFLECTION OF THE LOWER TANK SUPPORT RODS  
TO LESS THAN 0.25"
17. DIMENSIONS SHOW IN INSPECTION OVAL ARE REFERENCED IN THE FABRICATION TRAVELER
18. COPPER STRAP ATTACHED TO THE THERMAL ANCHORS DO NOT HAVE TO BE EVENLY SPACED.
19. ALL DIMENSIONS GIVEN AT ROOM TEMPERATURE

ITEM	PART NO.	RECD	DESCRIPTION	MATERIAL
35	251235	1	PIPING DFBXDH 1P2.8 RH 24C362	SS 304L
34	25M802	1	LIQUID HELIUM TANK, COVER PLATE, FIXED	304L SS
33	251119	1	LIQUID HELIUM TANK, COVER PLATE	304L SS
32	251160	1	OUTSIDE, RIGHT SIDE PLATE	304L SS
31	251123	1	INSIDE, RIGHT SIDE PLATE	304L SS
30	251164	1	600 AMP, 2-LEAD CLUSTER ASSEMBLY	-
29	251144	1	TOP PLATE WELDMENT SUBASSY 1P28B RIGHT	-
28	-	4	WOIST RING: AMER; DRILL BUSHING #24020 LONG BAR	SS
27	251182	3	JSR JACK	-
26	251166	3	THRUST LOAD BUMPER WELDMENT	304L SS
25	251194	1	THERMAL SHIELD JUMPER, JC2	-
24	251193	1	THERMAL SHIELD JUMPER, JC1	-
23	251171	1	DH RELIEF VALVE ASSEMBLY	-
22	251179	4	O3 MOUNTING BRACKET KIT	-
21	251167	1	ENCLOSURE JUMPER, JC2	-
20	251168	1	ENCLOSURE JUMPER, JC1	-
19	251858	1	BASE PLATE ASSY	-
18	251133	1	D1 PLATE ASSY DFBXG	-
17	251125	1	SIDE PLATE COVER	304L SS
16	251910	1	ROUGHING PORT ASSEMBLY	-
15	251339	1	HELIUM PORT RELIEF VALVE ASSEMBLY	-
14	251129	1	O3 PLATE ASSY	-
13	24C353	2	600 AMP, 6 LEAD VAPOR COOLED ASSY	-
12	24C322	1	120 AMP VC LEAD MOUNTING ASSY	-
11	25M820	1	ALIGNMENT PLATE	-
10	251868	2	TOOLING BALL, LHC1MGAD0092	-
9	251162	1	LHE DIAGNOSTIC ASSY	-
8	251156	6	PIRELLI HTS LEAD KIT	-
6	251163	1	LHX DIAGNOSTIC ASSY	-
5	251831	1	LHX DIAGNOSTIC ASSEMBLY	-
4	251864	1	BUS DUCT ASSEMBLY	-
3	251079	1	THERMAL SHIELD ASSY, DFBXG	-

UNLESS OTHERWISE SPECIFIED TOLERANCES: X.X ± 0.1 FRACTION ± 1/64 X.XX ± 0.03 ANGLES ± 1.0° X.XXX ± 0.010 FINISH: 125 µm DO NOT SCALE PRINT THREADS ARE CLASS 2 CHAMFER ENDS OF ALL SCREW THREADS 30° BREAK EDGES .015 MAX. ON MACHINED WORK REMOVE BURRS, WELD SPATTER & LOOSE SCALE IN ACCORDANCE WITH ASTM F1681 ENCL. 1		SHOP ORDERS DATE: 03-NOV-01 DATE: 03-OCT-02 DATE: 03-OCT-02	ERNEST ORLANDO LAWRENCE BERKELEY NATIONAL LABORATORY UNIVERSITY OF CALIFORNIA BERKELEY LHC IR FEEDBOX MAJOR ASSEMBLY DFBX, DFBX, (1P28B, RIGHT) FEED BOX ASSY MICROFILMED: DWG. TYPE: ASSEM SCALE: 1:3/100 SHEET 1 OF 11 24C3626 B
---	--	--	---



8 7 6 5 4 3 2 1

D

D

C

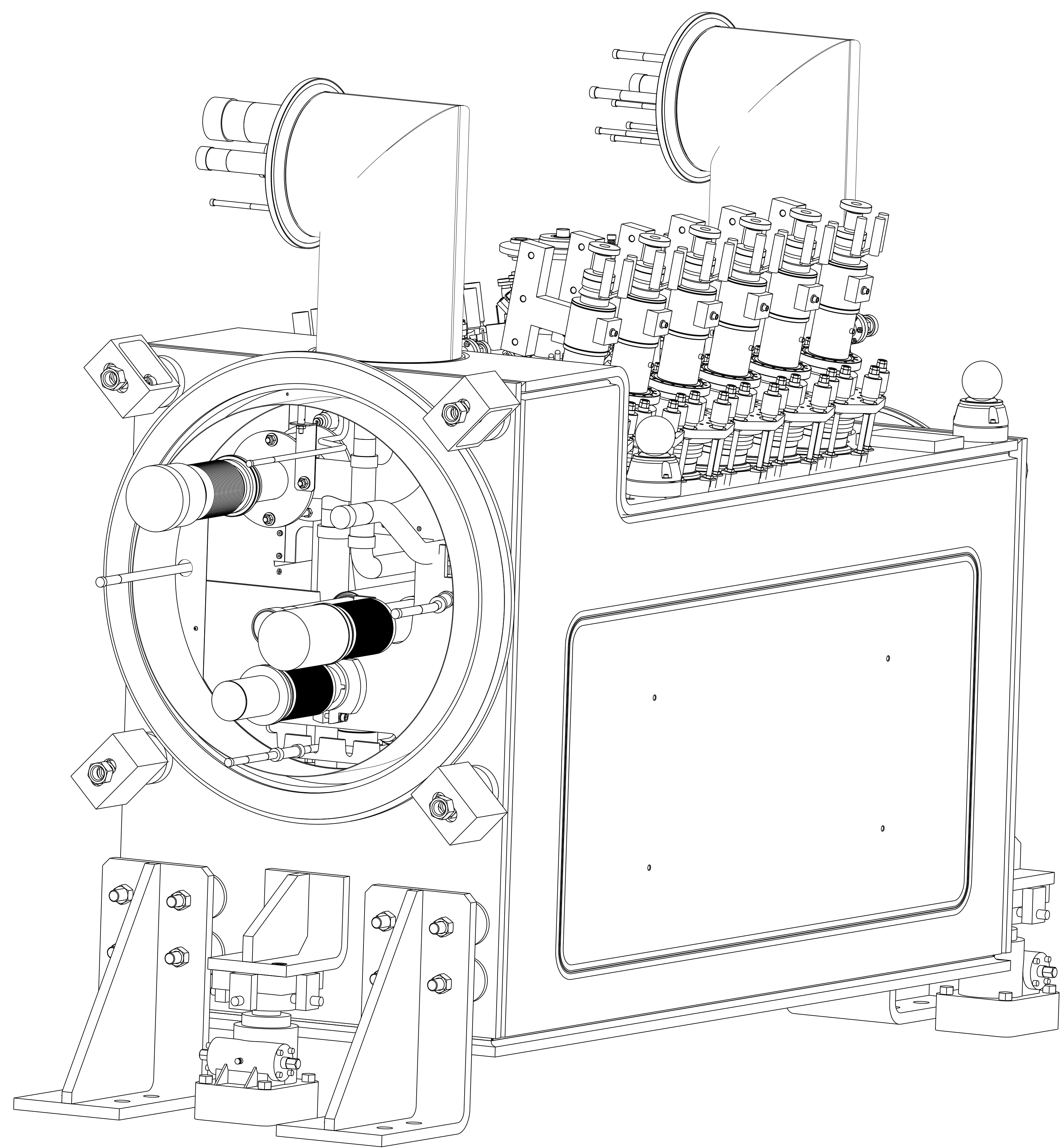
C

B

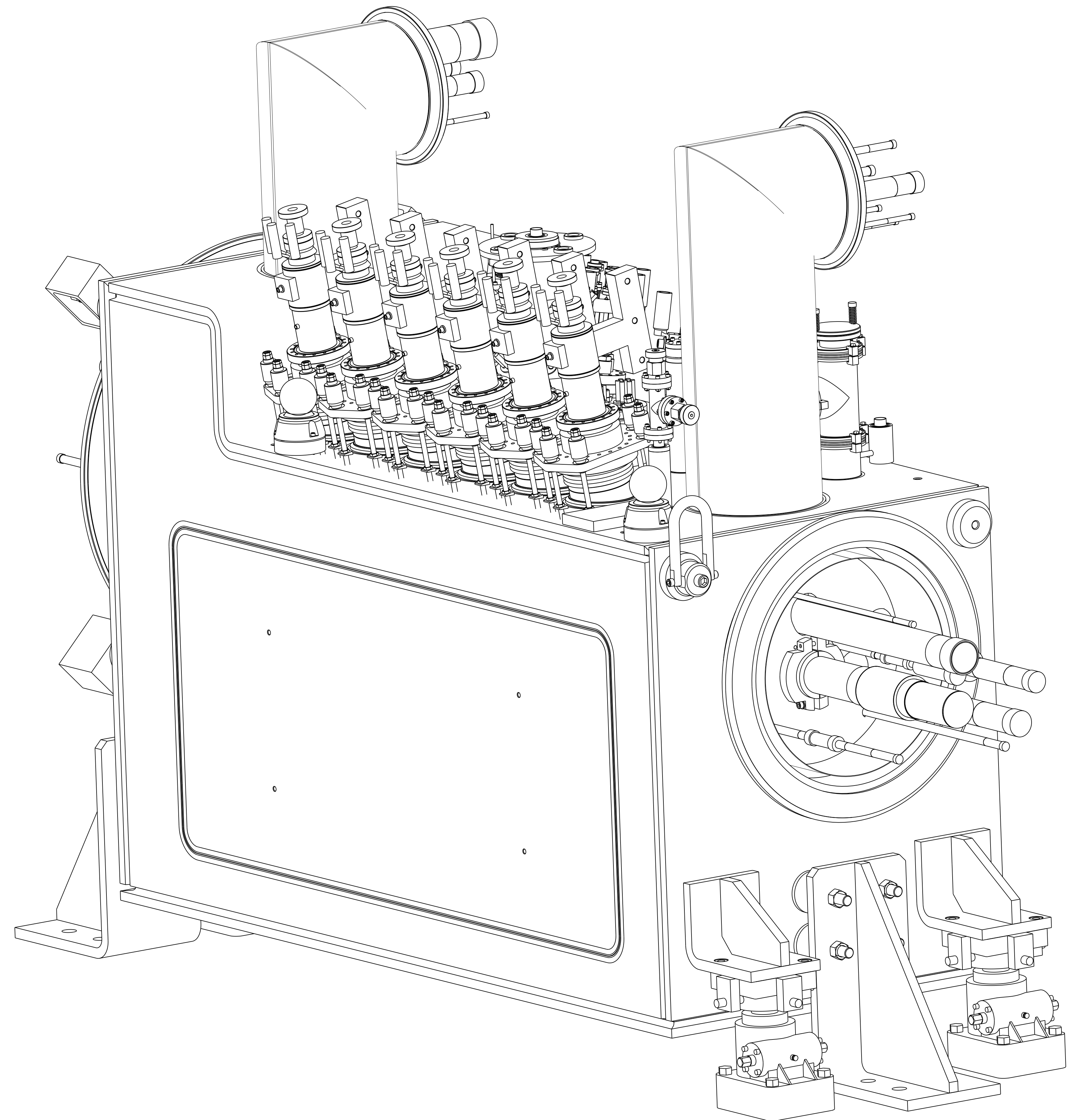
B

A

A

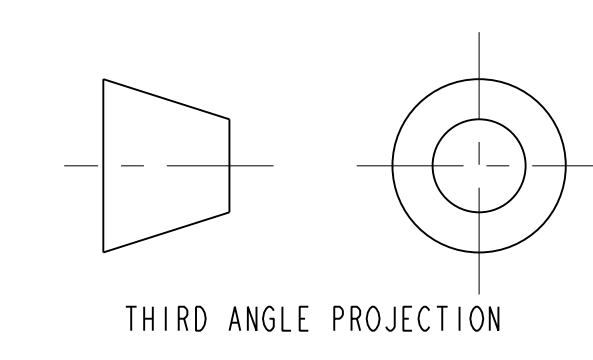


Q3 END



D1 END

DFBXD, IP2 (RIGHT)  
 DFBXH, IP8 (RIGHT)

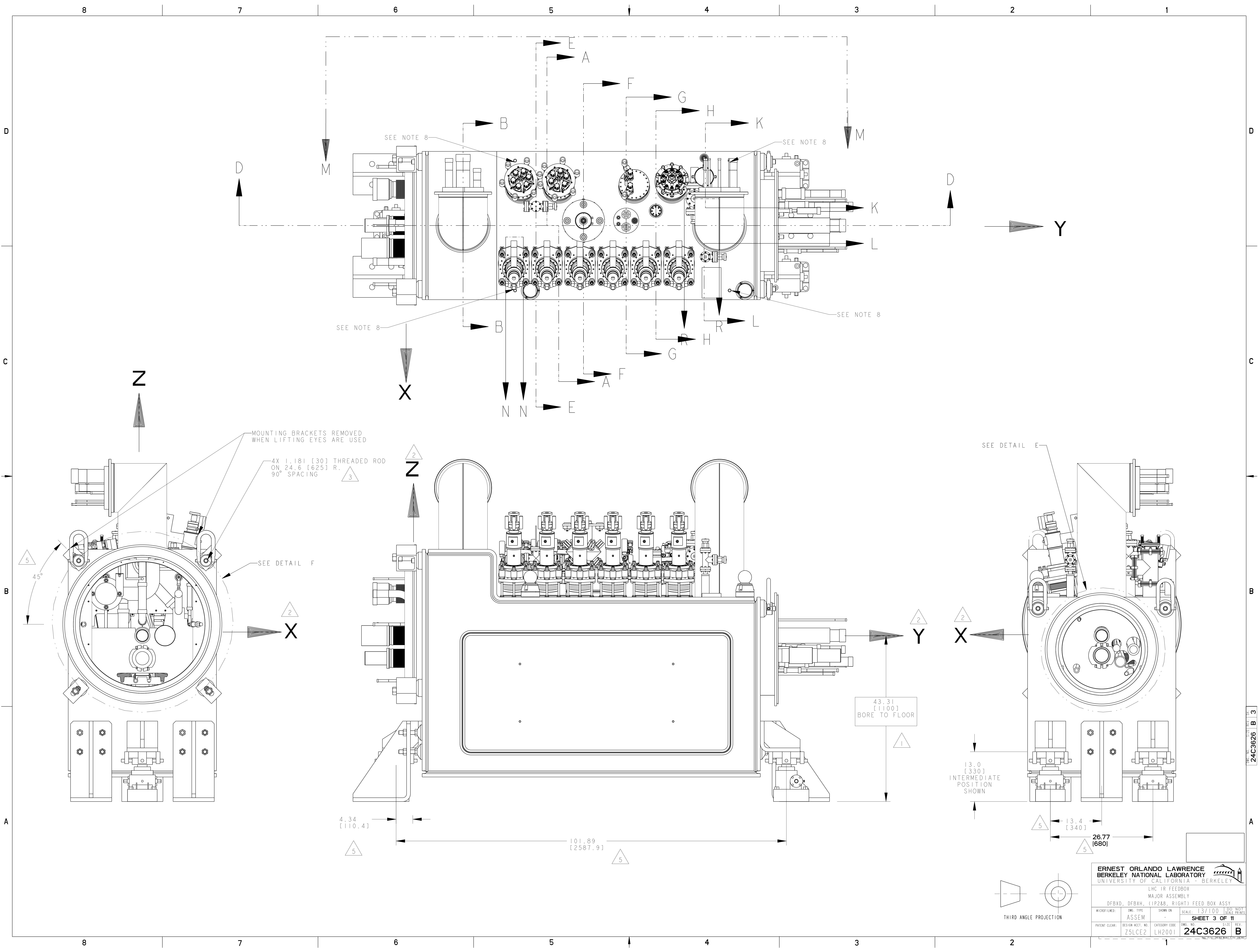


THIRD ANGLE PROJECTION

ERNEST ORLANDO LAWRENCE BERKELEY NATIONAL LABORATORY UNIVERSITY OF CALIFORNIA BERKELEY			
LHC IR FEEDBOX MAJOR ASSEMBLY			
DFBXD, DFBXH, (IP2&8, RIGHT) FEED BOX ASSY			
MICROFILMED	DWG. TYPE	SHOWN ON	SCALE
	ASSEM		9/50
PATENT CLEAR:			DESIGN ACCT. NO.
			ZSLCE2
CATEGORY CODE			DWG. NO.
LH2001			24C3626
SHEET 2 OF 11			REV.
			B

8 7 6 5 4 3 2 1

24C3626 B 2



SEE NOTE 8

SEE NOTE 8

SEE NOTE 8

SEE NOTE 8

MOUNTING BRACKETS REMOVED  
WHEN LIFTING EYES ARE USED

4X 1.181 [30] THREADED ROD  
ON 24.6 [625] R.  
90° SPACING

43.31  
[1100]  
BORE TO FLOOR

13.0  
[330]  
INTERMEDIATE  
POSITION  
SHOWN

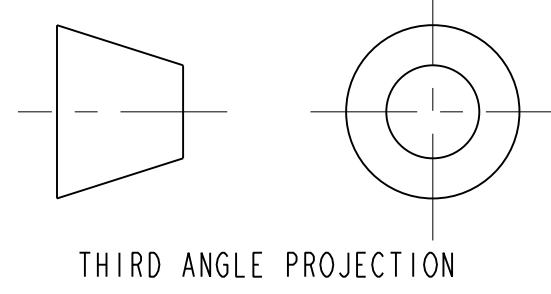
13.4  
[340]

26.77  
[680]

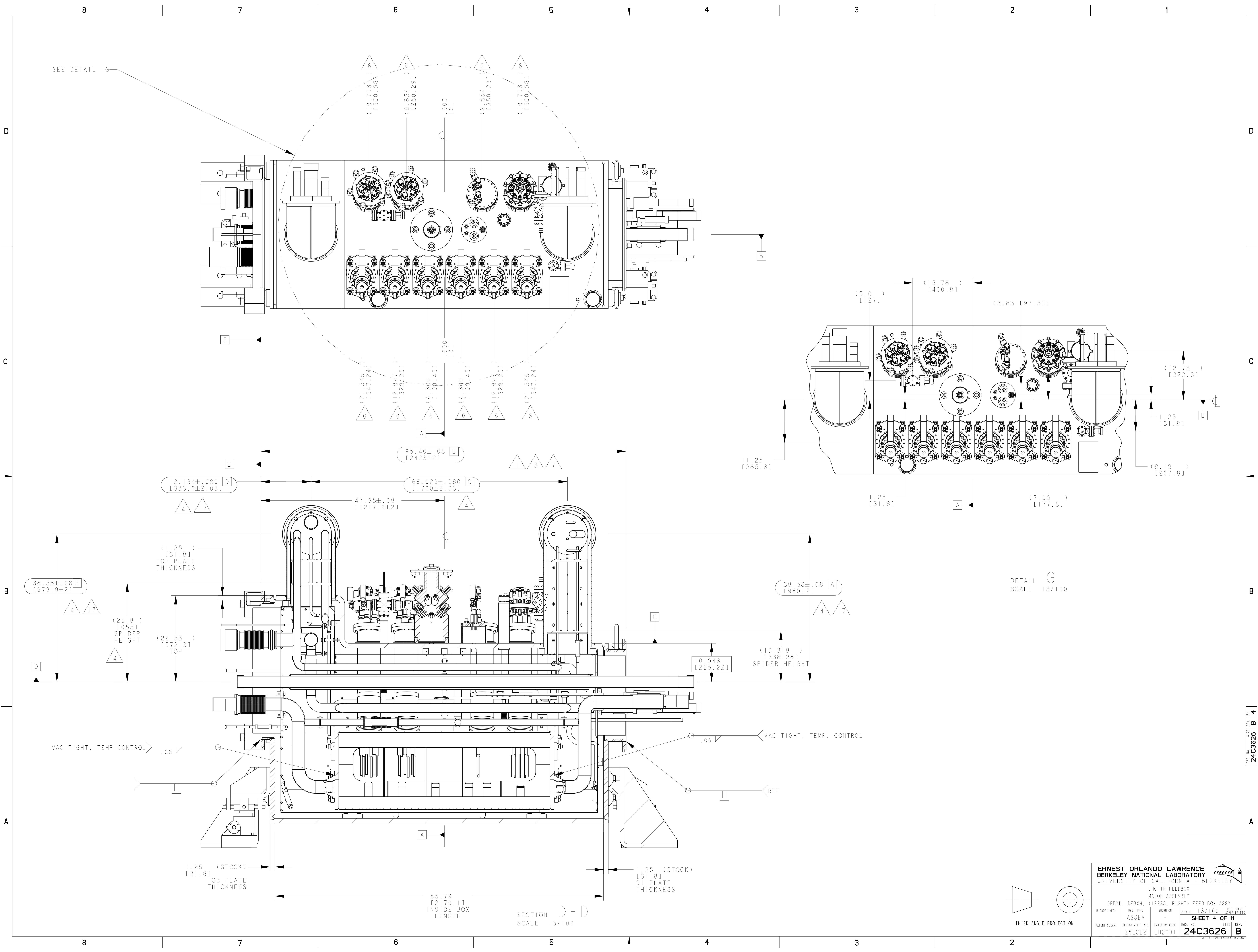
4.34  
[110.4]

101.89  
[2587.9]

<b>ERNEST ORLANDO LAWRENCE</b> <b>BERKELEY NATIONAL LABORATORY</b> UNIVERSITY OF CALIFORNIA - BERKELEY			
LHC IR FEEDBOX MAJOR ASSEMBLY DFBXD, DFBXH, (1P288, RIGHT) FEED BOX ASSY			
MICROFILMED:	DWG. TYPE:	SHOWN ON:	SCALE:
	ASSEM		1:3/100
SHEET 3 OF 11			DO NOT SCALE PRINTS
PATENT CLEAR:	DESIGN ACCT. NO.	CATEGORY CODE:	DWG. NO.
	Z5LCE2	LH2001	24C3626
			REV. B



DWG. NO. 24C3626 B 3

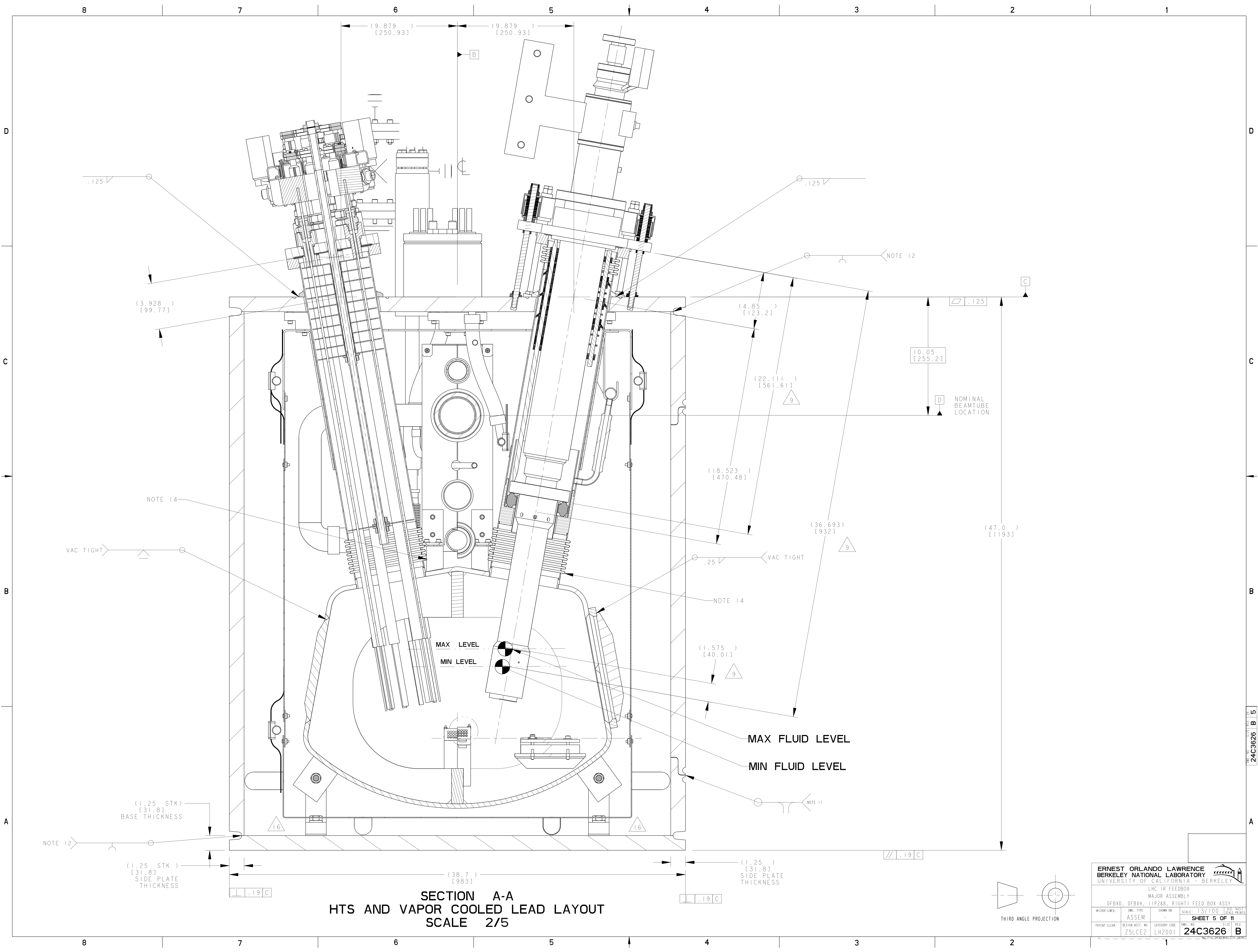


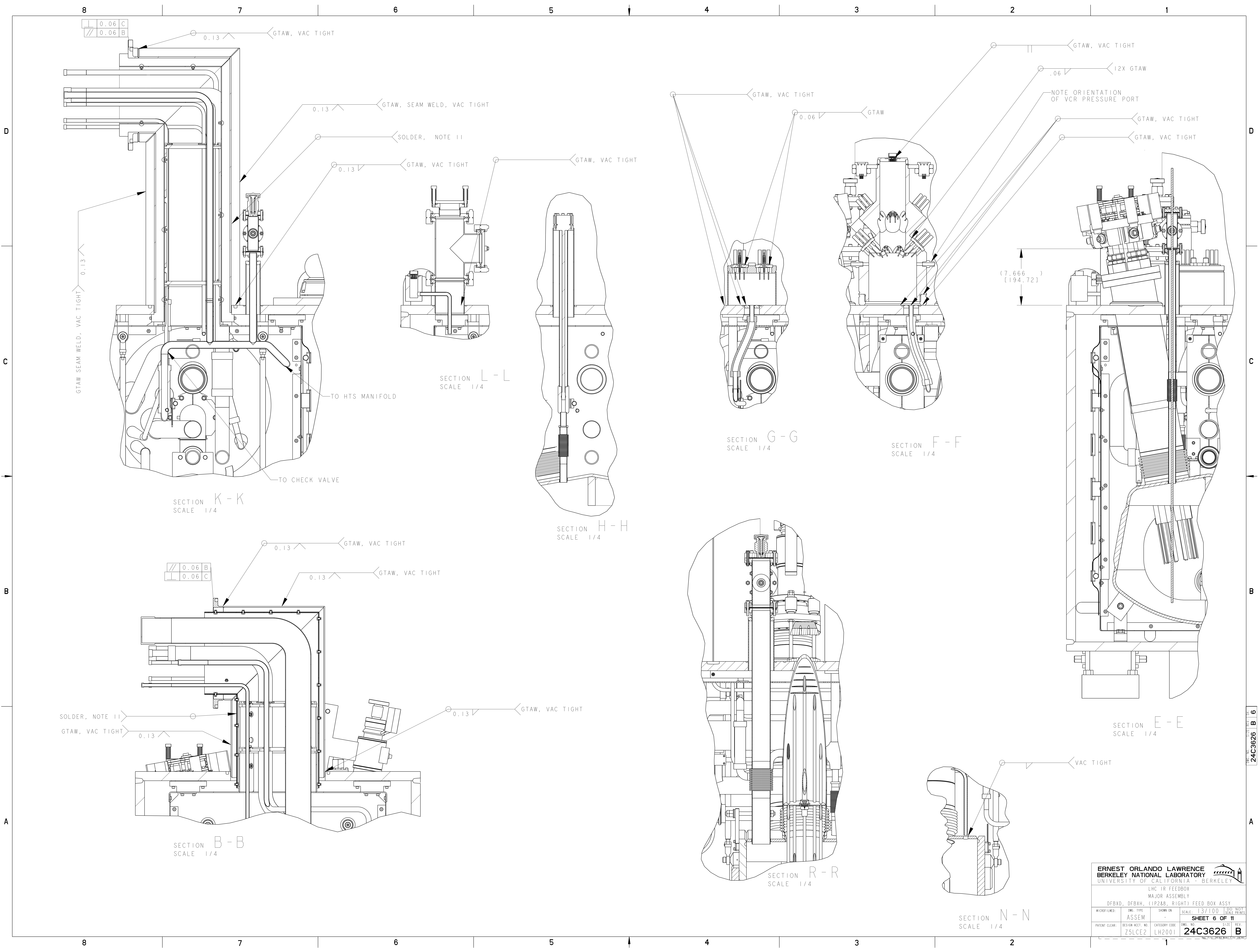
ERNEST ORLANDO LAWRENCE  
UNIVERSITY OF CALIFORNIA BERKELEY

LHC IR FEEDBOX  
MAJOR ASSEMBLY  
DFBXD, DFBXH, (1P288, RIGHT) FEED BOX ASSY

MICROFILMED	DWG. TYPE	SHOWN ON	SCALE	13/100	DO NOT SCALE PRINTS
	ASSEM				
SHEET 4 OF 11			DWG. NO. 24C3626		
PATENT CLEAR.	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	SHEET	REV.
	ZSLCE2	LH2001			B

DWG. NO. 24C3626 B 4





0.06	C
0.06	B

SECTION K-K  
SCALE 1/4

SECTION L-L  
SCALE 1/4

SECTION H-H  
SCALE 1/4

SECTION G-G  
SCALE 1/4

SECTION F-F  
SCALE 1/4

SECTION E-E  
SCALE 1/4

SECTION R-R  
SCALE 1/4

SECTION N-N  
SCALE 1/4

0.06	B
0.06	C

SECTION B-B  
SCALE 1/4

ERNEST ORLANDO LAWRENCE UNIVERSITY OF CALIFORNIA BERKELEY					
LHC IR FEEDBOX MAJOR ASSEMBLY					
DFBXD, DFBXH, (1P288, RIGHT) FEED BOX ASSY					
MICROFILMED:	DWG. TYPE:	SHOWN ON:	SCALE:	13/100	DO NOT SCALE PRINTS
	ASSEM				
PATENT CLEAR:			DESIGN ACCT. NO:	CATEGORY CODE:	DWG. NO.:
			ZSLCE2	LH2001	24C3626
				SHEET 6 OF 11	B

DWG. NO. 24C3626 B 6

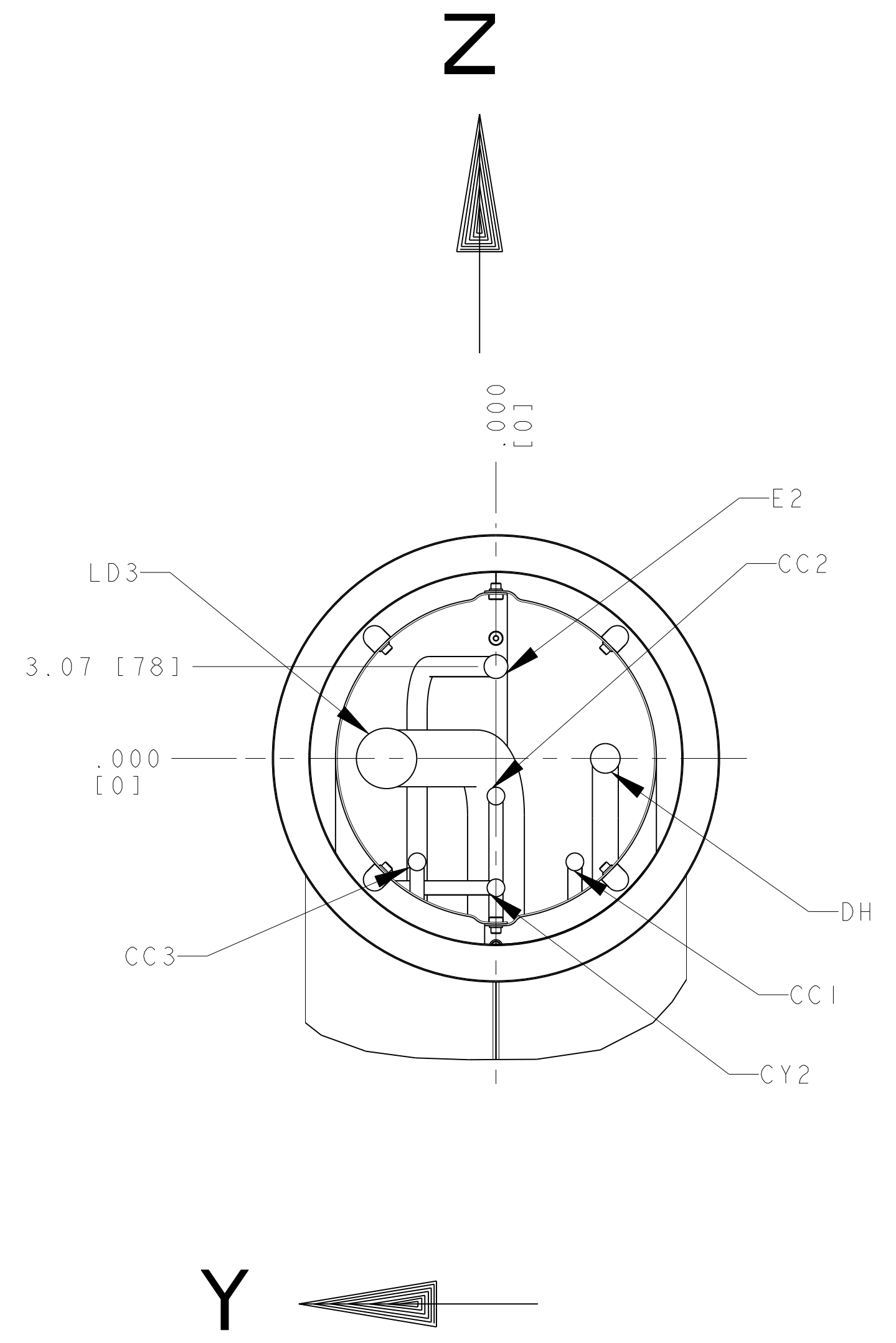
8 7 6 5 4 3 2 1

D

C

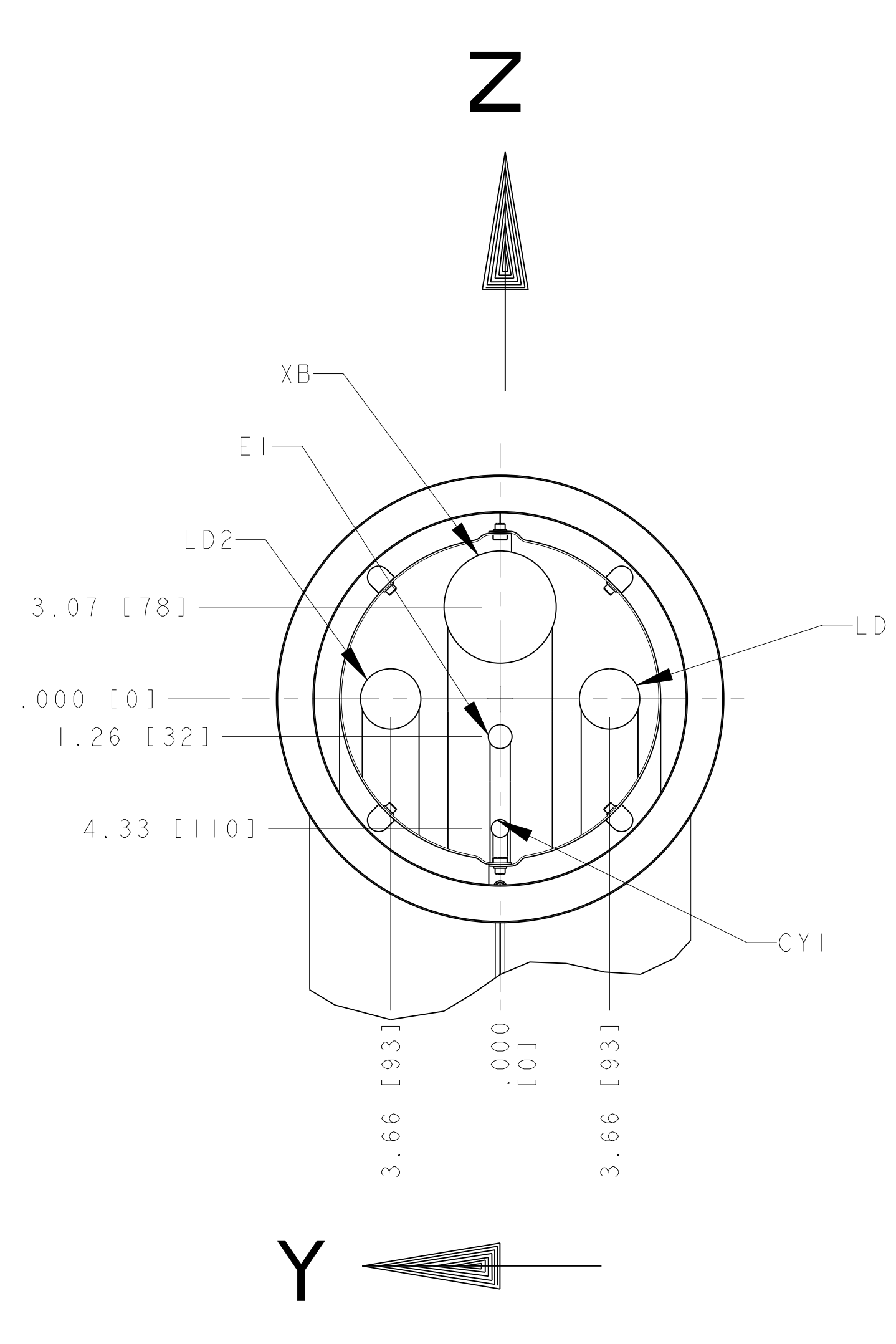
B

A



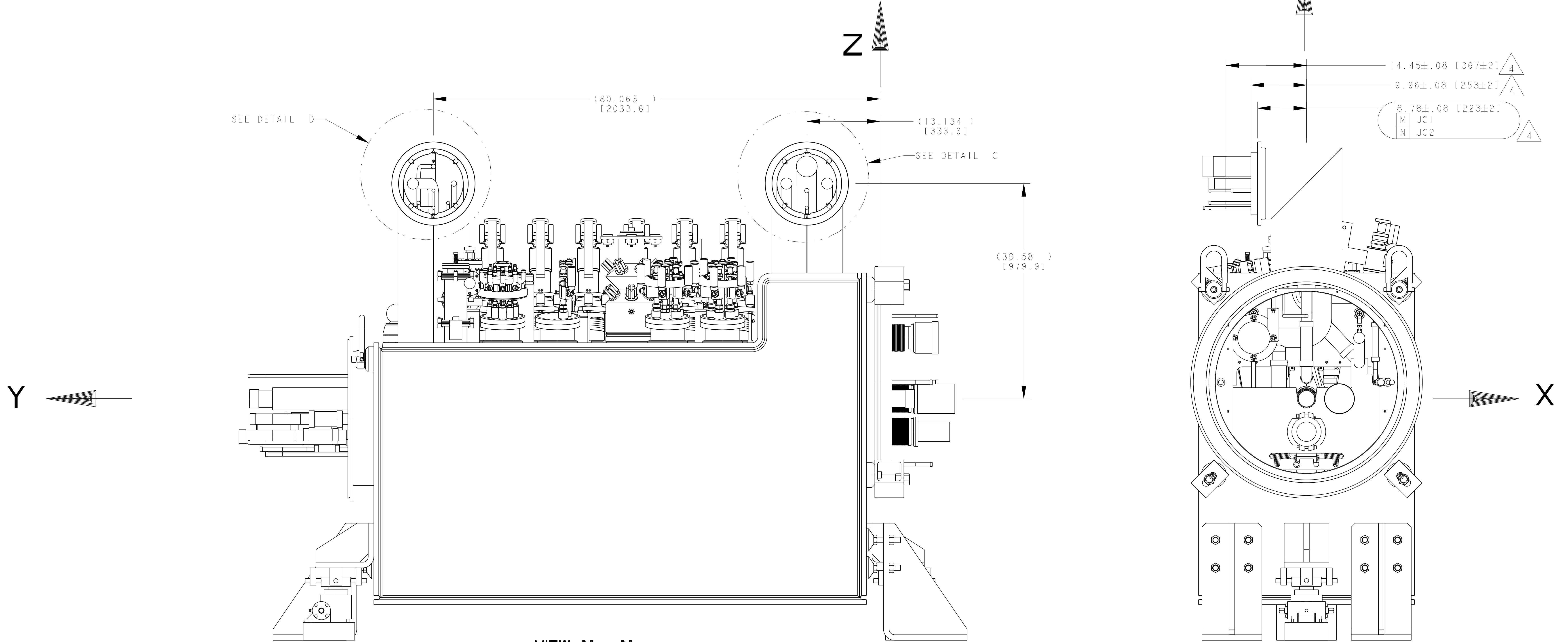
PIPE	DIM'S MEASURED FROM FLANGE CENTER		
	X	Y ±0.08	Z ±0.08
E2	-14.45±.08 [367±2]	0	3.07 [78]
DH	-14.45±.08 [367±2]	-3.66 [93]	0
LD3	-14.45±.08 [367±2]	3.66 [93]	0
CC2	-14.45±.08 [367±2]	0	-1.26 [32]
CC1	-14.45±.08 [367±2]	-2.64 [67]	-3.46 [88]
CC3	-14.45±.08 [367±2]	2.64 [67]	-3.46 [88]
CY2	-14.45±.08 [367±2]	0	-4.33 [110]

**DETAIL D**  
 JC2 / QQSD  
 DIMENSIONAL TOLERANCE ± 0.08  
 ORIENTATION OPPOSITE OF SPECIFICATION 240  
 SCALE 1/4

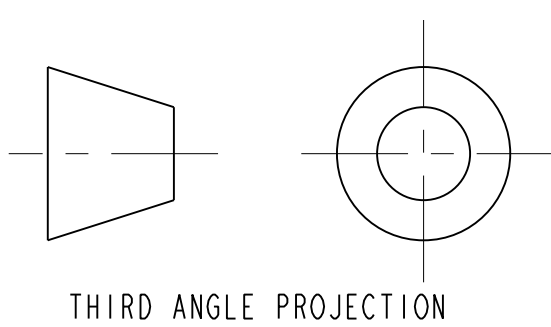
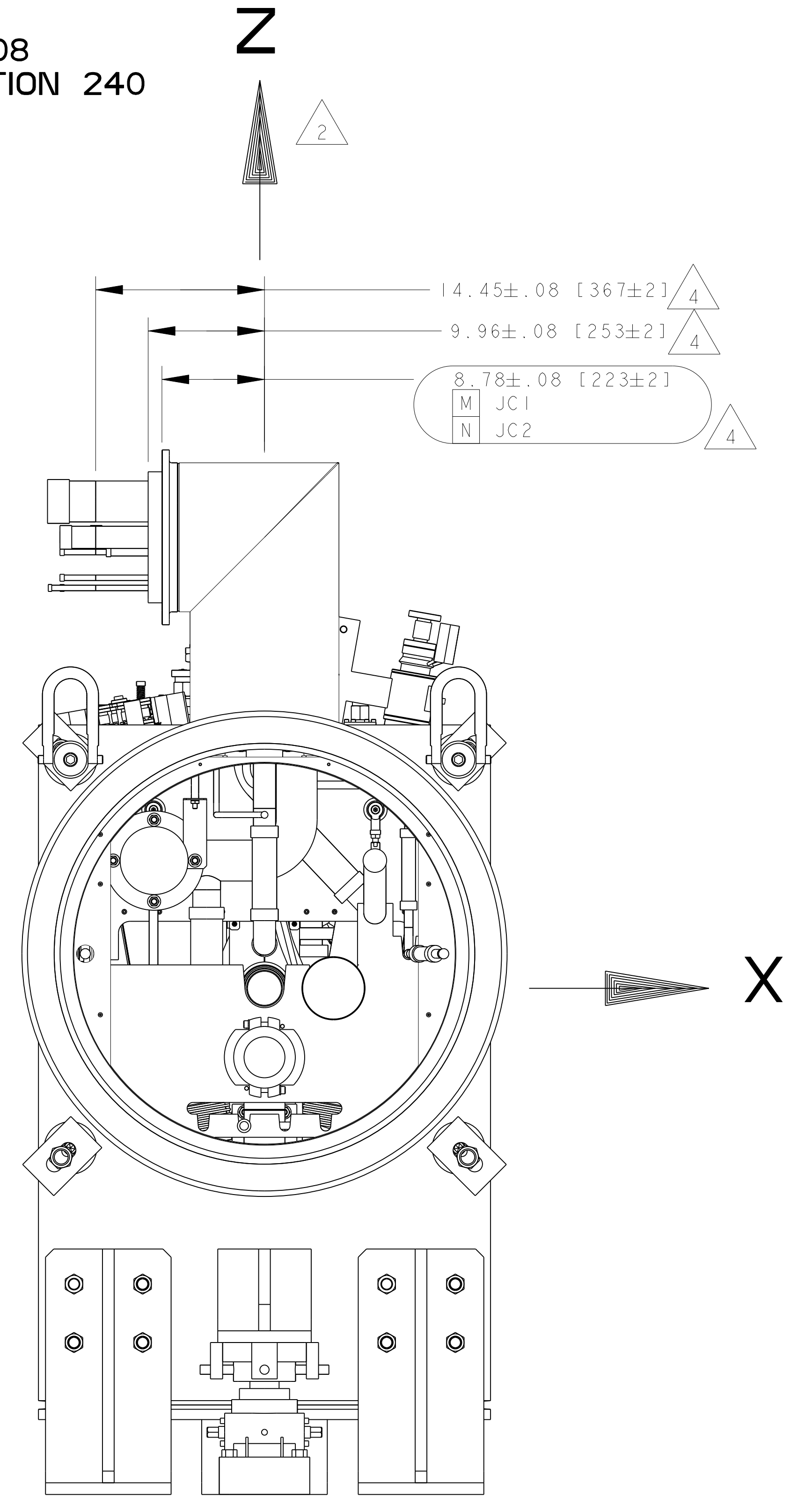


PIPE	DIM'S MEASURED FROM FLANGE CENTER		
	X	Y ±0.08	Z ±0.08
XB	-14.45±.08 [367±2]	0	3.07 [78]
LD2	-14.45±.08 [367±2]	3.66 [93]	0
LD1	-14.45±.08 [367±2]	-3.66 [93]	0
E1	-14.45±.08 [367±2]	0	-1.26 [32]
CY1	-14.45±.08 [367±2]	0	-4.33 [110]

**DETAIL C**  
 JC1 / QQC  
 DIMENSIONAL TOLERANCE ± 0.08  
 ORIENTATION OPPOSITE OF SPECIFICATION 240  
 SCALE 1/4



**VIEW M - M**  
 ROTATED 180°



THIRD ANGLE PROJECTION

ERNEST ORLANDO LAWRENCE  
 UNIVERSITY OF CALIFORNIA - BERKELEY

LHC IR FEEDBOX  
 MAJOR ASSEMBLY

DFBXD, DFBXH, (1P288, RIGHT) FEED BOX ASSY

MICROFILMED:	DWG. TYPE:	SHOWN ON:	SCALE:	DO NOT SCALE PRINTS
	ASSEM		1:3/100	

PATENT CLEAR: DESIGN ACCT. NO. ZSLCE2 CATEGORY CODE LH2001 DWG. NO. 24C3626 SHEET 7 OF 11

8 7 6 5 4 3 2 1

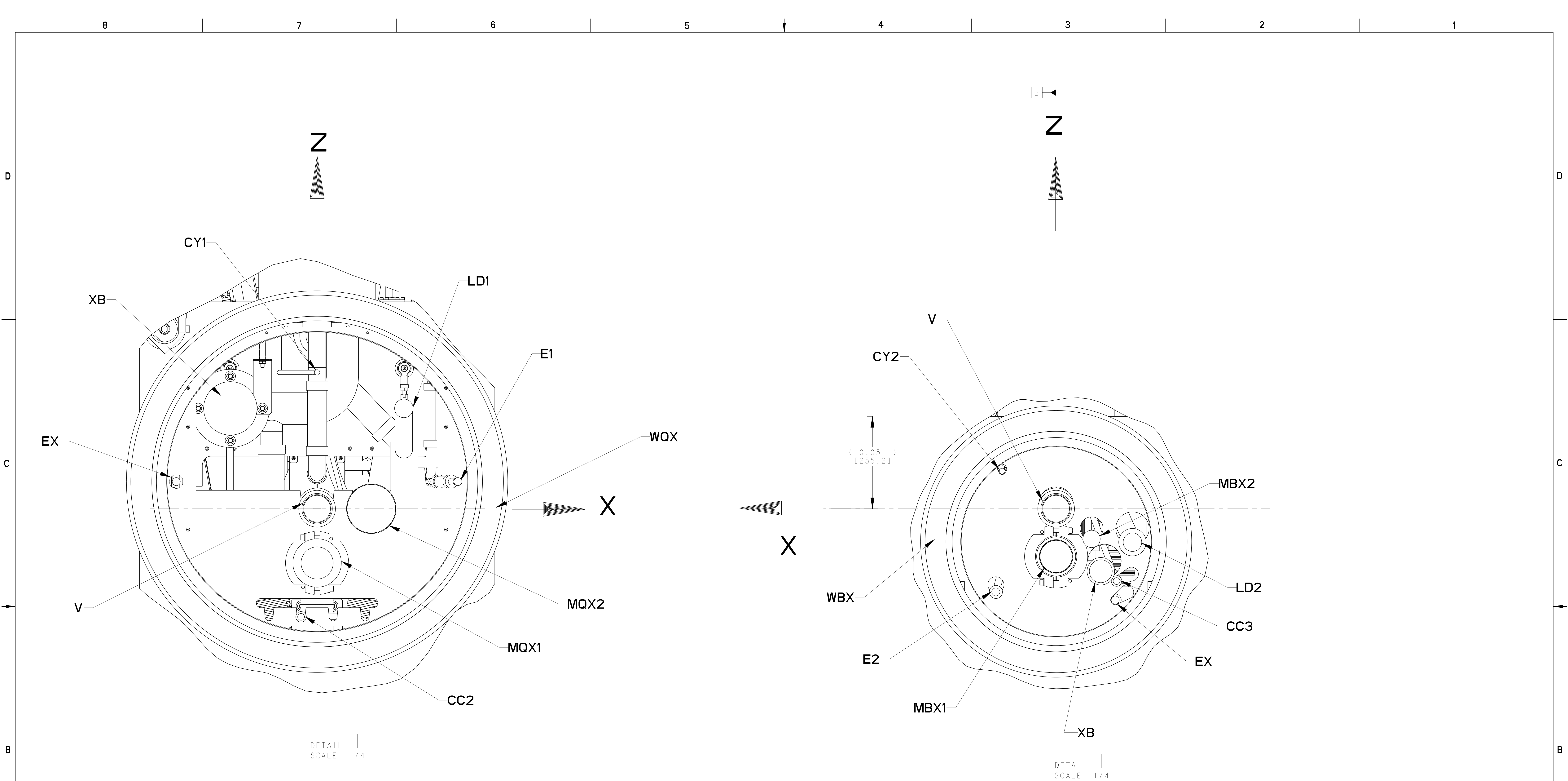
D

C

B

A

DWG. NO. 24C3626 B 7



DETAIL F  
SCALE 1/4

DETAIL E  
SCALE 1/4

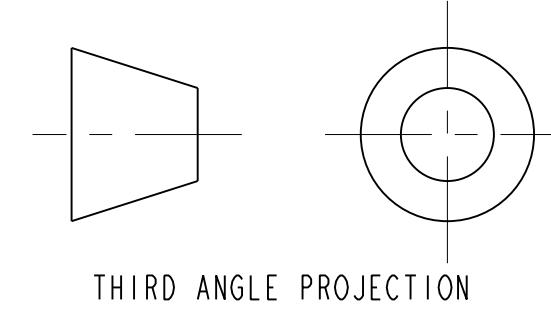
**Q3 PIPING INTERFACE**  
PER SPEC. LHC-DFBX-ES-210.00 REV 1.0

DFBX	PIPE OD/ID		PIPE COORDINATES AT 300 K		
	OD in [mm]	ID in [mm]	X in [mm] ±08	Z in [mm] ±08	Y in [mm] ±08
V	3.071 [78]	2.913 [73.99]	.000 [0]	.000 [0]	-2.032 [-51.61]
LD1	1.748 [44.4]	1.650 [41.91]	9.449 [240]	10.925 [277.5]	-6.299 [-159.99]
CC2	.626 [15.9]	.528 [13.41]	-1.744 [-44.3]	-11.772 [-299.01]	-6.299 [-159.99]
CY1	.626 [15.9]	.528 [13.41]	.000 [0]	14.839 [376.91]	-6.299 [-159.99]
E1	1.500 [38.1]	1.370 [34.8]	15.339 [389.61]	2.953 [75.01]	-6.299 [-159.99]
EX	1.500 [38.1]	1.370 [34.8]	-15.339 [-389.61]	2.953 [75.01]	-6.299 [-159.99]
MQX1	3.500 [88.9]	3.370 [85.6]	.000 [0]	-5.906 [-150.01]	-6.299 [-159.99]
MQX2	3.500 [88.9]	3.370 [85.6]	5.906 [150.01]	.000 [0]	-6.299 [-159.99]
WQX	41.535 [1055]	35.039 [890]	.000 [0]	2.953 [75.01]	.000 [0]
XB	3.500 [88.9]	3.370 [85.6]	-9.449 [-240]	10.925 [277.5]	-6.299 [-159.99]

**D1 PIPING INTERFACE**  
PER SPEC. LHC-DFBX-ES-230.00 REV 1.1

DFBX	PIPE OD/ID		PIPE COORDINATES AT 300 K		
	OD in [mm]	ID in [mm]	X in [mm] ±08	Z in [mm] ±08	Y in [mm] ±08
V	3.06 [77.7]	2.91 [73.9]	.000 [0]	.000 [0]	13.504 [343]
LD2	1.75 [44.5]	1.66 [42.2]	-8.311 [-211.1]	-3.642 [-92.51]	13.465 [342.01]
CC3	.63 [16]	.53 [13.5]	-6.583 [-167.21]	-7.874 [-200]	14.843 [377.01]
CY2	.63 [16]	.53 [13.5]	5.878 [149.3]	4.094 [103.99]	14.843 [377.01]
END TRANSITION	.50 [12.7]	.41 [10.4]			
Ex	1.50 [38.1]	1.38 [35.1]	-6.437 [-163.5]	-9.945 [-252.6]	11.693 [297]
E2	1.50 [38.1]	1.38 [35.1]	6.559 [166.6]	-9.059 [-230.1]	11.693 [297]
MBX1	3.50 [88.9]	3.38 [85.9]	.000 [0]	-5.193 [-131.9]	1.732 [43.99]
MBX2	.50 [12.7]	.38 [9.7]	-3.862 [-98.09]	-3.287 [-83.49]	5.465 [138.81]
END TRANSITION	1.47 [37.3]	1.34 [34]			
WBX	29.53 [750.1]	23.50 [596.9]	.000 [0]	-3.528 [-89.61]	.000 [0]
XB	2.88 [73.2]	2.72 [69.1]	-4.866 [-123.6]	-6.803 [-172.8]	13.465 [342.01]
END TRANSITION	2.00 [50.8]	1.88 [47.8]			

15



**ERNEST ORLANDO LAWRENCE**  
UNIVERSITY OF CALIFORNIA - BERKELEY

LHC IR FEEDBOX  
MAJOR ASSEMBLY  
DFBX, DFBX, (IP288, RIGHT) FEED BOX ASSY

MICROFILMED:	DWG. TYPE:	SHOWN ON:	SCALE:	DATE:
	ASSEM		1:3/100	

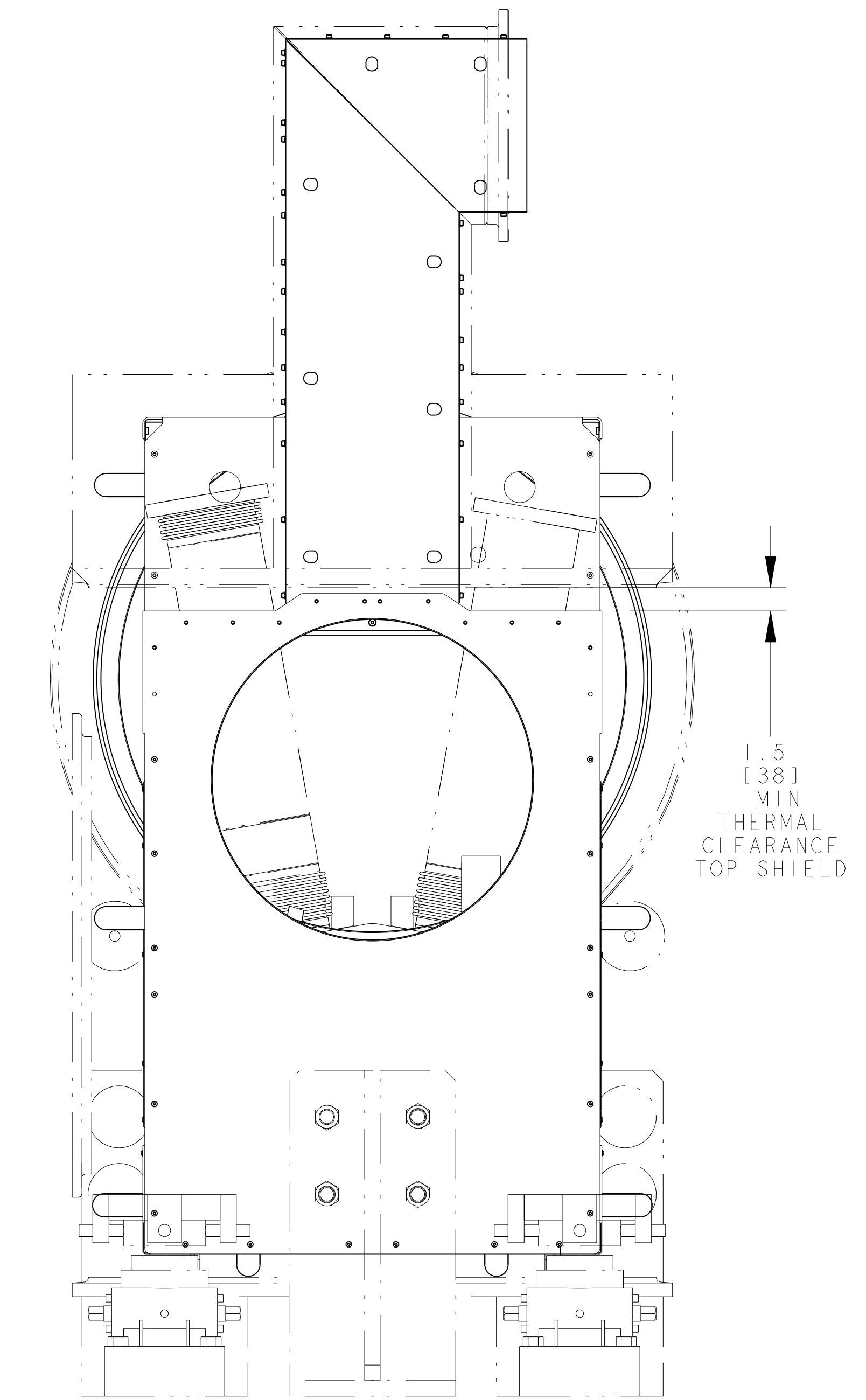
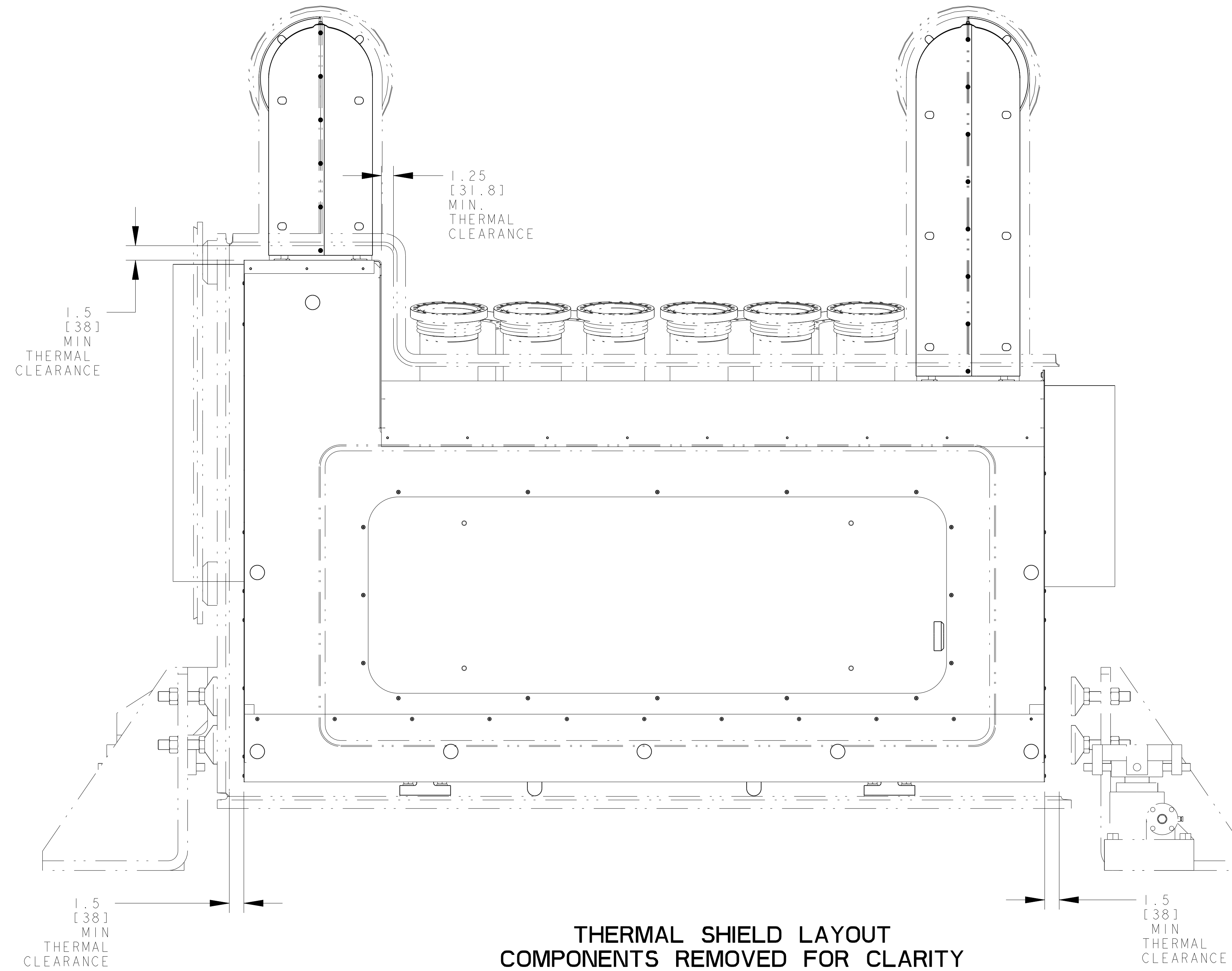
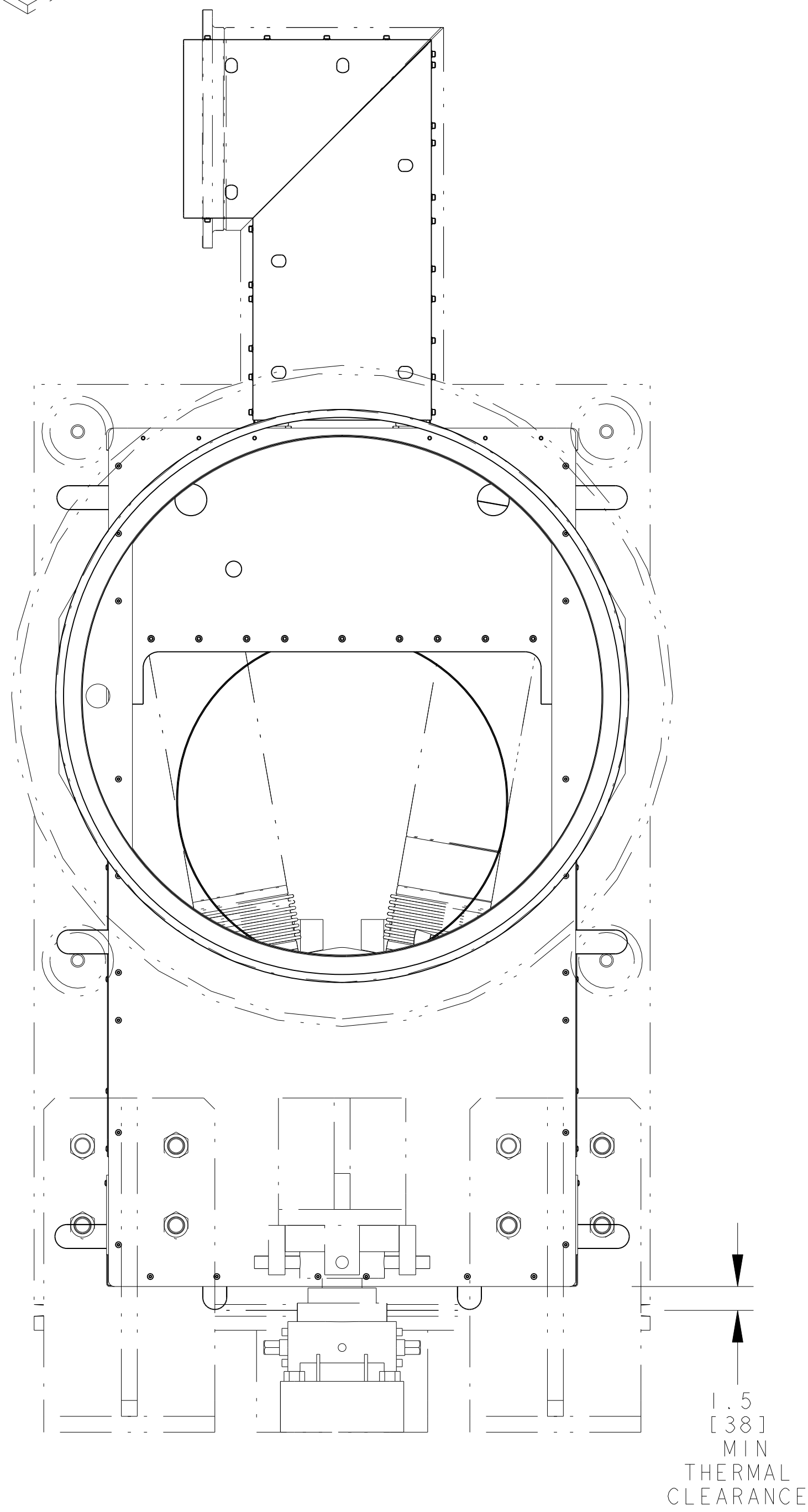
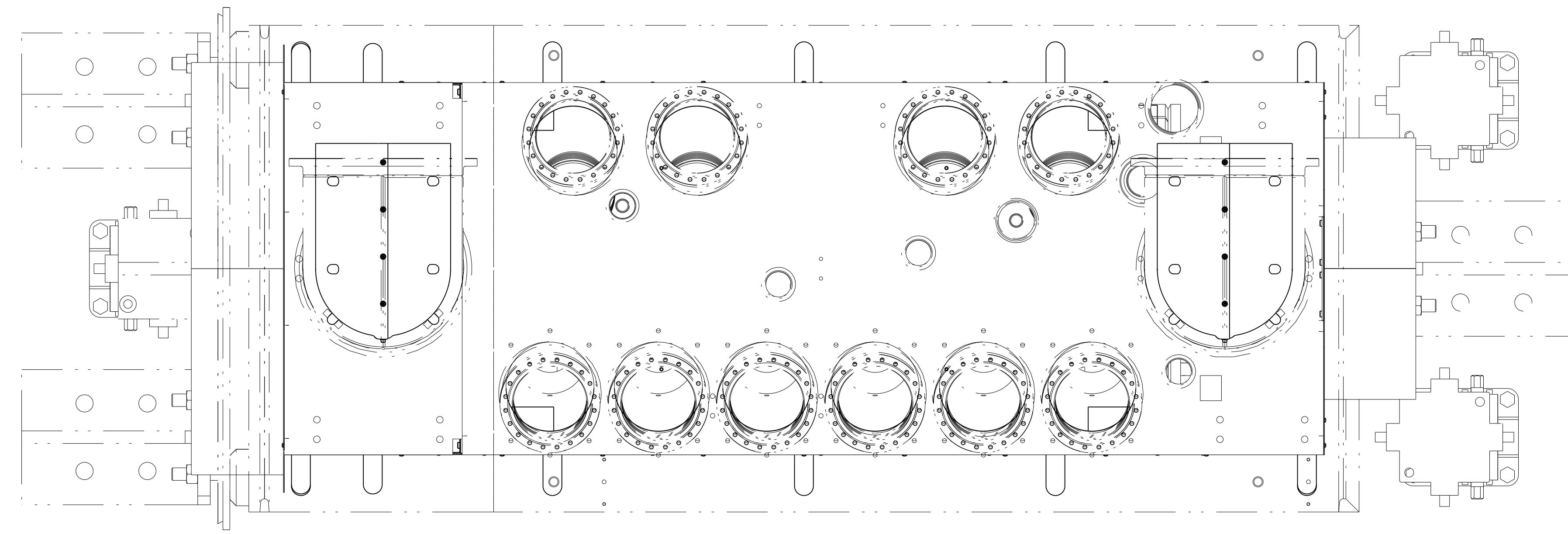
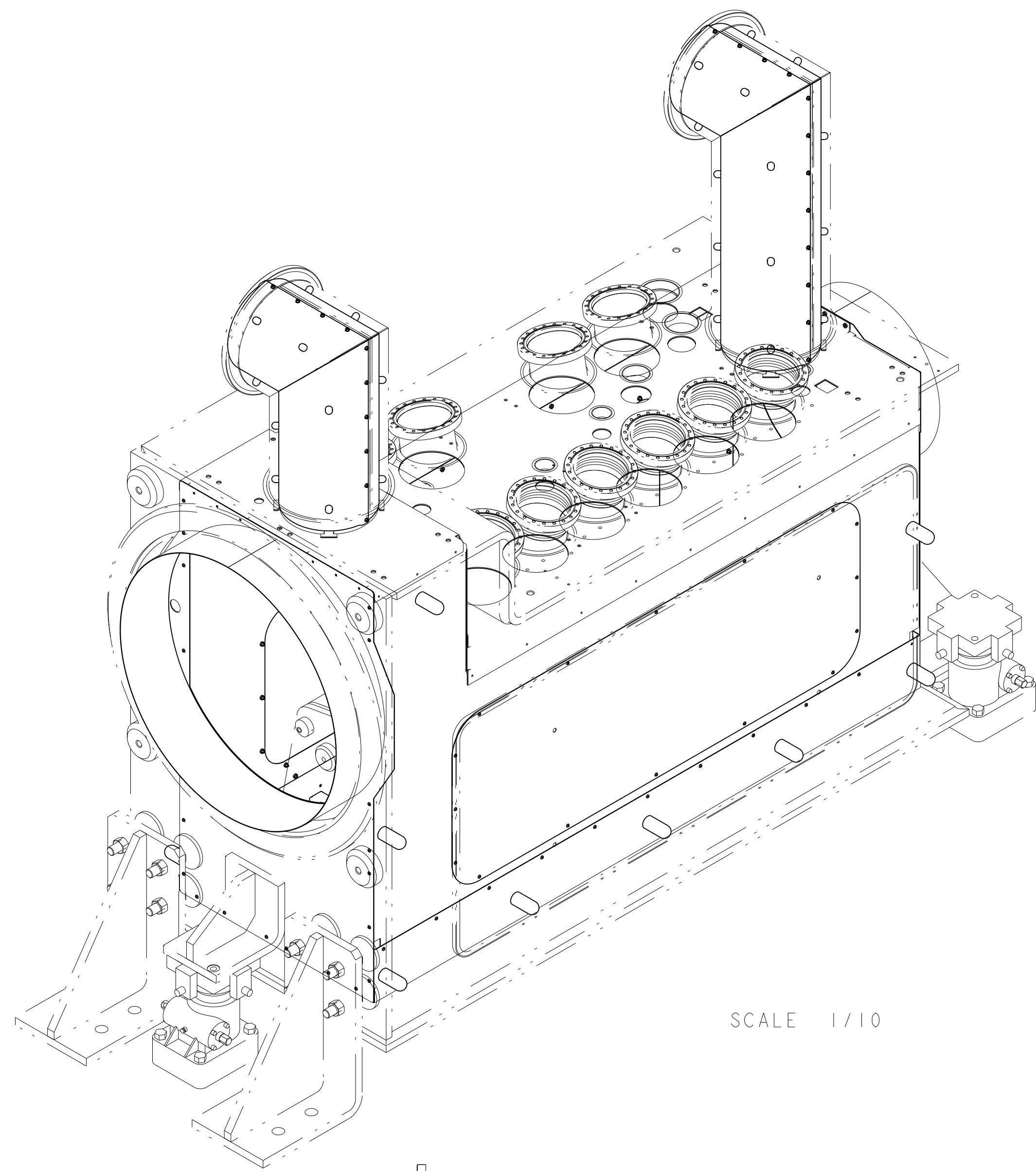
PATENT CLEAR: DESIGN ACCT. NO. ZSLCE2 CATEGORY CODE LH2001 DWG. NO. 24C3626 SHEET 8 OF 11

24C3626 B 15



8 7 6 5 4 3 2 1

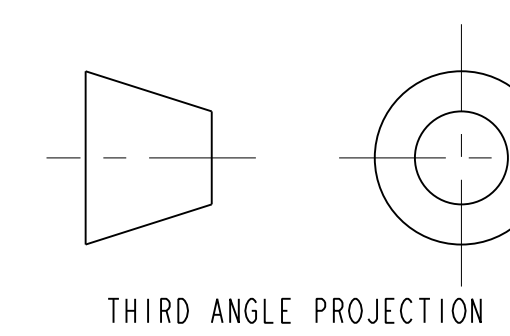
D  
C  
B  
A



**THERMAL SHIELD LAYOUT  
COMPONENTS REMOVED FOR CLARITY  
SCALE 3/20**

8 7 6 5 4 3 2 1

D  
C  
B  
A

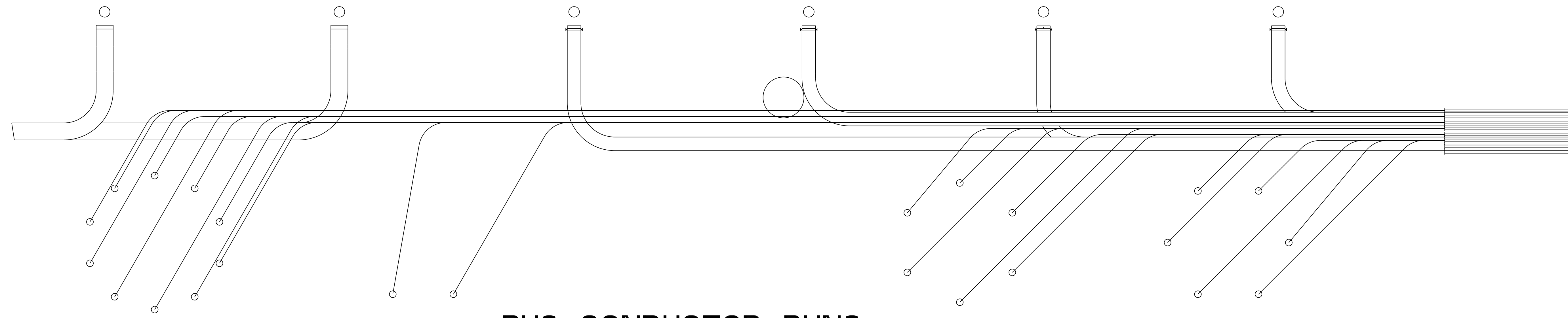


ERNEST ORLANDO LAWRENCE BERKELEY NATIONAL LABORATORY				UNIVERSITY OF CALIFORNIA BERKELEY	
LHC IR FEEDBOX MAJOR ASSEMBLY					
DFBXD, DFBXH, (1P288, RIGHT) FEED BOX ASSY					
MICROFILMED:	DWG. TYPE:	SHOWN ON:	SCALE:	1/3/100	DO NOT SCALE PRINTS
	ASSEM				
PATENT CLEAR:			DESIGN ACCT. NO:	CATEGORY CODE:	DWG. NO:
			ZSLCE2	LH2001	24C3626
				SHEET 9 OF 11	B

8 7 6 5 4 3 2 1

D

D

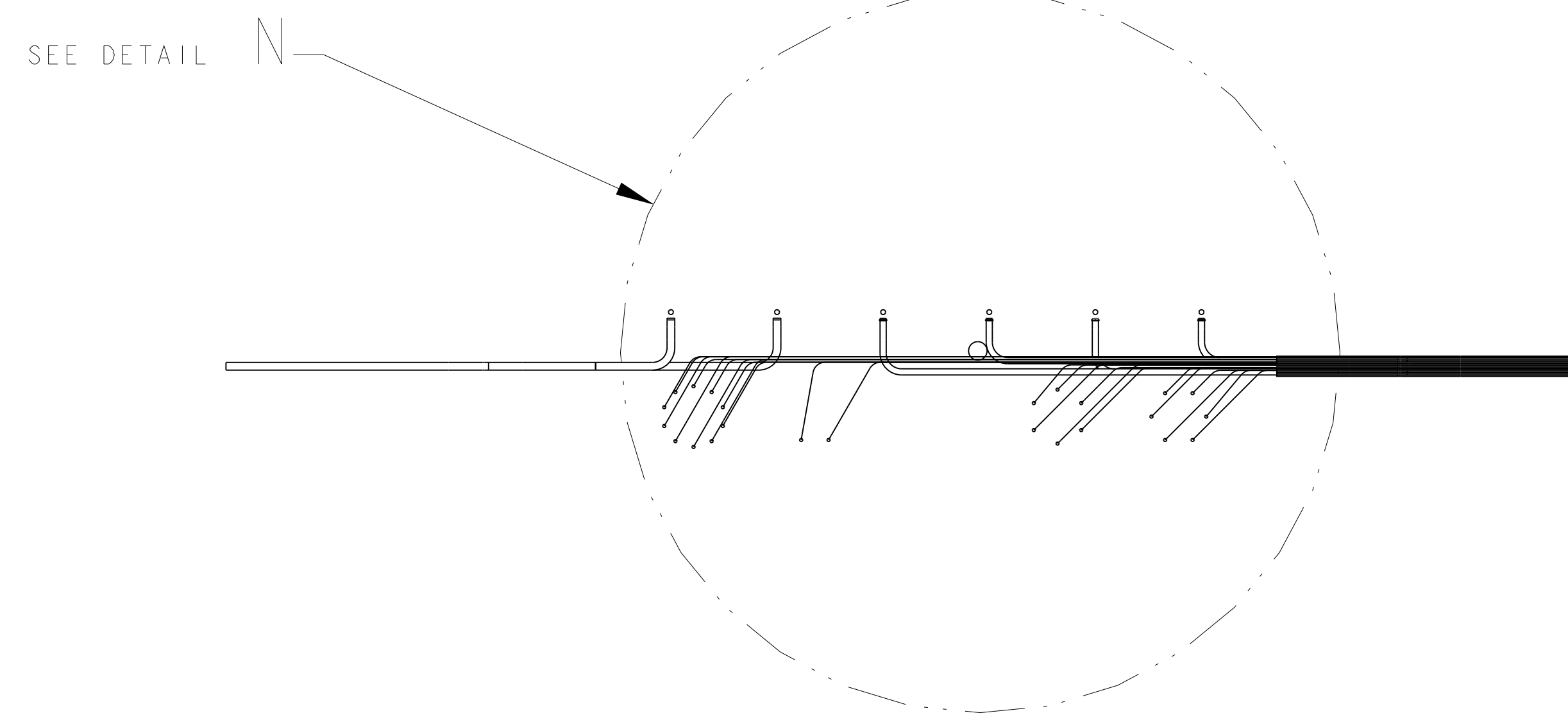


### BUS CONDUCTOR RUNS

DETAIL N  
SCALE 1/2

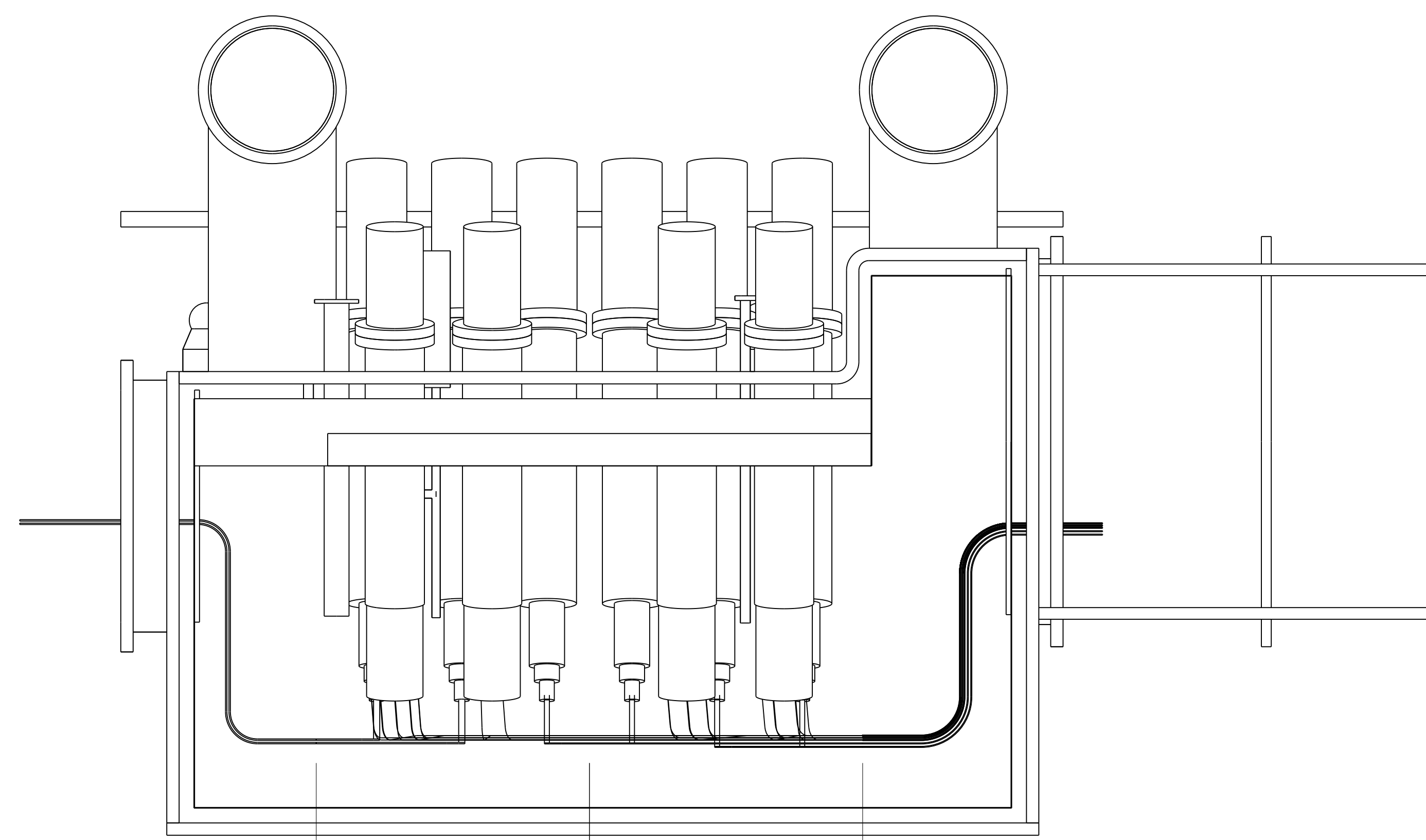
C

C



B

B



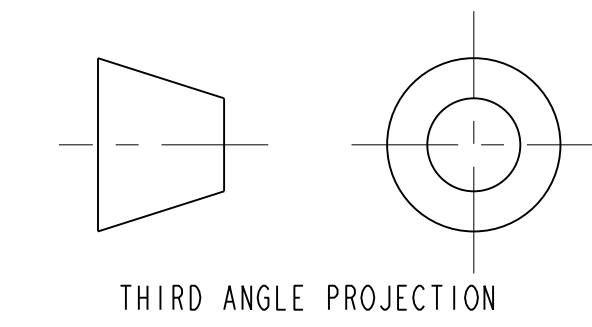
27.660 [702.56]      27.660 [702.56]

A

A

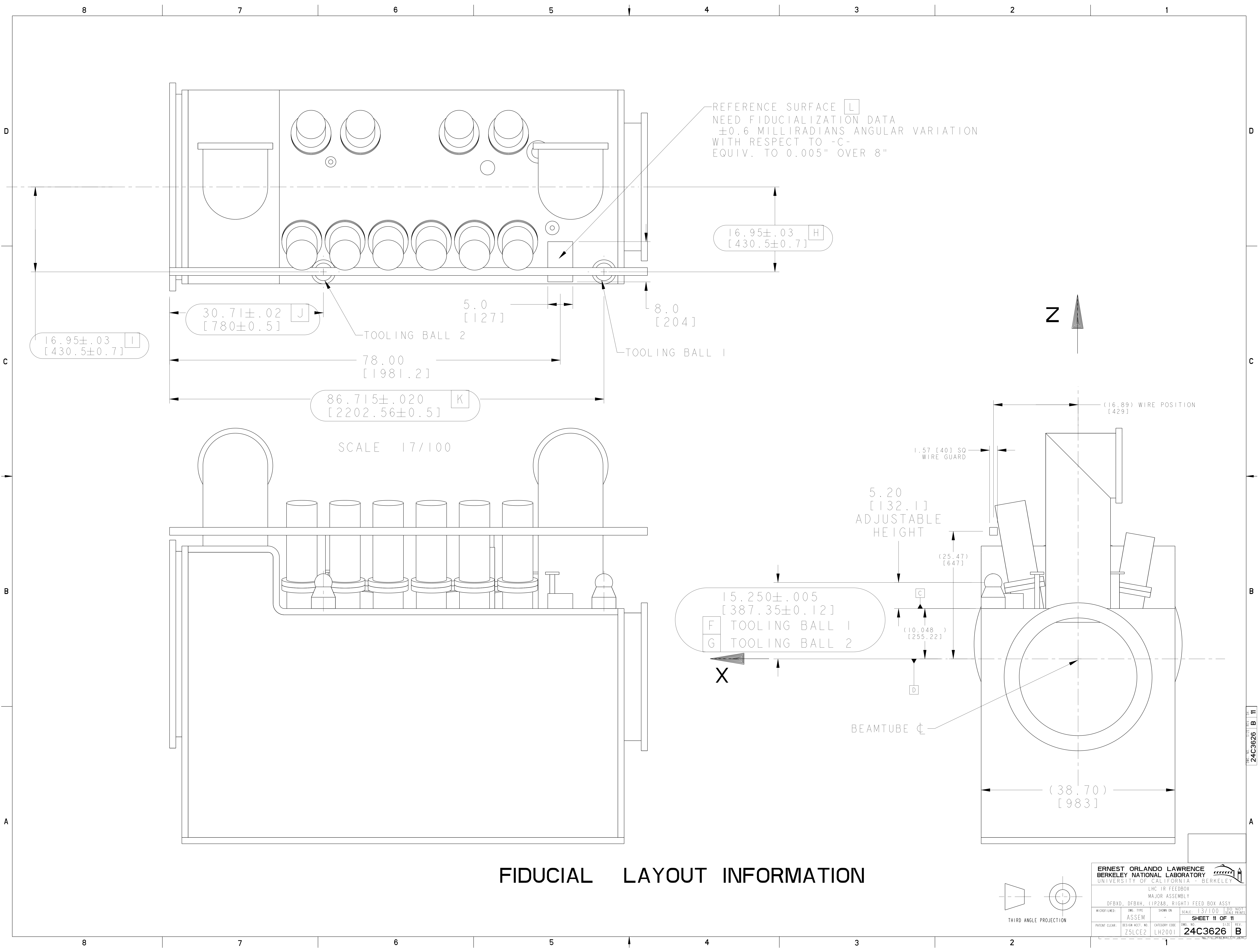
SCALE 1/10

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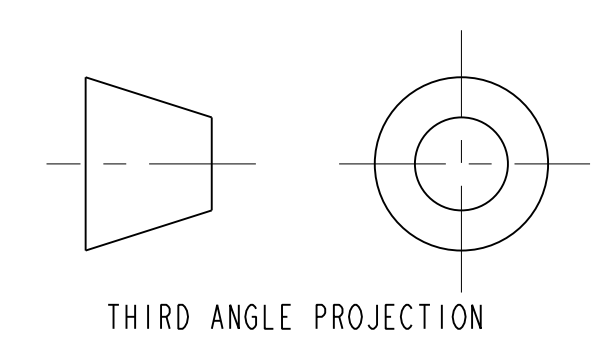


<b>ERNEST ORLANDO LAWRENCE</b> UNIVERSITY OF CALIFORNIA BERKELEY			
LHC IR FEEDBOX MAJOR ASSEMBLY			
DFBXD, DFBXH, (1P288, RIGHT) FEED BOX ASSY			
MICROFILMED:	DWG. TYPE:	SHOWN ON:	SCALE: 1:3/100
	ASSEM	-	<b>SHEET 10 OF 11</b>
PATENT CLEAR:	DESIGN ACCT. NO:	CATEGORY CODE:	DWG. NO. <b>24C3626</b>
	ZSLCE2	LH2001	SIZE: <b>B</b>

DWG. NO. 24C3626 B 10



FIDUCIAL LAYOUT INFORMATION



ERNEST ORLANDO LAWRENCE  
BERKELEY NATIONAL LABORATORY  
UNIVERSITY OF CALIFORNIA BERKELEY

LHC IR FEEDBOX  
MAJOR ASSEMBLY  
DFBXD, DFBXH, (1P288, RIGHT) FEED BOX ASSY

MICROFILMED	DWG. TYPE	SHOWN ON	SCALE	DO NOT SCALE PRINTS
	ASSEM		1:3/100	
PATENT CLEAR.	DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	REV.
	ZSLCE2	LH2001	24C3626	B

SHEET 11 OF 11