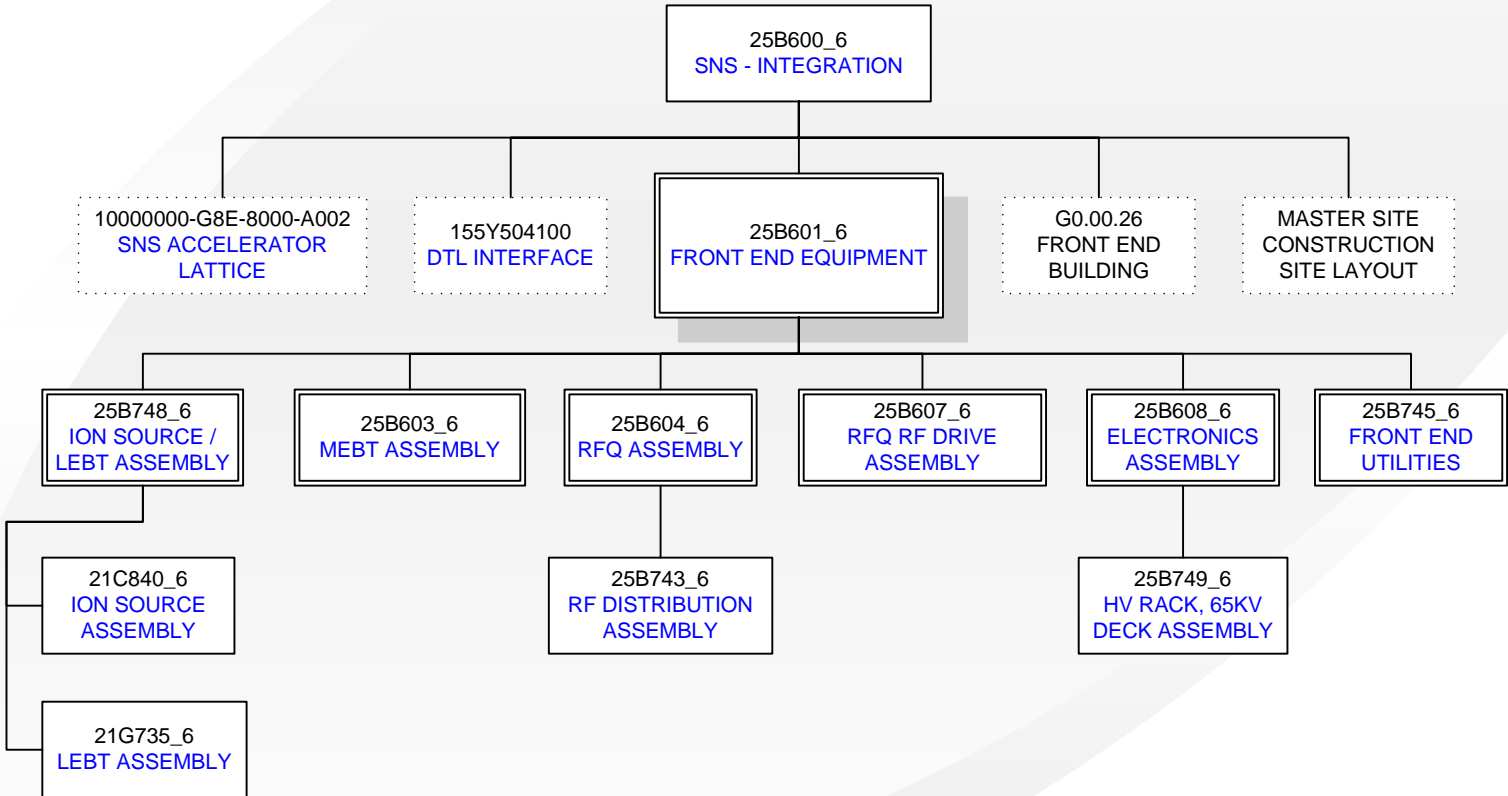
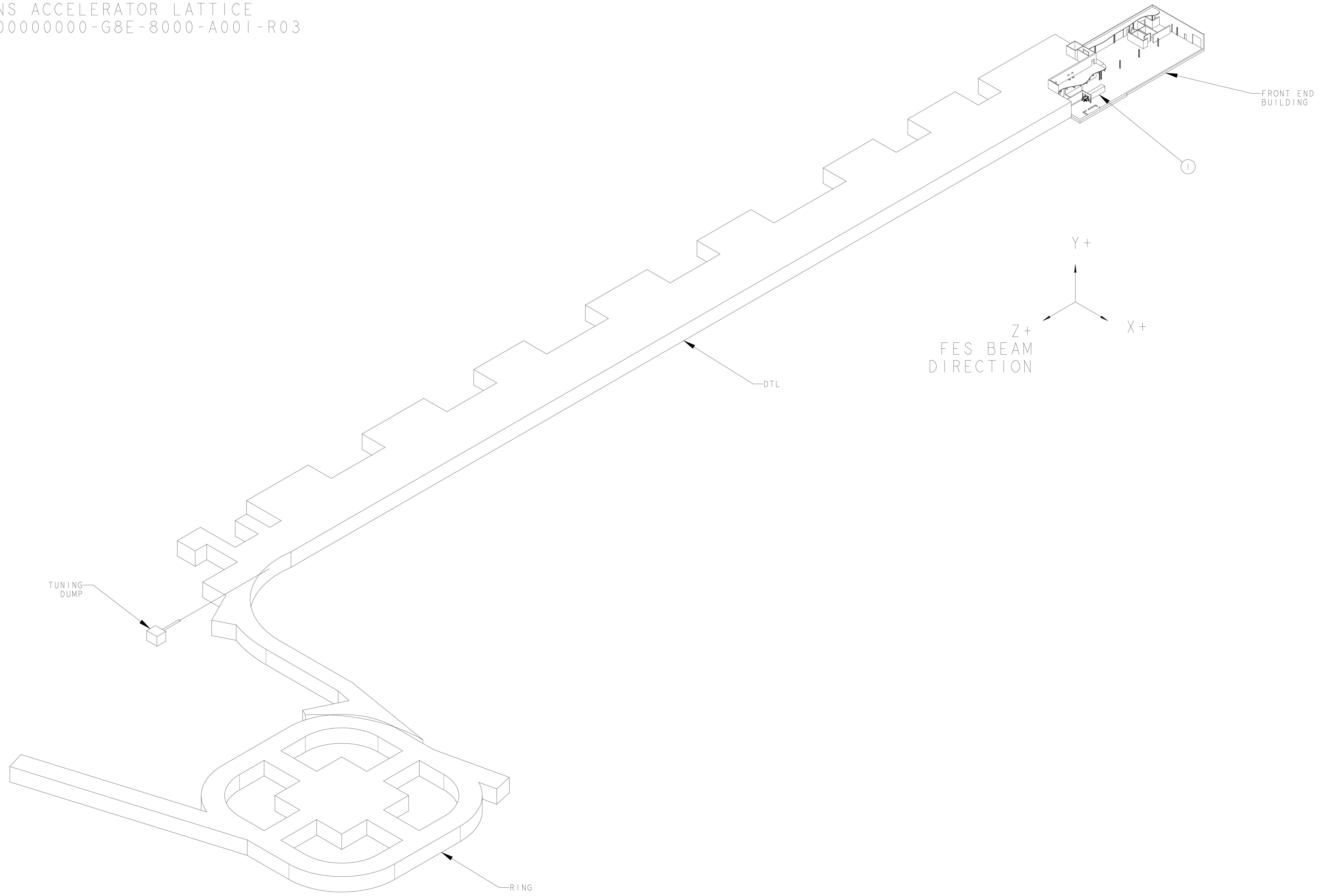


# SNS - FRONT END SYSTEM



REF: SNS ACCELERATOR LATTICE  
 DWG: 100000000-G8E-8000-A001-R03



SCALE 1/500

REV	DWG	CHK	ZONE	DATE	CHANGES

UNLESS OTHERWISE SPECIFIED  
 PROJECTION:   
 TOLERANCES: X.X ± 0.1 FRAC. ± 1/64  
 X.XX ± 0.03 Angles ± 1.0°  
 X.XXX ± 0.010 FINISH 125/  
 DO NOT SCALE PRINT  
 THREADS ARE CLASS 2  
 CHAMFER ENDS OF ALL SCREW THREADS 30°  
 CUT ROUNDS, 1.5 THREAD RELIEF ON MACHINED THREADS  
 BREAK EDGES .016 MAX. ON MACHINED WORK  
 REMOVE BURRS, WELD SPATTER & LOOSE SCALE  
 IN ACCORDANCE WITH ASME Y14.3M & Y14.1

1	25B601	1	FRONT END EQUIPMENT																																		
ITEM	PART NO.	QTY	DESCRIPTION	MATERIAL																																	
<table border="1"> <tr> <td>SHOP ORDERS</td> <td>REP. NO.</td> <td>-</td> </tr> <tr> <td>NO.</td> <td>DATE</td> <td>-</td> </tr> <tr> <td>REV.</td> <td>DATE</td> <td>-</td> </tr> <tr> <td>SURFACE</td> <td>TAG</td> <td></td> </tr> <tr> <td>TREATMENT</td> <td></td> <td></td> </tr> <tr> <td>METHOD</td> <td></td> <td></td> </tr> <tr> <td>PROJECT NUMBER</td> <td></td> <td></td> </tr> <tr> <td>PROJECT NAME</td> <td></td> <td></td> </tr> <tr> <td>DWG BY</td> <td>DATE</td> <td>06-May-02</td> </tr> <tr> <td>CHK BY</td> <td>DATE</td> <td></td> </tr> <tr> <td>APP BY</td> <td>DATE</td> <td></td> </tr> </table>					SHOP ORDERS	REP. NO.	-	NO.	DATE	-	REV.	DATE	-	SURFACE	TAG		TREATMENT			METHOD			PROJECT NUMBER			PROJECT NAME			DWG BY	DATE	06-May-02	CHK BY	DATE		APP BY	DATE	
SHOP ORDERS	REP. NO.	-																																			
NO.	DATE	-																																			
REV.	DATE	-																																			
SURFACE	TAG																																				
TREATMENT																																					
METHOD																																					
PROJECT NUMBER																																					
PROJECT NAME																																					
DWG BY	DATE	06-May-02																																			
CHK BY	DATE																																				
APP BY	DATE																																				
<p>ERNEST ORLANDO LAWRENCE          BERKELEY NATIONAL LABORATORY          UNIVERSITY OF CALIFORNIA - BERKELEY</p> <p>SNS FES          GENERAL          SNS - INTEGRATION</p> <p>SCALE: 1/2500</p> <p>SHEET 1 OF 1</p> <p>DWG. NO. 25B6006 A</p>																																					

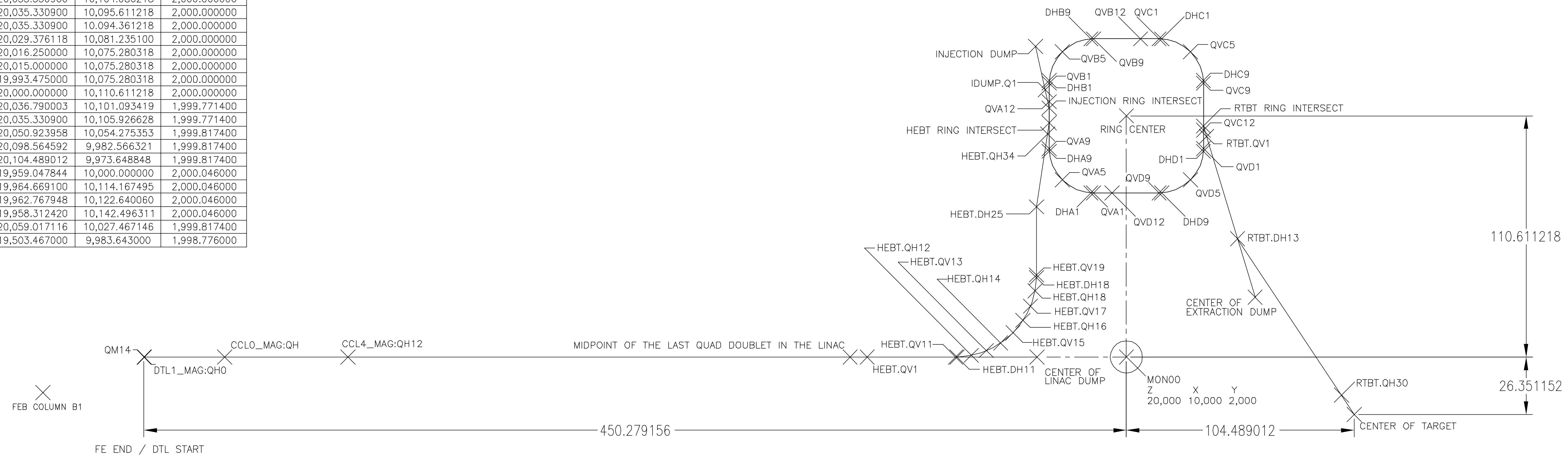
DWG. NO. 25B6006 A 1

SHEET REV. 1

COORDINATES OF KEY POINTS ALONG THE REFERENCE ORBIT				
Description	Name	Z	X	Y
Complex Center	MON00	20,000.000000	10,000.000000	2,000.000000
Last quad in MEBT	QM14	19,549.720844	10,000.000000	2,000.046000
First quad in DTL	DTL1_Mag:QH0	19,549.963344	10,000.000000	2,000.046000
Quad between DTL and CCL	CCL0_Mag:QH	19,586.684608	10,000.000000	2,000.046000
Last quad in CCL	CCL4_Mag:QH12	19,643.268831	10,000.000000	2,000.046000
Midpoint of the last quad doublet in the linac		19,873.388831	10,000.000000	2,000.046000
First quad in HEBT	HEBT.QV1	19,881.174844	10,000.000000	2,000.046000
	HEBT.QV11	19,921.674844	10,000.000000	2,000.046000
Beginning of HEBT bend	HEBT.DH11	19,922.424844	10,000.000000	2,000.046000
	HEBT.QH12	19,928.950180	10,000.765804	2,000.046000
	HEBT.QV13	19,935.936315	10,002.936241	2,000.046000
	HEBT.QH14	19,942.364790	10,006.427903	2,000.046000
HEBT bend center	HEBT.QV15	19,947.988549	10,011.106606	2,000.046000
	HEBT.QH16	19,952.591485	10,016.792550	2,000.046000
	HEBT.QV17	19,955.996705	10,023.267229	2,000.046000
	HEBT.QH18	19,958.073346	10,030.281824	2,000.046000
	HEBT.QV19	19,958.741601	10,037.566765	2,000.046000
End of HEBT bend	HEBT.DH18	19,958.741601	10,036.316765	2,000.046000
HEBT dog leg (bend point)	HEBT.DH25	19,958.741601	10,068.892794	2,000.046000
HEBT ring intersection		19,964.669100	10,107.382274	2,000.046000
Last quad in HEBT	HEBT.QH34	19,963.886411	10,102.299981	2,000.046000
Ring arc A begin	QVA1	19,985.000000	10,075.280318	2,000.046000
Beginning of ring arc A bend	DHA1	19,983.750000	10,075.280318	2,000.000000
Ring arc A center	QVA5	19,970.623882	10,081.235100	2,000.000000
End of ring arc A bend	DHA9	19,964.669100	10,094.361218	2,000.000000
Ring arc A end	QVA9	19,964.669100	10,095.611218	2,000.000000
First ring quad after foil	QVA12	19,964.669100	10,117.136218	2,000.000000
Ring arc B begin	QVB1	19,964.669100	10,125.611218	2,000.000000
Beginning of ring arc B bend	DHB1	19,964.669100	10,126.861218	2,000.000000
Ring arc B center	QVB5	19,970.623882	10,139.987336	2,000.000000
End of ring arc B bend	DHB9	19,983.750000	10,145.942118	2,000.000000
Ring arc B end	QVB9	19,985.000000	10,145.942118	2,000.000000
	QVB12	20,006.525000	10,145.942118	2,000.000000
Ring arc C begin	QVC1	20,015.000000	10,145.942118	2,000.000000
Beginning of ring arc C bend	DHC1	20,016.250000	10,145.942118	2,000.000000
Ring arc C center	QVC5	20,029.376118	10,139.987336	2,000.000000
End of ring arc C bend	DHC9	20,035.330900	10,126.861218	2,000.000000
Ring arc C end	QVC9	20,035.330900	10,125.611218	2,000.000000
	QVC12	20,035.330900	10,104.086218	2,000.000000
Ring arc D begin	QVD1	20,035.330900	10,095.611218	2,000.000000
Beginning of ring arc D bend	DHD1	20,035.330900	10,094.361218	2,000.000000
Ring arc D center	QVD5	20,029.376118	10,081.235100	2,000.000000
End of ring arc D bend	DHD9	20,016.250000	10,075.280318	2,000.000000
Ring arc D end	QVD9	20,015.000000	10,075.280318	2,000.000000
	QVD12	19,993.475000	10,075.280318	2,000.000000
Center of Ring		20,000.000000	10,110.611218	2,000.000000
First quad in RTBT	RTBT.QV1	20,036.790003	10,101.093419	1,999.771400
RTBT ring intersection		20,035.330900	10,105.926628	1,999.771400
RTBT dog leg (bend point)	RTBT.DH13	20,050.923958	10,054.275353	1,999.817400
Last quad in RTBT	RTBT.QH30	20,098.564592	9,982.566321	1,999.817400
Center of target		20,104.489012	9,973.648848	1,999.817400
Center of linac dump		19,959.047844	10,000.000000	2,000.046000
Injection dump Ring intersection	IDUMP.Q1	19,964.669100	10,114.167495	2,000.046000
Center of injection dump		19,962.767948	10,122.640060	2,000.046000
Center of extraction dump		19,958.312420	10,142.496311	2,000.046000
FEB- Column line B-1	FEB Col B-1	19,503.467000	9,983.643000	1,998.776000

NOTES:

- INTERPRET DRAWING PER GLOBAL ENGINEERING DOCUMENTS DRAWING REQUIREMENTS MANUAL.
- INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M.
- DIMENSIONS ARE IN METERS.
- ALL COORDINATES LISTED IN THE TABLE ARE THOSE OF THE CENTERS OF MAGNETS UNLESS OTHERWISE SPECIFIED. NOTE THAT THE COORDINATES OF HEBT.DH11, DHA1, DHB1, DHC1, DHD1 ARE THOSE OF THE UPSTREAM ENDS. THE COORDINATES OF THE HEBT.DH18, DHA9, DHB9, DHC9, DHD9 ARE THOSE OF THE DOWNSTREAM ENDS.
- THE BEAM LINE IN HEBT AND RING ARCS IS APPROXIMATED BY AN ARC THAT PASSES THROUGH THE QUAD CENTERS. THE LATTICE WILL BE CONSTRUCTED WITH THE APPROPRIATE SEGMENTS AS ADDITIONAL LATTICE POINTS ARE ADDED.



CAGE CODE	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	MATERIAL	SPECIFICATION	FIND NO
PARTS LIST					
NEXT ASSEMBLY					

QV CLAUSE	DOCUMENTS REQUIRED	APPLICABLE TO PART NO *
303	MATERIAL MILL TEST REPORT	
325	MATERIAL SELLER CERT	
326	SPECIAL MATERIAL INSPECTION REPORT	
205	MANUFACTURING, INSPECTION AND TEST PLAN	
312	FIELD INSPECTION AND TEST PLAN	
321	WELD AND BRAZE INSPECTION REPORT	
322	HEAT TREAT REPORT (IN/CW/RT)	
310	LEAK TEST REPORT	
315	CLEANING CERT	
318	DEVIATION REQUEST	
319	NONCONFORMANCE PROCESS	
323	DIMENSIONAL REPORT	
330	FUNCTIONAL TEST REPORT	
100	DOCUMENTATION	

\* SYMBOL X INDICATES APPLICABLE TO ALL PARTS OR ITEMS

SCALE 1 : 1  
TOLERANCES UNLESS OTHERWISE SPECIFIED  
FRACTIONS : XX DECIMALS ±.01  
XXX DECIMALS ±.005  
ANGLES ±0'15"  
BREAK SHARP EDGES .06 MAX  
FINISH 125 RMS UNLESS OTHERWISE SPECIFIED

DES: G.FORTIER 11-28-00  
DRW: G.FORTIER 11-28-00  
CHK: D. STOUT 11-28-00  
K. REECE 12-04-00

operated for the DEPARTMENT OF ENERGY under U.S. GOVERNMENT contract DE-AC05-00OR22725  
Oak Ridge National Laboratory  
Oak Ridge, Tennessee  
Spallation Neutron Source

SNS ACCELERATOR LATTICE

BLDG 701SCA FL 3 SHT 1 OF 1 CLASS - REV 003

10000000-C8E-8000-A001-R03

NO REPRESENTATION OR WARRANTY EXPRESSED OR IMPLIED IS MADE AS TO THE ACCURACY, COMPLETENESS OR USEFULNESS OF THE INFORMATION OR STATEMENTS CONTAINED IN THESE DRAWINGS, OR THAT THE USE OR DISCLOSURE OF ANY INFORMATION, APPARATUS, METHOD OR PROCESS DISCLOSED IN THESE DRAWINGS MAY NOT INFRINGE PRIVATE RIGHTS OF OTHERS. NO LIABILITY IS ASSUMED WITH RESPECT TO THE USE OF, OR FOR DAMAGES RESULTING FROM THE USE OF, ANY INFORMATION, APPARATUS, METHOD OR PROCESS DISCLOSED IN THESE DRAWINGS. DRAWINGS MADE AVAILABLE FOR INFORMATION TO BIDDER ARE NOT TO BE USED FOR OTHER PURPOSES, AND ARE TO BE RETURNED UPON REQUEST OF THE FORWARDING CONTRACTOR.

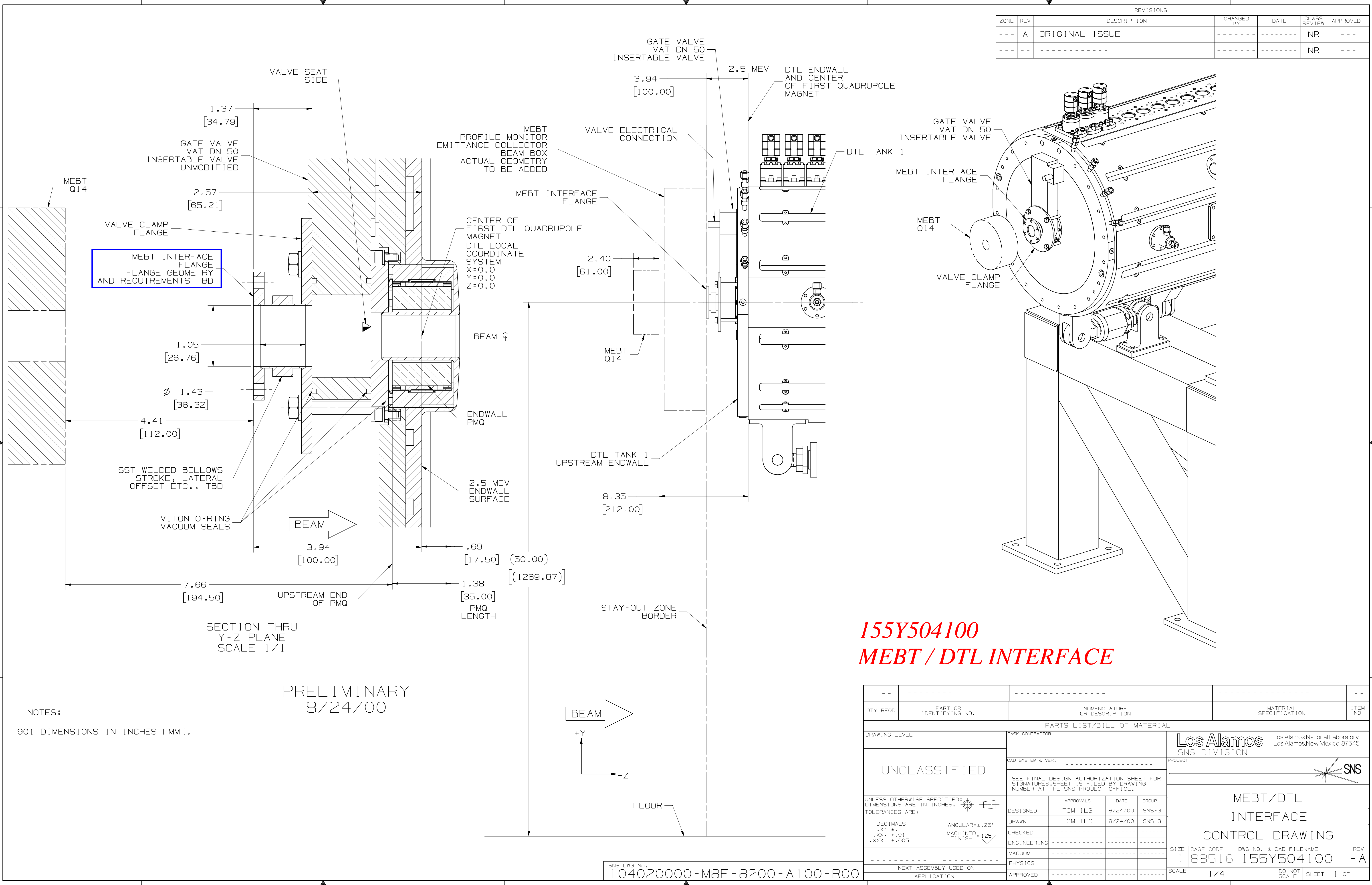
THIS DRAWING PRODUCED ON AUTOCAD

THIS DOCUMENT CONTROLLED BY CHANGE CONTROL SYSTEM

SNS PLAN 102010200-PC0002

REV	DATE	DESCRIPTION	BY	CHK	SECT	DEPT	DATE	PE	RED	DOE
003	- 3 -	CCL0_Mag:QH0 - Z - WAS 19586.686974	GF	DS	-	ASD	0-26-01			
002	- 3 -	REDRAW, REDESIGN, REMOVED SHEET 2	GF	DS	-	ASD	04-26-01			
001	- 3 -	10,142.53441 WAS 10,143.02941 ZONE F5 142.53441 WAS 143.02941 ZONE F3 1,999.77140 WAS 1,999.81740 ZONE F5	GF	DS	-	ASD	11-26-00			
000	- 3 -	ORIGINAL ISSUE	GF	DS	-	ASD	02-26-00		X	

REVISIONS					
ZONE	REV	DESCRIPTION	CHANGED BY	DATE	CLASS REVIEW APPROVED
---	A	ORIGINAL ISSUE	---	---	NR ---
---	---	---	---	---	NR ---



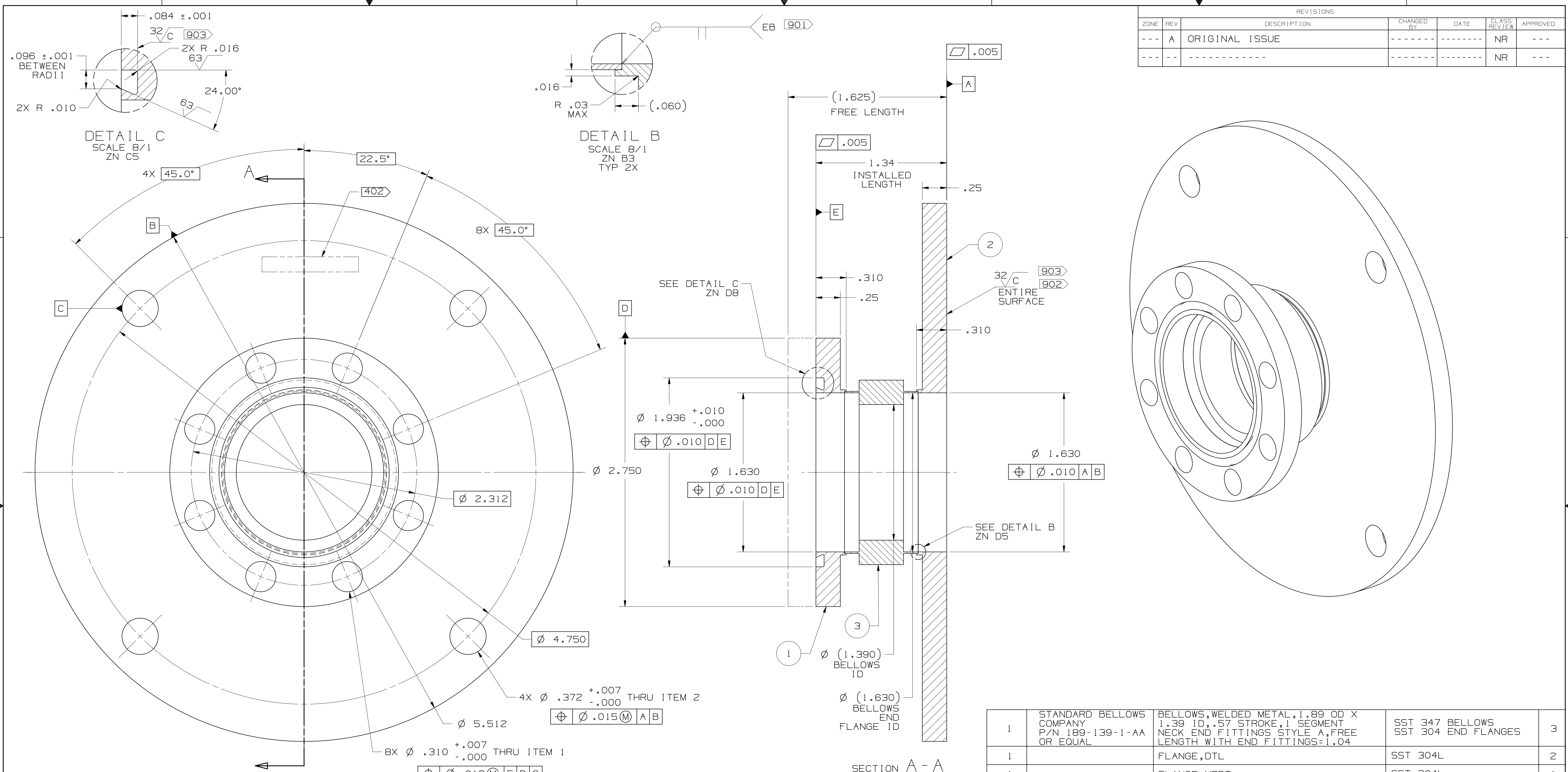
MEBT INTERFACE FLANGE  
FLANGE GEOMETRY  
AND REQUIREMENTS TBD

**155Y504100**  
**MEBT / DTL INTERFACE**

PRELIMINARY  
8/24/00

NOTES:  
901 DIMENSIONS IN INCHES (MM).

QTY	RECD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION	ITEM NO.
PARTS LIST/BILL OF MATERIAL					
DRAWING LEVEL		TASK CONTRACTOR		Los Alamos National Laboratory Los Alamos, New Mexico 87545	
UNCLASSIFIED		CAD SYSTEM & VER.		PROJECT	
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES. TOLERANCES ARE:		SEE FINAL DESIGN AUTHORIZATION SHEET FOR SIGNATURES. SHEET IS FILED BY DRAWING NUMBER AT THE SNS PROJECT OFFICE.		SNS	
DECIMALS .X= ±.1 .XX= ±.01 .XXX= ±.005		APPROVALS		MEBT/DTL INTERFACE CONTROL DRAWING	
ANGULAR: ±.25° MACHINED: 125		DESIGNED	TOM ILG	DATE	8/24/00
		DRAWN	TOM ILG	DATE	8/24/00
		CHECKED		GROUP	SNS-3
		ENGINEERING			
		VACUUM			
		PHYSICS			
		APPROVED			
NEXT ASSEMBLY USED ON APPLICATION		CAGE CODE		DWG NO. & CAD FILENAME	
104020000-M8E-8200-A100-R00		D 88516		155Y504100	
		SCALE		REV	
		1/4		-A	
		DO NOT SCALE		SHEET 1 OF 1	



REVISIONS					
ZONE	REV	DESCRIPTION	CHANGED BY	DATE	APPROVED
---	A	ORIGINAL ISSUE	---	---	NR
---	---	---	---	---	NR

- NOTES: UNLESS OTHERWISE SPECIFIED: A
- 101 ABBREVIATIONS PER ASME Y14.38-1999.
  - 102 THOROUGHLY CLEAN PARTS TO REMOVE ALL OIL, GREASE, DIRT, CHIPS, ETC.
  - 201 DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994.
  - 202 SURFACE TEXTURE SYMBOLS PER ASME Y14.36M-1996.
  - 203 SURFACE TEXTURE PER ASME B46.1-1995.
  - 204 ALL INSIDE CORNERS TO BE R.015 MAX.
  - 208 REMOVE BURRS AND SHARP EDGES TO .015 MAX.
  - 210 SULFUR BASED CUTTING OILS SHALL NOT BE USED.
  - 301 WELDING & BRAZING SYMBOLS PER AWS A2.4-1998.
  - 311 WELD IN ACCORDANCE WITH AWS D1.1-2000.

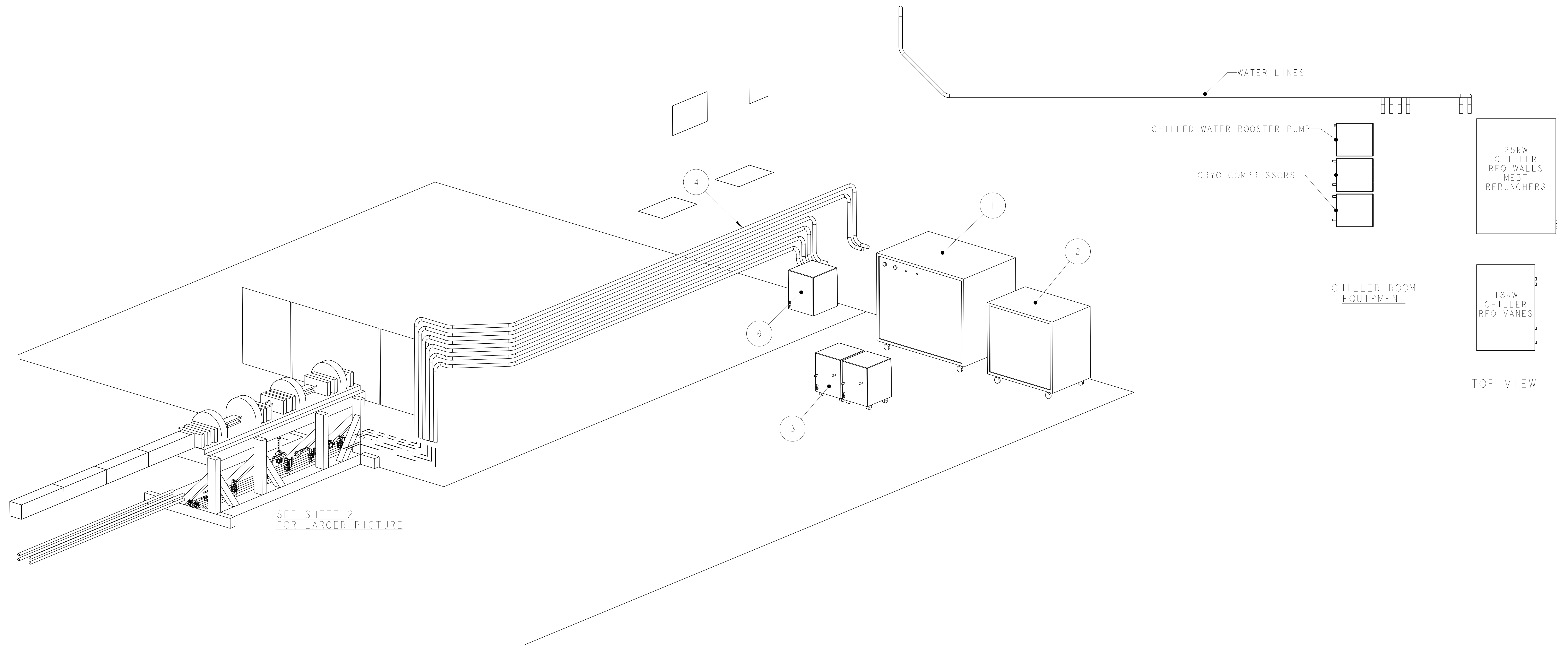
- [404] ELECTRO-CHEMICAL ETCH DRAWING NUMBER & REVISION LETTER, APPROXIMATELY WHERE SHOWN, IN 1/4" HIGH CHARACTERS.
- [901] VACUUM LEAK CHECK PER SNS-104020200-SW-000?-R00.
- [902] THIS SURFACE IS TO BE FREE OF SCRATCHES, MARKS, AND DENTS ETC.. AND PROTECTED FROM ALL DELETERIOUS EFFECTS OF SUBSEQUENT FABRICATION, FINISHING, PACKAGING, AND SHIPPING OPERATIONS.
- [903] CIRCULAR TOOLING MARKS ONLY ON THIS SURFACE.
- 904 ELECTRO-POLISH ALL INTERIOR SURFACES.

QTY	RECD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION	ITEM NO	
1			STANDARD BELLOWS COMPANY P/N 189-139-1-AA OR EQUAL	BELLOWS, WELDED METAL, 1.89 OD X 1.39 ID, .57 STROKE, 1 SEGMENT NECK END FITTINGS STYLE A, FREE LENGTH WITH END FITTINGS=1.04	SST 347 BELLOWS SST 304 END FLANGES	3
1				FLANGE, DTL	SST 304L	2
1				FLANGE, MEBT	SST 304L	1

DRAWING LEVEL PRODUCTION		TASK CONTRACTOR		Los Alamos SNS DIVISION	
UNCLASSIFIED		CAD SYSTEM & VER. UG V16.0.1		PROJECT	
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES. TOLERANCES ARE:		SEE FINAL DESIGN AUTHORIZATION SHEET FOR SIGNATURES, SHEET IS FILED BY DRAWING NUMBER AT THE SNS PROJECT OFFICE.		DTL MEBT DTL BEAM TUBE ASSEMBLY	
DECIMALS .X = ±.1 .XX = ±.01 .XXX = ±.005		ANGULAR: ±.25° MACHINED: 125 FINISH		APPROVALS	
155Y504502		NEXT ASSEMBLY USED ON APPLICATION		APPROVED R MARTINEAU	
SNS DWG No. 10402020-M8D-8200-A585-R00		VACUUM		DATE 9/26/00	
		PHYSICS		GROUP SNS-3	
		APPROVED		REV -A	
				SCALE 2/1	
				DO NOT SCALE	
				SHEET 1 OF 1	

REFER TO RFQ COOLING SCHEMATIC DRAWING NO. 25B875

REFER TO MEBT COOLING SCHEMATIC DRAWING NO. 25B615



SEE SHEET 2 FOR LARGER PICTURE

WATER LINES

CHILLED WATER BOOSTER PUMP

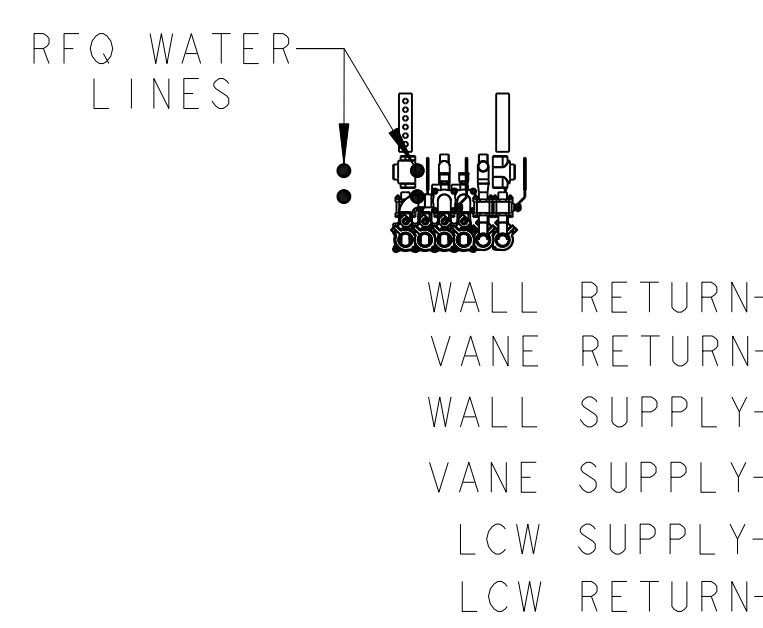
CRYO COMPRESSORS

CHILLER ROOM EQUIPMENT

25kW CHILLER RFQ WALLS MEBT REBUNCHERS

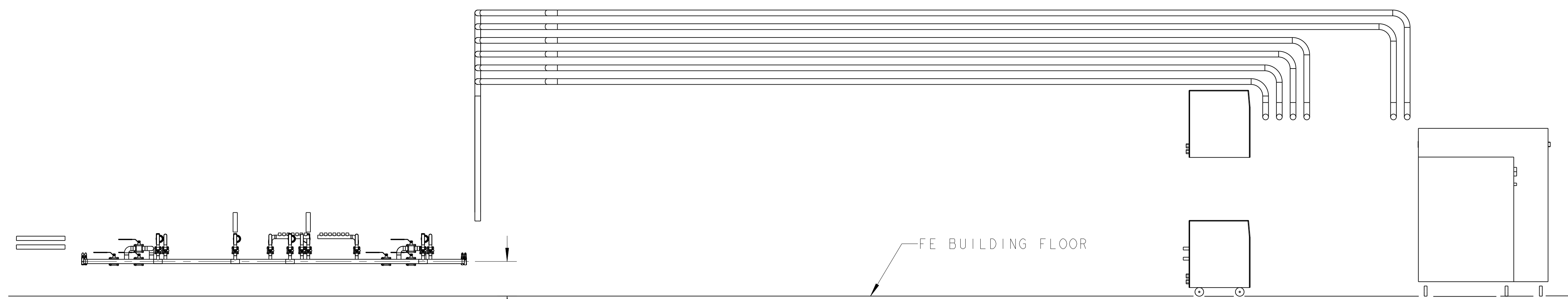
18kW CHILLER RFQ VANES

TOP VIEW



\*\*\*THESE WATER LINES MUST BE IN THIS ORDER TO MATCH-UP WITH WATER LINES ON LOWER MEBT FRAME

END VIEW



12.0 HEIGHT OF TUBING ABOVE FE FLOOR

FE BUILDING FLOOR

PLAN VIEW

ITEM	PART NO	REQD	DESCRIPTION	MATERIAL
6		1	PUMP, BUILDING CHILLED WATER BOOSTER	-
5	25B615	1	WATER SYSTEM ASSEMBLY	-
4		1	WATER PIPES, 2" SUPPLY & RETURN, RFQ & MEBT	-
3		2	He COMPRESSOR, CYROGENICS 9600, RFQ	-
2		1	CHILLER, WATER, 18kW - RFQ	-
1		1	CHILLER, WATER, 25kW - RFQ & MEBT	-

UNLESS OTHERWISE SPECIFIED  
 PROJECTION:   
 TOLERANCES: X.X ± 0.1 FRAC. ± 1/64  
 X.XX ± 0.03 Angles ± 1.0°  
 X.XXX ± 0.010 FINISH 12/  
 DO NOT SCALE PRINT  
 HORN AND CLASS 2  
 CHAMFER END OF ALL SCREW THREADS 30°  
 CUT ROUNDS, 1.5 THREAD RELIEF ON MACHINED THREADS  
 BREAK EDGES .016 MAX. ON MACHINED WORK  
 REMOVE BURRS, WELD SPATTER & LOOSE SCALE  
 IN ACCORDANCE WITH ASME Y14.3M-84 11.1

SHOP ORDERS  
 SER NO. \_\_\_\_\_  
 DATE \_\_\_\_\_  
 DESIGNED BY: A. HARRIS DATE: 01-Apr-02  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 APPROVED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

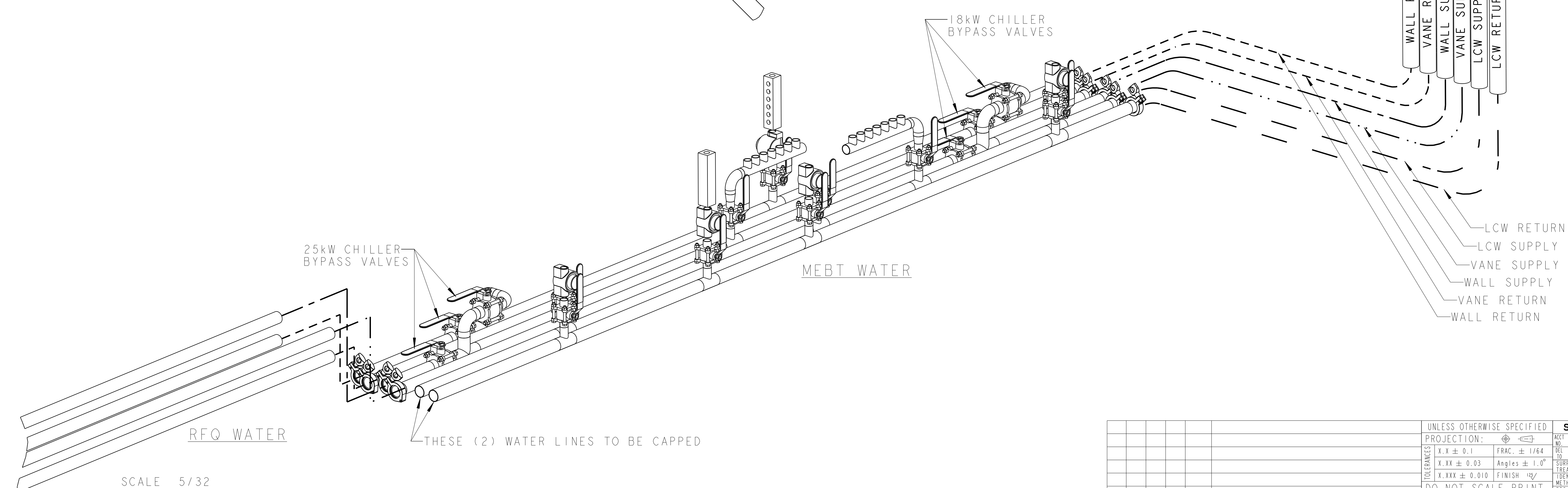
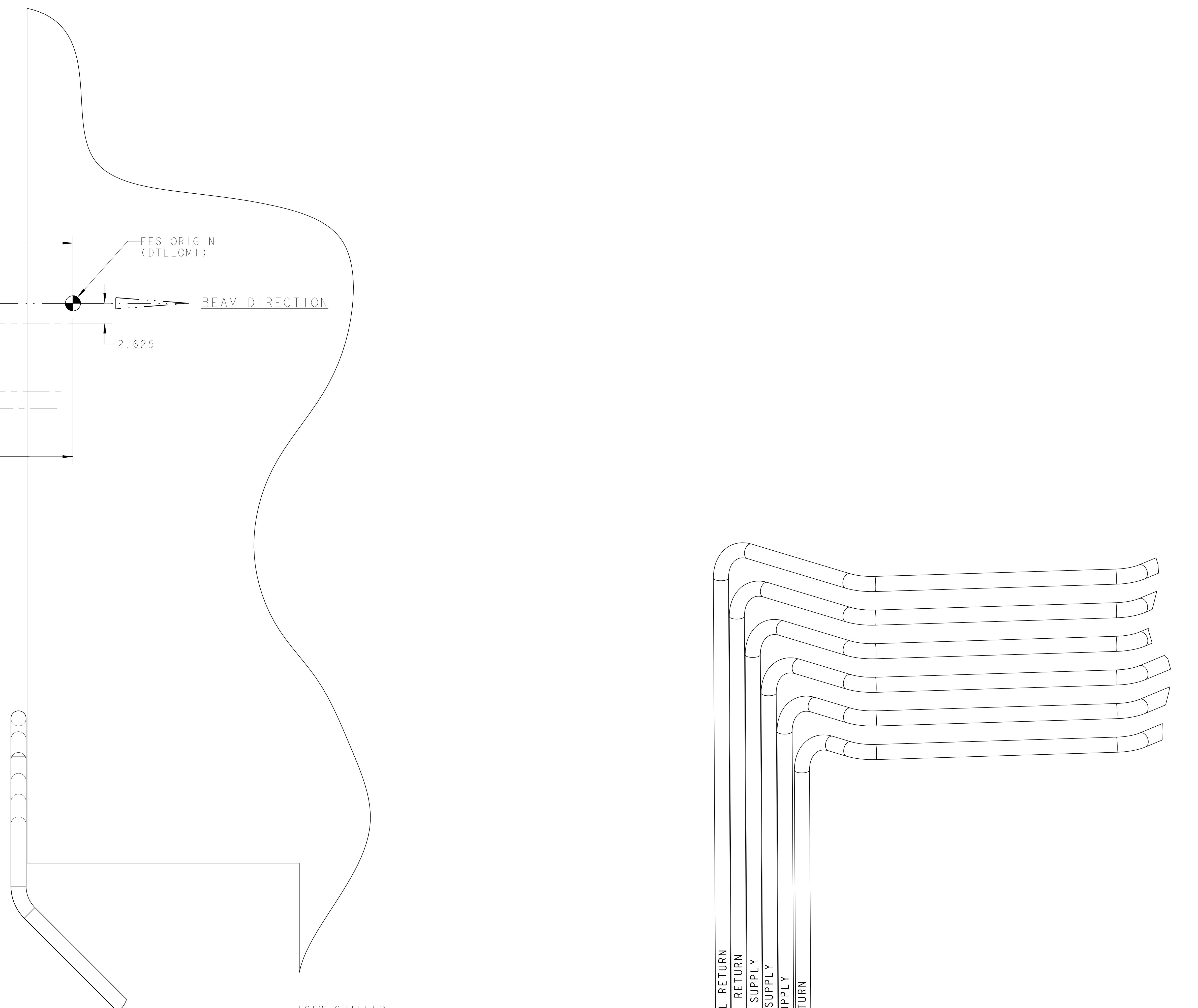
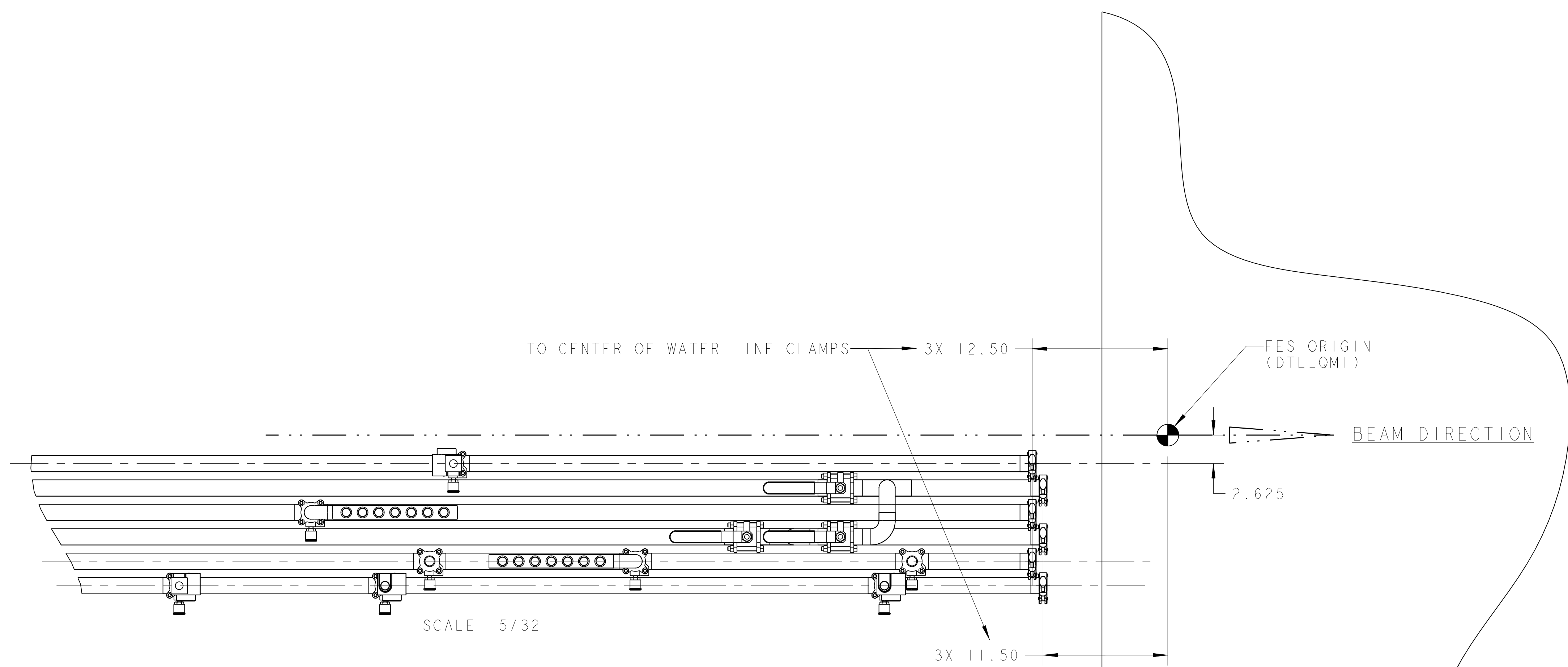
ERNEST ORLANDO LAWRENCE  
 BERKELEY NATIONAL LABORATORY  
 UNIVERSITY OF CALIFORNIA - BERKELEY

SNS - INTEGRATION  
 FRONT END EQUIPMENT  
 FRONT END UTILITIES

SCALE: ~1/32  
 SHEET 1 OF 2  
 DWG. NO. 25B7456 A  
 CATEGORY CODE FE3000

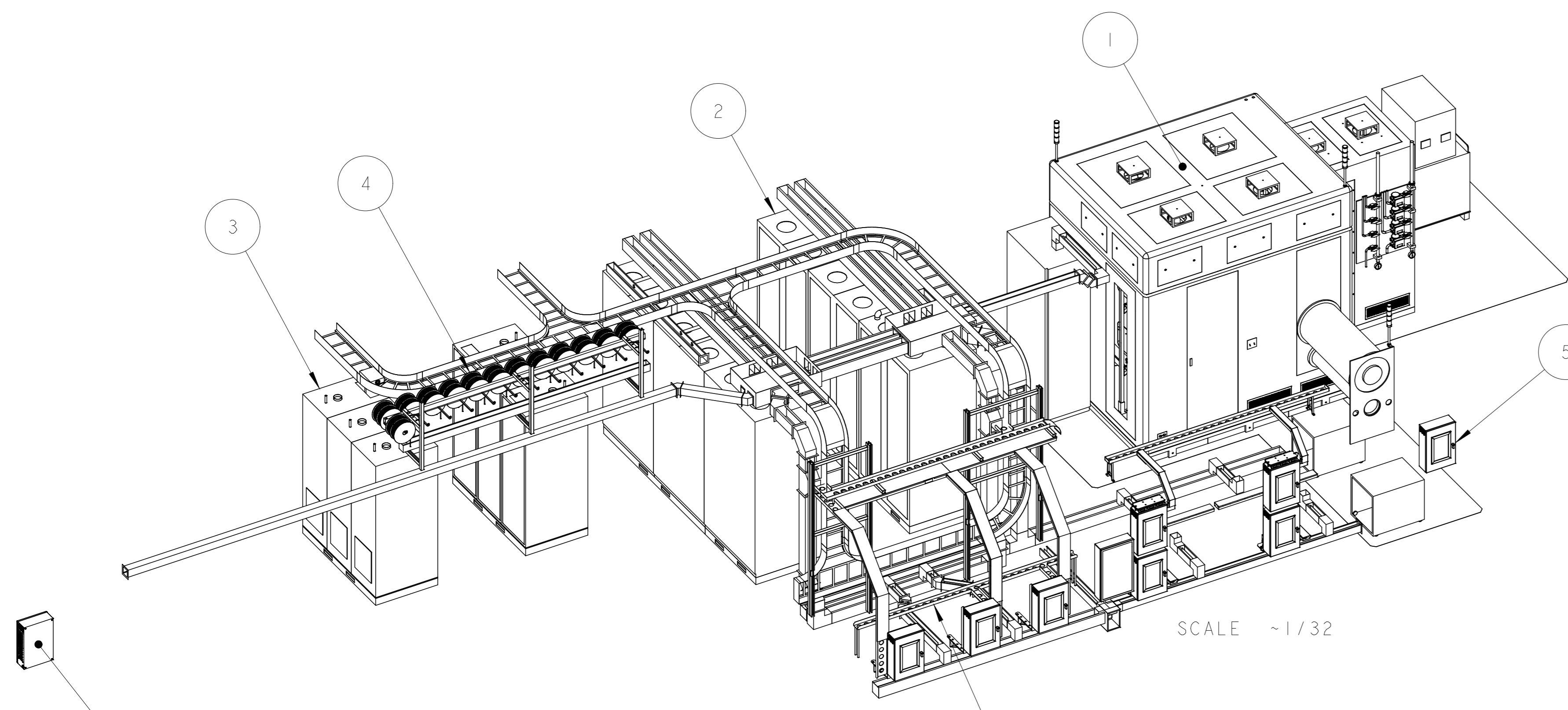
REV	DWG	CHK	ZONE	DATE	CHANGES

DWG. NO. 25B7456 A 1



UNLESS OTHERWISE SPECIFIED	PROJECTION:	SHOP ORDERS	REV. NO. -
TOLERANCES	X.X ± 0.1	FRAC. ± 1/64	DATE -
	X.XX ± 0.03	FINISH 125	DATE -
	X.XXX ± 0.010	ANGLES ± 1.0°	DATE -
DO NOT SCALE PRINT			
THIS DRAWING IS THE PROPERTY OF ERNEST ORLANDO LAWRENCE BERKELEY NATIONAL LABORATORY. IT IS TO BE USED ONLY FOR THE PROJECT AND PURPOSE SPECIFIED. IT IS NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT THE EXPRESS WRITTEN PERMISSION OF ERNEST ORLANDO LAWRENCE BERKELEY NATIONAL LABORATORY.			
REV. DWG. CHK. ZONE DATE	CHANGES		

ERNEST ORLANDO LAWRENCE BERKELEY NATIONAL LABORATORY UNIVERSITY OF CALIFORNIA - BERKELEY	SNS - INTEGRATION FRONT END EQUIPMENT FRONT END UTILITIES	SCALE: ~1/32	SHEET 2 OF 2
DESIGN ACCT. NO. FE3000	DWG. NO. 25B7456	SIZE A	REV. A

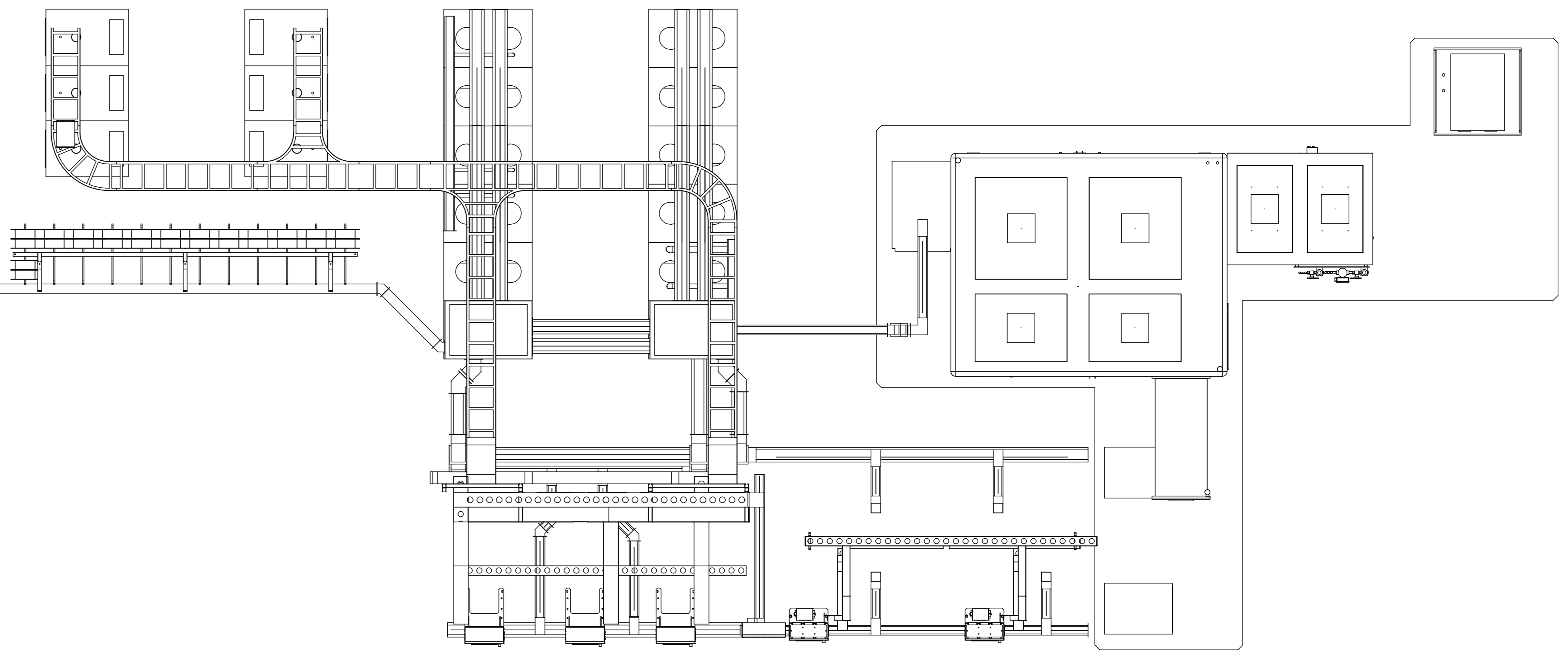


THIS BASIC ENCLOSURE ASSY IS USED FOR LEPT CONTROLS INTERFACE

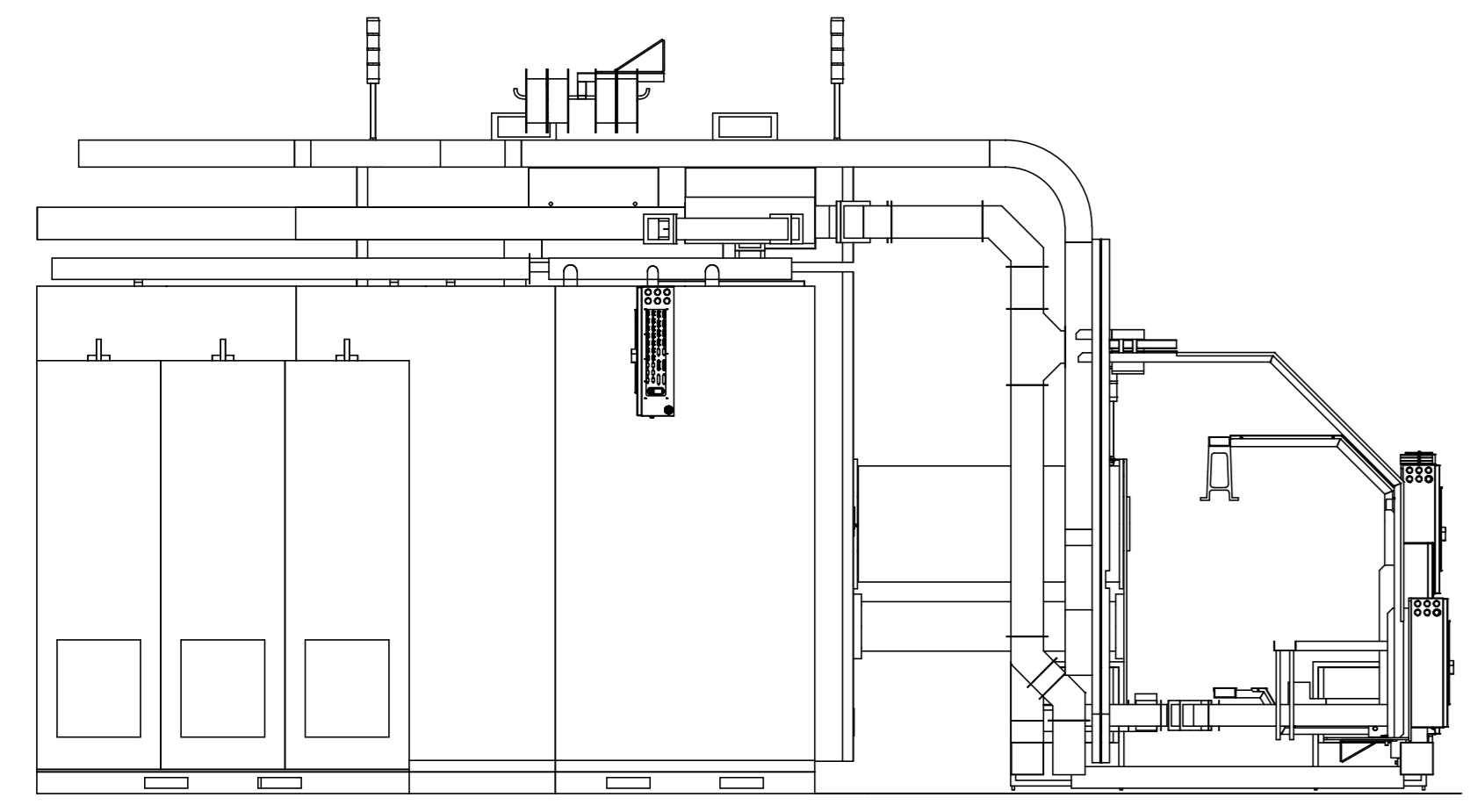
SCALE ~1/32

5 CHILLER CONTROLS INTERFACE

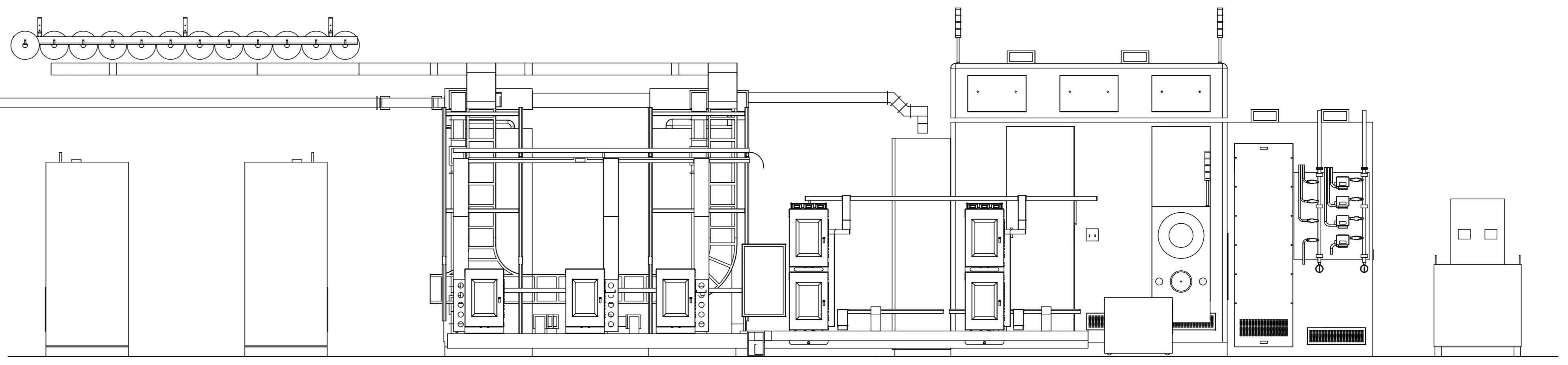
6 THIS CABLE TRAY IS USED FOR MEBT CABLES



TOP



END



ELEVATION, FRONT, ORNL

ITEM	PART NO	REQD	DESCRIPTION	MATERIAL
7	shxxxx	1	ELECTRONICS ASSY	-
6		1	TRAY, 4 IN., MEBT B-LINE	-
5	25B530	2	ENCLOSURE ASSY, FLEX 170 24 IN.	-
4	25B869	1	CABLE SPOOL ASSY, DELAY LINE (BEAM POSITION MONITOR)	-
3	25B868	1	REBUNCHER AMPS, MEBT FER20 / FER25	-
2	25B867	1	EQUIPMENT RACKS, MEBT FER08 / FER19	-
1	25B866	1	ENCLOSURE, HV, TRANSFORMER & AC DISTRIBUTION	-

REV	DWG	CHK	ZONE	DATE	CHANGES
C	DPO			1/1/02	SEE SHEET 6
REV	DWG	CHK	ZONE	DATE	CHANGES

UNLESS OTHERWISE SPECIFIED  
 PROJECTION: FIRST ANGLE  
 TOLERANCES: X.X ± 1.0 FRAC. ± 1/64  
 X.XX ± 0.26 Angles ± 1.0°  
 X.XXX ± 0.130 FINISH 125/  
 THREADS ARE CLASS 2  
 CHAMFER ENDS OF ALL SCREW THREADS 30°  
 CUT ROUNDS, 1/8 THREAD RELIEF ON MACHINED THREADS  
 BREAK EDGES .016 MAX. ON MACHINED WORK  
 REMOVE BURRS, WELD SPATTER & LOOSE SCALE  
 IN ACCORDANCE WITH ASME Y14.5M & Y14.5

SHOP ORDERS  
 ACT NO. DATE  
 REV. DATE  
 SURFACE  
 TREATMENT  
 PROJECT NUMBER  
 PROJECT TAG  
 NAME  
 DATE 20-Mar-02  
 DATE  
 DATE

ERNEST ORLANDO LAWRENCE  
 BERKELEY NATIONAL LABORATORY  
 UNIVERSITY OF CALIFORNIA - BERKELEY

SNS-FES PROJECT  
 GENERAL  
 ELECTRONICS ASSEMBLY

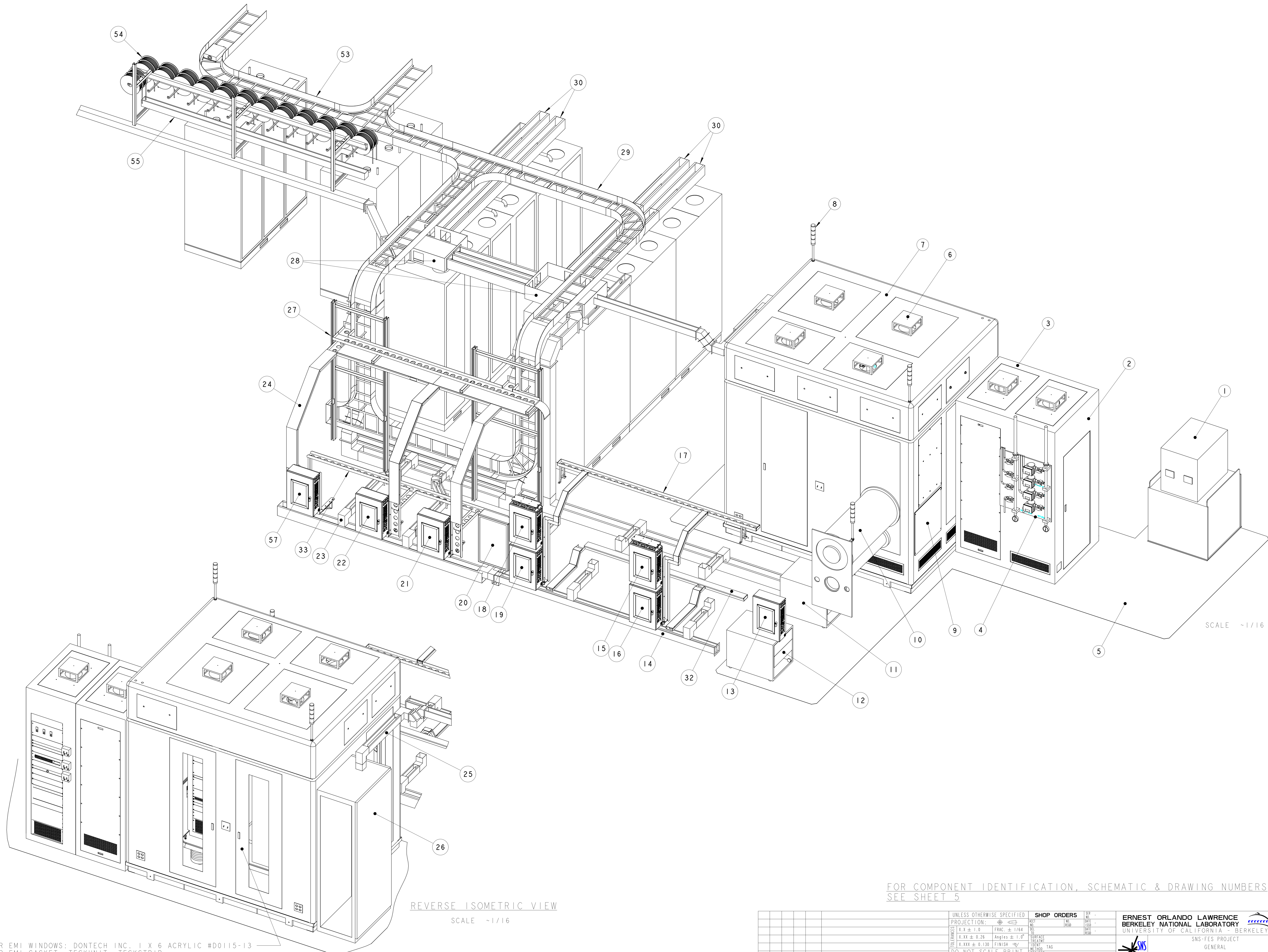
SCALE: ~1/32

ASSEM 25Bxxx X SHEET 1 OF 6

FE3000 25B6086 C

25B6086 C 1





SCALE - 1/16

REVERSE ISOMETRIC VIEW  
SCALE - 1/16

3X DOOR EMI WINDOWS: DONTCH INC. 1 X 6 ACRYLIC #D0115-13  
 4X DOOR EMI GASKET: TECKHNIT, TECKSTRIP  
 51-89300 (5')  
 51-89302 (7 1/2')

FOR COMPONENT IDENTIFICATION, SCHEMATIC & DRAWING NUMBERS  
 SEE SHEET 5

REV	DWG	CHK	ZONE	DATE	CHANGES

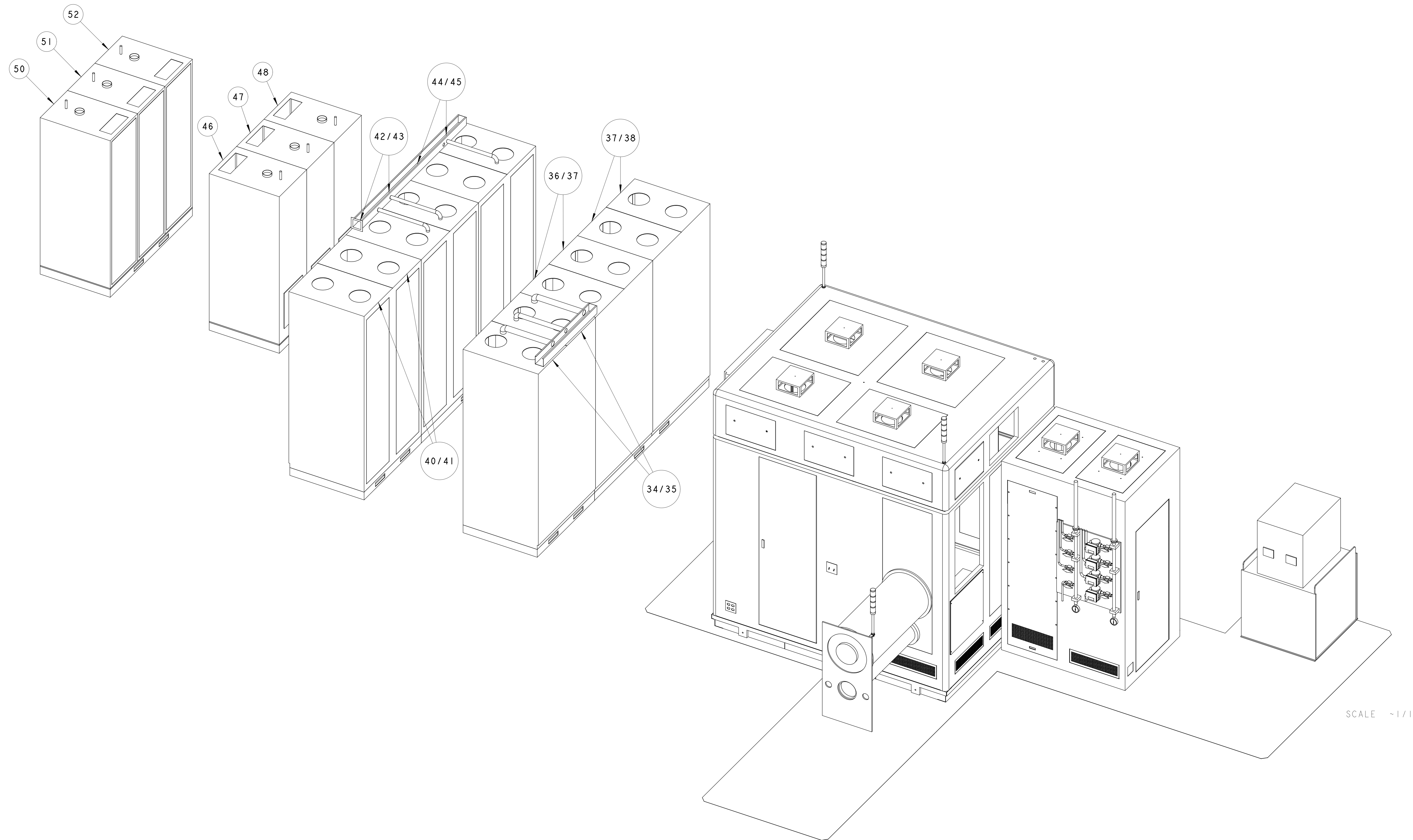
UNLESS OTHERWISE SPECIFIED		SHOP ORDERS		DES. NO.	-
PROJECTION:		ACT. NO.	NO.	DATE	-
TOLERANCES:	X.X ± 1.0	FRAC.	± 1/64	ISS.	-
	X.XX ± 0.26	ANGLES	± 1.0°	REV.	-
	X.XXX ± 0.130	FINISH	125	DATE	-
DO NOT SCALE PRINT					
THREADS ARE CLASS 2					
CHAMFER ENDS OF ALL SCREW THREADS 30°					
CUT ROUND, 1/8" THREAD RELIEF ON MACHINED THREADS					
BREAK EDGES .016 MAX. ON MACHINED WORK					
REMOVE BURRS, WELD SPATTER & LOOSE SCALE					
IN ACCORDANCE WITH ASME Y14.3M & Y14.1					

ERNEST ORLANDO LAWRENCE BERKELEY NATIONAL LABORATORY UNIVERSITY OF CALIFORNIA - BERKELEY		SNS-FES PROJECT GENERAL ELECTRONICS ASSEMBLY	
MICROFILMED:	DWG. TYPE	SHOWN ON	SCALE:
ASSEM	ASSEM	25Bxxx X	~3/64
DESIGN ACCT. NO.	CATEGORY CODE	DWG. NO.	SIZE
8212E1	FE3000	25B6086	REV. 6
PATENT CLEAR:		DWG. NO.	SIZE
8212E1		25B6086	REV. 6

8 7 6 5 4 3 2 1

DWG. NO. 25B6086 C 1/2

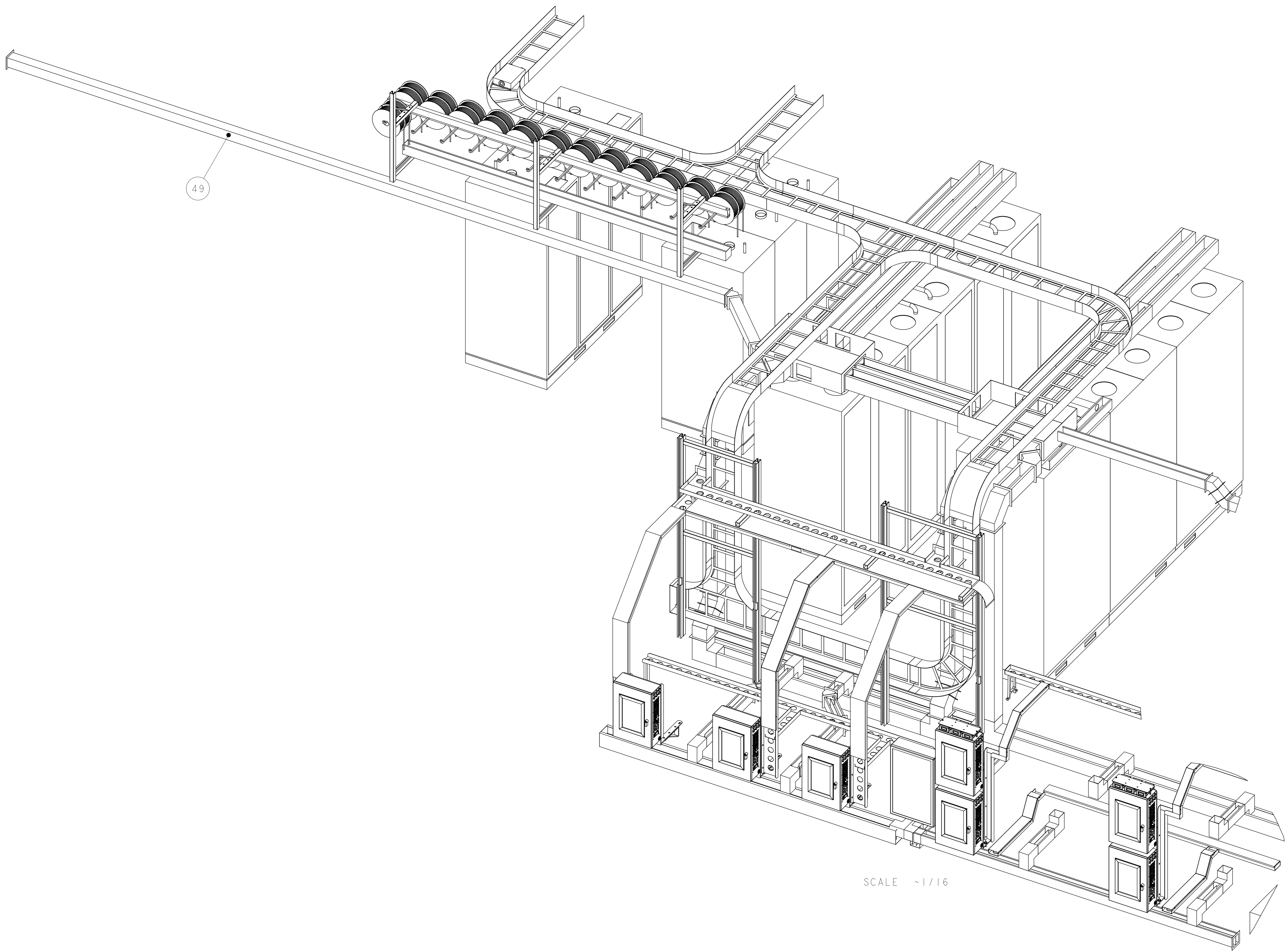
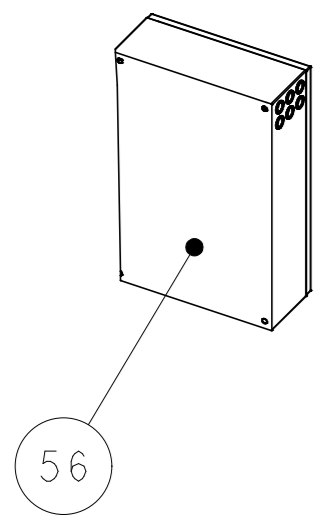


FOR COMPONENT IDENTIFICATION, SCHEMATIC & DRAWING NUMBERS  
SEE SHEET 5

UNLESS OTHERWISE SPECIFIED		SHOP ORDERS		ERNEST ORLANDO LAWRENCE BERKELEY NATIONAL LABORATORY UNIVERSITY OF CALIFORNIA - BERKELEY	
PROJECTION:		ASST. NO.	DATE	SNS-FES PROJECT GENERAL ELECTRONICS ASSEMBLY	
TOLERANCES		NO.	DATE		
x.x ± 1.0	FRAC. ± 1/64	DATE	DATE	SCALE: ~3/64	
x.xx ± 0.26	Angles ± 1.0°	DATE	DATE	ASSEM 25Bxxx	
x.xxx ± 0.130	FINISH: 125/	DATE	DATE	SHEET 3 OF 6	
DO NOT SCALE PRINT		DATE: 20-Mar-02		SIZE: REV.	
THREADS ARE CLASS 2		DATE		PATENT CLEAR: 8212E1	
CHAMFER ENDS OF ALL SCREW THREADS 30°		DATE		DESIGN ACCT. NO. FE3000	
CUT ROUNDS, 1.5 THREAD RELIEF ON MACHINED THREADS		DATE		DWG. NO. 25B6086	
BREAK EDGES .016 MAX. ON MACHINED WORK		DATE		C	
REMOVE BURRS, WELD SPATTER & LOOSE SCALE		DATE		REV.	
IN ACCORDANCE WITH ASME Y14.5M & Y14.1		DATE		REV.	
REV	DWG	CHK	ZONE	DATE	CHANGES

DWG. NO. 25B6086 C 3

REV. 1



SCALE 1/16

FOR COMPONENT IDENTIFICATION, SCHEMATIC & DRAWING NUMBERS SEE SHEET 5

UNLESS OTHERWISE SPECIFIED		SHOP ORDERS	
PROJECTION:	ASST. NO.	NO.	ISS. DATE
TOLERANCES	SURFACE		
x.x ± 1.0	FRAC. ± 1/64	TREATMENT	TAG
x.xx ± 0.26	Angles ± 1.0°	PROJECT NUMBER	
x.xxx ± 0.130	FINISH: 125/	PROJECT NAME	
DO NOT SCALE PRINT	HARDENING ARE CLASS 2		
	CHAMFER ENDS OF ALL SCREW THREADS 30°		
	CUT ROUNDS .015 MAX. ON MACHINED THREADS		
	BREAK EDGES .015 MAX. ON MACHINED WORK		
	REMOVE BURRS, WELD SPATTER & LOOSE SCALE		
	IN ACCORDANCE WITH ASME Y14.5M & Y14.5		

ERNEST ORLANDO LAWRENCE  
BERKELEY NATIONAL LABORATORY  
UNIVERSITY OF CALIFORNIA - BERKELEY

SNS-FES PROJECT  
GENERAL  
ELECTRONICS ASSEMBLY

SCALE: ~3/64

ASSEM 25BxxxX

8212E1 FE3000

SHEET 4 OF 6

25B6086 C

REV	DWG	CHK	ZONE	DATE	CHANGES

DWG. NO. 25B6086 C 4

ITEM NO.	DESCRIPTION	SCHEMATIC NO.	DRAWING NO.
1.	FER05, POWER SUPPLY, SOURCE, -65kV	43X2001, 43X0024, 43X0054	
2.	FER03, EQUIPMENT RACK, AC DISTRIBUTION	43X0034, 43X0044, 43X0054	
3.	FER03, EQUIPMENT RACK, TRANSFORMER SECTION	43X0034, 43X0044	
4.	MANIFOLD, DIW, S/R	43X2422	
5.	GROUND SYSTEM, GROUND PLANE	43X0204	
6.	FAN, CABINET EXHAUST (KOOLTRONIC #KBB4P280/63-101)	43X0044 W-3	
7.	ENCLOSURE, HV (BIG BLUE BOX)		25B5004
8.	TOWER, LIGHT INDICATING (IDEC #LTID-0135P)	43X0084 W-3	
9.	FEE10, COMPARTMENT, CONTROLS (CONTAINS FEE11 THRU 17)		25B5094
10.	NETWORK, MATCHING SECTION, 2 MHz	43X0024	
11/12	FER06,07, EQUIPMENT RACK, CHOPPER, LEBT	43X0024, 43X0374, 43X0054	
13.	FEE20, INTERFACE, VACUUM, CONTROLS, LEBT	43X (NEW)	
14.	RACEWAY, 4 X 4, SPLIT, RFQ COOLING		
15.	FEE30, INTERFACE, VACUUM CONTROLS, RFQ 1/2	43X2344	
16.	FEE35, INTERFACE, COOLING CONTROLS, RFQ 1/2	43X2354	
17.	RACEWAY, 2 X 4, RFQ VACUUM		
18.	FEE32, INTERFACE, VACUUM CONTROLS, RFQ 3/4	43X2324	
19.	FEE36, INTERFACE, COOLING CONTROLS, RFQ 3/4	43X2334	
20.	LOADCENTER, 208V, 3PH, 100A	43X2244	
21.	FEE40, INTERFACE, VACUUM CONTROLS, MEBT	43X (NEW)	
22.	FEE45, INTERFACE, COOLING CONTROLS, MEBT	43X2374	
23.	RACEWAY, 2 X 4, MEBT VACUUM CONTROL		
24.	RACEWAY, 2 X 6 ARM, MEBT CONTROLS		25B8544/8584
25.	RACEWAY, 4 X 4, FER04 to FER13 PULLCAN		
26.	FER04, EQUIPMENT RACK, HV POWER SUPPLIES	43X0054	
27.	SUPPORT, UNISTRUT, RACEWAY / CABLE TRAY		
28.	PULLCAN, 24 X 36 X 8, W/ COVER		
29.	TRAY, LADDER, 12" WIDE X 4" HIGH, ALUM.	B-LINE	
30/31	RACEWAY, 6" X 6", DIVIDED, STEEL, W/ REM. COVER	CIRCLE AW	
32.	RACEWAY, 2" X 4", VENTILATED W/ COVER, RFQ COOLING	"	
33.	RACEWAY, 2" X 4", VENTILATED W/ COVER, MEBT COOLING	"	
34.	FER13, EQUIPMENT RACK, RFQ / MEBT, LLRF	43X2404W-1, 43X0054L-2	
35.	FER12, EQUIPMENT RACK, FE DIAGNOSTICS / ICS	43X2404W-1, 43X0054L-2	
36.	FER11, EQUIPMENT RACK, FE DIAGNOSTICS	43X2404W-2, 43X0054L-2	
37.	FER10, EQUIPMENT RACK, RFQ CONTROLS	43X0054L-2	
38.	FER09, EQUIPMENT RACK, VACUUM, MEBT	43X0054L-2	
39.	FER08, EQUIPMENT RACK, VACUUM, LEBT AND RFQ	43X0054L-2	
40.	FER14, EQUIPMENT RACK, WIRE SCANNERS, MEBT	43X2404W-3, 43X0054L-4	
41.	FER15, EQUIPMENT RACK, CHOPPER, MEBT	43X (NEW), 43X0054L-4	
42.	FER16, EQUIPMENT RACK, QUAD PS', MEBT	43X0194W-1,W-3, 43X0054L-4	
43.	FER17, EQUIPMENT RACK, QUAD PS', MEBT	43X0194W-1,W-3, 43X0054L-4	
44.	FER18, EQUIPMENT RACK, STEERING PS', MEBT	43X0194W-2,W-3, 43X0054L-4	
45.	FER19, EQUIPMENT RACK, STEERING PS', MEBT	43X0194W-2,W-3, 43X0054L-4	

ITEM NO.	DESCRIPTION	SCHEMATIC NO.	DRAWING NO.
46.	FER22, POWER SUPPLY, RF, 20kW, MEBT, QE1	43X2081D-1, 43X0054L-6, 43X2404W-1	
47.	FER21, POWER SUPPLY, RF, 20kW, MEBT, QE1	43X2081D-1, 43X0054L-6, 43X2404W-1	
48.	FER20, POWER SUPPLY, RF, 20kW, MEBT, QE1	43X2081D-1, 43X0054L-6, 43X2404W-1	
49.	RACEWAY, 4" X 4", STEEL W/ COVER, CONTROL, CHILLER RM.	CIRCLE AW	
50.	FER23, POWER SUPPLY, RF, 20kW, MEBT, QE1	43X2081D-1, 43X0054L-6, 43X2404W-1	
51.	FER24, POWER SUPPLY, RF, 20kW, MEBT, QE1	43X2081D-1, 43X0054L-6, 43X2404W-1	
52.	FER25, POWER SUPPLY, RF, 20kW, MEBT, QE1	43X2081D-1, 43X0054L-6, 43X2404W-1	
53.	TRAY, LADDER, RF SIG / POWER CABLES, MEBT, 12" WIDE X 4" HIGH ALUM.	B-LINE	
54.	SUPPORT, CABLE REEL, LLRF, MEBT	B-LINE "DATA TRACK"	
55.	RACEWAY, 4" X 4", STEEL, OPEN, LLRF, MEBT		
56.	FEE50, INTERFACE, CHILLER CONTROLS	43X (NEW)	
57.	FEE48, INTERFACE, MEBT MOTOR DRIVE CONTROLS	43X (NEW)	

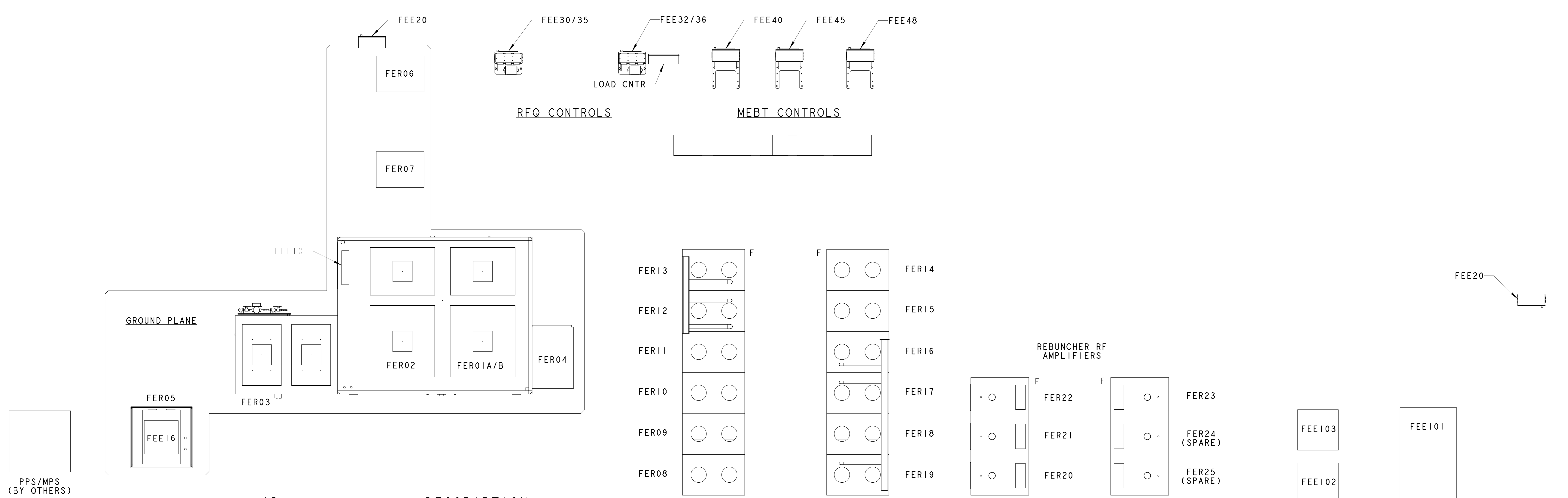
UNLESS OTHERWISE SPECIFIED		SHOP ORDERS			
PROJECTION:	ASST. NO.	NO.	DATE	SCALE: ~3/64	DO NOT SCALE
TOLERANCES: X.X ± 1.0	FRAC. ± 1/64	DATE	DATE	ASSEM 25Bxxx	SHEET 5 OF 6
X.XX ± 0.26	ANGLES ± 1.0°	DATE	DATE	FE3000	25B6086 C
X.XXX ± 0.130	FINISH: 125	DATE	DATE	FE3000	25B6086 C
DO NOT SCALE PRINT					
THREADS ARE CLASS 2					
CHAMFER ENDS OF ALL SCREW THREADS 30°					
CUT ROUNDS, 1.5 THREAD RELIEF ON MACHINED THREADS					
BREAK EDGES .016 MAX. ON MACHINED WORK					
REMOVE BURRS, WELD SPATTER & LOOSE SCALE					
IN ACCORDANCE WITH ASME Y14.5M & Y14.5					
REV	DWG	CHK	ZONE	DATE	CHANGES

D

C

B

A



ID	DESCRIPTION
FER01A	80kW RF AMP
FER01B	45kV HOT RACK
FER02	65kV HOT RACK
FER03	AC DISTRIBUTION
FER04	HV PS RACK (GND. RACK)
FER05	65kV SOURCE PS
FER06/07	LEBT
FER08/09	VACUUM
FER10	RFQ
FER11/12	DIAGNOSTICS
FER13	MEBT L/L RF
FER14	DIAGNOSTICS/WIRE SCANNERS
FER15	MEBT CHOPPER/DEI PULSERS/GLASSMAN P/S
FER16/17	MEBT QUAD PS
FER18/19	MEBT STEERING PS
FER20/25	MEBT REBUNCHER RF AMPLIFIERS
FEE20	LEBT VACUUM CNTRL
FEE30/32	RFQ VACUUM CNTRL
FEE35/36	RFQ COOLING CNTRL
FEE40	MEBT VACUUM CNTRL
FEE45	MEBT COOLING CNTRL
FEE48	MEBT MOTOR DRIVE CNTRL
FEE50	CHILLER CNTRL
FEE100	18kW RFQ CHILLER
FEE101	25kW RFQ CHILLER
FEE102/103	CRYO COMPRESSORS (CTI 9600 SERIES)
FEE16	DTI 65KV PS
FEE10	PERSONNEL SAFETY CHAIN HOFFMAN (24"X24")

FRONT END ELECTRONICS IDENTIFICATION

SCALE ~3/64

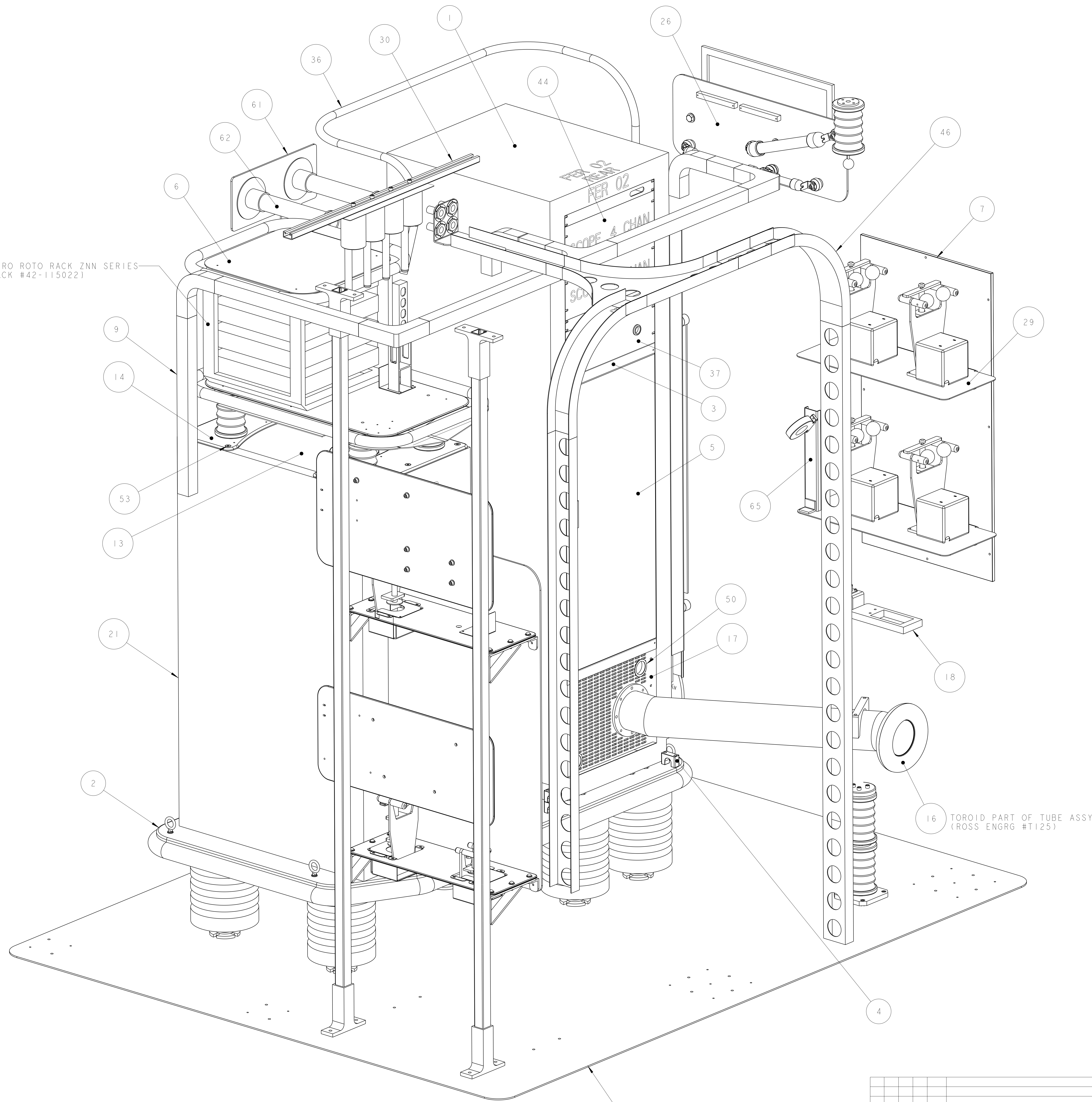
UNLESS OTHERWISE SPECIFIED		SHOP ORDERS			
PROJECTION:		ACT NO.	NO.	DATE	REV.
x.x ± 1.0	FRAC. ± 1/64	NO.	NO.	DATE	REV.
x.xx ± 0.26	Angles ± 1.0°	SUBSURFACE			
x.xxx ± 0.130	FINISH: 125/	METHOD			
DO NOT SCALE PRINT		PROJECT TAG			
TOLERANCES ARE CLASS 2		PROJECT NUMBER			
CHAMFER ENDS OF ALL STEEL THREADS 30°		PROJECT NAME			
CUT ROUNDS, 1.5 THREAD RELIEF ON MACHINED THREADS		DATE: 20-Mar-02			
BREAK EDGES .015 MAX. ON MACHINED WORK		DRAWN BY: A. HARRIS			
REMOVE BURRS, WELD SPATTER & LOOSE SCALE		CHECKED BY: W. ABRAHAM			
IN ACCORDANCE WITH ASME Y14.5M & Y14.1		DATE:			
C	DPO	1/1/02	MODIFIED FER14, FER15, ADDED FEE16, FEE10		
REV	DWG	CHK	ZONE	DATE	CHANGES

ERNEST ORLANDO LAWRENCE BERKELEY NATIONAL LABORATORY UNIVERSITY OF CALIFORNIA - BERKELEY					
SNS-FES PROJECT GENERAL ELECTRONICS ASSEMBLY					
MICROFILMED:	DWG. TYPE:	SHOWN ON:	SCALE:	~3/64	DO NOT SCALE PRINT
ASSEM	25Bxxx	FE3000	SHEET 6 OF 6	REV.	
PATENT CLEAR:	DESIGN ACCT. NO.	CATEGORY CODE:	DWG. NO.:	25B6086	C
8212E1	FE3000				

25B6086 C 6

25B6086 C

PART OF ZERO ROTO RACK ZNN SERIES  
WARRIOR RACK #42-1150221



65	1	MONITOR ASSEMBLY, CURRENT HV	-
64	1	COUPLER, DIRECTIONAL OE1/RF	-
63	2	BOLT, HEX, 1/2-13 X 3/4	-
62	2	DIVIDER, VOLTAGE 75KVDC (ROSS ENGRG #VD75-10YALB-B)	-
61	1	PLATE, VOLTAGE DIVIDER MOUNTING	-
60	1	INSULATOR, 120V/208v to FER02, 480v to OE1	-
59	1	INSULATOR, 120v to FER02 / 120v to 45kV	-
58	1	FLOOR, HV ENCLOSURE ("BIG BLUE BOX")	-
57	1	ISOLATOR, 45KV (PORCELAIN PROD. # T00041)	-
56	6	ISOLATOR, 65KV HOTDECK (LAPP INS. CO. #J-317010-70)	-
55	1	WASHER, FLAT 1/2 SAE	-
54	4	SCREW, PAN HD PHIL, 1/4-20 X 5/8	-
53	10	SCREW, FLAT HEAD PHILLIPS, 3/8-16 X 3/4	-
52	1	PANDUIT, SOLID, 3 X 3 X 68 (PANDUIT FS3X3LG6NM & CVR.1)	-
51	1	ELBOW, 1 5/8", MYAT COAX	-
50	3	BUSHING, PASS-THRU, HEYCO 2 1/4 in.	-
49	4	BASE, POST, UNISTRUT F5610 VE	-
48	1	BALL, GROUNDING, BRASS	-
47	2	UNISTRUT, HV ENCLOSURE (ESSEX-BROWNELL #CH-2212-10)	-
46	1	TRAY ASSY, HV ENCLOSURE	-
45	1	SUPPORT, HV ANGLE TUBE	-
44	2	SCOPE, 4 CHANNEL	-
43	1	POWER SUPPLY, MASS FLOW CNTLR, IMKS 1479A, W/246 PS1	-
42	1	POWER SUPPLY, E-DUMP 84V, .25 AMP (GLASSMAN LT)	-
41	1	CONDEL, 13 Mhz	-
40	1	ETHERNET HUB, FIBEROPTIC	-
39	1	PANEL, CIRCUIT BREAKER	-
38	1	PANEL, SU VENTED, FER02	-
37	1	PANEL, 4U W/ PASS-THRU BUSHING	-
36	1	CONDUIT, 120V TO 45KV DECK	-
35	1	PANEL, 2U	-
34	1	PANEL, 2U BLANK	-
33	1	PANEL, 1U, VENTED (USE LBNL PART NO. 25B5434)	-
32	1	PANEL, 1U	-
31	1	PANEL, 1U, BLANK	-
30	1	RESISTOR/CAPACITOR ASSY, 45KV DECK	-
29	2	SUPPORT, DUAL HV RELAY	-
28	1	PLATE, RELAY SUPPORT, LOW VOLTAGE	-
27	1	PLATE, LV RELAY SUPPORT	-
26	1	PANEL, RESISTOR MOUNTING, ENCL. SIDE	-
25	1	PANEL, RESISTOR INSULATING	-
24	1	PANEL, RESISTOR MOUNTING, LV	-
23	1	POWER SUPPLY, Cs HTR, 300V, 3.5 AMP (EMI LEM SERIES)	-
22	1	OE1 CONTROL UNITS	-
21	1	AMPLIFIER, 80kW, OE1	-
20	43X0364	1	POWER SUPPLY, MATCH. SECT. MOTOR DRIVER & TEMP INTFC.
19	43X2174	1	INTERFACE, GROUP 3 CNA
18	25B594	1	BRACKET ASSEMBLY, RF CONNECTOR
17	25B557	1	PANEL, VENTED, FER02 CABINET (REAR)
16	25B579	1	TUBE, HI VOLTAGE, FER02 / UTILITIES CONDUIT
15	25B720	1	SHIELD, SAFETY, HV RELAY RACK
14	25B572	2	SUPPORT PLATE, 45KV DECK to OE1
13	25B573	1	TOP PANEL, OE1 AMPLIFIER
12	25B597	3	PANEL, FILLER, 1 1/2" FER02
11	25B718	2	CLAMP, HV CABLE SUPPORT
10	25B721	4	ANGLE, SAFETY SHIELD, HV RELAY
9	25B722	1	WIREWAY ASSY, FIBER (PANDUIT 2 X 2 CLEAR #PS2X2CL6NM)
8	25B719	1	CLAMP, RF COAX OE1 to SOURCE
7	25B584	1	PANEL, SOLID, HV ENCLOSURE
6	25B553	1	ASSEMBLY, 45KV DECK
5	25B519	1	DOOR, REAR, FER02 RACK
4	25B715	5	CLAMP, RF CABLE OE1 to SOURCE
3	25B598	2	SUPPORT, UPPER DOOR, FER02 RACK
2	25B566	1	PLATE, 65KV HOTDECK, HV ENCLOSURE
1		1	ENCLOSURE, FER02

16 TOROID PART OF TUBE ASSY  
(ROSS ENGRG #T125)

58 PART OF HV ENCLOSURE

REV	DWG	CHK	ZONE	DATE	CHANGES

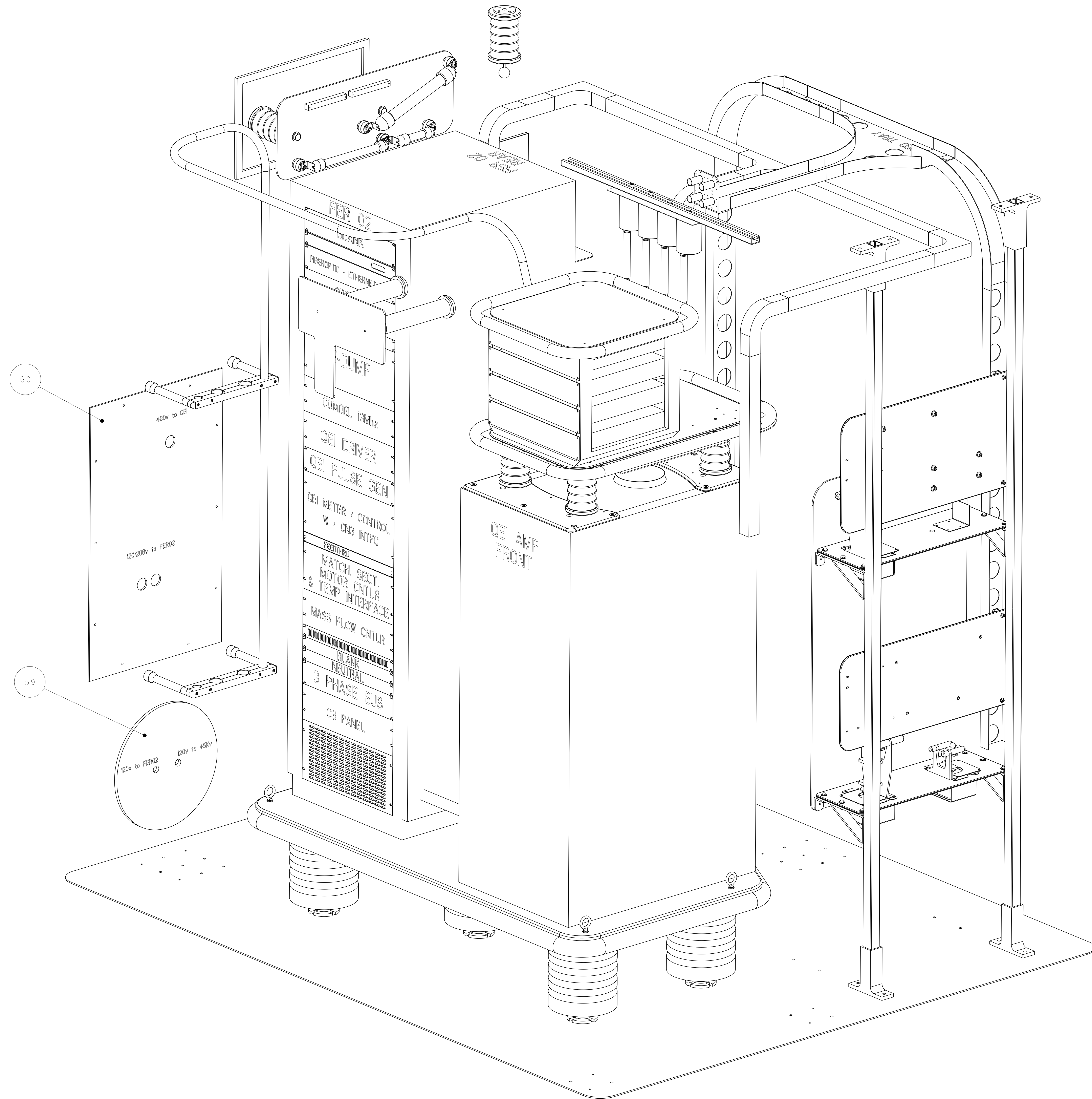
UNLESS OTHERWISE SPECIFIED		SHOP ORDERS	
PROJECTION:	1st Angle	REF NO.	NO.
TOLERANCES:	X.X ± 0.1	DATE	DATE
	FRAC. ± 1/64		
	X.XX ± 0.03		
	ANGLES ± 1.0°		
	X.XXX ± 0.010		
	FINISH 125		
DO NOT SCALE PRINT			
HARDENING CLASS 7			
CHAMFER END OF ALL SREW THREADS 30°			
CUT ROUNDS, 1.5 THREAD RELIEF ON MACHINED THREADS			
BREAK EDGES .016 MAX. ON MACHINED WORK			
REMOVE BURRS, WELD SPATTER & LOOSE SCALE			
IN ACCORDANCE WITH ASME Y14.3M-1 & Y14.5			

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

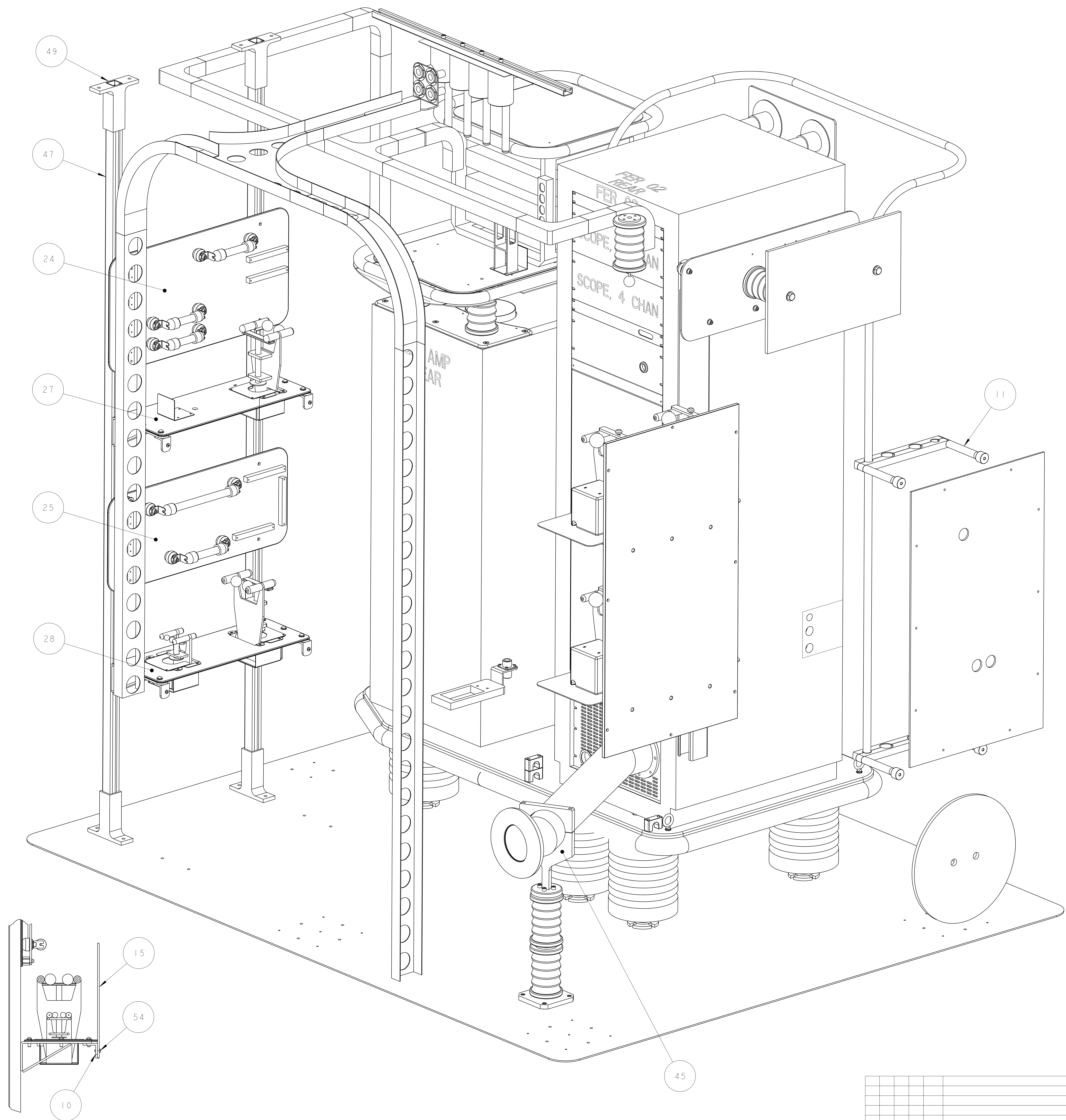
SNS-FES ION SOURCE & LBET  
ELECTRICAL SYSTEMS  
HV RACK, 65KV DECK ASSEMBLY

ASSEM 25BXXXX  
SHEET 1 OF 5

8210-21 FE3121  
25B7496 A



UNLESS OTHERWISE SPECIFIED		PROJECTION:		SHOP ORDERS		ERNEST ORLANDO LAWRENCE BERKELEY NATIONAL LABORATORY UNIVERSITY OF CALIFORNIA - BERKELEY	
TOLERANCES	X.X ± 0.1	FRAC. ± 1/64		REV.	NO.	DATE	SCALE: 0.188
	X.XX ± 0.03	ANGLES ± 1.0°		APP.	DATE		0.188
	X.XXX ± 0.010	FINISH 125/		CHK.	DATE		0.188
DO NOT SCALE PRINT				PROJECT: SNG-FES ION SOURCE & LEBT			
HARDING ARE CLASS 7				PROJECT NUMBER: HV RACK, 65kV DECK ASSEMBLY			
CHAMFER ENDS OF ALL SCREW THREADS 30°				ELECTRICAL SYSTEMS			
CUT ROUNDS, 1.5 THREAD RELIEF ON MACHINED THREADS				PROJECT TAG: SNG-FES ION SOURCE & LEBT			
BREAK EDGES .016 MAX. ON MACHINED WORK				PROJECT NUMBER: 25BXXXX			
REMOVE BURRS, WELD SPATTER & LOOSE SCALE				PROJECT NAME: ASSEM			
IN ACCORDANCE WITH ASME Y14.3M-88 FIG. 1				PROJECT NUMBER: FE3121			
REV	DWG	CHK	ZONE	DATE	CHANGES	DESIGN ACCT. NO.	8210-21
						CATEGORY CODE	25B7496 A
						DWG. NO.	25B7496 A
						DATE	
						DATE	
						DATE	

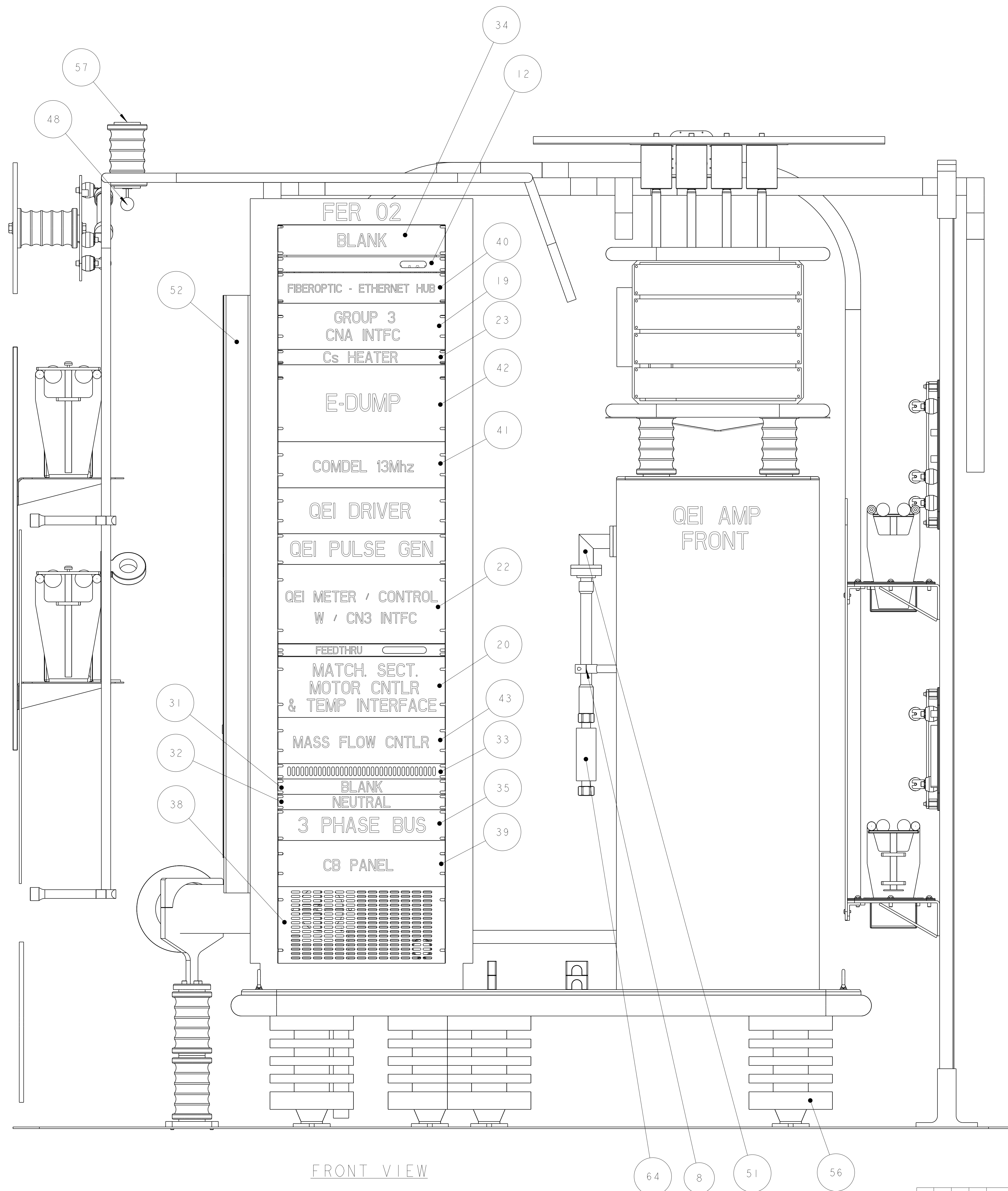


UNLESS OTHERWISE SPECIFIED		SHOP ORDERS		ERNEST ORLANDO LAWRENCE BERKELEY NATIONAL LABORATORY UNIVERSITY OF CALIFORNIA - BERKELEY	
PROJECTION:		REF. NO.	DATE	ASSEM	25BXXXX
TOLERANCES:	X.X ± 0.1	FRAC.	± 1/64	SCALE:	0.188
	X.XX ± 0.03	FINISH	125	SHEET	3 OF 5
	X.XXX ± 0.010	ANGLE	± 1.0°	REV.	W. ABRAHAM
DO NOT SCALE PRINT		DATE		04-Apr-02	
HARDEN ALL CLASS 7		DATE		DATE	
CHAMFER ENDS OF ALL SCREW THREADS 30°		DATE		DATE	
CUT ROUNDS, 1.5 THREAD RELIEF ON MACHINED THREADS		DATE		DATE	
BREAK EDGES .016 MAX. ON MACHINED WORK		DATE		DATE	
REMOVE BURRS, WELD SPATTER & LOOSE SCALE		DATE		DATE	
IN ACCORDANCE WITH ASME Y14.3M-98 FIG. 1		DATE		DATE	
REV	DWG	CHK	ZONE	DATE	CHANGES

25B7496 A 3

25B7496 A





FRONT VIEW

REV	DWG	CHK	ZONE	DATE	CHANGES

UNLESS OTHERWISE SPECIFIED  
 PROJECTION:   
 TOLERANCES: X.X ± 0.1    FRAC. ± 1/64  
 X.XX ± 0.03    Angles ± 1.0°  
 X.XXX ± 0.010    FINISH 125/  
 DO NOT SCALE PRINT  
 HORN AND CLASS 7  
 CHAMFER ENDS OF ALL SCREW THREADS 30°  
 CUT ROUNDS, 1.5 THREAD RELIEF ON MACHINED THREADS  
 BREAK EDGES .016 MAX. ON MACHINED WORK  
 REMOVE BURRS, WELD SPATTER & LOOSE SCALE  
 IN ACCORDANCE WITH ASME Y14.3M-88 FIG. 1

SHOP ORDERS		REV
REF. NO.	NO.	-
REV.	DATE	-
TO	DATE	-
SURFACE	FINISH	-
TOLERANCE	FRAC.	-
THREAD	FINISH	-
PROJECT	NO.	-
DATE	DATE	-
BY	DATE	-
CHK	DATE	-
APP	DATE	-

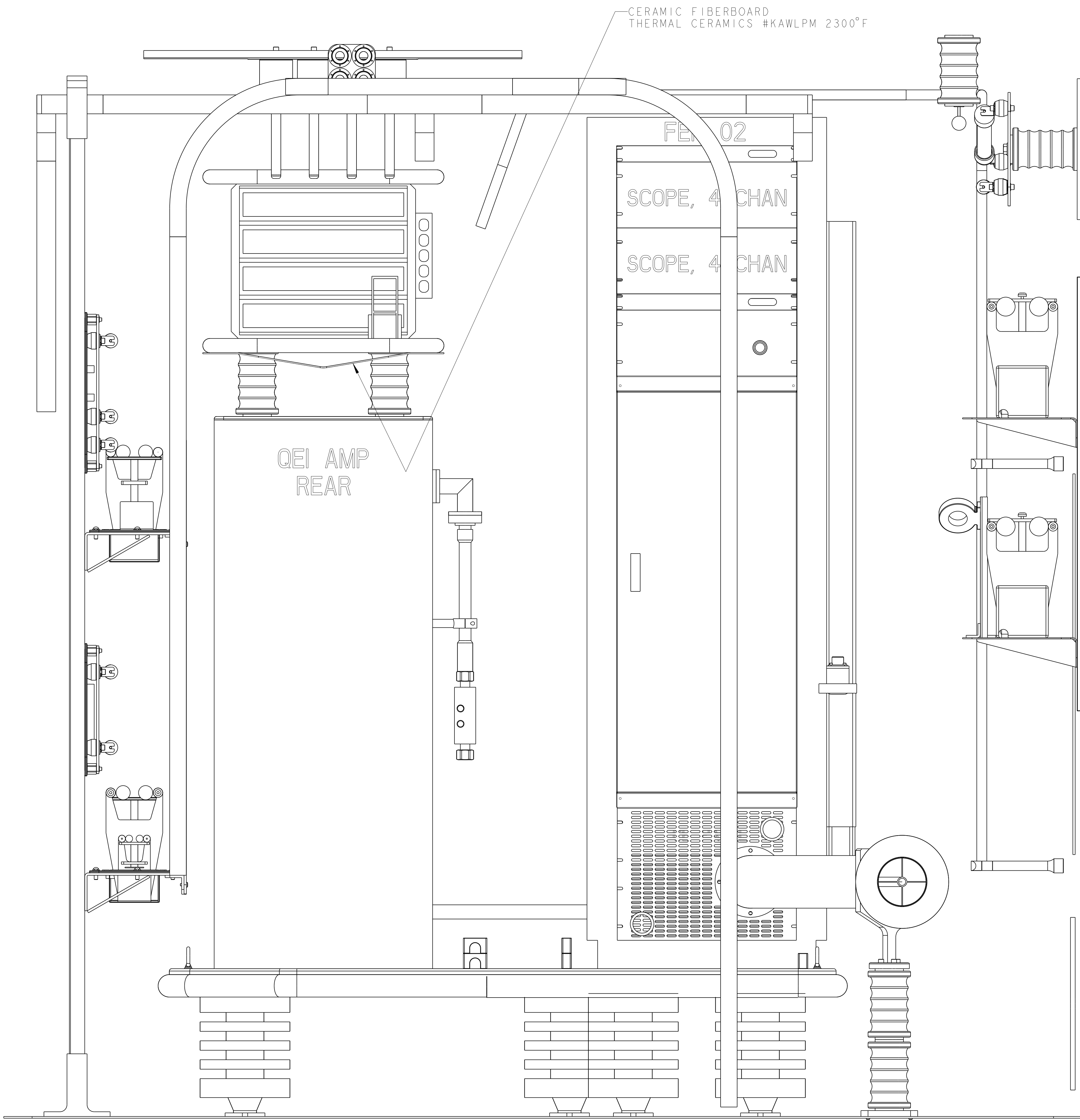
ERNEST ORLANDO LAWRENCE  
 BERKELEY NATIONAL LABORATORY  
 UNIVERSITY OF CALIFORNIA - BERKELEY

SNS-FES ION SOURCE & LEBT  
 ELECTRICAL SYSTEMS  
 HV RACK, 65kV DECK ASSEMBLY

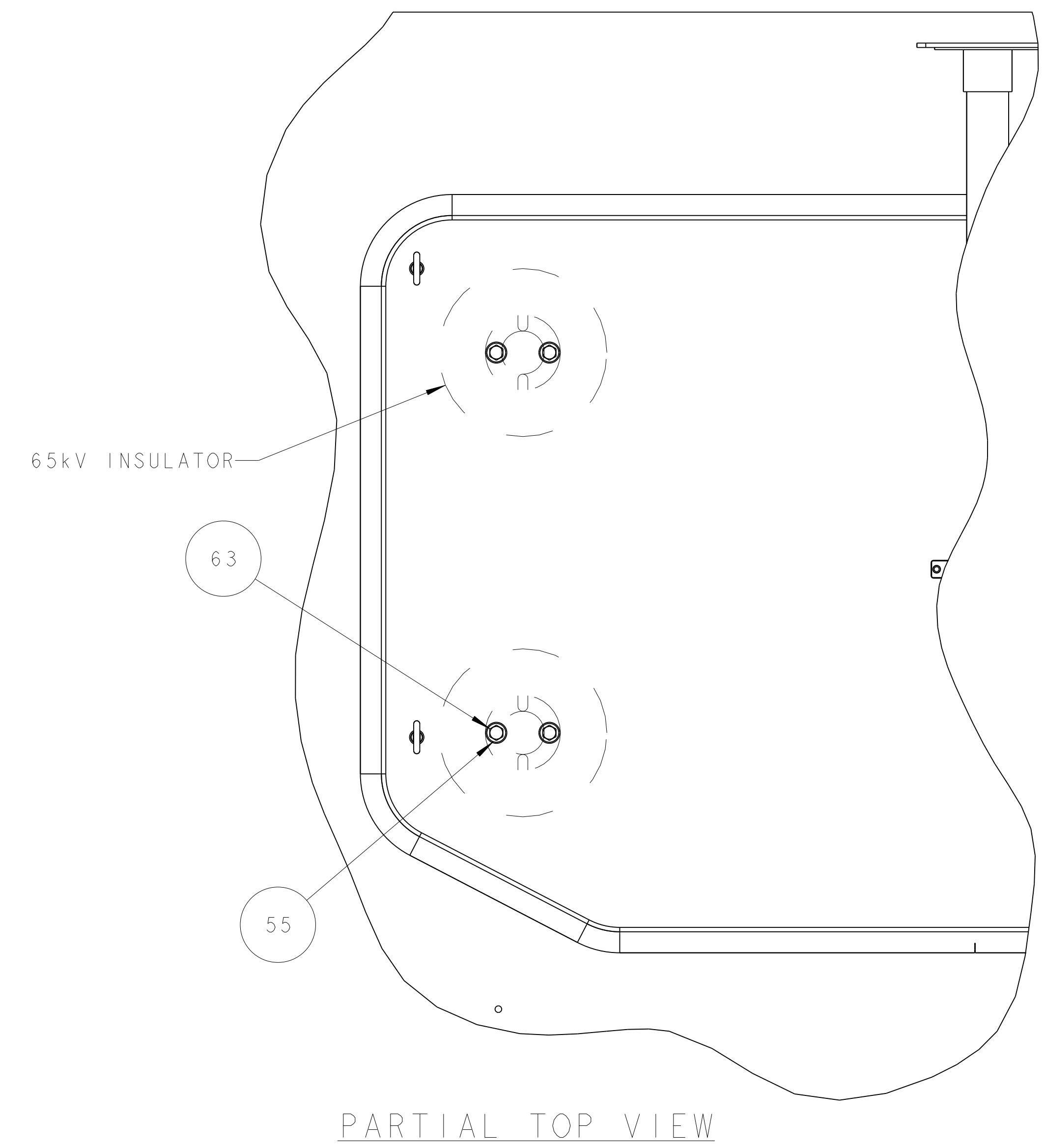
SCALE: 0.188  
 SHEET 4 OF 5

DESIGN ACCT. NO. 8210-21    CATEGORY CODE FE3121    DWG. NO. 25B7496    SIZE A

DRAWING NO. 25B7496 / A 4



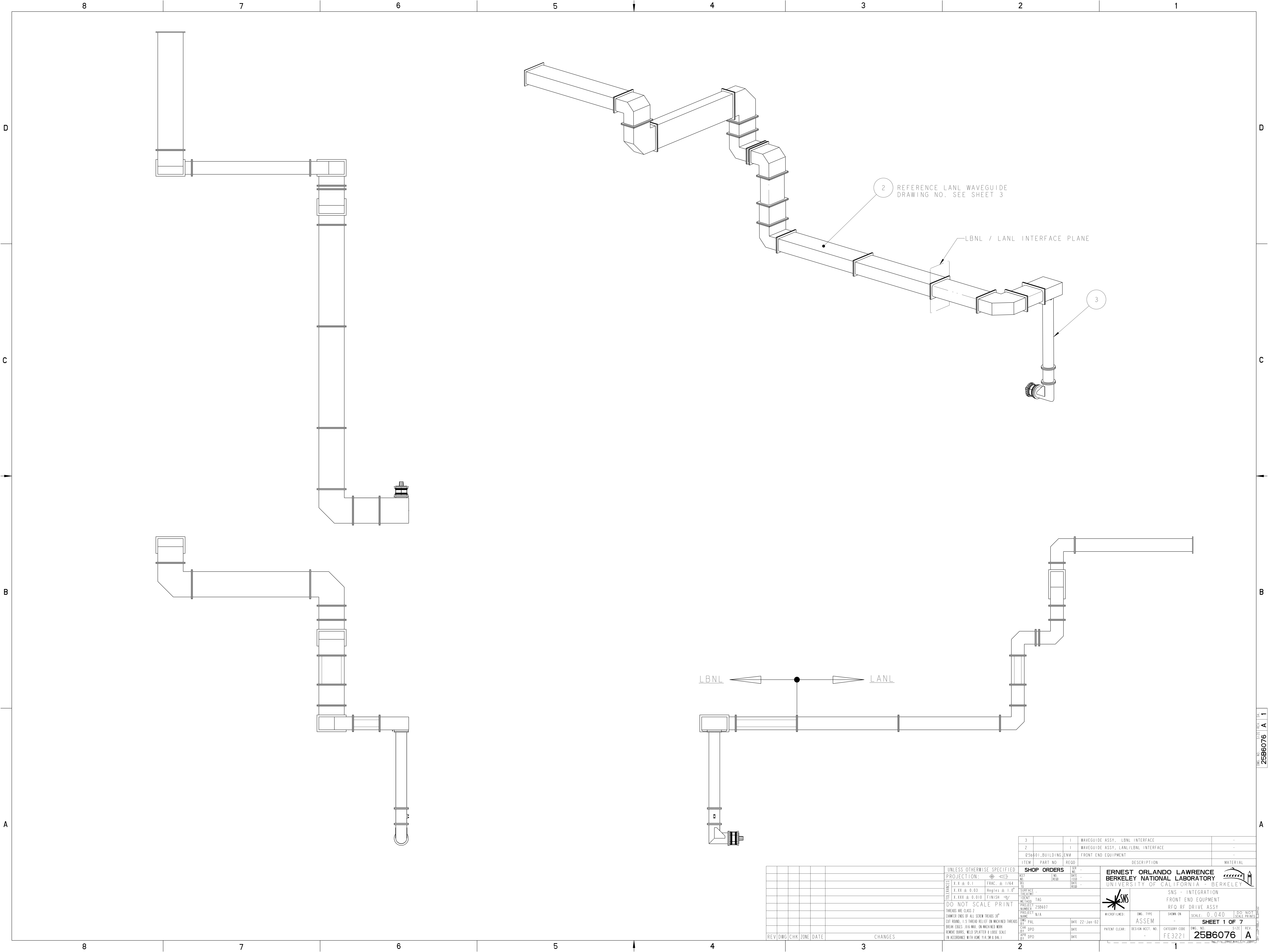
REAR VIEW



PARTIAL TOP VIEW

UNLESS OTHERWISE SPECIFIED		PROJECTION:		SHOP ORDERS		DES. NO. _____ DATE _____ DES. _____ DATE _____		<b>ERNEST ORLANDO LAWRENCE</b> <b>BERKELEY NATIONAL LABORATORY</b> UNIVERSITY OF CALIFORNIA - BERKELEY	
TOLERANCES	X.X ± 0.1	FRAC. ± 1/64		SURFACE		PROJECT	SNS-FES ION SOURCE & LEBT	SCALE: 0.188	1/8" NOT SCALE PRINT
	X.XX ± 0.03	ANGLES ± 1.0°		TREAT		PROJECT	ELECTRICAL SYSTEMS	ASSEM	25BXXX
	X.XXX ± 0.010	FINISH 125		NUMBER		PROJECT	HV RACK, 65KV DECK ASSEMBLY	8210-21	FE3121
DO NOT SCALE PRINT				MICROFILMED: _____ DATE: 11-Apr-02		SHEET 5 OF 5 SIZE: A		SHEET 5 OF 5 SIZE: A	
THREADS ARE CLASS 2 CHAMFER ENDS OF ALL SCREW THREADS 30° CUT ROUNDS, 1.5 THREAD RELIEF ON MACHINED THREADS BREAK EDGES .016 MAX. ON MACHINED WORK REMOVE BURRS, WELD SPATTER & LOOSE SCALE IN ACCORDANCE WITH ASME Y14.3M-98 FIG. 1				DESIGNED BY: A. HARRIS CHECKED BY: W. ABRAHAM DATE: _____		PATENT CLEAR: _____ DESIGN ACCT. NO. 8210-21 CATEGORY CODE FE3121		DWG. NO. 25B7496 REV. A	
REV	DWG	CHK	ZONE	DATE	CHANGES				

DRAWING NO. 25B7496 A 15



2 REFERENCE LANL WAVEGUIDE  
DRAWING NO. SEE SHEET 3

LBNL / LANL INTERFACE PLANE

3

LBNL ← → LANL

3	1	WAVEGUIDE ASSY, LBNL INTERFACE	-
2	1	WAVEGUIDE ASSY, LANL/LBNL INTERFACE	-
256601-BUILDING-EQUIP		FRONT END EQUIPMENT	-
ITEM	PART NO	REQD	MATERIAL

UNLESS OTHERWISE SPECIFIED			
PROJECTION:	FIRST ANGLE		
TOLERANCES:	X.X ± 0.1	FRAC. ± 1/64	
	X.XX ± 0.03	ANGLES ± 1.0°	
	X.XXX ± 0.010	FINISH 125	
DO NOT SCALE PRINT			
HARDING ARE CLASS 2			
CHAMFER ENDS OF ALL SCREW THREADS 30°			
CUT ROUNDS, 1.5 THREAD RELIEF ON MACHINED THREADS			
BREAK EDGES .016 MAX. ON MACHINED WORK			
REMOVE BURRS, WELD SPATTER & LOOSE SCALE			
IN ACCORDANCE WITH ASME Y14.3M-98 FIG. 1			

REV	DWG	CHK	ZONE	DATE	CHANGES

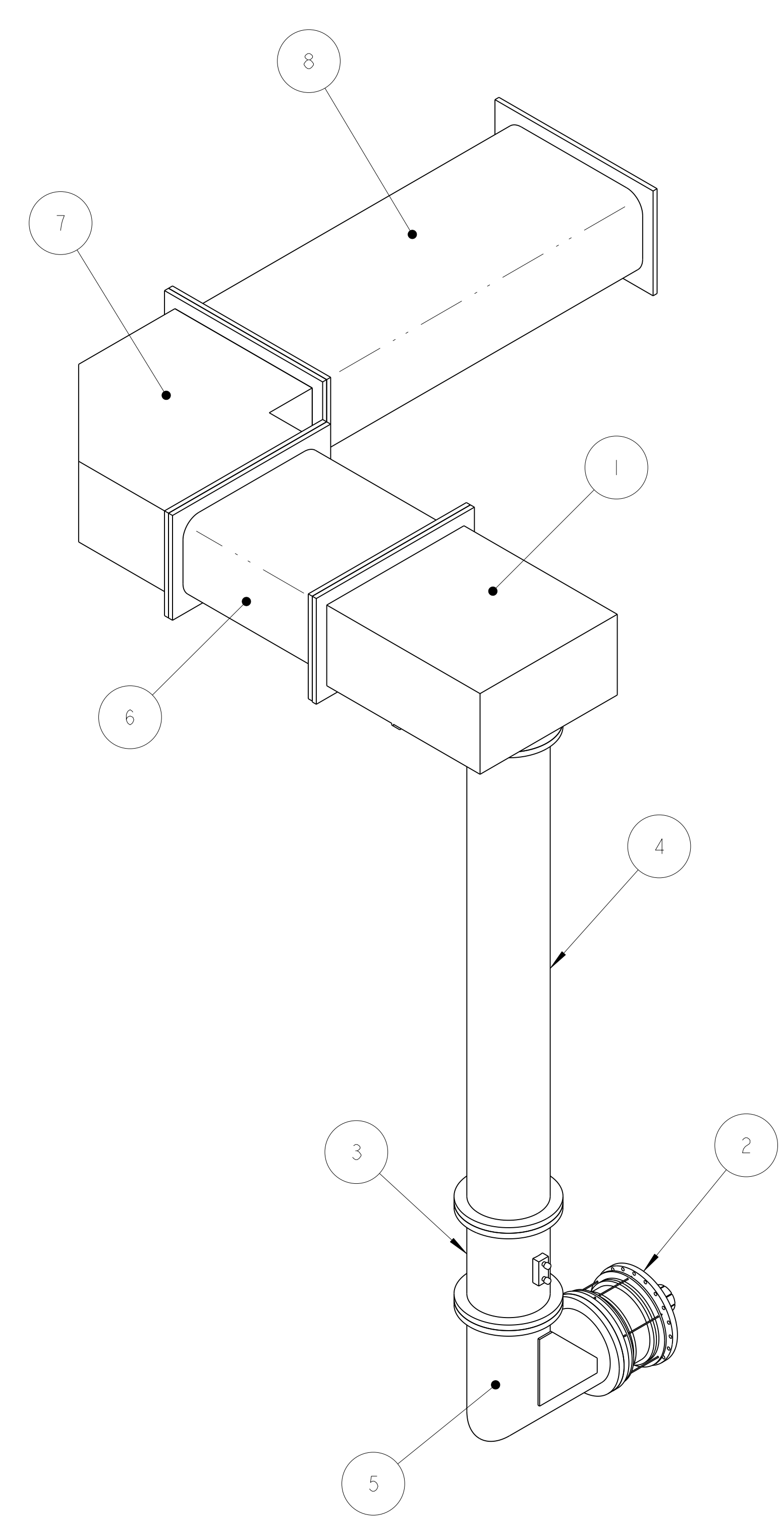
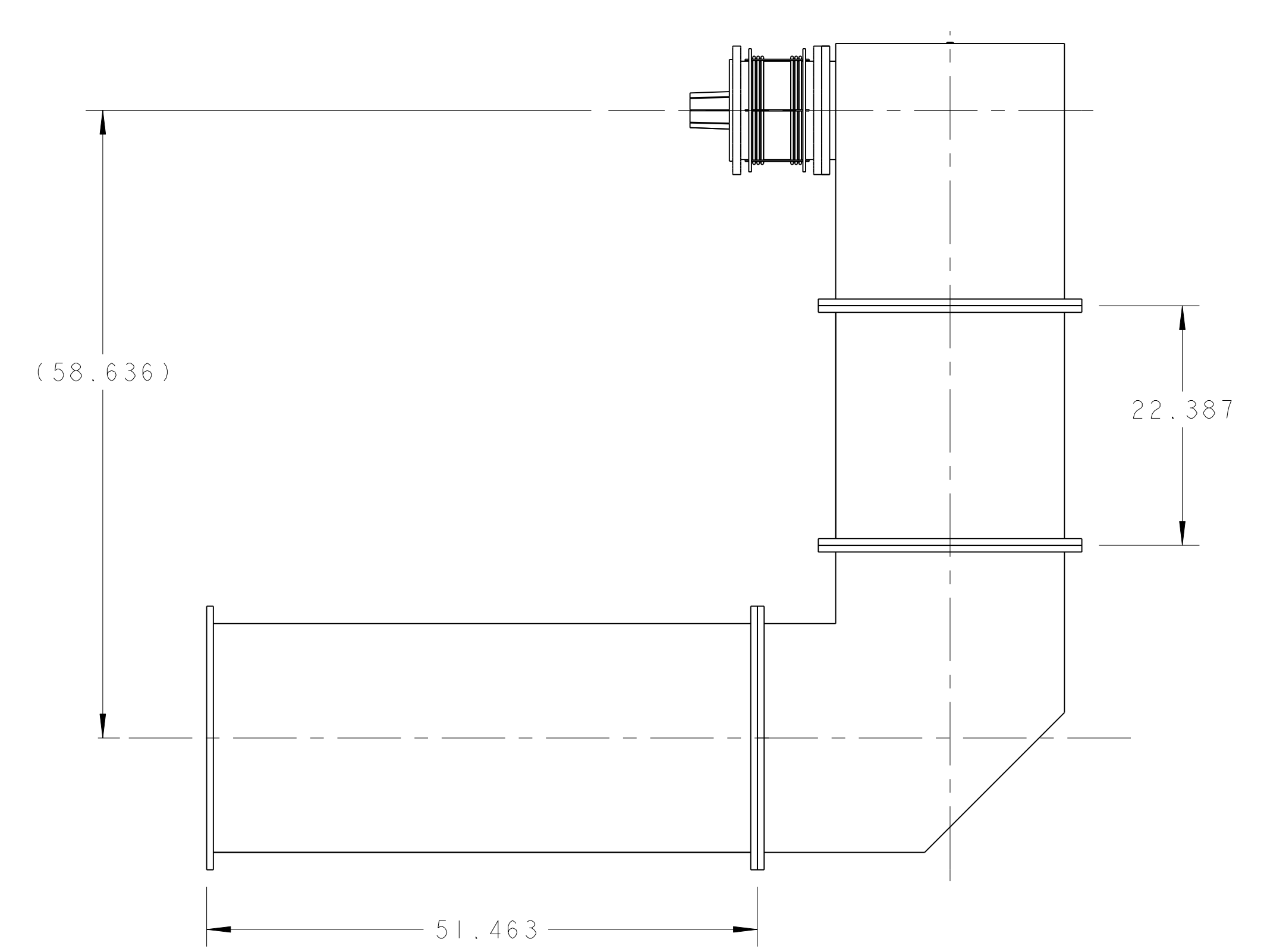
SHOP ORDERS		DATE	BY

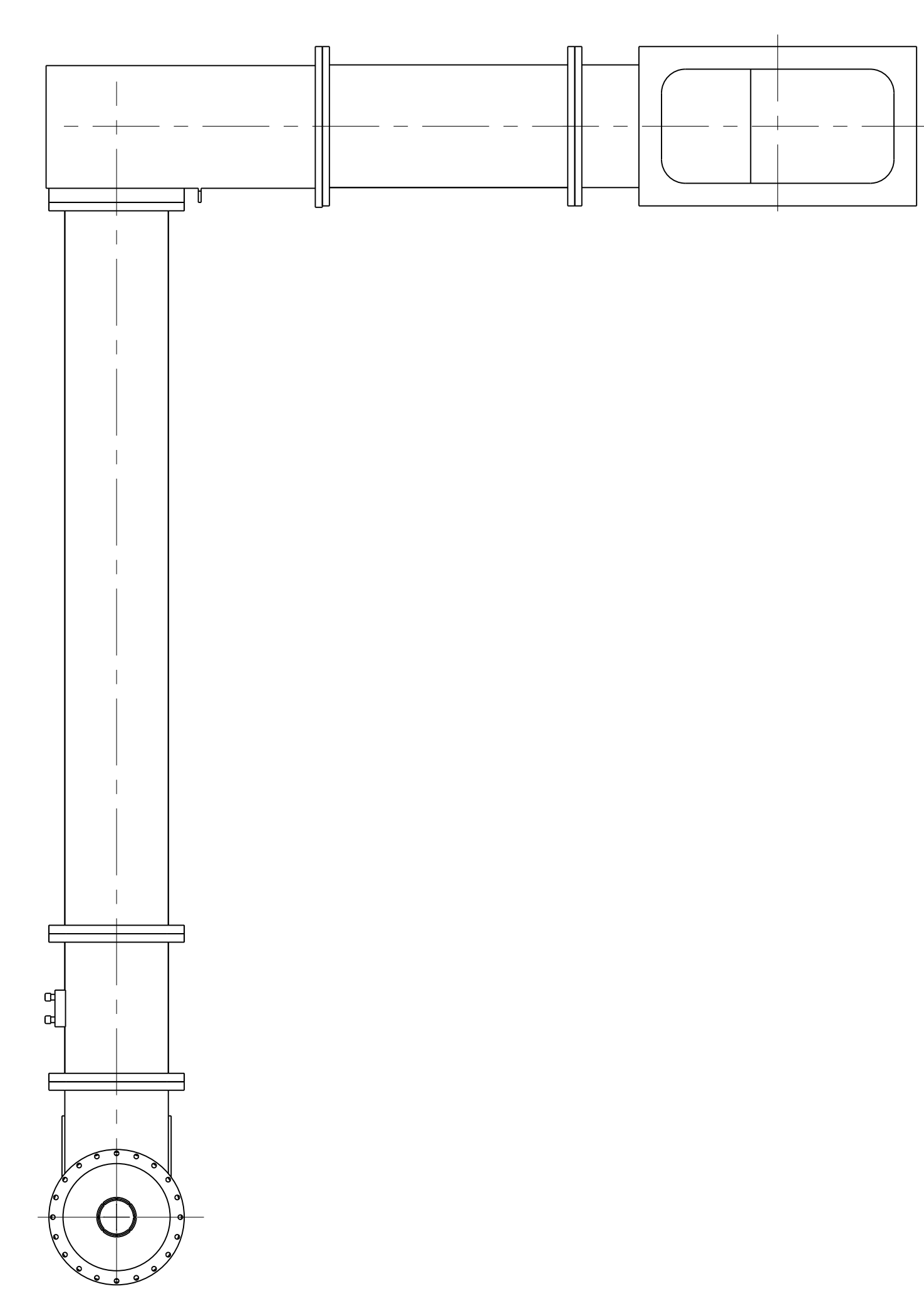
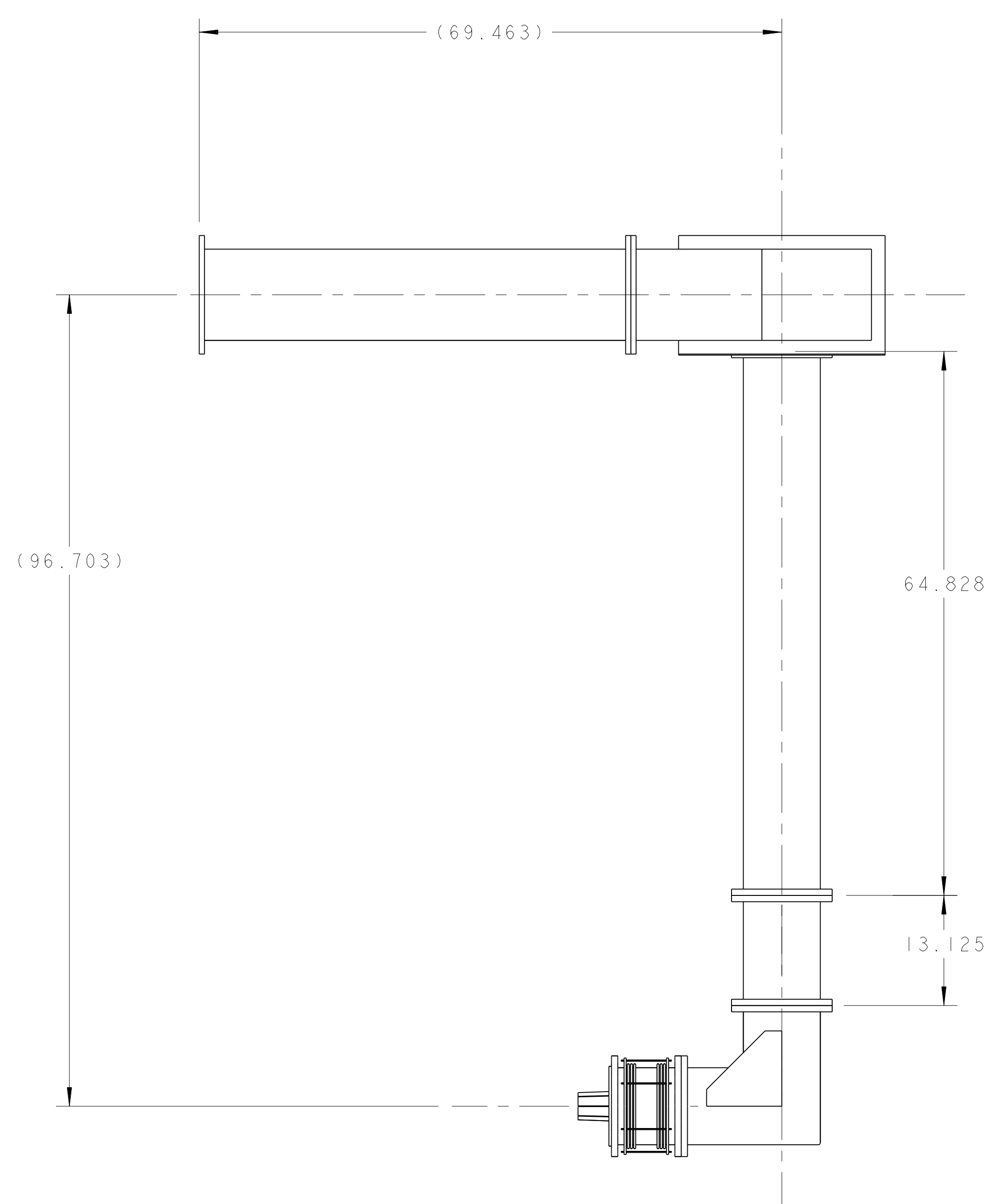
ERNEST ORLANDO LAWRENCE BERKELEY NATIONAL LABORATORY UNIVERSITY OF CALIFORNIA - BERKELEY			
SNS - INTEGRATION		FRONT END EQUIPMENT	
RFO RF DRIVE ASSY			
SCALE: 0.040		SHEET 1 OF 7	
DWG. NO. 25B6076		REV. A	

25B6076 A 1

D



C



B

ITEM	PART NO	RECD	DESCRIPTION	MATERIAL
8	1		WAVEGUIDE, FLEXIBLE WR2100 STYLE, LENGTH - 51.463	-
7	1		WAVEGUIDE, 90 DEGREE W-MITER ASSY, MEGA IND. 069Y7-3107001	-
6	1		WAVEGUIDE, FLEXIBLE WR2100 STYLE, LENGTH - 22.387	-
5	1		ELBOW, COAX, 9 3/16" X 64.828" 50 OHM 90 DEGREE HIGH PWR - MEGA IND. 069Y7-7804001	-
4	1		COAX, 9 3/16" X 64.828" 50 OHM TRANSMISSION LINE ASSY	-
3	1		COAX, 9 3/16" X 13.125" 50 OHM W/ DIR. COUPLER - MEGA IND. 069Y7-6818020	-
2	1		COAX, 9 3/16" X 8.31" 50 OHM, SEMI-FLEXIBLE MEGA IND. 069Y7-682600X	-
1	1		WAVEGUIDE, WR2100 TRANSITION TO 9 3/16" COAX, MEGA IND. 069Y7-3110170	-

REV	DWG	CHK	ZONE	DATE	CHANGES

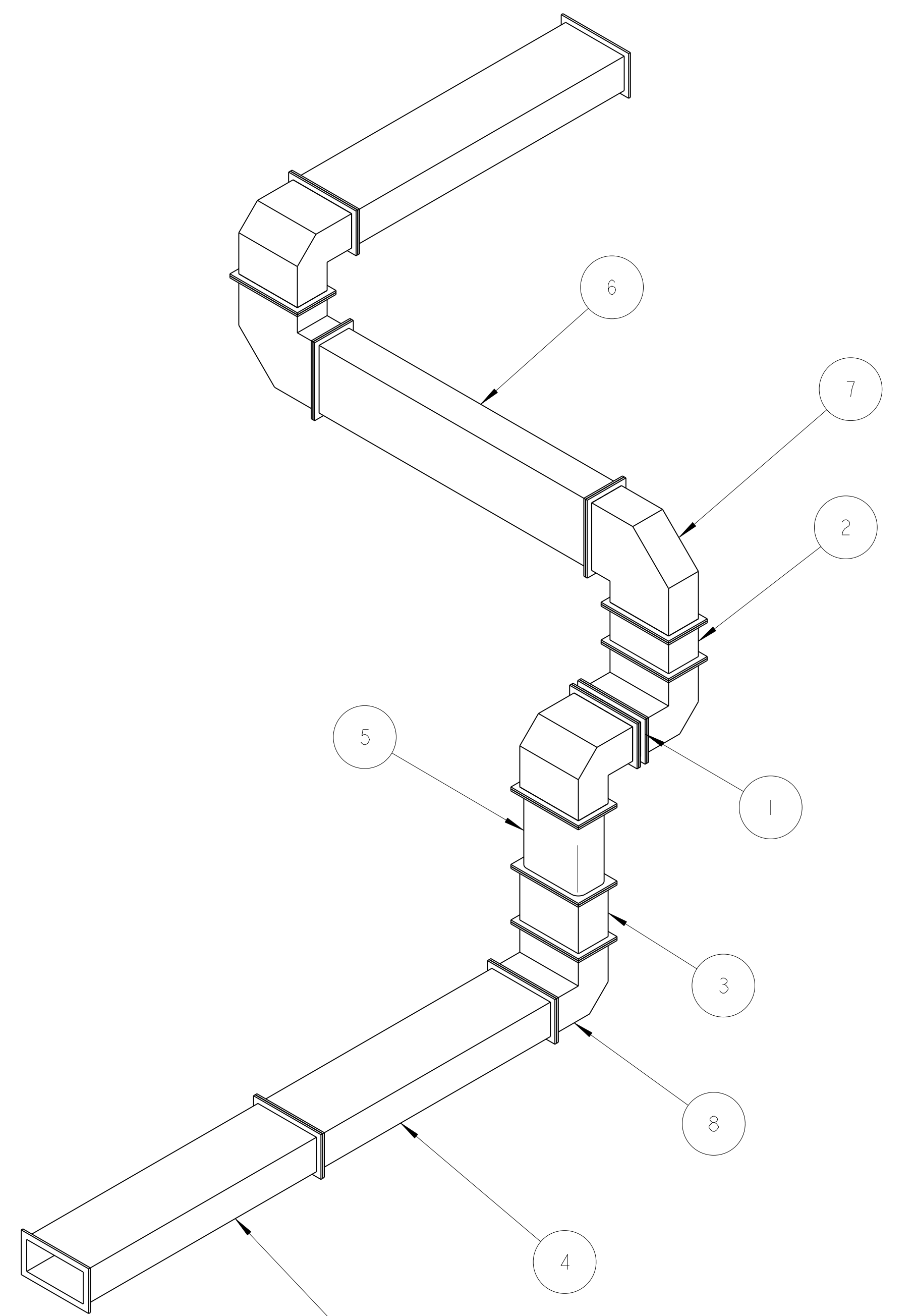
UNLESS OTHERWISE SPECIFIED	SHOP ORDERS
PROJECTION:	REF. NO. _____
TOLERANCES: X.X ± 0.1 FRACTION ± 1/64	DATE _____
X.XX ± 0.03 ANGLES ± 1.0°	ISSUED _____
X.XXX ± 0.010 FINISH 125	RECD _____

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BERKELEY NATIONAL LABORATORY**  
UNIVERSITY OF CALIFORNIA - BERKELEY

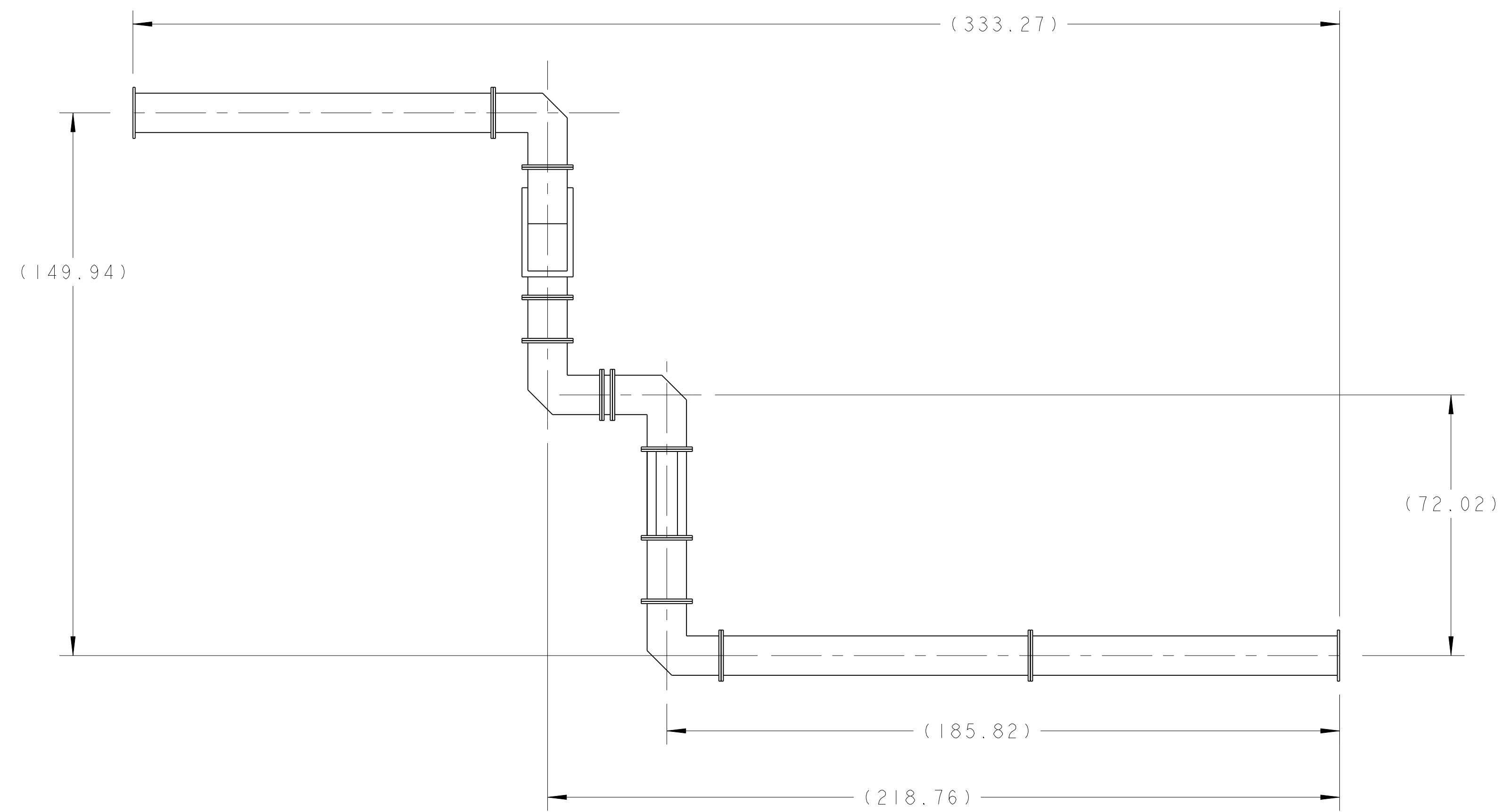
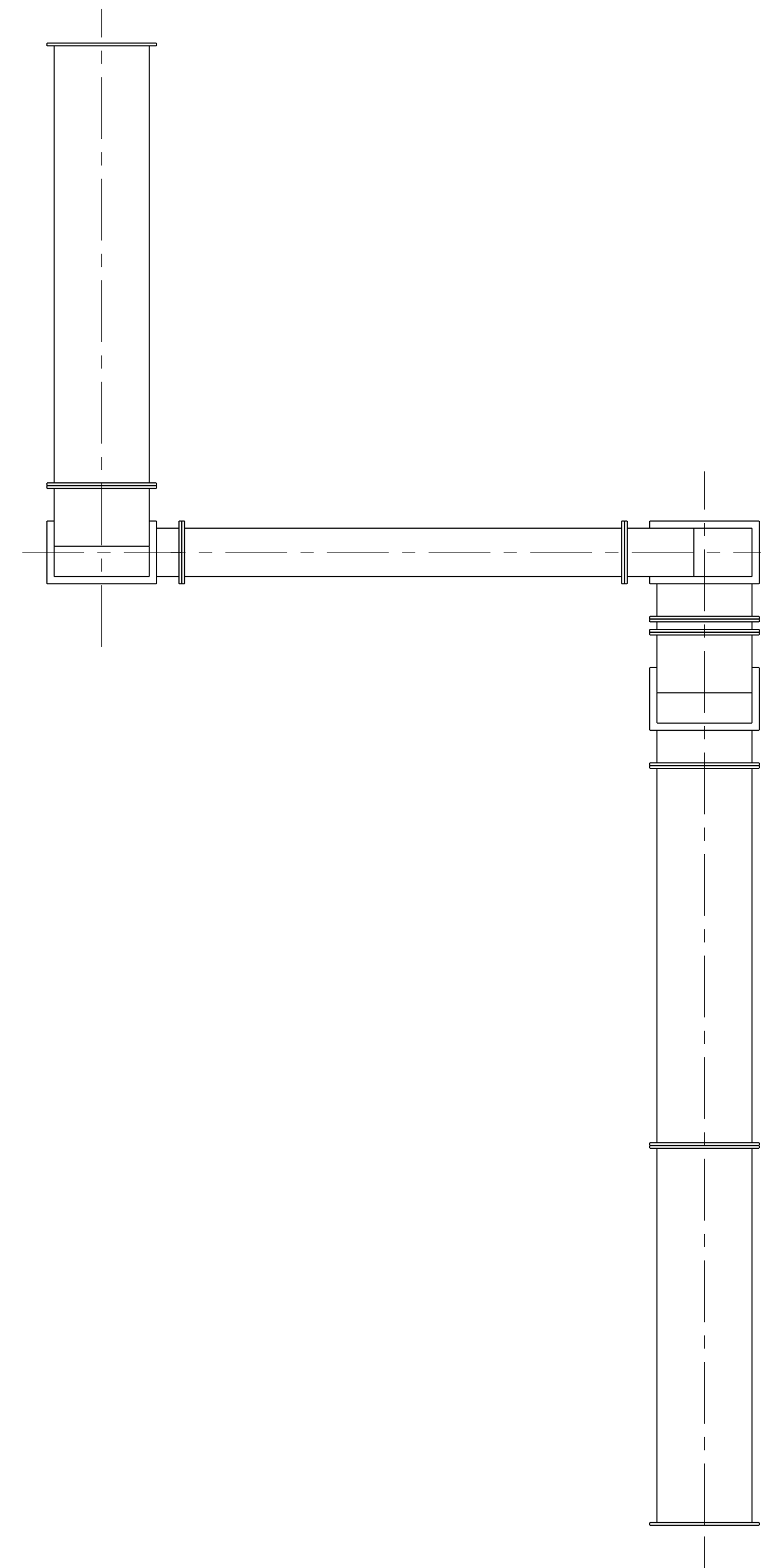
SNS - INTEGRATION  
FRONT END EQUIPMENT  
RFQ RF DRIVE ASSY

SCALE: 0.40  
SHEET 2 OF 7  
25B6076 A

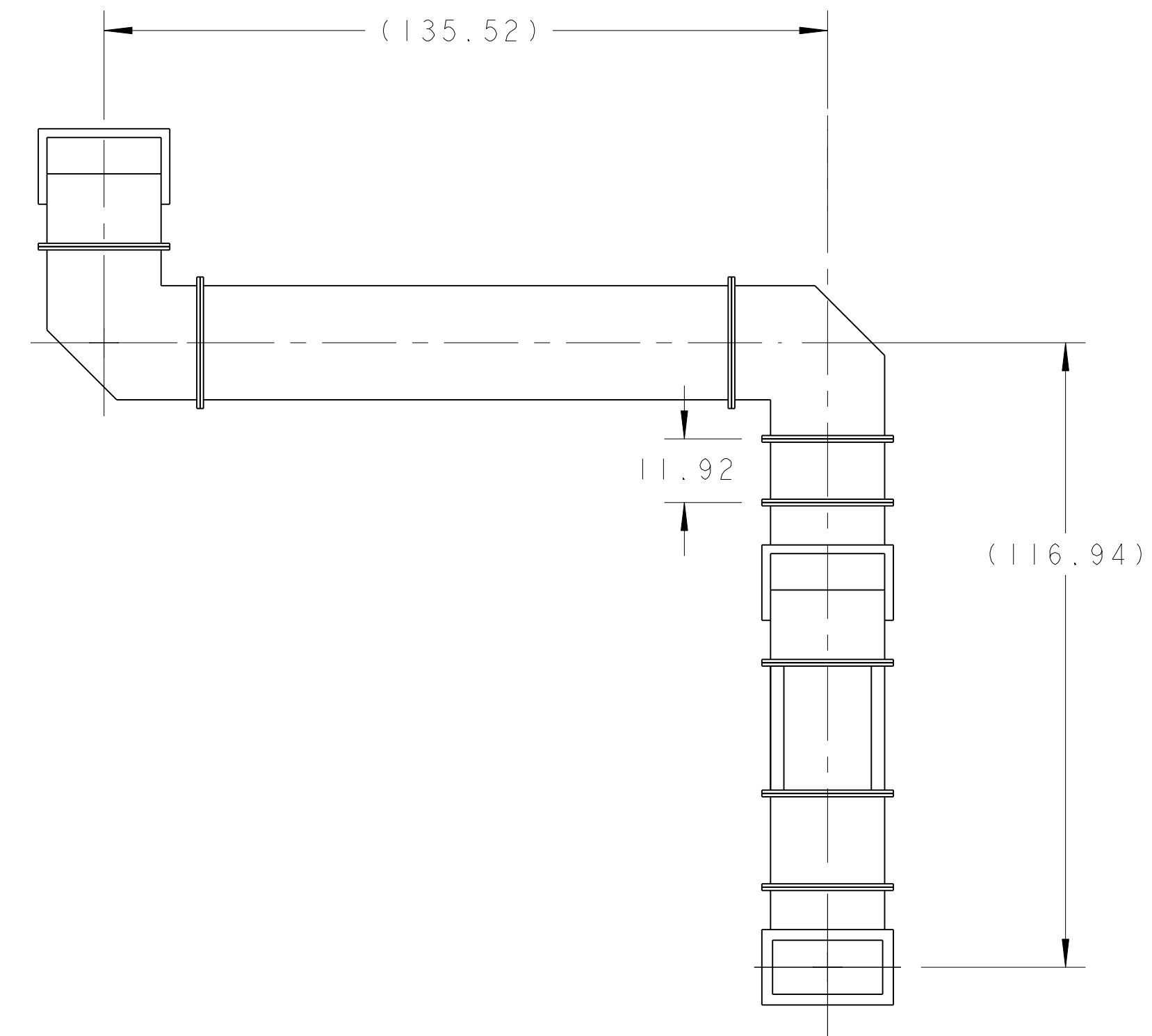
25B6076 A 2



WAVEGUIDE MAY BE MADE UP OF (2) PIECES FOR EASE OF HANDLING



REFERENCE SNS NO. 10401010201-E8D-8300-A007-R01



ALL DIMENSIONS & COMPONENT PARTS NUMBERS ARE FOR REFERENCE ONLY

ITEM	PART NO	RECD	DESCRIPTION	MATERIAL
8	4		WAVEGUIDE, 90 DEGREE E-MITER ASSY, MEGA IND. 06917-3106001	-
7	2		WAVEGUIDE, 90 DEGREE H-MITER ASSY, MEGA IND. 06917-3107001	-
6	2		WAVEGUIDE, WR2100 STYLE, 99.52" Lg. MEGA INDUSTRIES	-
5	1		WAVEGUIDE, FLEXIBLE, WR2100 STYLE, 24.48" Lg. MEGA INDUSTRIES	-
4	1		WAVEGUIDE, WR2100 STYLE, 170.82" Lg. MEGA INDUSTRIES	-
3	1		WAVEGUIDE, WR2100 STYLE, 17.54" Lg. MEGA INDUSTRIES	-
2	1		WAVEGUIDE, WR2100 STYLE, 11.92" Lg. MEGA INDUSTRIES	-
1	1		WAVEGUIDE, WR2100 STYLE, 2.94" Lg. MEGA INDUSTRIES	-

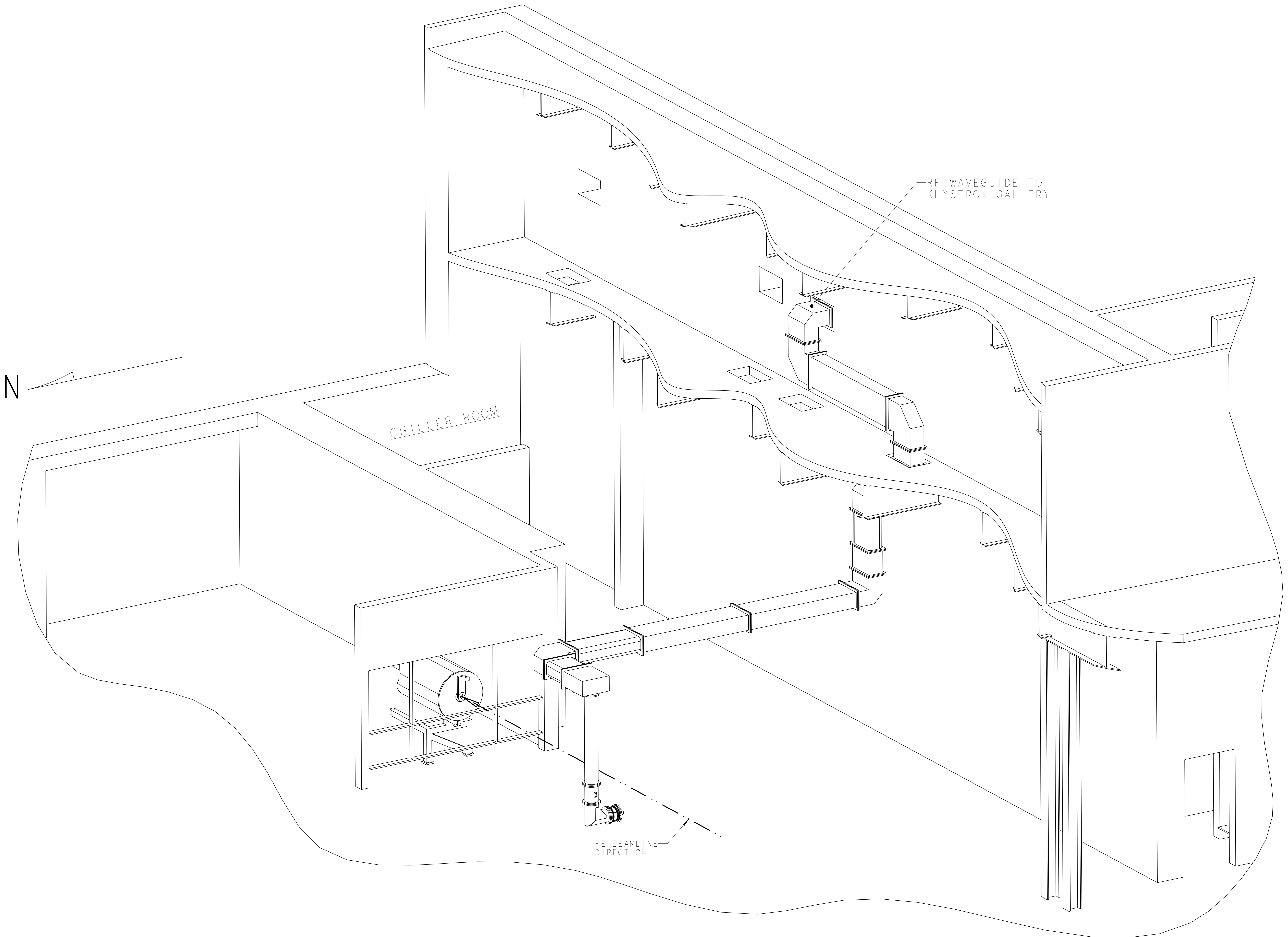
REV	DWG	CHK	ZONE	DATE	CHANGES

UNLESS OTHERWISE SPECIFIED			
PROJECTION:	ASME	DATE:	
TOLERANCES:	X.X ± 0.1	FRAC. ± 1/64	
	X.XX ± 0.03	ANGLES ± 1.0°	
	X.XXX ± 0.010	FINISH 125	
DO NOT SCALE PRINT			
HARDENING CLASS 7			
CHAMFER ENDS OF ALL SCREW THREADS 30°			
CUT ROUNDS .016 DIA. ON MACHINED WORK			
BREAK EDGES .016 DIA. ON MACHINED WORK			
REMOVE BURRS, WELD SPATTER & LOOSE SCALE			
IN ACCORDANCE WITH ASME Y14.3M-1994			

<b>ERNEST ORLANDO LAWRENCE</b> BERKELEY NATIONAL LABORATORY UNIVERSITY OF CALIFORNIA - BERKELEY		
SNS - INTEGRATION FRONT END EQUIPMENT RFO RF DRIVE ASSY		
MICROFILMED: ASSEM PATENT CLEAR:	DWS. TYPE: ASSEM DESIGN ACCT. NO.: FE3221	SHOWN ON: - SCALE: 0.40 SHEET 3 OF 7 25B6076 A

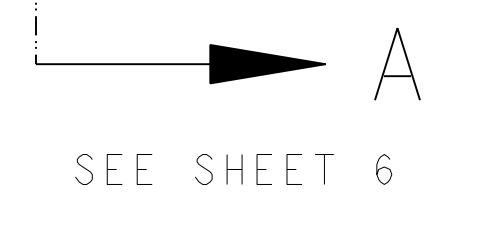
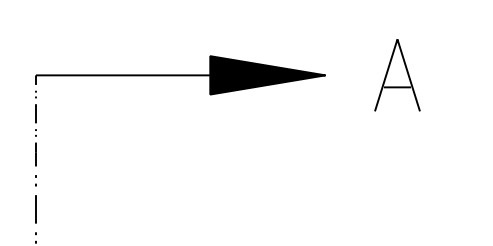
DRAWING NO. 25B6076 A 13

DATE: 26-Mar-02



PARTIAL ISOMETRIC VIEW

UNLESS OTHERWISE SPECIFIED PROJECTION:				SHOP ORDERS REF. NO. _____ DATE _____ QTY. _____ TO _____ SURFACE _____ TREATMENT _____ TOLERANCES: X.X ± 0.1 FRAC. ± 1/64 X.XX ± 0.03 Angles ± 1.0° X.XXX ± 0.010 FINISH 12/				ERNEST ORLANDO LAWRENCE BERKELEY NATIONAL LABORATORY UNIVERSITY OF CALIFORNIA - BERKELEY			
DO NOT SCALE PRINT THREADS ARE CLASS 2 CHAMFER ENDS OF ALL SCREW THREADS 30° CUT ROUNDS, 1.5 THREAD RELIEF ON MACHINED THREADS BREAK EDGES .016 MAX. ON MACHINED WORK REMOVE BURRS; WELD SPATTER & LOOSE SCALE IN ACCORDANCE WITH ASME Y14.3M-88 FIG. 1				SNS - INTEGRATION FRONT END EQUIPMENT RFO RF DRIVE ASSY							
PROJECT NUMBER: 258607 PROJECT NAME: N/A DATE: 01-Apr-02				MICROFILMED: _____ DWS. TYPE: ASSEM SHOWN ON: _____ SCALE: 0.40 SHEET 4 OF 7				PATENT CLEAR: _____ DESIGN ACCT. NO.: FE3221 CATEGORY CODE: _____ DWS. NO.: 2586076 SIZE: A			
REV   DWG   CHK   ZONE   DATE   CHANGES				SHEET NO. 2586076   A   4				SHEET 4 OF 7			



SEE SHEET 7

303.31 REF ONLY

233.85 REF ONLY

158.45  
CENTERLINE OF  
FE WAVEGUIDE  
"FIXED" REFERENCE

RF W/G  
FLEX SECTION  
WR2100 SIZE

LBNL

LANL

66 BEAMLINE CENTER

RF WAVEGUIDE FLANGE INTERFACE LOCATION  
FOR LANL AND LBNL RESPONSIBILITIES

CHILLER ROOM

PENETRATION OPENING  
MEZZANINE FLOOR  
REFERENCE ONLY

30.00

15.00

18.00

9.00

RF W/G  
WR2100 SIZE

135.52 REF ONLY

REV	DWG	CHK	ZONE	DATE	CHANGES

UNLESS OTHERWISE SPECIFIED  
PROJECTION:   
TOLERANCES: X.X ± 0.1    FRAC. ± 1/64  
                X.XX ± 0.03    Angles ± 1.0°  
                X.XXX ± 0.010    FINISH 125/  
DO NOT SCALE PRINT  
HARDING H6 CLASS 7  
CHAMFER END OF ALL SCREW THREADS 30°  
CUT ROUNDED 1.5 THREAD RELIEF ON MACHINED THREADS  
BREAK EDGES .016 MAX. ON MACHINED WORK  
REMOVE BURRS, WELD SPATTER & LOOSE SCALE  
IN ACCORDANCE WITH ASME Y14.3M-99 FIG. 1

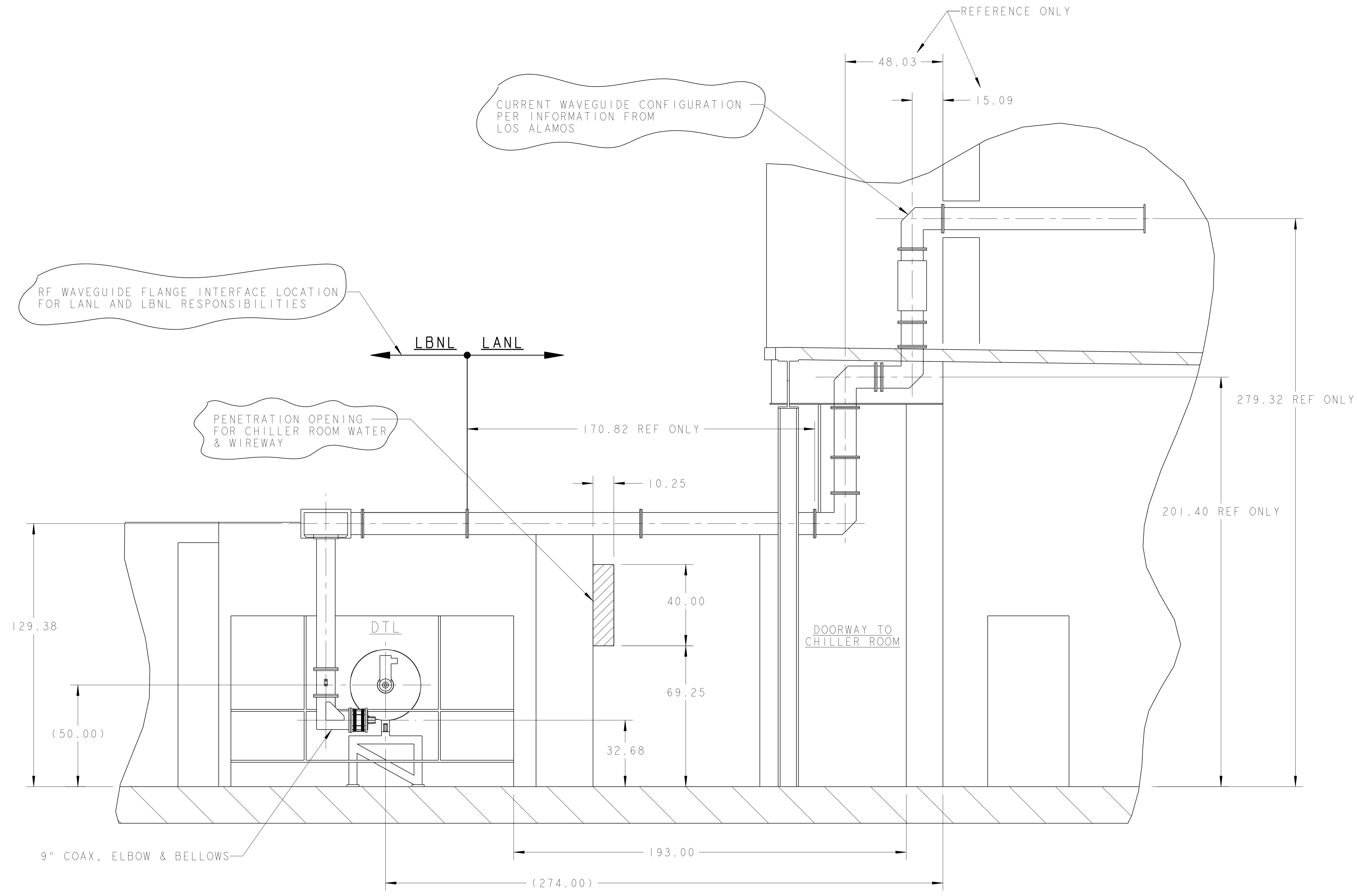
SHOP ORDERS	REQ. NO.	CHK. NO.

ERNEST ORLANDO LAWRENCE  
BERKELEY NATIONAL LABORATORY  
UNIVERSITY OF CALIFORNIA - BERKELEY

SNS - INTEGRATION  
FRONT END EQUIPMENT  
RF DRIVE ASSY

DWG. TYPE	ASSEM	SCALE	0.040
PROJECT	255607	DWG. NO.	25B6076 A
DATE	01-Apr-02	REV.	

SHEET 5 OF 7



SECTION A - A  
LOOKING EAST

PARTIAL ELEVATION VIEW

UNLESS OTHERWISE SPECIFIED		PROJECTION:		SHOP ORDERS		ERNEST ORLANDO LAWRENCE BERKELEY NATIONAL LABORATORY UNIVERSITY OF CALIFORNIA - BERKELEY	
TOLERANCES	X.X ± 0.1	FRAC. ± 1/64	ANGLES ± 1.0°	FINISH	125	DATE	01-Apr-02
DO NOT SCALE PRINT				PROJECT NUMBER		SNS - INTEGRATION FRONT END EQUIPMENT RFO RF DRIVE ASSY	
HARDING AND CLASS 7				PROJECT NAME		SHEET 6 OF 7	
CHAMFER ENDS OF ALL SCREW THREADS 30°				PROJECT NUMBER		SCALE: 0.40	
CUT ROUNDS, 1.5 THREAD RELIEF ON MACHINED THREADS				PROJECT NUMBER		SIZE: A	
BREAK EDGES .016 MAX. ON MACHINED WORK				PROJECT NUMBER		REV.:	
REMOVE BURRS, WELD SPATTER & LOOSE SCALE				PROJECT NUMBER		25B6076 A	
IN ACCORDANCE WITH ASME Y14.5M-98 FIG. 1				PROJECT NUMBER		REV.:	
REV	DWG	CHK	ZONE	DATE	CHANGES		



8 7 6 5 4 3 2 1

D

D

C

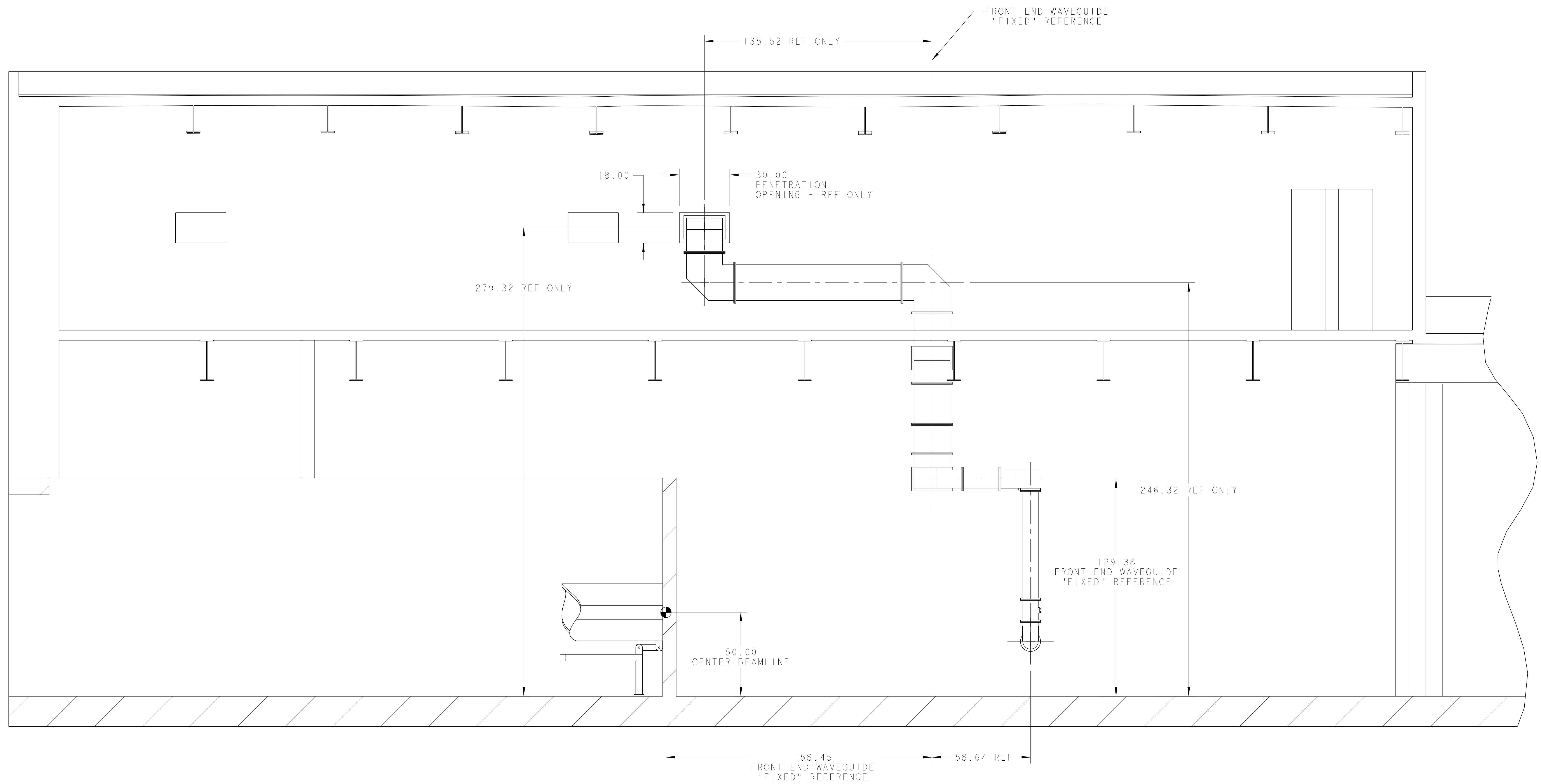
C

B

B

A

A



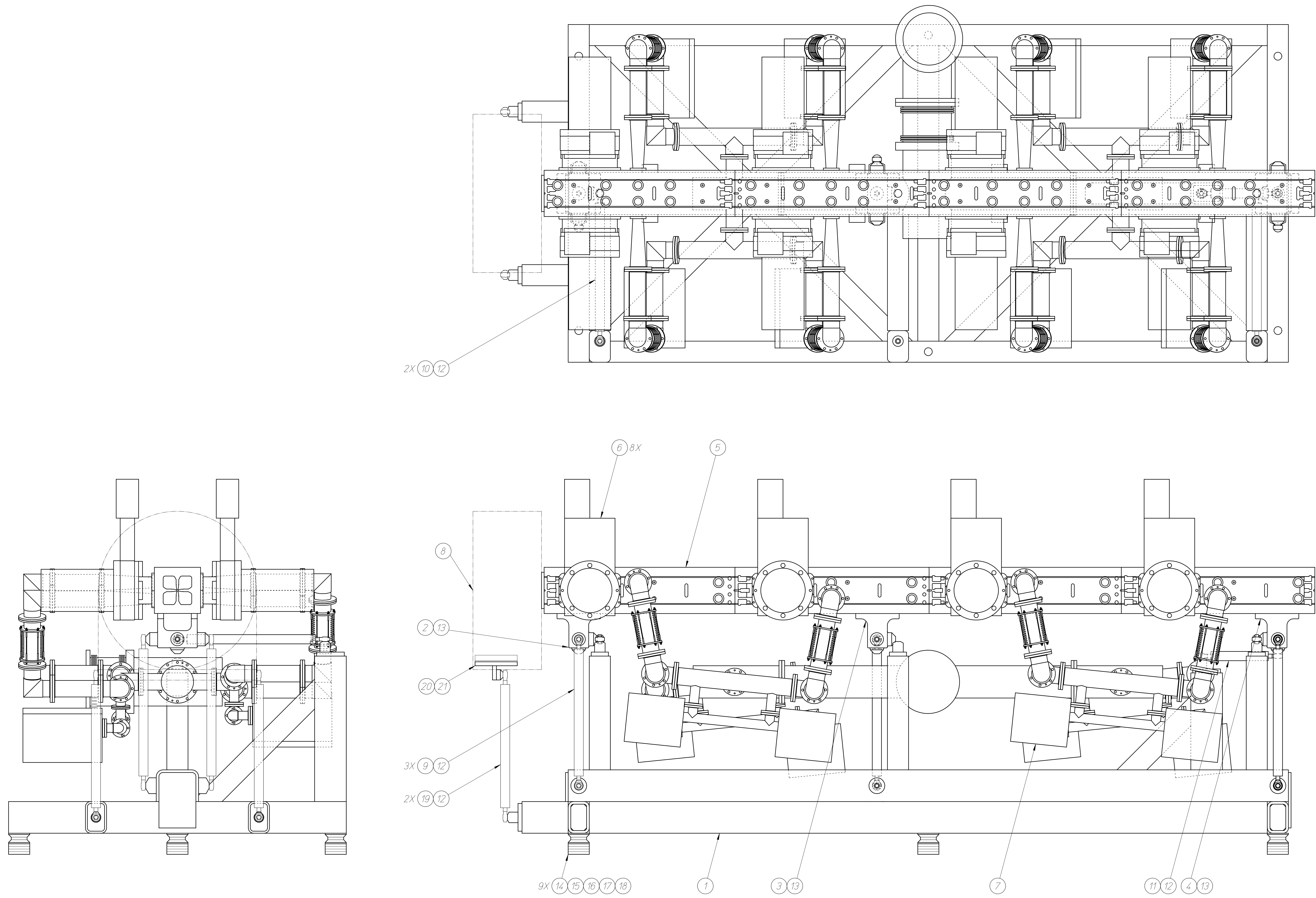
SECTION B-B  
LOOKING SOUTH

PARTIAL ELEVATION VIEW

UNLESS OTHERWISE SPECIFIED PROJECTION:		SHOP ORDERS NO. _____ DATE _____ BY _____ DATE _____		ERNEST ORLANDO LAWRENCE BERKELEY NATIONAL LABORATORY UNIVERSITY OF CALIFORNIA - BERKELEY	
TOLERANCES X.X ± 0.1    FRAC. ± 1/64 X.XX ± 0.03    Angles ± 1.0° X.XXX ± 0.010    FINISH 125		SURFACE: TEXTURE: TOLERANCE: PROJECT NUMBER: 258607		SNS - INTEGRATION FRONT END EQUIPMENT RFO RF DRIVE ASSY	
DO NOT SCALE PRINT THREADS ARE CLASS 2 CHAMFER ENDS OF ALL SCREW THREADS 30° CUT ROUNDS, 1.5 THREAD RELIEF ON MACHINED THREADS BREAK EDGES .016 MAX. ON MACHINED WORK REMOVE BURRS, WELD SPATTER & LOOSE SCALE IN ACCORDANCE WITH ASME Y14.3M-98 FIG. 1		MICROFILMED: DRG. TYPE: ASSEM SHOWN ON: _____ SCALE: 0.040 SHEET 7 OF 7		PATENT CLEAR: _____ DESIGN ACCT. NO.: FE3221 CATEGORY CODE: _____ DWG. NO.: 25B6076 SIZE: A REV: _____	
REV   DWG   CHK   ZONE   DATE   CHANGES					

8 7 6 5 4 3 2 1

25B6076 A 17



This drawing was previously 25B3656  
RFQ SUPPORT ASSEMBLY drawn by Alan  
Wandesforde on 3-05-01.

ITEM	REV	DESCRIPTION
21	A/R	25B8226 LEBT STRUT - BRACKET SHIM
20	Z	25B8216 LEBT STRUT BRACKET
19	Z	25B8206 LEBT STRUT ASSY
18	9	- NUT, STEEL, 3/4-10 UNC
17	9	- WASHER, 3/4
16	9	- STUD, 3/4-10 UNC X LENGTH AS REQUIRED
15	Z	- 1/4 SPACER SHIM
14	9	EN62754 GEAR TECHNIC DIAL SHIM
13	Z	- BOLT, STEEL, SOCKET HEAD, 1/4-20 UNC X 1.0 LONG
12	16	- BOLT, STEEL, SOCKET HEAD, 3/4-10 UNC X 2.0 LONG
11	1	25B3626-3 STRUT, Z, 1
10	Z	25B3626-2 STRUT, HORIZONTAL
9	3	25B3626-1 STRUT, VERTICAL
8	1	- SOURCE/LEBT ASSEMBLY
7	1	25B7436 RF DISTRIBUTION ASSY
6	1	- VACUUM PUMP AND VALVE ASSEMBLY
5	1	25B6206 RFQ SUB-ASSEMBLY
4	1	25B3614-3 RFQ STRUT MOUNT
3	1	25B3614-2 RFQ STRUT MOUNT
2	1	25B3614-1 RFQ STRUT MOUNT
1	1	25B3646 RFQ SUPPORT BASE

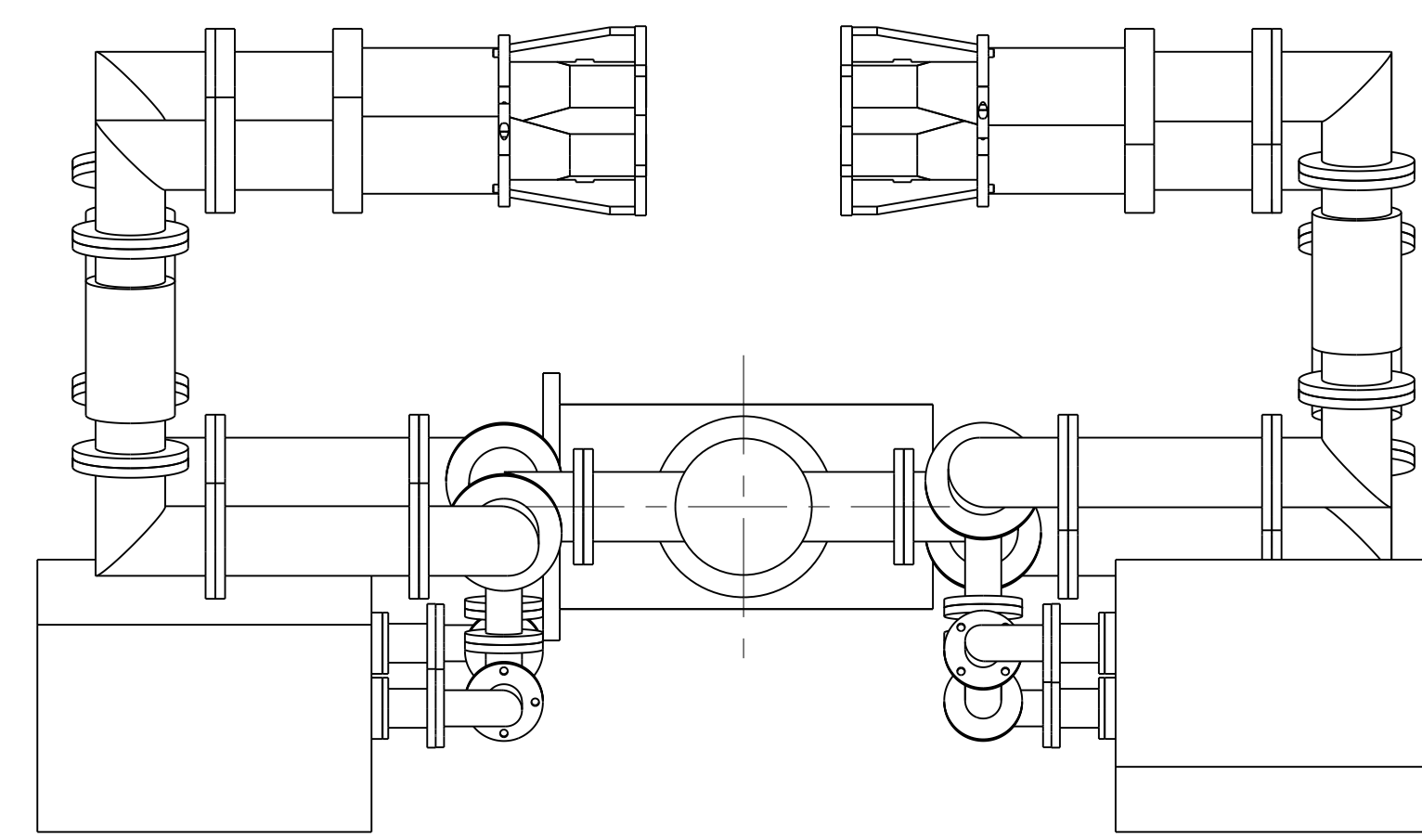
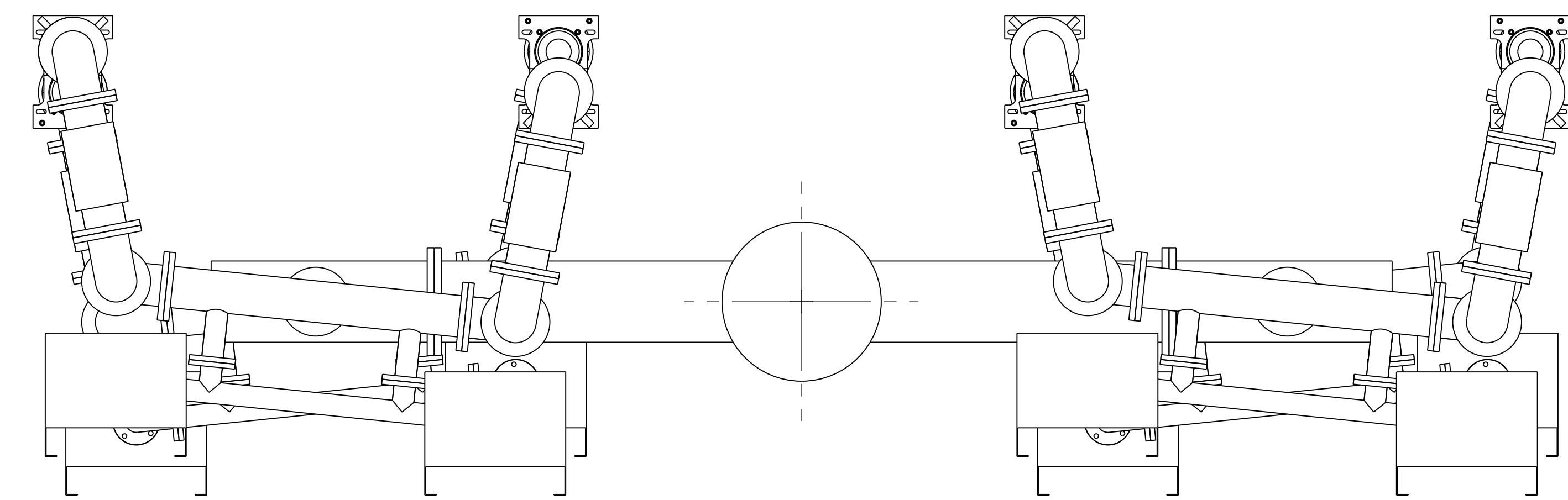
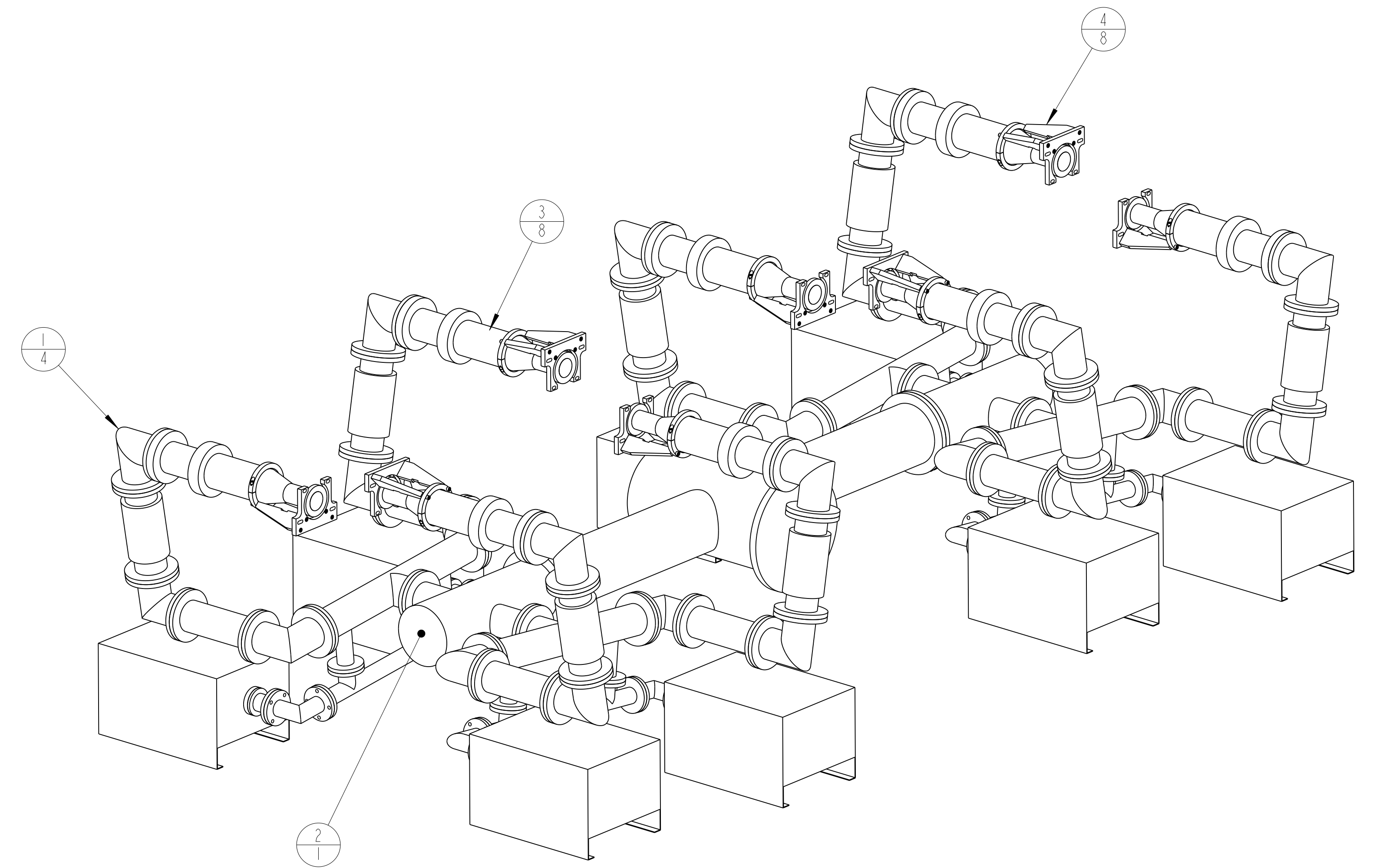
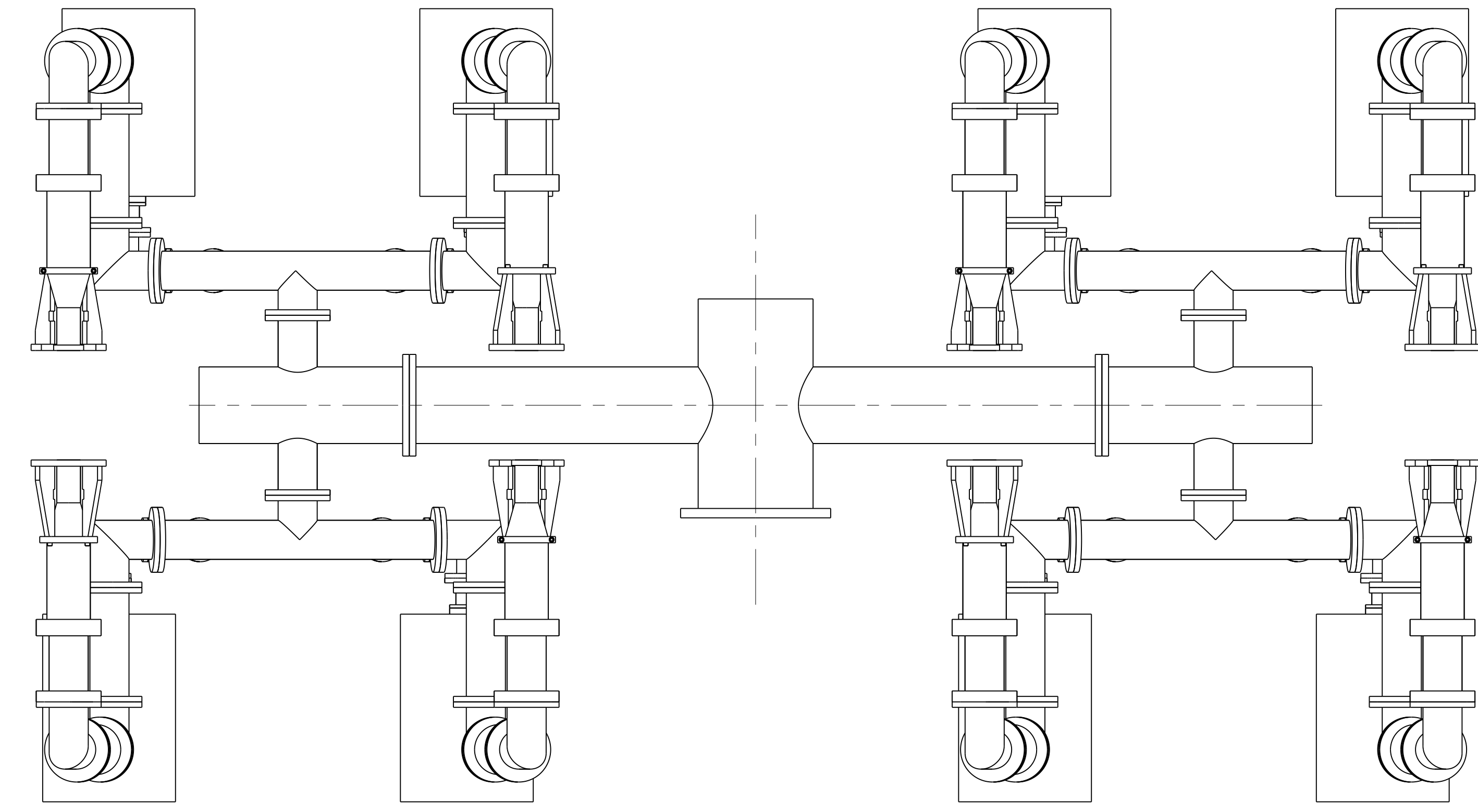
REV	DWN	CHK	ZONE	DATE	CHANGES
A	???	???	A-1	000000	ITEM 7 WAS RF WAVE GUIDE ASSEMBLY

UNLESS OTHERWISE SPECIFIED				SHOP ORDERS	
CD	X <sub>c</sub>	# D60	FRACT.	# 1/64	ACT
	XXX	# 020	ANGLE	# 25°	DATE
	XXX	# 005	FINISH	125 V <sub>Z</sub>	REV
					NO.
<small>           CHAMF. FLANGET. SHEARD OR STOCK FINISH            ALL SHREW THREADS ARE CLASS 3            CHAMFER ENDS OF ALL SHREW THREADS 30°            4 FITS RELIEF WITH ROUND VISE TOOL ON            ALL MACHINE CUT SHREW THREADS            REMOVE BURNS, LOOSE SCALE AND WELD SPATTER            PREFERENCES - ASSE 114.2 AND 84.4 AND 81.1            ALL DIMENSIONS ARE IN INCHES         </small>					

LAWRENCE BERKELEY NATIONAL LABORATORY			
UNIVERSITY OF CALIFORNIA - BERKELEY			
SNS-FES RFQ			
MECHANICAL SUBSYSTEMS			
RFQ ASSEMBLY			
PATENT CLEAR	DRAWING TYPE	SCALE	50 NOT SCALE
---	DETAIL	1:8	PRINTS
---	00X0000	FE-32-12	25B6046
---	8212DB	FE-32-12	A

25B6046A  
SHEET 1 OF 1

SHEET 1 OF 1



4	8	SUPPORT BRACKET, RFO POWER PORT	-	
3	8	POWER PORT, RFO RF	-	
2	1	MANIFOLD, RF DISTRIBUTION	-	
1	4	GTSEL ASSY, MYAT, RFO	-	
ITEM	PART NO	REQD	DESCRIPTION	MATERIAL

REV	DWG	CHK	ZONE	DATE	CHANGES

UNLESS OTHERWISE SPECIFIED  
 PROJECTION:   
 TOLERANCES: X.X ± 0.1    FRAC. ± 1/64  
 X.XX ± 0.03    Angles ± 1.0°  
 X.XXX ± 0.010    FINISH 125/  
 DO NOT SCALE PRINT  
 HARDING ARE CLASS 2  
 CHAMFER ENDS OF ALL SCREW THREADS 30°  
 CUT ROUNDS .015 THREAD RELIEF ON MACHINED THREADS  
 BREAK EDGES .016 MAX. ON MACHINED WORK  
 REMOVE BURRS, WELD SPATTER & LOOSE SCALE  
 IN ACCORDANCE WITH ASME Y14.3M-98 FIG. 1

**SHOP ORDERS**  
 REF. NO.    NO.    DATE    BY  
 100    1000    1/20/02    DSH  
 SURFACE    -  
 TREATMENT    -  
 TOLERANCE    TAG  
 PROJECT    25B743  
 NUMBER    -  
 NAME    N/A  
 DRG. BY    PAL    DATE    22-Jan-02  
 CHK. D. OSHATZ    DATE    -  
 APP. D. OSHATZ    DATE    -

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

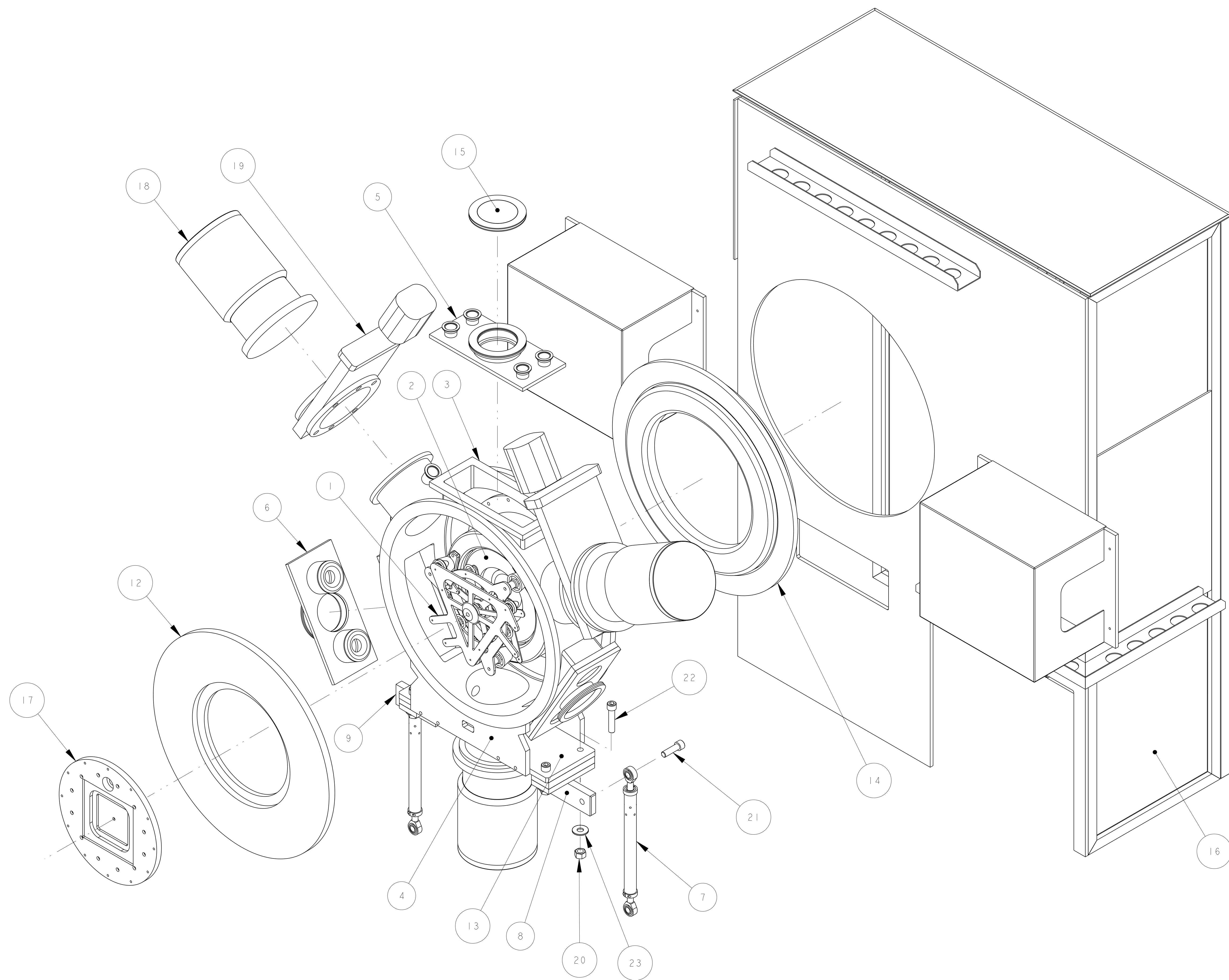
FRONT END EQUIPMENT  
 RFO RF DRIVE ASSY  
 RF DISTRIBUTION ASSY

MICROFILMED:    DRG. TYPE    SHOWN ON    SCALE: 1/8    SIZE: NOT SCALE PRINTED

ASSEM    -    SHEET 1 OF 1

PATENT CLEAR:    DESIGN ACCT. NO.    CATEGORY CODE    DWG. NO.    SIZE    REV.  
 -    -    FE3221    25B7436    A

DWG. NO. 25B7436 A 1



SCALE ~3/16

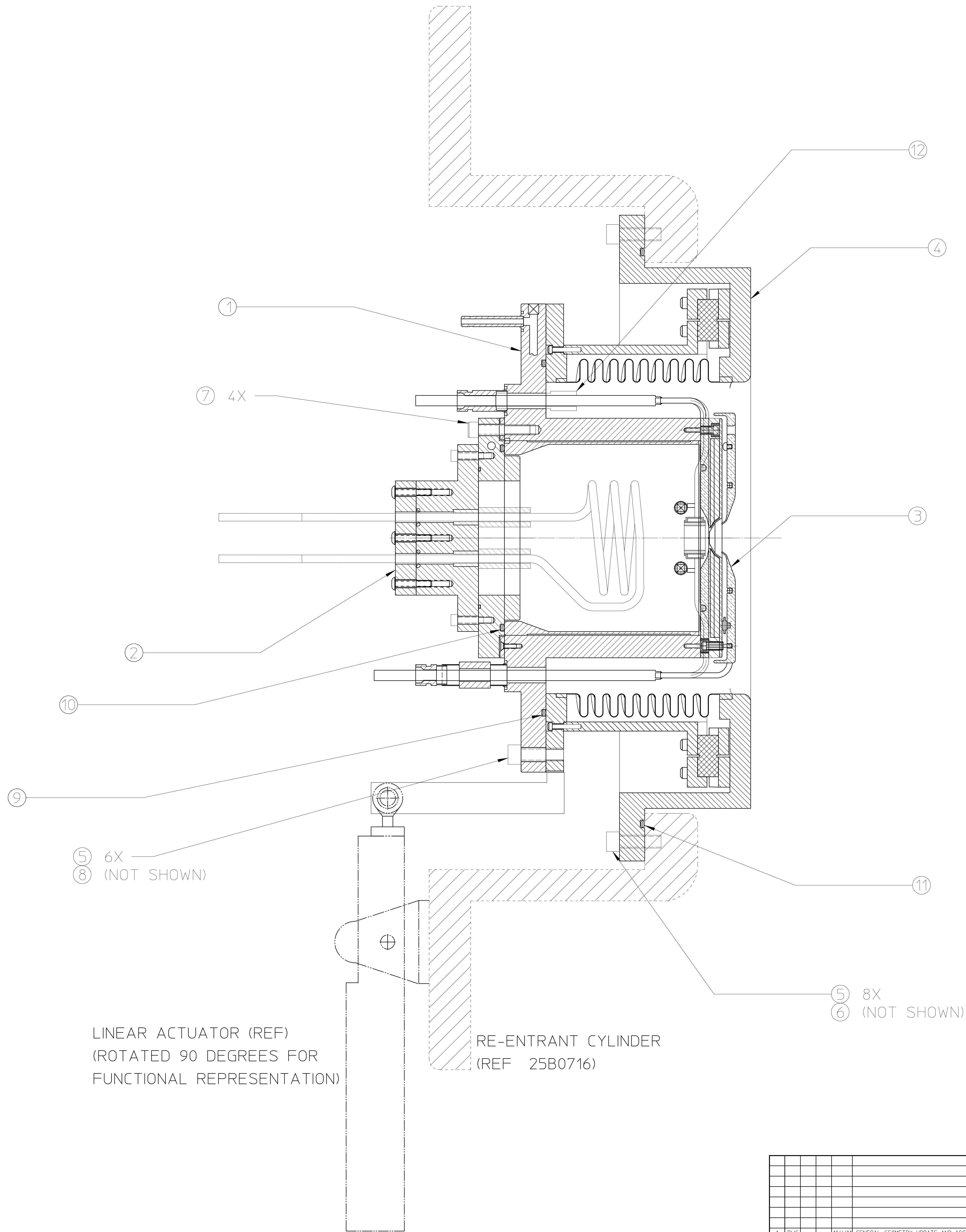
ITEM	PART NO	REQD	DESCRIPTION	MATERIAL
23	4		WASHER, 3/4 FLAT, USS	-
22	4		SCREW, MACH, SOCKET HD 3/4 X 3 1/2 1g.	-
21	2		SCREW, MACH, SOCKET HD 3/4 X 2 1/2 1g.	-
20	4		NUT, HEX 3/4	-
19	2		VALVE, GATE MDC 8000, LGV-8000V-P-01-03	-
18	3		PUMP, TURBO, PHEIFFER TMH PM P02 672 A	-
17	25B818	1	LEBT DIAGNOSTIC ASSEMBLY	-
16	25b750	1	BOX, BARRIER, LEBT	-
15	21G811	1	FLANGE, VIEWPORT	-
14	21G896	1	INSULATOR, 65kV, LEBT CHAMBER	-
13	25B088	2	STAND FOOT, VACUUM CHAMBER	-
12	25B072	1	PLATE, BULKHEAD, LEBT CHAMBER	-
9	25B021	1	BRACKET, LEBT STRUT, RH	-
8	25B021	1	BRACKET, LEBT STRUT, LH	-
7	25B020	2	STRUT ASSEMBLY, LEBT	-
6	21G810	2	FLANGE, LEBT VIEWPORT / FEEDTHRU	-
5	21G751	1	FLANGE, LEBT VIEWPORT / VAC GOUGE	-
4	25B087	2	STAND FACE, VACUUM CHAMBER	-
3	25B078	1	VACUUM CHAMBER, LEBT TEST STAND	-
2	21C840	1	ION SOURCE ASSY	-
1	21G735	1	LEBT ASSY	-

UNLESS OTHERWISE SPECIFIED PROJECTION:		SHOP ORDERS REF NO. _____ DATE _____ DESIGNED BY _____ CHECKED BY _____		<b>ERNEST ORLANDO LAWRENCE</b> <b>BERKELEY NATIONAL LABORATORY</b> UNIVERSITY OF CALIFORNIA - BERKELEY	
TOLERANCES X.X ± 0.1 X.XX ± 0.03 X.XXX ± 0.010 FINISH 125/	FRAC. ± 1/64 Angles ± 1.0°	SURFACE TEXTURE TAG PROJECT NUMBER 25B7486	MICROFILMED: _____ ASSEM 25BXXXX CATEGORY CODE FE3000	SHEET 1 OF 1 SCALE: ~0/1 SIZE: A	REV. _____ DATE _____ CHANGES

25B7486 A 1

A

REV. \_\_\_\_\_ DATE \_\_\_\_\_

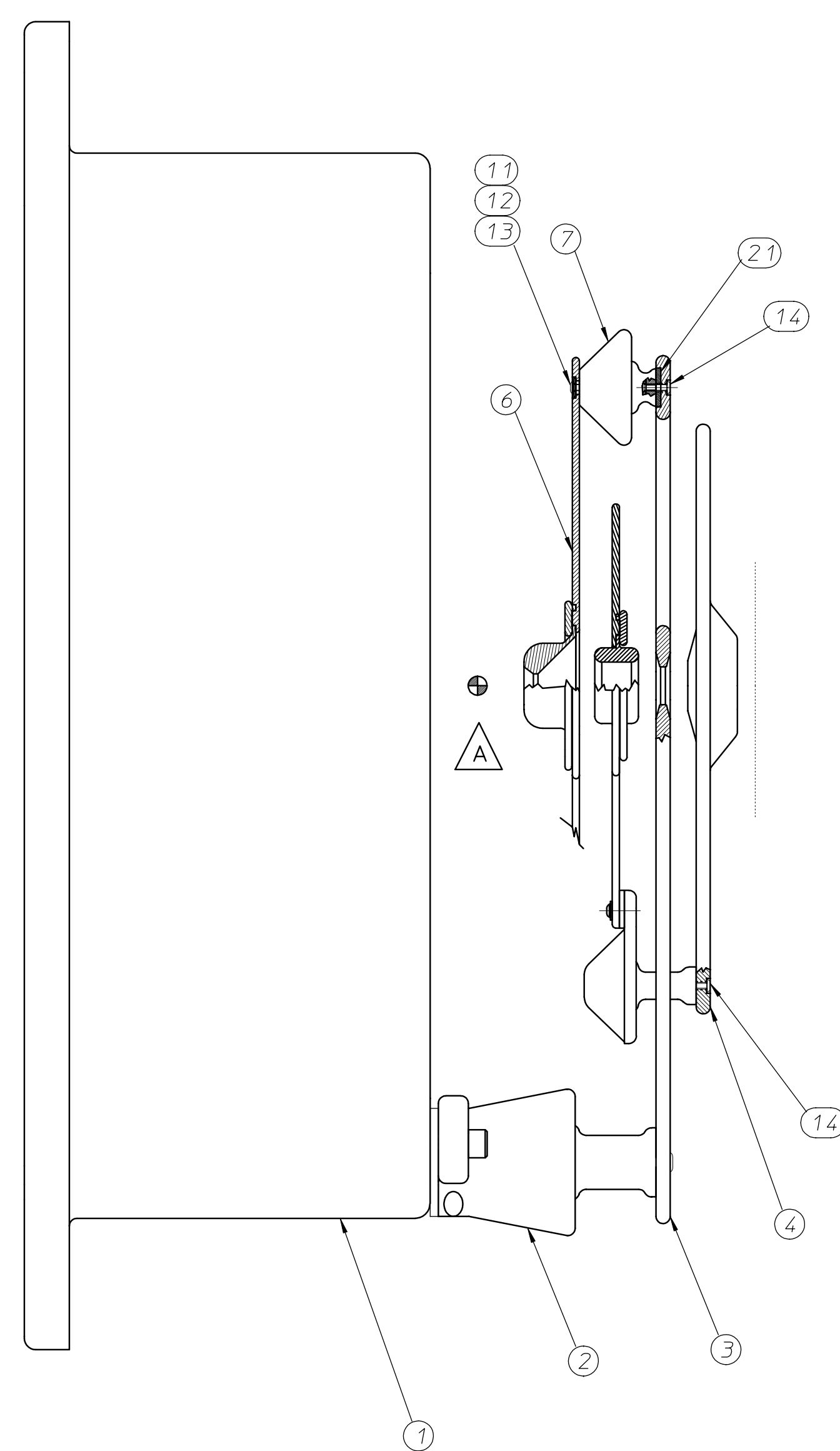


LINEAR ACTUATOR (REF)  
(ROTATED 90 DEGREES FOR  
FUNCTIONAL REPRESENTATION)

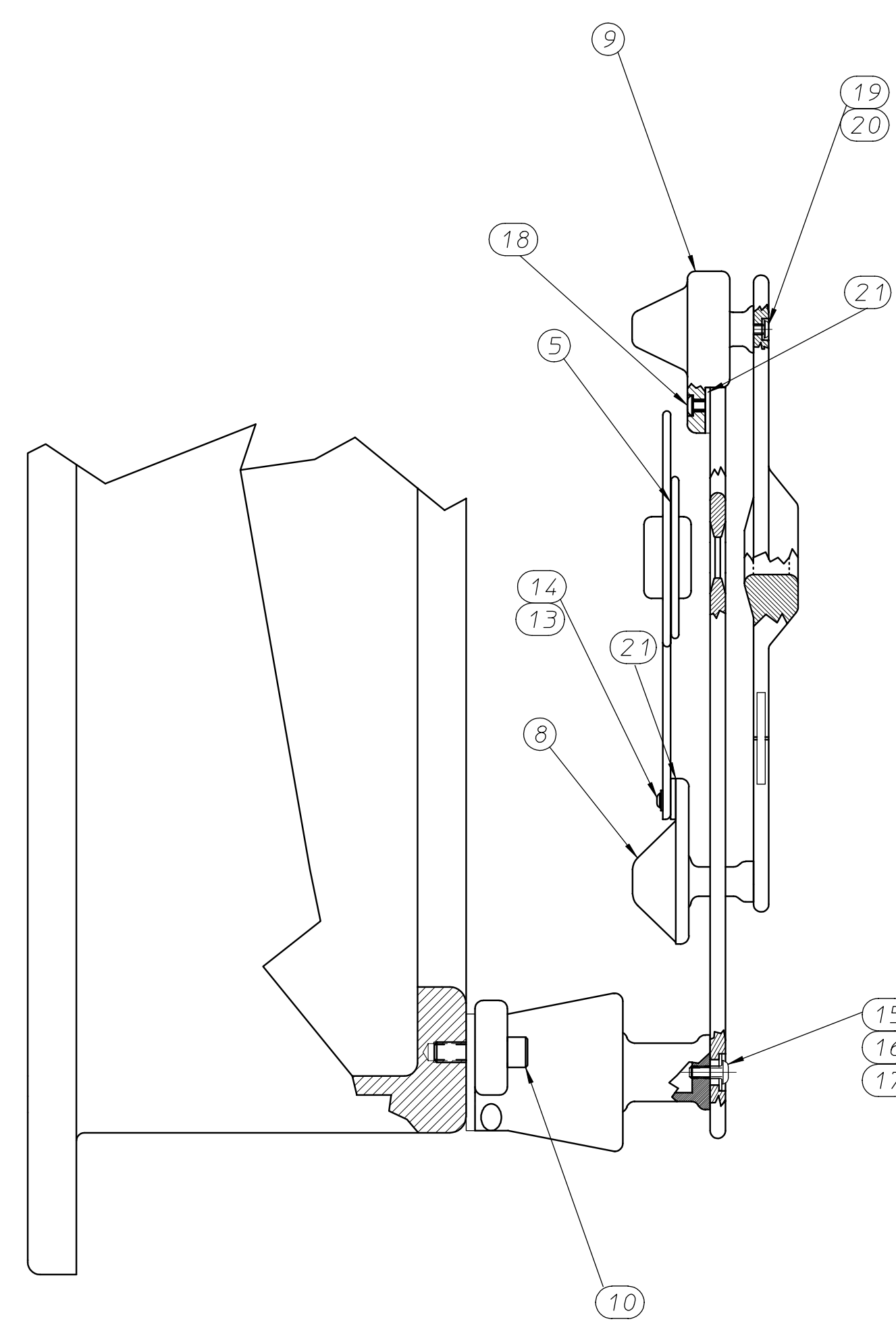
RE-ENTRANT CYLINDER  
(REF 25B0716)

REV	ITEM	PART NO.	DESCRIPTION
10	12	21C9912-1	CERAMIC INSULATOR FOR VACUUM FEEDTHRU
1	11	#2-280	O-RING, VITON, PARKER, INC., SPLICED TO 13.58" ID
1	10	#2-243	O-RING, VITON, PARKER, INC.
1	9	#2-267	O-RING, VITON, PARKER, INC.
2	8	-	DOWEL PIN, .375" DIA, 1.0" LONG
4	7	-	SHCS, 1/4-20, 1.0" LONG
2	6	-	DOWEL PIN, .250" DIA X 1.0" LONG
14	5	-	SHCS, 5/16-18 X 1.0" LONG
1	4	21G7584	TILT MECHANISM ASSEMBLY
1	3	21C8934	OUTLET ELECTRODE ASSEMBLY
1	2	21G7543	BACKFLANGE SUBASSEMBLY
1	1	21G8074	PLASMA CHAMBER MAGNET ASSEMBLY

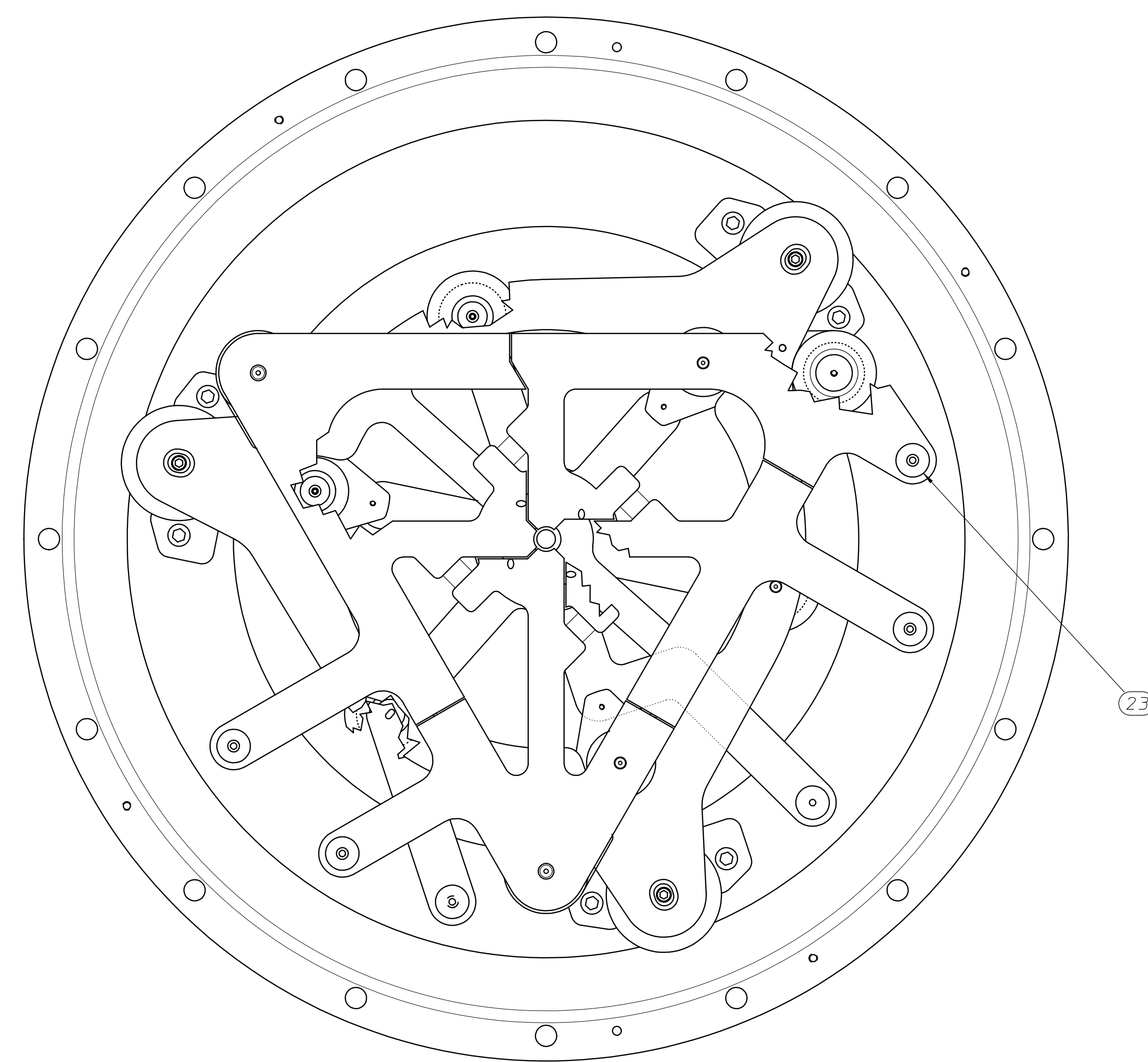
UNLESS OTHERWISE SPECIFIED				SHOP ORDERS				LAWRENCE BERKELEY LABORATORY			
CD	x ± .1	FRAC.	± 1/64	ACCT. NO.	SERIAL NO.	UNIVERSITY OF CALIFORNIA-BERKELEY		SNS - FRONT END SYSTEM		ION SOURCE PROTOTYPE DESIGN	
CS	xx ± .01	ANGLES	± 1°	DATE	DATE	PATENT CLEAR		DWG. TYPE		SCALE FULL	
CF	xxx ± .001	FINISH	125.7	DELIVER TO	NO. REQD.	ASSEMBLY		DWG. NO.		SIZE	
THREADS ARE CLASS 2				SURFACE TREATMENT				MICROFILMED			
CHUMPER ENDS OF ALL SCREW THREADS 30°				REWORK				DATE			
OUT 1.5 PITCH THRO RELIEF WITH ROUNO NOSE TOOL				DATE				FE1100			
ON MACHINE CUT THREADS				DATE				21C8406			
BREAK EDGES .016 MAX. ON MACHINED WORK				DATE				A			
REMOVE BURRS, WELD SPLATTER & LOOSE SCALE				DATE							
REFERENCES: ANSI Y14.2 & B46.1				DATE							
A	DWC	10/4/01	GENERAL GEOMETRY UPDATE AND ASSEMBLY CALLOUTS	DWG. BY	S. MUKHERJEE	DATE	01-04-99	FE1100	8210-14	FE1100	21C8406
REV	DWG	CHK	ZONE	DATE	CHK	M. LEITNER	DATE	3-14-99			



VIEW IS NOT TRUE PROJECTION



VIEW IS NOT TRUE PROJECTION



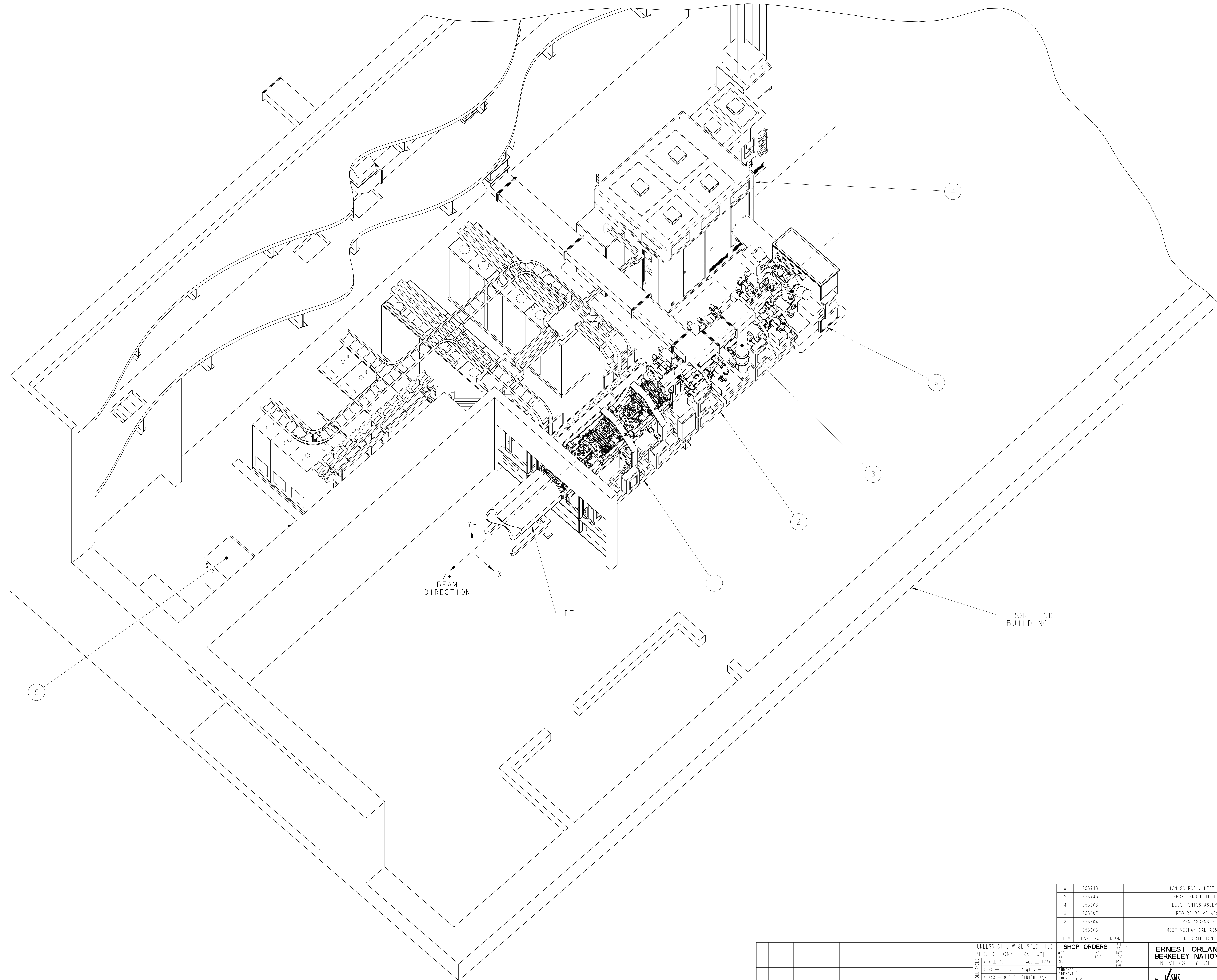
REV	NO	DATE	DESCRIPTION
6	23	21G7313	ELECTRODE HIGH-VOLTAGE CONNECT
A/R	22	-	SHIM, STAINLESS STEEL, NOM .138 THK
A/R	21	-	SHIM, STAINLESS STEEL, NOM .08 THK
21G7356A			
3	20	-	WASHER, STAINLESS STEEL, #6
3	19	-	BUTTON HEAD CAP SCREW, STAINLESS STEEL, #6-32, .5" LG., VENTED
3	18	-	BUTTON HEAD CAP SCREW, STAINLESS STEEL, #8-32, .5" LG.
3	17	21G7301	MAIN SUPPORT CERAMIC HOLDOFF WASHER
3	16	-	WASHER, STAINLESS STEEL, #10
3	15	-	SHCS, #10-24, .5" LG., VENTED
9	14	-	BUTTON HEAD CAP SCREW, #4-40, .375" LG, VENTED
6	13	-	WASHER, SIZE #4, STAINLESS STEEL
2	12	9714 K21	WAVE DISC SPRING, TYPE 302 SS, 134" ID, 183" OD, MCMASTER-CARR
3	11	94035 AS11	18-8 SS SOCKET SHOULDER SCREW, 125", 125" LG, #4-40, MCMASTER-CARR
6	10	-	SHCS, STAINLESS STEEL, 5/16-18, 1.125" LONG, VENTED
3	9	21G7252	GROUND-CHOPPER INSULATOR ASSEMBLY
3	8	21G7272	G3 INSULATOR ASSEMBLY
3	7	21G7282	EXTRACTOR INSULATOR ASSEMBLY
1	6	21G7004	EXTRACTOR ELECTRODE ASSEMBLY
1	5	21G7044	G3 ELECTRODE ASSEMBLY
1	4	21G7114	CHOPPER ELECTRODE ASSEMBLY
1	3	21G7086	GROUND ELECTRODE
3	2	21G7262	MAIN GROUND INSULATOR ASSEMBLY
1	1	21G7296	REENTRANT CYLINDER FINISH MACHINING

UNLESS OTHERWISE SPECIFIED		SHOP ORDERS		LAWRENCE BERKELEY LABORATORY	
FIN	XX ± .01	DATE	DATE	UNIVERSITY OF CALIFORNIA-BERKELEY	
FIN	XX ± .001	DATE	DATE	SNS-FES ION SOURCE AND LEPT	
FIN	XX ± .001	DATE	DATE	MECHANICAL SYSTEMS	
FIN	XX ± .001	DATE	DATE	LEPT ASSEMBLY	
FIN	XX ± .001	DATE	DATE	IDENT	SCALE
FIN	XX ± .001	DATE	DATE	DATE	1:2
FIN	XX ± .001	DATE	DATE	DATE	NO NOT SCALE
FIN	XX ± .001	DATE	DATE	DATE	REV
FIN	XX ± .001	DATE	DATE	DATE	A

REV	DWG	CHK	ZONE	DATE	DESCRIPTION
A	DWC	B6	12/16/00		ADDED THEORETICAL CENTERPOINT OF ION SOURCE
REV	DWG	CHK	ZONE	DATE	CHANGES

REV	DWG	CHK	ZONE	DATE	DESCRIPTION
A	DWC	B6	12/16/00		ADDED THEORETICAL CENTERPOINT OF ION SOURCE
REV	DWG	CHK	ZONE	DATE	CHANGES

REV	DWG	CHK	ZONE	DATE	DESCRIPTION
A	DWC	B6	12/16/00		ADDED THEORETICAL CENTERPOINT OF ION SOURCE
REV	DWG	CHK	ZONE	DATE	CHANGES



Z+  
BEAM  
DIRECTION

Y+

X+

DTL

FRONT END  
BUILDING

ITEM	PART NO	REQD	DESCRIPTION	MATERIAL
6	25B748	I	ION SOURCE / LEBT ASSY	-
5	25B745	I	FRONT END UTILITIES	-
4	25B608	I	ELECTRONICS ASSEMBLY	-
3	25B607	I	RFQ RF DRIVE ASSY	-
2	25B604	I	RFQ ASSEMBLY	-
1	25B603	I	MBET MECHANICAL ASSEMBLY	-

REV	DWG	CHK	ZONE	DATE	CHANGES
B	PALDPO	D6		6-21-02	ADDED 216.695 DIM, SHEET 4
A	PALDPO				INITIAL RELEASE

UNLESS OTHERWISE SPECIFIED  
 PROJECTION:   
 TOLERANCES: X.X ± 0.1 FRAC. ± 1/64  
 Y.XX ± 0.03 Angles ± 1.0°  
 X.XXX ± 0.010 FINISH 12/2  
 DO NOT SCALE PRINT  
 HORN AND CLASS 2  
 CHAMFER ENDS OF ALL SCREW THREADS 30°  
 CUT ROUNDS, 1.5 THREAD RELIEF ON MACHINED THREADS  
 BREAK EDGES .016 MAX. ON MACHINED WORK  
 REMOVE BURRS, WELD SPATTER & LOOSE SCALE  
 IN ACCORDANCE WITH ASME Y14.3M-88 11.1

REF. NO.	NO.	DATE	CHK. BY	DATE
1	1000			
2	1000			

ERNEST ORLANDO LAWRENCE  
 BERKELEY NATIONAL LABORATORY  
 UNIVERSITY OF CALIFORNIA - BERKELEY

SNS - INTEGRATION  
 FRONT END EQUIPMENT

ASSEM  
 FE3000

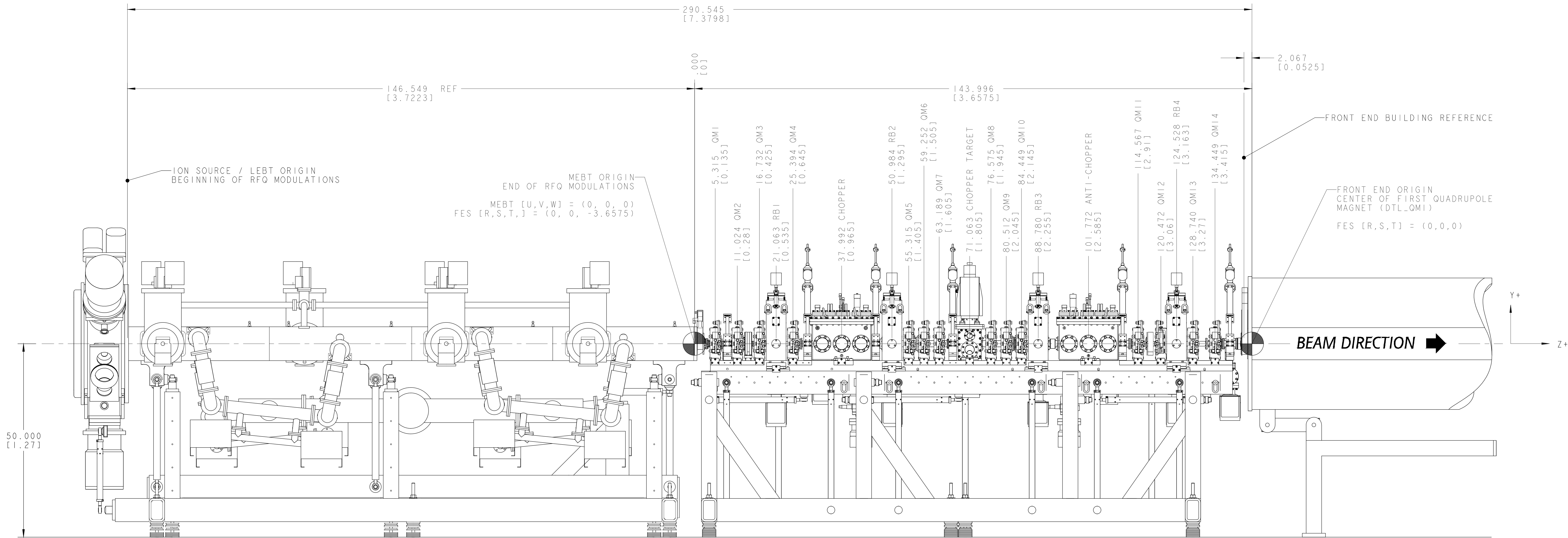
SCALE: 1/30  
 SHEET 1 OF 5  
 25B6016 B

25B6016 B 1

# PHYSICS LATTICE

NOMINAL DIMENSIONS FOR PHYSICS REFERENCE ONLY  
DIMENSIONS ARE IN INCHES / [METERS]

SCALE 1/10



ION SOURCE / LEBT

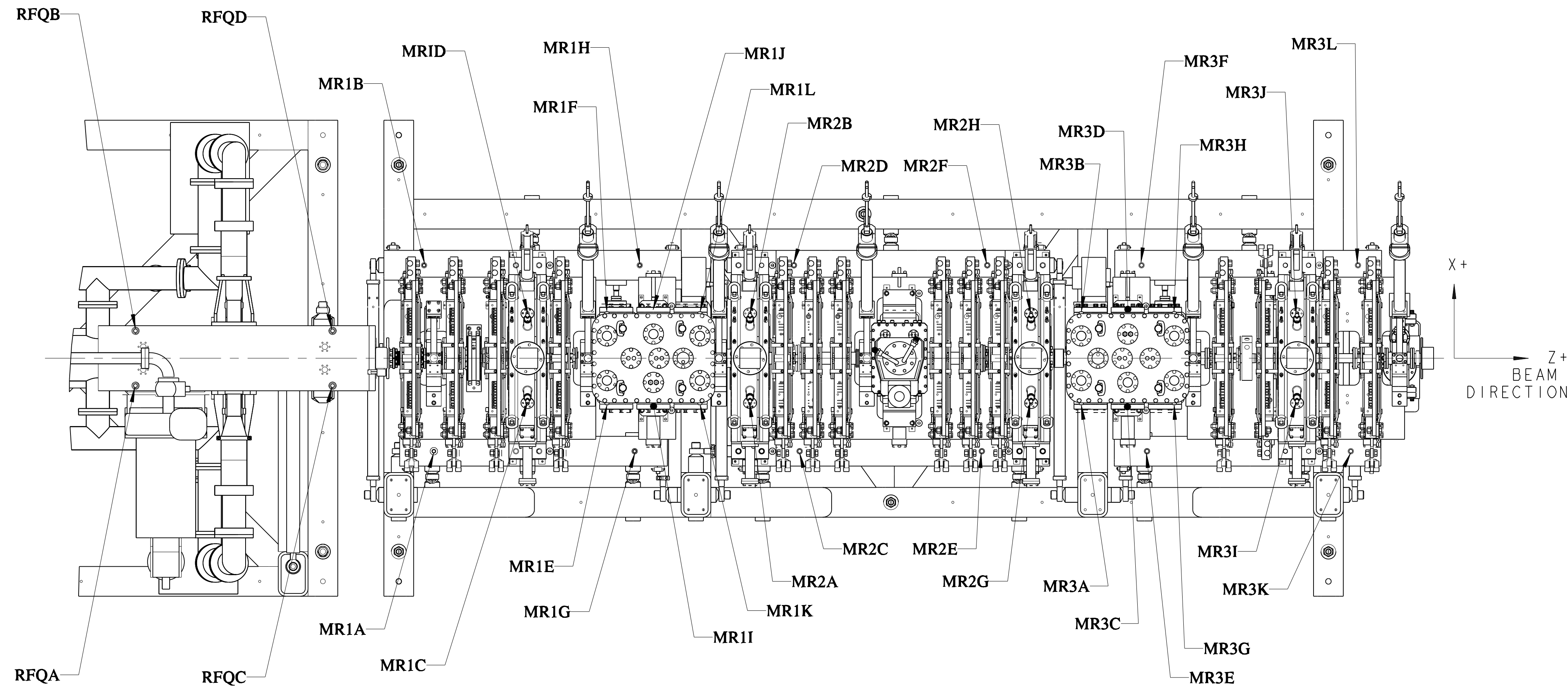
RFQ

MEBT

DTL

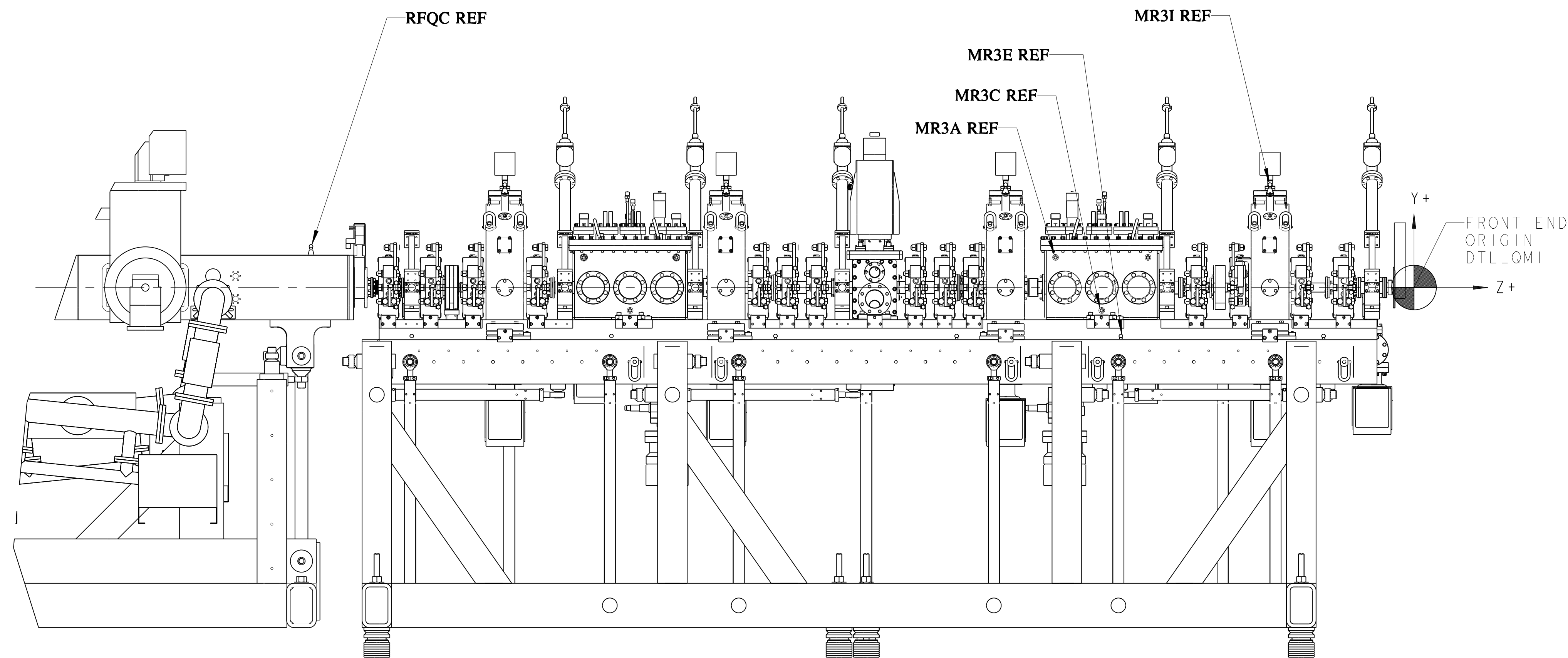
UNLESS OTHERWISE SPECIFIED		SHOP ORDERS		ERNEST ORLANDO LAWRENCE BERKELEY NATIONAL LABORATORY UNIVERSITY OF CALIFORNIA - BERKELEY	
PROJECTION:	FRAC. ± 1/64	ASSET NO.	DATE	SCALE:	1/60
X.X ± 0.1	Angles ± 1.0°	REV.	DATE	DO NOT SCALE PRINT	DO NOT SCALE PRINT
X.XX ± 0.03	FINISH 125	PROJECT NAME	DATE	ASSEM	ASSEM
X.XXX ± 0.010		PROJECT NUMBER	DATE	FE3000	FE3000
TOLERANCES		METHOD		SNS - INTEGRATION	
DO NOT SCALE PRINT		TAG		FRONT END EQUIPMENT	
BREAKS ARE CLASS 2		PROJECT NUMBER		SHEET 2 OF 5	
REMOVE ENDS OF ALL SCREEN THREADS 30°		PROJECT NAME		25B6016 B	
CUT ROUNDS, 1.5 THREAD RELIEF ON MACHINED THREADS		PROJECT NUMBER		REV.	
BREAK EDGES .016 MAX. ON MACHINED WORK		PROJECT NUMBER		REV.	
REMOVE BURRS, WELD SPATTER & LOOSE SCALE		PROJECT NUMBER		REV.	
IN ACCORDANCE WITH ASME Y14.5M & Y14.5		PROJECT NUMBER		REV.	





## TARGET LOCATIONS

SCALE 1/10



## ALIGNMENT TABLE

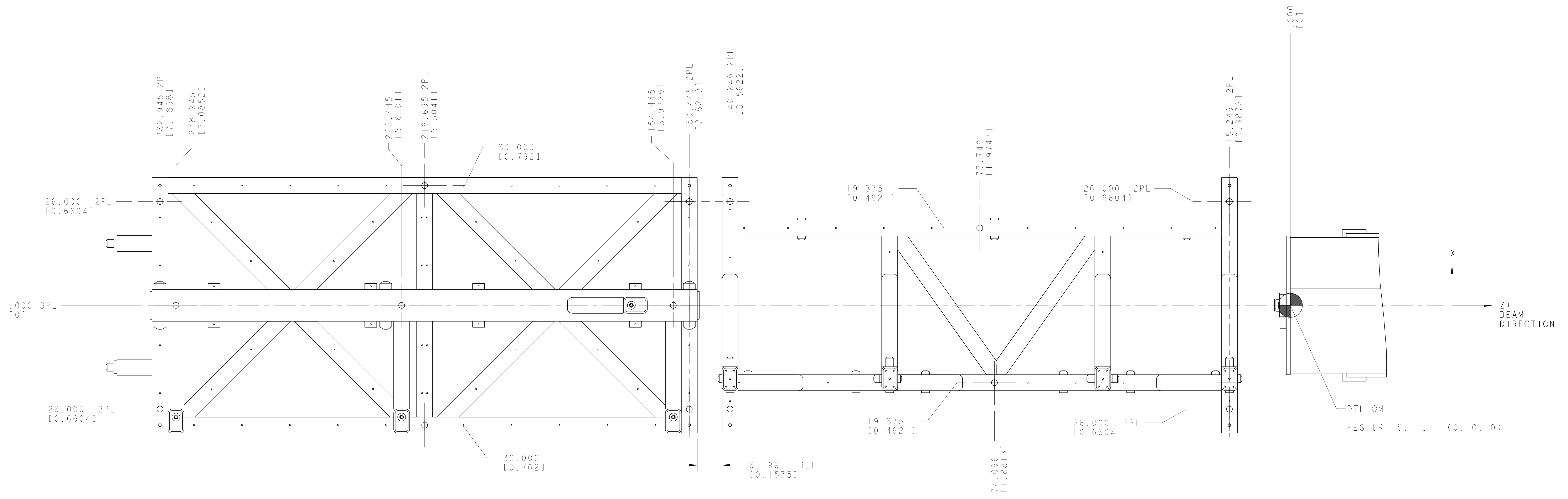
IDEAL LOCATIONS OF FIDUCIAL TARGETS

TARGET LABEL	IDEAL COORDINATES IN FES CS			REFERENCE DATA	IDEAL LOCATION IN MEBT CS		
	Z (METERS)	X (METERS)	Y (METERS)		X (INCHES)	Y (INCHES)	Z (INCHES)
RFQ				LBNL BLDG 71			
RFQA	-4.46157	-0.09379	0.14006	RFQ1 U/S North	-3.6925	5.5140	-31.6564
RFQB	-4.46150	0.09341	0.14013	RFQ2 U/S South	3.6777	5.5168	-31.6535
RFQC	-3.78843	-0.09372	0.14000	RFQ4 D/S North	-3.6896	5.5117	-5.1549
RFQD	-3.78847	0.09327	0.14008	RFQ3 D/S South	3.6719	5.5150	-5.1564
(MEBT ORIGIN)	-3.65750	0.00000	0.00000	(MEBT ORIGIN)	0.0000	0.0000	0.0000
MEBT RAFT 1				DWG 25B610 LABEL			
MR1A	-3.44202	-0.31719	-0.16625	RAFT_BALL_3			
MR1B	-3.47502	0.31792	-0.16609	RAFT_BALL_1			
MR1C	-3.12297	-0.14598	0.35333	RC_BALL_R			
MR1D	-3.12337	0.14665	0.35303	RC_BALL_L			
MR1E	-2.85097	-0.17095	0.10379	C_BALL_D			SEE CMM MEASUREMENT RESULTS TABLE IN 25B610
MR1F	-2.85120	0.17058	0.10377	C_BALL_B			
MR1G	-2.75642	-0.31770	-0.16661	RAFT_BALL_4			
MR1H	-2.73855	0.31742	-0.16676	RAFT_BALL_2			
MR1I	-2.69238	-0.17068	-0.07781	C_BALL_F			
MR1J	-2.69265	0.17049	-0.07772	C_BALL_C			
MR1K	-2.53371	-0.17083	0.10386	C_BALL_E			
MR1L	-2.53407	0.17074	0.10386	C_BALL_A			
MEBT RAFT 2				DWG 25B611 LABEL			
MR2A	-2.36334	-0.14598	0.35364	RC1_BALL_R			
MR2B	-2.36384	0.14635	0.35335	RC1_BALL_L			
MR2C	-2.19410	-0.31798	-0.16620	RAFT_BALL_3			
MR2D	-2.21422	0.31798	-0.16586	RAFT_BALL_1			
MR2E	-1.57182	-0.31813	-0.16650	RAFT_BALL_4			SEE CMM MEASUREMENT RESULTS TABLE IN 25B611
MR2F	-1.55385	0.31792	-0.16694	RAFT_BALL_2			
MR2G	-1.40331	-0.14615	0.35347	RC2_BALL_R			
MR2H	-1.40332	0.14655	0.35333	RC2_BALL_L			
MEBT RAFT 3				DWG 25B612 LABEL			
MR3A	-1.23114	-0.17105	0.10398	AC_BALL_D			
MR3B	-1.23117	0.17073	0.10419	AC_BALL_A			
MR3C	-1.07265	-0.17079	-0.07744	AC_BALL_F			
MR3D	-1.07255	0.17054	-0.07740	AC_BALL_C			
MR3E	-1.00743	-0.31748	-0.16650	RAFT_BALL_3			SEE CMM MEASUREMENT RESULTS TABLE IN 25B612
MR3F	-1.02558	0.31803	-0.16612	RAFT_BALL_1			
MR3G	-0.91373	-0.17107	0.10363	AC_BALL_E			
MR3H	-0.91375	0.17067	0.10386	AC_BALL_B			
MR3I	-0.49362	-0.14632	0.35345	RC_BALL_R			
MR3J	-0.49392	0.14652	0.35318	RC_BALL_L			
MR3K	-0.31140	-0.31867	-0.16666	RAFT_BALL_4			
MR3L	-0.28648	0.31709	-0.16695	RAFT_BALL_2			
(FES ORIGIN)	0.00000	0.00000	0.00000	(FES ORIGIN)	143.9961	0.0000	0.0000

### ALIGNMENT TABLE NOTES:

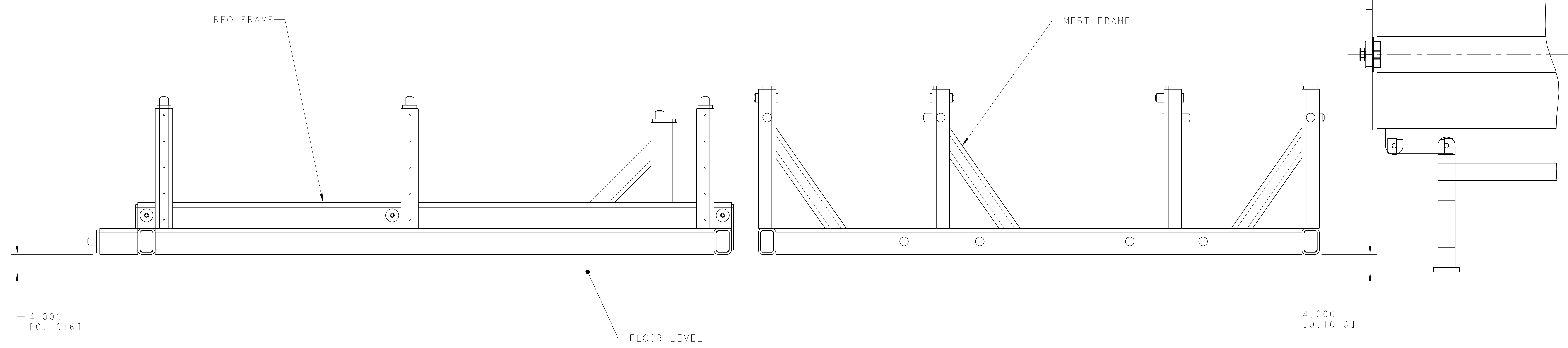
- 1) THE IDEAL LOCATIONS FOR THE MEBT RAFT FIDUCIAL TARGETS WERE DERIVED FROM MEASUREMENTS MADE WITH A COORDINATE MEASURING MACHINE (CMM) AFTER ASSEMBLY. THE CMM DATA FOR EACH RAFT WAS RECORDED IN A LOCAL COORDINATE SYSTEM (CS), THE MEBT CS (SEE DRAWING 25B601, SHEET 2).
- 2) THE IDEAL LOCATION OF THE RFQ FIDUCIAL TARGETS WAS DERIVED BY CMM MEASUREMENTS MADE ON THE FOURTH RFQ MODULE AFTER FINAL MACHINING OF THE ASSEMBLY. DURING ALIGNMENT AT LBNL (BUILDING 71) FOR COMMISSIONING, THE RFQ TARGETS WERE USED TO DETERMINE THE NOMINAL LOCATION OF THE MEBT CS. ALIGNMENT OF THE MEBT RAFTS AT LBNL WAS PERFORMED WITH A LASER TRACKER USING THE MEBT CS.
- 3) THE FOUR FIDUCIAL TARGETS ON MODULE FOUR OF THE RFQ ARE USED FOR ALIGNMENT OF THE ENTIRE RFQ AND ION SOURCE / LEPT ASSEMBLY. THE REMAINING TWELVE TARGETS ON THE RFQ WERE USED FOR FABRICATION PURPOSES AND SHOULD NOT BE USED FOR INSTALLATION OR PERIODIC ALIGNMENT.

UNLESS OTHERWISE SPECIFIED		SHOP ORDERS		ERNEST ORLANDO LAWRENCE BERKELEY NATIONAL LABORATORY UNIVERSITY OF CALIFORNIA - BERKELEY	
PROJECTION:	REF. NO.	REV. NO.	DATE	SCALE:	1/60
TOLERANCES:	X, X ± 0.1	FRAC. ± 1/64	DATE	SCALE:	1/60
	X, XX ± 0.03	ANGLES ± 1.0°	DATE	SCALE:	1/60
	X, XXX ± 0.010	FINISH 125	DATE	SCALE:	1/60
DO NOT SCALE PRINT		PROJECT NAME		SNS - INTEGRATION	
HARDEN THE CLASS 2		PROJECT NUMBER		FRONT END EQUIPMENT	
CHAMFER ENDS OF ALL SCREW THREADS 30°		PROJECT TAG		SHEET 3 OF 5	
CUT ROUNDS, 1.5 THREAD RELIEF ON MACHINED THREADS		PROJECT NAME		25B6016 B	
BREAK EDGES .016 MAX. ON MACHINED WORK		DATE		REV.	
REMOVE BURRS, WELD SPATTER & LOOSE SCALE		DATE		REV.	
IN ACCORDANCE WITH ASME Y14.5M-1994		DATE		REV.	



# FLOOR ANCHOR LOCATIONS

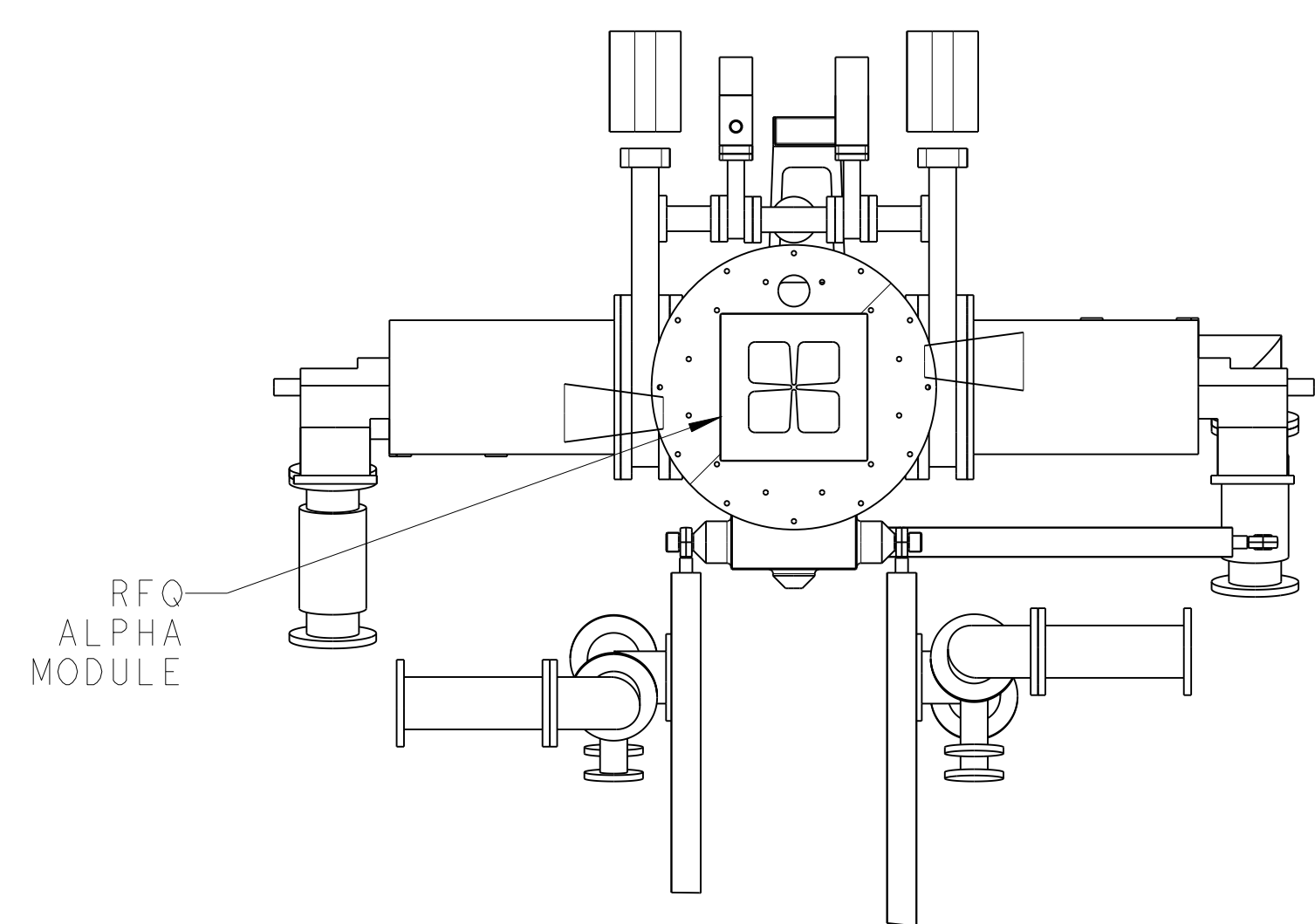
DIMENSIONS IN INCHES / [METERS]  
SCALE 1/10



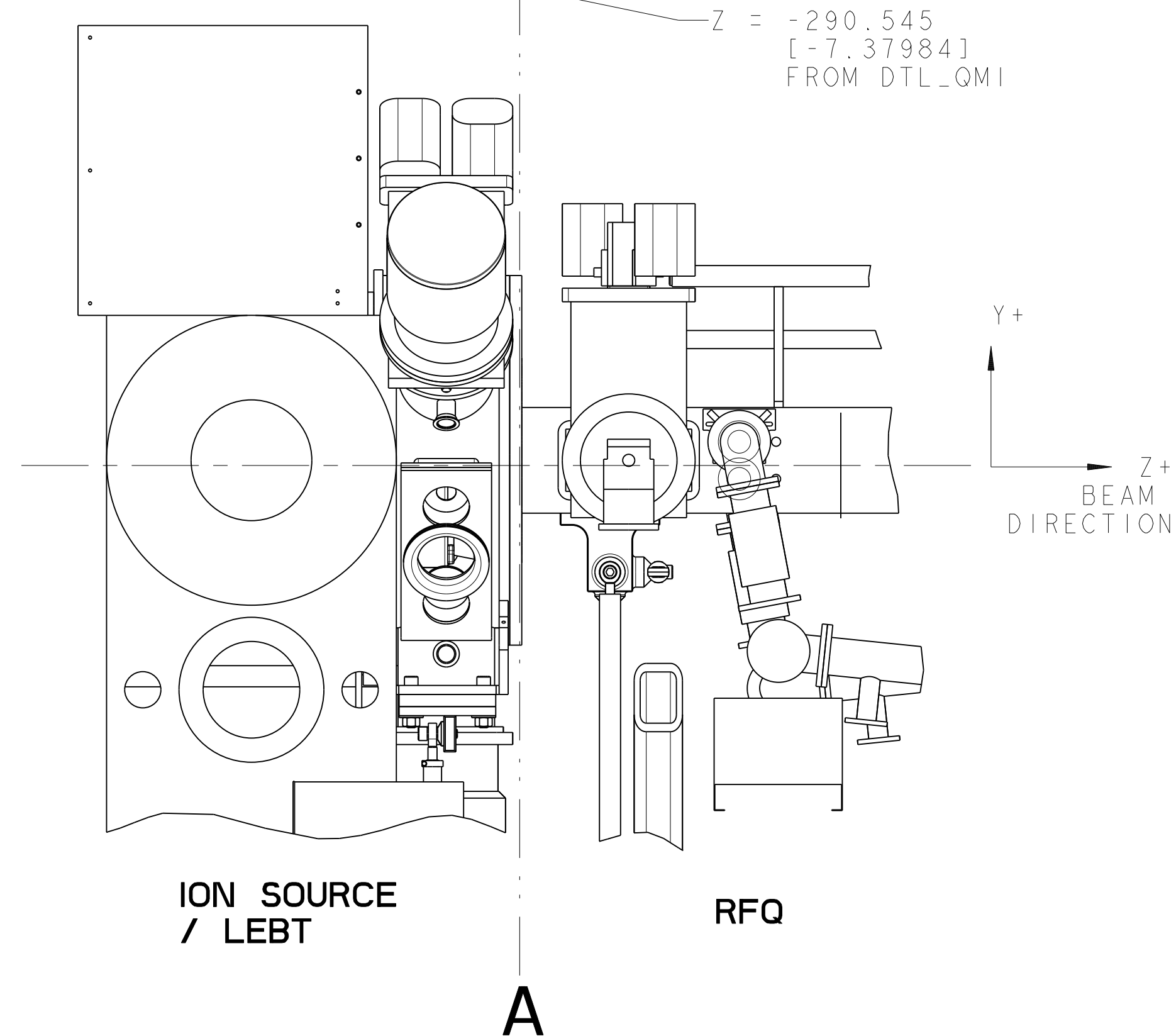
UNLESS OTHERWISE SPECIFIED		SHOP ORDERS		ERNEST ORLANDO LAWRENCE BERKELEY NATIONAL LABORATORY UNIVERSITY OF CALIFORNIA - BERKELEY	
PROJECTION:	ASME	REV:		FRONT END EQUIPMENT	
TOLERANCES:	X.X ± 0.1	FRAC. ± 1/64	DATE:	SCALE:	1/75
	X.XX ± 0.03	ANGLES ± 1.0°	DATE:		
	X.XXX ± 0.010	FINISH 125	DATE:		
DO NOT SCALE PRINT		DATE: 09-Apr-02		SHEET 4 OF 5	
THREADS ARE CLASS 2		DATE:		SIZE:	
CHAMFER ENDS OF ALL SCREW THREADS 30°		DATE:		REV:	
CUT ROUNDS, 1.5 THREAD RELIEF ON MACHINED THREADS		DATE:		25B6016 B	
BREAK EDGES .016 MAX. ON MACHINED WORK		DATE:		REV:	
REMOVE BURRS, WELD SPATTER & LOOSE SCALE		DATE:		REV:	
IN ACCORDANCE WITH ASME Y14.5M-04		DATE:		REV:	

# LEBT / RFQ INTERFACE

BOTH SECTIONS "A-A" SHARE THE SAME SECTION PLANE "A-A" - VIEWING DIRECTIONS ARE OPPOSITE

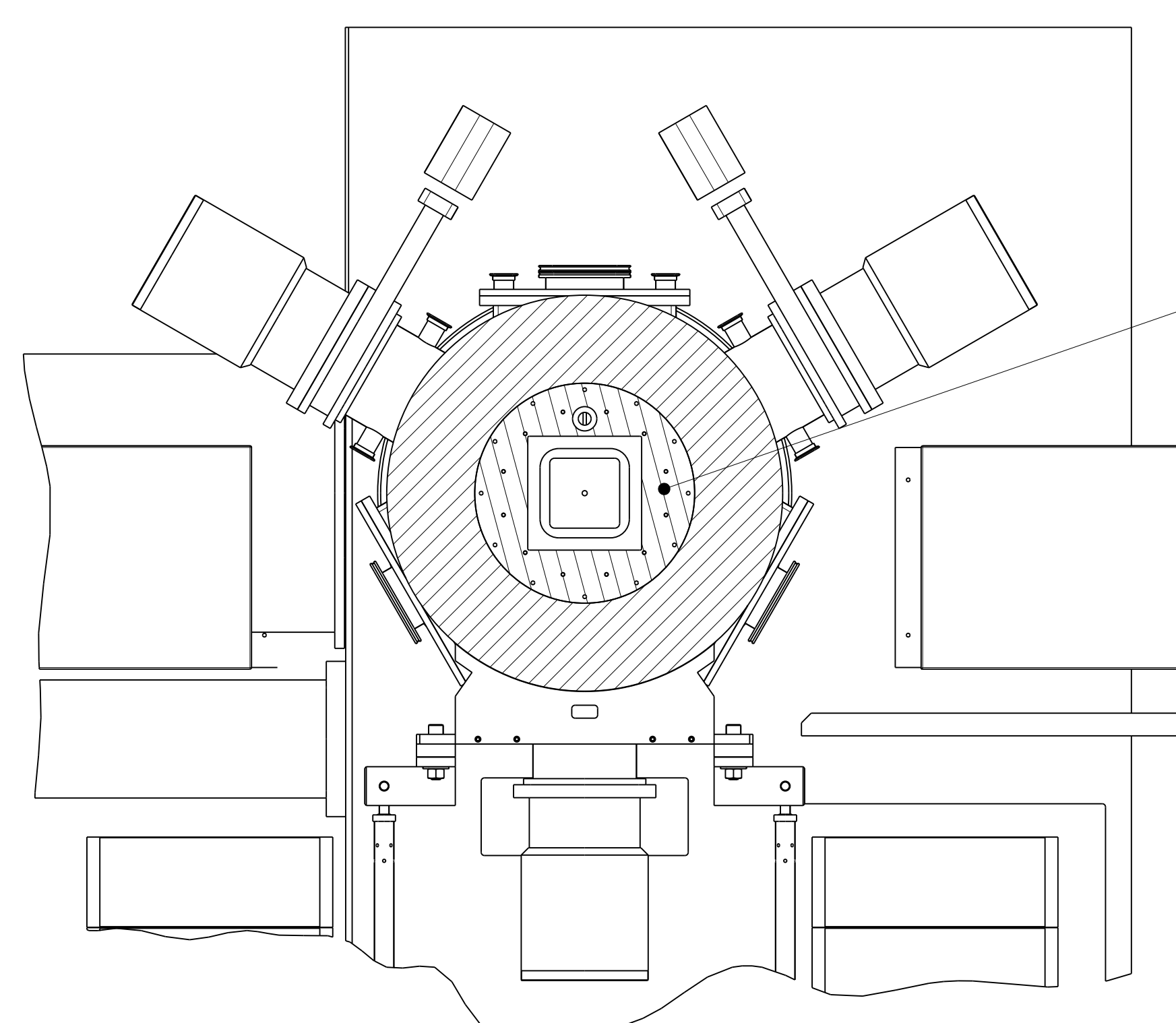


SECTION A-A



ION SOURCE / LEBT

RFQ

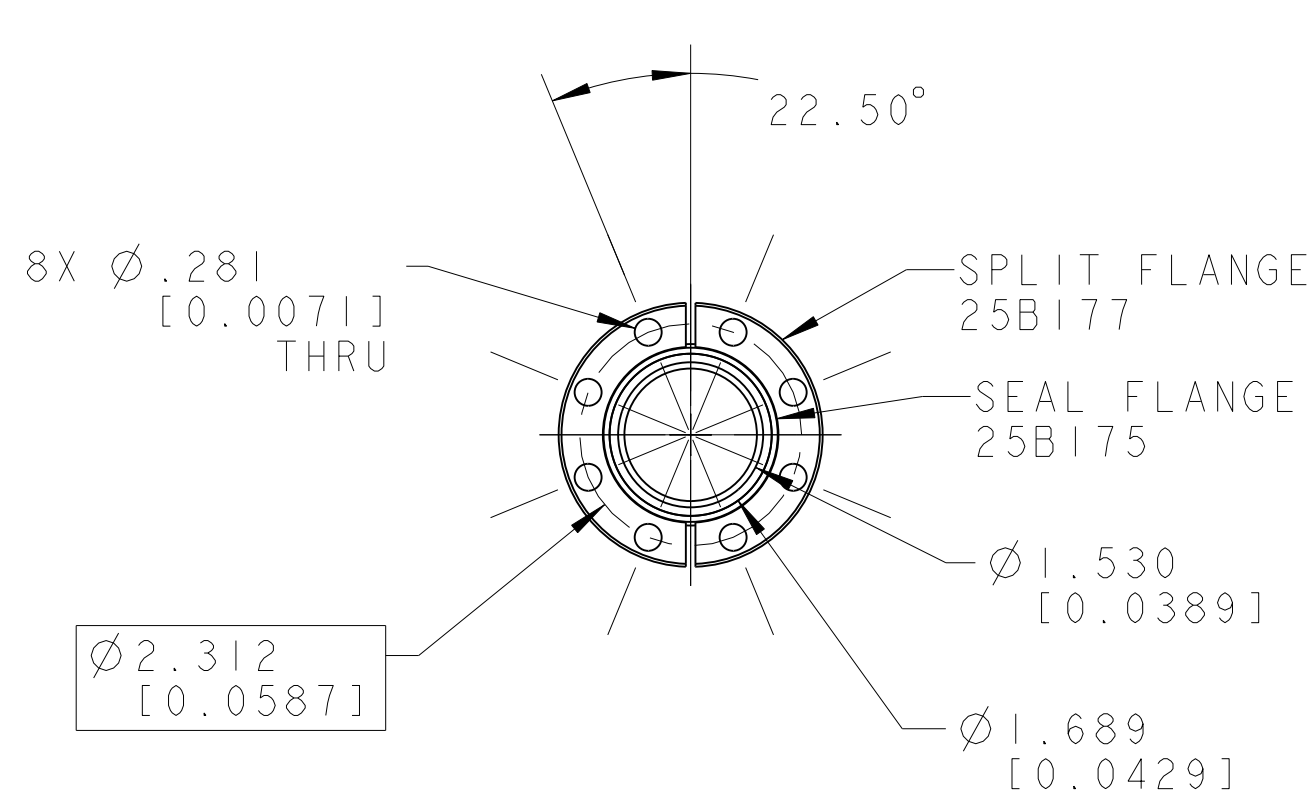


SECTION A-A  
SCALE 1/10

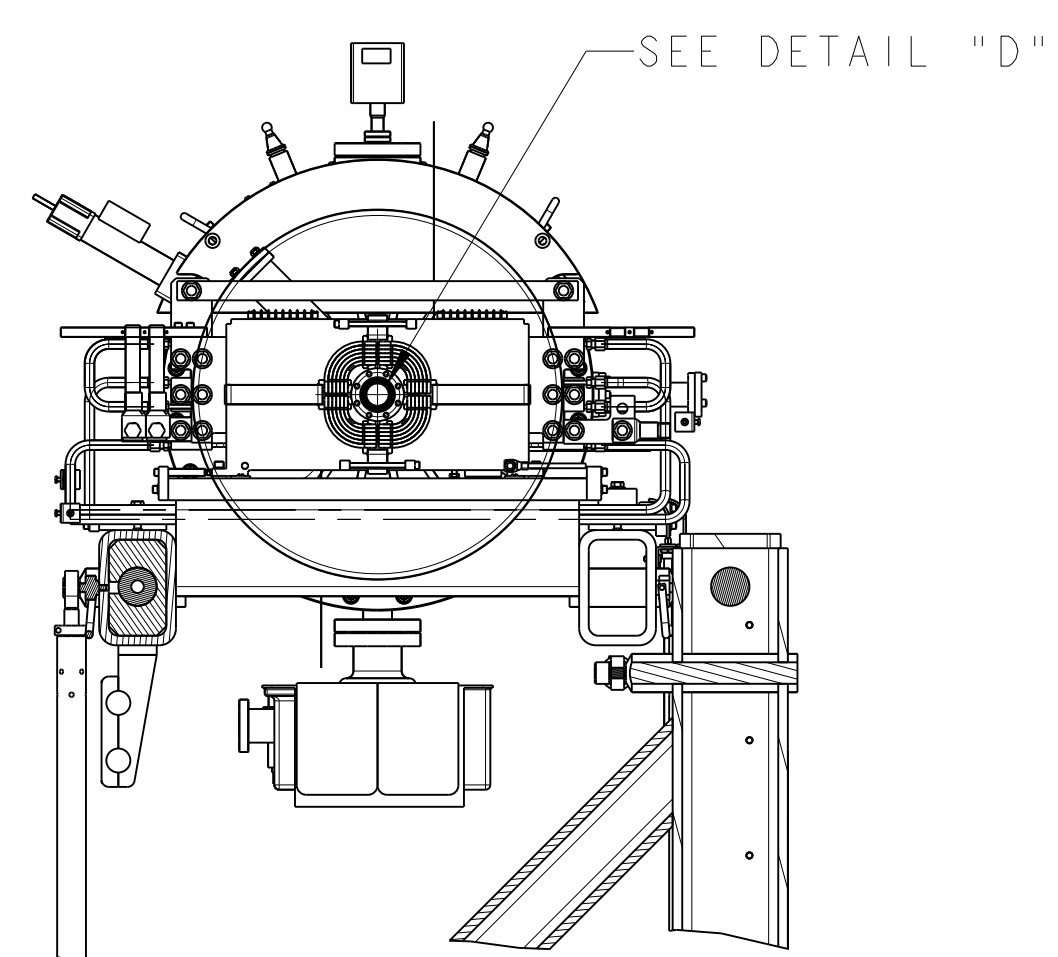
SEE ASSY DWG  
25B818\_6  
(ADAPTER PLATES)

# RFQ / MEBT INTERFACE

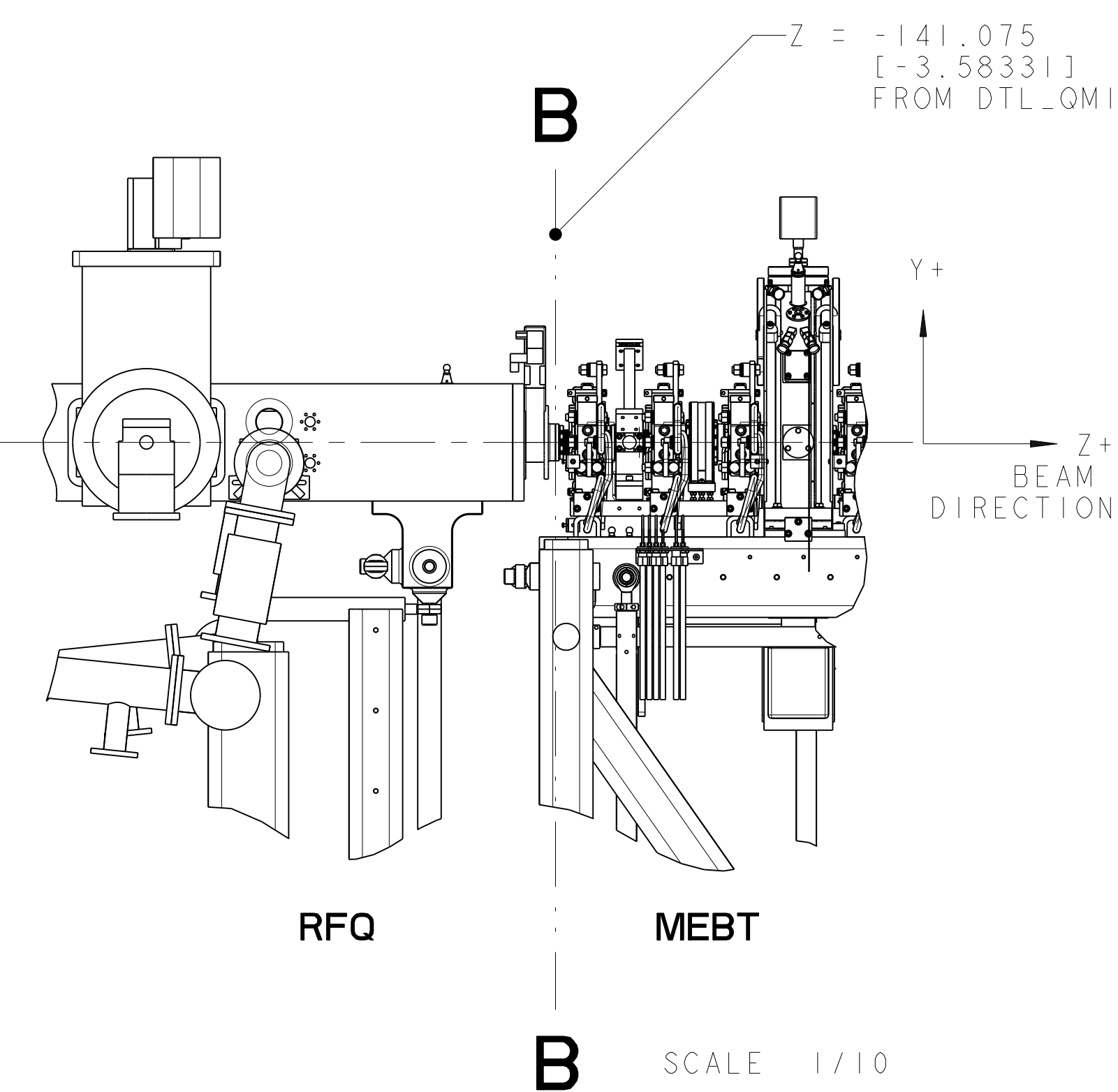
BOTH SECTIONS "B-B" SHARE THE SAME SECTION PLANE "B-B" - VIEWING DIRECTIONS ARE OPPOSITE



DETAIL D  
DIMS ARE REF  
SCALE 1/2



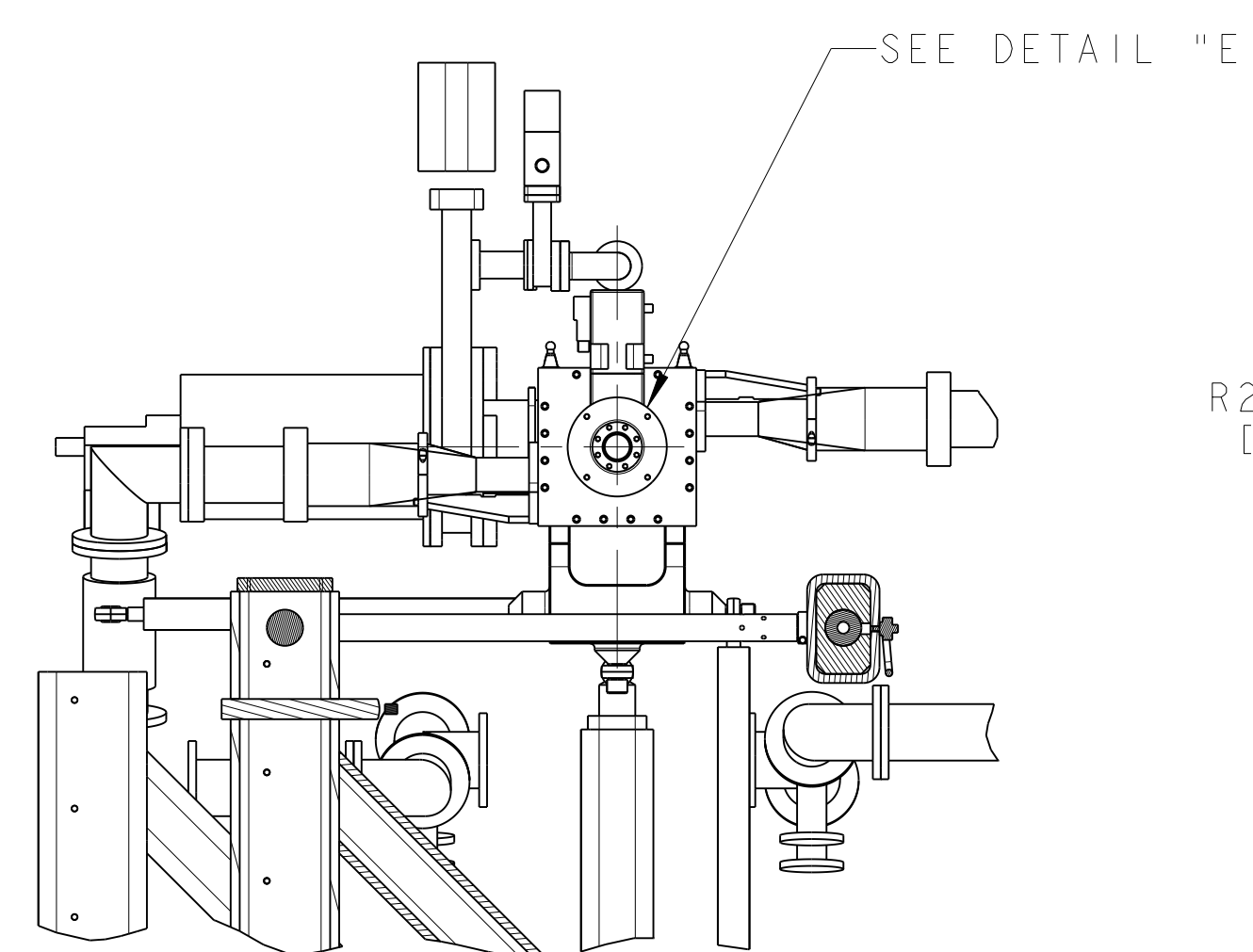
SECTION B-B



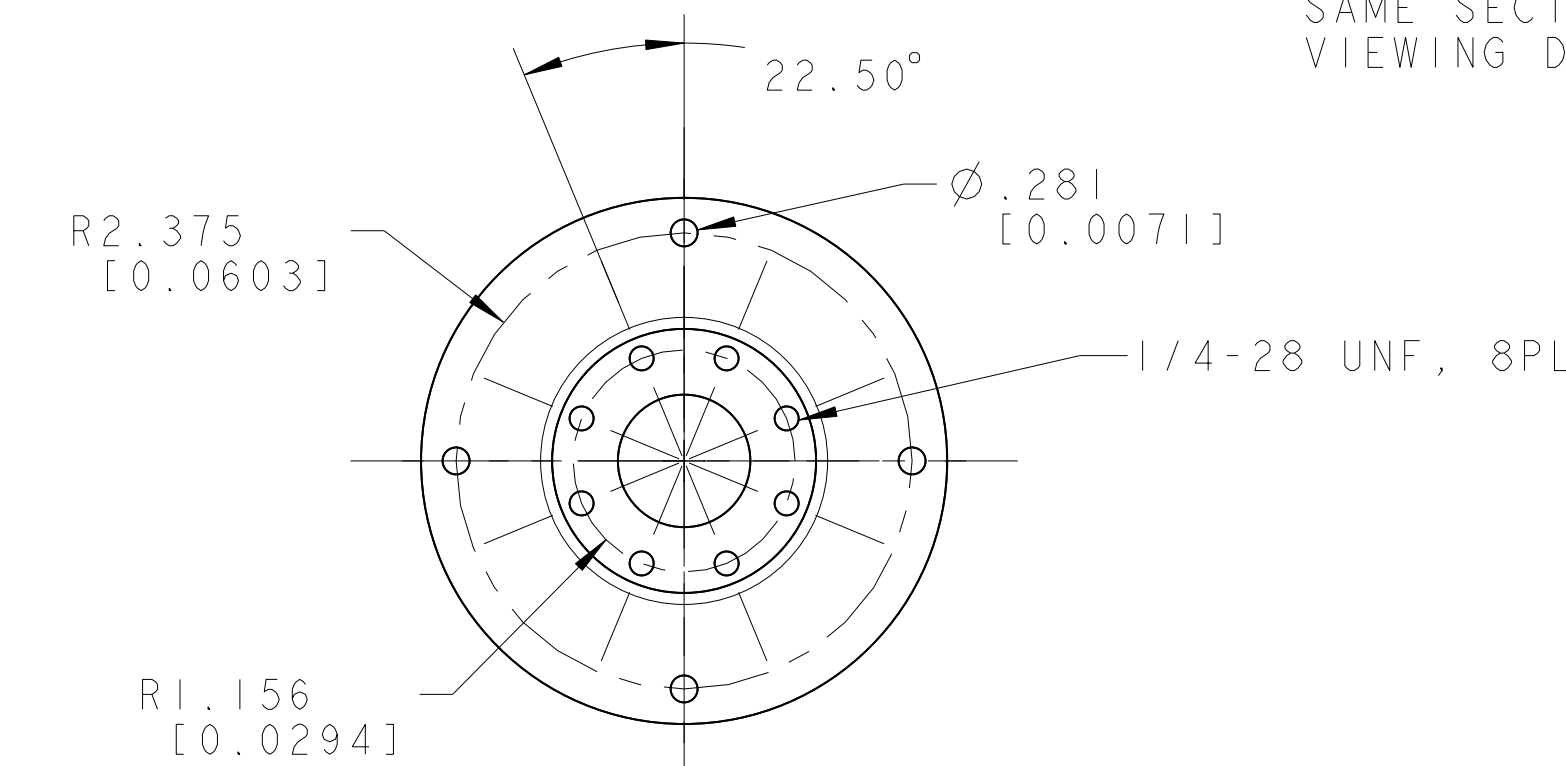
RFQ

MEBT

SCALE 1/10

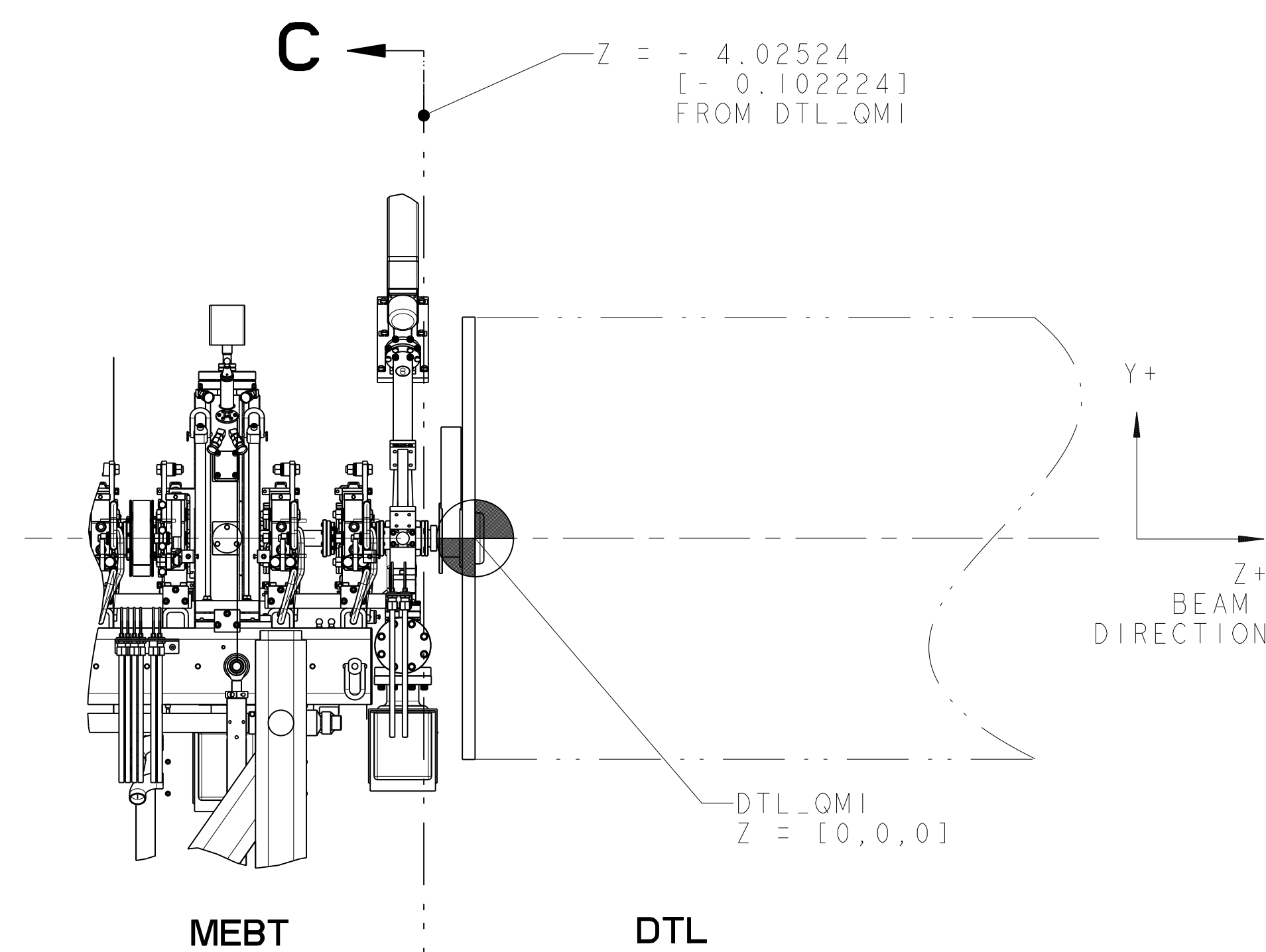


SECTION B-B



DETAIL E  
FLANGE 25B804  
DIMS ARE REF  
SCALE 1/2

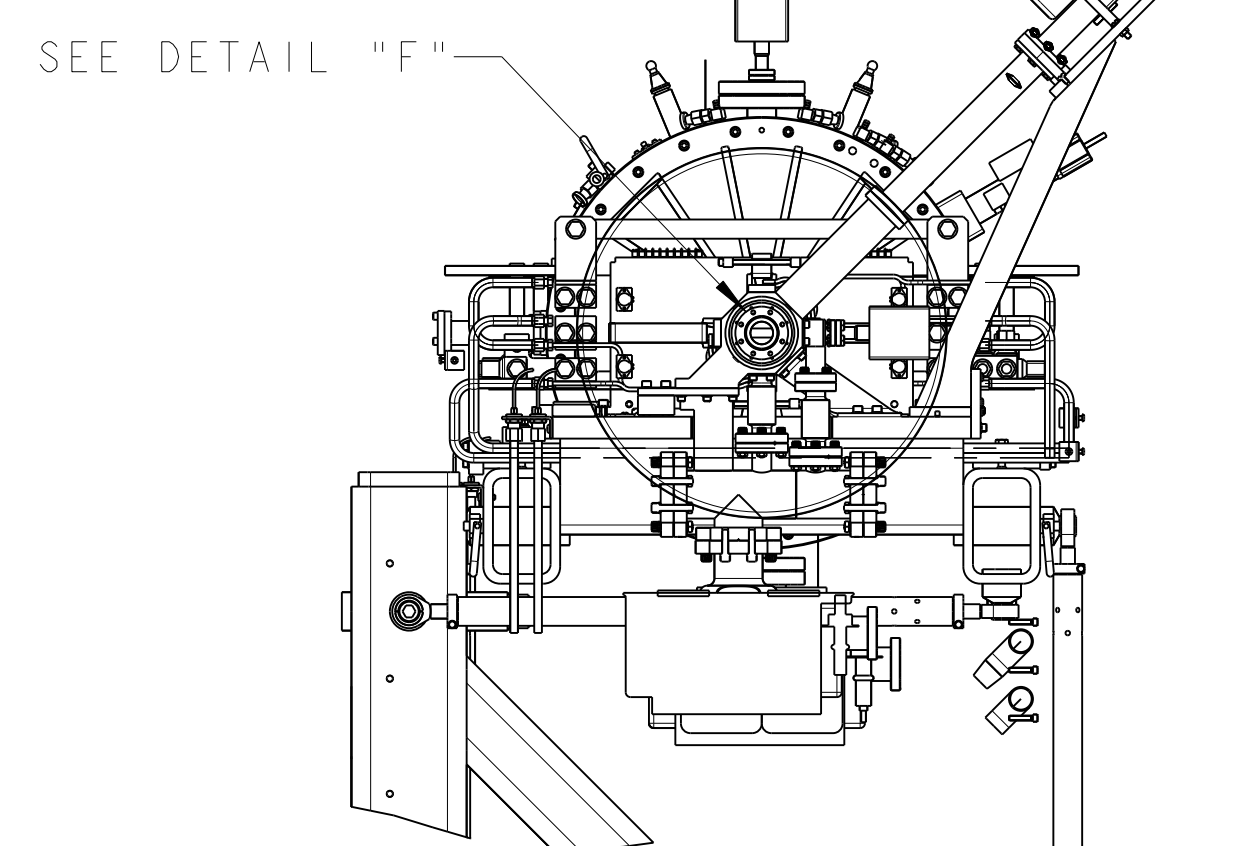
# MEBT / DTL INTERFACE



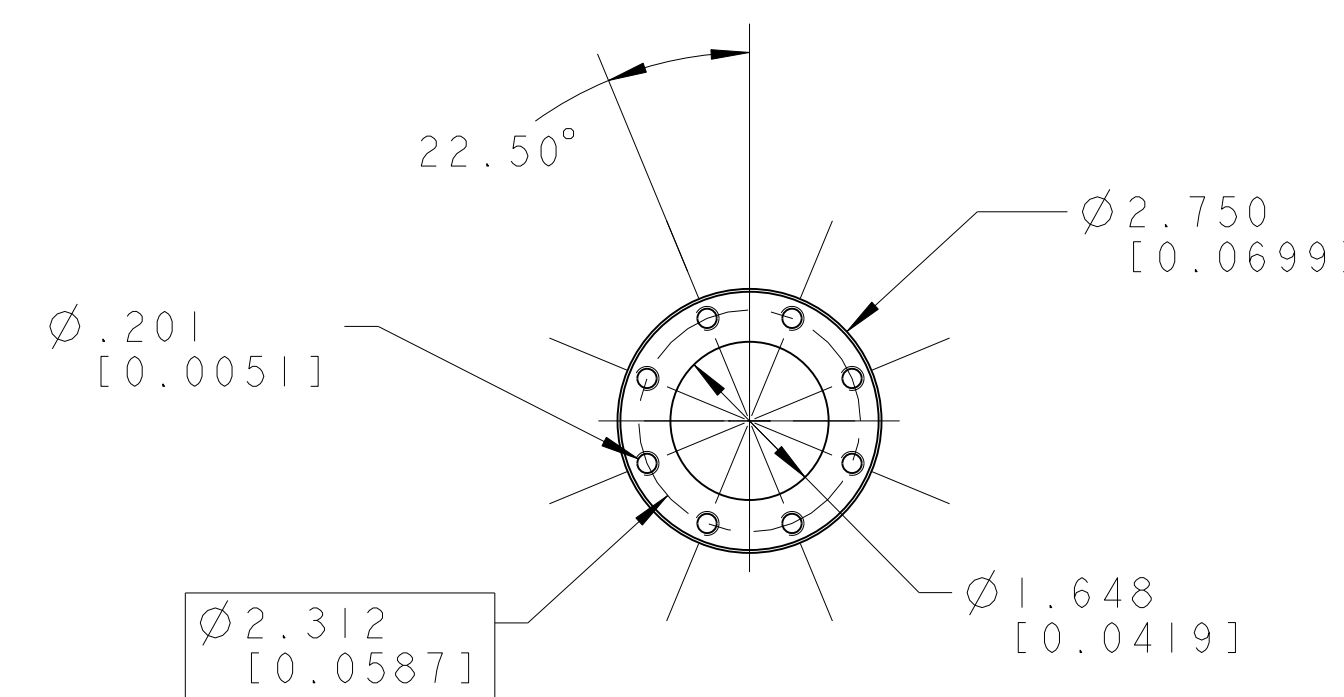
MEBT

DTL

SCALE 1/10

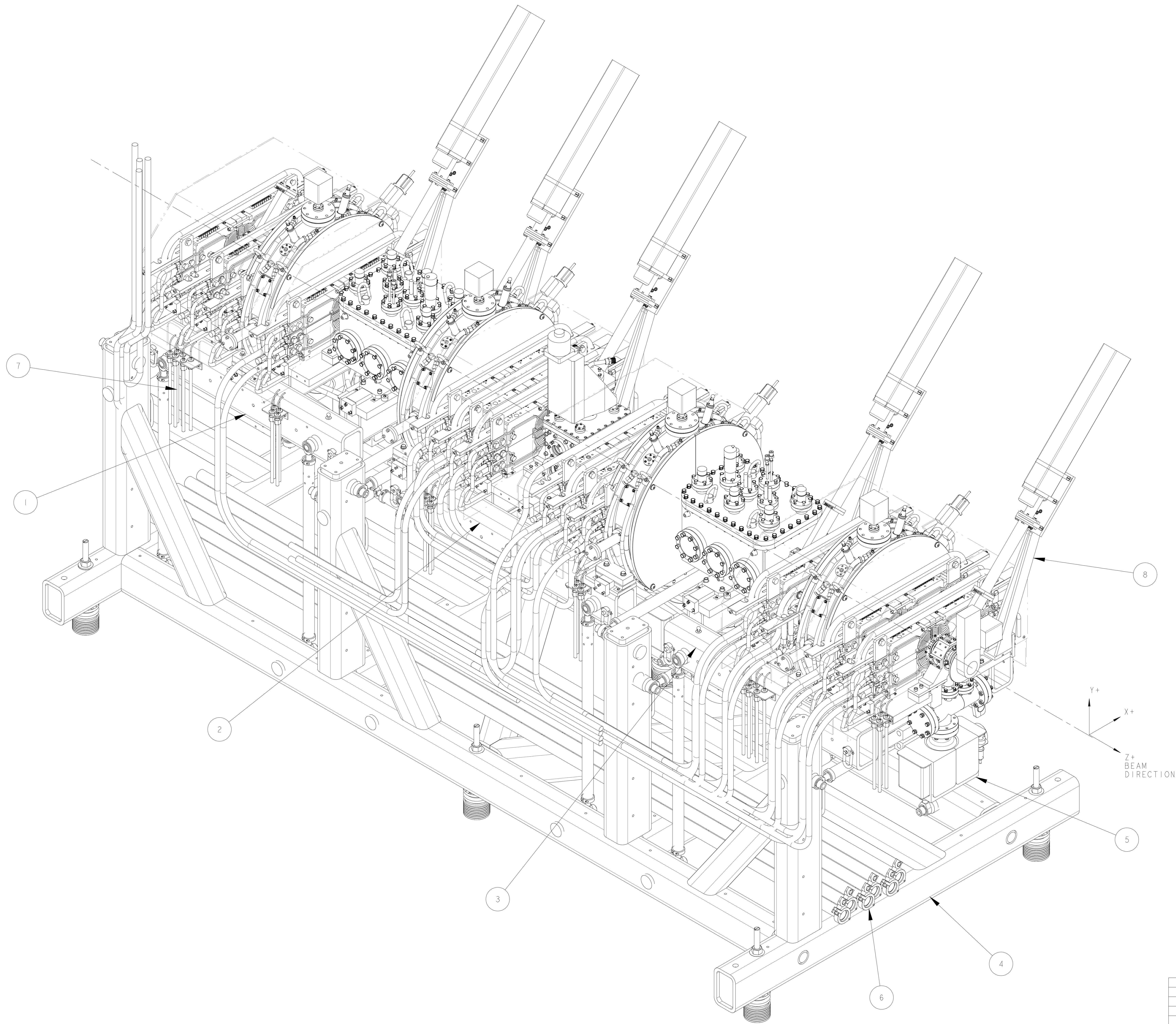


SECTION C-C



DETAIL F  
FLANGE 25B111  
DIMS ARE REF  
SCALE 1/2

UNLESS OTHERWISE SPECIFIED		SHOP ORDERS		ERNEST ORLANDO LAWRENCE BERKELEY NATIONAL LABORATORY UNIVERSITY OF CALIFORNIA - BERKELEY	
PROJECTION:	ASME	REV. NO.	DATE	SCALE:	1/75
TOLERANCES:	X.X ± 0.1	FRAC. ± 1/64	DATE	DATE	DATE
	X.XX ± 0.03	ANGLES ± 1.0°	DATE	DATE	DATE
	X.XXX ± 0.010	FINISH 125	DATE	DATE	DATE
DO NOT SCALE PRINT		THREADS ARE CLASS 2		CHAMFER ENDS OF ALL SCREW THREADS 30°	
CUT ROUNDS .016 MAX. ON MACHINED WORK		REMOVE BURRS, WELD SPATTER & LOOSE SCALE		IN ACCORDANCE WITH ASME Y14.3M-98 FIG. 1	
MICROFILMED:		DRG. TYPE:	ASSEM	SHOWN ON:	FRONT END EQUIPMENT
DESIGN ACCT. NO.:		CATEGORY CODE:	FE3000	DWG. NO.:	25B6016
PATENT CLEAR:		DATE:	09-Apr-02	SIZE:	SHEET 5 OF 5
APP. EST.:		DATE:		REV.:	B



SCALE 1/5

ITEM	PART NO	REQD	DESCRIPTION	MATERIAL
8	25B747	1	MISC. HARDWARE ASSEMBLY	-
7	25B699	1	BEAMLINE ELECTRICAL	-
6	25B615	1	WATER SYSTEM ASSEMBLY	-
5	25B614	1	MEBT VACUUM SYSTEM	-
4	25B613	1	MEBT FRAME	-
3	25B612	1	MEBT RAFT 3 ASSEMBLY	-
2	25B611	1	MEBT RAFT 2 ASSEMBLY	-
1	25B610	1	MEBT RAFT 1 ASSEMBLY	-

REV	DWG	CHK	ZONE	DATE	CHANGES

UNLESS OTHERWISE SPECIFIED  
 PROJECTION:   
 TOLERANCES: X.X ± 0.1 FRAC. ± 1/64  
 X.XX ± 0.03 Angles ± 1.0°  
 X.XXX ± 0.010 FINISH 125/  
 THREADS ARE CLASS 2  
 CHAMFER ENDS OF ALL SCREW THREADS 30°  
 CUT ROUNDS, 1.5 THREAD RELIEF ON MACHINED THREADS  
 BREAK EDGES .016 MAX. ON MACHINED WORK  
 REMOVE BURRS, WELD SPATTER & LOOSE SCALE  
 IN ACCORDANCE WITH ASME Y14.3M & Y14.1

SHOP ORDERS  
 ACT NO. NO. DATE  
 SOL. ISS. DATE  
 REC. DATE  
 SURFACE:  
 TREATMENT:  
 METHOD:  
 IDENT. TAG:  
 PROJECT NUMBER:  
 NAME: LBNL  
 DWG BY: PAL  
 CHK: -  
 EST: -  
 APP: D. OSHATZ

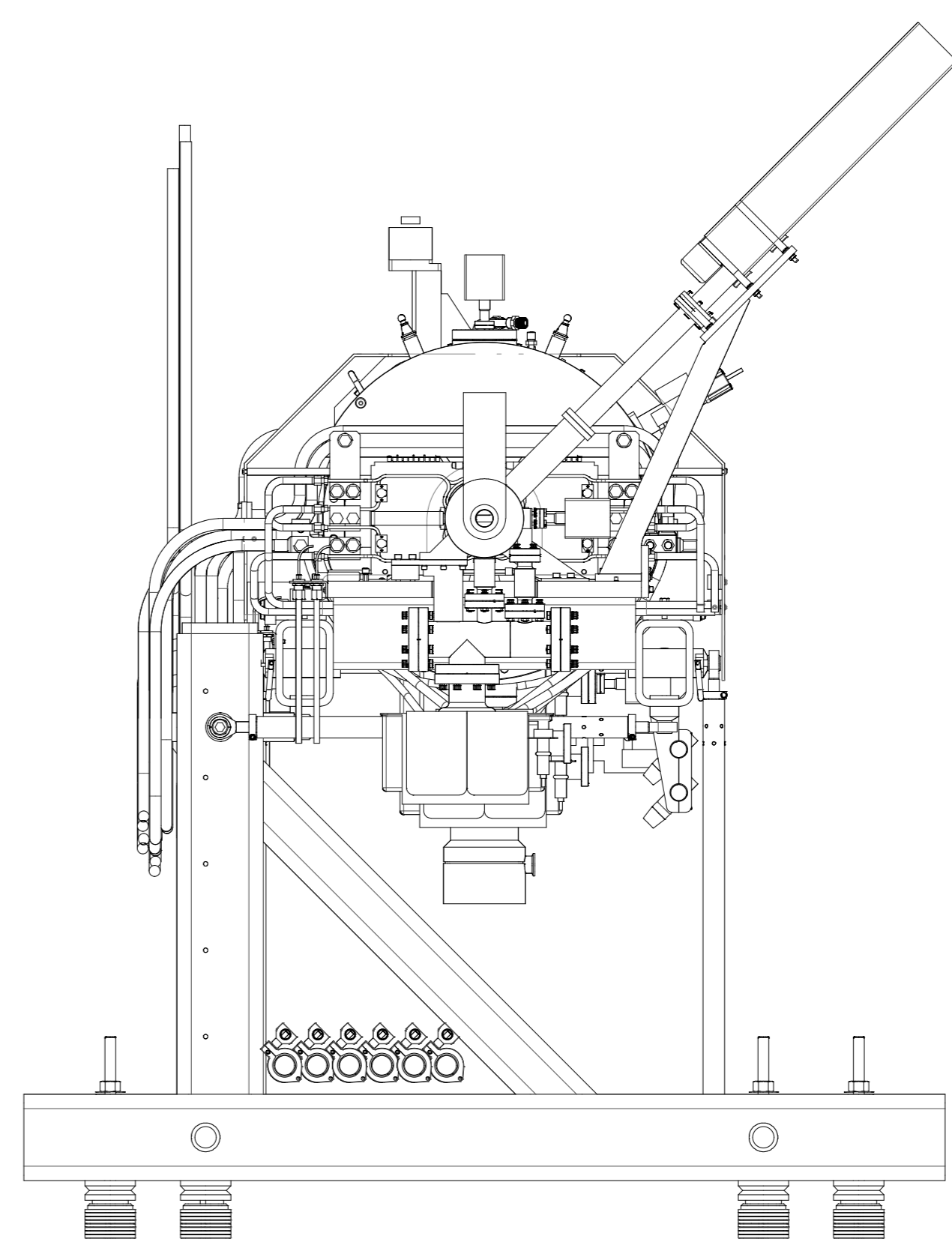
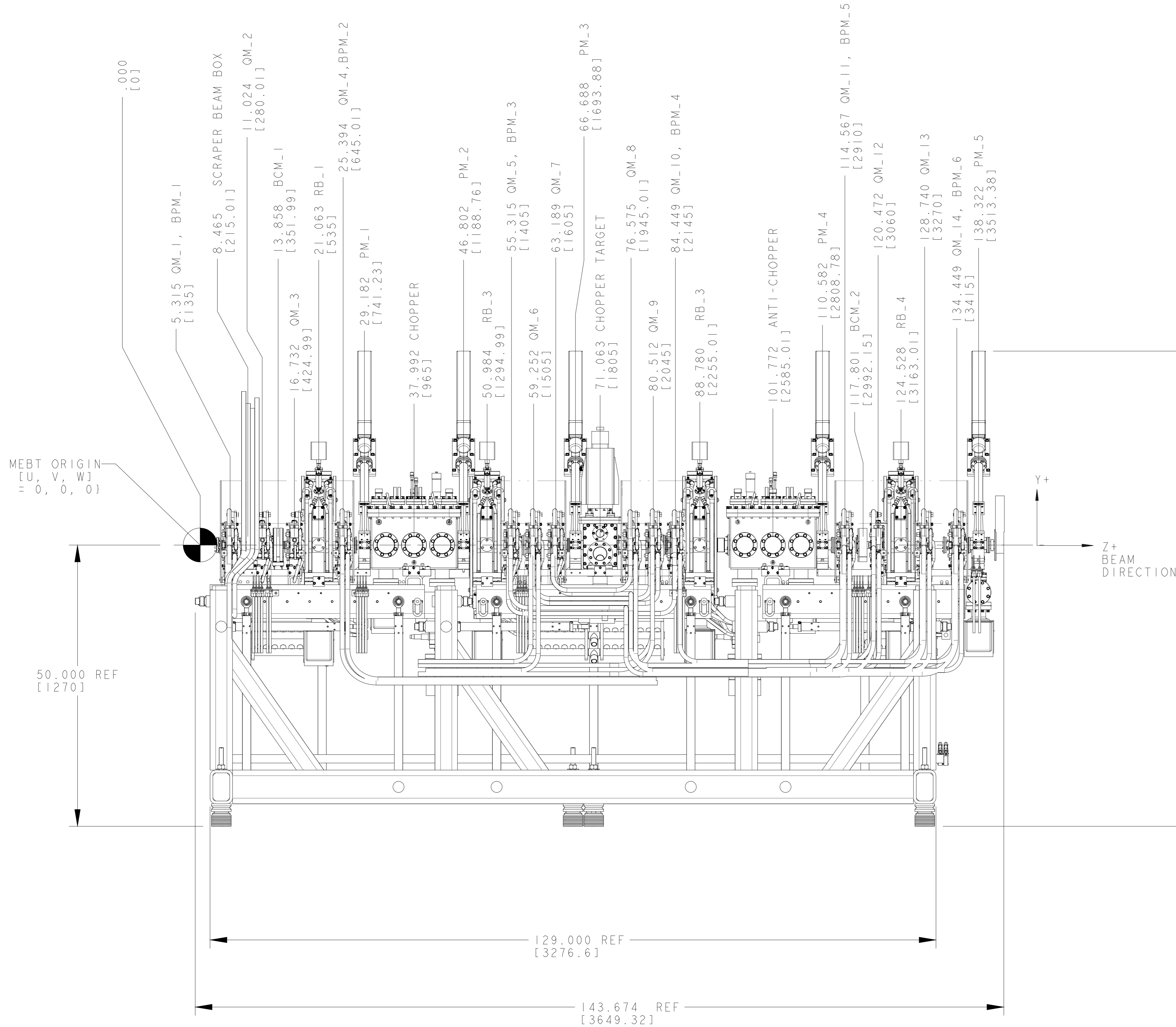
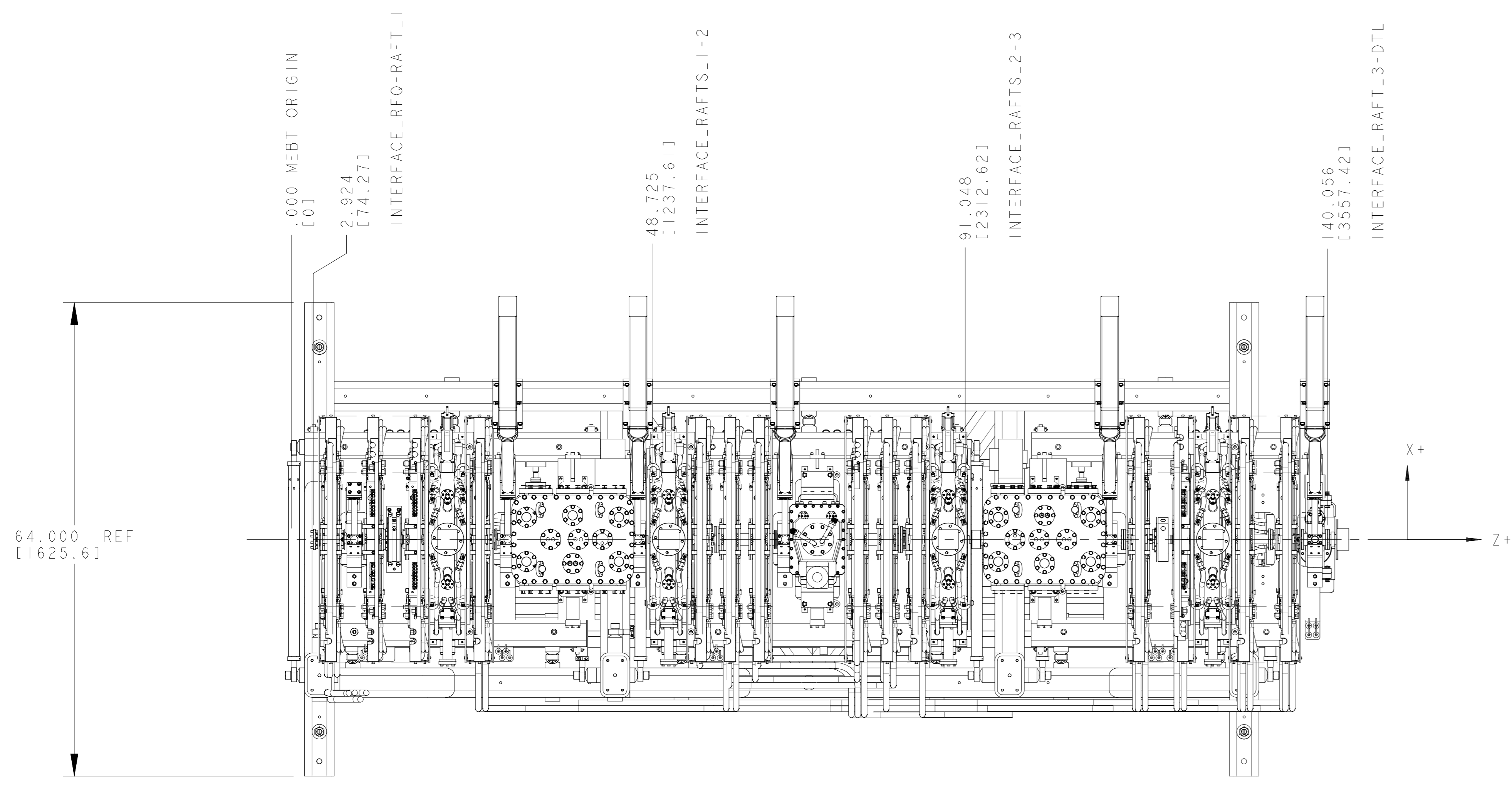
ERNEST ORLANDO LAWRENCE  
 BERKELEY NATIONAL LABORATORY  
 UNIVERSITY OF CALIFORNIA - BERKELEY

SNS - FES MEBT  
 MECHANICAL SYSTEMS  
 MEBT MECHANICAL ASSEMBLY

MICROFILMED: DWG. TYPE: ASSEM SHOWN ON: 25B601 SCALE: 1/10  
 DESIGN ACCT. NO. FE3300 CATEGORY CODE: FE3300 DWG. NO. 25B6036 A SHEET 1 OF 2  
 PATENT CLEAR: - SIZE: REV: -

DWG. NO. 25B6036 A 1

DO NOT SCALE DRAWING



REV	DWG	CHK	ZONE	DATE	CHANGES	UNLESS OTHERWISE SPECIFIED PROJECTION:	SHOP ORDERS	DES. NO. - DATE - ISS. DATE - REV. DATE -	<b>ERNEST ORLANDO LAWRENCE</b> <b>BERKELEY NATIONAL LABORATORY</b> UNIVERSITY OF CALIFORNIA - BERKELEY	SNS - FES MEBT MECHANICAL SYSTEMS MEBT MECHANICAL ASSEMBLY	MICROFILMED: _____	DWG. TYPE: ASSEM	SHOWN ON: 25B601	SCALE: 1/10	DO NOT SCALE DRAWING
TOLERANCES	X, Y ± 0.1	FRAC. ± 1/64	SURFACE: -	PROJECT NUMBER: no	PROJECT NAME: LBNL	DWG. DATE: 09-May-02	PATENT CLEAR: _____	DESIGN ACCT. NO.:			CATEGORY CODE: FE3300	DWG. NO.: 25B6036	SIZE: A	REV.:	SHEET 2 OF 2
DO NOT SCALE PRINT						FINISH: 125		DATE: _____		DATE: _____		DATE: _____		DATE: _____	
TITLES ARE CLASS 2						REMOVE BURRS, WELD SPATTER & LOOSE SCALE		DATE: _____		DATE: _____		DATE: _____		DATE: _____	
CHUNKER ENDS OF ALL SCREEN TRENDS 30°						REMOVE BURRS, WELD SPATTER & LOOSE SCALE		DATE: _____		DATE: _____		DATE: _____		DATE: _____	
CUT ROUNDS, 1.5 THREAD RELIEF ON MACHINED THREADS						REMOVE BURRS, WELD SPATTER & LOOSE SCALE		DATE: _____		DATE: _____		DATE: _____		DATE: _____	
BREAK EDGES .015 MAX. ON MACHINED WORK						REMOVE BURRS, WELD SPATTER & LOOSE SCALE		DATE: _____		DATE: _____		DATE: _____		DATE: _____	
IN ACCORDANCE WITH ASME Y14.5M & Y14.5						REMOVE BURRS, WELD SPATTER & LOOSE SCALE		DATE: _____		DATE: _____		DATE: _____		DATE: _____	

DWG. NO. 25B6036 A 2