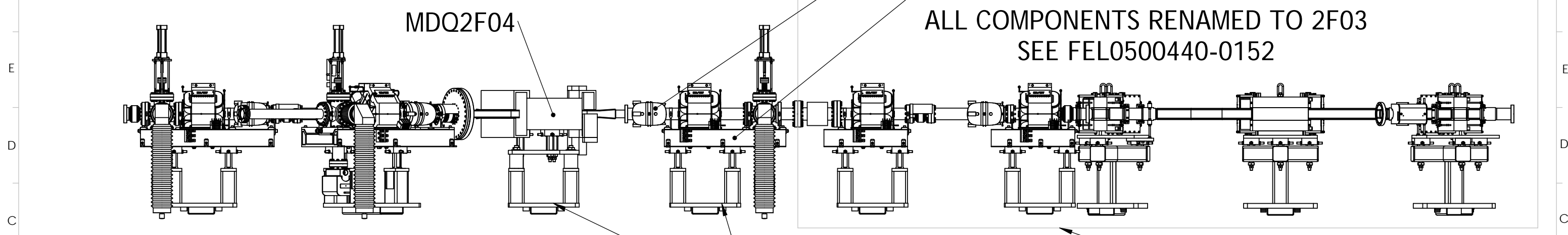


MDQ2F04 ALIGNMENT PINS

	Z(m)	X(m)
A	41.19456	19.75316
B	41.13590	20.27558
C	40.73660	20.17104
D	40.94147	19.68690



THIS AREA IS NOT CHANGED

QUAD CENTER LOCATION

	MQX2F03	MQX1X01
X(m)	20.00000	19.38168
Y(m)	105.00000	105.00000
Z(m)	42.02138	39.89479
YAW(deg)	180.00000	-150.65835

**FEL0500440-0152
STAND ONLY**

DOCUMENT CONTROL STAMP	REV	DIM & TOL PER ASME Y14.5 UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN METERS TOLERANCES: FRACTIONS DECIMAL ANGLES ±.05 X ±.1 ±.50° XX ±.01 .XXX ±.005	TRACKING NO. N/A	
	MATERIAL		APPROVALS	DATE
FINISH MACHINED SURFACES DEBURR & BREAK ALL SHARP EDGES DO NOT SCALE DRAWING	63 UNLESS OTHERWISE NOTED	THIRD ANGLE PROJECTION	DRAWN Joe Gubeli	10/29/2018
			CHECKED	
			APPROVED	
			APPROVED	

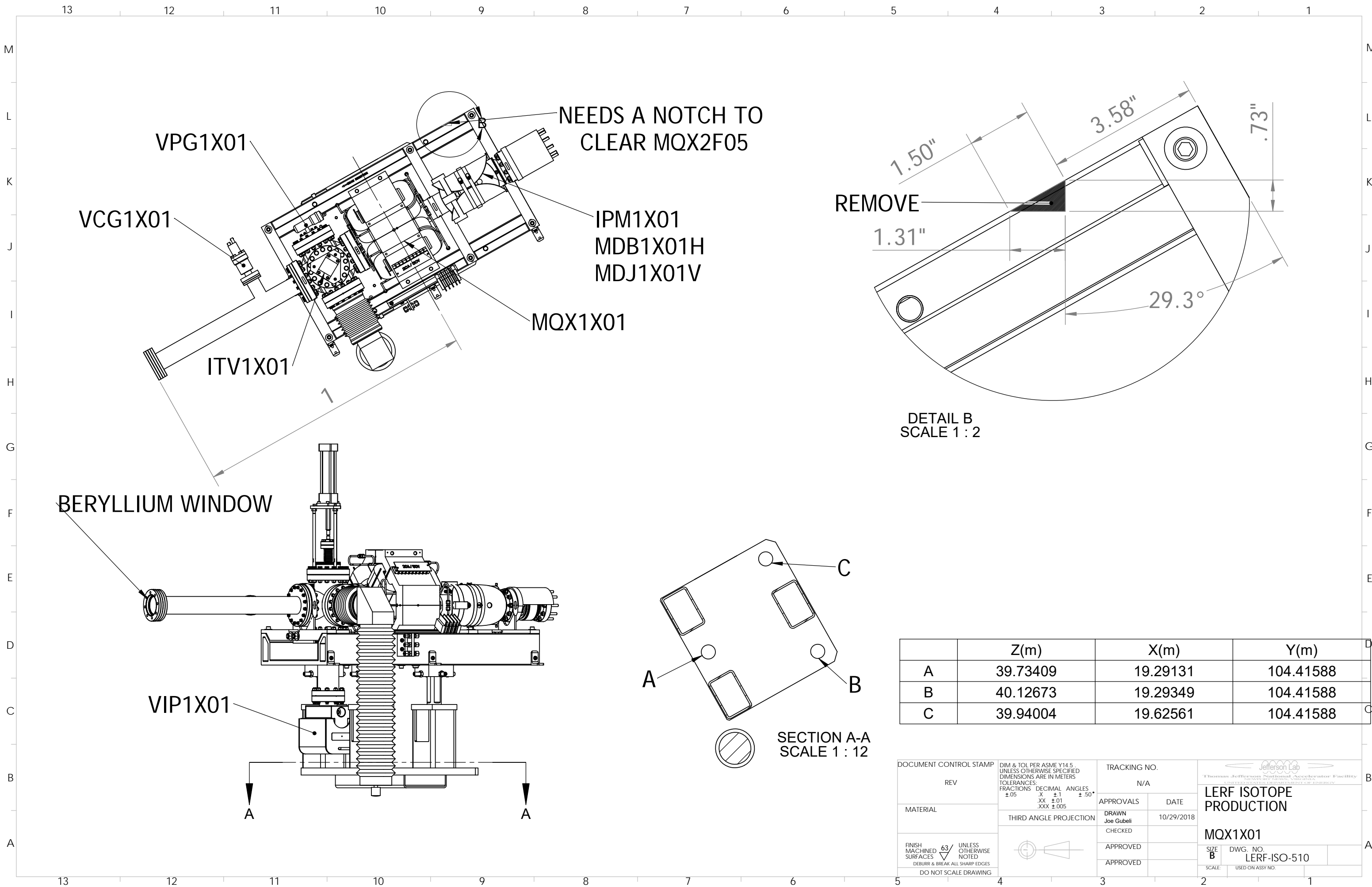
Jefferson Lab
Thomas Jefferson National Accelerator Facility
 UNITED STATES DEPARTMENT OF ENERGY

LERF ISOTOPE PRODUCTION

2F REGION LAYOUT

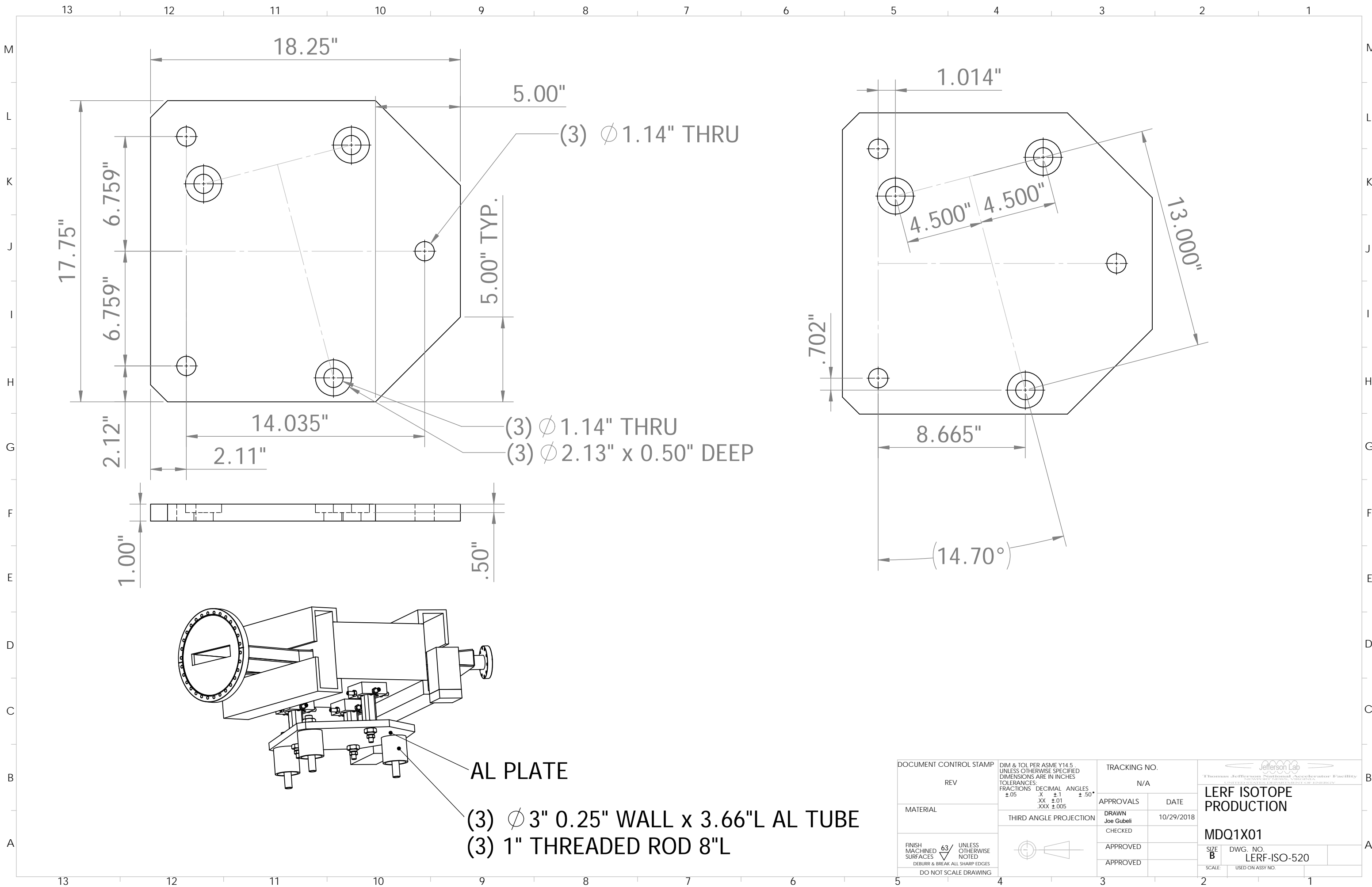
SIZE **B** DWG. NO. **LERF-ISO-500**

SCALE: USED ON ASSY NO.



	Z(m)	X(m)	Y(m)
A	39.73409	19.29131	104.41588
B	40.12673	19.29349	104.41588
C	39.94004	19.62561	104.41588

DOCUMENT CONTROL STAMP	REV	DIM & TOL PER ASME Y14.5 UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN METERS TOLERANCES: FRACTIONS DECIMAL ANGLES ±.05 X ±.1 ±.50° XX ±.01 XXX ±.005	TRACKING NO. N/A		 LERF ISOTOPE PRODUCTION MQX1X01 SIZE B DWG. NO. LERF-ISO-510 SCALE: USED ON ASSY NO.
	MATERIAL		THIRD ANGLE PROJECTION	APPROVALS DRAWN Joe Gubeli CHECKED	
FINISH MACHINED SURFACES DEBURR & BREAK ALL SHARP EDGES DO NOT SCALE DRAWING	 63 UNLESS OTHERWISE NOTED		APPROVED	APPROVED	



18.25"

17.75"

6.759"

6.759"

2.12"

2.11"

14.035"

5.00"

5.00" TYP.

(3) Ø 1.14" THRU

(3) Ø 1.14" THRU

(3) Ø 2.13" x 0.50" DEEP

1.000"

.500"

1.014"

13.000"

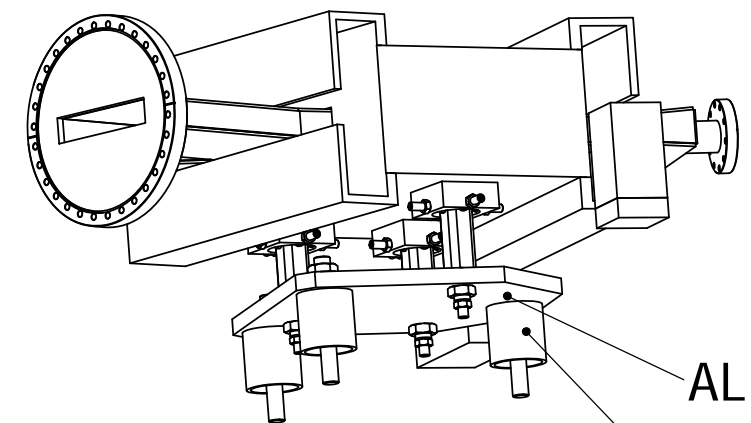
4.500"

4.500"

8.665"

.702"

(14.70°)

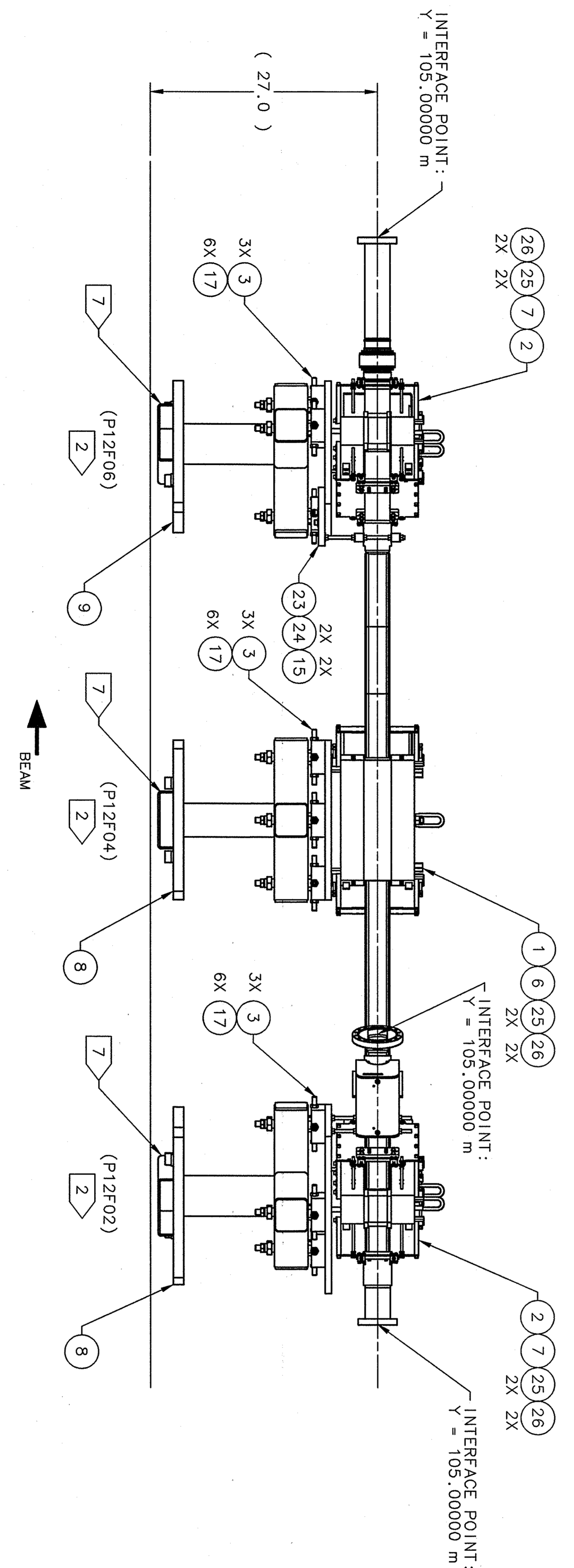
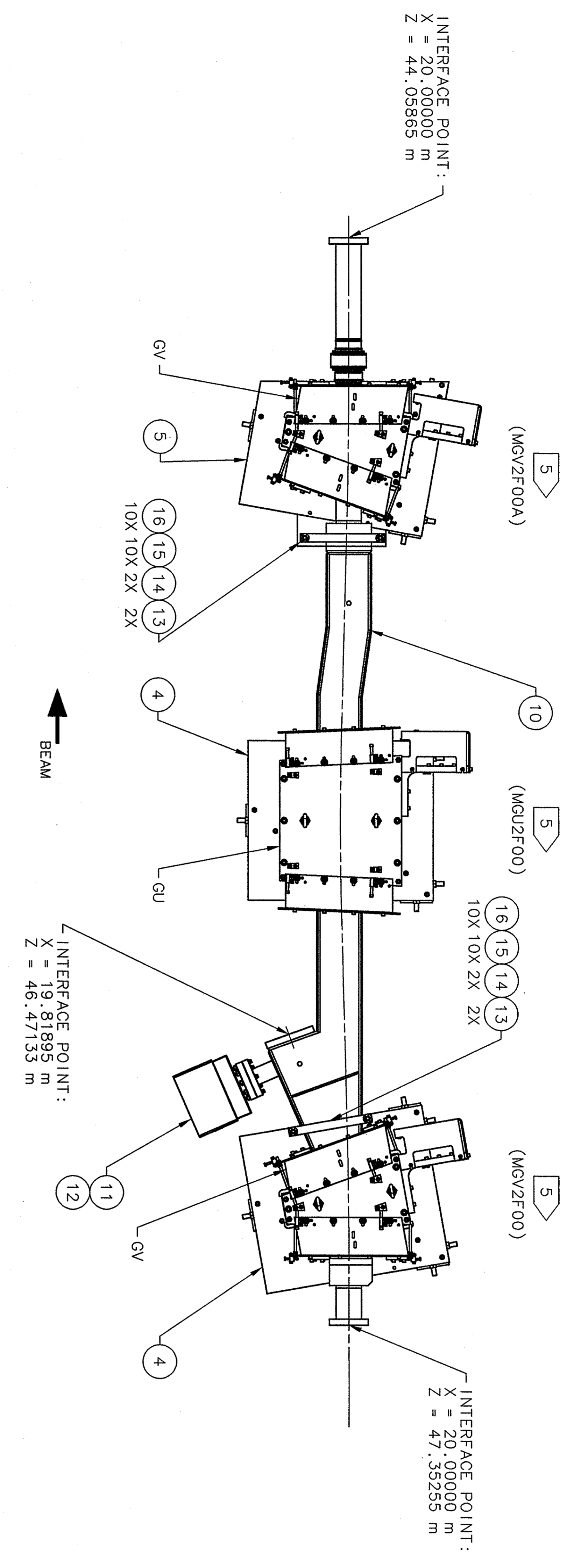


AL PLATE

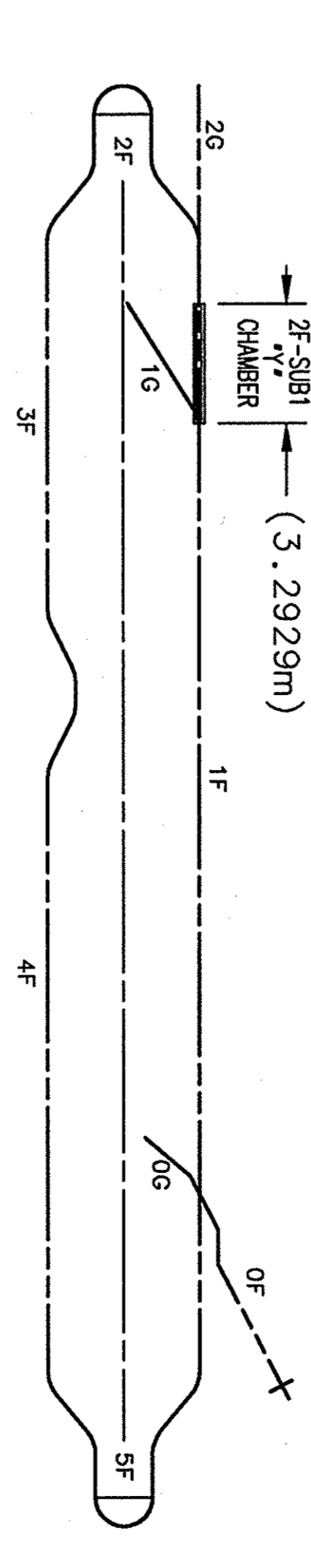
(3) Ø 3" 0.25" WALL x 3.66"L AL TUBE

(3) 1" THREADED ROD 8"L

DOCUMENT CONTROL STAMP		DIM & TOL PER ASME Y14.5 UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES		TRACKING NO. N/A		 <small>Thomas Jefferson National Accelerator Facility</small> <small>UNIVERSITY OF GEORGIA</small>	
REV		FRACTIONS ±.05	DECIMAL X ±.01	ANGLES .XXX ±.005	APPROVALS	DATE	LERF ISOTOPE PRODUCTION
MATERIAL		THIRD ANGLE PROJECTION			DRAWN Joe Gubeli	10/29/2018	MDQ1X01
FINISH MACHINED SURFACES	63/ UNLESS OTHERWISE NOTED	DO NOT SCALE DRAWING		APPROVED		APPROVED	SIZE B
				APPROVED		APPROVED	DWG. NO. LERF-ISO-520
							SCALE: USED ON ASSY NO.



- NOTES:
- CLEAN AND HANDLE PER JLAB SPECIFICATION NO. 22631-S-001 AND 22632-S-001.
 - ALL (P12FXXX) TO BE INSTALLED PER PEDESTAL AND CARTRIDGE INSTALLATION VIEW ON SHT 2.
 - REFERENCE INFORMATION:
A) BEAM ELEVATION IS 105.0000m
 - MATCHPOINTS ARE USED TO PARTITION AREAS OF REGIONS. INTERFERENCE POINTS ARE USED TO DEFINE THE CONNECTIONS BETWEEN REGIONS.
 - SEE SONGSHEET DWG NO. FEL0500550-0005 FOR COMPONENT NOMENCLATURE.
 - SEE SHT 3 FOR PEDESTAL BOLT AND CARTRIDGE COORDINATES. ALL COORDINATES ARE RELATIVE TO MACHINE ORIGIN. COORDINATES ARE IN METERS. ELECTRONIC FILE OF COORDINATES IS AVAILABLE AT: /group/ideas/jlab/fel/fel0500440-0151-.TXT
 - CONTROL BOX MUST HAVE FULL ACCESS AT BOTH ENDS AFTER GROUTING. PRECAUTIONS MUST BE TAKEN TO PREVENT ANY GROUT FROM LEAKING IN. (CONTROL BOX IS LOCATED UNDER PEDESTAL.)
 - SUGGESTED SOURCE:
PHYSICAL ELECTRONICS
6509 FLYING CLOUD DRIVE
EDEN PRAIRIE, MN. 55344
1-800-273-3603



NO.	QTY	ITEM	DESCRIPTION	MATERIAL	REVISION
6	26	HARDWARE	SOC. HEAD CAP SCREW .375-16UNC-2A X 1.25 LG	STAINLESS STEEL	
6	25	HARDWARE	SOC. HEAD CAP SCREW .438-16UNC-2A X 1.00 LG	STAINLESS STEEL	
2	24	HARDWARE	SOC. HEAD CAP SCREW .375-16UNC-2A X 1.00 LG	STAINLESS STEEL	
1	23	SPT-002-0330-0060	VACUUM CHAMBER MOUNTING PLATE		
18	22	072100100-01	PLATE WASHER		SH 2
9	21	#00049895	ANCHOR, DROP-IN - .500-13UNC		SH 2
9	20	THEADED ROD	.500-13UNC-2A X 9.00 LG.	ZINC PLATED STEEL	SH 2
9	19	HARDWARE	HEX NUT, .500-13UNC-2B	STAINLESS STEEL	SH 2
9	18	HARDWARE	LOCK WASHER, .50	ZINC PLATED STEEL	SH 2
18	17	HARDWARE	SOC. HEAD CAP SCREW .312-16UNC-2A X 1.00 LG	STAINLESS STEEL	
20	16	HARDWARE	HEX NUT, .375-16UNC-2B	STAINLESS STEEL	
22	15	HARDWARE	FLAT WASHER, SAE, .375	STAINLESS STEEL	
4	14	THEADED ROD	.375-16UNC-2A X 10.25 LG	STAINLESS STEEL	
4	13	SPT-002-0330-0058	VACUUM CHAMBER MOUNTING BAR		
1	12	PHYS. ELEC 2084040	40 L/S ION PUMP 4.63 CF7		8
1	11	VAC-500-0133-0001-06	4.63 CONFLAT HARDWARE TRND HOLES WITH BOLTS		
1	10	VAC-555-0123-0049	Y CHAMBER WELDMENT		
1	9	SPT-003-2040-1059	TEE 18.0 X 22.0 BASE 10° CUT		
2	8	SPT-003-2040-1010	SF REGION 'GV' WELDMENT		
2	7	SPT-003-2021-1028	GV SPACER		
1	6	SPT-003-2021-1027	GV SPACER		
1	5	SPT-002-0320-1003	PEDESTAL PLATE GRIDER MOD.		
2	4	SPT-002-0320-1000	PEDESTAL PLATE GRIDER		
9	3	SPT-001-0010-0101-04	ALIGNMENT CARTRIDGE / CAP ASSY		
2	2	VAC-003-0007-0000	GV DIPOLE MAGNET ASSEMBLY		
1	1	VAC-003-0006-0000	GV DIPOLE MAGNET ASSEMBLY		

APPROVALS

DESIGNED BY: [Signature]

CHECKED BY: [Signature]

DATE: 10/14/04

SCALE: 1 OF 3

NOTED: [Signature]

IR - INFRA RED REGION ASSEMBLY SUB REGION 1

FEL-050-0440-0151

AREA SIGNATURE DATE

VAC [Signature] 10/21/04

DIAG [Signature] 10/21/04

MAG [Signature] 10/21/04

OPS [Signature] 10/21/04

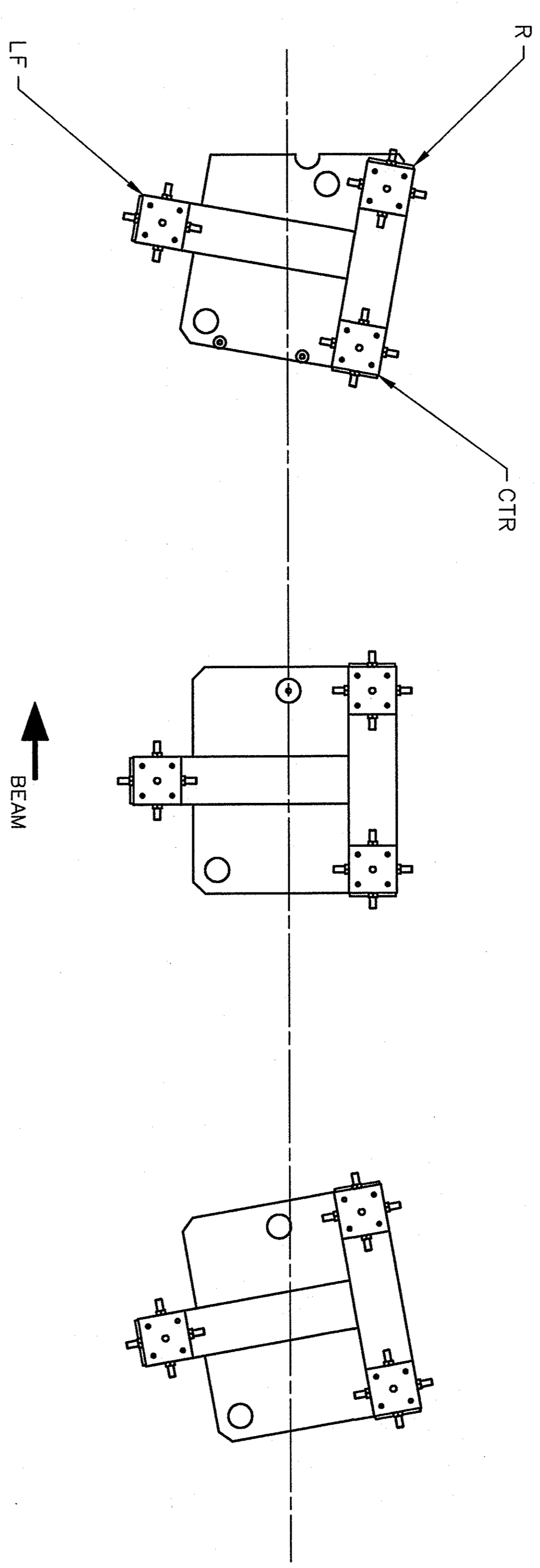
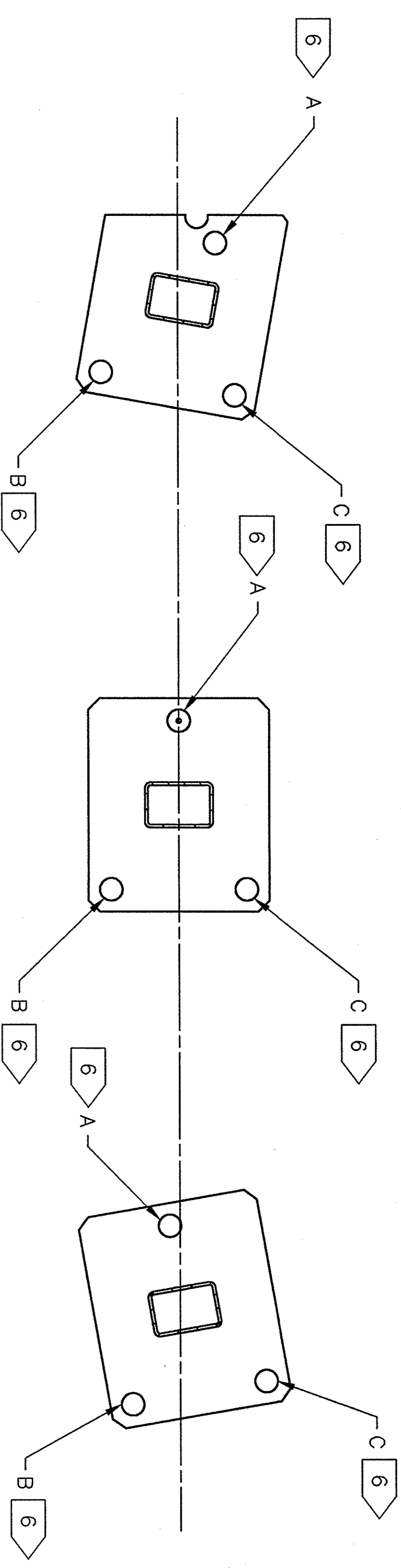
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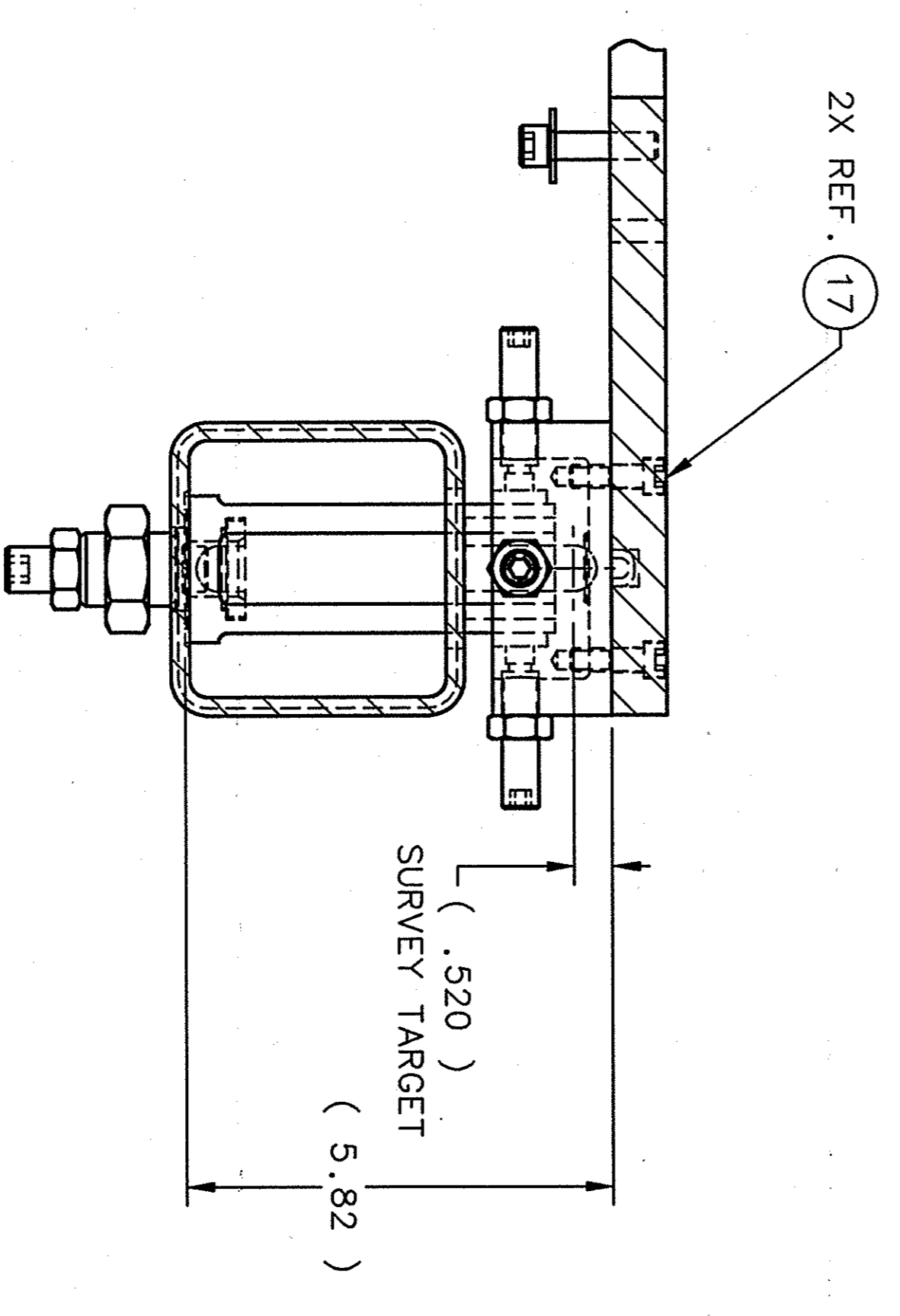
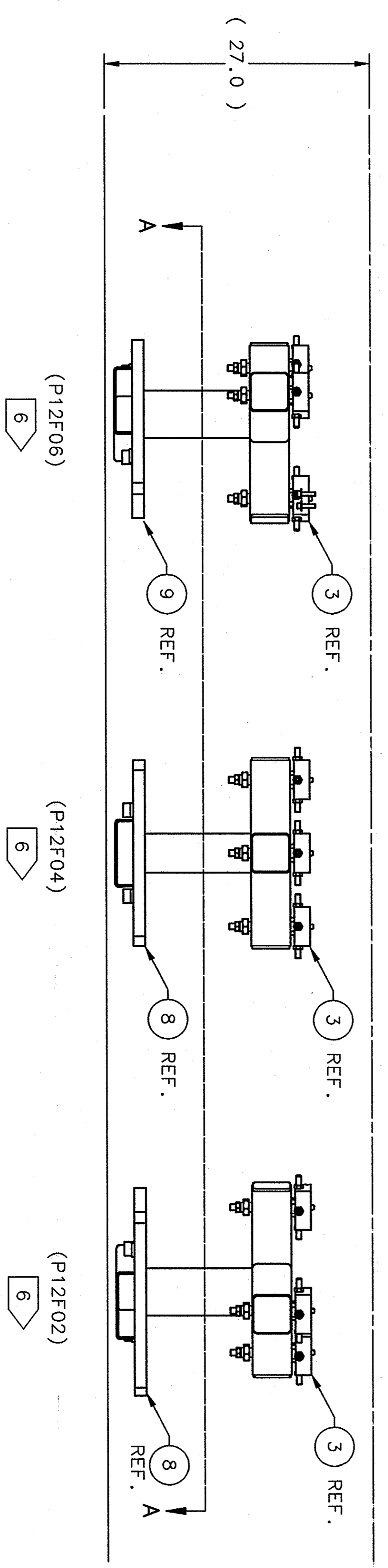
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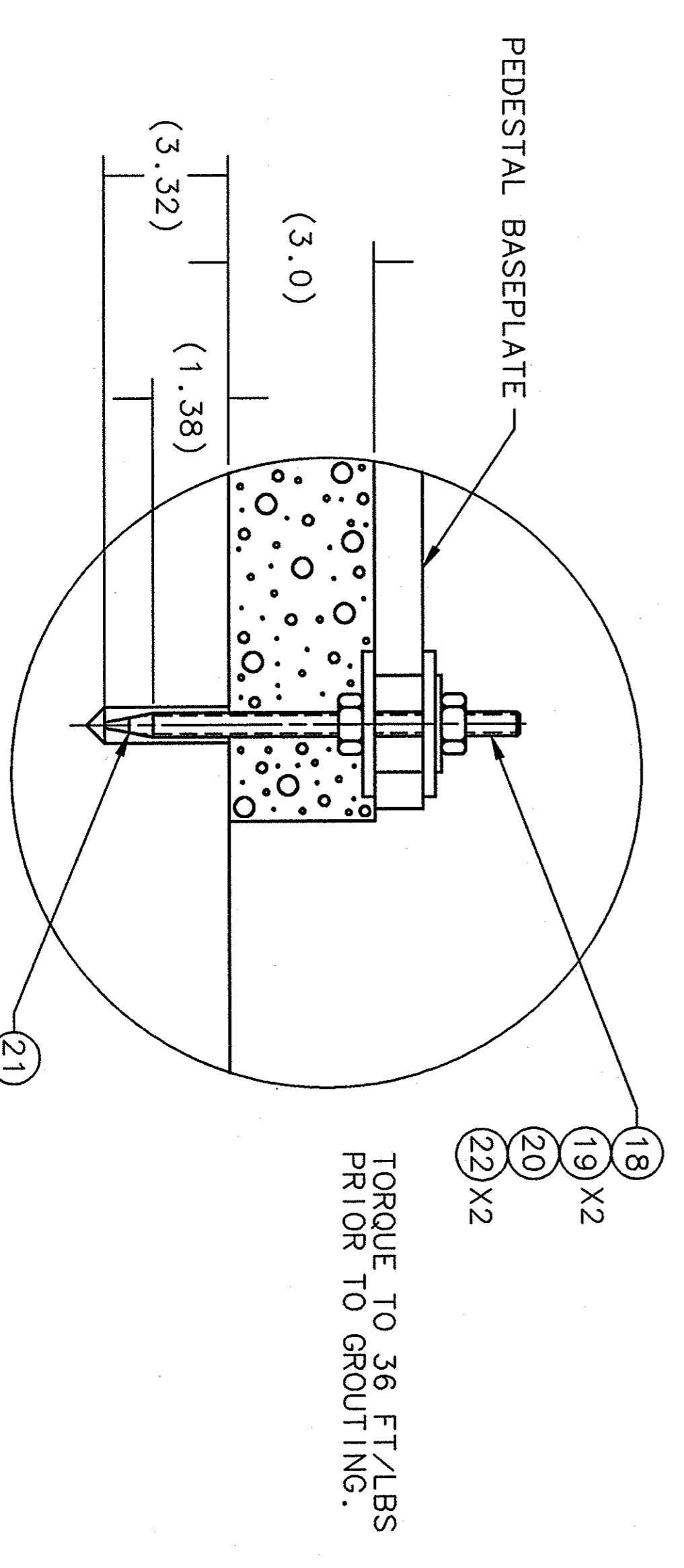
DO NOT SCALE DRAWING



PEDESTAL AND CARTRIDGE INSTALLATION
 PEDESTAL AND CARTRIDGE CAP NOMENCLATURE DEFINITION WITH PEDESTAL ORIENTATION



CARTRIDGE ASSEMBLY
 9 PLACES



SECTION A-A
 TYPICAL 3 PLACES
 EACH PEDESTAL
 NO SCALE

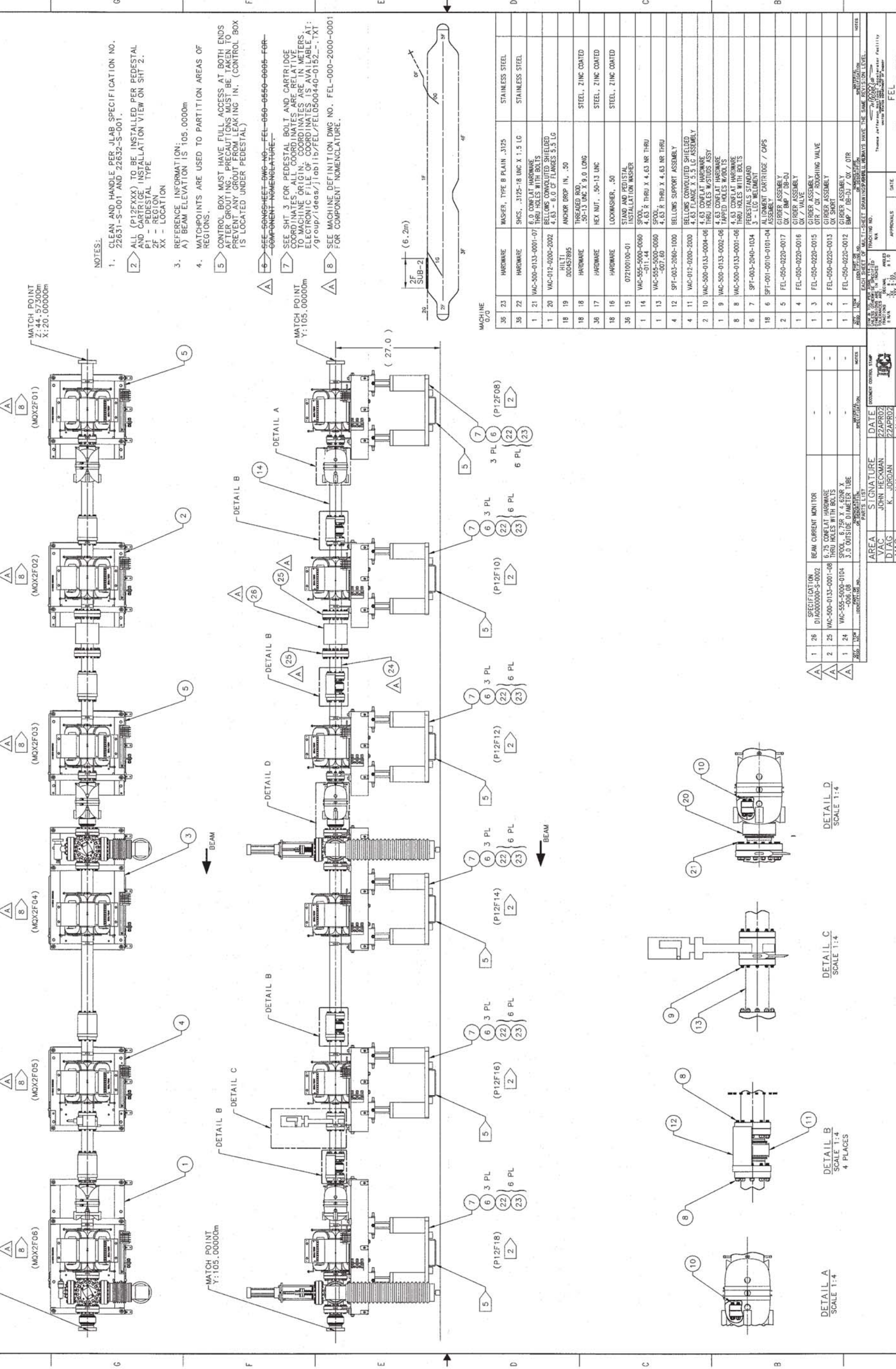
18
 19 X2
 20
 22 X2
 TORQUE TO 36 FT/LBS
 PRIOR TO GROUTING.

(COORDINATES IN METERS)

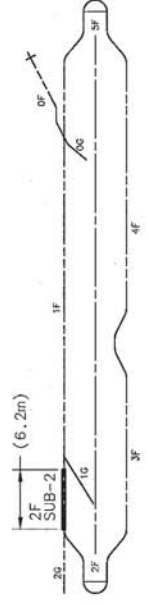
PED. BOLT LOCATION	REF. PT.	COORDINATES		
		Z	X	Y
P12F02-BOLT	A	46.77465	20.00334	104.4143
P12F02-BOLT	B	47.12340	20.21959	104.4143
P12F02-BOLT	C	47.17633	19.91942	104.4143
P12F04-BOLT	A	45.63398	20.02635	104.4143
P12F04-BOLT	B	46.01498	20.17875	104.4143
P12F04-BOLT	C	46.01498	19.87395	104.4143
P12F06-BOLT	A	44.55790	20.11068	104.4143
P12F06-BOLT	B	44.90076	20.15359	104.4143
P12F06-BOLT	C	44.84783	19.85322	104.4143

CARRIIDGE LOCATION	REF. PT.	COORDINATES		
		Z	X	Y
P12F02-CTR_CART	CENTER	46.74377	20.17844	104.8281
P12F02-L_CART	CENTER	47.01077	19.76127	104.8281
P12F02-R_CART	CENTER	47.11899	20.24460	104.8281
P12F04-CTR_CART	CENTER	45.63398	20.20415	104.8281
P12F04-L_CART	CENTER	45.82448	19.74695	104.8281
P12F04-R_CART	CENTER	46.01498	20.20415	104.8281
P12F06-CTR_CART	CENTER	44.56748	20.23795	104.8281
P12F06-L_CART	CENTER	44.63817	19.76123	104.8281
P12F06-R_CART	CENTER	44.90517	20.17841	104.8281

ZONE	REV	DESCRIPTION	DATE	APPROVED
VAR	A	1) REPLACED NOTE 6 WITH NOTE 8. 2) ADDED ITEMS 24 THRU 26. REL 105E04	11/9/05	[Signature]
			11/9/05	[Signature]



- NOTES:**
- CLEAN AND HANDLE PER JLAB SPECIFICATION NO. 22631-S-001 AND 22632-S-001.
 - ALL (P12FXXX) TO BE INSTALLED PER PEDESTAL AND CARTRIDGE INSTALLATION VIEW ON SHT 2.
P - PEDESTAL TYPE
XX - LOCATION
 - REFERENCE INFORMATION:
A) BEAM ELEVATION IS 105.0000m
 - MATCHPOINTS ARE USED TO PARTITION AREAS OF REGIONS.
 - CONTROL BOX MUST HAVE FULL ACCESS AT BOTH ENDS AFTER GROUTING. PRECAUTIONS MUST BE TAKEN TO PREVENT ANY GROUT FROM LEAKING IN. (CONTROL BOX IS LOCATED UNDER PEDESTAL)
 - SEE COMPONENT Nomenclature.
 - SEE SHT 3 FOR PEDESTAL BOLT AND CARTRIDGE COORDINATES. ALL COORDINATES ARE RELATIVE TO MACHINE ORIGIN. COORDINATES ARE IN METERS. ELECTRONIC FILE OF COORDINATES IS AVAILABLE AT: /group/ideas/10b11b/FEL/FEL050040-0152-.TXT
 - SEE MACHINE DEFINITION DWG NO. FEL-000-2000-0001 FOR COMPONENT NOMENCLATURE.

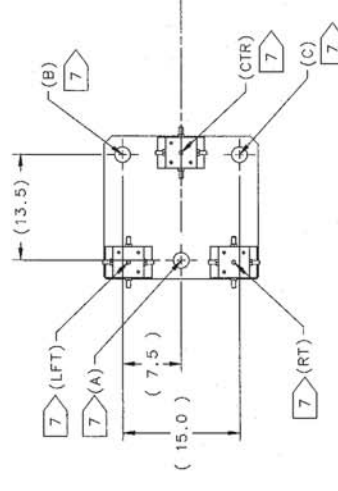


QTY	DESCRIPTION	MATERIAL	
35	23	WASHER, TYPE B PLAIN .3125	STAINLESS STEEL
36	22	HARDWARE	STAINLESS STEEL
1	21	VAC-500-0133-0001-07 6.0 CONFLAT HARDWARE THRU HOLES WITH BOLTS	
1	20	VAC-012-0200-2002 BELLWS CONVOLUTED SHIELDED 4.63 - 6.0 OF FLANGES 5.5 LG	
18	19	HILTI 000457895 ANCHOR DROP IN .50	
18	18	HARDWARE .50-13 UNC X 3.0 LONG	STEEL, ZINC COATED
36	17	HARDWARE HEX NUT .50-13 UNC	STEEL, ZINC COATED
18	16	HARDWARE LOCKWASHER .50	STEEL, ZINC COATED
36	15	072100100-01 STAND AND PEDESTAL INSTALLATION WASHER	
1	14	VAC-555-5000-0060 -011.44 SPOOL 4.63 R THRU X 4.63 NR THRU	
1	13	VAC-555-5000-0060 -007.60 SPOOL 4.63 R THRU X 4.63 NR THRU	
4	12	SPT-003-2080-1000 BELLWS SUPPORT ASSEMBLY	
4	11	VAC-012-0200-2000 BELLWS CONVOLUTED SHIELDED 4.63 FLANGE X 5.5 LG ASSEMBLY	
2	10	VAC-500-0133-0004-06 4.63 CONFLAT HARDWARE THRU HOLES W/STUDS ASSY	
1	9	VAC-500-0133-0002-06 4.63 CONFLAT HARDWARE THRU HOLES W/STUDS ASSY	
8	8	VAC-500-0133-0001-06 4.63 CONFLAT HARDWARE THRU HOLES WITH BOLTS	
6	7	SPT-003-2040-1034 PEDESTALS STANDARO 3 - LEG WELMENT	
18	6	SPT-001-0010-0101-04 ALIGNMENT CARTRIDGE / CAPS ASSEMBLY	
2	5	FEL-050-0220-0017 GIRDER ASSEMBLY GX / BMP / DB-DJ	
1	4	FEL-050-0220-0016 GIRDER ASSEMBLY GX / VALVE	
1	3	FEL-050-0220-0015 GIRDER ASSEMBLY DIR / GX / ROUGHING VALVE	
1	2	FEL-050-0220-0013 GIRDER ASSEMBLY	
1	1	FEL-050-0220-0012 GIRDER ASSEMBLY BMP / DB-DJ / GX / DIR	

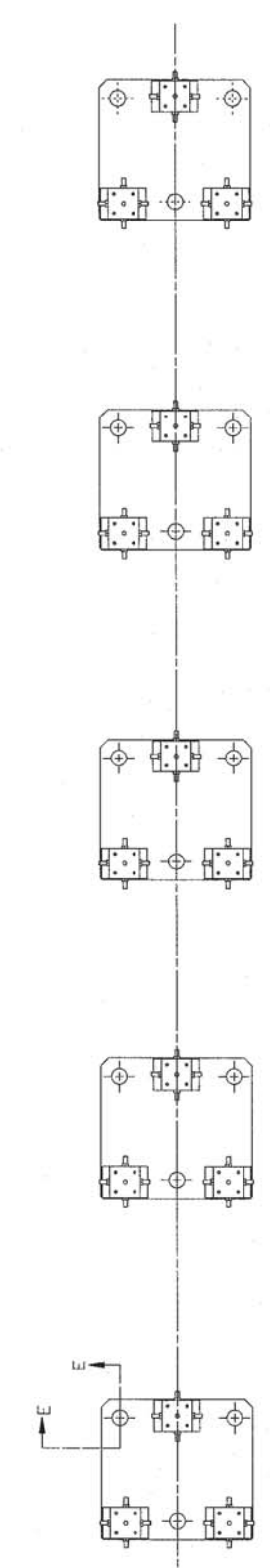
SPECIFICATION	DATE	SIGNATURE	AREA
1 26 DIA000000S-0002	22APR02	JOHN HECAMAN	BEAM CURRENT MONITOR
2 25 VAC-500-0133-0001-08	22APR02	K. JORDAN	6.75 CONFLAT HARDWARE THRU HOLES WITH BOLTS
1 24 VAC-555-5000-0104 -006.08	19APR02	C. CURTIS	SPOOL W/ 765 X 4.63 NR X 3.0 OUTSIDE DIAMETER TUBE

DETAIL	SCALE	PLACES
DETAIL A	SCALE 1:4	4 PLACES
DETAIL B	SCALE 1:4	4 PLACES
DETAIL C	SCALE 1:4	
DETAIL D	SCALE 1:4	

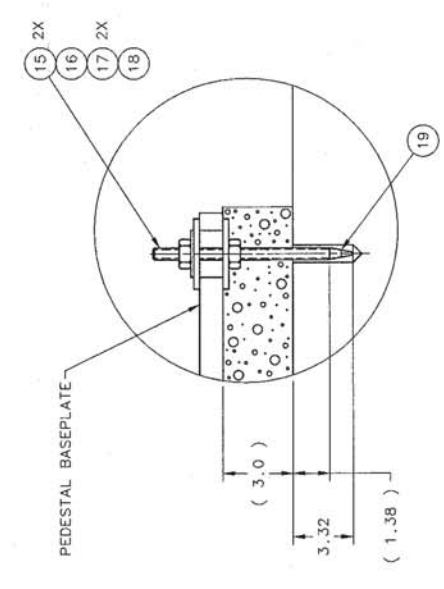
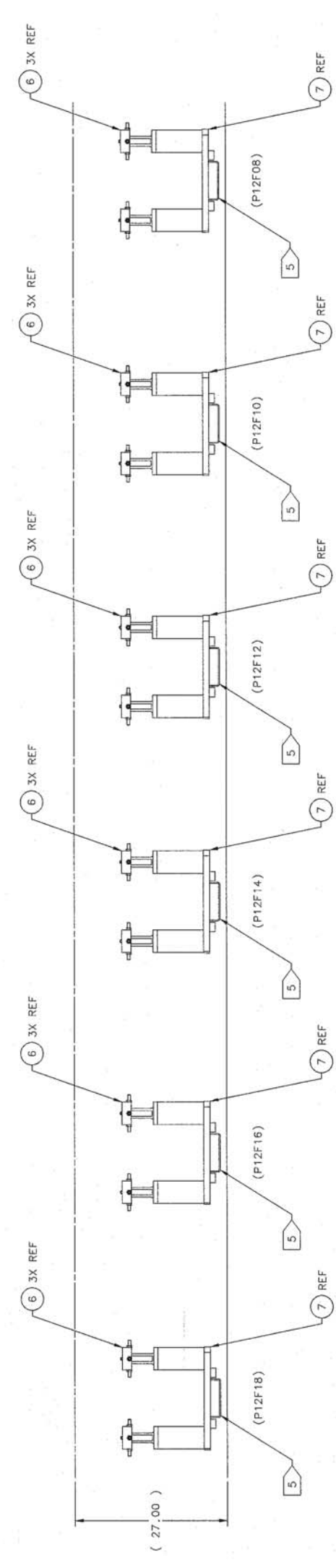
THIRD ANGLE PROJECTION
 APPROVALS: [Signatures]
 CHECKED: [Name]
 DRAWN: [Name]
 DATE: [Date]
 TITLE: FEL - INFRA RED REGION ASSEMBLY
 10W - 2F - 1ST ARC SUB-REGION 2
 SHEET 1 OF 3
 SCALE: 1:8
 PROJECT: FEL-050-0440-0152 A



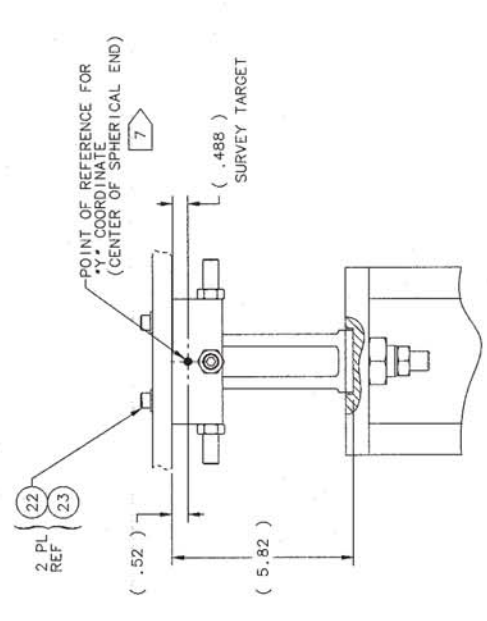
PEDESTAL AND CARTRIDGE INSTALLATION
 PEDESTAL AND CARTRIDGE CAP NOMENCLATURE
 DEFINITION W/PEDESTAL ORIENTATION



PEDESTAL / CARTRIDGE ORIENTATION
 BEAM



SECTION E-E
 TYPICAL 3 PLACES
 EACH PEDESTAL



CARTRIDGE ASSEMBLY
 VIEW ROTATED 90 CW TO BEAM
 15 PLACES

(COORDINATES IN METERS)

PED. BOLT LOCATION	REF. PT.	COORDINATES	
		Z	Y
P12F08-BOLT A	A	44.07780	19.99997
P12F08-BOLT B	B	44.42115	20.19047
P12F08-BOLT C	C	44.42115	19.80947
P12F10-BOLT A	A	42.98280	20.00000
P12F10-BOLT B	B	43.32615	20.19050
P12F10-BOLT C	C	43.32615	19.80950
P12F12-BOLT A	A	41.88780	20.00000
P12F12-BOLT B	B	42.23115	20.19050
P12F12-BOLT C	C	42.23115	19.80950
P12F14-BOLT A	A	40.83090	20.00000
P12F14-BOLT B	B	41.17425	20.19050
P12F14-BOLT C	C	41.17425	19.80950
P12F16-BOLT A	A	39.69780	20.00000
P12F16-BOLT B	B	40.04115	20.19050
P12F16-BOLT C	C	40.04115	19.80950
P12F18-BOLT A	A	38.59010	20.00000
P12F18-BOLT B	B	38.93345	20.19050
P12F18-BOLT C	C	38.93345	19.80950

CARTRIDGE LOCATION	REF. PT.	COORDINATES	
		Z	Y
P12F08-CTR_CART CENTER	A	44.42772	19.99996
P12F08-L_CART CENTER	B	44.07123	20.17163
P12F08-R_CART CENTER	C	44.07123	19.82829
P12F10-CTR_CART CENTER	A	43.33272	20.00000
P12F10-LFT_CART CENTER	B	42.97623	20.17167
P12F10-RT_CART CENTER	C	42.97623	19.82833
P12F12-CTR_CART CENTER	A	42.23772	20.00000
P12F12-LFT_CART CENTER	B	41.88123	20.17167
P12F12-RT_CART CENTER	C	41.88123	19.82833
P12F14-CTR_CART CENTER	A	41.18082	20.00000
P12F14-LFT_CART CENTER	B	40.82433	20.17167
P12F14-RT_CART CENTER	C	40.82433	19.82833
P12F16-CTR_CART CENTER	A	40.04772	20.00000
P12F16-LFT_CART CENTER	B	39.69123	20.17167
P12F16-RT_CART CENTER	C	39.69123	19.82833
P12F18-CTR_CART CENTER	A	38.94002	20.00000
P12F18-LFT_CART CENTER	B	38.58353	20.17167
P12F18-RT_CART CENTER	C	38.58353	19.82831