



MEBT Chopper Systems Coordination Meeting

January 11, 2001, 8:30 AM PST

1. **Chopper Structure Overview** **LANL**
 - Components
 - Cooling Requirements
 - Instrumentation

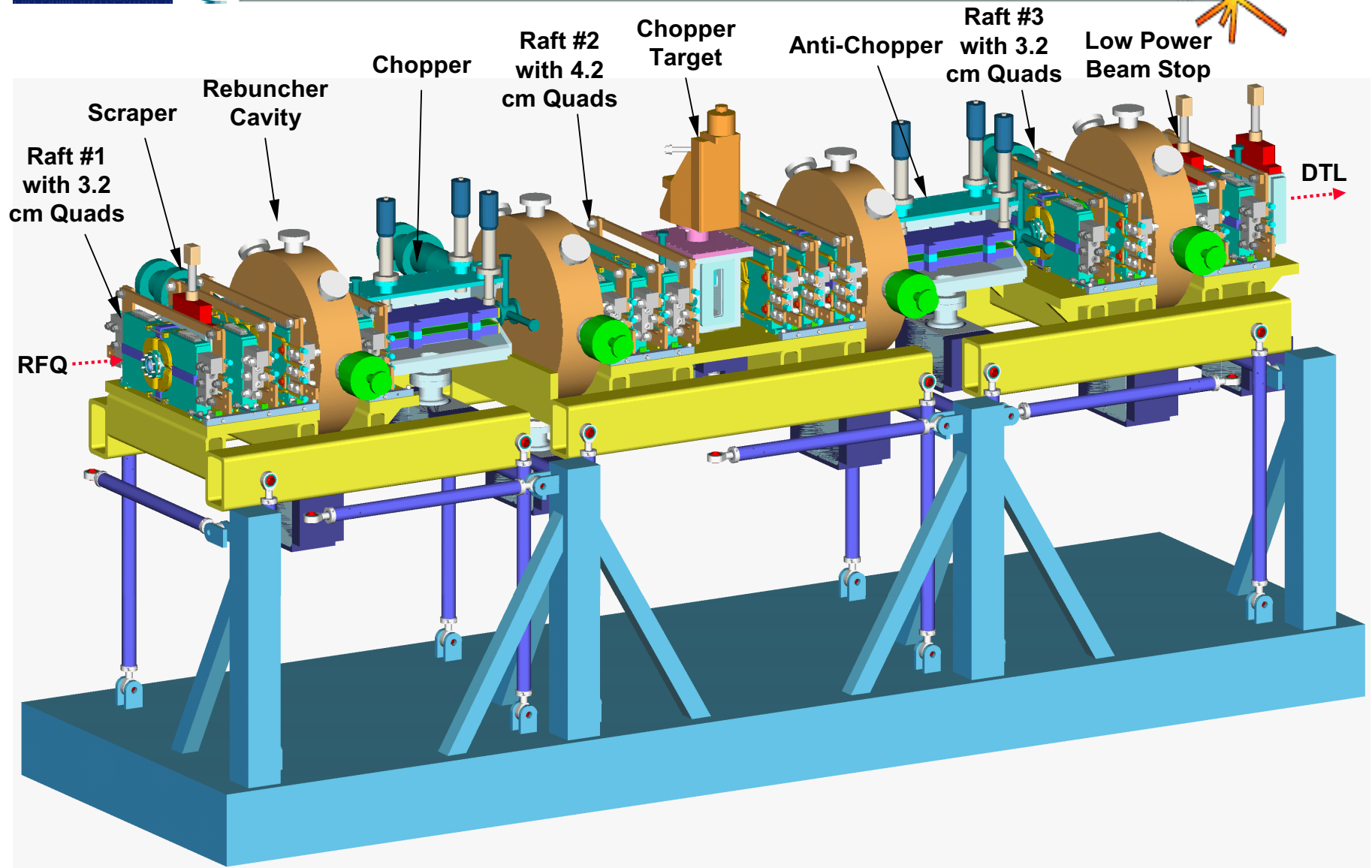
2. **Vacuum Shell Overview** **LBL**
 - Components ([MEBT](#), [Chopper Assembly](#))
 - Interface with beamline ([raft iso](#), [raft top view](#))

3. **Interface Finalization**
 - Interface Dimensions ([Chopper Assembly Interface](#))
 - Hardware Responsibilities
 - LANL Chopper Structures ([assy_1966_10-25-00](#))
 - HV Feedthroughs ([Photo](#))
 - Scraper Assemblies
 - In-vacuum HV Coax
 - In-vacuum water tubing
 - Thermocouples (up to feedthrough)

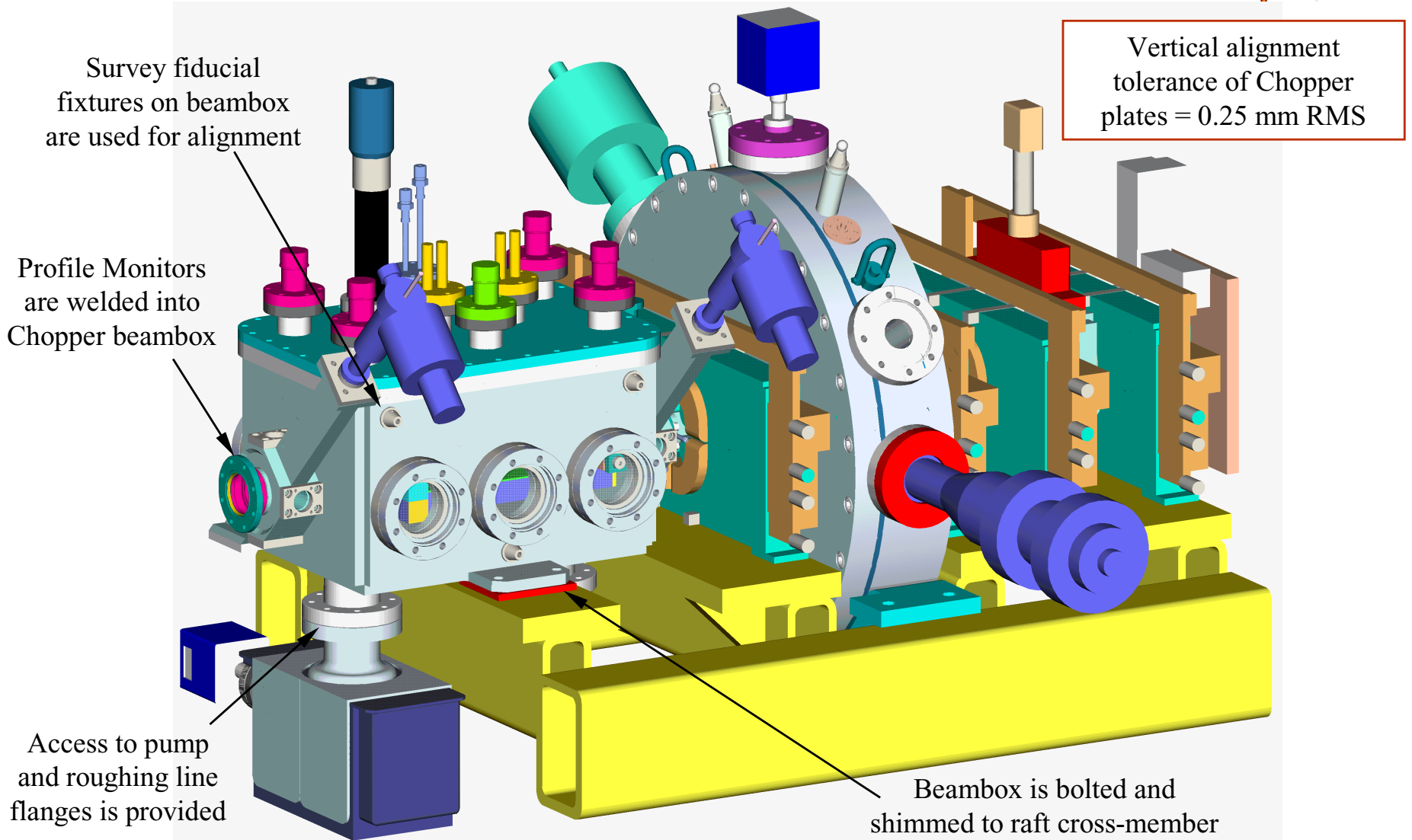
 - LBL Vacuum Shell ([beambox](#), [cover](#))
 - Pivot Assembly ([pivot bracket](#))
 - Ball Joint Assembly
 - Micrometer Feedthrough
 - Water Feedthrough
 - Signal Feedthrough
 - Thermocouple Feedthrough

4. **Schedule**
 - Assembly Plan ([tri_1](#), [tri_2](#), [tri_3](#), [tri_4](#), [new_front](#))
 - Deliverables

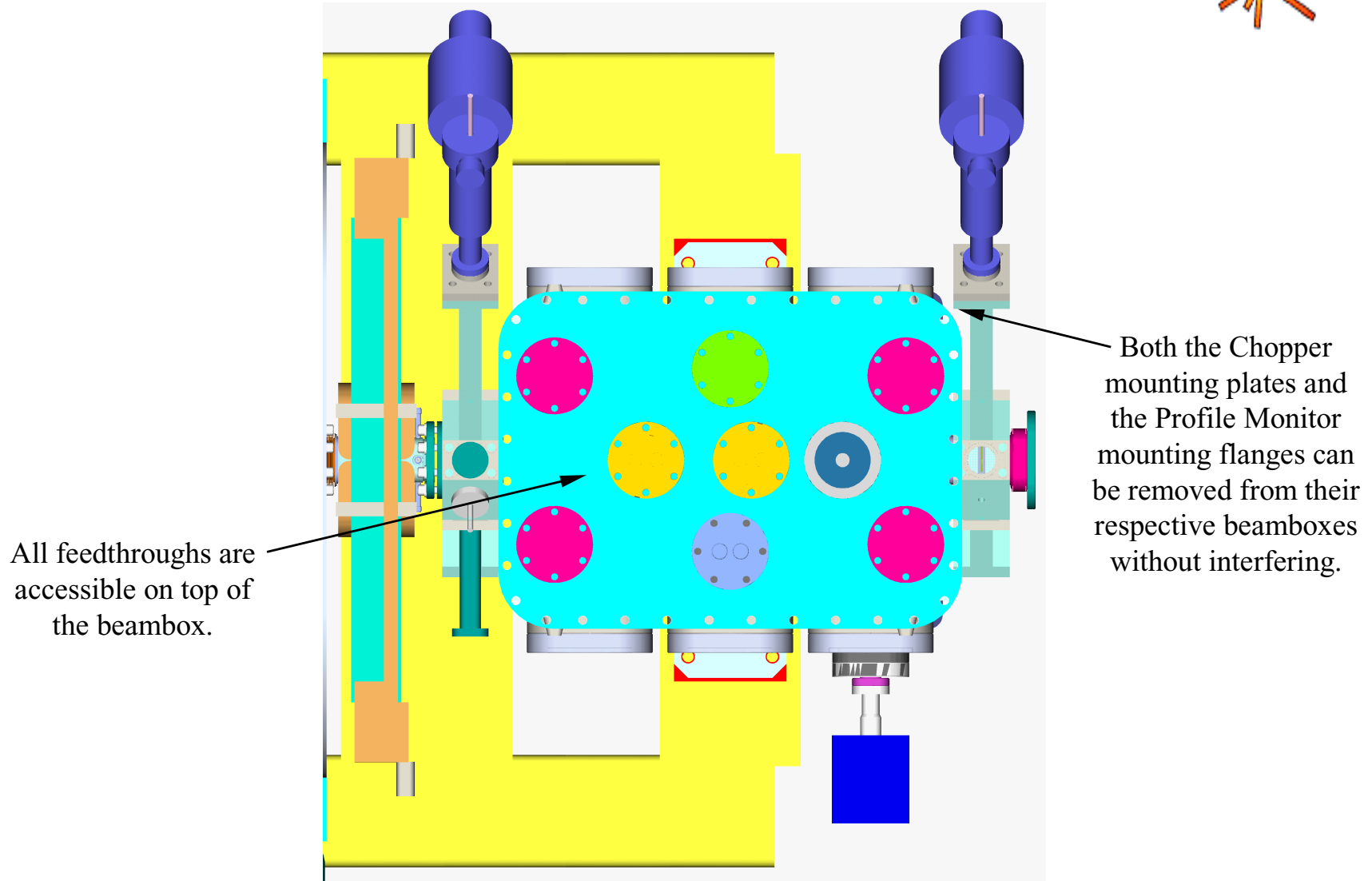
MEBT Components

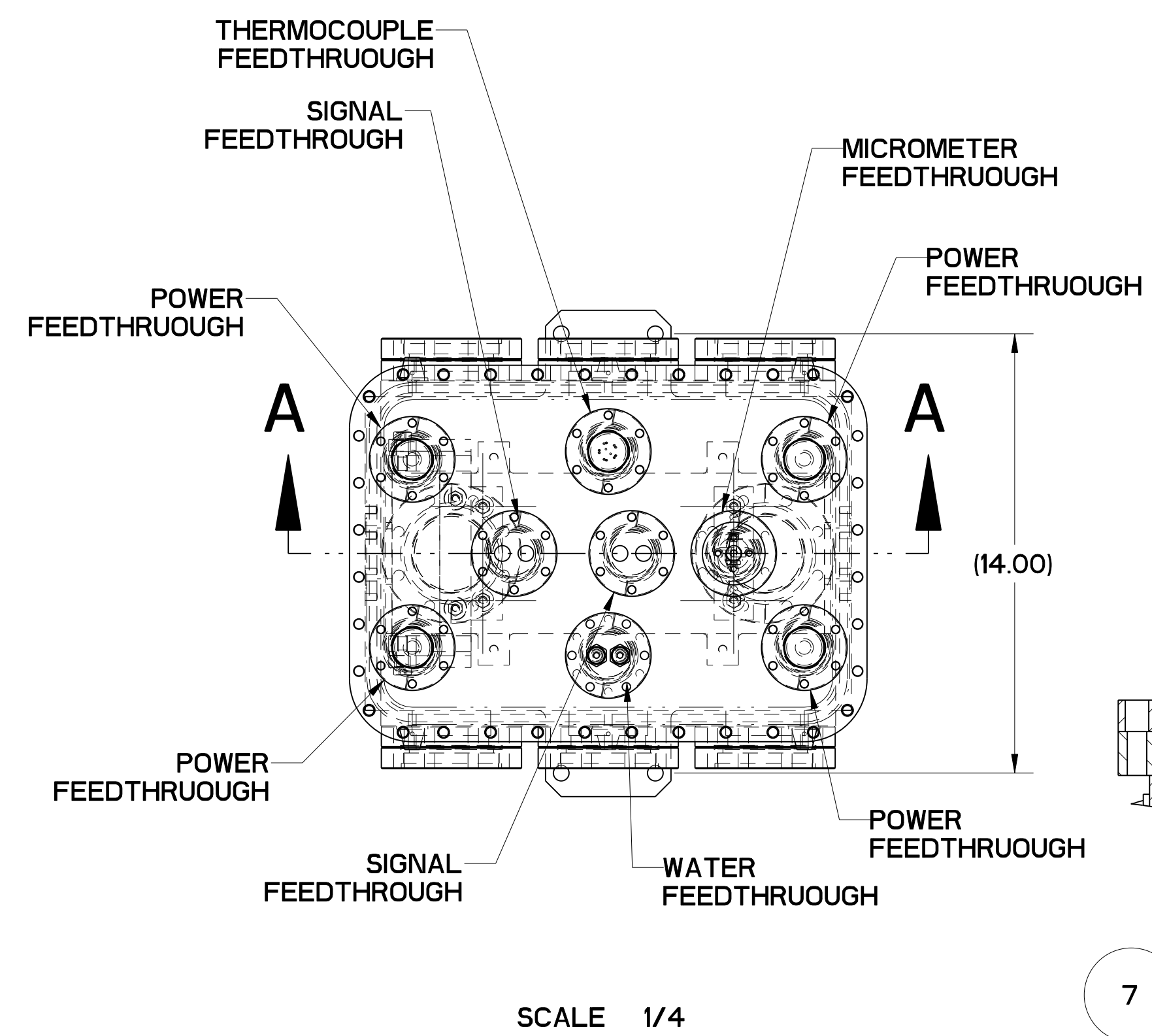


Chopper on MEBT Raft

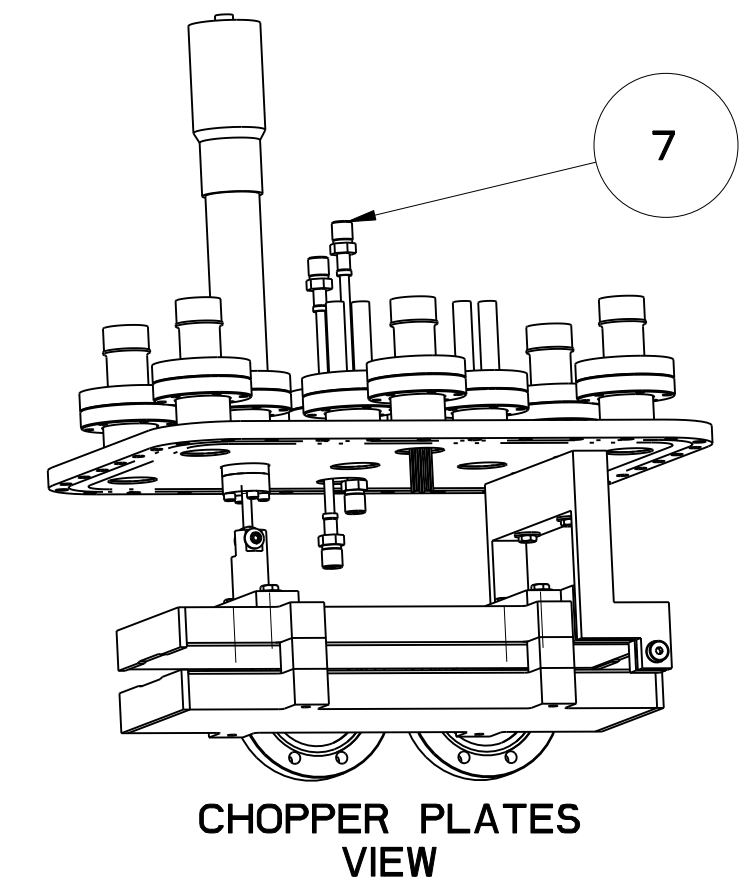


Mounting Plate Accessibility

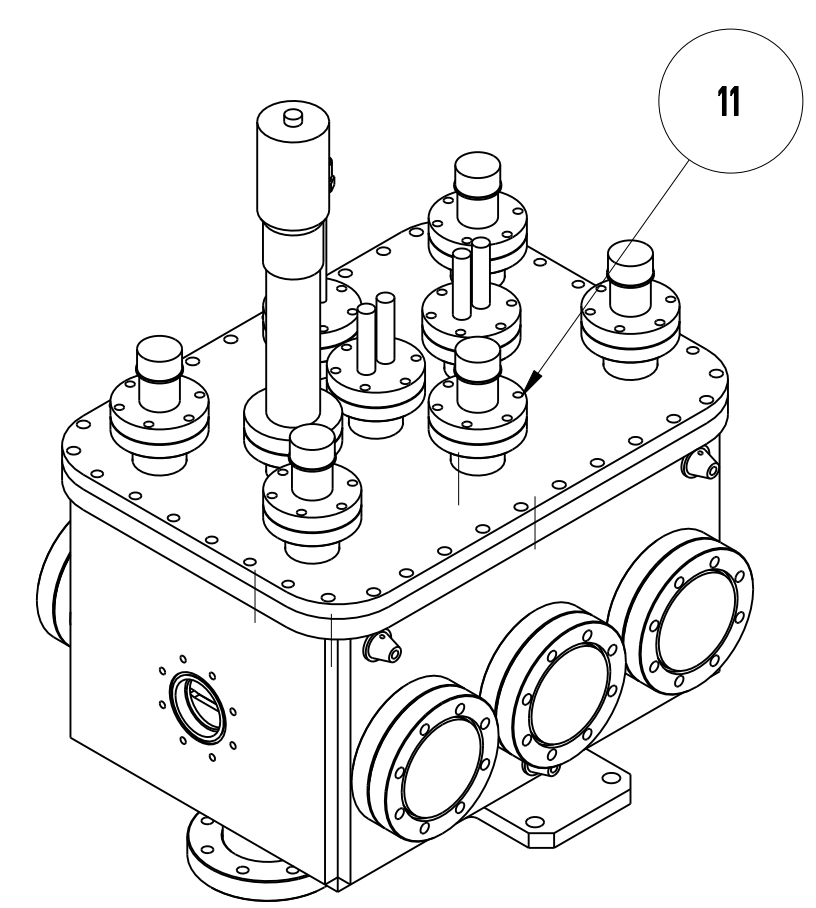




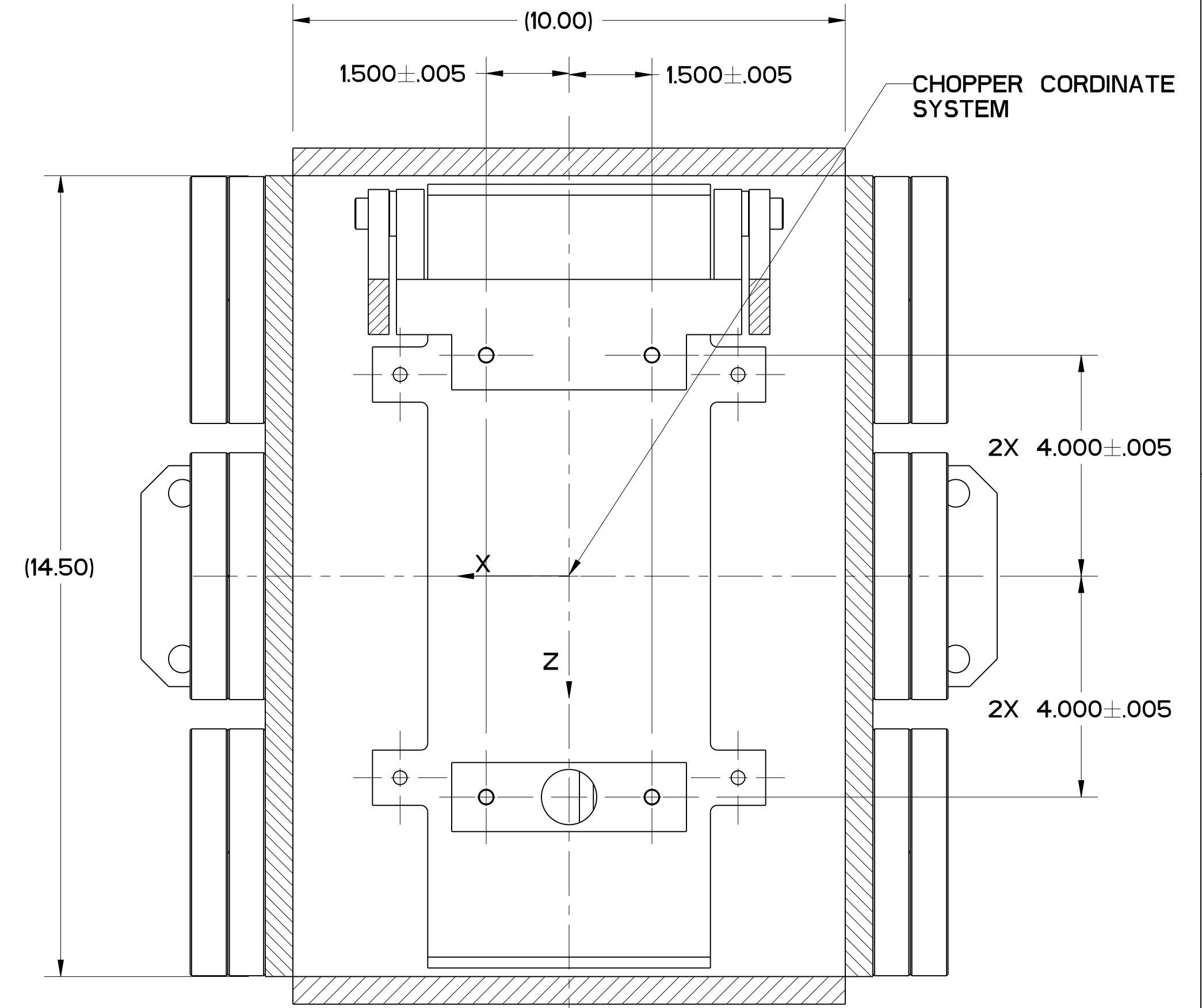
SCALE 1/4



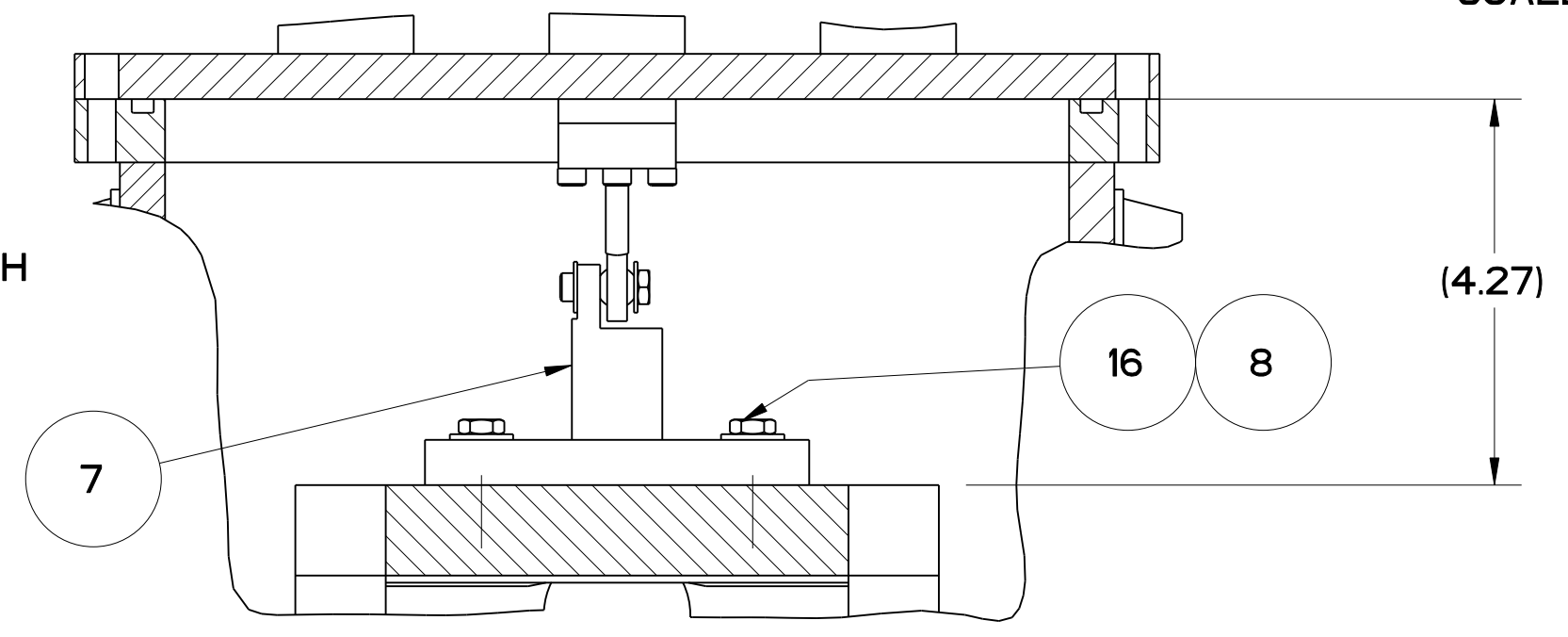
SCALE 3/16



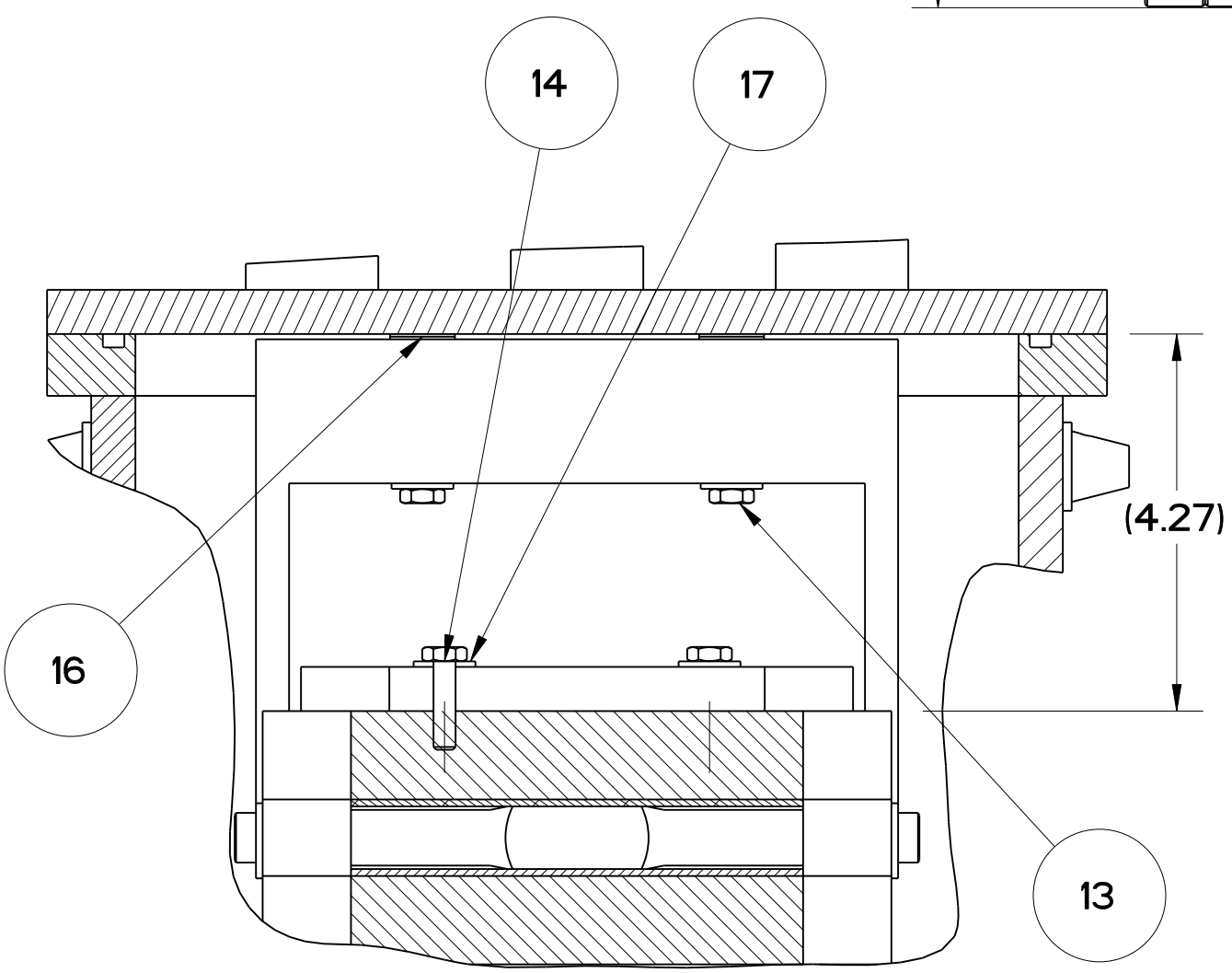
SCALE 3/16



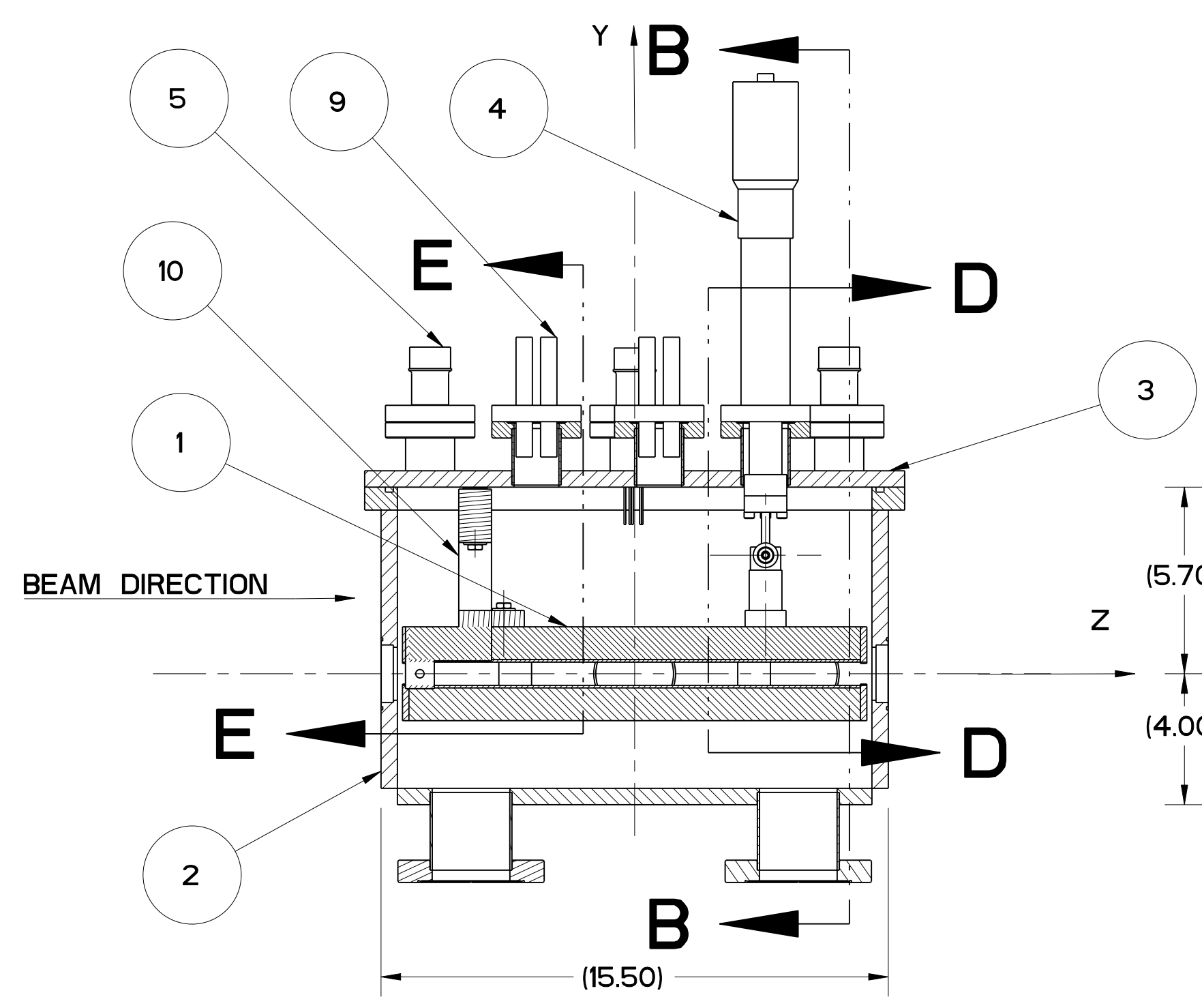
SECTION C-C SCALE 1/2



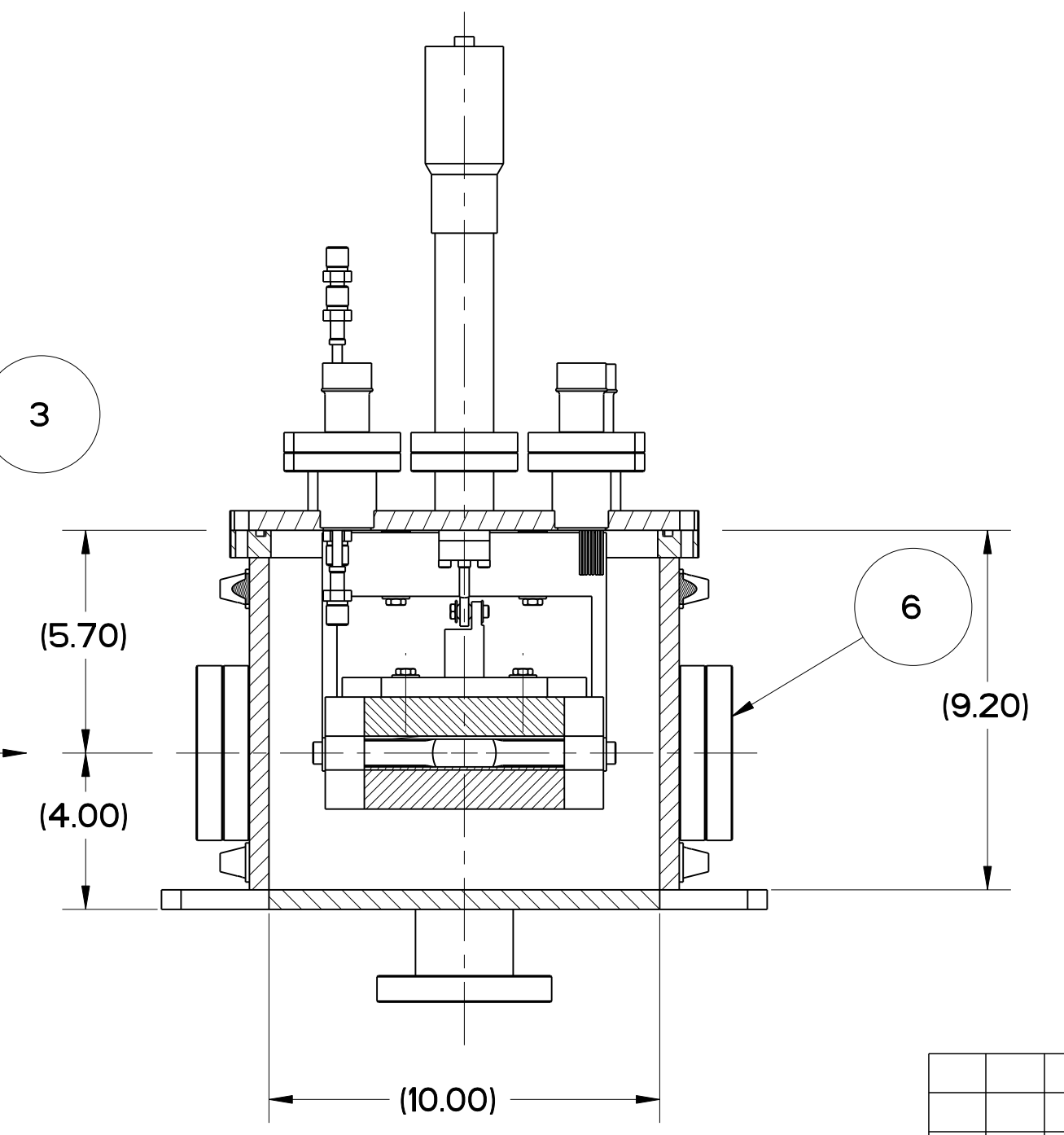
SECTION D-D SCALE 1/2



SECTION E-E SCALE 1/2



SECTION A-A



SECTION B-B

ITEM	PART NO	REQD	DESCRIPTION	MATERIAL
17	6		WASHER .25 NOM	
16	4		SHIM SUSPENSION	
14	4		HEX. HD. BOLT .25-28 UNF 2A, .75, VENTED	
13	2		HEX HD. BOLT .25-28 UNF. 2.00, VENTED	
12	-	1	WATER FEEDTHROUGH	
11	-	1	THERMOCOUPLE FEEDTHROUGH	
10	25B427	1	CHOPPER BOX HINGE SUSPENSION ASSEMBLY	
9	-	2	SIGNAL FEEDTHROUGH	
8	-	1	INNER PIVOT BRACKET	304 SS
7	-	1	BALL JOINT ASSEMBLY	
6	-	6	4 1/2 CONFLAT VIEW PORT	
5	-	4	POWER FEEDTHROUGH (LANL)	
4	-	1	CHOPPER MICROMETER FEEDTHROUGH	
3	25B426	1	CHOPPER BOX COVER ASSEMBLY	
2	25B421	1	CHOPPER BOX WELDMENT	
1	-	1	CHOPPER PLATES ASSY (LANL)	

REV	DWG	CHK	ZONE	DATE	CHANGES

UNLESS OTHERWISE SPECIFIED
 PROJECTION:
 TOLERANCES: XX ± .01 FRAC ± 1/64
 XXX ± .003 Angles ± 10°
 XXXX ± .0010 FINISH 12/1
 DO NOT SCALE PRINT
 THREADS ARE CLASS 2
 CHAMFER ENDS OF ALL SCREW THREADS 30°
 CUT ROUND, 15 THREAD RELIEF ON MACHINED THREADS
 BREAK EDGES .016 MAX. ON MACHINED WORK
 REMOVE BURRS, WELD SPLATTER & LOOSE SCALE
 IN ACCORDANCE WITH ASME Y14.5M & B46.1

SHOP ORDERS

ACCT NO.	NO.	SER. NO.
DEL. TO	ISSD DATE	REQD DATE
SURFACE TREATMT	TAG	
PROJECT NUMBER	N/A	
PROJECT NAME	N/A	
DWG BY: Andrew Zachoszcz	DATE: 25-Sep-00	
CHK BY: None	DATE:	
APP BY: Daryl Oshatz	DATE:	

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 BERKELEY NATIONAL LABORATORY
 UNIVERSITY OF CALIFORNIA - BERKELEY

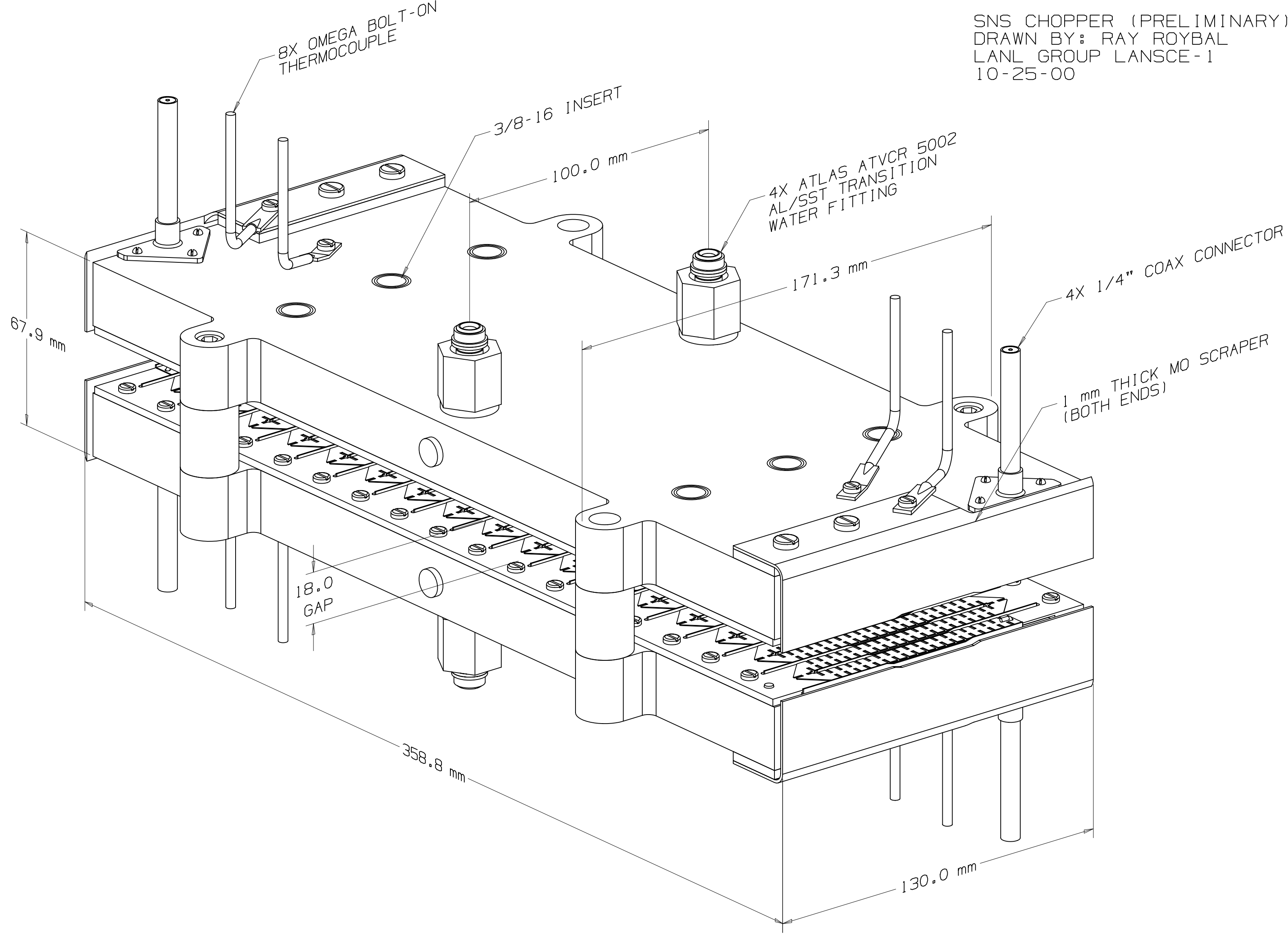
SNS - FES MEBT
 BEAM TRANSPORTATION SYSTEMS
 CHOPPER ASSEMBLY INTERFACE

MICROFILMED:

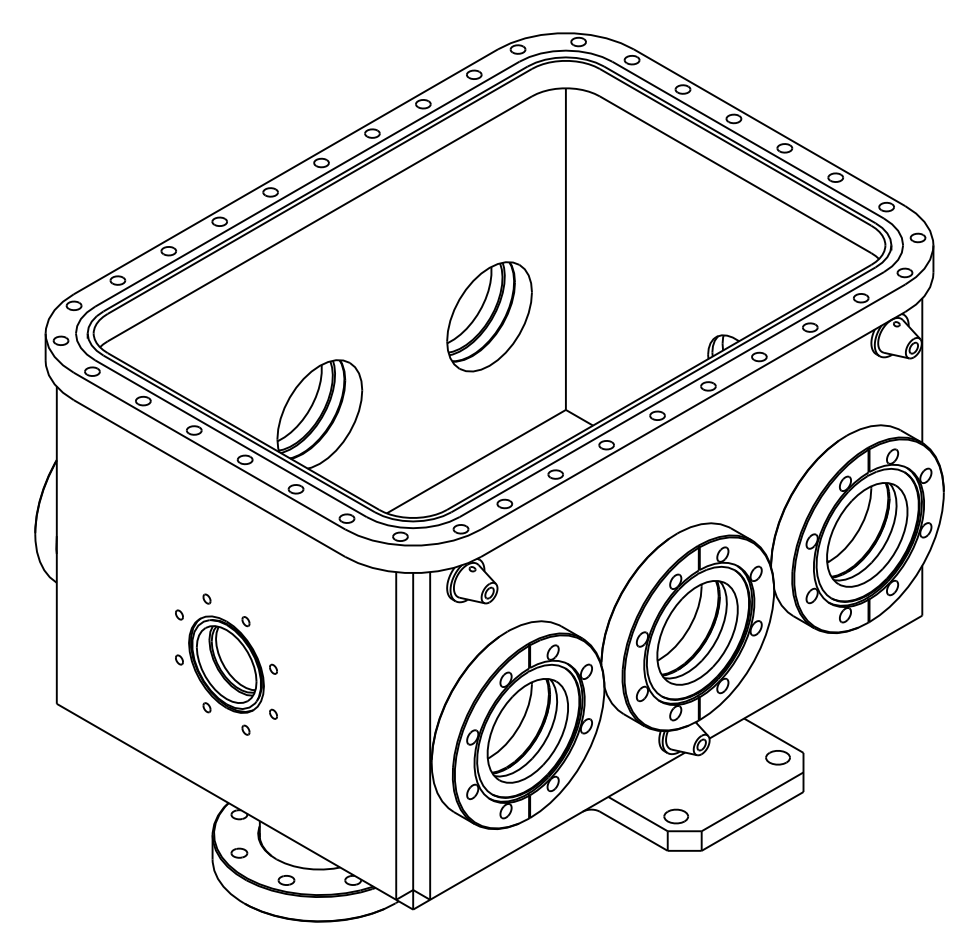
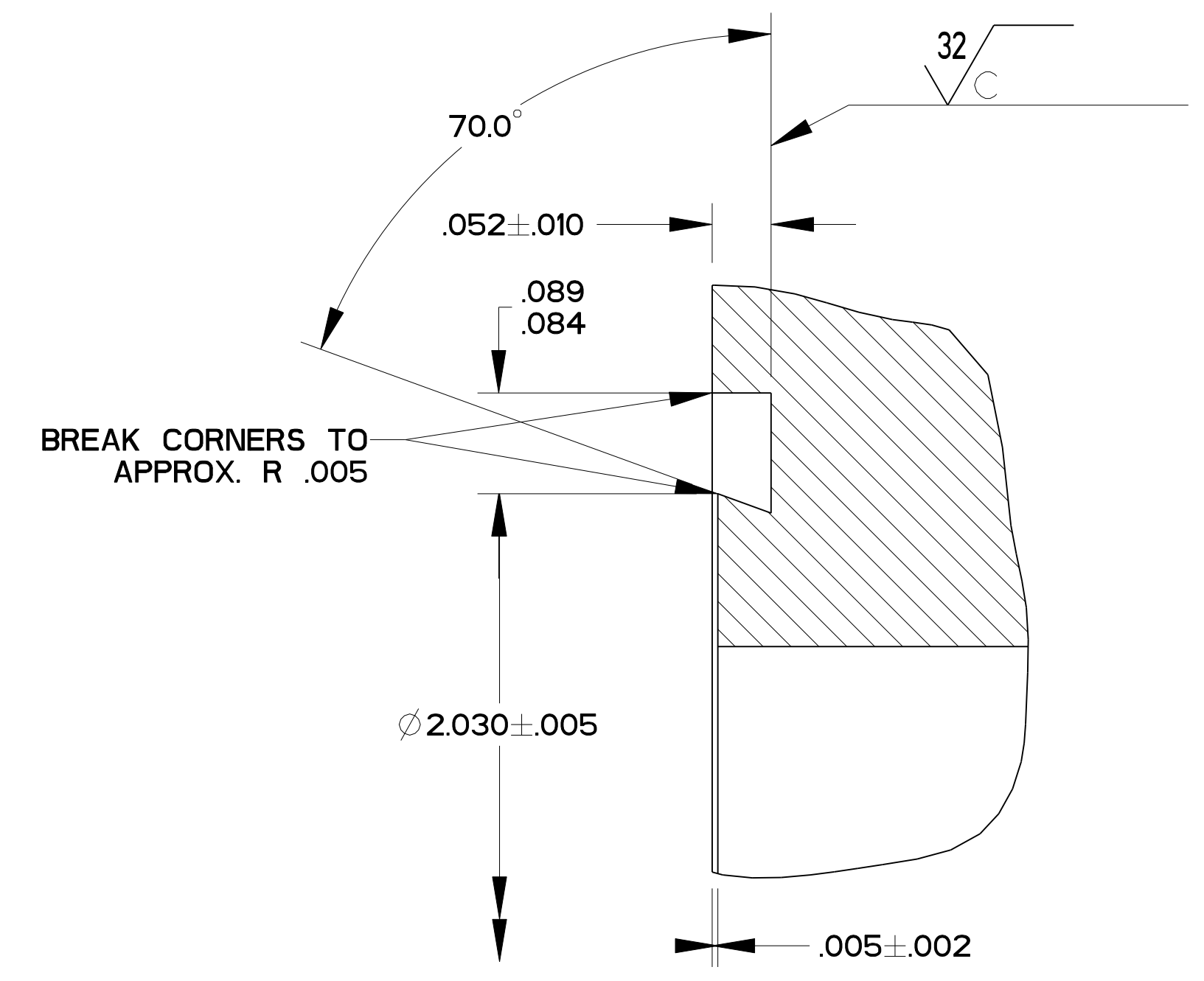
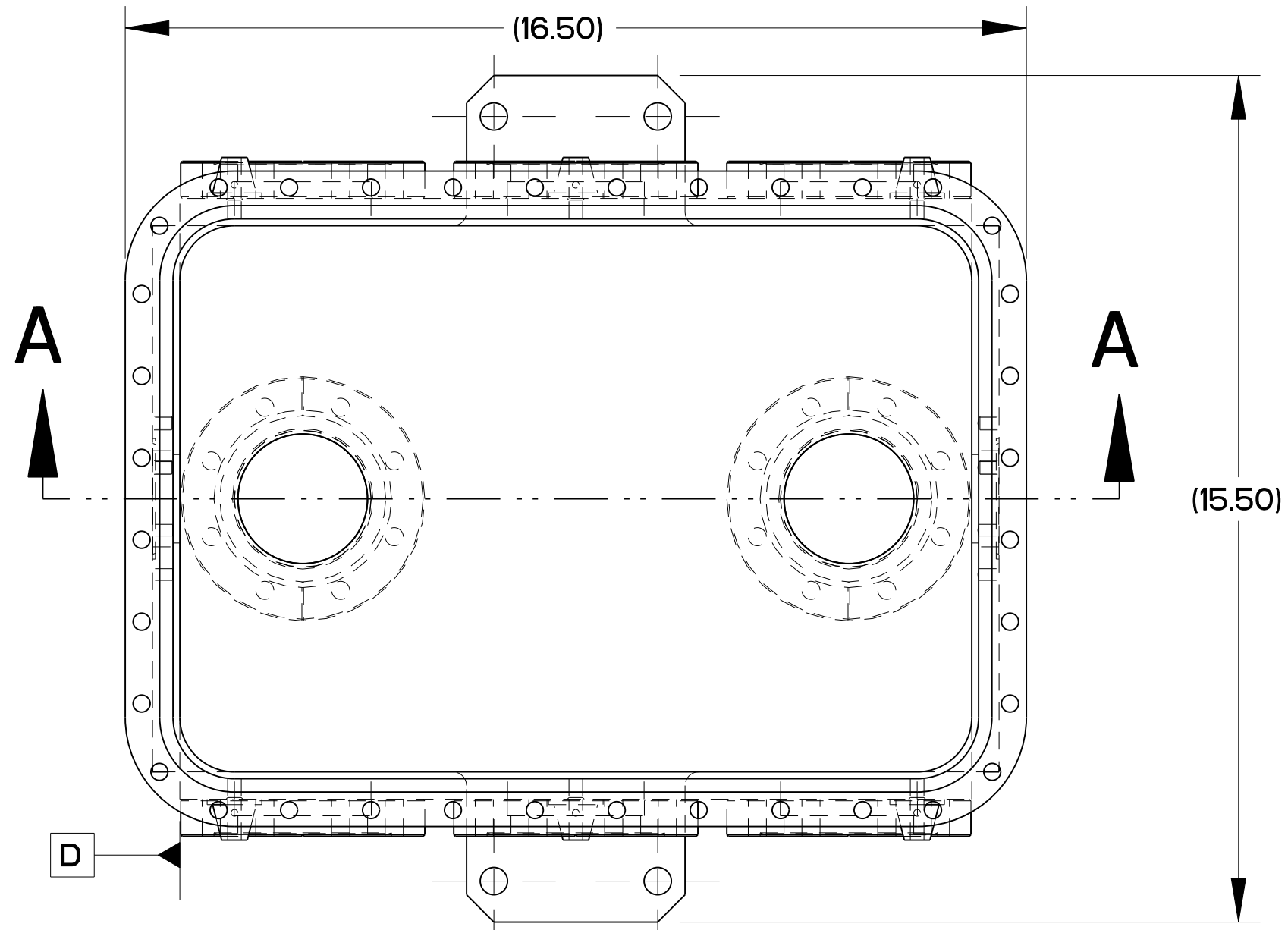
DWG. TYPE: ASSEM	SHOWN ON: -	SCALE: 1/4	DO NOT SCALE PRINTS
PATENT CLEAR: -	DESIGN ACCT. NO.:	CATEGORY CODE: FE3312	DWG. NO. 25B4204
			REV. C

SHEET 1 OF 1

SNS CHOPPER (PRELIMINARY)
DRAWN BY: RAY ROYBAL
LANL GROUP LANSCE-1
10-25-00

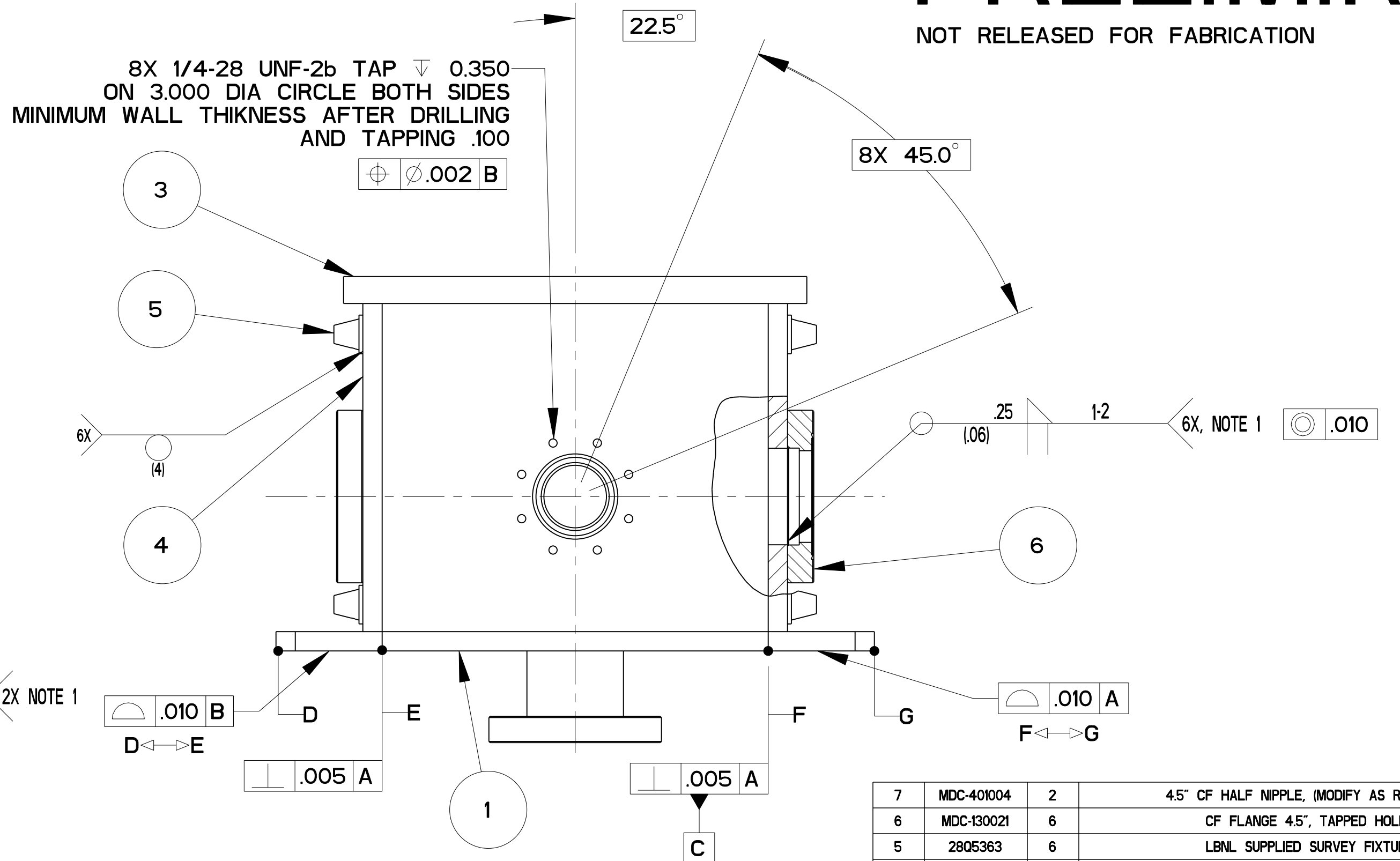
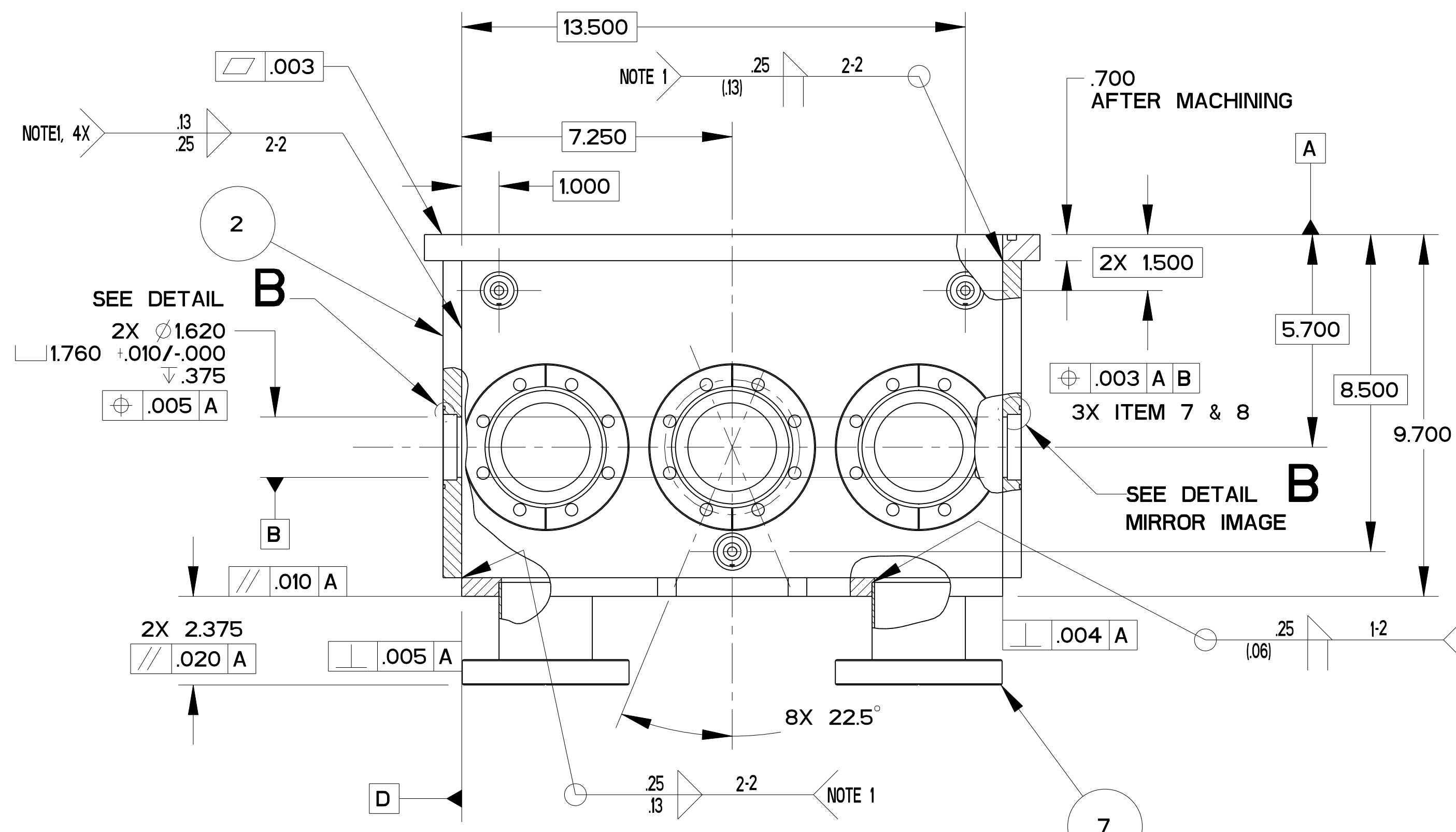






PRELIMINARY

NOT RELEASED FOR FABRICATION



NOTES:

1. FINISHED PART TO BE VACUUM TIGHT. LEAK RATE NOT TO EXCEED 1×10^{-8} TORR - LITERS PER SECOND HELIUM.
2. ULTRA-HIGH VACUUM CLEANING AND PACKING REQUIRED.
3. ASSEMBLE IN CLEAN ENVIRONMENT. AFTER ASSEMBLY AND WELDING, WRAP TO MAINTAIN CLEANLINESS.
4. PROTECT CONFLAT FLANGE KNIFE EDGE AT ALL TIMES.

PARTIAL VIEW SECTION A-A

REV	DWG	CHK	ZONE	DATE	CHANGES

UNLESS OTHERWISE SPECIFIED
 PROJECTION:
 TOLERANCES: XX ± .01, XXX ± .003, XXXX ± .0010
 DO NOT SCALE PRINT
 THREADS ARE CLASS 2
 CHAMFER ENDS OF ALL SCREW THREADS 30°
 CUT ROUND, 15 THREAD RELIEF ON MACHINED THREADS
 BREAK EDGES .016 MAX. ON MACHINED WORK
 REMOVE BURRS, WELD SPATTER & LOOSE SCALE
 IN ACCORDANCE WITH ASME Y14.5M & B46.1

ITEM	PART NO	RECD	DESCRIPTION	MATERIAL
7	MDC-401004	2	4.5" CF HALF NIPPLE, (MODIFY AS REQUIRED)	304 SS
6	MDC-130021	6	CF FLANGE 4.5", TAPPED HOLES	304 SS
5	2805363	6	LBNL SUPPLIED SURVEY FIXTURE	17-4-PH SS
4	25B425	2	CHOPPER BOX SIDE PLATE 1/2"	304 SS
3	25B424	1	CHOPPER BOX TOP FLANGE	304 SS
2	25B423	2	CHOPPER BOX END PLATE	304 SS
1	25B422	1	CHOPPER BOX BOTTOM PLATE	304 SS

SHOP ORDERS

ACCT NO. _____ NO. _____
 DEL. DATE ISSD _____ DATE RECD _____

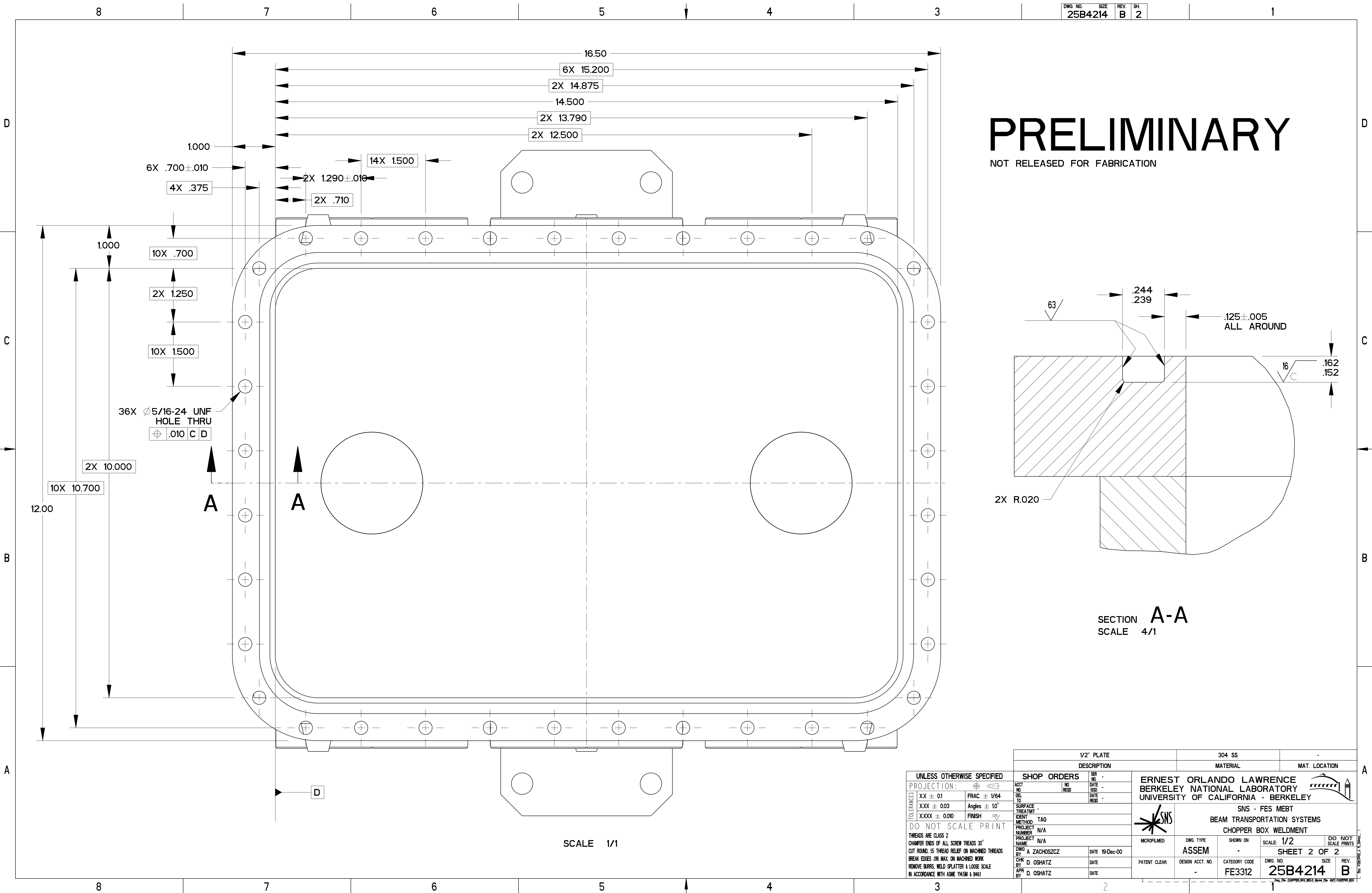
SURFACE TREATMT _____
 TIENT METHOD TAG _____
 PROJECT NUMBER N/A
 PROJECT NAME N/A

DWG BY A ZACHOSZCZ DATE 18-Dec-00
 CHK BY D. OSHATZ DATE _____
 APPR BY D. OSHATZ DATE _____

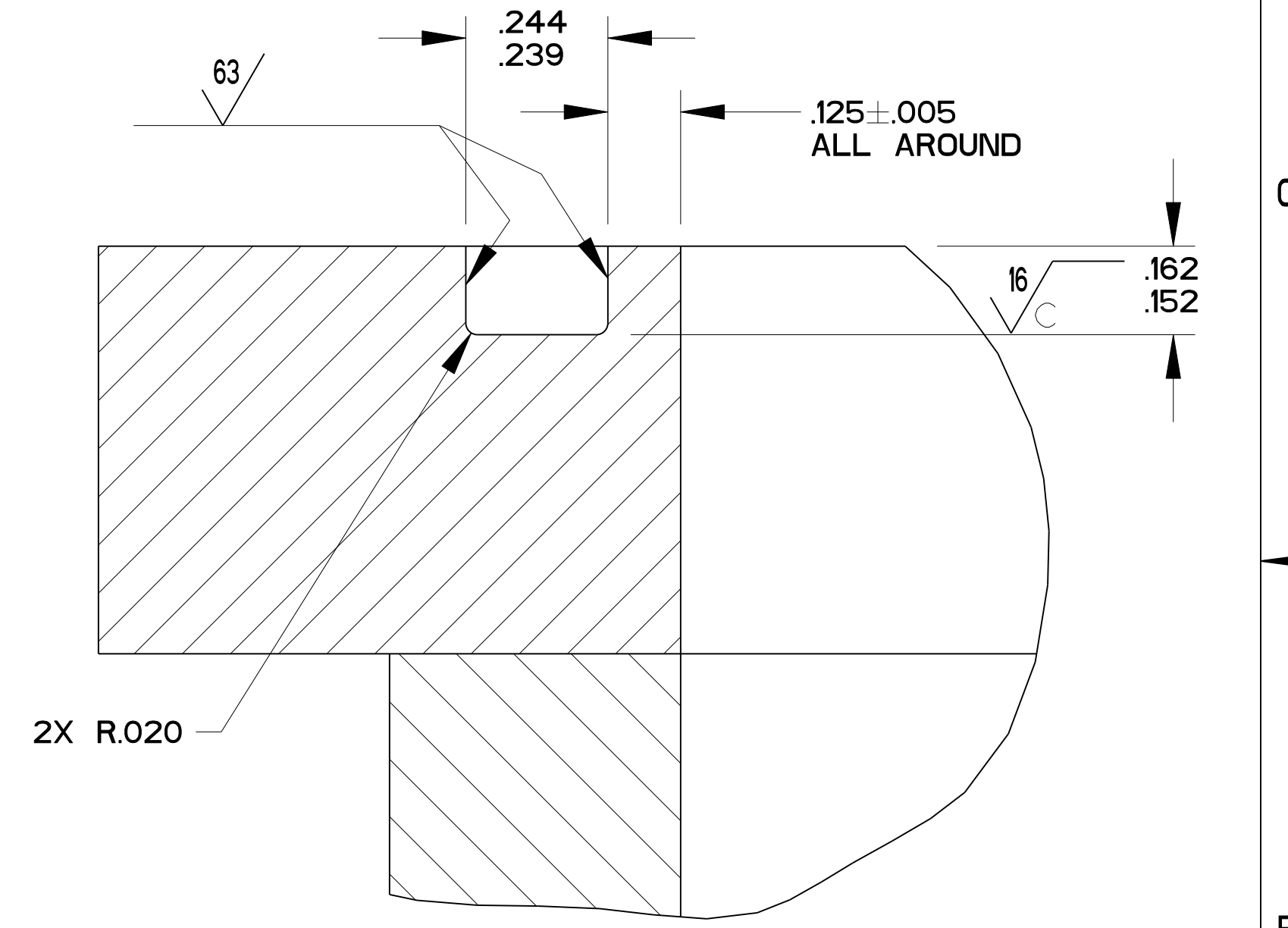
ERNEST ORLANDO LAWRENCE
 BERKELEY NATIONAL LABORATORY
 UNIVERSITY OF CALIFORNIA - BERKELEY

SNS - FES MEBT
 BEAM TRANSPORTATION SYSTEMS
 CHOPPER BOX WELDMENT

MICROFILMED: _____
 DWG. TYPE ASSEM
 SHOWN ON _____
 SCALE: 3/8
 SHEET 1 OF 2
 PATENT CLEAR: _____
 DESIGN ACCT. NO. FE3312
 DWG. NO. 25B4214
 SIZE B
 REV. B



PRELIMINARY
NOT RELEASED FOR FABRICATION



SCALE 1/1

UNLESS OTHERWISE SPECIFIED
PROJECTION:
TOLERANCES: XX ± .01, XXX ± .003, XXXX ± .010
FRAC. ± 1/64, Angles ± 10°, FINISH 12V
DO NOT SCALE PRINT
THREADS ARE CLASS 2
CHAMFER ENDS OF ALL SCREW THREADS 30°
CUT ROUND, 15 THREAD RELIEF ON MACHINED THREADS
BREAK EDGES .016 MAX. ON MACHINED WORK
REMOVE BURRS, WELD SPATTER & LOOSE SCALE
IN ACCORDANCE WITH ASME Y14.5M & B46.1

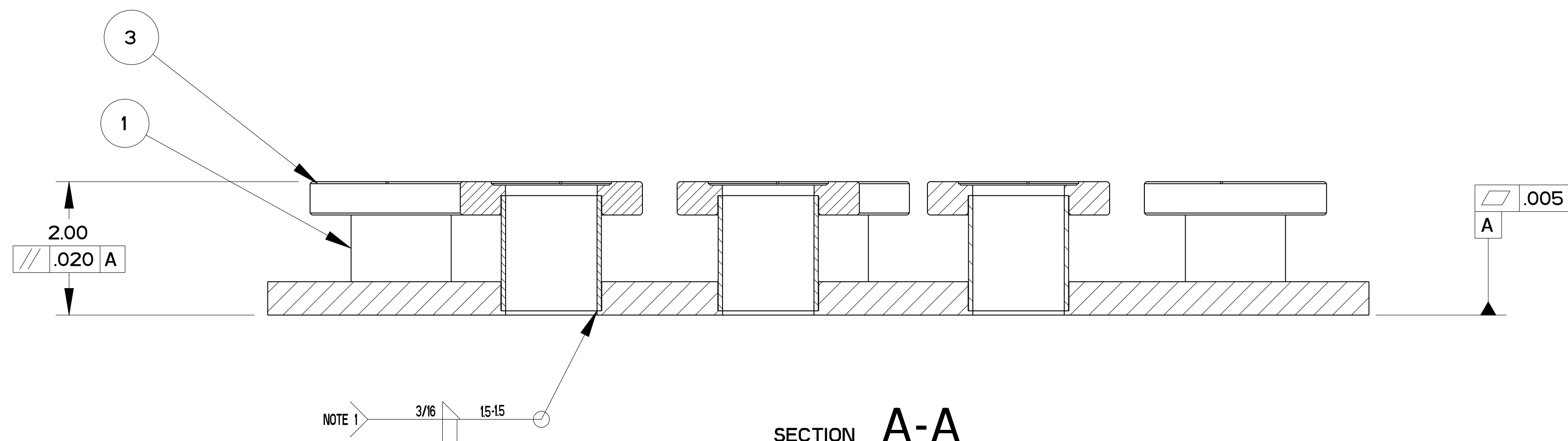
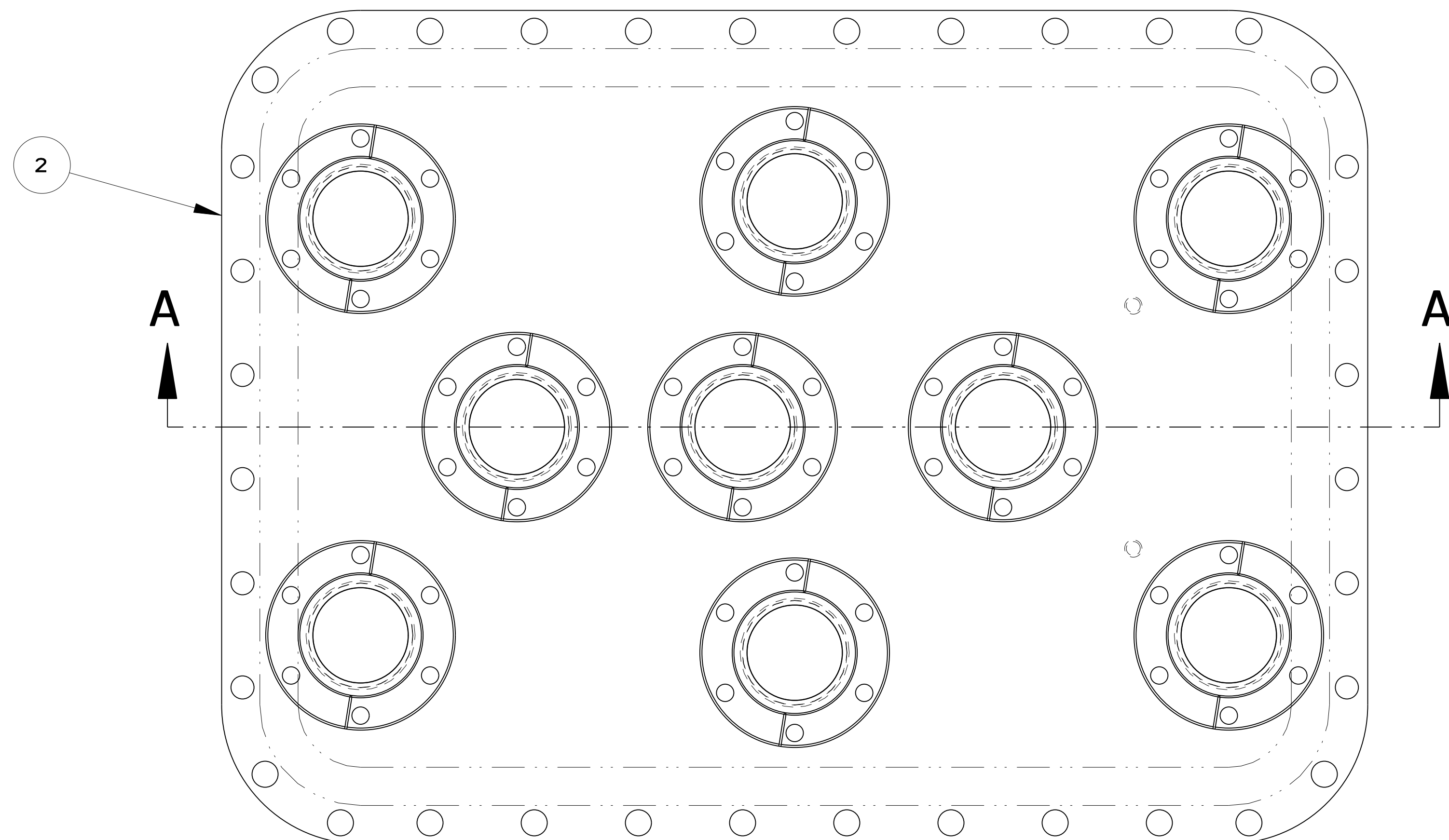
1/2" PLATE		304 SS		-	
DESCRIPTION		MATERIAL		MAT. LOCATION	
SHOP ORDERS		SER. NO.	NO.	DATE ISSD	DATE RECD
PROJECT NAME		ERNEST ORLANDO LAWRENCE BERKELEY NATIONAL LABORATORY UNIVERSITY OF CALIFORNIA - BERKELEY			
PROJECT NUMBER		SNS - FES MEBT BEAM TRANSPORTATION SYSTEMS CHOPPER BOX WELDMENT			
PROJECT NAME		MICROFILMED:		DWG. TYPE	SHOWN ON
DWG. BY: A ZACHOSZCZ		DATE: 19-Dec-00		ASSEM	SCALE: 1/2
CHK. BY: D. OSHATZ		DATE:		PATENT CLEAR.	DESIGN ACCT. NO.
APPR. BY: D. OSHATZ		DATE:		FE3312	CATEGORY CODE
				DO NOT SCALE PRINTS	SHEET 2 OF 2
				DWG. NO.	SIZE
				25B4214	B

D

C

B

A



SECTION A-A

NOTES:

1. FINISHED PART TO BE VACUUM TIGHT.
LEAK RATE NOT TO EXCEED 1×10^{-8} TORR - LITERS PER SECOND HELIUM.
2. ULTRA-HIGH VACUUM CLEANING AND PACKING REQUIRED.
3. ASSEMBLE IN CLEAN ENVIRONMENT.
AFTER ASSEMBLY AND WELDING, WRAP TO MAINTAIN CLEANLINESS.
4. PROTECT CONFLAT FLANGE KNIFE EDGE AT ALL TIMES.
5. PROTECT POLISHED O-RING SURFACE AT ALL TIMES.

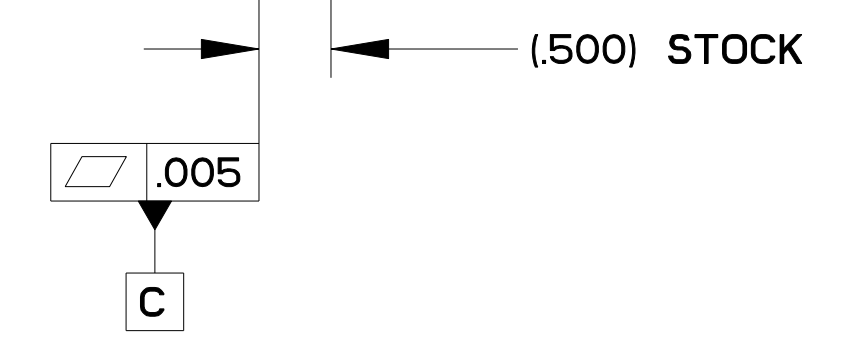
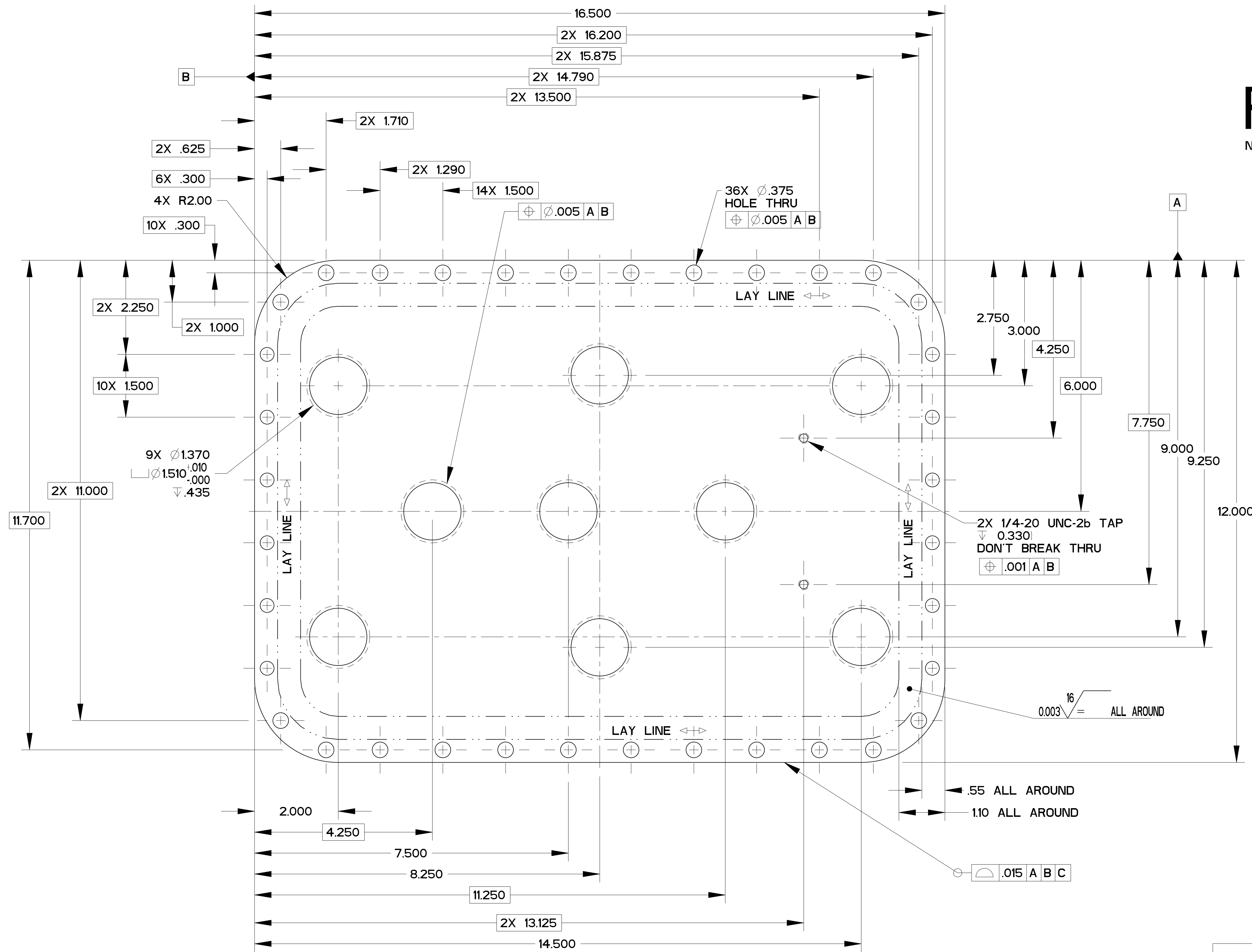
ITEM	PART NO	REQD	DESCRIPTION	MATERIAL
3		9	CF FLANGE 2.75"	
2	25B427	1	TOP COVER	304 SS
1		9	15" X .065 WALL TUBE	

SHOP ORDERS ACCT NO. _____ NO. _____ DEL TO _____ SURFACE TREATMT _____ TOLERANCES _____ PROJECT NUMBER _____ PROJECT NAME _____		ERNEST ORLANDO LAWRENCE BERKELEY NATIONAL LABORATORY UNIVERSITY OF CALIFORNIA - BERKELEY 	
UNLESS OTHERWISE SPECIFIED PROJECTION: TOLERANCES: XX ± 0.1 FRAC: ± 1/64 XXX ± 0.03 Angles ± 10° XXXX ± 0.010 FINISH		SNS - FE MEBT BEAM TRANSPORTATION SYSTEMS CHOPPER BOX COVER ASSEMBLY	
DO NOT SCALE PRINT THREADS ARE CLASS 2 CHAMFER ENDS OF ALL SCREW THREADS 30° CUT ROUND, 15 THREAD RELIEF ON MACHINED THREADS BREAK EDGES .016 MAX. ON MACHINED WORK REMOVE BURRS, WELD SPLATTER & LOOSE SCALE IN ACCORDANCE WITH ASME Y14.5M & B46.1		MICROFILMED: _____ DWG. BY: A ZACHOSZCZ DATE: 11-Dec-00 CHK BY: None DATE: _____ APPR BY: None DATE: _____	
PATENT CLEAR: _____ DESIGN ACCT. NO. XXXX-XX CATEGORY CODE XXnnnn		SCALE: 3/4 SHOWN ON: 25B420 SHEET 1 OF 1 DWG. NO. 25B4264 SIZE B REV.	

REV	DWG	CHK	ZONE	DATE	CHANGES

PRELIMINARY

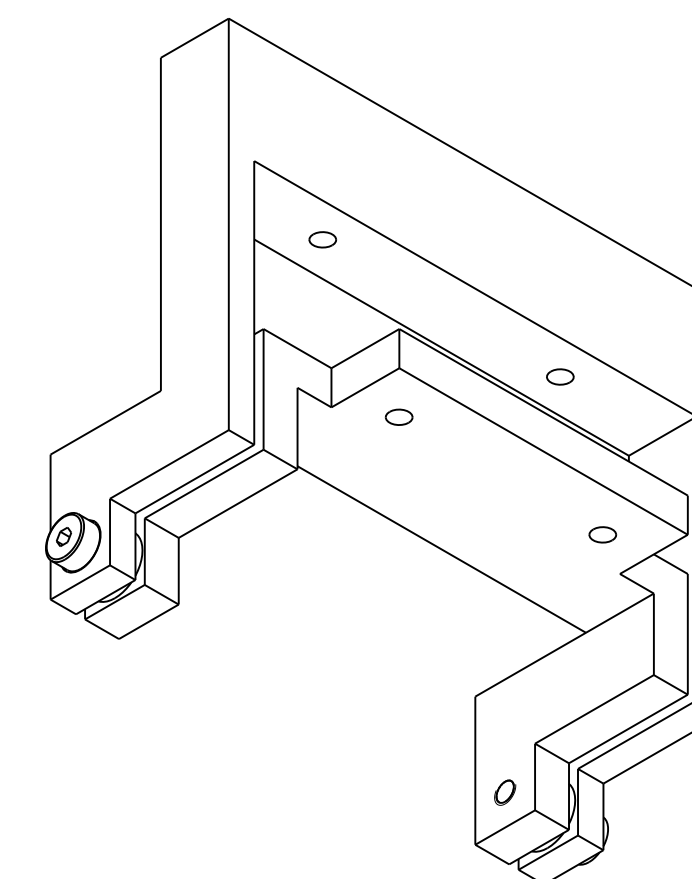
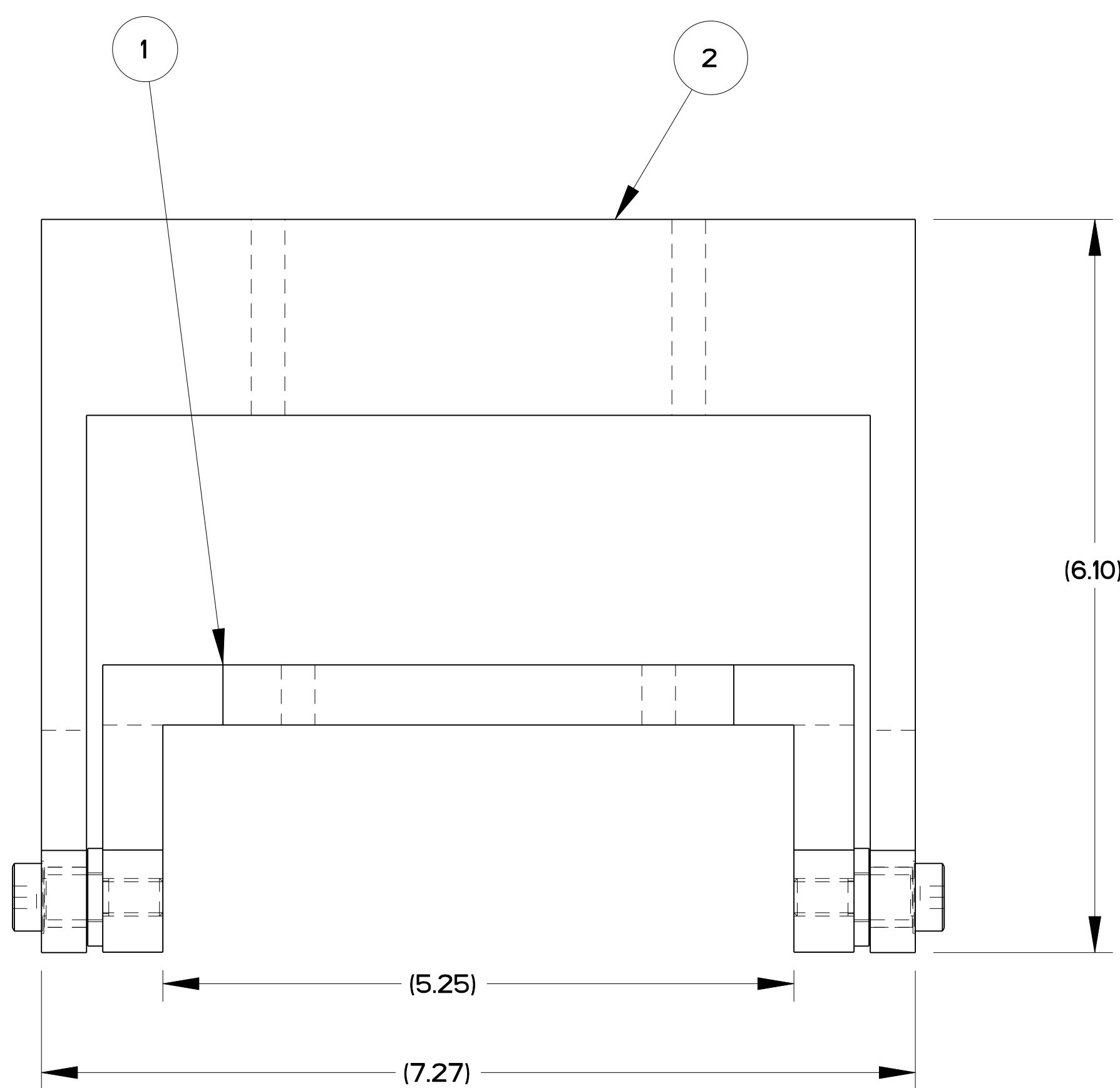
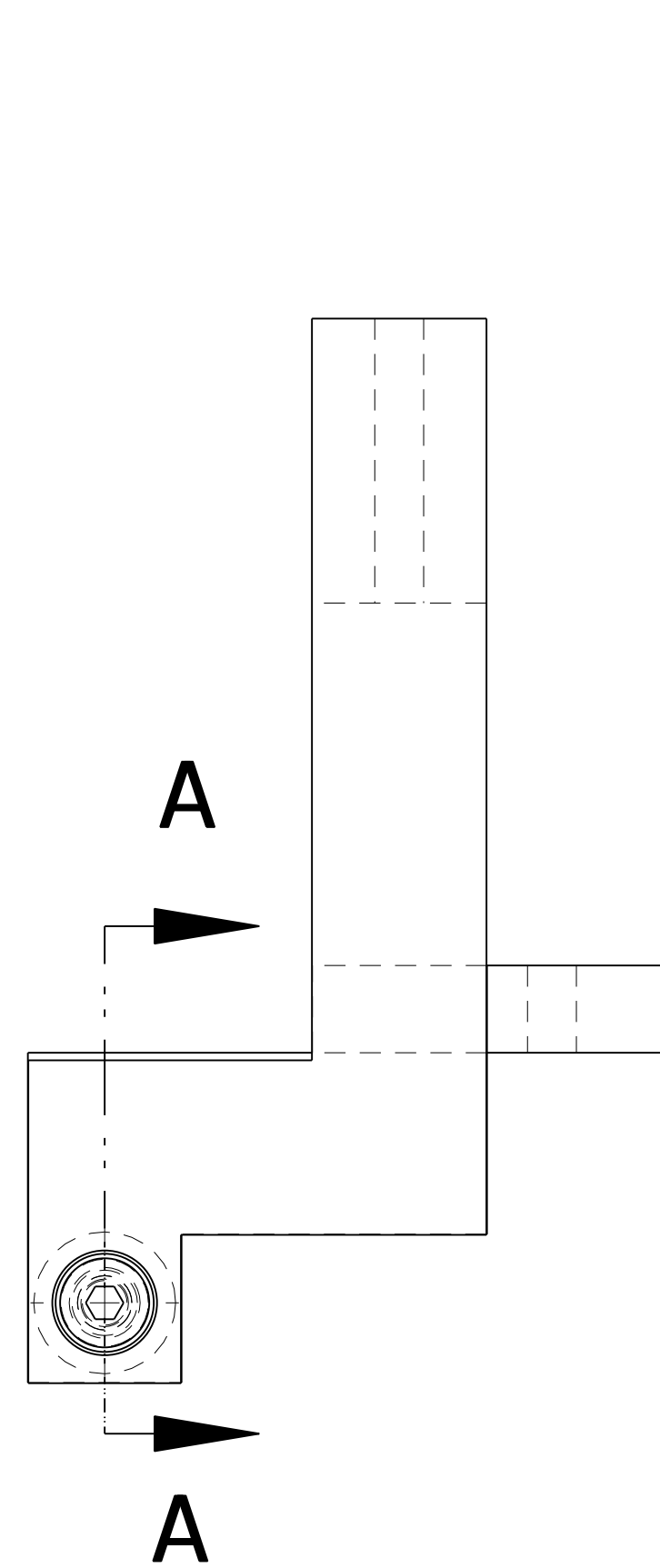
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REV	DWG	CHK	ZONE	DATE	CHANGES

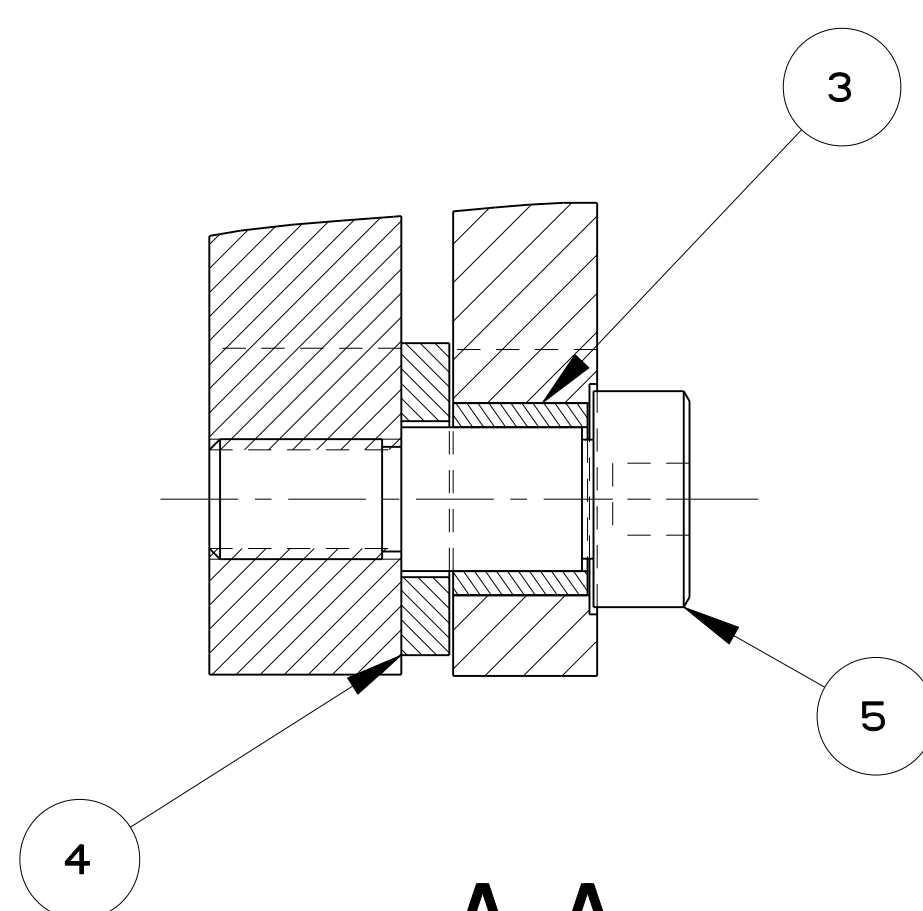
UNLESS OTHERWISE SPECIFIED
 PROJECTION:
 TOLERANCES: XX ± 0.1 FRAC. ± 1/64
 XXX ± 0.03 Angles ± 10°
 XXXX ± 0.010 FINISH
DO NOT SCALE PRINT
 THREADS ARE CLASS 2
 CHAMFER ENDS OF ALL SCREW THREADS 30°
 CUT ROUND, 15 THREAD RELIEF ON MACHINED THREADS
 BREAK EDGES 0.6 MAX. ON MACHINED WORK
 REMOVE BURRS, WELD SPLATTER & LOOSE SCALE
 IN ACCORDANCE WITH ASME Y14.5M & B46.1

1/2" PLATE		304 SS		-	
DESCRIPTION		MATERIAL		MAT. LOCATION	
SHOP ORDERS		SER. NO.		ERNEST ORLANDO LAWRENCE	
ACCT. NO.		NO.		BERKELEY NATIONAL LABORATORY	
DEL. TO		ISSD.		UNIVERSITY OF CALIFORNIA - BERKELEY	
SURFACE TREATMT.		TAG		SNS - FES MEBT	
IDENT. METHOD		N/A		BEAM TRANSPORTATION SYSTEMS	
PROJECT NUMBER		N/A		TOP COVER	
PROJECT NAME		N/A		MICROFILMED:	
DWG. BY: A ZACHOSZCZ		DATE: 11-Dec-00		DWG. TYPE: PART	
CHK. BY: None		DATE:		SHOWN ON: 25B426	
APPR. BY: None		DATE:		SCALE: 3/4	
PATENT CLEAR:		DESIGN ACCT. NO.:		DO NOT SCALE PRINTS	
-		FE3312		SHEET 1 OF 1	
-		-		DWG. NO. 25B4294	
-		-		SIZE B	
-		-		REV. 1	



PRELIMINARY

NOT RELEASED FOR FABRICATION



SECTION **A-A**
SCALE 2/1

NOTES:

1. ULTRA-HIGH VACUUM CLEANING AND PACKING REQUIRED.
2. ASSEMBLE IN CLEAN ENVIRONMENT. AFTER ASSEMBLY, WRAP TO MAINTAIN CLEANLINESS.

ITEM	PART NO	REQD	DESCRIPTION	MATERIAL
5	2		SHOULDER SCREW	
4	2		SHIM	
3	-	2	VESPEL BEARING	VESPEL SP-3
2	-	1	OUTER PIVOT BRACKET	304 SS
1	-	1	INNER PIVOT BRACKET	304 SS

REV	DWG	CHK	ZONE	DATE	CHANGES

UNLESS OTHERWISE SPECIFIED
PROJECTION:
 TOLERANCES: XX ± 0.1 FRAC. ± 1/84
 XXX ± 0.03 Angles ± 10°
 XXXX ± 0.010 FINISH
DO NOT SCALE PRINT
 THREADS ARE CLASS 2
 CHAMFER ENDS OF ALL SCREW THREADS 30°
 CUT ROUND, 15 THREAD RELIEF ON MACHINED THREADS
 BREAK EDGES 0.6 MAX. ON MACHINED WORK
 REMOVE BURRS, WELD SPATTER & LOOSE SCALE
 IN ACCORDANCE WITH ASME Y14.5M & B46.1

SHOP ORDERS		SER. NO.	DATE
ACCT. NO.	NO.	ISSD	DATE
DEL. TO	RECD	DATE	RECD

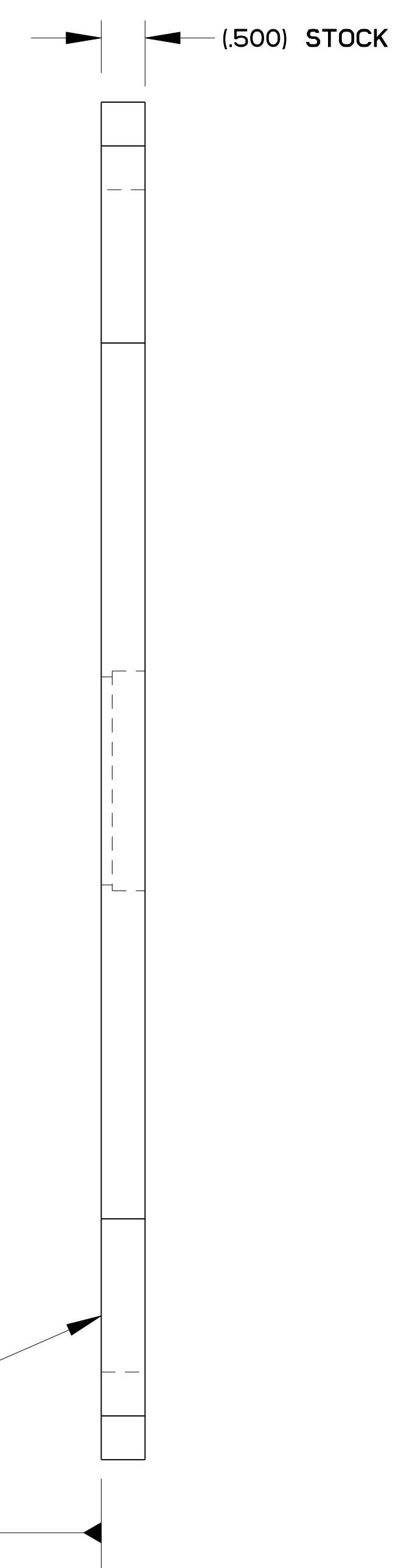
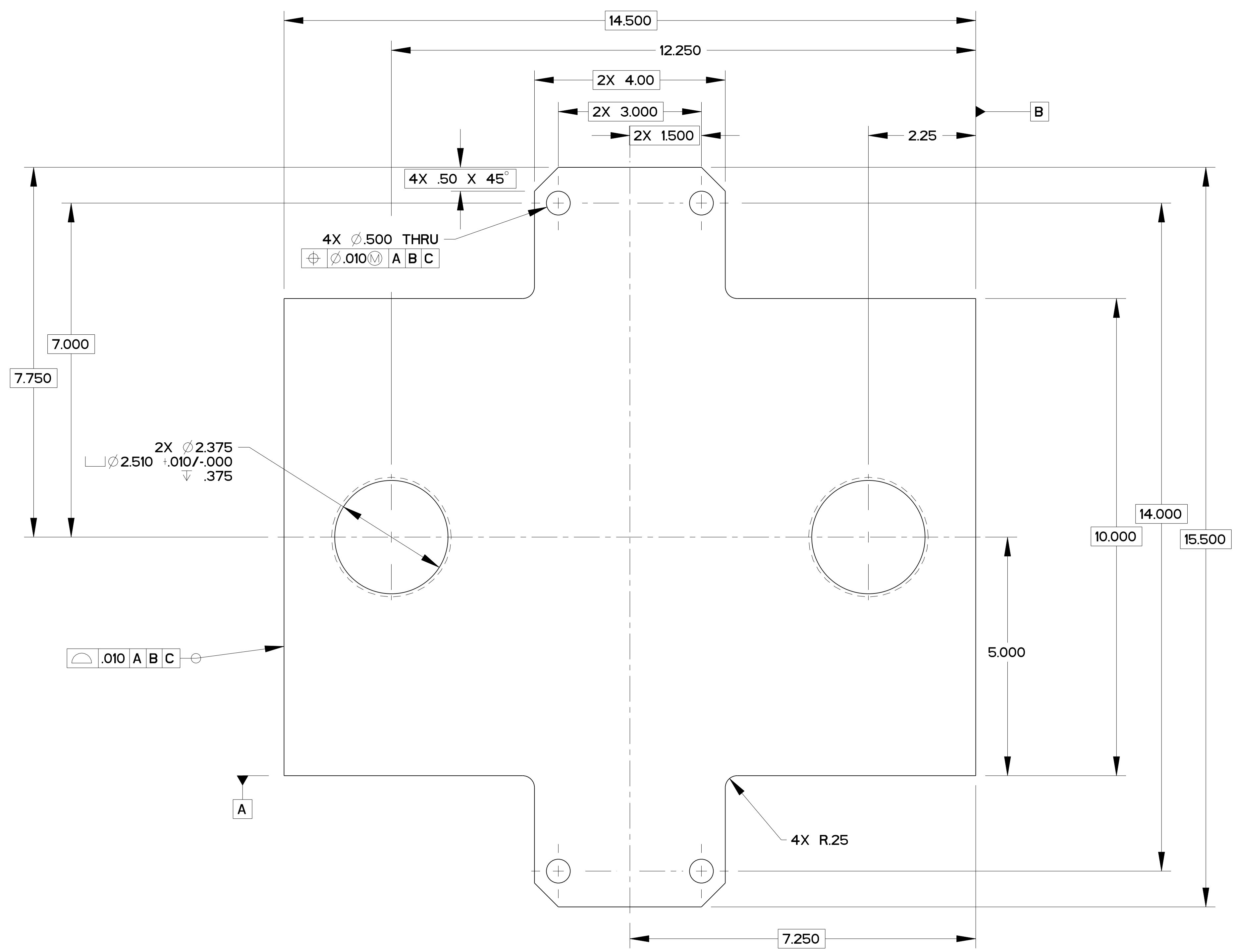
ERNEST ORLANDO LAWRENCE
 BERKELEY NATIONAL LABORATORY
 UNIVERSITY OF CALIFORNIA - BERKELEY

SNS - FES MEBT
 BEAM TRANSPORTATION SYSTEMS
 CHOPPER BOX HINGE SUSPENSION ASSEMBLY

MICROFILMED:
 DWG. TYPE: ASSEM SHOWN ON: - SCALE: 1/1 DO NOT SCALE PRINTS
 PATENT CLEAR: - DESIGN ACCT. NO.: FE3312 CATEGORY CODE: 25B4274 SHEET 1 OF 1

PRELIMINARY

NOT RELEASED FOR FABRICATION



REV	DWG	CHK	ZONE	DATE	CHANGES

UNLESS OTHERWISE SPECIFIED
 PROJECTION:
 TOLERANCES: XX ± 0.1 FRAC. ± 1/84
 XXX ± 0.03 Angles ± 10°
 XXXX ± 0.010 FINISH
 DO NOT SCALE PRINT
 THREADS ARE CLASS 2
 CHAMFER ENDS OF ALL SCREW THREADS 30°
 CUT ROUND, 15 THREAD RELIEF ON MACHINED THREADS
 BREAK EDGES .016 MAX. ON MACHINED WORK
 REMOVE BURRS, WELD SPLATTER & LOOSE SCALE
 IN ACCORDANCE WITH ASME Y14.5M & B46.1

1/2" PLATE		304 SS		-	
DESCRIPTION		MATERIAL		MAT. LOCATION	
SHOP ORDERS		SER. NO.	NO.	DATE ISSD	DATE RECD
ACCT. NO.		NO.	NO.	DATE ISSD	DATE RECD
DEL. TO		ERNEST ORLANDO LAWRENCE BERKELEY NATIONAL LABORATORY UNIVERSITY OF CALIFORNIA - BERKELEY			
SURFACE TREATMT		SNS - FES MEBT BEAM CHOPPER CHOPPER BOX BOTTOM PLATE			
IDENT. METHOD		TAG			
PROJECT NUMBER		N/A			
PROJECT NAME		N/A			
DWG. BY: A ZACHOSZCZ		DATE: 13-Dec-00		MICROFILMED:	
CHK. BY: None		DATE:		DWG. TYPE: PART	
APR. BY: None		DATE:		SHOWN ON: 25B421	
				SCALE: 3/4	
				DO NOT SCALE PRINTS	
				SHEET 1 OF 1	
				DWG. NO. 25B4224	
				SIZE B	
				REV. 1	

8

7

6

5

4

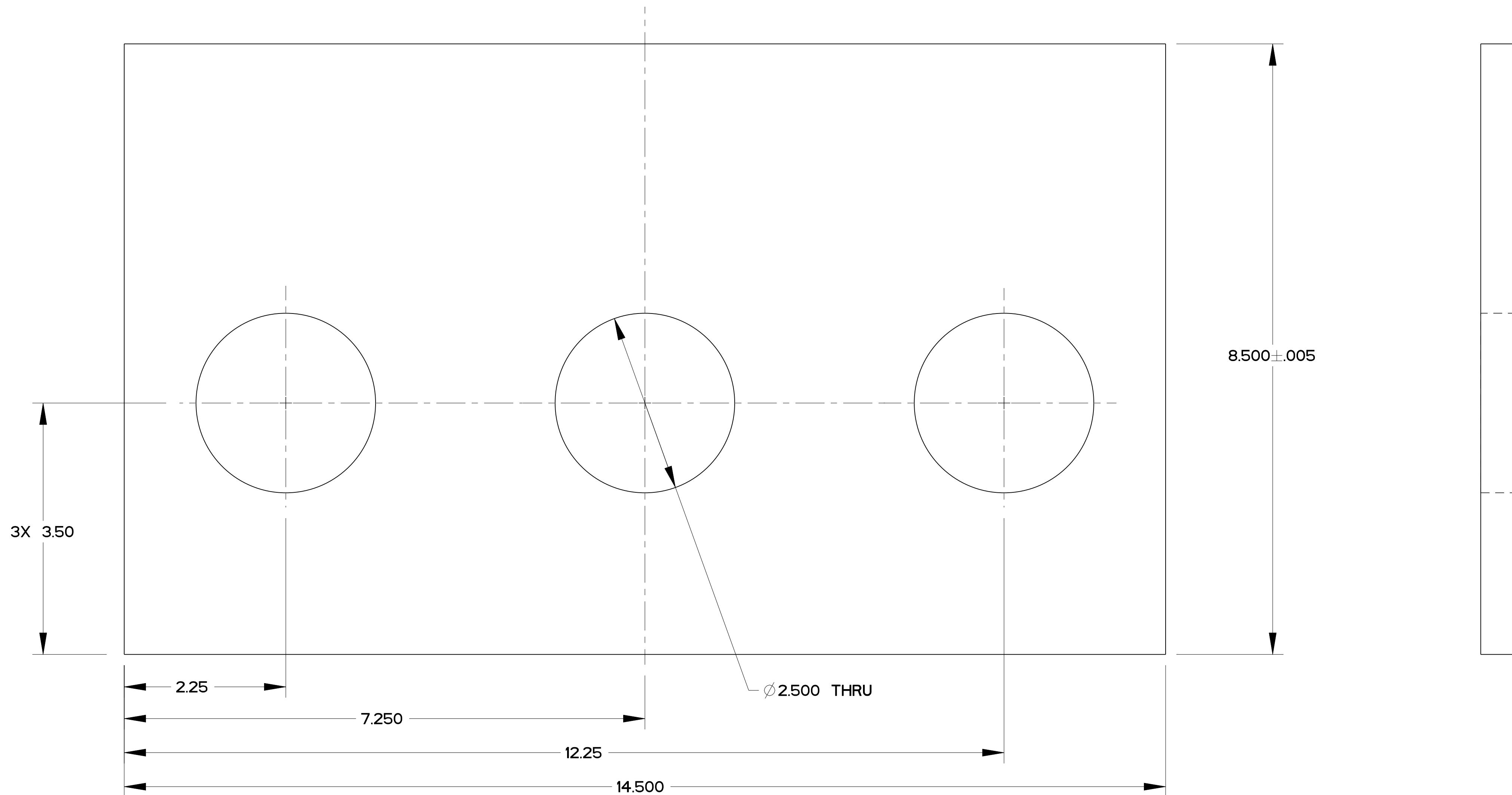
3

DWG. NO. 25B4254 SIZE B REV. 1

1

PRELIMINARY

NOT RELEASED FOR FABRICATION



REV	DWG	CHK	ZONE	DATE	CHANGES

UNLESS OTHERWISE SPECIFIED

PROJECTION:

TOLERANCES: XX ± 0.1 FRAC. ± 1/84
 XXX ± 0.03 Angles ± 10°
 XXXX ± 0.010 FINISH

DO NOT SCALE PRINT

THREADS ARE CLASS 2
 CHAMFER ENDS OF ALL SCREW THREADS 30°
 CUT ROUND, 15 THREAD RELIEF ON MACHINED THREADS
 BREAK EDGES .016 MAX. ON MACHINED WORK
 REMOVE BURRS, WELD SPLATTER & LOOSE SCALE
 IN ACCORDANCE WITH ASME Y14.5M & B46.1

1/2" PLATE		304 SS		-	
DESCRIPTION		MATERIAL		MAT. LOCATION	
SHOP ORDERS		SER. NO. -		ERNEST ORLANDO LAWRENCE	
ACCT. NO. -		NO. -		BERKELEY NATIONAL LABORATORY	
DEL. DATE -		ISSD. DATE -		UNIVERSITY OF CALIFORNIA - BERKELEY	
SURFACE TREATMT. -		TAG -		SNS - FE MEBT	
IDENT. METHOD -		PROJECT NUMBER -		BEAM TRANSPORTATION SYSTEMS	
PROJECT NAME -		PROJECT TAG -		CHOPPER BOX SIDE PLATE 1/2"	
DWG. BY: A ZACHOSZCZ		DATE: 08-Dec-00		MICROFILMED:	
CHK. BY: None		DATE: -		DWG. TYPE: PART	
APR. BY: None		DATE: -		SHOWN ON: 25B421	
				SCALE: 1/1	
				DO NOT SCALE PRINTS	
				SHEET 1 OF 1	
				DWG. NO. 25B4254	
				SIZE B	
				REV. 1	

8

7

6

5

4

3

2

1

ZC
YC
XC

