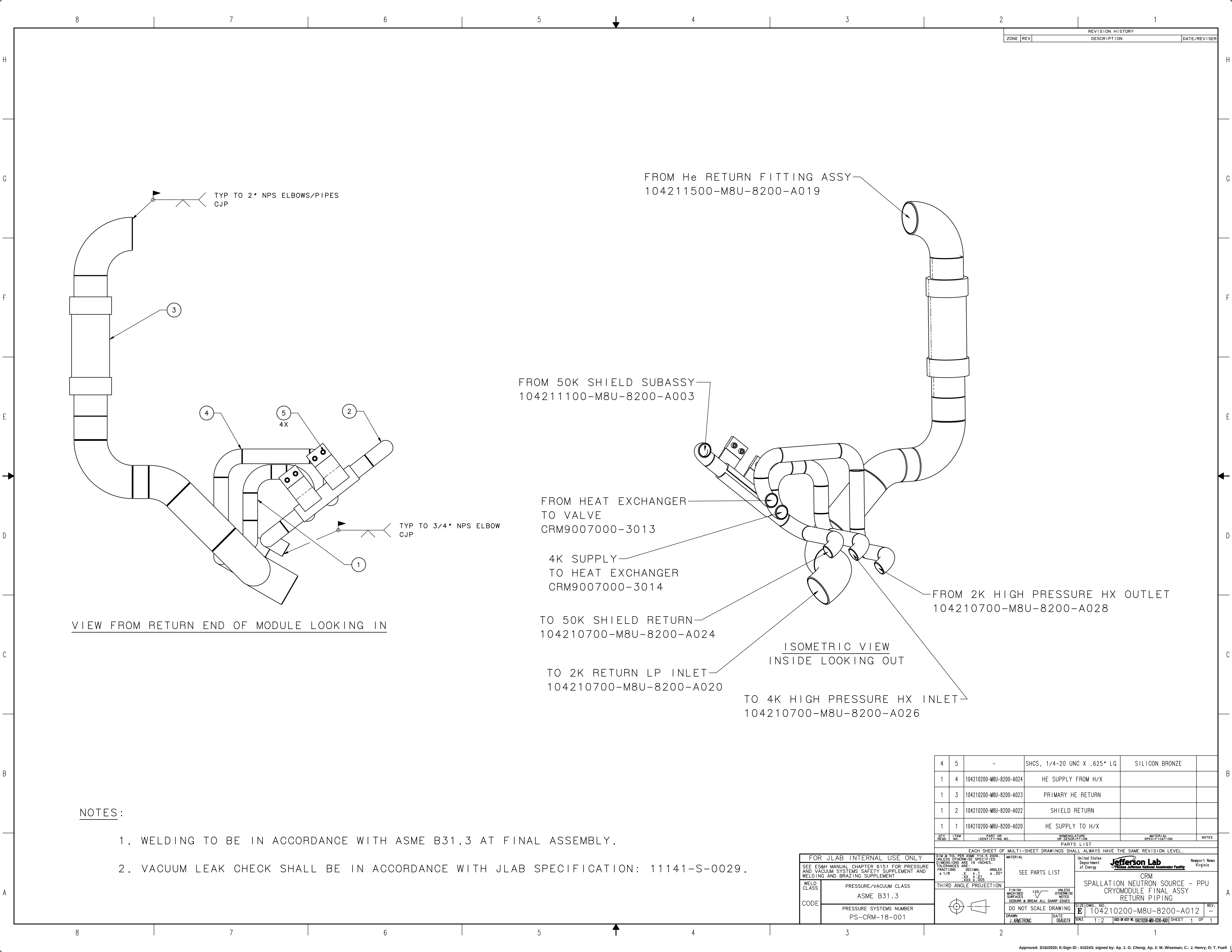




REVISION HISTORY		
ZONE	REV	DESCRIPTION
		DATE/REVISER

VIEW FROM RETURN END OF MODULE LOOKING IN

NOTES:

1. WELDING TO BE IN ACCORDANCE WITH ASME B31.3 AT FINAL ASSEMBLY.
2. VACUUM LEAK CHECK SHALL BE IN ACCORDANCE WITH JLAB SPECIFICATION: 11141-S-0029.

4	5	-	SHCS, 1/4-20 UNC X .625" LG	SILICON BRONZE	
1	4	104210200-M8U-8200-A024	HE SUPPLY FROM H/X		
1	3	104210200-M8U-8200-A023	PRIMARY HE RETURN		
1	2	104210200-M8U-8200-A022	SHIELD RETURN		
1	1	104210200-M8U-8200-A020	HE SUPPLY TO H/X		
QTY REQD	ITEM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION	NOTES

FOR JLAB INTERNAL USE ONLY			SEE ESH#1 MANUAL CHAPTER 6151 FOR PRESSURE AND VACUUM SYSTEMS SAFETY SUPPLEMENT AND WELDING AND BRAZING SUPPLEMENT		DIM & TOL PER ASME Y14.5 2009. UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ARE: FRACTIONS DECIMAL ANGLES		MATERIAL		United States Department of Energy		Jefferson Lab Thomas Jefferson National Accelerator Facility		Newport News Virginia		
WELD CLASS		PRESSURE/VACUUM CLASS		THIRD ANGLE PROJECTION		FINISH MACHINED SURFACES UNLESS OTHERWISE NOTED		SEE PARTS LIST		CRM SPALLATION NEUTRON SOURCE - PPU CRYOMODULE FINAL ASSY RETURN PIPING					
CODE		ASME B31.3				125°						SIZE (DWG. NO.)		REV.	
		PRESSURE SYSTEMS NUMBER				DO NOT SCALE DRAWING						104210200-M8U-8200-A012		1 OF 1	
		PS-CRM-18-001						DRAWN J. ARMSTRONG		DATE 06AUG19		SCALE 1:2		USED ON ASSY NO. 104210200-M8U-8200-A001 SHEET 1 OF 1	

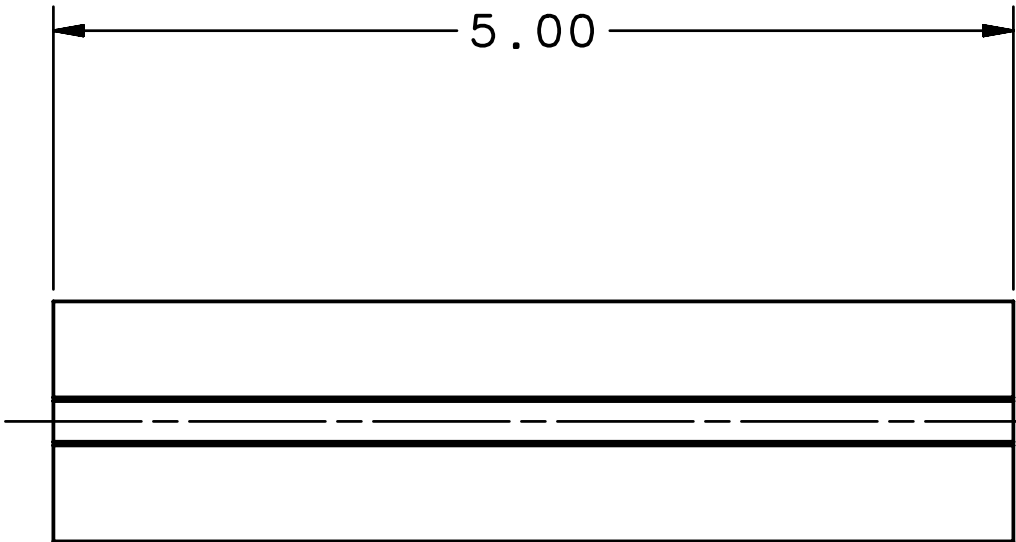
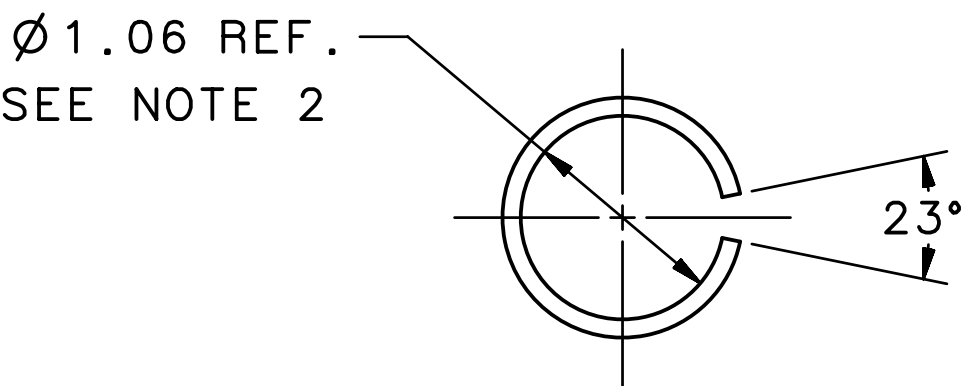
4

3

2

1

REVISION HISTORY			
ZONE	REV	DESCRIPTION	DATE/REVISER



NOTES:

- 1. CLEAN AND HANDLE PER TJNAF SPECIFICATION 11141-S-0035.
- 2. SWAGE ID OF COPPER TUBE OVER 3/4 NPS PIPE MANDREL.

DIM & TOL PER ASME Y14.5 2009. UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS DECIMAL ANGLES ± 1/8 .XX ± .1 ± .50° .XX ± .01 .XXX ± .005		UNITED STATES DEPARTMENT OF ENERGY Jefferson Lab OMAHA JEFFERSON NATIONAL ACCELERATOR FACILITY Newport News Virginia	
THIRD ANGLE PROJECTION 		MATERIAL Ø 1.25 OD TUBE. .12 WALL COPPER C11000	
FINISH 125 MACHINED SURFACES UNLESS OTHERWISE NOTED DEBURR & BREAK ALL SHARP EDGES		CRM SPALLATION NEUTRON SOURCE - PPU CRYOMODULE FINAL ASSY PIPING THERMAL SLEEVE	
DO NOT SCALE DRAWING		SIZE C	DWG. NO. 104210200-M8U-8200-A017
DRAWN J. ARMSTRONG		DATE 30 JUL 19	REV. -
SCALE 1:2		USED ON ASSY NO. 104210200-M8U-8200-A013/A022	
SHEET 1 OF 1			

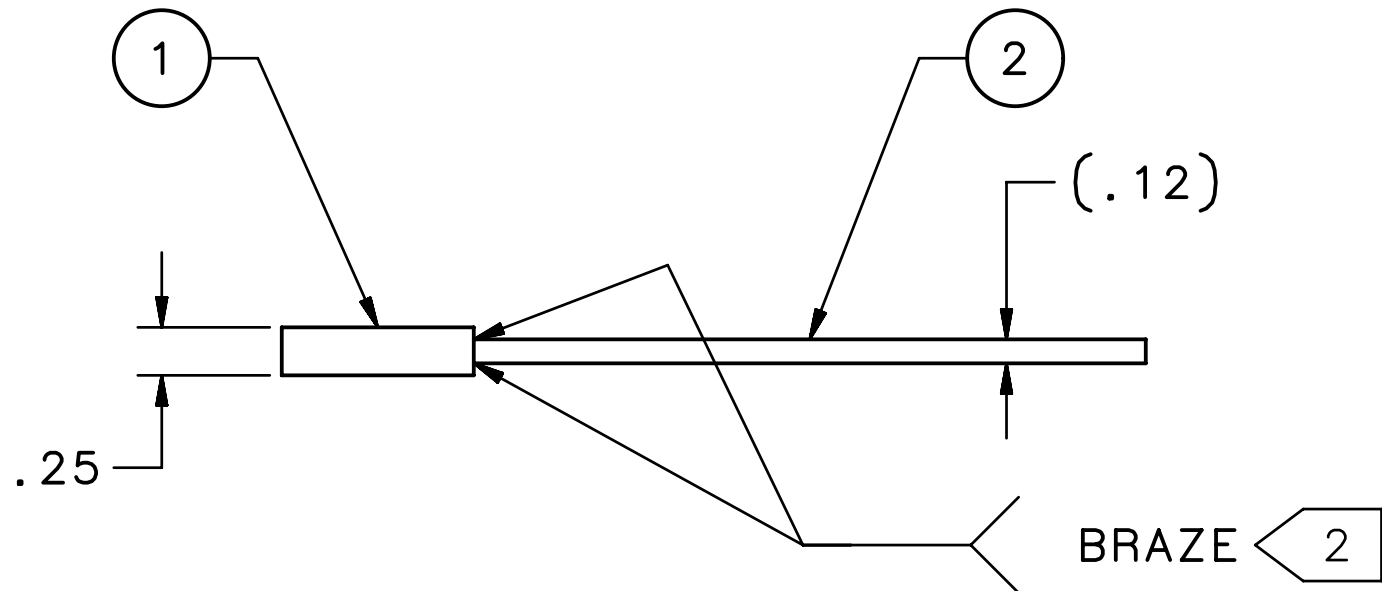
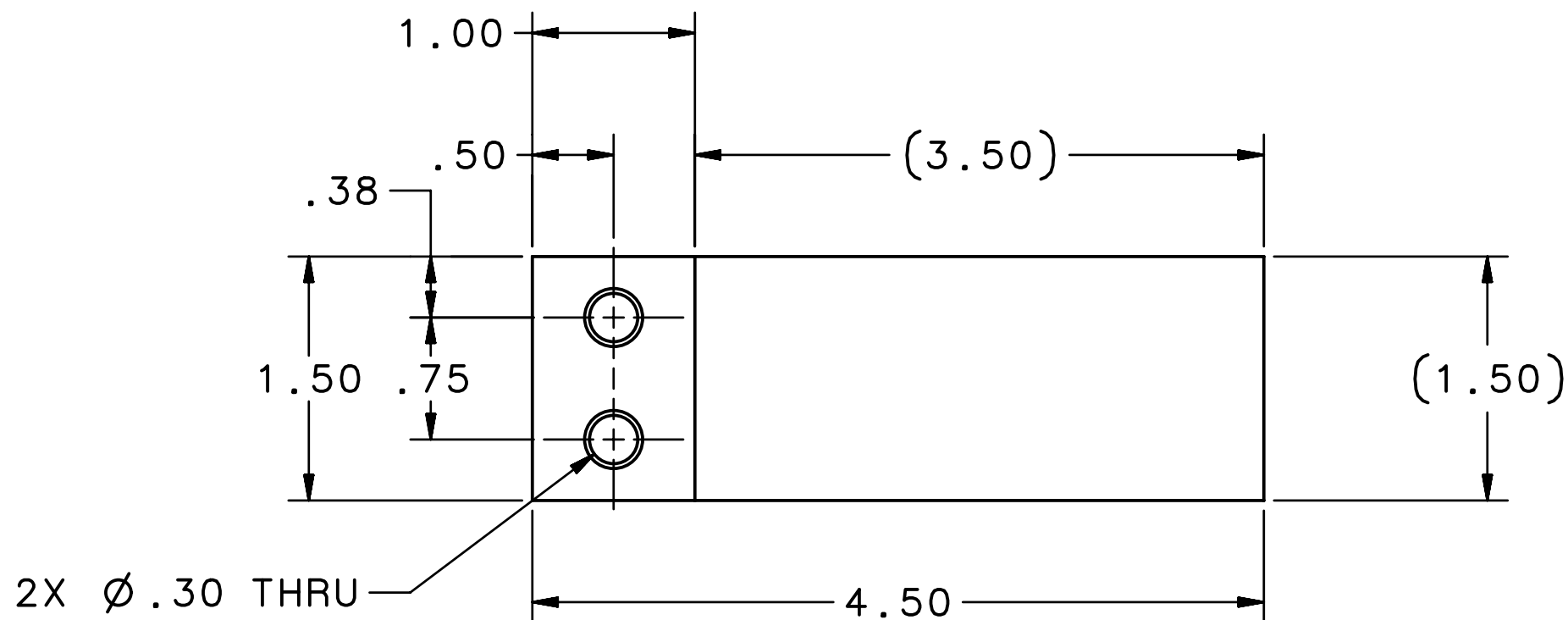
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3

2

1

REVISION HISTORY			
ZONE	REV	DESCRIPTION	DATE/REVISER



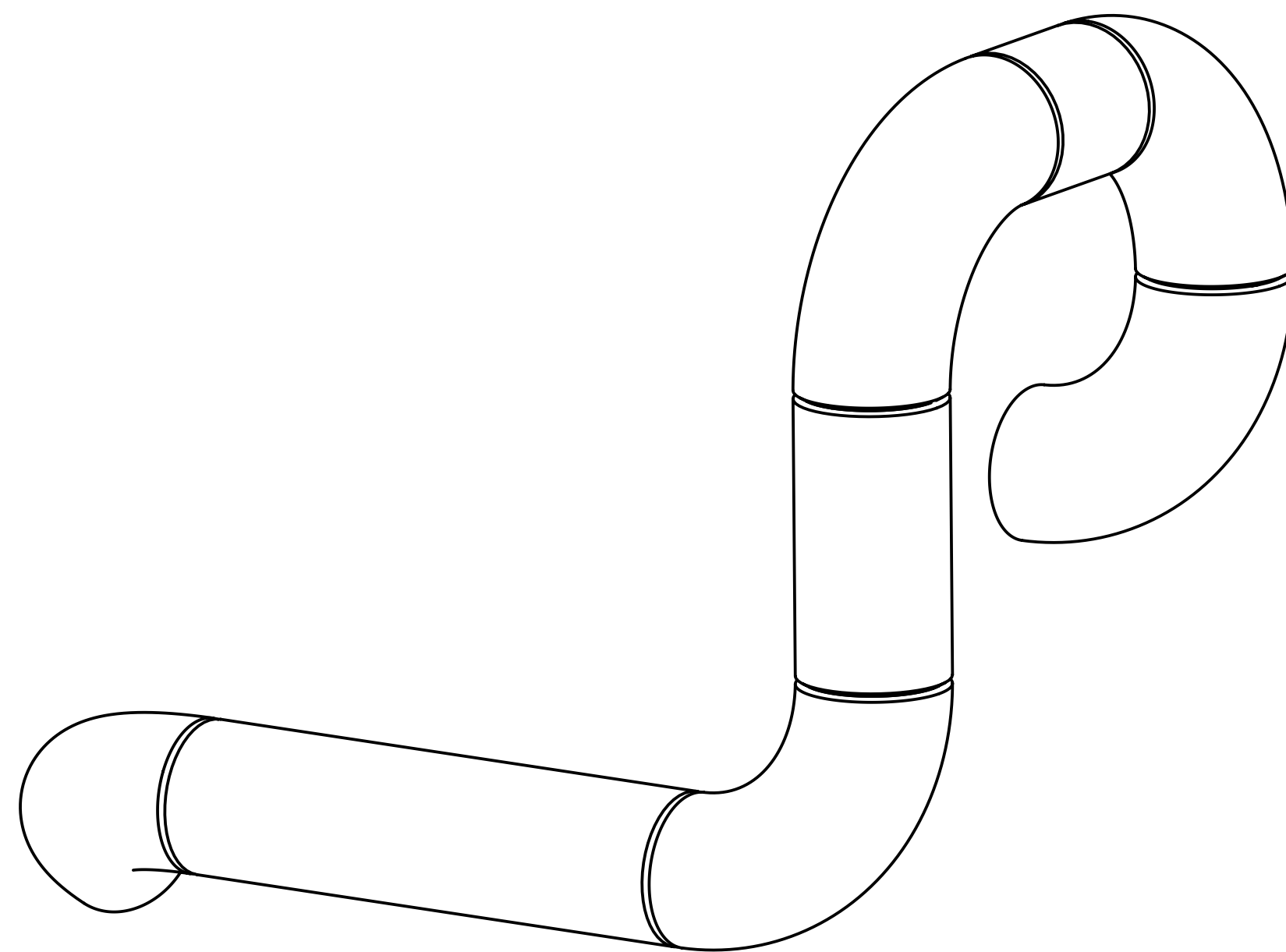
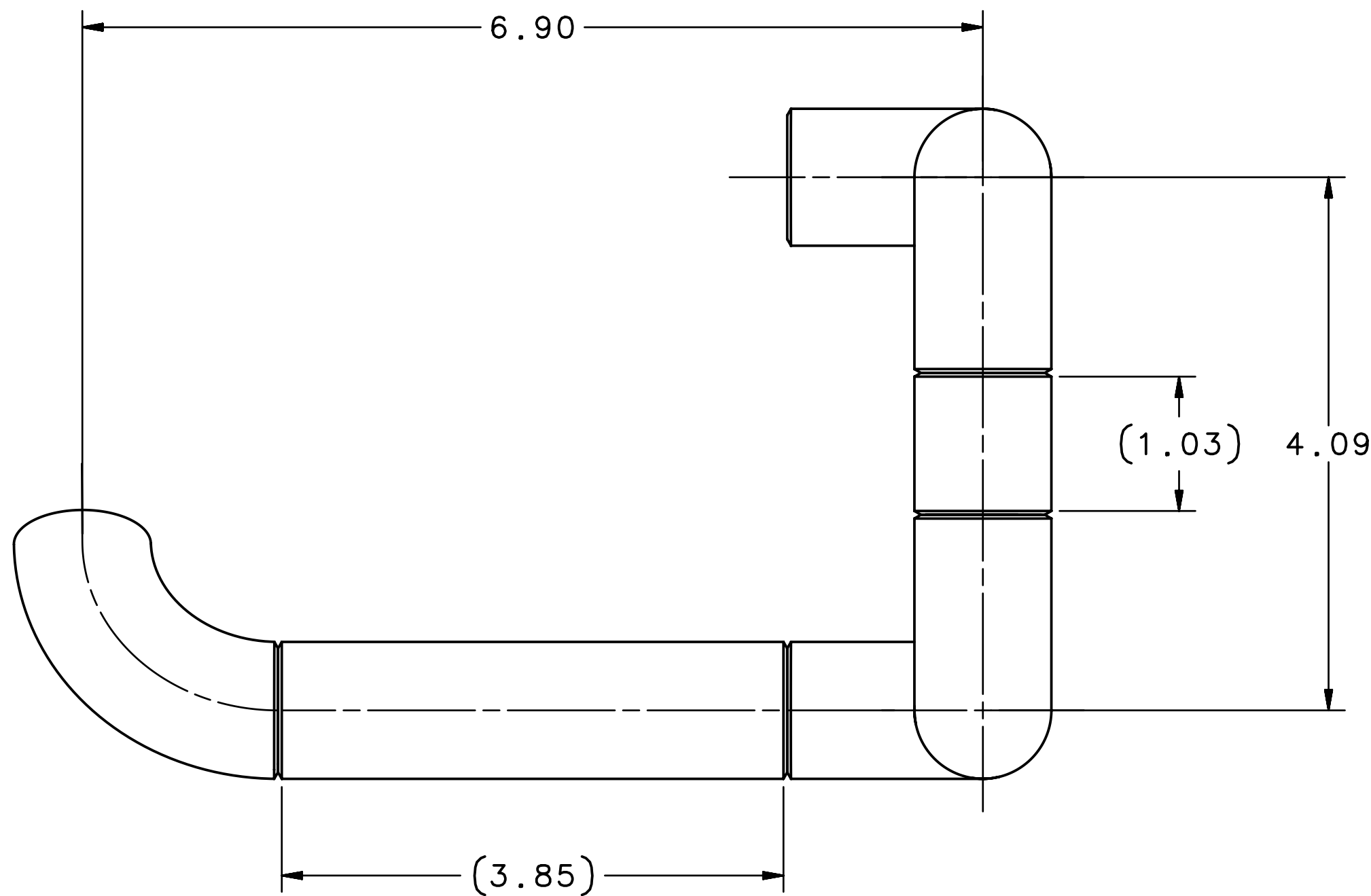
NOTES:

1. CLEAN AND HANDLE PER TJNAF SPECIFICATION 11141-S-0035.

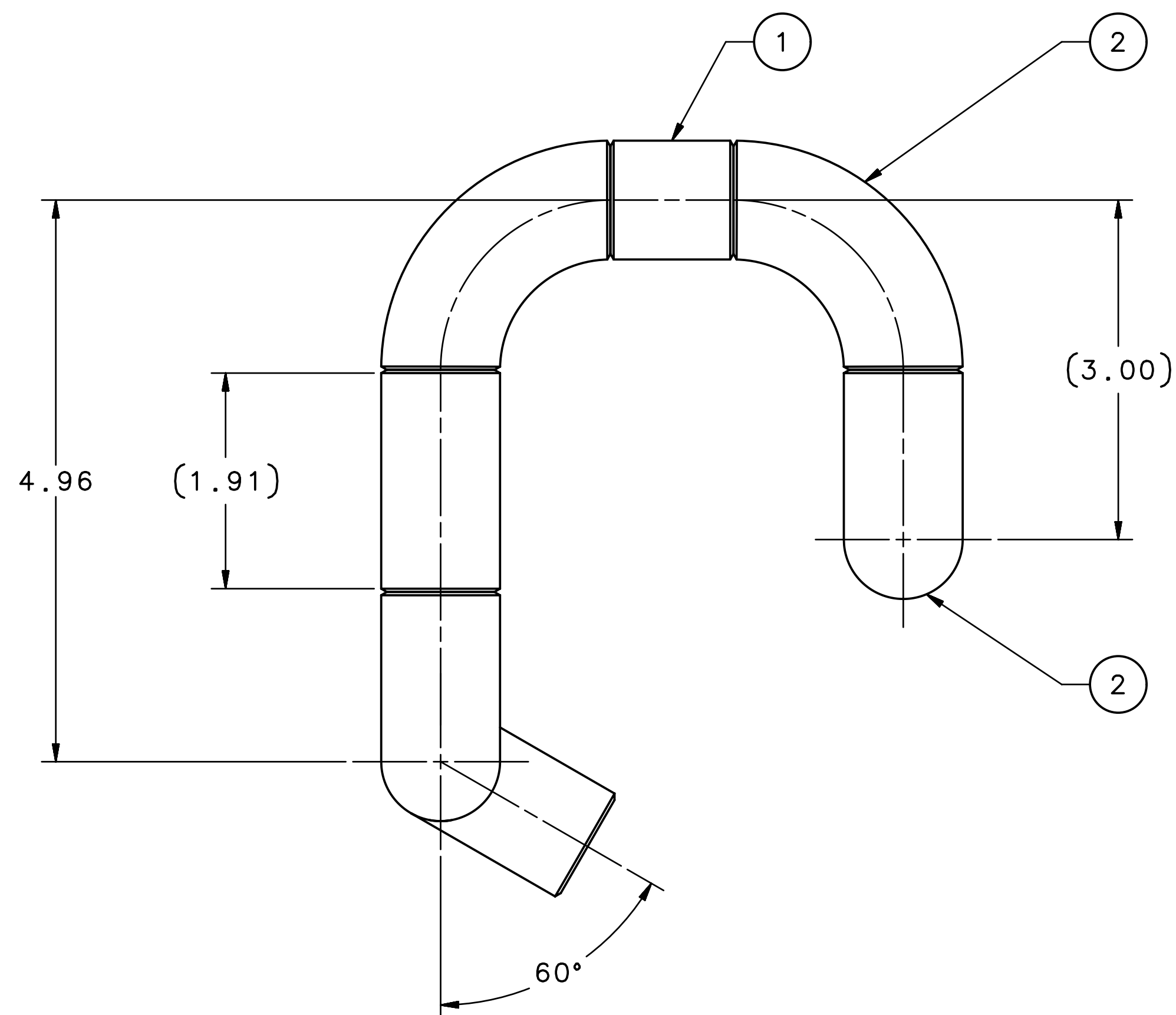
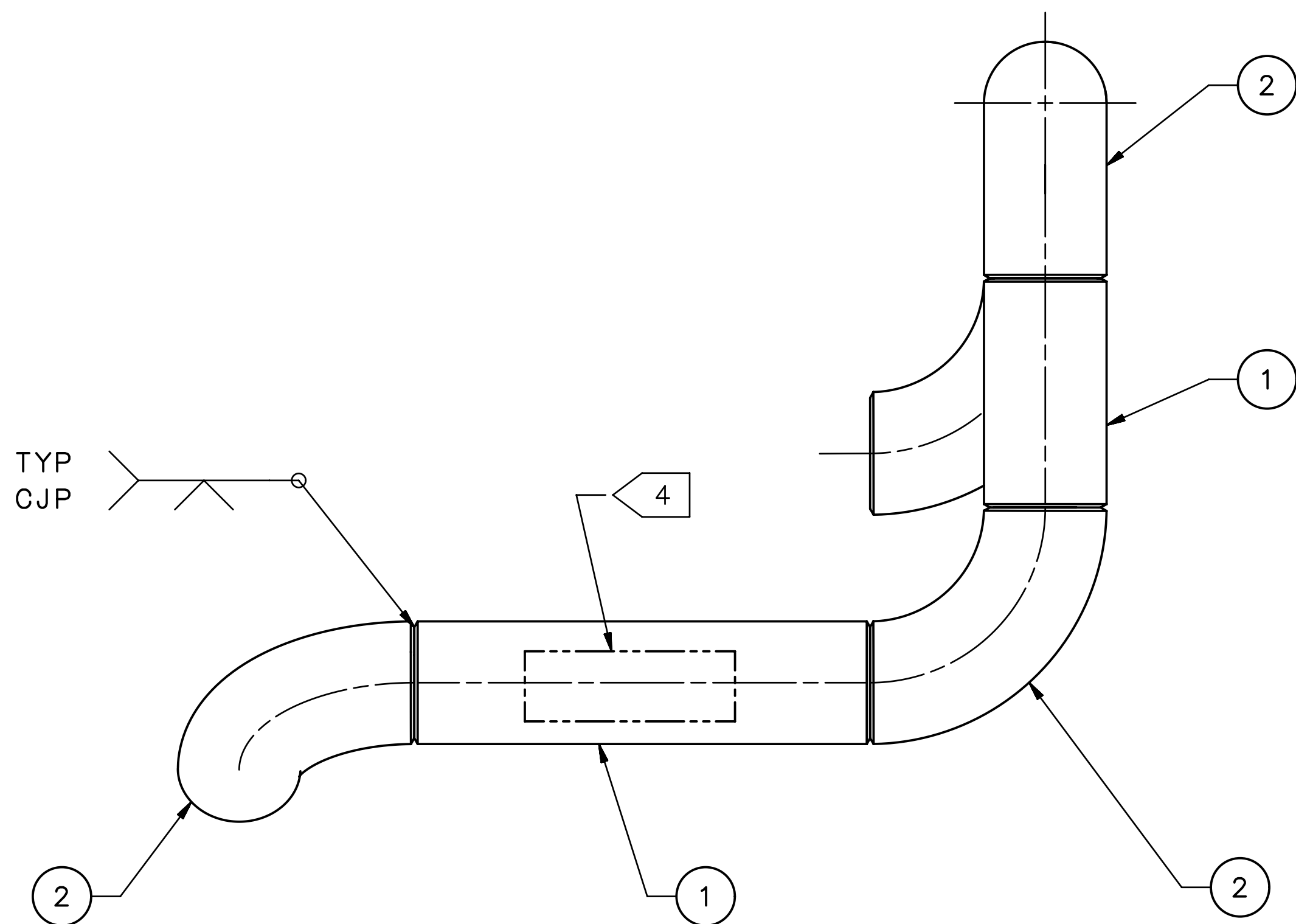
2. BRAZE MATERIAL: SAFETY-SILV 45 (BAg-5)

1	2	-	THERMAL STRAP 1.5" WIDE X .12" THK X 3.5" LONG	BRAIDED C10100 OFE COPPER	
1	1	-	THERMAL BLOCK	C10100 OFE COPPER	
QTY REQD	ITEM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION	NOTES
PARTS LIST					
FOR JLAB INTERNAL USE ONLY			MATERIAL		
SEE ES&H MANUAL CHAPTER 6151 FOR PRESSURE AND VACUUM SYSTEMS SAFETY SUPPLEMENT AND WELDING AND BRAZING SUPPLEMENT			SEE PARTS LIST		
WELD CLASS			THIRD ANGLE PROJECTION		
PRESSURE/VACUUM CLASS			FINISH 125 UNLESS MACHINED SURFACES ☒ OTHERWISE NOTED DEBURR & BREAK ALL SHARP EDGES		
N/A			DO NOT SCALE DRAWING		
PRESSURE SYSTEMS NUMBER			DRAWN J. ARMSTRONG DATE 30 JUL 19		
N/A			SCALE 1:1 USED ON ASSY NO. 104210200-M8U-8200-A022 SHEET 1 OF 1		
UNITED STATES DEPARTMENT OF ENERGY			Jefferson Lab Ottomans Jefferson National Accelerator Facility		
CRM SPALLATION NEUTRON SOURCE - PPU CRYMODULE FINAL ASSY RETURN PIPING THERMAL STRAP			SIZE DWG. NO. C 104210200-M8U-8200-A019		
REV.			REV. -		

REVISION HISTORY		
ZONE	REV	DESCRIPTION
		DATE/REVISER



ISOMETRIC VIEW
SCALE 1:1

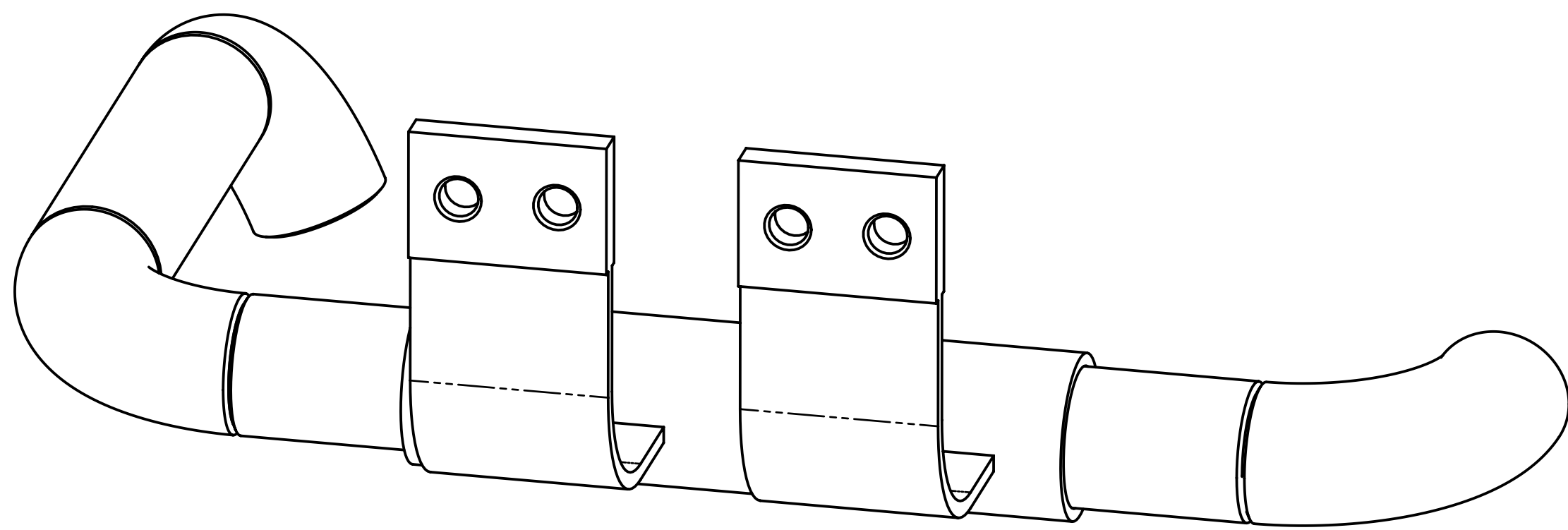
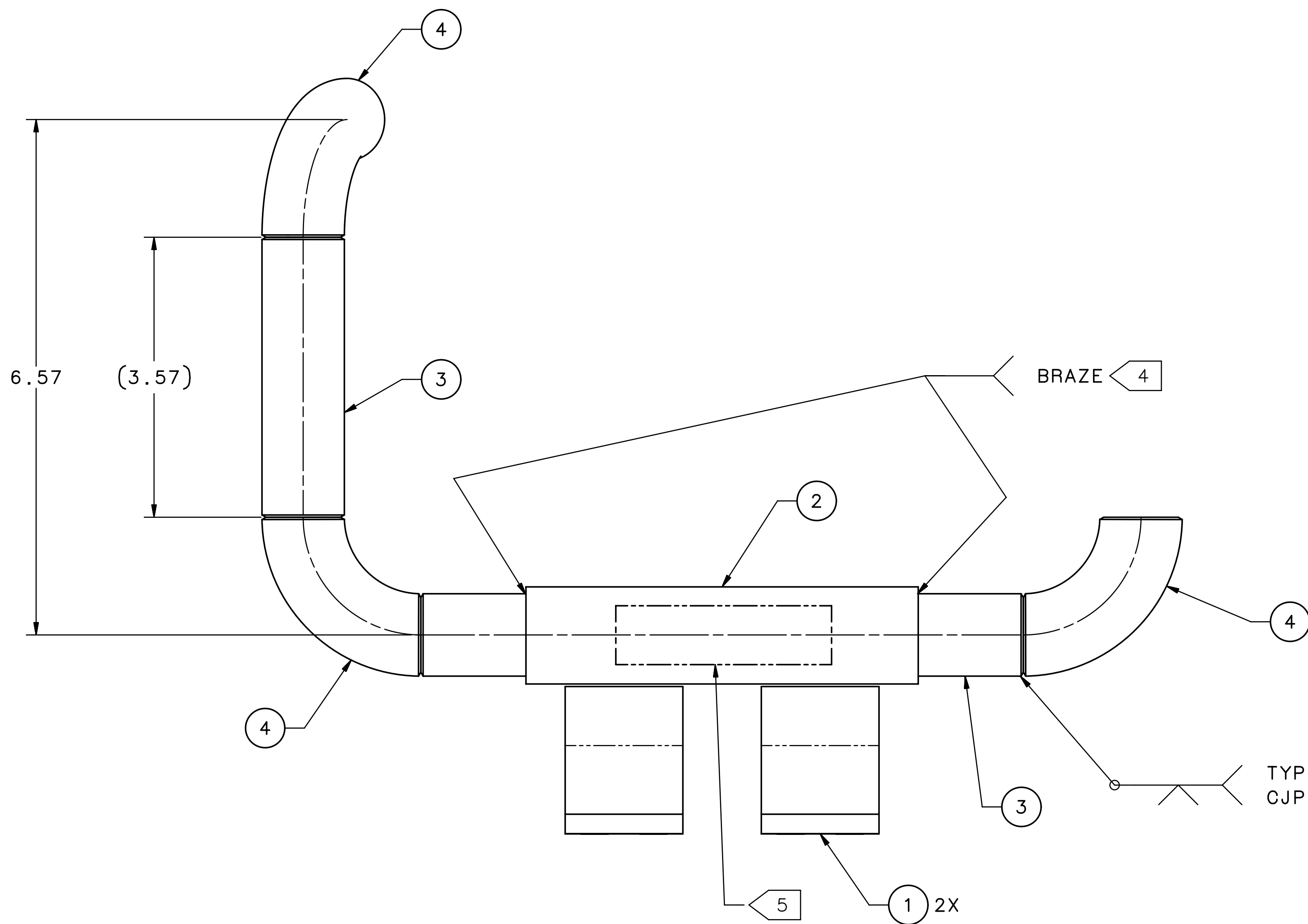


NOTES:

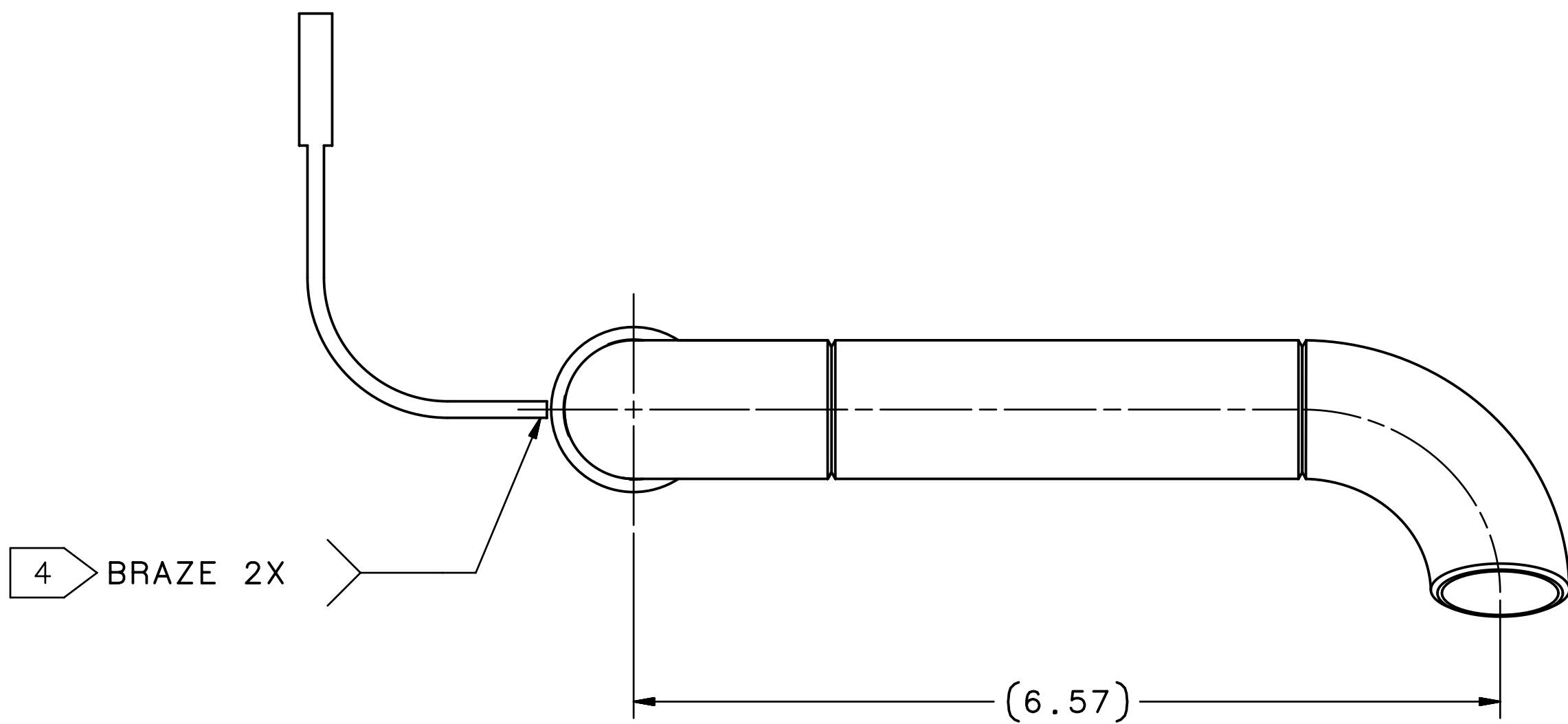
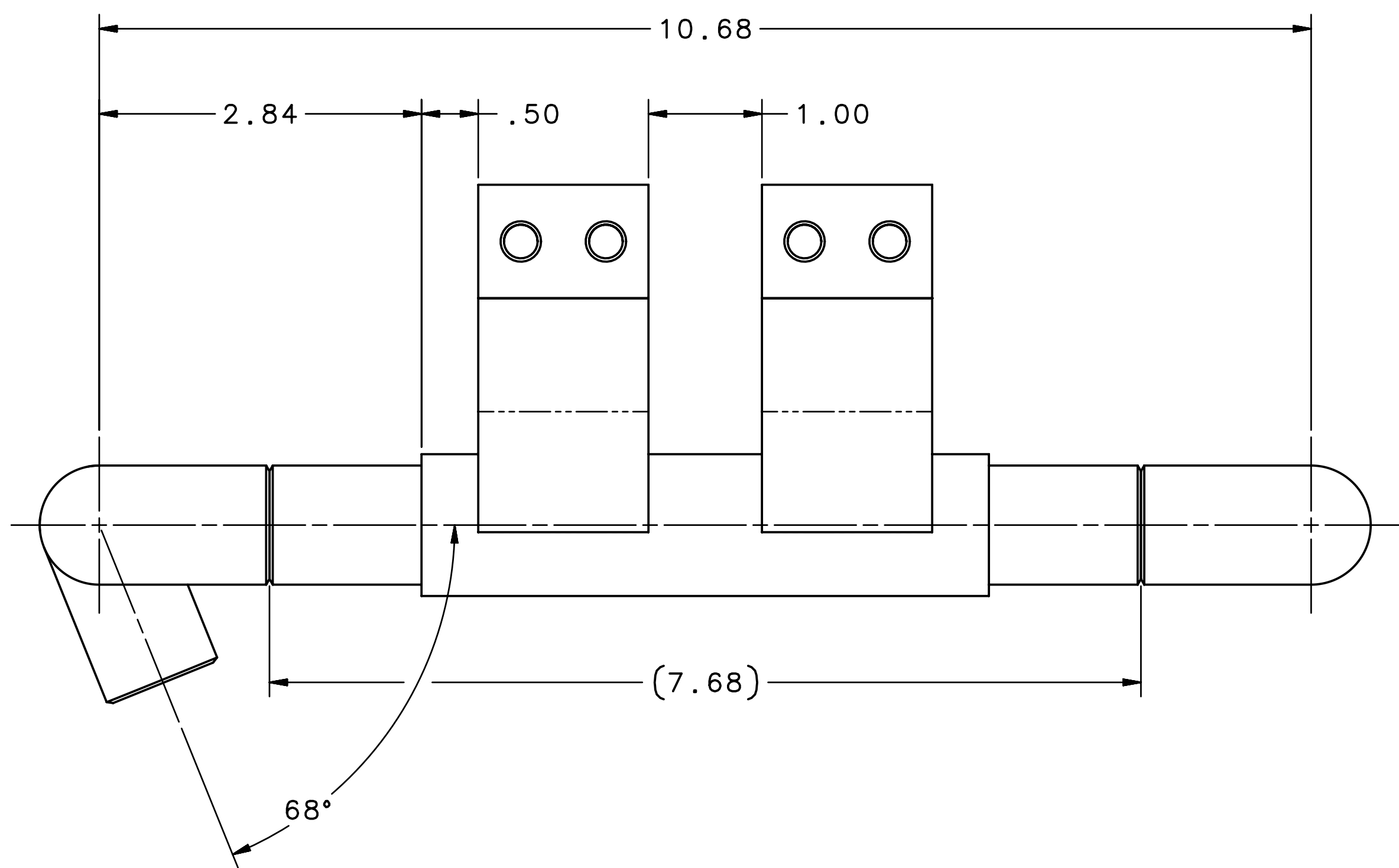
- WELDING TO BE IN ACCORDANCE WITH ASME B31.3.
- VACUUM LEAK CHECK SHALL BE IN ACCORDANCE WITH JLAB SPECIFICATION: 11141-S-0029.
- CLEAN AND HANDLE STAINLESS STEEL PER JLAB SPECIFICATION: 11141-S-0034.
- ENGRAVE OR ETCH "104210200-A020---XXX". XXX IS THE ASSIGNED 3-DIGIT SERIAL NUMBER.

5		2	-	ELBOW 90 DEG, 3/4 NPS SCH-10 LR, BW	ASME B16.9 ASTM A403-304L-SS	
A/R		1	-	3/4 NPS PIPE SCH 10 SS	ASTM A312-TP304L	
QTY REQD	ITEM NO.	PART OR IDENTIFYING NO.		NAME/ABBREVIATION OR DESCRIPTION	MATERIAL SPECIFICATION	NOTES
PARTS LIST						
EACH SHEET OF MULTI-SHEET DRAWINGS SHALL ALWAYS HAVE THE SAME REVISION LEVEL.						
FOR JLAB INTERNAL USE ONLY				UNITED STATES Department of Energy		NEWPORT NEWS Virginia
SEE ESHM MANUAL CHAPTER 6151 FOR PRESSURE AND VACUUM SYSTEMS SAFETY SUPPLEMENT AND WELDING AND BRAZING SUPPLEMENT				JEFFERSON LAB Thomas Jefferson National Accelerator Facility		
TOLERANCES ARE: FRACTIONS ± 1/8 DECIMAL ± .01 ANGLES ± .50°				SEE PARTS LIST		
THIRD ANGLE PROJECTION				CRM SPALLATION NEUTRON SOURCE - PPU CRYMODULE FINAL ASSY HE SUPPLY TO H/X		
WELD CLASS				FINISH MACHINED SURFACES DEBURR & BREAK ALL SHARP EDGES		REV. —
PRESSURE/VACUUM CLASS				UNLESS OTHERWISE NOTED		
ASME B31.3				DO NOT SCALE DRAWING		
PRESSURE SYSTEMS NUMBER				DRAWN J. ARMSTRONG		
PS-CRM-18-001				DATE 31 JUL 19		
				SIZE (DWG. NO.) SCALE 1:1		
				104210200-M8U-8200-A020		
				ISSUED ON ASSY NO. 104210200-M8U-8200-A020		
				SHEET 1 OF 1		

REVISION HISTORY		
ZONE	REV	DESCRIPTION
		DATE/REVISOR

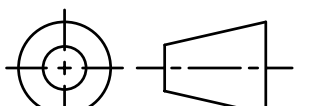


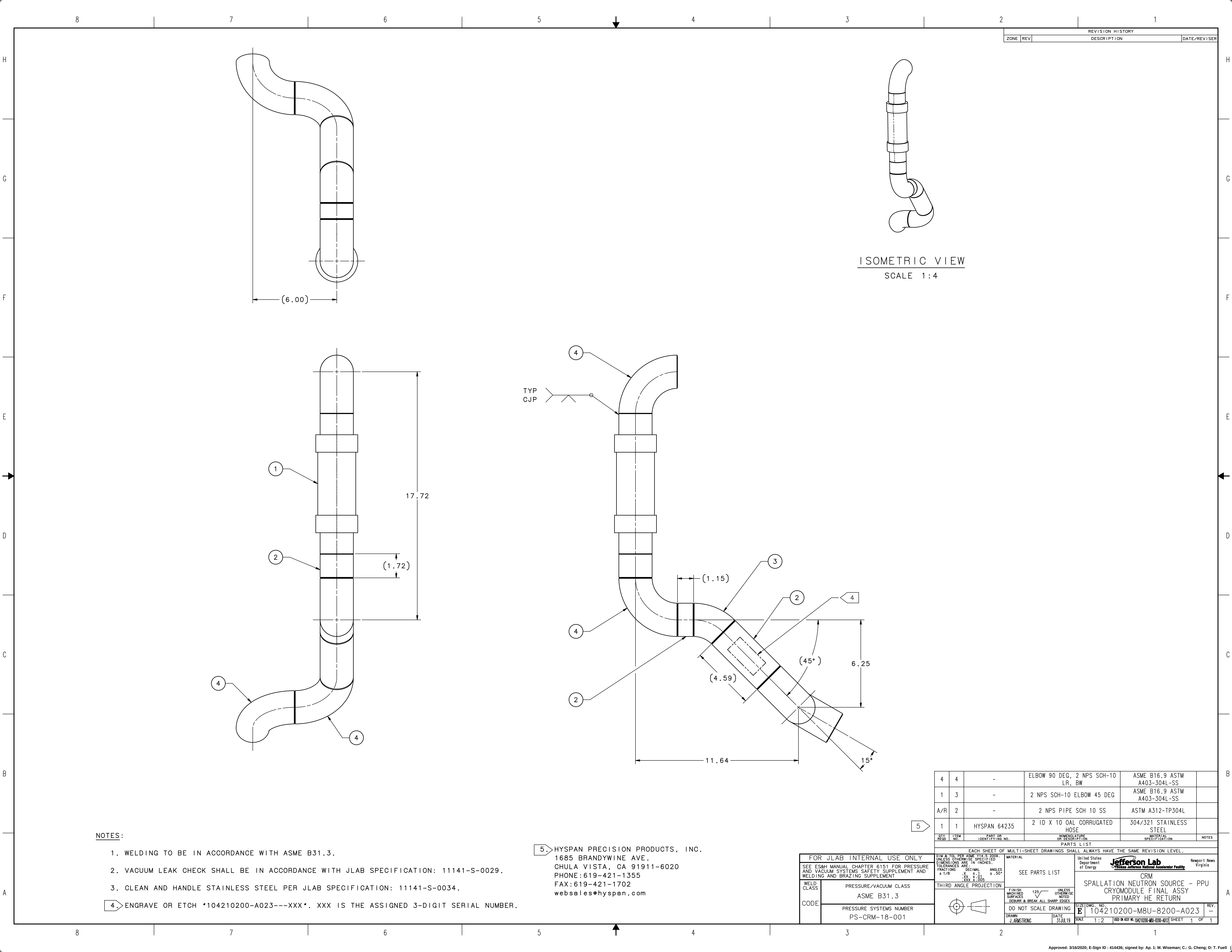
ISOMETRIC VIEW
SCALE 1:1



NOTES:

- WELDING TO BE IN ACCORDANCE WITH ASME B31.3.
- VACUUM LEAK CHECK SHALL BE IN ACCORDANCE WITH JLAB SPECIFICATION: 11141-S-0029.
- CLEAN AND HANDLE STAINLESS STEEL PER JLAB SPECIFICATION: 11141-S-0034.
- BRAZE. PQR/BQR, PQR AND BPQ/WPQ SHALL SHOW STRENGTH OF JOINT AT LEAST STRONGER THAN THE WEAKER BASE MATERIAL. CHOOSE BRAZE ALLOY MELTING POINT WISELY TO AVOID DAMAGING OTHER JOINTS.
- ENGRAVE OR ETCH "104210200-A022---XXX". XXX IS THE ASSIGNED 3-DIGIT SERIAL NUMBER.

3	4	-	ELBOW 90 DEG, 3/4 NPS SCH-10 LR, BW	ASME B16.9 ASTM A403-304L-SS	
A/R	3	-	3/4 NPS PIPE SCH 10 SS	ASTM A312-TP304L	
1	2	104210200-M8U-8200-A017	PIPING THERMAL SLEEVE		
2	1	104210200-M8U-8200-A019	RETURN PIPING THERMAL STRAP		
QTY REQD	ITEM NO.	PART OR IDENTIFYING NO.	DESCRIPTION	MATERIAL SPECIFICATION	NOTES
PARTS LIST					
EACH SHEET OF MULTI-SHEET DRAWINGS SHALL ALWAYS HAVE THE SAME REVISION LEVEL.					
DIM & TOL PER ASME Y14.5 2009. UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ARE: FRACTIONS DECIMAL ANGLES ± 1/8 ± .01 ± .005			United States Department of Energy		Newport News Virginia
SEE PARTS LIST			Jefferson Lab Thomas Jefferson National Accelerator Facility		
THIRD ANGLE PROJECTION			CRM SPALLATION NEUTRON SOURCE - PPU CRYMODULE FINAL ASSY SHIELD RETURN		
			FINISH MACHINED SURFACES UNLESS NOTED DEBURR & BREAK ALL SHARP EDGES		
DO NOT SCALE DRAWING			SIZE (DWG. NO.) SCALE 1:1		REV. -
DRAWN J. ARMSTRONG			DATE 31JUL19		USED ON ASSY NO. 104210200-M8U-8200-A012 SHEET 1 OF 1



REVISION HISTORY		
ZONE	REV	DESCRIPTION
		DATE/REVISER

ISOMETRIC VIEW
SCALE 1:4

NOTES:

1. WELDING TO BE IN ACCORDANCE WITH ASME B31.3.
2. VACUUM LEAK CHECK SHALL BE IN ACCORDANCE WITH JLAB SPECIFICATION: 11141-S-0029.
3. CLEAN AND HANDLE STAINLESS STEEL PER JLAB SPECIFICATION: 11141-S-0034.
4. ENGRAVE OR ETCH "104210200-A023---XXX". XXX IS THE ASSIGNED 3-DIGIT SERIAL NUMBER.

5. HYSpan PRECISION PRODUCTS, INC.
1685 BRANDYWINE AVE.
CHULA VISTA, CA 91911-6020
PHONE: 619-421-1355
FAX: 619-421-1702
websales@hyspan.com

FOR JLAB INTERNAL USE ONLY			
SEE ESH MANUAL CHAPTER 6151 FOR PRESSURE AND VACUUM SYSTEMS SAFETY SUPPLEMENT AND WELDING AND BRAZING SUPPLEMENT			
WELD CLASS	PRESSURE/VACUUM CLASS		THIRD ANGLE PROJECTION
CODE	ASME B31.3		
	PRESSURE SYSTEMS NUMBER		
	PS-CRM-18-001		
FINISH: MACHINED SURFACES DEBURR & BREAK ALL SHARP EDGES		UNLESS OTHERWISE NOTED	
DO NOT SCALE DRAWING		SCALE	
DRAWN: J. ARMSTRONG		DATE: 31 JUL 19	
		SCALE: 1:2	
		USED ON ASSY NO. 104210200-M8U-8200-A012	
		SHEET 1 OF 1	

4	4	-	ELBOW 90 DEG, 2 NPS SCH-10 LR, BW	ASME B16.9 ASTM A403-304L-SS	
1	3	-	2 NPS SCH-10 ELBOW 45 DEG	ASME B16.9 ASTM A403-304L-SS	
A/R	2	-	2 NPS PIPE SCH 10 SS	ASTM A312-TP304L	
1	1	HYSpan 64235	2 ID X 10 OAL CORRUGATED HOSE	304/321 STAINLESS STEEL	
QTY REQD	ITEM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION		NOTES

EACH SHEET OF MULTI-SHEET DRAWINGS SHALL ALWAYS HAVE THE SAME REVISION LEVEL.		
SEE PARTS LIST		
United States Department of Energy		
Jefferson Lab Thomas Jefferson National Accelerator Facility Newport News Virginia		
CRM SPALLATION NEUTRON SOURCE - PPU CRYOMODULE FINAL ASSY PRIMARY HE RETURN		
SIZE (DWG. NO.)	REV.	
B 104210200-M8U-8200-A023	-	

