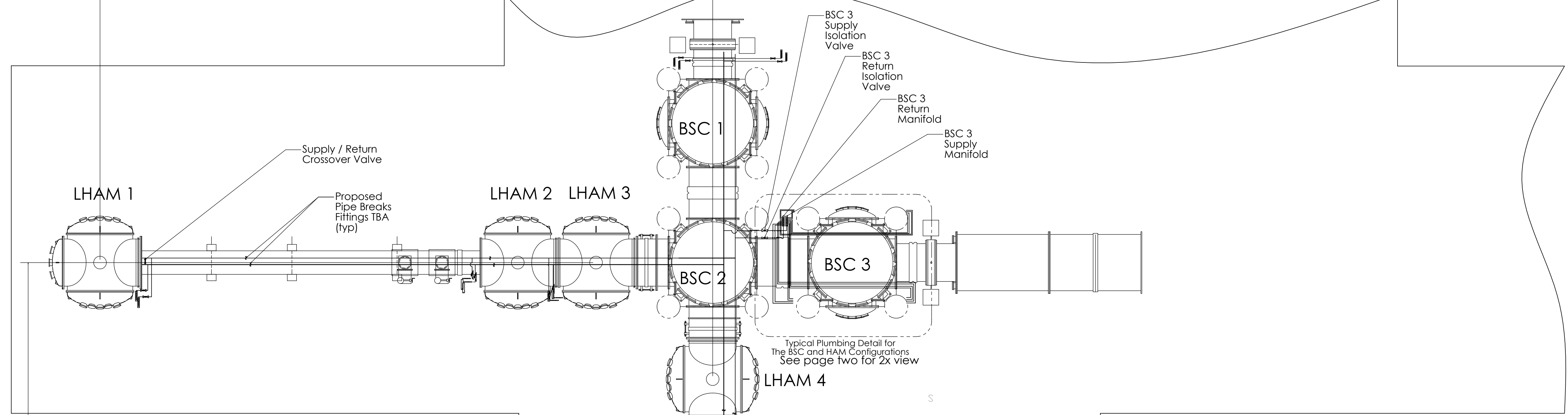


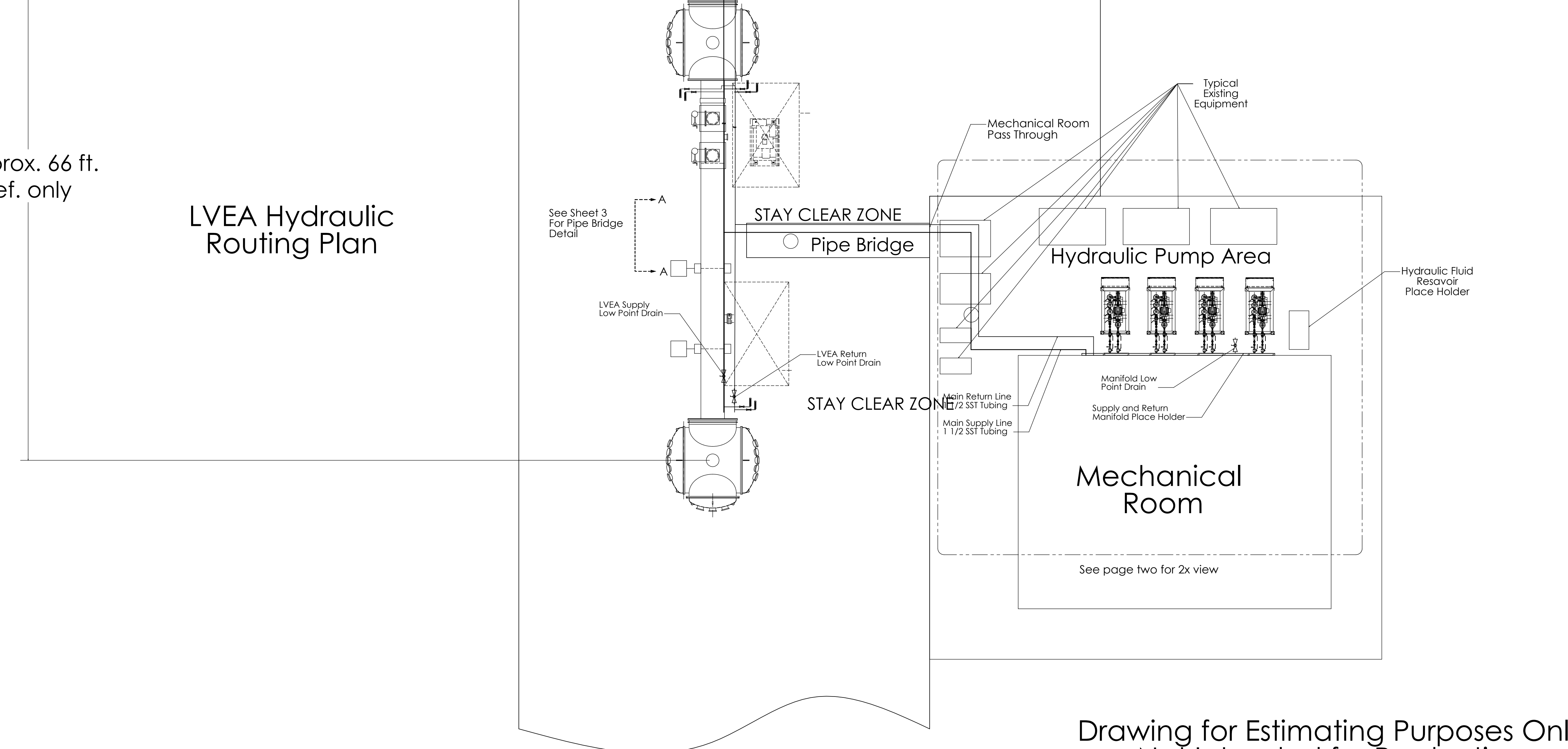
REV.	DATE	DCN #	DRAWING TREE #

approx. 66 ft.
ref. only



approx. 66 ft.
ref. only

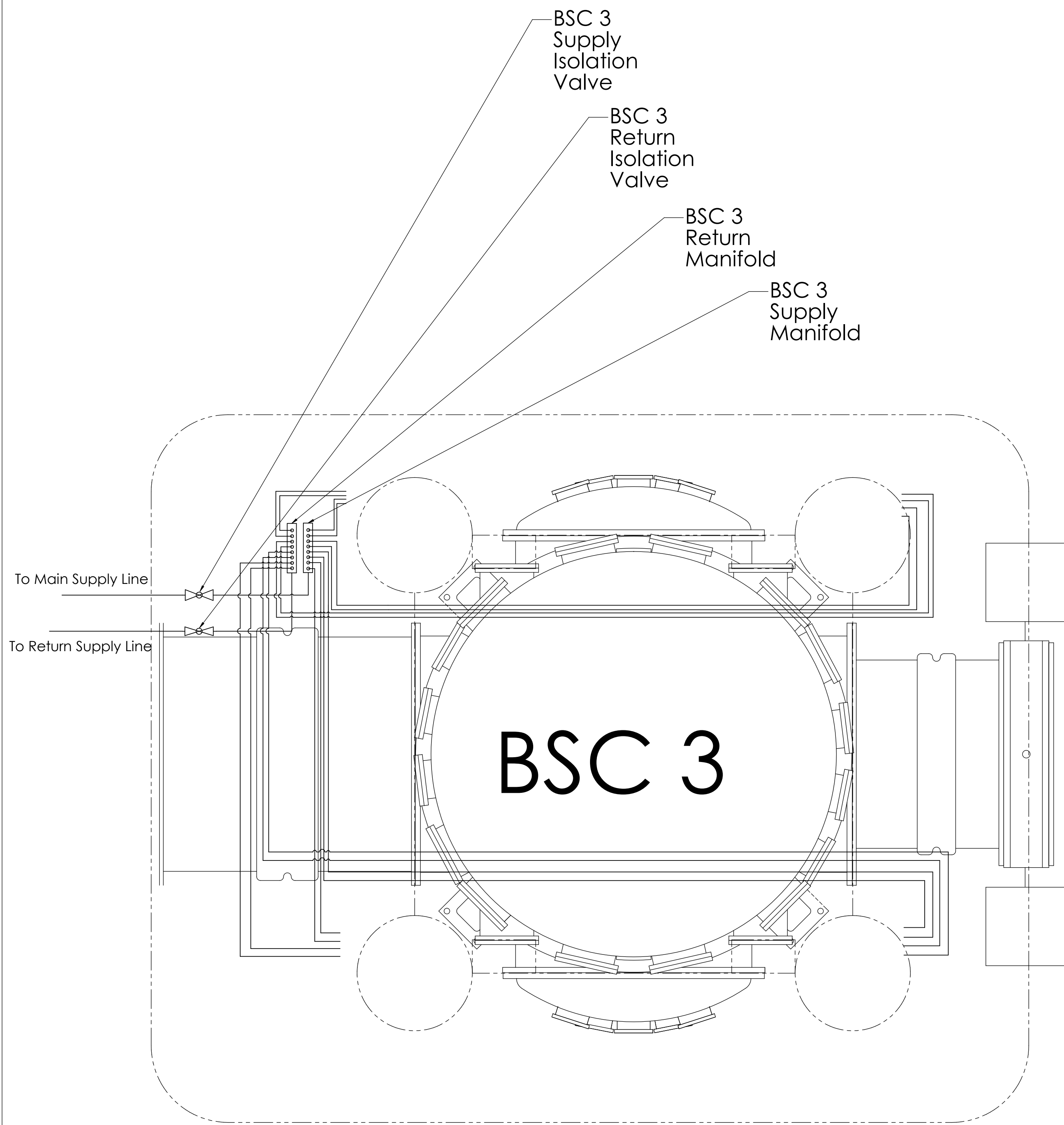
LVEA Hydraulic Routing Plan



NOTES: (UNLESS OTHERWISE SPECIFIED)		PARTS LIST	
1. REMOVE ALL SHARP EDGES. R.02 MIN.	DIMENSIONS ARE IN INCHES	LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY	
2. DO NOT SCALE FROM DRAWING.	TOLERANCES:	SYSTEM SEI External Pre-Isolation	
3. ALL MACHINING FLUIDS SHALL BE WASHED SOLUBLE AND FREE OF SILICUR, CHLORINE AND SILICONE, SUCH AS CINCINNATI MEASUREMENTS (CINTECH 410) (STAINLESS STEEL)	XXX ± 0.01 XXX ± 0.005 ANGULAR ± 0.5 °	SUB-SYSTEM HEPI	
4. SCRIBE, ENGRAVE OR STAMP DRAWING PART NUMBER ON UNFINISHED SURFACE OF PART AND A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST PART AND PROCEED CONSECUTIVELY. USE JIFFY HIGH CHANNEL TIE. EXAMPLE: D030756-001 A VIBRATORY TOOL MAY BE USED.	MATERIAL	NEXT ASSY	
		PART NAME	
		LVEA Hydraulic Routing Layout	
		SITE DWG. NO. D030756	
		REV. 00	
		SCALE: 1:1 PROJECTION:	
		SHEET 1 OF 3	

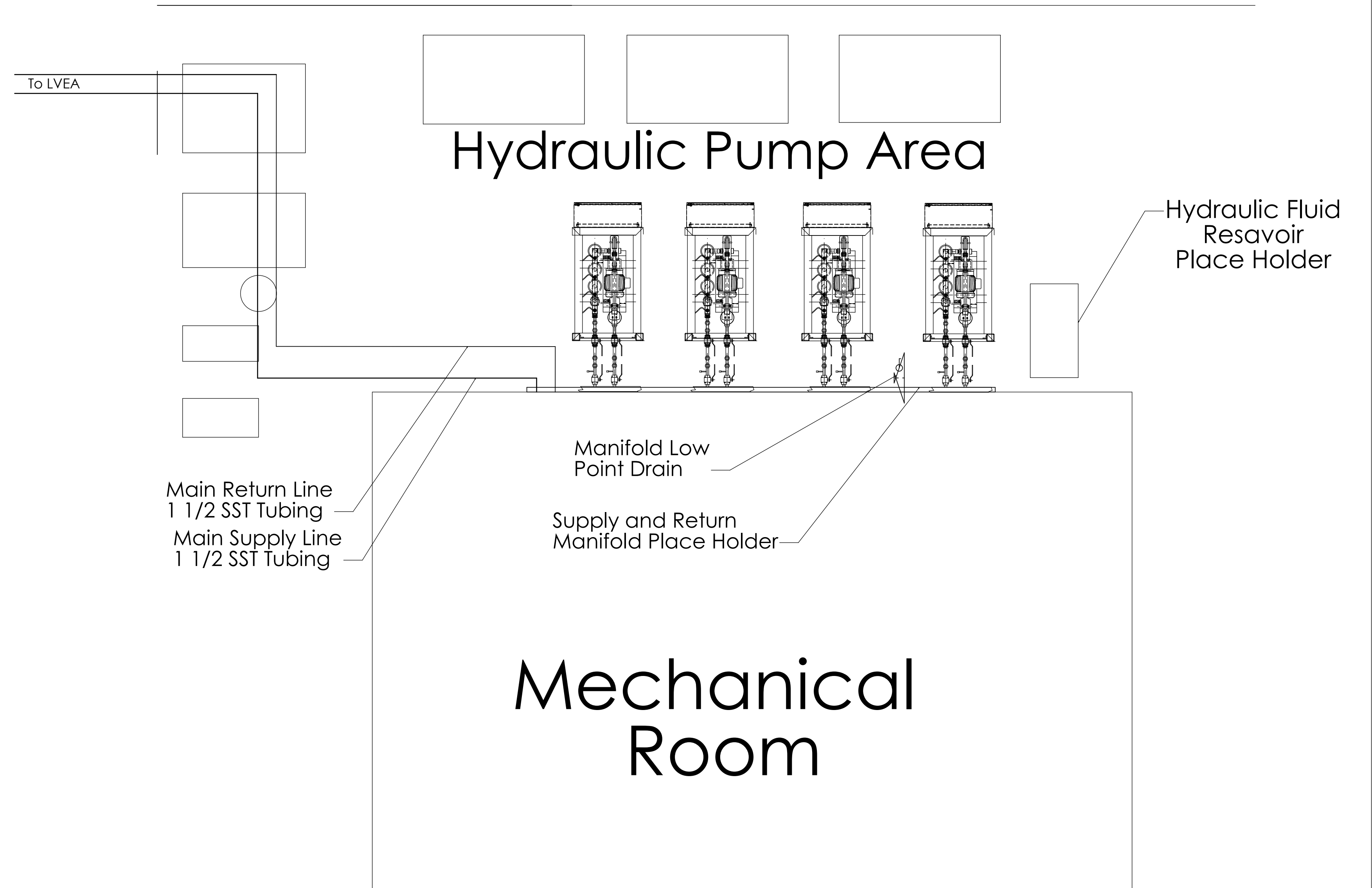
Drawing for Estimating Purposes Only
Not Intended for Production

REV.	DATE	DCN #	DRAWING TREE #



Typical Plumbing Detail for The BSC and HAM Configurations

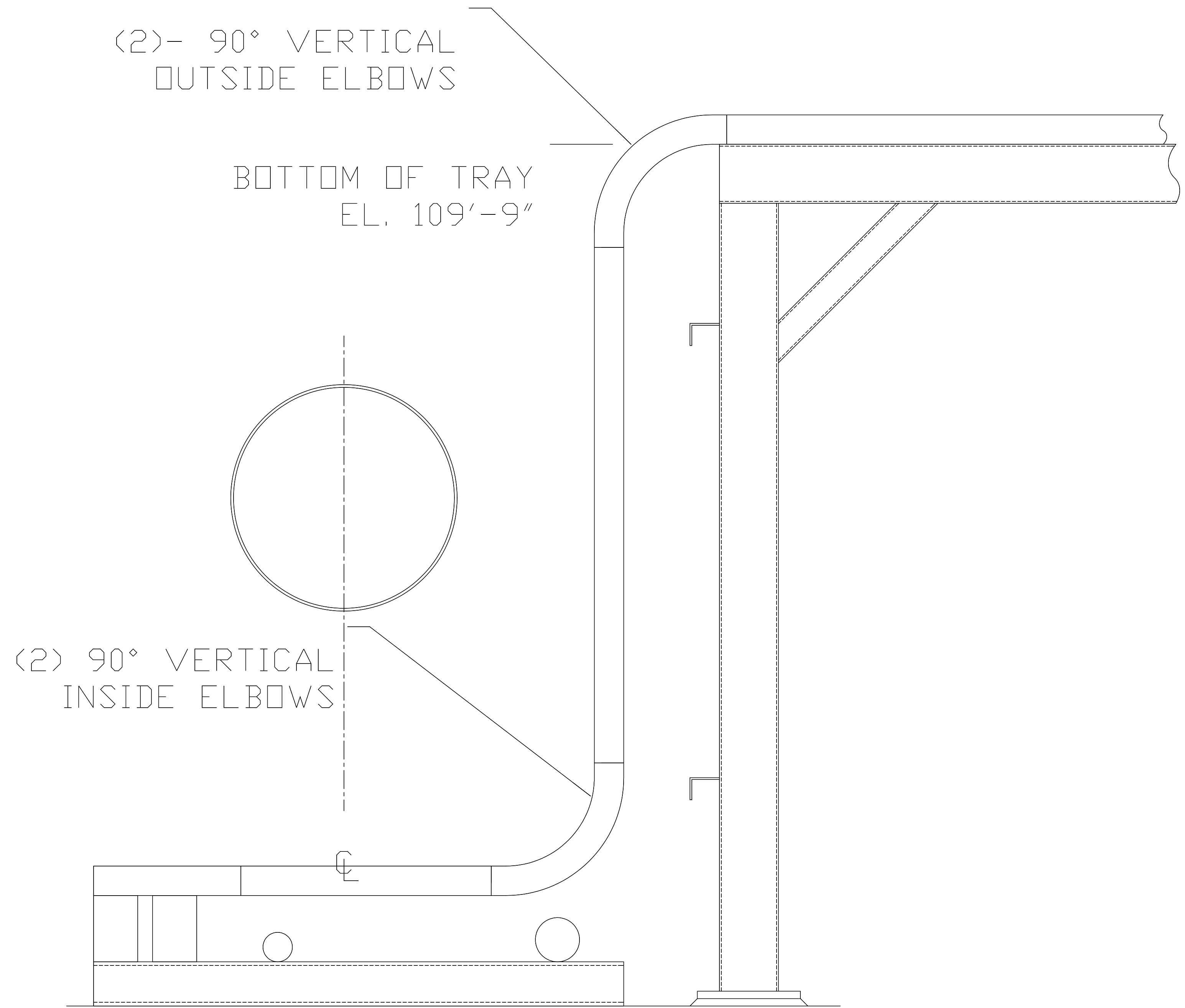
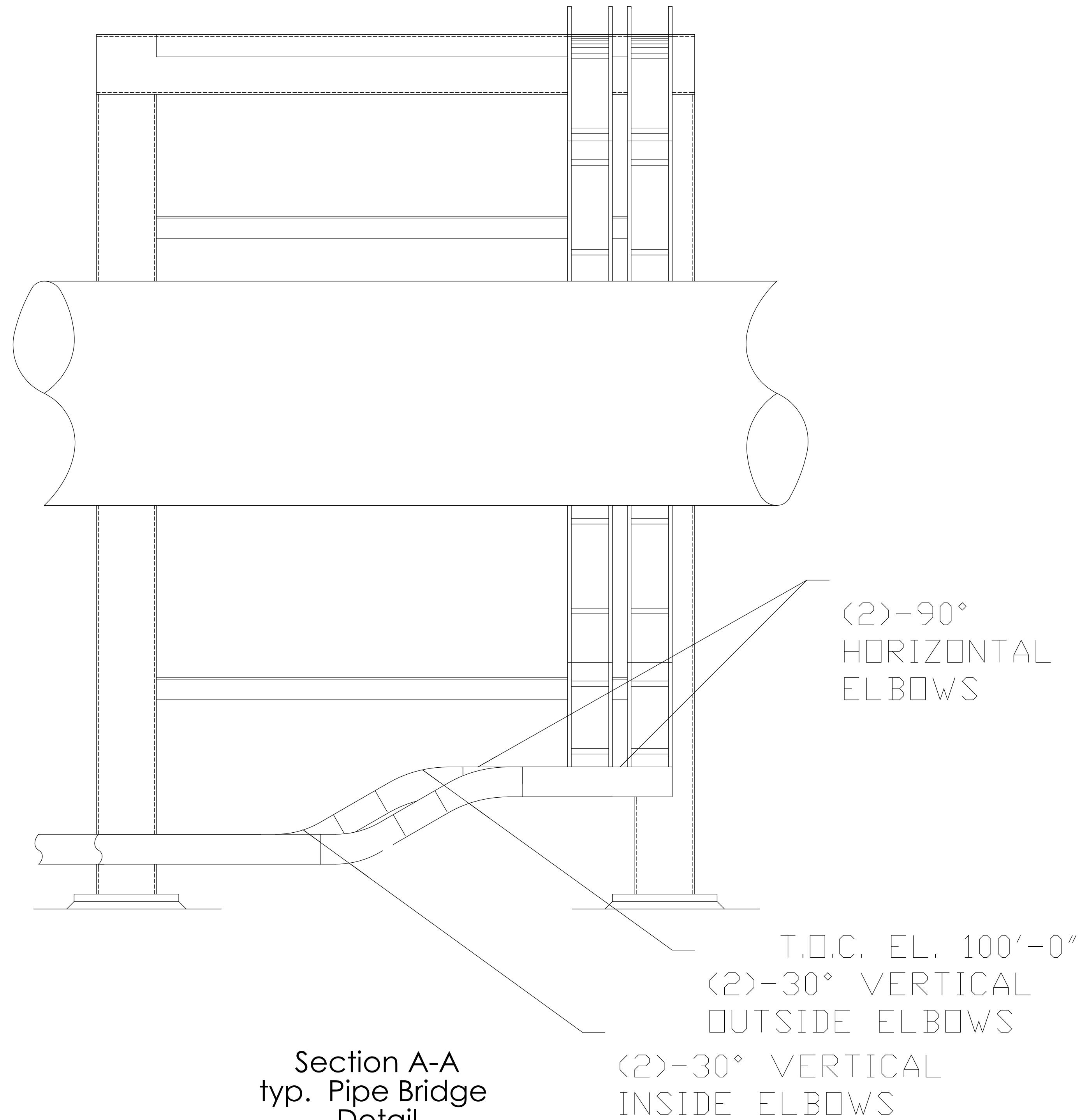
All manifold locations shown on pages 1 and 2 are notional only. All manifolds and associated hardware will be field fit



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Not Intended for Production

NOTES: (UNLESS OTHERWISE SPECIFIED)		PARTS LIST	
1. REMOVE ALL SHARP EDGES. 2. DO NOT SCALE FROM DRAWING. 3. ALL MACHINING FLUIDS SHALL BE WASH SOLUBLE AND FREE OF SILICUR, CHLORINE AND SILICONE, SUCH AS CINCINNATI MFG. GROUP'S CIMTECH 410 (STAINLESS STEEL).		DIMENSIONS ARE IN INCHES TOLERANCES: .XX ± 0.01 .XXX ± 0.005 ANGULAR ± 0.5 °	
④ SCRIBE, ENGRAVE OR STAMP DRAWING PART NUMBERS ON UNFINISHED SURFACE OF PART AND A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST PART AND PROCEED CONSECUTIVELY. USE JET HIGH CHANNEL TUBE. EXAMPLE: D030188-001 A VIBRATORY TOOL MAY BE USED.		MATERIAL: HEP1 FINISH: NEXT ASSY PART NAME: LVEA Hydraulic Routing Layout	
DRAWN: M. Hammond CHECKED: [Signature] APPROVED: [Signature]	DATE: 11/12/2003 SITE: B DWG. NO.: D030756 SCALE: 1:1	SYSTEM: SEI External Pre-Isolation SUB-SYSTEM: HEP1 PART NAME: LVEA Hydraulic Routing Layout SITE: B DWG. NO.: D030756 SCALE: 1:1	REV. 00 SHEET 2 OF 3

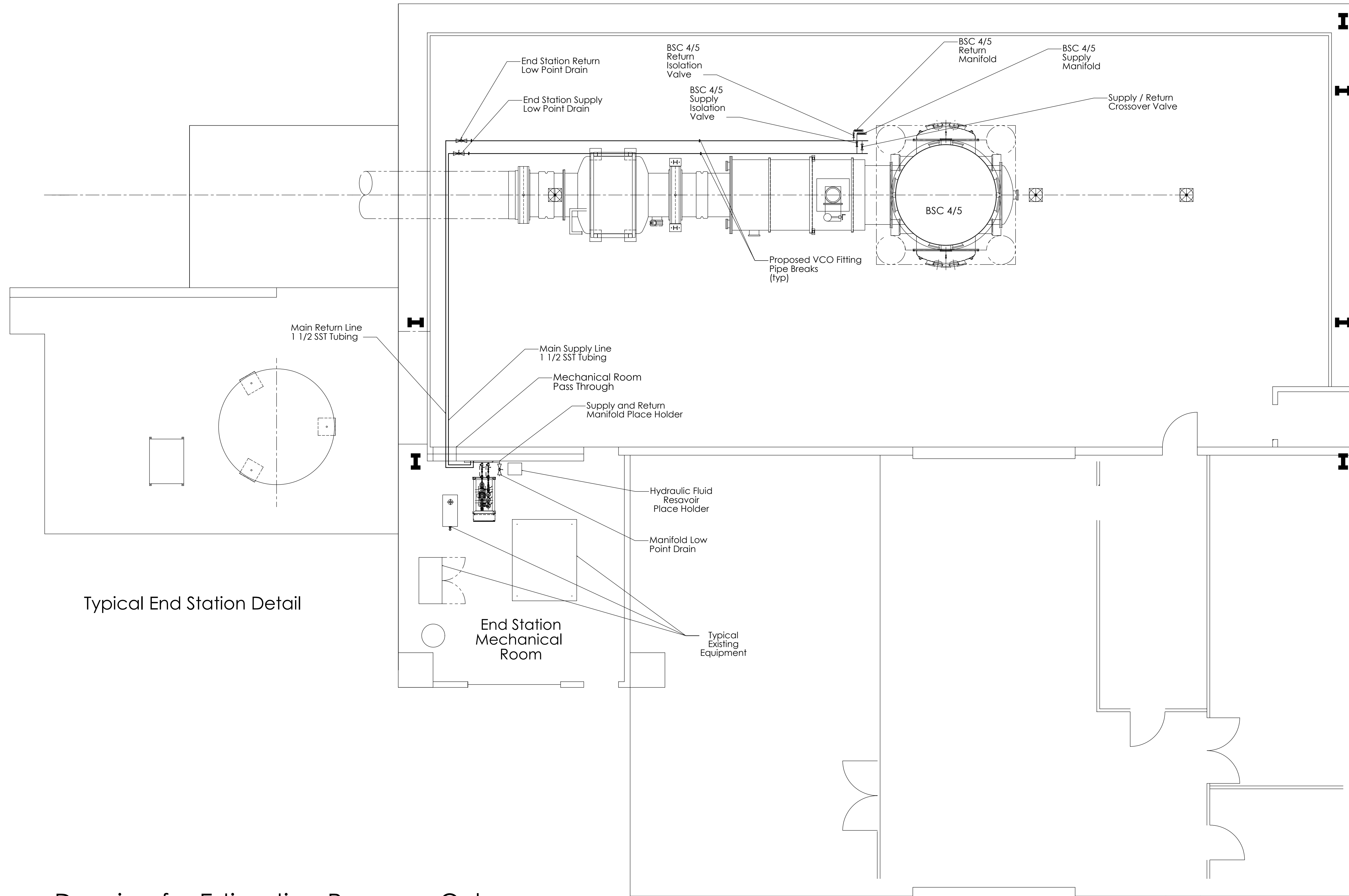
REV.	DATE	DCN #	DRAWING TREE #



Drawing for Estimating Purposes Only
Not Intended for Production

NOTES: (UNLESS OTHERWISE SPECIFIED)		PARTS LIST	
1. REMOVE ALL SHARP EDGES. R2.0 MIN.	DIMENSIONS ARE IN INCHES	CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY	
2. DO NOT SCALE FROM DRAWING.	TOLERANCES:	SYSTEM SEI External Pre-Isolation	
3. ALL MACHINING FLUIDS SHALL BE WASHED OUT AND FREE OF SULFUR, CHLORINE AND SILICONE, SUCH AS CINCINNATI M&P/ROCKWELL CMT/TECH 410 (STAINLESS STEEL)	XXX ± 0.01 XXXX ± 0.005 ANGULAR ± 0.5 °	SUB-SYSTEM HEPI	
4. SCRIBE, ENGRAVE OR STAMP DRAWING PART NUMBER ON UNCOATED SURFACE OF PART AND A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST PART AND PROCEED CONSECUTIVELY. USE 1/16" HIGH CHANNEL LETTERS. EXAMPLE: D030756-001 A VIBRATORY TOOL MAY BE USED.	FINISH	NEXT ASSY	
		PART NAME	
		LVEA Hydraulic Routing Layout	
DRAWN	NAME DATE	SIZE DWG. NO.	REV.
APPROVED		B D030756	00
	SCALE: 1:1	PROJECTION:	SHEET 3 OF 3

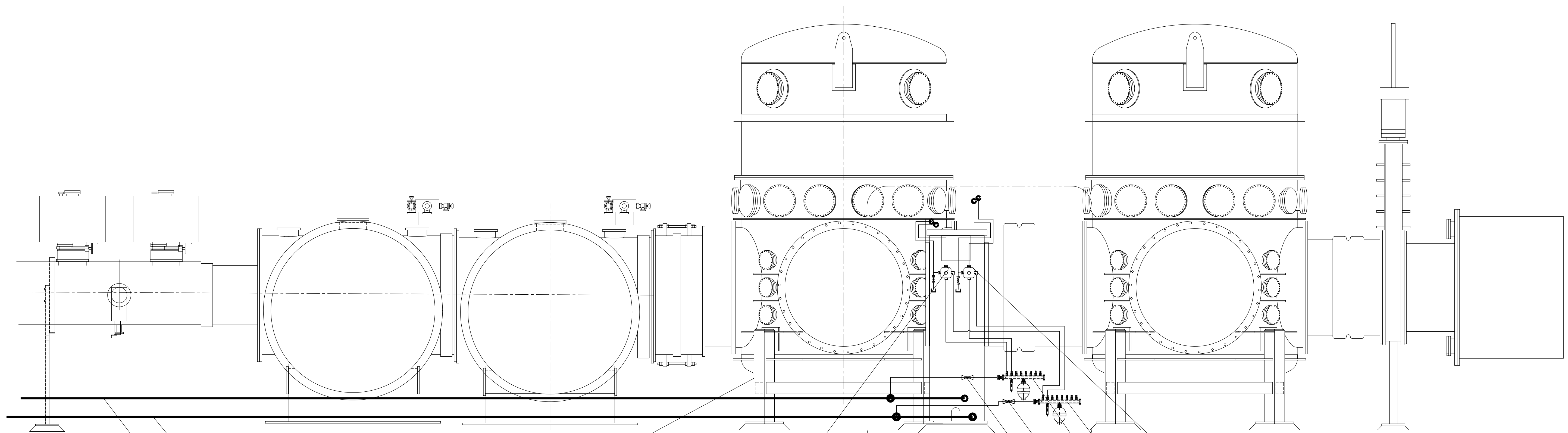
REV.	DATE	DCN #	DRAWING TREE #



Drawing for Estimating Purposes Only
Not Intended for Production

NOTES: (UNLESS OTHERWISE SPECIFIED)		DIMENSIONS ARE IN INCHES		LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY	
1. REMOVE ALL SHARP EDGES. R/0.25 MIN.	2. DO NOT SCALE FROM DRAWING.	TOLERANCES: XX ± 0.01 XXX ± 0.005	3. ALL MACHINING FLUTES SHALL BE WATER SOLUBLE AND FREE OF SULFUR, CHLORINE AND SILICONE, SUCH AS CHROMIUM NICKEL COPPER CINTECH 410 (STAINLESS STEEL)	SYSTEM SEI External Pre-Isolation	REV.
4. SCRIBE, ENGRAVE OR STAMP DRAWING PART NUMBER ON NOTED SURFACE OF PART AND A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS SHALL ALWAYS BE THE FIRST PART AND PROCESSED CONSECUTIVELY. USE 07 FOR CHAMFERS. EXAMPLE: 000108-001-A VIBRATORY TOOL MAY BE USED.	5. FINISH	MATERIAL	ANGULAR ± 0.5 °	SUB-SYSTEM HEP1	REV.
				NEXT ASSY	REV.
				PART NAME End Station Hydraulic Routing Layout	REV.
				SIZE B	00
				DWG. NO. D030757	00
				SCALE: 1:1	PROJECTION:
					SHEET 1 OF 1

REV.	DATE	DCN #	DRAWING TREE #



Main Return Line

BSC Chamber Stand

Hydraulic Actuator
4-way 2-position
crossover valve
(horizontal actuator)

see sheet 2 for
typ. routing
detail

Main Supply Line

Hydraulic Actuator
4-way 2-position
crossover valve
(vertical actuator)

Typical
Return
Manifold

Typical
Supply
Manifold

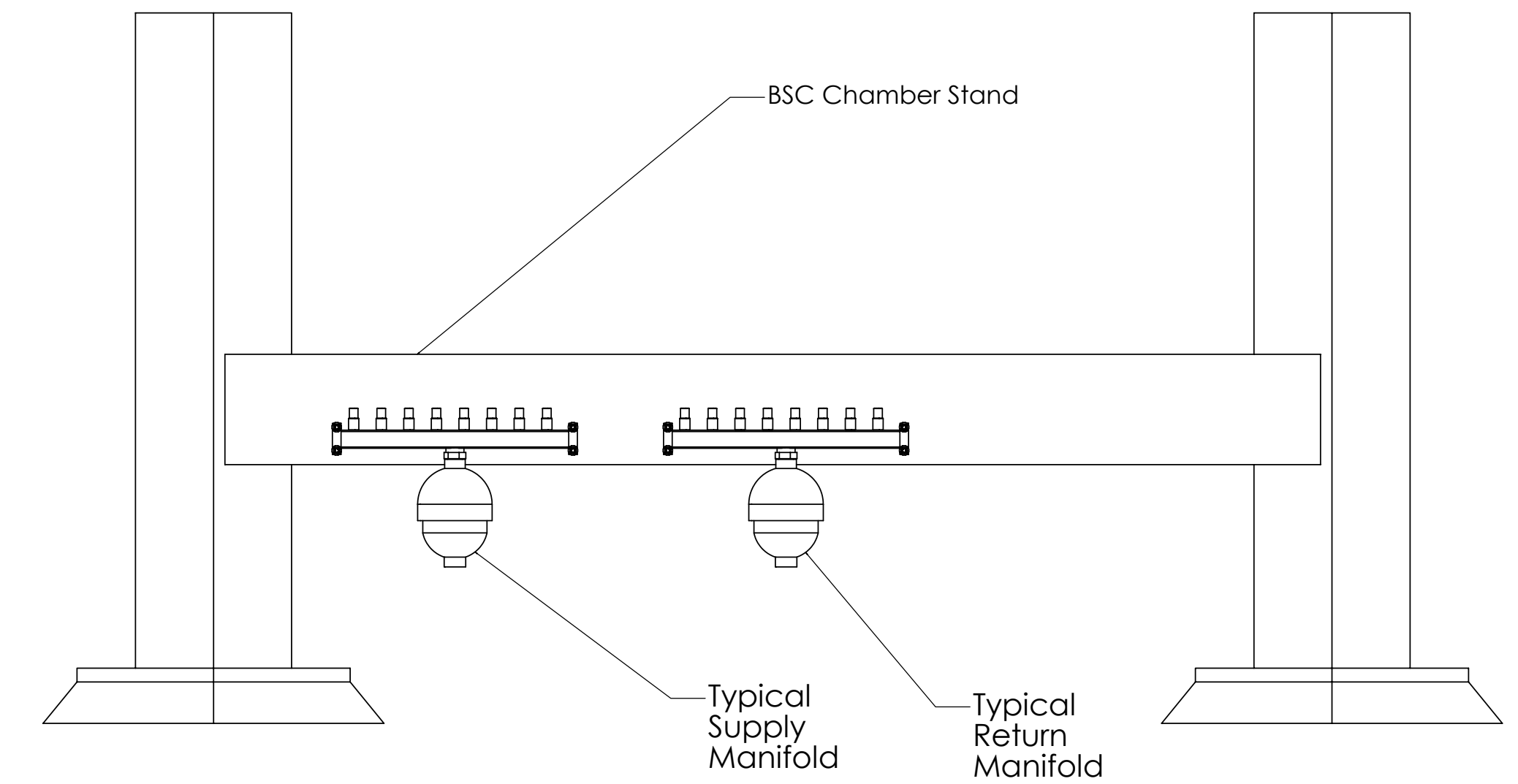
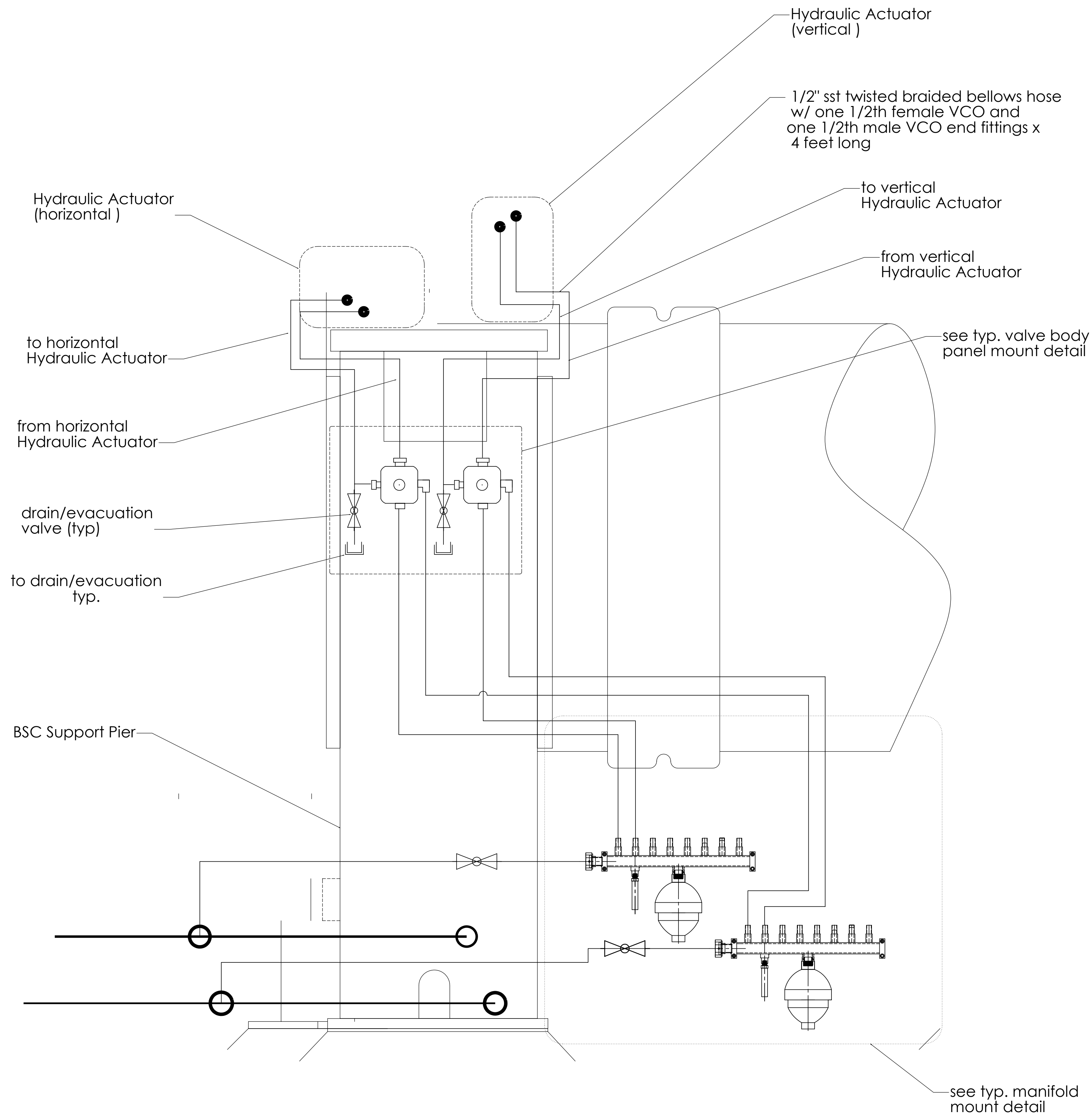
Typical
Return
Isolation
Valve

Typical
Supply
Isolation
Valve

Drawing for Estimating Purposes Only
Not Intended for Production

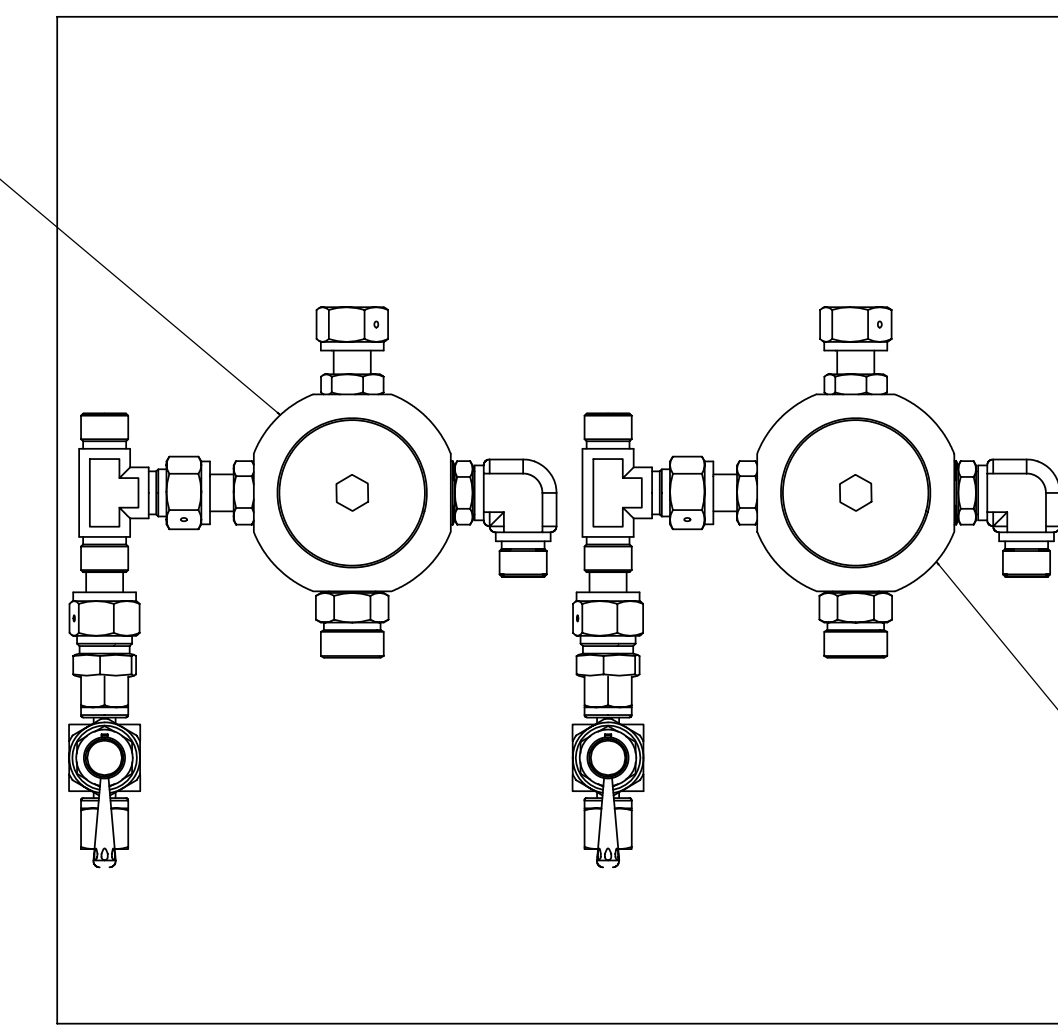
NOTES: (UNLESS OTHERWISE SPECIFIED)		DIMENSIONS ARE IN INCHES		LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY	
1. REMOVE ALL SHARP EDGES. R.02 MIN.	2. DO NOT SCALE FROM DRAWING.	XX ± 0.01	XXX ± 0.005	SYSTEM SEI External Pre-Isolation	
3. ALL MACHINING FLUTES SHALL BE WATER SOLUBLE AND FREE OF SULFUR, CHLORINE AND SILICONE. SUCH AS CHEMOMET MACHRONS CIMTECH 410 (STAINLESS STEEL)	4. SCREWS, ENGRAVE OR STAMP DRAWING PART NUMBER ON NOTED SURFACE OF PART AND A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST PART AND PROCEED CONSECUTIVELY. USE 07 FOR CHARACTERS. EXAMPLE: 000107S 001. A VIBRATORY TOOL MAY BE USED.	ANGULAR ± 0.5 °	MATERIAL	SUB-SYSTEM HEP1	
				NEXT ASSY	
				PART NAME EPI LVEA Elevation Layout	
DRAWN	M. Hammond 11/20/03	SIZE	DWG. NO.	REV.	
CHECKED		B	D030773	00	
APPROVED		SCALE: 1:1	PROJECTION:		SHEET 1 OF 3

REV.	DATE	DCN #	DRAWING TREE #



Typical Manifold Installation (Reference illustration only). Manifolds will be field fit during installation.

Hydraulic Actuator 4-way 2-position crossover valve (horizontal actuator)

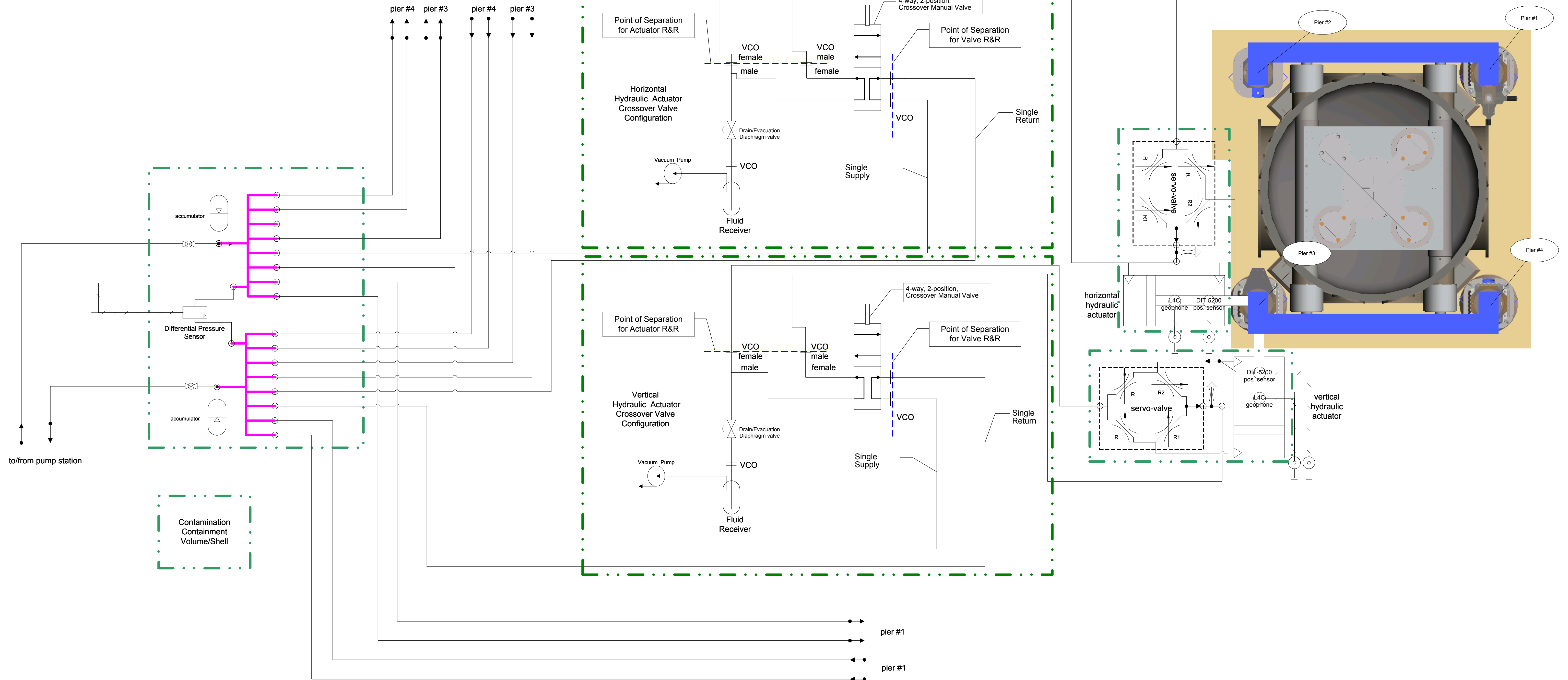


Typical Cross Over Valve Installation (Reference illustration only). Valves will be field fit during installation.

Drawing for Estimating Purposes Only
Not Intended for Production

NOTES: (UNLESS OTHERWISE SPECIFIED)		PARTS LIST	
1. REMOVE ALL SHARP EDGES. R.02 MIN.	2. DO NOT SCALE FROM DRAWING.	DIMENSIONS ARE IN INCHES	CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY
3. ALL MACHINING FLUTES SHALL BE WATER SOLUBLE AND FREE OF SULFUR, CHLORINE AND SILICONE, SUCH AS CHEMICAL MAGNACONS CIMTECH 410 (STAINLESS STEEL)	4. Scribe, engrave or stamp drawing part number on noted surface of part and a three digit serial number. SERIAL NUMBERS START AT 001 FOR THE FIRST PART AND PROCEED CONSECUTIVELY. USE 0 IF LEADING CHARACTER. EXAMPLE: 000155-001. A VIBRATORY TOOL MAY BE USED.	TOLERANCES: XX .001 XXX .0005 ANGULAR ± 0.5 °	
FINISH		NAME	PART NAME
DRAWN M. Hammond 11/20/03		DATE	EPI LVEA Elevation Layout
CHECKED		SIZE B	DWG. NO. D030773
APPROVED		SCALE 1:1.6	PROJECTION
			REV 00
			SHEET 2 OF 3

REV.	DATE	DCN #	DRAWING TREE #



Drawing for Estimating Purposes Only
Not Intended for Production

NOTES: (UNLESS OTHERWISE SPECIFIED)		DIMENSIONS ARE IN INCHES		LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY	
1. REMOVE ALL SHARP EDGES. R.02 MIN.	2. DO NOT SCALE FROM DRAWING.	XX ± 0.01	XXX ± 0.005	SYSTEM	SEI External Pre-Isolation
3. ALL MACHINING FLUTES SHALL BE WALLS SQUARE AND FREE OF SULFUR, CHLORINE AND SILICONE. SUCH AS CHEMOMETRIAL MICROFILMS CMTech 410 (STAINLESS STEEL)	4. SCREWS, ENGRAVE OR STAMP DRAWING PART NUMBER ON NOTED SURFACE OF PART AND A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS SHALL START AT 001 FOR THE FIRST PART AND PROCEED CONSECUTIVELY. USE 0177 FOR CHARACTERS. EXAMPLE: 000155-011. A VIBRATORY TOOL MAY BE USED.	ANGULAR ± 0.5 °	MATERIAL	SUB-SYSTEM	HEPI
FINISH		PART NAME		NEXT ASSY	
DRAWN	NAME	DATE	PART NAME	Piping & Instrumentation Diagram	
CHECKED	NAME	DATE	SIZE	DWG. NO.	REV.
APPROVED	NAME	DATE	B	D020214	01
SCALE: 1:1.6		PROJECTION:		SHEET 3 OF 3	