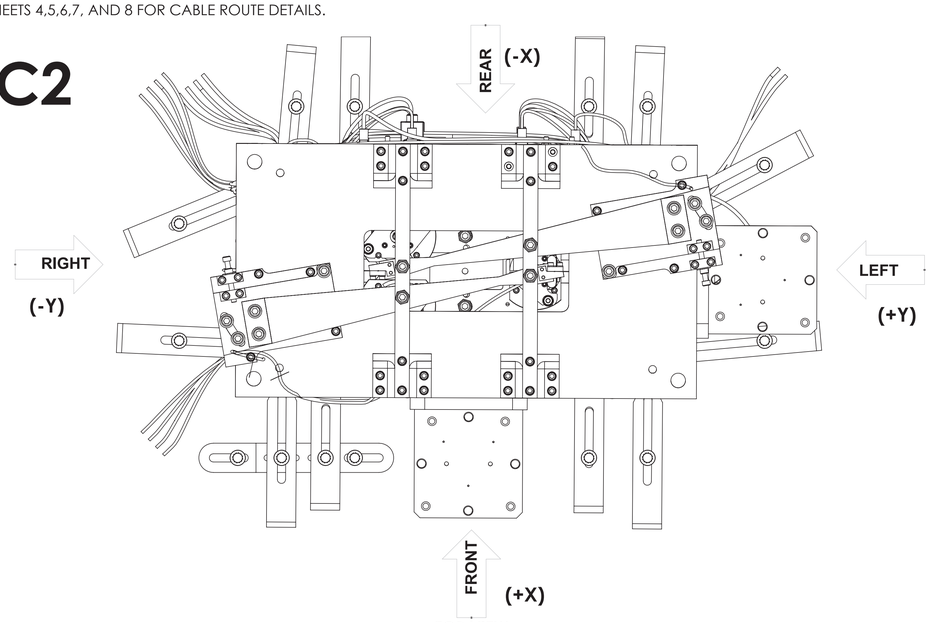
INSTALL CONFIGURATION (i.e.: IN CHAMBER - DOORS CLOSED)

REV.	DATE	DCN #	DRAWING TREE #
V1	25 APR 2012	-	-
v2	02 AUG 2012	E1200728-x	-
-	-	-	-

1. REFERENCED DOCUMENTATION:
   - 1.1 LIGO-E1100109, HAM SUS CONTROL ARRANGEMENT.
   - 1.2 LIGO-D1101493, OSEM ORIENTATION.
   - 1.3 LIGO-D1101463, SYSTEM CABLING DIAGRAM.
   - 1.4 LIGO-D1002424, VIBRATION ABSORVER ORIENTATION.
   - 1.5 LIGO-E1100411, CABLE CLAMP TORQUE.
   - 1.6 LIGO-D1101296, HAM ISI HOLE TABLE.
2. SEE SHEETS 4,5,6,7, AND 8 FOR CABLE ROUTE DETAILS.

MC2

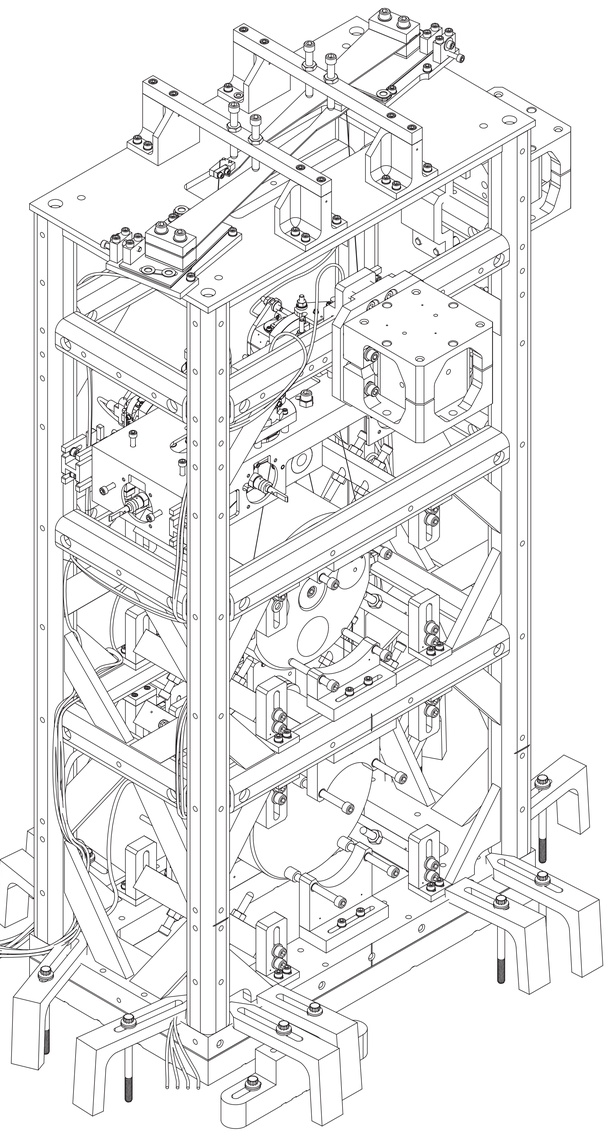


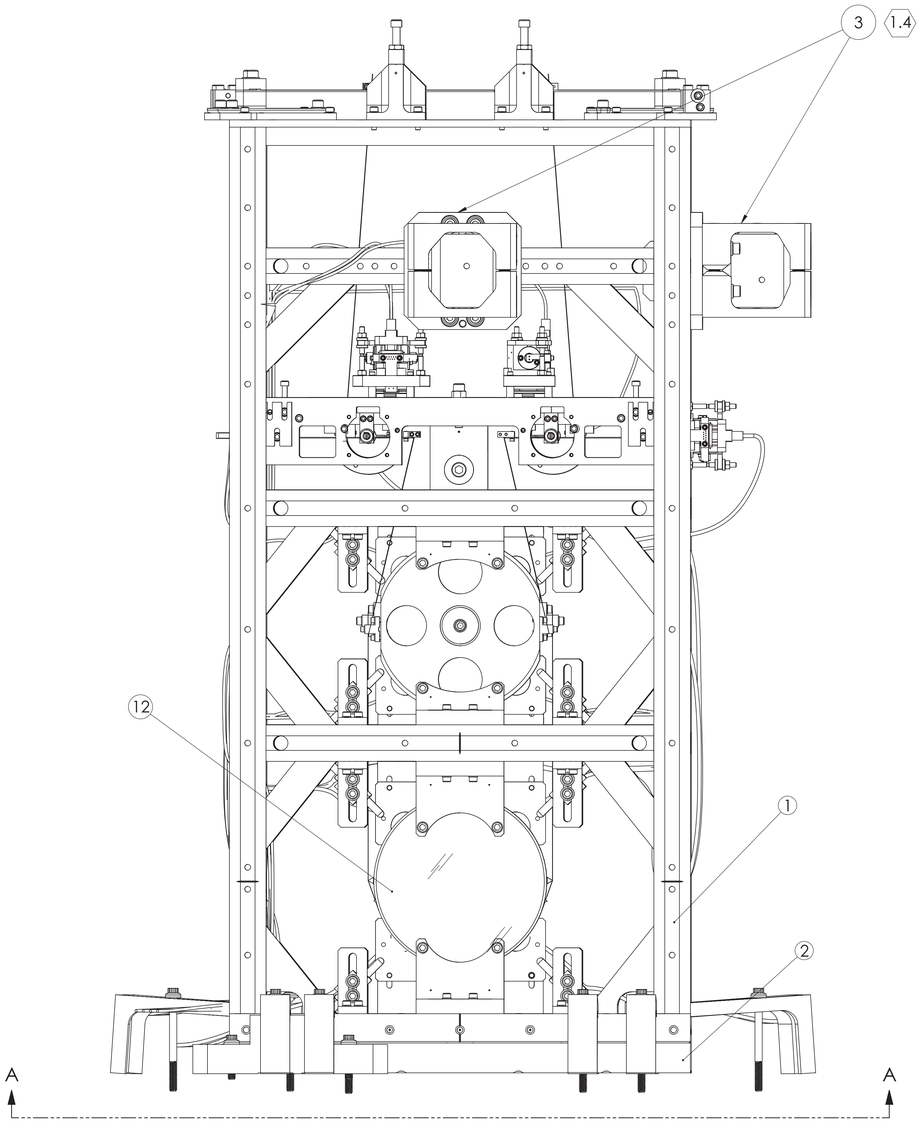
TOP VIEW
(SEE SHEET 3, FOR DOG CLAMP DETAILS)

TABLE 1: HAM3-H1 MC2 CABLING SPECIFICATIONS, FROM/TO DES.

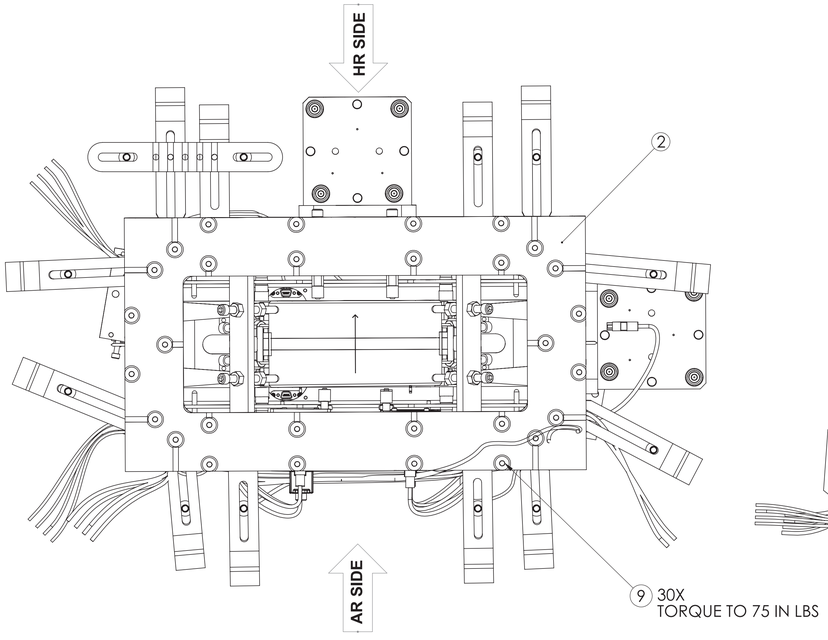
ROUTE NO.	FROM OSEM POSITION	TO CB FLOOR DES.	QP LEG DES.	CABLE PART NO.	NOM. CABLE LENGTH (IN)
1	M3-UL (S)	CB-4 (FIRST)	A	D1000234	60
	M3-LL (N)		B		
	M3-UR (N)		C		
	M3-LR (S)		D		
2	M2-UL (S)	CB-5 (FIRST)	A	D1000234	66
	M2-LL (N)		B		
	M2-UR (N)		C		
	M2-LR (S)		D		
3	M1-T1 (S)	CB-5 (SECOND)	A	D1000234	78
	M1-T2 (S)		B		
	M1-T3 (N)		C		
	M1-LF (N)		D		
4	M1-RT (S)	CB-2 (FIRST)	A	D1000234	96
	M1-SD (S)		B		

NOTE : ROUTE NO. 4 IS A SHARED CABLE, SEE D0901098 FOR QP LEGS 'C' AND D' ROUTING

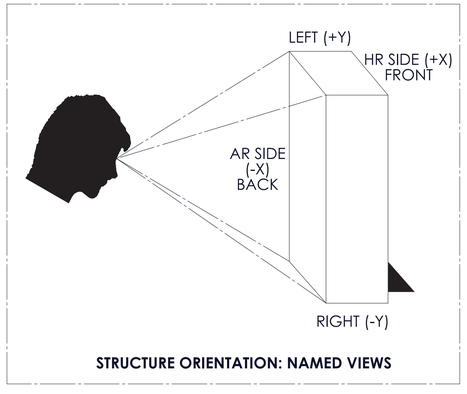




HR SIDE - FRONT



BOTTOM VIEW A-A



STRUCTURE ORIENTATION: NAMED VIEWS

LOCAL COORDINATES - REFERENCE

General Table			
Xmm	Ymm	Zmm	YAW°
-2.5	487.5	-86.2	.23°

REFER TO DRAWING D1101252 FOR HAM3-H1
INSTALLATION PLATE LAYOUT

ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
		PARTS LIST		
13	D0902462	CLAMP ASSY., UHV COMPATIBLE	N/A	1
12	D1101375	MC2 H1 OPTICS ASSEMBLY	N/A	1
11	2AL1.25-12SL	1/4-20 X 1.25 12PT BOLT	450 SSTL	4
10	2AL3.25-12SL	1/4-20 X 3.25 12PT BOLT	450 SSTL	10
9	FA-2024-NA	.25-20 X 1.5 FHSC SCREW UC COMPONENTS FA-2024-NA	18-8 SSTL	30
8	D1100785-530	WASHER, FLAT, .25 X .530 O.D.	NITRONIC 60	14
7	D1100641-09	AdvLIGO HAM Optics Table Dog Clamp Chamfered End 2.2L	304 SSTL	6
6	D1100641-08	AdvLIGO HAM Optics Table Dog Clamp Chamfered End 2.2M	304 SSTL	2
5	D1001376-08	AdvLIGO HAM Optics Table Dog Clamp 2.20M	304 SSTL	4
4	D1100191	aLIGO, DOG CLAMP SUPPORT HLTS-HSTS STRUCTURE	6061-T6 Al	1
3	D1002424	VIBRATION ABSORBER ASSEMBLY	N/A	2
2	D1100037	HSTS SUS STRUCTURE SPACER 25.9MM	6061-T6 Al	1
1	D020700	HSTS OVERALL ASSEMBLY	N/A	1

NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

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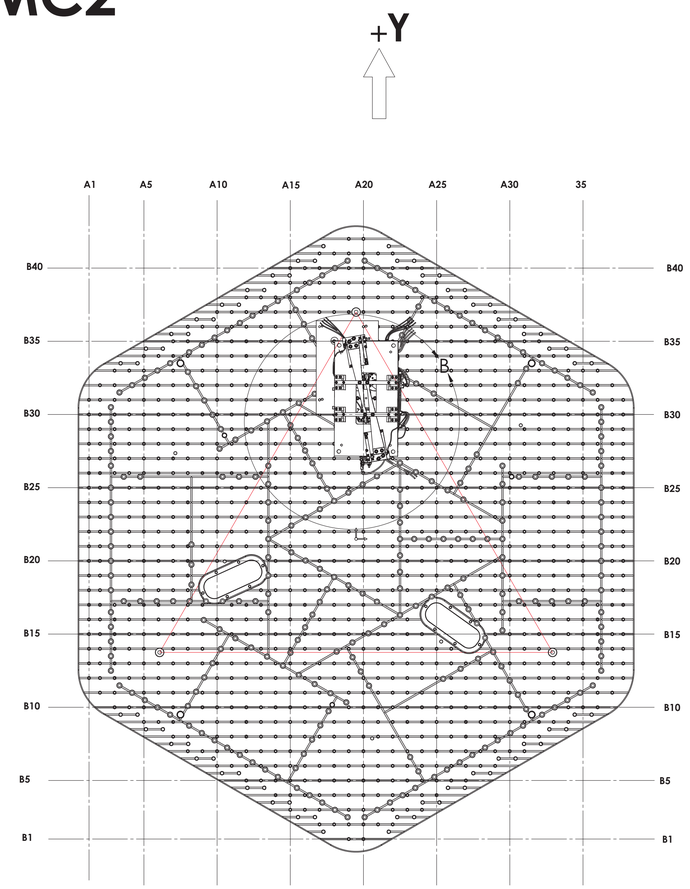
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

PART NAME: AdvLIGO SUS HAM3-H1, XYZ Local CS for HSTS (MC2) Sub-Assy

SYSTEM	SUB-SYSTEM	DESIGNER			SIZE	DWG. NO.	REV.
ADVANCED LIGO	SUS	DRAFTER	E.SANCHEZ	25 APR 2012	E	D0901099	v2
MATERIAL: N/A	FINISH: N/A µinch	CHECKER	SEE DCC	SEE DCC			
NEXT ASSY: D0901094		APPROVAL	SEE DCC	SEE DCC	SCALE: 1:2	PROJECTION:	SHEET 1 OF 9

D0901099 AdvLIGO SUS HAM3-H1, XYZ Local CS for HSTS (MC2) Sub-Assy, PART FOM REV: X.POS, DRAWING FOM REV: X.002

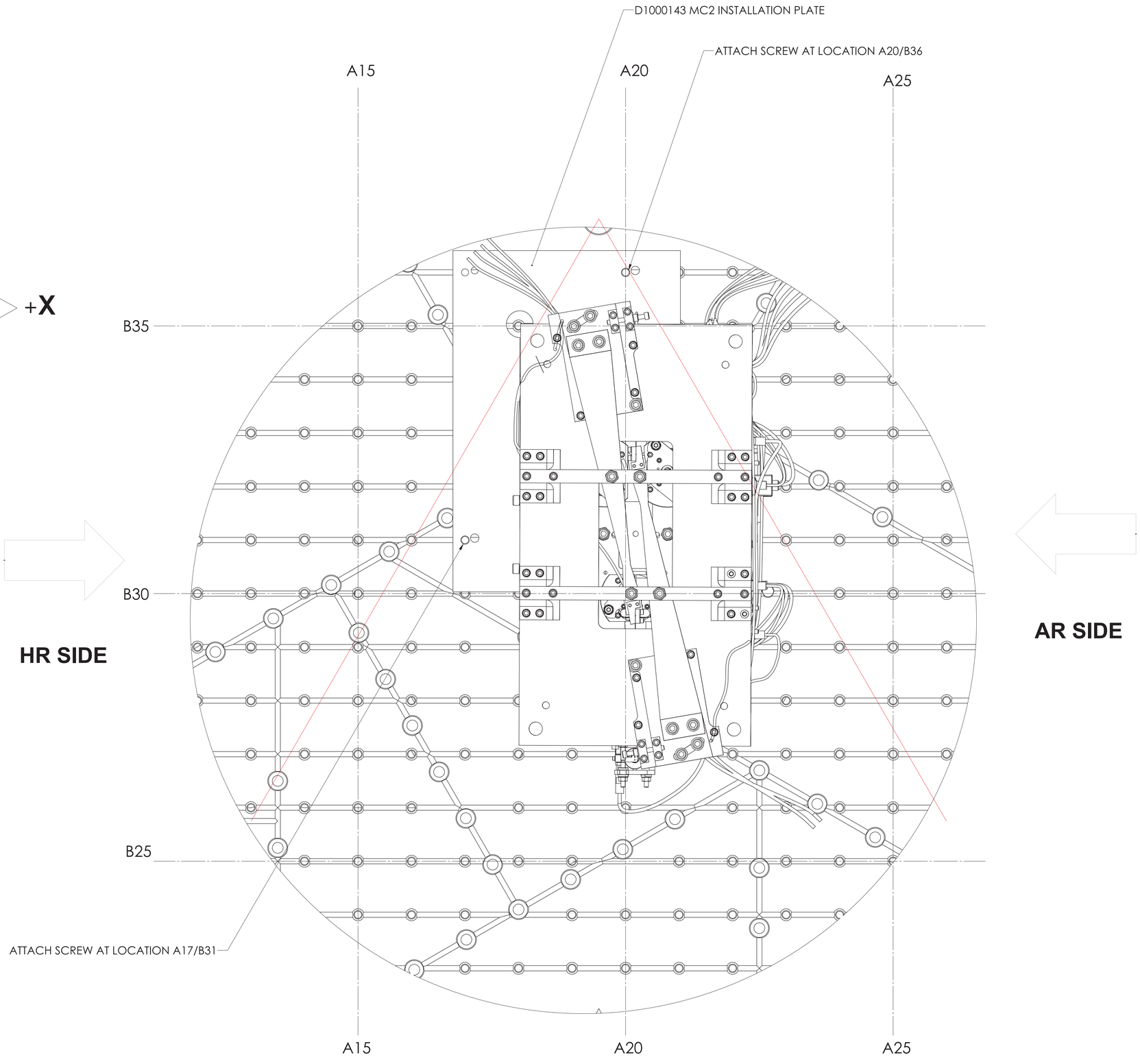
MC2



TOP VIEW 1.6

REF. TRIANGLE: SEE D1000125 FOR
ISI NAMING AND ORIENTATION CONVENTION

HR SIDE



AR SIDE

DETAIL B
SCALE 1 : 1.5
TOP VIEW SHOWING INSTALLATION PLATE LOCATION 1.6
OPTICAL TABLE SHOWN FOR STRUCTURE LOCATION AND ORIENTATION,
DOG CLAMPS VIBRATION ABSORBERS AND HARDWARE REMOVED FOR CLARITY

ALIGNMENT PLATE INSTALLATION / LOCATION

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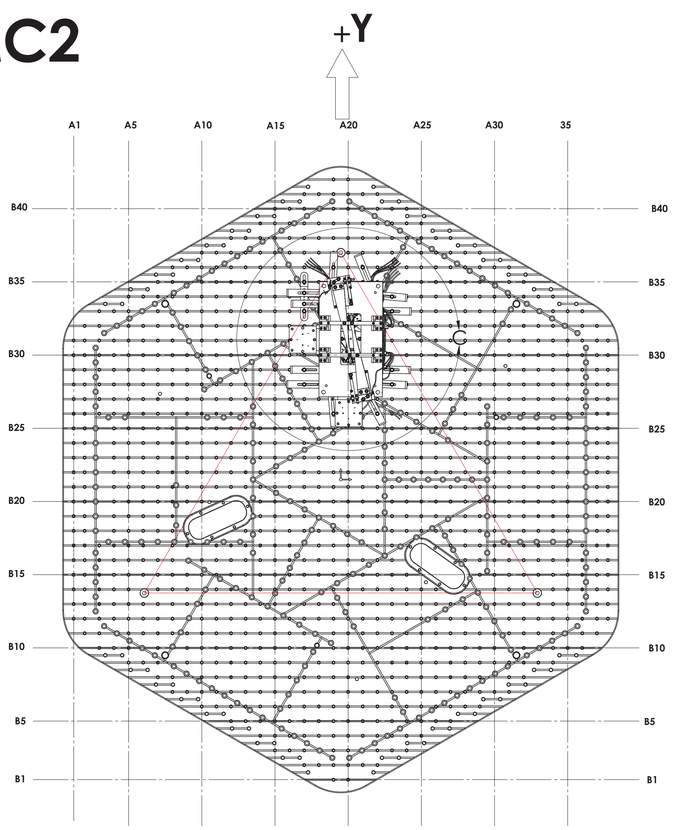
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SIZE	DWG. NO.	REV.
E	D0901099	v2

SCALE: 1:8 PROJECTION: SHEET 2 OF 9

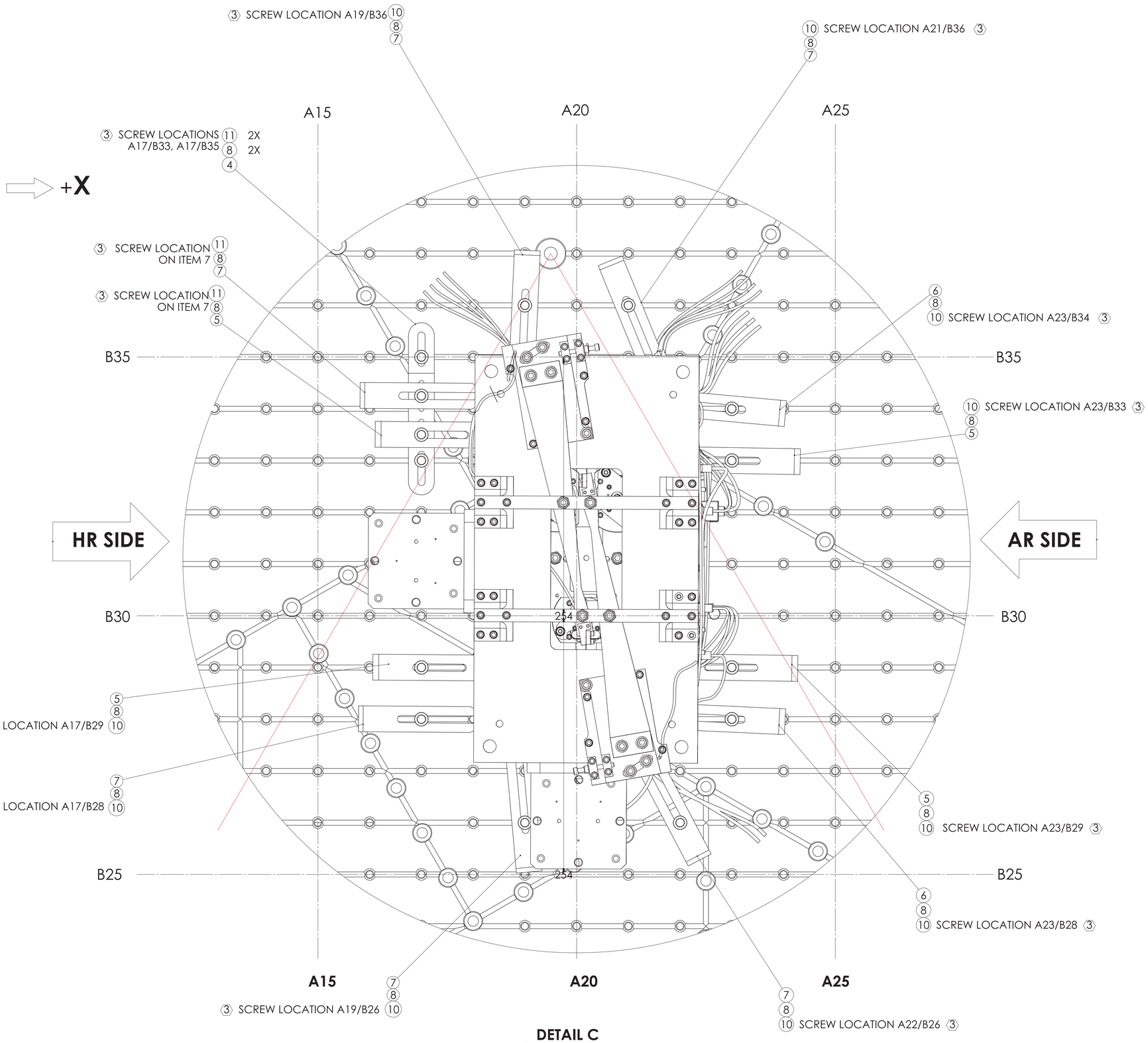
D0901099 ADVLIGO SUS HAM3-H1, XYZ Local CS for HSTS (MC2) Sub-Assy, PART PDM REV: X.000, DRAWING PDM REV: X.002

MC2



TOP VIEW ⟨1.6⟩

REF. TRIANGLE: SEE D1000125 FOR
ISI NAMING AND ORIENTATION CONVENTION



DETAIL C
SCALE 1 : 1.5

TOP VIEW ⟨1.6⟩

OPTICAL TABLE SHOWN FOR STRUCTURE LOCATION AND ORIENTATION ONLY.

ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
11	2AL1.25-12SL	1/4-20 X 1.25 12PT BOLT	450 SSTL	4
10	2AL3.25-12SL	1/4-20 X 3.25 12PT BOLT	450 SSTL	10
8	D1100785-530	WASHER, FLAT, .25 X .530 O.D.	NITRONIC 60	14
7	D1100641-09	AdvLIGO HAM Optics Table Dog Clamp Chamfered End 2.2L	304 SSTL	6
6	D1100641-08	AdvLIGO HAM Optics Table Dog Clamp Chamfered End 2.2M	304 SSTL	2
5	D1001376-08	AdvLIGO HAM Optics Table Dog Clamp 2.20M	304 SSTL	4
4	D1100191	aLIGO, DOG CLAMP SUPPORT HLTS-HSTS STRUCTURE	6061-T6 Al	1
PARTIAL BOM, SEE SHEET 1 FOR COMPLETE PARTS LIST				

DOG CLAMP IDENTIFICATION / INSTALLATION

③ TORQUE TO 100 IN LBS (USE STANDARD 12 PT SOCKET)

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MASSACHUSETTS INSTITUTE OF TECHNOLOGY

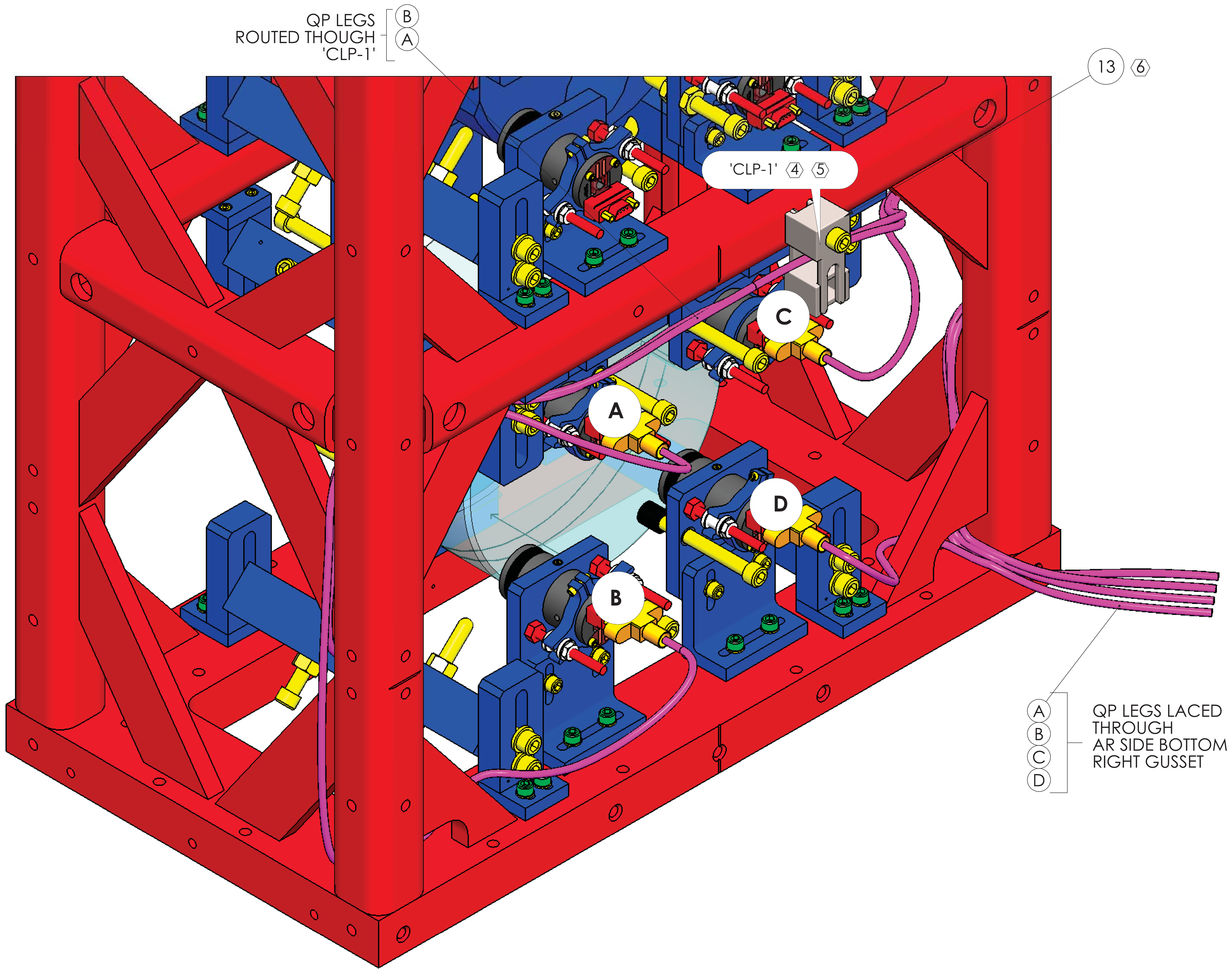
SIZE	DWG. NO.	REV.
E	D0901099	v2

SCALE: 1:8 PROJECTION: SHEET 3 OF 9

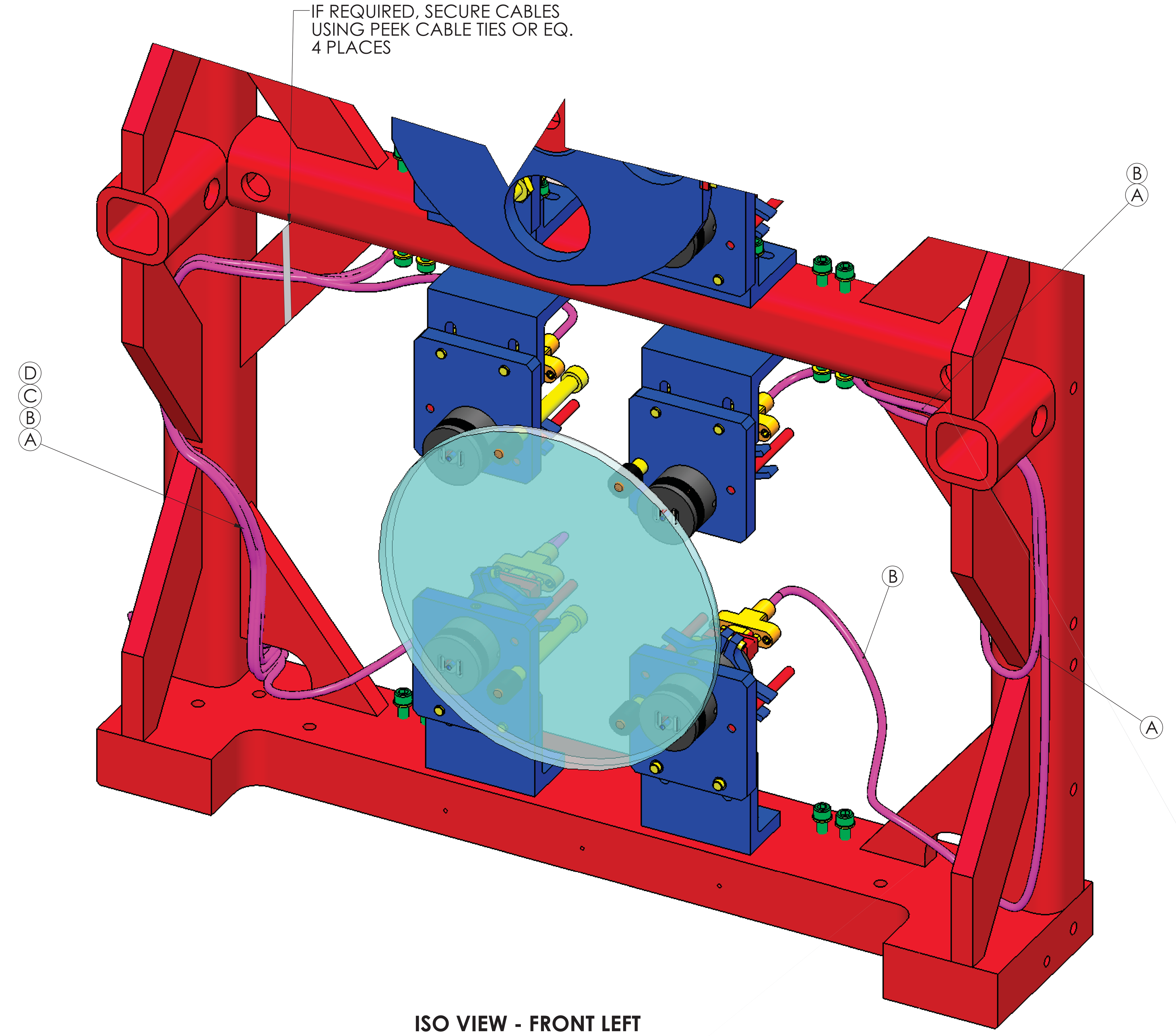
SEE SHEET 1, TABLE 1 ; FOR CABLING SPECIFICATIONS.

FOR SYSTEM CABLING DIAGRAM, CABLE BRACKET LOCATION/ORIENTATION WRT CHAMBER, & ROUTING LAYOUT SEE D1101463.

MC2

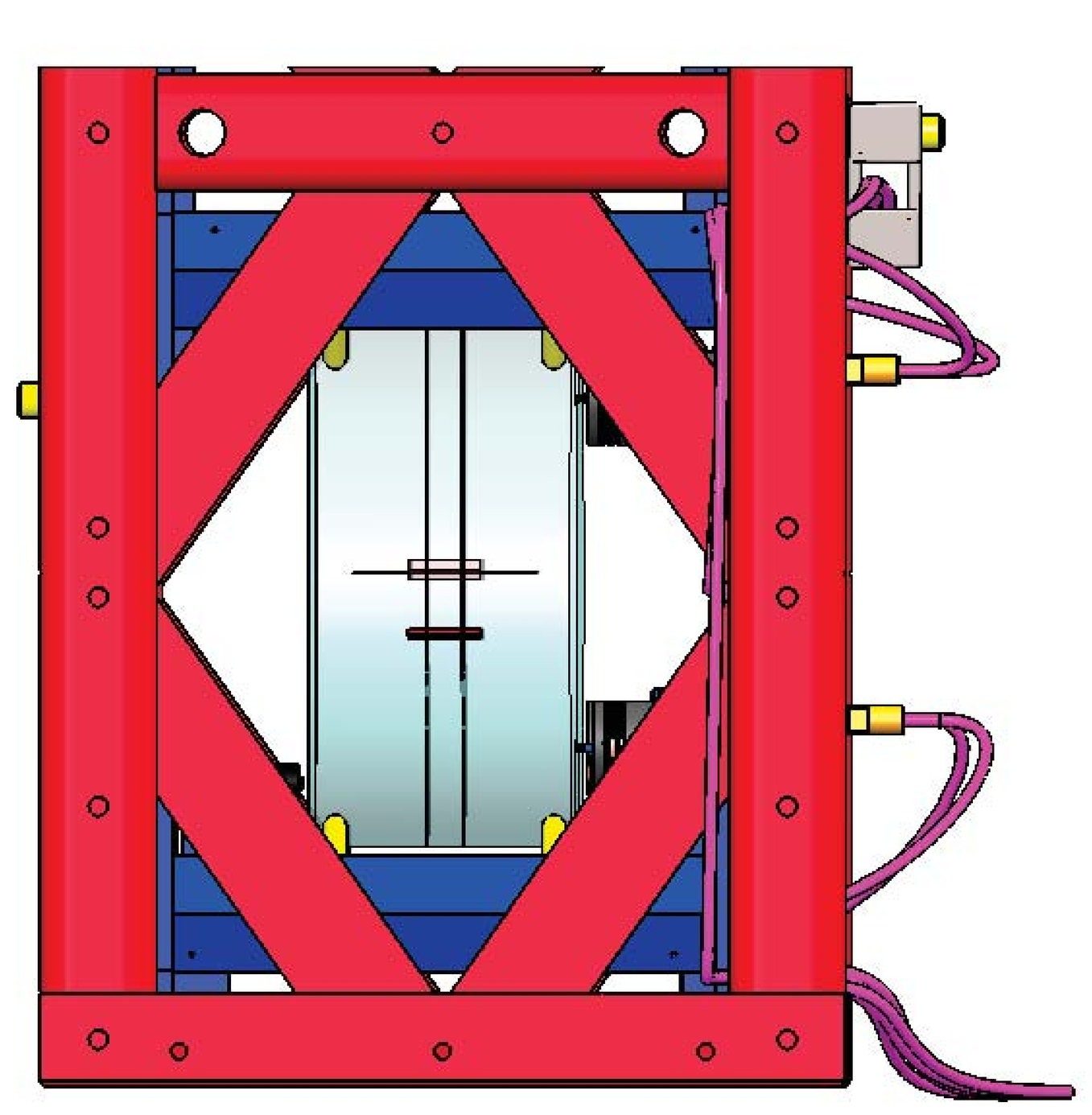


AR SIDE 1.5
ISO VIEW- REAR LEFT(-X)

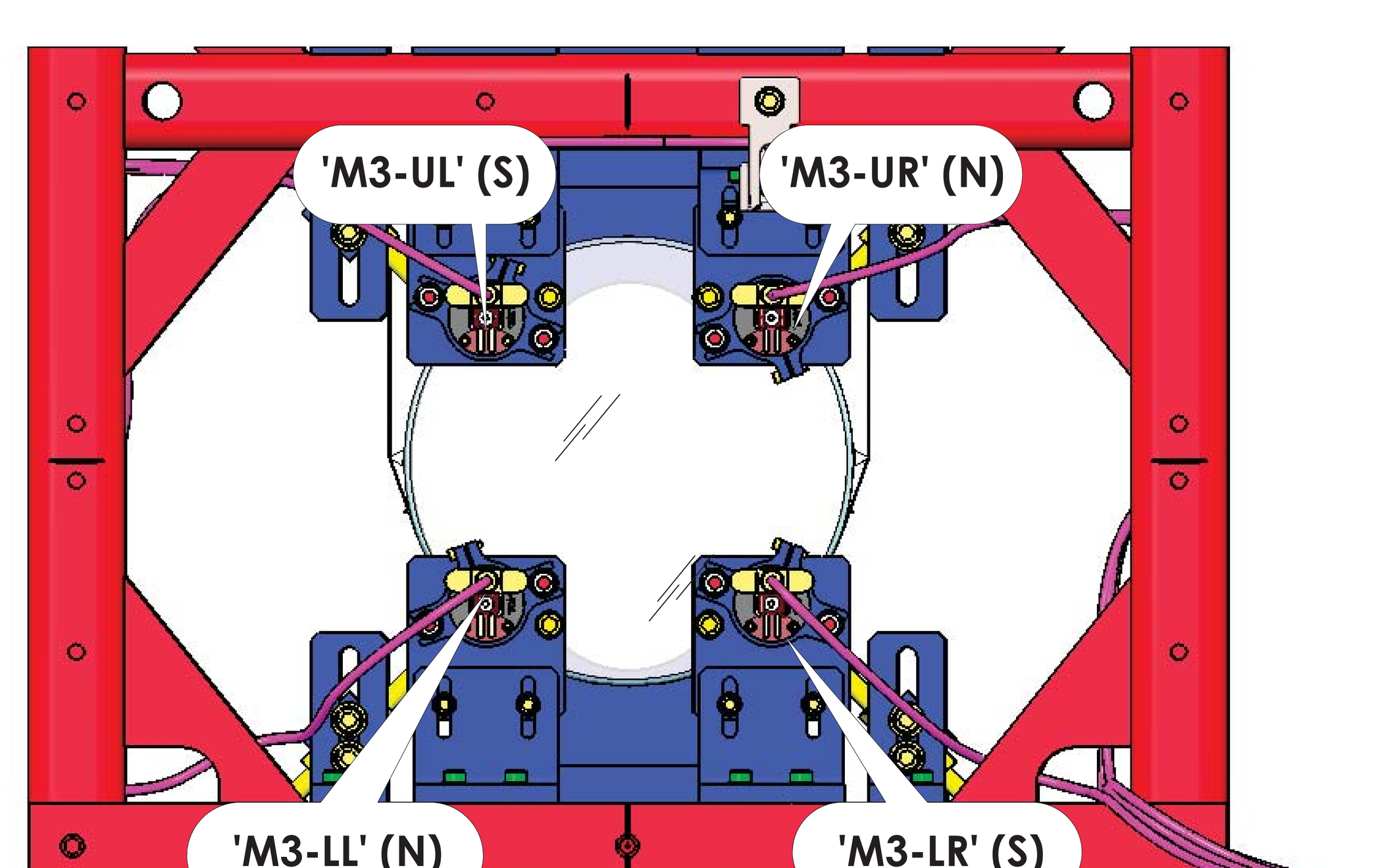


ISO VIEW - FRONT LEFT
BROKEN OUT SECTION
(AS VIEWED FROM INSIDE)

CABLE ROUTING:
ROUTE ALL CABLES IN ACCORDANCE WITH LIGO-T1200203 AND T1200318. CABLE ROUTES DEPICTED IN THIS DOCUMENT ARE NOT MANDATORY, BUT RATHER A CONSIDERED ROUTE AIMED TO CLEAR LASER BEAM PATHS. ALTERNATE ROUTES FOR PROBLEMATIC AREAS ARE ACCEPTABLE, BUT SHOULD BE HANDLED IN A CASE BY CASE SITUATION. IT IS IMPERATIVE TO CONSIDER THE LENGTH OF THE CABLE, THE LOCATION OF MATING CABLE BRACKET, AND LASER BEAM PATH PRIOR TO ROUTING / LACING VIA A NEW PATH.

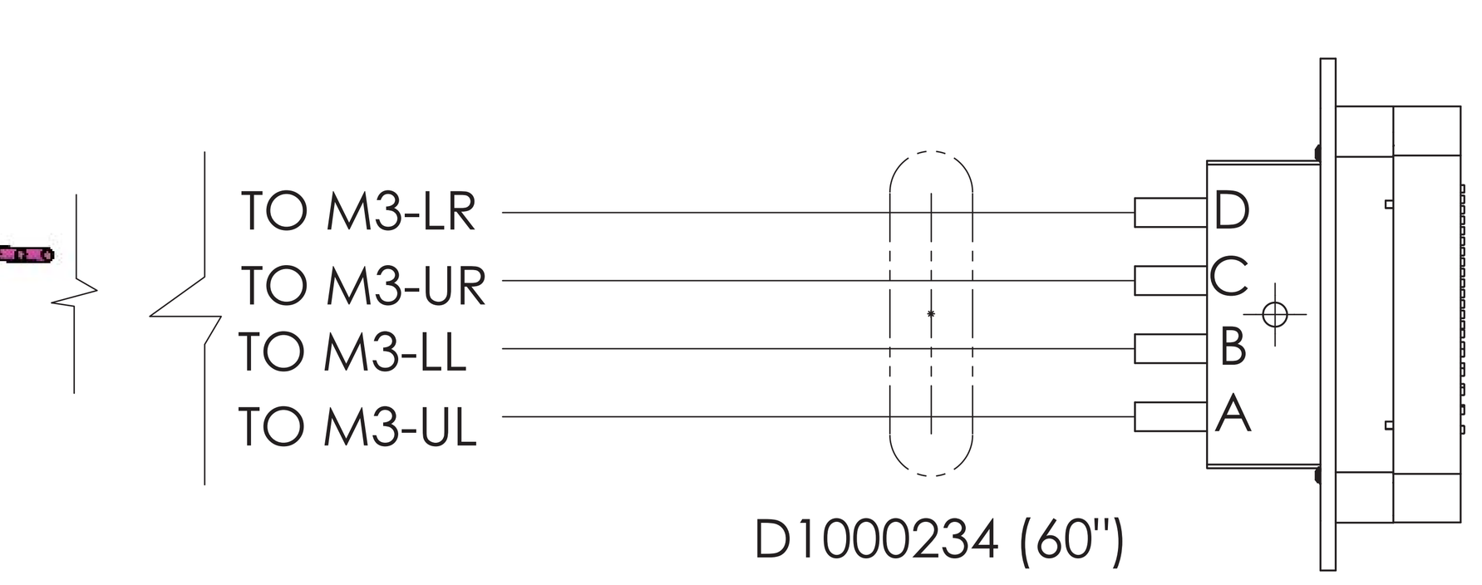


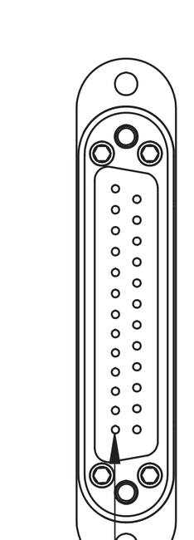
LEFT SIDE (+Y)

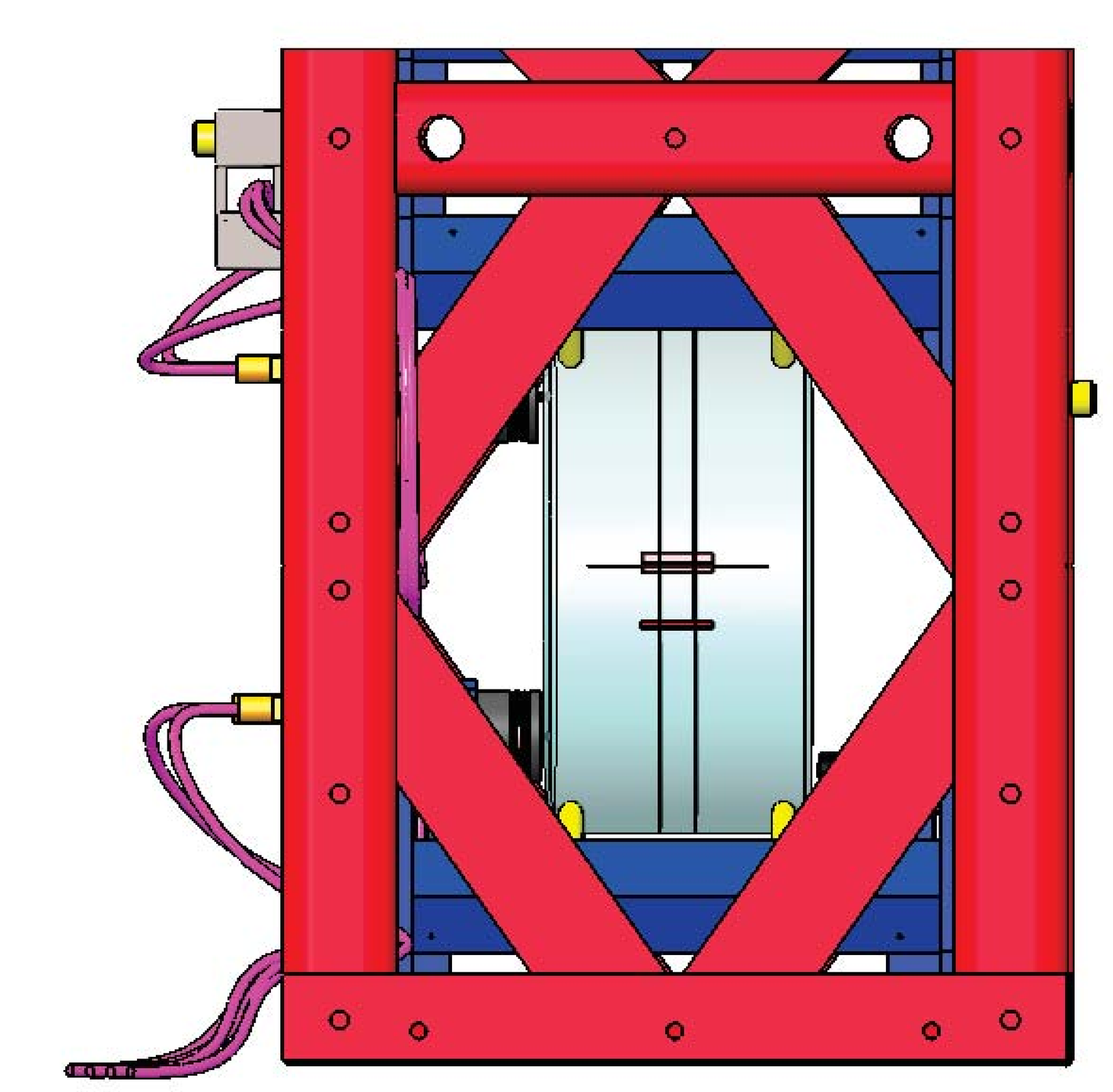


AR SIDE - REAR (-X) 1.1 1.2

(END CONNECTORS, NOT SHOWN FOR CLARITY)







RIGHT SIDE (-Y)

4 DO NOT CLAMP CABLES TIGHTLY. PROVIDE SUFFICIENT SPACE FOR THE CABLES TO RUN FREELY BETWEEN CLAMP JAWS.

5 SHORTING MAY OCCUR IN QP BOSEM & AOSEM TEFLON CABLES CLAMPED EXCESSIVELY TIGHT. THEREFORE, THE PEEK CLAMPS(i.e.: 'CLP-1' AND CABLE TIES) SHOULD SERVE ONLY AS A GUIDE FOR THE CABLES TO REACH THEIR DESTINATION, AND SHOULD NOT CLAMP THE CABLES IN PLACE.

6 TORQUE TO APPROXIMATELY 20 IN/LBS.

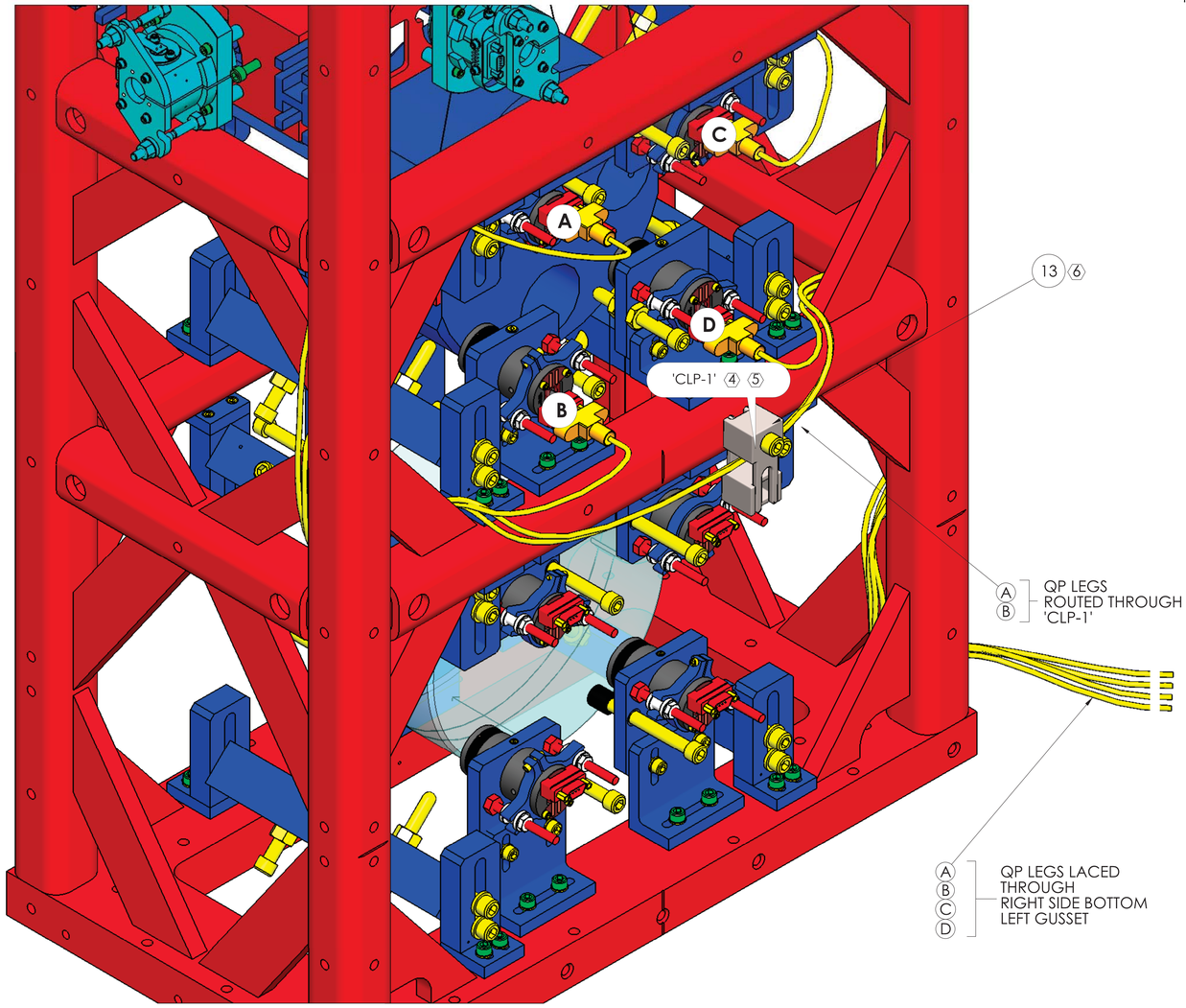
ROUTE NO.1

SEE LIGO-T1200318
FOR STEP BY STEP CABLING GUIDE

SEE SHEET 1, TABLE 1 ; FOR CABLING SPECIFICATIONS.

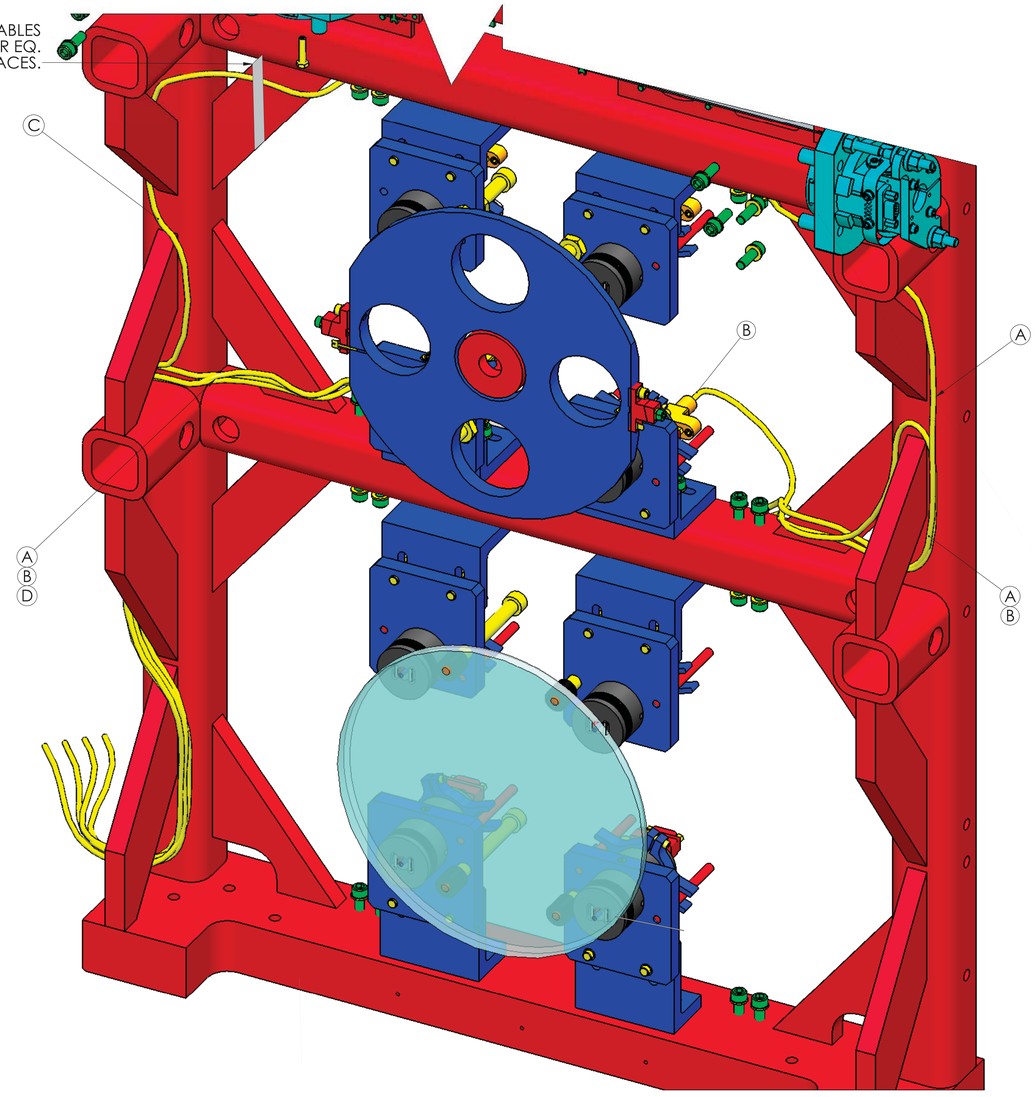
FOR SYSTEM CABLING DIAGRAM, CABLE BRACKET LOCATION/ORIENTATION WRT CHAMBER, & ROUTING LAYOUT SEE D1101463.

MC2



AR SIDE 1.5

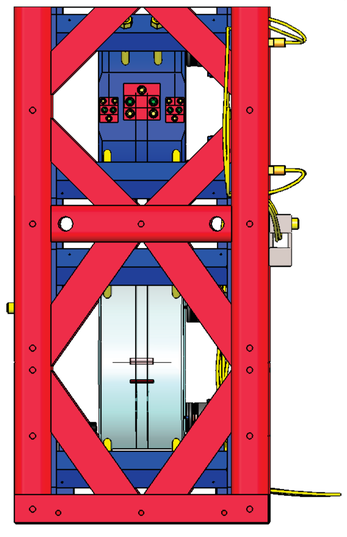
ISO VIEW- REAR LEFT (-X)



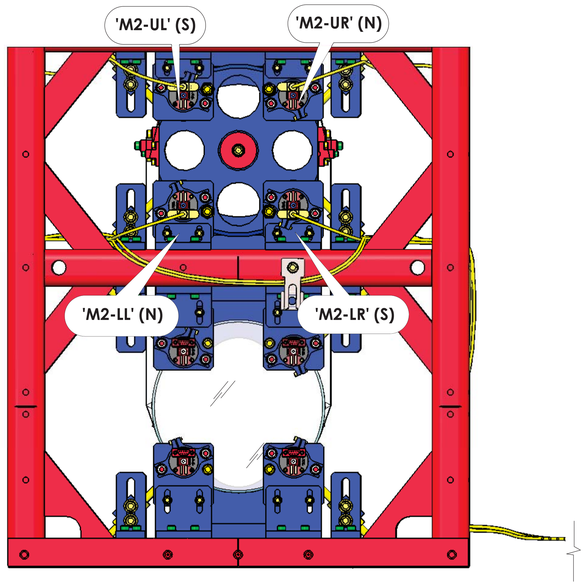
ISO VIEW - FRONT LEFT

BROKEN OUT SECTION

(AS VIEWED FROM INSIDE)

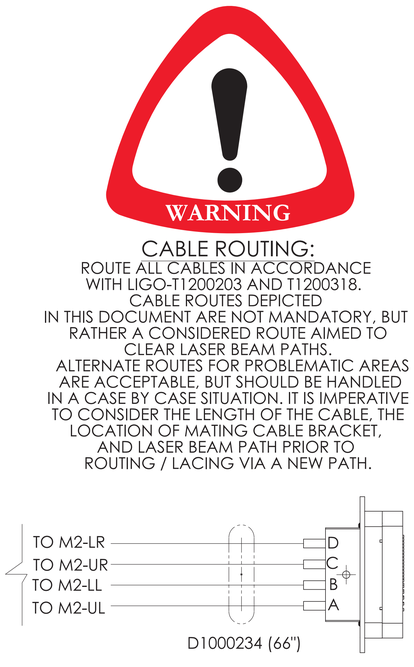


LEFT SIDE (+Y)



AR SIDE - REAR (-X) 1.1 1.2

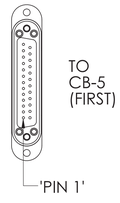
(END CONNECTORS, NOT SHOWN FOR CLARITY)

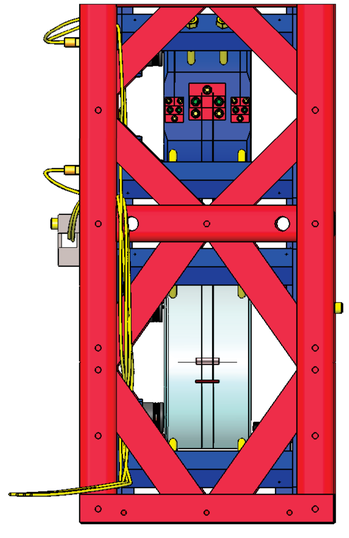


CABLE ROUTING:

ROUTE ALL CABLES IN ACCORDANCE WITH LIGO-T1200203 AND T1200318. CABLE ROUTES DEPICTED IN THIS DOCUMENT ARE NOT MANDATORY, BUT RATHER A CONSIDERED ROUTE AIMED TO CLEAR LASER BEAM PATHS. ALTERNATE ROUTES FOR PROBLEMATIC AREAS ARE ACCEPTABLE, BUT SHOULD BE HANDLED IN A CASE BY CASE SITUATION. IT IS IMPERATIVE TO CONSIDER THE LENGTH OF THE CABLE, THE LOCATION OF MATING CABLE BRACKET, AND LASER BEAM PATH PRIOR TO ROUTING / LACING VIA A NEW PATH.

D1000234 (66")





RIGHT SIDE (-Y)

ROUTE NO.2

SEE LIGO-T1200318

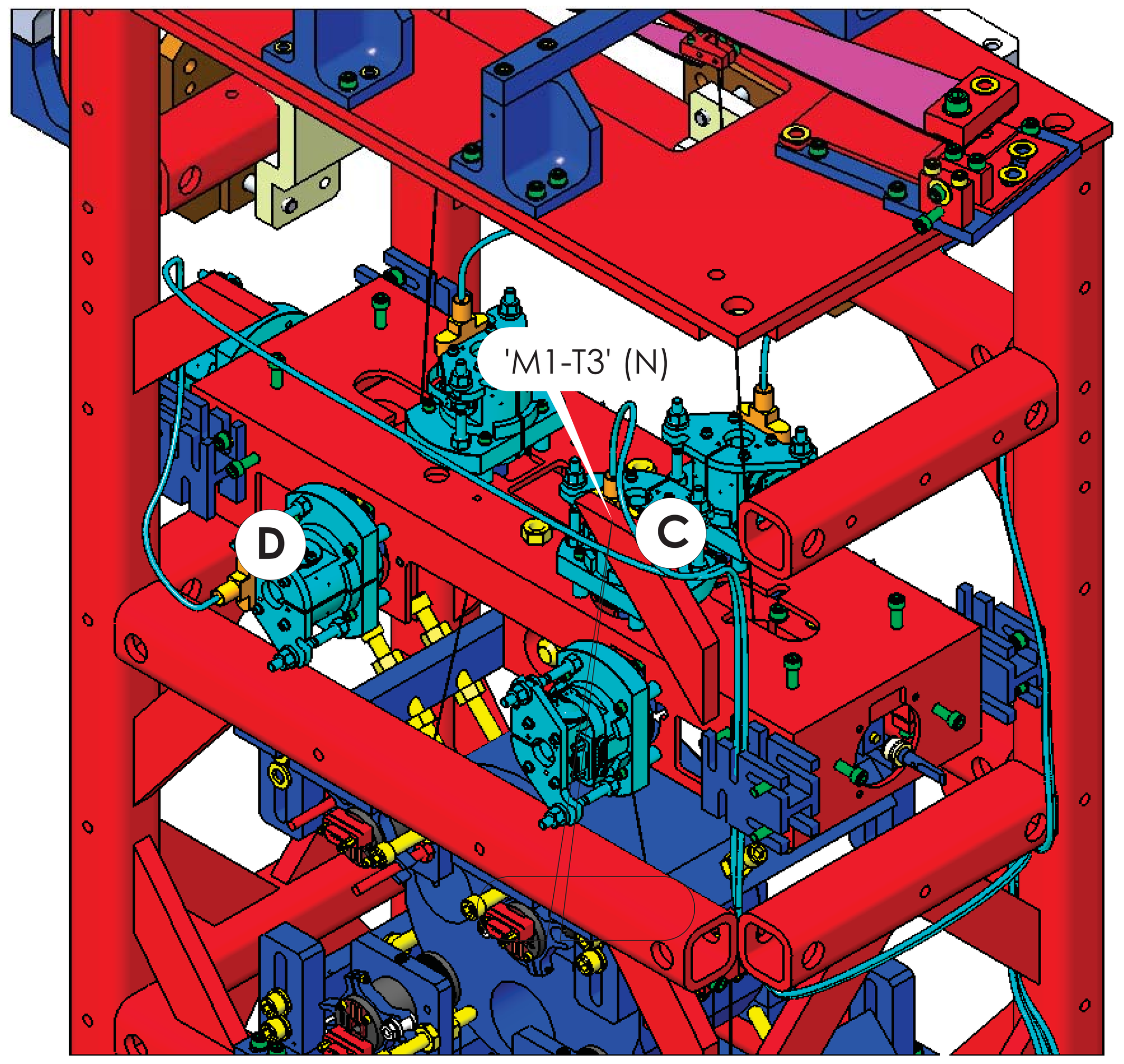
FOR STEP BY STEP CABLING GUIDE

LIGO	CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY	
SIZE	DWG. NO.	REV.
E	D0901099	v2
SCALE: 1:10	PROJECTION:	SHEET 5 OF 9

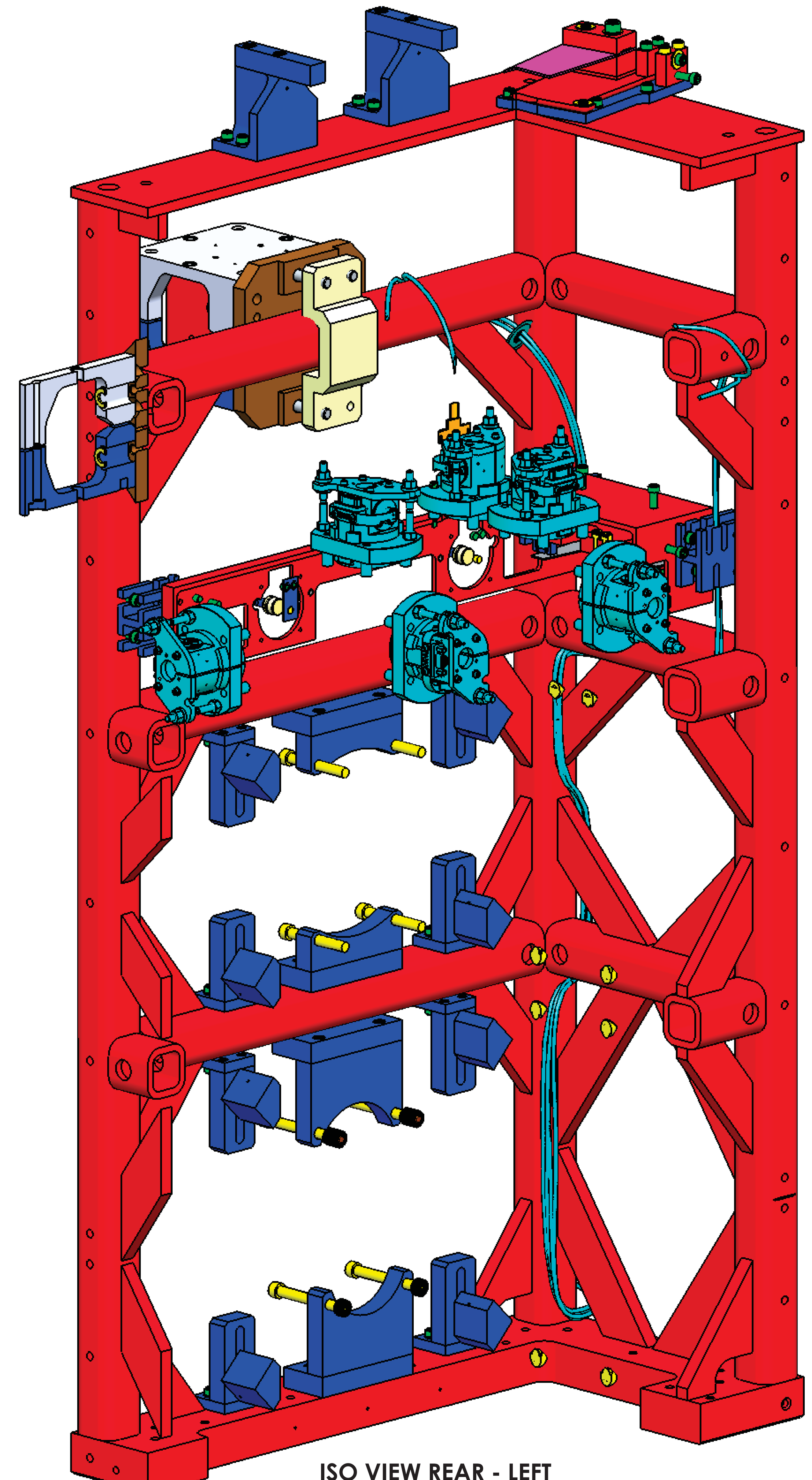
SEE SHEET 1, TABLE 1 ; FOR CABLING SPECIFICATIONS.

FOR SYSTEM CABLING DIAGRAM, CABLE BRACKET LOCATION/ORIENTATION WRT CHAMBER, & ROUTING LAYOUT SEE D1101463.

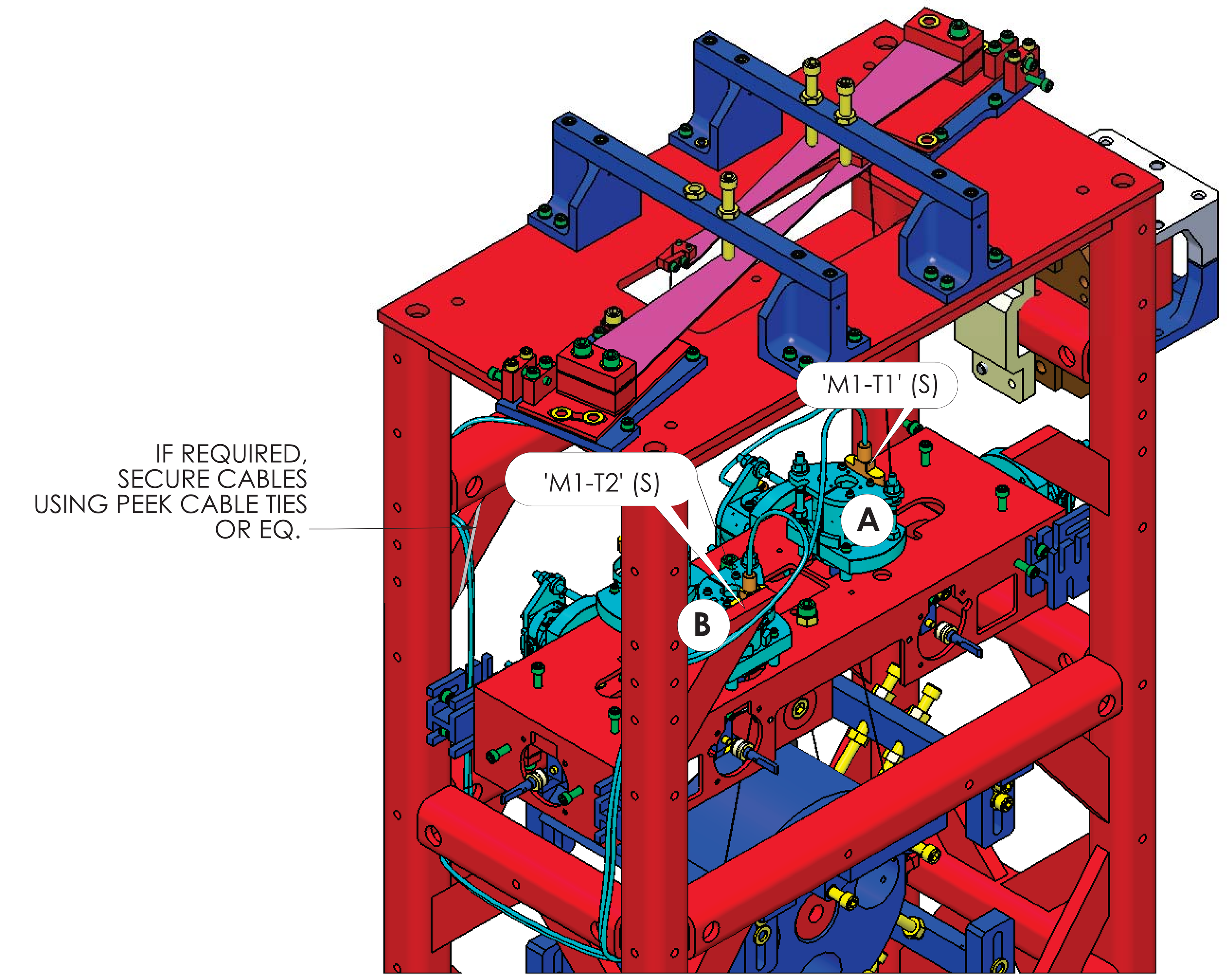
MC2



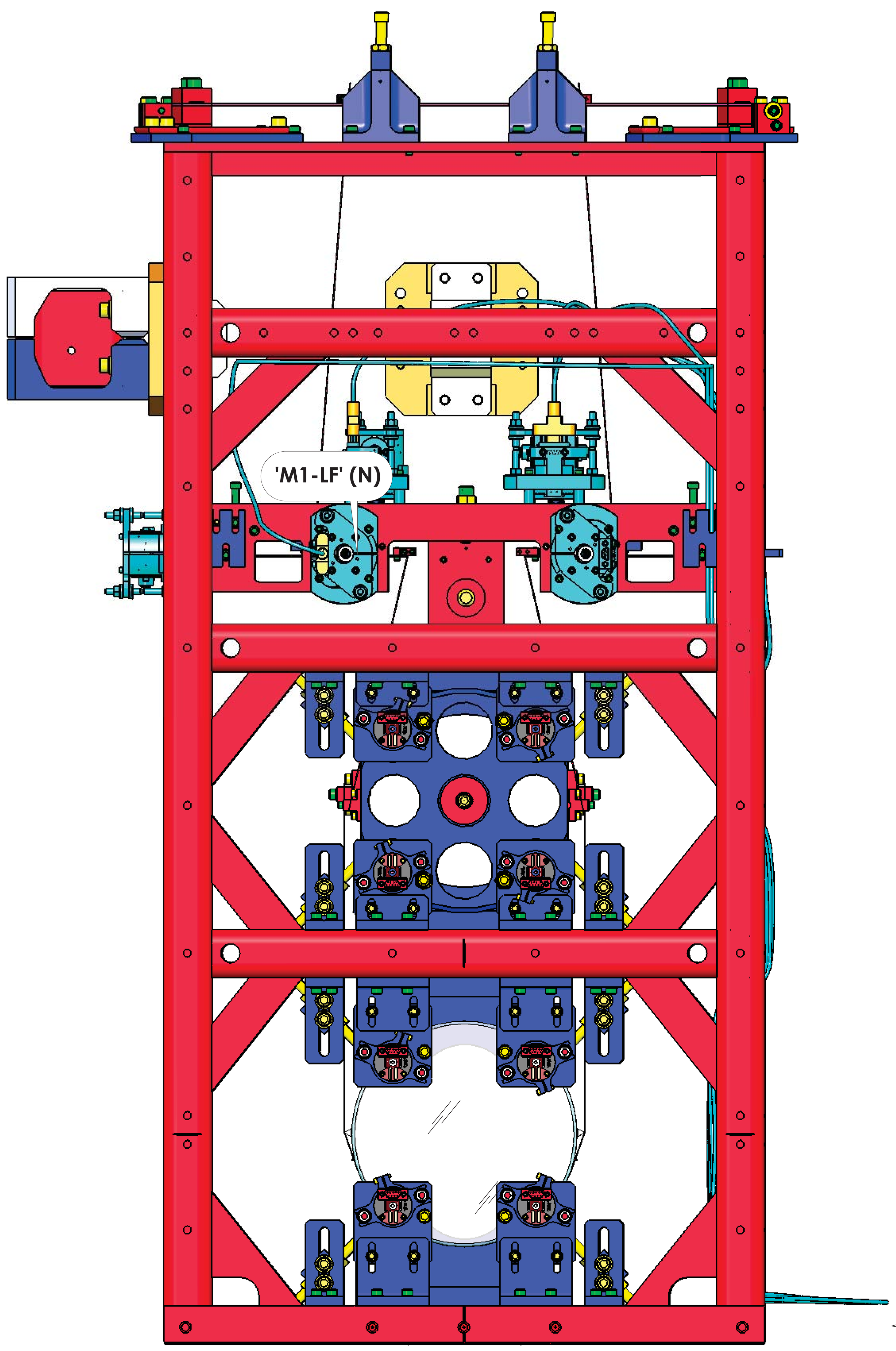
AR SIDE 1.1 1.2
ISO VIEW, REAR - RIGHT (-X)



ISO VIEW REAR - LEFT
BROKEN OUT SECTION
(AS VIEWED FROM INSIDE)



HR SIDE 1.1 1.2
ISO VIEW, FRONT-RIGHT(+X)



AR SIDE - REAR (-X) 1.1 1.2

(END CONNECTORS, NOT SHOWN FOR CLARITY)

CABLE ROUTING:
ROUTE ALL CABLES IN ACCORDANCE
WITH LIGO-T1200203 AND T1200318.
CABLE ROUTES DEPICTED
IN THIS DOCUMENT ARE NOT MANDATORY, BUT
RATHER A CONSIDERED ROUTE AIMED TO
CLEAR LASER BEAM PATHS.
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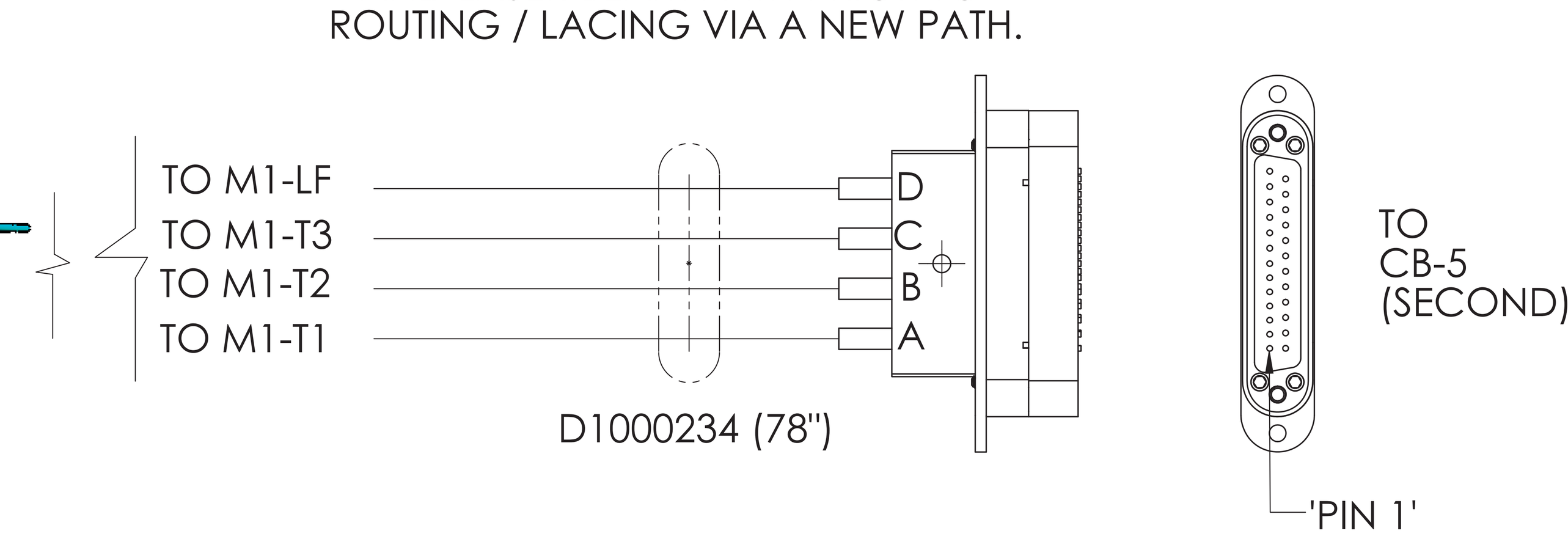
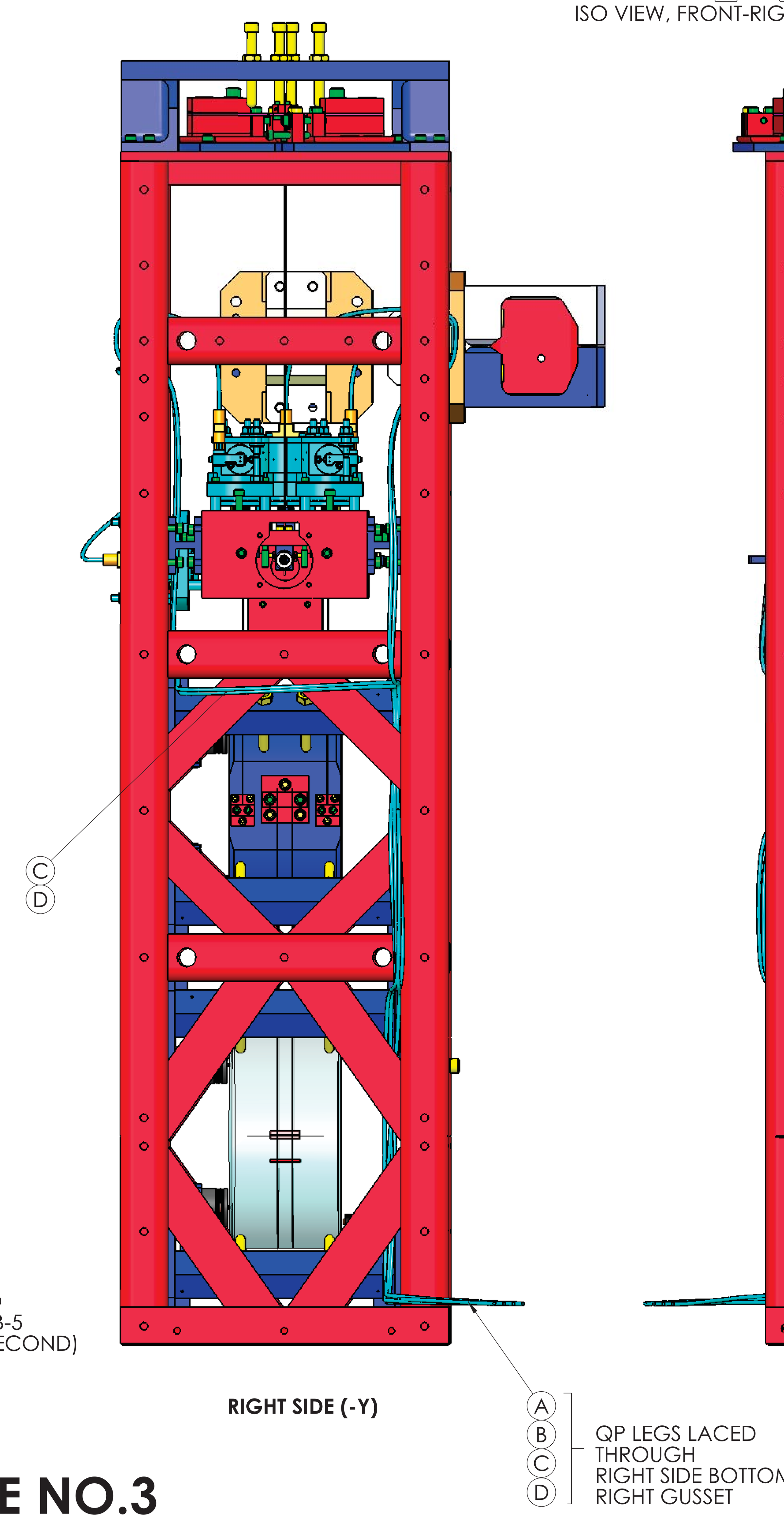
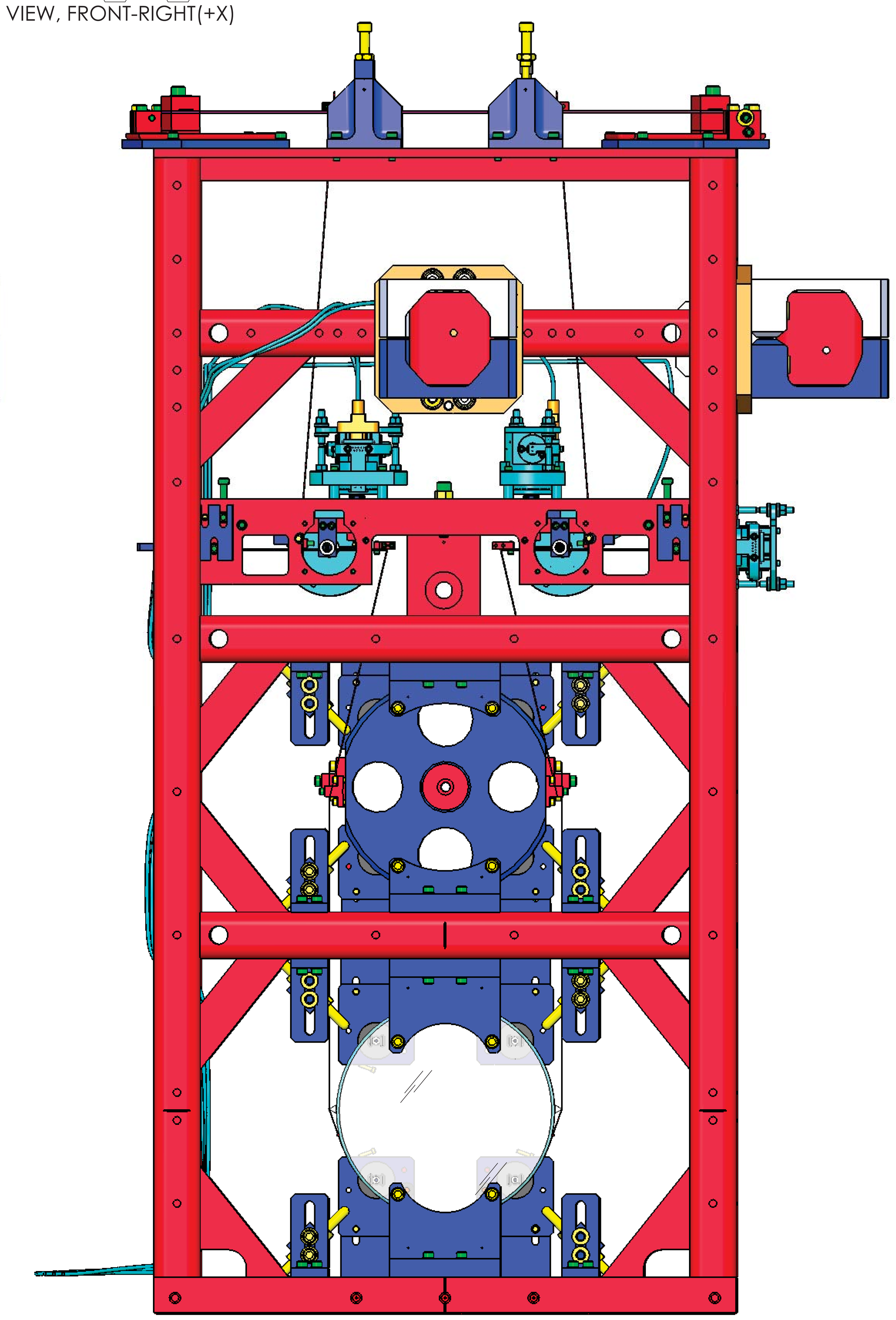
ARE ACCEPTABLE, BUT SHOULD BE HANDLED
IN A CASE BY CASE SITUATION. IT IS IMPERATIVE
TO CONSIDER THE LENGTH OF THE CABLE, THE
LOCATION OF MATING CABLE BRACKET,
AND LASER BEAM PATH PRIOR TO
ROUTING / LACING VIA A NEW PATH.





RIGHT SIDE (-Y)



HR SIDE - FRONT (+X)
(END CONNECTORS, NOT SHOWN FOR CLARITY)

ROUTE NO.3

SEE LIGO-T1200318
FOR STEP BY STEP CABLING GUIDE

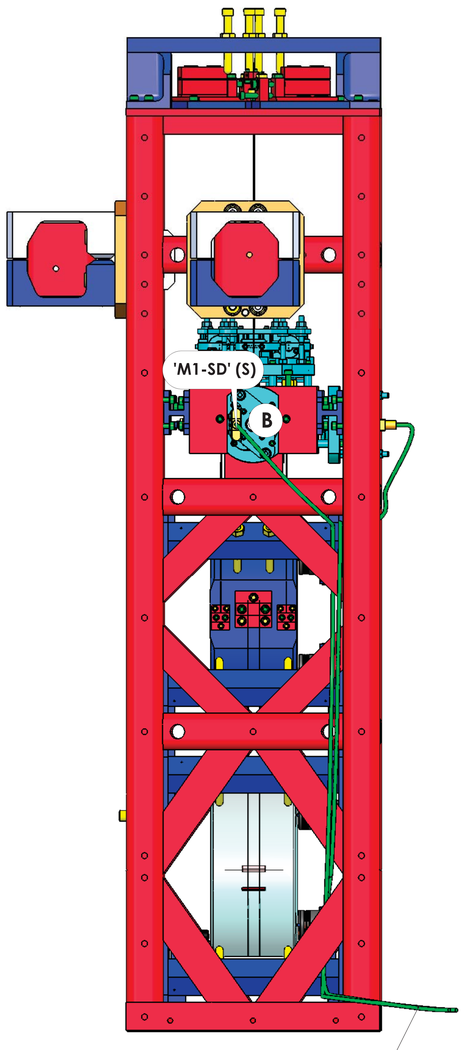
LIGO	CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY	
SIZE: E	DWG. NO.: D0901099	REV.: v2
SCALE: 1:10	PROJECTION:	SHEET 6 OF 9

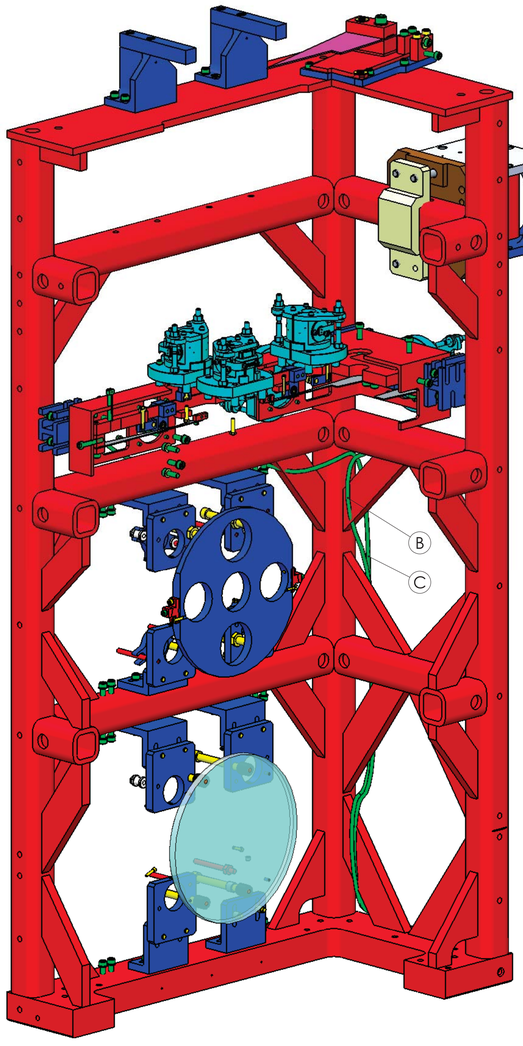
SEE SHEET 1, TABLE 1 ; FOR CABLING SPECIFICATIONS.

FOR SYSTEM CABLING DIAGRAM, CABLE BRACKET LOCATION/ORIENTATION WRT CHAMBER, & ROUTING LAYOUT SEE D1101463.

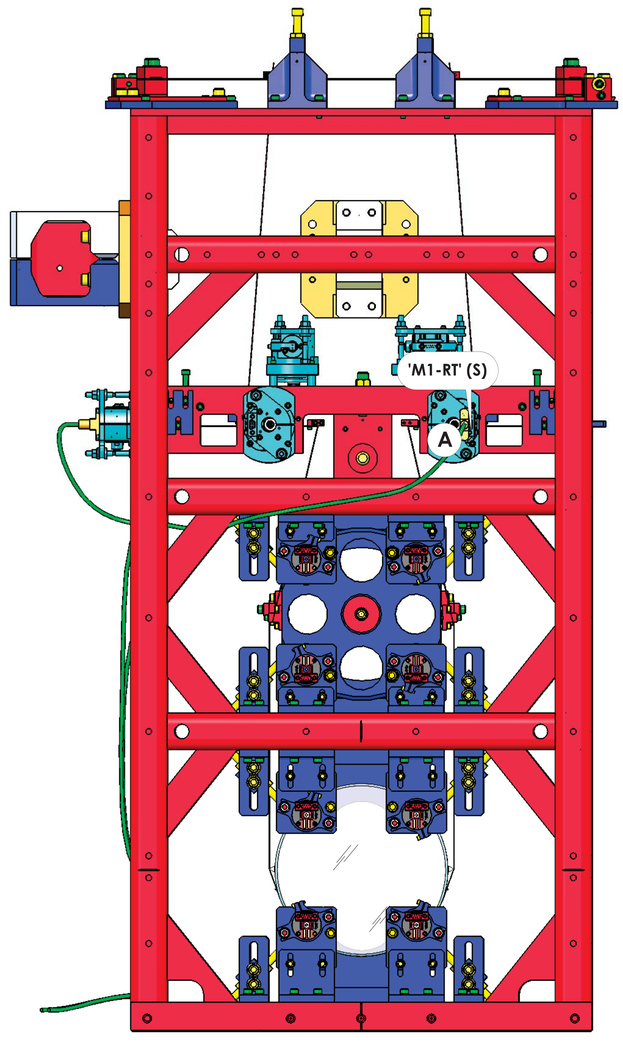
MC2

(SHARED)



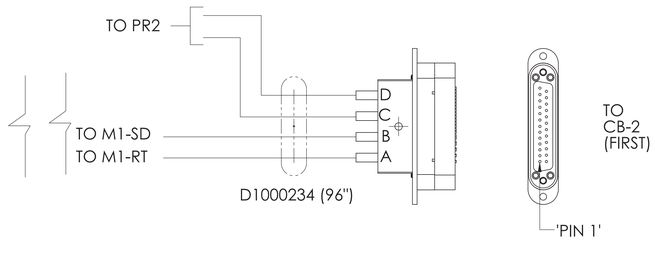


ISO VIEW FRONT - RIHGT
BROKEN OUT SECTION
(AS VIEWED FROM INSIDE)



AR SIDE - REAR (-X) 1.1 1.2

(END CONNECTORS, NOT SHOWN FOR CLARITY)



LEFT SIDE (+Y) 1.1 1.2

A, B, C, D — QP LEGS LACED THROUGH LEFT SIDE BOTTOM RIGHT GUSSET

WARNING

CABLE ROUTING:
ROUTE ALL CABLES IN ACCORDANCE WITH LIGO-T1200203 AND T1200318.
CABLE ROUTES DEPICTED IN THIS DOCUMENT ARE NOT MANDATORY, BUT RATHER A CONSIDERED ROUTE AIMED TO CLEAR LASER BEAM PATHS.
ALTERNATE ROUTES FOR PROBLEMATIC AREAS ARE ACCEPTABLE, BUT SHOULD BE HANDLED IN A CASE BY CASE SITUATION. IT IS IMPERATIVE TO CONSIDER THE LENGTH OF THE CABLE, THE LOCATION OF MATING CABLE BRACKET, AND LASER BEAM PATH PRIOR TO ROUTING / LACING VIA A NEW PATH.

ROUTE NO.4

SEE LIGO T1200318
FOR STEP BY STEP CABLING GUIDE

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SIZE	DWG. NO.	REV.
E	D0901099	v2

SCALE: 1:10 PROJECTION: SHEET 7 OF 9

D0901099 AdvLIGO SUS HAM3-H1, XYT Local CS for HSTS (MC2) Sub-Assy, PART FDM REV: X.000, DRAWING FDM REV: X.002

SEE SHEET 1, TABLE 1 ; FOR CABLING SPECIFICATIONS.

MC2

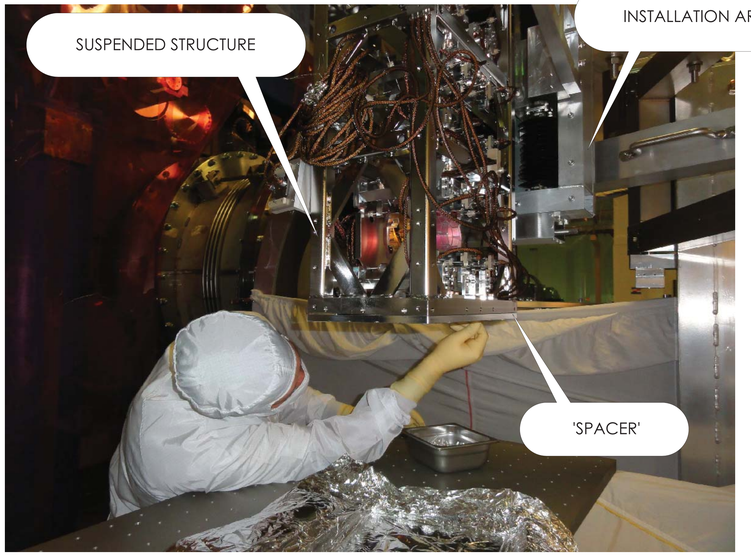
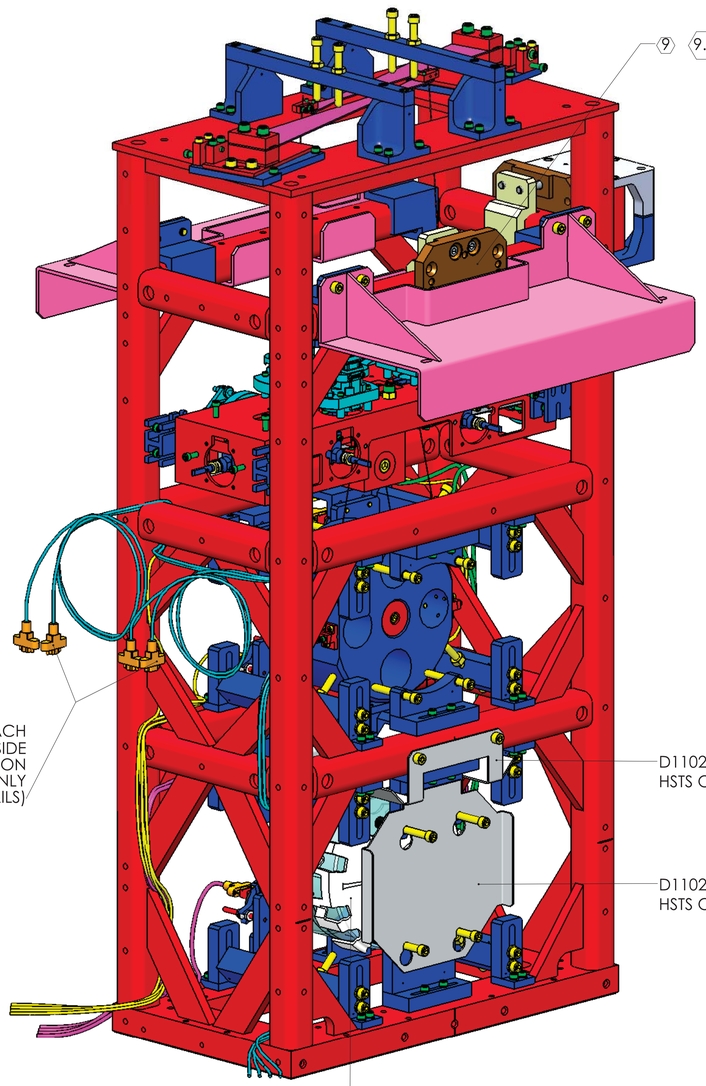


FIG 1.0: SPACER INSTALLATION 〈10〉



HR SIDE
ISO VIEW, FRONT - RIGHT (+X)

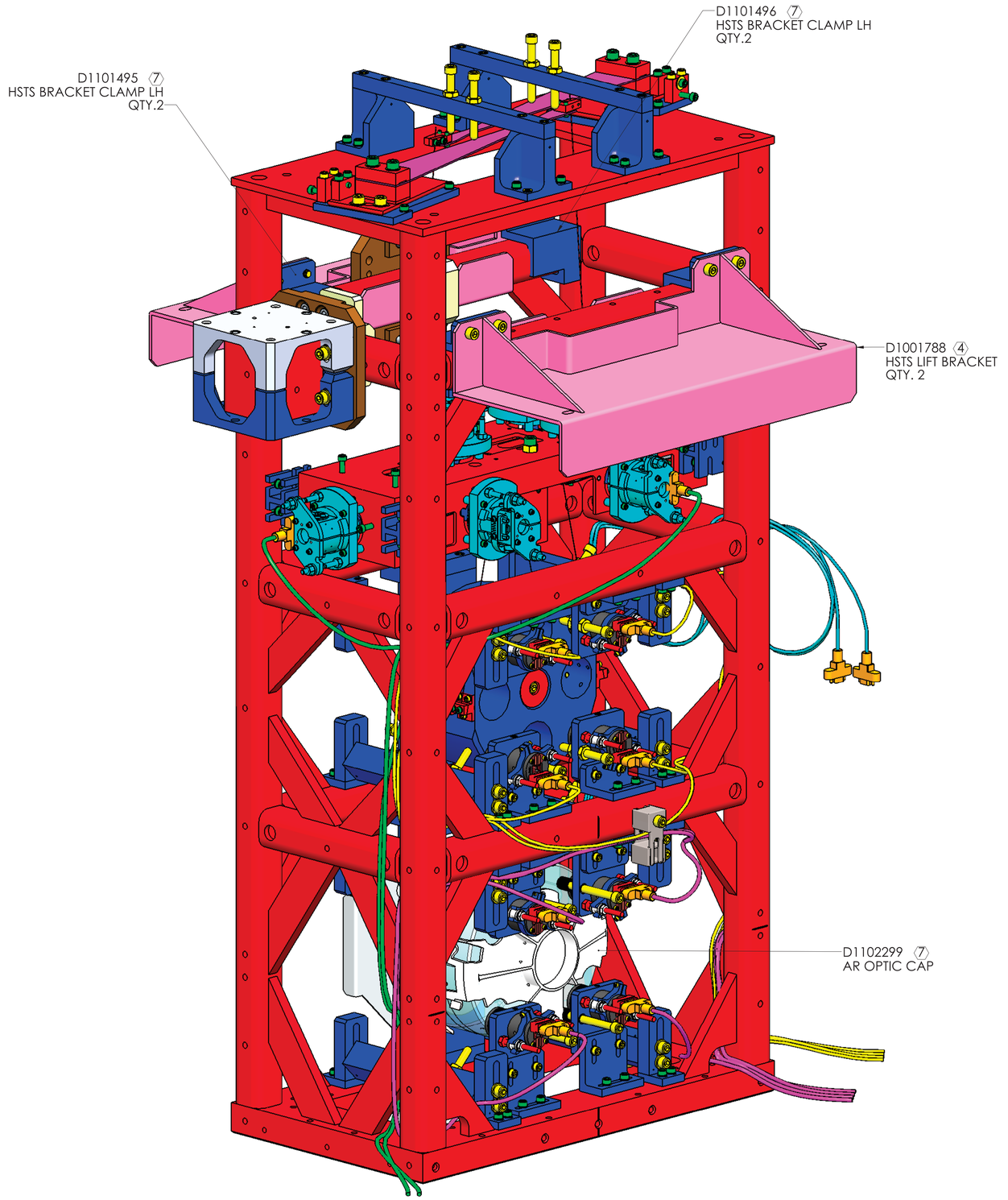
〈7〉 INDICATED ITEMS FOR TRANSPORTATION PURPOSES ONLY. AND ARE NOT PART OF FINISHED ASSEMBLY. SEE D1101674 FOR REFERENCE.

〈8〉 REMOVE INDICATED ITEMS FOR TRANSPORTATION PURPOSES. BUNDLE CABLES AS SHOWN.

〈9〉 REMOVE VIBRATION ABSORVER ON FRONT SIDE TO AVOID INTERFERENCE WITH BRACKET.
9.1 LOCKING PINS: RETAIN IN PLACE FOR TRANSPORTATION AND INSTALLATION ONLY. REVMOCE BEFOR CHAMBER DOORS ARE CLOSED

〈10〉 LIFT STRUCTURE VIA INSTALLATION ARM AT CHAMBER SIDE. ATTACH ITEM 2 (SPACER_

ISING ITEM 6 (SCREW). TORQUE TO 75 IN LB. SEE FIG. 1.0 FOR REFERENCE.



AR SIDE
ISO VIEW, REAR - LEFT (-X)

HSTS STRUCTURE TRANSP.

VIBRATION ABSORBERS ON FRONT SIDE NOT SHOWN
(REMOVED FOR TRANSP. PURPOSES)

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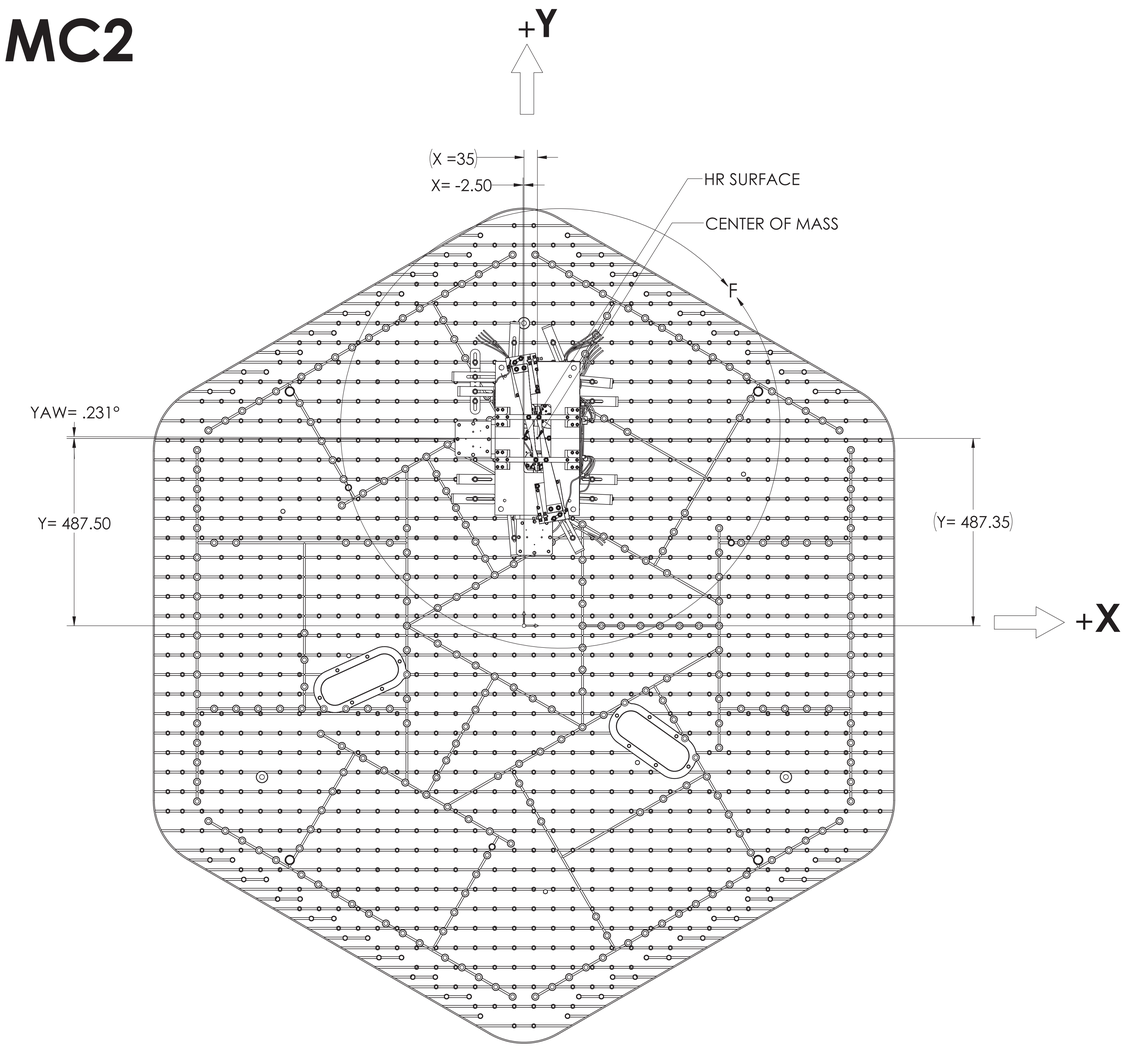
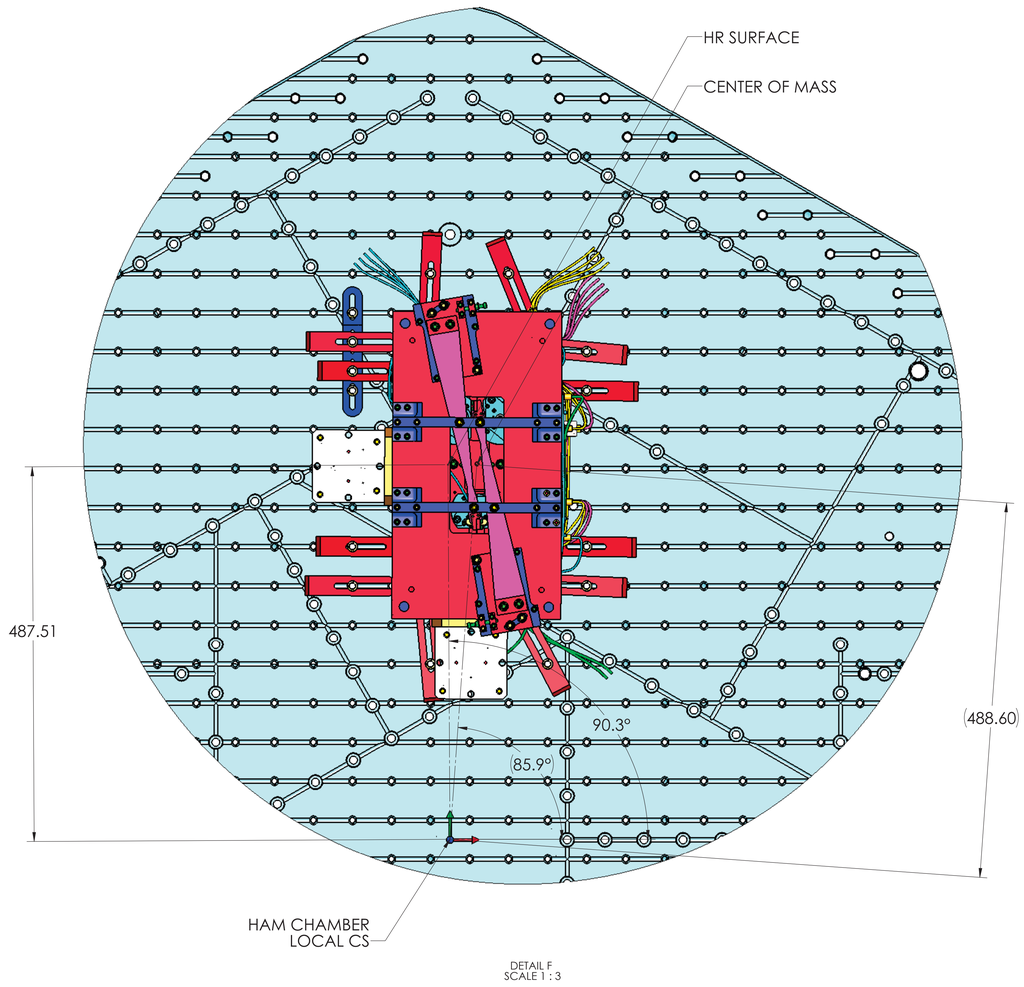
SIZE	DWG. NO.	REV.
E	D0901099	v2

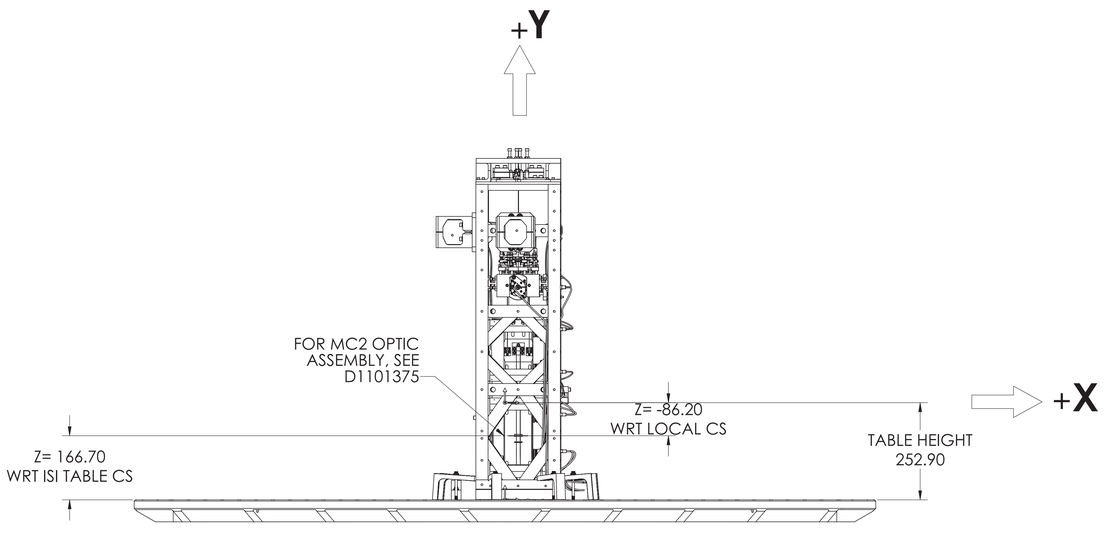
SCALE: 1:10 PROJECTION: SHEET 8 OF 9

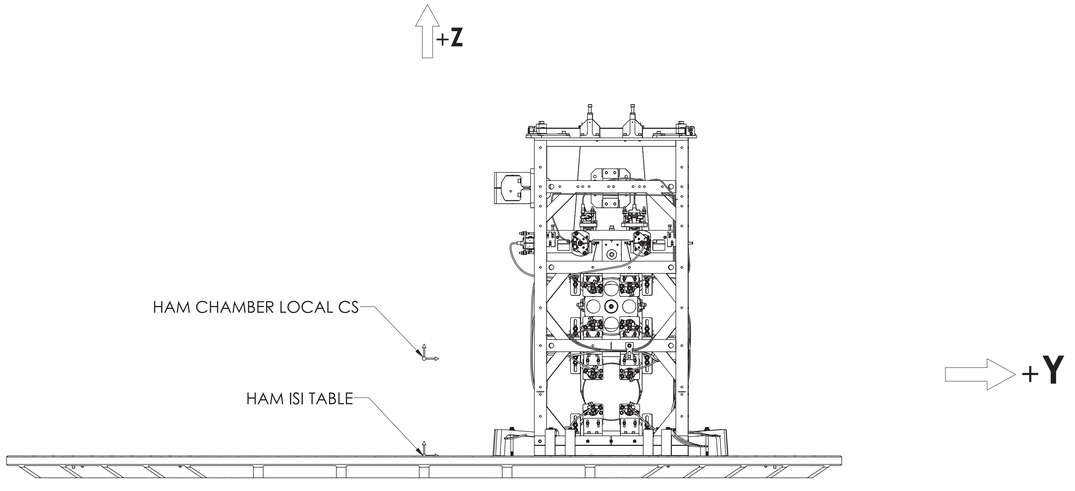
MC2





DETAIL F
SCALE 1 : 3





LOCAL COORDINATES DEFINITIONS

NOTE: DIMENSION IN PARENTHESIS (REFERENCE DIMENSIONS), ARE FROM CENTER OF MASS.

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E	D0901099	v2

SCALE: 1:10 PROJECTION: SHEET 9 OF 9