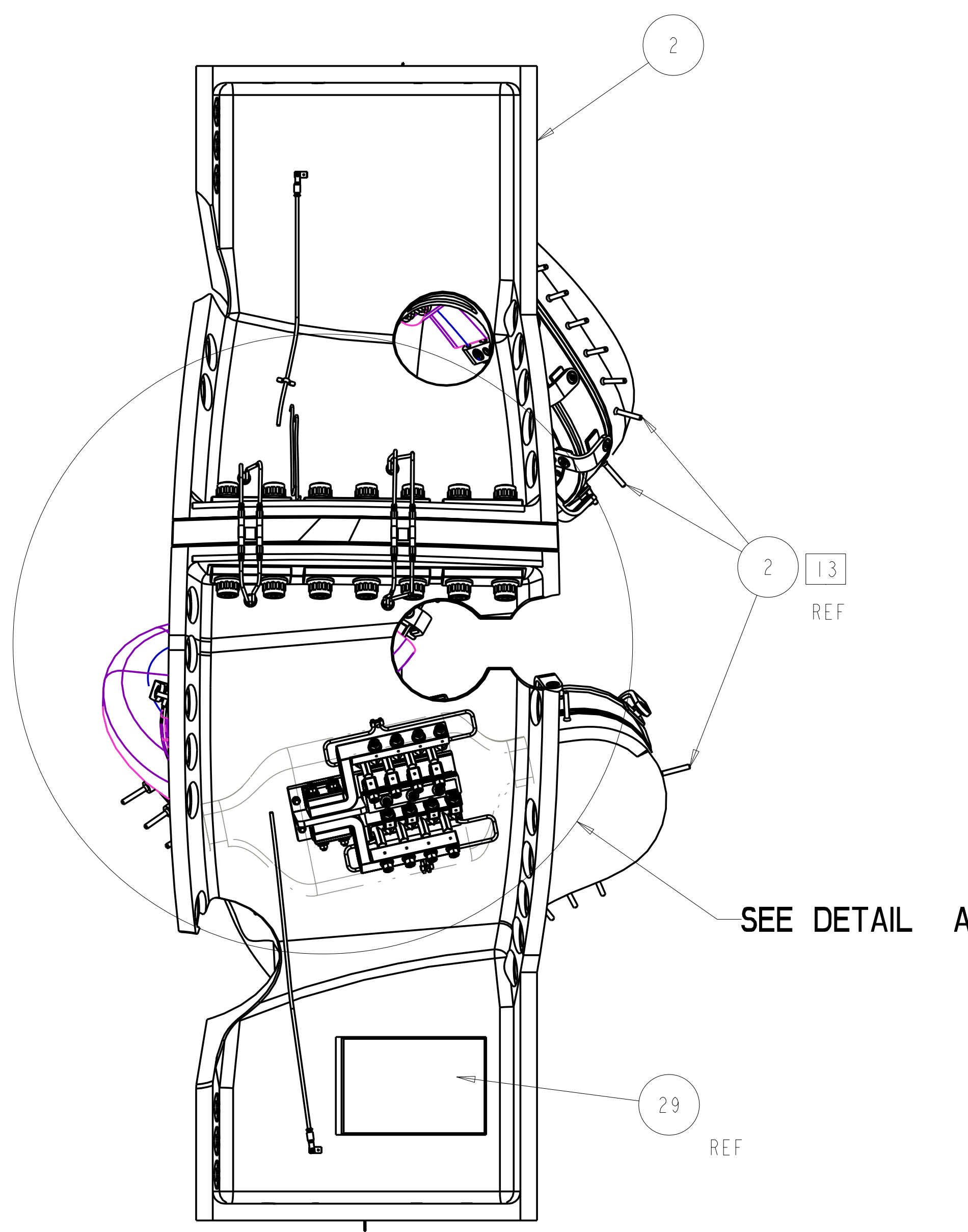
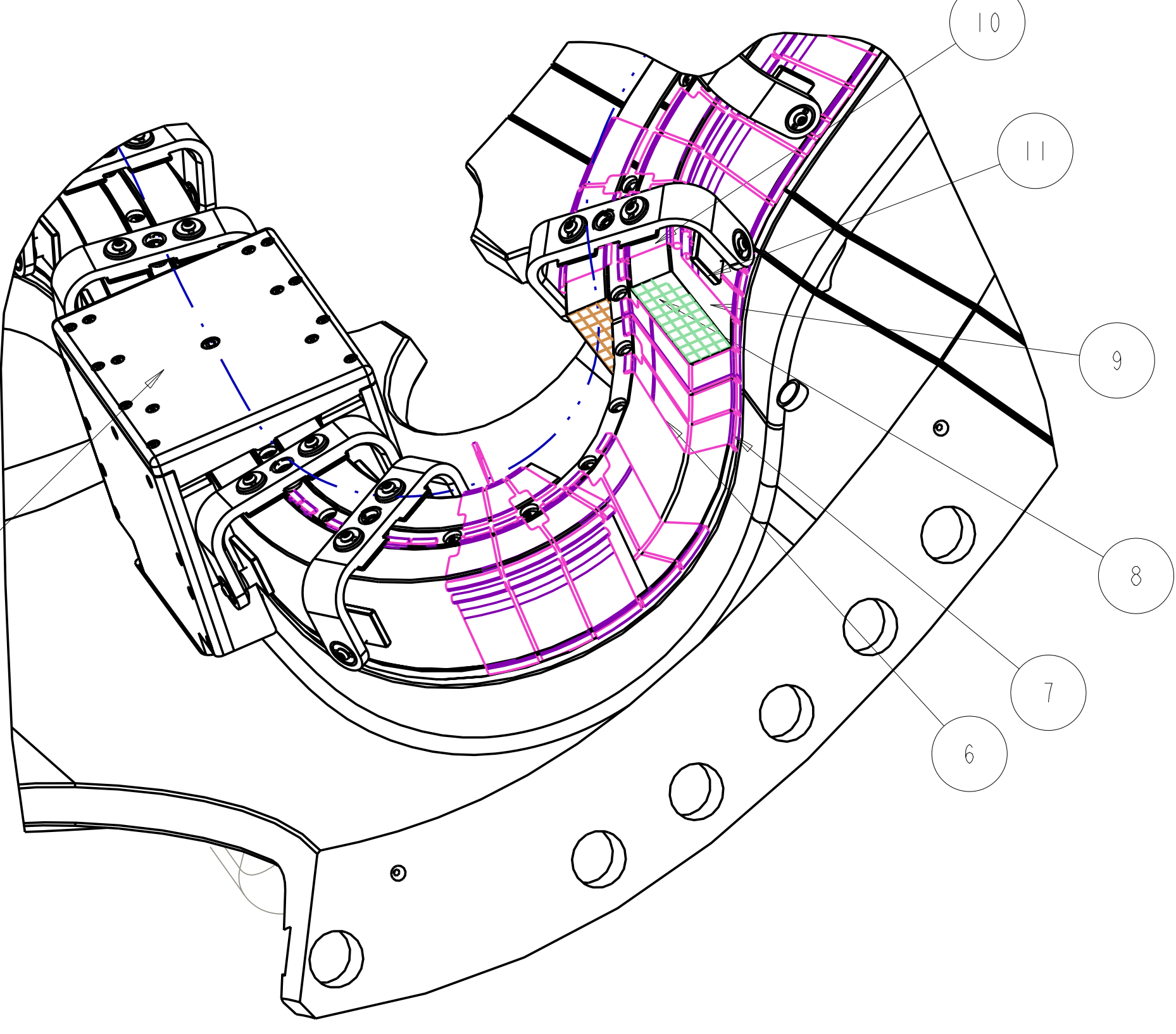


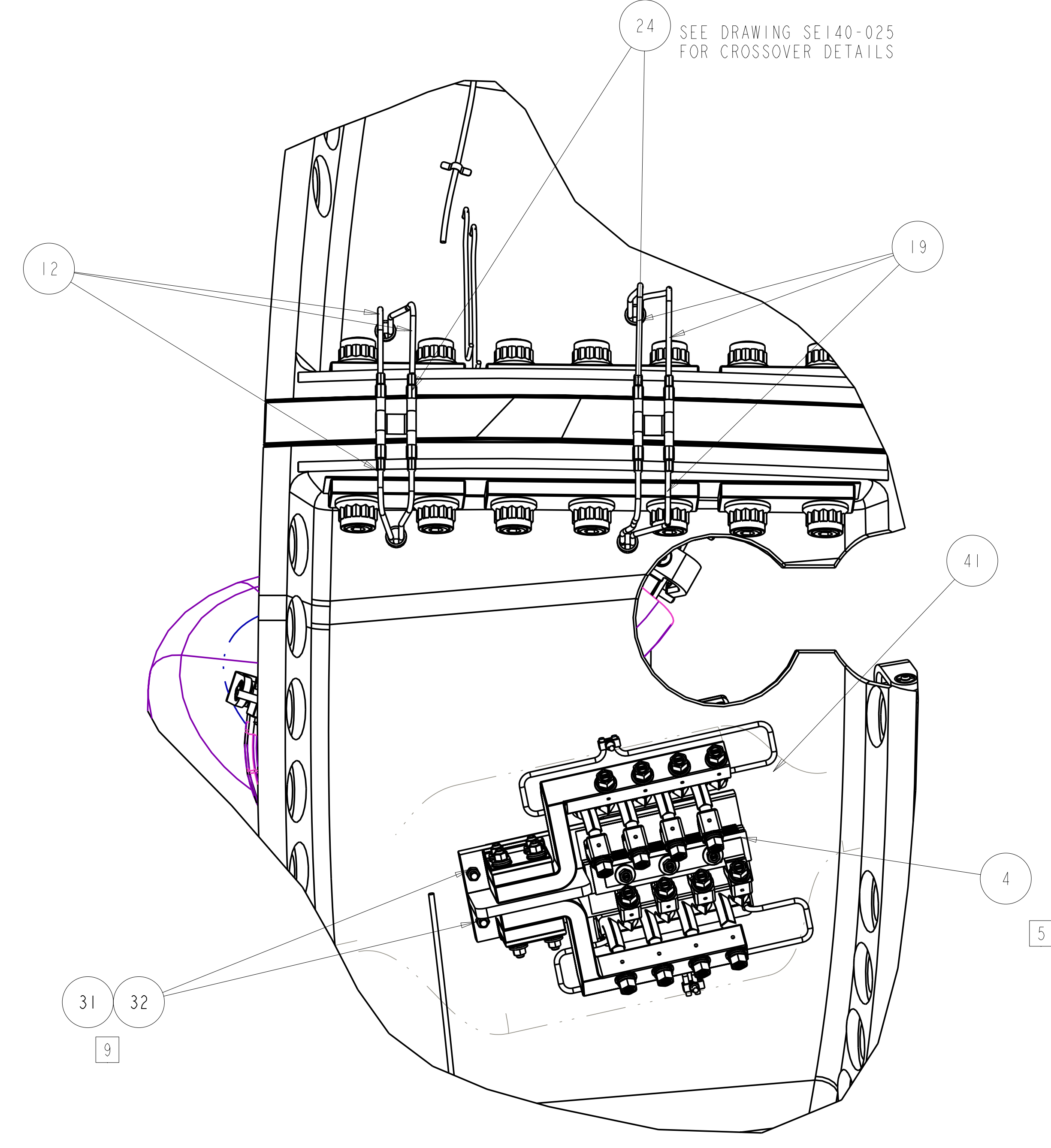
1 TYPE-C MODULAR COIL ASSEMBLY
SCALE .125



SEE DETAIL A



CUT-AWAY VIEW SHOWING WINDING INSTALLATION SEQUENCE (SIDE "A")
SCALE 0.25



DETAIL A
SCALE 0.25

RELEASED FOR FABRICATION / INSTALLATION
PPPL Drafting

- NOTES:
- DRAWING PREPARED IN ACCORDANCE WITH ASME Y14.100-2000.
 - INTERPRET DIMENSIONS AND TOLERANCES PER ANSI Y14.5M
 - DIMENSIONS ARE IN INCHES
 - DIMENSIONS APPLY AT ROOM TEMPERATURE. OPERATING TEMP 80 K.
 - LEADS AREA SHALL BE COVERED WITH AN INSULATING MATERIAL (F/N 41) TO PREVENT DEBRIS FROM CAUSING AN ELECTRICAL SHORT DURING OPERATION.
 - VENDOR INFORMATION: WARWICK MILLS
PO BOX 409
NEW IPSWITCH, NH 03071
888-477-4675 OR INQUIRIES@WARWICKMILLS.COM
 - SEE PROCEDURE D-NCSX-MCF-001 FOR ADDITIONAL REQUIREMENTS.
 - WELDING SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF PPPL PROCEDURE NO. ENG-037. VISUAL WELD INSPECTION SHALL BE PERFORMED IN ACCORDANCE WITH THE ACCEPTANCE CRITERIA OF AWS D1.6.
 - TACK WELD ANY ATTACHED FASTNERS OR HARDWARE TO SECURE LOCATION.
 - VENDOR INFORMATION: FISO FIBER OPTICS
500 ST. JEAN BAPTISTE AVE SUITE 195
QUEBEC QC, G2E 5R CANADA
418-688-8065 OR WWW.FISO.COM
 - VENDOR INFORMATION: OMEGA ENGINEERING CORP
ONE OMEGA DRIVE
STAMFORD, CT 06907
800-848-4286 OR WWW.OMEGA.COM
 - SOME PARTS IN THIS ASSEMBLY ARE GRAPHIC REPRESENTATIONS OF ACTUAL PARTS/ASSEMBLIES. FOR FULL MODELED ASSEMBLY SEE SEI40-103.ASM
 - TYPE "C" COIL: REMOVE ALL STUDS AFTER CLAMP AND INSULATION BLANKETS ARE ASSEMBLED (POST VP1).
 - MAGNETIC PERMEABILITY NOT TO EXCEED 1.02 AS MEASURED BY A SEVERN INDICATOR; AVAILABLE FROM: SEVERN ENGINEERING
555 OLD STAGE ROAD SUITE 14
AUBURN, ALABAMA 36830
 - FOR WINDINGS AND GROUNDWRAP DETAILS REFER TO MODULAR COIL CONDUCTOR SPECIFICATION NCSX-CSPEC-142-03-05, AND DRAWING SEI42C-019.
 - VENDOR INFORMATION: MCMASTER CARR
600 COUNTY LINE ROAD
ELMHURST IL 60126 PHONE 630-833-0300

REV	QTY	DESCRIPTION	MATERIAL	SPECIFICATION	FIND NO
5	6	AR SEI40-031 PROTECTIVE COVER	NOMEX CLOTH		41
		AR SEI42C-306 LOCKING TAB			40
11	3	NCSX-PRL-12-003 THERMOCOUPLE -SURFACE -LEADS 28"	INCONEL 718		39
	16	THERMOCOUPLE -SURFACE -LEADS 29"			38
	2	THERMOCOUPLE PLUG -LEADS 27"			37
11	1	AR SEI42B-030 THERMOCOUPLE -SURFACE -LEADS 30"			36
	AR	SEI42B-030 WIRE CLAMP			35
16	2	91735A146 PAN HEAD SCREW			34
	2	SEI23-155 THERMOCOUPLE MTG BLOCK			33
16	4	91950A031 3/8 FLAT WASHER	316 SST	ANSI B18.22.1	32
16	4	94819A049 3/8-16 UNC HEX NUT	316 SST	ANSI B18.2.2	31
	AR	DOW GREAT FOAM INSULATING FOAM	POLYMERIC DIOXIFORANATE, POLYIMIDES AND HYDROCARBON OILS		30
	1	SE310-032 FLUX LOOP BOX			29
10	AR	SFO-NS-398 FIBER OPTIC STRAIN GAGE			28
16	2	SS-810-1-8 SWAGelok BLEED VALVE			27
16	16	90257A007 6-32 HEX NUT	316 SST		26
	10	SEI40-030 TUBE CLAMP ASSEMBLY			25
	2	SEI40-025 POL BR CROSSOVER ASSEMBLY			24
16	16	92185A147 #6-32X3/8" SOC HD CAP SCR	316 SST		23
16	16	36892107 1/8" TUBE STRAP	OHFC COPPER		22
6	AR	-21 WINDING FORM INSULATION ASSY	1/8" NOMEX		21
	AR	SEE CHART (SHT2) CLAMP ASSEMBLY			20
12	AR	SEI42C-248 SIDE B COOLING TUBES (FIELD FIT)	COPPER TUBING	1/4"	19
	1	SEI42C-488 SIDE "B" CHILL PLATES (SIDE)			18
	1	SEI42C-486 SIDE "B" UPPER CHILL PLATES (TOP)			17
15	AR	-16 SIDE "B" GROUNDWRAP			16
15	AR	-15 SIDE "B" WINDING ASSEMBLY			15
	1	SEI42C-484 SIDE "B" LOWER CLADDING (BASE)			14
	1	SEI42C-482 SIDE "B" UPPER CLADDING (SEPTUM)			13
AR	SEI42C-258 SIDE A COOLING TUBES (FIELD FIT)	COPPER TUBING	1/4"	12	
	1	SEI42C-388 SIDE A LOWER CHILL PLATES (SIDE)			11
	1	SEI42C-386 SIDE A UPPER CHILL PLATES (TOP)			10
15	AR	-9 SIDE-A WP GROUNDWRAP			9
15	AR	-8 SIDE "A" WINDINGS ASSEMBLY			8
	1	SEI42C-384 SIDE "A" LOWER CLADDING (BASE)			7
	1	SEI42C-382 SIDE "A" UPPER CLADDING (SEPTUM)			6
12	1	SEI42C-080 TYPE "C" LEADS ASSEMBLY			5
	1	SEI42C-050 TYPE "C" TERMINAL ASSEMBLY			4
					3
13	1	SEI41-123 MOD COIL WINDING FORM ASSEMBLY TYPE-A			2
	AR	-1 MCWF-TYPE C ASM			1

PARTS LIST

NO REPRESENTATION OR WARRANTY, EXPRESSED OR IMPLIED, IS MADE AS TO THE ACCURACY, COMPLETENESS OR USEFULNESS OF THE INFORMATION OR STATEMENTS CONTAINED IN THESE DRAWINGS, OR THAT THE USE OR DISCLOSURE OF ANY INFORMATION, APPARATUS, METHOD OR PROCESS DISCLOSED IN THESE DRAWINGS MAY NOT INFRINGE PRIVATE RIGHTS OF OTHERS. NO LIABILITY IS ASSUMED WITH RESPECT TO THE USE OF, OR FOR DAMAGES RESULTING FROM THE USE OF, ANY INFORMATION, APPARATUS, METHOD OR PROCESS DISCLOSED IN THESE DRAWINGS. DRAWINGS MADE AVAILABLE FOR INFORMATION TO BIDDER ARE NOT TO BE USED FOR OTHER PURPOSES, AND ARE TO BE RETURNED UPON REQUEST OF THE FORWARDING CONTRACTOR.

P THIS DRAWING PRODUCED ON PRO-ENGINEER

REV	DESCRIPTION	BY	DATE	CHK	DEPT	DATE	PE	REQ	DATE	ORNL	DOE	DATE
1	REVISE ASSEMBLY AND DRAWING PER ECN 5361	GL	06/08									
0	ORIGINAL ISSUE	GL	07/01									

SCALE	NOTED	DES	DATE
		D WILLIAMSON	07/07
		G LOVETT	07/07
		CHK MIKE COLE	07/07
		DEPT :	
		PE :	
		CR :	
		PJ :	
		RD :	
		PPPL DRFT J SIEGLE	07/07

Oak Ridge National Laboratory
managed for the DEPARTMENT OF ENERGY under
U.S. GOVERNMENT contract DE-AC05-00OR22725
UT-BATTELLE, LLC. Oak Ridge, Tennessee

UT-BATTELLE
PROJECT NAME
NATIONAL COMPACT STELLARATOR EXPERIMENT

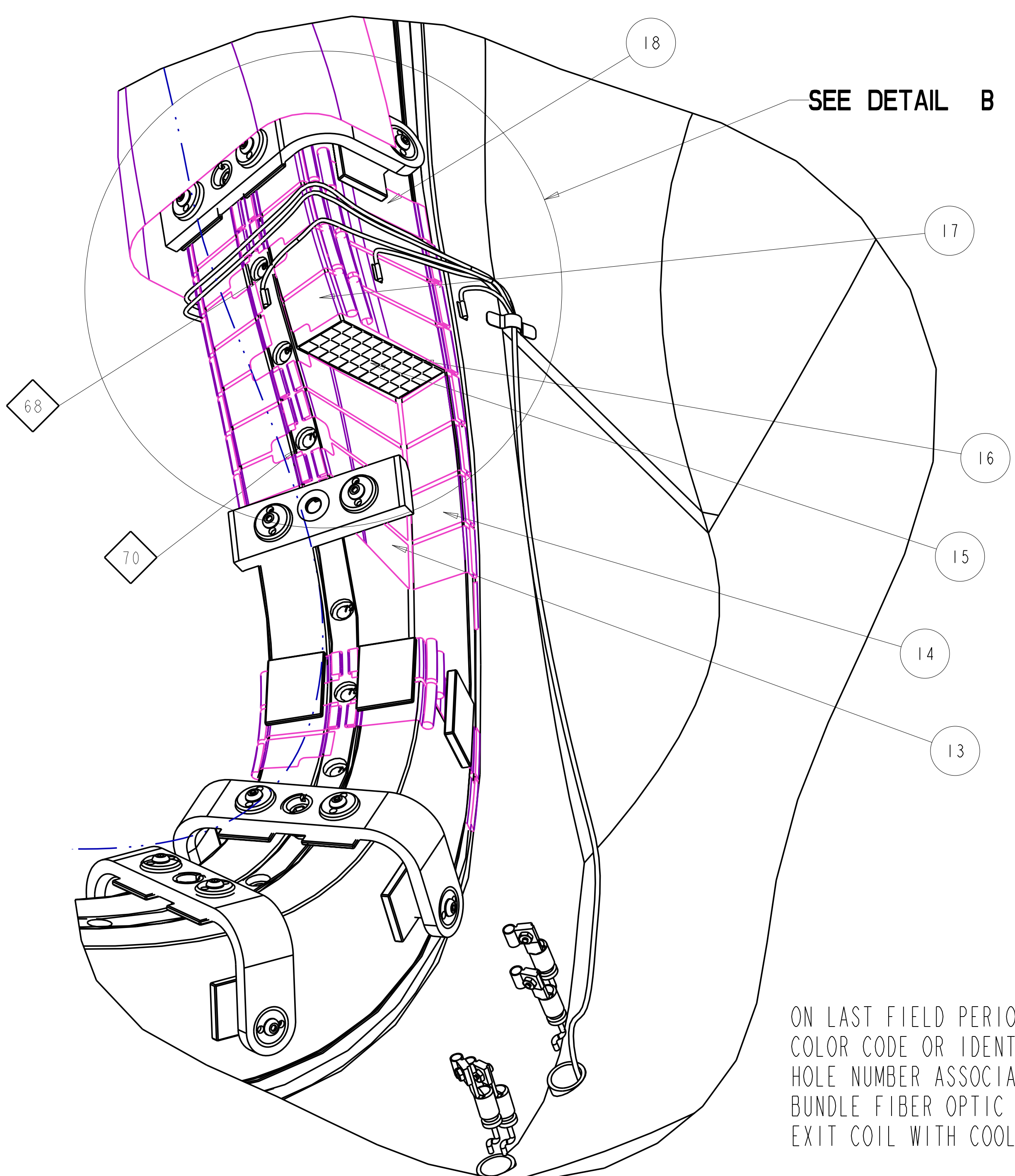
TYPE C MCWF
FINAL COIL ASSEMBLY

VERSION NO.	PLANT	BLDG	FL	SHT OF	TYPE	CLASS
2	ORNL	5700	3	1	3	S

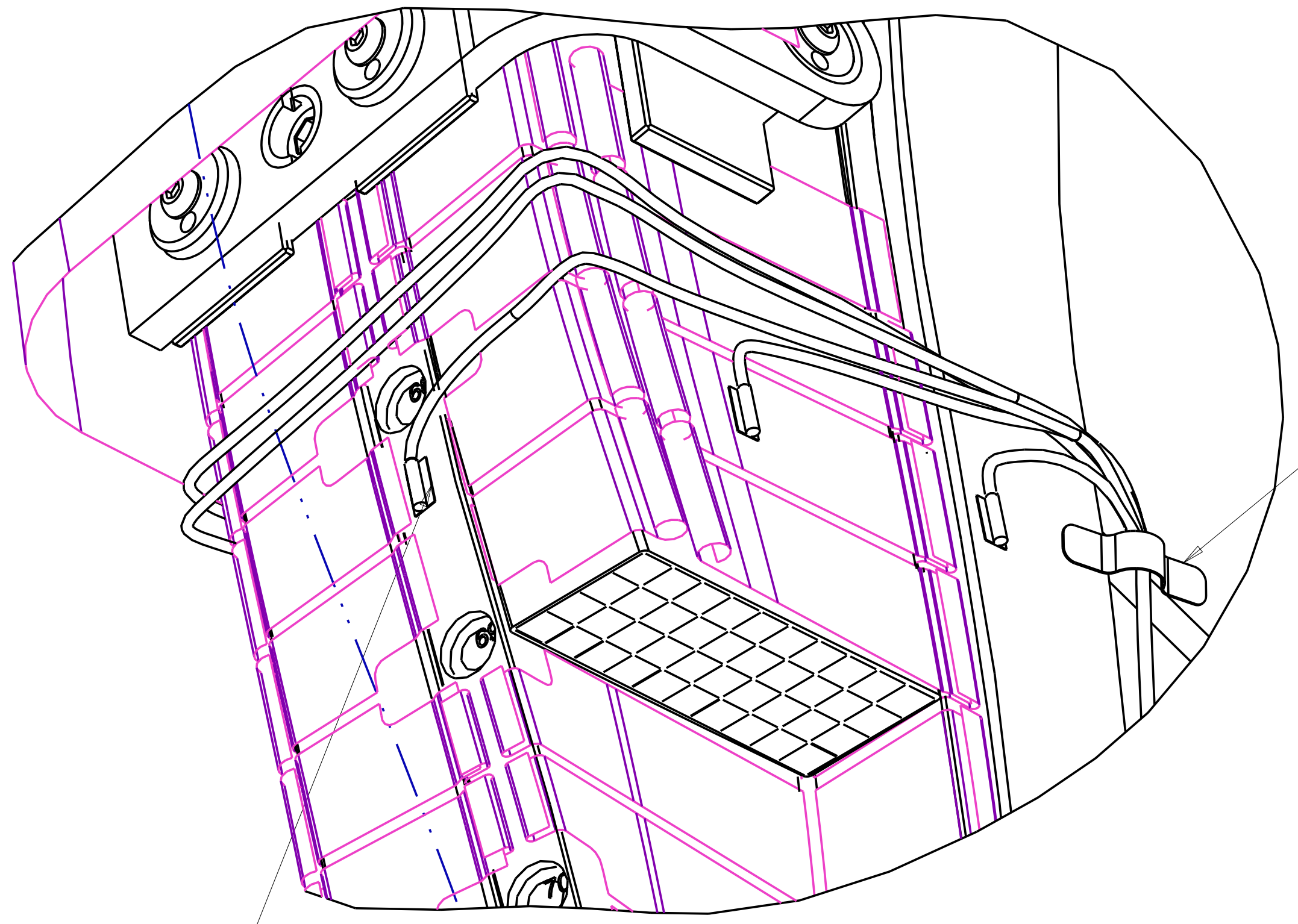
RELEASE LEVEL
Fabrication

SEI40-103

REV 0



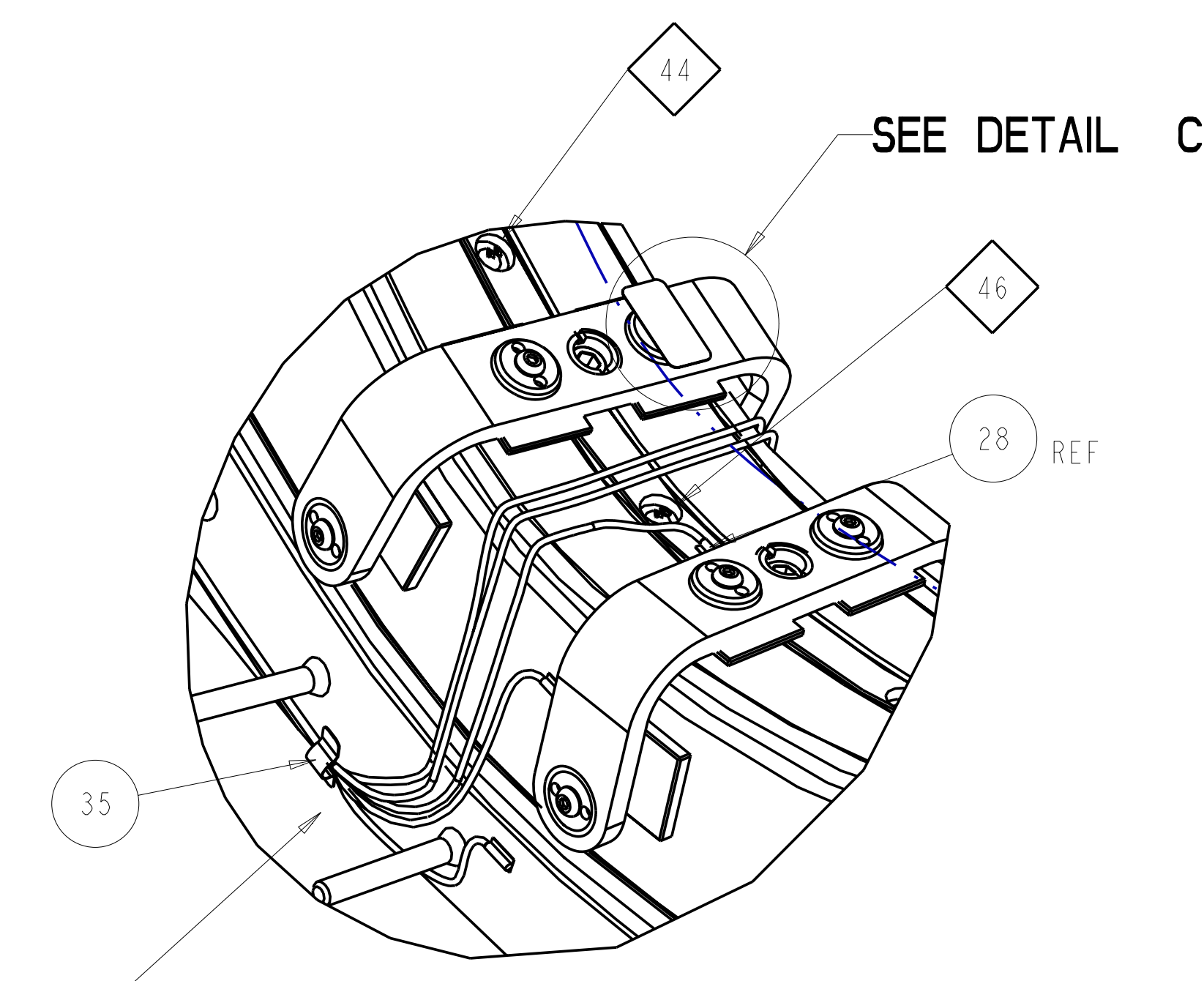
CUT-AWAY VIEW SHOWING WINDING ASSEMBLY SEQUENCE (SIDE "B")
 SCALE 0.50



DETAIL B
 SCALE 1.00

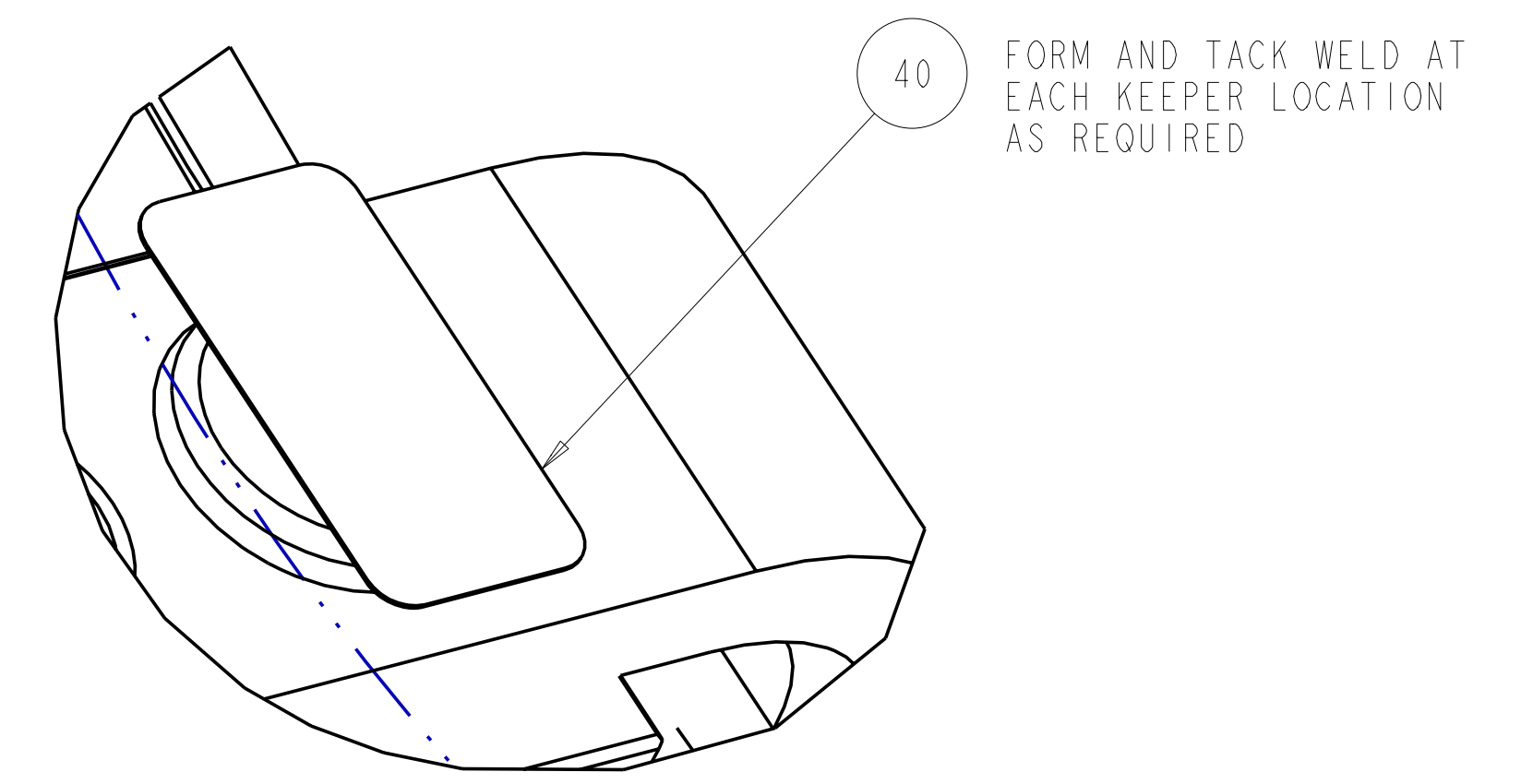
ON LAST FIELD PERIOD ASSEMBLY:
 LOCATE STRAIN SENSORS AND LABEL AS SHOWN
 1 EACH ON TOP OF TEE (OPTIONAL) (ie 68-T-TOP)
 2 EACH ON SIDE CHILL PLATE (OPTIONAL)
 ie (SIDE A) 68-C-A AND (SIDE B) 68-C-B
 2 EACH ALONG FORM BELOW VPI GROOVE
 ie (SIDE A) 68-V-A AND (SIDE B) 68-V-B

ON LAST FIELD PERIOD ASSEMBLY:
 COLOR CODE OR IDENTIFY EACH CABLE WITH
 HOLE NUMBER ASSOCIATED AND LOCATION
 BUNDLE FIBER OPTIC STRAIN SENSOR CABLE
 EXIT COIL WITH COOLING TUBES.



VIEW OF WINDING FORM AT HOLE 46
 SCALE .50

LOCATE STRAIN SENSORS AND LABEL AS SHOWN
 ON LAST FIELD PERIOD ASSEMBLY
 1 EACH ON TOP OF TEE (ie 46-T-TOP)
 2 EACH ON SIDE CHILL PLATE
 ie (SIDE A) 46-C-A AND (SIDE B) 46-C-B
 2 EACH ALONG FORM BELOW VPI GROOVE
 ie (SIDE A) 46-V-A AND (SIDE B) 46-V-B

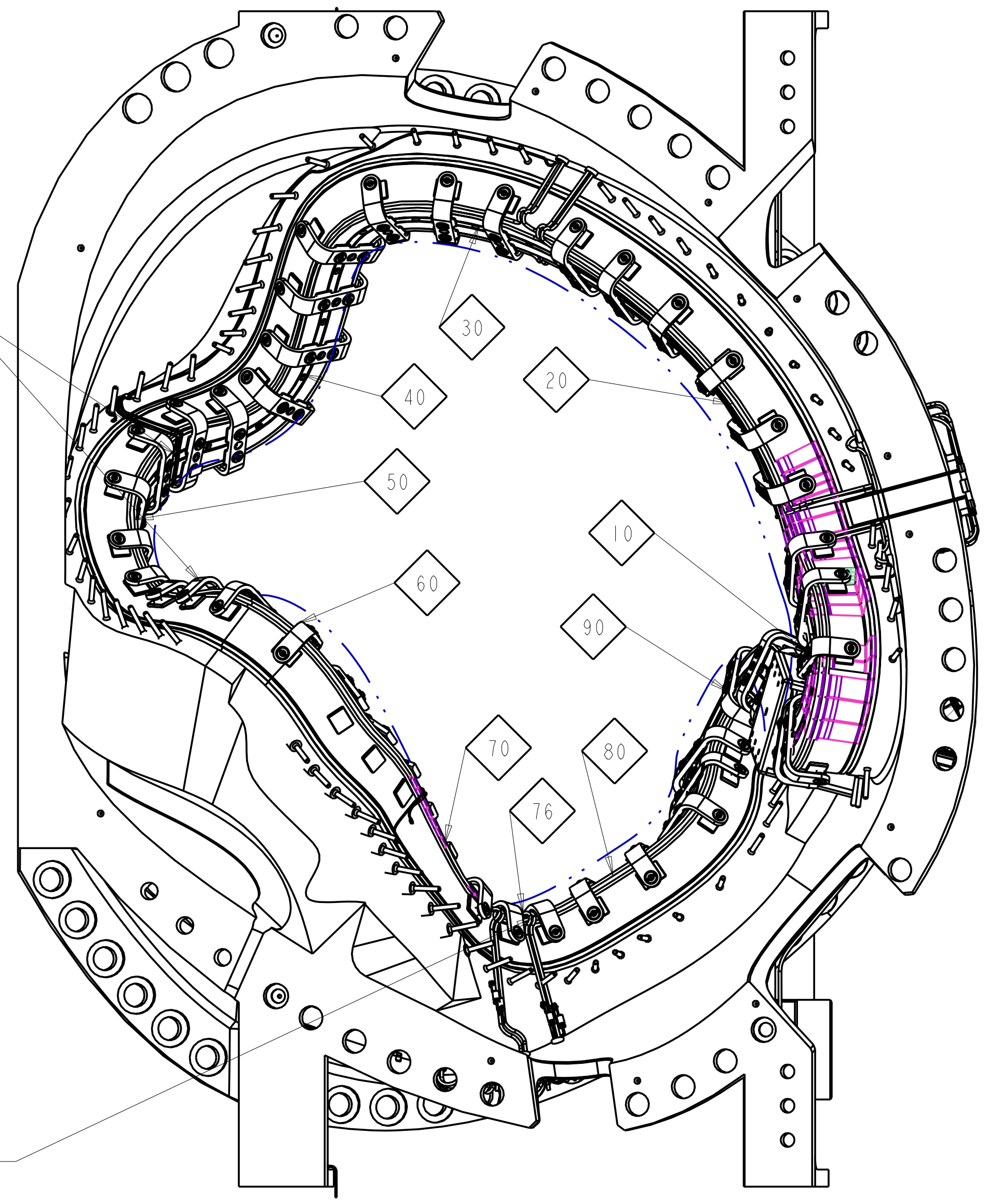


DETAIL C
 SCALE 2.00

CLAMP CHART		
NO.	HOLE NO.	CLAMP ASSEMBLY
1	04	SE142C-270
2	06	SE142C-270
3	09	SE142C-270
4	11	SE142C-270
5	13	SE142C-270
6	16	SE142C-270
7	18	SE142C-270
8	20	SE142C-270
9	22	SE142C-270
10	24	SE142C-270
11	26	SE142C-270
12	29	SE142C-270
13	31	SE142C-270
14	33	SE142C-270
15	35	SE142C-270
16	37	SE142C-270
17	39	SE142C-270
18	41	SE142C-270
19	43	SE142C-270
20	45	SE142C-270
21	47	SE142C-270
22	49	SE142C-270
23	51	SE142C-270
24	53	SE142C-270
25	55	SE142C-270
26	57	SE142C-270
27	59	SE142C-270
28	61	SE142C-270
29	63	SE142C-303
30	65	SE142C-303
31	67	SE142C-270
32	69	SE142C-303
33	71	SE142C-308
34	73	SE142C-270
35	75	SE142C-270
36	77	SE142C-270
37	79	SE142C-270
38	81	SE142C-270
39	83	SE142C-270
40	85	SE142C-270
41	87	SE142C-270
42	90	SE142C-270
43	92	SE142C-270
44	94	SE142C-270

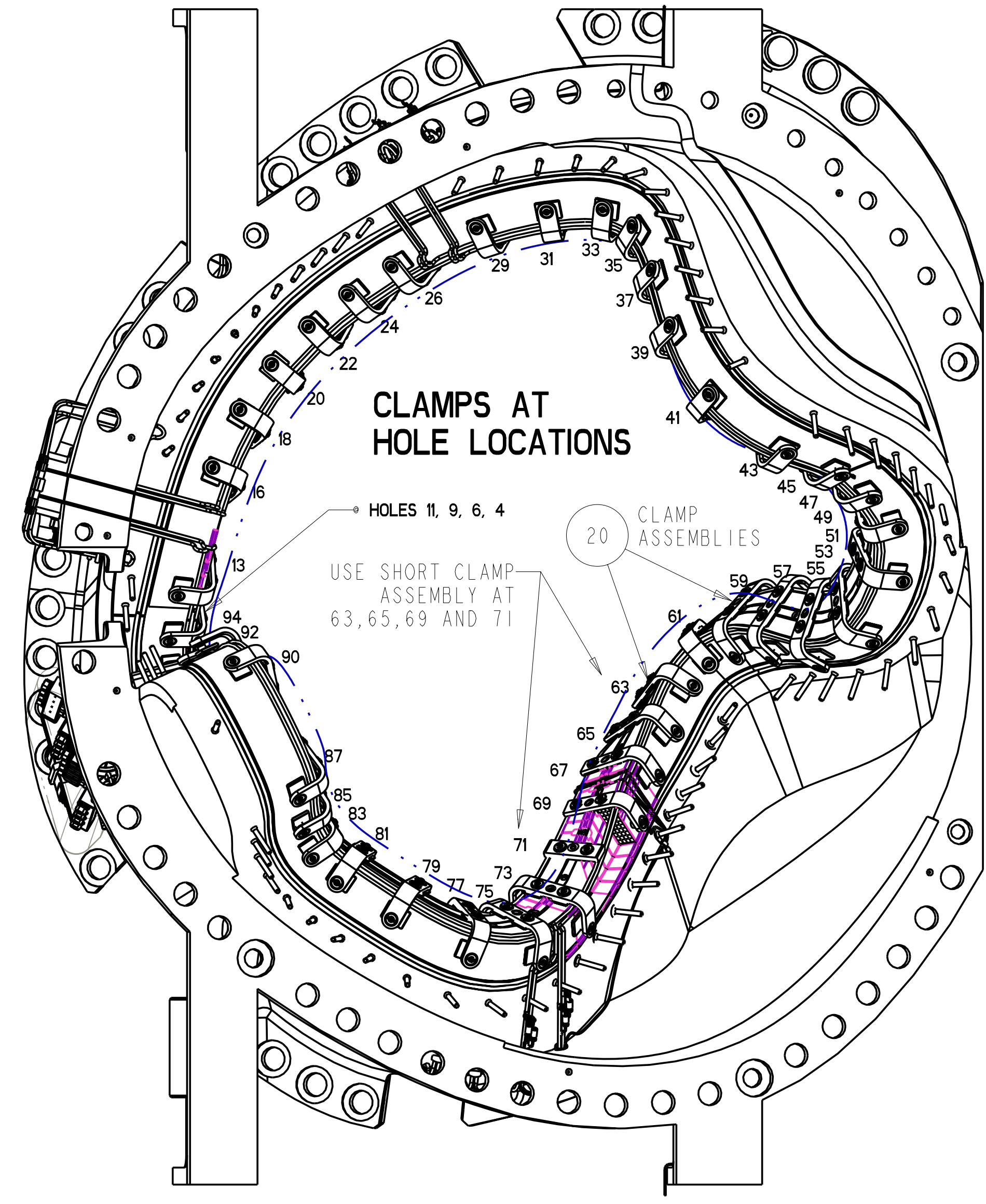
STRAIN GAGE CHART			
NO.	LABEL	LOCATION	LEAD LENGTH'S
1	46-T-TOP	HOLE 46 TOP OF TEE (OPTIONAL)	32'
2	46-C-A	HOLE 46 SIDE "A" CHILL PLATE (OPTIONAL)	32'
3	46-C-B	HOLE 46 SIDE "B" CHILL PLATE (OPTIONAL)	32'
4	46-V-A	HOLE 46 SIDE "A" UNDER VPI GROOVE	32'
5	46-V-B	HOLE 46 SIDE "B" UNDER VPI GROOVE	32'
6	64-T-TOP	HOLE 64 TOP OF TEE (OPTIONAL)	28'
7	64-C-A	HOLE 64 SIDE "A" CHILL PLATE (OPTIONAL)	28'
8	64-C-B	HOLE 64 SIDE "B" CHILL PLATE (OPTIONAL)	28'
9	64-V-A	HOLE 64 SIDE "B" UNDER VPI GROOVE	28'
10	64-V-B	HOLE 64 SIDE "B" UNDER VPI GROOVE	28'

SUGGESTED STRESS SENSOR LOCATION
 ON LAST FIELD PERIOD ASSEMBLY
 HIGH STRESS REGION ON PLANE
 NORMAL TO THE WINDING LAW
 BETWEEN HOLE NUMBER 45-54
 SEE DETAIL "B"



SIDE "A" VIEW
 SCALE .125

SUGGESTED STRESS SENSOR LOCATION
 ON LAST FIELD PERIOD ASSEMBLY
 HIGH STRESS REGION ON PLANE
 NORMAL TO THE WINDING LAW
 BETWEEN HOLE NUMBER 67-76
 SEE DETAIL "B"



SIDE "B" VIEW
 SCALE .125

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 UT-BATTELLE, LLC. Oak Ridge, Tennessee

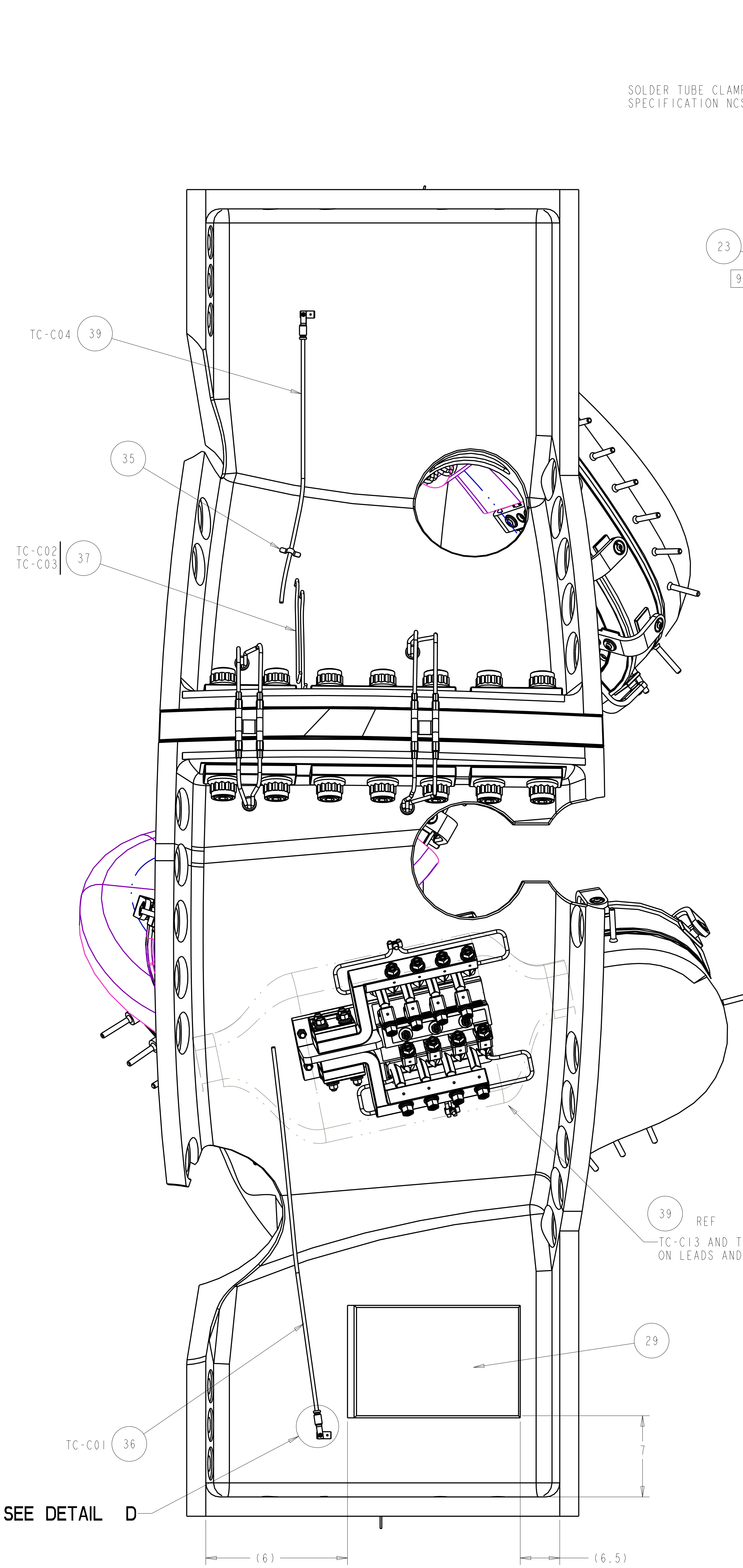
UT-BATTELLE

NATIONAL COMPACT STELLARATOR EXPERIMENT

TYPE C MCWF
 FINAL COIL ASSEMBLY

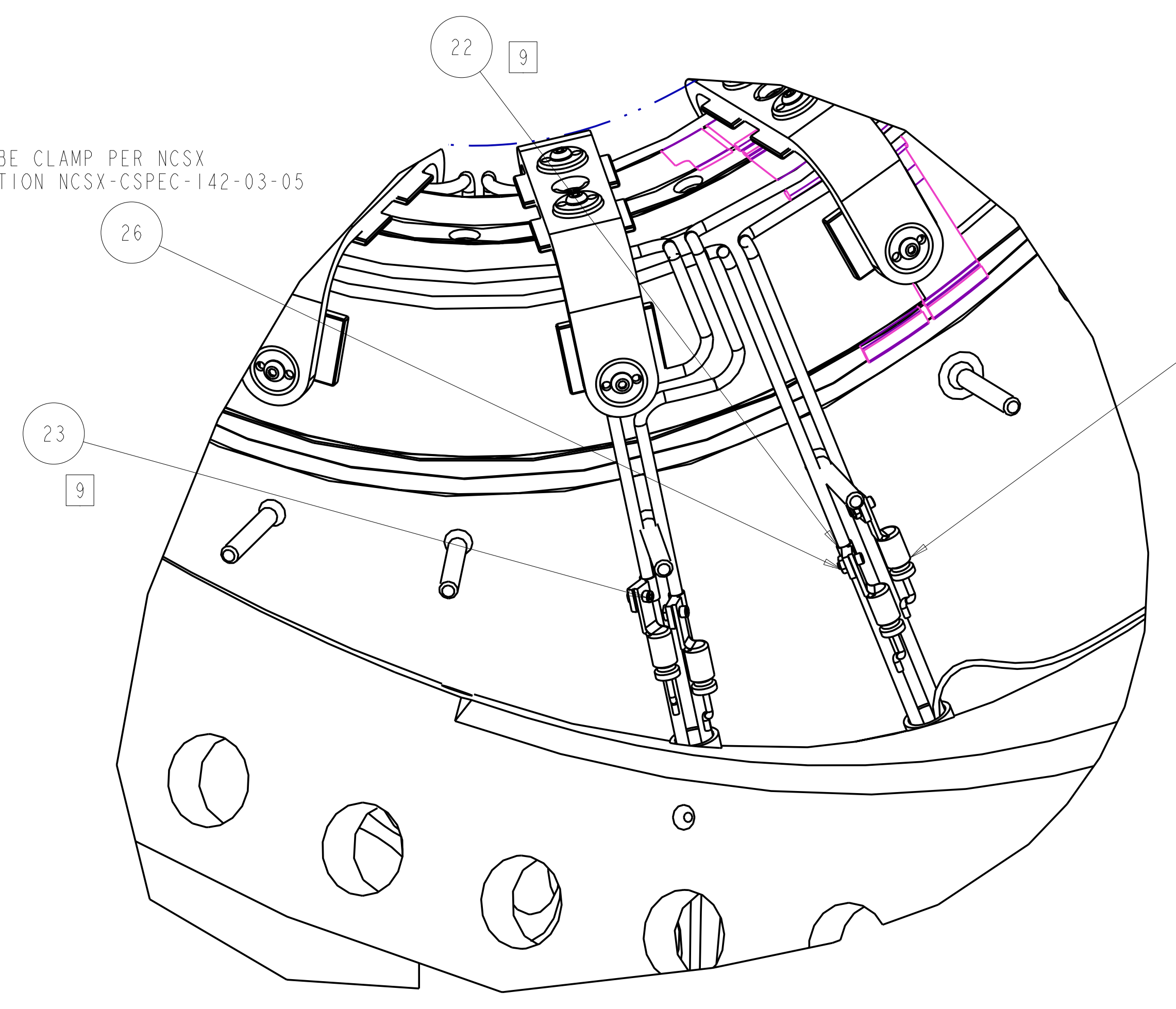
VERSION NO.	PLANT	BLDG	FL	SHT OF	TYPE	CLASS
1	ORNL	5700	3	2 3	S	U
RELEASE LEVEL		SE140-103				
Fabrication		0				

SE140-103

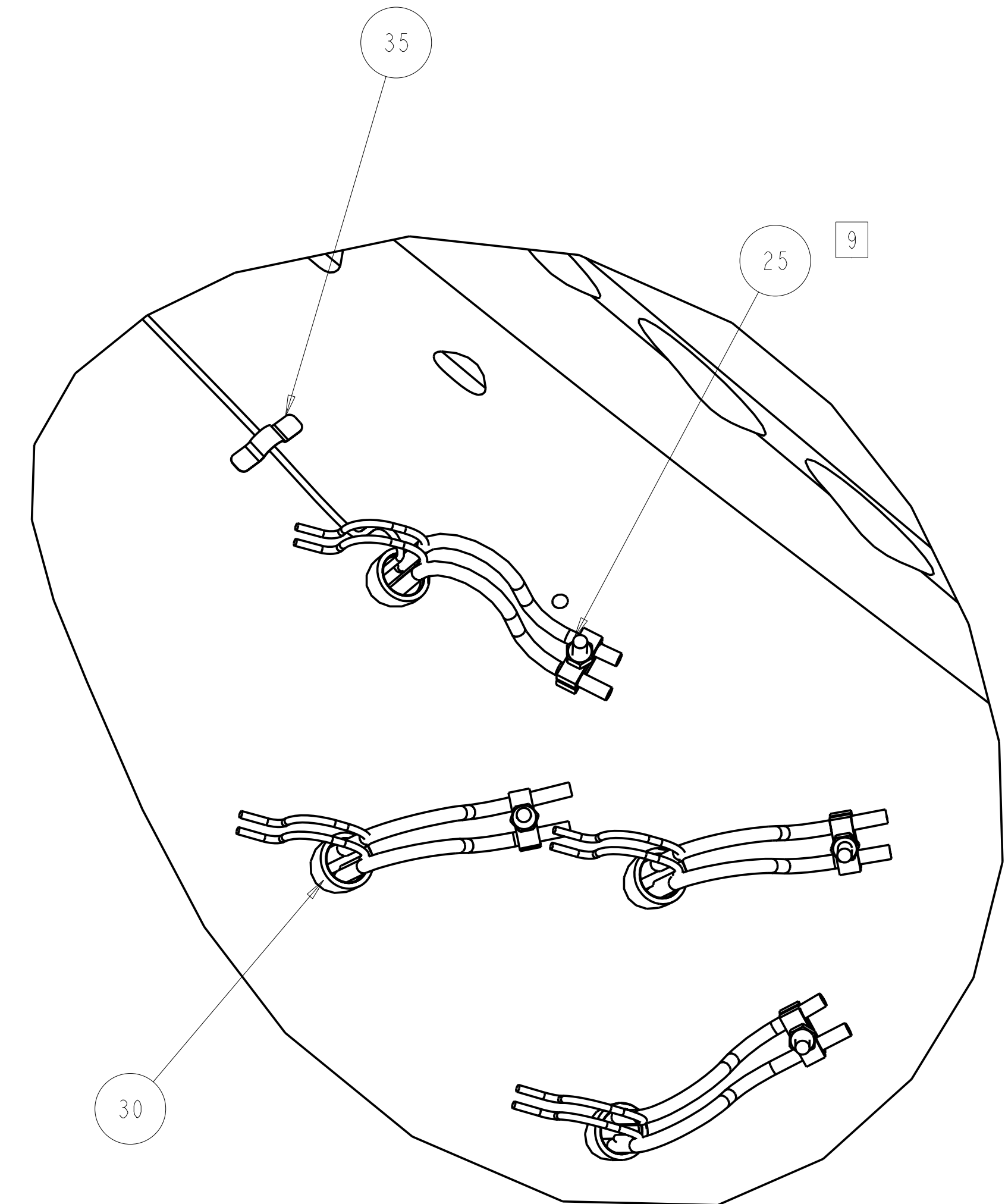


SCALE 0.25

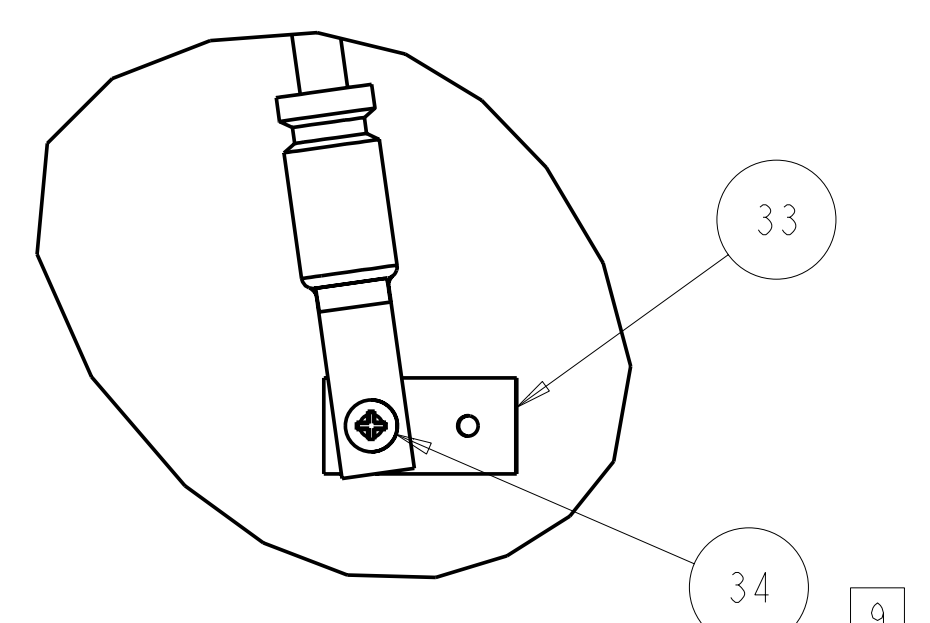
SOLDER TUBE CLAMP PER NCSX SPECIFICATION NCSX-CSPEC-142-03-05



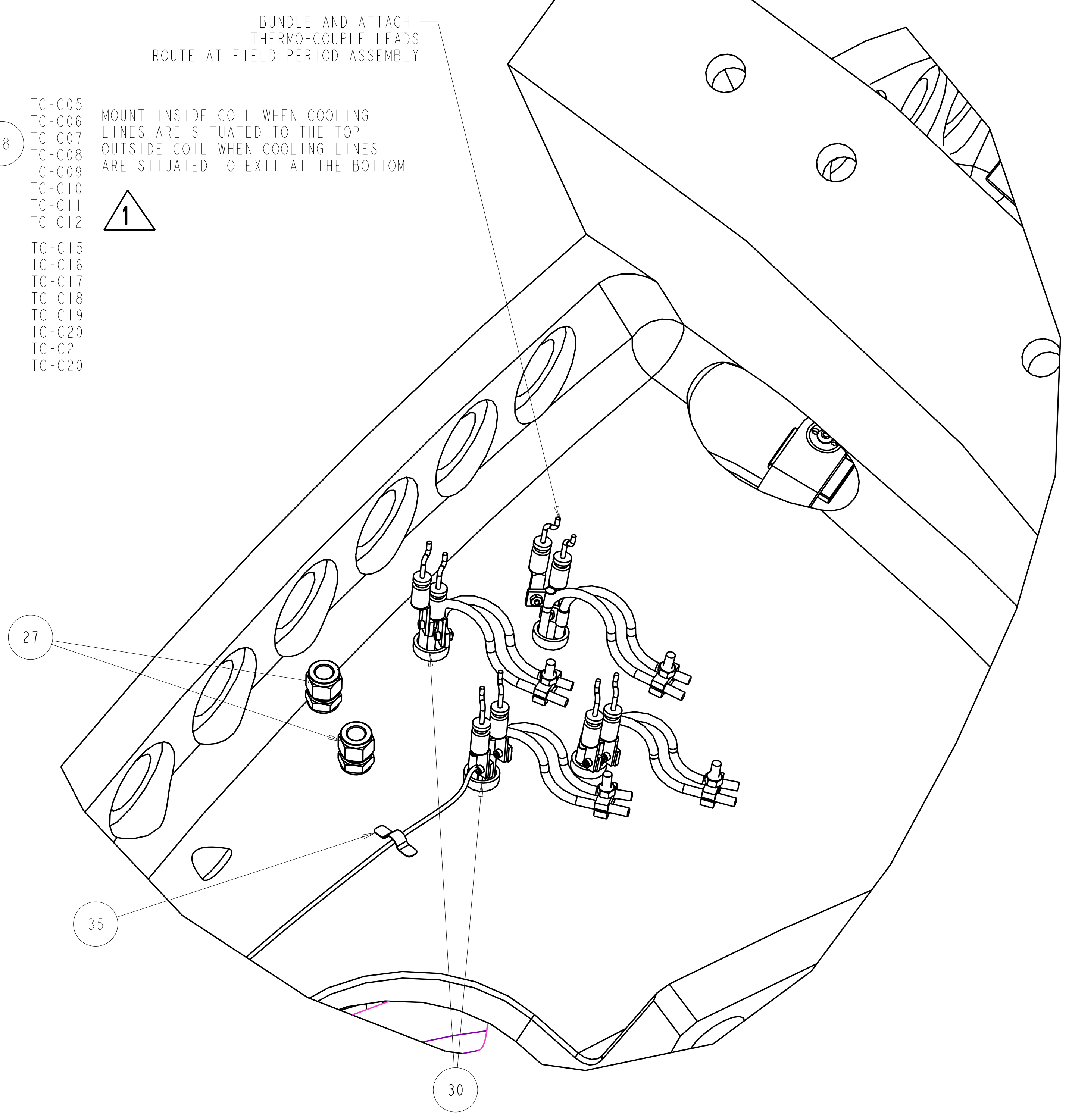
PARTIAL LEFT VIEW
 SCALE 0.500



PARTIAL BOTTOM VIEW
 SCALE 0.50



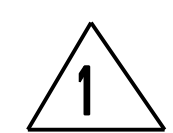
DETAIL D TYP 2 PLACES
 SCALE 1.00



PARTIAL TOP VIEW
 SCALE 0.50

- TC-C05
- TC-C06
- TC-C07
- TC-C08
- TC-C09
- TC-C10
- TC-C11
- TC-C12
- TC-C15
- TC-C16
- TC-C17
- TC-C18
- TC-C19
- TC-C20
- TC-C21
- TC-C22

MOUNT INSIDE COIL WHEN COOLING LINES ARE SITUATED TO THE TOP
 OUTSIDE COIL WHEN COOLING LINES ARE SITUATED TO EXIT AT THE BOTTOM



THERMOCOUPLE CHART			
NO.	LABEL	LOCATION	LEAD LENGTH (FT)* BUNDLE
1	TC-C01	OUTBOARD LOWER SUPPORT	30'
2	TC-C02	OUTBOARD T/C HOLE	27'
3	TC-C03	OUTBOARD T/C HOLE (DUPLICATE)	27'
4	TC-C04	OUTBOARD UPPER SUPPORT	28'
5	TC-C05	COOLING LINE OUTLET 1	29'
6	TC-C06	COOLING LINE OUTLET 2	29'
7	TC-C07	COOLING LINE OUTLET 3	29'
8	TC-C08	COOLING LINE OUTLET 4	29'
9	TC-C09	COOLING LINE OUTLET 5	29'
10	TC-C10	COOLING LINE OUTLET 6	29'
11	TC-C11	COOLING LINE OUTLET 7	29'
12	TC-C12	COOLING LINE OUTLET 8	29'
13	TC-C13	LEADS	28'
14	TC-C14	LEADS	28'
15	TC-C15	COOLING LINE OUTLET 9	29'
16	TC-C16	COOLING LINE OUTLET 10	29'
17	TC-C17	COOLING LINE OUTLET 11	29'
18	TC-C18	COOLING LINE OUTLET 12	29'
19	TC-C19	COOLING LINE OUTLET 13	29'
20	TC-C20	COOLING LINE OUTLET 14	29'
21	TC-C21	COOLING LINE OUTLET 15	29'
22	TC-C22	COOLING LINE OUTLET 16	29'

* FIELD FIT AND IDENTIFY.

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 UT-BATTELLE, LLC. Oak Ridge, Tennessee

UT-BATTELLE

NATIONAL COMPACT STELLARATOR EXPERIMENT

TYPE C MCWF
 FINAL COIL ASSEMBLY

VERSION NO.	PLANT	BLDG	FL	SHT OF	TYPE	CLASS
1	ORNL	5700	3	3	S	U
RELEASE LEVEL		SEI40-103		REV		0
Fabrication						

SEI40-103