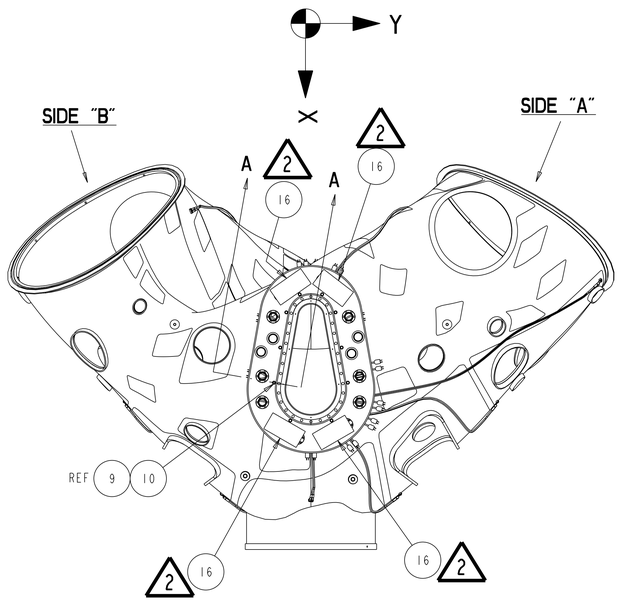
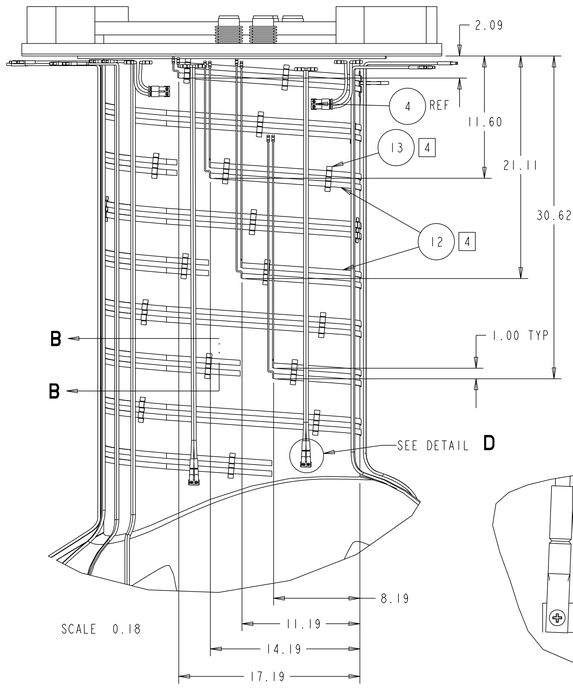
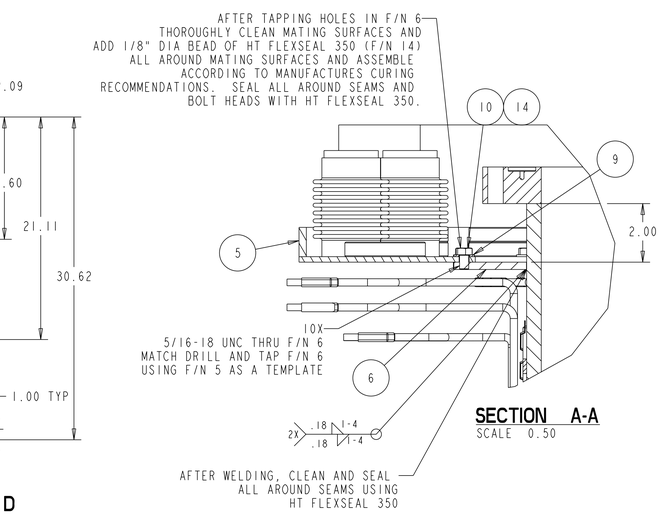
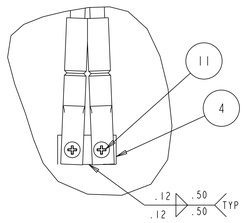






SECTION A-A
SCALE 0.50

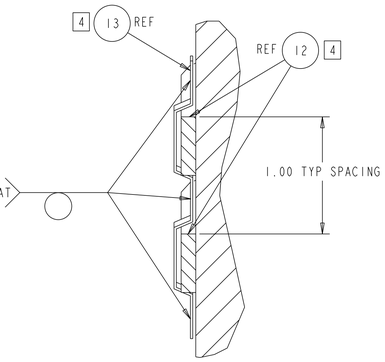


DETAIL D
SCALE 1.0

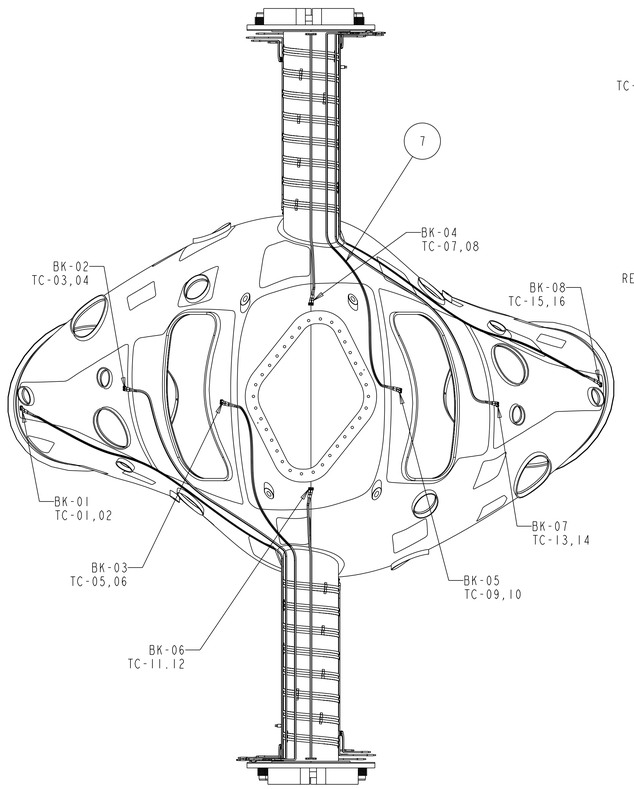
NOTES:
1. DRAWING PREPARED IN ACCORDANCE WITH ASME Y14.100-2000.
2. INTERPRET DIMENSIONS AND TOLERANCES PER ANSI Y14.5 - 1994.
3. DIMENSIONS ARE IN INCHES.
4. EVENLY DISTRIBUTE THE ENTIRE LENGTH OF HEAT TAPE ACROSS THE SURFACE OF THE PORT. ADJUST PITCH OF HEATER TAPE TO ENSURE FULL COVERAGE. USE FOIL, F/N 13, TACK WELDED ACROSS TAPE TO SECURE TAPE IN PLACE.
5. USE FOIL, F/N 13, TACK WELDED ACROSS THERMOCOUPLE TO SECURE THERMOCOUPLE IN PLACE.
6. MAGNETIC PERMEABILITY NOT TO EXCEED 1.02 AS TESTED BY A SEVERN INDICATOR. AVAILABLE FROM SEVERN ENGINEERING, AUBURN, ALABAMA 36830; WWW.SEVERNENGINEERING.COM
7. WELDING SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF PPPL PROCEDURE ENG-037. VISUAL WELD INSPECTION SHALL BE PERFORMED IN ACCORDANCE WITH THE ACCEPTANCE CRITERIA OF AWS D1.1 Section 6.
8. ASSEMBLE PER THIS DRAWING AND SPECIFICATION NCSX-CSPEC-185-01.
9. FIELD FIT SPLICE PLATES TO JOIN PART 6 HALVES AT ASSEMBLY.
10. a. ONE JUCTION BOX OCCUPIES TWO ADJACENT 2.73 CONFLAT FLANGES ON THE HORSE COLLAR.
    b. ONE MATCHING CONFLAT FLANGE SUPPLIED WITH THE JUNCTION BOX IS A BLANK ROTATABLE FLANGE WITH ∅0.070 HOLES DRILLED INTO THE DISC FOR THE 0.059 O.D. CABLING TO ENTER THE MATCH DRILLED HOLES IN THE JUNCTION BOX BASE. A SILICONE RUBBER MEMBRANE IS PLACED BETWEEN THE JB AND THE ROTATABLE CF.
    c. THE SECOND MATCHING CF FLANGE SUPPLIED WITH THE JB IS NON-ROTATABLE WITH ∅0.386 x 0.260 DEEP COUNTERBORED HOLES ON THE AIR SIDE TO PRECLUDE INTERFERENCE WITH THE JB ORIENTATION.
    d. THE SILICONE RUBBER IS SQUEEZED BETWEEN THE JB BOTTOM PLATE AND THE ROTATABLE CF FLANGE AND A SMALL HOLE (APPROX. ∅0.03 INCH) PUNCTURES THE RUBBER FOR THE CABLE TO PASS WHICH IT TIGHTLY SEALS AGAINST THE FEW INCHES OF WATER NITROGEN PRESSURE.
11. A DASH NUMBER (-1, -2 OR -3) IS TO BE ADDED TO EACH THERMOCOUPLE I.D. NUMBER TO INDICATE WHICH VVSA IT IS ASSOCIATED WITH. EXAMPLE: TC-01-2, 02-2 INDICATES THERMOCOUPLE ON VVSA 2.

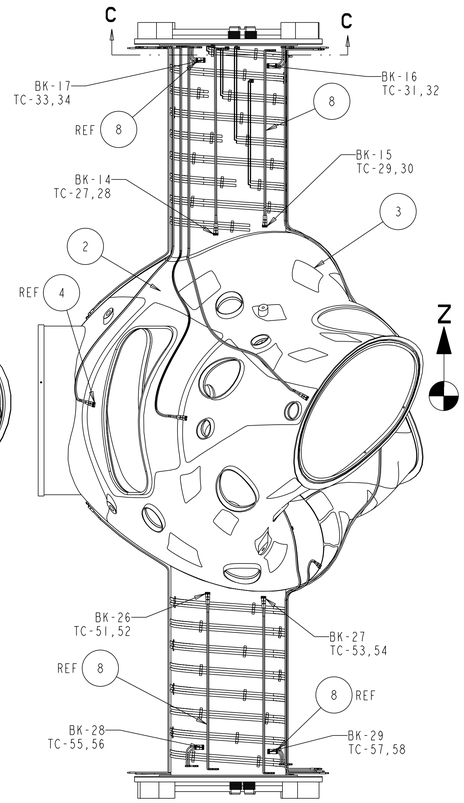
COORDINATES OF THERMOCOUPLE BLOCKS - POINT INDICATES CENTER OF BLOCK ON SURFACE OF VACUUM VESSEL
POINT LOCATIONS ARE APPROXIMATE ADJUSTMENTS MAY BE REQUIRED TO ACCOMODATE THE FLUX LOOPS
SEE NOTE 11

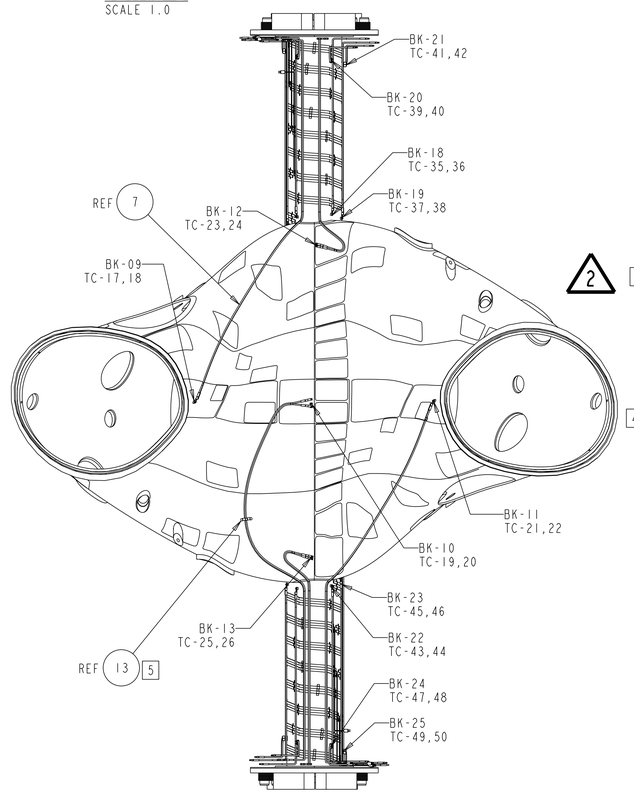
THERMOCOUPLE ID	BLOCK ID	X	Y	Z
ORGIN		0.000	0.000	0.000
TC-01,02	BK-01	41.108	-61.692	-2.463
TC-03,04	BK-02	66.968	-39.666	1.713
TC-05,06	BK-03	86.851	-19.111	-1.240
TC-07,08	BK-04	88.011	0.000	19.635
TC-09,10	BK-05	86.851	19.111	1.240
TC-11,12	BK-06	88.011	-0.000	-19.635
TC-13,14	BK-07	66.968	39.666	-1.713
TC-15,16	BK-08	41.108	61.692	2.463
TC-17,18	BK-09	26.367	25.500	-0.137
TC-19,20	BK-10	55.351	0.662	-0.821
TC-21,22	BK-11	26.367	-25.500	0.137
TC-23,24	BK-12	38.689	-0.394	33.260
TC-25,26	BK-13	38.689	0.394	-33.260
TC-27,28	BK-14	60.764	5.321	37.662
TC-29,30	BK-15	50.299	3.476	39.370
TC-31,32	BK-16	49.546	3.343	73.549
TC-33,34	BK-17	63.278	5.764	74.756
TC-35,36	BK-18	50.563	-3.522	39.931
TC-37,38	BK-19	62.490	-5.625	39.077
TC-39,40	BK-20	49.411	-3.319	72.808
TC-41,42	BK-21	63.564	-5.760	71.912
TC-43,44	BK-22	50.299	-3.476	-39.370
TC-45,46	BK-23	49.546	-3.343	-73.549
TC-47,48	BK-24	60.764	-5.321	-37.662
TC-49,50	BK-25	63.278	-5.764	-74.756
TC-51,52	BK-26	62.490	5.625	-39.077
TC-53,54	BK-27	50.563	3.522	-39.931
TC-55,56	BK-28	63.564	5.815	-71.912
TC-57,58	BK-29	49.411	3.319	-72.808



SECTION B-B
SCALE 2.0





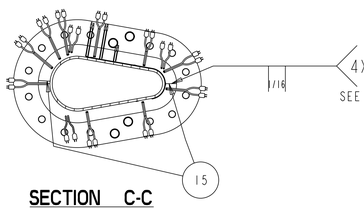


-1,-2,-3 VVSA ASSEMBLY STATION 1 PHASE 1 [8]
SCALE 0.80

	8	8	8	SE310-034 SE310-035	VERTICAL PORT 12 - JUNCTION BOX VERTICAL PORT 12 - CF INTERFACE		16
	AR	AR	AR		316SS SPLICE PLATE .5 X 2.5 X .25 THK	316SS	15
	AR	AR	AR	HT FLEXSEAL 350	HIGH TEMPERATURE RTV SILICONE	FORTAFIX LTD. PETERBOROUGH PE1 5BJ, UNITED KINGDOM WWW.FORTAFIX.COM	14
	AR	AR	AR		1/2" HEAT TAPE RETENTION FOIL	36 GA. (.005") INCONEL 625 OR 316 SST — ASTM B443 / ASTM A240	13
4	16	16	16	PPY491001	HEAT TAPE .50" WIDE X .125" THK X 120" LONG NON-MAGNETIC (NCSX-PRL-002)	BRISK HEAT (BH THERMAL CORP) COLUMBUS, OH 43201 (800)-848-7673 WWW.BRISKHEAT.COM	12
	58	58	58	91735A146	PAN HEAD SCREW #6-32 UNC X .38 LG 316 SST	McMASTER-CARR ATLANTA, GA 30336-2852 (404) 346-7000 WWW.MCMASTER.COM	11
	20	20	20	93190A578	HEX HEAD SCREW 5/16-18 UNC X .50 LG 316 SST		10
	20	20	20	91950A030	FLAT WASHER .688 OD X .344 ID X .064 THK 316 STAINLESS STL		9
	32	32	32	NCSX-PRL-003	THERMOCOUPLE - 36" LEADS ISOLATED (TC-01 THRU 26)	OMEGA ENGINEERING, INC. STAMFORD, CONNECTICUT 06907 (800)-848-4286 WWW.OMEGA.COM	8
	26	26	26		THERMOCOUPLE - 120" LEADS ISOLATED (TC-27 THRU 58)		7
	4	4	4	SE123-167	MOUNT FLANGE		6
	2	2	2	SE123-164	CRYOSTAT INTERFACE FLG WELDMENT		5
	29	29	29	SE123-155	THERMOCOUPLE MOUNTING PLATE (BK-01 THRU 29)		4
	1			SE310-030-3	FLUX LOOP GEOMETRY-VVSA 3		3
		1		SE310-030-2	FLUX LOOP GEOMETRY-VVSA 2		3
			1	SE310-030-1	FLUX LOOP GEOMETRY-VVSA 1		3
	1	1	1	SE120-002	VACUUM VESSEL SUB ASSEMBLY		2
AR				-3	VVSA ASSEMBLY STATION 1, PHASE 1 - VVSA 3		1
AR				-2	VVSA ASSEMBLY STATION 1, PHASE 1 - VVSA 2		1
AR				-1	VVSA ASSEMBLY STATION 1, PHASE 1 - VVSA 1		1
SE121-008	-3	-2	-1	CAGE CODE / PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	MATERIAL / SPECIFICATION	FIND NO

NEXT ASSEMBLY

PARTS LIST



SECTION C-C

RELEASED FOR FABRICATION / INSTALLATION
PPPL Drafting Jerry Siegel 2007.03.26 10:42:20 -05'00'

WELDING ENGINEER
APPROVED L. DUDEK DATE: 10/15/2006

REV	DESCRIPTION	BY	DATE	CHK	DEPT	DATE	PE	REQ	DATE	ORNL	DOE	DATE
2	REVISED PER ECN# 5235	LM	3/07	TB								
1	REVISED PER ECN# 5198	MM	10/06	LD								
0	ORIGINAL ISSUE	MTB	10/06									

REVISION OR ISSUE PURPOSE | REVISION APPROVAL

SCALE NOTED
TOLERANCES UNLESS OTHERWISE SPECIFIED
FRACTIONS :
XX DECIMALS ±.01
XXX DECIMALS ±.005
ANGLES ±0°15'
BREAK SHARP EDGES .06 MAX
FINISH 125 UNLESS OTHERWISE SPECIFIED

DRAWING APPROVALS		DATE
DES	P GORANSON	10/06
DRW	MT BROWN	10/06
CHK	M COLE	10/06
SECT	:	:
DEPT	:	:
PE	:	:
CR	:	:
PJ	:	:
REQ	:	:
PPPL DRFT	J.SIEGEL	10/06
	:	:
	:	:

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

PROJECT NAME: NATIONAL COMPACT STELLARATOR EXPERIMENT

VVSA ASSEMBLY STATION 1, PHASE 1

VERSION NO.	PLANT	BLDG	FL	SHT	OF	TYPE	CLASS
1	ORNL	5700	3	1	1	A	U

RELEASE LEVEL: Fabrication — SE121-004 — REV 2

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