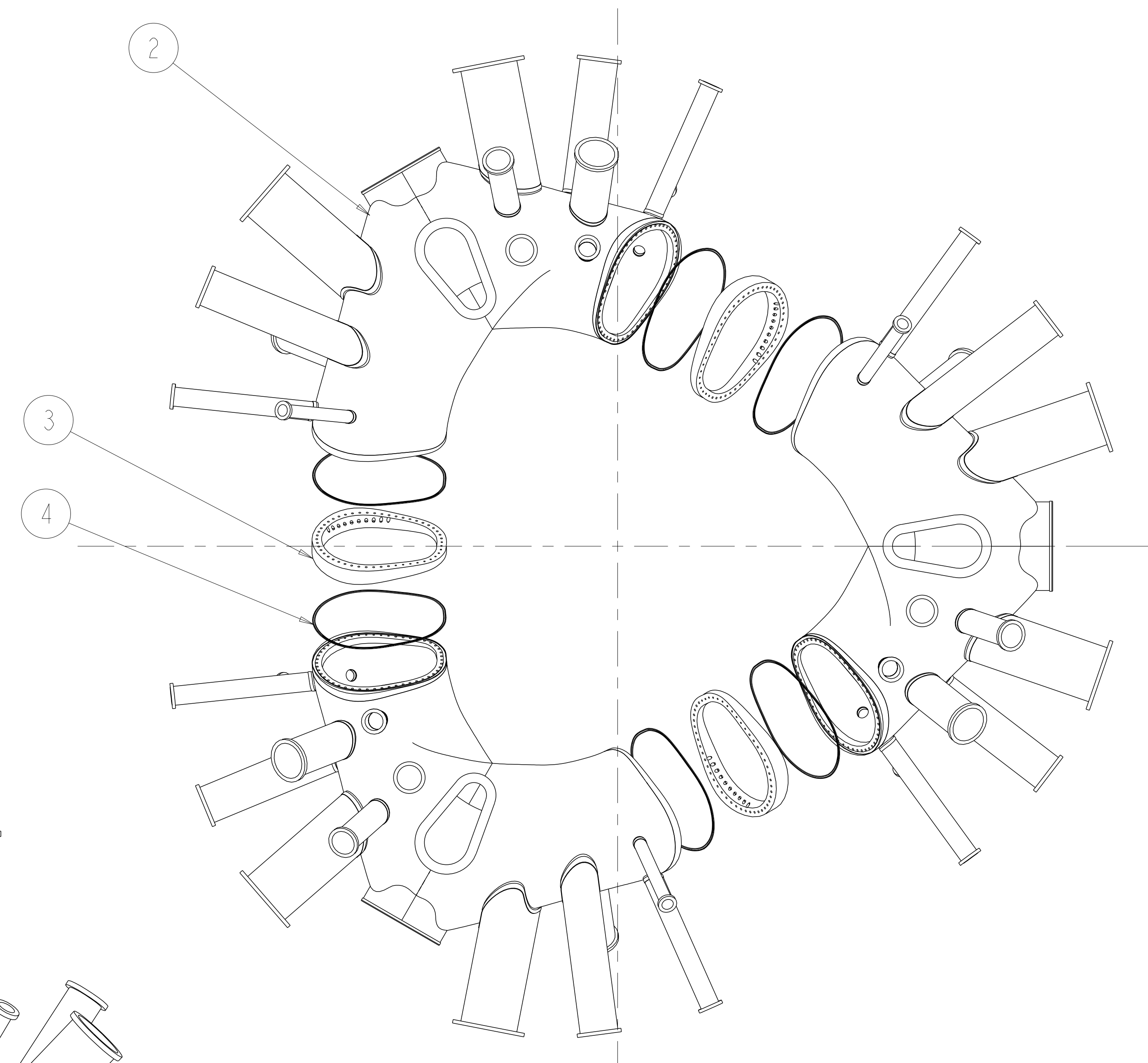
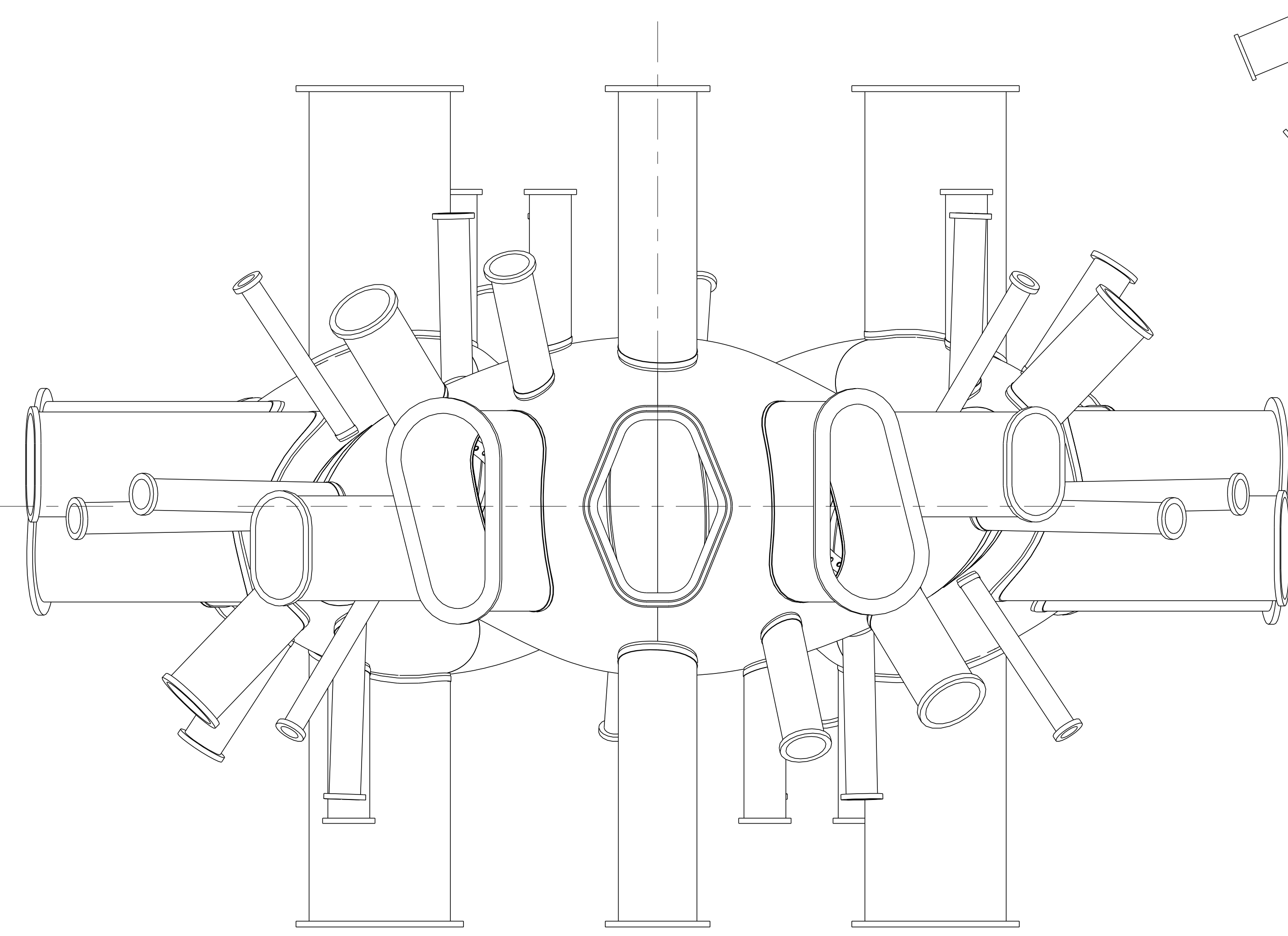
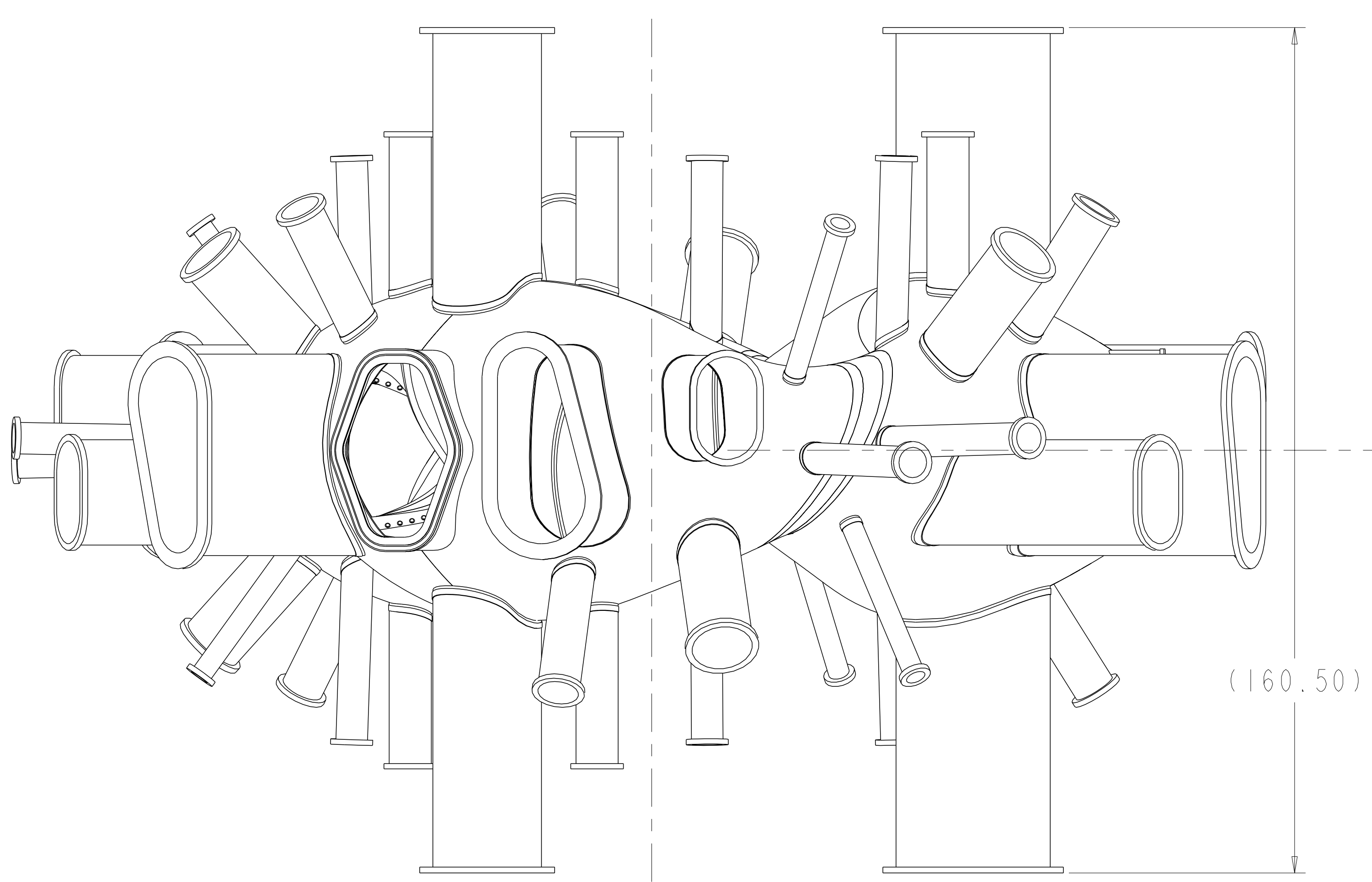


TYPICAL FLANGE/SEAL CONFIGURATION

- NOTES:
1. INTERPRET DIMENSIONS AND TOLERANCES PER ANSI Y14.5M.
 2. DIMENSION ARE IN INCHES.
 3. REQUIREMENTS FOR FABRICATING THE VACUUM VESSEL ARE DEFINED IN THE DRAWINGS, MODELS, AND SPECIFICATION.
 4. THE VACUUM VESSEL GEOMETRY IS DEFINED IN CAD MODELS/FILES SE120-001.ASM, SE120-002.ASM, AND SE121-019.PRT.
 5. ADDITIONAL TOLERANCE LIMITS ARE DEFINED IN DOCUMENT NCSX-12-122002-PH
 6. HELIUM LEAK TEST SHALL SHOW NO DETECTABLE LEAK WITH THE DETECTOR SENSITIVITY SET AT 1.0×10^{-9} STD-CC/SEC.



EXPLODED VIEW
SCALE 0.040



① SCALE = 0.060
Weight = 18808 lbs

PRELIMINARY
FOR INFORMATION ONLY

Acrobat file name 20021221-vac-ves.pdf

QTY	CAGE CODE	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	MATERIAL	SPECIFICATION	FIND NO
300		.625-11UNC-2A X 3.0 LG	SOC HD CAP SCREW			5
6		-4	VACUUM VESSEL SEAL			4
3		SE121-019	VACUUM VESSEL SPACER			3
3		SE120-002	VACUUM VESSEL PERIOD ASSEMBLY			2
X		SE120-001	VACUUM VESSEL ASSEMBLY			1

← NEXT ASSEMBLY

QV CLAUSE	DOCUMENTS REQUIRED	APPLICABLE TO PART NO *
303	MATERIAL MILL TEST REPORT	
325	MATERIAL SELLER CERT	X
326	SPECIAL MATERIAL INSPECTION REPORT	
205	MANUFACTURING INSPECTION AND TEST PLAN	X
312	FIELD INSPECTION AND TEST PLAN	X
321	WELD AND BRAZE INSPECTION REPORT	X
322	HEAT TREAT REPORT (MCHMT)	X
310	LEAK TEST REPORT	X
315	CLEANING CERT	X
318	DEVIATION REQUEST	X
319	NONCONFORMANCE REPORT	X
323	DIMENSIONAL REPORT	X
330	FUNCTIONAL TEST REPORT	X

* SYMBOL X INDICATES APPLICABLE TO ALL PARTS OR ITEMS

DES: P. L. GORANSON/102	DATE	
DRW: M. J. COLE	12/02	
CHK: :		
SECT: :		
DEPT: :		
PE: :		
CR: :		
PJ: :		
REQ: :		
FINISH: :		
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		

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 STELLERATOR EXPERIMENT	
VACUUM VESSEL ASSEMBLY	
VERSION NO. 4+	PLANT XX BLDG XX FL X SHT OF 1 TYPE U
RELEASE LEVEL WIP	REV 0

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.

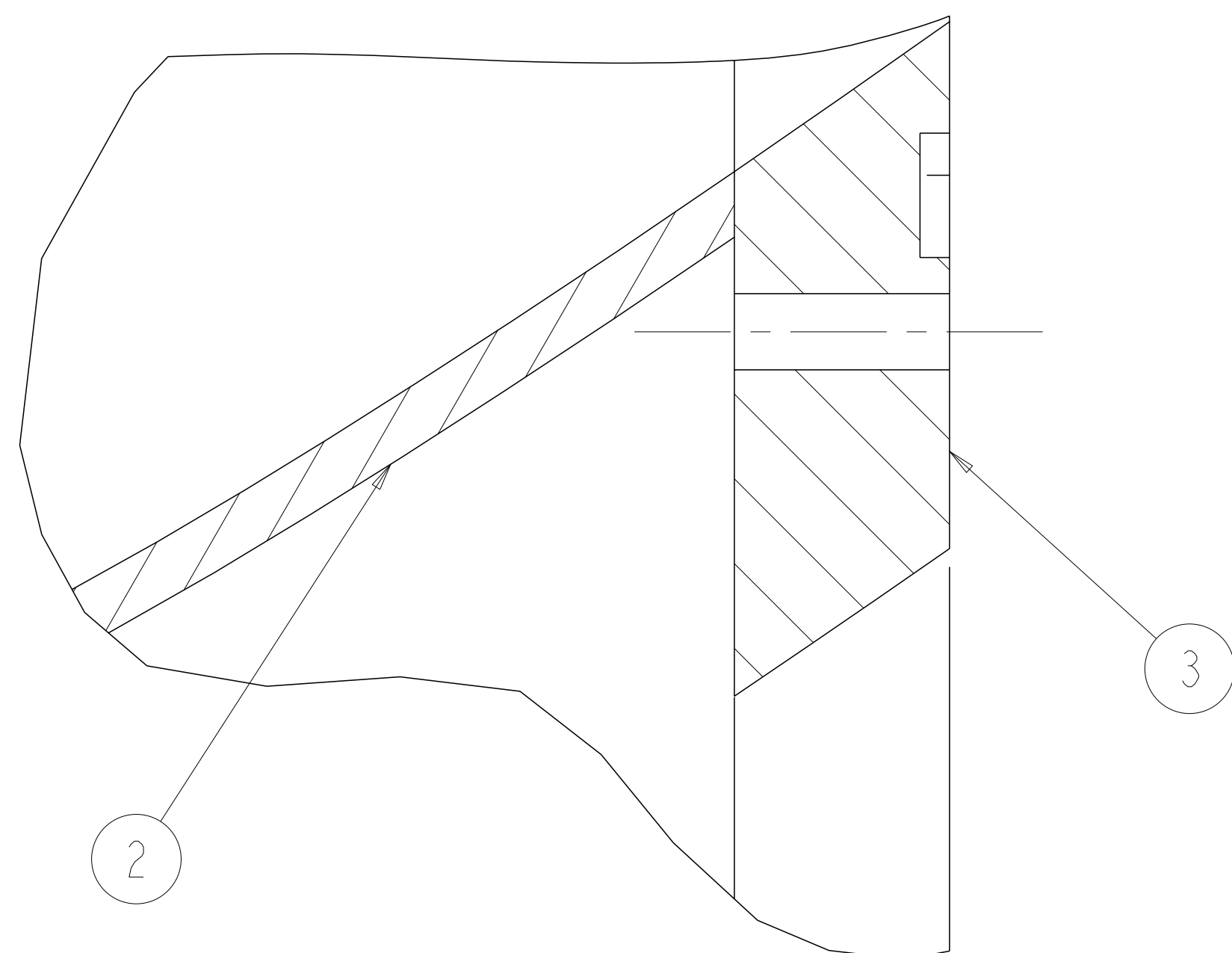
P THIS DRAWING PRODUCED ON PRO-ENGINEER

REV	DESCRIPTION	A-E	BY	CHK	SECT	DEPT	DATE	PE	REQ DATE	ORNL DATE	DOC DATE	QA	CV	EC	EE	EM	IE	M	PD	SE	ST	XAD	PES

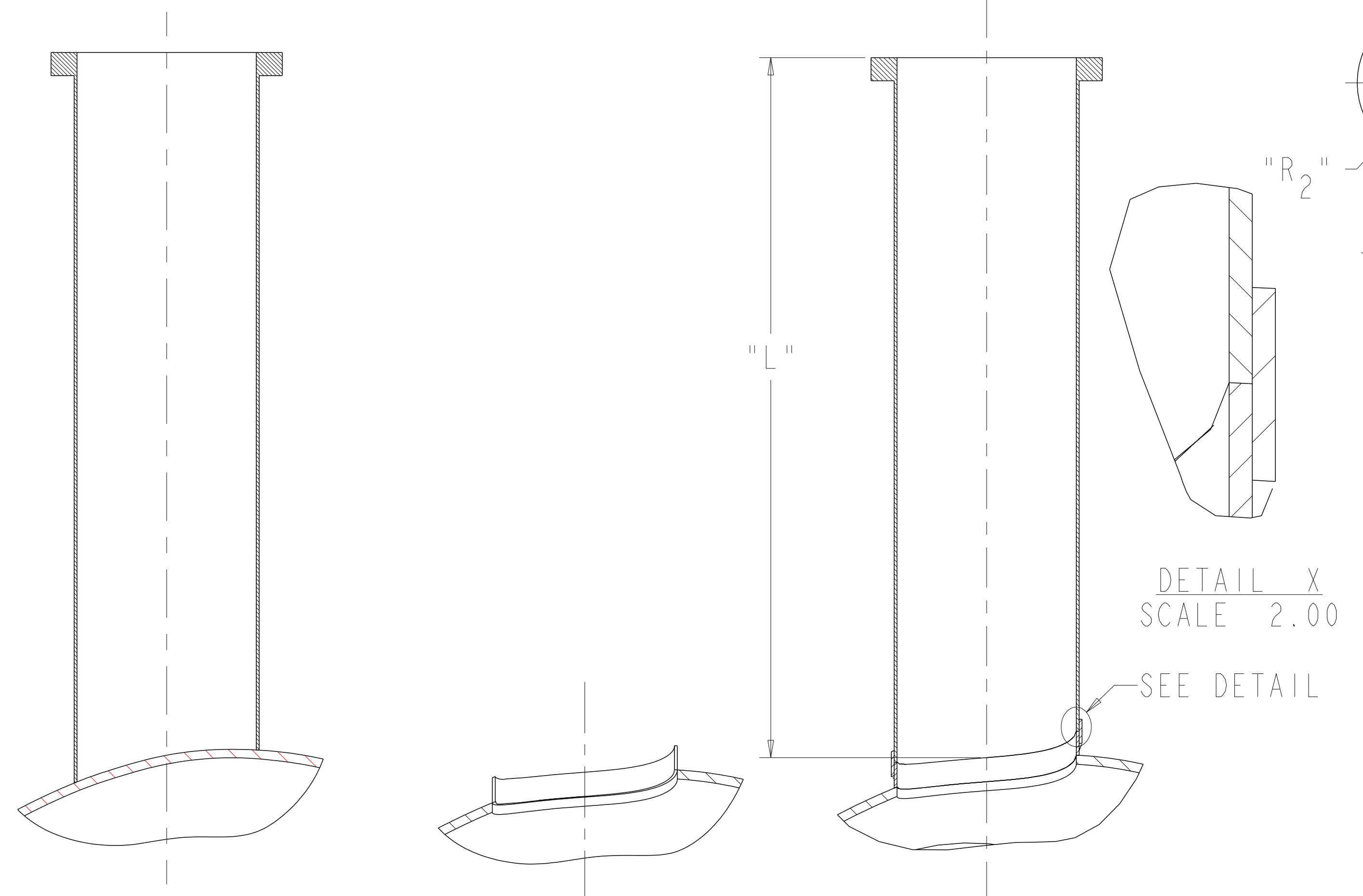
SE120-001

- NOTES:
1. INTERPRET DIMENSIONS AND TOLERANCES PER ANSI Y14.5M.
 2. DIMENSION ARE IN INCHES.
 3. REQUIREMENTS FOR FABRICATING THE VACUUM VESSEL ARE DEFINED IN THE DRAWINGS, MODELS, AND SPECIFICATION.
 4. GEOMETRY OF VACUUM VESSEL IS DEFINED IN CAD MODELS/FILES SE120-001.ASM, SE120-002.ASM AND SE121-019.PRT
 5. HELIUM LEAK TEST SHALL SHOW NO DETECTABLE LEAK WITH LEAK DETECTOR SENSITIVITY SET AT 1.0×10^{-9} STD-CC/S.
 6. ALL MATERIAL EXCEPT FOR CONFLAT FLANGES TO BE UNS N06625. CONFLAT FLANGES TO BE 304 SST.
 7. BLANK MATING FLANGES AND ASSOCIATED SEALS AND HARDWARE TO BE FURNISHED FOR ALL PORTS.
 8. ADDITIONAL TOLERANCE LIMITS ARE DEFINED IN DOCUMENT NCSX-12-122002-PH.

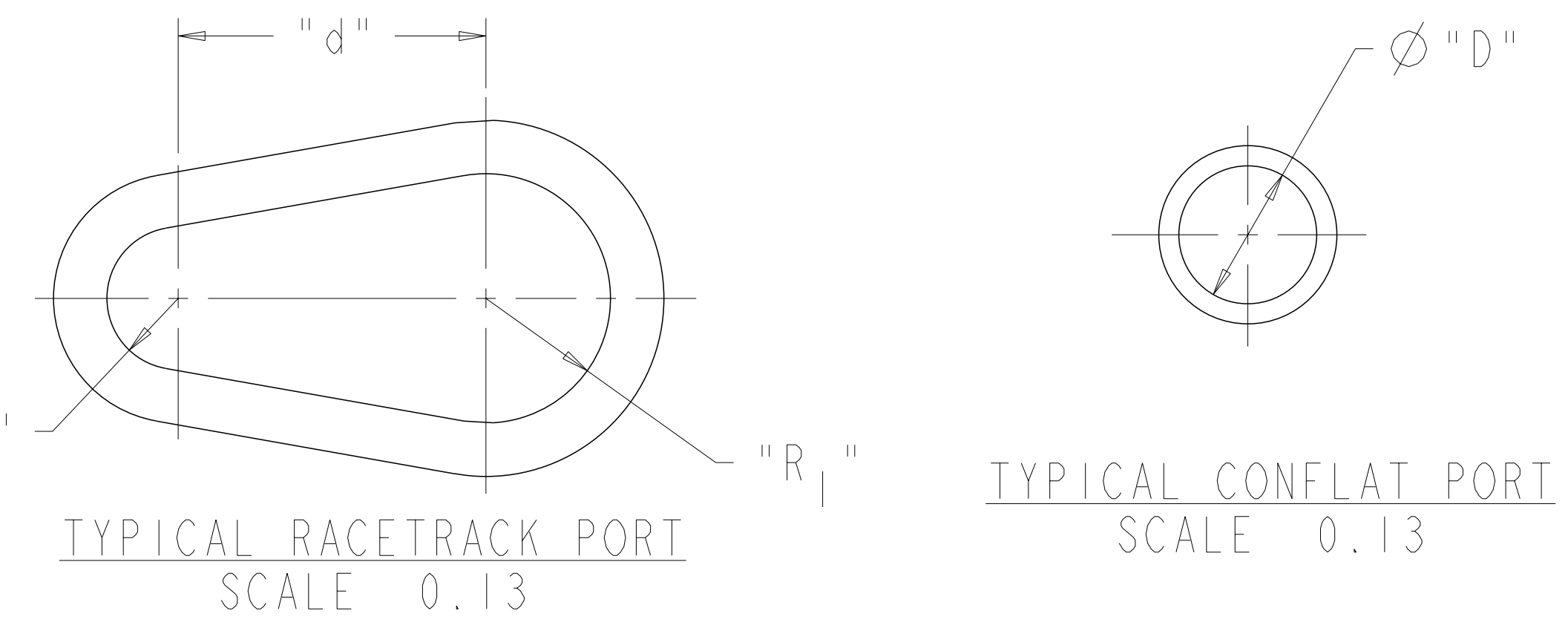
PORT #	QTY	"L" APPROXIMATE	"D" TUBE O.D.	"R ₁ " TUBE	"R ₂ " TUBE	"D" TUBE	"T" TUBE THK	FLANGE TYPE
P2	2	35.5	Ø4	--	--	--	.125	Ø6" CONFLATE
P4	2	32.0	--	9.0	6	23.25	.5	O-RING FLANGE
P5	2	26.0	Ø8	--	--	--	.125	Ø10" CONFLATE
P6	2	25.0	Ø12	--	--	--	.25	Ø14" CONFLATE
P7	2	28.5	Ø8	--	--	--	.125	Ø10" CONFLATE
P8	2	44.0	Ø6	--	--	--	.125	Ø8" CONFLATE
P10	2	44.0	--	6	6	8	.25	O-RING FLANGE
P11	2	32.0	Ø6	--	--	--	.125	Ø8" CONFLATE
P12	2	47.0	--	7.5	4.5	17.28	.5	O-RING FLANGE



TYPICAL FLANGE CONFIGURATION
 SCALE: 1.00



TYPICAL PORT CONFIGURATION
 SCALE: .25



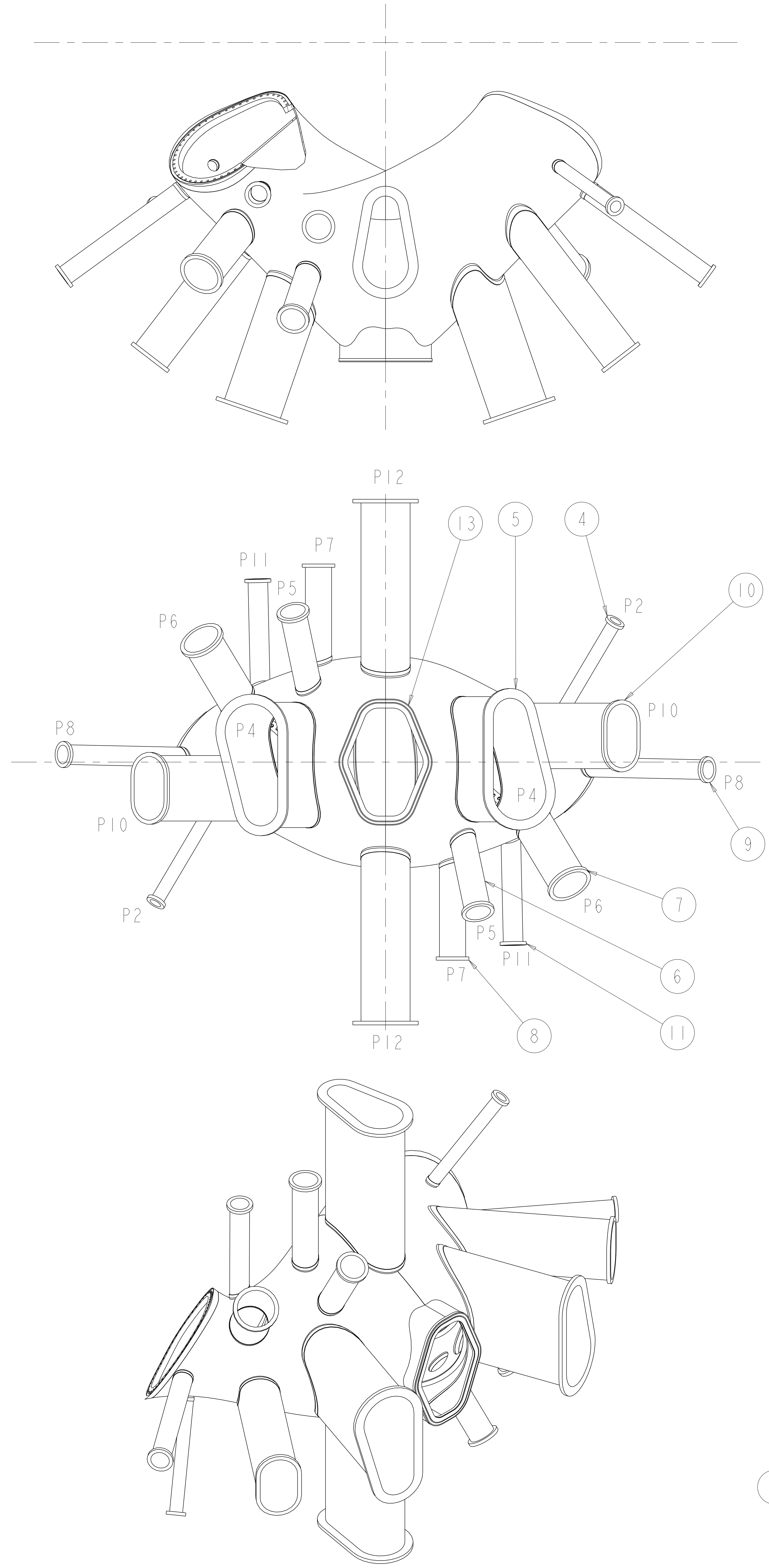
TYPICAL RACETRACK PORT SCALE 0.13
 TYPICAL CONFLAT PORT SCALE 0.13

QTY	DESCRIPTION	MATERIAL	SPECIFICATION	FIND NO
13	NEUTRAL BEAM PORT WELDMENT			13
12	P12 PORT WELDMENT			12
11	P11 PORT WELDMENT			11
10	P10 PORT WELDMENT			10
9	P8 PORT WELDMENT			9
8	P7 PORT WELDMENT			8
7	P6 PORT WELDMENT			7
6	P5 PORT WELDMENT			6
5	P4 PORT WELDMENT			5
4	P2 PORT WELDMENT			4
3	VACUUM VESSEL FLANGE			3
2	VACUUM VESSEL BODY			2
1	VACUUM VESSEL PERIOD ASSEMBLY			1

QV CLAUSE	DOCUMENTS REQUIRED	APPLICABLE TO PART NO.
303	MATERIAL MILL TEST REPORT	
325	MATERIAL SELLER CERT	X
326	SPECIAL MATERIAL INSPECTION REPORT	
305	MANUFACTURING INSPECTION AND TEST PLAN	X
312	FIELD INSPECTION AND TEST PLAN	X
321	WELD AND BRAZE INSPECTION REPORT	X
322	HEAT TREAT REPORT (INCH/MT)	X
310	LEAK TEST REPORT	X
315	CLEANING CERT	X
318	DEVIATION REQUEST	X
319	NONCONFORMANCE REPORT	X
323	DIMENSIONAL REPORT	X
330	FUNCTIONAL TEST REPORT	

PRELIMINARY
 FOR INFORMATION ONLY

Acrobat file name 20021221-vac-ves.pdf



ISOMETRIC VIEW

P THIS DRAWING PRODUCED ON PRO-ENGINEER

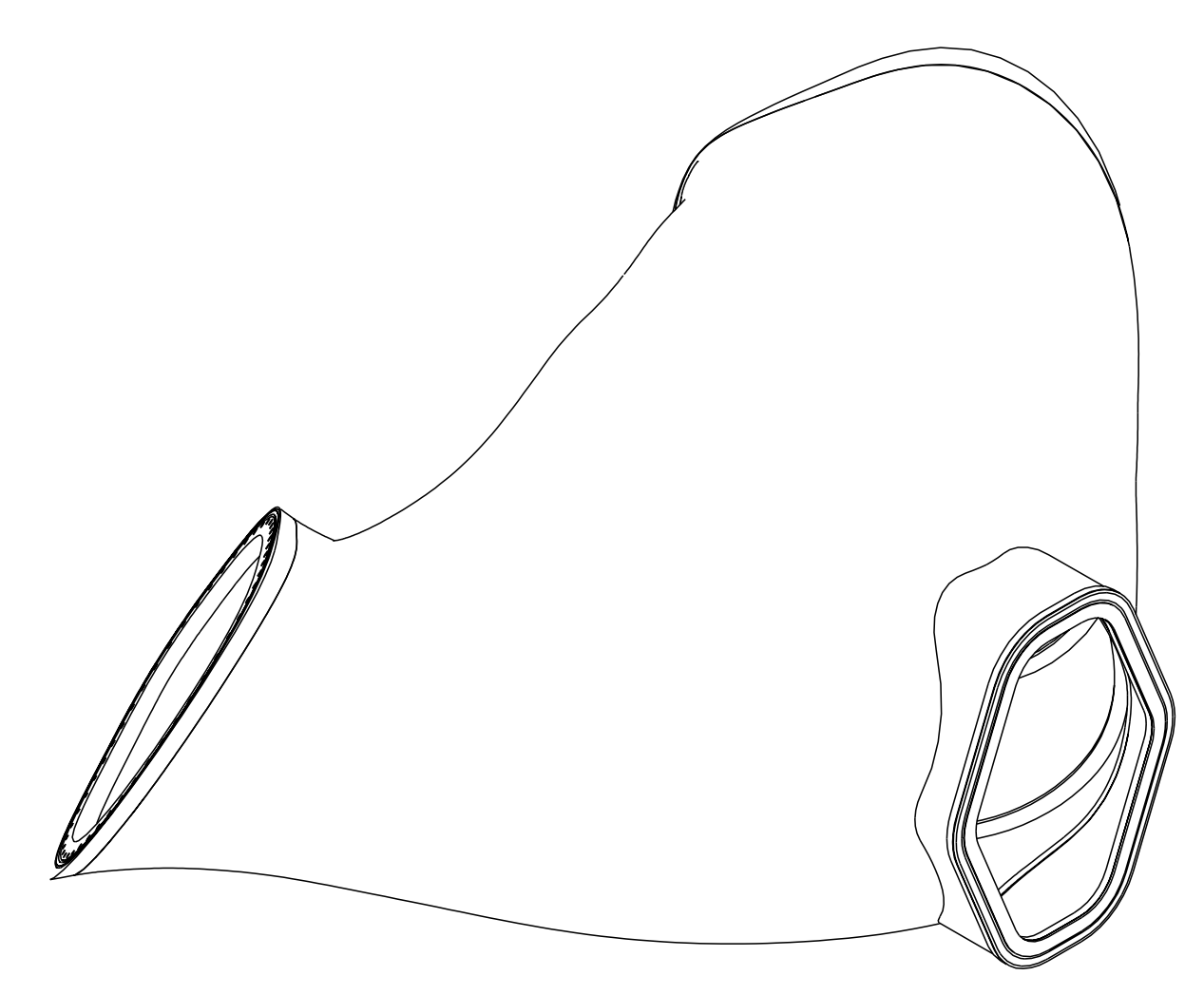
REV	DESCRIPTION	A-E	BY	CHK	SECT	DEPT	DATE	PE	REQ. DATE	ORNL DATE	DOE DATE	QA	CV	EC	EE	EM	IE	M	PD	SE	ST	XAD	PES

SCALE NOTED	DESIGNER	DATE	DRW	DATE	UT-BATTELLE	PROJECT NAME	VERSION NO.	PLANT	BLDG	FL	SHT OF	TYPE	CLASS
TOLERANCES UNLESS OTHERWISE SPECIFIED	P. L. GORANSON	12/02	M. J. COLE & G. H. JONES	12/02	NATIONAL COMPACT STELLERATOR EXPERIMENT	VACUUM VESSEL PERIOD ASSEMBLY	5+	XX	XX	XX	1 2	XX	U

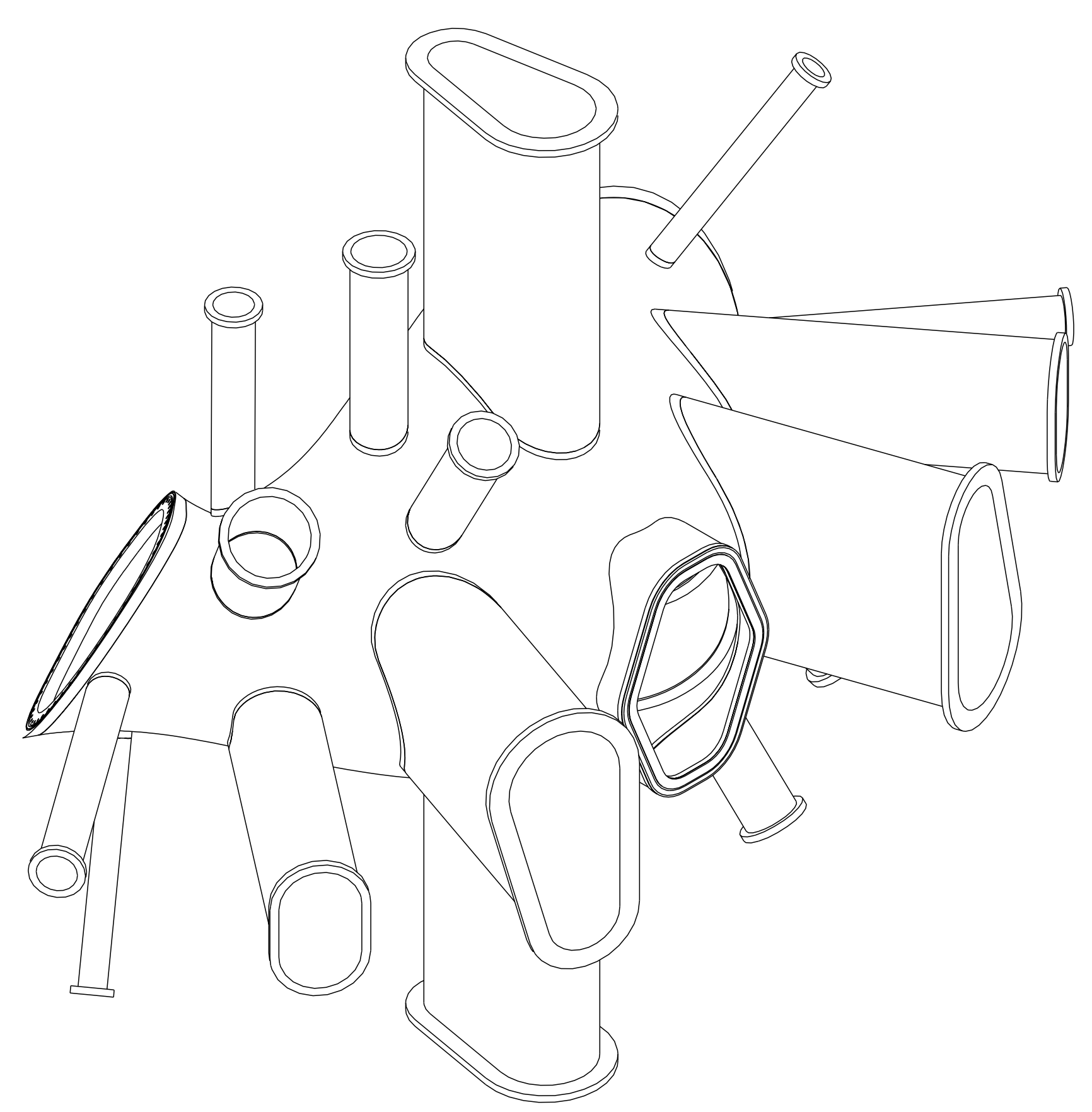
NO REPRESENTATION OR WARRANTY, EXPRESSED OR IMPLIED, IS MADE AS TO THE ACCURACY, COMPLETENESS OR USEFULNESS OF THE INFORMATION OR STATEMENTS CONTAINED IN THESE DRAWINGS, OR THAT THE USE OR DISCLOSURE OF ANY INFORMATION, APPARATUS, METHOD OR PROCESS DISCLOSED IN THESE DRAWINGS MAY NOT INFRINGE PRIVATE 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.

SE120-002

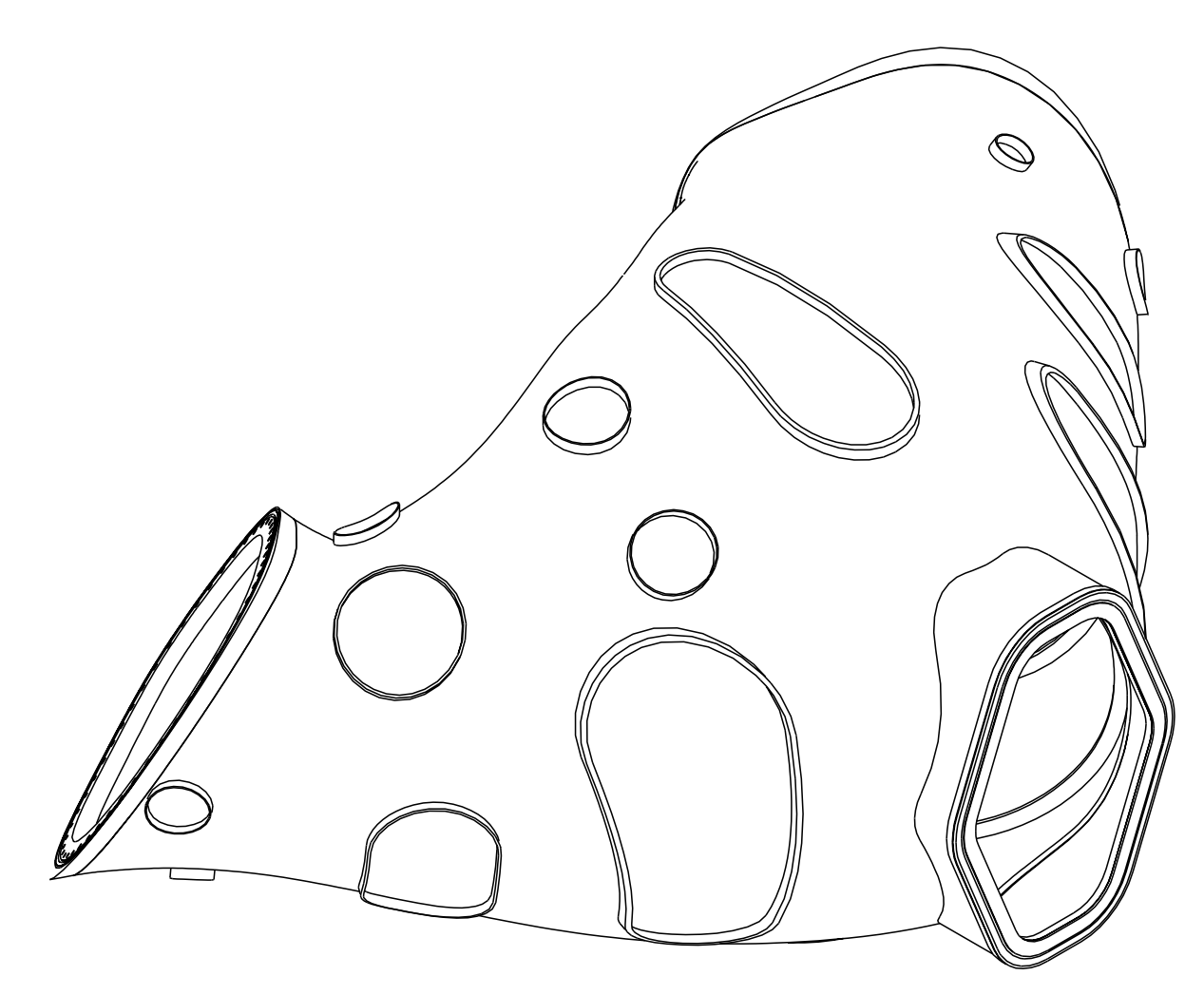
FABRICATION STEPS (VENDOR RESPONSIBLE FOR STEPS 1 THRU 4)



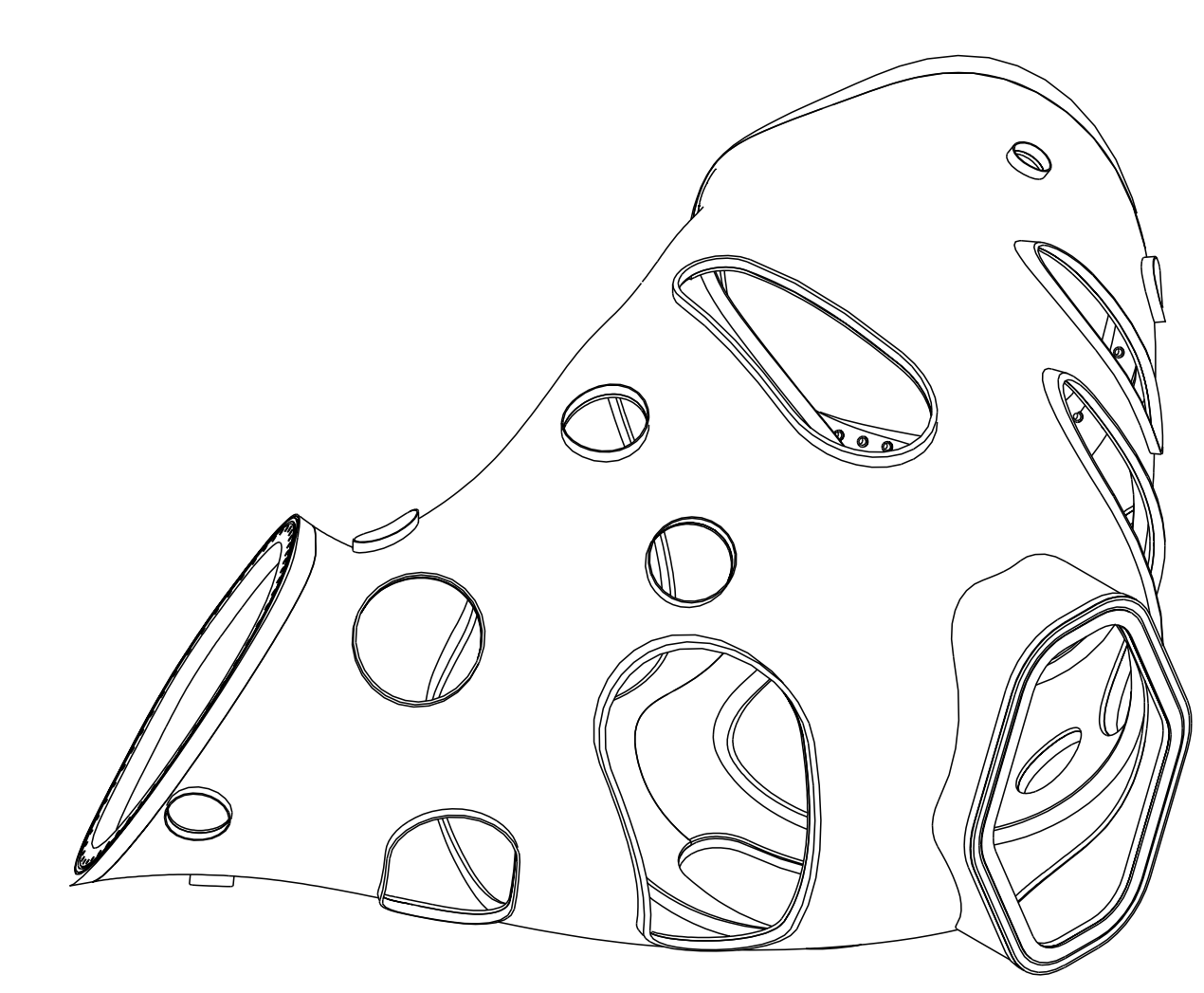
STEP 1
BASIC VESSEL
CONFIGURATION



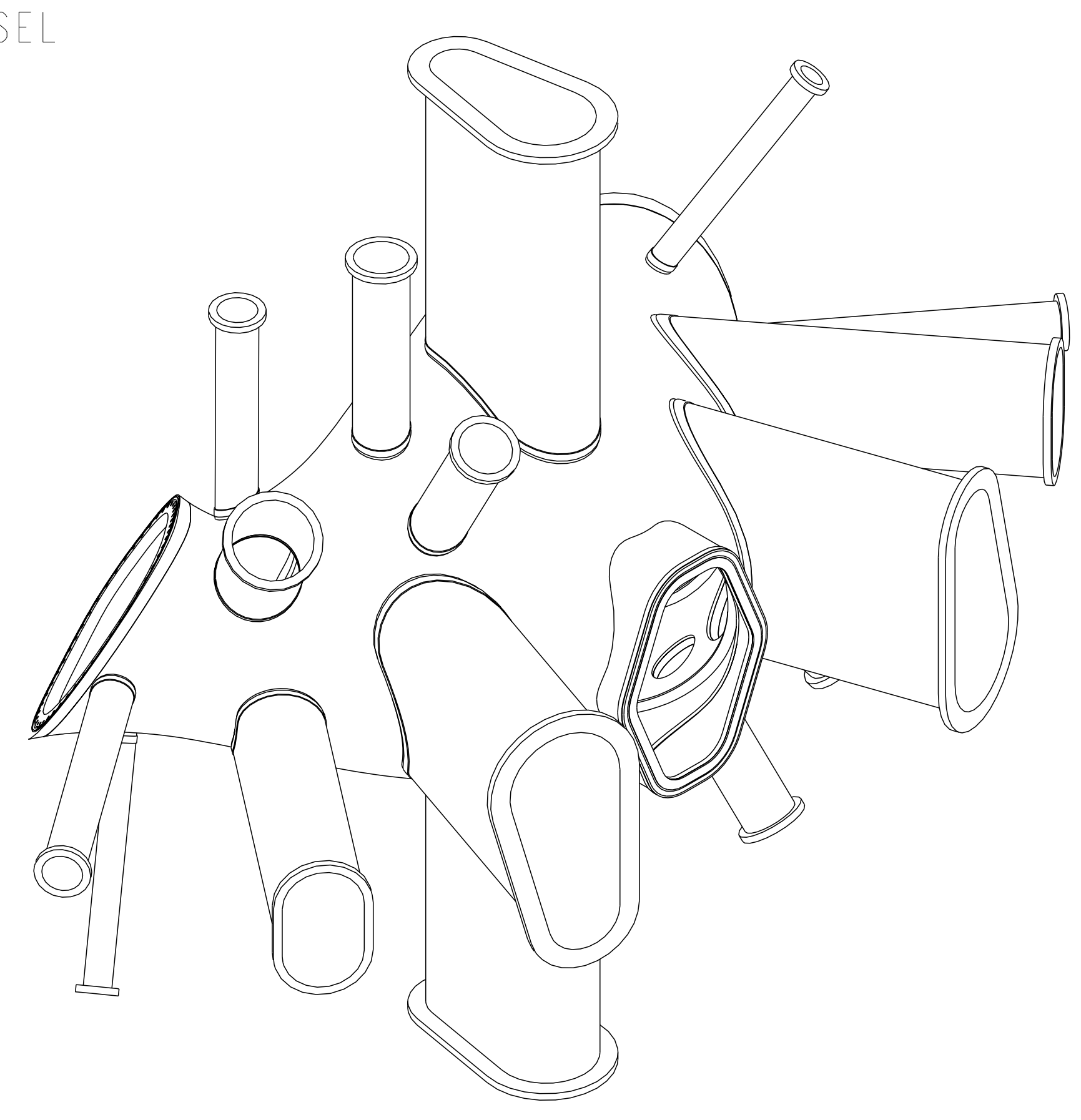
STEP 2
PORTS HAVE BEEN
POSITIONED AND
WELDED TO
VESSEL



STEP 3
PORTS HAVE BEEN CUT
LEAVING A STUB ON THE
VESSEL FOR REATTACHING
PORTS AT PPPL



STEP 4
HOLES HAVE BEEN
CUT IN THE VESSEL



STEP 5
DURING THE DEVICE ASSEMBLY
AT PPPL THE PORTS WILL BE
REATTACHED AS SHOWN.

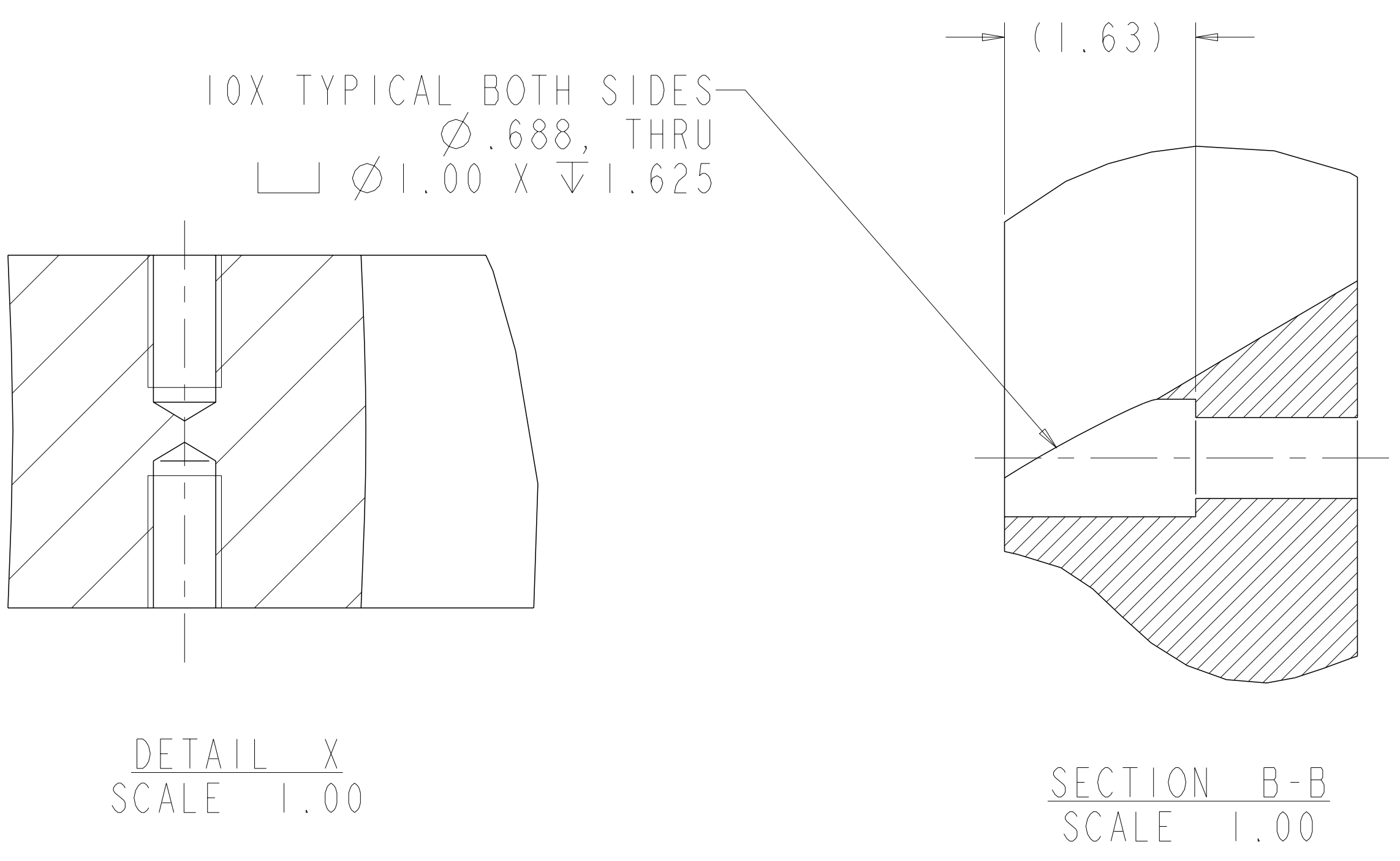
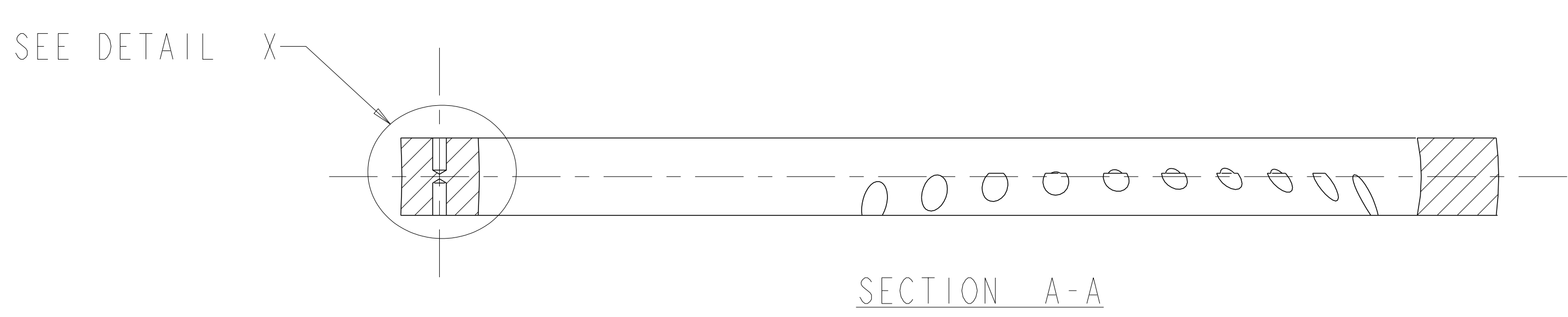
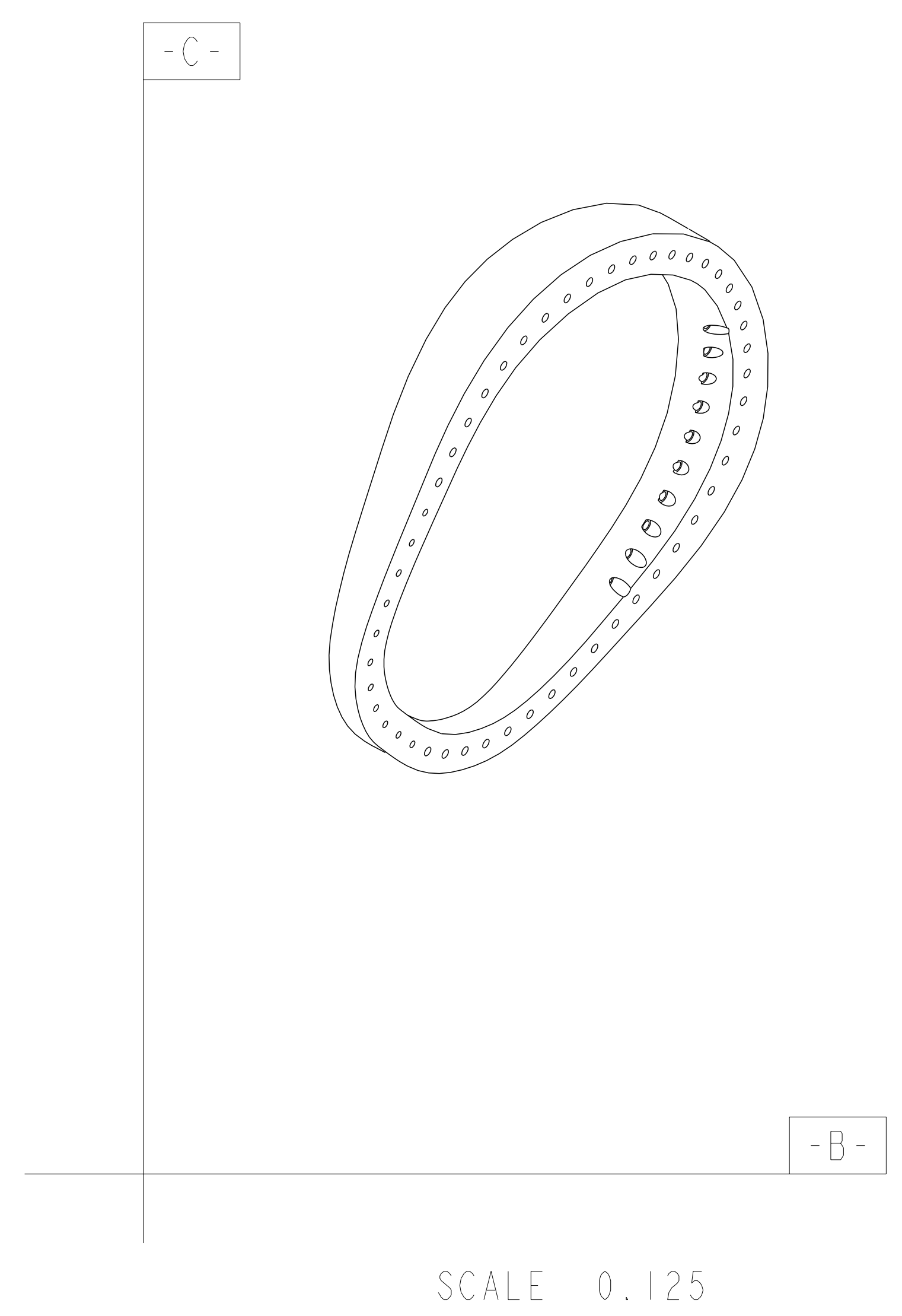
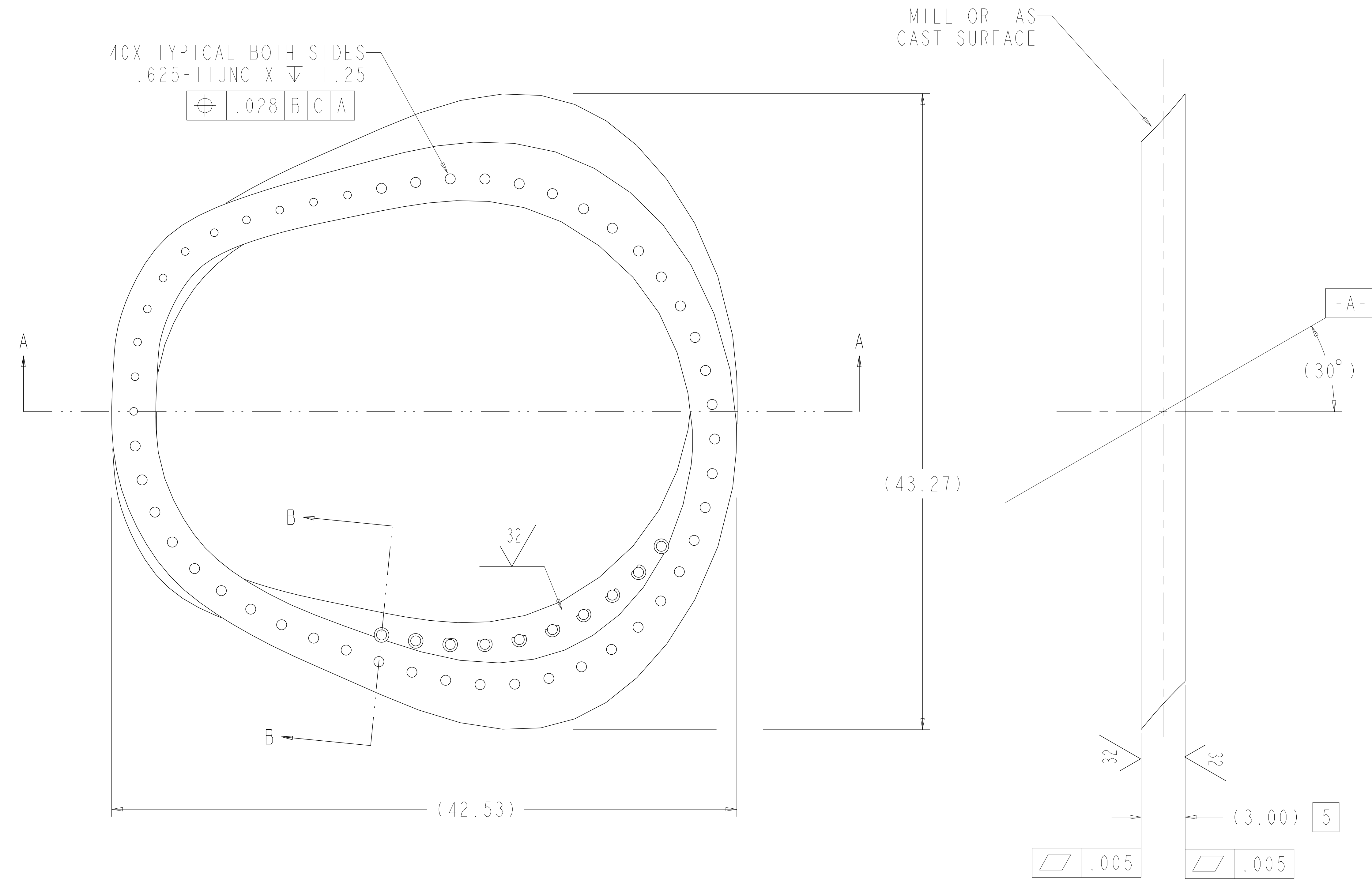
Acrobat file name 20021221-vac-ves.pdf

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 STELLERATOR EXPERIMENT VACUUM VESSEL PERIOD ASSEMBLY							
VERSION NO.	PLANT	BLDG	FL	SHT OF	TYPE	CLASS	
6+	XX	XX	XX	2 2	XX	U	
RELEASE LEVEL	SE120-002					REV	
WIP						0	

SE120-002

A

- NOTES:
1. INTERPRET DIMENSIONS AND TOLERANCES PER ANSI Y14.5M.
 2. DIMENSION ARE IN INCHES.
 3. REQUIREMENTS FOR FABRICATING THE VACUUM VESSEL SPACER ARE DEFINED IN THE DRAWINGS, MODELS, AND SPECIFICATION.
 4. GEOMETRY OF VACUUM VESSEL SPACER IS DEFINED IN CAD MODELS/FILES SEI21-019.PRT.ASM, SEI20-001.ASM, AND SEI20-002.ASM.
 5. MEASURE AND MACHINE TO FIT AT ASSEMBLY, SEI20-001.
 6. HELIUM LEAK TEST SHALL SHOW NO DETECTABLE LEAK WITH DETECTOR SENSITIVITY SET AT 1.0×10^{-9} STD-CC/SEC.
 7. ADDITIONAL TOLERANCE LIMITS ARE DEFINED IN DOCUMENT NCSX-12-122002-PH.



SCALE: .25

WEIGHT = 362.83 lbs

PRELIMINARY FOR INFORMATION ONLY

Acrobat file name 20021221-vac-ves.pdf

AR	CAGE CODE	PART OR IDENTIFYING NO	VACUUM VESSEL SPACER DETAIL	UNS N06625	SPECIFICATION	FIND NO
SEI20-002		-1	VACUUM VESSEL SPACER DETAIL	UNS N06625		

QV CLAUSE	DOCUMENTS REQUIRED	APPLICABLE TO PART NO *
303	MATERIAL MILL TEST REPORT	
325	MATERIAL SELLER CERT	X
326	SPECIAL MATERIAL INSPECTION REPORT	
205	MANUFACTURING INSPECTION AND TEST PLAN	X
312	FIELD INSPECTION AND TEST PLAN	X
321	WELD AND BRAZE INSPECTION REPORT	X
322	HEAT TREAT REPORT (MCHMT)	X
310	LEAK TEST REPORT	X
315	CLEANING CERT	X
318	DEVIATION REQUEST	X
319	NONCONFORMANCE REPORT	X
323	DIMENSIONAL REPORT	X
330	FUNCTIONAL TEST REPORT	

DES. P. L. GORANSONI	12/02	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
DRW. M.J. COLE & G.W. JONES	12/02	NATIONAL COMPACT STELLERATOR EXPERIMENT	
VACUUM VESSEL SPACER DETAIL			
VERSION NO. 3+	PLANT XX	BLDG XX	FL XX
RELEASE LEVEL WIP	SHT OF 1		TYPE I
DRAWING APPROVALS	DATE	SEI21-019	REV 0

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	A-E	BY	CHK	SECT	DEPT	DATE	PE	REQ. DATE	ORNL DATE	DOC DATE	QA	CV	EC	EE	EM	IE	M	PD	SE	ST	XAD	PES

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

H
G
F
E
D
C
B
A