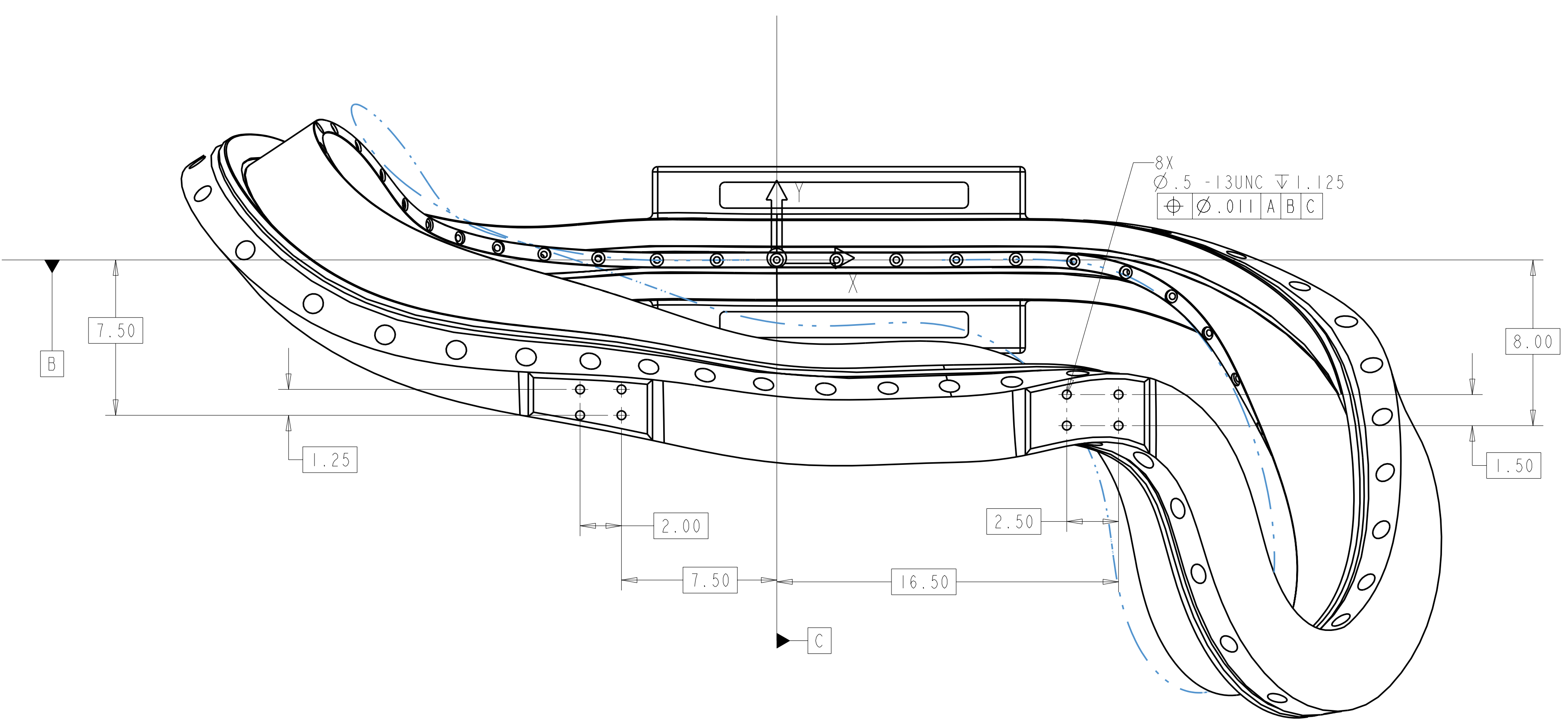
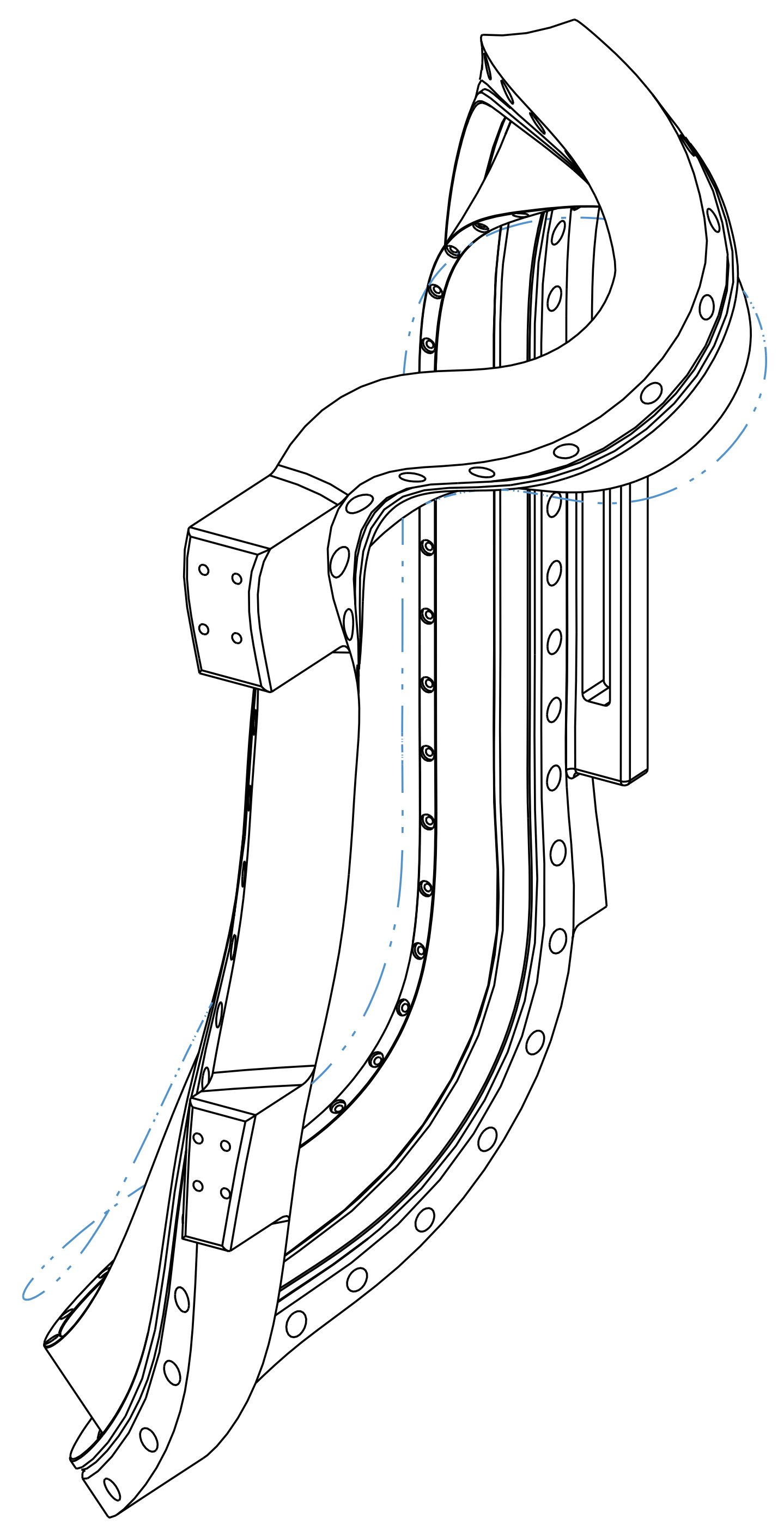


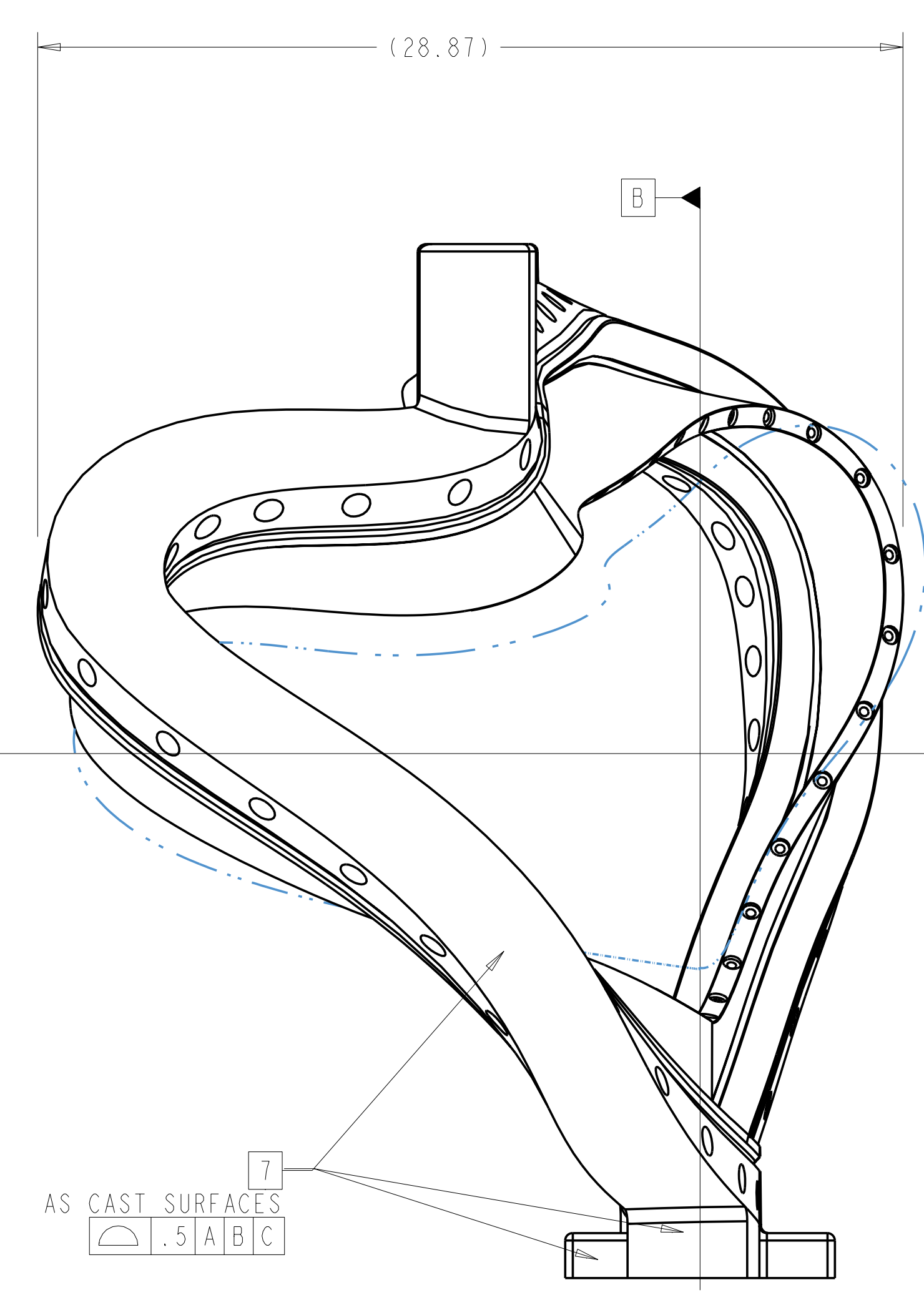
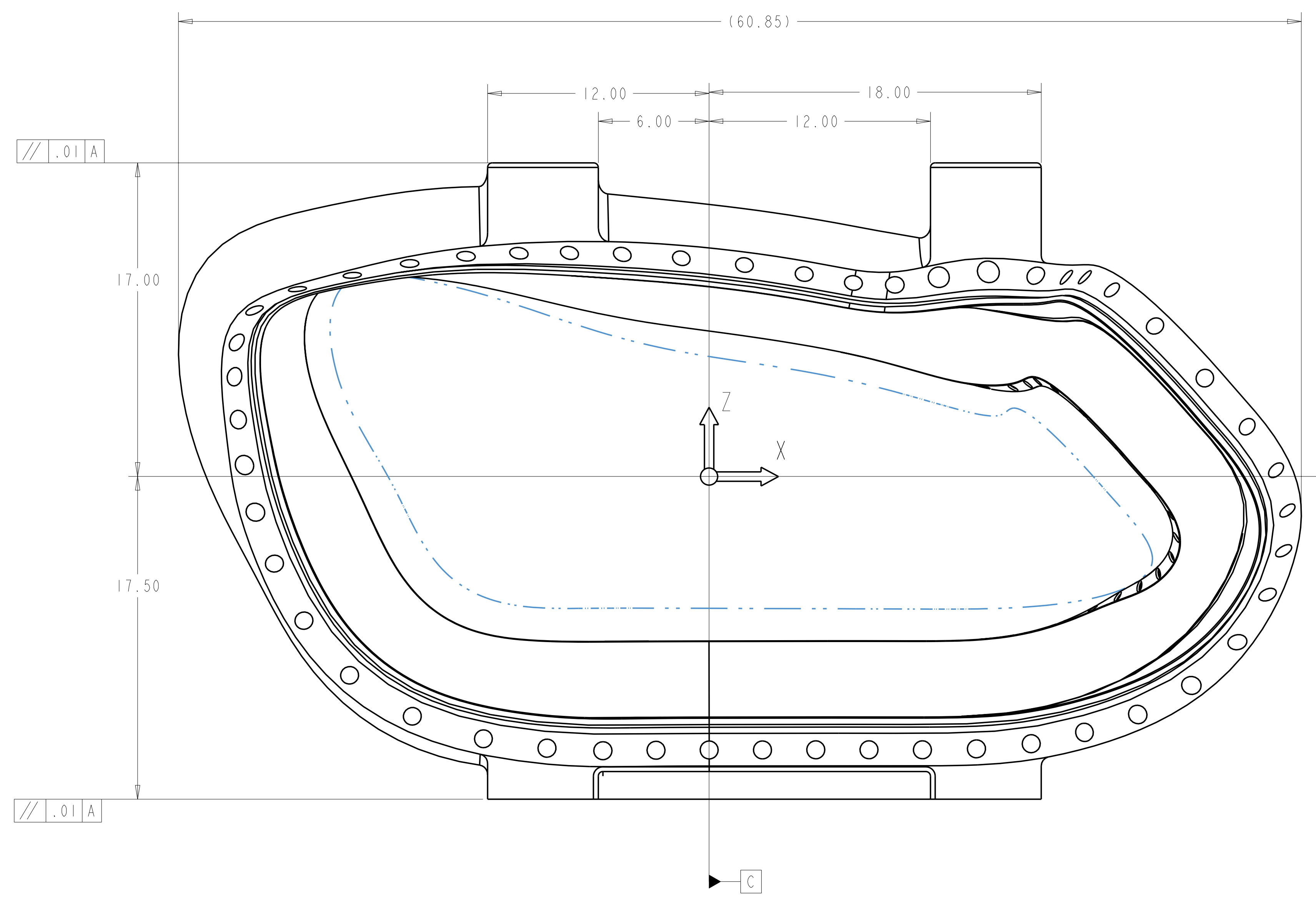
- NOTES:
1. INTERPRET DIMENSIONS AND TOLERANCES PER ANSI Y14.5M
 2. DIMENSIONS ARE IN INCHES
 3. DIMENSIONS APPLY AT ROOM TEMPERATURE. OPERATING TEMP 80 K.
 4. GEOMETRY IS DEFINED IN PRO ENGINEER CAD MODELS/FILES SE140-084.PRT
 5. DRAWING AND MODELS COMBINED DEFINE FINISHED MACHINED PART.
 6. MACHINE FINISHED SURFACES TO CAD DATA, PROFILE WITHIN 0.020" UNLESS OTHERWISE SPECIFIED. PROFILE TOLERANCE IS BILATERAL, i.e. 0.010" EITHER SIDE OF THE REFERENCE SURFACE.
 7. AS-CAST SURFACES SHOWN IN NOMINAL MATERIAL CONDITION, THICKNESS TOLERANCE +/- 0.25. SURFACE PROFILE MUST BE WITHIN 0.5 INCHES OF CAD DATA, EXCEPT IN REGIONS OF INTERSECTING SURFACES WHERE FILLETS ARE EXPECTED.
 8. SEE SPECIFICATION, NCSX-CSPEC 141-02-00 FOR ADDITIONAL REQUIREMENTS.
 9. SEE SPECIFICATION NCSX-CSPEC 141-02-00 SECTION 3.2.1.1 FOR MATERIAL REQUIREMENTS.



DATUM A = PLANE THRU "XY"
 DATUM B = PLANE THRU "XZ"
 DATUM C = PLANE THRU "YZ"



ISOMETRIC VIEW



REV	DESCRIPTION	BY	DATE	CHK	DEPT	DATE	PE	REQ	DATE	ORNL	DOE	DATE

SEI 140-080	SEI 140-084	WINDING FORM	SEE NOTE 9	SEE NOTE 8	-1
CAGE CODE	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	MATERIAL	SPECIFICATION	FIND NO
←	NEXT ASSEMBLY	PARTS LIST			

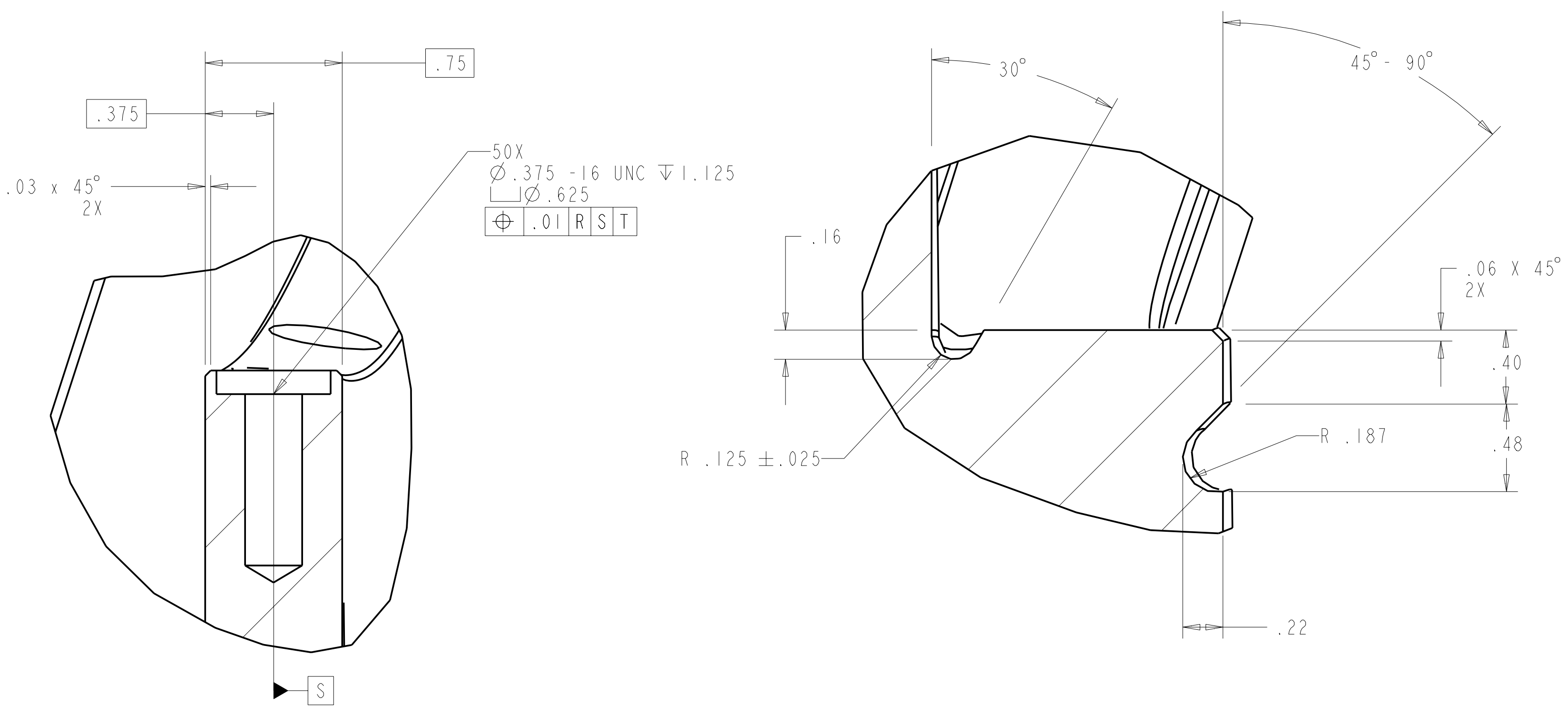
APPROXIMATE WEIGHT = 725 LBS

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.

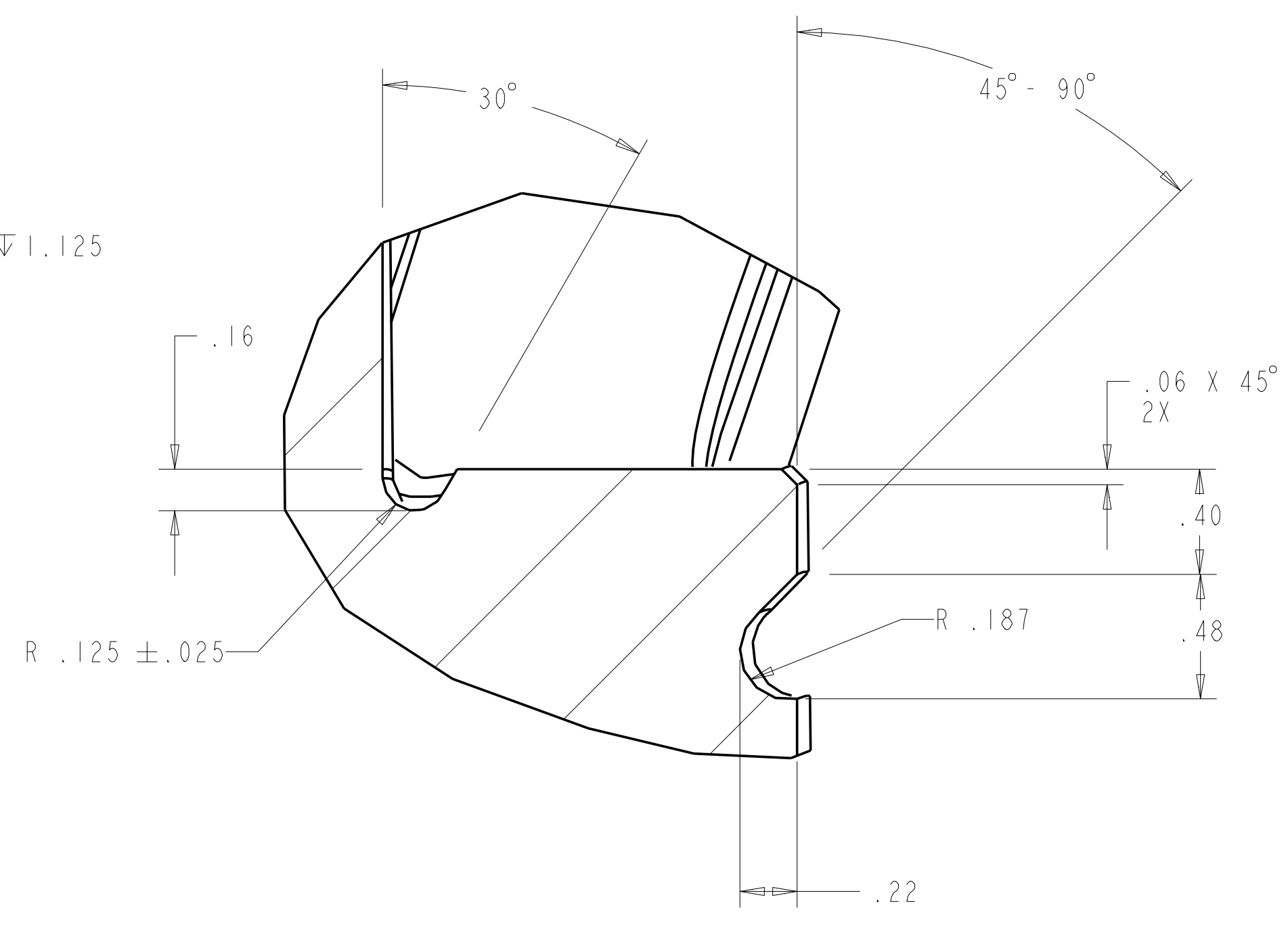
P THIS DRAWING PRODUCED ON PRO-ENGINEER

SCALE .250 UNO	DES: DAVID WILLIAMSON 11-03-03	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
TOLERANCES UNLESS OTHERWISE SPECIFIED	DRW: GARY LOVETT 11-03-03	
FRACTIONS	CHK: :	TWISTED RACETRACK WINDING FORM
XX DECIMALS ±.01	SECT: :	
XXX DECIMALS ±.005	DEPT: :	VERSION NO.:
ANGLES ±0°15'	PE: :	PLANT: X-10
BREAK SHARP EDGES .06 MAX	CR: :	BLDG: 5700
FINISH .125 UNLESS OTHERWISE SPECIFIED	PJ: :	FL: 3
	RED: :	SHT OF: 3
	PPPL DRFT: :	TYPE: S
		CLASS: U
		REV: -
		WIP

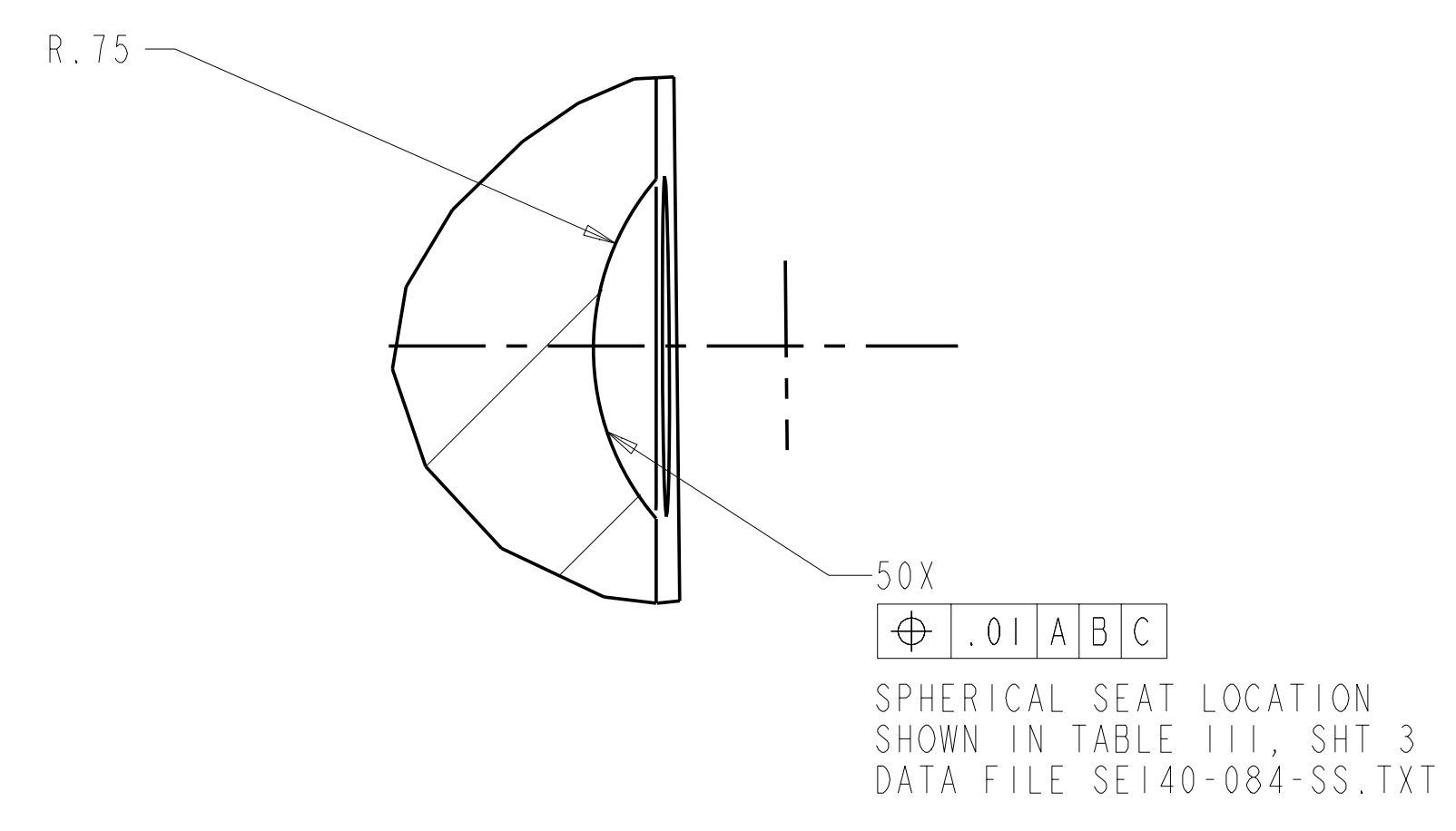
H
G
F
E
D
C
B
A



DETAIL 1
SCALE 2.0

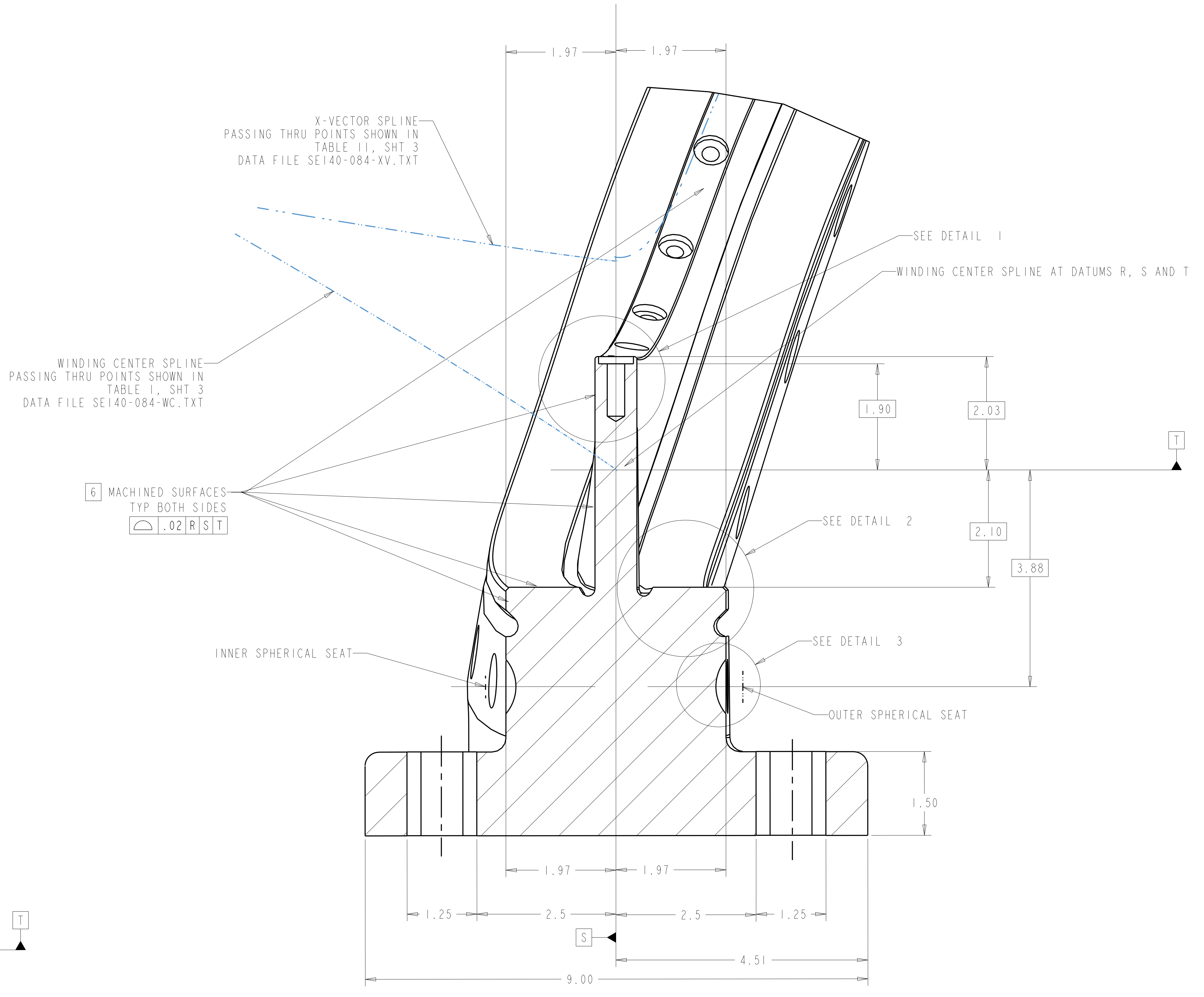
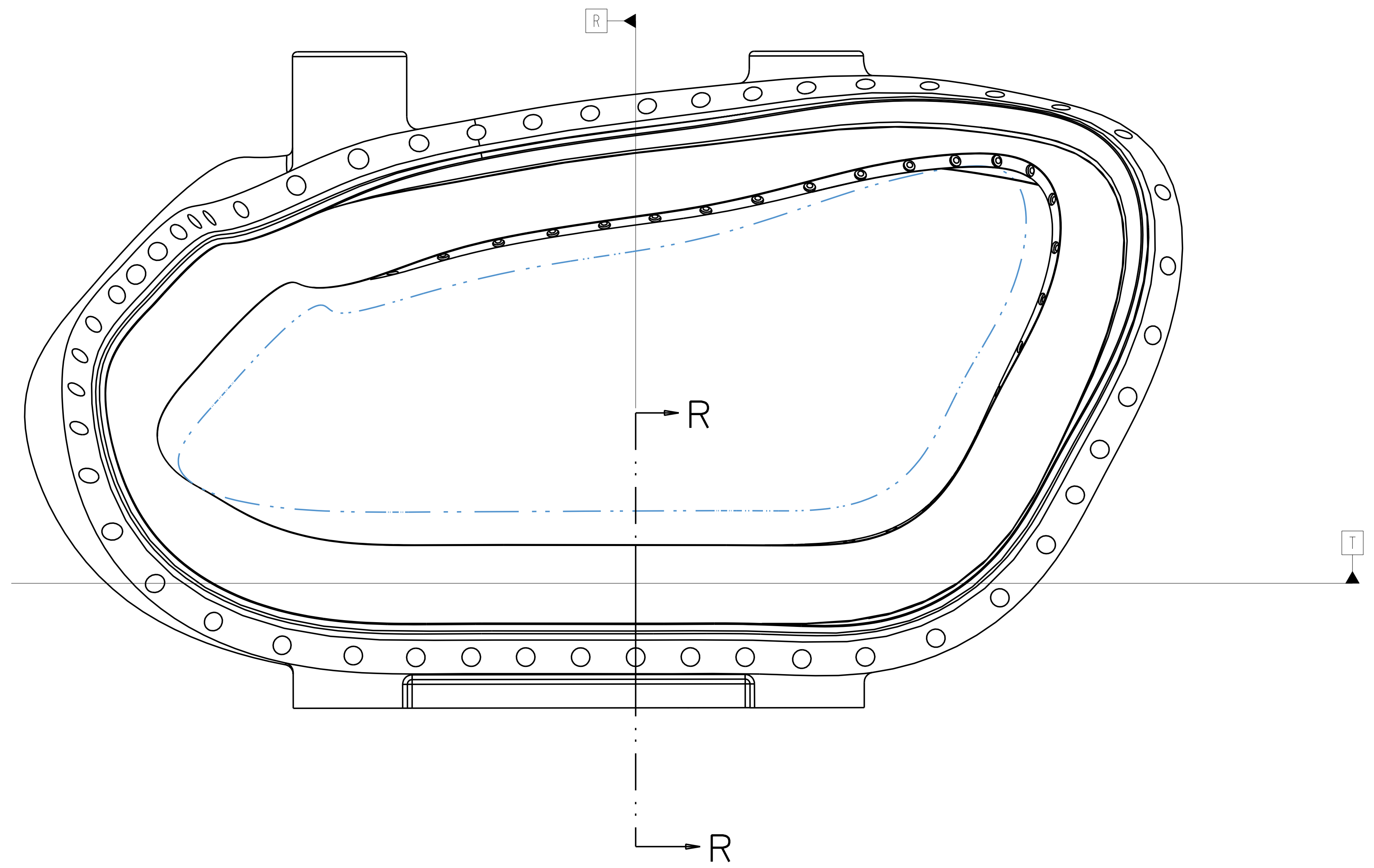


DETAIL 2
SCALE 2.0



DETAIL 3
SCALE 2.0

DATUM R = PLANE NORMAL TO WINDING CENTER
 DATUM S = PLANE PASSING THRU WINDING CENTER AND
 X-VECTOR AT DATUM R
 DATUM T = PLANE PASSING THRU WINDING CENTER ORTHOGONAL
 TO DATUM S



SECTION R-R
 SCALE 1.0
 APPLIES AT ALL POINTS
 ALONG WINDING CENTER

Oak Ridge National Laboratory managed for the DEPARTMENT OF ENERGY under U.S. GOVERNMENT contract DE-AC05-00OR22725 UT-BATTELLE, LLC, Oak Ridge, Tennessee							
NATIONAL COMPACT STELLARATOR EXPERIMENT							
TWISTED RACETRACK WINDING FORM							
VERSION NO.	PLANT	BLDG	FL	SHT OF	TYPE	CLASS	
8	X-10	5700	3	2 3	S	U	
RELEASE LEVEL	SEI40-084						REV
WIP							-

SEI40-084

TABLE I
WINDING CENTER SPLINE CO-ORDINATE DATA FILE
(FILE SE140-084-WC.TXT)

Winding Center No.	X	Y	Z
1	0.000	-0.002	-10.953
2	2.888	0.000	-10.949
3	5.776	-0.001	-10.943
4	8.663	0.004	-10.941
5	11.551	0.022	-10.948
6	14.436	-0.064	-10.879
7	17.253	-0.559	-10.536
8	19.814	-1.656	-9.812
9	21.983	-3.261	-8.800
10	23.752	-5.211	-7.621
11	25.159	-7.389	-6.355
12	26.194	-9.738	-5.037
13	26.839	-12.205	-3.688
14	27.012	-14.732	-2.310
15	26.577	-17.184	-0.862
16	25.442	-19.264	0.767
17	23.707	-20.381	2.725
18	21.776	-19.871	4.754
19	20.163	-17.961	6.131
20	19.161	-15.315	6.616
21	18.513	-12.503	6.551
22	17.430	-9.840	6.500
23	15.490	-7.744	6.789
24	13.018	-6.372	7.327
25	10.303	-5.628	7.950
26	7.489	-5.400	8.544
27	4.650	-5.491	9.059
28	1.796	-5.531	9.490
29	-1.050	-5.228	9.856
30	-3.841	-4.581	10.216
31	-6.584	-3.789	10.646
32	-9.331	-3.046	11.134
33	-12.109	-2.381	11.559
34	-14.894	-1.656	11.781
35	-17.614	-0.692	11.762
36	-20.149	0.657	11.512
37	-22.263	2.438	10.737
38	-23.533	4.238	8.929
39	-23.706	5.254	6.268
40	-23.071	5.377	3.467
41	-22.027	4.851	0.834
42	-20.898	3.781	-1.596
43	-19.793	2.538	-3.956
44	-18.484	1.554	-6.330
45	-16.675	0.825	-8.448
46	-14.296	0.267	-9.966
47	-11.539	-0.018	-10.741
48	-8.663	-0.029	-10.966
49	-5.775	0.012	-10.976
50	-2.888	0.005	-10.959

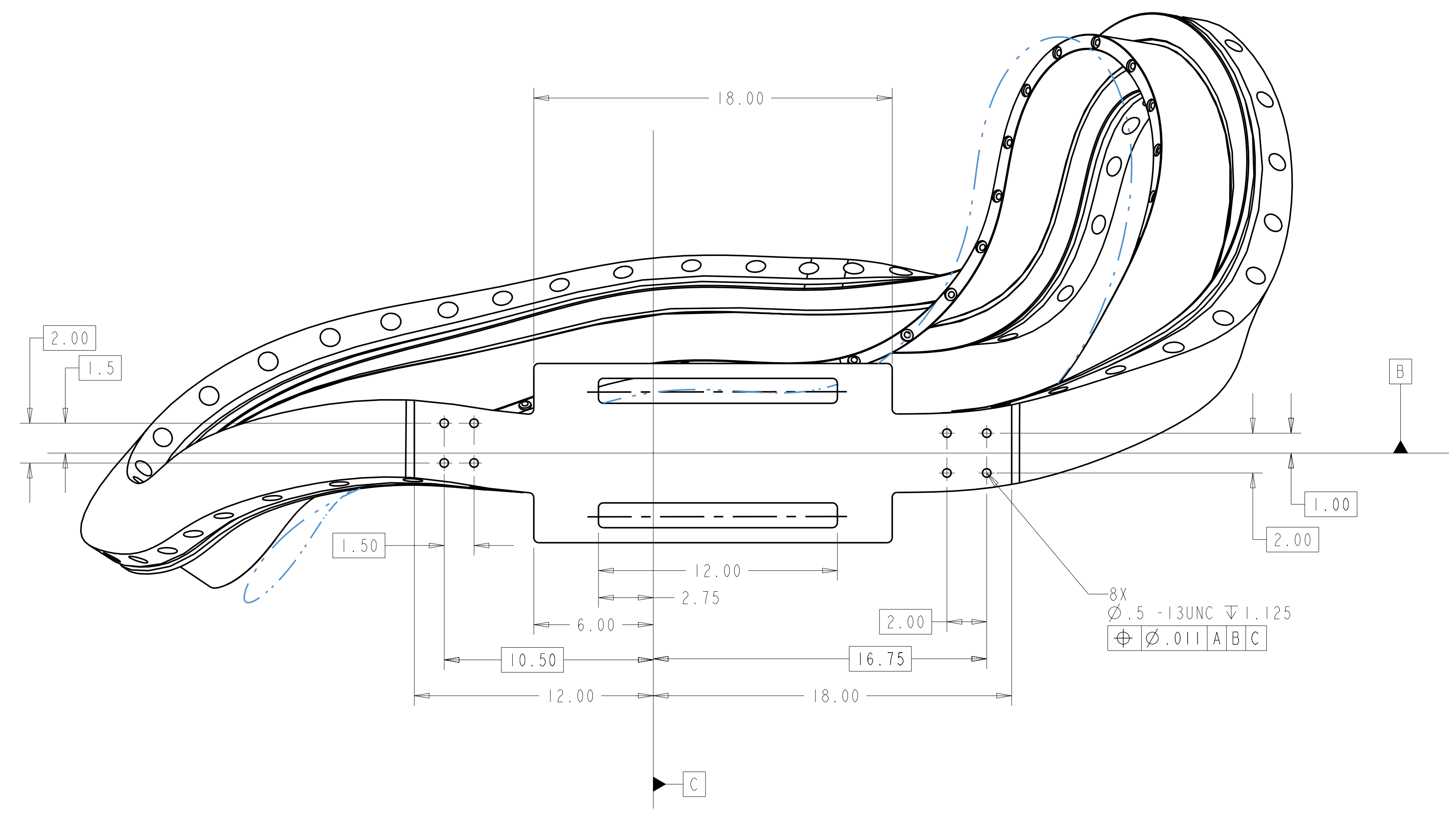
TABLE II
X VECTOR CURVE CO-ORDINATE DATA FILE
(FILE SE140-084-XV.TXT)

X-Vector No.	X	Y	Z
1	-0.005	0.002	-7.153
2	2.880	0.000	-7.162
3	5.768	-0.001	-7.171
4	8.670	0.003	-7.181
5	11.545	0.032	-7.194
6	14.215	-0.081	-7.188
7	16.558	-0.629	-7.118
8	18.649	-1.817	-6.951
9	20.438	-3.632	-6.678
10	21.871	-5.873	-6.314
11	22.921	-8.320	-5.874
12	23.624	-10.820	-5.366
13	23.986	-13.286	-4.781
14	23.970	-15.592	-4.096
15	23.555	-17.718	-3.238
16	22.605	-19.612	-2.016
17	20.776	-20.864	0.044
18	18.847	-20.336	2.076
19	17.351	-18.448	3.349
20	16.503	-15.879	3.705
21	16.113	-13.284	3.508
22	15.645	-10.814	3.291
23	14.531	-8.132	3.382
24	12.549	-5.559	3.892
25	9.886	-3.700	4.639
26	6.878	-3.032	5.357
27	4.013	-3.125	5.885
28	1.441	-3.170	6.280
29	-1.028	-2.869	6.672
30	-3.598	-2.165	7.198
31	-6.303	-1.199	7.943
32	-9.031	-0.243	8.835
33	-11.625	0.615	9.684
34	-14.017	1.487	10.335
35	-16.197	2.510	10.779
36	-18.017	3.723	10.948
37	-19.371	5.053	10.655
38	-20.339	6.547	9.443
39	-20.473	7.469	7.022
40	-19.770	7.259	4.400
41	-18.553	6.114	1.978
42	-17.280	4.385	-0.222
43	-16.198	2.810	-2.352
44	-15.119	1.848	-4.219
45	-13.938	1.312	-5.521
46	-12.606	0.928	-6.368
47	-10.923	0.558	-6.911
48	-8.573	0.174	-7.148
49	-5.802	-0.017	-7.146
50	-2.902	-0.010	-7.142

TABLE III
SPHERICAL SEAT LOCATION CO-ORDINATES
(FILE SE140-084-SS.TXT)

No.	Spherical Seat - Left			Spherical Seat - Right		
	X	Y	Z	X	Y	Z
1	0.000	-2.546	-14.830	0.000	2.534	-14.830
2	2.896	-2.540	-14.829	2.895	2.540	-14.820
3	5.782	-2.541	-14.823	5.784	2.539	-14.820
4	8.669	-2.535	-14.822	8.643	2.545	-14.820
5	11.561	-2.528	-14.821	11.554	2.552	-14.830
6	14.462	-2.578	-14.776	14.871	2.485	-14.720
7	17.351	-2.922	-14.525	18.699	1.961	-14.150
8	20.195	-3.682	-13.966	22.357	0.774	-12.830
9	23.112	-4.670	-13.071	25.377	-0.767	-10.740
10	26.112	-5.753	-11.576	27.514	-2.516	-7.921
11	28.713	-7.170	-9.326	28.632	-4.685	-4.896
12	30.448	-9.231	-6.815	29.044	-7.254	-2.351
13	31.399	-11.838	-4.449	29.111	-9.983	-0.310
14	31.647	-14.891	-2.240	28.880	-12.736	1.435
15	31.037	-18.108	0.011	28.160	-15.193	3.016
16	29.424	-20.916	2.476	26.980	-16.933	4.469
17	26.955	-22.421	5.332	26.145	-17.406	5.315
18	24.037	-21.668	8.381	25.203	-17.172	6.326
19	21.526	-18.866	10.470	24.275	-16.109	7.208
20	19.969	-15.302	11.182	23.531	-14.229	7.723
21	18.953	-12.144	11.153	22.786	-11.328	7.920
22	17.458	-10.028	11.134	21.046	-7.665	8.423
23	15.127	-9.340	11.128	17.946	-5.304	9.875
24	12.525	-9.556	10.663	14.531	-4.960	11.477
25	10.097	-9.730	10.103	11.349	-5.408	12.462
26	7.777	-9.738	10.156	8.384	-5.634	13.089
27	5.115	-9.828	10.634	5.417	-5.734	13.626
28	1.859	-9.869	11.128	2.420	-5.772	14.079
29	-1.606	-9.532	11.493	-0.540	-5.545	14.455
30	-4.817	-8.871	11.683	-3.351	-5.132	14.794
31	-7.660	-8.168	11.726	-6.089	-4.763	15.153
32	-10.363	-7.536	11.664	-8.940	-4.535	15.508
33	-13.194	-6.888	11.458	-12.076	-4.391	15.738
34	-16.213	-6.038	11.032	-15.482	-4.107	15.673
35	-19.299	-4.781	10.367	-18.951	-3.435	15.253
36	-22.242	-3.016	9.607	-22.436	-1.969	14.574
37	-24.450	-0.999	8.521	-25.831	0.672	13.116
38	-25.276	0.401	6.994	-28.026	3.567	9.861
39	-25.385	1.038	5.312	-28.315	5.164	5.756
40	-25.234	1.292	3.088	-27.455	5.728	1.995
41	-24.999	1.296	0.662	-26.021	5.873	-1.290
42	-24.547	0.926	-1.791	-24.417	5.439	-4.121
43	-23.594	-0.052	-4.542	-23.061	4.594	-6.524
44	-21.999	-1.158	-7.670	-21.524	3.693	-9.102
45	-19.520	-2.100	-10.651	-19.091	2.812	-11.870
46	-16.108	-2.845	-12.888	-15.739	2.104	-13.970
47	-12.195	-3.098	-14.146	-12.103	1.922	-14.910
48	-8.706	-2.772	-14.705	-8.802	2.300	-14.970
49	-5.736	-2.499	-14.875	-5.762	2.580	-14.830
50	-2.887	-2.520	-14.849	-2.861	2.560	-14.820

ALL POINT LOCATION IN TABLES ARE BASIC DIMENSIONS TO DATUMS A, B, AND C



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						
UT-BATTELLE NATIONAL COMPACT STELLARATOR EXPERIMENT						
TWISTED RACETRACK WINDING FORM						
VERSION NO.	PLANT	BLDG	FL	SHT OF	TYPE	CLASS
8	X-10	5700	3	3	S	U
RELEASE LEVEL		REV				
WIP		SE140-084				