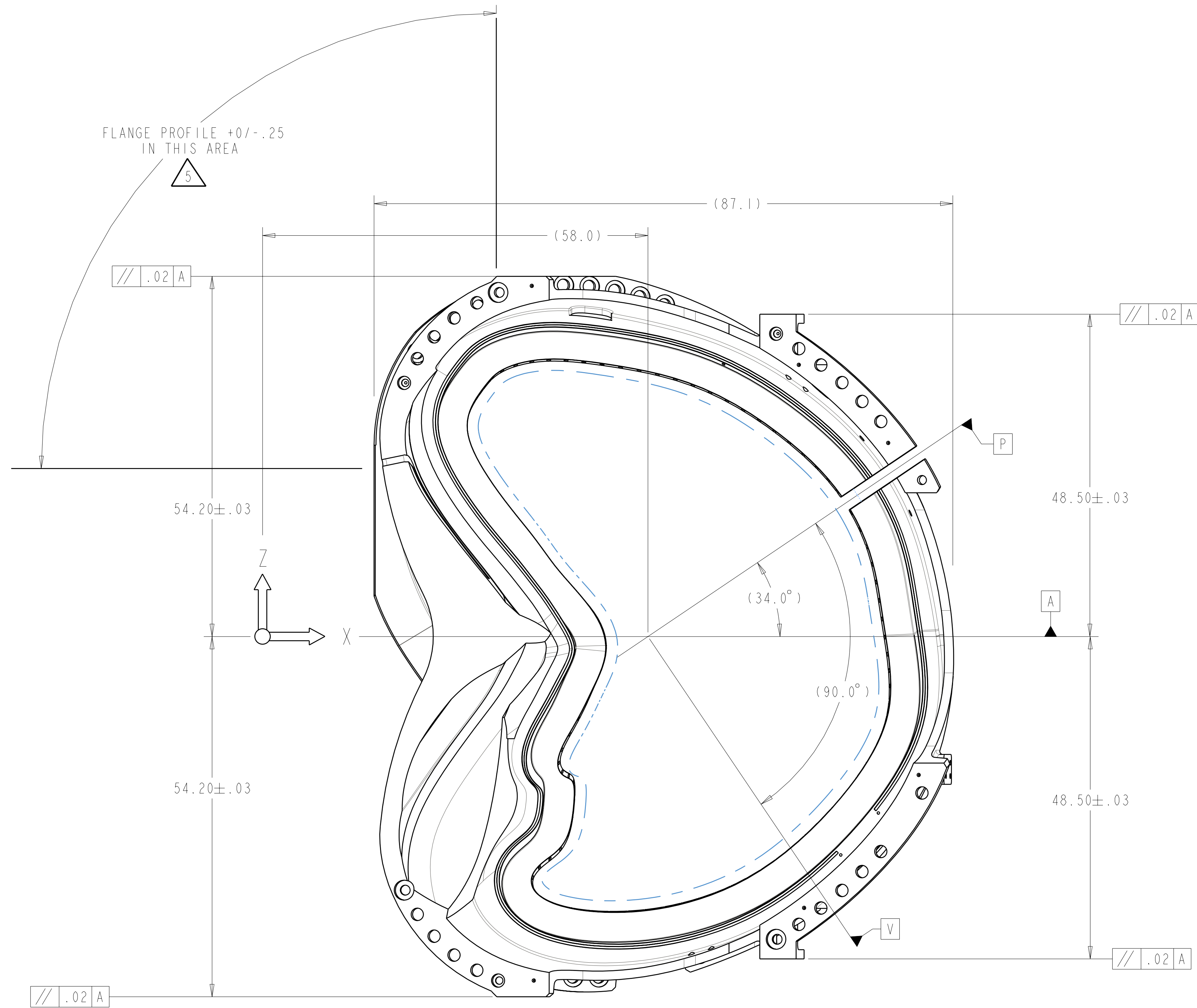


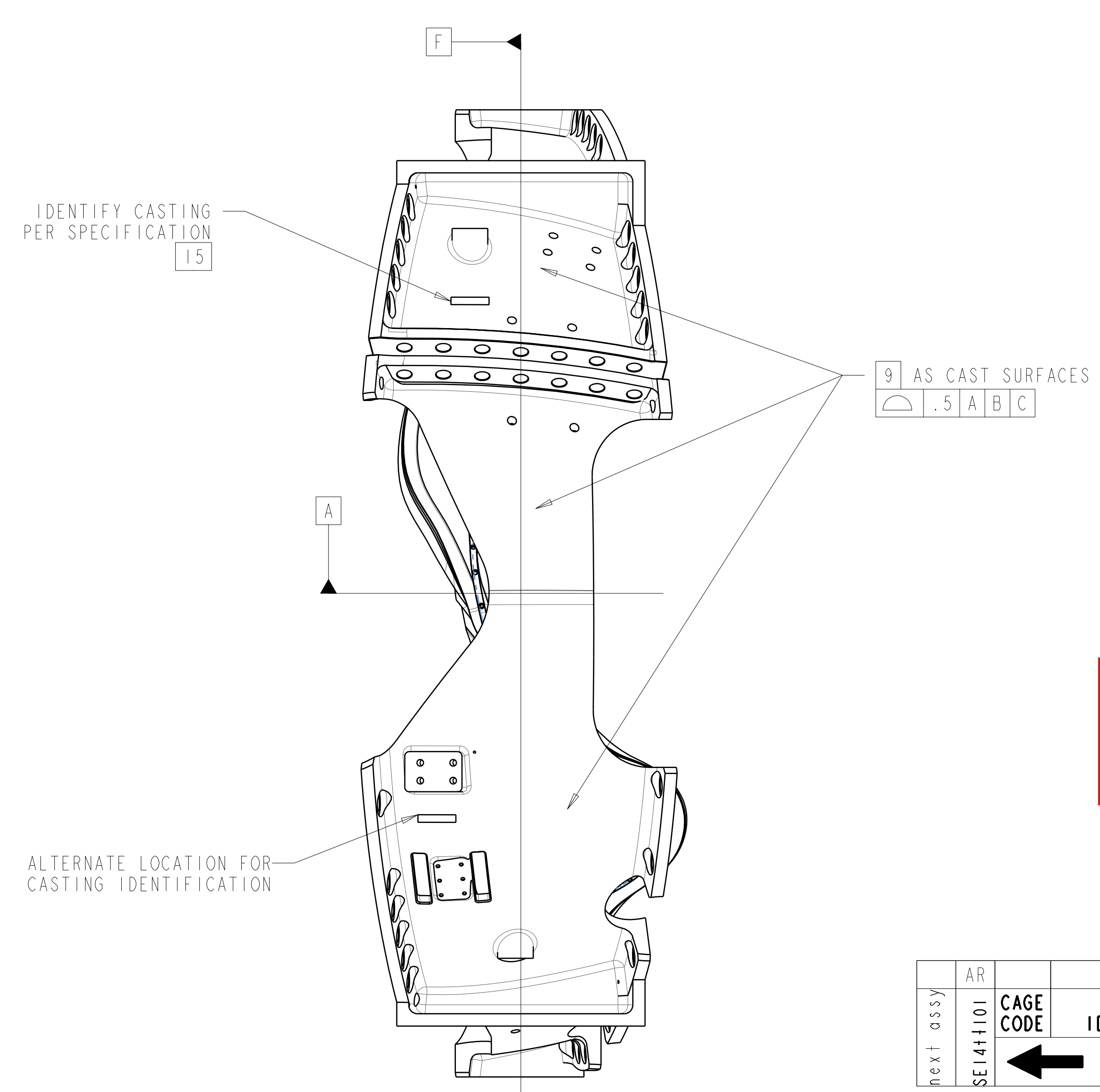
ISOMETRIC VIEW



SCALE 0.10

NOTES:

1. DRAWING PREPARED IN ACCORDANCE WITH ASME Y14.8M-1996.
2. INTERPRET DIMENSIONS AND TOLERANCES PER ANSI Y14.5M-1994.
3. DIMENSIONS ARE IN INCHES.
4. DRAWING DEPICTS FINAL MACHINED STATE OF PART DEFINED BY PRO/ENGINEER FILE SEI41-114.PRT.
5. UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE RELATED TO DATUM A- (PRIMARY X-Y PLANE, TOP) DATUM B- (SECONDARY Y-Z PLANE, SIDE) DATUM C- (TERTIARY X-Z PLANE, FRONT)
6. DIMENSIONS APPLY AT TEMPERATURE OF 20-30°C (68-86°F).
7. DIMENSIONS AND TOLERANCES EXCLUDE PROCESS MATERIAL ALLOWANCES WHICH MAY ADD MASS.
8. APPROXIMATE WEIGHT = 4819 LBS. WEIGHT OF FINISHED PART NOT TO EXCEED 6000 LBS.
- 9 UNLESS OTHERWISE SPECIFIED, AS-CAST SURFACE PROFILE TOLERANCE = +/- .25 INCH, WITH EXEMPTION FOR INTERSECTING SURFACES WHERE FILLETS ARE EXPECTED. MIN FILLET AND CORNER RADI = 0.5 +/- 0.1 IN.
- 10 DESIGNATED SURFACE REGIONS HAVE PROFILE TOLERANCE OF -0.12 TO -0.25-IN. WHERE POSITIVE INDICATES OUTWARD SURFACE NORMAL DIRECTION (ADDS MATERIAL).
11. MIN THICKNESS PER CAD GEOMETRY, TOLERANCE = +0.25 IN / -0.0 IN.
12. PARTING LINE EDGES, FLASH, GATES, RUNNER, AND RISER EXTENSIONS 0.25 IN MAX
- 13 UNLESS OTHERWISE SPECIFIED, MACHINED SURFACE PROFILE TOLERANCE = +/- 0.01 IN.
14. BACK SPOTFACE ALL THRU HOLES MINIMUM TO CLEAN UP.
- 15 SEE LATEST REVISION OF SPECIFICATION NCSX-CSPEC-141-03 FOR ADDITIONAL REQUIREMENTS.
- 16 GRIND TEE BASE AS REQUIRED TO ACHIEVE CLEARANCE DEFINED BY TEMPLATE SHOWN IN THE SPECIFICATION.



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 PPPL Drafting:

| REV | DESCRIPTION  | BY | DATE | CHK | DEPT | DATE | PE | REG | DATE | ORNL | DOE | DATE |
|-----|--|----|------|-----|------|------|----|-----|------|------|-----|------|
| 1   | REMOVED SPHERICAL SEATS, REVISED LEAD BLOCK/COOLING PER ECN-4903 | GL | 9/04 | MJC | DEW  |      |    |     |      |      |     |      |
| 2   | REVISED PART AND DRAWING PER ECN 4944                            | GL | 1/05 | MJC | DEW  |      |    |     |      |      |     |      |
| 3   | REVISED PART AND DRAWING PER ECN 4965                            | GL | 3-05 | MJC | DEW  |      |    |     |      |      |     |      |
| 4   | REVISED PART AND DRAWING PER ECN 4994                            | GL | 6-05 | MJC | DEW  |      |    |     |      |      |     |      |
| 5   | REVISE PART AND DRAWING PER ECN 5009                             | GL | 7-05 | MJC | DEW  |      |    |     |      |      |     |      |
| 6   | REVISE PART AND DRAWING PER ECN 5059 AND 5064                    | GL | 8/08 | MJC | DEW  |      |    |     |      |      |     |      |

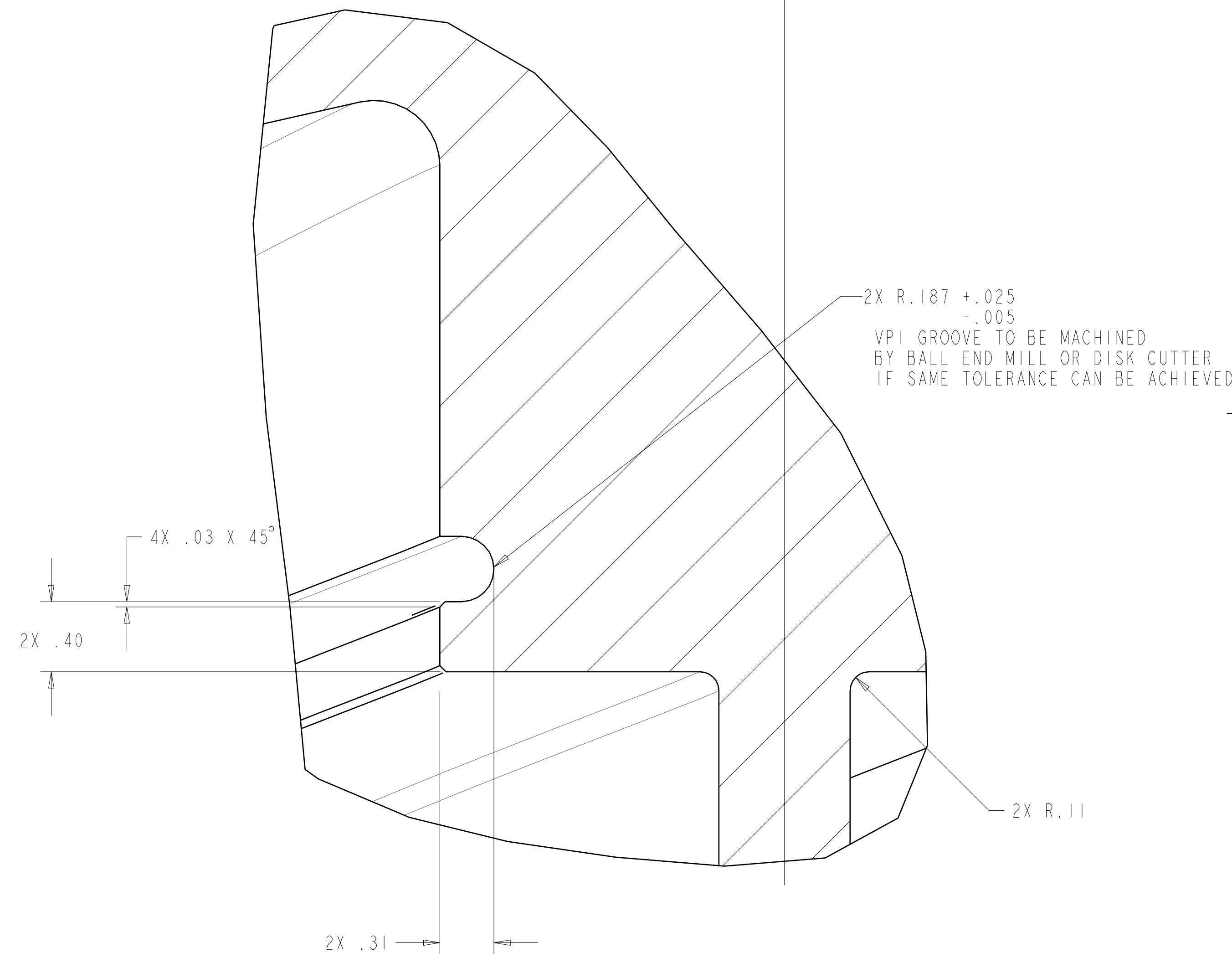
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| SCALE NOTED                            | DES T BROWN 06-01-04                    | DRW P MILLER 06-02-04 | CHK M COLE 7/22/04 | DEPT :   | PE D WILLIAMSON 7/22/04 | CR : | PJ : | REG : | PPPL DRFT J SIEGEL 7/22/04 | VERSION NO. 13 | PLANT X-10 | BLDG 5700 | FL 3 | SHT OF 11 | TYPE IIS | CLASS U |
| TOLERANCES 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 |                         |      |      |       |                            |                |            |           |      |           |          |         |
| FRACTIONS                              | NATIONAL COMPACT STELLARATOR EXPERIMENT |                       |                    | PRODUCT NAME   |                         |      |      |       |                            |                |            |           |      |           |          |         |
| XX DECIMALS ± .01                      | PRODUCTION WINDING FORM TYPE-A          |                       |                    | RELEASE LEVEL  |                         |      |      |       |                            |                |            |           |      |           |          |         |
| XXX DECIMALS ± .005                    | Fabrication                             |                       |                    | SEI41-114  |                         |      |      |       |                            |                |            |           |      |           |          |         |
| ANGLES ± 0°15'                         | REV 6                                   |                       |                    |  |                         |      |      |       |                            |                |            |           |      |           |          |         |
| BREAK SHARP EDGES .06 MAX              |   |                       |                    |  |                         |      |      |       |                            |                |            |           |      |           |          |         |
| FINISH .125 UNLESS OTHERWISE SPECIFIED |   |                       |                    |  |                         |      |      |       |                            |                |            |           |      |           |          |         |

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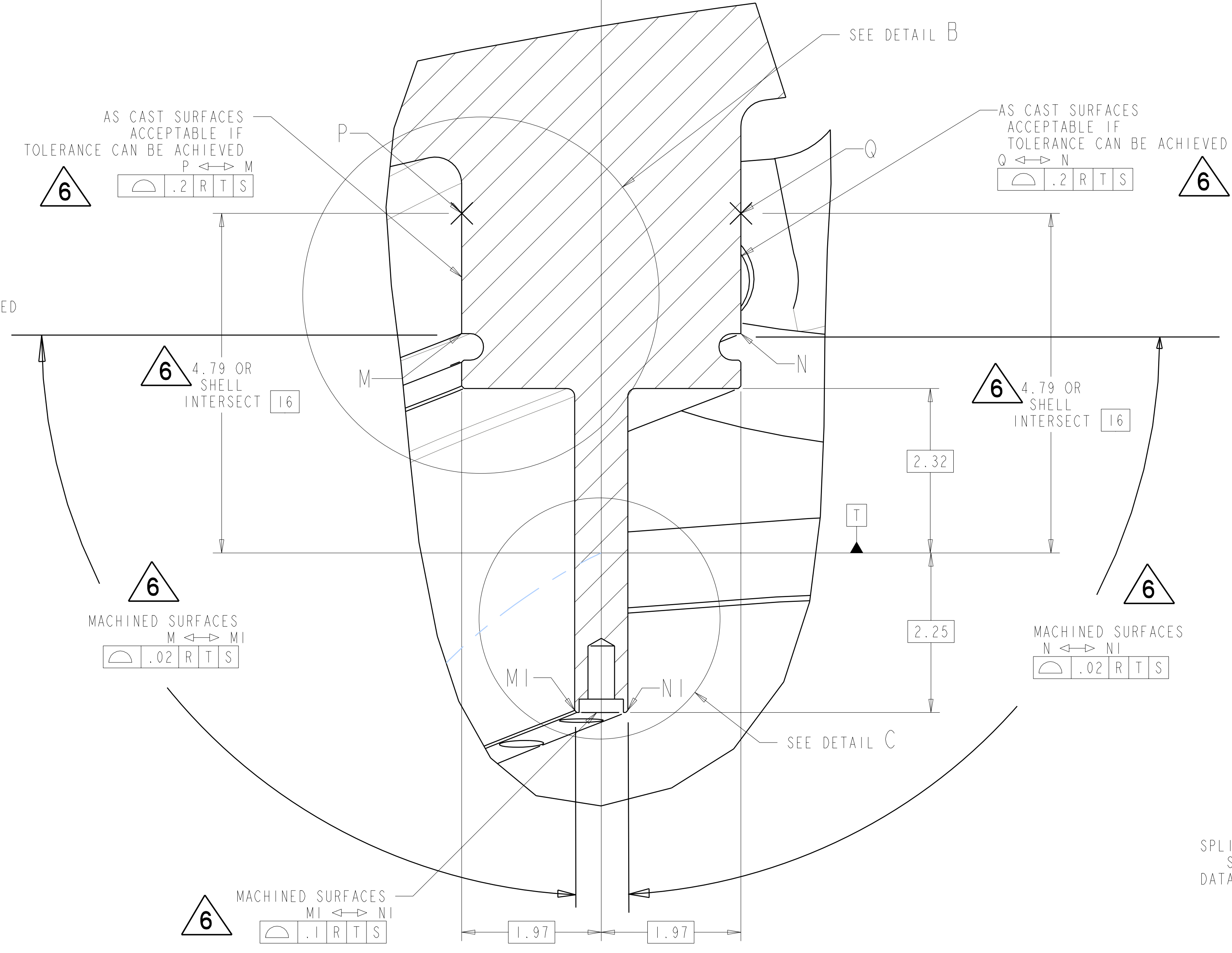
**P** THIS DRAWING PRODUCED ON PRO-ENGINEER

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E  
D  
C  
B  
A

FOR NOTES AND PARTS LIST SEE SHEET 1

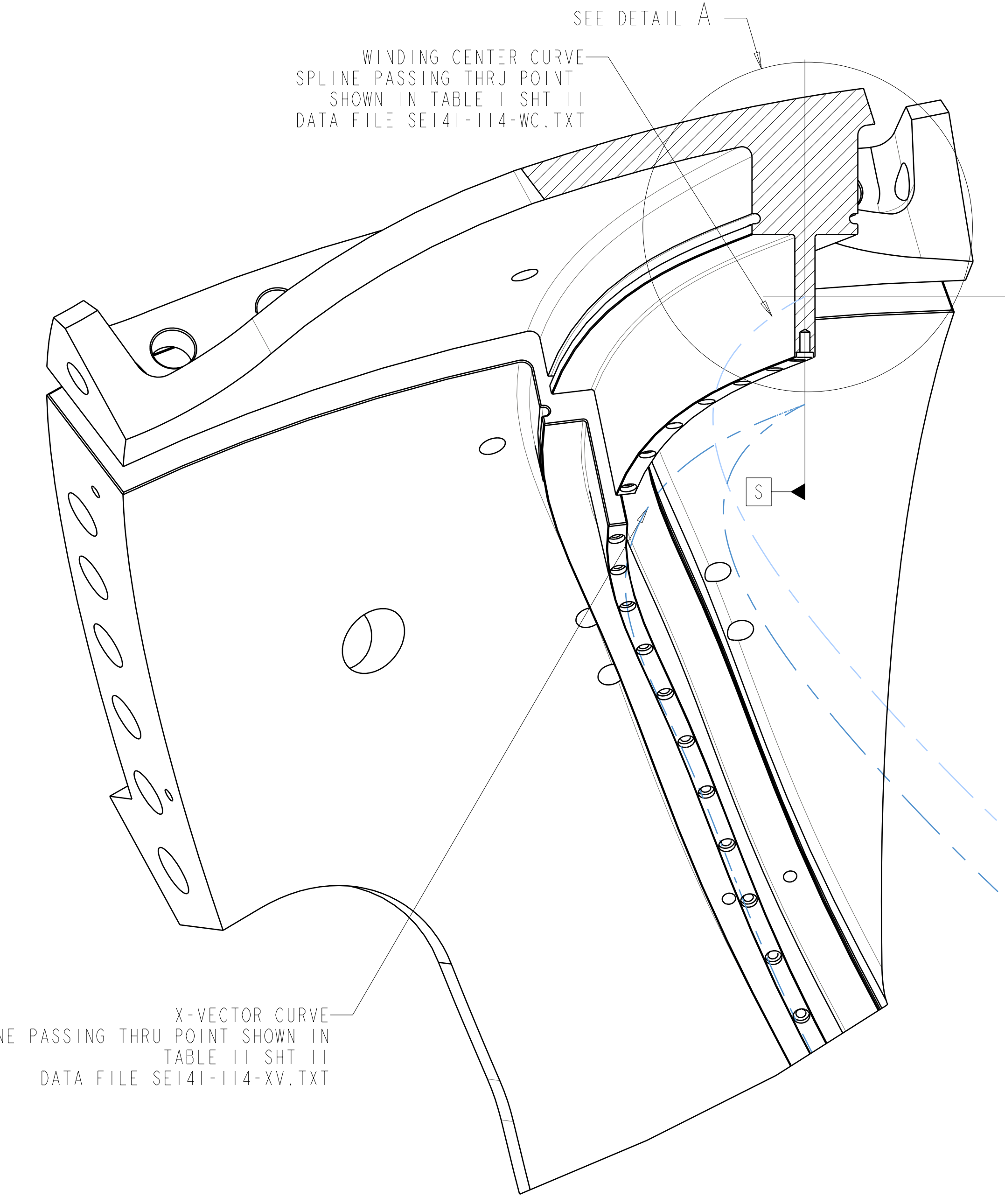


DETAIL B  
 SCALE 2.00

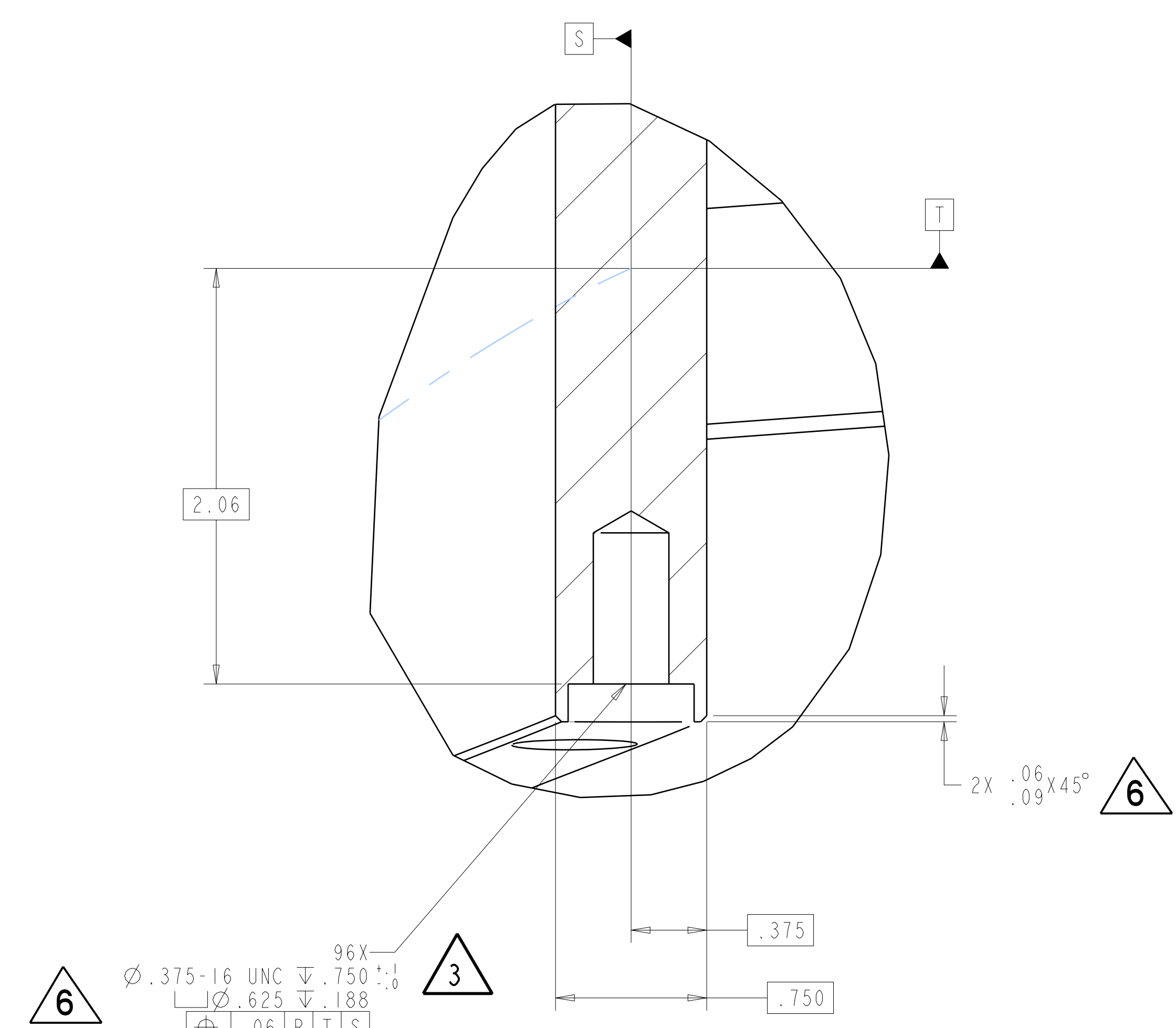
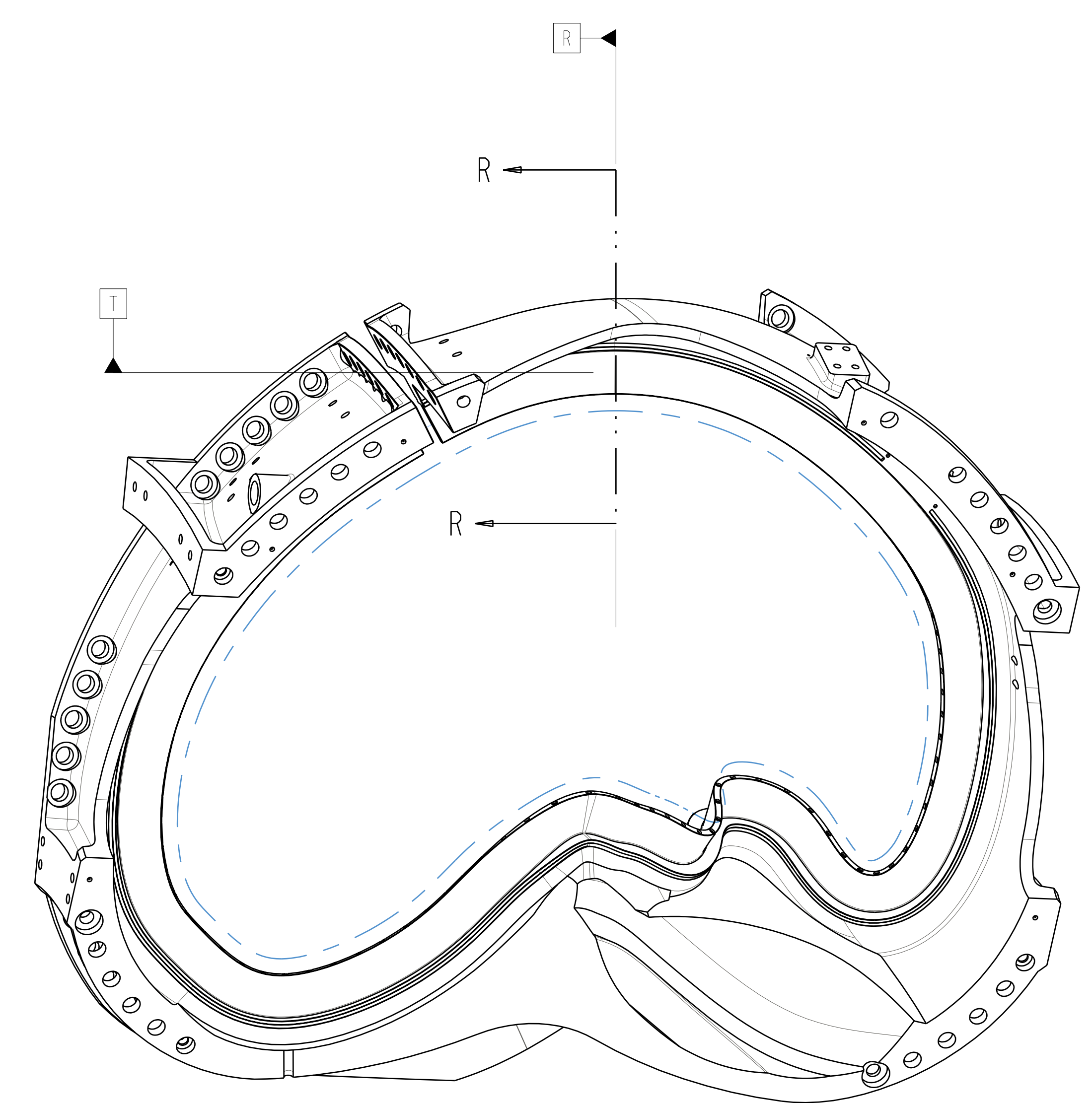


DETAIL A  
 SCALE 1.00

TYPICAL FOR ALL POINTS ALONG WINDING CENTER



SECTION R-R  
 SCALE 0.30



DETAIL C  
 SCALE 2.00

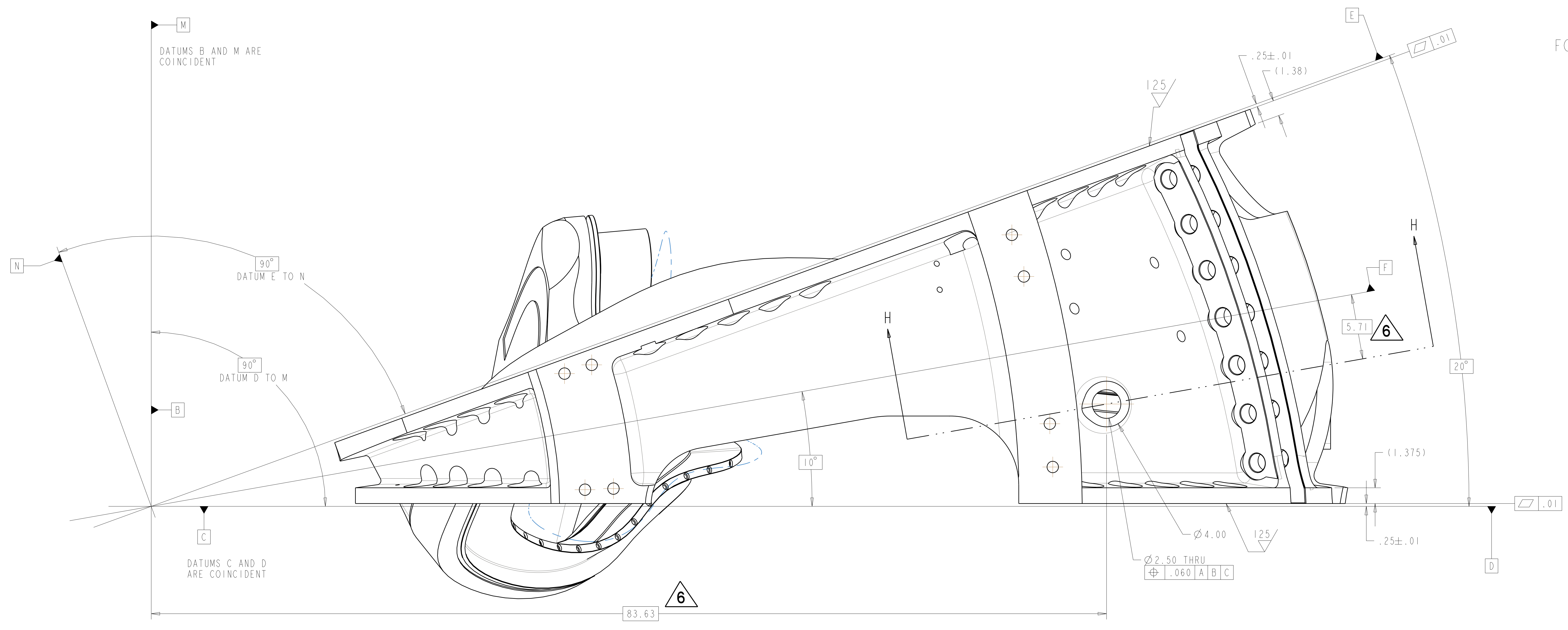
DATUM R = PLANE NORMAL TO WINDING CENTER  
 DATUM S = PLANE PASSING THRU WINDING CENTER AND X VECTOR AT DATUM R  
 DATUM T = PLANE PASSING THRU WINDING CENTER ORTHOGONAL TO DATUM S

**RELEASED FOR  
 FABRICATION / INSTALLATION**  
 PPPL Drafting

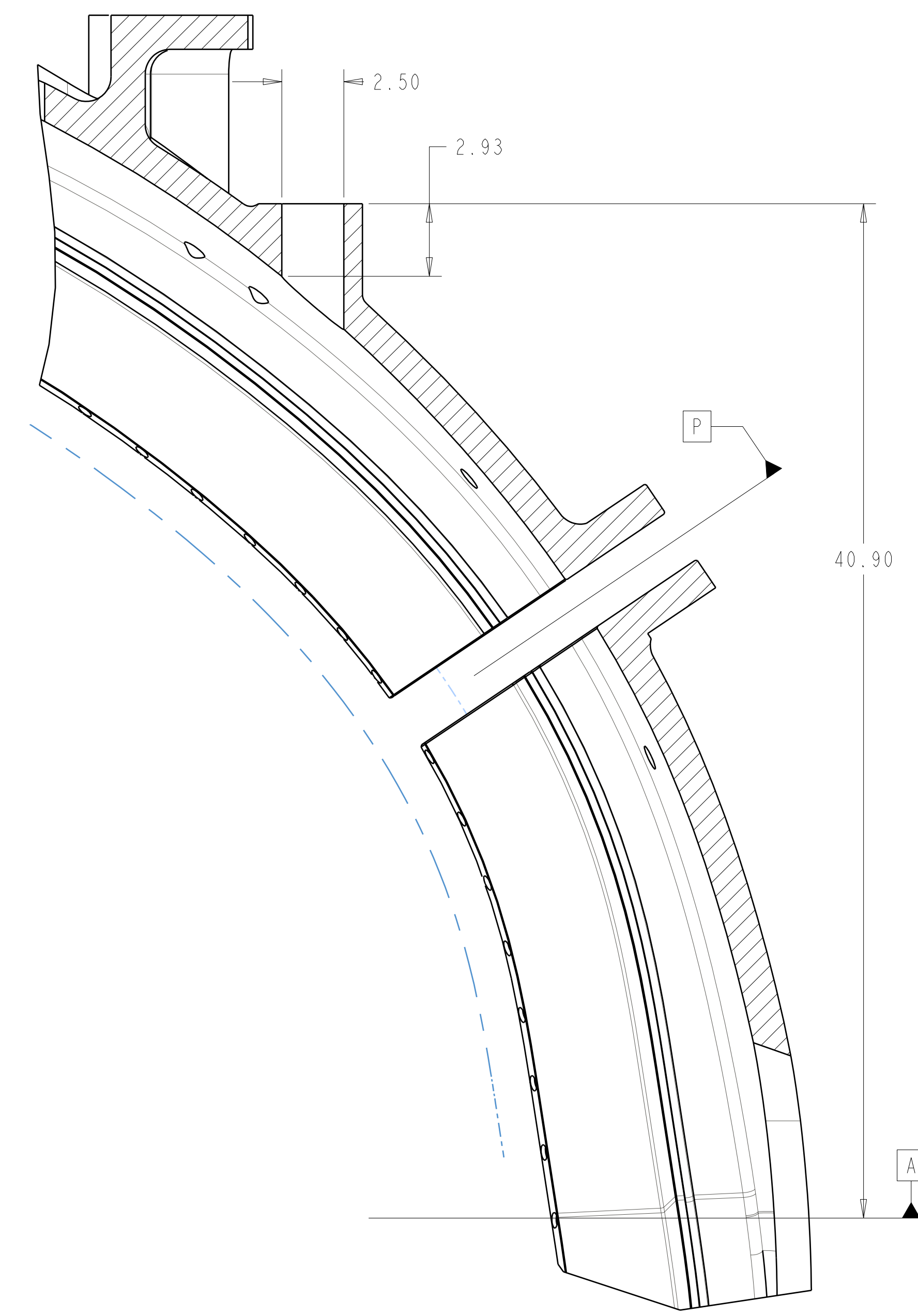
|   |           |      |    |        |      |       |     |
|---|-----------|------|----|--------|------|-------|-----|
| Oak Ridge National Laboratory<br>managed for the DEPARTMENT OF ENERGY under<br>U.S. GOVERNMENT contract DE-AC05-00OR22725<br>UT-BATTELLE, LLC. Oak Ridge, Tennessee<br>PROJECT NAME |           |      |    |        |      |       |     |
| <b>UT-BATTELLE</b><br>NATIONAL COMPACT STELLARATOR EXPERIMENT   |           |      |    |        |      |       |     |
| PRODUCTION WINDING FORM TYPE-A  |           |      |    |        |      |       |     |
| VERSION NO.   | PLANT     | BLDG | FL | SHT OF | TYPE | CLASS |     |
| 13  | X-10      | 5700 | 3  | 2      | 11   | S     | U   |
| RELEASE LEVEL   | SE141-114 |      |    |        |      |       | REV |
| Fabrication   |           |      |    |        |      |       | 6   |

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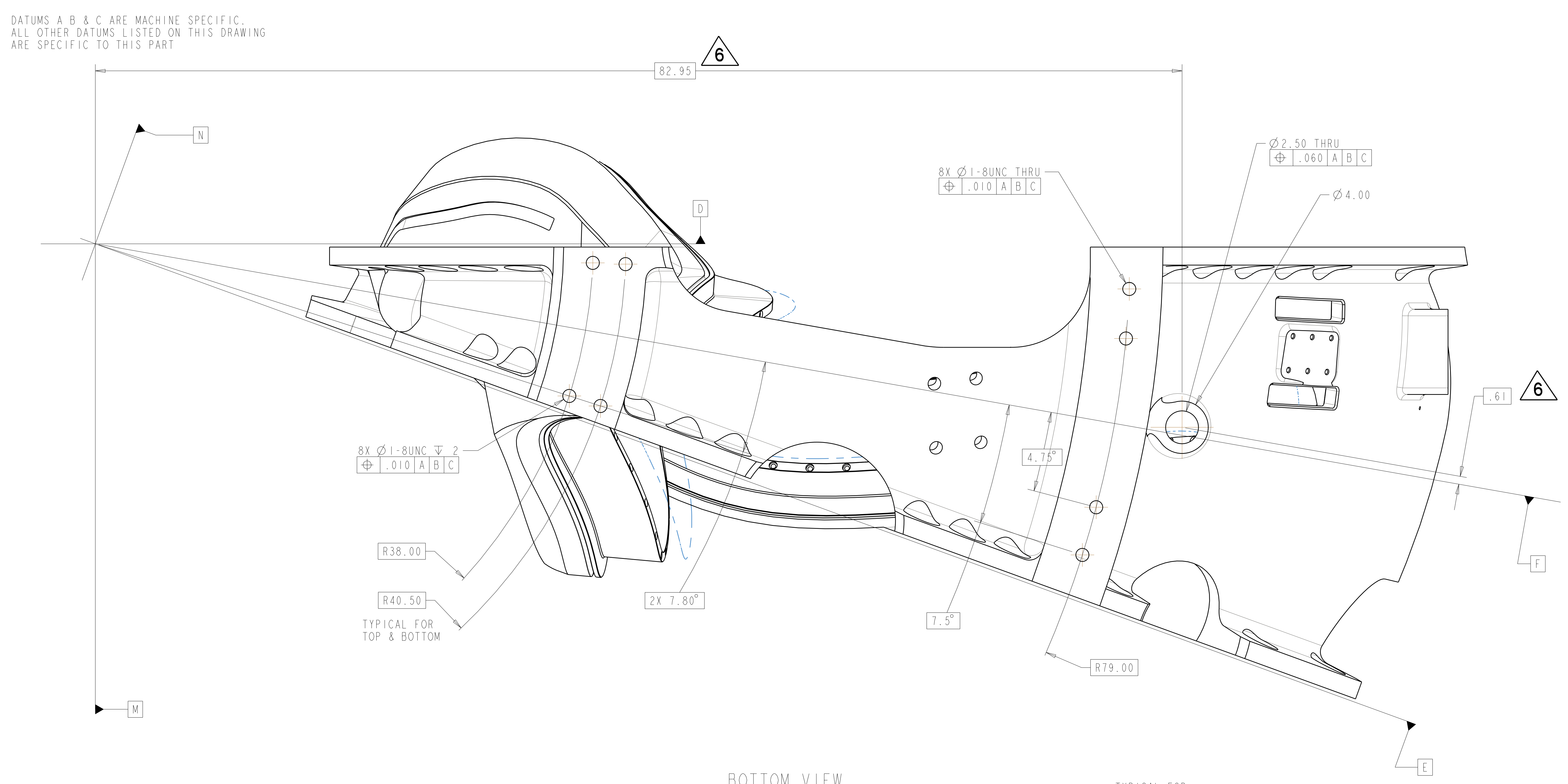
FOR NOTES AND PARTS LIST SEE SHEET 1



TOP VIEW  
SCALE 0.25



SECTION H-H  
SCALE 0.25



BOTTOM VIEW  
SCALE 0.25

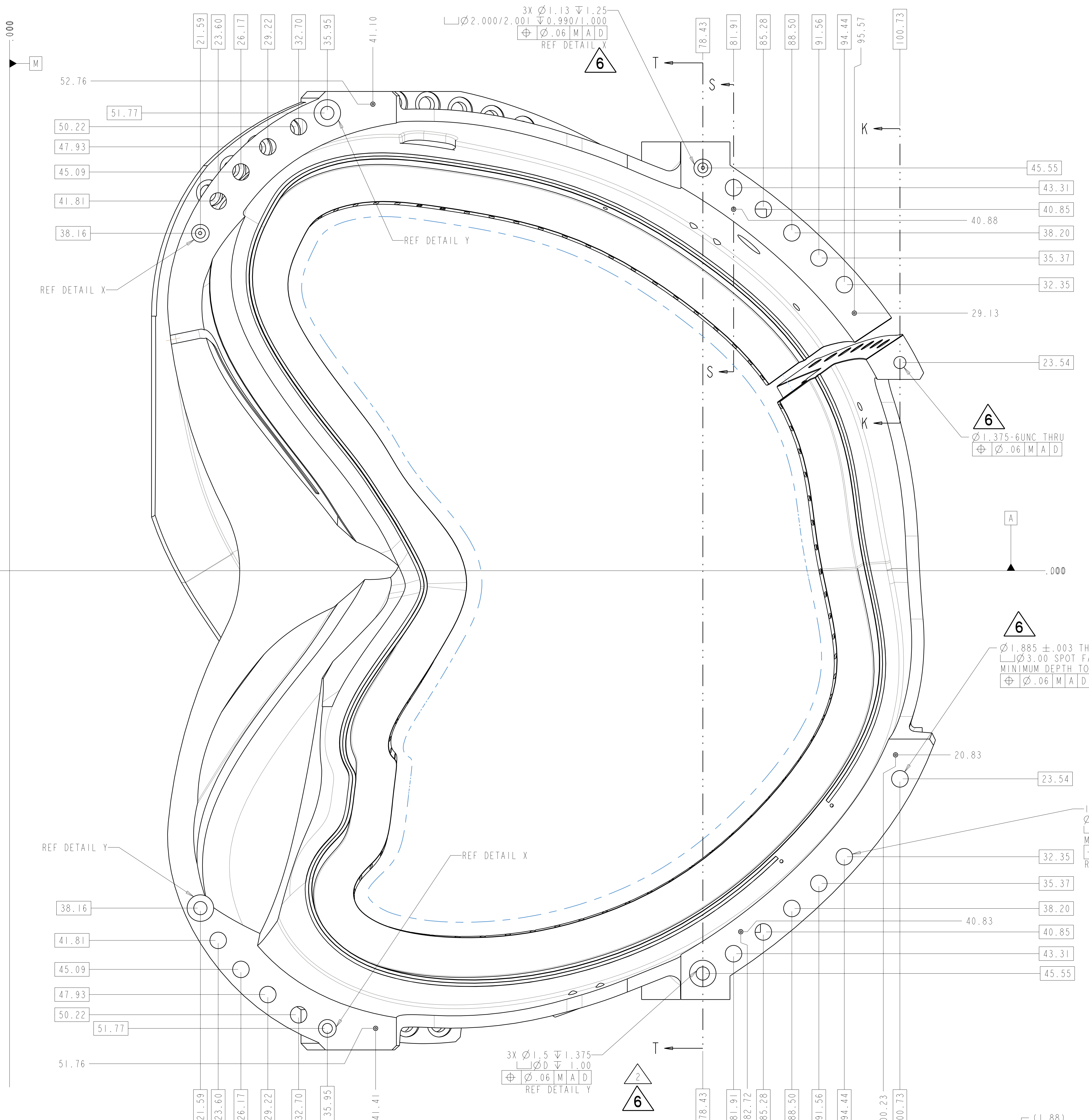
TYPICAL FOR TOP & BOTTOM

RELEASED FOR FABRICATION / INSTALLATION  
PPPL Drafting:

|  |       |           |    |        |      |       |   |
|--|-------|-----------|----|--------|------|-------|---|
| Oak Ridge National Laboratory<br>managed for the DEPARTMENT OF ENERGY under<br>U.S. GOVERNMENT contract DE-AC05-00OR22725<br>UT-BATTELLE, LLC, Oak Ridge, Tennessee<br>PROJECT NAME: |       |           |    |        |      |       |   |
| <b>UT-BATTELLE</b><br><b>NATIONAL COMPACT STELLARATOR EXPERIMENT</b><br><b>PRODUCTION WINDING FORM TYPE-A</b>  |       |           |    |        |      |       |   |
| VERSION NO.  | PLANT | BLDG      | FL | SHT OF | TYPE | CLASS |   |
| 13   | X-10  | 5700      | 3  | 3      | 11   | S     | U |
| RELEASE LEVEL  |       |           |    |        |      |       |   |
| Fabrication  |       | SEI41-114 |    |        |      |       |   |
|  |       |           |    |        |      | REV   | 6 |

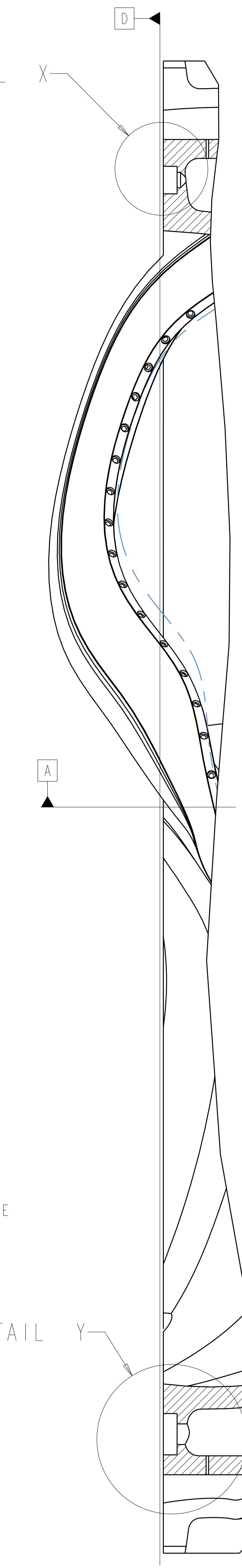
SEI41-114

FOR NOTES AND PARTS LIST SEE SHEET I

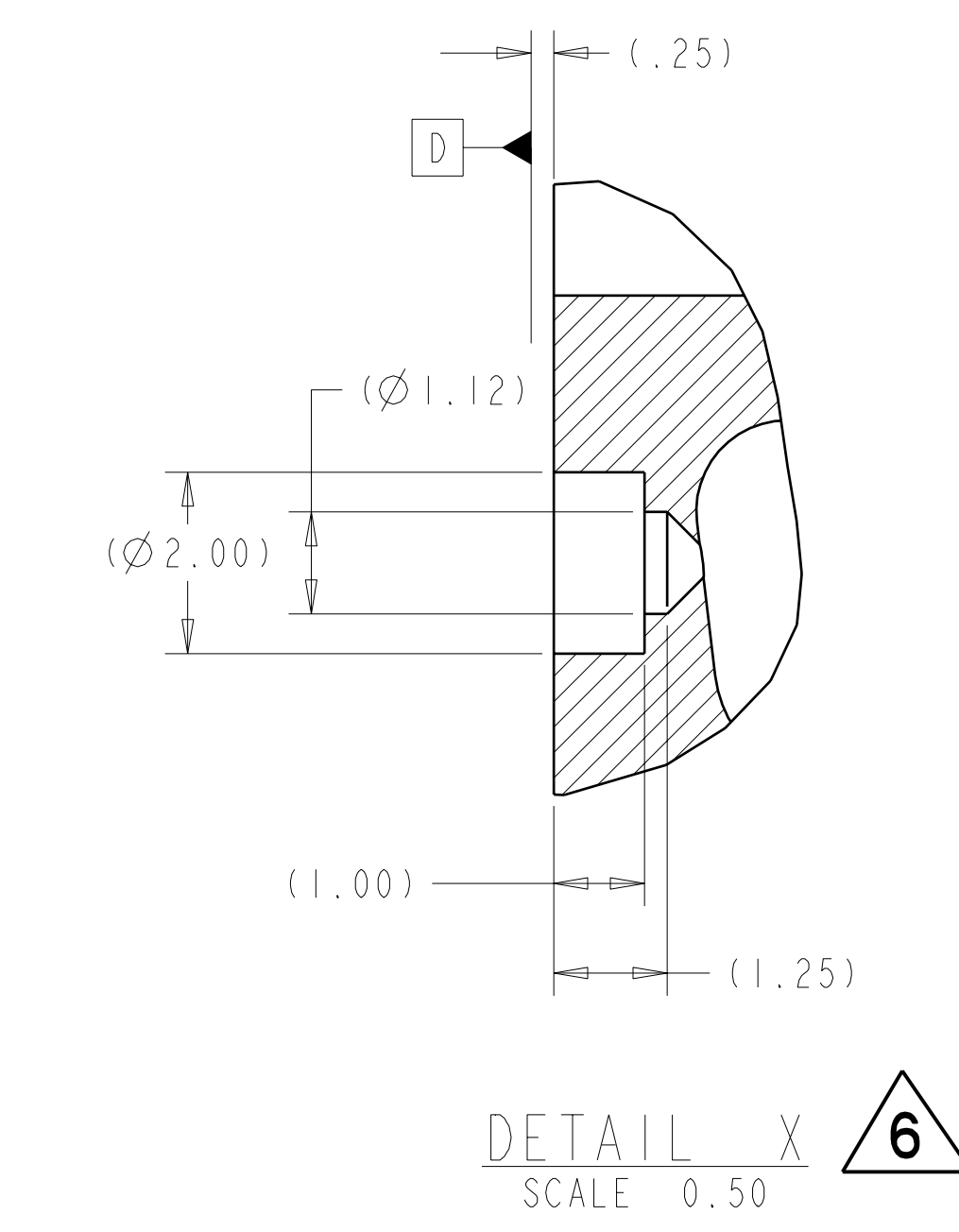


VIEW AT DATUM D  
 SCALE 0.20

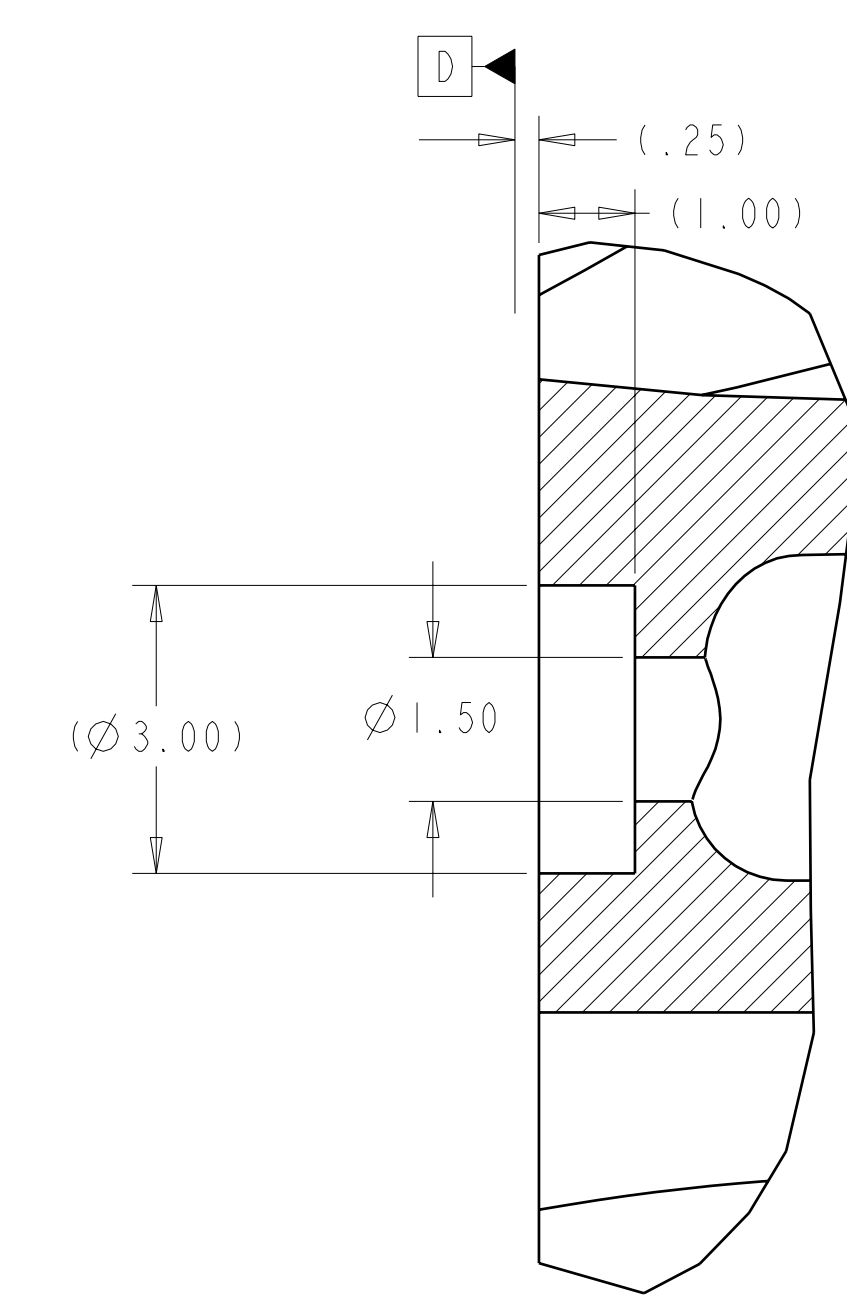
SEE DETAIL X



SECTION T-I



DETAIL X  
 SCALE 0.50



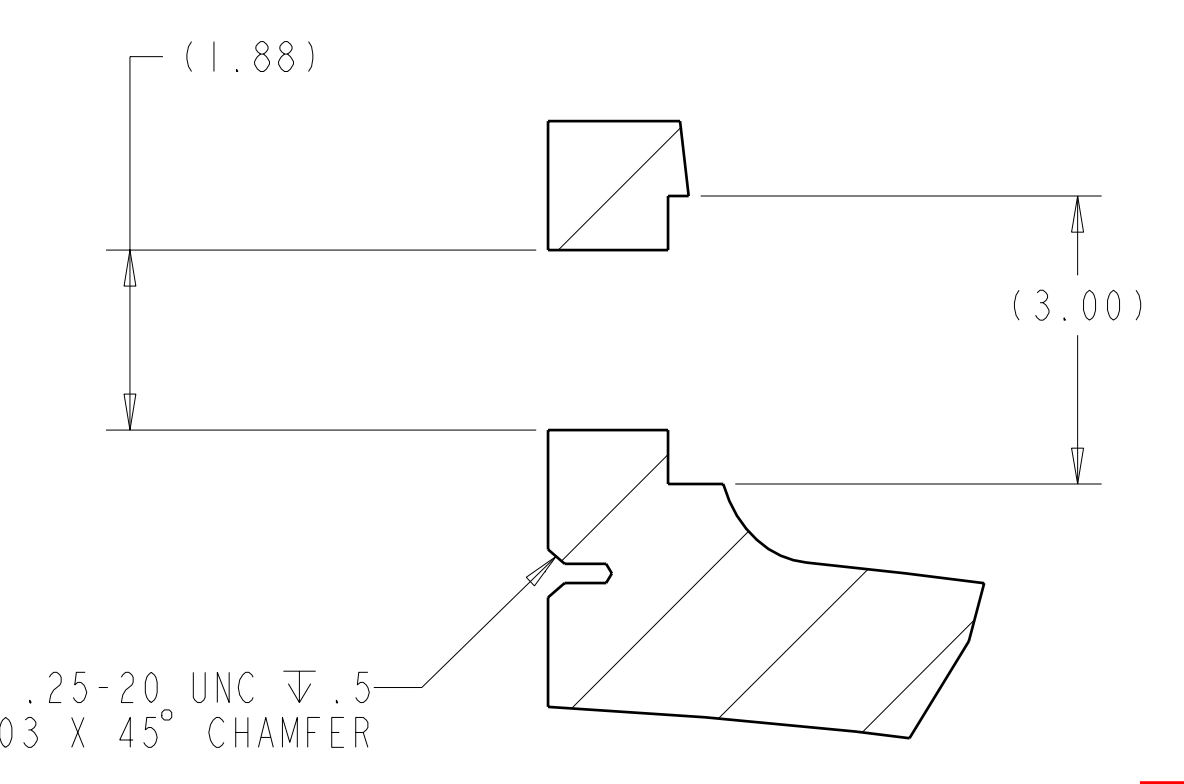
DETAIL Y  
 SCALE 0.50

6  
 $\varnothing 1.375-6UNC$  THRU  
 $\varnothing .06$  M | A | D

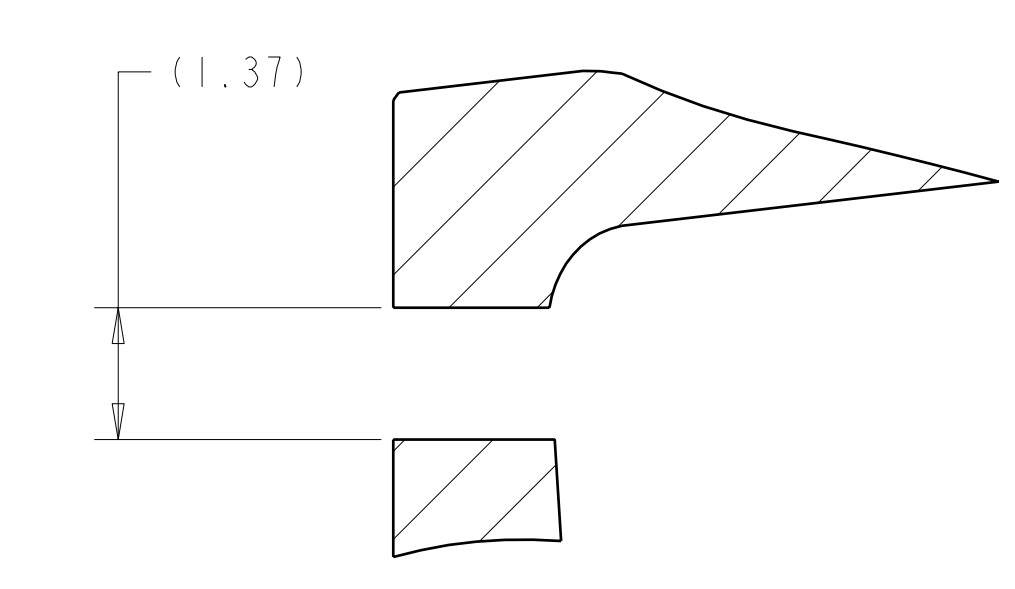
6  
 $\varnothing 1.885 \pm .003$  THRU  
 $\varnothing 3.00$  SPOT FACE BACKSIDE  
 MINIMUM DEPTH TO CLEAN UP  
 $\varnothing .06$  M | A | D

3 6  
 18X  
 $\varnothing 1.885 \pm .003$  THRU  
 $\varnothing 3.0$  SPOT FACE BACKSIDE  
 MINIMUM DEPTH TO CLEANUP  
 $\varnothing .06$  M | A | D  
 REF SECTION S-S

2  
 6X .25-20 UNC  $\varnothing .5$   
 .03 X 45° CHAMFER



SECTION S-S  
 SCALE 0.50



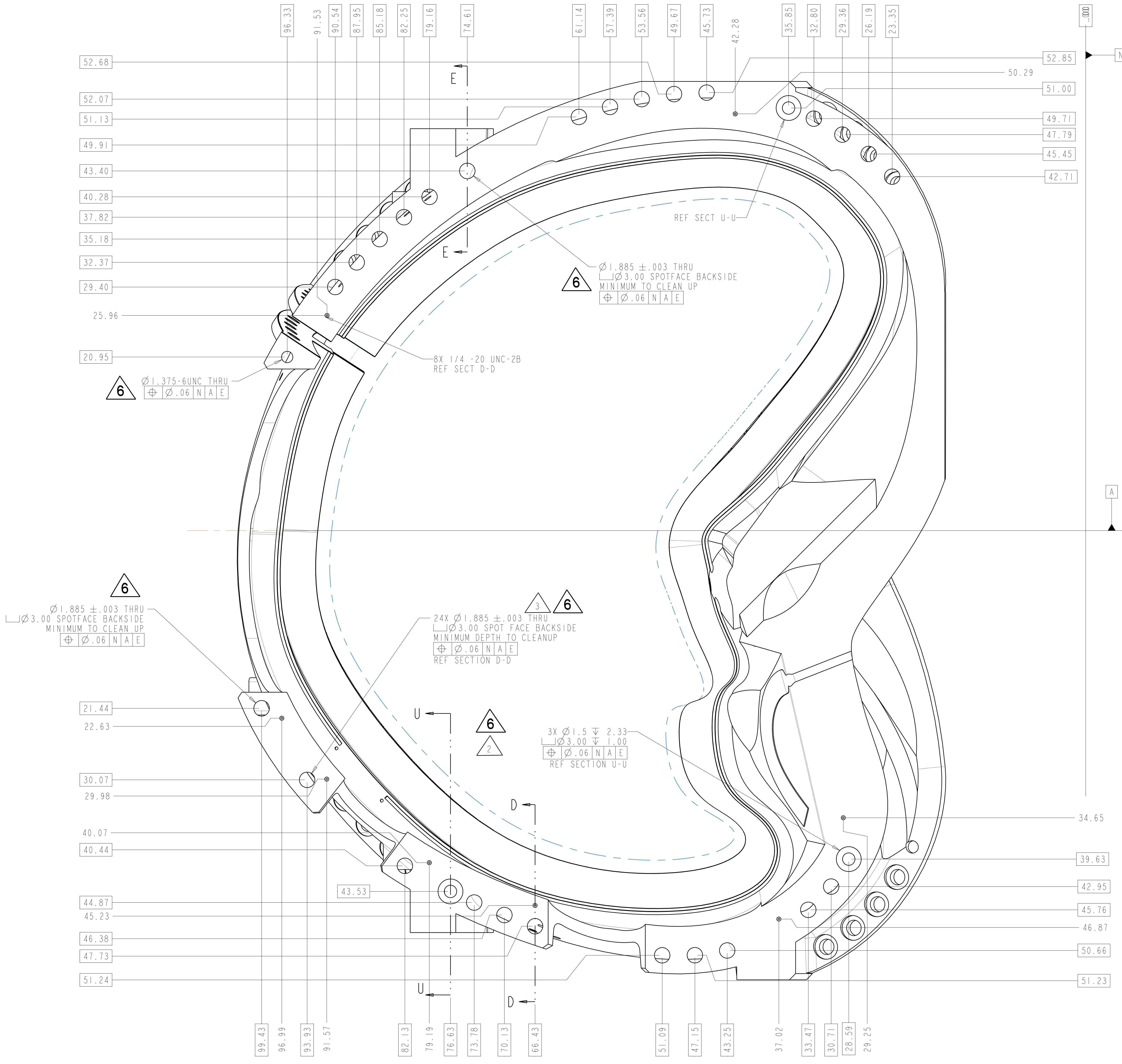
SECTION K-K  
 SCALE 0.50

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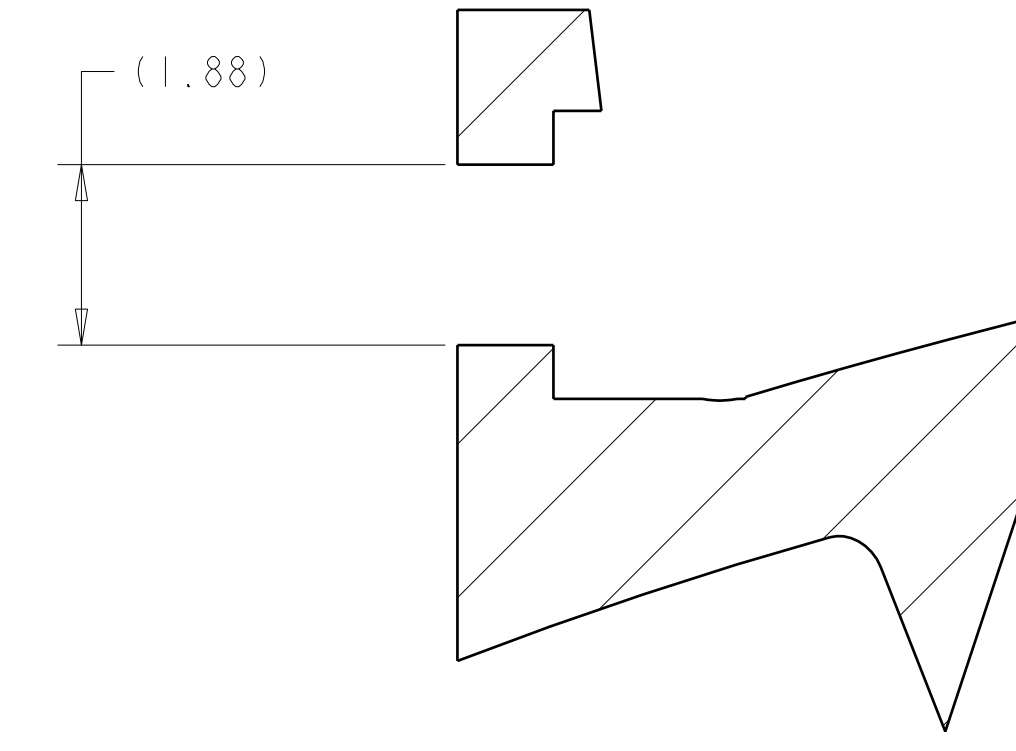
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| <b>UT-BATTELLE</b><br>NATIONAL COMPACT STELLARATOR EXPERIMENT<br>PRODUCTION WINDING FORM TYPE-A  |           |      |    |        |      |       |     |
| VERSION NO.  | PLANT     | BLDG | FL | SHT OF | TYPE | CLASS |     |
| 13   | X-10      | 5700 | 3  | 4      | 11   | S     | U   |
| RELEASE LEVEL  | SEI41-114 |      |    |        |      |       | REV |
| Fabrication  |           |      |    |        |      |       | 6   |

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 SEI41-114

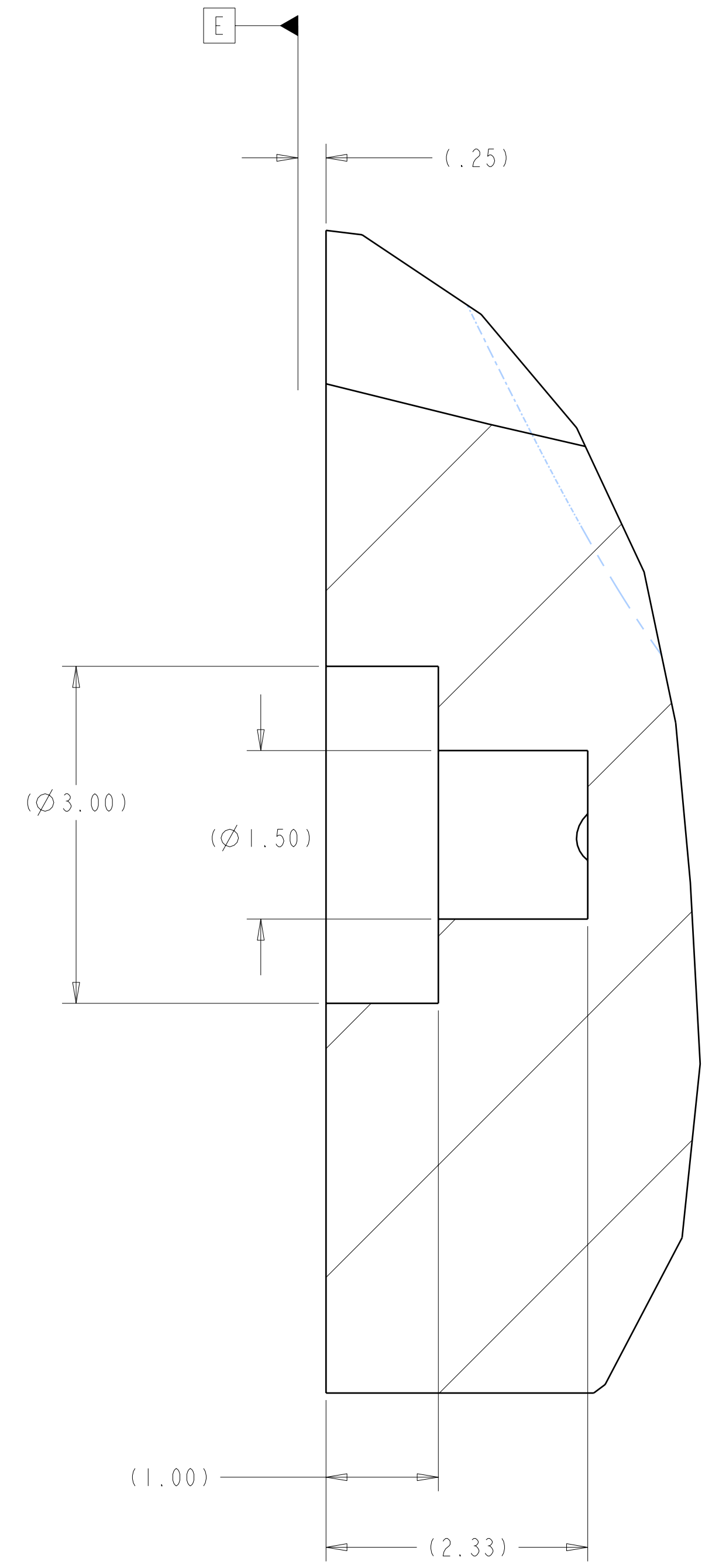
FOR NOTES AND PARTS LIST SEE SHEET 1



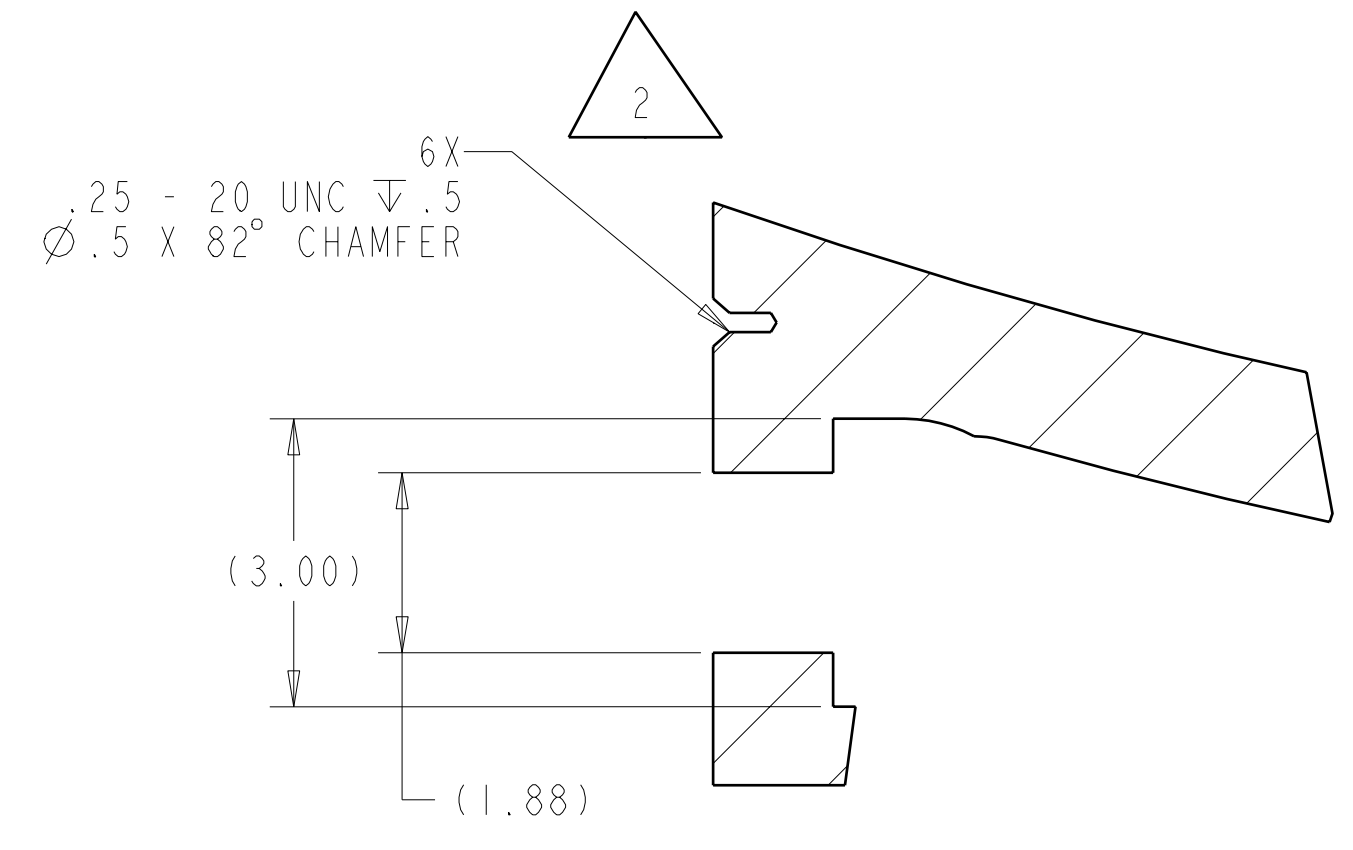
VIEW AT DATUM E  
 SCALE 0.20



SECTION E-E  
 SCALE 0.50



SECTION U-U  
 SCALE 1.00



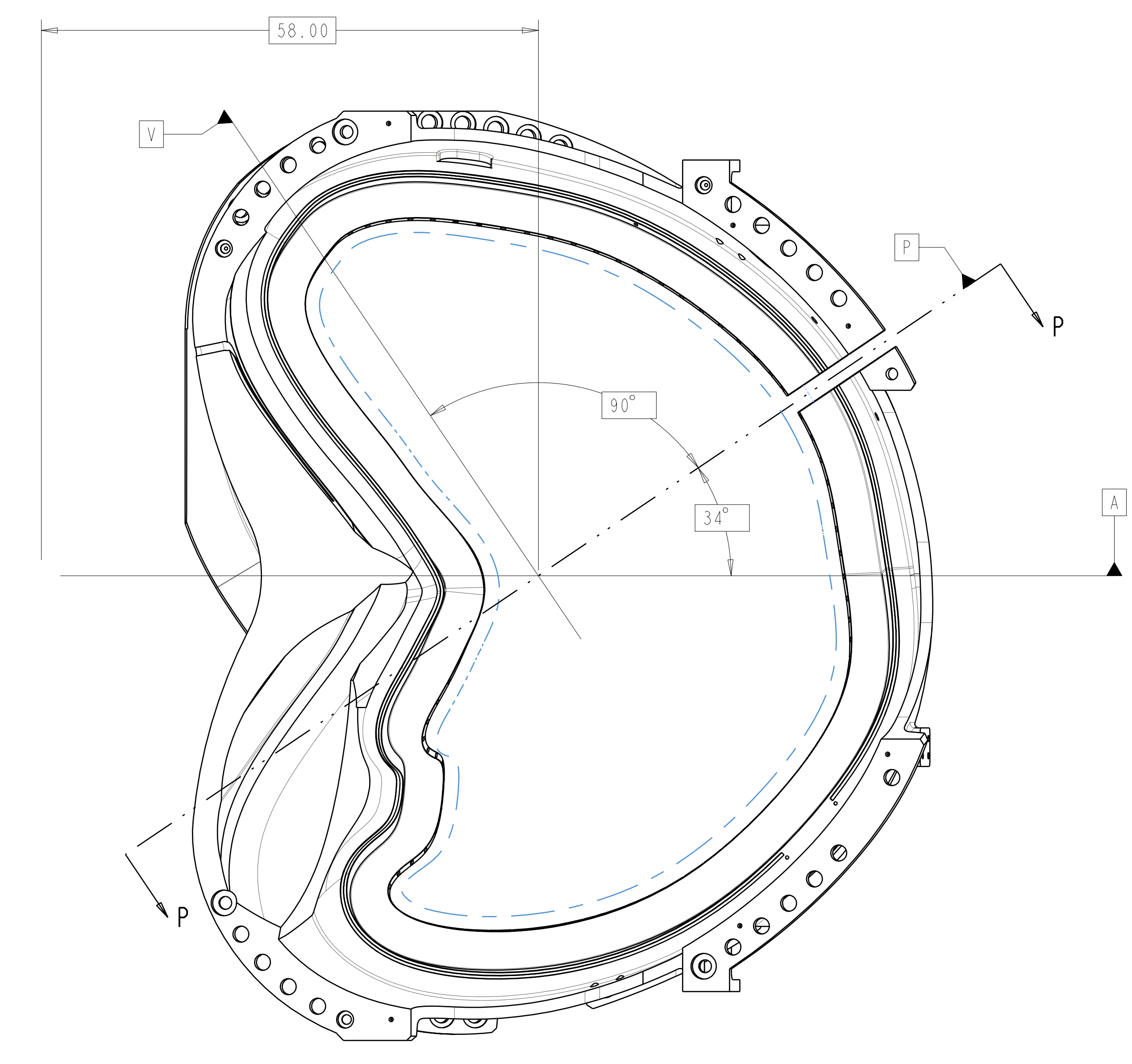
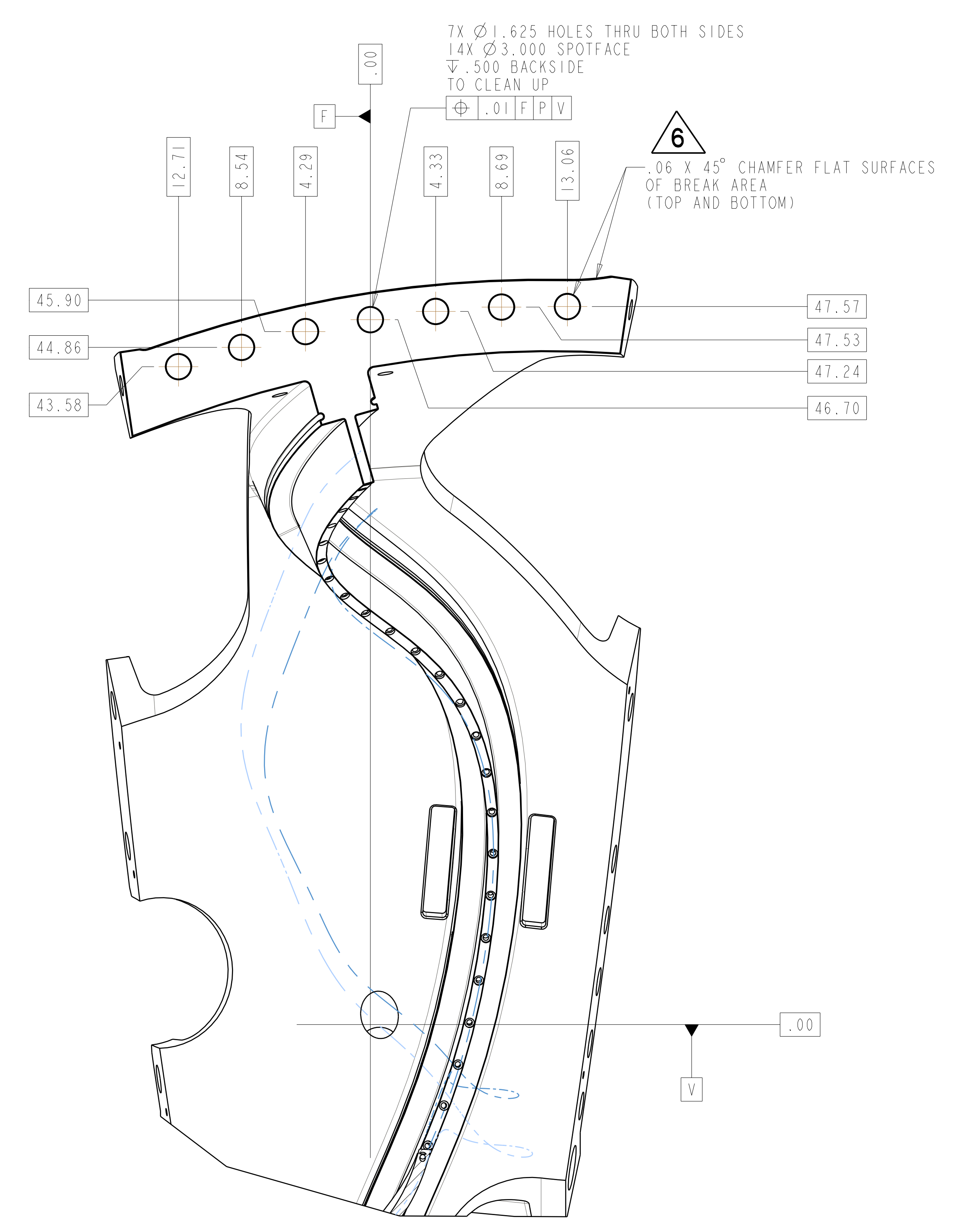
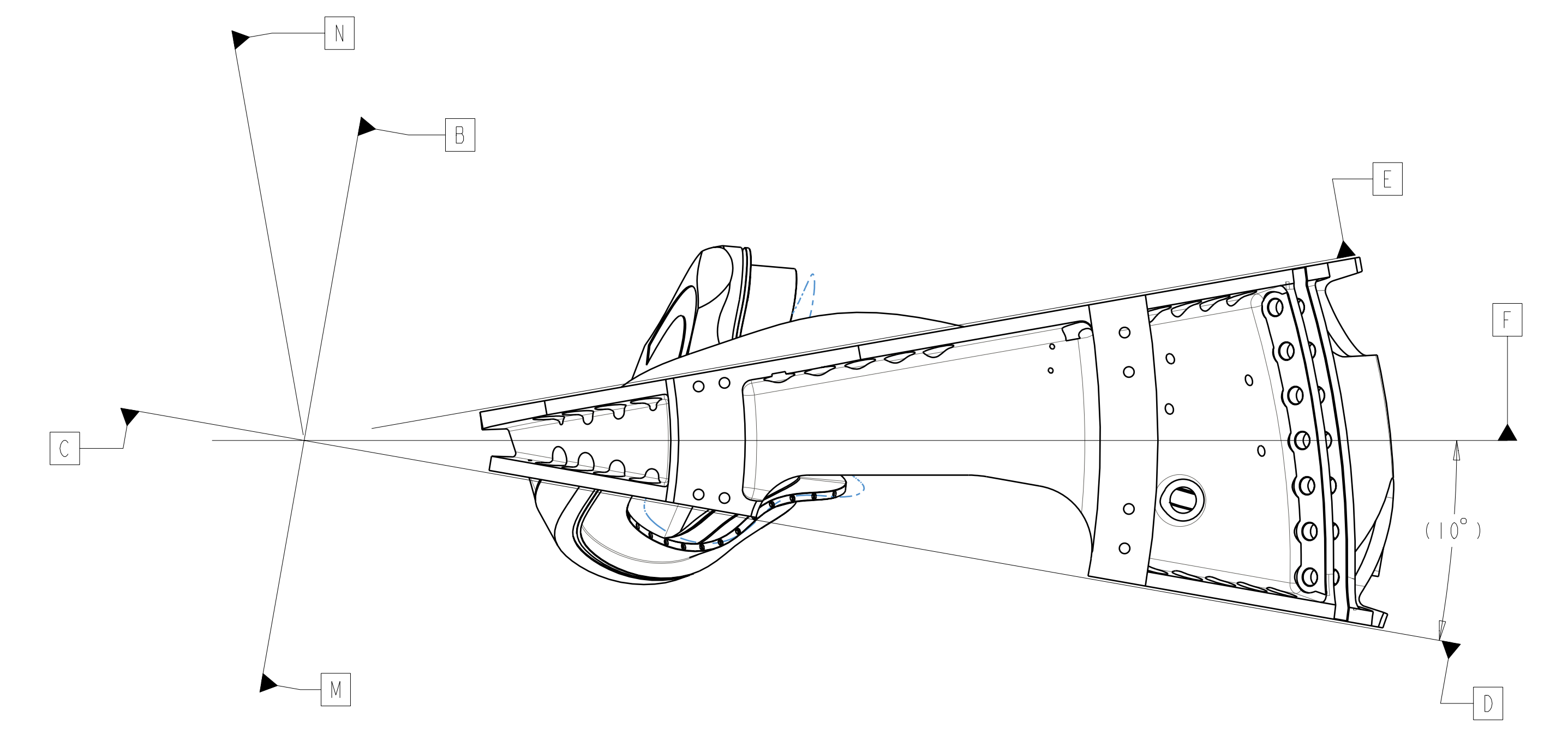
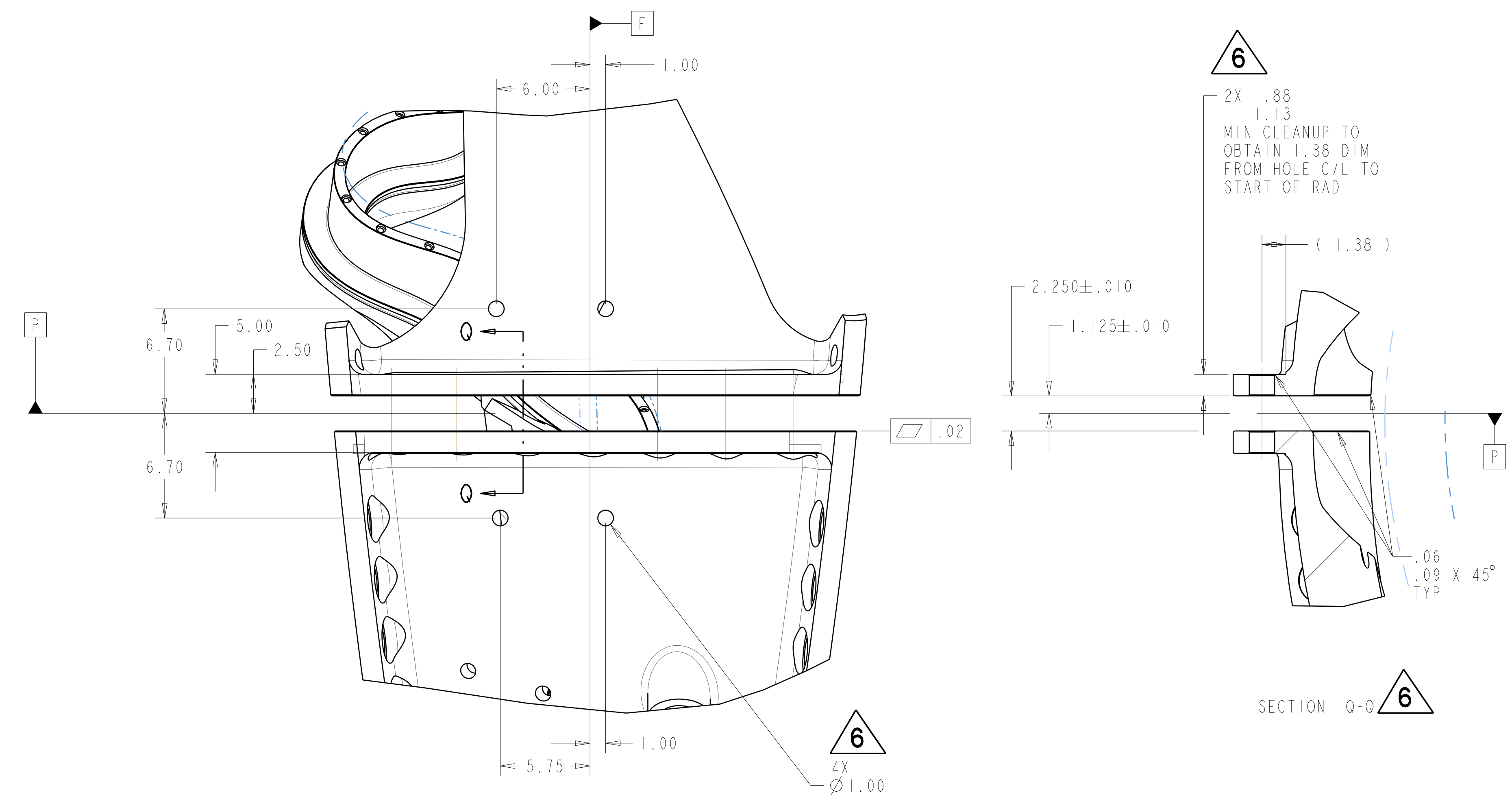
SECTION D-D  
 SCALE 0.50

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| Oak Ridge National Laboratory<br>managed for the DEPARTMENT OF ENERGY under<br>U.S. GOVERNMENT contract DE-AC05-00OR22725<br>UT-BATTELLE, LLC, Oak Ridge, Tennessee<br>PROJECT NAME: |           |      |    |        |      |       |     |
| <b>UT-BATTELLE</b><br>NATIONAL COMPACT STELLARATOR EXPERIMENT  |           |      |    |        |      |       |     |
| PRODUCTION WINDING FORM TYPE-A   |           |      |    |        |      |       |     |
| VERSION NO.  | PLANT     | BLDG | FL | SHT OF | TYPE | CLASS |     |
| 13   | X-10      | 5700 | 3  | 5      | 11   | S     | U   |
| RELEASE LEVEL  | SEI41-114 |      |    |        |      |       | REV |
| Fabrication  |           |      |    |        |      |       | 6   |

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FOR NOTES AND PARTS LIST SEE SHEET 1



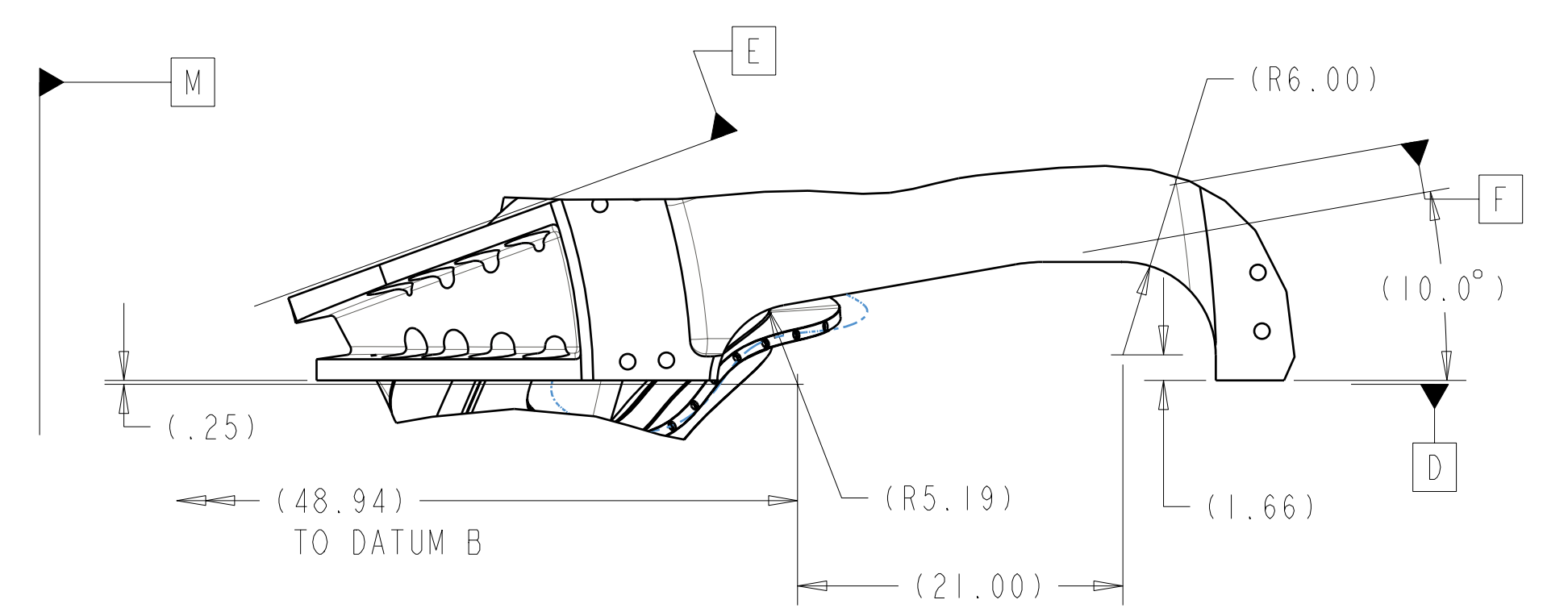
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PPPL Drafting:

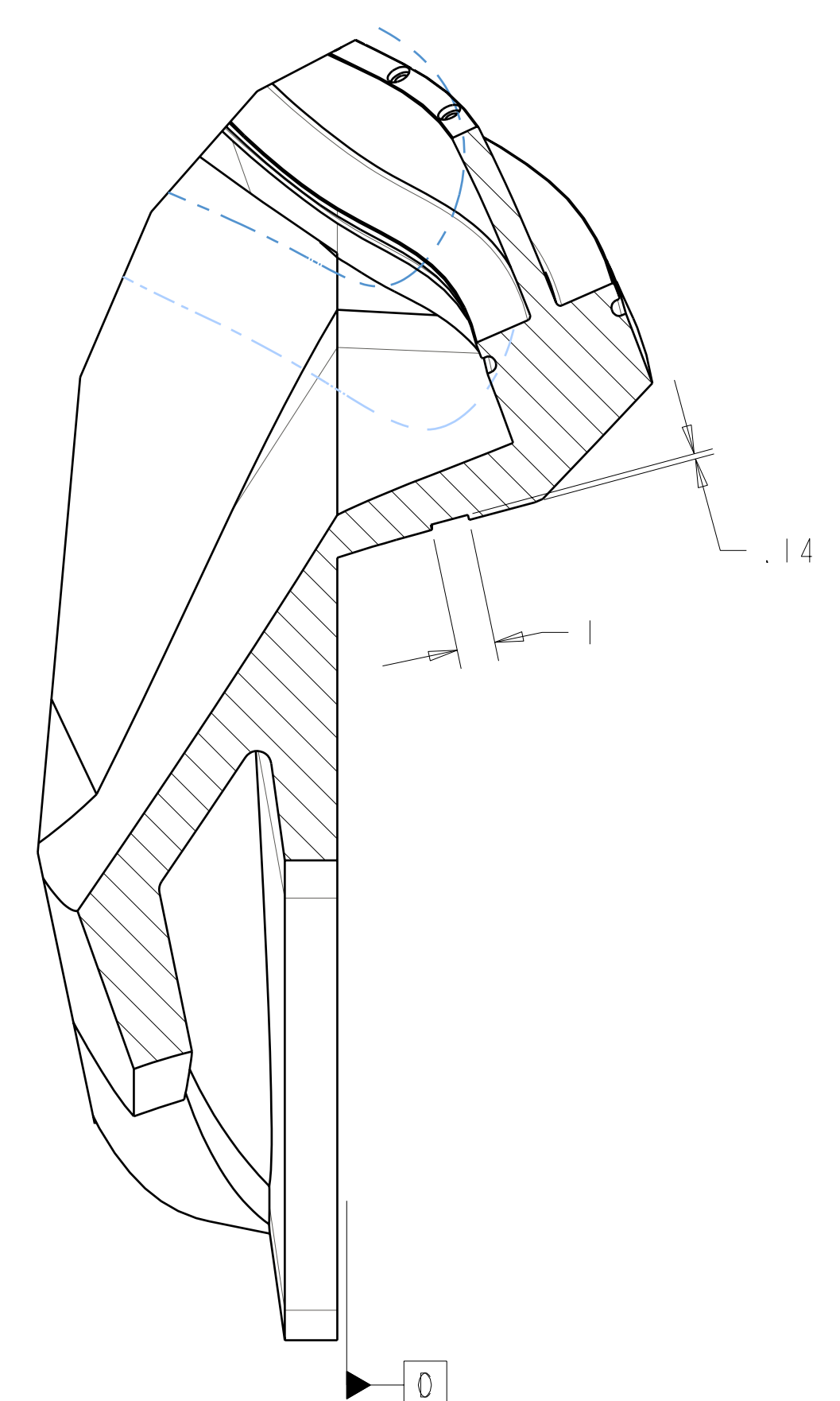
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| Oak Ridge National Laboratory<br>managed for the DEPARTMENT OF ENERGY under<br>U.S. GOVERNMENT contract DE-AC05-00OR22725<br>UT-BATTELLE, LLC, Oak Ridge, Tennessee<br>PROJECT NAME |           |      |    |        |      |       |     |
| <b>UT-BATTELLE</b><br><b>NATIONAL COMPACT STELLARATOR EXPERIMENT</b><br>PRODUCTION WINDING FORM TYPE-A  |           |      |    |        |      |       |     |
| VERSION NO.   | PLANT     | BLDG | FL | SHT OF | TYPE | CLASS |     |
| 13  | X-10      | 5700 | 3  | 6      | 11   | S     | U   |
| RELEASE LEVEL   | SEI41-114 |      |    |        |      |       | REV |
| Fabrication   |           |      |    |        |      |       | 6   |

SEI41-114

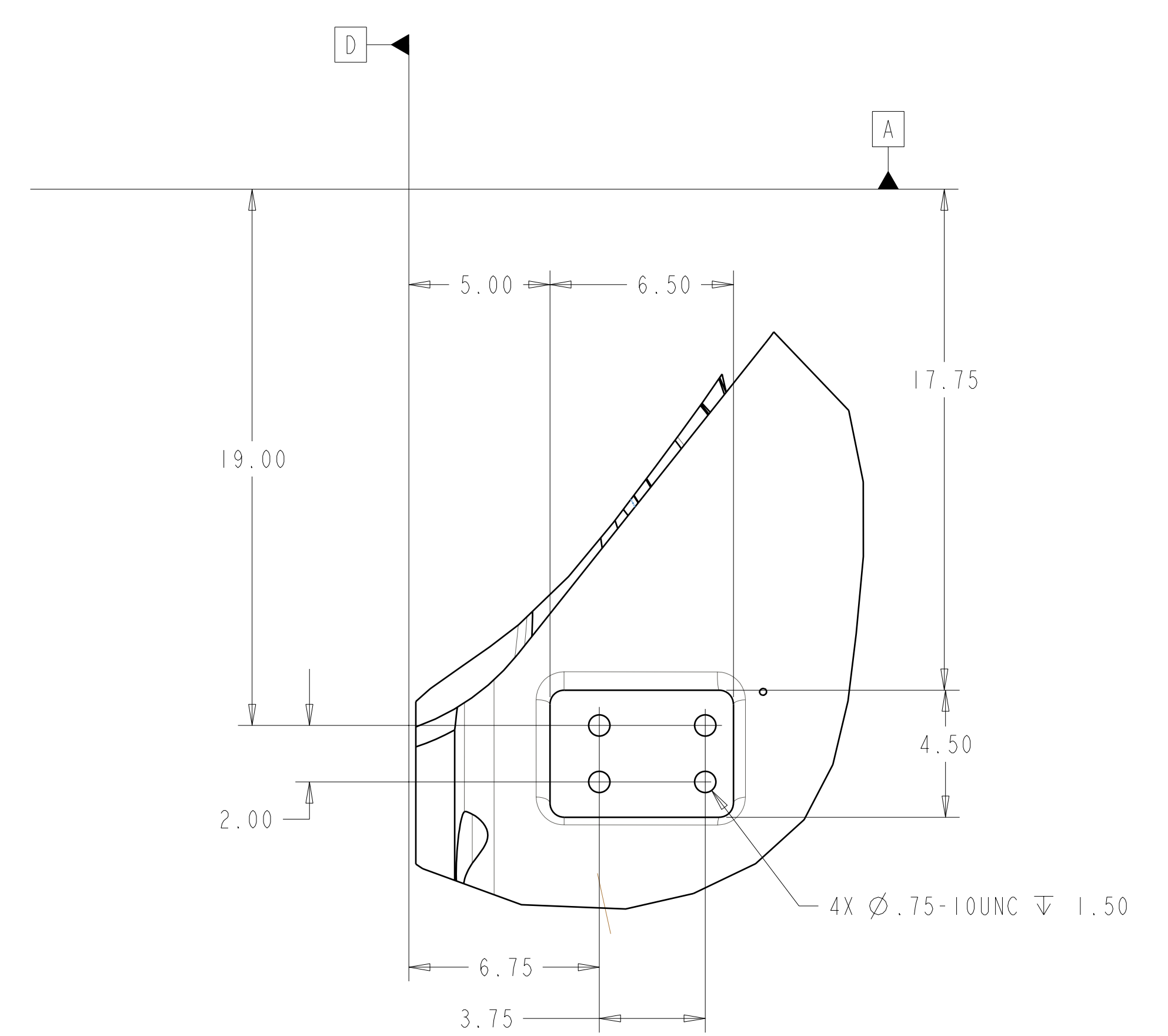
FOR NOTES AND PARTS LIST SEE SHEET 1



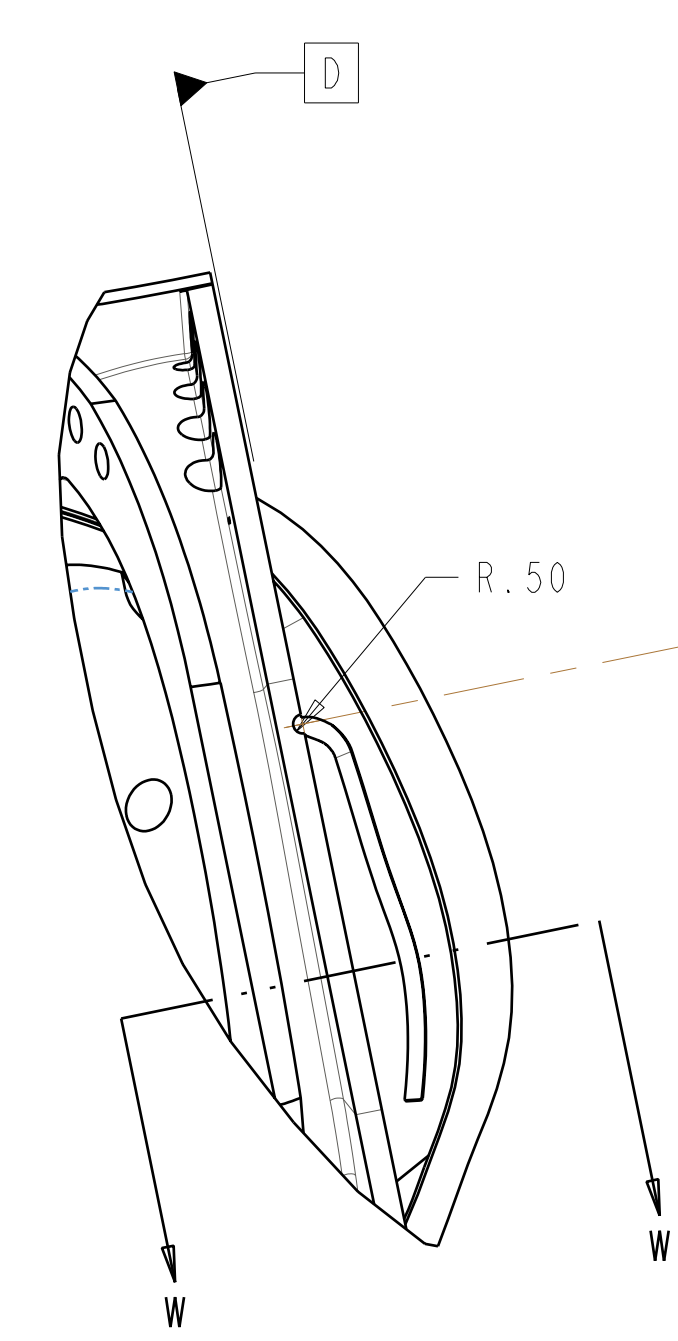
TOP VIEW 6



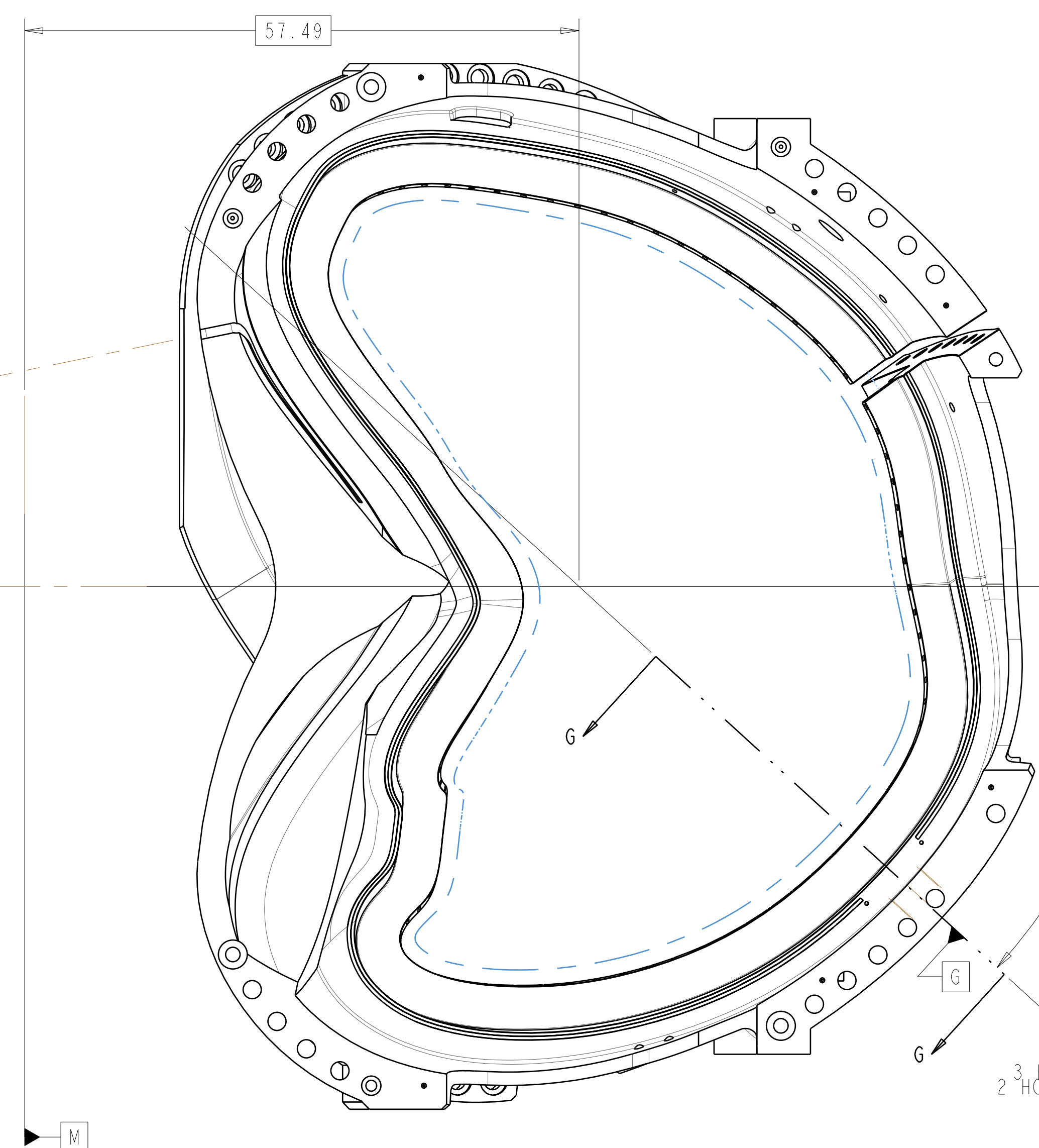
SECTION W-W  
WING SHIM POCKET  
SCALE 0.25



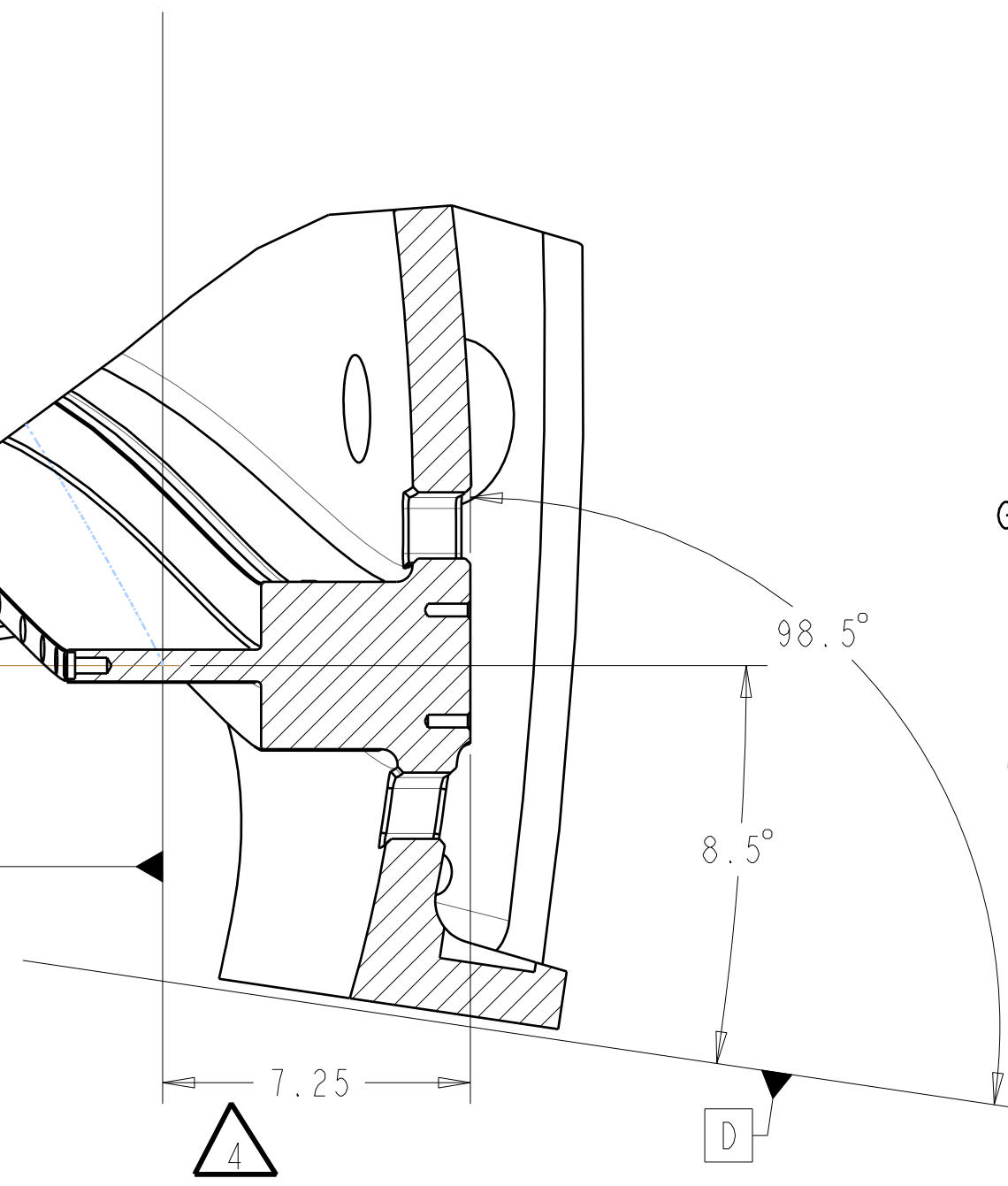
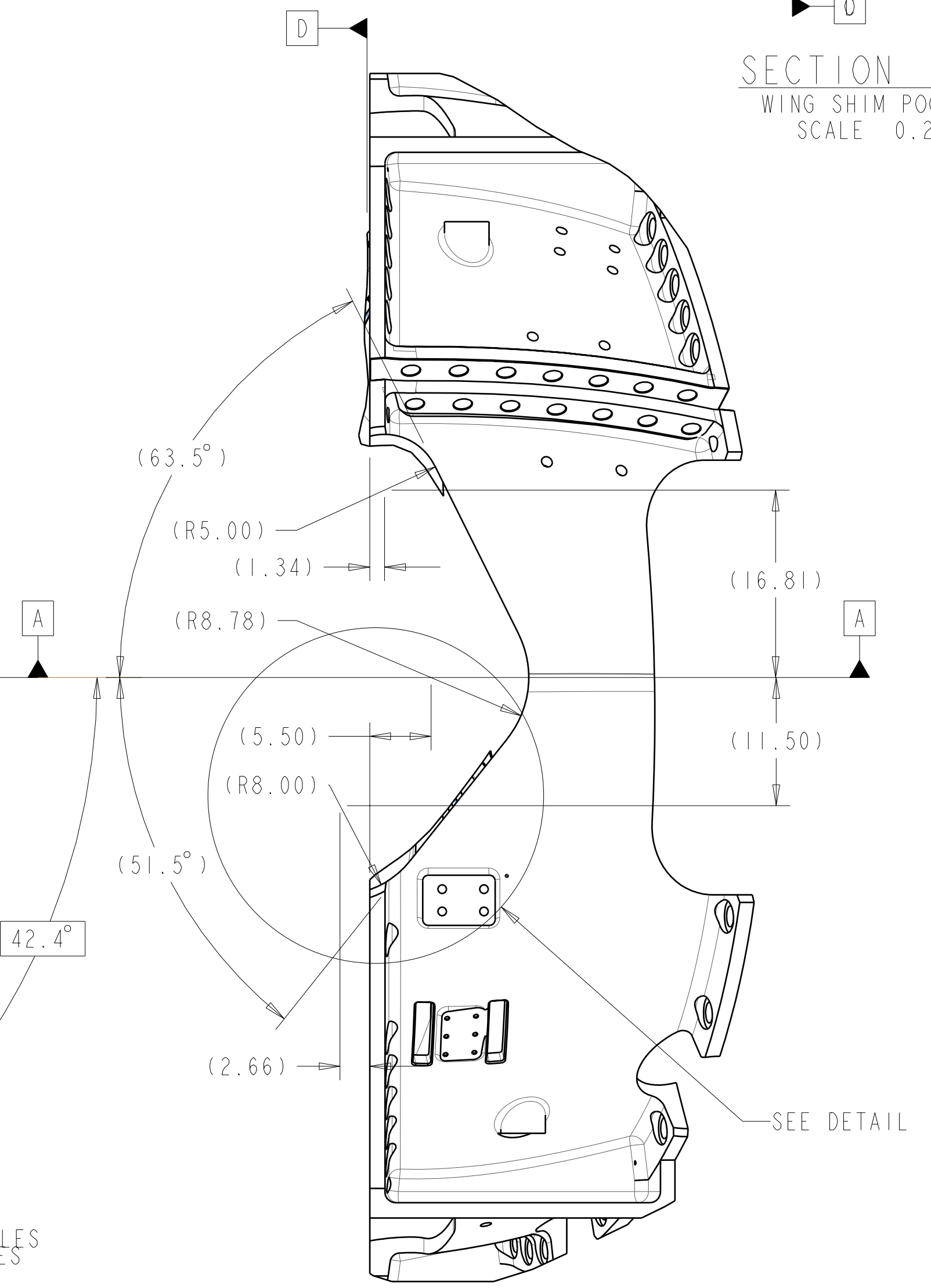
DETAIL J  
ASSEMBLY FIXTURE MOUNT  
SCALE 0.25



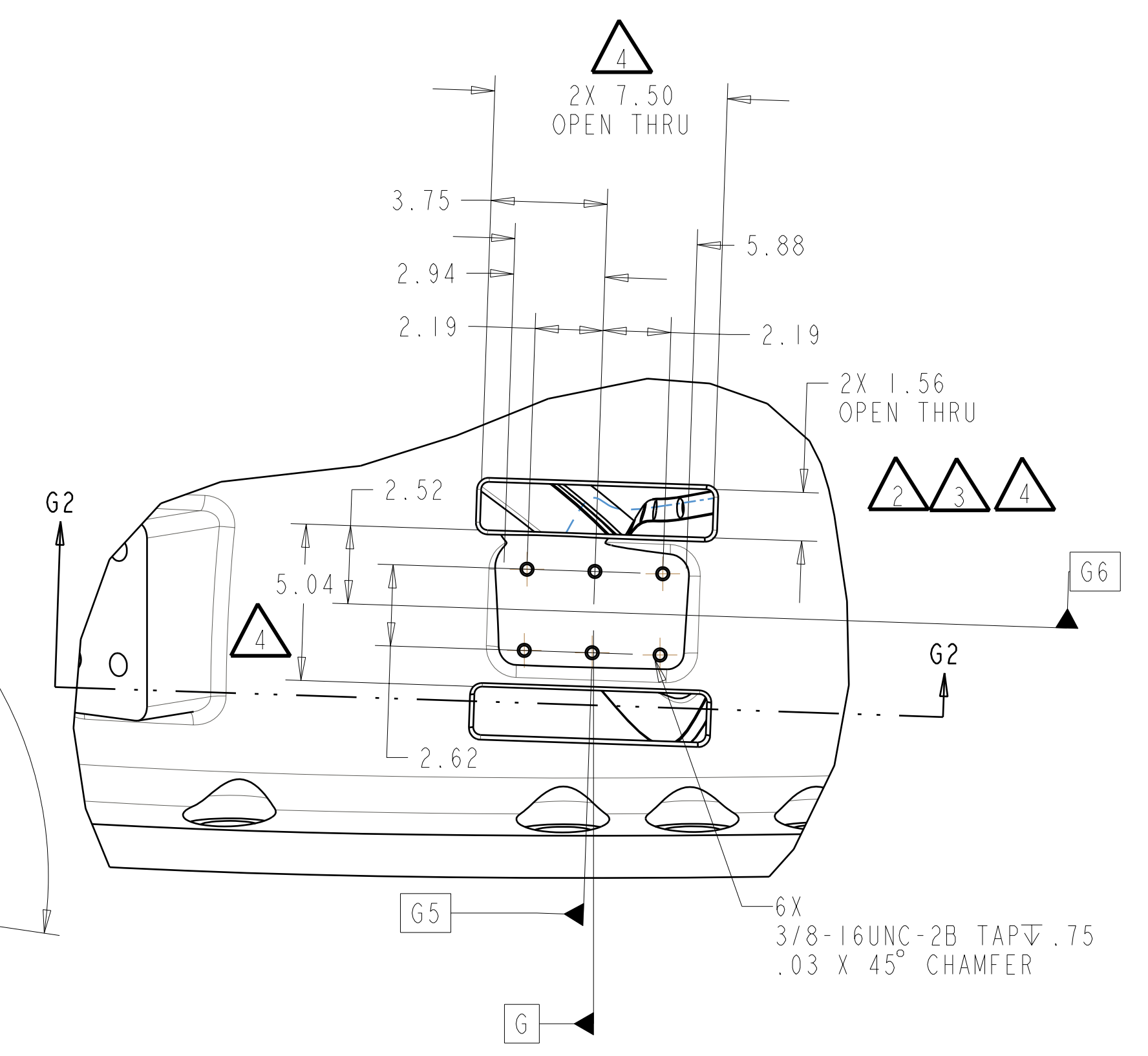
AUX VIEW TO SHOW  
WING SHIM POCKET



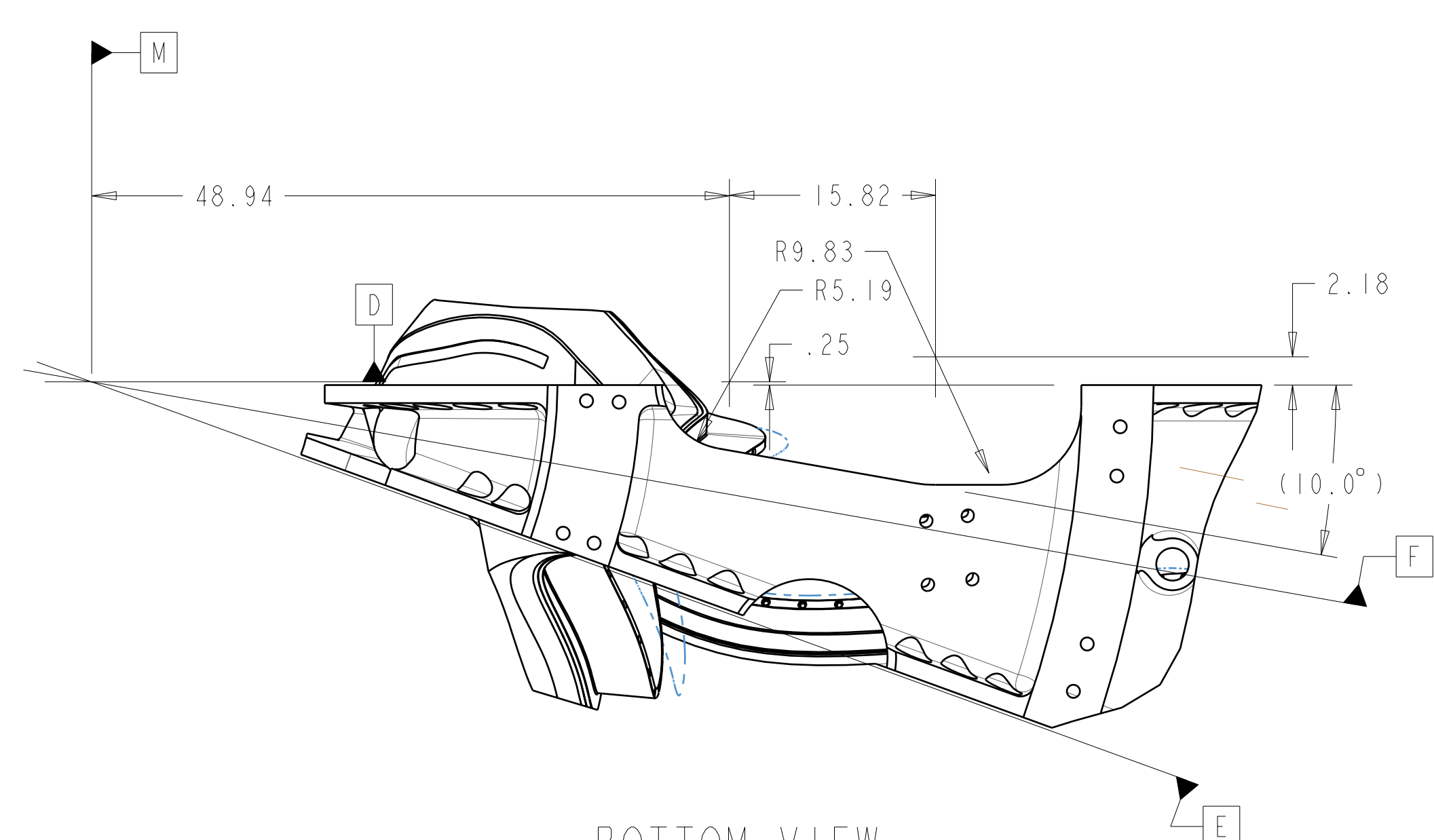
VIEW AT DATUM D  
SCALE 0.1



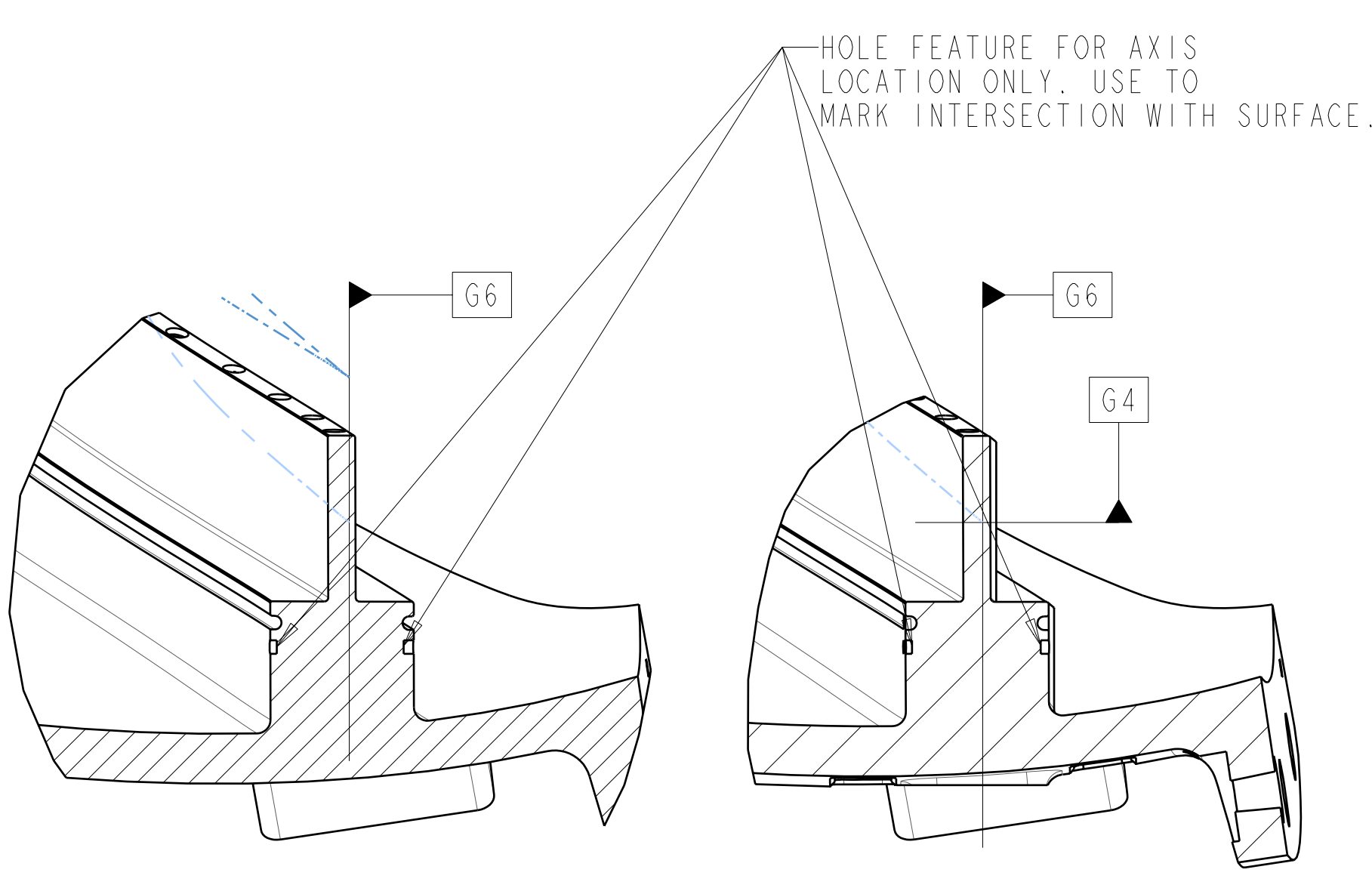
SECTION G-G  
LEAD BLOCK DETAIL  
SCALE 0.25



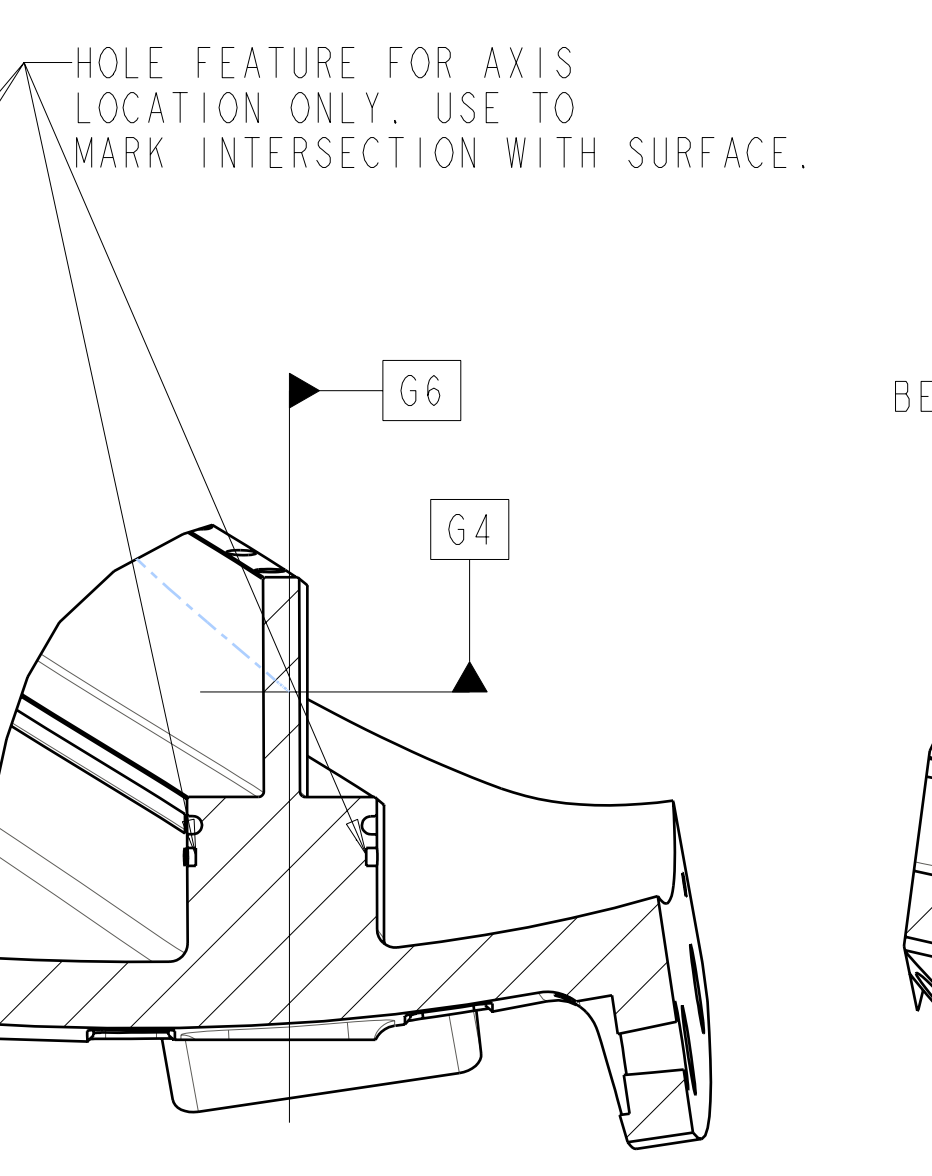
6 SOME FEATURES NOT SHOWN FOR CLARITY



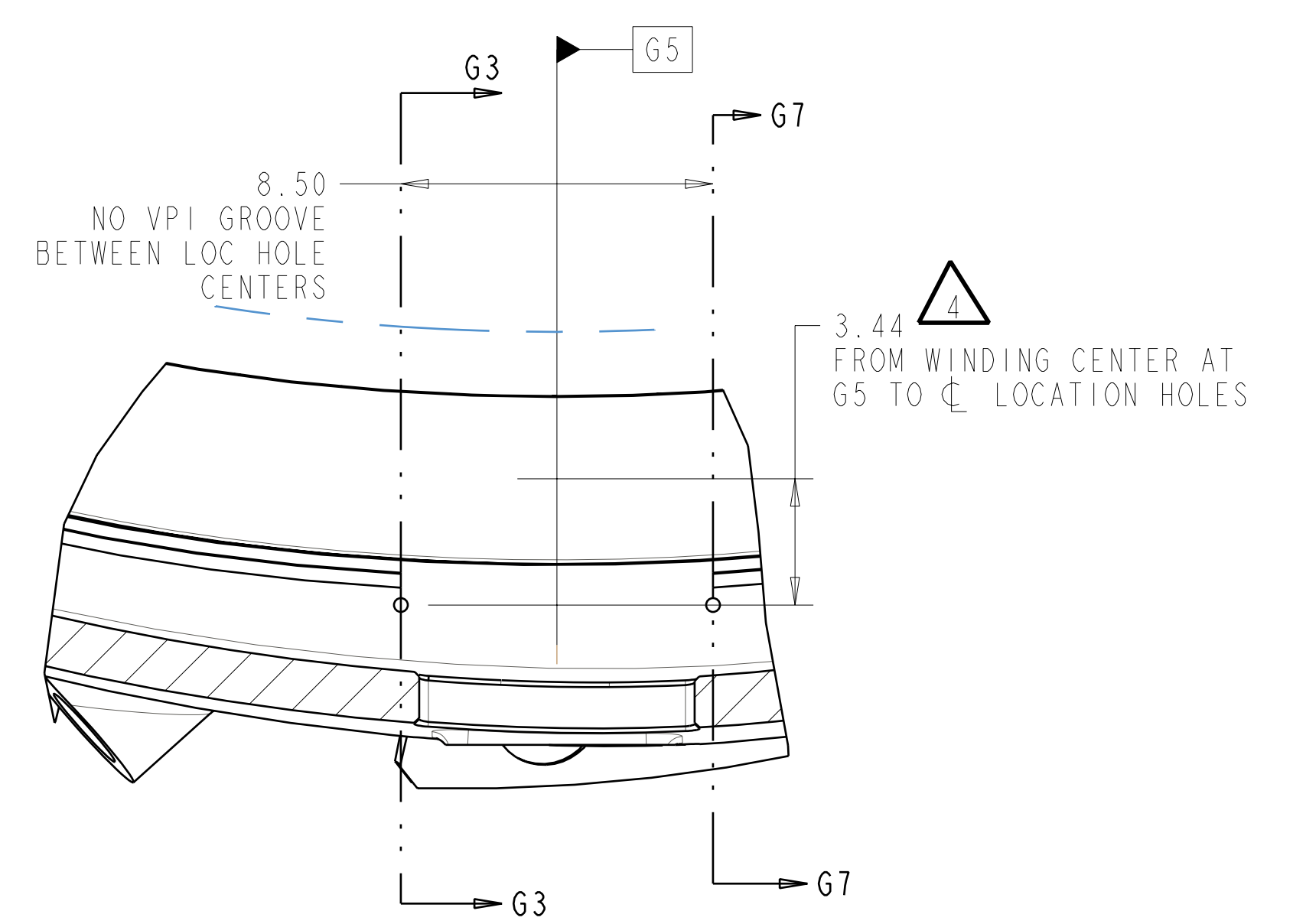
BOTTOM VIEW



SECTION G7-G7



SECTION G3-G3

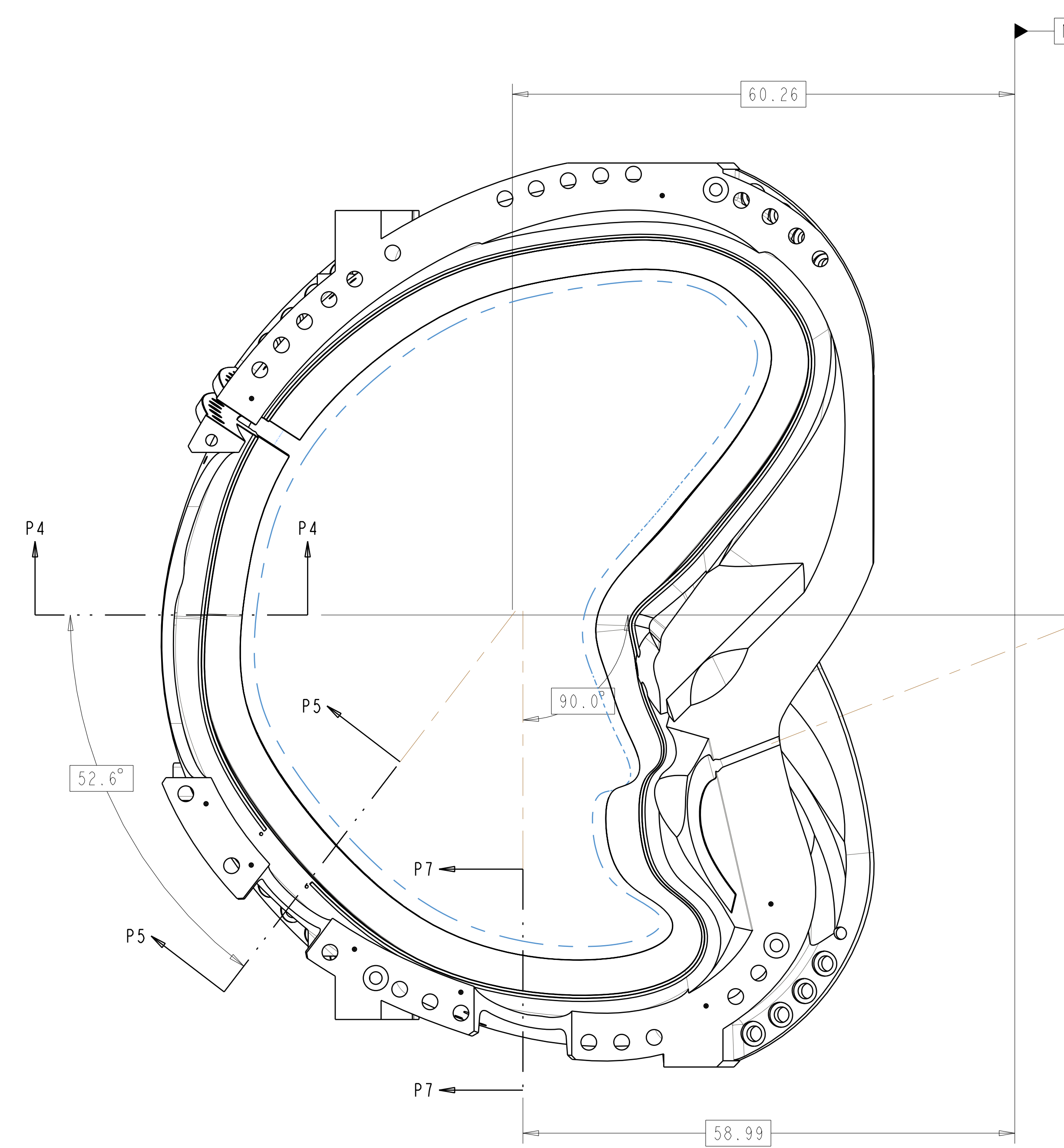


SECTION G2-G2  
SCALE 0.250

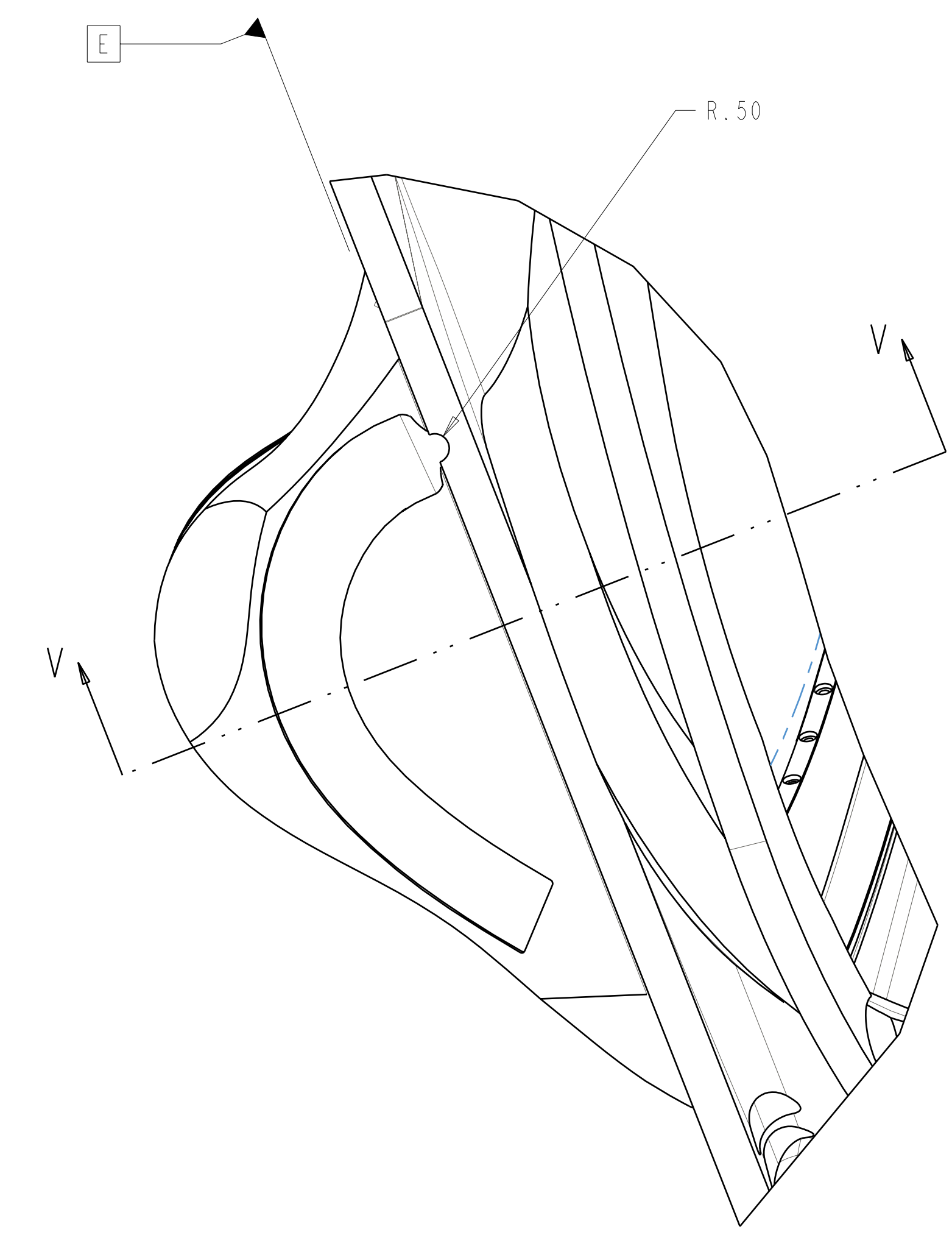
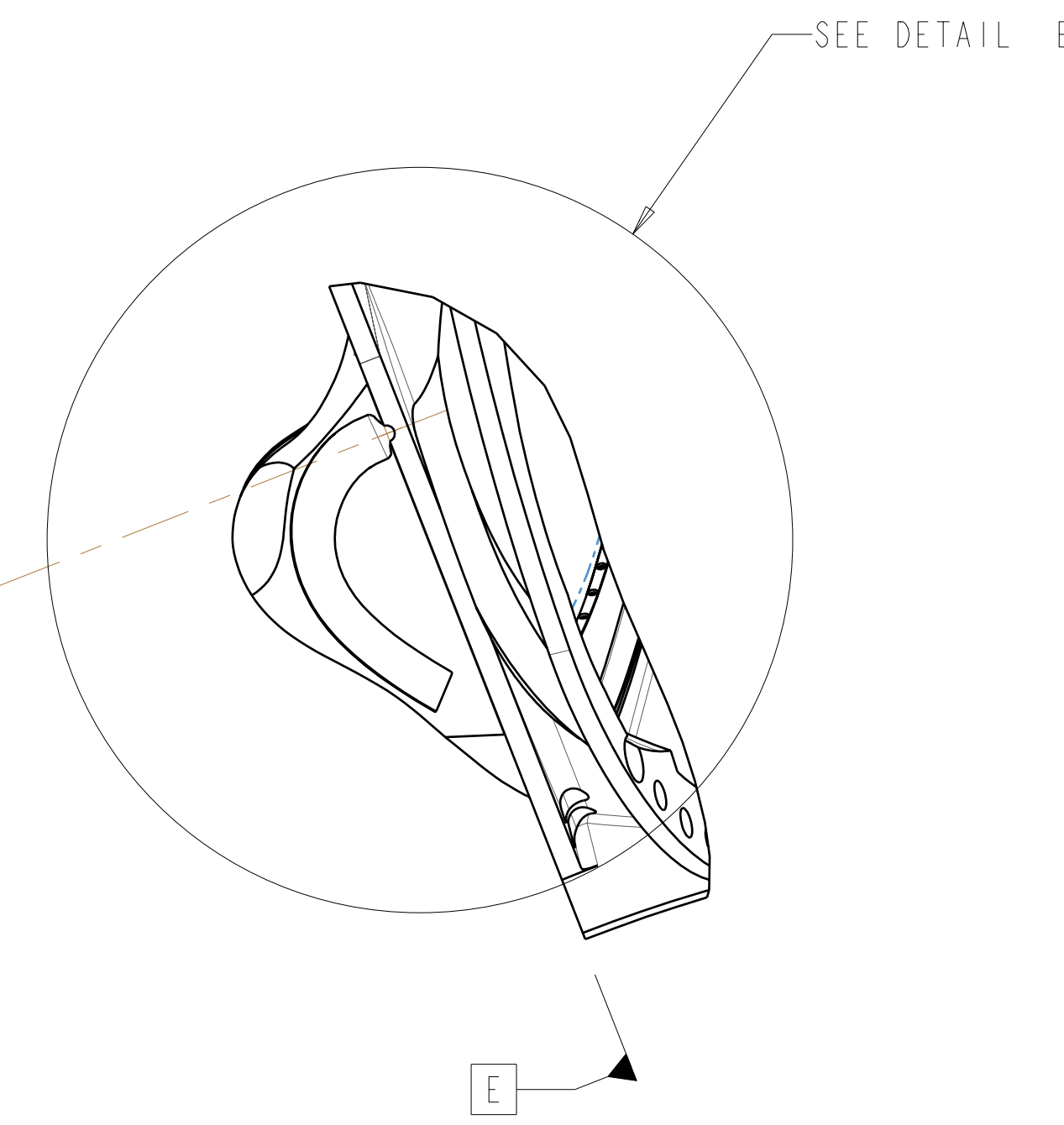
**RELEASED FOR  
FABRICATION / INSTALLATION**  
PPPL Drafting:

|  |       |           |    |        |      |       |       |
|--|-------|-----------|----|--------|------|-------|-------|
| Oak Ridge National Laboratory<br>managed for the DEPARTMENT OF ENERGY under<br>U.S. GOVERNMENT contract DE-AC05-00OR22725<br>UT-BATTELLE, LLC, Oak Ridge, Tennessee<br>PROJECT NAME: |       |           |    |        |      |       |       |
| <b>NATIONAL COMPACT STELLARATOR EXPERIMENT</b>   |       |           |    |        |      |       |       |
| <b>PRODUCTION WINDING FORM TYPE-A</b>  |       |           |    |        |      |       |       |
| VERSION NO.  | PLANT | BLDG      | FL | SHT OF | TYPE | CLASS |       |
| 13   | X-10  | 5700      | 3  | 7      | 11   | S     | U     |
| RELEASE LEVEL  |       | SEI41-114 |    |        |      |       |       |
| Fabrication  |       |           |    |        |      |       |       |
|  |       |           |    |        |      |       | REV 6 |

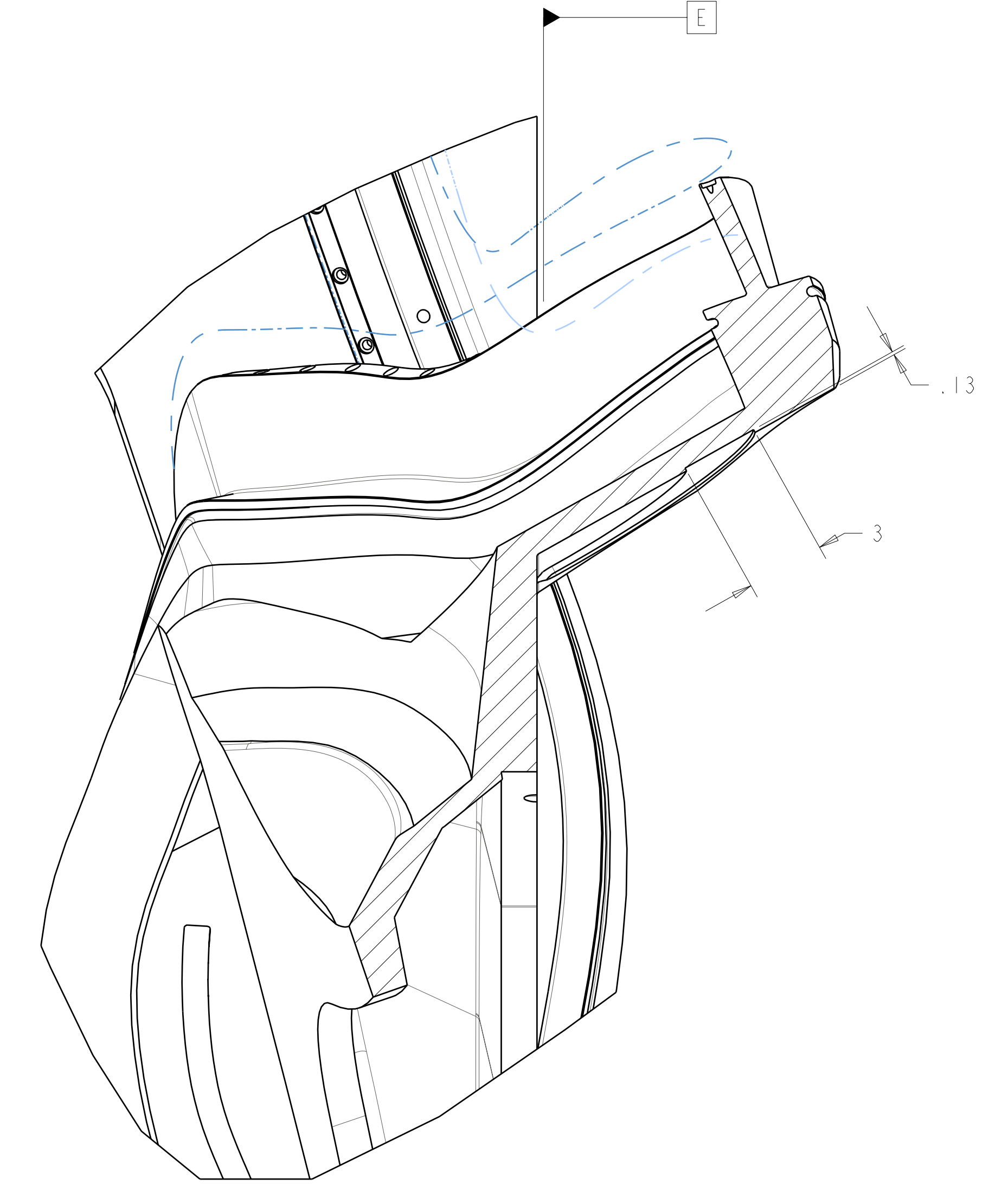
FOR NOTES AND PARTS LIST SEE SHEET 1



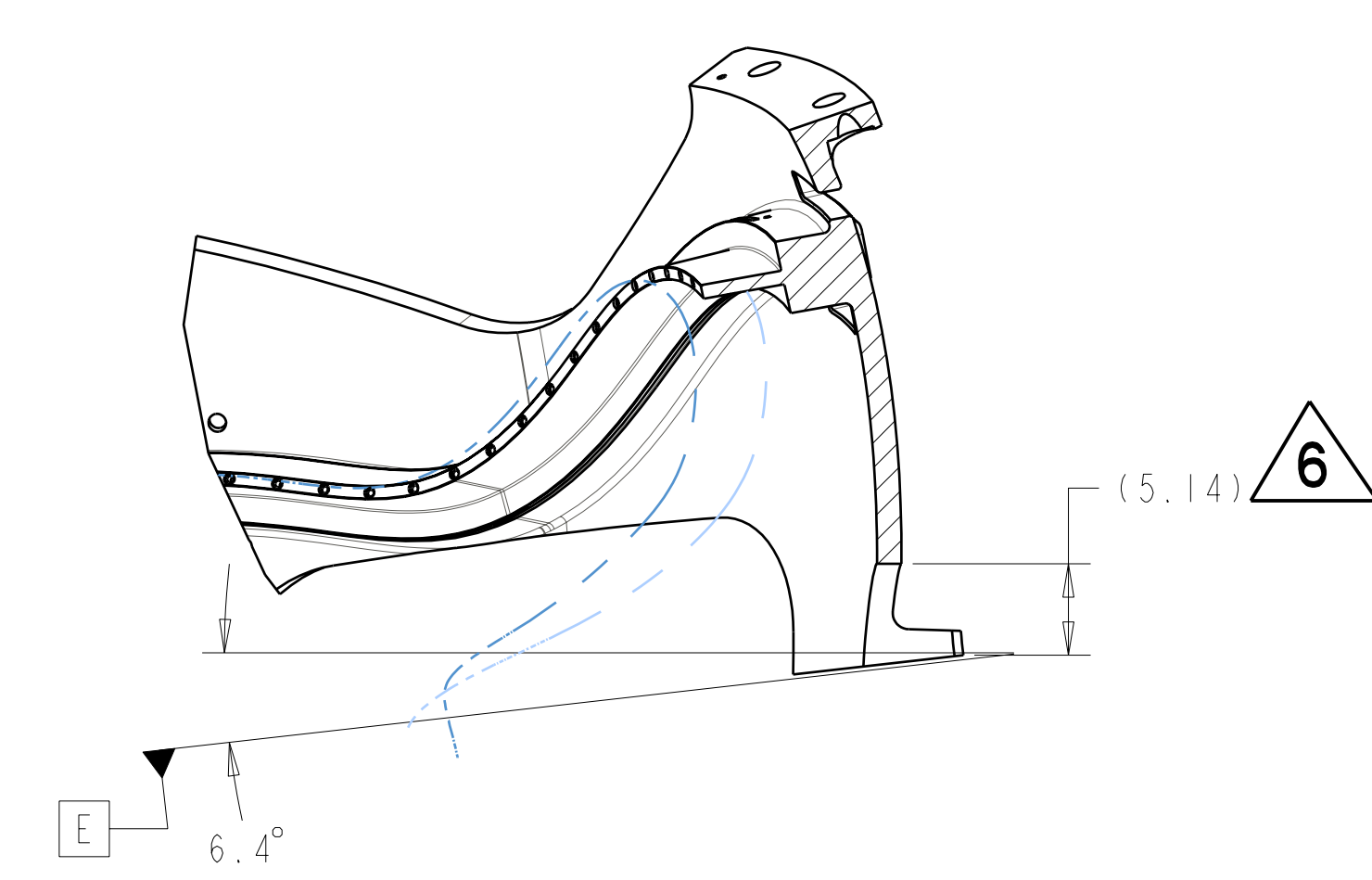
VIEW AT DATUM E  
 SCALE 0.1



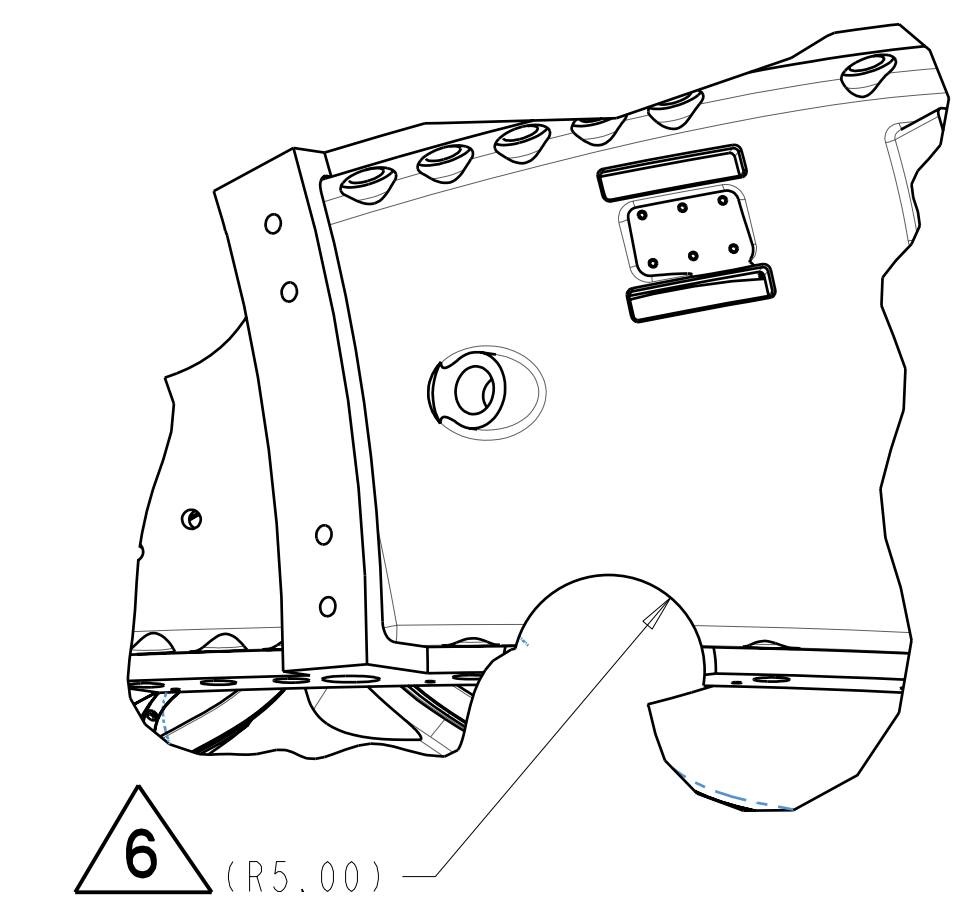
DETAIL E  
 WING SHIM POCKET  
 SCALE 0.25



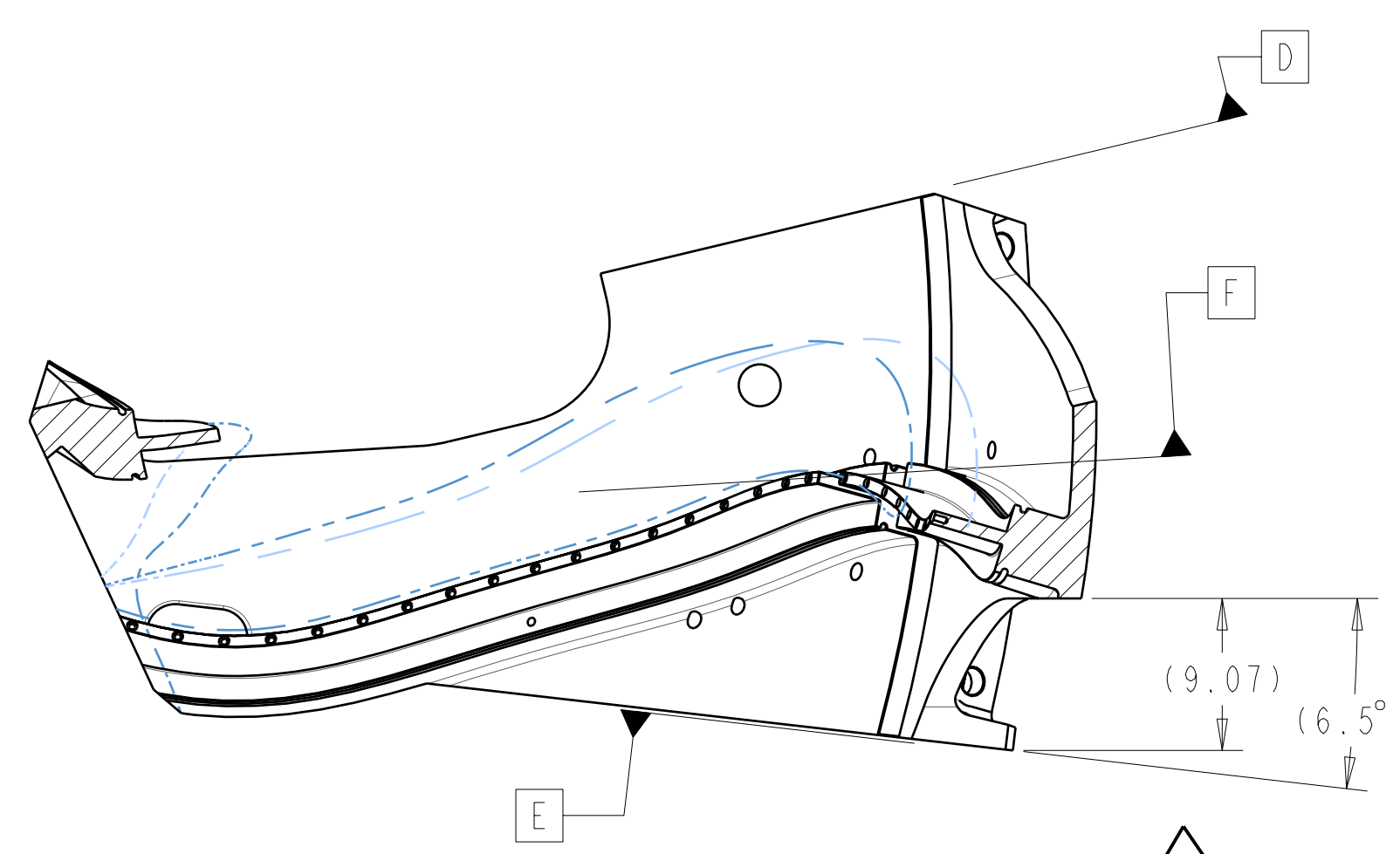
SECTION V-V  
 SCALE 0.25



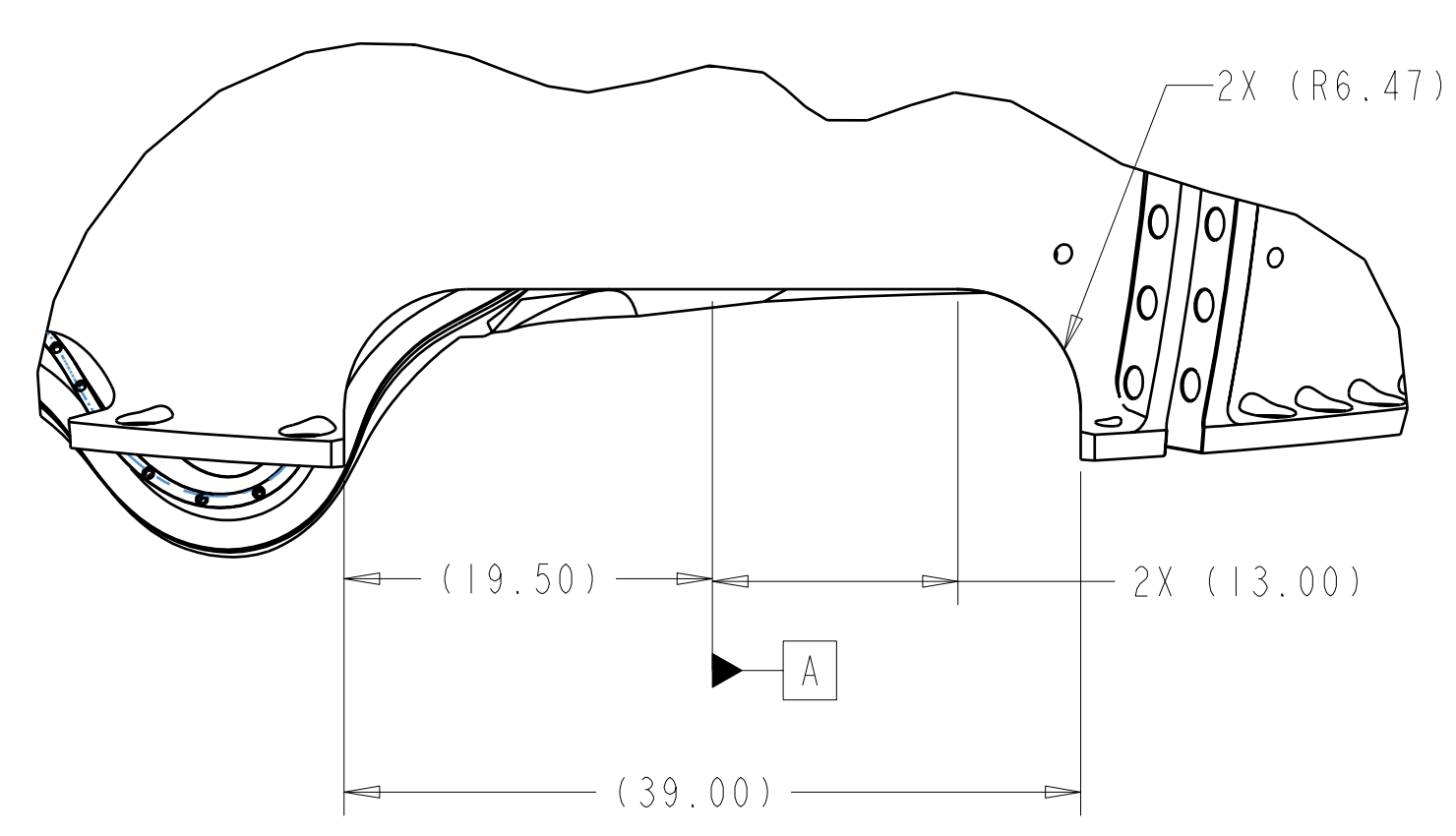
SECTION P5-P5  
 SCALE 0.1



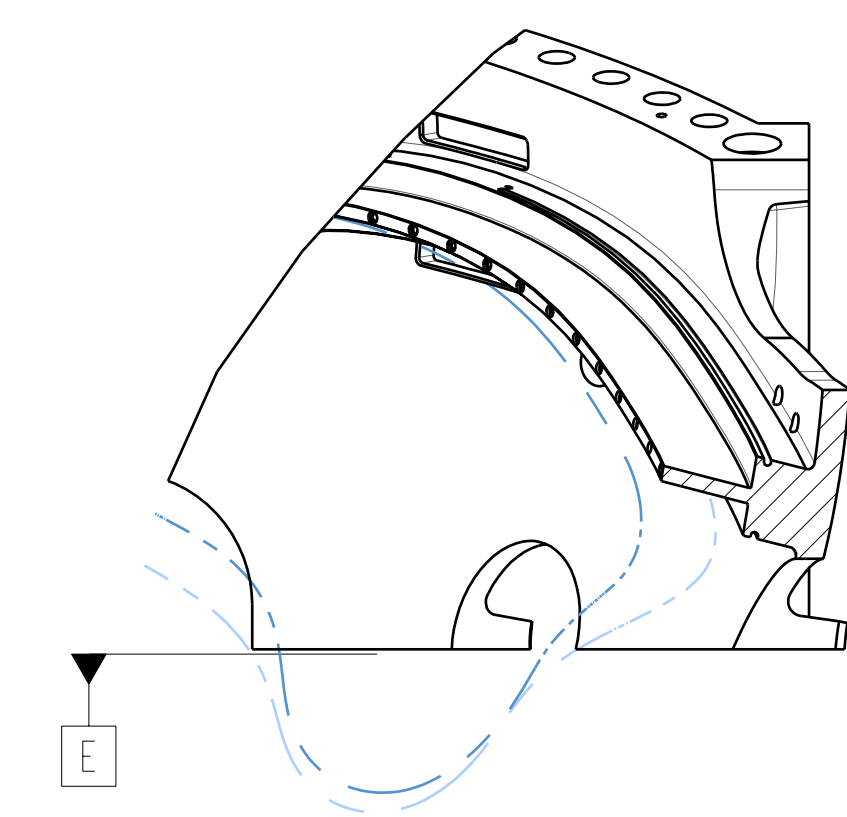
SOME FEATURES NOT SHOWN FOR CLARITY



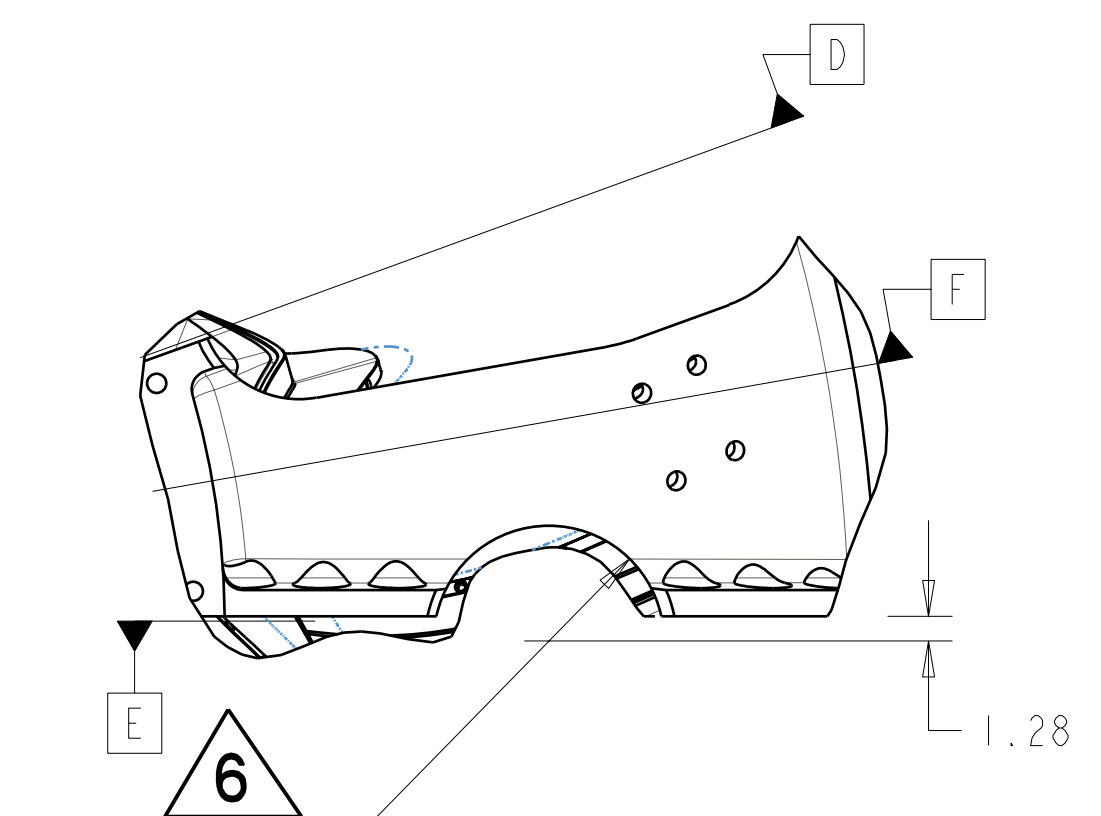
SECTION P4-P4  
 SCALE 0.1



6



SECTION P7-P7  
 SCALE 0.1



SOME FEATURES NOT SHOWN FOR CLARITY

**RELEASED FOR FABRICATION / INSTALLATION**  
 PPPL Drafting:

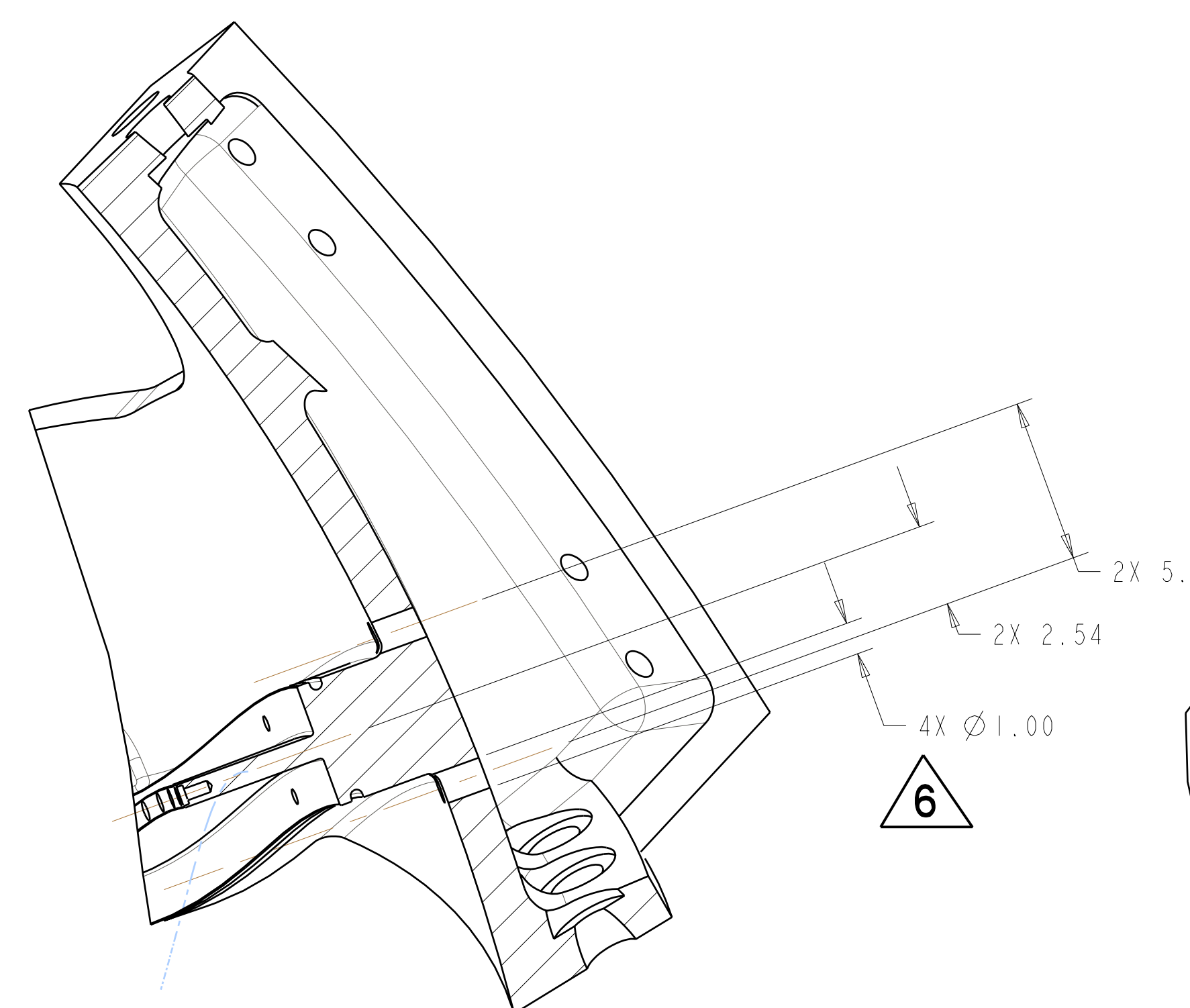
|  |           |      |    |        |      |       |     |
|--|-----------|------|----|--------|------|-------|-----|
| Oak Ridge National Laboratory<br>managed for the DEPARTMENT OF ENERGY under<br>U.S. GOVERNMENT contract DE-AC05-00OR22725<br>UT-BATTELLE, LLC, Oak Ridge, Tennessee<br>PROJECT NAME: |           |      |    |        |      |       |     |
| <b>NATIONAL COMPACT STELLARATOR EXPERIMENT</b>   |           |      |    |        |      |       |     |
| PRODUCTION WINDING FORM TYPE-A   |           |      |    |        |      |       |     |
| VERSION NO.  | PLANT     | BLDG | FL | SHT OF | TYPE | CLASS |     |
| 13   | X-10      | 5700 | 3  | 8      | 11   | S     | U   |
| RELEASE LEVEL  | SEI41-114 |      |    |        |      |       | REV |
| Fabrication  |           |      |    |        |      |       | 6   |

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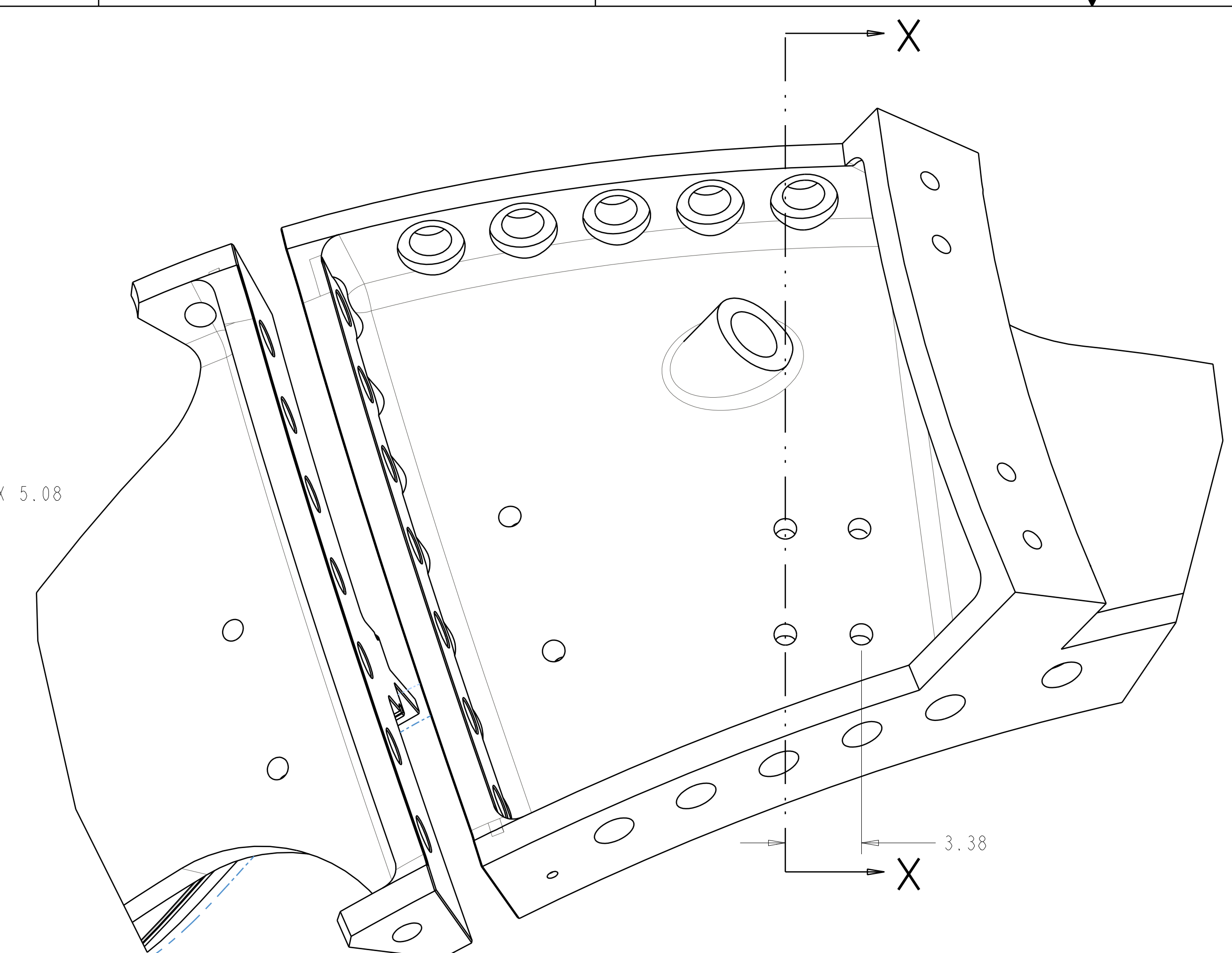
SEI41-114



FOR NOTES AND PARTS LIST SEE SHEET 1

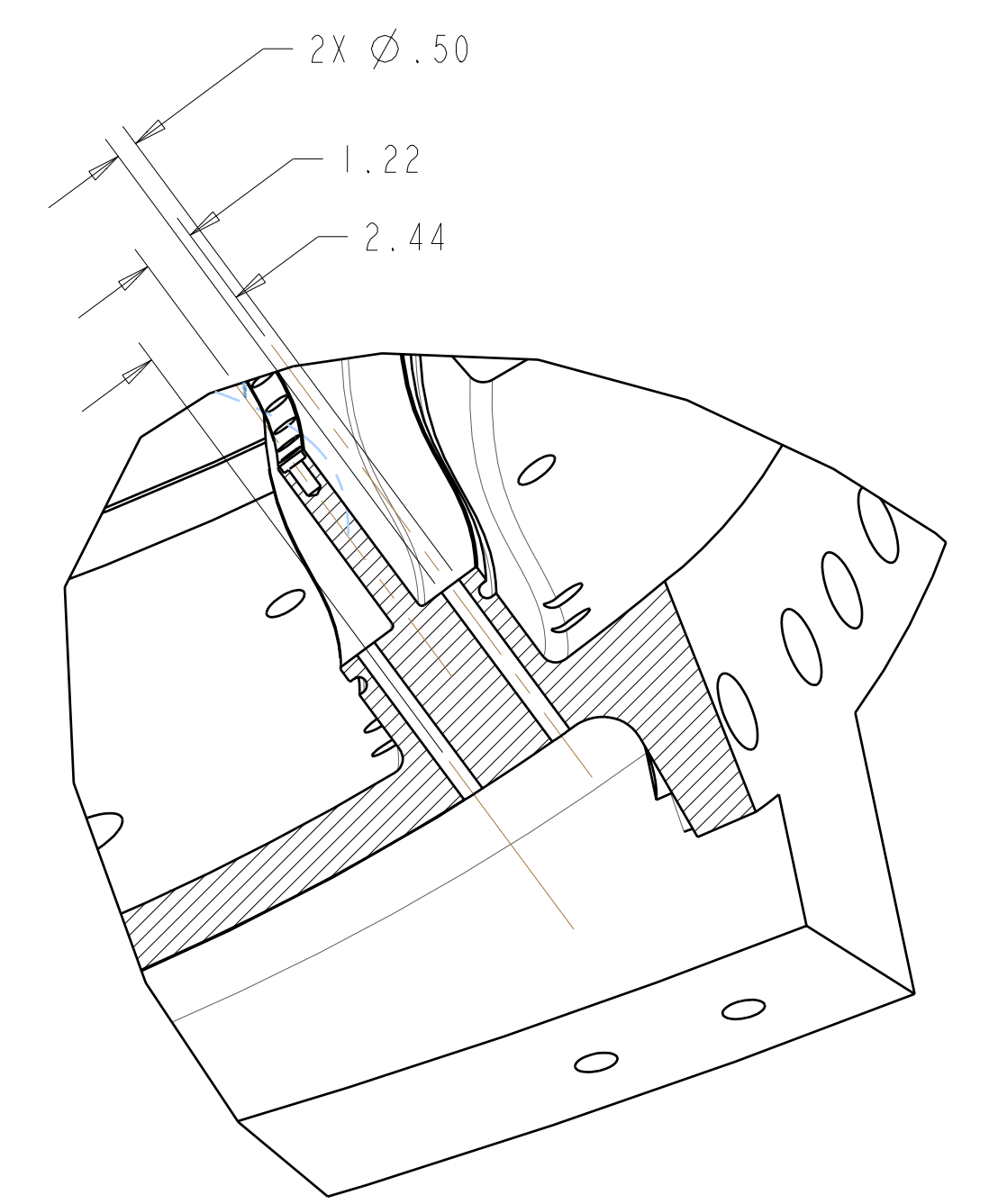


SECTION X-X

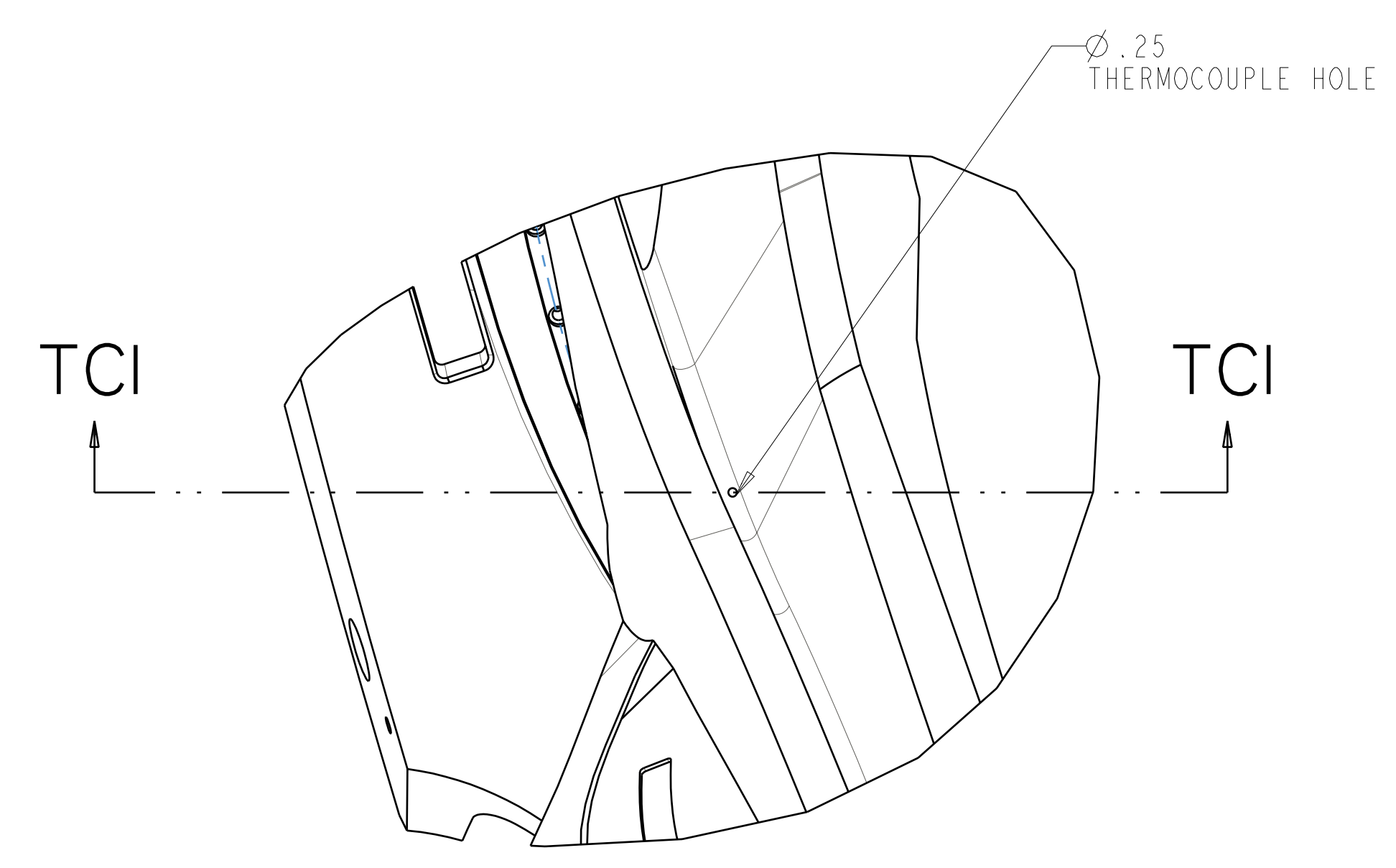


COOLING INLET / OUTLET HOLES  
 TYPICAL 2 PLACES

SCALE 0.250  
 USE PRO/E MODEL GEOMETRY TO  
 DETERMINE SECTION ORIENTATION

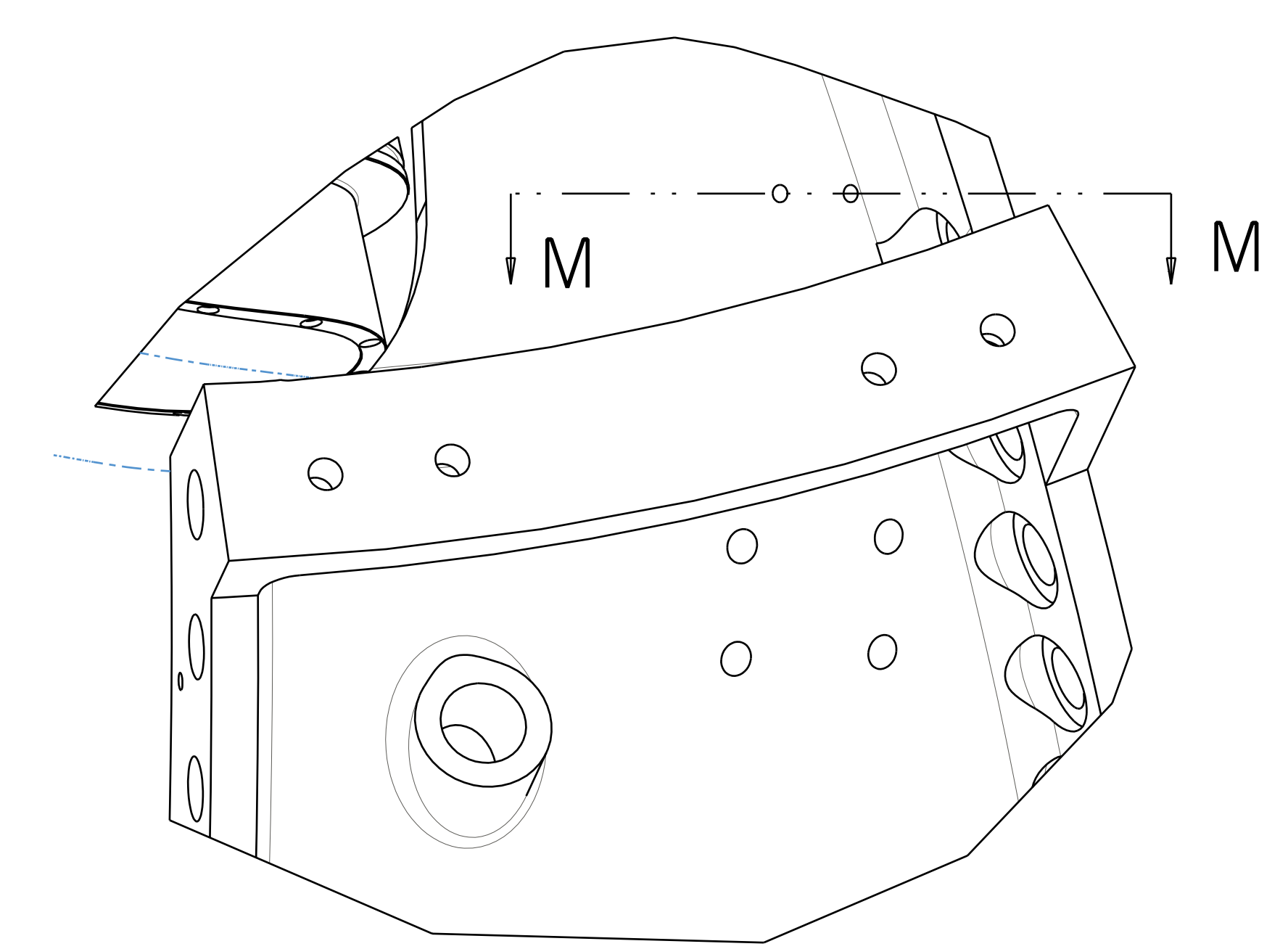


SECTION M-M



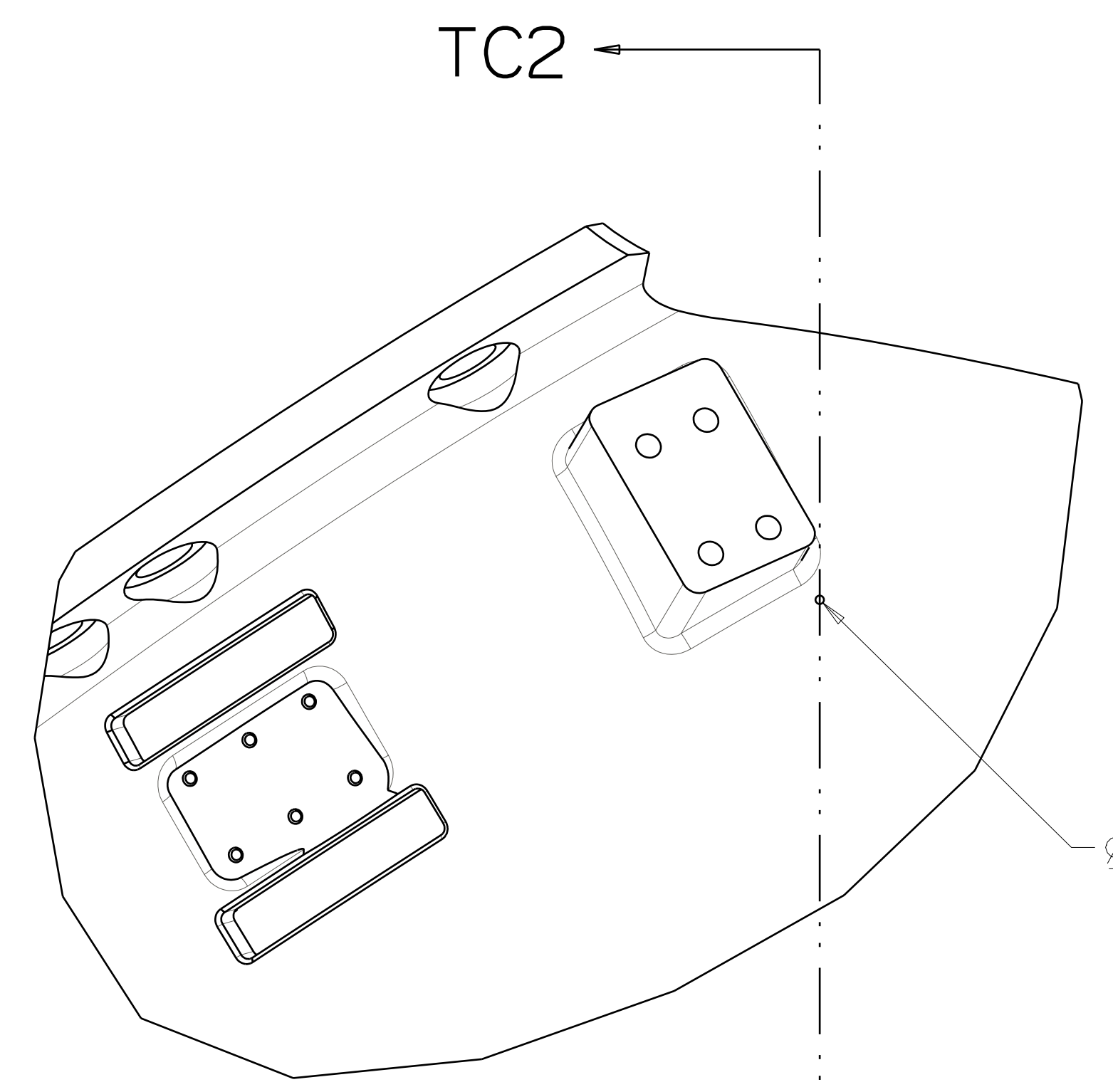
THERMOCOUPLE HOLE

SCALE 0.250  
 USE PRO/E MODEL GEOMETRY TO  
 DETERMINE SECTION ORIENTATION



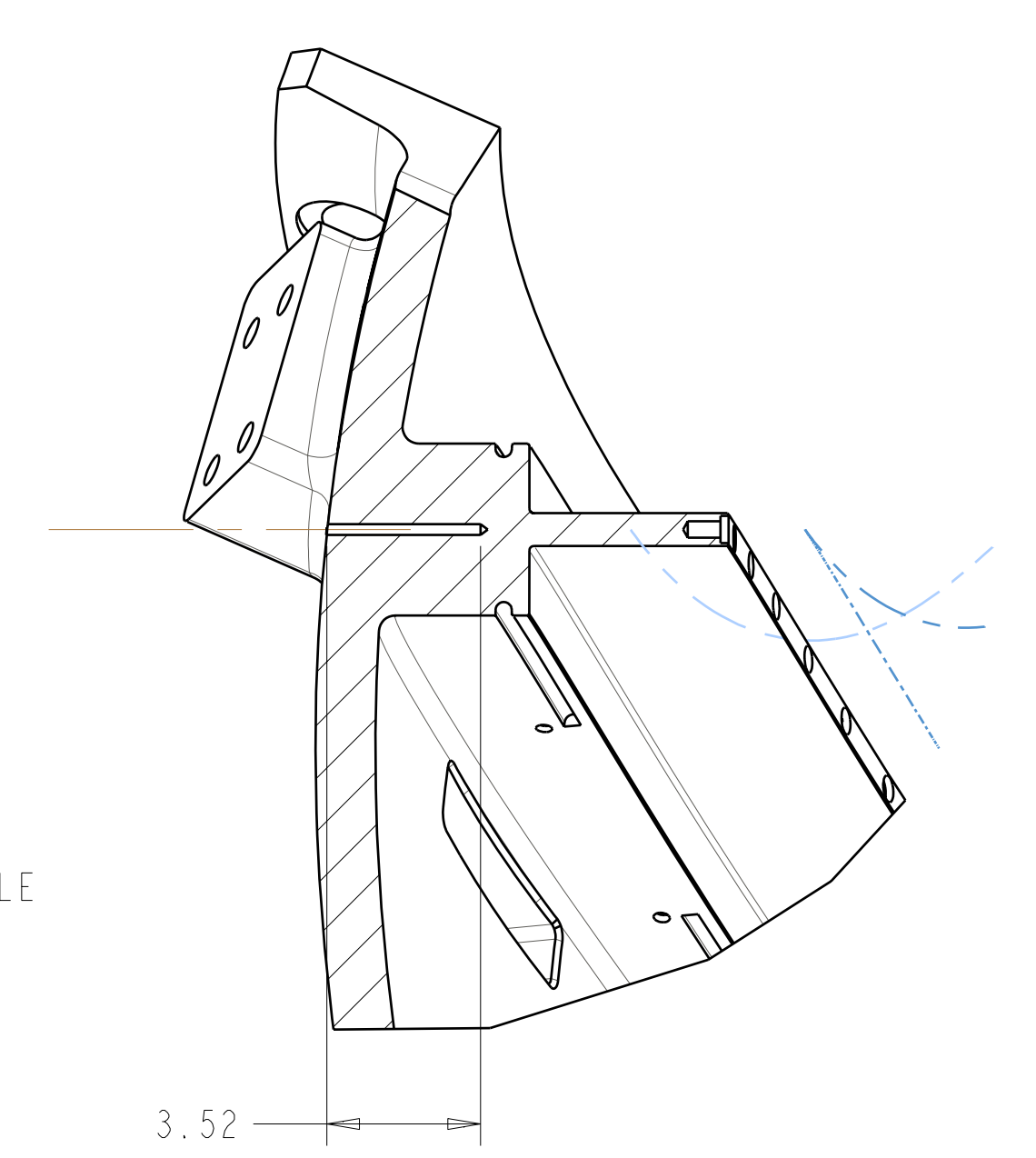
VPI BLEED HOLES

SCALE 0.250  
 USE PRO/E MODEL GEOMETRY TO  
 DETERMINE SECTION ORIENTATION

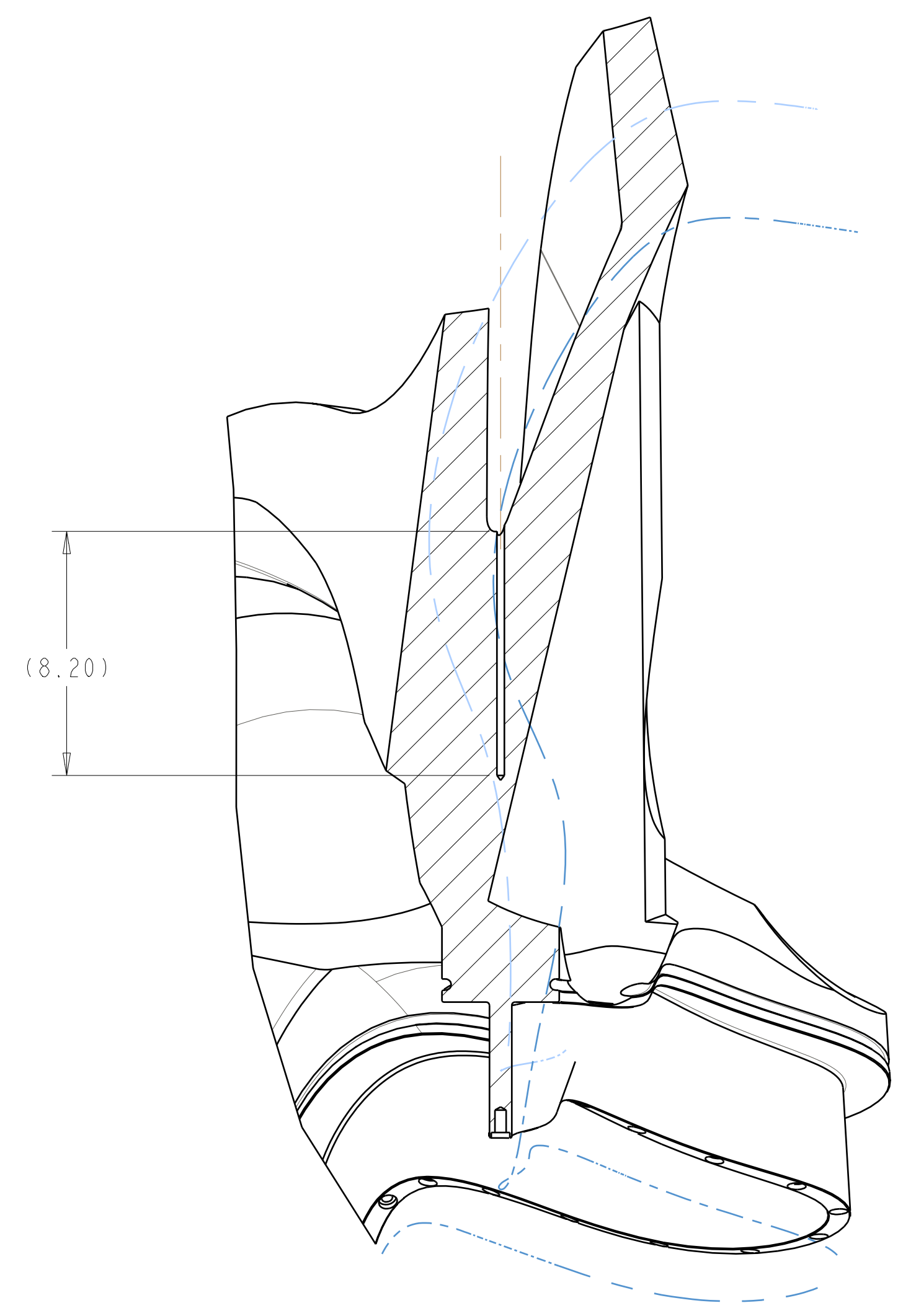


THERMOCOUPLE HOLE

SCALE 0.250  
 USE PRO/E MODEL GEOMETRY TO  
 DETERMINE SECTION ORIENTATION



SECTION TC2-TC2



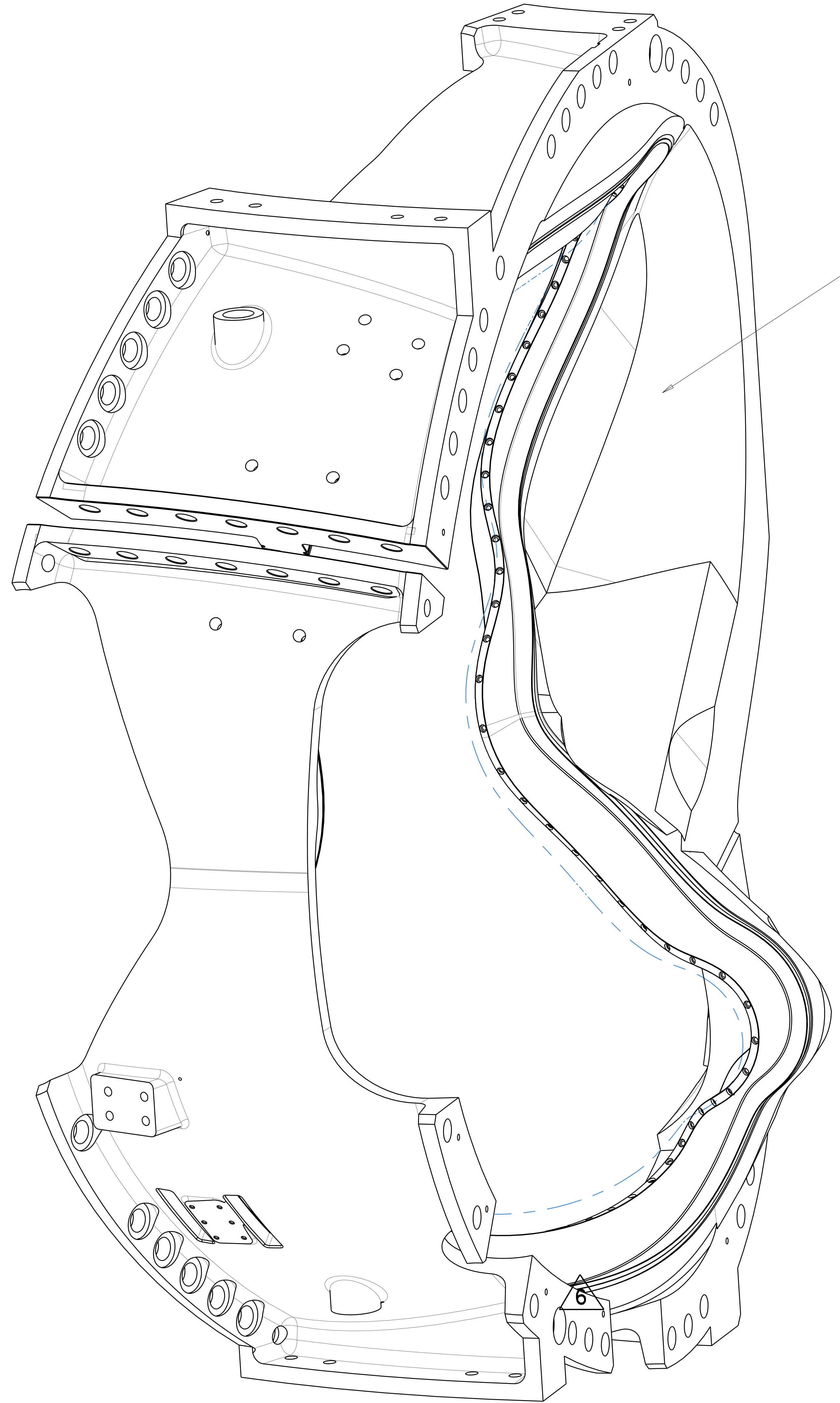
SECTION TCI-TCI

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 PPPL Drafting:

|   |           |      |    |        |      |       |     |
|---|-----------|------|----|--------|------|-------|-----|
| Oak Ridge National Laboratory<br>managed for the DEPARTMENT OF ENERGY under<br>U.S. GOVERNMENT contract DE-AC05-00OR22725<br>UT-BATTELLE, LLC, Oak Ridge, Tennessee<br>PROJECT NAME |           |      |    |        |      |       |     |
| <b>NATIONAL COMPACT STELLARATOR EXPERIMENT</b>  |           |      |    |        |      |       |     |
| PRODUCTION WINDING FORM TYPE-A  |           |      |    |        |      |       |     |
| VERSION NO.   | PLANT     | BLDG | FL | SHT OF | TYPE | CLASS |     |
| 13  | X-10      | 5700 | 3  | 9      | 11   | S     | U   |
| RELEASE LEVEL   | SEI41-114 |      |    |        |      |       | REV |
| Fabrication   |           |      |    |        |      |       | 6   |

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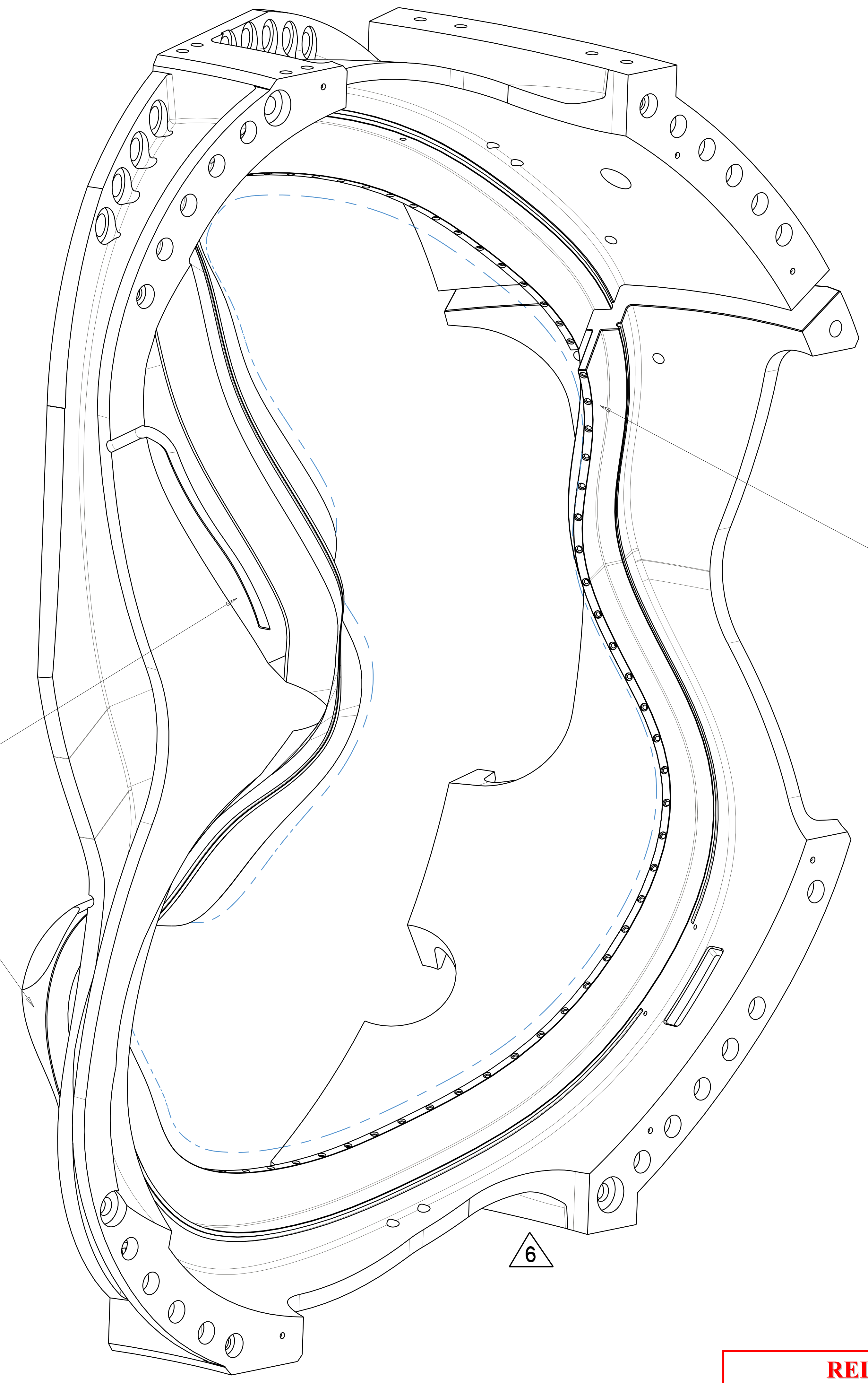
FOR NOTES AND PARTS LIST SEE SHEET 1



ISOMETRIC VIEW  
 SCALE 0.20

AS CAST SURFACES  
 .5 A C B

10 6  
 WING SURFACES  
 -.12 / -.25 A B C



ISOMETRIC VIEW  
 SCALE 0.20

MACHINED SURFACES  
 .02 R S T

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 FABRICATION / INSTALLATION**  
 PPPL Drafting:

|  |       |   |    |        |      |       |  |
|--|-------|---|----|--------|------|-------|--|
| <b>UT-BATTELLE</b>                             |       | Oak Ridge National Laboratory<br>managed for the DEPARTMENT OF ENERGY under<br>U.S. GOVERNMENT contract DE-AC05-00OR22725<br>UT-BATTELLE, LLC, Oak Ridge, Tennessee |    |        |      |       |  |
| <b>NATIONAL COMPACT STELLARATOR EXPERIMENT</b> |       |   |    |        |      |       |  |
| <b>PRODUCTION WINDING FORM TYPE-A</b>          |       |   |    |        |      |       |  |
| VERSION NO.                                    | PLANT | BLDG  | FL | SHT OF | TYPE | CLASS |  |
| 13   | X-10  | 5700  | 3  | 10     | I S  | U     |  |
| RELEASE LEVEL                                  |       | SEI41-114   |    |        | REV  |       |  |
| Fabrication                                    |       |   |    |        | 6    |       |  |

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