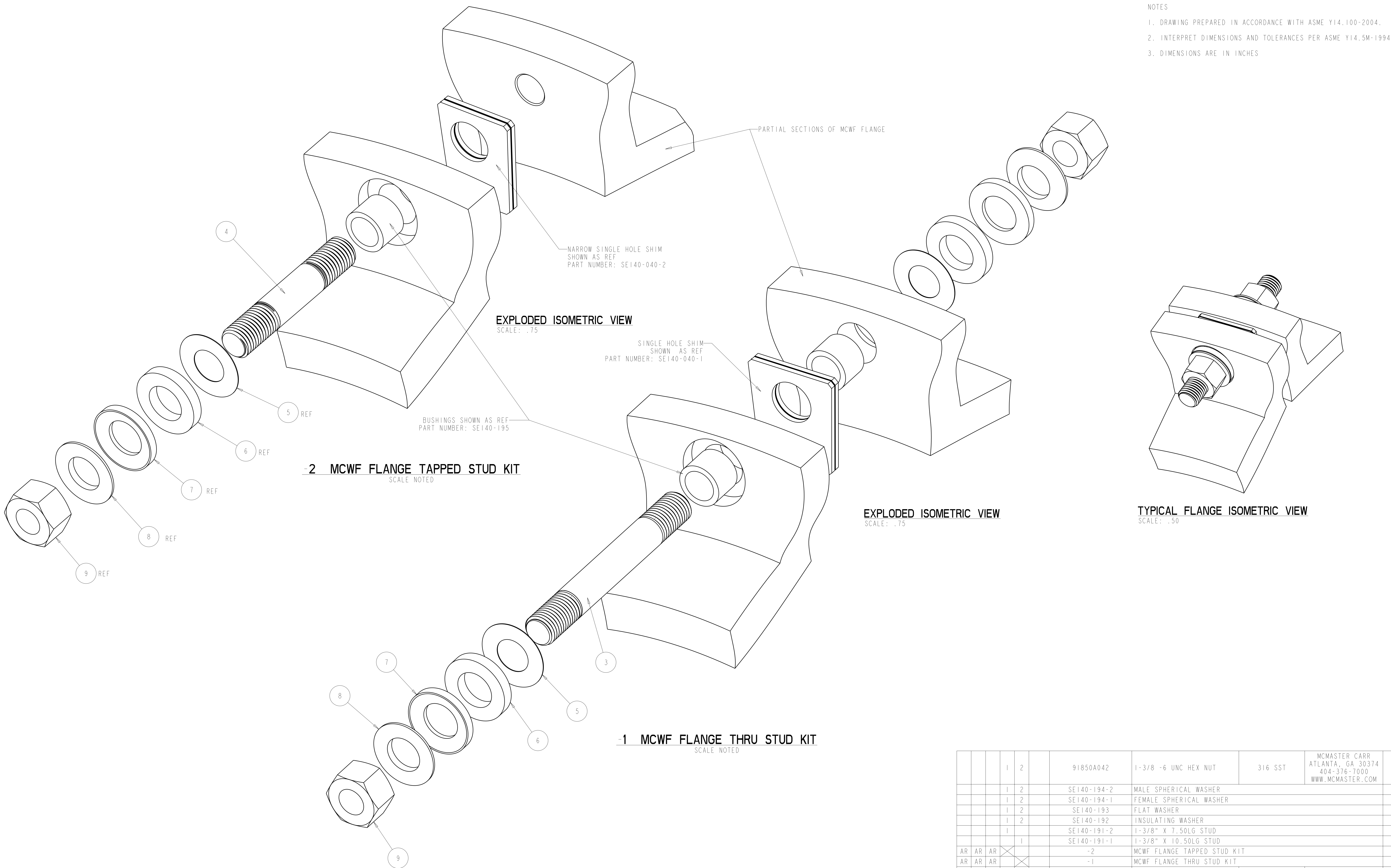


NOTES
 1. DRAWING PREPARED IN ACCORDANCE WITH ASME Y14.100-2004.
 2. INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.
 3. DIMENSIONS ARE IN INCHES



REV	DESCRIPTION	BY	DATE	CHK	DEPT	DATE	PE	REQ	DATE	ORNL	DOE	DATE
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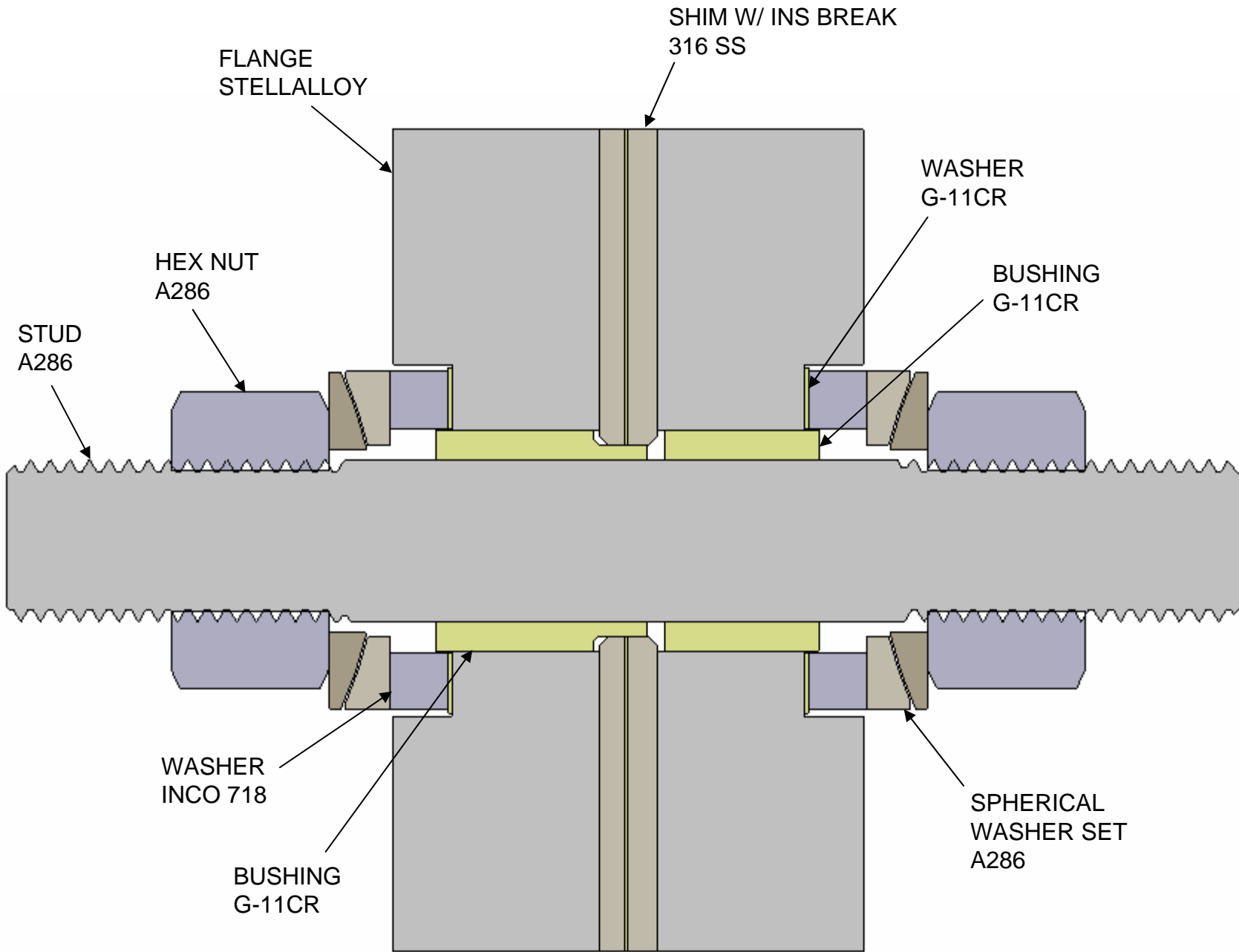
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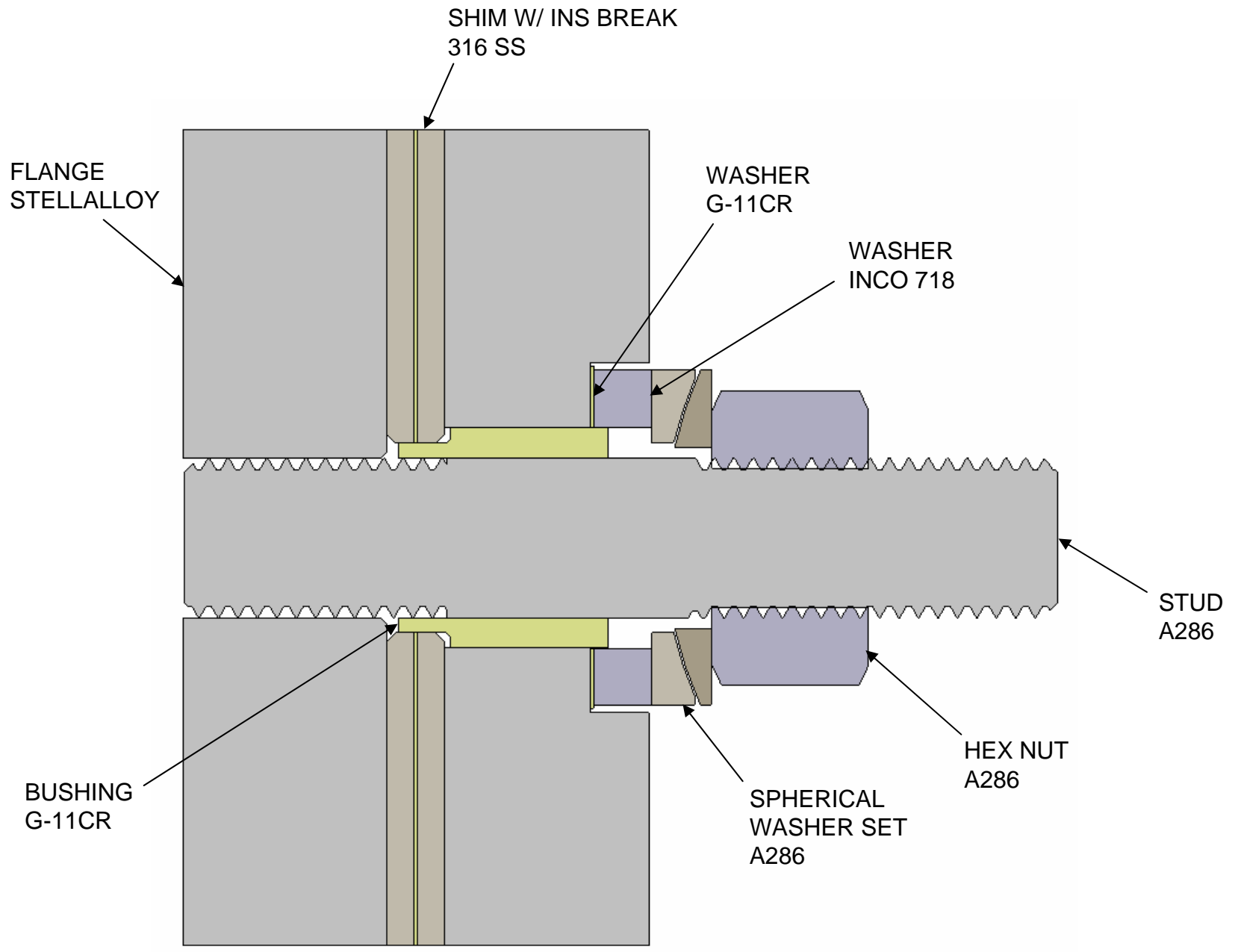
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SHIM W/ INS BREAK
316 SS

FLANGE
STELLALLOY

WASHER
G-11CR

WASHER
INCO 718

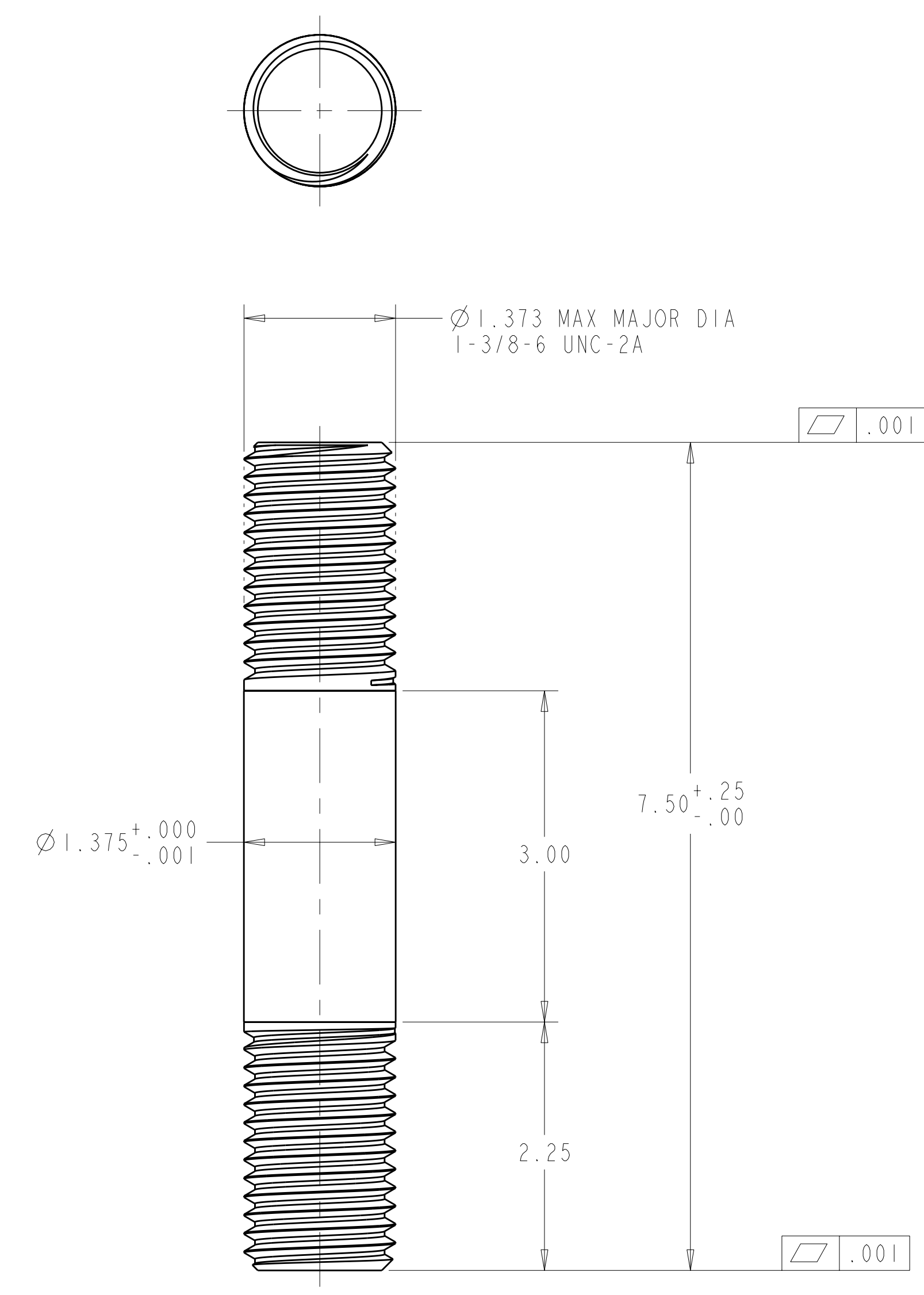
BUSHING
G-11CR

STUD
A286

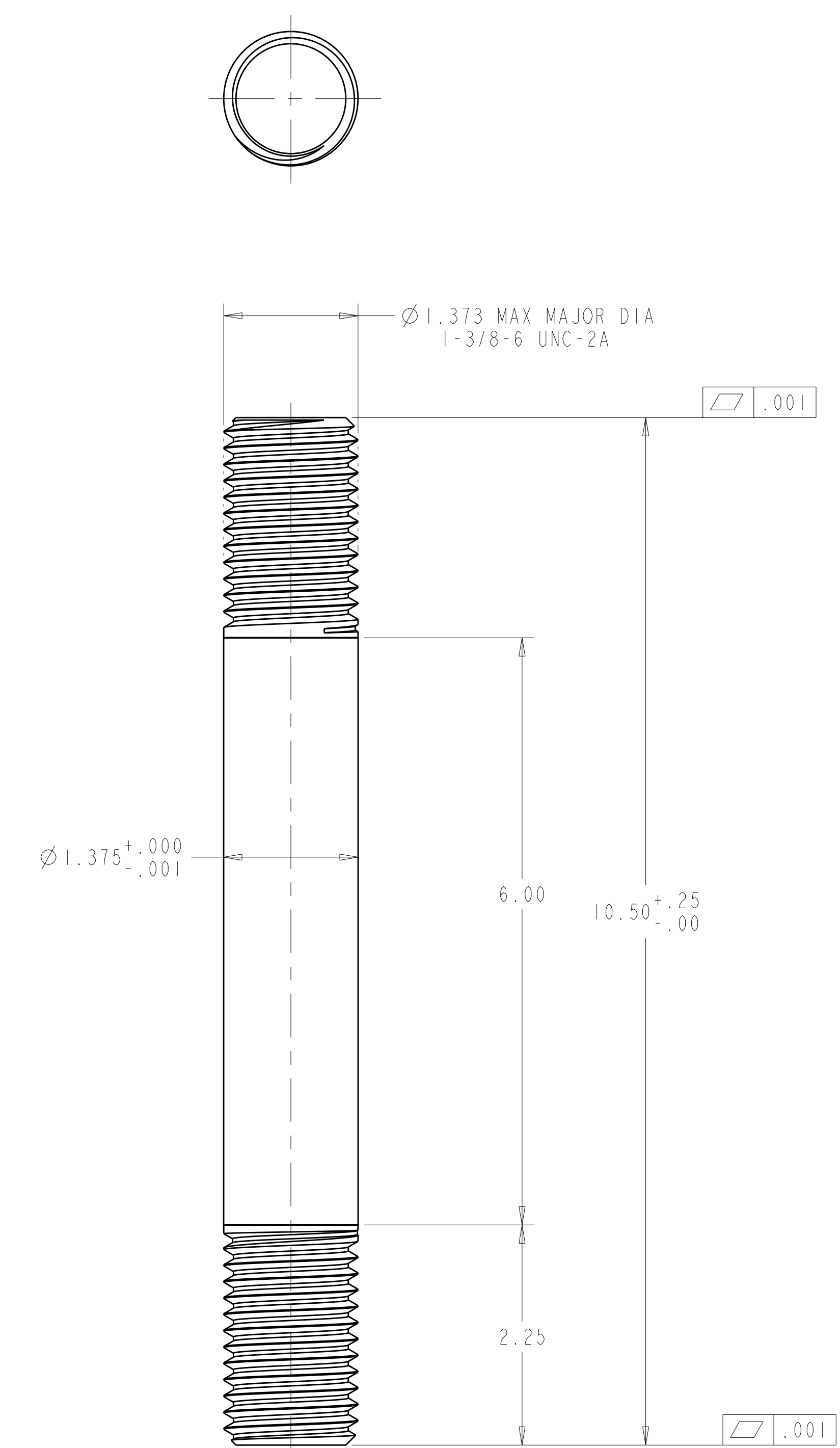
SPHERICAL
WASHER SET
A286

HEX NUT
A286

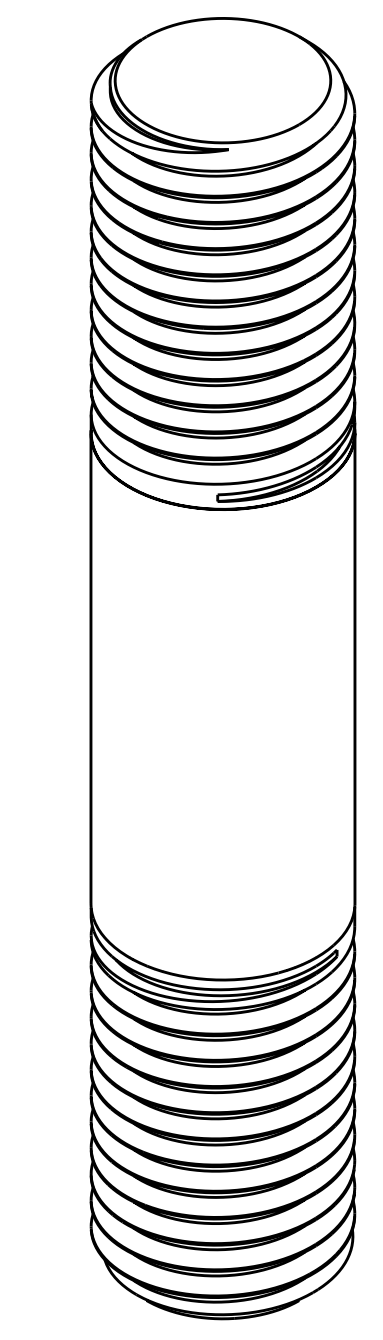
- NOTES
1. DRAWING PREPARED IN ACCORDANCE WITH ASME Y14.100-2004.
 2. INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.
 3. DIMENSIONS ARE IN INCHES



-2 MCWF FLANGE STUD
SCALE 1.000



-1 MCWF FLANGE STUD
SCALE 1.000



ISOMETRIC VIEW
SCALE 1.00

AR	CAGE CODE	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	MATERIAL	SPECIFICATION	FIND NO	
AR	-2	1-3/8- 6 UNC X 7.50LG STUD	UNS S66286	ASTM A453 GRADE 660B	2		
AR	-1	1-3/8- 6 UNC X 10.50LG STUD	SILVER PLATE PER AMS 2410		1		
SEI 140-190	NEXT ASSEMBLY						

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
0	ORIGINAL ISSUE	GM	02/07									
REVISION OR ISSUE PURPOSE												
REVISION APPROVAL												

SCALE NOTED	DES D WILLIAMSON 02/07
TOLERANCES UNLESS OTHERWISE SPECIFIED	DRW G MCGINNIS 02/07
FRACTIONS ±.01	CHK : :
XX DECIMALS ±.01	SECT : :
XXX DECIMALS ±.005	DEPT : :
ANGLES ±0'15"	PE : :
BREAK SHARP EDGES OR MAX FINISH .125 UNLESS OTHERWISE SPECIFIED	CR : :
	PJ : :
	RD : :
	REO : :
	PPPL DRFT J SIEGEL 02/07
	VERSION NO. 0+
	PLANT ORNL
	BLDG 5700
	FL 3
	SHT 1
	OF 1
	TYPE S
	CLASS U
	REV 0

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

NATIONAL COMPACT STELLARATOR EXPERIMENT

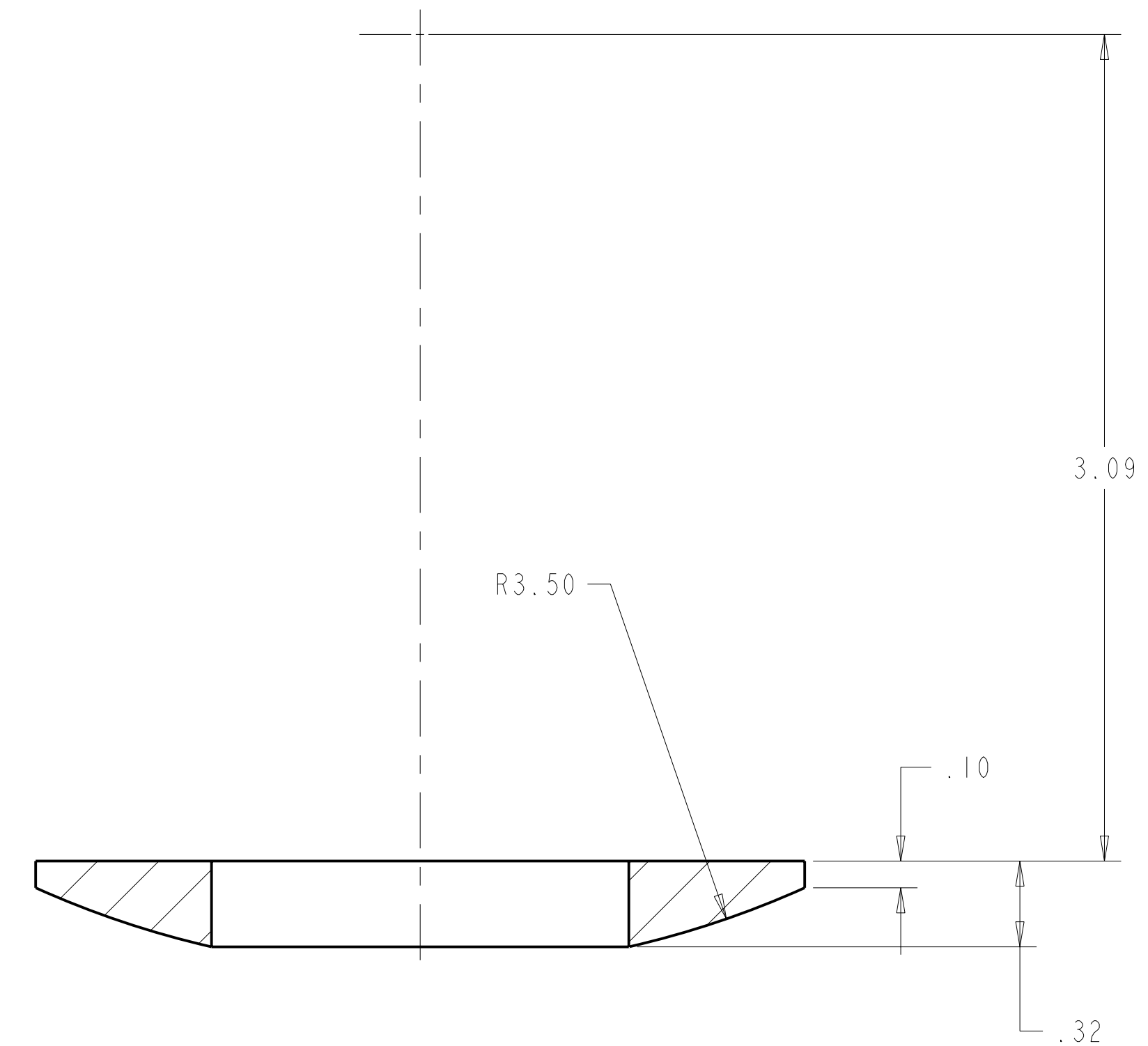
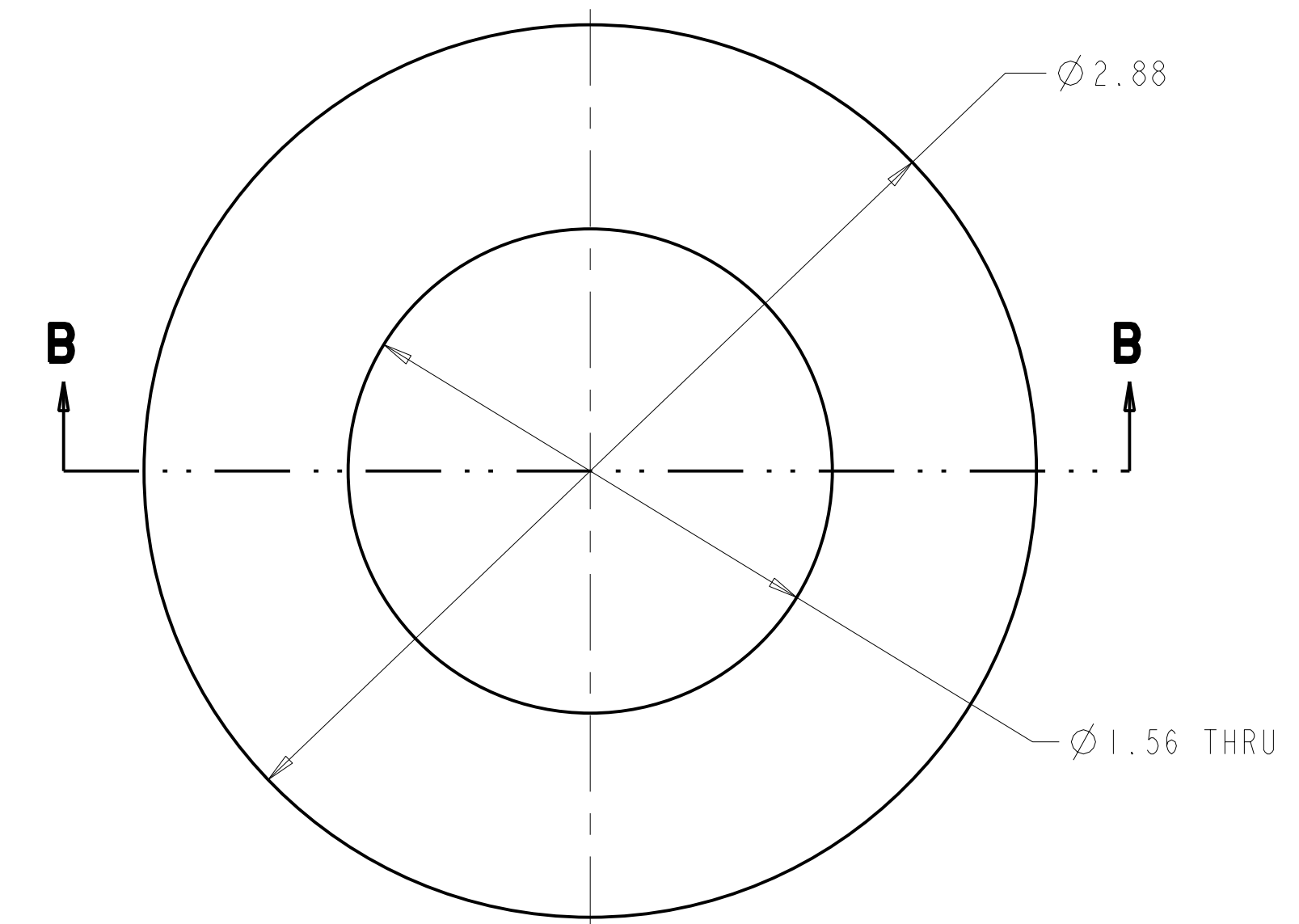
MCWF FLANGE STUDS

VERSION NO. 0+ PLANT ORNL BLDG 5700 FL 3 SH 1 OF 1 TYPE S CLASS U

RELEASE LEVEL WIP

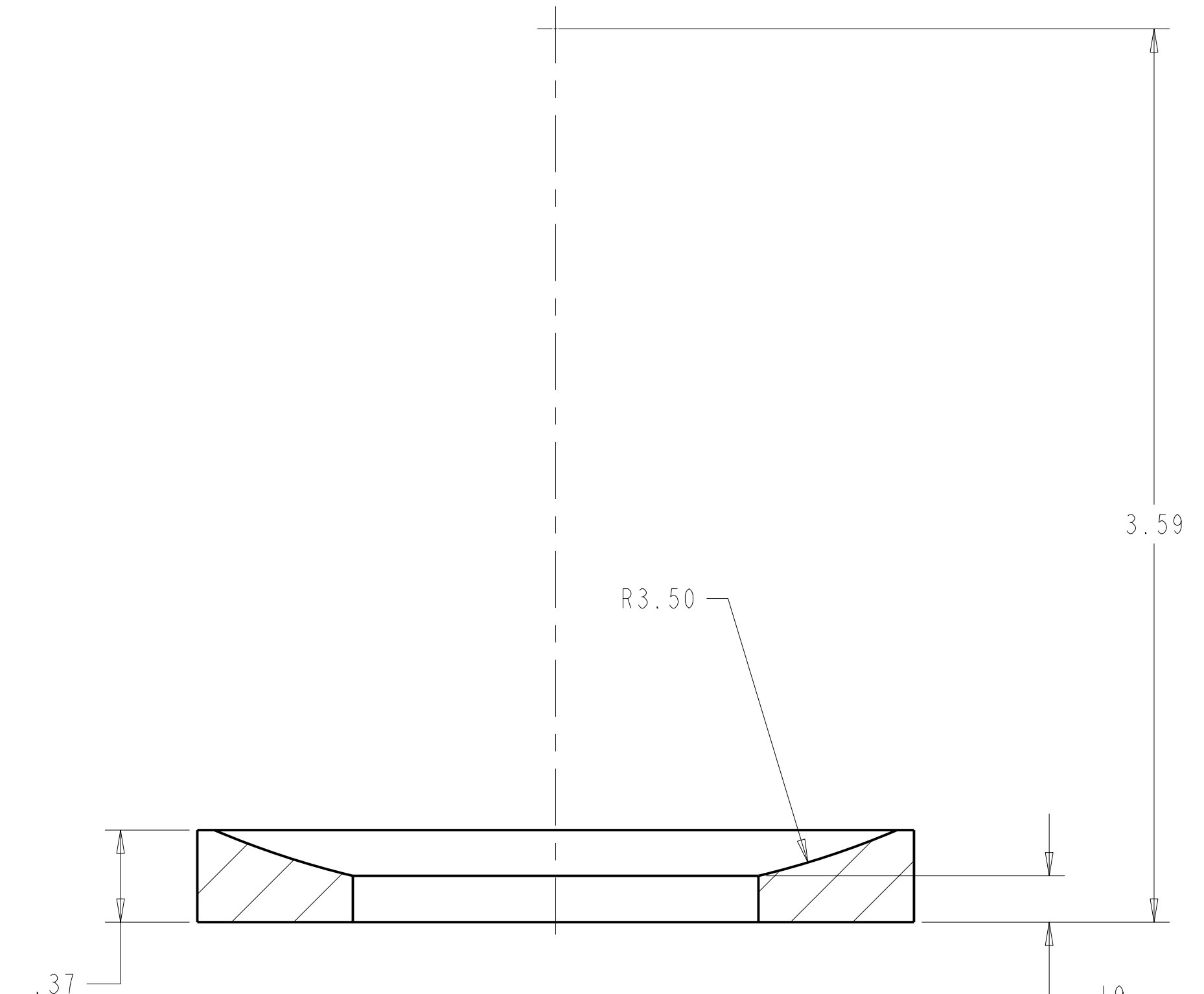
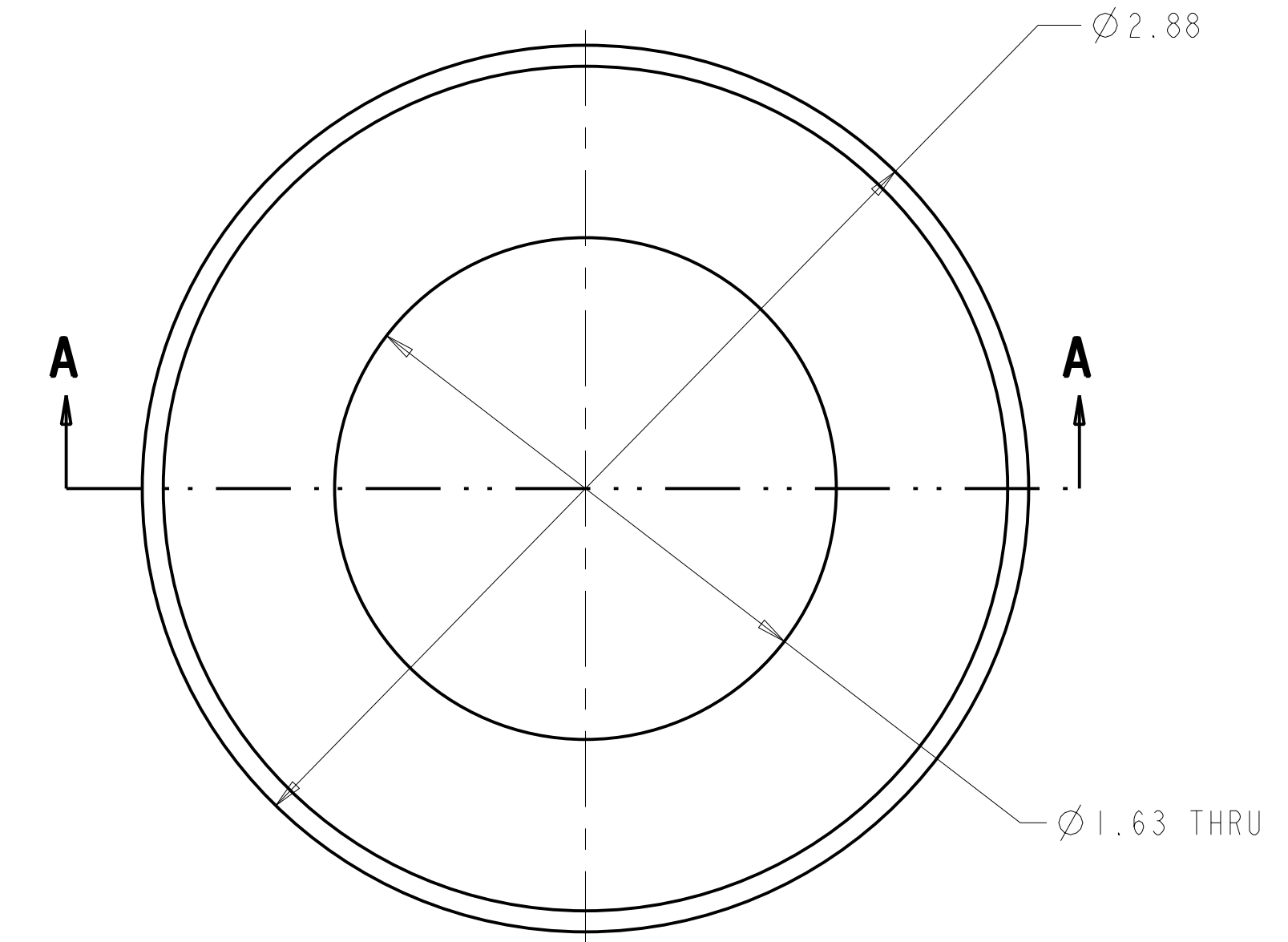
SEI 140-191

- NOTES
1. DRAWING PREPARED IN ACCORDANCE WITH ASME Y14.100-2004.
 2. INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.
 3. DIMENSIONS ARE IN INCHES
 4. MAGNETIC PERMEABILITY NOT TO EXCEED 1.02 AS TESTED BY A SEVERN INDICATOR. AVAILABLE FROM:
SEVERN ENGINEERING
AUBURN, ALABAMA 36830
WWW.SEVERNGINEERING.COM



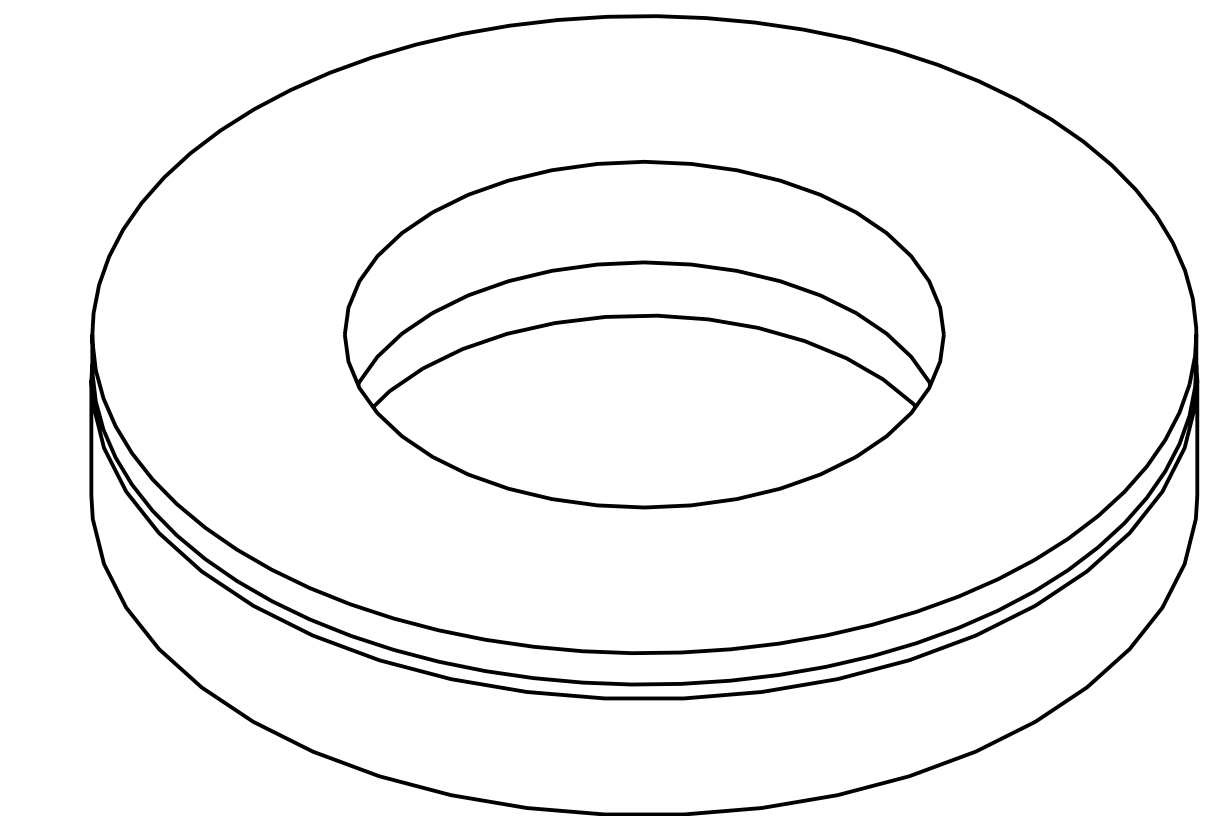
SECTION B-B

-2 MALE SPHERICAL WASHER
SCALE 2.000



SECTION A-A

-1 SPHERICAL WASHER SET
SCALE 1.000



ASSEMBLED ISOMETRIC VIEW
SCALE 1.00

AR		-2	MALE SPHERICAL WASHER	UNS N06625	2
AR		-1	FEMALE SPHERICAL WASHER		
SEI40-194	CAGE CODE	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	MATERIAL	SPECIFICATION
			← NEXT ASSEMBLY	PARTS LIST	

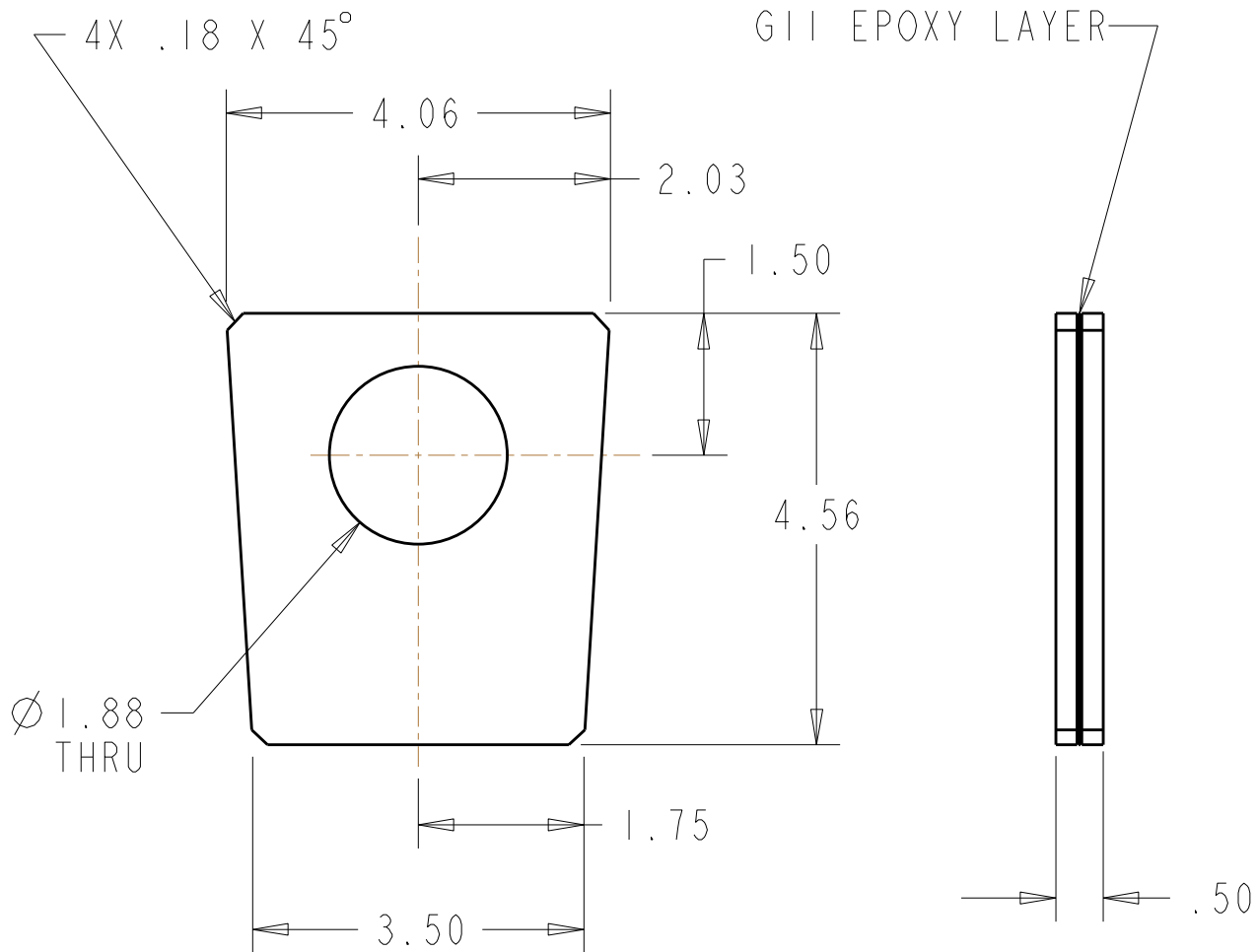
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P THIS DRAWING PRODUCED ON PRO-ENGINEER

REV	DESCRIPTION	BY	DATE	CHK	DEPT	DATE	PE	REQ	DATE	ORNL	DOE	DATE
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REVISION OR ISSUE PURPOSE												
REVISION APPROVAL												

SCALE NOTED		DES D WILLIAMSON 11/06
TOLERANCES UNLESS OTHERWISE SPECIFIED		DRW G MCGINNIS 11/06
FRACTIONS		CHK
XX DECIMALS ±.01		SECT :
XXX DECIMALS ±.005		DEPT :
ANGLES ±0°15'		CR :
BREAK SHARP EDGES OR MAX		PJ :
FINISH .125 UNLESS OTHERWISE SPECIFIED		REQ :
		REO :
		PPPL DRFT J SIEGEL 11/06
		VERSION NO.
		PLANT ORNL
		BLDG 5700
		FL 3
		SHT 1
		OF 1
		TYPE I
		CLASS S
		U
		REV 0

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	
SPHERICAL WASHER SET	
VERSION NO.	1
PLANT	ORNL
BLDG	5700
FL	3
SHT	1
OF	1
TYPE	I
CLASS	S
U	
REV	0
RELEASE LEVEL	WIP
SEI40-194	



NOTE: ALL DIMENSIONS SHOWN ARE PRELIMINARY

APPROXIMATE QUANTITY = 500

MATERIAL	316 SST	SOURCE	BID / PREFERRED
SPEC	NA	VENDOR	COMPANY ADDRESS PHONE
HEAT TREAT	NA		
COATING	NA		
UNITS	INCHES		

DATA SHEET



FILENAME
DS140-040

PREPARED BY
G MCGINNIS

TITLE / DESCRIPTION
SINGLE PLACE SHIM PLATE

CHECKED BY

APPROVED BY

ISSUE DATE

VER

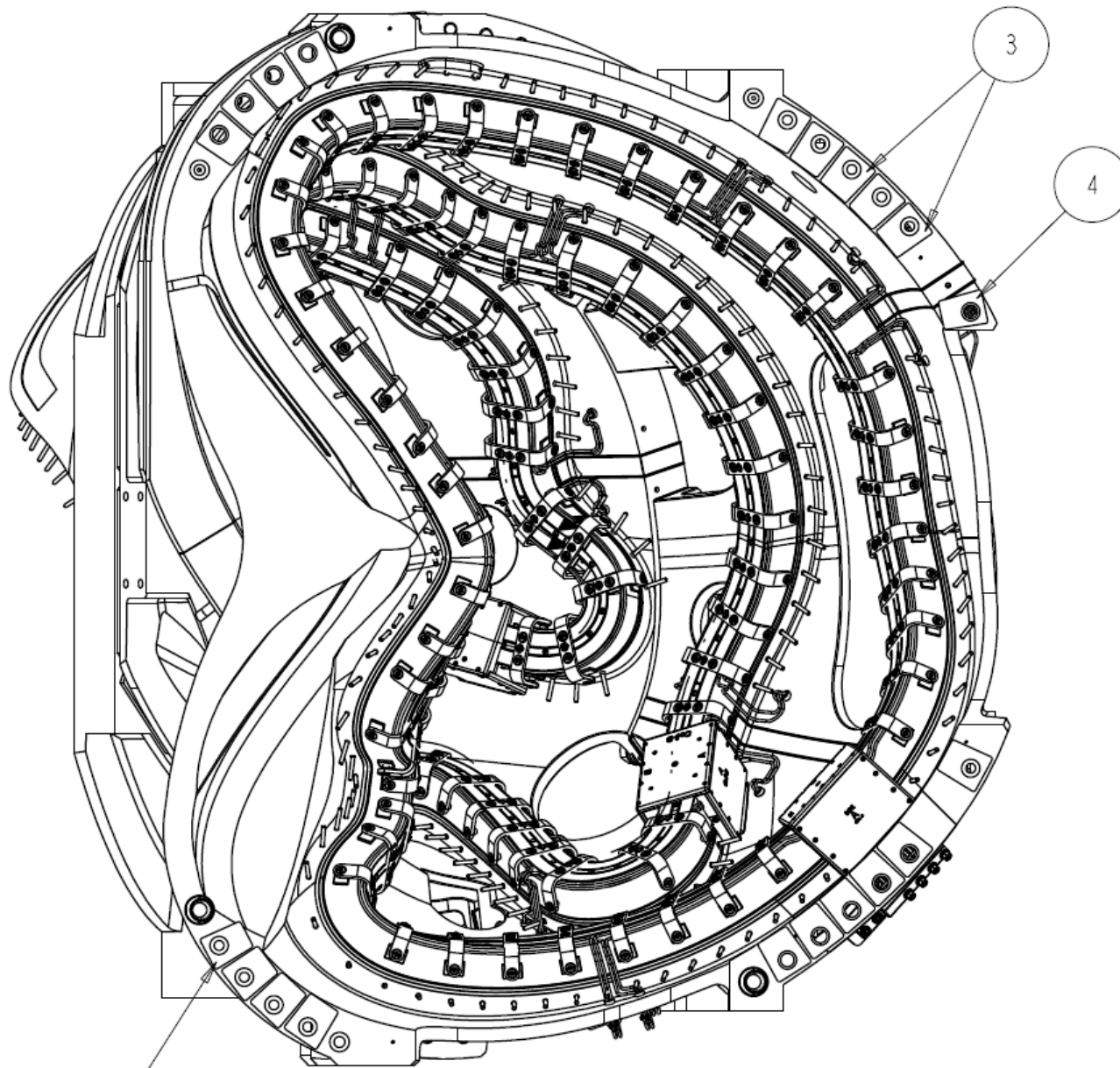
REV

D WILLIAMSON

01/16/07

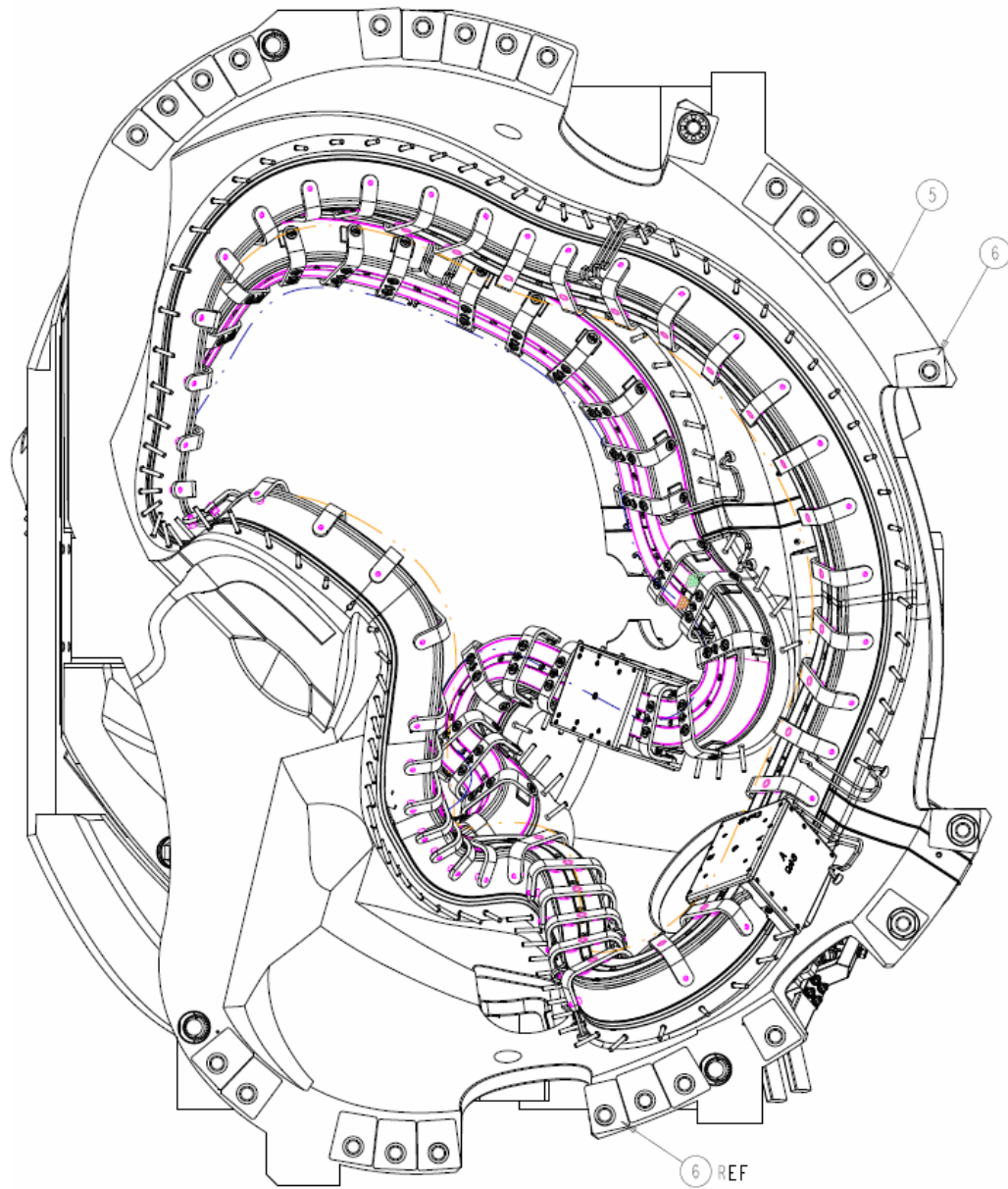
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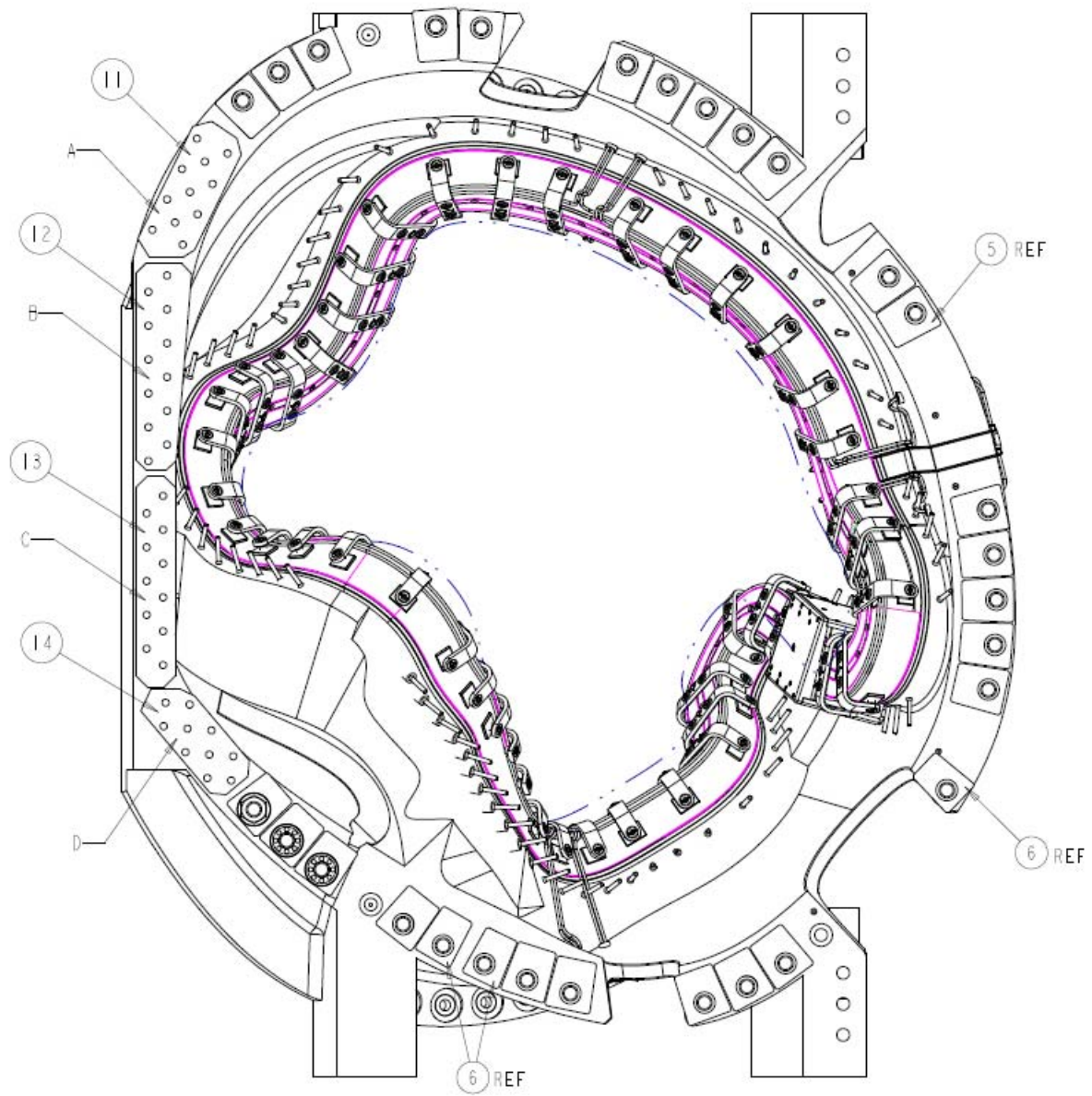


4 REF

BOLTED JOINT SHIM LAYOUT - AA

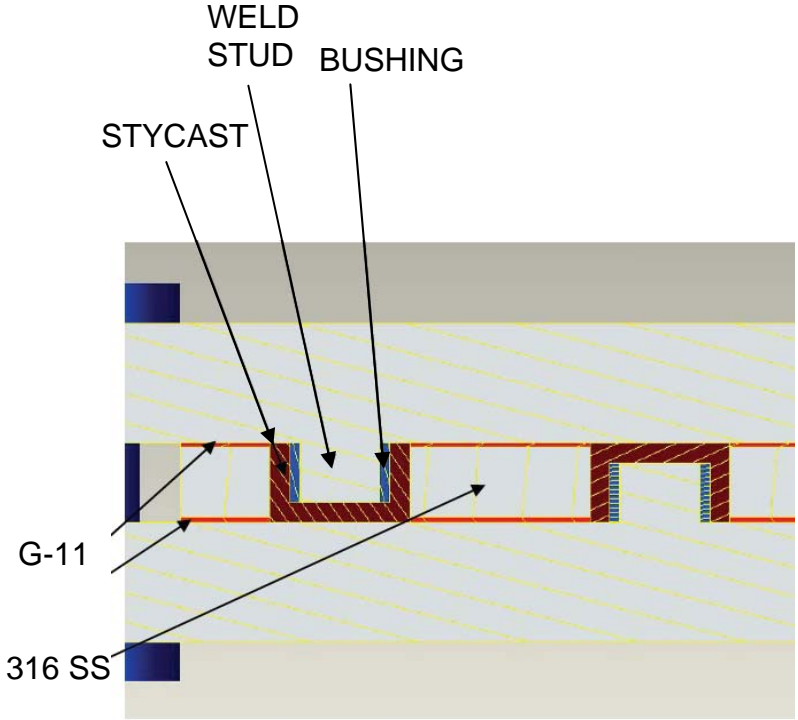


VIEW C-C A-B SHIM-SHEAR PLATES
SCALE .12

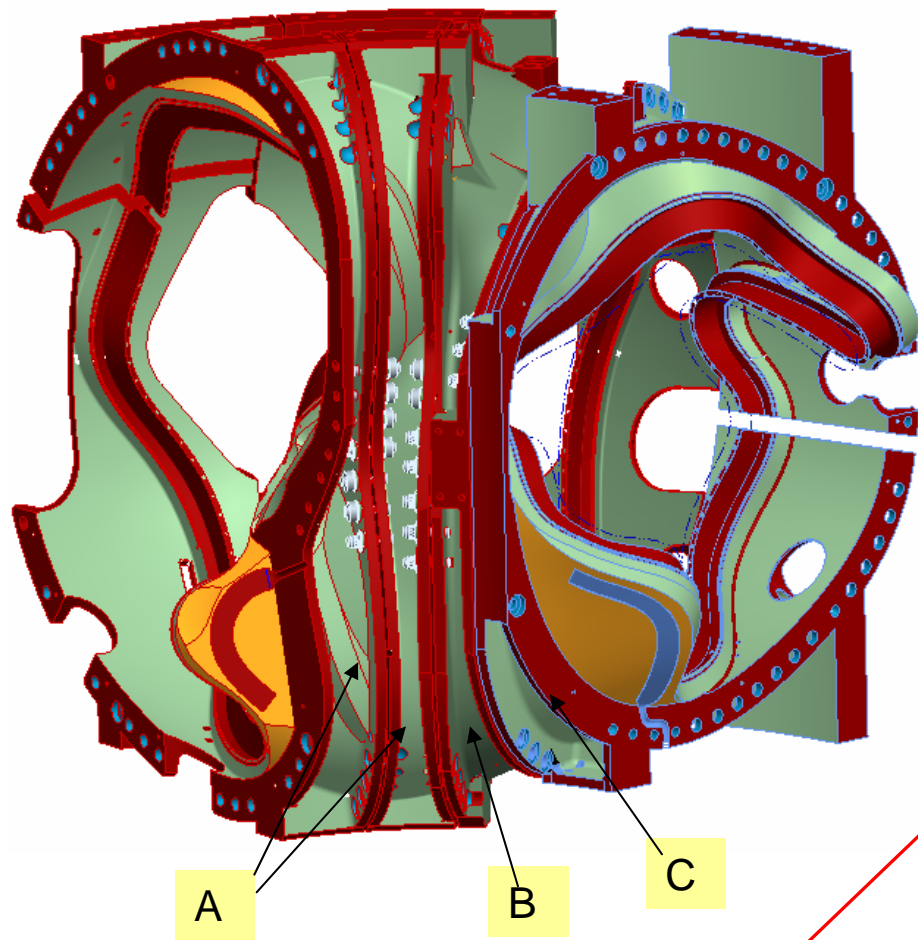


VIEW D-D B-C SHIM-SHEAR PLATES
SCALE .12

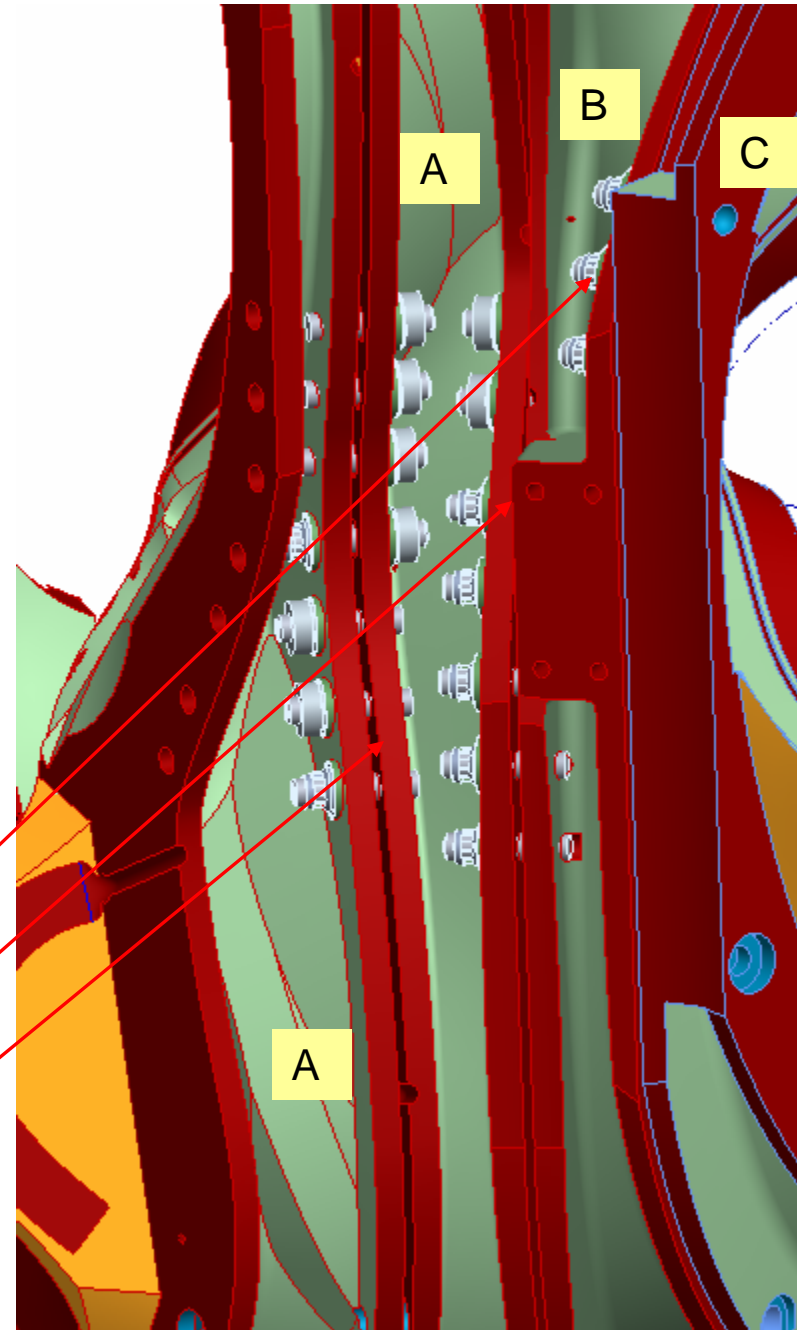
INBOARD LEG CONCEPT – SHEAR PINS



INBOARD LEG CONCEPT – ADDITIONAL BOLTS



- 3 of 3 bolts added at B – C joint
- 3 of 7 bolts added at B – A joint
- 0 of 7 bolts added at A – A joint



Tom Brown's Study 3/17/06

3 of 3 bolts added at B – C joint

No problem with the 3 bolts as shown.

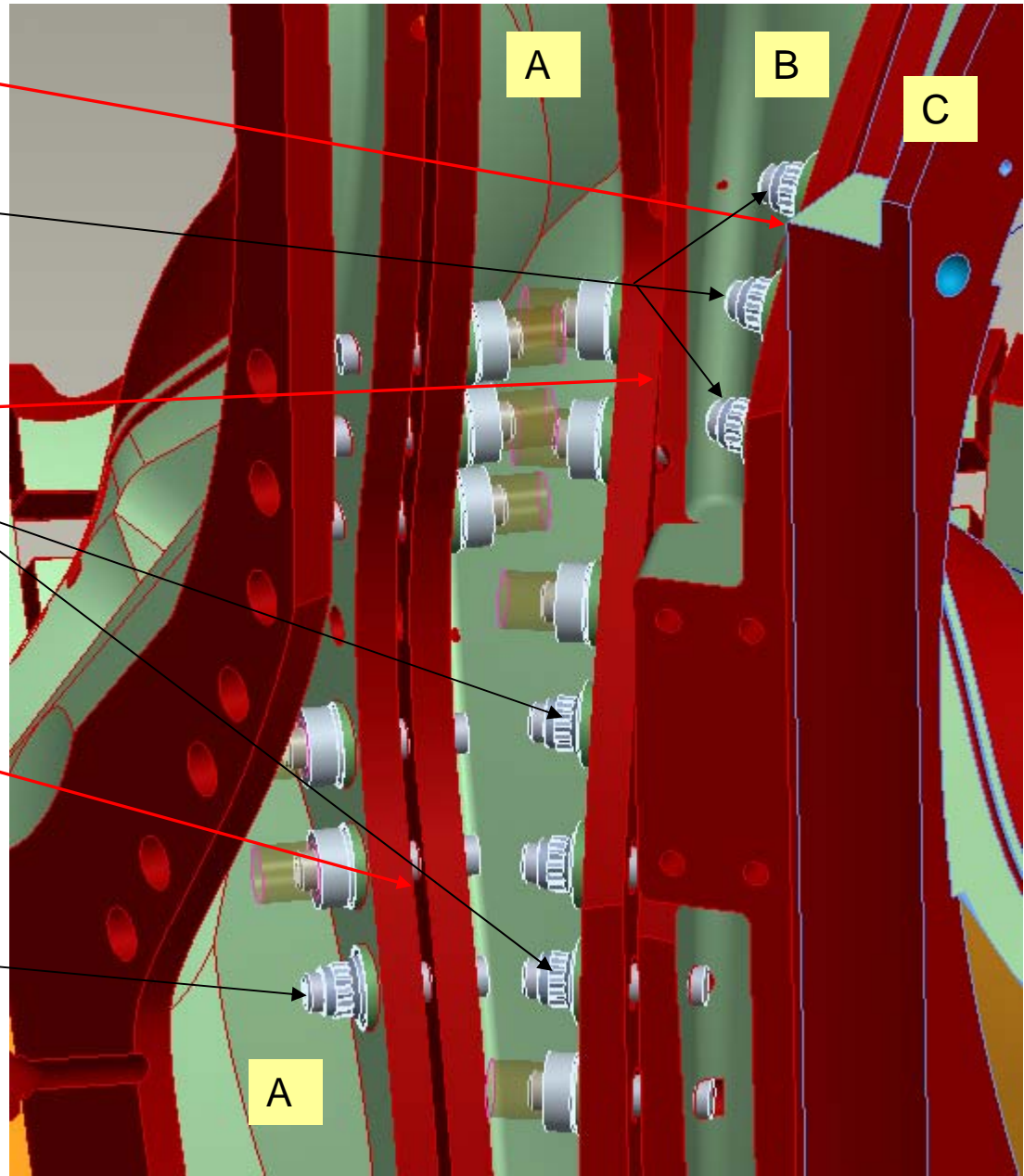
3 of 7 bolts added at B – A joint

These 3 bolts are in the clear, located on one side of the CL.

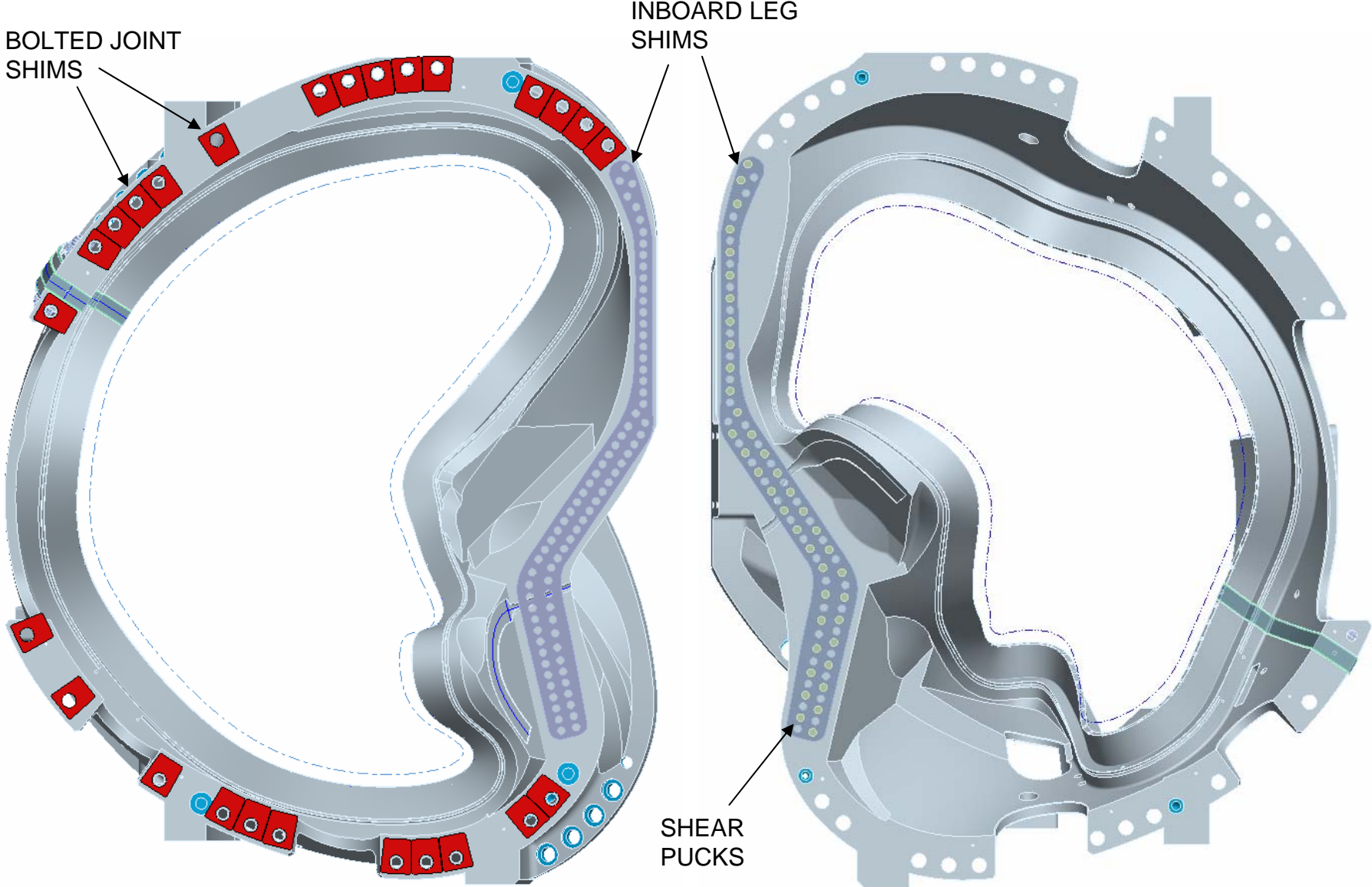
0 of 7 bolts added at A – A joint

No problem here. If you need one for positioning the put one here.

Updated 31/31/07

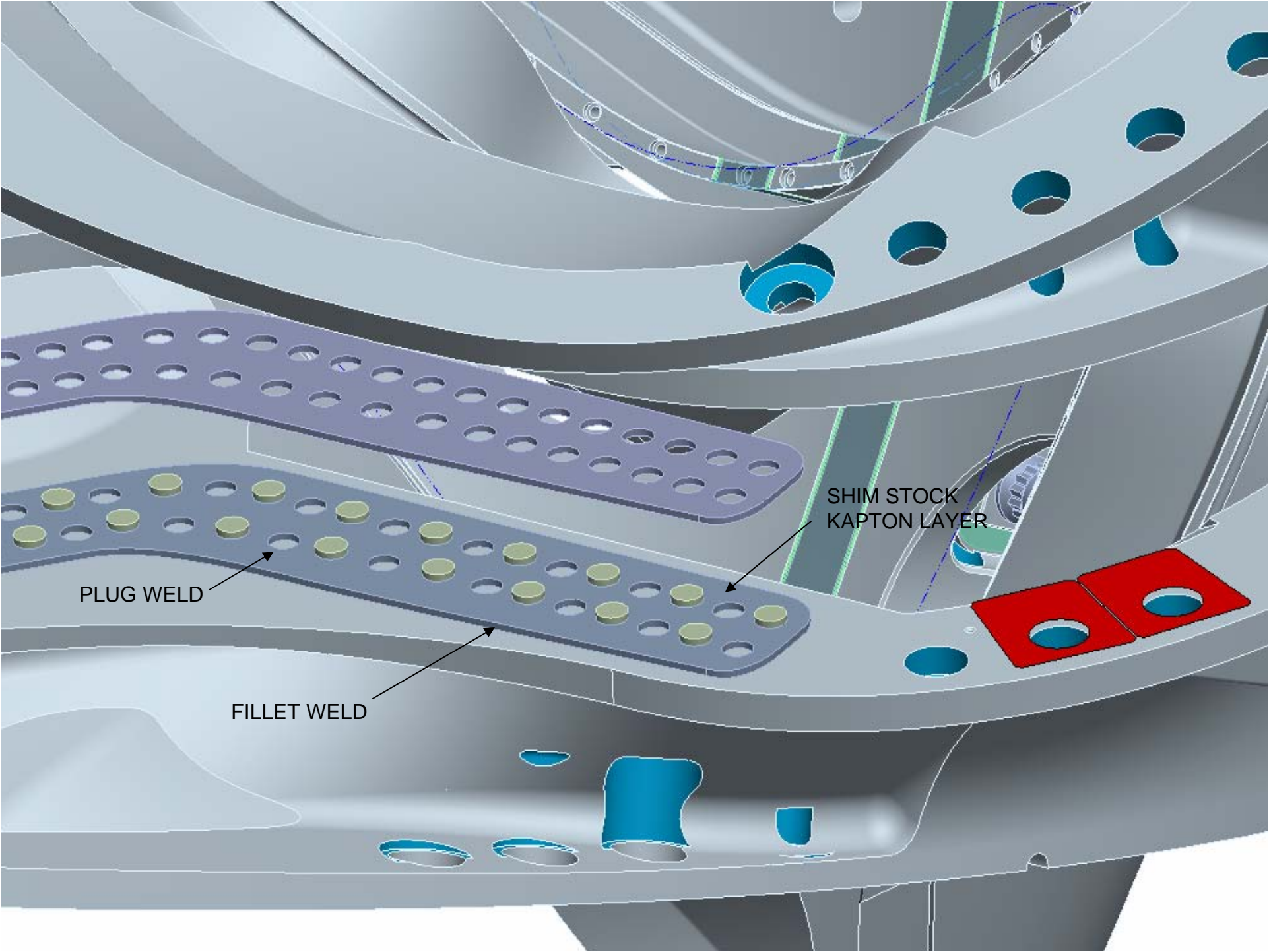


INBOARD LEG CONCEPT – SHEAR PUCKS



TYPE-A

TYPE-B



PLUG WELD

FILLET WELD

SHIM STOCK
KAPTON LAYER

CONCLUSION