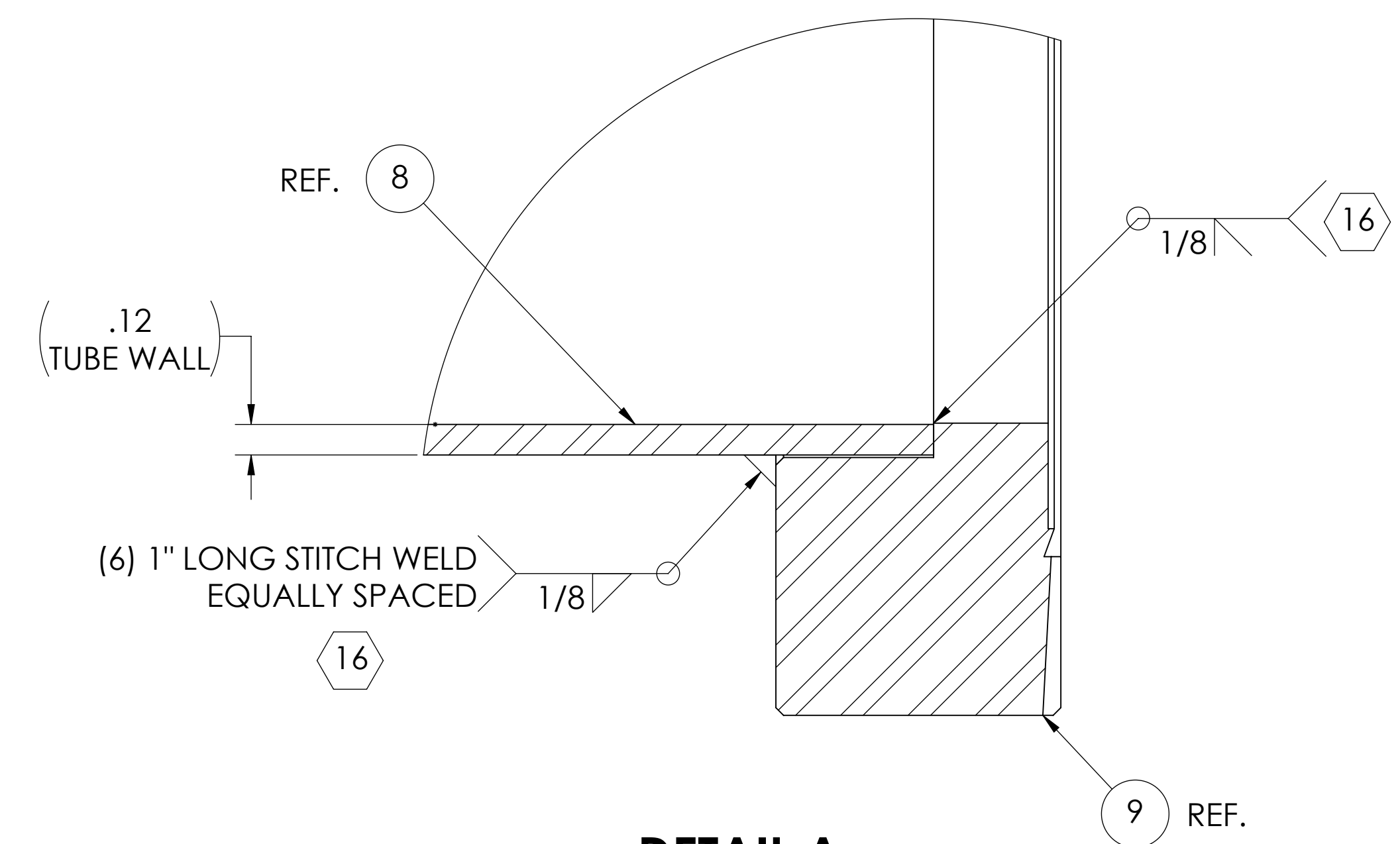
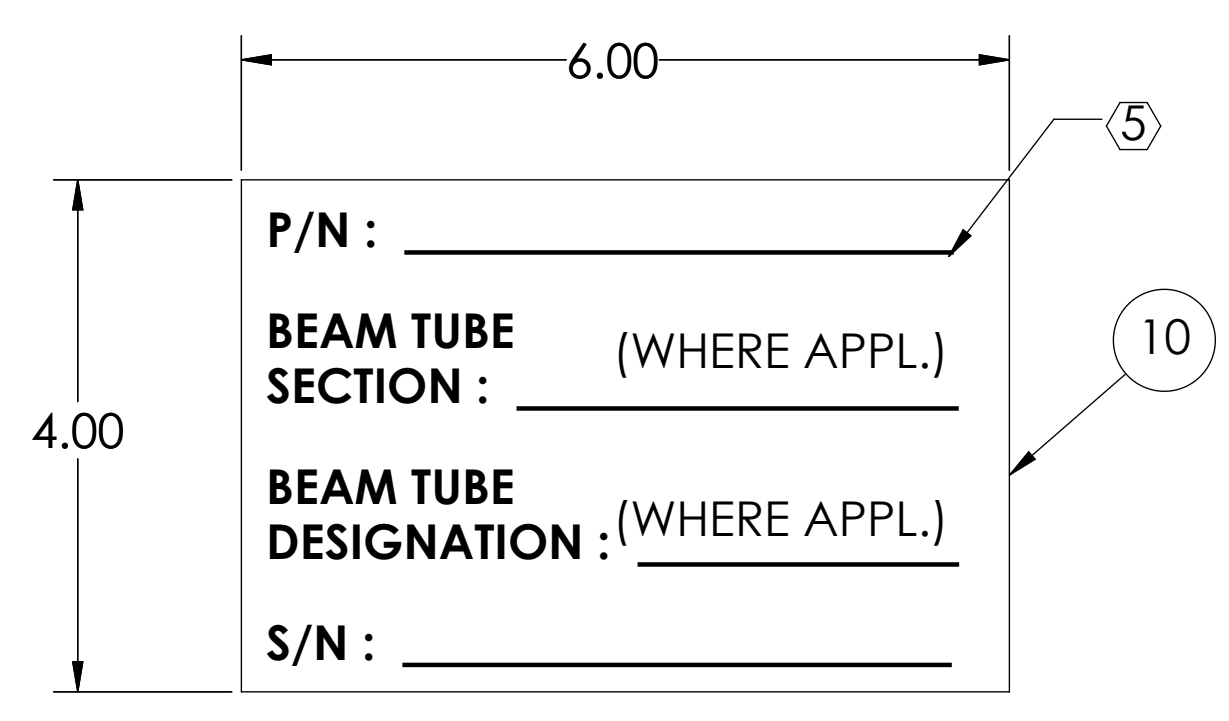
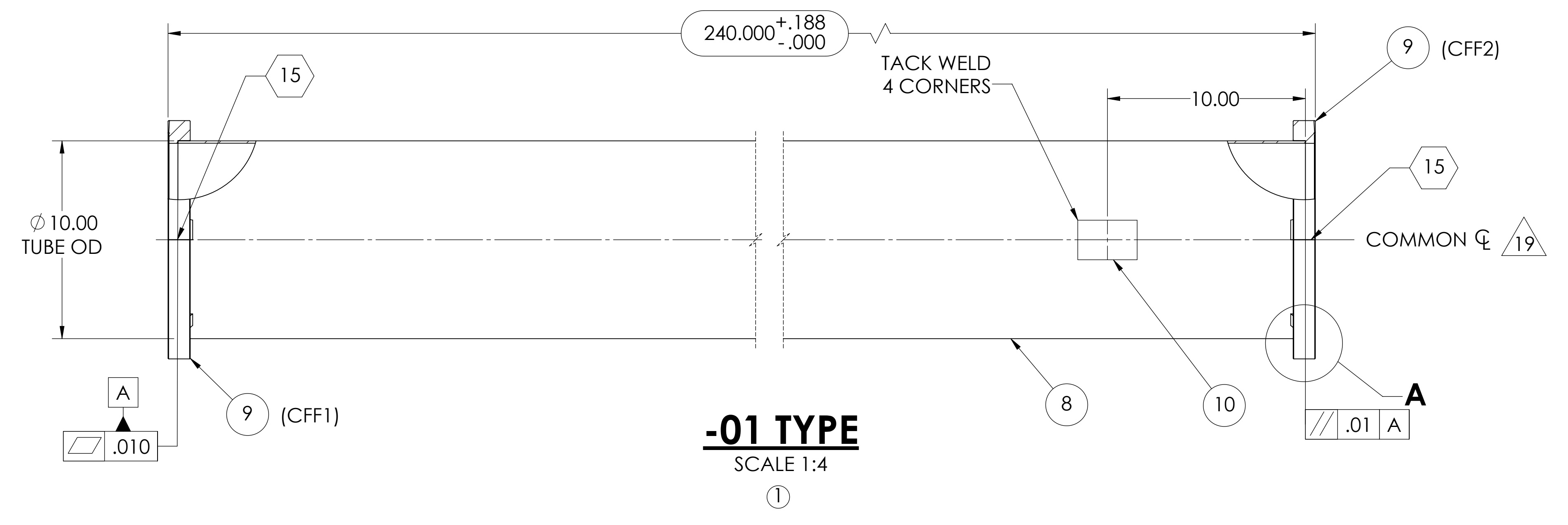
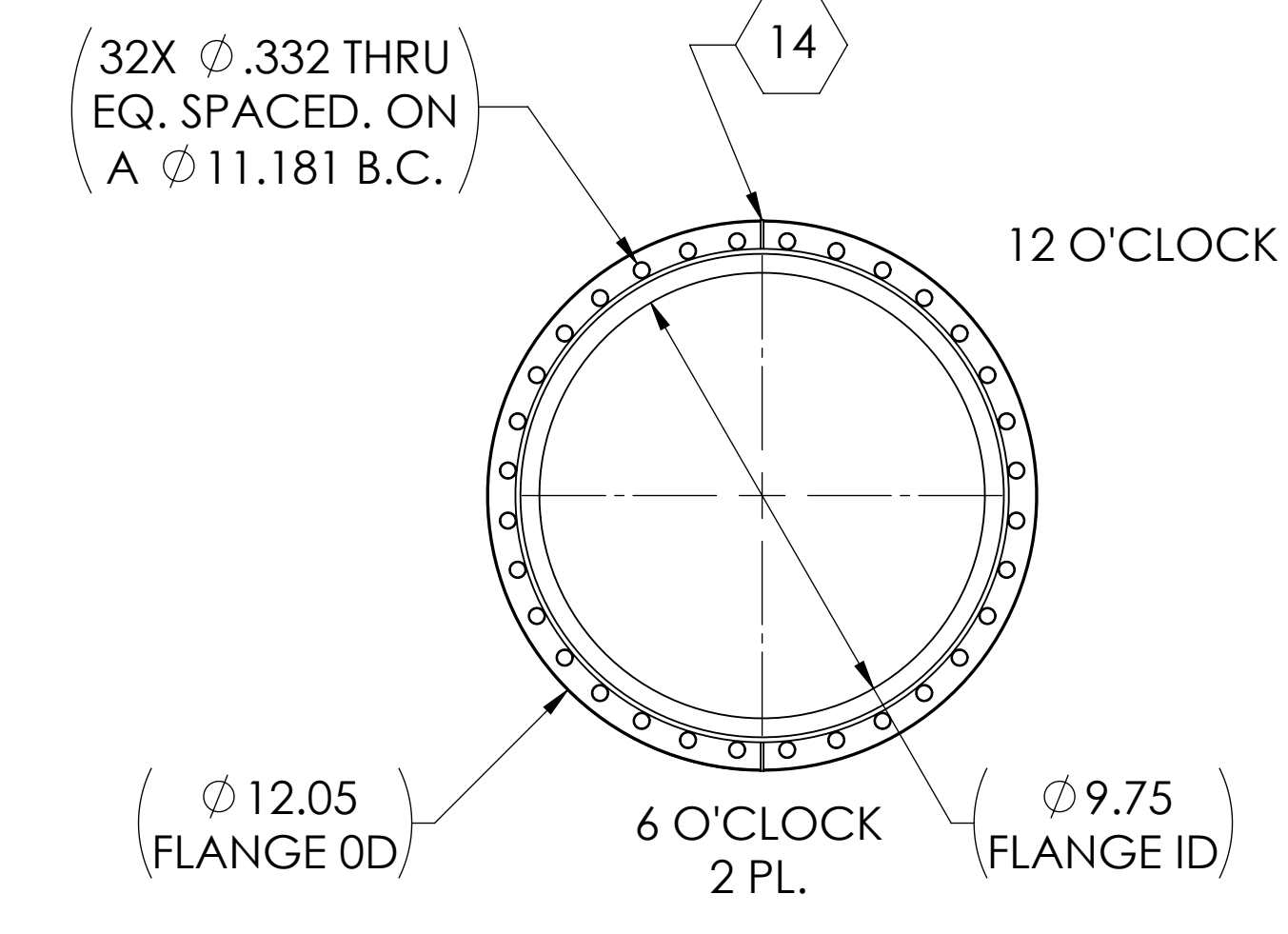
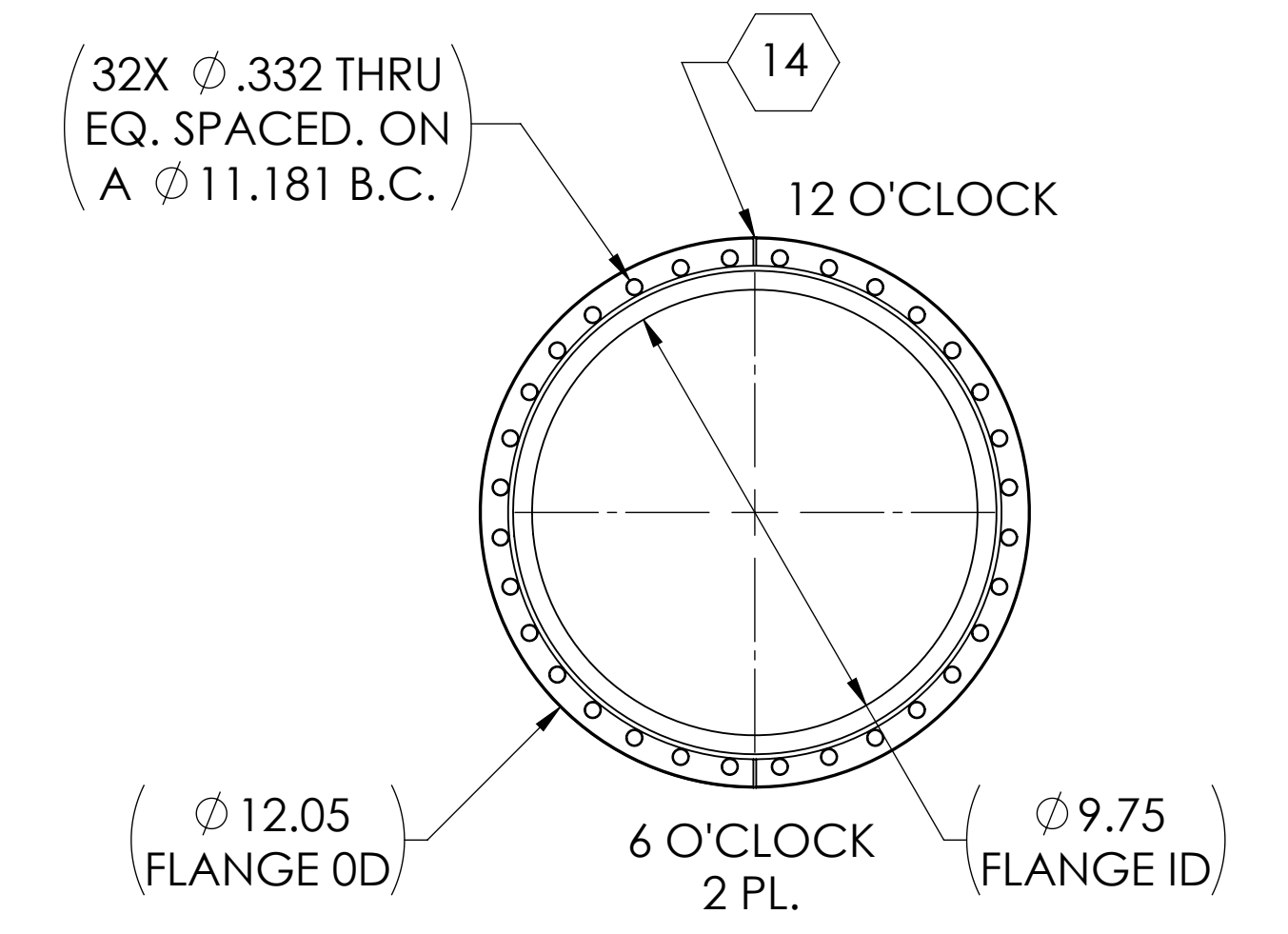
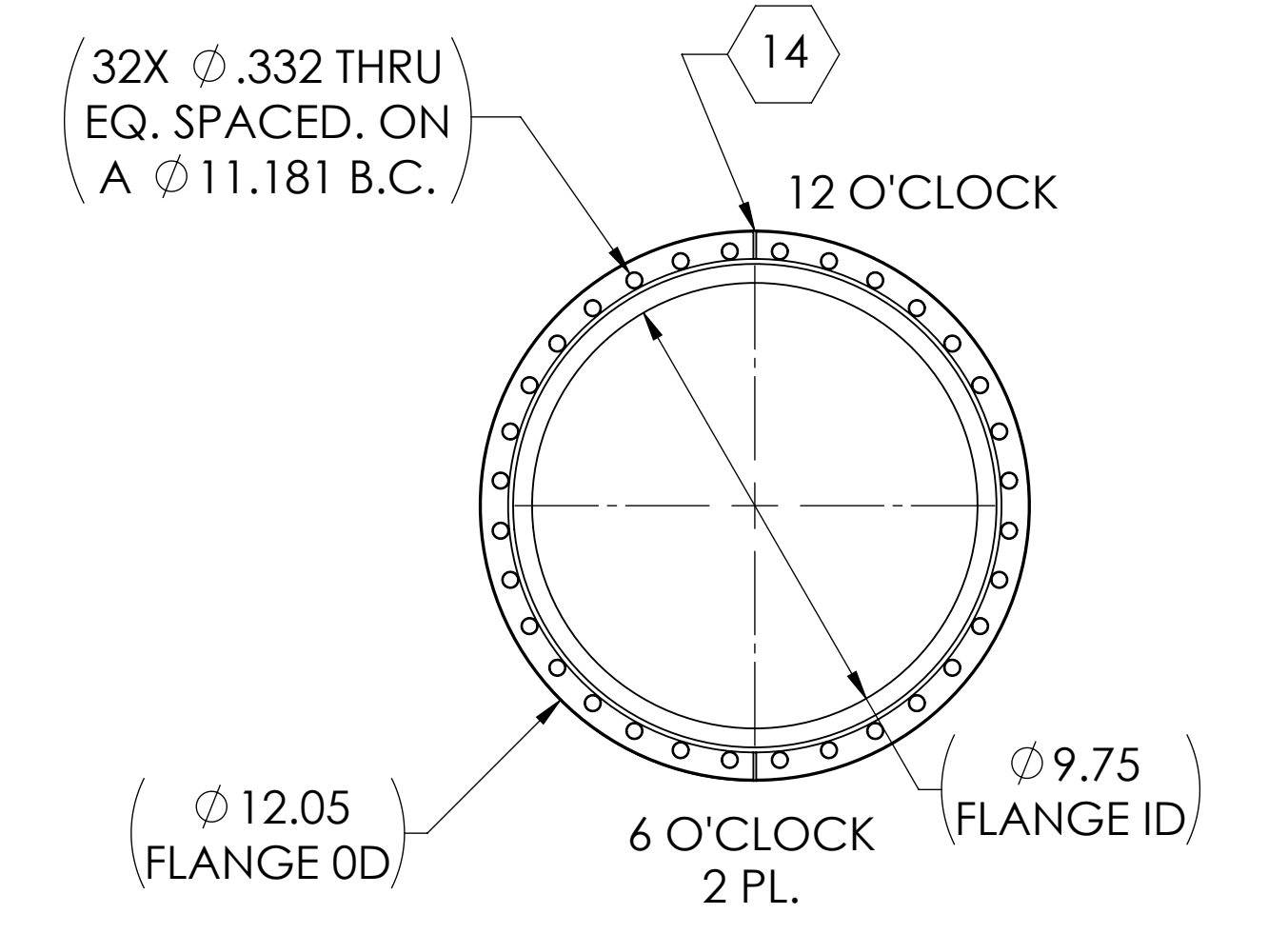
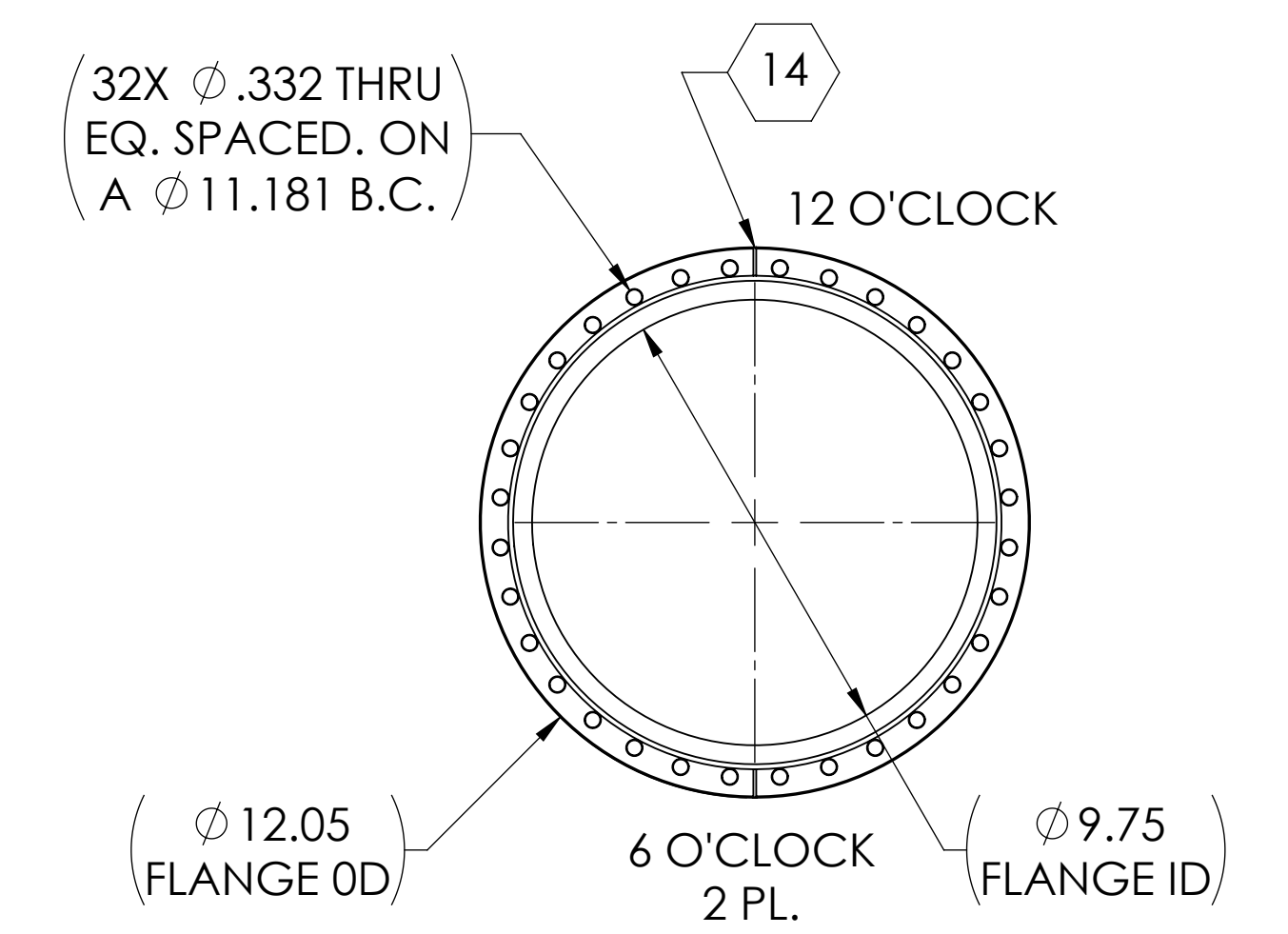


- NOTES CONTINUED:
- 5. SCRIBE ENGRAVE (A VIBRATORY TOOL MAY BE USED), LASER MARK OR MECHANICALLY STAMP (NO INKS OR DYES) DRAWING PART NUMBER, REVISION (AND VARIANT OR TYPE IF APPLICABLE) ON NOTED SURFACE OF PART FOLLOWED ON THE NEXT LINE WITH A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST ARTICLE AND PROCEED CONSECUTIVELY. USE MINIMUM 0.12" HIGH CHARACTERS, UNLESS THE SIZE OF THE PART DICTATES SMALLER CHARACTERS. EXAMPLE: DXXXXXX-VV, TYPE-XX, S/N XXX
 - 6. ALL MATERIAL IS TO BE VIRGIN MATERIAL (i.e. NO WELD REPAIRS, PLUGS OR RECYCLED MATERIAL). NO REPAIRS SHALL BE MADE UNLESS APPROVED IN ADVANCE, AND IN WRITING, BY LIGO LABORATORY.
 - 7. ALL MATERIAL TO BE 304L STAINLESS STEEL.
 - 8. FOR SURFACE ROUGHNESS REFER TO LIGO E1900024
 - 9. GRINDING TO INTERNAL VACUUM BOUNDARY SURFACES IS NOT ALLOWED. DO NOT USE CARBON STEEL BRUSHES OR BRUSHES CONTAMINATED WITH CARBON STEEL ON STAINLESS OR ALUMINUM MATERIAL.
 - 10. MACHINE TOOL LAY TO BE CONCENTRIC ON ALL SURFACES THAT REQUIRE A 32 RMS FINISH.
 - 11. FLANGES WILL BE USED IN UHV SERVICE.
 - 12. NO ABRASIVE STONES, CLOTHS OR GRINDING WHEELS MAY BE USED.
 - 13. NO OIL BASED OR HYDROCARBON BASED CUTTING FLUIDS MAY BE USED.
 - 14. FLANGE LEAK PORTS SHALL BE CENTERED AT 12 AND 6 O'CLOCK POSITIONS.
 - 15. SCRIBE LINE ON OUTSIDE SURFACE OF CF FLANGE WHERE SHOWN.
 - 16. FOR WELDING AND HELIUM LEAK TEST SPECIFICATIONS REFER TO LIGO E0900408 AND E0900404
 - 17. CONFLAT FLANGES ARE TO BE PROTECTED WITH RIGID COVERS AT ALL TIMES DURING AND AFTER MANUFACTURING.
 - 18. PACKAGE, HANDLE, AND SHIP IN SUCH A MANNER S TO MAINTAIN SPECIFIED SURFACE FINISHED AND FLATNESS TOLERANCES.
 - 19. CENTER LINES OF ALL BEAM TUBES AND FLANGES ARE TO BE ON THE COMMON CENTER LINE WITHIN $\pm 1/16"$.
 - 20. DIMENSIONS DENOTED WITH \varnothing TO BE MEASURED AND RESULTS INCLUDED IN AN INSPECTION REPORT.

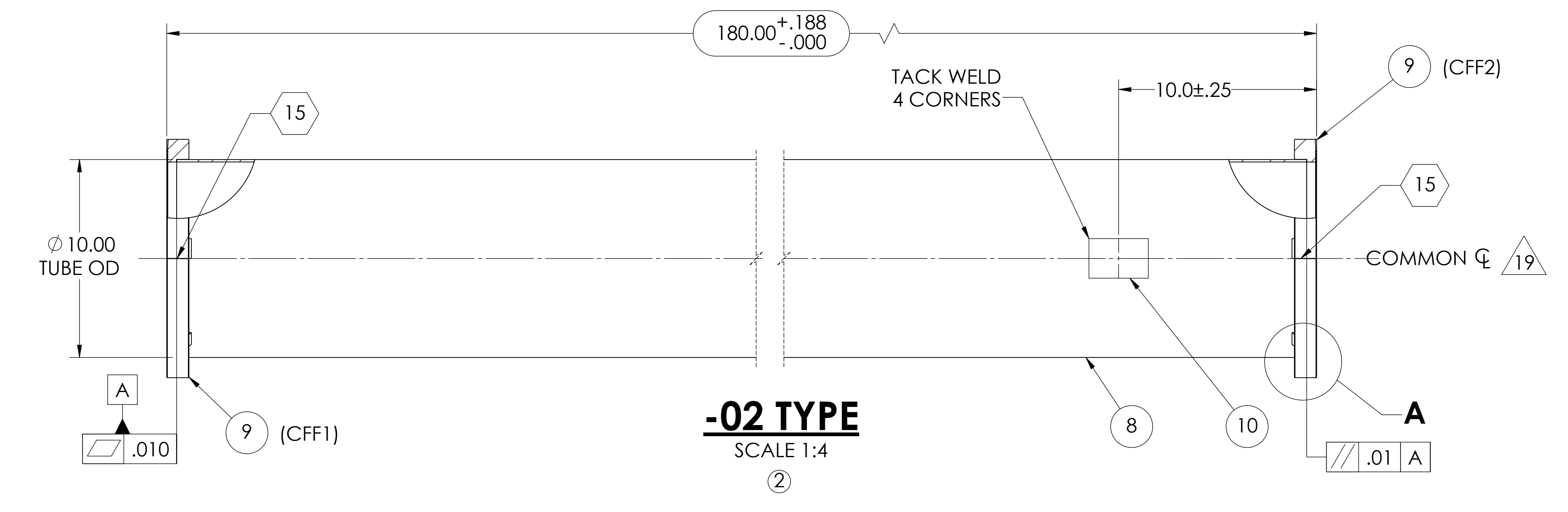


DETAIL A
SCALE 2:1
TYPICAL

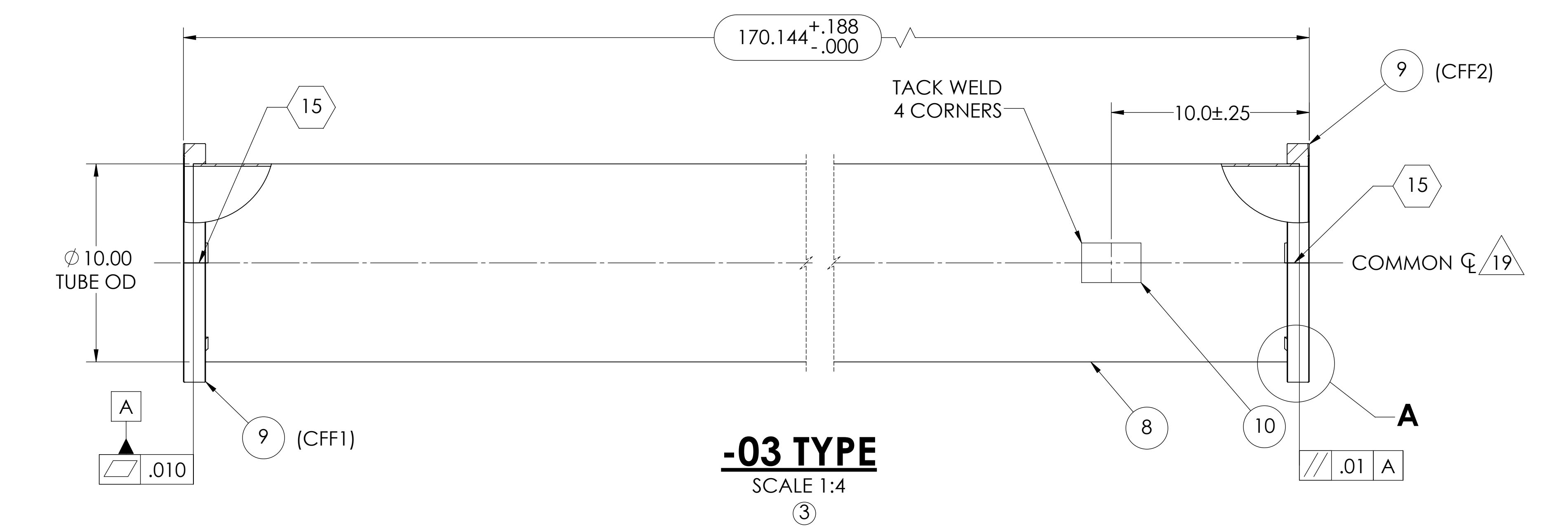
ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
10	BY VENDOR	NAMEPLATE, 2in X 3in X .06 THK	SSTL	1
9	BY VENDOR	CF FLANGE, 12" OD, X 10" ID, NON-ROTATABLE	ALSI 304	2
8	BY VENDOR	A+, 10" OD, TUBE, .12" WALL	ALSI 304	A/R
7	D1900443-07	A+, VE, FC FC BEAM TUBE, 10 IN. O.D, 12" CF, 90" LG.	ALSI 304	1
6	D1900443-06	A+, VE, FC FC BEAM TUBE, 10 IN. O.D, 12" CF, 96" LG.	ALSI 304	1
5	D1900443-05	A+, VE, FC FC BEAM TUBE, 10 IN. O.D, 12" CF, 144" LG.	ALSI 304	1
4	D1900443-04	A+, VE, FC FC BEAM TUBE, 10 IN. O.D, 12" CF, 183.75" LG.	ALSI 304	1
3	D1900443-03	A+, VE, FC FC BEAM TUBE, 10 IN. O.D, 12" CF, 170.14" LG.	ALSI 304	1
2	D1900443-02	A+, VE, FC FC BEAM TUBE, 10 IN. O.D, 12" CF, 180" LG.	ALSI 304	1
1	D1900443-01	A+, VE, FC FC BEAM TUBE, 10 IN. O.D, 12" CF, 240" LG.	ALSI 304	1



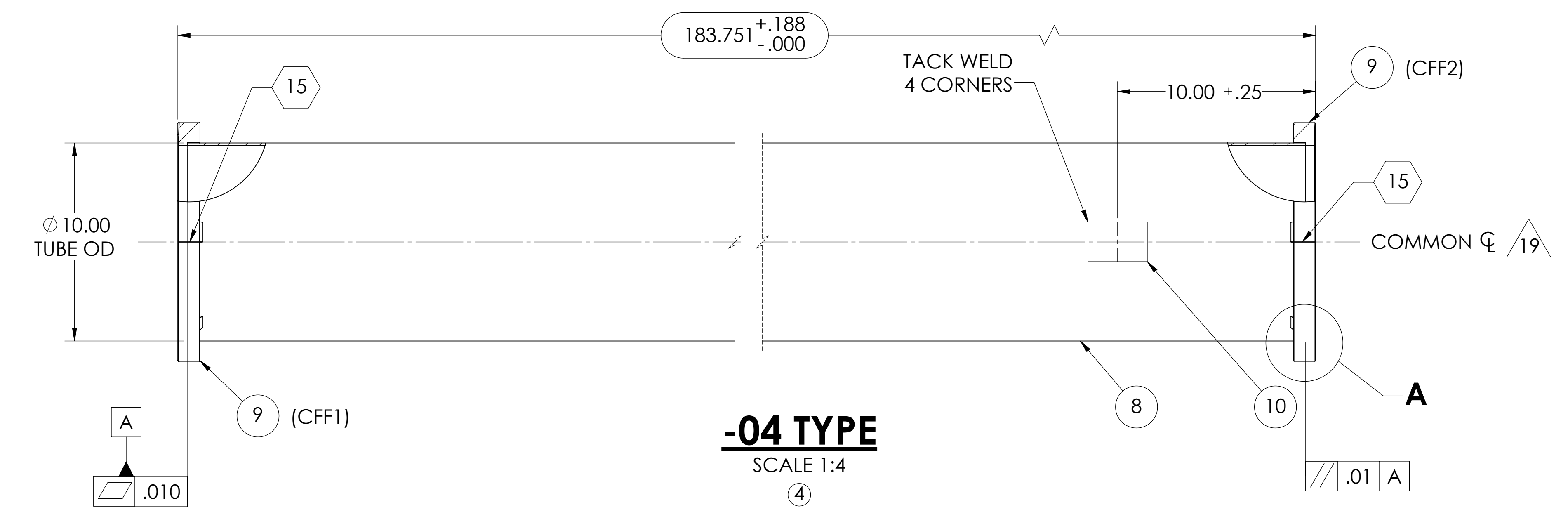
-01 TYPE
SCALE 1:4
①



-02 TYPE
SCALE 1:4
②



-03 TYPE
SCALE 1:4
③



-04 TYPE
SCALE 1:4
④

NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

- INTERPRET DRAWING PER ASME Y14.5-1994.
- REMOVE ALL SHARP EDGES, .005-.015, FOR MACHINED PARTS.
- DO NOT SCALE FROM DRAWING.
- ALL MACHINING FLUIDS MUST BE FULLY SYNTHETIC, FULLY WATER SOLUBLE AND FREE OF SULFUR, SILICONE, AND CHLORINE.

TOLERANCES:
 .XX ± .03
 .XXX ± .010
 ANGULAR ± 0.5°

DIMENSIONS ARE IN INCHES

MATERIAL	304L SSTL	FINISH	μinch
NEXT ASSY	TBD	SYSTEM	A+
SUB-SYSTEM	VE	DESIGNER	D. GRIFFIN
DATE	30 SEP 2019	CHECKER	SEE DCC
APPROVAL	SEE DCC	SCALE	NTS

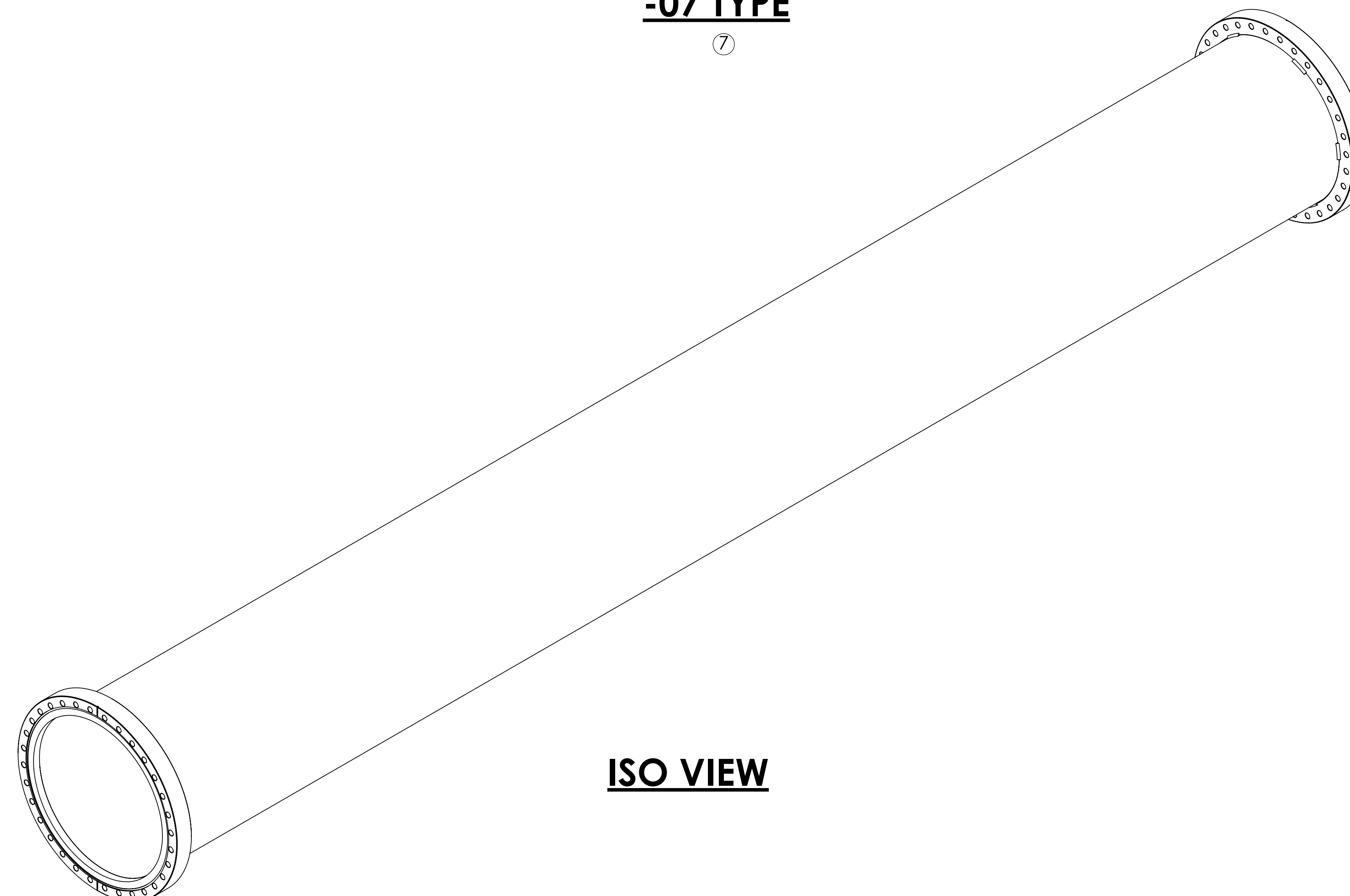
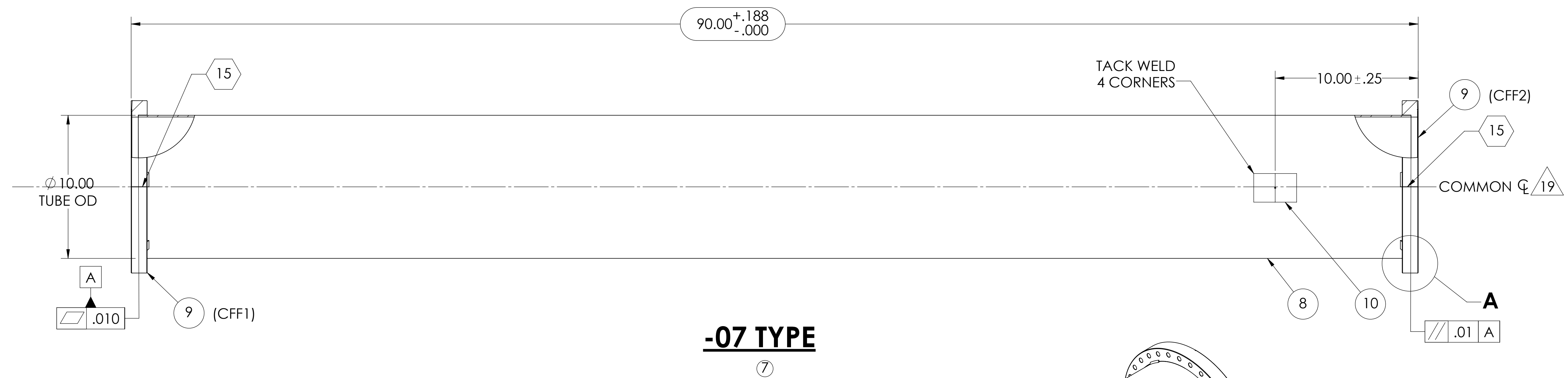
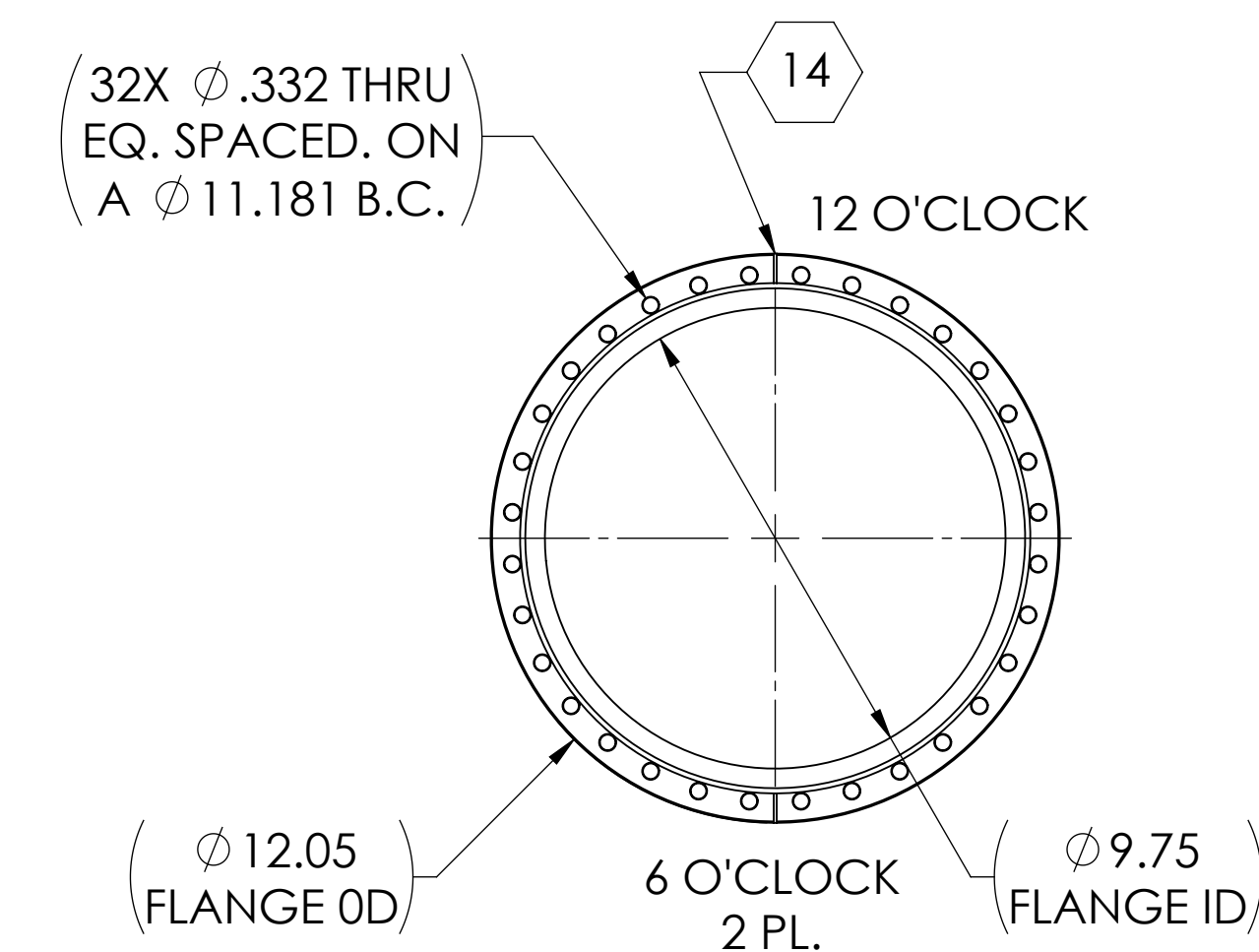
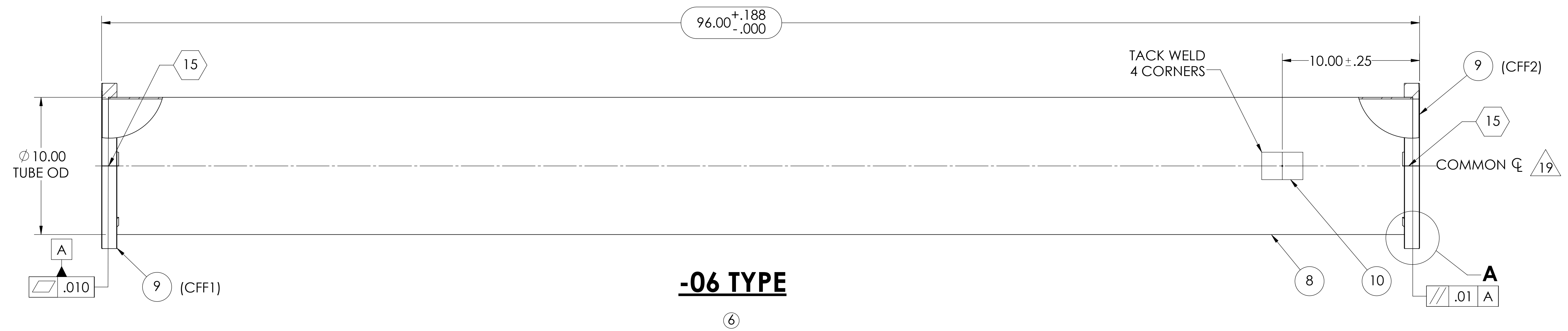
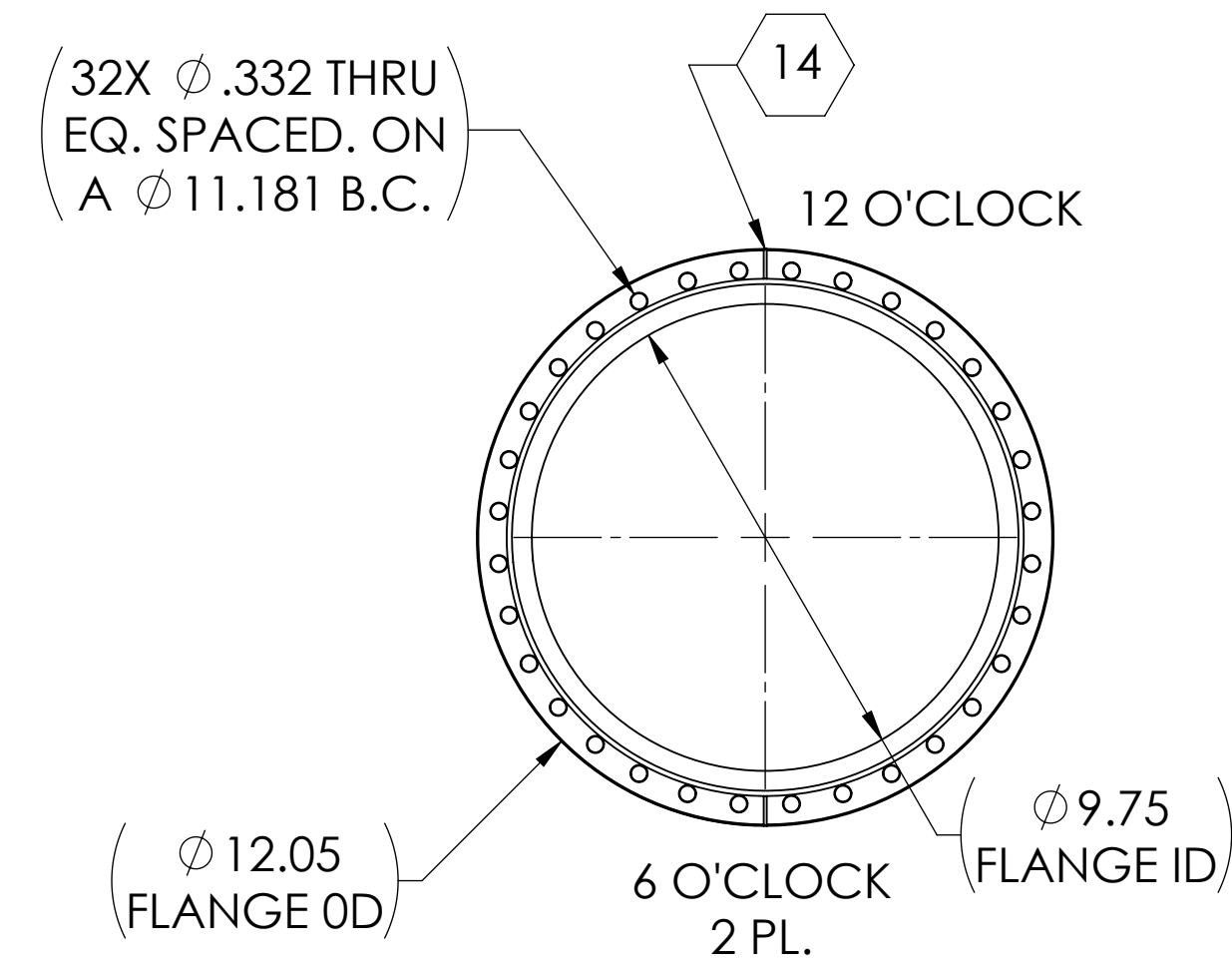
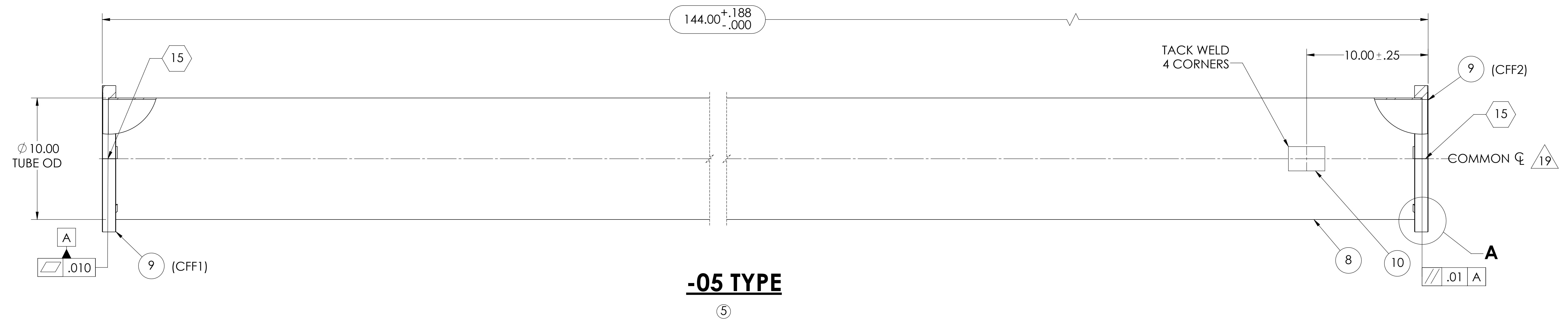
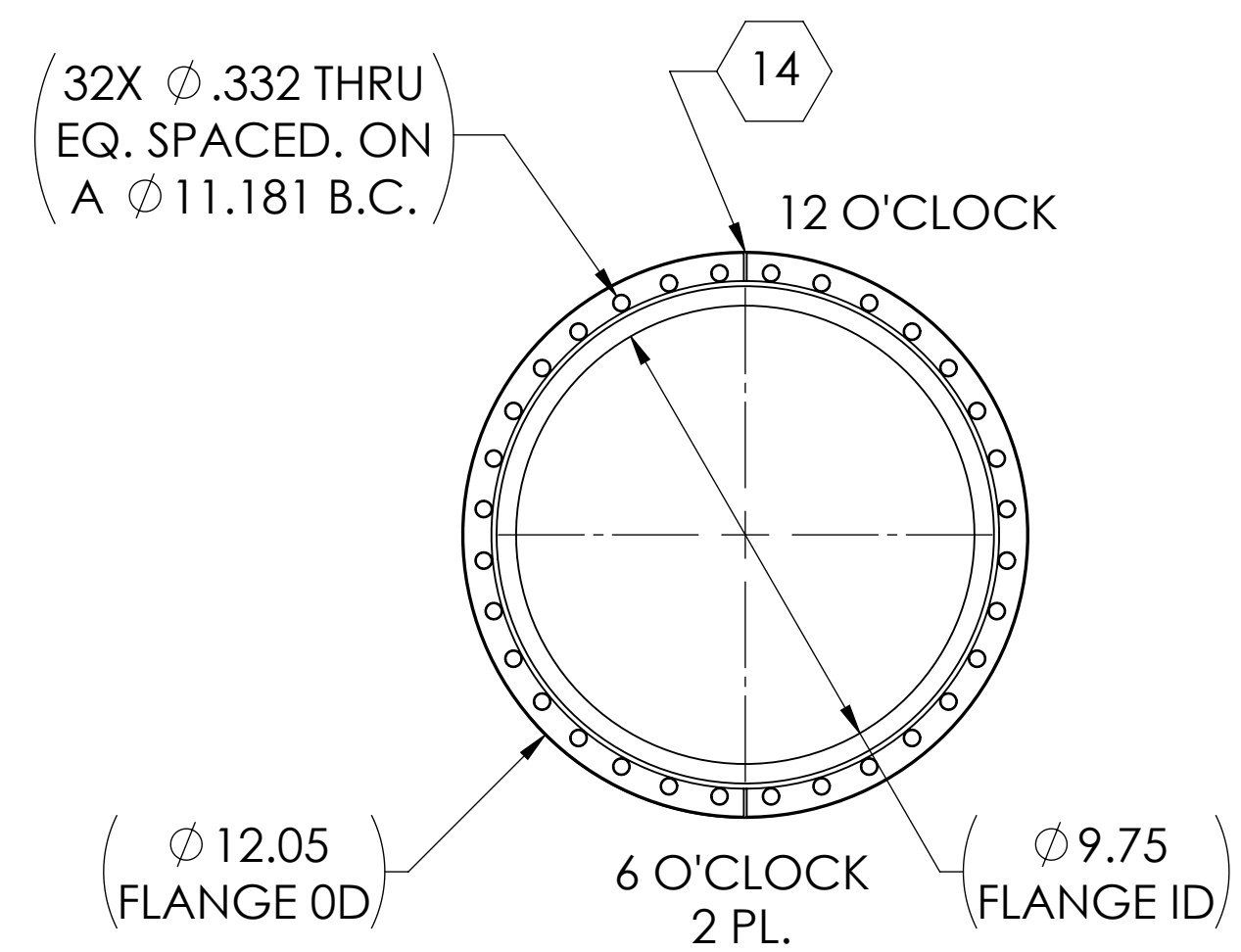
CALIFORNIA INSTITUTE OF TECHNOLOGY
 MASSACHUSETTS INSTITUTE OF TECHNOLOGY

PART NAME: A+ VE, FC TUBE, 10in OD

SIZE DWG. NO. E D1900443

REV. v8

SHEET 1 OF 2



ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
10	BY VENDOR	NAMEPLATE, 2in X 3in X .06 THK	SSTL	1
9	BY VENDOR	CF FLANGE, 12" O.D. X 10" I.D. NON-ROTATABLE	AISI 304	2
8	BY VENDOR	A+, 10" O.D. TUBE, .12" WALL	AISI 304	A/R
7	D1900443-07	A+, VE, FC FC BEAM TUBE, 10 IN. O.D, 12" CF, 90" LG.	AISI 304	1
6	D1900443-06	A+, VE, FC FC BEAM TUBE, 10 IN. O.D, 12" CF, 96" LG.	AISI 304	1
5	D1900443-05	A+, VE, FC FC BEAM TUBE, 10 IN. O.D, 12" CF, 144" LG.	AISI 304	1
4	D1900443-04	A+, VE, FC FC BEAM TUBE, 10 IN. O.D, 12" CF, 183.75" LG.	AISI 304	1
3	D1900443-03	A+, VE, FC FC BEAM TUBE, 10 IN. O.D, 12" CF, 170.14" LG.	AISI 304	1
2	D1900443-02	A+, VE, FC FC BEAM TUBE, 10 IN. O.D, 12" CF, 180" LG.	AISI 304	1
1	D1900443-01	A+, VE, FC FC BEAM TUBE, 10 IN. O.D, 12" CF, 240" LG.	AISI 304	1