




FD1 HV EW Design Review

Thomas Kutter
for the LSU team





















Overview of Drawings

CERN EDMS entries




EDMS 2633165 v1: Endwall and hanging structure

 DFD_EW_Winch_091121.pdf	1.1 MB	2021-09-21 16:19:32	VICTOR GUARINO
 EW_Retainers_091721.pdf	426.4 KB	2021-09-21 16:19:32	VICTOR GUARINO
 DFD_EW_092522.pdf	10.0 MB	2022-09-30 09:05:08	VICTOR GUARINO
 DFD-22-5500_102022.pdf	1.4 MB	2022-10-21 11:19:43	VICTOR GUARINO

EDMS 2786837 v1: Endwall tooling

2787665 v.1 ★  Assembly Table	@ 2	 In Work	2022-10-11	VICTOR GUARI	Drawing
2787666 v.1 ★  Bender Clamp Assembly	@ 4	 In Work	2022-10-11	VICTOR GUARI	Drawing
2787667 v.1 ★  Box Beam Large Hole Location...	@ 4	 In Work	2022-10-11	VICTOR GUARI	Drawing
2787668 v.1 ★  Box Beam Small Hole Location ...	@ 3	 In Work	2022-10-11	VICTOR GUARI	Drawing
2787669 v.1 ★  Comb Assembly	@ 5	 In Work	2022-10-11	VICTOR GUARI	Drawing
2787671 v.1 ★  EW Alignment Bracket Left	@ 2	 In Work	2022-10-11	VICTOR GUARI	Drawing
2787672 v.1 ★  EW Alignment Bracket Right	@ 2	 In Work	2022-10-11	VICTOR GUARI	Drawing
2787673 v.1 ★  EW Alignment L Bar	@ 2	 In Work	2022-10-11	VICTOR GUARI	Drawing
2787674 v.1 ★  Profile Bending Tool	@ 2	 In Work	2022-10-11	VICTOR GUARI	Drawing
2787676 v.1 ★  EW Roller Base	@ 7	 In Work	2022-10-11	VICTOR GUARI	Drawing

EDMS 2633165 Comments

 DFD_EW_Winch_091121.pdf	1.1 MB	2021-09-21 16:19:32	VICTOR GUARINO
 EW_Retainers_091721.pdf	426.4 KB	2021-09-21 16:19:32	VICTOR GUARINO
 DFD_EW_092522.pdf	10.0 MB	2022-09-30 09:05:08	VICTOR GUARINO
 DFD-22-5500_102022.pdf	1.4 MB	2022-10-21 11:19:43	VICTOR GUARINO

Some duplication of drawings

DFD-22-5127

DFD-22-5129

DFD-22-5181

DFD-22-5182

...

DFD-22- 5194

...

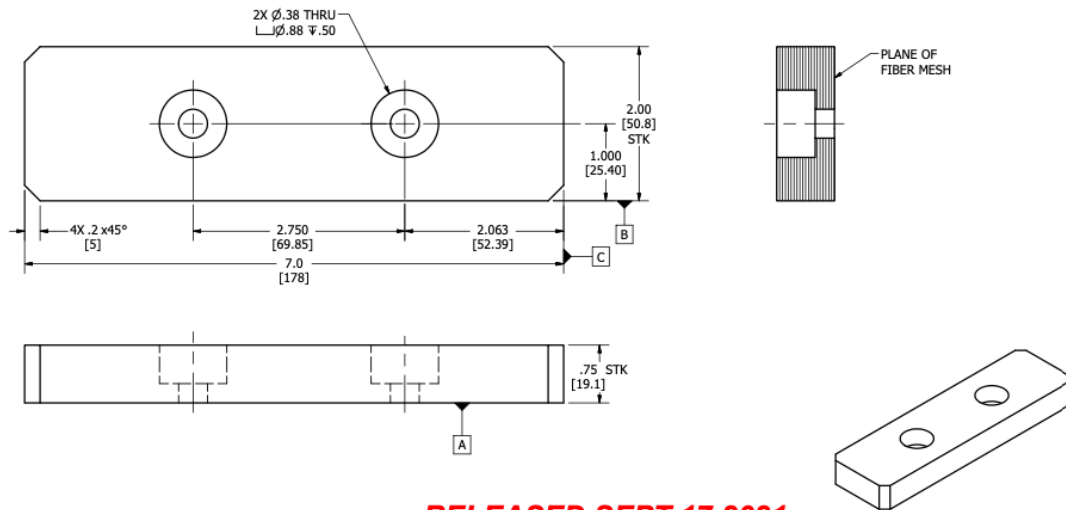
Action item: Remove duplicates and super-seeded drawing versions

EW_Retainers_091721 Comments

DFD-19-2027/2031 for the endwall-APA restraints contains a small built in asymmetry

- Left hole center to edge = 2.187"
- Right hole center to edge = 2.063"

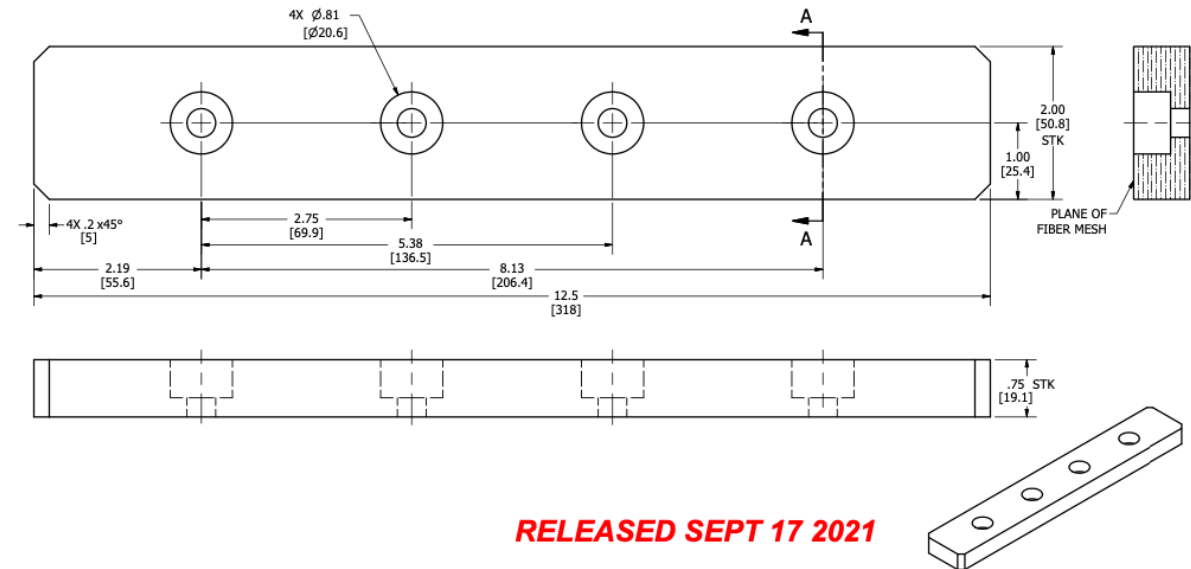
Action item: This should be corrected so that the restraints are symmetric



RELEASED SEPT 17 2021

<small>UNLESS OTHERWISE NOTED ALL DIMENSIONS ARE IN INCHES</small> <small>DECIMAL TOLERANCE</small> .XX # .01 .XXX # .005 .XXXX # .0005 <small>ANGULAR TOL # 1/2</small> <small>FRACTIONAL TOL # 1/64</small> <small>THIRD ANGLE PROJECTION</small> <small>REMOVE ALL BURRS AND SHARP EDGES</small> <small>SAWED TO ALL IN ACCORDANCE WITH LATEST PRC FILE 1</small> <small>SHIMMERS & TOLERANCES IN ACCORDANCE WITH LATEST APM 104.04</small>	STATUS: RELEASED	DO NOT SCALE DRAWING		ARGONNE NATIONAL LABORATORY	DFD-19-2035, -2040	QTY: 8020	
	DRAWN BY: RTKMAK	DATE: 8/15/2021	GROUP LEADER:	DATE:			
	CHECKED BY:	DATE:	PROJECT MGR:	DATE:	DESCRIPTION: CLAMP BAR - FRONT	PROJECT NUMBER: PRJ0103842	REV: 00
	RESPONSIBLE ENGINEER: V GUARINO	DATE:	APPROVED:	DATE:	MATERIAL: FR4, FLAME RESISTANT	SCALE: 1 : 1	SHEET: 1 OF 1

- NOTES:
- 1 - ALL DIMENSIONS IN INCHES [mm].
 - 2 - ALL HOLES $\Phi_{.010|A|B|C}$ UNLESS OTHERWISE NOTED.
 - 3 - ALL MACHINED / SAWCUT EDGES TO BE COATED WITH 3M #2216 TRANSLUCENT EPOXY. DO NOT COAT HOLES Ø.50 OR SMALLER.



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- NOTES:
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 - 2 - ALL HOLES $\Phi_{.010|A|B|C}$ UNLESS OTHERWISE NOTED.
 - 3 - ALL MACHINED / SAWCUT EDGES TO BE COATED WITH 3M #2216 TRANSLUCENT EPOXY. DO NOT COAT HOLES Ø.50 OR SMALLER.

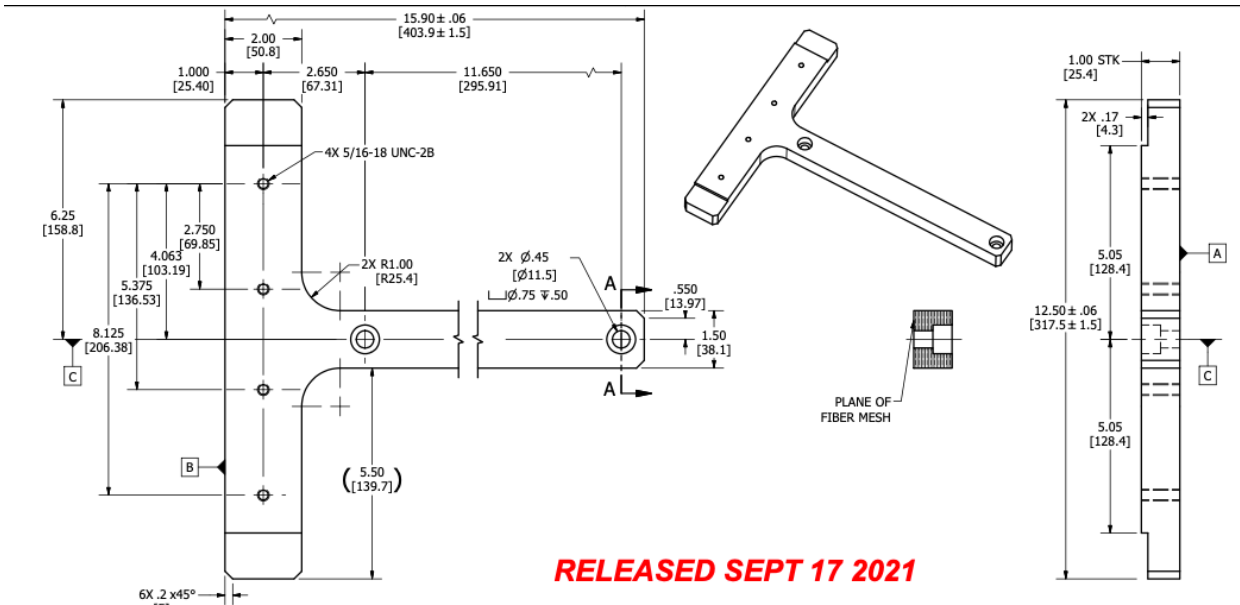
<small>UNLESS OTHERWISE NOTED ALL DIMENSIONS ARE IN INCHES</small> <small>DECIMAL TOLERANCE</small> .XX # .01 .XXX # .005 .XXXX # .0005 <small>ANGULAR TOL # 1/2</small> <small>FRACTIONAL TOL # 1/64</small> <small>THIRD ANGLE PROJECTION</small> <small>REMOVE ALL BURRS AND SHARP EDGES</small> <small>SAWED TO ALL IN ACCORDANCE WITH LATEST PRC FILE 1</small> <small>SHIMMERS & TOLERANCES IN ACCORDANCE WITH LATEST APM 104.04</small>	STATUS: RELEASED	DO NOT SCALE DRAWING		ARGONNE NATIONAL LABORATORY	DFD-19-2030	QTY: 8020	
	DRAWN BY: RTKMAK	DATE: 8/16/2021	GROUP LEADER:	DATE:			
	CHECKED BY:	DATE:	PROJECT MGR:	DATE:	DESCRIPTION: DOUBLE CLAMP BAR - FRONT	PROJECT NUMBER: PRJ0103842	REV: 00
	RESPONSIBLE ENGINEER: V GUARINO	DATE:	APPROVED:	DATE:	MATERIAL: FR4, FLAME RESISTANT	SCALE: 1 : 1	SHEET: 1 OF 1

EW_Retainers_091721 Comments

DFD-19-2032/2034: Inconsistent tolerances on the endwall-APA/CPA restraints

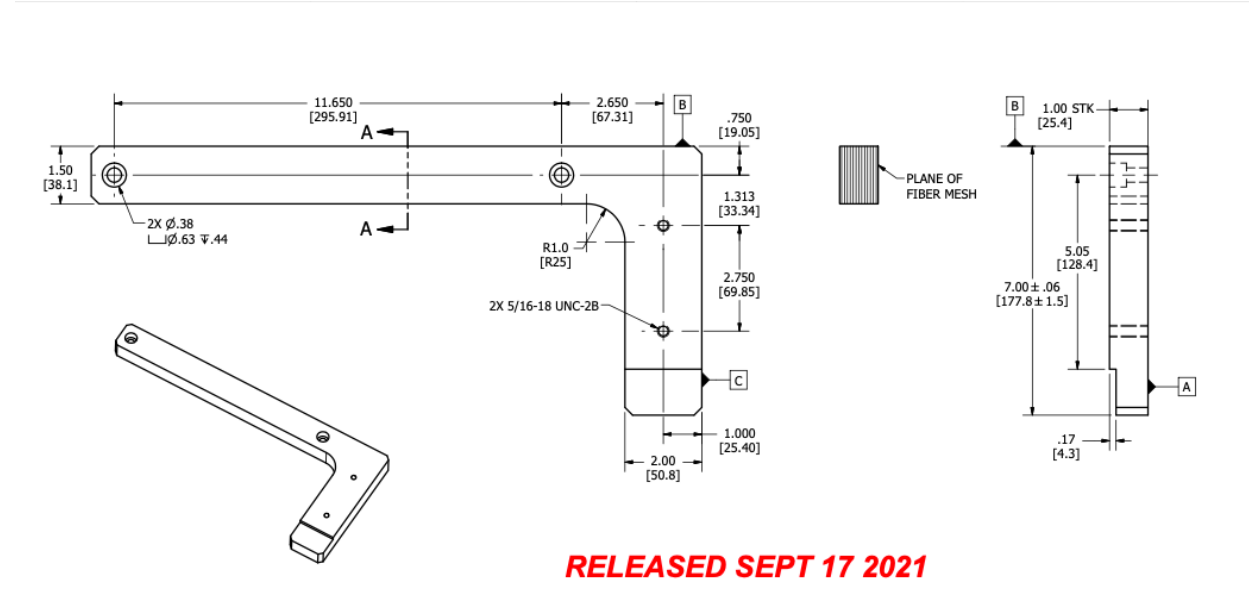
- Tolerance on length is +/- 0.1"
- Tolerance on short arm is +/- 0.06"

Action item: This should be corrected so the reflected tolerances are consistent



- NOTES:
 1 - ALL DIMENSIONS IN INCHES [mm].
 2 - ALL HOLES ϕ .010[A|B|C] UNLESS OTHERWISE NOTED.
 3 - ALL MACHINED / SAWCUT EDGES TO BE COATED WITH 3M #2216 TRANSLUCENT EPOXY. DO NOT COAT HOLES ϕ .50 OR SMALLER.

UNLESS OTHERWISE NOTED ALL DIMENSIONS ARE IN INCHES DECIMAL TOLERANCE X .1 XX .01 XXX .005 ANGULAR TOL .1/2 FRACTIONAL TOL .1/64 THIRD ANGLE PROJECTION	STATUS: RELEASED	DO NOT SCALE DRAWING	Argonne NATIONAL LABORATORY	NEXT ASSEMBLY: DFD-19-2030	QTY. REQD
	DRAWN BY: RTKMAK	DATE: 8/16/2021	GROUP LEADER: []	DATE: []	
CHECKED BY: []	DATE: []	PROJECT MGR: []	DATE: []	DESCRIPTION: ANCHOR BAR - TEE	
RESPONSIBLE ENGINEER: V GUARINO	DATE: []	APPROVED: []	DATE: []	PROJECT: DUNE-PAR DETECTOR	PROJECT NUMBER: PDU003643
MATERIAL: FR4, FLAME RESISTANT	SCALE: 1:1	SHEET: 1 OF 1	SHEET SIZE: B	PART NUMBER: DFD-19-2032	REV: 00



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 1 - ALL DIMENSIONS IN INCHES [mm].
 2 - ALL HOLES ϕ .010[A|B|C] UNLESS OTHERWISE NOTED.
 3 - ALL MACHINED / SAWCUT EDGES TO BE COATED WITH 3M #2216 TRANSLUCENT EPOXY. DO NOT COAT HOLES ϕ .50 OR SMALLER.

UNLESS OTHERWISE NOTED ALL DIMENSIONS ARE IN INCHES DECIMAL TOLERANCE X .1 XX .01 XXX .005 ANGULAR TOL .1/2 FRACTIONAL TOL .1/64 THIRD ANGLE PROJECTION	STATUS: RELEASED	DO NOT SCALE DRAWING	Argonne NATIONAL LABORATORY	NEXT ASSEMBLY: DFD-19-2035	QTY. REQD
	DRAWN BY: RTKMAK	DATE: 8/15/2021	GROUP LEADER: []	DATE: []	
CHECKED BY: []	DATE: []	PROJECT MGR: []	DATE: []	DESCRIPTION: ANCHOR BAR (L)	
RESPONSIBLE ENGINEER: V GUARINO	DATE: []	APPROVED: []	DATE: []	PROJECT: DUNE-PAR DETECTOR	PROJECT NUMBER: PDU003643
MATERIAL: FR4, FLAME RESISTANT	SCALE: 1:2	SHEET: 1 OF 1	SHEET SIZE: B	PART NUMBER: DFD-19-2034	REV: 00

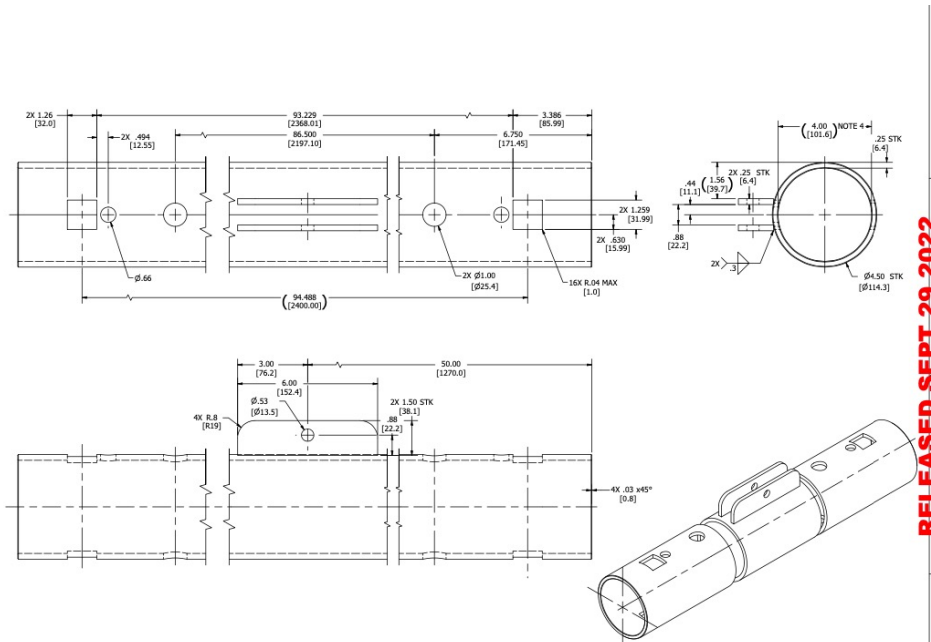
DFD_EW_092522 Comments

PD2-22-5182/5186:

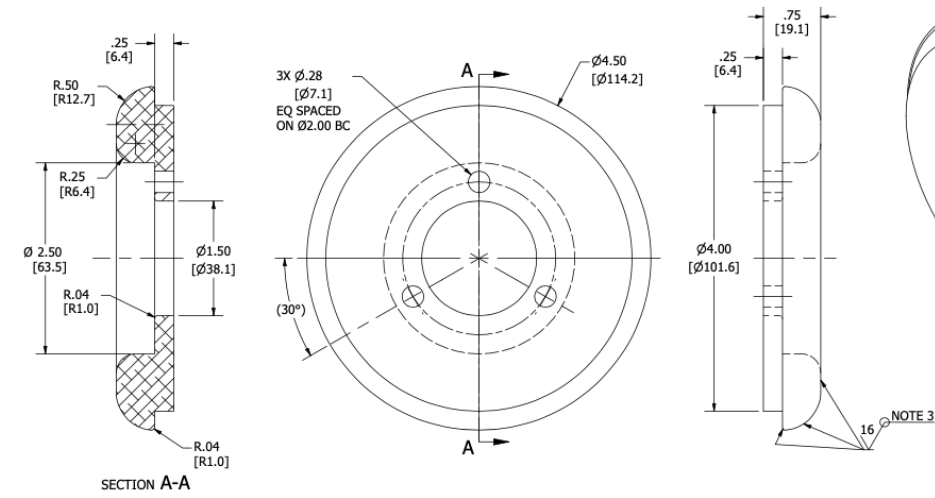
The inner diameter of the end caps does not always fit on the end of the hanger tube (PD2-22-5182)

Action item 1: reduce the inner diameter of endcaps by ~10/1000"

Action item 2: rounding of edges of PD2-22-5186 on side facing DFD-22-5182of



RELEASED SEPT 29 2022



RELEASED SEPT 29 2022

- NOTES:
 1 - ALL DIMENSIONS IN INCHES (mm).
 2 - ALL HOLES (Ø) (Ø) UNLESS OTHERWISE NOTED
 3 - APPROX. WEIGHT = 100.0 LBS
 4 - SEE DRAWINGS DFD-22-5183, DFD-22-5184.

UNLESS OTHERWISE NOTED		RELEASED		DO NOT SCALE DRAWING		Argonne NATIONAL LABORATORY		PROJECT NUMBER: DFD-22-5180	REV: 00
DATE: 10/29/2022	BY: RTK/MAK	DATE: 10/29/2022	BY: RTK/MAK	SCALE: 1:1	SHEET: 1 OF 1	DESCRIPTION: HANGER TUBE	PROJECT NUMBER: DFD-22-5182	REV: 00	

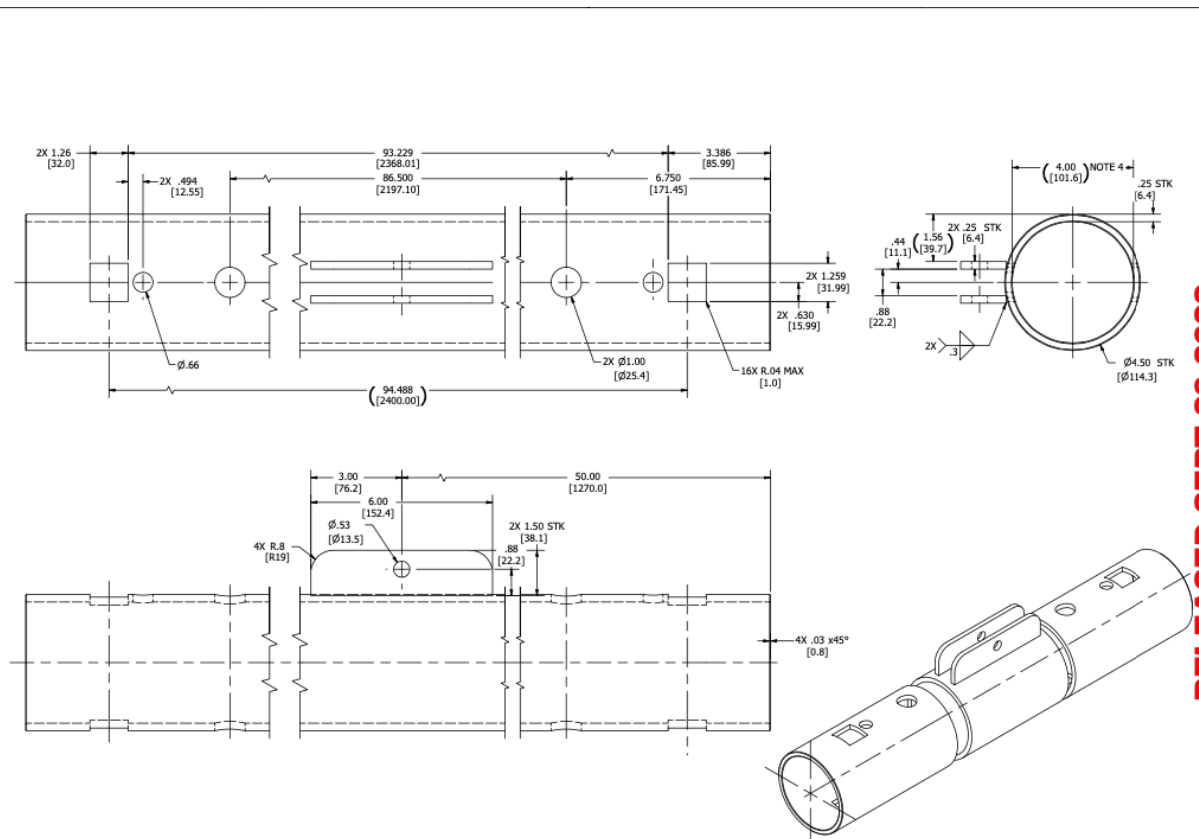
- NOTES:
 1 - ALL DIMENSIONS IN INCHES (mm).
 2 - APPROX. WEIGHT = 0.7 LBS
 3 - MAY FINISH W/1000 GRIT PAPER, CLEAN AWAY ANY GRIT OR RESIDUE

UNLESS OTHERWISE NOTED ALL DIMENSIONS ARE IN INCHES DECIMAL TOLERANCE .125 = .005 .375 = .010 .625 = .015 .875 = .020 1.125 = .025 1.375 = .030 1.625 = .035 1.875 = .040 2.125 = .045 2.375 = .050 2.625 = .055 2.875 = .060 3.125 = .065 3.375 = .070 3.625 = .075 3.875 = .080 4.125 = .085 4.375 = .090 4.625 = .095 4.875 = .100 5.125 = .105 5.375 = .110 5.625 = .115 5.875 = .120 6.125 = .125 6.375 = .130 6.625 = .135 6.875 = .140 7.125 = .145 7.375 = .150 7.625 = .155 7.875 = .160 8.125 = .165 8.375 = .170 8.625 = .175 8.875 = .180 9.125 = .185 9.375 = .190 9.625 = .195 9.875 = .200 10.125 = .205 10.375 = .210 10.625 = .215 10.875 = .220 11.125 = .225 11.375 = .230 11.625 = .235 11.875 = .240 12.125 = .245 12.375 = .250 12.625 = .255 12.875 = .260 13.125 = .265 13.375 = .270 13.625 = .275 13.875 = .280 14.125 = .285 14.375 = .290 14.625 = .295 14.875 = .300 15.125 = .305 15.375 = .310 15.625 = .315 15.875 = .320 16.125 = .325 16.375 = .330 16.625 = .335 16.875 = .340 17.125 = .345 17.375 = .350 17.625 = .355 17.875 = .360 18.125 = .365 18.375 = .370 18.625 = .375 18.875 = .380 19.125 = .385 19.375 = .390 19.625 = .395 19.875 = .400 20.125 = .405 20.375 = .410 20.625 = .415 20.875 = .420 21.125 = .425 21.375 = .430 21.625 = .435 21.875 = .440 22.125 = .445 22.375 = .450 22.625 = .455 22.875 = .460 23.125 = .465 23.375 = .470 23.625 = .475 23.875 = .480 24.125 = .485 24.375 = .490 24.625 = .495 24.875 = .500 25.125 = .505 25.375 = .510 25.625 = .515 25.875 = .520 26.125 = .525 26.375 = .530 26.625 = .535 26.875 = .540 27.125 = .545 27.375 = .550 27.625 = .555 27.875 = .560 28.125 = .565 28.375 = .570 28.625 = .575 28.875 = .580 29.125 = .585 29.375 = .590 29.625 = .595 29.875 = .600 30.125 = .605 30.375 = .610 30.625 = .615 30.875 = .620 31.125 = .625 31.375 = .630 31.625 = .635 31.875 = .640 32.125 = .645 32.375 = .650 32.625 = .655 32.875 = .660 33.125 = .665 33.375 = .670 33.625 = .675 33.875 = .680 34.125 = .685 34.375 = .690 34.625 = .695 34.875 = .700 35.125 = .705 35.375 = .710 35.625 = .715 35.875 = .720 36.125 = .725 36.375 = .730 36.625 = .735 36.875 = .740 37.125 = .745 37.375 = .750 37.625 = .755 37.875 = .760 38.125 = .765 38.375 = .770 38.625 = .775 38.875 = .780 39.125 = .785 39.375 = .790 39.625 = .795 39.875 = .800 40.125 = .805 40.375 = .810 40.625 = .815 40.875 = .820 41.125 = .825 41.375 = .830 41.625 = .835 41.875 = .840 42.125 = .845 42.375 = .850 42.625 = .855 42.875 = .860 43.125 = .865 43.375 = .870 43.625 = .875 43.875 = .880 44.125 = .885 44.375 = .890 44.625 = .895 44.875 = .900 45.125 = .905 45.375 = .910 45.625 = .915 45.875 = .920 46.125 = .925 46.375 = .930 46.625 = .935 46.875 = .940 47.125 = .945 47.375 = .950 47.625 = .955 47.875 = .960 48.125 = .965 48.375 = .970 48.625 = .975 48.875 = .980 49.125 = .985 49.375 = .990 49.625 = .995 49.875 = 1.000 50.125 = 1.005 50.375 = 1.010 50.625 = 1.015 50.875 = 1.020 51.125 = 1.025 51.375 = 1.030 51.625 = 1.035 51.875 = 1.040 52.125 = 1.045 52.375 = 1.050 52.625 = 1.055 52.875 = 1.060 53.125 = 1.065 53.375 = 1.070 53.625 = 1.075 53.875 = 1.080 54.125 = 1.085 54.375 = 1.090 54.625 = 1.095 54.875 = 1.100 55.125 = 1.105 55.375 = 1.110 55.625 = 1.115 55.875 = 1.120 56.125 = 1.125 56.375 = 1.130 56.625 = 1.135 56.875 = 1.140 57.125 = 1.145 57.375 = 1.150 57.625 = 1.155 57.875 = 1.160 58.125 = 1.165 58.375 = 1.170 58.625 = 1.175 58.875 = 1.180 59.125 = 1.185 59.375 = 1.190 59.625 = 1.195 59.875 = 1.200 60.125 = 1.205 60.375 = 1.210 60.625 = 1.215 60.875 = 1.220 61.125 = 1.225 61.375 = 1.230 61.625 = 1.235 61.875 = 1.240 62.125 = 1.245 62.375 = 1.250 62.625 = 1.255 62.875 = 1.260 63.125 = 1.265 63.375 = 1.270 63.625 = 1.275 63.875 = 1.280 64.125 = 1.285 64.375 = 1.290 64.625 = 1.295 64.875 = 1.300 65.125 = 1.305 65.375 = 1.310 65.625 = 1.315 65.875 = 1.320 66.125 = 1.325 66.375 = 1.330 66.625 = 1.335 66.875 = 1.340 67.125 = 1.345 67.375 = 1.350 67.625 = 1.355 67.875 = 1.360 68.125 = 1.365 68.375 = 1.370 68.625 = 1.375 68.875 = 1.380 69.125 = 1.385 69.375 = 1.390 69.625 = 1.395 69.875 = 1.400 70.125 = 1.405 70.375 = 1.410 70.625 = 1.415 70.875 = 1.420 71.125 = 1.425 71.375 = 1.430 71.625 = 1.435 71.875 = 1.440 72.125 = 1.445 72.375 = 1.450 72.625 = 1.455 72.875 = 1.460 73.125 = 1.465 73.375 = 1.470 73.625 = 1.475 73.875 = 1.480 74.125 = 1.485 74.375 = 1.490 74.625 = 1.495 74.875 = 1.500 75.125 = 1.505 75.375 = 1.510 75.625 = 1.515 75.875 = 1.520 76.125 = 1.525 76.375 = 1.530 76.625 = 1.535 76.875 = 1.540 77.125 = 1.545 77.375 = 1.550 77.625 = 1.555 77.875 = 1.560 78.125 = 1.565 78.375 = 1.570 78.625 = 1.575 78.875 = 1.580 79.125 = 1.585 79.375 = 1.590 79.625 = 1.595 79.875 = 1.600 80.125 = 1.605 80.375 = 1.610 80.625 = 1.615 80.875 = 1.620 81.125 = 1.625 81.375 = 1.630 81.625 = 1.635 81.875 = 1.640 82.125 = 1.645 82.375 = 1.650 82.625 = 1.655 82.875 = 1.660 83.125 = 1.665 83.375 = 1.670 83.625 = 1.675 83.875 = 1.680 84.125 = 1.685 84.375 = 1.690 84.625 = 1.695 84.875 = 1.700 85.125 = 1.705 85.375 = 1.710 85.625 = 1.715 85.875 = 1.720 86.125 = 1.725 86.375 = 1.730 86.625 = 1.735 86.875 = 1.740 87.125 = 1.745 87.375 = 1.750 87.625 = 1.755 87.875 = 1.760 88.125 = 1.765 88.375 = 1.770 88.625 = 1.775 88.875 = 1.780 89.125 = 1.785 89.375 = 1.790 89.625 = 1.795 89.875 = 1.800 90.125 = 1.805 90.375 = 1.810 90.625 = 1.815 90.875 = 1.820 91.125 = 1.825 91.375 = 1.830 91.625 = 1.835 91.875 = 1.840 92.125 = 1.845 92.375 = 1.850 92.625 = 1.855 92.875 = 1.860 93.125 = 1.865 93.375 = 1.870 93.625 = 1.875 93.875 = 1.880 94.125 = 1.885 94.375 = 1.890 94.625 = 1.895 94.875 = 1.900 95.125 = 1.905 95.375 = 1.910 95.625 = 1.915 95.875 = 1.920 96.125 = 1.925 96.375 = 1.930 96.625 = 1.935 96.875 = 1.940 97.125 = 1.945 97.375 = 1.950 97.625 = 1.955 97.875 = 1.960 98.125 = 1.965 98.375 = 1.970 98.625 = 1.975 98.875 = 1.980 99.125 = 1.985 99.375 = 1.990 99.625 = 1.995 99.875 = 2.000 100.125 = 2.005 100.375 = 2.010 100.625 = 2.015 100.875 = 2.020 101.125 = 2.025 101.375 = 2.030 101.625 = 2.035 101.875 = 2.040 102.125 = 2.045 102.375 = 2.050 102.625 = 2.055 102.875 = 2.060 103.125 = 2.065 103.375 = 2.070 103.625 = 2.075 103.875 = 2.080 104.125 = 2.085 104.375 = 2.090 104.625 = 2.095 104.875 = 2.100 105.125 = 2.105 105.375 = 2.110 105.625 = 2.115 105.875 = 2.120 106.125 = 2.125 106.375 = 2.130 106.625 = 2.135 106.875 = 2.140 107.125 = 2.145 107.375 = 2.150 107.625 = 2.155 107.875 = 2.160 108.125 = 2.165 108.375 = 2.170 108.625 = 2.175 108.875 = 2.180 109.125 = 2.185 109.375 = 2.190 109.625 = 2.195 109.875 = 2.200 110.125 = 2.205 110.375 = 2.210 110.625 = 2.215 110.875 = 2.220 111.125 = 2.225 111.375 = 2.230 111.625 = 2.235 111.875 = 2.240 112.125 = 2.245 112.375 = 2.250 112.625 = 2.255 112.875 = 2.260 113.125 = 2.265 113.375 = 2.270 113.625 = 2.275 113.875 = 2.280 114.125 = 2.285 114.375 = 2.290 114.625 = 2.295 114.875 = 2.300 115.125 = 2.305 115.375 = 2.310 115.625 = 2.315 115.875 = 2.320 116.125 = 2.325 116.375 = 2.330 116.625 = 2.335 116.875 = 2.340 117.125 = 2.345 117.375 = 2.350 117.625 = 2.355 117.875 = 2.360 118.125 = 2.365 118.375 = 2.370 118.625 = 2.375 118.875 = 2.380 119.125 = 2.385 119.375 = 2.390 119.625 = 2.395 119.875 = 2.400 120.125 = 2.405 120.375 = 2.410 120.625 = 2.415 120.875 = 2.420 121.125 = 2.425 121.375 = 2.430 121.625 = 2.435 121.875 = 2.440 122.125 = 2.445 122.375 = 2.450 122.625 = 2.455 122.875 = 2.460 123.125 = 2.465 123.375 = 2.470 123.625 = 2.475 123.875 = 2.480 124.125 = 2.485 124.375 = 2.490 124.625 = 2.495 124.875 = 2.500 125.125 = 2.505 125.375 = 2.510 125.625 = 2.515 125.875 = 2.520 126.125 = 2.525 126.375 = 2.530 126.625 = 2.535 126.875 = 2.540 127.125 = 2.545 127.375 = 2.550 127.625 = 2.555 127.875 = 2.560 128.125 = 2.565 128.375 = 2.570 128.625 = 2.575 128.875 = 2.580 129.125 = 2.585 129.375 = 2.590 129.625 = 2.595 129.875 = 2.600 130.125 = 2.605 130.375 = 2.610 130.625 = 2.615 130.875 = 2.620 131.125 = 2.625 131.375 = 2.630 131.625 = 2.635 131.875 = 2.640 132.125 = 2.645 132.375 = 2.650 132.625 = 2.655 132.875 = 2.660 133.125 = 2.665 133.375 = 2.670 133.625 = 2.675 133.875 = 2.680 134.125 = 2.685 134.375 = 2.690 134.625 = 2.695 134.875 = 2.700 135.125 = 2.705 135.375 = 2.710 135.625 = 2.715 135.875 = 2.720 136.125 = 2.725 136.375 = 2.730 136.625 = 2.735 136.875 = 2.740 137.125 = 2.745 137.375 = 2.750 137.625 = 2.755 137.875 = 2.760 138.125 = 2.765 138.375 = 2.770 138.625 = 2.775 138.875 = 2.780 139.125 = 2.785 139.375 = 2.790 139.625 = 2.795 139.875 = 2.800 140.125 = 2.805 140.375 = 2.810 140.625 = 2.815 140.875 = 2.820 141.125 = 2.825 141.375 = 2.830 141.625 = 2.835 141.875 = 2.840 142.125 = 2.845 142.375 = 2.850 142.625 = 2.855 142.875 = 2.860 143.125 = 2.865 143.375 = 2.870 143.625 = 2.875 143.875 = 2.880 144.125 = 2.885 144.375 = 2.890 144.625 = 2.895 144.875 = 2.900 145.125 = 2.905 145.375 = 2.910 145.625 = 2.915 145.875 = 2.920 146.125 = 2.925 146.375 = 2.930 146.625 = 2.935 146.875 = 2.940 147.125 = 2.945 147.375 = 2.950 147.625 = 2.955 147.875 = 2.960 148.125 = 2.965 148.375 = 2.970 148.625 = 2.975 148.875 = 2.980 149.125 = 2.985 149.375 = 2.990 149.625 = 2.995 149.875 = 3.000 150.125 = 3.005 150.375 = 3.010 150.625 = 3.015 150.875 = 3.020 151.125 = 3.025 151.375 = 3.030 151.625 = 3.035 151.875 = 3.040 152.125 = 3.045 152.375 = 3.050 152.625 = 3.055

DFD_EW_092522 Comments

DFD-22-5182: outdated

Action item: replace with PD2 equivalent set of drawings



RELEASED SEPT 29 2022

- NOTES:
 1 - ALL DIMENSIONS IN INCHES (mm).
 2 - ALL HOLES Φ [Ø] UNLESS OTHERWISE NOTED
 3 - APPROX. WEIGHT = 100.0 LBS
 4 - SEE DRAWINGS DFD-22-5183, DFD-22-5184.

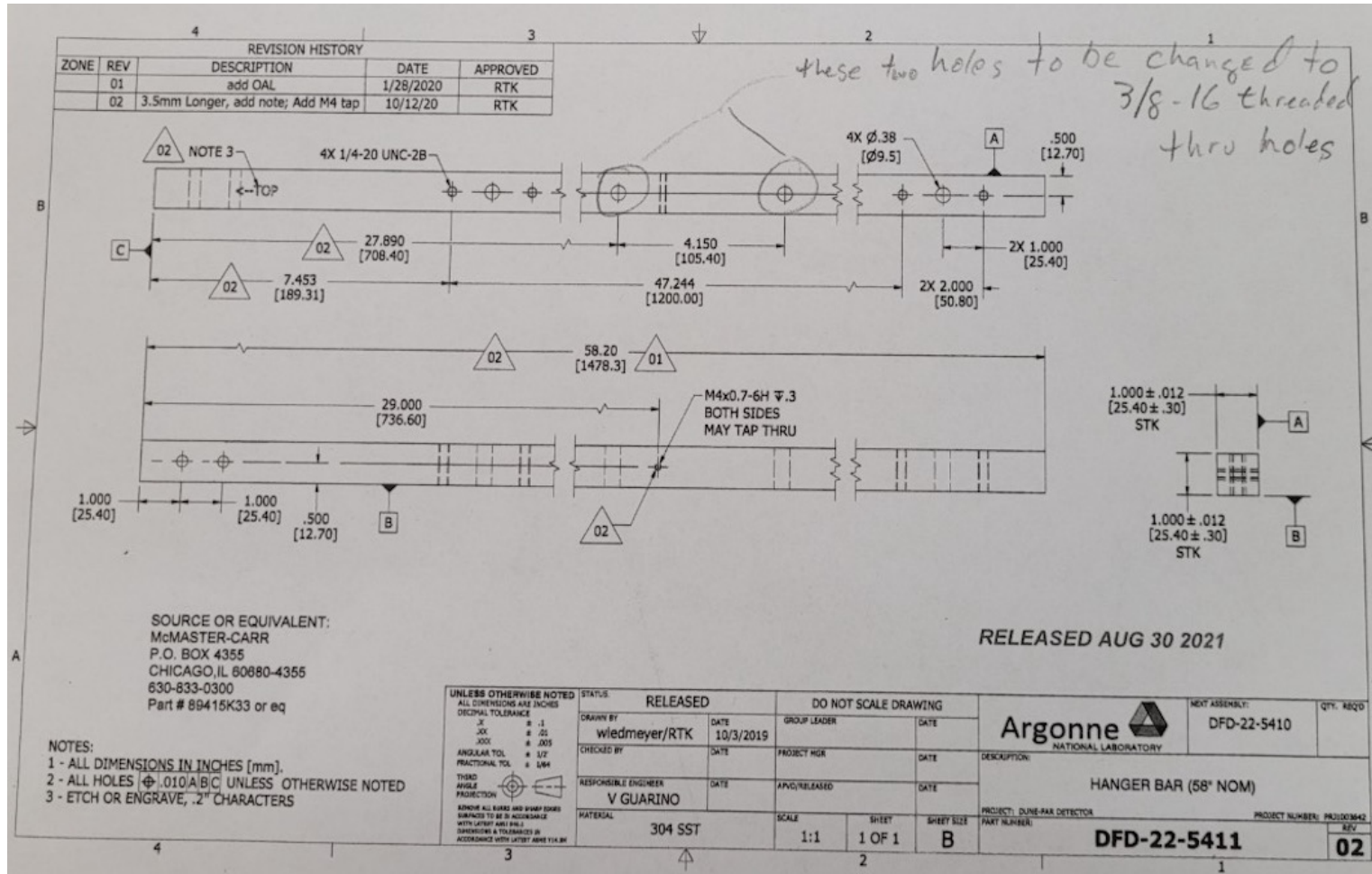
UNLESS OTHERWISE NOTED		RELEASED		DO NOT SCALE DRAWING		Argonne NATIONAL LABORATORY		DFD-22-5180	QTY. REQ'D
DECIMAL TOLERANCE	AS SHOWN	DRAWN BY	DATE	GROUP LEADER	DATE	DESCRIPTION			
ANGULAR TOL.	AS SHOWN	RTKMAK	10/30/2020			HANGER TUBE			
FUNCTIONAL TOL.	AS SHOWN	DESIGNED BY	DATE	PROJECT MGR	DATE	PROJECT: DEMEAL DETECTOR			
FORM	AS SHOWN	V. GLARINO				PROJECT NUMBER: PROS304S			
PRELIMINARY	AS SHOWN	DATE	APPROVED	DATE					
MATERIAL		304 SST	SCALE		1:1	SHEET		1 OF 1	REV. C
SHEET NUMBER		DFD-22-5182		00					

DFD_EW_092522 Comments

DFD-22-5411:

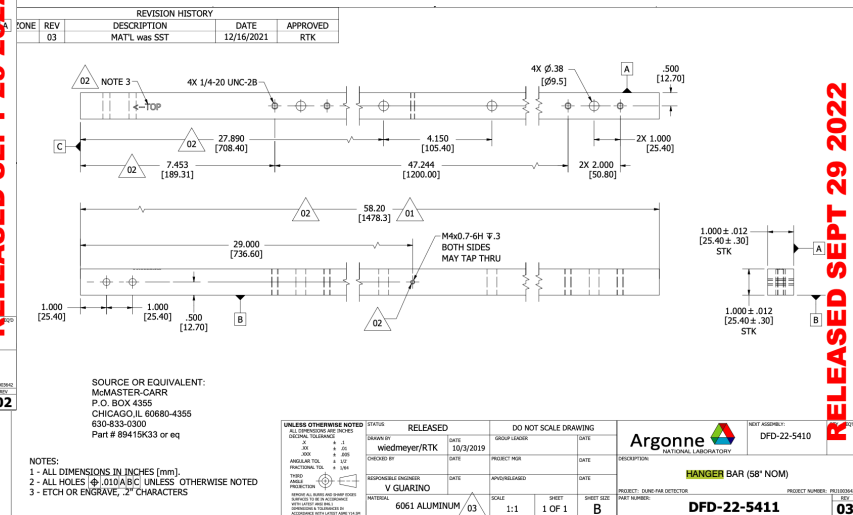
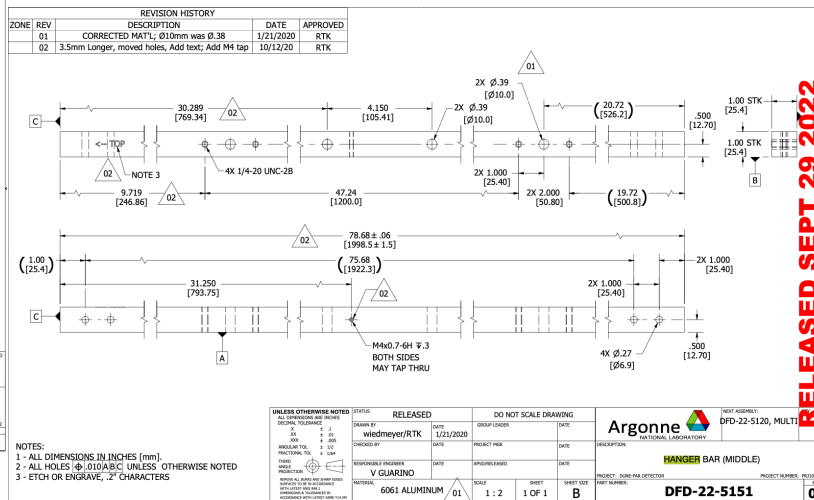
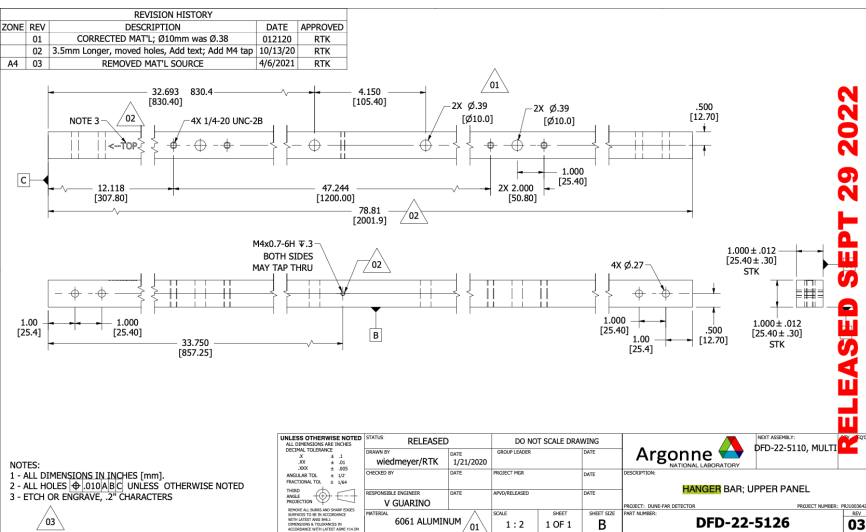
Threading not shown

Action item: indicate 3/8-16 threaded through holes



DFD_EW_092522 Comments

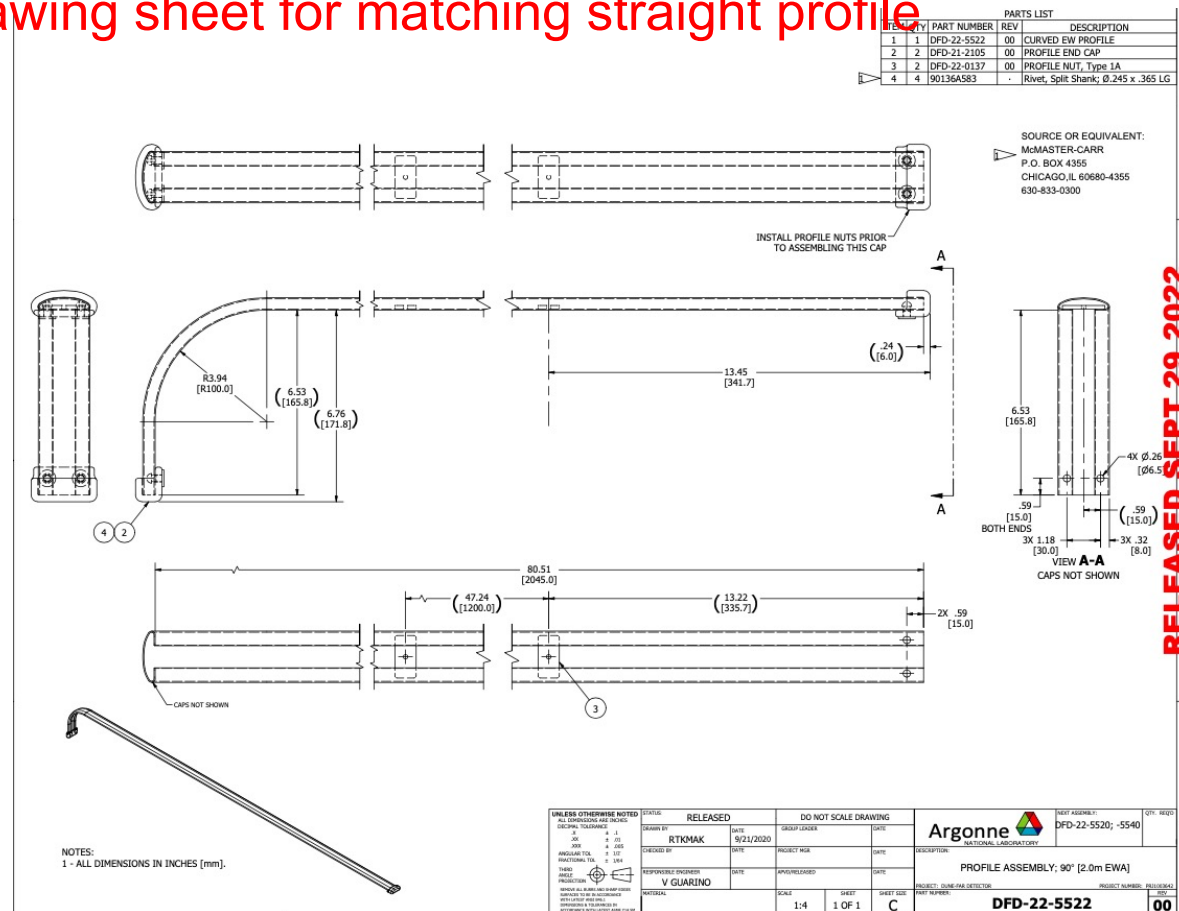
DFD-22-5126/5151/5411: add chamfer on top side to facilitate insertion to C-brackets
Action item: chamfer (1/8") top of hanger bars for middle and bottom panels.



DFD_EW_092522 Comments

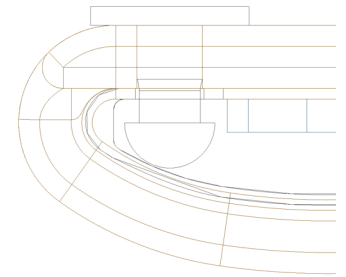
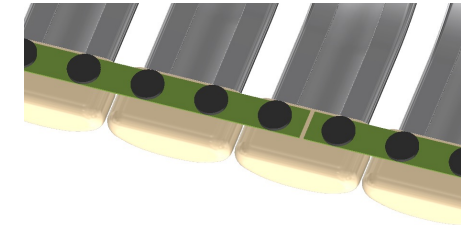
DFD-22-5522: When cutting profiles to be bent, one must take into account the compression of the material during the bend. Will lose 5.03 mm in length on the long straight portion of the profiles.

Action item: Need to account for and explicitly show profile length to be cut ; add drawing sheet for matching straight profile



Other EW Comments

A thin G10 strip should be attached to the end caps of bent profiles to ensure the profiles align properly



Action item: Make and post corresponding drawing

DFD-21-2130: drawing for termination board for T/B FC is missing

~~Action item: Make and post assembly drawing~~ Include in T/B FC drawing package

DFD-21-2191: drawing for C-bracket for mounting T/B FC termination board is missing (made by CERN for ProtoDUNE2 from stainless steel since Al broke)

Action item: Make and post drawing for C-bracket for mounting T/B FC termination boards
Include in T/B FC drawing package; Specify material (Al 5056)

EDMS 2786837 Comments

2787665 v.1	★	📄	Assembly Table	🗨️ 2	🔴 In Work	2022-10-11	VICTOR GUARI	Drawing
2787666 v.1	★	📄	Bender Clamp Assembly	🗨️ 4	🔴 In Work	2022-10-11	VICTOR GUARI	Drawing
2787667 v.1	★	📄	Box Beam Large Hole Location...	🗨️ 4	🔴 In Work	2022-10-11	VICTOR GUARI	Drawing
2787668 v.1	★	📄	Box Beam Small Hole Location ...	🗨️ 3	🔴 In Work	2022-10-11	VICTOR GUARI	Drawing
2787669 v.1	★	📄	Comb Assembly	🗨️ 5	🔴 In Work	2022-10-11	VICTOR GUARI	Drawing
2787671 v.1	★	📄	EW Alignment Bracket Left	🗨️ 2	🔴 In Work	2022-10-11	VICTOR GUARI	Drawing
2787672 v.1	★	📄	EW Alignment Bracket Right	🗨️ 2	🔴 In Work	2022-10-11	VICTOR GUARI	Drawing
2787673 v.1	★	📄	EW Alignment L Bar	🗨️ 2	🔴 In Work	2022-10-11	VICTOR GUARI	Drawing
2787674 v.1	★	📄	Profile Bending Tool	🗨️ 2	🔴 In Work	2022-10-11	VICTOR GUARI	Drawing
2787676 v.1	★	📄	EW Roller Base	🗨️ 7	🔴 In Work	2022-10-11	VICTOR GUARI	Drawing

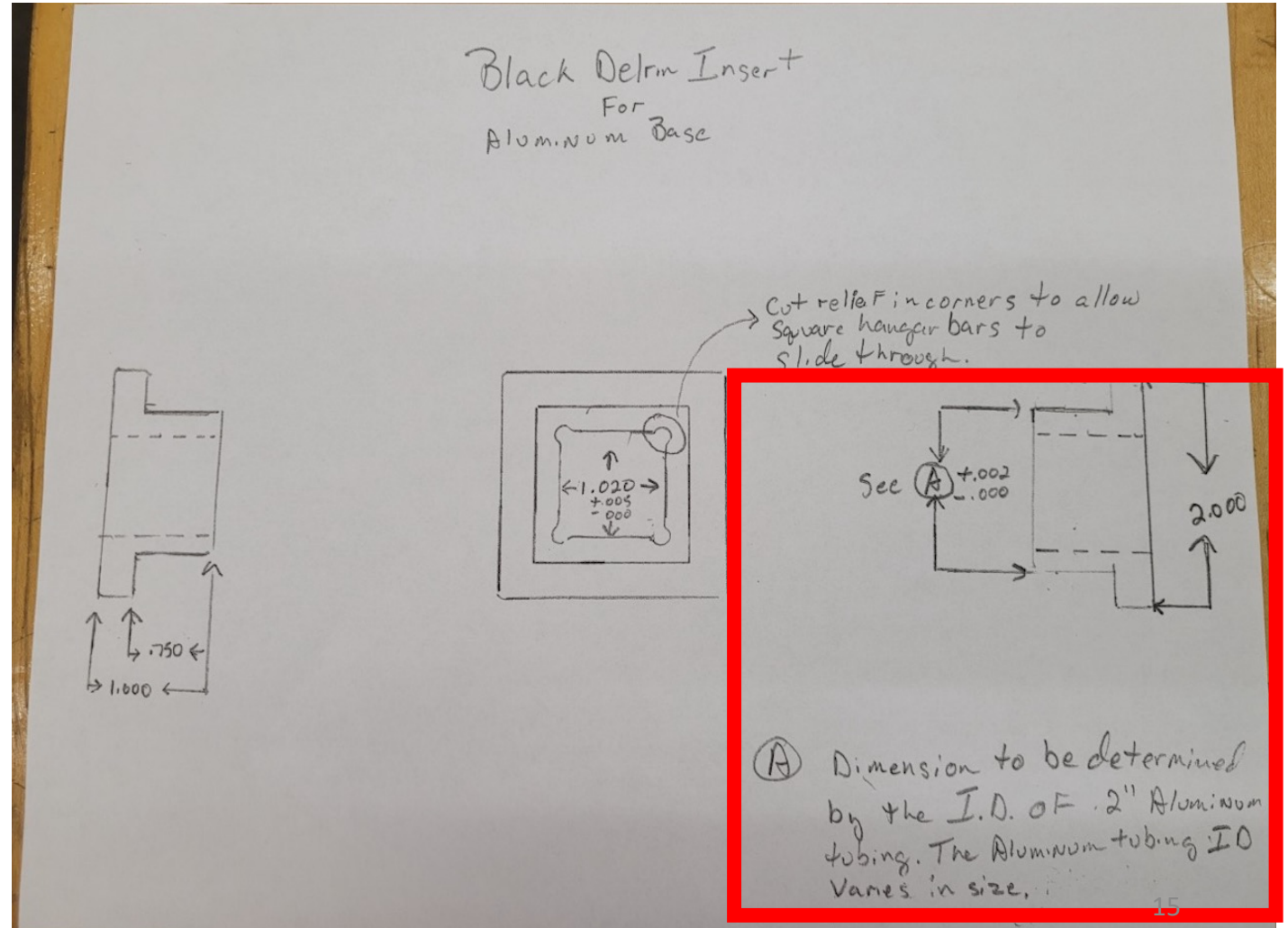
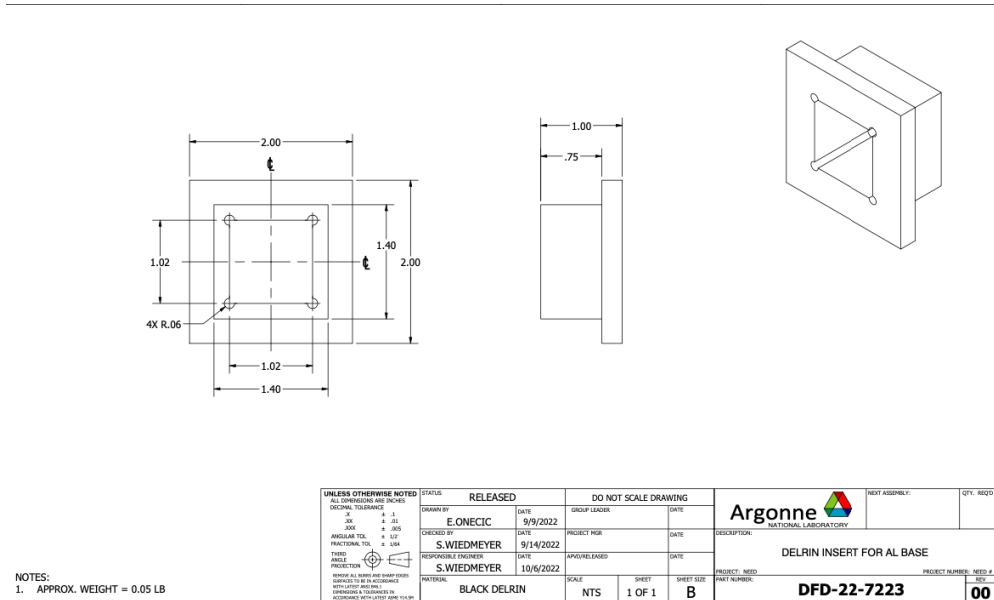
Drawings live in many (qty: 40 !) individual pdf files

Action item: bundle pdf drawings for tools into single file

DFD_22_7223 Comments

DFD-22-5522: Part needs to match ID of 2" Al tubing (DFD-22-7219) which varies in size

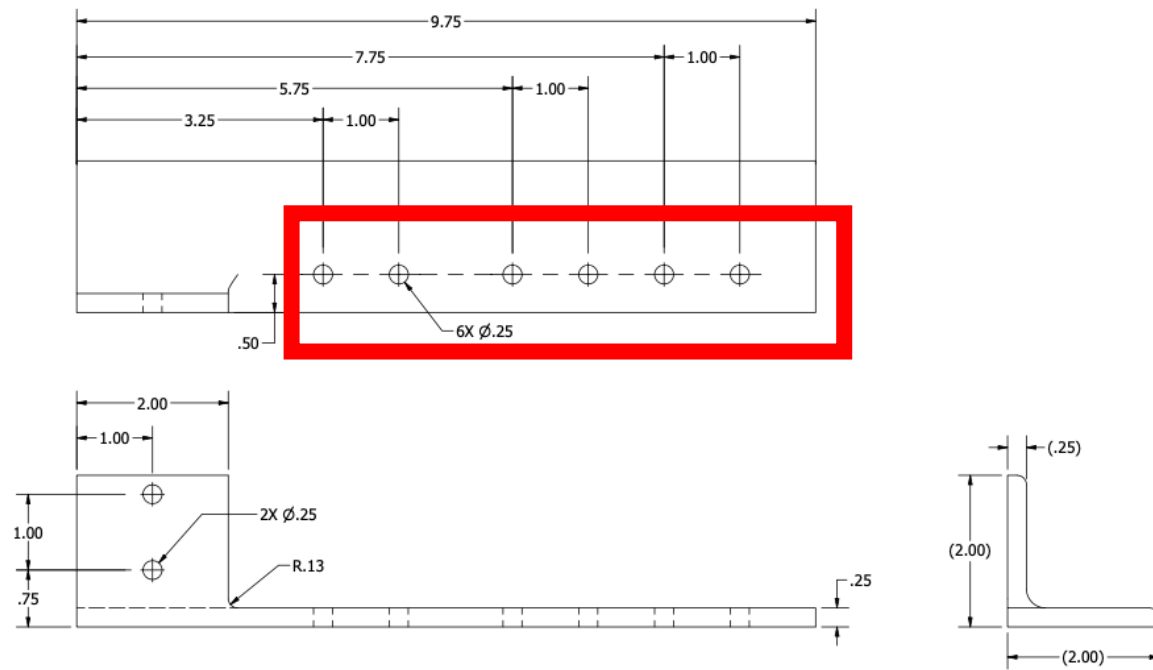
Action item: Ad coment as per pic



DFD_22_7213 Comments

DFD-22-7213: The L-bracket holes used for attaching the alignment bar should have the 3 sets of holes labeled to avoid any confusion during assembly

Action item: Label hole sets



1 SOURCE OR EQUIVALENT
McMASTER CARR
PO BOX 4355
CHICAGO, IL 60680-4355
(708) 833-0300

NOTES:

- MATERIAL: 2 IN X 2 IN X 1/4 IN THK. 6061 AL (8982K36).
- APPROX. WEIGHT = 0.55 LB

UNLESS OTHERWISE NOTED
ALL DIMENSIONS ARE IN INCHES

DECIMAL TOLERANCE	± .1
X	± .01
XXX	± .005
ANGULAR TOL	± 1/2°
FRACTIONAL TOL	± 1/64

THIRD ANGLE PROJECTION

REMOVE ALL BURRS AND SHARP EDGES SURFACES TO BE IN ACCORDANCE WITH LATEST AMS 2654 CONFORMING TO TOLERANCES IN ACCORDANCE WITH LATEST ASME Y14.5M

STATUS: RELEASED		DO NOT SCALE DRAWING	
DRAWN BY	DATE	GROUP LEADER	DATE
E. ONECIC	9/9/2022		
CHECKED BY	DATE	PROJECT MGR	DATE
S. WIEDMEYER	9/14/2022		
RESPONSIBLE ENGINEER	DATE	APPROVED/RELEASED	DATE
S. WIEDMEYER	10/6/2022		
MATERIAL	SEE NOTE 1	SCALE	SHEET
		NTS	1 OF 1
			SHEET SIZE
			B

Argonne NATIONAL LABORATORY

DESCRIPTION: FC EW ALIGNMENT BRACKET LEFT

PROJECT: NEED PART NUMBER: DFD-22-7213

PROJECT NUMBER: NEED # REV: 00

Other EW Tooling Comments

1. Need assembly drawing for profile alignment comb
2. Need drawing for long, sturdy alignment L-bracket used for profile alignments
3. Need assembly drawing for roller bases for top and middle panels

Action item: Make and post corresponding drawings

See also [“endwall issues/modifications”](#) Google sheet for open issues highlighted in yellow.

date	entry made by	description of item affected	drawing no.	issue	fix
2022/01/31	T.Kutter	sample entry only	DFD-XX-YYYY	overall length incorrect in drawing	cut to length
2022/04/05	T. Schefke, T. Kutter	profile comb	NA	need to generate a proper assembly drawing for profile comb	link to hand drawing: https://drive.google.com/drive/folders/1cUpui4h1mZa1_BvlIVZr_edIHUFJO
2022/08/09	T. Stokes	profile comb	NA	The bolts on the comb can loosen over time resulting in non-square comb.	Use lock washers in design
2022/04/05	T.Kutter	brackets to attach L-bracket	NA	need to generate drawings	link to drawings: https://drive.google.com/drive/folders/11K2nvEEM16kHSH0vMa-V8F8oK157HL
2022/09/09	T.Kutter, T.Stokes	alignment L-bracket	NA	need to generate drawings	link to drawings: https://drive.google.com/drive/folders/1uzNH93UcOlxK_jvtpb66iGdndCqLEiv4Y
2022/04/05	T.Kutter	roller bases + parts	NA	need to generate drawings of all parts	link to drawings: https://drive.google.com/drive/folders/1WWb4_AjiViyqR7obTqKEuTvlpJzDTxb?
2022/06/20	T. Schefke	End caps	PD2-22-5186		Reduce inner diameter by ~10/1000"
2022/05	T. Schefke	Upper Panel, Ported- Hanger Bars	PD2-22-5627	Missing clearance hole for RDB mounting	Add feature
2022/07/04	T. Stokes	Middle Panel, Ported-Hanger Bars	PD2-22-5631	holes to box beam were shifted by 1 inch during manufacturing	Fill and redrill holes
2022/8/1	T. Schefke, T. Kutter	endwall-APA restraints	PD2-129-1027	The drawings have a small asymmetry build in: left hole center to edge = 2.187" right hole center to edge = 2.063"	none for PD II
2022/8/1	T. Schefke, T. Kutter	endwall-APA restraints	PD2-19-1027 PD2-19-1034	tolerance on length is +/- 0.1" tolerance on short arm is +/- 0.06"	none for PD II
2022/8/9	T.Kutter	Turnbuckle Rod	PD2-22-5194	Turn relief grooves 0.1 wide by 0.105 +0.005 - 0.000 deep. Drill #3 center dr	incorporate all mods into latest set of drawings. link to commented drawings: https://drive.google.com/drive/folders/1wNYSki7r2N5rNmeP9dHuGYHEHYQfcR1
2022/8/9	T.Kutter	Lower Panel, Hanger Bars	DFD-22-5411	Clearance holes changed to 3/8-16 threaded thru holes	incorporate all mods into latest set of drawings. link to commented drawings: https://drive.google.com/drive/folders/1wNYSki7r2N5rNmeP9dHuGYHEHYQfcR1
2022/08/09	T. Schefke	Lower Panel, roller bases	N/A	Lower panels slightly tilting when attached to roller bases	Redesign lower panel support bars to reduce this effect. link to drawings: https://drive.google.com/drive/folders/1hV8L43nA24huHVqC17i5G-E0UUqpsj4s?usp=sharing
2022/08/16	T. Schefke	QA/QC Tools for box beams	N/A	need to generate a proper drawing for QA/QC tools	https://drive.google.com/drive/folders/1hV8L43nA24huHVqC17i5G-E0UUqpsj4s?usp=sharing
2022/8/19	T.Kutter	block	PD2-22-5192	depth of hole causes deeper part of hole to be too narrow if recommended dri	Redesign lower panel support bars to reduce this effect. link to drawings: https://drive.google.com/drive/folders/1hV8L43nA24huHVqC17i5G-E0UUqpsj4s?usp=sharing
2022/8/24	T.Kutter	assembly table w/ profile QA/QC te	NA	need to generate a proper drawing	silver coat turnbuckle rod to avoid galling
2022/9/7	T.Kutter	profile bender	NA	need to generate a proper drawing	link to pptx sketch: https://drive.google.com/drive/folders/1kqDyPRZRnyqlbvCi3J9OEGVzM_0Wc
2022/9/8	T.Kutter, B. Amos	profile bend QA/QC tool	NA	need to generate drawing/drawing number	link to details: https://drive.google.com/drive/folders/1JxO_fBv9t1GIEvZjH-wMIL715aBNEq_b?u
2022/11/17	T.Kutter	various revisions	various	need to implement revisions	link to details: https://drive.google.com/file/d/1T8TfWjDIQrws181DKISv1hooM-UmFK/view?usp=sharing
2022/11/17	T.Kutter	roler base middle/top panel		need to generate proper drawing	link to details: https://drive.google.com/drive/folders/1WJ6XVADo63pSwKWO36WUkrMcYpDUTs

Endwall Field Cage

(list from Bo Yu; Jan. 24, 2023)

- Adopt the PDII style EW yoke for FD1
- Implement the G10 strips at the end of the bent profiles to improve the alignment of the profile ends
- Add chamfered aluminum bar top end to aid quick insertion when connecting EWFC?
- Has the new EW pushers been sent to Ash River to be tested?
- Check for interference between EW installation winches and the GP support structure / internal cryo pipes.
 - Detected minor interference but appears to be ok (??)
- EW yoke pipe and its end caps maybe misaligned due to pipe diameter variation(?). Introduce a fillet at the end of the pipe to avoid sharp step
- Document the position of the profile in the bender.
 - Profile alignment tool ensures proper positioning and bend result
- Does the lower EW module still stand on its roller base tilted?
 - yes, slightly but not considered to be an issue

