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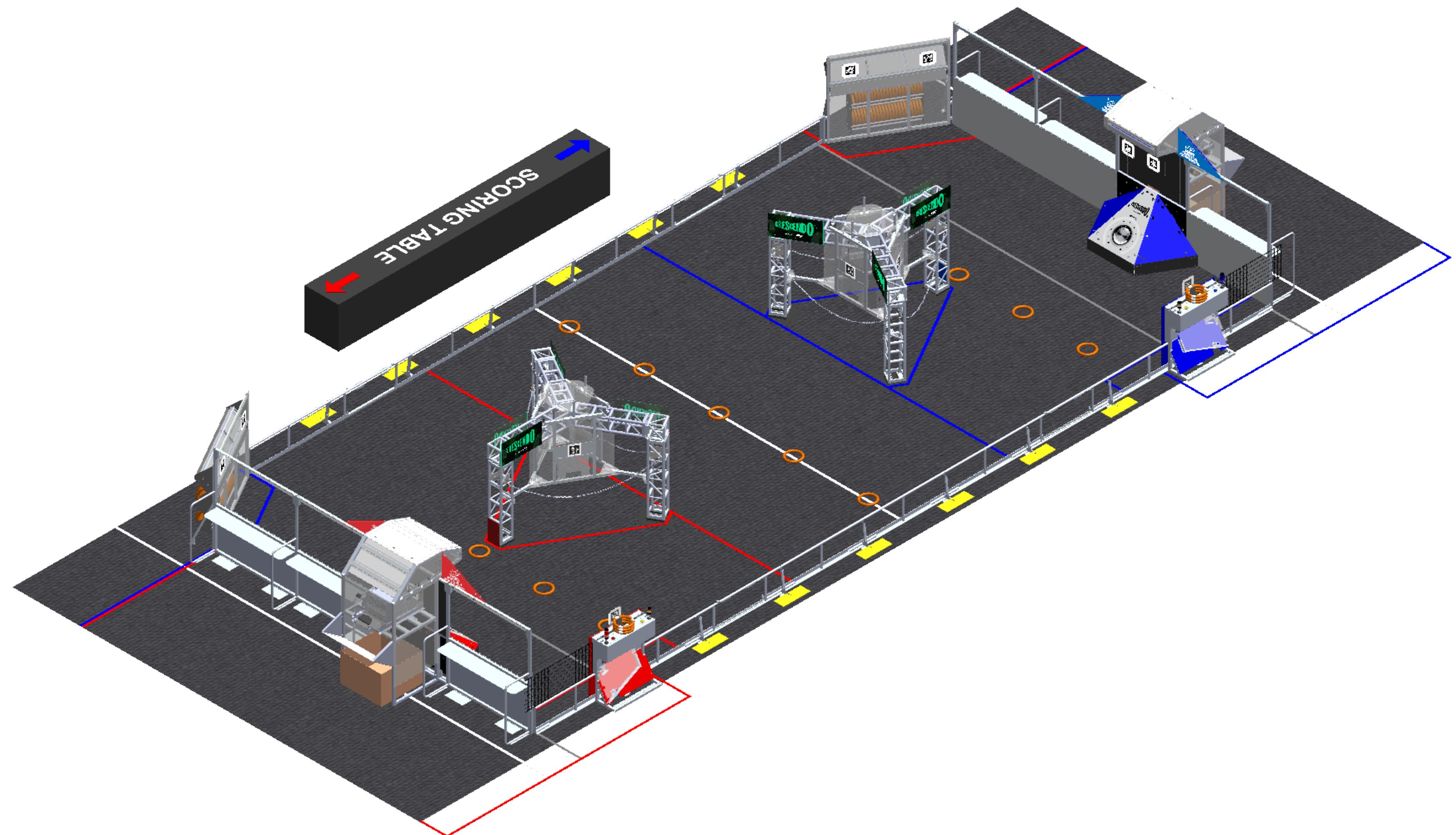
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DRAWN	DF	12/20/2023	
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 **FIRST
ROBOTICS
COMPETITION**  **SOLIDWORKS**
Modeling Solutions Partner

TITLE: **2024 Field
Layout and
Marking**

SIZE DWG. NO. REV
C FE-2024

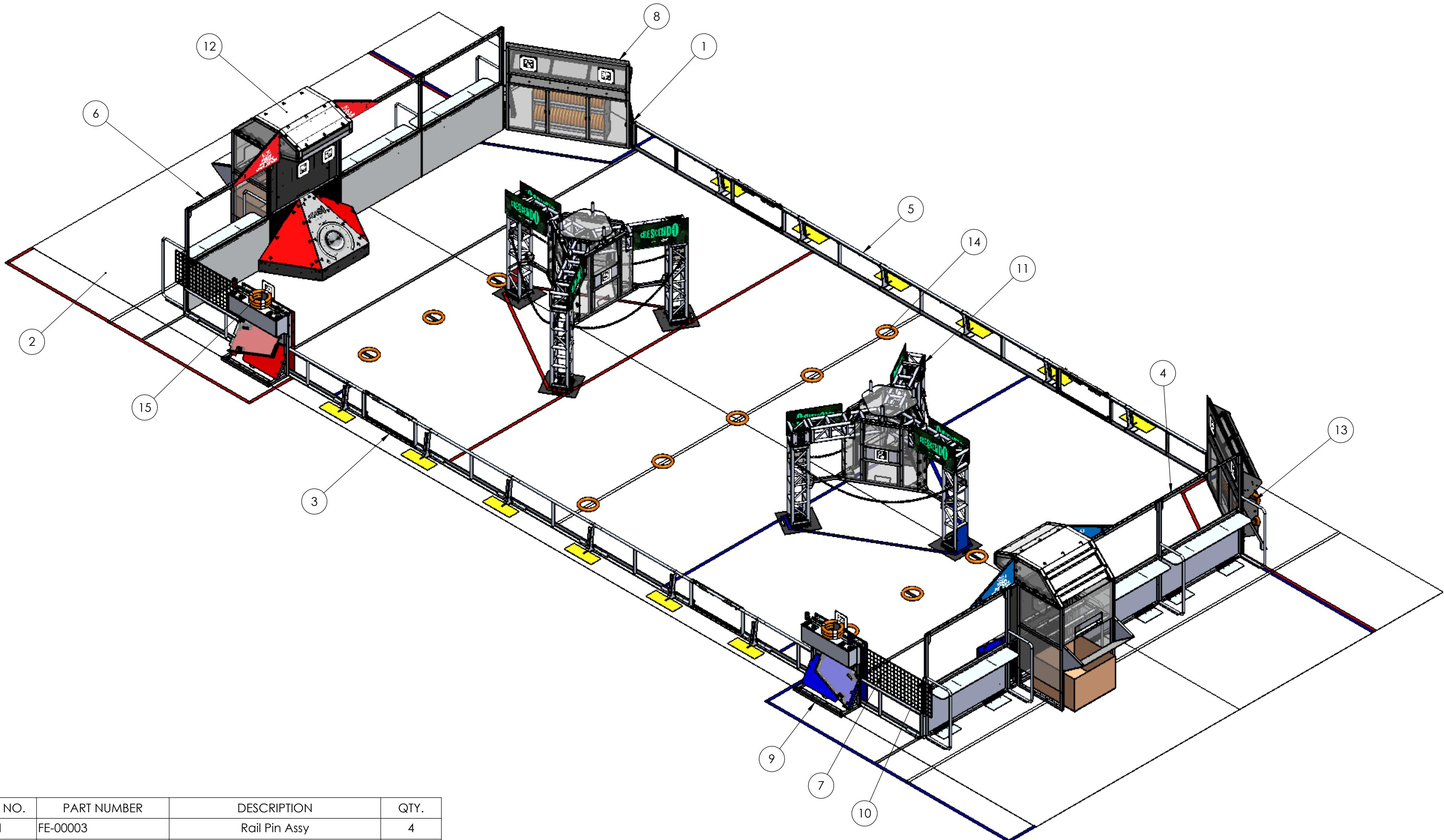
SCALE: 1:50 SHEET 1 OF 6

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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	FE-00003	Rail Pin Assy	4
2	FE-2024-01	Carpet	2
3	FE-2024-02	Side Border	1
4	FE-2024-03	End Wall	1
5	FE-2024-04	Side Border	1
6	FE-2024-05	End Wall	1
7	GE-23266	ULINE Grid	2
8	GE-24000	Source	2
9	GE-24100	Amp Station	2
10	GE-24130	Extra Long Corner Pin	2
11	GE-24200	Stage Assembly	2
12	GE-24300	Speaker	2
13	GE-24400	Note Holder	2
14	GE-24500	Note	105
15	GE-24501	High Note	6

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DIMENSIONS ARE IN INCHES	DRAWN	DF	12/21/2023
TOLERANCES: FRACTIONAL $\pm 1/2$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .50$	PROPRIETARY AND CONFIDENTIAL		
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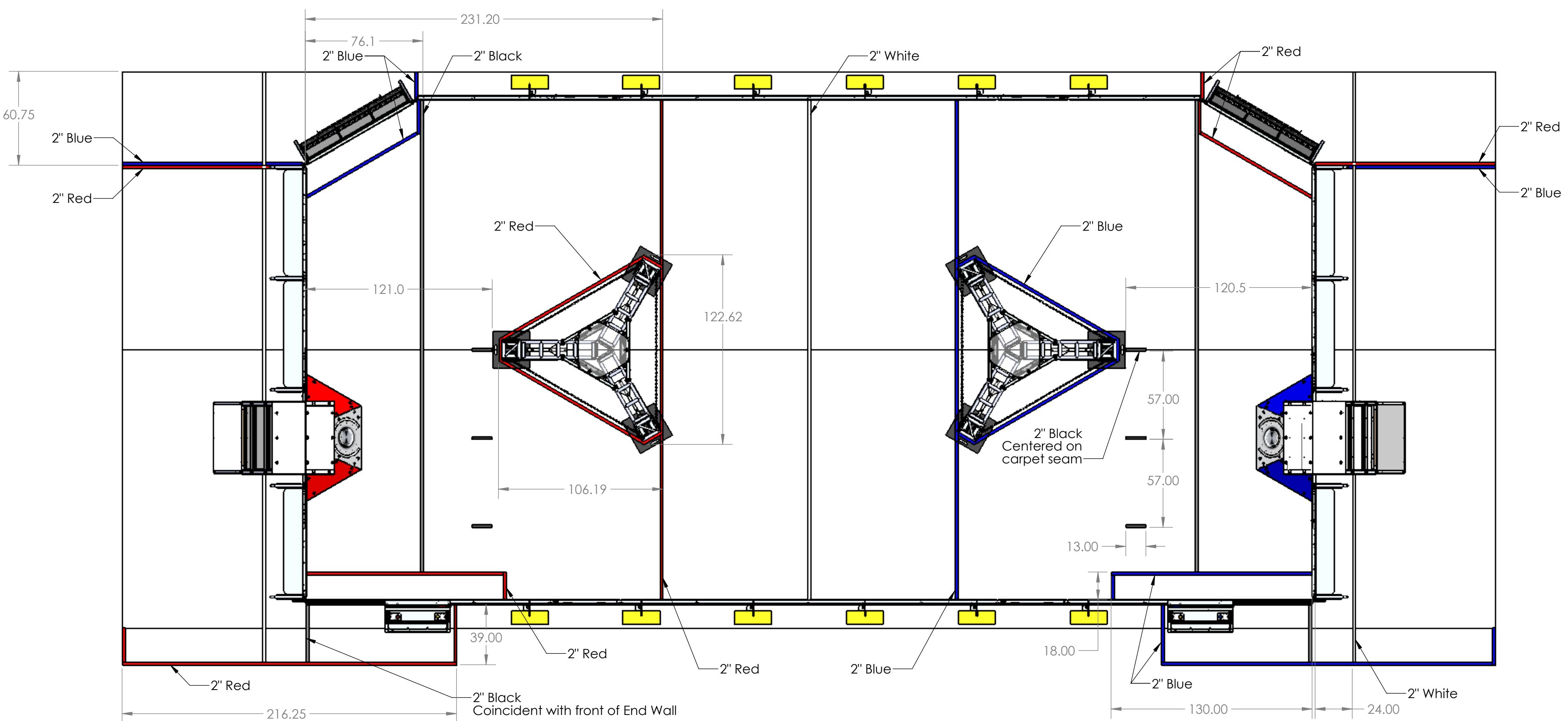
FIRST ROBOTICS COMPETITION SOLIDWORKS Modeling Solutions Partner

2024 Field Layout and Marking

C **FE-2024**

SCALE: 1:45 **SHEET 2 OF 6**

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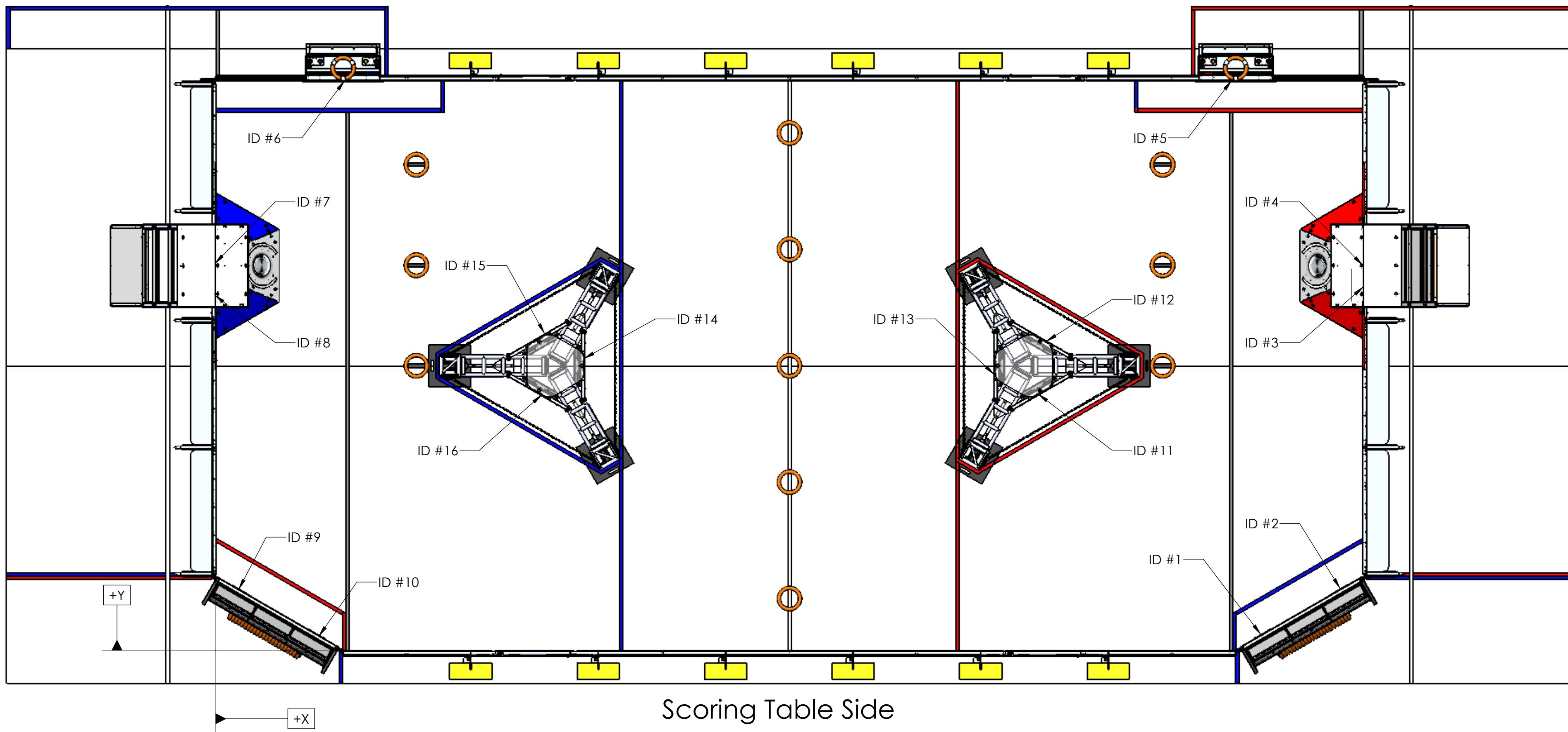


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UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DRAWN	DF	12/21/2023	
PROPRIETARY AND CONFIDENTIAL			
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COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
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SOLIDWORKS Modeling Solutions Partner			
TITLE: 2024 Field Layout and Marking			
SIZE	DWG. NO.	REV	
C	FE-2024		
SCALE: 1:50 SHEET 3 OF 6			



AprilTag Coordinates

The XYZ Origin is established in the bottom left corner of the field (as viewed in the image above). An x coordinate of 0 is aligned with the Blue Alliance Station diamond plate. A y coordinate of 0 is aligned with the side border polycarbonate on the Scoring Table side of the field. A z coordinate of 0 is on the carpet.

+Z is up into the air from the carpet, +X is horizontal to the right (in this image above) toward the opposing alliance stations, and +Y runs from the Field Border towards the SPEAKERS. The face-pose of the tags is denoted with 1 degree representation, the Z-rotation. 0° faces the red alliance station, 90° faces the non-scoring table side, and 180° faces the blue alliance station. Distances are measured to the center of the tag.

ID	X	Y	Z	Rotation
1	593.68	9.68	53.38	120°
2	637.21	34.79	53.38	120°
3	652.73	196.17	57.13	180°
4	652.73	218.42	57.13	180°
5	578.77	323.00	53.38	270°
6	72.5	323.00	53.38	270°
7	-1.50	218.42	57.13	0°
8	-1.50	196.17	57.13	0°
9	14.02	34.79	53.38	60°
10	57.54	9.68	53.38	60°
11	468.69	146.19	52.00	300°
12	468.69	177.10	52.00	60°
13	441.74	161.62	52.00	180°
14	209.48	161.62	52.00	0°
15	182.73	177.10	52.00	120°
16	182.73	146.19	52.00	240°

UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	JO	12/21/2023
TOLERANCES: FRACTIONAL $\pm 1/2$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .50$	PROPRIETARY AND CONFIDENTIAL		
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MATERIAL/FINISH:	COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.		
DO NOT SCALE DRAWING			

FIRST ROBOTICS COMPETITION SOLIDWORKS Modeling Solutions Partner

2024 Field Layout and Marking

SIZE DWG. NO. REV
C FE-2024

SCALE: 1:45 SHEET 4 OF 6

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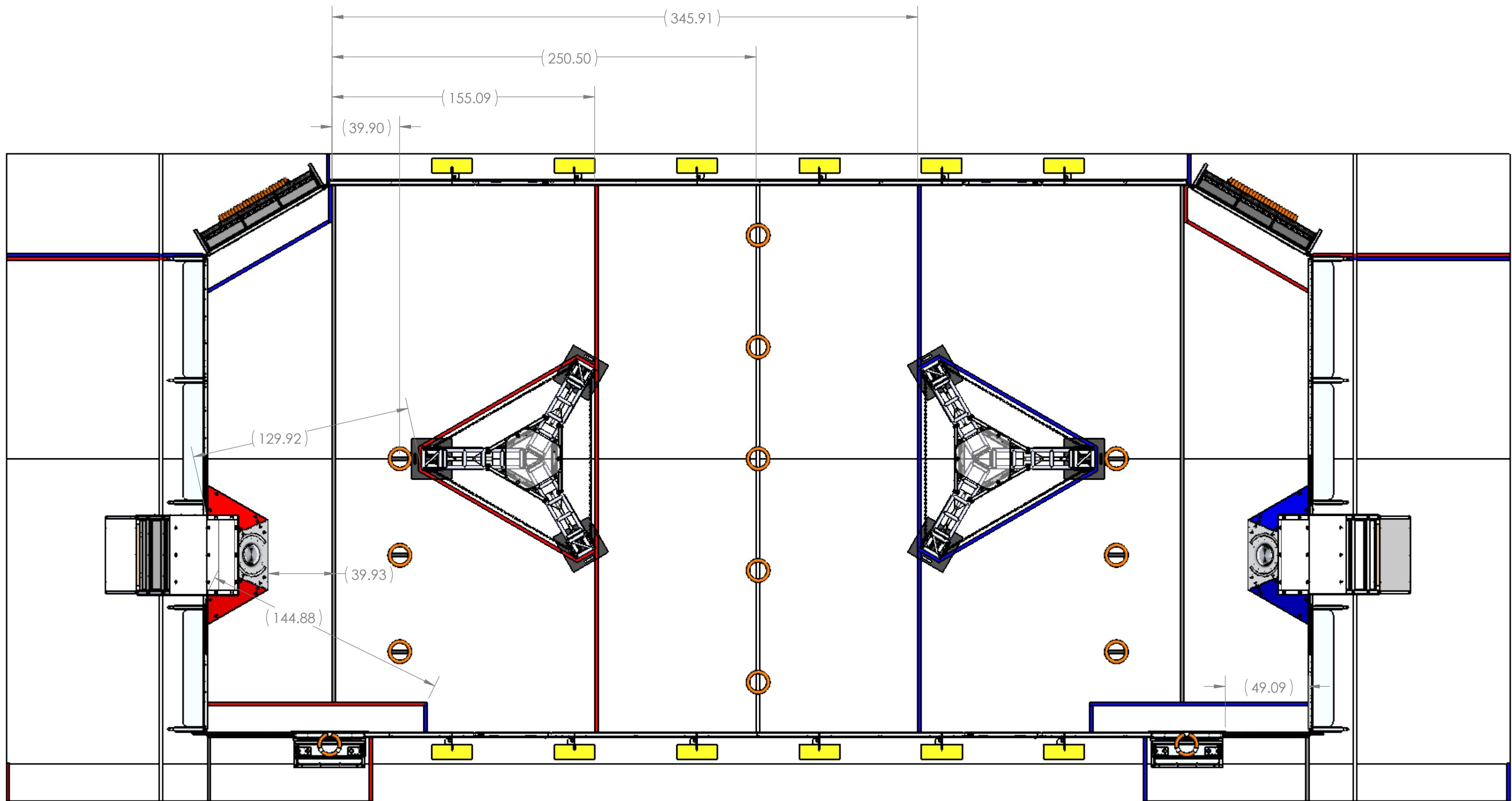
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UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DRAWN	DF	12/21/2023	
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 **FIRST
ROBOTICS
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Modeling Solutions Partner

TITLE: **2024 Field Layout and Marking**

SIZE DWG. NO. REV
C FE-2024

SCALE: 1:50 SHEET 5 OF 6

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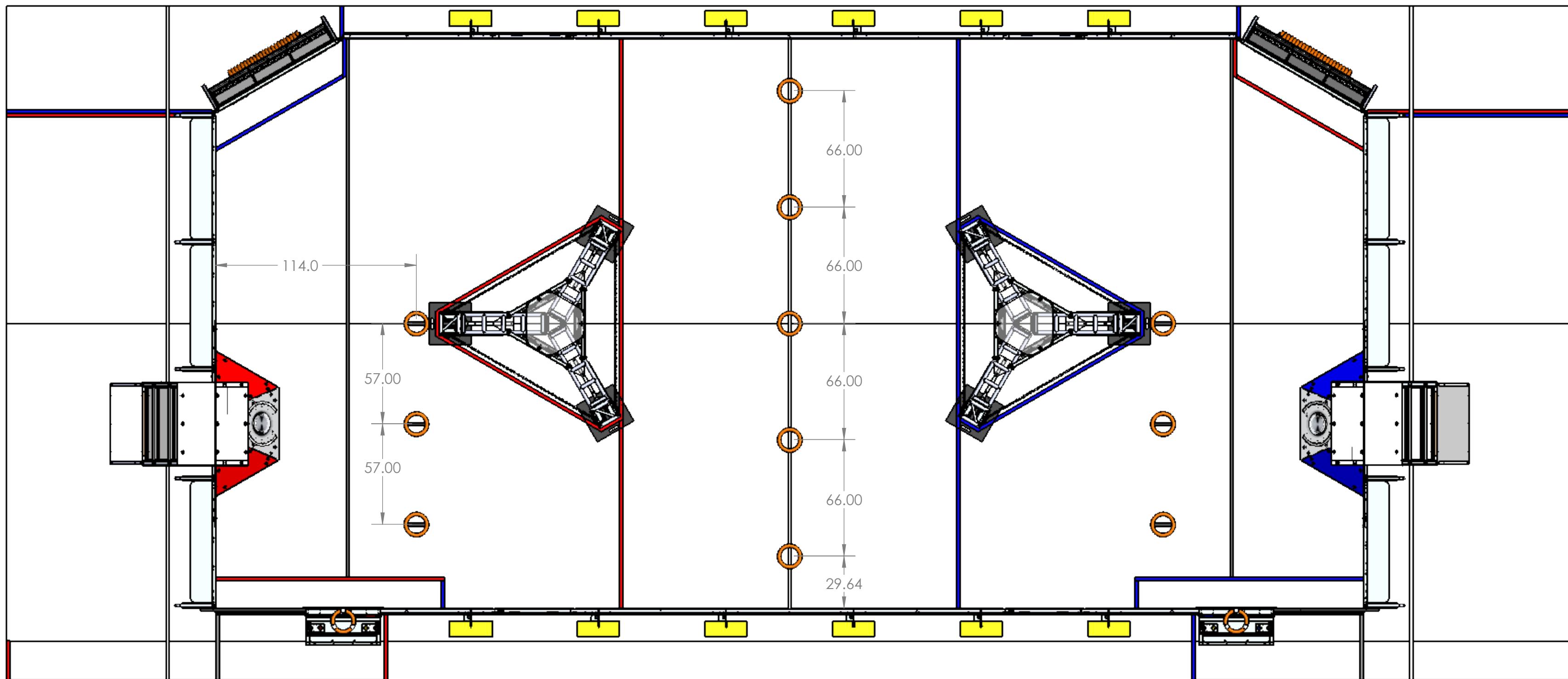
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UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DRAWN	DF	12/21/2023	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

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COMPETITION**  **SOLIDWORKS**
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TITLE: **2024 Field
Layout and
Marking**

SIZE DWG. NO. REV
C FE-2024

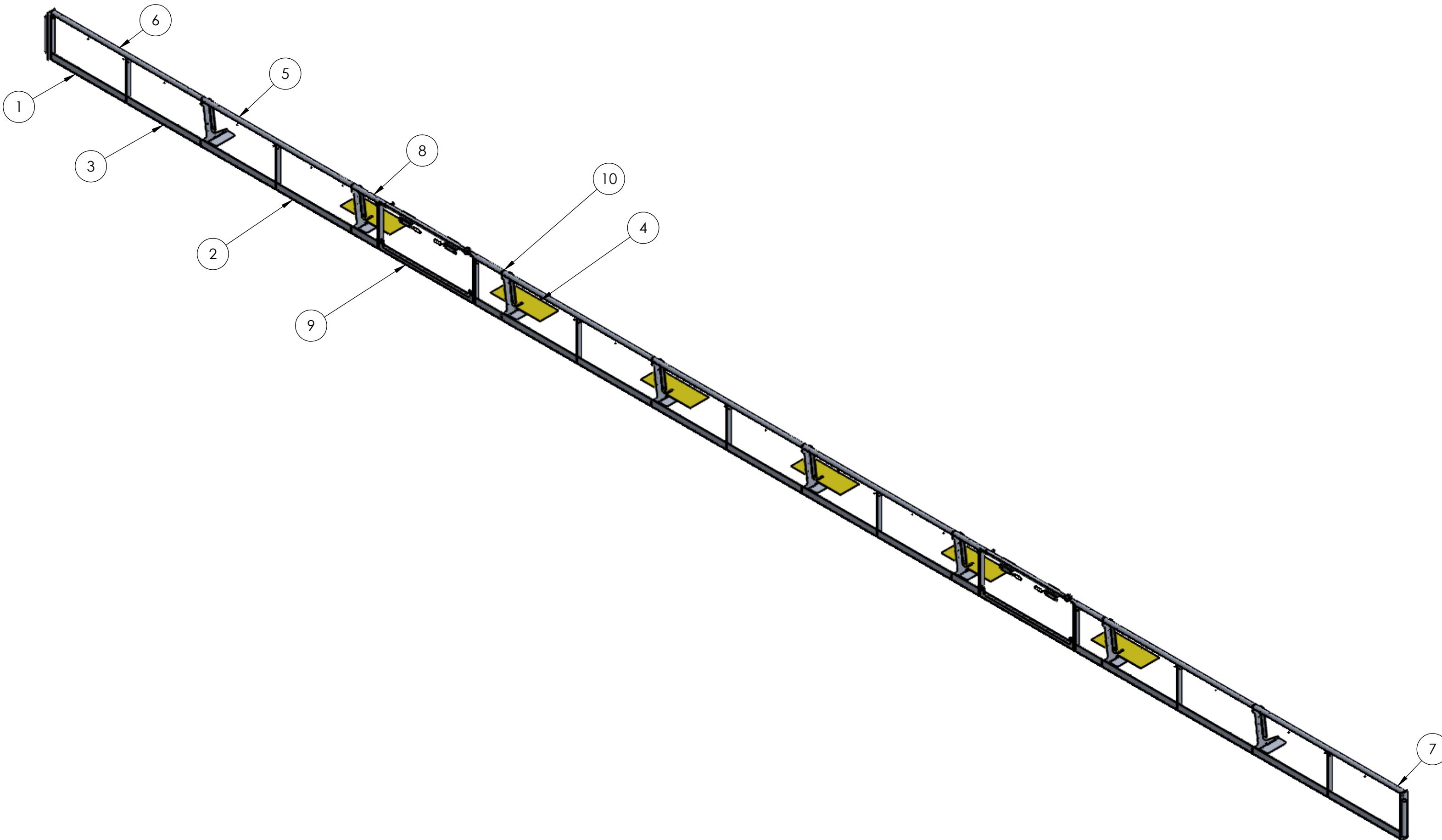
SCALE: 1:50 SHEET 6 OF 6

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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	FE-00008	Field Plastic "A"	2
2	FE-00009	Field Plastic "B"	4
3	FE-00010	Field Plastic "C"	4
4	FE-00015	Trip Guard	6
5	FE-00022	Field Rail Assy - Mid	5
6	FE-00023	Field Rail Assy - Left	1
7	FE-00024	Field Rail Assy - Right	1
8	FE-00029	Field Gate, Assembly	2
9	FE-00047	Gate Plastic Assembly	2
10	FE-00050	Outrigger	8

UNLESS OTHERWISE SPECIFIED:			FIELD	NAME	DATE
			DRAWN	JO	12/21/2023
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COMMENTS:					
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DO NOT SCALE DRAWING					
			SIZE	DWG. NO.	REV
			C	FE-2024-02	
			SCALE: 1:30	SHEET 1 OF 1	

FIRST ROBOTICS COMPETITION Modeling Solutions Partner

Title: Side Border

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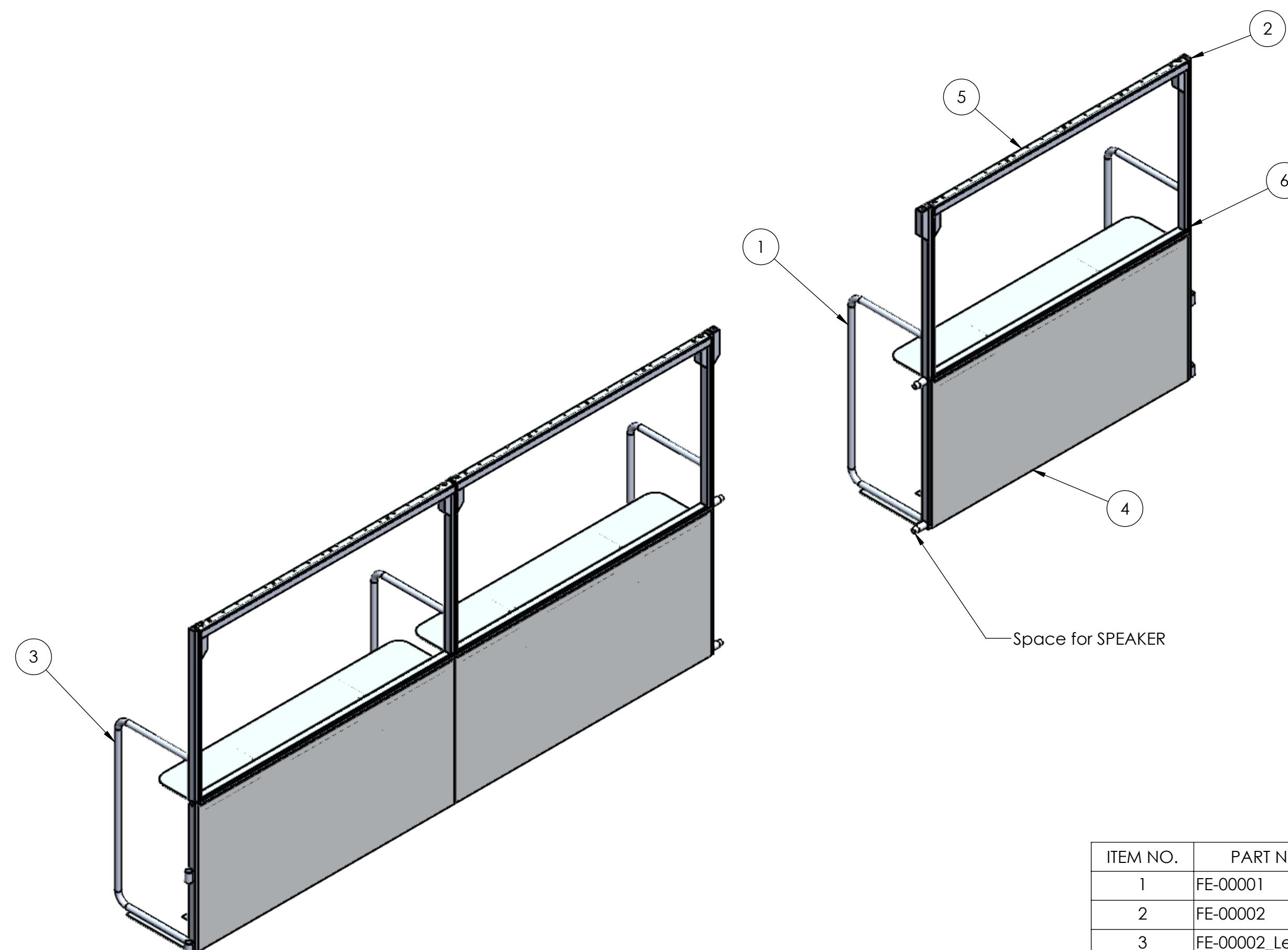
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	FE-00001	Drivers Station Support	3
2	FE-00002	Corner Supports, Right	1
3	FE-00002_Left	Corner Supports, Left	1
4	FE-00004	End Panel	3
5	FE-00007	Field Top Rail	3
6	FE-00012	Drivers Station Acrylic	3

UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES

TOLERANCES:

FRACTIONAL $\pm\frac{1}{2}$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .50$

MATERIAL/FINISH:

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COMMENTS:

REMOVE ALL BURRS AND SHARP EDGES.

DO NOT SCALE DRAWING



TITLE: End Wall

SIZE DWG. NO. REV
C FE-2024-03

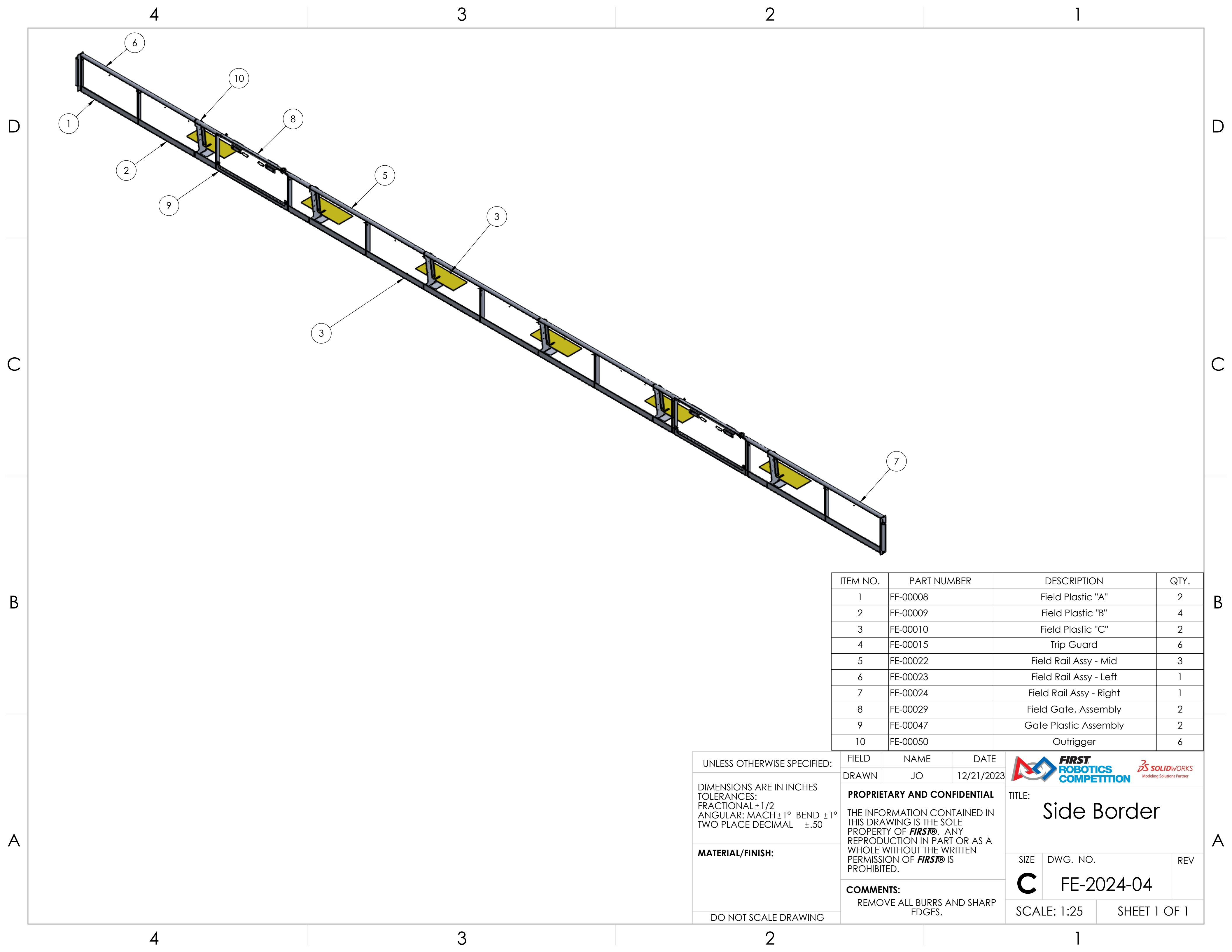
SCALE: 1:20 SHEET 1 OF 1

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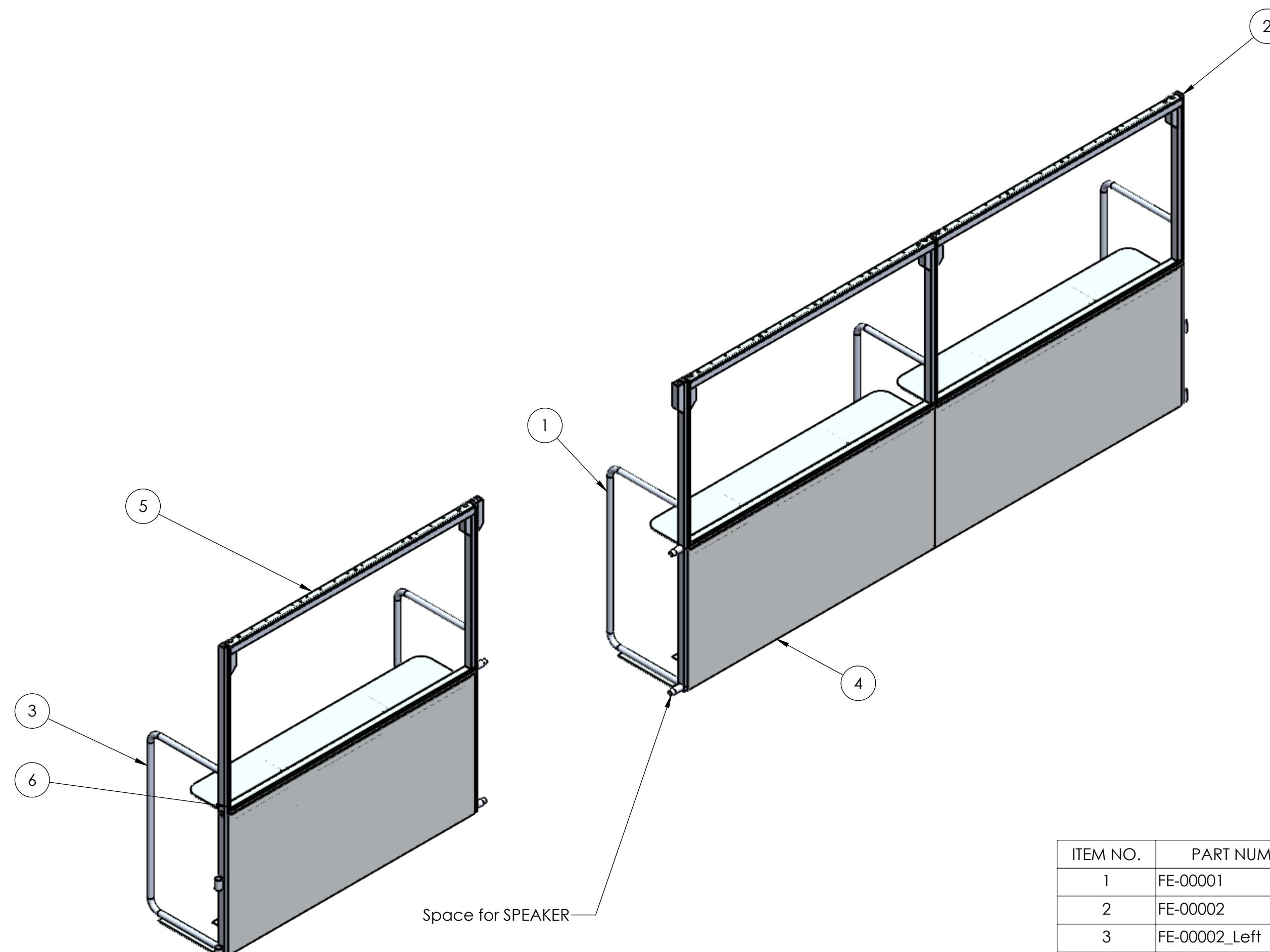
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	FE-00001	Drivers Station Support	3
2	FE-00002	Corner Supports, Right	1
3	FE-00002_Left	Corner Supports, Left	1
4	FE-00004	End Panel	3
5	FE-00007	Field Top Rail	3
6	FE-00012	Drivers Station Acrylic	3

UNLESS OTHERWISE SPECIFIED:			FIELD	NAME	DATE
			DRAWN	JO	12/21/2023
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DO NOT SCALE DRAWING					
SIZE	DWG. NO.	REV			
C	FE-2024-05				
SCALE: 1:20			SHEET 1 OF 1		

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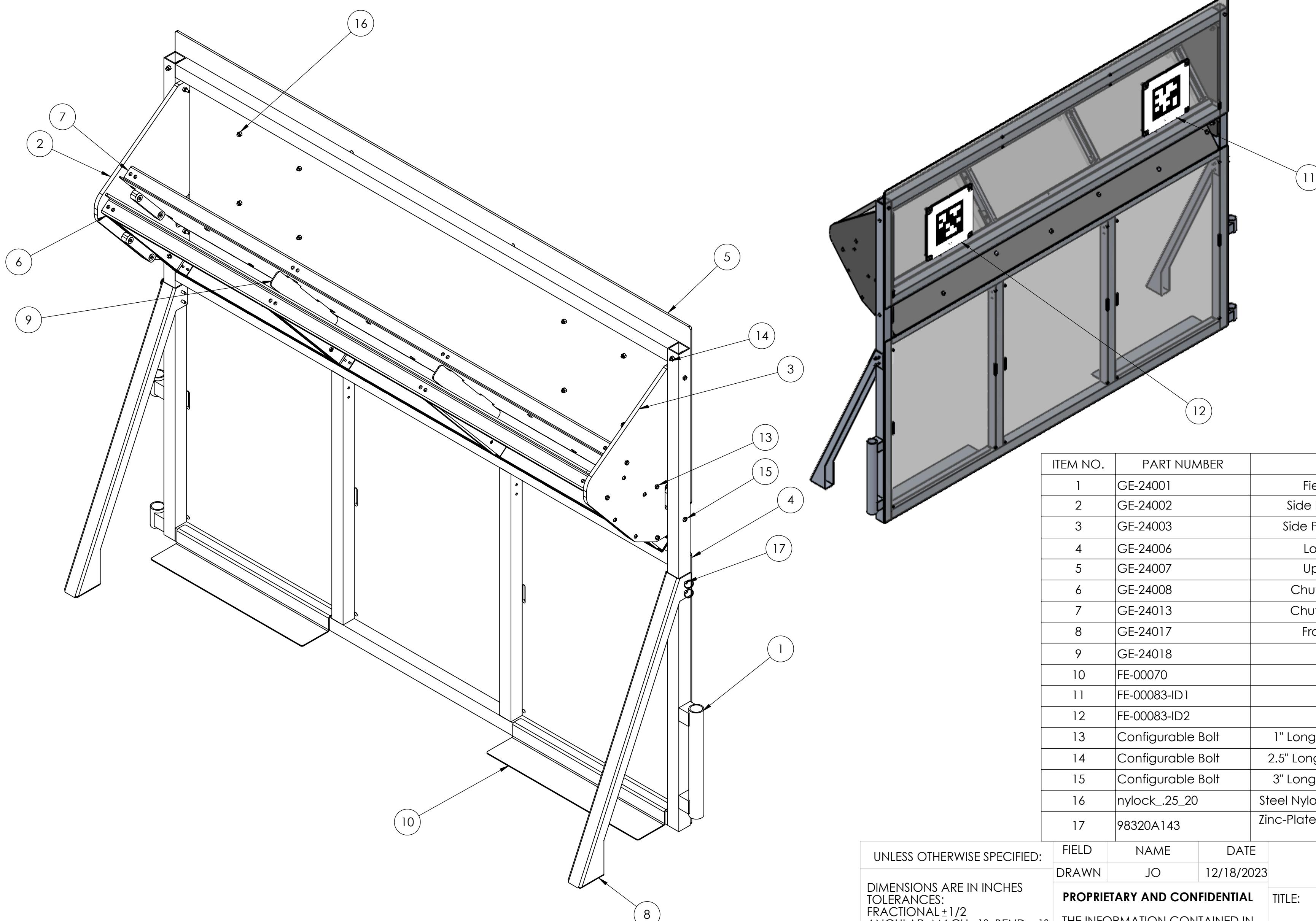
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REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
2-B1, 2-B2	A	Sheet 2 added	12/19/2023	JO



Notes:

Blue Source shown above, Red Source has ① flipped and different ID numbers on April Tags

UNLESS OTHERWISE SPECIFIED:

FIELD	NAME	DATE
DRAWN	JO	12/18/2023

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DO NOT SCALE DRAWING

TITLE: Source

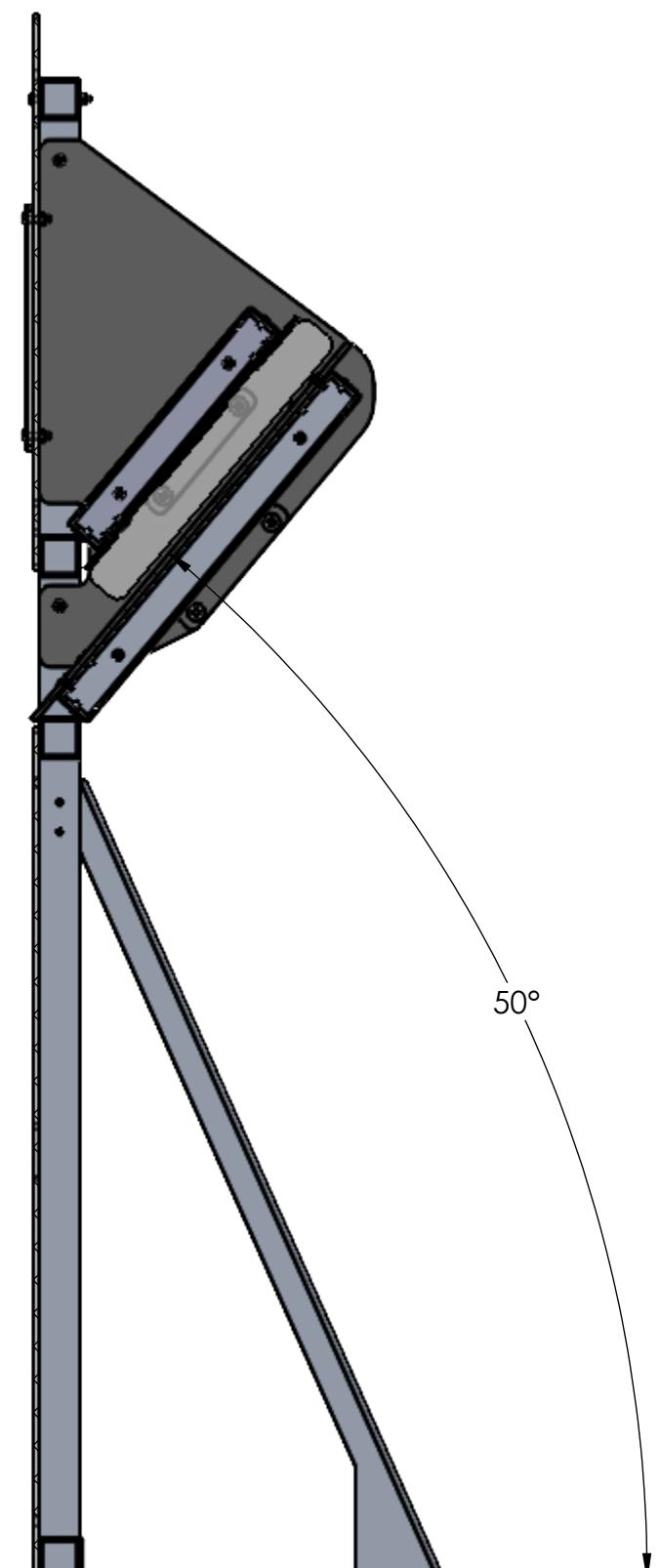
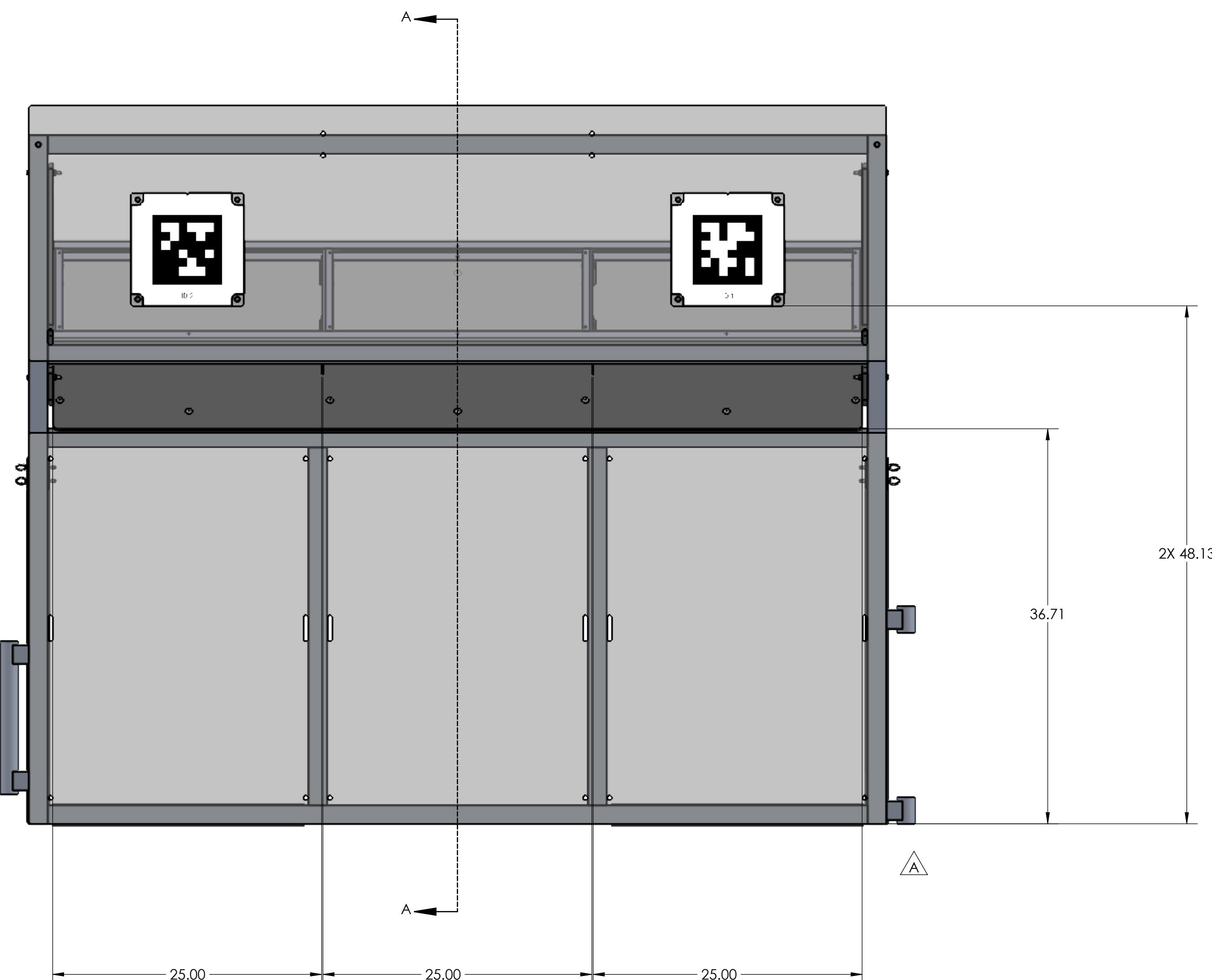
SIZE DWG. NO. REV

C GE-24000 A

SCALE: 1:8 SHEET 1 OF 7

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
-	-	See Sheet1	-	-



UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	JO	12/18/2023
TOLERANCES: FRACTIONAL $\pm 1/2$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .50$	PROPRIETARY AND CONFIDENTIAL THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.		
MATERIAL/FINISH:	TITLE: Source		
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.	SIZE	DWG. NO.	REV
	C	GE-24000	A
DO NOT SCALE DRAWING	SCALE: 1:8	SHEET 2 OF 7	

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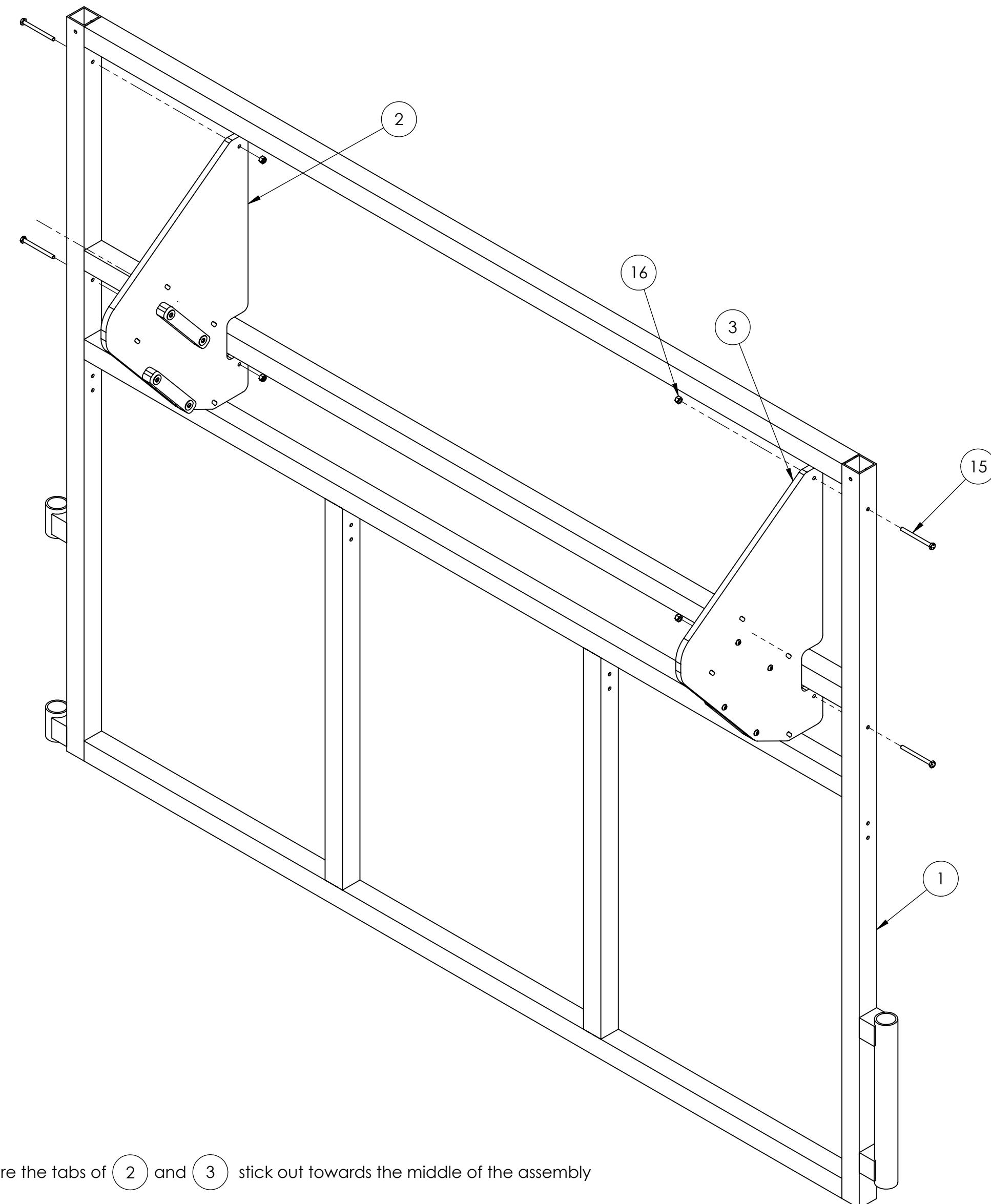
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MATERIAL/FINISH:	SIZE	DWG. NO.	REV	
	C	GE-24000	A	
DO NOT SCALE DRAWING	SCALE: 1:7	SHEET 3 OF 7		

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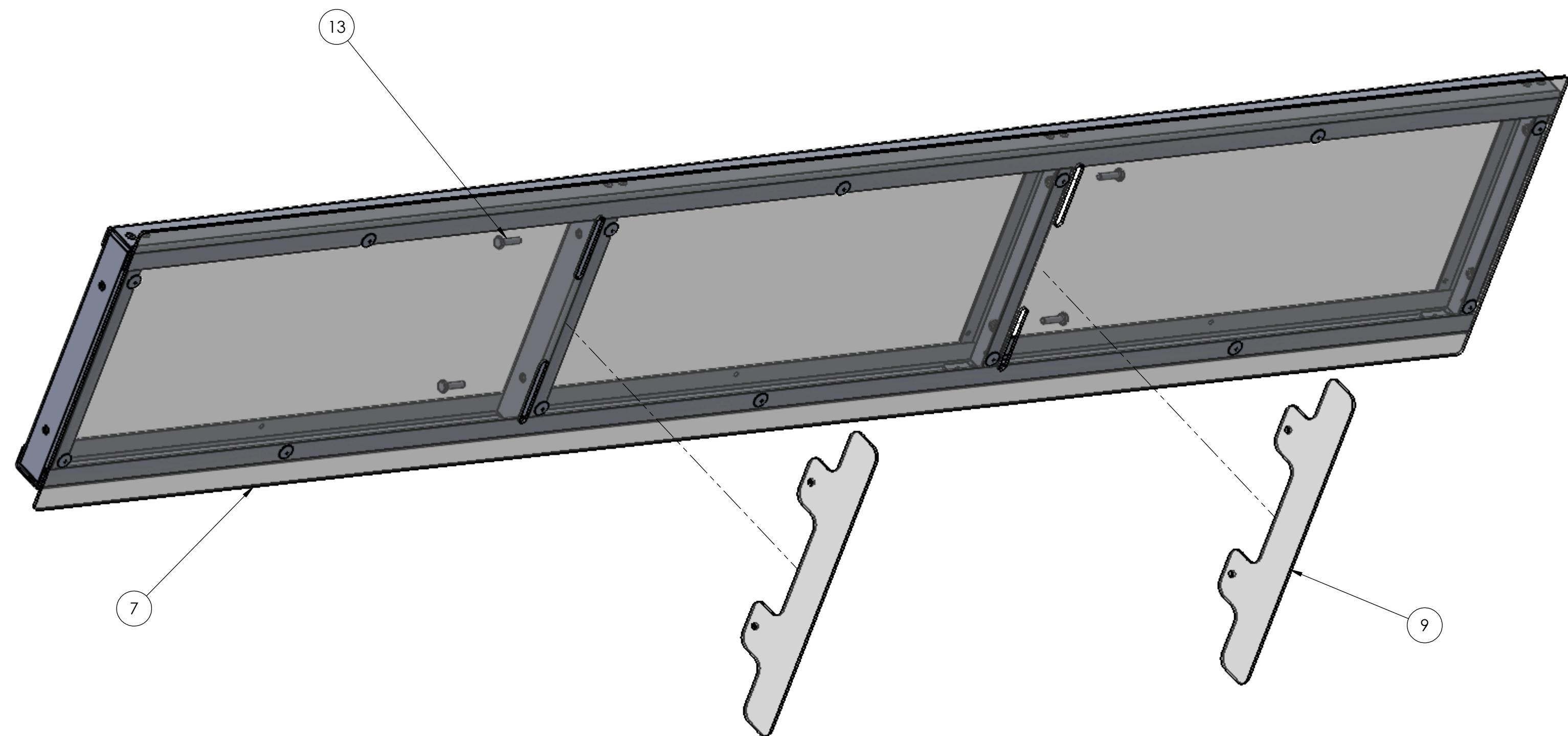
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Slide (9) through the slots in (7) and attach with (13).

UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE	
DRAWN	JO	12/18/2023		
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	C	GE-24000	A	
COMMENTS:	REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING	SCALE: 1:4	SHEET 4 OF 7		

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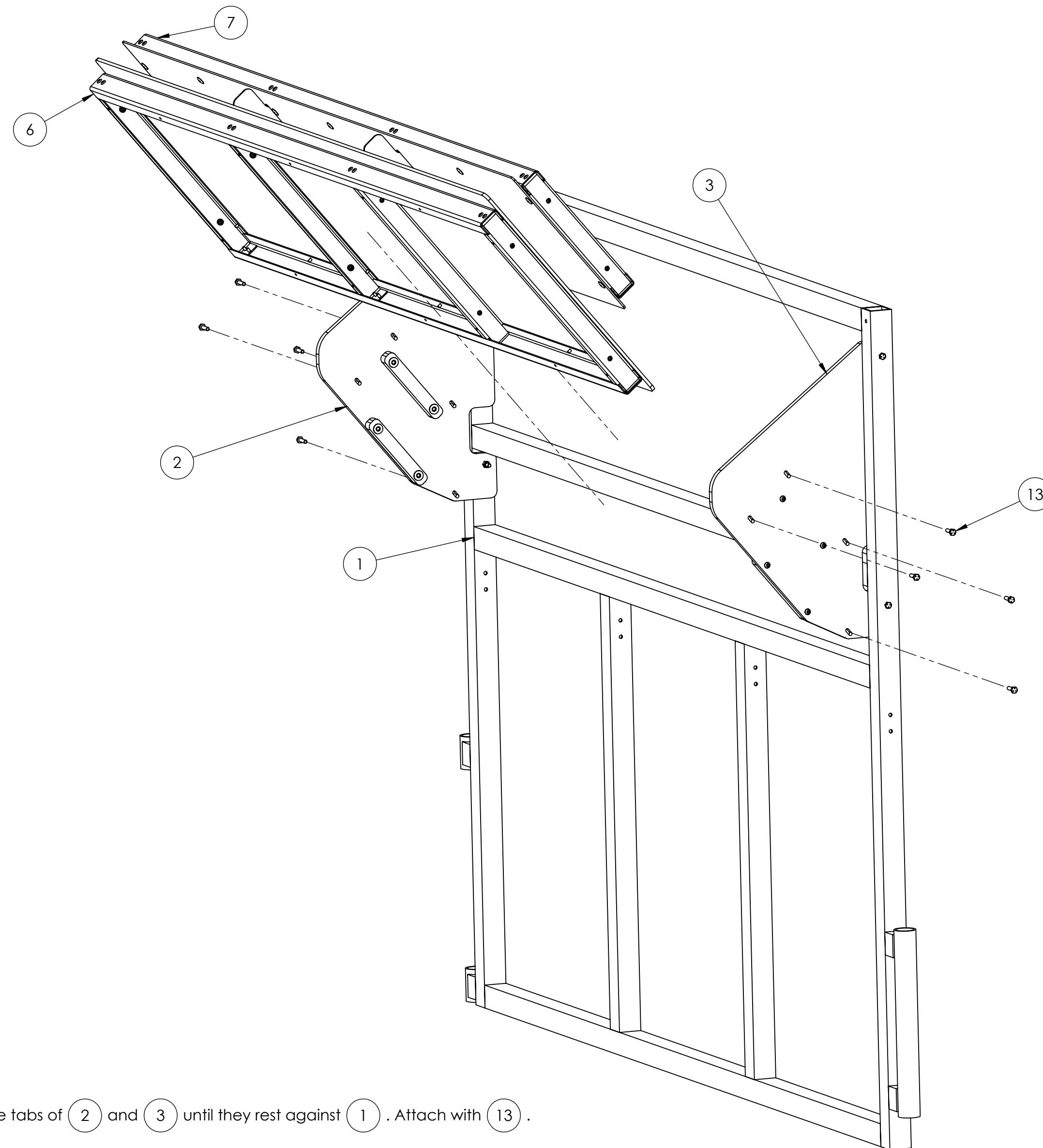
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UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE	
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm\frac{1}{2}$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .50$	DRAWN	JO	12/18/2023	
PROPRIETARY AND CONFIDENTIAL				
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MATERIAL/FINISH:	SIZE	DWG. NO.	REV	
	C	GE-24000	A	
COMMENTS:	REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING	SCALE: 1:7	SHEET 5 OF 7		

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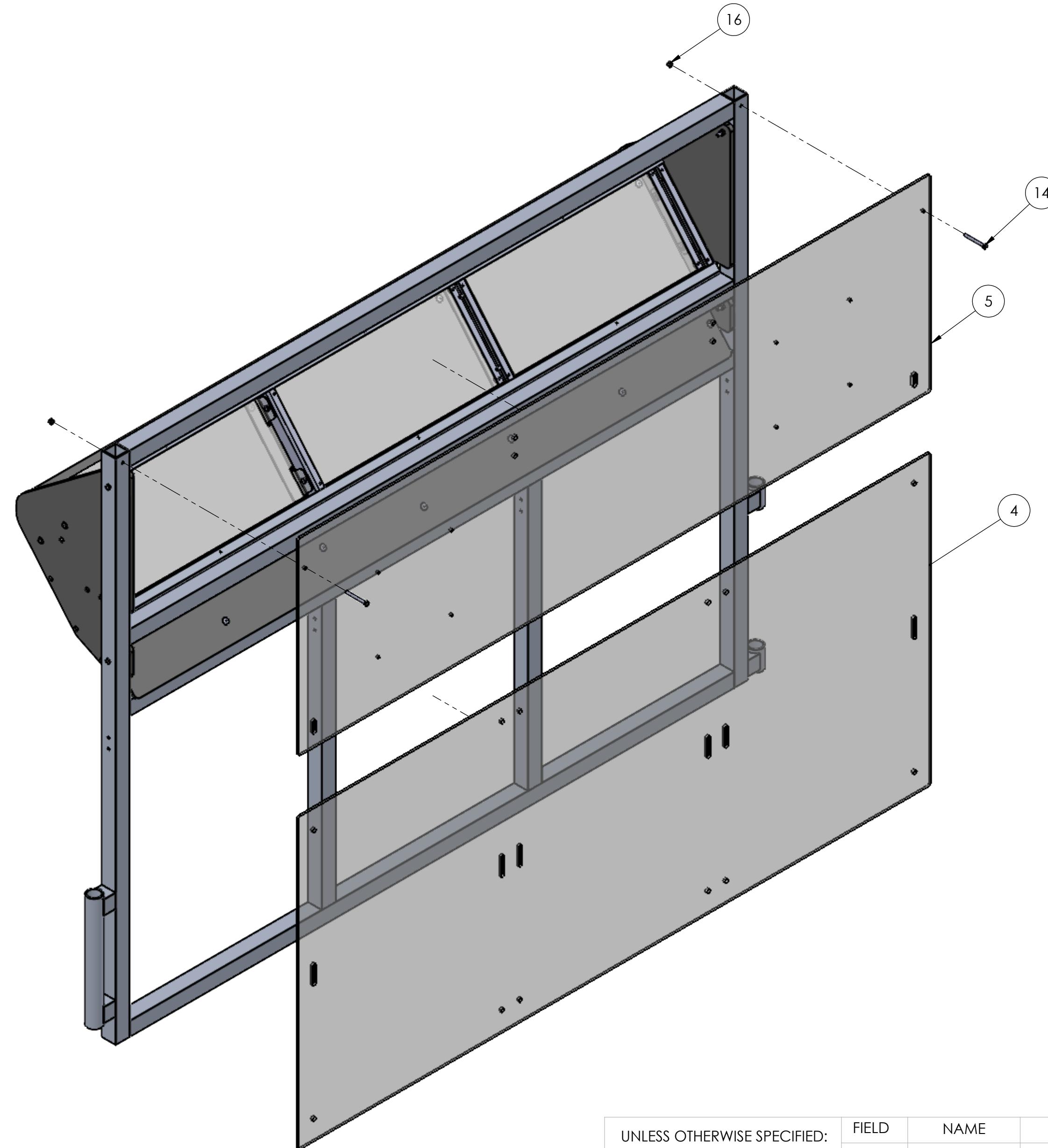
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Attach (5) to the assembly using (14) and (16), then attach with 4x 120lb Cable Ties.

Attach (4) to the assembly with 12x 120 lb Cable Ties

UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm\frac{1}{2}$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .50$	DRAWN	JO	12/18/2023

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COMMENTS:
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DO NOT SCALE DRAWING

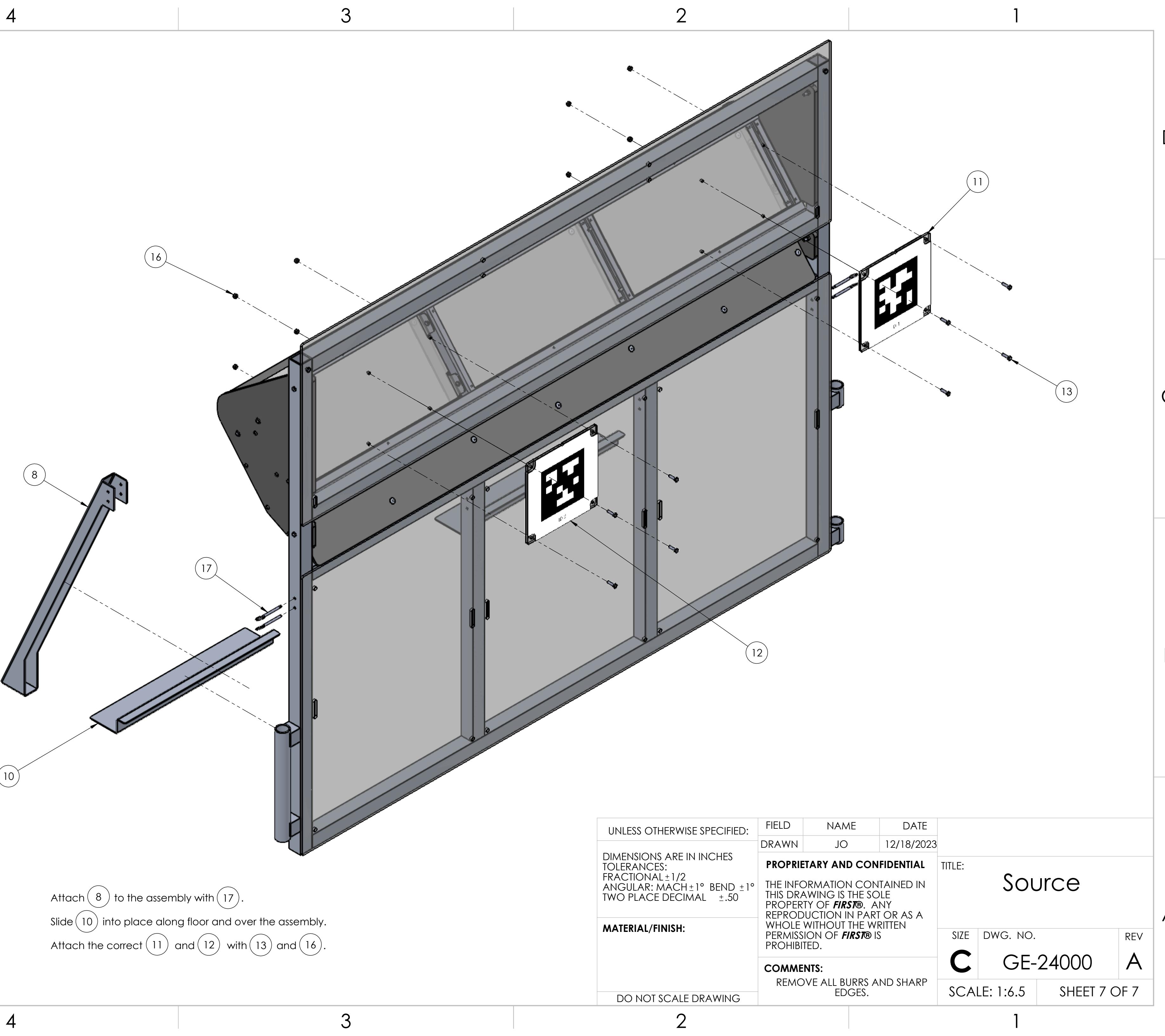
SIZE	DWG. NO.	REV
C	GE-24000	A
SCALE: 1:8	SHEET 6 OF 7	

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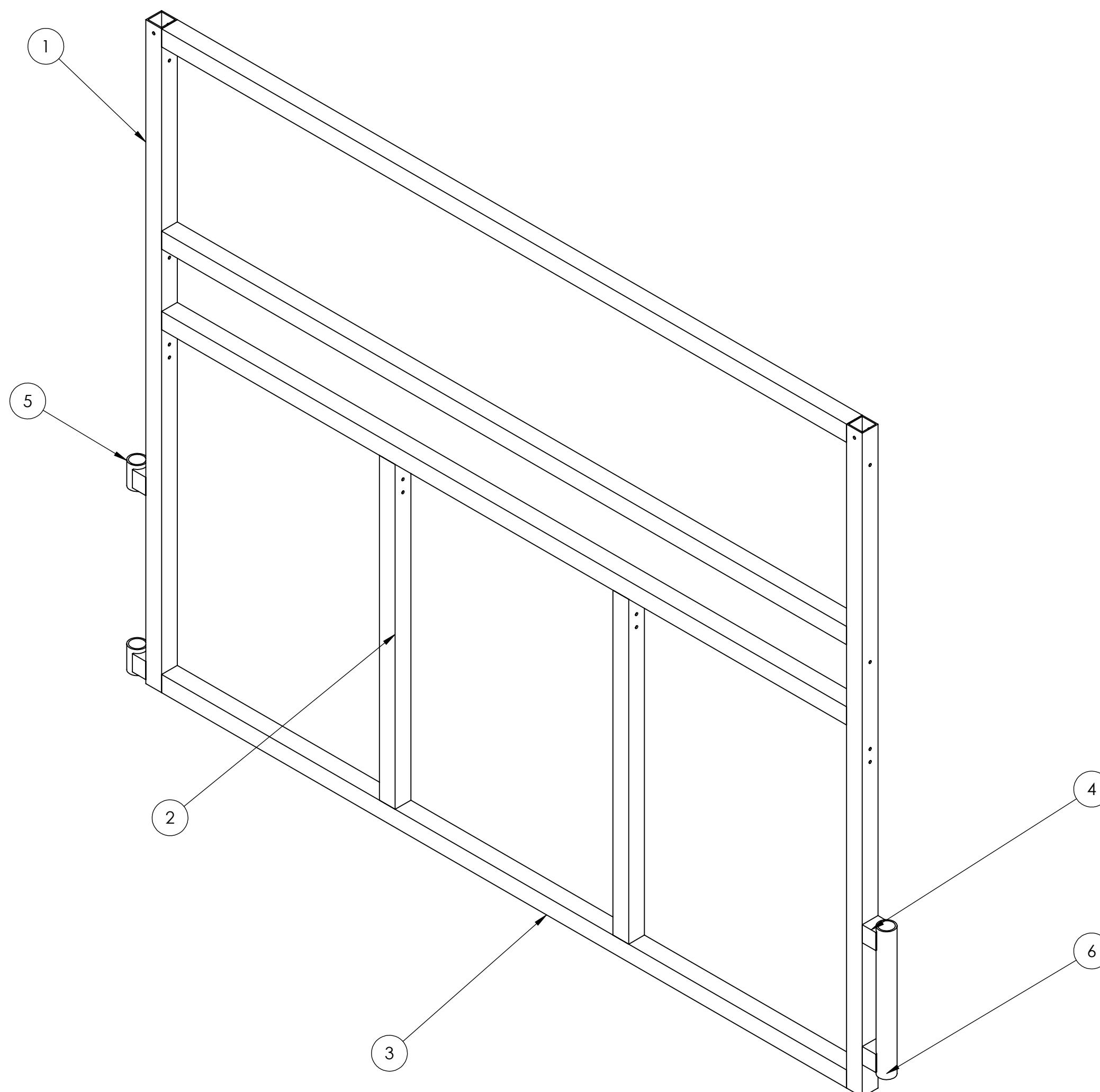
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UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE	
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm\frac{1}{2}$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .50$	DRAWN	JO	12/18/2023	
PROPRIETARY AND CONFIDENTIAL				
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MATERIAL/FINISH:				TITLE: Source
COMMENTS:				SIZE DWG. NO. REV
REMOVE ALL BURRS AND SHARP EDGES.	C	GE-24000	A	
DO NOT SCALE DRAWING	SCALE: 1:6.5	SHEET 7 OF 7		



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24001-01	Field Border Frame Outer Upright	2
2	GE-24001-02	Field Border Frame Inner Upright	2
3	GE-24001-03	Field Border Frame Horizontal	4
4	GE-24001-04	Field Border Frame Pin Shell Connectors	4
5	GE-24001-05	Field Border Frame Short Pin Shell	2
6	GE-24001-06	Field Border Frame Long Pin Shell	1

UNLESS OTHERWISE SPECIFIED:	WELD	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	NE	3/1/2023
TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .02$ THREE PLACE DECIMAL $\pm .015$	PROPRIETARY AND CONFIDENTIAL THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.		
MATERIAL/FINISH: 6061 Aluminum - 1.75" x .125" Square Box Tube and 1-1/4" Sch 40 Pipe	COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.		
DO NOT SCALE DRAWING			

FIRST ROBOTICS COMPETITION SOLIDWORKS Modeling Solutions Partner

TITLE: Field Border Frame

SIZE DWG. NO. REV

C GE-24001

SCALE: 1:8 SHEET 1 OF 4

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Technical drawing showing a top-down view of a mechanical assembly. The drawing includes several horizontal and vertical lines representing structural components. Dimension lines indicate specific measurements: height from 0 to 64.00, width from 0 to 26.00, and height from 0 to 82.41. Callouts point to various features: 'NO WELD PERMISSIBLE ON INSIDE OF TUBES. 3 PLACES.' points to a circular detail at the top left; 'NOTE HOLE ORIENTATION. HOLES SHOULD LINE UP WITH THE ONES ON THE OUTSIDE VERTICALS' points to a circular detail at the bottom right; 'NOTE HOLE C' points to a hole near the bottom right corner; '4X' indicates four occurrences of a feature; '2X' indicates two occurrences of a feature. Material thicknesses are noted as 0.25. Specific part numbers labeled include 1, 2, 3, 4, 5, and 6.

Technical drawing illustrating welding details and overall dimensions for a structural component.

Detail B (Scale 1:4): Shows a circular weld joint. The top horizontal leg has a thickness of 0.25, and the bottom horizontal leg has a thickness of 0.25. The vertical leg has a thickness of 0.25. The weld length is indicated as 2X. A note specifies "NO WELD PERMISSABLE BEYOND THIS FACE AT THIS JOINT".

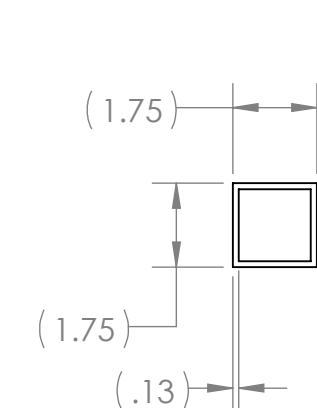
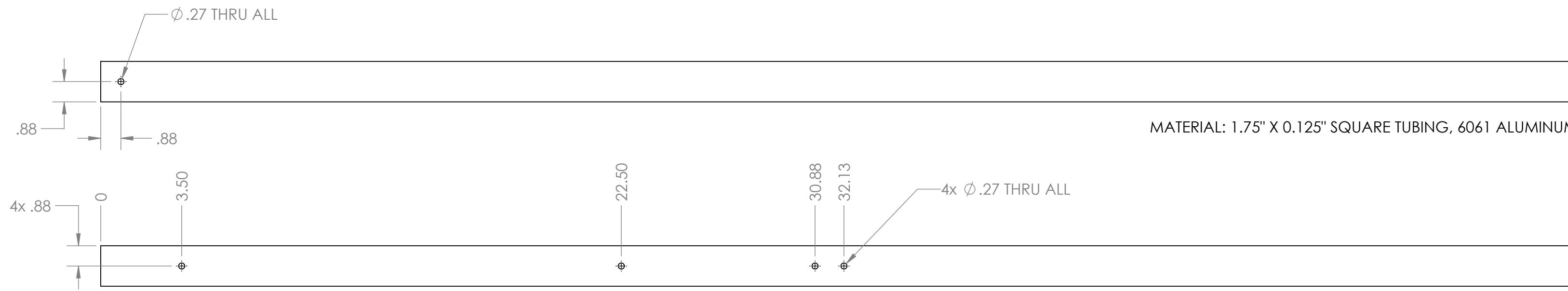
Detail D (Scale 1:2): Shows a circular weld joint. The top horizontal leg has a thickness of 0.25, and the bottom horizontal leg has a thickness of 0.25. The vertical leg has a thickness of 0.25. The weld length is indicated as 4X. A note specifies "NO WELD PERMISSABLE BEYOND THIS FACE AT THIS JOINT".

Overall Dimensions:

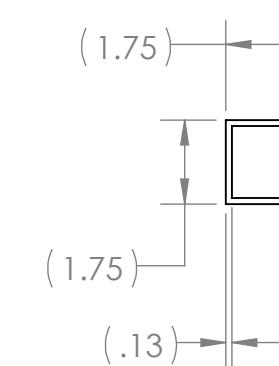
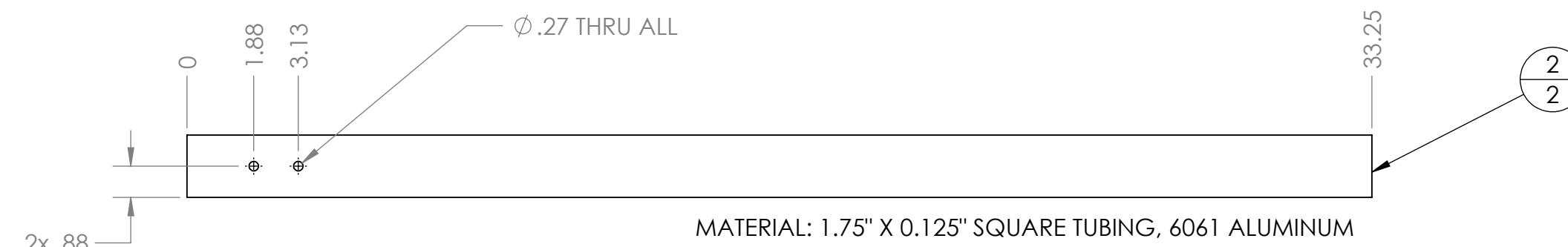
- Total height: 64.00
- Bottom flange thickness: TYP .38
- Left side wall thickness: 17.75
- Right side wall thickness: 18.13

UNLESS OTHERWISE SPECIFIED:		WELD	NAME	DATE	 FIRST. ROBOTICS COMPETITION	DS SOLIDWORKS <small>Modeling Solutions Partner</small>
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .02$ THREE PLACE DECIMAL $\pm .015$		DRAWN	NE	3/1/2023		
MATERIAL/FINISH: 6061 Aluminum - 1.75" x .125" Square Box Tube and 1-1/4" Sch 40 Pipe		<p>PROPRIETARY AND CONFIDENTIAL</p> <p>THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.</p> <p>COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.</p>				
DO NOT SCALE DRAWING		SIZE	DWG. NO.		REV.	
		C	GE-24001			
		SCALE: 1:10			SHEET 2 OF 4	

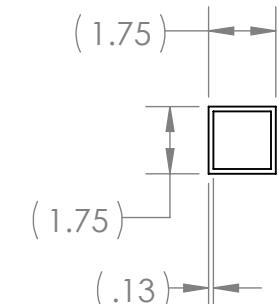
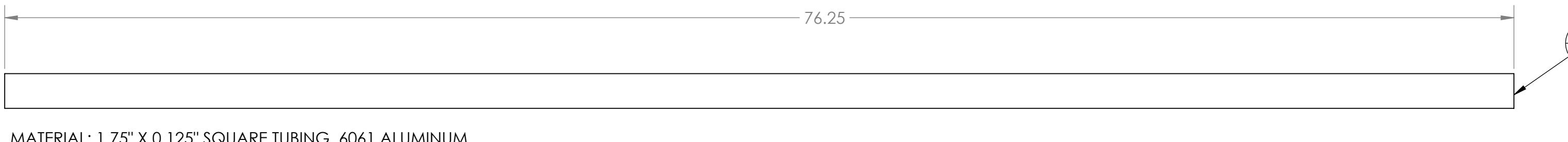
D



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UNLESS OTHERWISE SPECIFIED:			WELD	NAME	DATE
			DRAWN	NE	3/1/2023
PROPRIETARY AND CONFIDENTIAL					
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.					
MATERIAL/FINISH:					
6061 Aluminum - 1.75" x .125" Square Box Tube and 1-1/4" Sch 40 Pipe					
COMMENTS:					
REMOVE ALL BURRS AND SHARP EDGES.					
DO NOT SCALE DRAWING					

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
**Field Border
Frame**

SIZE DWG. NO. REV
C GE-24001

SCALE: 1:8 SHEET 3 OF 4

4

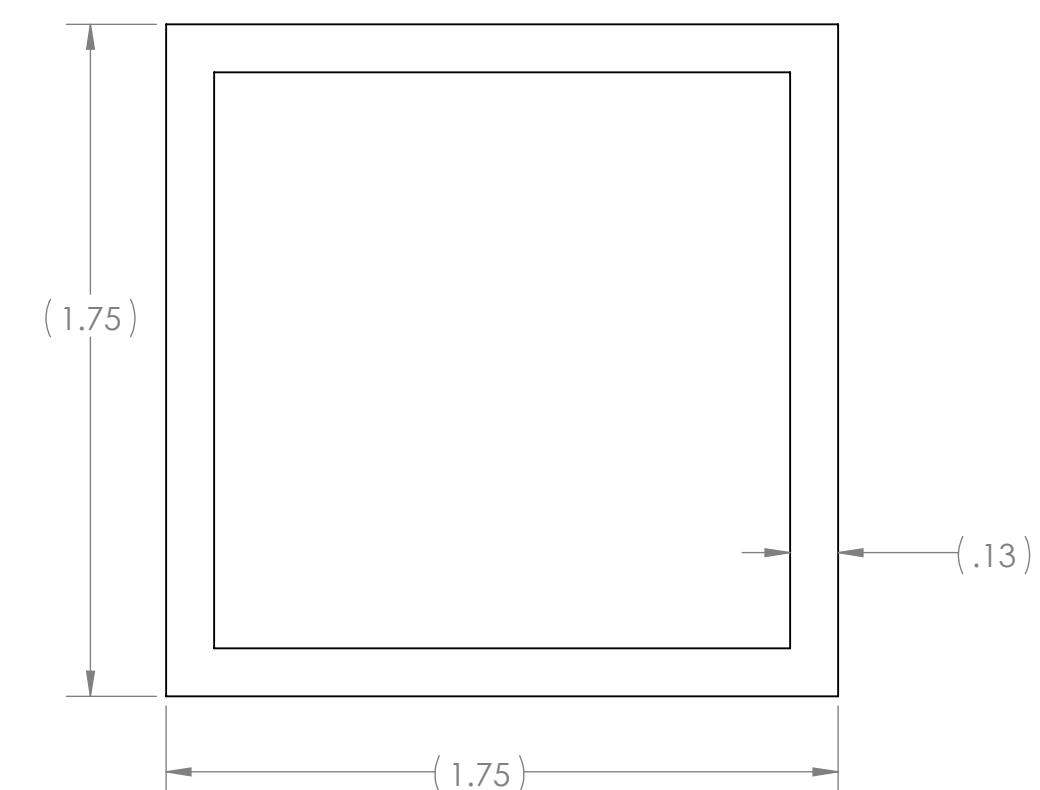
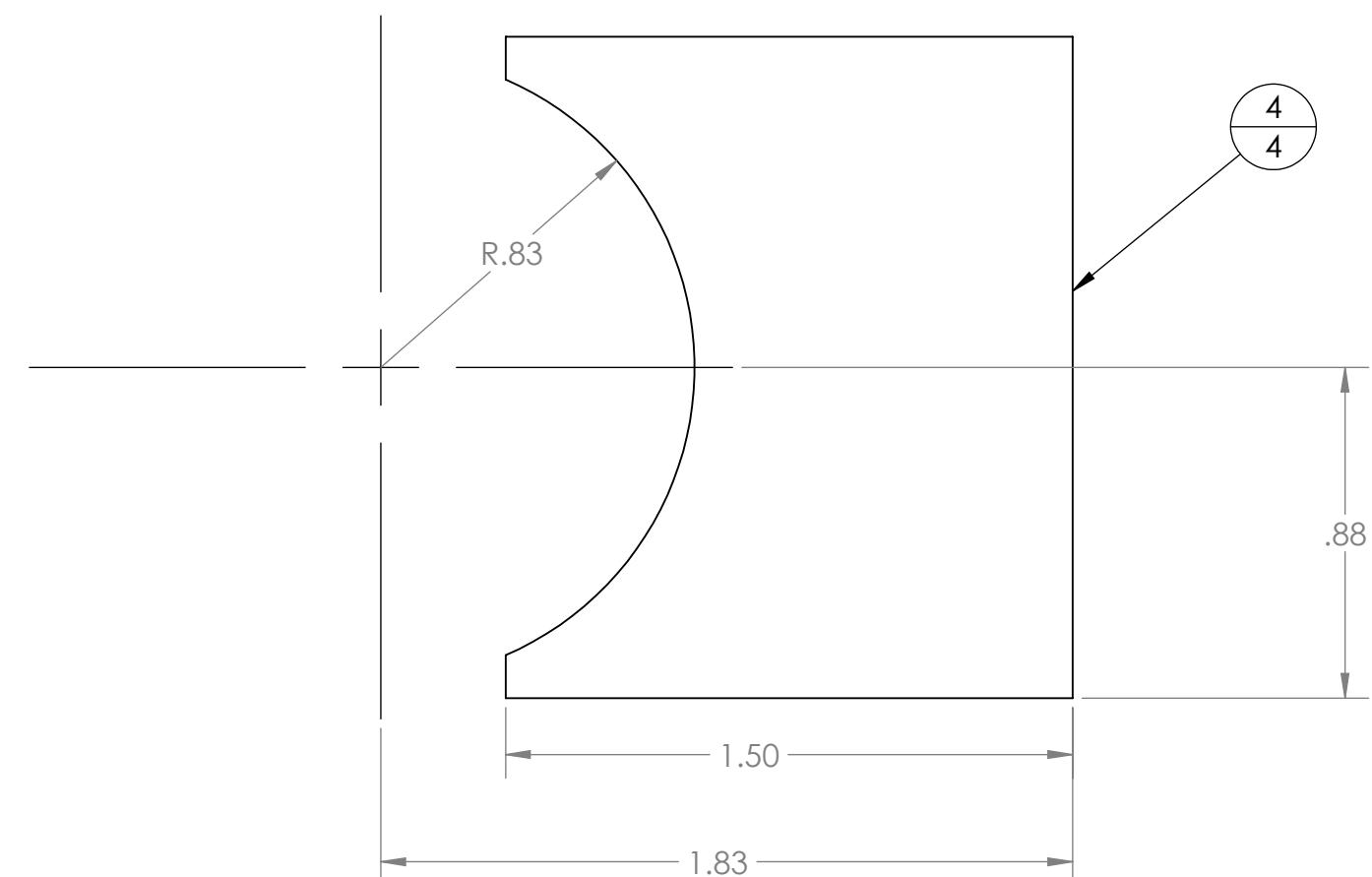
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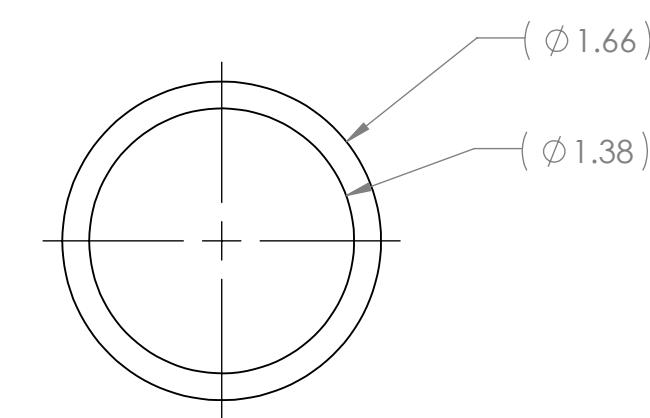
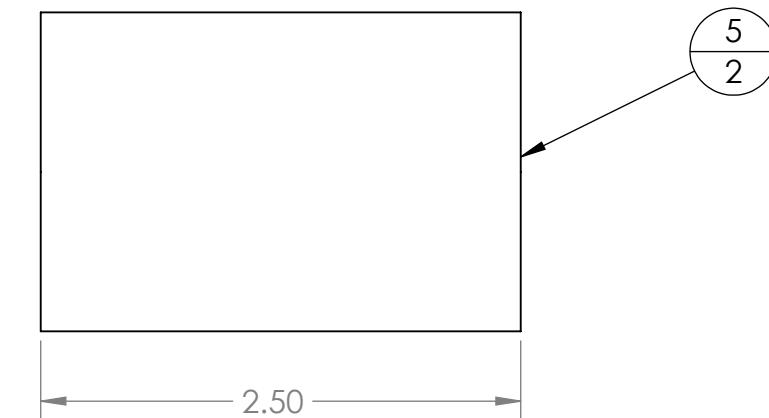


MATERIAL: 1.75" X 0.125" SQUARE TUBING, 6061 ALUMINUM

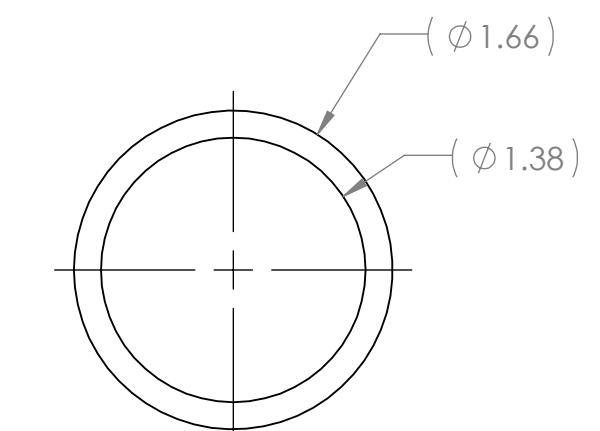
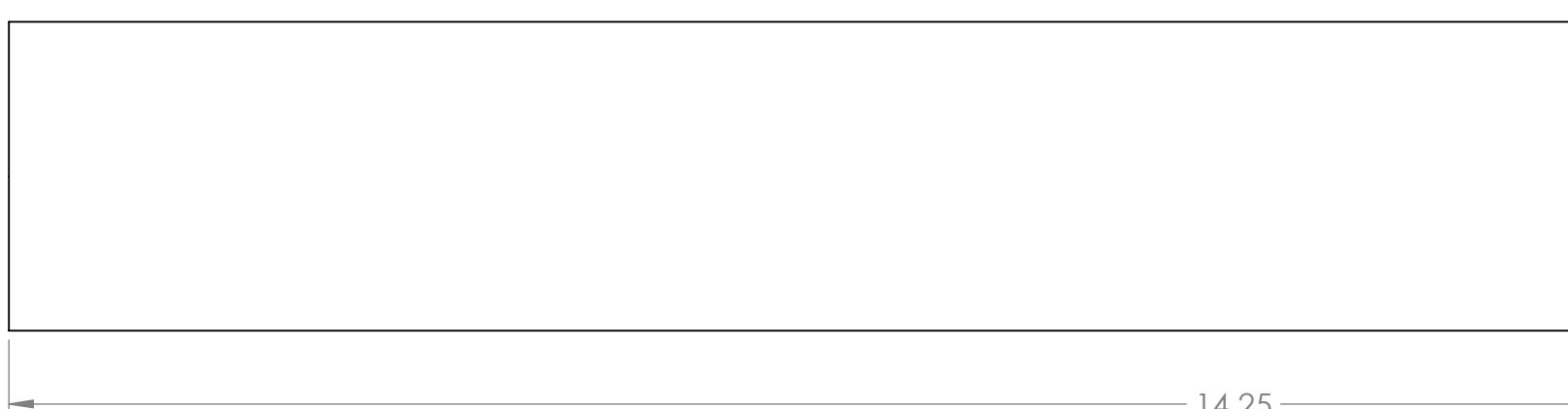
C

C

MATERIAL: 1.25" SCH 40 ROUND PIPE, 6061 ALUMINUM



MATERIAL: 1.25" SCH 40 ROUND PIPE, 6061 ALUMINUM



UNLESS OTHERWISE SPECIFIED:	WELD	NAME	DATE
DRAWN	NE	3/1/2023	
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH: 6061 Aluminum - 1.75" x .125" Square Box Tube and 1-1/4" Sch 40 Pipe			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
**Field Border
Frame**

SIZE DWG. NO. REV
C GE-24001

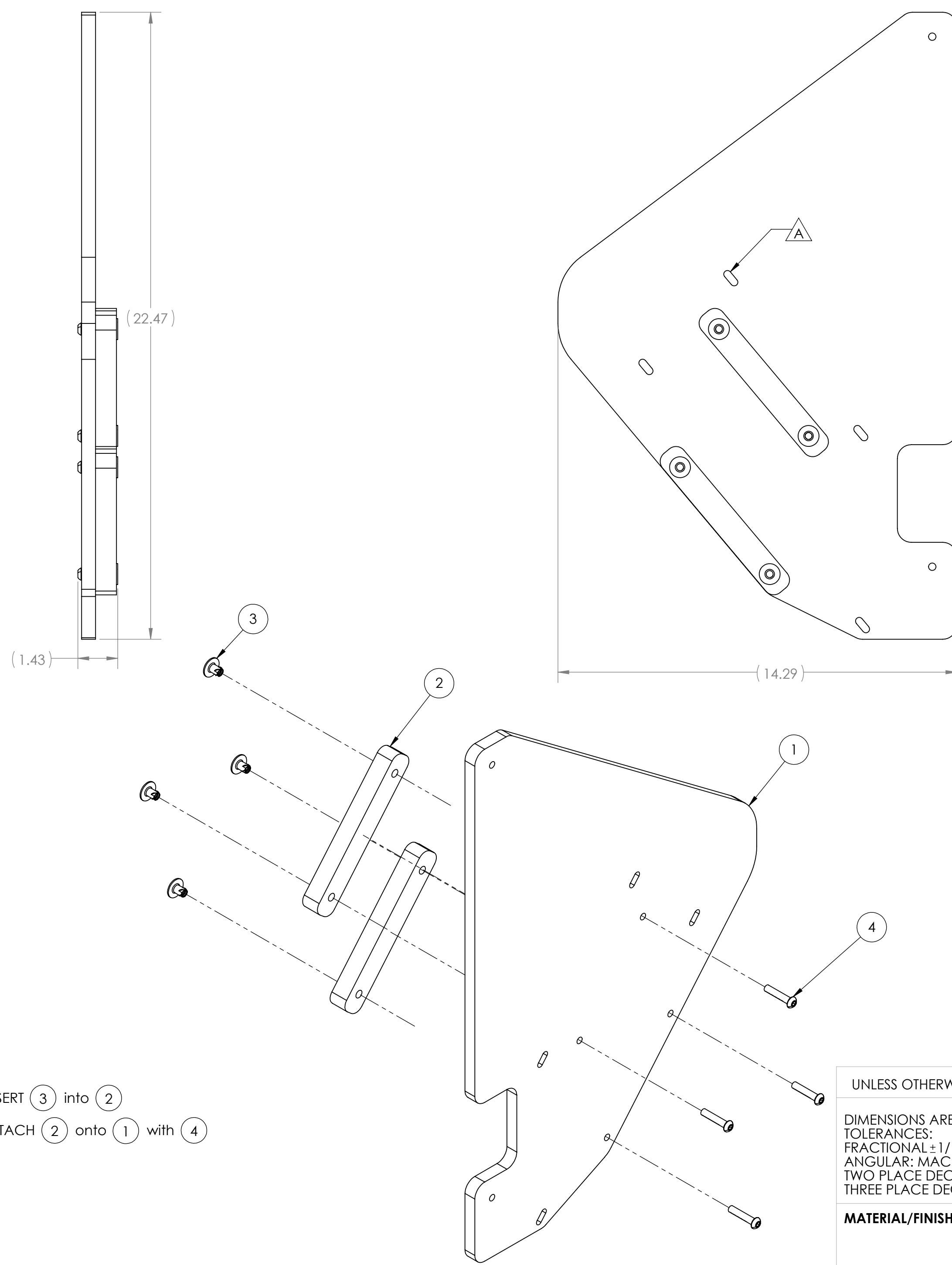
SCALE: 2:1 SHEET 4 OF 4

4

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UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES

TOLERANCES:

FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .005$ **MATERIAL/FINISH:**

DO NOT SCALE DRAWING

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24004	Side Plate	1
2	GE-24005	Side Plate Guide Rail	2
3	TeeNut_ultra_split_rst_.25_20	.25-20 TeeNut ultra split resistant	4
4	button_hex_.25_20_1.25	Button Head, Hex, 1/4-20 x 1.25	4

VEND	NAME	DATE
DRAWN	JO	6/7/2023

PROPRIETARY AND CONFIDENTIAL

THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.

COMMENTS:

REMOVE ALL BURRS AND SHARP EDGES.



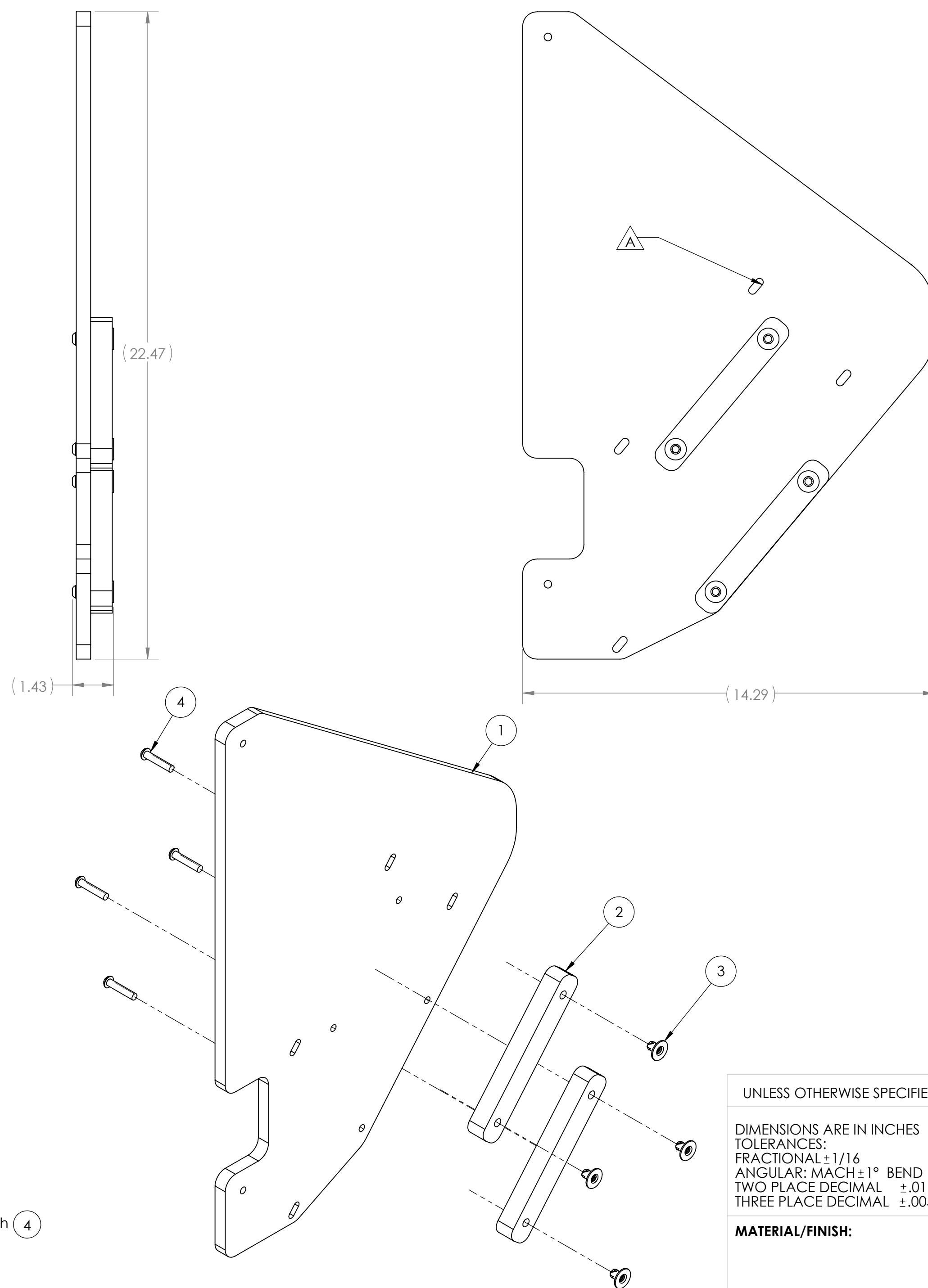
Title:
Side Plate Assembly Left

SIZE	DWG. NO.	REV
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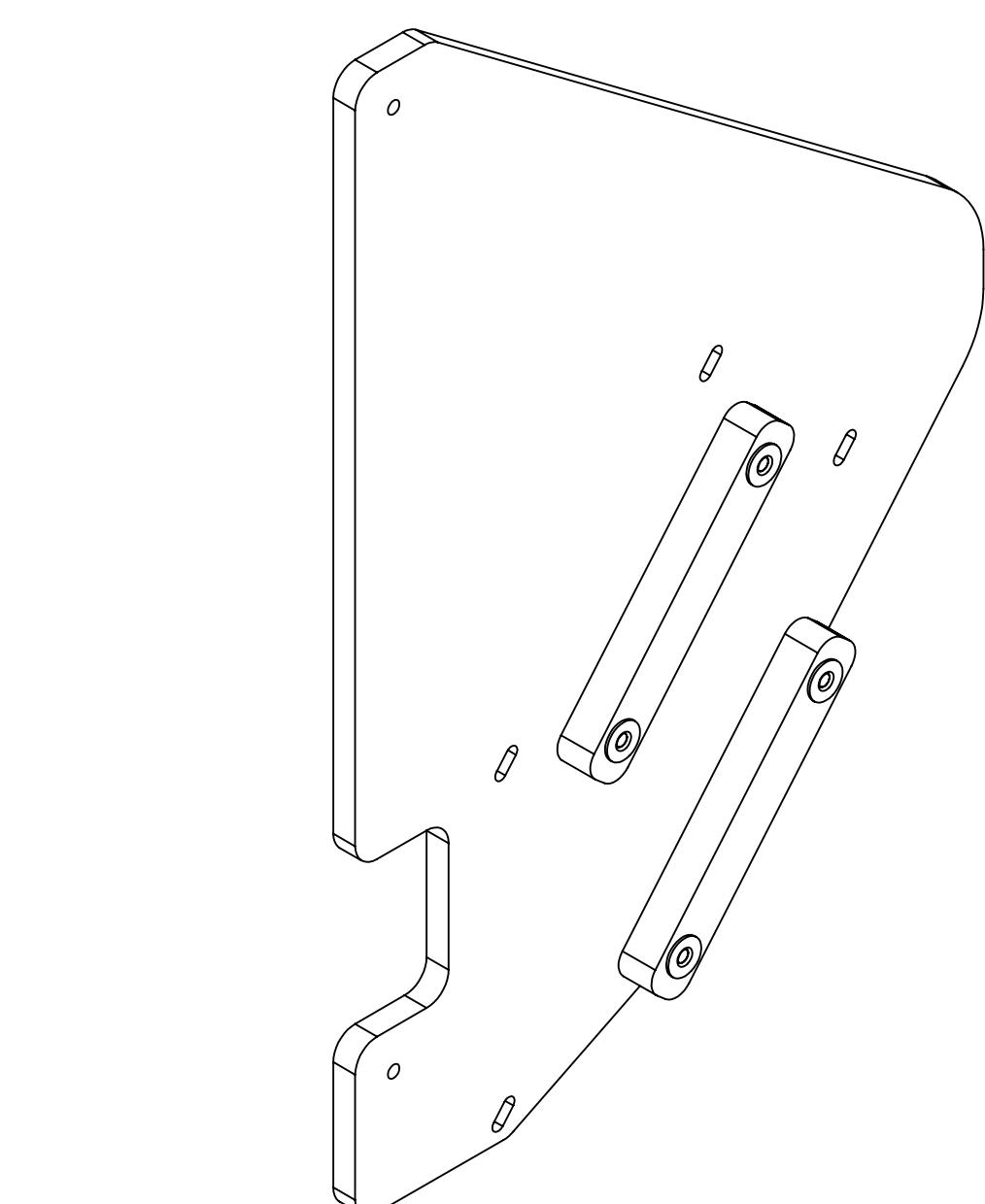
C	GE-24002	A
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SCALE: 1:3	SHEET 1 OF 1
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D



REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
D2	A	GE-24004 HAS UPDATED GEOMETRY	9/28/2023	NWE



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24004	Side Plate	1
2	GE-24005	Side Plate Guide Rail	2
3	TeeNut_ultra_split_rst_.25_20	.25-20 TeeNut ultra split resistant	4
4	button_hex_.25_20_1.25	Button Head, Hex, 1/4-20 x 1.25	4

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL $\pm\frac{1}{16}$
ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$
TWO PLACE DECIMAL $\pm .01$
THREE PLACE DECIMAL $\pm .005$

MATERIAL/FINISH:
DO NOT SCALE DRAWING

VEND NAME DATE
DRAWN JO 6/7/2023

PROPRIETARY AND CONFIDENTIAL
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.

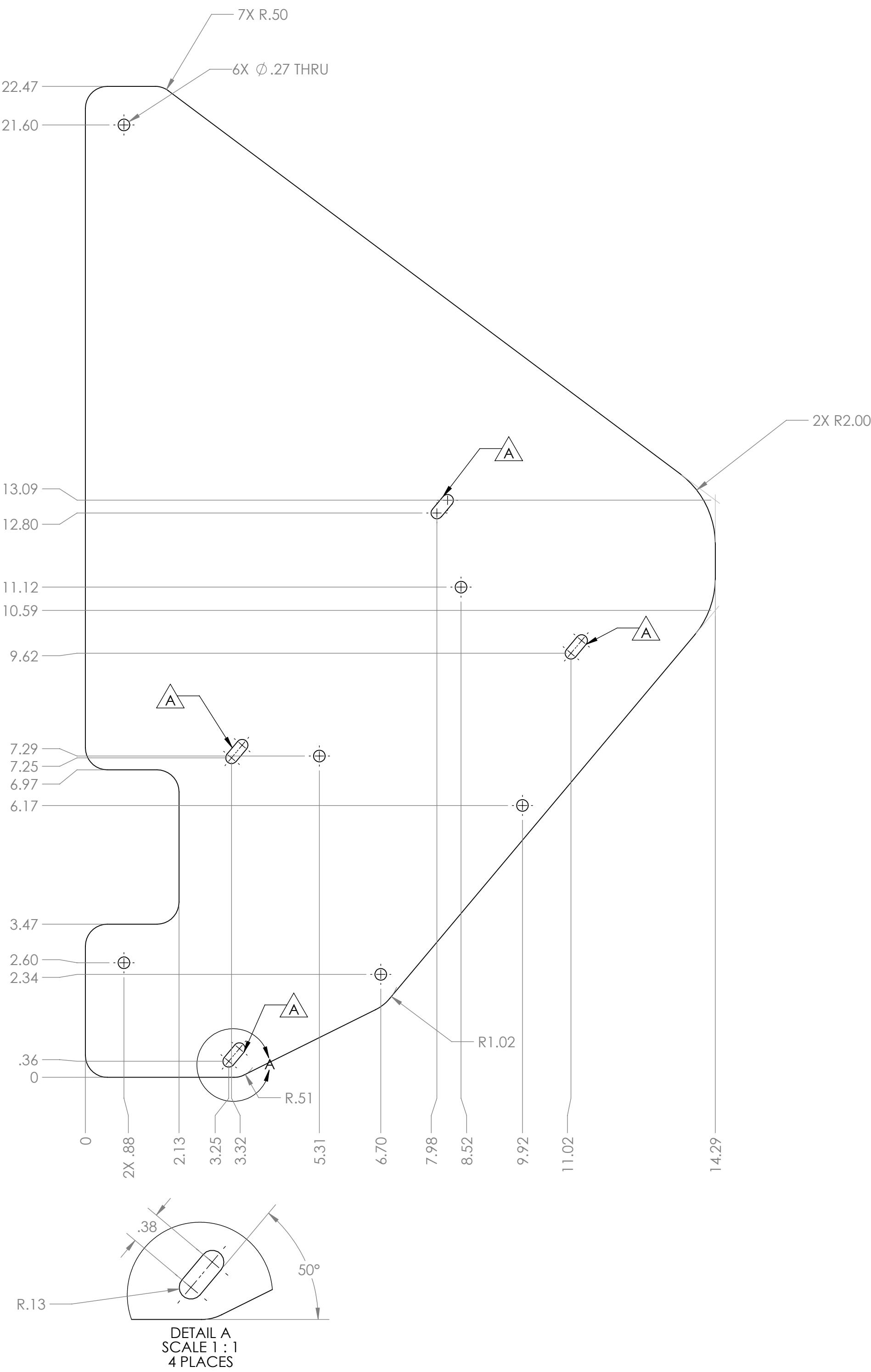
COMMENTS:
REMOVE ALL BURRS AND SHARP EDGES.

SIZE	DWG. NO.	REV
C	GE-24003	A
SCALE: 1:3		SHEET 1 OF 1

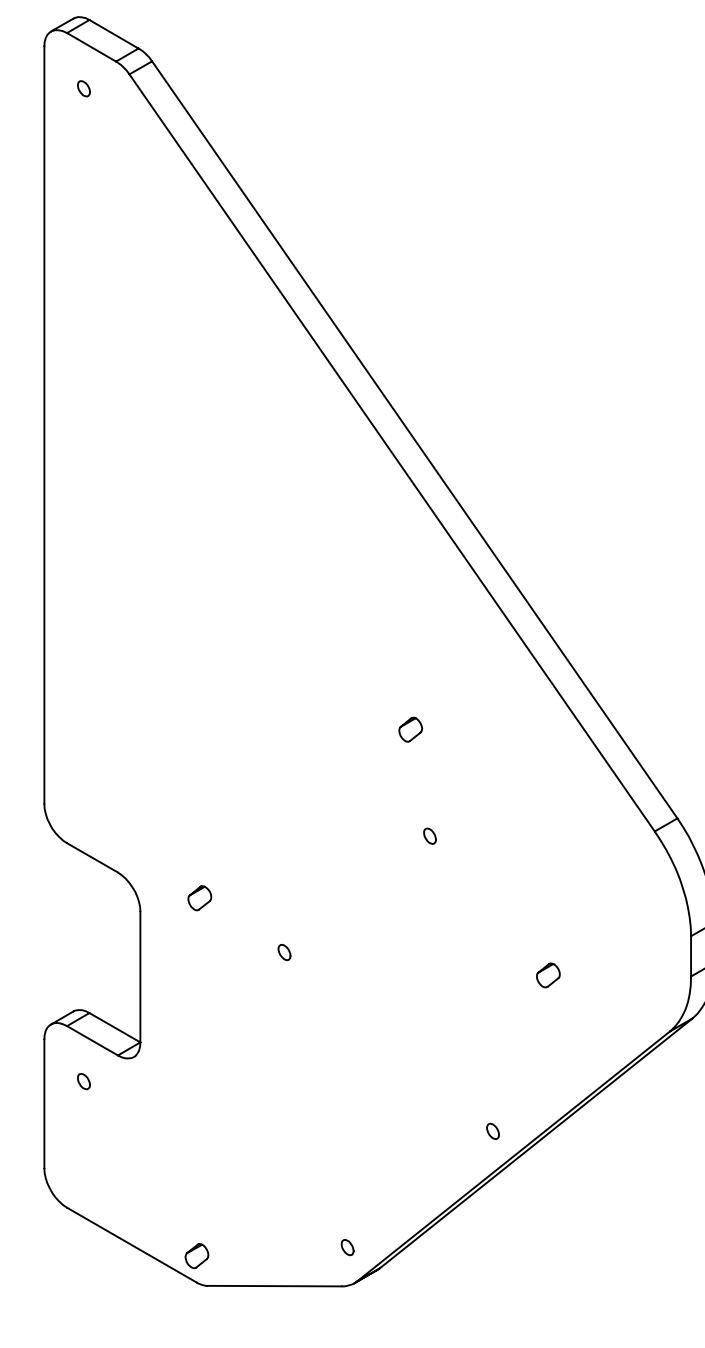
FIRST ROBOTICS COMPETITION SOLIDWORKS Modeling Solutions Partner

Title:
Side Plate Assembly Right

D



REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
B4, C3	A	4 HOLES WERE REPLACED WITH SLOTS	9/28/2023	NWE



UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DRAWN	NE	3/3/2023	
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH:	1/2" Black HDPE, Orange Peel Texture		
COMMENTS:	REMOVE ALL BURRS AND SHARP EDGES.		
DO NOT SCALE DRAWING			

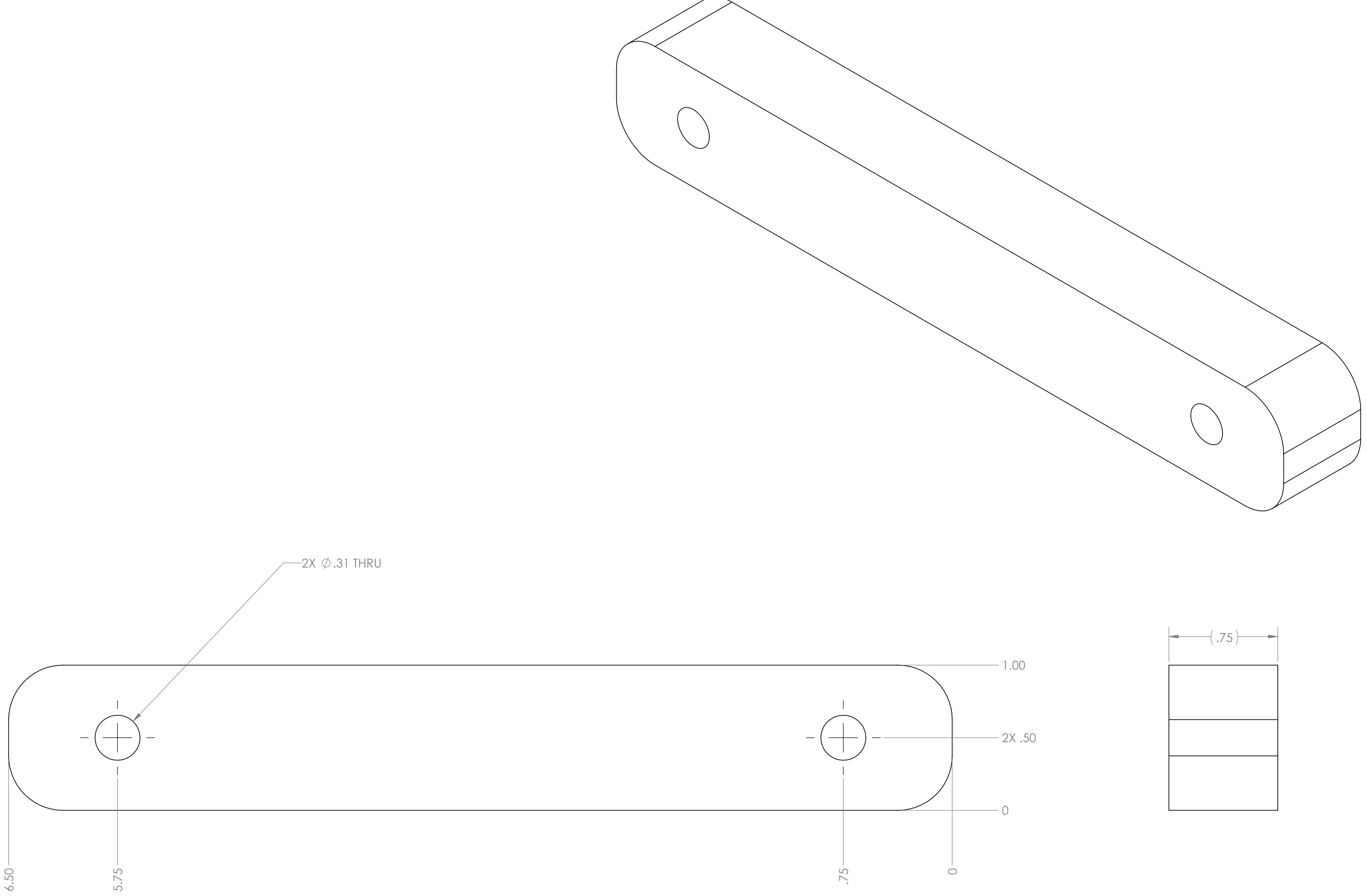
 **FIRST ROBOTICS COMPETITION**  **SOLIDWORKS**
Modeling Solutions Partner

TITLE:
Side Plate

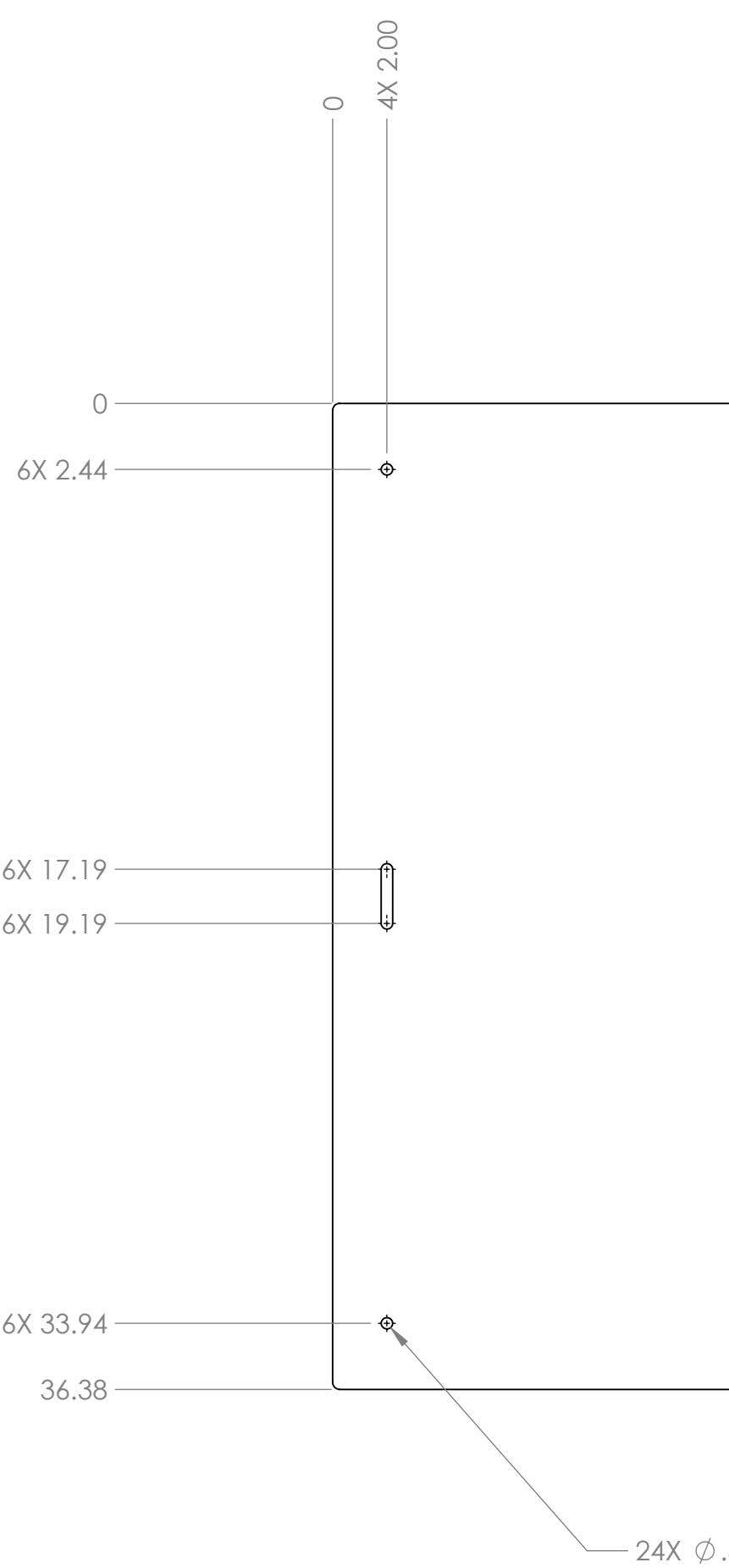
SIZE DWG. NO. REV

C GE-24004 **A**

SCALE: 1:2 SHEET 1 OF 1



UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE		
DRAWN	NE	3/3/2023			
PROPRIETARY AND CONFIDENTIAL					
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.					
MATERIAL/FINISH:					
3/4" Black HDPE, Orange Peel Texture					
COMMENTS:					
REMOVE ALL BURRS AND SHARP EDGES.					
DO NOT SCALE DRAWING					
FIRST ROBOTICS COMPETITION	SOLIDWORKS				
Modeling Solutions Partner					
TITLE:					
Side Plate Guide Rail					
SIZE	DWG. NO.	REV			
C	GE-24005				
SCALE: 2:1		SHEET 1 OF 1			



UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DRAWN	NE	3/4/2023	
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH:			
1/4" Polycarbonate			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			
 FIRST ROBOTICS COMPETITION	 SOLIDWORKS Modeling Solutions Partner		
TITLE: Lower Front Plastic			
SIZE	DWG. NO.	REV	
C	GE-24006		
SCALE: 1:6		SHEET 1 OF 1	

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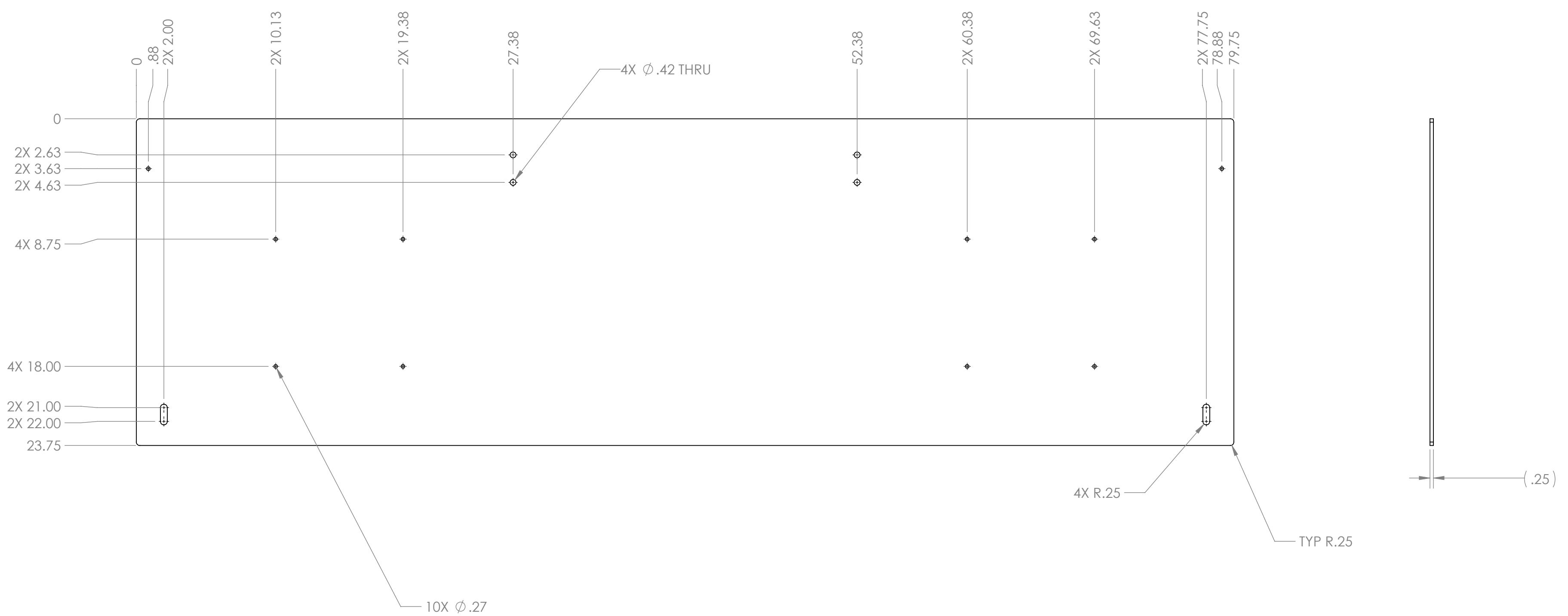
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UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DRAWN	NE	3/4/2023	
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH:			
1/4" Polycarbonate			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
**Upper Front
Plastic**

SIZE DWG. NO. REV
C GE-24007

SCALE: 1:6 SHEET 1 OF 1

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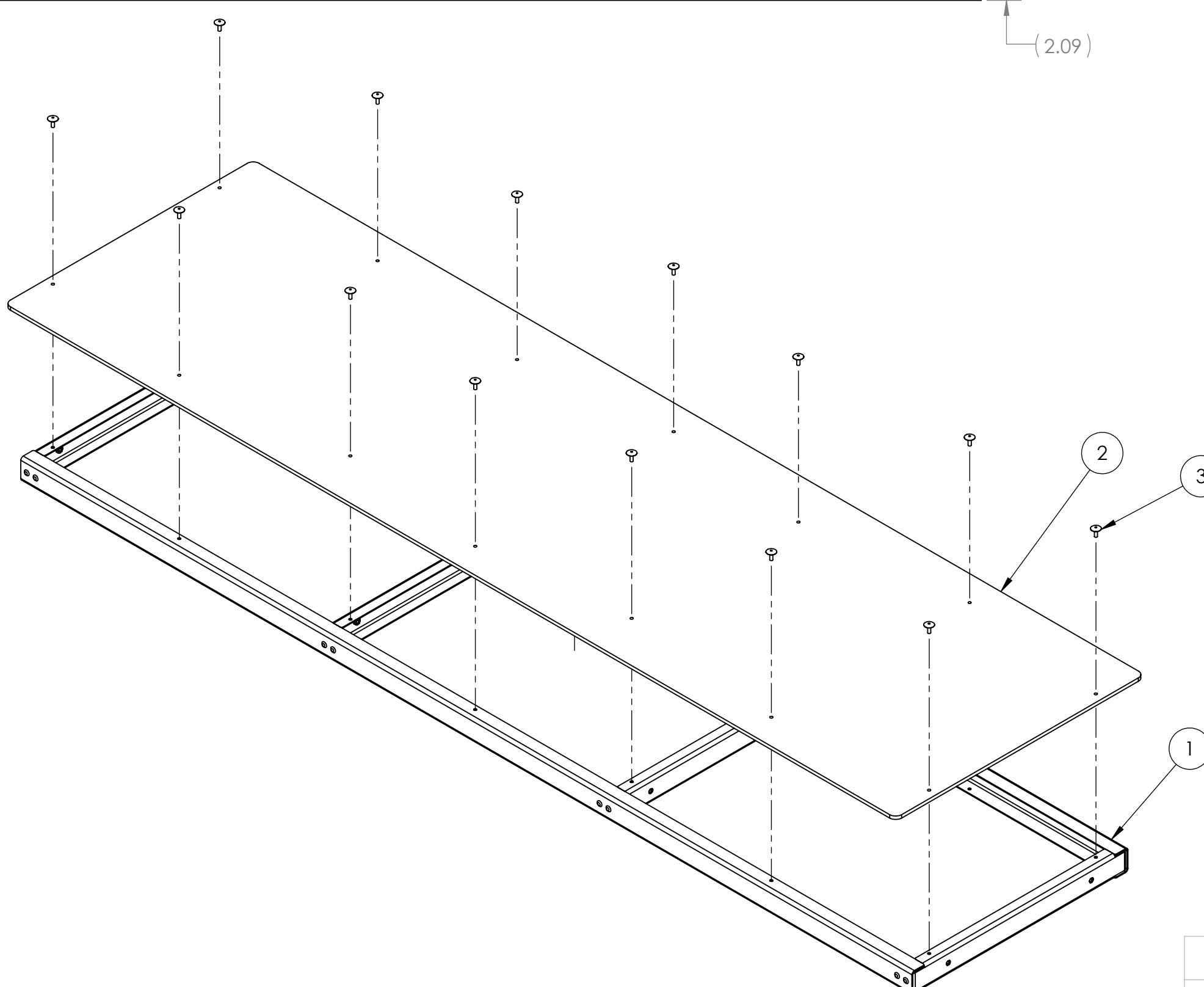
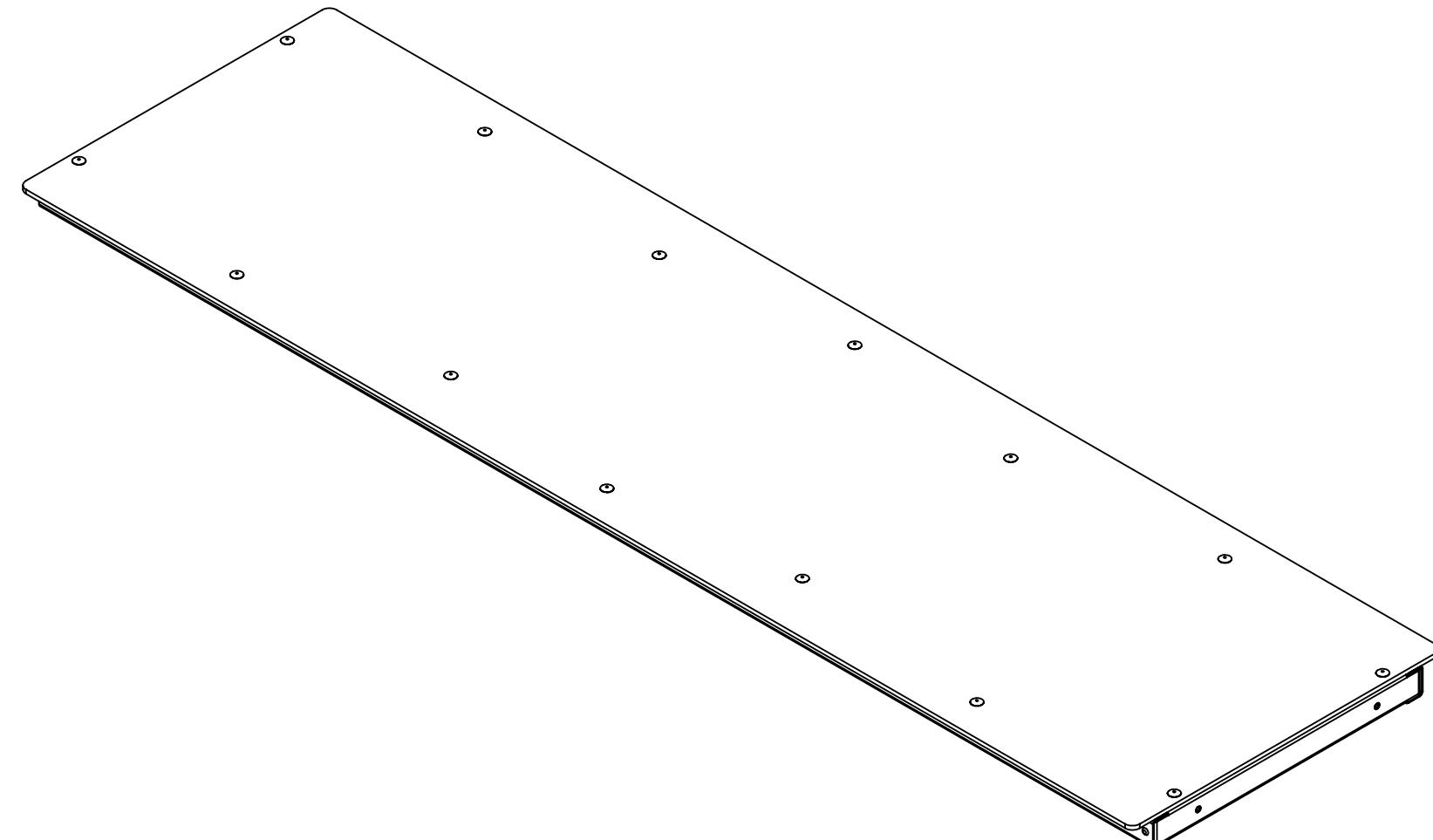
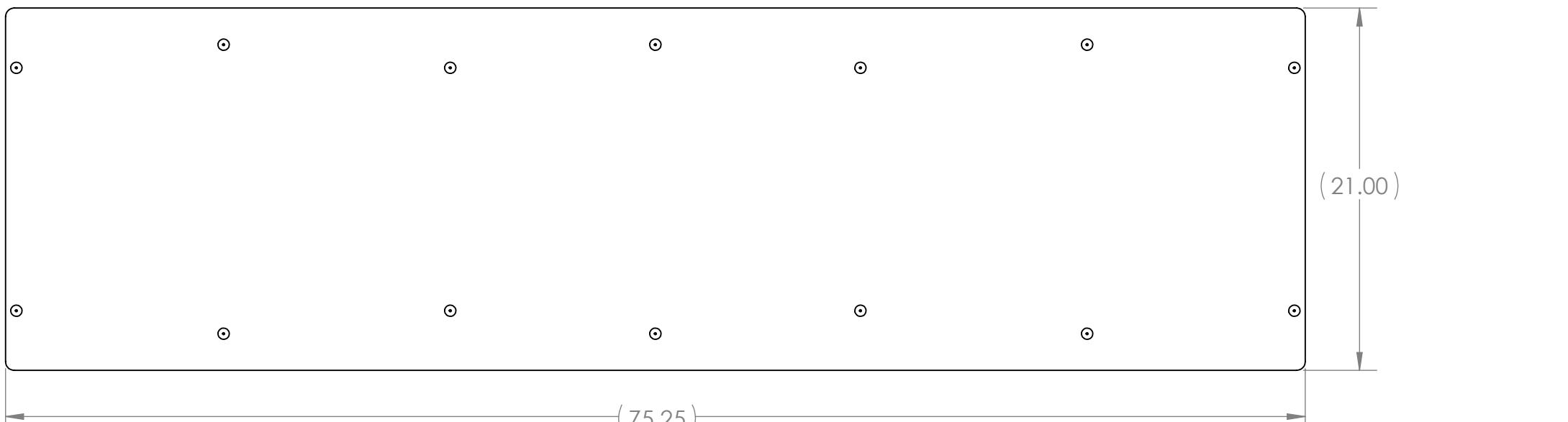
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- NOTES:
1. ASSEMBLE AS SHOWN
 2. LABEL ASSEMBLY WITH PART NUMBER

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24009	Chute Ramp Frame	1
2	GE-24012	Chute Ramp HDPE	1
3	rivet .1875-.251-.375_largeHead	3/16" Large Head Aluminum Rivet, .251-.375 Grip Range	14

UNLESS OTHERWISE SPECIFIED:			VEND	NAME	DATE
DIMENSIONS ARE IN INCHES			DRAWN	JO	6/7/2023
TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .005$					
PROPRIETARY AND CONFIDENTIAL					
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.					
MATERIAL/FINISH:					
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.					
DO NOT SCALE DRAWING					



SOLIDWORKS
Modeling Solutions Partner

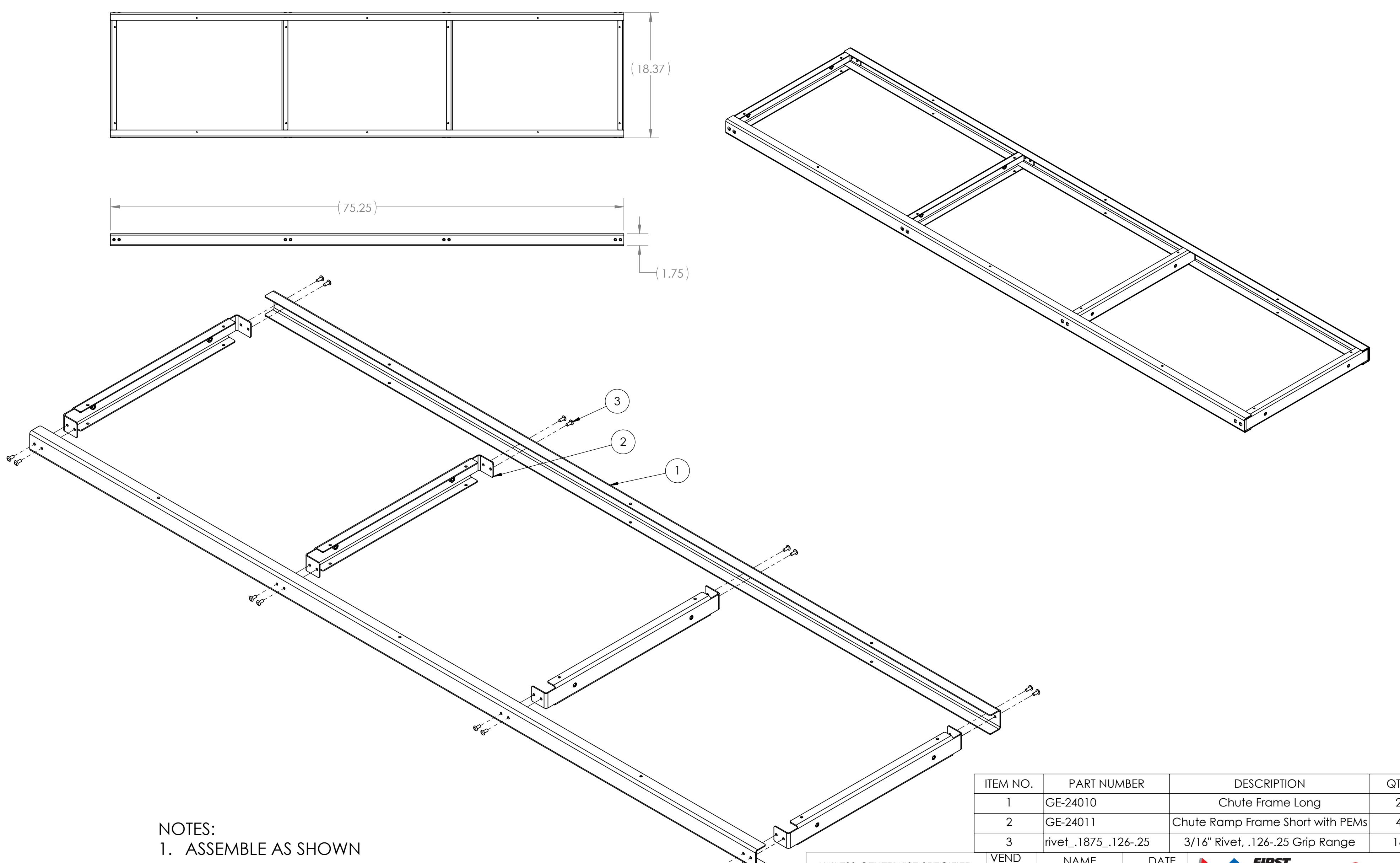
SIZE	DWG. NO.	REV
C	GE-24008	
SCALE: 1:8	SHEET 1 OF 1	

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NOTES:
1. ASSEMBLE AS SHOWN

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24010	Chute Frame Long	2
2	GE-24011	Chute Ramp Frame Short with PEMs	4
3	rivet_.1875_.126-.25	.3/16" Rivet, .126-.25 Grip Range	16

VEND	NAME	DATE
DRAWN	JO	6/7/2023

PROPRIETARY AND CONFIDENTIAL

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COMMENTS:
REMOVE ALL BURRS AND SHARP EDGES.

DO NOT SCALE DRAWING



Chute Ramp Frame

SIZE DWG. NO. REV
C GE-24009

SCALE: 1:10 SHEET 1 OF 1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
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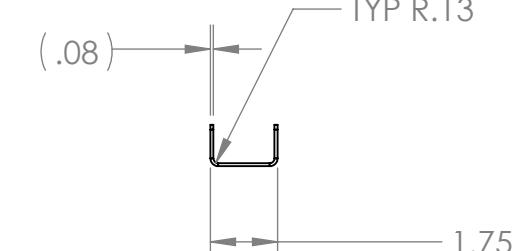
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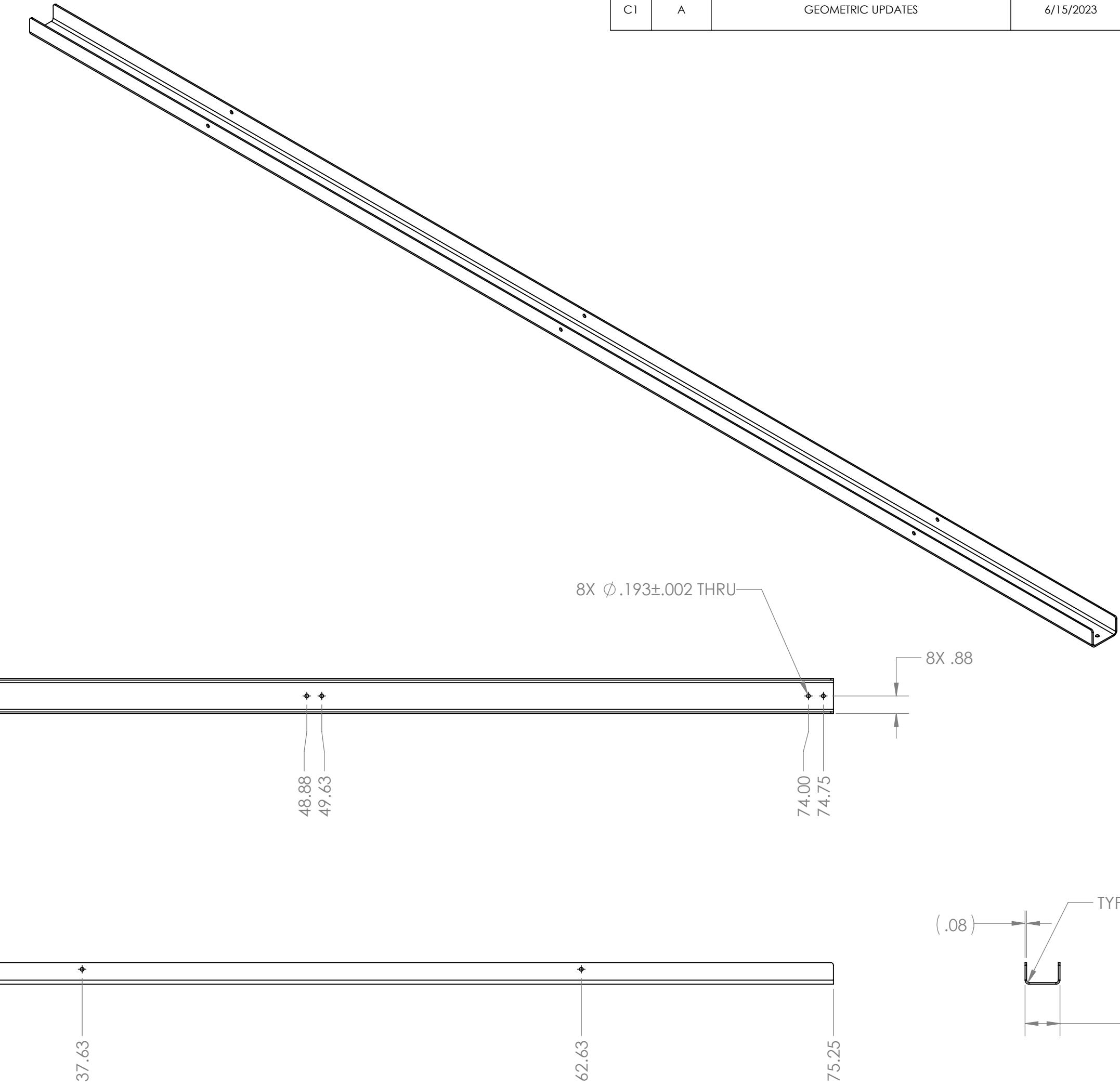


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NOTES:
1. REMOVE ALL BURRS AND SHARP EDGES



UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES

TOLERANCES:

FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .02$ THREE PLACE DECIMAL $\pm .010$

MATERIAL/FINISH:

12 Gauge (.08") 5052
Aluminum

DO NOT SCALE DRAWING

BEND NAME DATE

DRAWN NE 3/21/2023



TITLE: Chute Frame
Long

SIZE DWG. NO. REV

C GE-24010 A

SCALE: 1:5 SHEET 1 OF 1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A	GEOMETRIC UPDATES	6/15/2023	NWE

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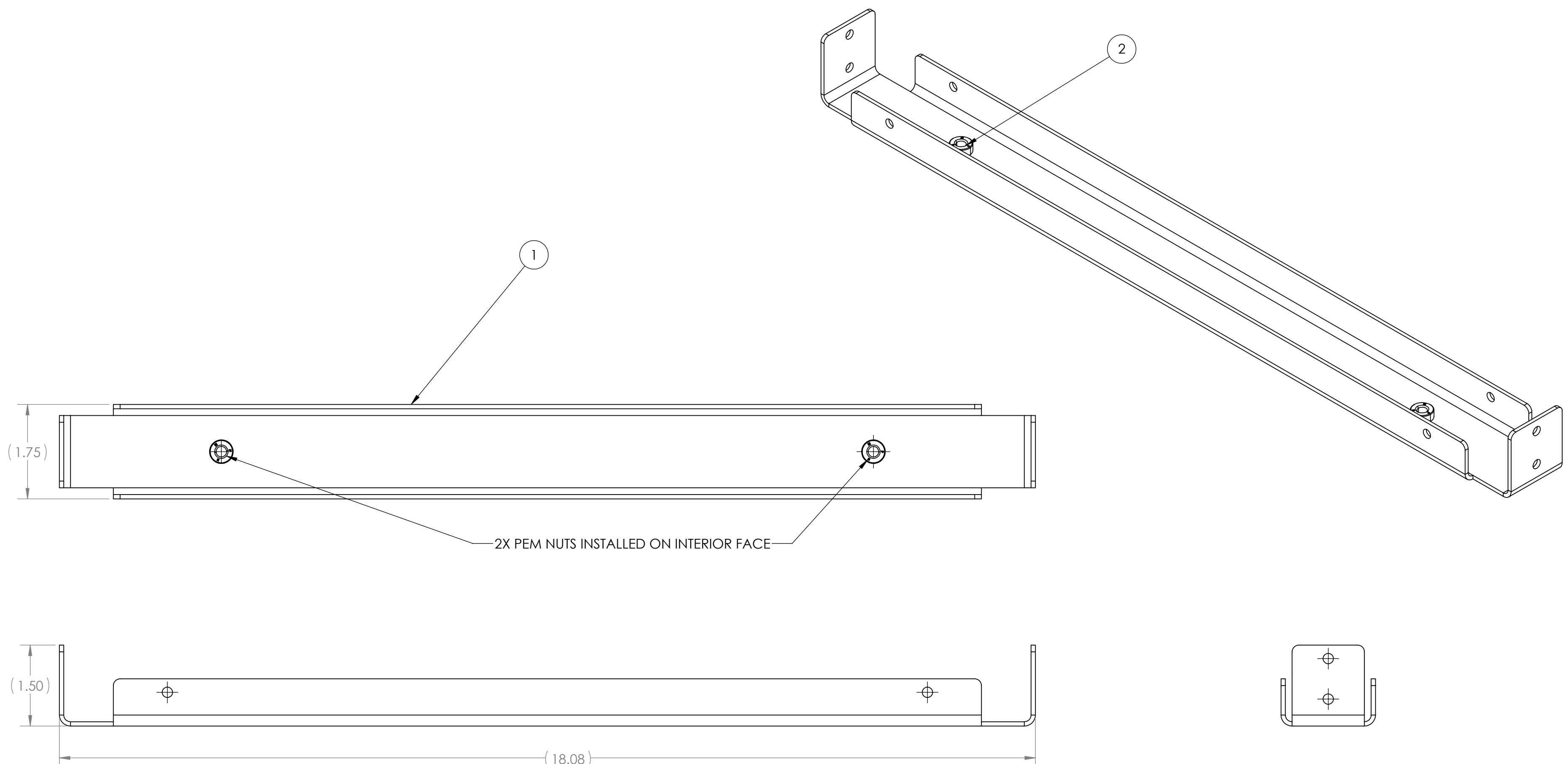
C

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NOTES:
1. REMOVE ALL BURRS AND SHARP EDGES

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24011-01	Chute Ramp Frame Short	1
2	pem_clinchnut_.25_20 .054	1/4-20 self-clinching nut, .054 shank	2
UNLESS OTHERWISE SPECIFIED:			
VEND	NAME	DATE	
DRAWN	NE	3/21/2023	
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH:			
12 Gauge (0.08") 5052 Aluminum			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE: Chute Ramp
Frame Short with
PEMs

SIZE DWG. NO. REV

C GE-24011 A

SCALE: 2:3 SHEET 1 OF 1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A	GEOMETRIC UPDATES	6/15/2023	NWE

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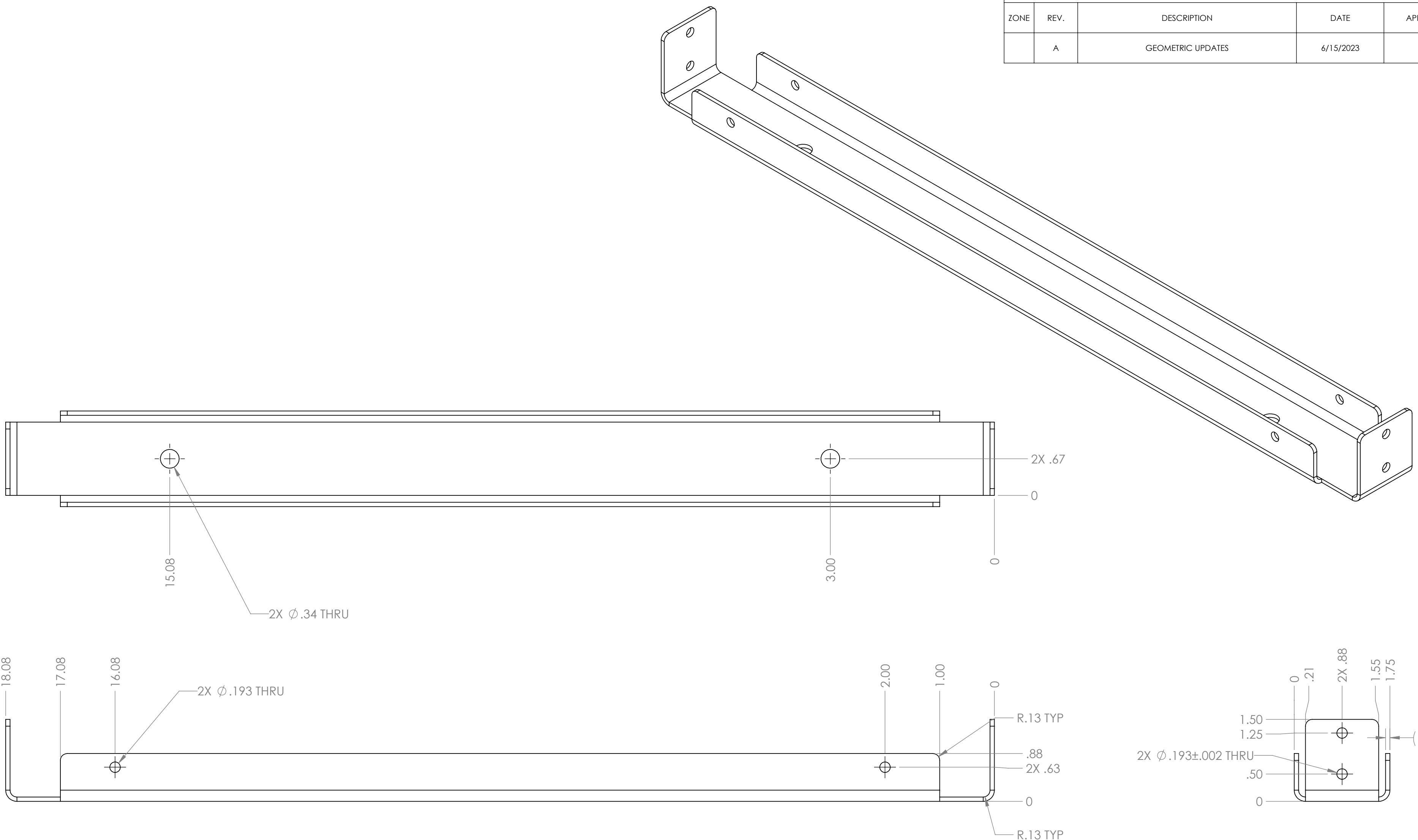
C

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UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES

TOLERANCES:

FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .02$ THREE PLACE DECIMAL $\pm .010$

MATERIAL/FINISH:

12 Gauge (0.08") 5052
Aluminum

DO NOT SCALE DRAWING

BEND
DRAWN
NAME
JO
DATE
6/6/2023

PROPRIETARY AND CONFIDENTIAL

THE INFORMATION CONTAINED IN
THIS DRAWING IS THE SOLE
PROPERTY OF FIRST®. ANY
REPRODUCTION IN PART OR AS A
WHOLE WITHOUT THE WRITTEN
PERMISSION OF FIRST® IS
PROHIBITED.COMMENTS:
REMOVE ALL BURRS AND SHARP
EDGES.FIRST
ROBOTICS
COMPETITION
SOLIDWORKS
Modeling Solutions PartnerTITLE:
Chute Ramp
Frame ShortSIZE DWG. NO.
C GE-24011-01 A REV

SCALE: 3:4 SHEET 1 OF 1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
C1	A	GEOMETRIC UPDATES	6/15/2023	NWE

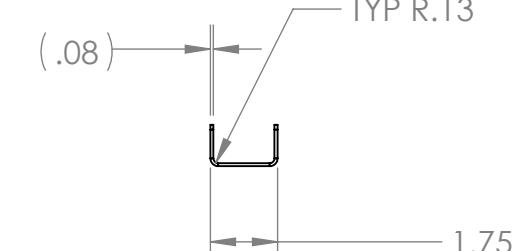
D

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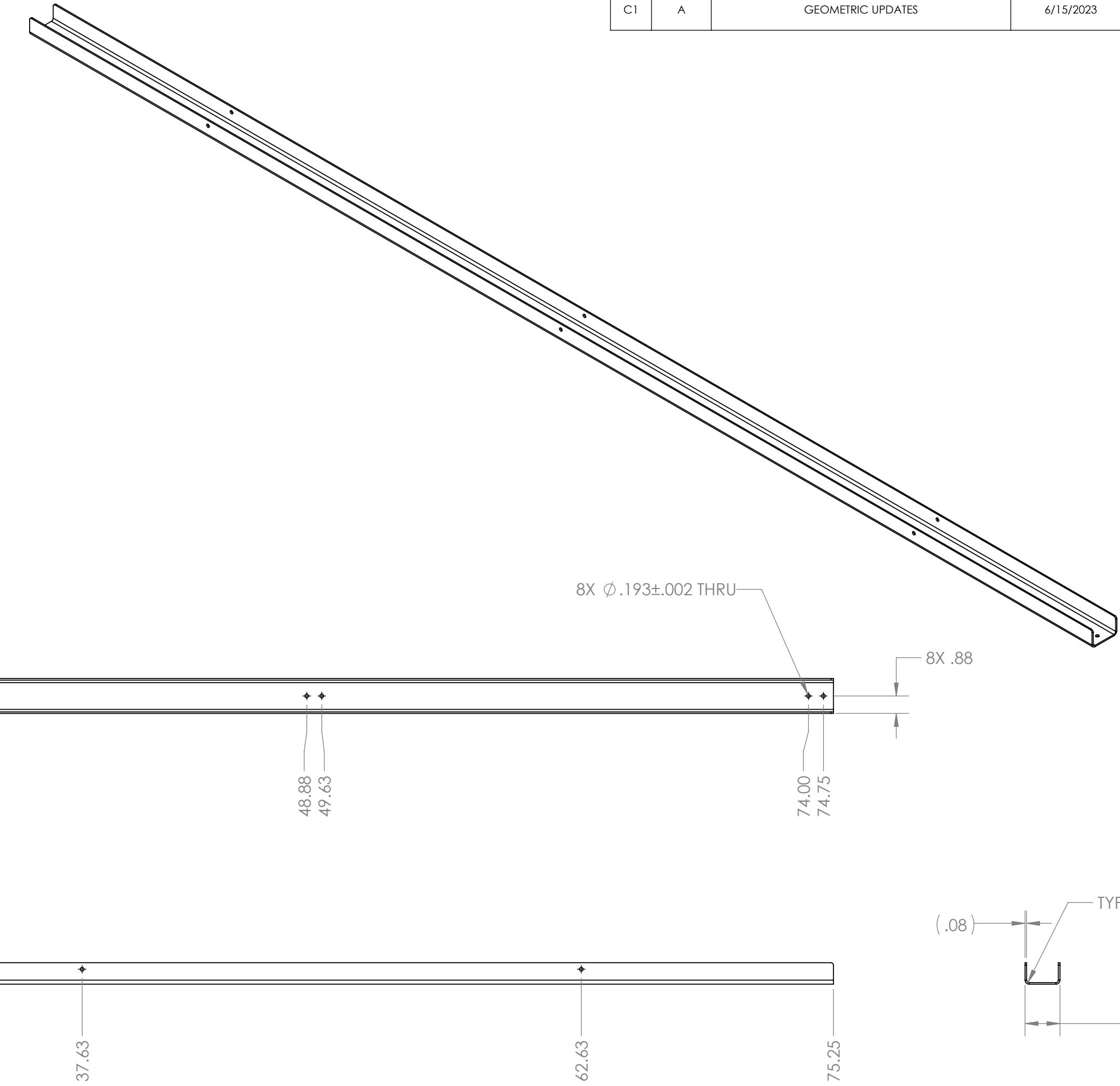


B

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NOTES:
1. REMOVE ALL BURRS AND SHARP EDGES



UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES

TOLERANCES:

FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .02$ THREE PLACE DECIMAL $\pm .010$

MATERIAL/FINISH:

12 Gauge (.08") 5052
Aluminum

DO NOT SCALE DRAWING

BEND NAME DATE

DRAWN NE 3/21/2023

PROPRIETARY AND CONFIDENTIAL

THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.

COMMENTS:

REMOVE ALL BURRS AND SHARP EDGES.

**FIRST
ROBOTICS
COMPETITION**
SOLIDWORKS
Modeling Solutions Partner

TITLE: **Chute Frame Long**

SIZE DWG. NO. REV

C GE-24010 **A**

SCALE: 1:5 SHEET 1 OF 1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A	GEOMETRIC UPDATES	6/15/2023	NWE

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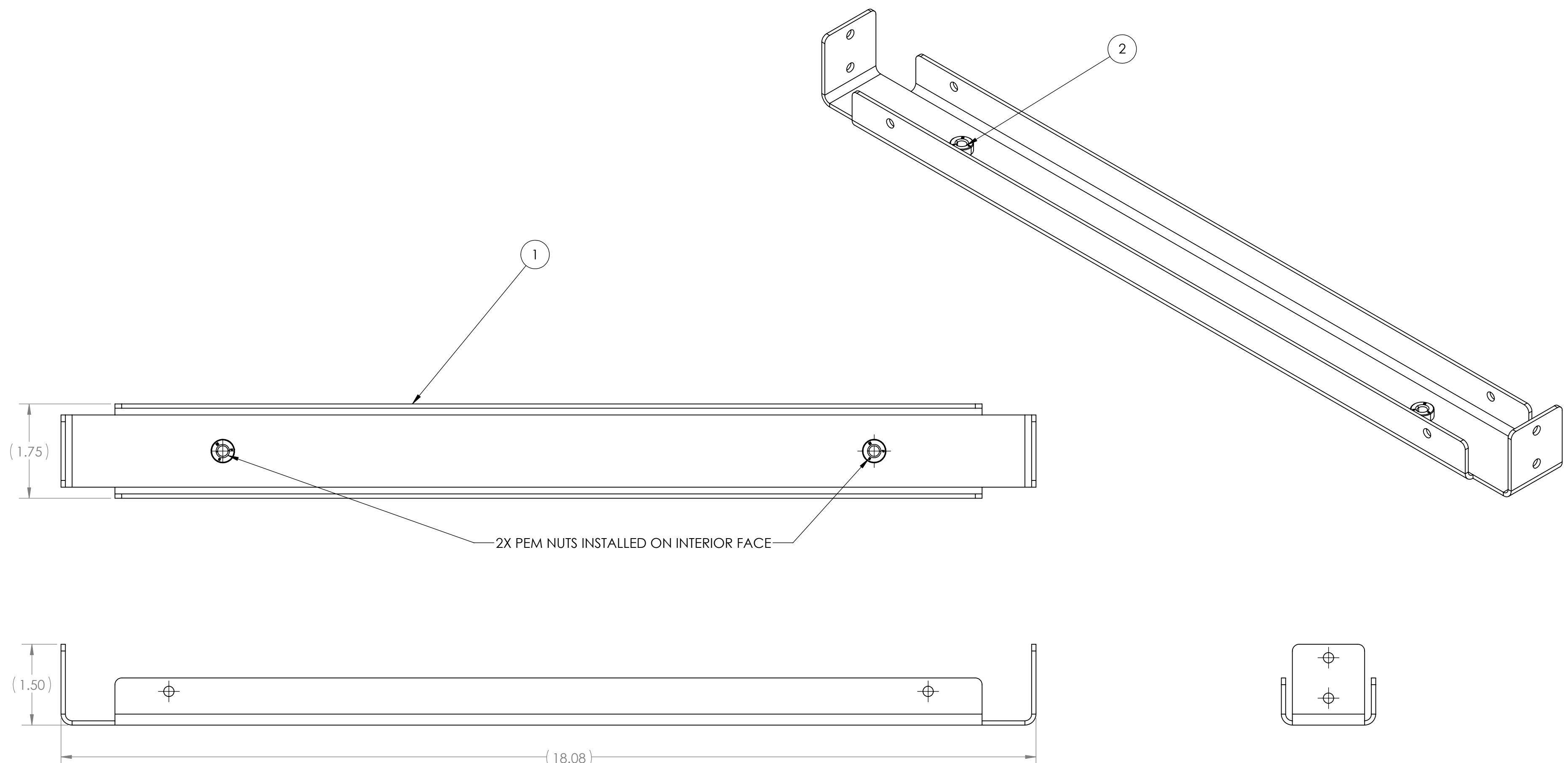
C

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NOTES:
1. REMOVE ALL BURRS AND SHARP EDGES

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24011-01	Chute Ramp Frame Short	1
2	pem_clinchnut_.25_20 .054	1/4-20 self-clinching nut, .054 shank	2
UNLESS OTHERWISE SPECIFIED:			
VEND	NAME	DATE	
DRAWN	NE	3/21/2023	
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH:			
12 Gauge (0.08") 5052 Aluminum			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE: Chute Ramp
Frame Short with
PEMs

SIZE DWG. NO. REV

C GE-24011 A

SCALE: 2:3 SHEET 1 OF 1

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REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A	GEOMETRIC UPDATES	6/15/2023	NWE

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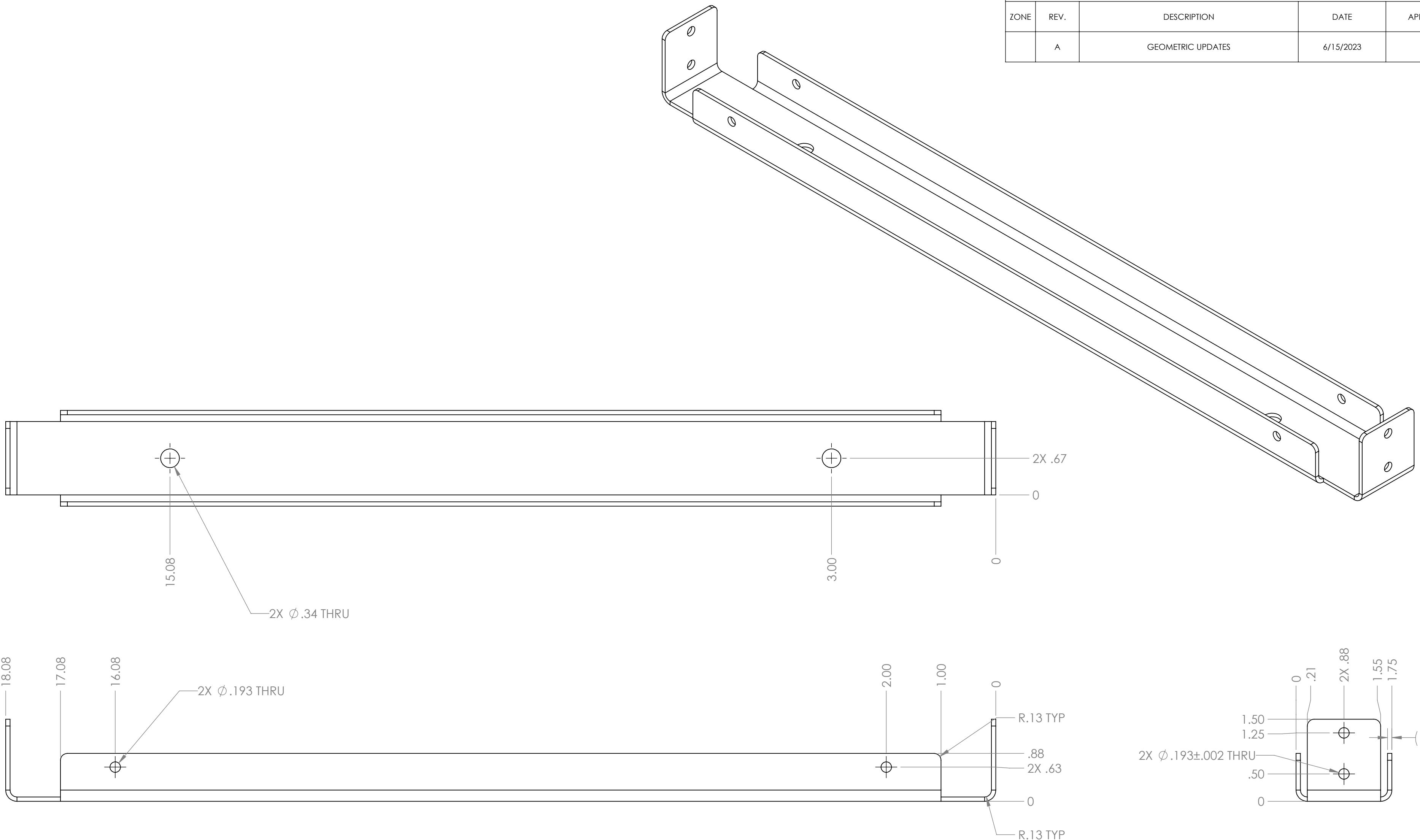
C

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UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES

TOLERANCES:

FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .02$ THREE PLACE DECIMAL $\pm .010$

MATERIAL/FINISH:

12 Gauge (0.08") 5052
Aluminum

DO NOT SCALE DRAWING

BEND NAME DATE

DRAWN JO 6/6/2023



TITLE:

Chute Ramp
Frame Short

SIZE

DWG. NO.

REV

C GE-24011-01 A

SCALE: 3:4 SHEET 1 OF 1

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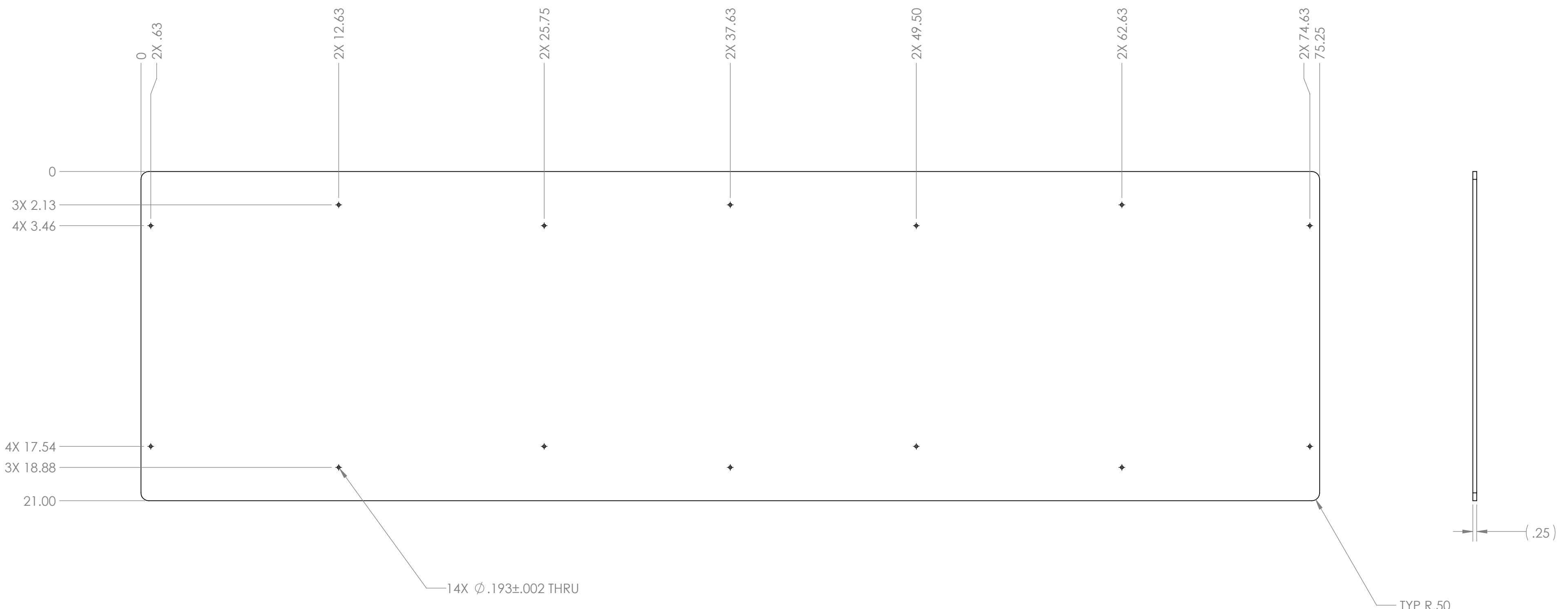
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UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DRAWN	NE	3/4/2023	
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH: 1/4" Black HDPE, Orange Peel Texture			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

 **FIRST
ROBOTICS
COMPETITION**  **SOLIDWORKS**
Modeling Solutions Partner

TITLE:
**Chute Ramp
HDPE**

SIZE DWG. NO. REV
C GE-24012

SCALE: 1:5 SHEET 1 OF 1

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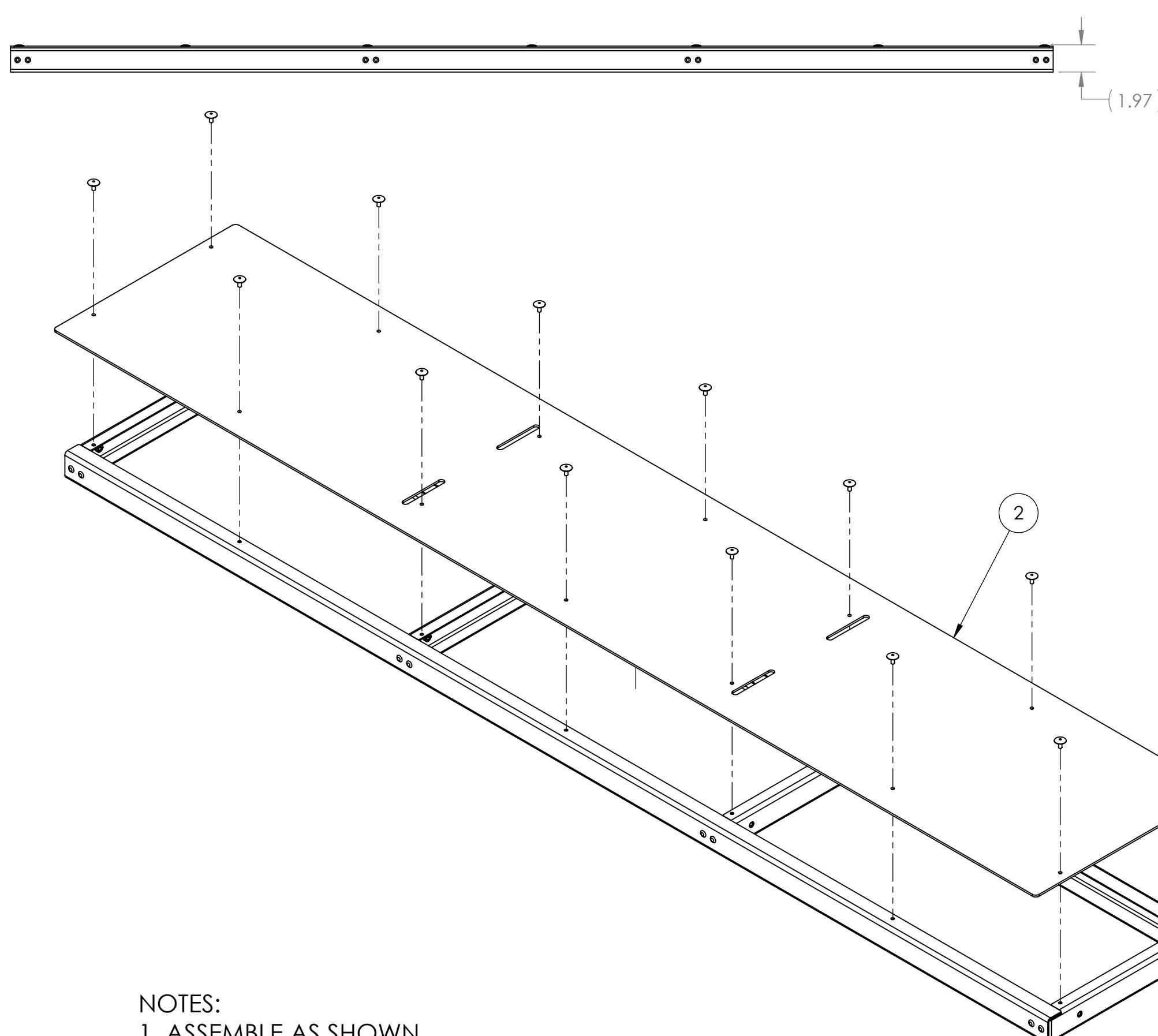
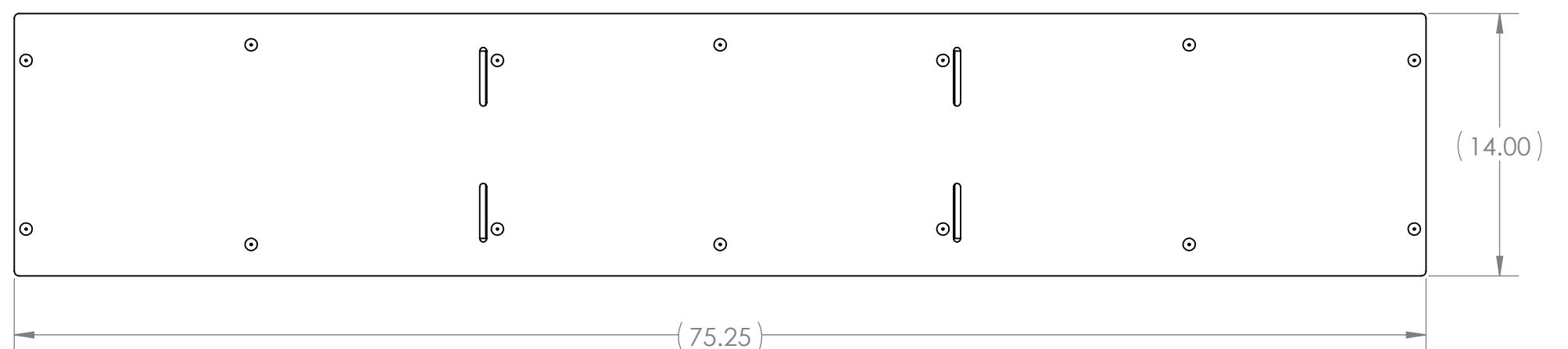
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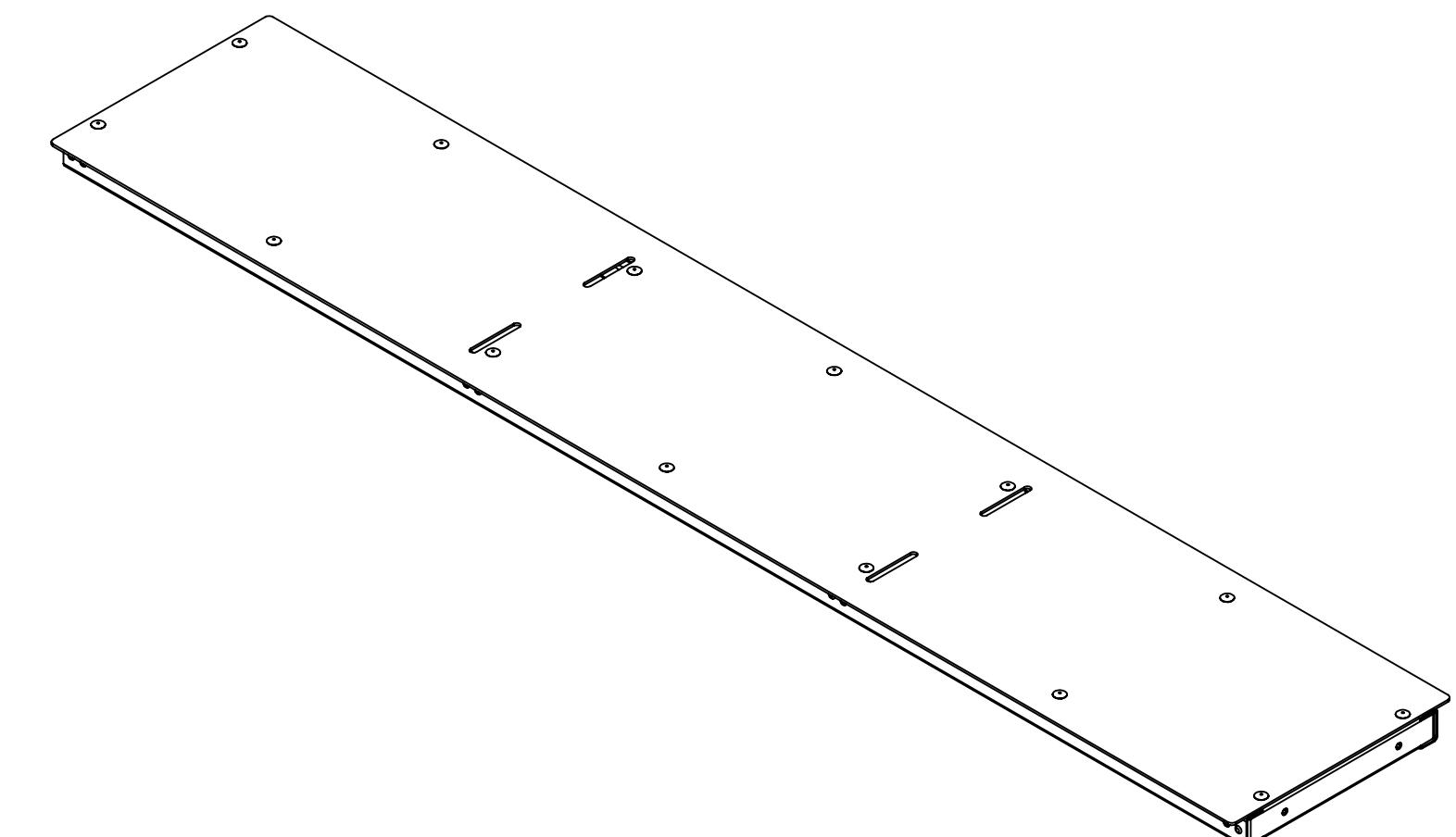
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- NOTES:
1. ASSEMBLE AS SHOWN
 2. LABEL ASSEMBLY WITH PART NUMBER



UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES

TOLERANCES:

FRACTIONAL $\pm 1/16$
 ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$
 TWO PLACE DECIMAL $\pm .01$
 THREE PLACE DECIMAL $\pm .005$

MATERIAL/FINISH:

PROPRIETARY AND CONFIDENTIAL
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COMMENTS:
 REMOVE ALL BURRS AND SHARP
 EDGES.

DO NOT SCALE DRAWING

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24014	Chute Cover Frame	1
2	GE-24016	Chute Cover Plastic	1
3	rivet .1875-.125-.25_largeHead	3/16" Large Head Aluminum Rivet, .126-.26 Grip Range	14

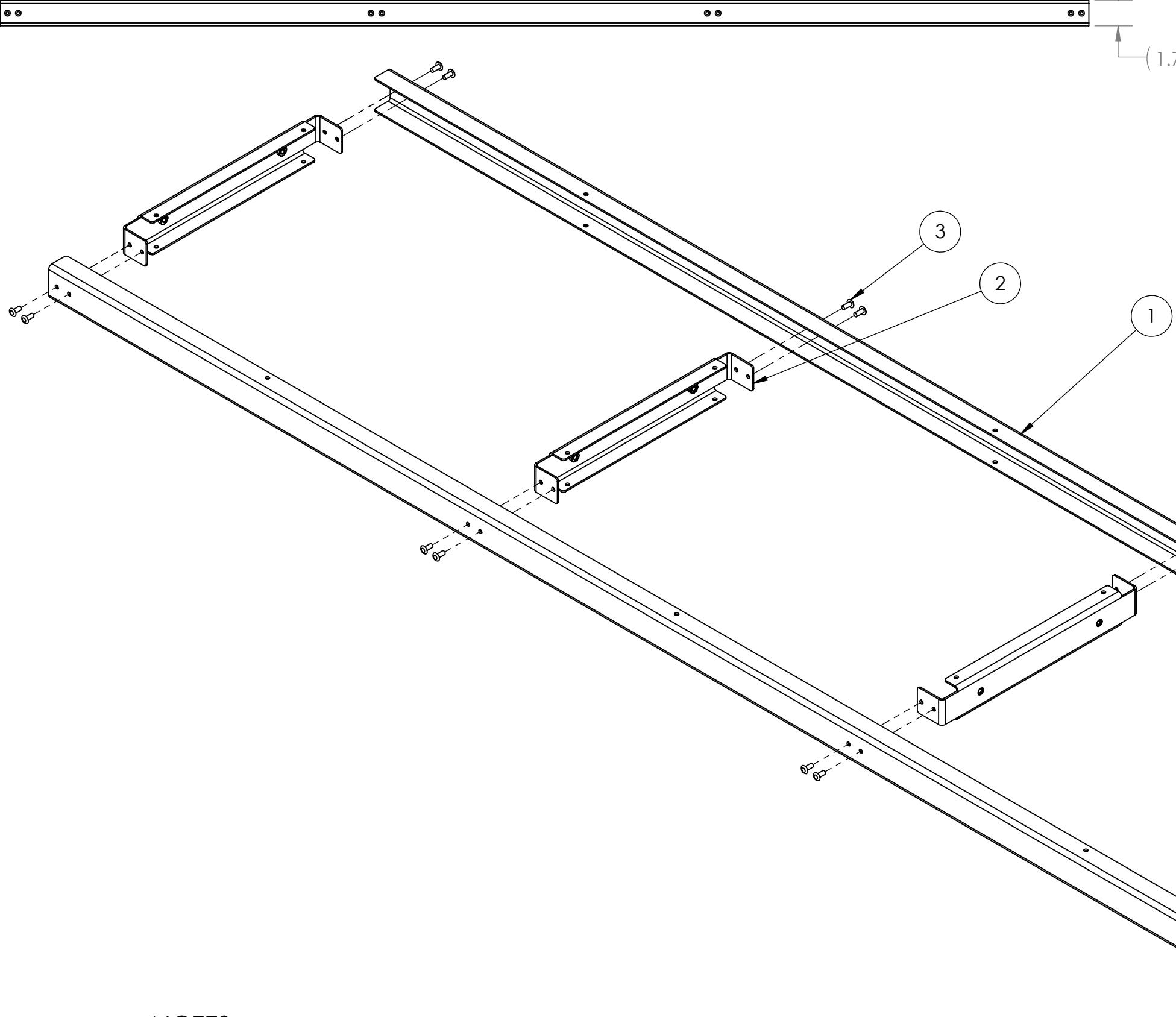
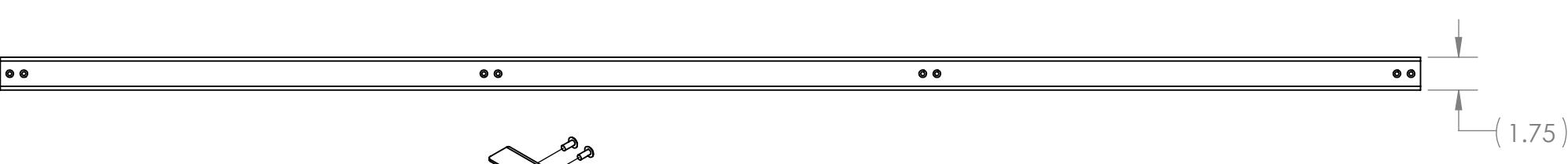
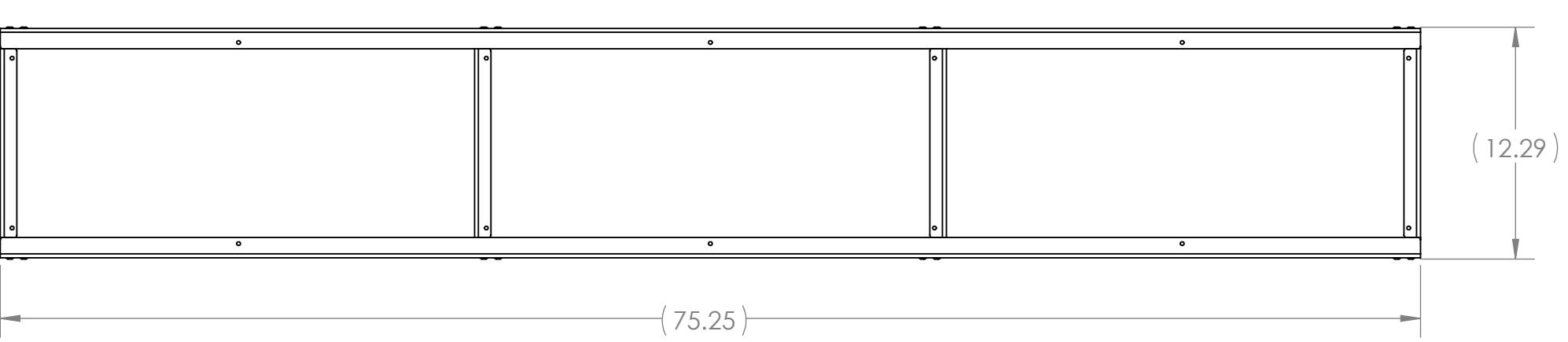
VEND NAME DATE
 DRAWN JO 6/7/2023

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ROBOTICS
COMPETITION DS SOLIDWORKS
 Modeling Solutions Partner

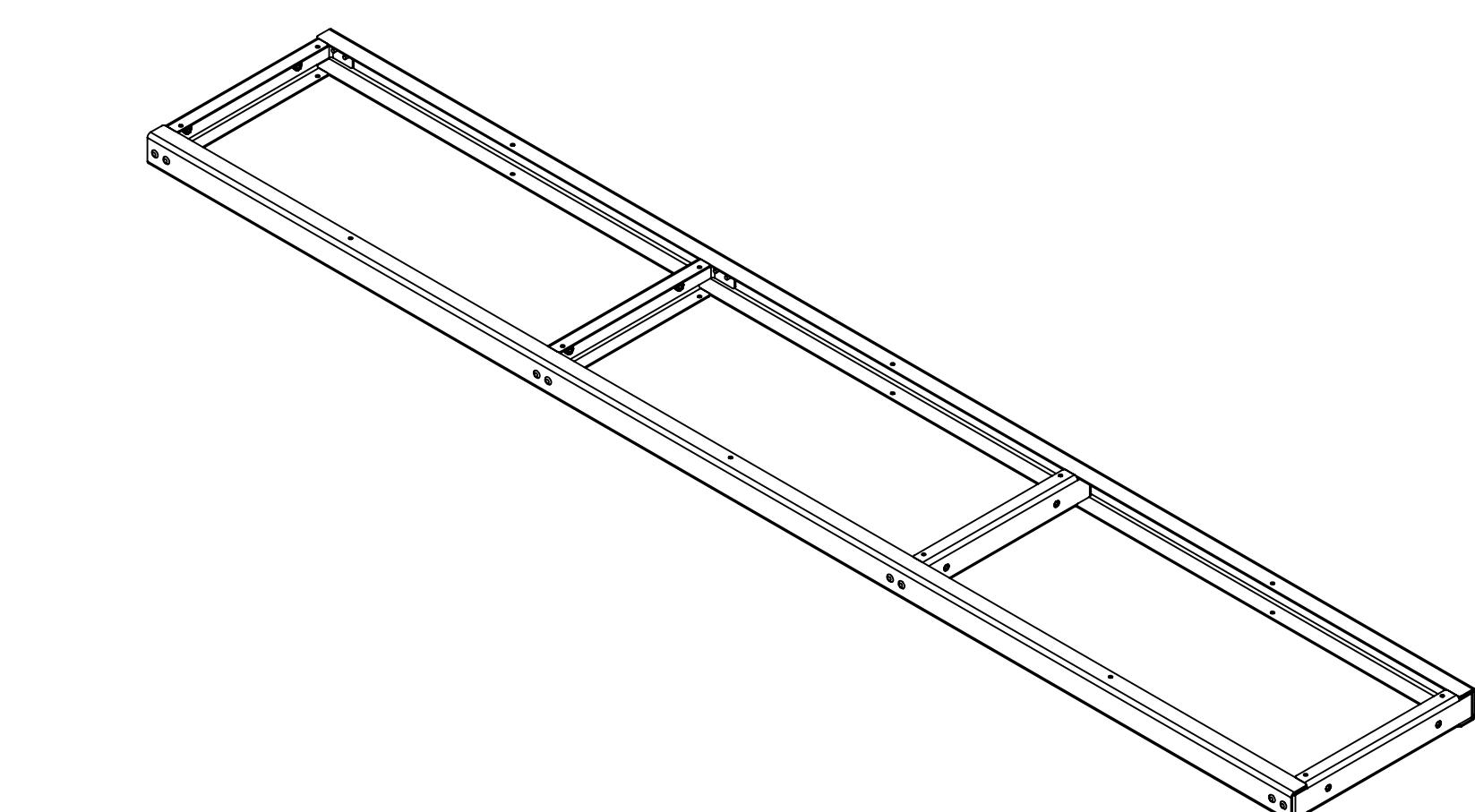
TITLE:
**Chute Cover
Assembly**

SIZE DWG. NO. REV
C GE-24013

SCALE: 1:8 SHEET 1 OF 1



NOTES:
1. ASSEMBLE AS SHOWN



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24010	Chute Frame Long	2
2	GE-24015	Chute Cover Frame Short with PEMs	4
3	rivet_.1875_.126-.25	3/16" Rivet, .126-.25 Grip Range	16

VEND	NAME	DATE
DRAWN	JO	6/7/2023

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL $\pm 1/16$
ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$
TWO PLACE DECIMAL $\pm .01$
THREE PLACE DECIMAL $\pm .005$

PROPRIETARY AND CONFIDENTIAL
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MATERIAL/FINISH:
COMMENTS:
REMOVE ALL BURRS AND SHARP EDGES.

DO NOT SCALE DRAWING

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ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
**Chute Cover
Frame**

SIZE DWG. NO. REV

C GE-24014

SCALE: 1:8 SHEET 1 OF 1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
C1	A	GEOMETRIC UPDATES	6/15/2023	NWE

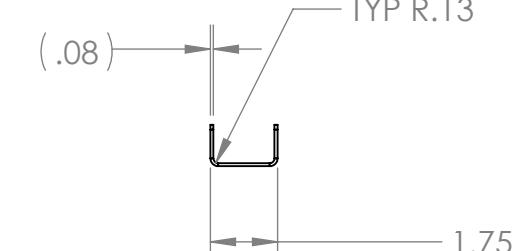
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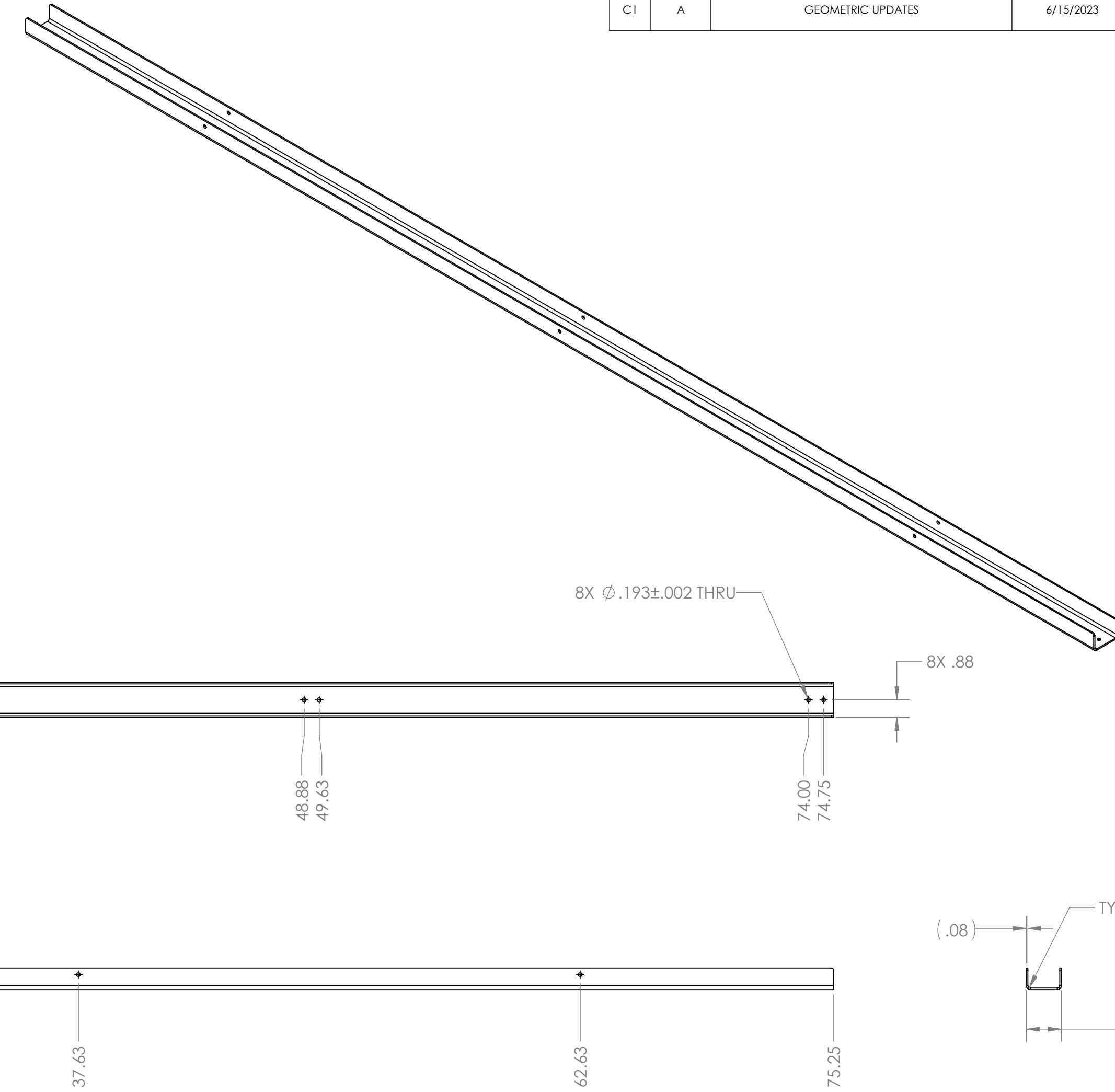


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NOTES:
1. REMOVE ALL BURRS AND SHARP EDGES



UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES

TOLERANCES:

FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .02$ THREE PLACE DECIMAL $\pm .010$

MATERIAL/FINISH:

12 Gauge (.08") 5052
Aluminum

DO NOT SCALE DRAWING

BEND NAME DATE

DRAWN NE 3/21/2023



TITLE: Chute Frame
Long

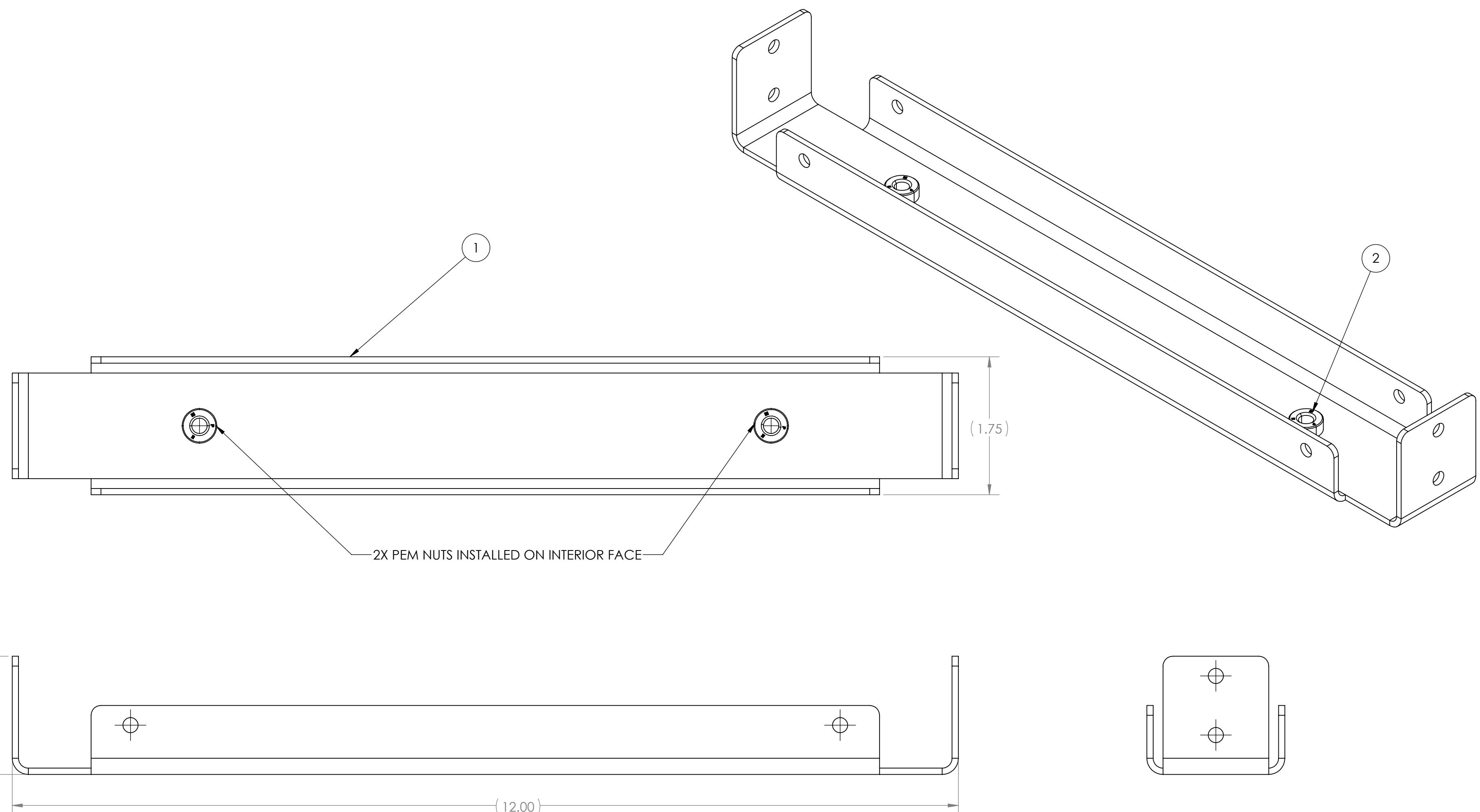
SIZE DWG. NO. REV

C GE-24010 A

SCALE: 1:5 SHEET 1 OF 1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A	GEOMETRIC UPDATES	6/15/2023	NWE



NOTES:
1. REMOVE ALL BURRS AND SHARP EDGES

UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL $\pm 1/16$
ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$
TWO PLACE DECIMAL $\pm .02$
THREE PLACE DECIMAL $\pm .010$

MATERIAL/FINISH:

12 Gauge (0.08") 5052
Aluminum

DO NOT SCALE DRAWING

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24015-01	Chute Cover Frame Short	1
2	pem_clinchnut_.25_20 .054	1/4-20 self-clinching nut, .054 shank	2

BEND NAME DATE
DRAWN NE 3/21/2023

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COMMENTS:
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COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE: Chute Cover Frame
Short with PEMs

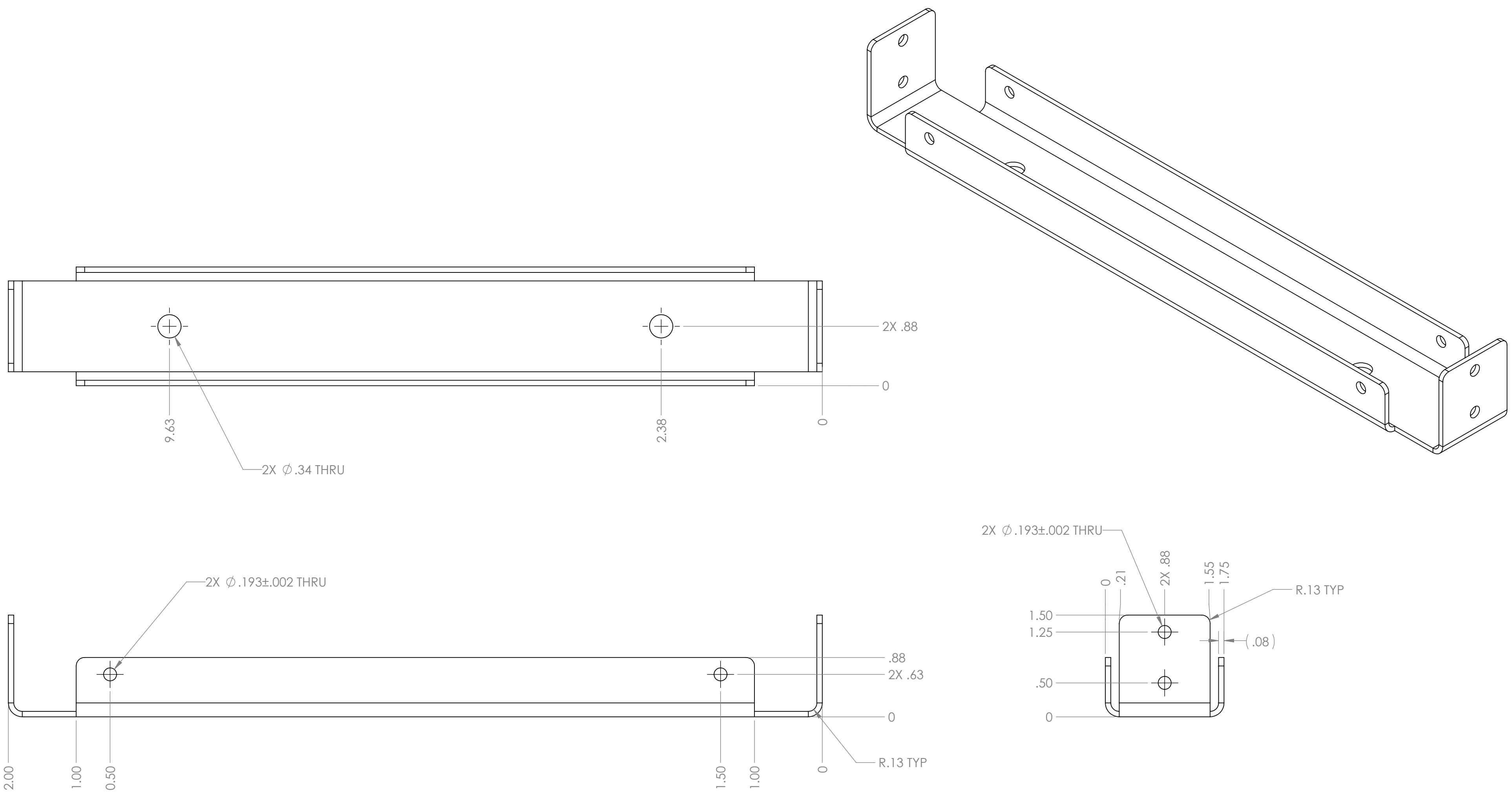
SIZE DWG. NO. REV

C GE-24015 A

SCALE: 1:1 SHEET 1 OF 1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A	GEOMETRIC UPDATE	6/15/2023	NWE



UNLESS OTHERWISE SPECIFIED:	BEND	NAME	DATE
DRAWN	JO	6/6/2023	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH: 12 Gauge (.08") 5052 Aluminum			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

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ROBOTICS
COMPETITION  SOLIDWORKS
Modeling Solutions Partner

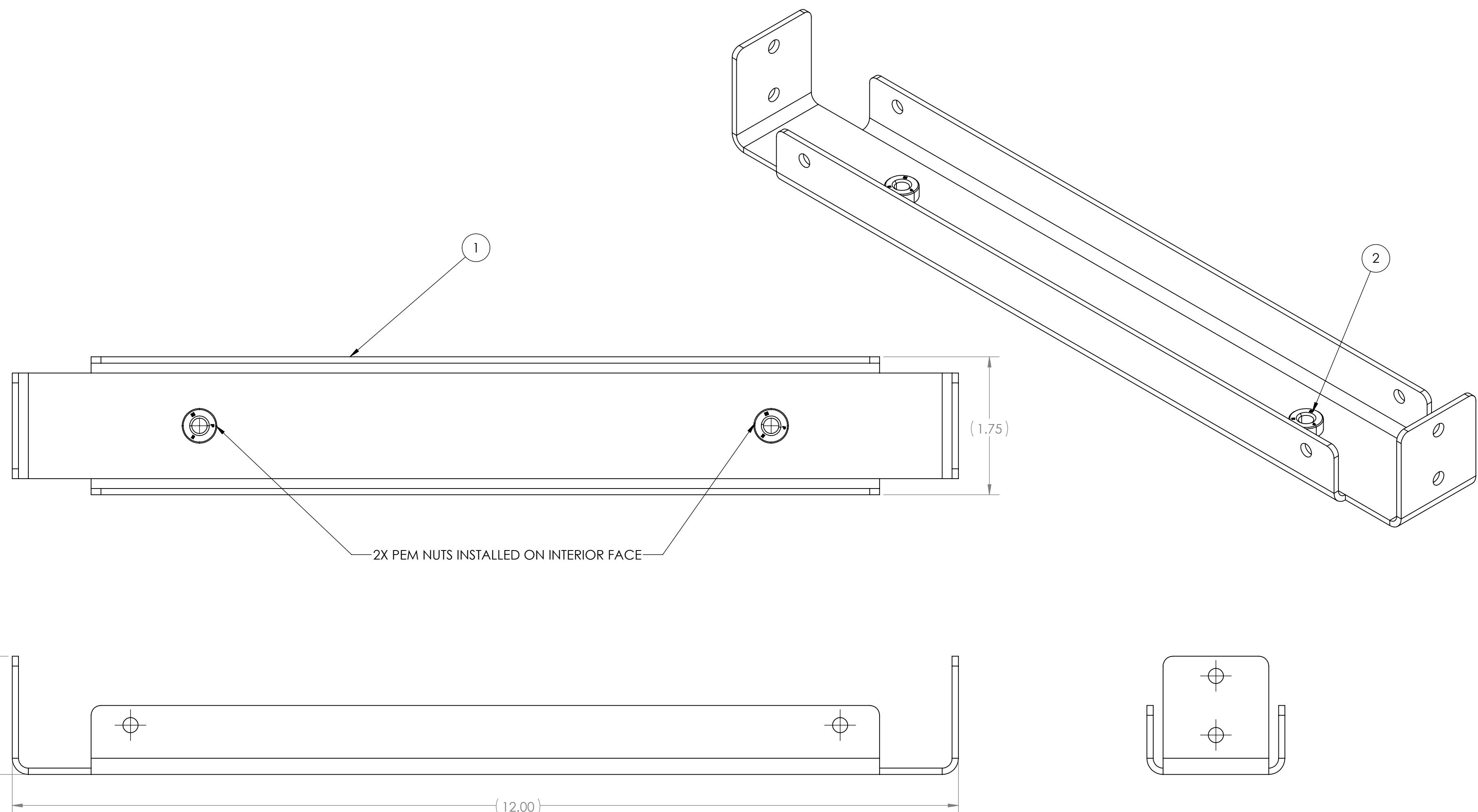
TITLE:
**Chute Cover
Frame Short**

SIZE DWG. NO. REV
C GE-24015-01 A

SCALE: 9:10 SHEET 1 OF 1

REVISED

ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A	GEOMETRIC UPDATES	6/15/2023	NWE



NOTES:
1. REMOVE ALL BURRS AND SHARP EDGES

UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL $\pm 1/16$
ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$
TWO PLACE DECIMAL $\pm .02$
THREE PLACE DECIMAL $\pm .010$

MATERIAL/FINISH:

12 Gauge (.08") 5052
Aluminum

DO NOT SCALE DRAWING

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24015-01	Chute Cover Frame Short	1
2	pem_clinchnut_.25_20 .054	1/4-20 self-clinching nut, .054 shank	2

BEND NAME DATE
DRAWN NE 3/21/2023

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PROHIBITED.

COMMENTS:
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EDGES.

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COMPETITION

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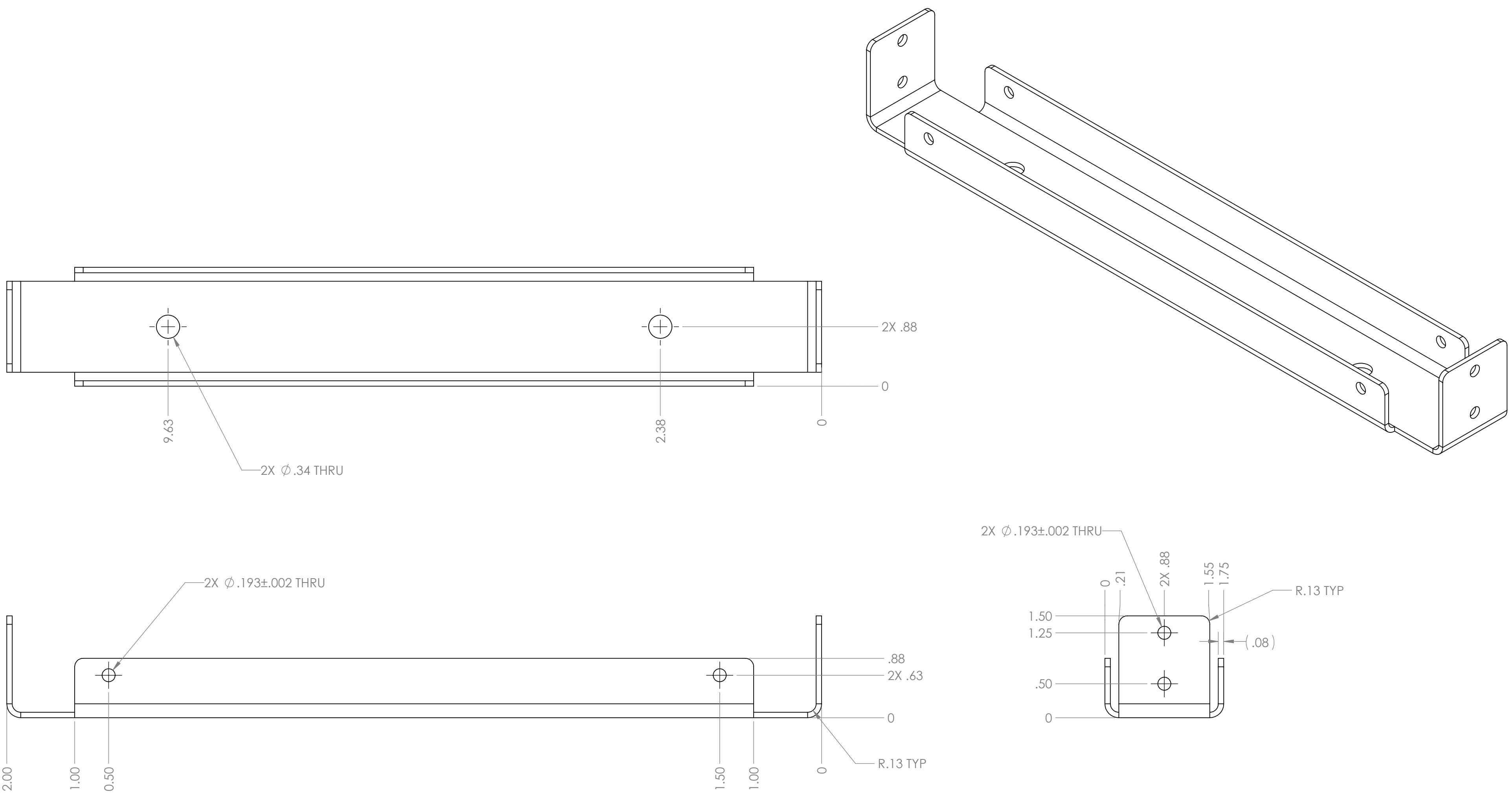
TITLE: Chute Cover Frame
Short with PEMs

SIZE DWG. NO. REV
C GE-24015 **A**

SCALE: 1:1 SHEET 1 OF 1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A	GEOMETRIC UPDATE	6/15/2023	NWE



UNLESS OTHERWISE SPECIFIED:	BEND	NAME	DATE
DRAWN	JO	6/6/2023	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH: 12 Gauge (.08") 5052 Aluminum			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

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ROBOTICS
COMPETITION  SOLIDWORKS
Modeling Solutions Partner

TITLE:
**Chute Cover
Frame Short**

SIZE DWG. NO. REV
C GE-24015-01 A

SCALE: 9:10 SHEET 1 OF 1

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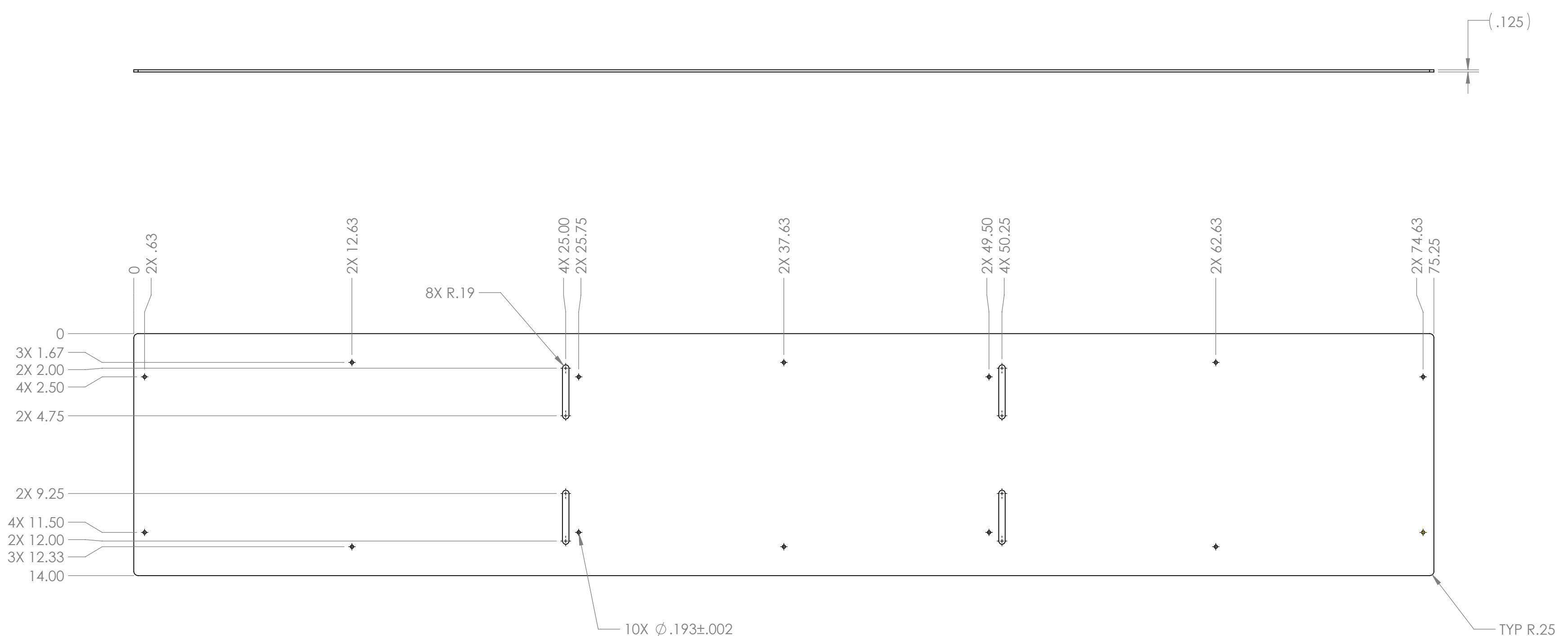
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UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DRAWN	NE	3/4/2023	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:	SIZE	DWG. NO.	REV
0.125" Polycarbonate	C	GE-24016	
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING	SCALE: 1:5	SHEET 1 OF 1	

 **FIRST
ROBOTICS
COMPETITION**  **SOLIDWORKS**
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TITLE:
**Chute Cover
Plastic**

SIZE DWG. NO. REV
C GE-24016

SCALE: 1:5 SHEET 1 OF 1

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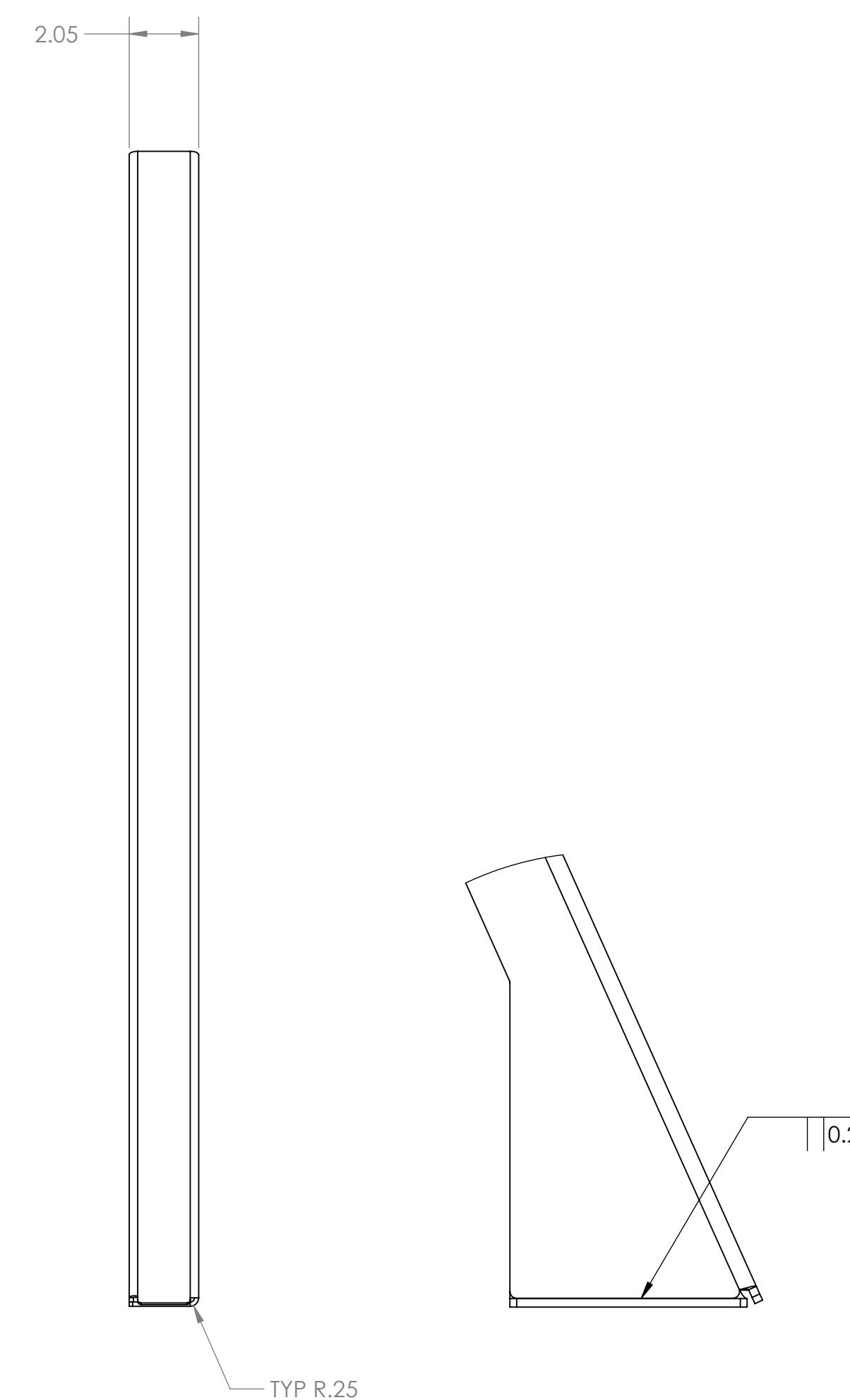
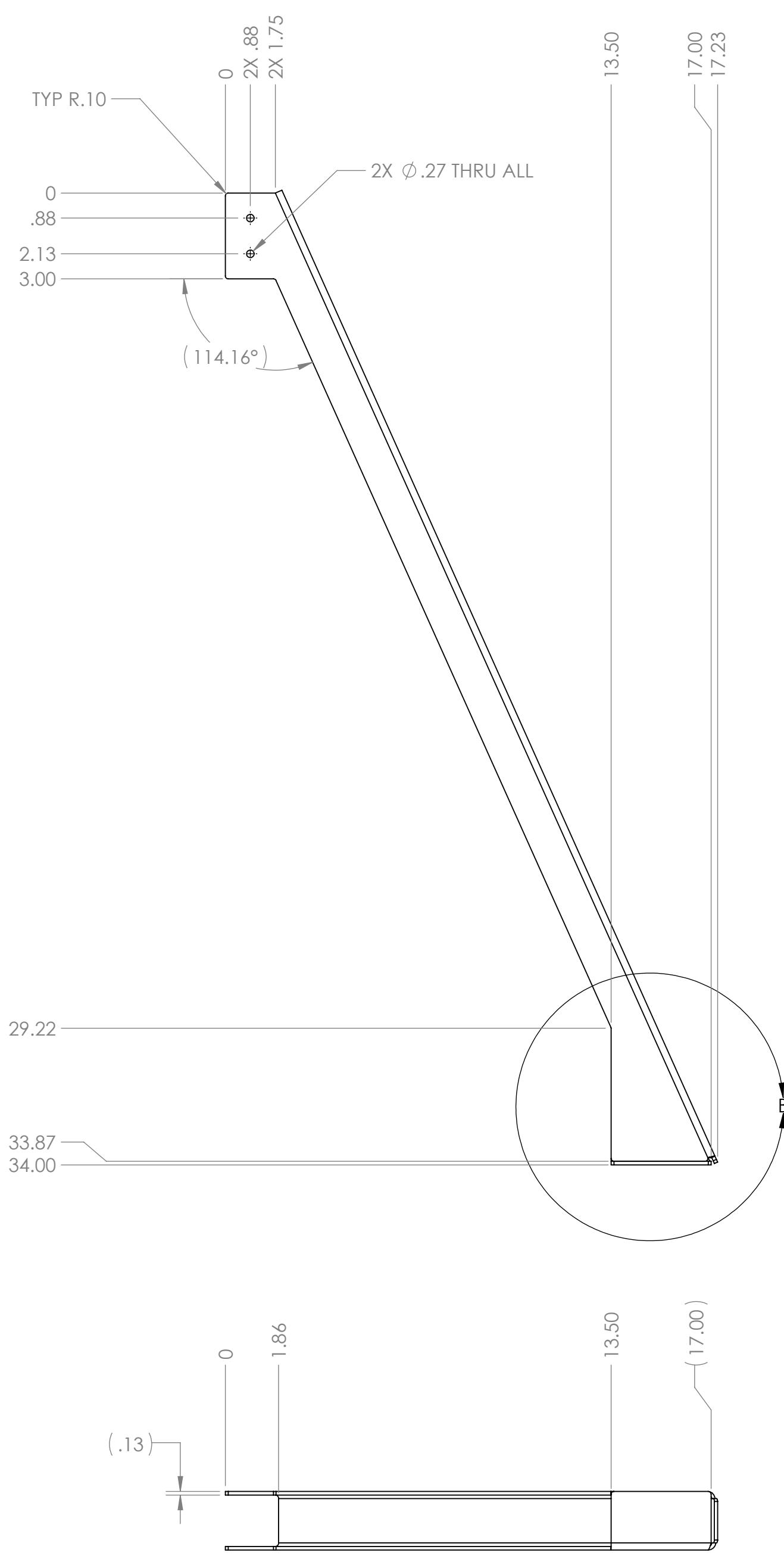
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UNLESS OTHERWISE SPECIFIED:			BEND	NAME	DATE
			DRAWN	NE	6/22/2023
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .02$ THREE PLACE DECIMAL $\pm .010$					
PROPRIETARY AND CONFIDENTIAL THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.					
MATERIAL/FINISH: 0.125" 5052 Aluminum					
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.					
DO NOT SCALE DRAWING					

FIRST ROBOTICS COMPETITION SOLIDWORKS Modeling Solutions Partner

TITLE: Frame Support Leg

SIZE DWG. NO. REV

C GE-24017

SCALE: 1:4 SHEET 1 OF 1

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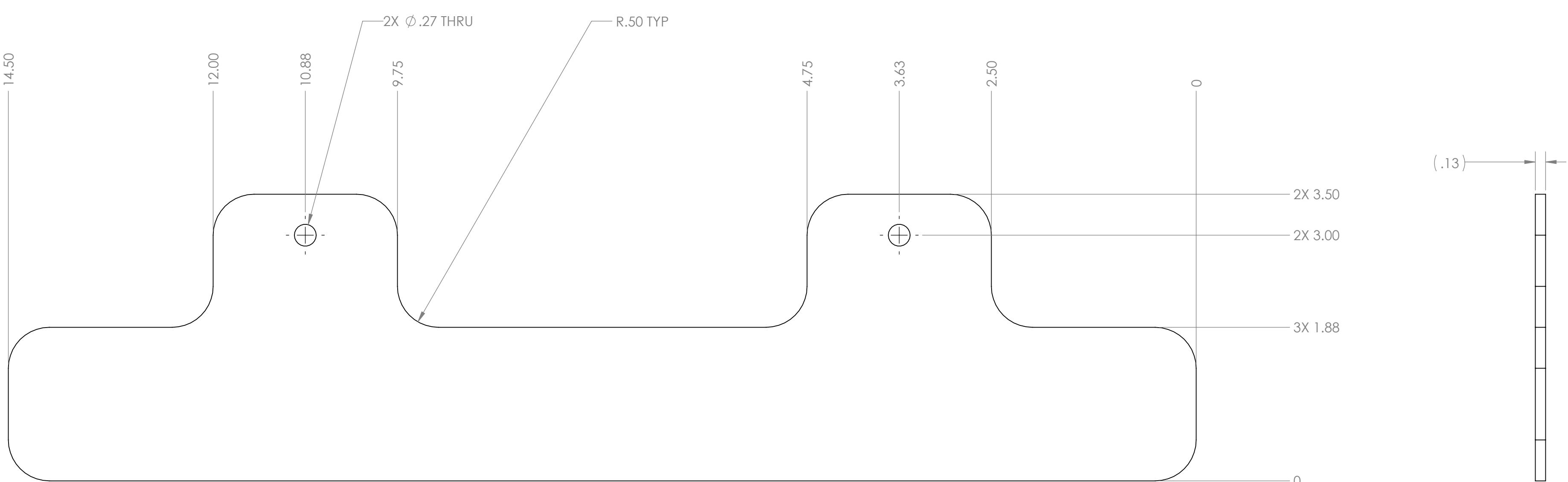
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UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	JO	6/6/2023	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:	SIZE	DWG. NO.	REV
0.125" Polycarbonate	C	GE-24018	
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING	SCALE: 1:2	SHEET 1 OF 1	

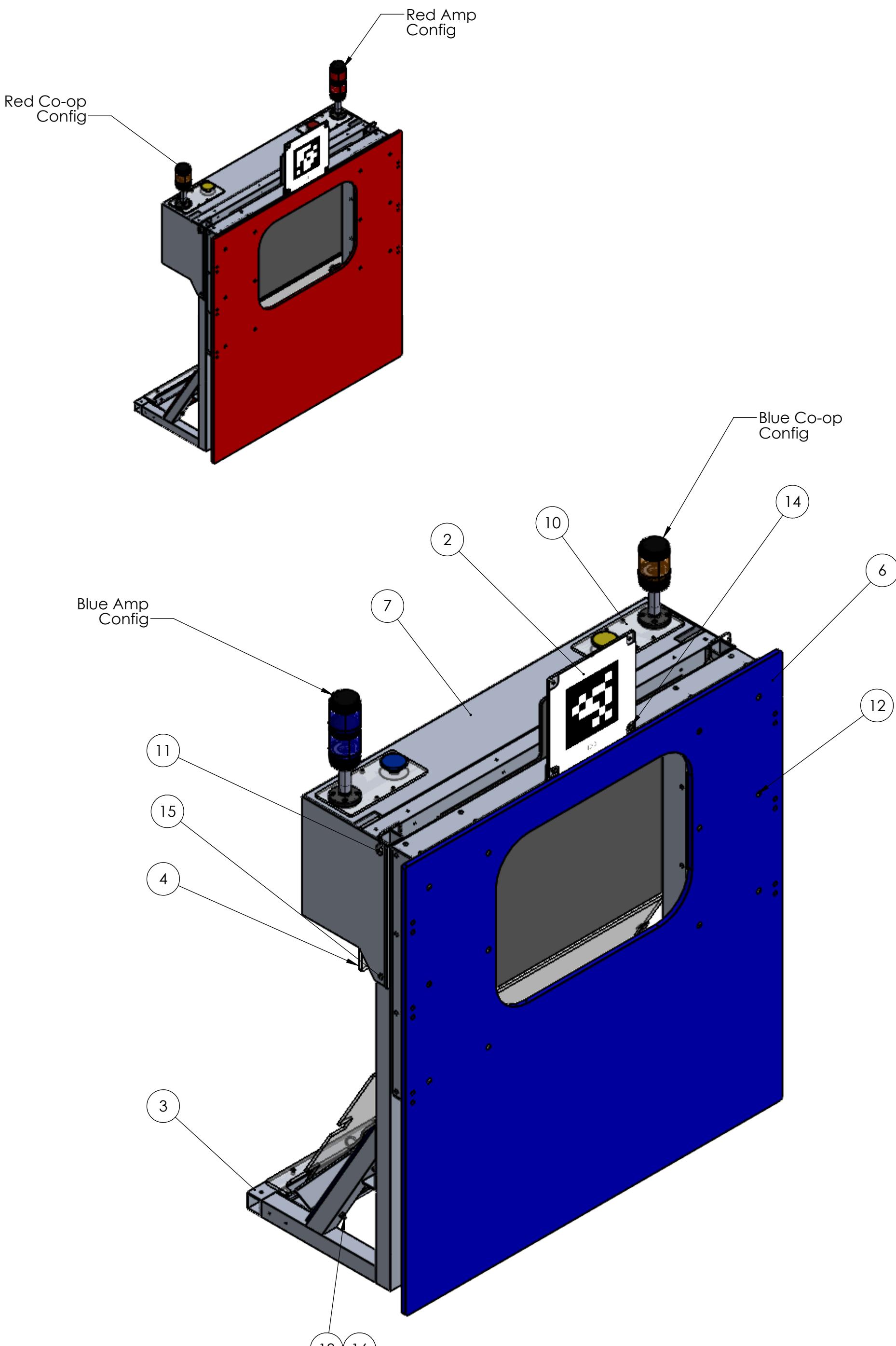


TITLE: Chute Divider

SIZE DWG. NO. REV

C GE-24018

SCALE: 1:2 SHEET 1 OF 1



REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
2-B2	A	Added Sheet 2	12/20/2023	DAF

ITEM NO.	PART NUMBER	DESCRIPTION	BLUE CONFIG QTY.	RED CONFIG QTY.
1	FE-00083-ID5	AprilTag	-	1
2	FE-00083-ID6	AprilTag	1	-
3	GE-24101	Amp Permanent Assembly	1	1
4	GE-24113	Truss Capture Large	1	1
5	GE-24114	Front Red	1	-
6	GE-24115	Front Blue	-	1
7	GE-24116	Stacklight and Button Box	1	1
8	GE-24118	Ring Counter Red	1	-
9	GE-24119	Ring Counter Blue	-	1
10	GE-24128	Stacklight and Button Plate Assembly	2	2
11	98416A013	pin_clevis_.25_2.1875	2	2
12	flat_phil_.25_20_1	Steel Phillips Flat Head Screw, 1/4"x20 x 1" long, fully threaded	12	12
13	flat_phil_.25_20_2.5	Steel Phillips Flat Head Screw, 1/4"-20 x 2-1/2" long, fully threaded	4	4
14	hex_.25_20_0.75	Steel Hex Head Screw, 1/4"-20 x 0.75" long, fully threaded	2	2
15	hex_.25_20_2.5_partial	Steel Hex Head Screw, 1/4"-20 x 2-1/2" long, partially threaded	2	2
16	nylock_.25_20	Steel Nylon-Insert Locknut, 1/4"-20	6	6

UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
	DRAWN	DF	12/18/2023
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/2$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .50$			
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MATERIAL/FINISH:			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

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ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
Amp Station

SIZE DWG. NO. REV

C GE-24100 **A**

SCALE: 1:8 SHEET 1 OF 4

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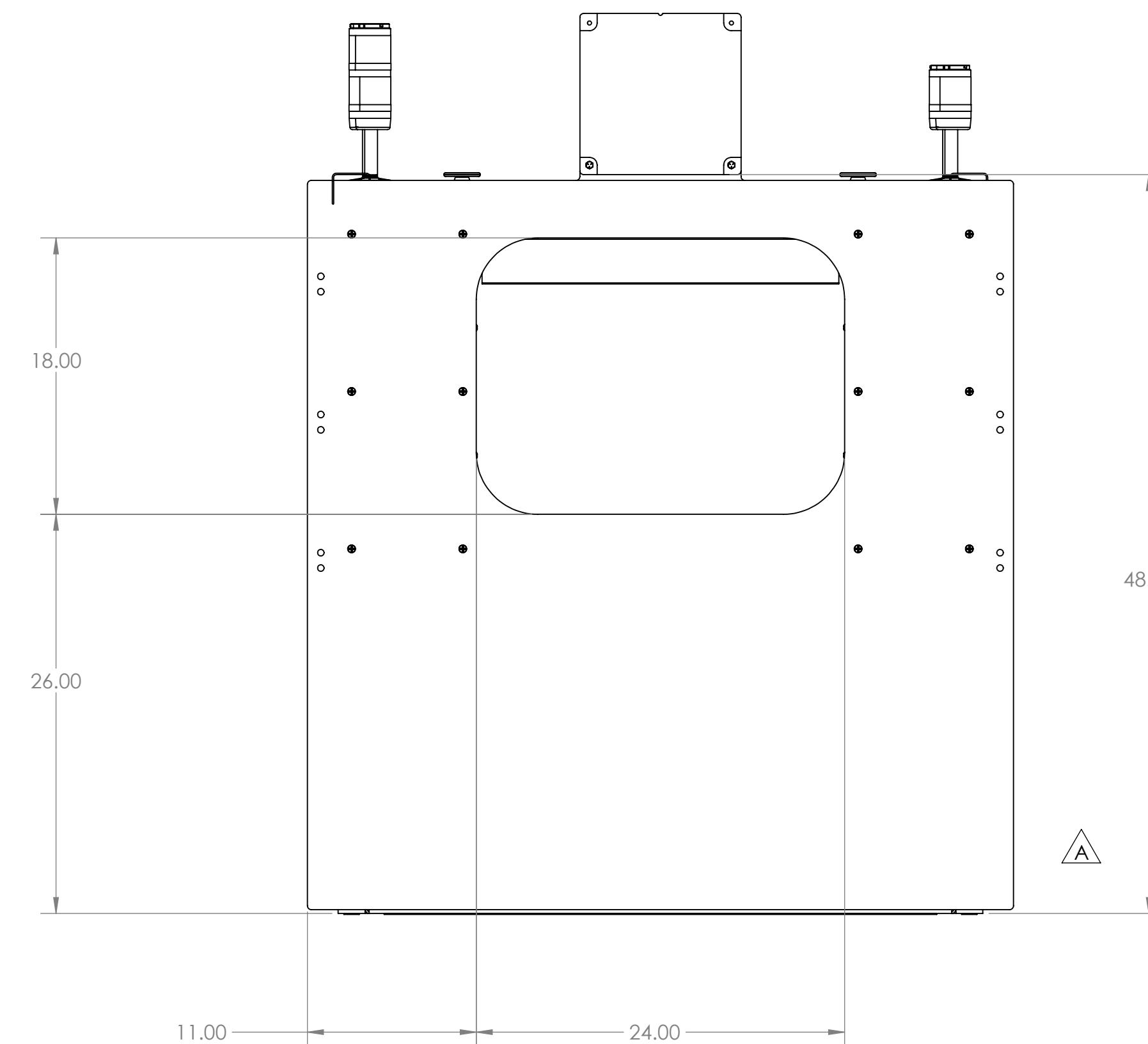
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UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DRAWN	DF	12/18/2023	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

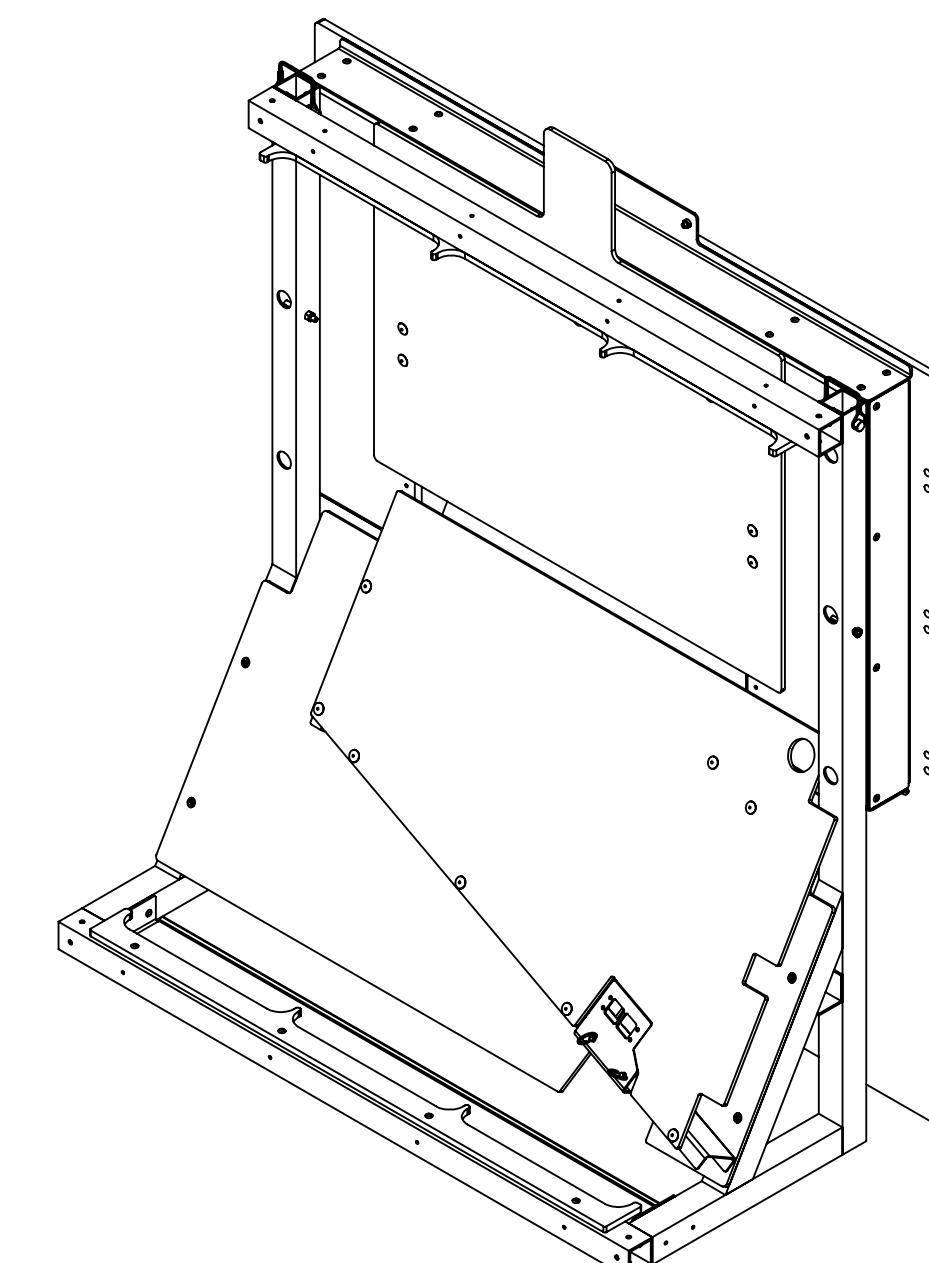
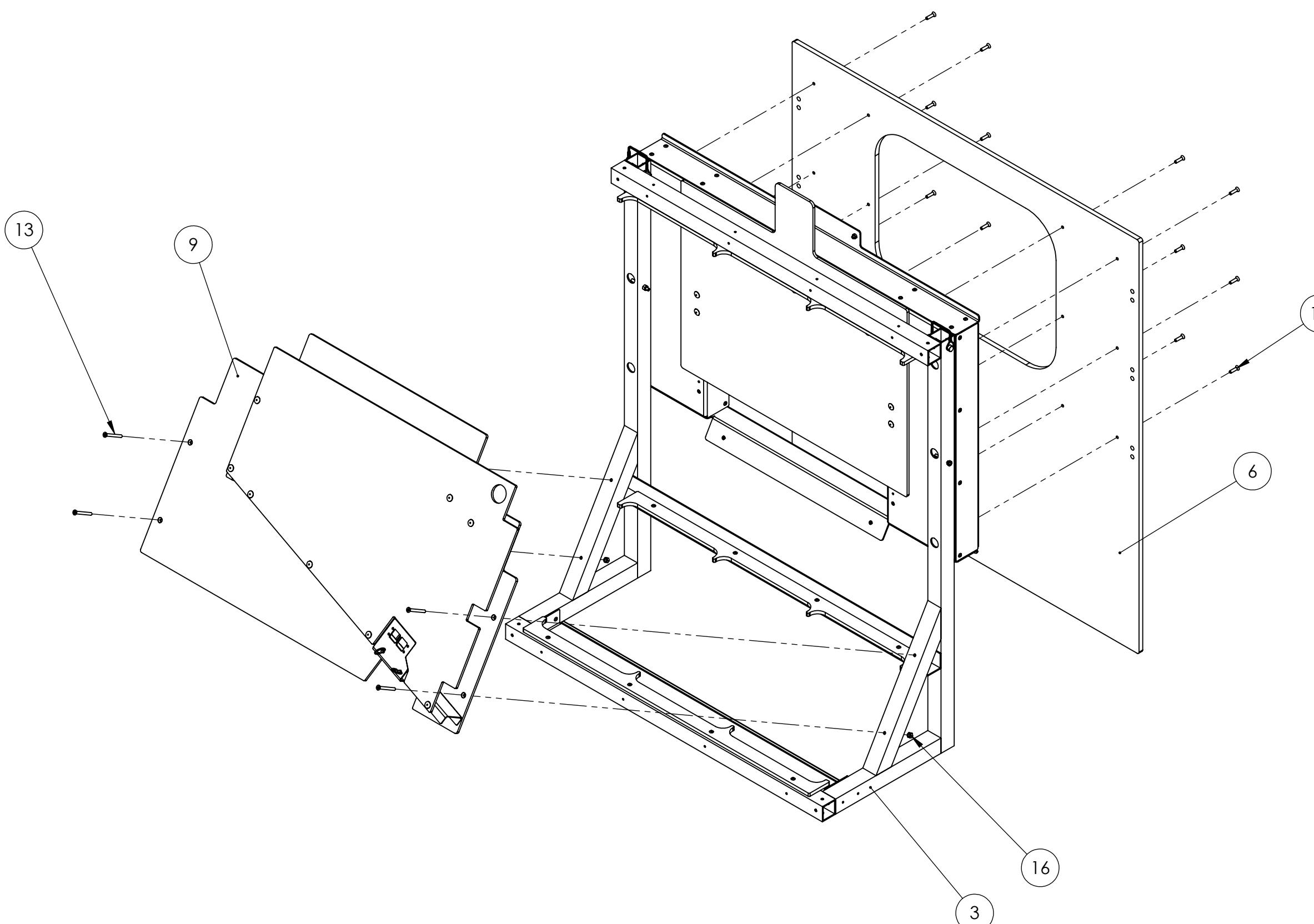
 **FIRST
ROBOTICS
COMPETITION**  **SOLIDWORKS**
Modeling Solutions Partner

TITLE:
Amp Station

SIZE DWG. NO. REV
C GE-24100 A

SCALE: 1:16 SHEET 2 OF 4

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UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm\frac{1}{2}$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .50$	DRAWN	DF	12/18/2023
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:	SIZE	DWG. NO.	REV
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.	C	GE-24100	A
DO NOT SCALE DRAWING	SCALE: 1:10	SHEET 3 OF 4	

 **FIRST
ROBOTICS
COMPETITION**  **SOLIDWORKS**
Modeling Solutions Partner

TITLE:
Amp Station

4

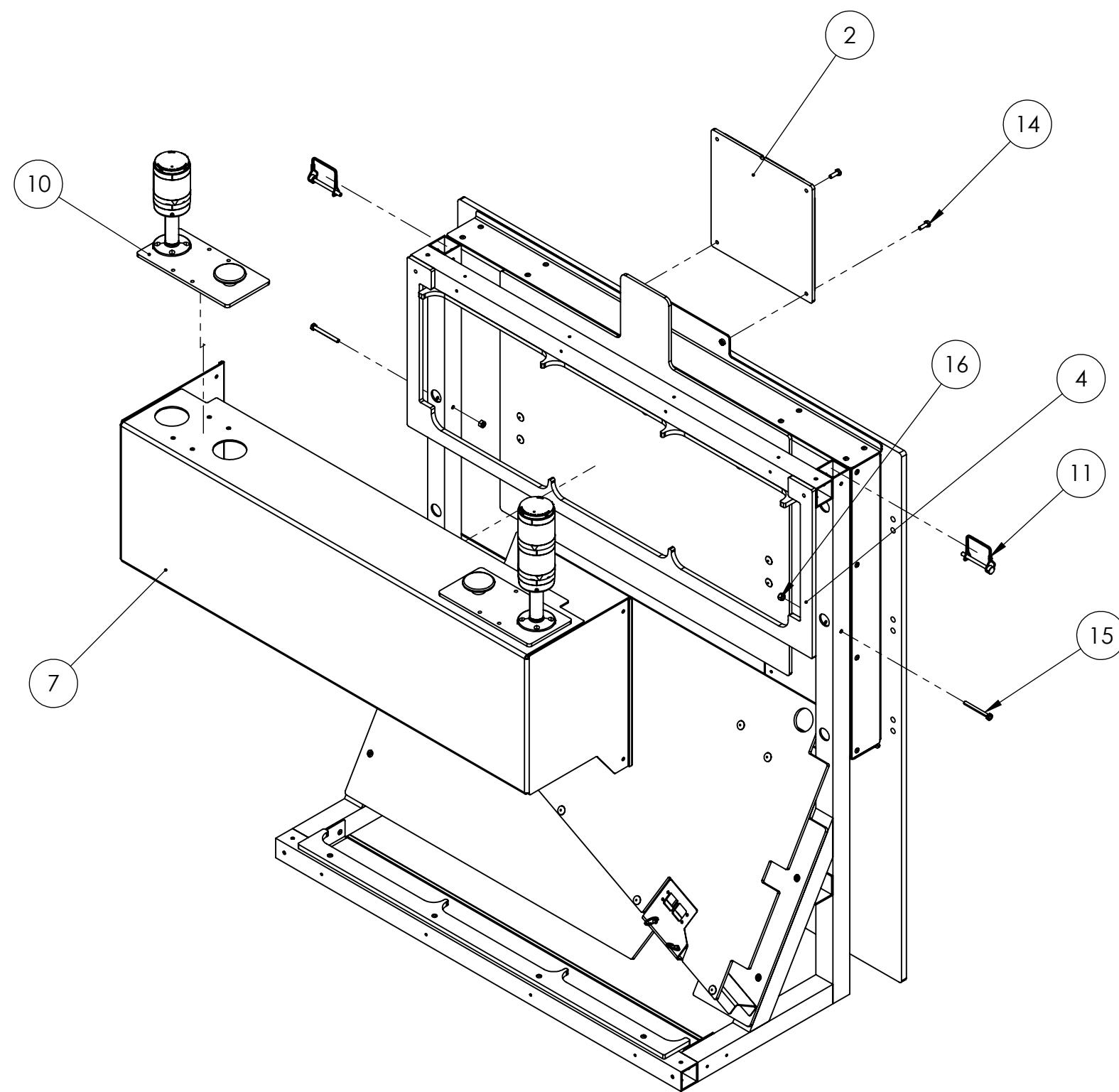
3

2

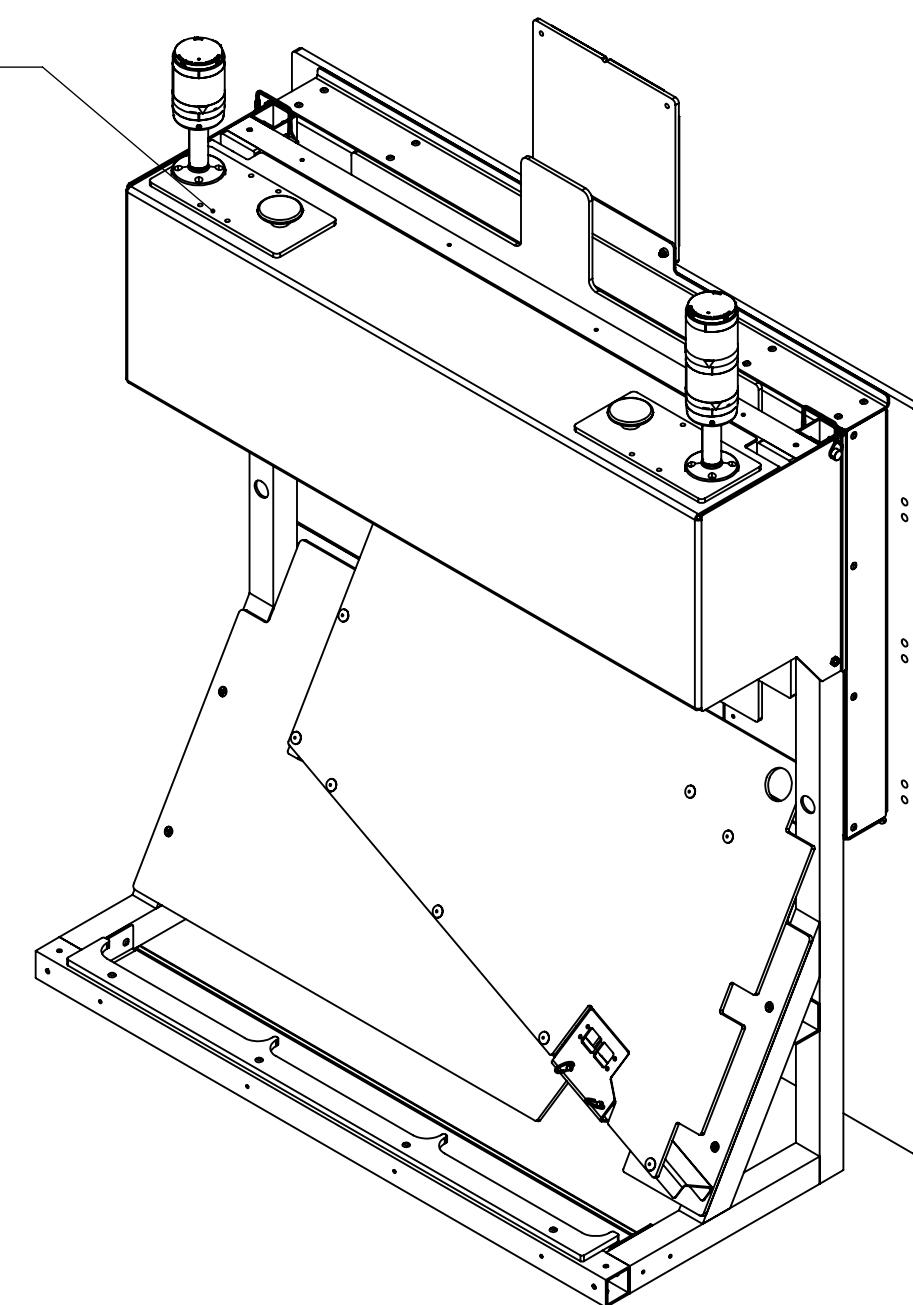
1

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Attach with cable ties. 4 places



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UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm\frac{1}{2}$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .50$	DRAWN	DF	12/18/2023
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

 **FIRST
ROBOTICS
COMPETITION**  **SOLIDWORKS**
Modeling Solutions Partner

TITLE:
Amp Station

SIZE DWG. NO. REV

C GE-24100 **A**

SCALE: 1:10 SHEET 4 OF 4

4

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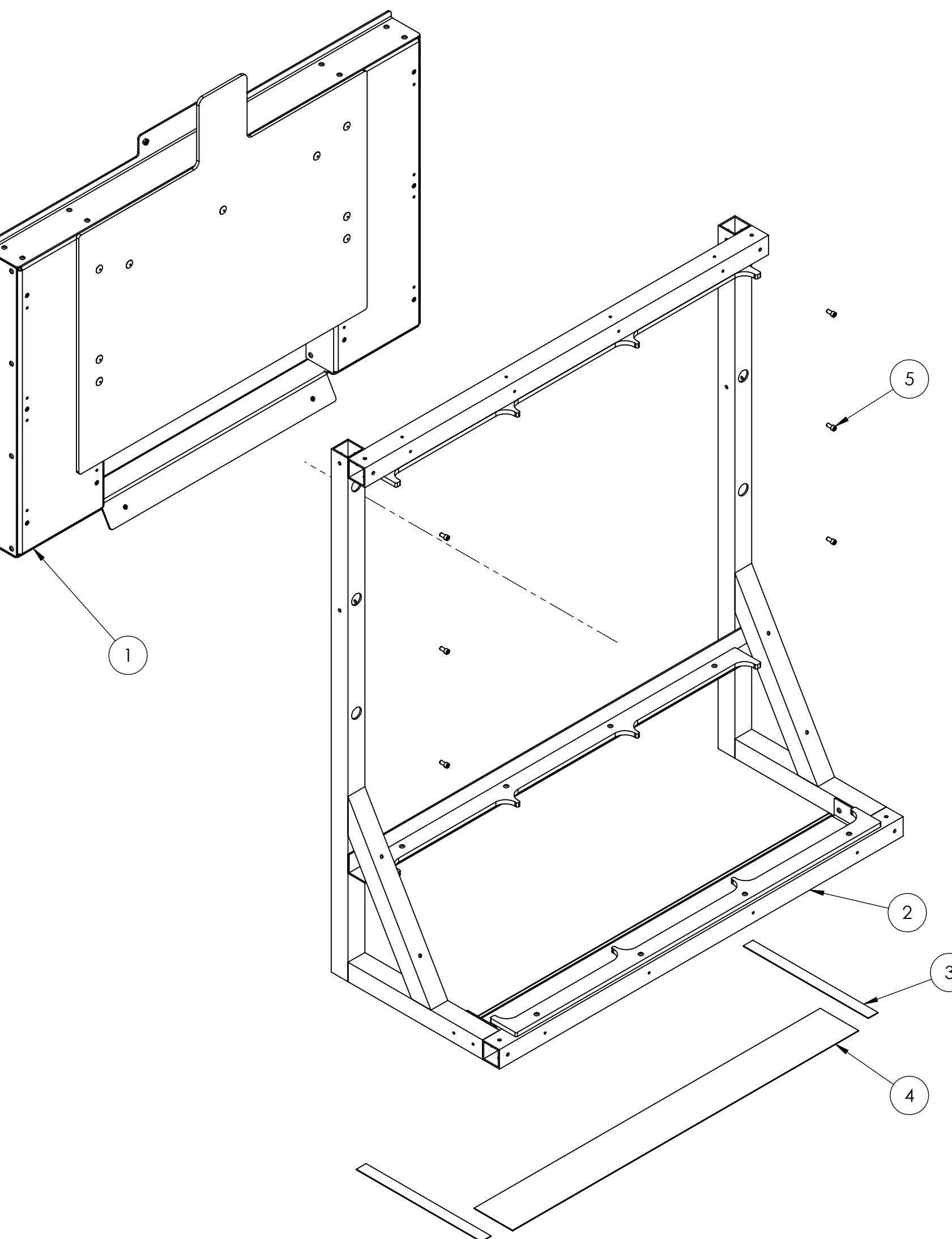
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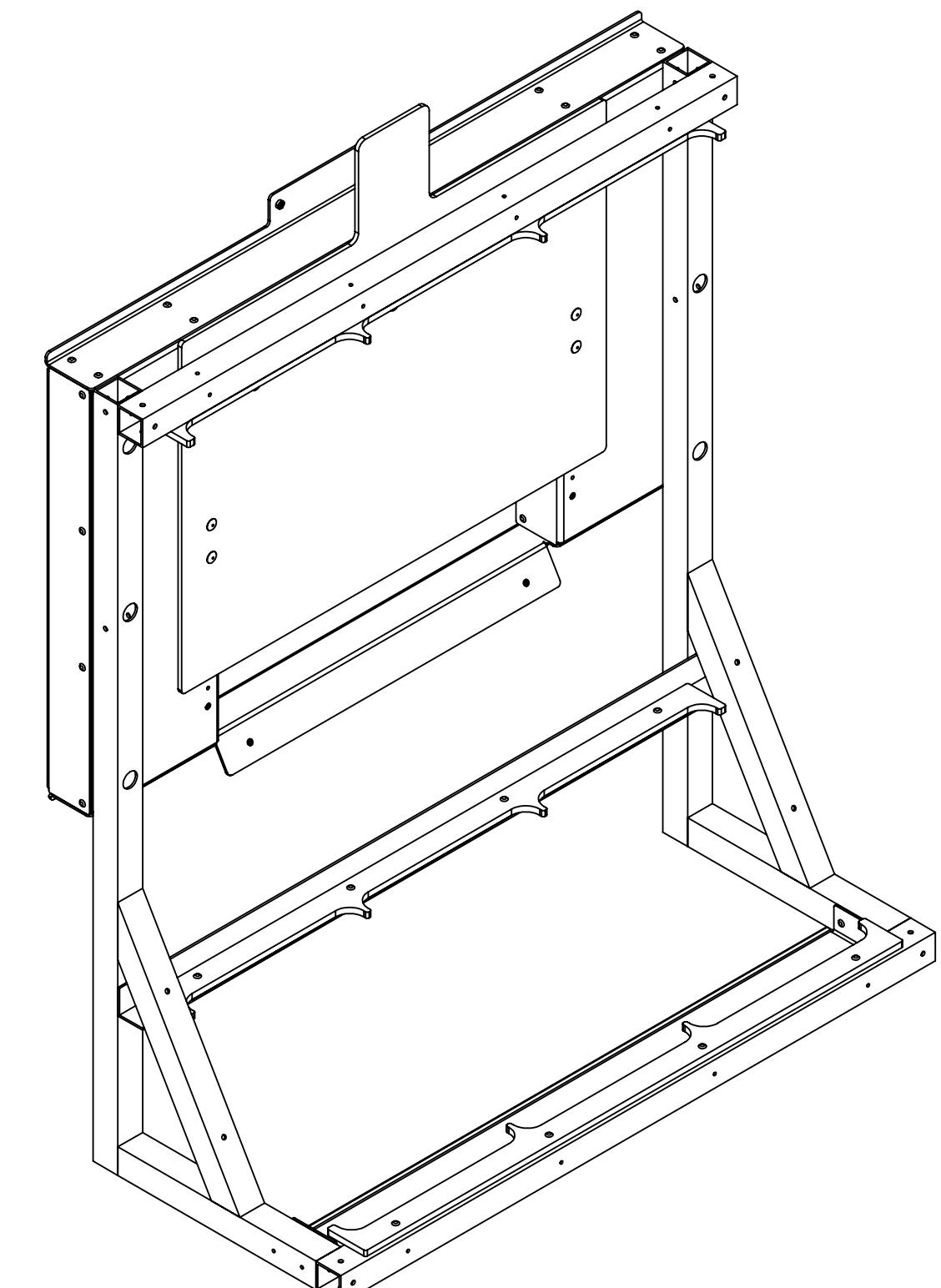
1

D



Attach (1) to (2) with (5).

Adhere (3) and (4) to (2).



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24106	Amp Frame with Plastic	1
2	GE-24102	Weldment with Truss Floor and Truss Capture	1
3	Hook_1_13	1" x 13" Hook, Adhesive Backed	2
4	Hook_4_36	4" x 36" Hook, Adhesive Backed	1
5	Configurable Bolt	.5" Long 1/4-20 Socket Head Cap Screw	6

UNLESS OTHERWISE SPECIFIED:		
FIELD	NAME	DATE
DRAWN	JO	11/1/2023
PROPRIETARY AND CONFIDENTIAL		
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COMMENTS:		
REMOVE ALL BURRS AND SHARP EDGES.		

FIRST
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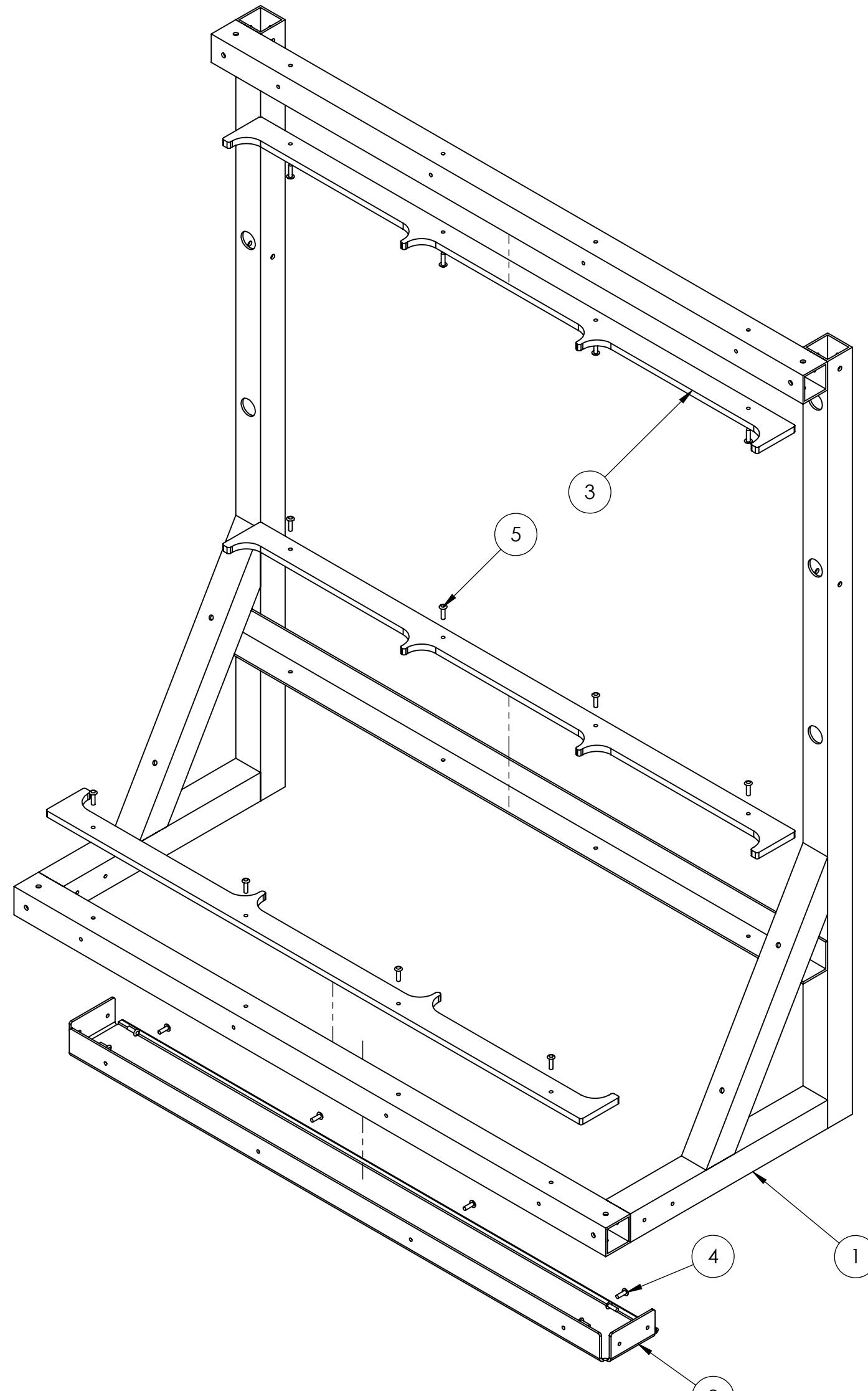
SOLIDWORKS
Modeling Solutions Partner

TITLE: Amp Permanent Assembly

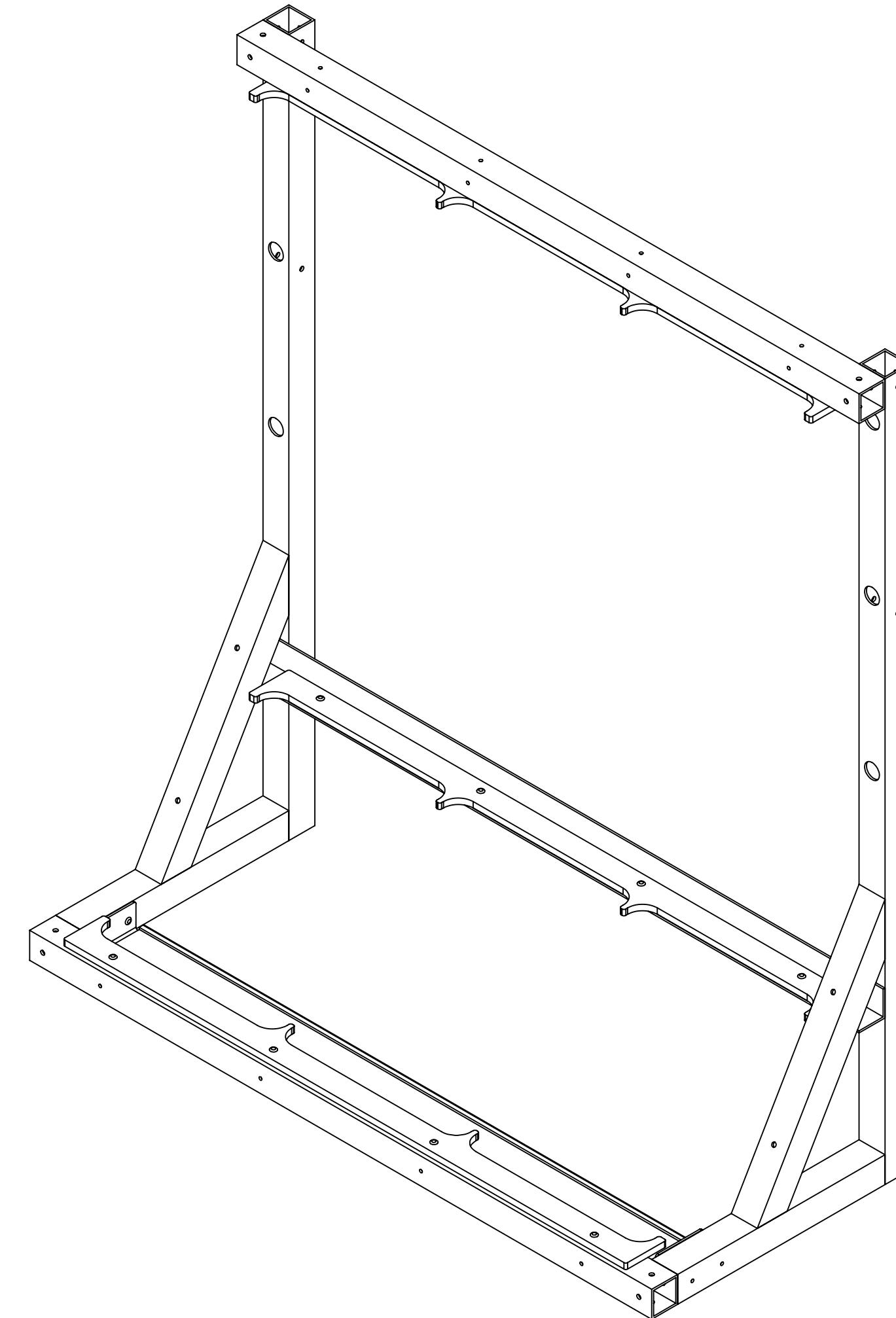
SIZE DWG. NO. REV

C GE-24101

SCALE: 1:8 SHEET 1 OF 1



Attach (3) to (1) with (5) in 3 places.
Attach (2) to (1) with (4)



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24103	Amp Weldment	1
2	GE-24104	Truss Floor	1
3	GE-24105	Truss Capture Small	3
4	rivet_.1875_.251-.375	.251-.375 Grip Range	8
5	rivet_.1875_.376-.5	.376-.5 Grip Range	12

UNLESS OTHERWISE SPECIFIED:		
FIELD	NAME	DATE
DRAWN	JO	11/1/2023
PROPRIETARY AND CONFIDENTIAL		
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MATERIAL/FINISH:		
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.		
DO NOT SCALE DRAWING		

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Weldment with Truss Floor and Truss Capture

C **GE-24102**

SIZE **DWG. NO.** **REV**

SCALE: 1:6 **SHEET 1 OF 1**

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24103-01	Weldment Vertical	2
2	GE-24103-02	Weldment Width	2
3	GE-24103-03	Weldment Horizontal	2
4	GE-24103-04	Weldment Angled Tube	2
5	GE-24103-05	Weldment Angle	1

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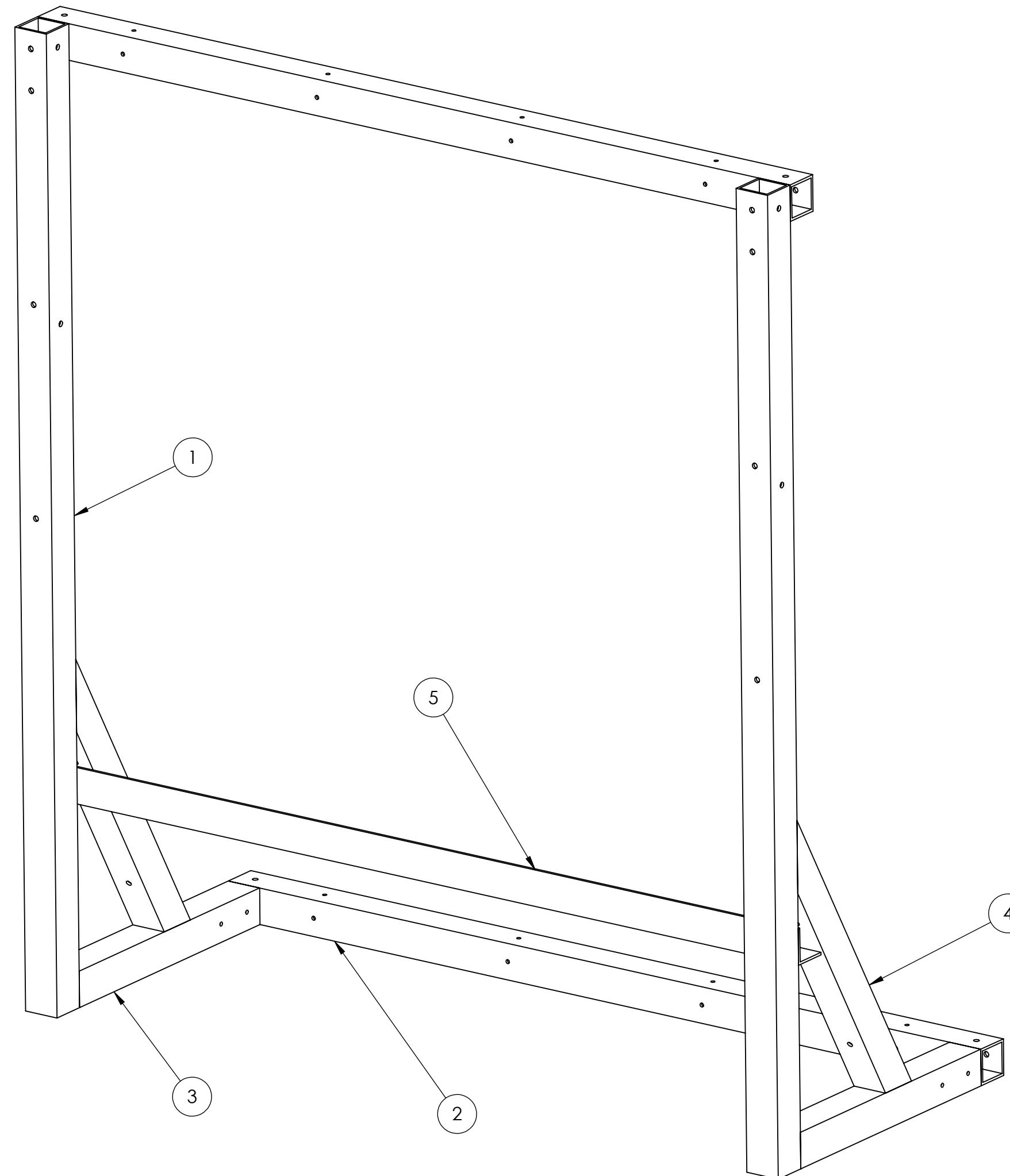
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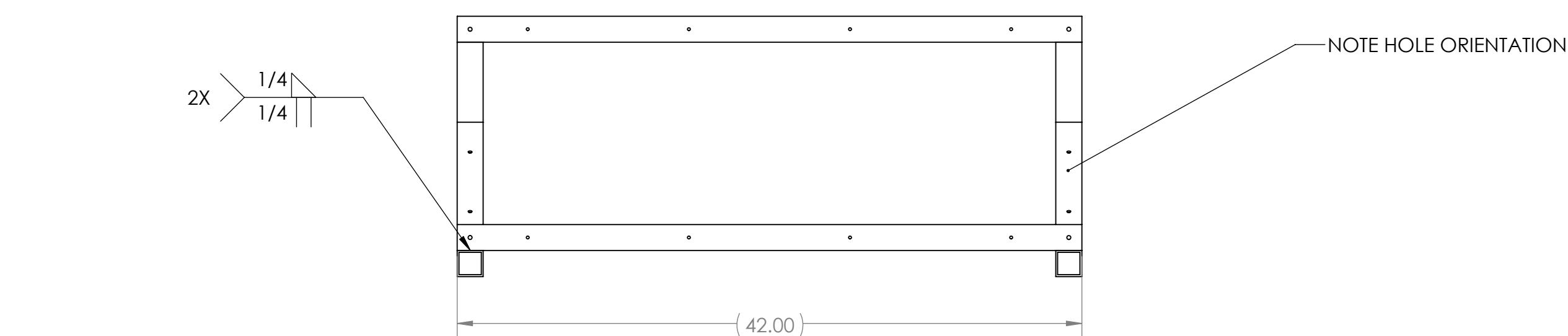


Note: Tag or Label with Part Number

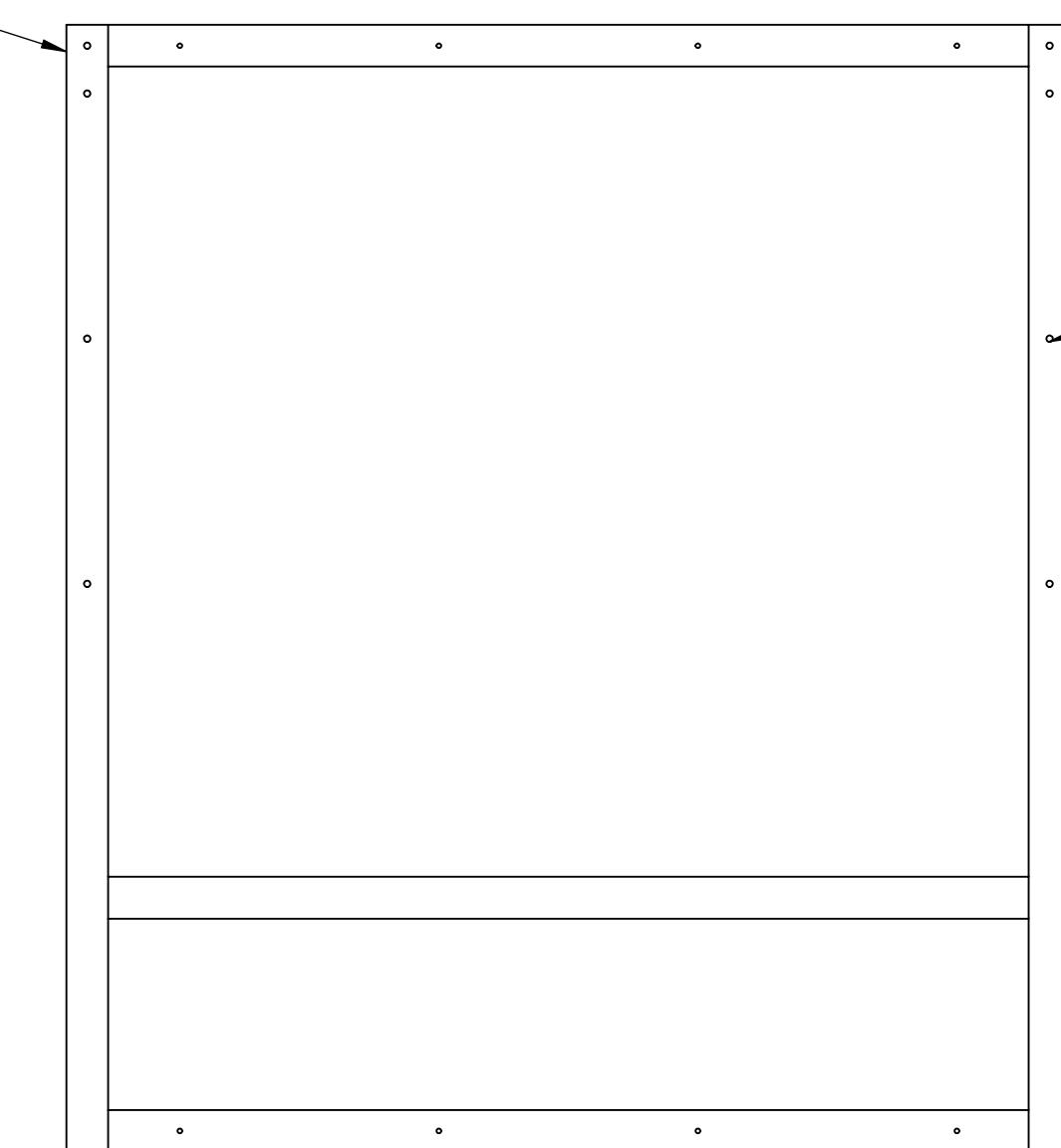
UNLESS OTHERWISE SPECIFIED:	WELD	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	NE	9/12/2023
TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .02$ THREE PLACE DECIMAL $\pm .015$	PROPRIETARY AND CONFIDENTIAL THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.		
MATERIAL/FINISH: 6061 Aluminum	TITLE: Amp Weldment		
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.		SIZE	DWG. NO.
		C	GE-24103
SCALE: 1:5		REV	
		SHEET 1 OF 4	

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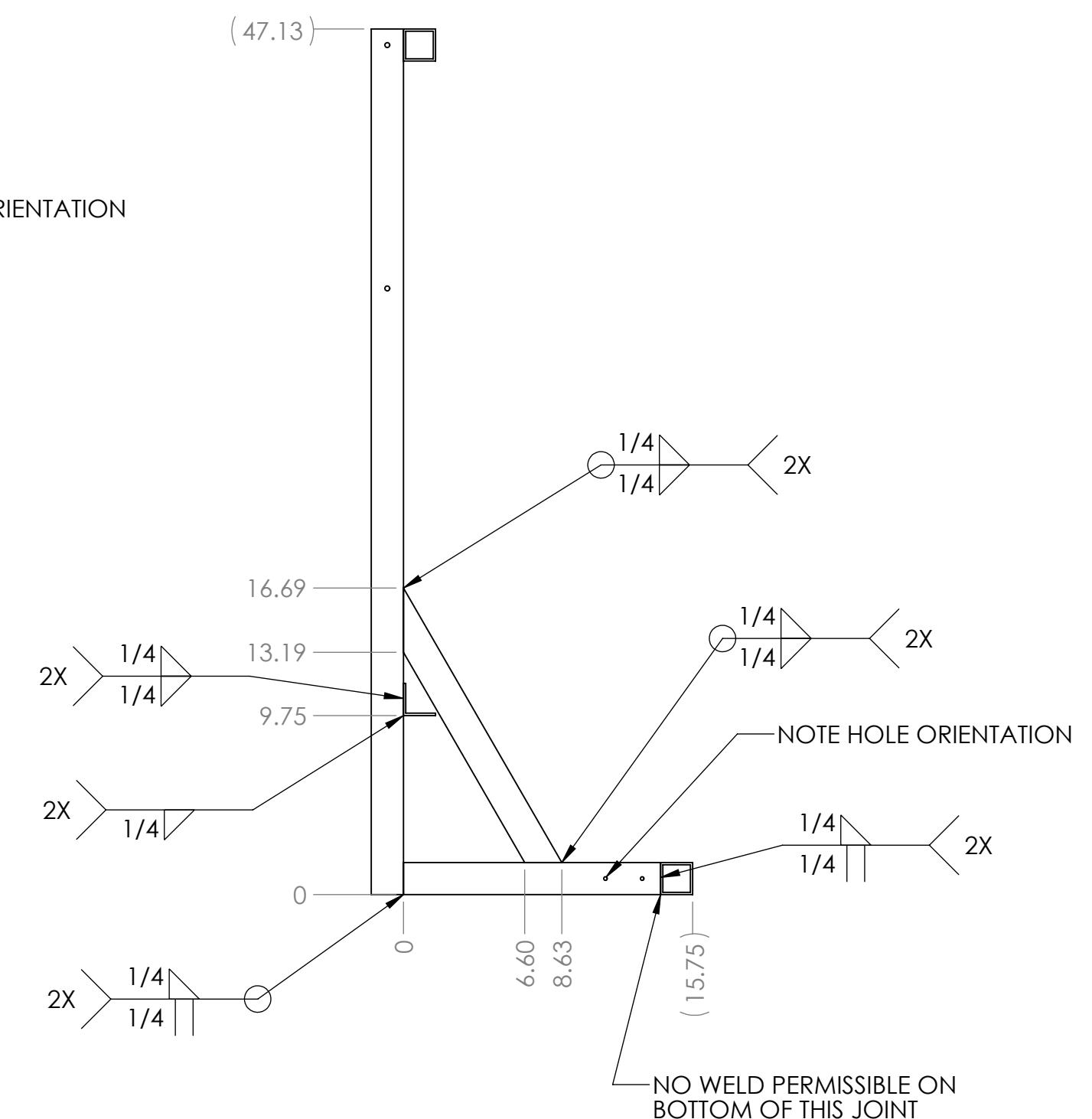
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NO WELD PERMISSIBLE ON OUTSIDE
FACE FOR THIS WELD



NO WELD PERMISSIBLE ON OUTSIDE FACE FOR THIS WELD



UNLESS OTHERWISE SPECIFIED:		WELD	NAME	DATE
		DRAWN	NE	9/12/2023
PROPRIETARY AND CONFIDENTIAL				
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.				
MATERIAL/FINISH:	6061 Aluminum	REV		
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.				
DO NOT SCALE DRAWING		SCALE: 1:8	SHEET 2 OF 4	

 **FIRST
ROBOTICS
COMPETITION**  **SOLIDWORKS**
Modeling Solutions Partner

TITLE: **Amp Weldment**

SIZE DWG. NO. REV
C GE-24103

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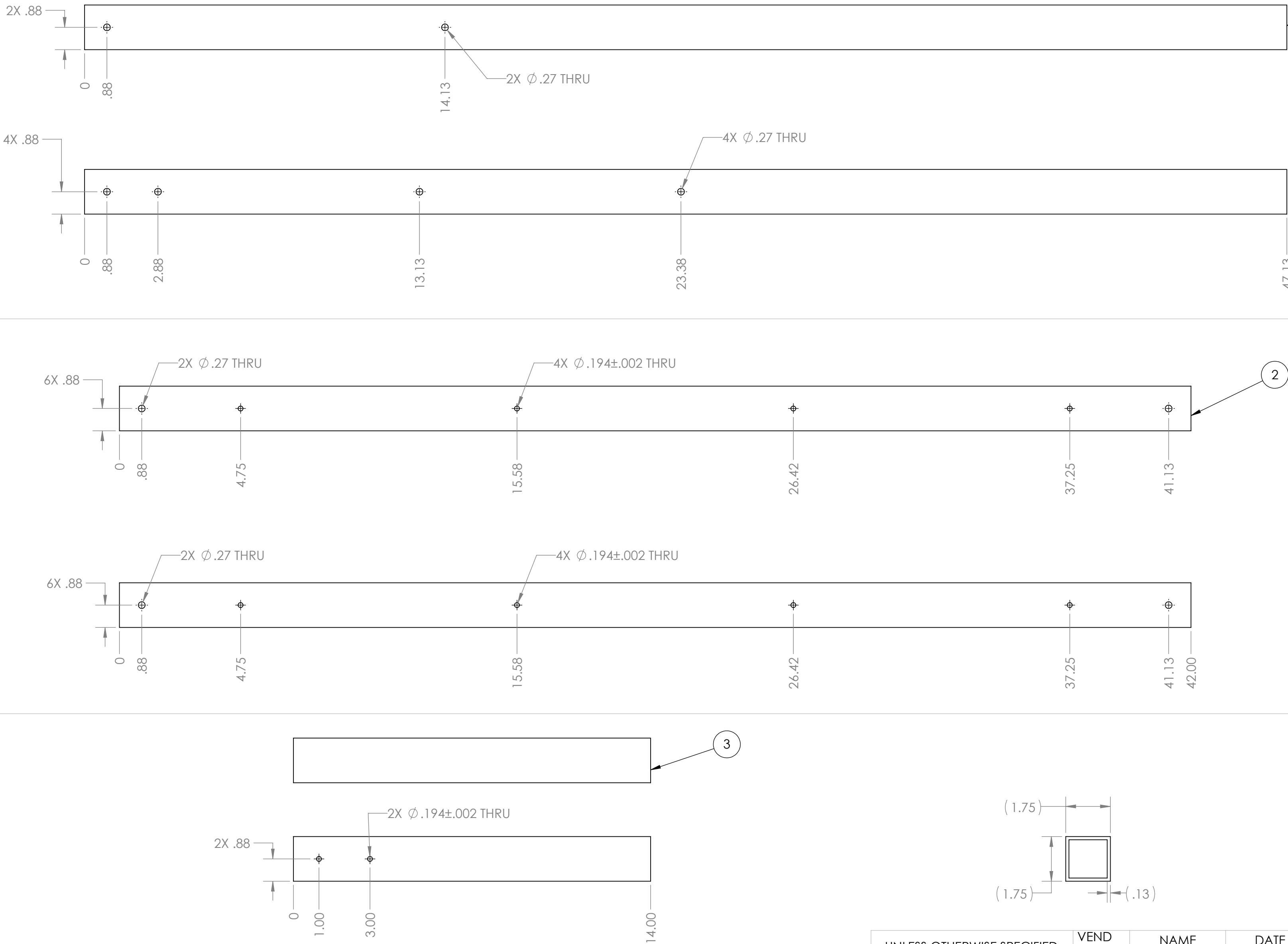
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UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	NE	9/12/2023	
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH: 1.75" x .125" 6061 Aluminum Square Tube			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
Amp Weldment

SIZE DWG. NO. REV
C GE-24103

SCALE: 1:3 SHEET 3 OF 4

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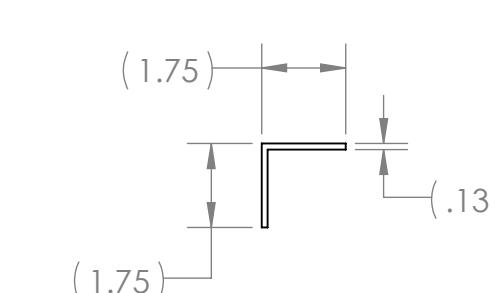
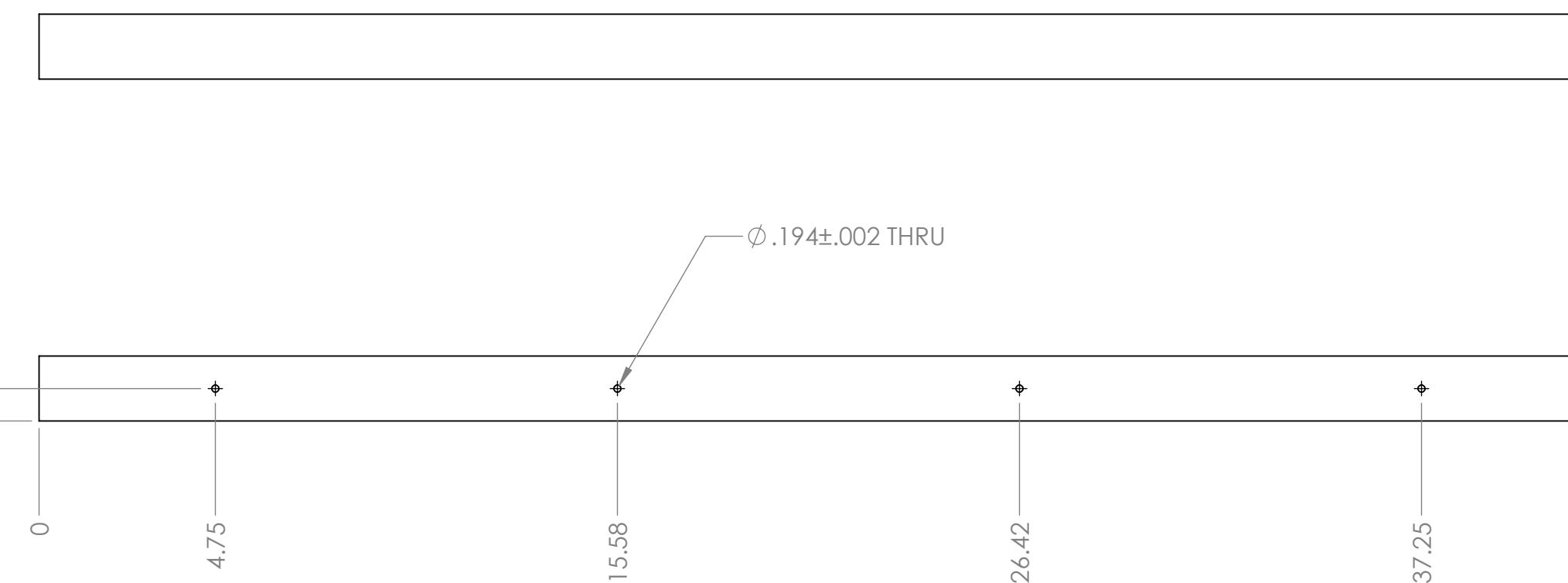
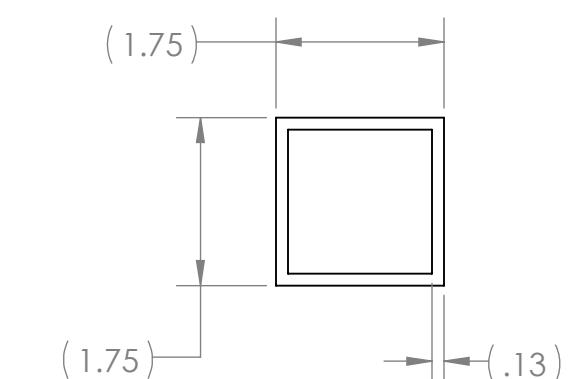
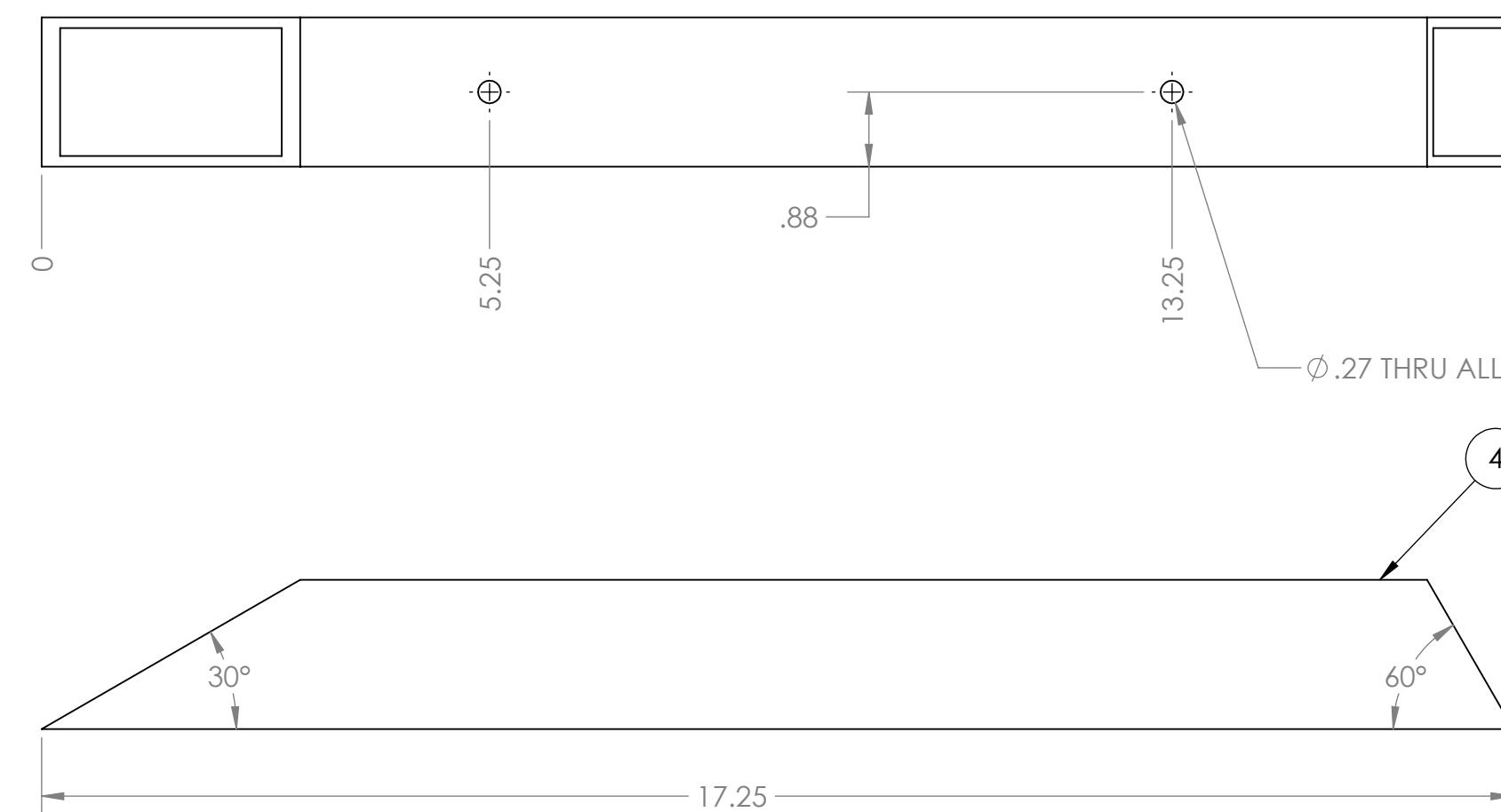
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UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	NE	9/12/2023	
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH:	SIZE	DWG. NO.	REV
1.75" x .125" 6061 Aluminum Square Tube and 90° Angle Bracket	C	GE-24103	
DO NOT SCALE DRAWING			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
Amp Weldment

SIZE DWG. NO. REV
C GE-24103

SCALE: 1:2 SHEET 4 OF 4

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REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
C1, C4	A	GEOMETRY NEAR CORNERS HAS CHANGED TO CREATE LARGER GAPS	10/13/2023	NWE

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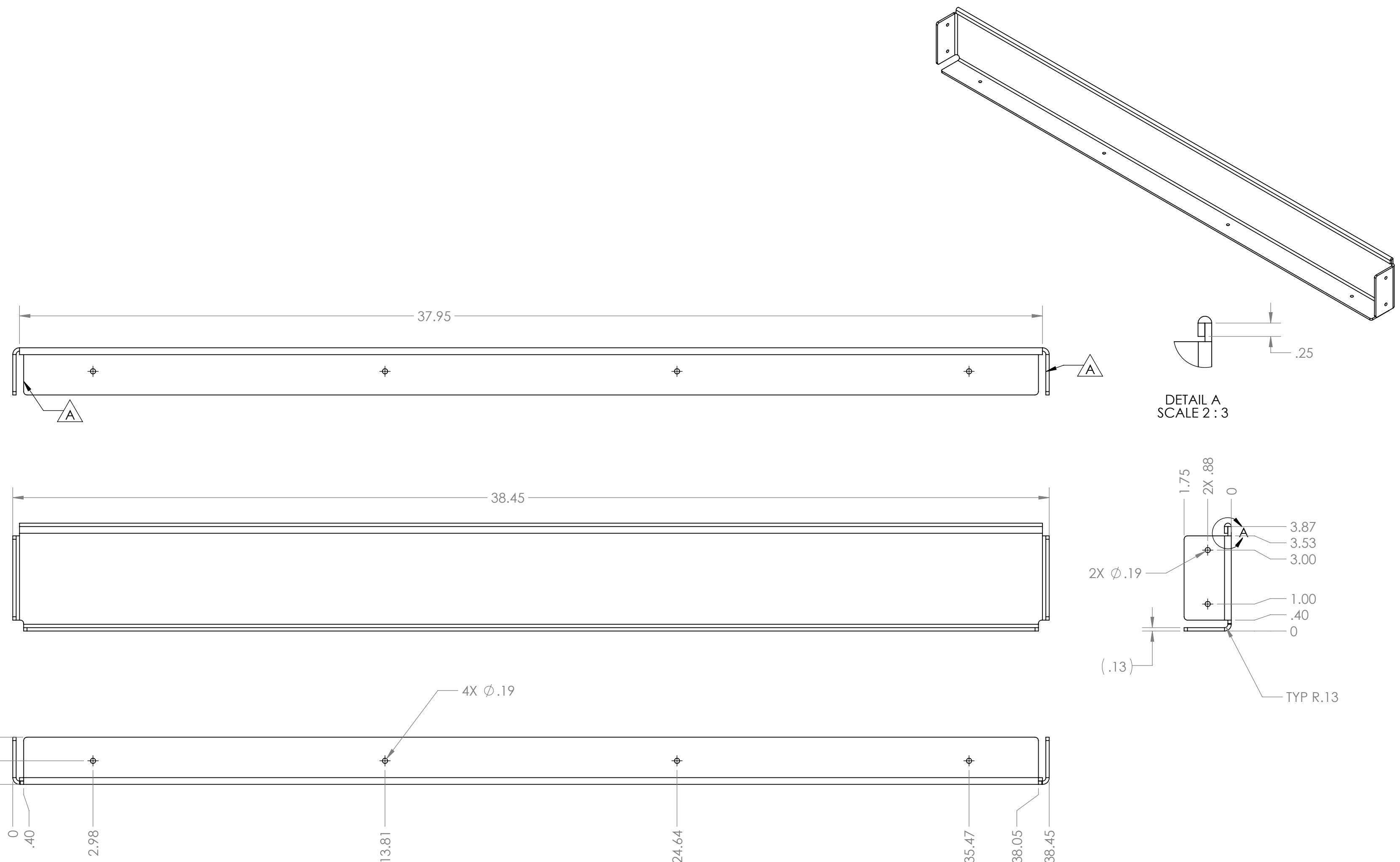
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UNLESS OTHERWISE SPECIFIED:	BEND	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	NE	9/19/2023
TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$	PROPRIETARY AND CONFIDENTIAL		
TWO PLACE DECIMAL $\pm .02$ THREE PLACE DECIMAL $\pm .010$	THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.		
MATERIAL/FINISH: 8GA 5052 Aluminum	COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.		
DO NOT SCALE DRAWING			

FIRST ROBOTICS COMPETITION SOLIDWORKS Modeling Solutions Partner

Truss Floor

SIZE DWG. NO. REV
C GE-24104 **A**

SCALE: 1:3 SHEET 1 OF 1

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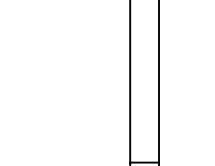
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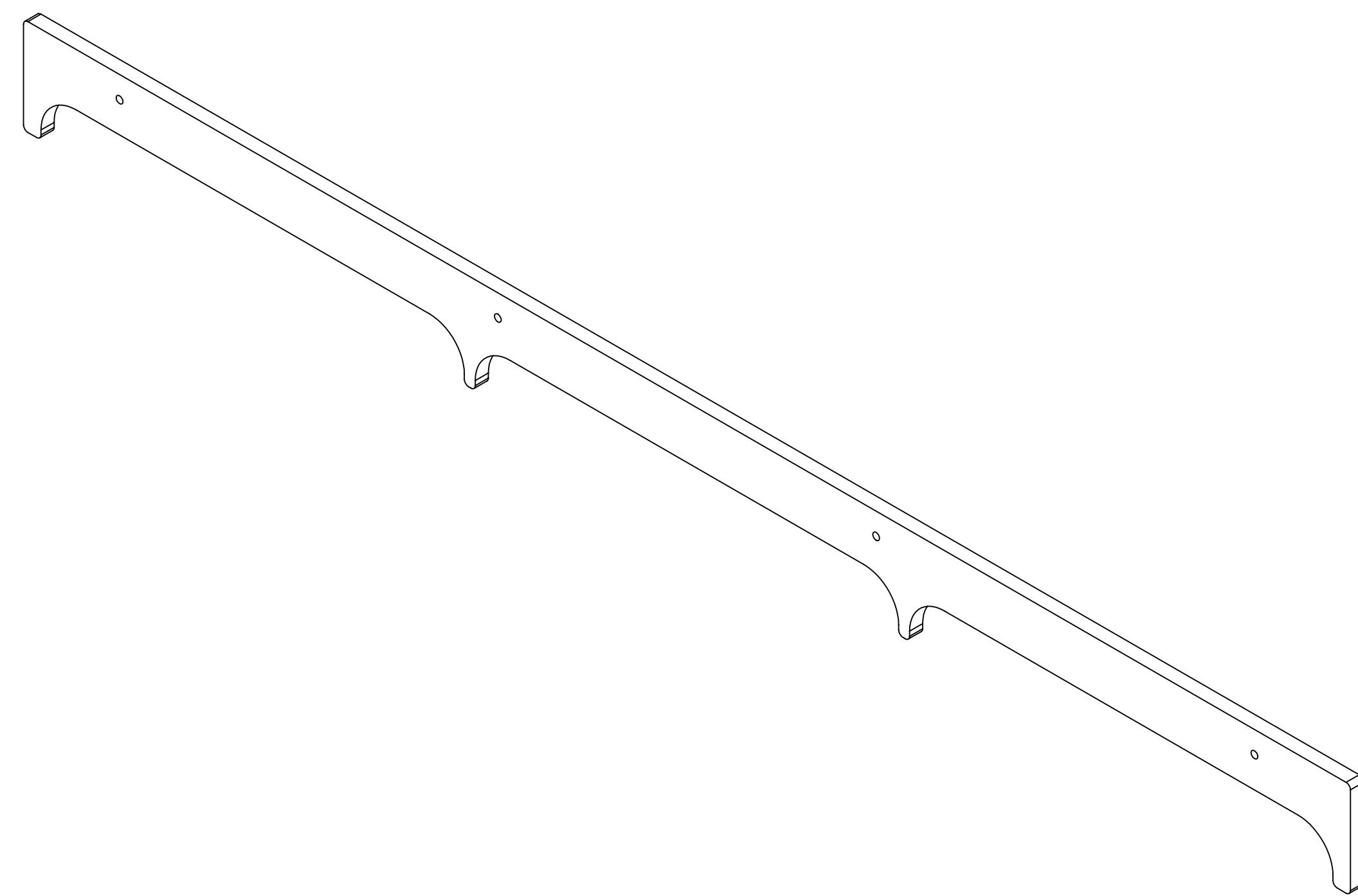


10X R.13
38.00
37.50
35.25

25.38
25.06
24.42

4X $\phi .194 \pm .002$ THRU
13.58
12.94
12.63
6X R1.00

0
4X .63
3X 1.50
4X 2.75
2.75
.50
0



Note: Tag or Label with Part Number

UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	JO	10/12/2023	 FIRST ROBOTICS COMPETITION
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST IS PROHIBITED.			
MATERIAL/FINISH: 3/8" Polycarbonate, Clear			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			
TITLE: Truss Capture Small			
SIZE DWG. NO. REV			
C GE-24105			
SCALE: 2:5 SHEET 1 OF 1			

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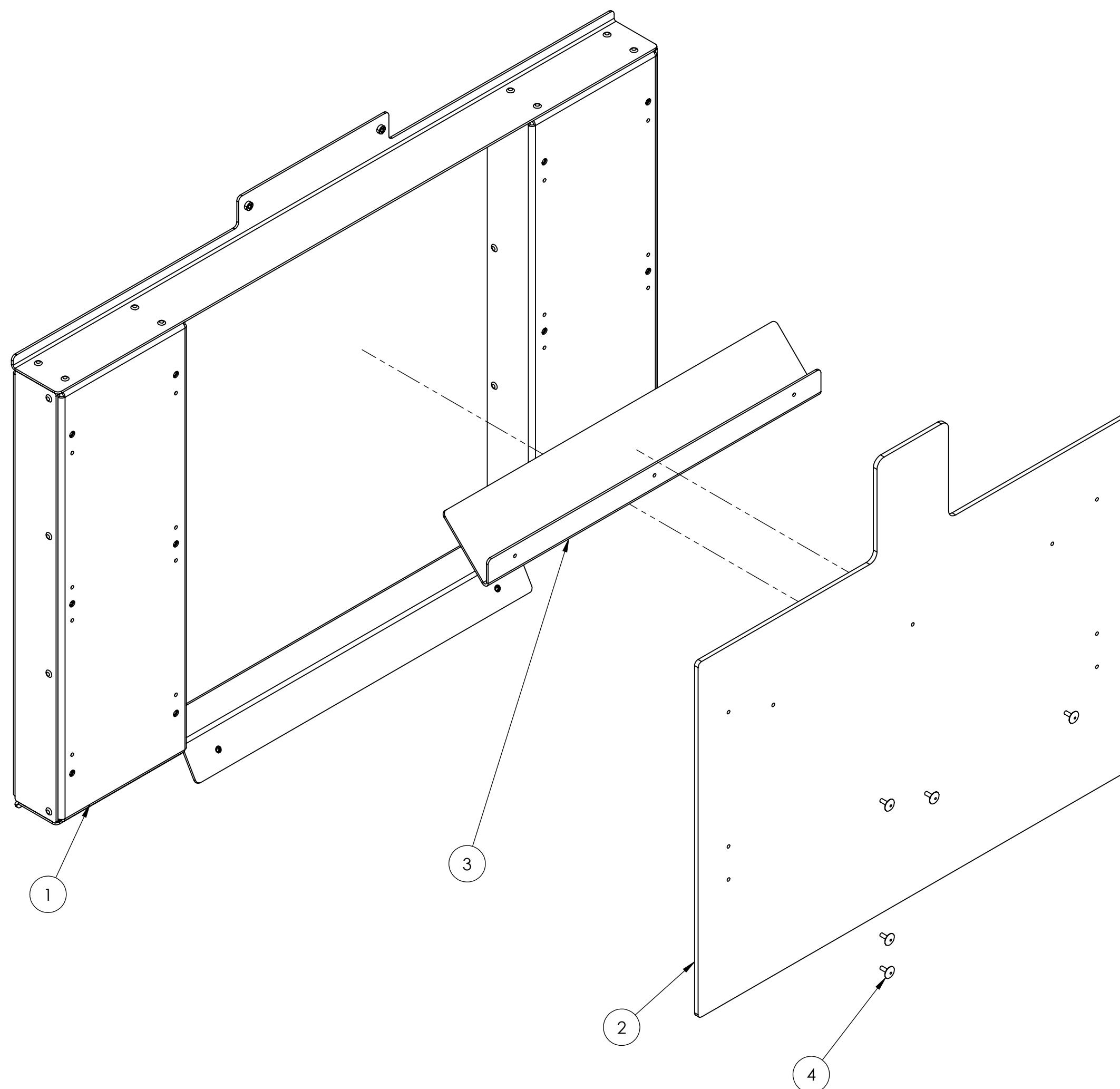
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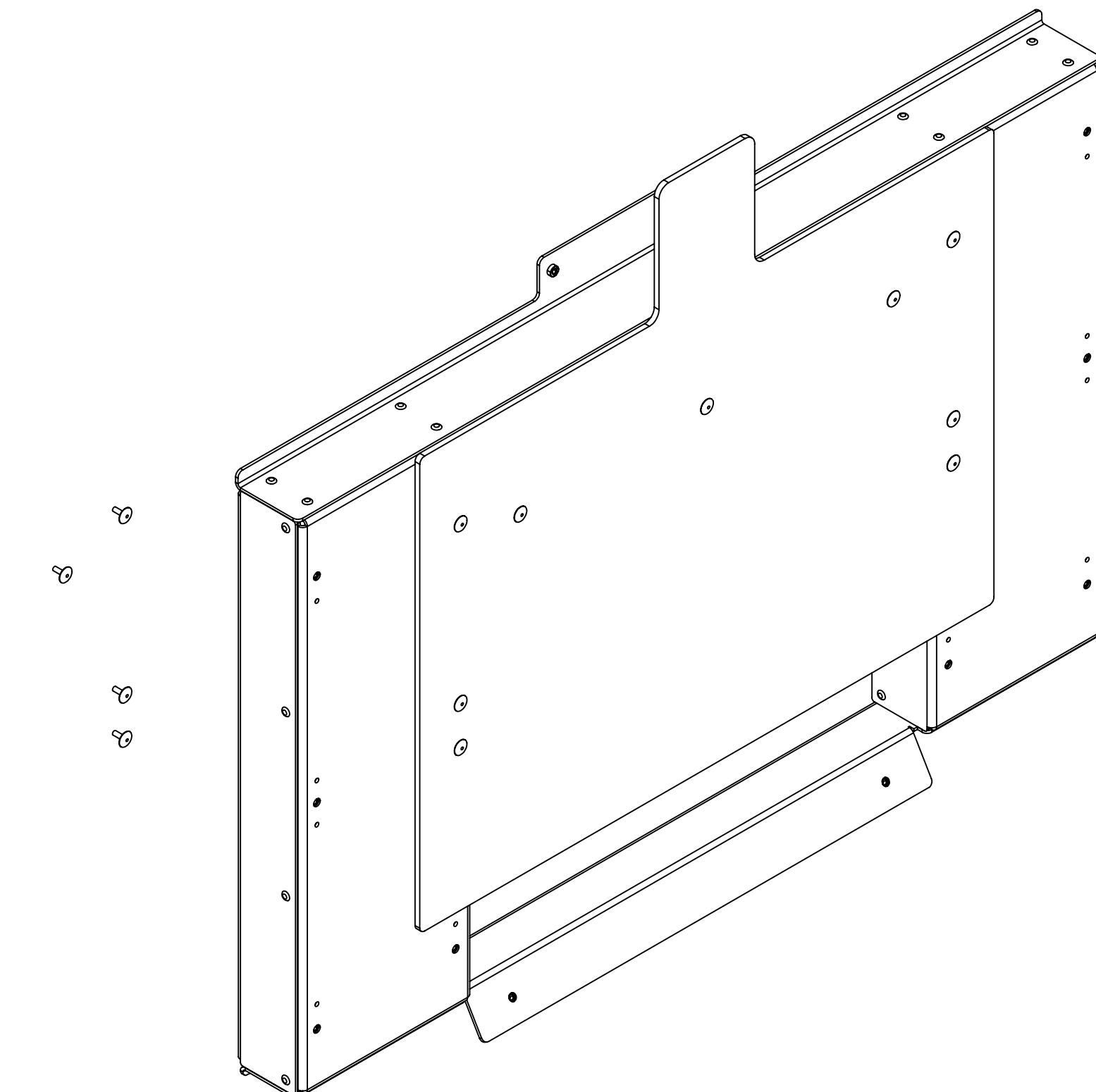
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Notes:
 Attach (3) to (2) with (4).
 Attach (2) to (1) with (4).

Tag or Label with Part Number.



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24107	Amp Frame	1
2	GE-24111	Amp Back	1
3	GE-24112	Amp Deflector	1
4	rivet .1875-.251-.375_largeHead	3/16" Large Head Aluminum Rivet, .251-.375 Grip Range	9

UNLESS OTHERWISE SPECIFIED:			VEND	NAME	DATE
DIMENSIONS ARE IN INCHES			DRAWN	JO	10/12/2023
TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .005$					
PROPRIETARY AND CONFIDENTIAL					
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.					
COMMENTS:					
REMOVE ALL BURRS AND SHARP EDGES.					
DO NOT SCALE DRAWING			SIZE	DWG. NO.	REV
			C	GE-24106	
			SCALE: 1:5	SHEET 1 OF 1	



Amp Frame with Plastic

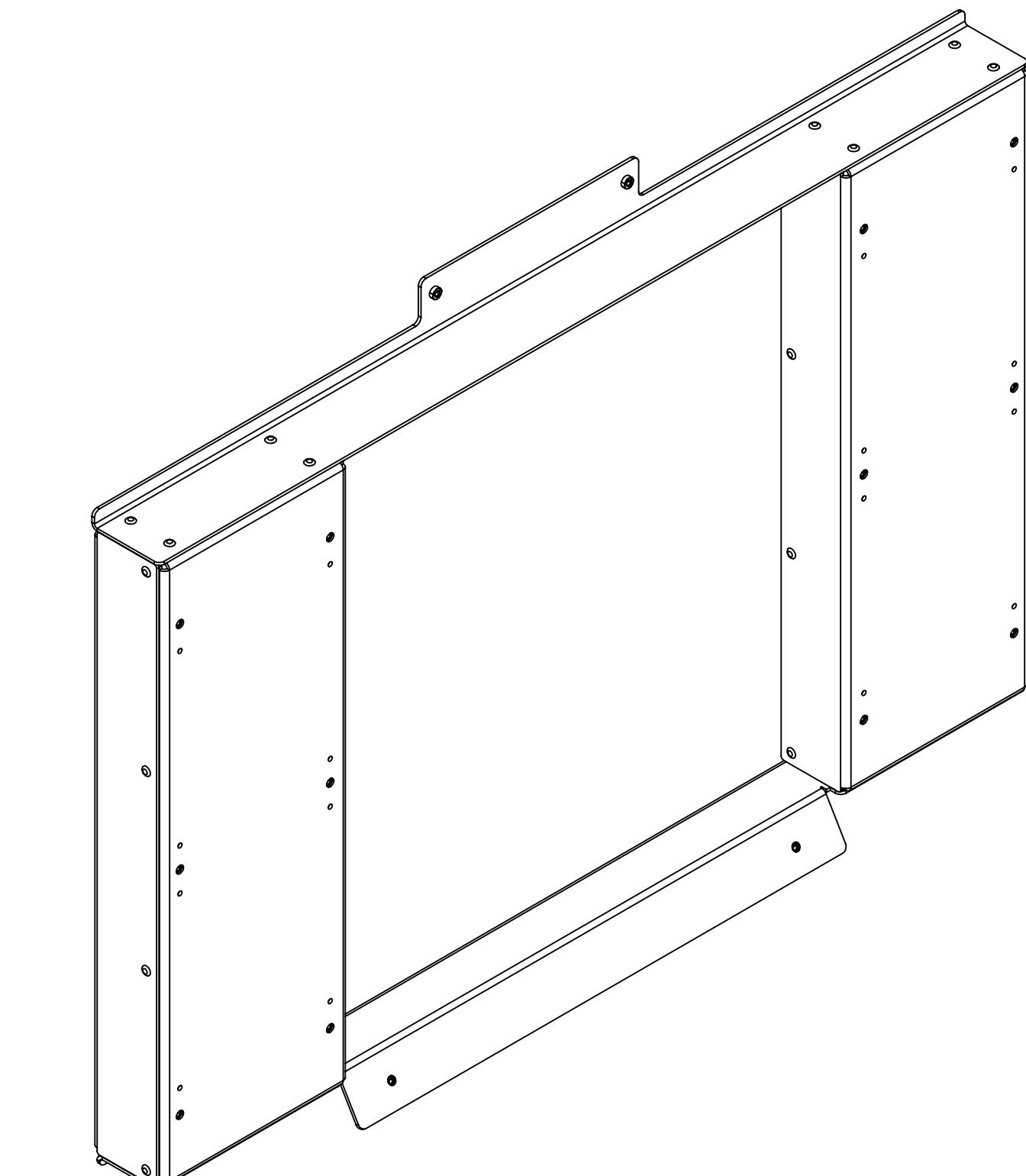
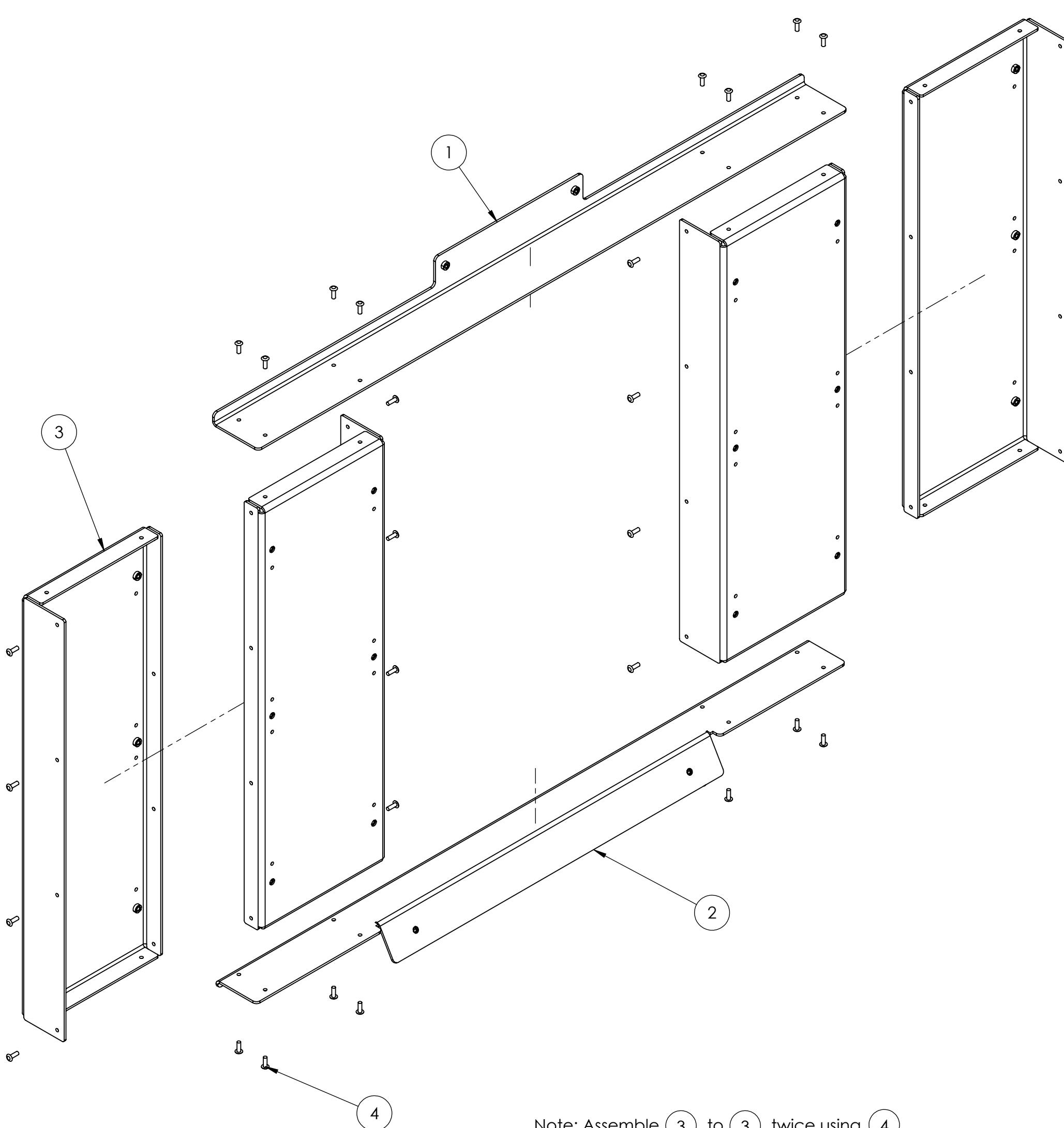
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24108	Amp Frame Top with PEMs	1
2	GE-24109	Amp Frame Bottom with PEMs	1
3	GE-24110	Amp Frame Side with PEMs	4
4	rivet_.1875_.251-.375	3/16" Aluminum Rivet, .251-.375 Grip Range	32

UNLESS OTHERWISE SPECIFIED:		
VEND	NAME	DATE
DRAWN	JO	10/12/2023
PROPRIETARY AND CONFIDENTIAL		
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.		
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.		
DO NOT SCALE DRAWING		

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE: Amp Frame

SIZE DWG. NO. REV

C GE-24107

SCALE: 1:5 SHEET 1 OF 1

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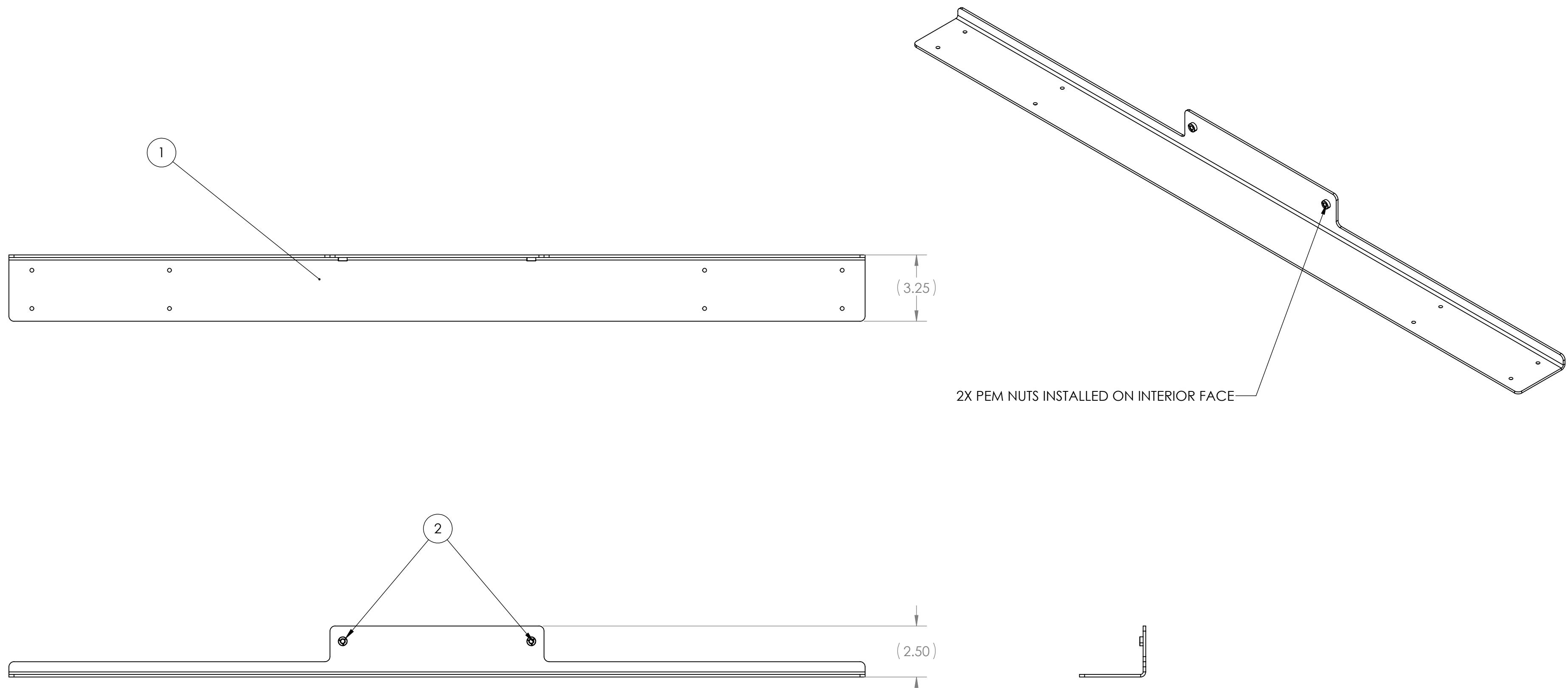
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24108-01	Amp Frame Top	1
2	pem_clinchnut_.25_20 .054	1/4-20 self-clinching nut, .054 shank	2

UNLESS OTHERWISE SPECIFIED:			VEND	NAME	DATE
DIMENSIONS ARE IN INCHES			DRAWN	NE	9/18/2023
TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .005$					
PROPRIETARY AND CONFIDENTIAL THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.					

MATERIAL/FINISH:	COMMENTS:		
8GA 5052 Aluminum	REMOVE ALL BURRS AND SHARP EDGES.		

DO NOT SCALE DRAWING	SIZE	DWG. NO.	REV
	C	GE-24108	

SCALE: 1:4	SHEET 1 OF 1
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FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
**Amp Frame Top
with PEMs**

SIZE DWG. NO. REV

C GE-24108

SCALE: 1:4 SHEET 1 OF 1

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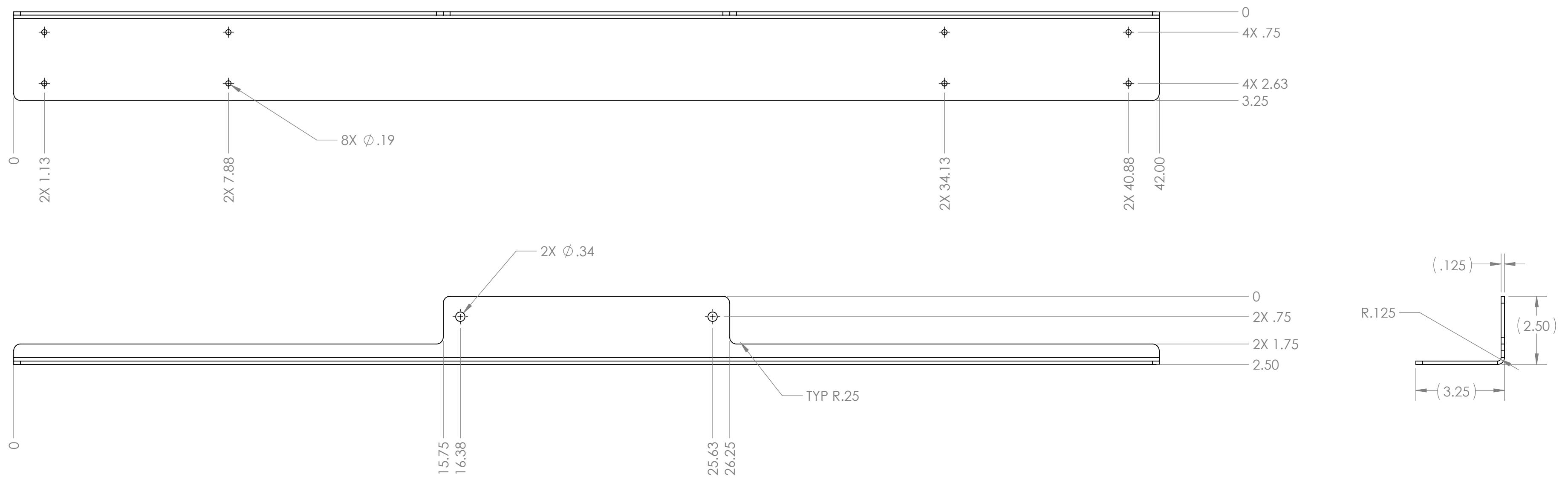
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UNLESS OTHERWISE SPECIFIED:	BEND	NAME	DATE
DRAWN	NE	9/18/2023	
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH:	SIZE	DWG. NO.	REV
8GA 5052 Aluminum	C	GE-24108-01	
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING	SCALE: 1:3	SHEET 1 OF 1	

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
Amp Frame Top

SIZE DWG. NO. REV
C GE-24108-01

SCALE: 1:3 SHEET 1 OF 1

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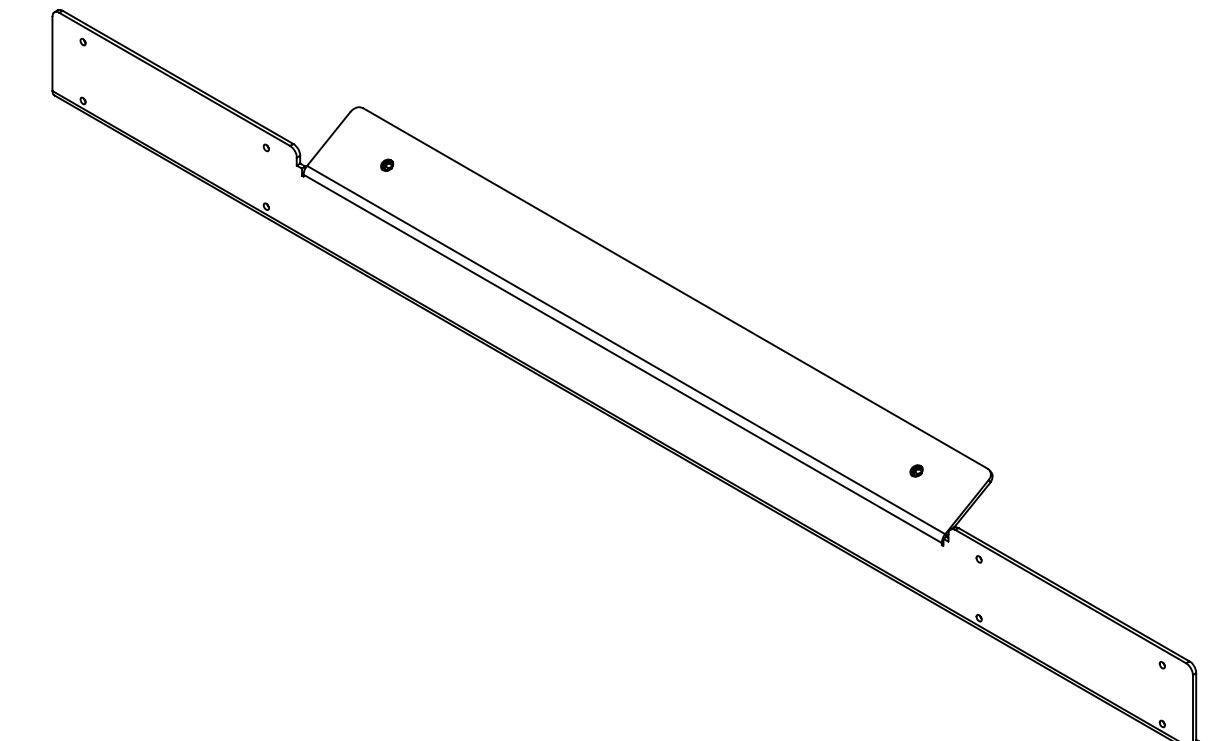
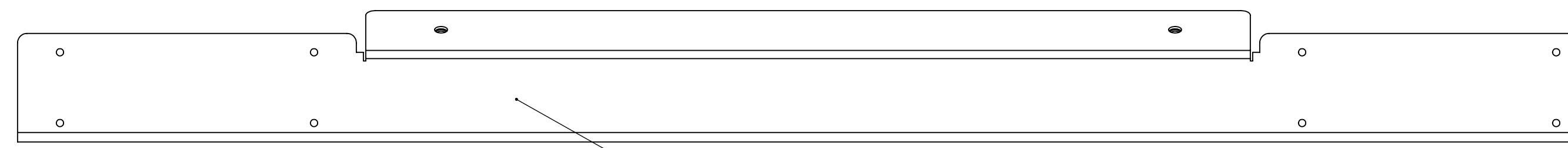
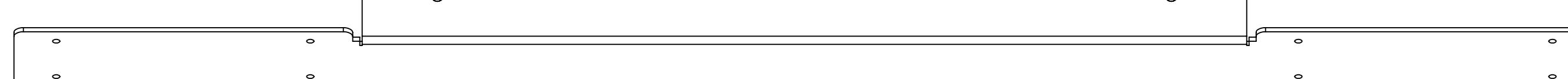
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24109-01	Amp Frame Bottom	1
2	pem_clinchnut_.25_20 .054	1/4-20 self-clinching nut, .054 shank	2

UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL $\pm 1/16$
ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$
TWO PLACE DECIMAL $\pm .01$
THREE PLACE DECIMAL $\pm .005$

MATERIAL/FINISH:
8GA 5052 Aluminum

DO NOT SCALE DRAWING

VEND	NAME	DATE
DRAWN	NE	9/18/2023

PROPRIETARY AND CONFIDENTIAL

THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.

COMMENTS:
REMOVE ALL BURRS AND SHARP EDGES.

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:

**Amp Frame
Bottom with PEMs**

SIZE DWG. NO. REV

C GE-24109

SCALE: 1:3 SHEET 1 OF 1

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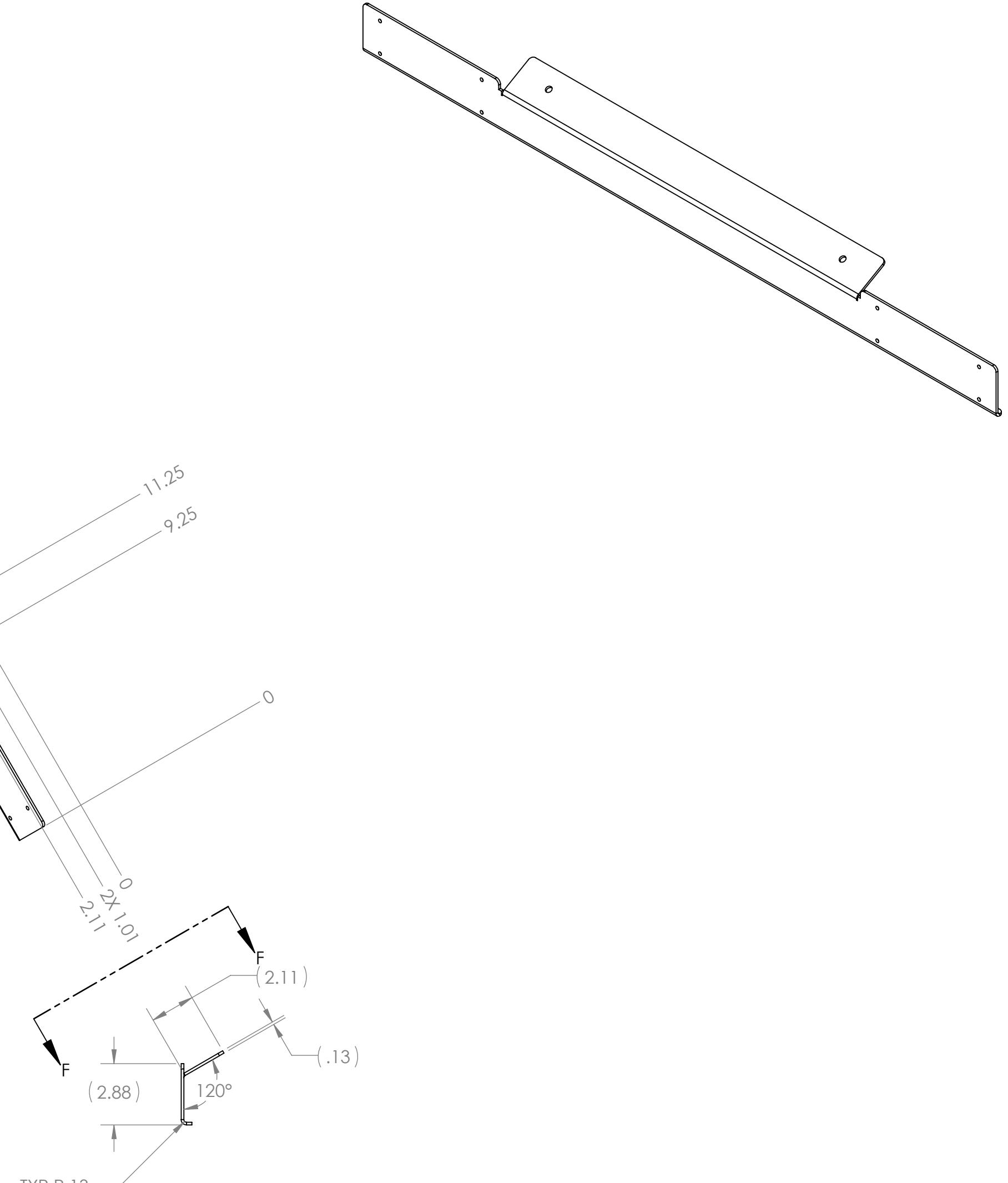
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42.00
2X 40.88
2X 34.13
33.90
32.75
TYP R.25
8X Ø .19

.50
2X 1.13
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4X .50
2X 7.88
2X 2.88
2.21
2.38
.50
9.25

VIEW F-F



UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES

TOLERANCES:

FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .02$ THREE PLACE DECIMAL $\pm .010$

MATERIAL/FINISH:

8GA 5052 Aluminum

BEND NAME DATE

DRAWN NE 9/18/2023

PROPRIETARY AND CONFIDENTIAL

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COMMENTS:

REMOVE ALL BURRS AND SHARP EDGES.

DO NOT SCALE DRAWING

 FIRST ROBOTICS COMPETITION  SOLIDWORKS Modeling Solutions Partner

TITLE:
**Amp Frame
Bottom**

SIZE DWG. NO. REV
C GE-24109-01

SCALE: 1:5 SHEET 1 OF 1

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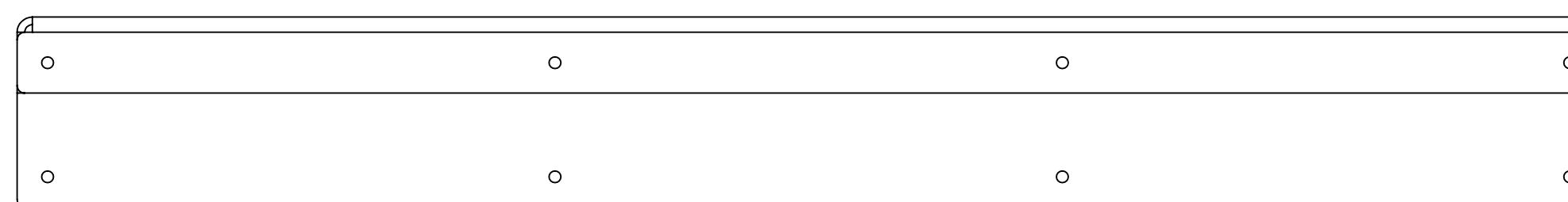
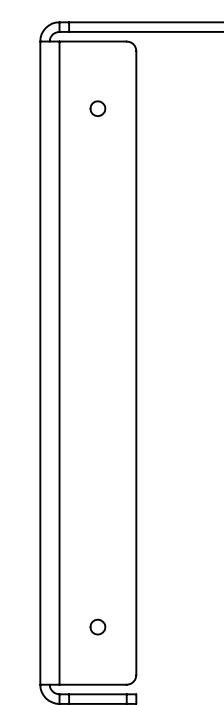
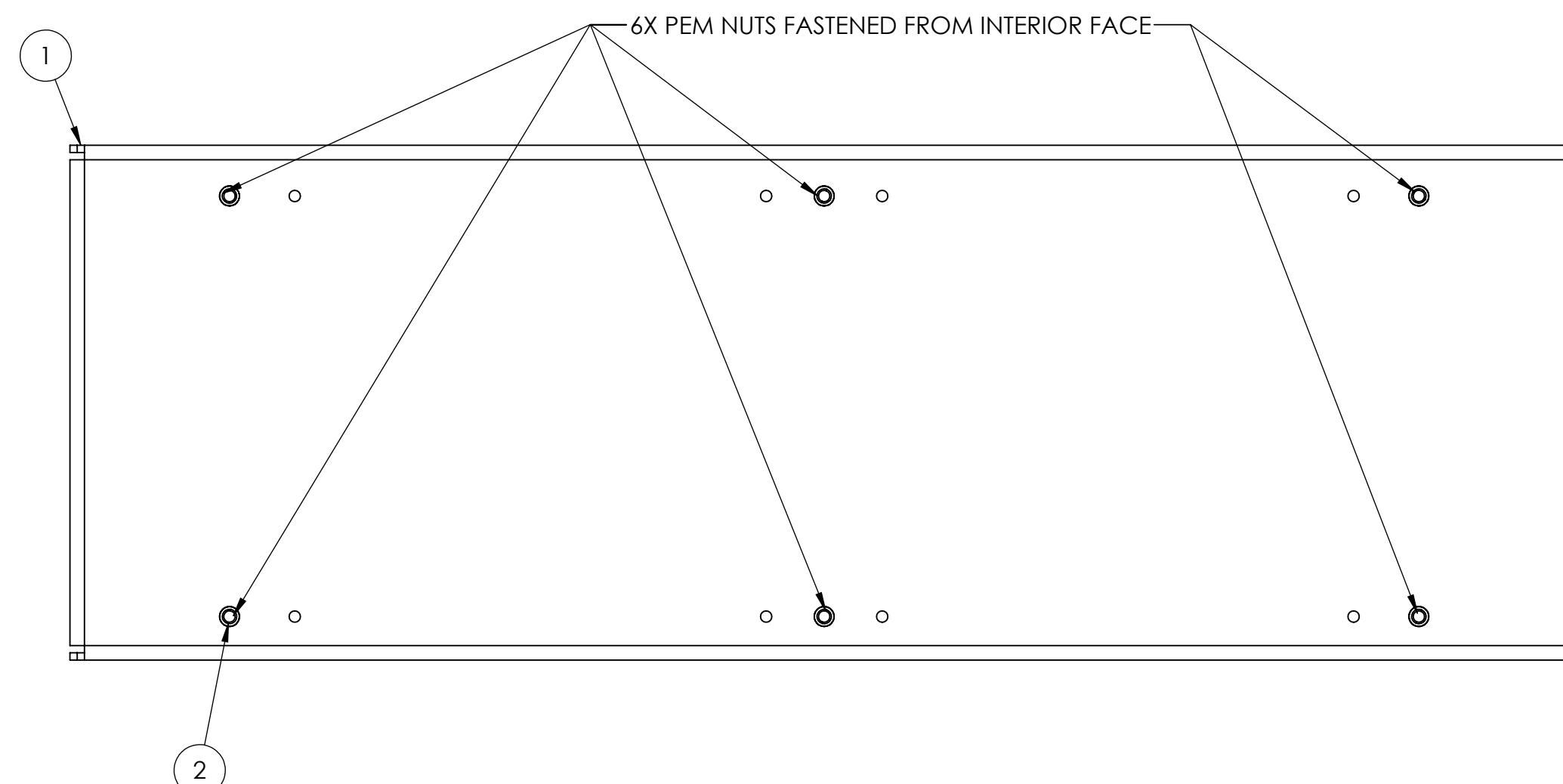
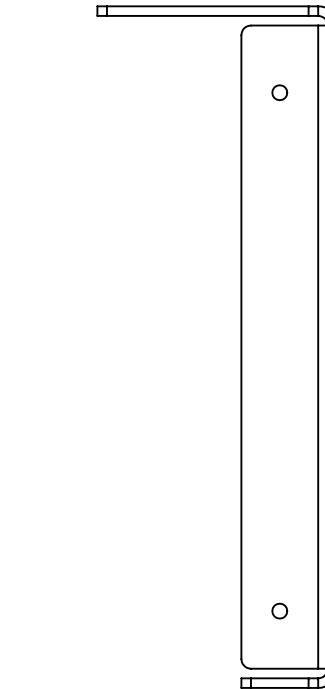
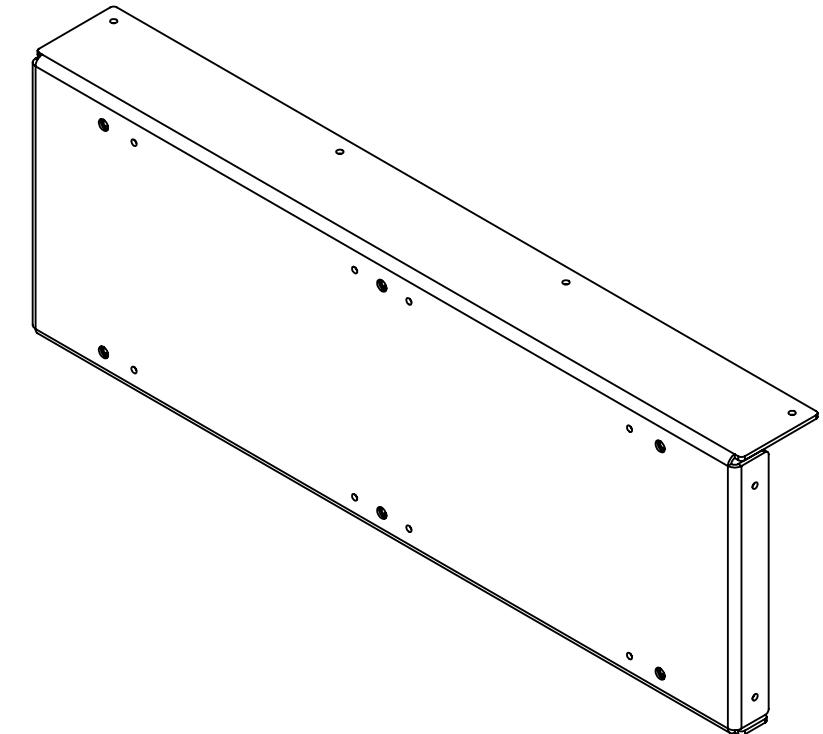
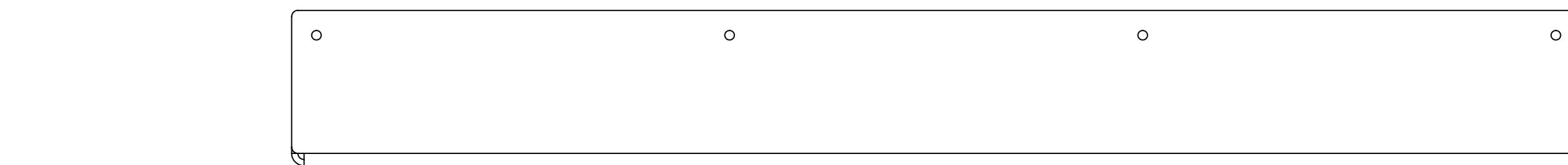
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NOTES:
1. REMOVE ALL BURRS AND SHARP EDGES

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24110-01	Amp Frame Side	1
2	pem_clinchnut_.25_20 .054	1/4-20 self-clinching nut, .054 shank	6
VEND	NAME	DATE	
DRAWN	NE	9/18/2023	

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES
TOLERANCES: FRACTIONAL $\pm 1/16$
ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$
TWO PLACE DECIMAL $\pm .01$
THREE PLACE DECIMAL $\pm .005$

PROPRIETARY AND CONFIDENTIAL
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MATERIAL/FINISH: 8GA 5052 Aluminum

COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.

DO NOT SCALE DRAWING NOTES: 1. REMOVE ALL BURRS AND SHARP EDGES

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE: Amp Frame Side with PEMs

SIZE	DWG. NO.	REV
C	GE-24110	
SCALE: 2:5	SHEET 1 OF 1	

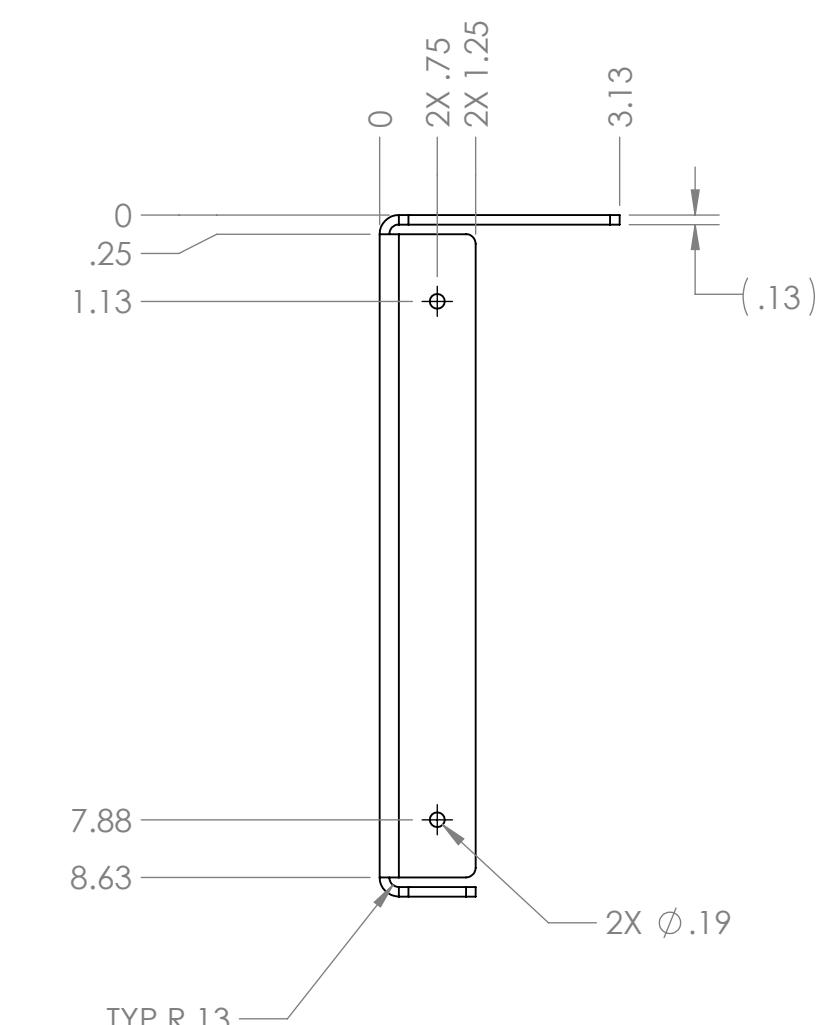
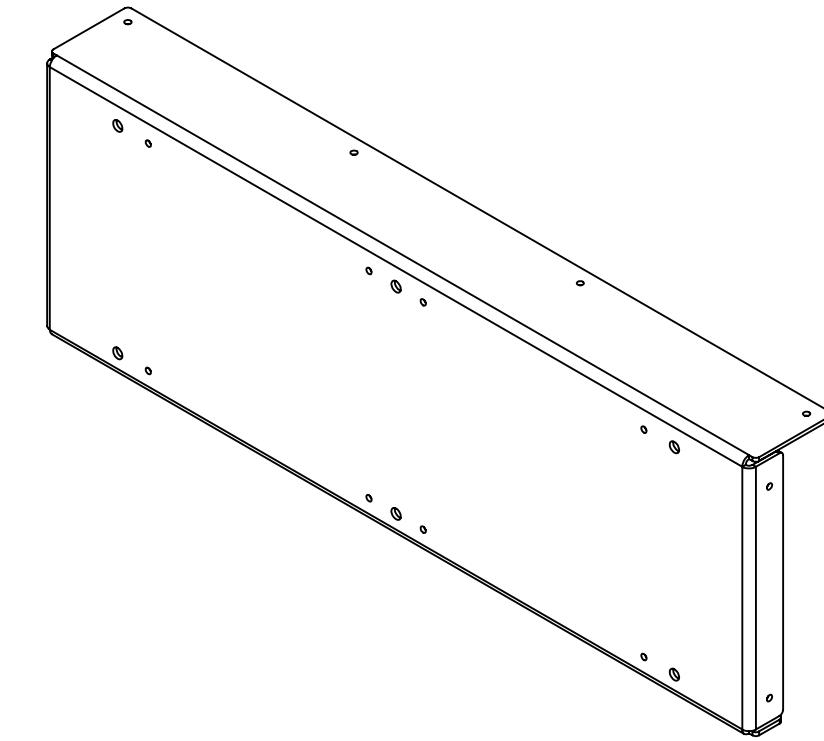
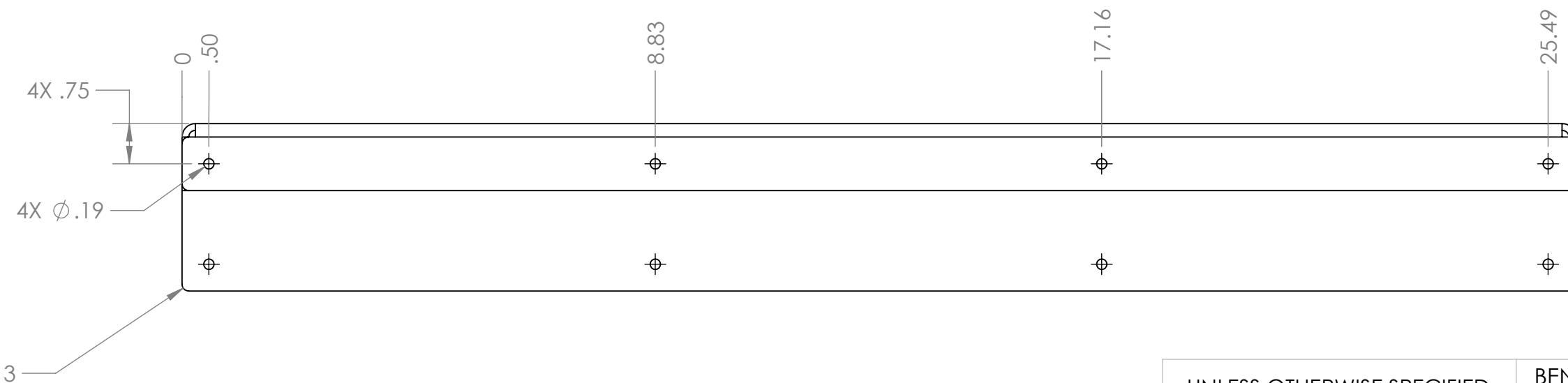
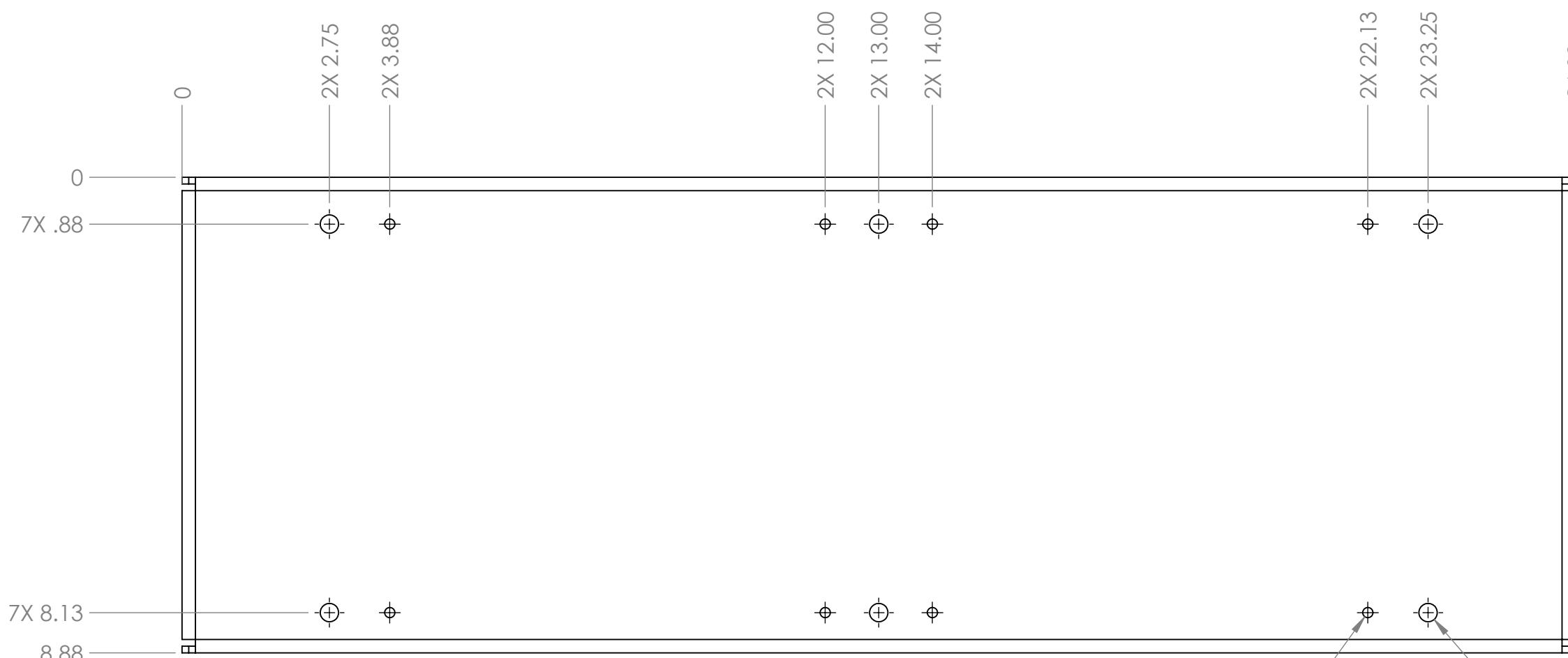
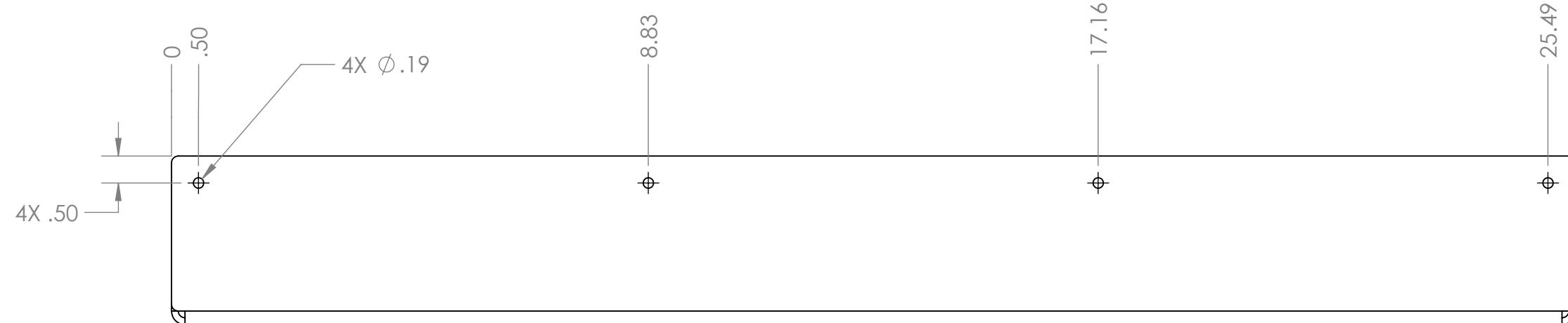
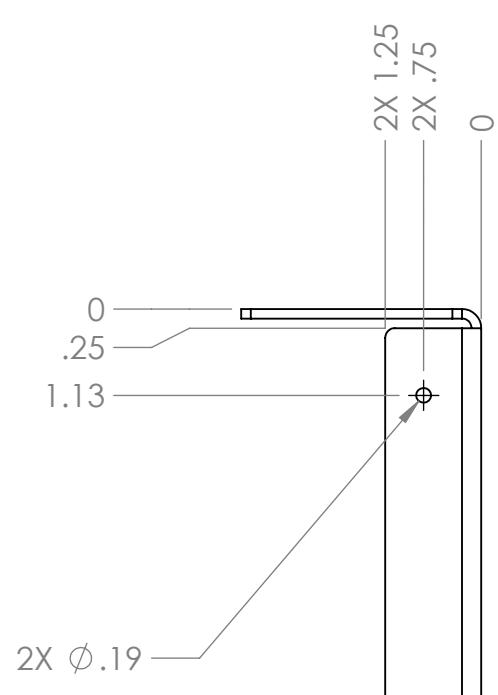
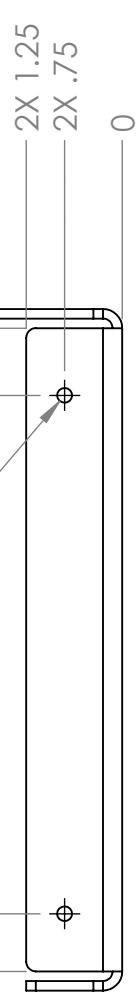
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UNLESS OTHERWISE SPECIFIED:		BEND	NAME	DATE
DIMENSIONS ARE IN INCHES		DRAWN	NE	9/18/2023
TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$				
TWO PLACE DECIMAL $\pm .02$ THREE PLACE DECIMAL $\pm .010$				
PROPRIETARY AND CONFIDENTIAL				
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.				
MATERIAL/FINISH: 8GA 5052 Aluminum				
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.				
DO NOT SCALE DRAWING				

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE: Amp Frame Side

SIZE DWG. NO. REV

C GE-24110-01

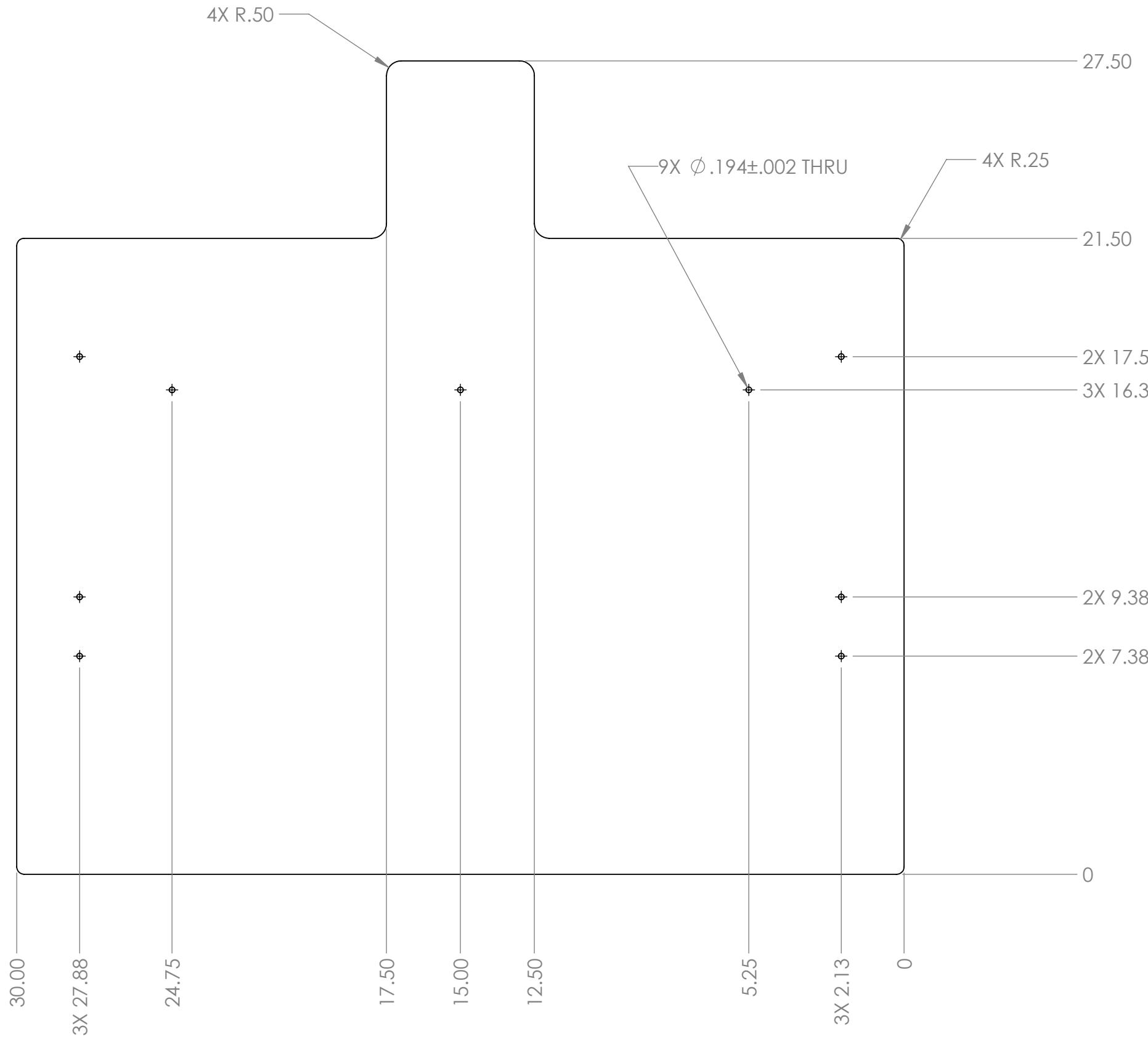
SCALE: 2:5 SHEET 1 OF 1

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Note: Tag or Label with Part Number

UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES

TOLERANCES:

FRACTIONAL $\pm 1/16$

ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$

TWO PLACE DECIMAL $\pm .01$

THREE PLACE DECIMAL $\pm .005$

MATERIAL/FINISH:

1/4" HDPE, Black Matte Finish

DO NOT SCALE DRAWING

VEND NAME DATE

DRAWN JO 10/12/2023

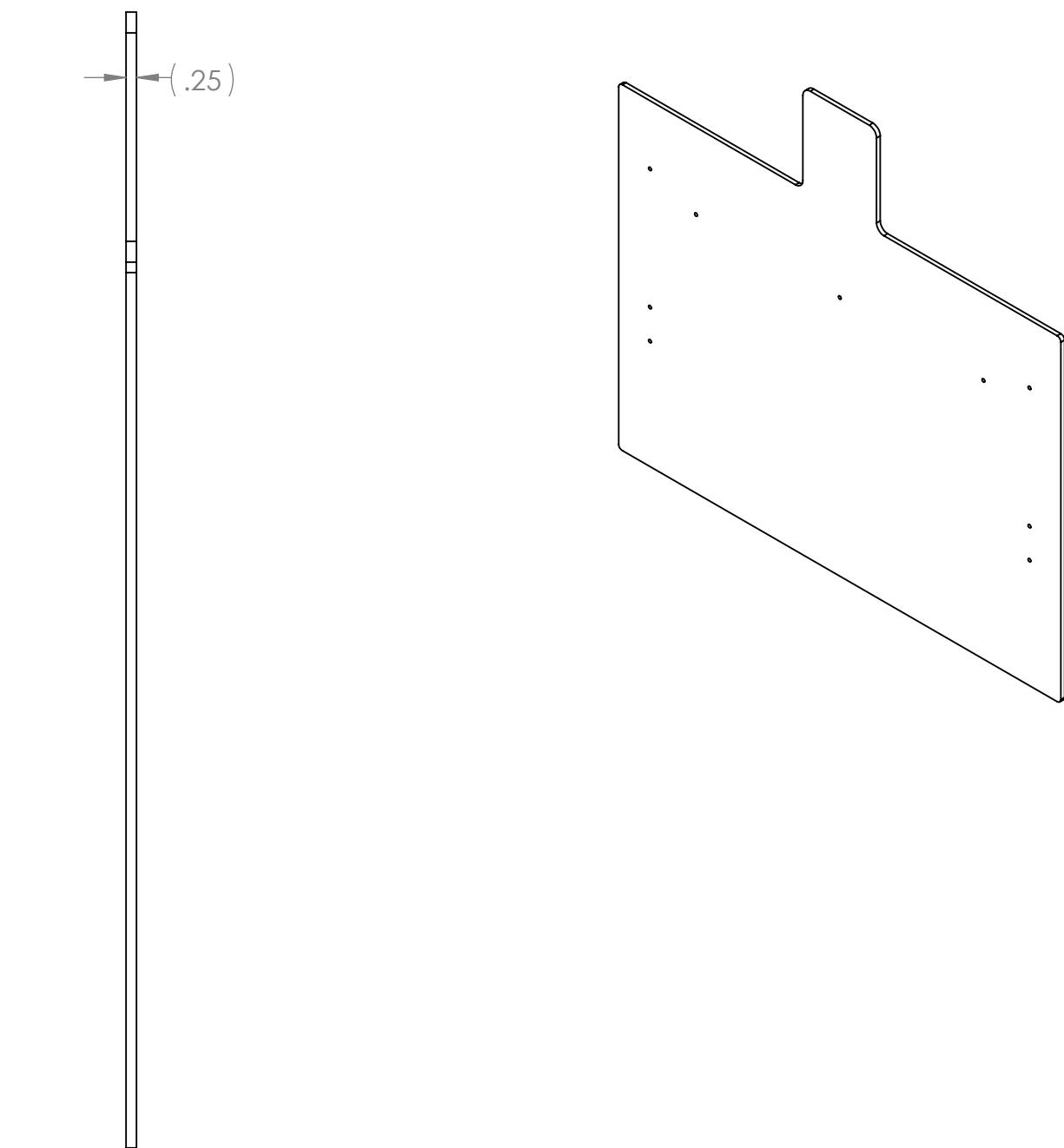


TITLE: Amp Back

SIZE DWG. NO. REV

C GE-24111

SCALE: 1:4 SHEET 1 OF 1



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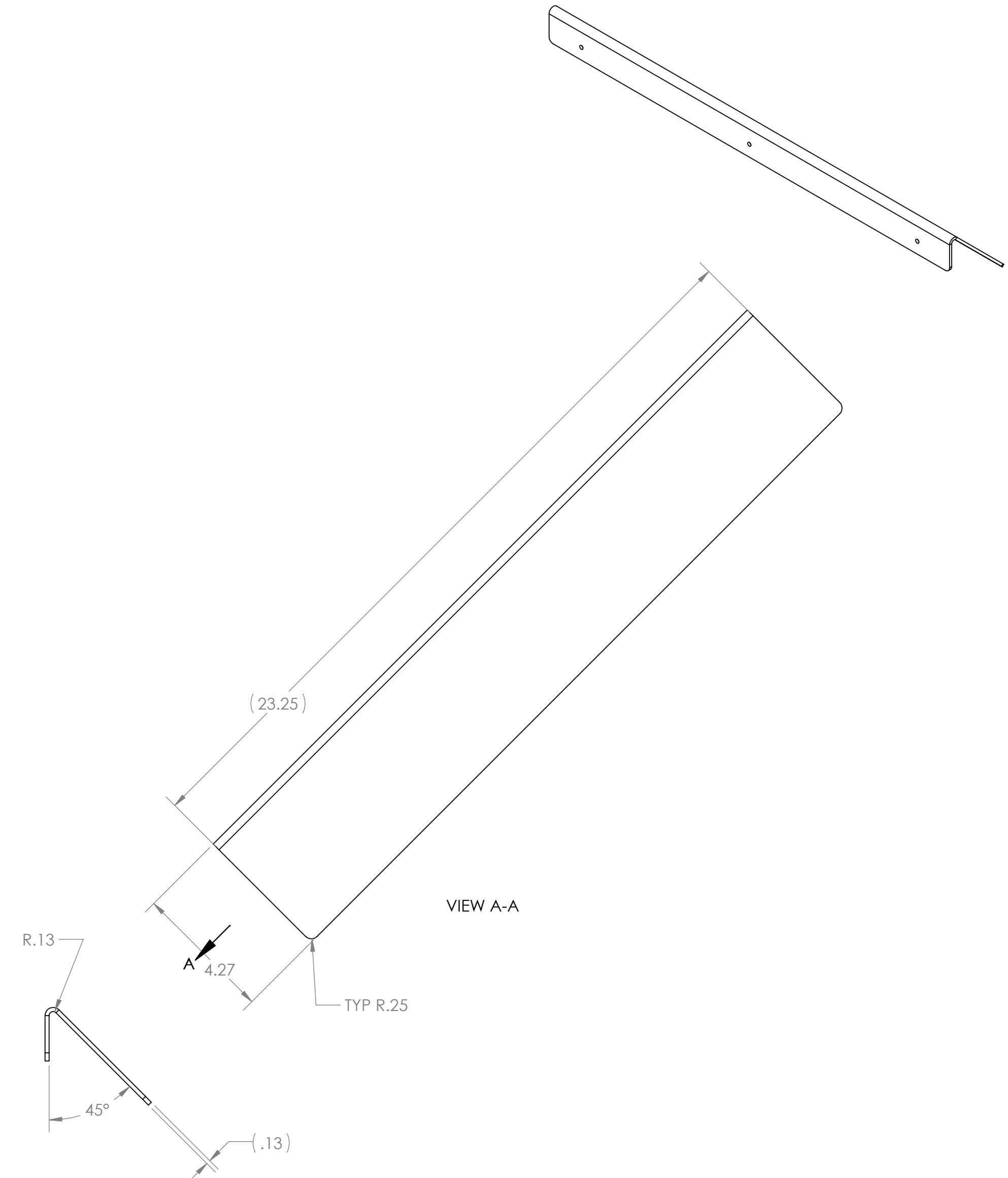
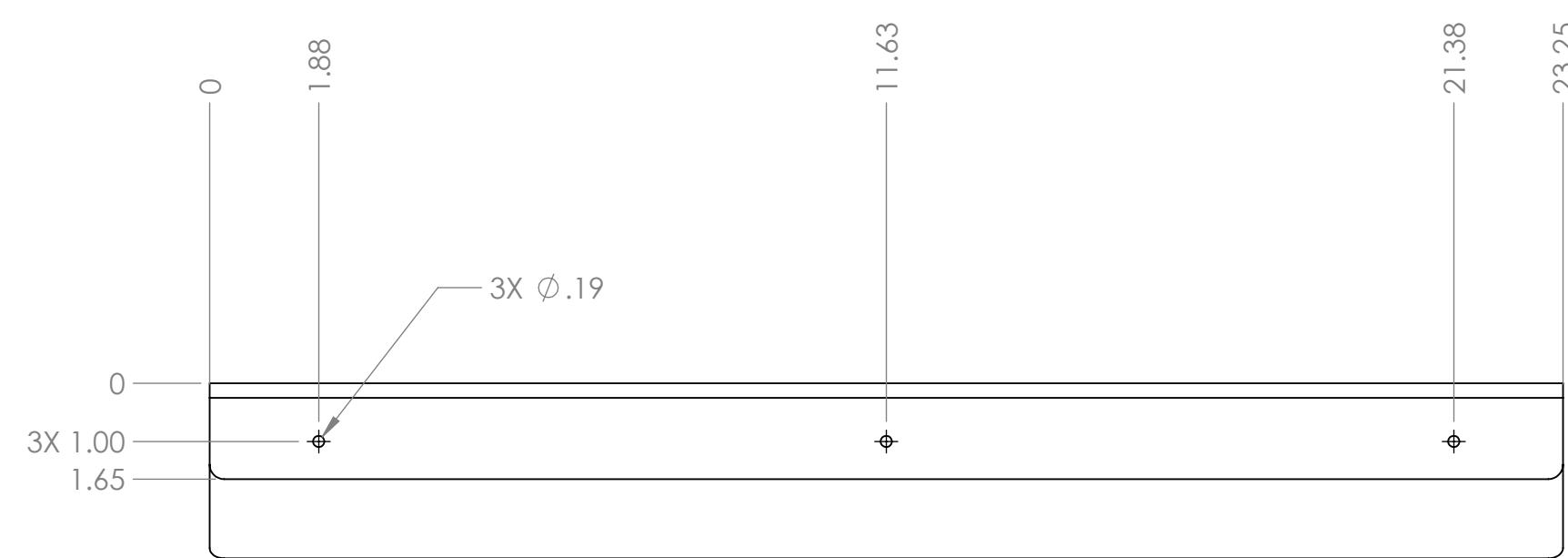
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UNLESS OTHERWISE SPECIFIED:	BEND	NAME	DATE
DRAWN	NE	9/18/2023	
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH:	SIZE	DWG. NO.	REV
8GA 5052 Aluminum	C	GE-24112	
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING	SCALE: 1:3	SHEET 1 OF 1	

 **FIRST ROBOTICS COMPETITION**  **SOLIDWORKS**
Modeling Solutions Partner

TITLE: **Amp Deflector**

SIZE DWG. NO. REV
C GE-24112

SCALE: 1:3 SHEET 1 OF 1

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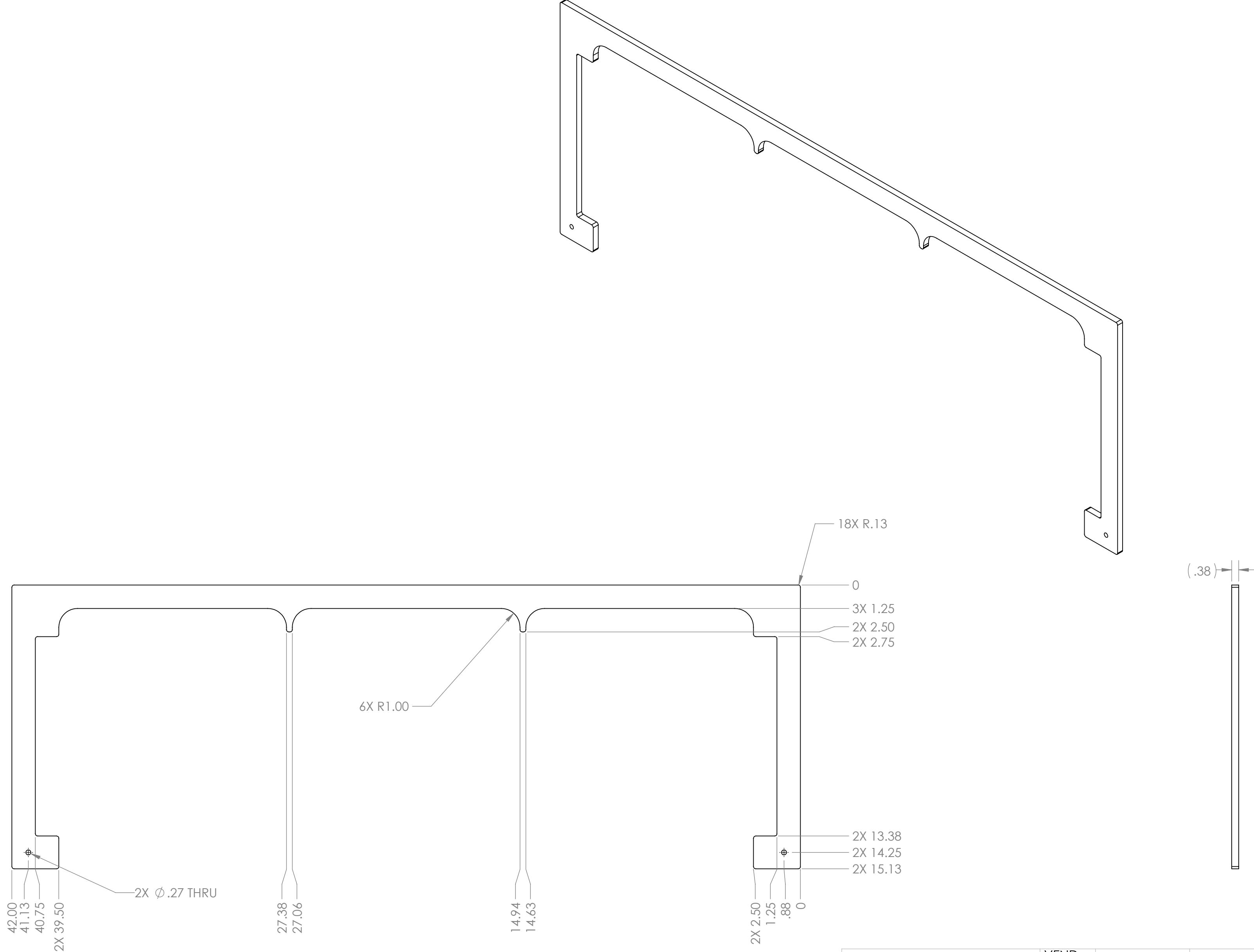
C

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Note: Tag or Label with Part Number

UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	JO	10/12/2023	
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH: 3/8" Polycarbonate, Clear			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
**Truss Capture
Large**

SIZE DWG. NO. REV
C GE-24113

SCALE: 1:4 SHEET 1 OF 1

4

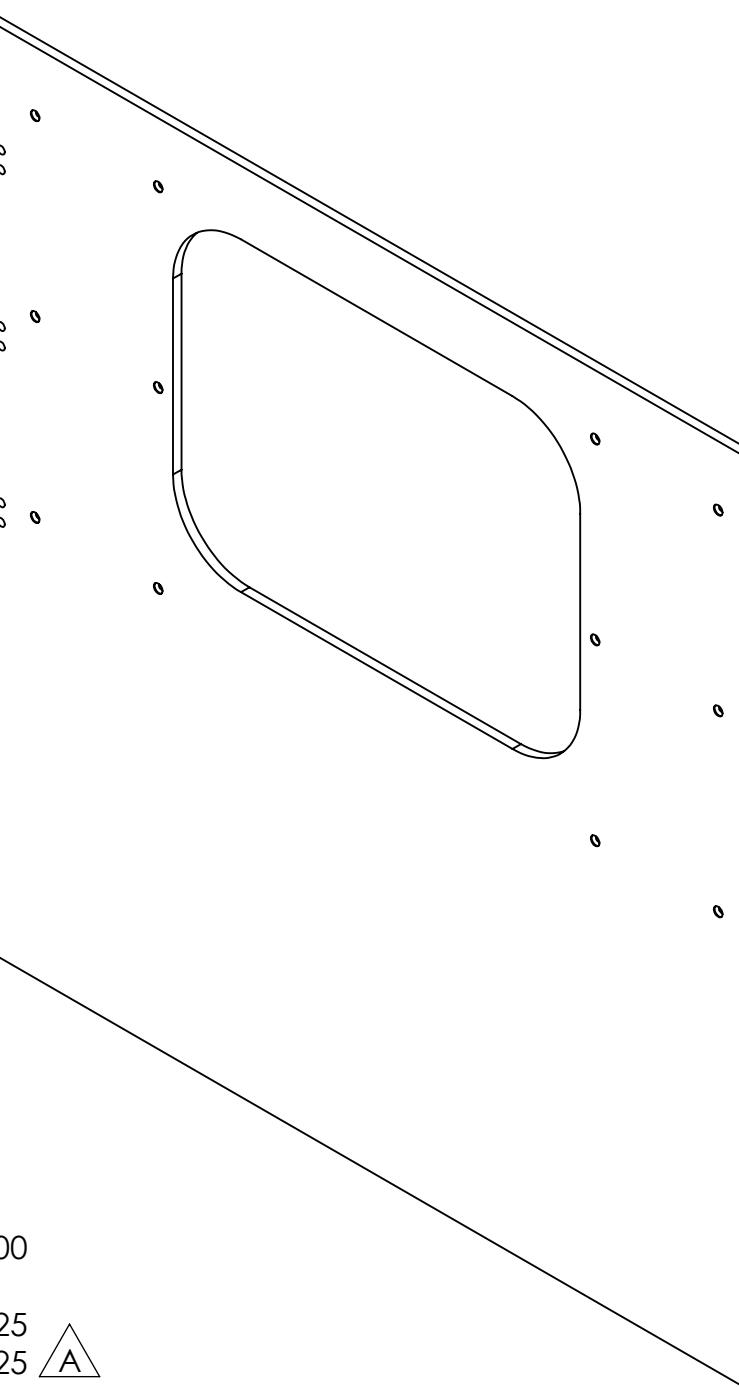
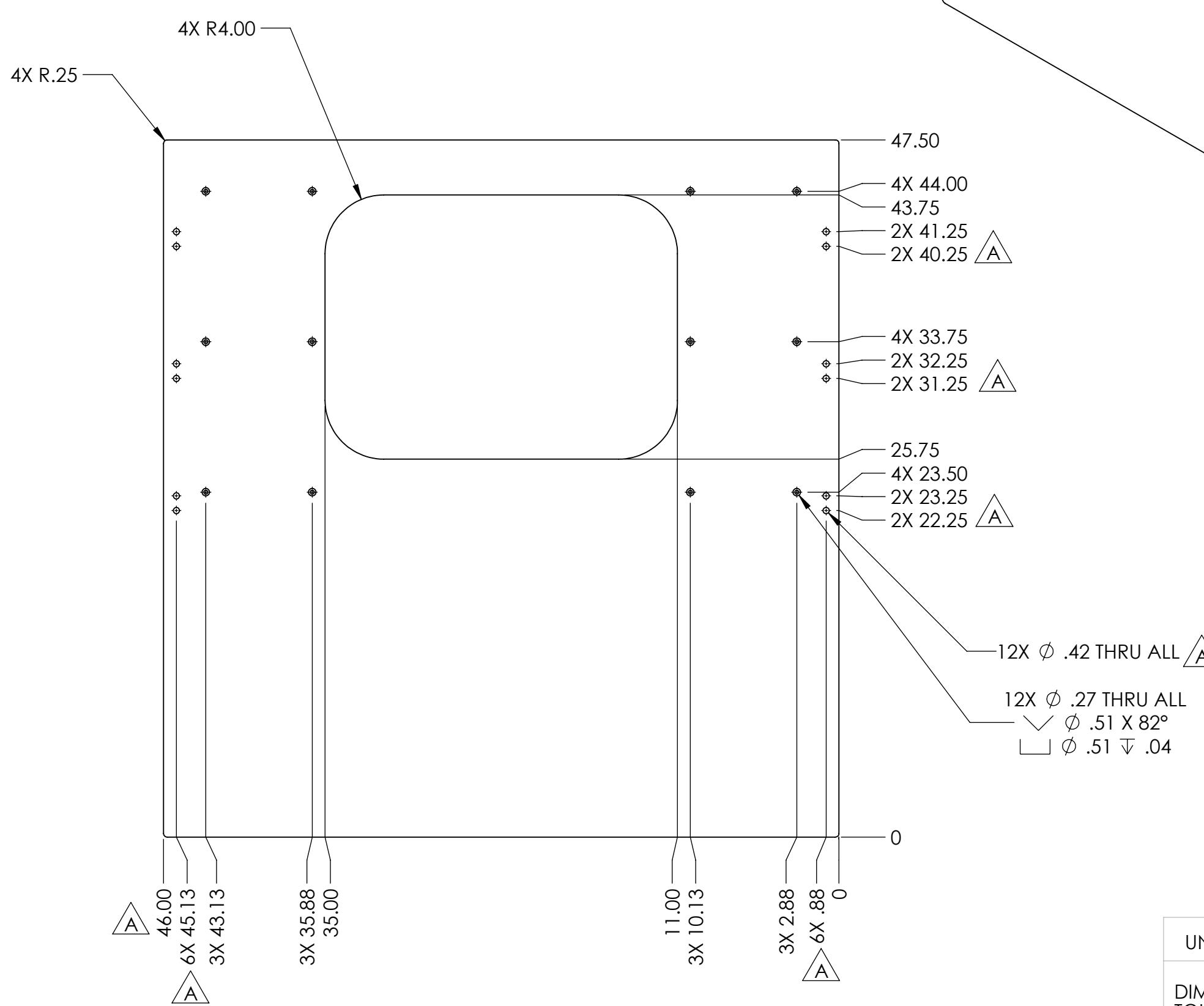
3

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REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
A3, A4, B2, B3, C3	A	Part made wider and holes added for Cable Ties	10/24/2023	JO

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL $\pm 1/16$
ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$
TWO PLACE DECIMAL $\pm .01$
THREE PLACE DECIMAL $\pm .005$

PROPRIETARY AND CONFIDENTIAL
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MATERIAL/FINISH:
1/2" HDPE, Red Matte Finish

COMMENTS:
REMOVE ALL BURRS AND SHARP EDGES.

DO NOT SCALE DRAWING

VEND NAME DATE
DRAWN JO 10/12/2023

TITLE: Front Red

SIZE DWG. NO. REV
C GE-24114 A

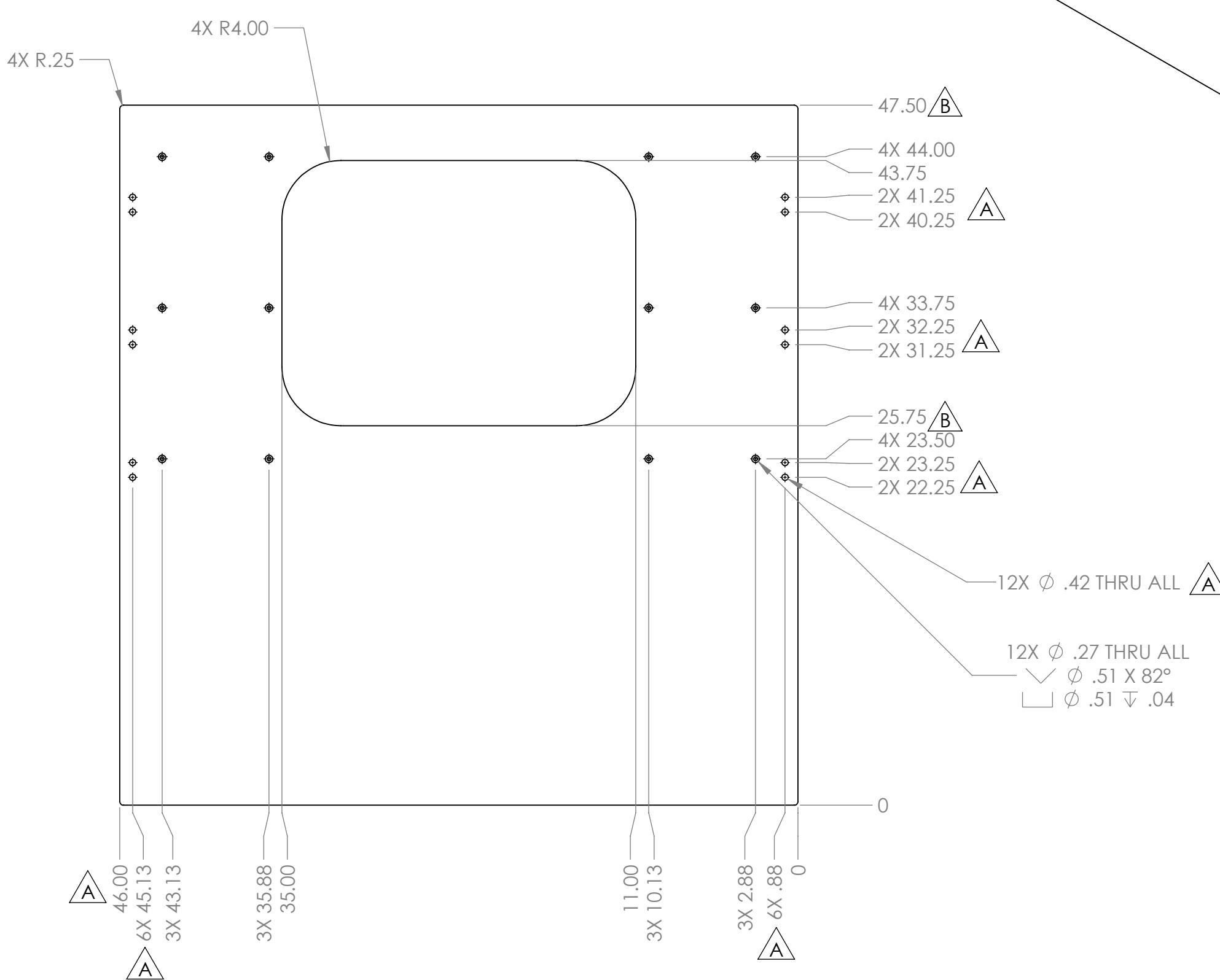
SCALE: 1:8 SHEET 1 OF 1



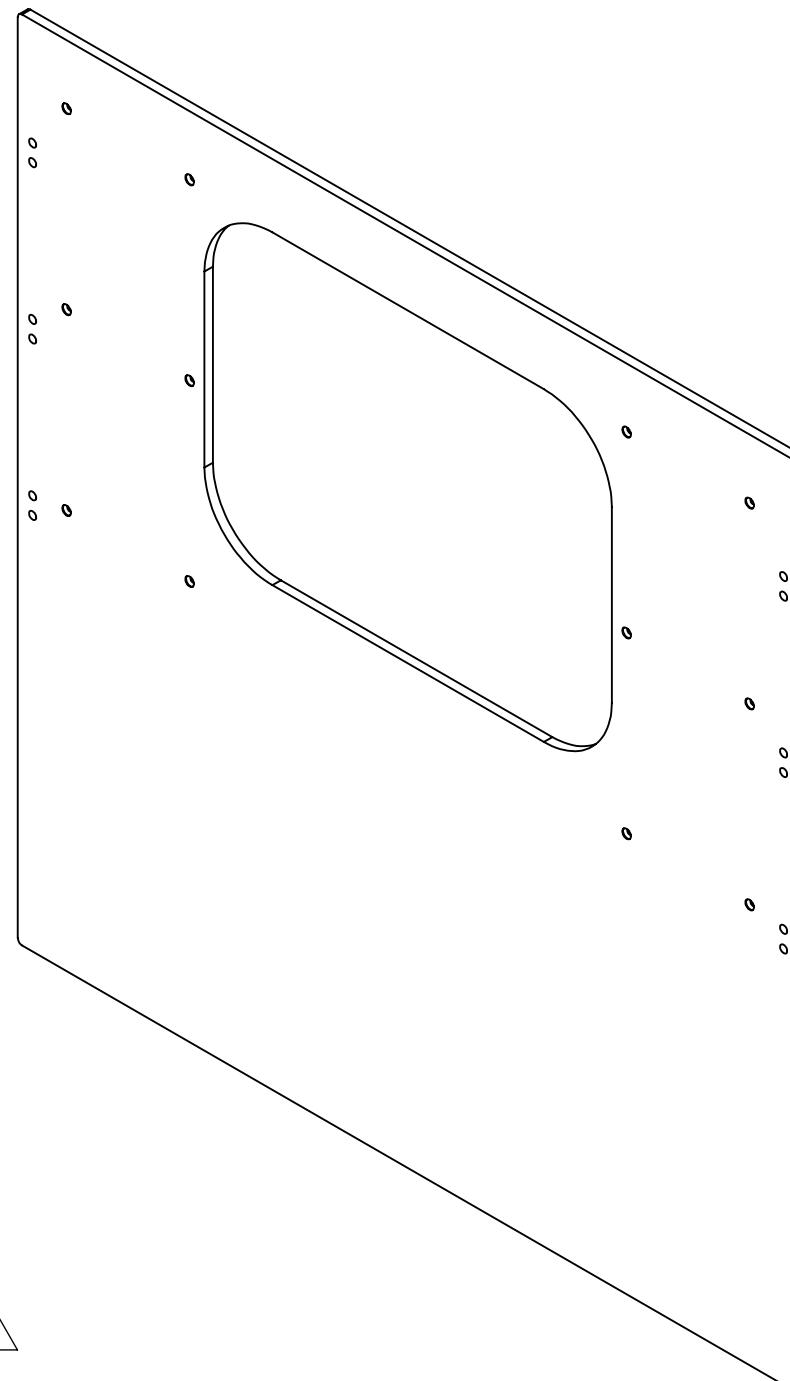
SOLIDWORKS
Modeling Solutions Partner

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Note: Tag or Label with Part Number



REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
A3, A4, B2, B3, C3	A	Part made wider and Cable tie holes added	10/24/2023	JO
B3, C3	B	Shortened total part length 0.25" to match GE-24114	11/15/2023	NE

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL $\pm 1/16$
ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$
TWO PLACE DECIMAL $\pm .01$
THREE PLACE DECIMAL $\pm .005$

PROPRIETARY AND CONFIDENTIAL
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MATERIAL/FINISH:
1/2" HDPE, Blue Matte Finish

COMMENTS:
REMOVE ALL BURRS AND SHARP EDGES.

DO NOT SCALE DRAWING

VEND NAME DATE
DRAWN JO 10/12/2023

FIRST ROBOTICS COMPETITION SOLIDWORKS Modeling Solutions Partner

TITLE: Front Blue

SIZE DWG. NO. REV
C GE-24115 B

SCALE: 1:8 SHEET 1 OF 1

4

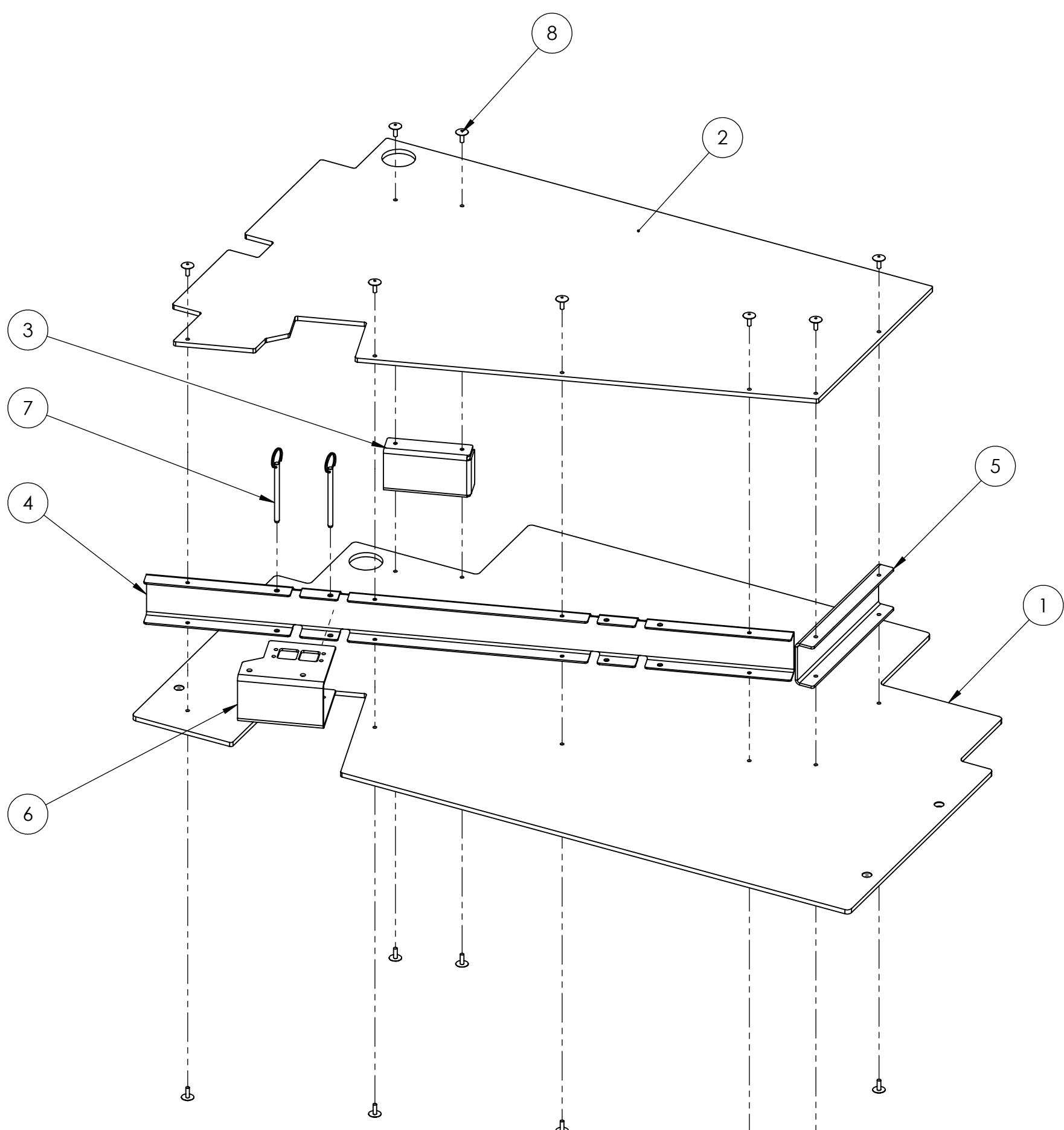
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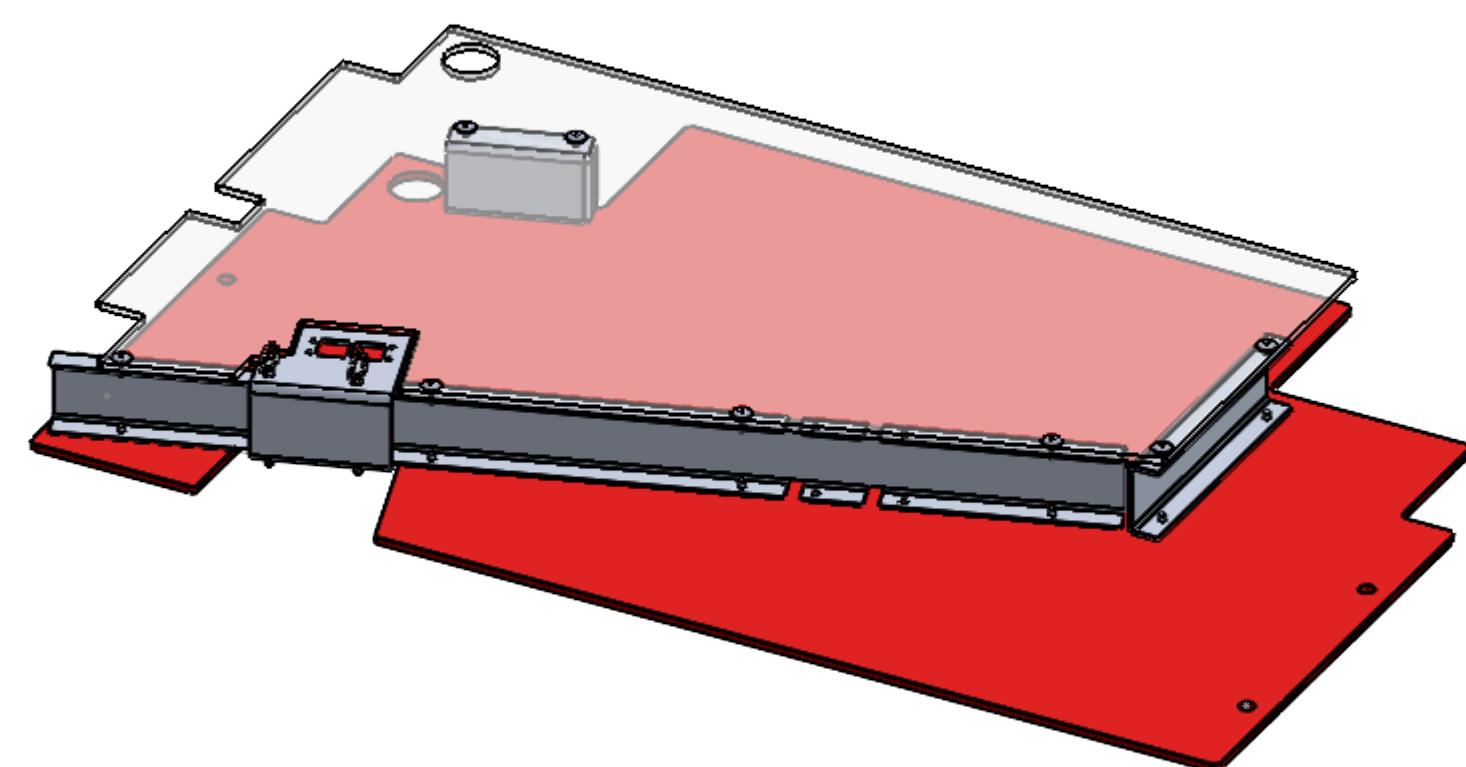
C

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A



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24120	Chute Floor Red	1
2	GE-24122	Chute Top	1
3	GE-24123	Ring Capture Top	1
4	GE-24124	Ring Capture Bottom	1
5	GE-24125	Ring Capture Side	1
6	GE-24126	Sensor Bracket	1
7	pin_quick_ring_.25_3	Pin, Ring-Grip Quick-Release with SS Ring, 1/4" Diameter, 3" Usable Length	2
8	rivet_.1875_.251-.375_largeHead	3/16" Large Head Aluminum Rivet, .251-.375 Grip Range	16

UNLESS OTHERWISE SPECIFIED:

FIELD NAME DATE

DRAWN DF 12/18/2023

**FIRST
ROBOTICS
COMPETITION**
SOLIDWORKS
Modeling Solutions Partner
DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL $\pm 1/2$
ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$
TWO PLACE DECIMAL $\pm .50$

PROPRIETARY AND CONFIDENTIAL

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WHOLE WITHOUT THE WRITTEN
PERMISSION OF FIRST® IS
PROHIBITED.

MATERIAL/FINISH:

COMMENTS:
REMOVE ALL BURRS AND SHARP
EDGES.

DO NOT SCALE DRAWING

TITLE:
**Ring Counter
Red**

SIZE DWG. NO. REV

C GE-24118

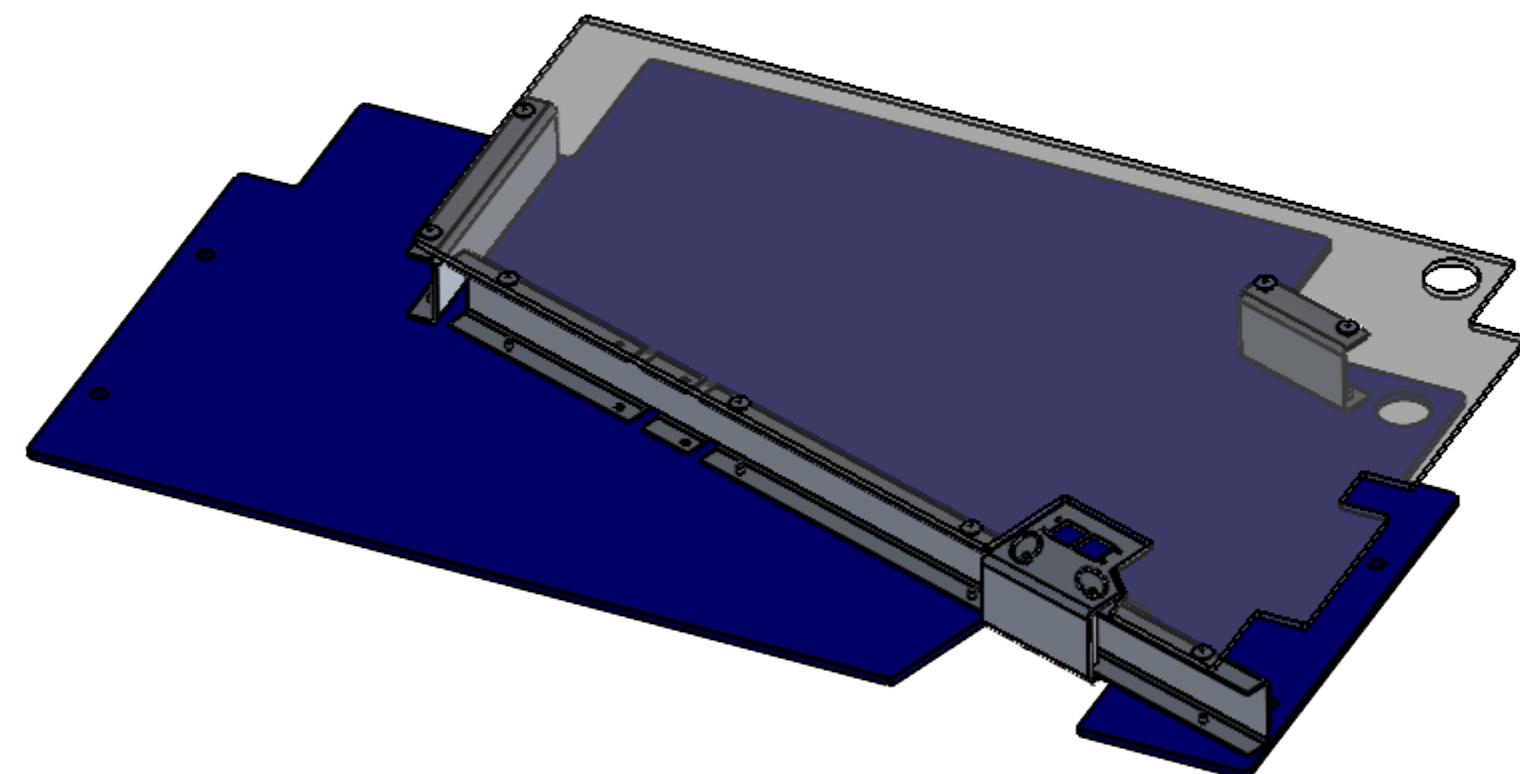
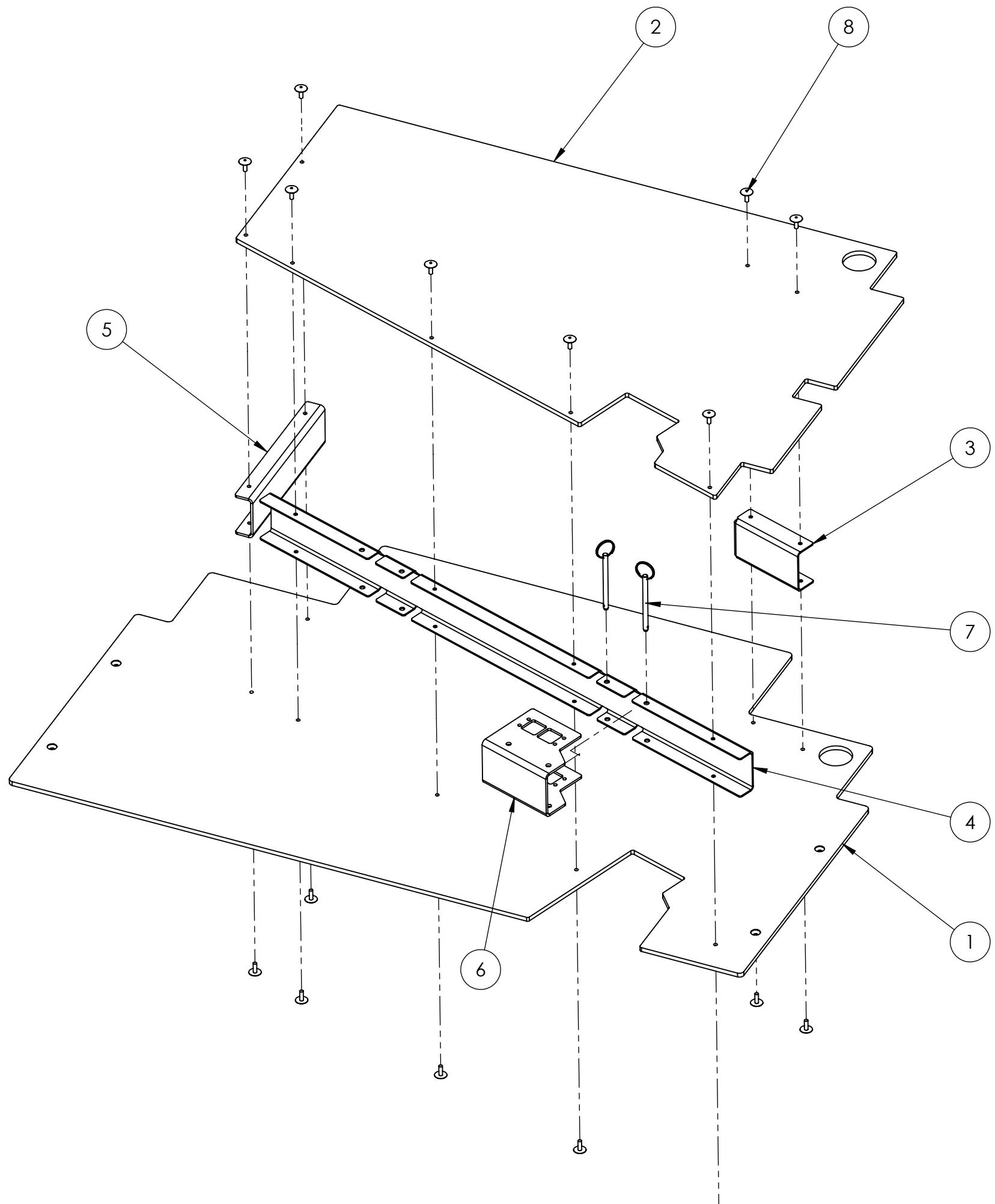
SCALE: 1:6 SHEET 1 OF 1

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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24121	Chute Floor Blue	1
2	GE-24122	Chute Top	1
3	GE-24123	Ring Capture Top	1
4	GE-24124	Ring Capture Bottom	1
5	GE-24125	Ring Capture Side	1
6	GE-24126	Sensor Bracket	1
7	pin_quick_ring_.25_3	Pin, Ring-Grip Quick-Release with SS Ring, 1/4" Diameter, 3" Usable Length	2
8	rivet_.1875_.251-.375_largeHead	3/16" Large Head Aluminum Rivet, .251-.375 Grip Range	16

UNLESS OTHERWISE SPECIFIED:			FIELD	NAME	DATE
			DRAWN	DF	12/18/2023
PROPRIETARY AND CONFIDENTIAL					
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MATERIAL/FINISH:					
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.					
DO NOT SCALE DRAWING					

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Ring Counter Blue

SIZE	DWG. NO.	REV
C	GE-24119	

SCALE: 1:6 **SHEET 1 OF 1**

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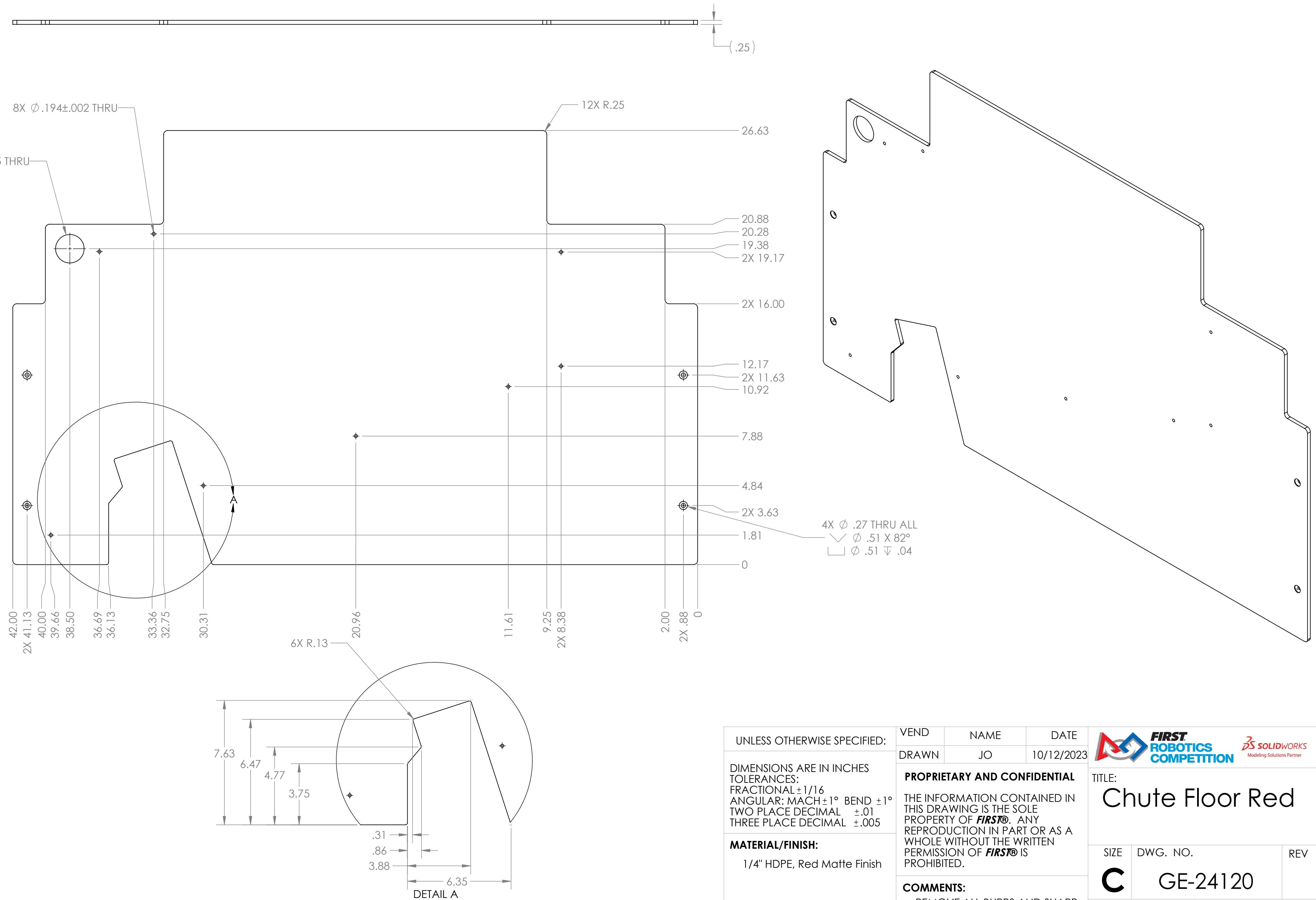
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SIZE	DWG. NO.	REV
C	GE-24120	
SCALE: 1:4	SHEET 1 OF 1	

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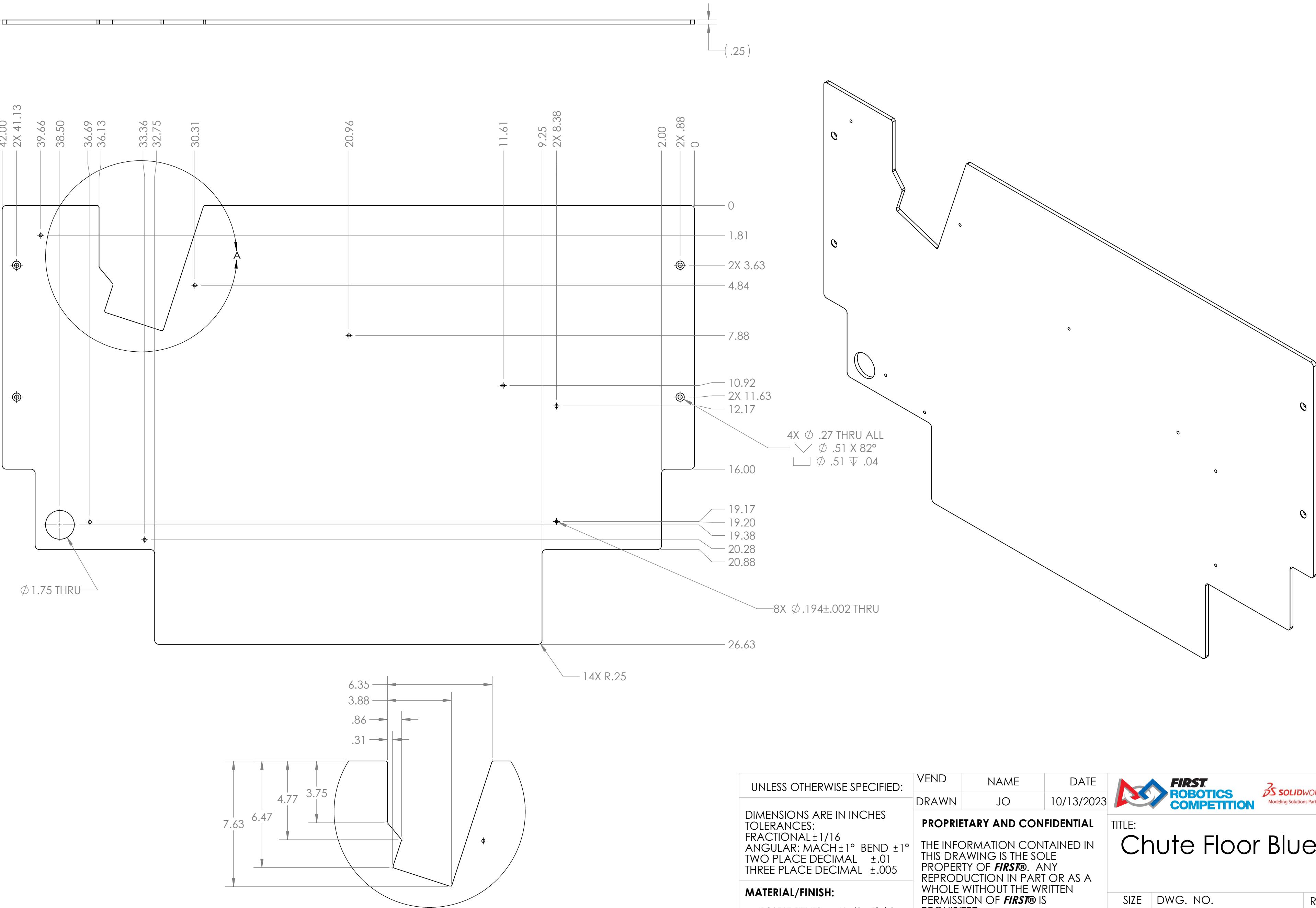
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VEND	NAME	DATE
DRAWN	JO	10/13/2023
FIRST ROBOTICS COMPETITION		
SOLIDWORKS Modeling Solutions Partner		
TITLE:	Chute Floor Blue	
SIZE	DWG. NO.	REV
C	GE-24121	
SCALE: 1:4	SHEET 1 OF 1	

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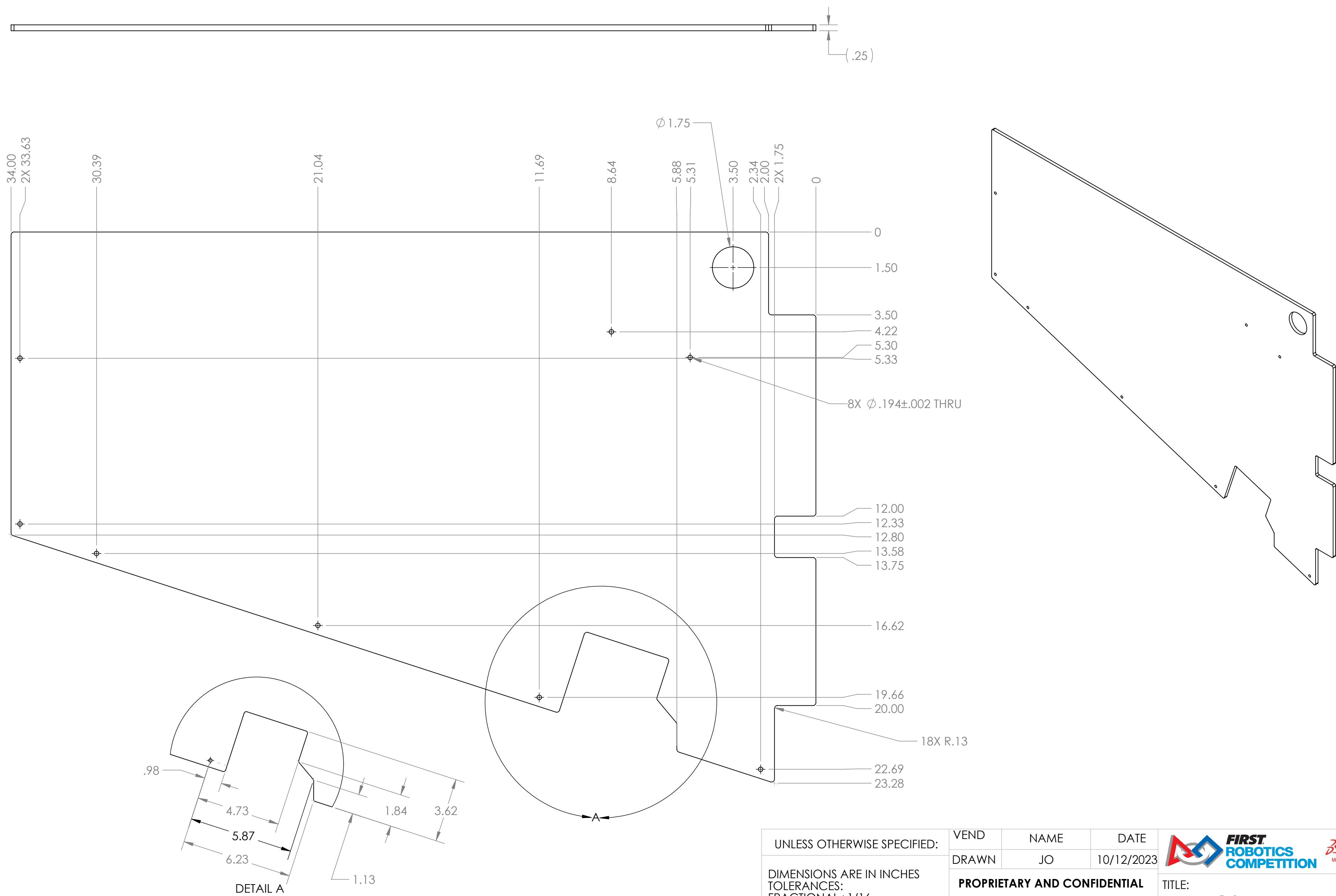
C

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UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL $\pm 1/16$
ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$
TWO PLACE DECIMAL $\pm .01$
THREE PLACE DECIMAL $\pm .005$

MATERIAL/FINISH:

1/4" Polycarbonate, Clear

DO NOT SCALE DRAWING

VEND NAME DATE

DRAWN JO 10/12/2023

PROPRIETARY AND CONFIDENTIAL

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COMMENTS:

REMOVE ALL BURRS AND SHARP EDGES.

SOLIDWORKS
Modeling Solutions Partner

TITLE:

Chute Top

SIZE DWG. NO. REV

C GE-24122

SCALE: 1:4 SHEET 1 OF 1

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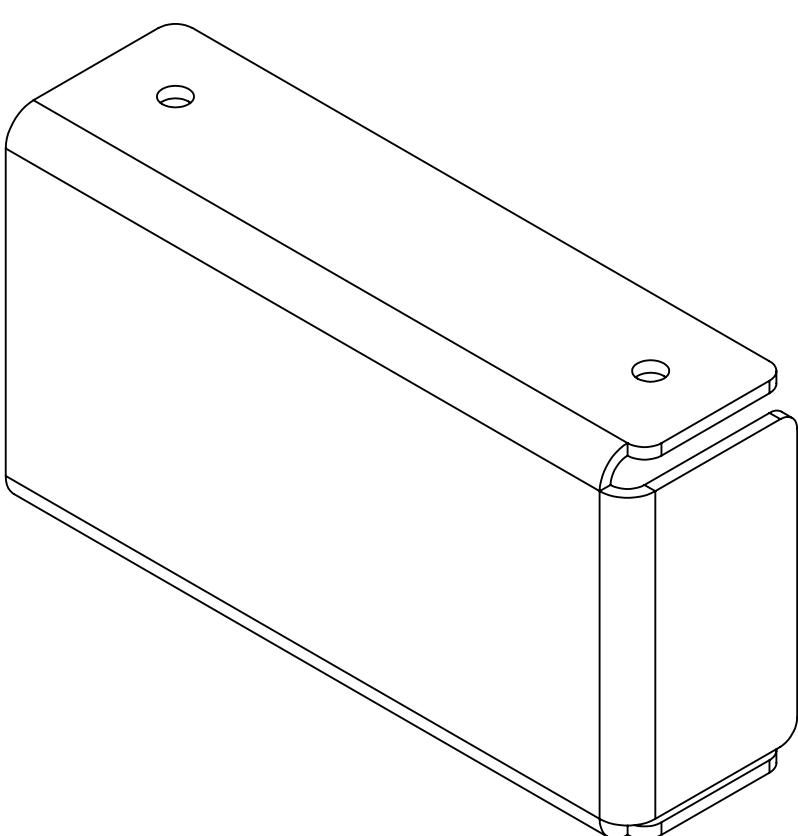
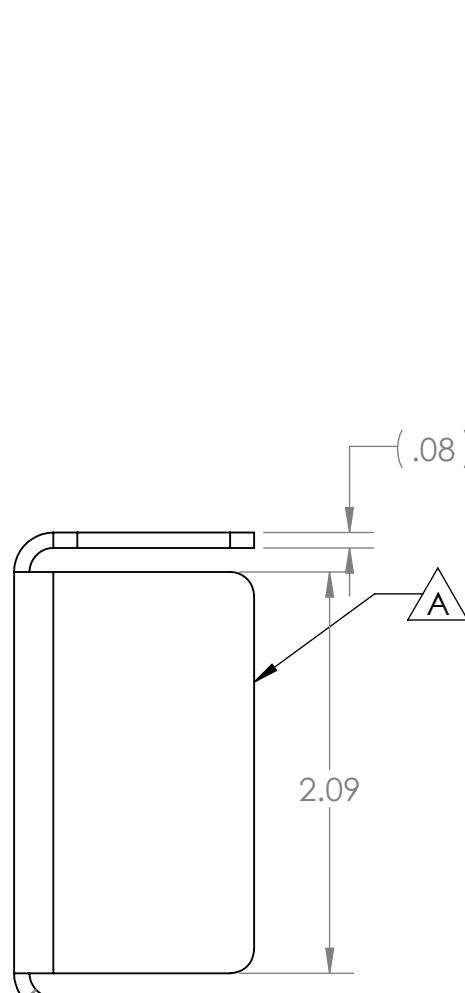
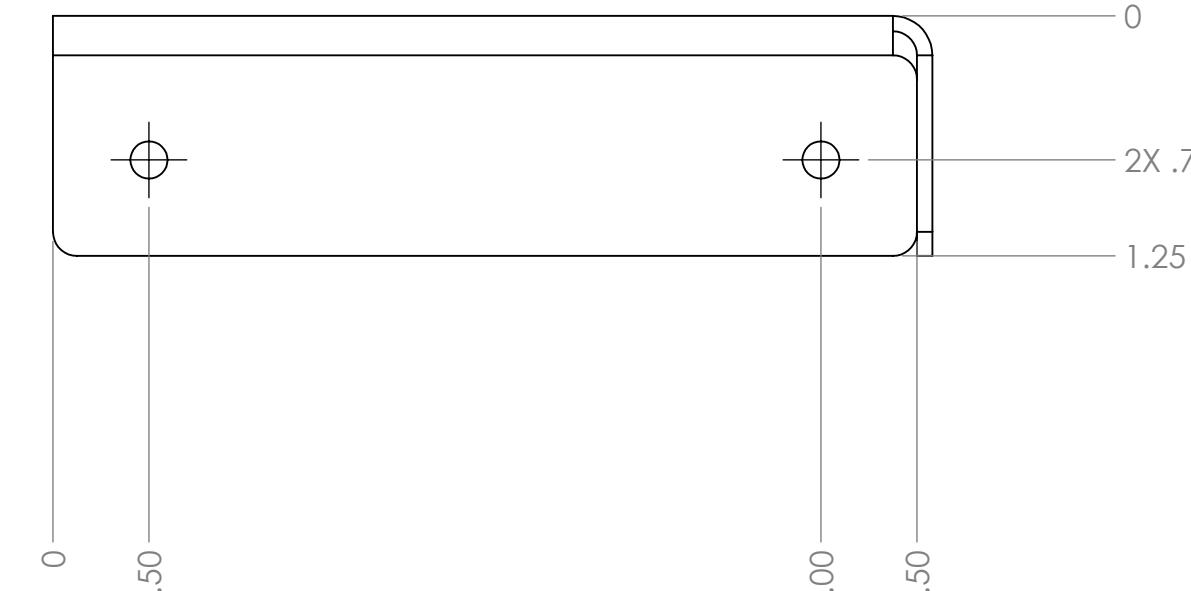
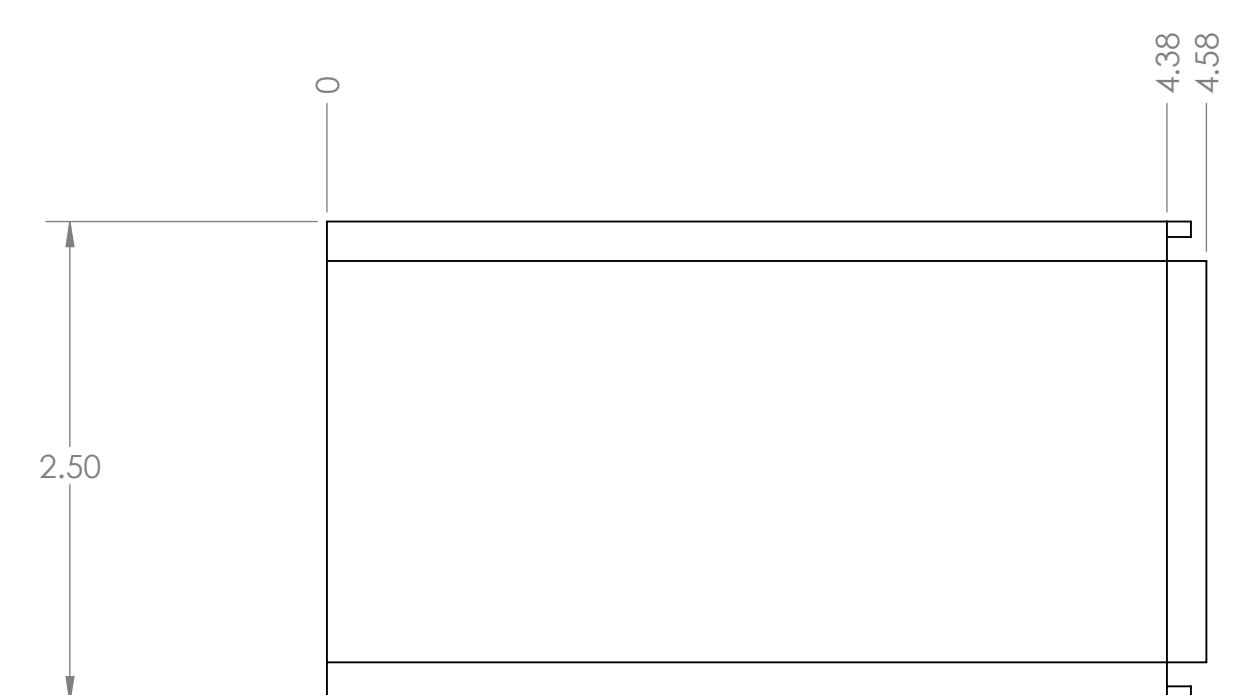
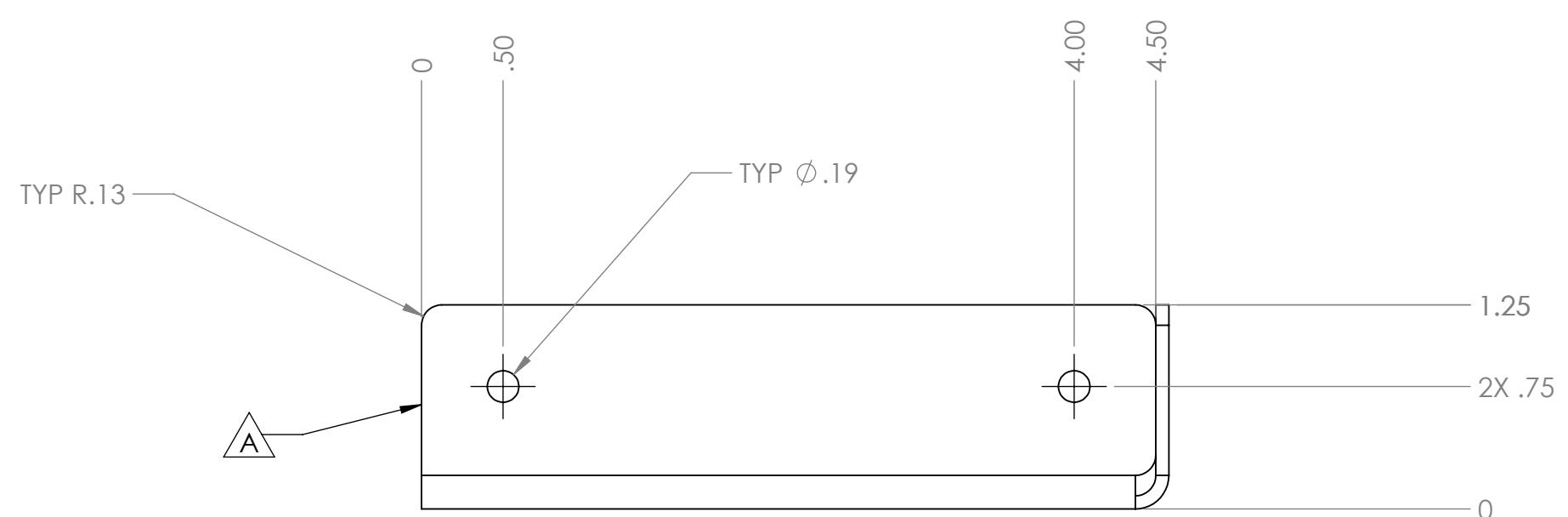
1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
C2, C4	A	TOTAL PART LENGTH AND FLANGE LENGTH	10/13/2023	NWE

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D



UNLESS OTHERWISE SPECIFIED:

BEND NAME DATE

DRAWN NE 9/18/2023

DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL $\pm 1/16$
ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$
TWO PLACE DECIMAL $\pm .02$
THREE PLACE DECIMAL $\pm .010$

MATERIAL/FINISH:
12GA 5052 Aluminum

COMMENTS:
REMOVE ALL BURRS AND SHARP EDGES.

DO NOT SCALE DRAWING

 FIRST ROBOTICS COMPETITION  SOLIDWORKS Modeling Solutions Partner

TITLE: Ring Capture Top

SIZE DWG. NO. REV

C GE-24123 A

SCALE: 1:1 SHEET 1 OF 1

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REVISIONS

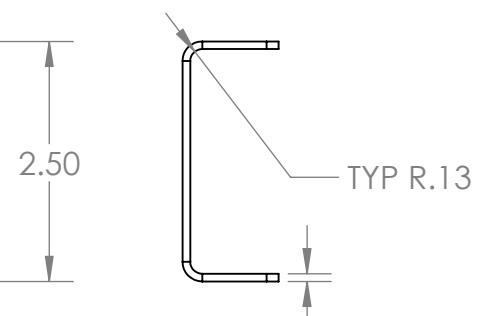
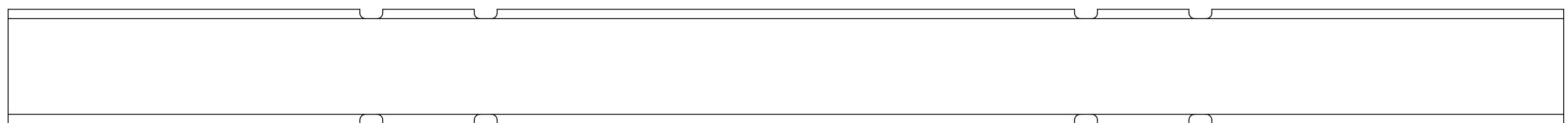
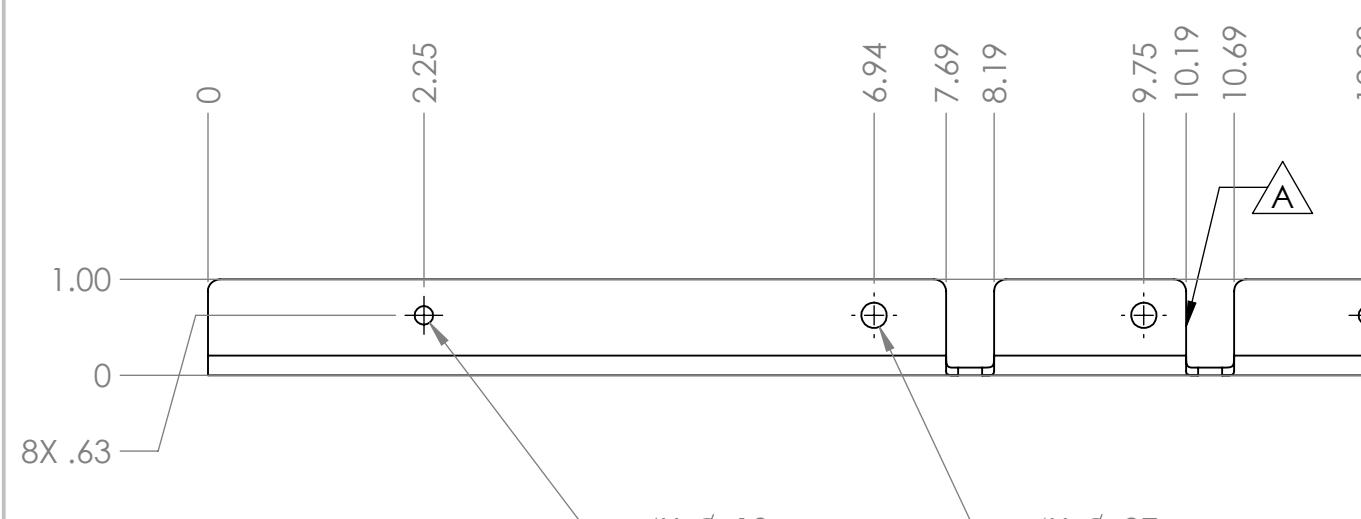
ZONE	REV.	DESCRIPTION	DATE	APPROVED
B2, B3, C2, C3	A	NOTCHES ADDED	10/13/2023	NWE

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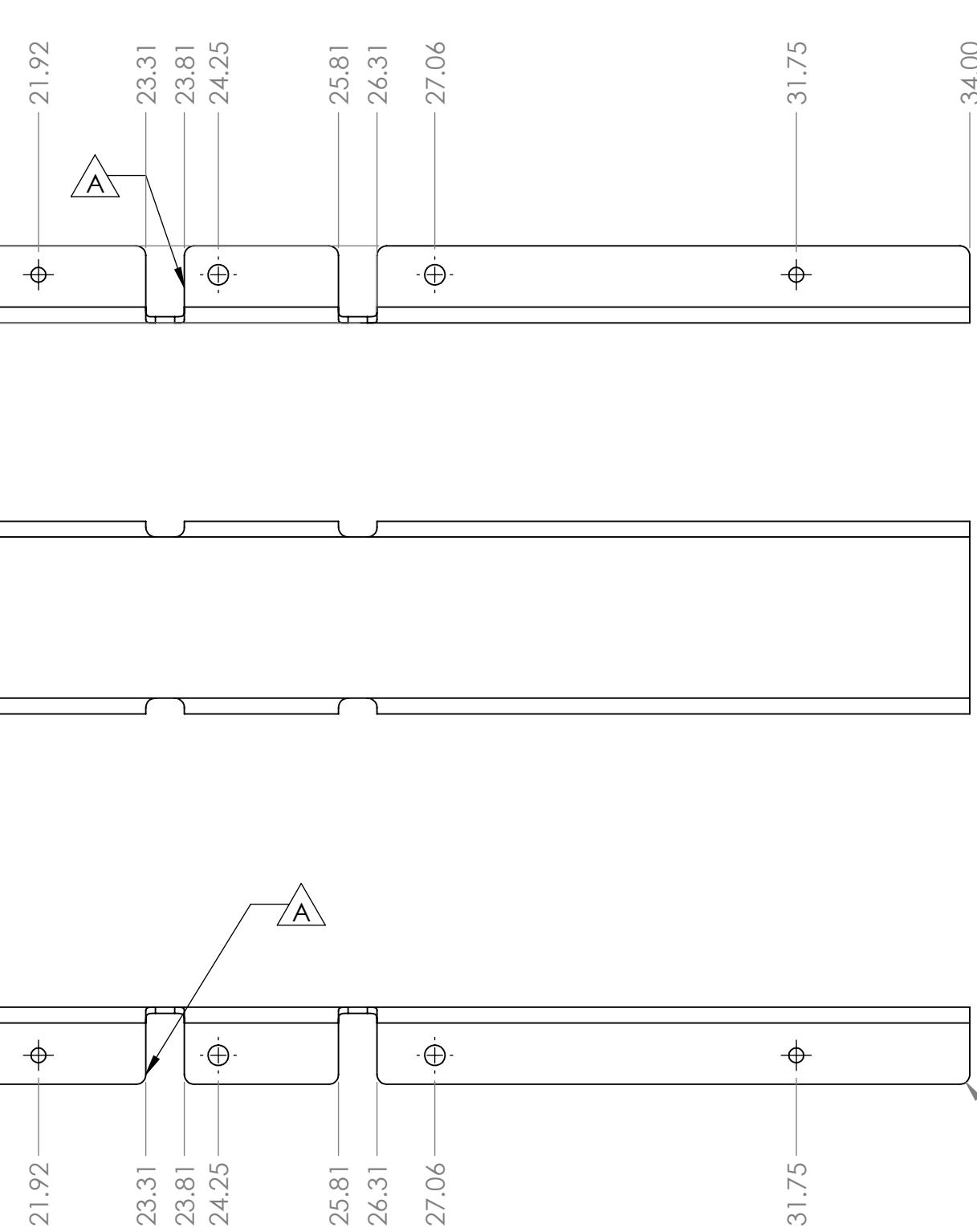
C

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SOLIDWORKS
Modeling Solutions Partner

TITLE:
**Ring Capture
Bottom**

SIZE DWG. NO. REV

C GE-24124 **A**

SCALE: 1:2 SHEET 1 OF 1

UNLESS OTHERWISE SPECIFIED:	BEND	NAME	DATE
DRAWN	NE	9/18/2023	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH: 12GA 5052 Aluminum			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

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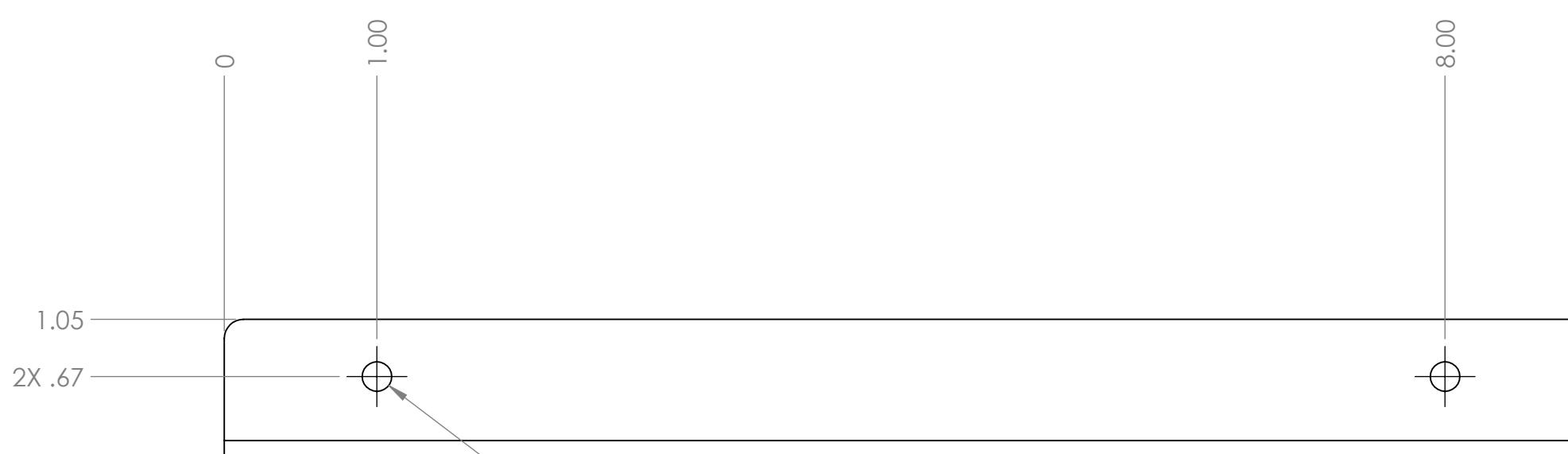
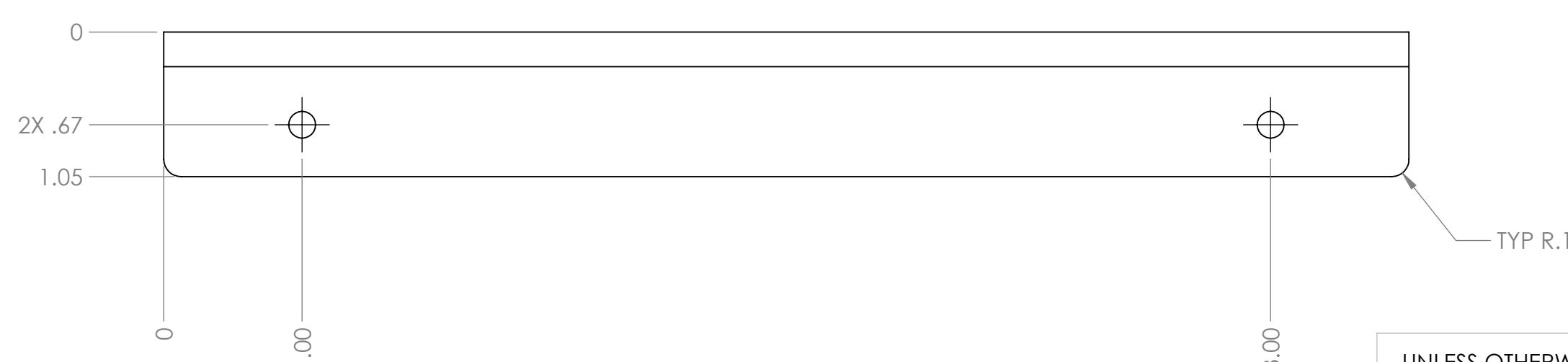
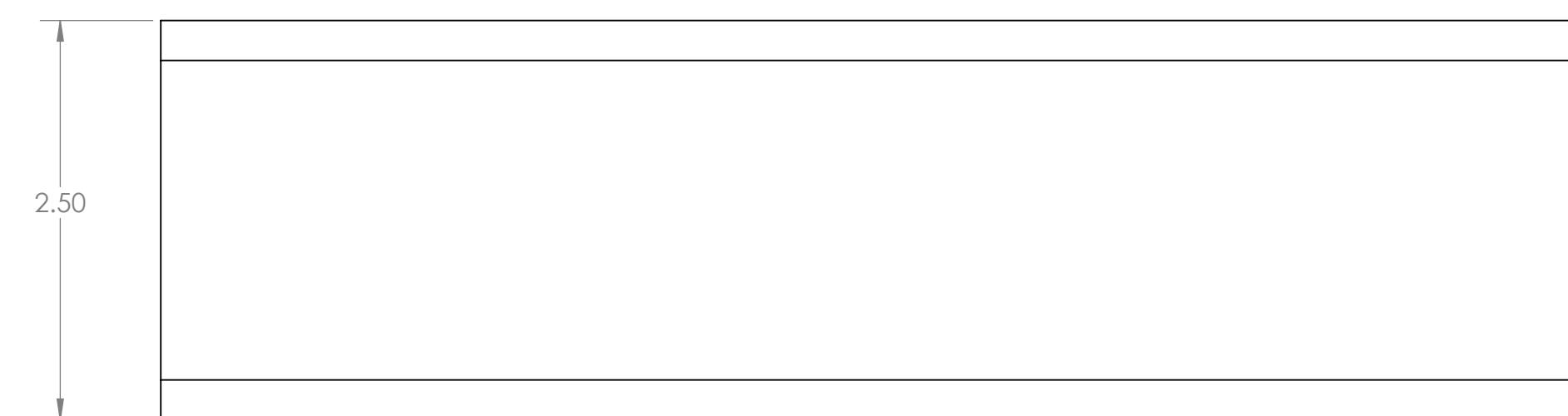
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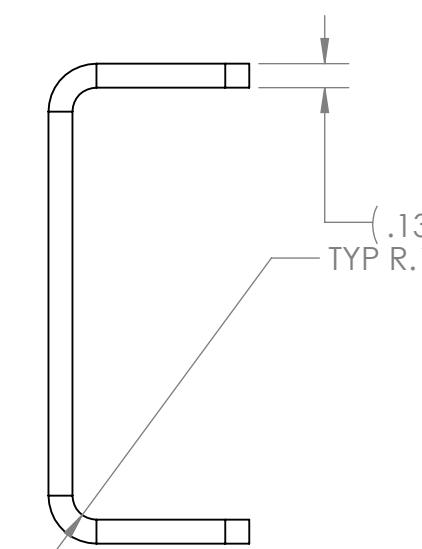
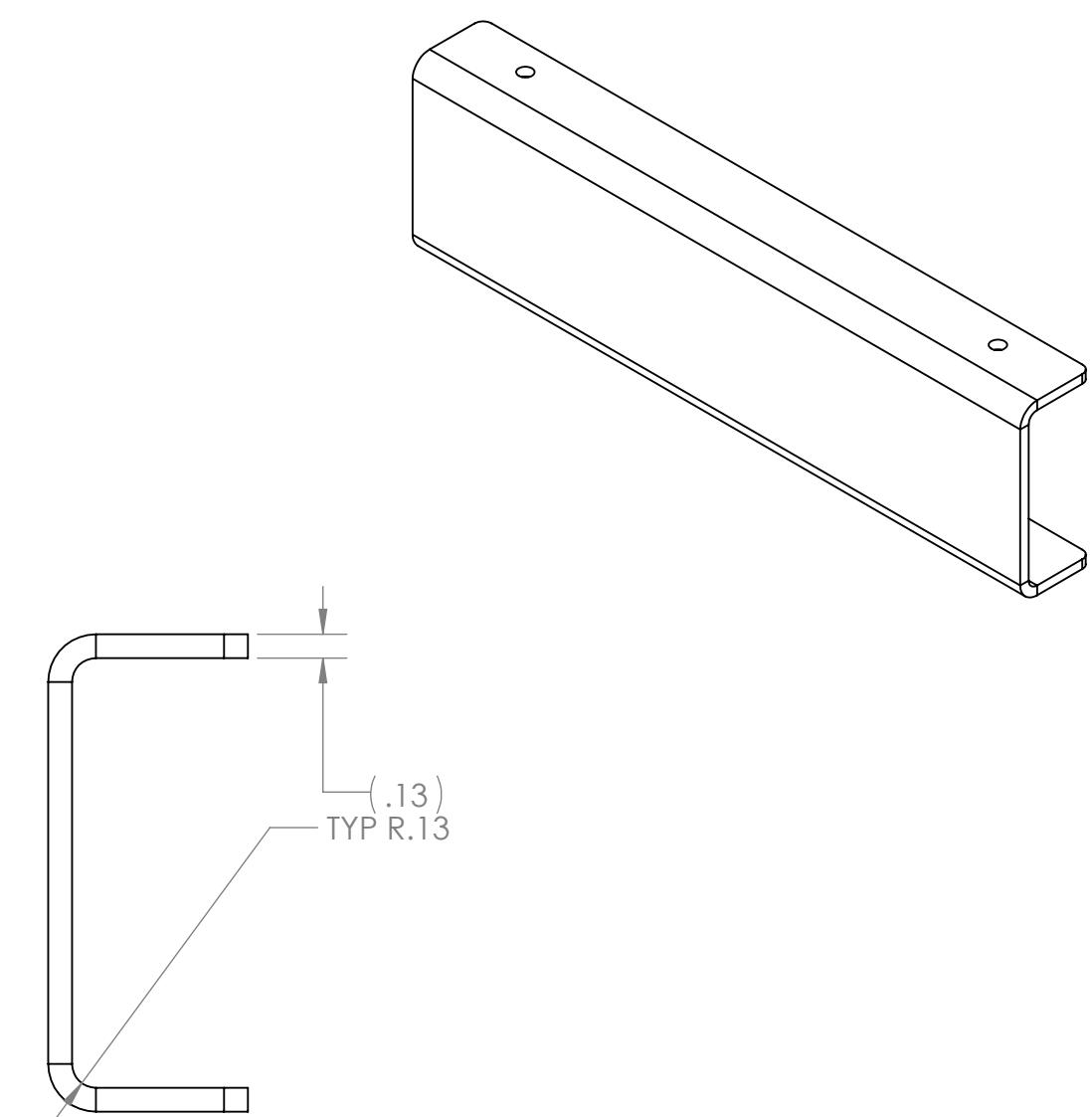
REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
D2	A	TOTAL PART LENGTH CHANGED	10/13/2023	NWE

D

TYP ϕ .19

TYP R.13



UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES

TOLERANCES:

FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .02$ THREE PLACE DECIMAL $\pm .010$

MATERIAL/FINISH:

12GA 5052 Aluminum

DO NOT SCALE DRAWING

BEND

DRAWN

NAME

NE

DATE

9/18/2023

PROPRIETARY AND CONFIDENTIAL

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COMMENTS:

REMOVE ALL BURRS AND SHARP EDGES.



SOLIDWORKS
Modeling Solutions Partner

TITLE: Ring Capture Side

SIZE DWG. NO. REV

C GE-24125 A

SCALE: 1:1 SHEET 1 OF 1

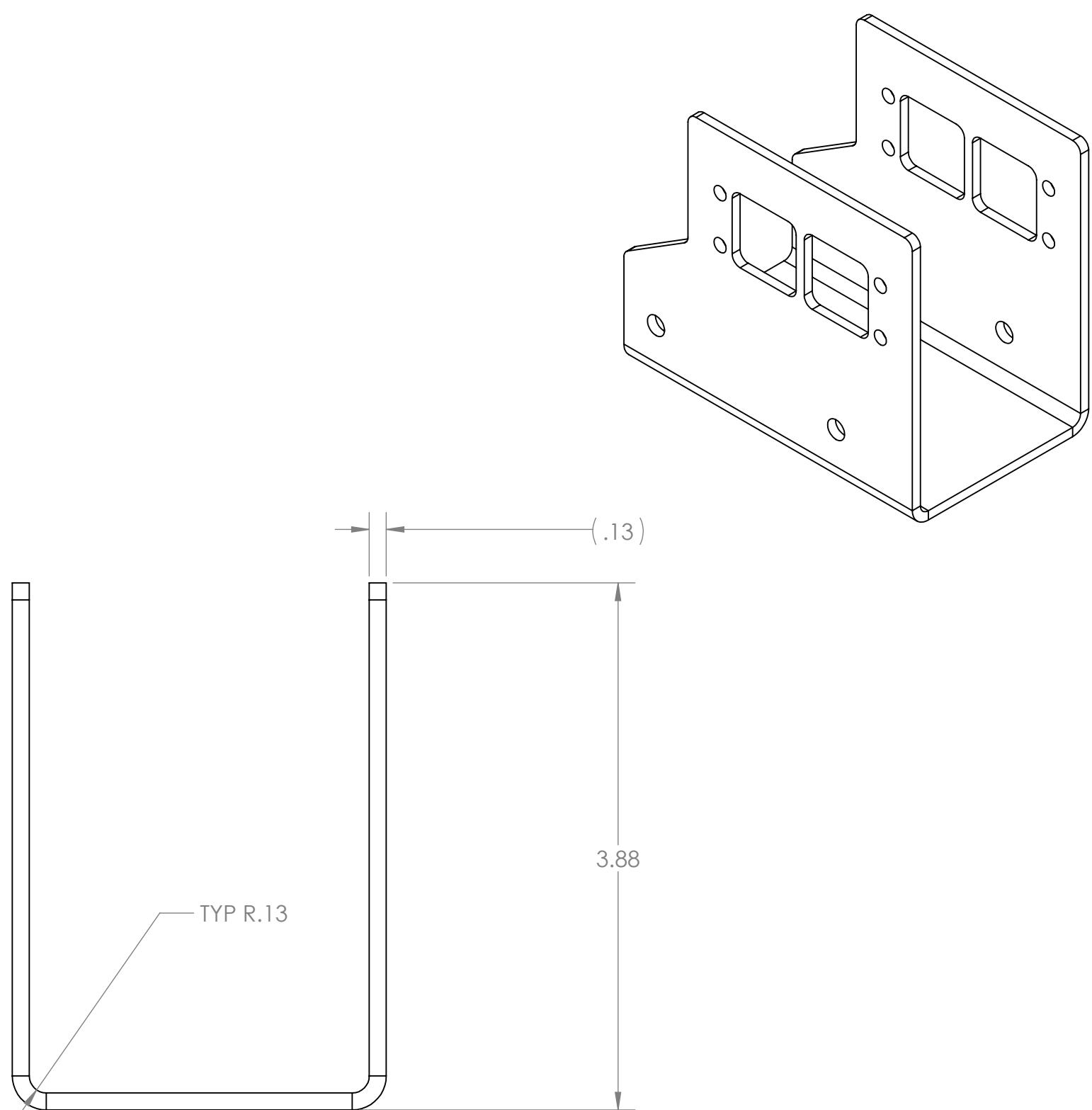
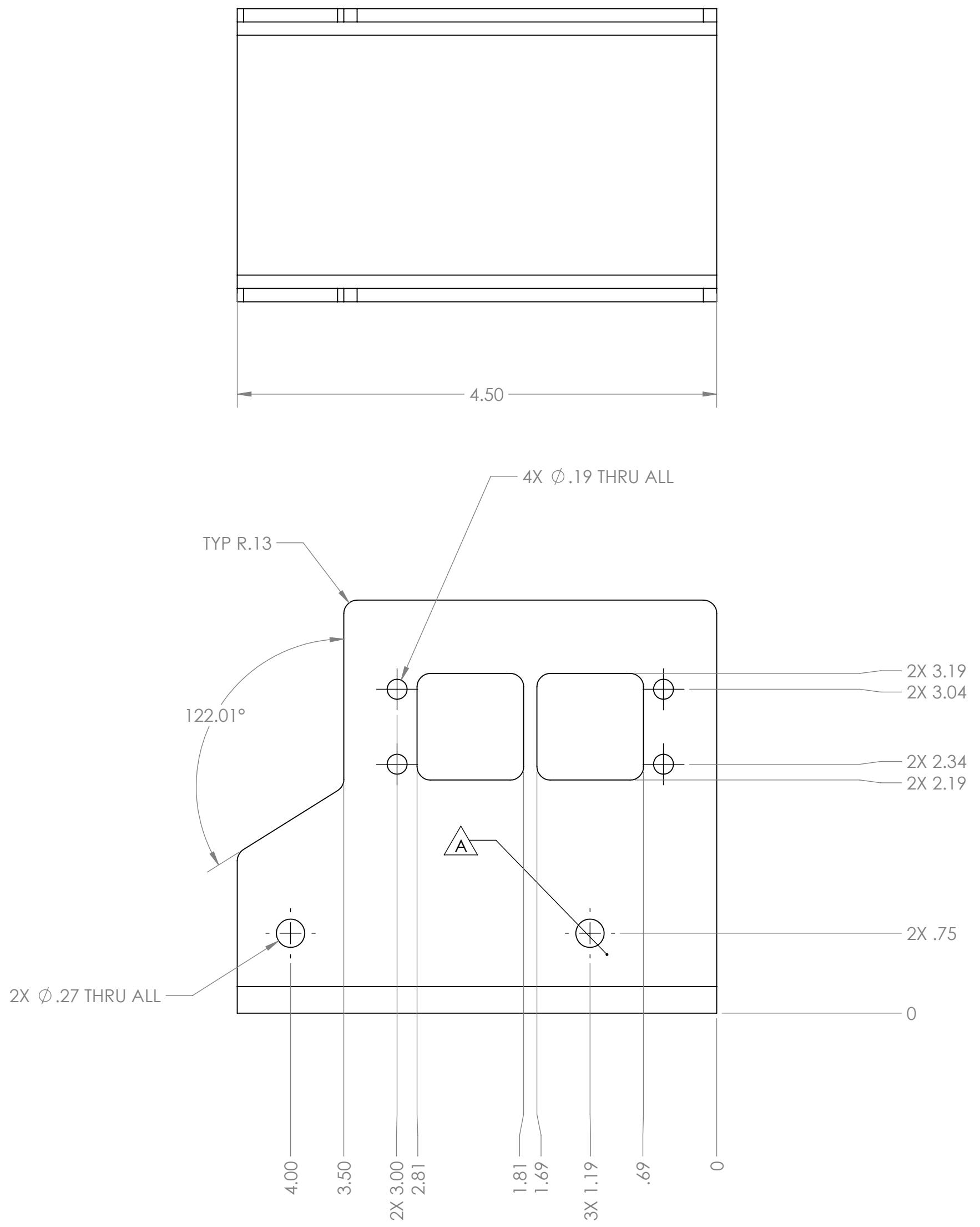
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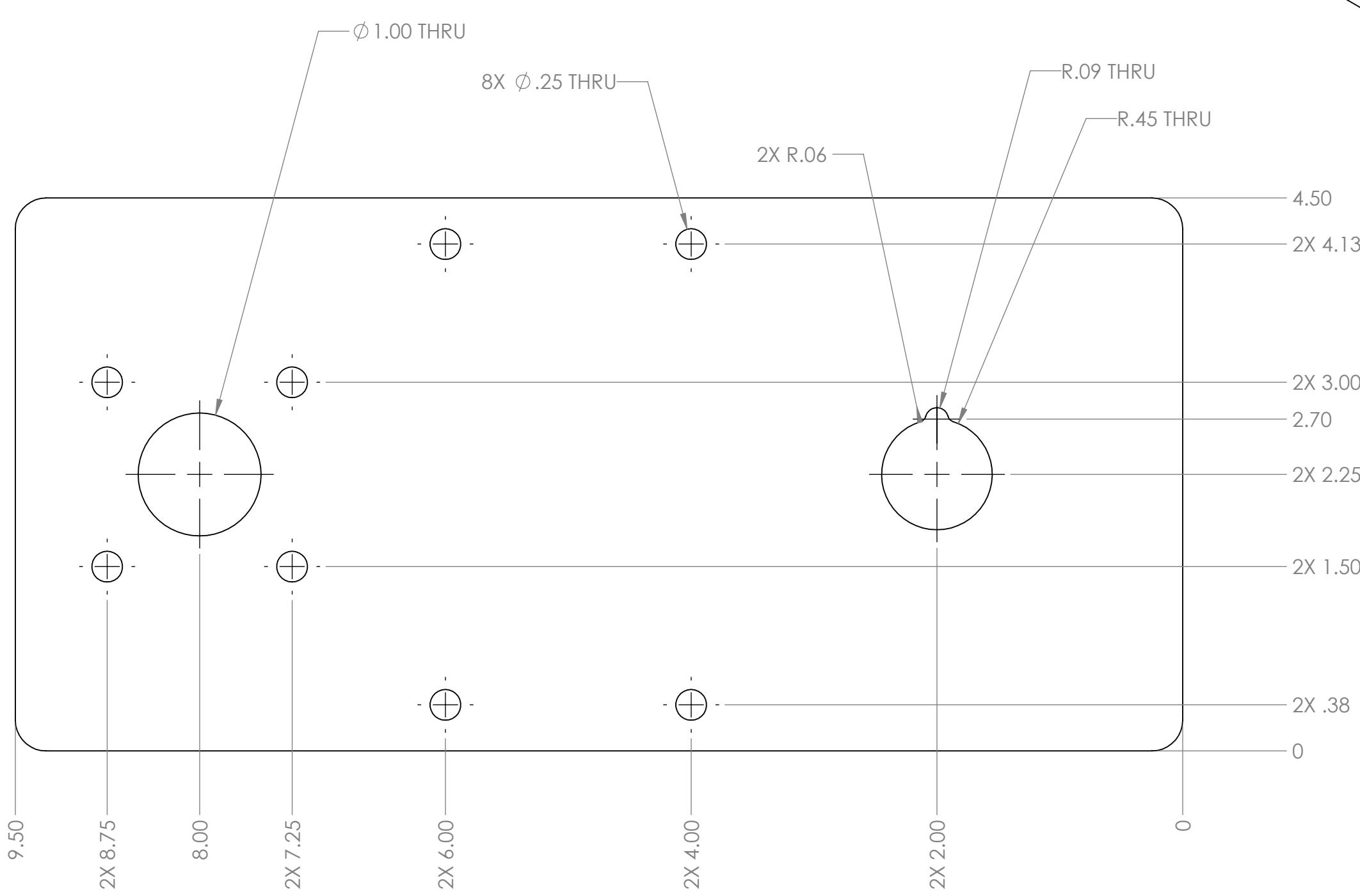
REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
B3	A	HOLE LOCATION MOVED	10/13/2023	NWE



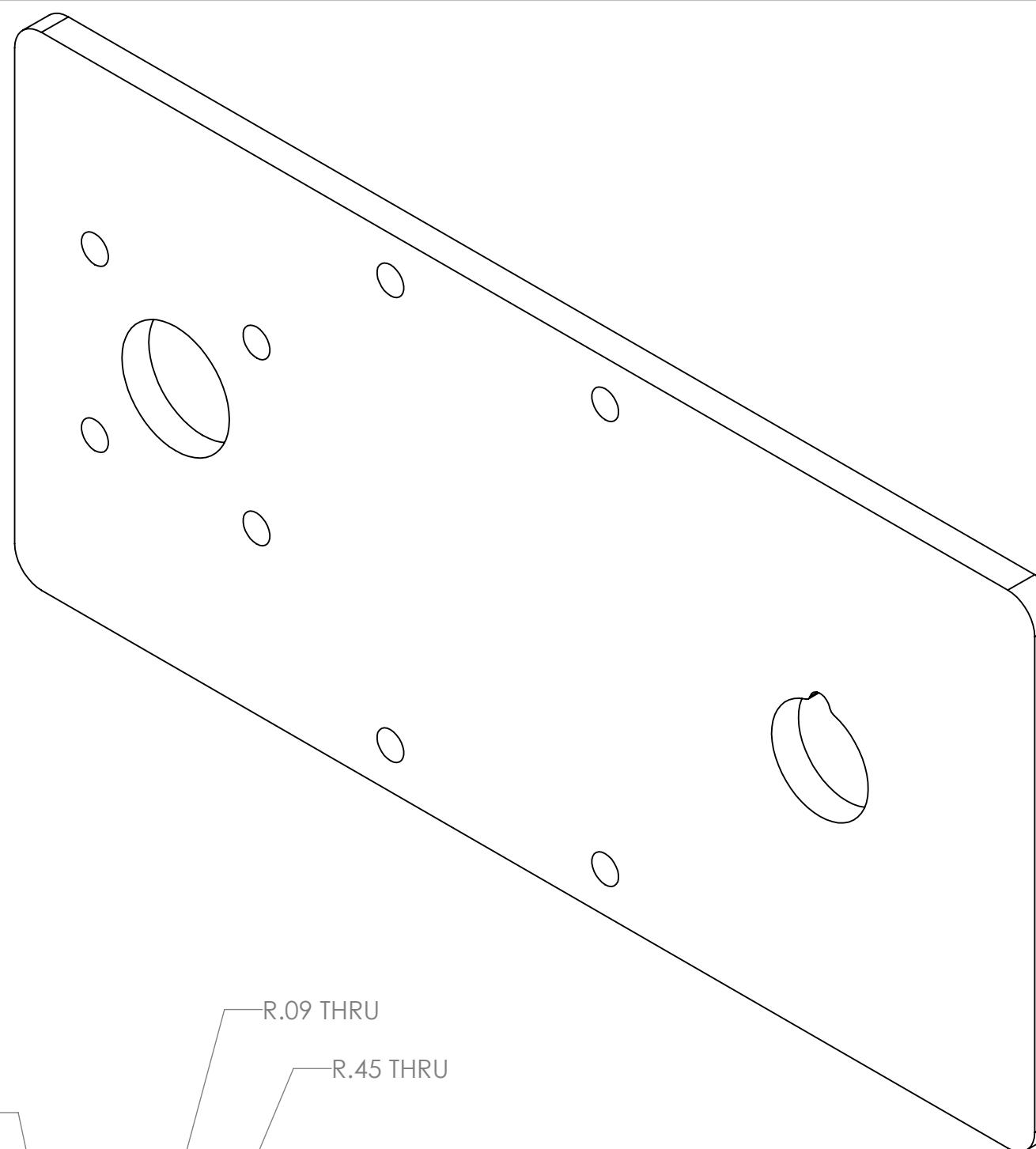
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .02$ THREE PLACE DECIMAL $\pm .010$	BEND	NAME	DATE
	DRAWN	NE	9/18/2023
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH: 8GA 5052 Aluminum	SIZE	DWG. NO.	REV
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.	C	GE-24126	A
DO NOT SCALE DRAWING	SCALE: 1:1	SHEET 1 OF 1	

 **FIRST**
ROBOTICS
COMPETITION  **SOLIDWORKS**
Modeling Solutions Partner

TITLE: **Sensor Bracket**



Note: Tag or Label with Part Number



UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL $\pm 1/16$
ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$

TWO PLACE DECIMAL $\pm .01$
THREE PLACE DECIMAL $\pm .005$

MATERIAL/FINISH:

1/4" Polycarbonate, Clear

DO NOT SCALE DRAWING

VEND NAME DATE

DRAWN JO 10/12/2023

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WHOLE WITHOUT THE WRITTEN

PERMISSION OF FIRST[®] IS

PROHIBITED.

COMMENTS:

REMOVE ALL BURRS AND SHARP
EDGES.



SOLIDWORKS
Modeling Solutions Partner

TITLE:
**Stacklight and
Button Plate**

SIZE DWG. NO. REV
C GE-24127

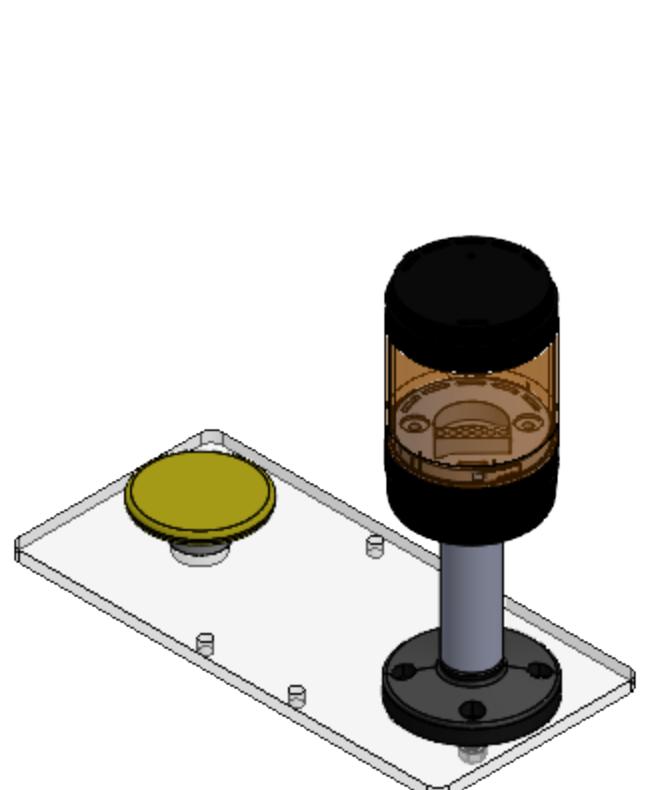
SCALE: 1:1 SHEET 1 OF 1

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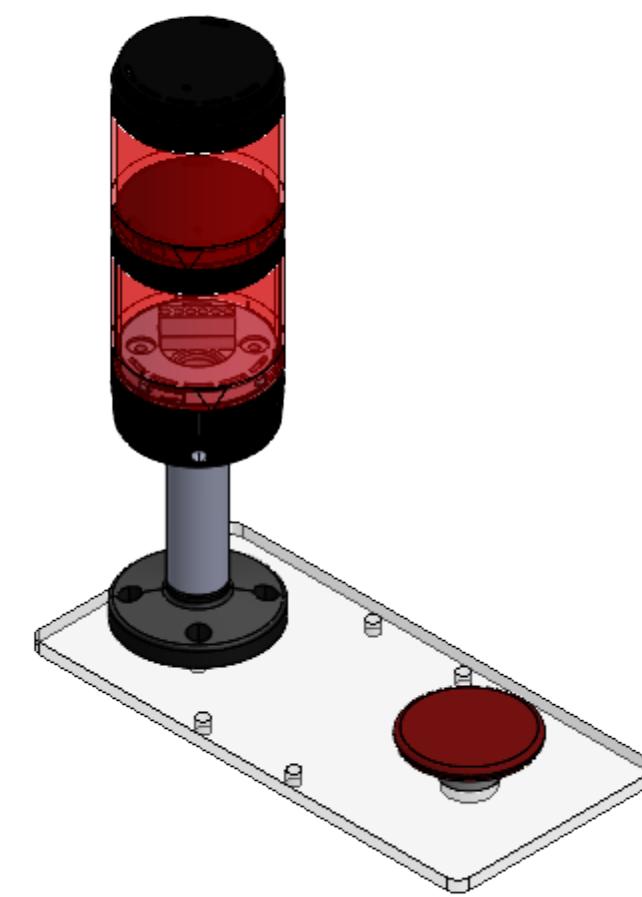
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2

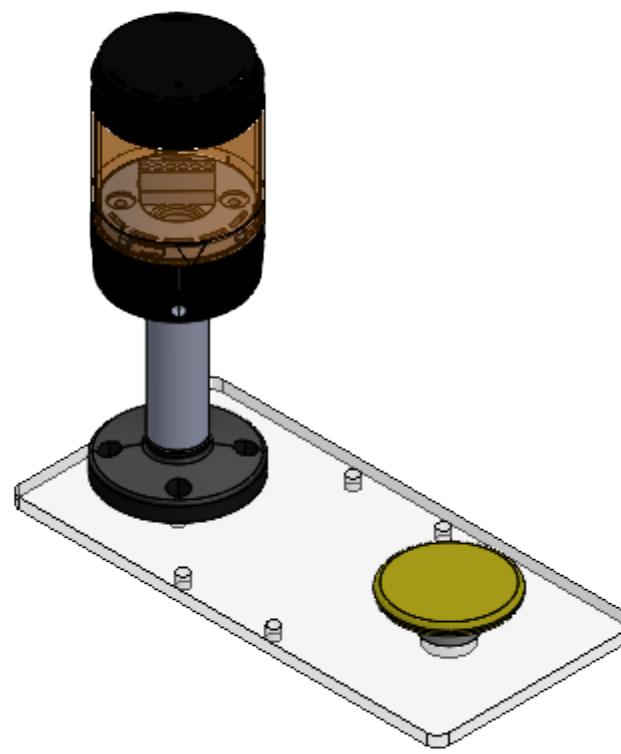
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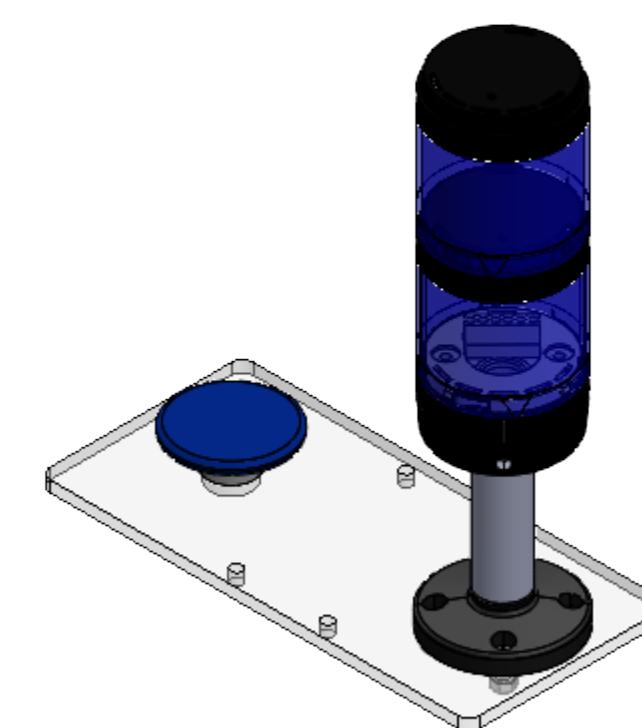
Red Co-op



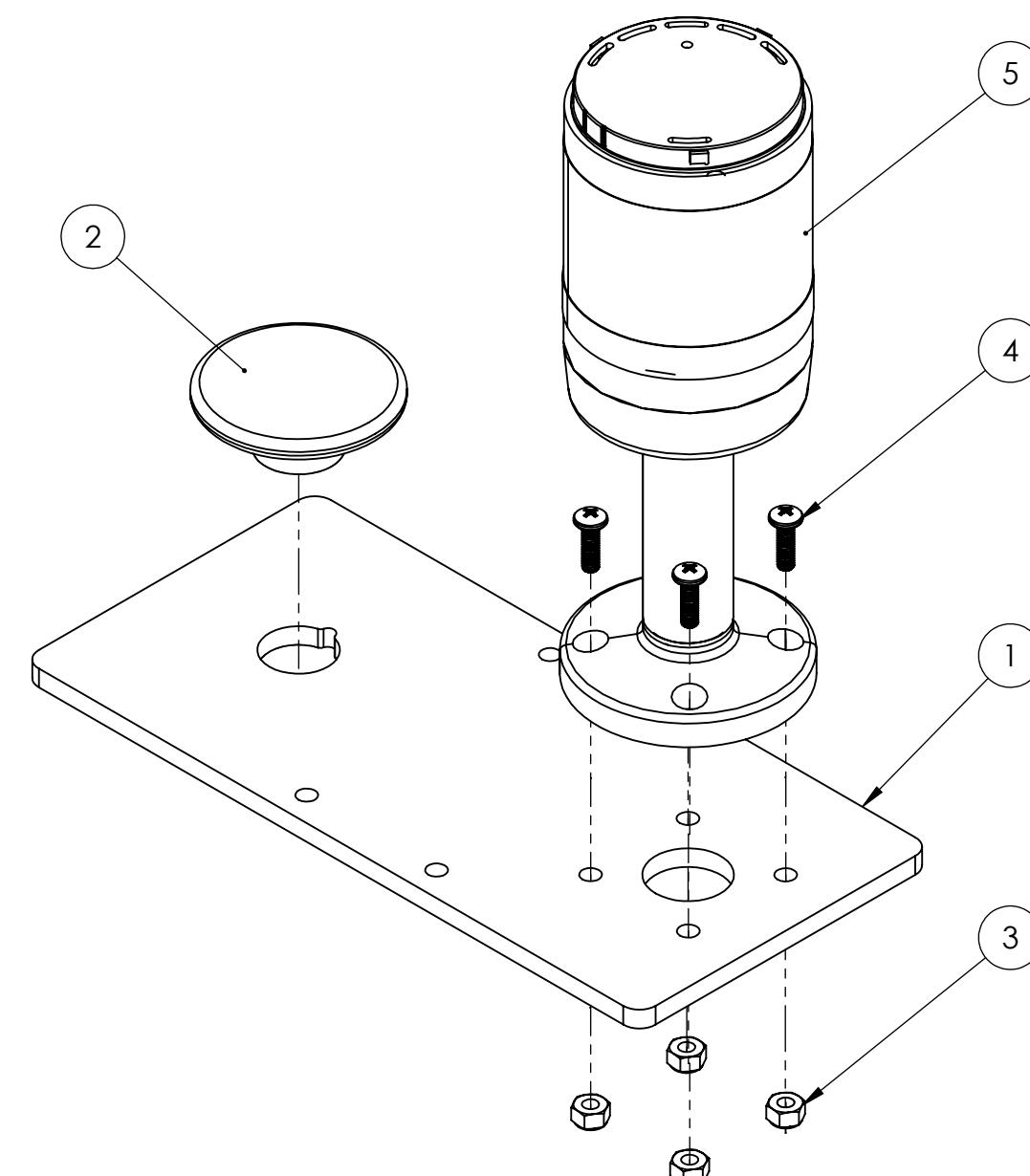
Red Amp



Blue Co-op



Blue Amp

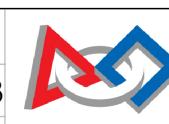


Note:

1. (2) comes in the following configurations:
 1. Red Co-op
 2. Red Boost
 3. Blue Co-op
 4. Blue Boost

ITEM NO.	PART NUMBER	DESCRIPTION		QTY.
1	GE-24127	Stacklight and Button Plate		1
2	Amp_Button_Yellow	Button, Push, Yellow		1
3	nylock_10_32	Low-Strength Steel Nylon-Insert Locknut, Zinc-Plated, 10-32 Thread Size		4
4	Pan_phil_10-32_.625	Pan head Phil 10-32 x 5/8		4
5	StackLight_Assembly	Stack Light Assembly		1

UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
	DRAWN	DF	12/18/2023
PROPRIETARY AND CONFIDENTIAL			
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COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST ROBOTICS COMPETITION
 
 TITLE: Stacklight and Button Plate Assembly
 SIZE DWG. NO. REV
C GE-24128
 SCALE: 1:2 SHEET 1 OF 1

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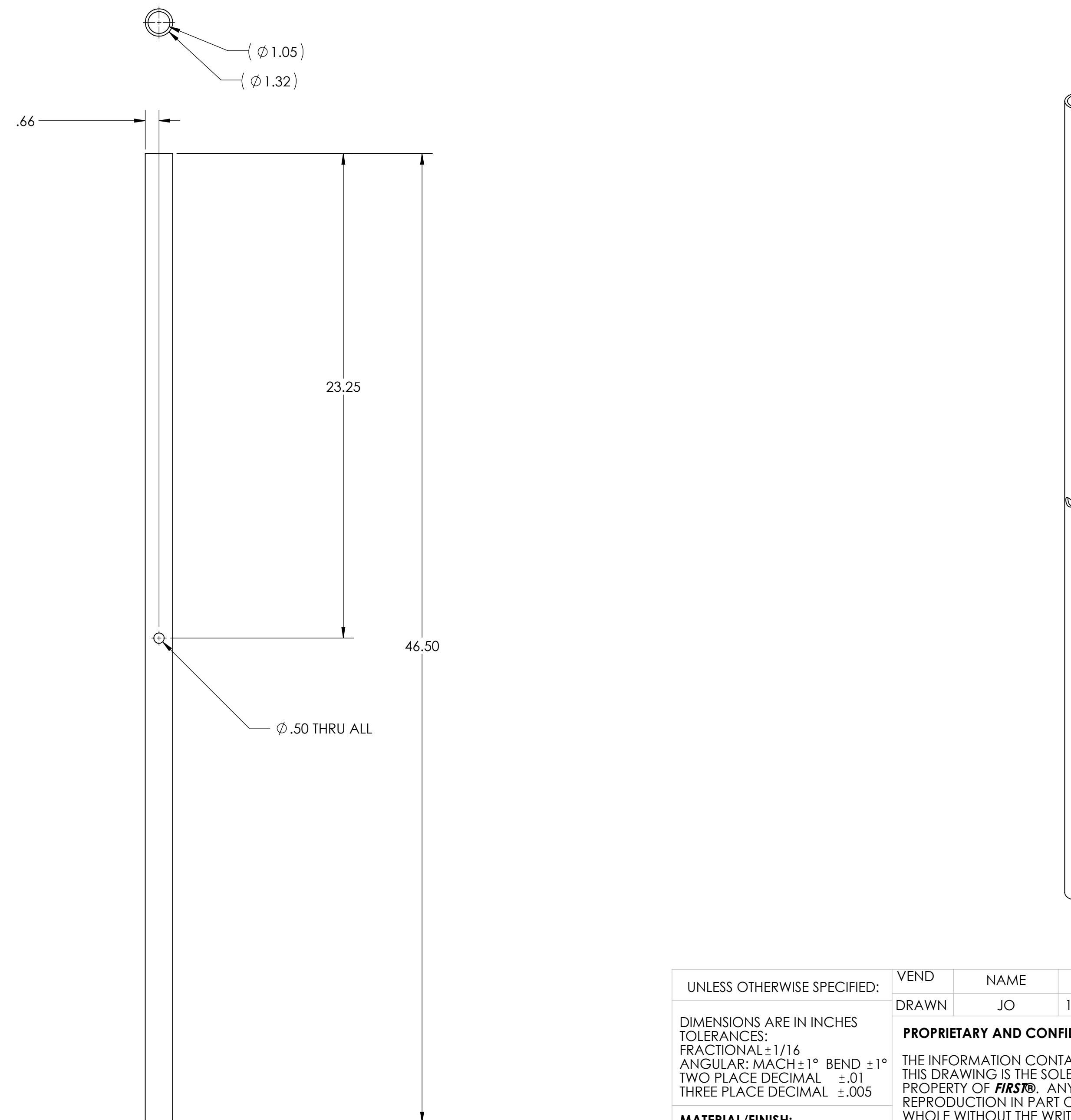
C

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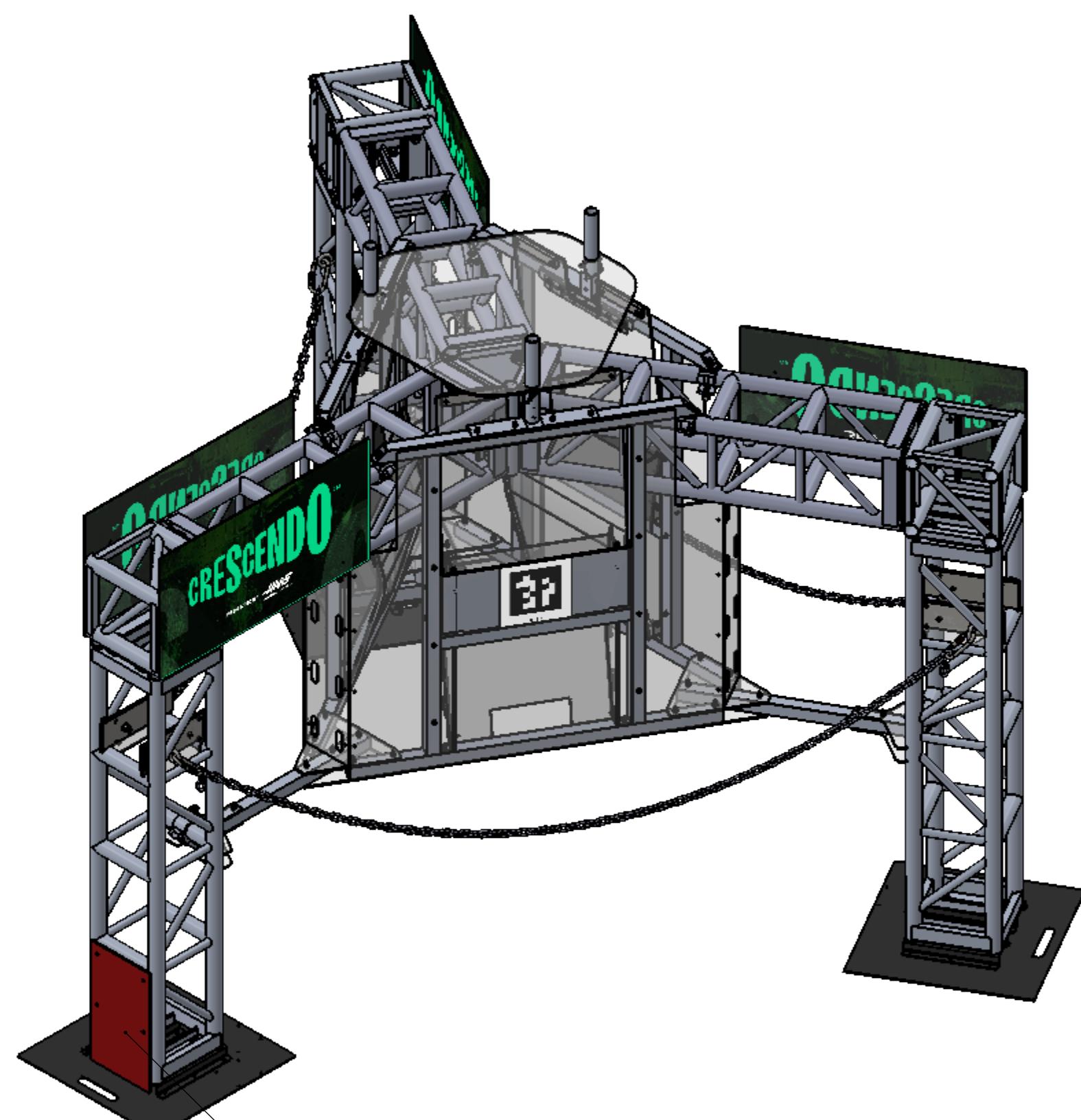
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UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	JO	10/24/2023	
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH:	SIZE	DWG. NO.	REV
1" Schedule 40 6061 Aluminum Tube	C	GE-24130	
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING	SCALE: 1:4	SHEET 1 OF 1	

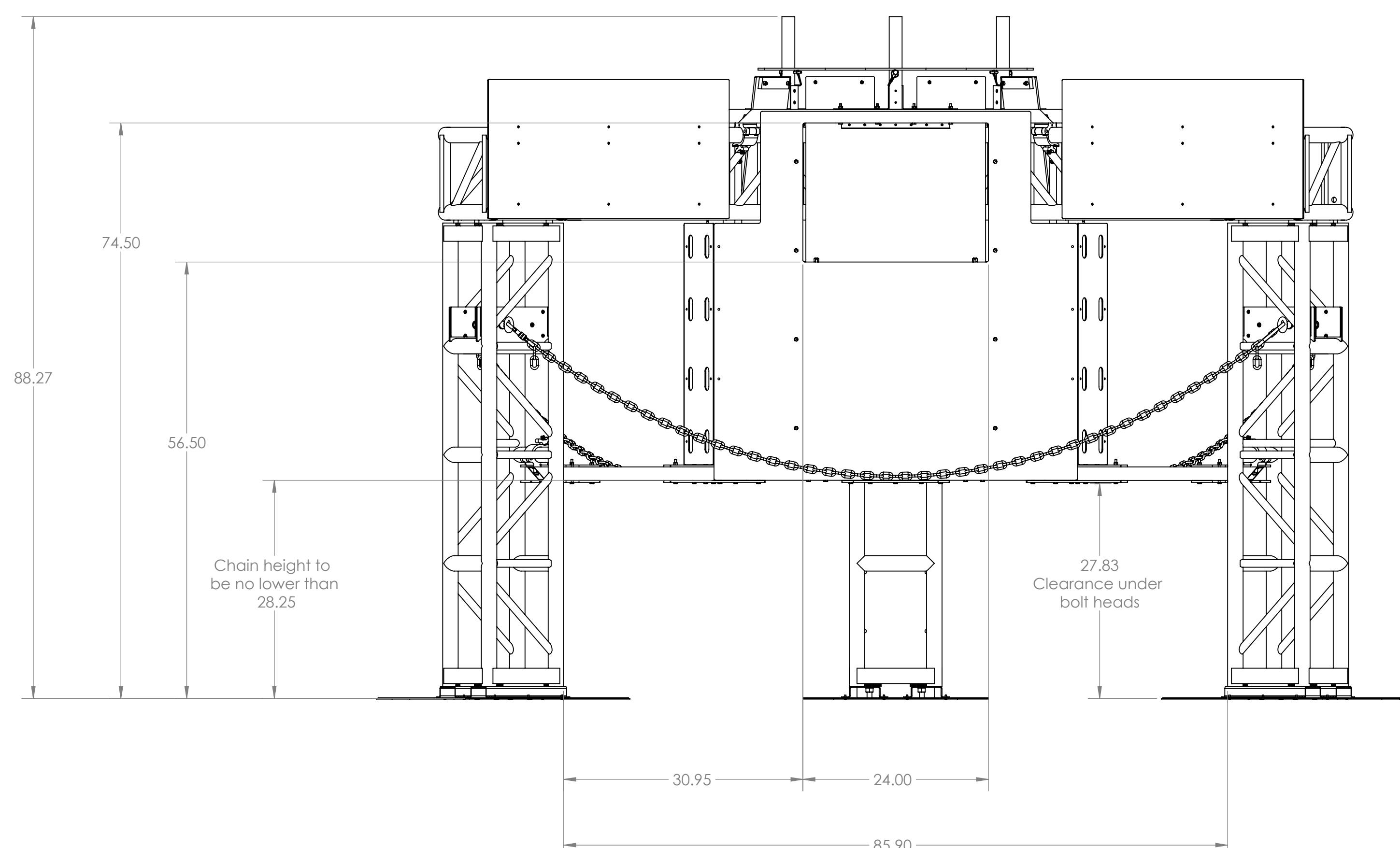


There is a blue configuration for this plastic

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24201	Stage Top	1
2	GE-24202	Stage Vinyl Logo	4
3	GE-24204	Stage Face Filler Poly	3
4	GE-24205	Stage Chain	3
5	GE-24207-RED	Podium - Red	1
6	GE-24208	Chain Plate with Fasteners	6
7	GE-24210	Base Truss Assembly	1
8	GE-24220	Wall Assembly	3
9	GE-24250	Stage Lateral Support	3
10	3216T41_Carabiner	Carabiner, Locking Steel, .38 thick	6
11	hex_.25_20_3_partial	Steel Hex Head Screw, 1/4"-20 x 3" long, partially threaded	12
12	nylock_.25_20	Steel Nylon-Insert Locknut, 1/4"-20	12
13	pin_wire_lock_.25_2.1875	1/4" Steel Wire Lock Pin, 3 1/16" Long, 2 3/16" Usable Length	3

UNLESS OTHERWISE SPECIFIED:		FIELD	NAME	DATE
		DRAWN	DF	12/19/2023
PROPRIETARY AND CONFIDENTIAL				
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.				
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.				
DO NOT SCALE DRAWING				
 FIRST ROBOTICS COMPETITION  SOLIDWORKS Modeling Solutions Partner				
TITLE: Stage Assembly				
SIZE DWG. NO. REV				
C GE-24200				
SCALE: 1:16 SHEET 1 OF 4				

D



Notes:

1. Dimensions shown are for reference and do not take into account deflection, wear and tear over the course of the season, or damage.

UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DRAWN	DF	12/19/2023	
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH:			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			
 FIRST ROBOTICS COMPETITION  SOLIDWORKS Modeling Solutions Partner			
TITLE: Stage Assembly			
SIZE	DWG. NO.	REV	
C	GE-24200		
SCALE: 1:16		SHEET 2 OF 4	

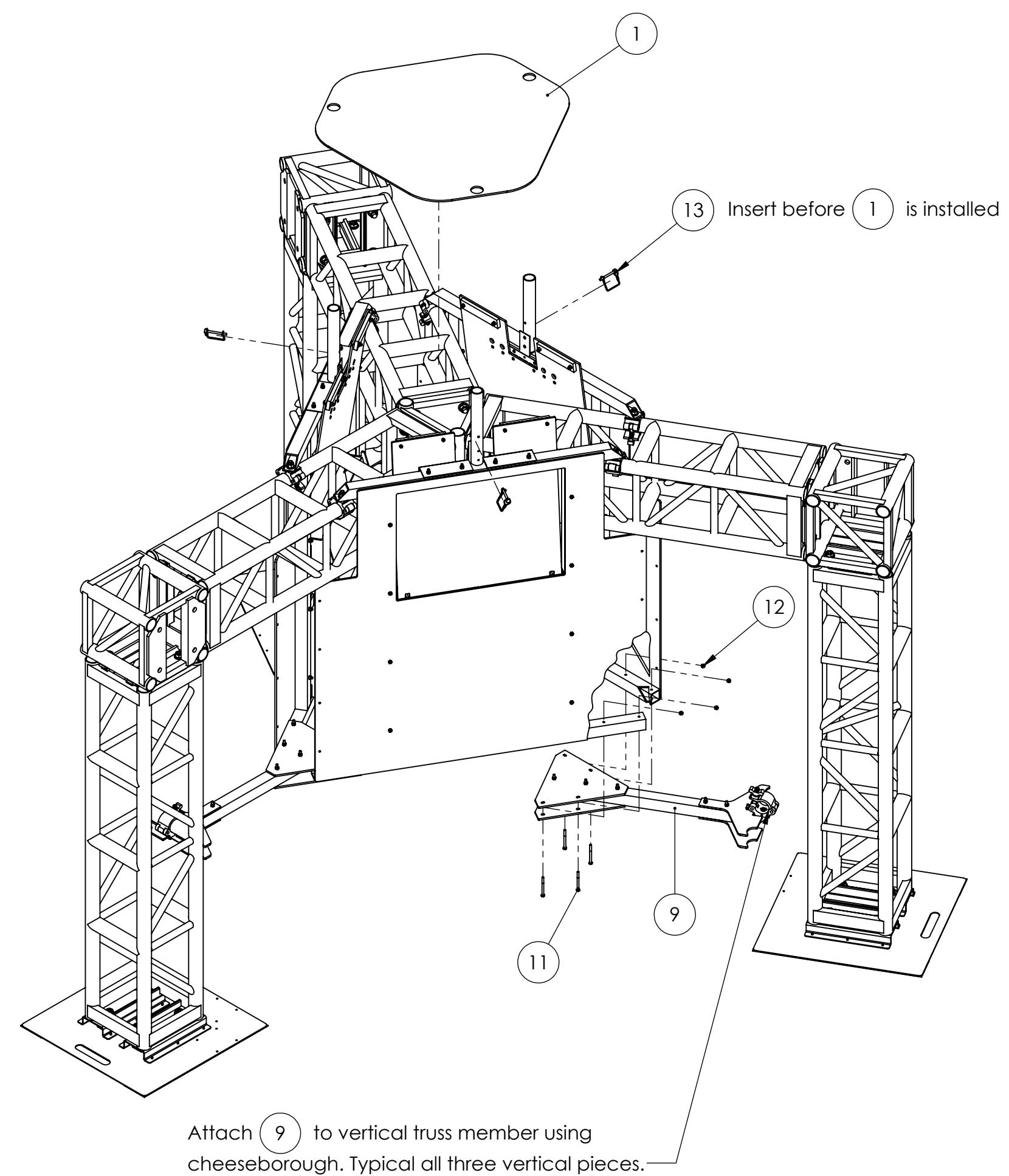
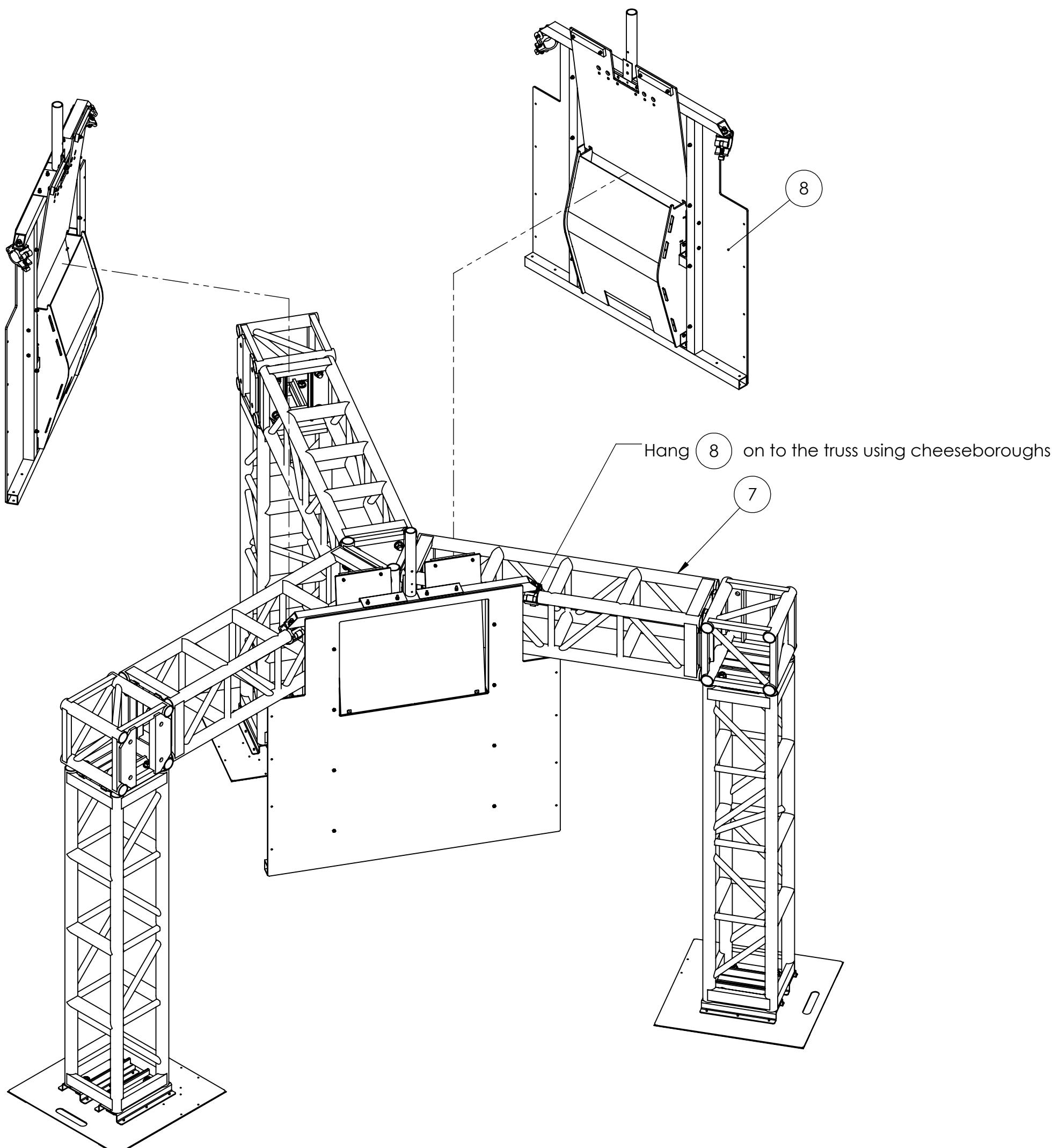
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UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm\frac{1}{2}$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .50$	DRAWN	DF	12/19/2023
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH:	SIZE	DWG. NO.	REV
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.	C	GE-24200	
DO NOT SCALE DRAWING	SCALE: 1:16	SHEET 3 OF 4	

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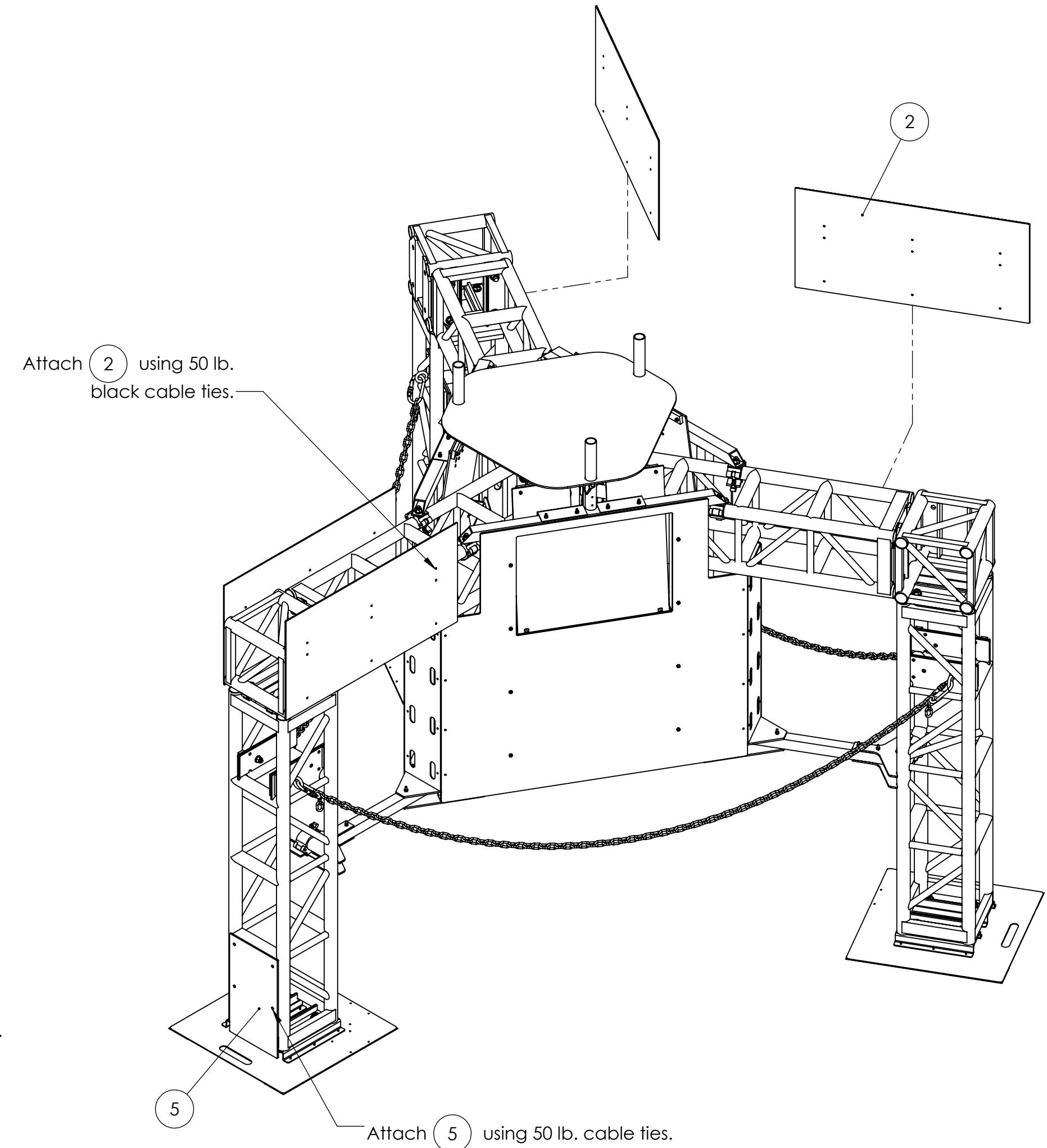
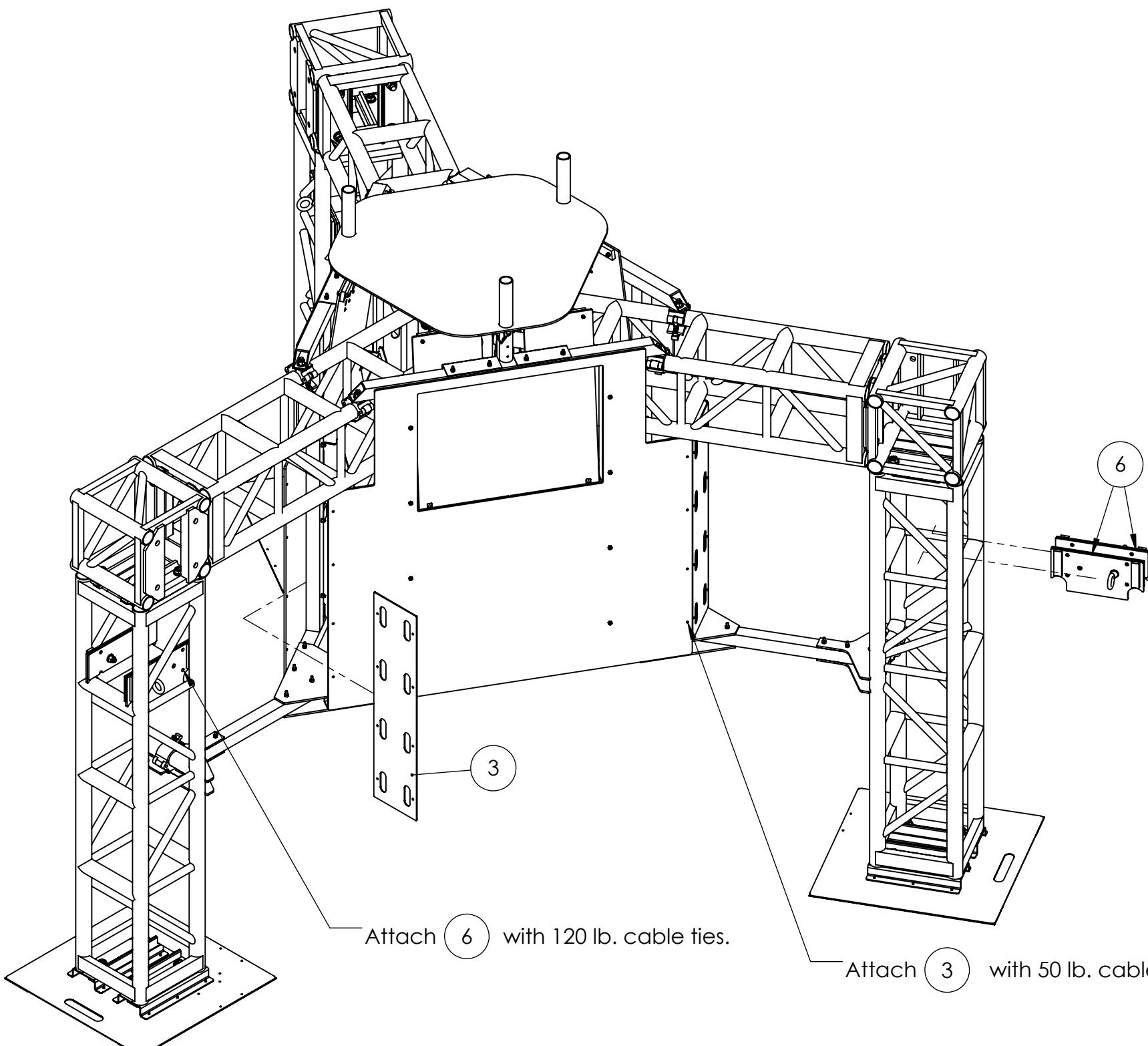
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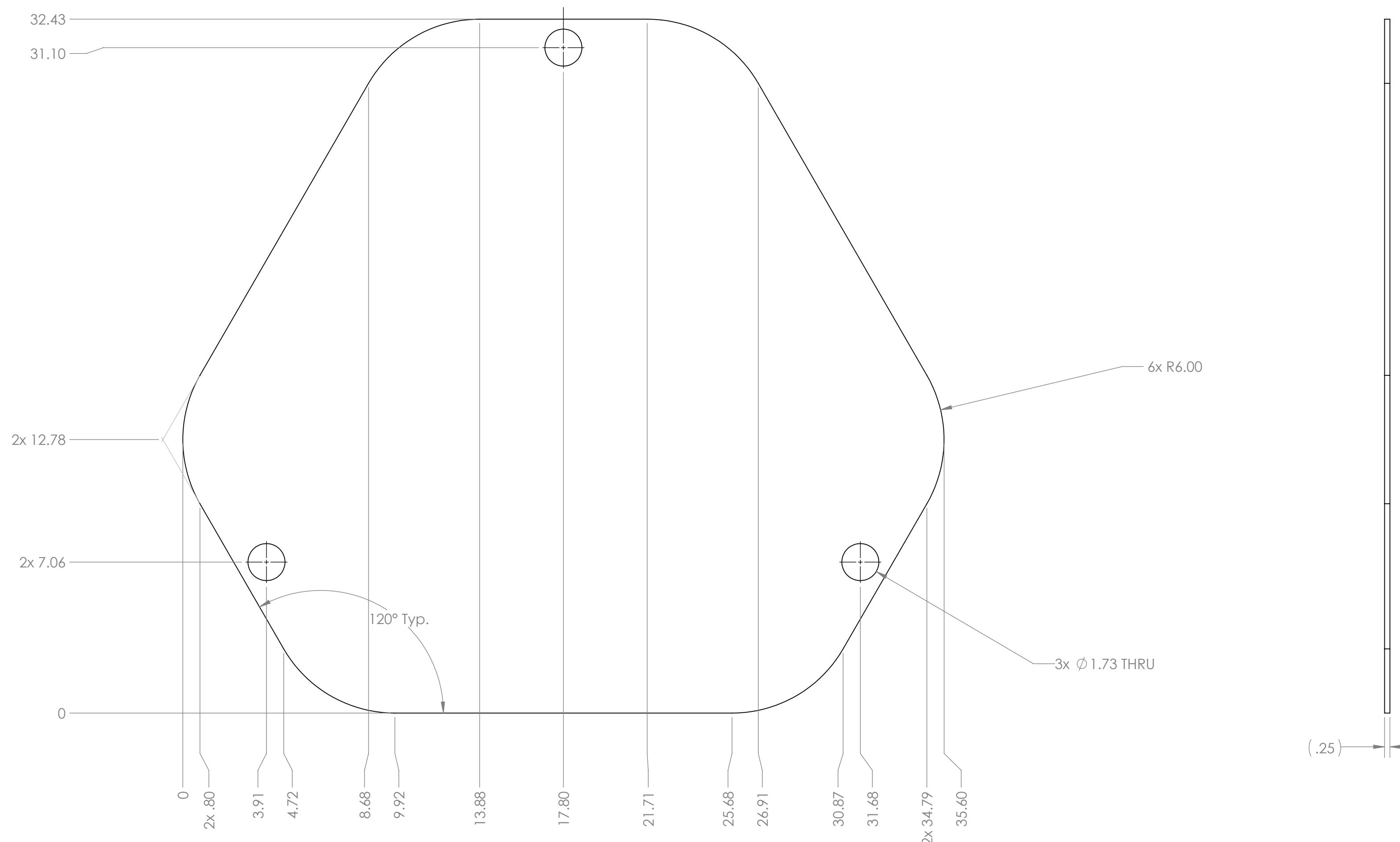
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DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm\frac{1}{2}$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .50$	DRAWN	DF	12/19/2023
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH:	SIZE	DWG. NO.	REV
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.	C	GE-24200	
DO NOT SCALE DRAWING	SCALE: 1:16	SHEET 4 OF 4	

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Notes:
1. Tag or label with part number

UNLESS OTHERWISE SPECIFIED:			VEND	NAME	DATE									
			DRAWN	CO	8/22/2023									
<p>DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .005$</p> <p>MATERIAL/FINISH: 1/4" Polycarbonate, Clear</p> <p>DO NOT SCALE DRAWING</p>			<p>PROPRIETARY AND CONFIDENTIAL</p> <p>THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.</p> <p>COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.</p>											
			 FIRST ROBOTICS COMPETITION											
			<p>TITLE: Stage Top</p> <table border="1"> <thead> <tr> <th>SIZE</th> <th>DWG. NO.</th> <th>REV</th> </tr> </thead> <tbody> <tr> <td>C</td> <td>GE-24201</td> <td></td> </tr> <tr> <td colspan="2">SCALE: 1:4</td> <td>SHEET 1 OF 1</td> </tr> </tbody> </table>			SIZE	DWG. NO.	REV	C	GE-24201		SCALE: 1:4		SHEET 1 OF 1
SIZE	DWG. NO.	REV												
C	GE-24201													
SCALE: 1:4		SHEET 1 OF 1												

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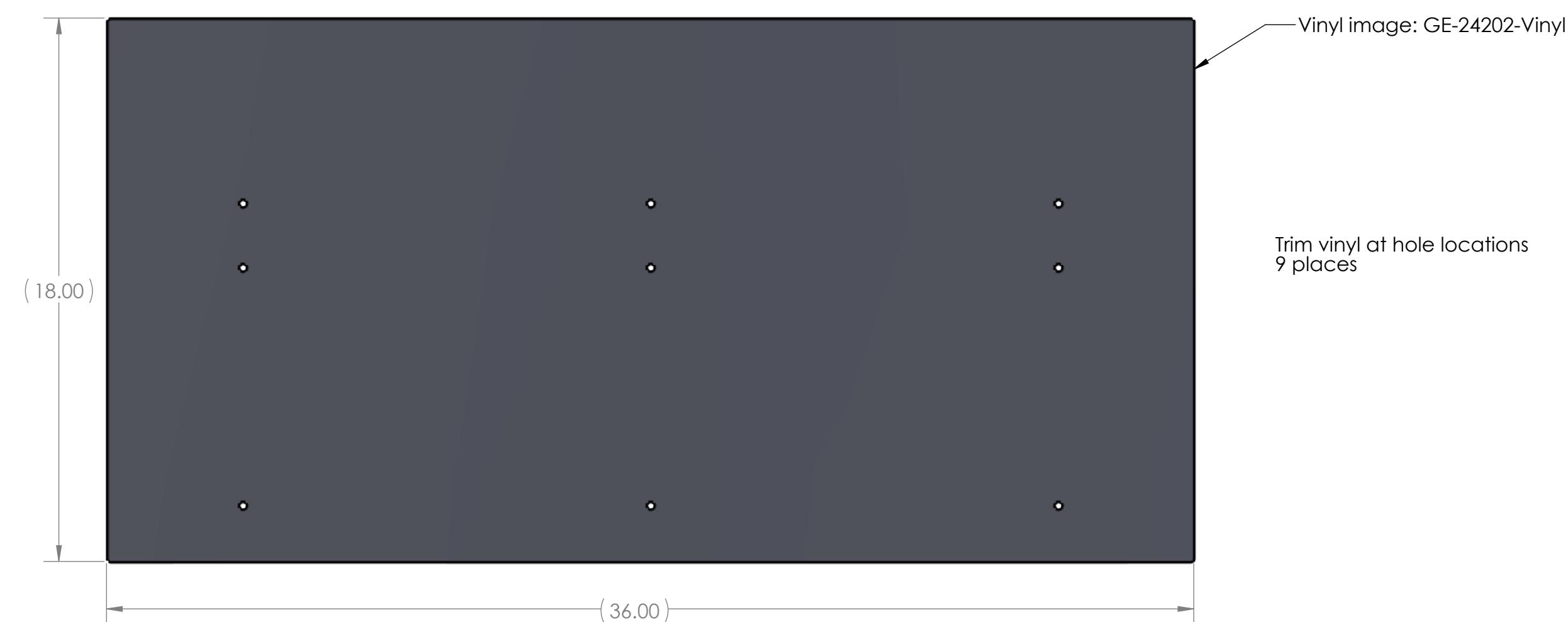
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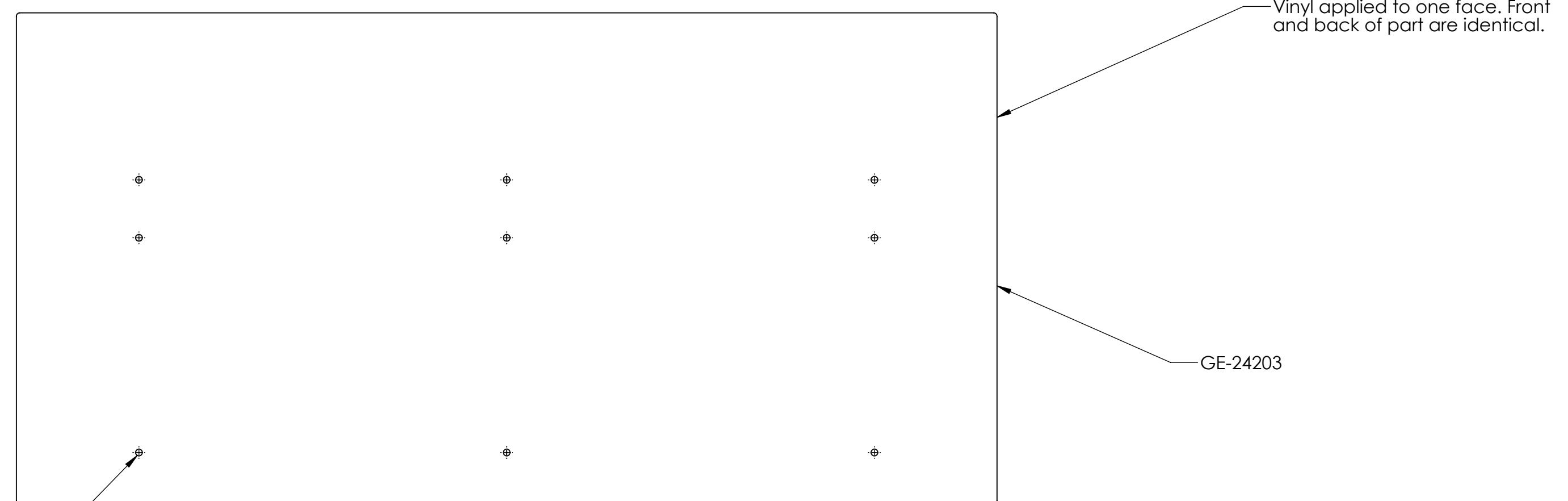
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Single row of holes close to
the edge of the part
indicate the bottom.

Notes:
1. QTY per field: 8
2. Gloss vinyl finish

UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	CO	9/6/2023	
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH: Polycarbonate/Vinyl			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
**Stage Vinyl
Logo**

SIZE DWG. NO. REV
C GE-24202

SCALE: 1:4 SHEET 1 OF 1

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18.00

3x 11.88

3x 9.75

3x 1.88

0

3x 4.50

3x 18.00

3x 31.50

36.00

(.13)

9X \emptyset .25 THRU ALL

4x R.13

Notes:
1. Vinyl to be applied to face.

UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	CO	8/17/2023	
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH: 1/8" Polycarbonate, Clear			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			
FIRST ROBOTICS COMPETITION			
SOLIDWORKS Modeling Solutions Partner			
TITLE: Stage Vinyl Base Plastic			
SIZE	DWG. NO.	REV	
C	GE-24203	A	
SCALE: 1:3		SHEET 1 OF 1	

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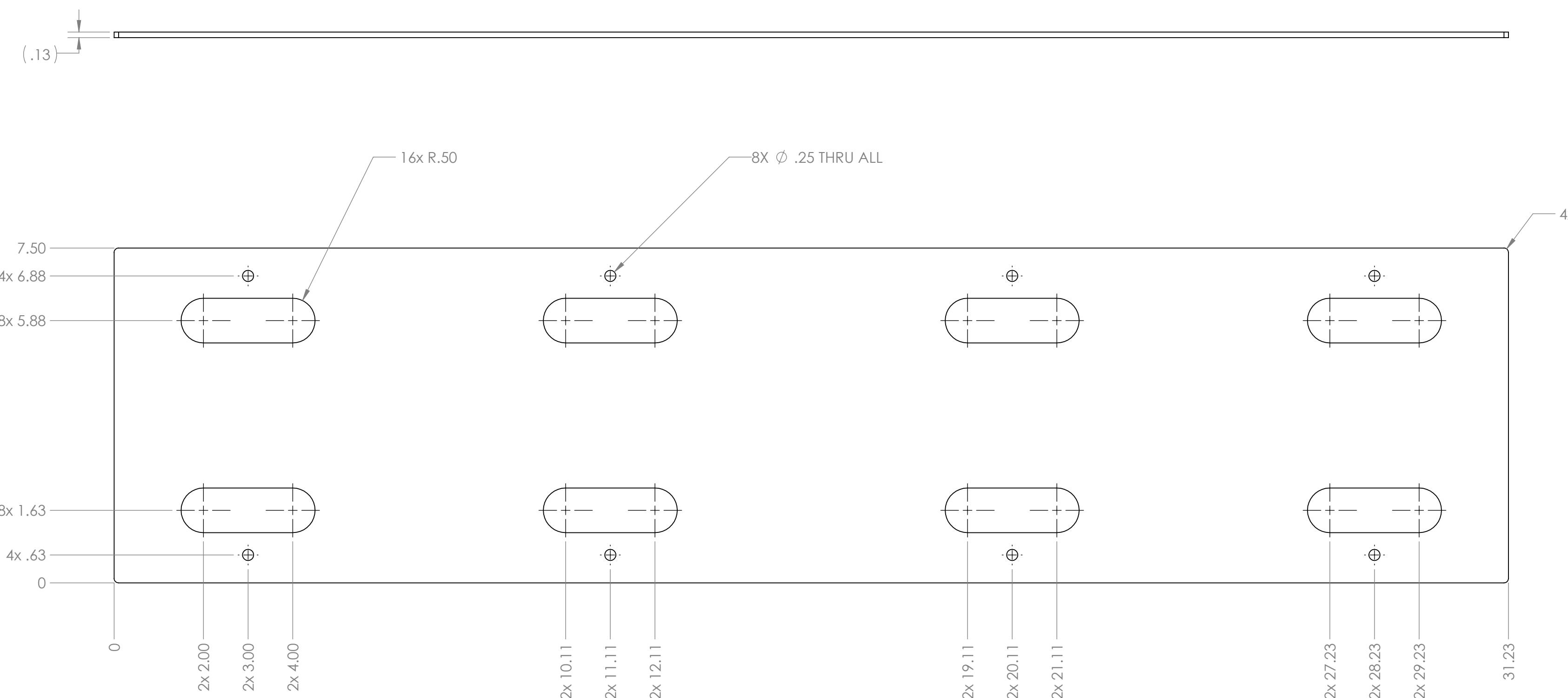
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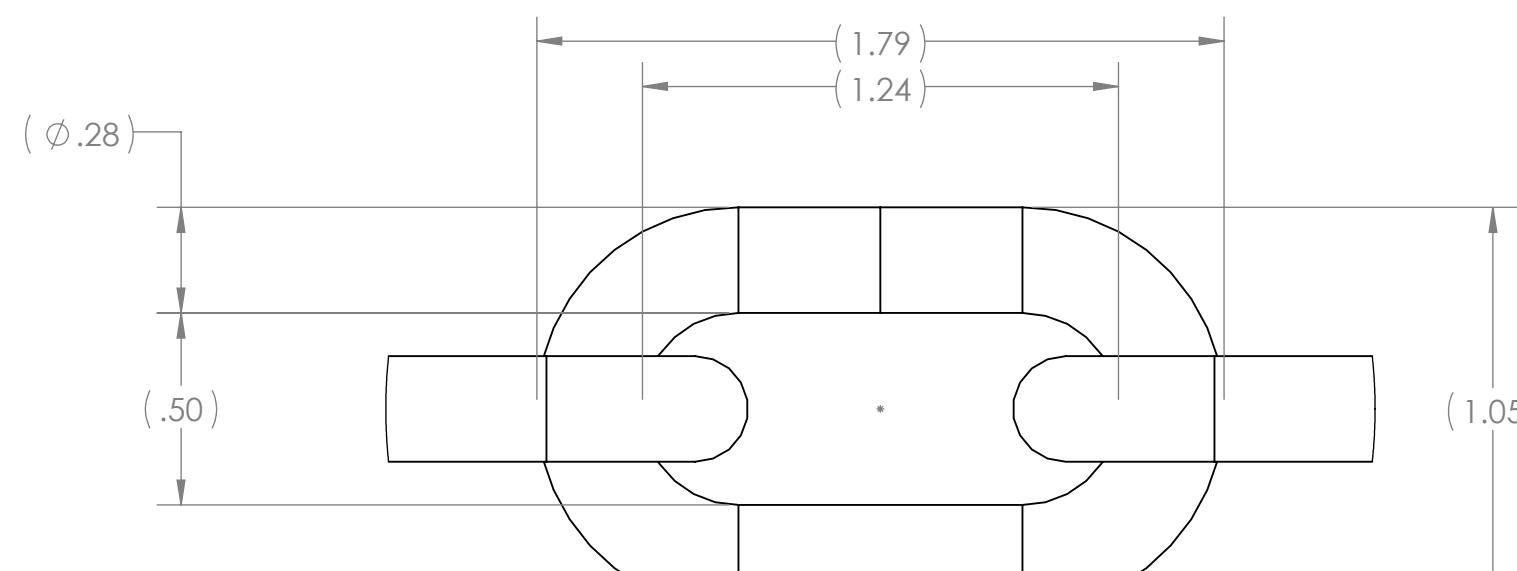
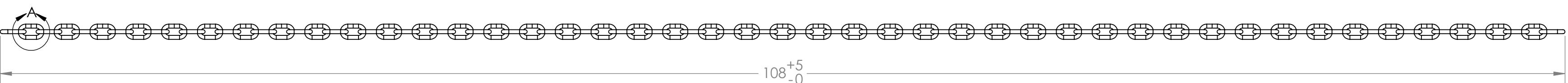
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UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	CO	7/20/2023	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH: 1/8" Polycarbonate, Clear			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			
FIRST ROBOTICS COMPETITION			
SOLIDWORKS Modeling Solutions Partner			
TITLE: Stage Face Filler Poly			
SIZE DWG. NO. REV			
C GE-24204			
SCALE: 1:2 SHEET 1 OF 1			

D



DETAIL A
SCALE 2 : 1

- Notes:
- Supplier: Perfection Chain Products
 - Packaged in groups of 9
 - Individual link dimensions provided as reference for teams based on a measured sample. Sizes of chain of a given grade and trade size vary.

UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	CO	9/25/2023	
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH:	Grade 43 Zinc Plated Chain, 1/4" Trade Size		
COMMENTS:	REMOVE ALL BURRS AND SHARP EDGES.		
DO NOT SCALE DRAWING			

 **FIRST ROBOTICS COMPETITION** 

TITLE:
Stage Chain

SIZE DWG. NO. REV
C GE-24205-straight

SCALE: 1:6 SHEET 1 OF 1

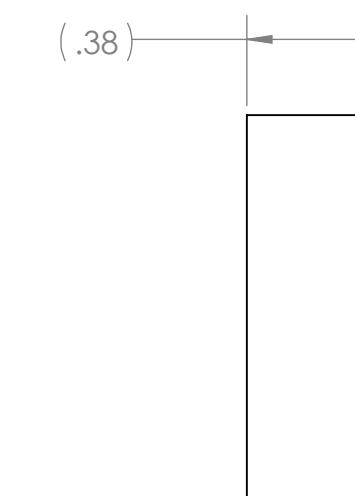
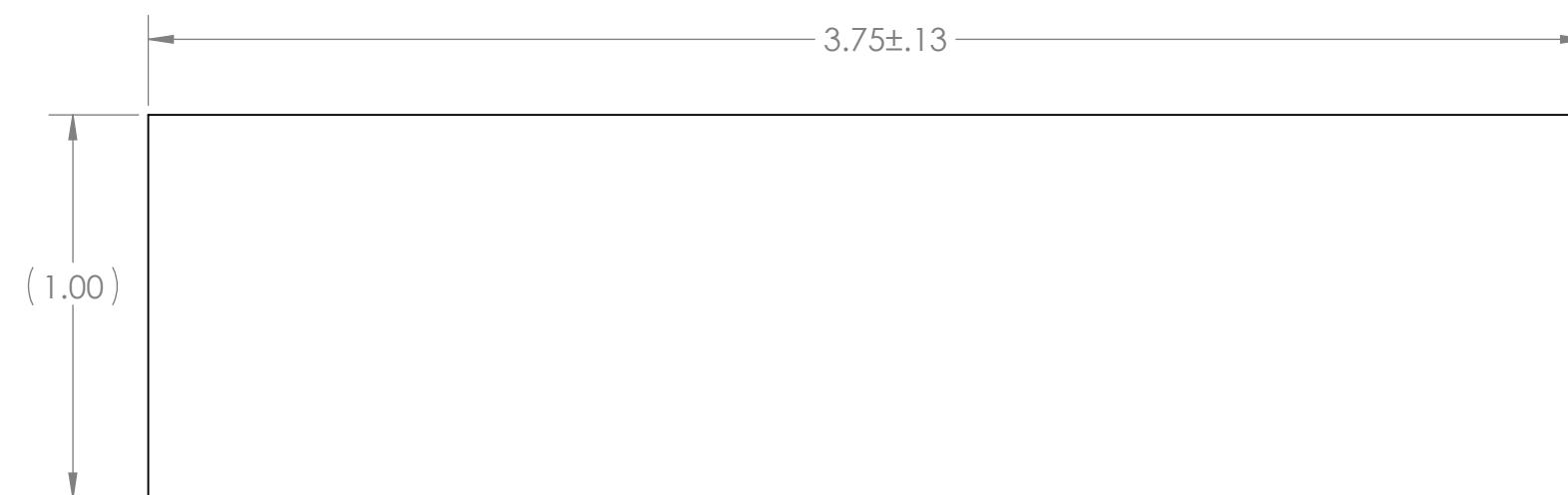
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Notes:

1. Make from: McMaster-Carr part number 8634K376
 - Economical abrasion-resistant SBR rubber
 - Adhesive backed strip
 - $3/8"$ thick, $1"$ x $36"$
 - Color: black
 - Texture: smooth
 - Durometer: 75A (hard)
2. Bag in quantities of 28 with part number.

UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	DF	10/16/2023	 
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH:	SIZE	DWG. NO.	REV
SBR Rubber	C	GE-24206	
COMMENTS:		REMOVE ALL BURRS AND SHARP EDGES.	
DO NOT SCALE DRAWING		SCALE: 2:1	SHEET 1 OF 1

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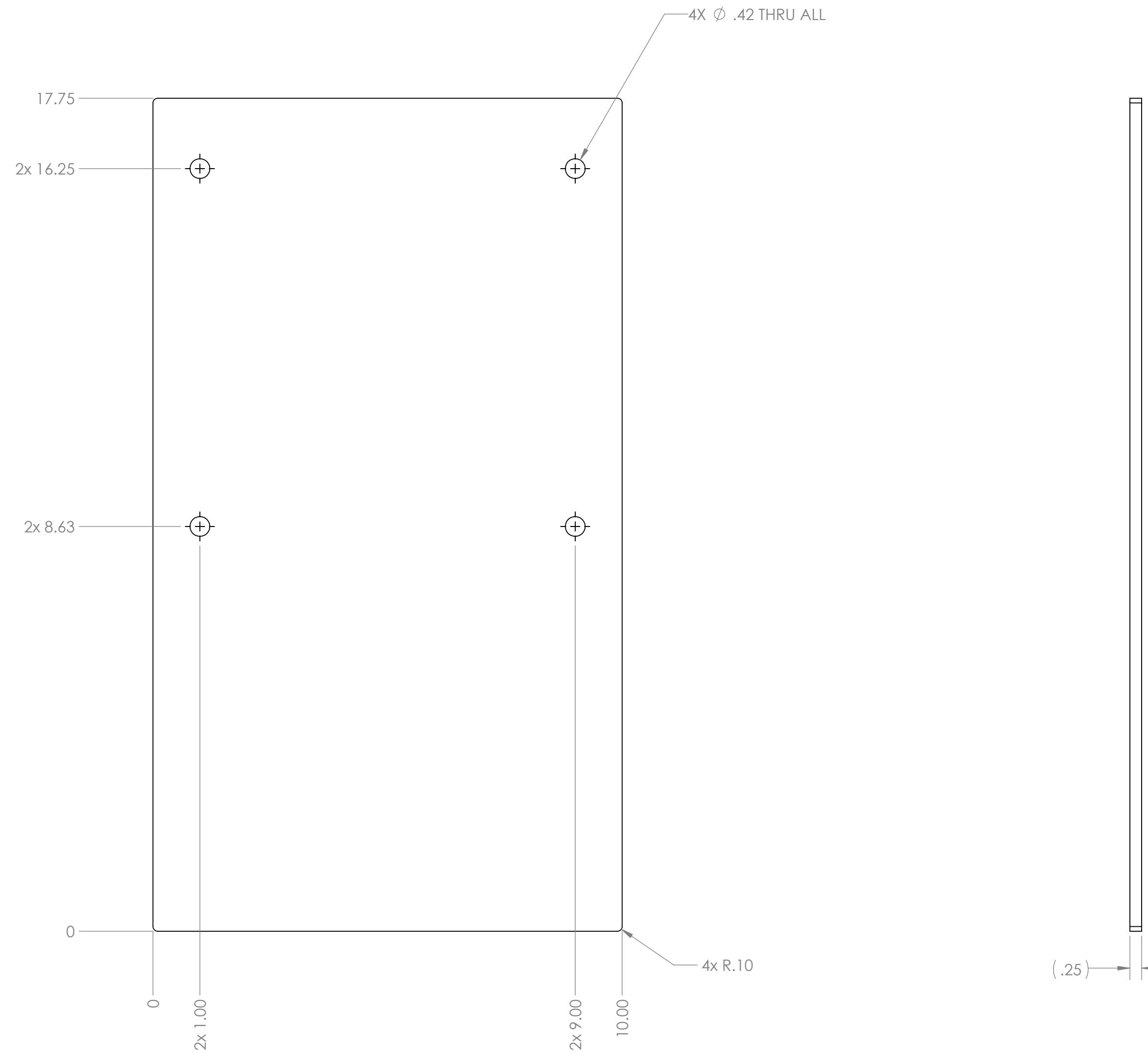
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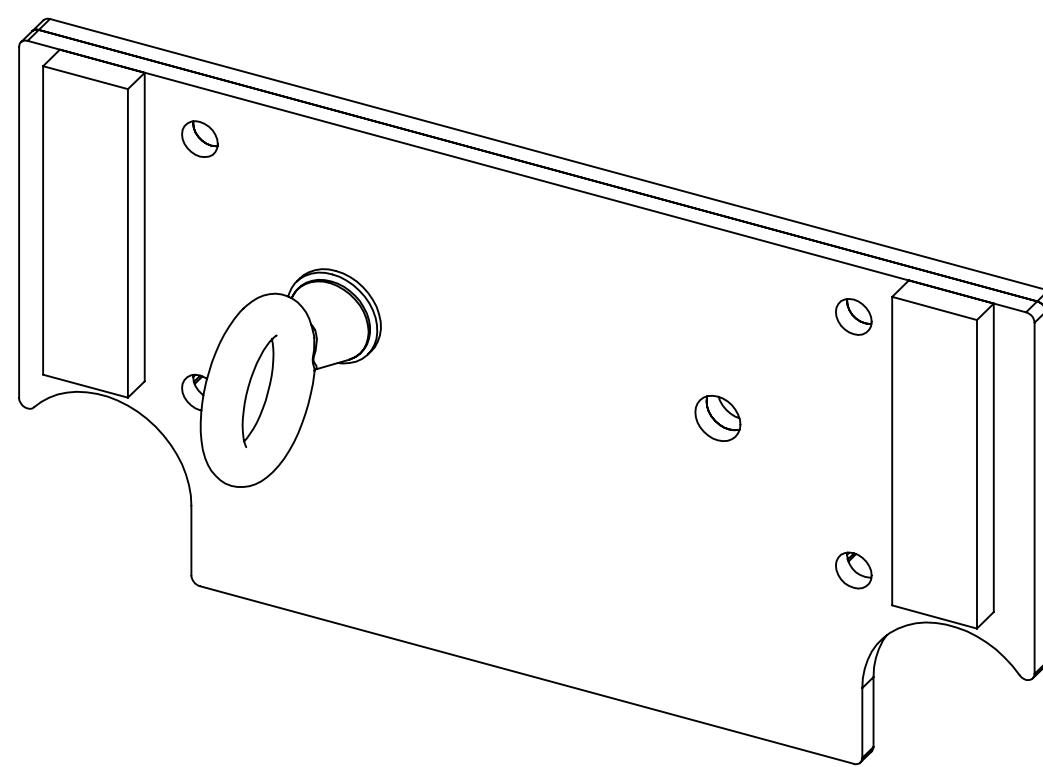
Notes:
1. Tag or label with part number.



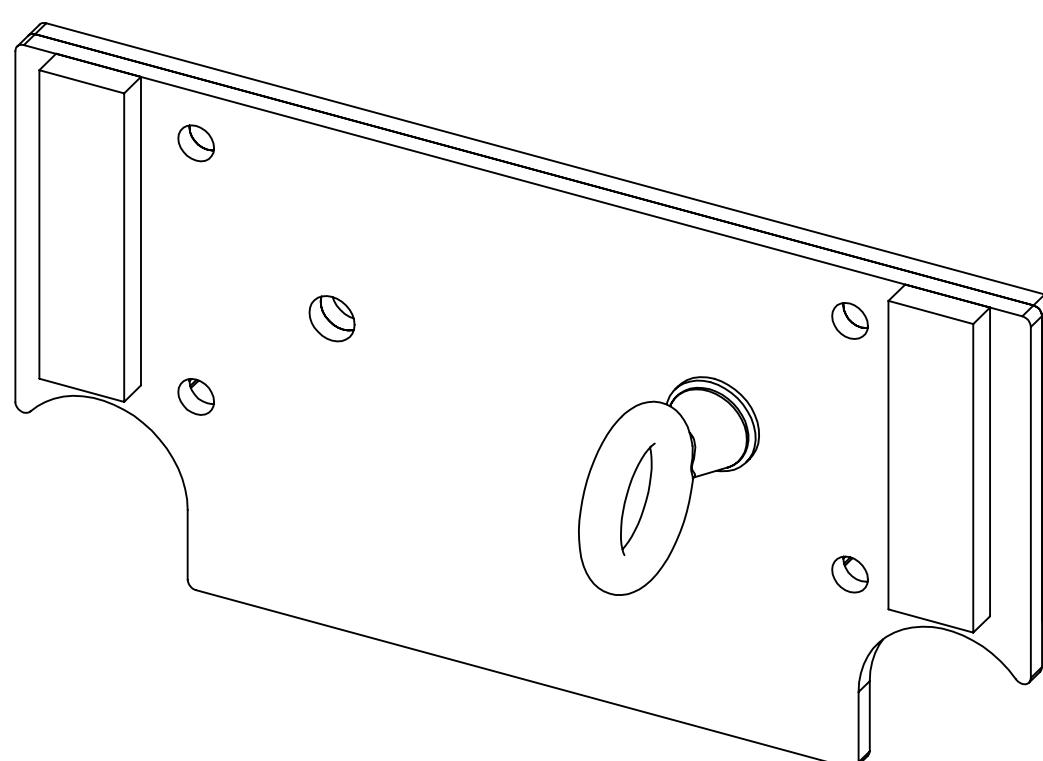
Part Number	Color
GE-24207-RED	Red
GE-24207-BLU	Blue

DO NOT SCALE DRAWING

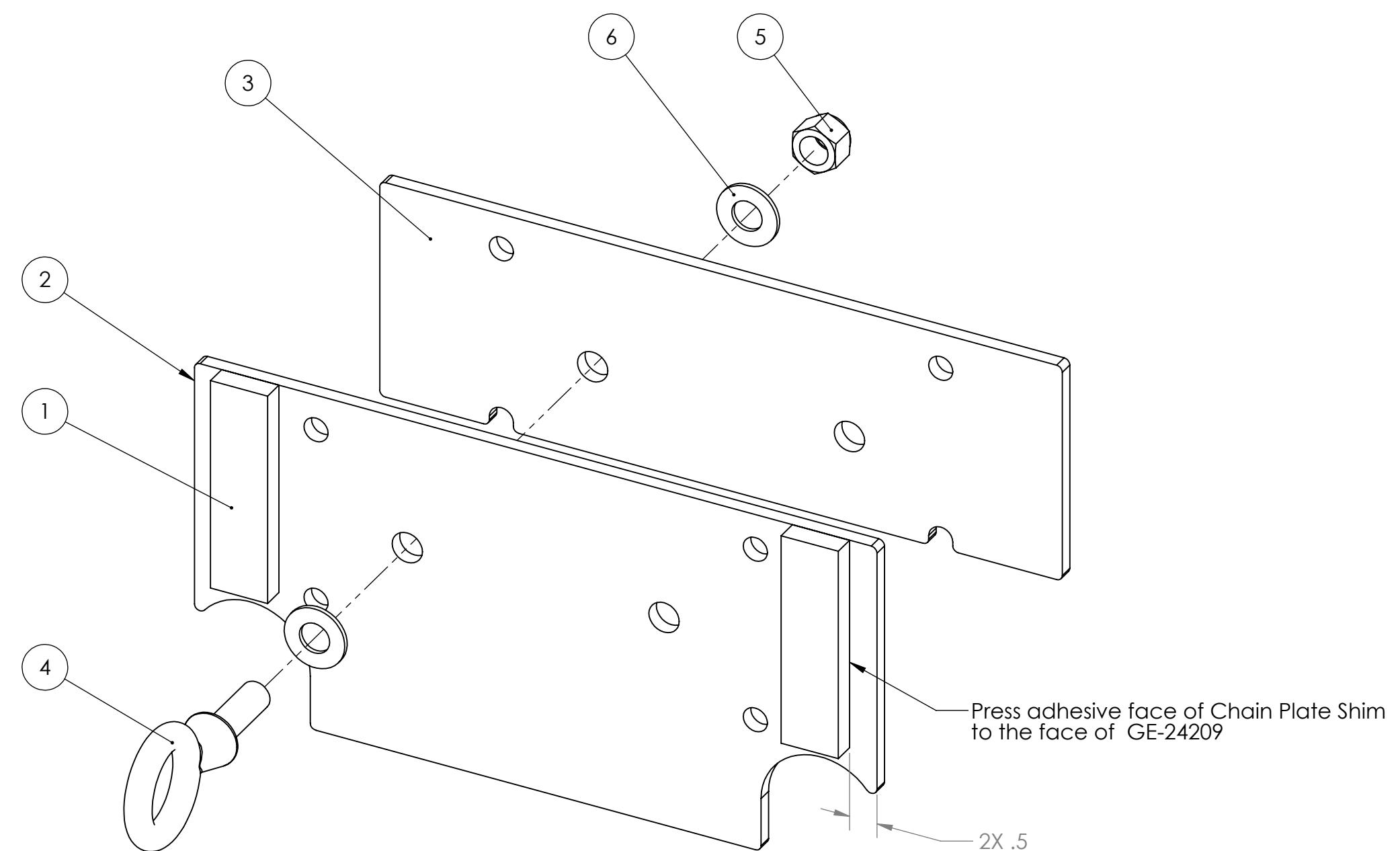
UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	CO	7/20/2023
TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .005$	PROPRIETARY AND CONFIDENTIAL		
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH: 1/4" HDPE, Smooth	COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.		
FIRST ROBOTICS COMPETITION			SOLIDWORKS Modeling Solutions Partner
TITLE: Podium			
SIZE	DWG. NO.	REV	
C	GE-24207		
SCALE: 1:2		SHEET 1 OF 1	



Left Version



Right Version



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24206	Chain Plate Shim	2
2	GE-24209	Chain Polycarbonate plate	1
3	GE-24213	Chain Metal plate	1
4	eyebolt_shoulder_.5_13_1.5	Steel Eyebolt with Shoulder, 1/2"-13 x 1.5" long, fully threaded	1
5	nylock_.5_13	Steel nylon-insert locknut, 1/2" - 13	1
6	washer_flat_.5	Flat Washer for 1/2" Screw	2

UNLESS OTHERWISE SPECIFIED:			FIELD	NAME	DATE
			DRAWN	DF	11/27/2023
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm\frac{1}{2}$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .50$					
PROPRIETARY AND CONFIDENTIAL THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.					
MATERIAL/FINISH:					
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.					
DO NOT SCALE DRAWING					

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Chain Plate with Fasteners

SIZE	DWG. NO.	REV
C	GE-24208	

SCALE: 1:2 **SHEET 1 OF 1**

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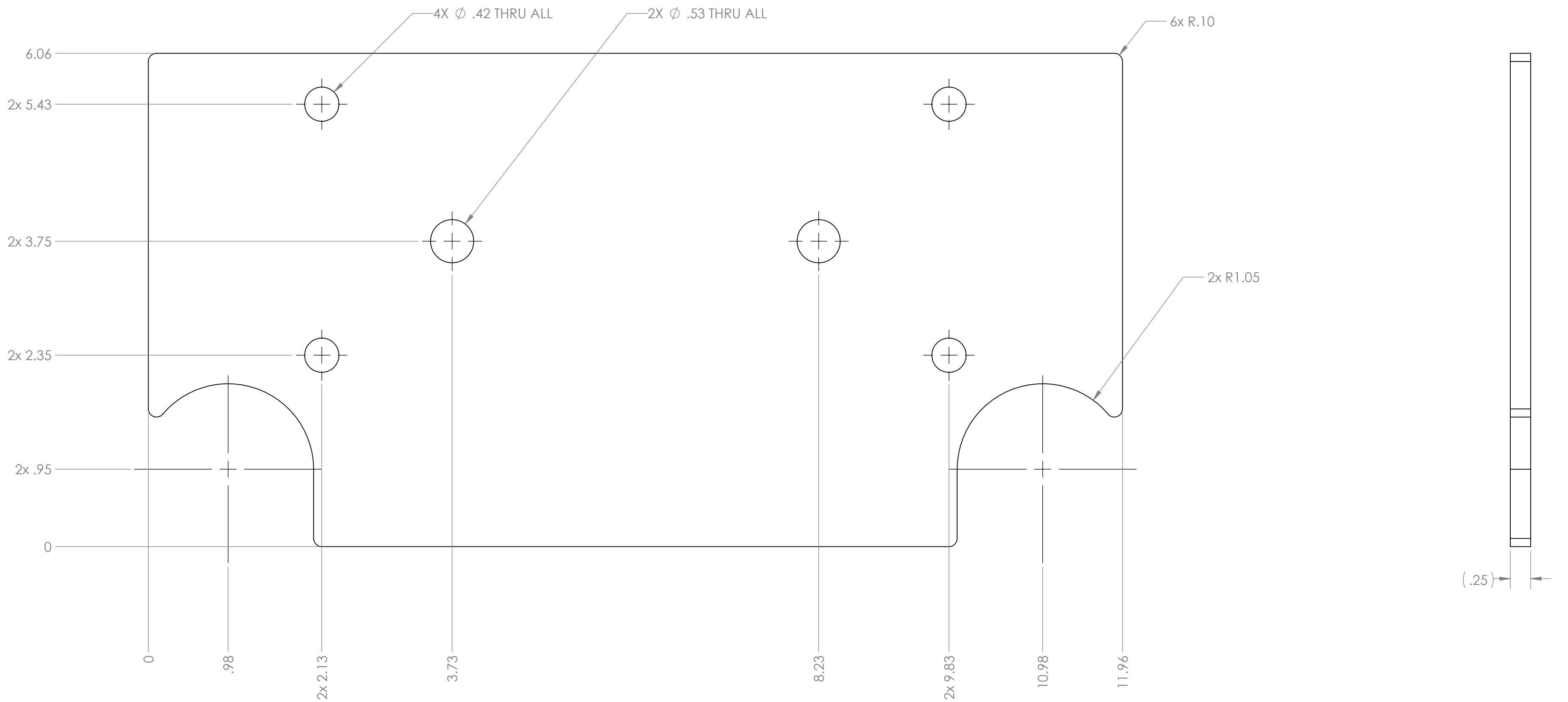
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Notes:
1. Tag or label with part number.



UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	CO	8/18/2023
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH: 1/4" thk. polycarbonate			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			
FIRST ROBOTICS COMPETITION			
SOLIDWORKS Modeling Solutions Partner			
TITLE: Chain Polycarbonate plate			
SIZE DWG. NO. REV			
C GE-24209			
SCALE: 1:1 SHEET 1 OF 1			

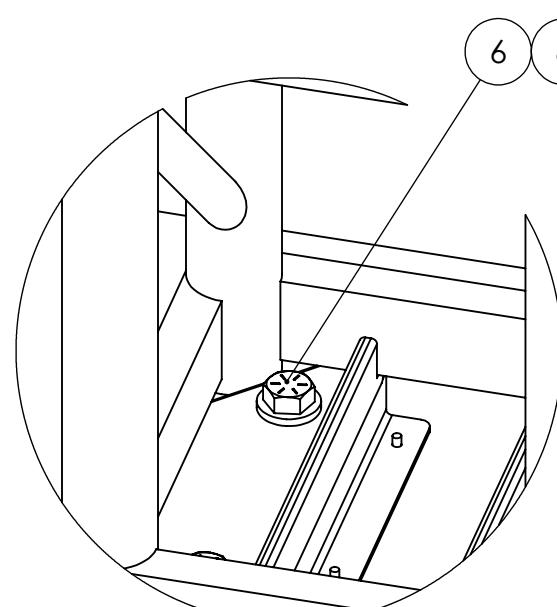
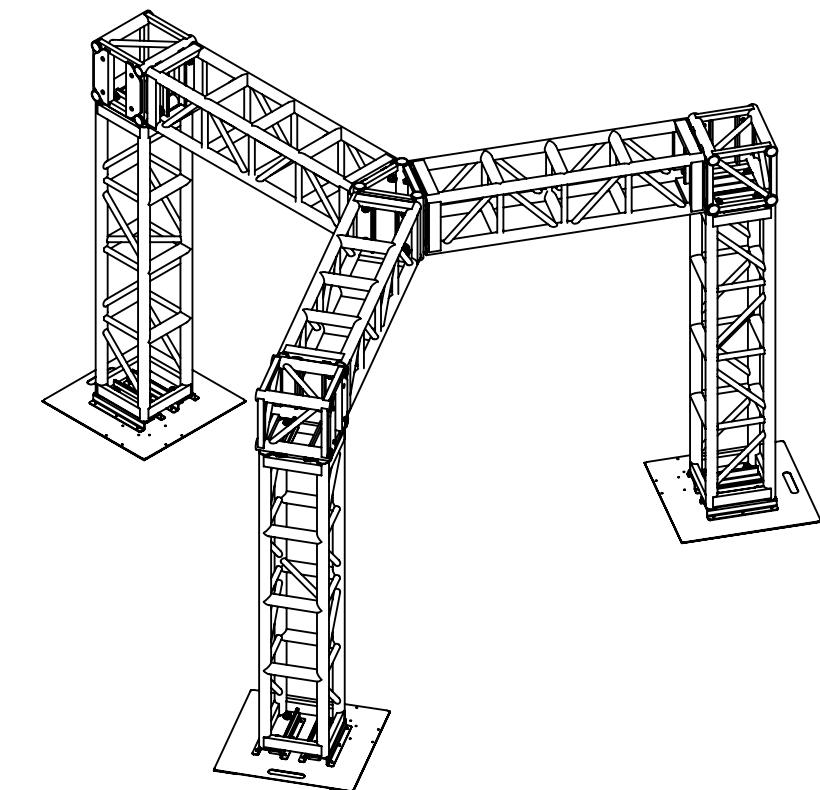
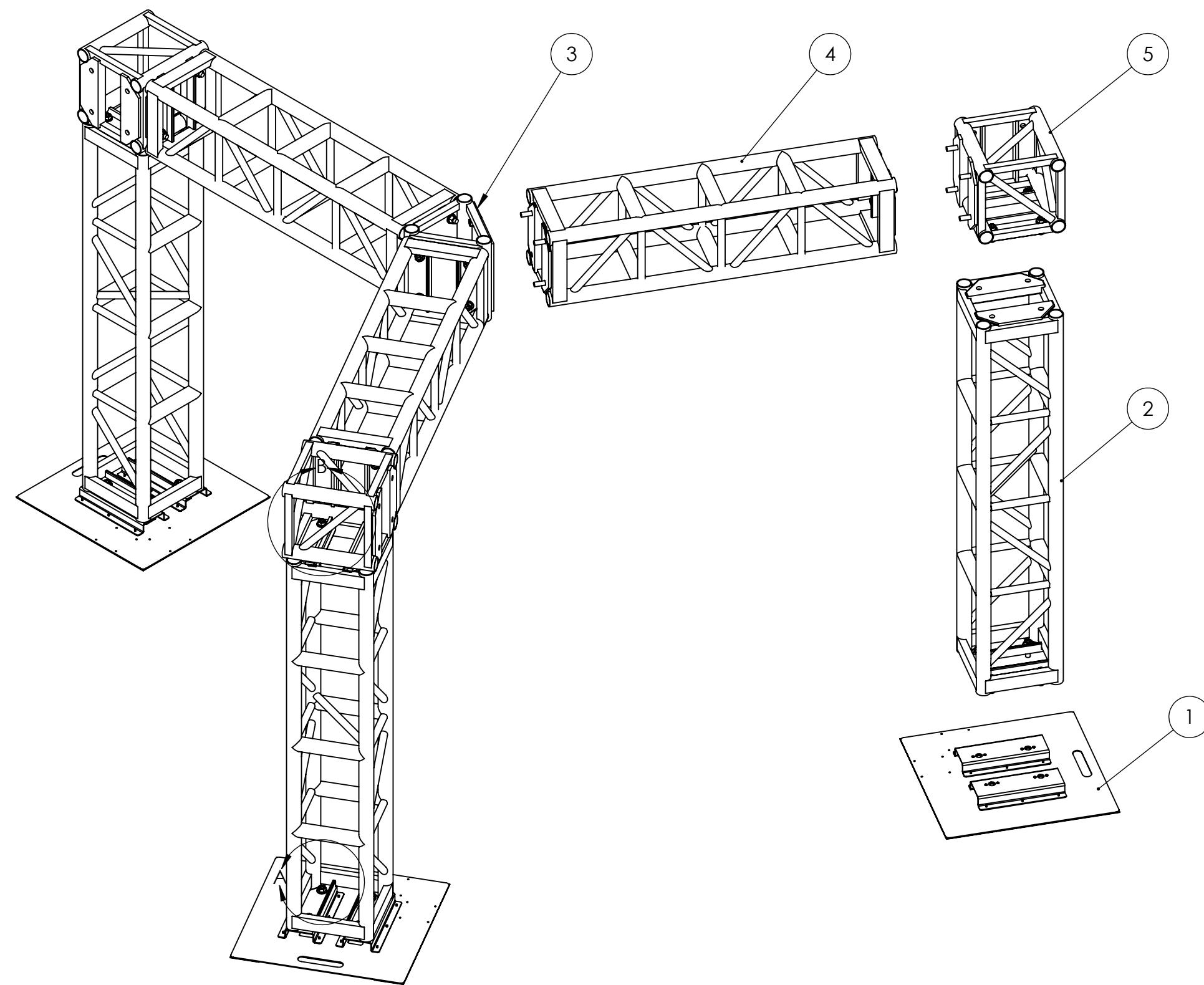
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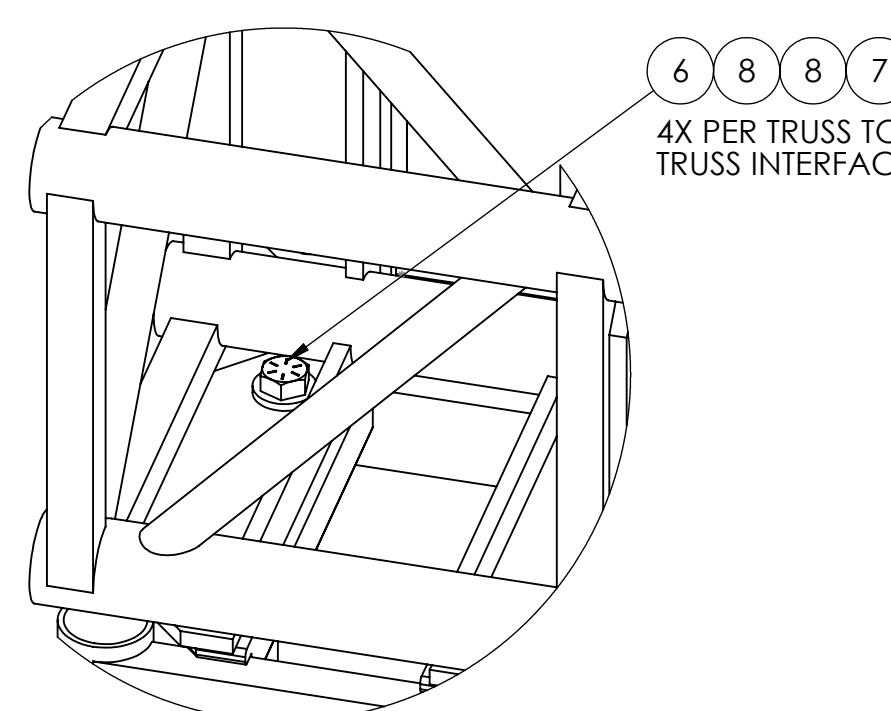
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DETAIL A
SCALE 1 : 4



DETAIL B
SCALE 1 : 4

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	FE-01021	Truss Base	3
2	FE-01003	5' x 1' x 1' Square Truss	3
3	GE-24211	Triangular Truss Block	1
4	FE-01002	4' x 1' x 1' Square Truss	3
5	FE-01012	3 Way Corner Block	3
6	hex_.625_11_2.00	Hex Head Bolt, 5/8"-11 Thread, 2" length	48
7	hexnut_.625_11	5/8"-11 hex nut	36
8	washer_flat_.625	Flat washer for 5/8" screw	84

UNLESS OTHERWISE SPECIFIED: FIELD NAME DATE
DRAWN DF 12/7/2023

DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL $\pm\frac{1}{2}$
ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$
TWO PLACE DECIMAL $\pm .50$

PROPRIETARY AND CONFIDENTIAL
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MATERIAL/FINISH:

COMMENTS:
REMOVE ALL BURRS AND SHARP EDGES.

DO NOT SCALE DRAWING

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

Base Truss Assembly

SIZE DWG. NO. REV

C GE-24210

SCALE: 1:16 SHEET 1 OF 1

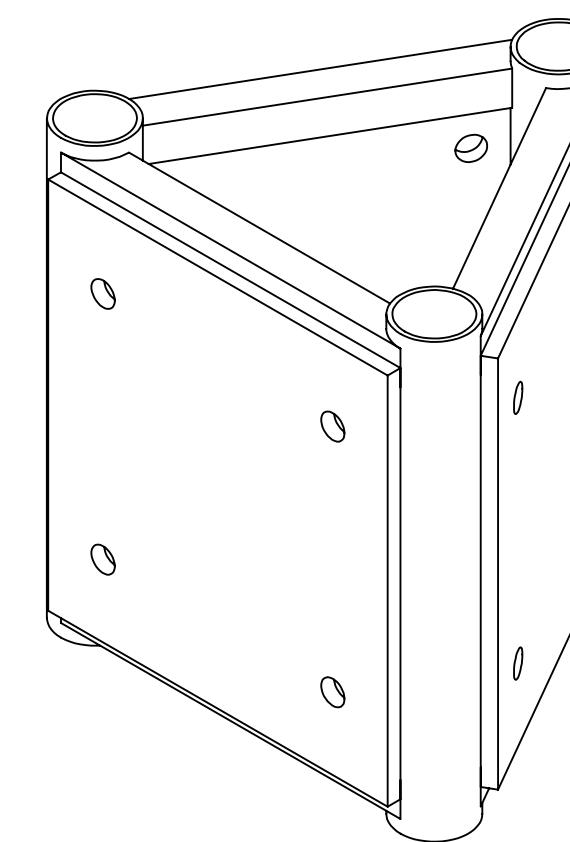
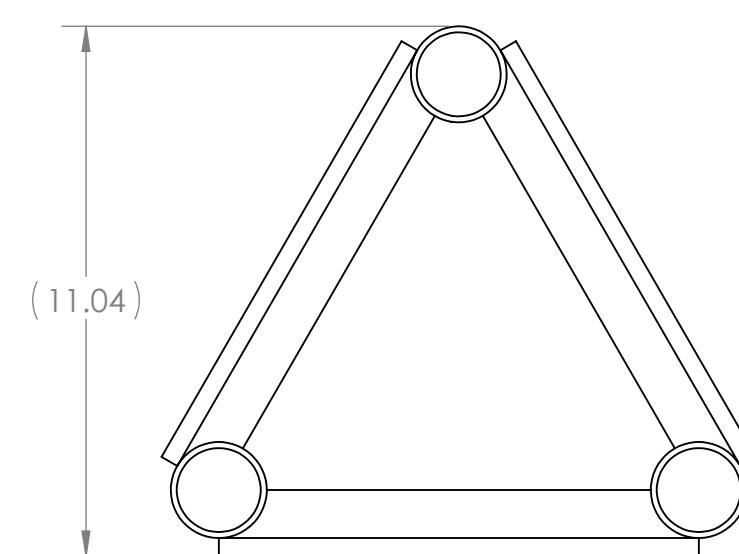
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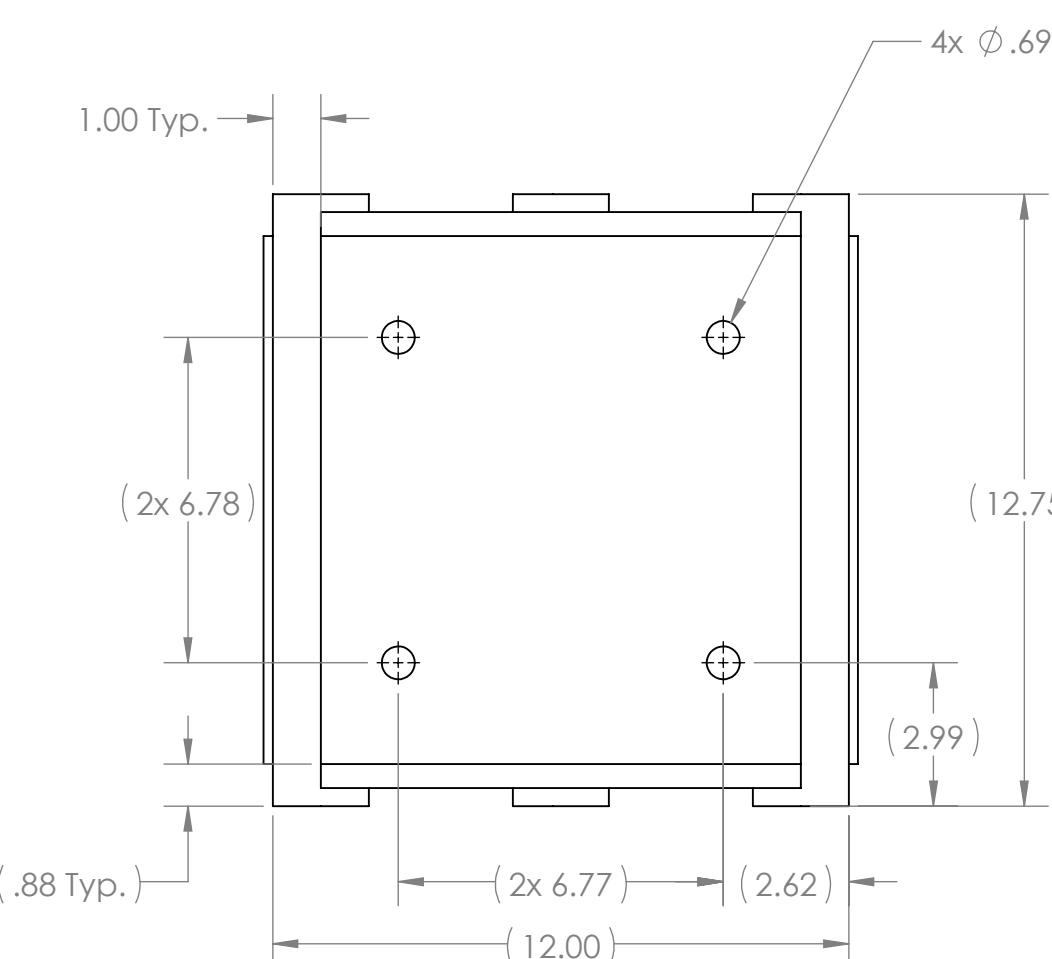
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Notes:

1. Description: 6061-T6 Aluminum - Light Duty 3 Way Spoke Corner Block
2. Vendor: Total Structures
3. Part Number: 1212LD 3WAY SPOKE
4. Note: Substitutions not allowed

UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
	DRAWN	CO	7/20/2023
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

 **FIRST
ROBOTICS
COMPETITION**  SOLIDWORKS
Modeling Solutions Partner

TITLE:
**Triangular Truss
Block**

SIZE DWG. NO. REV
C GE-24211

SCALE: 1:4 SHEET 1 OF 1

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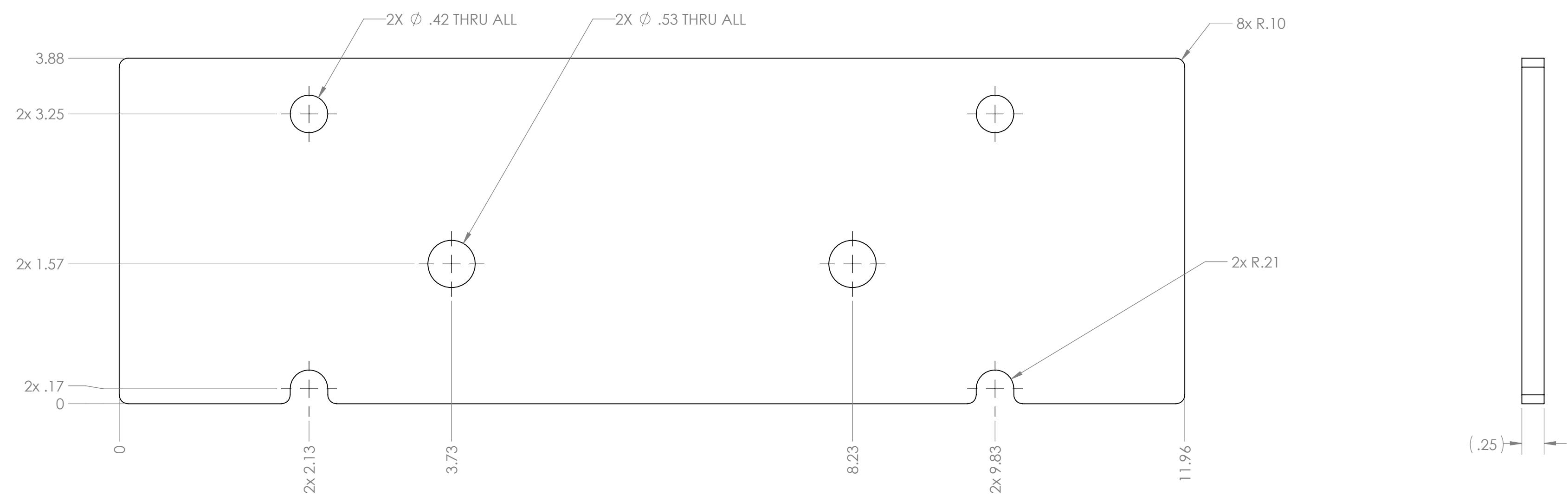
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UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	CO	9/14/2023	
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH:			
1/4" thk. A36 Steel			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
**Chain Metal
plate**

SIZE DWG. NO. REV
C GE-24213

SCALE: 1:1 SHEET 1 OF 1

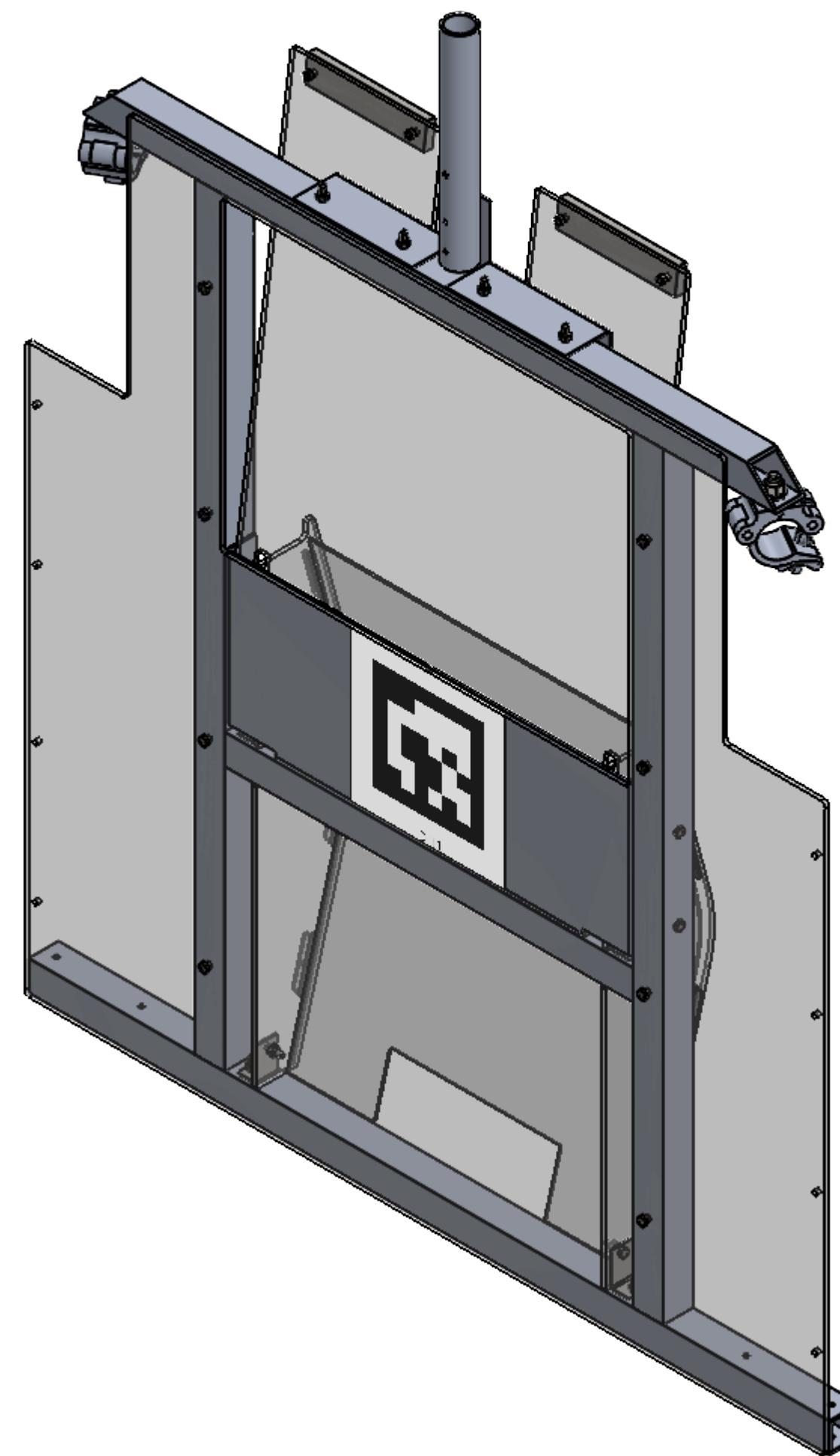
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24221	Endgame Weldment	1
2	GE-24222	Wall poly	1
3	GE-24230	Flap/Pole Assembly	1
4	GE-24240	Chute	1
5	GE-24224	Stage AprilTag	1
6	FE-01016	Cheeseborough for Truss _ Single	2
7	hex_.25_20_2.5_partial	Steel Hex Head Screw, 1/4"-20 x 2-1/2" long, partially threaded	20
8	nylock_.25_20	Steel Nylon-Insert Locknut, 1/4"-20	16
9	hex_.5_13_1.25	Steel Hex Head Screw, 1/2"-13 x 1.25" long, fully threaded	2
10	nylock_.5_13	steel nylon-insert locknut, 1/2" - 13	2
11	washer_flat_.5	Flat Washer for 1/2" Screw	2

UNLESS OTHERWISE SPECIFIED:			FIELD	NAME	DATE
			DRAWN	DF	12/4/2023
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/2$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .50$					
PROPRIETARY AND CONFIDENTIAL THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.					
MATERIAL/FINISH:					
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.					
DO NOT SCALE DRAWING					

FIRST ROBOTICS COMPETITION Modeling Solutions Partner
TITLE: Wall Assembly
SIZE DWG. NO. **REV**
C GE-24220
SCALE: 1:8 **SHEET** 1 OF 3

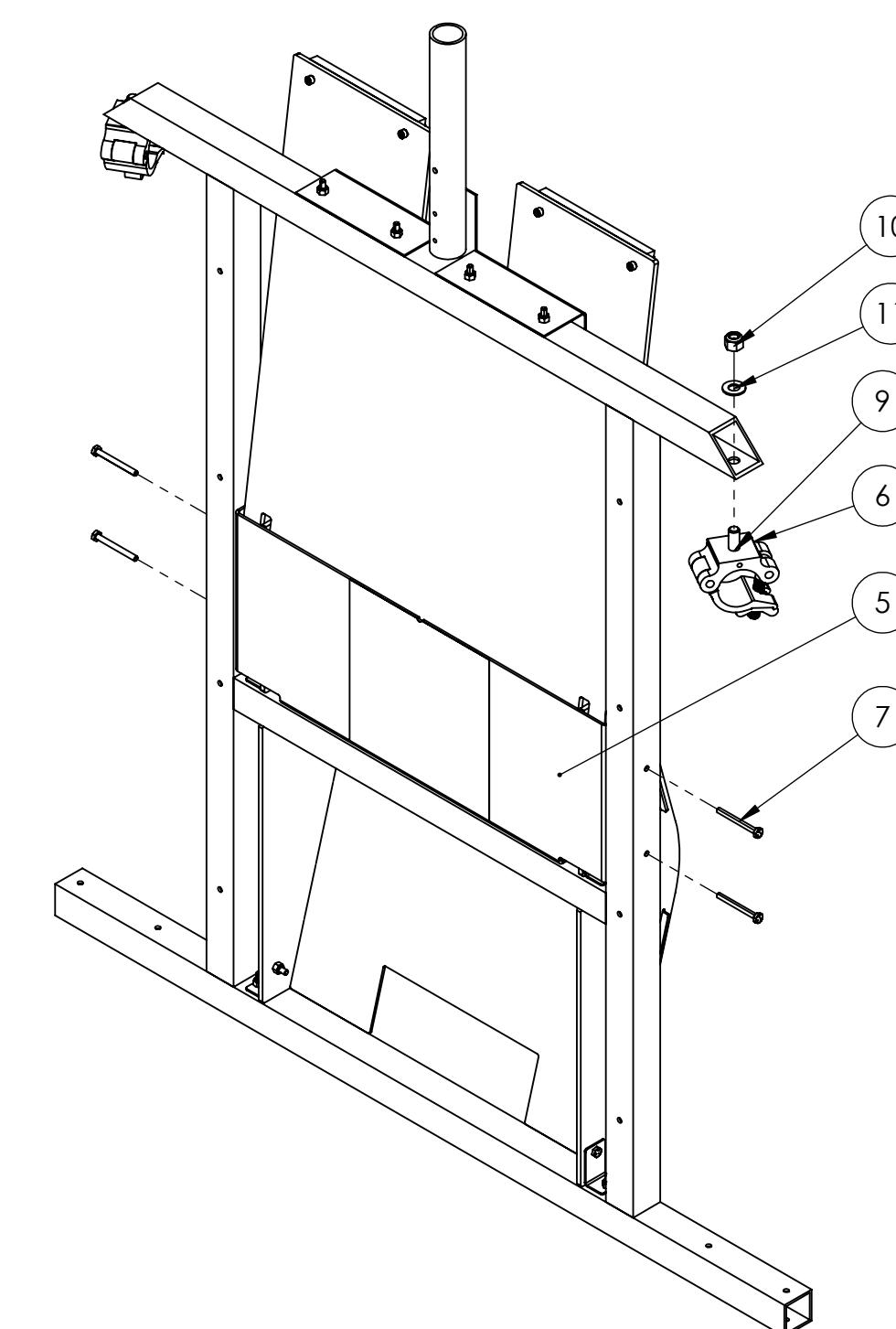
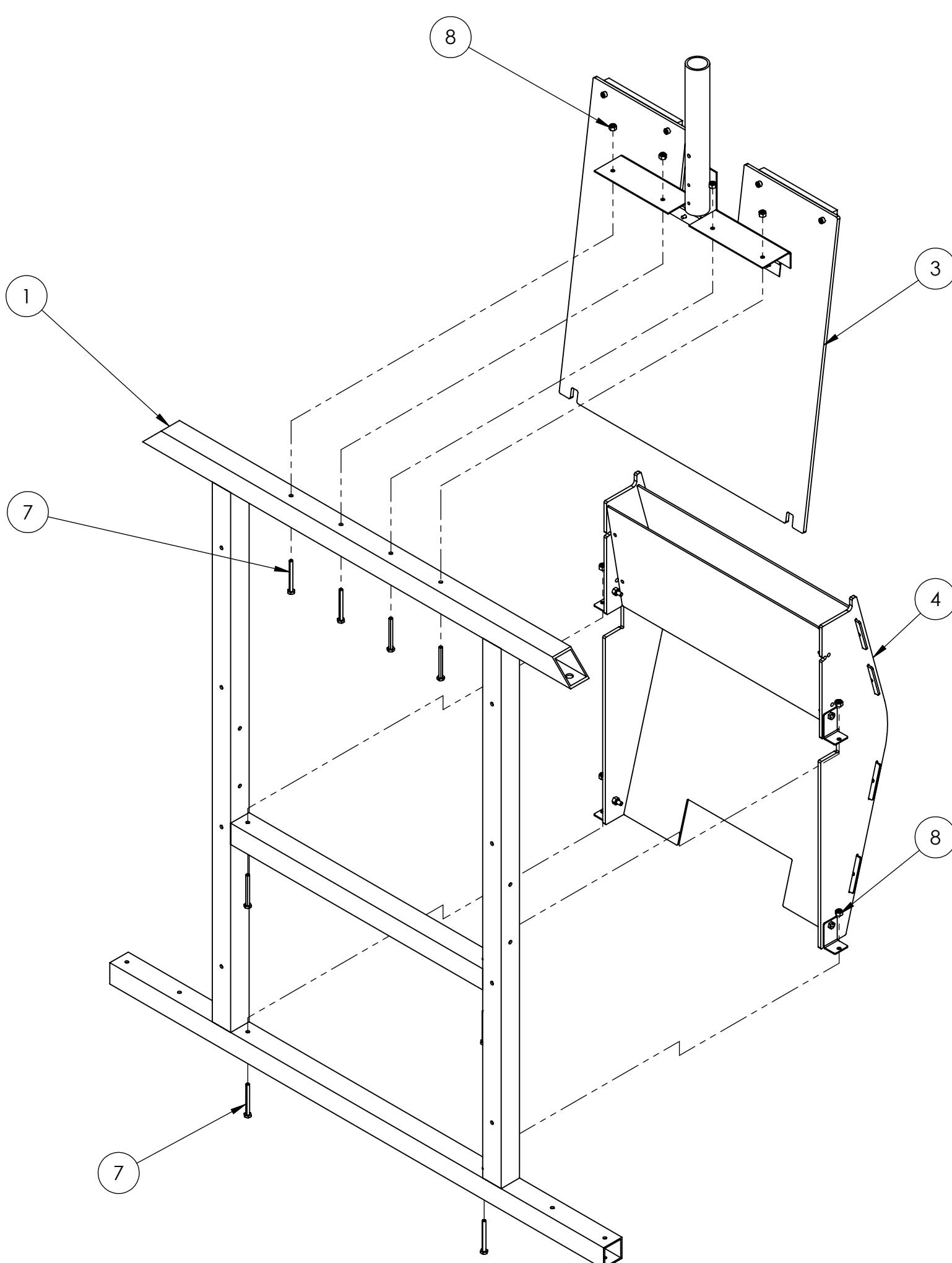
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UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm\frac{1}{2}$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .50$	DRAWN	DF	12/4/2023
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH:			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

 **FIRST
ROBOTICS
COMPETITION**  **SOLIDWORKS**
Modeling Solutions Partner

TITLE:
Wall Assembly

SIZE DWG. NO. REV

C GE-24220

SCALE: 1:8 SHEET 2 OF 3

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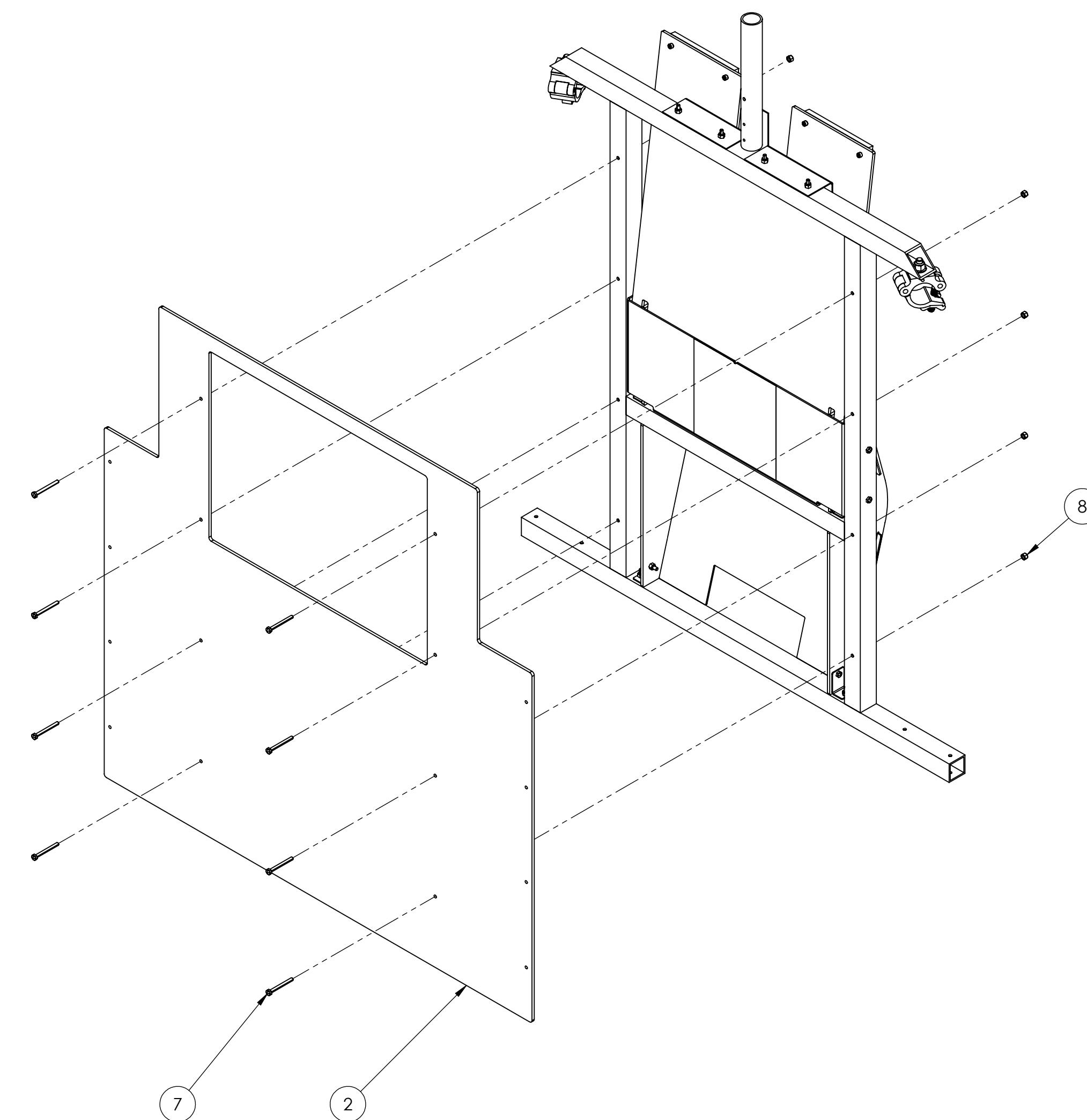
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UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm\frac{1}{2}$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .50$	DRAWN	DF	12/4/2023
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH:	SIZE	DWG. NO.	REV
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.	C	GE-24220	
DO NOT SCALE DRAWING	SCALE: 1:8	SHEET 3 OF 3	

 **FIRST
ROBOTICS
COMPETITION**  **SOLIDWORKS**
Modeling Solutions Partner

TITLE:
Wall Assembly

SIZE DWG. NO. REV
C GE-24220

SCALE: 1:8 SHEET 3 OF 3

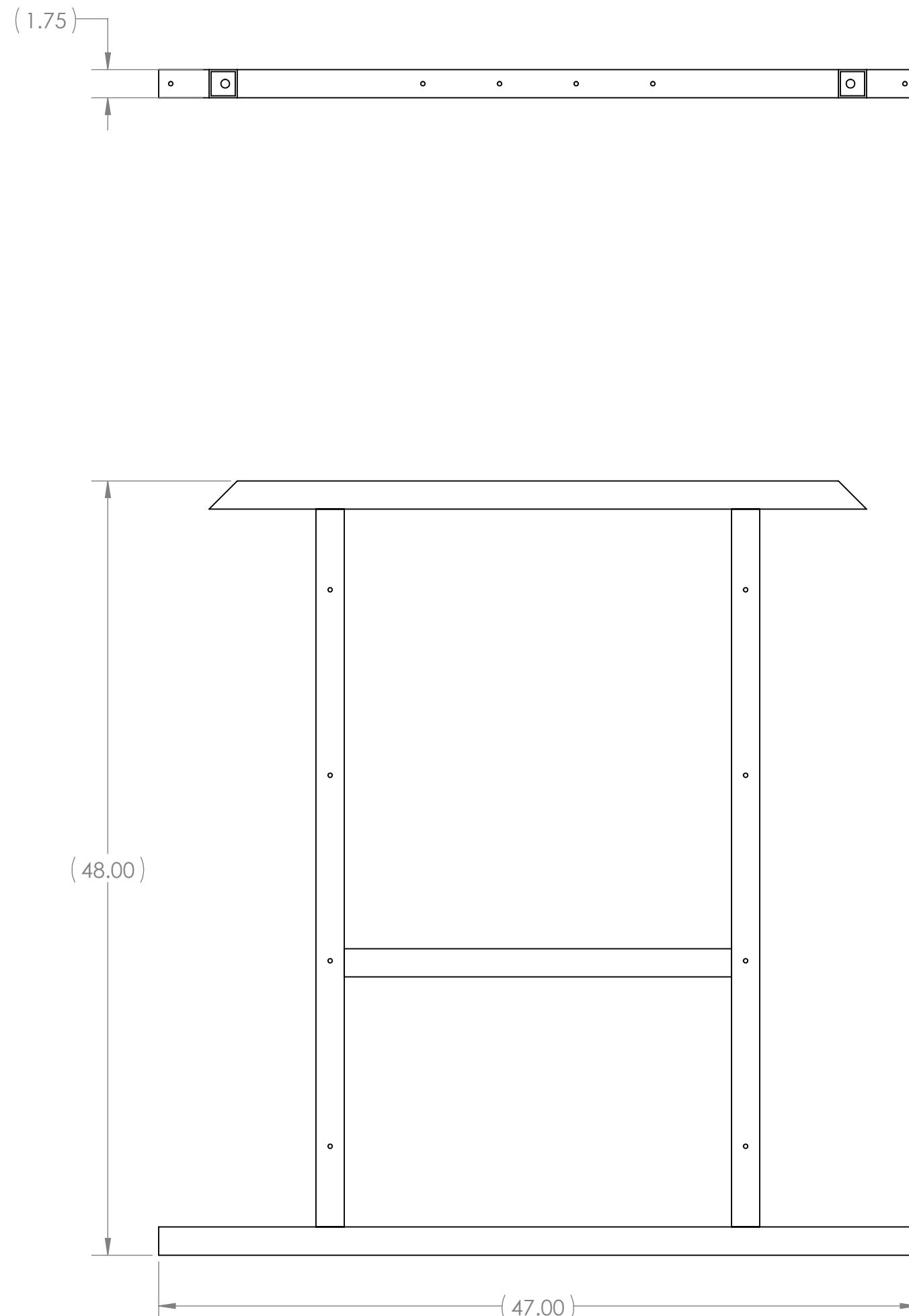
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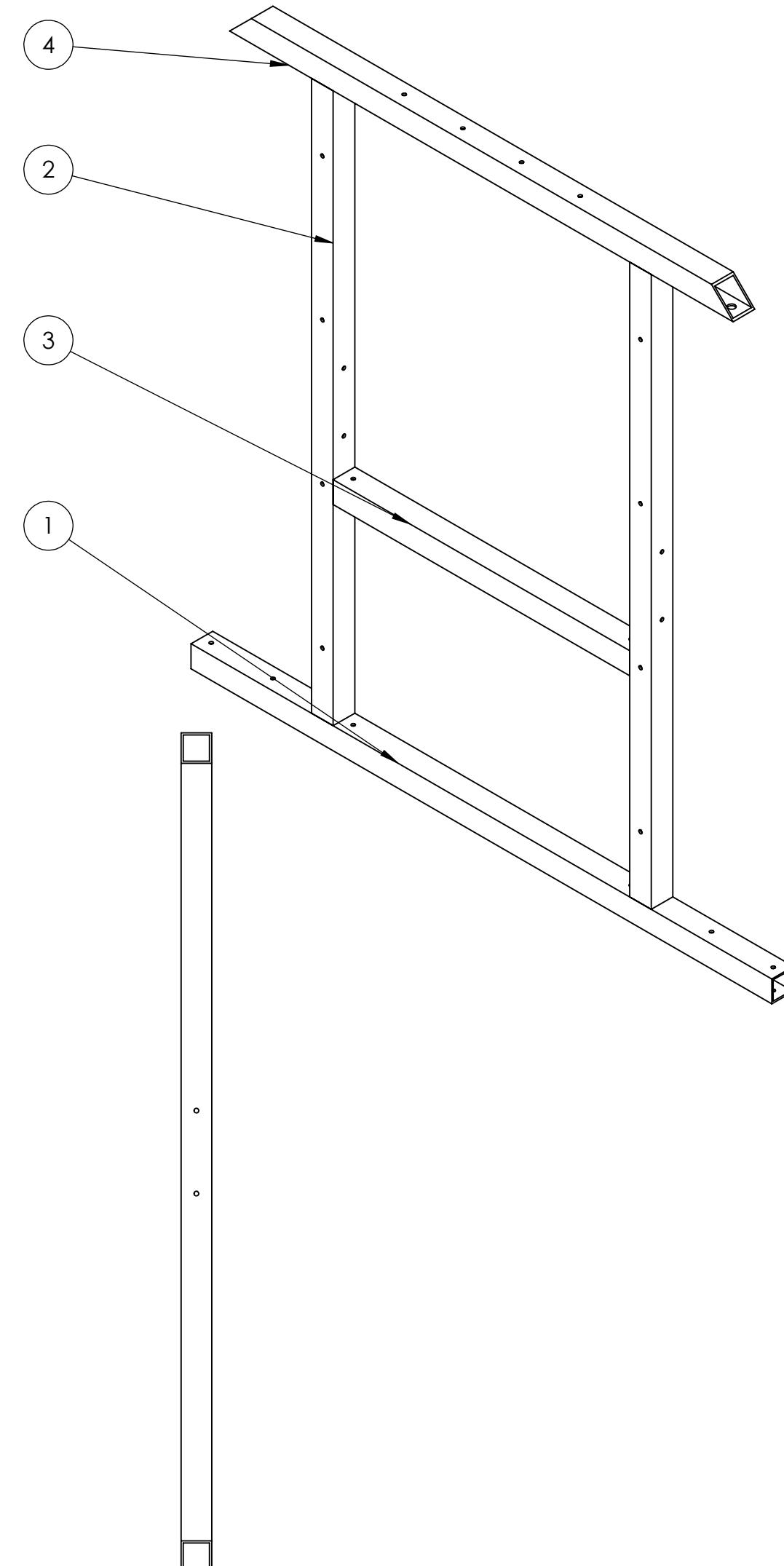
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Notes:
1. Tag or label with part number.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24221-01	1.75" x .125" thk. Square Tubing, 6061	1
2	GE-24221-02	1.75" x .125" thk. Square Tubing, 6061	2
3	GE-24221-03	1.75" x .125" thk. Square Tubing, 6061	1
4	GE-24221-04	1.75" x .125" thk. Square Tubing, 6061	1



UNLESS OTHERWISE SPECIFIED:	WELD	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	CO	7/24/2023
TOLERANCES: FRACTIONAL $\pm 1/16$	PROPRIETARY AND CONFIDENTIAL		
ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$	THE INFORMATION CONTAINED IN		
TWO PLACE DECIMAL $\pm .02$	THIS DRAWING IS THE SOLE		
THREE PLACE DECIMAL $\pm .015$	PROPERTY OF FIRST®. ANY		
MATERIAL/FINISH:	REPRODUCTION IN PART OR AS A		
1.75" x .125" thk. Square Tubing, 6061 Aluminum	WHOLE WITHOUT THE WRITTEN		
PERMISSION OF FIRST® IS			
PROHIBITED.			
COMMENTS:			
REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST ROBOTICS COMPETITION SOLIDWORKS Modeling Solutions Partner

Endgame Weldment

SIZE DWG. NO. REV

C GE-24221

SCALE: 1:8 SHEET 1 OF 3

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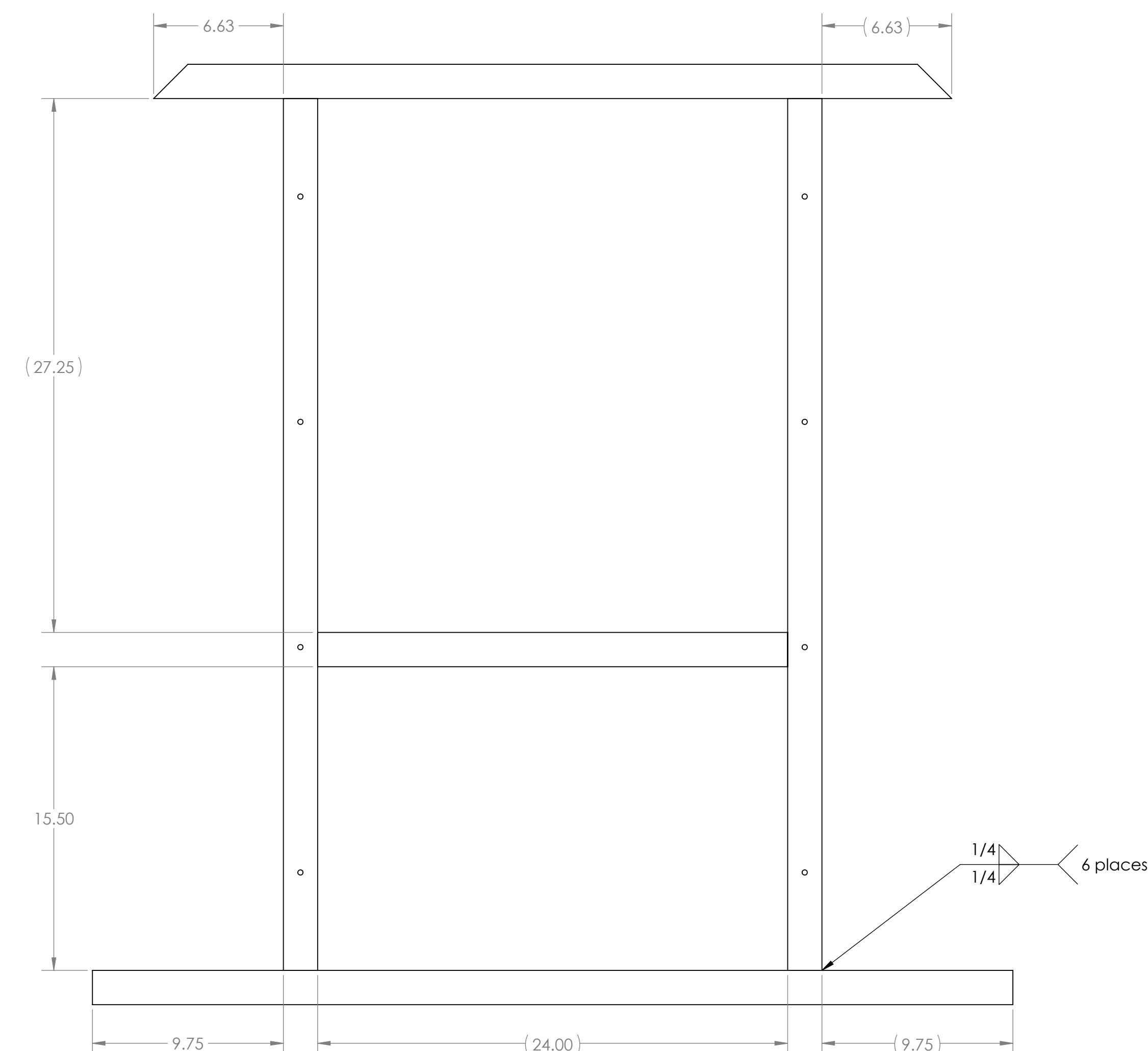
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UNLESS OTHERWISE SPECIFIED:	WELD	NAME	DATE
DRAWN	CO	7/24/2023	
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH: 1.75" x .125" thk. Square Tubing, 6061 Aluminum			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			



TITLE: Endgame Weldment

SIZE DWG. NO. REV
C GE-24221

SCALE: 1:5 SHEET 2 OF 3

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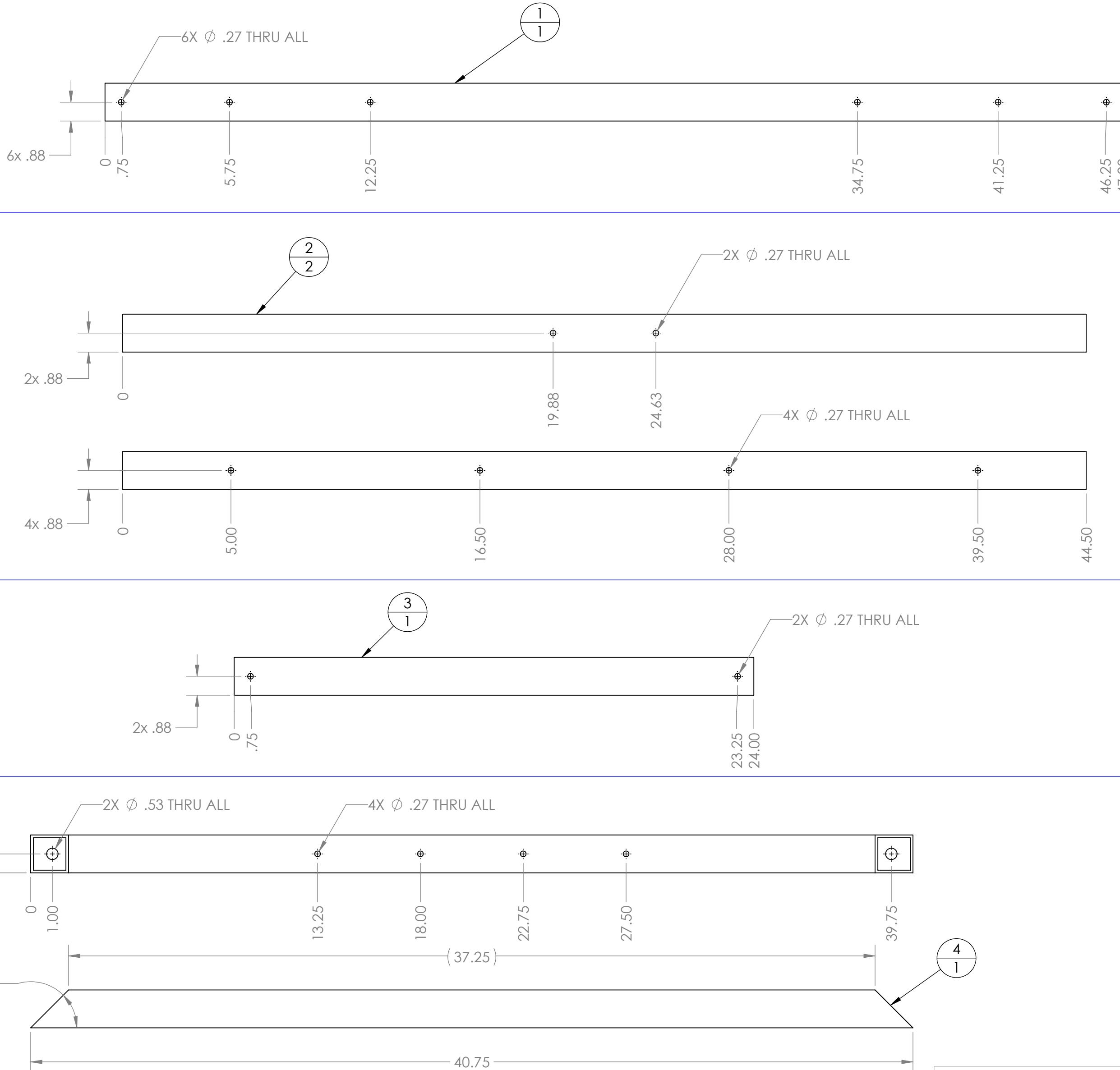
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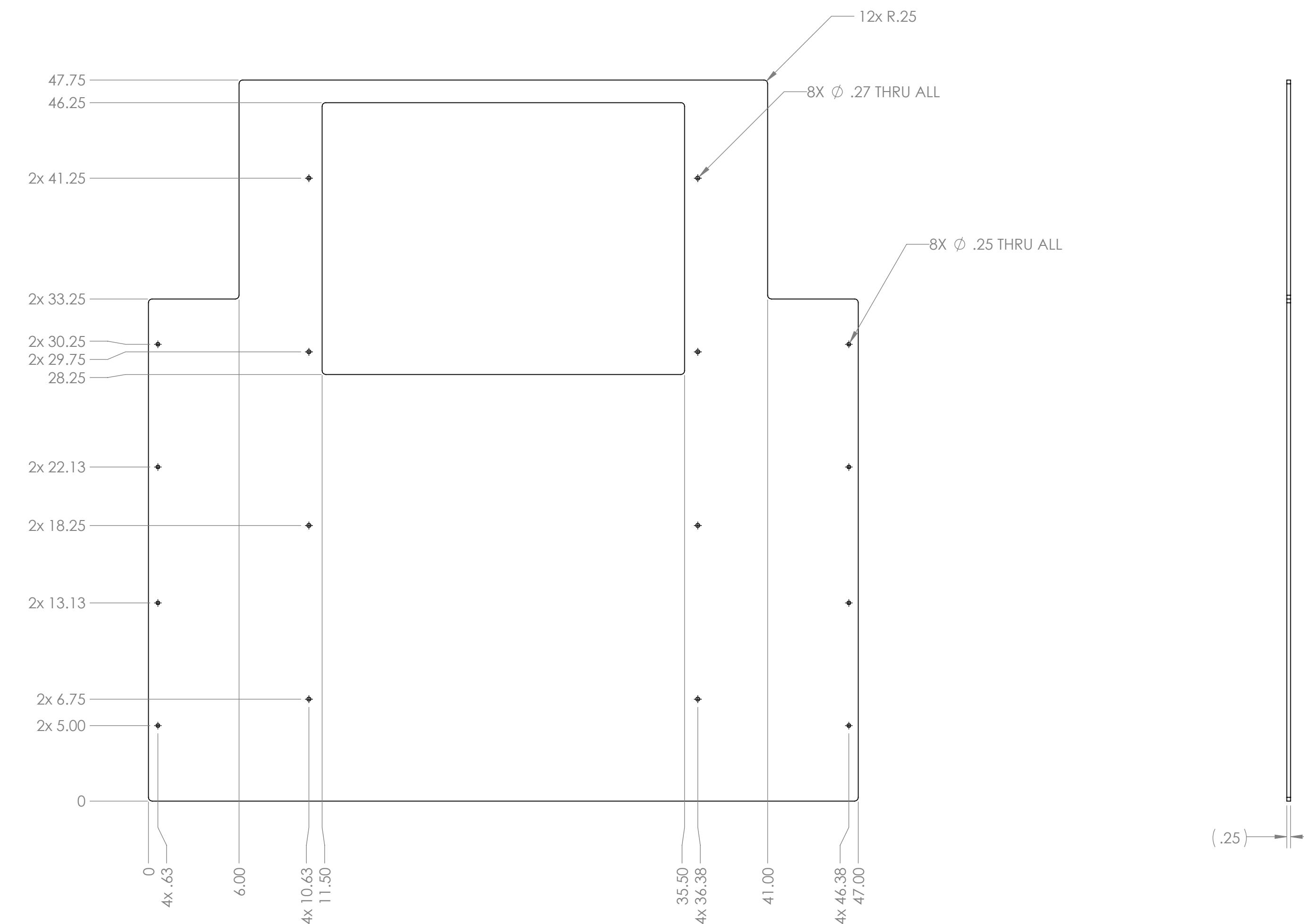
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UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE			
DIMENSIONS ARE IN INCHES	DRAWN	CO	7/24/2023			
TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .005$	PROPRIETARY AND CONFIDENTIAL					
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.						
MATERIAL/FINISH:	1/4" polycarbonate, clear					
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.						
DO NOT SCALE DRAWING						

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
Wall poly

SIZE DWG. NO. REV

C GE-24222

SCALE: 1:6 SHEET 1 OF 1

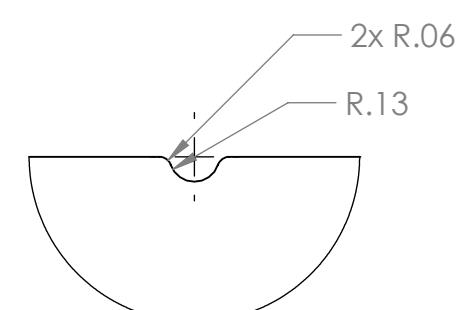
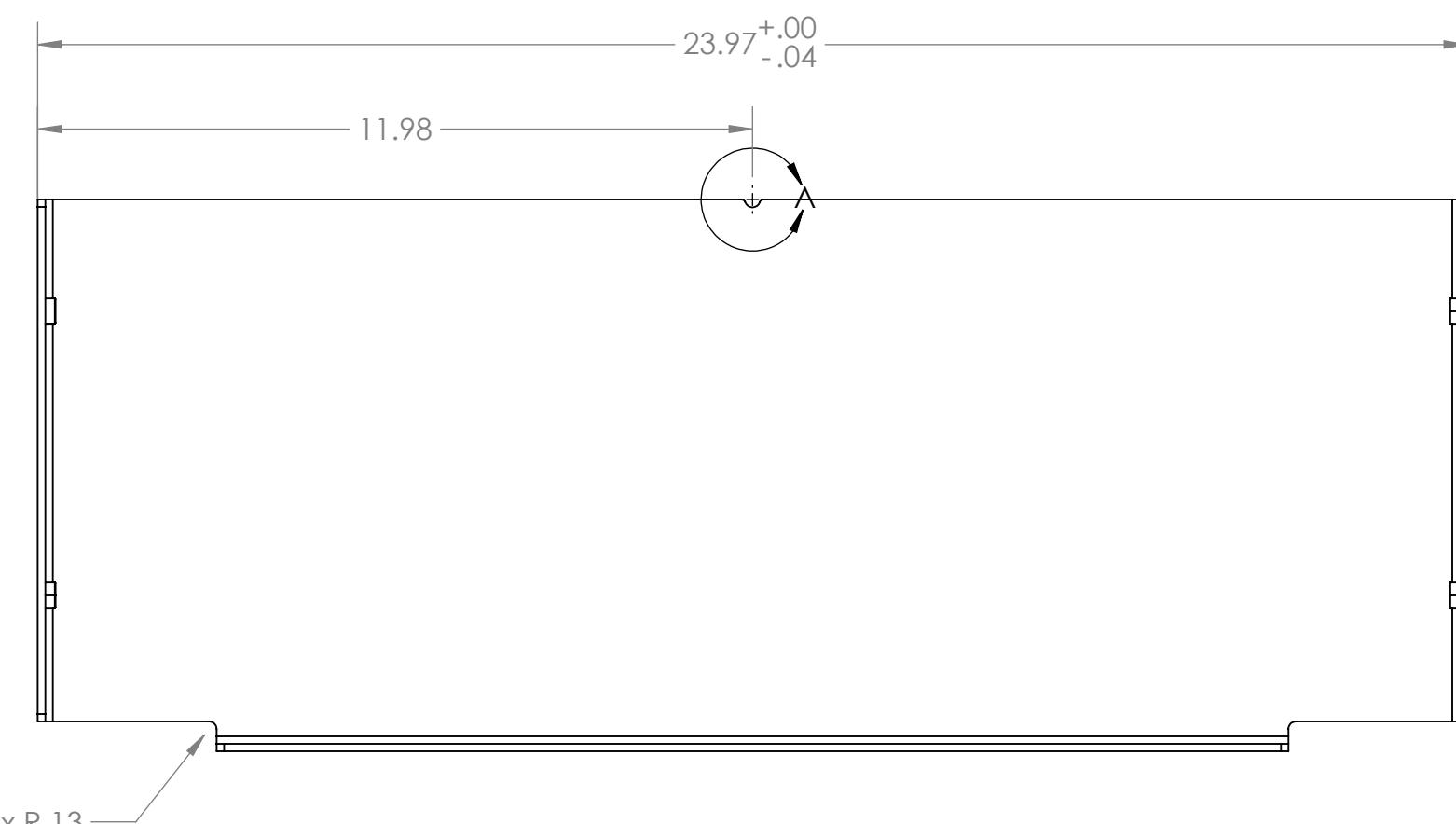
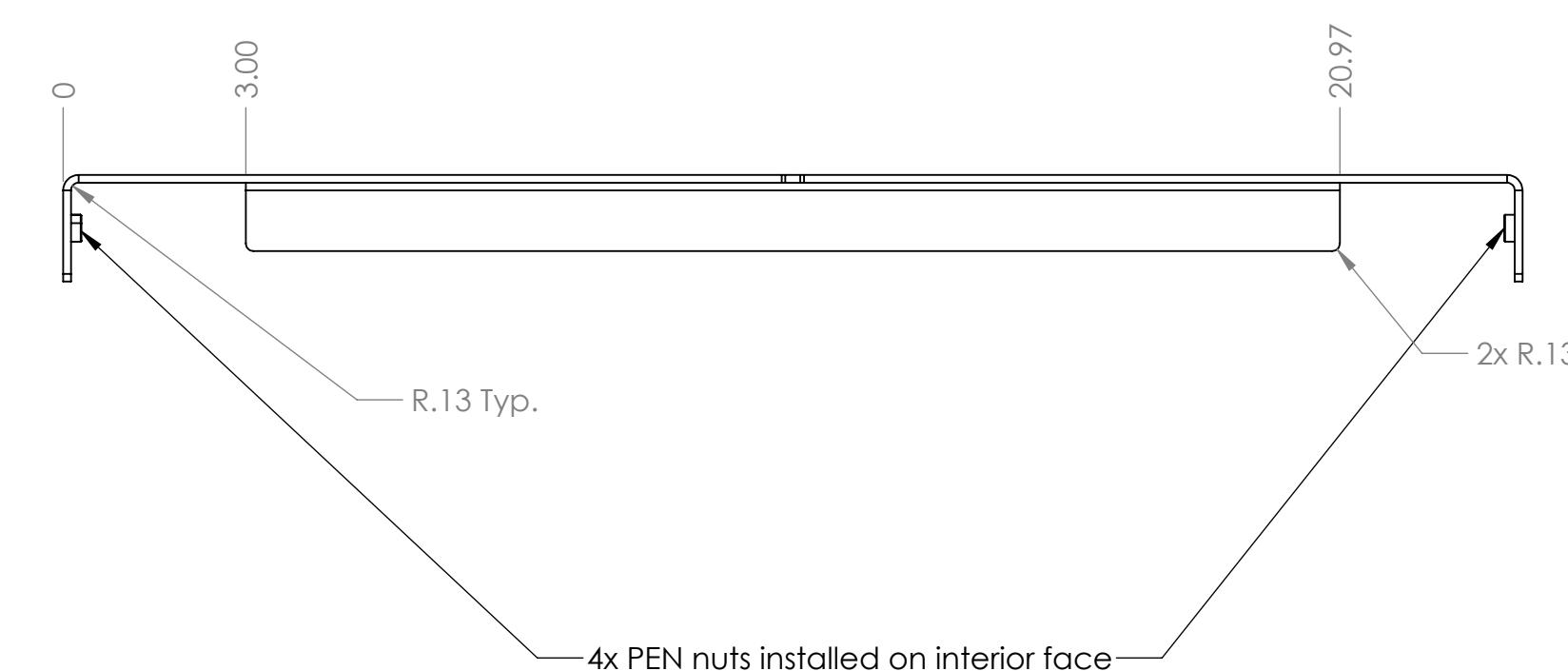
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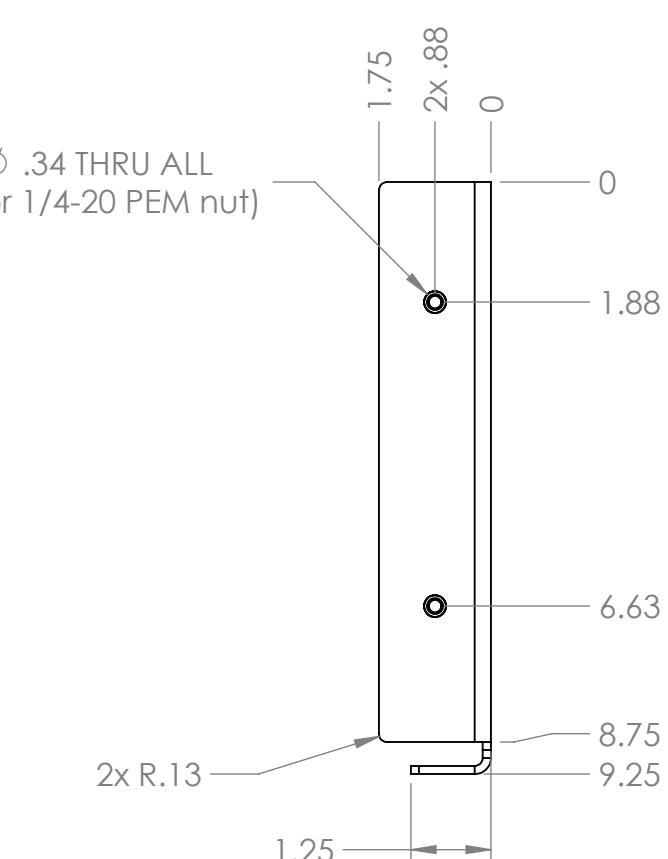
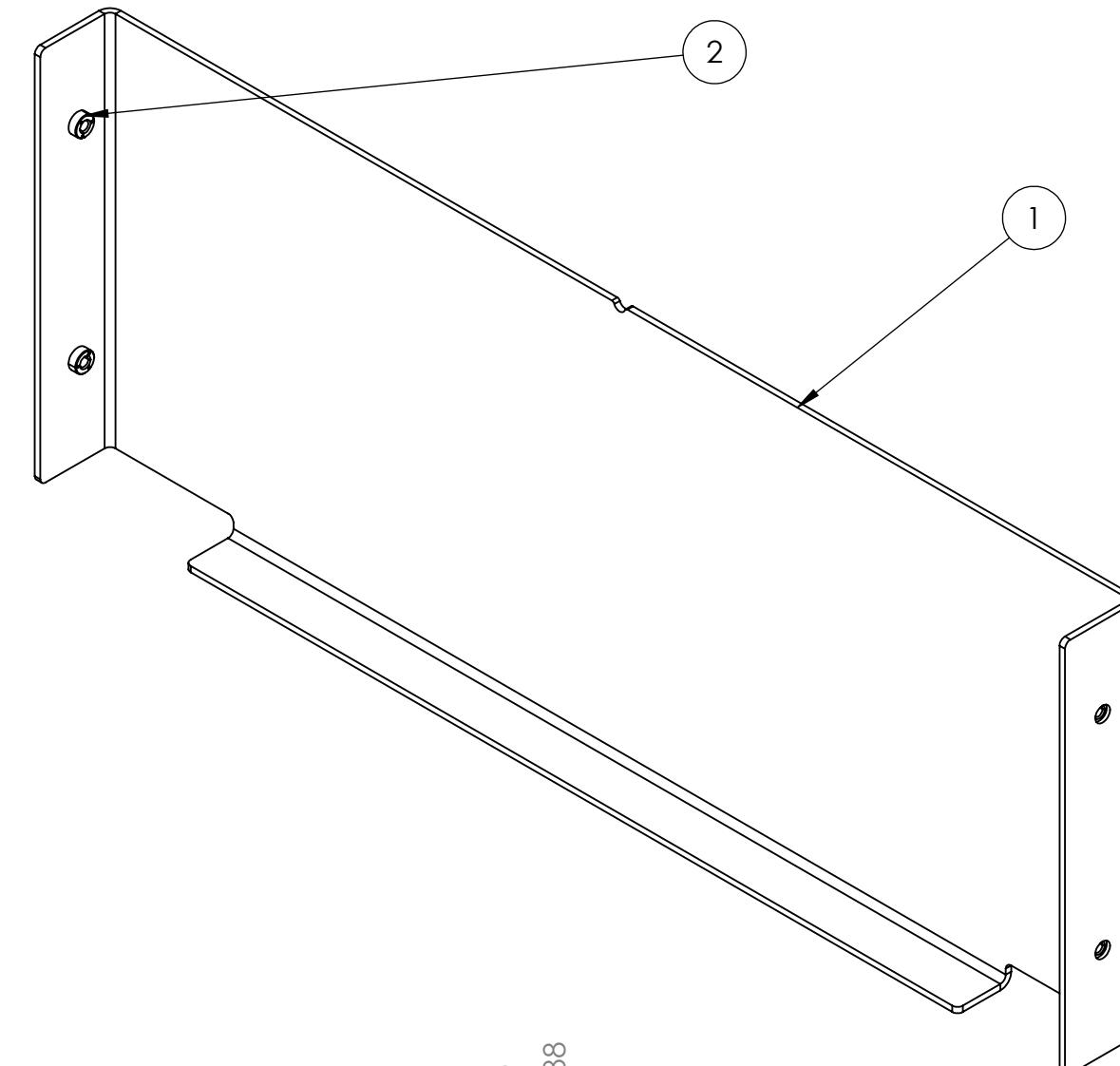
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Notes:
1. Vinyl to be applied to face.

DETAIL A
SCALE 1 : 1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24223-01	8 Ga. Aluminum 5052	1
2	pem_clinchnut_.25_20_.054	1/4-20 self-clinching nut, .054 shank	4



UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES

TOLERANCES:

FRACTIONAL $\pm 1/16$

ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$

TWO PLACE DECIMAL $\pm .02$

THREE PLACE DECIMAL $\pm .010$

MATERIAL/FINISH:

8 Ga. Aluminum 5052

BEND NAME DATE

DRAWN CO 7/24/2023

PROPRIETARY AND CONFIDENTIAL

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COMMENTS:

REMOVE ALL BURRS AND SHARP EDGES.

FIRST ROBOTICS COMPETITION
SOLIDWORKS
Modeling Solutions Partner

**Endgame April
Base**

SIZE DWG. NO. REV

C GE-24223 A

SCALE: 1:3 SHEET 1 OF 1

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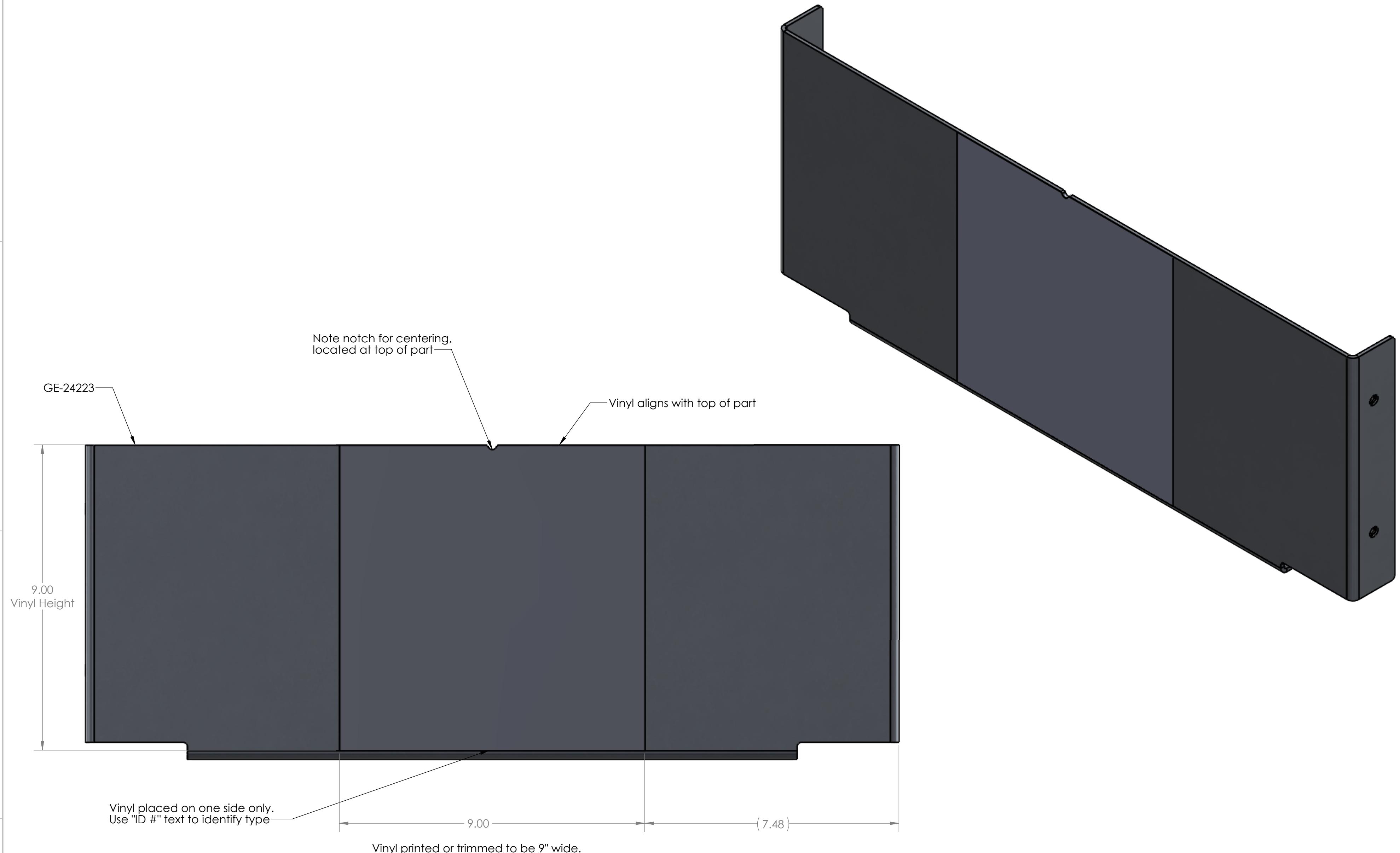
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Notes:
1. Matte vinyl

Tag Variations			
Part Number	Vinyl Image	Vinyl QTY per field	Part QTY per field
GE-24224-ID11	GE-24224-ID11-Vinyl	1	1
GE-24224-ID12	GE-24224-ID12-Vinyl	1	1
GE-24224-ID13	GE-24224-ID13-Vinyl	1	1
GE-24224-ID14	GE-24224-ID14-Vinyl	1	1
GE-24224-ID15	GE-24224-ID15-Vinyl	1	1
GE-24224-ID16	GE-24224-ID16-Vinyl	1	1

UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	CO	9/7/2023
TOLERANCES: FRACTIONAL $\pm 1/2$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .50$	PROPRIETARY AND CONFIDENTIAL		
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH:	COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.		
DO NOT SCALE DRAWING			

FIRST ROBOTICS COMPETITION SOLIDWORKS Modeling Solutions Partner

Stage AprilTag

C GE-24224

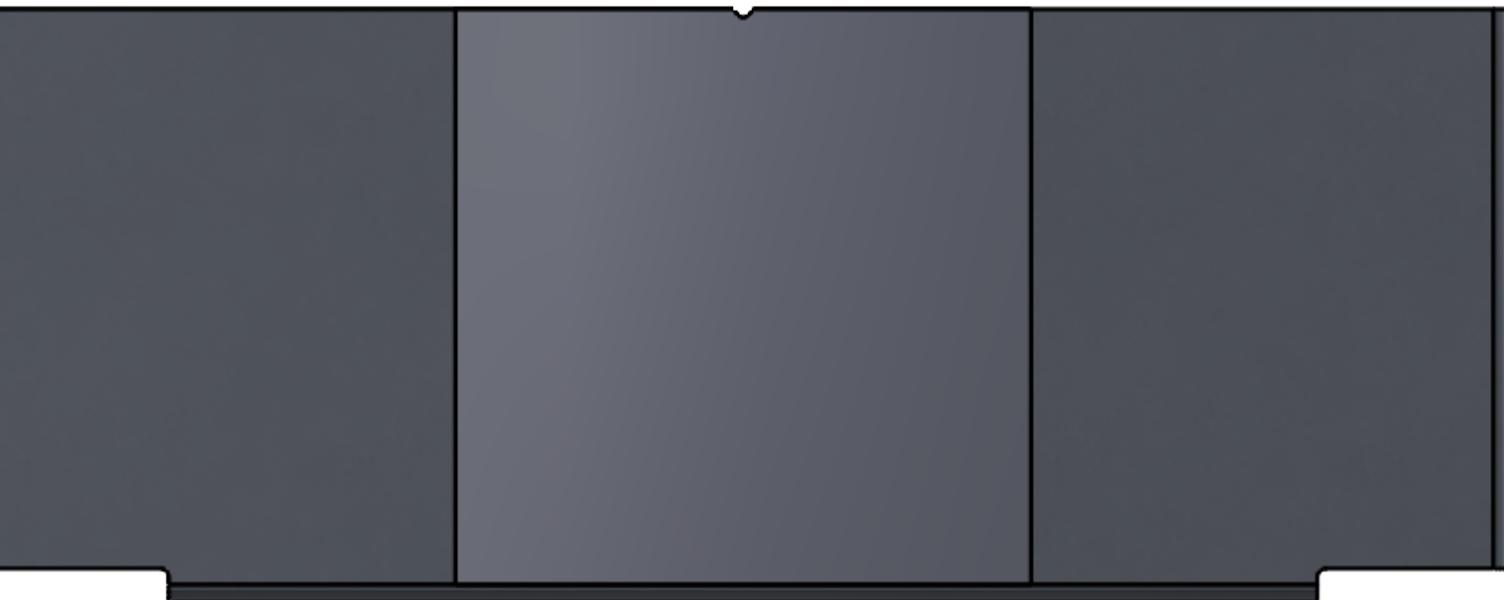
SCALE: 1:2 SHEET 1 OF 3

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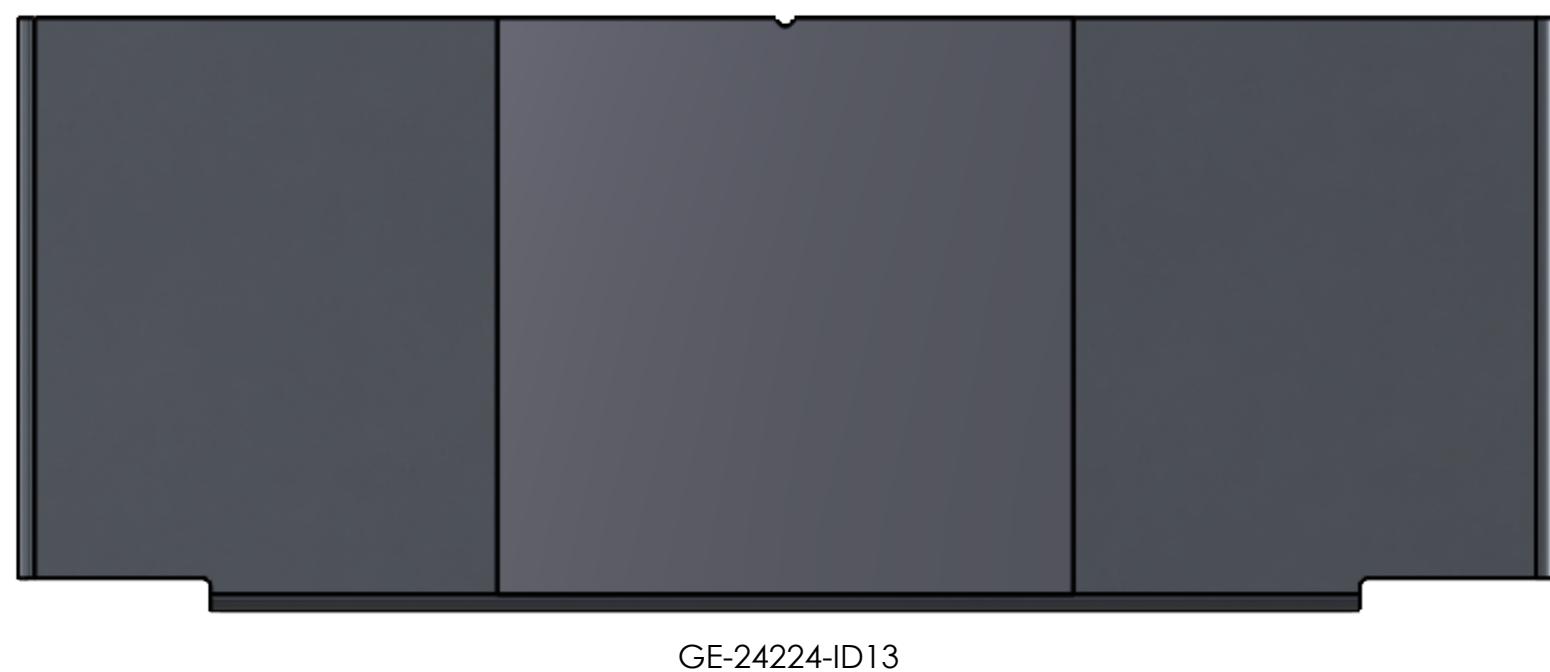
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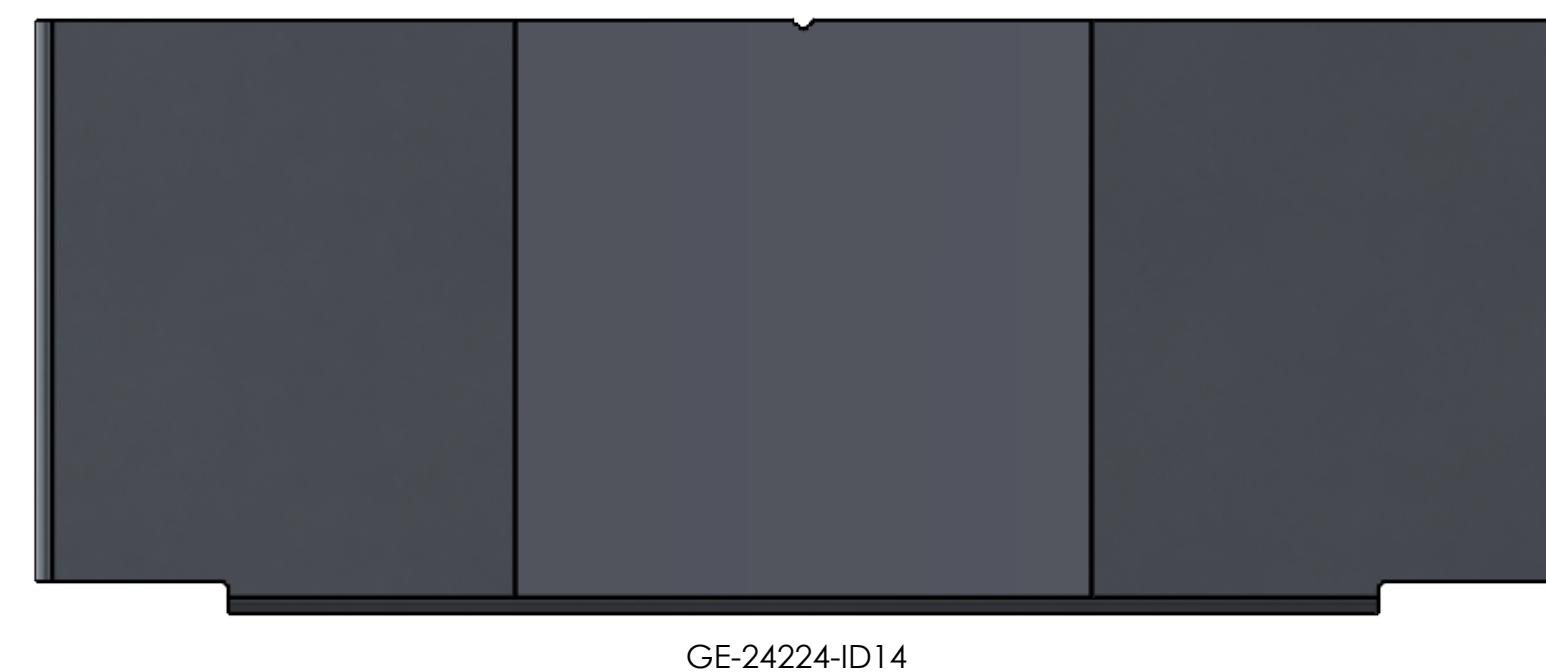
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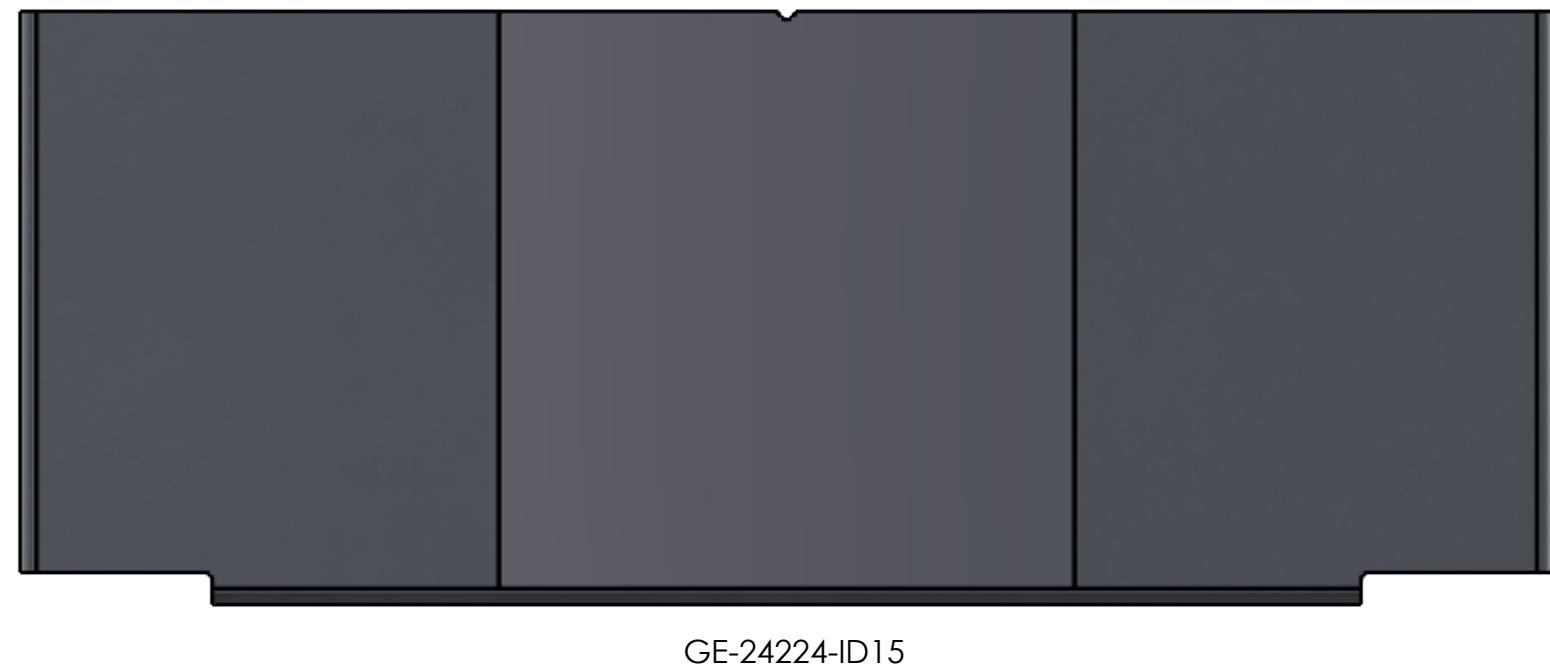
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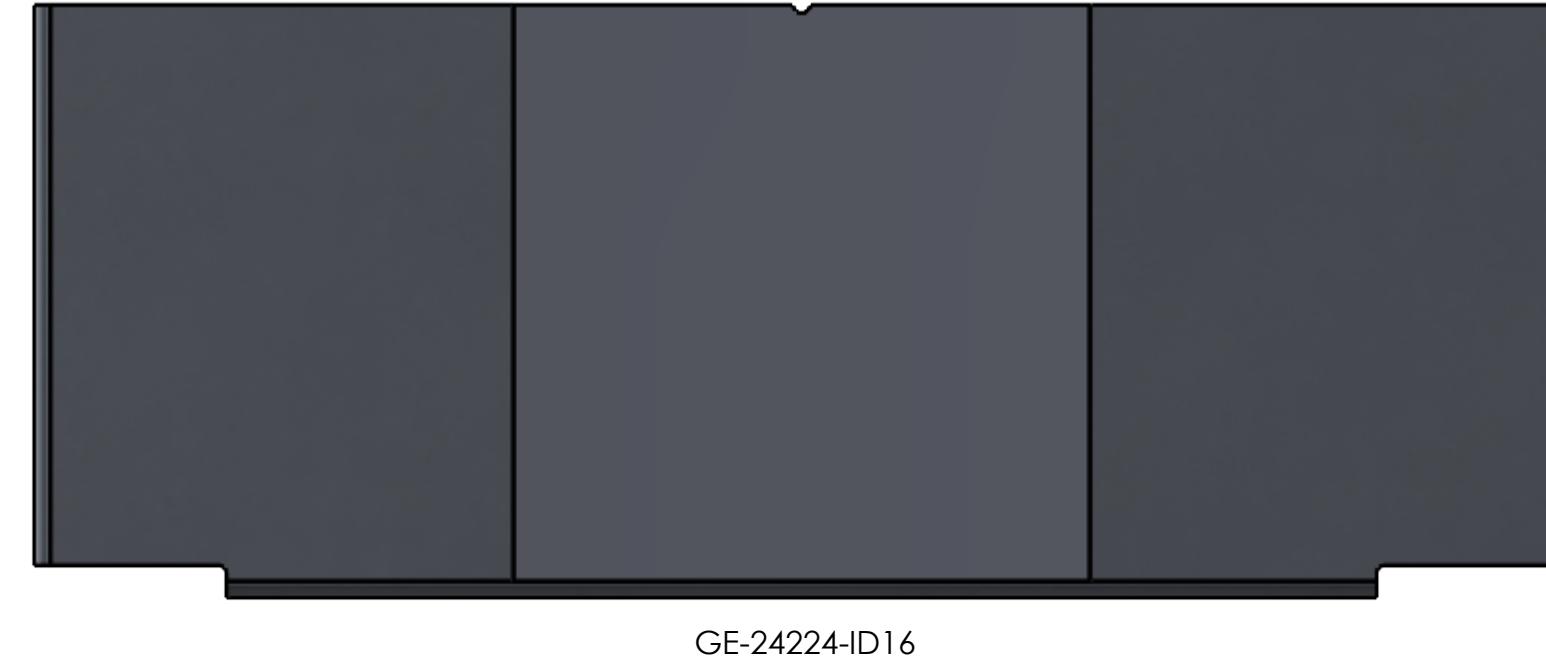
GE-24224-ID13



GE-24224-ID14



GE-24224-ID15



GE-24224-ID16

UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DRAWN	CO	9/7/2023	
PROPRIETARY AND CONFIDENTIAL			
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COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			
 FIRST ROBOTICS COMPETITION  TITLE: Stage AprilTag SIZE DWG. NO. REV C GE-24224 SCALE: 1:3 SHEET 2 OF 3			

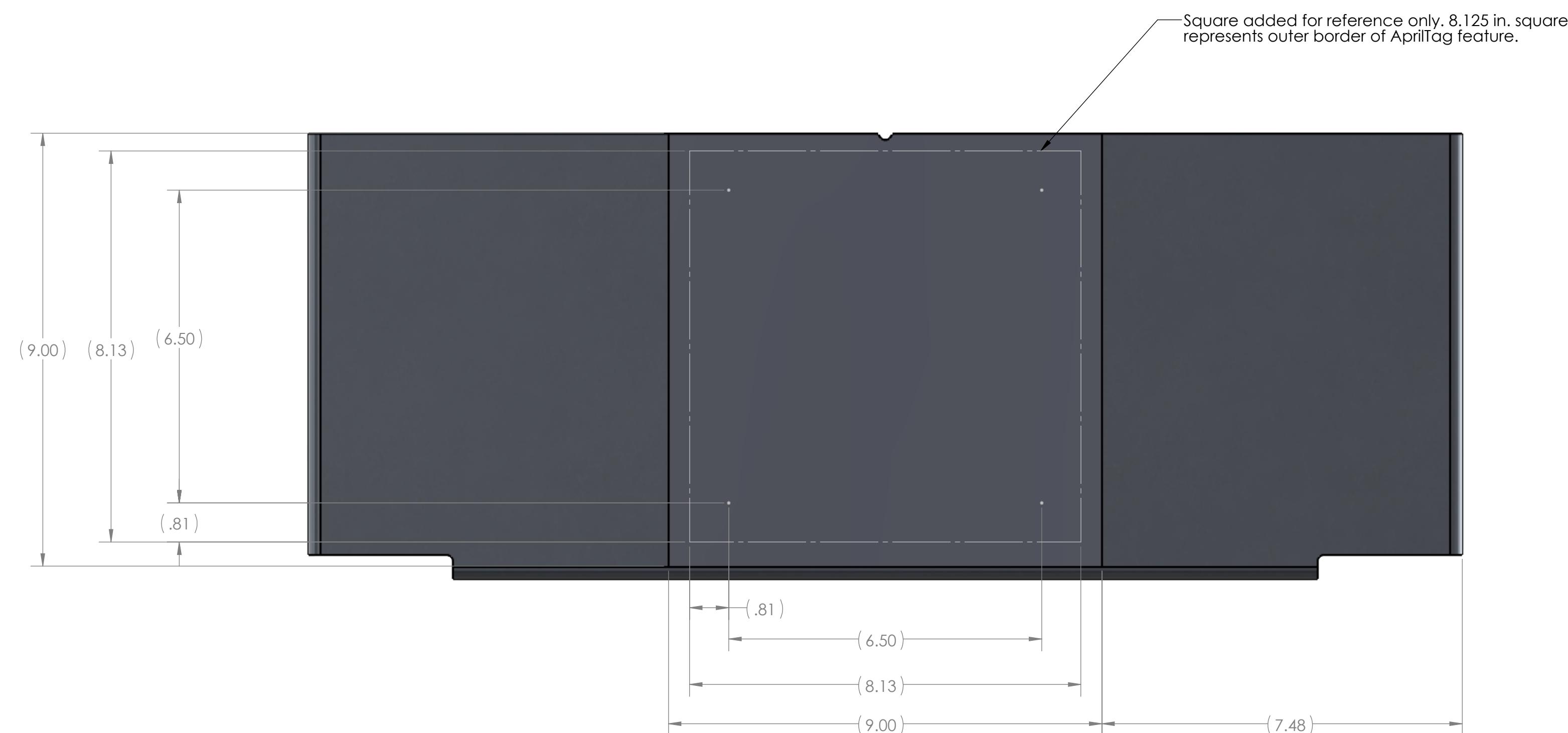
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UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DRAWN	CO	9/7/2023	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
Stage AprilTag

SIZE DWG. NO. REV

C GE-24224

SCALE: 1:2 SHEET 3 OF 3

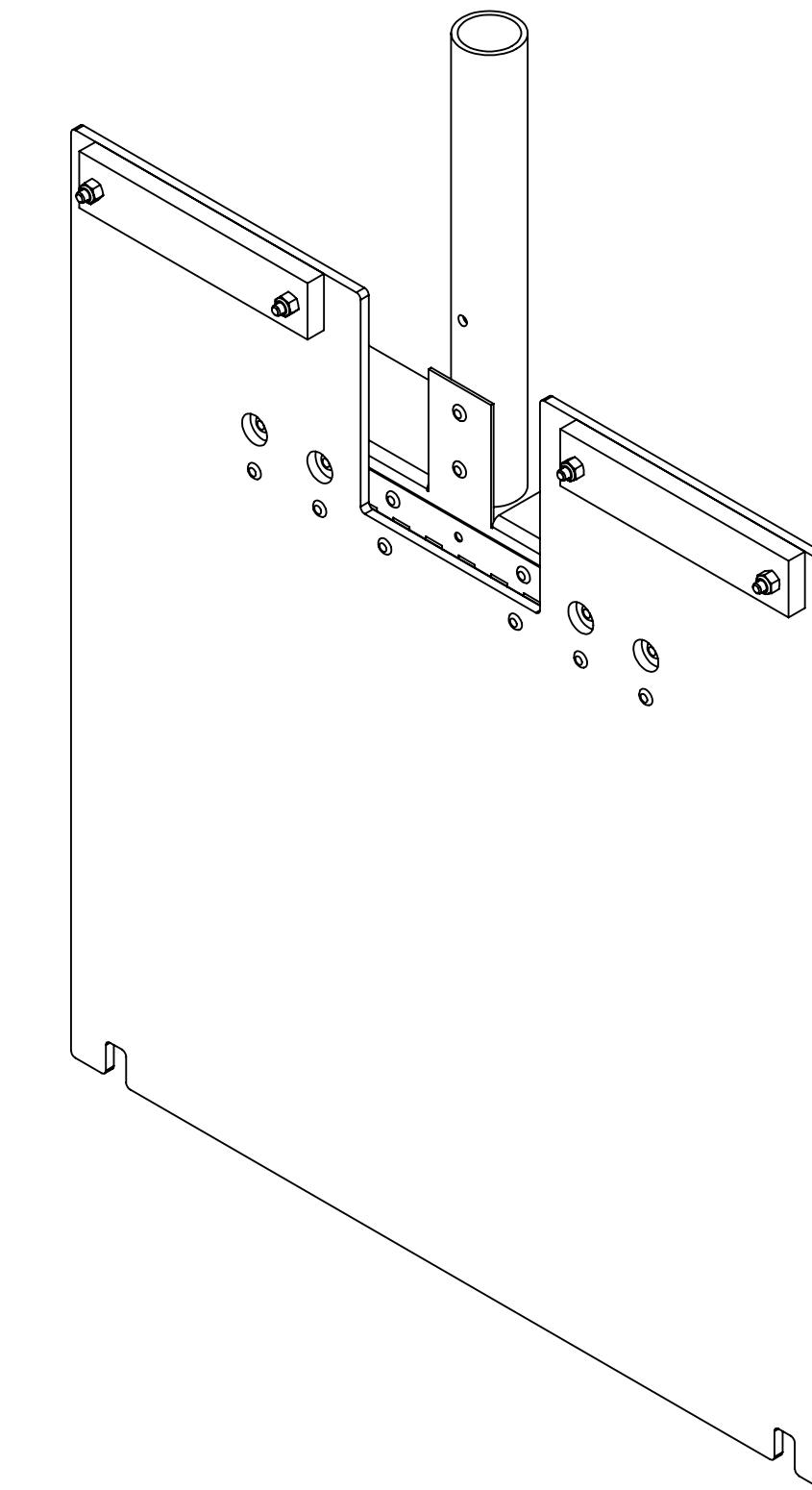
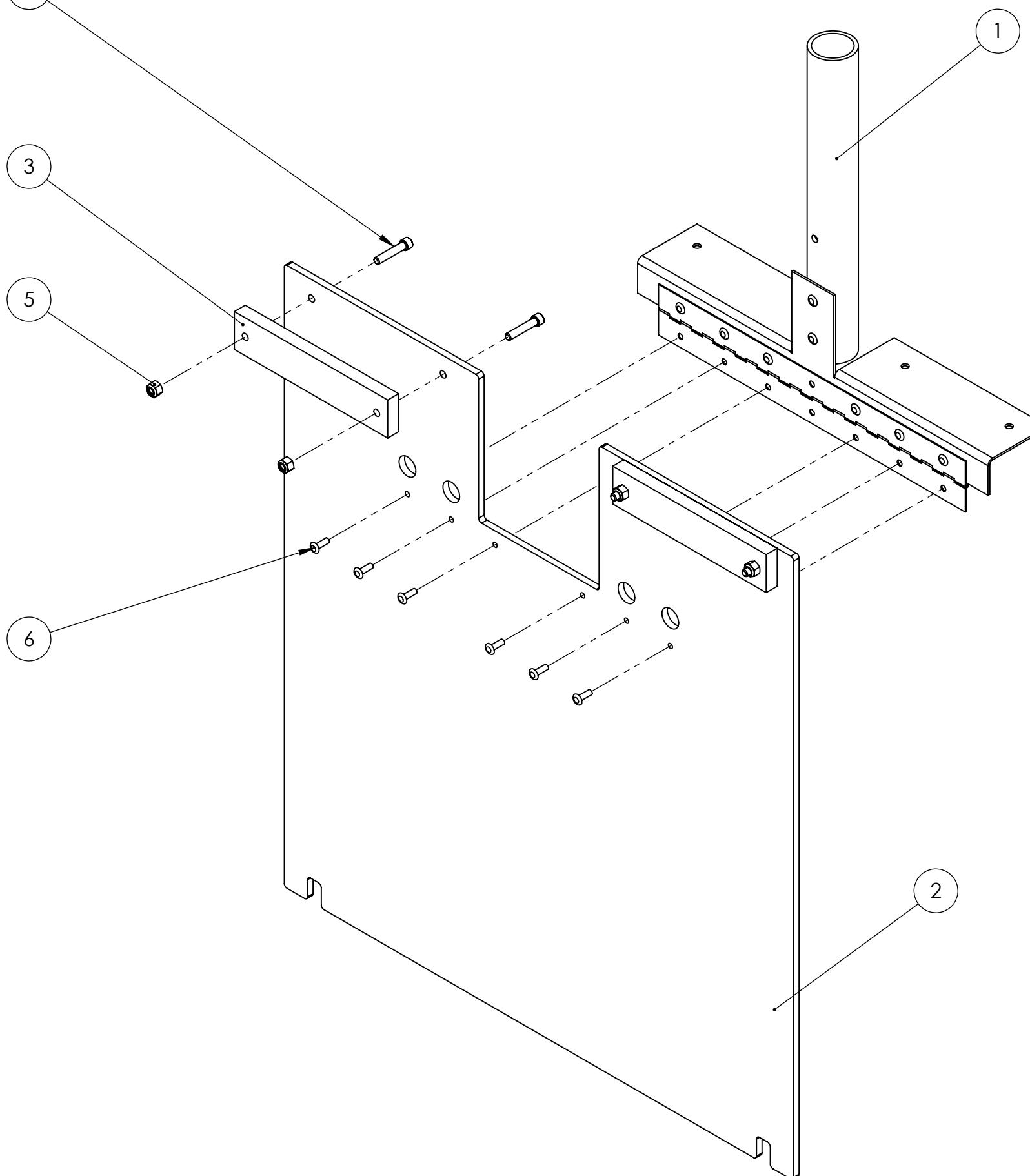
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24231	Flap Hinge Microphone Subassembly	1
2	GE-24232	Flap	1
3	GE-24233	Flap Weight	2
4	socket_hex_.25_20_1.25	Socket Head Screw, 1/4-20 x 1.25" long, fully threaded	4
5	nylock_.25_20	Steel Nylon-Insert Locknut, 1/4"-20	4
6	rivet_.1875_.251-.375	3/16" Aluminum Rivet, .251-.375 Grip Range	6

UNLESS OTHERWISE SPECIFIED:			FIELD	NAME	DATE
			DRAWN	DF	11/27/2023
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/2$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .50$					
PROPRIETARY AND CONFIDENTIAL THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.					
MATERIAL/FINISH:					
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.					
DO NOT SCALE DRAWING					

FIRST ROBOTICS COMPETITION SOLIDWORKS Modeling Solutions Partner

Flap/Pole Assembly

SIZE	DWG. NO.	REV
C	GE-24230	
SCALE: 1:4		SHEET 1 OF 1

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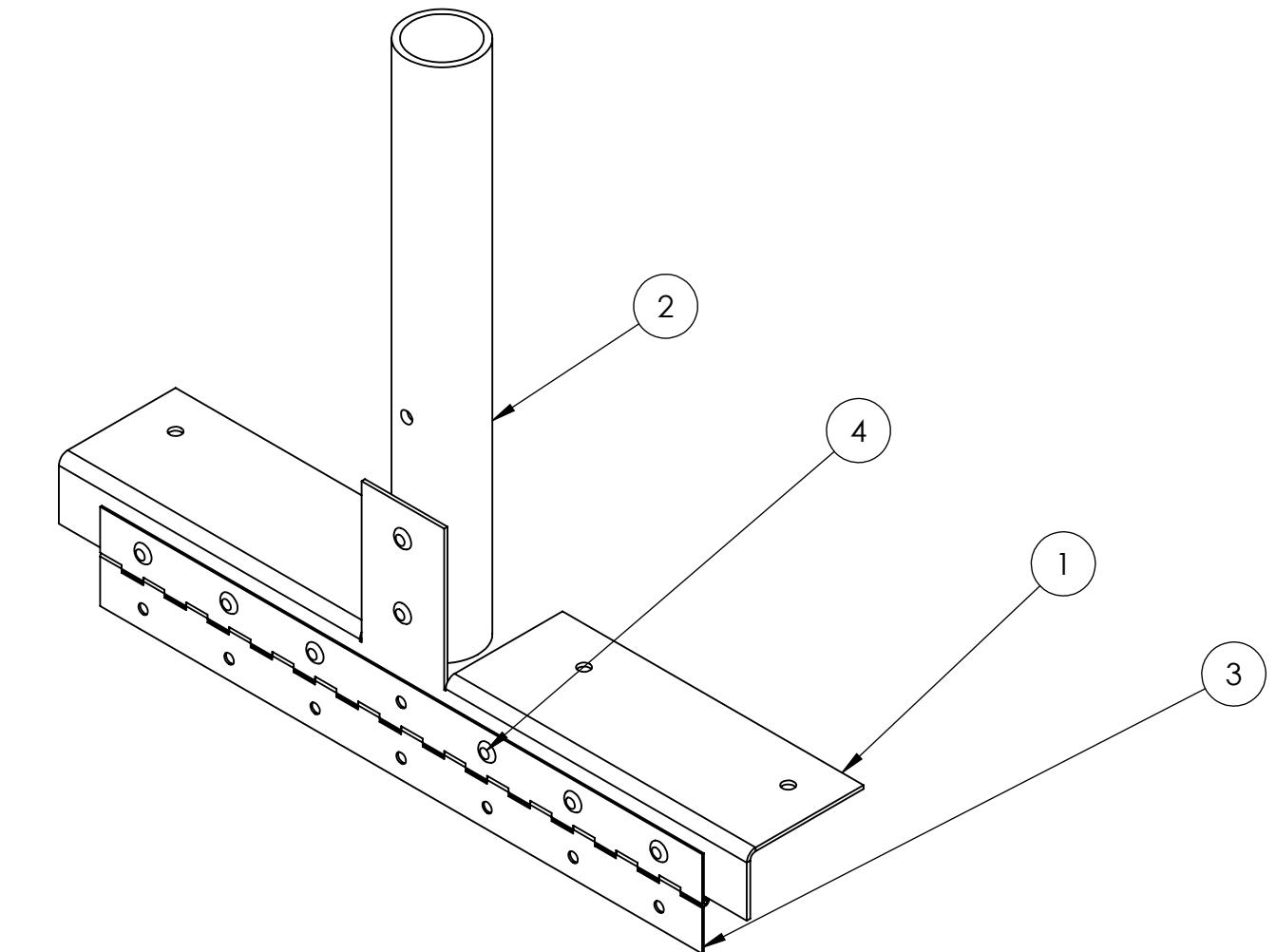
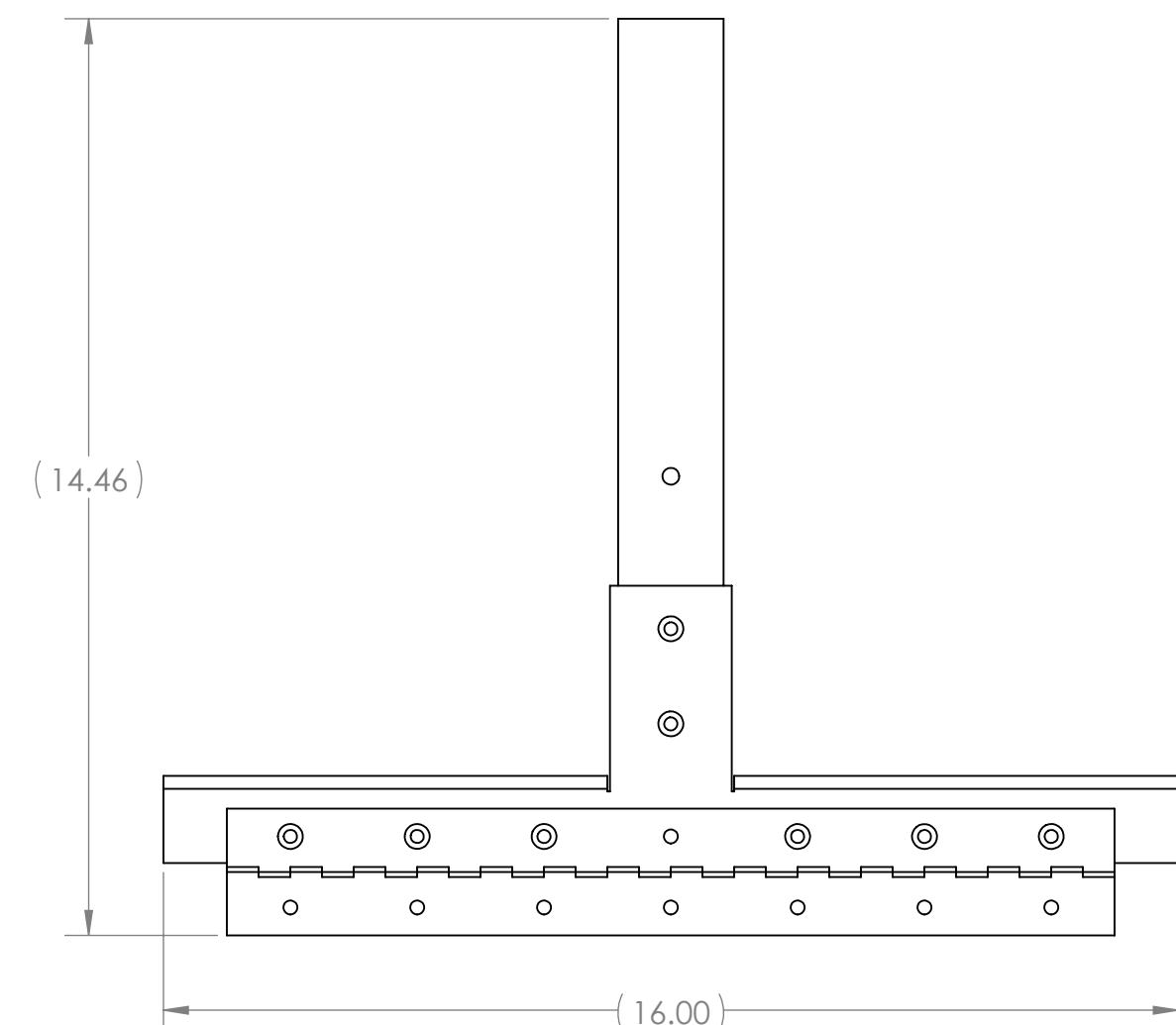
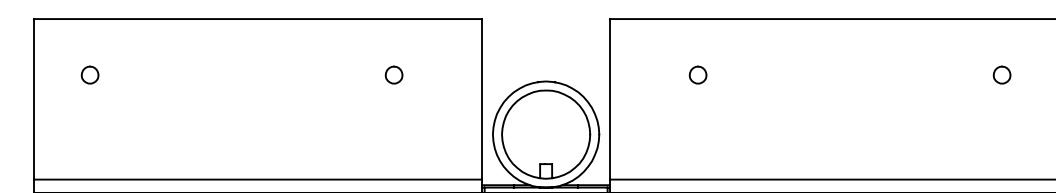
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24231-01	12 ga. Aluminum 5052	1
2	GE-24231-02	1.25" Schedule 40 Pipe, 6061 Aluminum	1
3	GE-24231-03	0.04" x 2.0" x 14 Steel Hinge with Nickel Plate & Mounting Holes	1
4	rivet_.1875_.126-.25	3/16" Rivet, .126-.25 Grip Range	8

UNLESS OTHERWISE SPECIFIED:	BEND	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	CO	8/22/2023
TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .02$ THREE PLACE DECIMAL $\pm .010$	PROPRIETARY AND CONFIDENTIAL THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.		
MATERIAL/FINISH:	COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.		
DO NOT SCALE DRAWING			

FIRST ROBOTICS COMPETITION SOLIDWORKS Modeling Solutions Partner

TITLE: Flap Hinge Microphone Subassembly

SIZE DWG. NO. REV

C GE-24231

SCALE: 1:3 SHEET 1 OF 4

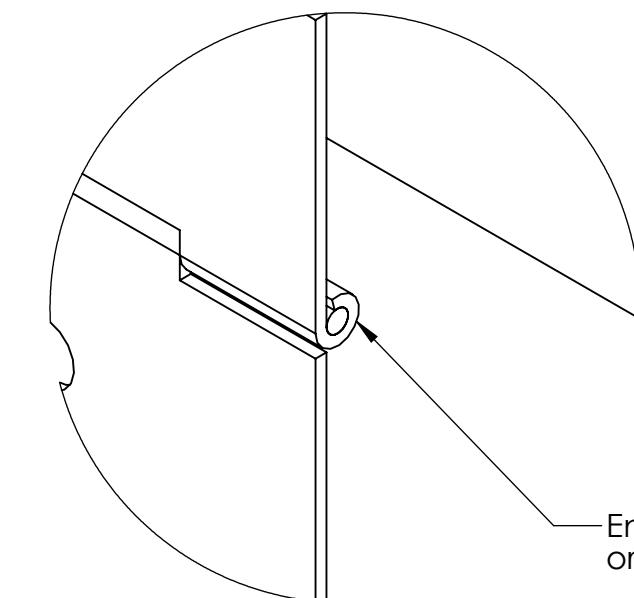
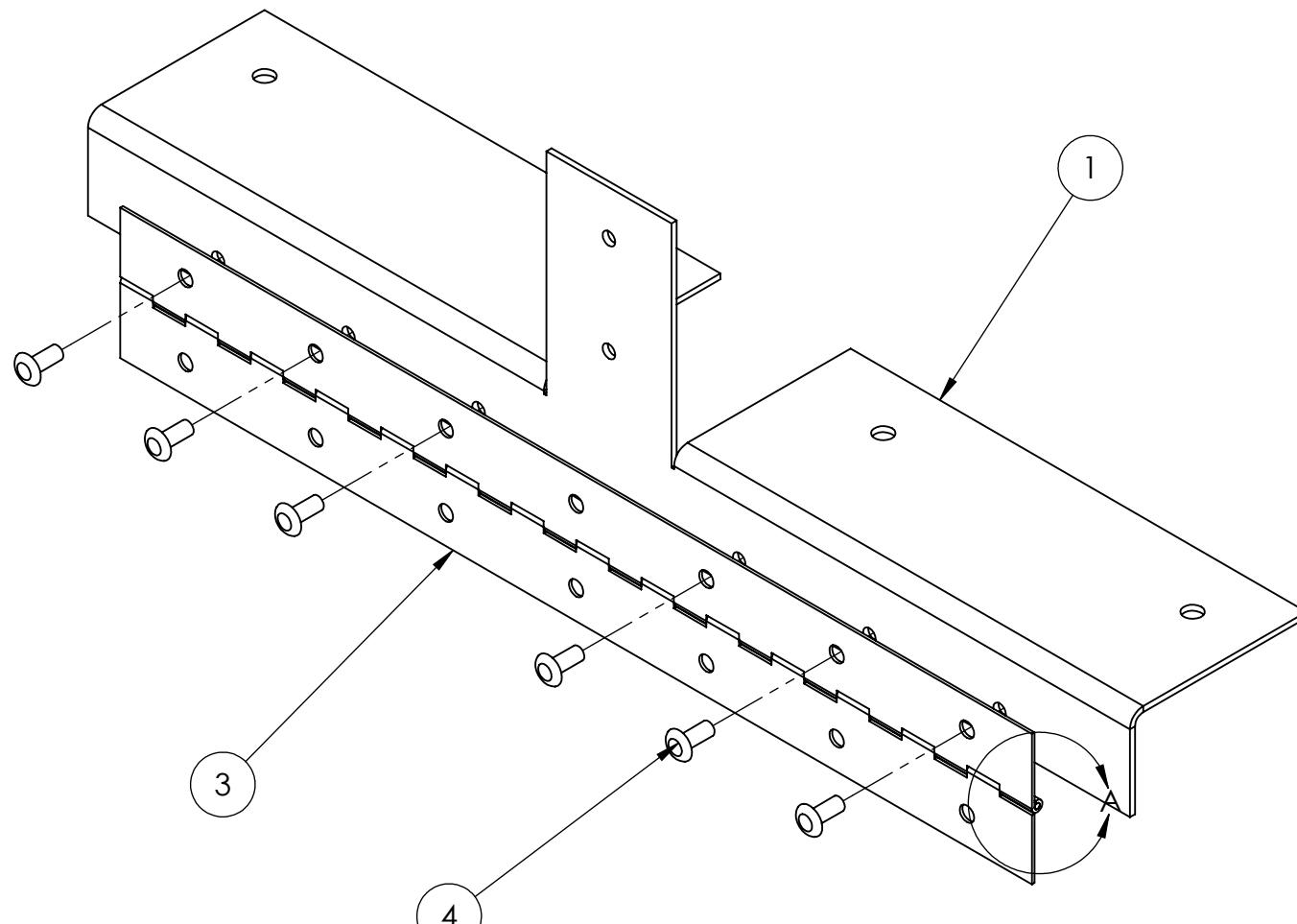
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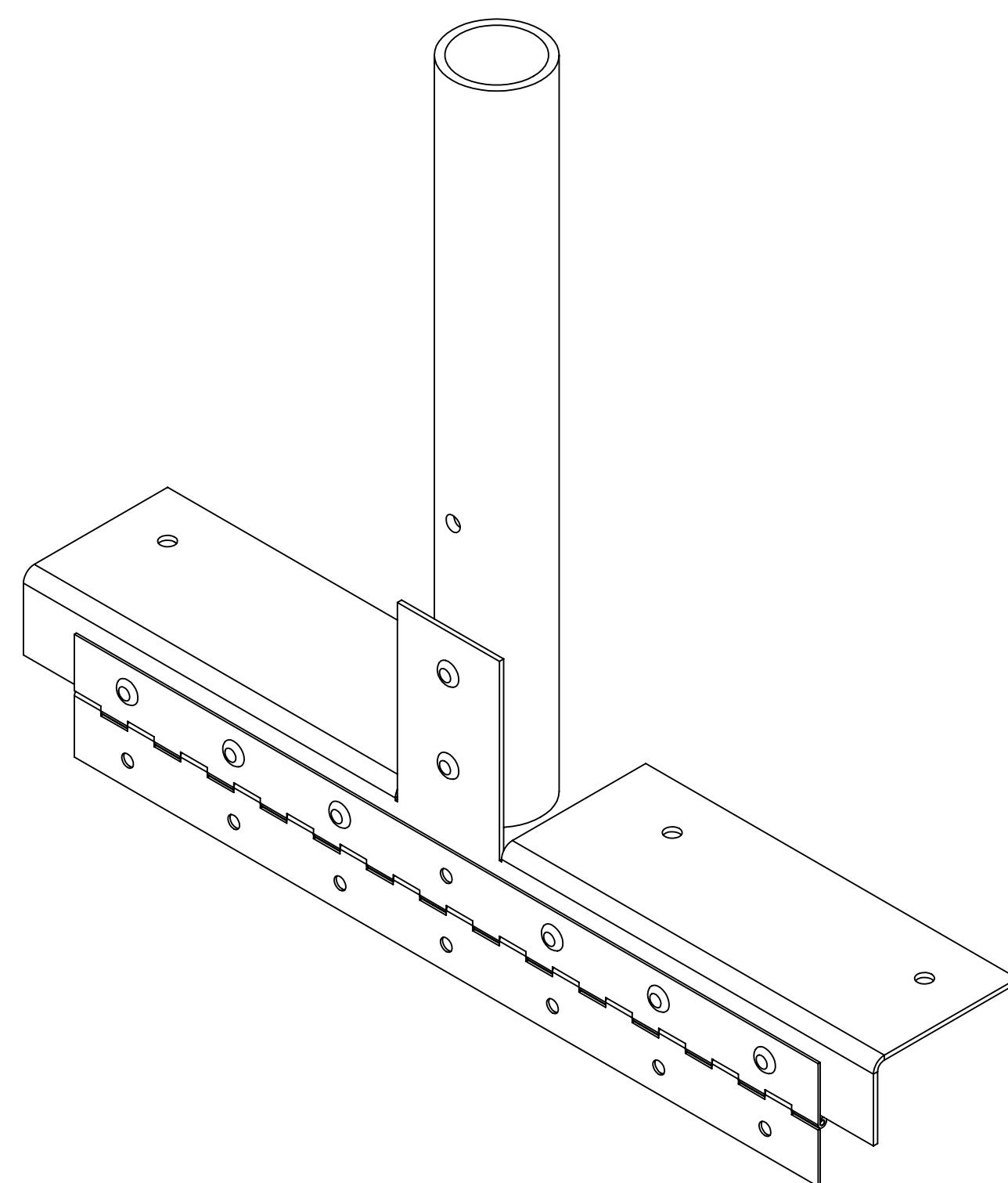
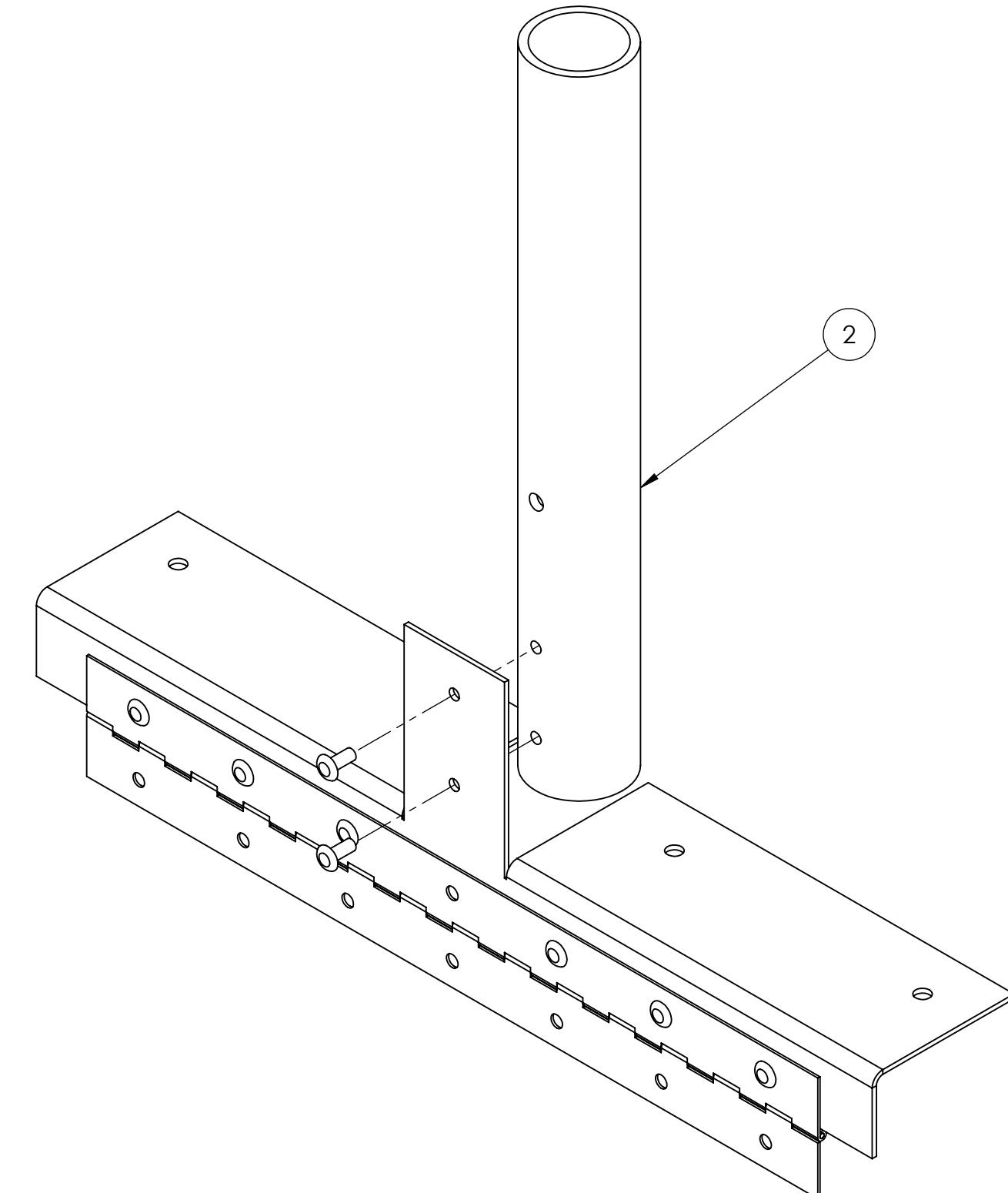
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Ensure hinge knuckle
oriented as shown



UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL $\pm 1/16$
ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$
TWO PLACE DECIMAL $\pm .02$
THREE PLACE DECIMAL $\pm .010$

MATERIAL/FINISH:

DO NOT SCALE DRAWING

BEND	NAME	DATE
DRAWN	CO	8/22/2023

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PROHIBITED.

COMMENTS:

REMOVE ALL BURRS AND SHARP
EDGES.

 **FIRST
ROBOTICS
COMPETITION**  **SOLIDWORKS**
Modeling Solutions Partner

TITLE: **Flap Hinge
Microphone
Subassembly**

SIZE	DWG. NO.	REV
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C GE-24231

SCALE: 1:2	SHEET 2 OF 4
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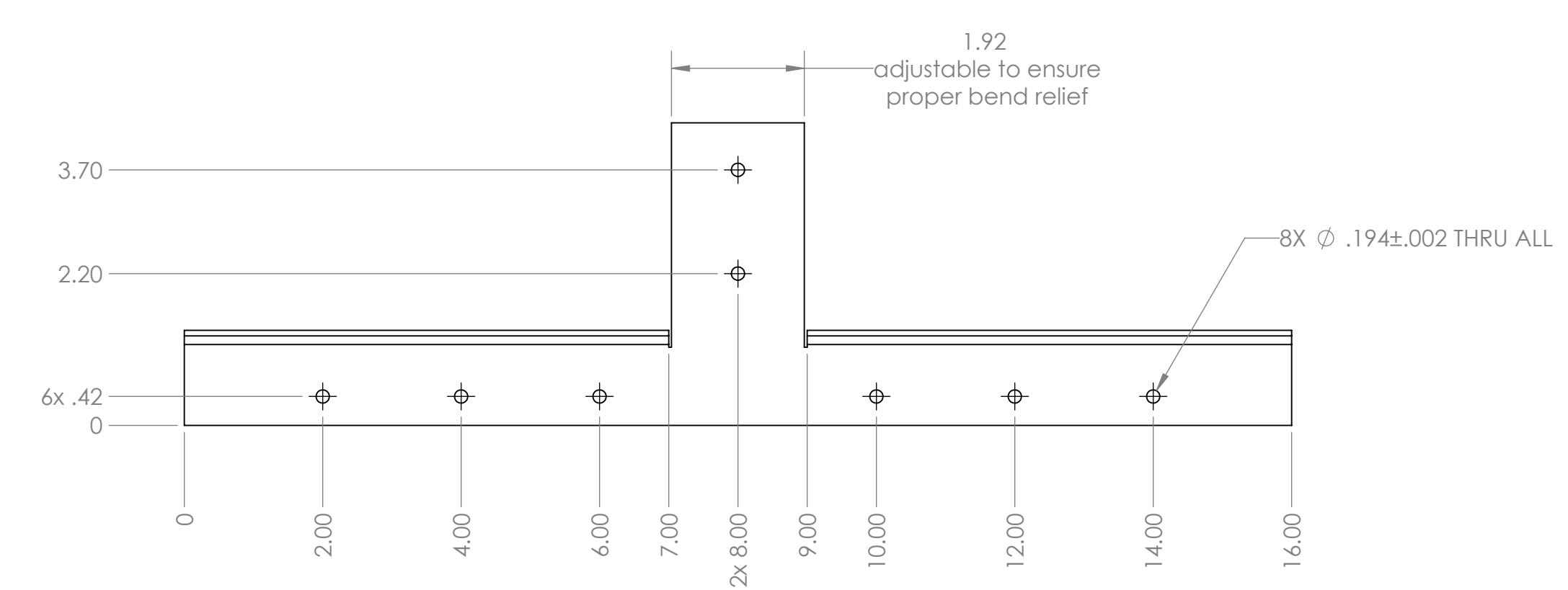
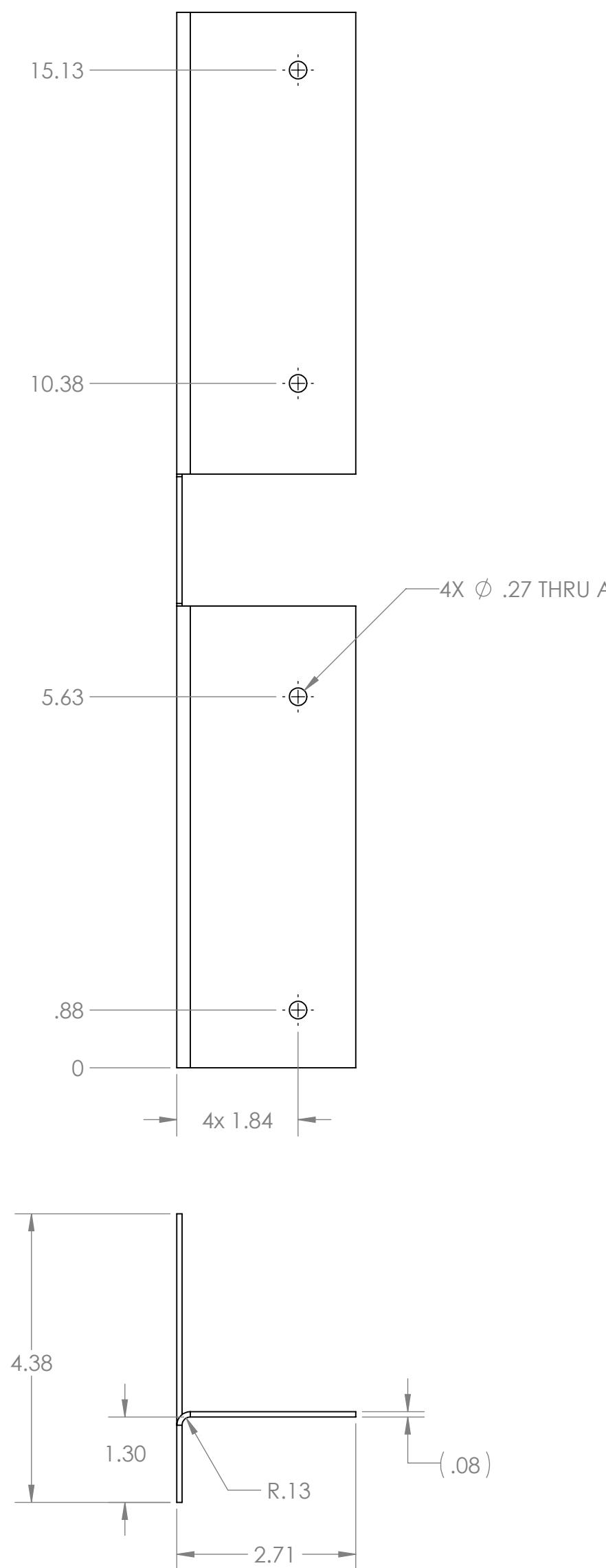
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UNLESS OTHERWISE SPECIFIED:	BEND	NAME	DATE
DRAWN	CO	8/22/2023	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:			
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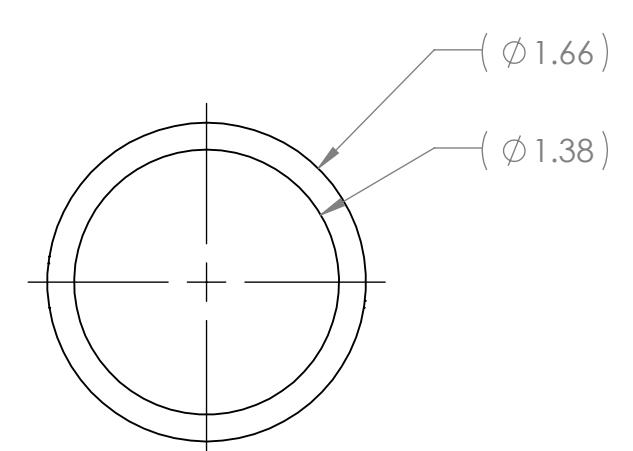
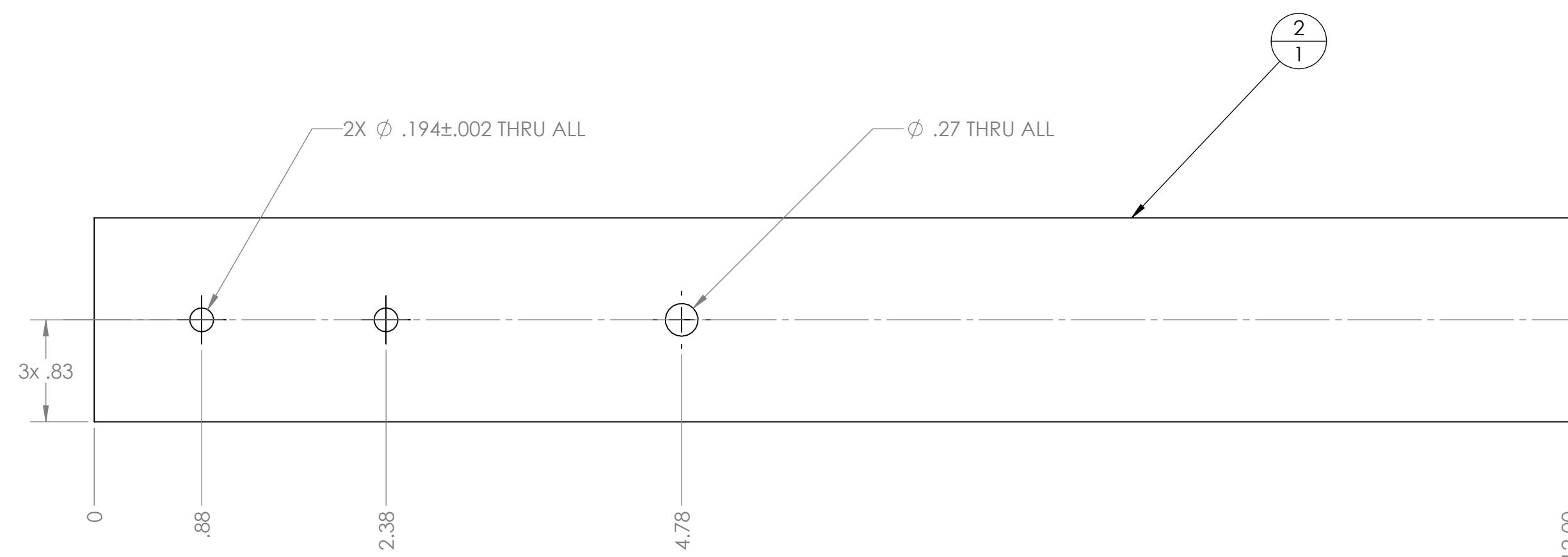
 **FIRST
ROBOTICS
COMPETITION**  **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Flap Hinge Microphone Subassembly
SIZE DWG. NO. REV
C GE-24231

SCALE: 1:2 SHEET 3 OF 4

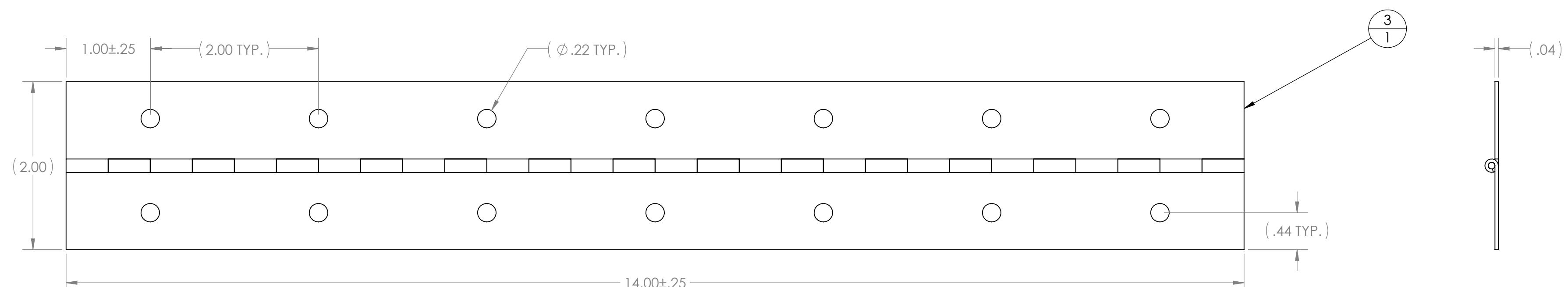
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Notes:
 1. Make from commercial part:
 Vendor: TCH
 Website: TCHWEB.com
 SKU #: 505-1965801
 Description: STEEL CONTINUOUS HINGE - 0.04" X
 2.0" x 72" WITH NICKEL PLATE & MOUNTING HOLES

UNLESS OTHERWISE SPECIFIED:	BEND	NAME	DATE
	DRAWN	CO	8/22/2023
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST ROBOTICS COMPETITION DS SOLIDWORKS Modeling Solutions Partner

TITLE: Flap Hinge Microphone Subassembly

SIZE DWG. NO. REV

C GE-24231

SCALE: 1:1 **SHEET** 4 OF 4

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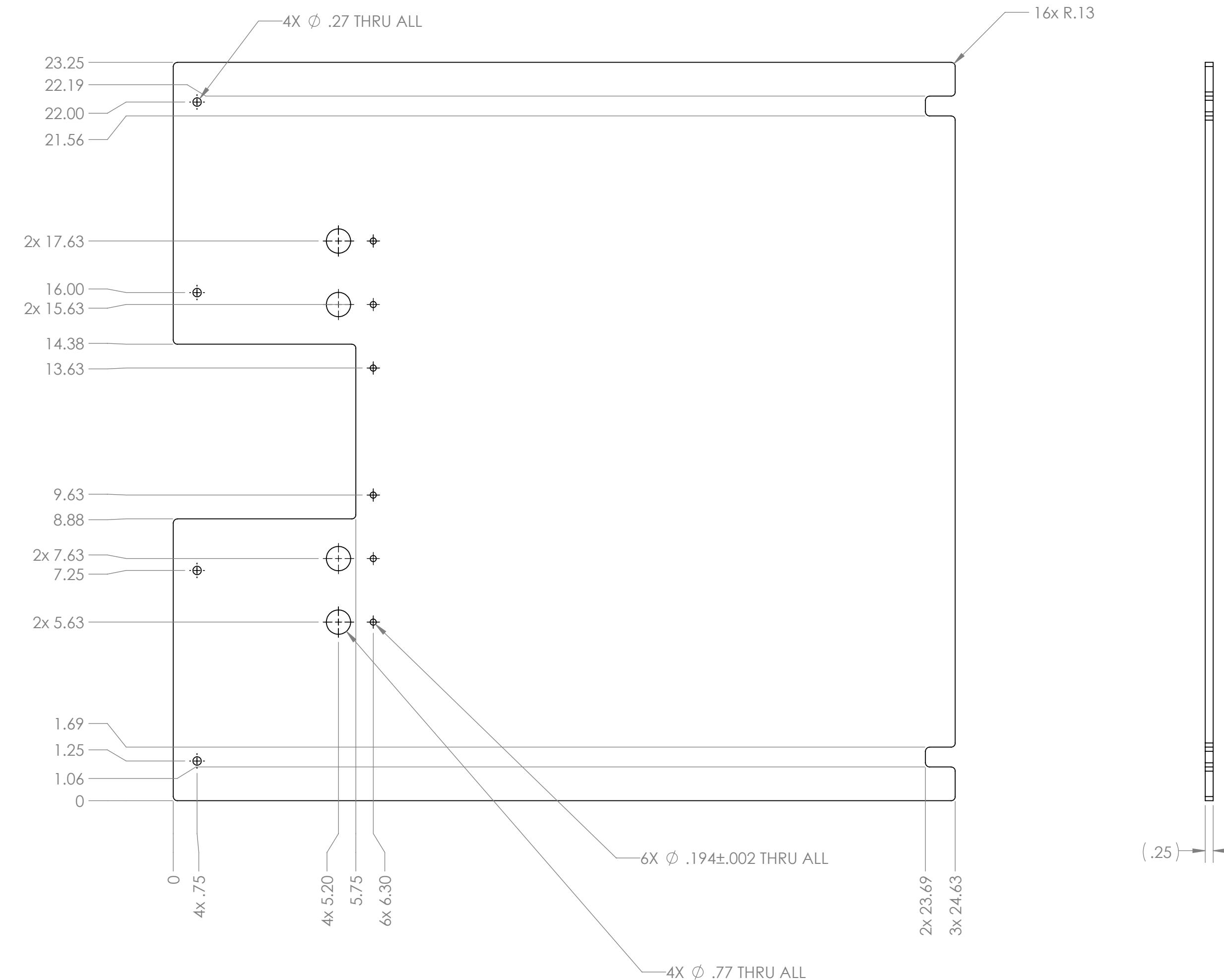
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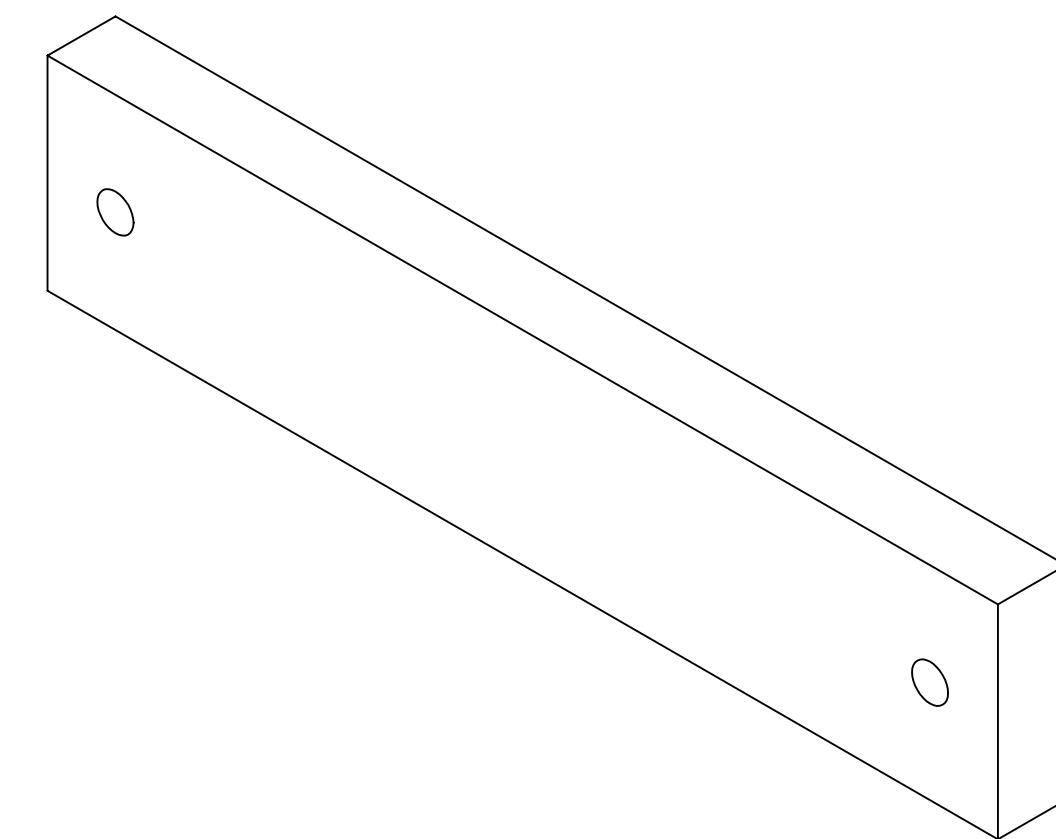
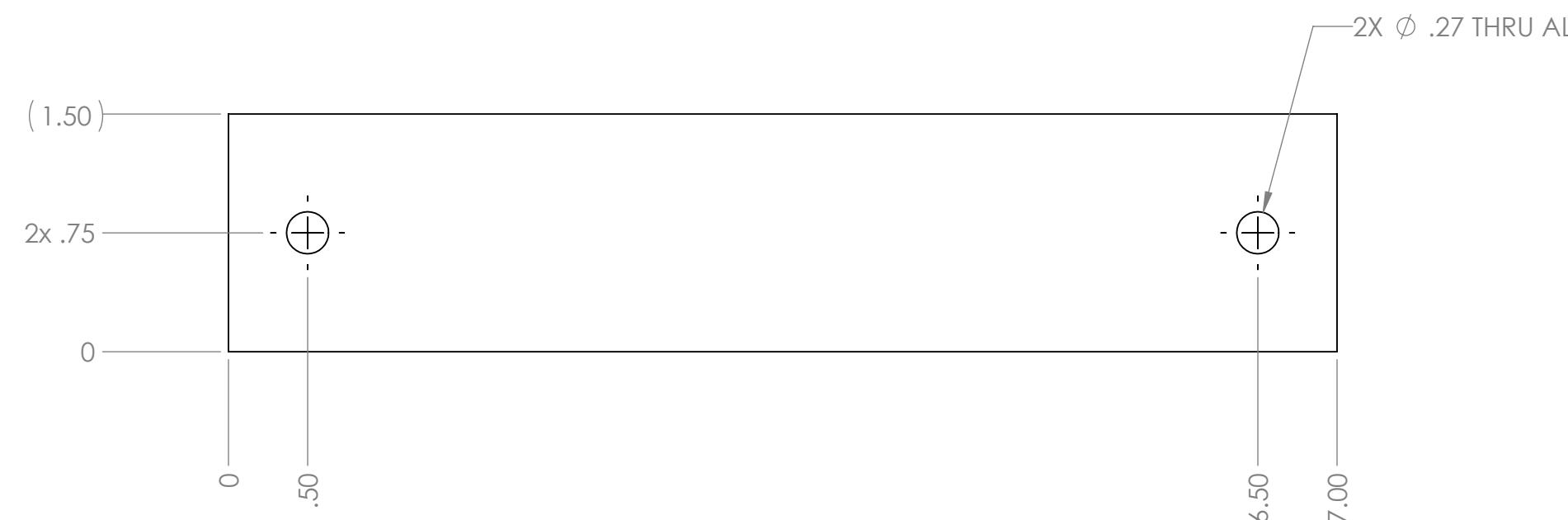
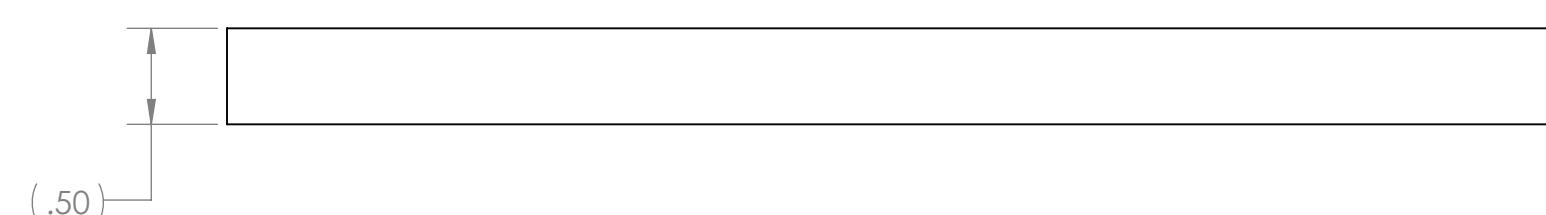


Notes:
1. Tag or label with part number.

UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	CO	8/1/2023	
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH:	SIZE	DWG. NO.	REV
1/4" Polycarbonate, Clear	C	GE-24232	
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING	SCALE: 1:3	SHEET 1 OF 1	

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Notes:
1. Tag or label with part number.

UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	CO	7/31/2023
TOLERANCES:			
FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .005$			
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:			
1.5" x 0.5" Cold Rolled Steel Bar			
COMMENTS:			
REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST ROBOTICS COMPETITION
SOLIDWORKS
Modeling Solutions Partner

TITLE: Flap Weight

SIZE DWG. NO. REV

C GE-24233

SCALE: 1:1 **SHEET** 1 OF 1

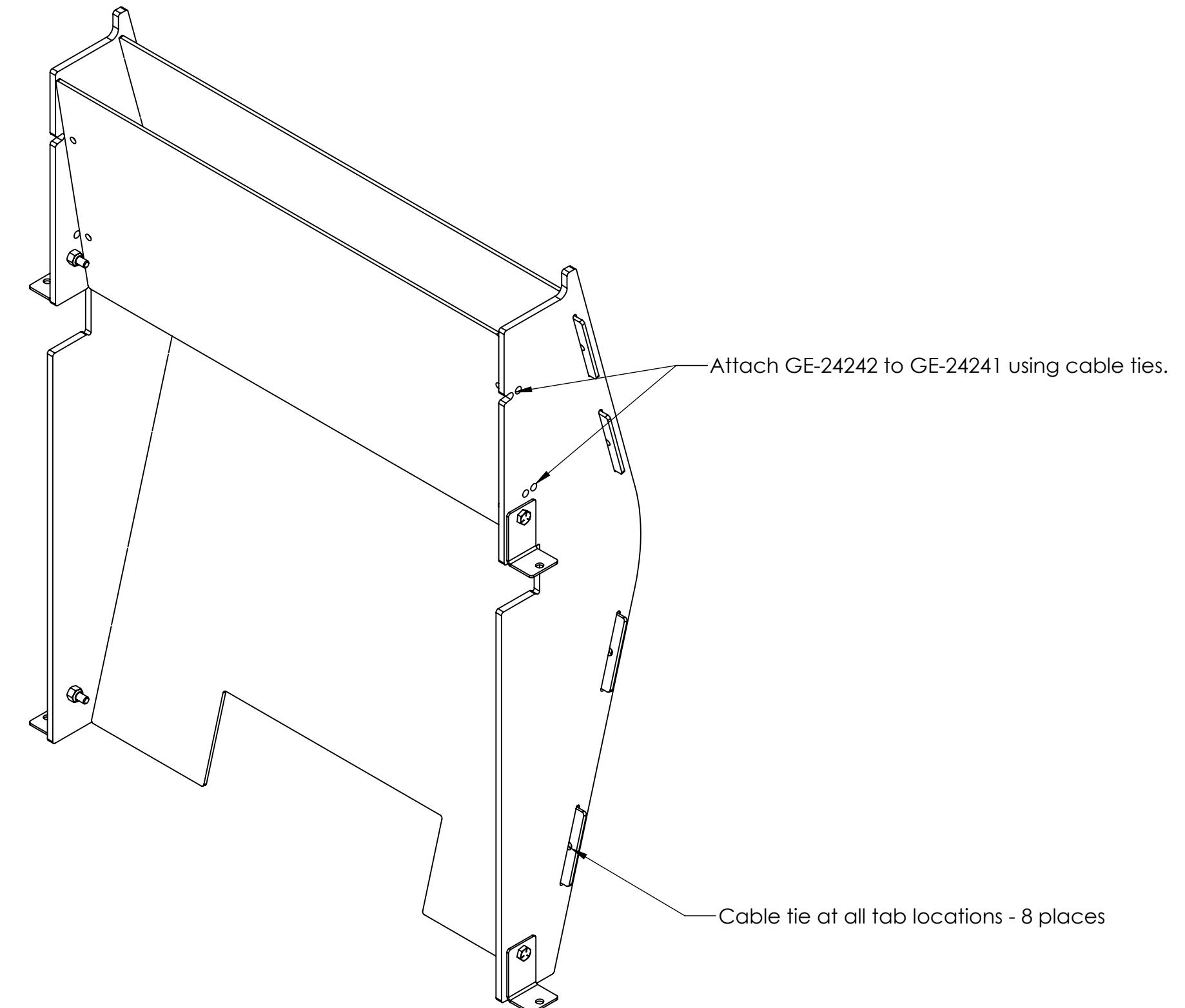
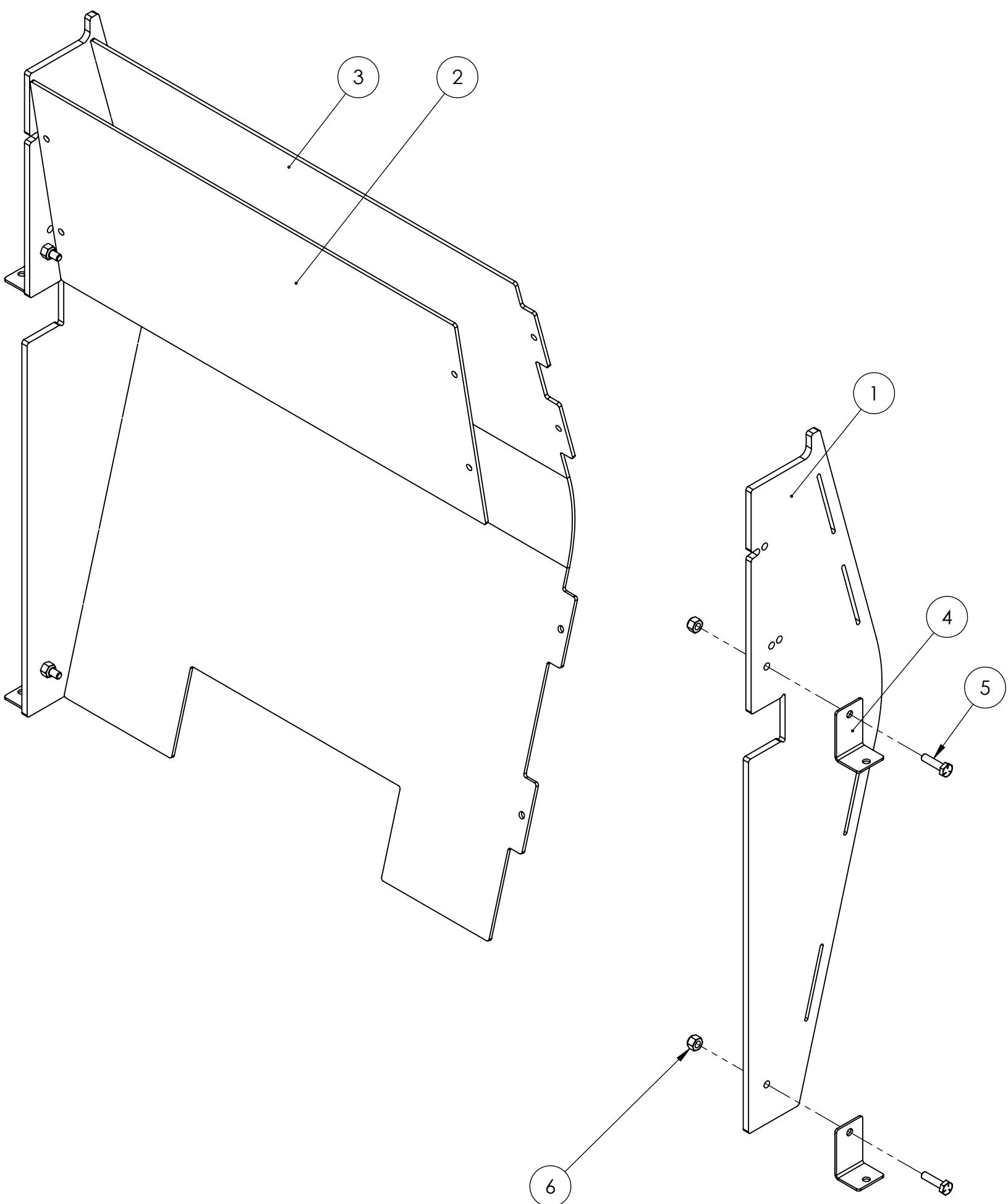
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24241	Chute Side Poly	2
2	GE-24242	Chute Small Ramp	1
3	GE-24243	Chute Main Ramp	1
4	GE-24244	Chute angle mount	4
5	hex_.25_20_1	Steel Hex Head Screw, 1/4"-20 x 1" long, fully threaded	4
6	nylock_.25_20	Steel Nylon-Insert Locknut, 1/4"-20	4

UNLESS OTHERWISE SPECIFIED:			FIELD	NAME	DATE
			DRAWN	DF	12/1/2023
PROPRIETARY AND CONFIDENTIAL					
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.					
MATERIAL/FINISH:					
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.					
DO NOT SCALE DRAWING			SIZE	DWG. NO.	REV
			C	GE-24240	
			SCALE: 1:4	SHEET 1 OF 1	

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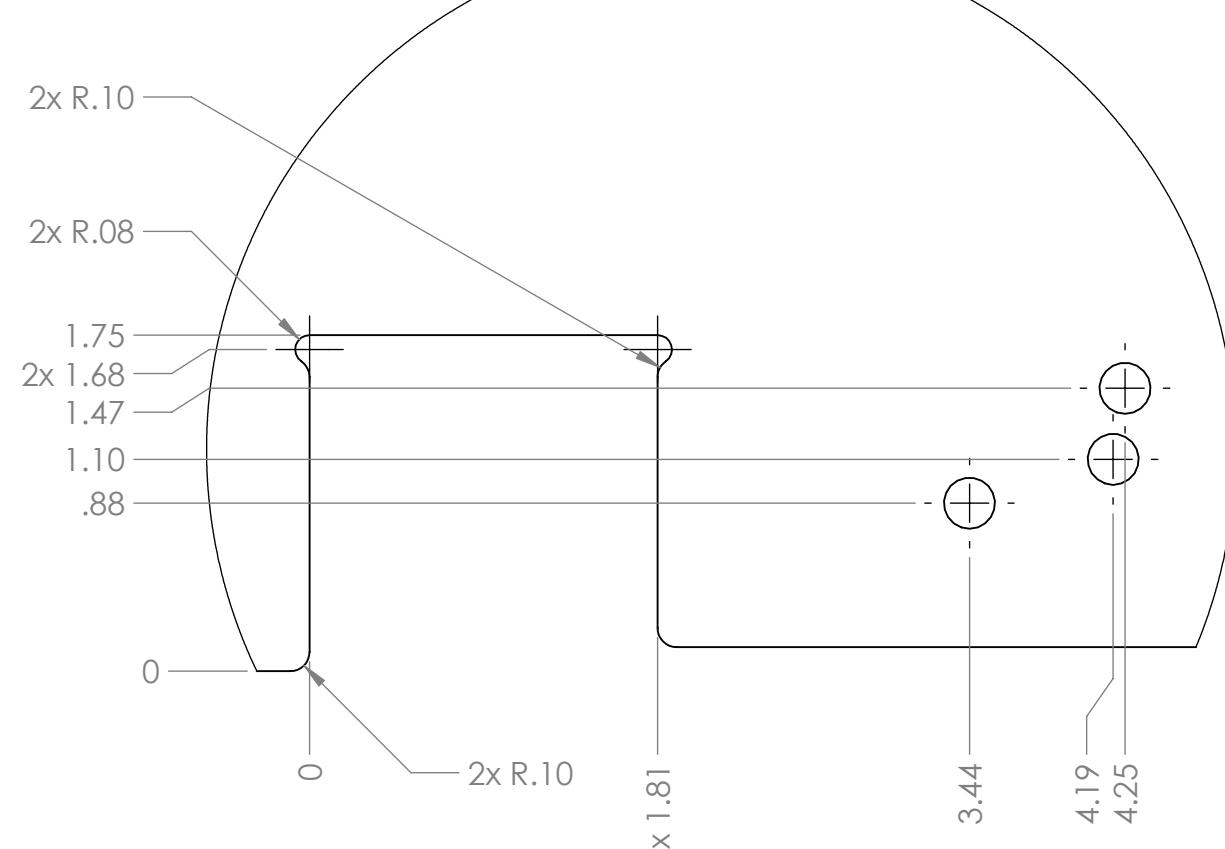
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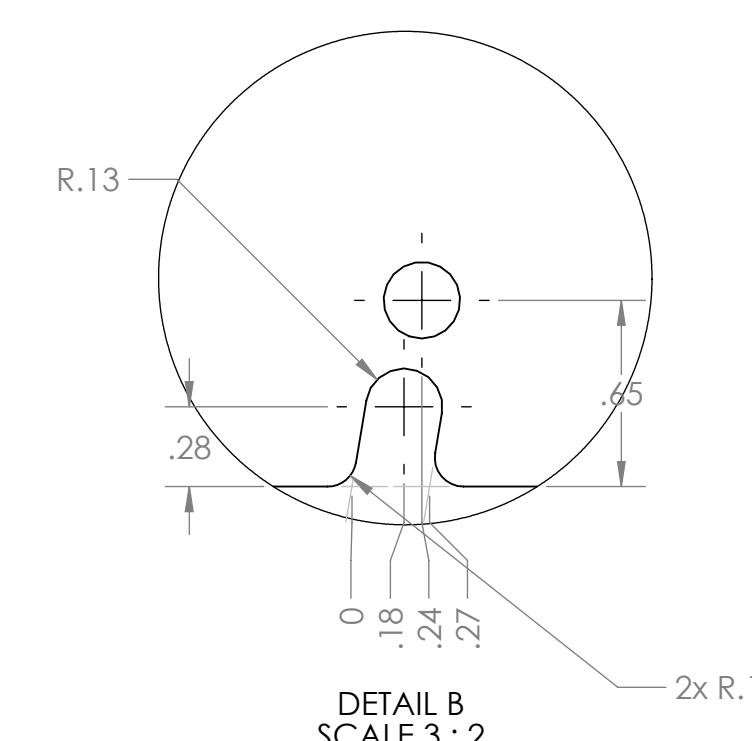
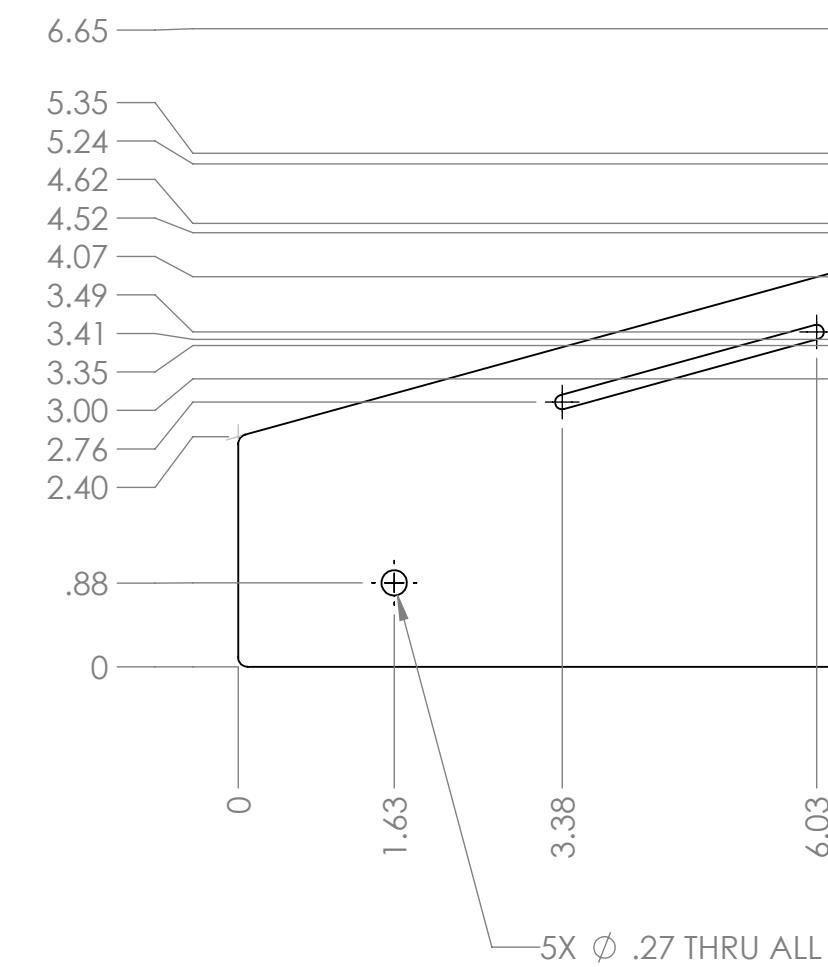
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- Notes:
1. Tag or label with part number.



UNLESS OTHERWISE SPECIFIED:			VEND	NAME	DATE
DIMENSIONS ARE IN INCHES			DRAWN	CO	7/25/2023
TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .005$					
PROPRIETARY AND CONFIDENTIAL					
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.					
MATERIAL/FINISH: 1/4" Polycarbonate, Clear					
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.					
DO NOT SCALE DRAWING					
SIZE			DWG. NO.	REV	
C			GE-24241		
SCALE: 1:2			SHEET 1 OF 1		

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
Chute Side Poly

SIZE DWG. NO. REV

C GE-24241

SCALE: 1:2 SHEET 1 OF 1

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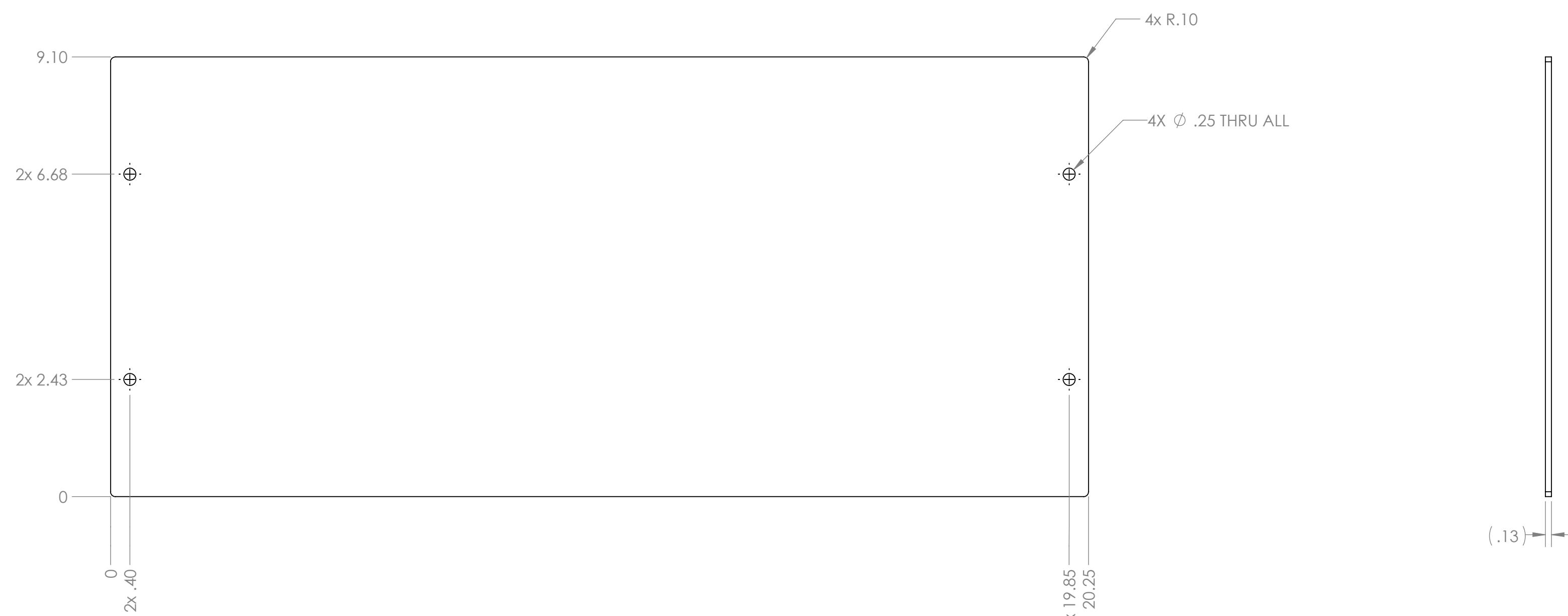
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Notes:
1. Tag or label with part number.

UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	CO	7/28/2023
TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$	PROPRIETARY AND CONFIDENTIAL		
TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .005$	THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.		
MATERIAL/FINISH: 1/8" Black HDPE, Smooth	COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.		
DO NOT SCALE DRAWING	SCALE: 1:2		



SOLIDWORKS
Modeling Solutions Partner

TITLE: Chute Small Ramp

SIZE DWG. NO. REV
C GE-24242

SCALE: 1:2 SHEET 1 OF 1

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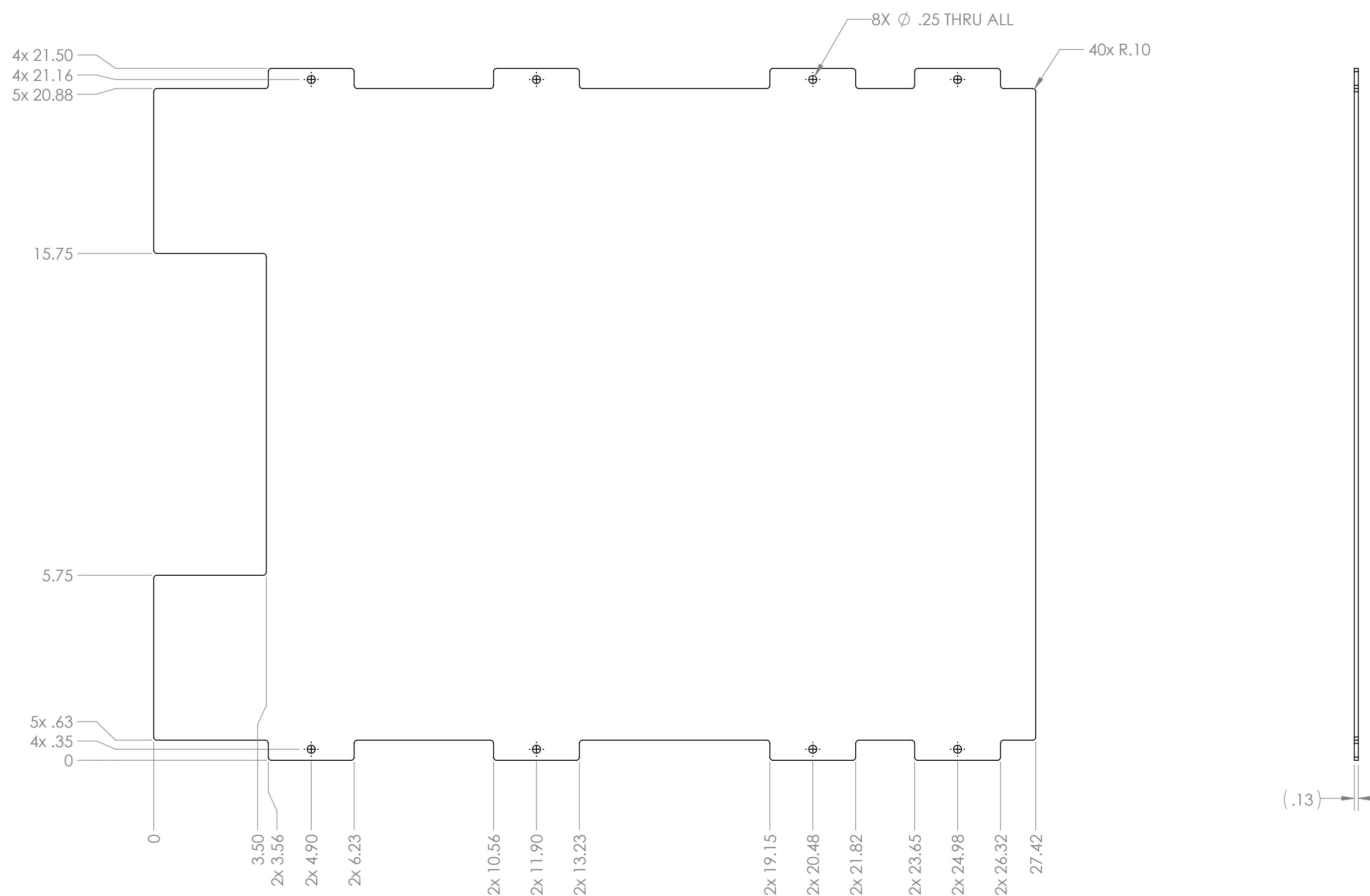
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UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	CO	7/28/2023	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH: 1/8" Polycarbonate, Clear			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

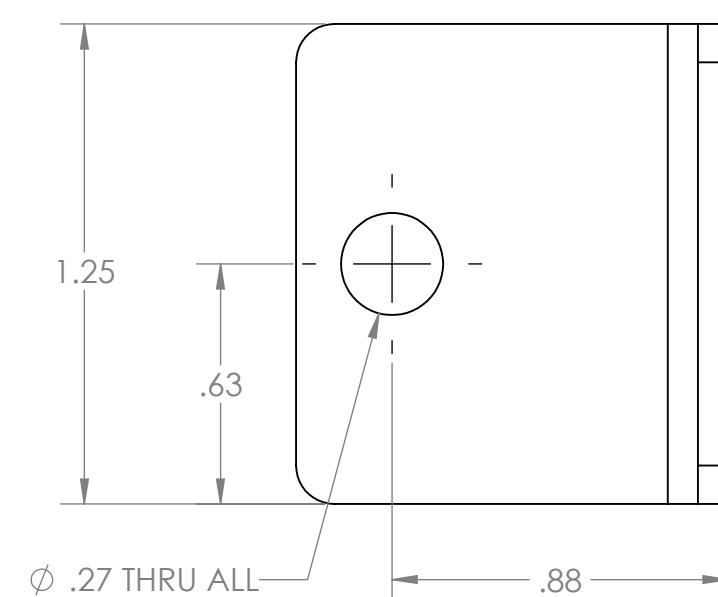


TITLE:
**Chute Main
Ramp**

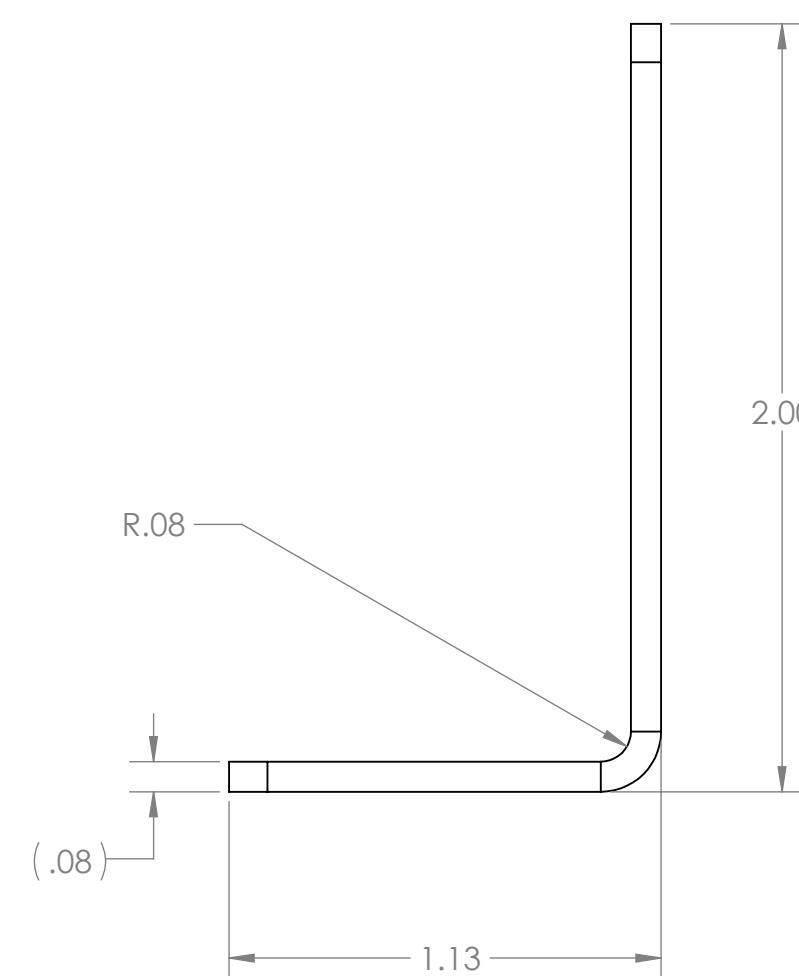
SIZE DWG. NO. REV
C GE-24243

SCALE: 1:3 SHEET 1 OF 1

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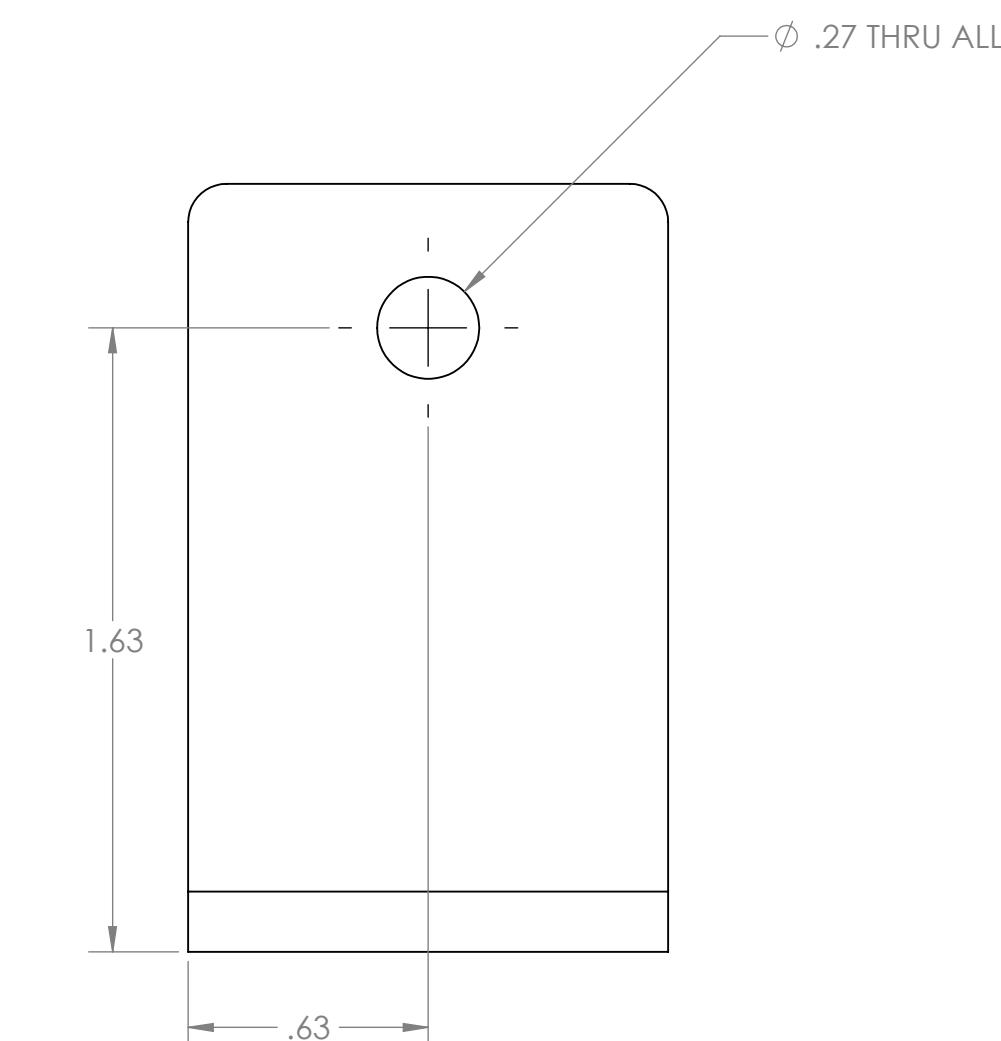
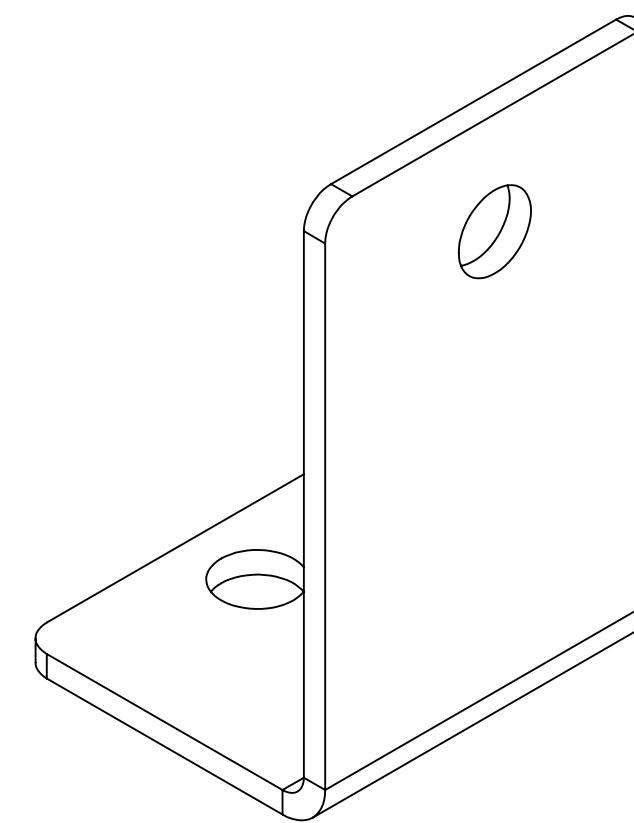


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- Notes:
1. Tag or label with part number.
 2. Package in groups of 12 or 24.



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UNLESS OTHERWISE SPECIFIED:	BEND	NAME	DATE
DRAWN	CO	7/31/2023	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH: 14 Ga. Preplated Steel			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

 **FIRST
ROBOTICS
COMPETITION**  SOLIDWORKS
Modeling Solutions Partner

TITLE:
**Chute angle
mount**

SIZE DWG. NO. REV

C GE-24244

SCALE: 2:1 SHEET 1 OF 1

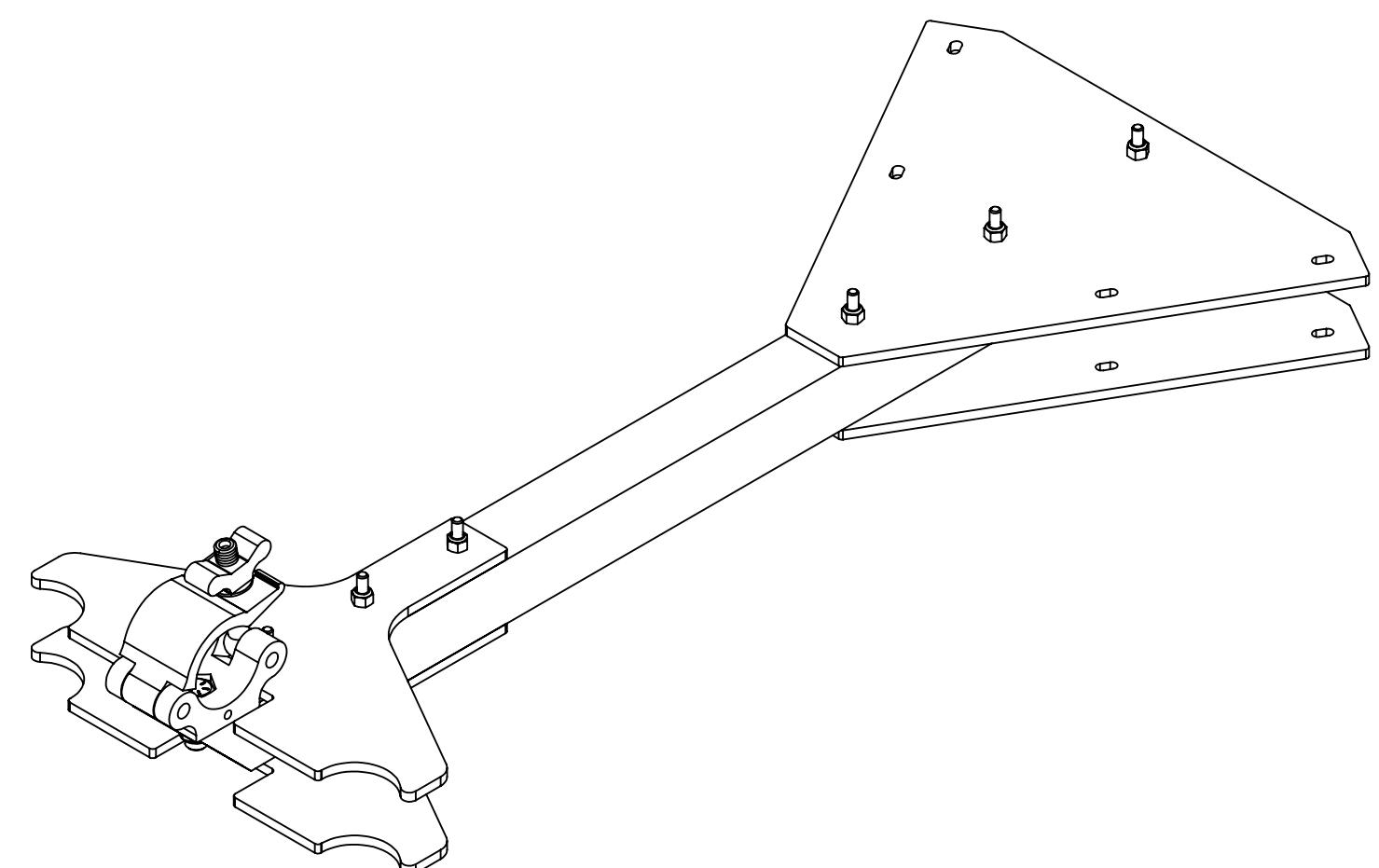
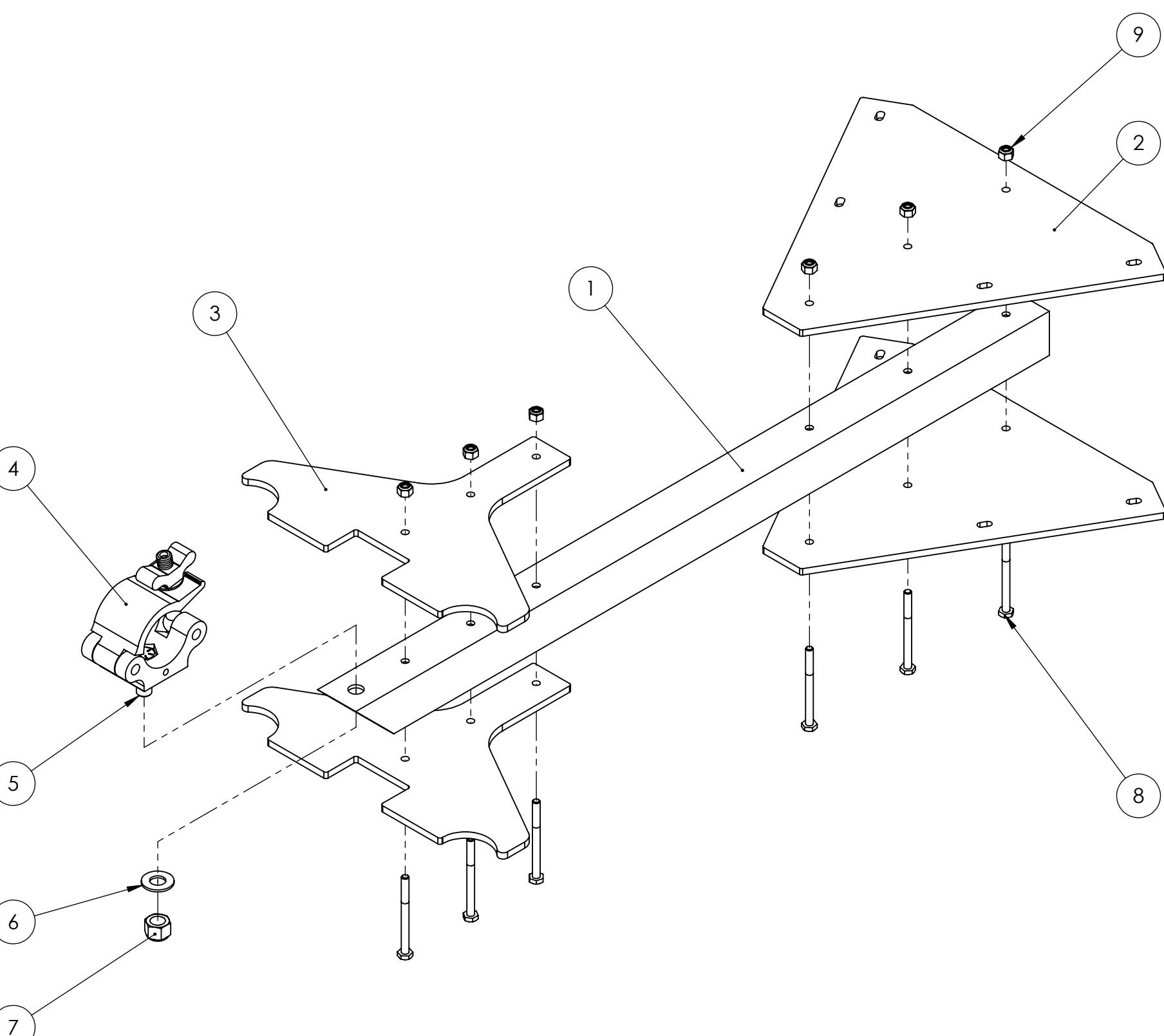
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24251	Stage Lateral Support Bar	1
2	GE-24253	Stage Lateral Support Center Brace	2
3	GE-24252	Stage Lateral Support Truss Brace	2
4	FE-01016	Cheeseborough for Truss _ Single	1
5	hex_.5_13_1.25	Steel Hex Head Screw, 1/2"-13 x 1.25" long, fully threaded	1
6	washer_flat_.5	Flat Washer for 1/2" Screw	1
7	nylock_.5_13	Steel Nylon-Insert Locknut, 1/2" - 13	1
8	hex_.25_20_3_partial	Steel Hex Head Screw, 1/4"-20 x 3" long, partially threaded	6
9	nylock_.25_20	Steel Nylon-Insert Locknut, 1/4"-20	6

UNLESS OTHERWISE SPECIFIED:

FIELD NAME DATE

DRAWN DF 11/27/2023



TITLE:
Stage Lateral Support

DIMENSIONS ARE IN INCHES

TOLERANCES:

FRACTIONAL $\pm 1/2$
ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$
TWO PLACE DECIMAL $\pm .50$ **MATERIAL/FINISH:**

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COMMENTS:
REMOVE ALL BURRS AND SHARP EDGES.

DO NOT SCALE DRAWING

SIZE DWG. NO. REV

C GE-24250

SCALE: 1:4 SHEET 1 OF 1

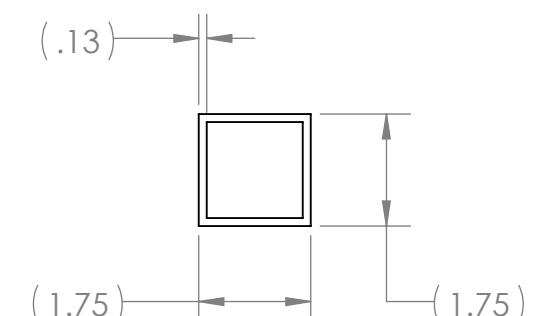
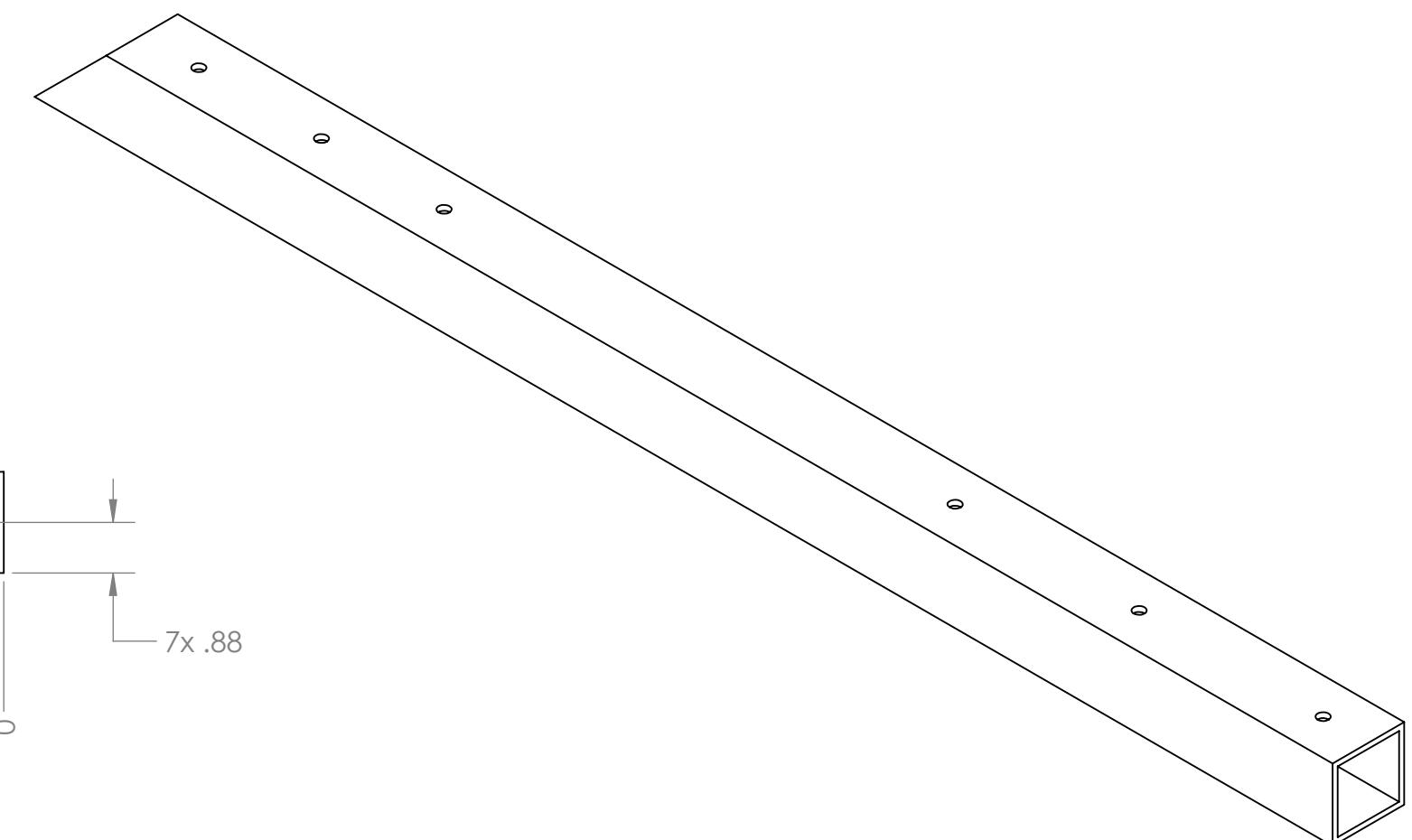
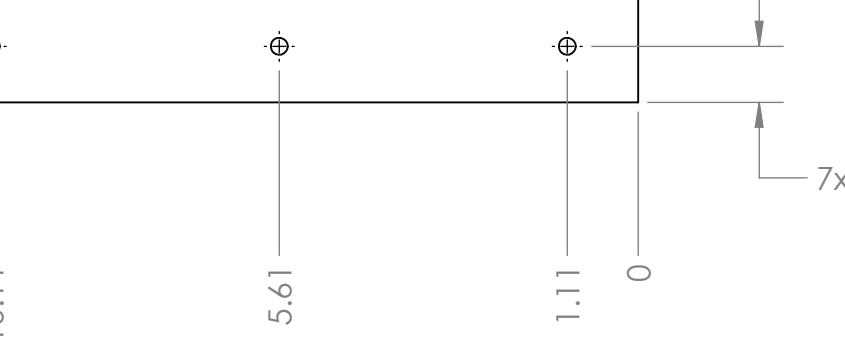
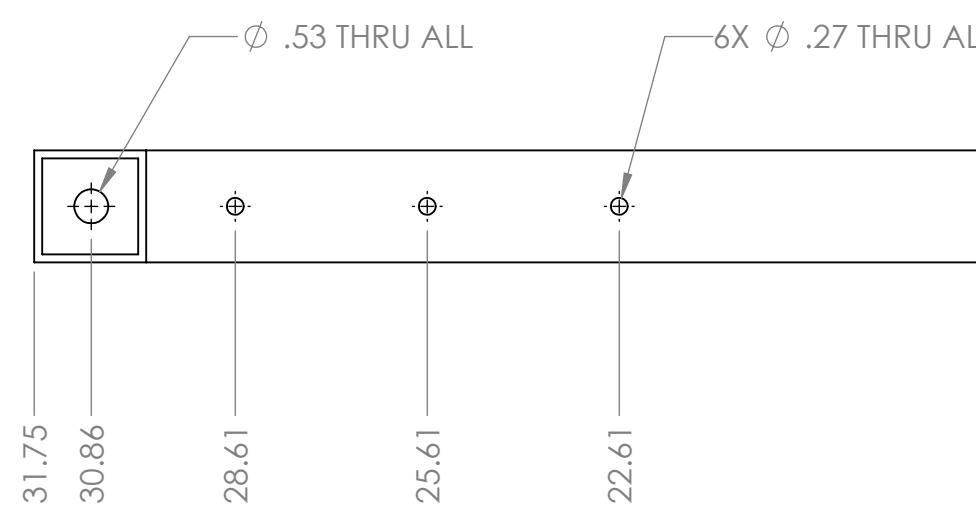
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Notes:
1. Tag or label with part number.

UNLESS OTHERWISE SPECIFIED:			VEND	NAME	DATE
			DRAWN	CO	7/24/2023
PROPRIETARY AND CONFIDENTIAL					
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.					
MATERIAL/FINISH:	1.75" x .125" thk. Square Tube, 6061 Aluminum				
COMMENTS:	REMOVE ALL BURRS AND SHARP EDGES.				
DO NOT SCALE DRAWING					

FIRST ROBOTICS COMPETITION DS SOLIDWORKS Modeling Solutions Partner

TITLE: Stage Lateral Support Bar

SIZE DWG. NO. REV

C GE-24251

SCALE: 1:3 **SHEET 1 OF 1**

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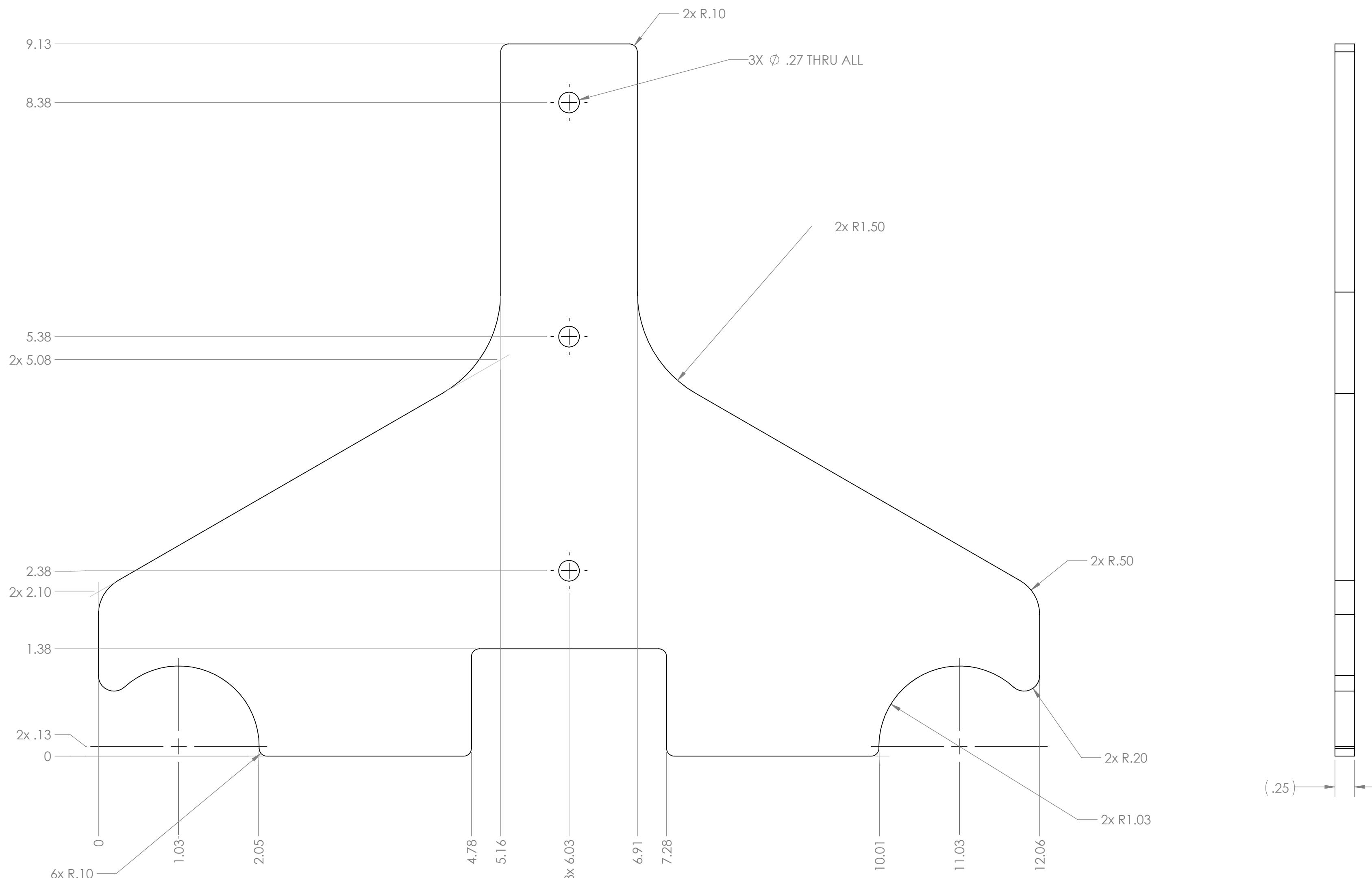
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UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	CO	7/25/2023	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH: 1/4" Polycarbonate, Clear			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			
FIRST ROBOTICS COMPETITION			
SOLIDWORKS Modeling Solutions Partner			
TITLE: Stage Lateral Support Truss Brace		SIZE	DWG. NO.
C GE-24252			REV
SCALE: 1:1		SHEET 1 OF 1	

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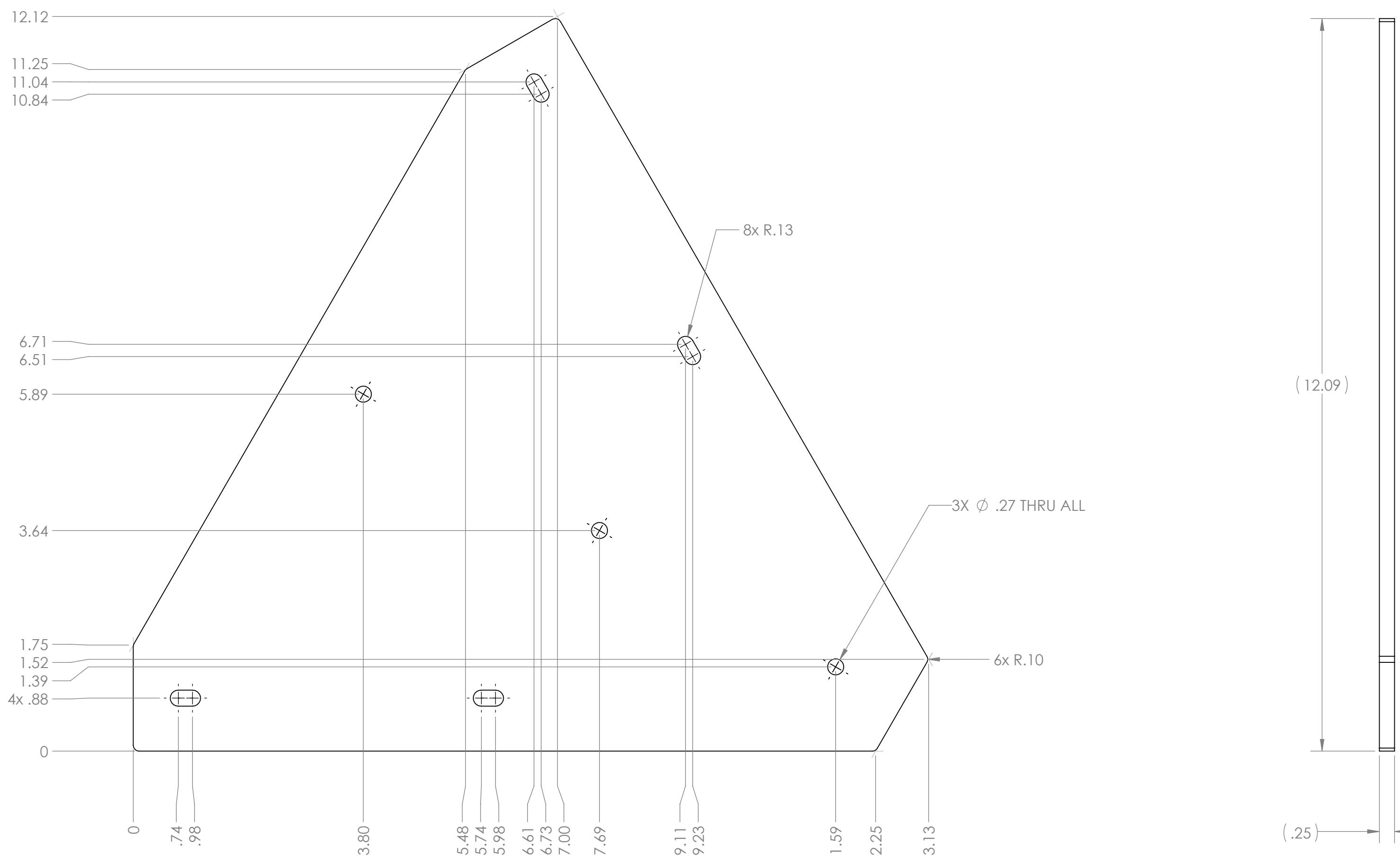
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Notes:

1. Tag or label with part number.

UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	CO	7/25/2023	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH: 1/4" Polycarbonate, Clear			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

 **FIRST
ROBOTICS
COMPETITION**  **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Stage Lateral Support Center Brace
SIZE: DWG. NO. **REV:**
C GE-24253

SCALE: 2:3 **SHEET 1 OF 1**

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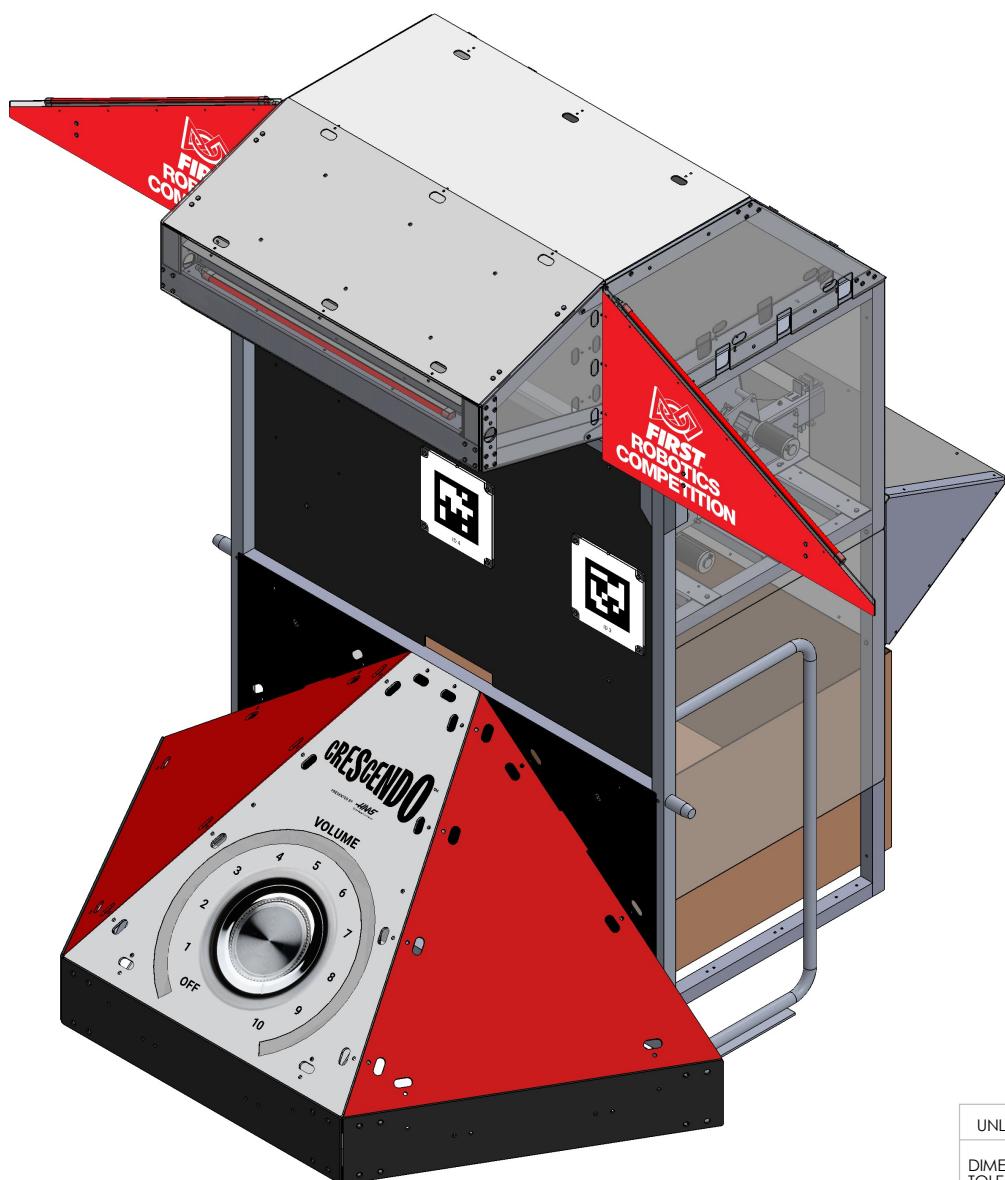
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	FE-00001	Drivers Station Support	2
2	GE-24301	Speaker Side Frame	2
3	GE-24302	Speaker Crossbeams with PEMs	4
4	GE-24303	Side Guard Walls	4
5	GE-24306	Speaker Back Cover	1
6	GE-24307	Speaker Inner Side Ramp	2
7	GE-24308	Speaker Inner Back Ramp	1
8	GE-24309	Speaker Inner Side Wall	2
9	GE-24310	Speaker Top Frame	1
10	GE-24321	Backboard Bracket	4
11	GE-24322	Speaker Alliance Wall Plastic	1
12	GE-24325	Briweld Field Crossbeam Assembly	1
13	GE-24330	Subwoofer	1
14	GE-24331	Wall Goal Frame Weldment	1
15	GE-24350	Ring Counter	1
16	GE-24391	Collection Ramp w/ PEMs	2
17	GE-24392	Collection Ramp	1
18	GE-24328-LeftRed	Speaker Wing Plastic with Vinyl	1
19	barLight-36		3
20	GE-24328-RightRed	Speaker Wing Plastic with Vinyl	1
21	S-4478	Cardboard Box	1
22	FE-00083-ID3	AprilTag	1
23	FE-00083-ID4	AprilTag	1
24	Configurable Bolt	1" Long 1/4-20 Hex Head Bolt	28
25	Configurable Bolt	2.5" Long 1/4-20 Hex Head Bolt	24
26	Configurable Bolt	1/4-20 Hex Head Bolt 4" Long	4
27	nylock_25_20	Steel Nylon-Insert Locknut, 1/4"-20	32

UNLESS OTHERWISE SPECIFIED:			FIELD	NAME	DATE
			DRAWN	JO	12/19/2023
PROPRIETARY AND CONFIDENTIAL					
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COMMENTS:					
REMOVE ALL BURRS AND SHARP EDGES.					
DO NOT SCALE DRAWING					
SIZE	DWG. NO.	REV			
C	GE-24300				
SCALE: 1:10			SHEET 1 OF 6		

FIRST
ROBOTICS
COMPETITION
SOLIDWORKS
Modeling Solutions Partner

TITLE:
Speaker

4

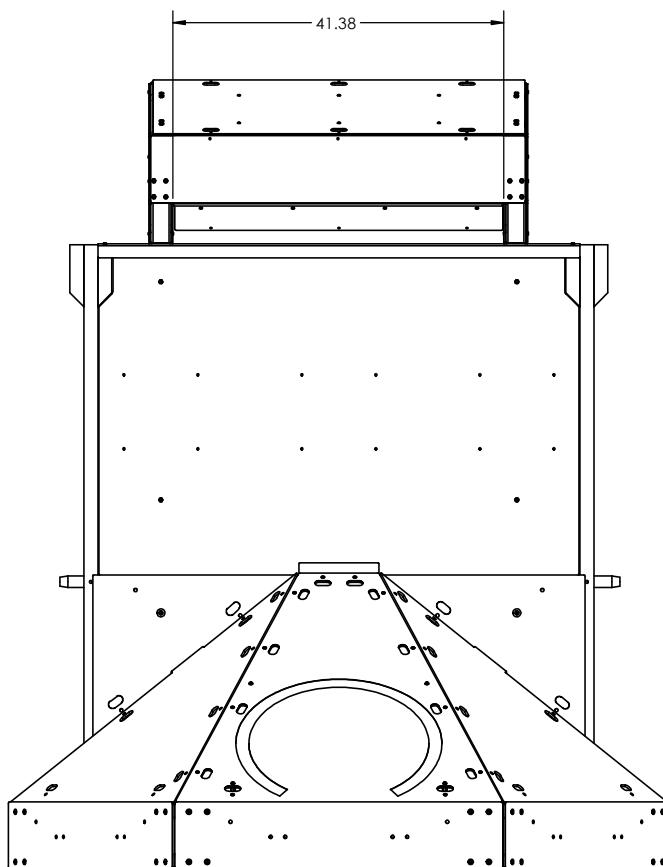
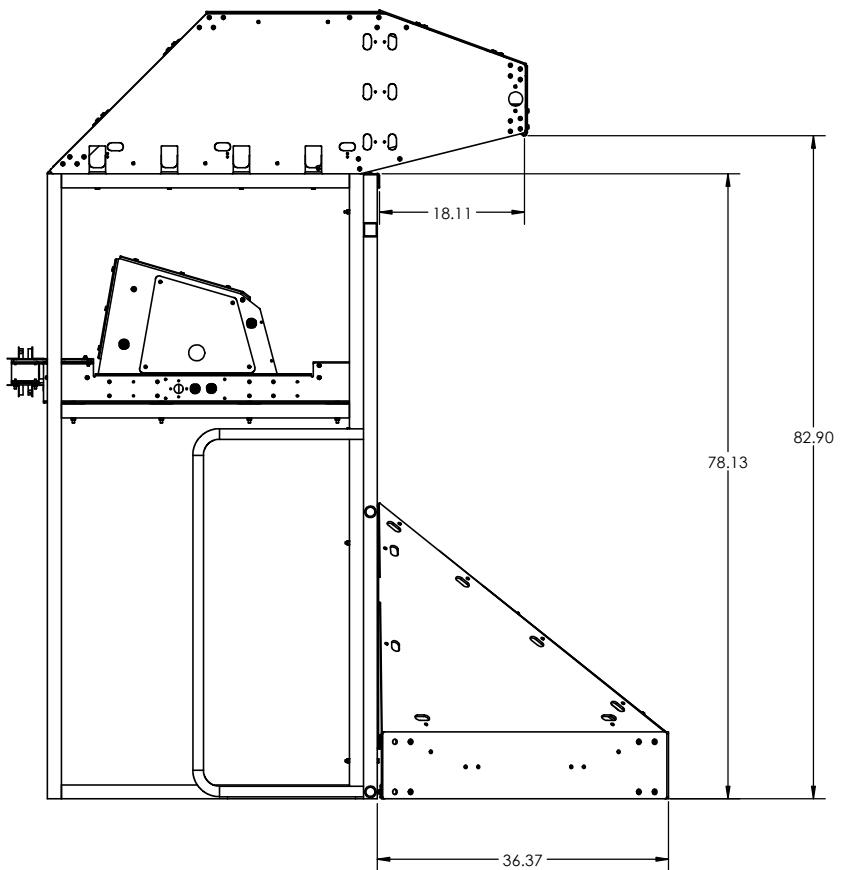
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UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES

TOLERANCES:

FRACTIONAL $\pm 1/2$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .00$

FIELD	NAME	DATE
DRAWN	JO	12/19/2023

FIRST
ROBOTICS
COMPETITION
DS SOLIDWORKS
Modeling Solutions Partner

TITLE:

Speaker

SIZE

DWG. NO.

REV

C

GE-24300

SCALE: 1:12

SHEET 2 OF 6

MATERIAL/FINISH:

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COMMENTS:

REMOVE ALL BURRS AND SHARP EDGES.

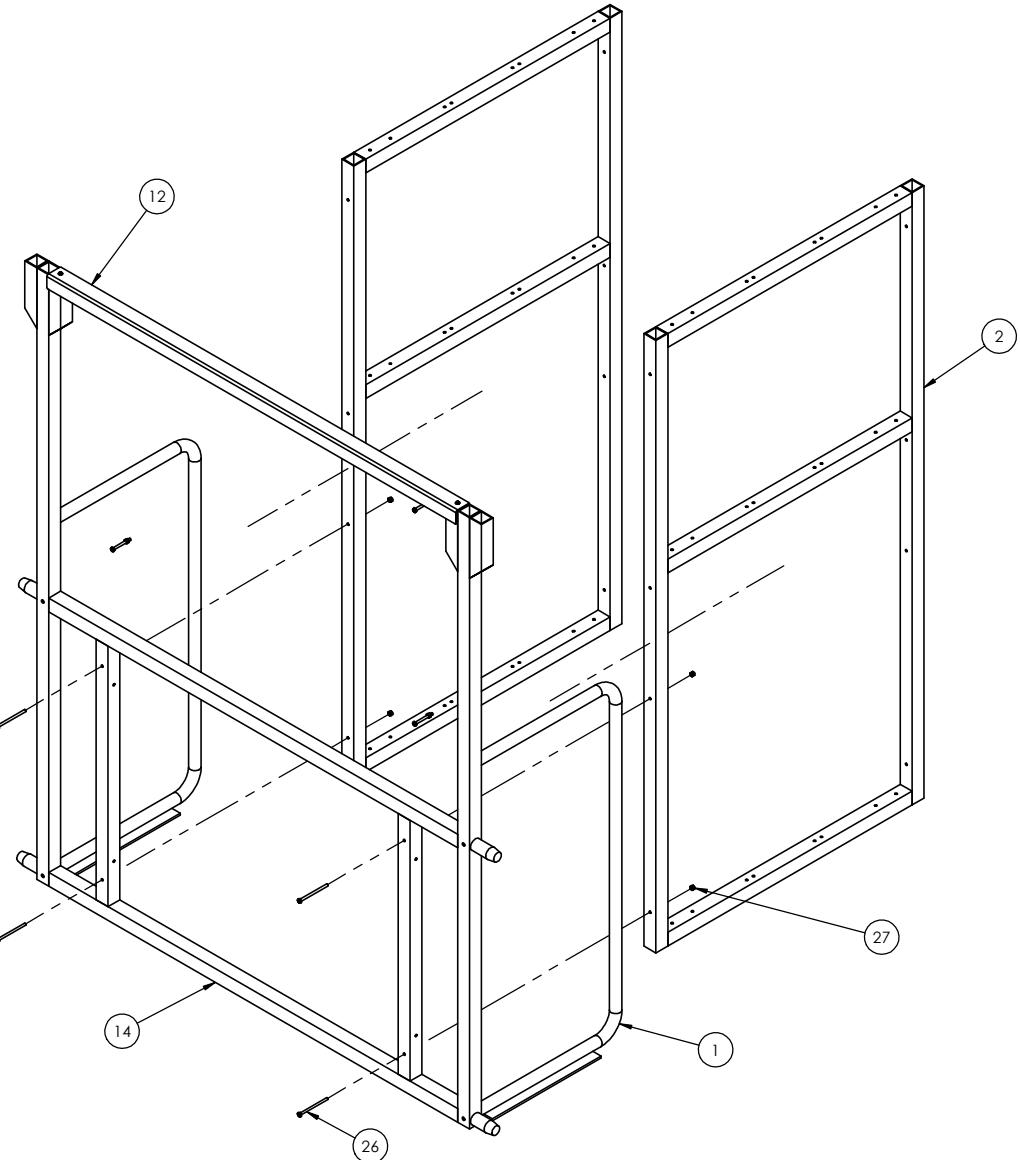
DO NOT SCALE DRAWING

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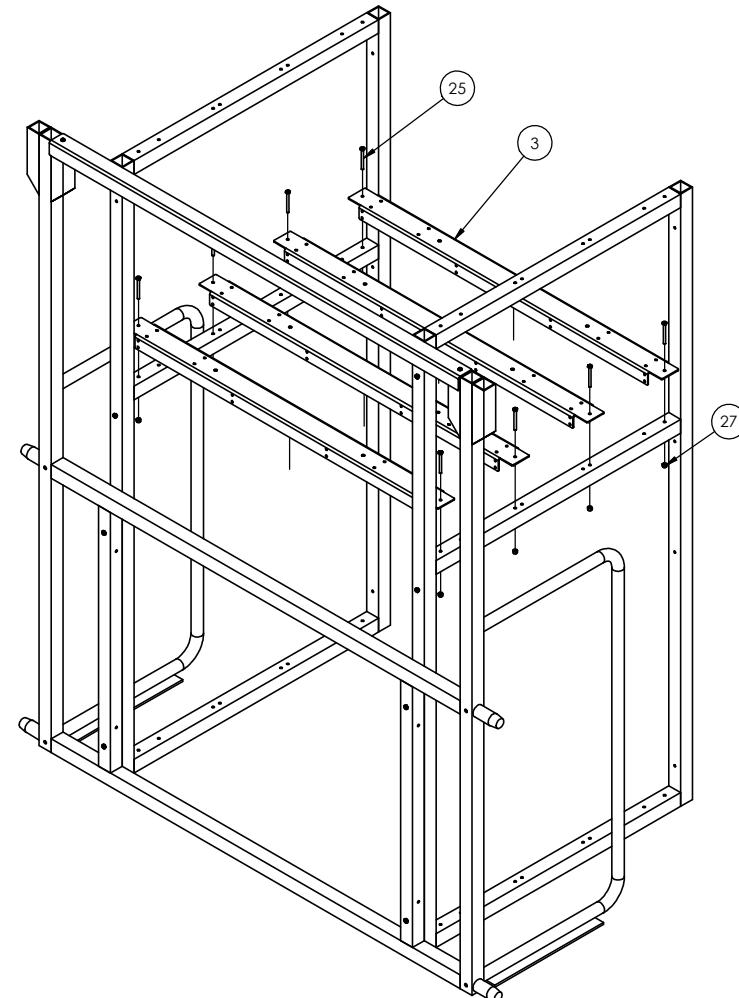
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Include (14) in the Alliance Wall assembly as a starting point between two (1) segments.
slide (2) into position and attach with (26) and (27).



Attach (3) to the assembly with (25) and (27)

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DRAWN	JO	12/19/2023	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			
A	B	C	D
A	B	C	D

 FIRST
ROBOTICS
COMPETITION
 SOLIDWORKS
Modeling Solutions Partner

TITLE:
Speaker

SIZE	DWG. NO.	REV
C	GE-24300	
SCALE: 1:10	SHEET 3 OF 6	

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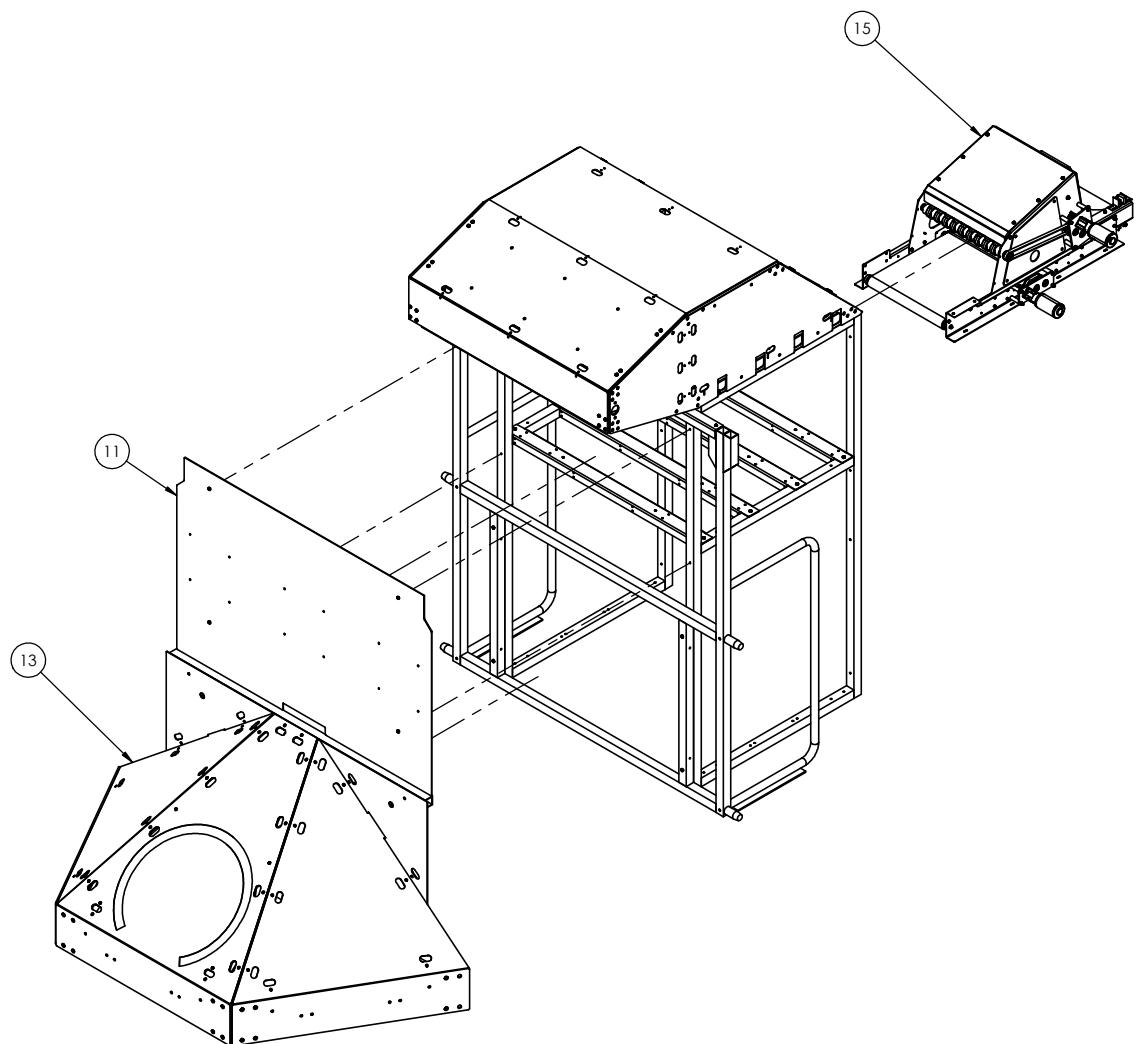
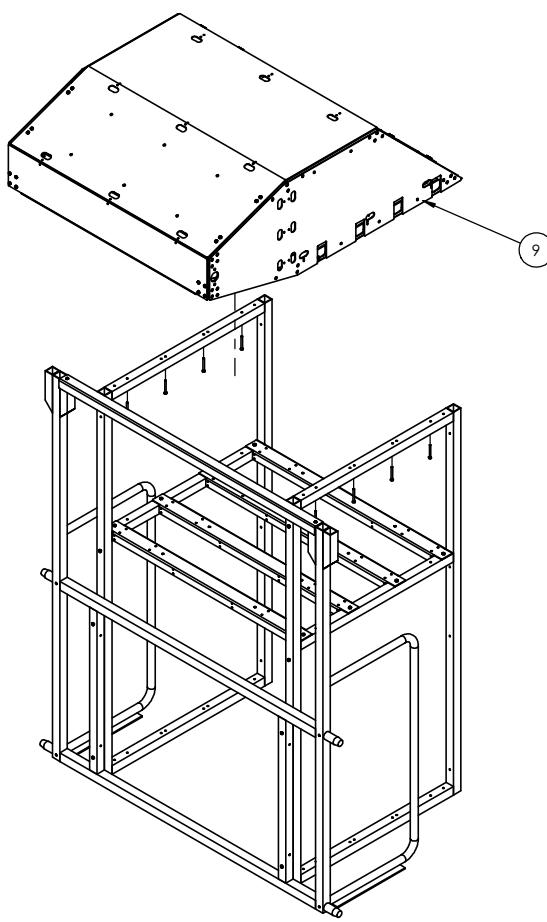
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Attach all Subassemblies and panels as shown

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DRAWN	JO	12/19/2023	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			
SIZE DWG. NO. REV			
C GE-24300			
SCALE: 1:16 SHEET 4 OF 6			



Title:
Speaker

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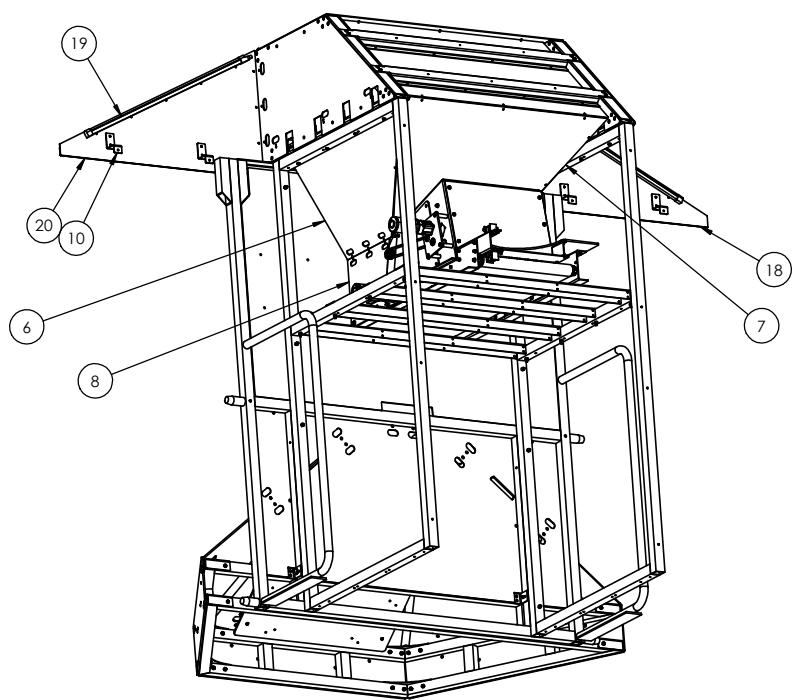
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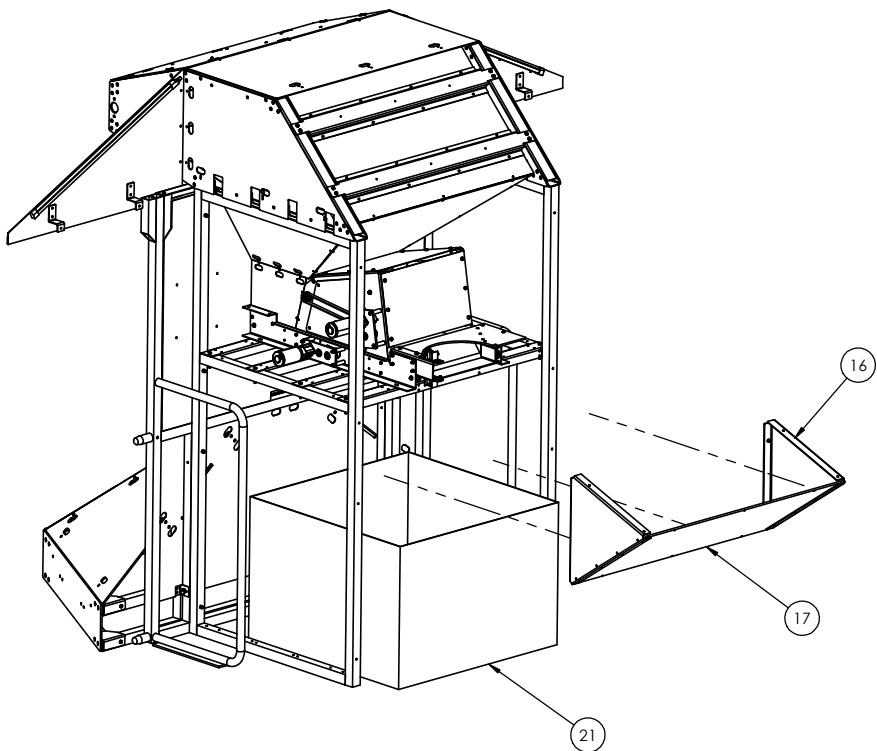
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Attach Ramps, Wings and Lights with 50lb Cable Ties



Attach 16 to assembly with 1" bolts, then attach 17 with 50lb cable ties

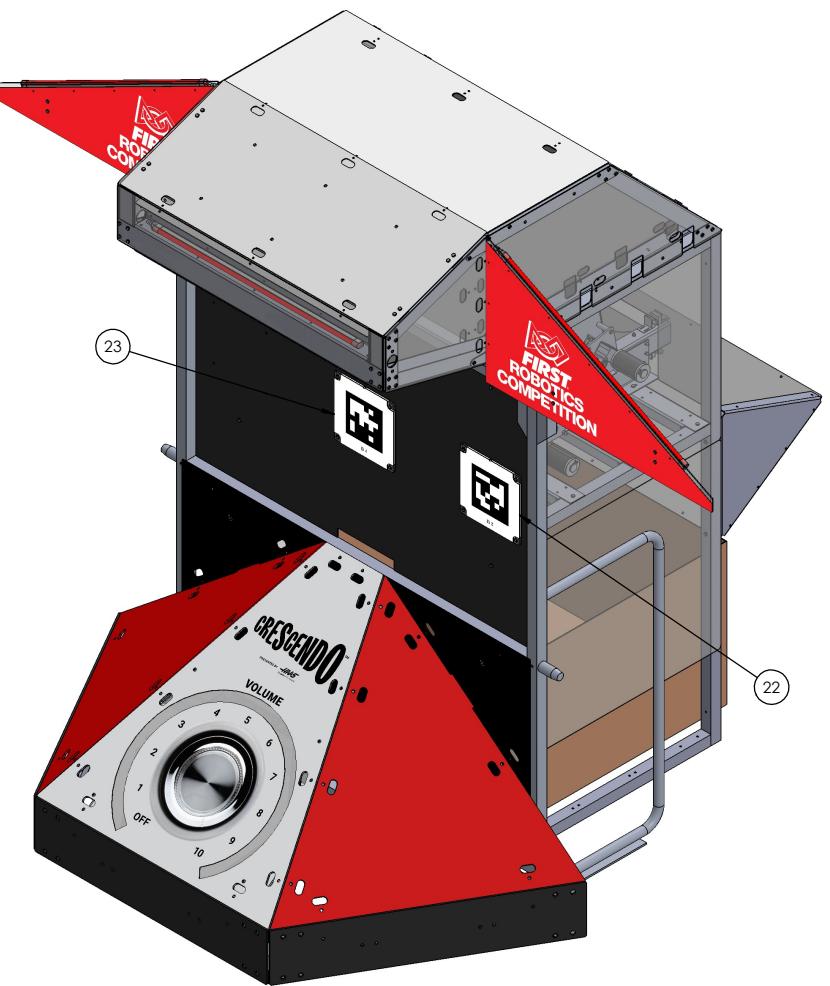
Slide 21 into place under ring counter

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/2$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .50$	FIELD DRAWN NAME JO DATE 12/19/2023
PROPRIETARY AND CONFIDENTIAL	
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MATERIAL/FINISH:	
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.	
DO NOT SCALE DRAWING	SIZE DWG. NO. REV C GE-24300
	SCALE: 1:16 SHEET 5 OF 6

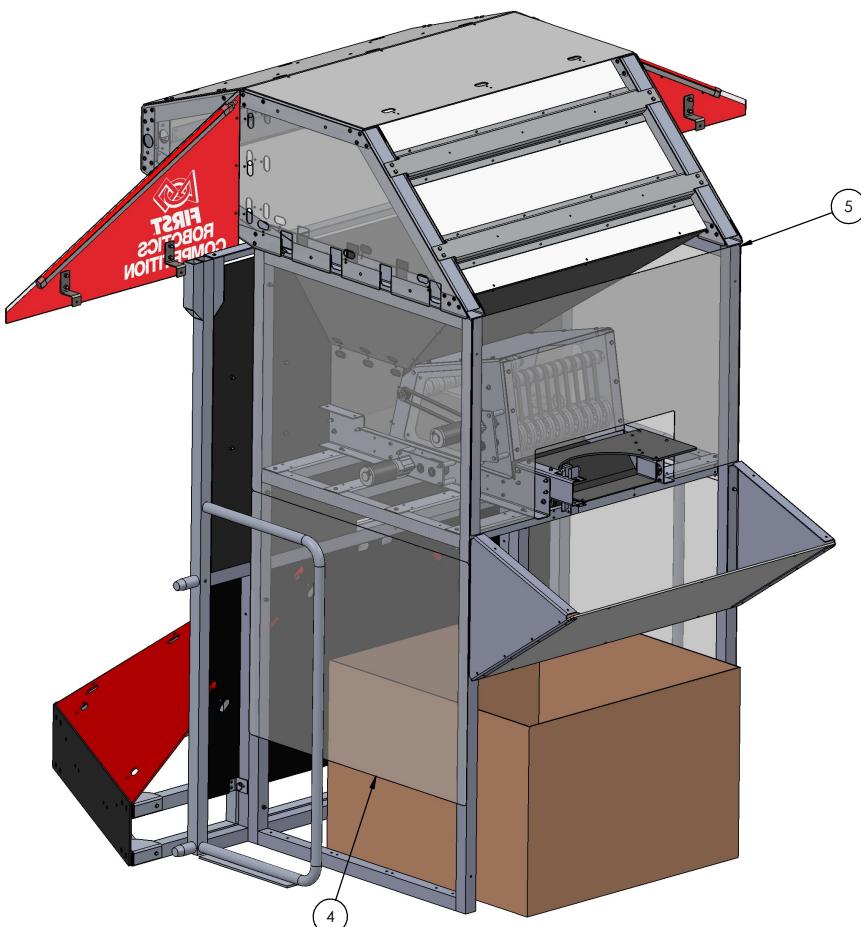
FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

Speaker



Attach (22) and (23) with 1" bolts and locknuts

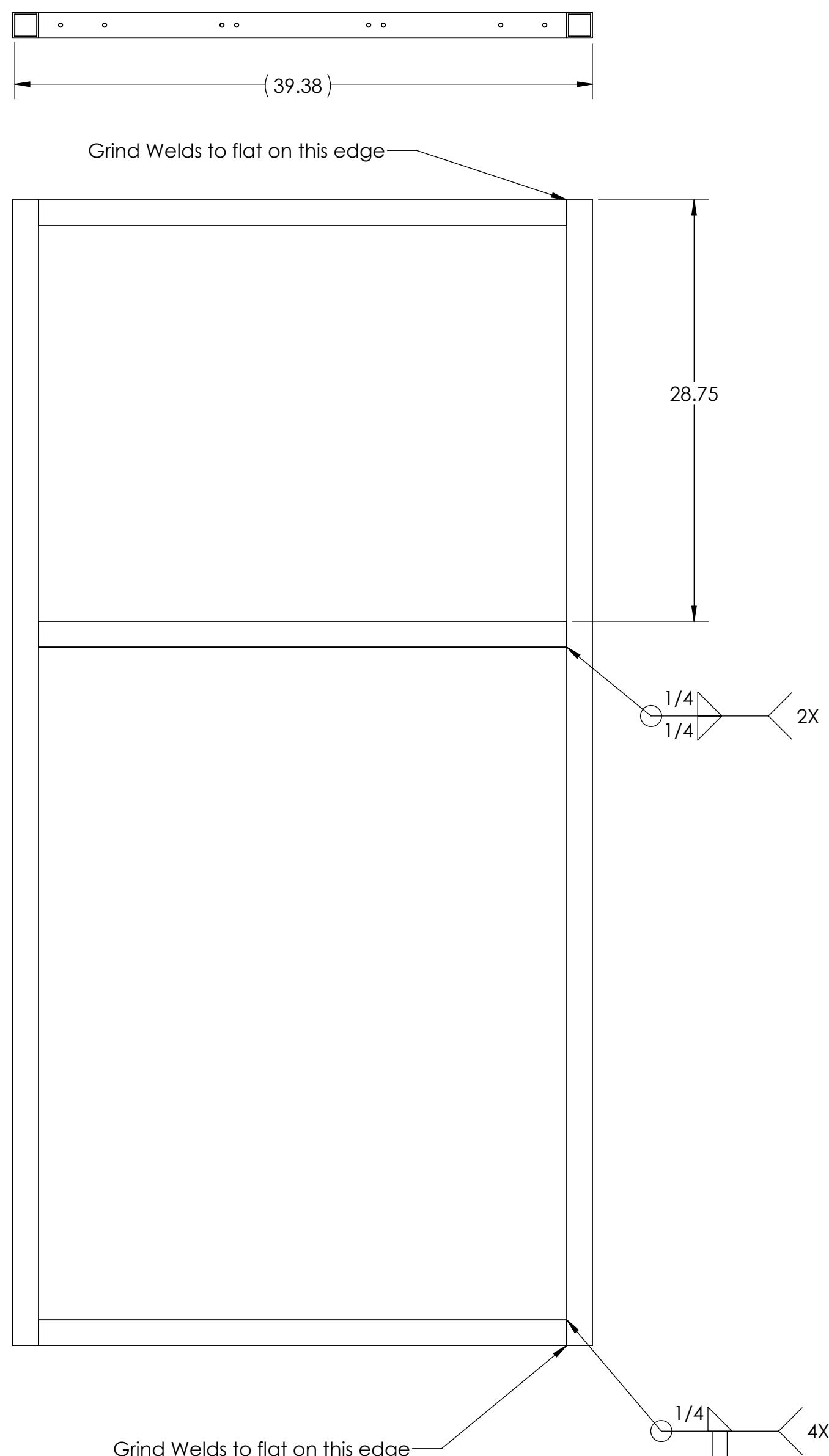


Attach (4) and (5) with hook and loop adhesive

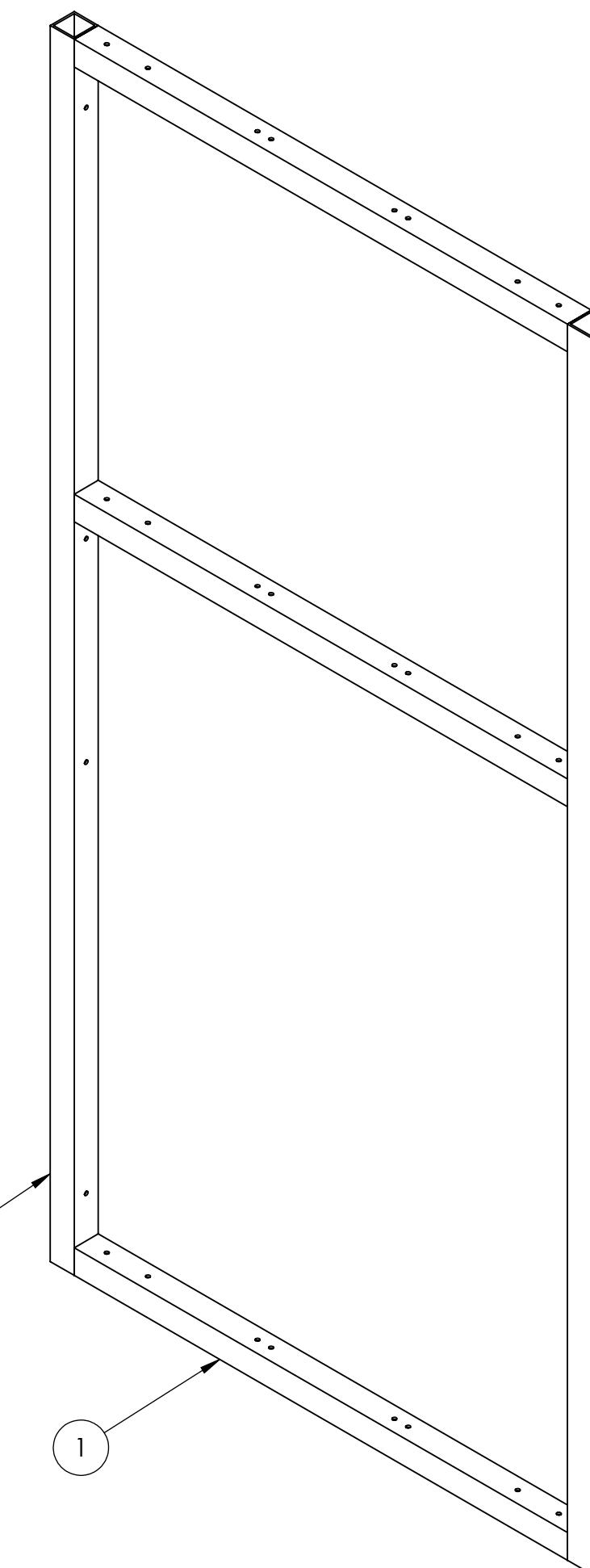
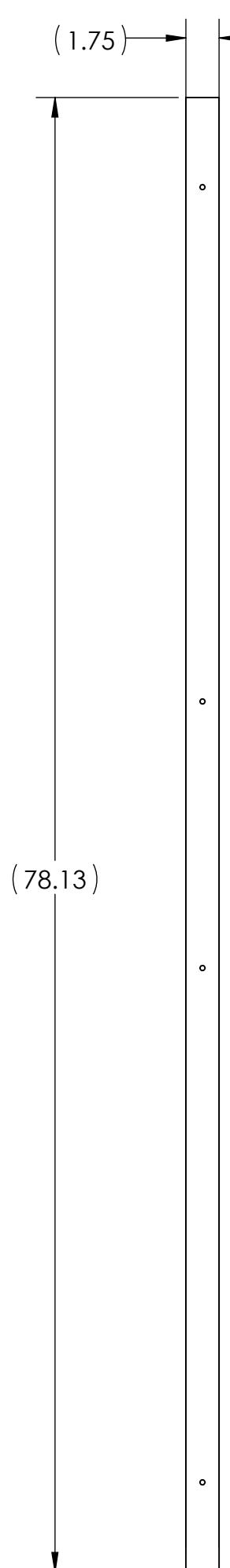
UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/2$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .50$	DRAWN	JO	12/19/2023
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			
  Speaker			
SIZE DWG. NO. REV			
C GE-24300			
SCALE: 1:12 SHEET 6 OF 6			

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Notes:
Note hole orientation before welding
Tag or Label with Part Number



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24301-01	Speaker Depth Tube	3
2	GE-24301-02	Speaker Frame Height Tube	2

UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES

TOLERANCES:

FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .02$ THREE PLACE DECIMAL $\pm .015$

MATERIAL/FINISH:

1.75" x .125" 6061
Aluminum Square Tube

DO NOT SCALE DRAWING

WELD	NAME	DATE
DRAWN	JO	8/30/2023

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
**Speaker Side
Frame**

SIZE DWG. NO. REV
C GE-24301

SCALE: 1:8 SHEET 1 OF 2

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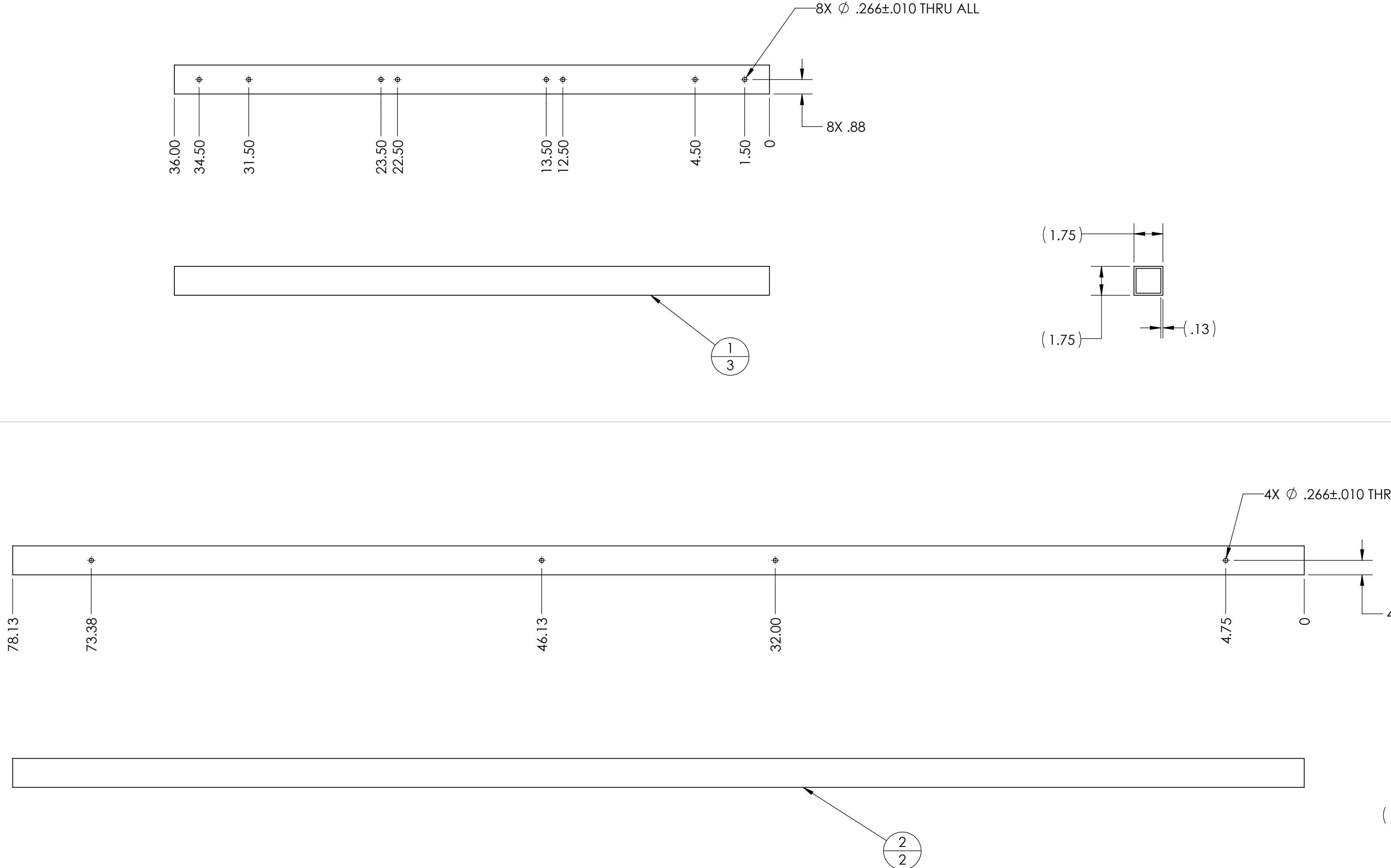
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UNLESS OTHERWISE SPECIFIED:	WELD	NAME	DATE
DRAWN	JO	8/30/2023	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH: 1.75" x .125" 6061 Aluminum Square Tube			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST ROBOTICS COMPETITION SOLIDWORKS Modeling Solutions Partner

Title: Speaker Side Frame

Size: DWG. NO. **REV:**

C GE-24301

Scale: 1:5 **Sheet:** 2 OF 2

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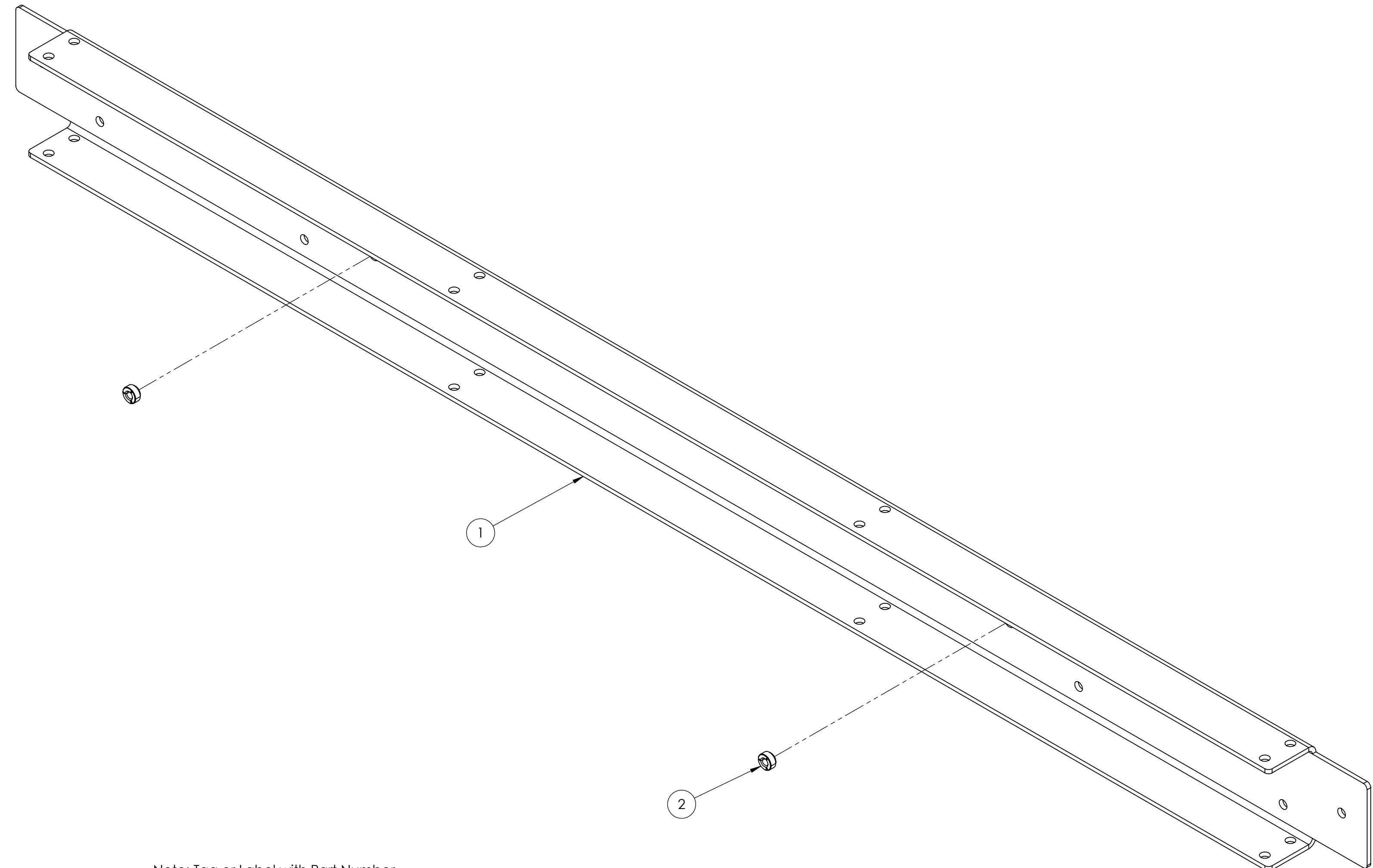
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24302-01	Speaker Base Frame Crossbeams	1
2	pem_clinchnut_25_20 .054	1/4-20 self-clinching nut, .054 shank	2

UNLESS OTHERWISE SPECIFIED:			VEND	NAME	DATE
			DRAWN	JO	10/6/2023
PROPRIETARY AND CONFIDENTIAL					
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.					
COMMENTS:					
REMOVE ALL BURRS AND SHARP EDGES.					
DO NOT SCALE DRAWING					

FIRST ROBOTICS COMPETITION Modeling Solutions Partner

TITLE: Speaker Crossbeams with PEMs

SIZE DWG. NO. REV

C GE-24302

SCALE: 1:2 SHEET 1 OF 1

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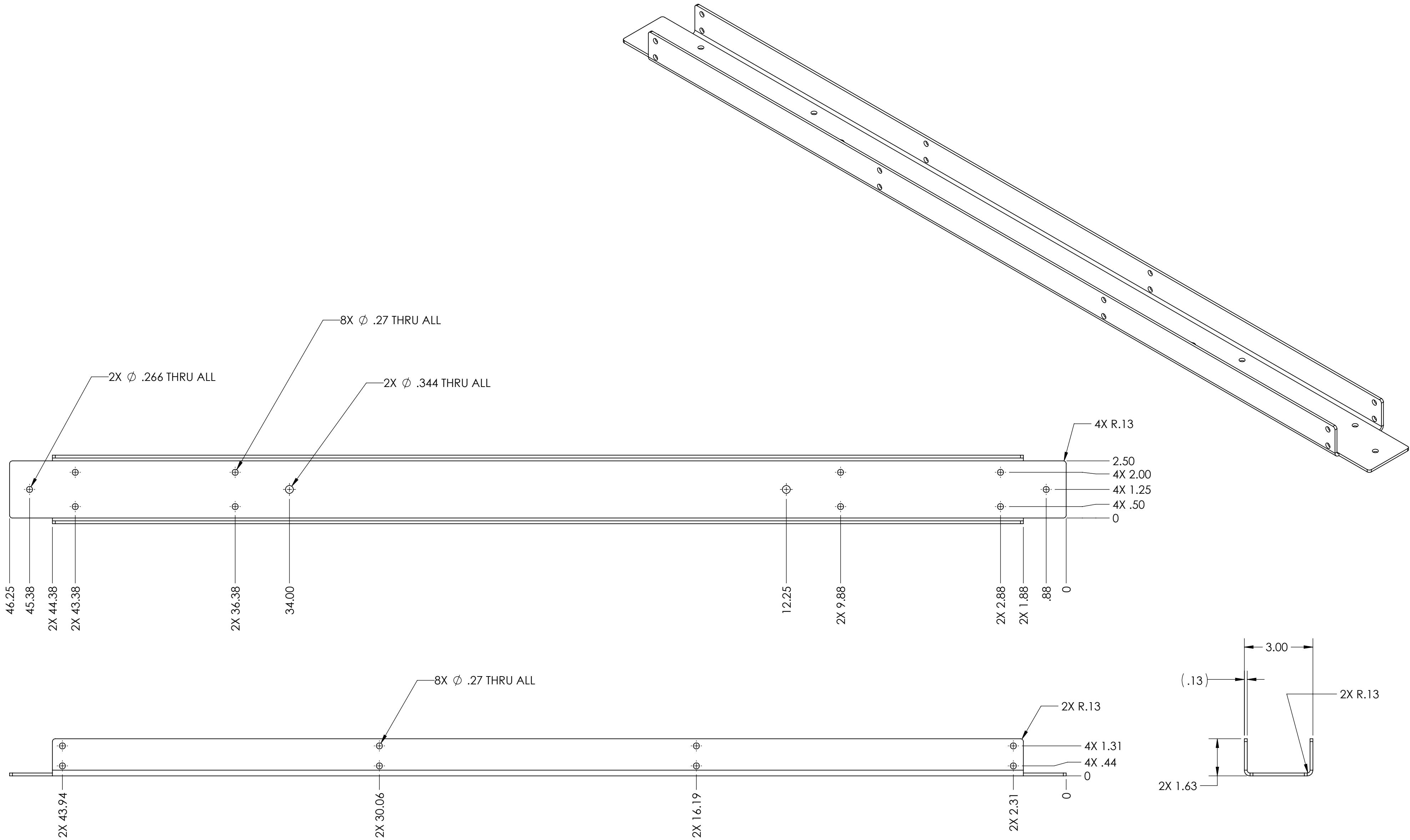
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UNLESS OTHERWISE SPECIFIED:	BEND	NAME	DATE
DRAWN	JO	9/12/2023	
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH: 8 Ga 5052 Aluminum			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE: Speaker Base
Frame
Crossbeams
SIZE DWG. NO. REV
C GE-24302-01

SCALE: 1:3 SHEET 1 OF 1

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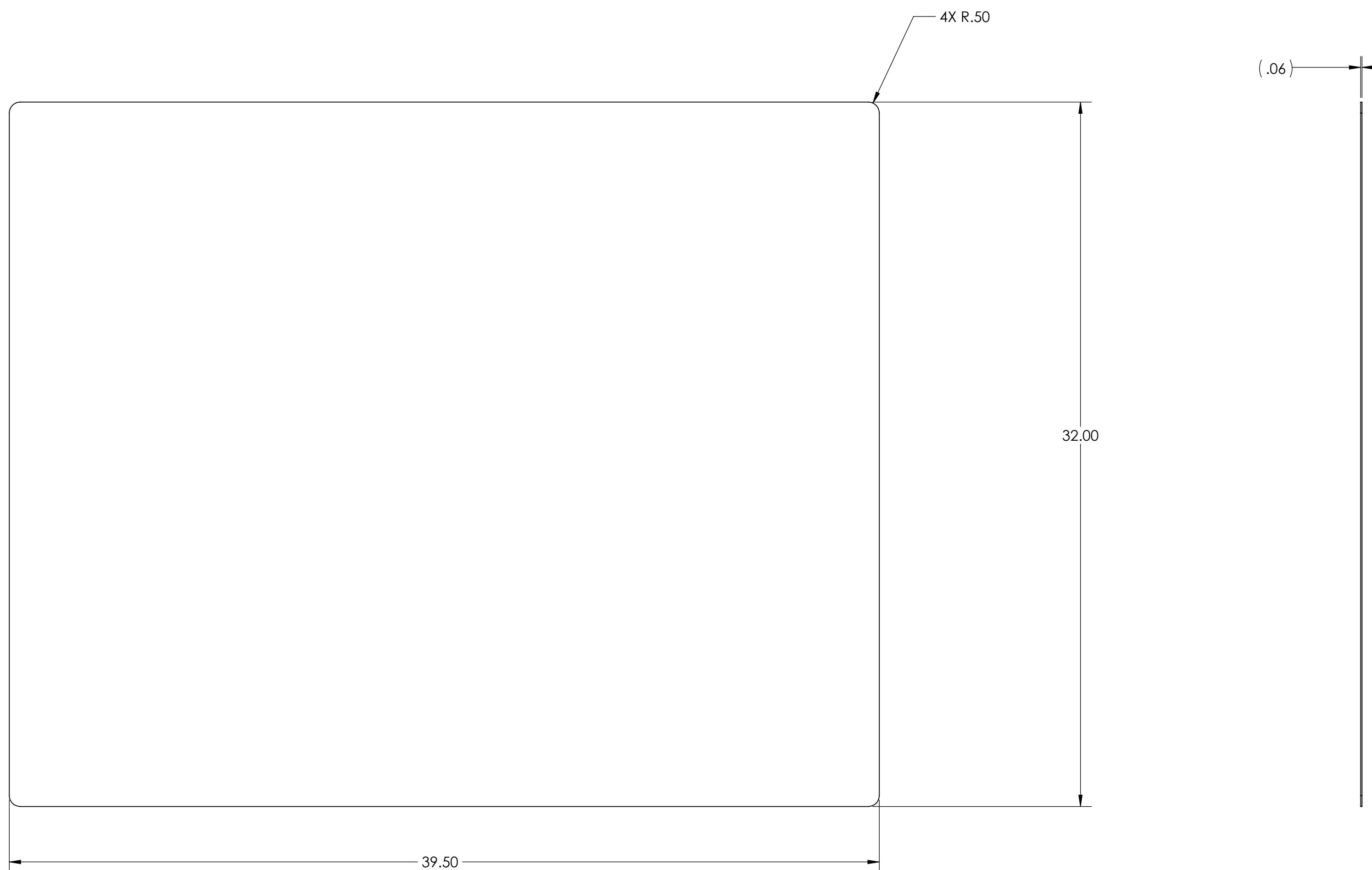
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Tag or Label with Part Number

UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .005$	DRAWN	JO	10/19/2023
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH: 1/16" Polycarbonate, Clear			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

 FIRST ROBOTICS COMPETITION  SOLIDWORKS Modeling Solutions Partner

TITLE: Side Guard Walls

SIZE DWG. NO. REV

C GE-24303

SCALE: 1:4 SHEET 1 OF 1

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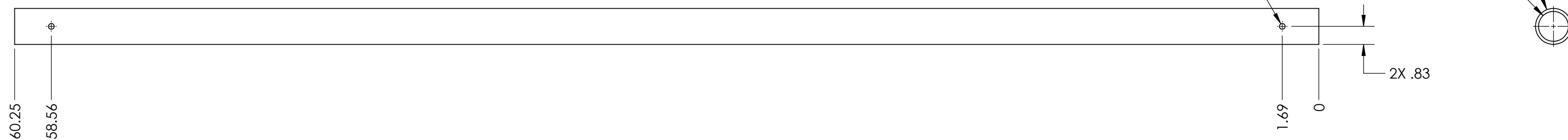
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Tag or Label with Part Number



UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	JO	8/30/2023	
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH: 6061 Aluminum 1.25" Schedule 40 Pipe			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

 **FIRST
ROBOTICS
COMPETITION**  **SOLIDWORKS**
Modeling Solutions Partner

TITLE:
**AndyMark Field
Crossbeam**

SIZE DWG. NO. REV
C GE-24304

SCALE: 1:4 SHEET 1 OF 1

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UNLESS OTHERWISE SPECIFIED:	BEND	NAME	DATE
DRAWN	JO	8/30/2023	
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH: 8 Ga 5052 Aluminum			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

 **FIRST
ROBOTICS
COMPETITION**  **SOLIDWORKS**
Modeling Solutions Partner

TITLE:
**Briweld Field
Crossbeam**

SIZE DWG. NO. REV
C GE-24305

SCALE: 1:4 SHEET 1 OF 1

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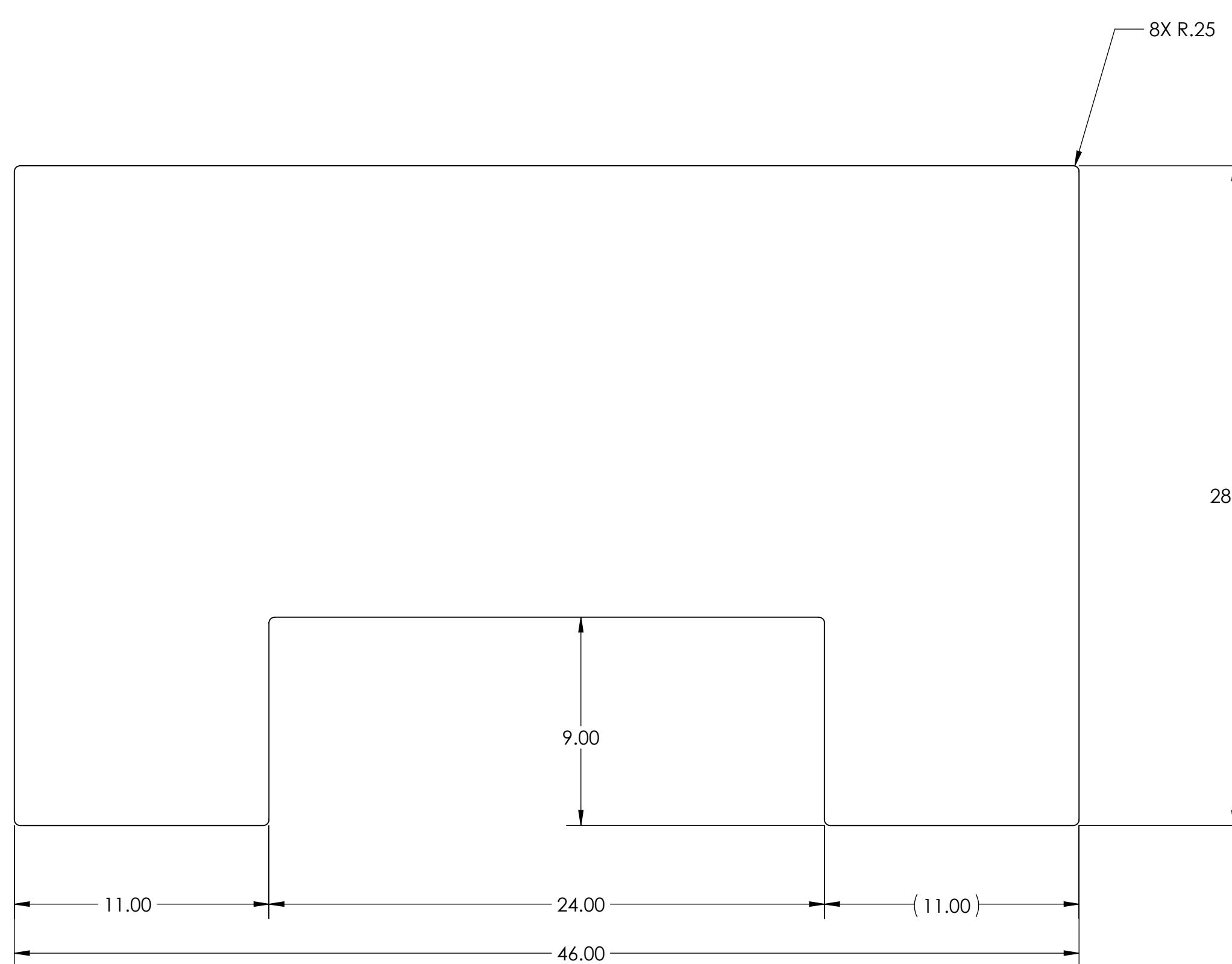
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UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
	DRAWN	JO	11/27/2023
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH: 1/16" Polycarbonate, Clear			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
Speaker Back Cover

SIZE DWG. NO. REV
C GE-24306

SCALE: 1:5 SHEET 1 OF 1

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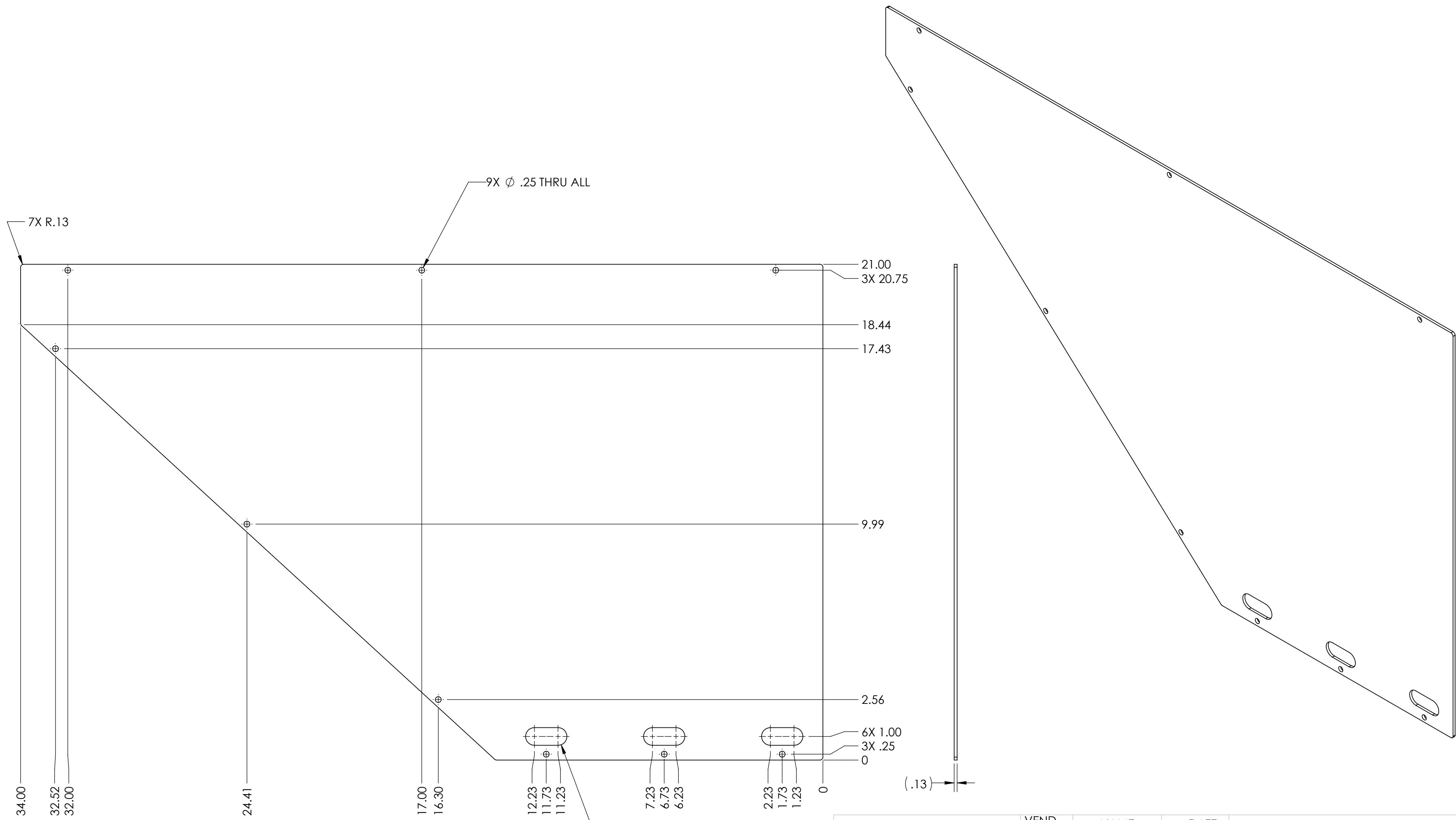
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UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
	DRAWN	JO	9/14/2023
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH: 1/8" HDPE, Black Smooth Finish			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
**Speaker Inner
Side Ramp**

SIZE DWG. NO. REV
C GE-24307

SCALE: 1:3 SHEET 1 OF 1

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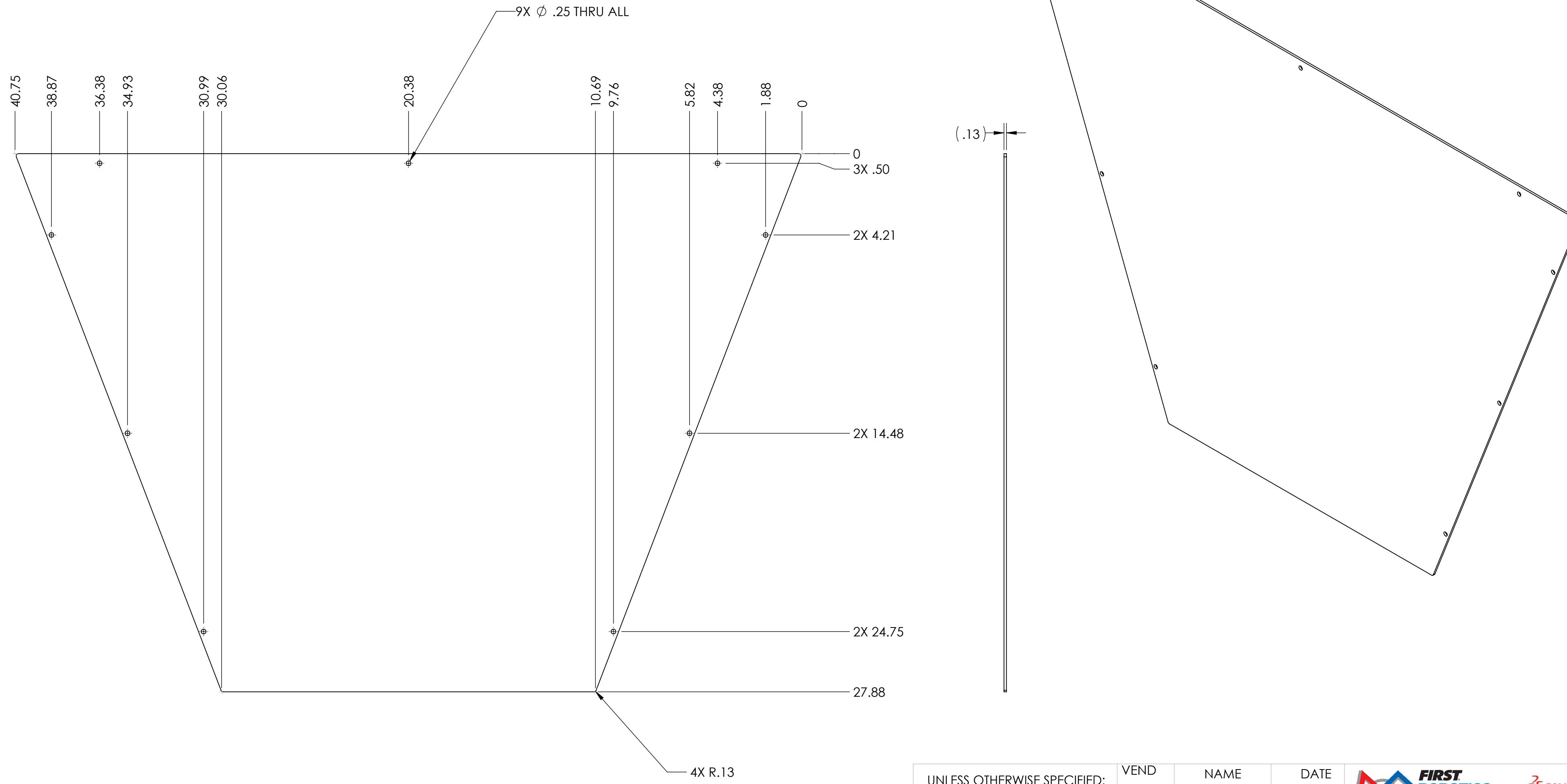
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UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	JO	9/14/2023	
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH:	SIZE	DWG. NO.	REV
1/8" HDPE, Black Smooth Finish	C	GE-24308	
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING	SCALE: 1:4	SHEET 1 OF 1	

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
**Speaker Inner
Back Ramp**

SIZE DWG. NO. REV
C GE-24308

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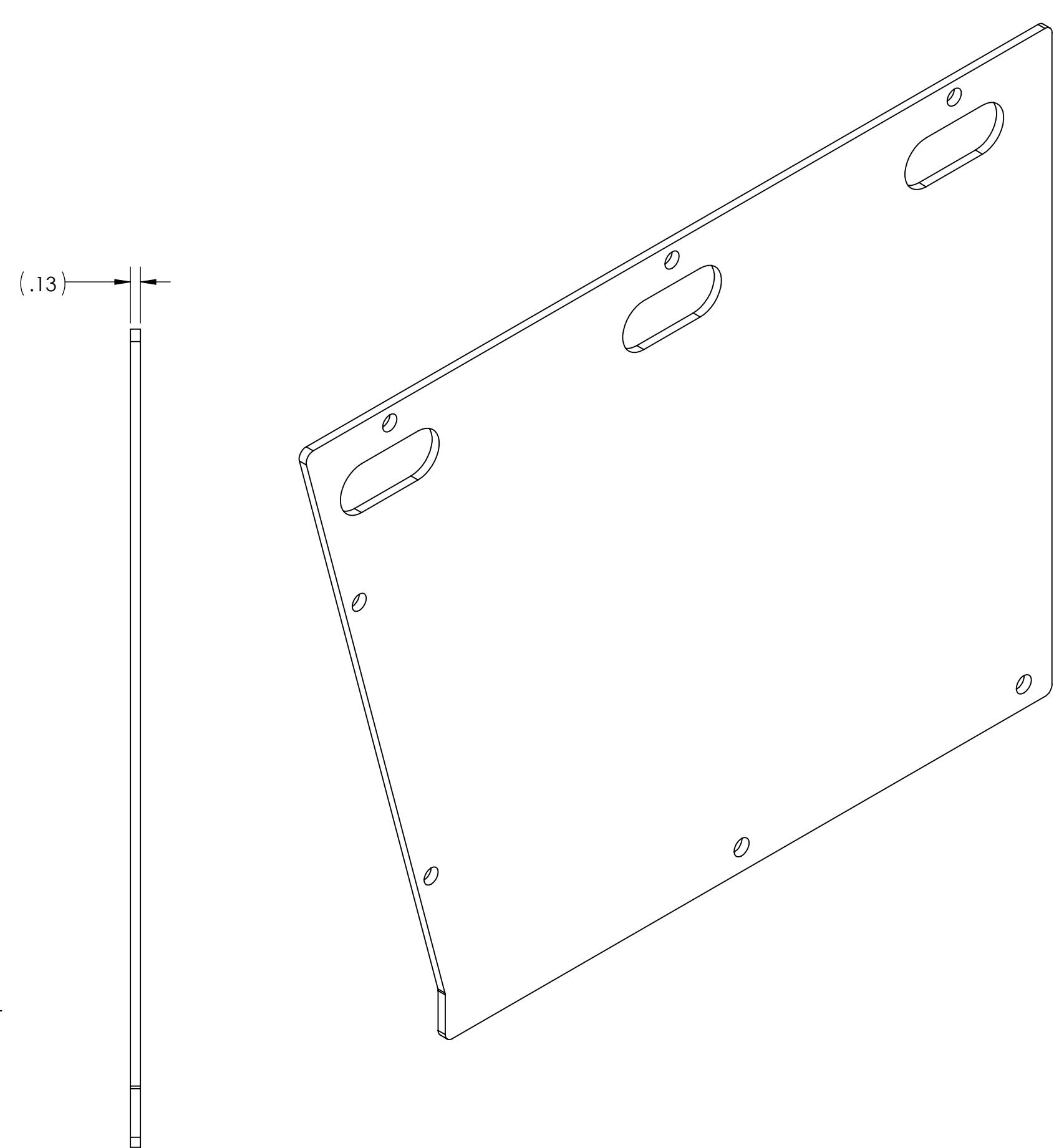
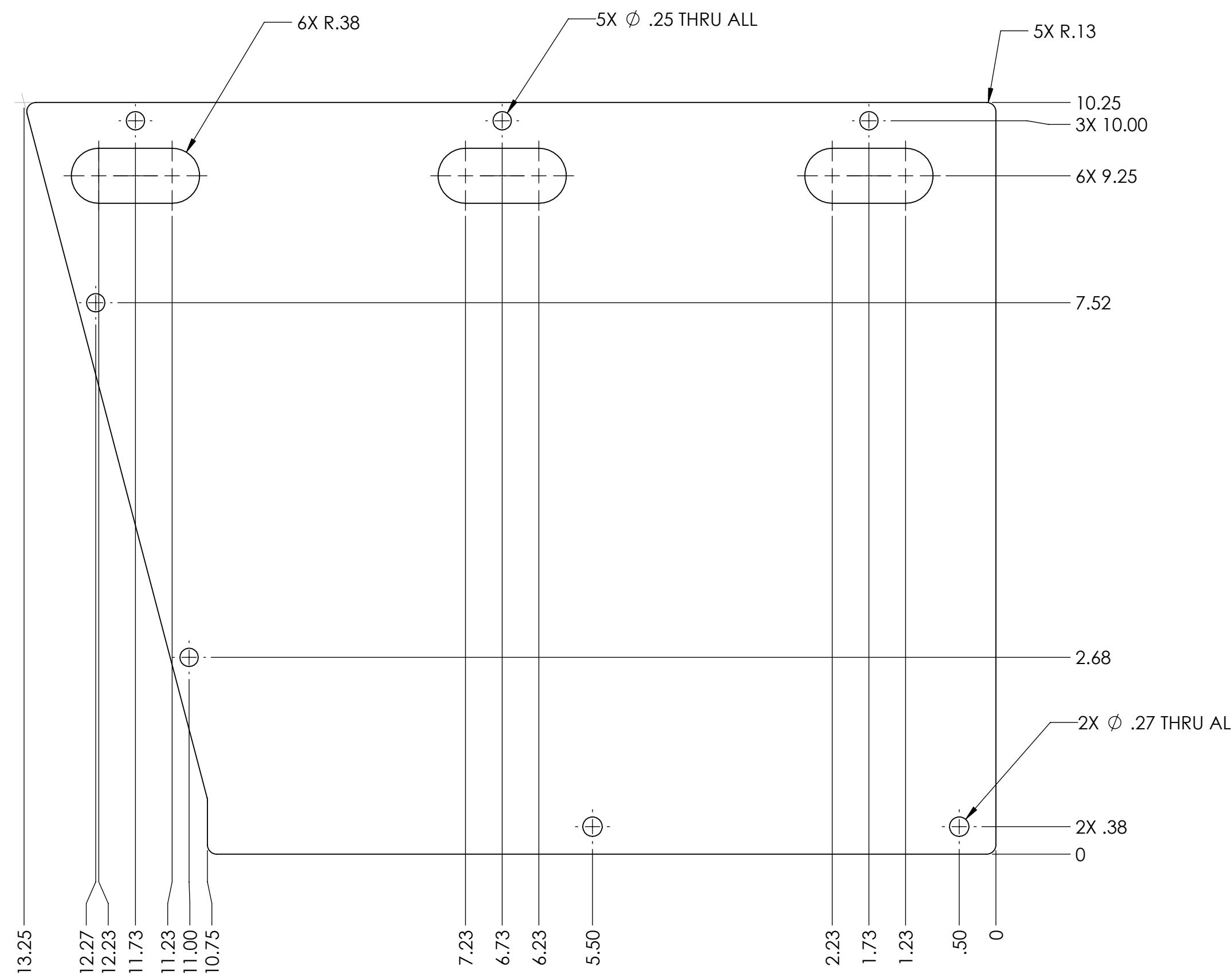
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UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	JO	9/14/2023	
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH: 1/8" Polycarbonate, Clear			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
**Speaker Inner
Side Wall**

SIZE DWG. NO. REV
C GE-24309

SCALE: 2:3 SHEET 1 OF 1

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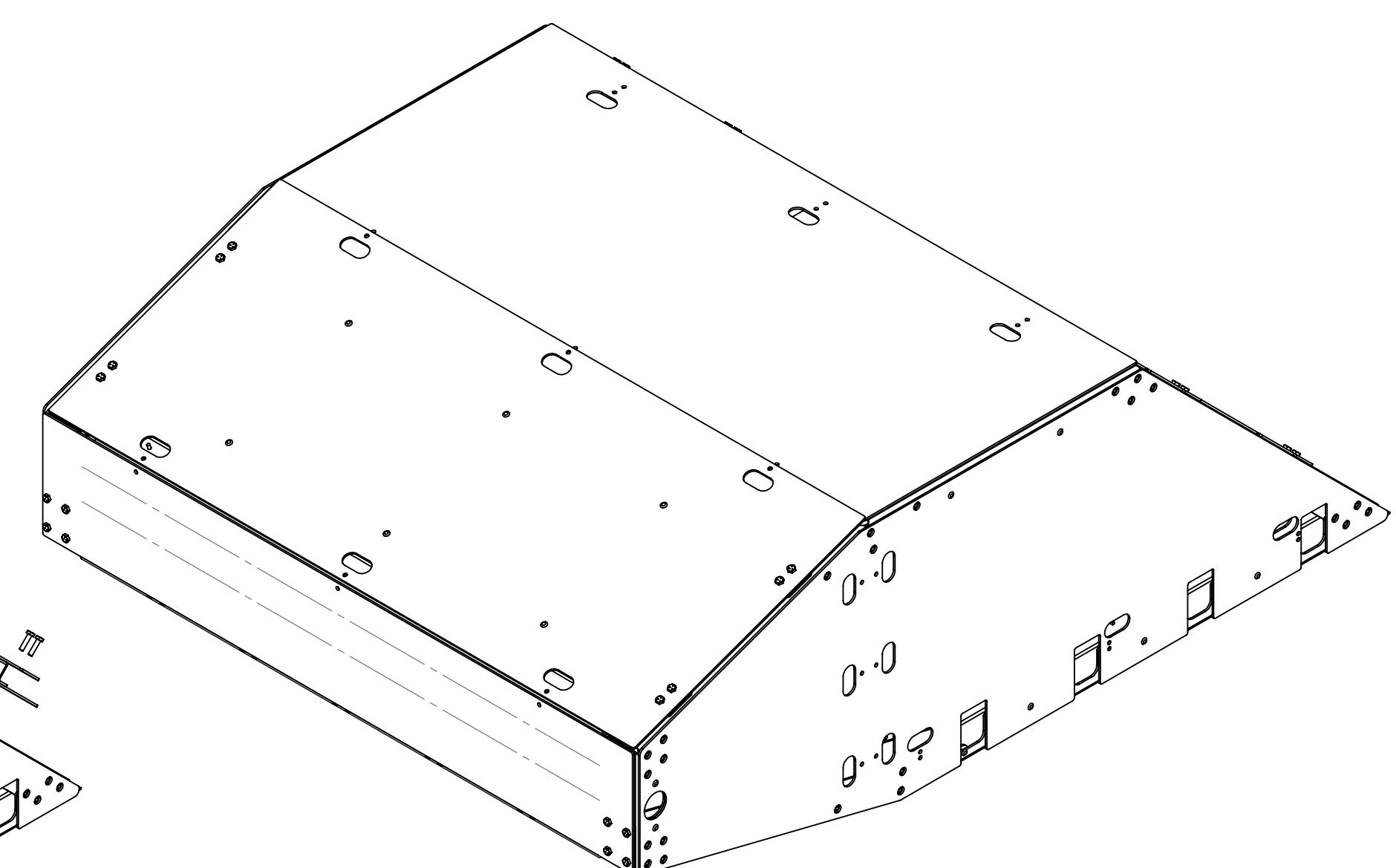
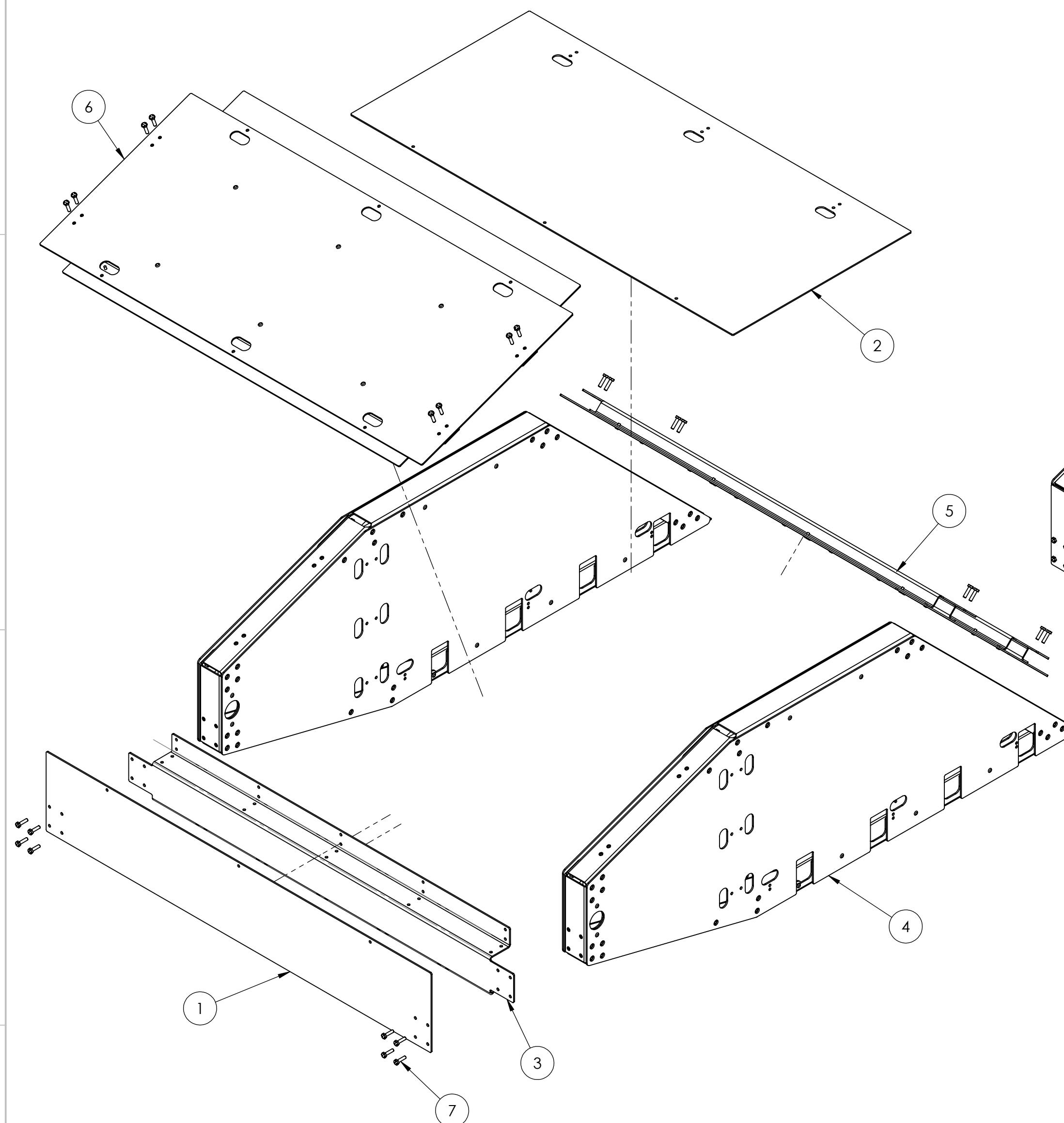
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24313	Speaker Front Plastic	1
2	GE-24315	Speaker Top Plastic	1
3	GE-24319	Goal Hat Front Beam	1
4	GE-24323	Speaker Side Assembly	2
5	GE-24324	Speaker Back Assembly	1
6	GE-24326	Speaker Front Angled Assembly	1
7	Configurable Bolt	1" Long 1/4-20 Hex Head Bolt	24

UNLESS OTHERWISE SPECIFIED:		
FIELD	NAME	DATE
DRAWN	JO	11/1/2023
PROPRIETARY AND CONFIDENTIAL		
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.		
MATERIAL/FINISH:		
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.		
DO NOT SCALE DRAWING		

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
 Modeling Solutions Partner

TITLE: Speaker Top Frame

SIZE DWG. NO. **REV**

C GE-24310

SCALE: 1:8 **SHEET** 1 OF 1

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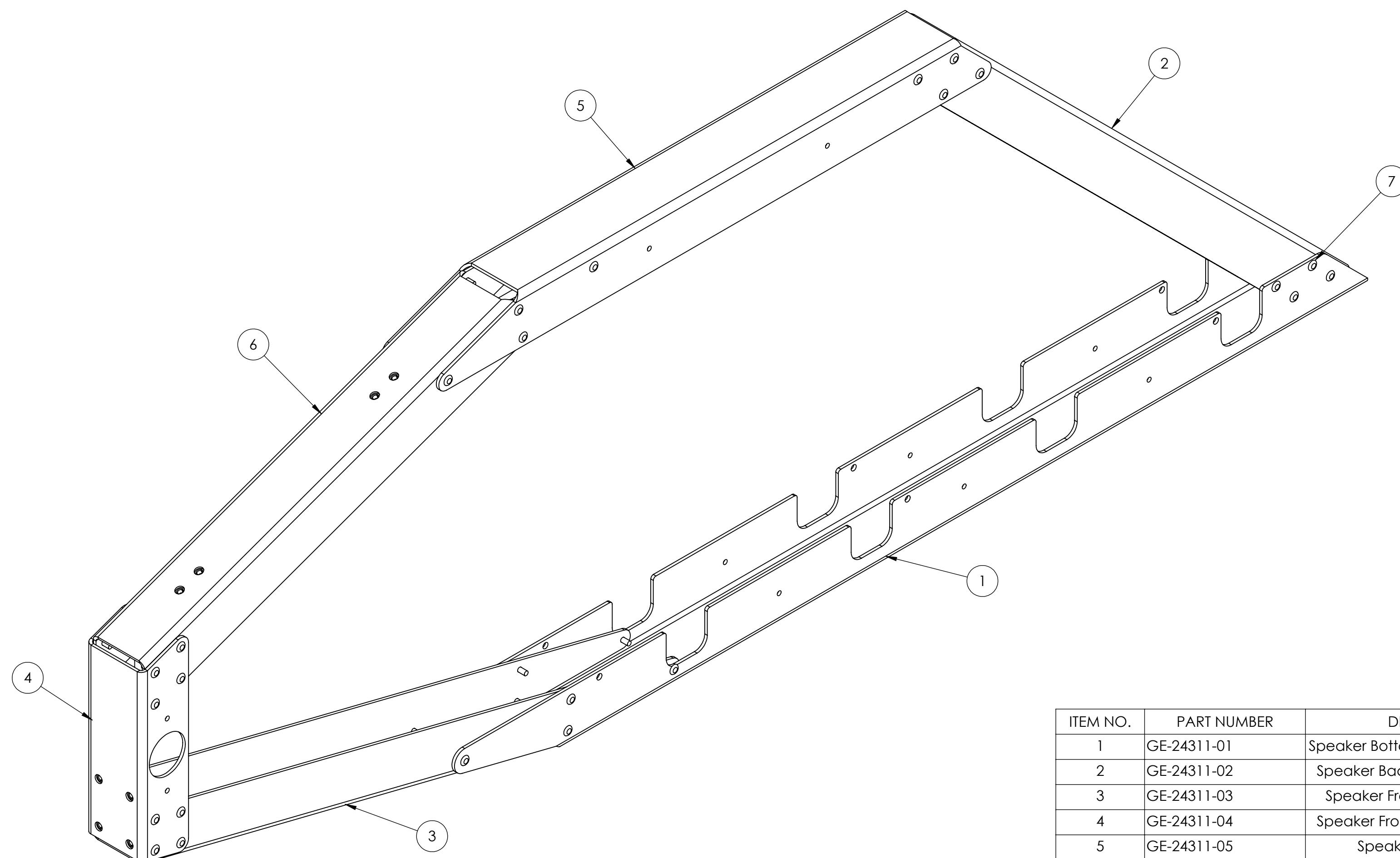
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24311-01	Speaker Bottom Channel with PEMs	1
2	GE-24311-02	Speaker Back Channel with PEMs	1
3	GE-24311-03	Speaker Front Bottom Channel	1
4	GE-24311-04	Speaker Front Channel with PEMs	1
5	GE-24311-05	Speaker Top Channel	1
6	GE-24311-06	Speaker Front Top Channel with PEMs	1
7	rivet_.1875_.251-.375	3/16" Aluminum Rivet, .251-.375 Grip Range	48

UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES

TOLERANCES:

FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .005$

MATERIAL/FINISH:

VEND	NAME	DATE
DRAWN	JO	8/30/2023

PROPRIETARY AND CONFIDENTIAL

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COMMENTS:

REMOVE ALL BURRS AND SHARP EDGES.

DO NOT SCALE DRAWING

TITLE:
**Speaker Side
Sheetmetal**

SIZE	DWG. NO.	REV
C	GE-24311	

SCALE: 1:3 SHEET 1 OF 2

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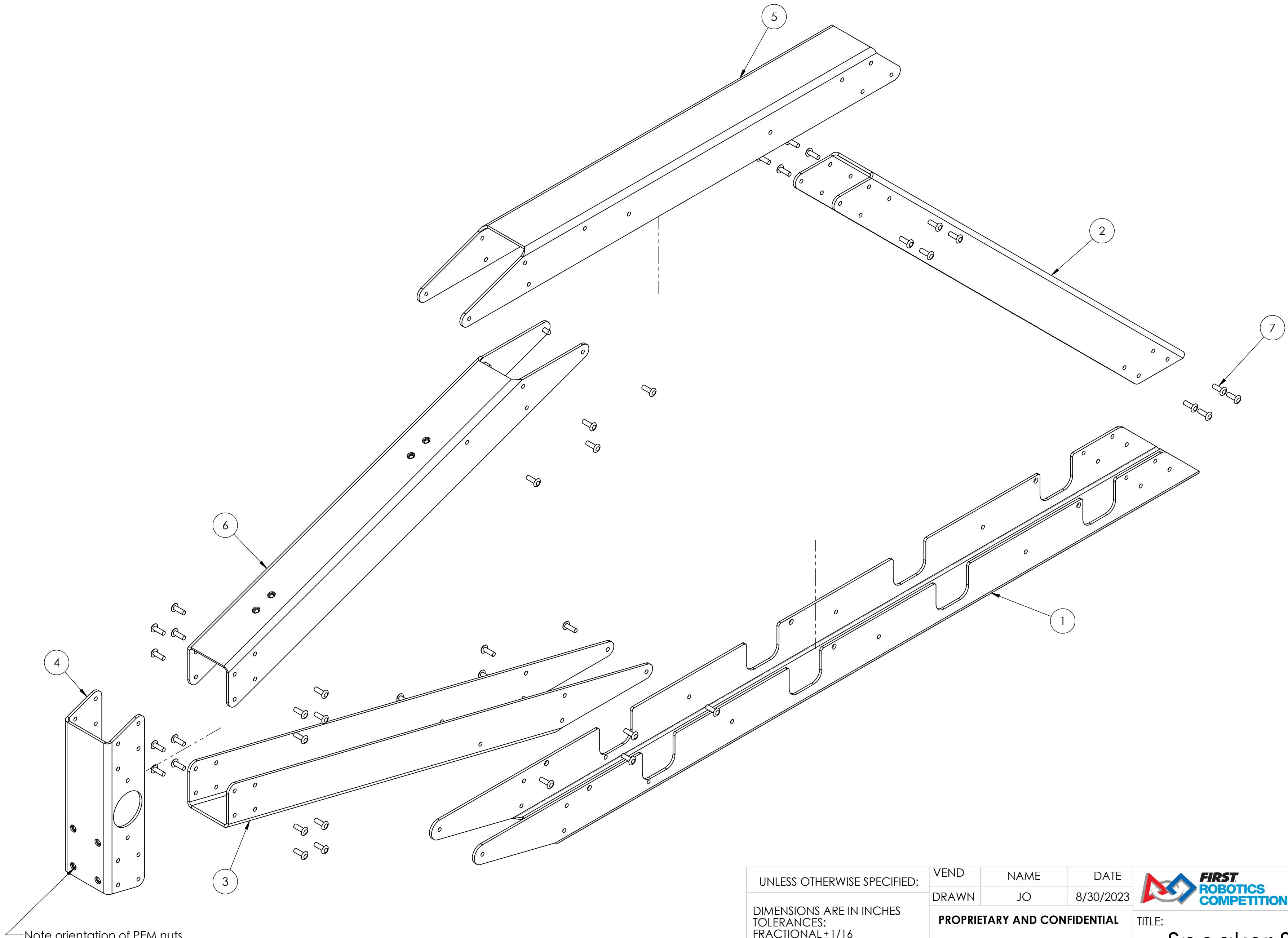
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UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES

TOLERANCES:

FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .005$

VEND NAME DATE

DRAWN JO 8/30/2023



TITLE:

Speaker Side
Sheetmetal

SIZE DWG. NO.

REV

C GE-24311

MATERIAL/FINISH:

PROPRIETARY AND CONFIDENTIAL

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COMMENTS:

REMOVE ALL BURRS AND SHARP EDGES.

DO NOT SCALE DRAWING

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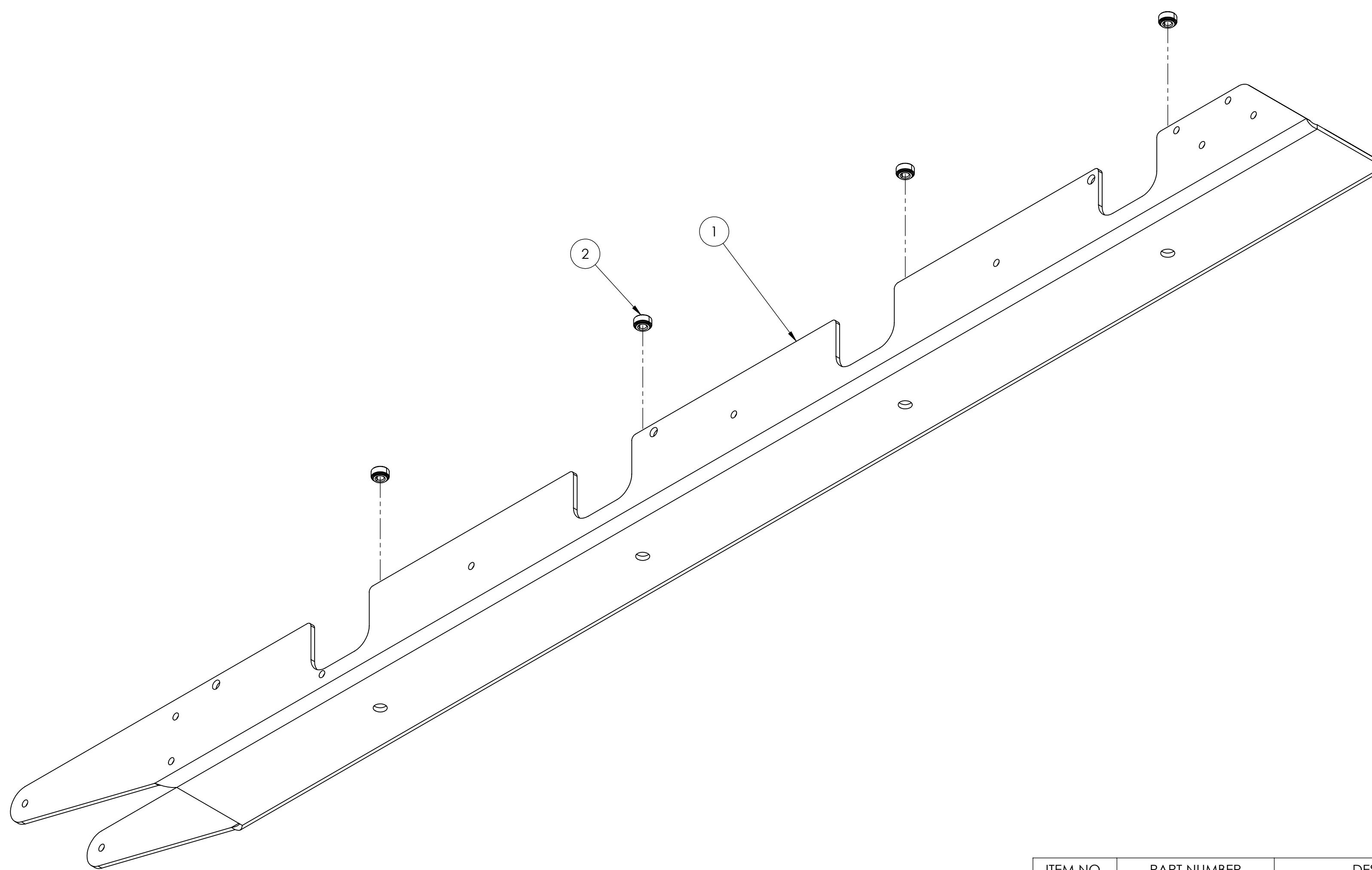
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Notes:
Insert PEM hardware as shown

ITEM NO.			PART NUMBER		DESCRIPTION		QTY.
1			GE-24311-07		Speaker Bottom Channel		1
2			pem_clinchnut_.25_20 .054		1/4-20 self-clinching nut, .054 shank		4
VEND	NAME	DATE					
DRAWN	JO	8/30/2023					
PROPRIETARY AND CONFIDENTIAL							
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.							
MATERIAL/FINISH:							
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.							
DO NOT SCALE DRAWING							

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE: Speaker Bottom
Channel with
PEMs

SIZE DWG. NO. REV
C GE-24311-01

SCALE: 1:2 SHEET 1 OF 1

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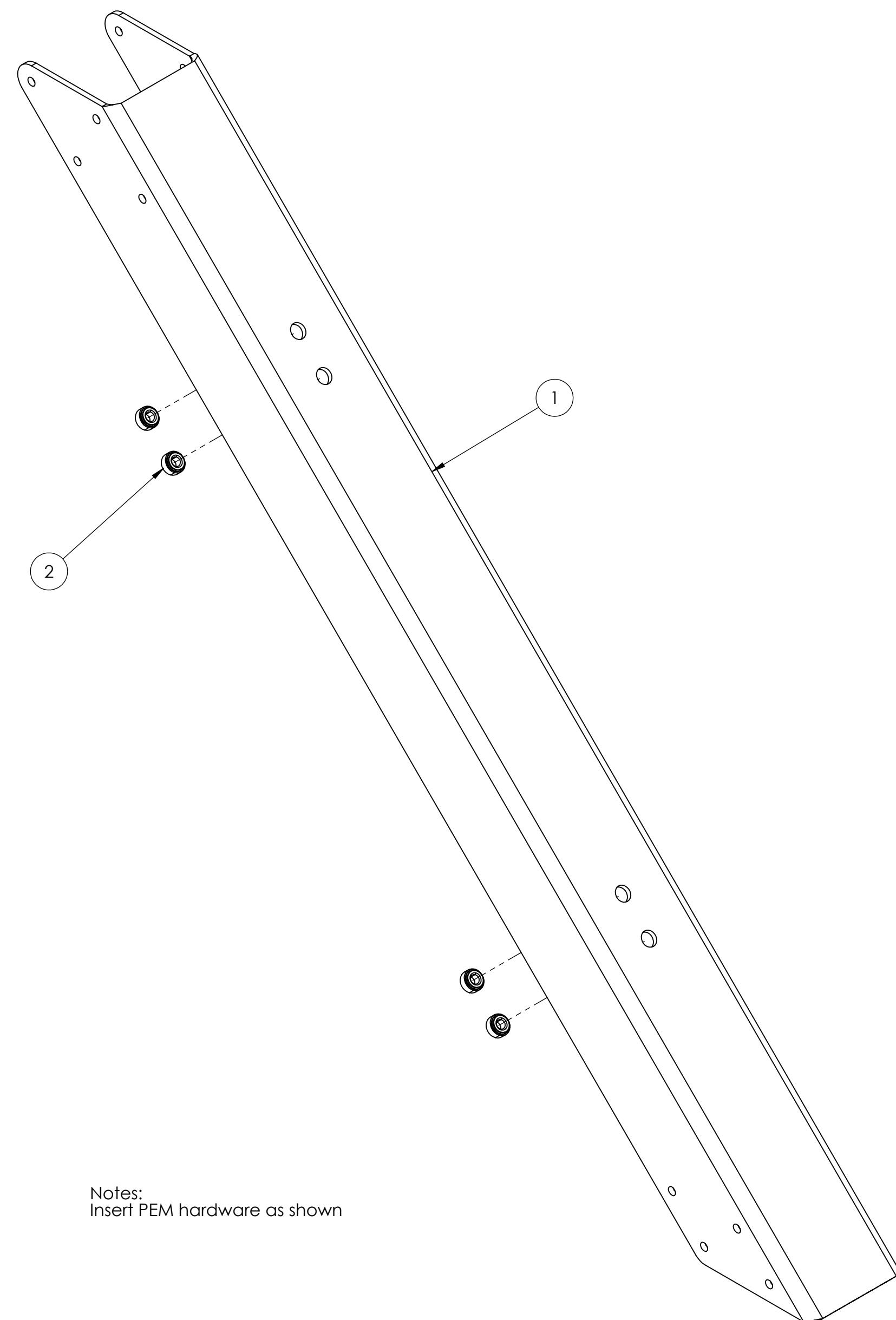
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Notes:
Insert PEM hardware as shown

UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES
TOLERANCES:

FRACTIONAL $\pm 1/16$

ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$

TWO PLACE DECIMAL $\pm .01$

THREE PLACE DECIMAL $\pm .005$

MATERIAL/FINISH:

DO NOT SCALE DRAWING

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24311-08	Speaker Back Channel	1
2	pem_clinchnut_25_20 .054	1/4-20 self-clinching nut, .054 shank	4

VEND	NAME	DATE
DRAWN	JO	8/30/2023

PROPRIETARY AND CONFIDENTIAL

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COMMENTS:

REMOVE ALL BURRS AND SHARP EDGES.

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE: Speaker Back
Channel with
PEMs

SIZE DWG. NO. REV
C GE-24311-02

SCALE: 1:2 SHEET 1 OF 1

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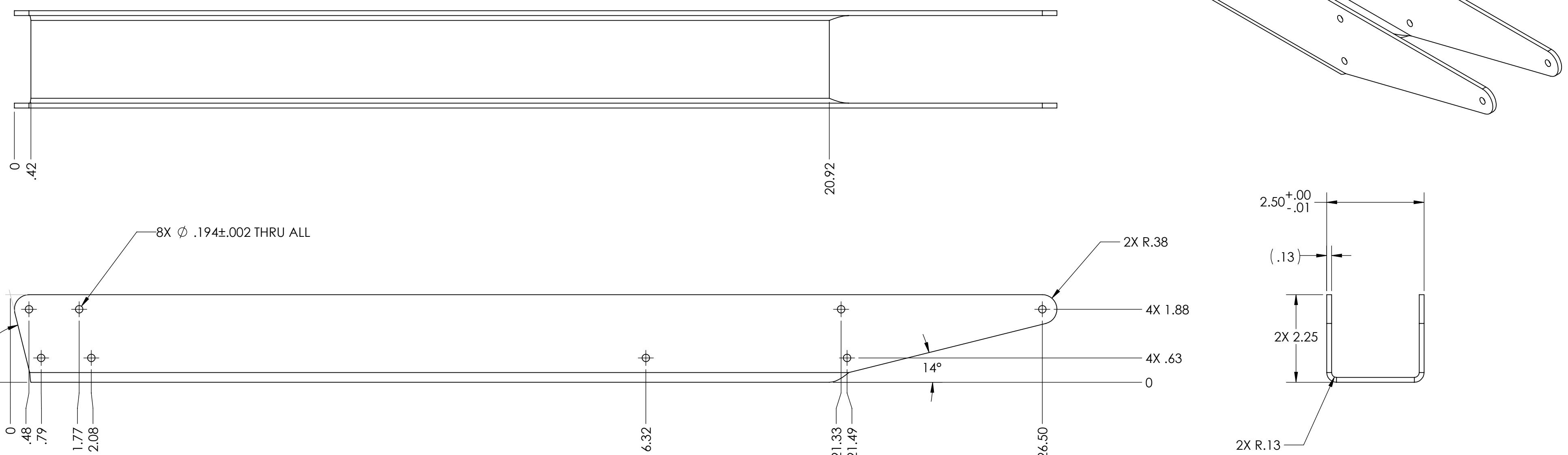
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UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES

TOLERANCES:

FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .02$ THREE PLACE DECIMAL $\pm .010$

MATERIAL/FINISH:

8 Ga 5052 Aluminum

DO NOT SCALE DRAWING

BEND
DRAWN
NAME
JO
DATE
8/29/2023**PROPRIETARY AND CONFIDENTIAL**

THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST[®]. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST[®] IS PROHIBITED.

COMMENTS:
REMOVE ALL BURRS AND SHARP EDGES.

FIRST[®] ROBOTICS COMPETITION
SOLIDWORKS
Modeling Solutions Partner

TITLE:
Speaker Front Bottom Channel
SIZE DWG. NO. REV

C GE-24311-03

SCALE: 1:2 SHEET 1 OF 1

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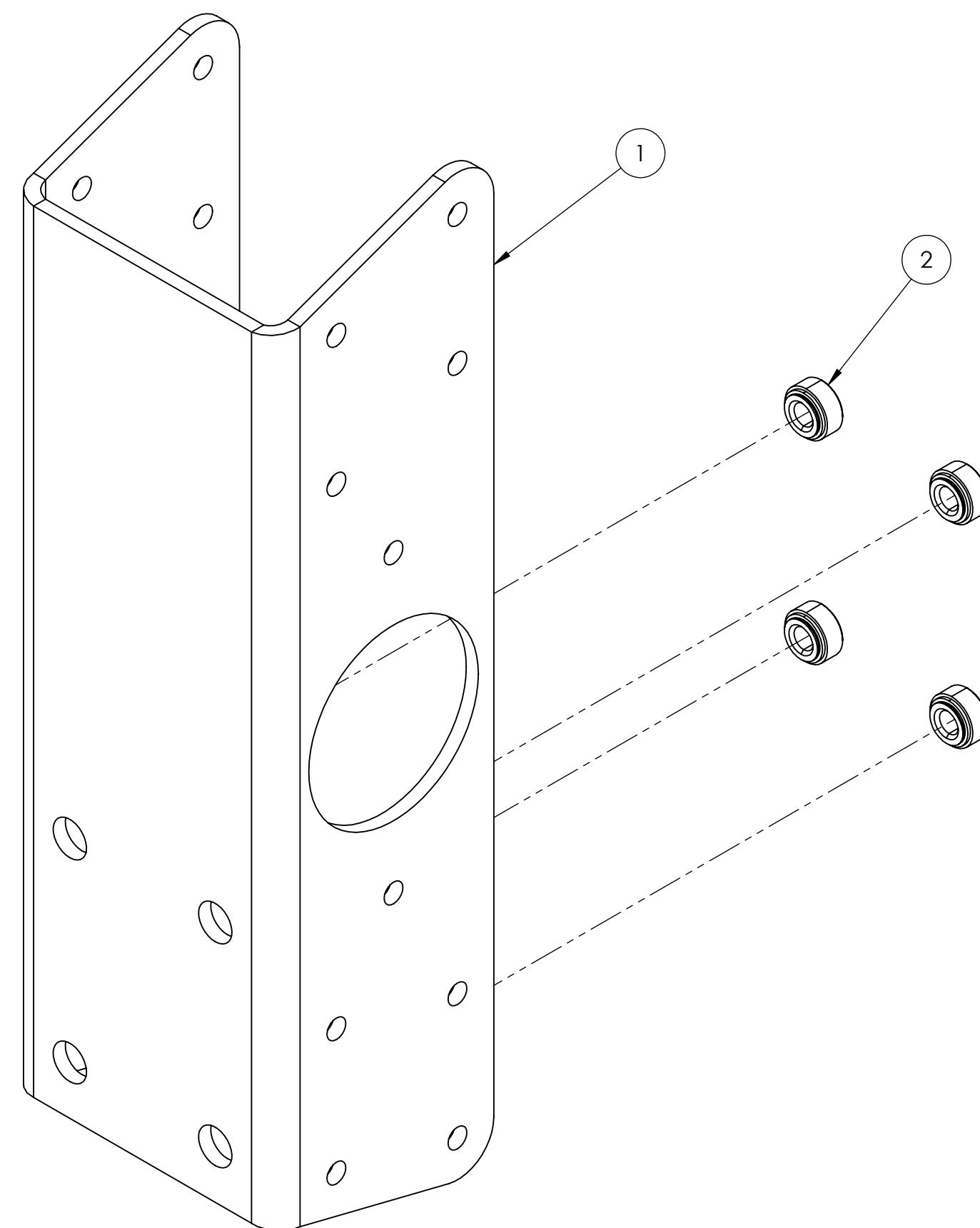
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Notes:
Insert PEM hardware as shown

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24311-09	Speaker Front Channel	1
2	pem_clinchnut_.25_20 .054	1/4-20 self-clinching nut, .054 shank	4

UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .005$	DRAWN	JO	8/30/2023

PROPRIETARY AND CONFIDENTIAL	TITLE:
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.	Speaker Front Channel with PEMs

COMMENTS:	SIZE	DWG. NO.	REV
REMOVE ALL BURRS AND SHARP EDGES.	C	GE-24311-04	

SCALE: 1:1	SHEET 1 OF 1
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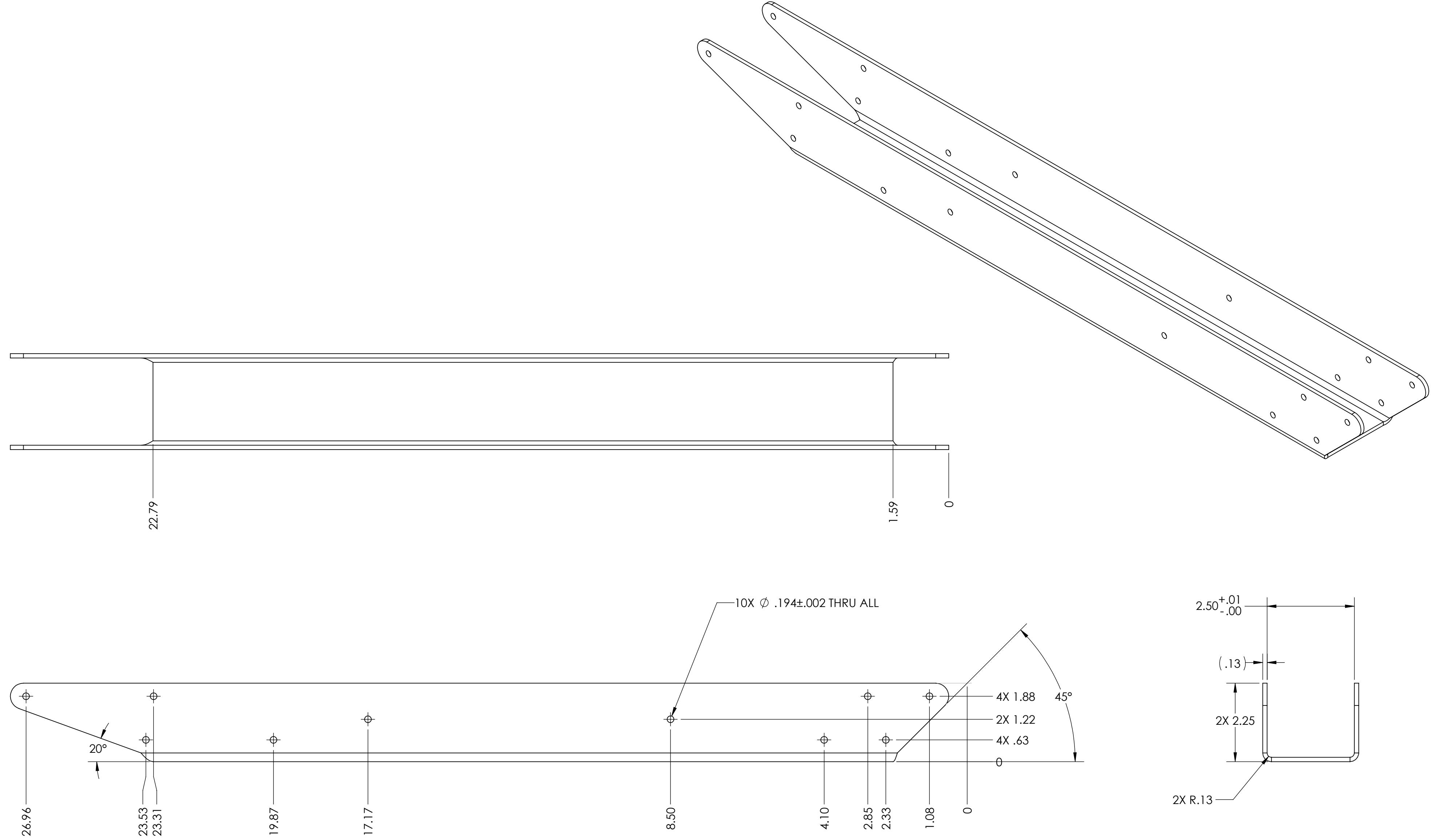
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UNLESS OTHERWISE SPECIFIED:	BEND	NAME	DATE
DRAWN	JO	8/29/2023	
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH:			
8 Ga 5052 Aluminum			
COMMENTS:			
REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
**Speaker Top
Channel**

SIZE DWG. NO. REV
C GE-24311-05

SCALE: 1:2 SHEET 1 OF 1

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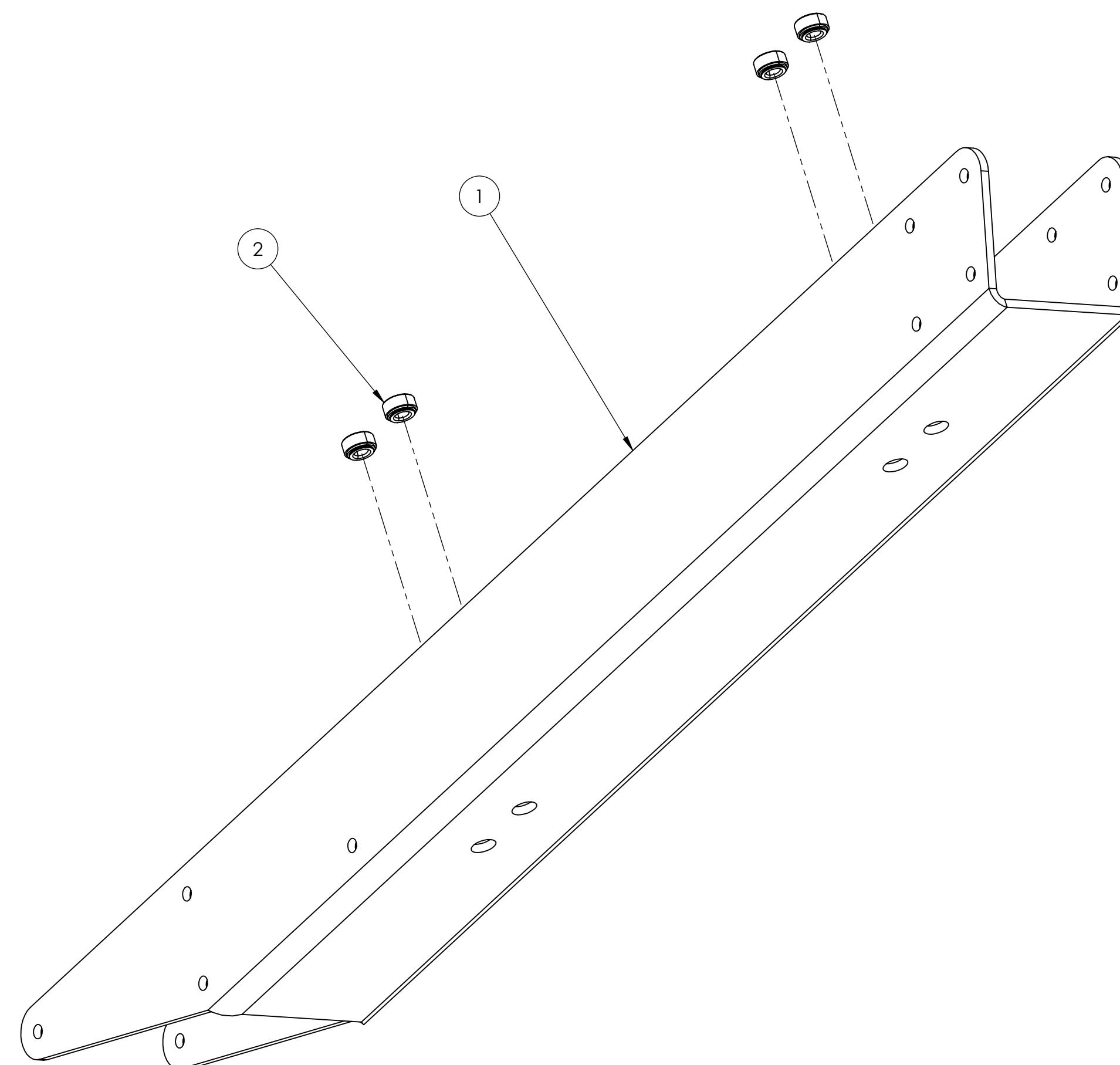
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Notes:
Insert PEM hardware as shown

ITEM NO.			PART NUMBER		DESCRIPTION		QTY.
1			GE-24311-10		Speaker Front Top Channel		1
2			pem_clinchnut_.25_20 .054		1/4-20 self-clinching nut, .054 shank		4
VEND	NAME	DATE					
DRAWN	JO	8/30/2023					
PROPRIETARY AND CONFIDENTIAL							
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COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.							
SIZE	DWG. NO.	REV					
C	GE-24311-06						
SCALE: 2:3		SHEET 1 OF 1					

UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL $\pm 1/16$
ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$
TWO PLACE DECIMAL $\pm .01$
THREE PLACE DECIMAL $\pm .005$

MATERIAL/FINISH:

DO NOT SCALE DRAWING

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE: Speaker Front
Top Channel
with PEMs

SIZE DWG. NO. REV
C GE-24311-06

SCALE: 2:3 SHEET 1 OF 1

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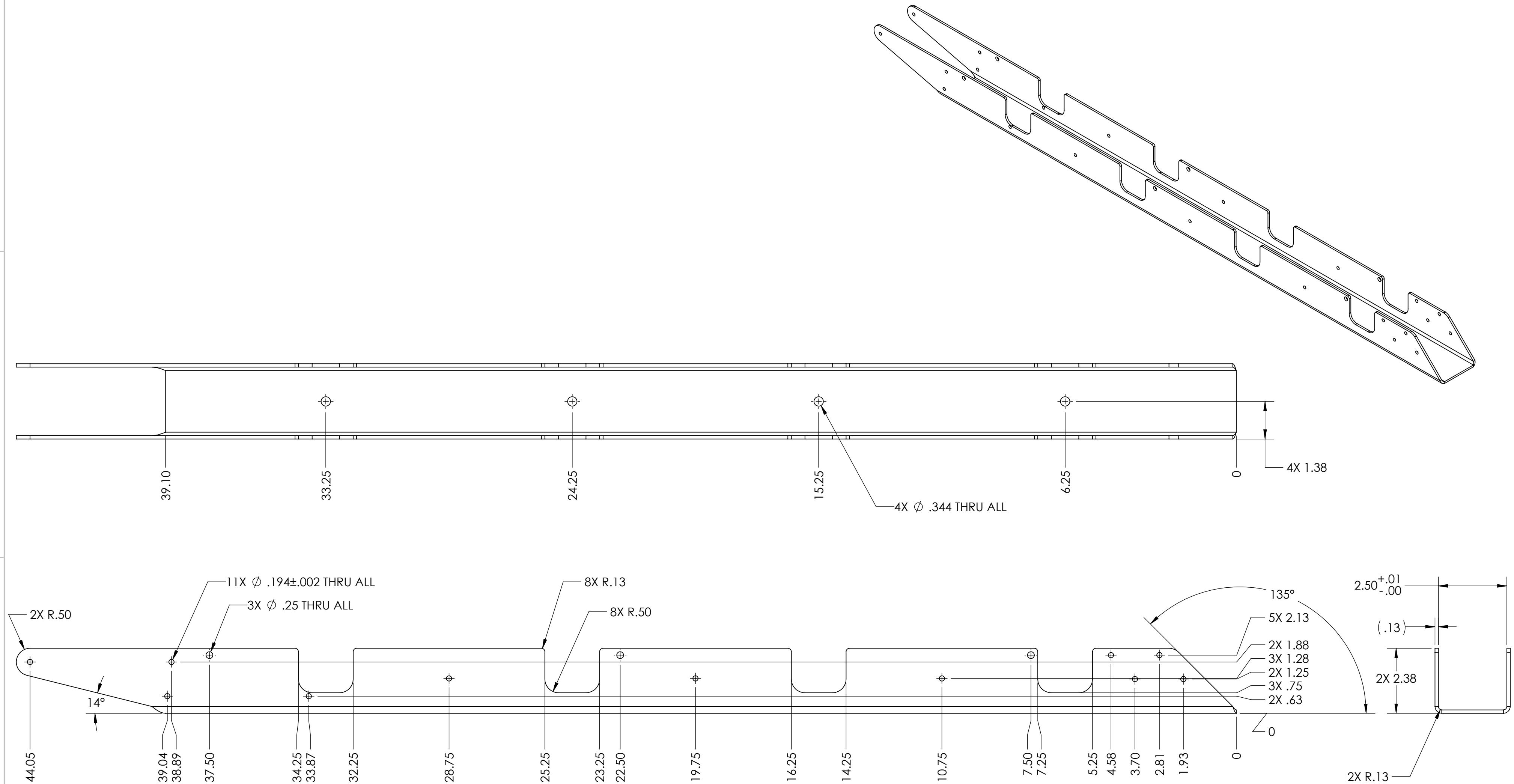
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UNLESS OTHERWISE SPECIFIED:	BEND	NAME	DATE
DRAWN	JO	8/29/2023	
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH: 8 Ga 5052 Aluminum			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

 **FIRST
ROBOTICS
COMPETITION**  **SOLIDWORKS**
Modeling Solutions Partner

TITLE:
**Speaker Bottom
Channel**

SIZE DWG. NO. REV
C GE-24311-07

SCALE: 38:100 SHEET 1 OF 1

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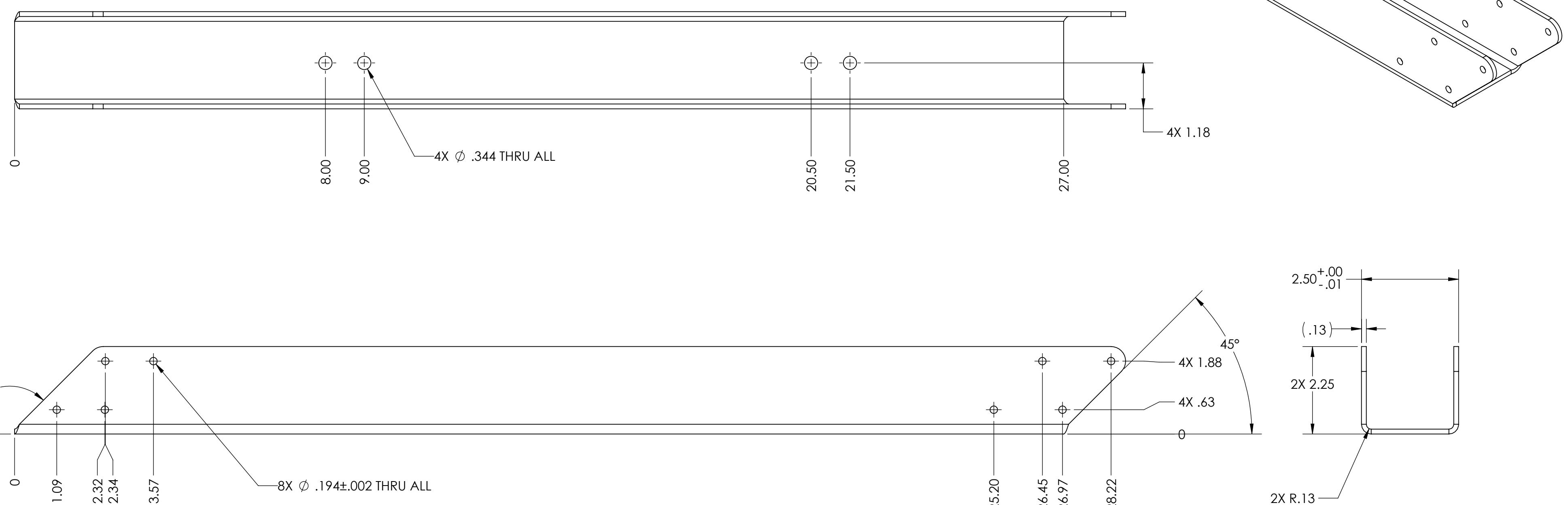
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UNLESS OTHERWISE SPECIFIED:	BEND	NAME	DATE
DRAWN	JO	8/29/2023	
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH:	8 Ga 5052 Aluminum		
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

 **FIRST
ROBOTICS
COMPETITION**  **SOLIDWORKS**
Modeling Solutions Partner

TITLE:
**Speaker Back
Channel**

SIZE DWG. NO. REV
C GE-24311-08

SCALE: 1:2 SHEET 1 OF 1

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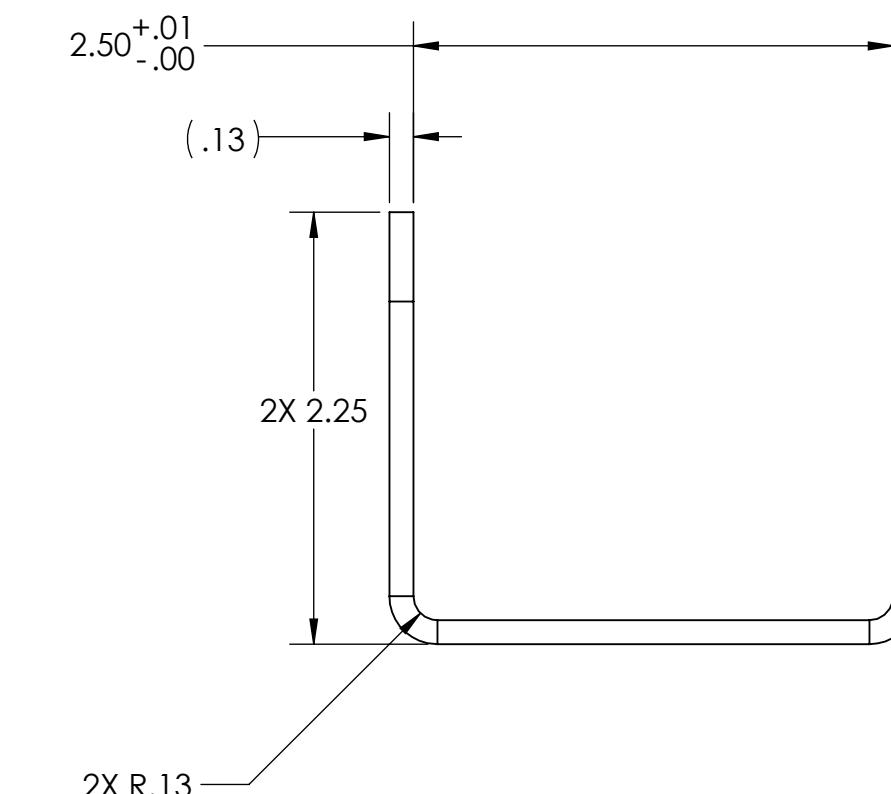
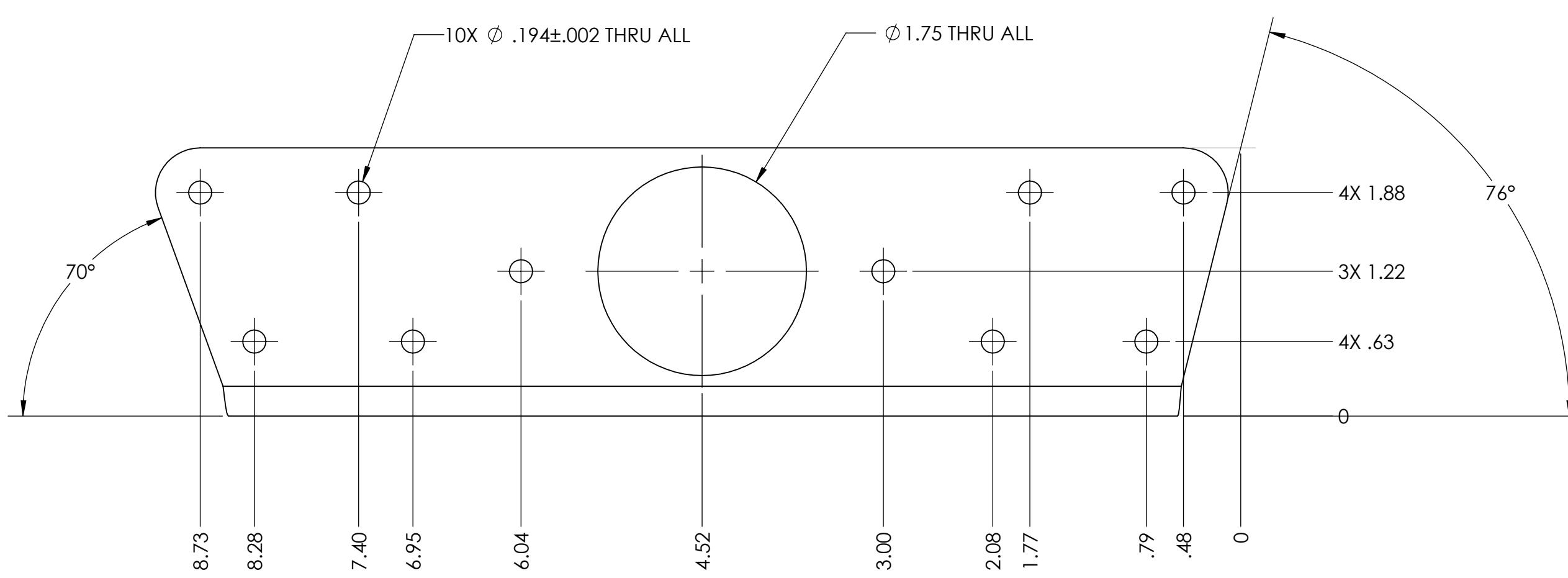
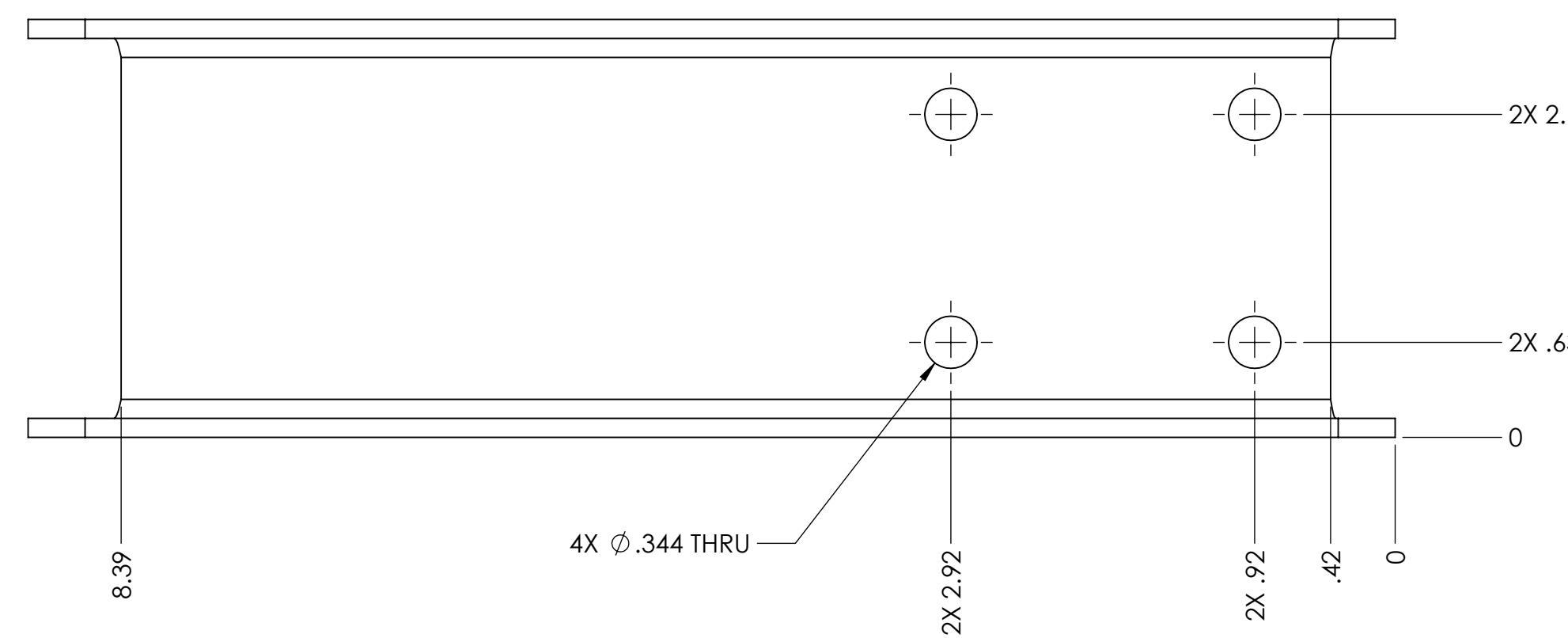
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UNLESS OTHERWISE SPECIFIED:	BEND	NAME	DATE
DRAWN	JO	8/29/2023	
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH:			
8 Ga 5052 Aluminum			
COMMENTS:			
REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			
FIRST ROBOTICS COMPETITION	SOLIDWORKS Modeling Solutions Partner		
TITLE: Speaker Front Channel			
SIZE	DWG. NO.	REV	
C	GE-24311-09		
SCALE: 1:1		SHEET 1 OF 1	

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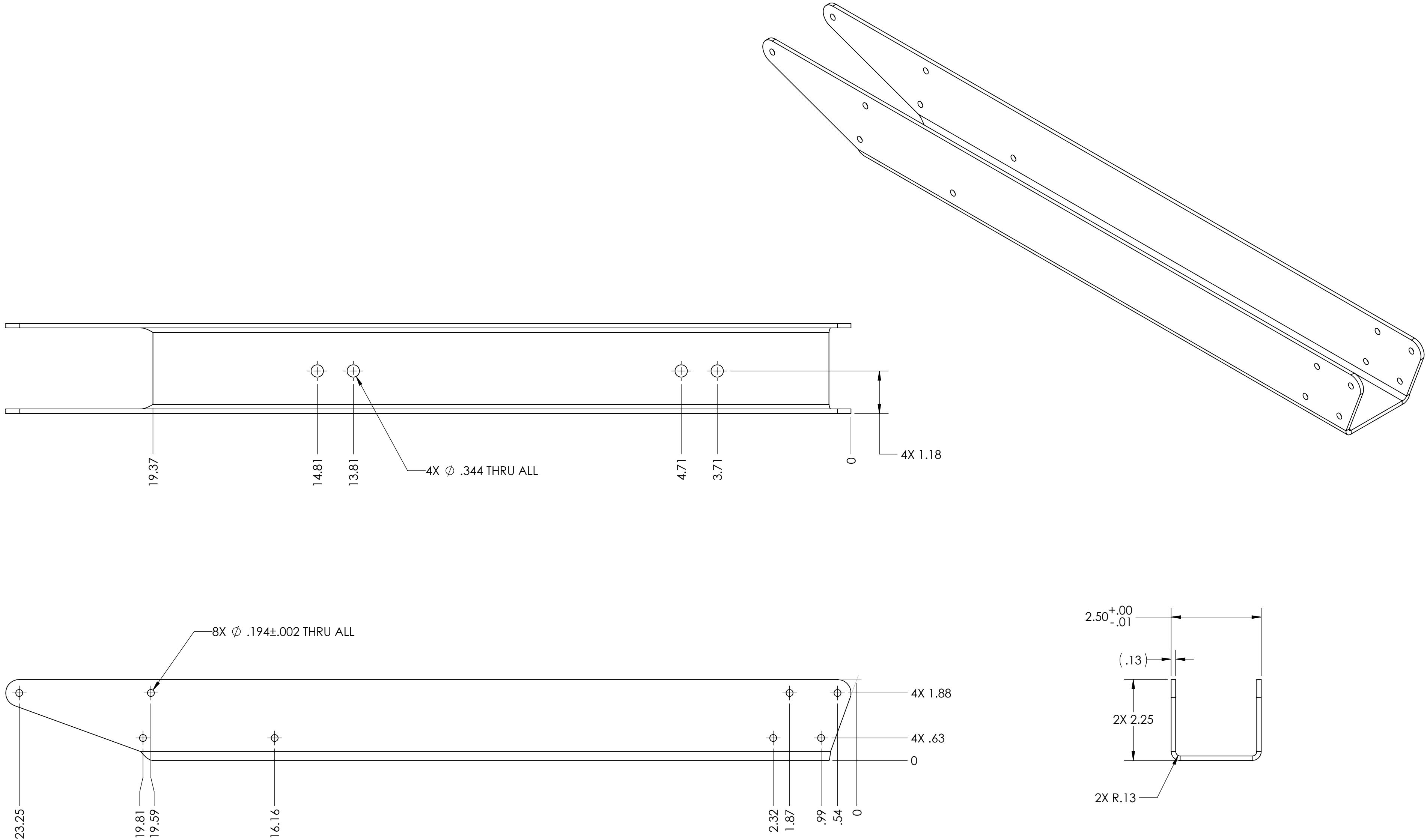
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UNLESS OTHERWISE SPECIFIED:	BEND	NAME	DATE
DRAWN	JO	8/29/2023	
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH: 8 Ga 5052 Aluminum			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
Speaker Front
Top Channel

SIZE DWG. NO. REV
C GE-24311-10

SCALE: 1:2 SHEET 1 OF 1

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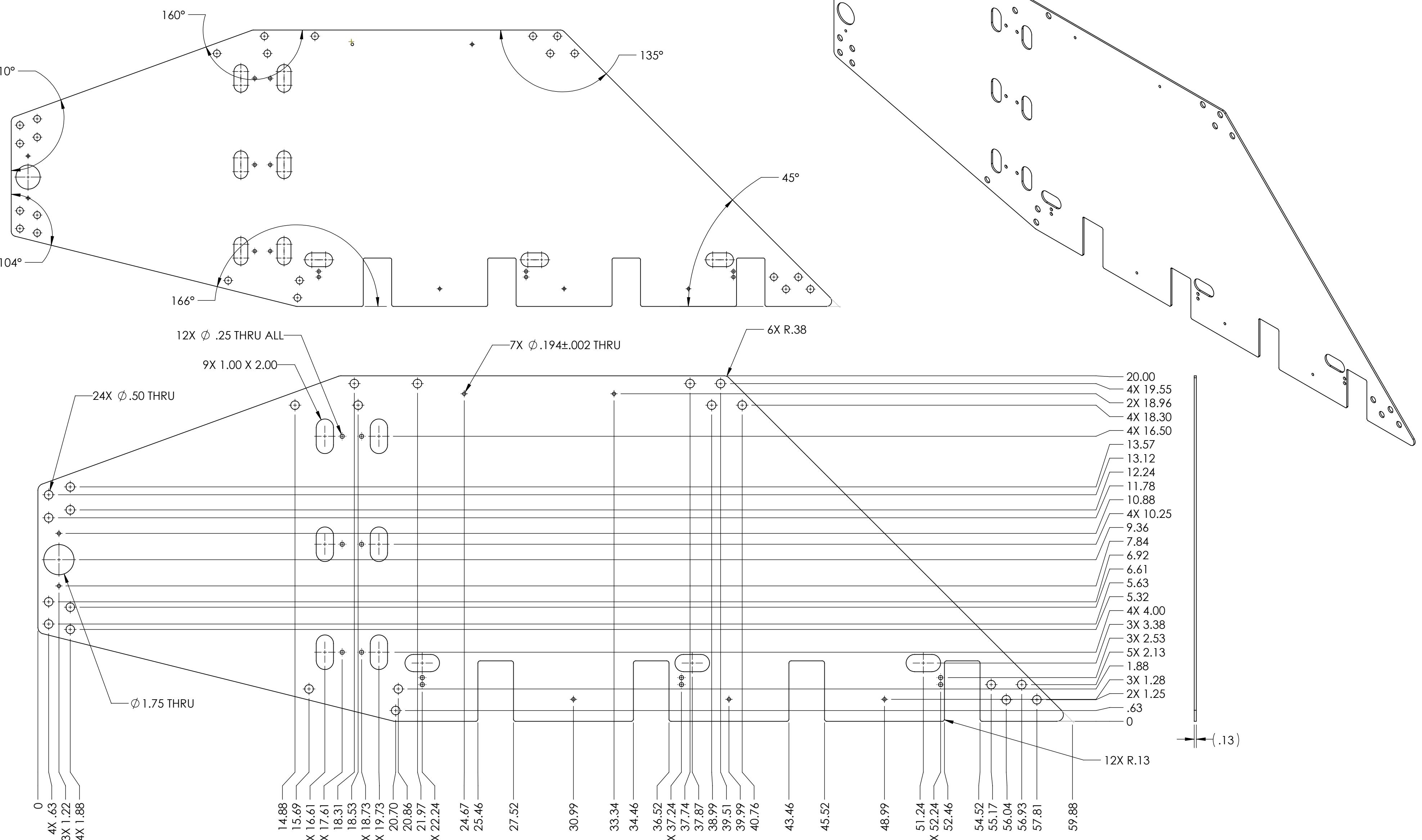
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Tag or Label with Part Number

UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
	DRAWN	JO	8/29/2023
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH: 1/8" Polycarbonate, Clear			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

 **FIRST
ROBOTICS
COMPETITION**  **SOLIDWORKS**
Modeling Solutions Partner

TITLE:
**Speaker Top
Side Plastic**

SIZE DWG. NO. REV

C GE-24312

SCALE: 1:4 SHEET 1 OF 1

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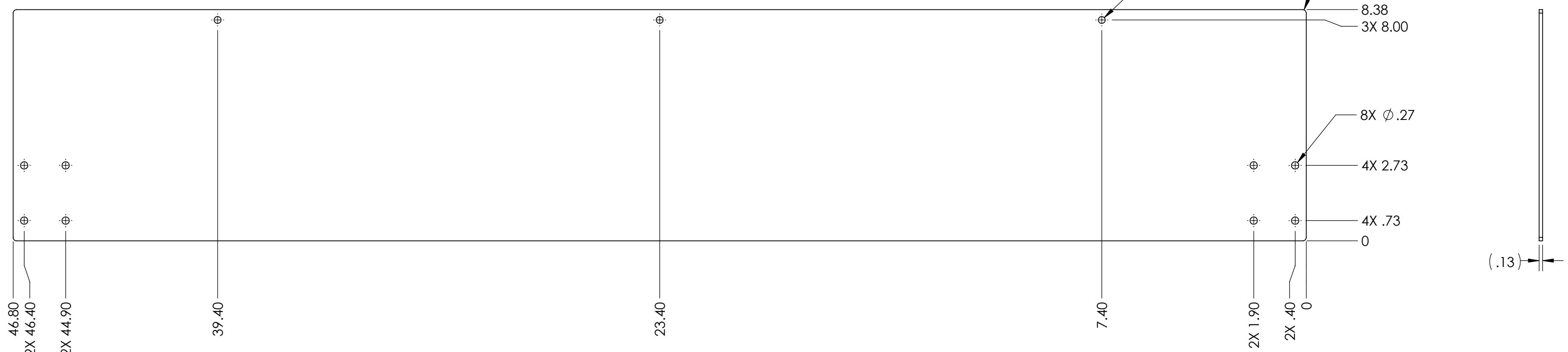
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Tag or Label with Part Number

UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	JO	8/29/2023	
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH: 1/8" Polycarbonate, Clear			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

**FIRST
ROBOTICS
COMPETITION**
SOLIDWORKS

Modeling Solutions Partner

TITLE:
Speaker Front Plastic
SIZE DWG. NO. REV

C GE-24313

SCALE: 1:3 SHEET 1 OF 1

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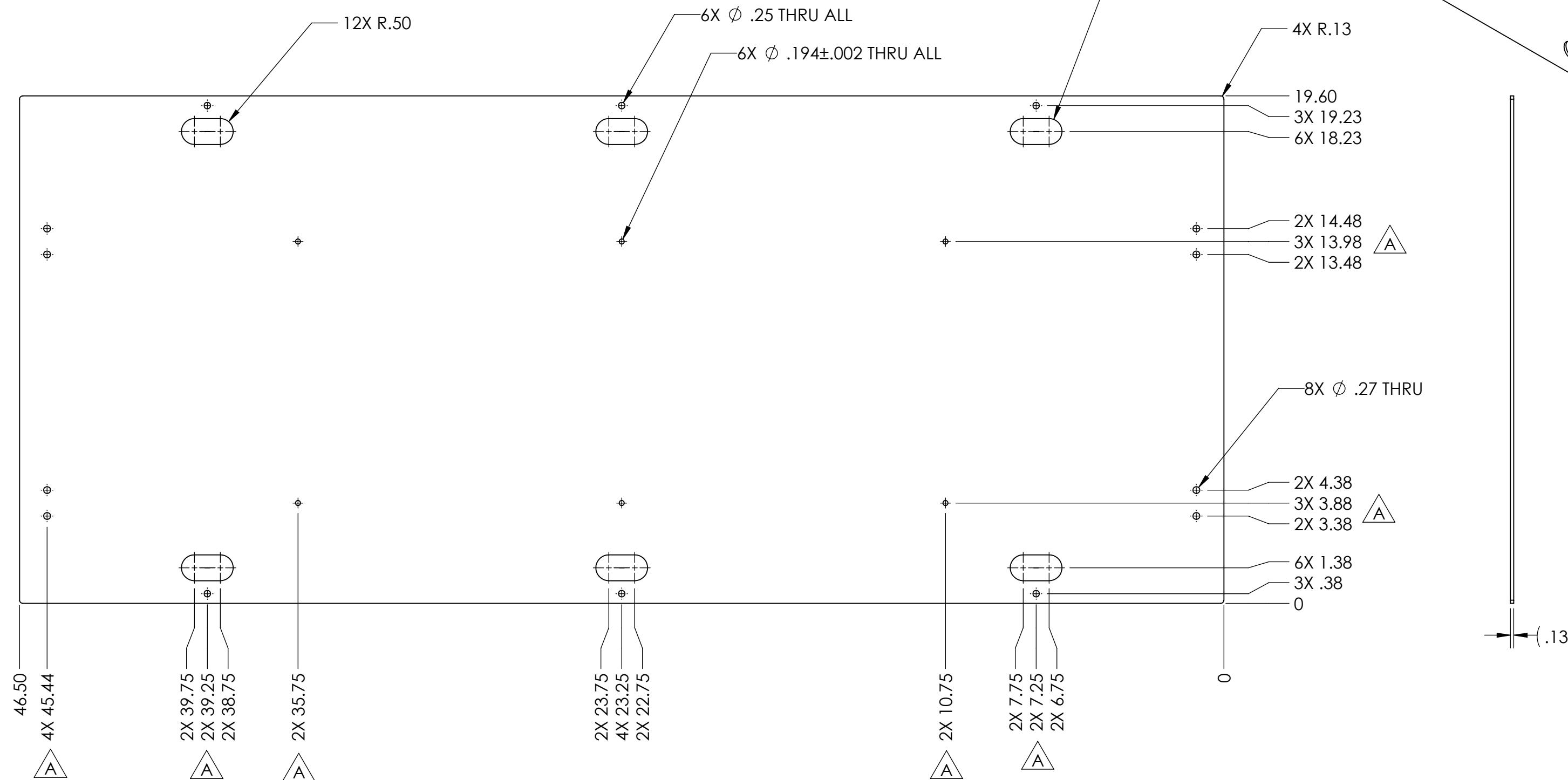
2

1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
A2, A4, B2, C2	A	Hole Locations Updated, Missing information added	10/18/2023	JO

D



UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	JO	8/29/2023	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH: 1/8" HDPE, White, Smooth Finish			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			
FIRST ROBOTICS COMPETITION			
SOLIDWORKS Modeling Solutions Partner			
TITLE: Speaker Front Top Plastic			
SIZE	DWG. NO.	REV	
C	GE-24314	A	
SCALE: 1:4	SHEET 1 OF 1		

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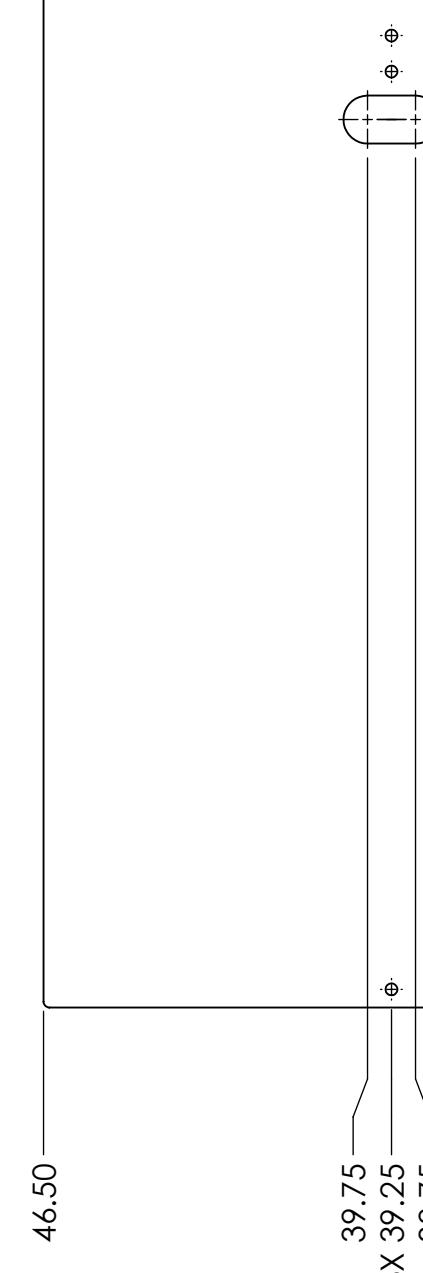
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Tag or Label with Part Number



9X Ø .25 THRU ALL

6X R.50

4X R.13

21.75

3X 20.25

3X 19.50

6X 18.50

3X .38

0

(.13)

UNLESS OTHERWISE SPECIFIED: VEND _____ NAME _____ DATE _____
 DRAWN _____ JO _____ 8/29/2023

DIMENSIONS ARE IN INCHES
 TOLERANCES:
 FRACTIONAL $\pm 1/16$
 ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$
 TWO PLACE DECIMAL $\pm .01$
 THREE PLACE DECIMAL $\pm .005$

MATERIAL/FINISH:
 1/8" HDPE. White, Smooth Finish

COMMENTS:
 REMOVE ALL BURRS AND SHARP EDGES.

DO NOT SCALE DRAWING

FIRST
 ROBOTICS
 COMPETITION

SOLIDWORKS
 Modeling Solutions Partner

TITLE: Speaker Top Plastic
 SIZE DWG. NO. REV
 C GE-24315

SCALE: 1:4 SHEET 1 OF 1

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REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
A2, A3, A4	A	Hole Locations Updated	10/18/2023	JO

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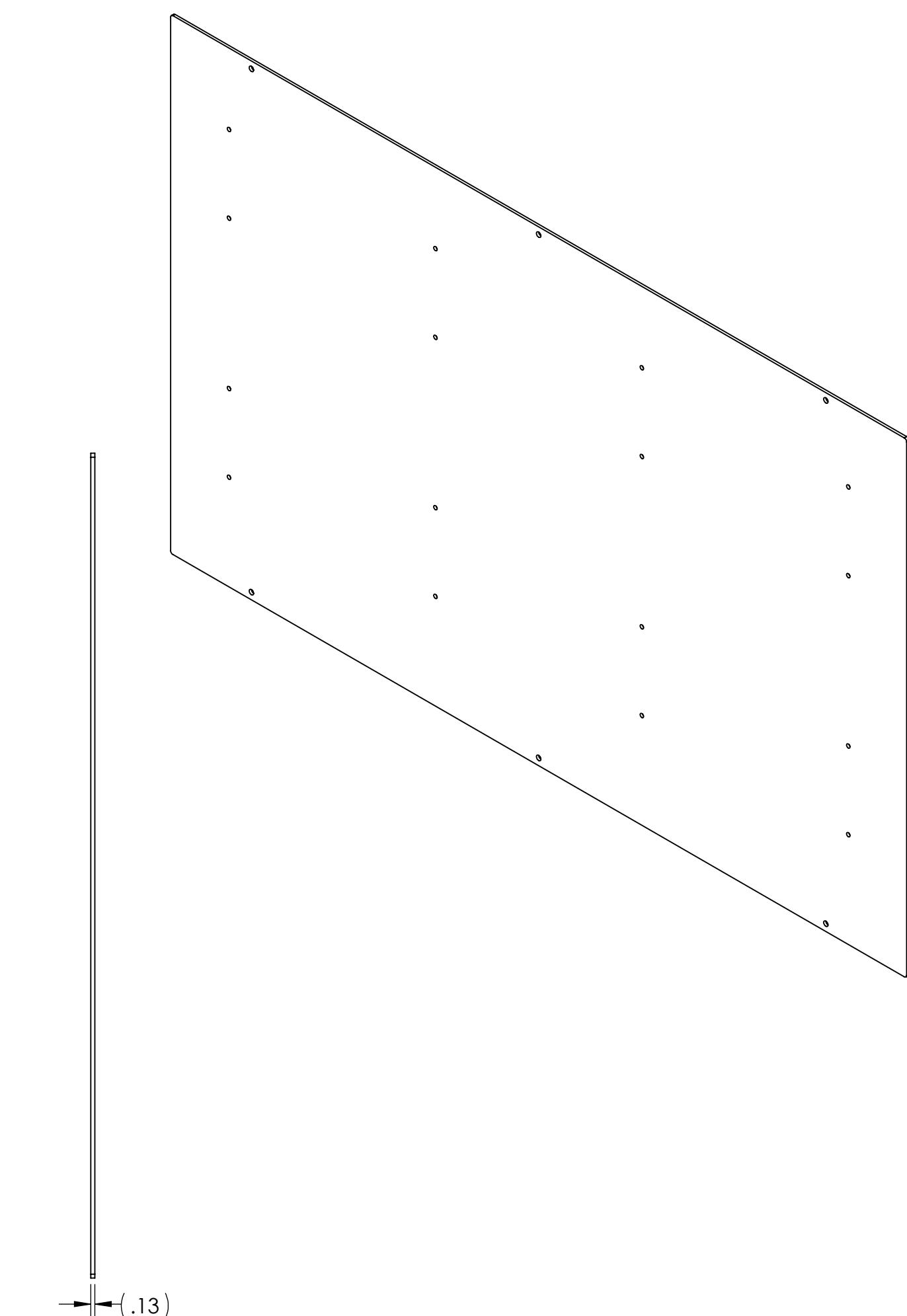
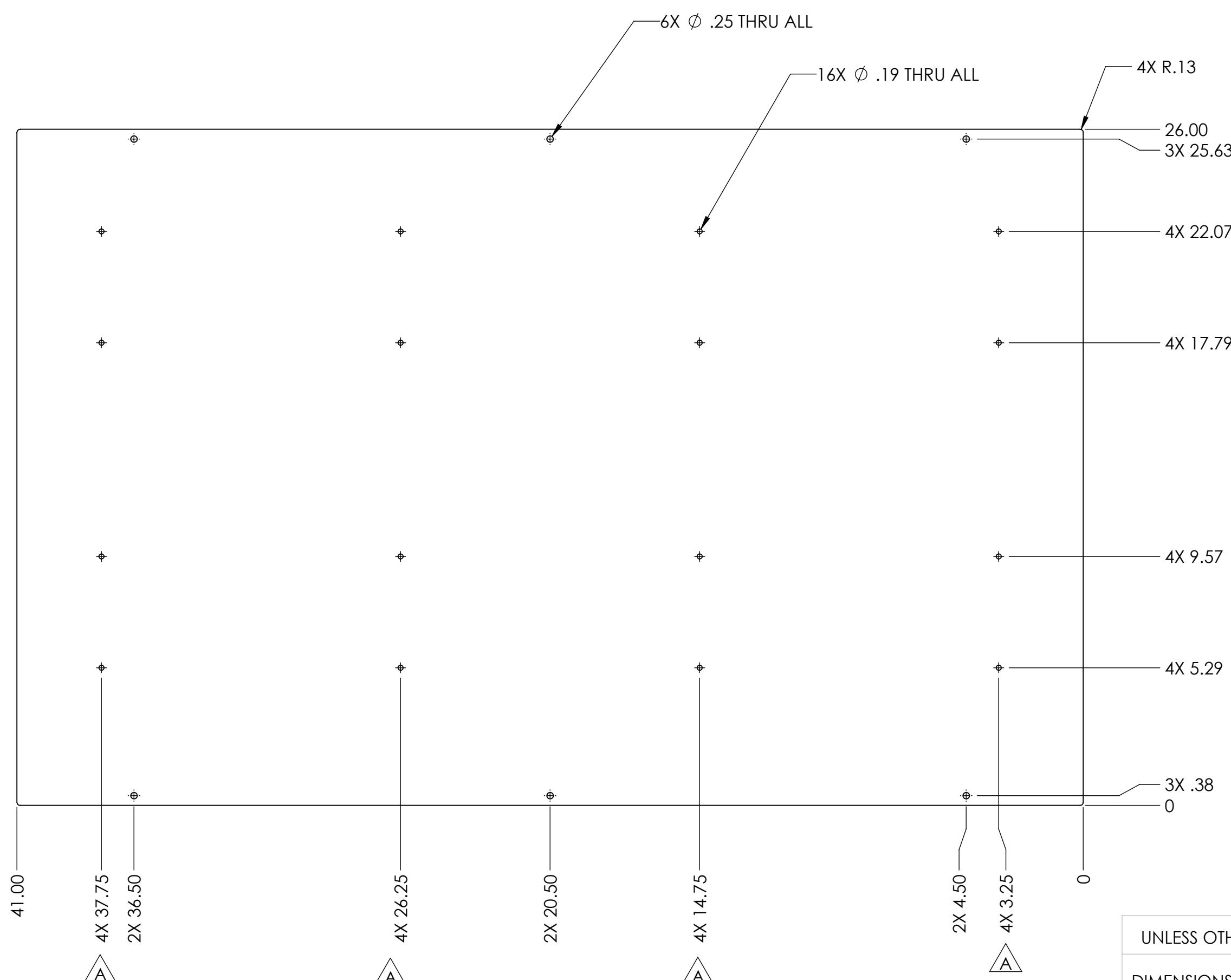
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UNLESS OTHERWISE SPECIFIED:

VEND DATE
DRAWN JO 8/29/2023

TITLE: Speaker Inner Top Plastic

SIZE DWG. NO. REV
C GE-24316 A

DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL $\pm 1/16$
ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$
TWO PLACE DECIMAL $\pm .01$
THREE PLACE DECIMAL $\pm .005$

PROPRIETARY AND CONFIDENTIAL

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MATERIAL/FINISH:

1/8" HDPE, White, Smooth

COMMENTS:

REMOVE ALL BURRS AND SHARP EDGES.

DO NOT SCALE DRAWING

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
A2, A3, A4	A	Hole Locations Fixed	10/18/2023	JO

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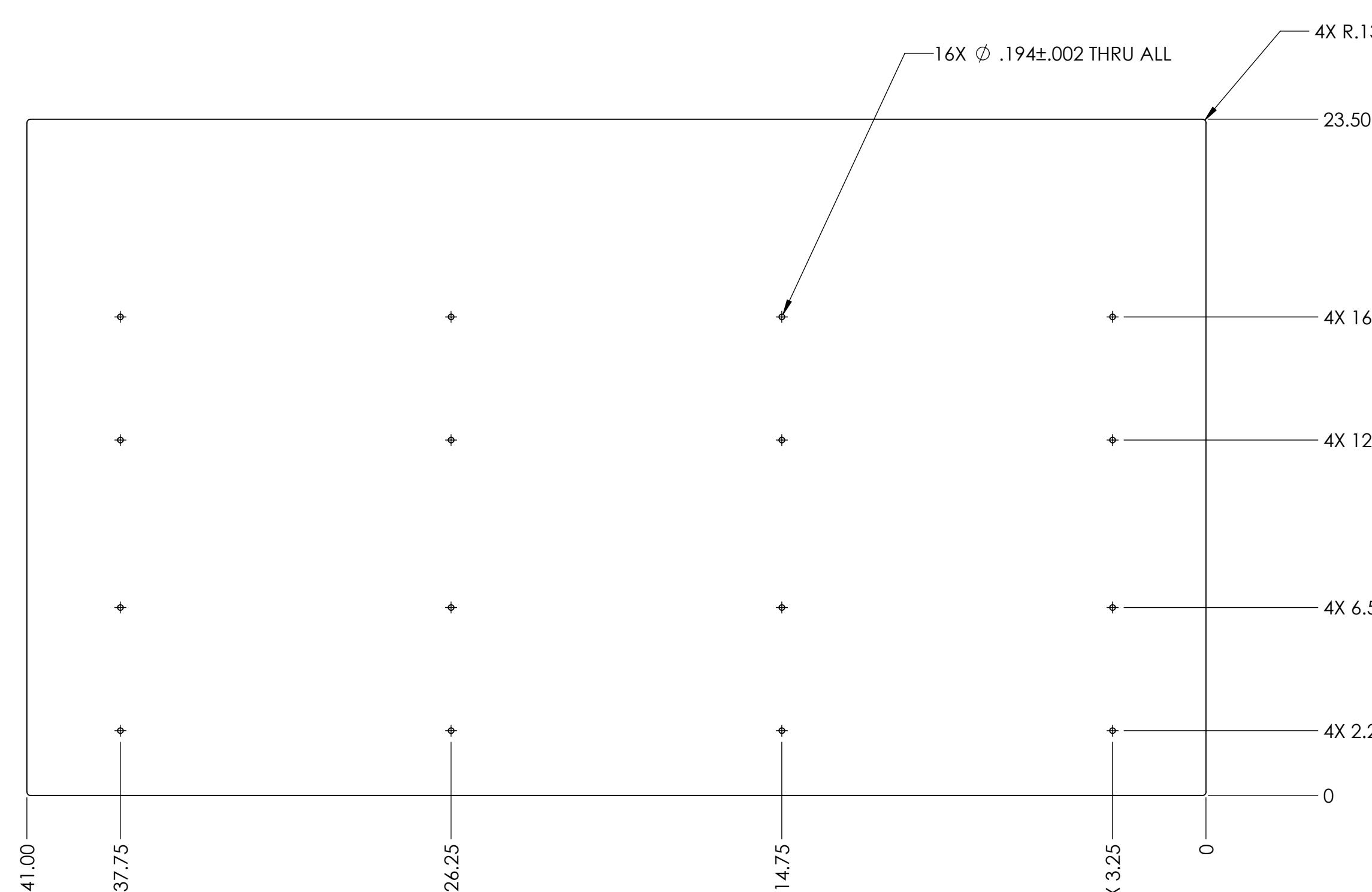
C

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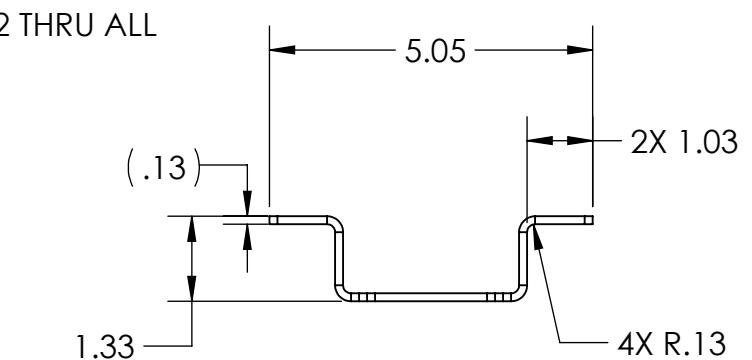
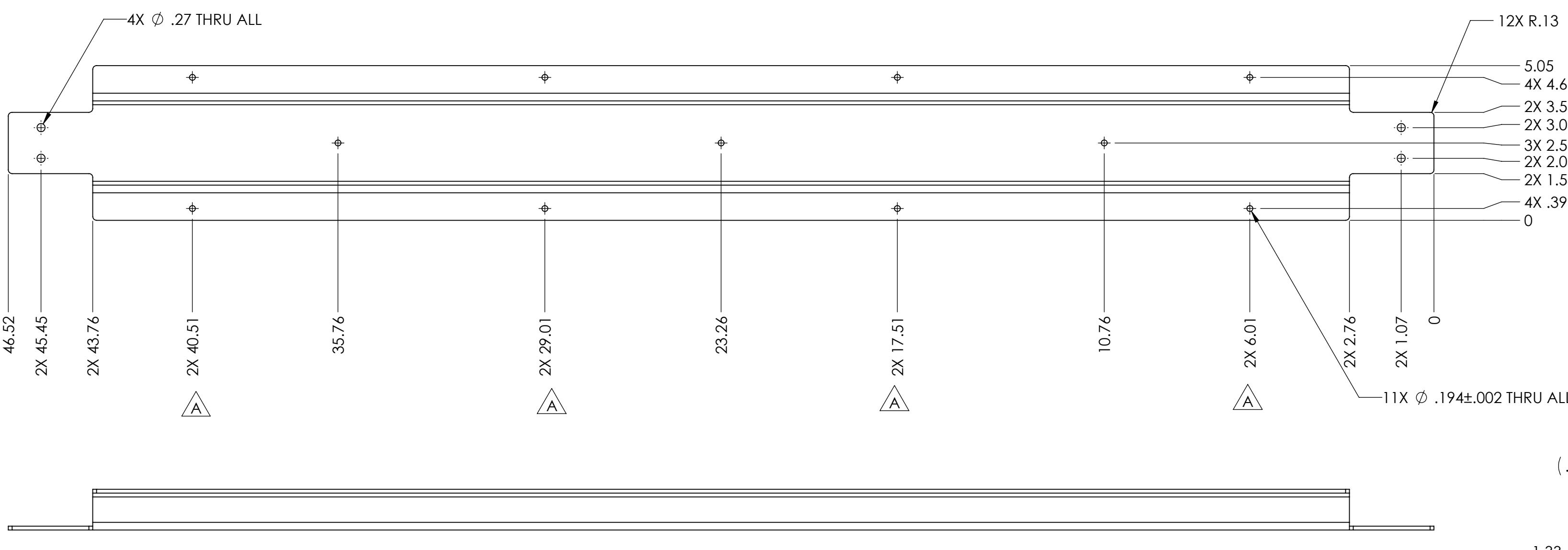
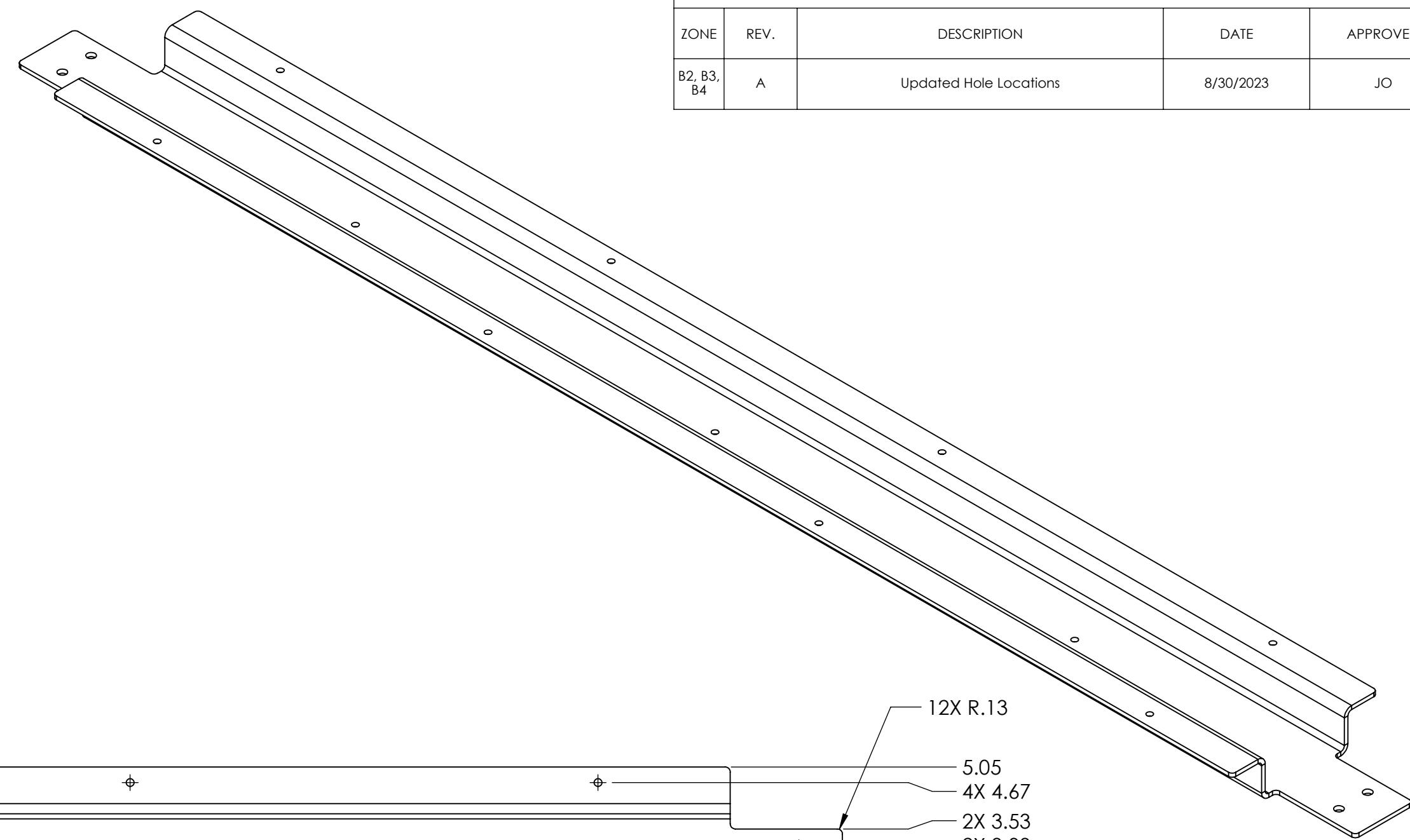
UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
	DRAWN	JO	8/29/2023
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH: 1/8" HDPE, White, Smooth Finish			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			



TITLE:
**Speaker Inner
Front Top Plastic**

SIZE DWG. NO. REV
C GE-24317 A

SCALE: 1:4 SHEET 1 OF 1



UNLESS OTHERWISE SPECIFIED:	BEND	NAME	DATE
DRAWN	JO	8/28/2023	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH: 8 Ga 5052 Aluminum			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
**Goal Hat
Crossbeam**

SIZE DWG. NO. REV
C GE-24318 B

SCALE: 1:3 SHEET 1 OF 1

4

3

2

1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
A2, A3, A4, B1, B3	A	Added Cable Tie Mounting Holes, Increased Flange Size	9/13/2023	JO

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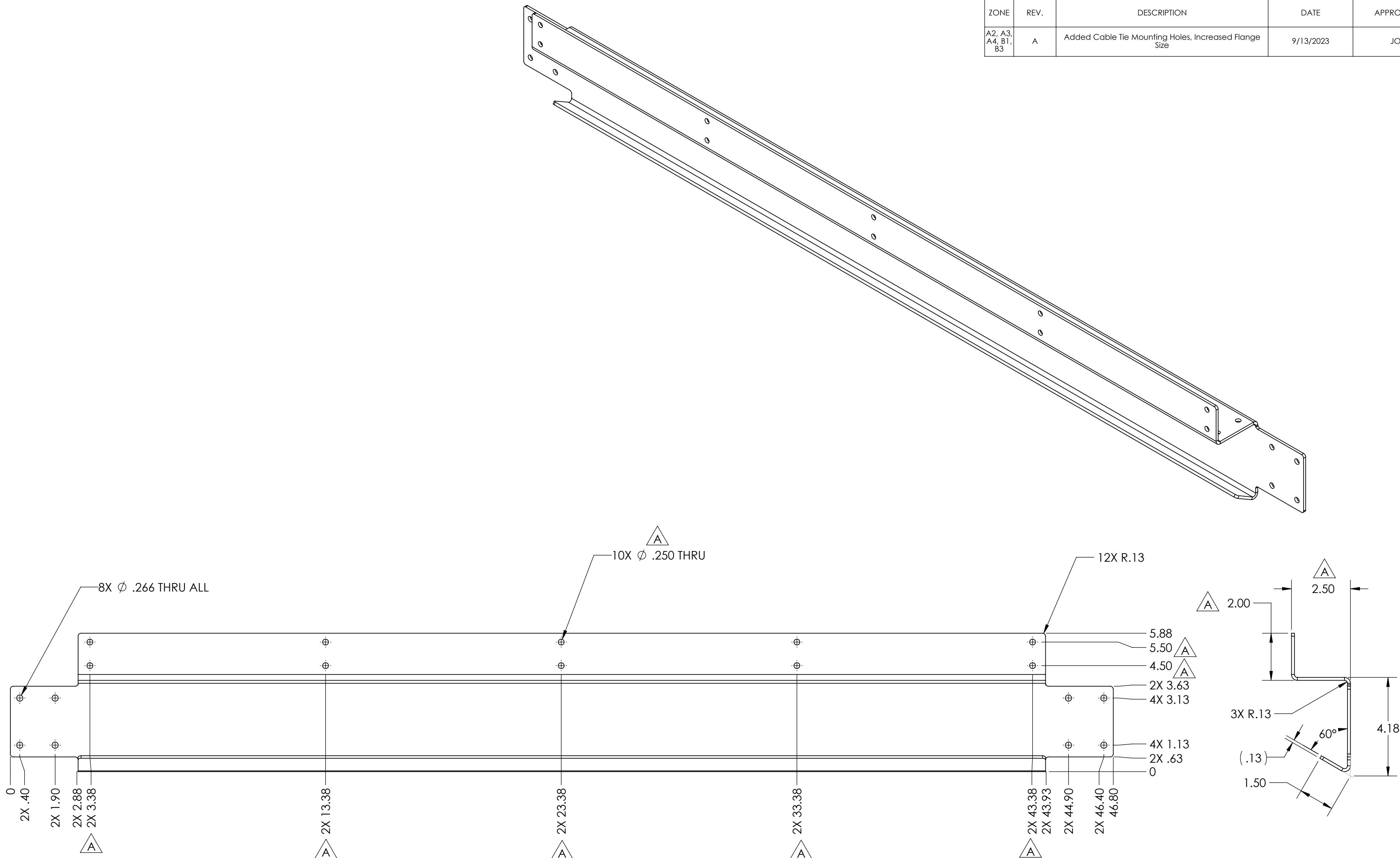
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Tag or Label with Part Number

UNLESS OTHERWISE SPECIFIED:	BEND	NAME	DATE
DRAWN	JO	8/28/2023	
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH: 8 Ga 5052 Aluminum			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

 **FIRST
ROBOTICS
COMPETITION**  **SOLIDWORKS**
Modeling Solutions Partner

TITLE:
**Goal Hat Front
Beam**

SIZE DWG. NO. REV

C GE-24319 **A**

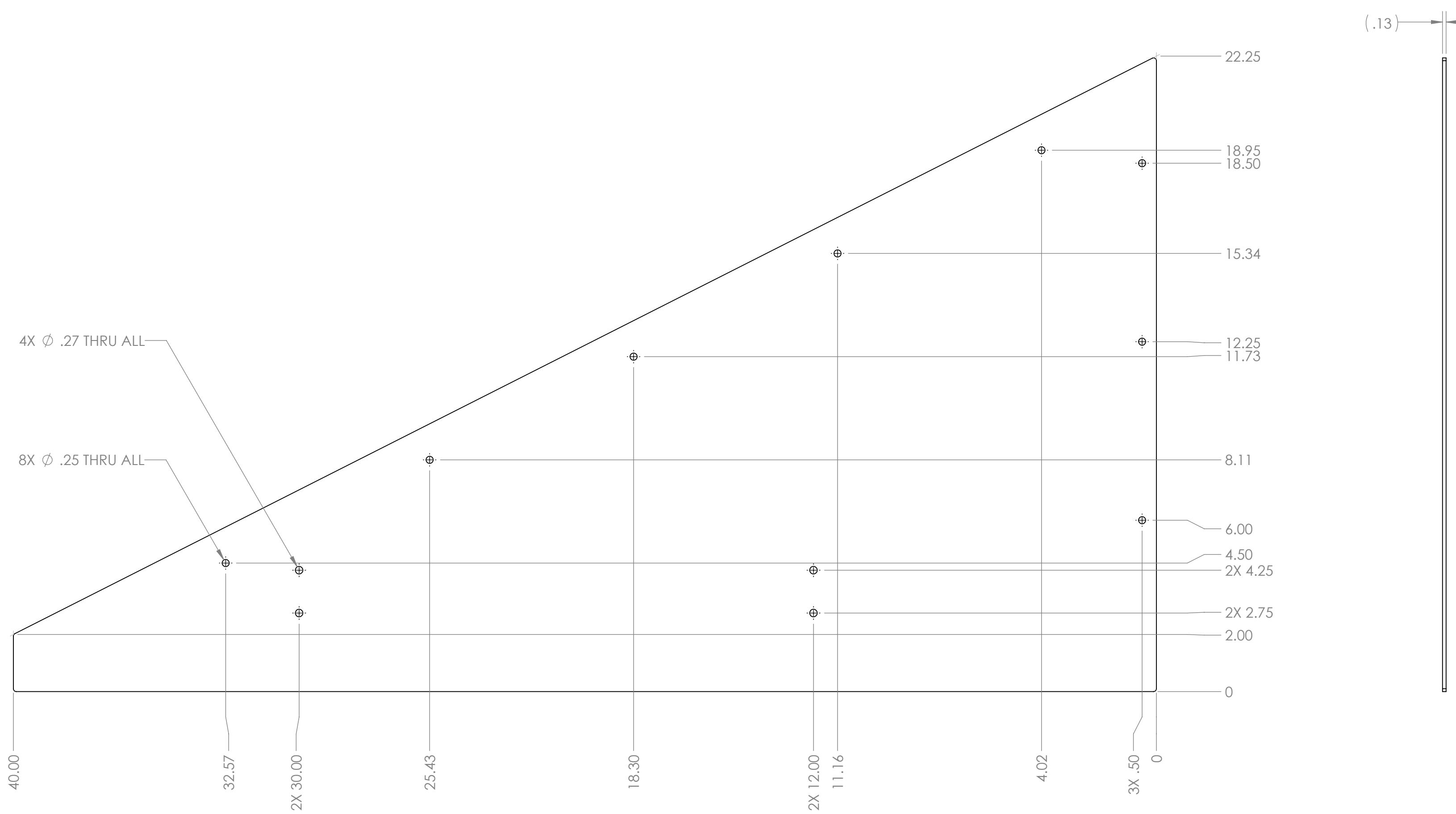
SCALE: 1:3 SHEET 1 OF 1

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UNLESS OTHERWISE SPECIFIED:			VEND	NAME	DATE
			DRAWN	JO	8/31/2023
<p>DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .005$</p> <p>MATERIAL/FINISH: 1/8" Polycarbonate, Clear</p> <p>DO NOT SCALE DRAWING</p>			<p>PROPRIETARY AND CONFIDENTIAL</p> <p>THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.</p> <p>COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.</p>		
			 FIRST ROBOTICS COMPETITION		
			TITLE: <h1>Speaker Wing Plastic</h1>		
			SIZE	DWG. NO.	REV
			C	GE-24320	A
			SCALE: 1:3		SHEET 1 OF 1

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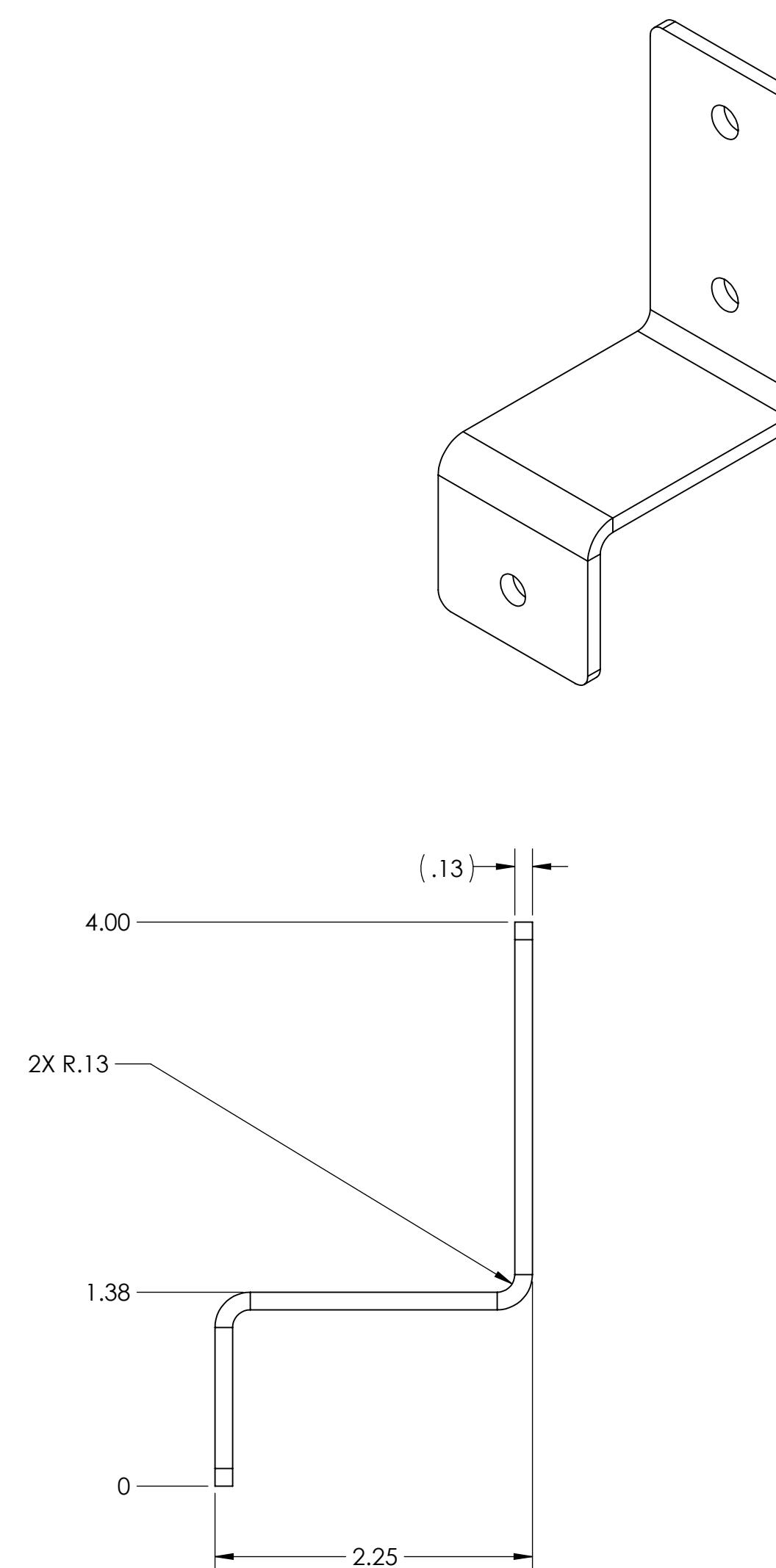
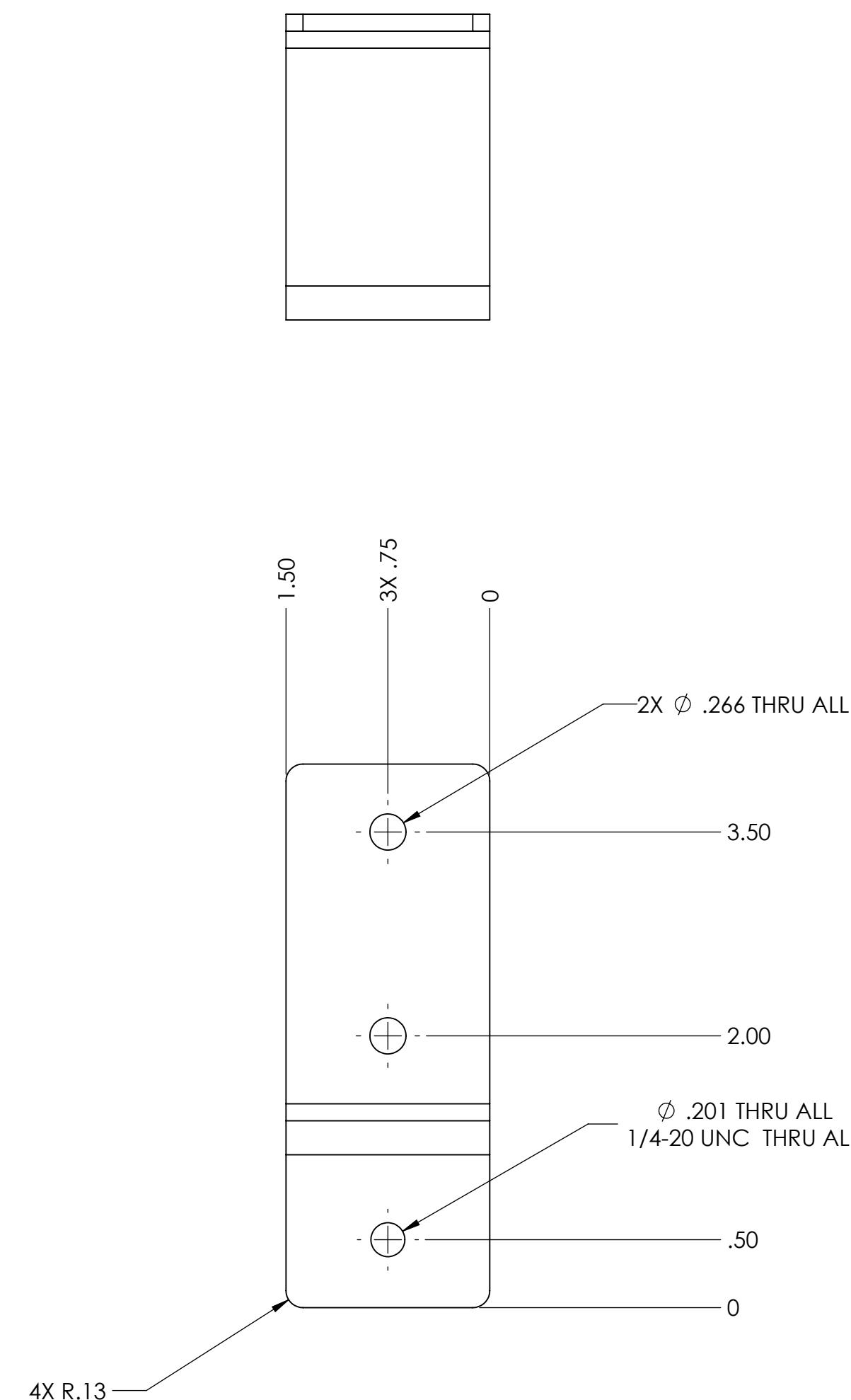
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UNLESS OTHERWISE SPECIFIED:	BEND	NAME	DATE
DRAWN	JO	8/31/2023	
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH: 11 Ga Preplated Steel			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
**Backboard
Bracket**

SIZE DWG. NO. REV
C GE-24321

SCALE: 1:1 SHEET 1 OF 1

4

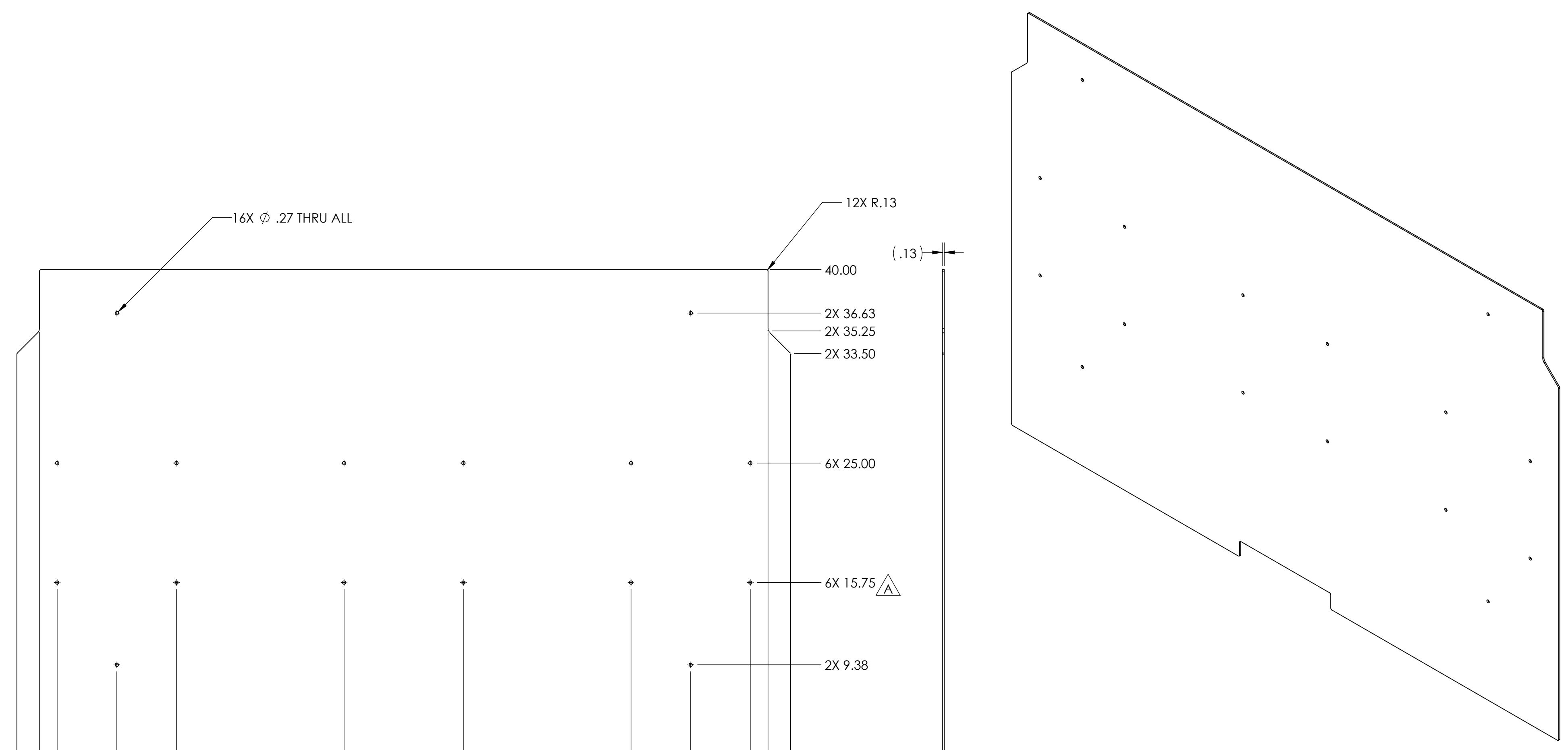
3

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REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
A3, A4, B2	A	Hole Locations Updated	10/24/2023	JO



UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES

TOLERANCES:

FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .005$

MATERIAL/FINISH:

1/8" HDPE Black, Smooth Finish

COMMENTS:

DO NOT SCALE DRAWING

VEND

DRAWN

NAME

JO

DATE

8/31/2023



TITLE: Speaker
Alliance Wall
Plastic

SIZE DWG. NO. REV
C GE-24322 **A**

SCALE: 1:6 SHEET 1 OF 1

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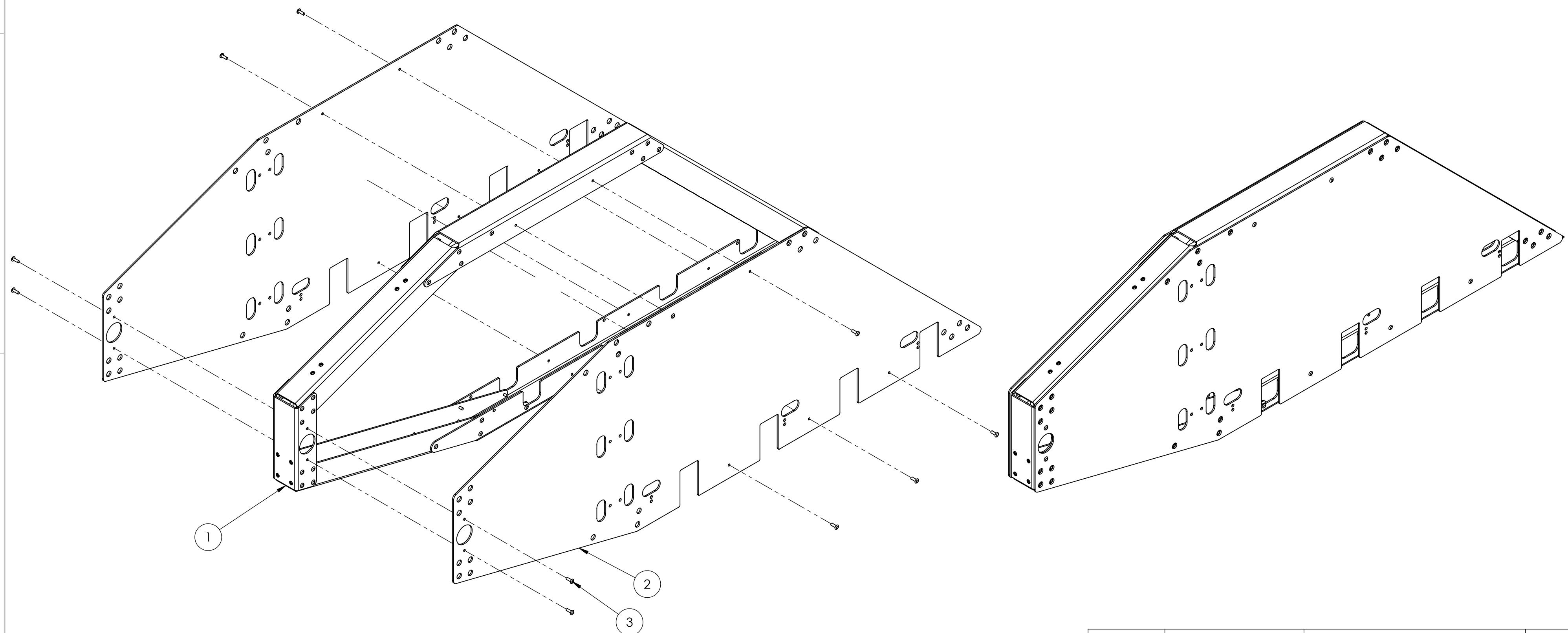
C

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Notes:

Assemble (2) to (1) using (3)
Tag or Label with Part Number

UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL $\pm 1/16$
ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$
TWO PLACE DECIMAL $\pm .01$
THREE PLACE DECIMAL $\pm .005$

MATERIAL/FINISH:

DO NOT SCALE DRAWING

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24311	Speaker Side Sheetmetal	1
2	GE-24312	Speaker Top Side Plastic	2
3	rivet_.1875_.251-.375	3/16" Aluminum Rivet, .251-.375 Grip Range	14

VEND	NAME	DATE
DRAWN	JO	8/30/2023

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COMMENTS:
REMOVE ALL BURRS AND SHARP EDGES.

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
Speaker Side Assembly

SIZE DWG. NO. REV

C GE-24323

SCALE: 1:6 SHEET 1 OF 1

4

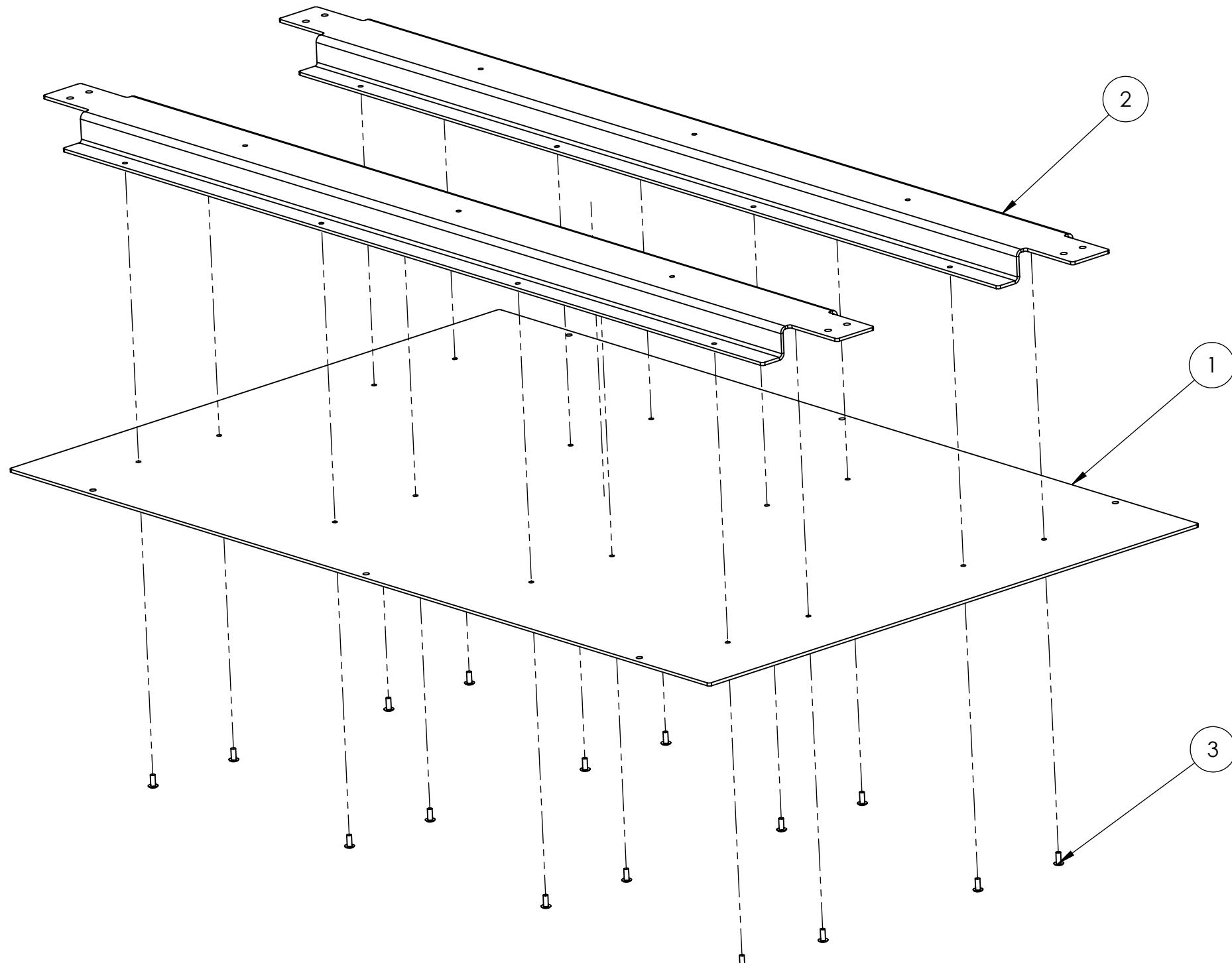
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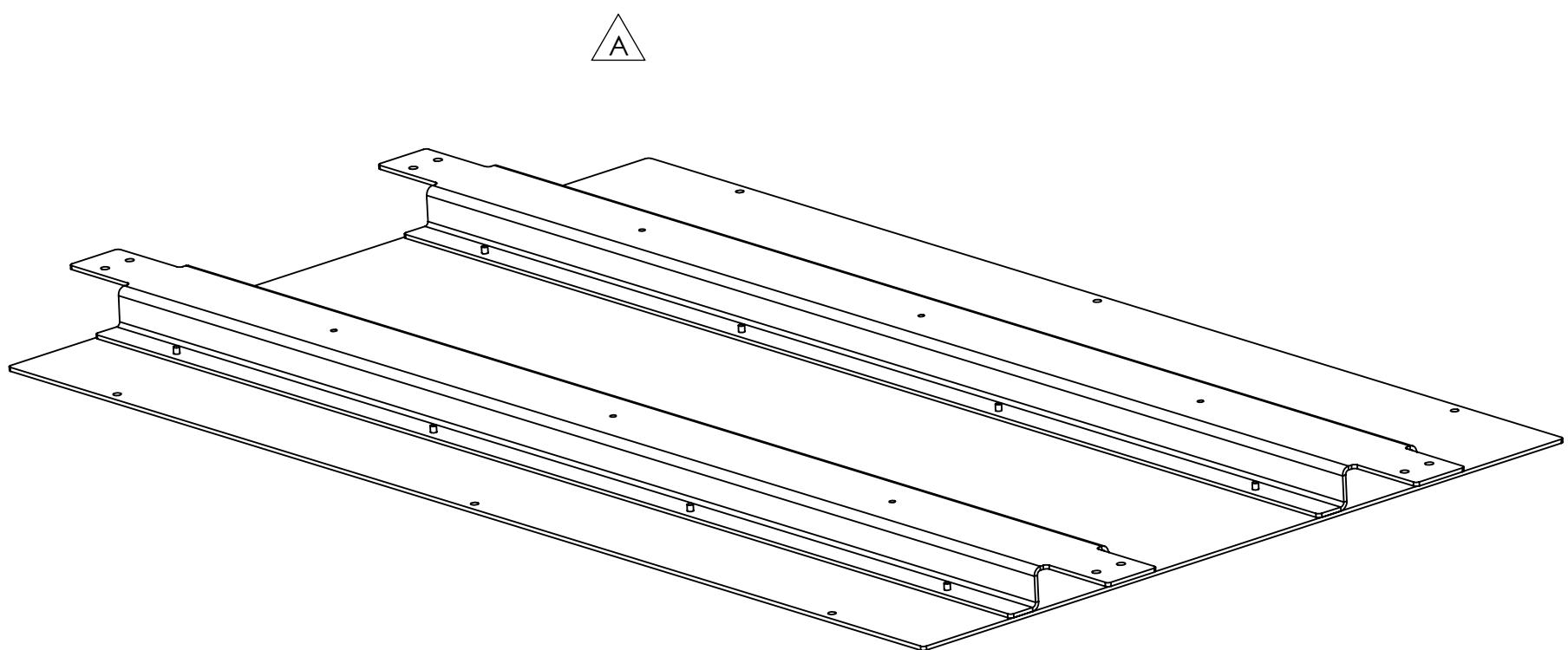
REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
C2	A	All Parts updated to fix symmetry issues	10/18/2023	JO



Notes:

Assemble (2) to (1) using (3)
Tag or Label with Part Number



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24316	Speaker Inner Top Plastic	1
2	GE-24318	Goal Hat Crossbeam	2
3	rivet_.1875_.126-.25	3/16" Rivet, .126-.25 Grip Range	16

UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES

TOLERANCES:

FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .005$

MATERIAL/FINISH:

DO NOT SCALE DRAWING

VEND NAME DATE

DRAWN JO 8/30/2023

PROPRIETARY AND CONFIDENTIAL

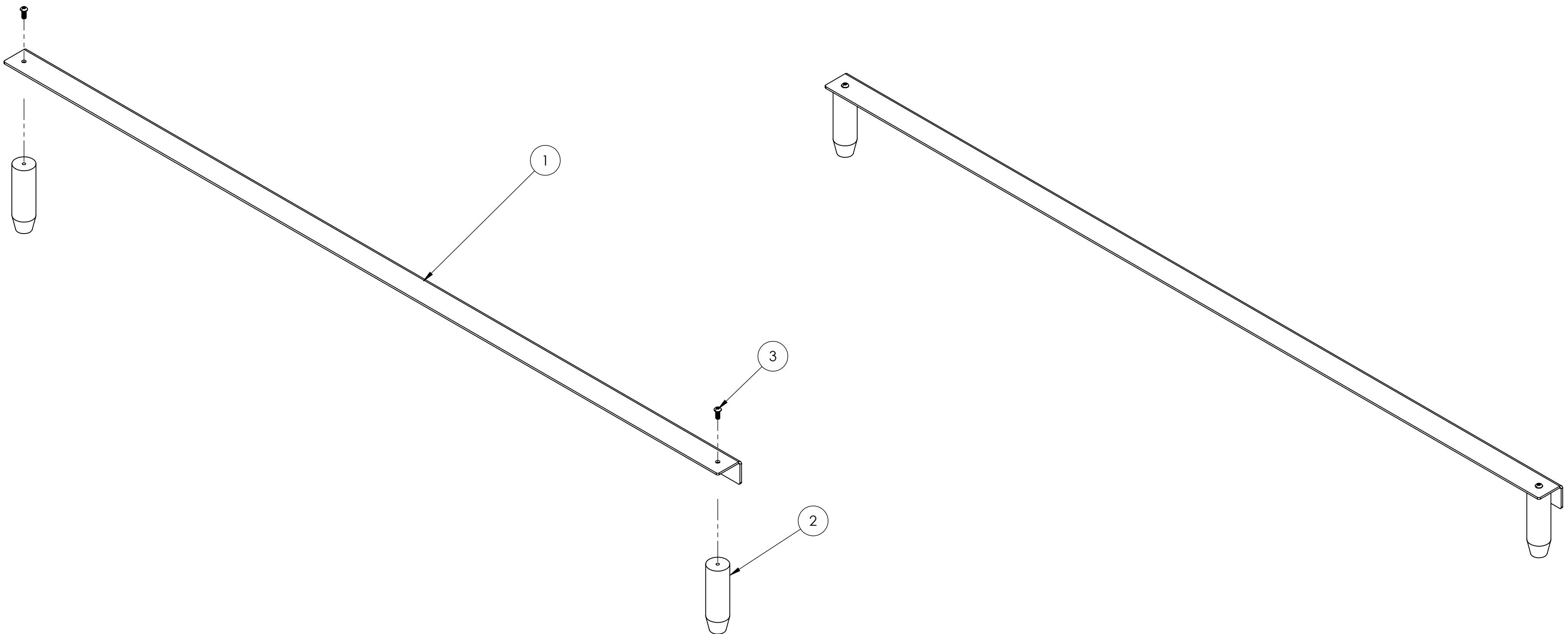
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COMMENTS:

REMOVE ALL BURRS AND SHARP EDGES.

TITLE:
Speaker Back AssemblySIZE DWG. NO. REV
C GE-24324 A

SCALE: 1:5 SHEET 1 OF 1



Notes:
Assemble (2) to (1) using (3)
Tag or Label with Part Number

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24305	Briweld Field Crossbeam	1
2	FE-00060	Top Rail, Post	2
3	button_hex_.25_20_.625	1/4-20 x 5/8" Long Button Head Cap Screw	2

UNLESS OTHERWISE SPECIFIED:			VEND	NAME	DATE
DIMENSIONS ARE IN INCHES			DRAWN	JO	8/30/2023
PROPRIETARY AND CONFIDENTIAL					
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MATERIAL/FINISH:					
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.					
DO NOT SCALE DRAWING					

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE: Briweld Field Crossbeam Assembly
SIZE DWG. NO. REV
C GE-24325

SCALE: 1:5 SHEET 1 OF 1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
C2	A	All parts updated to fix symmetry issues	10/18/2023	JO

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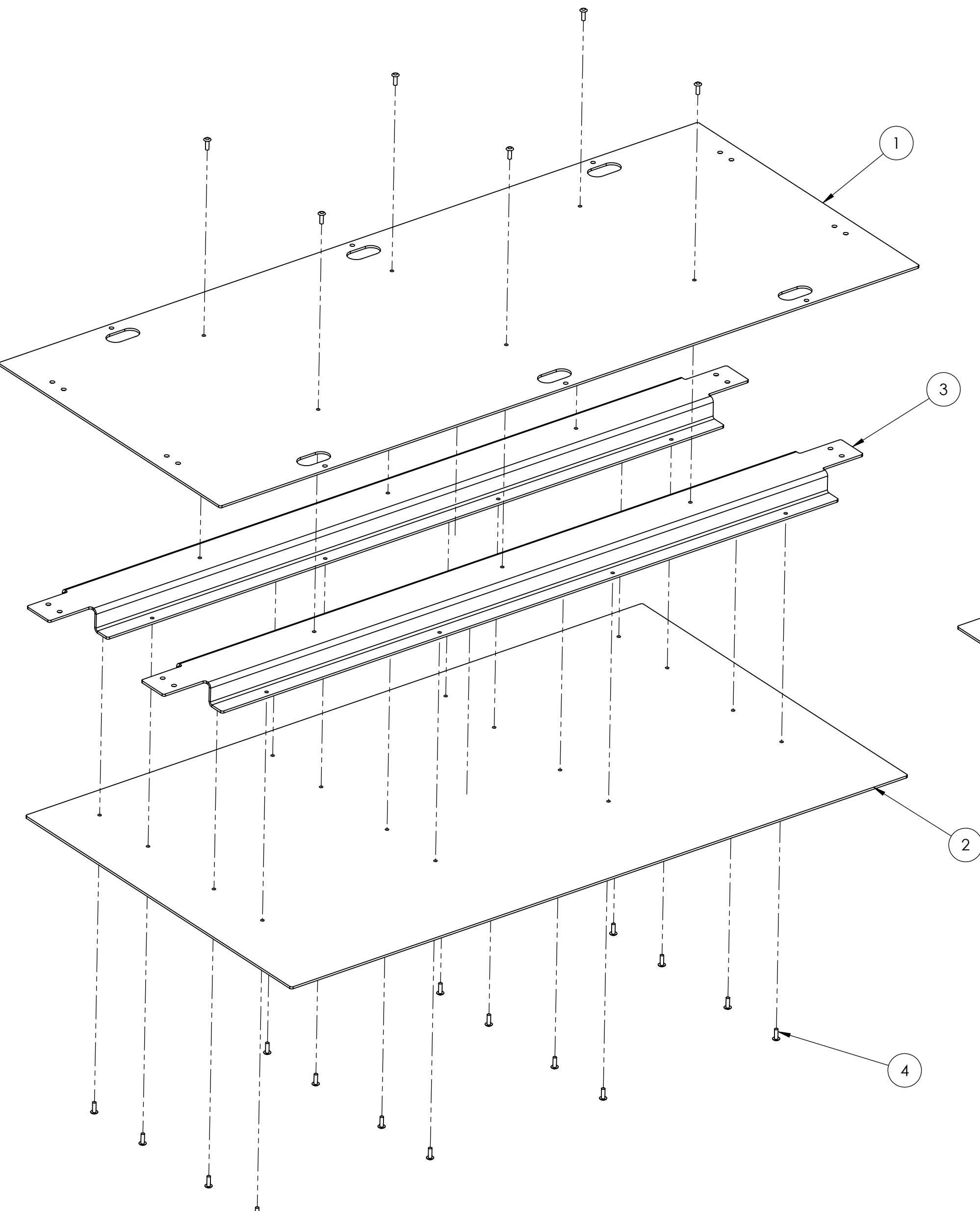
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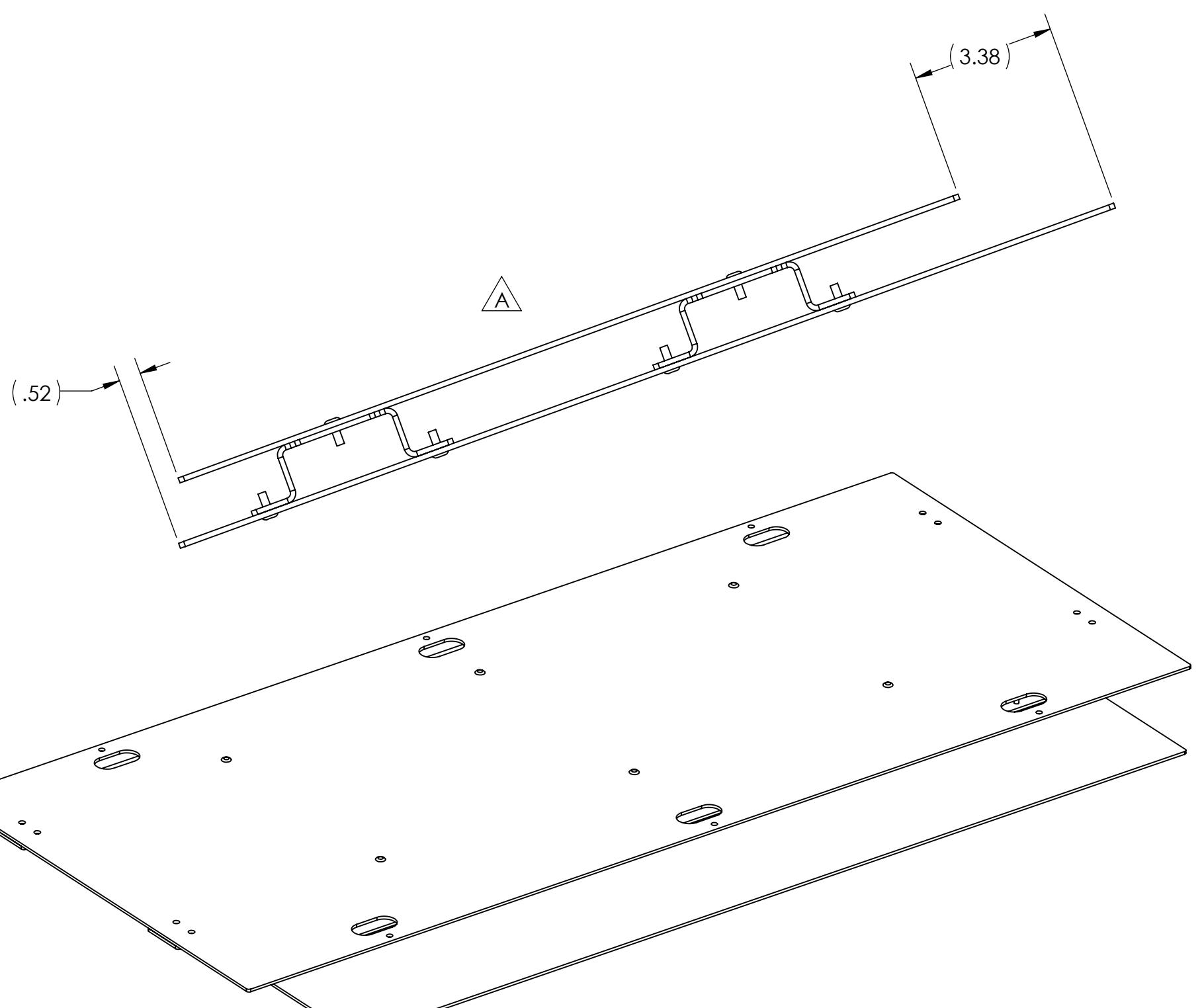
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Notes:
Assemble (2) and (1) to (3) using (4)
Tag or Label with Part Number



UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES

TOLERANCES:

FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .005$

MATERIAL/FINISH:

DO NOT SCALE DRAWING

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24314	Speaker Front Top Plastic	1
2	GE-24317	Speaker Inner Front Top Plastic	1
3	GE-24318	Goal Hat Crossbeam	2
4	rivet_.1875_.251-.375	3/16" Aluminum Rivet, .251-.375 Grip Range	22

VEND	NAME	DATE
DRAWN	JO	8/30/2023

PROPRIETARY AND CONFIDENTIAL

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COMMENTS:

REMOVE ALL BURRS AND SHARP EDGES.

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE: Speaker Front
Angled
Assembly

SIZE DWG. NO. REV
C GE-24326 **A**

SCALE: 1:5 SHEET 1 OF 1

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GE-24328-LeftBlue-Vinyl

GE-24328-RightBlue-Vinyl

C

C

Trim vinyl at all hole locations. 12 places per part.

.63

(21.45)

GE-24328-LeftRed-Vinyl

GE-24328-RightRed-Vinyl

Right vinyl applied to this face, left vinyl applied to opposite face.

GE-24320

(1.20)

Color Variations		
Part Number	Vinyl Image	Qty per field
GE-24328-LeftRed	GE-24328-LeftRed-Vinyl	1
GE-24328-RightRed	GE-24328-RightRed-Vinyl	1
GE-24328-LeftBlue	GE-24328-LeftBlue-Vinyl	1
GE-24328-RightBlue	GE-24328-RightBlue-Vinyl	1

UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	JO	8/31/2023	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:			
REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

 **FIRST
ROBOTICS
COMPETITION**  **SOLIDWORKS**
Modeling Solutions Partner

TITLE:
**Speaker Wing
Plastic with Vinyl**

SIZE DWG. NO. REV
C GE-24328

SCALE: 1:5 SHEET 1 OF 1

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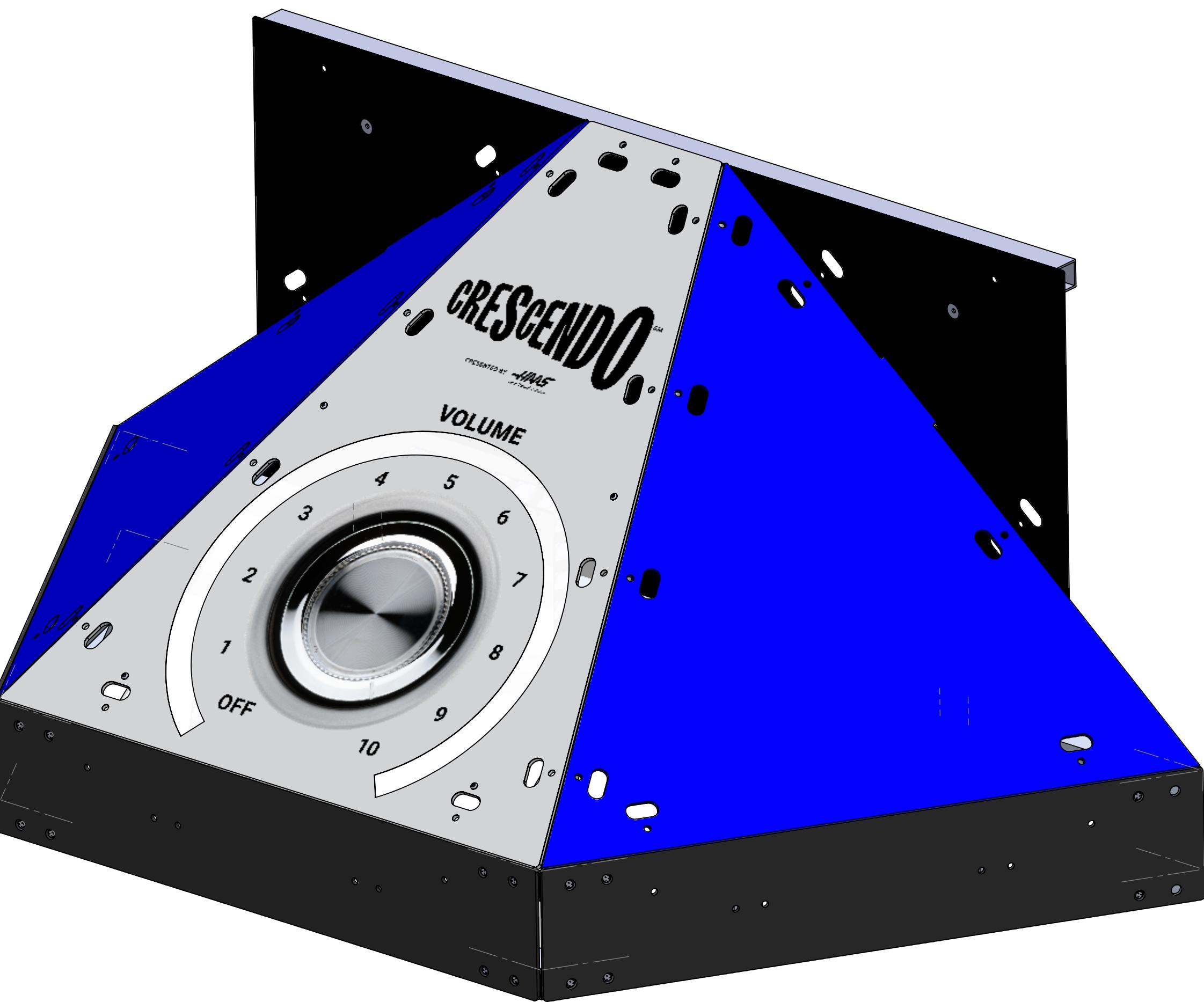
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UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL $\pm\frac{1}{2}$
ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$
TWO PLACE DECIMAL $\pm .50$

MATERIAL/FINISH:

PROPRIETARY AND CONFIDENTIAL
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PROHIBITED.

COMMENTS:
REMOVE ALL BURRS AND SHARP
EDGES.

DO NOT SCALE DRAWING

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24331	Wall Goal Frame Weldment	1
2	GE-24332	Subwoofer Backboard	1
3	GE-24333	Subwoofer Side Panel	2
4	GE-24335	Subwoofer Bumper	3
5	GE-24336	Subwoofer Small Frame	3
6	GE-24338	Subwoofer Back Bracket	4
7	GE-24339	Front Subwoofer Bracket	4
8	GE-24341	Subwoofer Support Pipe	2
9	GE-24342	Subwoofer Back Frame with Brackets	1
10	GE-24343	Subwoofer Middle Panel with Vinyl	1
11	GE-24345	Subwoofer Light Panel Assembly	1
12	Configurable Bolt	.75" Long 1/4-20 Button Head Cap Screw	8
13	Configurable Bolt	2.25" Long 1/4-20 Hex Head Bolt	24
14	nylock_.25_20	Steel Nylon-Insert Locknut, 1/4"-20	24
15	91780A363_Female Threaded Hex Standoff	Female Threaded Hex Standoff, 1/4-20 x 1" Long	4
16	98320A143	Zinc-Plated Steel Ring-Grip Quick-Release Pin	2

FIELD	NAME	DATE
DRAWN	JO	11/1/2023

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE: Subwoofer

SIZE DWG. NO. REV

C GE-24330

SCALE: 1:6 SHEET 1 OF 6

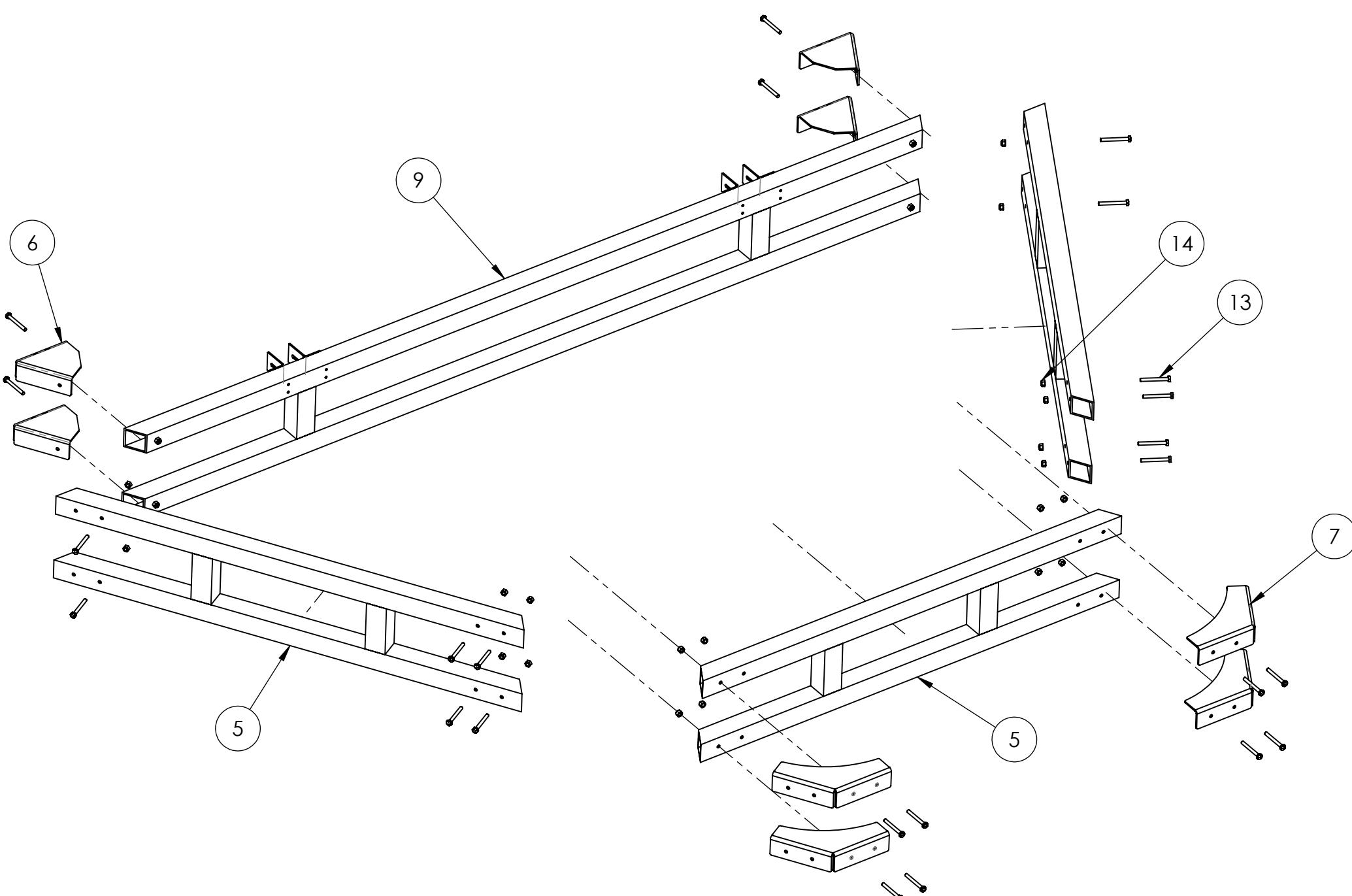
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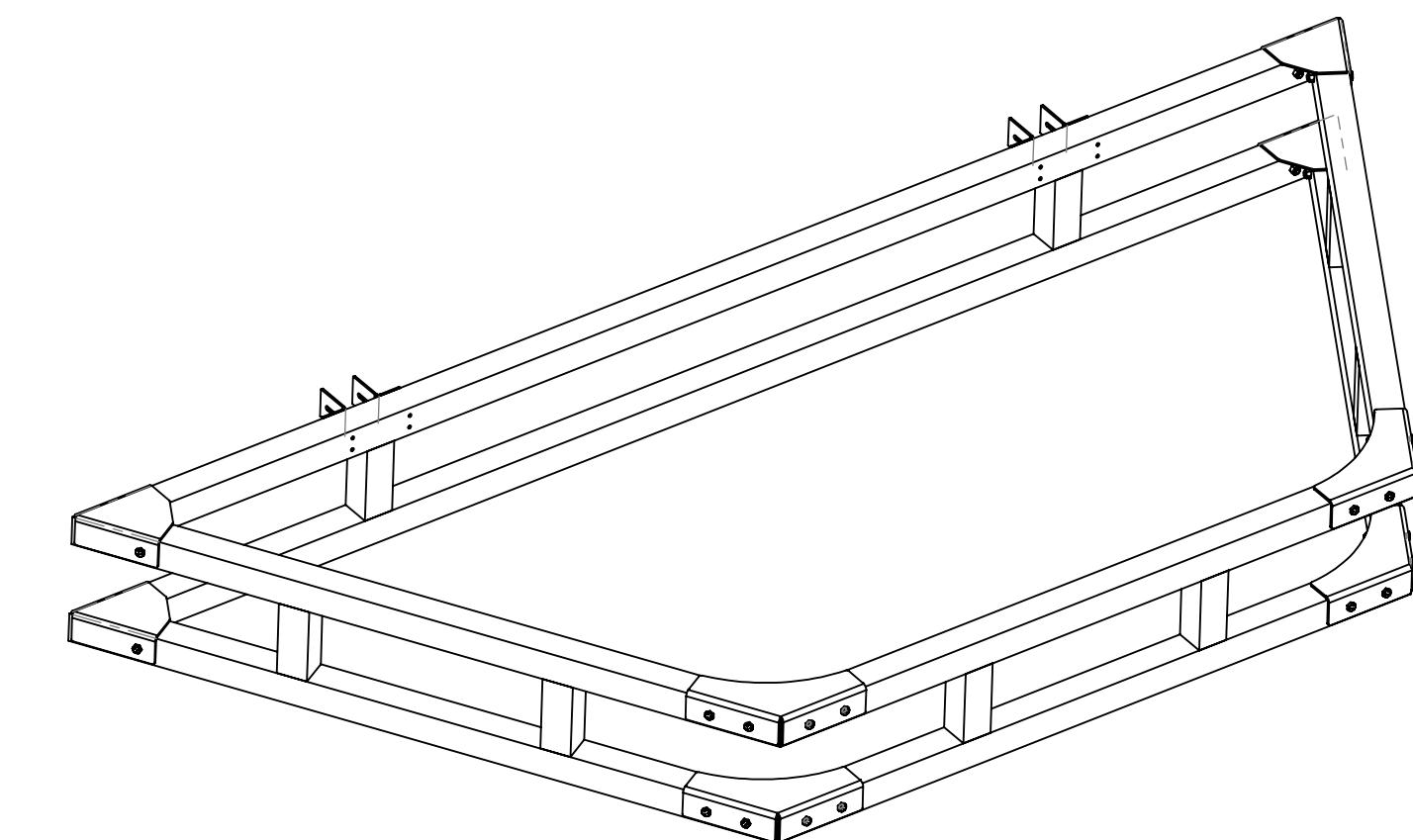
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Assemble as shown, do not over-tighten bolts



UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm\frac{1}{2}$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .50$	DRAWN	JO	11/1/2023
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

 **FIRST
ROBOTICS
COMPETITION**  **SOLIDWORKS**
Modeling Solutions Partner

TITLE: **Subwoofer**

SIZE DWG. NO. REV
C GE-24330

SCALE: 1:10 SHEET 2 OF 6

4

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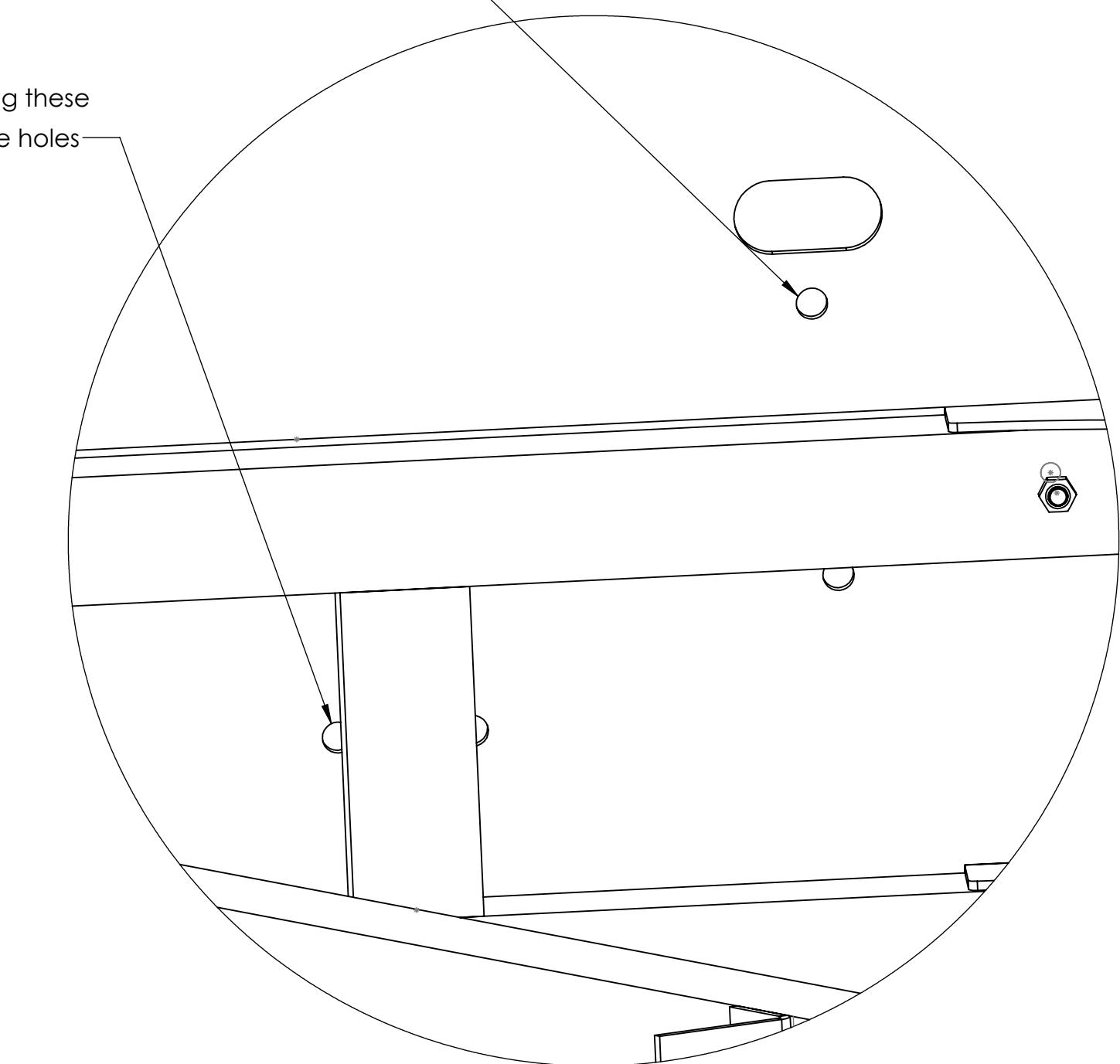
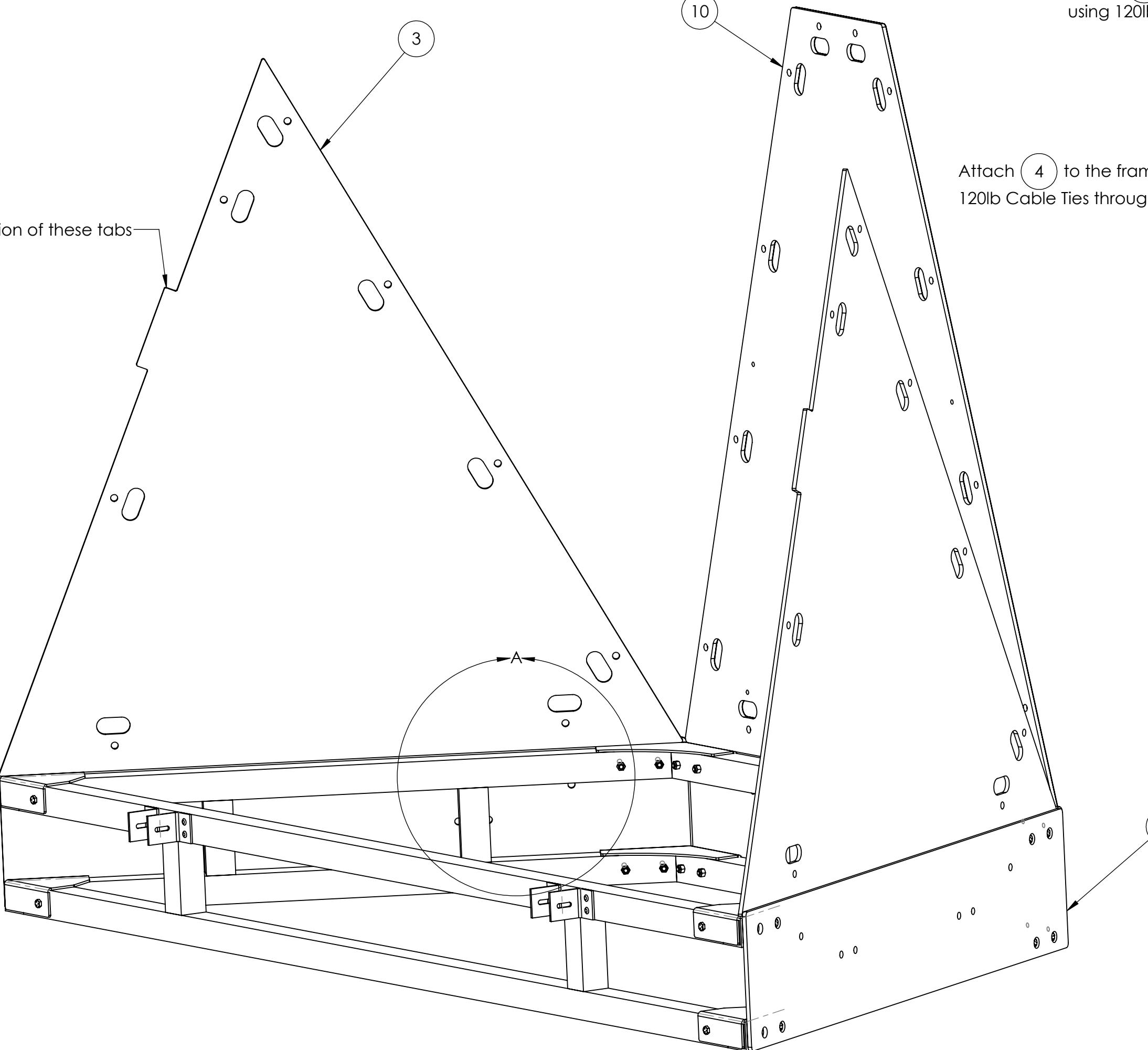
Note orientation of these tabs

3

10

Attach (3) and (10) to the frame and (4) using 120lb Cable Ties through these holes

Attach (4) to the frame using these 120lb Cable Ties through these holes

DETAIL A
SCALE 1 : 2

UNLESS OTHERWISE SPECIFIED:

FIELD NAME DATE

DRAWN JO 11/1/2023

DIMENSIONS ARE IN INCHES

TOLERANCES:

FRACTIONAL $\pm 1/2$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .50$

MATERIAL/FINISH:

PROPRIETARY AND CONFIDENTIAL

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COMMENTS:

REMOVE ALL BURRS AND SHARP
EDGES.

DO NOT SCALE DRAWING

FIRST
ROBOTICS
COMPETITION
SOLIDWORKS
 Modeling Solutions Partner
TITLE:
Subwoofer

SIZE DWG. NO. REV

C GE-24330

SCALE: 1:6 SHEET 3 OF 6

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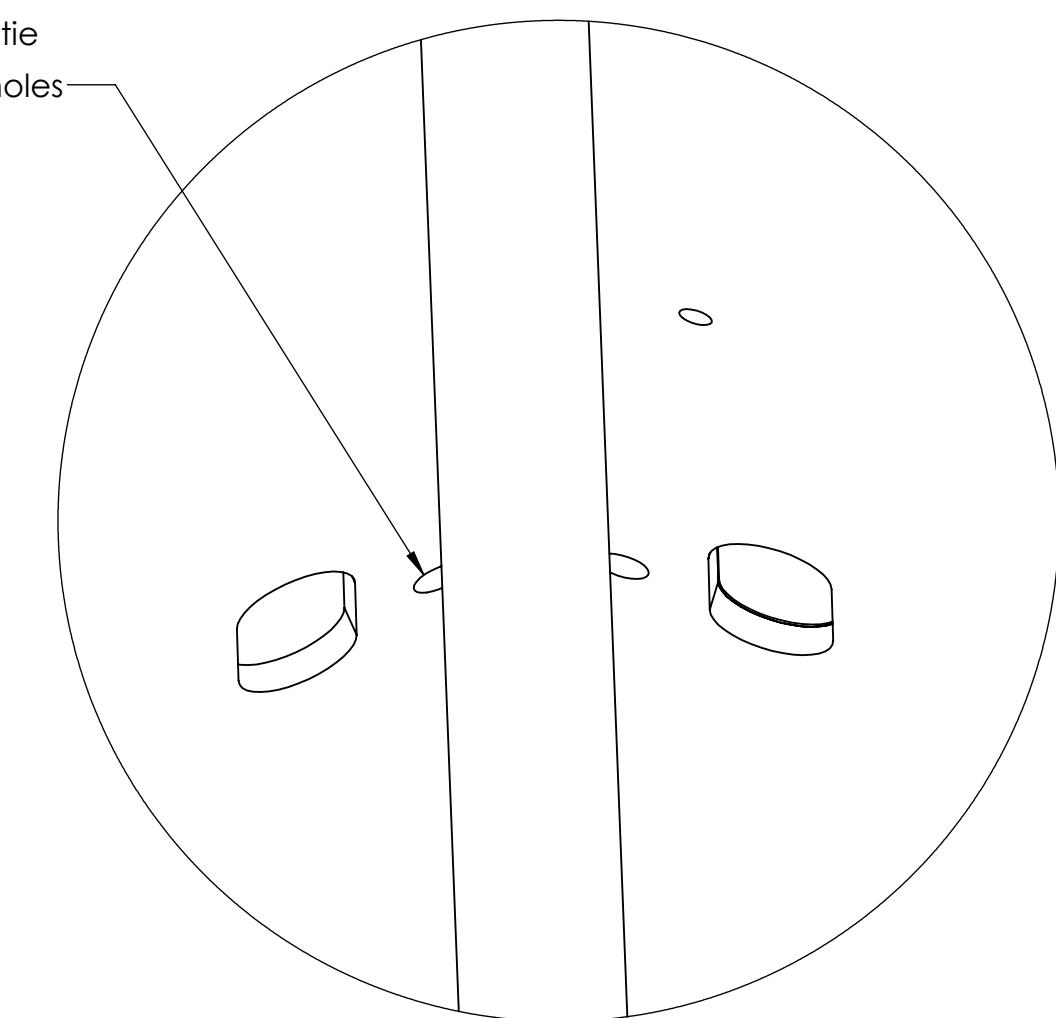
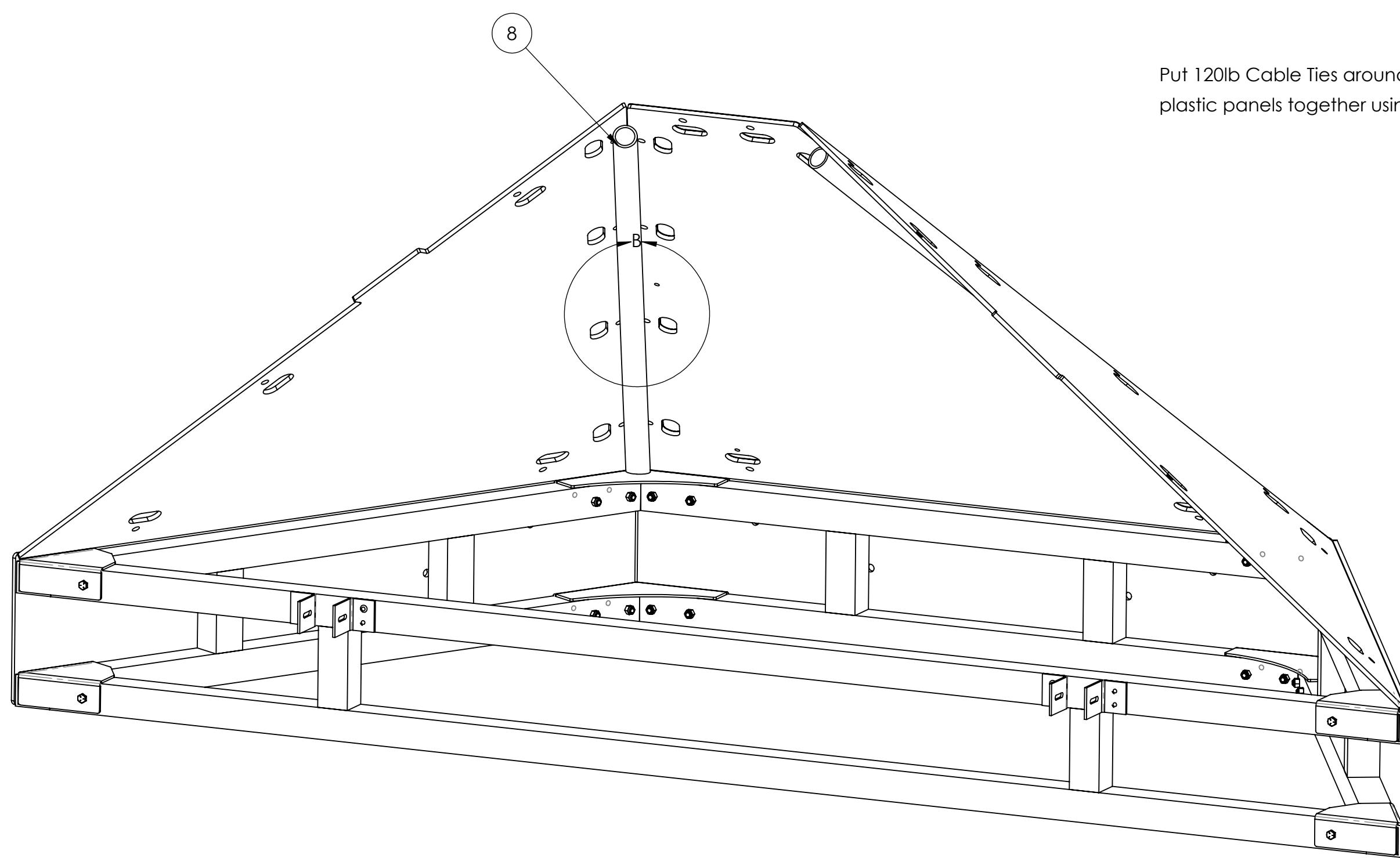
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DETAIL B
SCALE 2 : 3

UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DRAWN	JO	11/1/2023	
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MATERIAL/FINISH:			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

 **FIRST
ROBOTICS
COMPETITION**  **SOLIDWORKS**
Modeling Solutions Partner

TITLE: **Subwoofer**

SIZE DWG. NO. REV
C GE-24330

SCALE: 1:6 SHEET 4 OF 6

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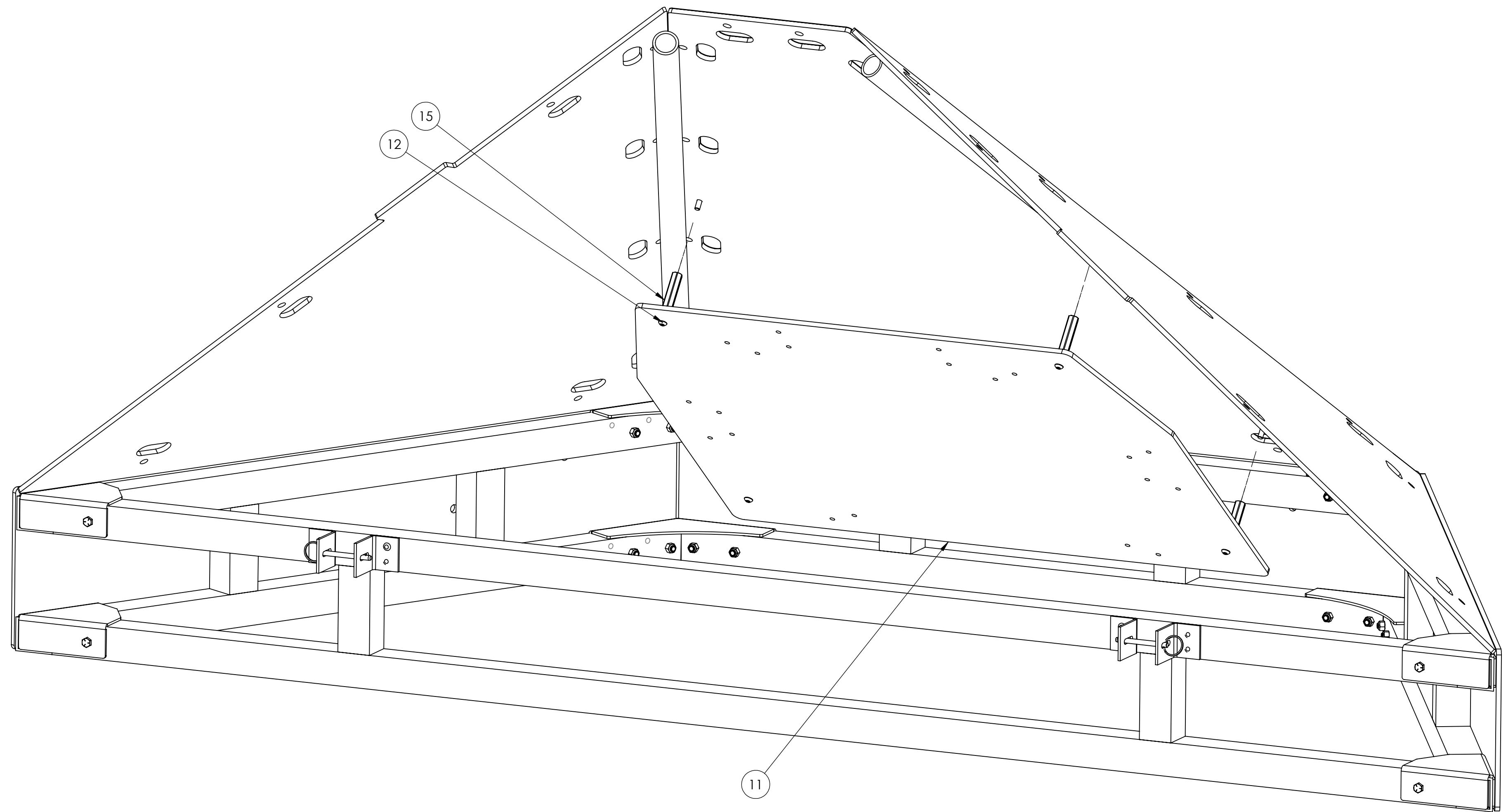
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Attach (11) to the underside of the assembly with (15) and (12).

UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DRAWN	JO	11/1/2023	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			



TITLE:
Subwoofer

SIZE DWG. NO. REV
C GE-24330

SCALE: 1:4 SHEET 5 OF 6

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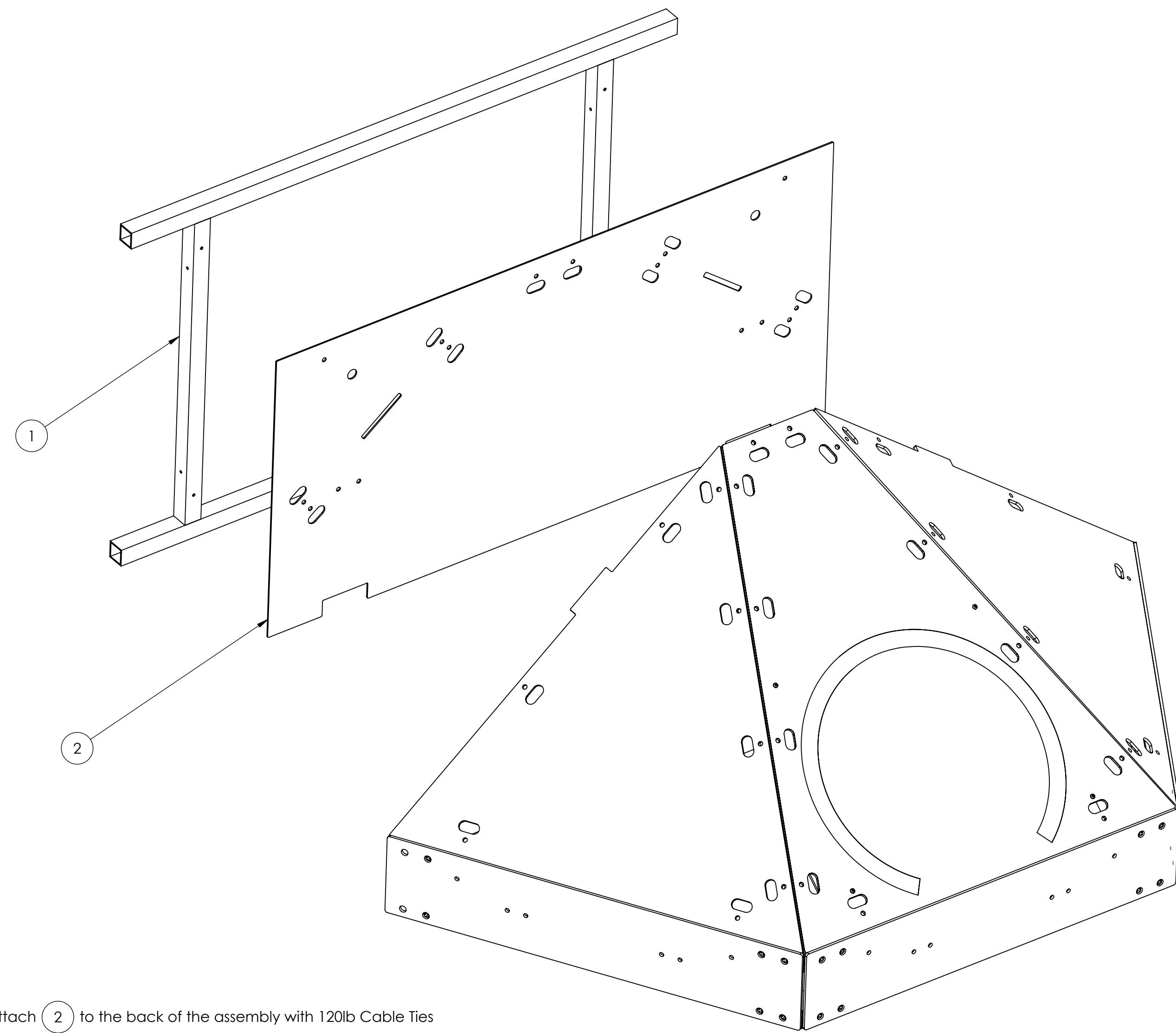
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Attach (2) to the back of the assembly with 120lb Cable Ties

Slide assembly up to (1) and attach with pins



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DRAWN	JO	11/1/2023	
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MATERIAL/FINISH:			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

 **FIRST
ROBOTICS
COMPETITION**  **SOLIDWORKS**
Modeling Solutions Partner

TITLE: **Subwoofer**

SIZE DWG. NO. REV

C GE-24330

SCALE: 1:8 SHEET 6 OF 6

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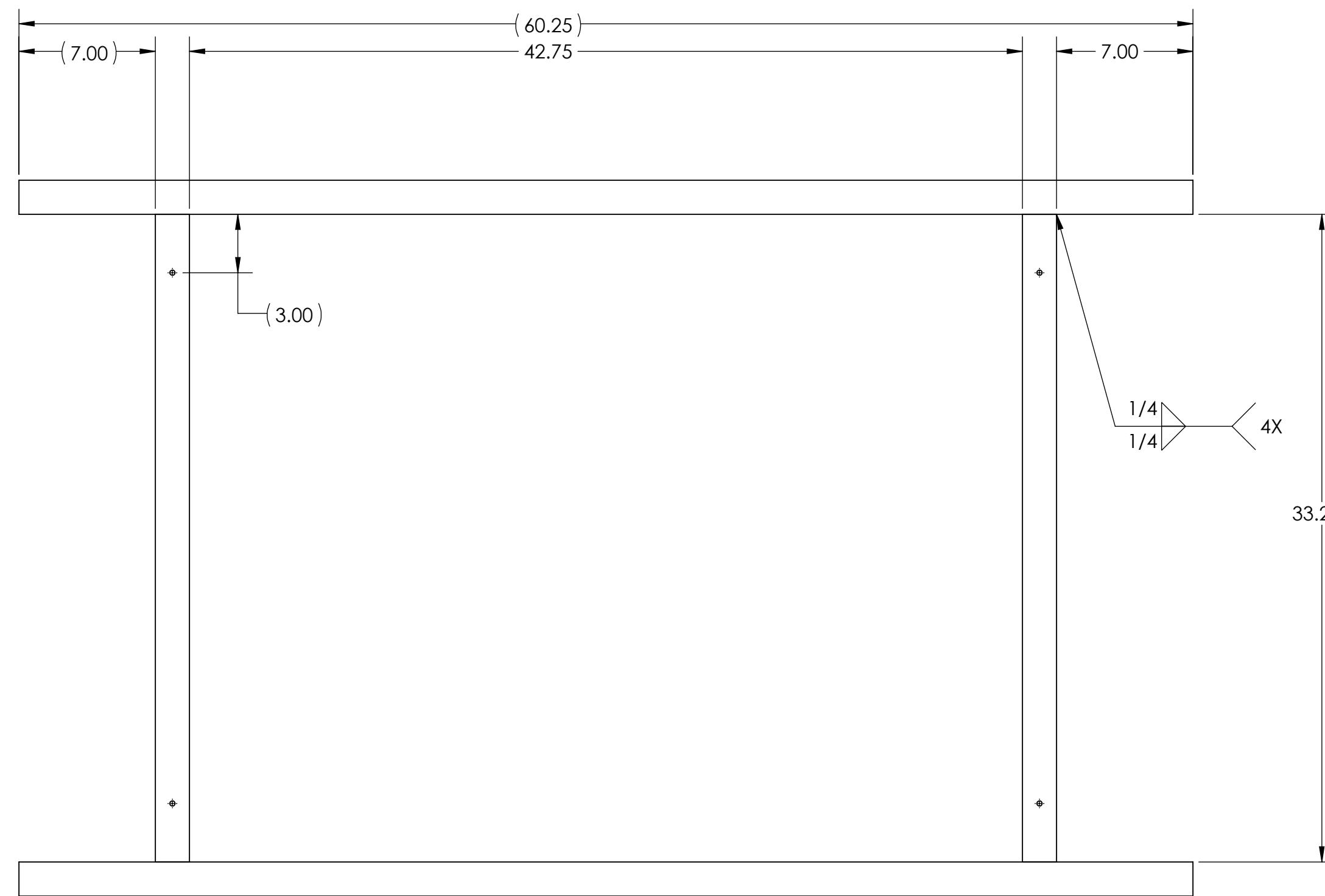
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Note: Tag or Label with Part Number

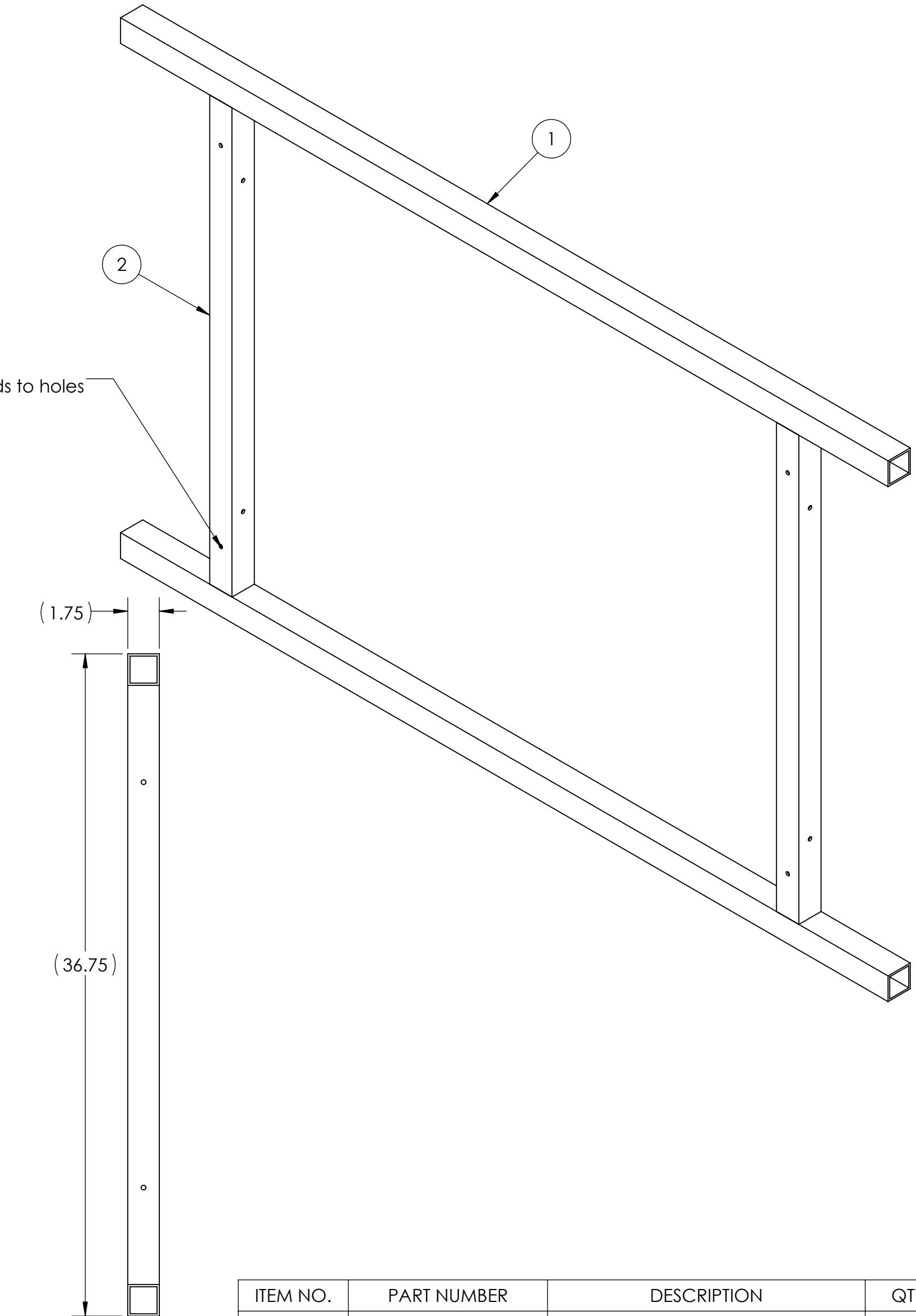
UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL $\pm 1/16$
ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$
TWO PLACE DECIMAL $\pm .02$
THREE PLACE DECIMAL $\pm .015$

MATERIAL/FINISH:
1.75" x .125" 6061
Aluminum Square Tube

DO NOT SCALE DRAWING

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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24331-01	Wall Frame Horizontal	2
2	GE-24331-02	Wall Frame Vertical	2



SOLIDWORKS
Modeling Solutions Partner

TITLE: Wall Goal
Frame
Weldment

SIZE DWG. NO. REV

C GE-24331

SCALE: 1:6 SHEET 1 OF 2

4

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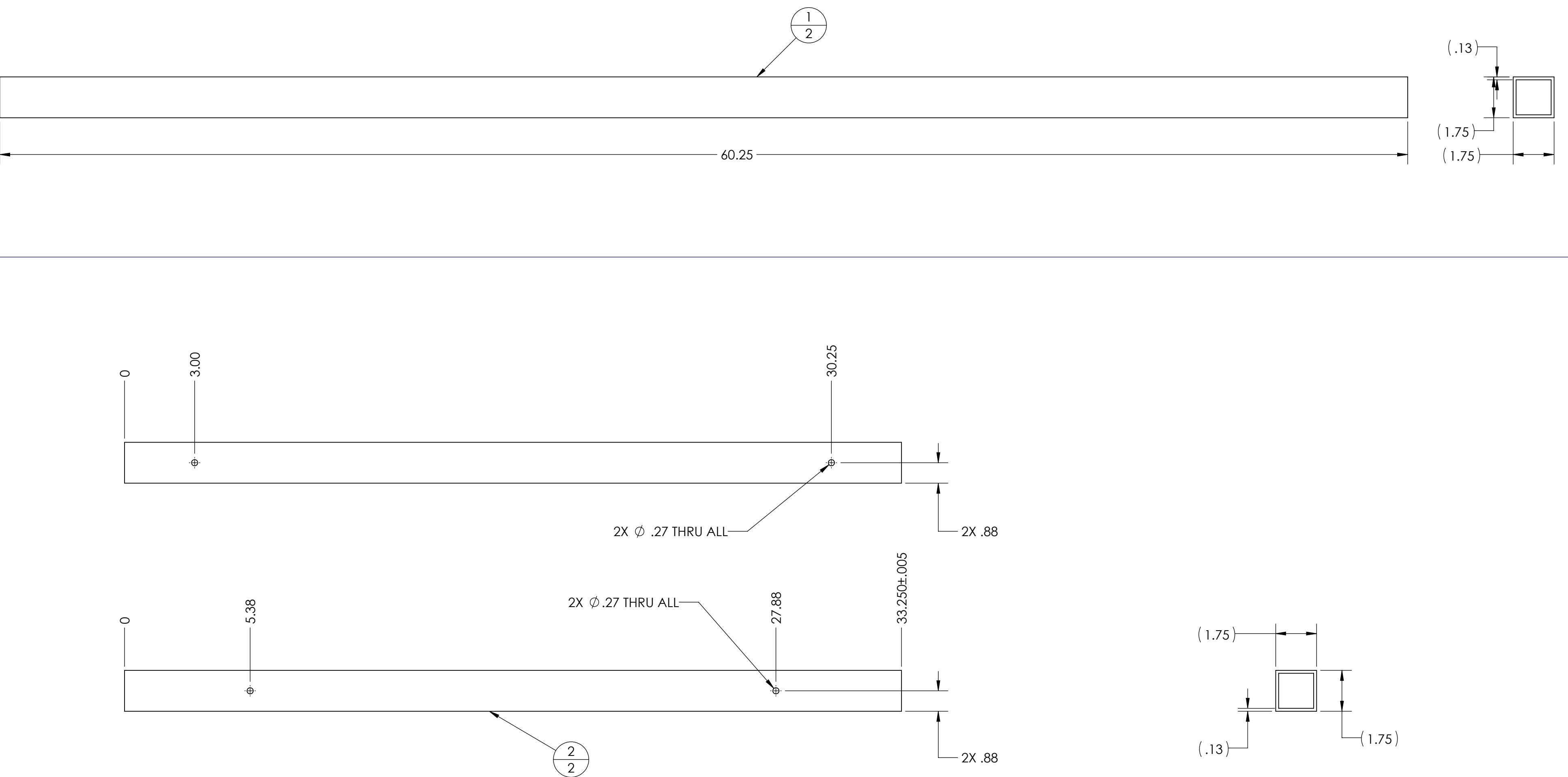
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DRAWN	JO	8/28/2023	
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MATERIAL/FINISH: 1.75" x .125" 6061 Aluminum Square Tube			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
**Wall Goal
Frame
Weldment**

SIZE DWG. NO. REV
C GE-24331

SCALE: 3:10 SHEET 2 OF 2

4

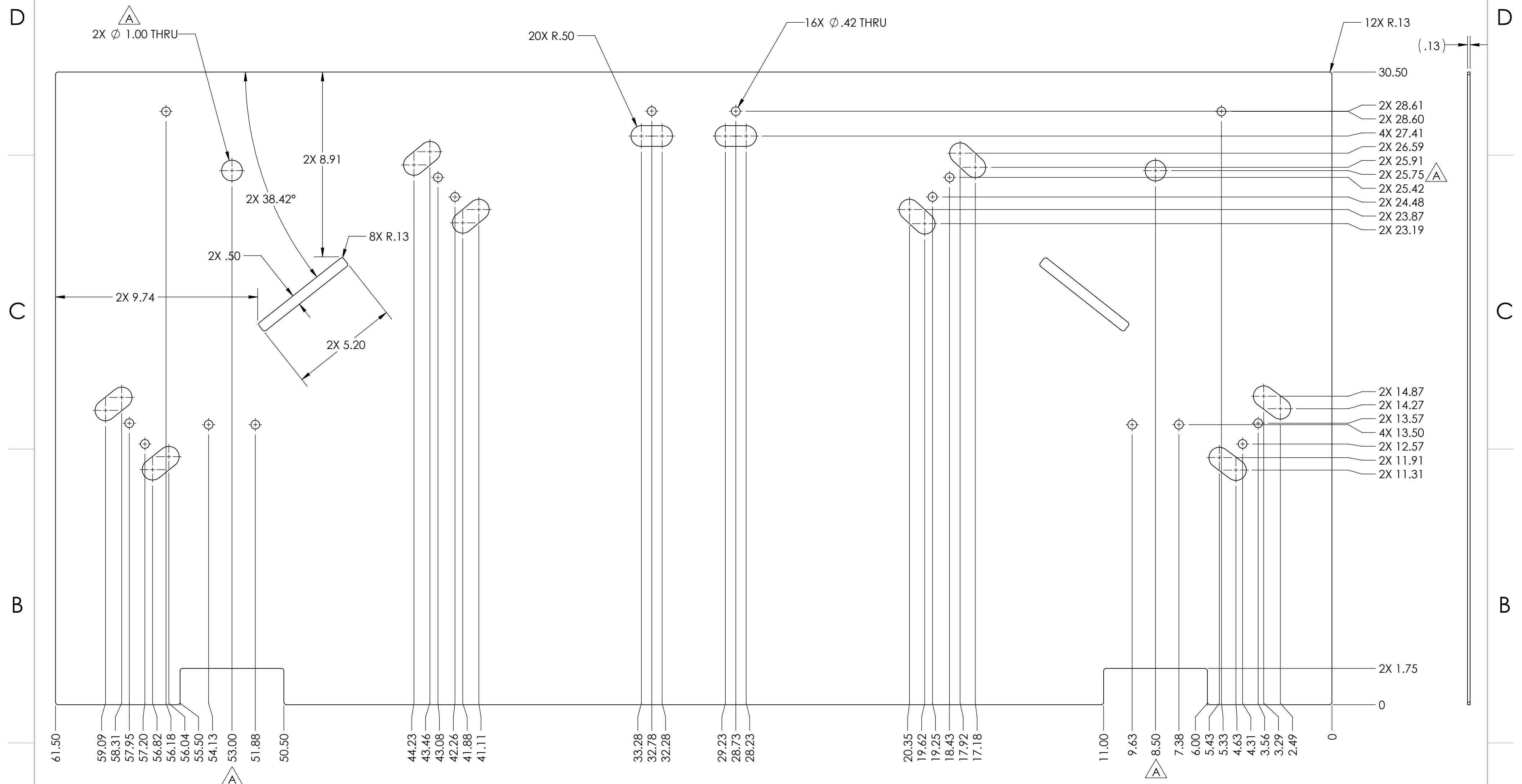
3

2

1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
A1, A4, C1, D4	A	Added Clearance Holes for Bolt Heads	9/11/2023	JO



UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	JO	8/28/2023
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH: 1/8" HDPE Black Smooth Finish			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST ROBOTICS COMPETITION

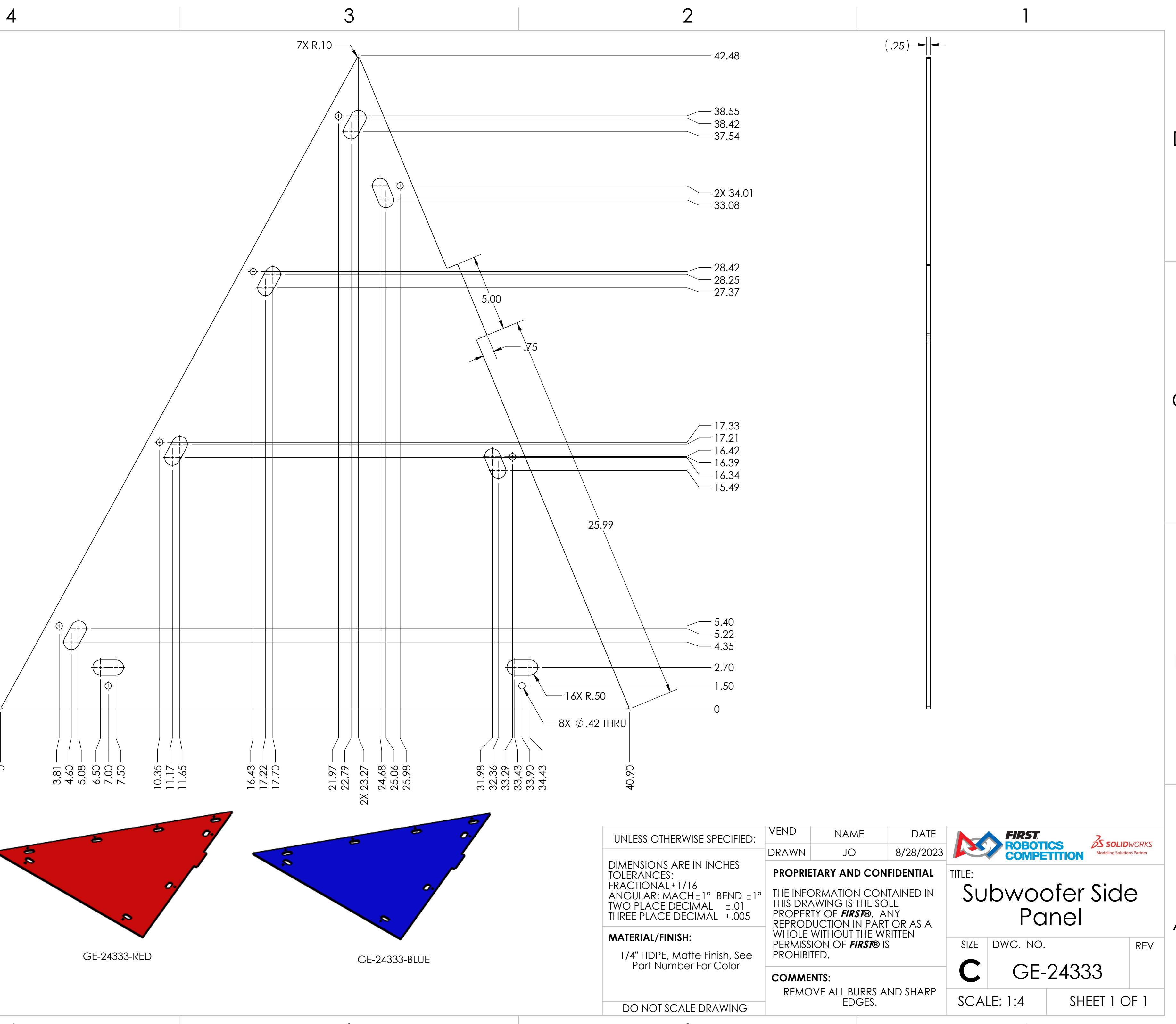
SOLIDWORKS Modeling Solutions Partner

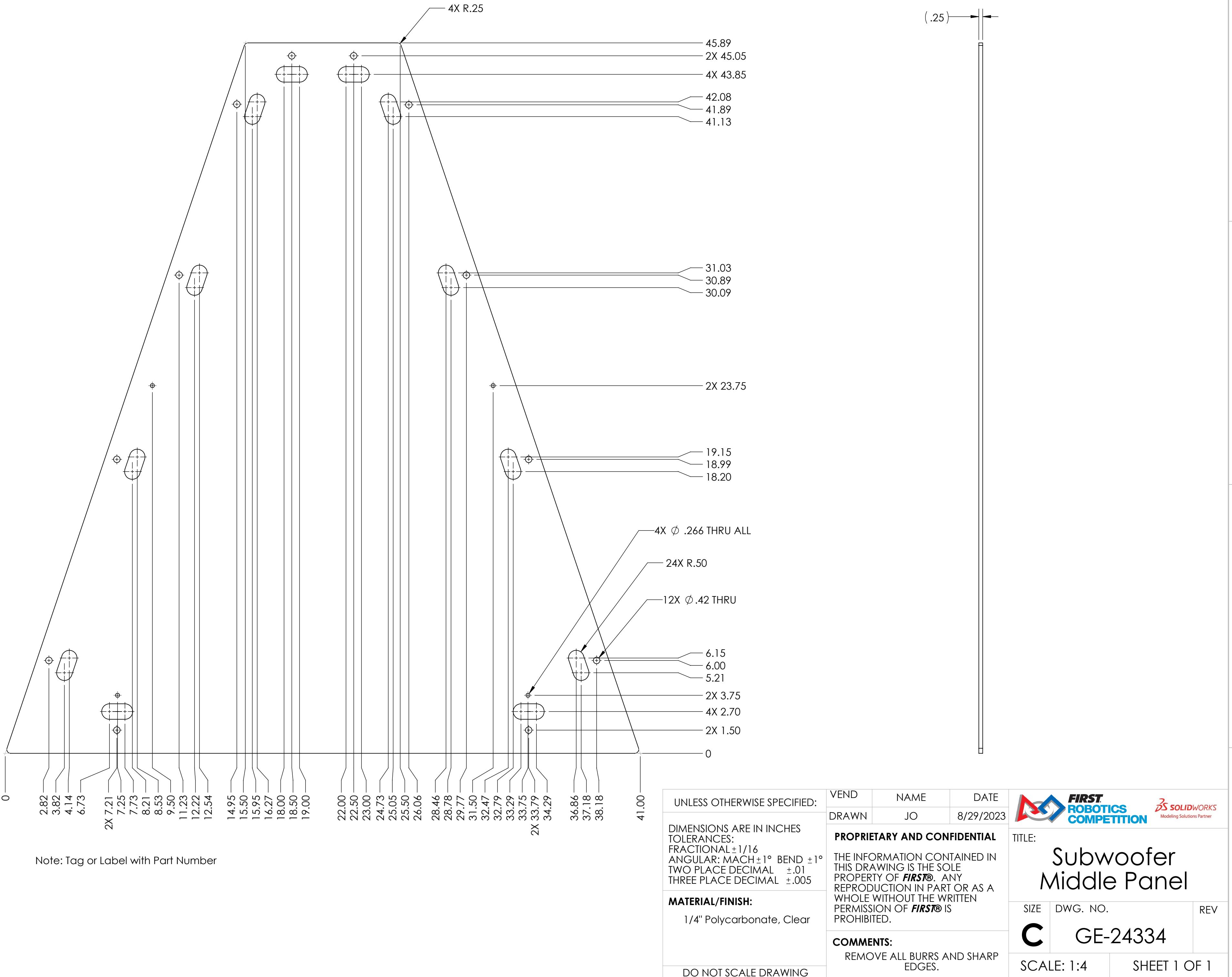
TITLE: Subwoofer Backboard

SIZE DWG. NO. REV

C GE-24332 A

SCALE: 3:10 SHEET 1 OF 1





FIRST
ROBOTICS
COMPETITION

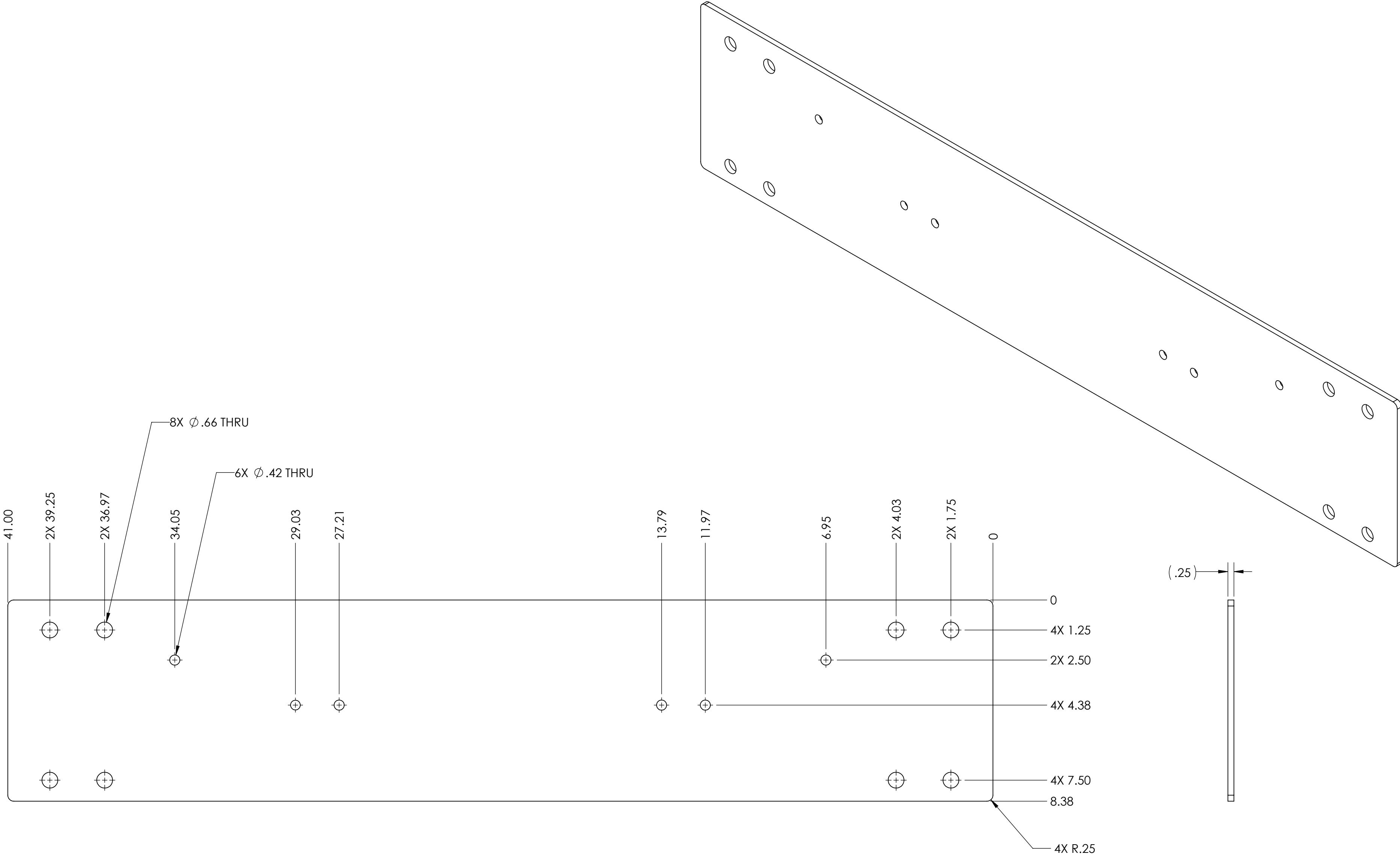
SOLIDWORKS
Modeling Solutions Partner

TITLE:
Subwoofer
Middle Panel

SIZE DWG. NO. REV

C GE-24334

SCALE: 1:4 SHEET 1 OF 1



UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	JO	8/28/2023	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:	SIZE	DWG. NO.	REV
1/4" HDPE Black Matte Finish	C	GE-24335	
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING	SCALE: 1:3	SHEET 1 OF 1	

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
**Subwoofer
Bumper**

SIZE DWG. NO. REV

C GE-24335

SCALE: 1:3 SHEET 1 OF 1

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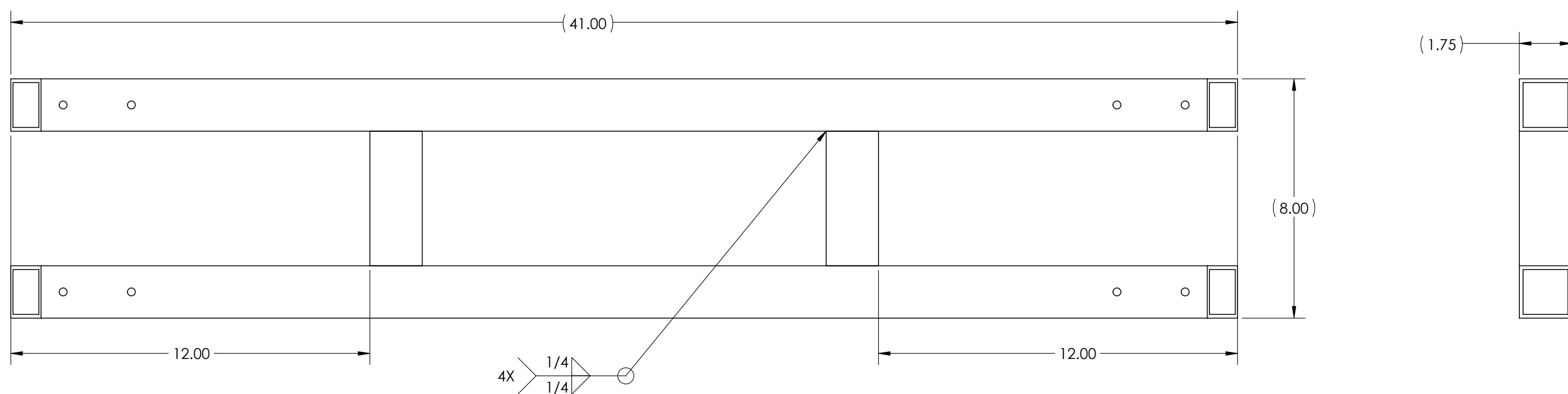
C

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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24336-01	Subwoofer Small Frame Horizontal	2
2	GE-24336-02	Subwoofer Frame Vertical	2

UNLESS OTHERWISE SPECIFIED:		
WELD	NAME	DATE
DRAWN	JO	8/28/2023
PROPRIETARY AND CONFIDENTIAL		
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MATERIAL/FINISH:		
1.75" x .125" 6061 Aluminum Square Tube		
COMMENTS:		
REMOVE ALL BURRS AND SHARP EDGES.		
DO NOT SCALE DRAWING		

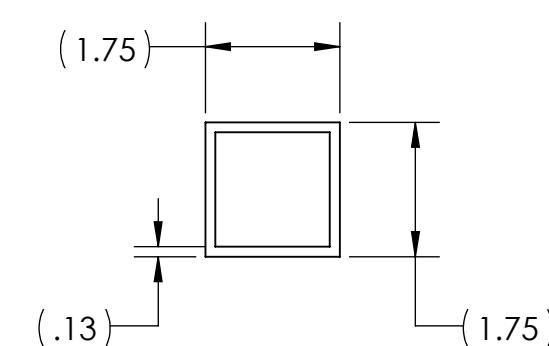
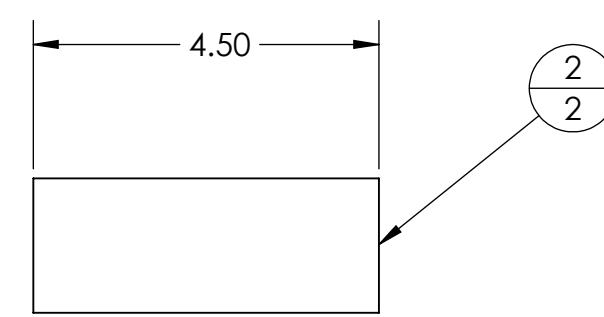
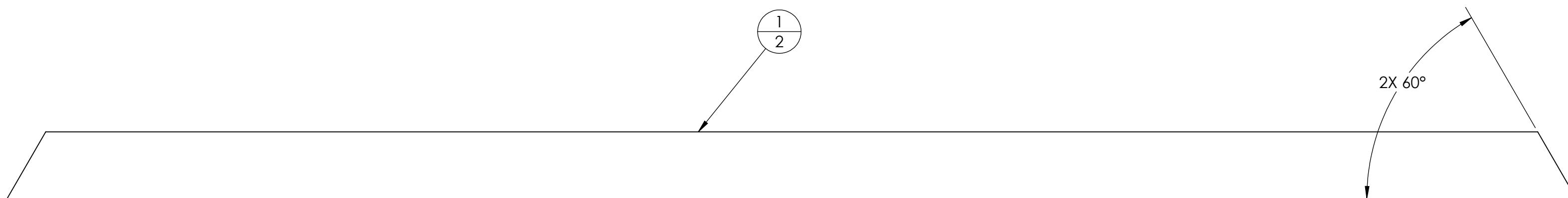
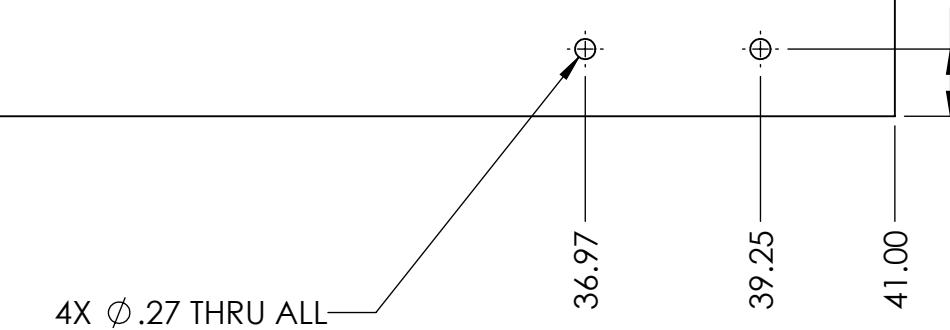
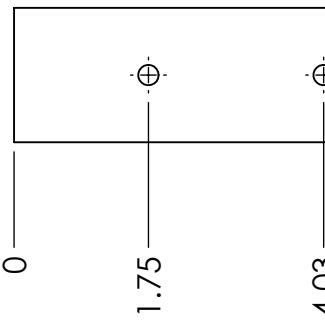
FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Subwoofer Small Frame

SIZE DWG. NO. REV

C GE-24336

SCALE: 1:3 SHEET 1 OF 2



UNLESS OTHERWISE SPECIFIED:	WELD	NAME	DATE
DRAWN	JO	8/28/2023	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH: 1.75" x .125" 6061 Aluminum Square Tube			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			
 FIRST ROBOTICS COMPETITION  SOLIDWORKS Modeling Solutions Partner			
TITLE: Subwoofer Small Frame			
SIZE	DWG. NO.	REV	
C	GE-24336		
SCALE: 2:5	SHEET 2 OF 2		

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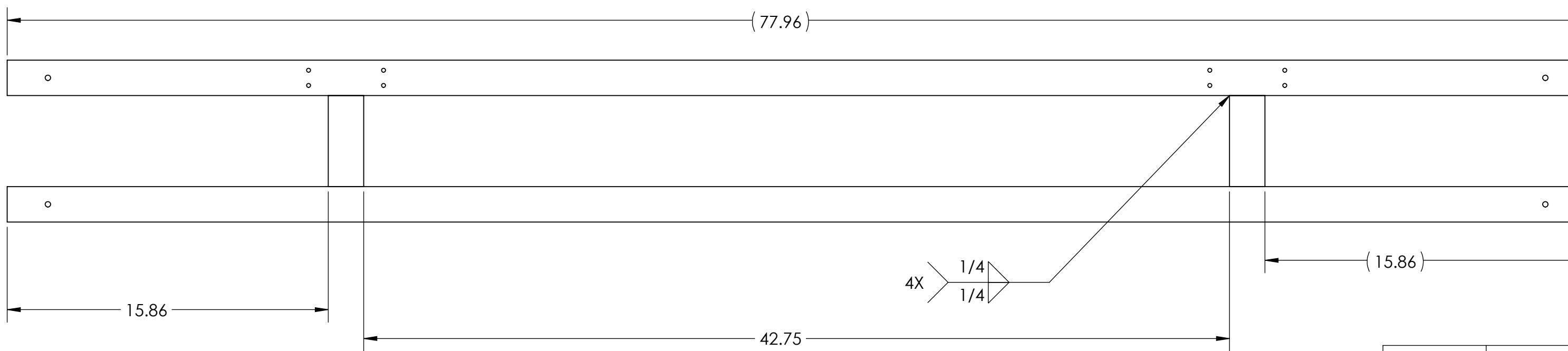
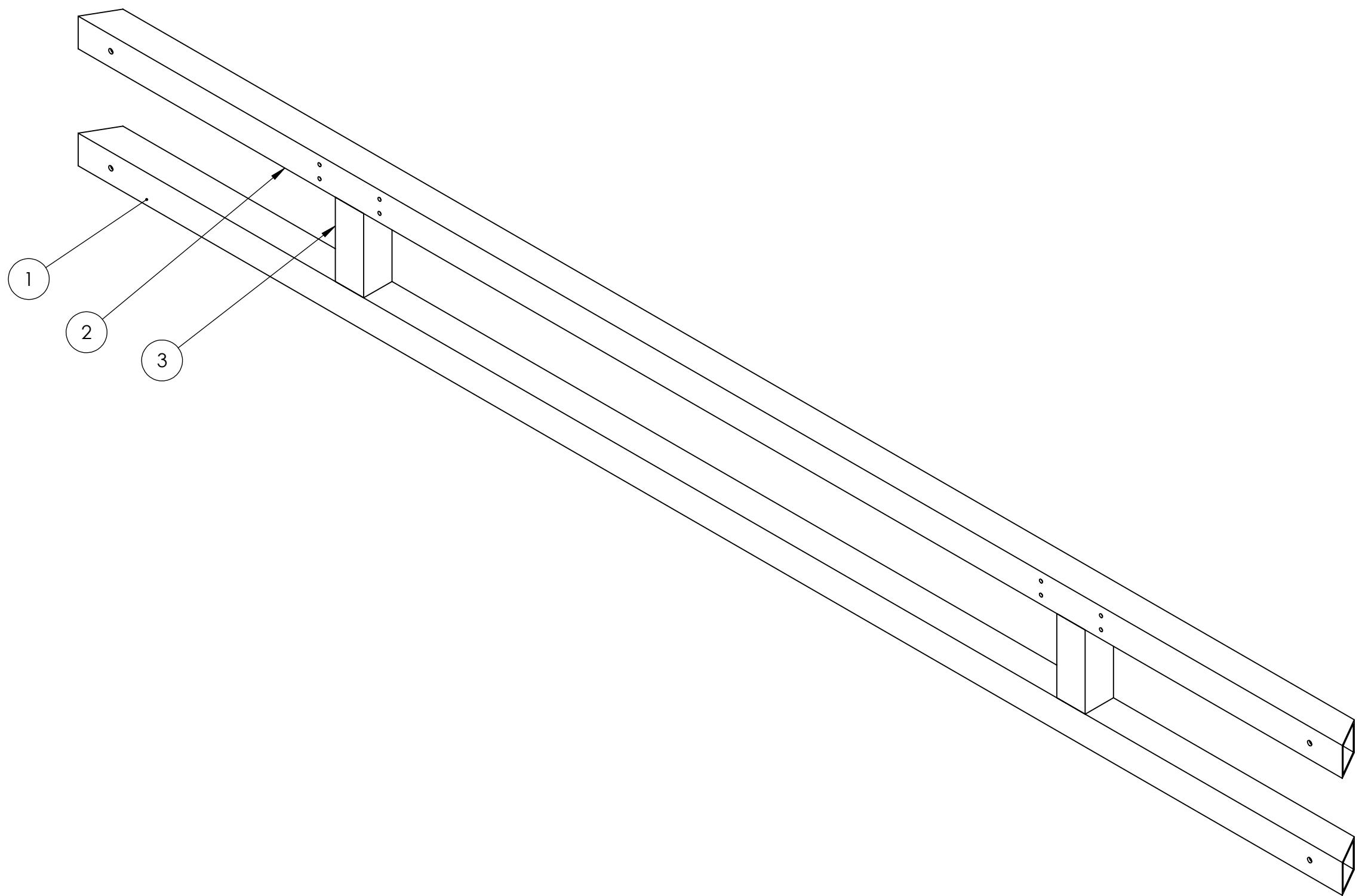
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24337-01	Subwoofer Back Frame Bottom Tube	1
2	GE-24337-02	Subwoofer Back Frame Top Tube	1
3	GE-24336-02	Subwoofer Frame Vertical	2

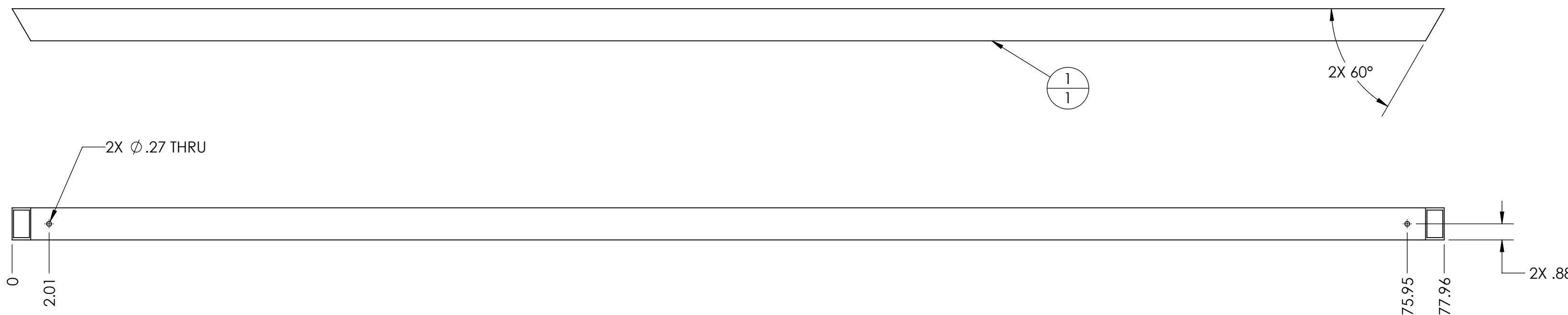
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WELD	NAME	DATE
DRAWN	JO	8/28/2023
PROPRIETARY AND CONFIDENTIAL		
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MATERIAL/FINISH: 1.75" x .125" 6061 Aluminum Square Tube		
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.		
DO NOT SCALE DRAWING		

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COMPETITION**  **SOLIDWORKS**
 Modeling Solutions Partner

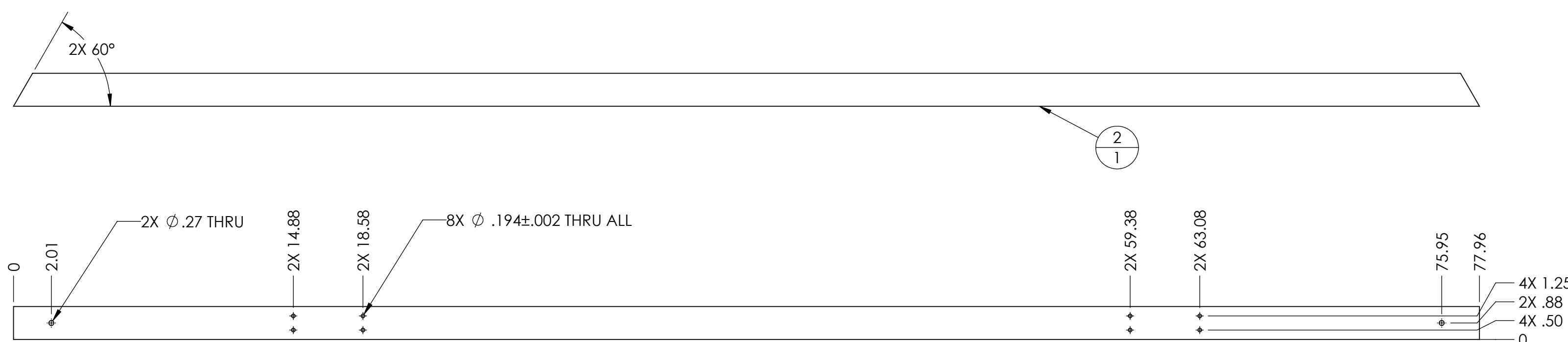
TITLE: Subwoofer Back Frame
SIZE DWG. NO. REV
C GE-24337

SCALE: 1:5 **SHEET 1 OF 2**

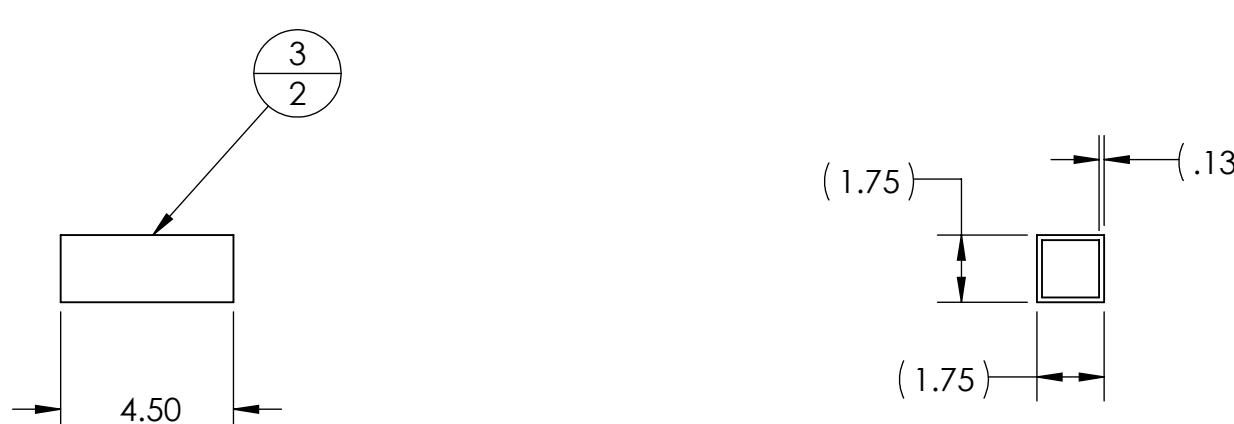
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UNLESS OTHERWISE SPECIFIED:	WELD	NAME	DATE
DRAWN	JO	8/28/2023	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH: 1.75" x .125" 6061 Aluminum Square Tube			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			
FIRST ROBOTICS COMPETITION			
SOLIDWORKS Modeling Solutions Partner			
TITLE: Subwoofer Back Frame			
SIZE DWG. NO. REV			
C GE-24337			
SCALE: 1:5 SHEET 2 OF 2			

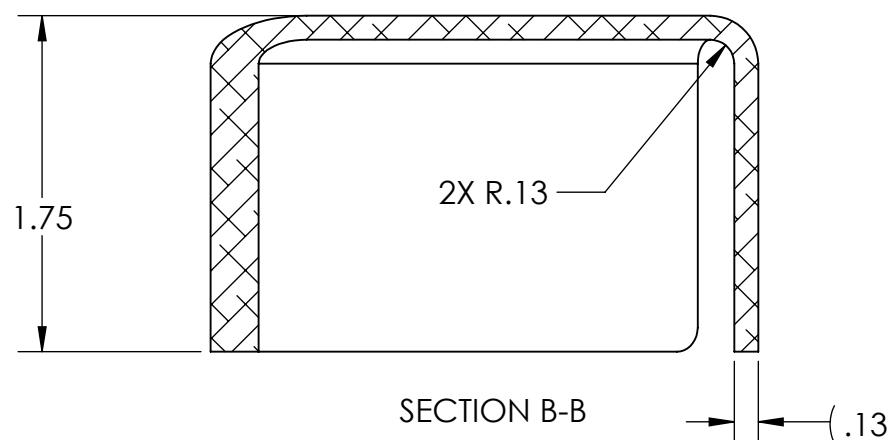
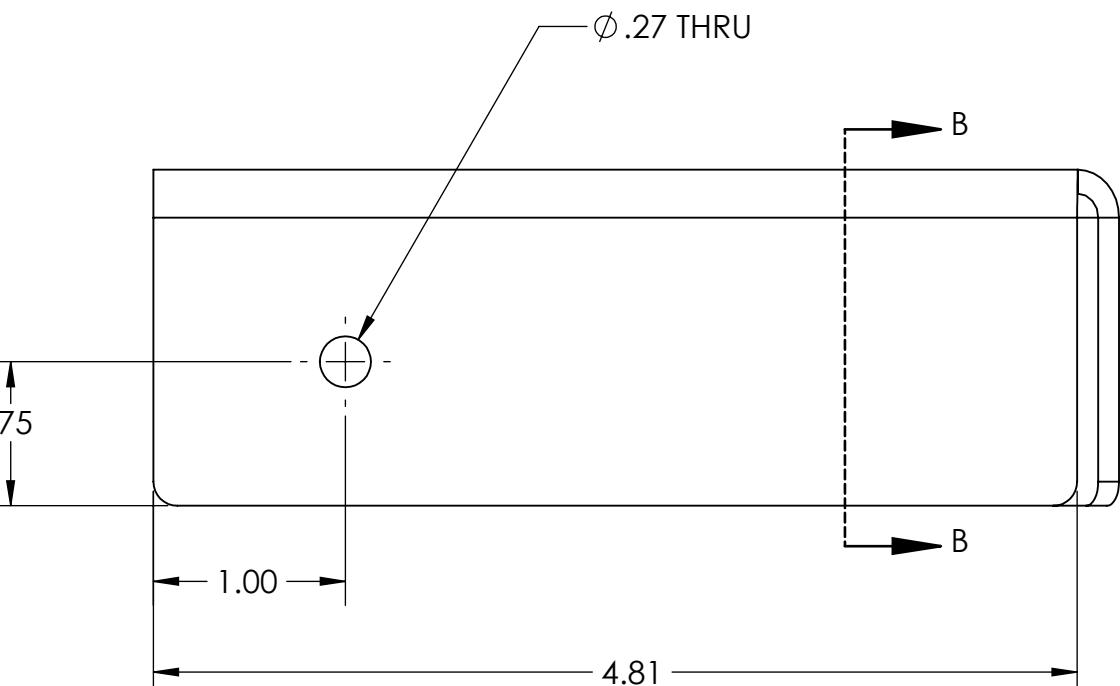
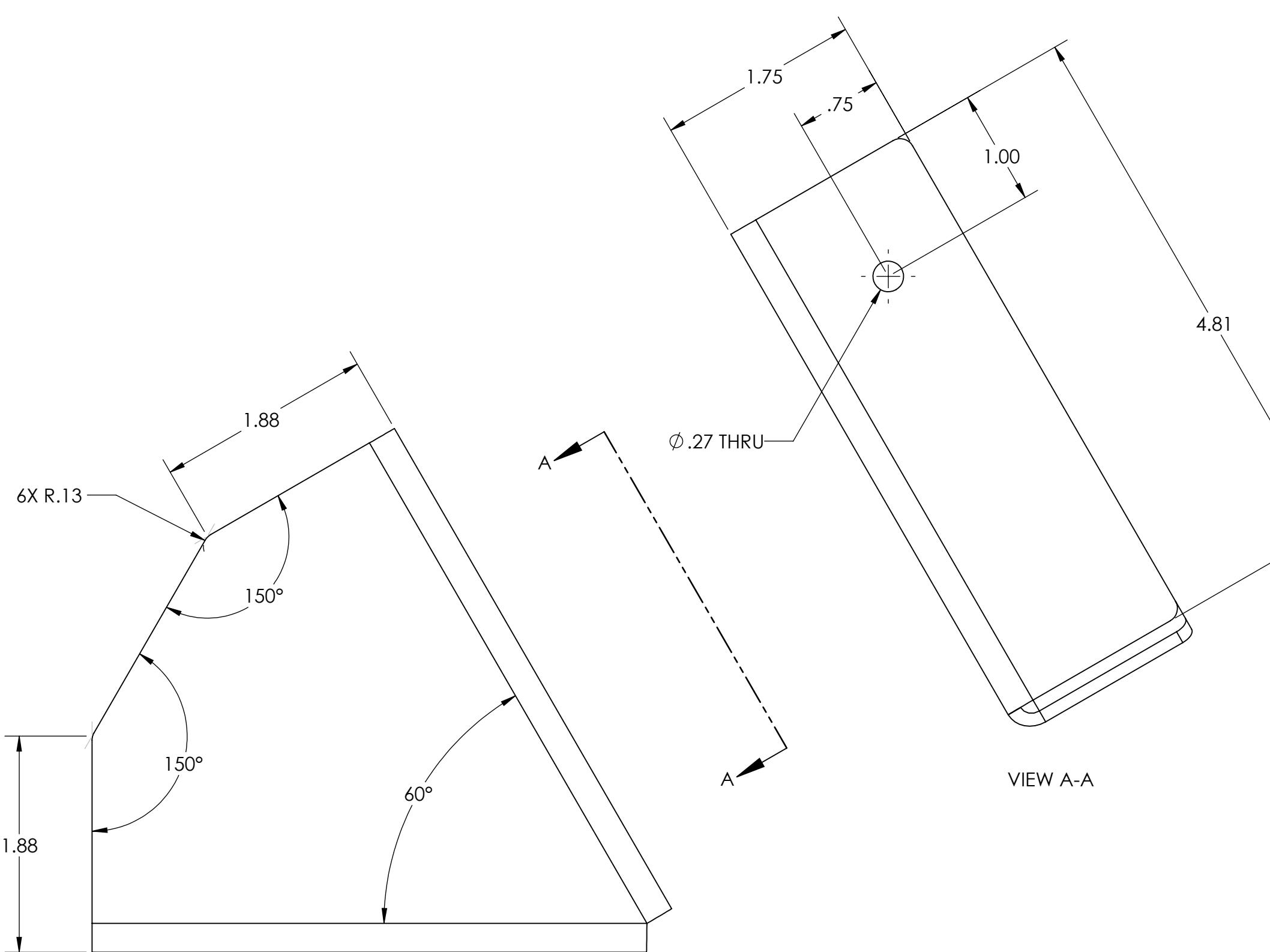
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Note: Tag or Label with Part Number

UNLESS OTHERWISE SPECIFIED:	BEND	NAME	DATE
DRAWN	JO	8/28/2023	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH: 8 Ga 5052 Aluminum			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

 **FIRST
ROBOTICS
COMPETITION**  **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Subwoofer Back Bracket

SIZE DWG. NO. REV

C GE-24338

SCALE: 1:1 SHEET 1 OF 1

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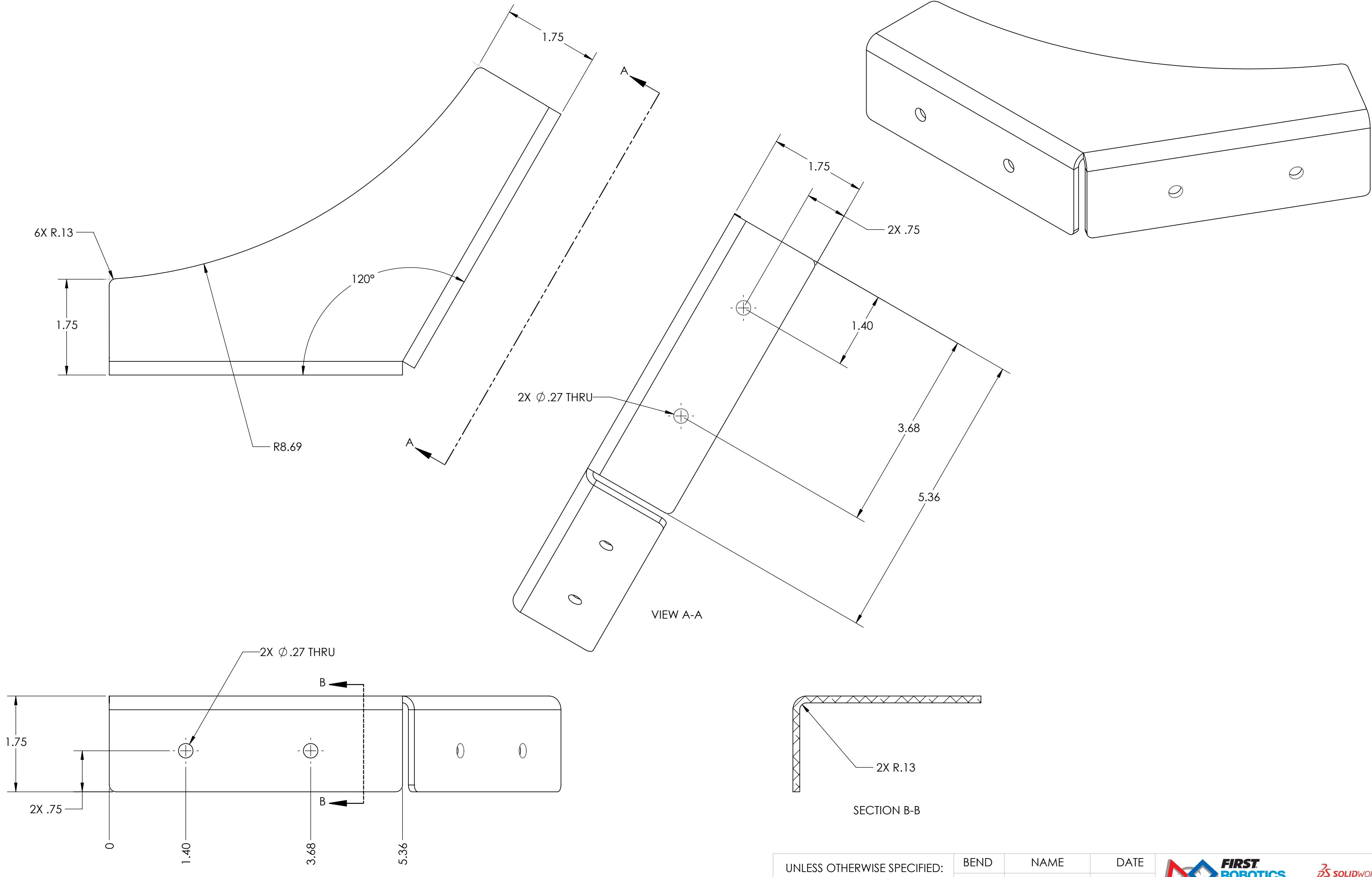
C

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Note: Tag or Label with Part Number

UNLESS OTHERWISE SPECIFIED:	BEND	NAME	DATE
DRAWN	JO	8/28/2023	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH: 8 Ga 5052 Aluminum			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

**FIRST
ROBOTICS
COMPETITION**
SOLIDWORKS
Modeling Solutions Partner

**Front Subwoofer
Bracket**
C GE-24339
SCALE: 4:5 SHEET 1 OF 1

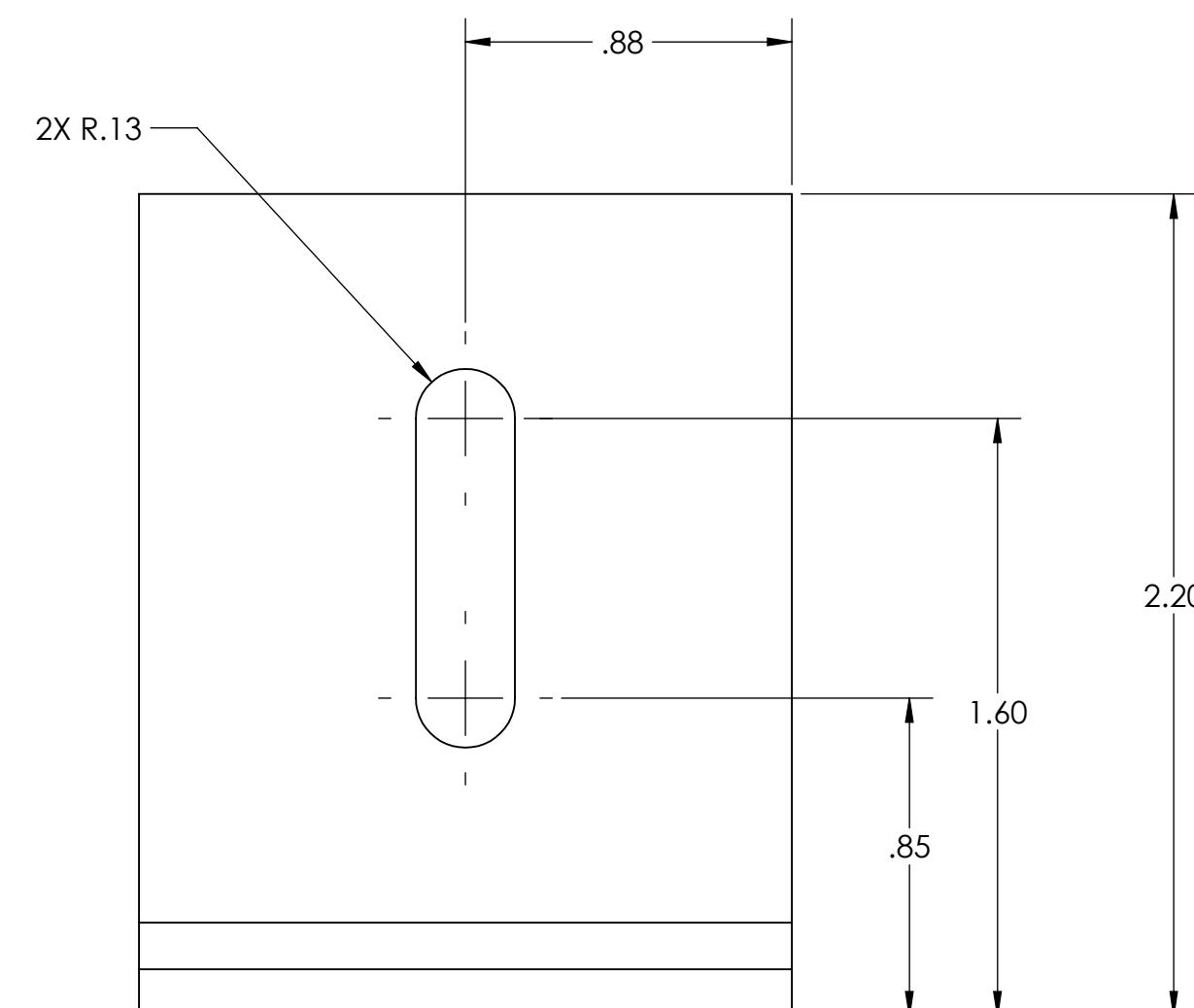
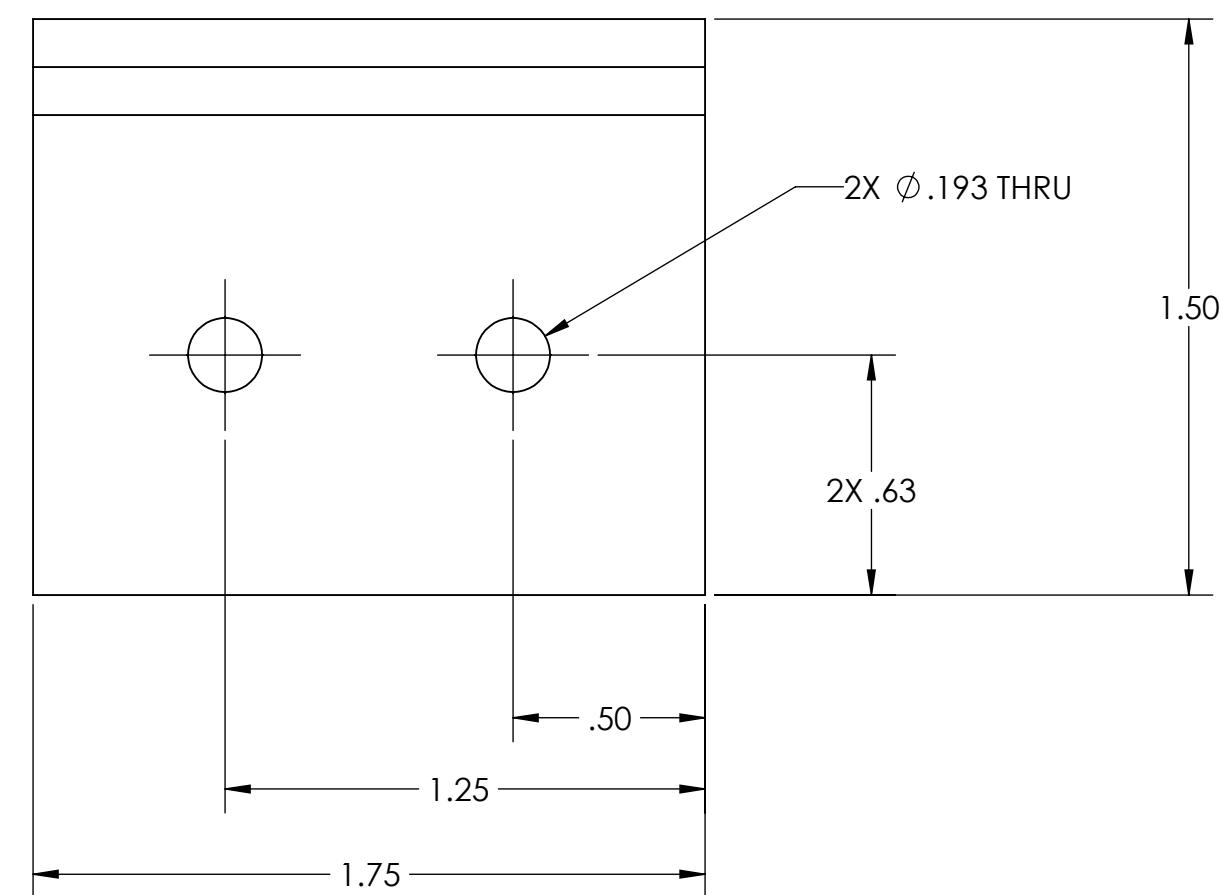
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Note: Tag or Label with Part Number

UNLESS OTHERWISE SPECIFIED:	BEND	NAME	DATE
DRAWN	JO	8/28/2023	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH: 8 Ga 5052 Aluminum			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

 **FIRST
ROBOTICS
COMPETITION**  **SOLIDWORKS**
Modeling Solutions Partner

TITLE: **Subwoofer
Mounting
Bracket**

SIZE DWG. NO. REV

C GE-24340

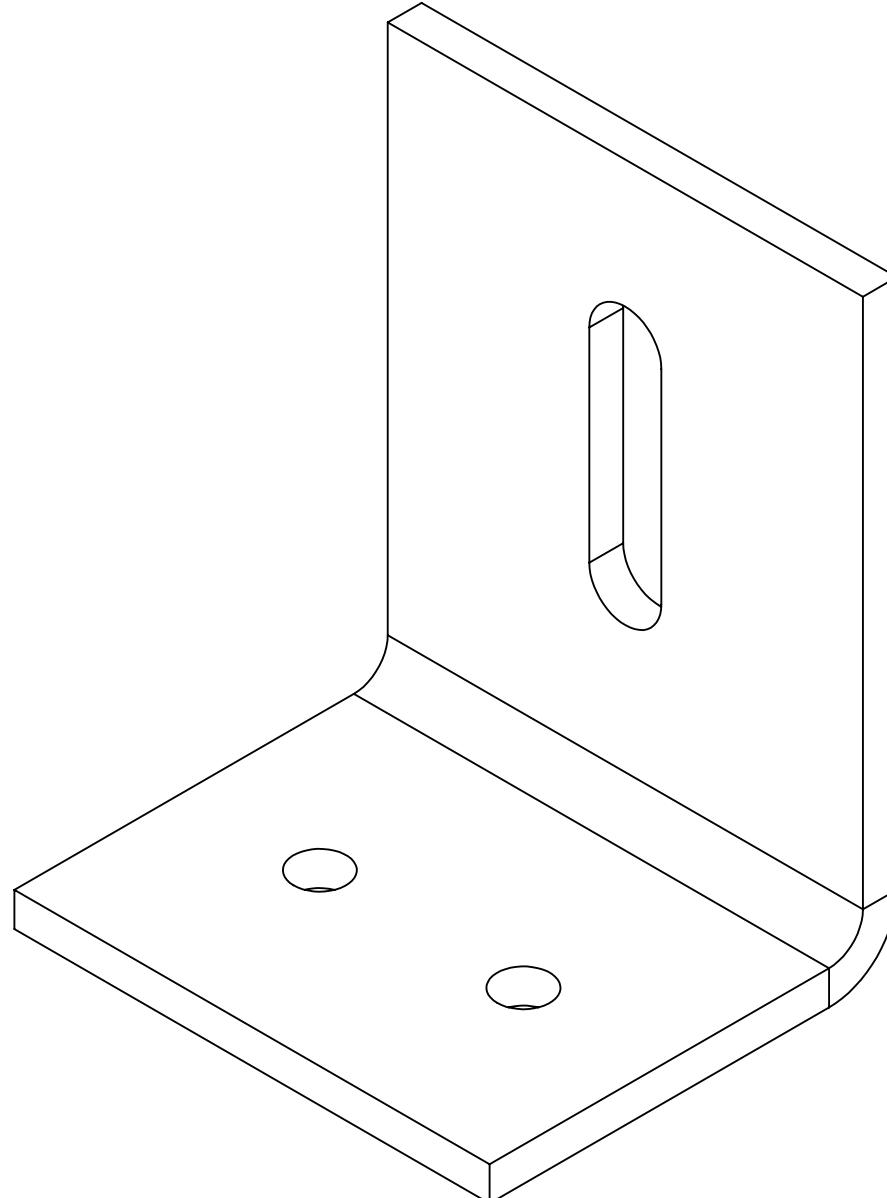
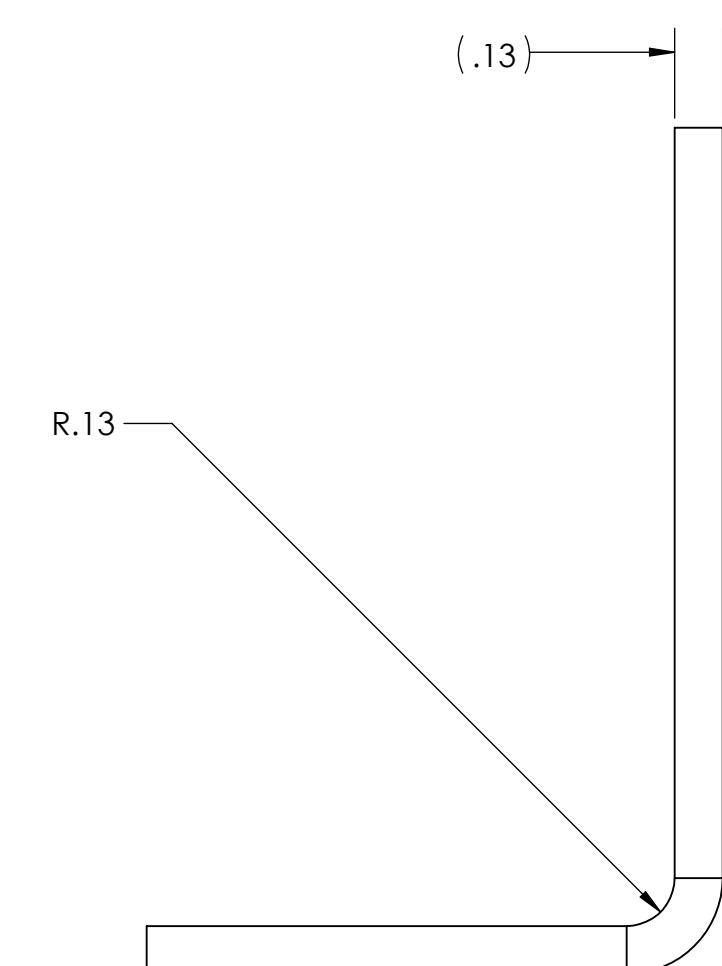
SCALE: 2:1 SHEET 1 OF 1

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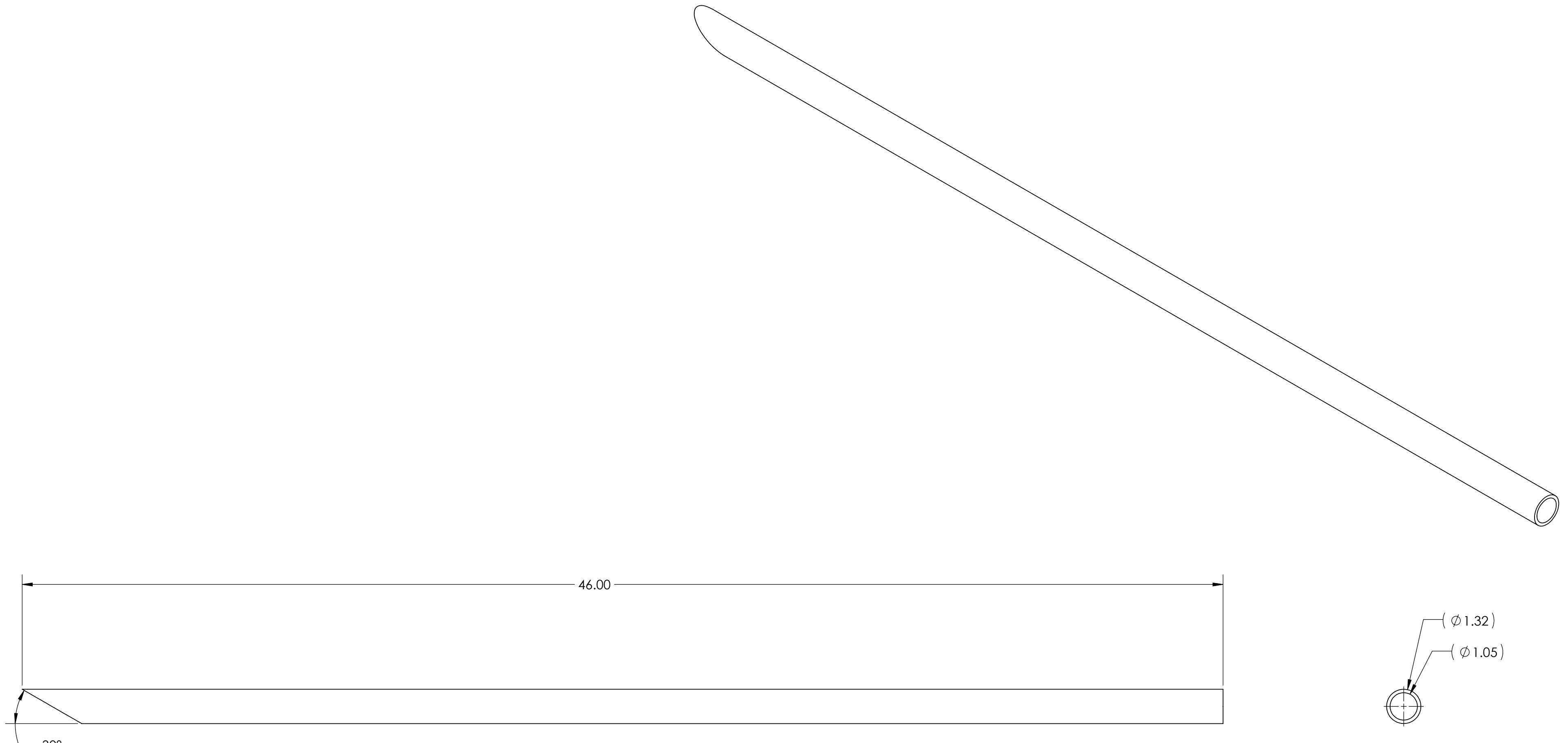
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Note: Tag or Label with Part Number

UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	JO	8/28/2023	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:	SIZE	DWG. NO.	REV
1" Schedule 40 6061 Aluminum Pipe	C	GE-24341	
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING	SCALE: 1:3	SHEET 1 OF 1	

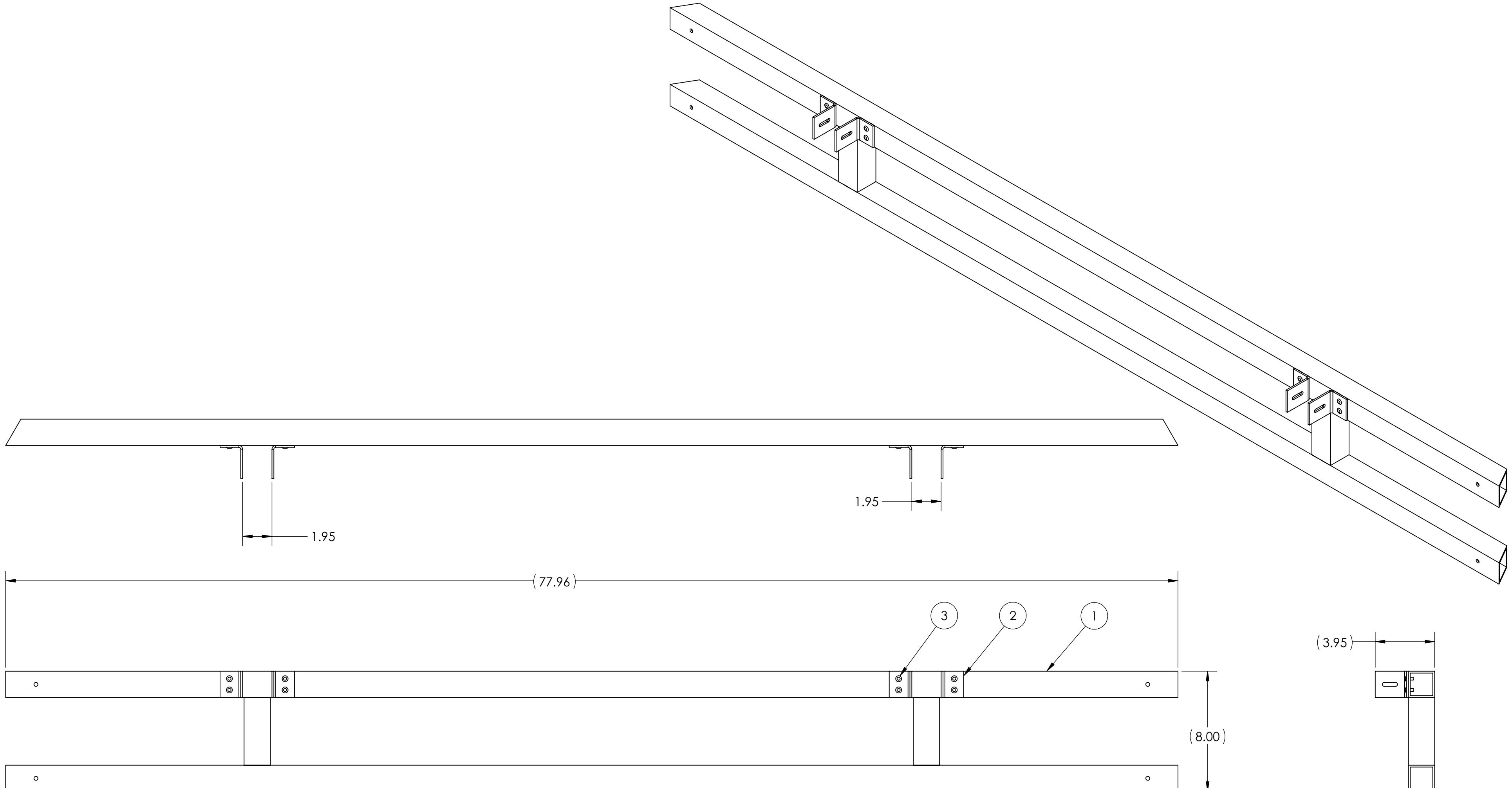
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Notes:

Attach (2) to (1) with (3)

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24337	Subwoofer Back Frame	1
2	GE-24340	Subwoofer Mounting Bracket	4
3	rivet_.1875_.126-.25	.3/16" Rivet, .126-.25 Grip Range	8

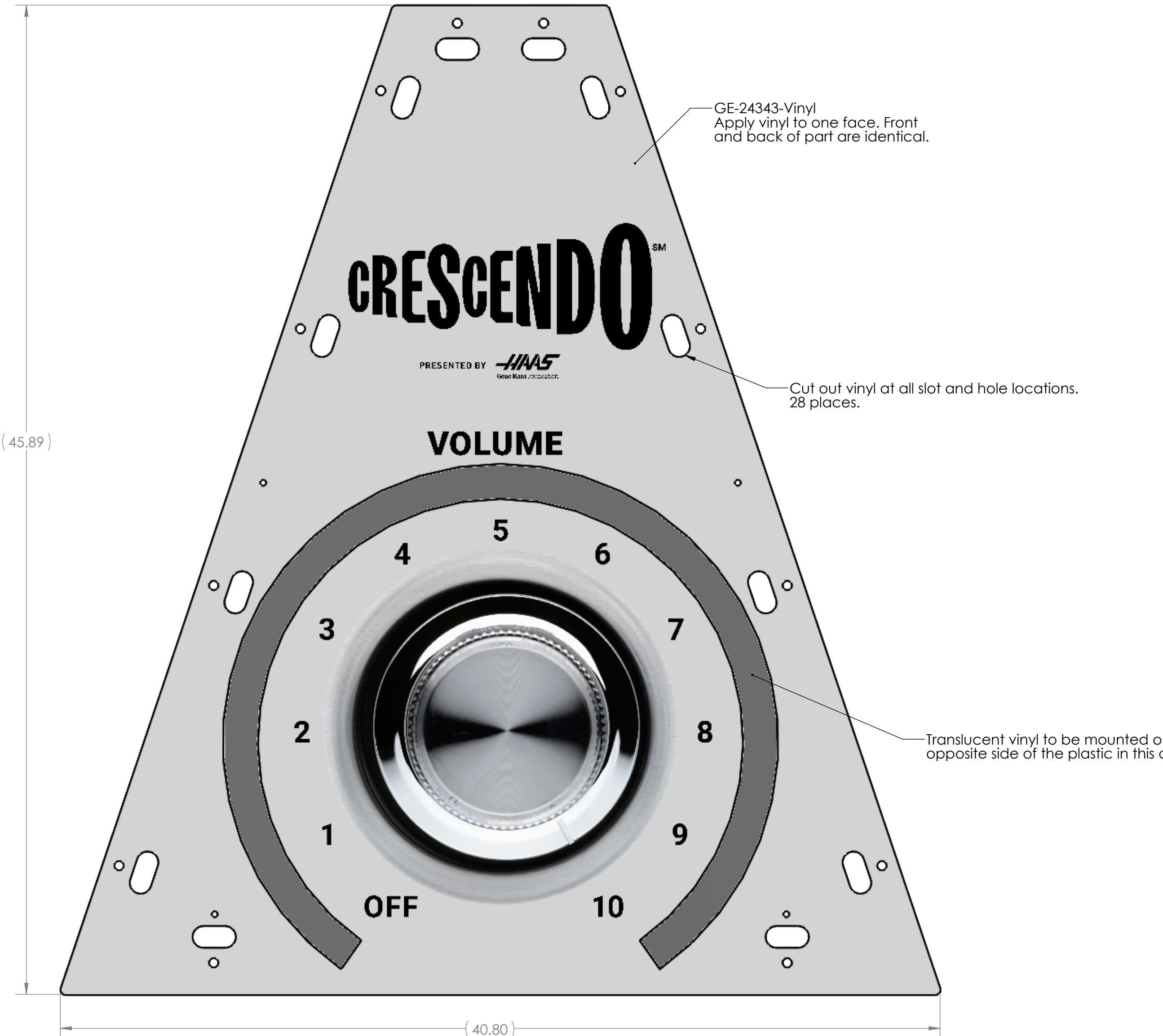
UNLESS OTHERWISE SPECIFIED:			VEND	NAME	DATE
			DRAWN	JO	8/28/2023
PROPRIETARY AND CONFIDENTIAL					
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.					
COMMENTS:					
REMOVE ALL BURRS AND SHARP EDGES.					
DO NOT SCALE DRAWING			SIZE	DWG. NO.	REV
			C	GE-24342	
			SCALE: 1:5	SHEET 1 OF 1	

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UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	DF	10/18/2023
TOLERANCES: FRACTIONAL $\pm 1/2$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .50$			
PROPRIETARY AND CONFIDENTIAL THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH:			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Subwoofer Middle Panel with Vinyl

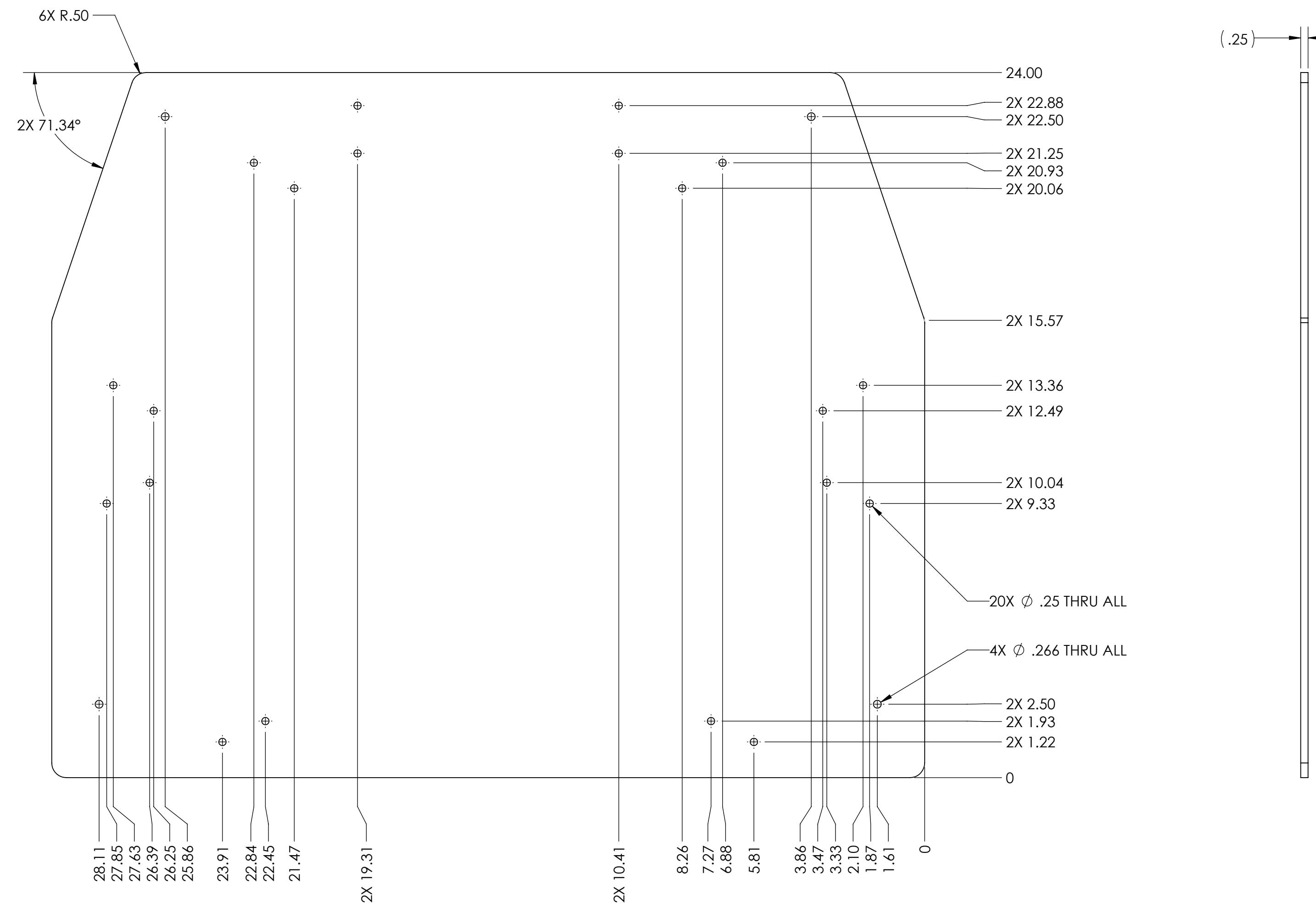
SIZE DWG. NO. REV

C GE-24343

SCALE: 1:4 SHEET 1 OF 1

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UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	JO	10/6/2023	
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH: 1/4" Polycarbonate, Clear			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
**Subwoofer Light
Mount Panel**

SIZE DWG. NO. REV
C GE-24344

SCALE: 1:3 SHEET 1 OF 1

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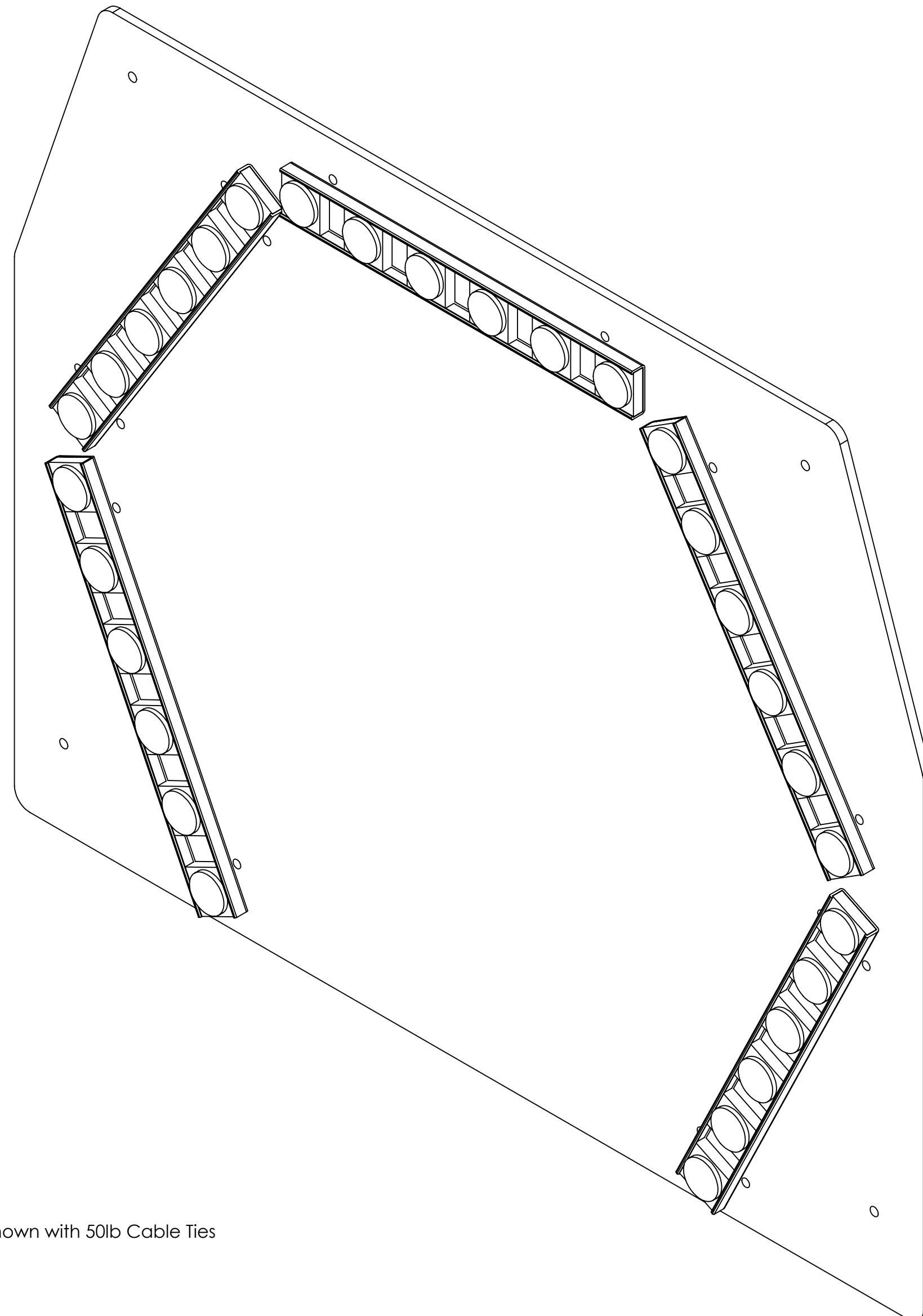
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Attach Ligths as shown with 50lb Cable Ties

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24344	Subwoofer Light Mount Panel	1
2	lightTrackWithLights_d uckbill		5

UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL $\pm\frac{1}{2}$
ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$
TWO PLACE DECIMAL $\pm .50$

MATERIAL/FINISH:

DO NOT SCALE DRAWING

FIELD NAME DATE

DRAWN JO 12/19/2023



SOLIDWORKS
Modeling Solutions Partner

DS

FIRST
ROBOTICS
COMPETITION

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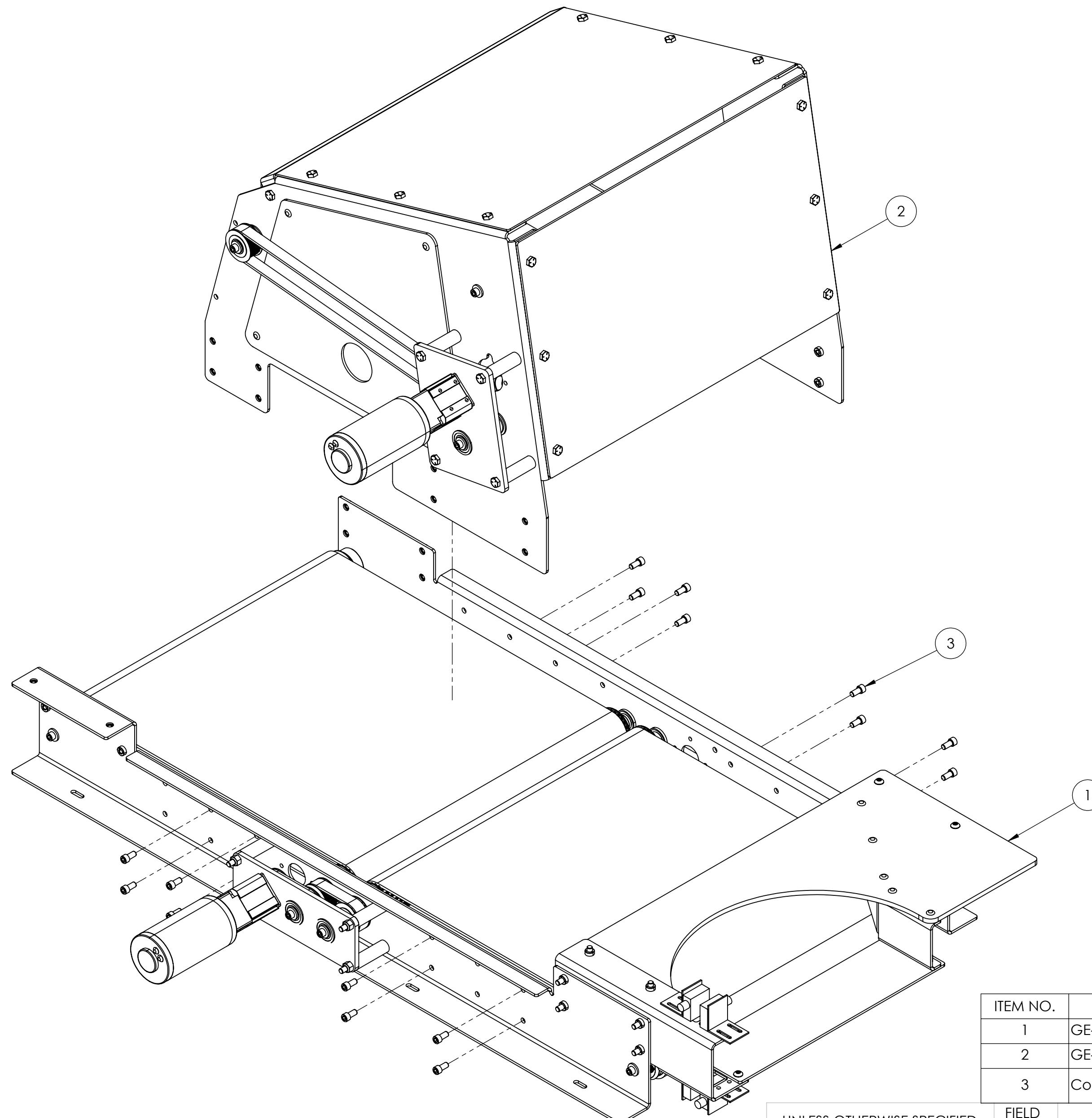
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UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES

TOLERANCES:

FRACTIONAL $\pm\frac{1}{2}$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .50$

MATERIAL/FINISH:

PROPRIETARY AND CONFIDENTIAL

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COMMENTS:

REMOVE ALL BURRS AND SHARP EDGES.

DO NOT SCALE DRAWING

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24351	Ring Counter Bottom Assembly	1
2	GE-24370	Ring Counter Top Assembly	1
3	Configurable Bolt	.5" Long 1/4-20 Socket Head Cap Screw	16



TITLE: Ring Counter

SIZE DWG. NO. REV
C GE-24350

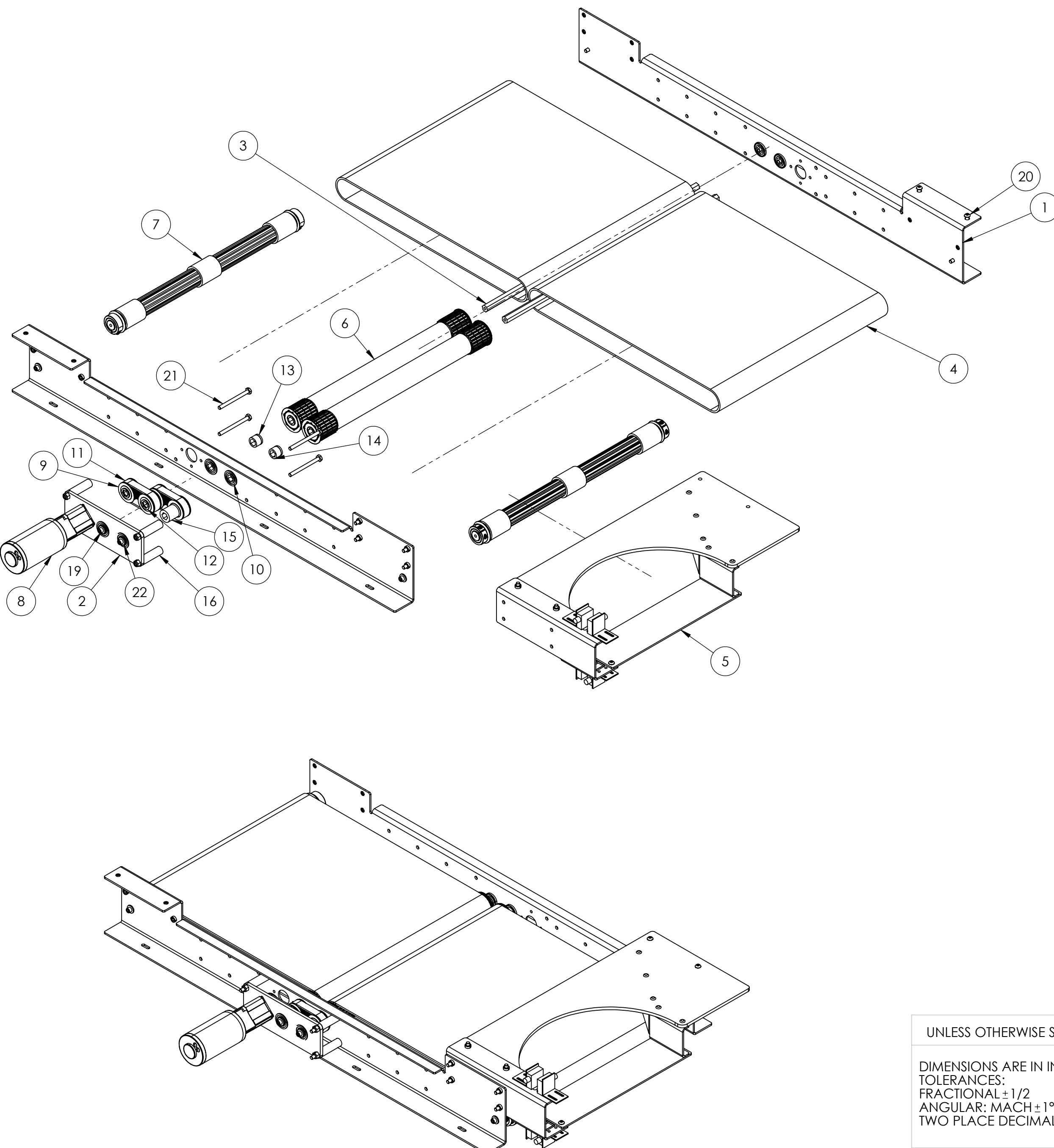
SCALE: 1:4 SHEET 1 OF 1

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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24352	Counter Side Plate w/ PEMs	2
2	GE-24353	Speaker Counter Bottom Motor Plate	1
3	GE-24354	Note Counter Bottom Hex Shaft	2
4	GE-24355	Custom Wide Belt	2
5	GE-24361	Ring Counter Sensor Box	1
6	GE-24383	Live Shaft - Bottom Assembly	2
7	GE-24384	Dead Shaft - Bottom Assembly	2
8	2 Stage Gearmotor	12:1 Sport Gearbox and CIM Motor	1
9	am-4626 24T 5mm HTD 500IN Hex 15mm Wide Bore Pulley		4
10	0.500 Hex ID x 1.125 OD x 0.313 WD (Flanged Bearing v2) (217-3875)		6
11	225-5m-15 Belt		2
12	.0625 Hex Spacer		4
13	.125 Hex Spacer		5
14	.5 Hex Spacer		4
15	1 in hex spacer		1
16	2.25 Bolt Spacer		4
17	91255A261_Button Head Hex Drive Screw		1
18	washer_flat_10_oversized	Oversized flat Washer for #10 Screw	1
19	Configurable Bolt	.5" Long 1/4-20 Socket Head Cap Screw	8
20	Configurable Bolt	.75" Long 1/4-20 Button Head Cap Screw	6
21	Configurable Bolt	3" Long 1/4-20 Hex Head Bolt	4
22	washer_flat_.25	Flat Washer for 1/4" Screw	8
23	nylock_.25_20	Steel Nylon-Insert Locknut, 1/4"-20	4

UNLESS OTHERWISE SPECIFIED:		
FIELD	NAME	DATE
DRAWN	JO	12/19/2023
PROPRIETARY AND CONFIDENTIAL		
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COMMENTS:		
REMOVE ALL BURRS AND SHARP EDGES.		
DO NOT SCALE DRAWING		
SIZE	DWG. NO.	REV
C	GE-24351	
SCALE: 1:6	SHEET 1 OF 1	

 **FIRST
ROBOTICS
COMPETITION**  **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Ring Counter Bottom Assembly

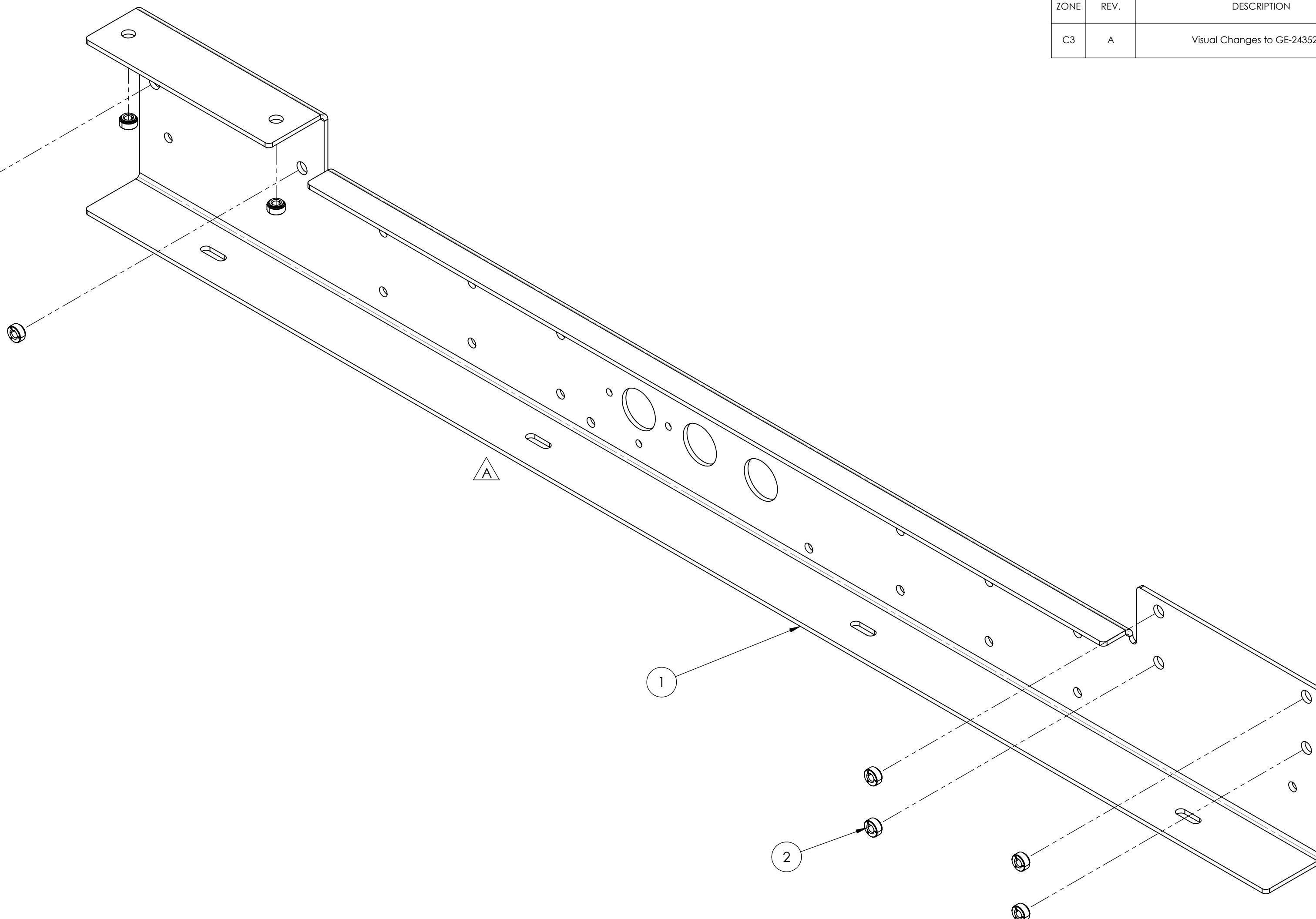
SIZE DWG. NO. REV

C GE-24351

SCALE: 1:6 SHEET 1 OF 1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
C3	A	Visual Changes to GE-24352-01	10/12/2023	JO



Notes:
Insert PEMs as shown
Tag or Label with Part Number

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24352-01	Counter Side Plate	1
2	pem_clinchnut_25_20 .054	1/4-20 self-clinching nut, .054 shank	8

UNLESS OTHERWISE SPECIFIED:			VEND	NAME	DATE
DIMENSIONS ARE IN INCHES			DRAWN	JO	9/12/2023
TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .005$					
PROPRIETARY AND CONFIDENTIAL					
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MATERIAL/FINISH:					
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.					
DO NOT SCALE DRAWING					
TITLE: Counter Side Plate w/ PEMs			SIZE DWG. NO. REV		
C GE-24352			A		
SCALE: 1:2			SHEET 1 OF 1		

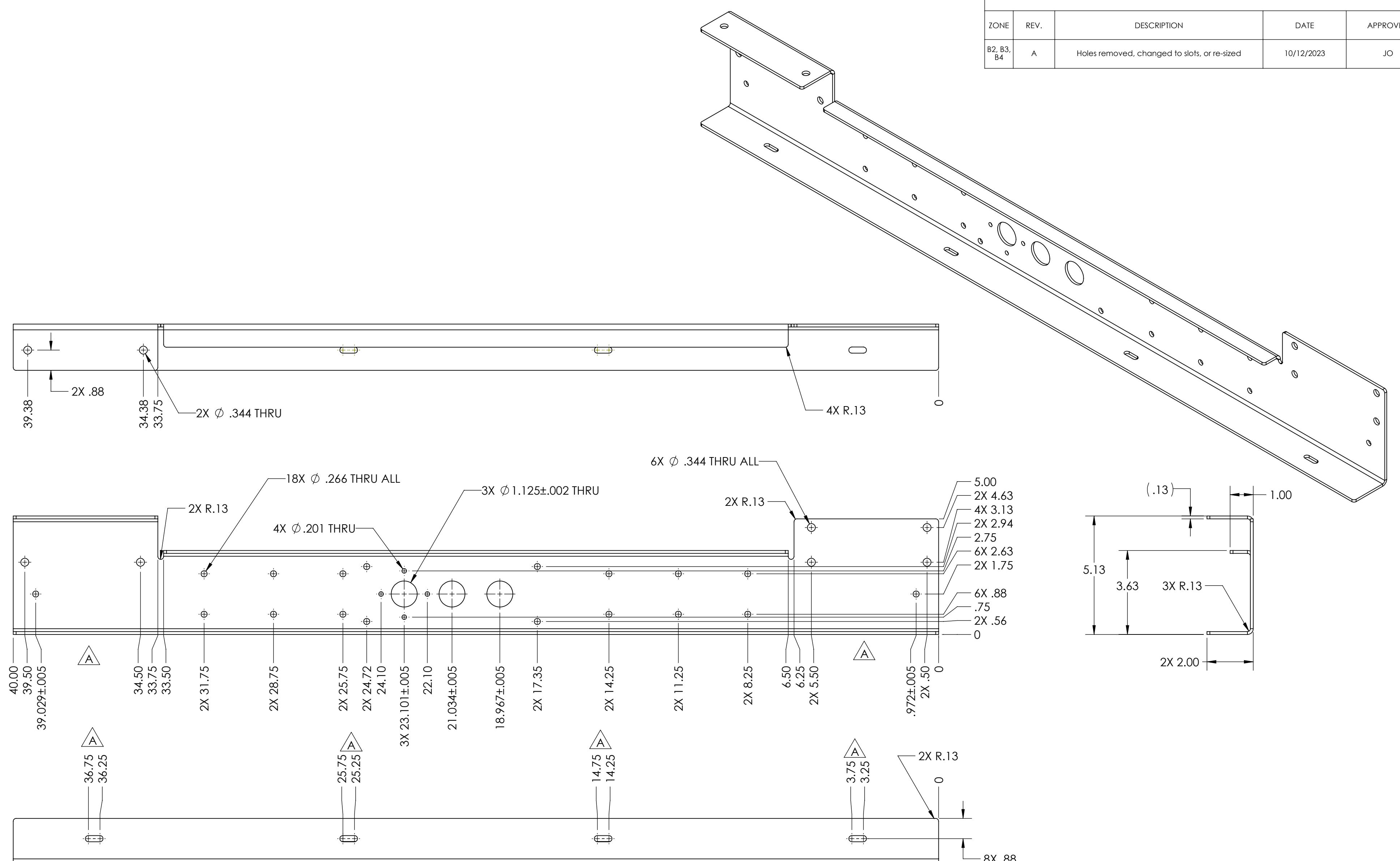


TITLE:
Counter Side Plate w/ PEMs

SIZE DWG. NO. REV

C GE-24352 **A**

SCALE: 1:2 SHEET 1 OF 1



UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES

TOLERANCES:

FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .02$ THREE PLACE DECIMAL $\pm .010$ **MATERIAL/FINISH:**

8 Ga 5052 Aluminum

BEND NAME DATE

DRAWN JO 9/12/2023



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PROHIBITED.

COMMENTS:
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EDGES.

DO NOT SCALE DRAWING

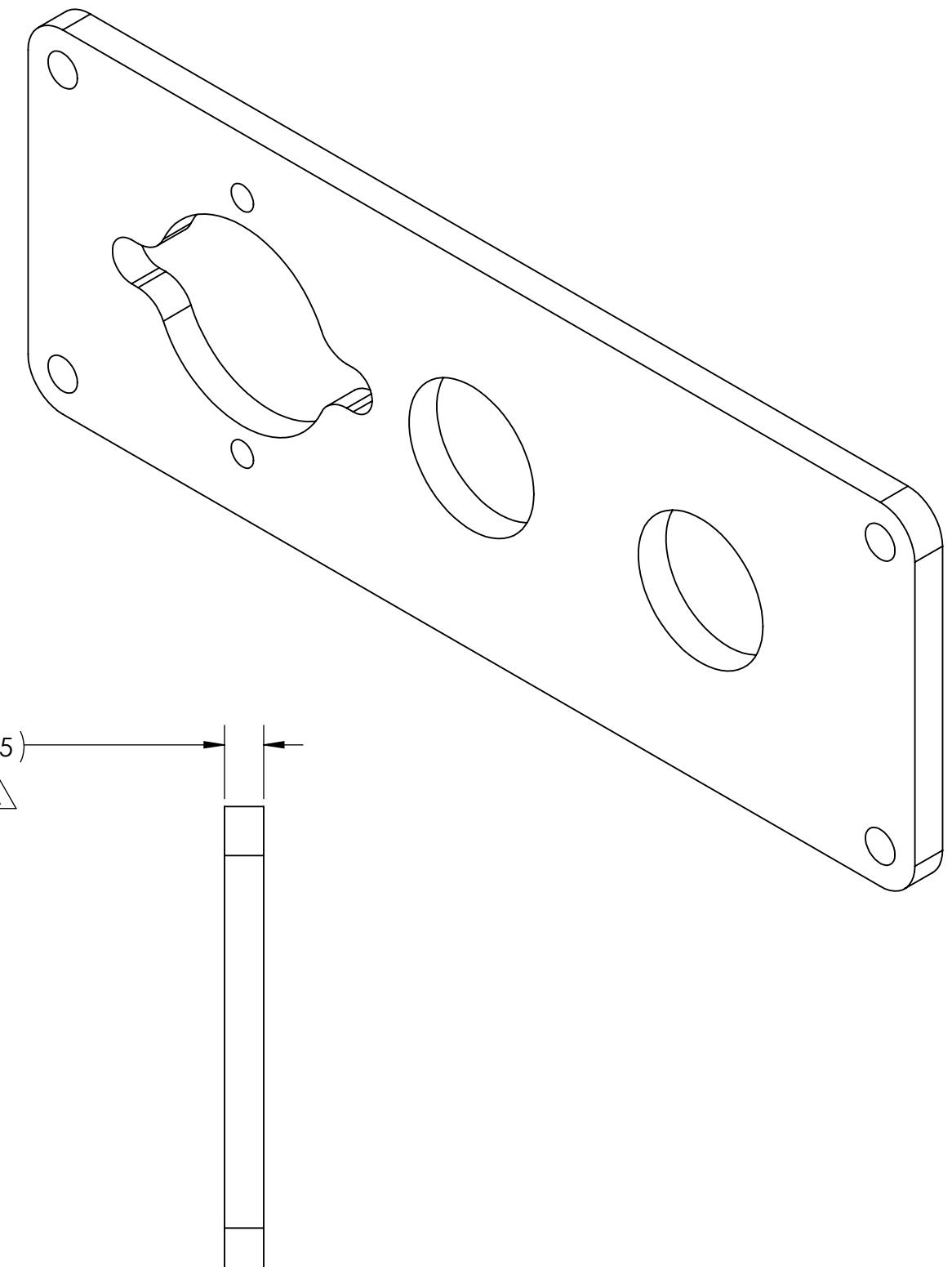
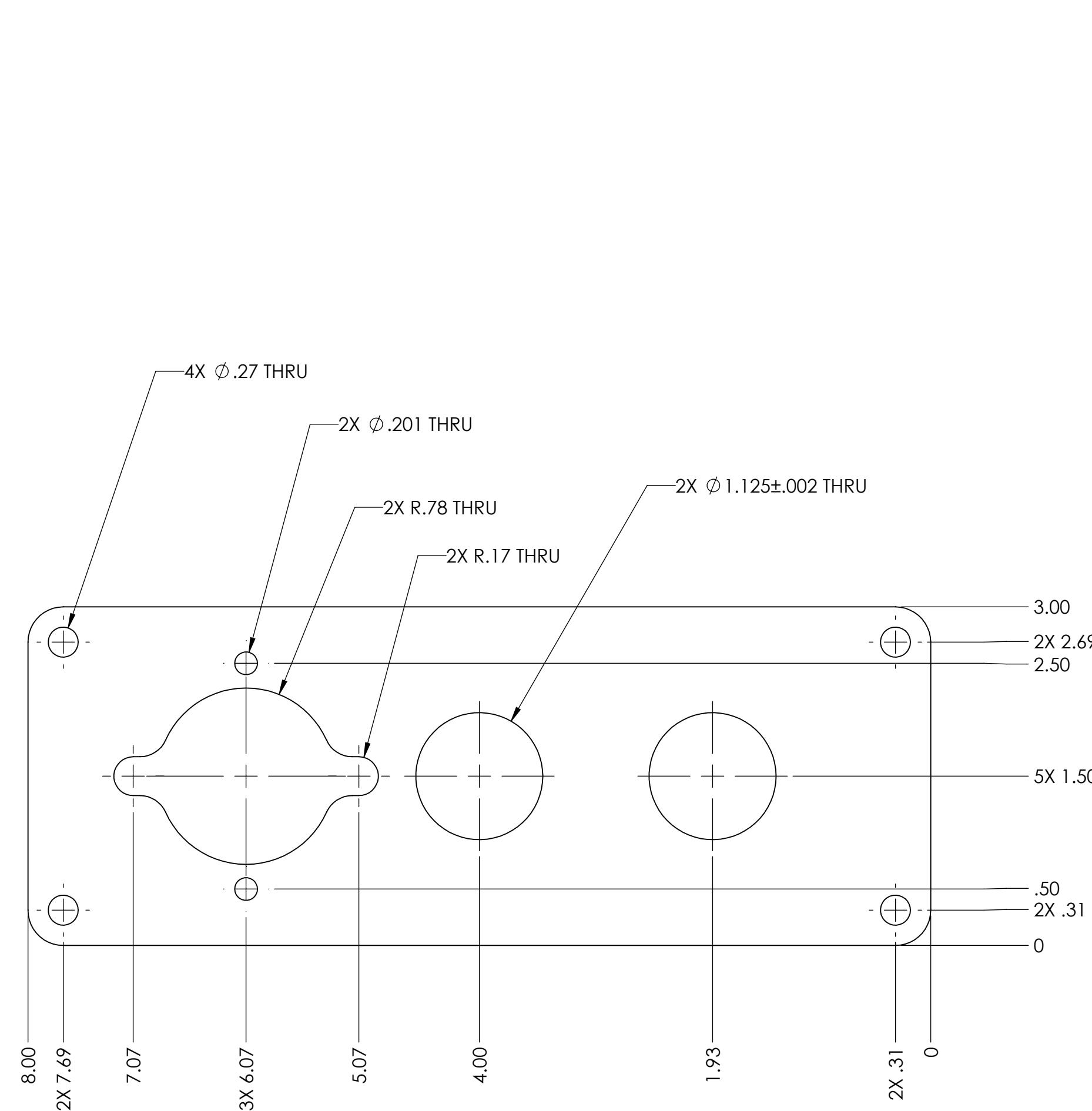
SCALE: 1:3 SHEET 1 OF 1

SIZE DWG. NO. REV

C GE-24352-01 **A**

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
A2, C2	A	Thickness Increased	10/11/2023	JO



UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	JO	9/14/2023	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:	SIZE	DWG. NO.	REV
1/4" 6061 Aluminum	C	GE-24353	A
COMMENTS:		SCALE: 1:1	
REMOVE ALL BURRS AND SHARP EDGES.		SHEET 1 OF 1	
DO NOT SCALE DRAWING			

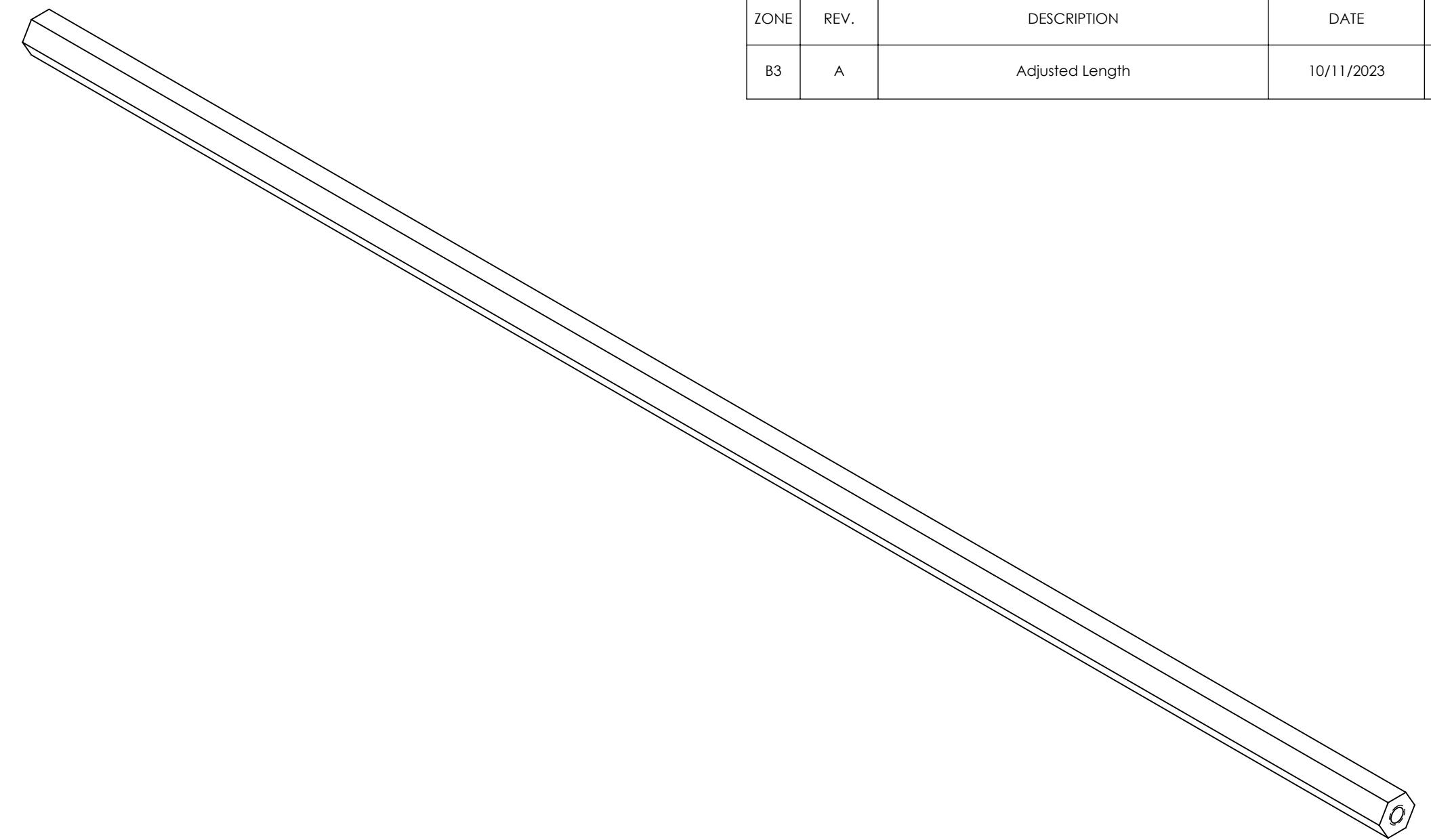
FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE: Speaker
Counter Bottom
Motor Plate

SIZE DWG. NO. REV
C GE-24353 A

SCALE: 1:1 SHEET 1 OF 1



$\phi .20 \pm .65$
1/4-20 UNC $\pm .50$

22.13
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$\phi .20 \pm .65$
1/4-20 UNC $\pm .50$

.500^{+0.000}_{-0.002} HEX

UNLESS OTHERWISE SPECIFIED:			VEND	NAME	DATE
DIMENSIONS ARE IN INCHES			DRAWN	JO	9/12/2023
TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$					
TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .005$					
MATERIAL/FINISH:	PROPRIETARY AND CONFIDENTIAL				
1018 Steel 1/2" Hex Shaft	THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.				
COMMENTS:	REMOVE ALL BURRS AND SHARP EDGES.				
DO NOT SCALE DRAWING			SIZE	DWG. NO.	REV
			C	GE-24354	A
			SCALE: 2:3	SHEET 1 OF 1	

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE: Note Counter
Bottom Hex
Shaft

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Specs:
 168 Tooth, RT-25 Profile
 Length: 17.50" Long

UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	JO	10/11/2023
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH: REV Robotics RT-25 Belt			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			
 FIRST ROBOTICS COMPETITION  SOLIDWORKS <small>Modeling Solutions Partner</small>			
TITLE: Custom Wide Belt			
SIZE C DWG. NO. GE-24355 REV			
SCALE: 1:4 SHEET 1 OF 1			

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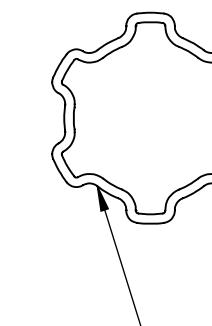
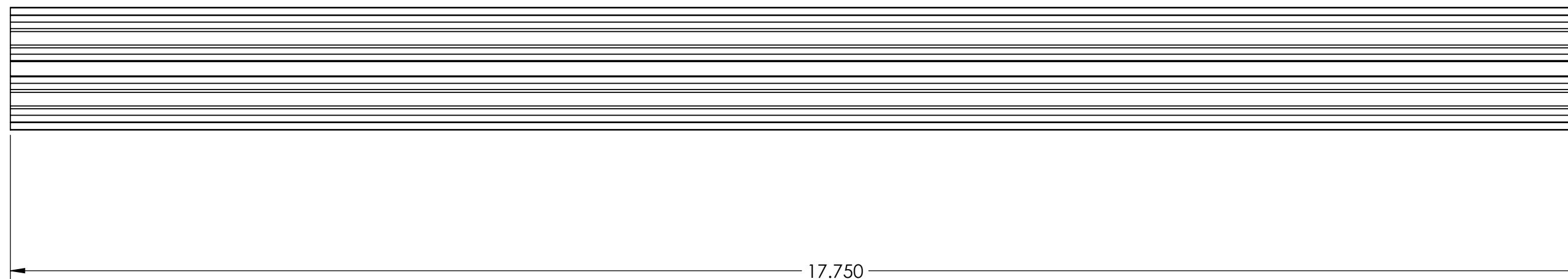
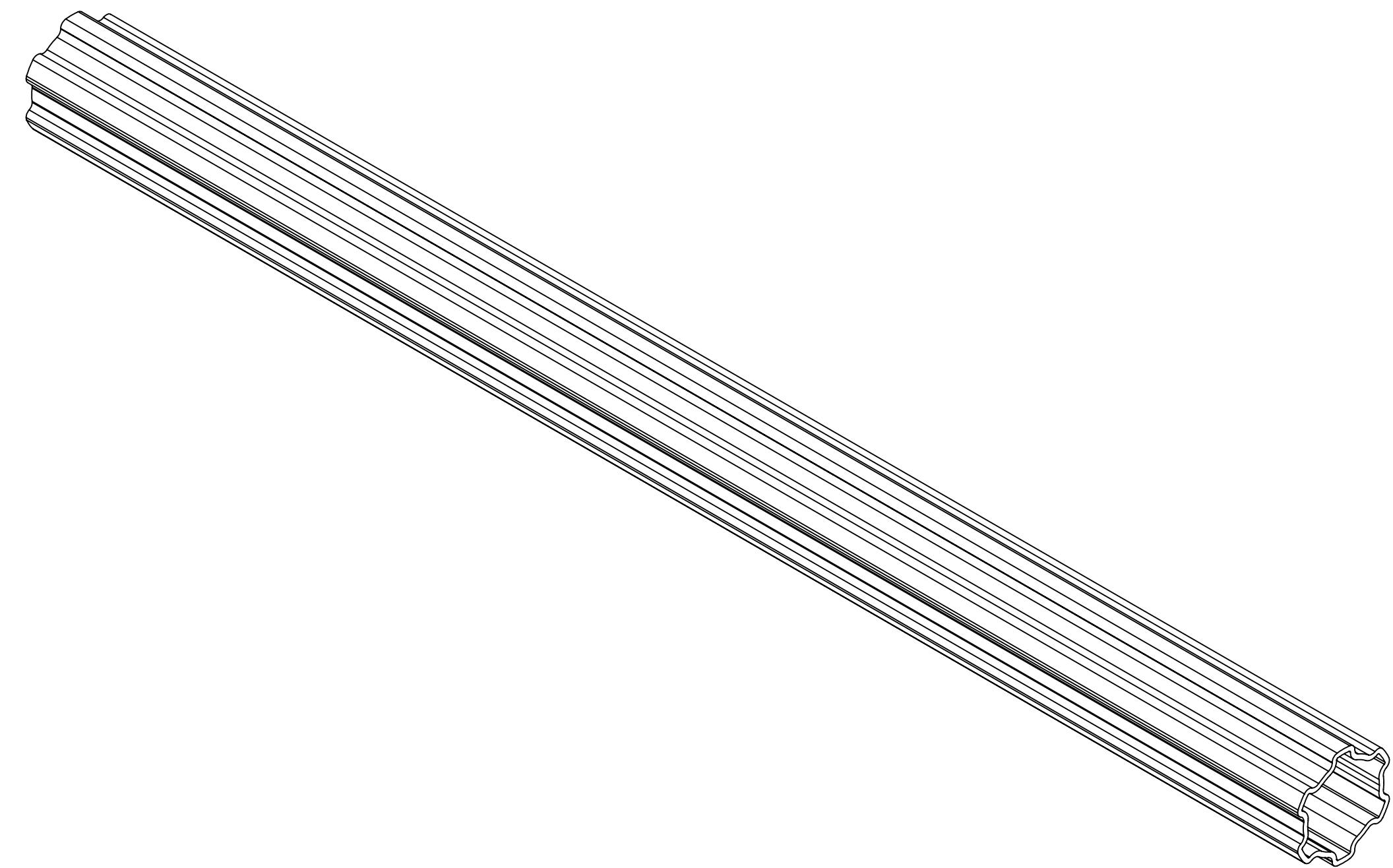
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REV Robotics MAXSpline

UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL $\pm 1/16$
ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$
TWO PLACE DECIMAL $\pm .01$
THREE PLACE DECIMAL $\pm .005$ MATERIAL/FINISH:
6061 Aluminum

DO NOT SCALE DRAWING

VEND NAME DATE

DRAWN JO 10/11/2023

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EDGES.

**FIRST
ROBOTICS
COMPETITION**

SOLIDWORKS
Modeling Solutions Partner
TITLE: **Bottom
Assembly
MAXSpline**

SIZE DWG. NO. REV

C GE-24357

SCALE: 4:5 SHEET 1 OF 1

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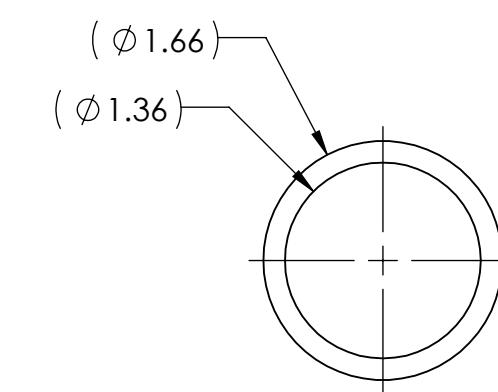
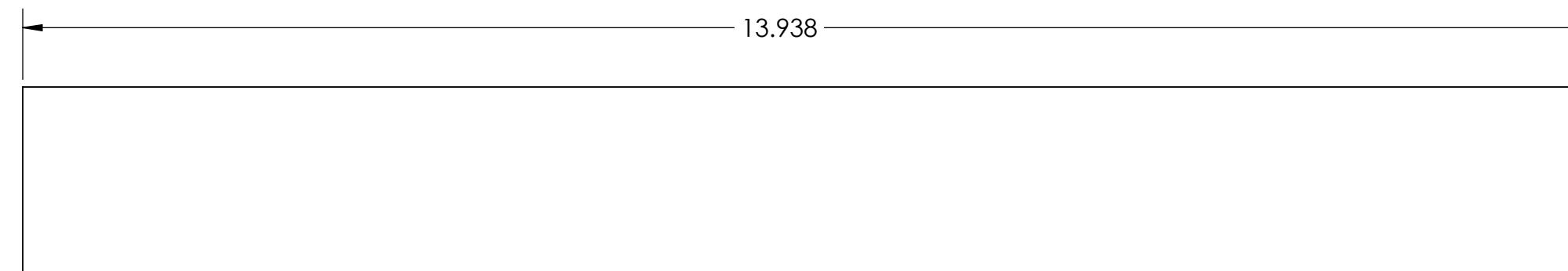
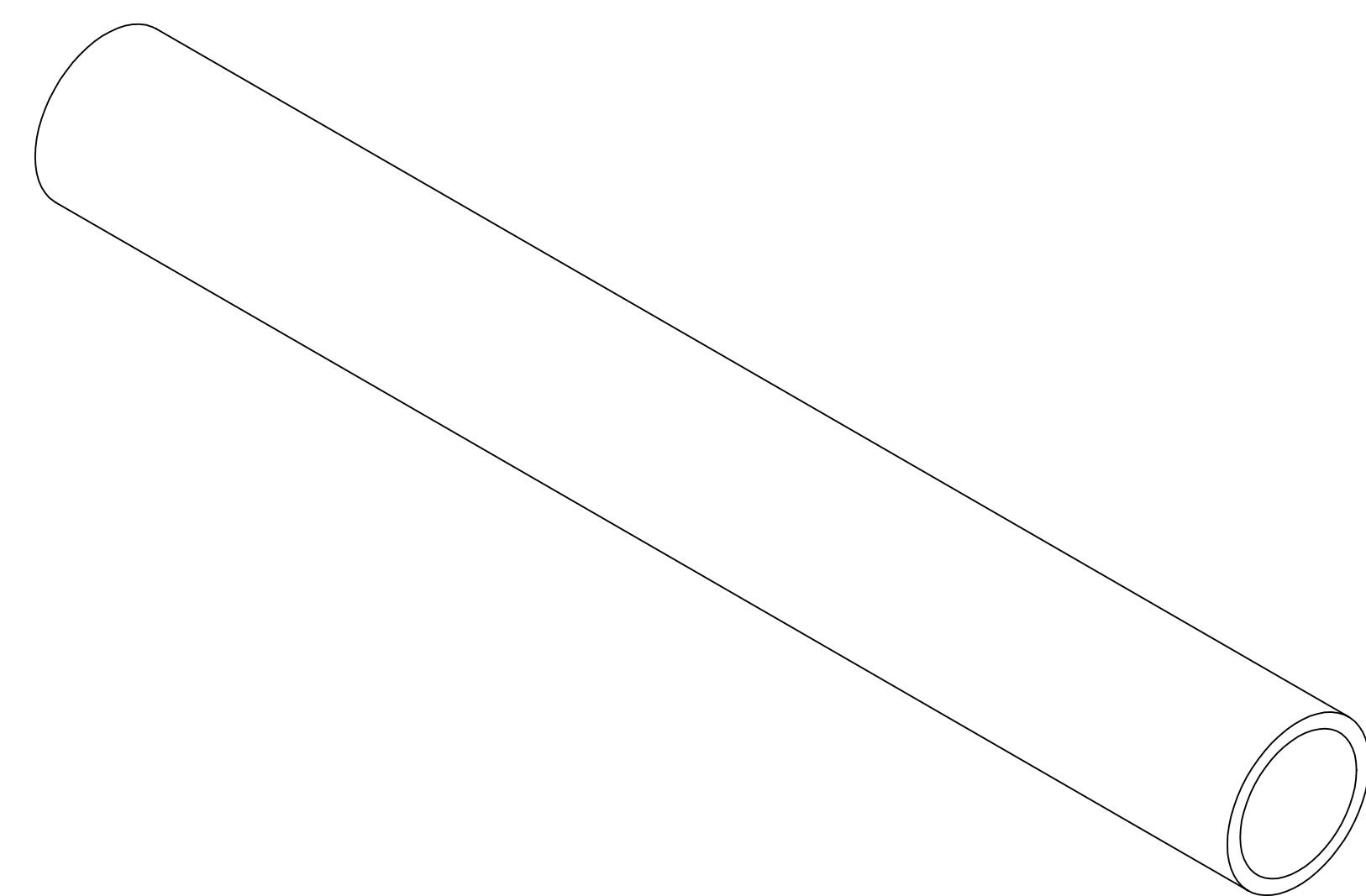
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UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL $\pm 1/16$
ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$
TWO PLACE DECIMAL $\pm .01$
THREE PLACE DECIMAL $\pm .005$ MATERIAL/FINISH:
1-1/4" Schedule 40 PVC
Pipe

DO NOT SCALE DRAWING

VEND NAME DATE

DRAWN JO 10/12/2023

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EDGES.

TITLE: Long PVC Spacer

SIZE DWG. NO. REV

C GE-24360

SCALE: 3:4 SHEET 1 OF 1

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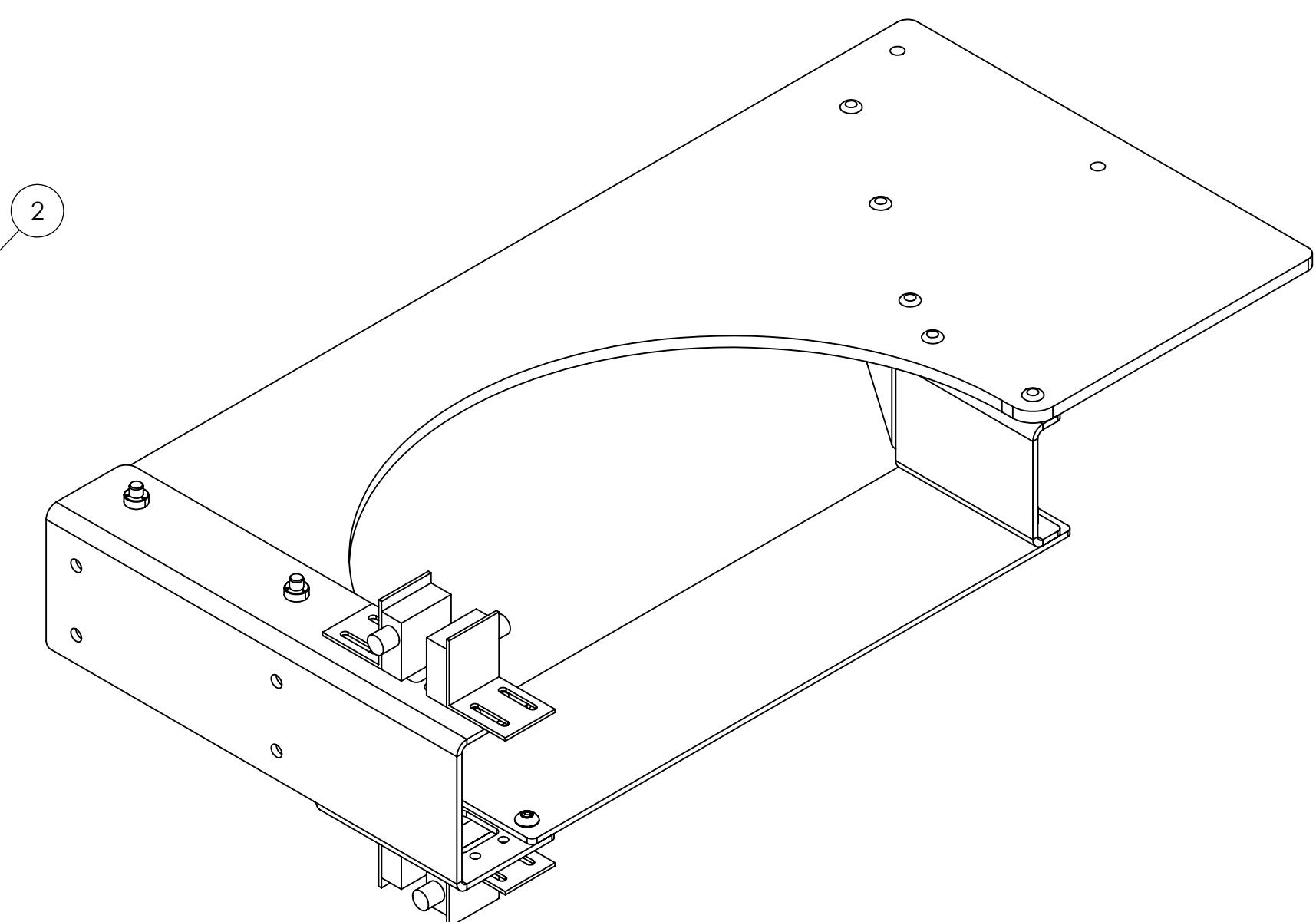
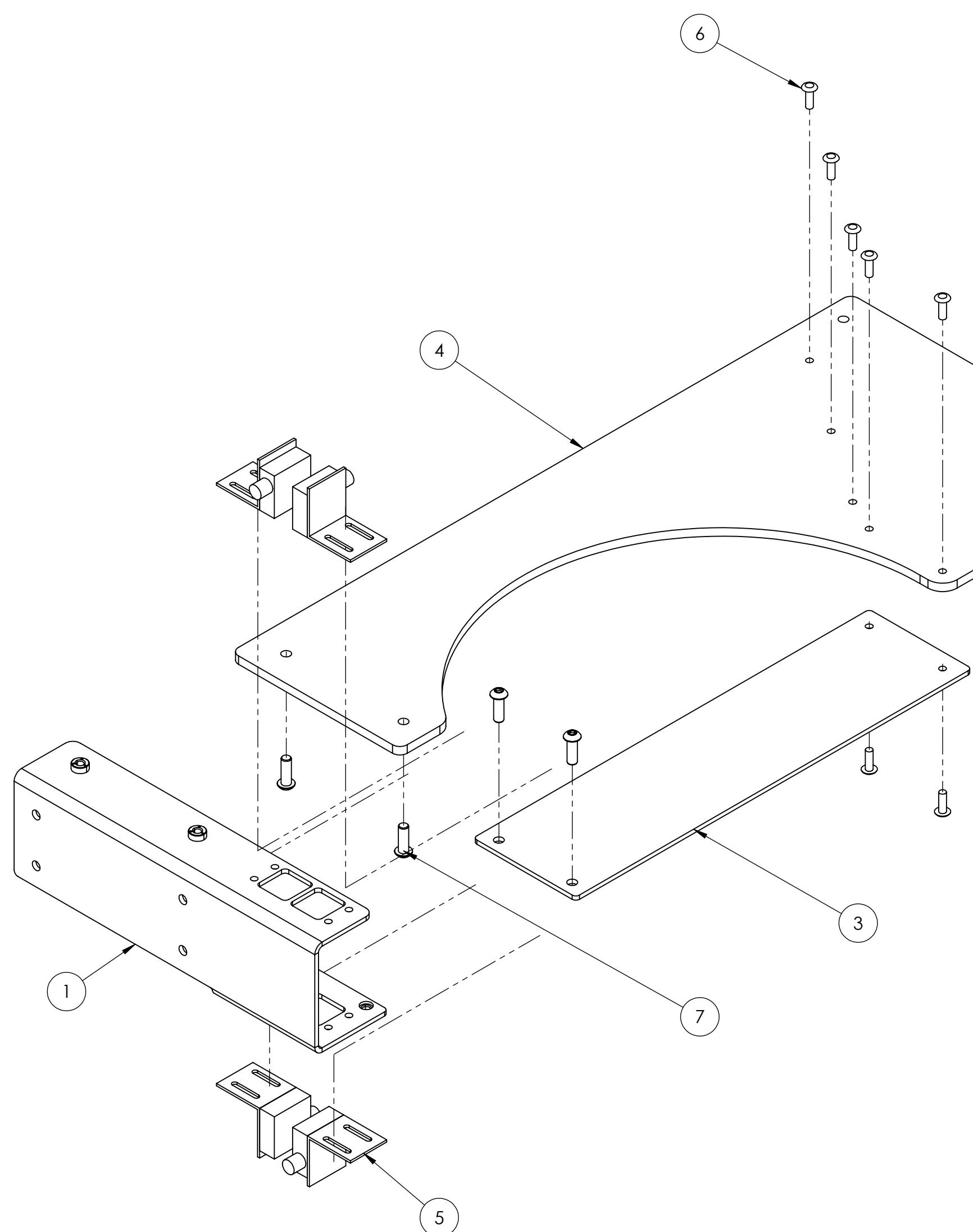
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24362	Counting Sensor Bracket w/ PEMs	1
2	GE-24363	Counting Sensor Far Bracket	1
3	GE-24364	Counter Sensor Floor	1
4	GE-24365	Counting Sensor Roof	1
5	42SMR	Beam Break	4
6	rivet_.1875_.251-.375	.3/16" Aluminum Rivet, .251-.375 Grip Range	7
7	Configurable Bolt	.75" Long 1/4-20 Button Head Cap Screw	4

UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES

TOLERANCES:

FRACTIONAL $\pm 1/2$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .50$

MATERIAL/FINISH:

PROPRIETARY AND CONFIDENTIAL
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COMMENTS:

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DO NOT SCALE DRAWING


**FIRST
ROBOTICS
COMPETITION**

SOLIDWORKS
 Modeling Solutions Partner

TITLE:
**Ring Counter
Sensor Box**

SIZE DWG. NO. REV

C GE-24361

SCALE: 1:2.6 SHEET 1 OF 1

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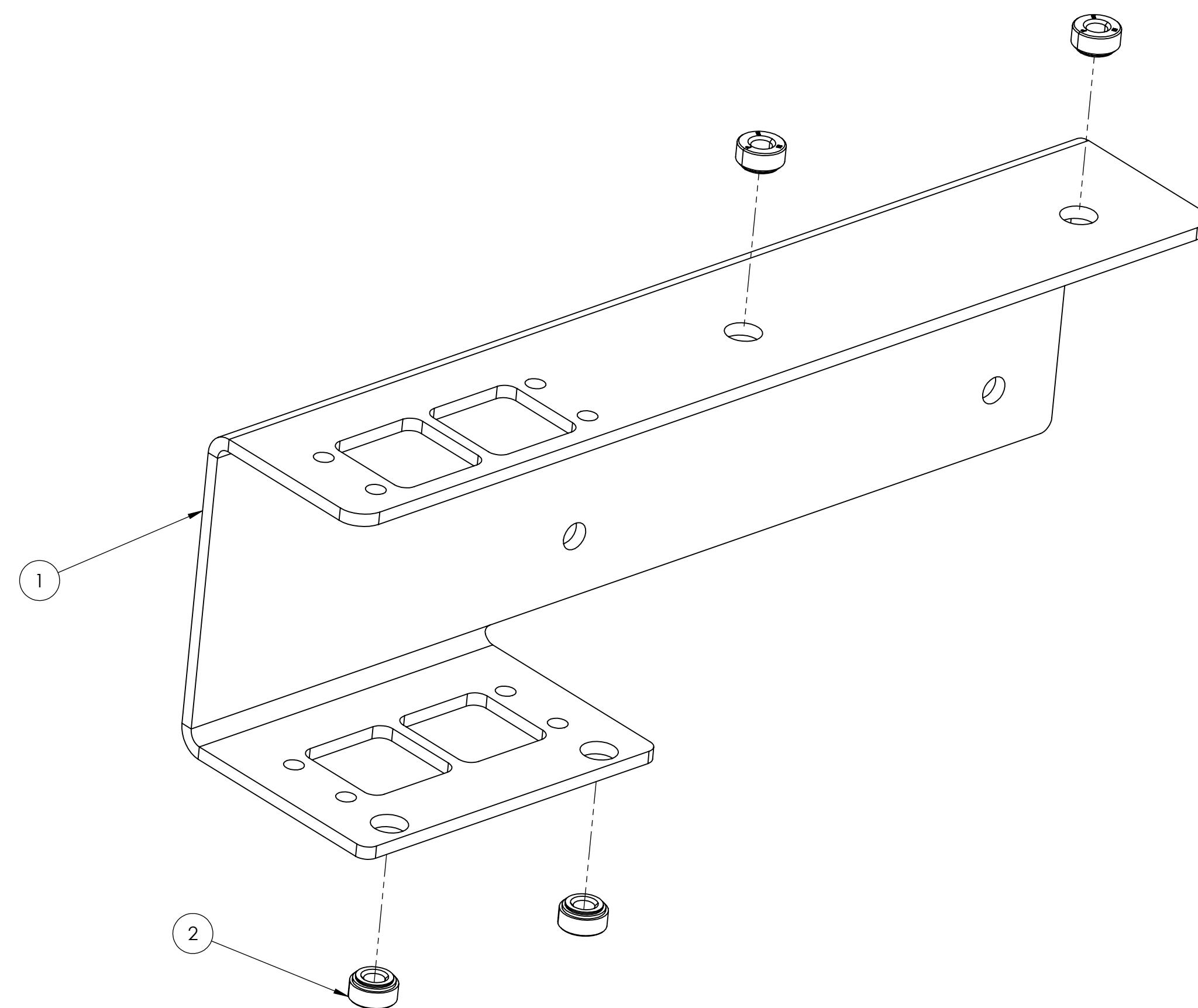
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Tag or Label with Part Number

ITEM NO.	PART NUMBER	DESCRIPTION		QTY.
1	GE-24362-01	Counting Sensor Bracket		1
2	pem_clinchnut_.25_20 .054	1/4-20 self-clinching nut, .054 shank		4
VEND	NAME	DATE		
DRAWN	JO	10/19/2023		
PROPRIETARY AND CONFIDENTIAL				
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COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.				
DO NOT SCALE DRAWING				

 FIRST
ROBOTICS
COMPETITION

 SOLIDWORKS
Modeling Solutions Partner

TITLE: Counting Sensor
Bracket w/
PEMs

SIZE DWG. NO. REV

C GE-24362

SCALE: 1:1 SHEET 1 OF 1

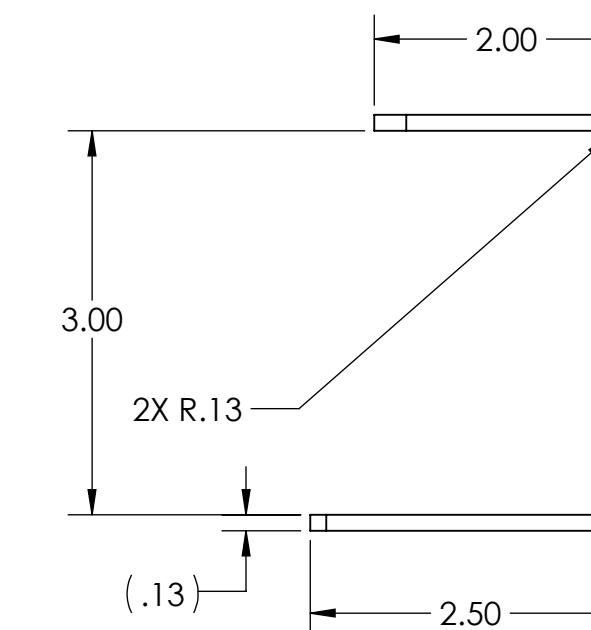
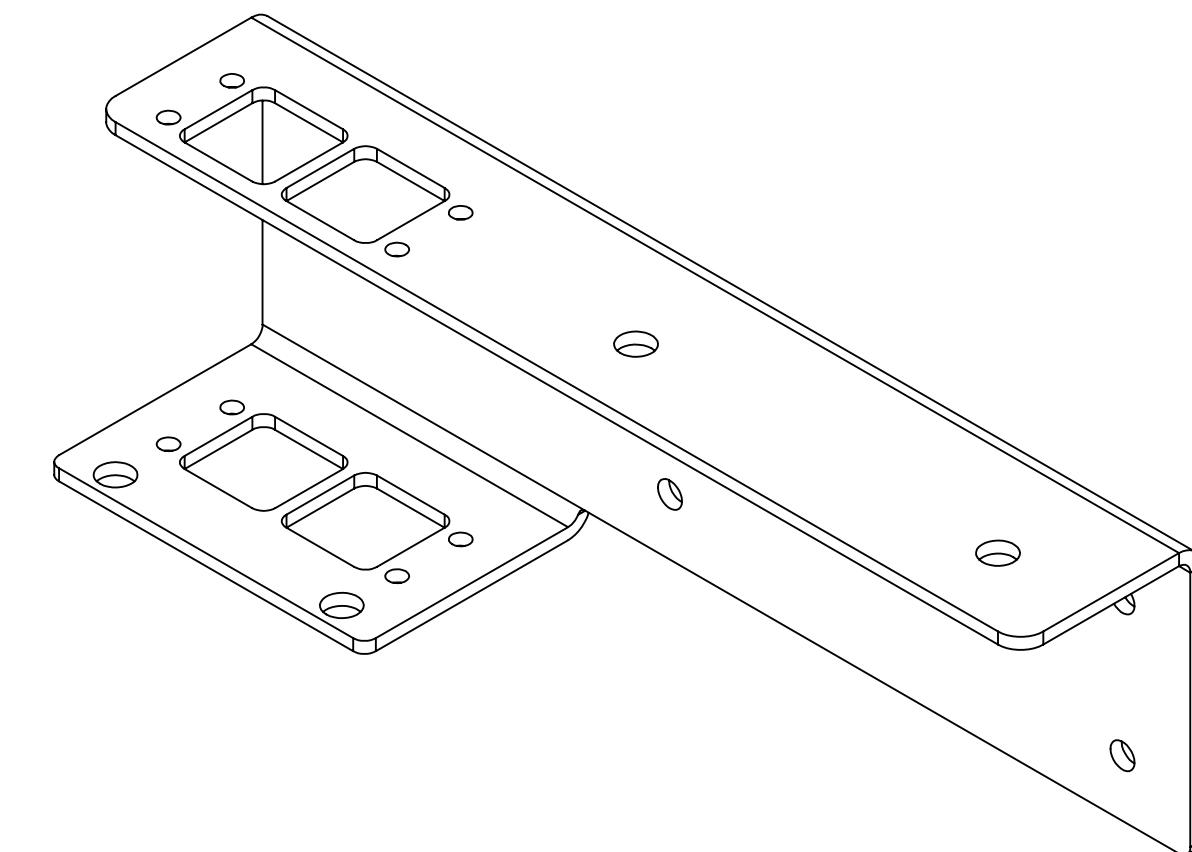
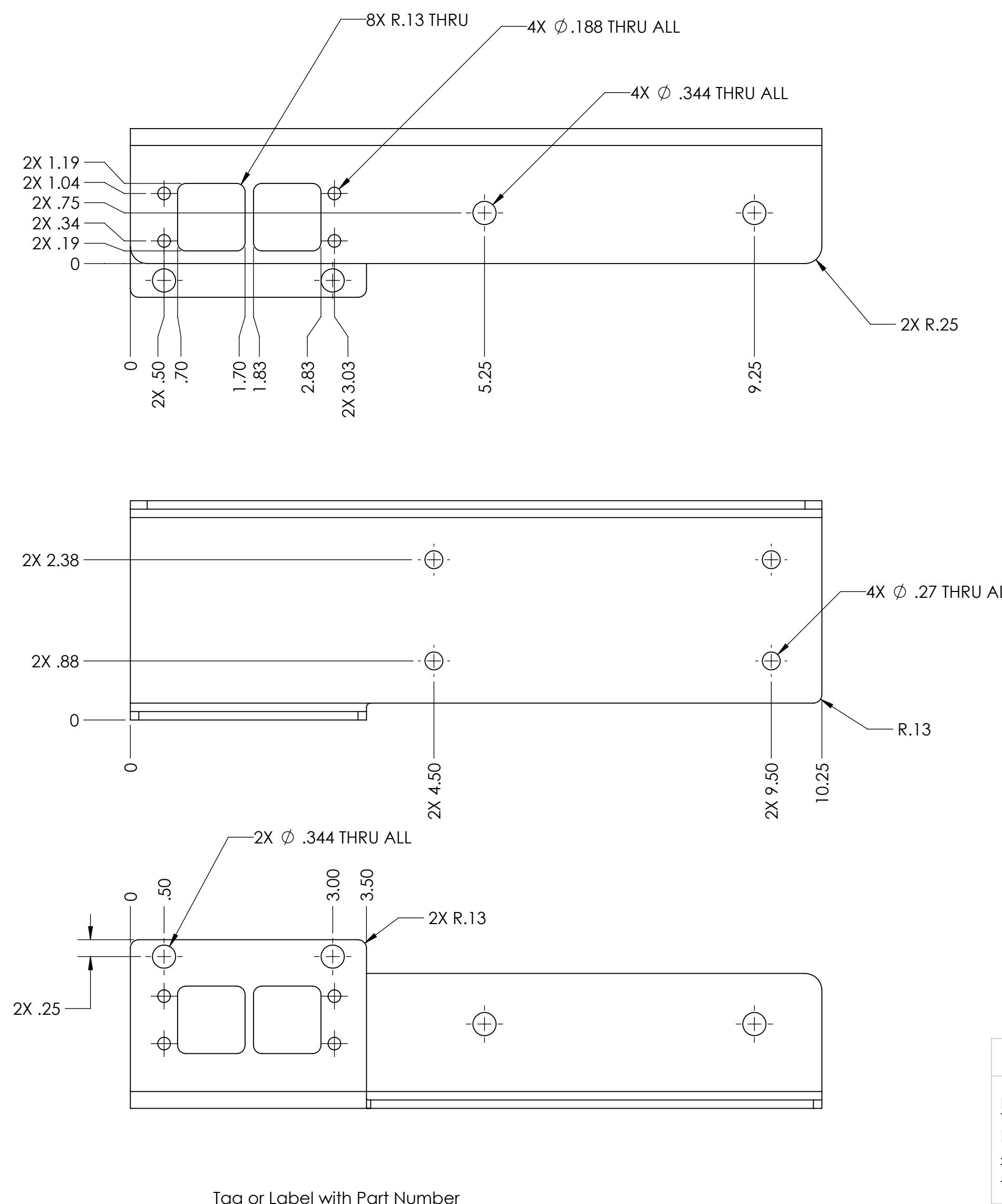
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UNLESS OTHERWISE SPECIFIED:

BEND NAME DATE

DRAWN JO 8/28/2023

DIMENSIONS ARE IN INCHES

TOLERANCES:

FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .02$ THREE PLACE DECIMAL $\pm .010$

MATERIAL/FINISH:

8 Ga 5052 Aluminum

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COMMENTS:

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DO NOT SCALE DRAWING

FIRST
ROBOTICS
COMPETITION
SOLIDWORKS
 Modeling Solutions Partner

TITLE: Counting Sensor Bracket

SIZE DWG. NO. REV

C GE-24362-01

SCALE: 2:3 SHEET 1 OF 1

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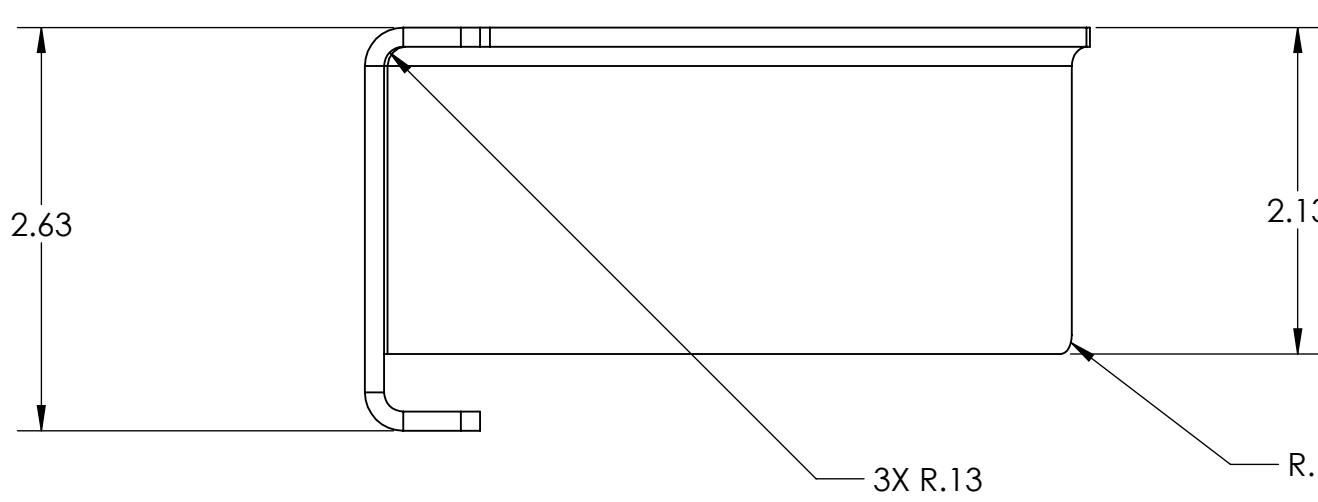
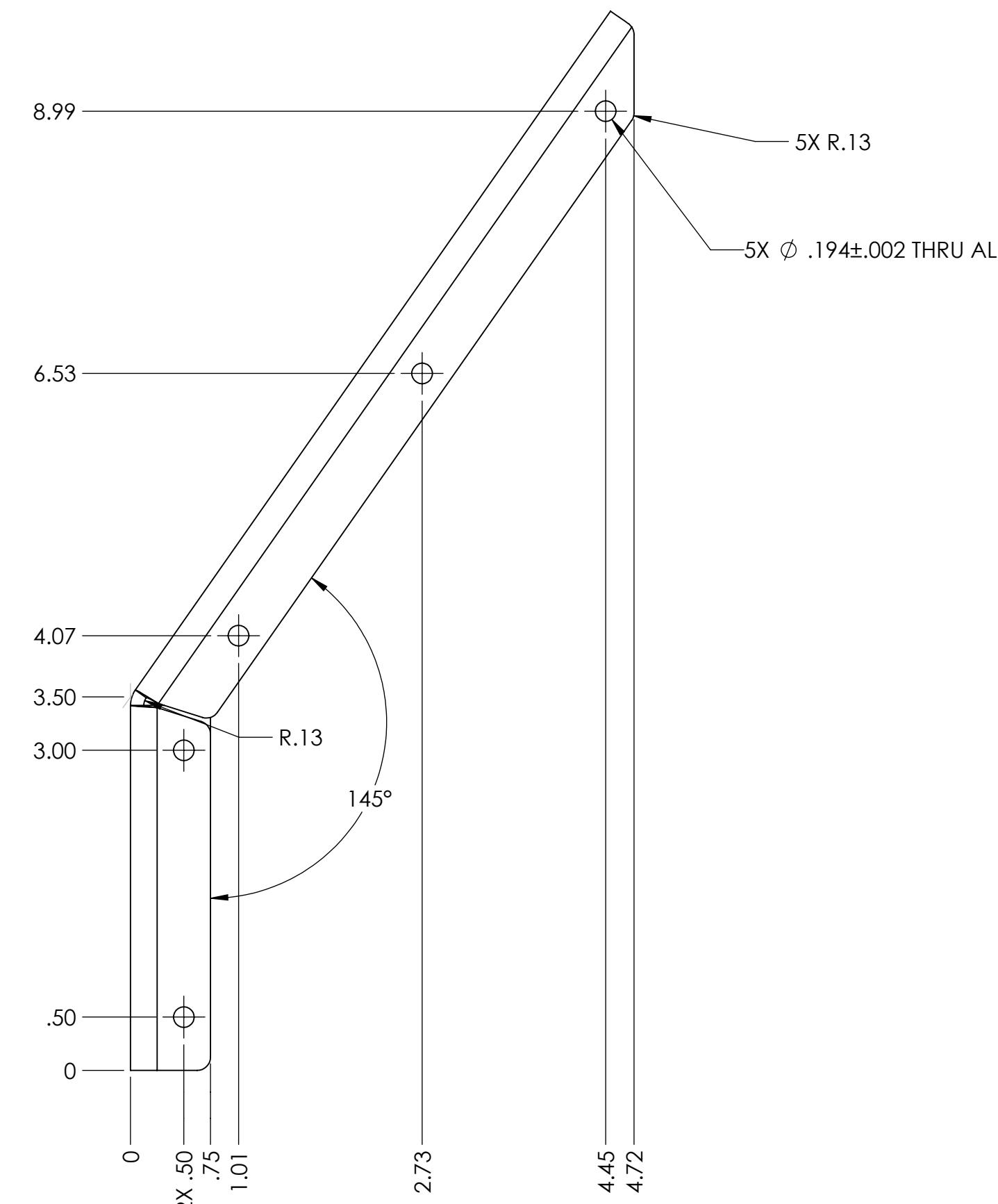
C

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Tag or Label with Part Number

UNLESS OTHERWISE SPECIFIED:	BEND	NAME	DATE
DRAWN	JO	8/28/2023	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH: 8 Ga 5052 Aluminum			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

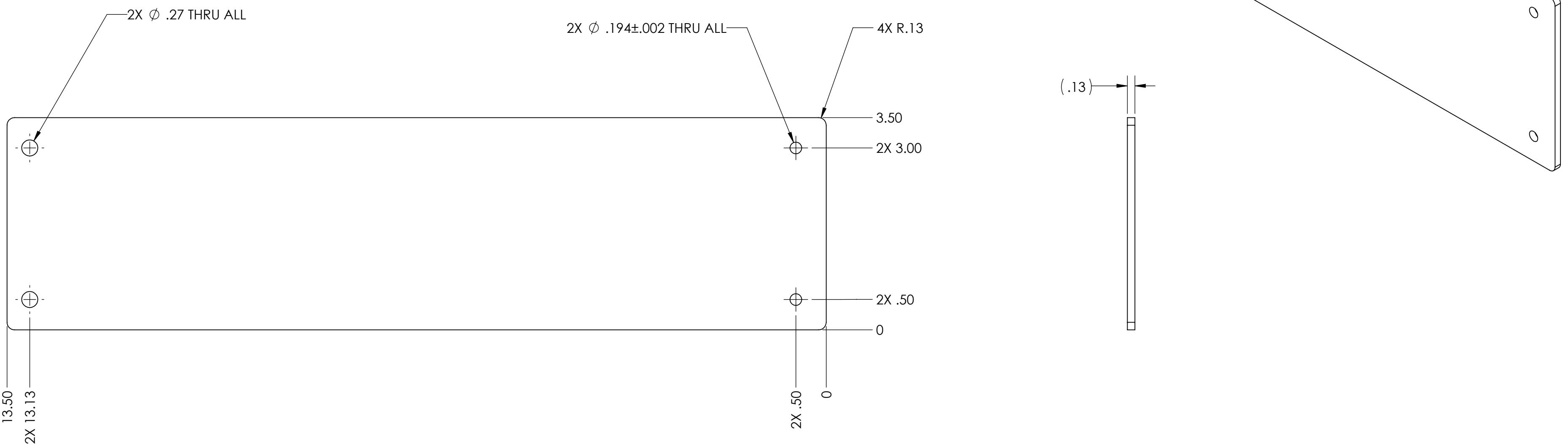
FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
**Counting Sensor
Far Bracket**

SIZE DWG. NO. REV
C GE-24363

SCALE: 4:5 SHEET 1 OF 1



Tag or Label with Part Number

UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	JO	9/14/2023
TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$	PROPRIETARY AND CONFIDENTIAL		
TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .005$	THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.		
MATERIAL/FINISH: 1/8" HDPE, Black Smooth Finish	COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.		
DO NOT SCALE DRAWING			



TITLE:
**Counter Sensor
Floor**

SIZE DWG. NO. REV
C GE-24364

SCALE: 3:4 SHEET 1 OF 1

4

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C

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21.13
2X 20.25
19.50

4X R.25

Tag or Label with Part Number

2X R.50

13.88

R6.75

5X $\phi .194 \pm .002$ THRU ALL

4X $\phi .27$ THRU ALL

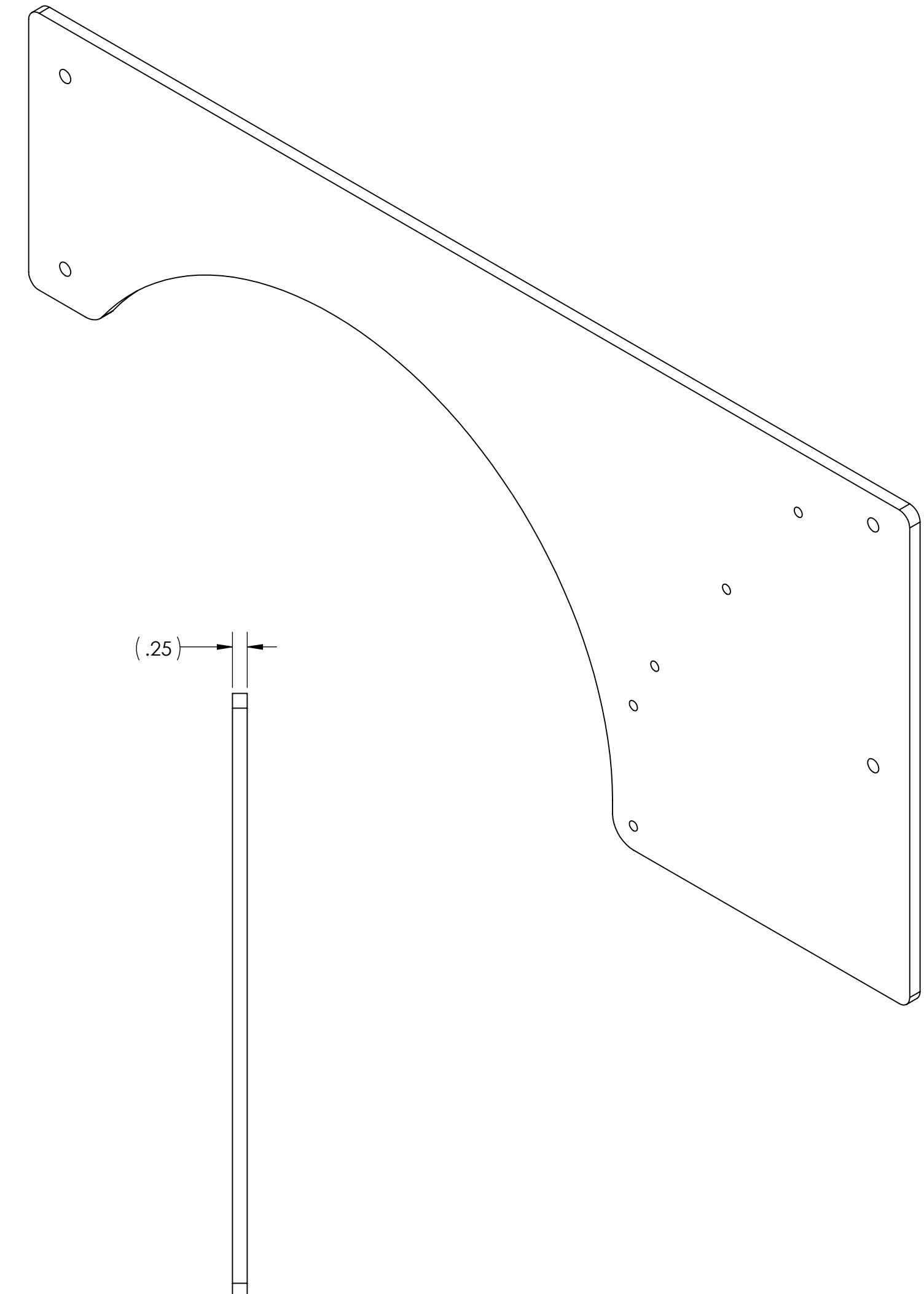
10.25
9.63
9.25
8.99

6.53
5.25
4.63
4.50
4.07

3.00

.77
.50
0

2X 6.33
6.11
4.39
2.67
2X .88
0



UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES

TOLERANCES:

FRACTIONAL $\pm 1/16$

ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$

TWO PLACE DECIMAL $\pm .01$

THREE PLACE DECIMAL $\pm .005$

MATERIAL/FINISH:

1/4" HDPE, Black Matte Finish

DO NOT SCALE DRAWING

VEND NAME DATE

DRAWN JO 9/14/2023

PROPRIETARY AND CONFIDENTIAL

THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.

COMMENTS:

REMOVE ALL BURRS AND SHARP EDGES.

 FIRST ROBOTICS COMPETITION  SOLIDWORKS Modeling Solutions Partner

TITLE:

Counting Sensor Roof

SIZE DWG. NO. REV

C GE-24365

SCALE: 1:2 SHEET 1 OF 1

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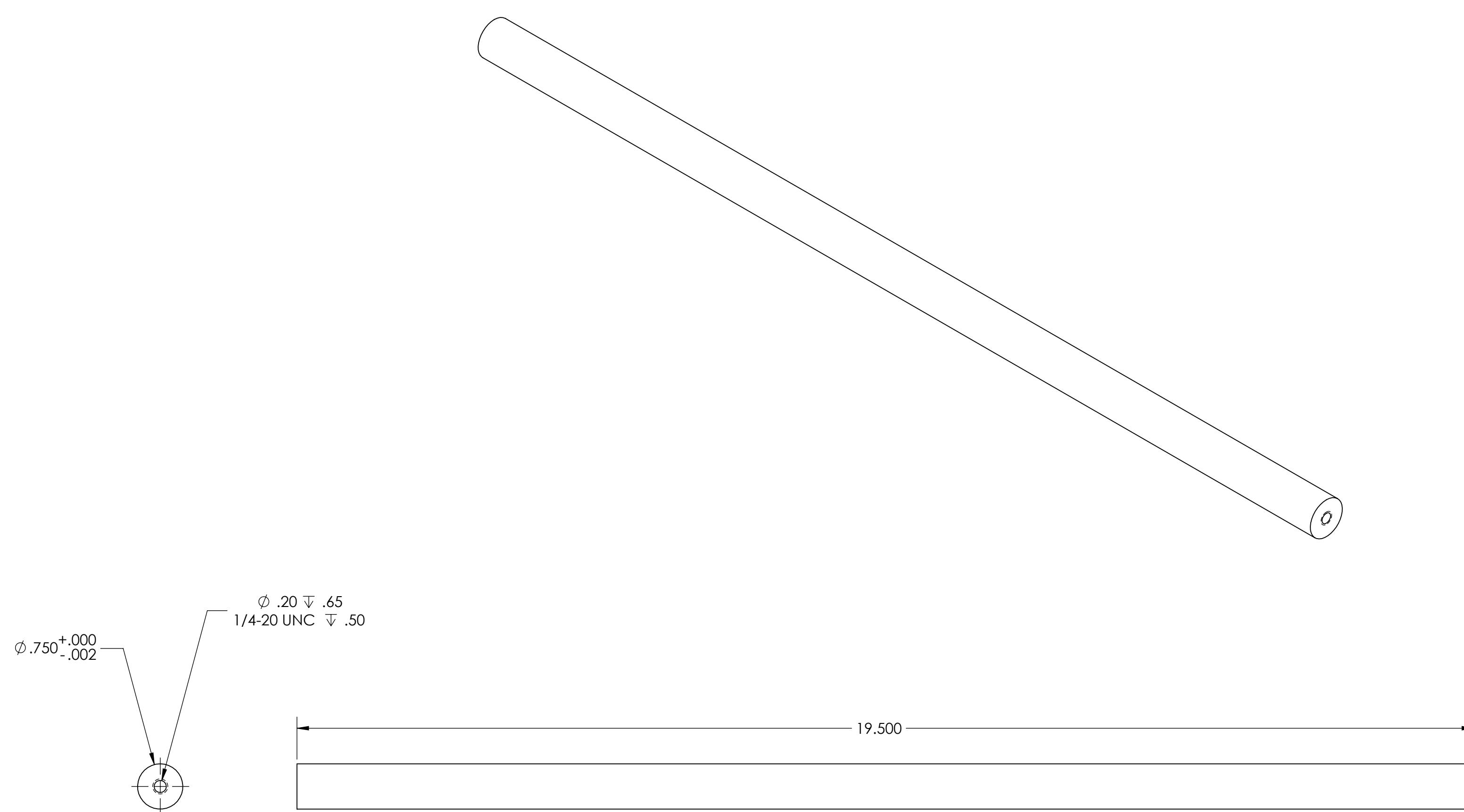
C

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B

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A



Note: Tag or Label with Part Number

UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	JO	10/12/2023	
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH: Steel, Zinc Plated			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			
 FIRST ROBOTICS COMPETITION  <small>SOLIDWORKS Modeling Solutions Partner</small>			
TITLE: Counter Bottom Dead Shaft			
SIZE		DWG. NO.	REV
C		GE-24367	A
SCALE: 2:3		SHEET 1 OF 1	

4

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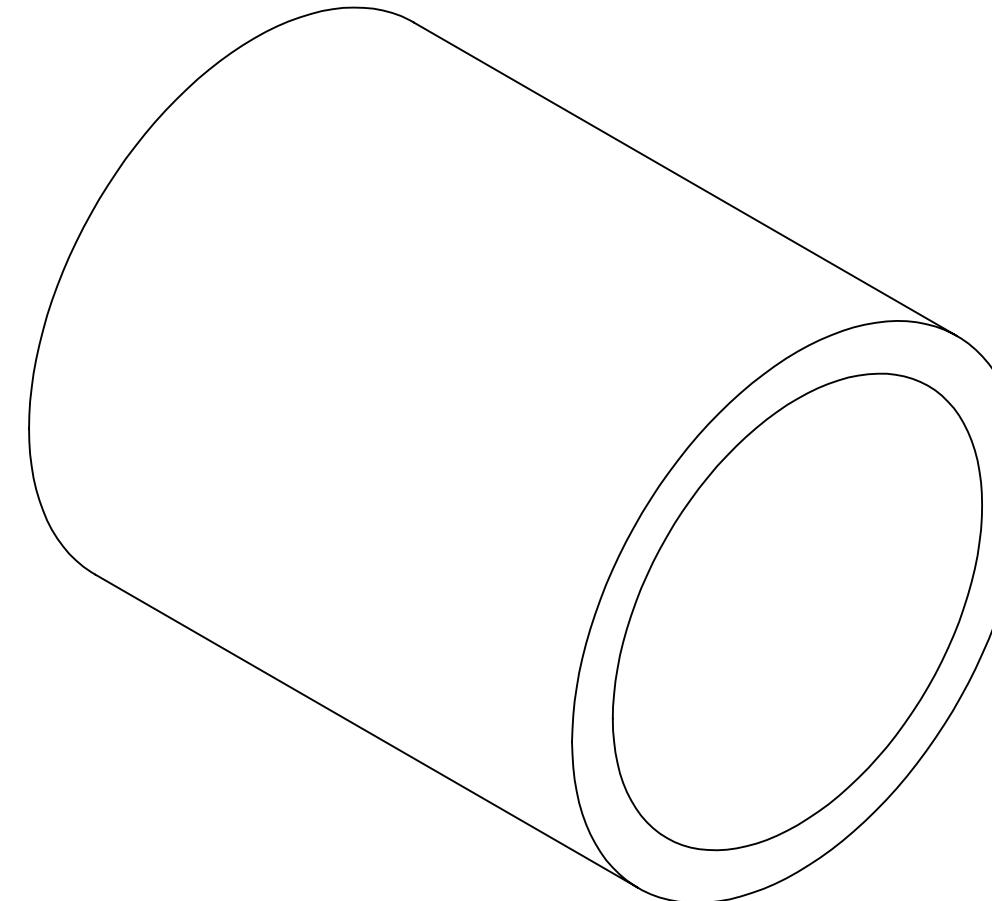
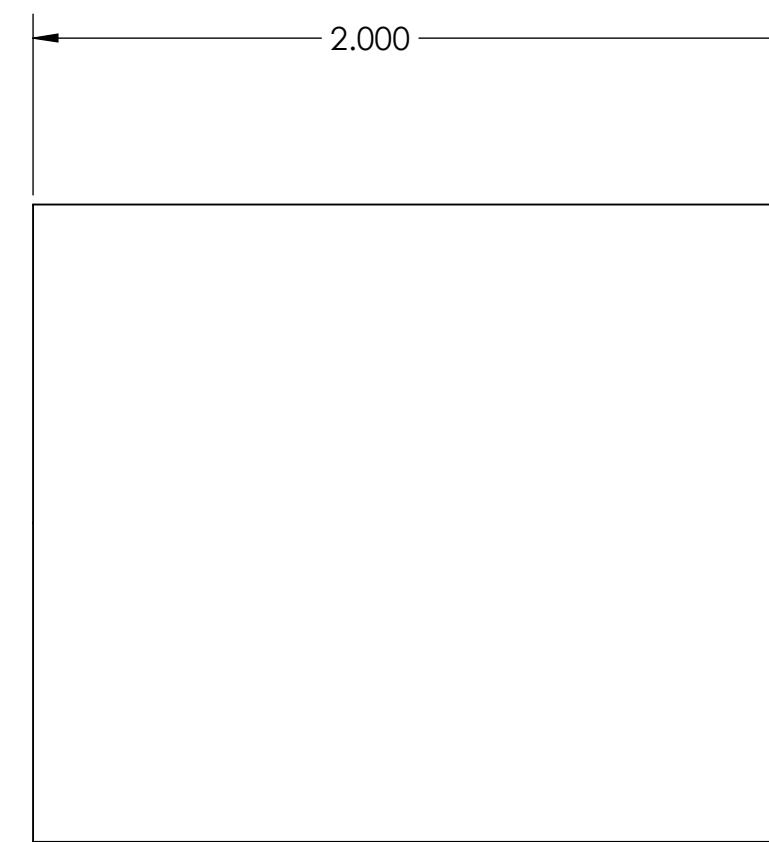
C

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A



UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	JO	10/12/2023
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH:	SIZE	DWG. NO.	REV
1-1/4" Schedule 40 PVC Pipe	C	GE-24368	
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING	SCALE: 2:1	SHEET 1 OF 1	

 **FIRST
ROBOTICS
COMPETITION**  **SOLIDWORKS**
Modeling Solutions Partner

TITLE:
**Counter Bottom
Flat Pulley**

SIZE DWG. NO. REV
C GE-24368

SCALE: 2:1 SHEET 1 OF 1

4

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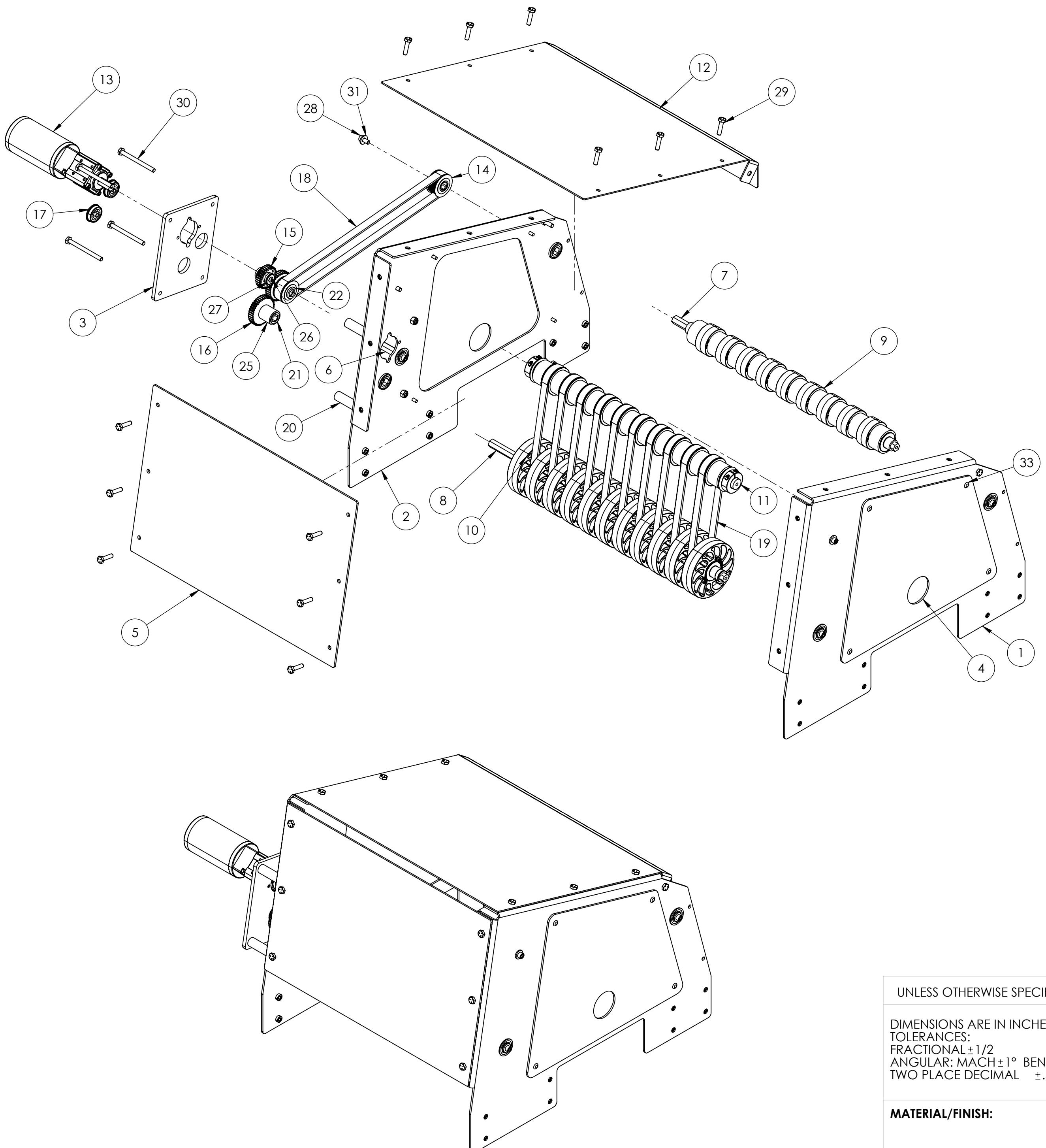
C

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A



UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES

TOLERANCES:

FRACTIONAL $\pm\frac{1}{2}$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .50$

MATERIAL/FINISH:

DO NOT SCALE DRAWING

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24371	Counter Top Left Plate w/ PEMs	1
2	GE-24372	Counter Top Right Plate w/ PEMs	1
3	GE-24373	Counter Upper Motor Plate	1
4	GE-24374	Speaker Counter Side Shield	2
5	GE-24375	Speaker Counter Back Cover	1
6	GE-24377	Counter Top Short Hex Shaft	1
7	GE-24378	Counter Top Medium Hex Shaft	1
8	GE-24379	Counter Top Long Hex Shaft	1
9	GE-24385	Roller Shaft - Top Assembly	1
10	GE-24386	Live Shaft - Top Assembly	1
11	GE-24387	Dead Shaft - Top Assembly	1
12	GE-24390	Counter Roof w/ PEMs	1
13	2 Stage Gearmotor	12:1 Sport Gearbox and CIM Motor	1
14	am-4626 24T 5mm HTD 500IN Hex 15mm Wide Bore Pulley		2
15	am-4215 30T 20DP 500hex 375 FW		1
16	am-4710 40T 20DP 500hex 375 FW		2
17	0.500 Hex ID x 1.125 OD x 0.313 WD (Flanged Bearing v2) (217-3875)		7
18	850-5m-15 Belt		1
19	80 tooth RT-25 Belt		10
20	2.25 Bolt Spacer		4
21	.0625 Hex Spacer		4
22	.125 Hex Spacer		6
23	.25 Hex Spacer		5
24	.5 Hex Spacer		4
25	1 in hex spacer		1
26	91255A261_Button Head Hex Drive Screw		1
27	washer_flat_10_oversized	Oversized flat Washer for #10 Screw	1
28	Configurable Bolt	.5" Long 1/4-20 Socket Head Cap Screw	8
29	Configurable Bolt	1" Long 1/4-20 Hex Head Bolt	14
30	Configurable Bolt	3" Long 1/4-20 Hex Head Bolt	4
31	washer_flat_.25	Flat Washer for 1/4" Screw	8
32	nylock_.25_20	Steel Nylon-Insert Locknut, 1/4"-20	4
33	rivet_.1875_.251-.375	3/16" Aluminum Rivet, .251-.375 Grip Range	8

**FIRST
ROBOTICS
COMPETITION**  

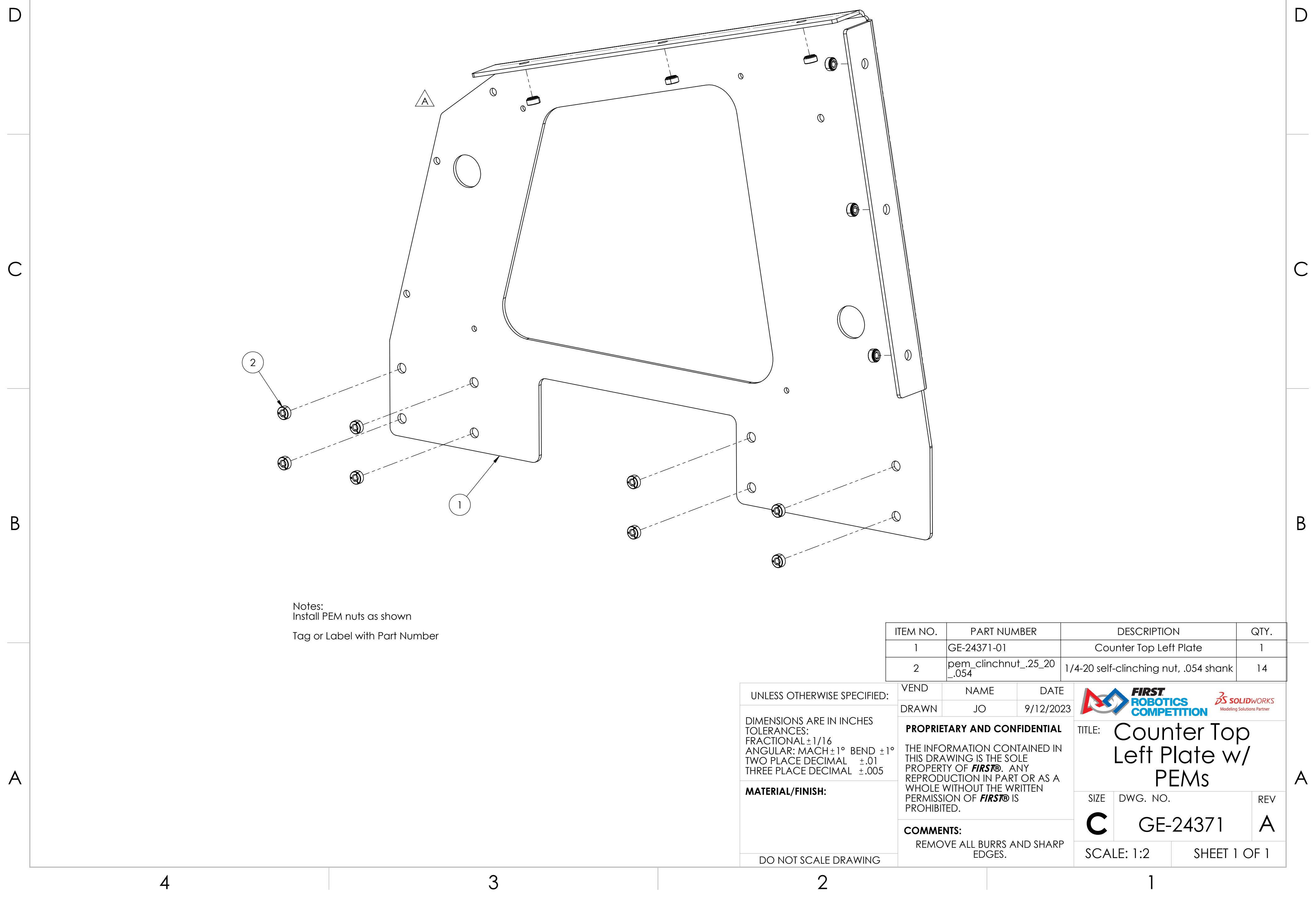
Ring Counter Top Assembly

SIZE DWG. NO. REV
C GE-24370

SCALE: 1:5 SHEET 1 OF 1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
D3	A	Visual Changes from GE-24371-01	10/12/2023	JO



REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
C2, C4	A	One hole removed, one re-sized	10/12/2023	JO

D

D

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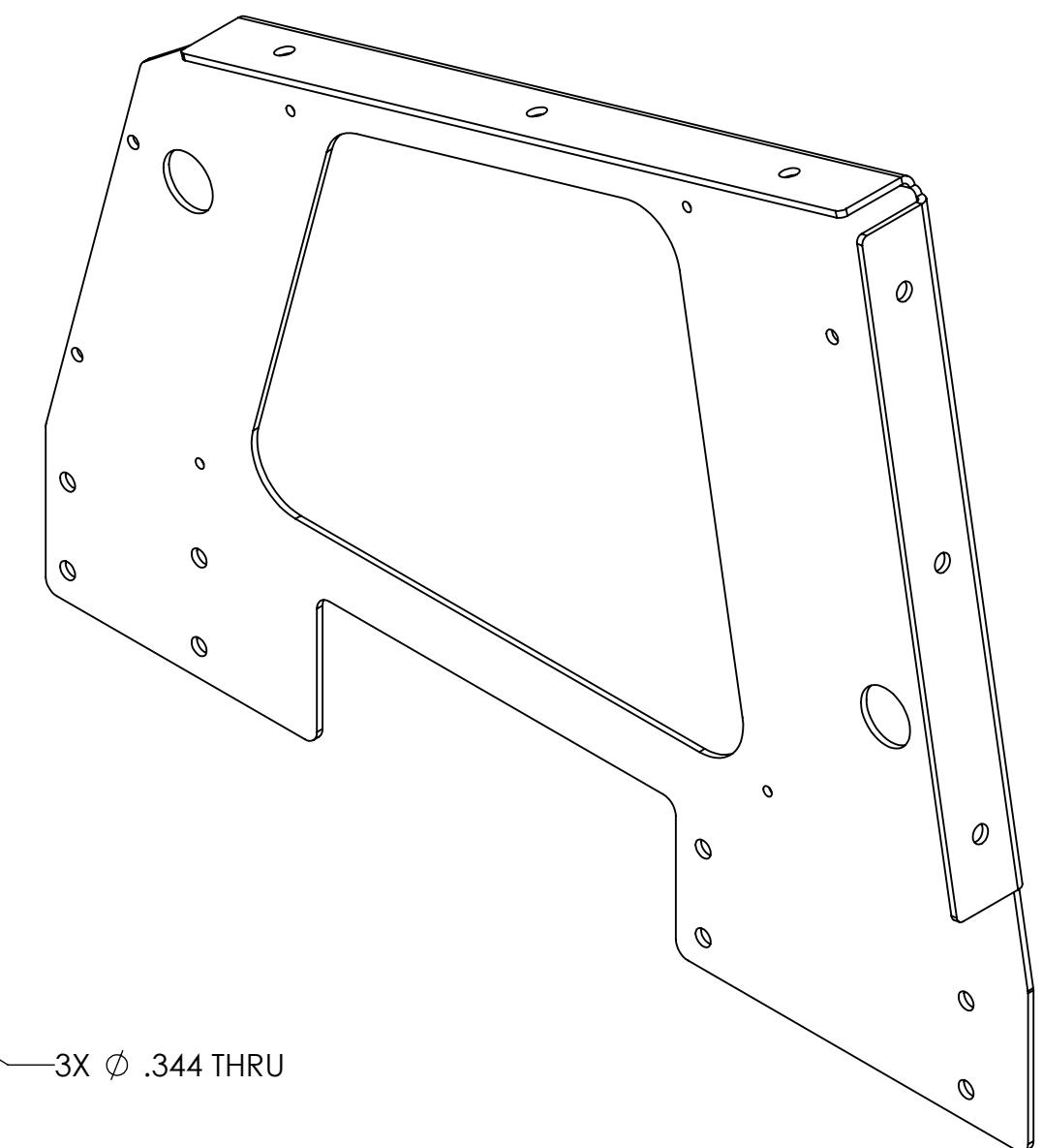
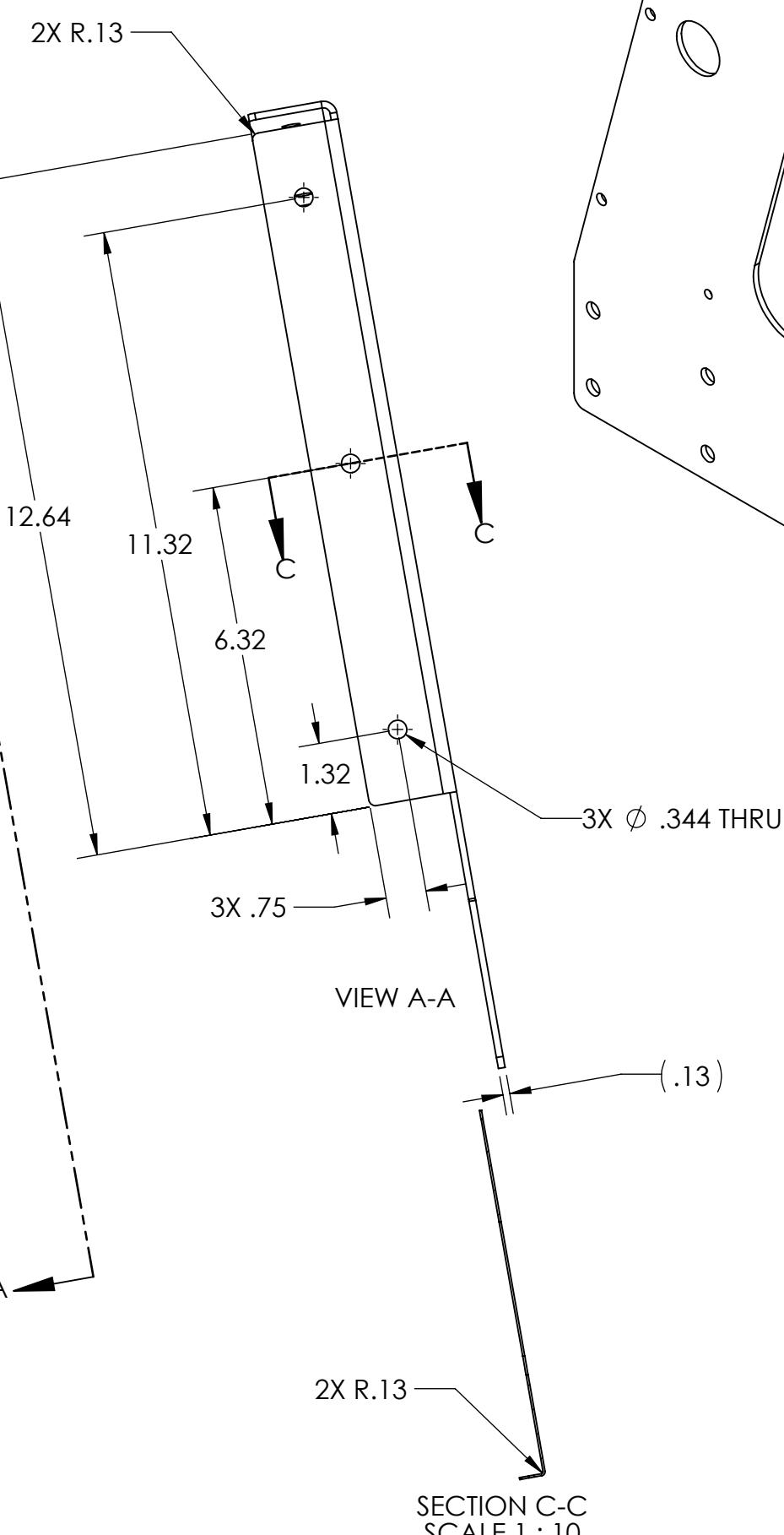
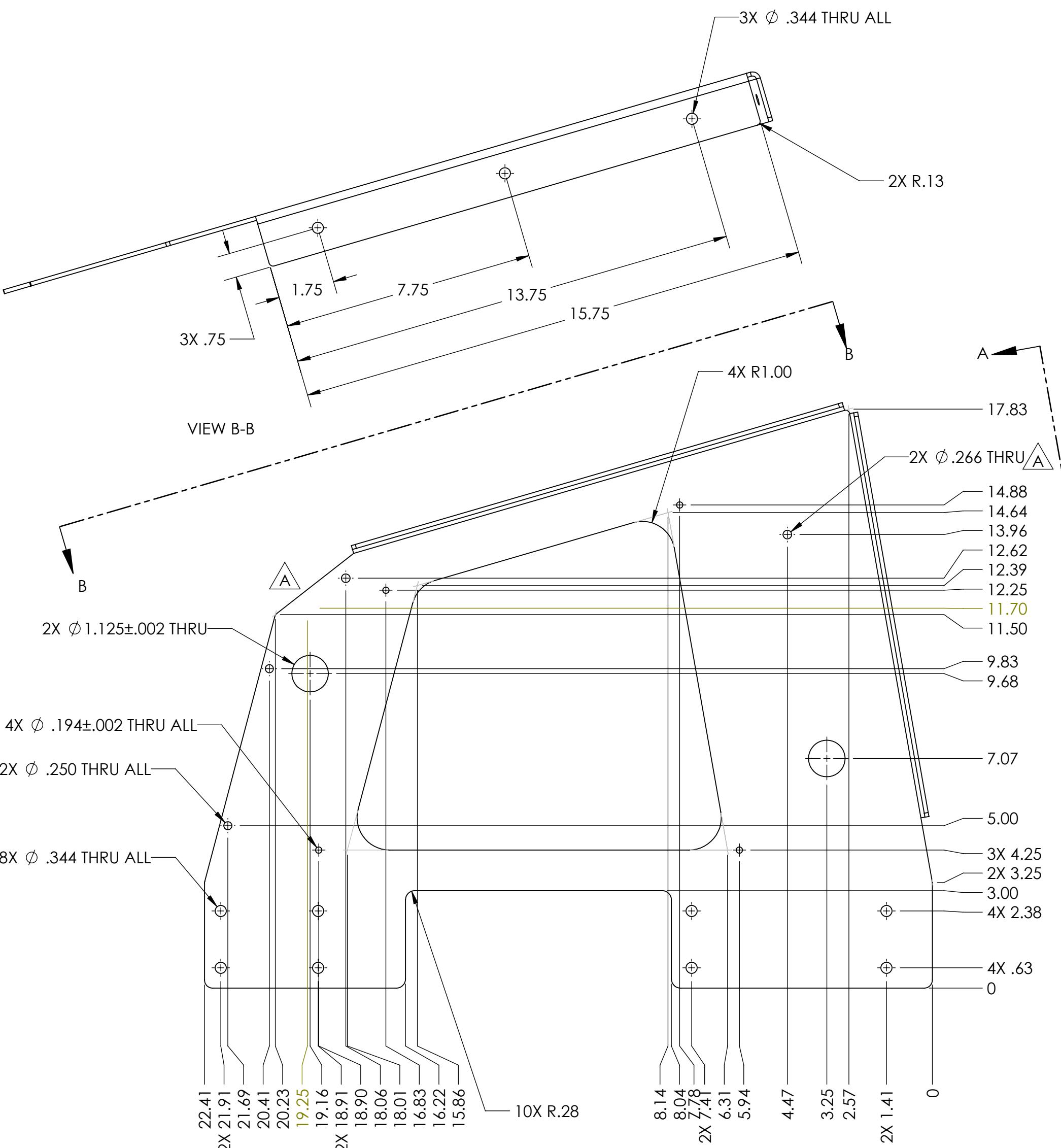
C

B

B

A

A



UNLESS OTHERWISE SPECIFIED:		BEND	NAME	DATE
		DRAWN	JO	9/12/2023
PROPRIETARY AND CONFIDENTIAL				
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.				
MATERIAL/FINISH: 8 Ga 5052 Aluminum				
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.				
DO NOT SCALE DRAWING				

FIRST ROBOTICS COMPETITION SOLIDWORKS Modeling Solutions Partner

TITLE: Counter Top Left Plate

SIZE	DWG. NO.	REV
C	GE-24371-01	A
SCALE: 1:3		SHEET 1 OF 1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
C2	A	Visual Changes from GE-24372-01	10/12/2023	JO

D

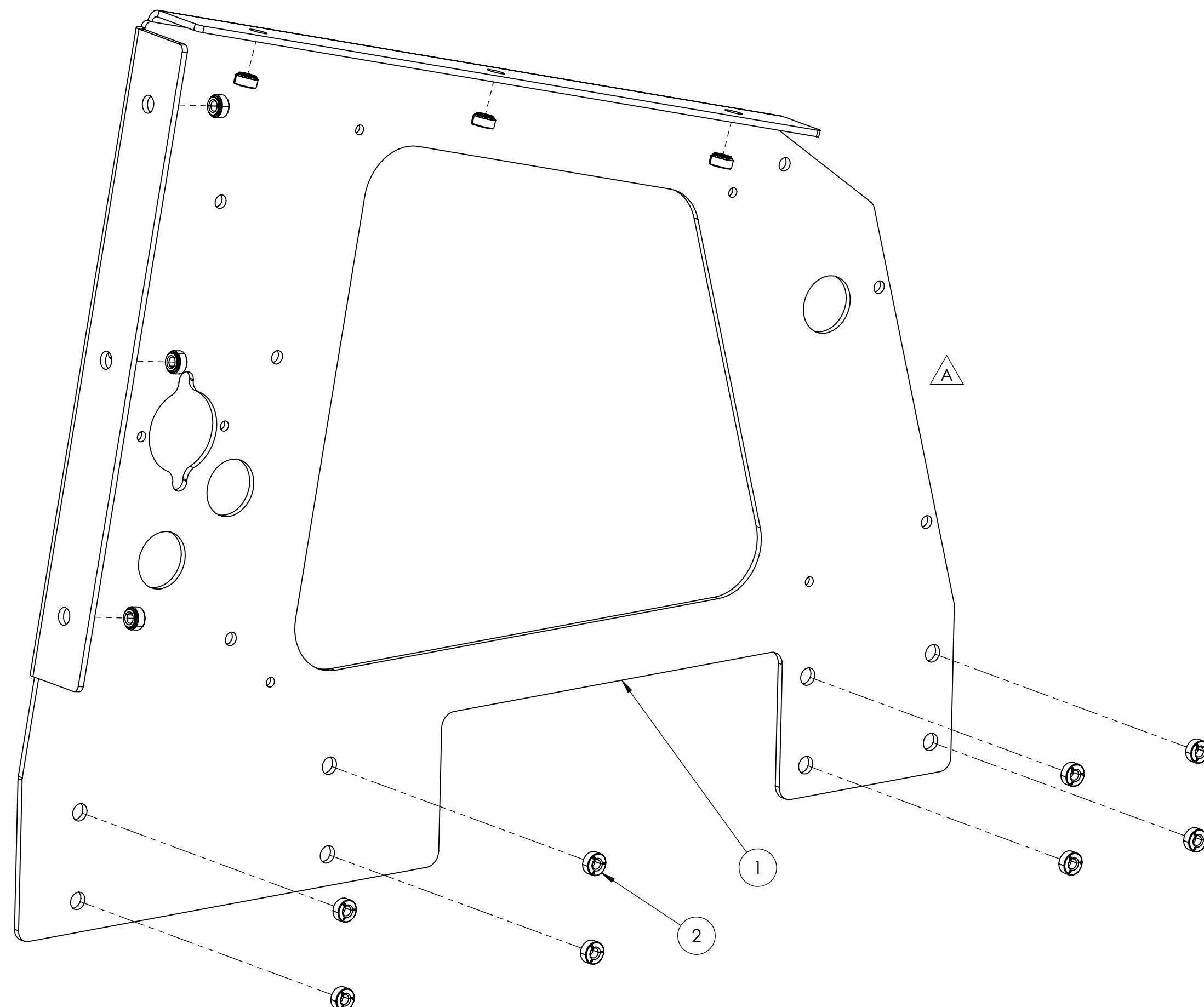
D

C

C

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Note: Tag or Label with Part Number

UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL $\pm 1/16$
ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$
TWO PLACE DECIMAL $\pm .01$
THREE PLACE DECIMAL $\pm .005$

MATERIAL/FINISH:

DO NOT SCALE DRAWING

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24372-01	Counter Top Right Plate	1
2	perm_clinchnut_.25_20 .054	1/4-20 self-clinching nut, .054 shank	14

VEND	NAME	DATE
DRAWN	JO	9/12/2023

PROPRIETARY AND CONFIDENTIAL

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COMMENTS:
REMOVE ALL BURRS AND SHARP EDGES.

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE: Counter Top
Right Plate w/
PEMs

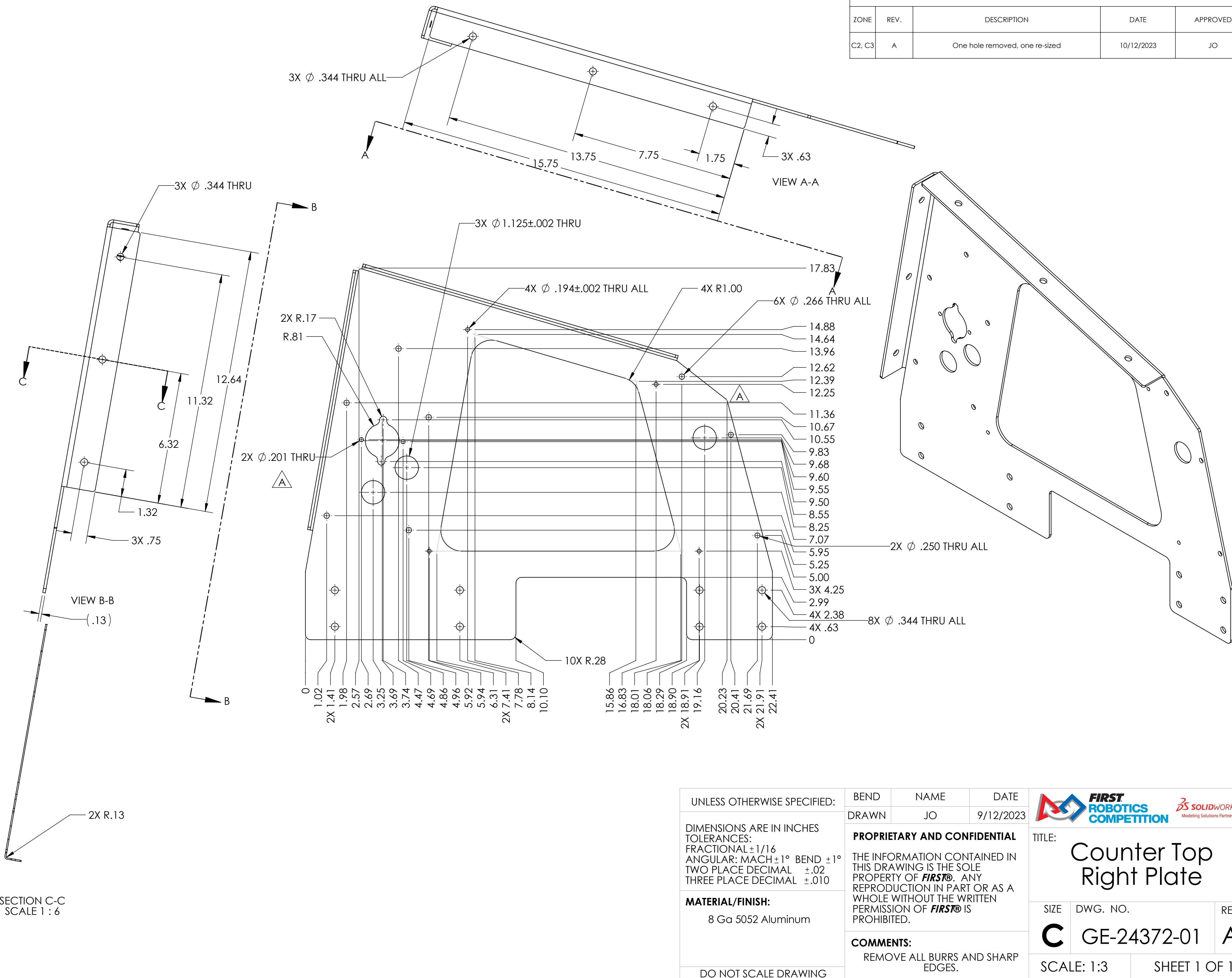
SIZE DWG. NO. REV

C GE-24372 A

SCALE: 1:2 SHEET 1 OF 1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
C2, C3	A	One hole removed, one re-sized	10/12/2023	JO

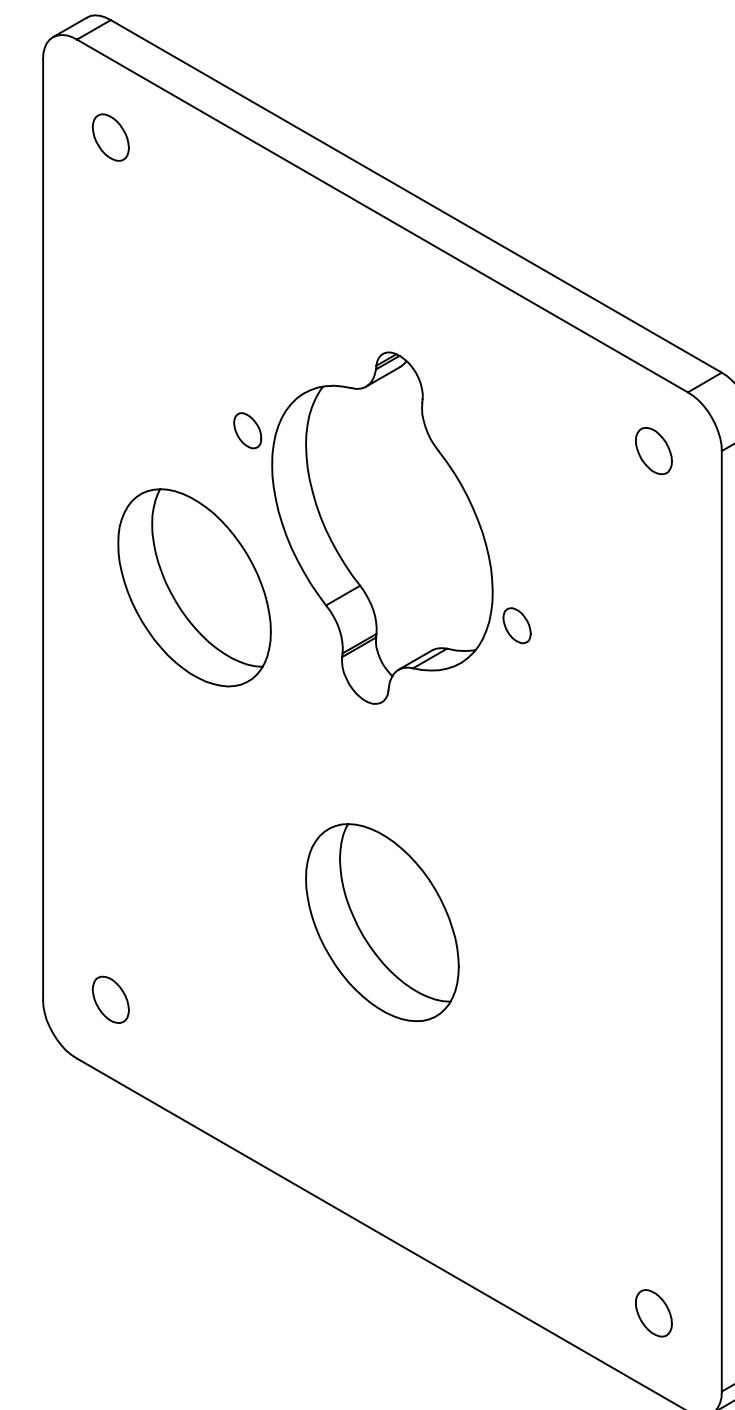
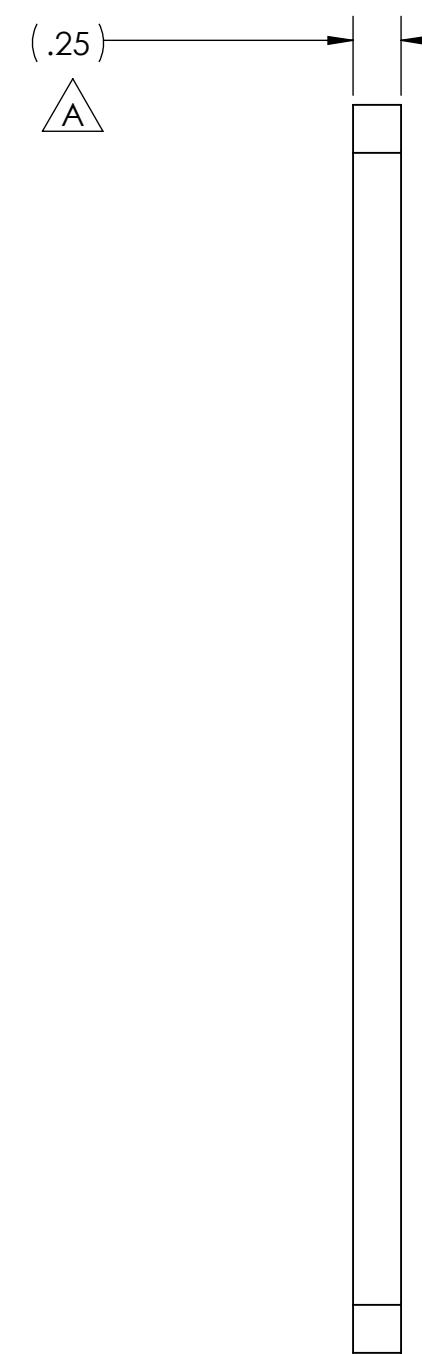
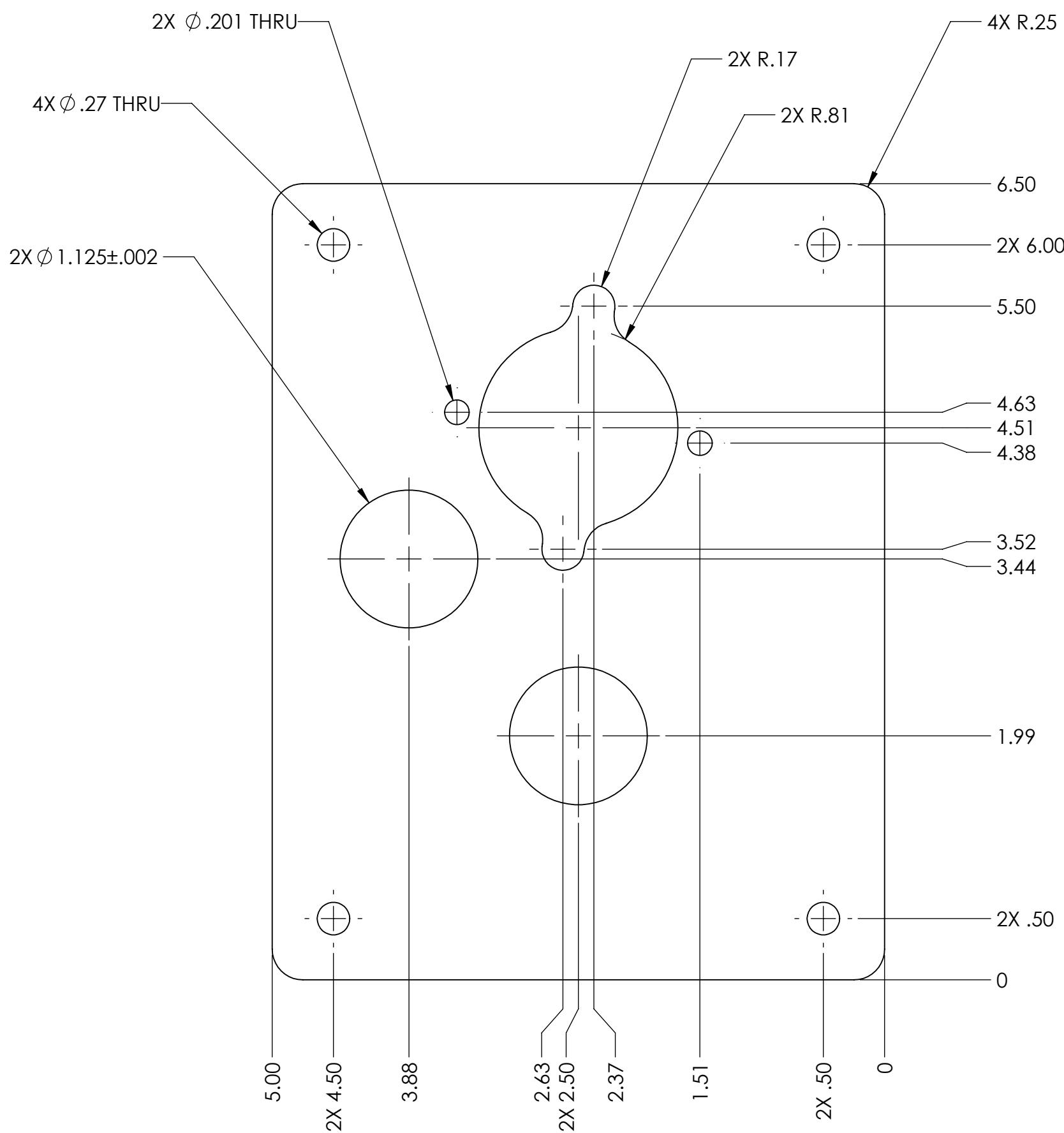


REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
A2, C2	A	Thickness Increased	10/11/2023	JO

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UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES

TOLERANCES:

FRACTIONAL \pm 1/16ANGULAR: MACH \pm 1° BEND \pm 1°TWO PLACE DECIMAL \pm .01THREE PLACE DECIMAL \pm .005

MATERIAL/FINISH:

1/4" 6061 Aluminum

DO NOT SCALE DRAWING

VEND

DRAWN

NAME

JO

DATE

9/14/2023

PROPRIETARY AND CONFIDENTIAL

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COMMENTS:

REMOVE ALL BURRS AND SHARP EDGES.

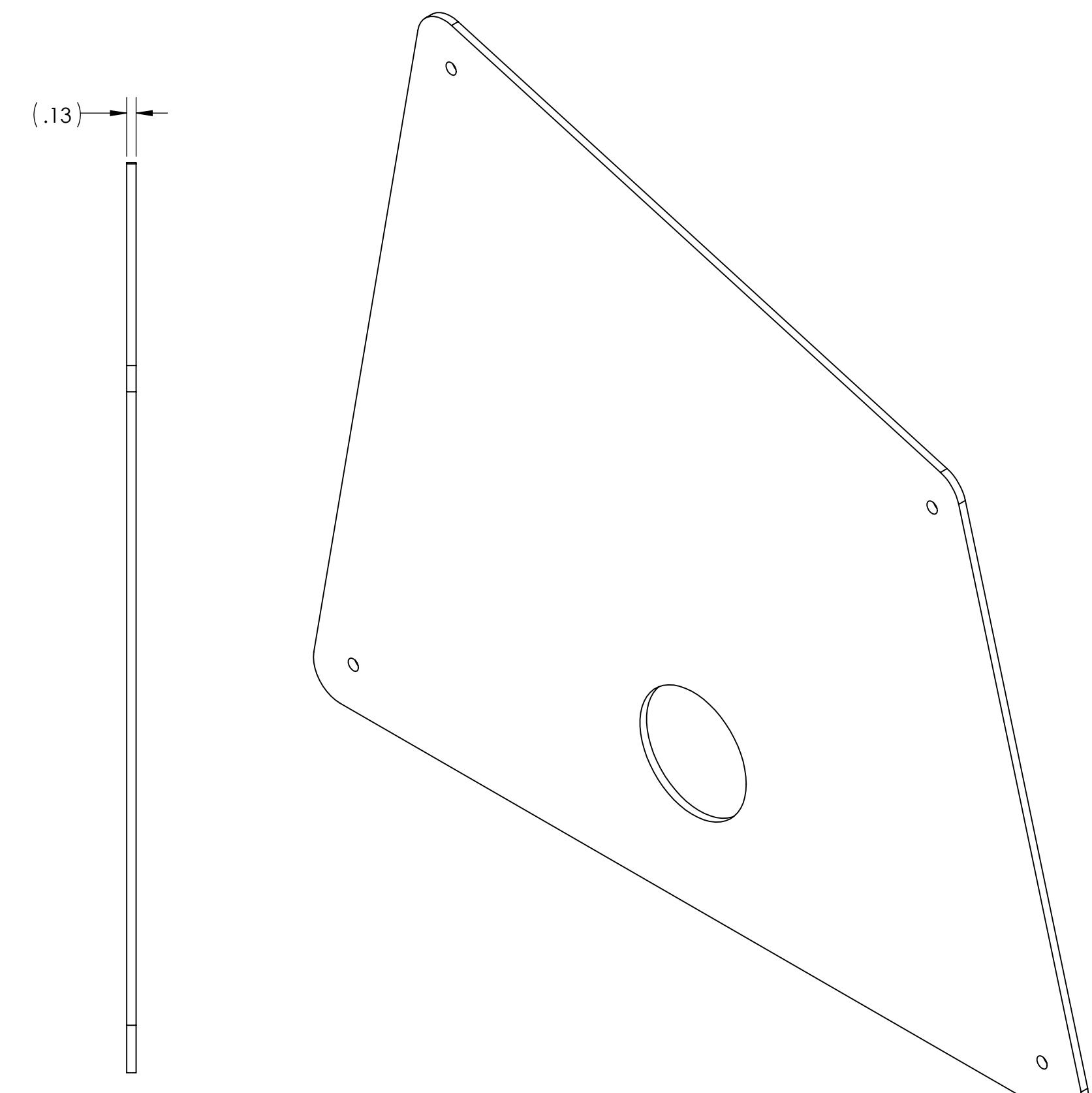
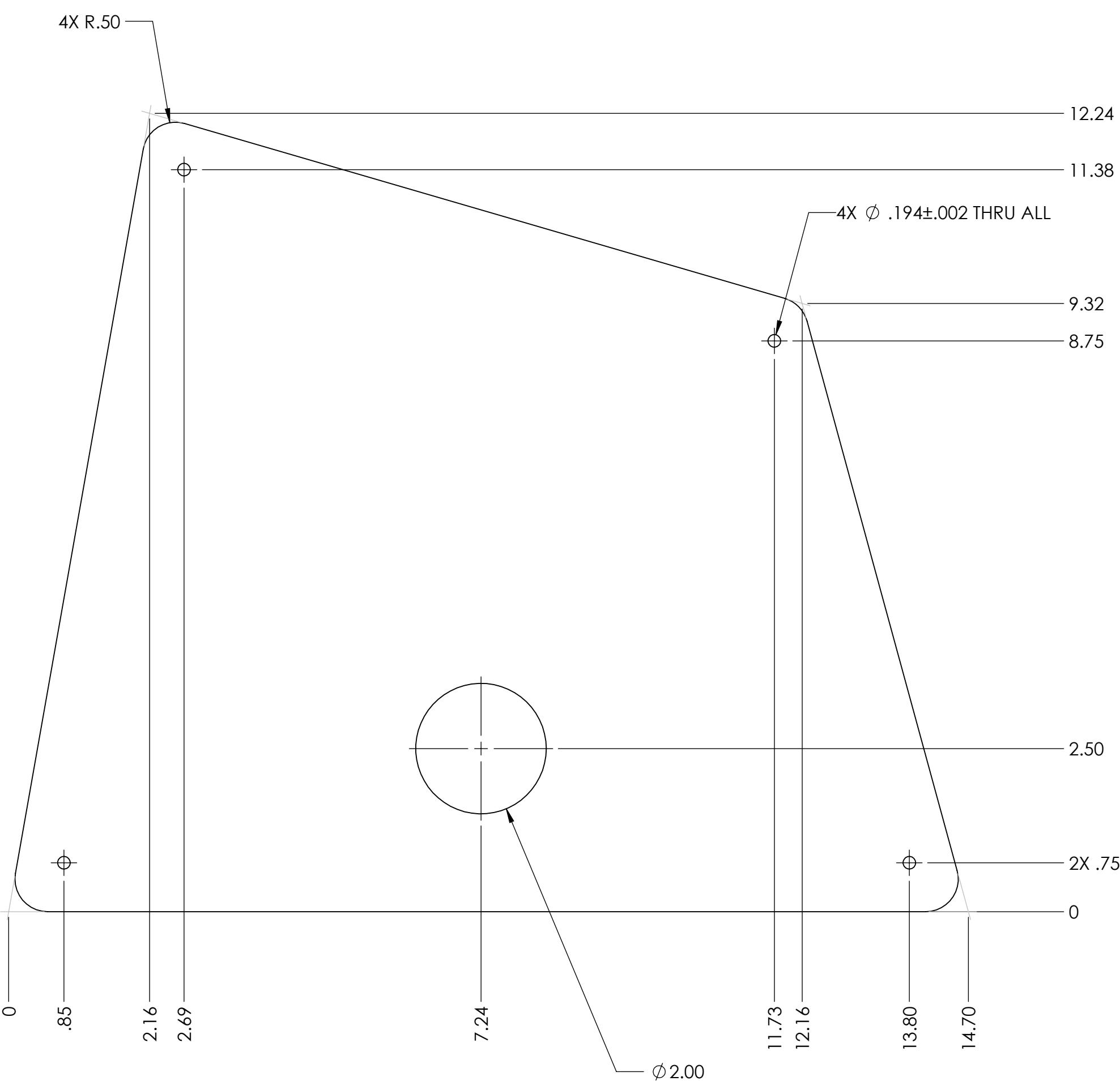


TITLE:
Counter Upper
Motor Plate

SIZE DWG. NO. REV

C GE-24373 A

SCALE: 1:1 SHEET 1 OF 1



UNLESS OTHERWISE SPECIFIED:			VEND	NAME	DATE
			DRAWN	JO	9/14/2023
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .005$					
PROPRIETARY AND CONFIDENTIAL					
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.					
MATERIAL/FINISH:	1/8" Polycarbonate, Clear				
COMMENTS:	REMOVE ALL BURRS AND SHARP EDGES.				
DO NOT SCALE DRAWING					

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
Speaker
Counter Side
Shield

SIZE DWG. NO. REV
C GE-24374

SCALE: 6:10 SHEET 1 OF 1

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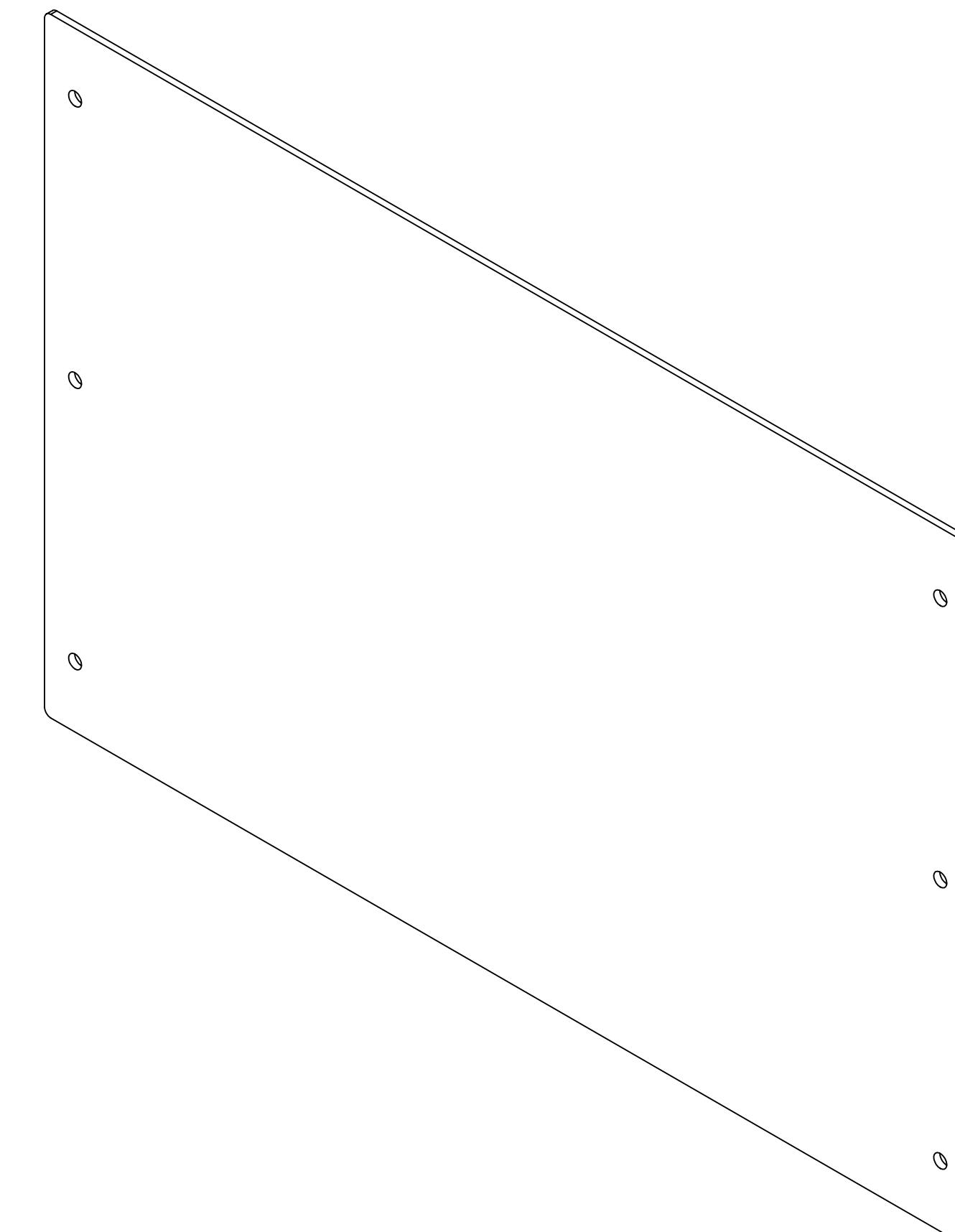
A

A

6X ϕ .27 THRU ALL

3X 18.38

4X R.13
 12.50
 (.13)
 2X 11.25
 2X 6.25
 2X 1.25
 0
 3X .63



UNLESS OTHERWISE SPECIFIED:

DRAWN

VEND

JO

NAME

9/14/2023

DATE



SOLIDWORKS

Modeling Solutions Partner

DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$
TWO PLACE DECIMAL $\pm .01$
THREE PLACE DECIMAL $\pm .005$

PROPRIETARY AND CONFIDENTIAL

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REPRODUCTION IN PART OR AS A
WHOLE WITHOUT THE WRITTEN
PERMISSION OF FIRST[®] IS
PROHIBITED.

MATERIAL/FINISH:

1/8" Polycarbonate, Clear

DO NOT SCALE DRAWING

TITLE: Speaker
Counter Back
Cover

SIZE DWG. NO. REV

C GE-24375

SCALE: 1:2 SHEET 1 OF 1

4

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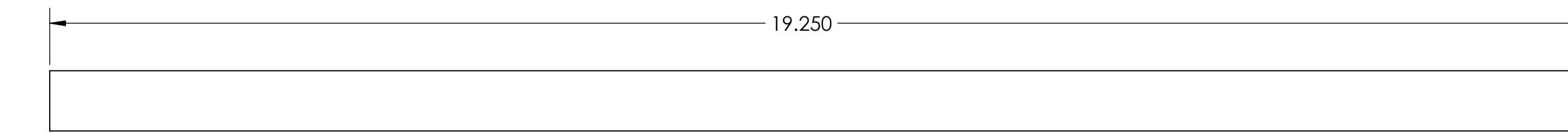
A

$\phi .750^{+.000}_{-.002}$



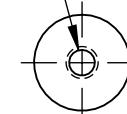
$\phi .20 \nparallel .65$

1/4-20 UNC $\nparallel .50$



$\phi .20 \nparallel .65$

1/4-20 UNC $\nparallel .50$



UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	JO	10/12/2023	
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH:	SIZE	DWG. NO.	REV
Steel, Zinc Plated	C	GE-24376	A
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING		SCALE: 2:3	SHEET 1 OF 1

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
**Counter Top
Dead Shaft**

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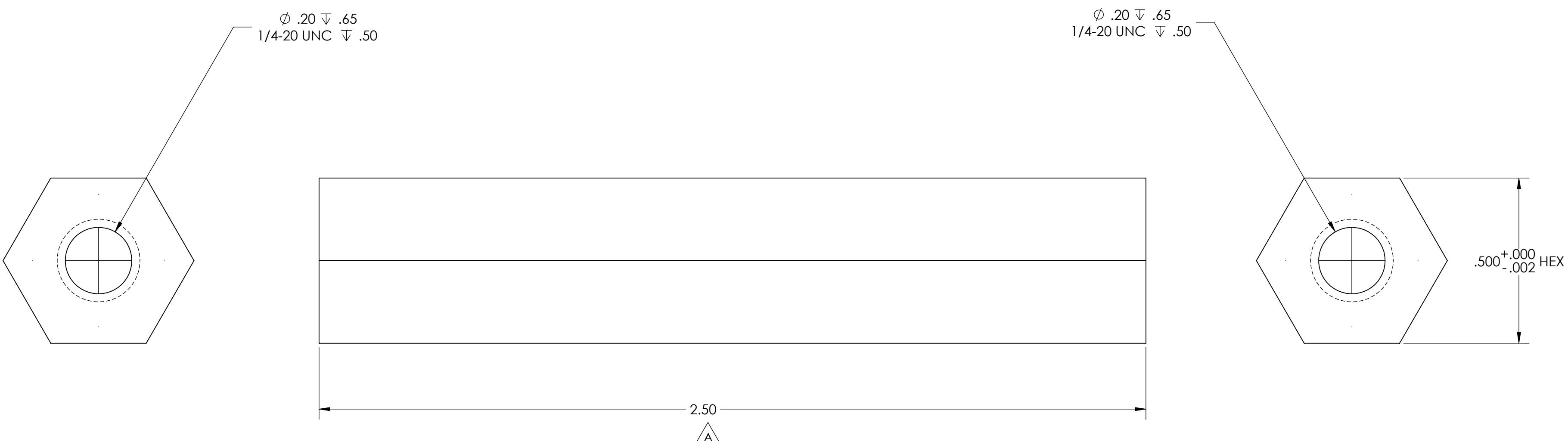
2

1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
B3	A	Adjusted Length	10/11/2023	JO

D



C

B

A

D

C

B

A

UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL $\pm 1/16$
ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$
TWO PLACE DECIMAL $\pm .01$
THREE PLACE DECIMAL $\pm .005$

MATERIAL/FINISH:
1018 Steel 1/2" Hex Shaft

DO NOT SCALE DRAWING

VEND NAME DATE
DRAWN JO 9/12/2023

PROPRIETARY AND CONFIDENTIAL

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COMMENTS:
REMOVE ALL BURRS AND SHARP EDGES.

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
Counter Top
Short Hex Shaft

SIZE DWG. NO. REV
C GE-24377 **A**

SCALE: 4:1 SHEET 1 OF 1

4

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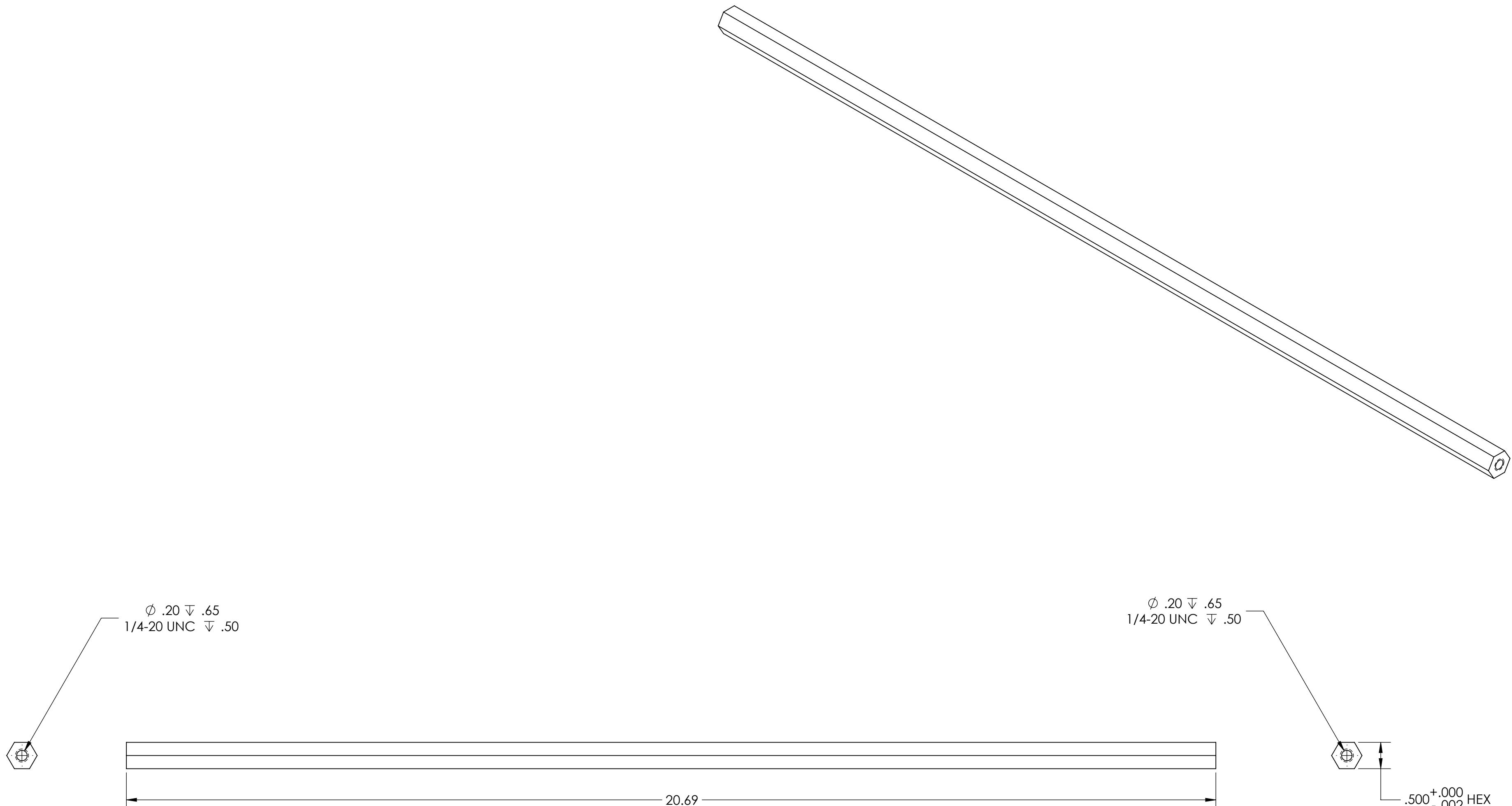
C

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UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	JO	9/12/2023	
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH: 1018 Steel 1/2" Hex Shaft			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE: Counter Top Medium Hex Shaft

SIZE DWG. NO. REV
C GE-24378

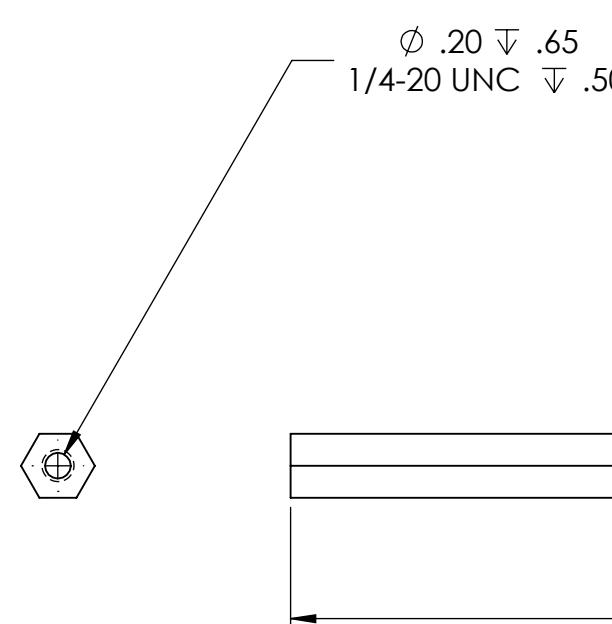
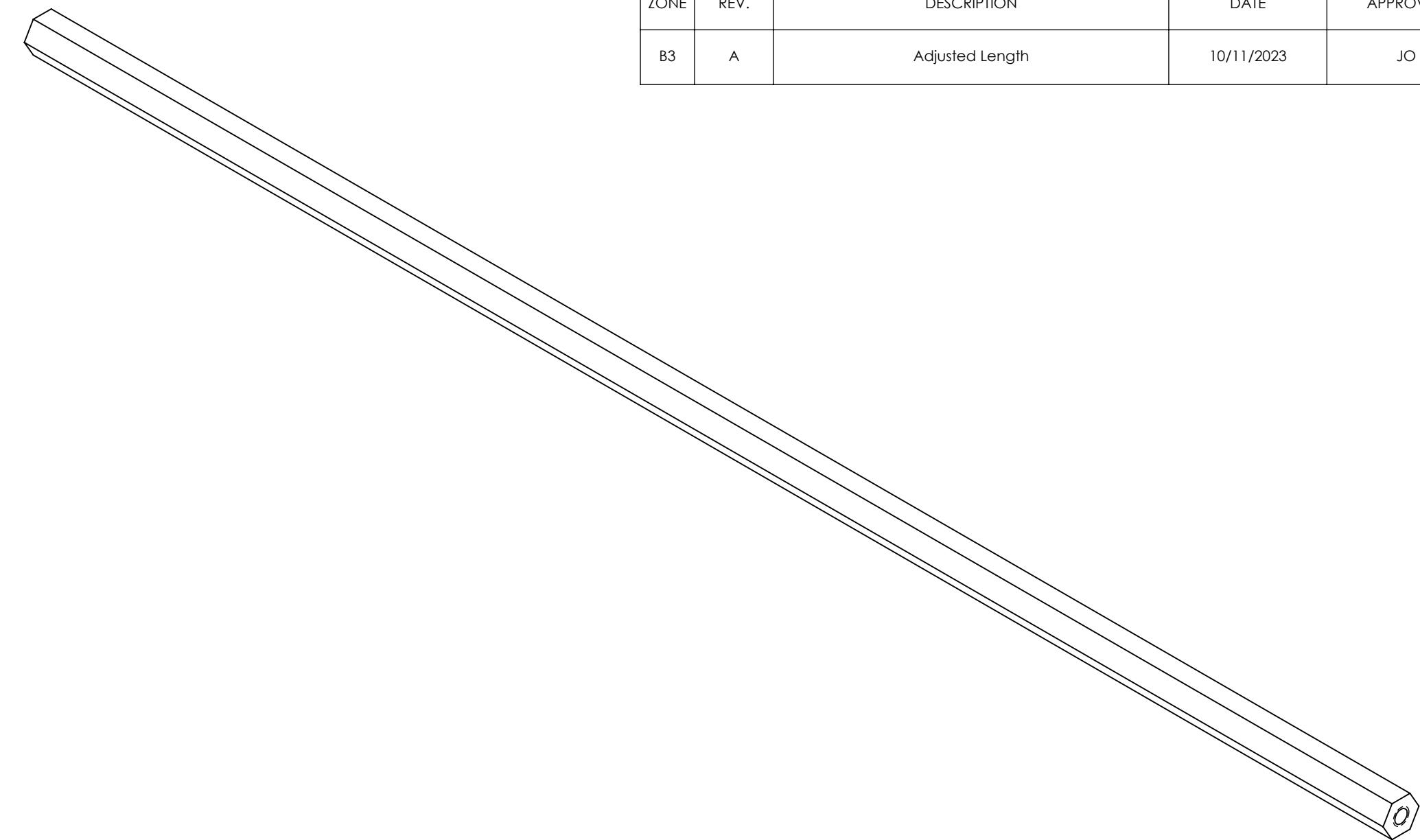
SCALE: 2:3 SHEET 1 OF 1

4

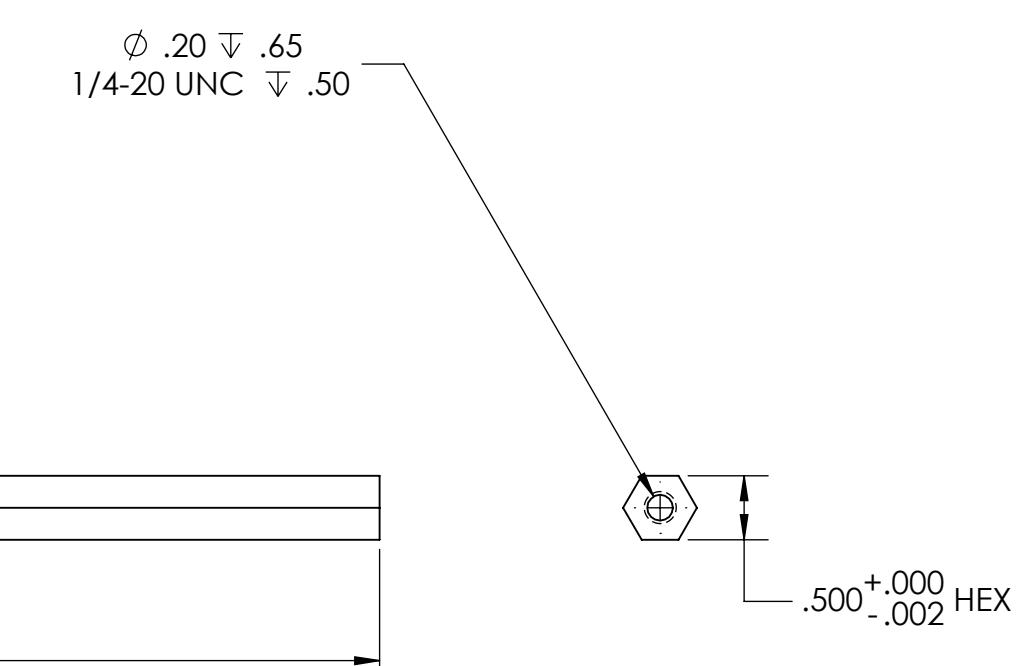
3

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UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL $\pm 1/16$
ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$
TWO PLACE DECIMAL $\pm .01$
THREE PLACE DECIMAL $\pm .005$

MATERIAL/FINISH:
1018 Steel 1/2" Hex Shaft

DO NOT SCALE DRAWING

VEND	NAME	DATE
DRAWN	JO	9/12/2023

PROPRIETARY AND CONFIDENTIAL

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COMMENTS:
REMOVE ALL BURRS AND SHARP EDGES.

TITLE:	FIRST ROBOTICS COMPETITION	SOLIDWORKS
		Modeling Solutions Partner

TITLE: Counter Top Long Hex Shaft

SIZE	DWG. NO.	REV
C	GE-24379	A

SCALE: 2:3 SHEET 1 OF 1

4

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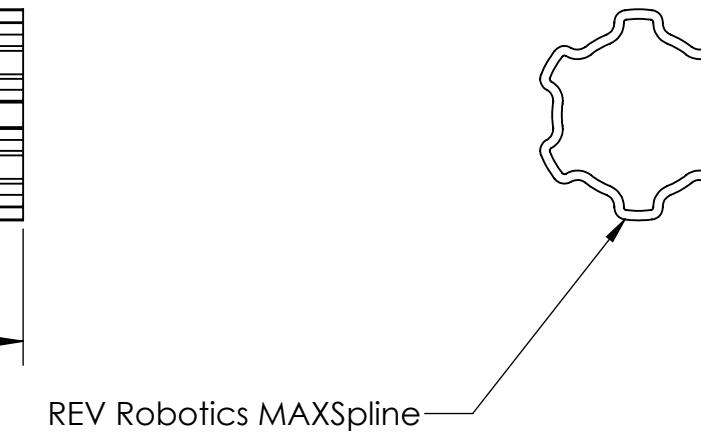
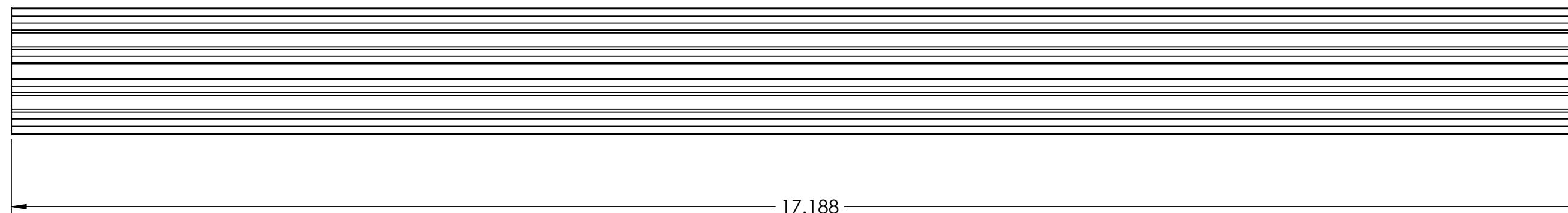
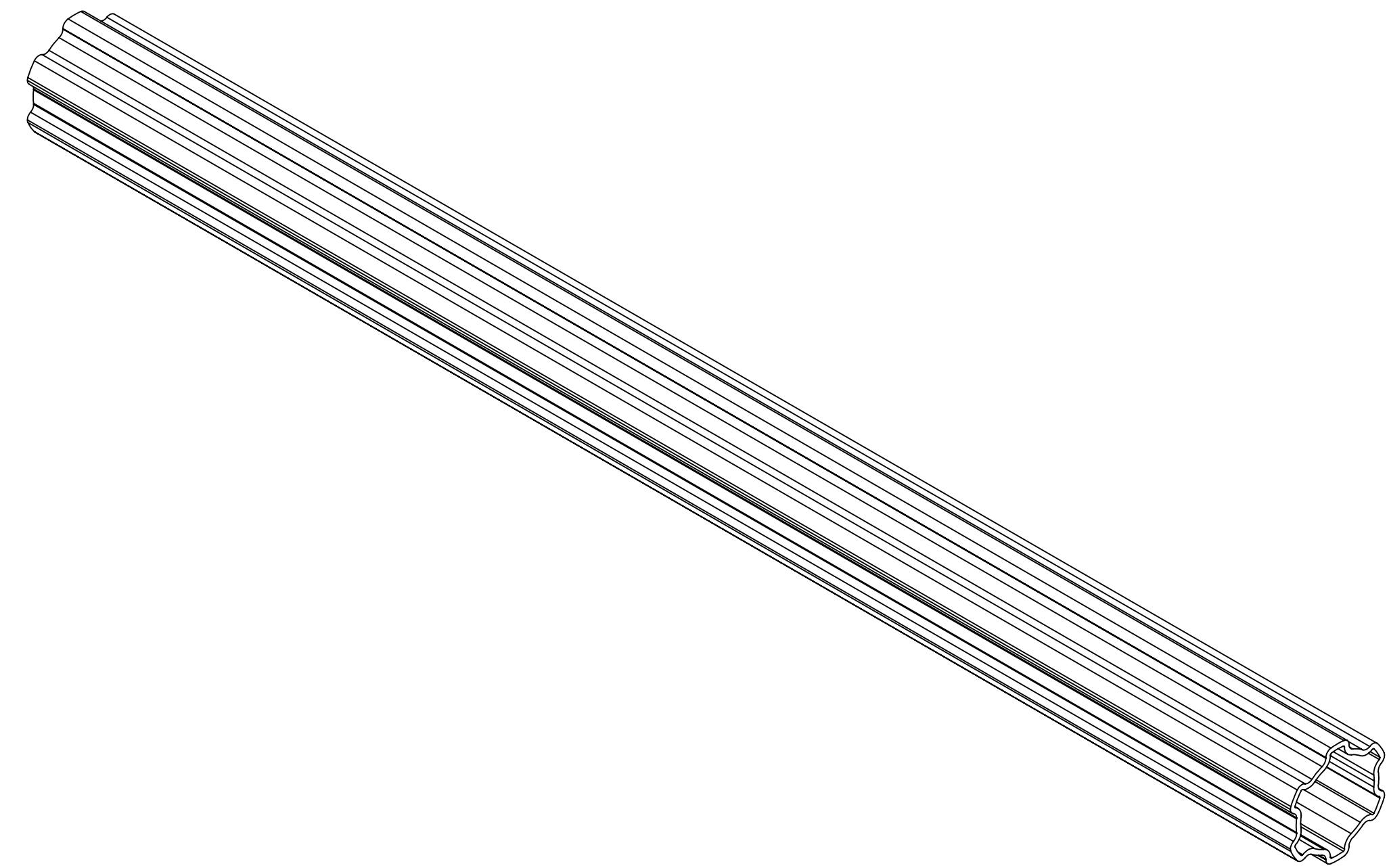
C

B

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A



UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	JO	10/11/2023	
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH: 6061 Aluminum			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

**Top Assembly
Belt MAXSpline**

SIZE DWG. NO. REV
C GE-24381

SCALE: 4:5 SHEET 1 OF 1

4

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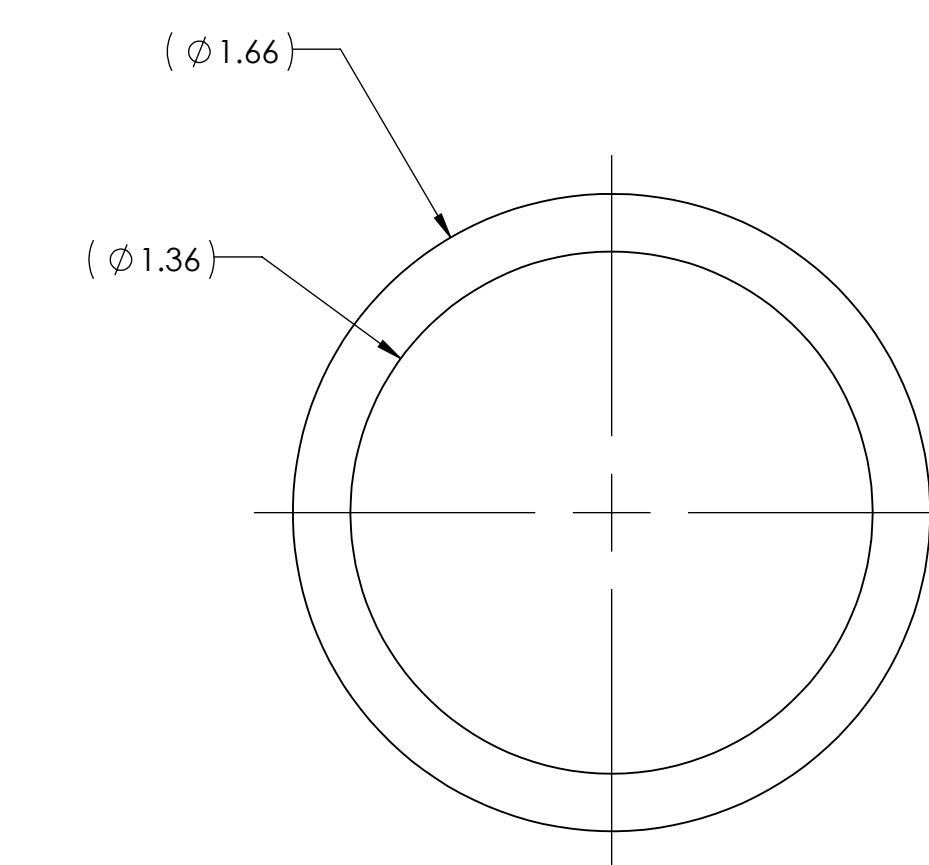
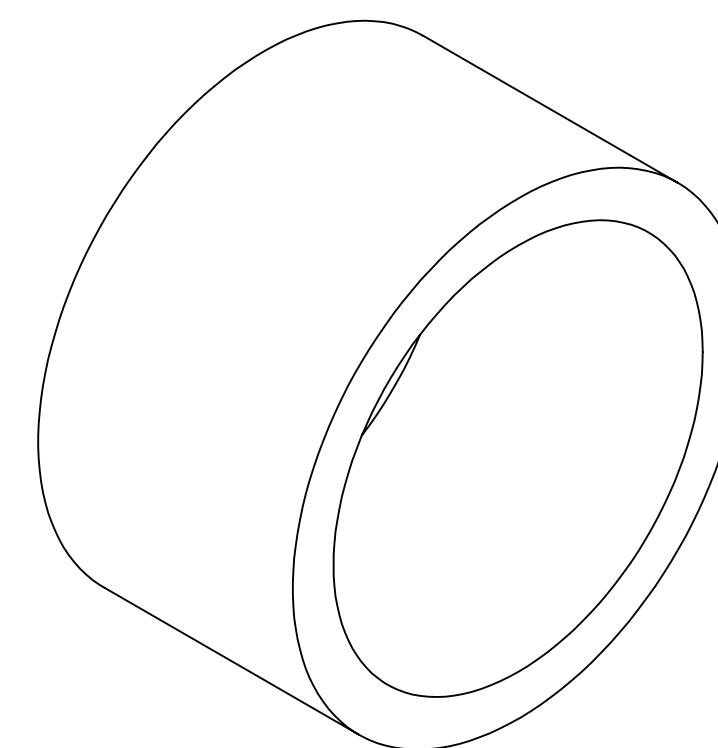
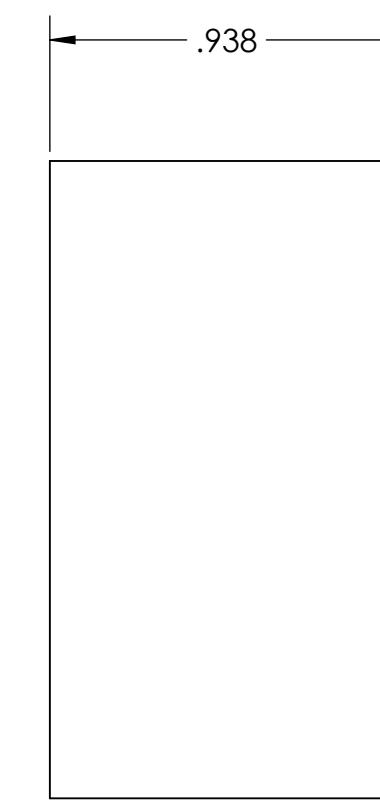
C

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A



UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES
TOLERANCES:

FRACTIONAL $\pm 1/16$

ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$

TWO PLACE DECIMAL $\pm .01$

THREE PLACE DECIMAL $\pm .005$

MATERIAL/FINISH:

1-1/4" Schedule 40 PVC
Pipe

DO NOT SCALE DRAWING

VEND NAME DATE

DRAWN JO 10/12/2023



TITLE:

Counter Top
Spacer

SIZE DWG. NO. REV

C GE-24382

SCALE: 2:1 SHEET 1 OF 1

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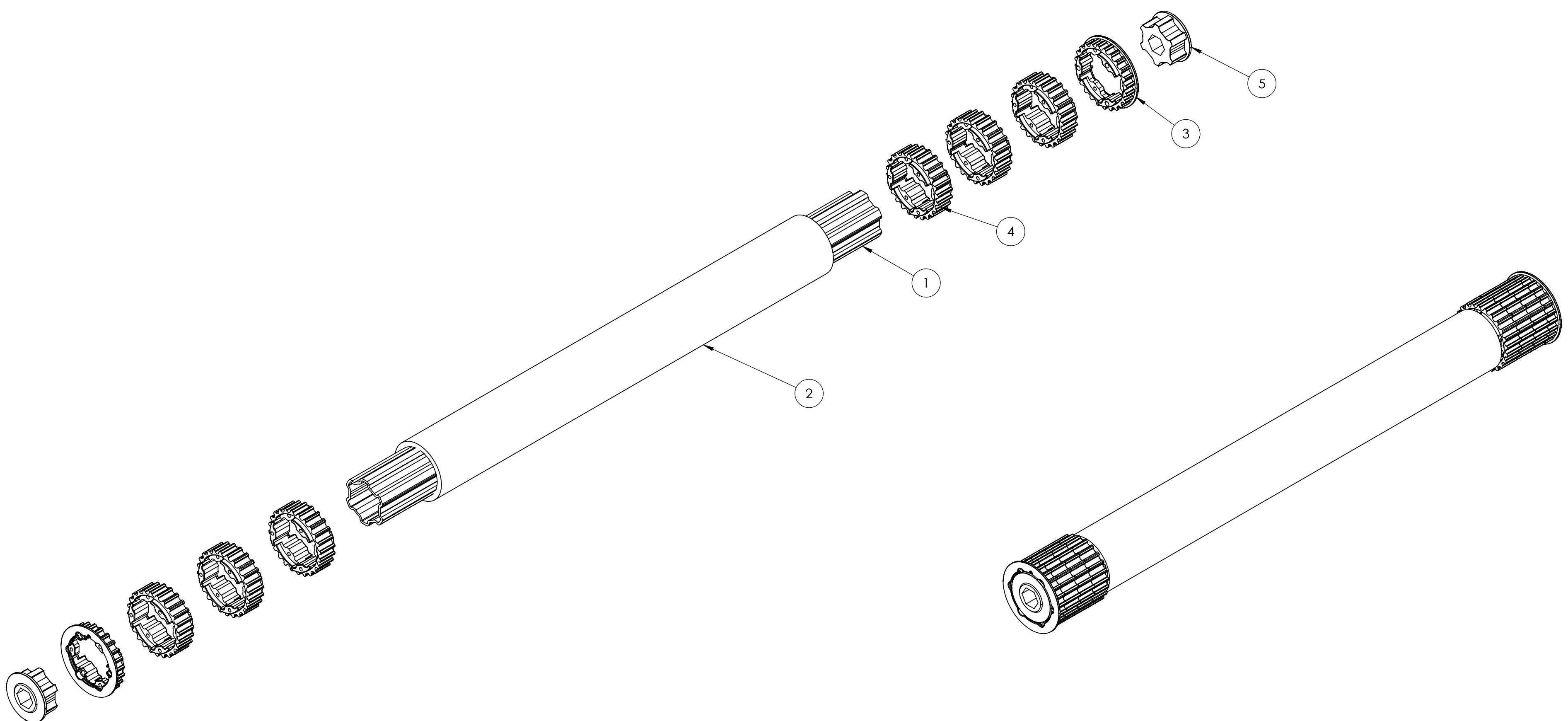
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Assemble as shown

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24357	Bottom Assembly MAXspline	1
2	GE-24360	Long PVC Spacer	1
3	REV-21-2222	Rev MAXspline 24tooth Pulley End	2
4	REV-21-2223	Rev MAXspline 24tooth Middle Pulley	6
5	REV-21-2393	Rev MAXspline Hex End Cap	2

UNLESS OTHERWISE SPECIFIED:			FIELD	NAME	DATE
			DRAWN	JO	11/1/2023
PROPRIETARY AND CONFIDENTIAL					
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.					
MATERIAL/FINISH:					
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.					
DO NOT SCALE DRAWING			SIZE	DWG. NO.	REV
			C	GE-24383	
			SCALE: 1:2	SHEET 1 OF 1	

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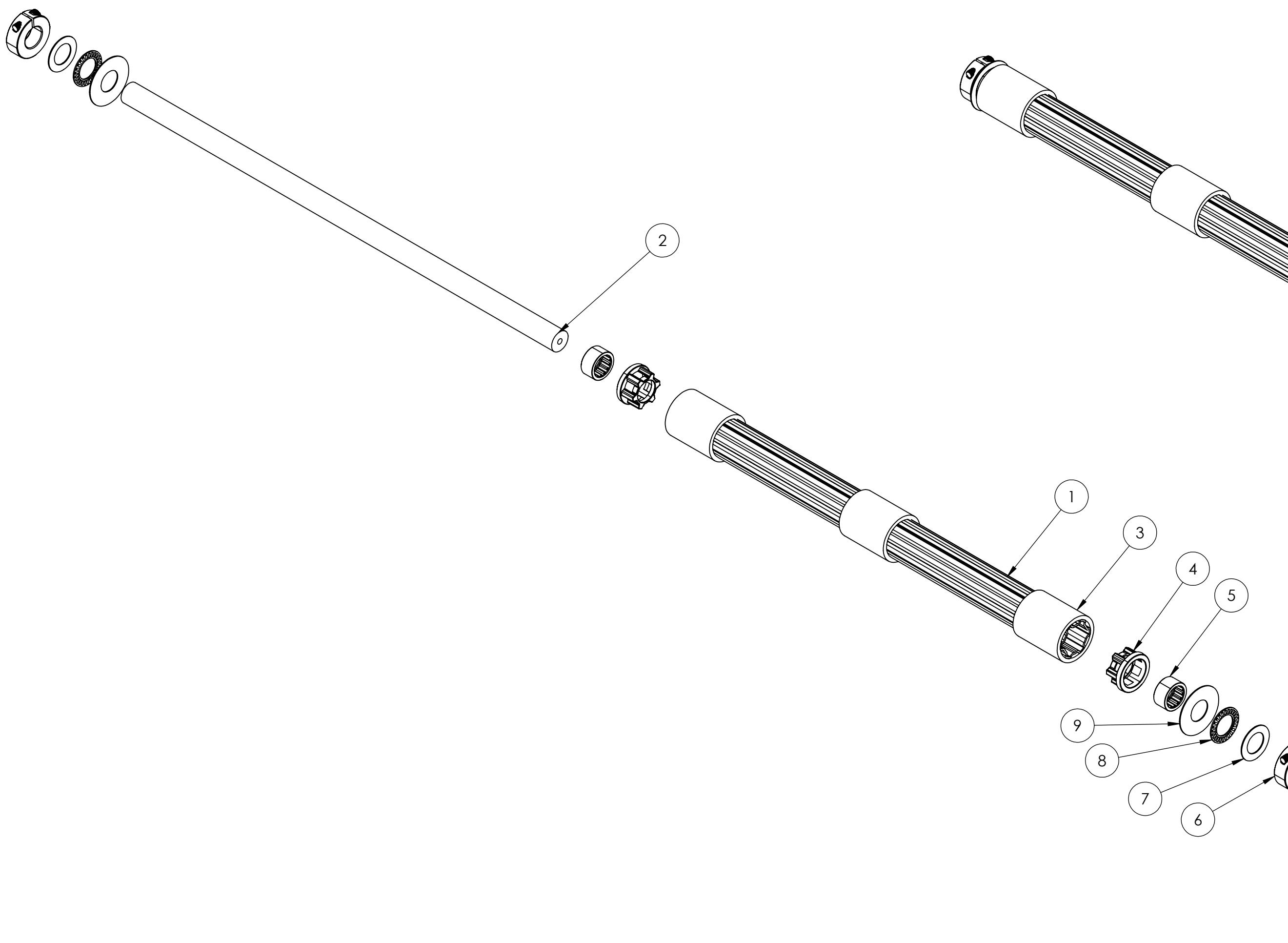
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24357	Bottom Assembly MAXSpline	1
2	GE-24367	Counter Bottom Dead Shaft	1
3	GE-24368	Counter Bottom Flat Pulley	3
4	REV-21-2385	Rev MAXSpline Needle Bearing Housing	2
5	REV-21-2386	Rev MAXSpline Needle Roller Bearing	2
6	6435K16_Clamping Shaft Collar	McMaster 3/4" Clamping Shaft Collar	2
7	5909K46_0.032 Thick Washer for 3-4 Shaft Diameter Needle-Roller Thrust Bearing	McMaster 3/4" Needle Roller Bearing Washer	2
8	5909K33_Needle-Roller Thrust Bearing	McMaster 3/4" Needle Roller Thrust Bearing	2
9	GE-24393	Custom Thrust Washer	2

UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DRAWN	JO	11/1/2023	
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
SIZE DWG. NO. REV			
C GE-24384			
SCALE: 1:3		SHEET 1 OF 1	

 **FIRST
ROBOTICS
COMPETITION**  **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Dead Shaft -
Bottom
Assembly

SIZE DWG. NO. REV
C GE-24384

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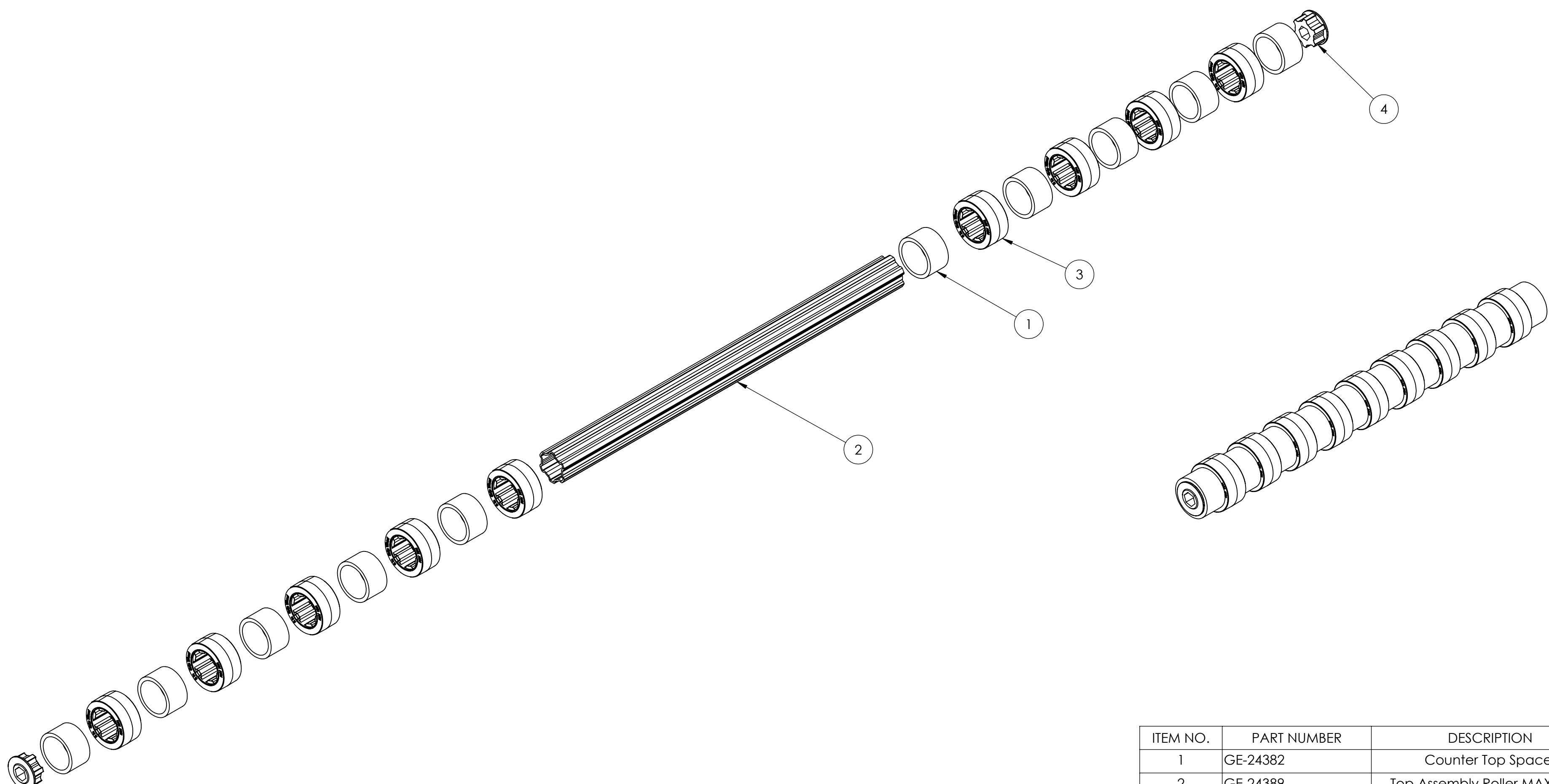
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Assemble as Shown

UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL $\pm 1/2$
ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$
TWO PLACE DECIMAL $\pm .50$

MATERIAL/FINISH:

DO NOT SCALE DRAWING

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24382	Counter Top Spacer	10
2	GE-24389	Top Assembly Roller MAXSpline	1
3	Grip_Wheel-2in-MAXSpline	Rev 2" MAXSpline Grip Wheel	9
4	REV-21-2393	Rev MAXSpline Hex End Cap	2

FIELD	NAME	DATE
DRAWN	JO	11/1/2023

PROPRIETARY AND CONFIDENTIAL

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COMMENTS:

REMOVE ALL BURRS AND SHARP EDGES.

FIRST	ROBOTICS	COMPETITION
		SOLIDWORKS Modeling Solutions Partner

TITLE:

**Roller Shaft -
Top Assembly**

SIZE DWG. NO. REV

C GE-24385

SCALE: 1:3 SHEET 1 OF 1

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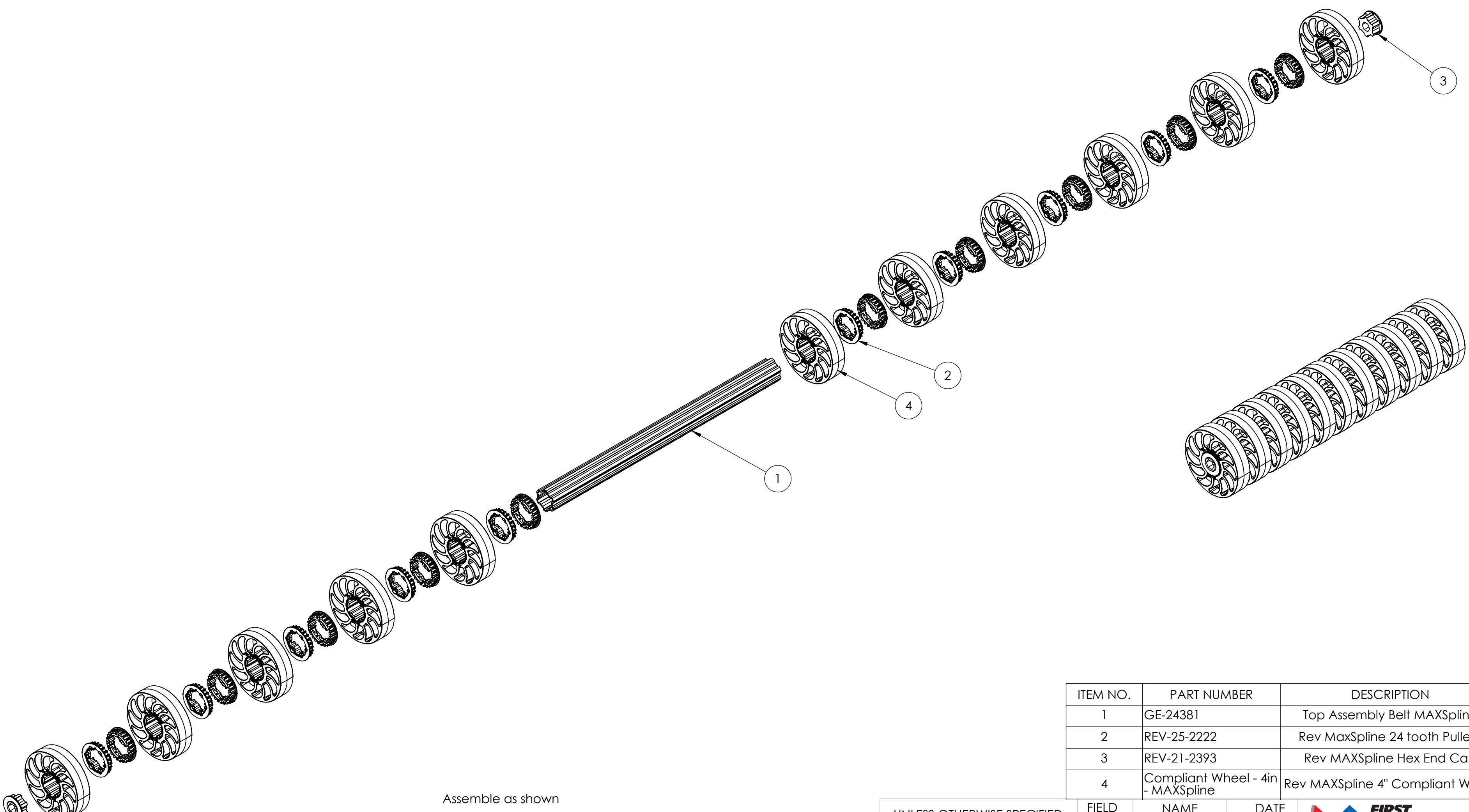
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24381	Top Assembly Belt MAXspline	1
2	REV-25-2222	Rev MaxSpline 24 tooth Pulleys	10
3	REV-21-2393	Rev MAXSpline Hex End Cap	2
4	Compliant Wheel - 4in - MAXsplines	Rev MAXSpline 4" Compliant Wheel	11

UNLESS OTHERWISE SPECIFIED:			FIELD	NAME	DATE
DRAWN	JO	11/1/2023			
PROPRIETARY AND CONFIDENTIAL					
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COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.					
DO NOT SCALE DRAWING					

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
Live Shaft - Top Assembly

SIZE	DWG. NO.	REV
C	GE-24386	
SCALE: 1:4	SHEET 1 OF 1	

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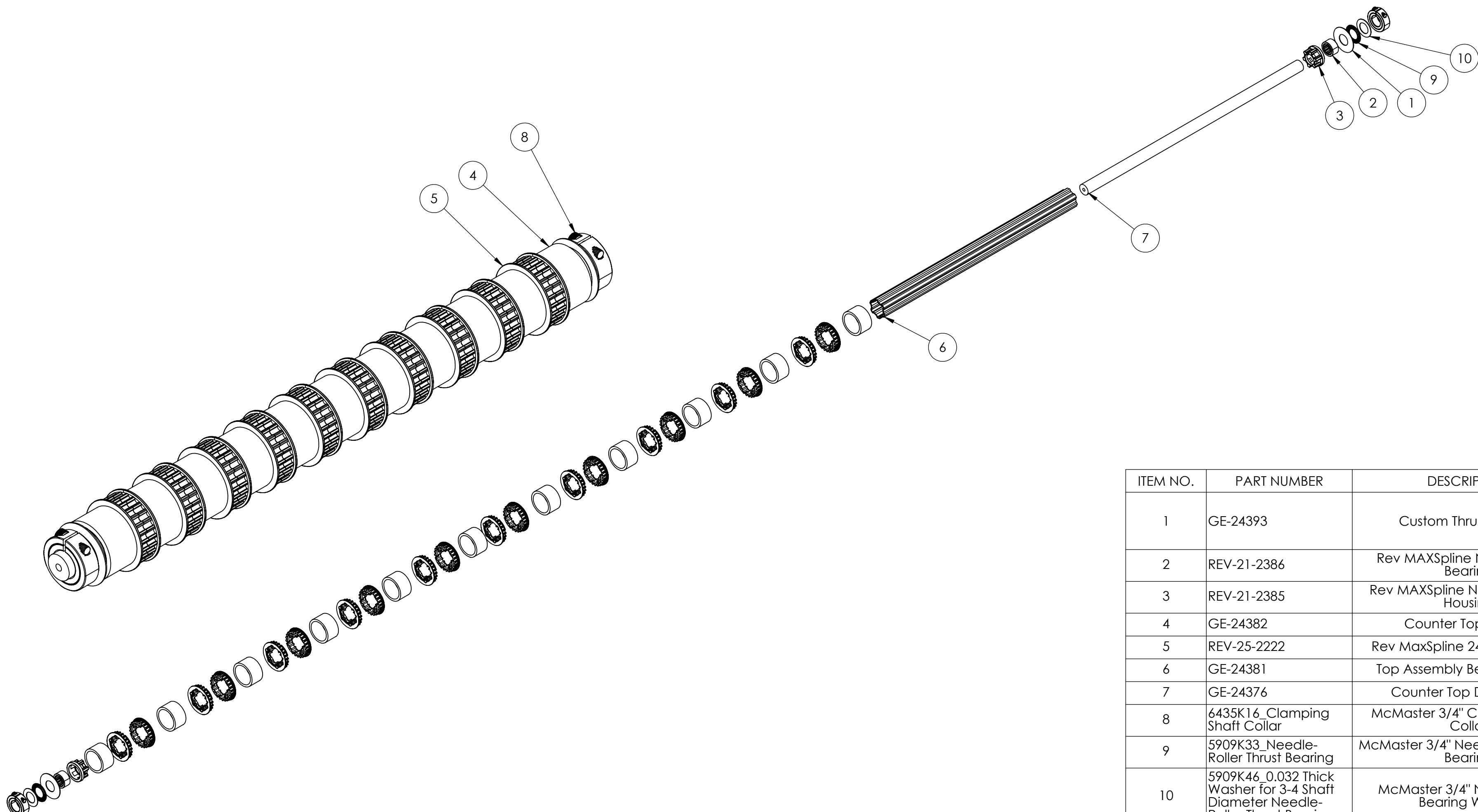
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24393	Custom Thrust Washer	2
2	REV-21-2386	Rev MAXSpline Needle Roller Bearing	2
3	REV-21-2385	Rev MAXSpline Needle Bearing Housing	2
4	GE-24382	Counter Top Spacer	11
5	REV-25-2222	Rev MaxSpline 24 tooth Pulleys	10
6	GE-24381	Top Assembly Belt MAXSpline	1
7	GE-24376	Counter Top Dead Shaft	1
8	6435K16_Clamping Shaft Collar	McMaster 3/4" Clamping Shaft Collar	2
9	5909K33_Needle-Roller Thrust Bearing	McMaster 3/4" Needle Roller Thrust Bearing	2
10	5909K46_0.032 Thick Washer for 3-4 Shaft Diameter Needle-Roller Thrust Bearing	McMaster 3/4" Needle Roller Bearing Washer	2

UNLESS OTHERWISE SPECIFIED:		
FIELD	NAME	DATE
DRAWN	JO	11/1/2023
PROPRIETARY AND CONFIDENTIAL		
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COMMENTS:		
REMOVE ALL BURRS AND SHARP EDGES.		
DO NOT SCALE DRAWING		
TITLE: Dead Shaft - Top Assembly		
SIZE	DWG. NO.	REV
C	GE-24387	
SCALE: 1:5		SHEET 1 OF 1

 FIRST
ROBOTICS
COMPETITION  SOLIDWORKS
Modeling Solutions Partner

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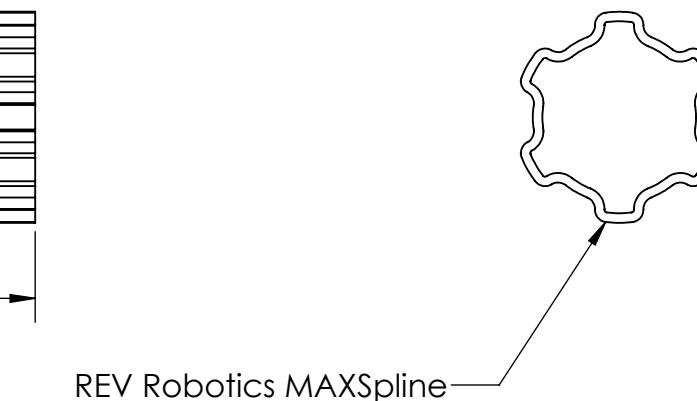
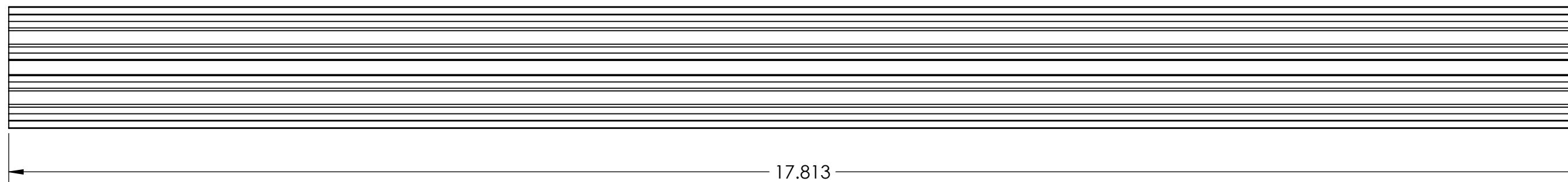
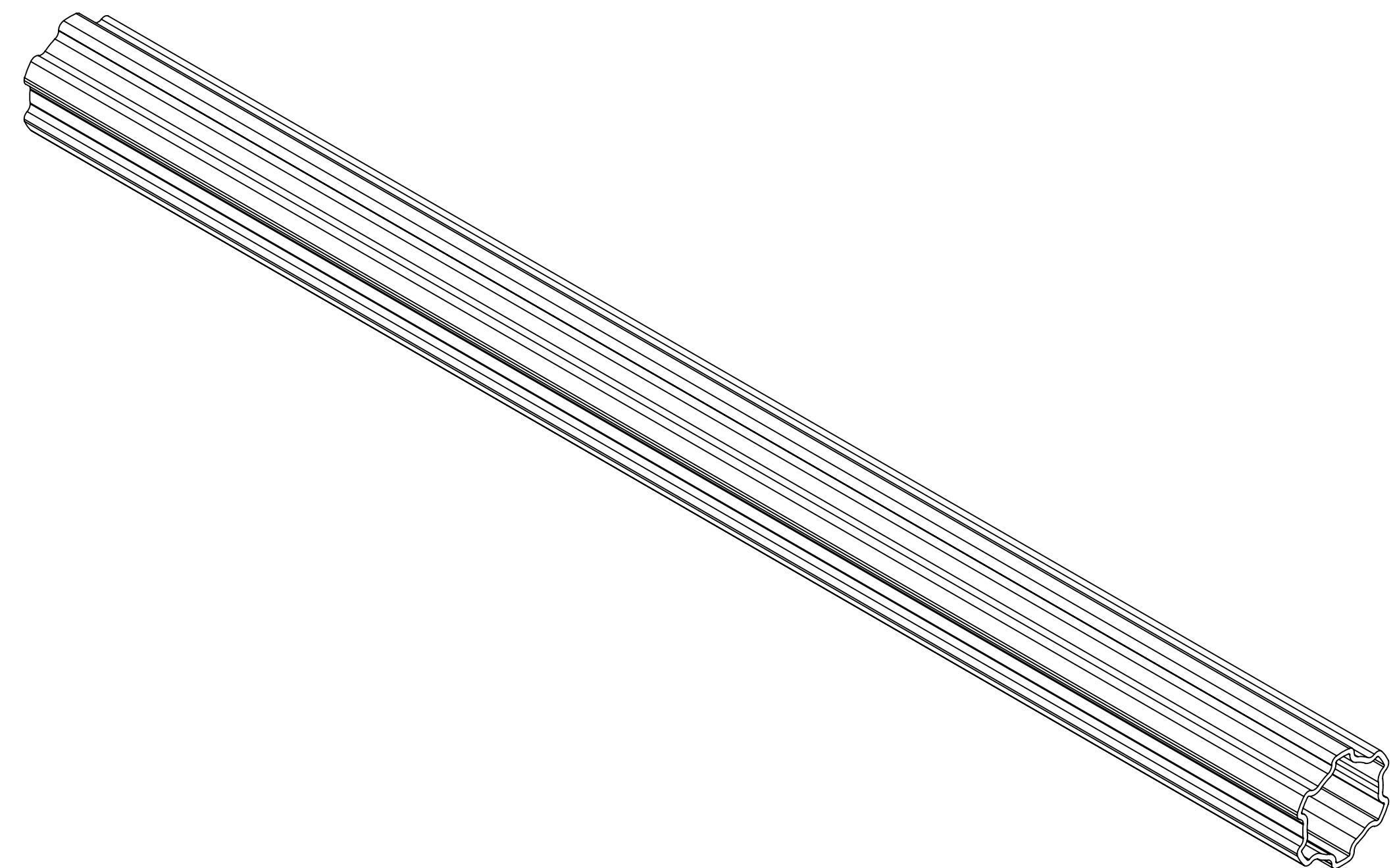
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UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	JO	10/11/2023	
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH: 6061 Aluminum			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

 **FIRST
ROBOTICS
COMPETITION**  **SOLIDWORKS**
Modeling Solutions Partner

TITLE: **Top Assembly
Roller
MAXSpline**
SIZE **C** DWG. NO. **GE-24389** REV **1**

SCALE: 4:5 SHEET 1 OF 1

4

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1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
B3	A	Visual Geometry Changes from GE-24390-01	10/16/2023	JO
B2	B	Visual Geometry Changes from GE-24390-01	10/17/2023	JO

D

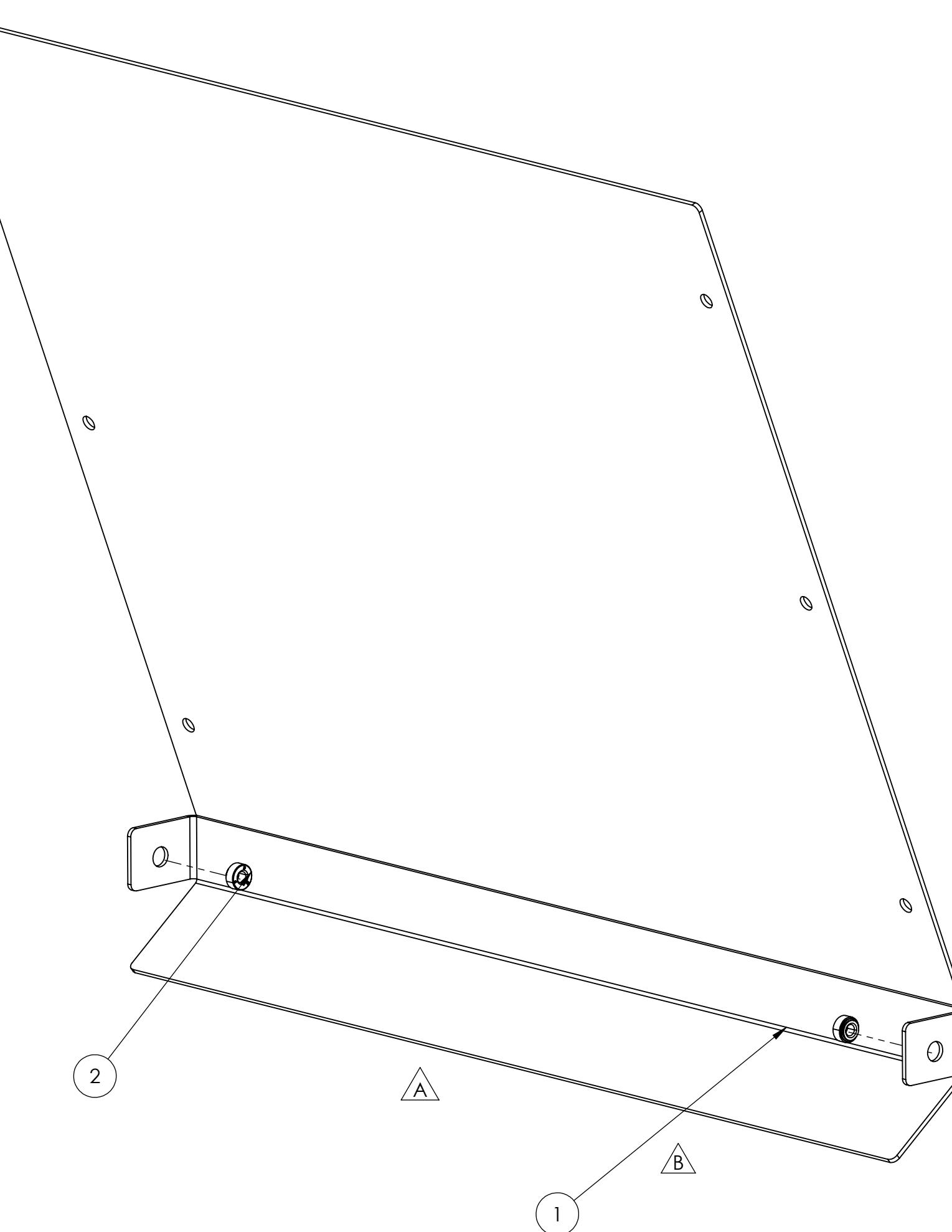
D

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Note: Tag or Label with Part Number

UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL $\pm 1/16$
ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$
TWO PLACE DECIMAL $\pm .01$
THREE PLACE DECIMAL $\pm .005$

MATERIAL/FINISH:

DO NOT SCALE DRAWING

VEND	NAME	DATE
DRAWN	JO	9/12/2023
PROPRIETARY AND CONFIDENTIAL		
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COMMENTS:
REMOVE ALL BURRS AND SHARP EDGES.

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:

Counter Roof
w/ PEMs

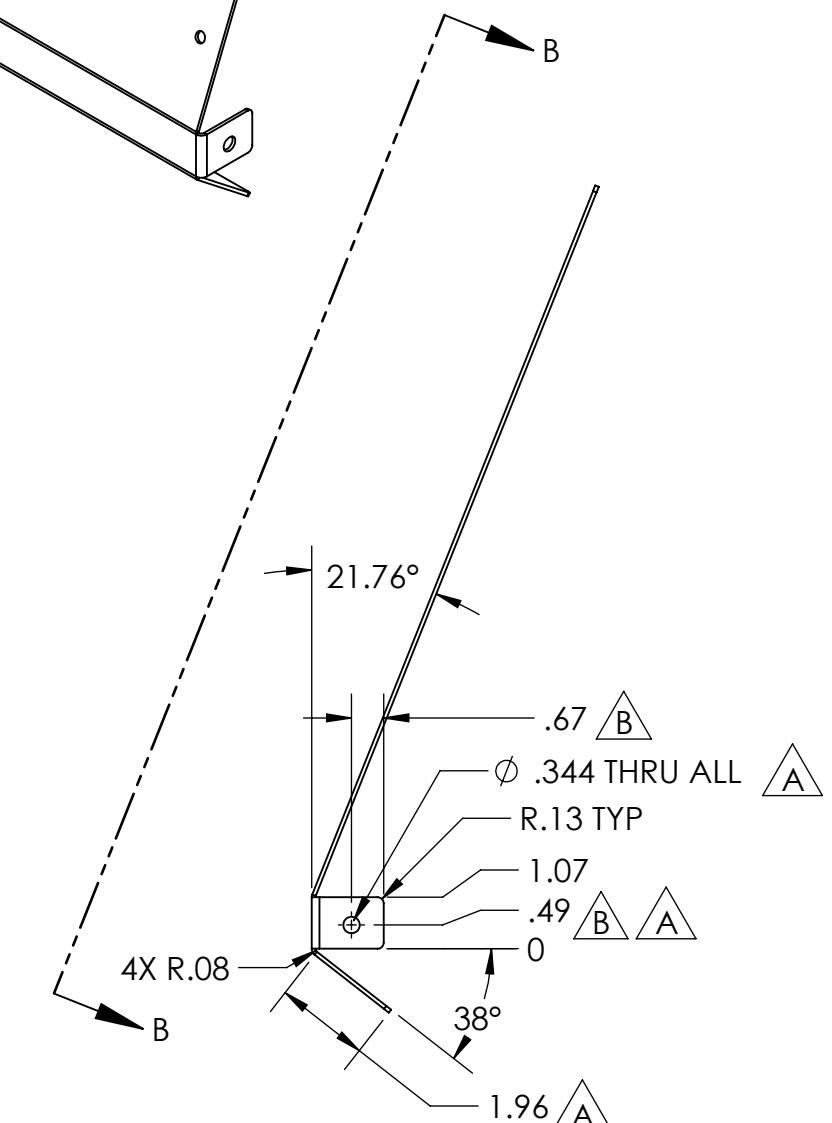
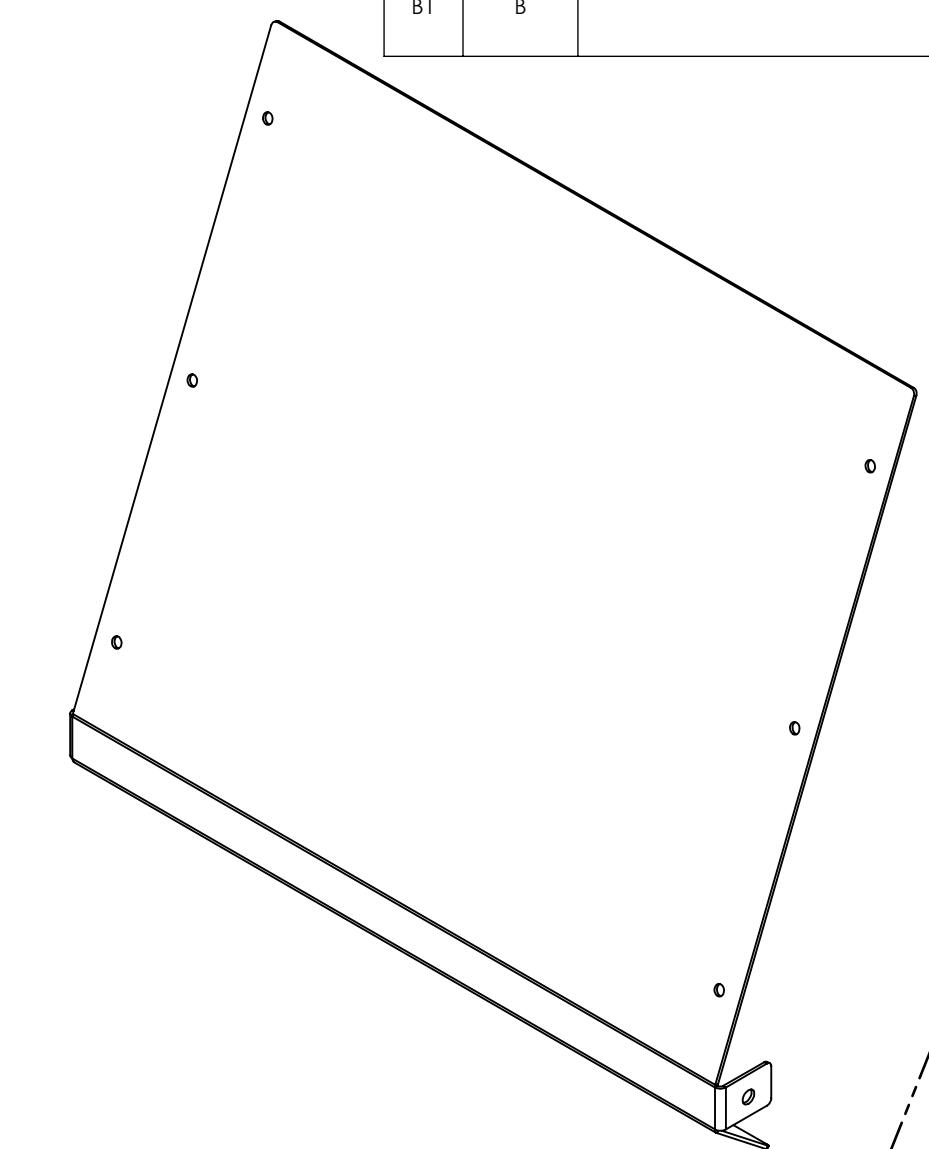
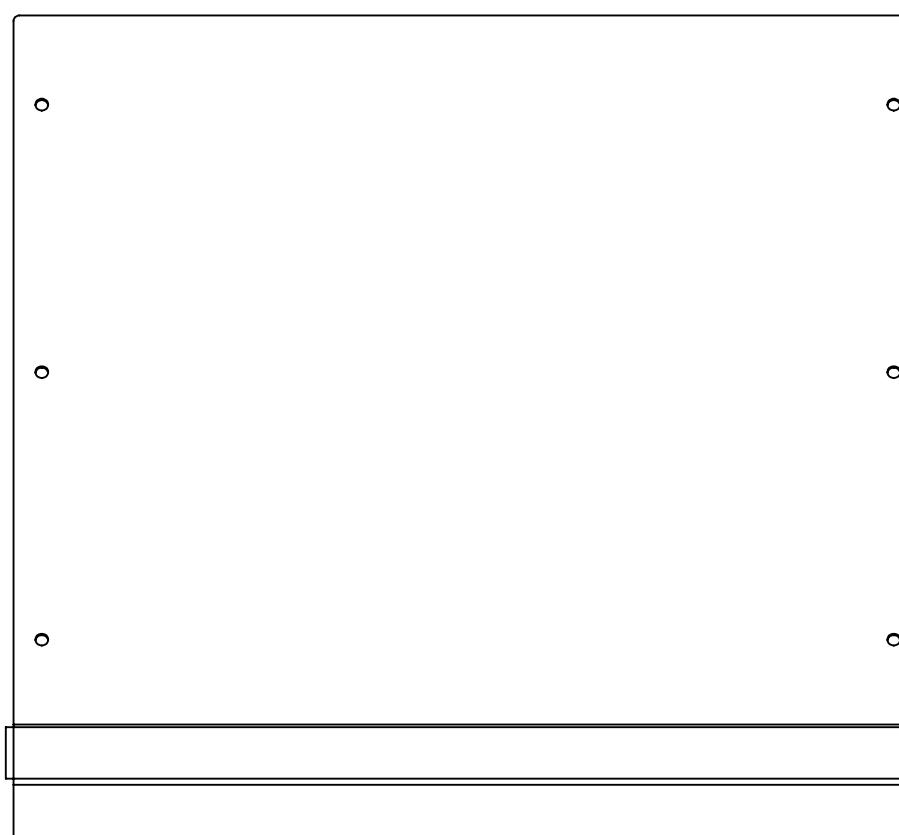
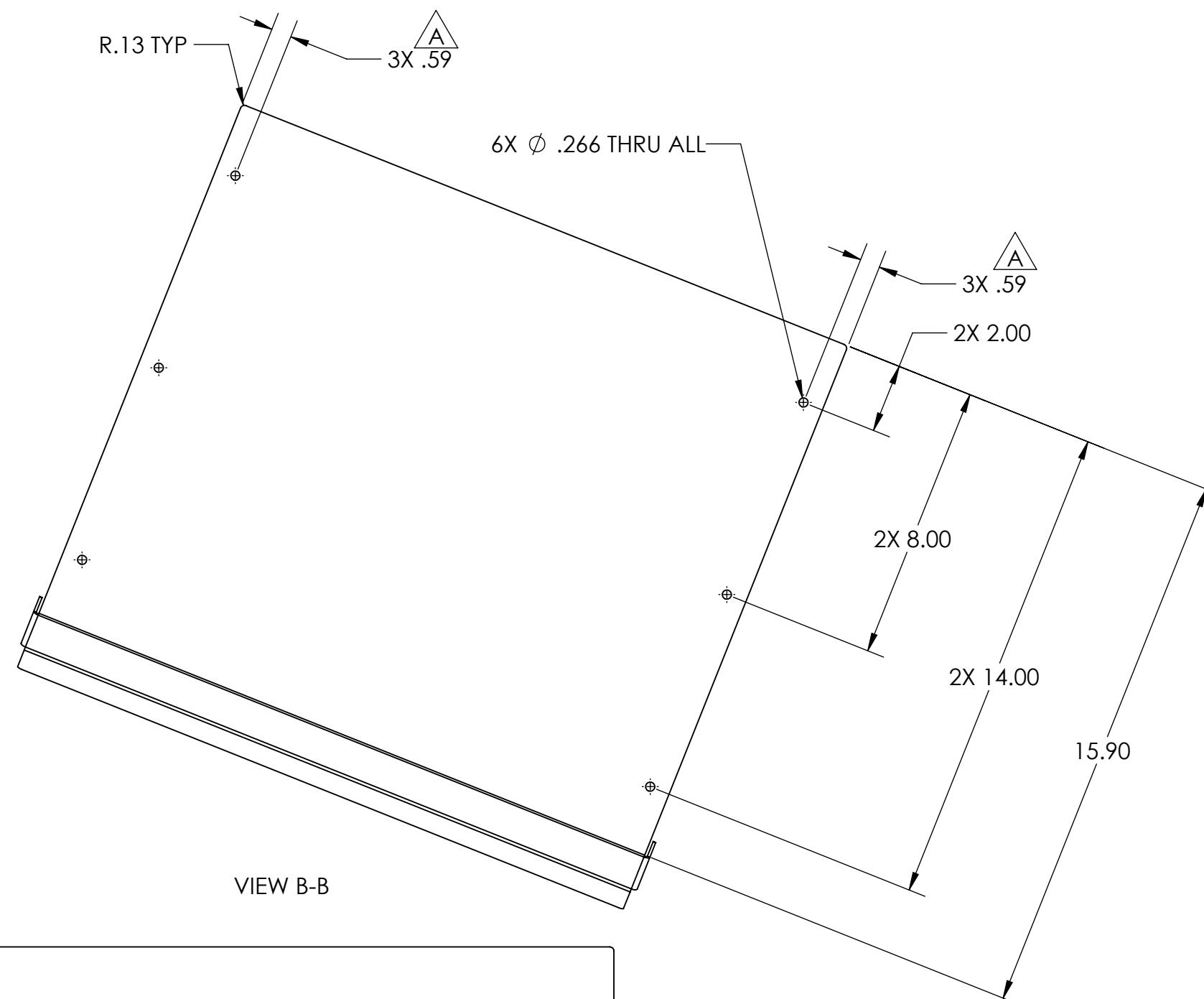
SIZE DWG. NO. REV

C GE-24390 B

SCALE: 1:2 SHEET 1 OF 1

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UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES

TOLERANCES:

FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .02$ THREE PLACE DECIMAL $\pm .010$

MATERIAL/FINISH:

12 Ga 5052 Aluminum

DO NOT SCALE DRAWING

BEND

DRAWN

NAME

JO

DATE

9/12/2023

PROPRIETARY AND CONFIDENTIAL

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WHOLE WITHOUT THE WRITTEN

PERMISSION OF FIRST® IS

PROHIBITED.

COMMENTS:REMOVE ALL BURRS AND SHARP
EDGES.

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
A1, B1, D3, D4	A	Changes to Side and Bottom Flanges, and hole locations	10/16/2023	JO
B1	B		10/17/2023	


**FIRST
ROBOTICS
COMPETITION**

SOLIDWORKS
Modeling Solutions Partner
TITLE:
Counter Roof

SIZE DWG. NO. REV

C GE-24390-01 **B**

SCALE: 1:4 SHEET 1 OF 1

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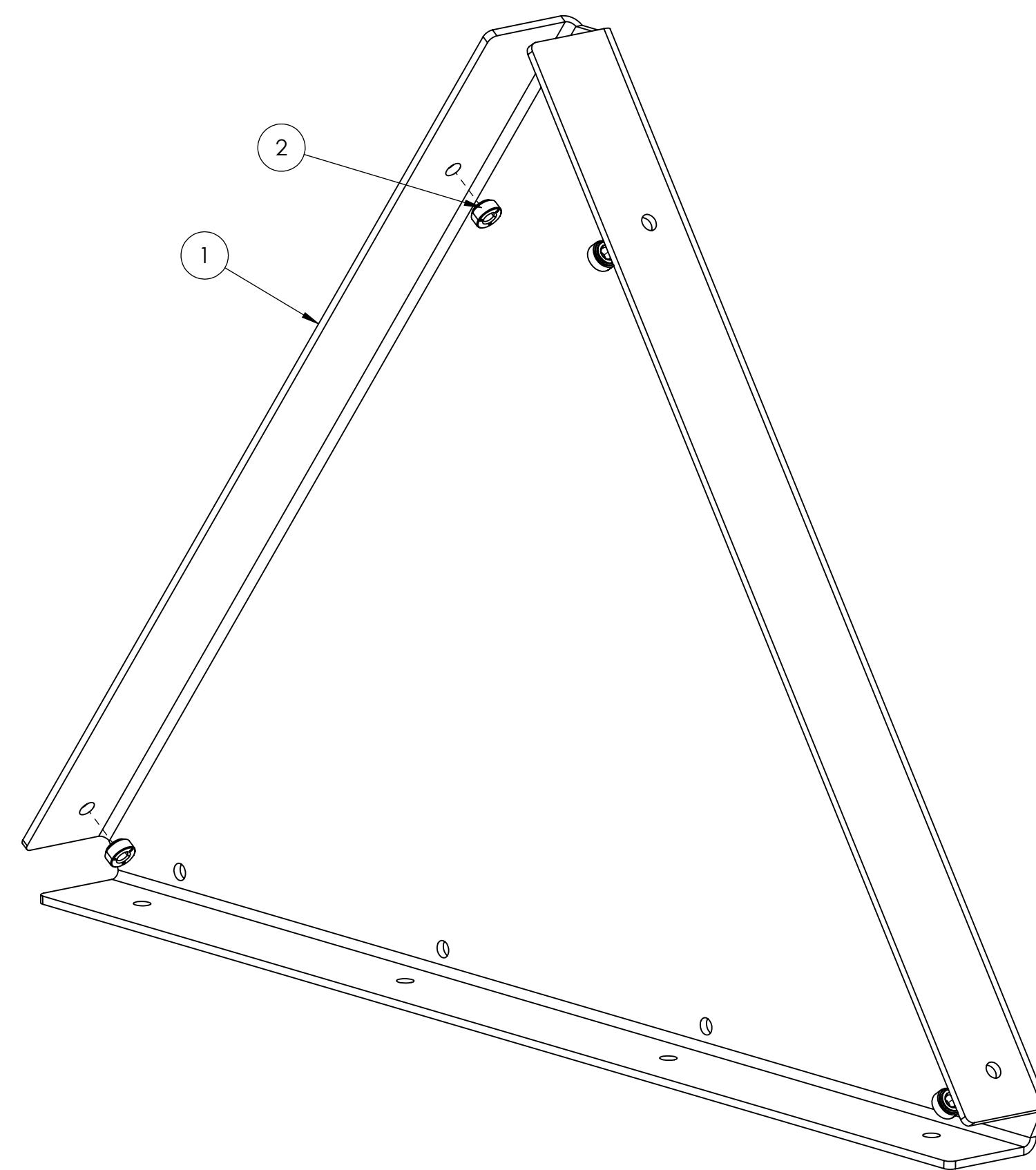
C

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Notes:
Assemble as shown
Tag or Label with Part Number

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24391-01	Collection Side Ramp	1
2	pem_clinchnut_.25_20 .054	1/4-20 self-clinching nut, .054 shank	4

UNLESS OTHERWISE SPECIFIED:

VEND NAME DATE

DRAWN JO 10/19/2023



SOLIDWORKS

PROPRIETARY AND CONFIDENTIAL

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MATERIAL/FINISH:

DO NOT SCALE DRAWING

REV

TITLE:
**Collection
Ramp w/ PEMs**

SIZE DWG. NO. REV
C GE-24391

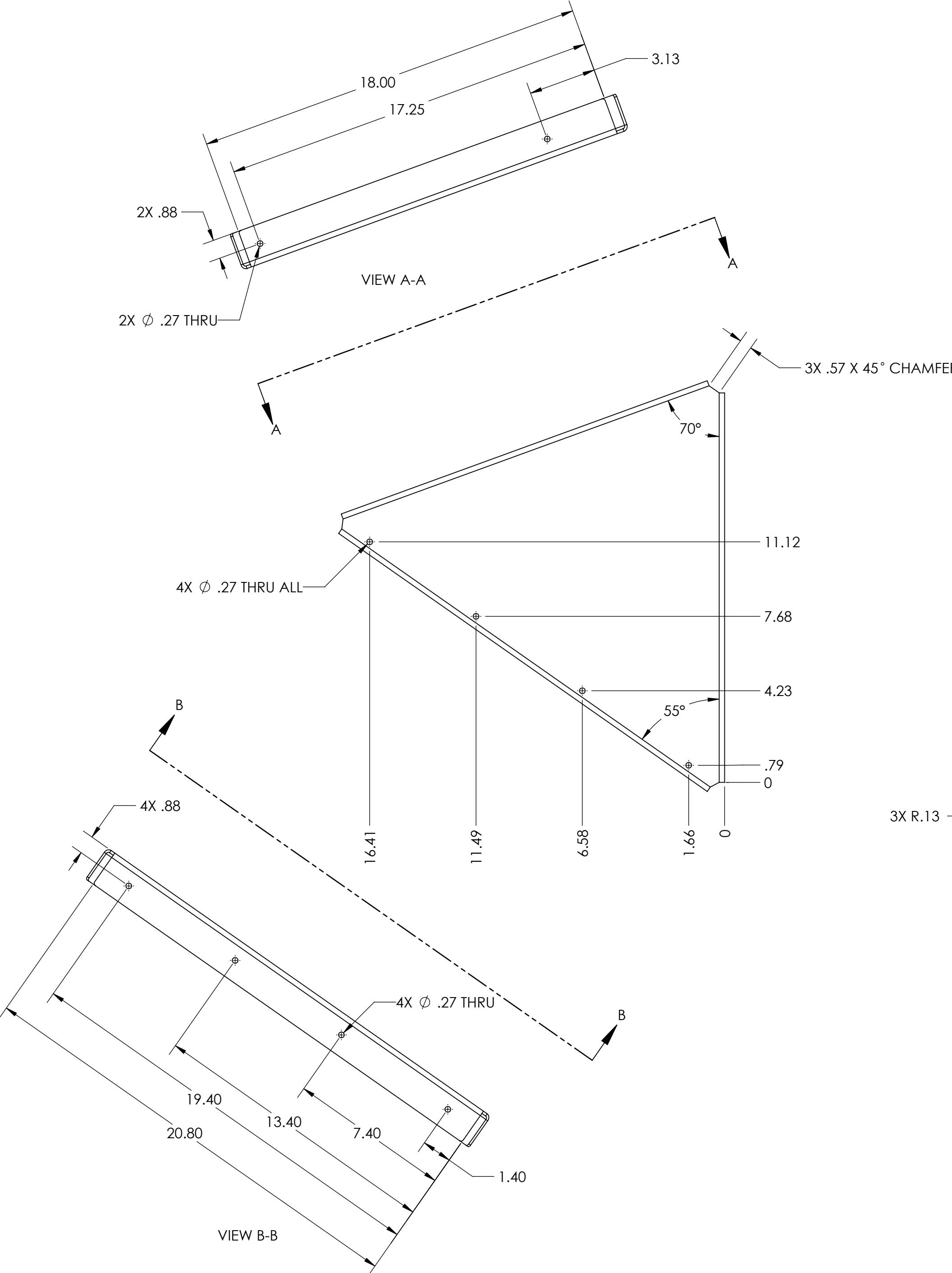
SCALE: 1:2 SHEET 1 OF 1

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UNLESS OTHERWISE SPECIFIED:			BEND	NAME	DATE
			DRAWN	JO	10/19/2023
PROPRIETARY AND CONFIDENTIAL					
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.					
MATERIAL/FINISH:			8 Ga 5052 Aluminum		
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.					
DO NOT SCALE DRAWING					

FIRST ROBOTICS COMPETITION SOLIDWORKS Modeling Solutions Partner

TITLE: Collection Side Ramp

SIZE	DWG. NO.	REV
C	GE-24391-01	

SCALE: 1:4 SHEET 1 OF 1

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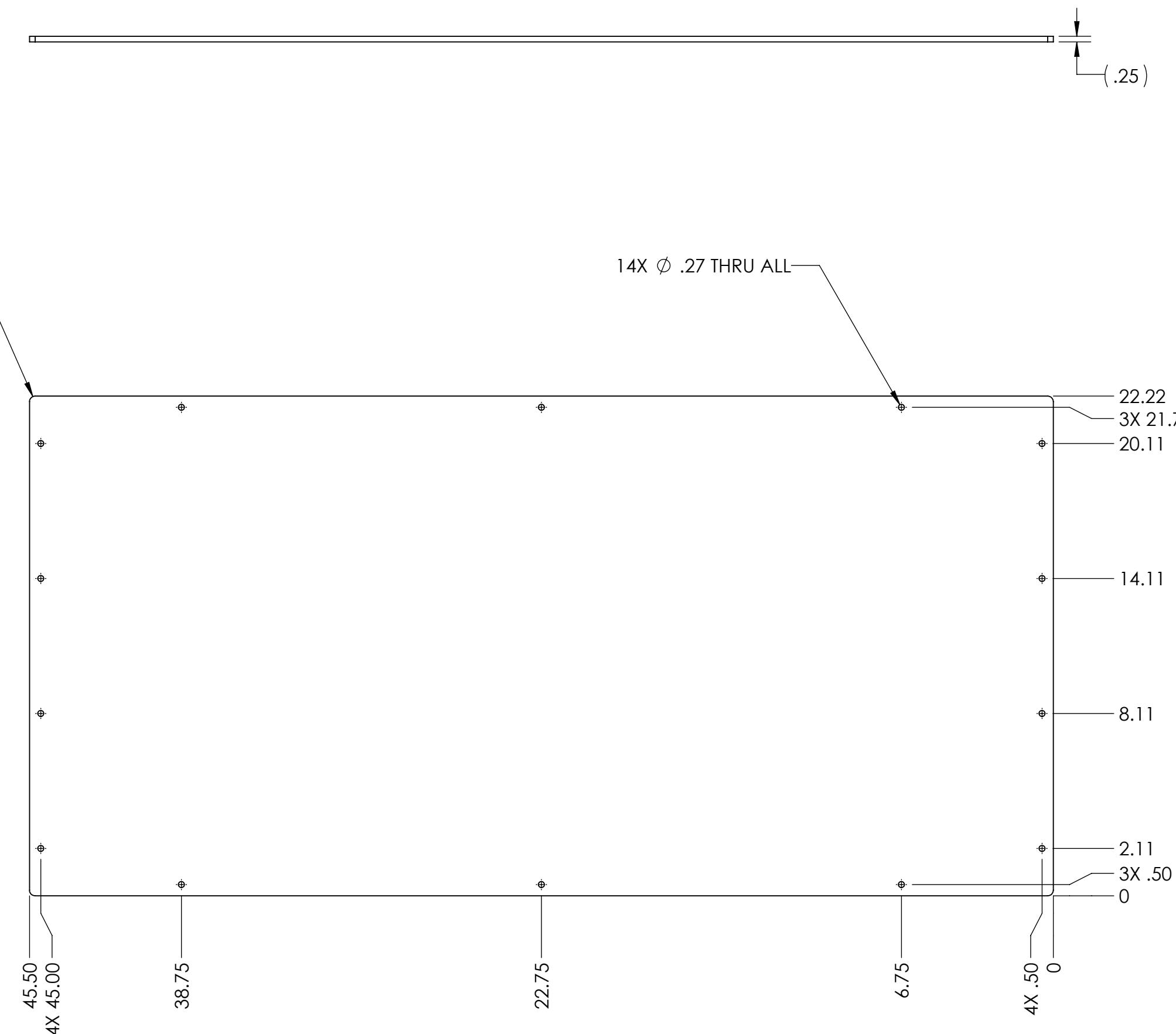
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Tag or Label with Part Number

UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	JO	10/19/2023	 
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH: 1/4" HDPE, Black Matte Finish			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

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GE-24392

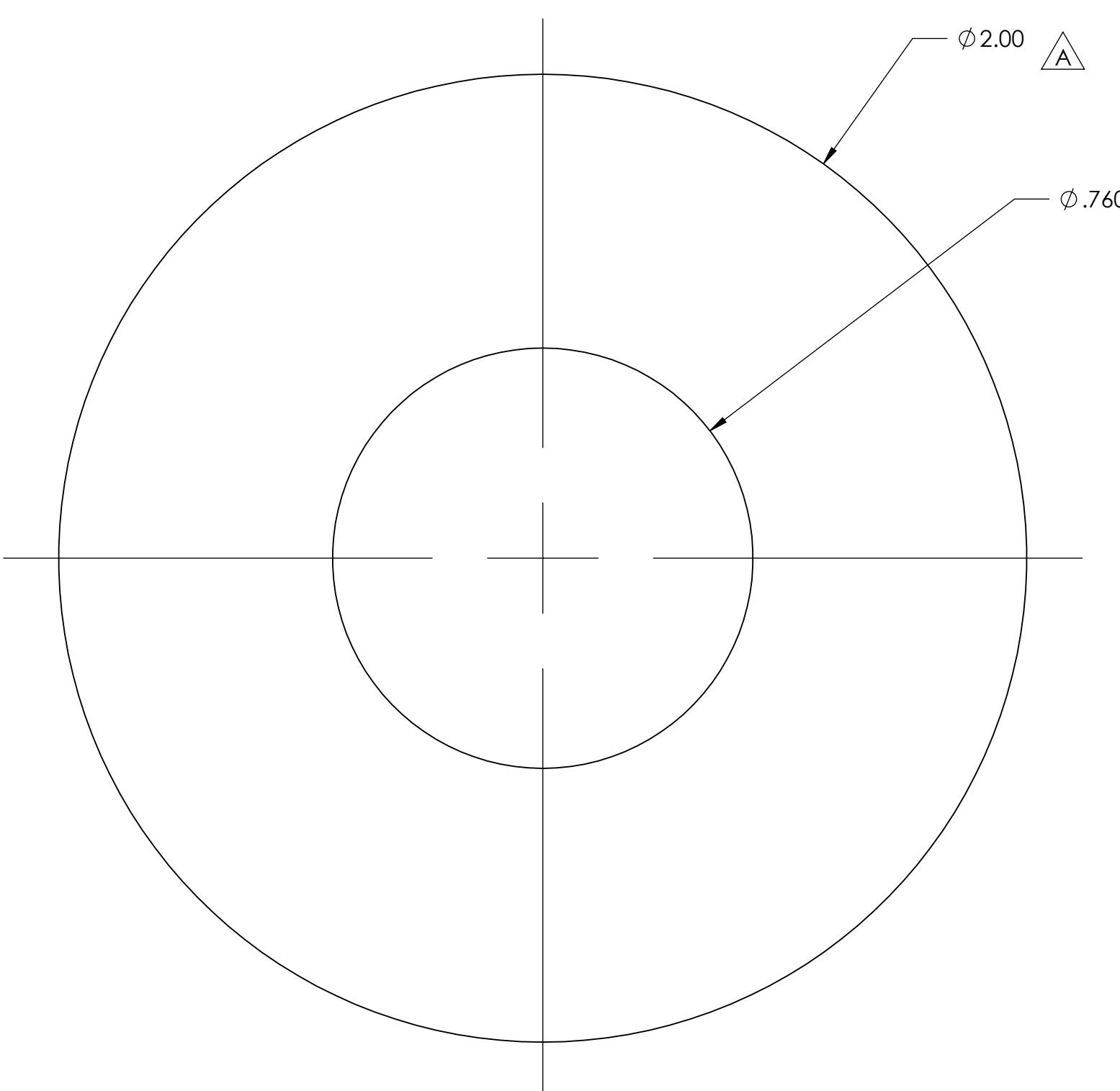
SCALE: 1:5 SHEET 1 OF 1

SIZE DWG. NO. REV

C GE-24392

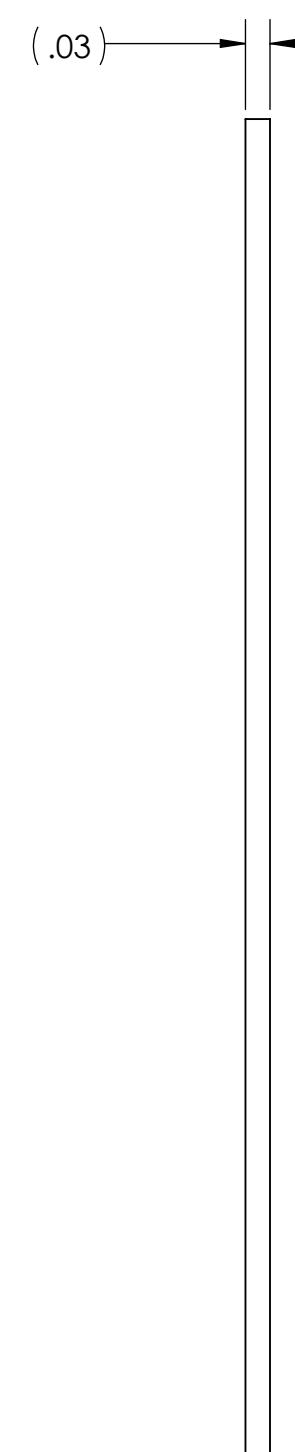
TITLE: Collection Ramp

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Tag or label with part number

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
C3	A	Outer Diameter Increased	12/20/2023	JO



UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	JO	11/27/2023	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:	SIZE	DWG. NO.	REV
22 Ga Stainless Steel			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING	SCALE: 4:1	SHEET 1 OF 1	

 **FIRST
ROBOTICS
COMPETITION**  **SOLIDWORKS**
Modeling Solutions Partner

TITLE:
**Custom Thrust
Washer**

SIZE DWG. NO. REV
CGE-24393 Rev AA

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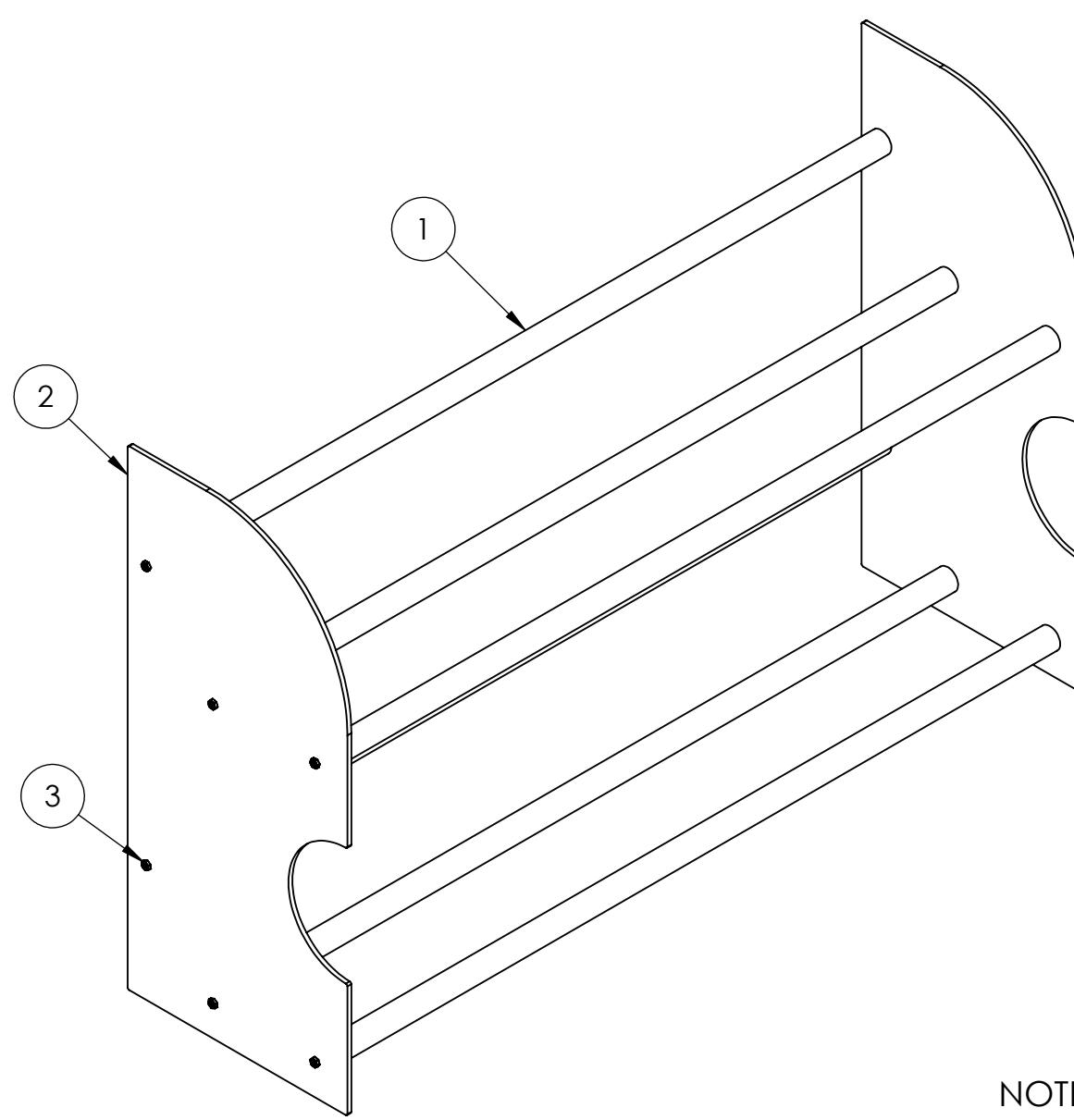
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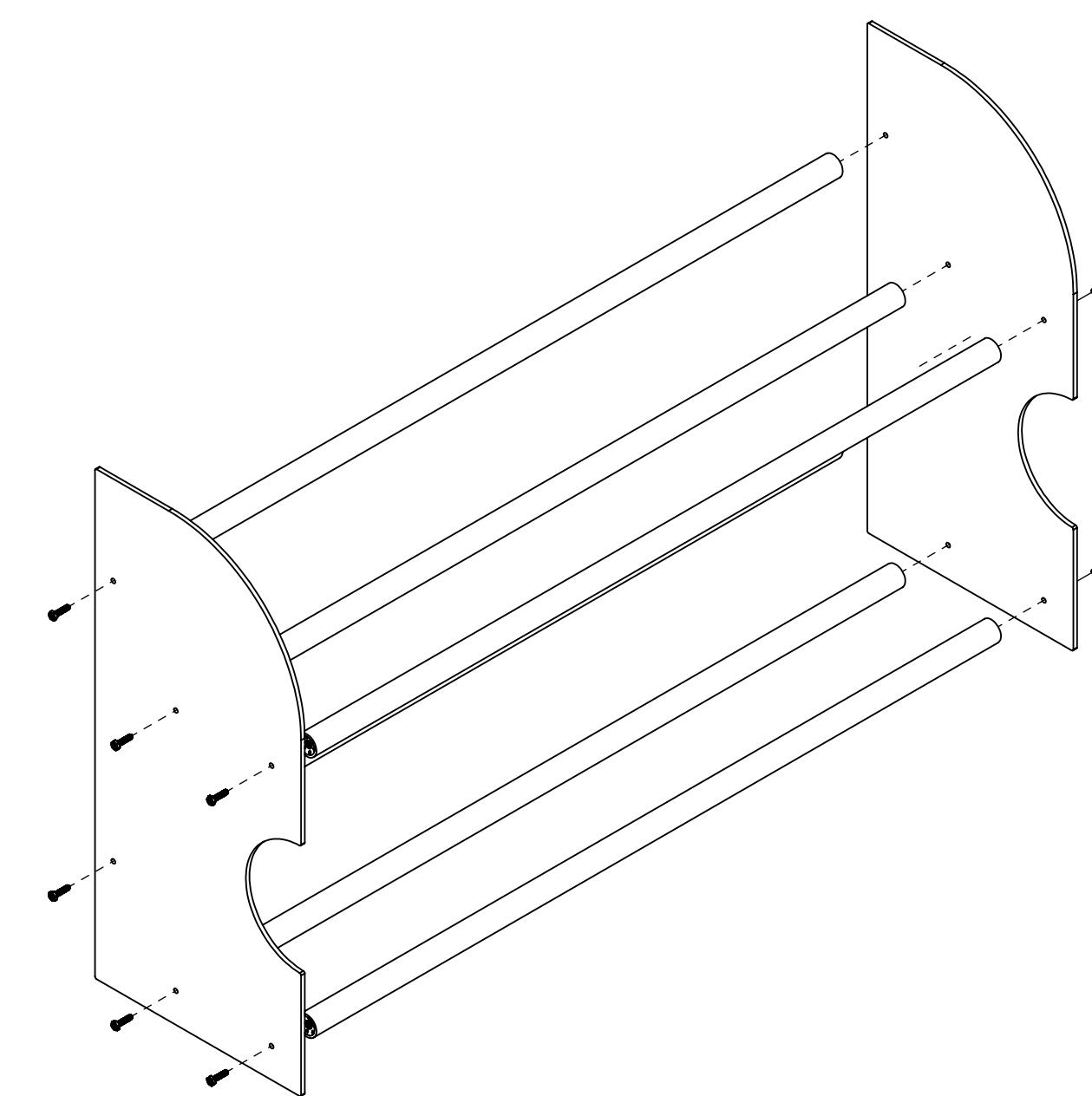
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NOTES:
1. Bolt the tubes to the side panels



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24401	Pipe_Tubnut	6
2	GE-24403	Plastic Side Panel	2
3	91286A109	High-Strength Grade 8 Steel Hex Head Screw	12

UNLESS OTHERWISE SPECIFIED:			VEND	NAME	DATE
			DRAWN	EA	8/2/2023

PROPRIETARY AND CONFIDENTIAL		
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COMMENTS:		
REMOVE ALL BURRS AND SHARP EDGES.		
SIZE	DWG. NO.	REV
C	GE-24400	
SCALE:	1:8	SHEET 1 OF 1

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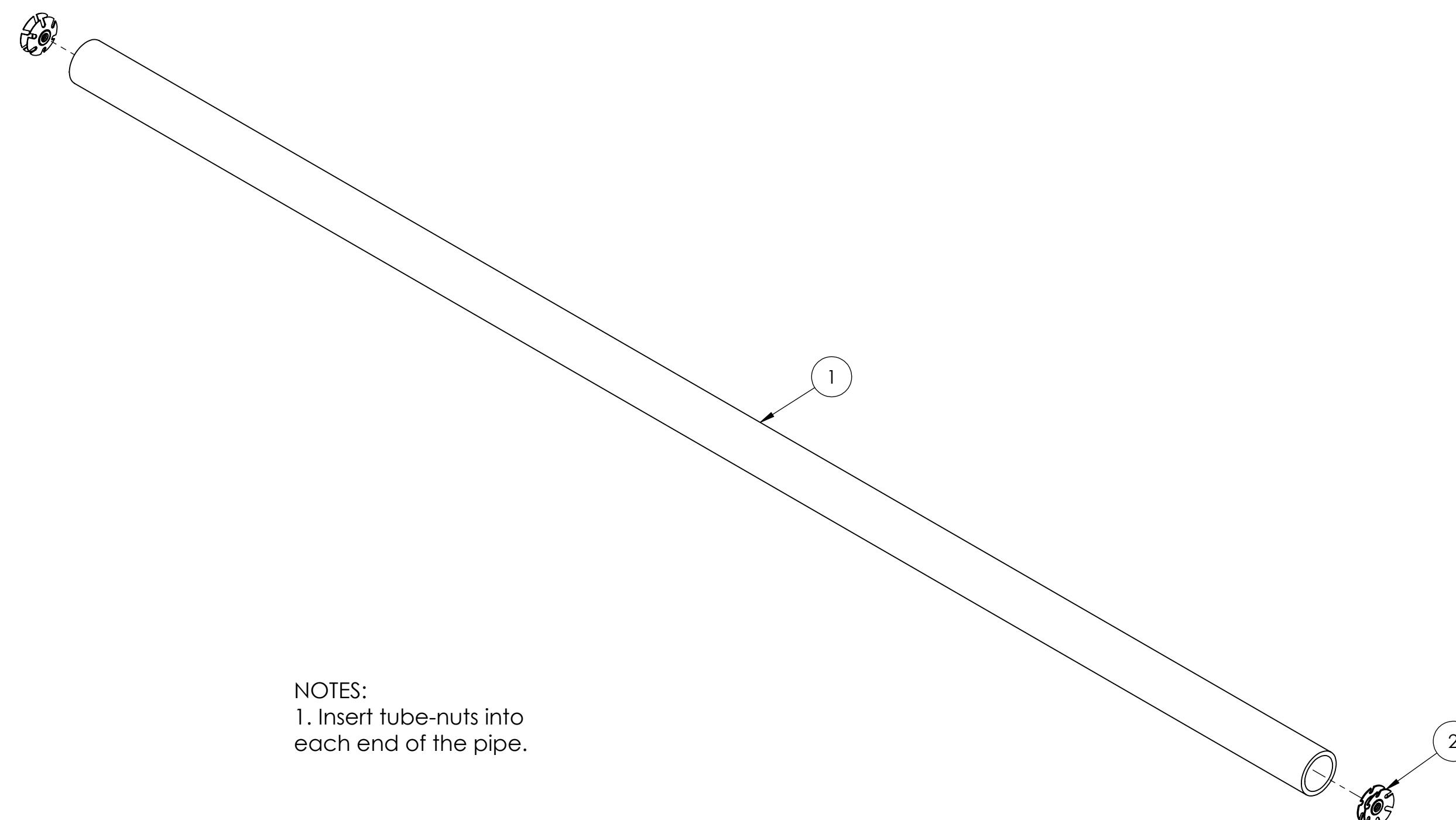
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NOTES:

1. Insert tube-nuts into each end of the pipe.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-24402	Pipe Support	1
2	94290A557	Tube-Connecting Nut	2

UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL $\pm 1/16$
ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$
TWO PLACE DECIMAL $\pm .01$
THREE PLACE DECIMAL $\pm .005$

MATERIAL/FINISH:

VEND	NAME	DATE
DRAWN	EA	8/2/2023
TITLE:		
Pipe_Tubenut		
SIZE	DWG. NO.	REV
C	GE-24401	
SCALE: 1:3	SHEET 1 OF 1	

DO NOT SCALE DRAWING



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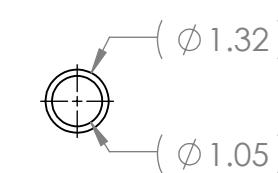
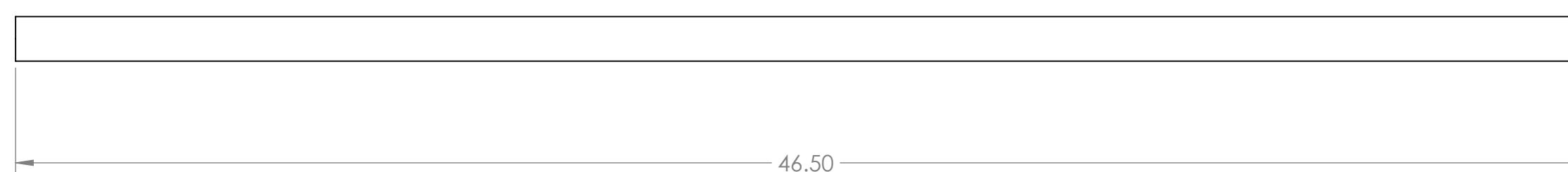
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NOTES:
1. Tag or label with part number

UNLESS OTHERWISE SPECIFIED:	BEND	NAME	DATE	 FIRST ROBOTICS COMPETITION
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .02$ THREE PLACE DECIMAL $\pm .010$	DRAWN	EA	7/31/2023	
PROPRIETARY AND CONFIDENTIAL				TITLE: Pipe Support
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.				SIZE DWG. NO. REV
MATERIAL/FINISH: 1" Schedule 40 6061 Al Pipe	C	GE-24402		
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.	SCALE: 1:4	SHEET 1 OF 1		
DO NOT SCALE DRAWING				

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
A2	A	Material Finish	10/26/2023	JO

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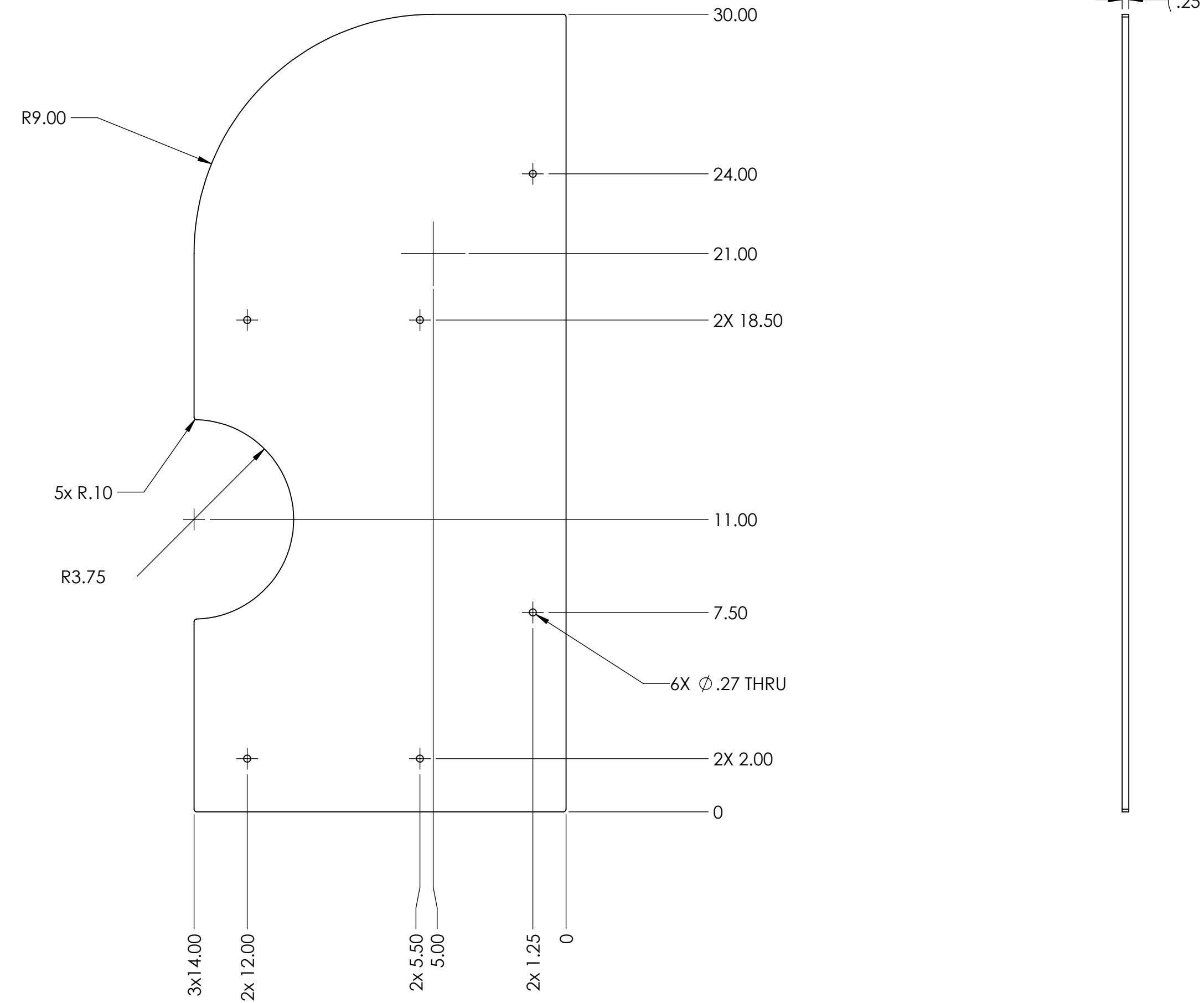
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NOTES:

1. Tag or label with part number

UNLESS OTHERWISE SPECIFIED:

VEND NAME DATE

DRAWN EA 6/28/2023



TITLE:
Plastic Side
Panel

SIZE DWG. NO. REV

C GE-24403 A

SCALE: 1:4 SHEET 1 OF 1

DIMENSIONS ARE IN INCHES

TOLERANCES:

FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .005$

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MATERIAL/FINISH:

1/4" Black HDPE, Matte Finish

COMMENTS:

REMOVE ALL BURRS AND SHARP EDGES.

DO NOT SCALE DRAWING

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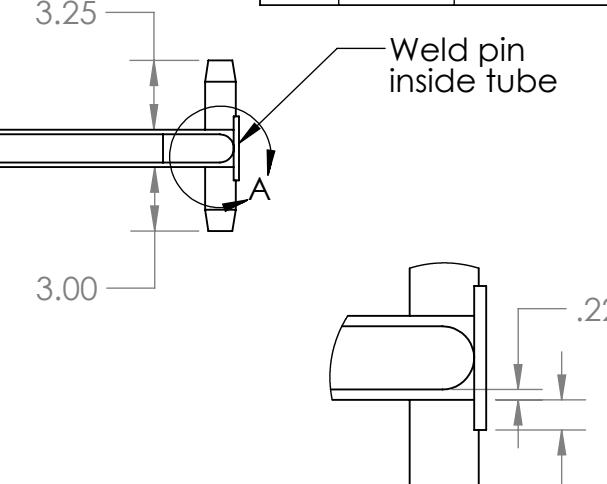
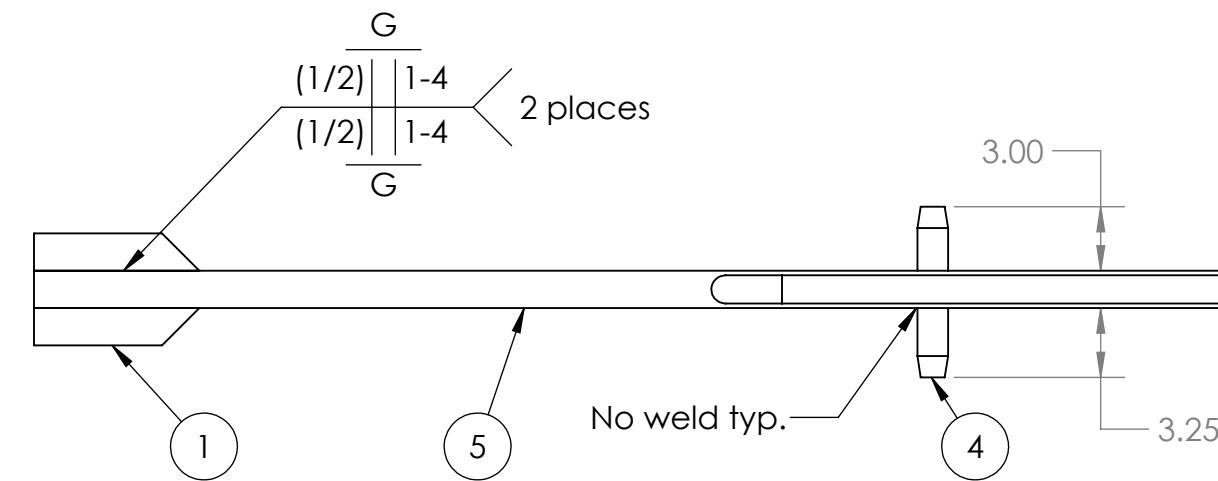
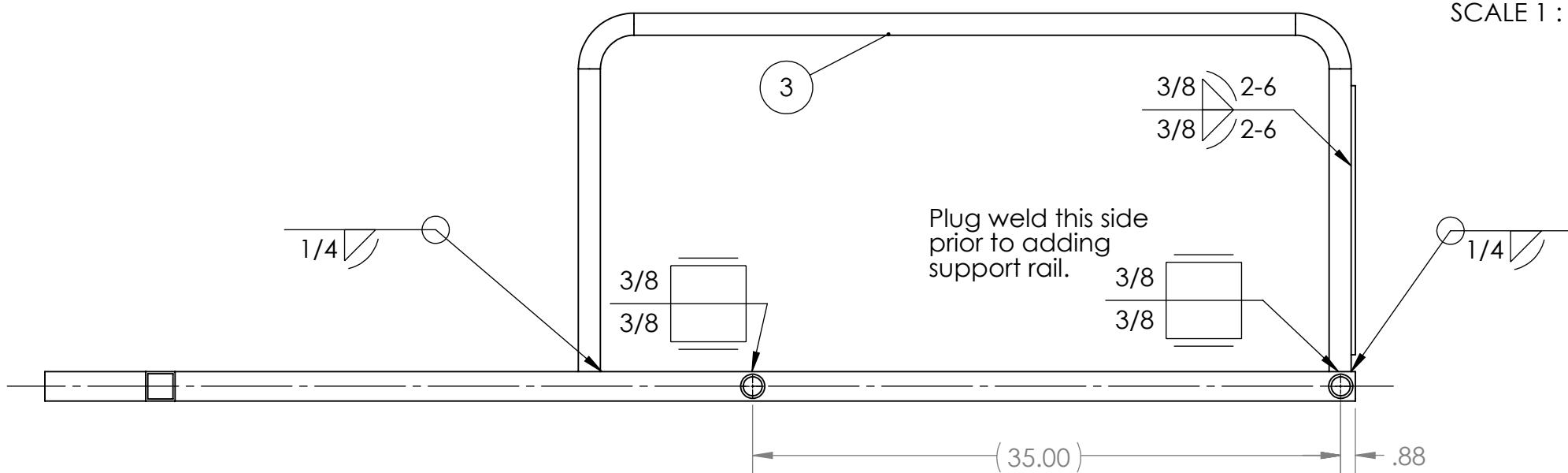
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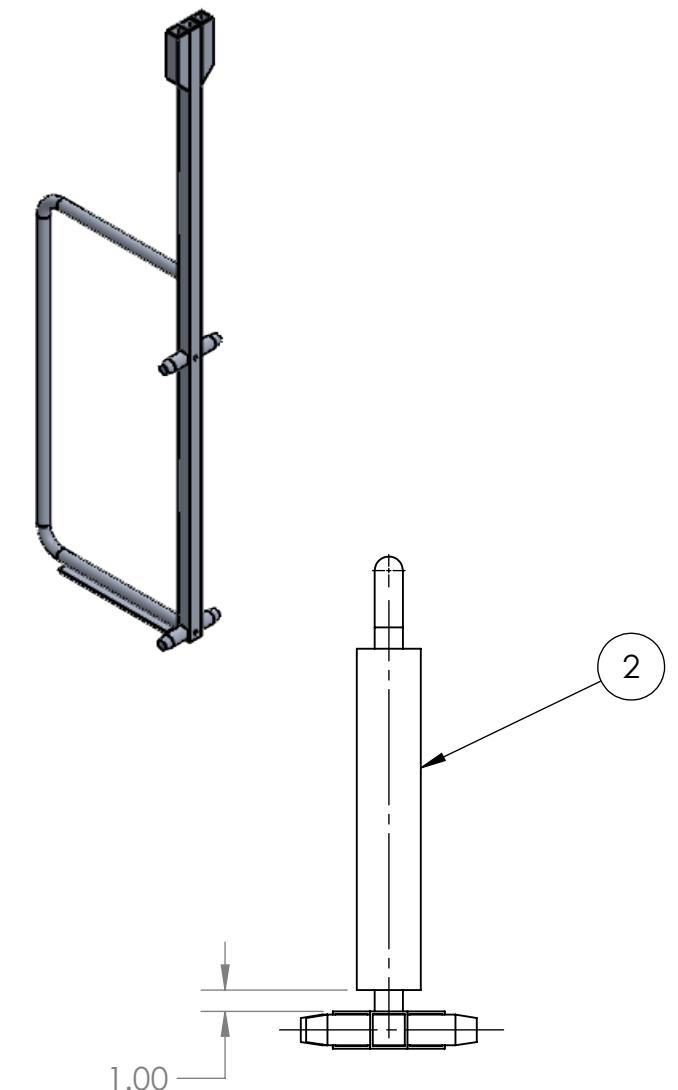
1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A	Redraw	5/14/2008	narosenberg
A4, 2-A2, 2-B4	B	Items renumbered, solid rod diameter updated, drawing reformatted.	3/19/2020	CPO

DETAIL A
SCALE 1 : 4

Notes:
1. Remove all sharp edges



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	FE-00001-01	1 3/4" x 1 3/4" x 1/8" 6061 Aluminum Tubing	2
2	FE-00001-02	1/4" 6061 Aluminum Plate	1
3	FE-00001-03	1" Schedule 40 Aluminum Tube	1
4	FE-00001-04	1 7/16" Dia. 6061 Aluminum Solid Rod	2
5	FE-00001-05	1 3/4" x 1 3/4" x 1/8" 6061 Aluminum Tubing	1

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		UNLESS OTHERWISE SPECIFIED:	NAME	DATE
DIMENSIONS ARE IN INCHES				
TOLERANCES:				
FRACTIONAL ±1/16				
ANGULAR: MACH ±1° BEND ±1°				
TWO PLACE DECIMAL ±.01				
THREE PLACE DECIMAL ±.001				
INTERPRET GEOMETRIC TOLERANCING PER:				
MATERIAL				
NEXT ASSY		FINISH		
APPLICATION		DO NOT SCALE DRAWING		
TITLE: Drivers Station Support				
SIZE B	DWG. NO. FE-00001	REV. B		
SCALE: 1:9	WEIGHT:	SHEET 1 OF 3		

FIRST ROBOTICS COMPETITION

SOLIDWORKS
Modeling Solutions Partner

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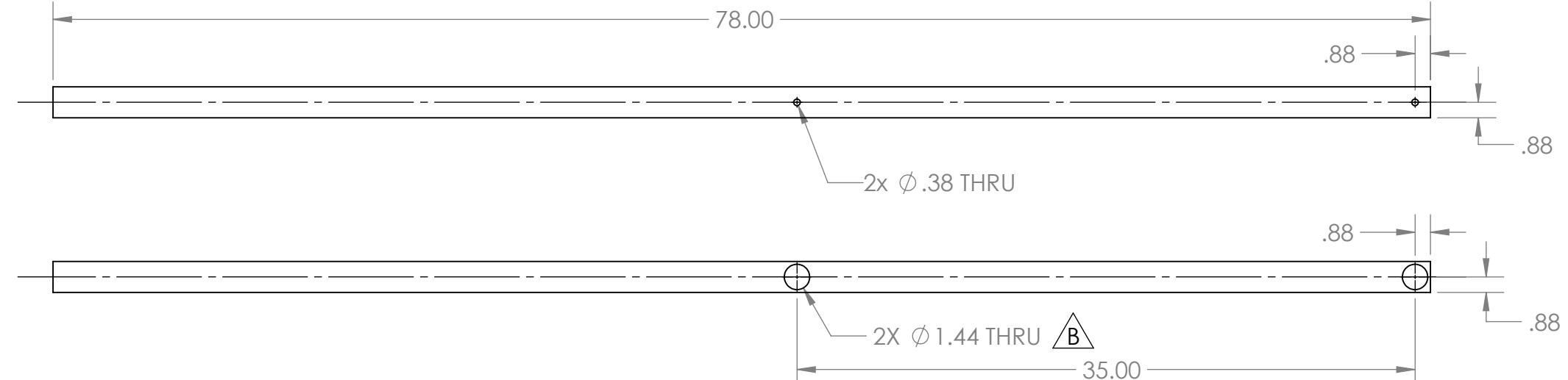
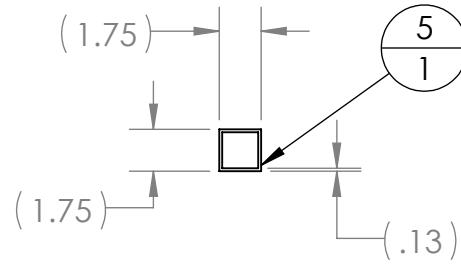
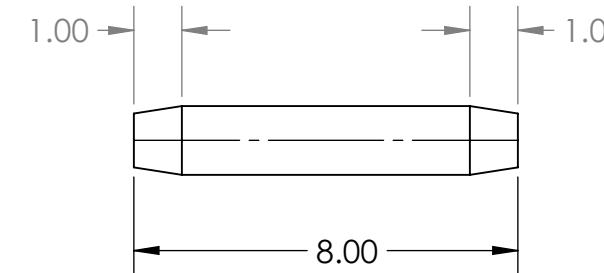
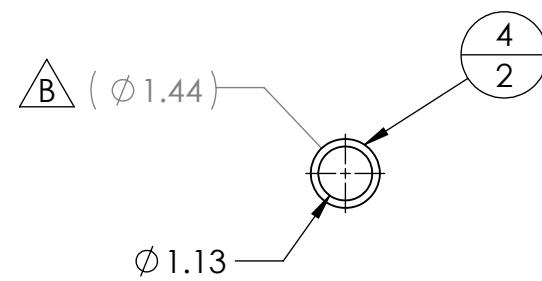
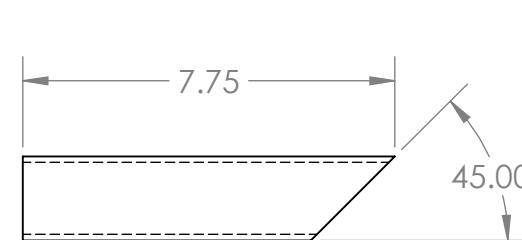
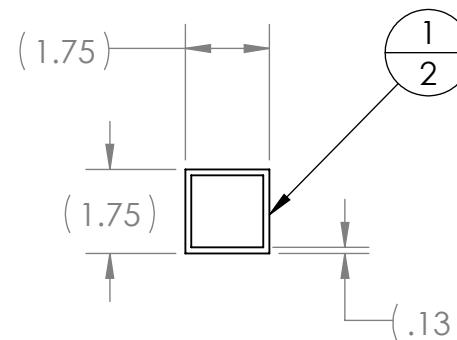
3

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		DRAWN			
		CHECKED			
		ENG APPR.			
		MFG APPR.			
		Q.A.			
		COMMENTS:			
NEXT ASSY	USED ON	MATERIAL			
APPLICATION	FINISH				
	DO NOT SCALE DRAWING				

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Drivers Station Support

SIZE DWG. NO. REV
B FE-00001 B

SCALE: 1:2 WEIGHT: SHEET 2 OF 3

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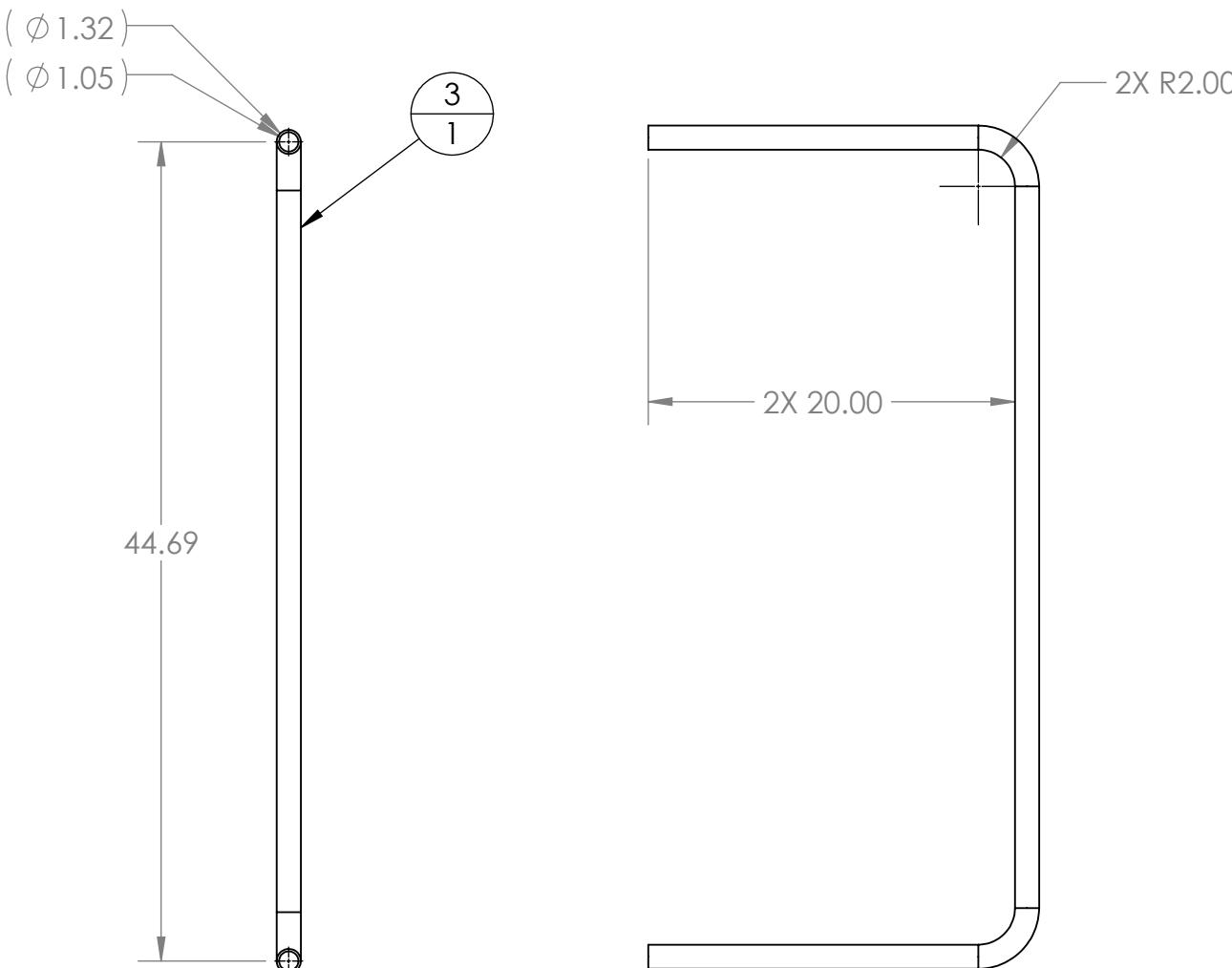
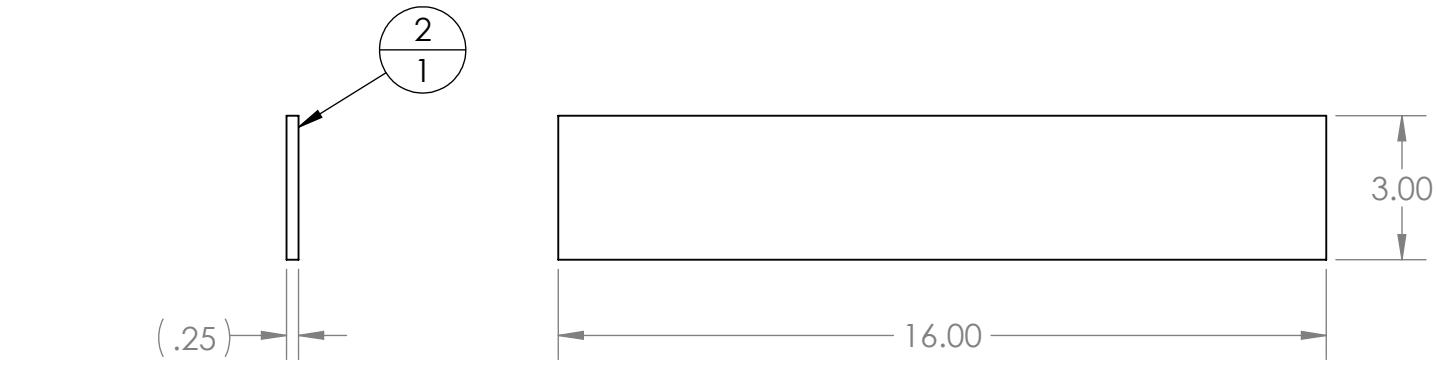
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		DRAWN			
		CHECKED			
		ENG APPR.			
		MFG APPR.			
		Q.A.			
		COMMENTS:			
		MATERIAL			
		NEXT ASSY	USED ON	FINISH	
		APPLICATION		DO NOT SCALE DRAWING	

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Drivers Station Support

SIZE	DWG. NO.	REV
B	FE-00001	B
	WEIGHT:	SHEET 3 OF 3

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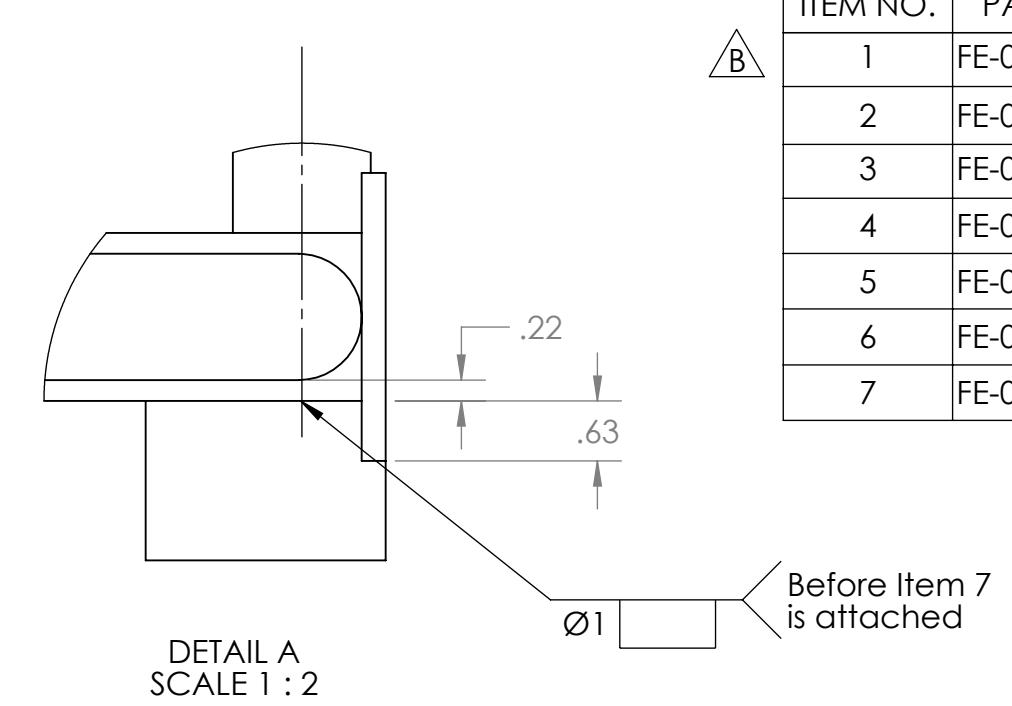
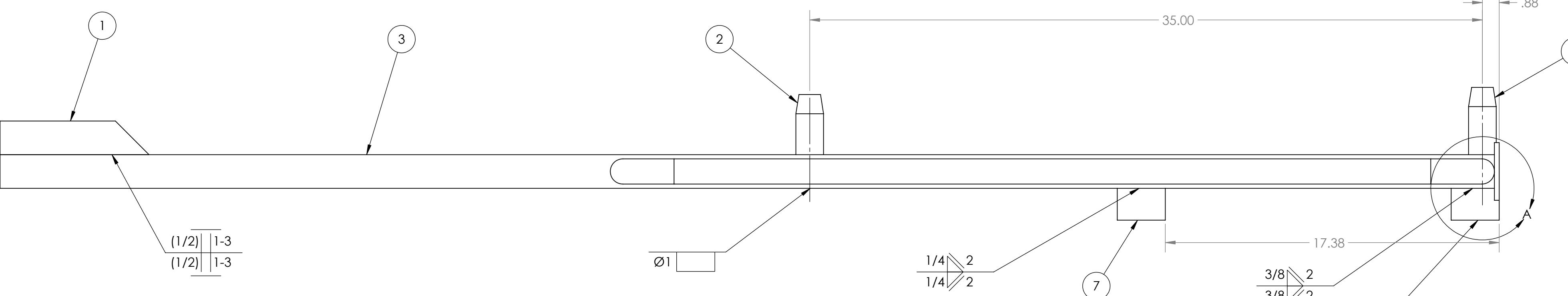
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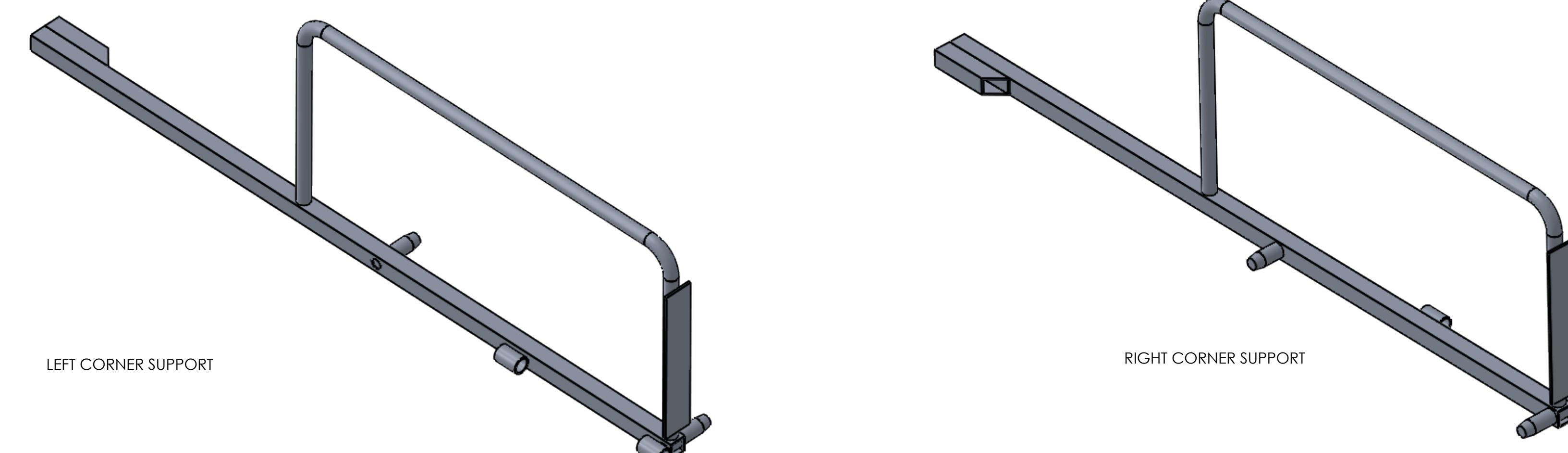
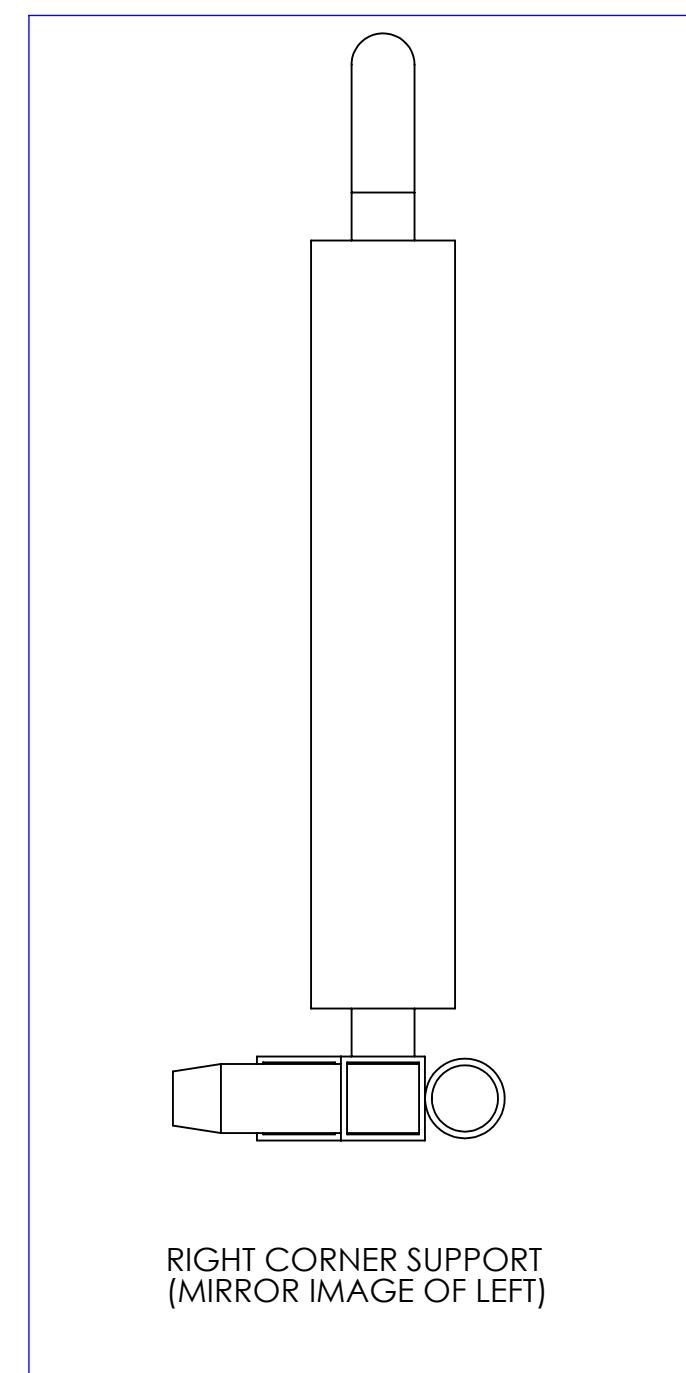
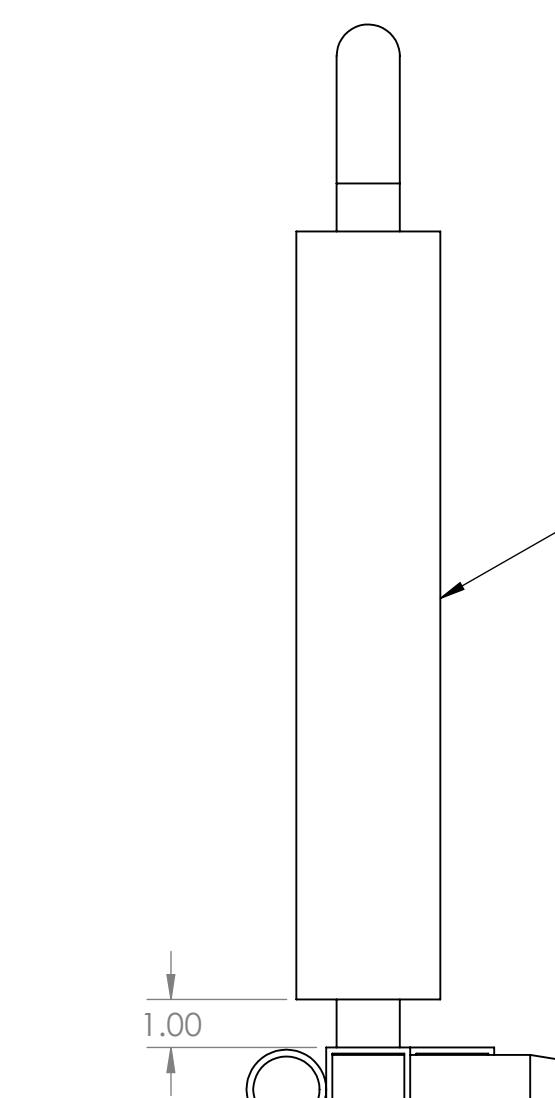
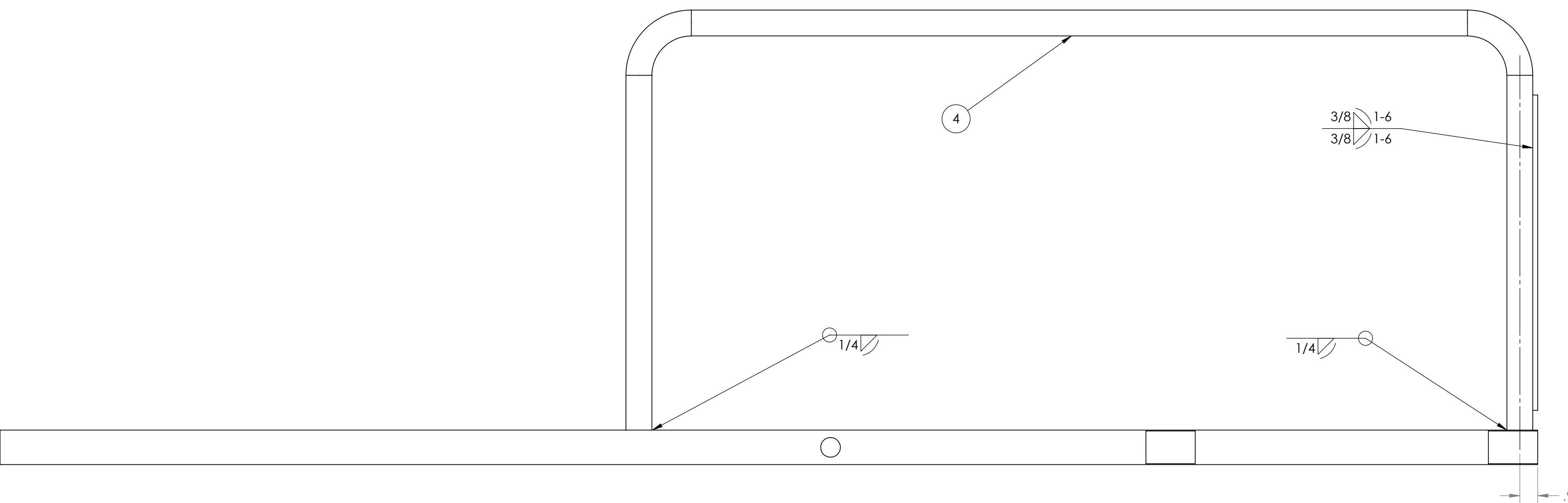
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1



REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
	1	Redraw	5/19/2008	narosenberg
D2	B	Items renumbered, drawing reformatted	3/19/2020	CPO

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	FE-00002-01	1 3/4" x 1 3/4" x 1/8" 6061 Aluminum Tubing	1
2	FE-00002-02	1 7/16" Dia. 6061 Aluminum Solid Rod	1
3	FE-00002-03	1 3/4" x 1 3/4" x 1/8" 6061 Aluminum Tubing	1
4	FE-00002-04	1" Schedule 40 Aluminum Tube	1
5	FE-00002-05	3" x 1/4" 6061 Aluminum Bar	1
6	FE-00002-06	1 7/16" Dia. 6061 Aluminum Solid Rod	1
7	FE-00002-07	1 1/4" Schedule 40 Aluminum Tube	2



- Notes:
1. Left corner support shown, right is same components, mirror image assy
 2. Remove all sharp edges

UNLESS OTHERWISE SPECIFIED:	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	
TOLERANCES: FRACTIONAL: 1/16" ANGULAR: MACH 1° BEND ±1° TWO PLACE DECIMAL: ±.01 THREE PLACE DECIMAL: ±.001	CHECKED	
ENG APPR.	ENG APPR.	
MFG APPR.	MFG APPR.	
Q.A.	Q.A.	
COMMENTS:		
INTERPRET GEOMETRIC TOLERANCING PER: MATERIAL		
NEXT ASSY	USED ON	FINISH
APPLICATION	DO NOT SCALE DRAWING	

FIRST
ROBOTICS
COMPETITION

TITLE: Corner Supports, Left

SIZE DWG. NO. D FE-00002 REV. B

SCALE: 1:4 WEIGHT: SHEET 1 OF 2

8

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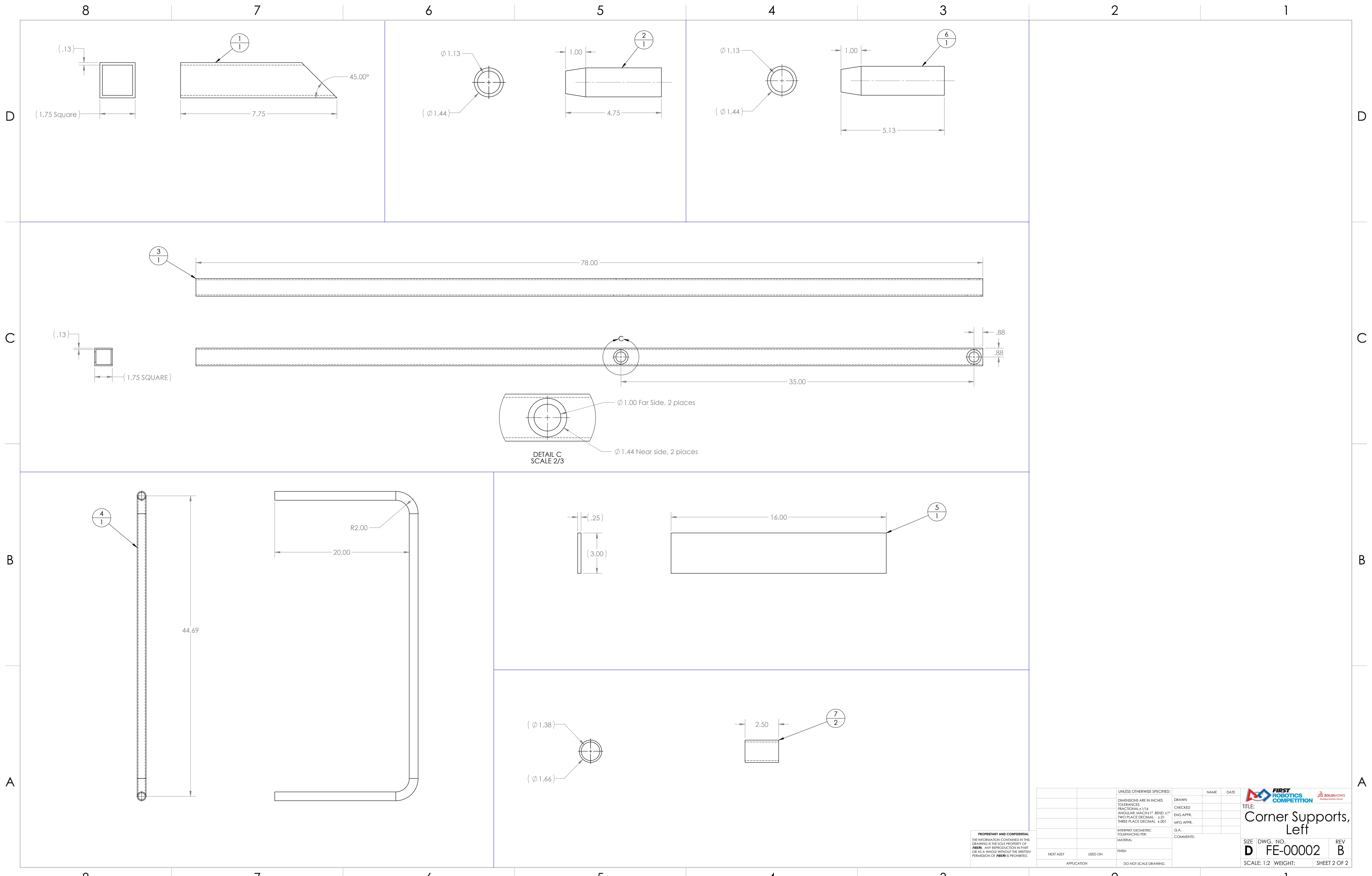
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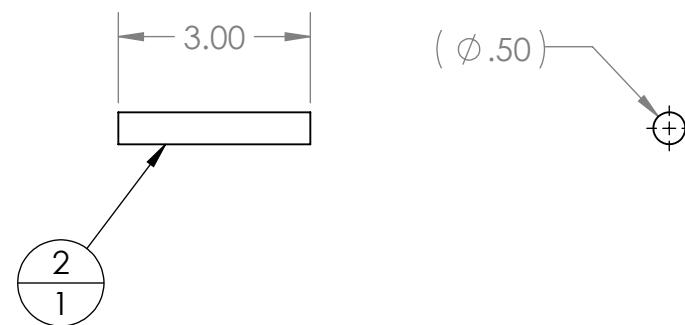
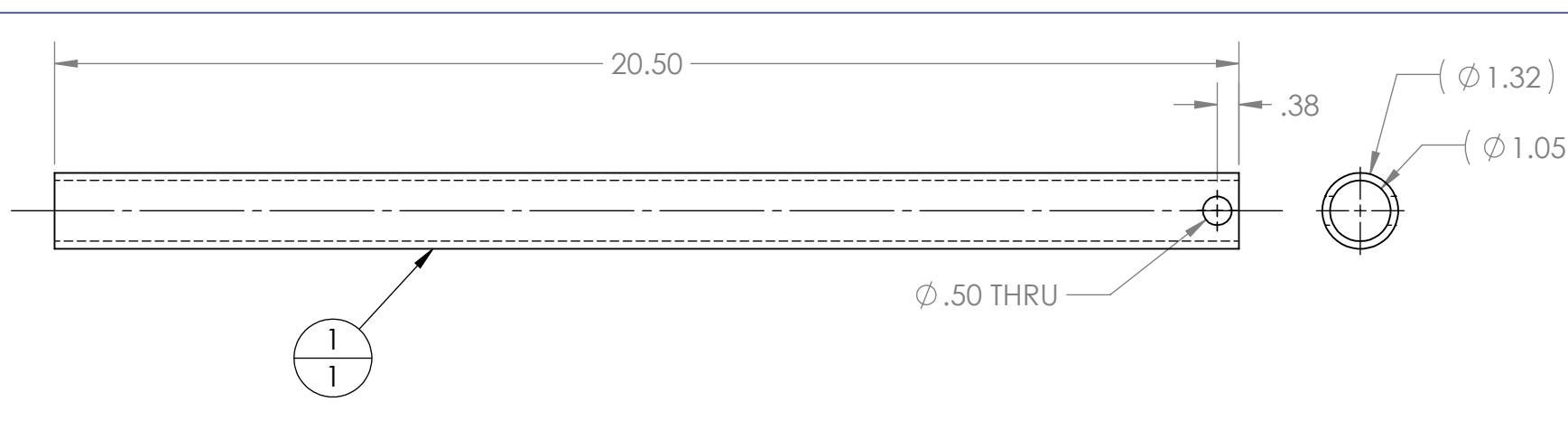
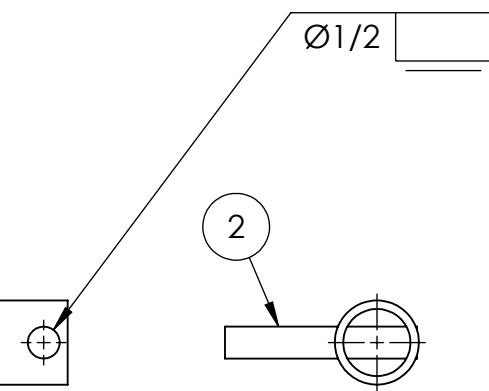
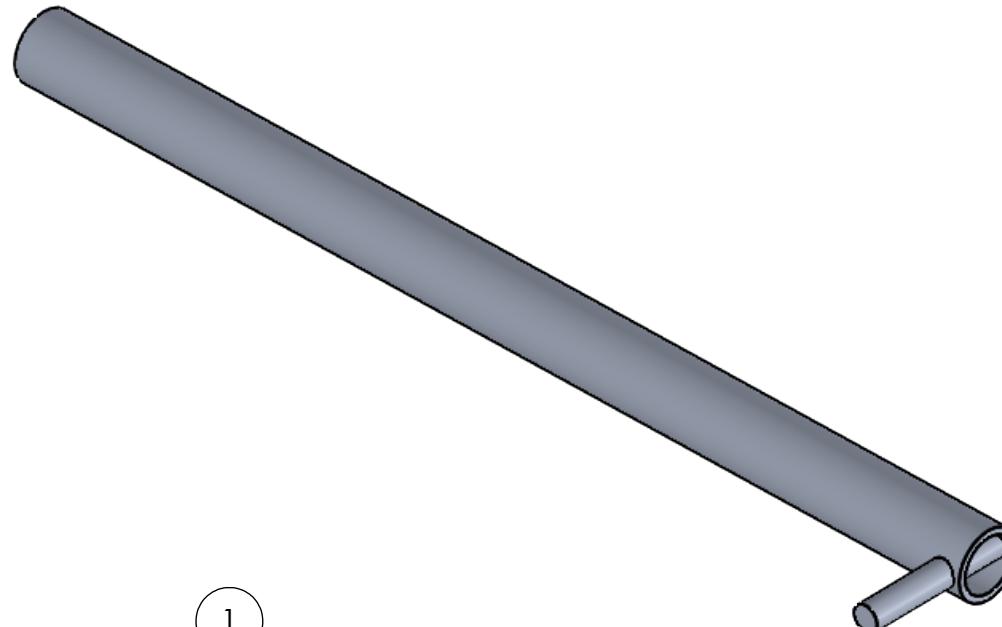


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REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A	Redraw	5/20/2008	narosenberg
	B	Drawing reformatted	3/19/2020	CPO

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	FE-00003-01	1" Schedule 40 6061 Aluminum Tube	1
2	FE-00003-02	1/2" 6061 Aluminum Rod	1

Notes:

1. Remove all sharp edges

		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$		NAME	DATE
		DRAWN			
		CHECKED			
		ENG APPR.			
		MFG APPR.			
		Q.A.			
		COMMENTS:			
		MATERIAL			
		NEXT ASSY	USED ON	FINISH	
		APPLICATION		DO NOT SCALE DRAWING	
SIZE	DWG. NO.	REV			
B	FE-00003	B			
SCALE: 1:3	WEIGHT:	SHEET 1 OF 1			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
Rail Pin Assy

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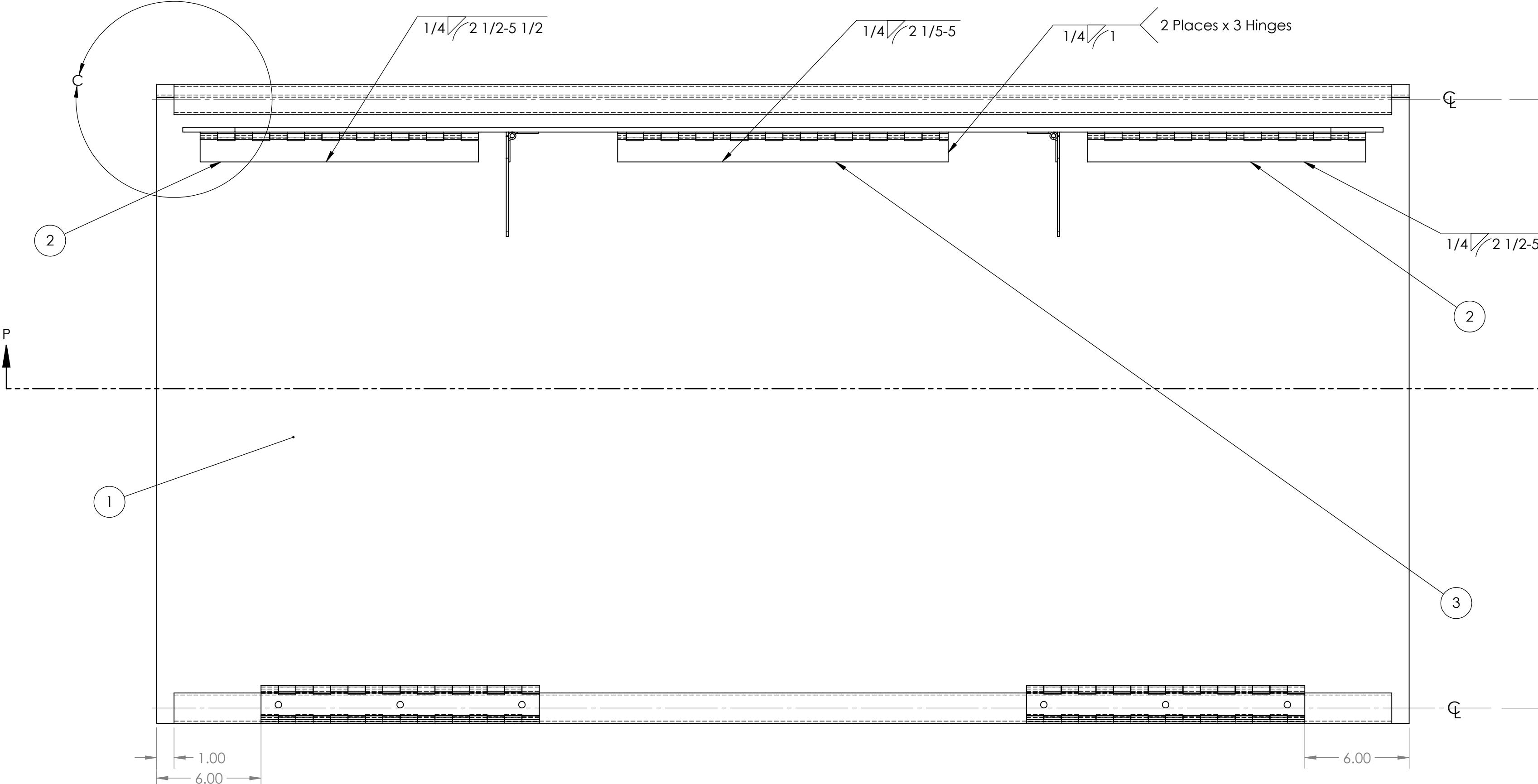
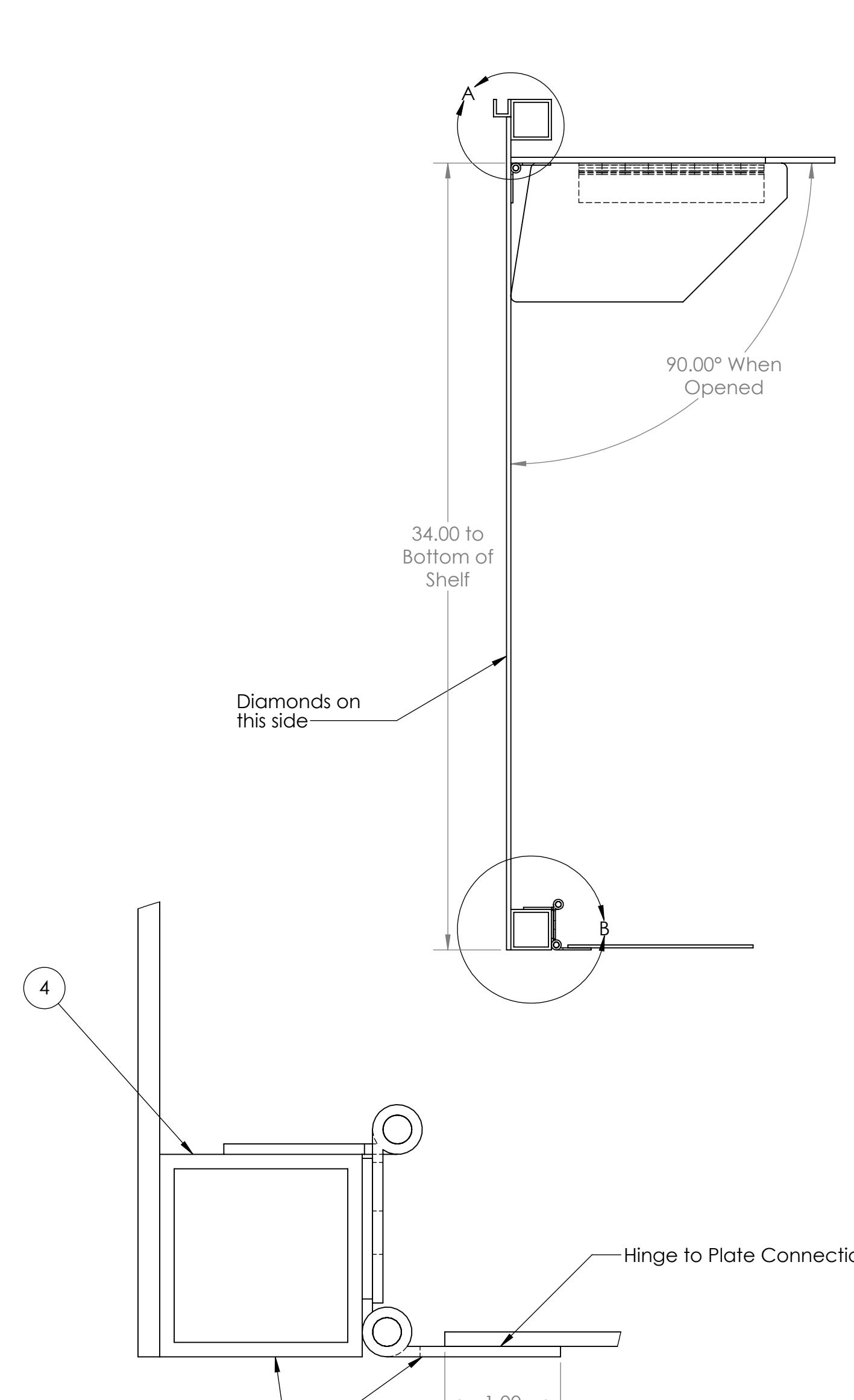
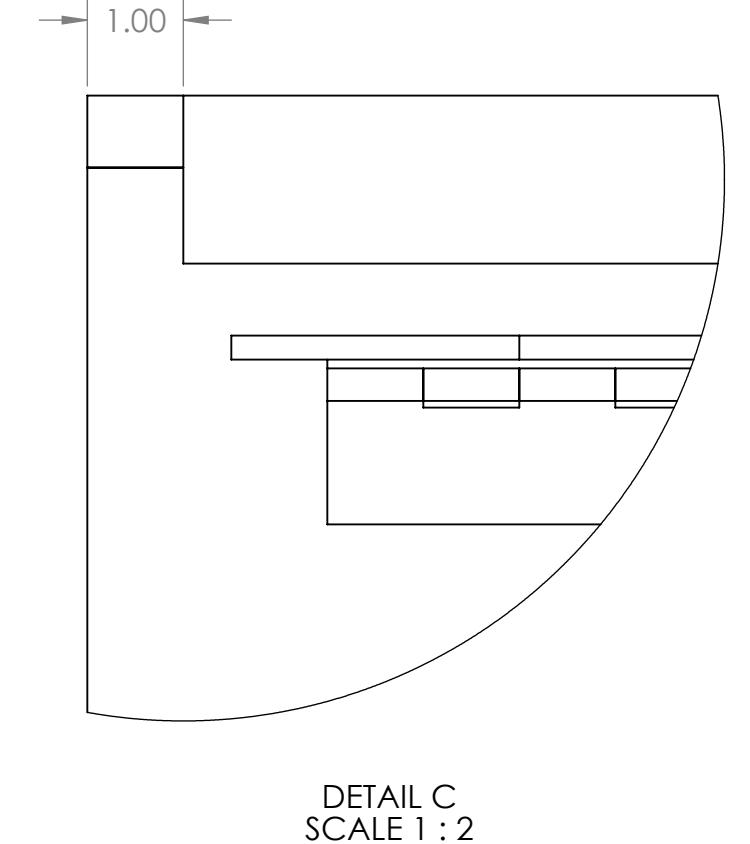
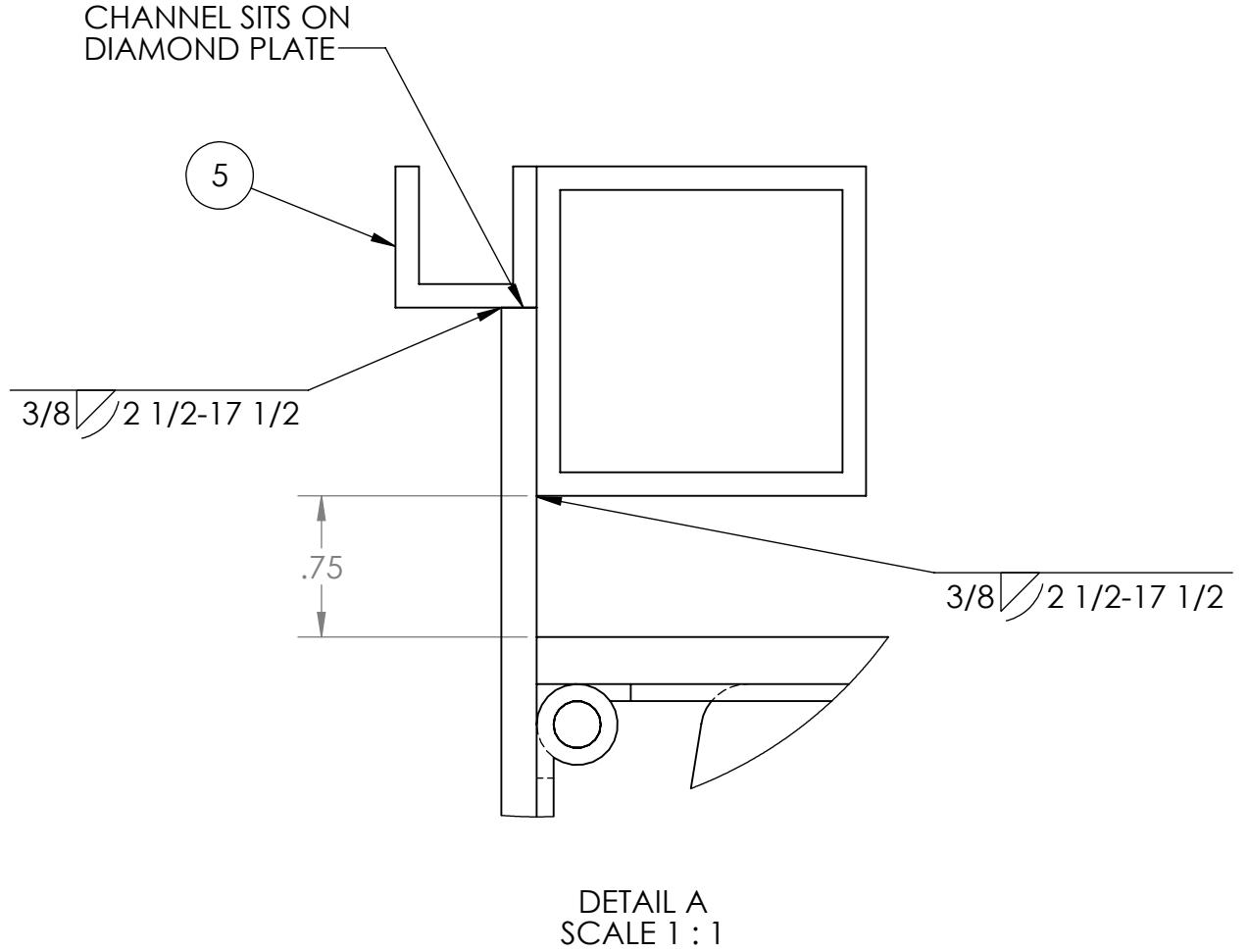
3

2

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REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
	1	Redraw	5/20/2008	narosenberg
2-D7	2	Weld size changed for consistency, drawing reformatted.	3/19/2020	CPO



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	FE-00004-01	3/16 Aluminum Diamond Plate	1
2	FE-00004-02	Hinge, Aluminum 3" x .09", 1/4" Pin	2
3	FE-00004-03	Hinge, Aluminum 3" x .09", 1/4" Pin	1
4	FE-00004-04	1 3/4" x 1 3/4" x 1/8" Square 6061 Aluminum Tubing	2
5	FE-00004-05	3/4" x 3/4" x 1/8" 6061 Aluminum 'U' Channel	1
6	FE-00004-06	1/4" 6061 Aluminum Plate	1
7	FE-00004-07	Hinge, Aluminum 3" x .09", 1/4" Pin (2 Pieces Welded)	2
8	FE-00004-08	Hinge, Aluminum 3" x .09", 1/4" Pin	2
9	FE-00004-09	1/8" 6061 Aluminum Plate	2
10	FE-00004-10	1/8" 6061 Aluminum Plate	2

Notes:
1. Remove all sharp edges and burrs

UNLESS OTHERWISE SPECIFIED:	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	
TOLERANCES:	CHECKED	
FRACTIONAL: 1/16	ENG APPR.	
ANGULAR: MACH 1° BEND ±1°	MFG APPR.	
TWO PLACE DECIMAL: ±.01	Q.A.	
THREE PLACE DECIMAL: ±.001	COMMENTS:	
PROPRIETARY AND CONFIDENTIAL		
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INTERPRET GEOMETRIC		
TOLERANCING PER:		
MATERIAL		
NEXT ASSY	USED ON	
	FINISH	
APPLICATION	DO NOT SCALE DRAWING	

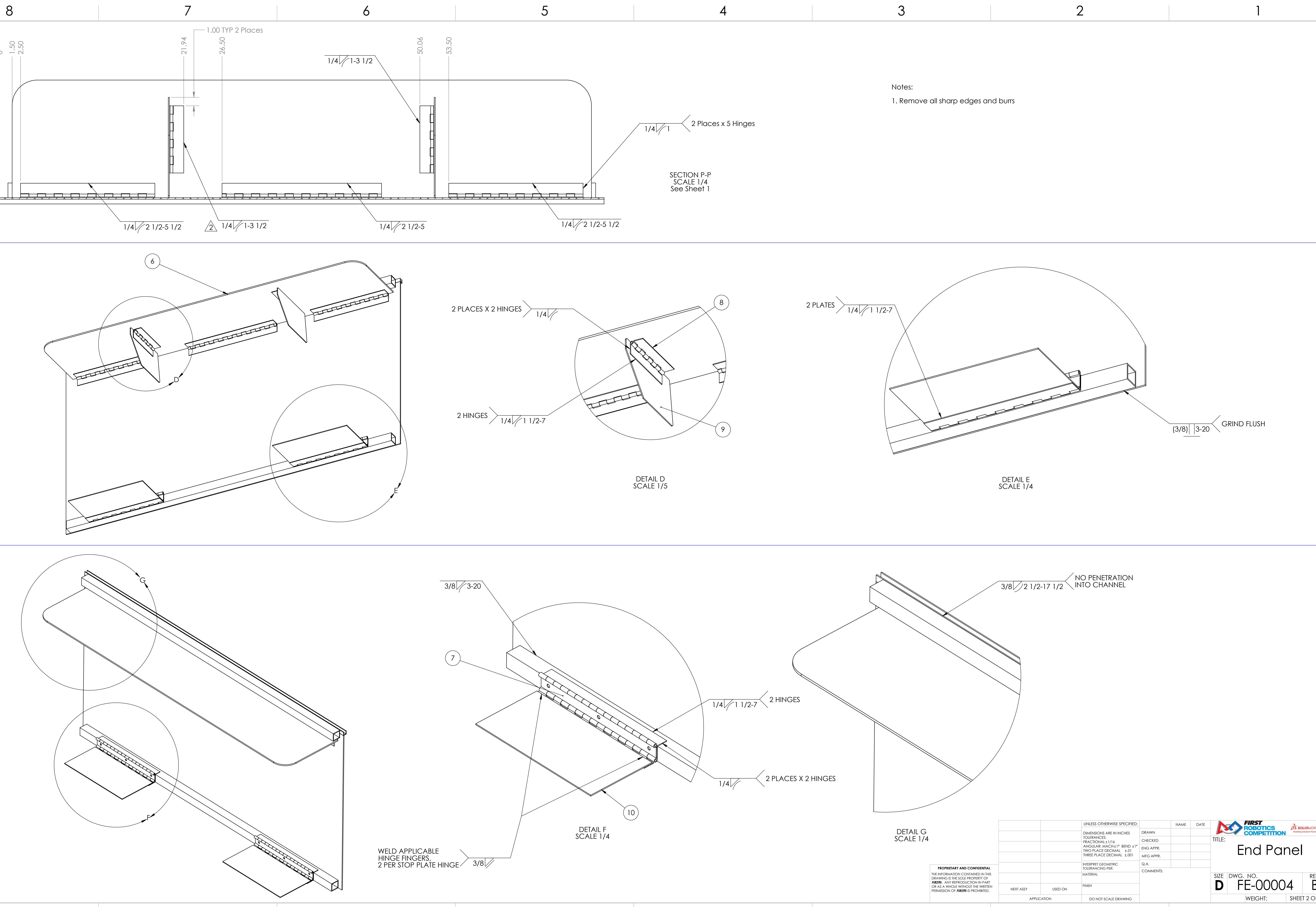
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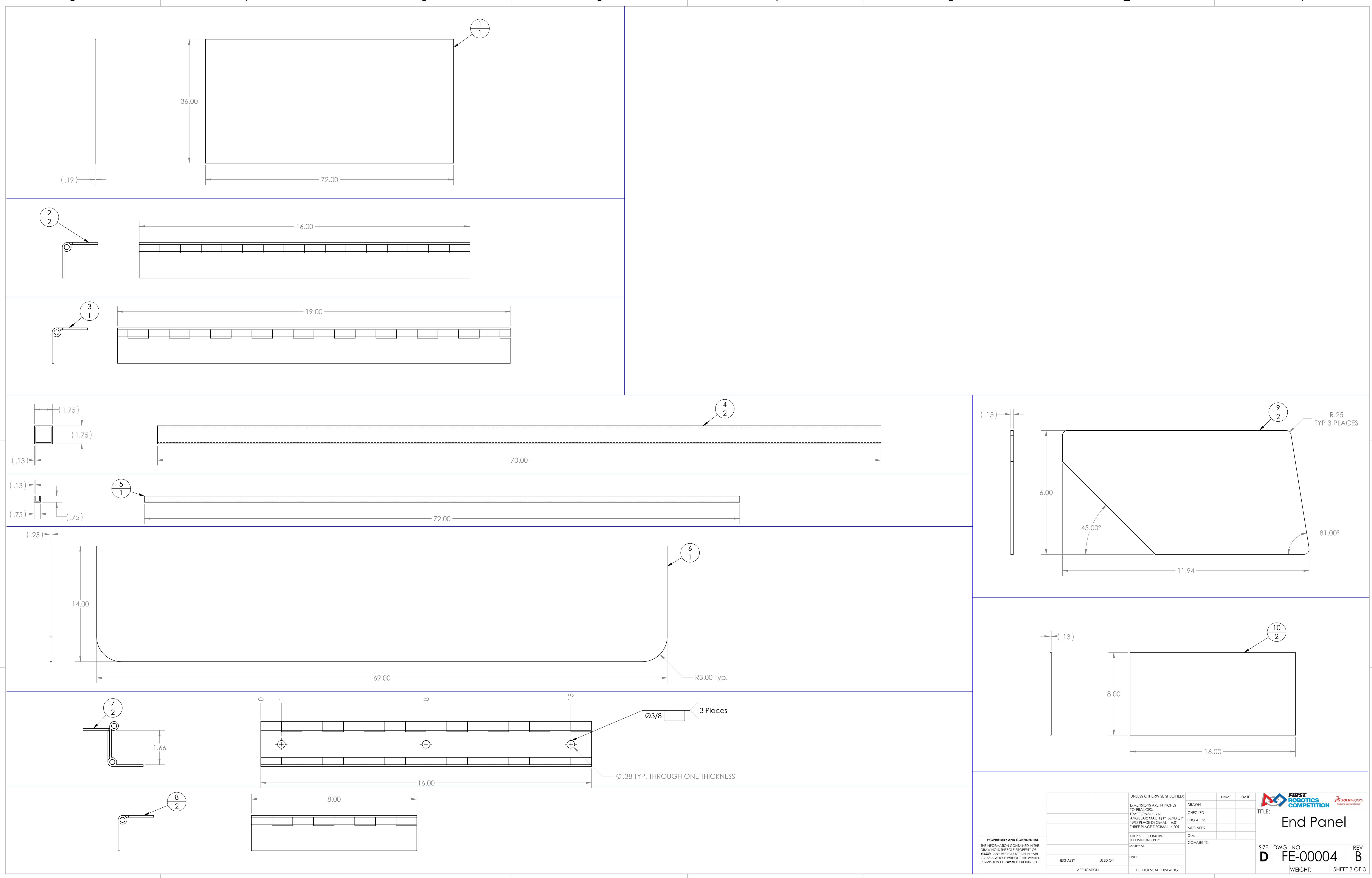
SOLIDWORKS

FIRST ROBOTICS COMPETITION

SIZE DWG. NO. D FE-00004 REV. B

SCALE: 1:5 WEIGHT: SHEET 1 OF 3





REVISIONS

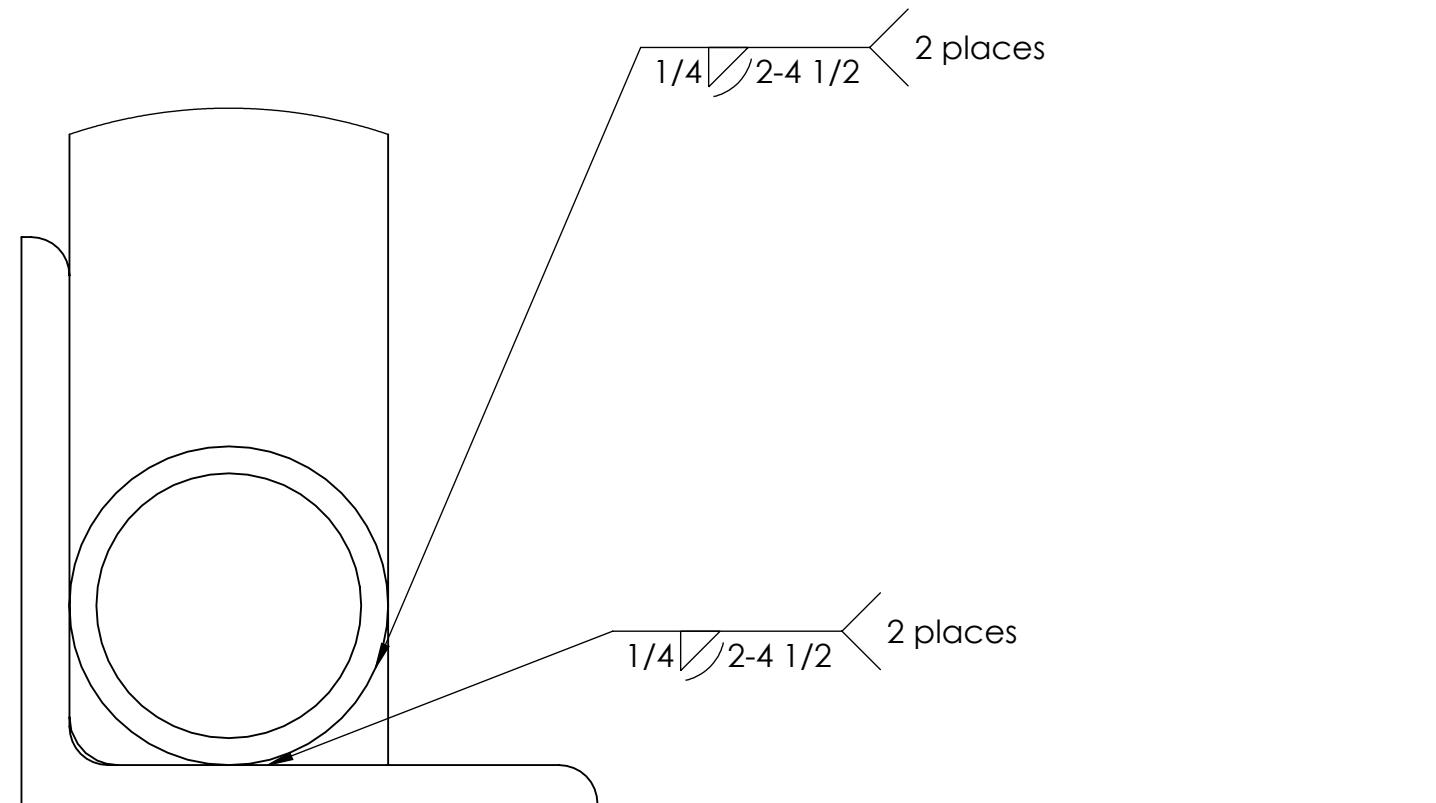
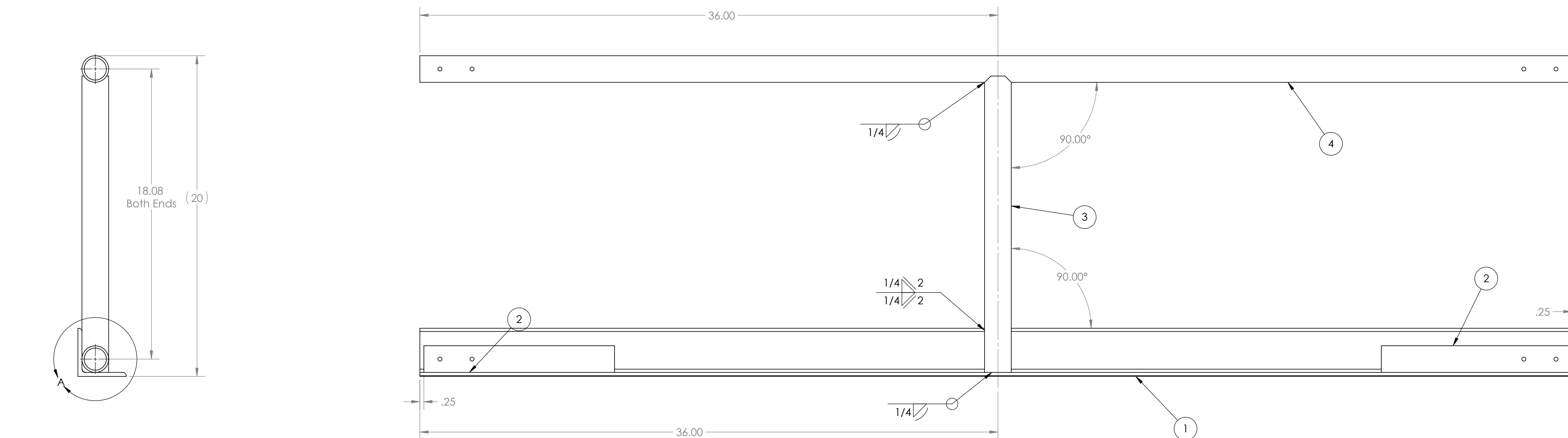
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	A	Redrawn	5/28/2008	narosenberg
	B	Drawing reformatted	3/19/2020	CPO

D D

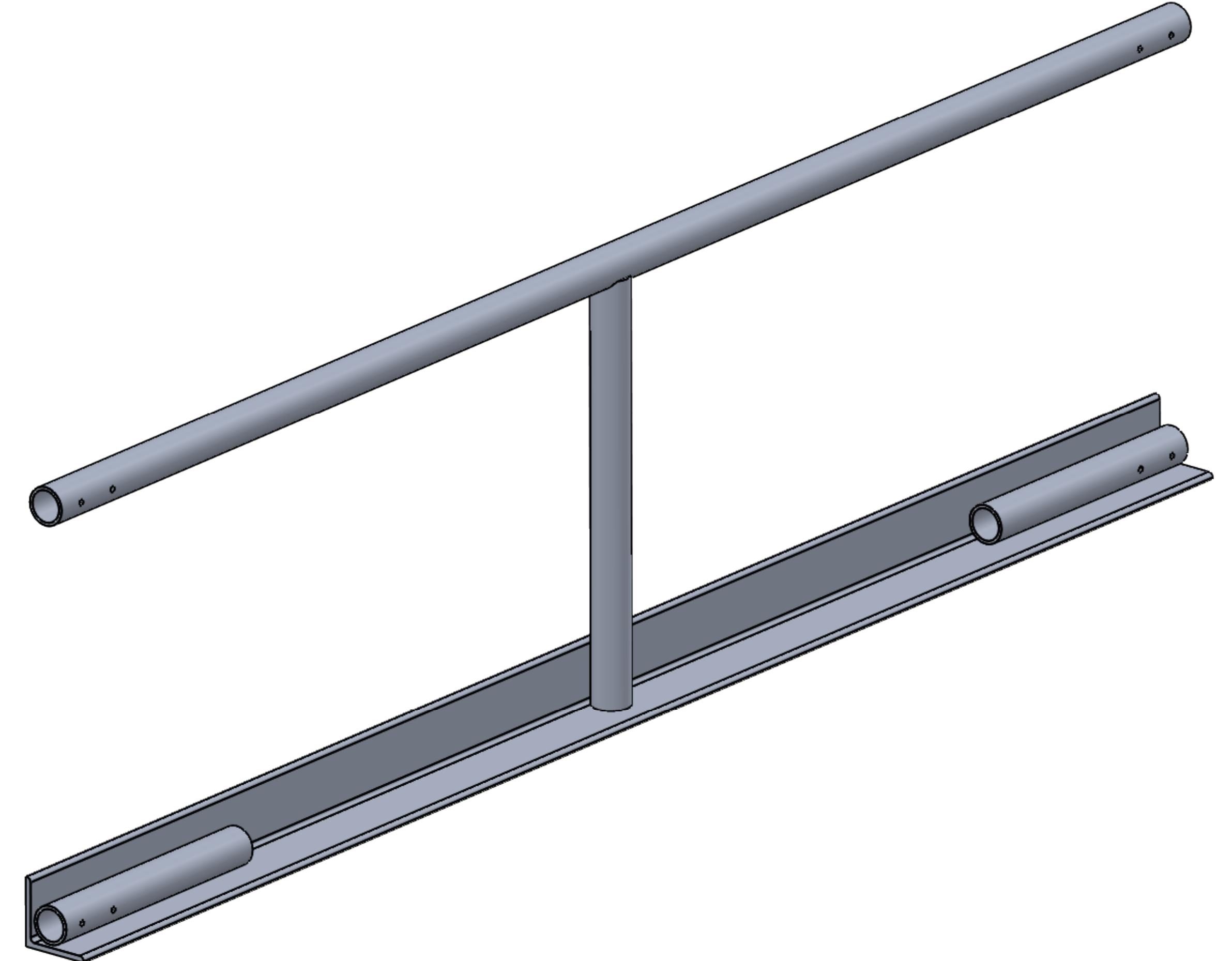
C C

B B

A A

DETAIL A
SCALE 1 : 1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	FE-00005-01	3" x 3" x 1/4" 6061-T6 Aluminum Angle	1
2	FE-00005-02	1 1/4" Schedule 40 6061-T6 Aluminum Pipe	2
3	FE-00005-03	1 1/4" Schedule 40 6061-T6 Aluminum Pipe	1
4	FE-00005-04	1 1/4" Schedule 40 6061-T6 Aluminum Pipe	1



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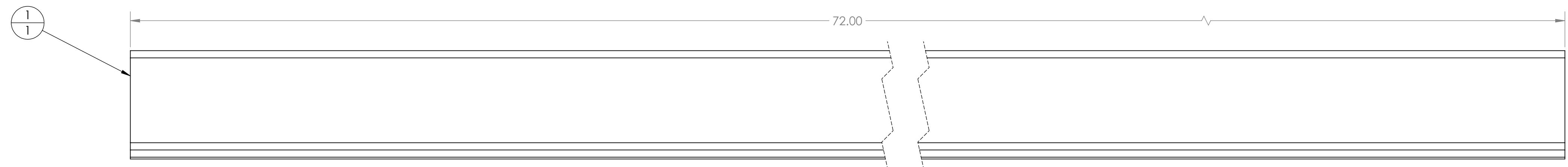
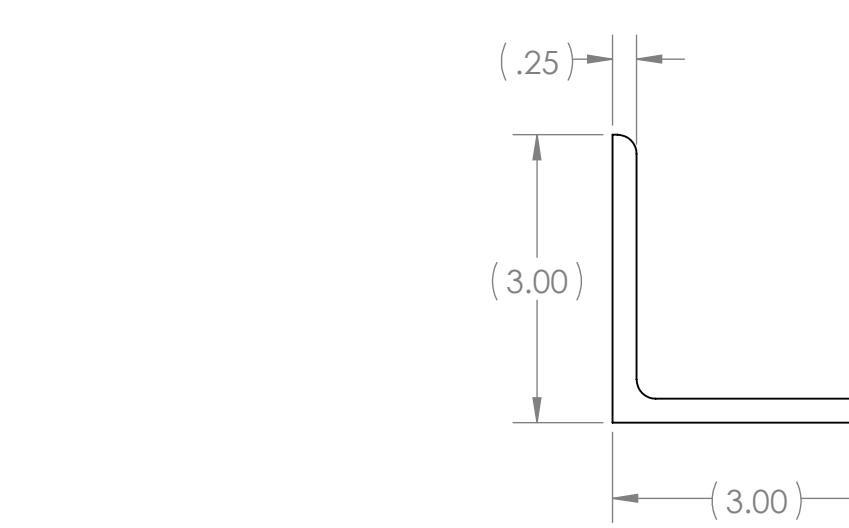
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DIMENSIONS ARE IN INCHES	DRAWN	
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ENG APPR.	ENG APPR.	
MFG APPR.	MFG APPR.	
INTERPRET GEOMETRIC TOLERANCING PER: MATERIAL	Q.A.	
COMMENTS:	NEXT ASSY	USED ON
	FINISH	
	APPLICATION	DO NOT SCALE DRAWING

TITLE: Field Rail		SOLIDWORKS
SIZE	DWG. NO.	REV.
D	FE-00005	B
SCALE: 1:4	WEIGHT:	SHEET 1 OF 2

8 | 7 | 6 | 5 | 4 | 3 | 2 | 1

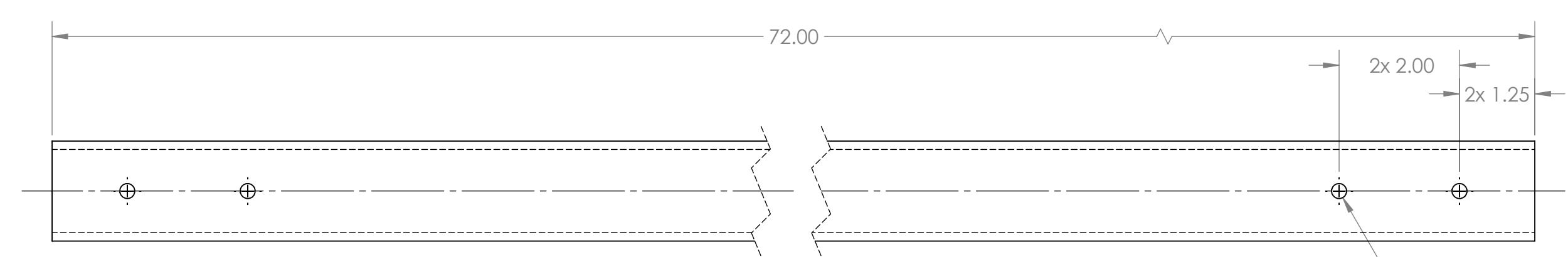
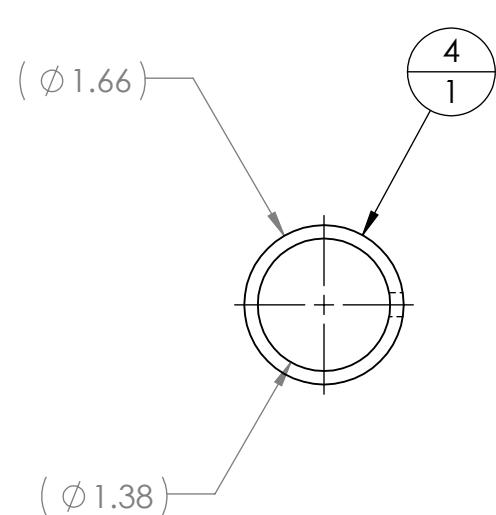
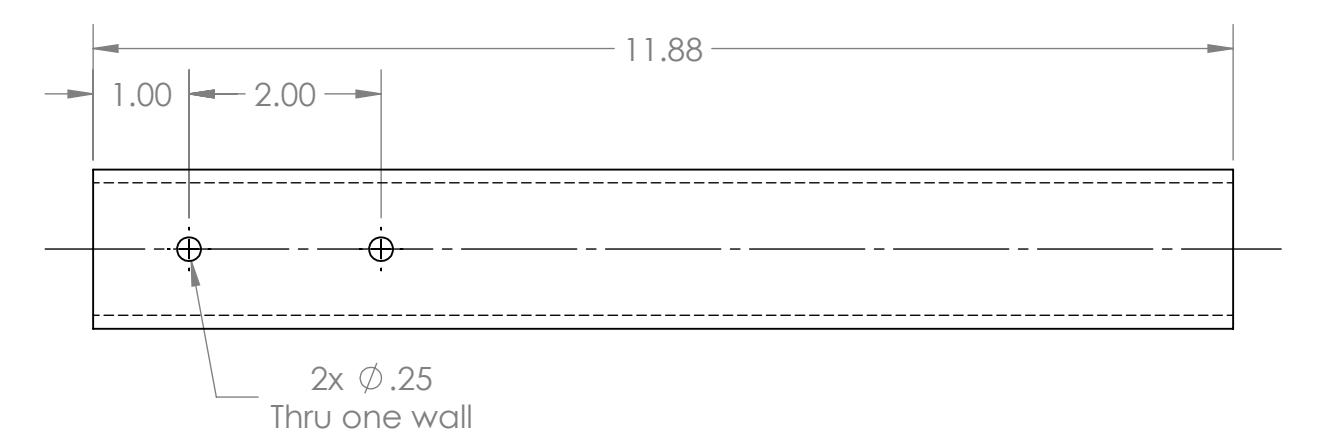
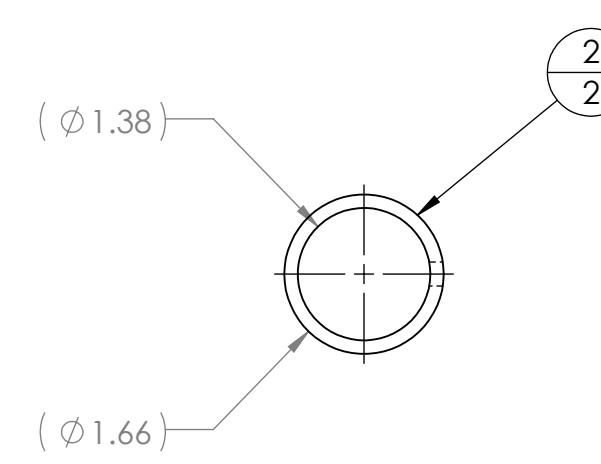
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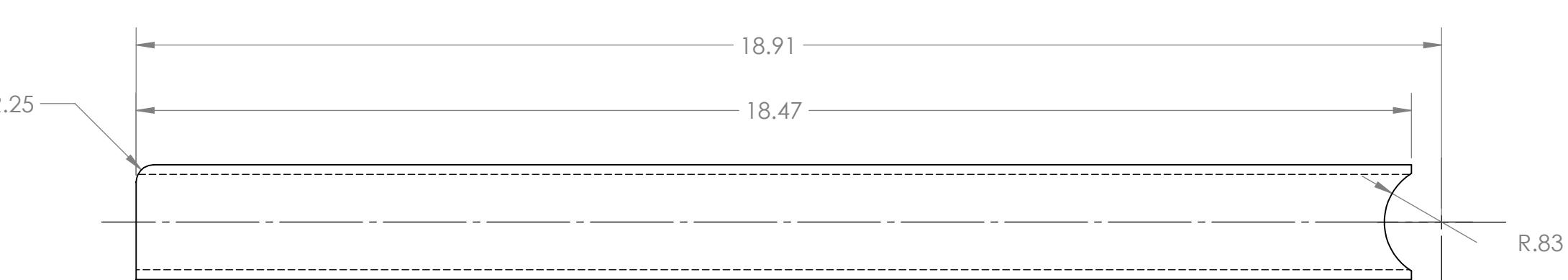
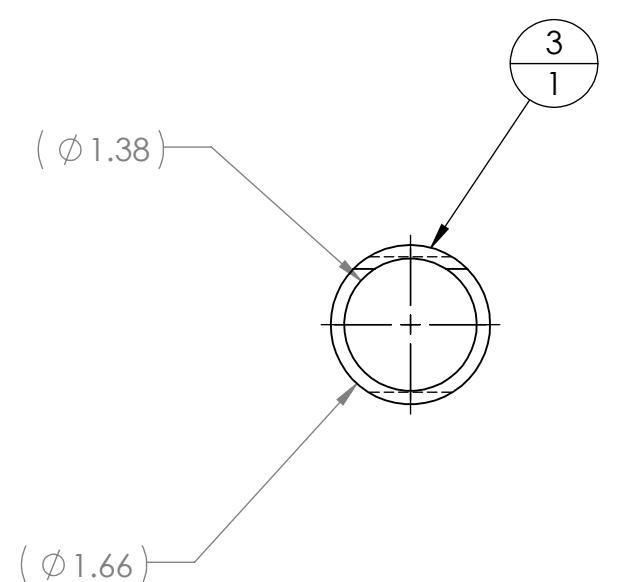
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		DIMENSIONS ARE IN INCHES	DRAWN	
		TOLERANCES: FRACTIONAL: 1/16 ANGULAR: MACH 1° BEND ±1° TWO PLACE DECIMAL: ±.01 THREE PLACE DECIMAL: ±.001	CHECKED	
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		MFG APPR.	MFG APPR.	
Q.A.		INTERPRET GEOMETRIC TOLERANCING PER:	INTERPRET GEOMETRIC TOLERANCING PER:	
		MATERIAL	MATERIAL	
COMMENTS:			COMMENTS:	
NEXT ASSY	USED ON	FINISH		
APPLICATION	DO NOT SCALE DRAWING			

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ROBOTICS
COMPETITION
SOLIDWORKS
Building Solutions Better

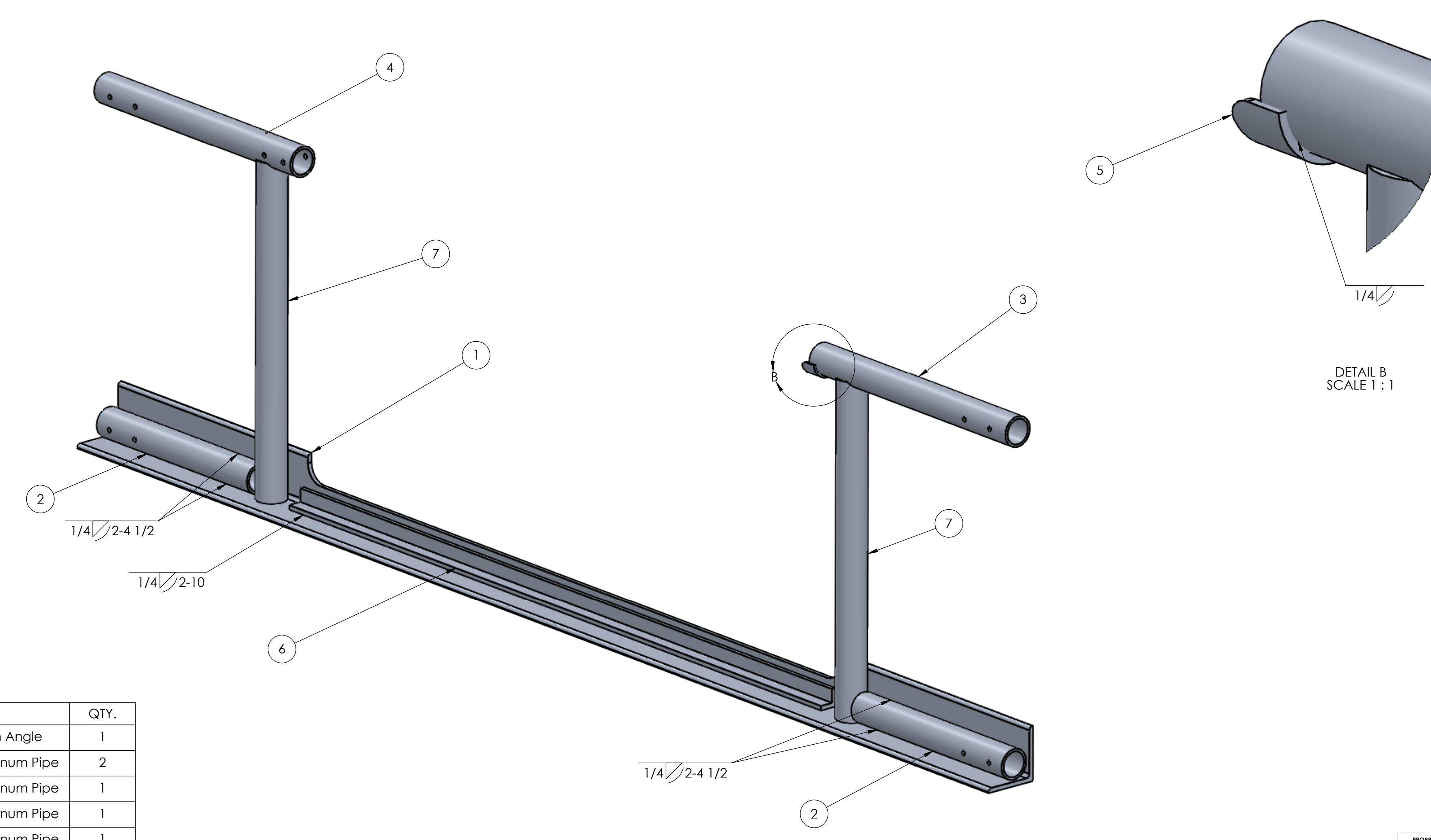
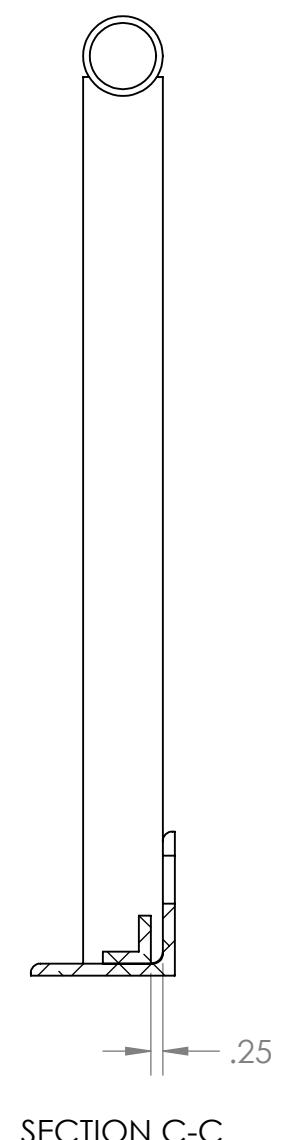
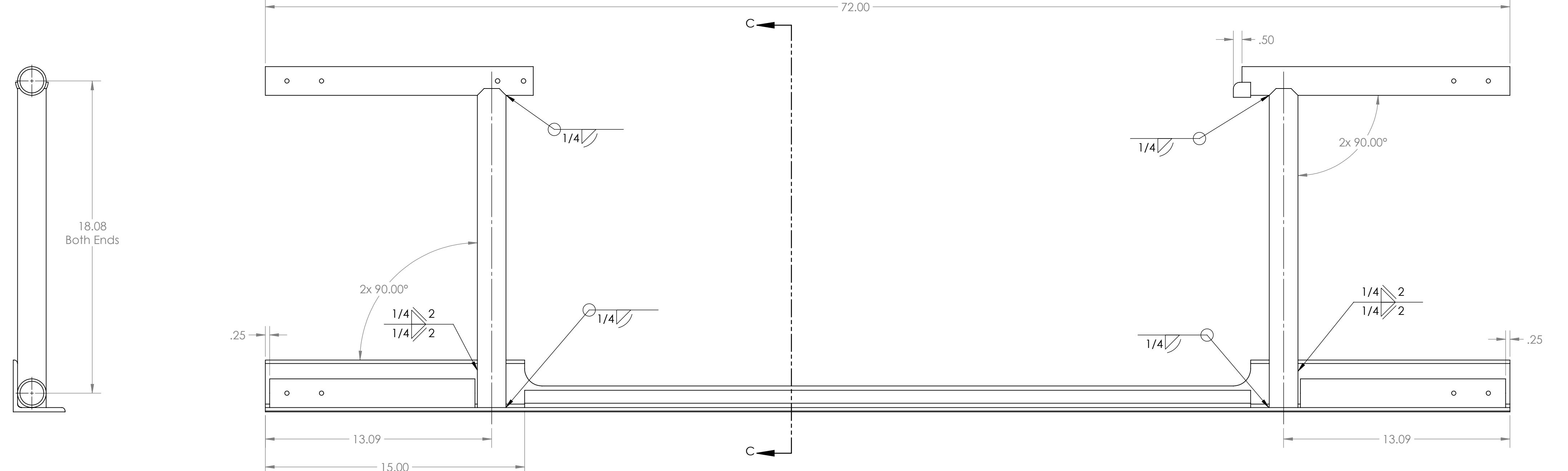
Field Rail

SIZE DWG. NO. REV
D FE-00005 B

SCALE: 1:2 WEIGHT: SHEET 2 OF 2

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
A		Redrawn	8/7/2008	narosenberg
A7, 2- B6, 3- C6	B	Parts renumbered, drawing reformatting, hole diameter updated; hole changed to thru one wall for consistency.	3/20/2020	CPO



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	FE-00006-01	3" x 3" x 1/4" 6061-T6 Aluminum Angle	1
2	FE-00006-02	1-1/4" Schedule 40 6061-T6 Aluminum Pipe	2
3	FE-00006-03	1-1/4" Schedule 40 6061-T6 Aluminum Pipe	1
4	FE-00006-04	1-1/4" Schedule 40 6061-T6 Aluminum Pipe	1
5	FE-00006-05	1-1/2" Schedule 40 6061-T6 Aluminum Pipe	1
6	FE-00006-06	1" x 1" x 1/4" 6061-T6 Aluminum Angle	1
7	FE-00006-07	1-1/4" Schedule 40 6061-T6 Aluminum Pipe	2

B

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UNLESS OTHERWISE SPECIFIED:	DRAWN	NAME	DATE
DIMENSIONS ARE IN INCHES	CHECKED		
TOLERANCES: FRACTIONAL: 1/16 ANGULAR: MACH 1° BEND ±1° TWO PLACE DECIMAL: ±.01 THREE PLACE DECIMAL: ±.001	ENG APPR.		
ENG APPR.	MFG APPR.		
Q.A.	COMMENTS:		
INTERPRET GEOMETRIC TOLERANCING PER: MATERIAL			
NEXT ASSY	USED ON		
APPLICATION	FINISH		
DO NOT SCALE DRAWING			

FIRST[®] ROBOTICS COMPETITION

Field Gate, Weldment

SIZE DWG. NO. REV. D FE-00006 B

SCALE: 1:4 WEIGHT: SHEET 1 OF 3

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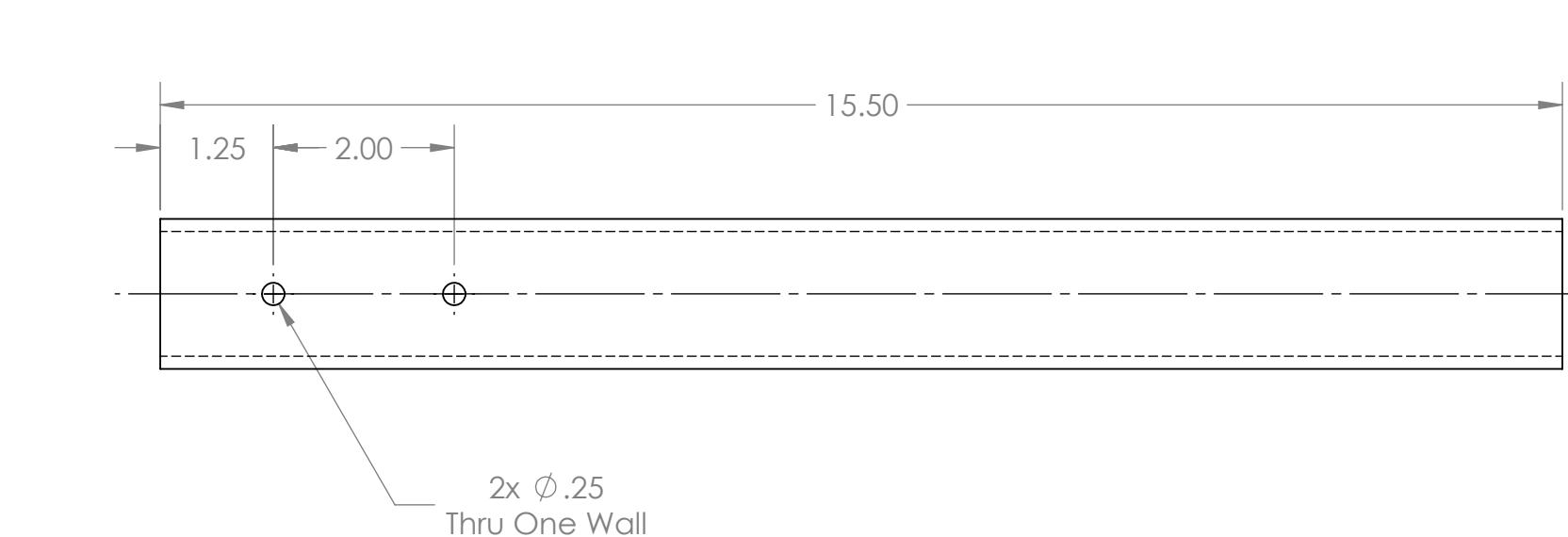
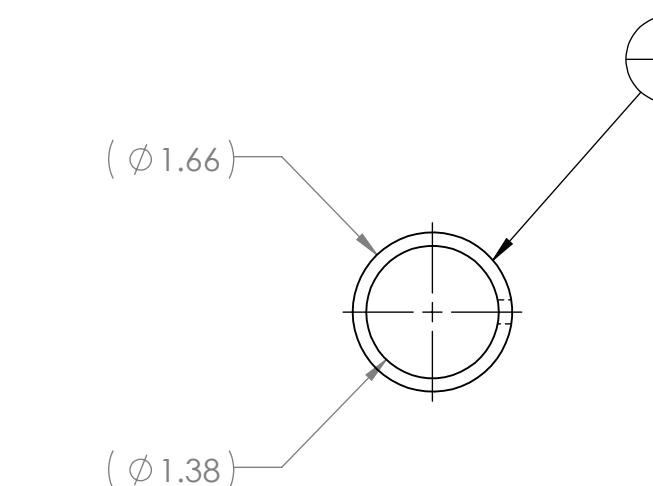
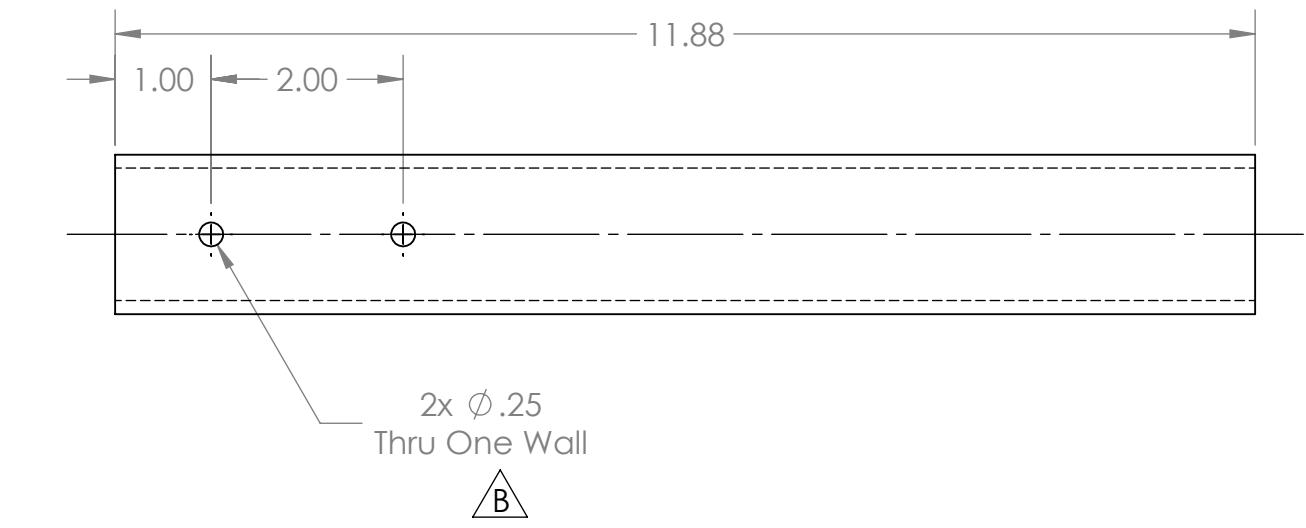
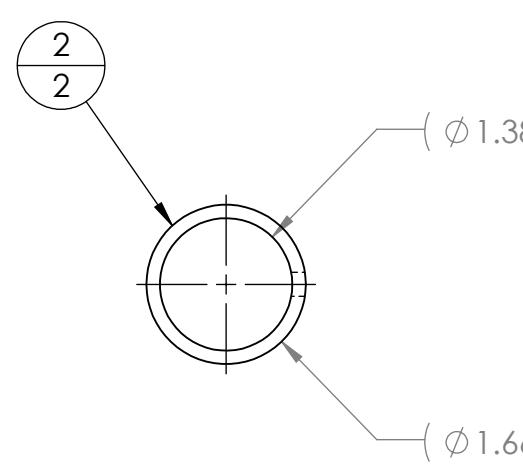
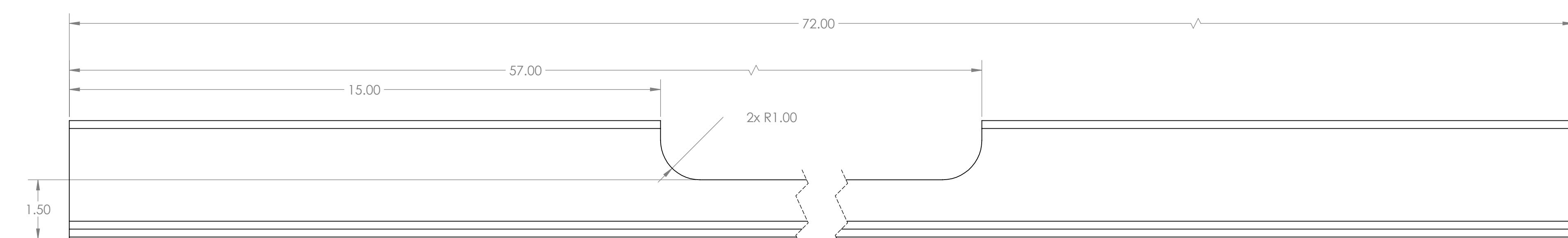
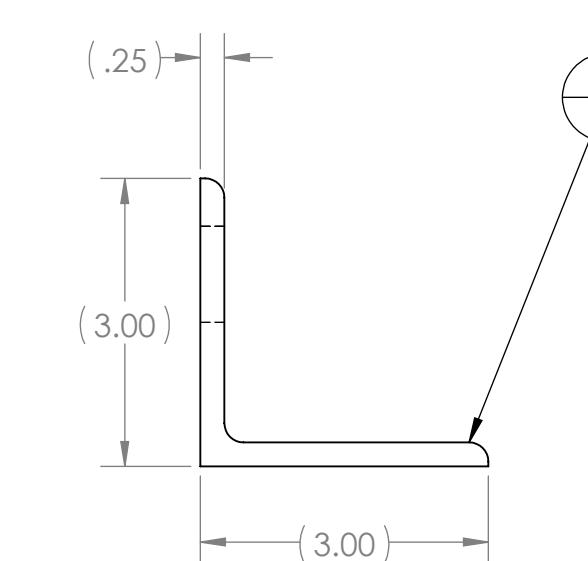
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A

A



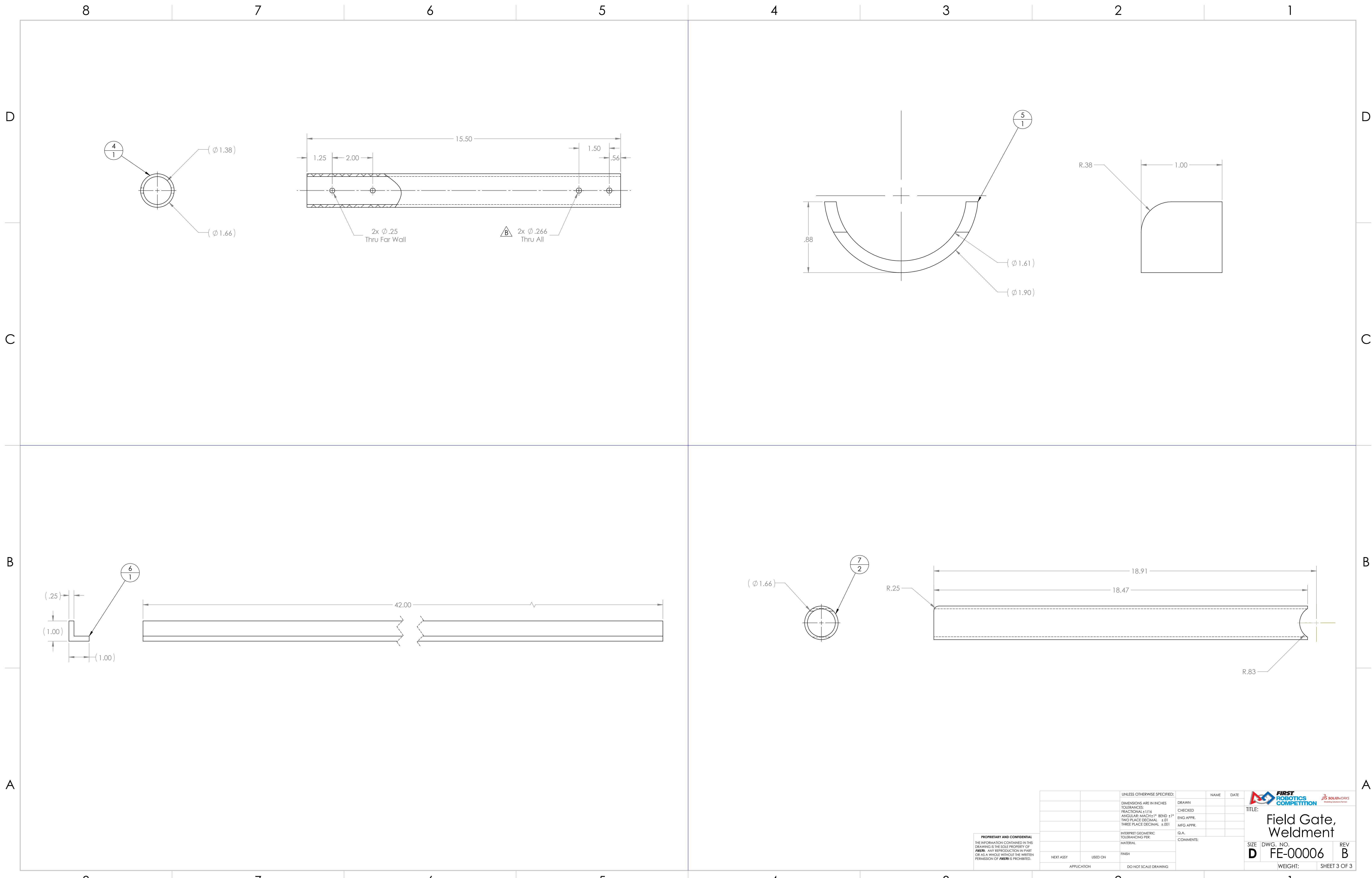
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		ANGLE: MACH 1 ⁺ BEND ±1°	MFG APPR.			
		TWO PLACE DECIMAL: ±.01	Q.A.			
		THREE PLACE DECIMAL: ±.001	COMMENTS:			
		PROPRIETARY AND CONFIDENTIAL				
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		DRAWING IS THE SOLE PROPERTY OF				
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		OR AS A WHOLE WITHOUT THE WRITTEN				
		PERMISSION OF FIRST [®] IS PROHIBITED.				
NEXT ASSY	USED ON	INTERPRET GEOMETRIC TOLERANCING PER: MATERIAL				
APPLICATION	FINISH					
		DO NOT SCALE DRAWING				

FIRST[®] ROBOTICS COMPETITION Building Solutions for the Future

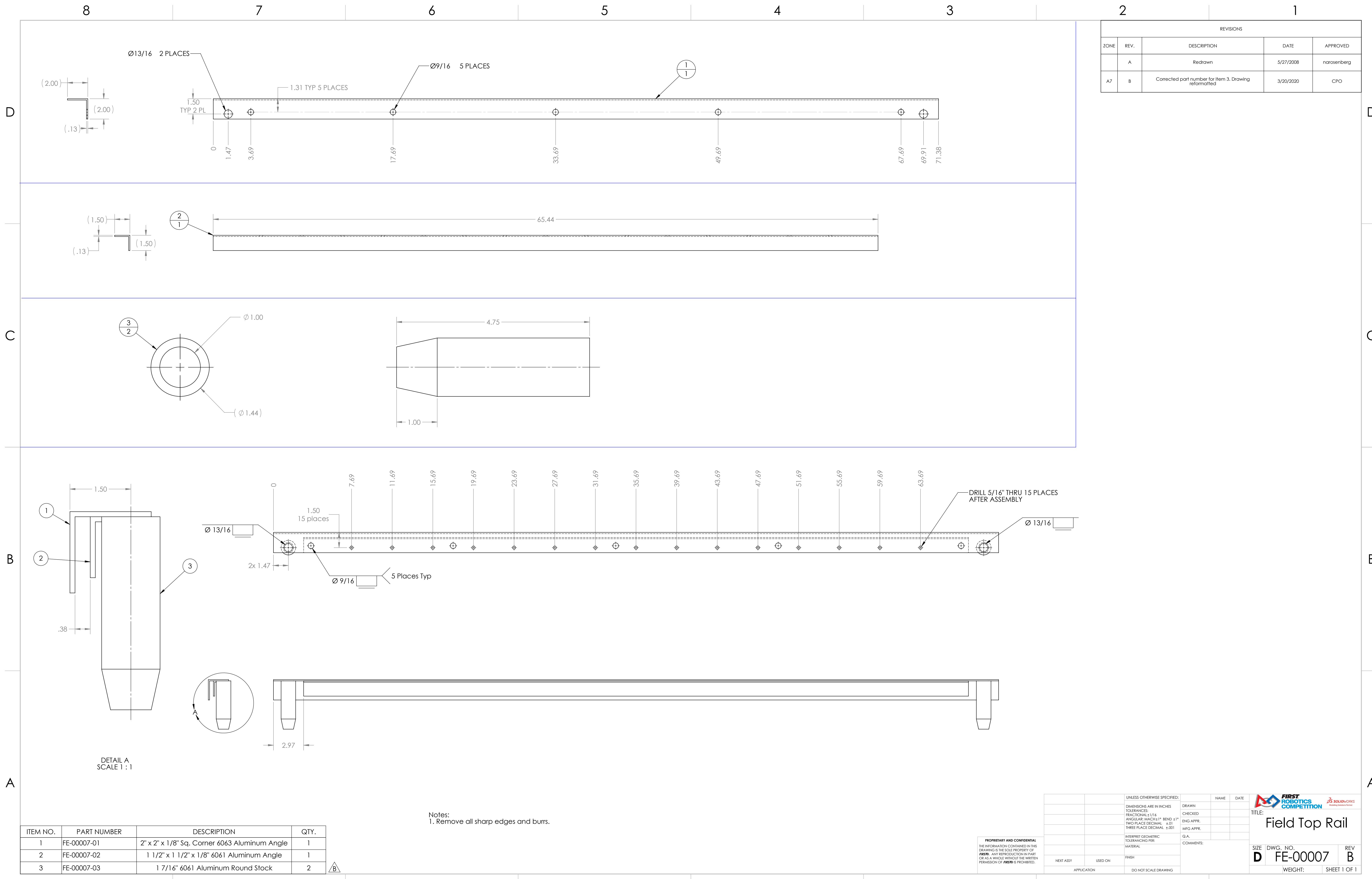
Field Gate, Weldment

SIZE DWG. NO. REV
D FE-00006 B

WEIGHT: SHEET 2 OF 3



8 7 6 5 4 3 2 1



4

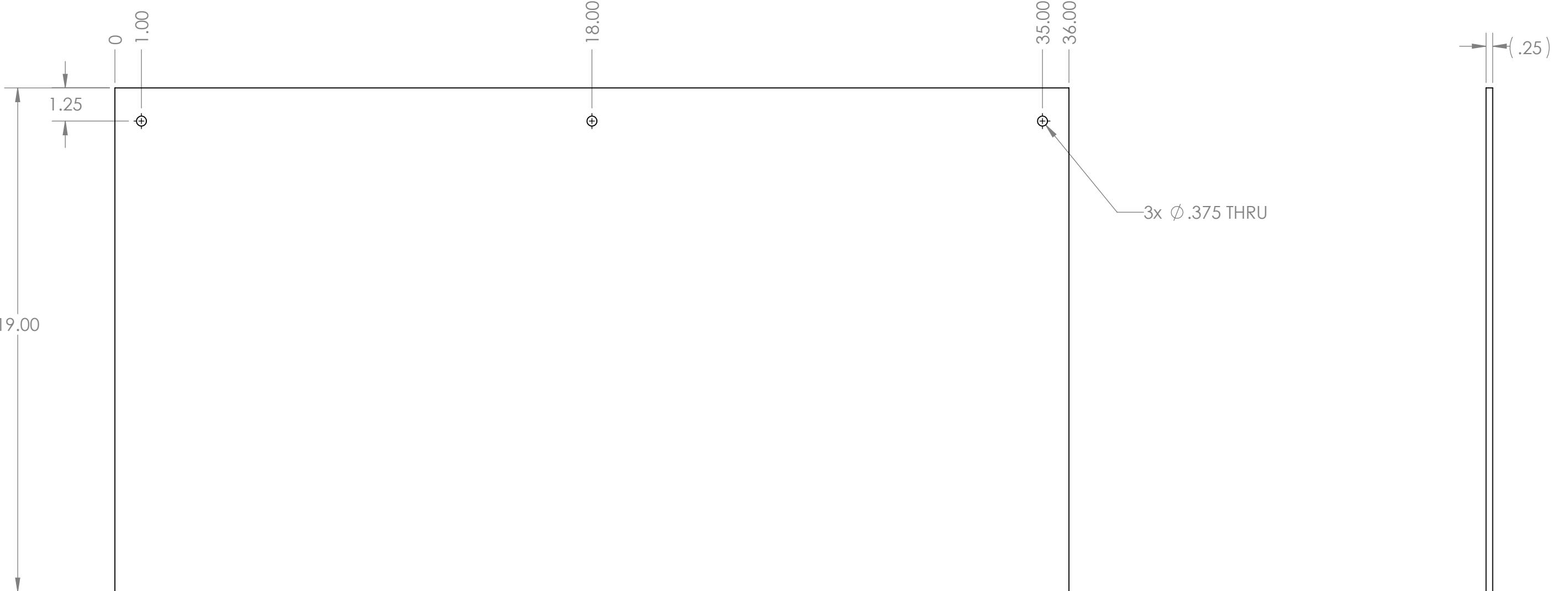
3

2

1

B

B



Notes:

1. Material: 1/4" Thick Clear Polycarbonate.
2. Remove all sharp edges.

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		UNLESS OTHERWISE SPECIFIED:			NAME _____ DATE _____	
		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL: ±1/16 ANGULAR: MACH ±1° BEND ±1° TWO PLACE DECIMAL: ±.01 THREE PLACE DECIMAL: ±.001				
		INTERPRET GEOMETRIC TOLERANCING PER:				
		MATERIAL				
NEXT ASSY	USED ON	FINISH				
APPLICATION		DO NOT SCALE DRAWING				
A	A	Field Plastic "A"			SOLIDWORKS Modeling Solutions Partner	
B	FE-00008				FIRST ROBOTICS COMPETITION	
SIZE	DWG. NO.				REV	
SCALE: 1:4	WEIGHT:				SHEET 1 OF 1	

4

3

2

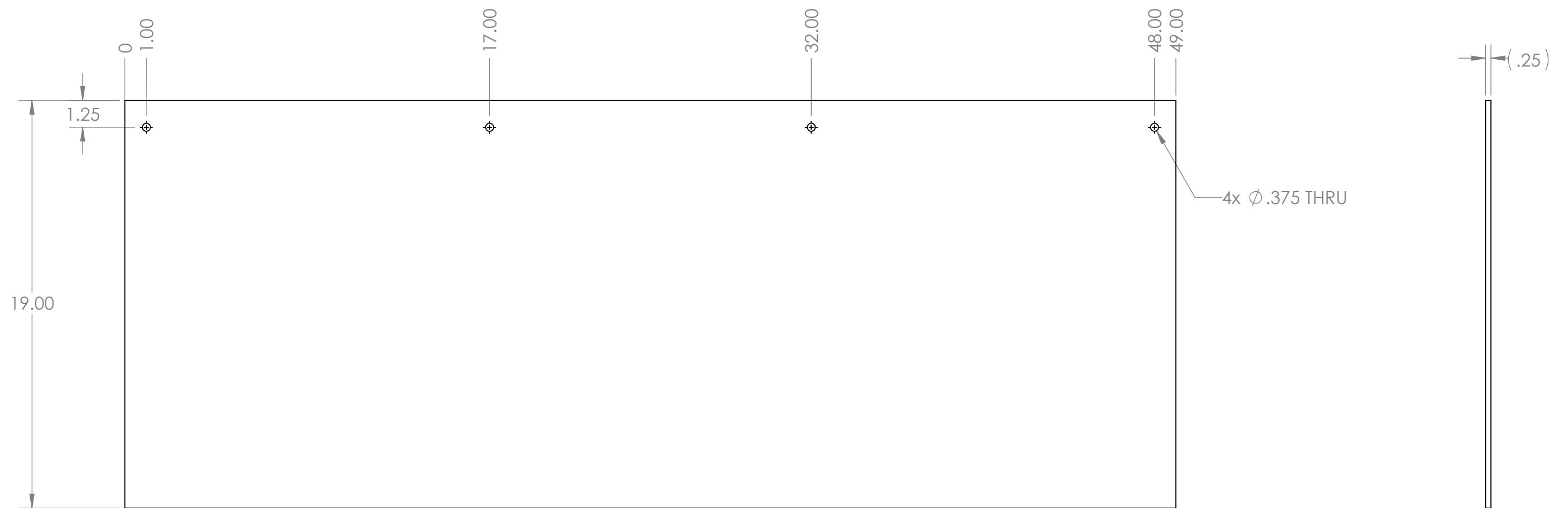
1

4

3

2

1



Notes:

1. Material: 1/4" Thick Clear Polycarbonate.
2. Remove all sharp edges.

4

3

2

1

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		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$		NAME	DATE
		DRAWN			
		CHECKED			
		ENG APPR.			
		MFG APPR.			
		Q.A.			
		COMMENTS:			
		MATERIAL			
		NEXT ASSY	USED ON	FINISH	
		APPLICATION		DO NOT SCALE DRAWING	
SIZE	DWG. NO.		REV		
B	FE-00009				
SCALE: 1:5	WEIGHT:		SHEET 1 OF 1		

 **FIRST**
ROBOTICS
COMPETITION 
SOLIDWORKS
 Modeling Solutions Partner

TITLE:
Field Plastic "B"

4

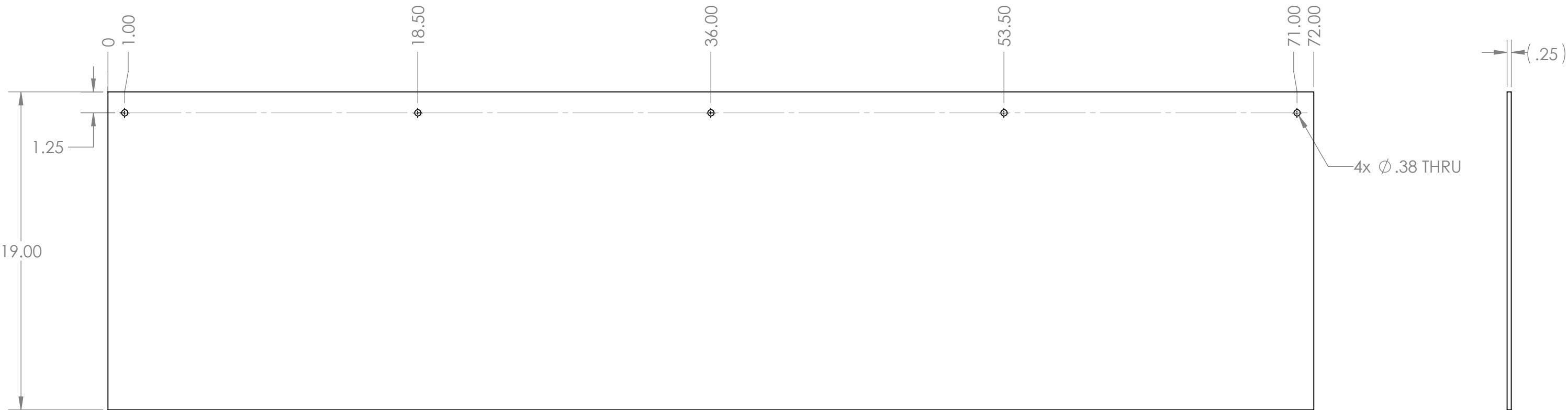
3

2

1

B

B



Notes:

1. Material: 1/4" Thick Clear Polycarbonate.
2. Remove all sharp edges.

A

A

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		UNLESS OTHERWISE SPECIFIED:		NAME	DATE
		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$			
		INTERPRET GEOMETRIC TOLERANCING PER:		Q.A.	COMMENTS:
		MATERIAL			
NEXT ASSY	USED ON	FINISH			
APPLICATION		DO NOT SCALE DRAWING			
A					
B					

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Field Plastic "C"

SIZE	DWG. NO.	REV
B	FE-00010	
SCALE: 1:6	WEIGHT:	SHEET 1 OF 1

4

3

2

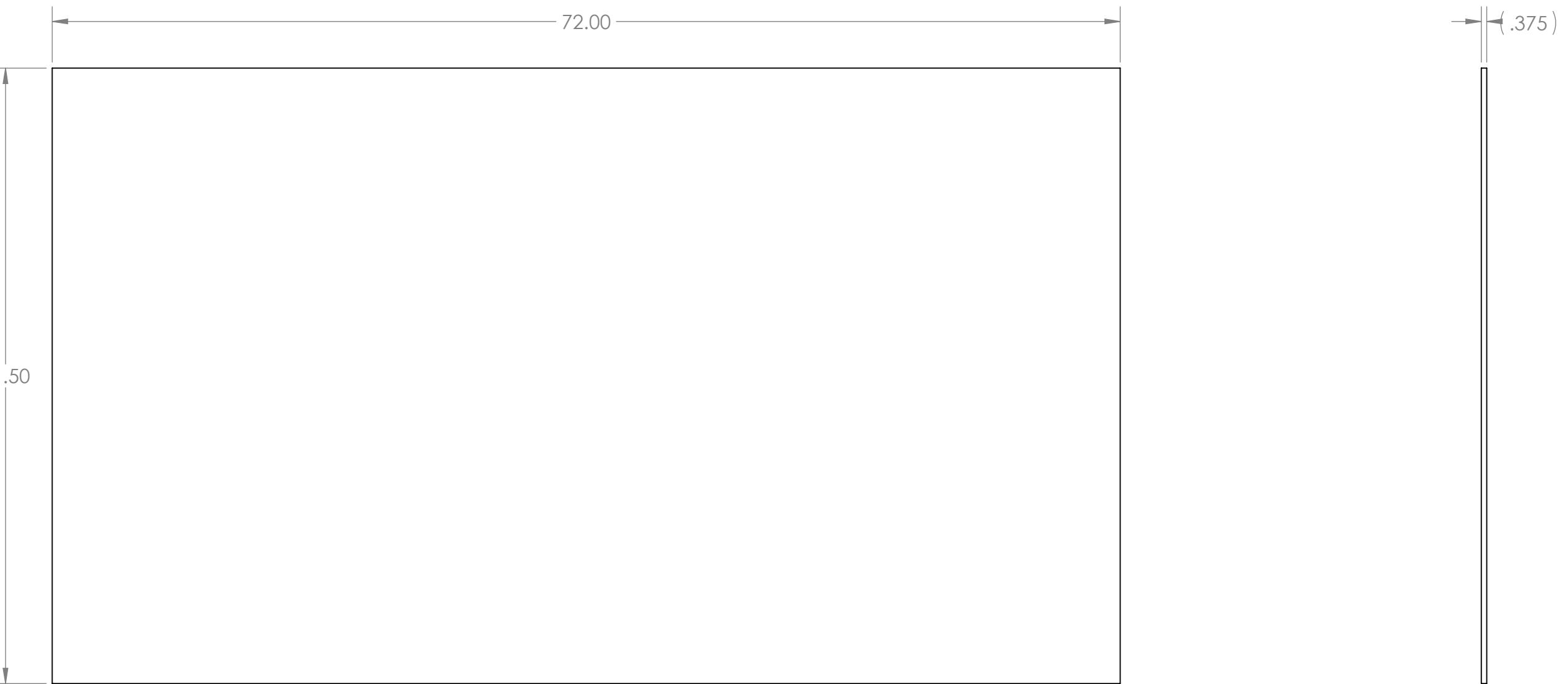
1

4

3

2

1



B

B

A

A

Notes:

- Material: 3/8" Thick Acrylic Sheet

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		UNLESS OTHERWISE SPECIFIED:		NAME	DATE		
		DIMENSIONS ARE IN INCHES					
TOLERANCES:		FRACTIONAL $\pm 1/16$					
ANGULAR: MACH $\pm 1^\circ$		BEND $\pm 1^\circ$					
TWO PLACE DECIMAL $\pm .01$		THREE PLACE DECIMAL $\pm .001$					
INTERPRET GEOMETRIC TOLERANCING PER:		Q.A.		COMMENTS:			
		MATERIAL					
NEXT ASSY		FINISH					
APPLICATION		DO NOT SCALE DRAWING					

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Drivers Station Acrylic

B	FE-00012	REV
SCALE: 1:8	WEIGHT:	SHEET 1 OF 1

4

3

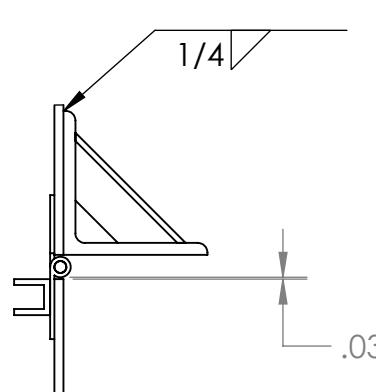
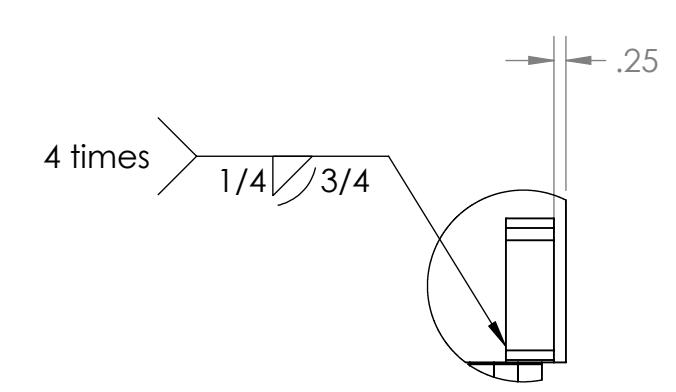
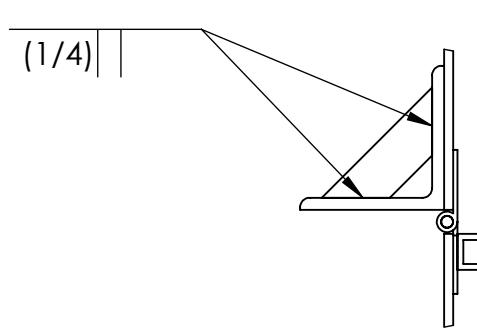
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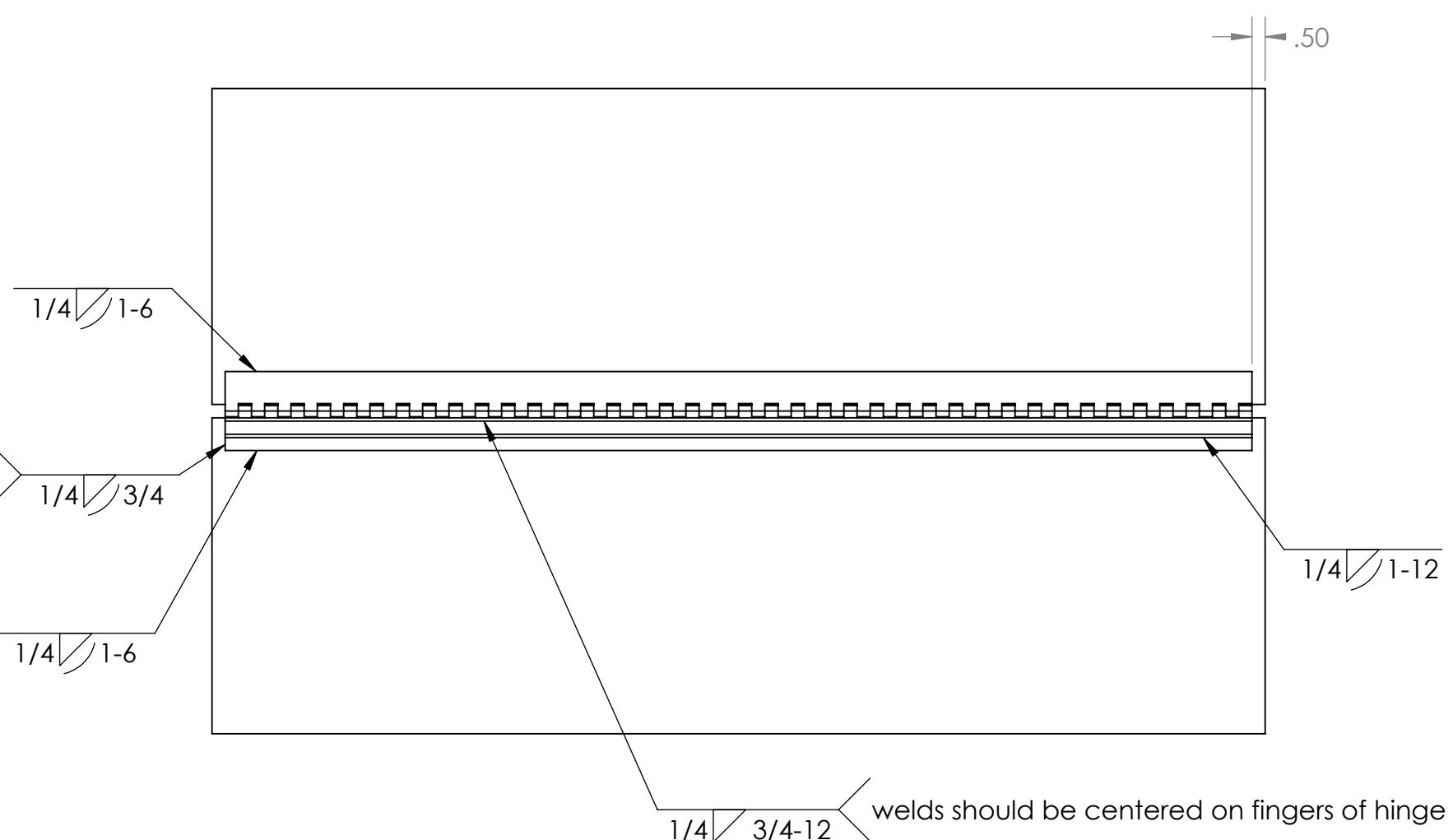
REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A	Redrawn	5/27/2008	narosenberg
	B	Drawing Reformatted	3/20/2020	CPO

D

DETAIL B
SCALE 1 : 4DETAIL A
SCALE 1 : 4DETAIL C
SCALE 1 : 4

C



4 places

1/4V/1-6

1/4V/3/4

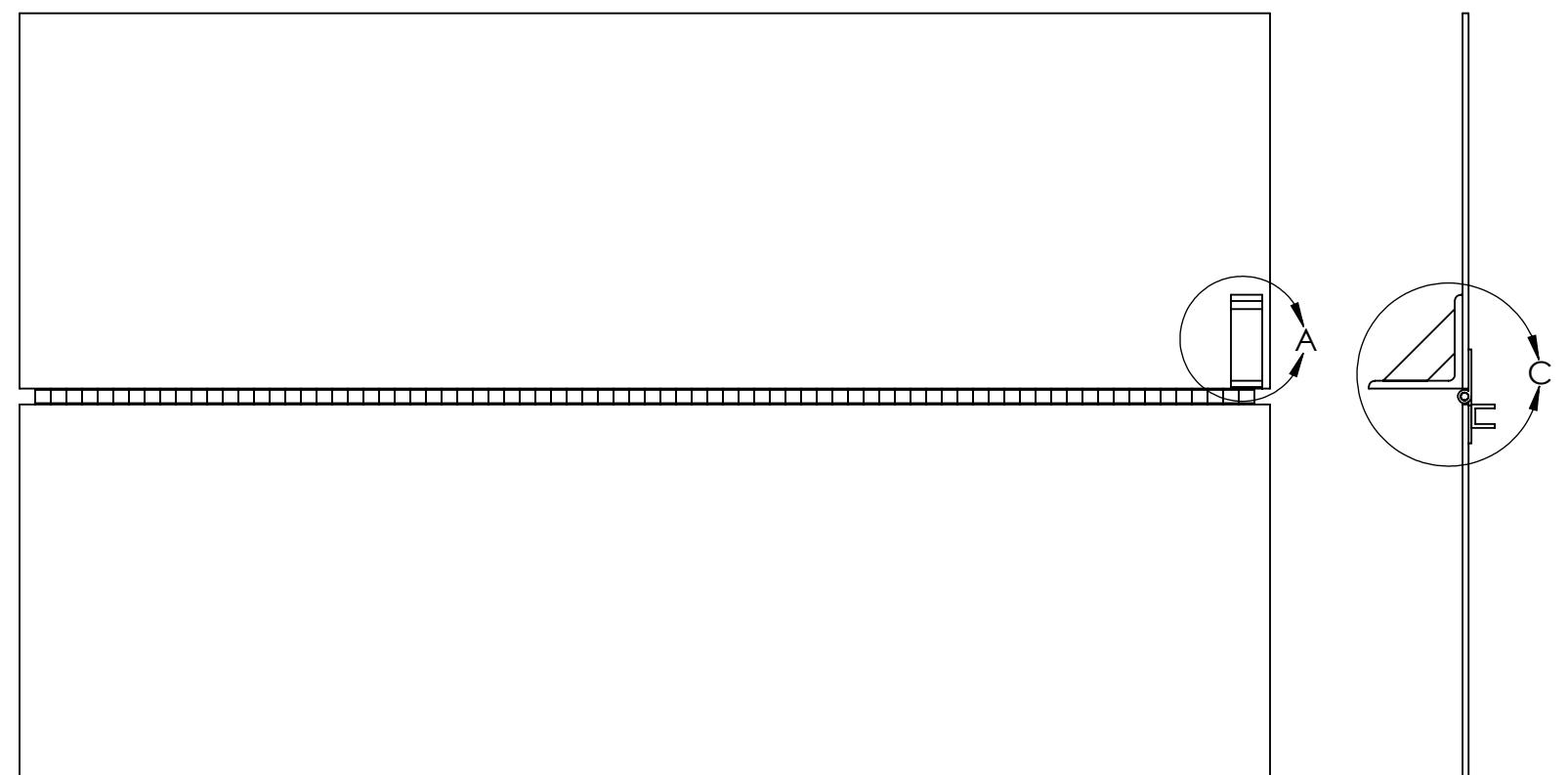
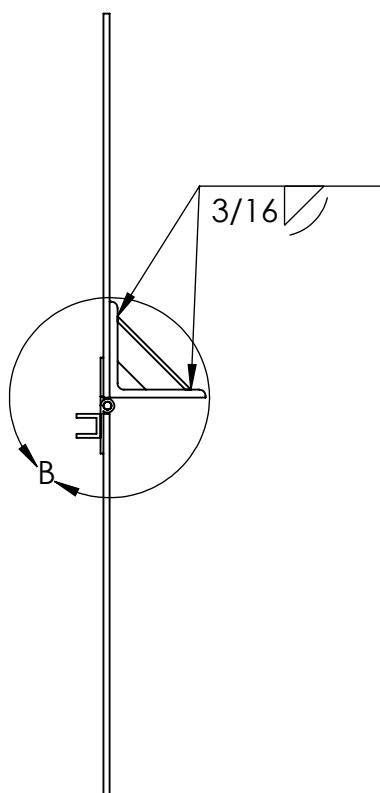
1/4V/1-6

1/4V 3/4-12

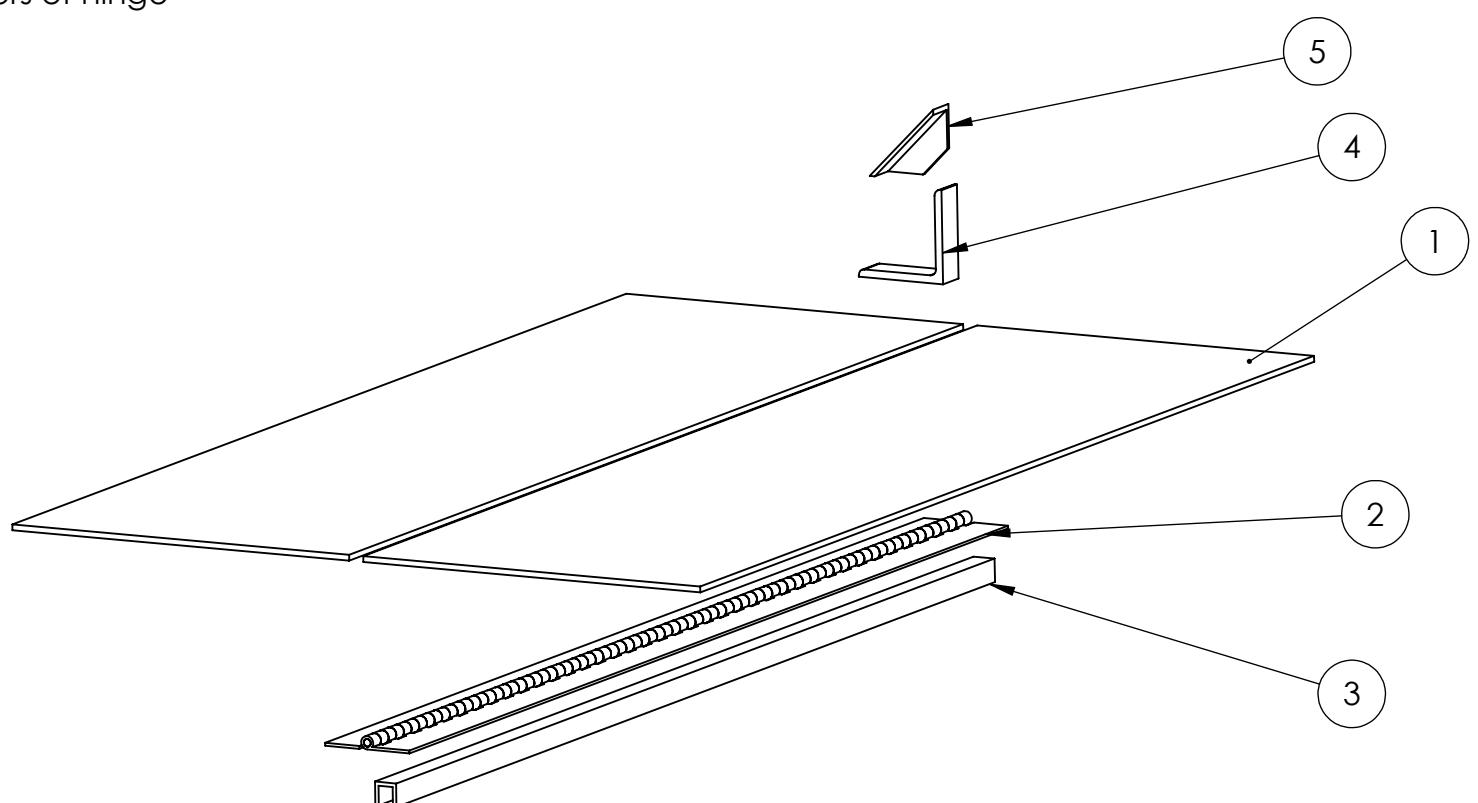
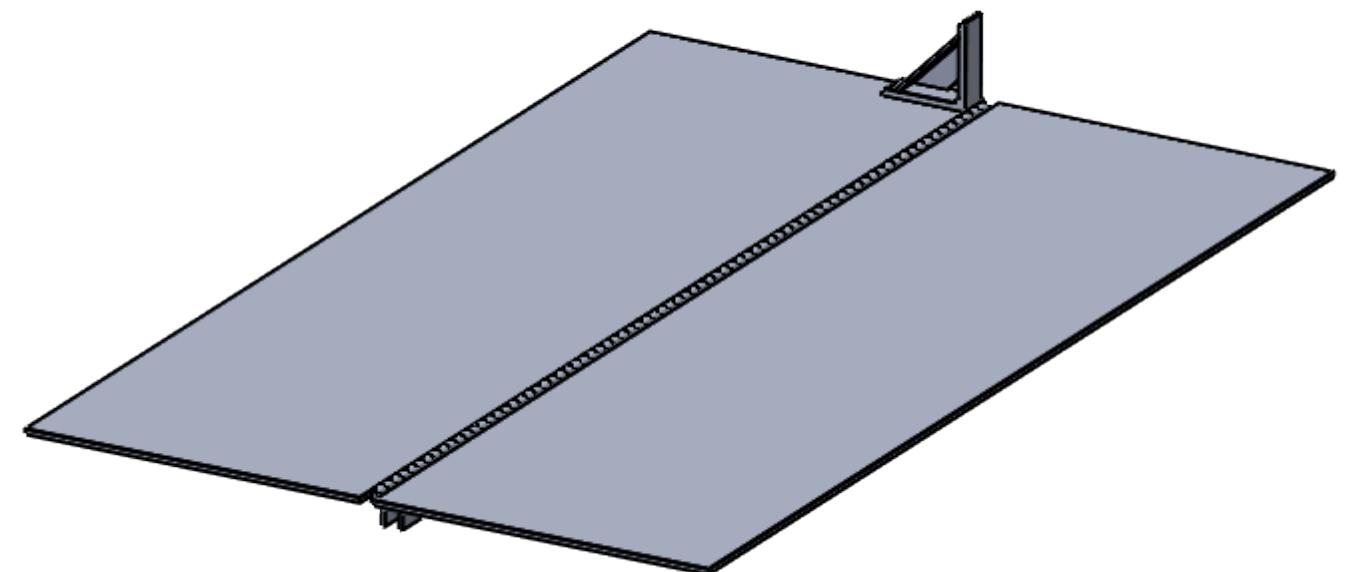
1/4V 1-12

1/4V 3/4-12

welds should be centered on fingers of hinge



B



A

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	FE-00014-01	3/16" 3003 Aluminum Diamond Plate	2
2	FE-00014-02	3" Aluminum Hinge, 1/4" Pin	1
3	FE-00014-03	3/4" x 3/4" x 1/8" 6061-T6 Aluminum 'U' Channel	1
4	FE-00014-04	3" x 3" x 1/4" 6061-T6 Aluminum Angle	1
5	FE-00014-05	1" x 1" x 1/8" 6061-T6 Aluminum Angle	1

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		TOLERANCES	CHECKED		
		FRACTIONAL: $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$	ENG APPR.		
			MFG APPR.		
			Q.A.		
			COMMENTS:		
NEXT ASSY	USED ON	FINISH			
APPLICATION	DO NOT SCALE DRAWING				

FIRST[®] ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Field Entry Ramp

SIZE DWG. NO. REV.
C FE-00014 B

SCALE: 1:6 WEIGHT: SHEET 1 OF 2

4

3

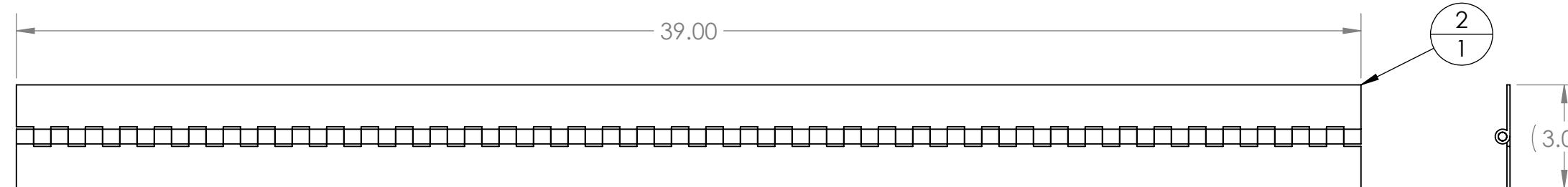
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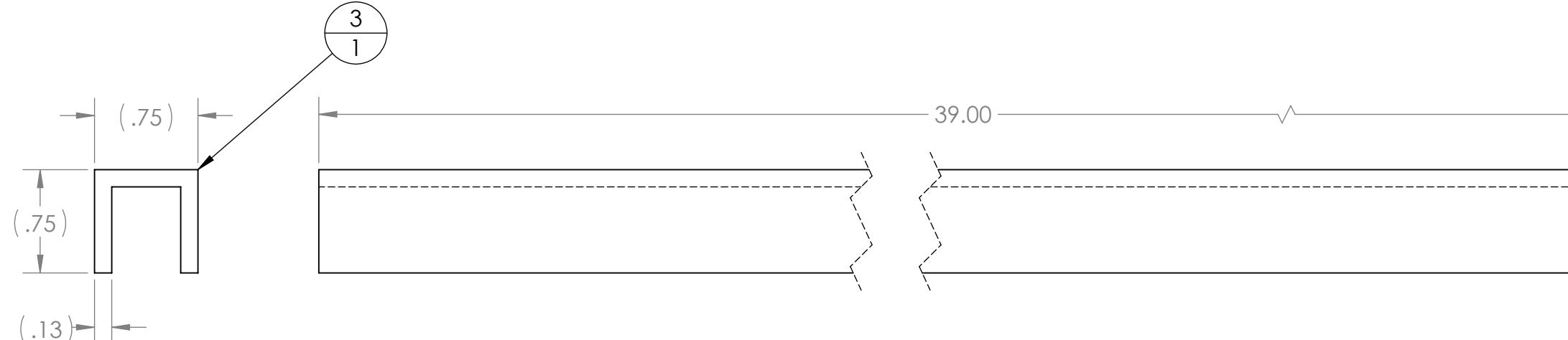
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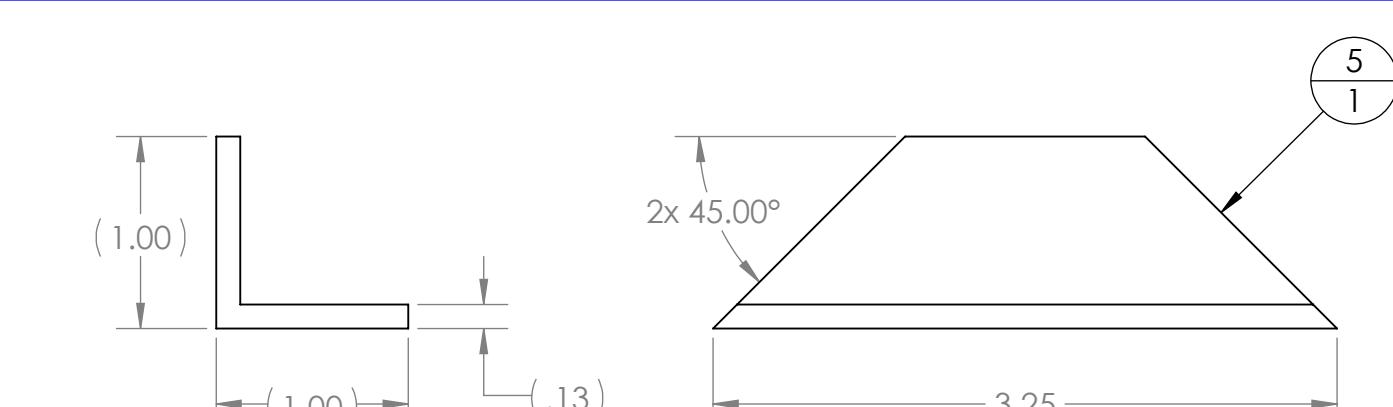
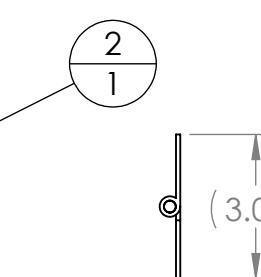
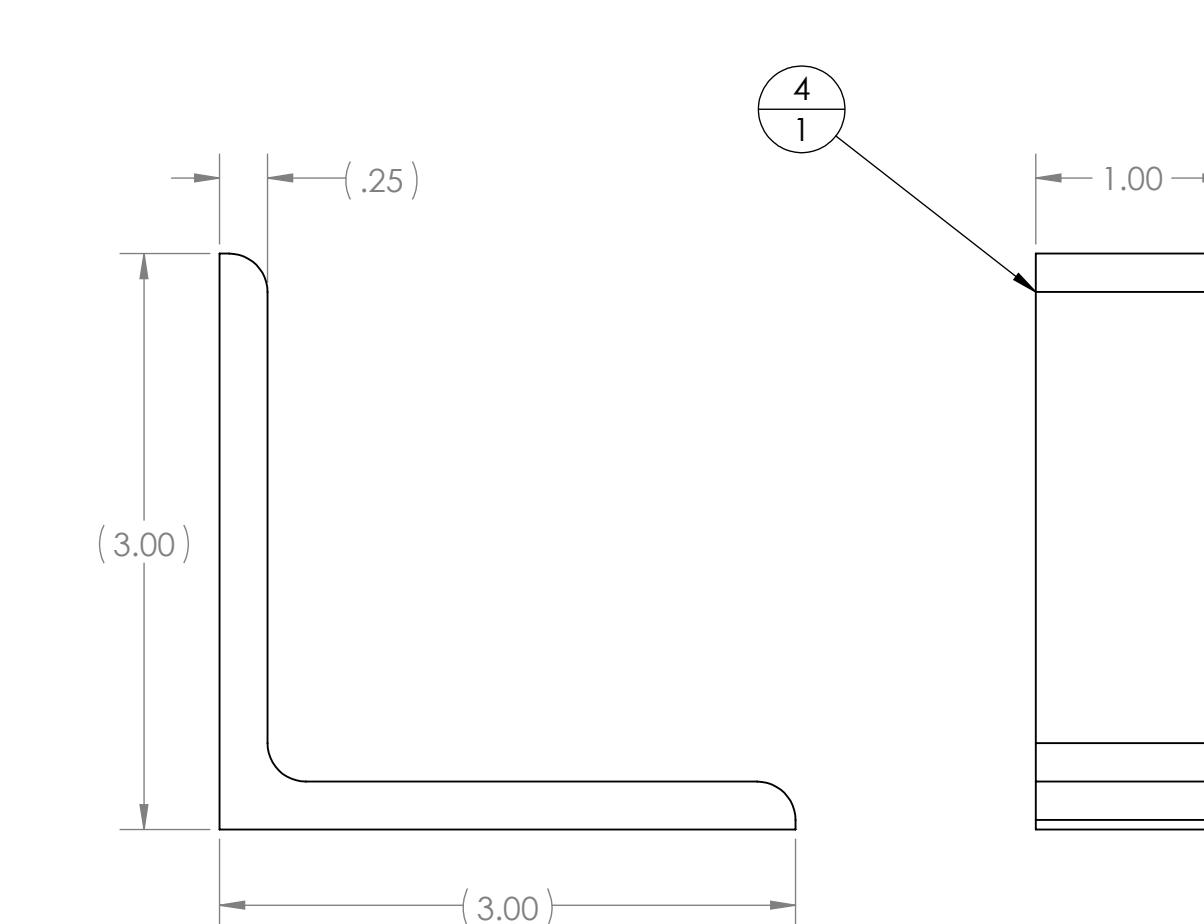
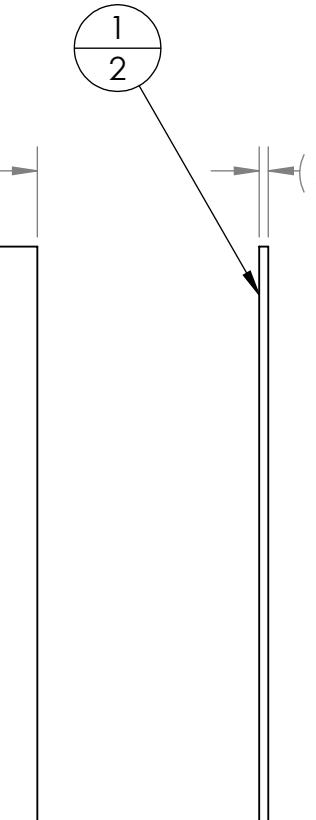
C



B



A



Note: Remove all sharp edges.

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		UNLESS OTHERWISE SPECIFIED:		DRAWN	NAME	DATE			
		DIMENSIONS ARE IN INCHES							
		TOLERANCES							
		FRACTIONAL: $\pm 1/16$							
		ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$							
		TWO PLACE DECIMAL: $\pm .01$							
		THREE PLACE DECIMAL: $\pm .001$							
INTERPRET GEOMETRIC TOLERANCING PER:		MATERIAL							
NEXT ASSY		FINISH							
APPLICATION		DO NOT SCALE DRAWING							

FIRST[®] ROBOTICS COMPETITION SOLIDWORKS
Modeling Solutions Partner

TITLE: Field Entry Ramp

SIZE DWG. NO. REV
C FE-00014 **B**

WEIGHT: SHEET 2 OF 2

4

3

2

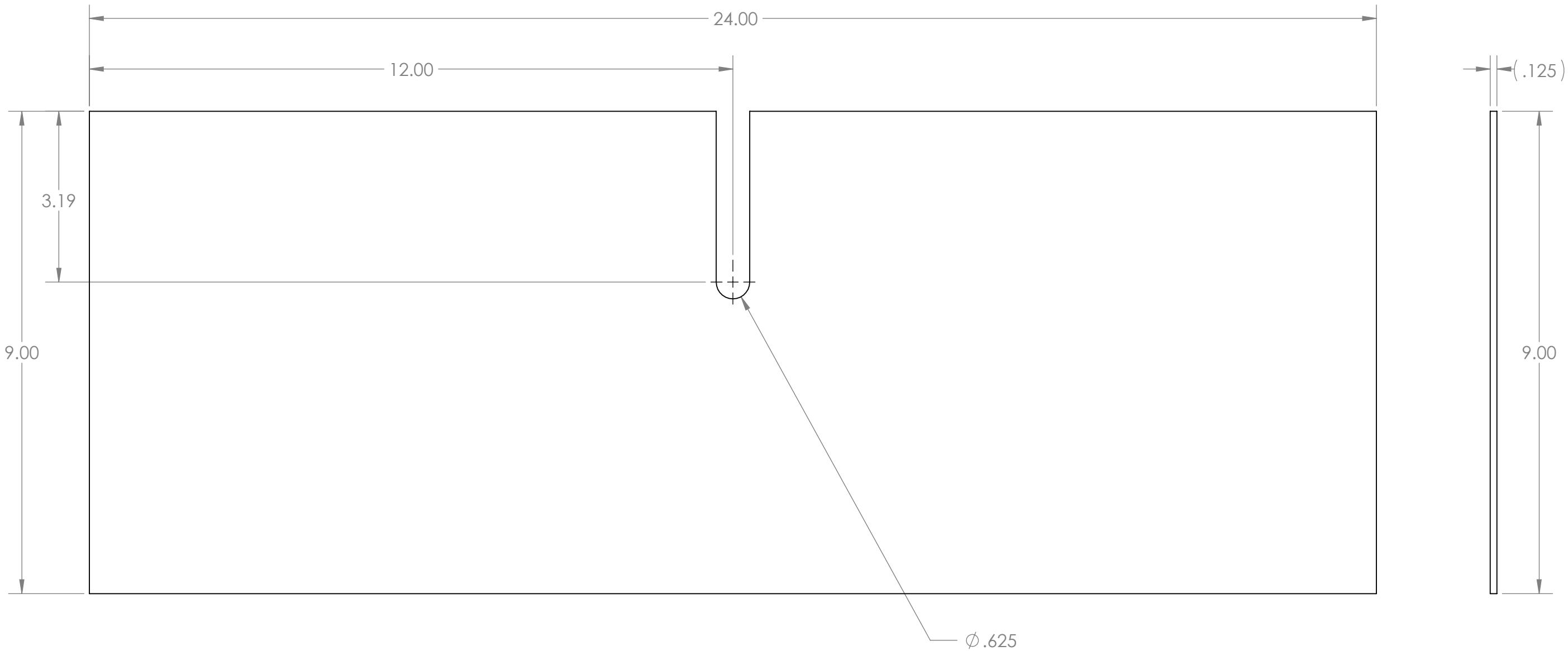
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4

3

2

1



Notes:

1. Material: 1/8" Thick HDPE, Yellow.
2. Remove all sharp edges.

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		DIMENSIONS ARE IN INCHES				
		TOLERANCES:				
		FRACTIONAL $\pm 1/16$				
		ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$				
		TWO PLACE DECIMAL $\pm .01$				
		THREE PLACE DECIMAL $\pm .001$				
		INTERPRET GEOMETRIC TOLERANCING PER:				
		MATERIAL				
NEXT ASSY		FINISH				
		APPLICATION				
		DO NOT SCALE DRAWING				
SIZE	DWG. NO.				REV	
B	FE-00015					
SCALE: 1:2	WEIGHT:	SHEET 1 OF 1				

4

3

2

1

B

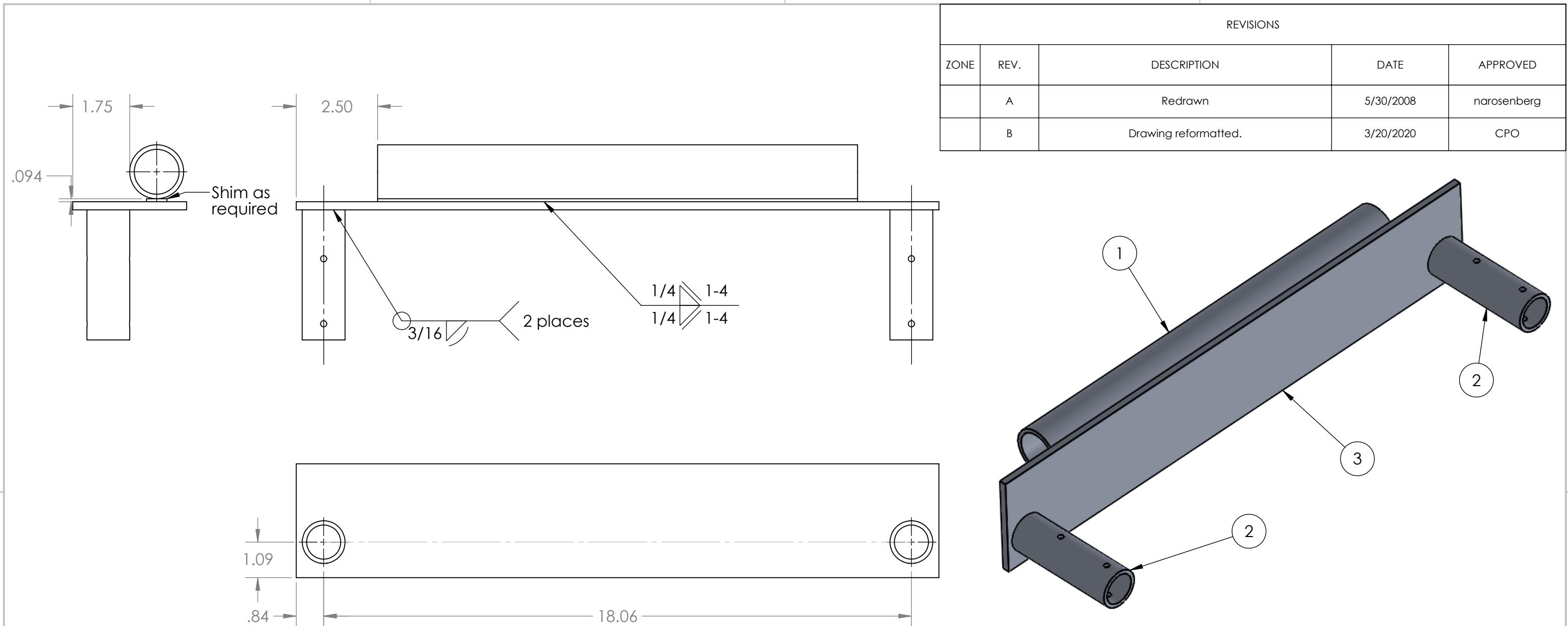
A

4

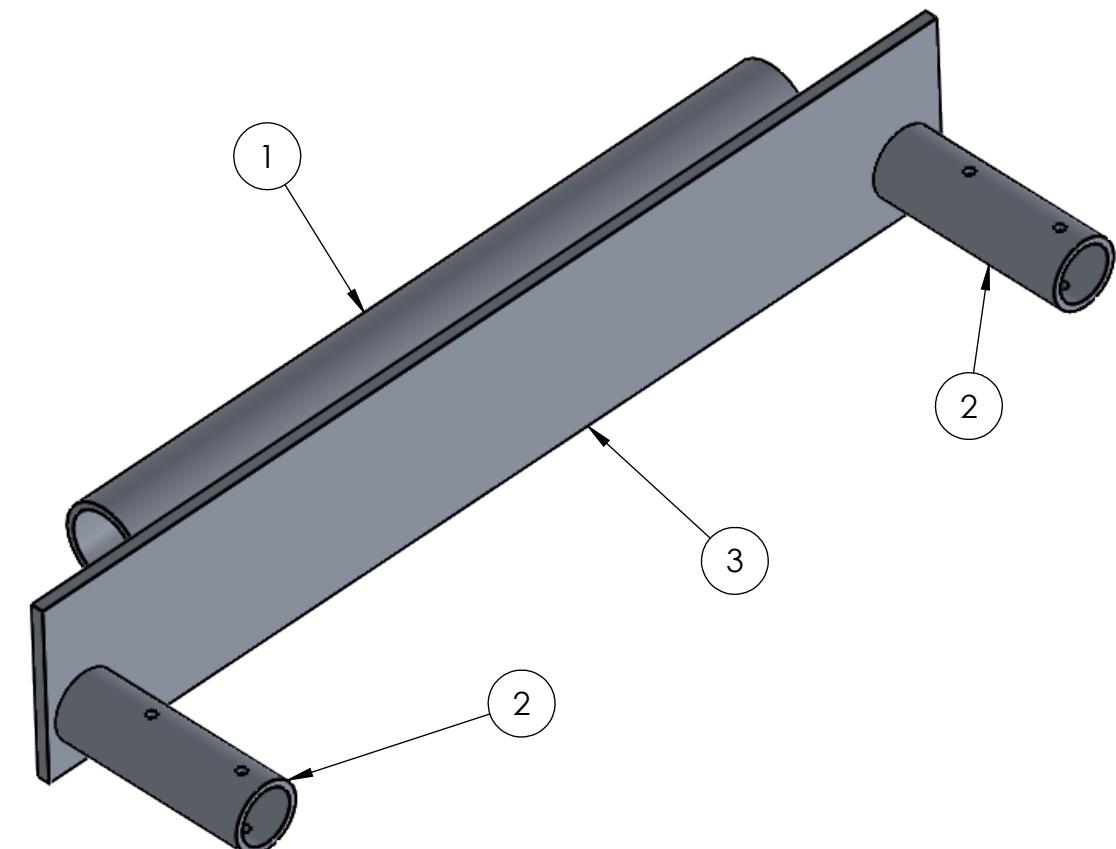
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2

1



REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A	Redrawn	5/30/2008	narosenberg
	B	Drawing reformatted.	3/20/2020	CPO



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	FE-00018-01	1 1/4" Schedule 40 6061-T6 Aluminum Pipe	1
2	FE-00018-02	1" Schedule 40 6061-T6 Aluminum Pipe	2
3	FE-00018-03	3 1/2" x 1/4" 6061-T6 Aluminum Bar	1

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		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL: $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$, BEND $\pm 1^\circ$ TWO PLACE DECIMAL: $\pm .01$ THREE PLACE DECIMAL: $\pm .001$	NAME	DATE
		DRAWN		
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
		MATERIAL		
		FINISH		
		APPLICATION	DO NOT SCALE DRAWING	

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Corner Connector

SIZE DWG. NO. REV
B FE-00018 **B**

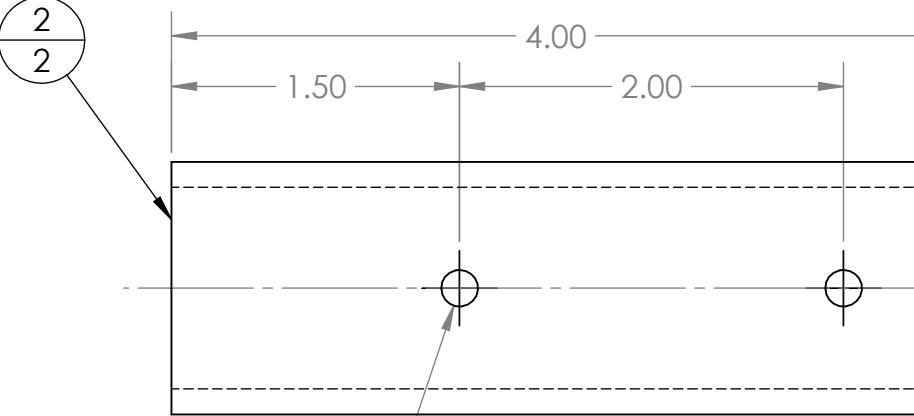
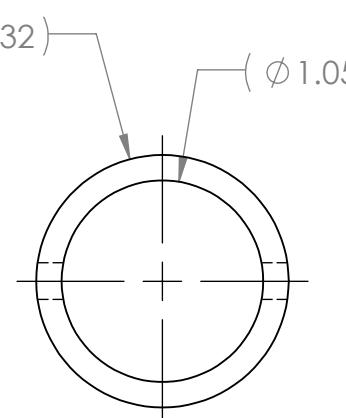
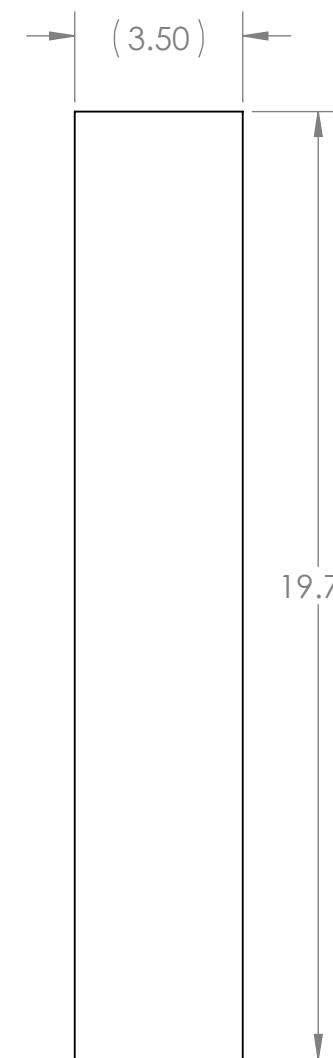
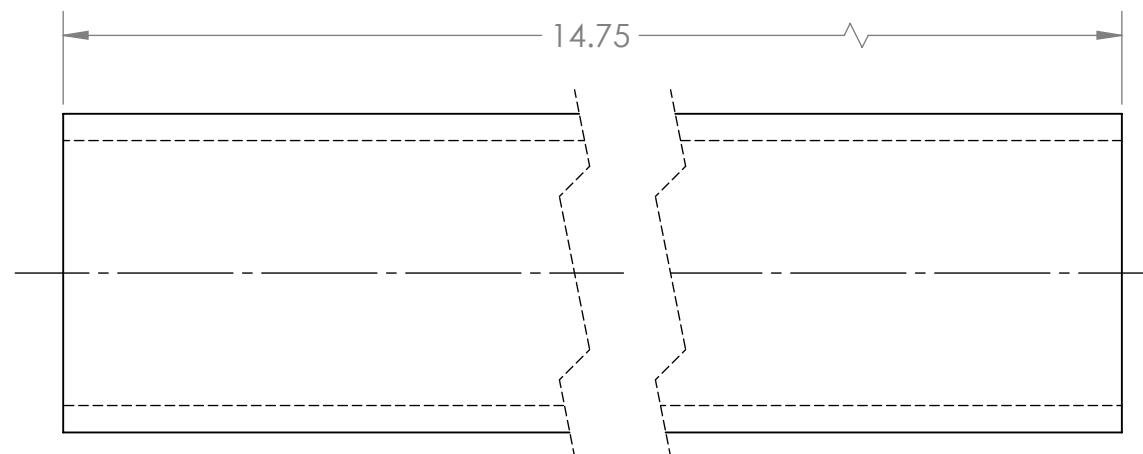
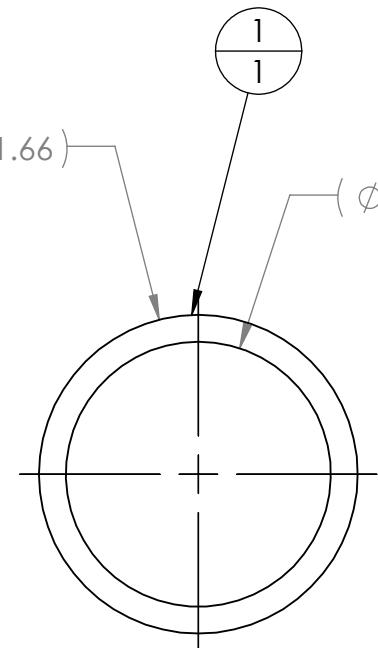
SCALE: 1:3 WEIGHT: SHEET 1 OF 2

4

3

2

1



2x ϕ .191 THRU
#11 Drill

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		UNLESS OTHERWISE SPECIFIED:			TITLE: Corner Connector	
		DIMENSIONS ARE IN INCHES				
		TOLERANCES:				
		FRACTIONAL: $\pm 1/16$				
		ANGULAR: MACH $\pm 1^\circ$, BEND $\pm 1^\circ$				
		TWO PLACE DECIMAL $\pm .01$				
		THREE PLACE DECIMAL $\pm .001$				
		INTERPRET GEOMETRIC TOLERANCING PER:				
		ENG APPR.				
		MFG APPR.				
		Q.A.				
		COMMENTS:				
NEXT ASSY		MATERIAL				
USED ON		FINISH				
APPLICATION		DO NOT SCALE DRAWING				
B		FE-00018			REV B	
					WEIGHT: SHEET 2 OF 2	

4

3

2

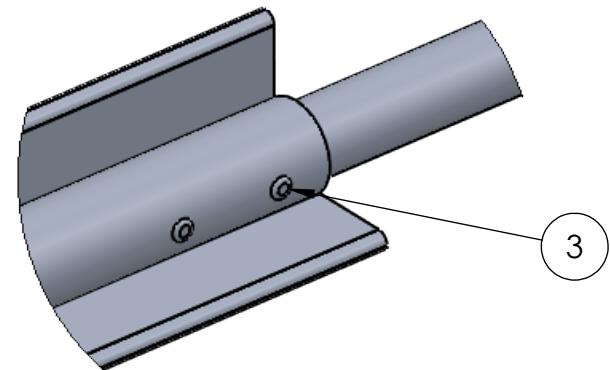
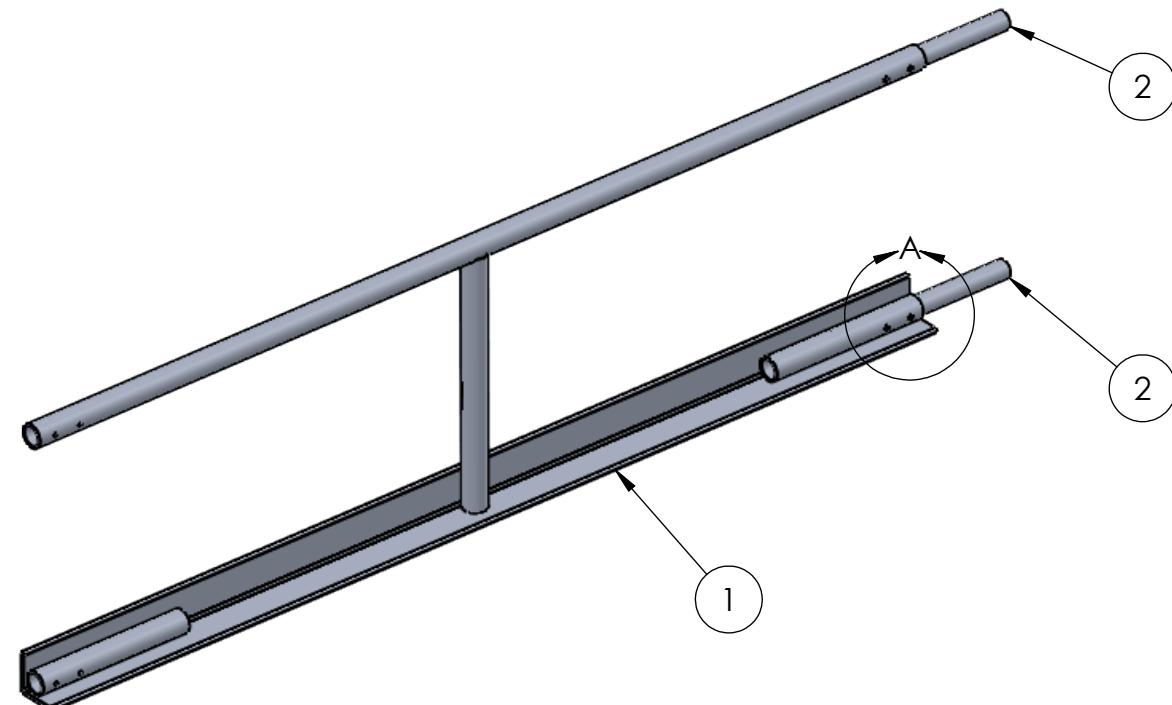
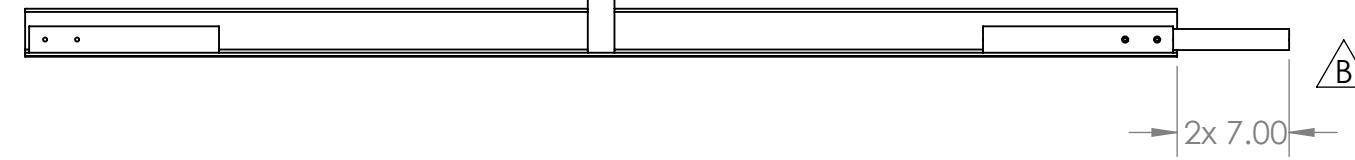
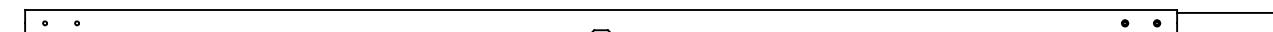
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4

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1



DETAIL A
SCALE 1 : 3

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	FE-00005	Field Rail	1
2	FE-00026	Connector Pin	2
3	rivet_.1875_.251-.375	3/16" Aluminum Rivet, .251-.375 Grip Range	4

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REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
B2	B	Connector Pin moved so both are on same side of assembly	3/15/2018	CPO
A4	C	Rivet description and part number changed to add more detail.	3/20/2020	CPO

		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL: ±1/16 ANGULAR: MACH ±1° BEND ±1° TWO PLACE DECIMAL: ±.01 THREE PLACE DECIMAL: ±.001	DRAWN	NAME	DATE
			CHECKED		
			ENG APPR.		
			MFG APPR.		
			Q.A.		
			COMMENTS:		
			MATERIAL		
			FINISH		
			APPLICATION	DO NOT SCALE DRAWING	
SIZE	DWG. NO.		REV		
B	FE-00022		C		
SCALE: 1:12	WEIGHT:		SHEET 1 OF 1		

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
**Field Rail Assy -
Mid**

SIZE DWG. NO.
B **FE-00022** REV
C

4

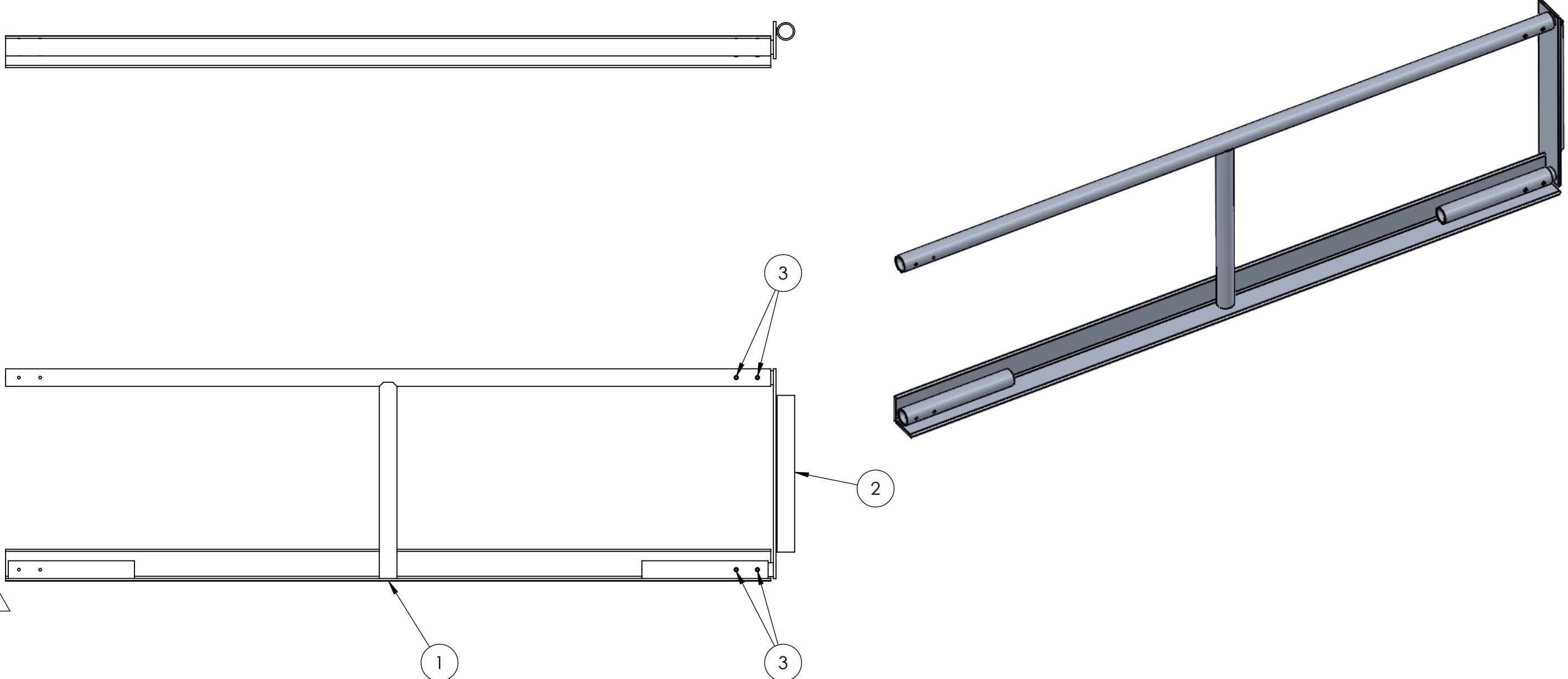
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2

1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
A4	B	Removed use of FE-00018 Connector Pin, modified rivet part numer and description.	3/20/2020	CPO



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	FE-00005	Field Rail	1
2	FE-00018	Corner Connector	1
3	rivet_.1875_.251-.375	3/16" Aluminum Rivet, .251-.375 Grip Range	4

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		UNLESS OTHERWISE SPECIFIED:		NAME	DATE
		DIMENSIONS ARE IN INCHES	DRAWN		
		TOLERANCES:	CHECKED		
		FRACTIONAL: ±1/16	ENG APPR.		
		ANGULAR: MACH ±1° BEND ±1°	MFG APPR.		
		TWO PLACE DECIMAL ±.01	Q.A.		
		THREE PLACE DECIMAL ±.001	COMMENTS:		
			MATERIAL		
			FINISH		
NEXT ASSY	USED ON				
		APPLICATION	DO NOT SCALE DRAWING		

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Field Rail Assy - Left

SIZE DWG. NO. **REV**
B **FE-00023** **B**

SCALE: 1:10 WEIGHT: SHEET 1 OF 1

4

3

2

1

4

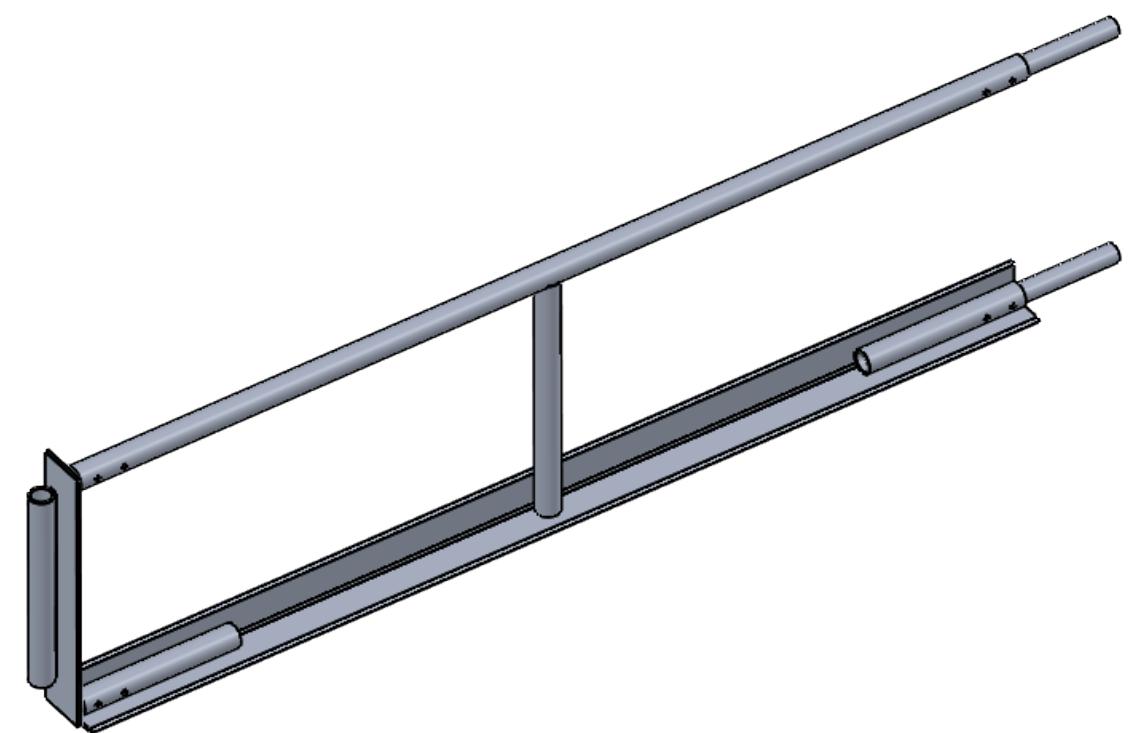
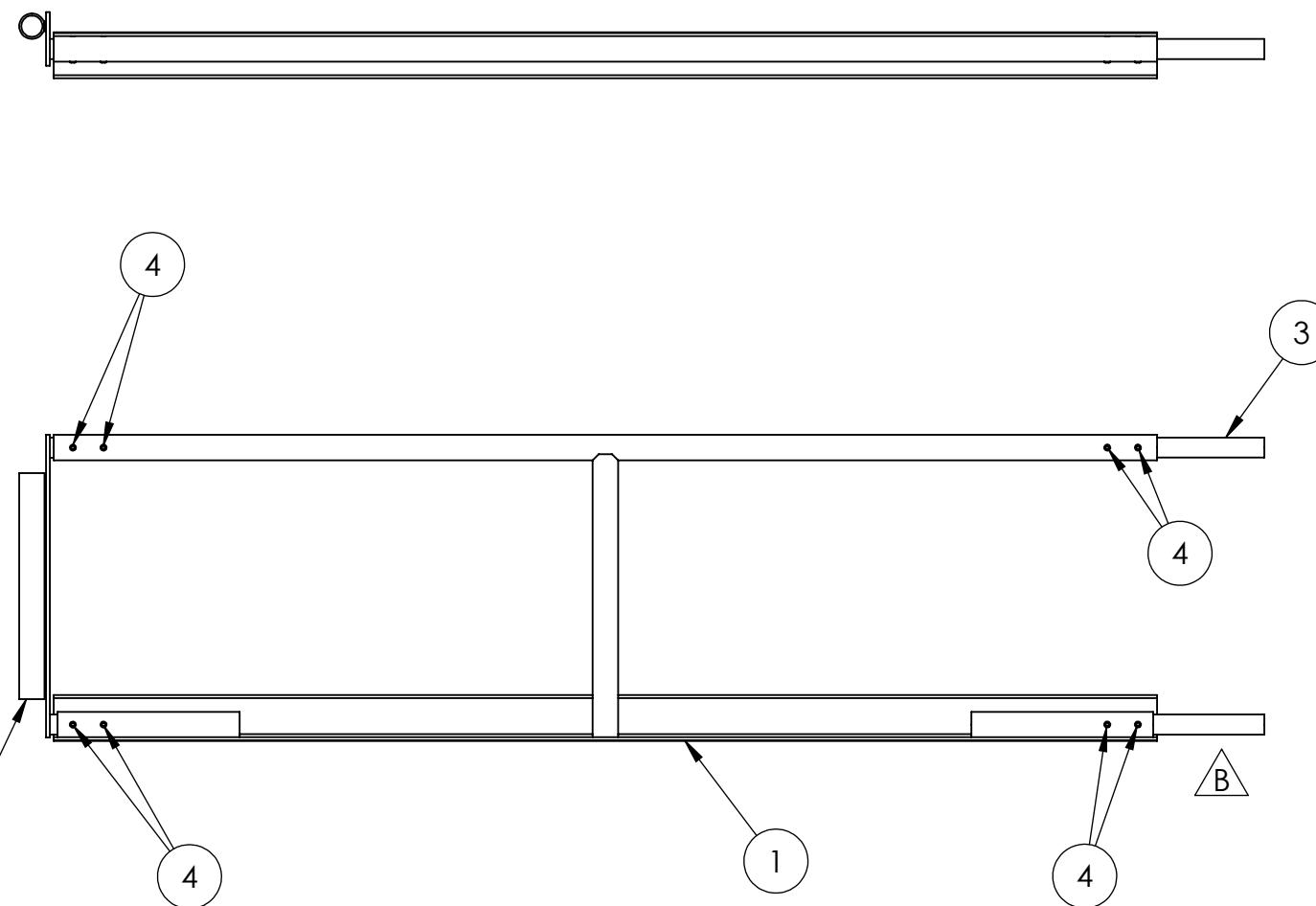
3

2

1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
A3, A4	B	Additional FE-00026 Connector Pin added to assembly, rivet part number and description modified	3/20/2020	CPO



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	FE-00005	Field Rail	1
2	FE-00018	Corner Connector	1
3	FE-00026	Connector Pin	2
4	rivet_.1875_.251-.375	3/16" Aluminum Rivet, .251-.375 Grip Range	8

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		UNLESS OTHERWISE SPECIFIED:		NAME	DATE
		DIMENSIONS ARE IN INCHES	DRAWN		
		TOLERANCES:	CHECKED		
		FRACTIONAL: ±1/16	ENG APPR.		
		ANGULAR: MACH ±1° BEND ±1°	MFG APPR.		
		TWO PLACE DECIMAL: ±.01	Q.A.		
		THREE PLACE DECIMAL: ±.001	COMMENTS:		
			MATERIAL		
			FINISH		
			APPLICATION	DO NOT SCALE DRAWING	
TITLE:		FIRST ROBOTICS COMPETITION			SOLIDWORKS Modeling Solutions Partner
Field Rail Assy - Right					
SIZE	DWG. NO.	REV			
B	FE-00024	B			
SCALE: 1:12	WEIGHT:	SHEET 1 OF 1			

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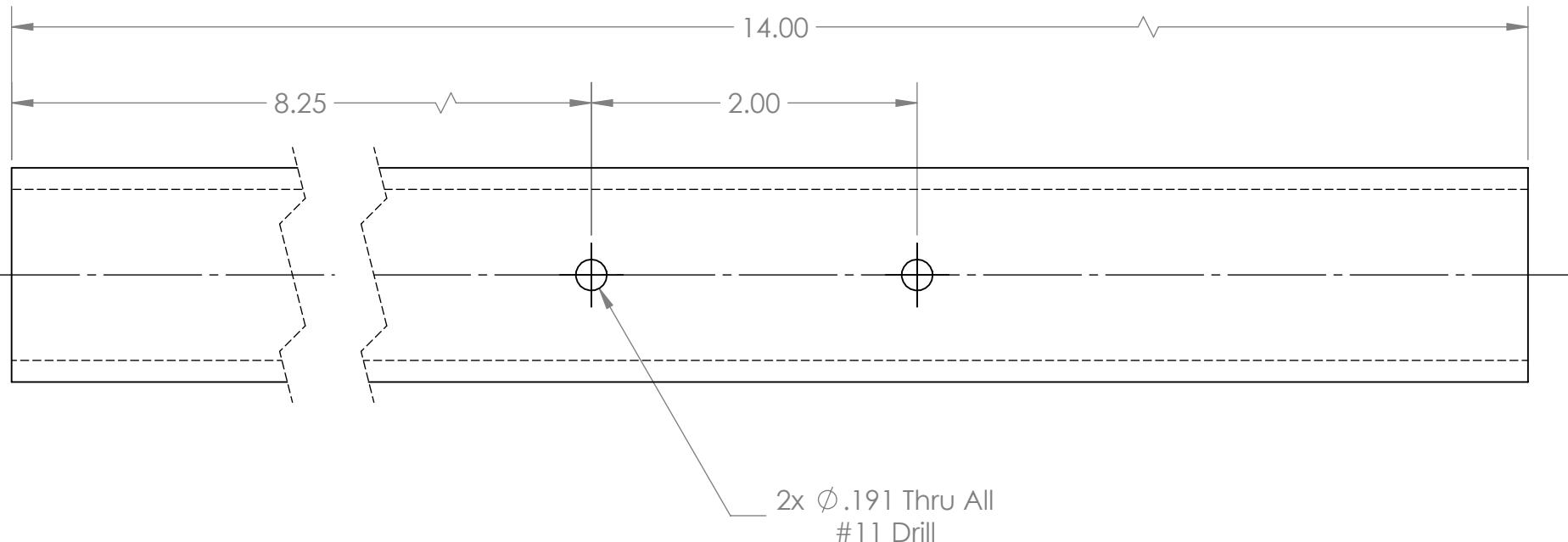
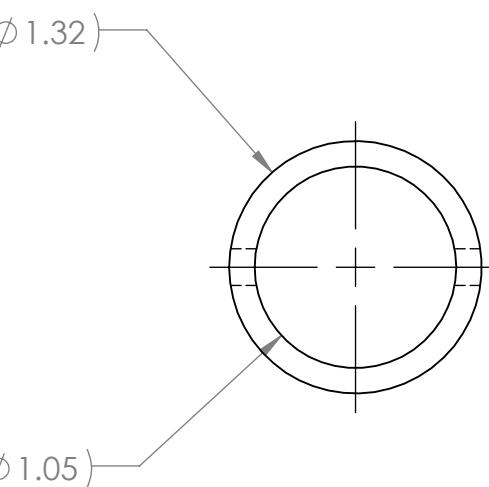
2

1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A	redrawn	6/5/2008	dfoster

B



B

Notes:

1. Material: 1" Schedule 40 Pipe, 6061-T6 Aluminum
2. Remove all sharp edges

4

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DRAWING IS THE SOLE PROPERTY OF
FIRST®. ANY REPRODUCTION IN PART
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		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$	NAME	DATE
		DRAWN		
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
NEXT ASSY	USED ON	INTERPRET GEOMETRIC TOLERANCING PER: MATERIAL		
		FINISH		
APPLICATION		DO NOT SCALE DRAWING		

**FIRST
ROBOTICS
COMPETITION** **SOLIDWORKS**
Modeling Solutions Partner

Connector Pin

B FE-00026 A

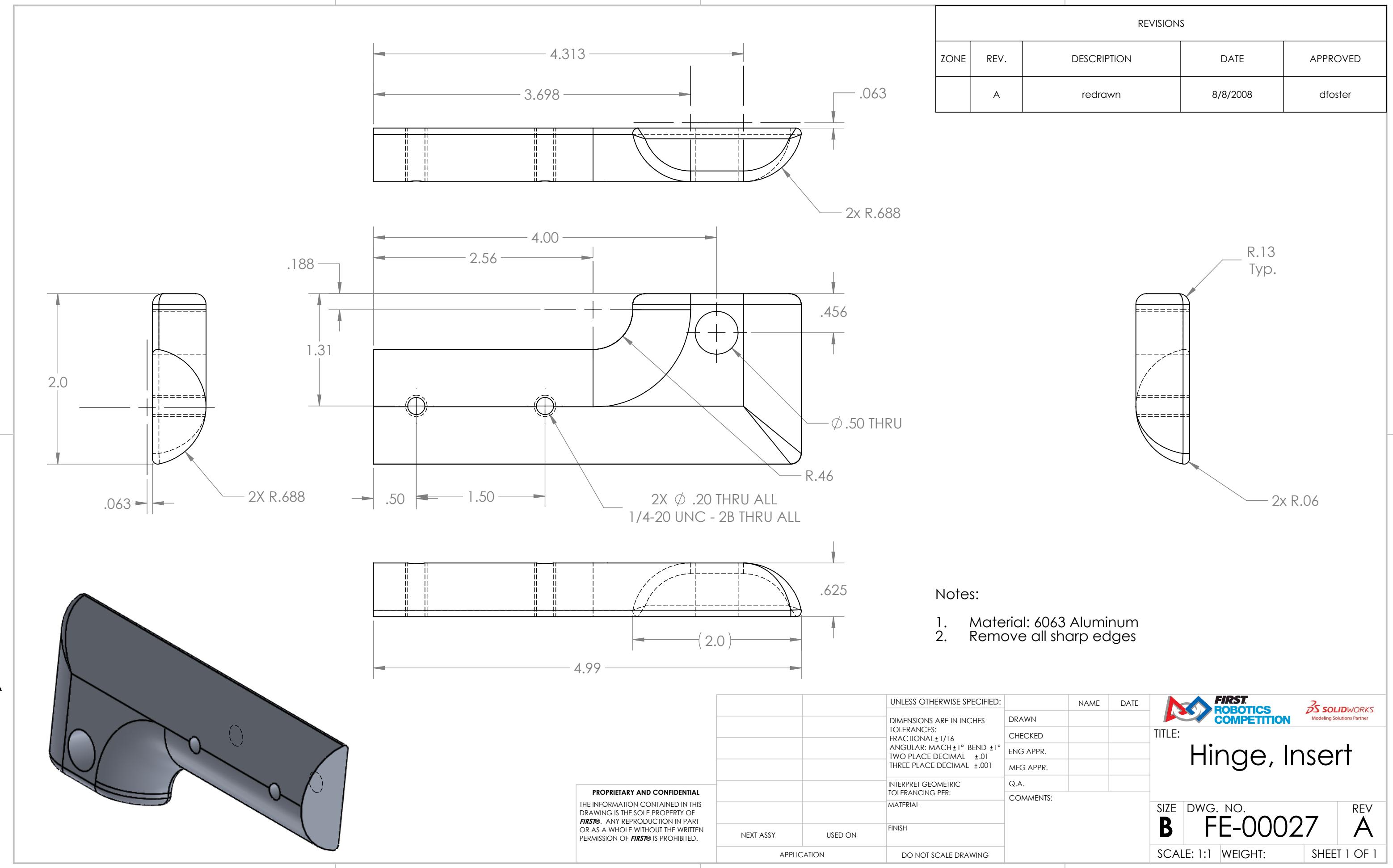
SIZE DWG. NO. REV.
SCALE: 1:1 WEIGHT: SHEET 1 OF 1

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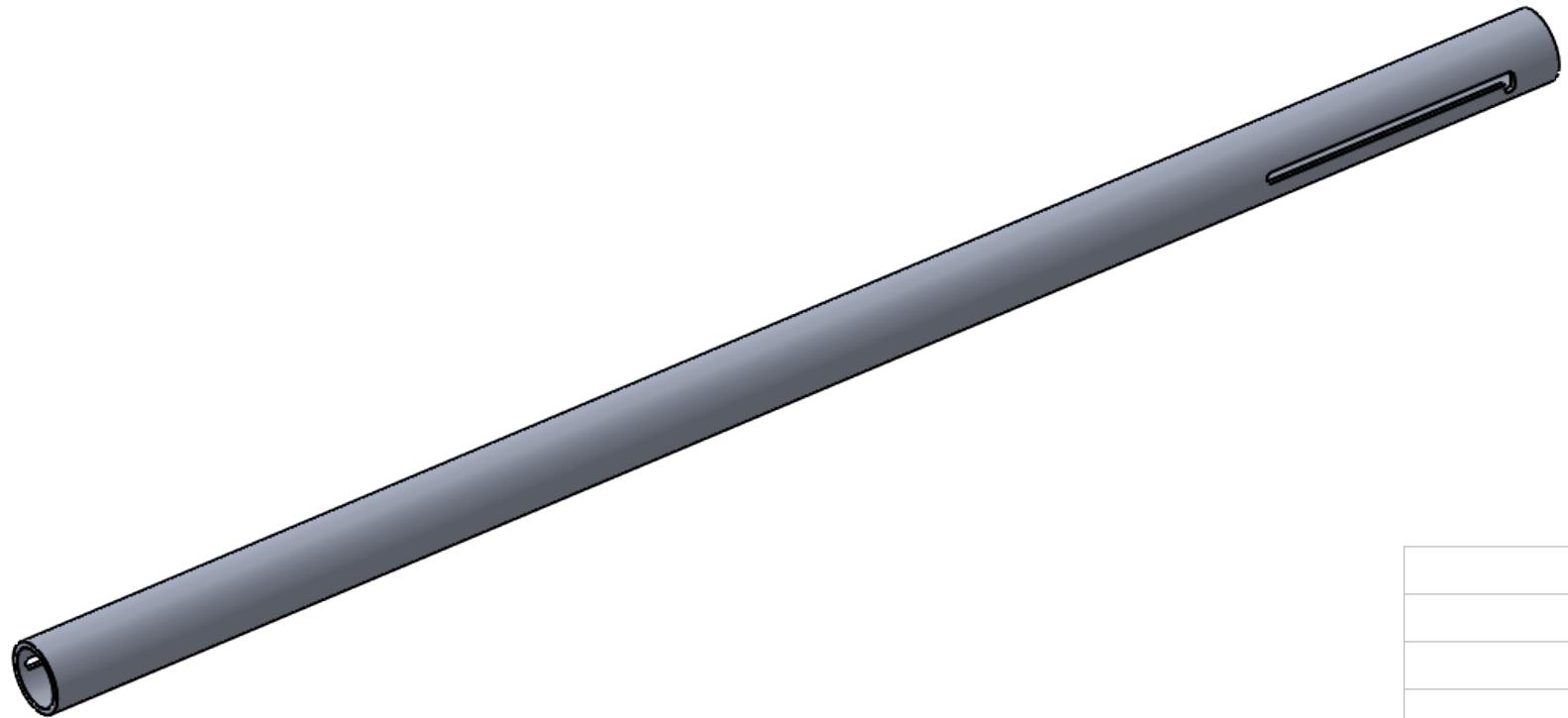
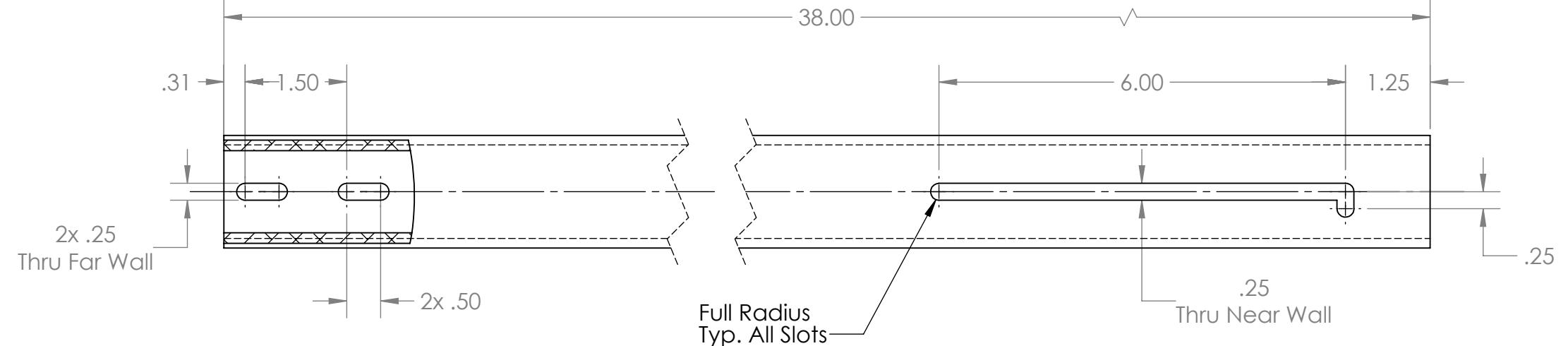
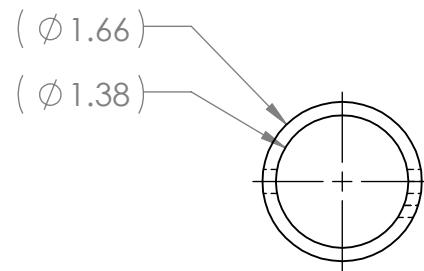
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REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A	Redrawn	8/6/2008	dfoster

B

B



Notes:

- Material: 1-1/4" Aluminum 6061-T6 Schedule 40 Pipe
- Remove all sharp edges.

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		DRAWN			
		CHECKED			
		ENG APPR.			
		MFG APPR.			
		Q.A.			
		COMMENTS:			
SIZE	DWG. NO.				REV
B	FE-00028				A
	WEIGHT:				SHEET 1 OF 1

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
Arm, Field Gate

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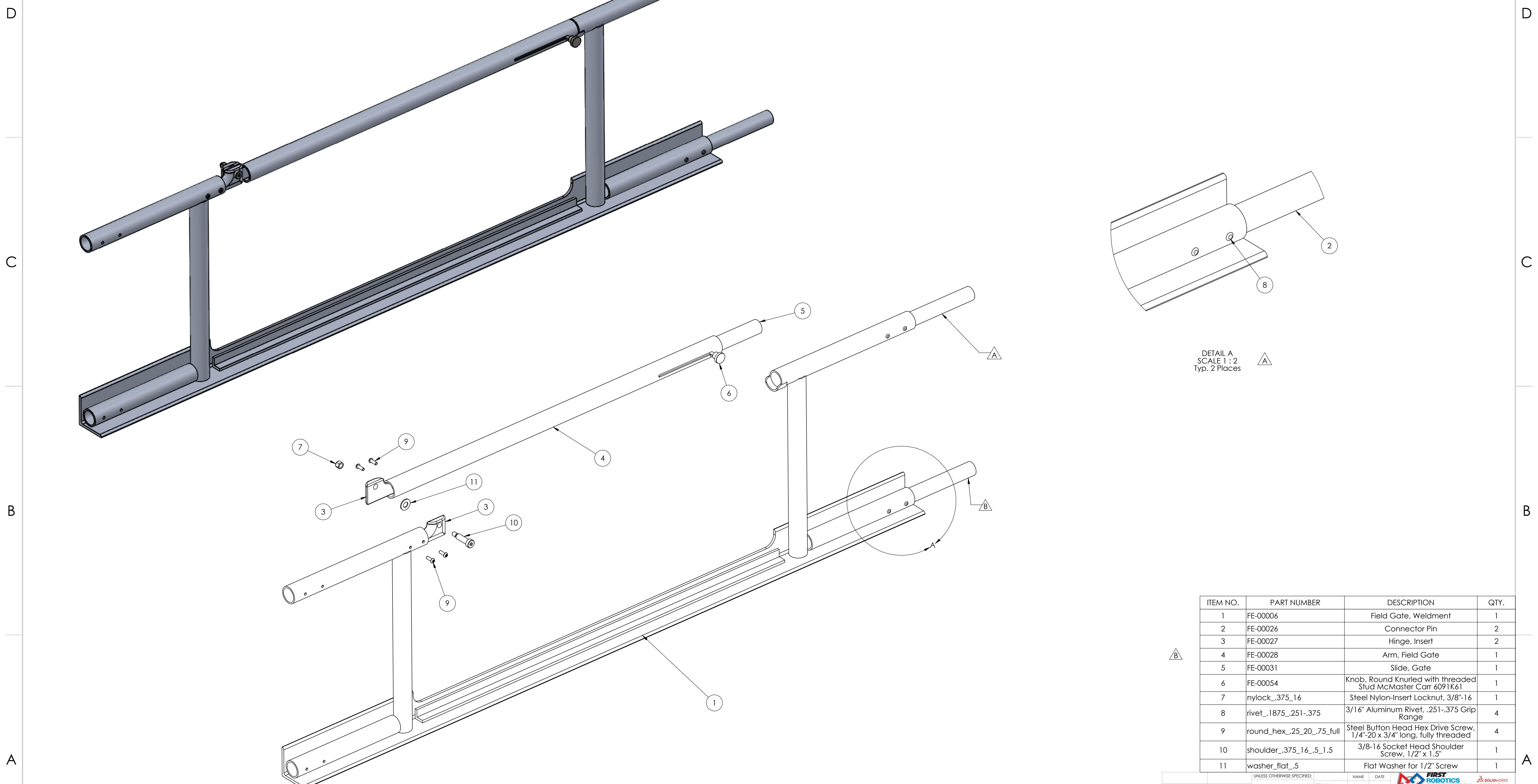
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2

1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
A7, C2, C3	A	Relocated Item 3 (x2), Relocated Detail A	1/7/2009	dfoster
A2, B3	B	Relocated Item 2, renumbered items, hardware part number and descriptions modified.	3/23/2020	CPO



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	FE-00006	Field Gate, Weldment	1
2	FE-00026	Connector Pin	2
3	FE-00027	Hinge, Insert	2
4	FE-00028	Arm, Field Gate	1
5	FE-00031	Slide, Gate	1
6	FE-00054	Knob, Round Knurled with threaded Stud McMaster Carr 6091K61	1
7	nylock_.375_16	Steel Nylon-Insert Locknut, 3/8"-16	1
8	rivet_.1875_.251-.375	3/16" Aluminum Rivet, .251-.375 Grip Range	4
9	round_hex_.25_20_.75_full	Steel Button Head Hex Drive Screw, 1/4"-20 x 3/4" long, fully threaded	4
10	shoulder_.375_16_.5_1.5	3/8-16 Socket Head Shoulder Screw, 1/2" x 1.5"	1
11	washer_flat_.5	Flat Washer for 1/2" Screw	1

NAME	DATE	
TITLE: Field Gate, Assembly		
SIZE	DWG. NO.	REV.
D	FE-00029	B
SCALE: 1:4 WEIGHT:		
SHEET 1 OF 1		

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DRAWN
CHECKED
ENG APPR.
MFG APPR.
QA.
COMMENTS:

INTERPRET GEOMETRIC
TOLERANCING PER:
MATERIAL

NEXT ASSY
USED ON
APPLICATION

FINISH
DO NOT SCALE DRAWING

8

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6

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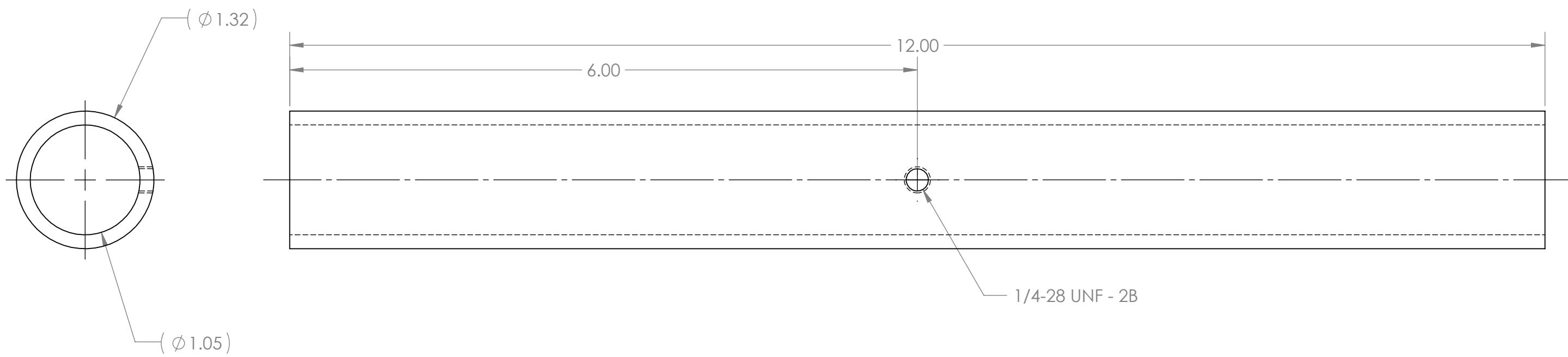
3

2

1

B

B



Notes:

1. Material: 1" Schedule 40 Aluminum 6061-T6.
2. Remove all sharp edges.

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		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$	NAME	DATE
		DRAWN		
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
		MATERIAL		
NEXT ASSY	USED ON	FINISH		
APPLICATION		DO NOT SCALE DRAWING		

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Slide, Gate

SIZE DWG. NO. **B** FE-00031 **REV**

SCALE: 1:1 WEIGHT: SHEET 1 OF 1

4

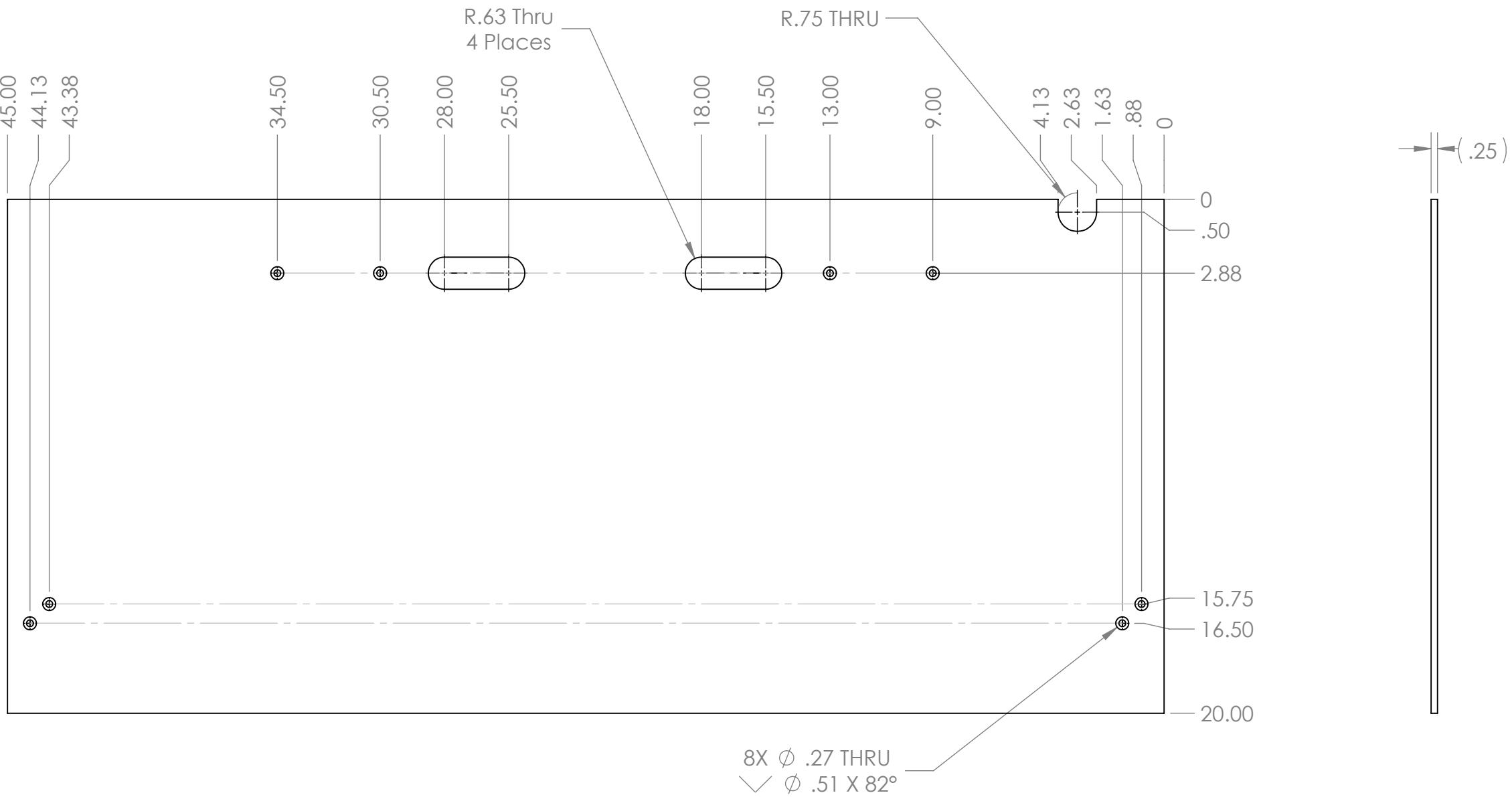
3

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1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A	Added counter sinks, hand holes and a notch	9/23/14	MLC



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		DRAWN		
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
		MATERIAL		
		FINISH		
NEXT ASSY	USED ON			
APPLICATION	DO NOT SCALE DRAWING			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE: Field Plastic "G"

SIZE DWG. NO. REV
B FE-00044 **A**

SCALE: 1:5 WEIGHT: SHEET 1 OF 1

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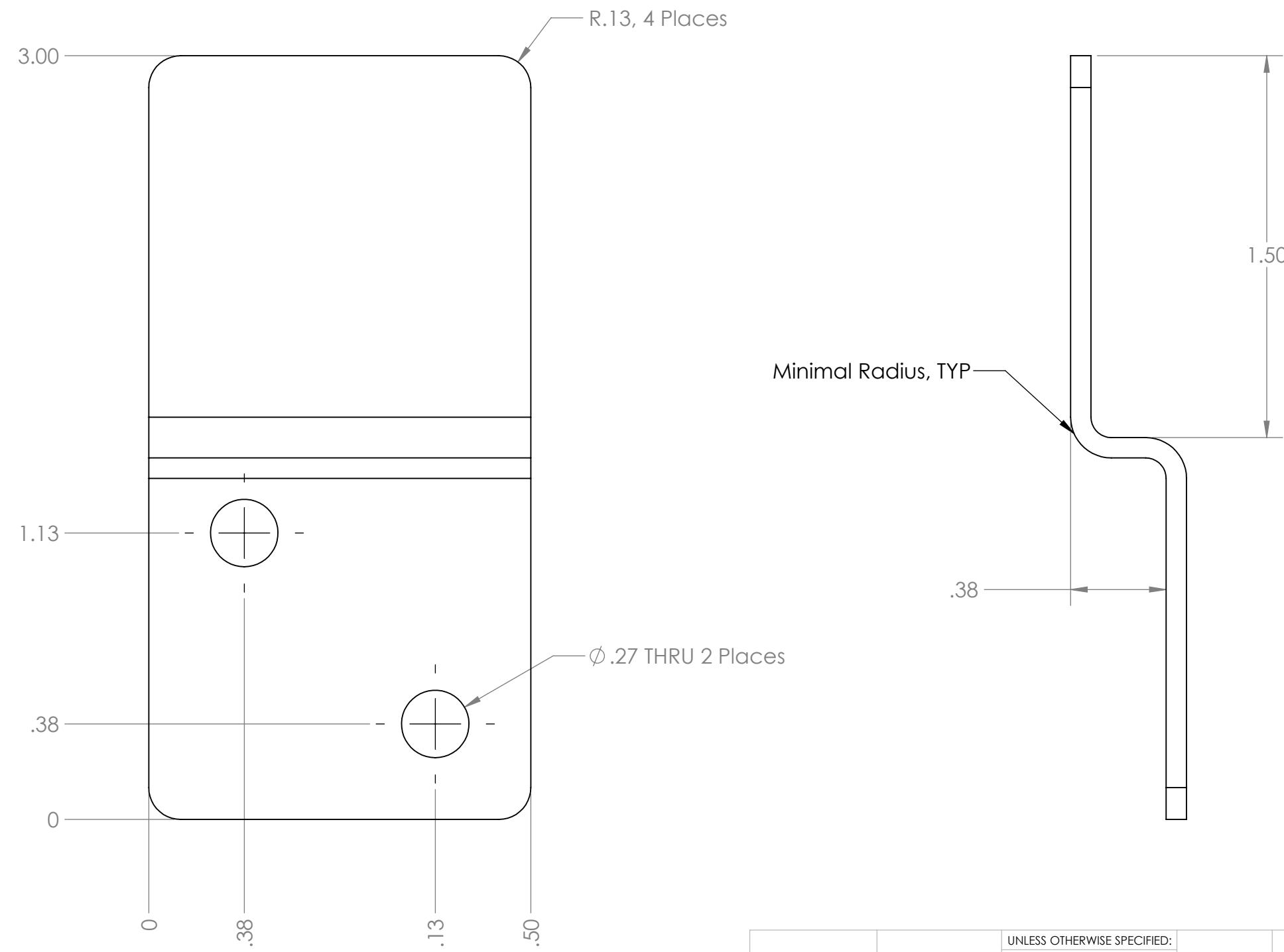
3

2

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B

B



- Notes:
1. 12 Gauge 5052 Aluminum
 2. Remove all burrs and sharp edges

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		UNLESS OTHERWISE SPECIFIED:		NAME	DATE
		DIMENSIONS ARE IN INCHES			
		TOLERANCES:			
		FRACTIONAL: ±1/16			
		ANGULAR: MACH ±1° BEND ±1°			
		TWO PLACE DECIMAL: ±.01			
		THREE PLACE DECIMAL: ±.001			
		INTERPRET GEOMETRIC TOLERANCING PER:			
		MATERIAL			
NEXT ASSY	USED ON	FINISH			
APPLICATION		DO NOT SCALE DRAWING	COMMENTS:		
SCALE: 2:1		WEIGHT:		SHEET 1 OF 1	REV
B		FE-00045			



SOLIDWORKS
Modeling Solutions Partner

TITLE:
**Lower Z-Bracket,
Gate Plastic**

4

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1

4

3

2

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B

B

3.50

.75

0

0

1.00

5.00

6.00

R.13, 4 Places

 $\phi .27$ THRU 2 Places

1.75

1.75

Minimal
Radius
TYP

Notes:

1. 12 Gauge 5052 Aluminum
2. Remove all burrs and sharp edges

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		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$	NAME	DATE
		DRAWN		
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
		MATERIAL		
		FINISH		
NEXT ASSY	USED ON	APPLICATION	DO NOT SCALE DRAWING	
SIZE		DWG. NO.	REV	
B		FE-00046		
SCALE: 1:1		WEIGHT:	SHEET 1 OF 1	


SOLIDWORKS
 Modeling Solutions Partner

Upper Z-Bracket, Gate Plastic

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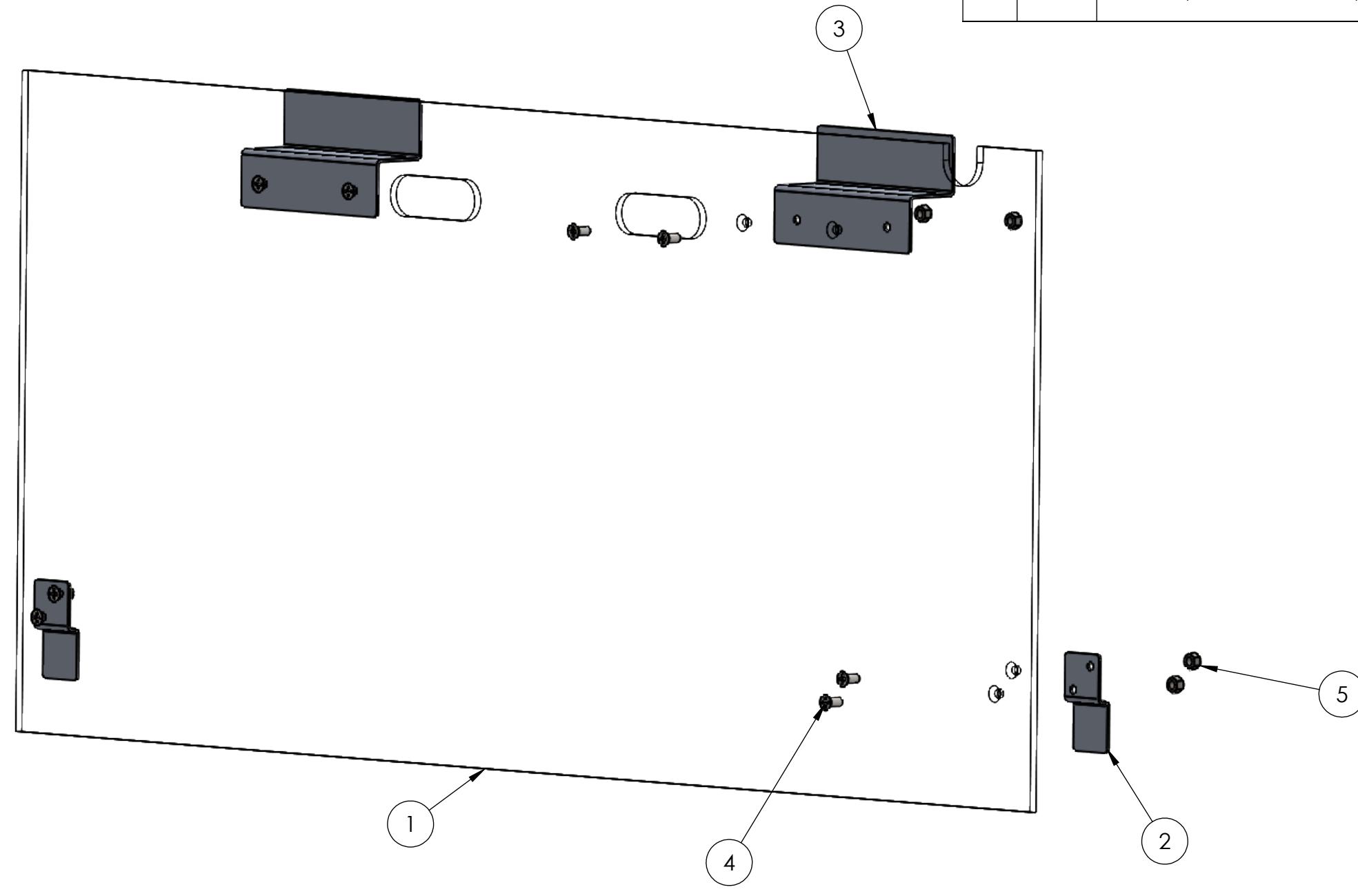
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2

1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
A4	A	Fastener part number and descriptions modified.	3/23/2020	CPO



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	FE-00044	Field Plastic "G"	1
2	FE-00045	Lower Z-Bracket, Gate Plastic	2
3	FE-00046	Upper Z-Bracket, Gate Plastic	2
4	flat_phil_.25_20_.625	Steel Phillips Flat Head Screw, 1/4"x20 x 5/8" long, fully threaded	8
5	nylock_.25_20	Steel Nylon-Insert Locknut, 1/4"-20	8

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		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL: ±1/16 ANGULAR: MACH ±1° BEND ±1° TWO PLACE DECIMAL: ±.01 THREE PLACE DECIMAL: ±.001	NAME	DATE
		DRAWN		
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
		MATERIAL		
		FINISH		
NEXT ASSY	USED ON	APPLICATION	DO NOT SCALE DRAWING	
SCALE: 1:4 WEIGHT: SHEET 1 OF 1				

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Gate Plastic Assembly

B **FE-00047** **A**

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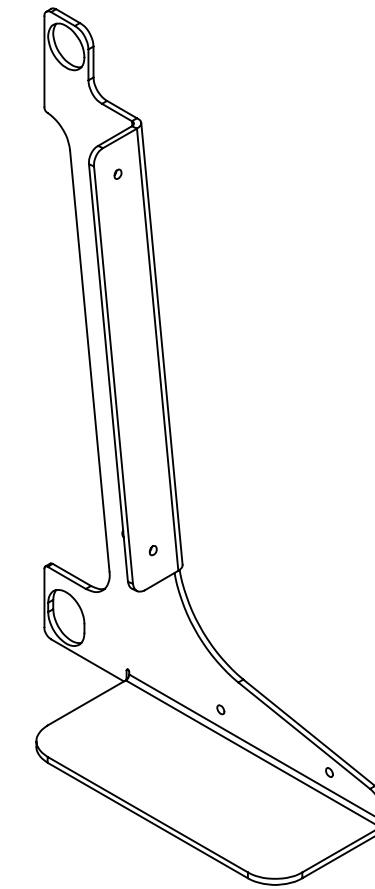
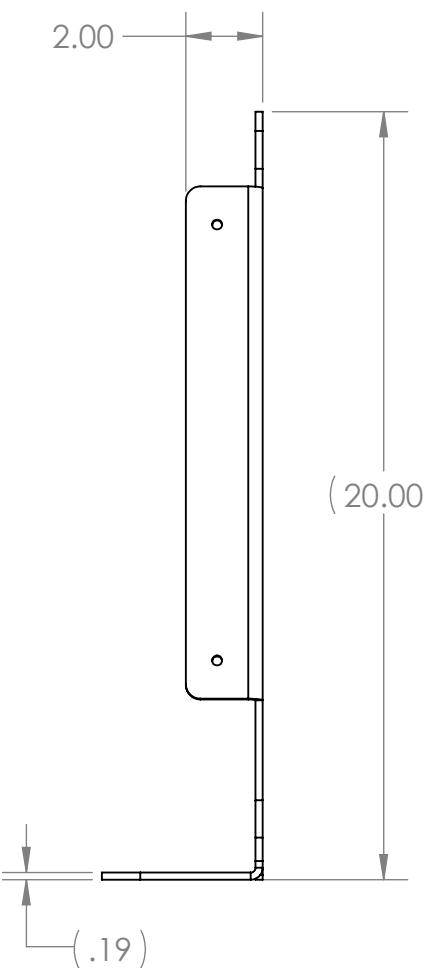
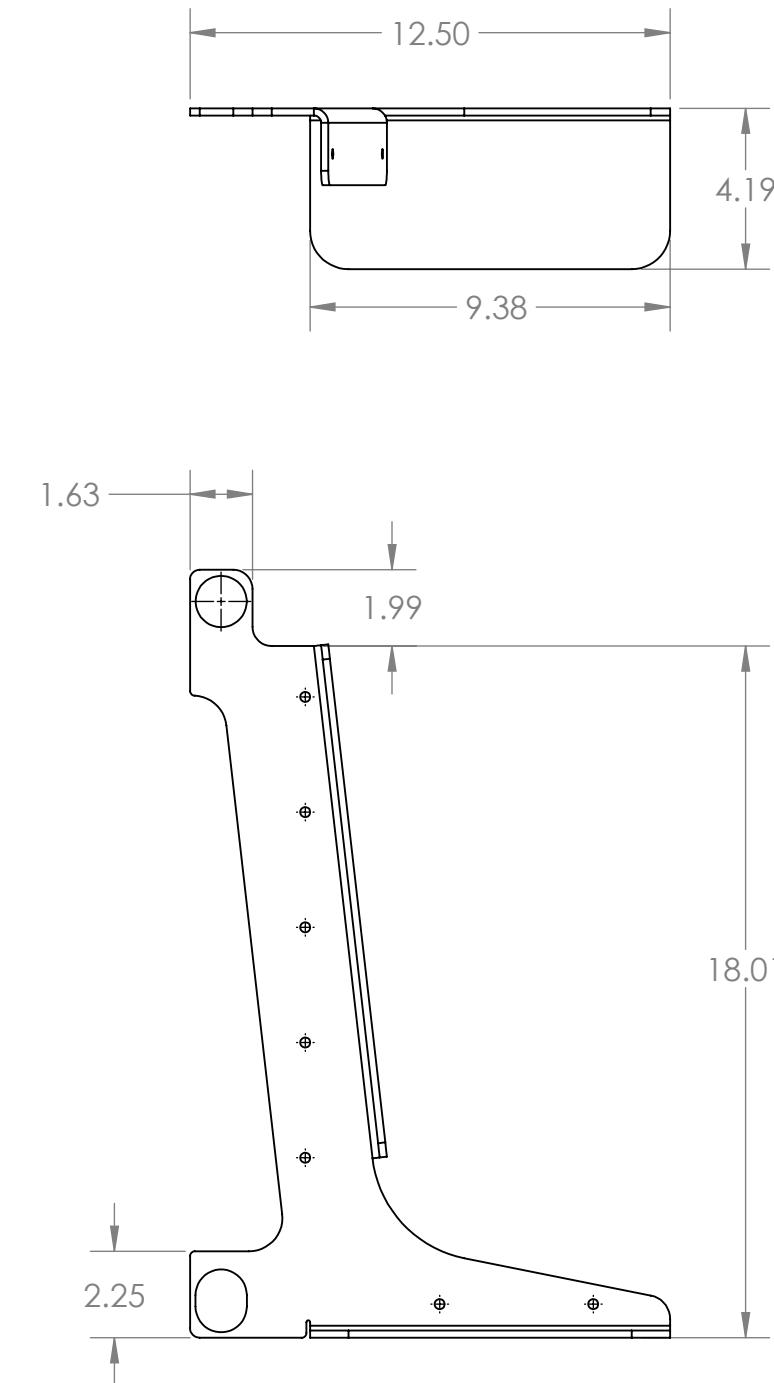
4

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B



Note:

Material: 5052 Aluminum Sheet, 3/16" Thick

This drawing represents overall dimensions for AndyMark AM-2810. Please see the AndyMark website for more details regarding part dimensions.

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		DRAWN			
		CHECKED			
		ENG APPR.			
		MFG APPR.			
		Q.A.			
		COMMENTS:			
SIZE	DWG. NO.				REV
B	FE-00050				
SCALE: 1:5	WEIGHT:				SHEET 1 OF 1

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner
Title: Outrigger
Size: DWG. NO. **B** FE-00050 **Rev:**
Scale: 1:5 **Weight:** **Sheet 1 of 1**

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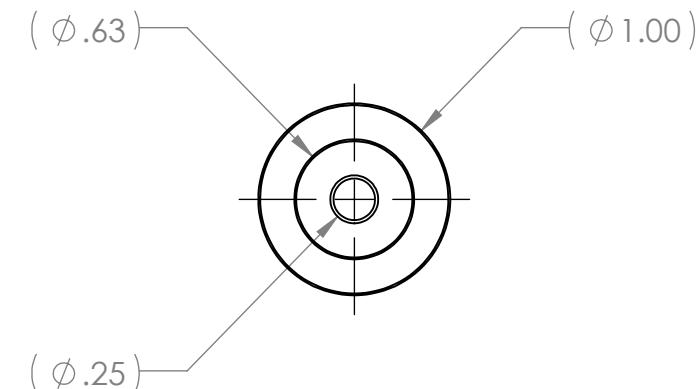
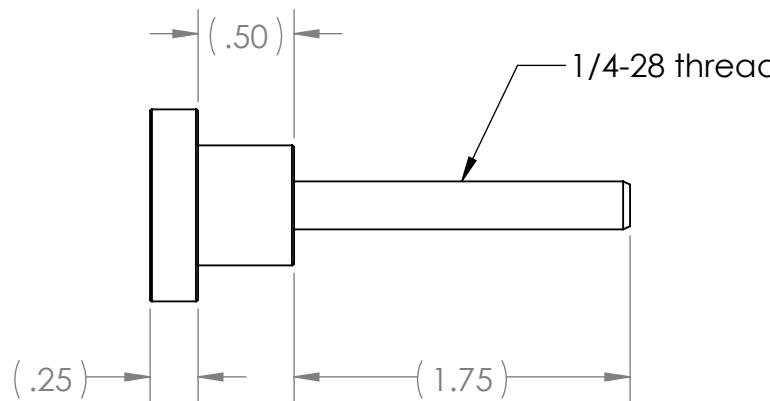
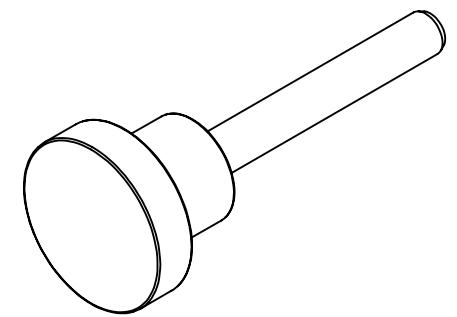
3

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B



Notes:

1. Description: 303 Stainless Steel Knurled Knob with 1/4"-28 Thread 1-3/4" Long Stud, 1" Head Diameter
2. Vendor: McMaster-Carr
3. Part Number: 6091K61
4. Equivalent substitutions allowed

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		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL ±1/16 ANGULAR: MACH ±1° BEND ±1° TWO PLACE DECIMAL ±.01 THREE PLACE DECIMAL ±.001	NAME	DATE
	DRAWN			
	CHECKED			
	ENG APPR.			
	MFG APPR.			
	Q.A.			
	COMMENTS:			
	MATERIAL			
NEXT ASSY	USED ON	FINISH		
	APPLICATION	DO NOT SCALE DRAWING		

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Knob, Round Knurled with threaded Stud McMaster Carr 6091K61

SIZE DWG. NO. **B** FE-00054 **REV**

SCALE: 1:1 WEIGHT: SHEET 1 OF 1

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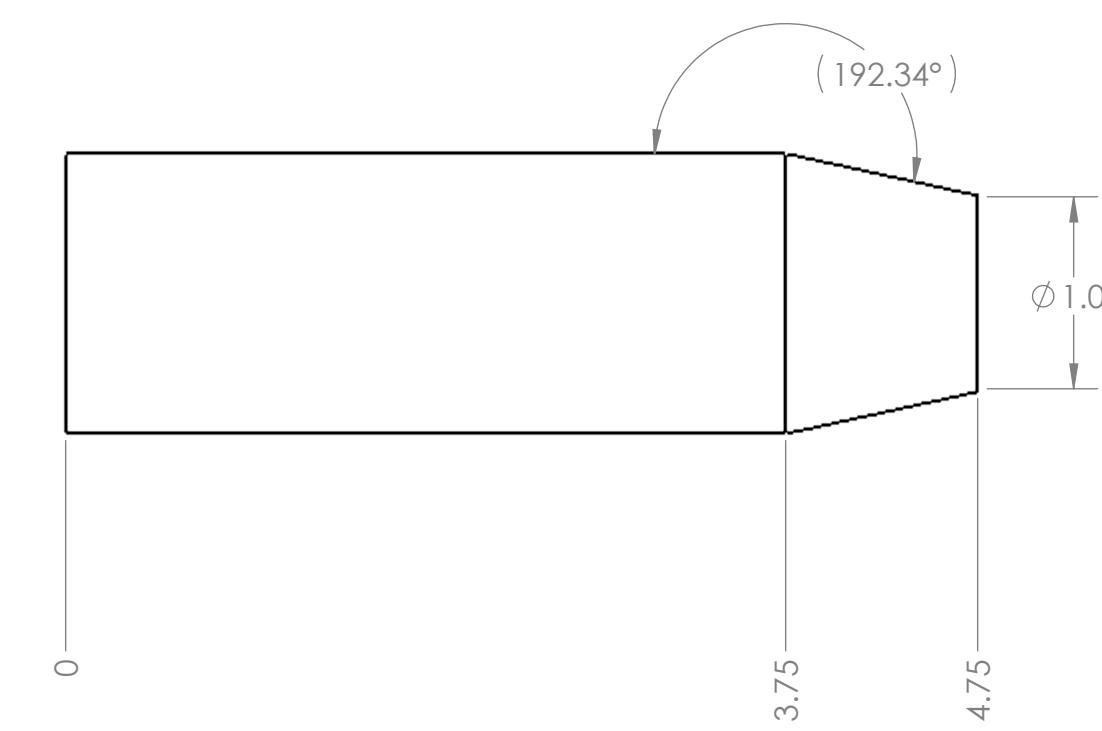
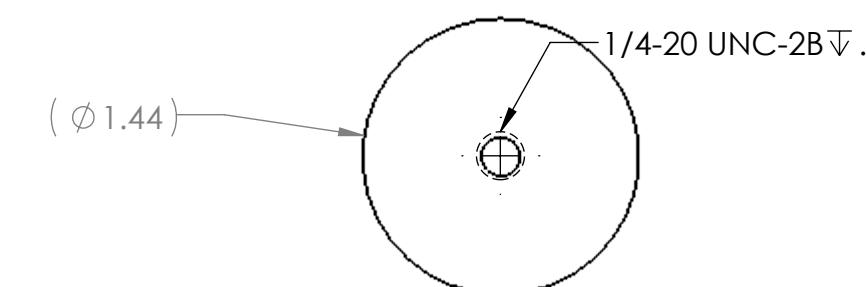
C

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B

A

A



UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	NW	8/22/2022	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:	SIZE	DWG. NO.	REV
1-7/16" round 6061	C	FE-00060	
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING		SCALE: 1:1	SHEET 1 OF 1

4

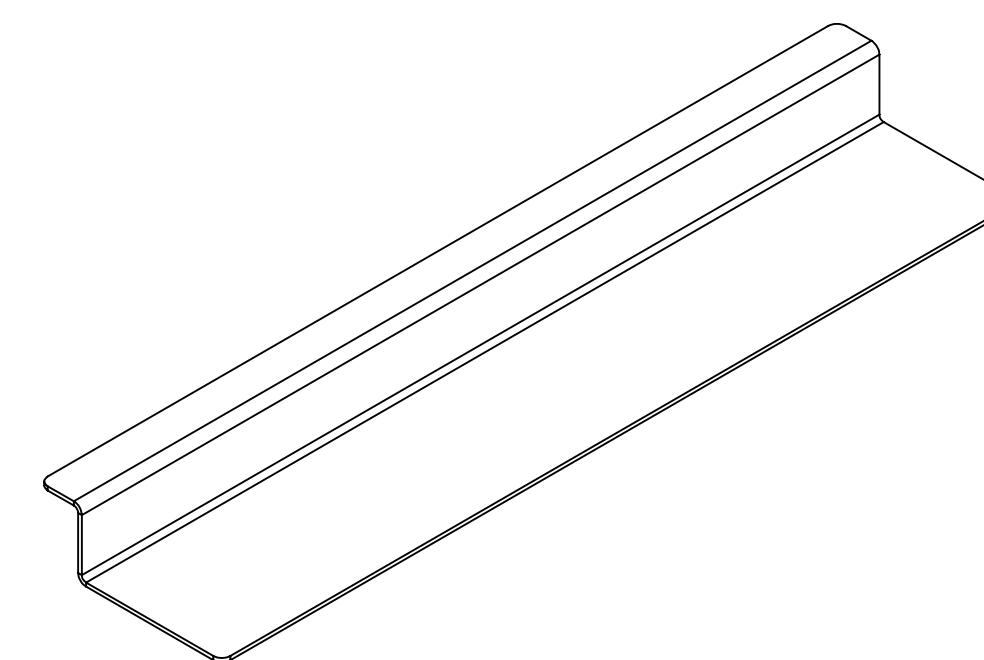
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D

(5.38) R.25 4x



C

1.25
2x R.13
4.23
.11

2.00 23.50

B

A

UNLESS OTHERWISE SPECIFIED:	BEND	NAME	DATE
DRAWN	NW	8/24/2022	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:	SIZE	DWG. NO.	REV
12 ga pre-plated steel	C	FE-00070	
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING	SCALE: 1:4	SHEET 1 OF 1	

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE:
Anchor

4

3

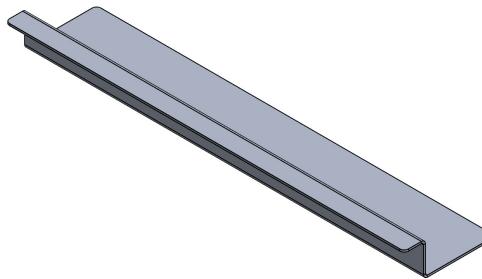
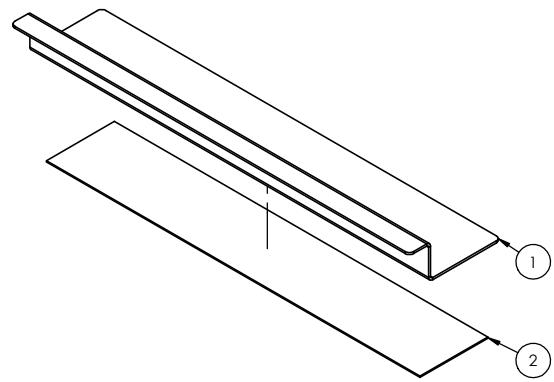
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1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	FE-00070	Anchor	1
2	Hook_4_22	4"x 22" Hook, Adhesive Backed	1

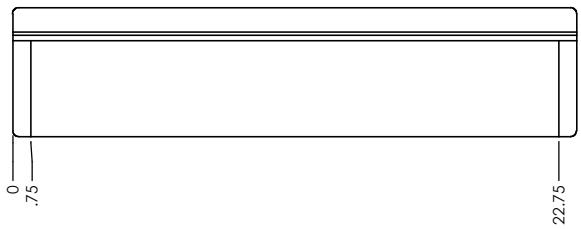
D

D



C

C



B

B

UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/2$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .50$	DRAWN	NW	10/3/2022
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST[®]
ROBOTICS
COMPETITION

DS SOLIDWORKS
Modeling Solutions Partner

TITLE: FE-00070 w/
hook

SIZE DWG. NO. REV

C FE-00071

SCALE: 1:4 SHEET 1 OF 1

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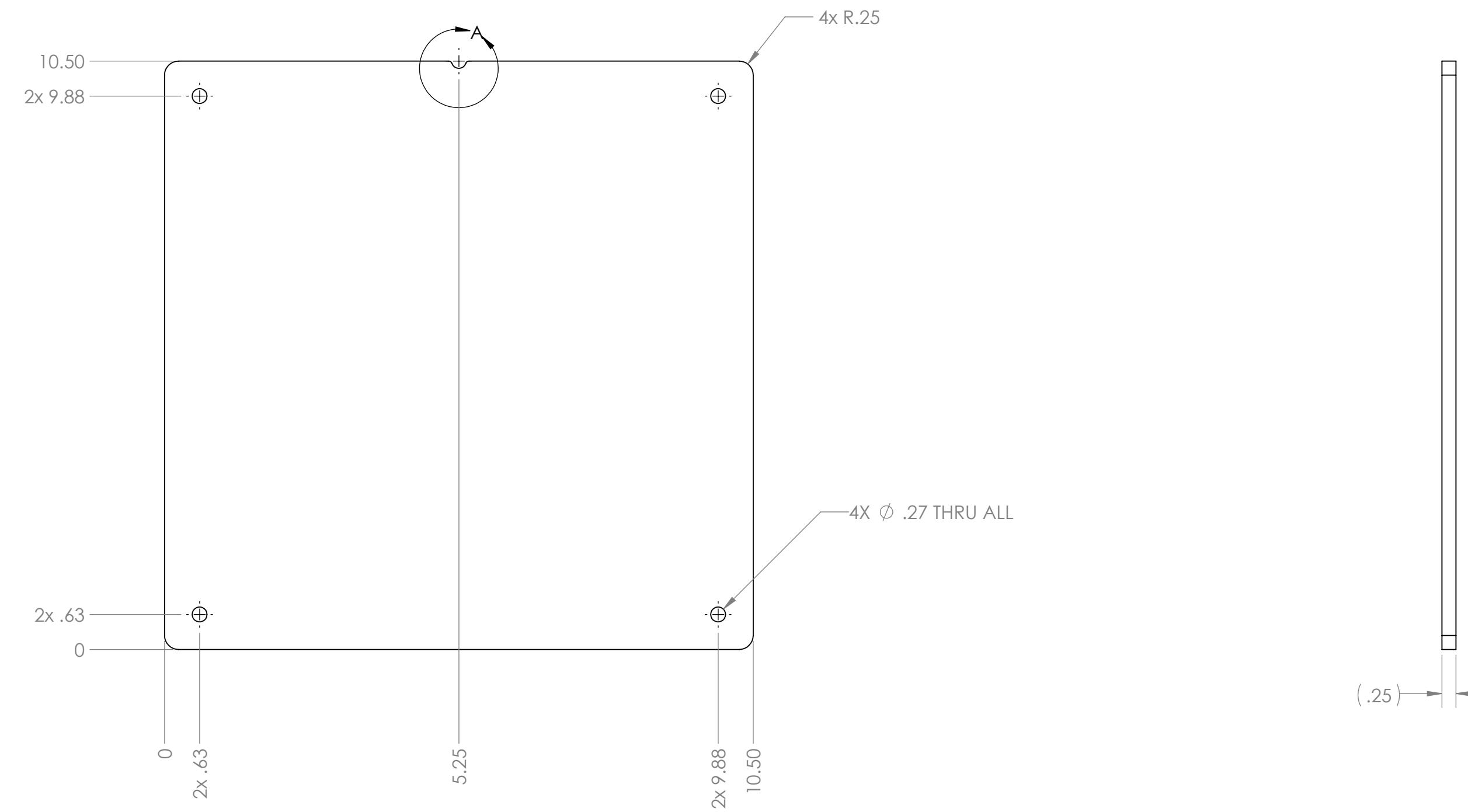
B

B

A

A

Notes:
1. Vinyl to be applied to face.



UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	CO	8/29/2023	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH: 1/4" Polycarbonate, Clear			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			



TITLE: AprilTag Base Poly

SIZE DWG. NO. REV
C FE-00082

SCALE: 1:2 SHEET 1 OF 1

4

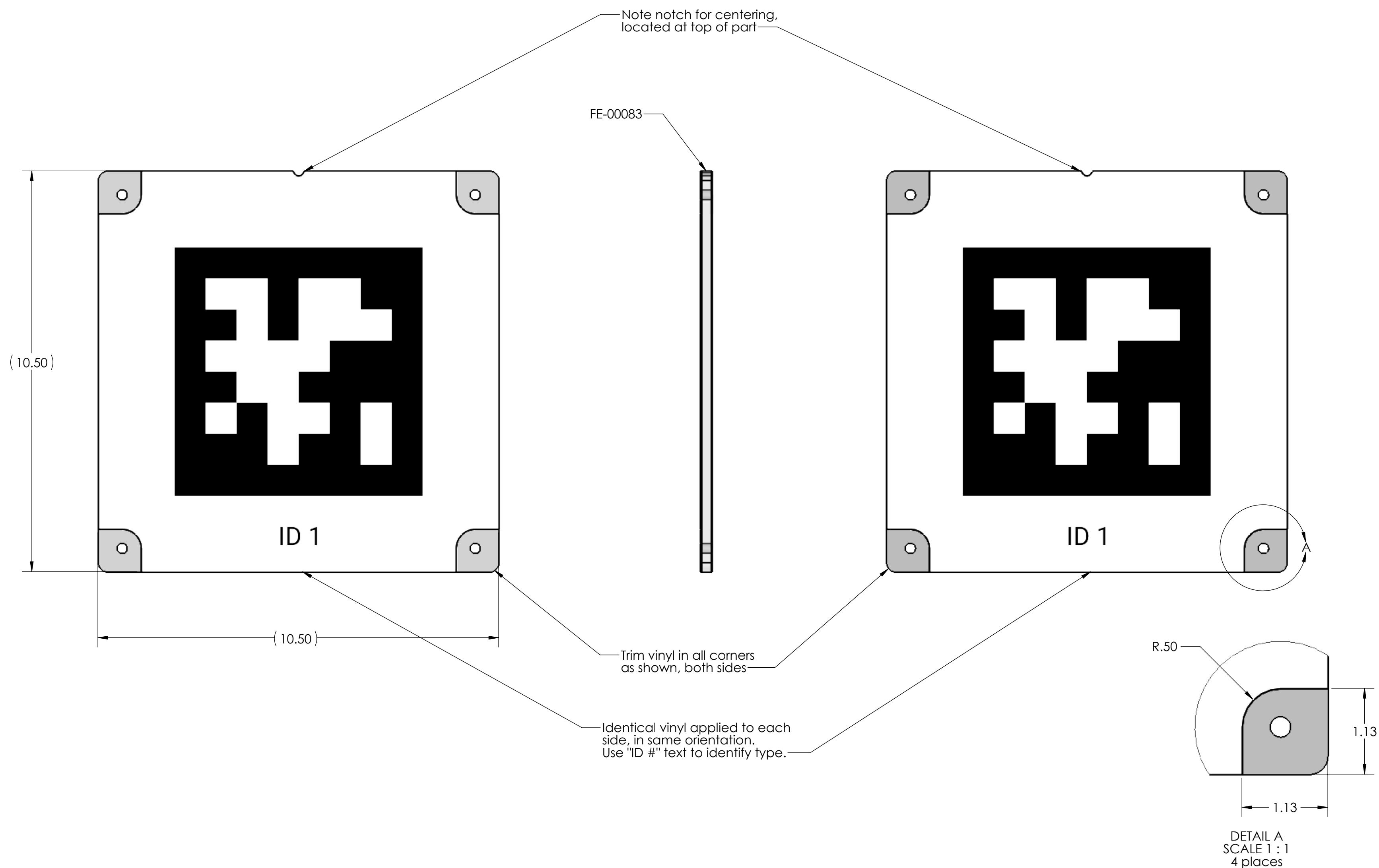
3

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D

D



Notes:
1. Matte vinyl

Tag Variations			
Part Number	Vinyl Image	Vinyl QTY per field	Part QTY per field
FE-00083-ID1	FE-00083-ID1-Vinyl	2	1
FE-00083-ID2	FE-00083-ID2-Vinyl	2	1
FE-00083-ID3	FE-00083-ID3-Vinyl	2	1
FE-00083-ID4	FE-00083-ID4-Vinyl	2	1
FE-00083-ID5	FE-00083-ID5-Vinyl	2	1
FE-00083-ID6	FE-00083-ID6-Vinyl	2	1
FE-00083-ID7	FE-00083-ID7-Vinyl	2	1
FE-00083-ID8	FE-00083-ID8-Vinyl	2	1
FE-00083-ID9	FE-00083-ID9-Vinyl	2	1
FE-00083-ID10	FE-00083-ID10-Vinyl	2	1

UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	CO	9/6/2023
TOLERANCES: FRACTIONAL $\pm 1/2$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .50$	PROPRIETARY AND CONFIDENTIAL		
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MATERIAL/FINISH:	Polycarbonate/Vinyl		
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

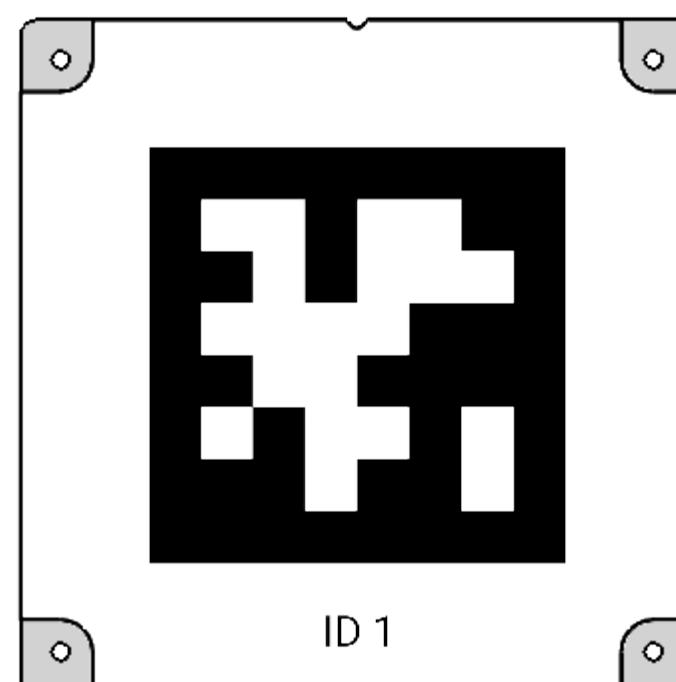
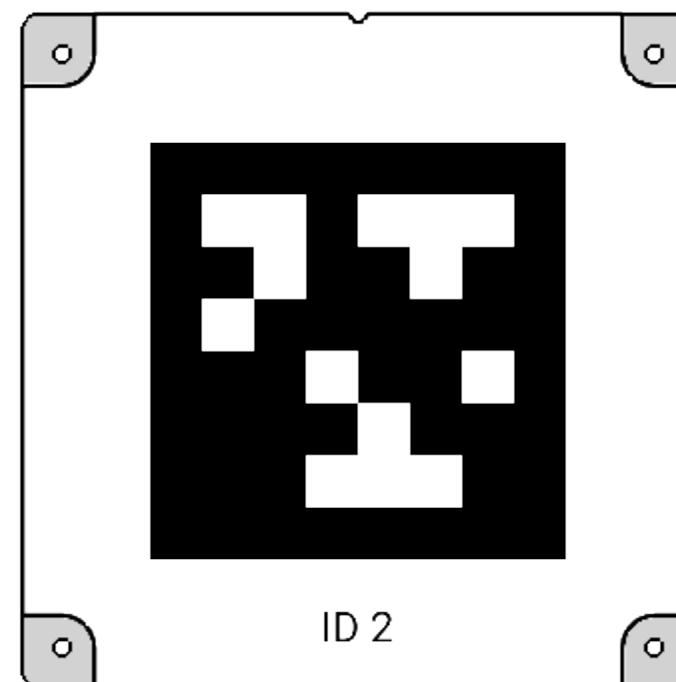
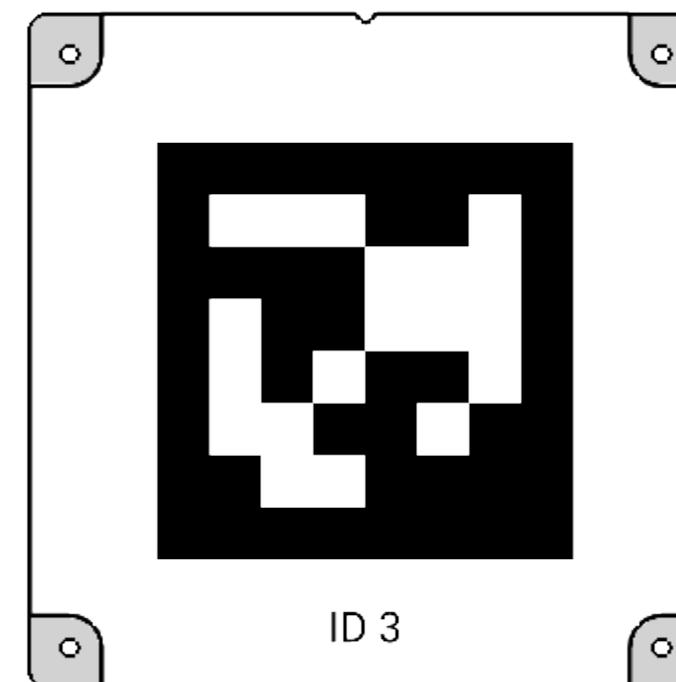
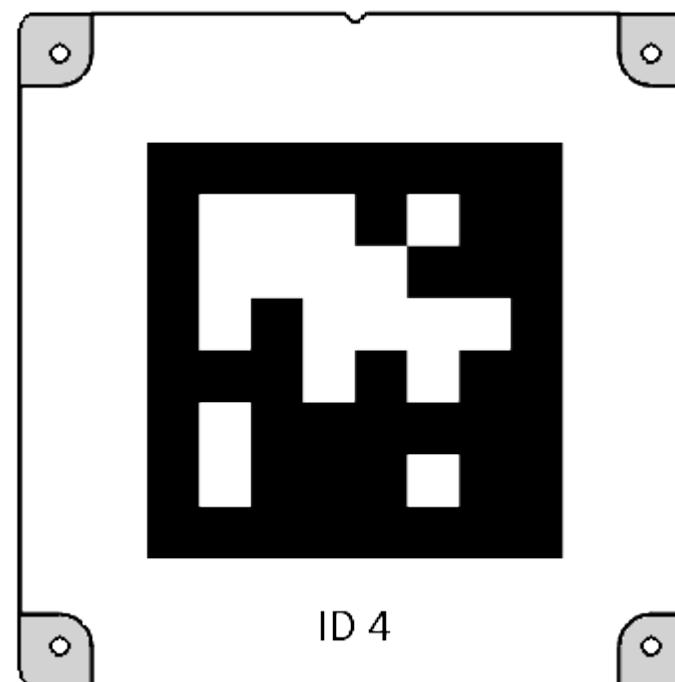
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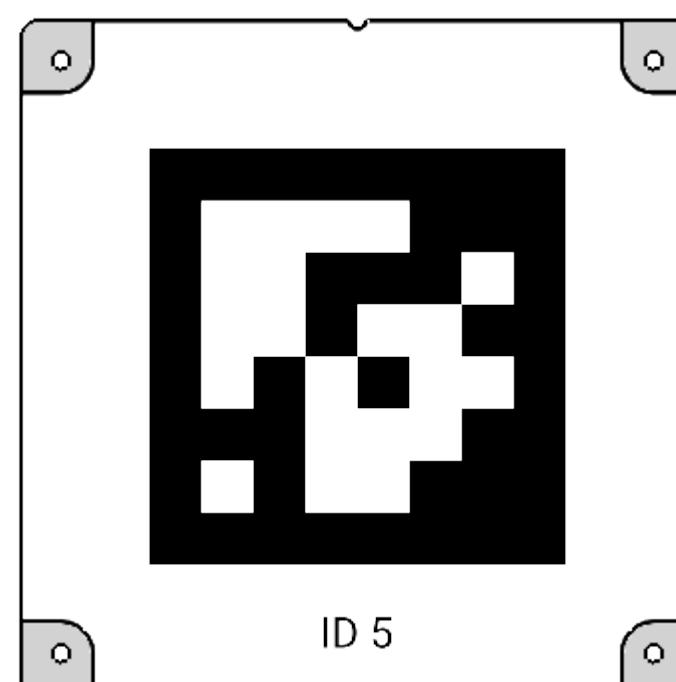
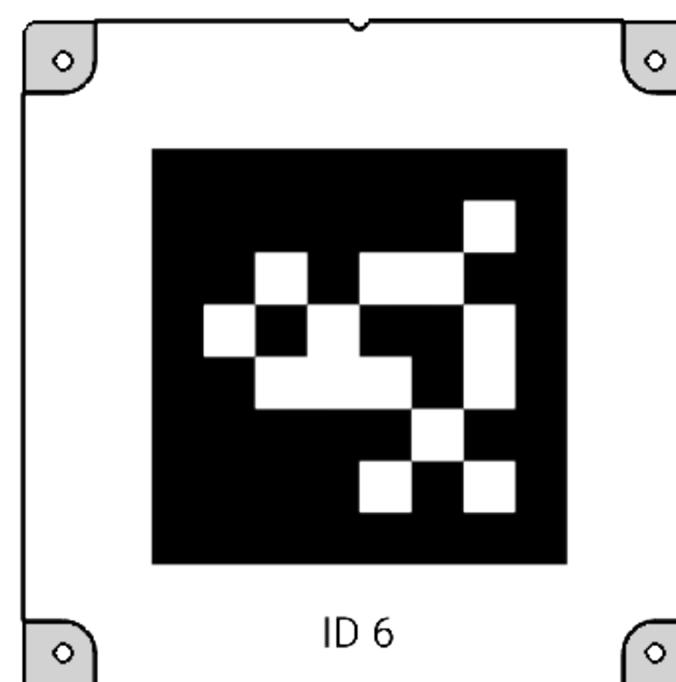
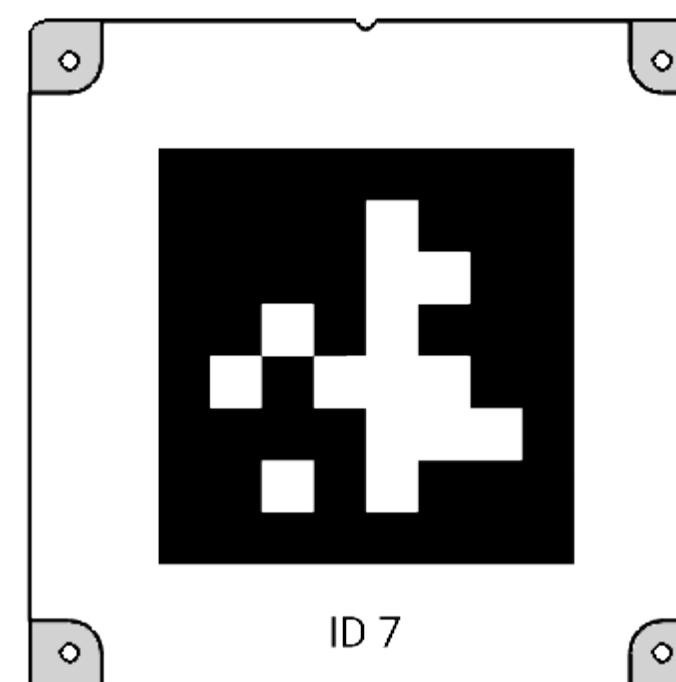
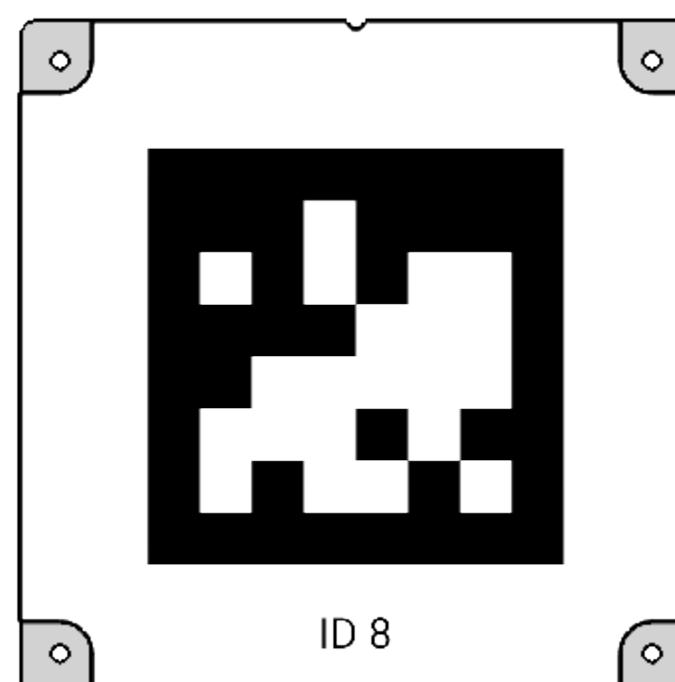
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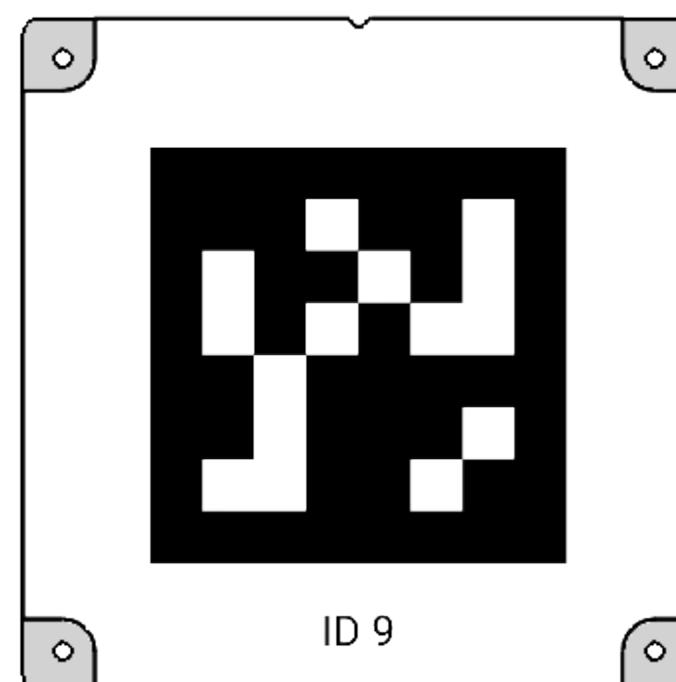
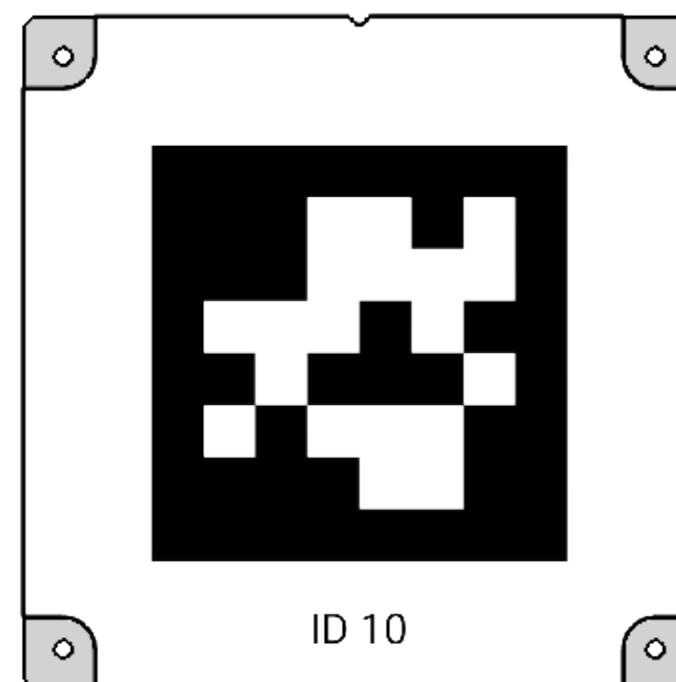
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B

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