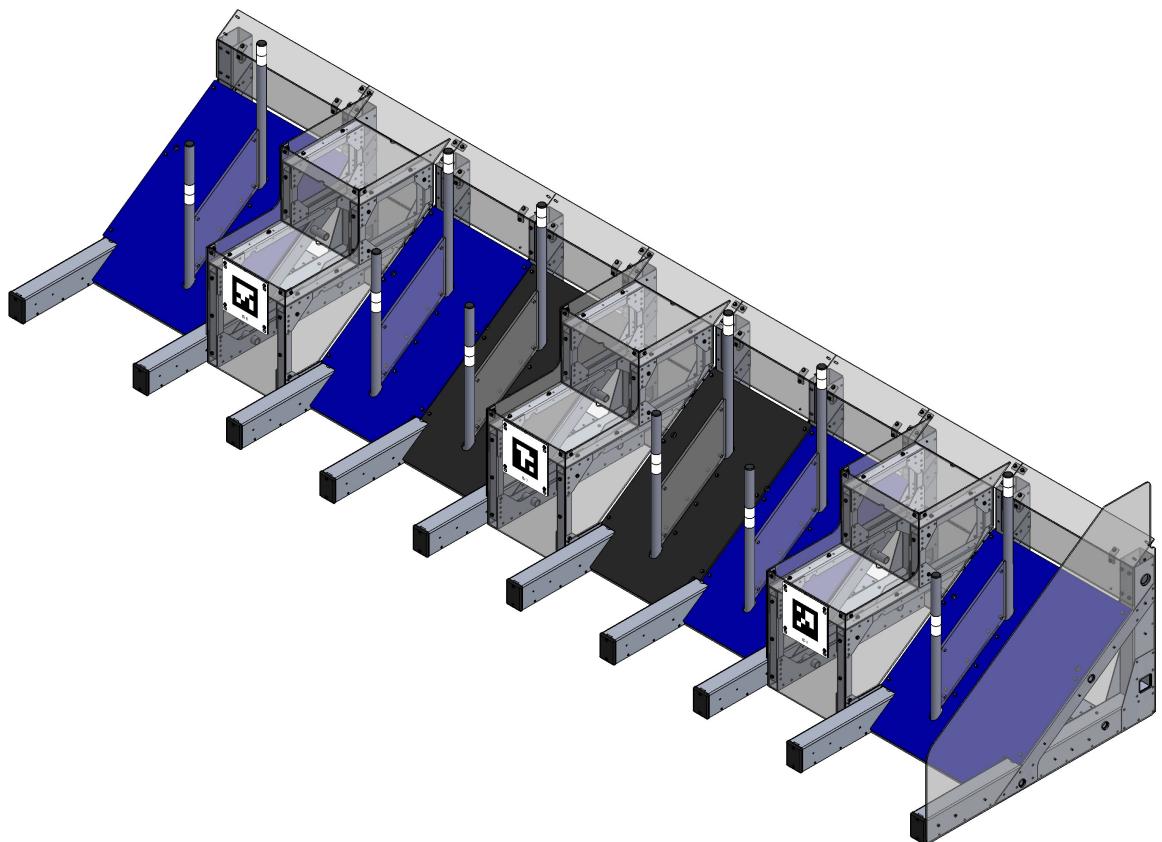


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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23010	Middle Divider	8
2	GE-23020	Lower Pole Base	4
3	GE-23021-BLK	Black Middle Goal Cover	2
4	GE-23021-BLU	Blue Center Goal Cover	2
5	GE-23022-BLU	Blue End Goal Cover	2
6	GE-23025	Right End Divider	1
7	GE-23026	Left End Divider	1
8	GE-23030	Upper Pole Base	4
9	GE-23040	Upper Pole Crossbar	4
10	GE-23045	Upper Shelf Corner Light	1
11	GE-23045-ALT	Upper Shelf Corner Light	1
12	GE-23050	Upper Pole End Crossbar	2
13	GE-23055	Upper Shelf Middle Light	4
14	GE-23060	Upper Pole End Base (HP Station End)	1
15	GE-23060	Upper Pole End Base (Side Border End)	1
16	GE-23070	Lower Pole End Base (HP Station End)	1
17	GE-23070	Lower Pole End Base (Side Border End)	1
18	GE-23075	Upper Pole Cube Light	3
19	GE-23080	Cube Shelf	3
20	GE-23091	Shark Fin Poly	6
21	GE-23097	Shark Fin Bracket with PEM Nuts installed	12
22	GE-23099	Goal Side Wall	1
23	FE-00081-ID6	AprilTag Target	1
24	FE-00081-ID7	AprilTag Target	1
25	FE-00081-ID8	AprilTag Target	1
26	hex_.25_20_2.5	Steel Hex Head Screw, 1/4"-20 x 2-1/2" long, fully threaded	12
27	90566A029	1/4-20 x 1" Hex Head Bolt	30
28	92865A542 and 250	1/4-20 x 1" Hex Head Bolt and Washer	96
29	92865A542	Medium-Strength Grade 5 Steel Hex Head Screw	18

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UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DRAWN	JO	12/23/2022	
PROPRIETARY AND CONFIDENTIAL			
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COMMENTS:			
REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			
SIZE	DWG. NO.	REV	
C	GE-23000		
SCALE: 1:16		SHEET 1 OF 11	

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
Set of 3 GRIDS

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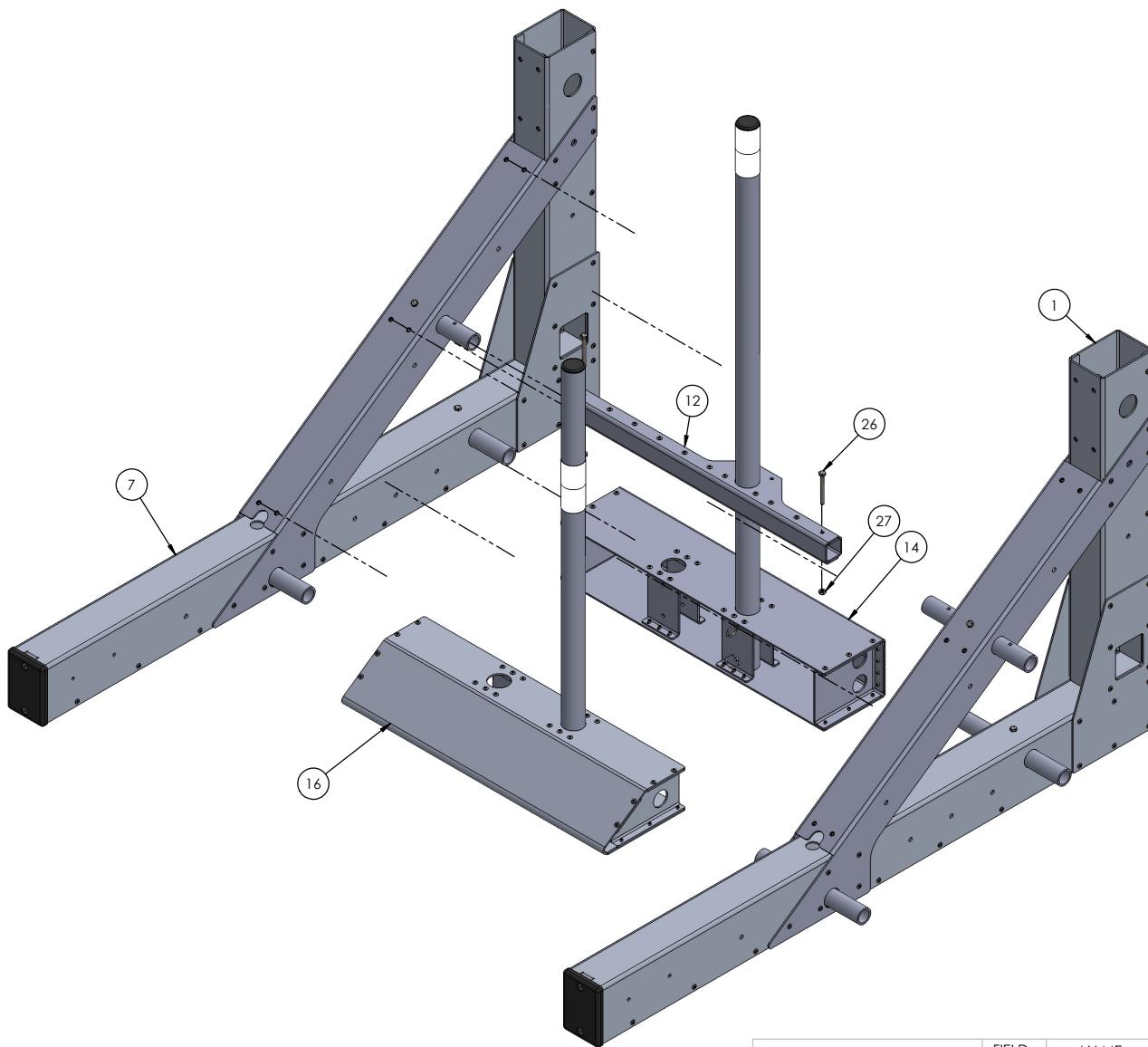
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Step 1: Place (7) down.

Step 2: Slide (12), (14) and (16) over the connector pins and push them all the way on.

Step 3: Slide (1) into the connector pin holes on the other end.

Step 4: Use 2x (26) and (27) to fasten the assembly together.

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 NAME DATE

DRAWN JO 12/23/2022



TITLE: Set of 3 GRIDS

SIZE DWG. NO. REV

C GE-23000

SCALE: 1:6 SHEET 2 OF 11

MATERIAL/FINISH:

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COMMENTS:

REMOVE ALL BURRS AND SHARP EDGES.

DO NOT SCALE DRAWING

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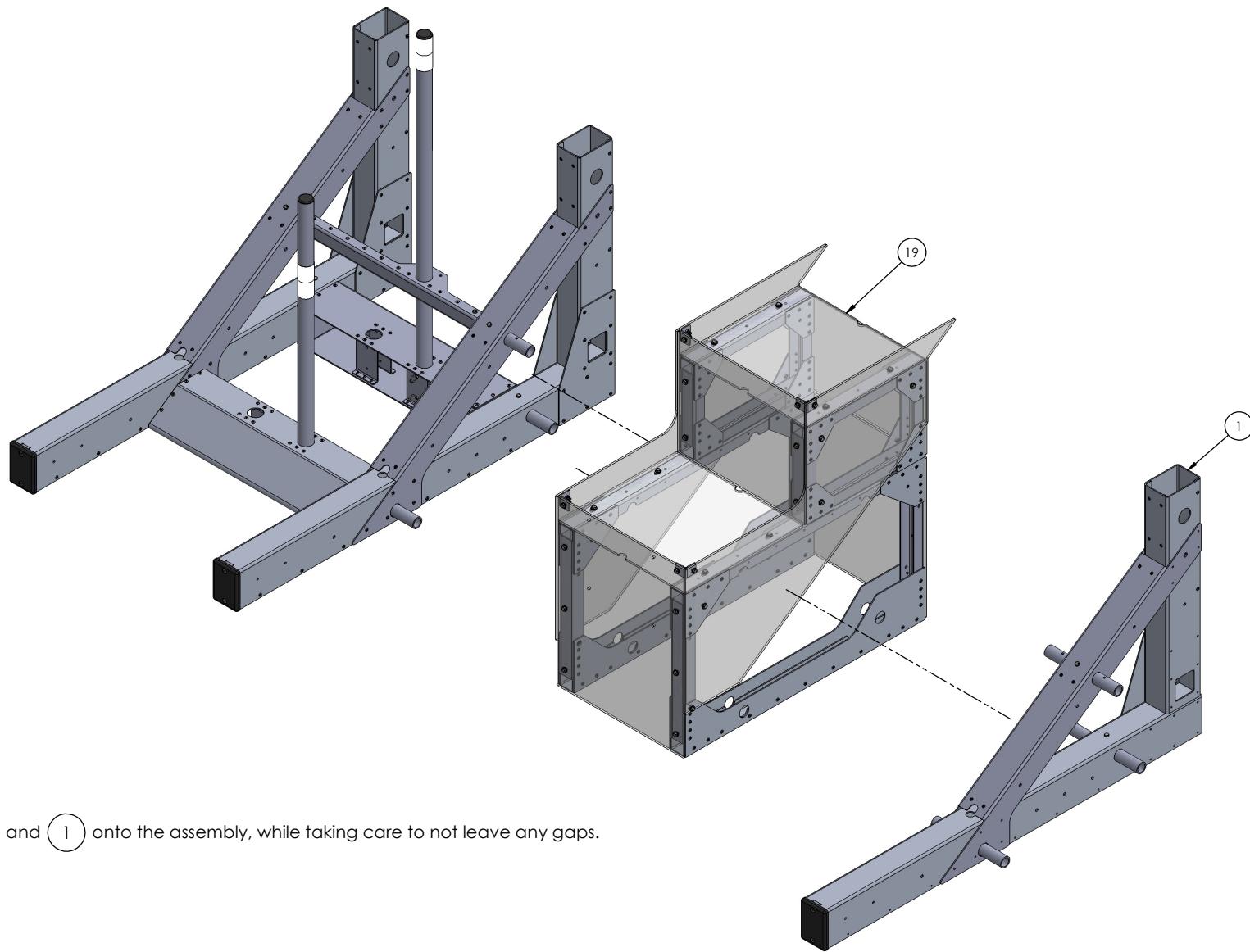
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UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/2$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .50$	FIELD DRAWN	NAME JO	DATE 12/23/2022
PROPRIETARY AND CONFIDENTIAL			
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COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING	SIZE C	DWG. NO. GE-23000	REV
SCALE: 1:8	SHEET 3 OF 11		

 FIRST
ROBOTICS
COMPETITION  SOLIDWORKS
Modeling Solutions Partner

TITLE:
Set of 3 GRIDS

SIZE DWG. NO. REV

C GE-23000

SCALE: 1:8 SHEET 3 OF 11

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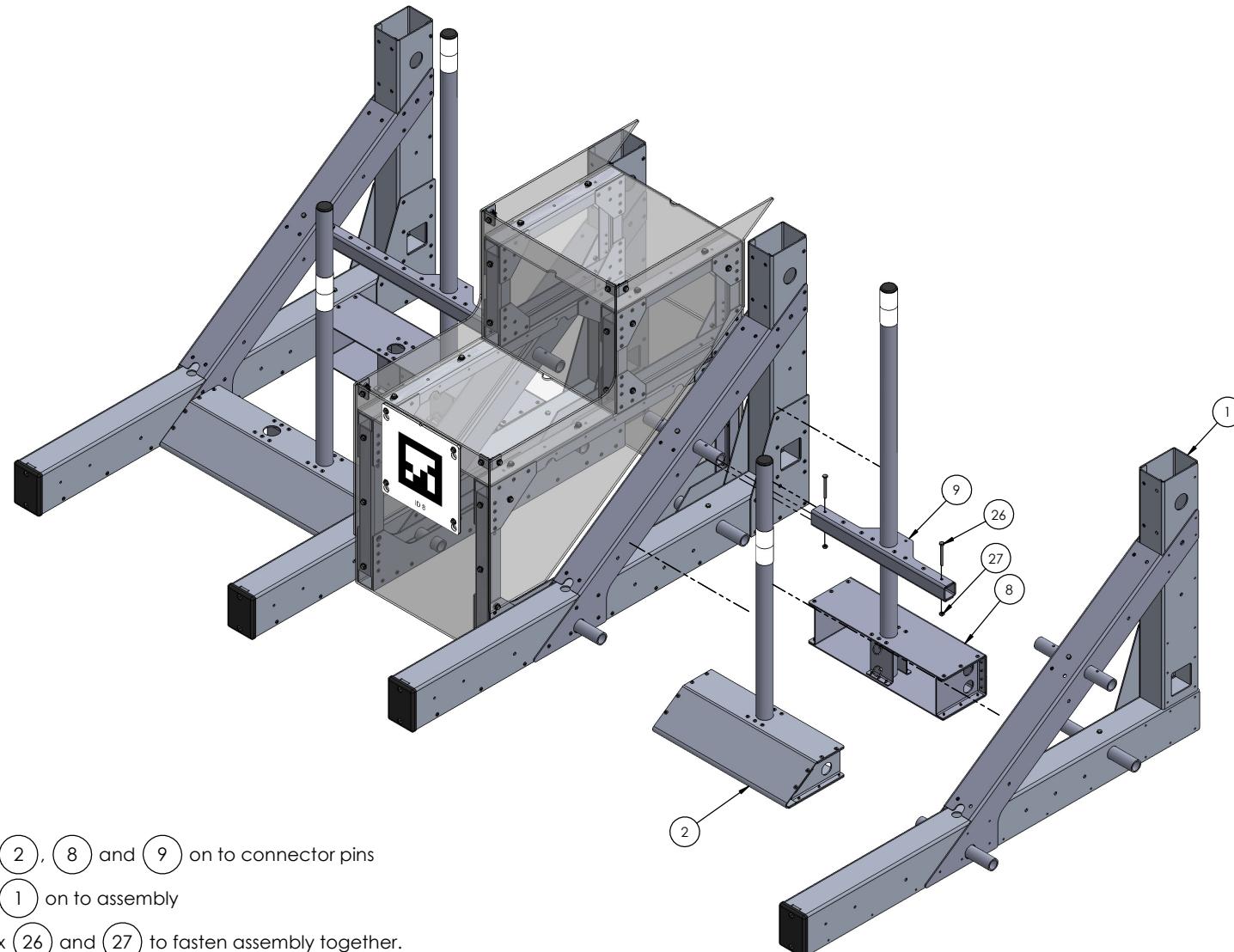
C

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UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DRAWN	JO	12/23/2022	
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:
Set of 3 GRIDS

SIZE DWG. NO. REV

C GE-23000

SCALE: 1:8 SHEET 4 OF 11

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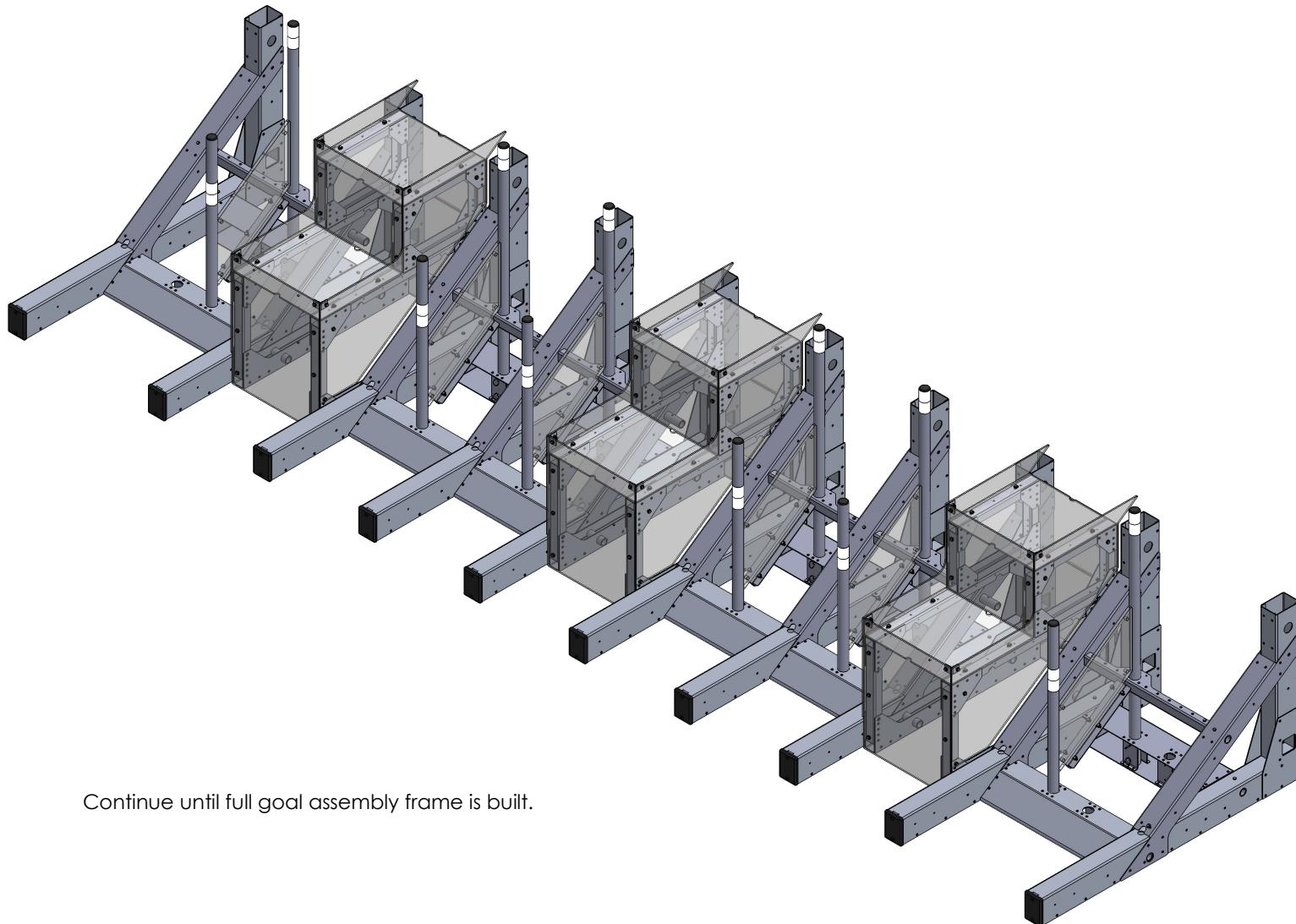
C

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Continue until full goal assembly frame is built.



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 $\pm .50$	FIELD DRAWN	NAME JO	DATE 12/23/2022
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-23000		
SCALE: 1:12	SHEET 5 OF 11		

FIRST
ROBOTICS
COMPETITION

DS SOLIDWORKS
Modeling Solutions Partner

Set of 3 GRIDS

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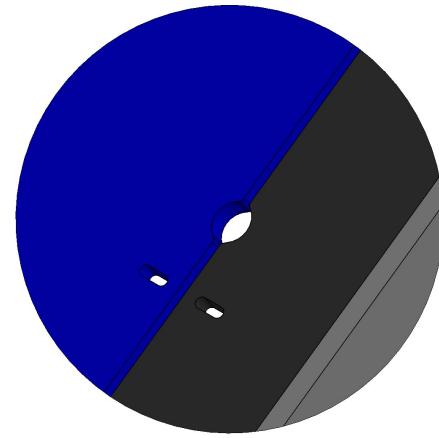
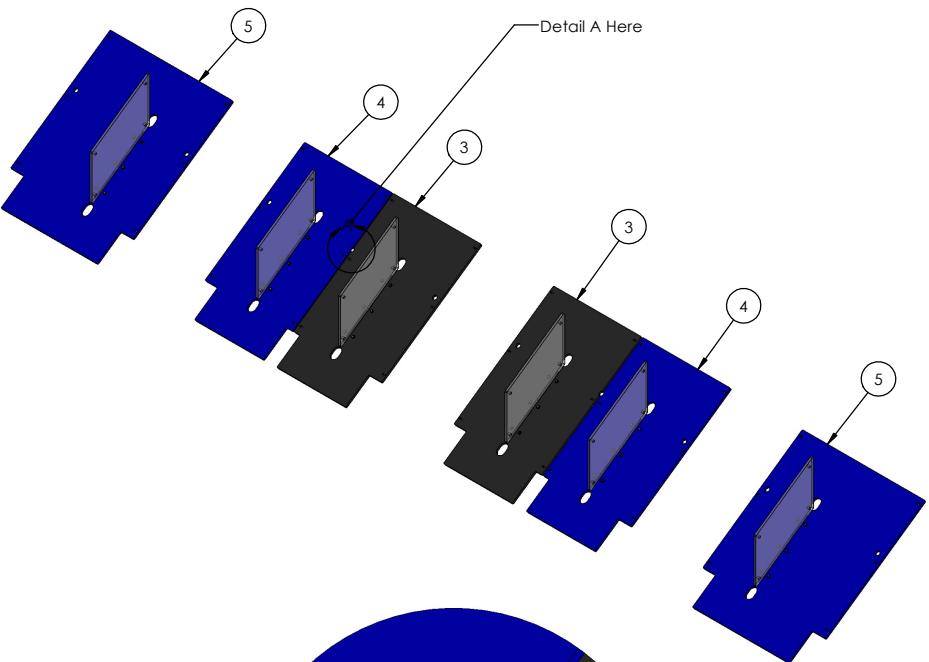
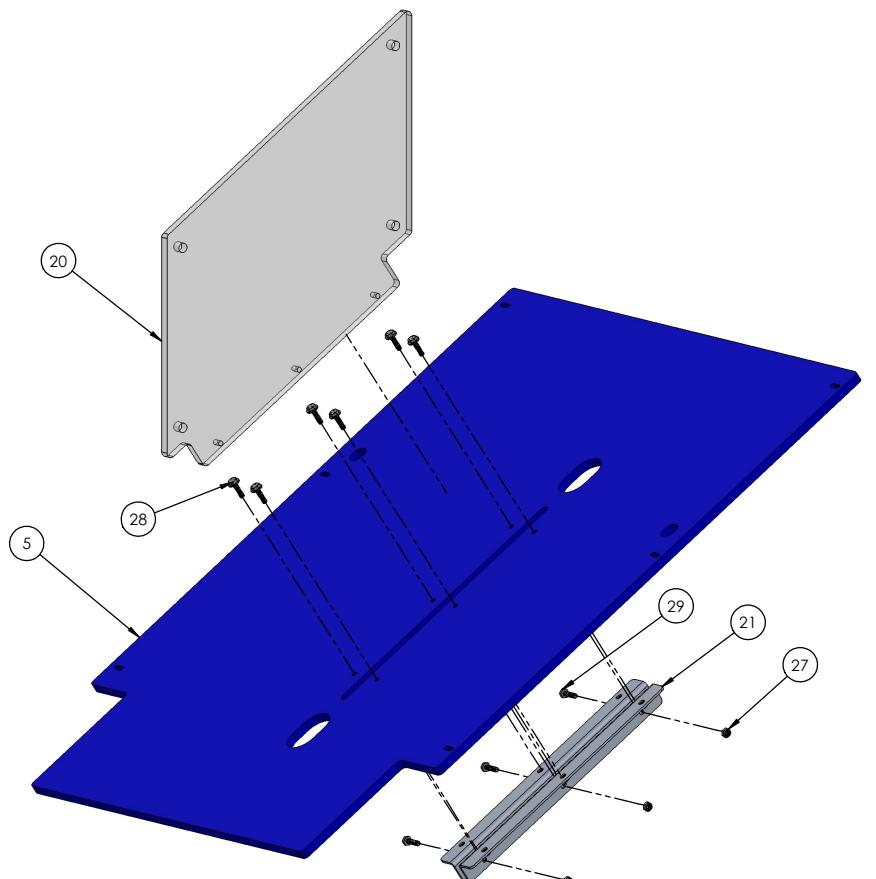
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Shark Fin assembly shown above. Note that for each goal, there is a left hand and right hand version of each cover plastic. The semi-circular notch shown in Detail A can be used to determine left and right for middle covers.

DETAIL A
SCALE 1 : 2

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	12/23/2022
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:
Set of 3 GRIDS

SIZE DWG. NO. REV

C GE-23000

SCALE: 1:5 SHEET 6 OF 11

4

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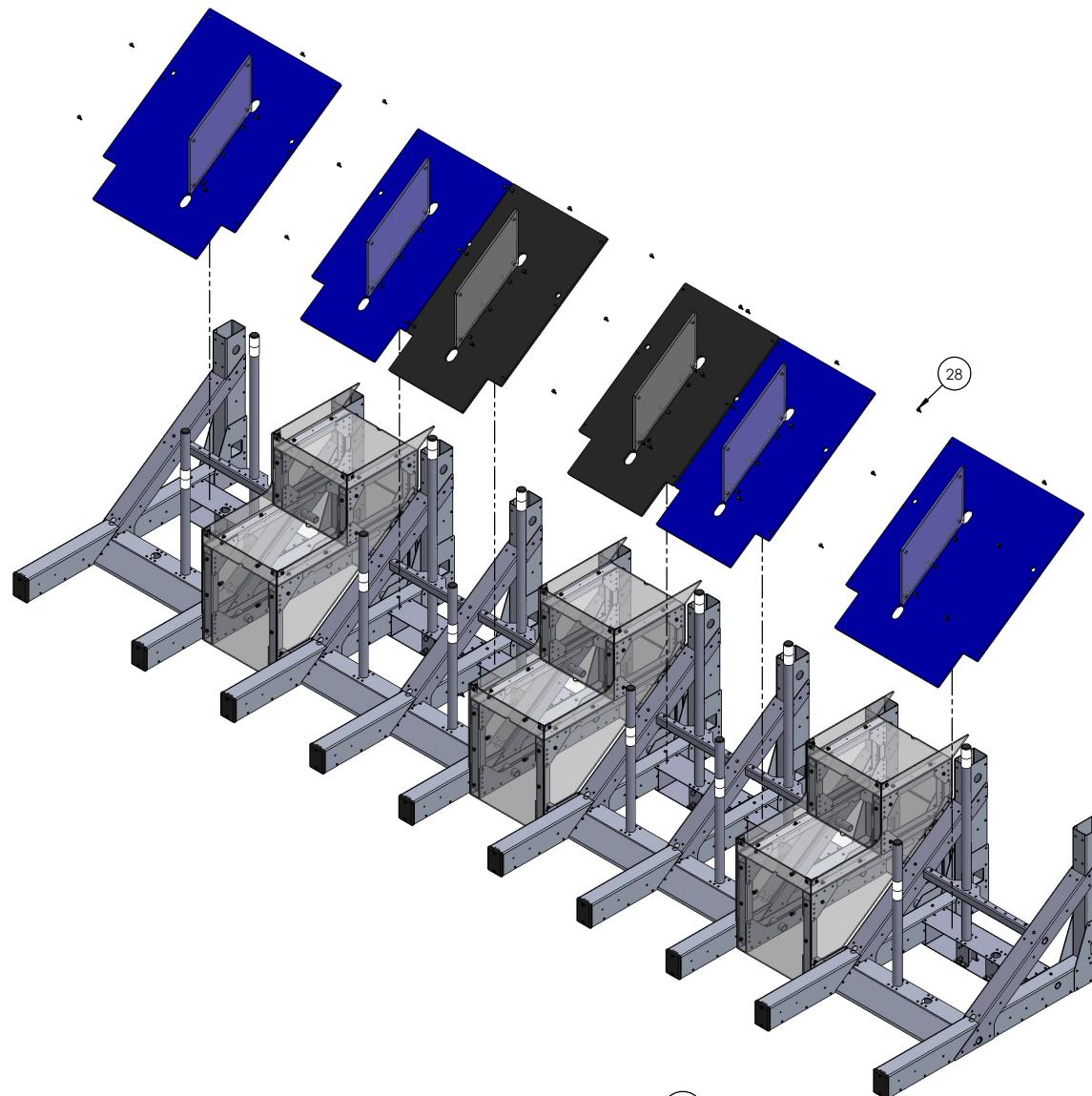
C

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Slide Plastic Covers with Shark Fins over poles and onto frame, attach with 1/4-20 x 1" bolts and washers (28).

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 12/23/2022
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 DS SOLIDWORKS Modeling Solutions Partner

Title: Set of 3 GRIDS

Size: DWG. NO. **Rev:**

C GE-23000

Scale: 1:16 **Sheet:** 7 OF 11

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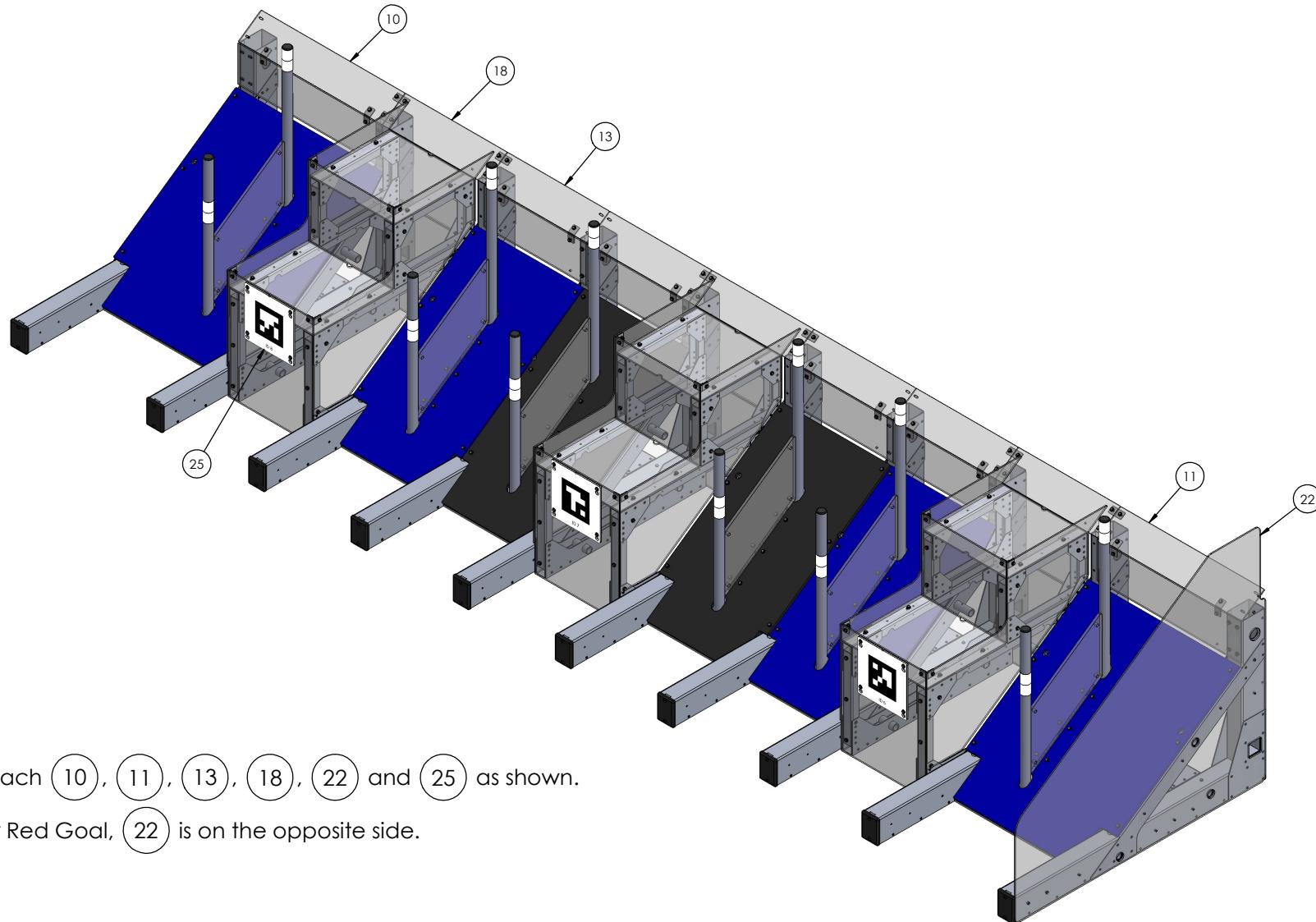
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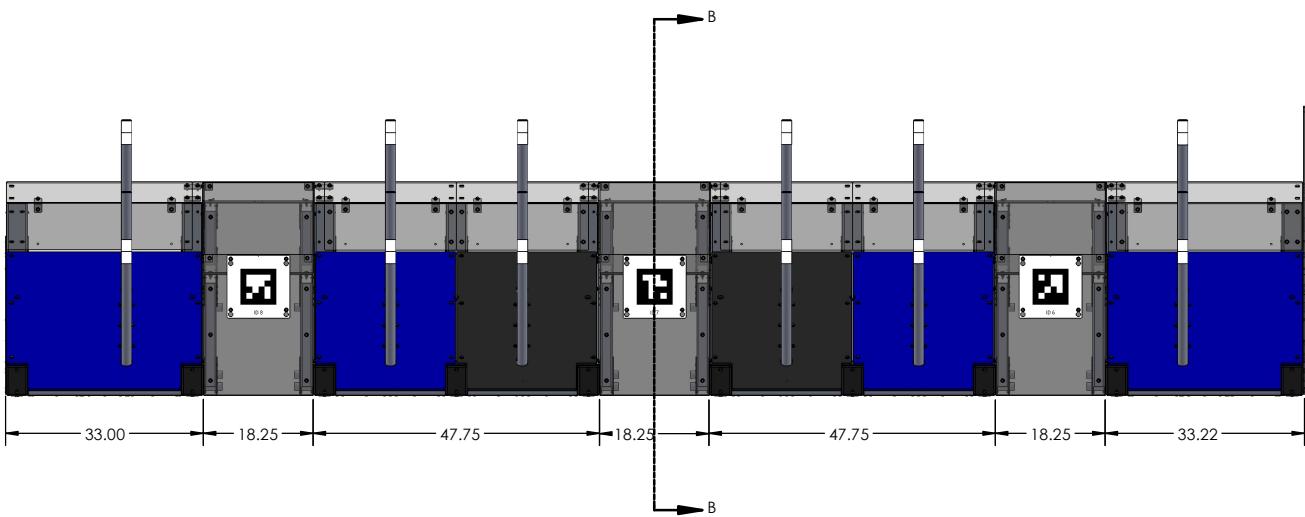
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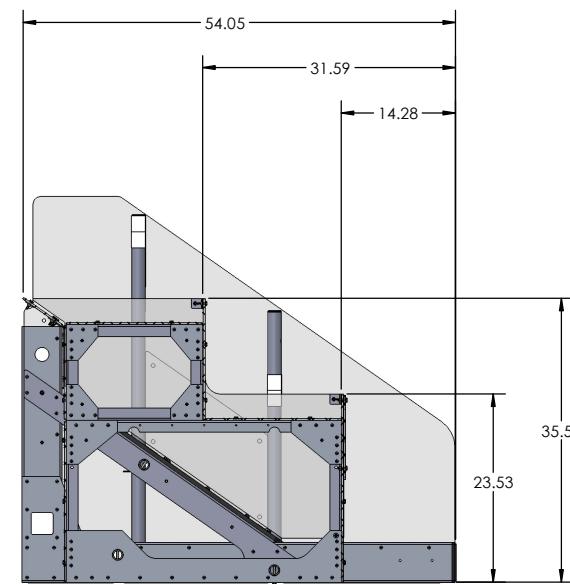
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PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING	SIZE	DWG. NO.	REV
C	GE-23000		
SCALE: 1:12	SHEET 8 OF 11		



Cube Shelf Dimensions



SECTION B-B
SCALE 1 : 12

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 12/23/2022	NAME DATE 12/23/2022
PROPRIETARY AND CONFIDENTIAL		
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MATERIAL/FINISH:		
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.		
DO NOT SCALE DRAWING	SIZE C DWG. NO. GE-23000	REV SCALE: 1:16 SHEET 9 OF 11

FIRST
ROBOTICS
COMPETITION
DS SOLIDWORKS
Modeling Solutions Partner

TITLE:
Set of 3 GRIDS

4

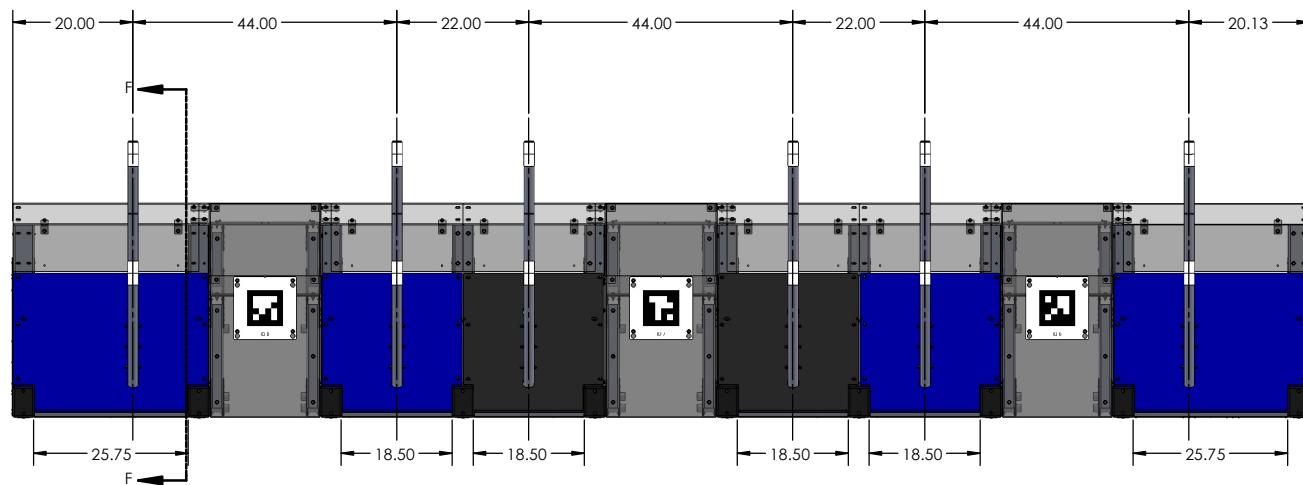
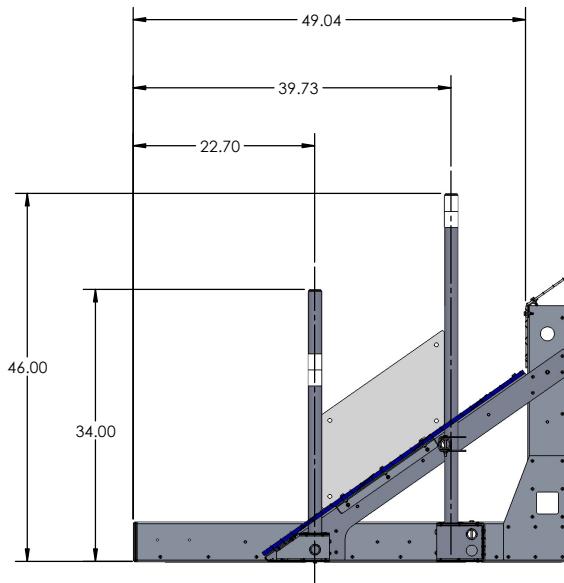
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Cone Pole Dimensions

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 12/23/2022
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:
Set of 3 GRIDS

SIZE DWG. NO. REV

C GE-23000

SCALE: 1:16 SHEET 10 OF 11

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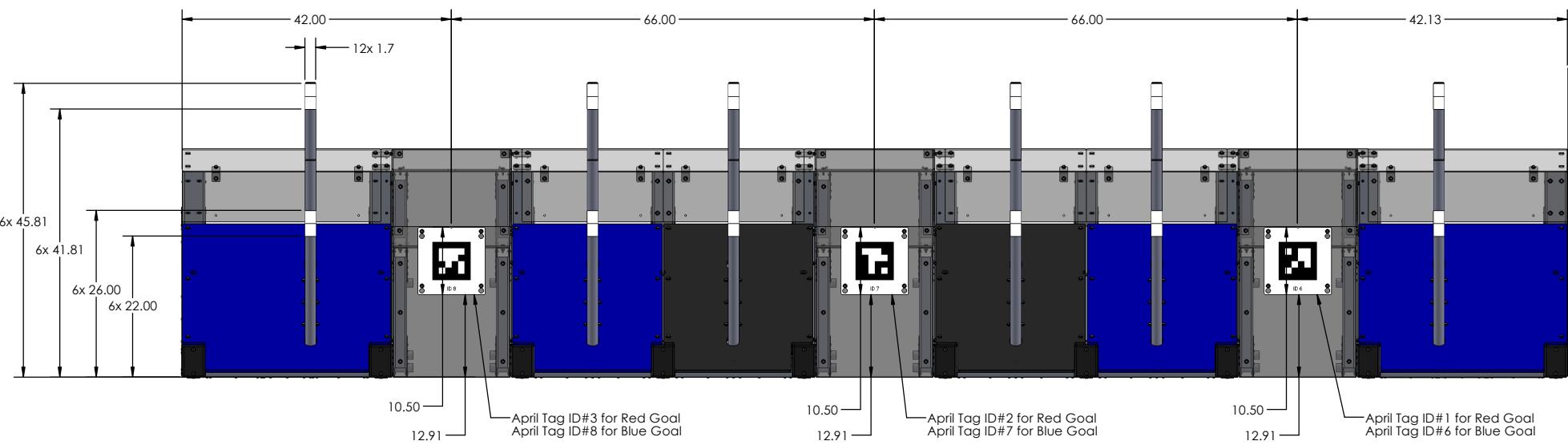
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Vision Target Dimensions

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 12/23/2022
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-23000		
SCALE: 1:12	SHEET 11 OF 11		

FIRST
ROBOTICS
COMPETITION

DS SOLIDWORKS
Modeling Solutions Partner

TITLE:
Set of 3 GRIDS

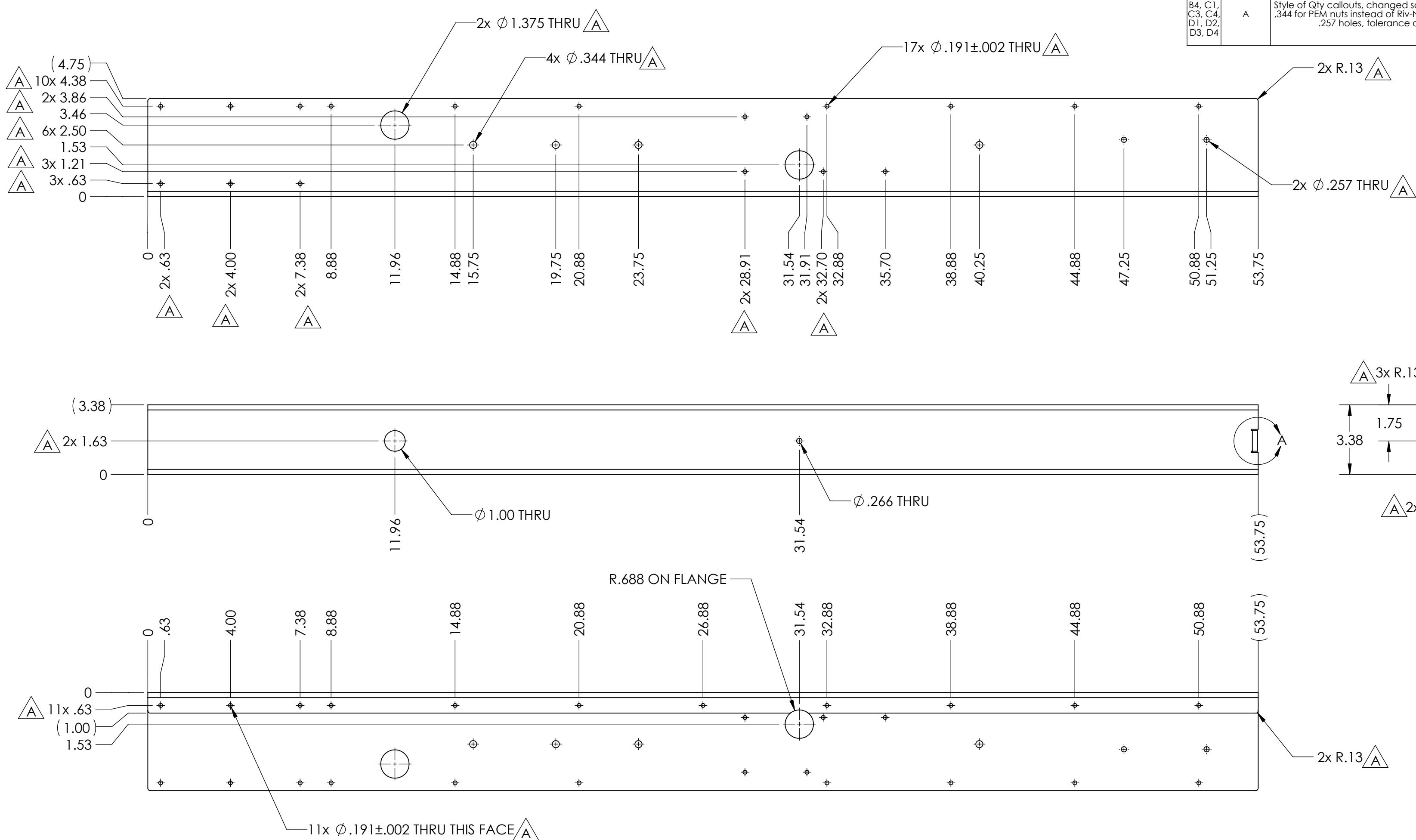
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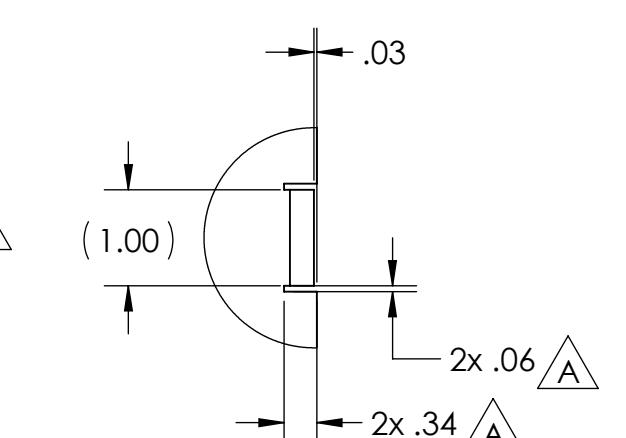
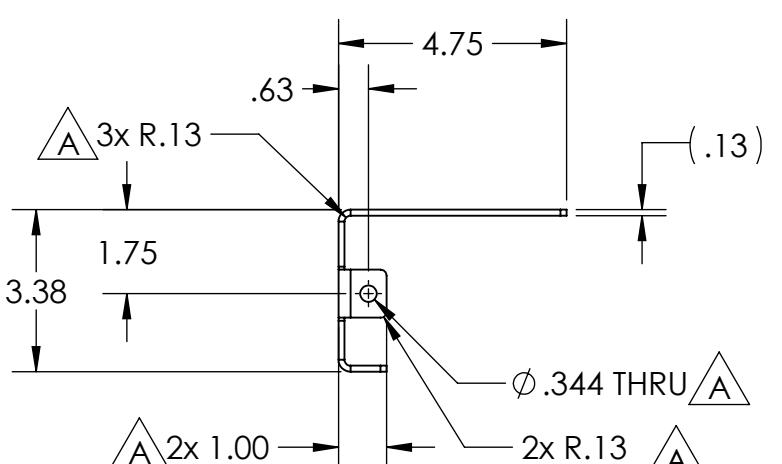
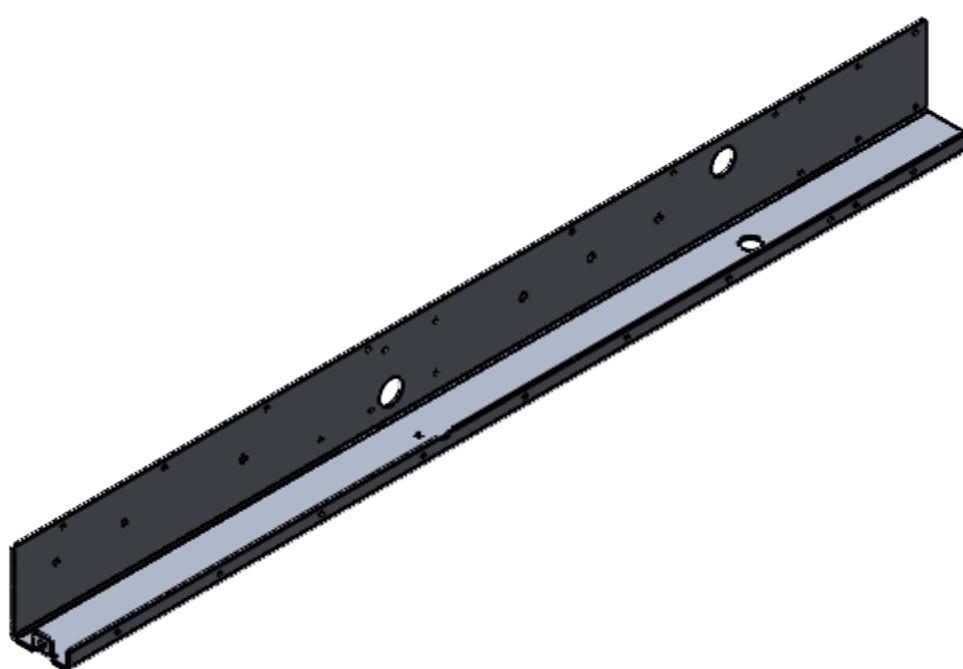
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D



REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
B1, B3, B4, C1, C3, C4, D1, D2, D3, D4	A	Style of Qty callouts, changed some holes from .391 to .344 for PEM nuts instead of Riv-Nuts, added callout for .257 holes, tolerance of rivet holes.	9/23/2022	JO

DETAIL A
SCALE 1 : 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 $\pm .010$

MATERIAL/FINISH:

8 GA 5052 Aluminum

BEND NAME DATE

DRAWN NAL 9/23/2022

PROPRIETARY AND CONFIDENTIAL

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COMMENTS:

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DO NOT SCALE DRAWING


FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
 Modeling Solutions Partner
TITLE: **Divider Base A**

SIZE DWG. NO. REV

C GE-23001

SCALE: 1:4 SHEET 1 OF 1

4

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1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23001	Divider Base A	1
2	pem_clinchnut_.25_20 .054	1/4-20 self-clinching nut, .054 shank	1

D

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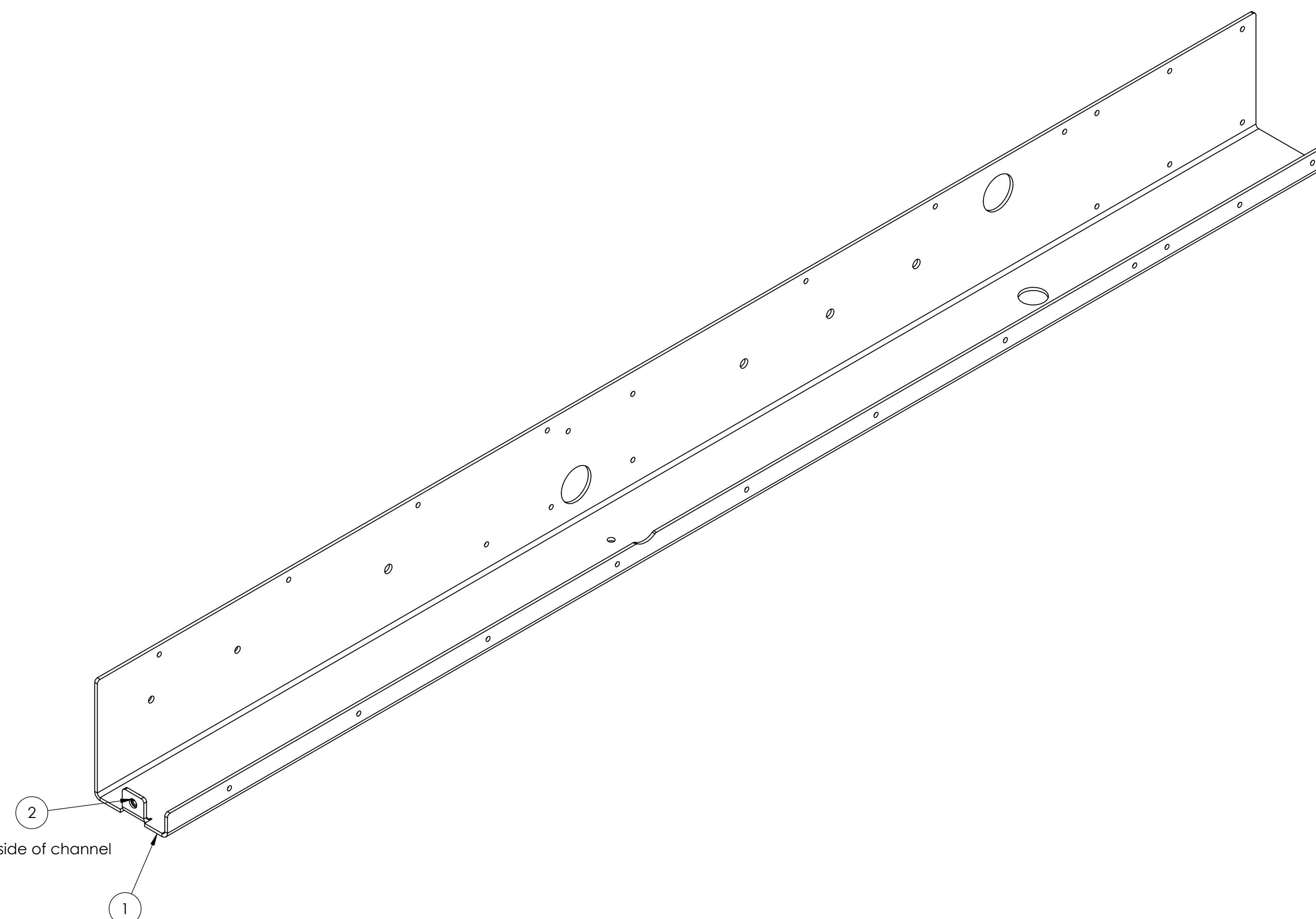
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B

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PEM nut protrudes inside of channel

UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	JO	10/4/2022
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:	COMMENTS:		
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DO NOT SCALE DRAWING			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
Divider Base A
Config 1

SIZE DWG. NO. REV
C GE-23001-01

SCALE: 1:8 SHEET 1 OF 1

4

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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23001	Divider Base A	1
2	pem_clinchnut_25_20 .054	1/4-20 self-clinching nut, .054 shank	5

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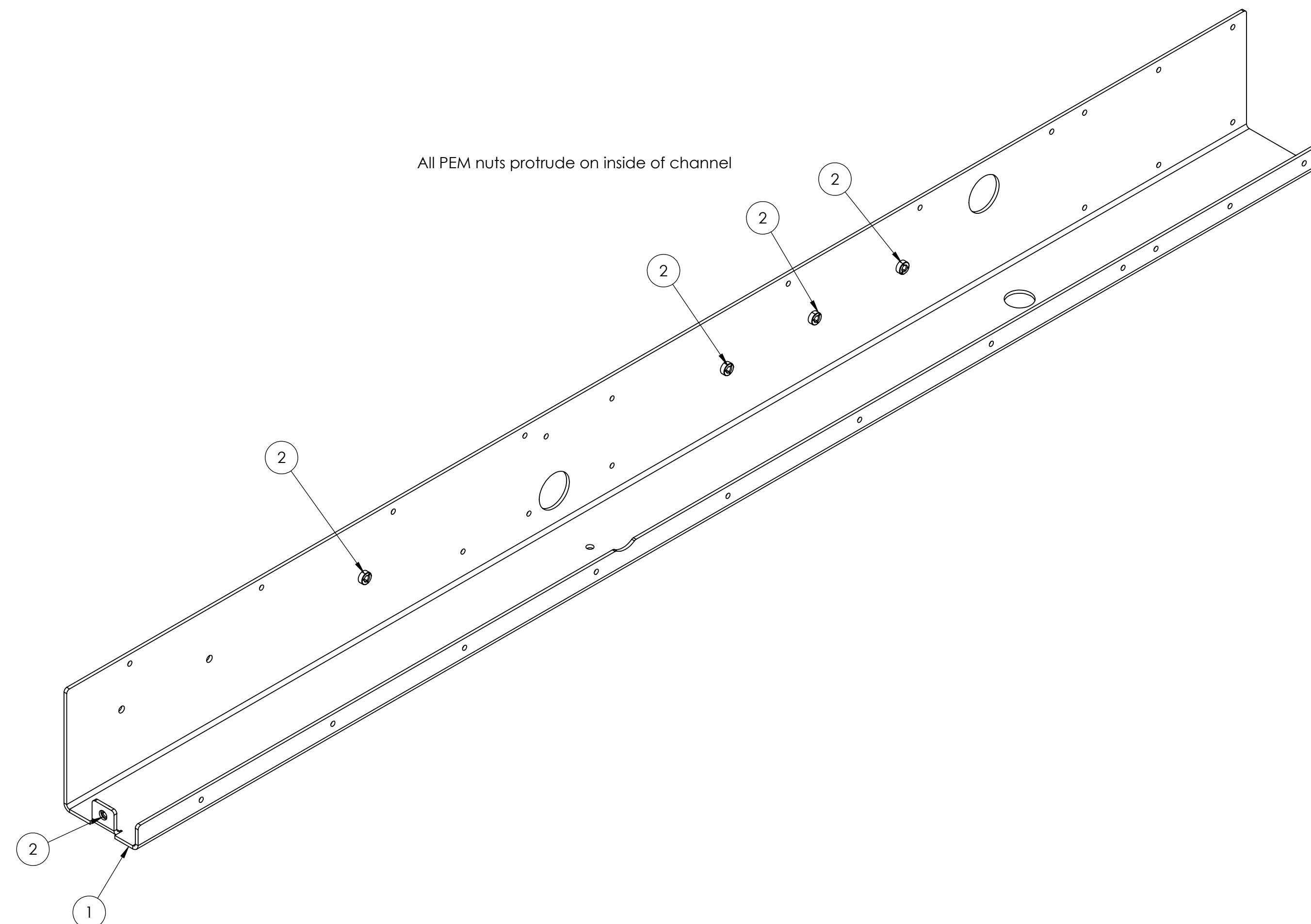
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UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	JO	10/4/2022
TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$	PROPRIETARY AND CONFIDENTIAL		
TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .005$	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:	COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.		
DO NOT SCALE DRAWING			

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

TITLE:
**Divider Base A
Config 2**

SIZE DWG. NO. REV
C GE-23001-02

SCALE: 1:8 SHEET 1 OF 1

4

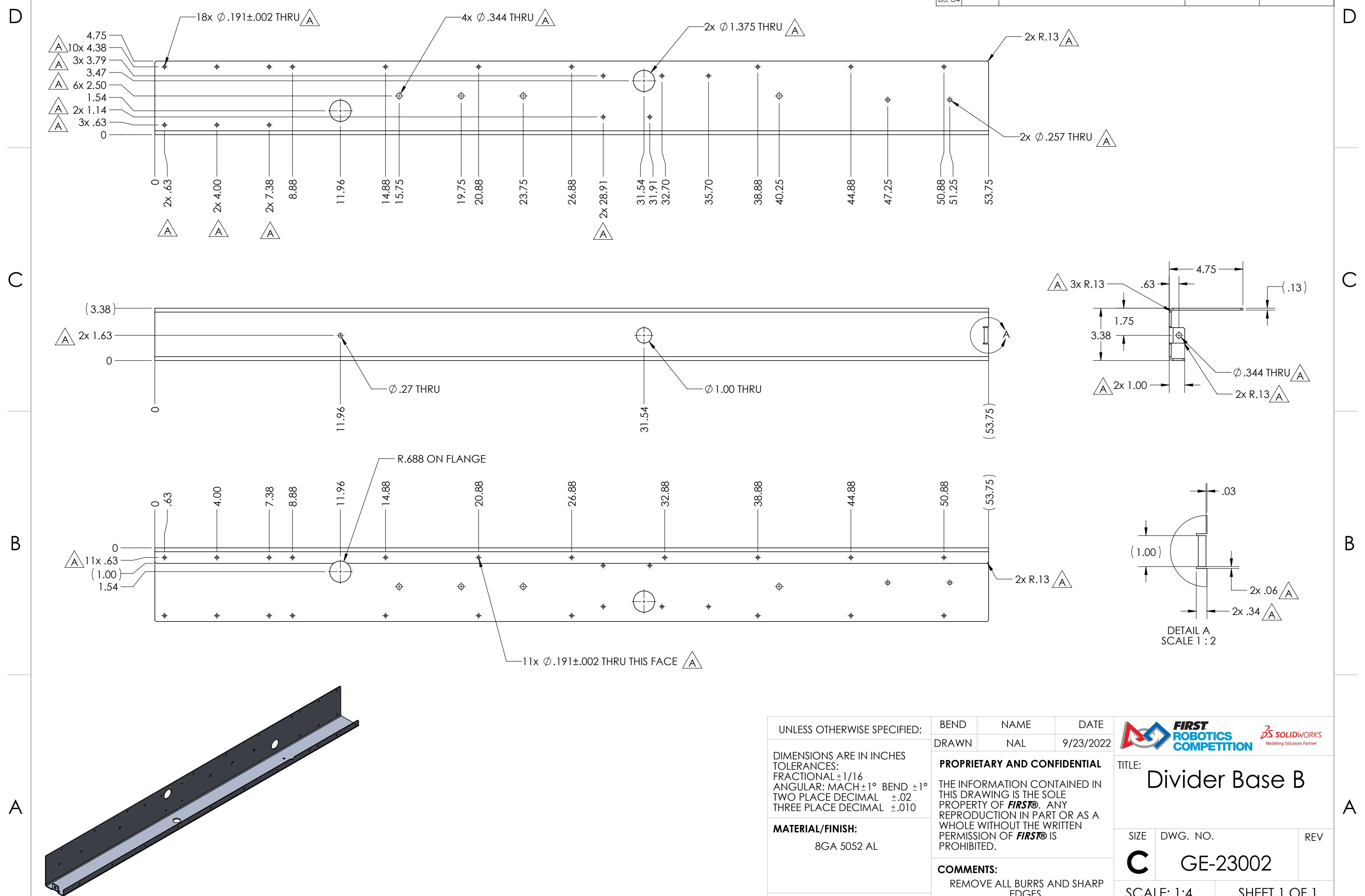
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REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
B1, B2, B4, C1, C3, C4, D1, D2, D3, D4	A	Style of Qty callouts, changed some holes from .391 to .344 for PEM nuts instead of Riv-Nuts, tolerance of rivet holes, added callout for .257 holes.	9/23/2022	JO



4

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2

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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23002	Divider Base B	1
2	pem_clinchnut_.25_20 .054	1/4-20 self-clinching nut, .054 shank	1

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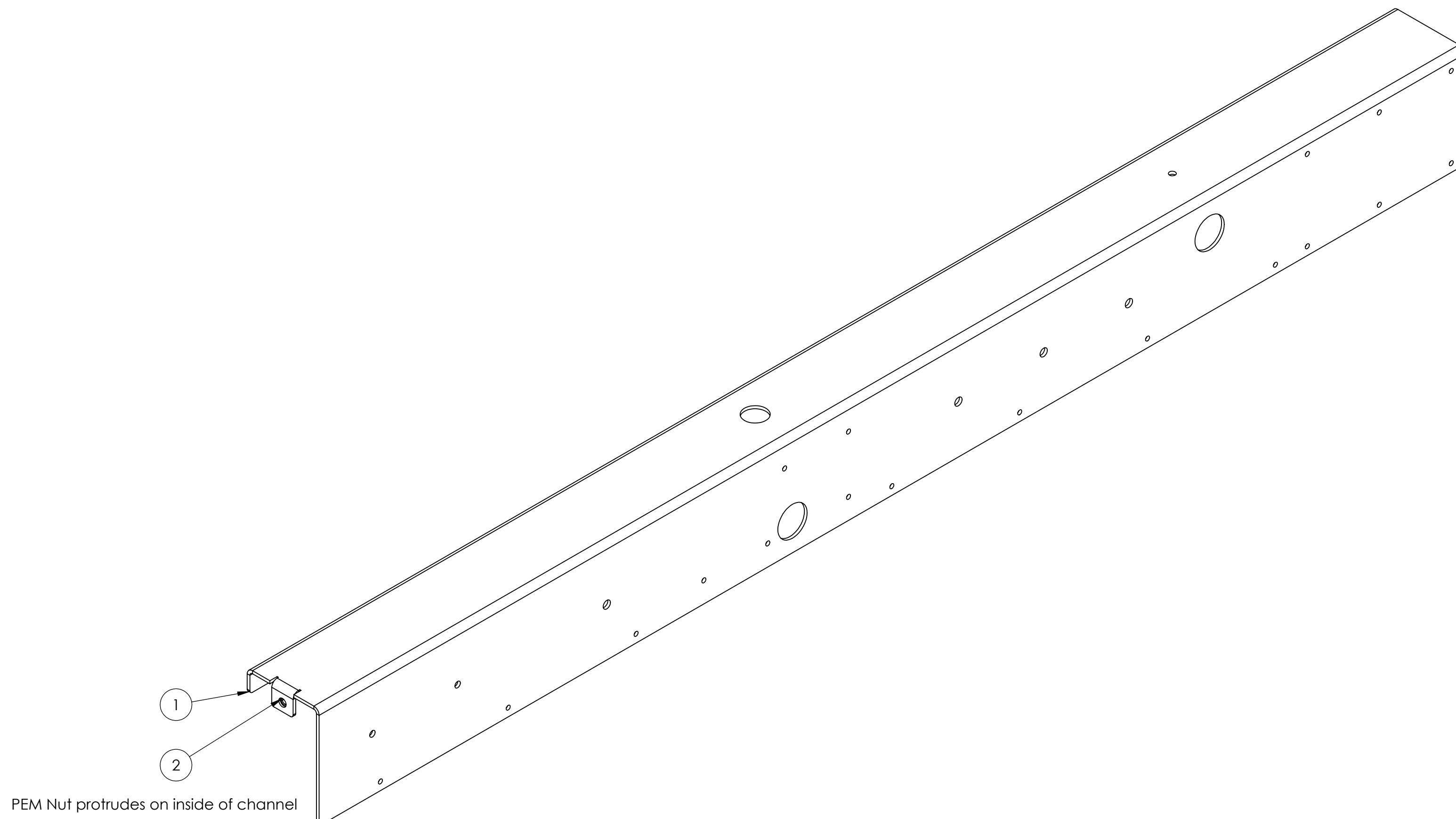
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UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	JO	10/4/2022	
PROPRIETARY AND CONFIDENTIAL			
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DO NOT SCALE DRAWING			
 FIRST ROBOTICS COMPETITION  SOLIDWORKS Modeling Solutions Partner			
TITLE: Divider Base B Config 1			
SIZE DWG. NO. REV			
C GE-23002-01			
SCALE: 1:8 SHEET 1 OF 1			

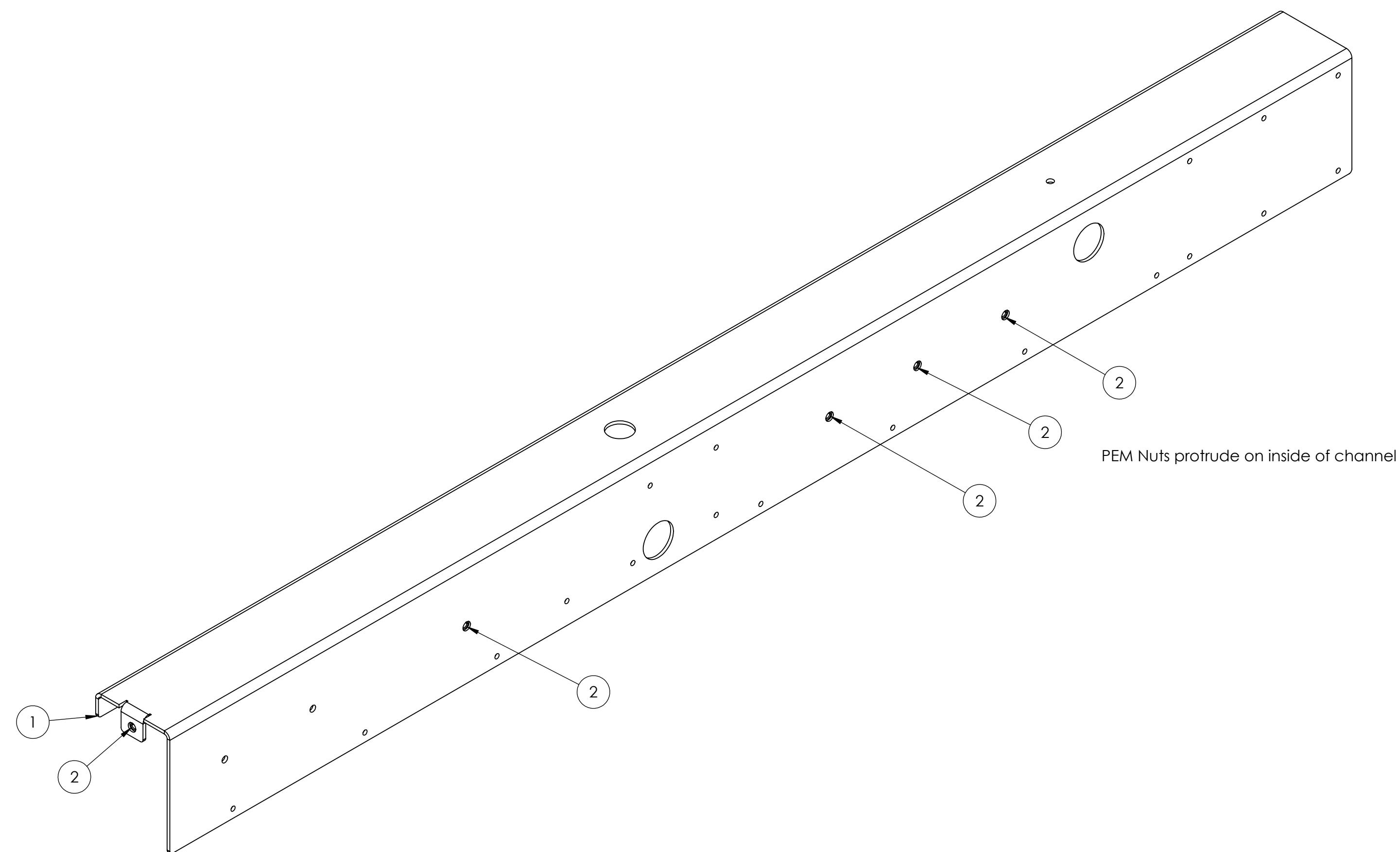
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23002	Divider Base B	1
2	pem_clinchnut_.25_20 .054	1/4-20 self-clinching nut, .054 shank	5



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

DRAWN

NAME

JO

DATE

10/4/2022



TITLE:

Divider Base B Config 2

SIZE

C

GE-23002-02

REV

COMMENTS:

REMOVE ALL BURRS AND SHARP
EDGES.

SCALE: 1:8

SHEET 1 OF 1

4

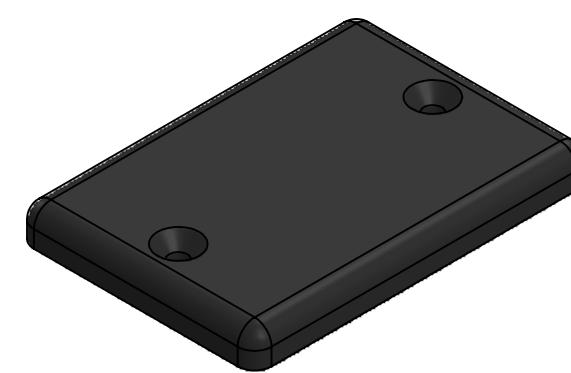
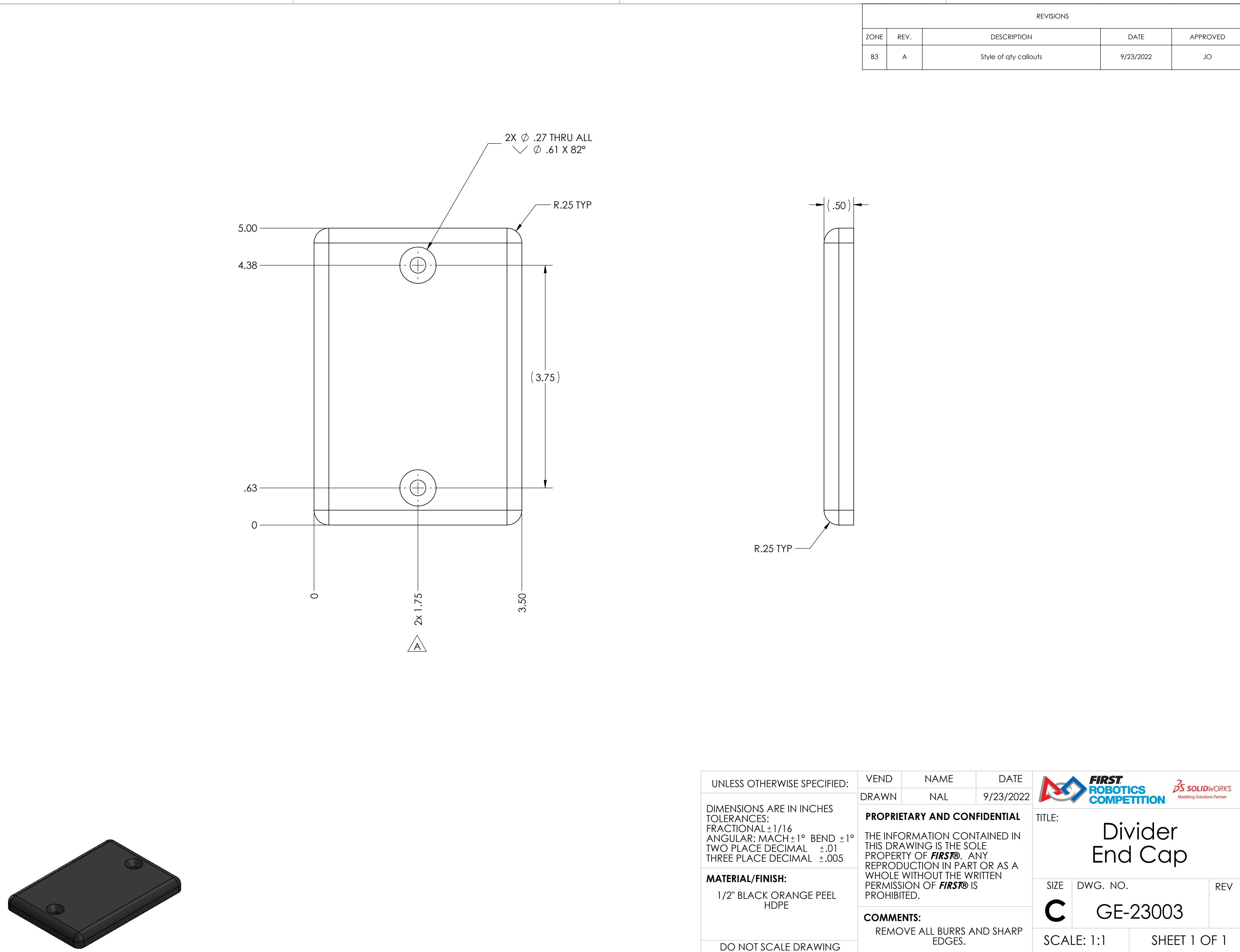
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UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	NAL	9/23/2022
TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$	PROPRIETARY AND CONFIDENTIAL		
TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .005$	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: 1/2" BLACK ORANGE PEEL HDPE	COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.		
DO NOT SCALE DRAWING			

 **FIRST ROBOTICS COMPETITION**  SOLIDWORKS
Modeling Solutions Partner

TITLE:
Divider End Cap

SIZE DWG. NO. REV

C GE-23003

SCALE: 1:1 SHEET 1 OF 1

4

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2

1

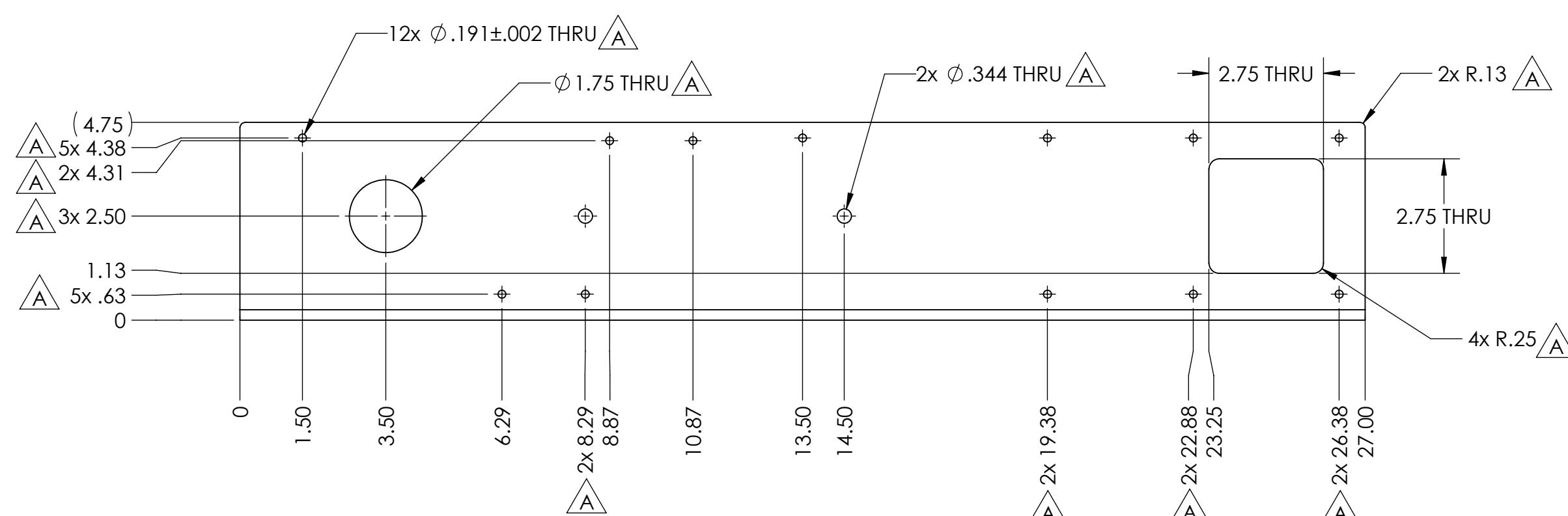
D

C

B

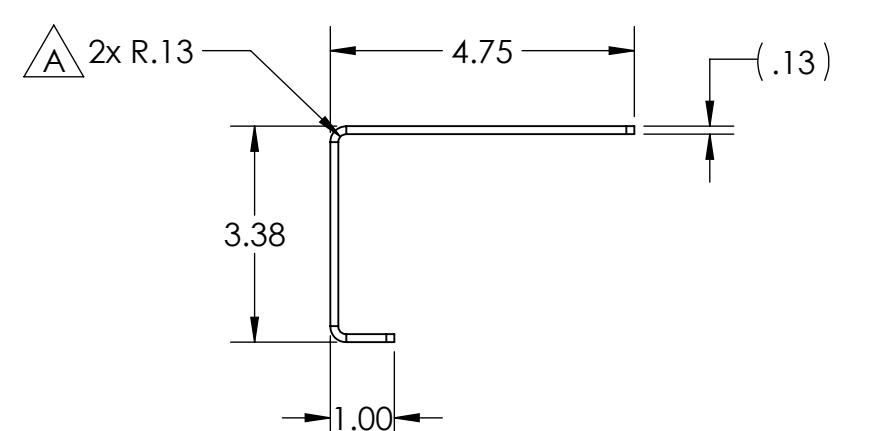
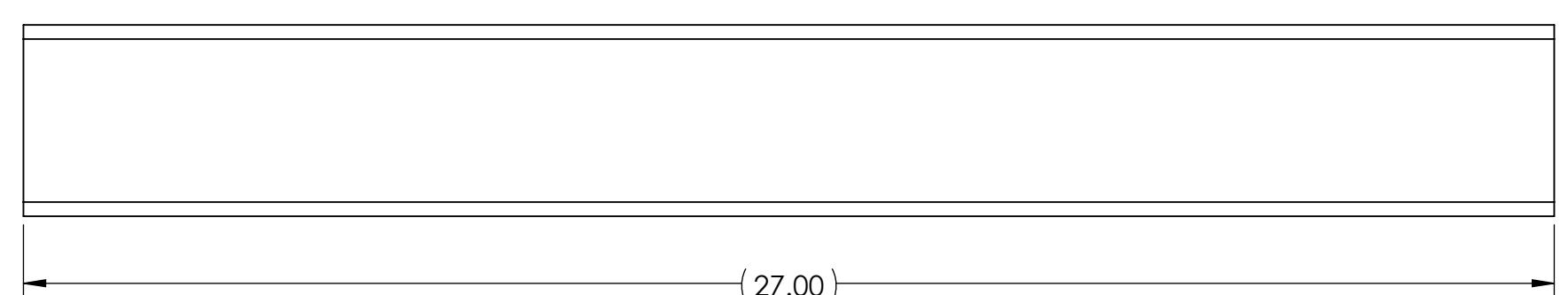
A

D

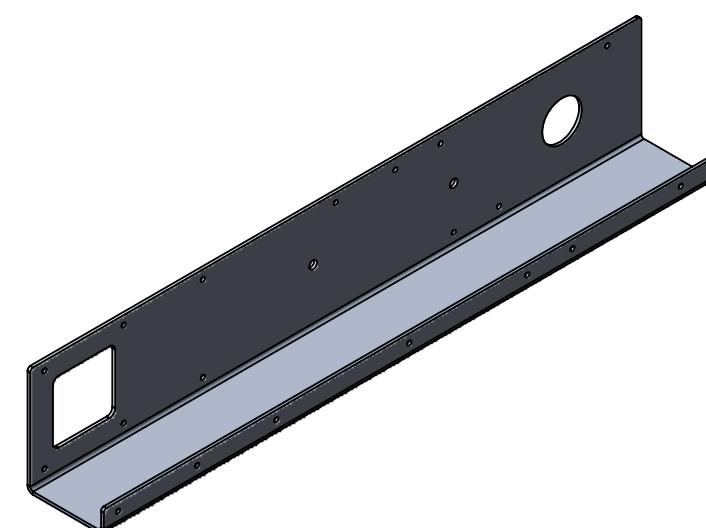
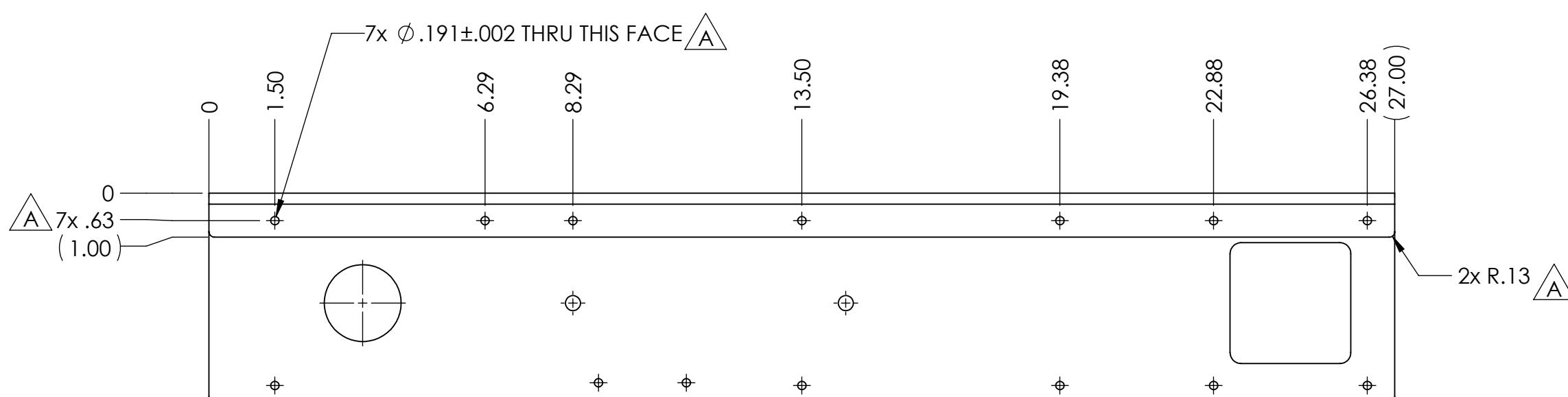


REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
B2, B3, B4, C2, C3, D2, D3, D4	A	Style of Qty callouts, changed some holes from .391 to .344 for PEM nuts instead of Riv-nuts, rivet hole tolerance	9/23/2022	JO

C



B



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 $\pm .010$

DO NOT SCALE DRAWING

BEND NAME DATE
DRAWN NAL 9/23/2022

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WHOLE WITHOUT THE WRITTEN
PERMISSION OF FIRST® IS
PROHIBITED.

MATERIAL/FINISH:
8GA 5052 AL

COMMENTS:

REMOVE ALL BURRS AND SHARP
EDGES.

FIRST
ROBOTICS
COMPETITION
SOLIDWORKS
Modeling Solutions Partner

TITLE: Divider Vertical
A

SIZE DWG. NO. REV

C GE-23004

SCALE: 1:3 SHEET 1 OF 1

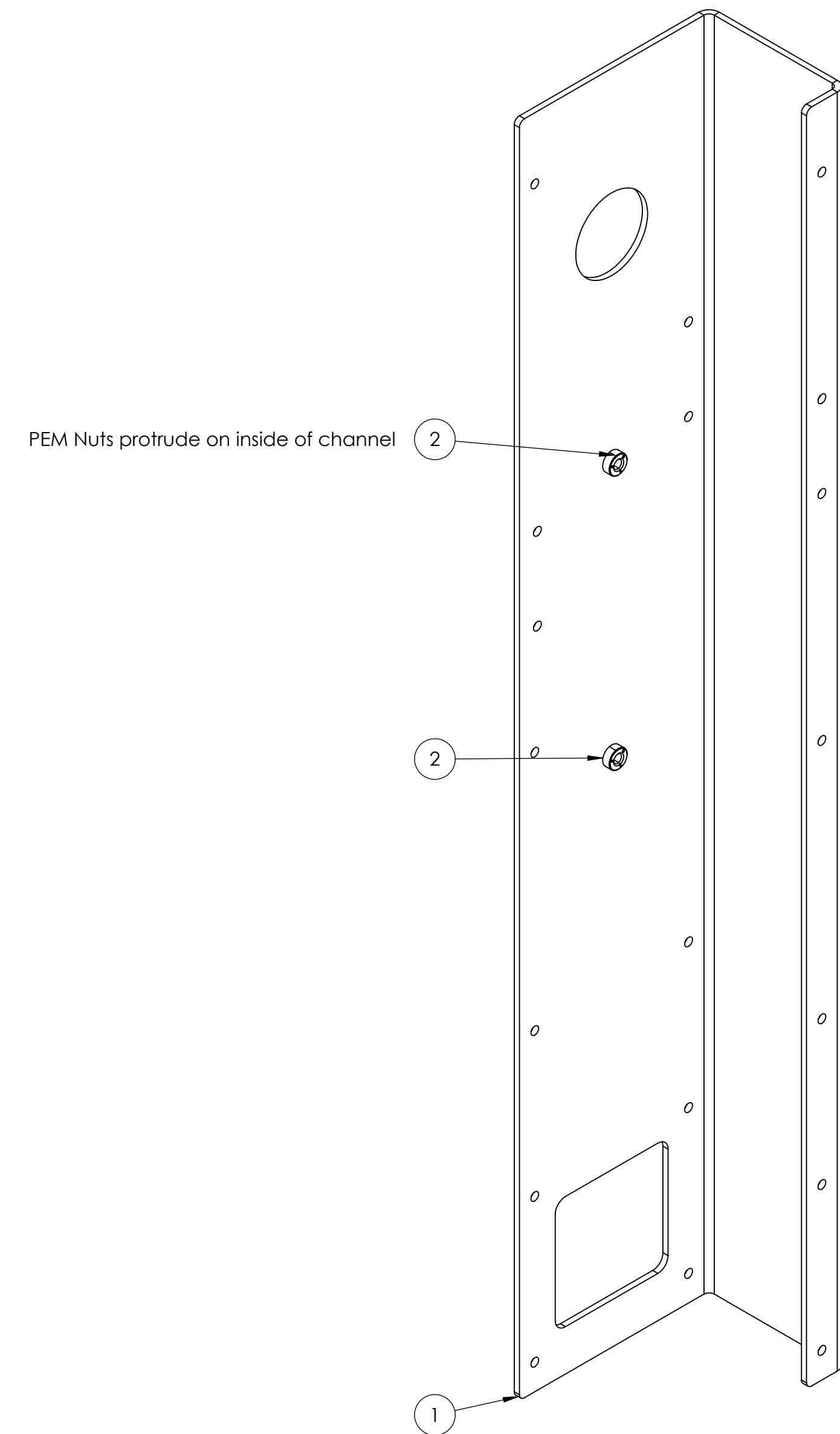
4

3

2

1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23004	Divider Vertical A	1
2	pem_clinchnut_.25_20_.054	1/4-20 self-clinching nut, .054 shank	2



PEM Nuts protrude on inside of channel

A diagram consisting of several geometric elements. On the left, there is a circle containing the number '2'. A horizontal line extends from the right side of this circle to a vertical line. From the right end of the vertical line, a curved arrow points towards the right.

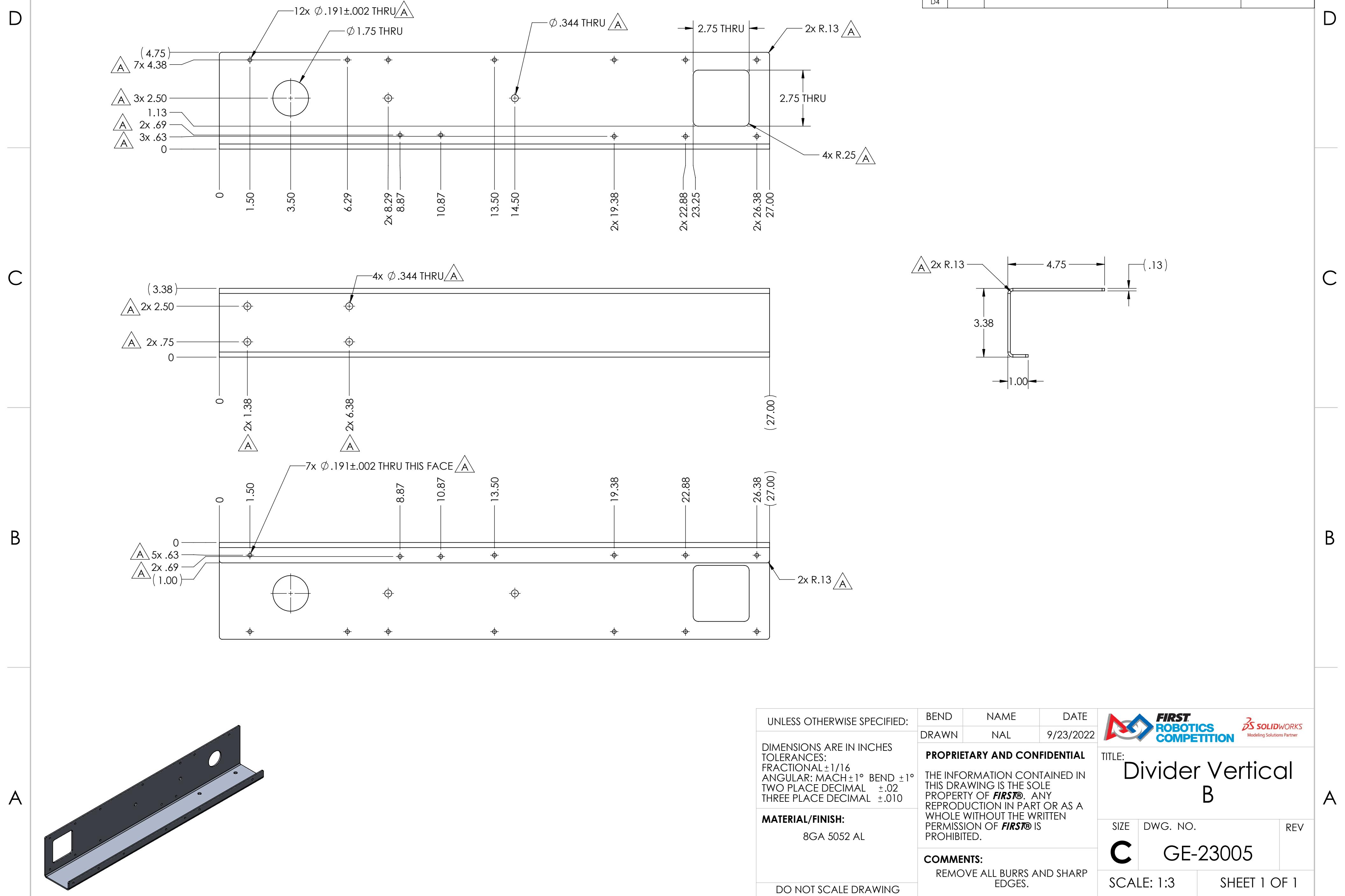
1

A diagram consisting of a circle containing the number '1'. A horizontal arrow originates from the right side of the circle and points towards the right.

UNLESS OTHERWISE SPECIFIED:			VEND	NAME	DATE
			DRAWN	JO	10/4/2022
			PROPRIETARY AND CONFIDENTIAL		
			<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>		
MATERIAL/FINISH:			COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.		
DO NOT SCALE DRAWING			SIZE	DWG. NO.	REV
			C	GE-23004-01	
			SCALE: 1:4	SHEET 1 OF 1	

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
B2, B3, B4, C2, C3, C4, D2, D3, D4	A	Changed style of qty callouts, changed some holes from .391 to .344 for PEM nuts instead of Riv-nuts, Rivet Hole Tolerance	9/23/2022	JO



4

3

2

1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23005	Divider Vertical B	1
2	pem_clinchnut_25_20 .054	1/4-20 self-clinching nut, .054 shank	4

D

D

C

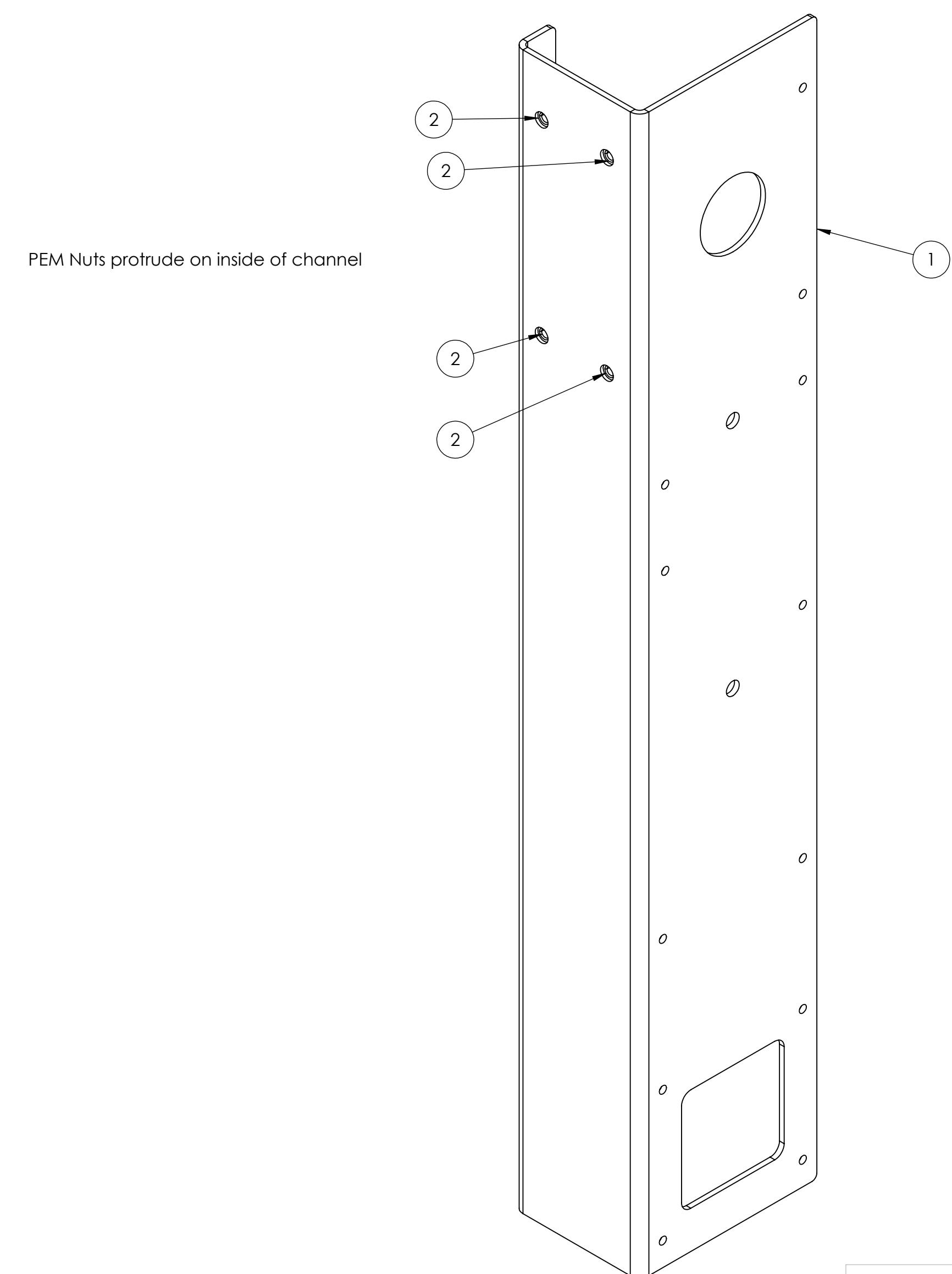
C

B

B

A

A



UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	JO	10/4/2022
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:	COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.		
DO NOT SCALE DRAWING			

FIRST ROBOTICS COMPETITION SOLIDWORKS Modeling Solutions Partner

TITLE: Divider Vertical B Config 1

SIZE DWG. NO. REV

C GE-23005-01

SCALE: 1:4 SHEET 1 OF 1

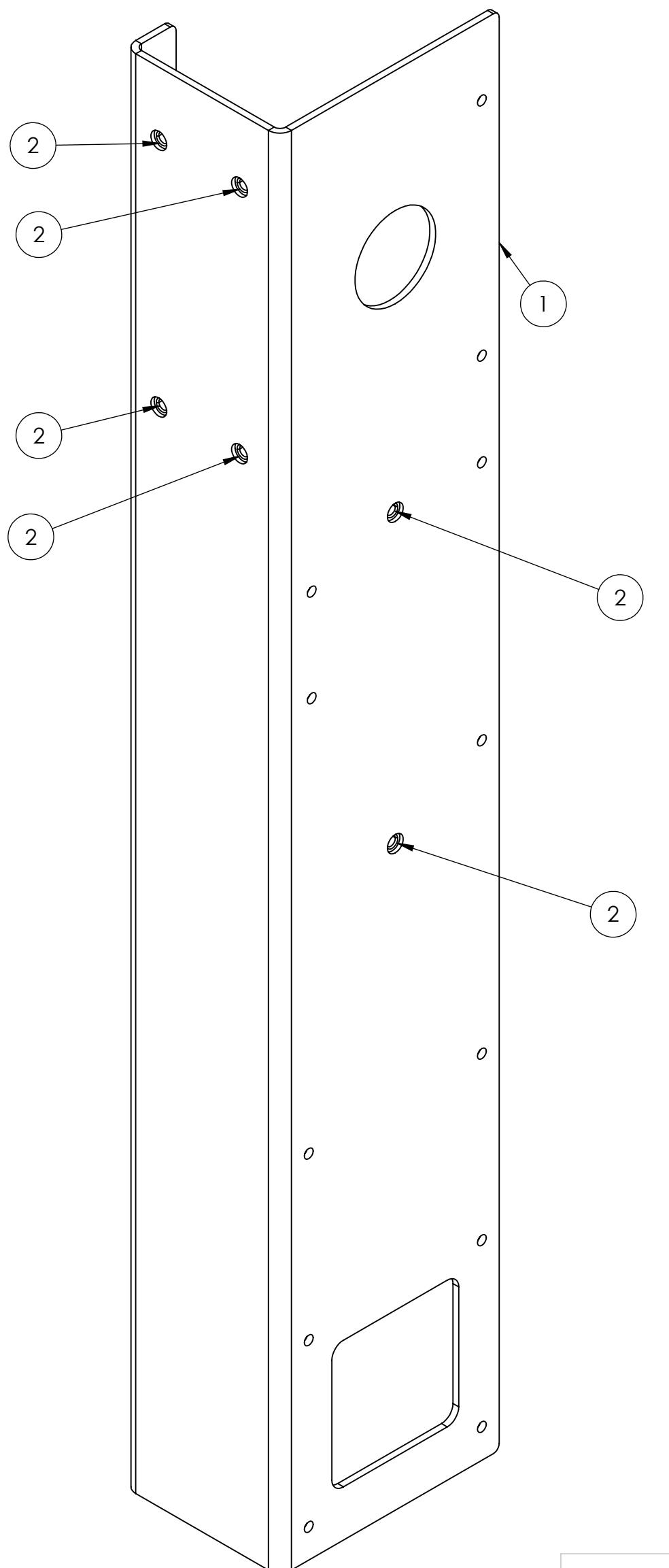
4

3

2

1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23005	Divider Vertical B	1
2	pem_clinchnut_.25_20 .054	1/4-20 self-clinching nut, .054 shank	6



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 10/4/2022

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COMMENTS:

REMOVE ALL BURRS AND SHARP EDGES.



TITLE:
Divider Vertical B Config 2

SIZE DWG. NO. REV

C GE-23005-02

SCALE: 1:4 SHEET 1 OF 1

4

3

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1

D

D

C

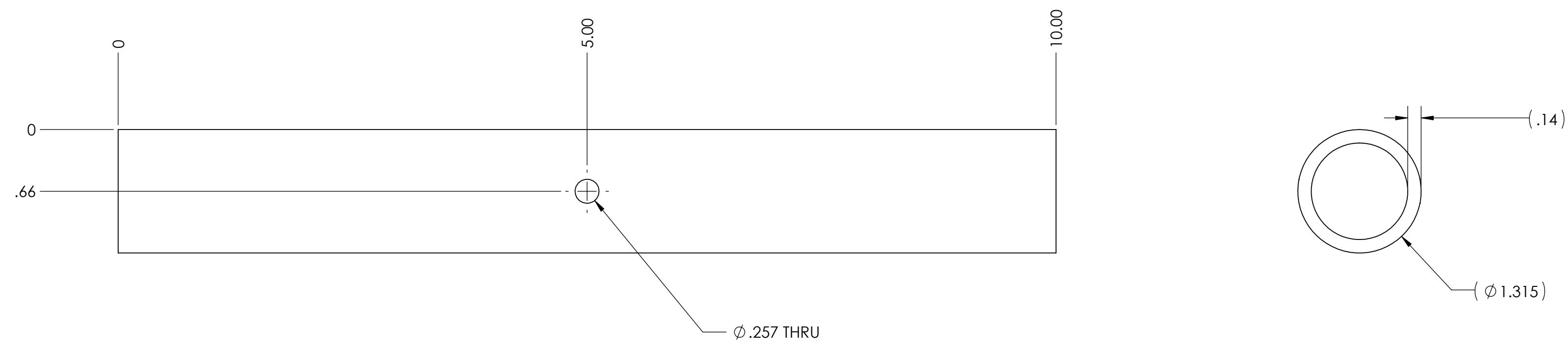
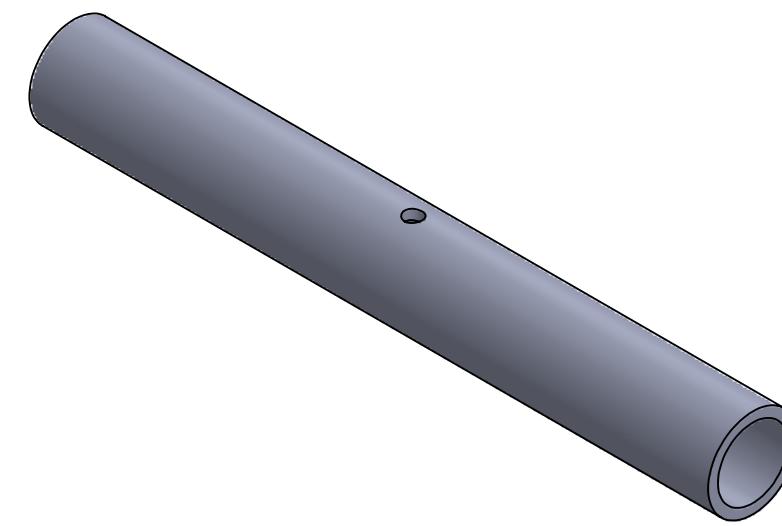
C

B

B

A

A



UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	NAL	9/23/2022
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH: 1" SCH40 Al Tube			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

 FIRST
ROBOTICS
COMPETITION  SOLIDWORKS
Modeling Solutions Partner

TITLE: Divider Middle
Bottom Connector
Pin

SIZE DWG. NO. REV
C GE-23006

SCALE: 1:1 SHEET 1 OF 1

4

3

2

1

4

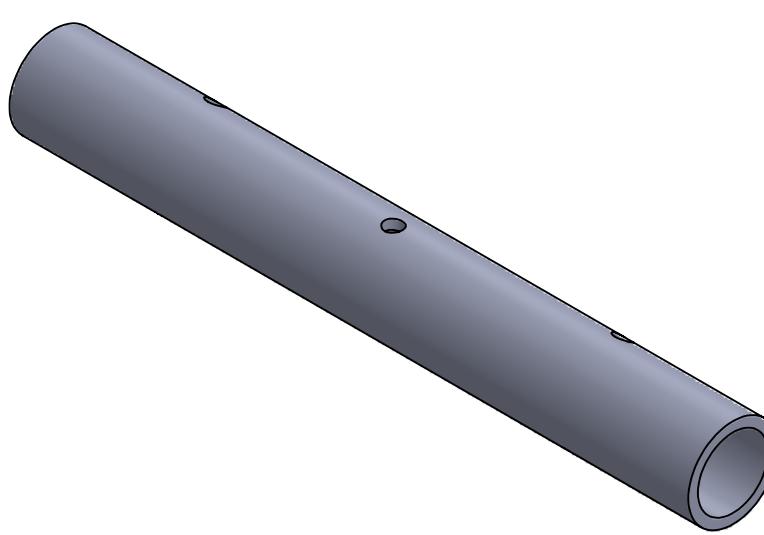
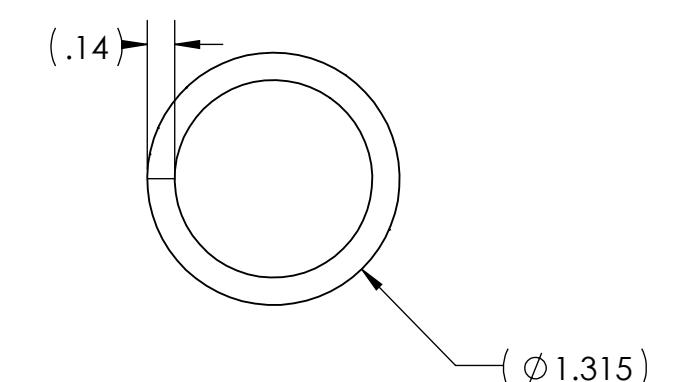
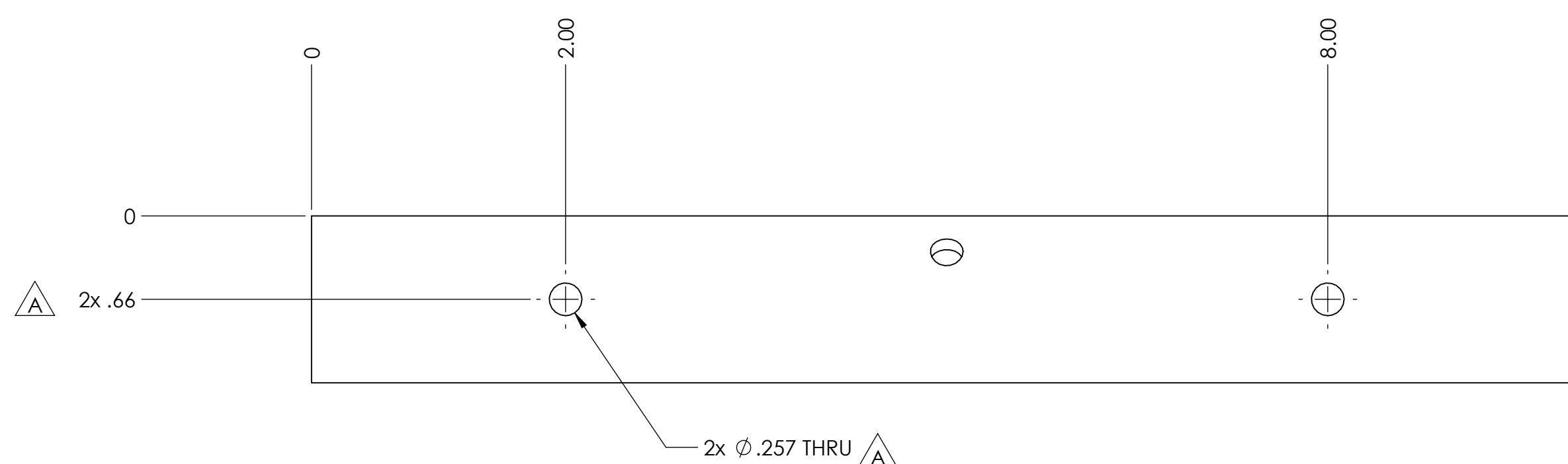
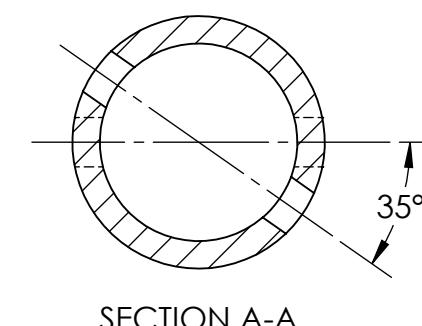
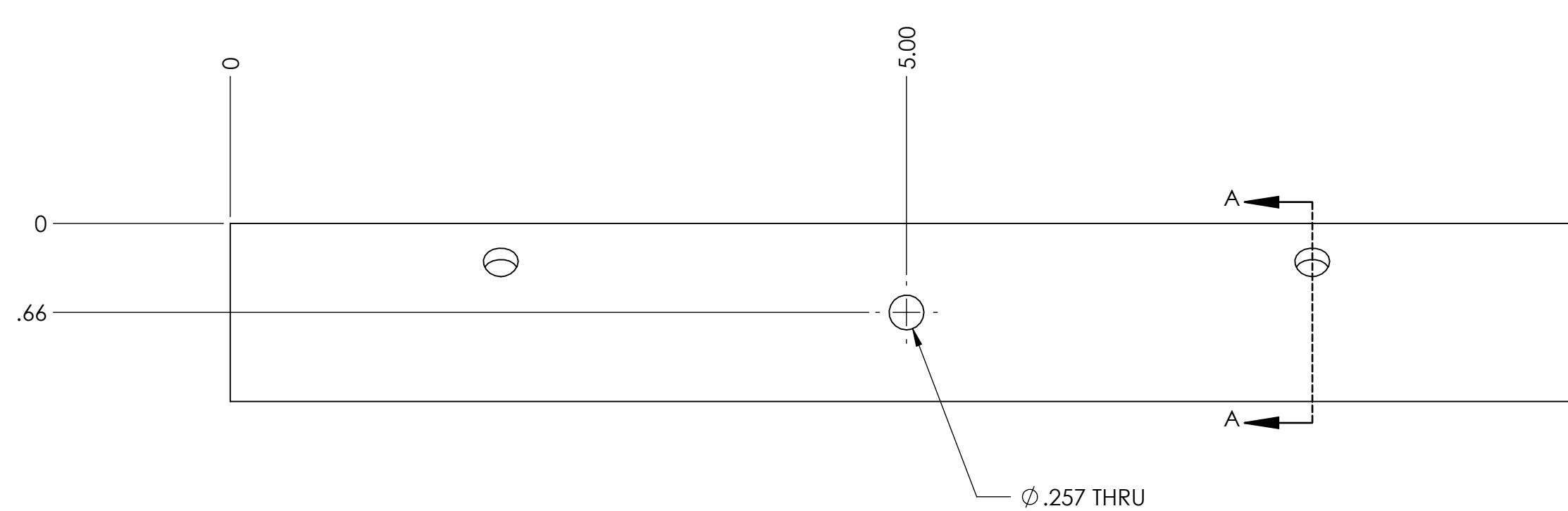
3

2

1

D

D



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 NAL 9/23/2022

FIRST ROBOTICS COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE: Divider Angle Brace Connector Pin

SIZE DWG. NO. REV

C GE-23007

SCALE: 1:1 SHEET 1 OF 1

PROPRIETARY AND CONFIDENTIAL
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MATERIAL/FINISH:
1in SCH40 AL Tube

COMMENTS:
REMOVE ALL BURRS AND SHARP EDGES.

DO NOT SCALE DRAWING

A

A

4

3

2

1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
A2, B3, B4, C4, D3, D4	A	Style of Qty callouts, Rivet Hole Tolerance, Block Tolerance	9/23/2022	JO

D

D

C

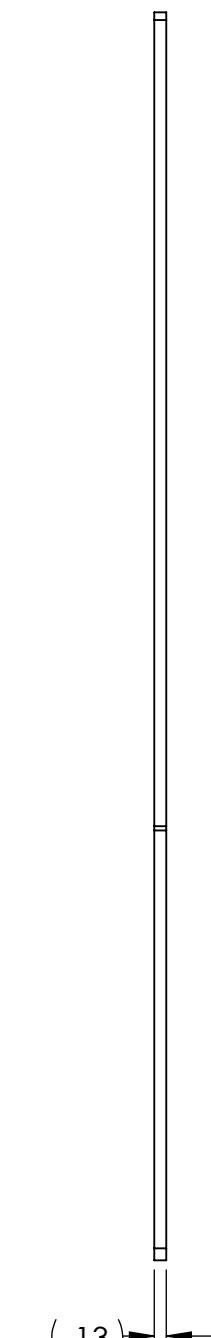
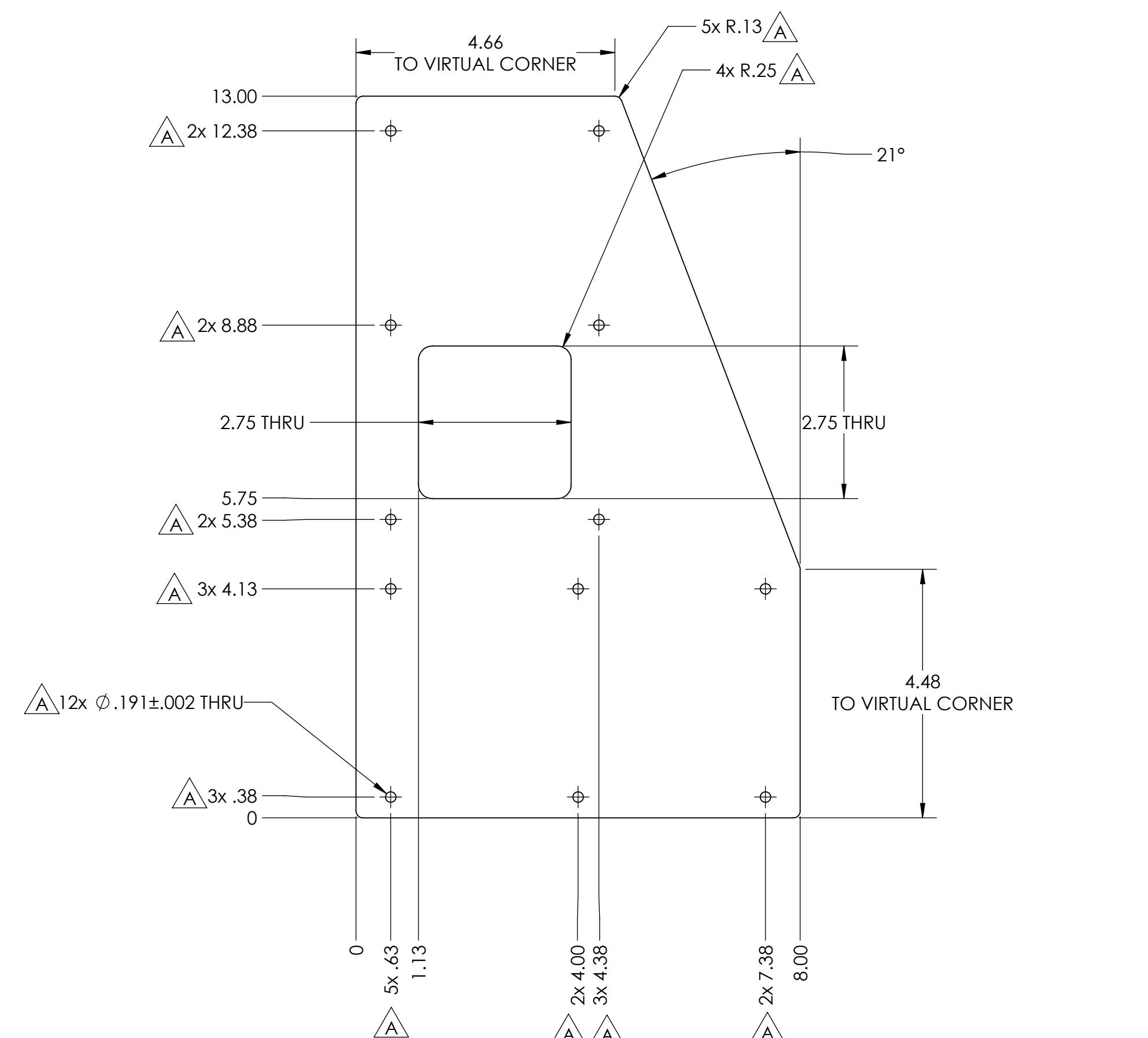
C

B

B

A

A



UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	NAL	9/23/2022	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH: 8GA 5052 AL			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
**Divider 90
Gusset**

SIZE DWG. NO. REV

C GE-23008

SCALE: 1:2 SHEET 1 OF 1

4

3

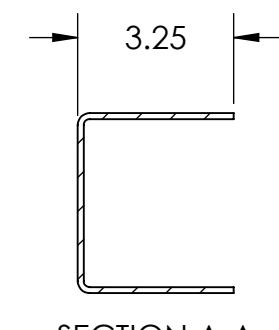
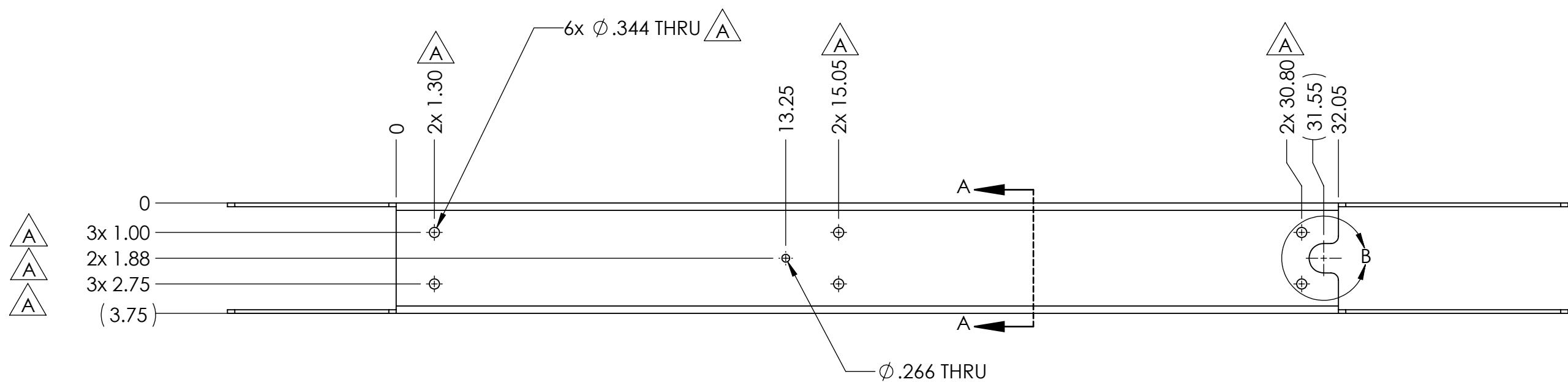
2

1

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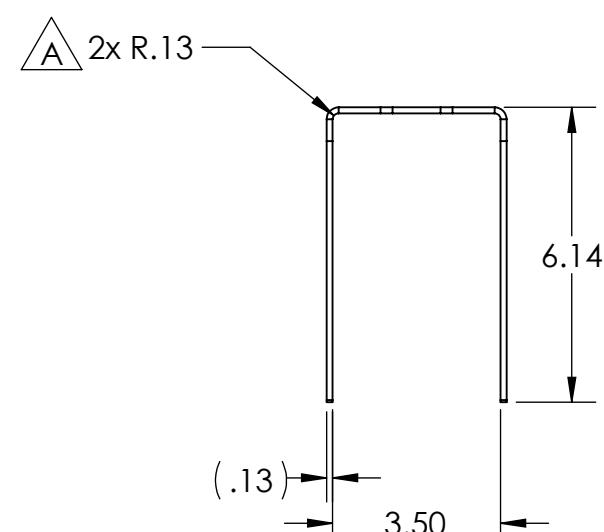
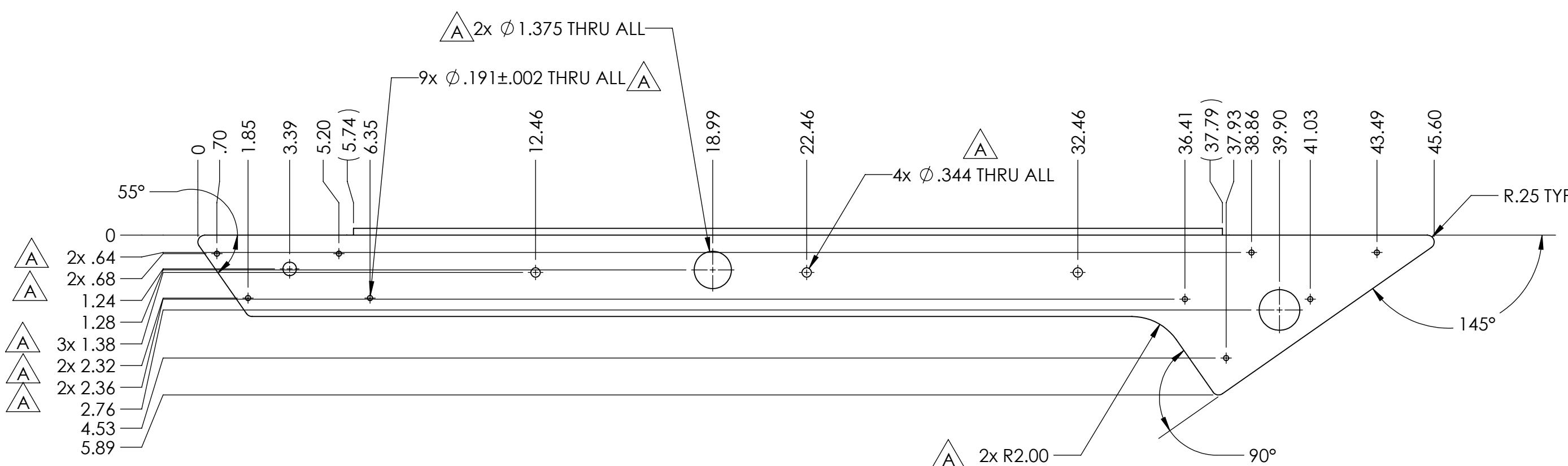
REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
A2, B3, B4, C1, C3, C4, D2, D3, D4	A	Style of Qty callouts, changed some holes from .391 to .344 for PEM nuts instead of Riv-Nuts, Rivet Hole Tolerance	9/23/2022	JO



SECTION A-A

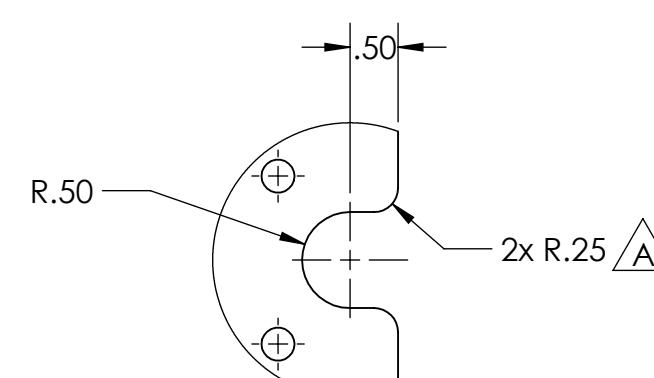
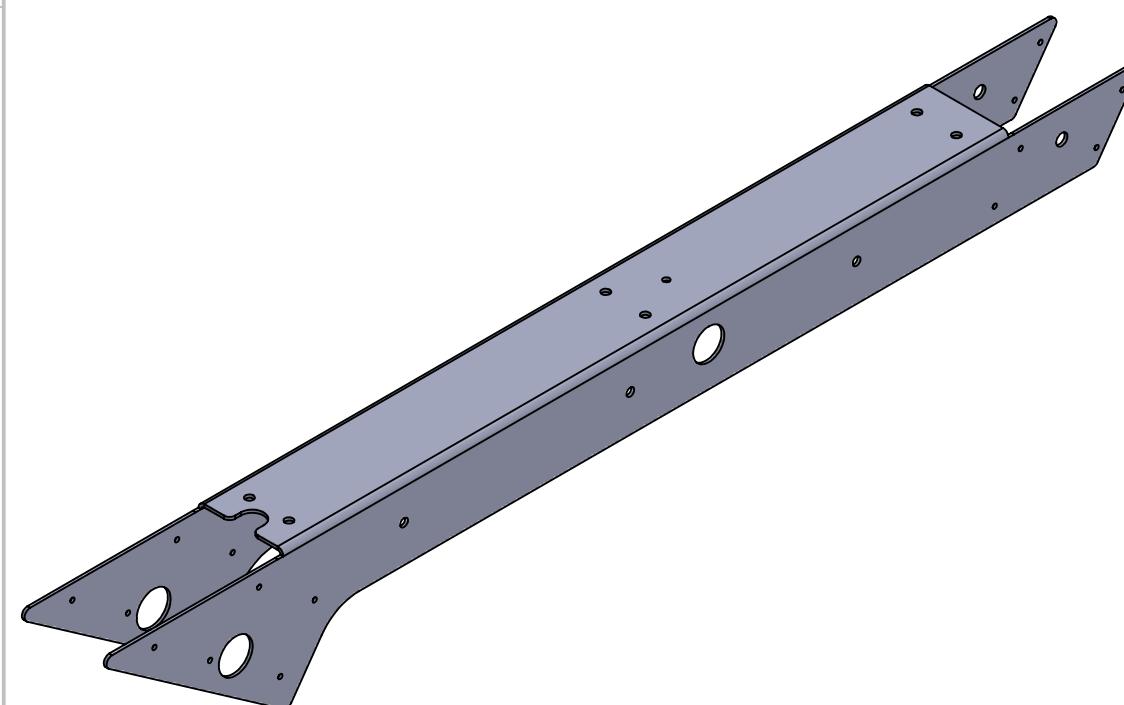
○

○



E

B



DETAIL B
SCALE 1 : 2

UNLESS OTHERWISE SPECIFIED:		BEND	NAME	DATE			
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	NAL	9/23/2022			
MATERIAL/FINISH: 8GA 5052 AL		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-23009		
					SCALE: 1:4	SHEET 1 OF 1	

4

3

2

1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23009	Divider Angle Brace	1
2	pem_clinchnut_25_20 .054	1/4-20 self-clinching nut, .054 shank	6

D

D

C

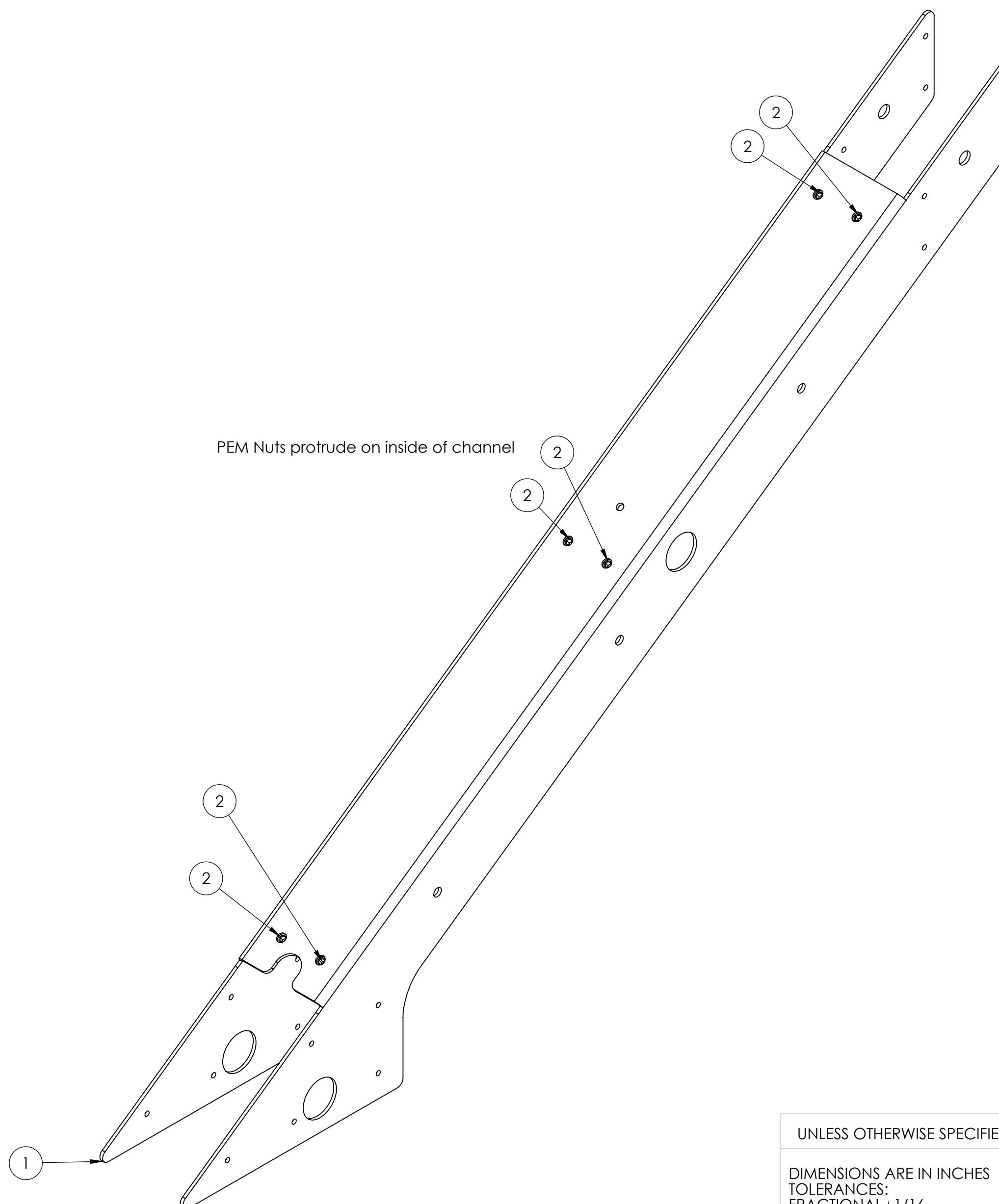
C

B

B

A

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:

DO NOT SCALE DRAWING

VEND NAME DATE

DRAWN JO 10/4/2022

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COMMENTS:

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TITLE:
**Divider Angle
Brace Config 1**

SIZE DWG. NO. REV

C GE-23009-01

SCALE: 1:8 SHEET 1 OF 1

4

3

2

1

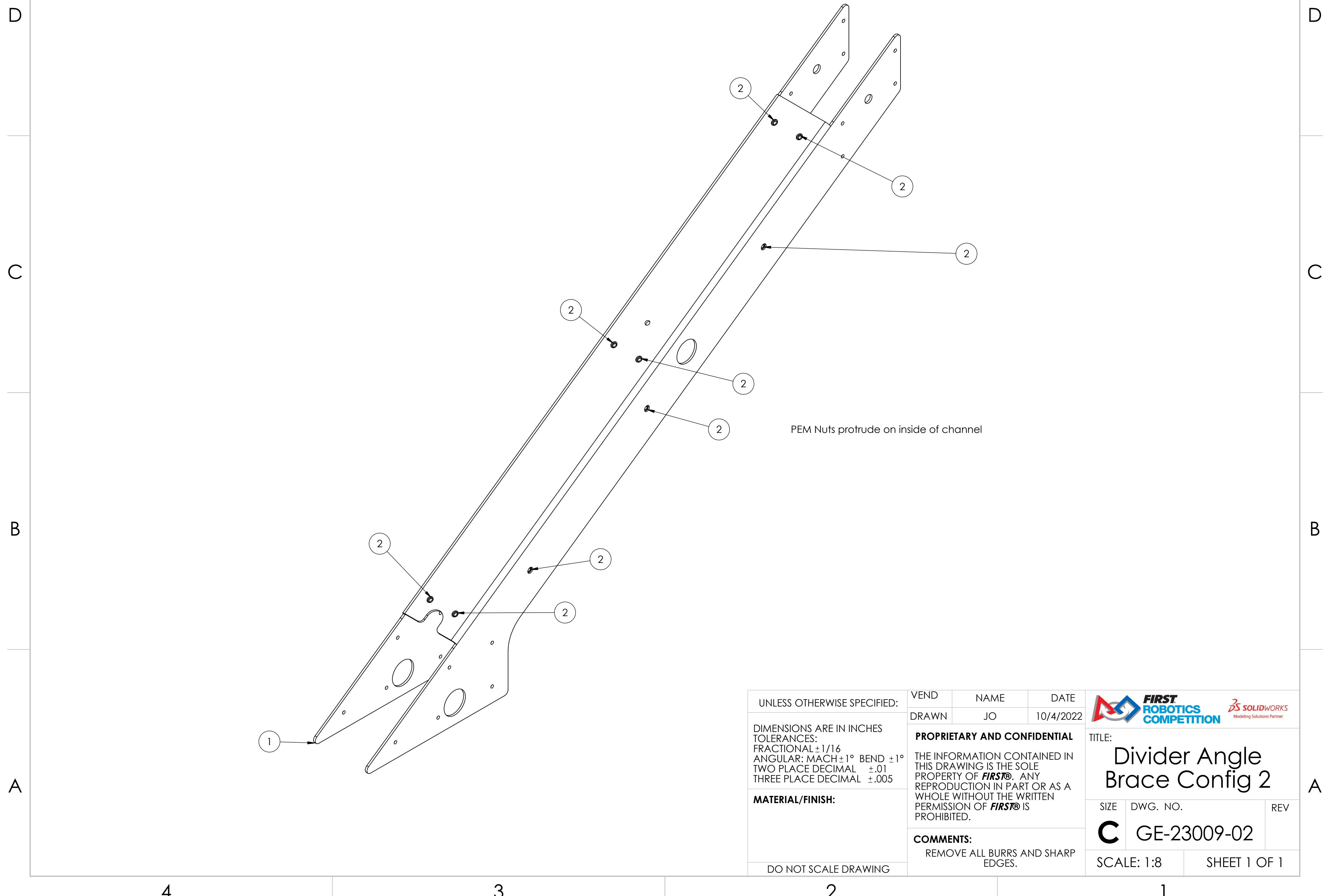
4

3

2

1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23009	Divider Angle Brace	1
2	pem_clinchnut_.25_20 .054	1/4-20 self-clinching nut, .054 shank	9



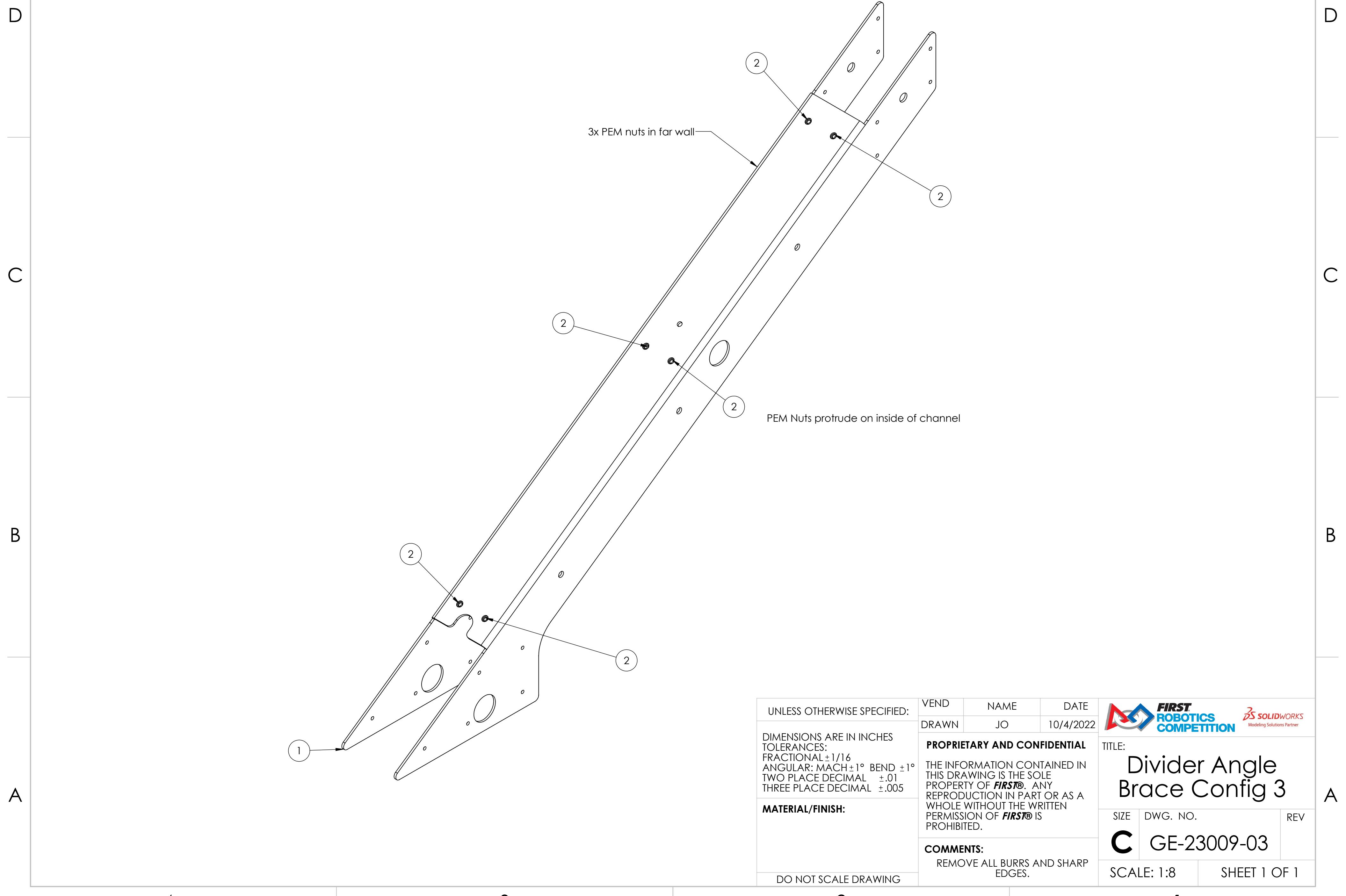
4

3

2

1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23009	Divider Angle Brace	1
2	pem_clinchnut_25_20 .054	1/4-20 self-clinching nut, .054 shank	9



4

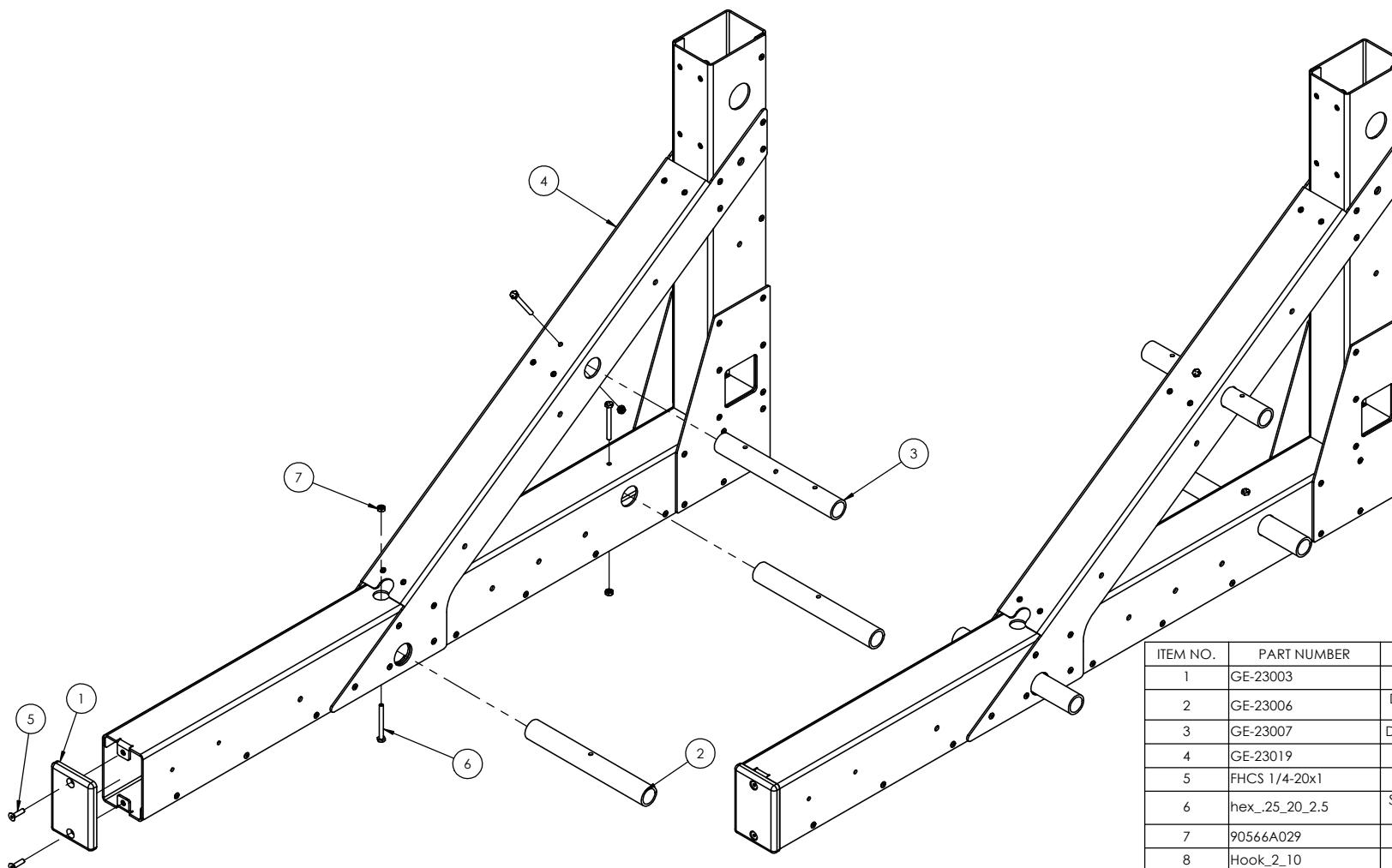
3

2

1

D

D



Assembly Notes:

1. Ensure Unused Holes on (3) are vertical after installation

UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE	 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 $\pm .50$	DRAWN	JO	9/29/2022	TITLE: Middle Divider		
MATERIAL/FINISH:	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
	COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			C	GE-23010	
DO NOT SCALE DRAWING				SCALE: 1:5	SHEET 1 OF 1	

4

3

2

1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
B2, B3, B4, C1, C2, C4, D3, D4	A	Style of Qty callouts, rivet hole tolerance	9/23/2022	JO

D

This technical drawing shows a cross-sectional view of a mechanical part. The vertical axis is labeled with dimensions: 0, .48, .88, 1.81, 2.88, and 3.14. Feature callouts indicate specific dimensions: "10x Ø.191±.002 THRU THIS FACE" at the top, "2x .25" on the left, and "2x 8.13", "3x 9.13", and "2x 10.13" on the right. A circle with a crosshair is located in the lower right quadrant. The drawing uses standard engineering conventions like leader lines and callout boxes.

The diagram shows a corner bracket assembly. A vertical leg on the left has a top width of (.13) and a height of 3.76 to a 'TO VIRTUAL CORNER'. The bracket turns 145° at its junction. The horizontal leg has a radius of R.25 at its entry point. It then turns 35° downwards, with a distance of 4.79 to another 'TO VIRTUAL CORNER'. A U-shaped cutout is located at the bottom right end of the horizontal leg, with a depth of 1.4. Two arrows labeled 'B' point to the vertical leg and the horizontal leg respectively.

Technical drawing showing a part with a central hole and a stepped base. The top surface has a diameter of 18.25 mm. The base has a height of 13.13 mm and a shoulder of 9.13 mm. A note specifies five holes of diameter 0.191 ± 0.002 mm through the base face.

3

This technical drawing shows a top-down view of a rectangular component. The overall width is 2x 18.00 (36.00 mm). The left edge has a thickness of 2x .25 (0.50 mm) and a height of 2x 2.17 (4.34 mm) above a horizontal line at 0. The right edge has a height of 2x 18.00 (36.00 mm) above a horizontal line at 0, with a note indicating a thickness of (.18.25) mm. A central circular hole has a diameter of 4x Ø.191±.002. Four small circular features are located at the corners of the rectangle. A leader line points to one of these corner features with the text "4x Ø.191±.002 THRU THIS FACE". A view reference "VIEW B-B" with an angle of "35.00°" is also present.

A 3D rendering of a rectangular metal plate with a light blue surface and a grey top layer. The plate features a central circular hole and two sets of corner cutouts: one set on the shorter sides and another set on the longer sides. Small circular holes are also present along the edges between the main features.

1000

FILED:	BEND	NAME	DATE
	DRAWN	MAK	6/22/2000

 FIRST
ROBOTICS
COMPETITION

 SOLIDWORKS
Modeling Solutions Partner

DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL $\pm 1/16$
ANGULAR: MACH $\pm 1^\circ$ BEND
TWO PLACE DECIMAL $\pm .02$
THREE PLACE DECIMAL $\pm .01$

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MATERIAL/FINISH:

COMMENTS:

DO NOT SCALE DRAWING

3

2

1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
B2, B3, B4, C2, C3, C4	A	Style of Qty callouts, Rivet Hole Tolerance	9/23/2022	JO

D

D

C

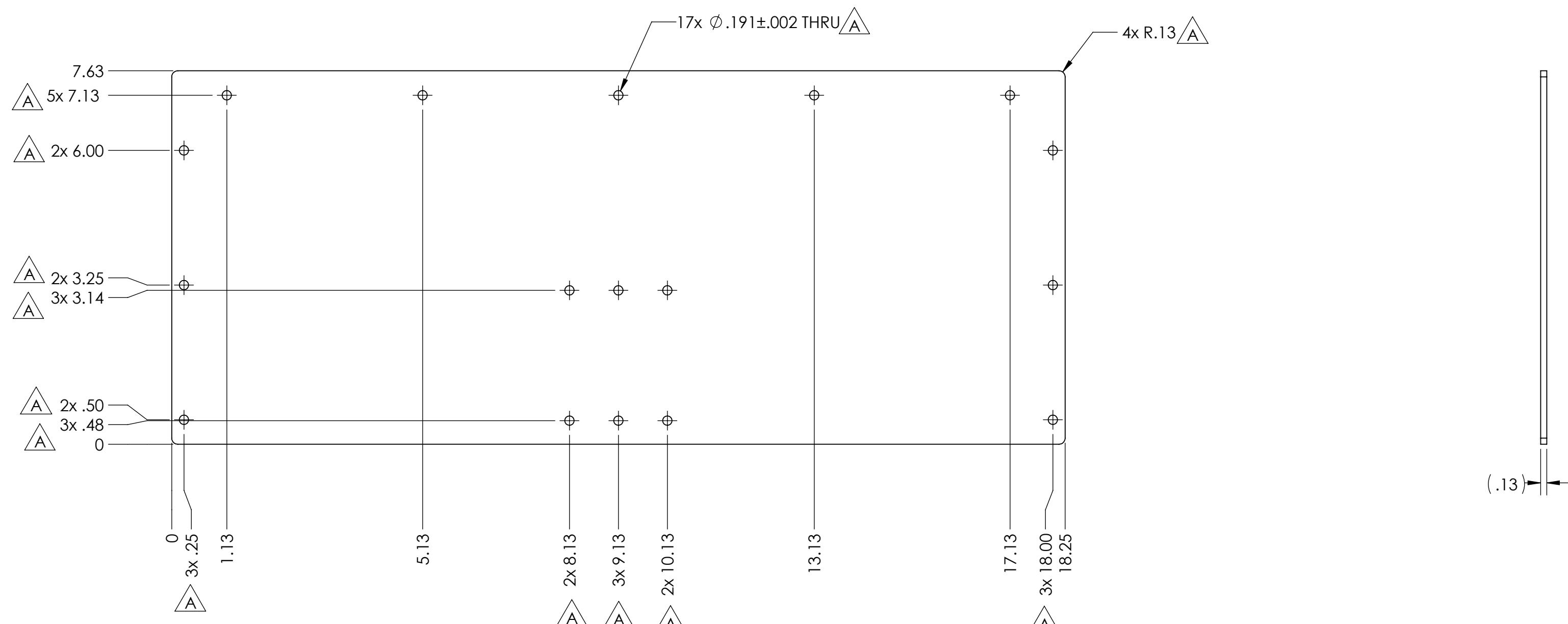
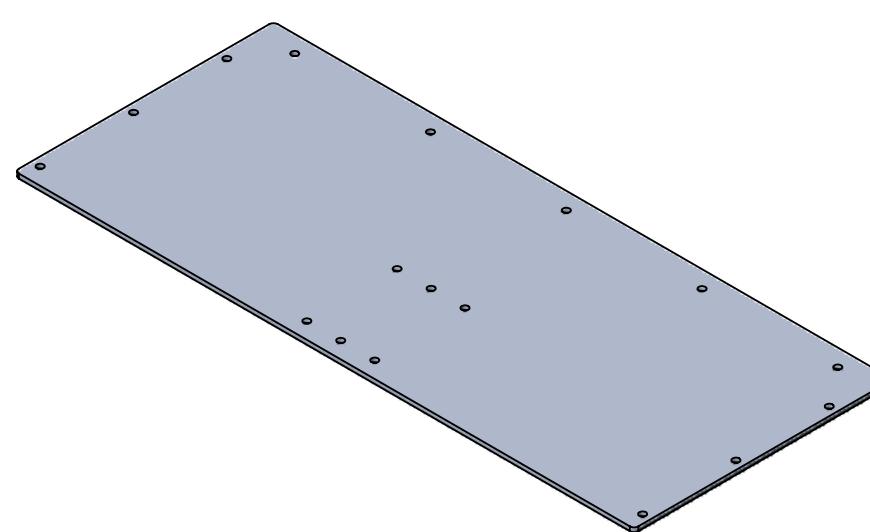
C

B

B

A

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:

8GA 5052 AL

DO NOT SCALE DRAWING

VEND DATE

DRAWN NAL 9/23/2022

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COMMENTS:

REMOVE ALL BURRS AND SHARP EDGES.

FIRST ROBOTICS COMPETITION

SOLIDWORKS

Modeling Solutions Partner

TITLE:

Lower Pole
Base Bottom

SIZE

DWG. NO.

REV

C GE-23012

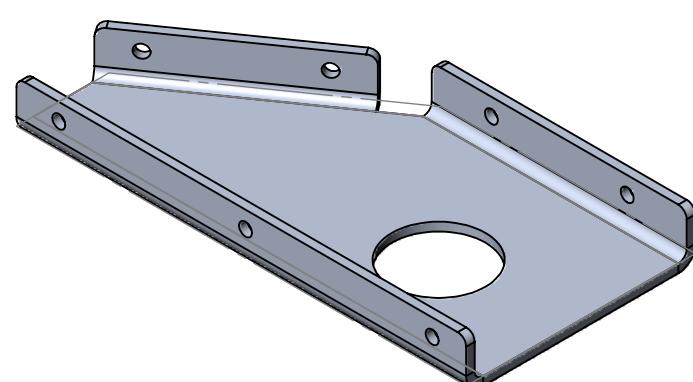
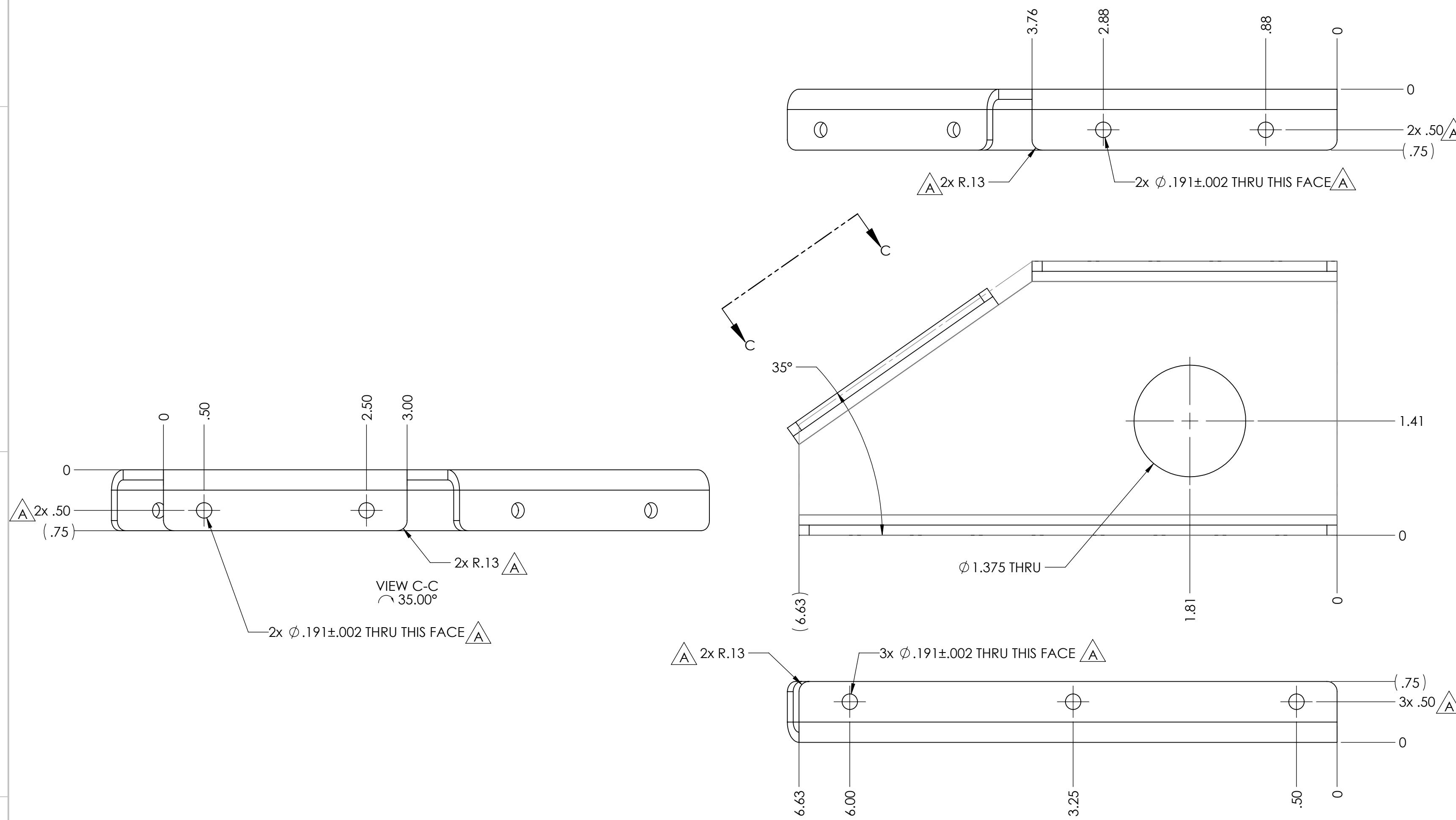
SCALE: 1:2 SHEET 1 OF 1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
B1, B2, B3, B4, C1, C2	A	Style of Qty Callouts, Rivet Hole Tolerance	9/23/2022	JO

D

D



B

B

A

A

UNLESS OTHERWISE SPECIFIED

UNLESS OTHERWISE SPECIFIED: BEND NAME DATE
DRAWN NAL 6/26/2000

DIMENSIONS ARE IN INCHES
TOLERANCES

PROPRIETARY AND CONFIDENTIAL

TOLERANCES: FRACTIONAL + 1/4

FRACTIONAL ± 1/16
ANGULAR MACH ± 1° BEND

ANGULAR. MACH ± 1 BEND
TWO PLACE DECIMAL ± .0

MATERIAL / FINISH

MATERIAL/FINISH:

8GA 5052 AL

 FIRST[®]
ROBOTICS

TITLE: Lower Pole Base Side A

SIZE	DWG. NO.	REV
------	----------	-----

SCALE: 1:1 SHEET 1 OF 1

4

3

2

1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
A2, A3, B1, B4, C1, C3, D1, D2	A	Style of Qty Callouts, Rivet Hole Tolerance	9/23/2022	JO

D

D

C

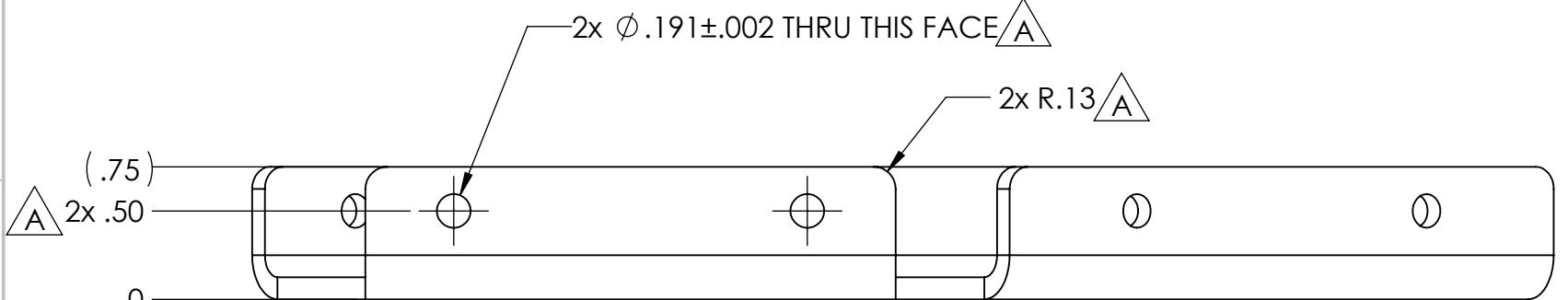
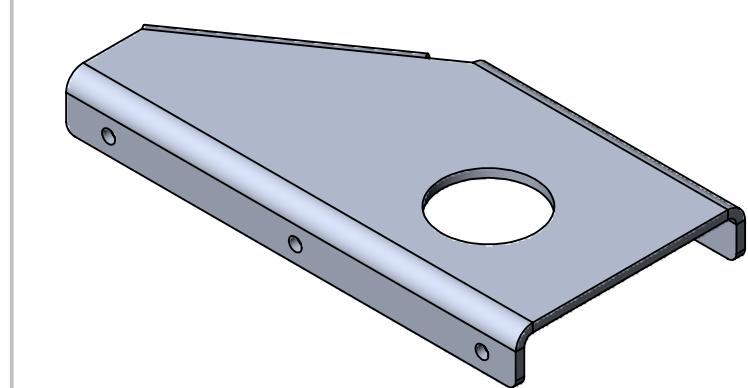
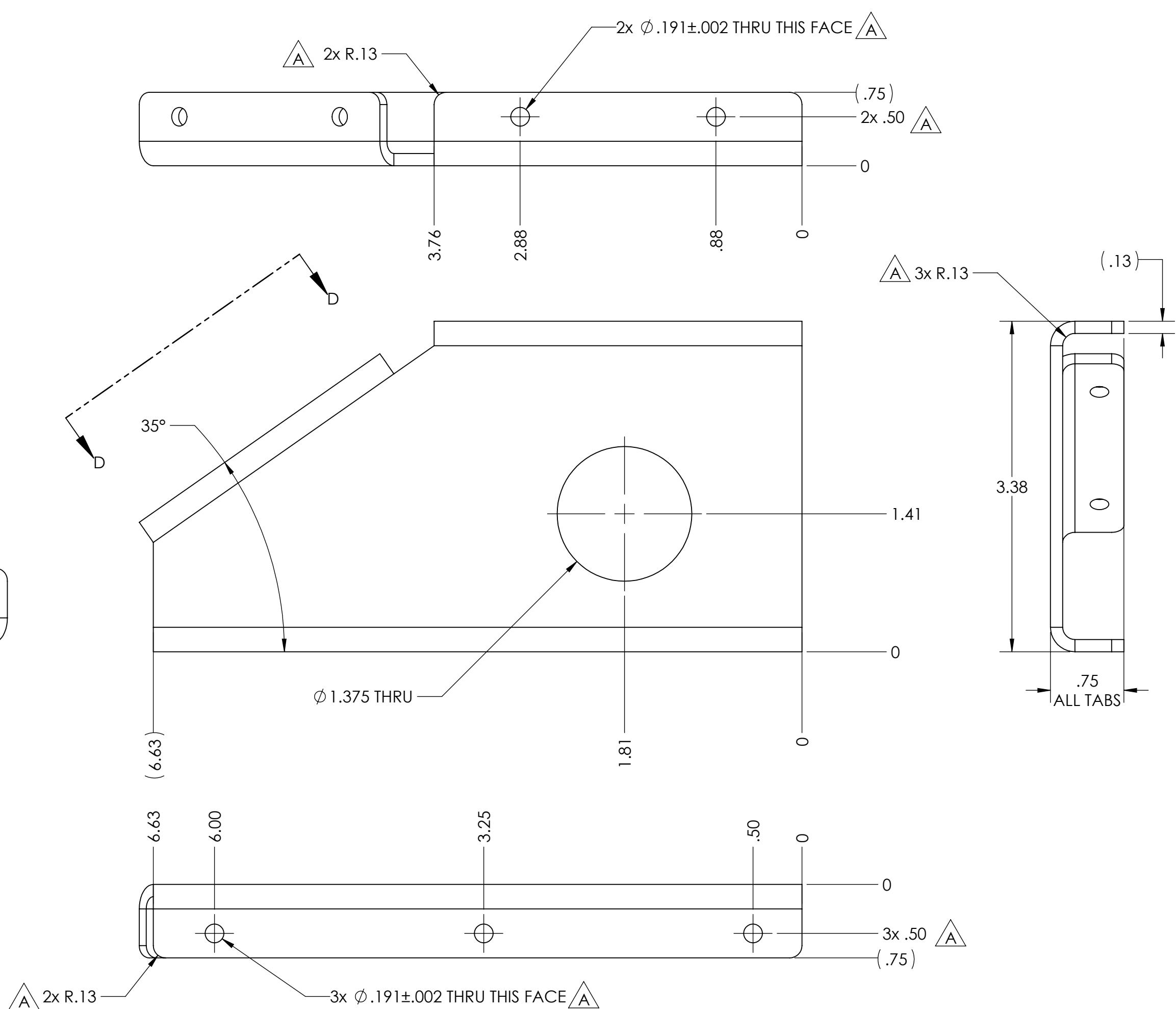
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VIEW D-D
35.00°

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 NAL 9/23/2022

PROPRIETARY AND CONFIDENTIAL

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MATERIAL/FINISH:
8GA 5052 AL

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

FIRST ROBOTICS COMPETITION SOLIDWORKS Modeling Solutions Partner

TITLE: Lower Pole Base Side B

SIZE DWG. NO. REV

C GE-23014

SCALE: 1:1 SHEET 1 OF 1

4

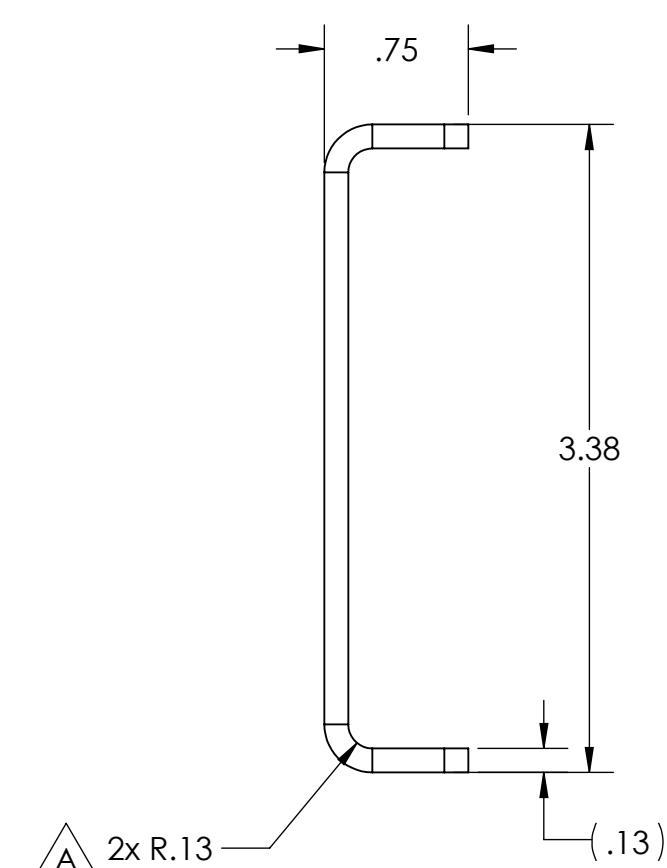
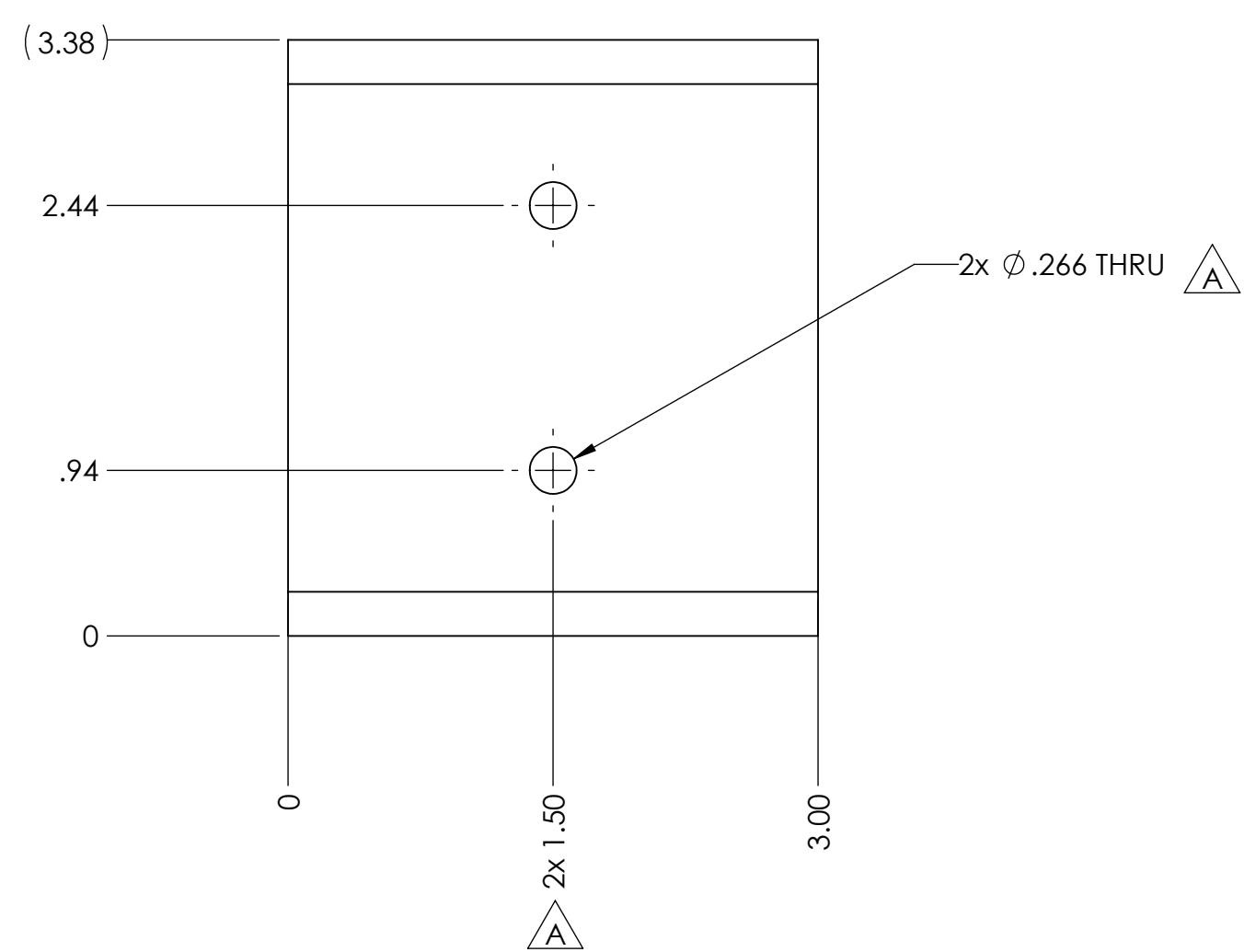
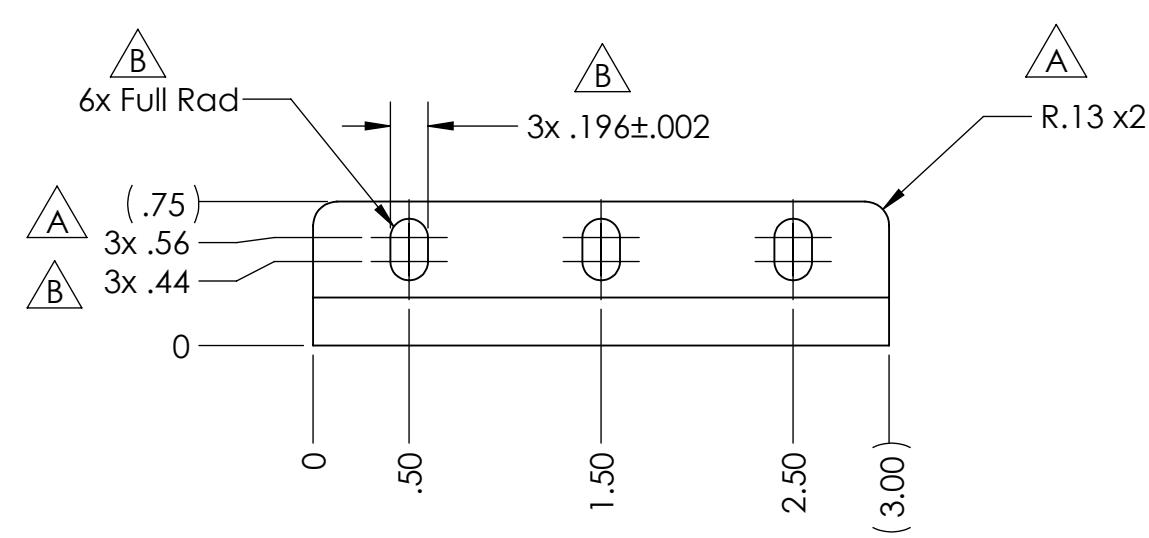
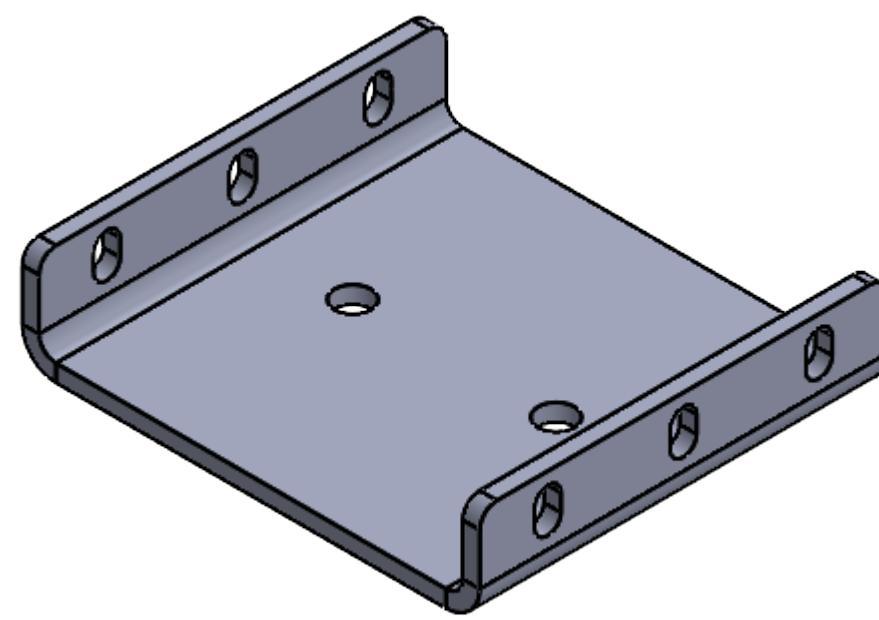
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UNLESS OTHERWISE SPECIFIED:			BEND	NAME	DATE
			DRAWN	NAL	9/23/2022
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .02$ THREE PLACE DECIMAL $\pm .010$					
PROPRIETARY 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: 8GA 5052 AL					
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.					
DO NOT SCALE DRAWING					

FIRST ROBOTICS COMPETITION  SOLIDWORKS Modeling Solutions Partner

TITLE: Lower Pole Pipe Brace

SIZE DWG. NO. REV

C GE-23015 B

SCALE: 1:1 SHEET 1 OF 1

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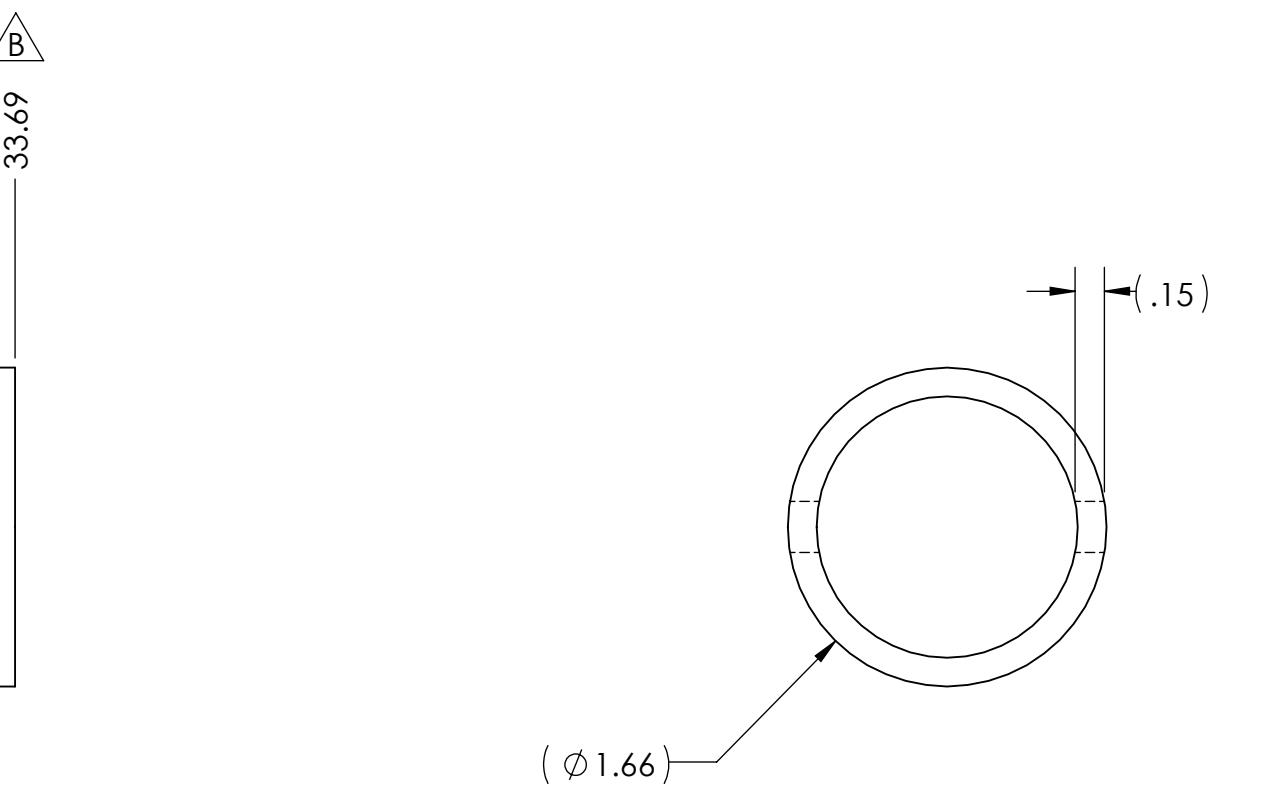
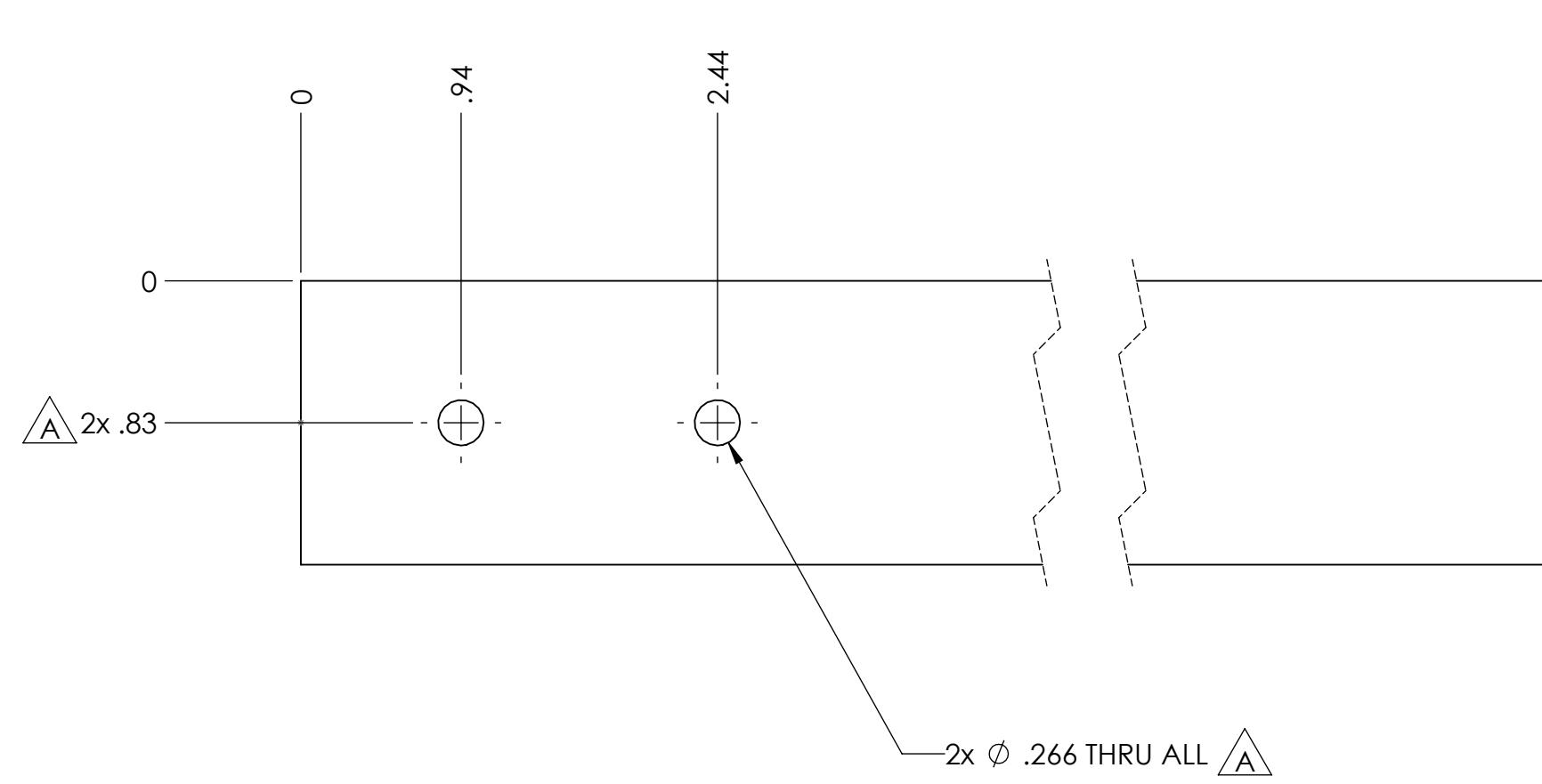
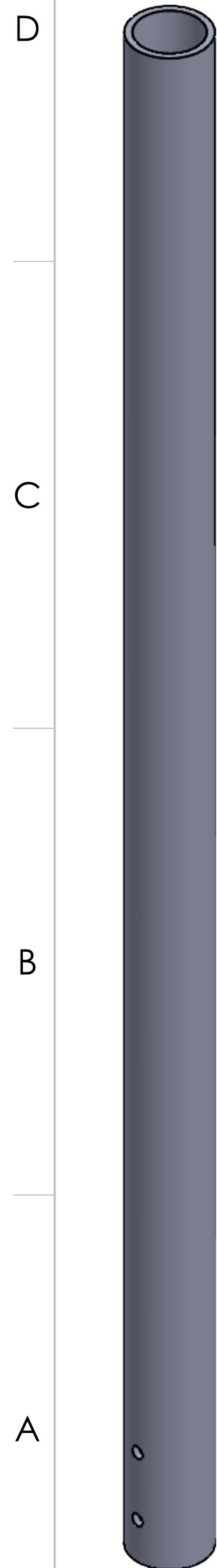
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UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .005$	DRAWN	NAL	9/23/2022
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:	SIZE	DWG. NO.	REV
1.25IN SCH40 AL TUBE	C	GE-23016	B
COMMENTS:	SCALE: 1:1	SHEET 1 OF 1	
REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
Lower Pole

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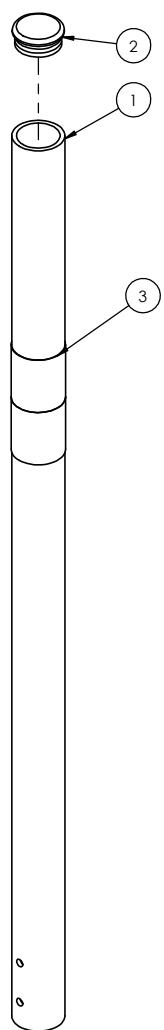
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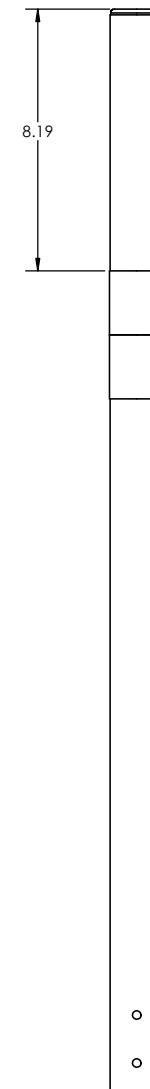
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Assembly Notes:
1. Seam of Tape should be perpendicular to thru-holes



ITEM NO.	PART NUMBER	QTY.
1	GE-23016	1
2	CCF-RT-13-1	1
3	tape_VISIONTARGET	2

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	12/13/2022
PROPRIETARY AND CONFIDENTIAL			
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COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			
  TITLE: Short Pole with Cap and Vision Tape SIZE: DWG. NO. REV: C GE-23017 SCALE: 1:3 SHEET 1 OF 1			

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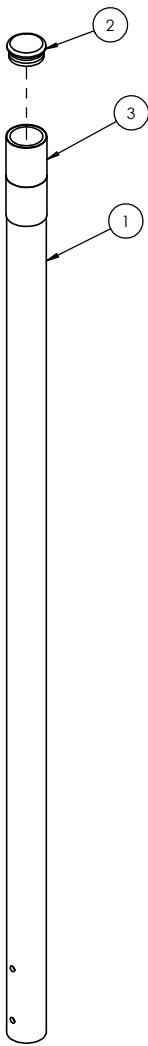
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Assembly Notes:

1. Start Tape from top edge of pipe
2. Seam of Tape should be Perpendicular to Thru-Holes



ITEM NO.	PART NUMBER	QTY.
1	GE-23035	1
2	CCF-RT-13-1	1
3	tape_VISIONTARGET	2

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	12/13/2022
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: Tall Pole with Cap and Vision Tape

SIZE DWG. NO. REV

C GE-23018

SCALE: 1:14 SHEET 1 OF 1

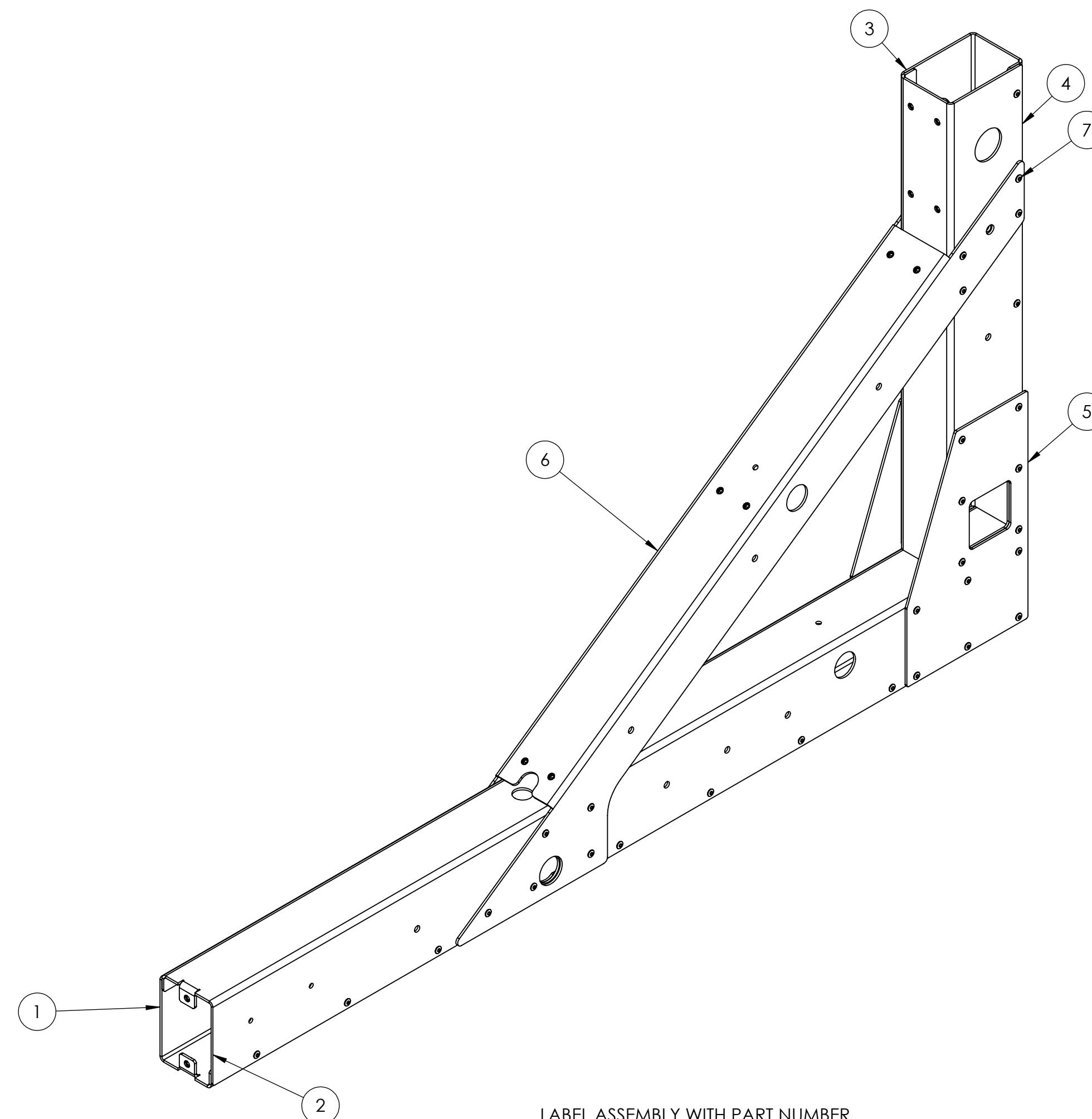
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23001-01	Divider Base A Config 1	1
2	GE-23002-01	Divider Base B Config 1	1
3	GE-23004	Divider Vertical A	1
4	GE-23005-01	Divider Vertical B Config 1	1
5	GE-23008	Divider 90 Gusset	2
6	GE-23009-01	Divider Angle Brace Config 1	1
7	187 pop rivet	3/16" Steel Rivet	60



UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	JO	9/30/2022
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:	SIZE DWG. NO. REV		
	C GE-23019		
DO NOT SCALE DRAWING	SCALE: 1:24 SHEET 1 OF 3		

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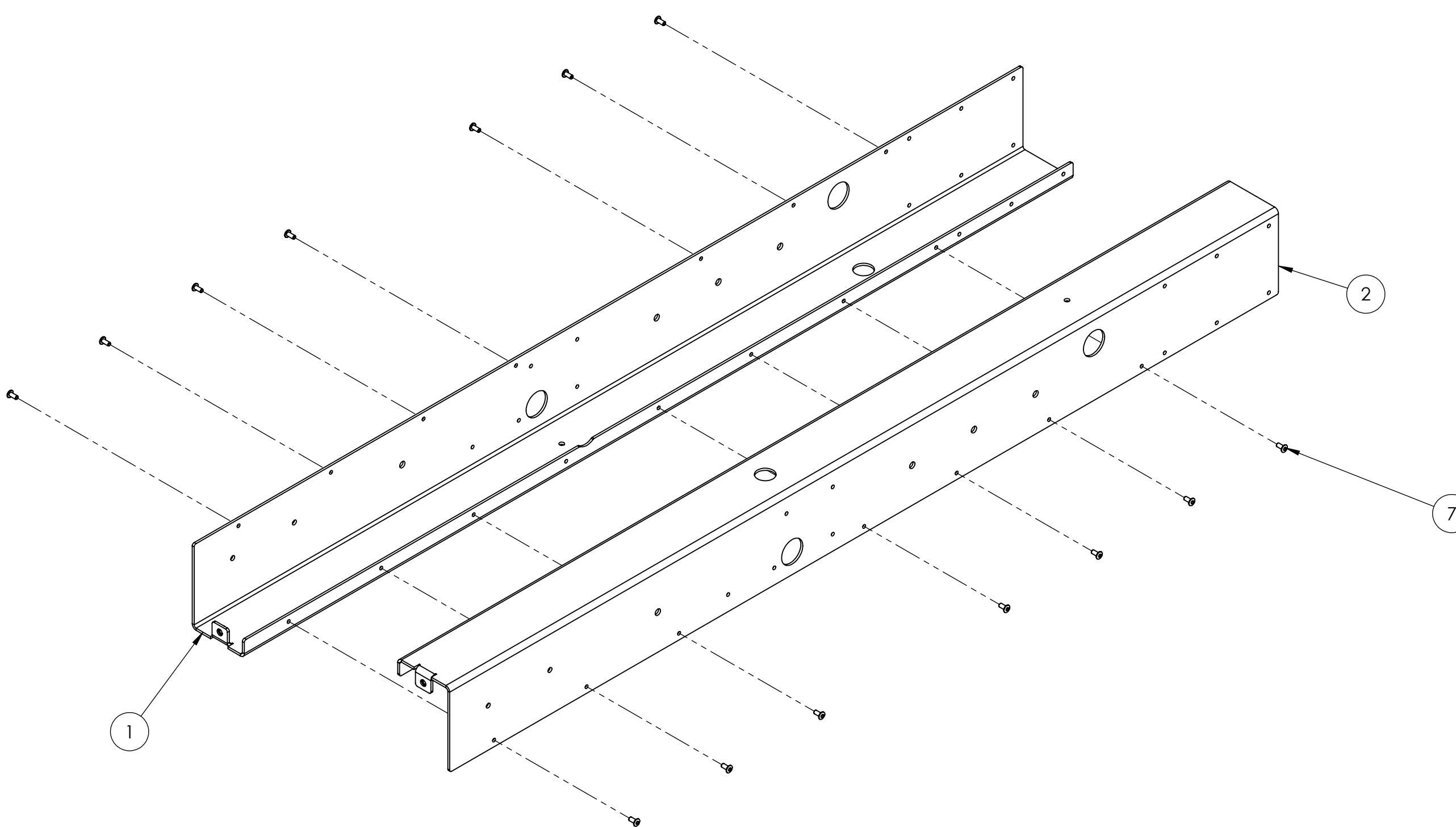
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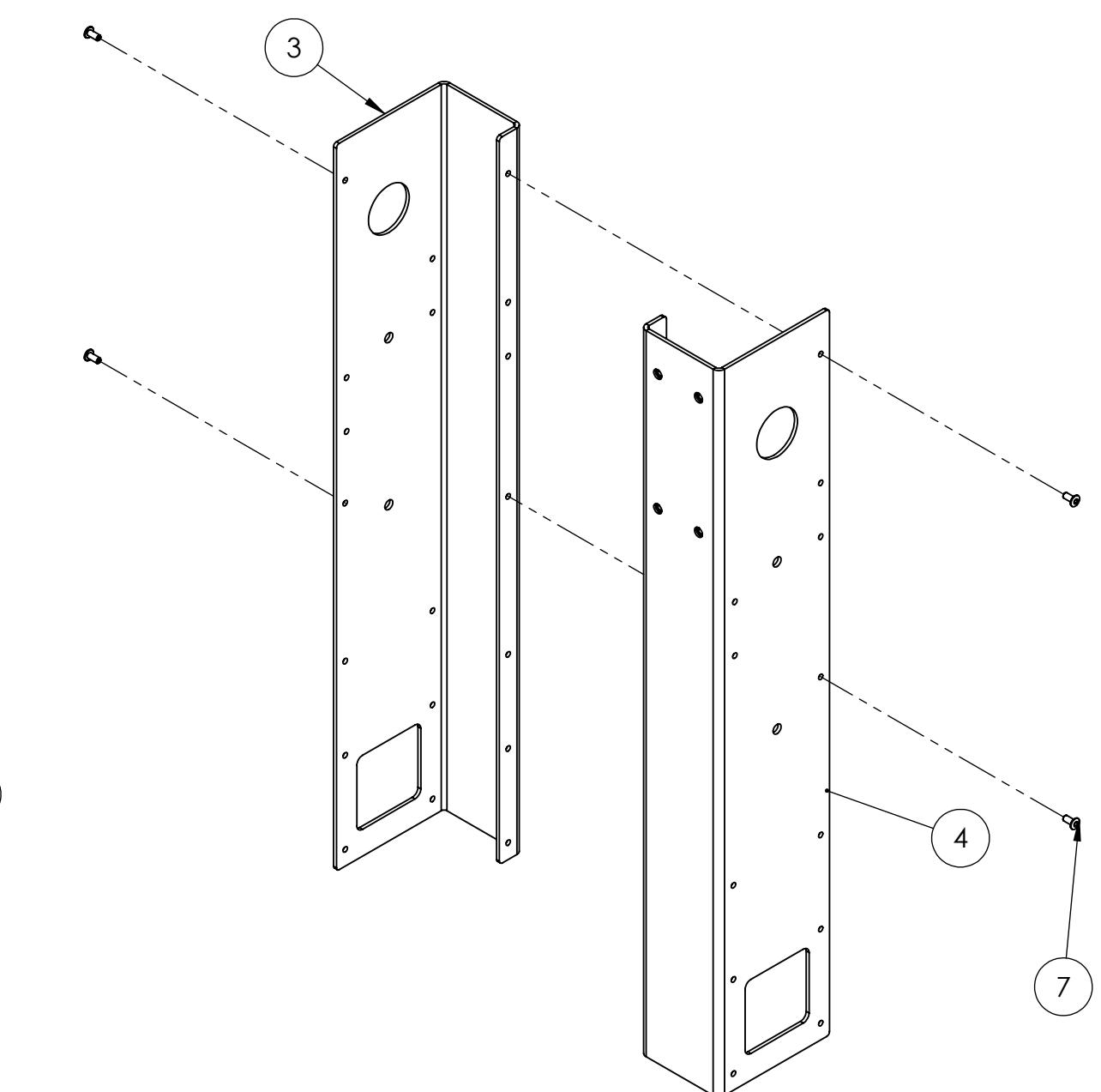
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Step 1



Step 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:

DO NOT SCALE DRAWING

VEND

NAME

DATE

DRAWN

JO

9/30/2022

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COMMENTS:

REMOVE ALL BURRS AND SHARP EDGES.



TITLE:
**Middle Divider
Sheetmetal**

SIZE DWG. NO. REV
C GE-23019

SCALE: 1:8 SHEET 2 OF 3

4

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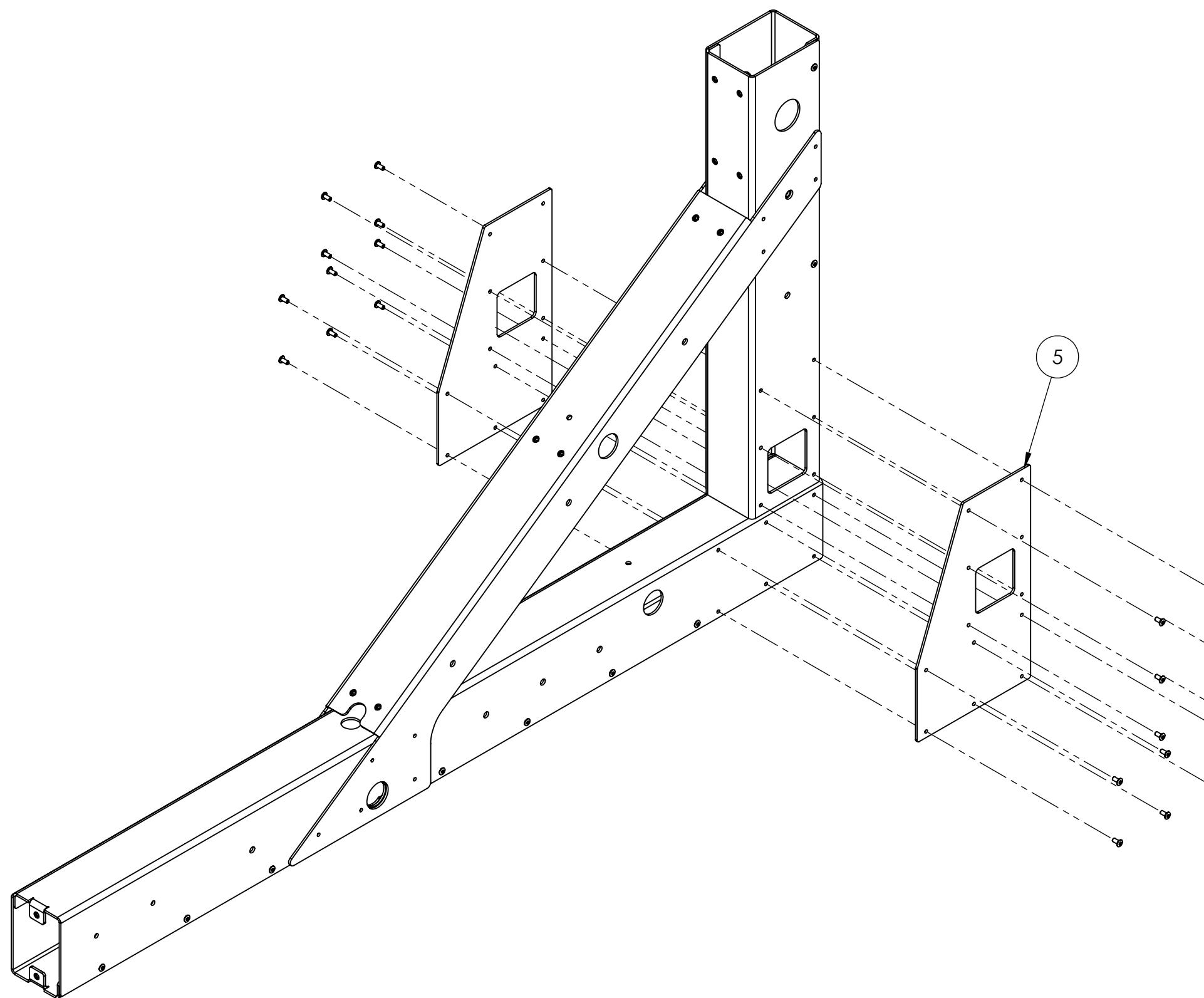
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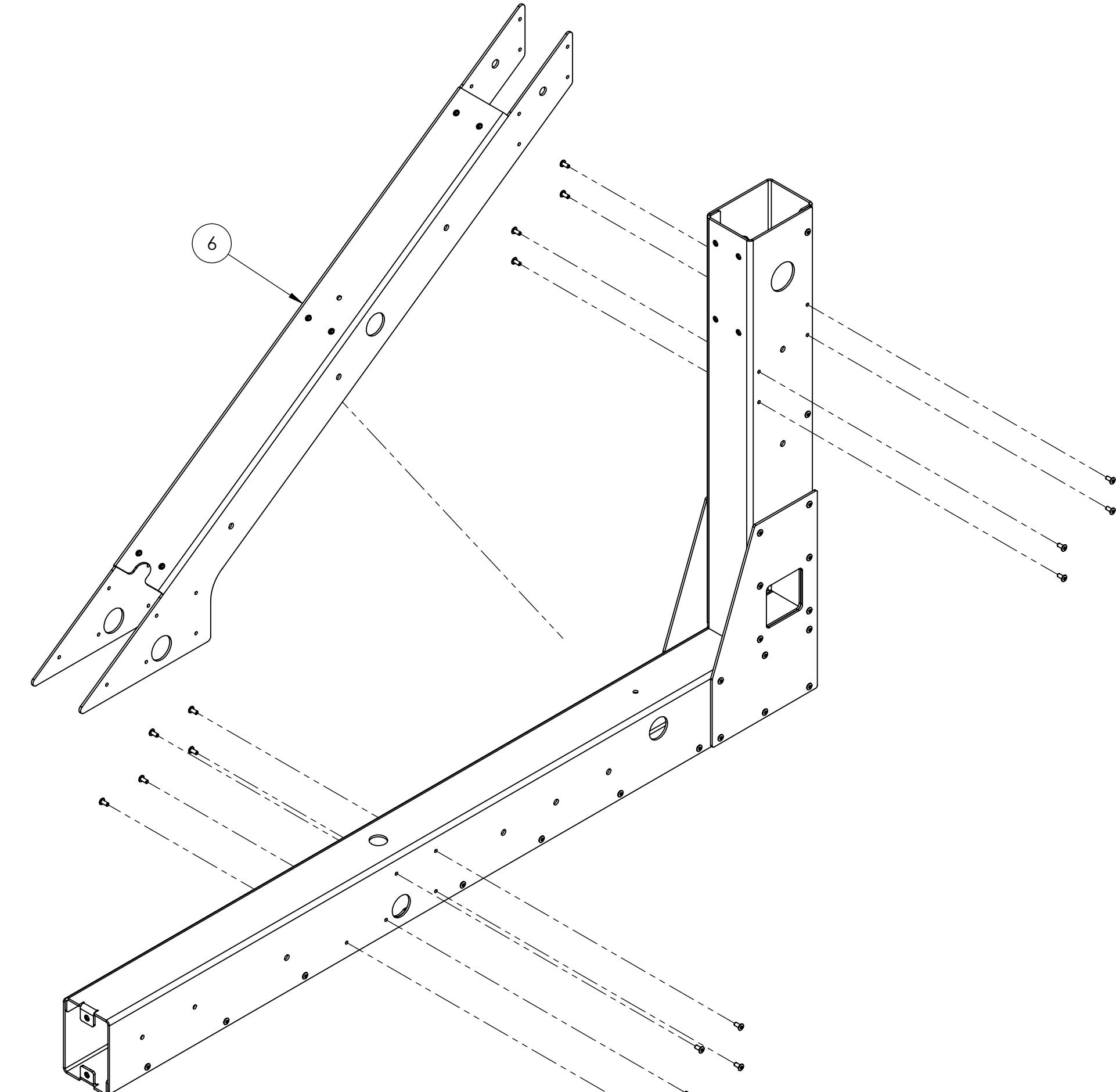
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Step 3



Step 4

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UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	JO	9/30/2022	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:	SIZE	DWG. NO.	REV
	C	GE-23019	
DO NOT SCALE DRAWING		SCALE: 1:4	SHEET 3 OF 3

 **FIRST
ROBOTICS
COMPETITION**  SOLIDWORKS
Modeling Solutions Partner

TITLE:
**Middle Divider
Sheetmetal**

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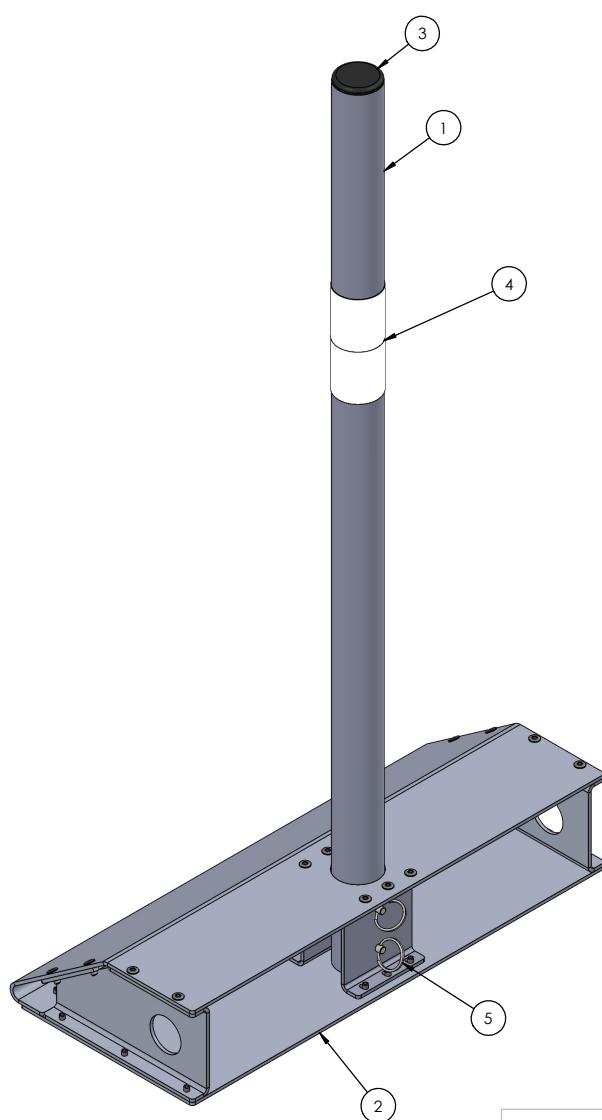
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UNLESS OTHERWISE SPECIFIED:

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:

Various

DO NOT SCALE DRAWING

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23016	Lower Pole	1
2	GE-23029	Lower Pole Base Sheetmetal	1
3	CCF-RT-13-1	Pole Caps	1
4	tape_VISIONTARGET	tape_VISIONTARGET	2
5	pin_quick_ring_.25_2.5	Pin, Ring-Grip Quick-Release with SS Ring, 1/4" Diameter, 2.5" Usable Length	2

BEND NAME DATE
 DRAWN NAL 9/29/2022

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COMMENTS:
REMOVE ALL BURRS AND SHARP EDGES.

FIRST
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COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
Lower Pole Base

SIZE DWG. NO. REV

C GE-23020

SCALE: 1:3 SHEET 1 OF 1

4

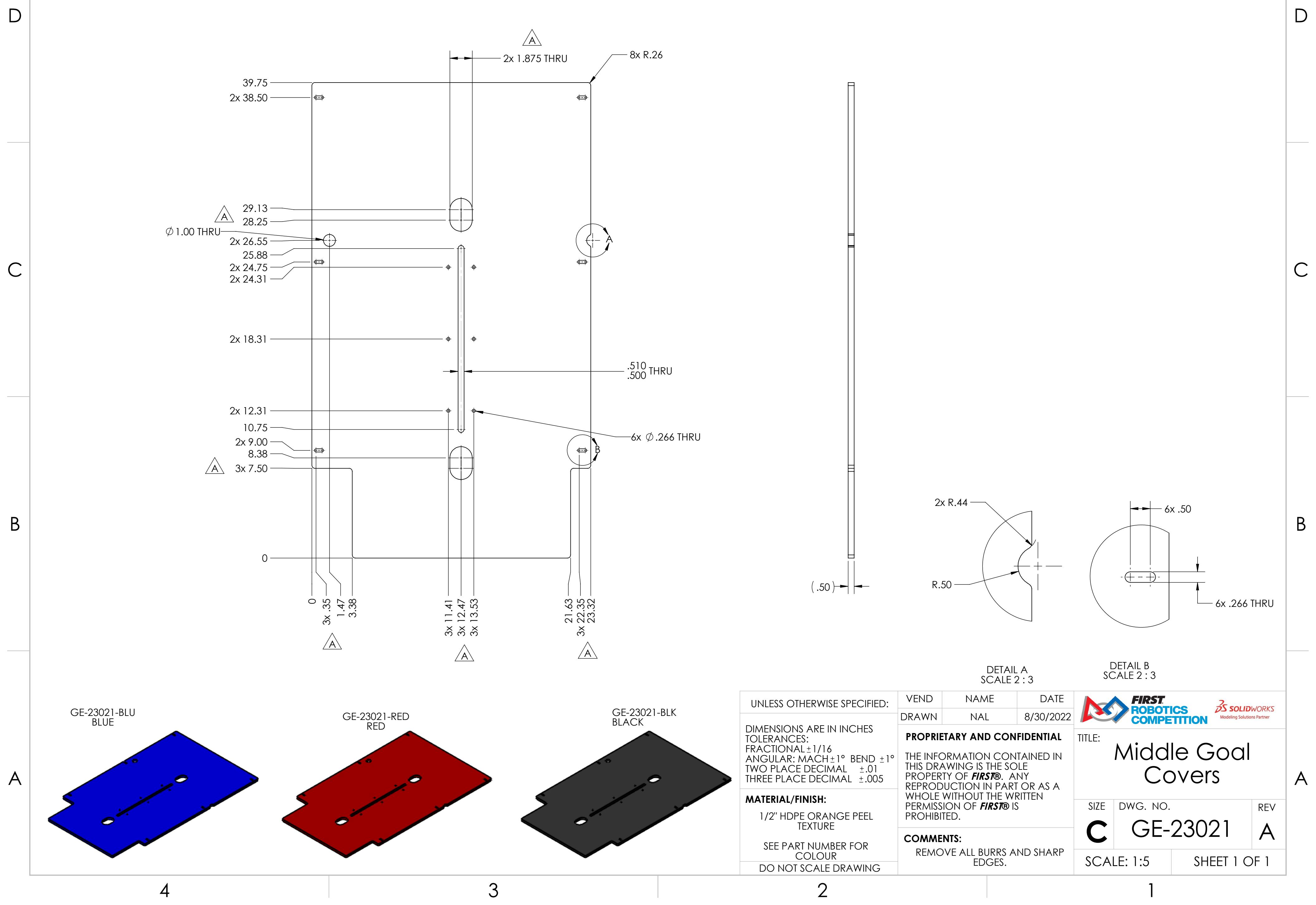
3

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REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
A3, B3, B4, C4, D3	A	Cut 3/8" off left side and 1/8" off right side, adjusted all horizontal dimensions, opened up slots for poles	12/6/2022	JRO

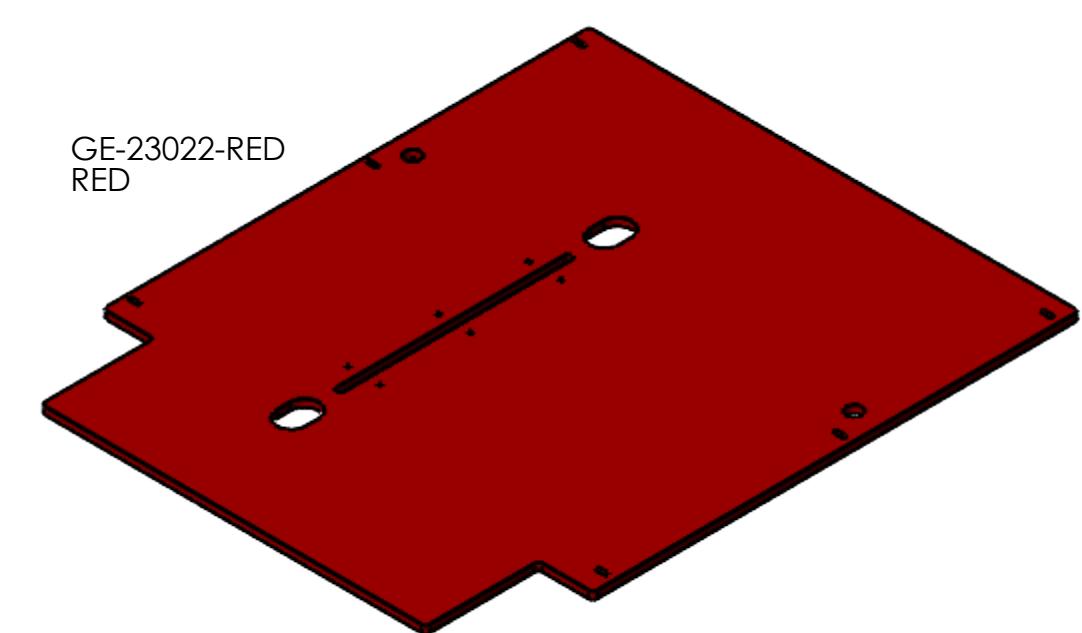
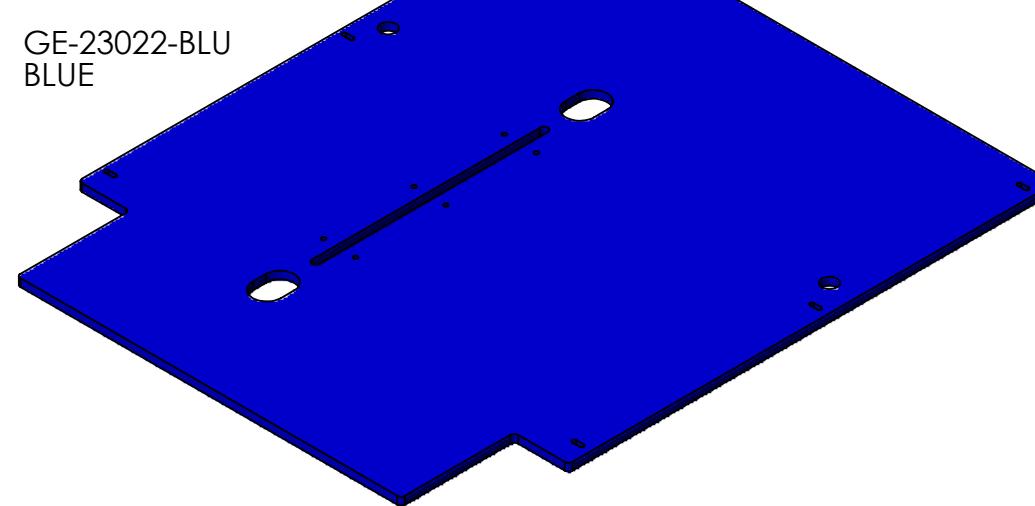
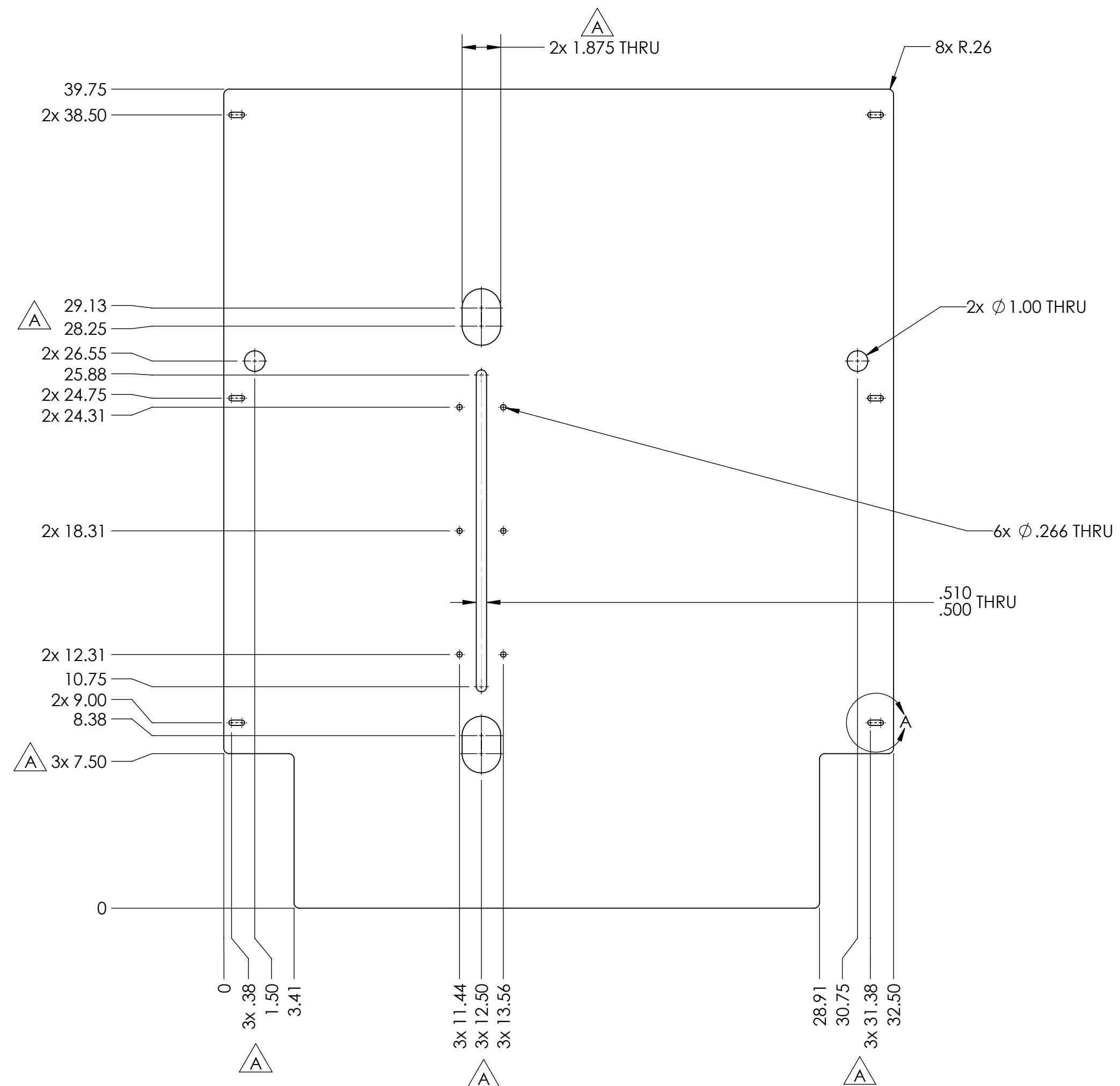


REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
B2, B3, B4, C4, D3	A	Cut 3/8" off left side and 1/8" off right side, adjusted all horizontal dimensions, opened up slots for poles	12/6/2022	JRO

D

D



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 NAL 8/30/2022

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MATERIAL/FINISH:

1/2" HDPE ORANGE PEEL TEXTURE

SEE PART NUMBER FOR COLOUR

DO NOT SCALE DRAWING

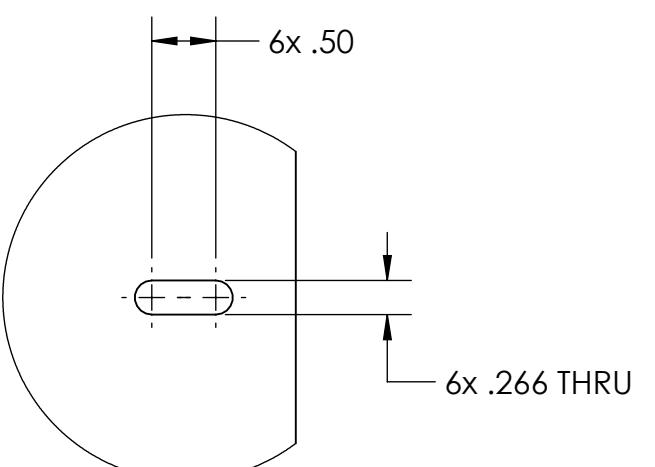
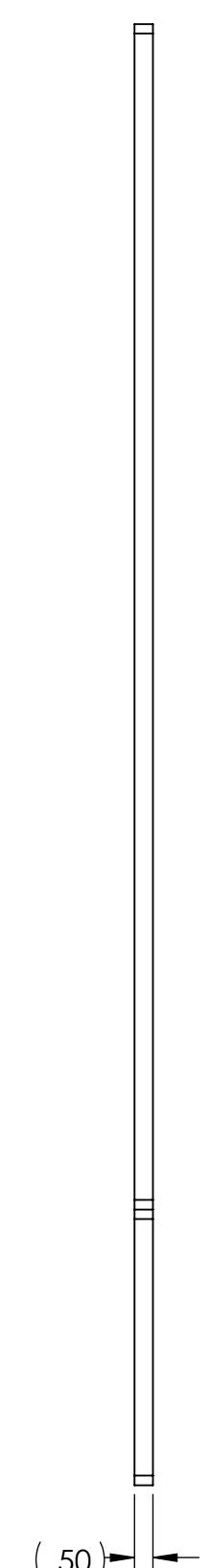
FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
**End Goal
Covers**

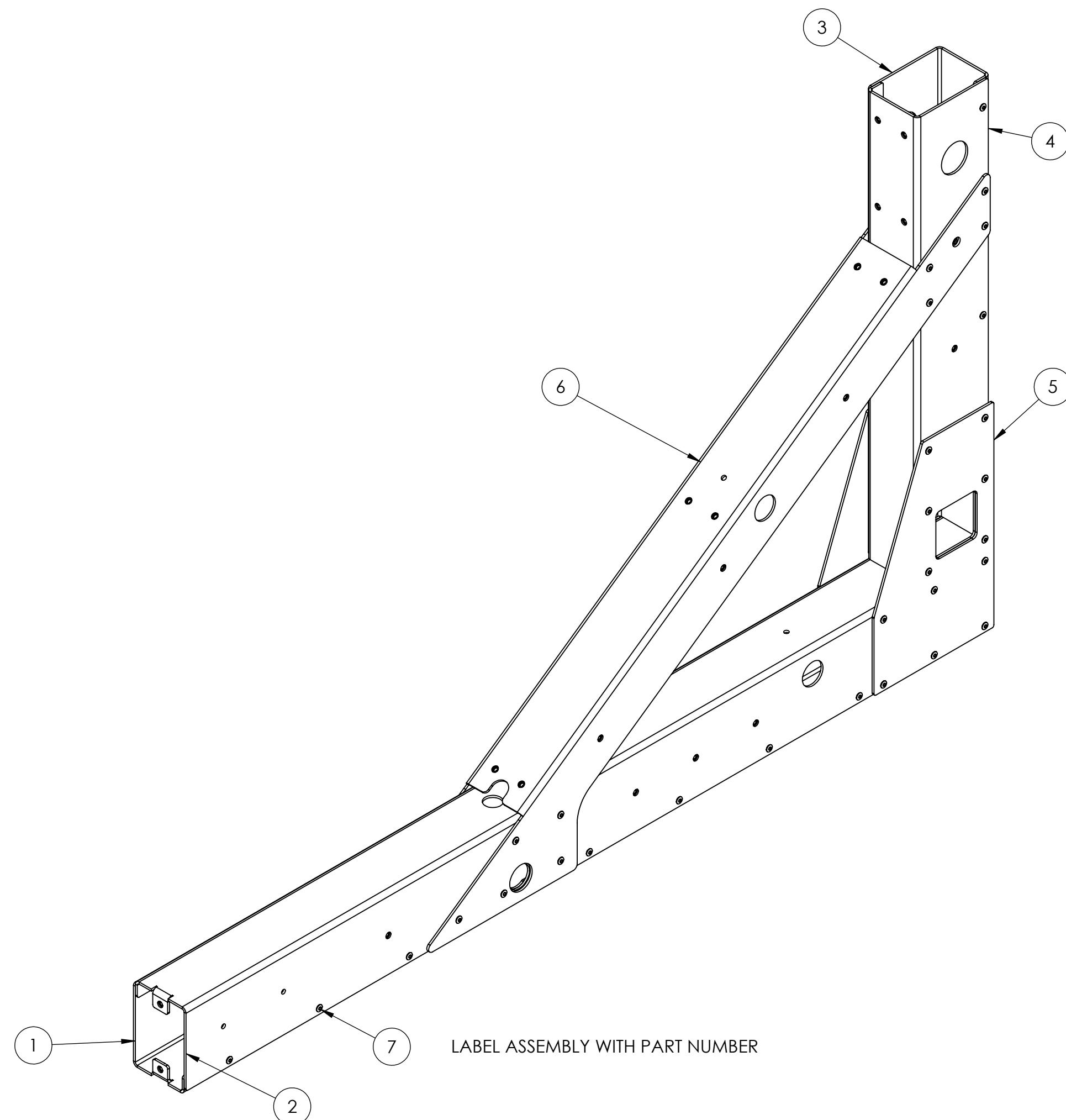
SIZE DWG. NO. REV
C GE-23022 A

SCALE: 1:5 SHEET 1 OF 1



DETAIL A
SCALE 2 : 3

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23001-01	Divider Base A Config 1	1
2	GE-23002-02	Divider Base B Config 2	1
3	GE-23004	Divider Vertical A	1
4	GE-23005-02	Divider Vertical B Config 2	1
5	GE-23008	Divider 90 Gusset	2
6	GE-23009-02	Divider Angle Brace Config 2	1
7	187 pop rivet	3/16" Steel Rivet	60



UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	JO	9/30/2022
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:	COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.		
DO NOT SCALE DRAWING			

FIRST ROBOTICS COMPETITION SOLIDWORKS Modeling Solutions Partner

TITLE: Left End Divider Sheetmetal

SIZE DWG. NO. REV

C GE-23023

SCALE: 1:24 SHEET 1 OF 3

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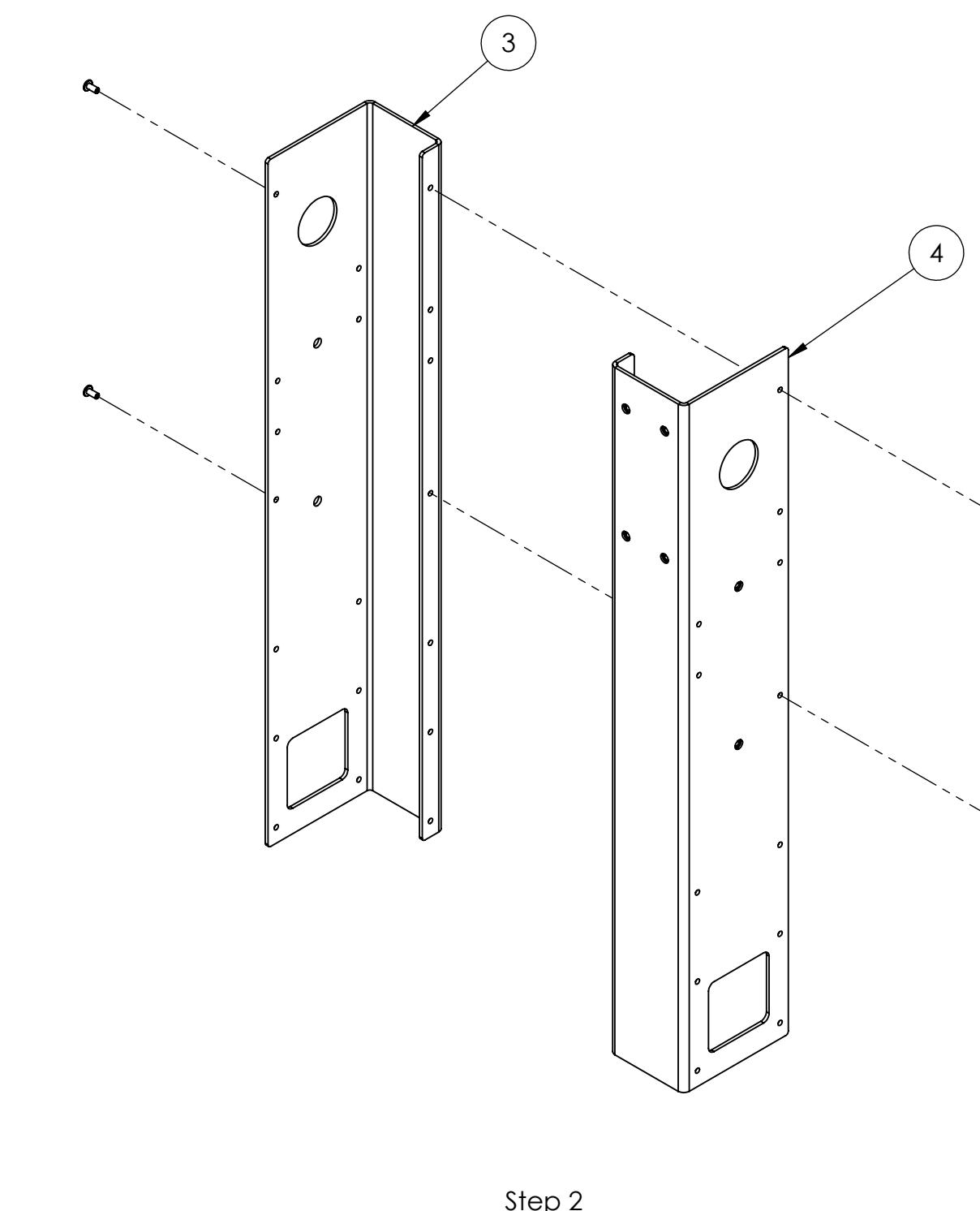
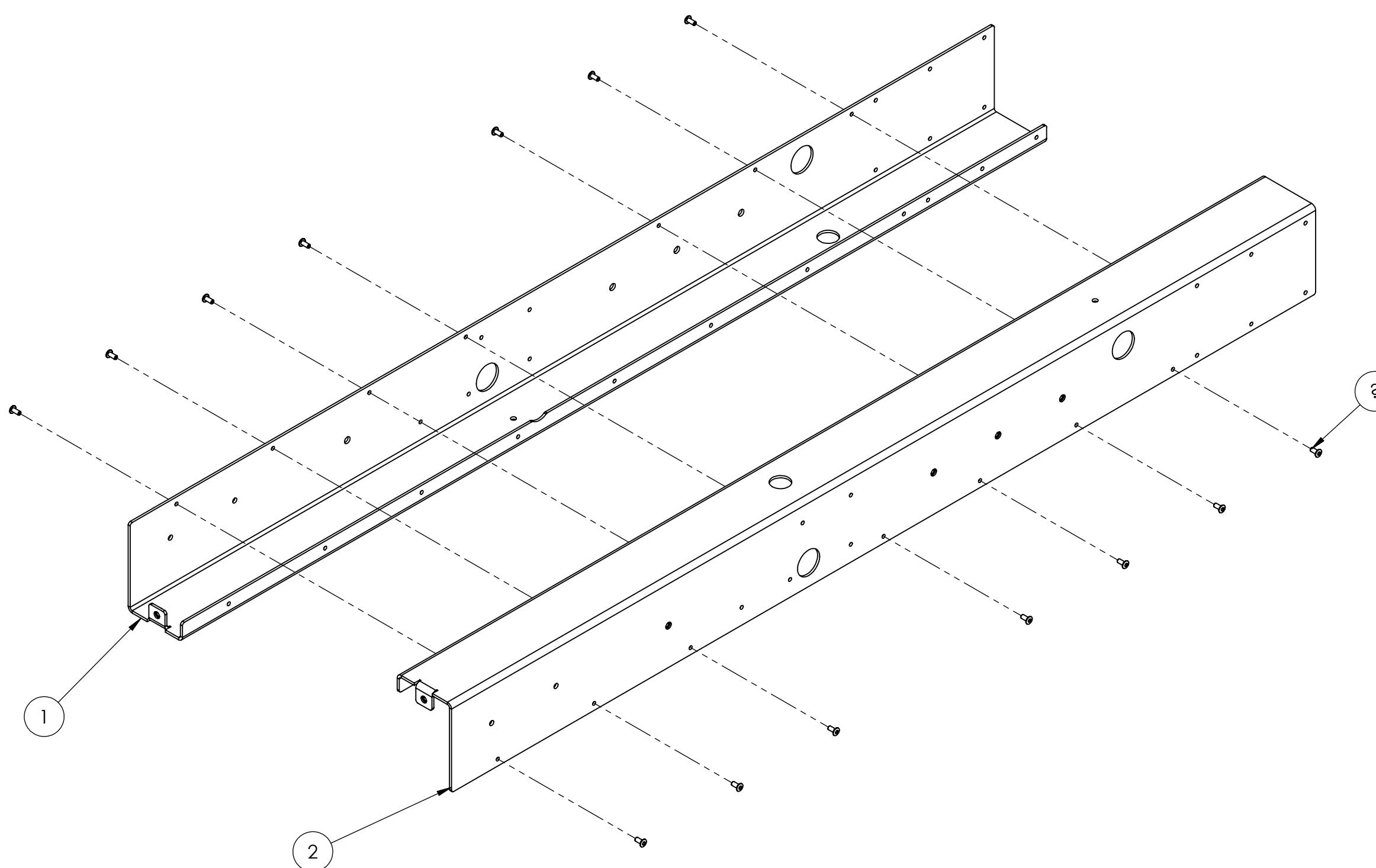
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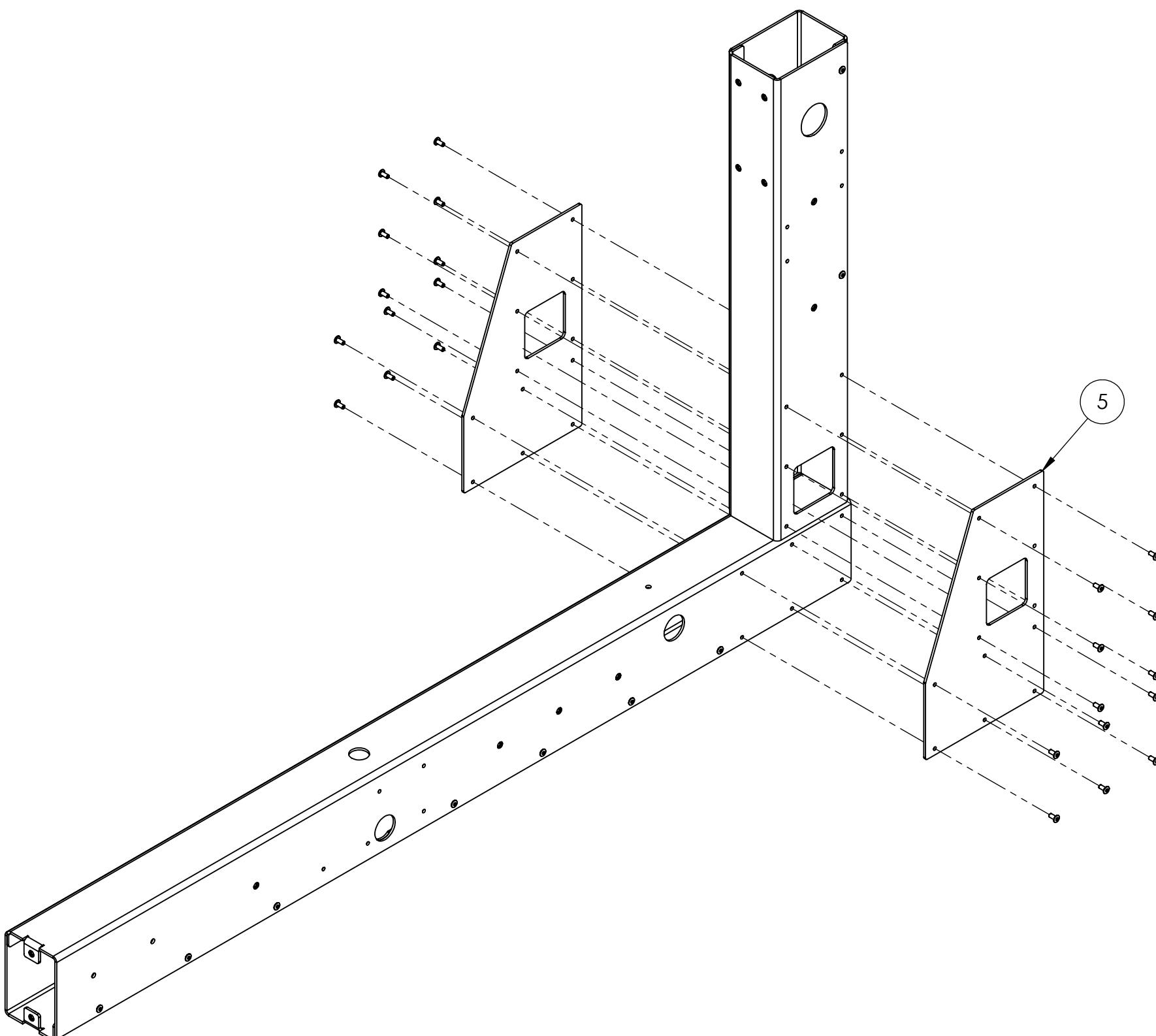
UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	JO	9/30/2022	
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MATERIAL/FINISH:	SIZE	DWG. NO.	REV
	C	GE-23023	
COMMENTS:		SCALE: 1:8	
REMOVE ALL BURRS AND SHARP EDGES.		SHEET 2 OF 3	
DO NOT SCALE DRAWING			

4

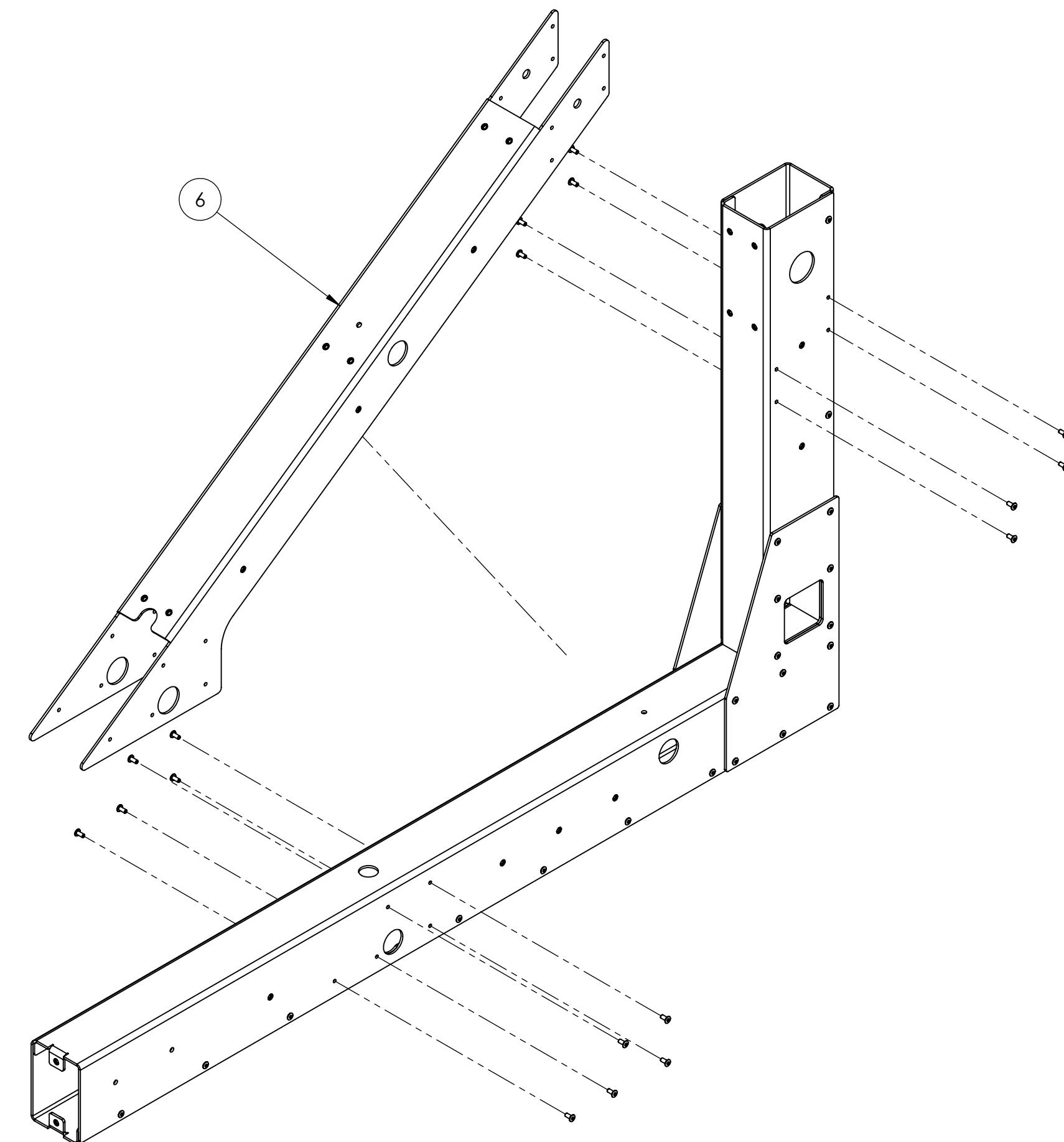
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Step 3



Step 4

UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	JO	9/30/2022	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:	SIZE	DWG. NO.	REV
	C	GE-23023	
DO NOT SCALE DRAWING	SCALE: 1:12 SHEET 3 OF 3		

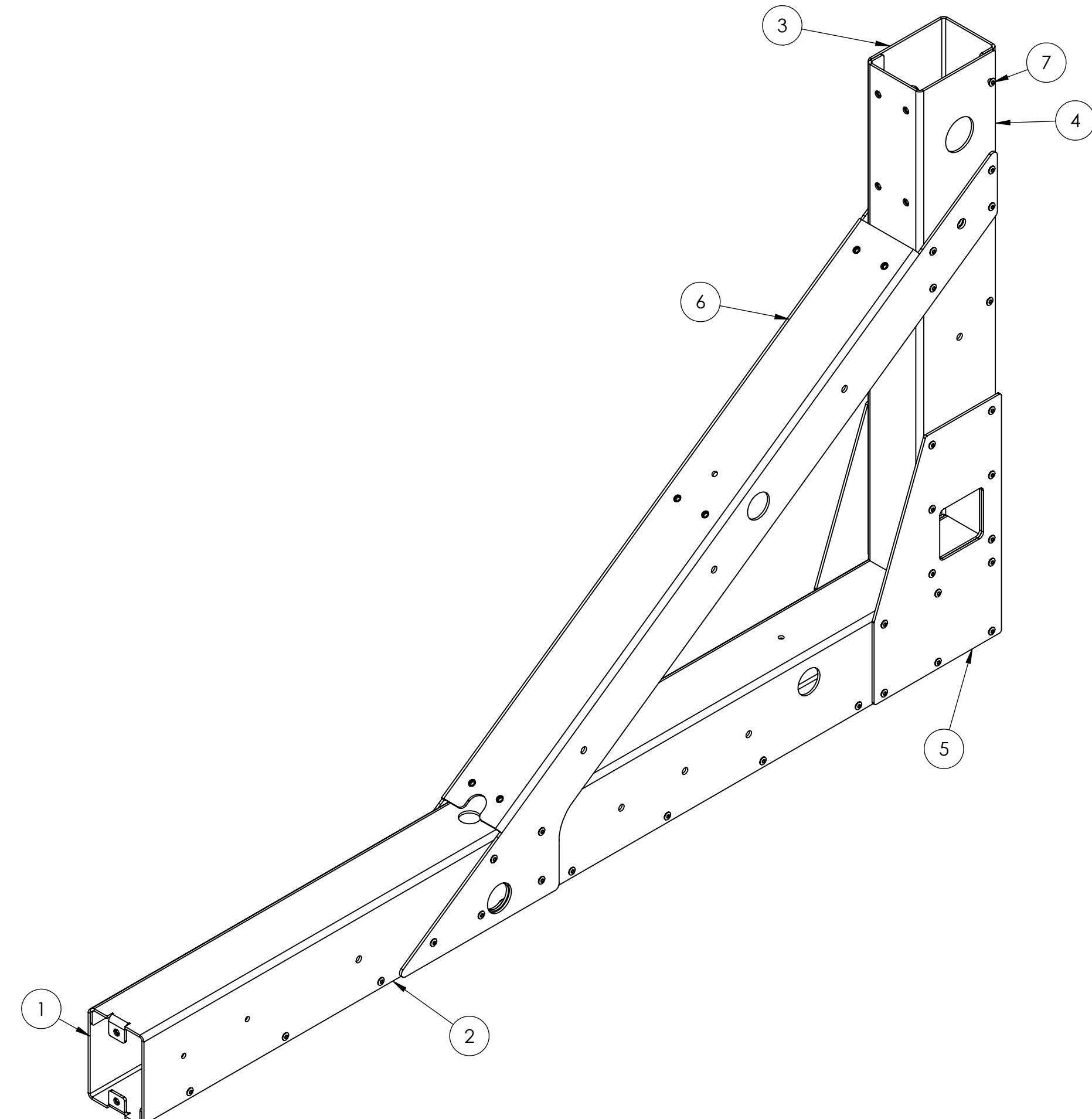
 **FIRST
ROBOTICS
COMPETITION**  SOLIDWORKS
Modeling Solutions Partner

TITLE:
**Left End Divider
Sheetmetal**

SIZE DWG. NO. REV
C GE-23023

SCALE: 1:12 SHEET 3 OF 3
REMOVE ALL BURRS AND SHARP EDGES.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23001-02	Divider Base A Config 2	1
2	GE-23002-01	Divider Base B Config 1	1
3	GE-23004-01	Divider Vertical A Config 1	1
4	GE-23005-01	Divider Vertical B Config 1	1
5	GE-23008	Divider 90 Gusset	2
6	GE-23009-03	Divider Angle Brace Config 3	1
7	187 pop rivet	3/16" Steel Rivet	60



LABEL ASSEMBLY WITH PART NUMBER

UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	JO	9/30/2022
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:	COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.		
DO NOT SCALE DRAWING			

FIRST ROBOTICS COMPETITION SOLIDWORKS Modeling Solutions Partner

TITLE: Right End Divider Sheetmetal

SIZE DWG. NO. **REV**

C GE-23024

SCALE: 1:16 **SHEET** 1 OF 3

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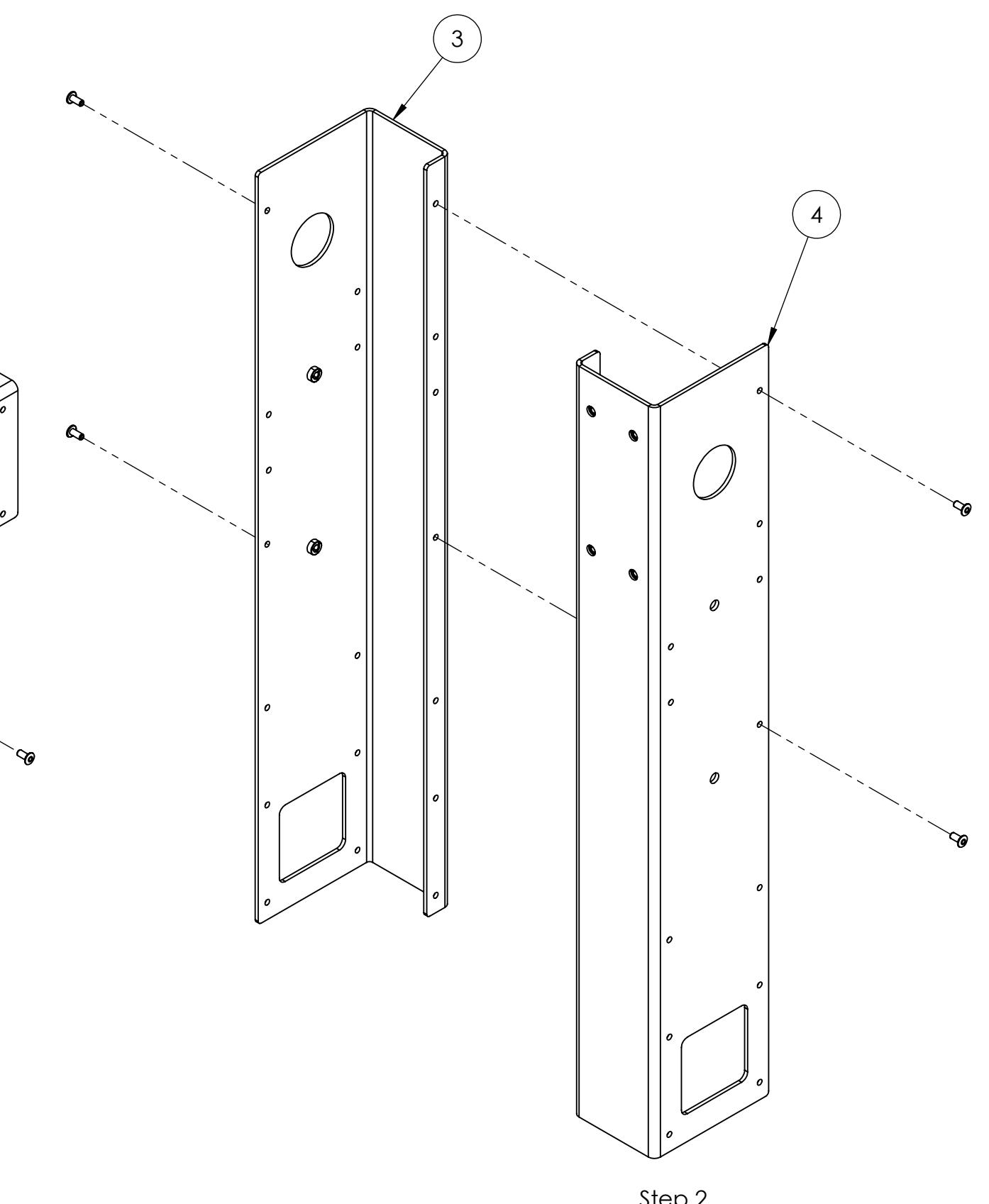
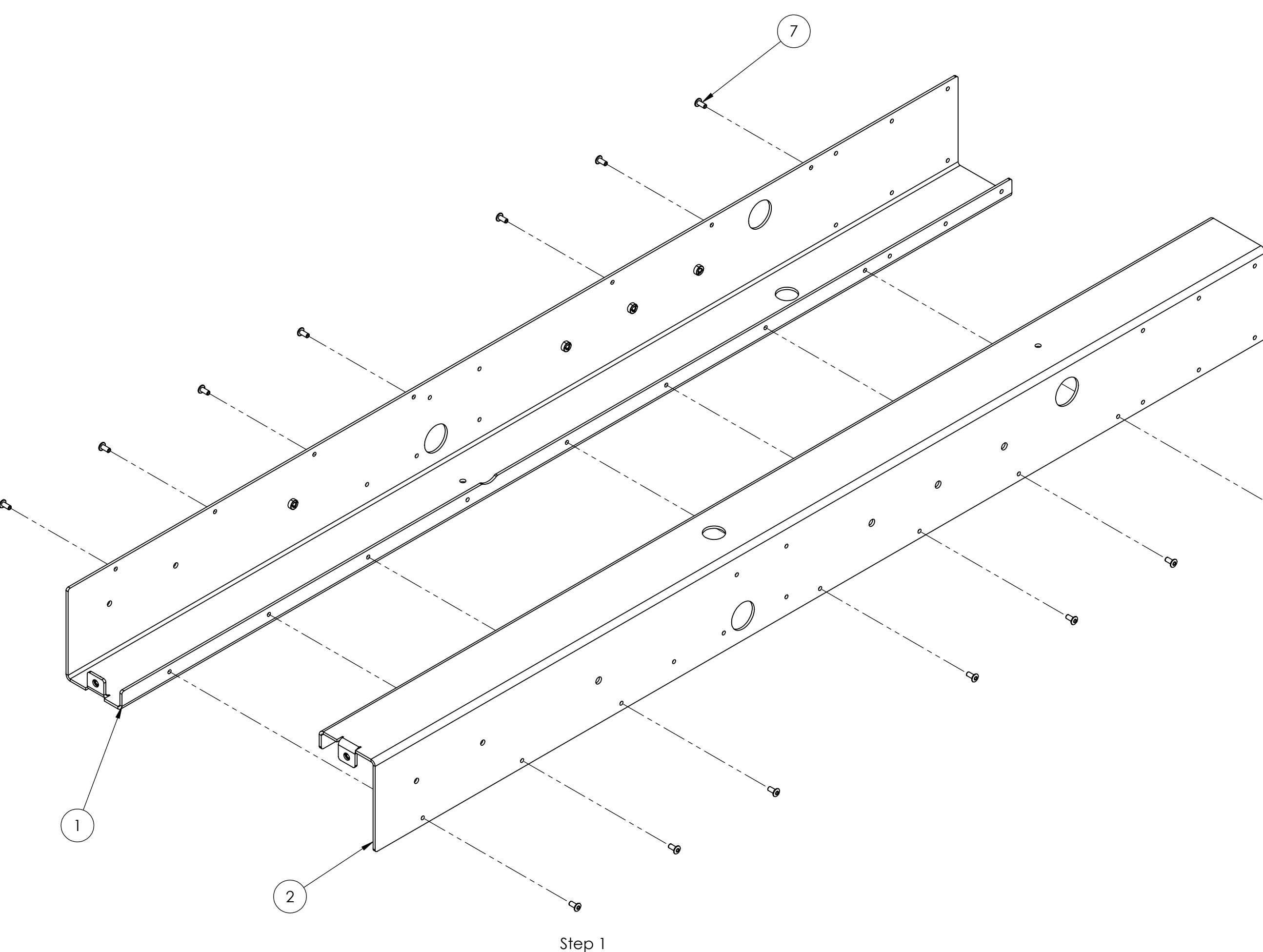
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UNLESS OTHERWISE SPECIFIED:

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:

DO NOT SCALE DRAWING

VEND

DRAWN

NAME

JO

DATE

9/30/2022

FIRST
ROBOTICS
COMPETITION
SOLIDWORKS
Modeling Solutions Partner
TITLE: Right End
Divider
Sheetmetal

SIZE DWG. NO. REV

C GE-23024

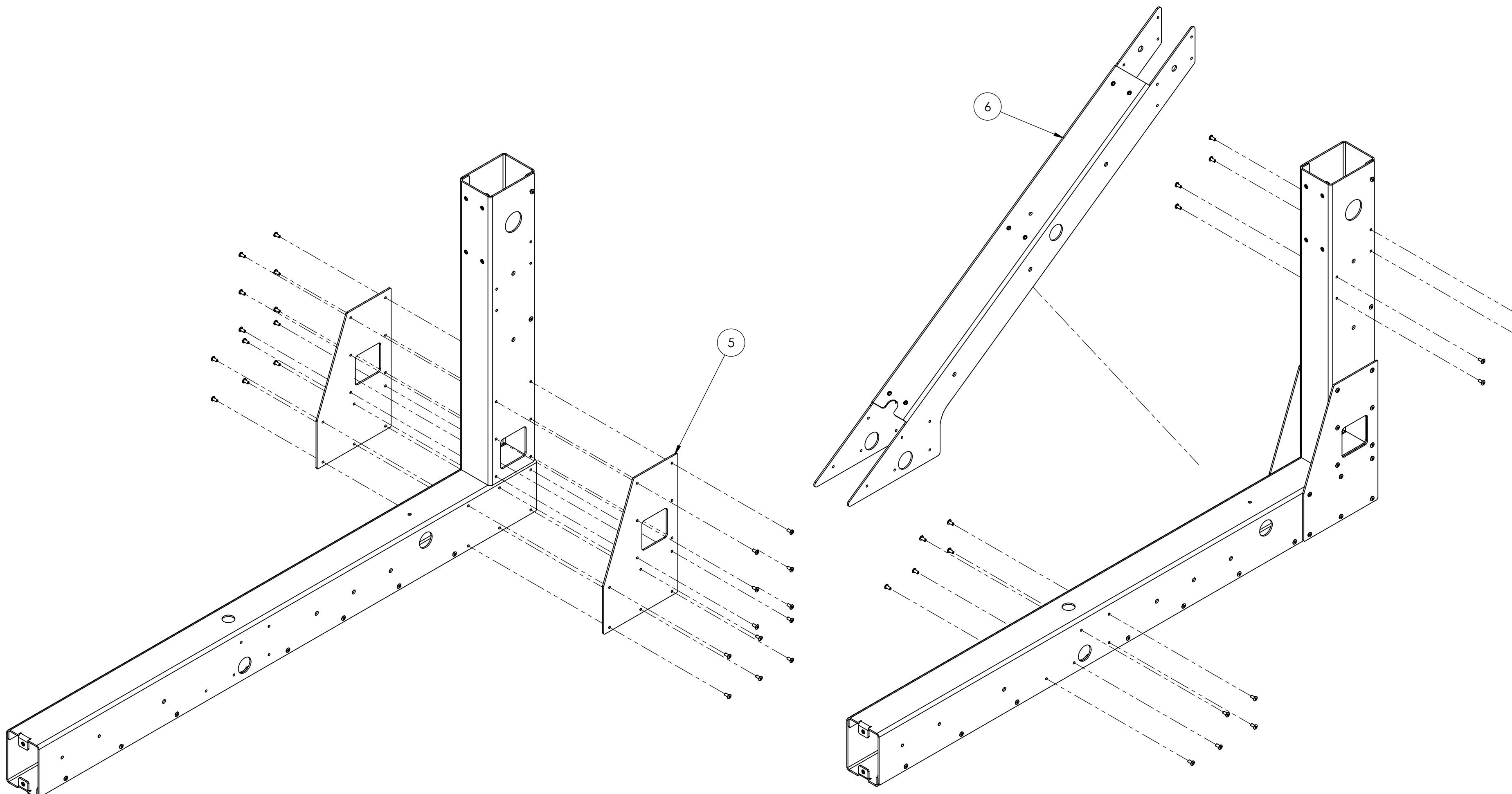
SCALE: 1:4 SHEET 2 OF 3

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Step 3

Step 4

UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	JO	9/30/2022	
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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: **Right End
Divider
Sheetmetal**
SIZE DWG. NO. REV
C GE-23024

SCALE: 1:12 SHEET 3 OF 3

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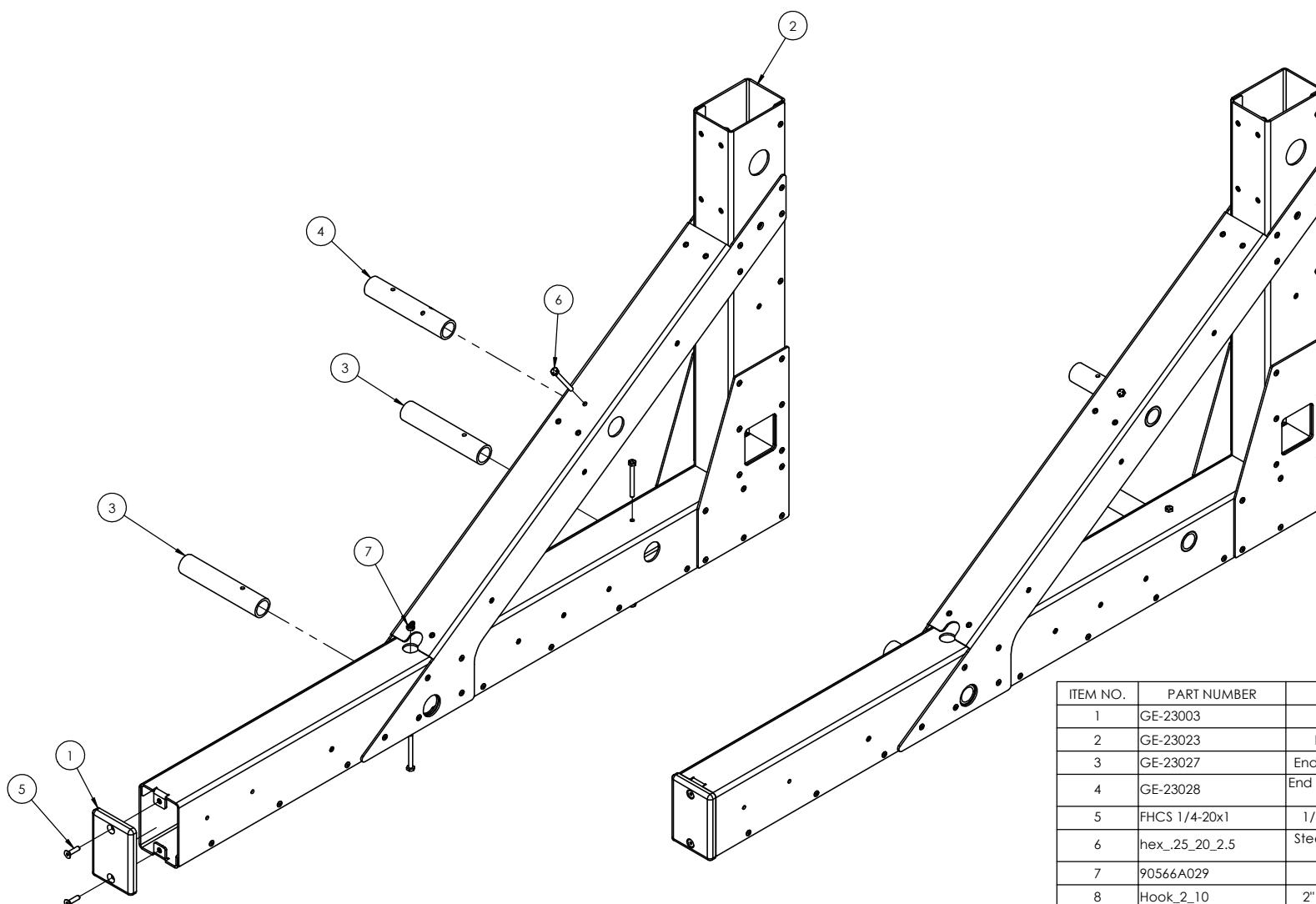
C

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Assemble as shown. Note that (3) and (4) stick out the side opposite any PEM nuts.

Note the hole on the segment of (4) that is sticking out is vertical when assembled.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23003	Divider End Cap	1
2	GE-23023	Left End Divider Sheetmetal	1
3	GE-23027	End Divider Bottom Connector Pin	2
4	GE-23028	End Divider Angle Brace Connector Pin	1
5	FHCS 1/4-20x1	1/4-20 x 1 Flat Head Cap Screw	2
6	hex_.25_20_2.5	Steel Hex Head Screw, 1/4"-20 x 2-1/2" long, fully threaded	3
7	90566A029	1/4-20 Locknut	3
8	Hook_2_10	2" x 10" Hook, Adhesive Backed	1
9	Hook_2_17.5	2" x 12.5" Hook, Adhesive Backed	2

DRAWN	NAME	DATE	FIRST ROBOTICS COMPETITION			
			SOLIDWORKS	Modeling Solutions Partner		
PROPRIETARY AND CONFIDENTIAL						
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COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.						
DO NOT SCALE DRAWING						

SIZE	DWG. NO.	REV
C	GE-23025	
SCALE: 1:5	SHEET 1 OF 1	

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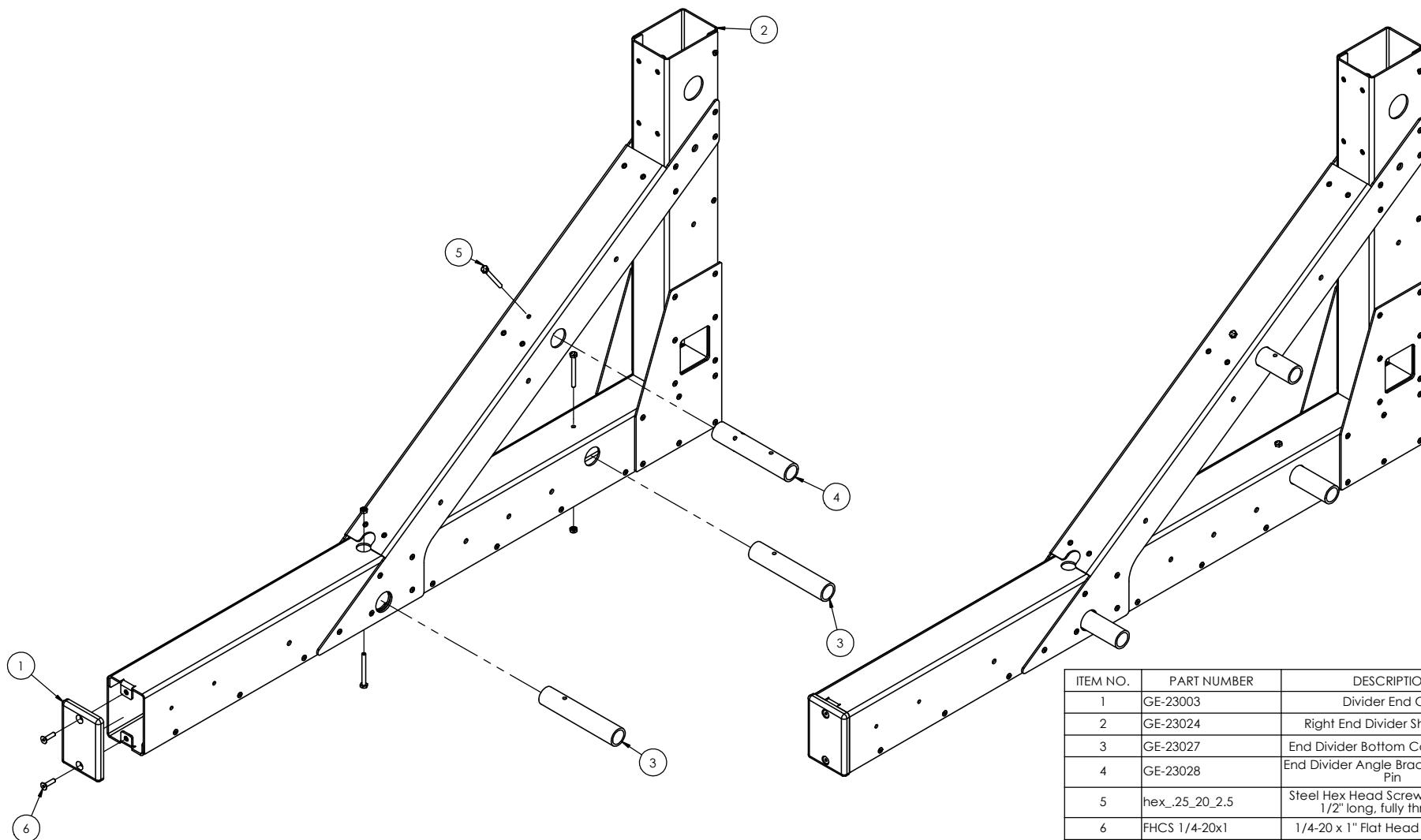
C

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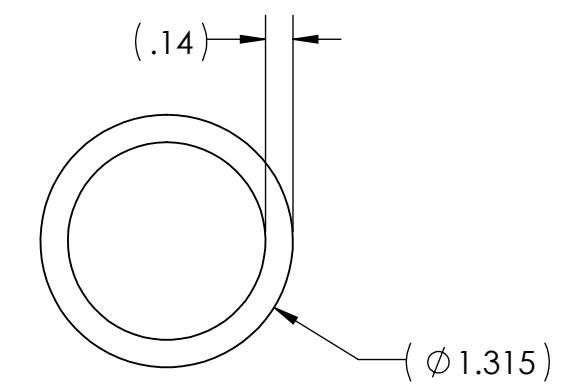
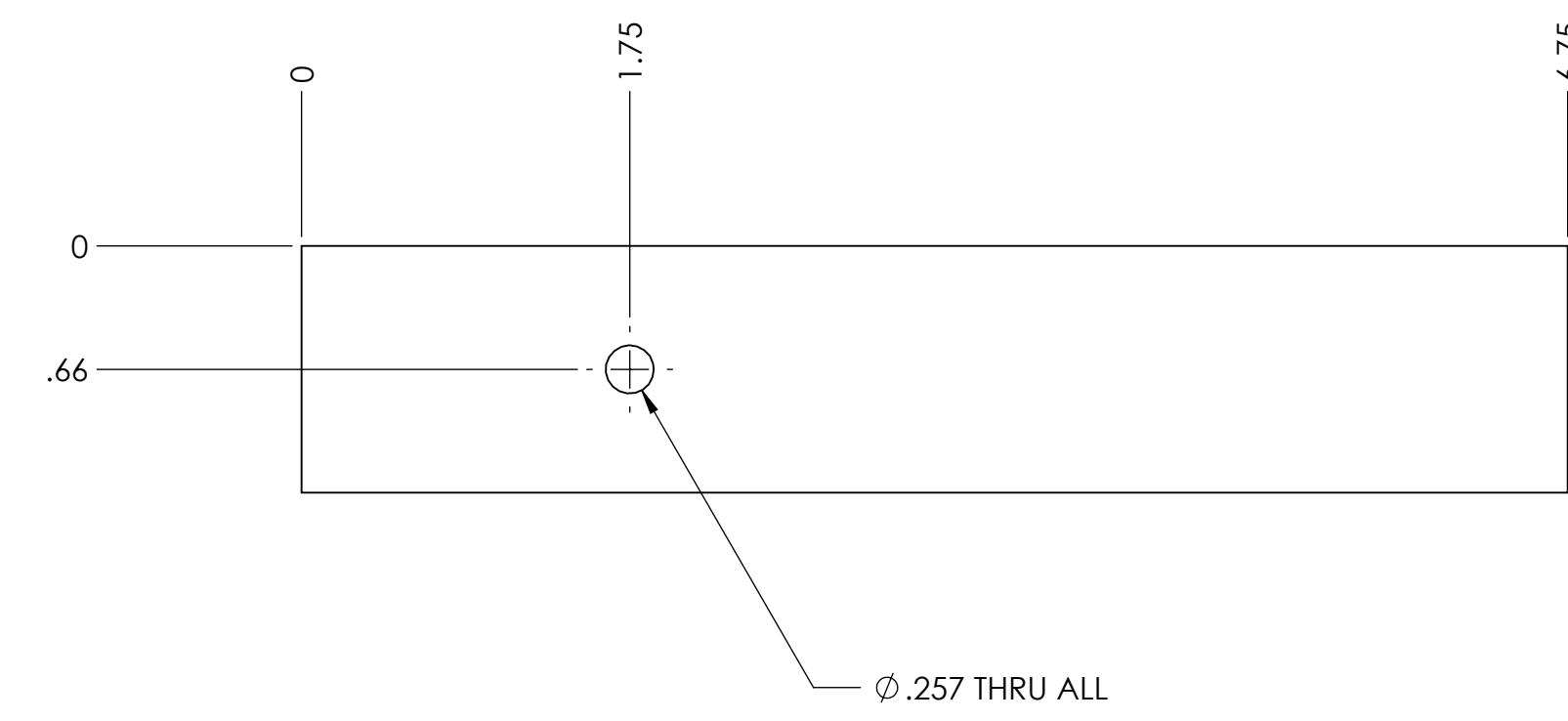
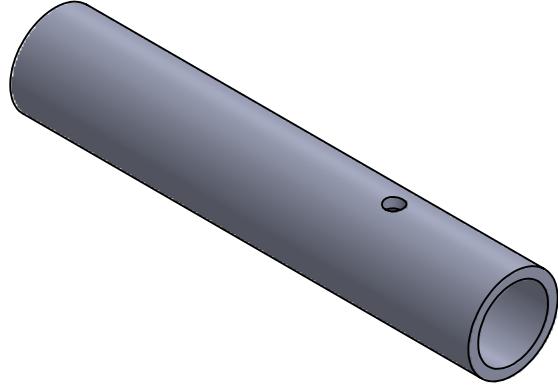


Assemble as shown. Note that (3) and (4) stick out the side opposite any PEM nuts.

Note the hole on the segment of (4) that is sticking out is vertical when assembled.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23003	Divider End Cap	1
2	GE-23024	Right End Divider Sheetmetal	1
3	GE-23027	End Divider Bottom Connector Pin	2
4	GE-23028	End Divider Angle Brace Connector Pin	1
5	hex_25_20_2.5	Steel Hex Head Screw, 1/4"-20 x 2-1/2" long, fully threaded	3
6	FHCS 1/4-20x1	1/4-20 x 1" Flat Head Cap Screw	2
7	90566A029	1/4-20 Locknut	3
8	Hook_2_10	2" x 10" Hook, Adhesive Backed	1
9	Hook_2_17.5	2" x 12.5" Hook, Adhesive Backed	2

UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	JO	9/29/2022
TOLERANCES: FRACTIONAL: $\pm 1/2$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .50$	FIRST ROBOTICS COMPETITION <small>DS SOLIDWORKS Modeling Solutions Partner</small>		
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-23026		
SCALE: 1:5	SHEET 1 OF 1		



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	NAL	9/28/2022
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: 1in SCH40 AL Tube			
DO NOT SCALE DRAWING	SIZE	DWG. NO.	REV
	C	GE-23027	A
SCALE: 1:1		SHEET 1 OF 1	

 FIRST ROBOTICS COMPETITION  SOLIDWORKS Modeling Solutions Partner

TITLE: End Divider Bottom Connector Pin

SIZE DWG. NO. REV

C GE-23027 A

SCALE: 1:1 SHEET 1 OF 1

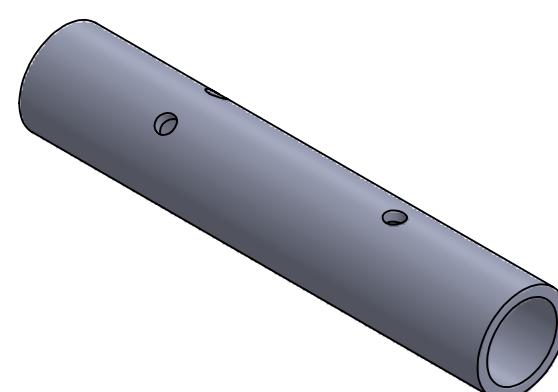
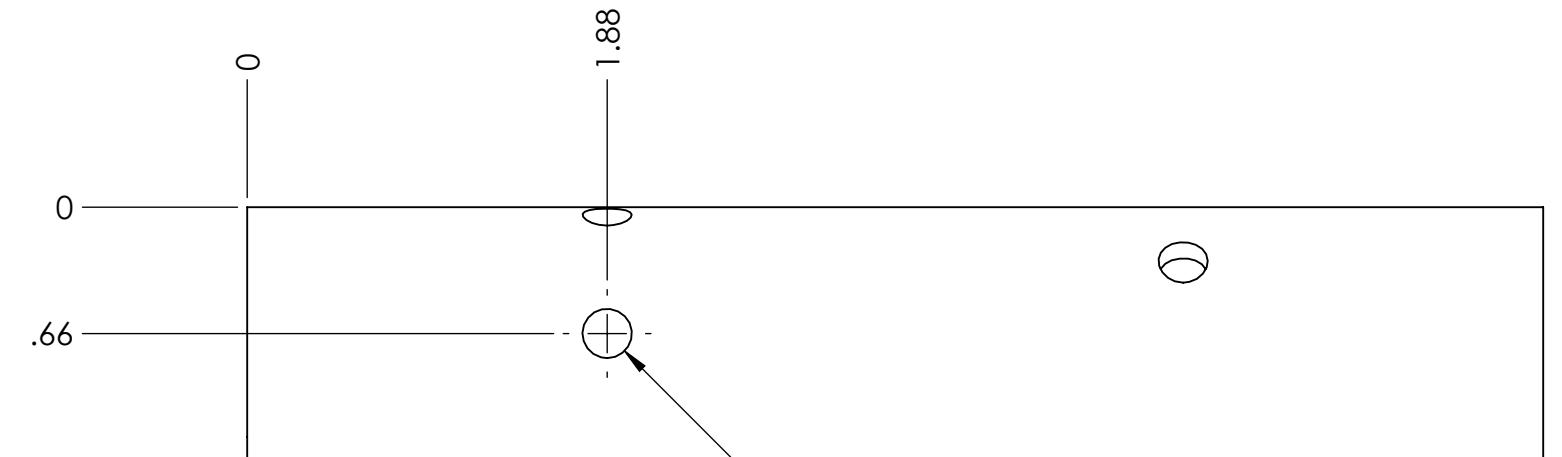
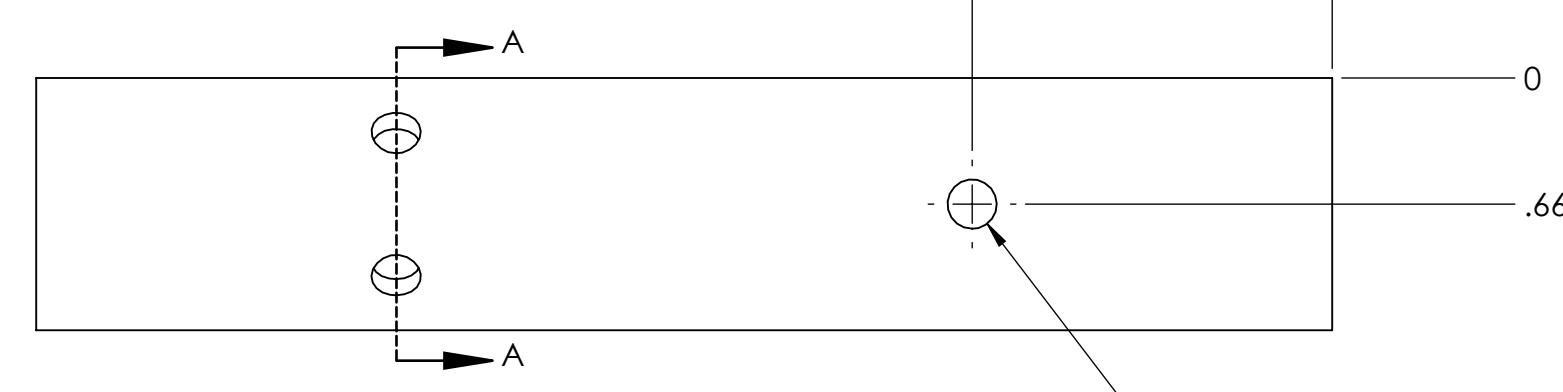
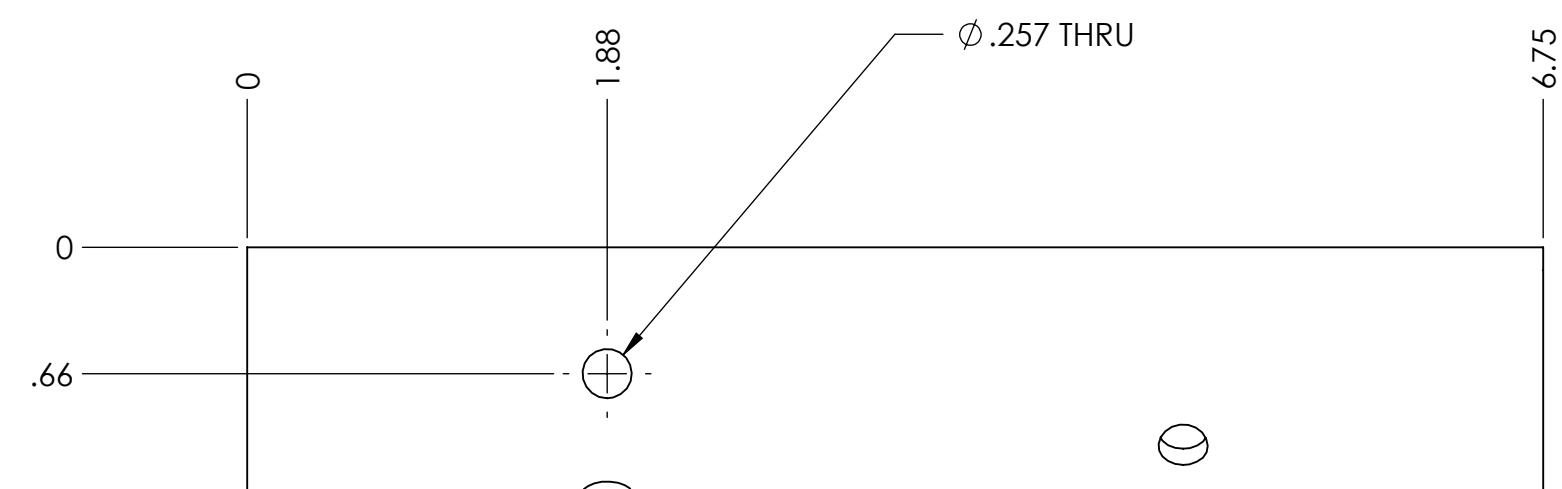
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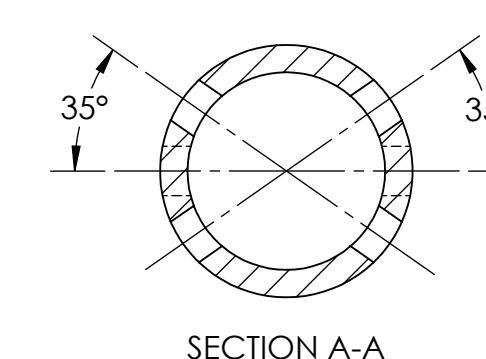
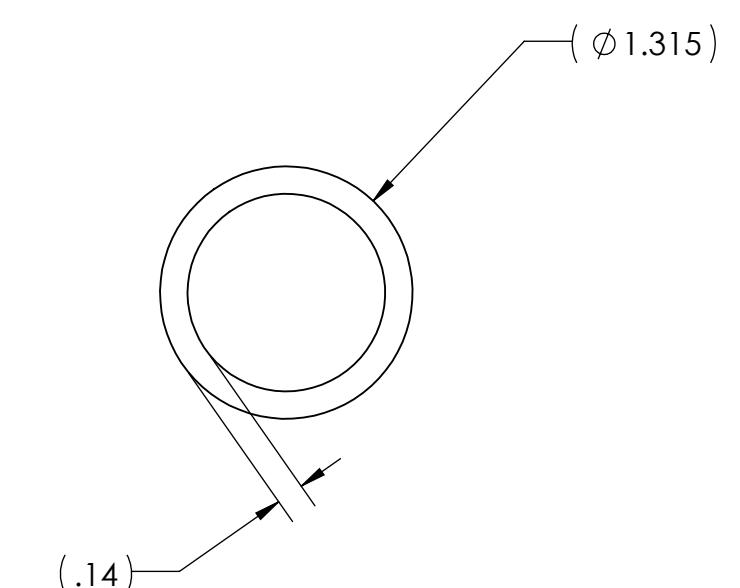
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REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
A2	A	Block Tolerance	9/30/2022	JO



SECTION A-A

UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	NAL	9/28/2022	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH: 1IN SCH40 AL TUBE			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

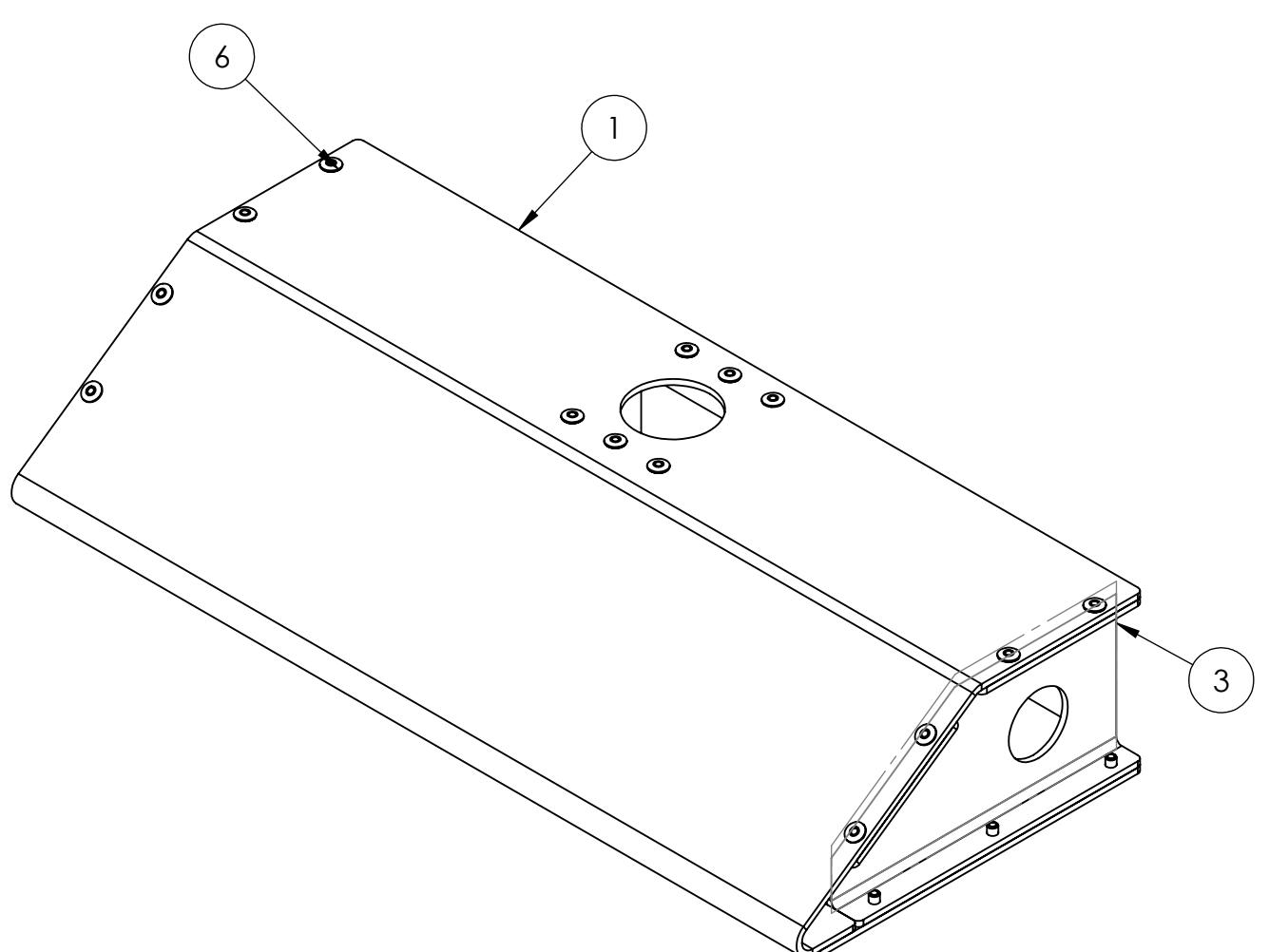
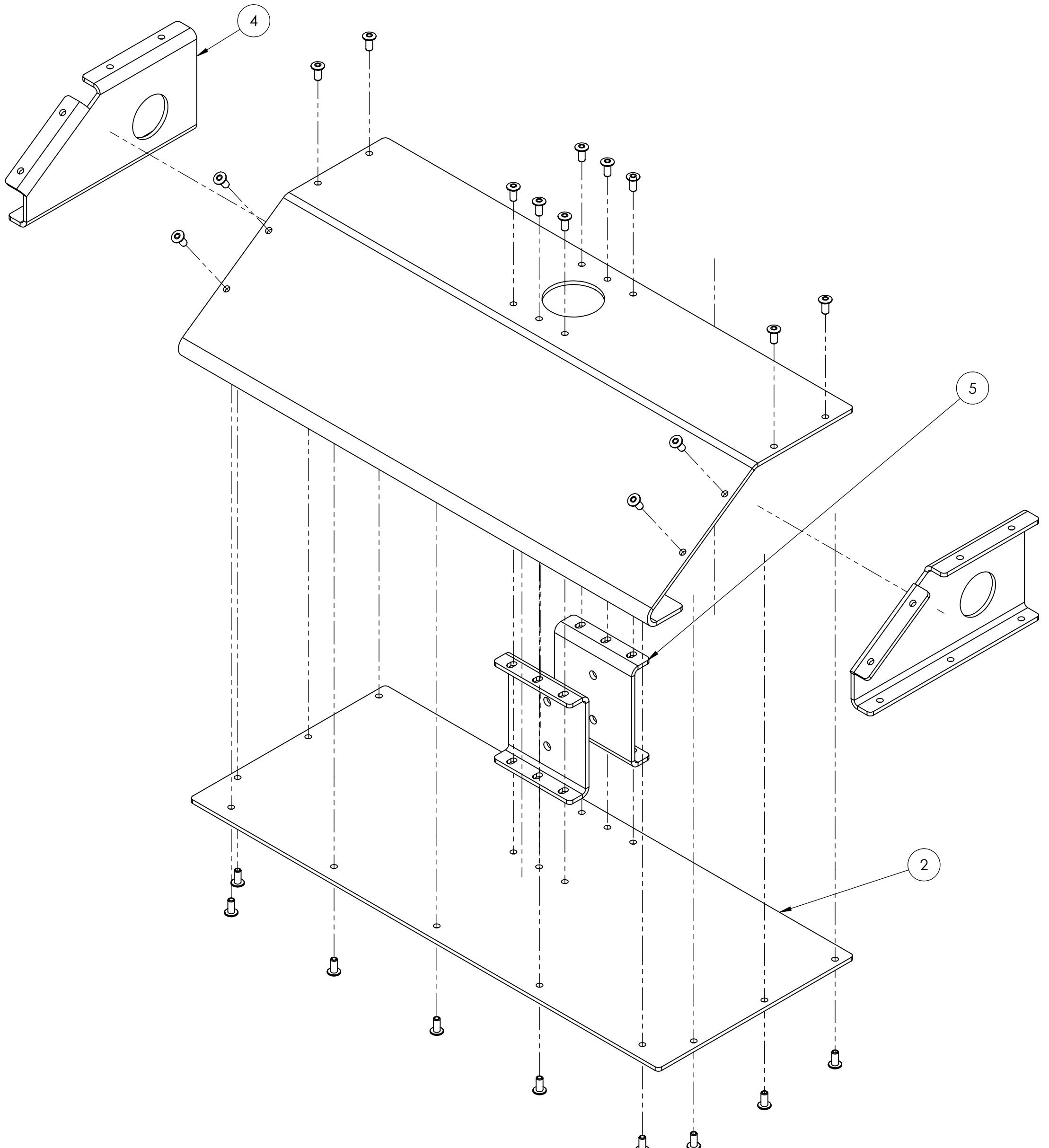
FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
End Divider Angle
Brace Connector
Pin

SIZE DWG. NO. REV
C GE-23028

SCALE: 1:1 SHEET 1 OF 1



Notes:

1. Label Assembly with Part Number
 2. 1-1/4" SCH 40 Pipe (1.66" OD) Fits between the two (5) brackets.
 Use a Pipe during assembly to get a slip fit between the brackets.

A

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23011	Lower Base Pole Top	1
2	GE-23012	Lower Pole Base Bottom	1
3	GE-23013	Lower Pole Base Side A	1
4	GE-23014	Lower Pole Base Side B	1
5	GE-23015	Lower Pole Pipe Brace	2
6	187 pop rivet	3/16" Steel Rivet	31

A

UNLESS OTHERWISE SPECIFIED:		VEND	NAME	DATE
		DRAWN	JO	9/30/2022
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MATERIAL/FINISH:				
DO NOT SCALE DRAWING				

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 $\pm .005$

COMMENTS:
 REMOVE ALL BURRS AND SHARP EDGES.

FIRST ROBOTICS COMPETITION SOLIDWORKS Modeling Solutions Partner

TITLE: Lower Pole Base Sheetmetal

SIZE DWG. NO. REV

C GE-23029 **A**

SCALE: 1:4 SHEET 1 OF 1

4

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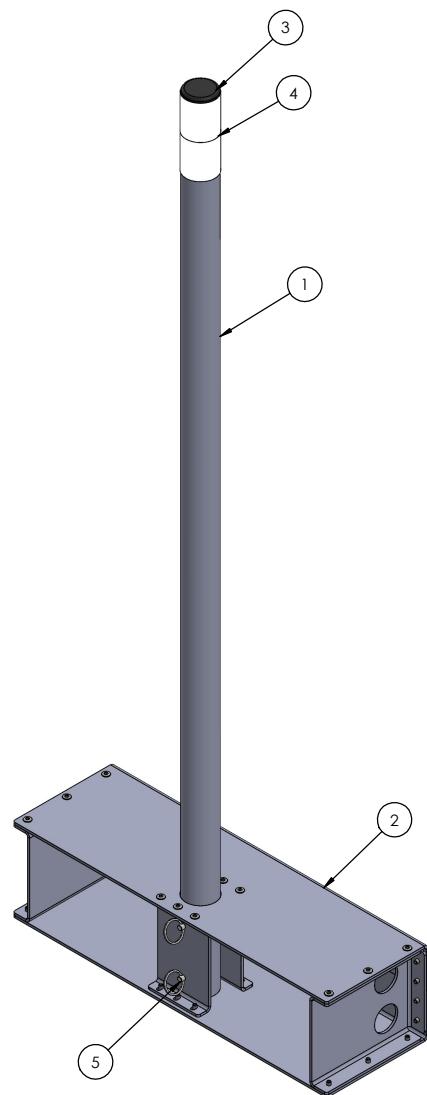
C

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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23035	Upper Pole	1
2	GE-23043	Upper Pole Base Sheetmetal	1
3	CCF-RT-13-1	Pole Cap	1
4	tape_VISIONTARGET	tape_VISIONTARGET	2
5	pin_quick_ring_.25_2.5	Pin, Ring-Grip Quick-Release with SS Ring, 1/4" Diameter, 2.5" Usable Length	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 $\pm .010$

MATERIAL/FINISH:

Various

DO NOT SCALE DRAWING

BEND	NAME	DATE
DRAWN	NAL	9/29/2022

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COMMENTS:
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FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
Upper Pole Base

SIZE DWG. NO. REV
C GE-23030

SCALE: 1:4 SHEET 1 OF 1

4

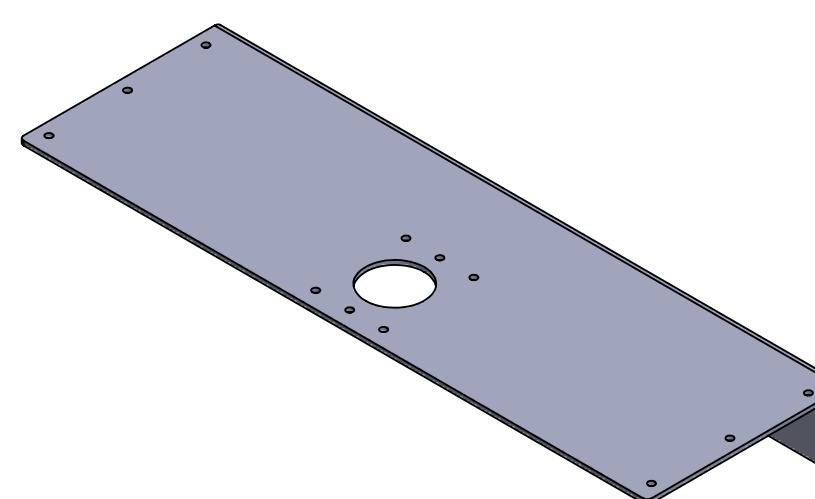
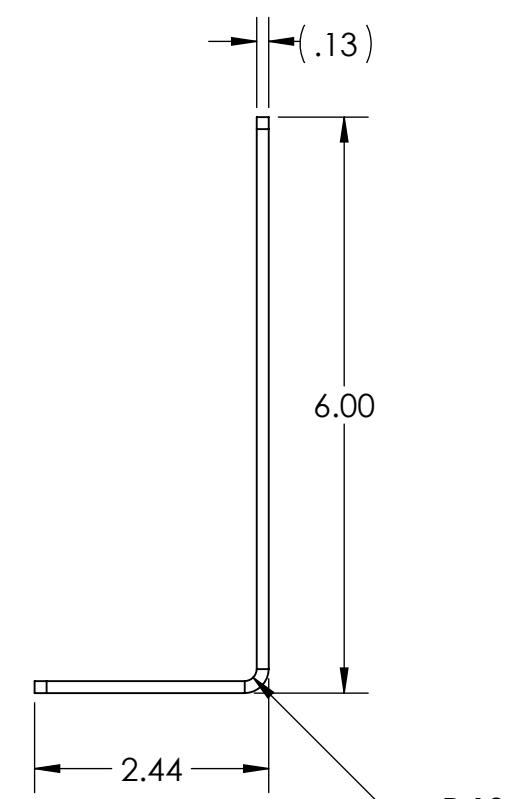
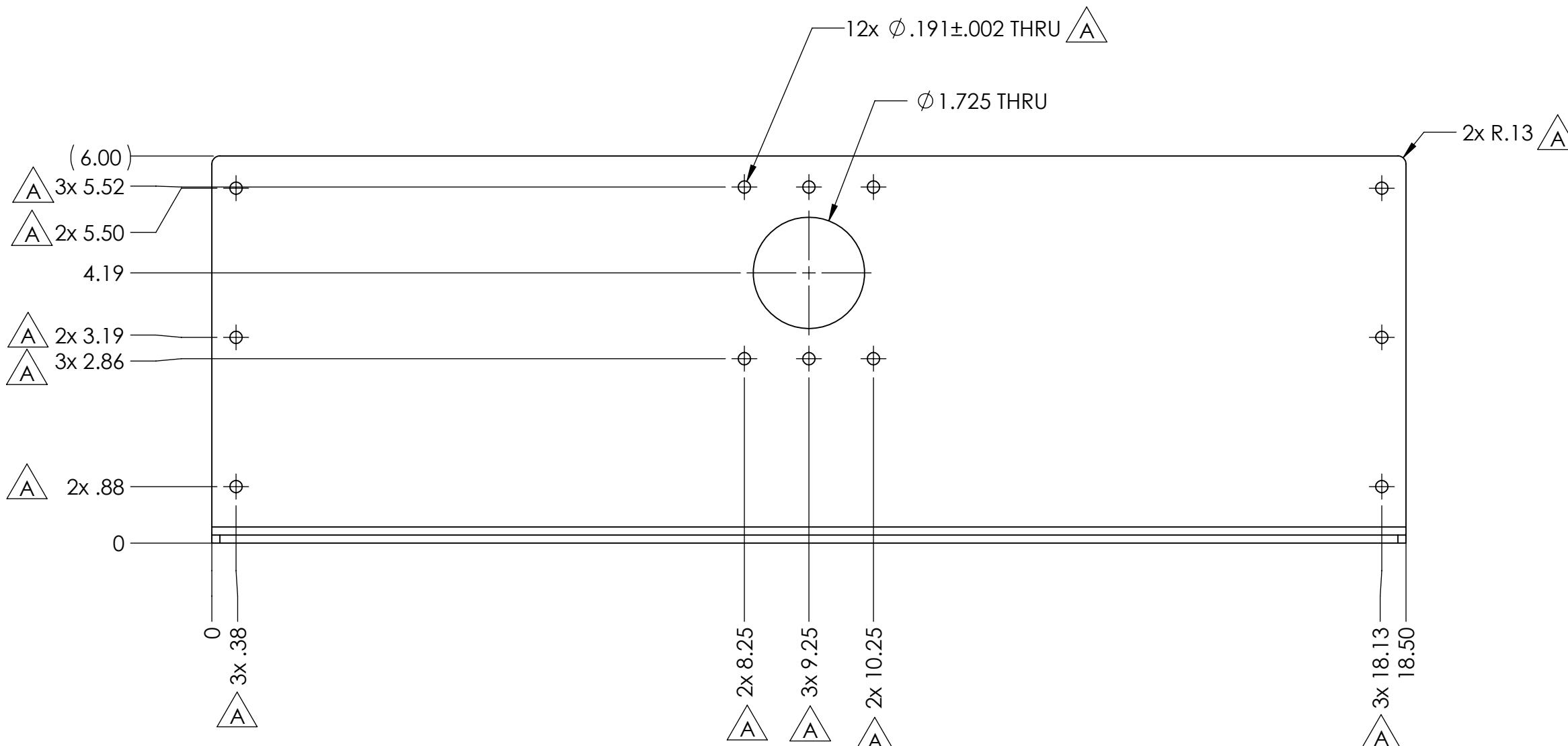
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UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL $\pm 1/16$
ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$
TWO PLACE DECIMAL $\pm .02$
THREE PLACE DECIMAL $\pm .010$

DO NOT SCALE DRAWING

BEND NAME DATE
DRAWN NAL 9/23/2022

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PROHIBITED.

MATERIAL/FINISH:
8GA 5052 AL

COMMENTS:

REMOVE ALL BURRS AND SHARP
EDGES.

FIRST[®] ROBOTICS COMPETITION
SOLIDWORKS
Modeling Solutions Partner

TITLE:
Upper Pole
Base Top

SIZE DWG. NO. REV
C GE-23031

SCALE: 1:2 SHEET 1 OF 1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
B2, B3, B4, C4, D2, D3	A	Style of Qty callouts, Rivet Hole Tolerance	9/23/2022	JO

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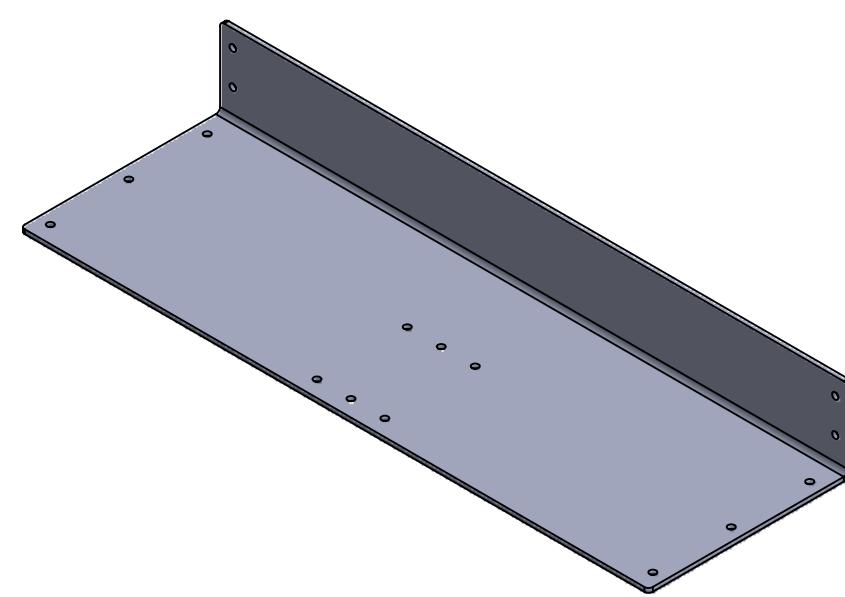
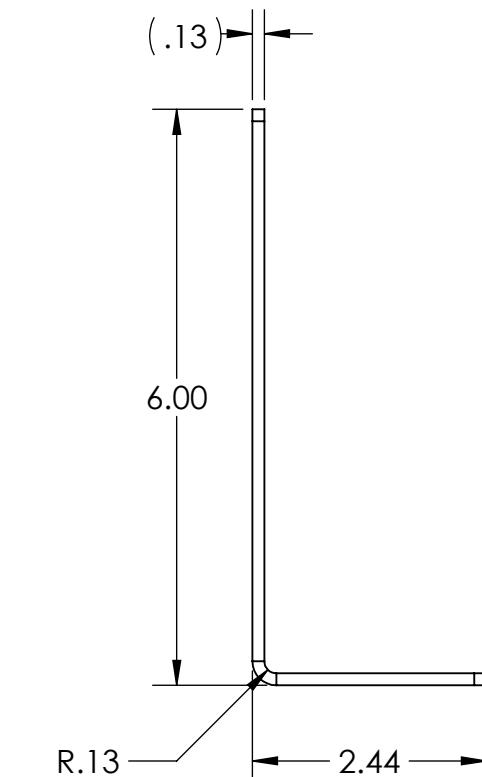
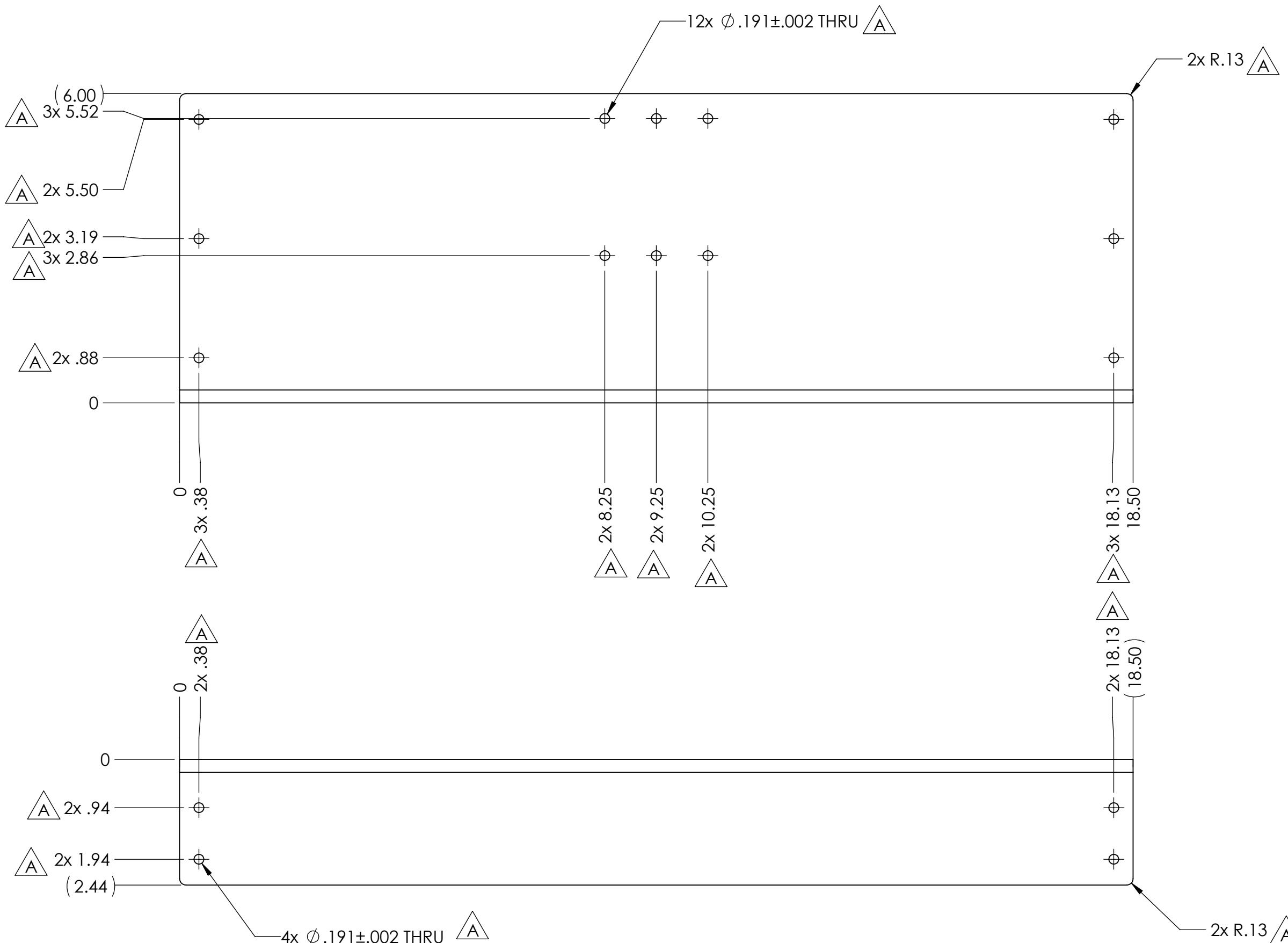
C

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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:
8GA 5052 AL

DO NOT SCALE DRAWING

BEND NAME DATE
DRAWN NAL 9/23/2022

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COMMENTS:
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FIRST ROBOTICS COMPETITION DS SOLIDWORKS Modeling Solutions Partner

TITLE: Upper Pole
Base Bottom

SIZE DWG. NO. REV
C GE-23032

SCALE: 1:2 SHEET 1 OF 1

4

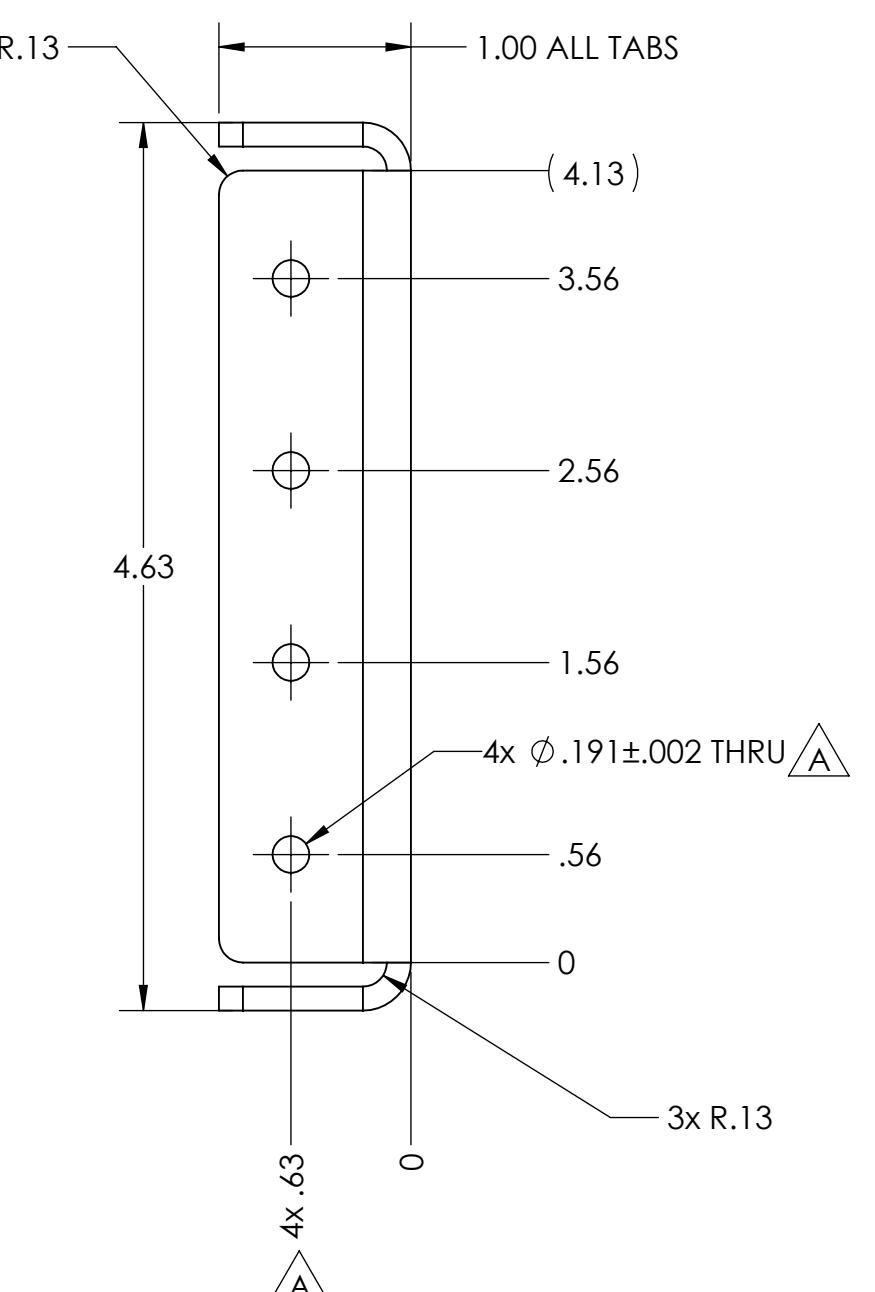
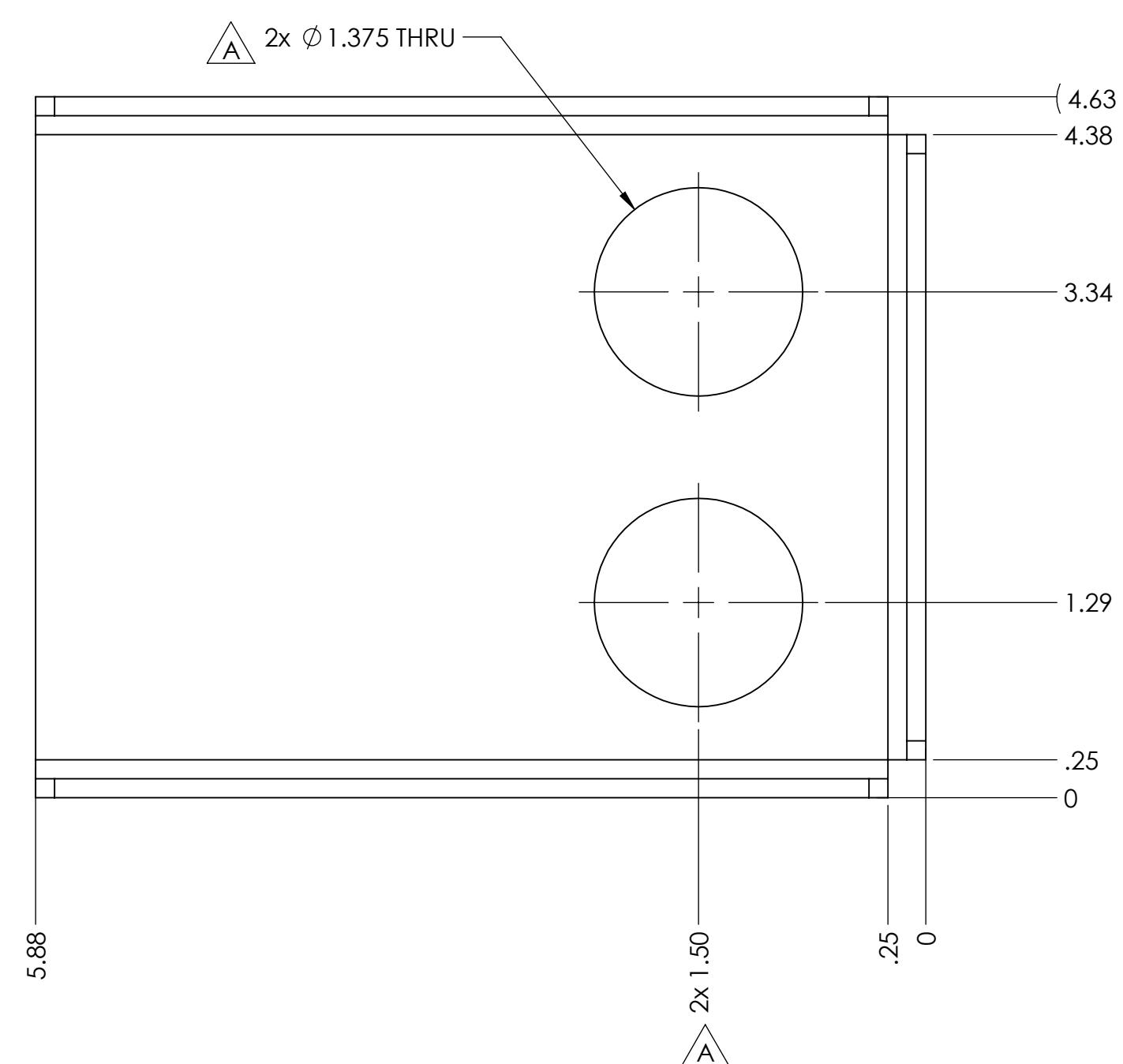
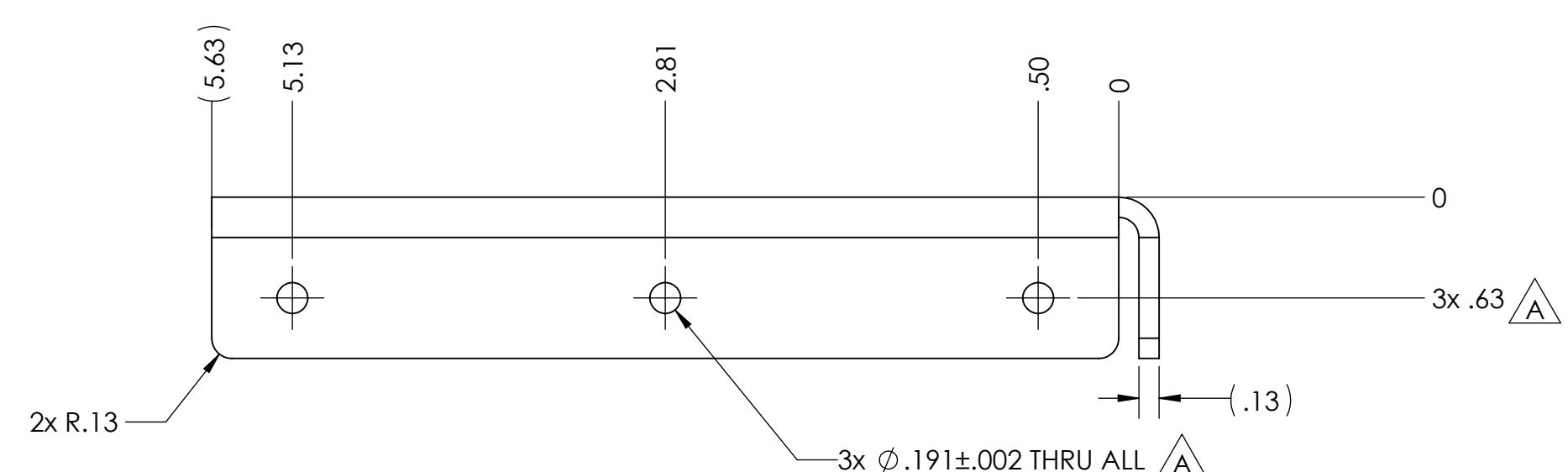
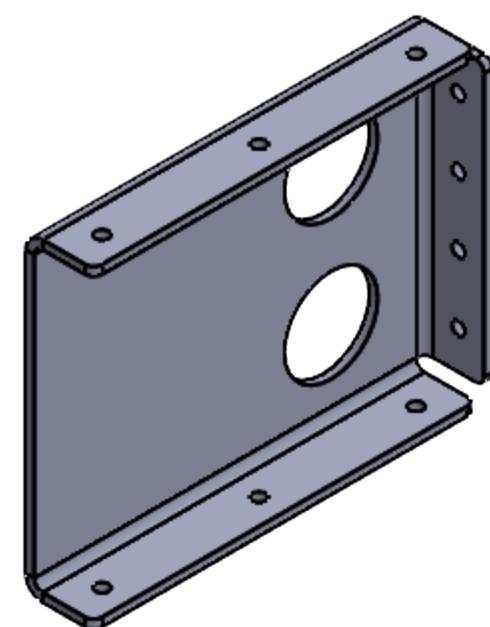
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UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL $\pm 1/16$
ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$
TWO PLACE DECIMAL $\pm .02$
THREE PLACE DECIMAL $\pm .010$

MATERIAL/FINISH:
8GA 5052 AL

COMMENTS:
REMOVE ALL BURRS AND SHARP
EDGES.

BEND NAME DATE
DRAWN NAL 9/23/2022

FIRST ROBOTICS COMPETITION
SOLIDWORKS
Modeling Solutions Partner

TITLE: Upper Pole
Base Side

SIZE DWG. NO. REV
C GE-23033

SCALE: 1:1 SHEET 1 OF 1

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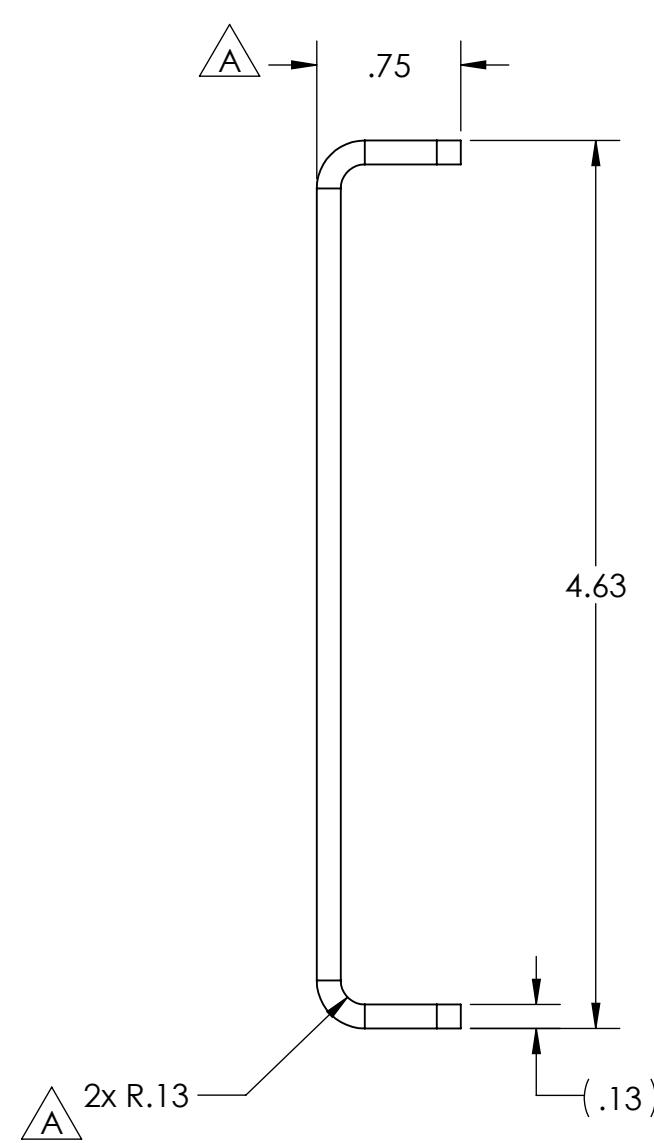
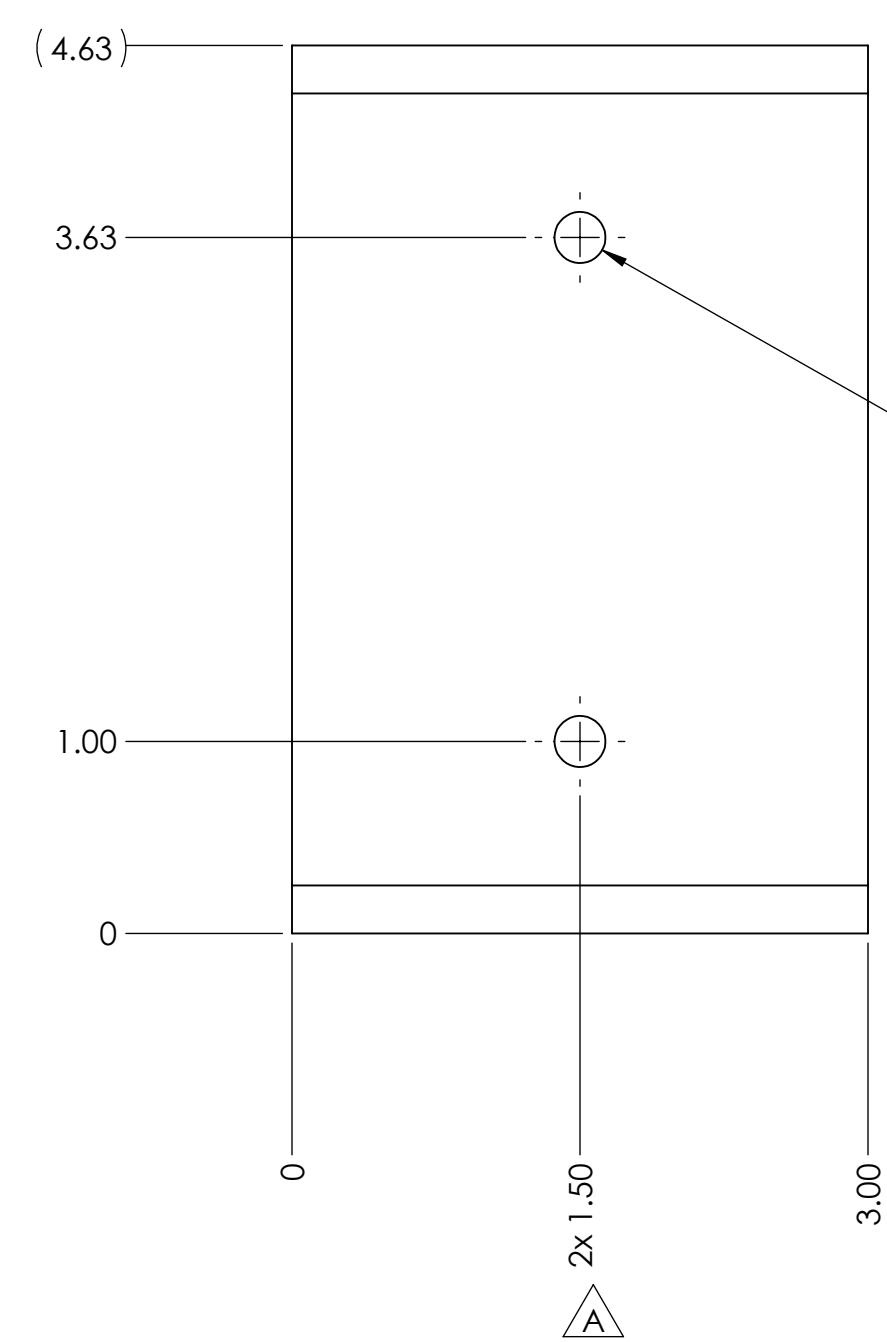
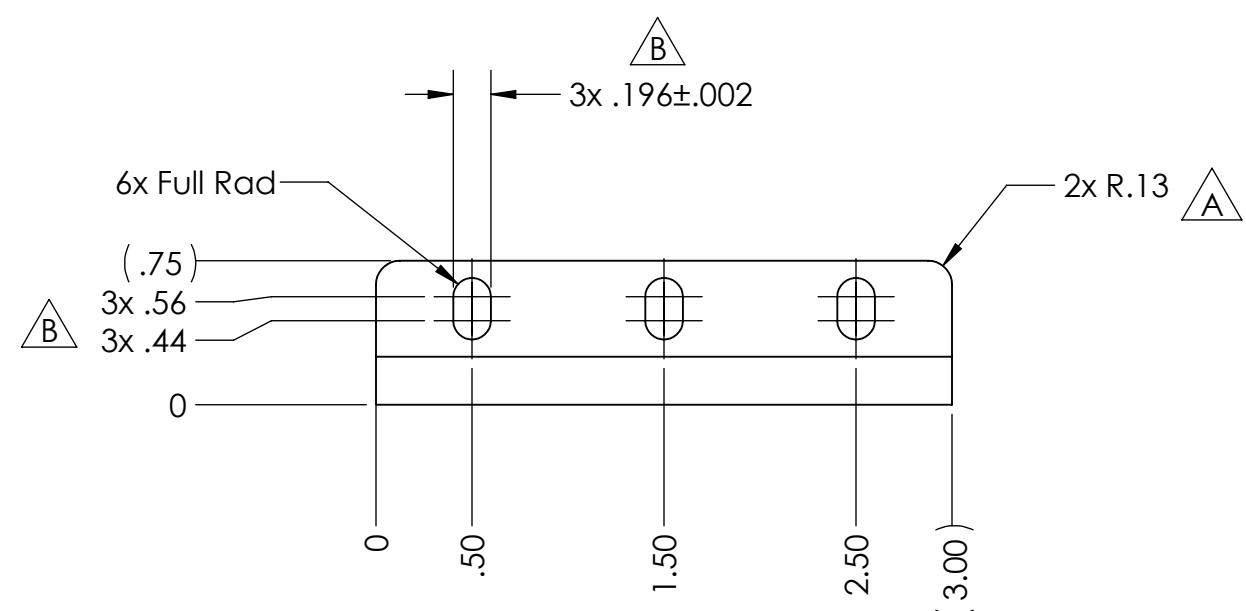
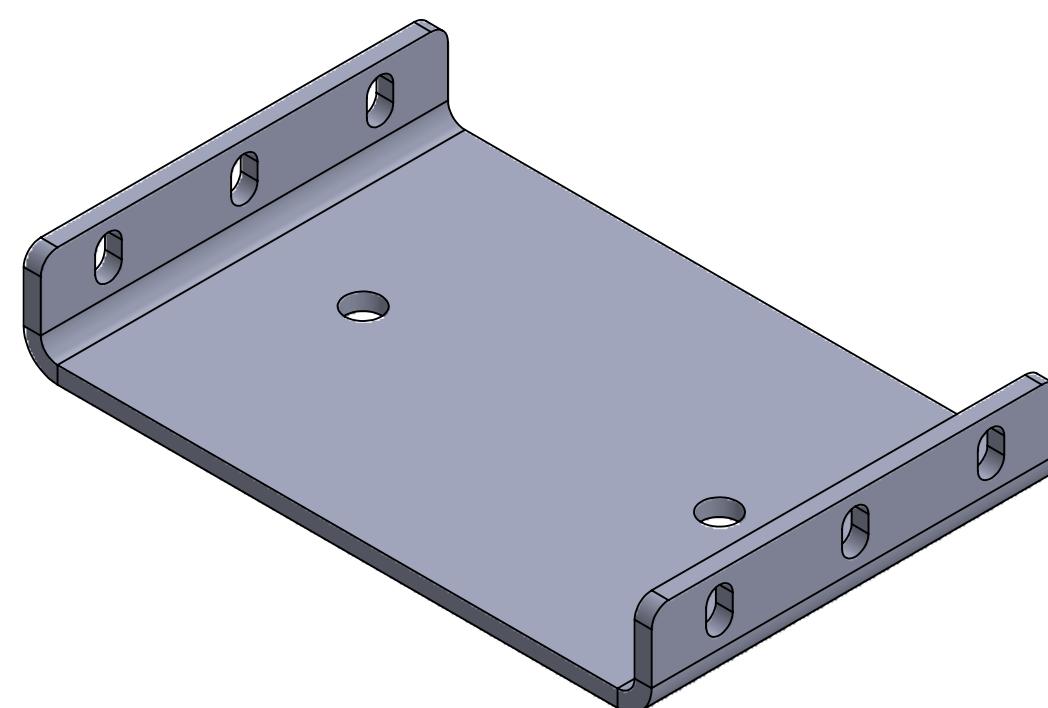
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			DRAWN	NAL	9/23/2022
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MATERIAL/FINISH:	8GA 5052 AL	REV	C	GE-23034	B
COMMENTS:	REMOVE ALL BURRS AND SHARP EDGES.				
DO NOT SCALE DRAWING					

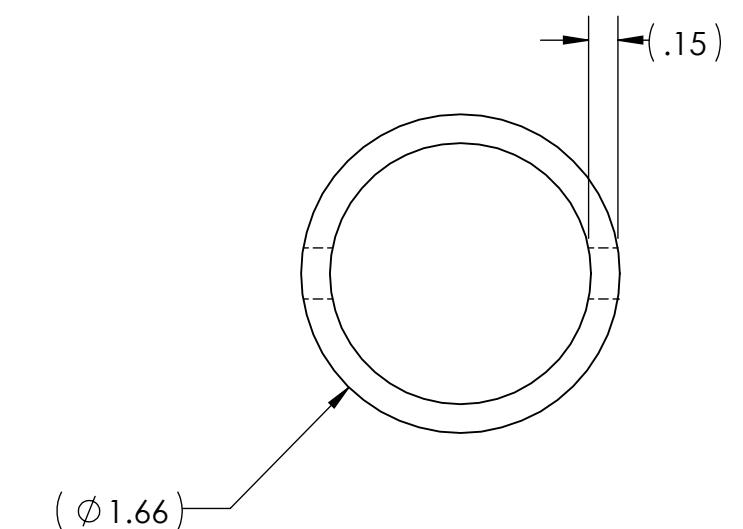
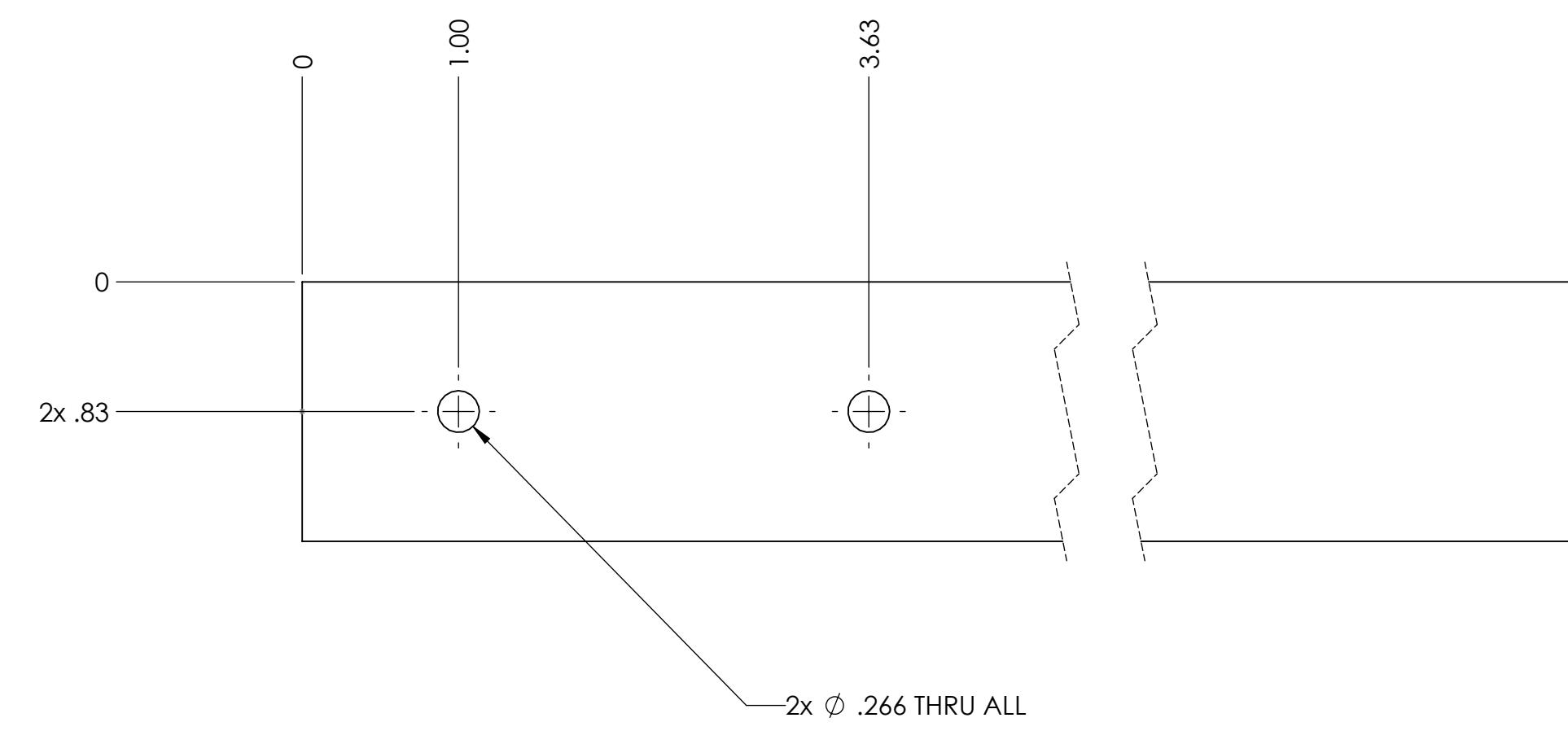
FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
**Upper Pole Base
Pole Brace**

SIZE DWG. NO. REV
C GE-23034 B

SCALE: 1:1 SHEET 1 OF 1



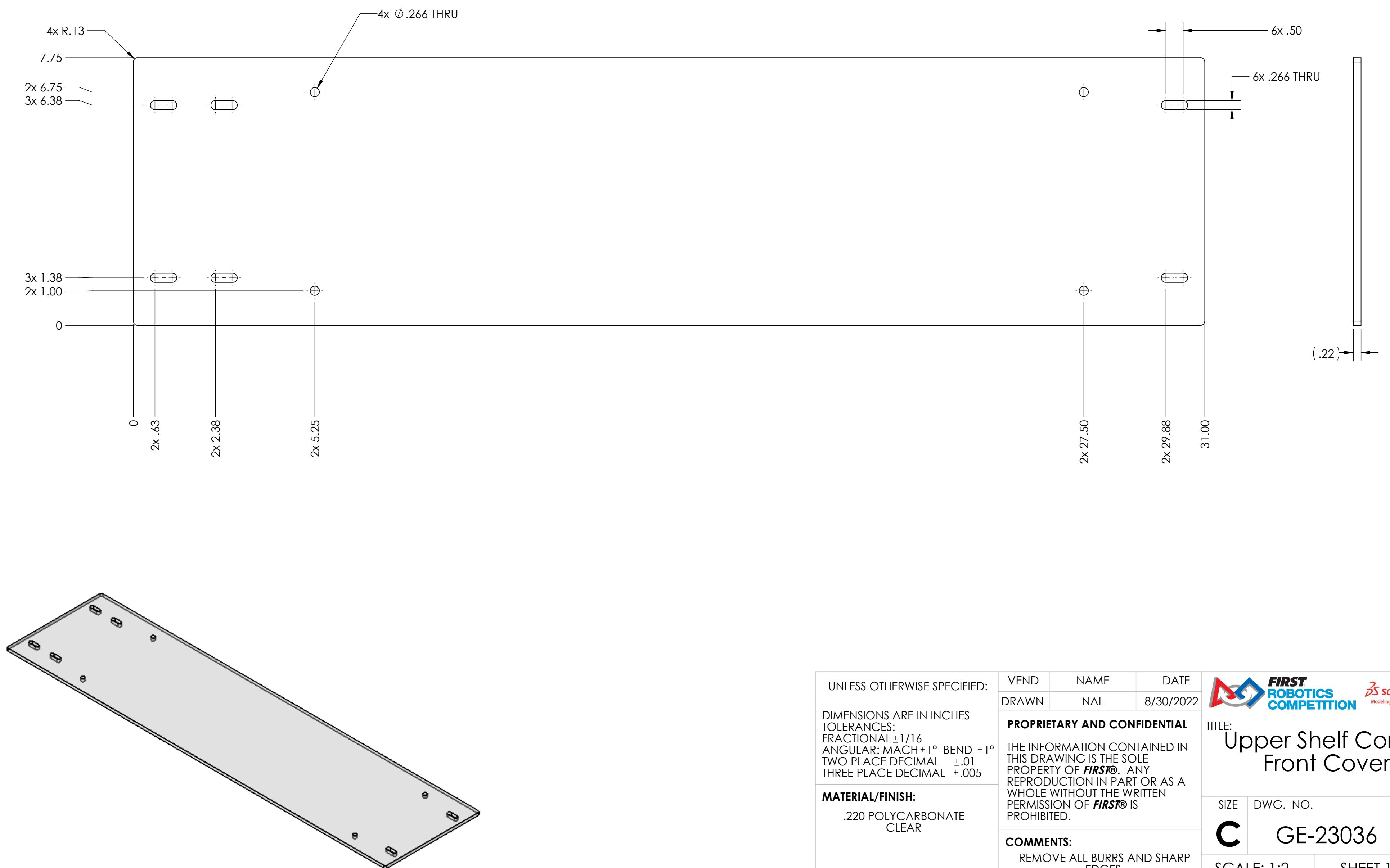
UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .005$	DRAWN	NAL	9/23/2022
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:	SIZE	DWG. NO.	REV
1.25IN SCH40 AL TUBE	C	GE-23035	
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING	SCALE: 1:1	SHEET 1 OF 1	

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

TITLE: **Upper Pole**

SIZE DWG. NO. REV
C GE-23035

SCALE: 1:1 SHEET 1 OF 1



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	NAL	8/30/2022
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:	SIZE	DWG. NO.	REV
.220 POLYCARBONATE CLEAR	C	GE-23036	
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
Upper Shelf Corner
Front Cover

SIZE DWG. NO. REV

C GE-23036

SCALE: 1:2 SHEET 1 OF 1

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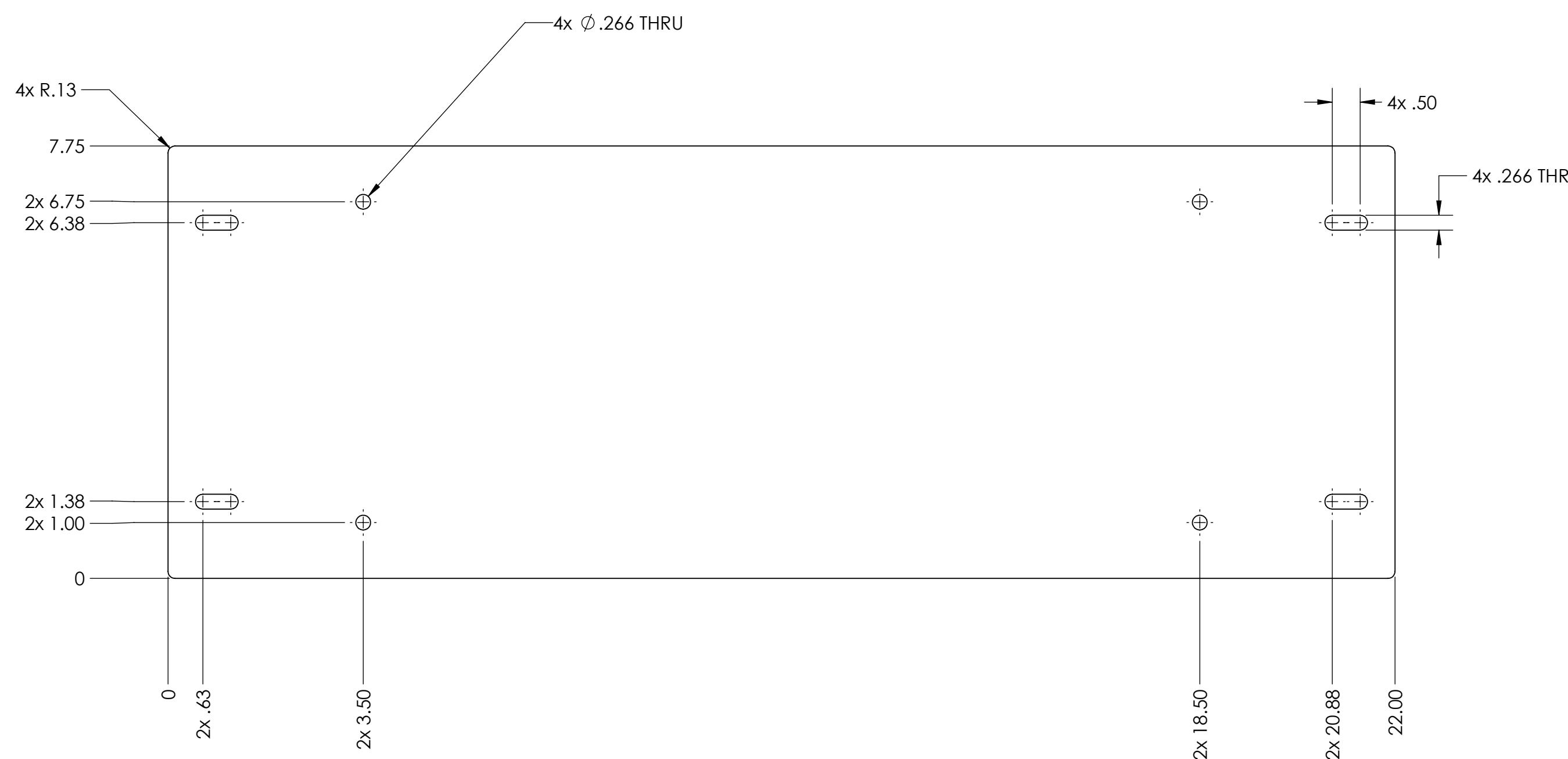
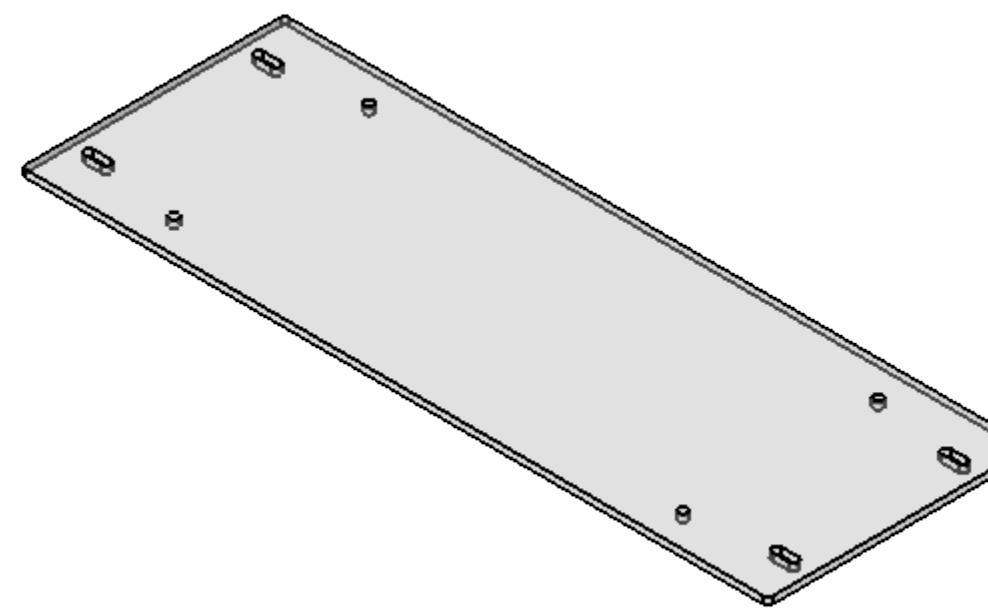
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UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	NAL	8/30/2022
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MATERIAL/FINISH: .220 POLYCARBONATE CLEAR			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
**Upper Shelf
Front Cover**

SIZE DWG. NO. REV
C GE-23037

SCALE: 1:2 SHEET 1 OF 1

4

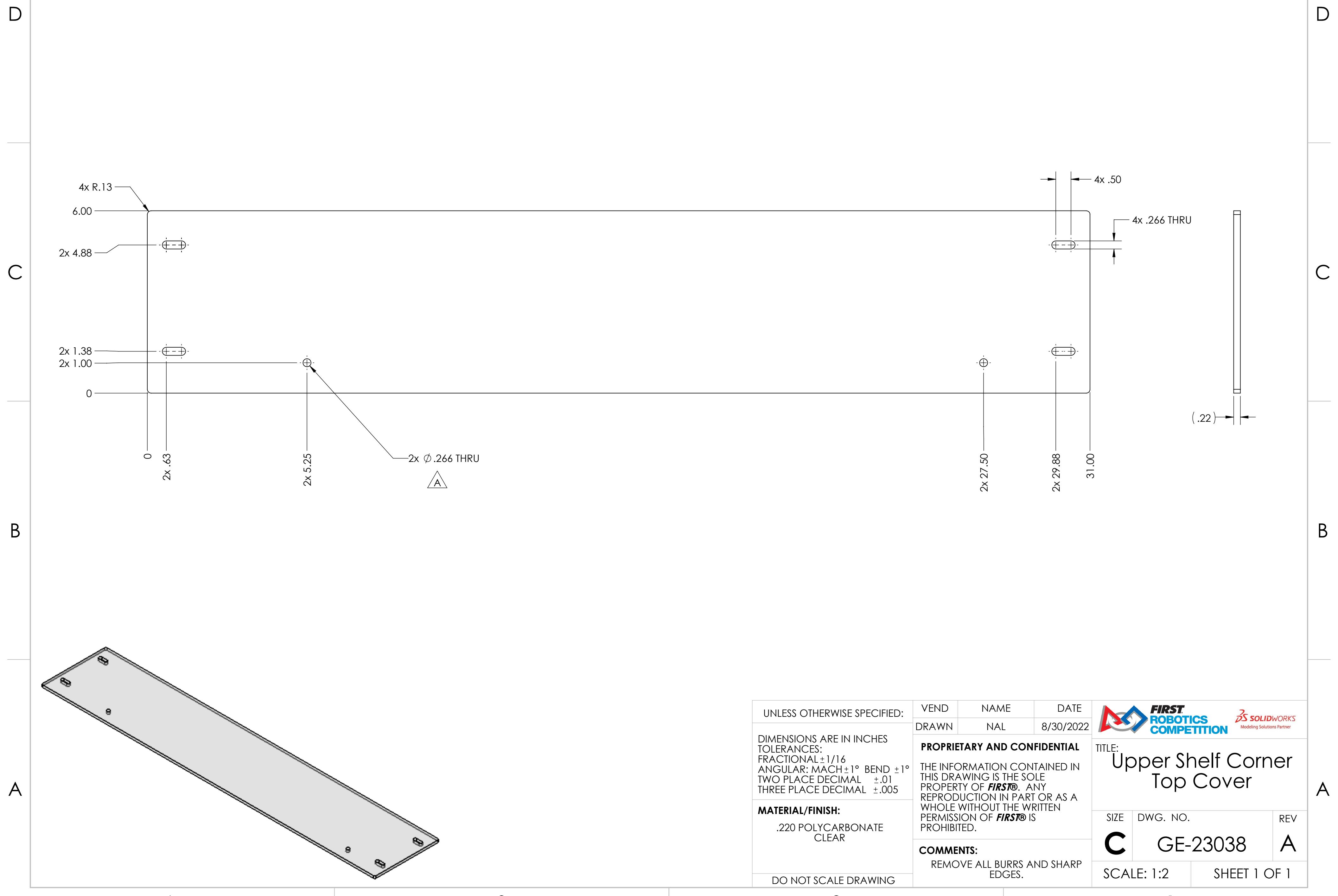
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REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
B3	A	Removed two holes from part	12/6/2022	JRO



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:

.220 POLYCARBONATE
CLEAR

DO NOT SCALE DRAWING

VEND	NAME	DATE
DRAWN	NAL	8/30/2022

PROPRIETARY AND CONFIDENTIAL

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COMMENTS:

REMOVE ALL BURRS AND SHARP EDGES.

 FIRST ROBOTICS COMPETITION  SOLIDWORKS
Modeling Solutions Partner

TITLE: Upper Shelf Corner Top Cover

SIZE DWG. NO. REV

C GE-23038 A

SCALE: 1:2 SHEET 1 OF 1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
B3	A	Removed two holes from part	12/6/2022	JRO

D

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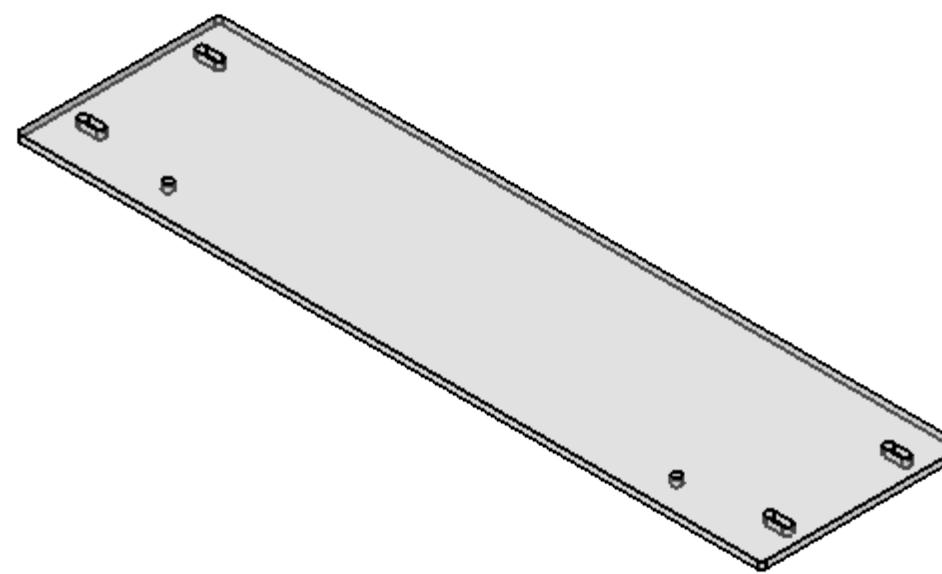
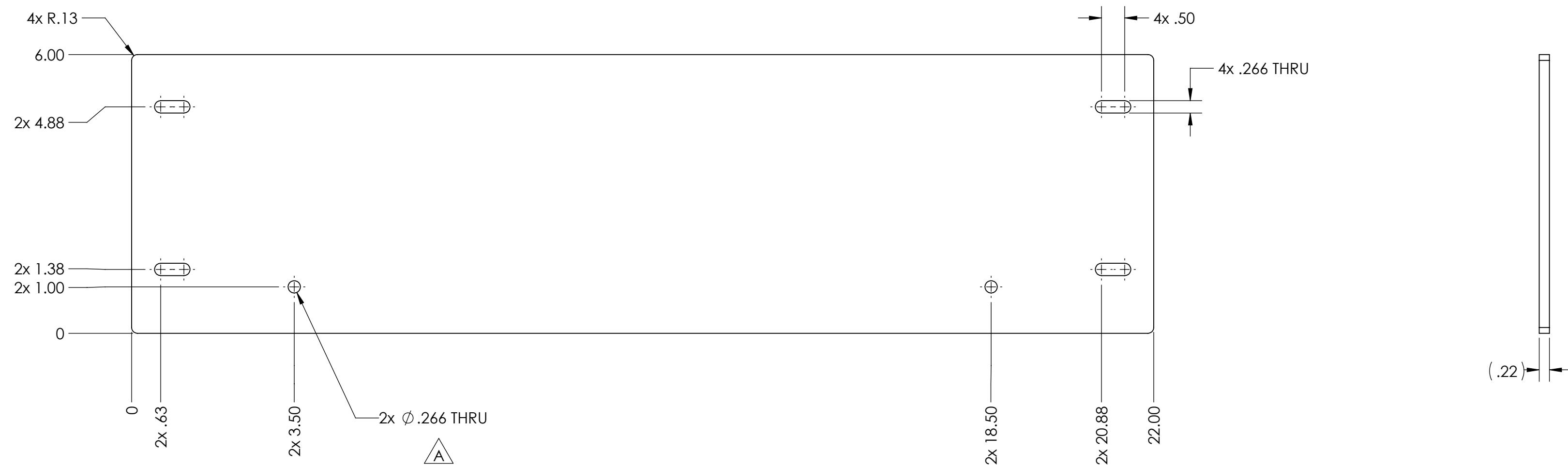
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UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL $\pm 1/16$
ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$
TWO PLACE DECIMAL $\pm .01$
THREE PLACE DECIMAL $\pm .005$

MATERIAL/FINISH:
.220 POLYCARBONATE
CLEAR

DO NOT SCALE DRAWING

VEND NAME DATE
DRAWN NAL 8/30/2022

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FIRST
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COMPETITION

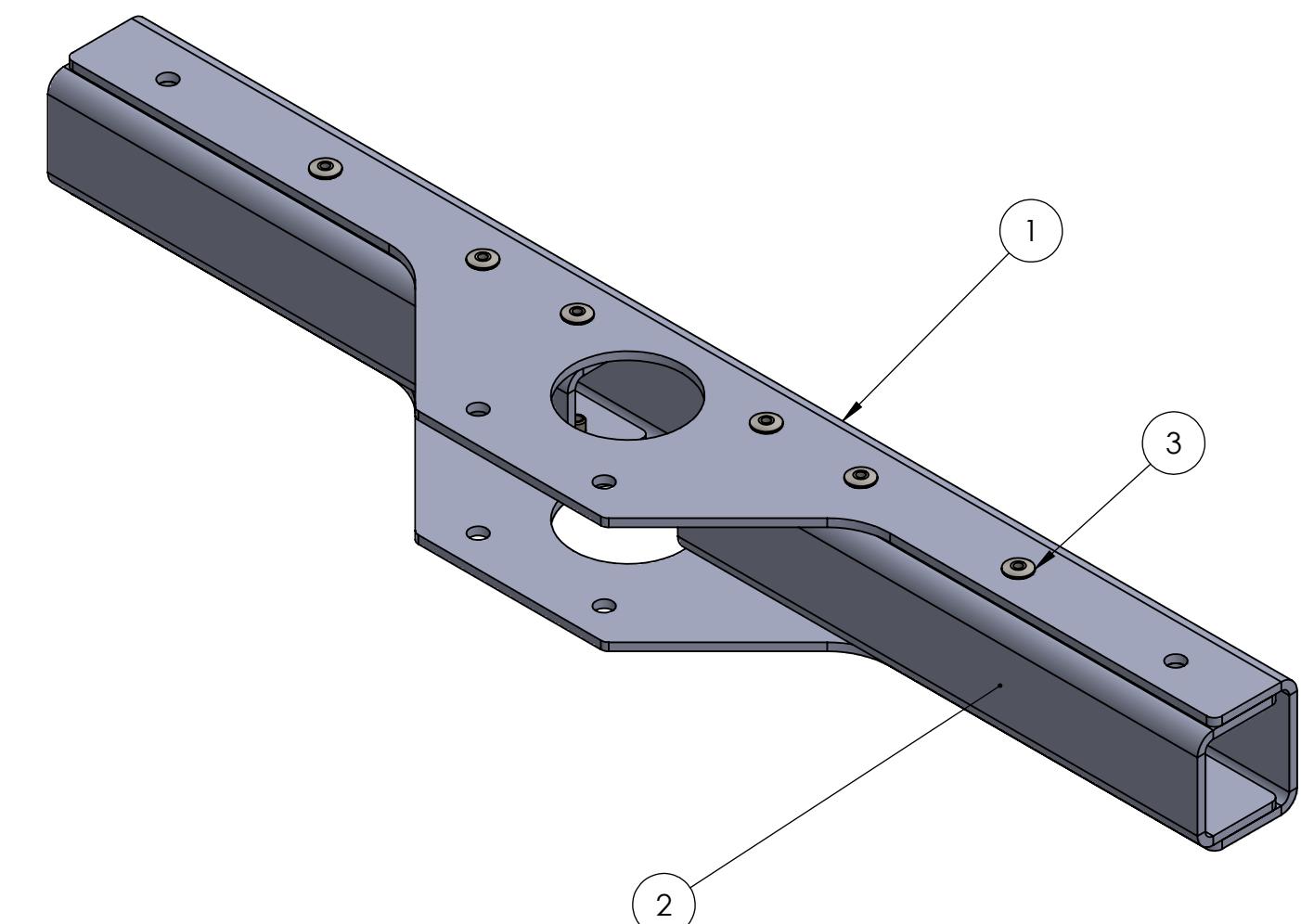
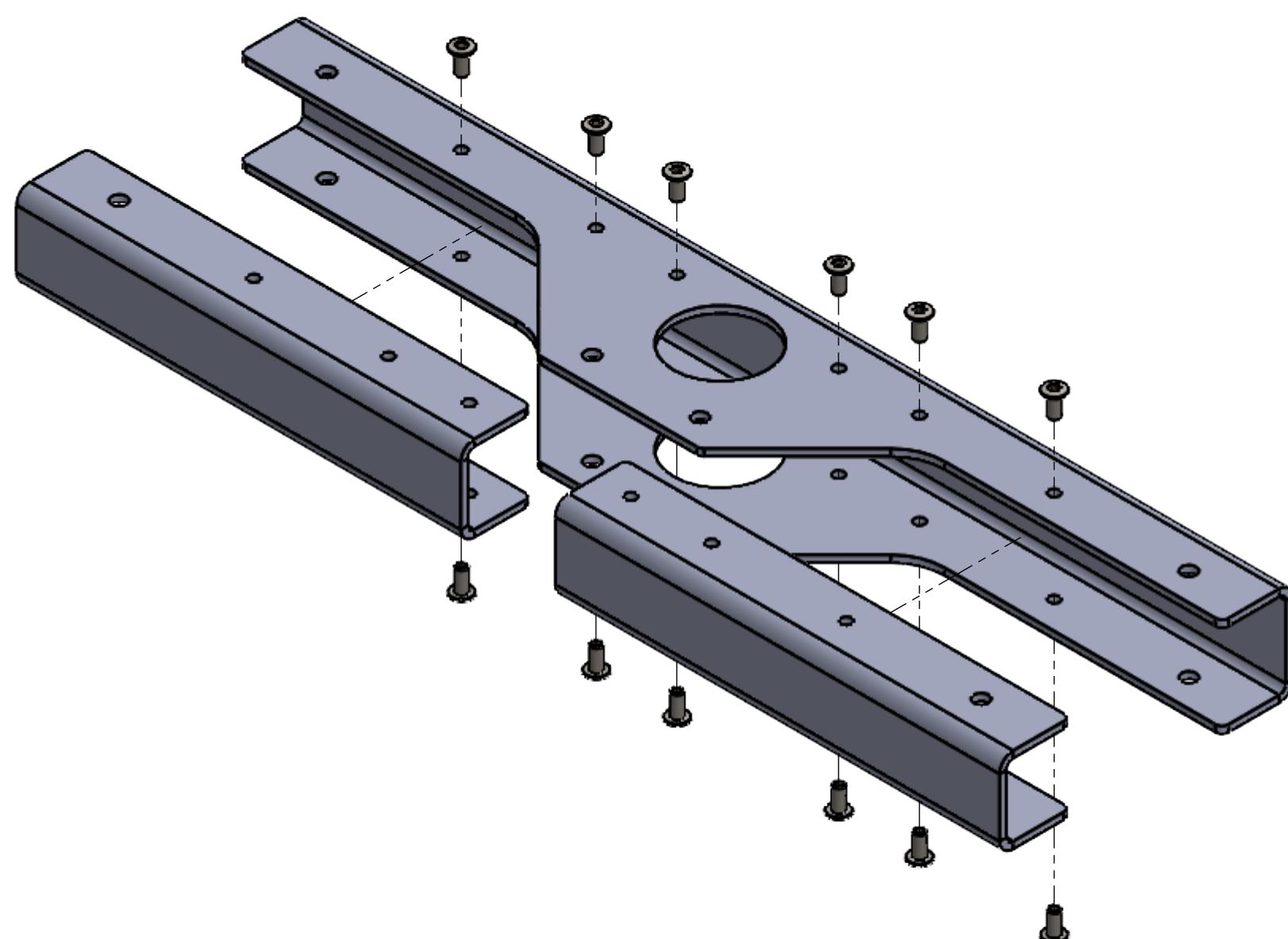
SOLIDWORKS
Modeling Solutions Partner

TITLE: Upper Shelf Top
Cover

SIZE DWG. NO. REV
C GE-23039 A

SCALE: 1:2 SHEET 1 OF 1

ITEM NO.	PART NUMBER	Description	QTY.
1	GE-23041	Upper Pole Crossbar A	1
2	GE-23042	Upper Pole Crossbar B	2
3	187 pop rivet	3/16" Steel Rivet	12



NOTE: TAG 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 $\pm .02$
THREE PLACE DECIMAL $\pm .010$

MATERIAL/FINISH:

DO NOT SCALE DRAWING

BEND NAME DATE

DRAWN NAL 9/29/2022

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COMMENTS:

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FIRST ROBOTICS COMPETITION
SOLIDWORKS
Modeling Solutions Partner

TITLE:
Upper Pole Crossbar

SIZE DWG. NO. REV

C GE-23040

SCALE: 1:2 SHEET 1 OF 1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
B1, B2, C1, C2, C4	A	Style of Qty callouts, Rivet Hole Tolerance	9/23/2022	JO

D

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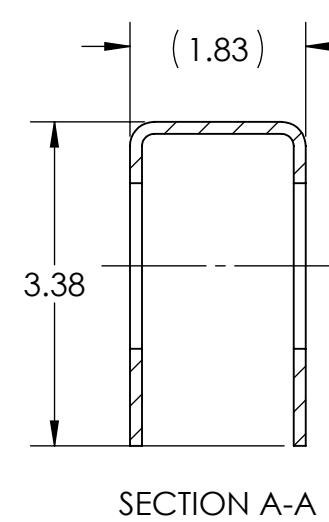
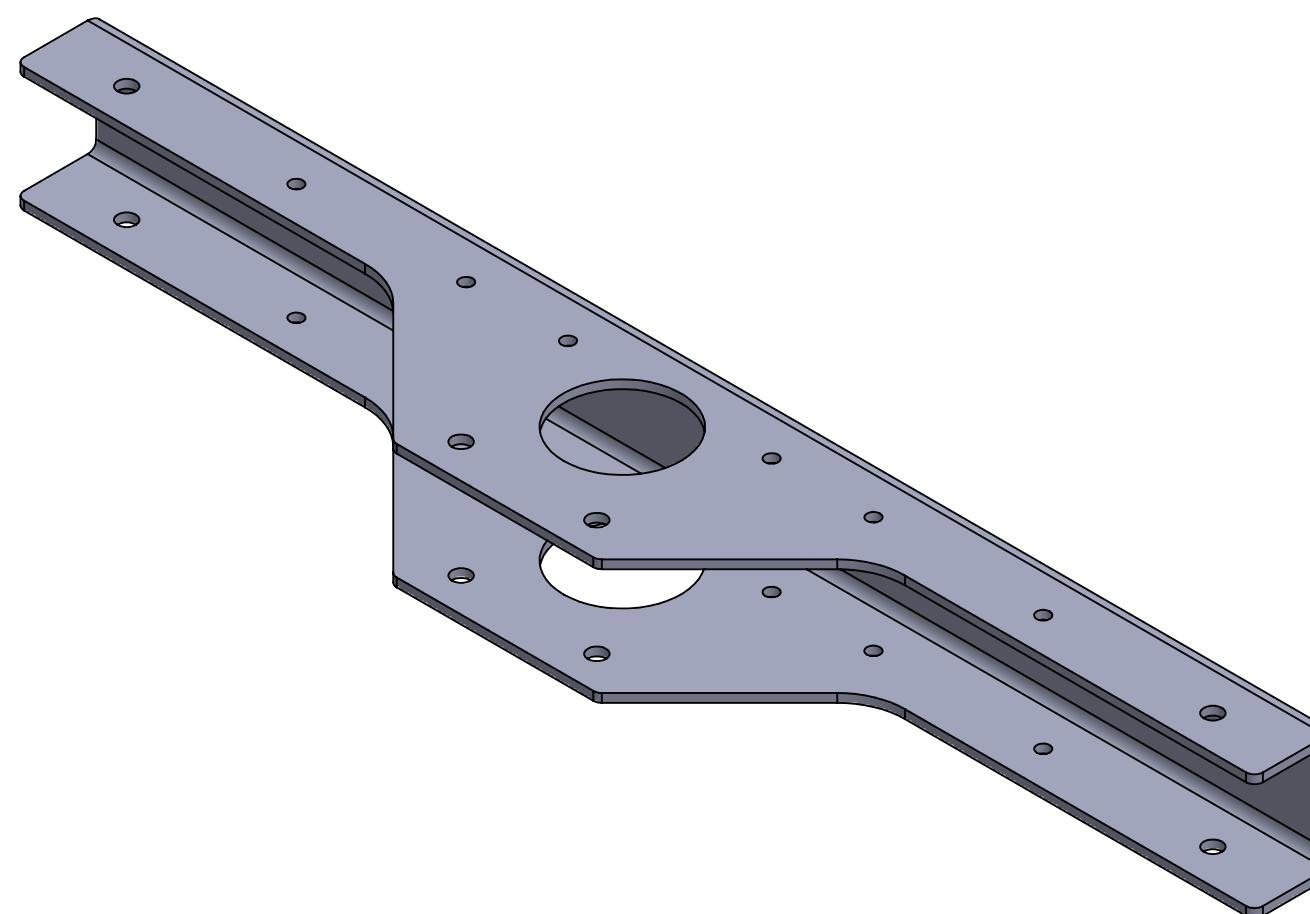
C

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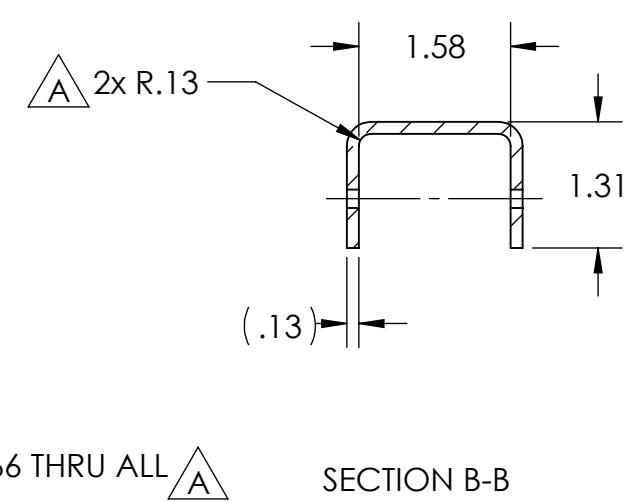
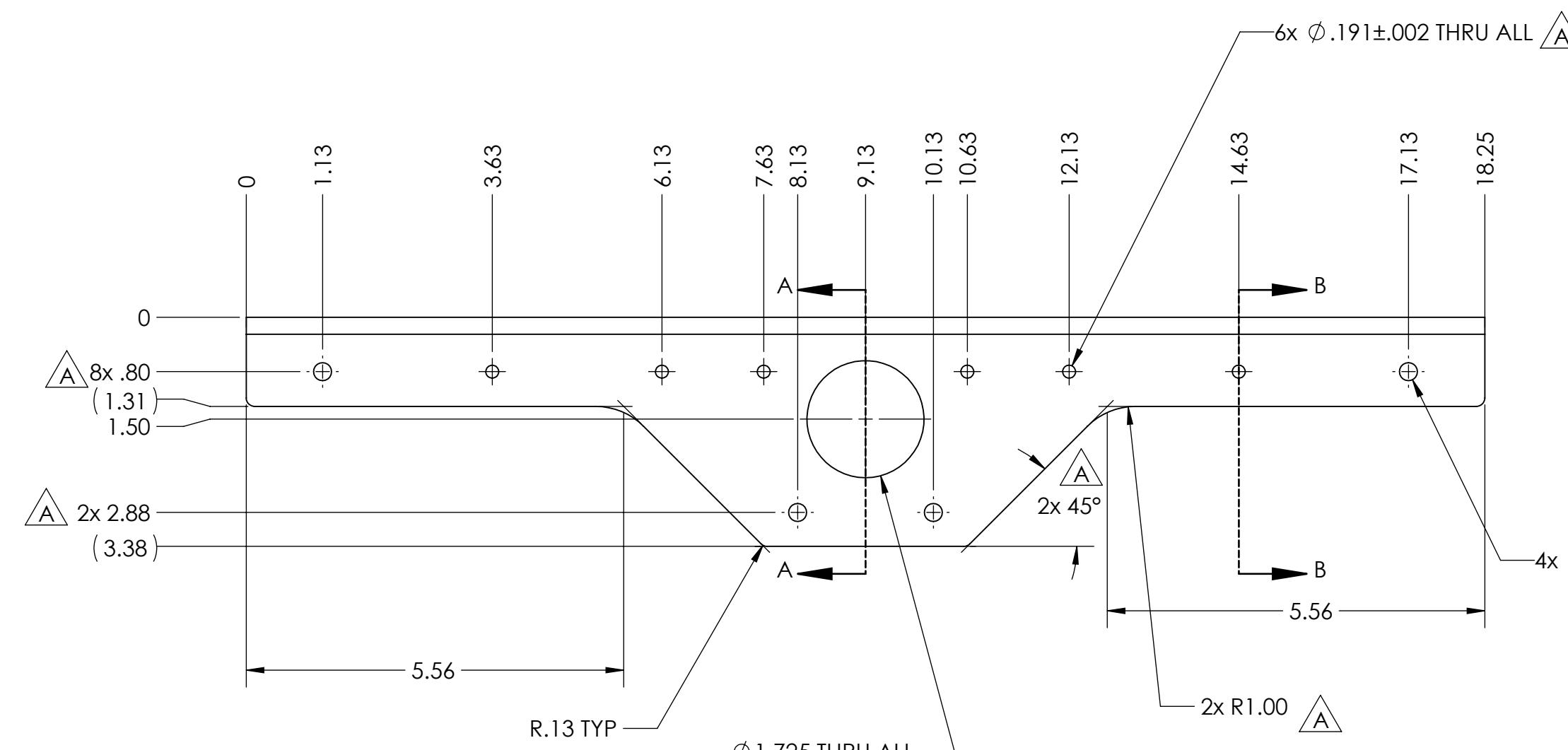
B

A

A



SECTION A-A



SECTION B-B

UNLESS OTHERWISE SPECIFIED:	BEND	NAME	DATE
DRAWN	NAL	9/23/2022	
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Modeling Solutions Partner

TITLE:
**Upper Pole
Crossbar A**

SIZE DWG. NO. REV
C GE-23041

SCALE: 1:2 SHEET 1 OF 1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
B2, C1, C4	A	Style of Qty callouts, Rivet Hole Tolerance	9/23/2022	JO

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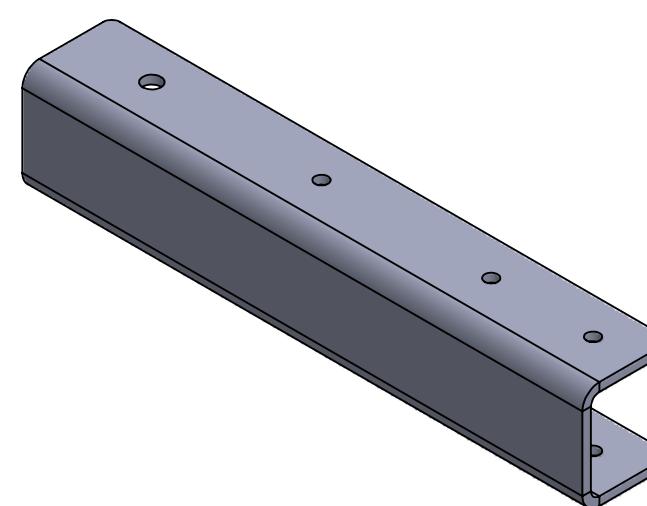
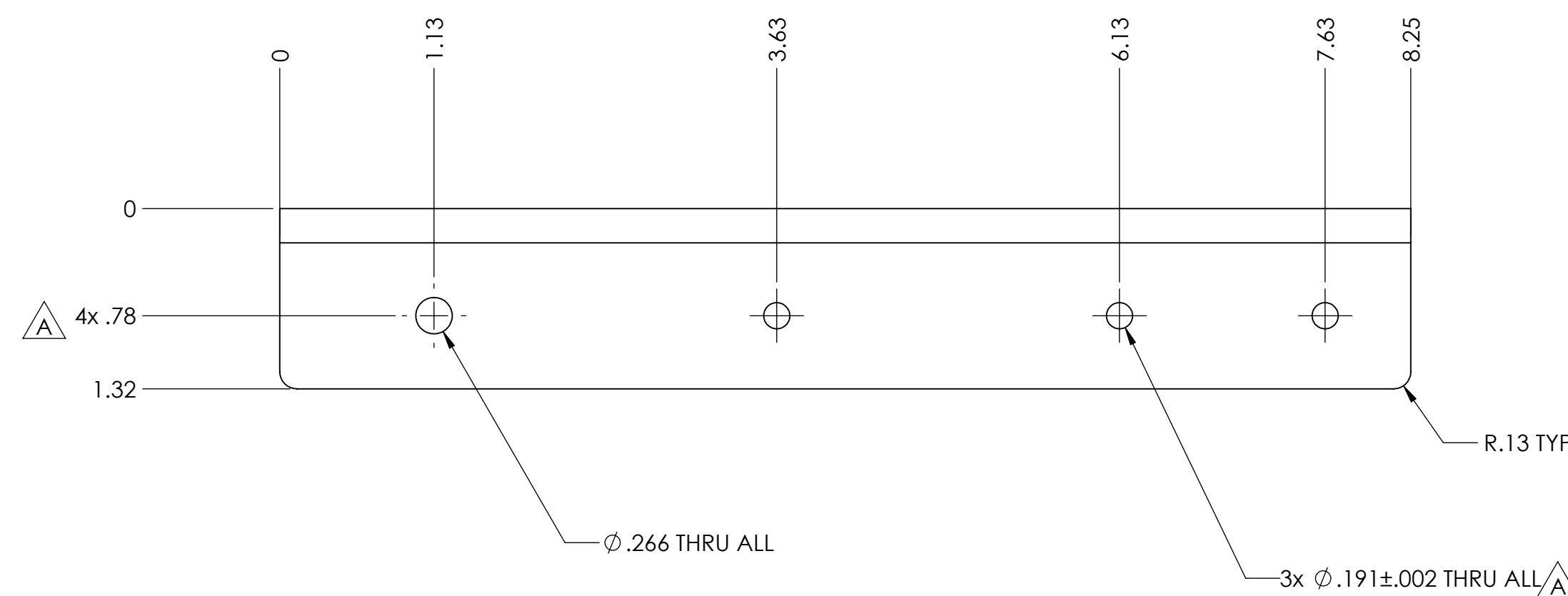
C

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UNLESS OTHERWISE SPECIFIED:	BEND	NAME	DATE
DRAWN	NAL	9/23/2022	
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MATERIAL/FINISH: 8GA 5052 AL			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

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ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

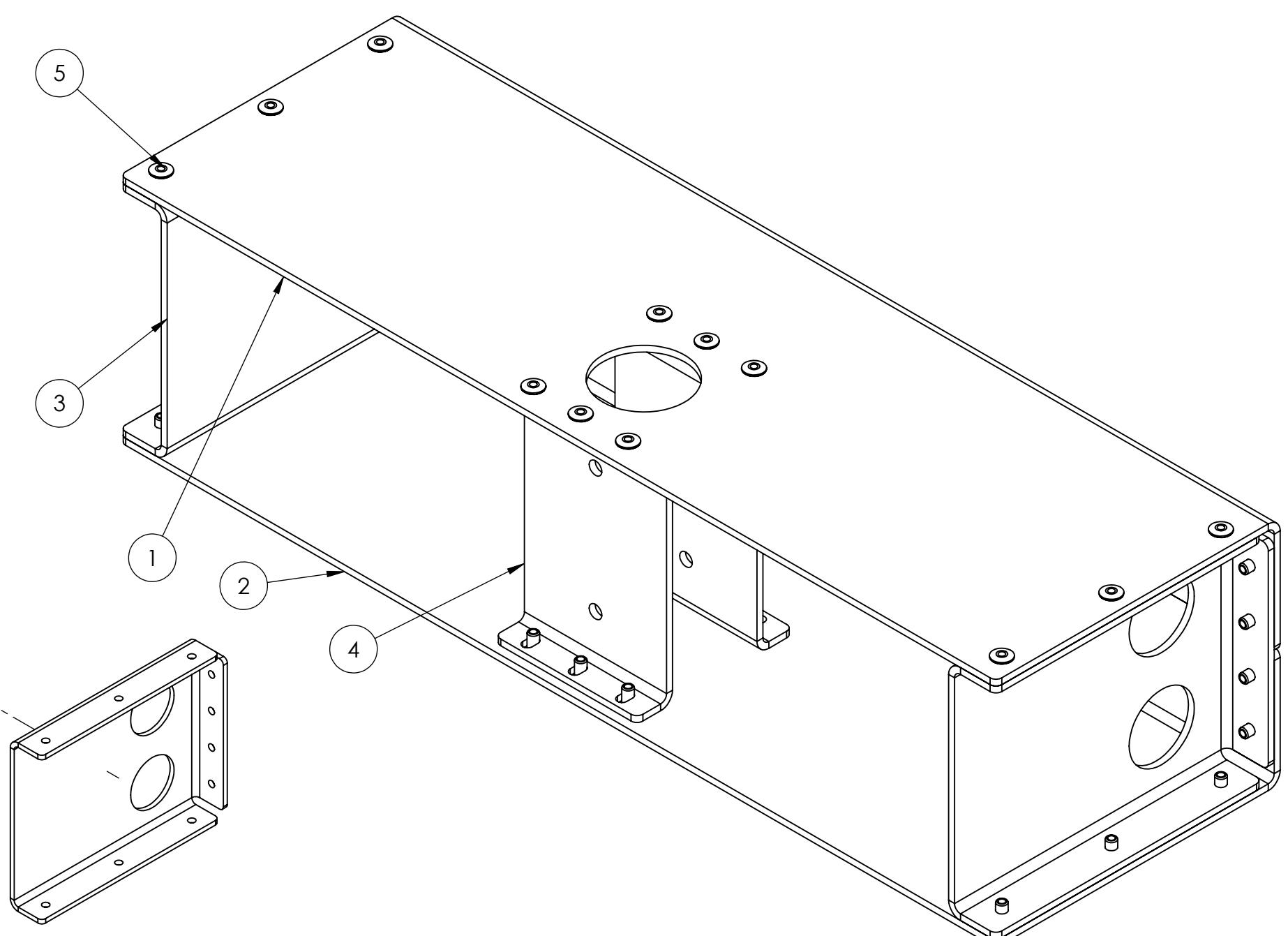
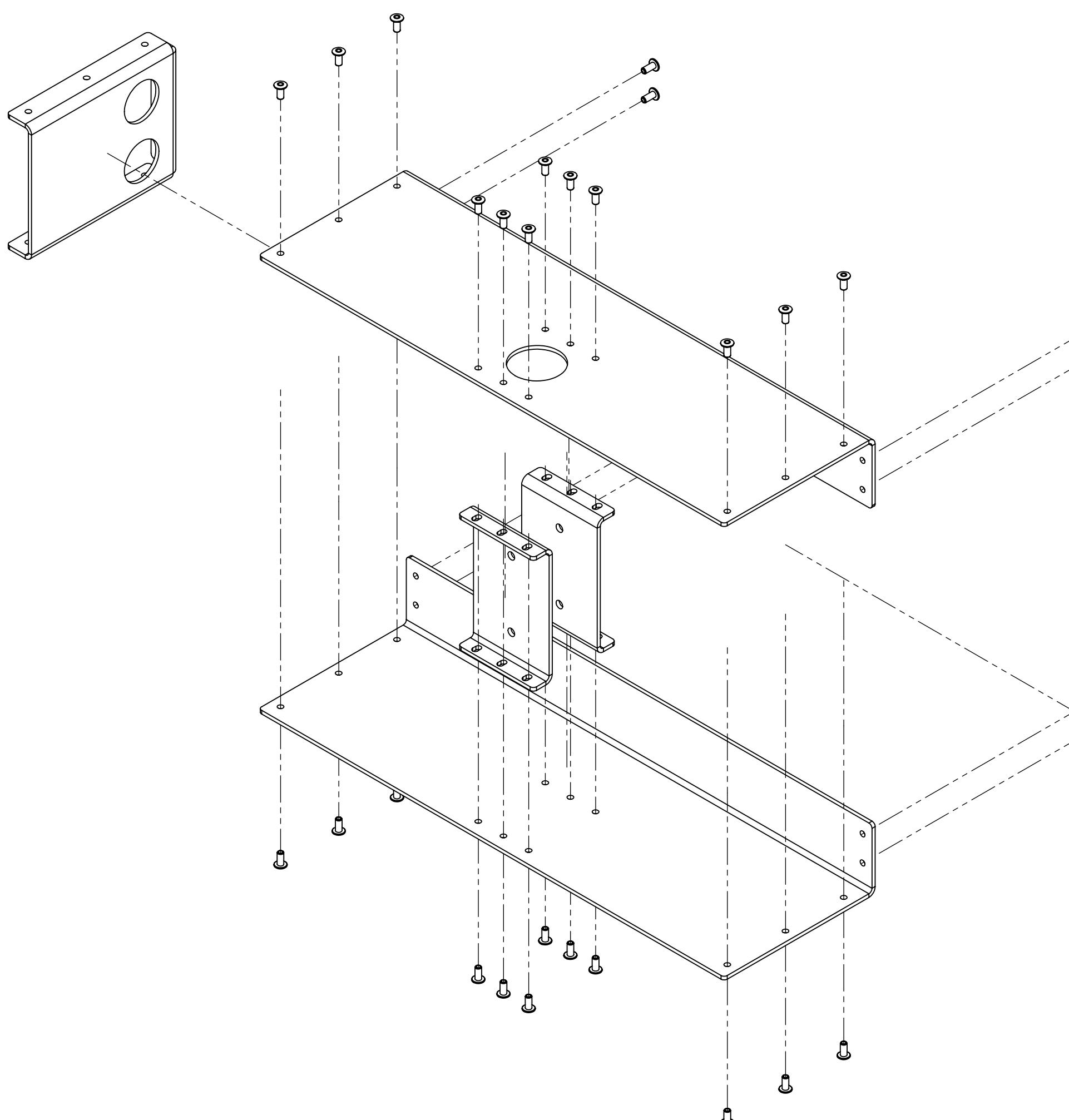
TITLE:
**Upper Pole
Crossbar B**

SIZE DWG. NO. REV
C GE-23042

SCALE: 1:1 SHEET 1 OF 1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
A3, B2	A	Moved BOM Table, added note for assembly	12/13/2022	JO



Notes:

1. Label Assembly with Part Number
 2. 1-1/4" SCH 40 Pipe (1.66" OD) Fits between the two (4) brackets.
 Use a Pipe during assembly to get a slip fit between the brackets.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23031	Upper Pole Base Top	1
2	GE-23032	Upper Pole Base Bottom	1
3	GE-23033	Upper Pole Base Side	2
4	GE-23034	Upper Pole Base Pole Brace	2
5	187 pop rivet	3/16" Steel Rivet	32

A

UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	JO	9/30/2022	
PROPRIETARY AND CONFIDENTIAL			
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COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			
C SOLIDWORKS Modeling Solutions Partner			
TITLE: Upper Pole Base Sheetmetal			
SIZE DWG. NO. REV			
C GE-23043 A			
SCALE: 1:8 SHEET 1 OF 1			

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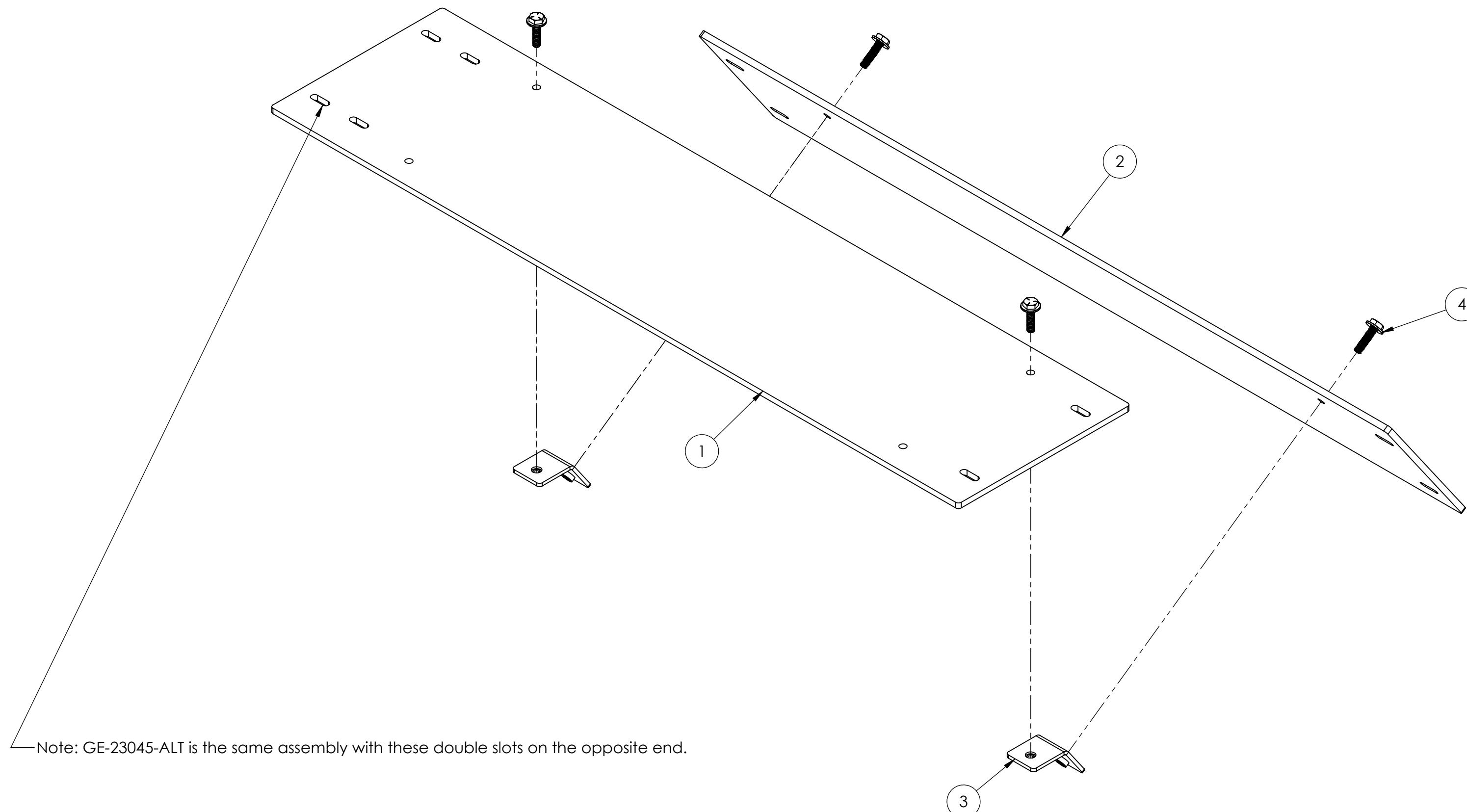
C

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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23036	Upper Shelf Corner Front Cover	1
2	GE-23038	Upper Shelf Corner Top Cover	1
3	GE-23065	Light Cover Angled Bracket with PemNuts	2
4	92865A542 and 250	1/4-20 x 1" Hex Head Bolts with Washer	10

UNLESS OTHERWISE SPECIFIED:			FIELD	NAME	DATE
			DRAWN	JO	12/27/2022
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					
SIZE	DWG. NO.	REV	TITLE: Upper Shelf Corner Light		
C	GE-23045				
SCALE: 1:3			SHEET 1 OF 1		

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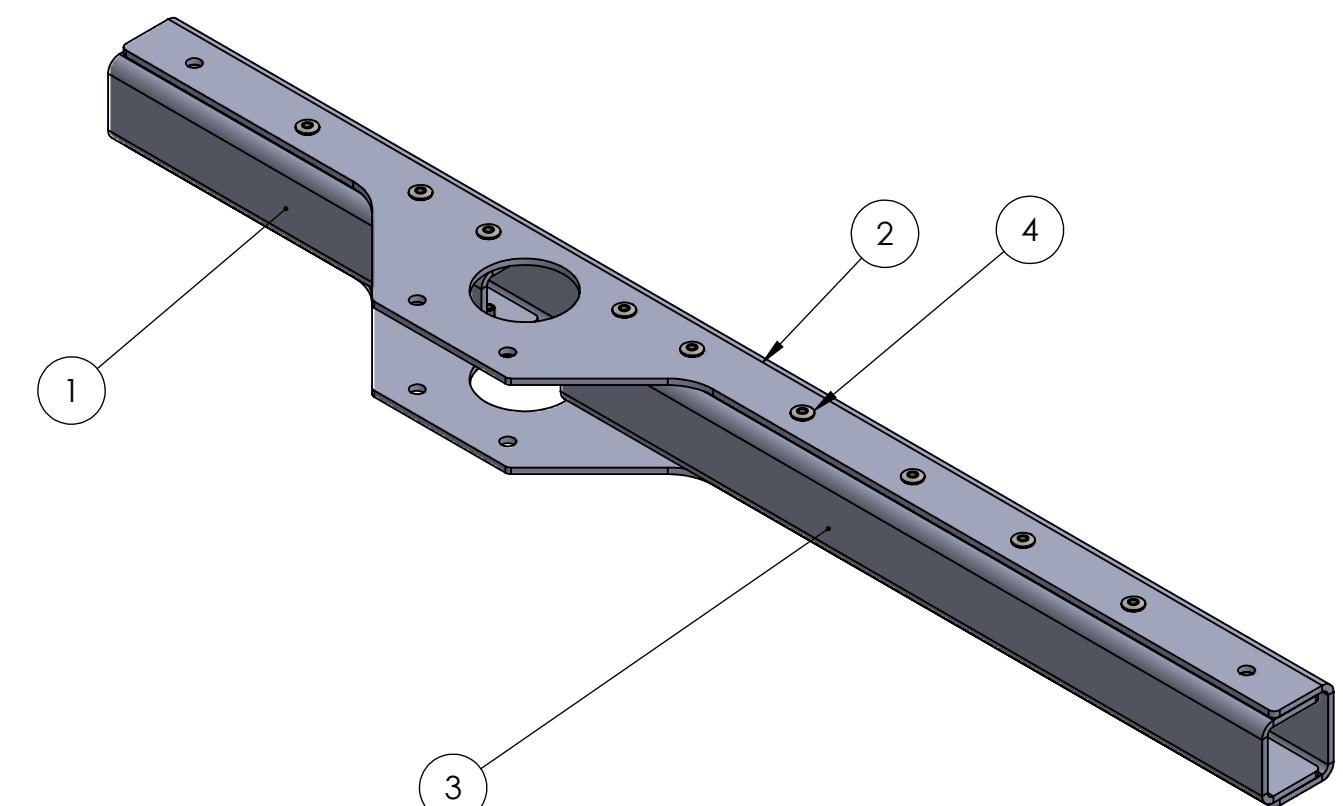
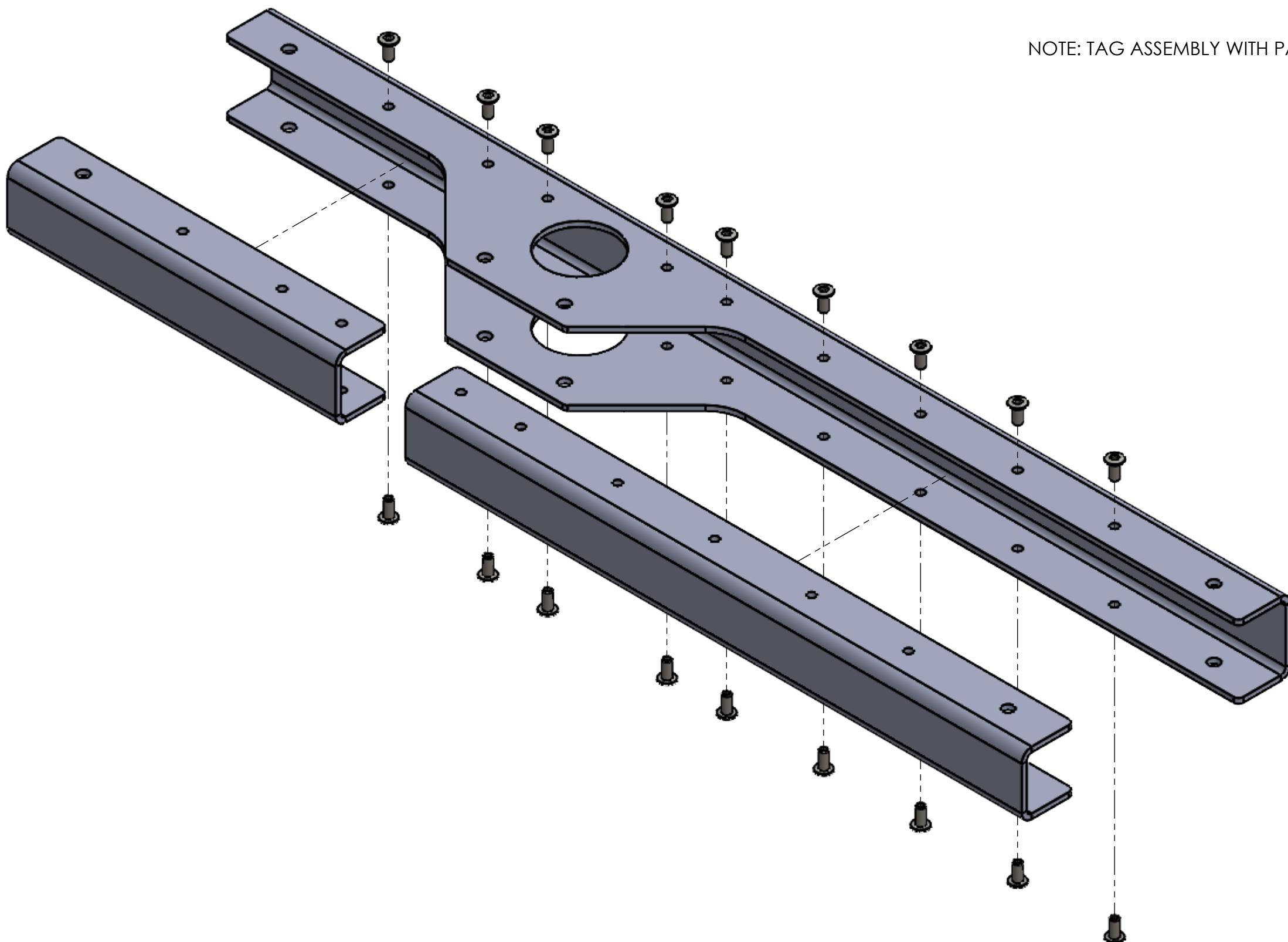
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ITEM NO.	PART NUMBER	Description	QTY.
1	GE-23042	Upper Pole Crossbar B	1
2	GE-23051	Upper Pole End Crossbar A	1
3	GE-23053	Upper Pole Crossbar C	1
4	187 pop rivet	3/16" Steel Rivet	18



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

NAL

9/29/2022

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COMMENTS:

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TITLE:
Upper Pole
End Crossbar

SIZE DWG. NO. REV

C GE-23050

SCALE: 1:2 SHEET 1 OF 1

4

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REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
C1, C2, C3, C4	A	Style of Qty callouts, Rivet Hole Tolerance	9/23/2022	JO

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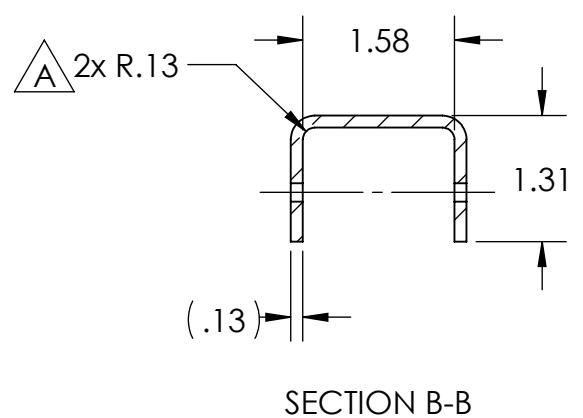
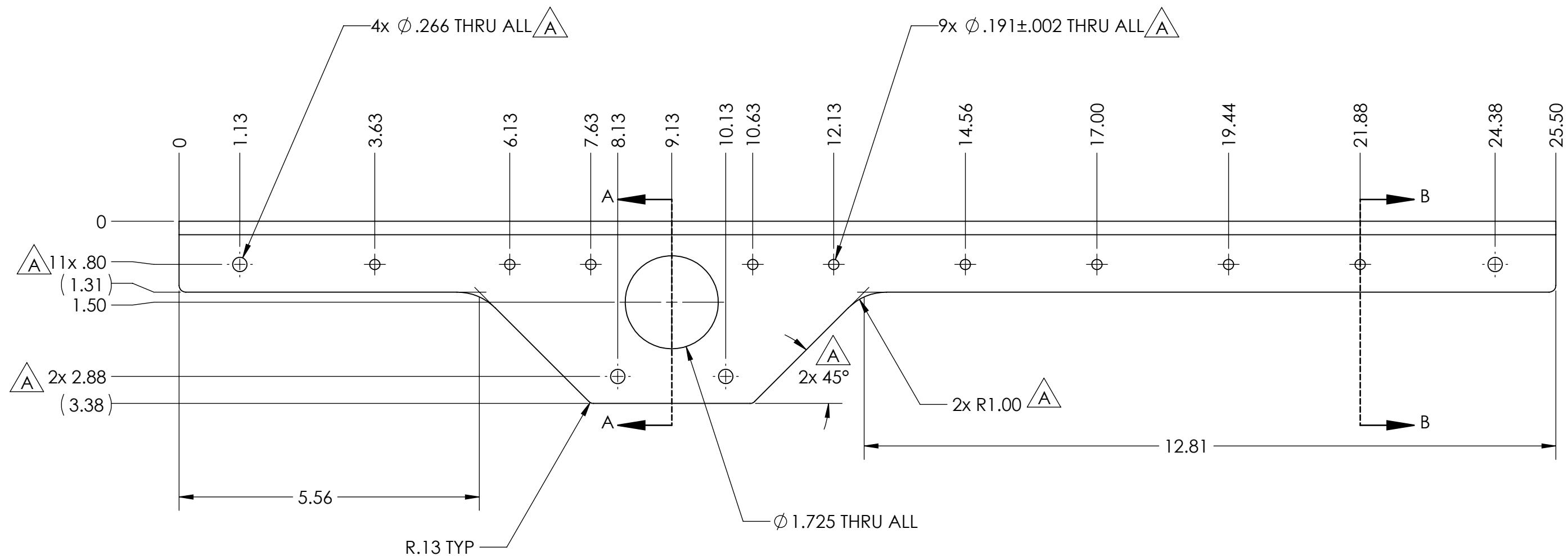
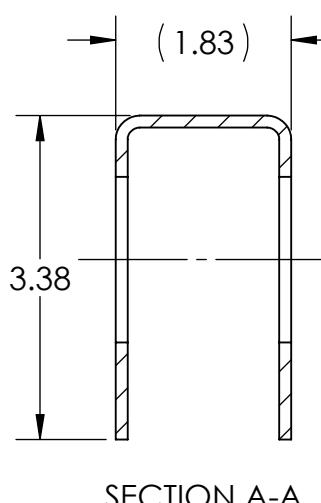
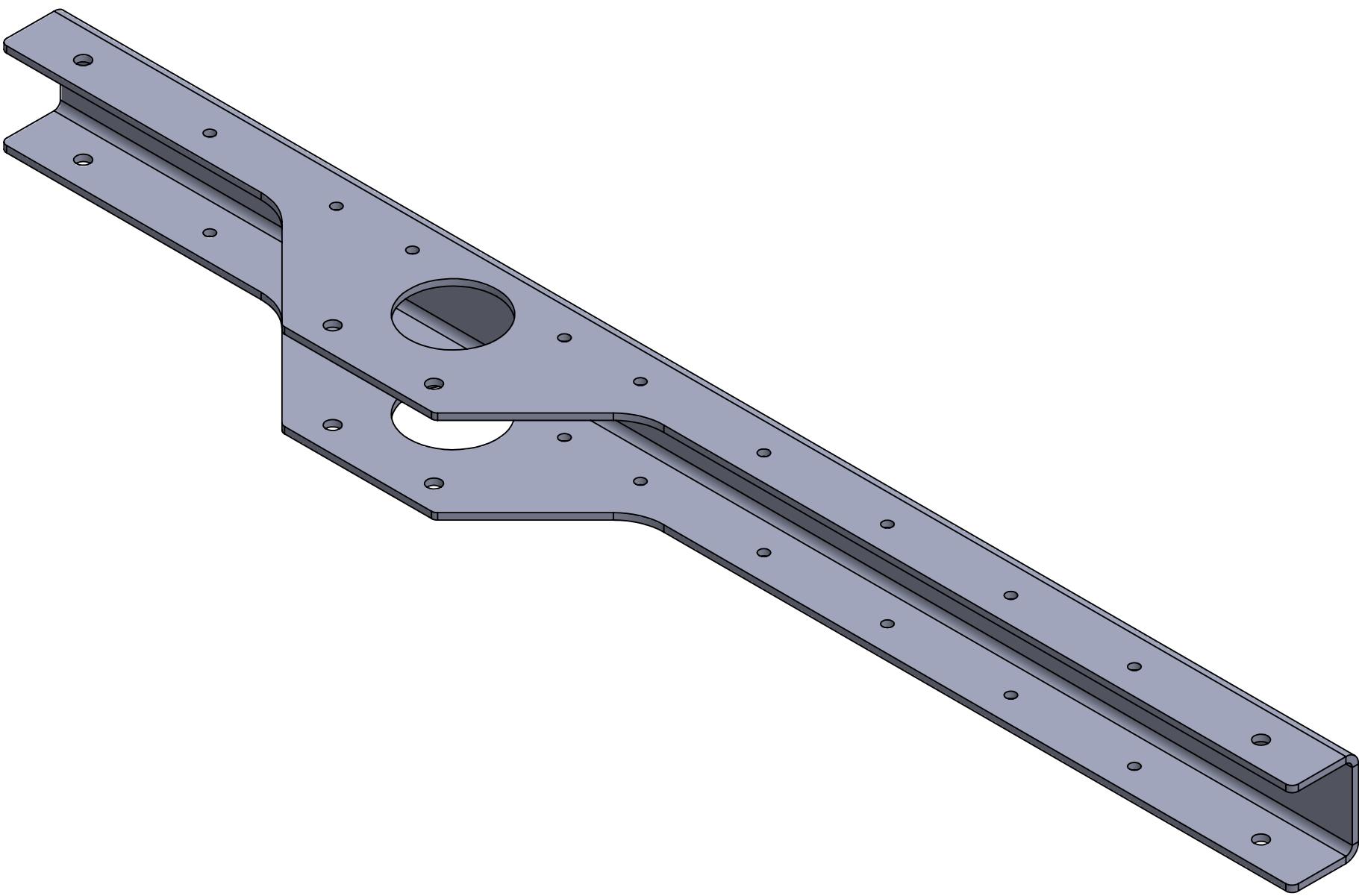
C

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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 $\pm .010$	BEND	NAME	DATE
	DRAWN	NAL	9/23/2022
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COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
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Modeling Solutions Partner

TITLE:
Upper Pole
End Crossbar A

SIZE DWG. NO. REV

C GE-23051

SCALE: 1:2 SHEET 1 OF 1

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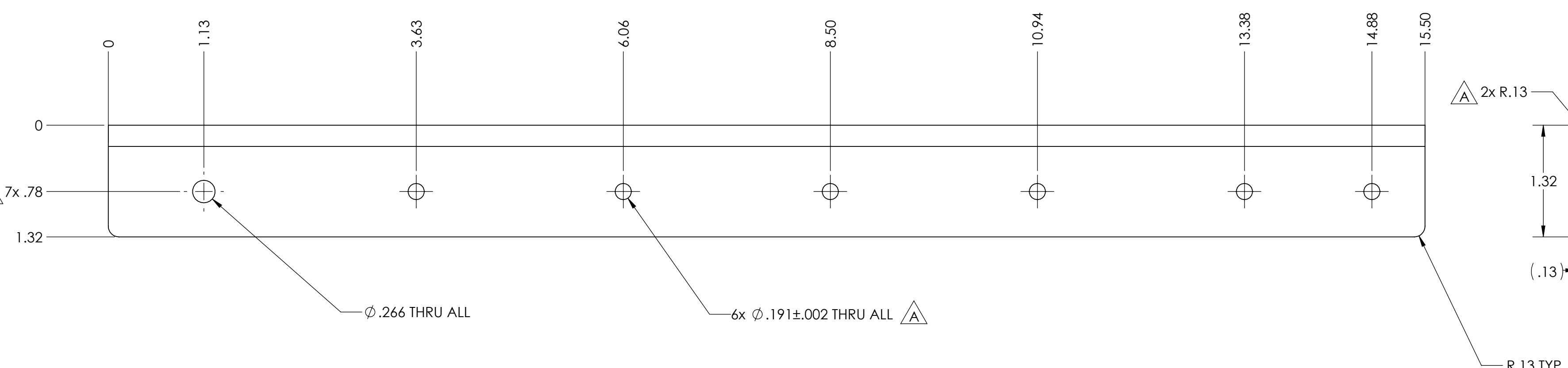
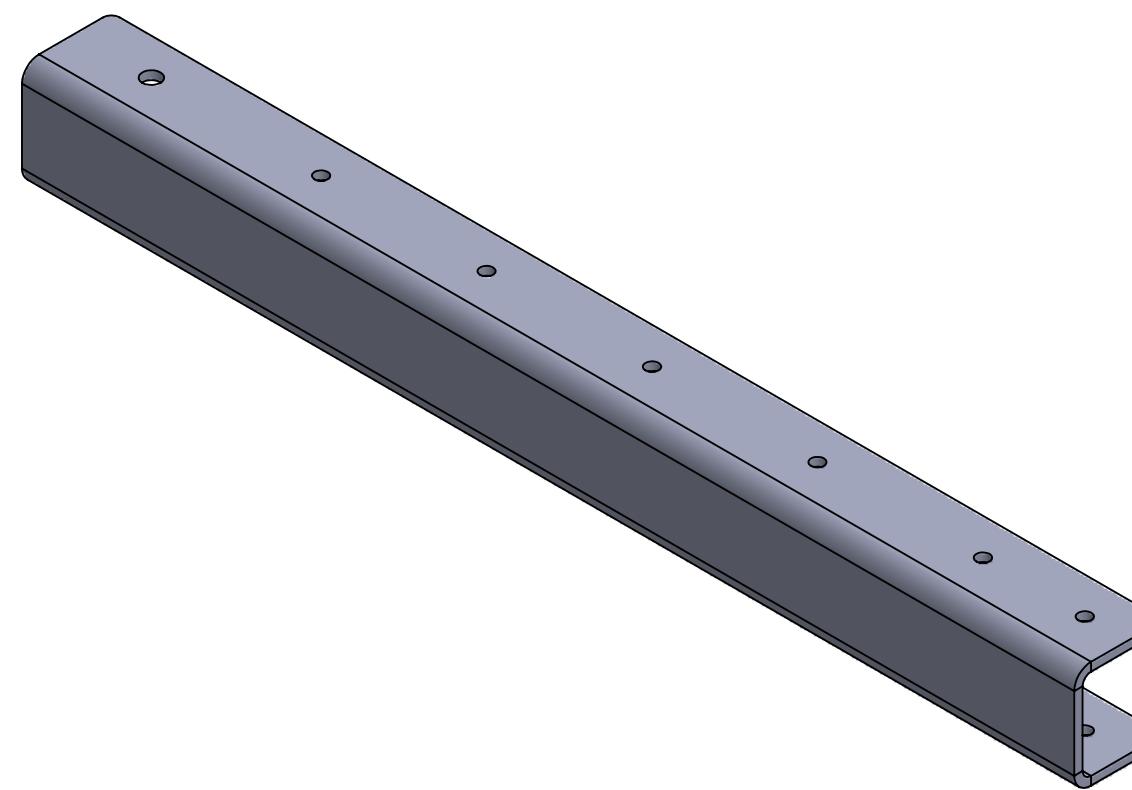
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UNLESS OTHERWISE SPECIFIED:	BEND	NAME	DATE
DRAWN	NAL	9/23/2022	
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COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
**Upper Pole
Crossbar C**

SIZE DWG. NO. REV
C GE-23053

SCALE: 1:1 SHEET 1 OF 1

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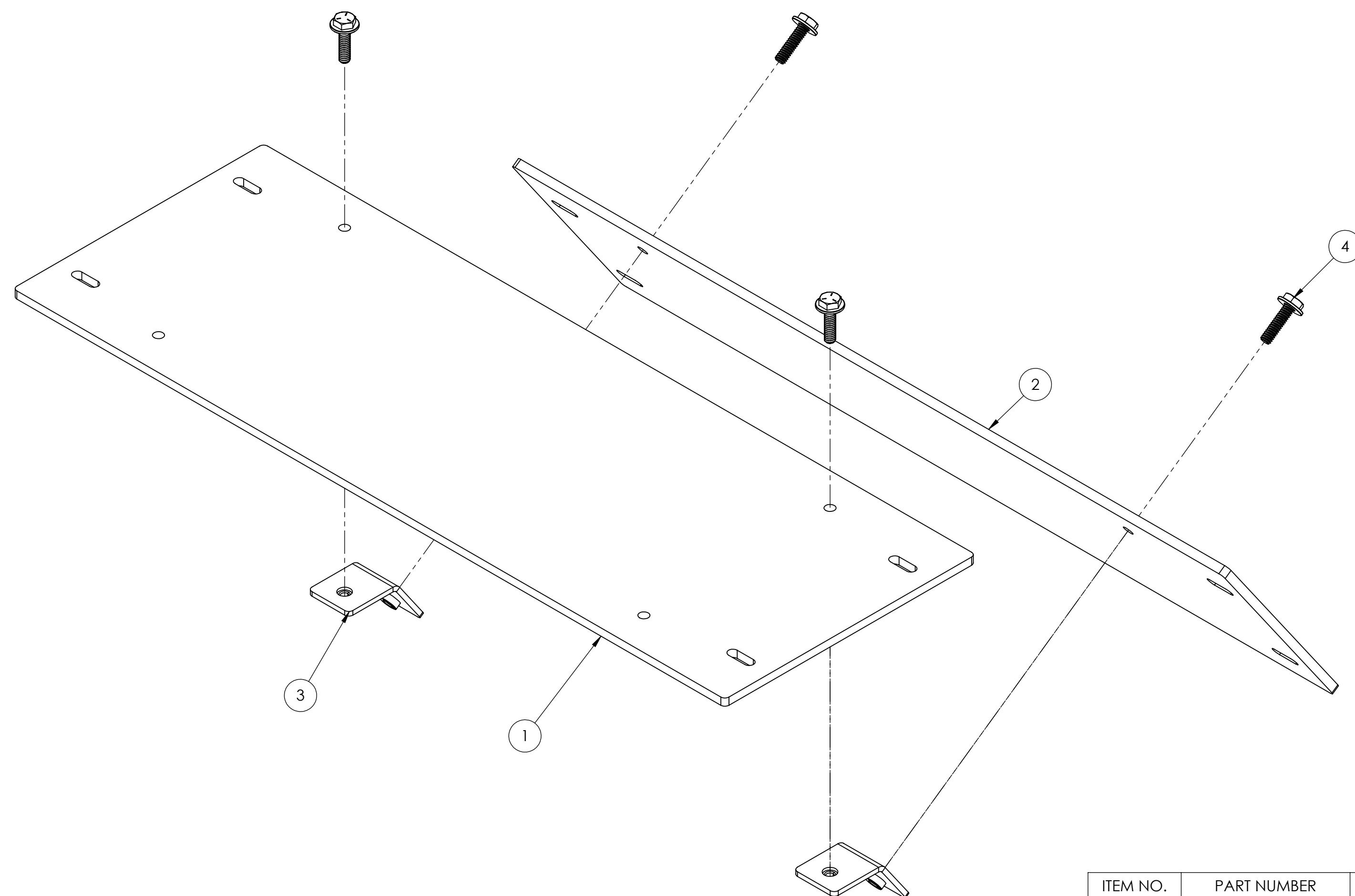
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23037	Upper Shelf Front Cover	1
2	GE-23039	Upper Shelf Top Cover	1
3	GE-23065	Light Cover Angled Bracket with PemNuts	2
4	92865A542 and 250	1/4-20 x 1" Hex Head Bolt and Washer	8

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	12/27/2022

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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: Upper Shelf Middle Light

SIZE DWG. NO. REV
C GE-23055

SCALE: 1:2 SHEET 1 OF 1

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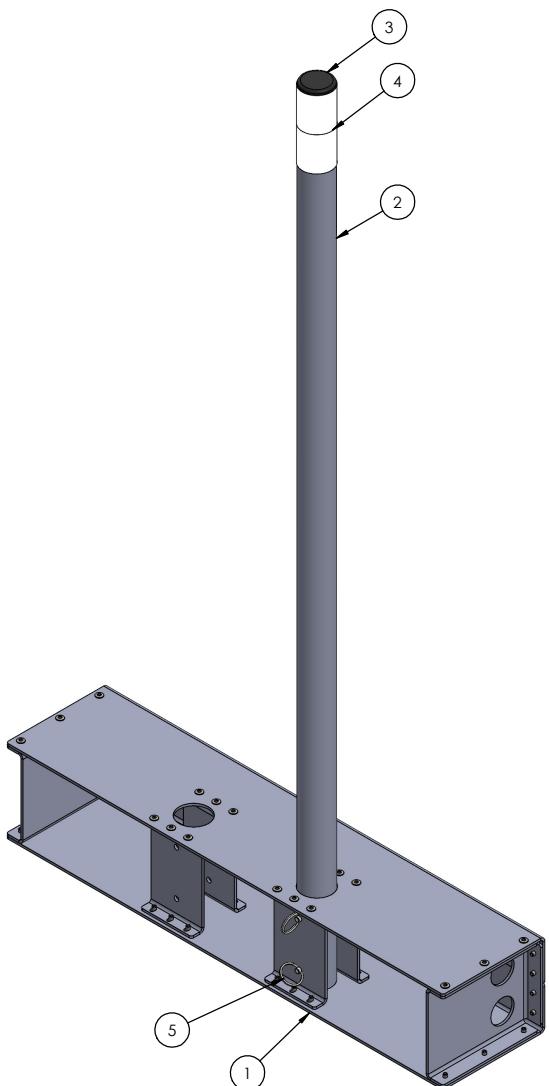
C

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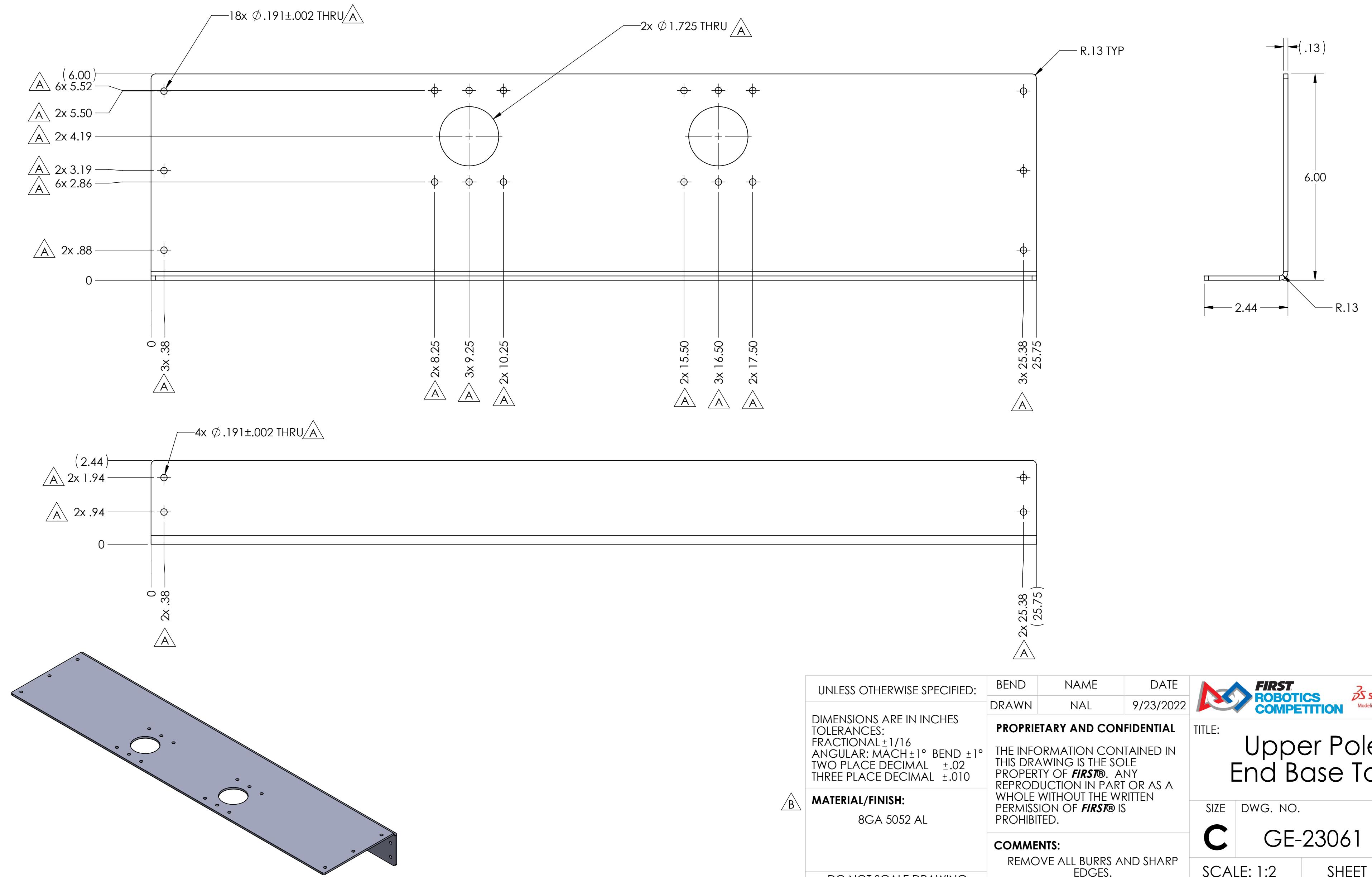
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23063	Upper Pole End Base Sheetmetal	1
2	GE-23035	Upper Pole	1
3	CCF-RT-13-1	Pole Cap	1
4	tape_VISIONTARGET	tape_VISIONTARGET	2
5	pin_quick_ring_.25.2.5	Pin, Ring-Grip Quick-Release with SS Ring, 1/4" Diameter, 2.5" Usable Length	2

UNLESS OTHERWISE SPECIFIED:		BEND	NAME	DATE
DIMENSIONS ARE IN INCHES		DRAWN	NAL	9/29/2022
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: Various		COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.		
DO NOT SCALE DRAWING				

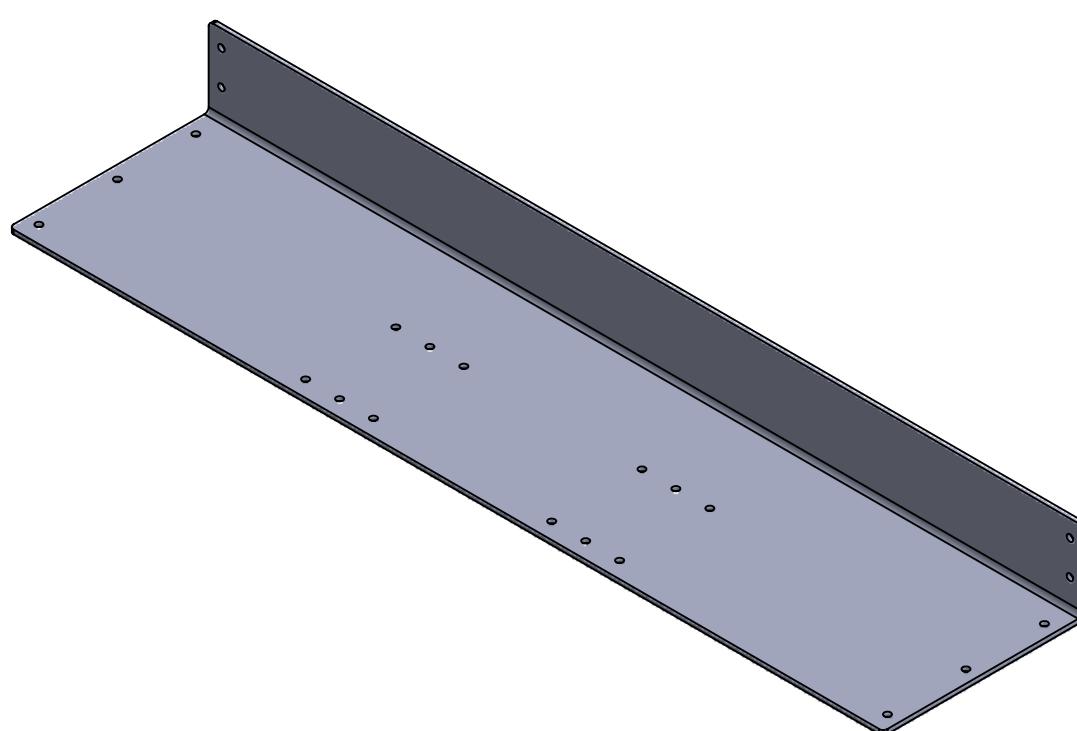
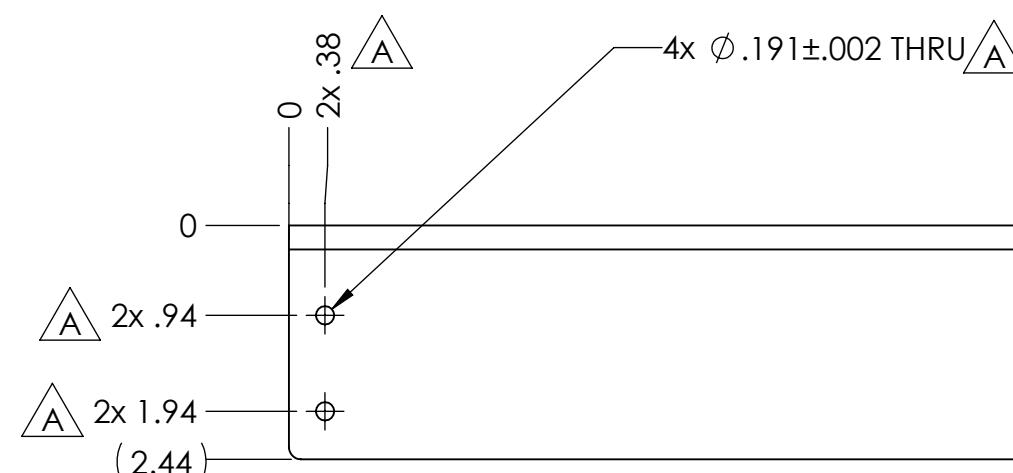
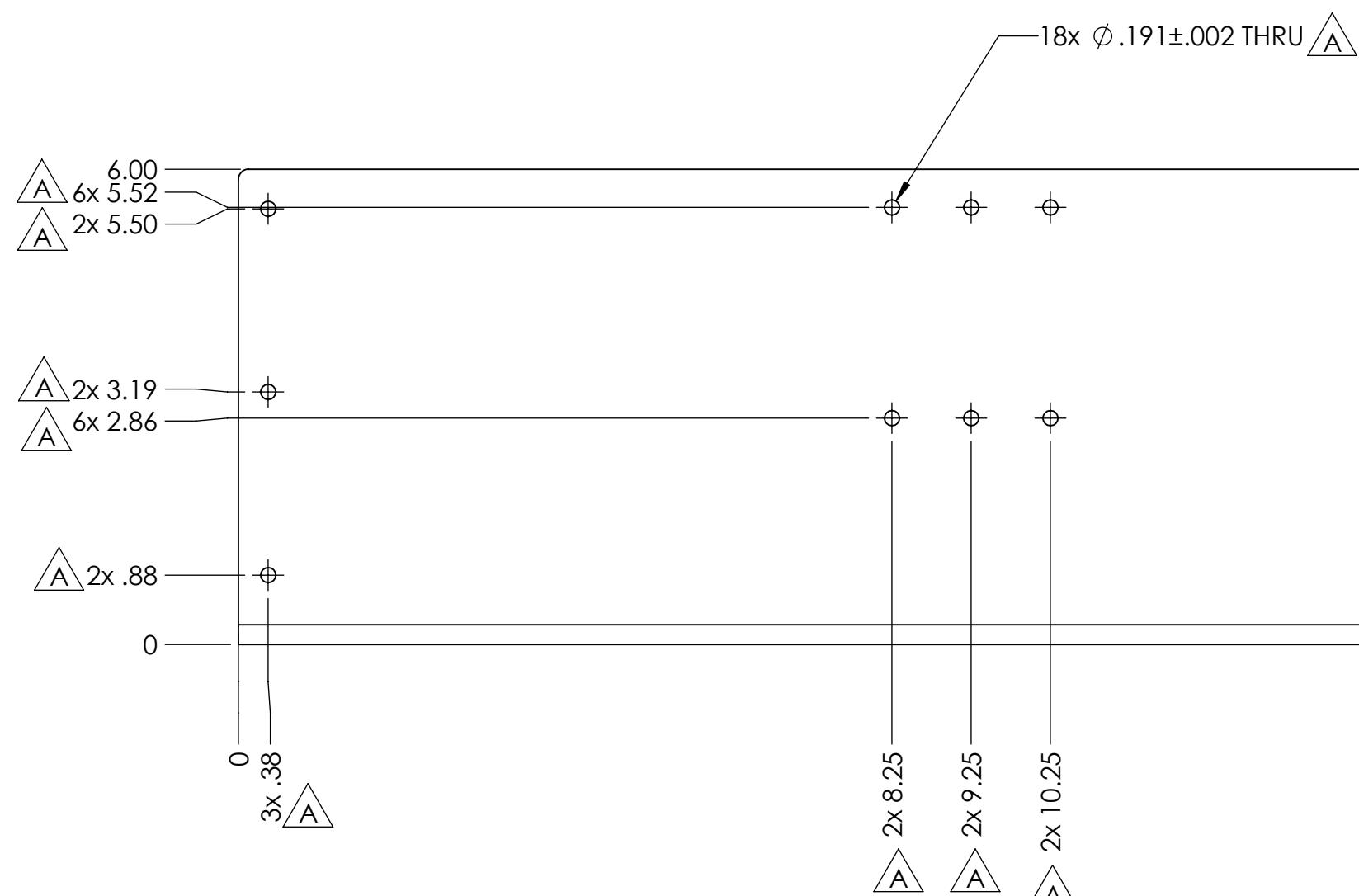
FIRST
ROBOTICS
COMPETITION
DS SOLIDWORKS
Modeling Solutions Partner

TITLE: **Upper Pole End Base**
 SIZE: DWG. NO. REV:
C GE-23060
 SCALE: 1:4 SHEET 1 OF 1

D



D



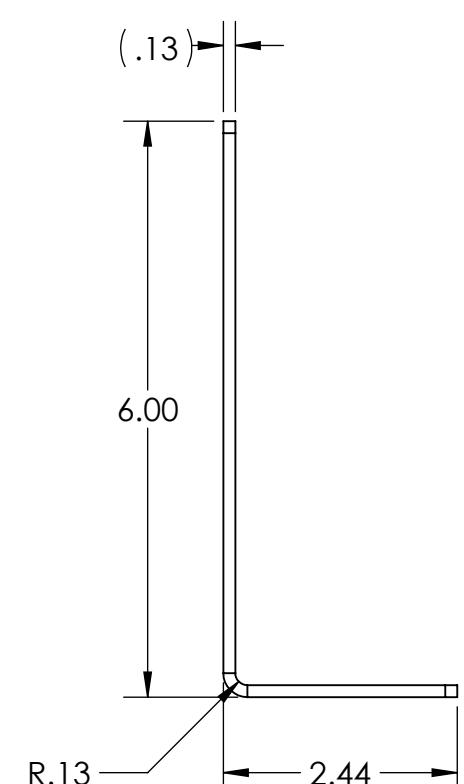
UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL $\pm 1/16$
ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$
TWO PLACE DECIMAL $\pm .02$
THREE PLACE DECIMAL $\pm .010$

BEND NAME DATE
DRAWN NAL 9/23/2022

MATERIAL/FINISH:
8GA 5052 AL

DO NOT SCALE DRAWING

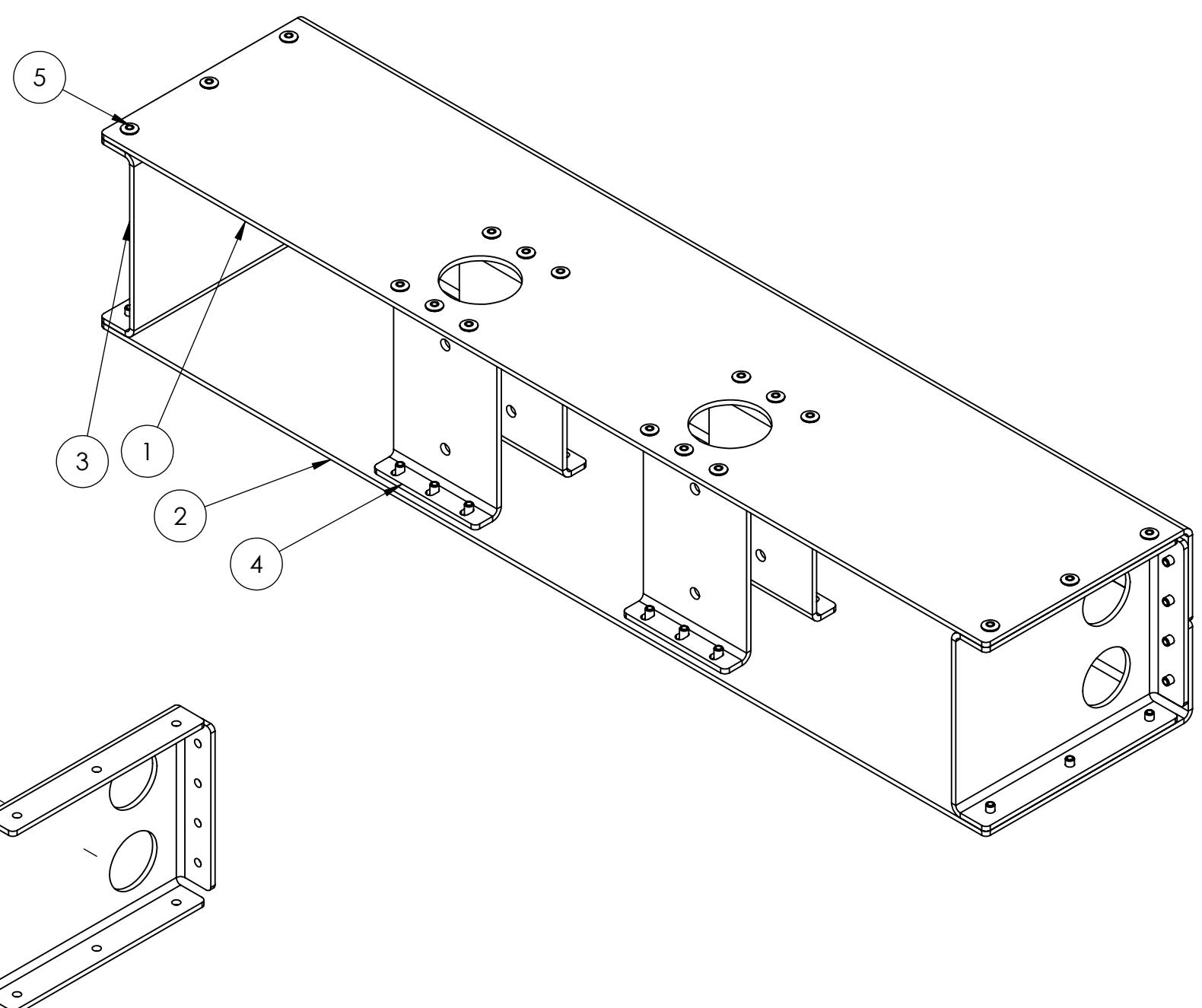
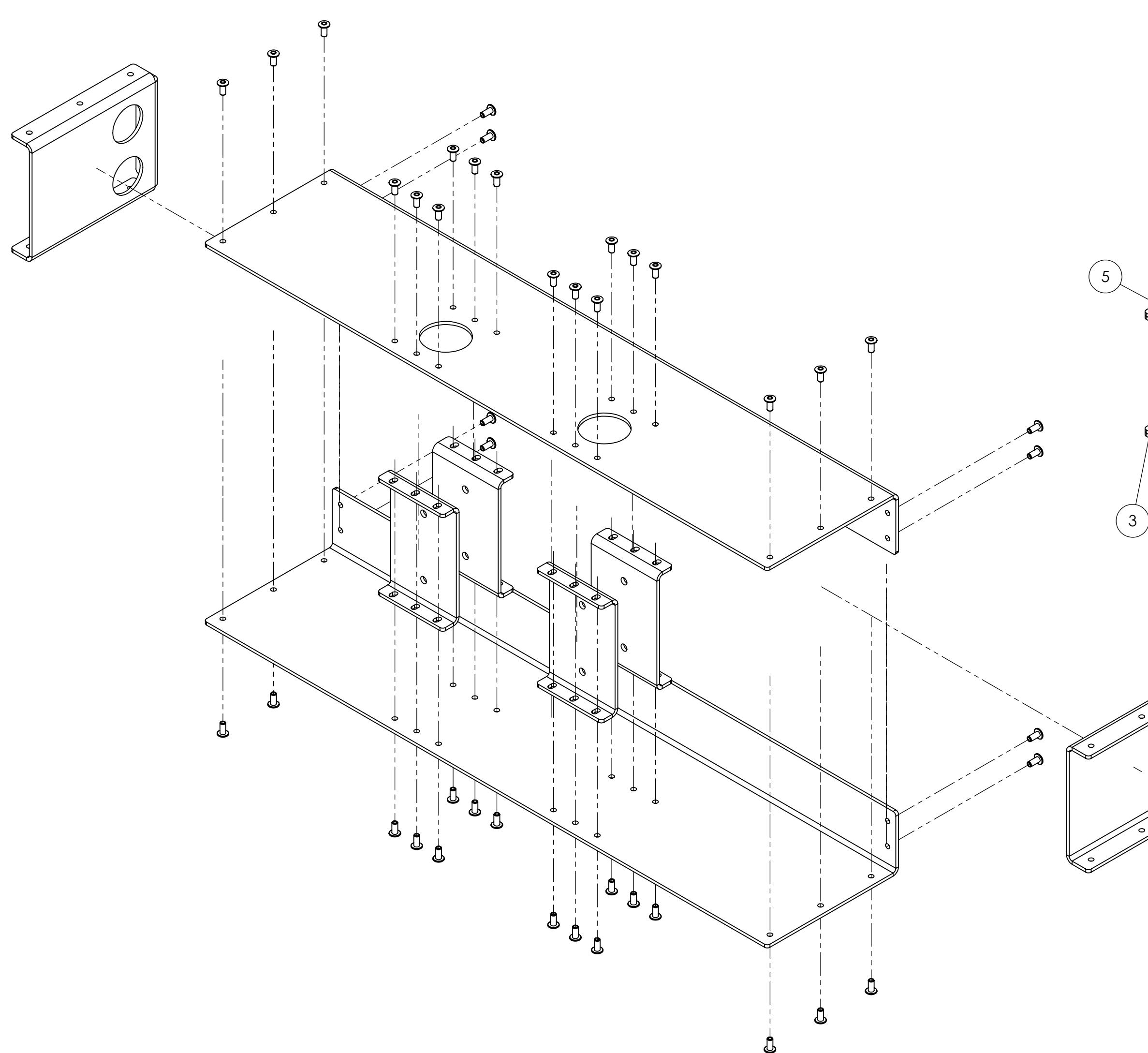
REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
B2, B3, B4, C2, C4, D3, D4	A	Style of Qty callouts, Rivet Hole Tolerance	9/23/2022	JO
A2	B	Fixed Material Callout	11/3/2022	JO



FIRST ROBOTICS COMPETITION
SOLIDWORKS
Modeling Solutions Partner

TITLE: Upper Pole End Base Bottom

SIZE	DWG. NO.	REV
C	GE-23062	B
SCALE: 1:2		SHEET 1 OF 1



Notes:

1. Label Assembly with Part Number
 2. 1-1/4" SCH 40 Pipe (1.66" OD) Fits between the two (4) brackets.
 Use a Pipe during assembly to get a slip fit between the brackets.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23061	Upper Pole End Base Top	1
2	GE-23062	Upper Pole End Base Bottom	1
3	GE-23033	Upper Pole Base Side	2
4	GE-23034	Upper Pole Base Pole Brace	4
5	187 pop rivet	3/16 Steel Rivet	44



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 DATE
DRAWN JO 9/30/2022

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TITLE: Upper Pole End
Base
Sheetmetal

SIZE DWG. NO. REV

C GE-23063 A

SCALE: 1:8 SHEET 1 OF 1

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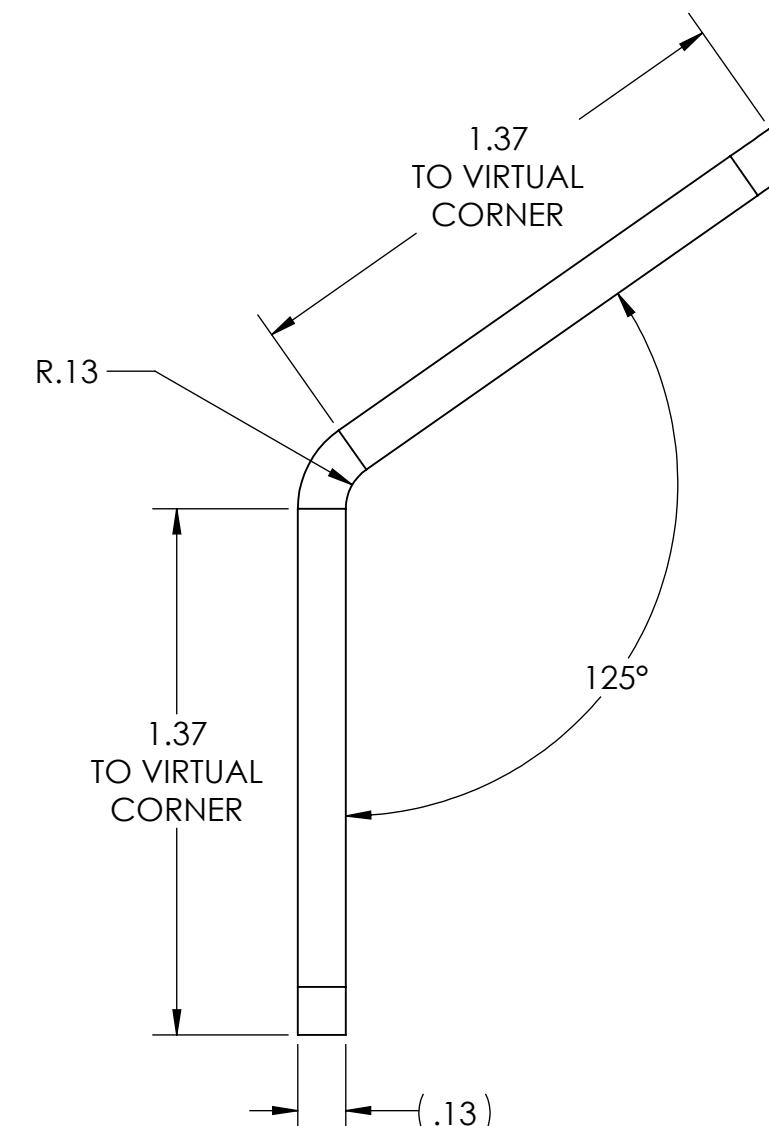
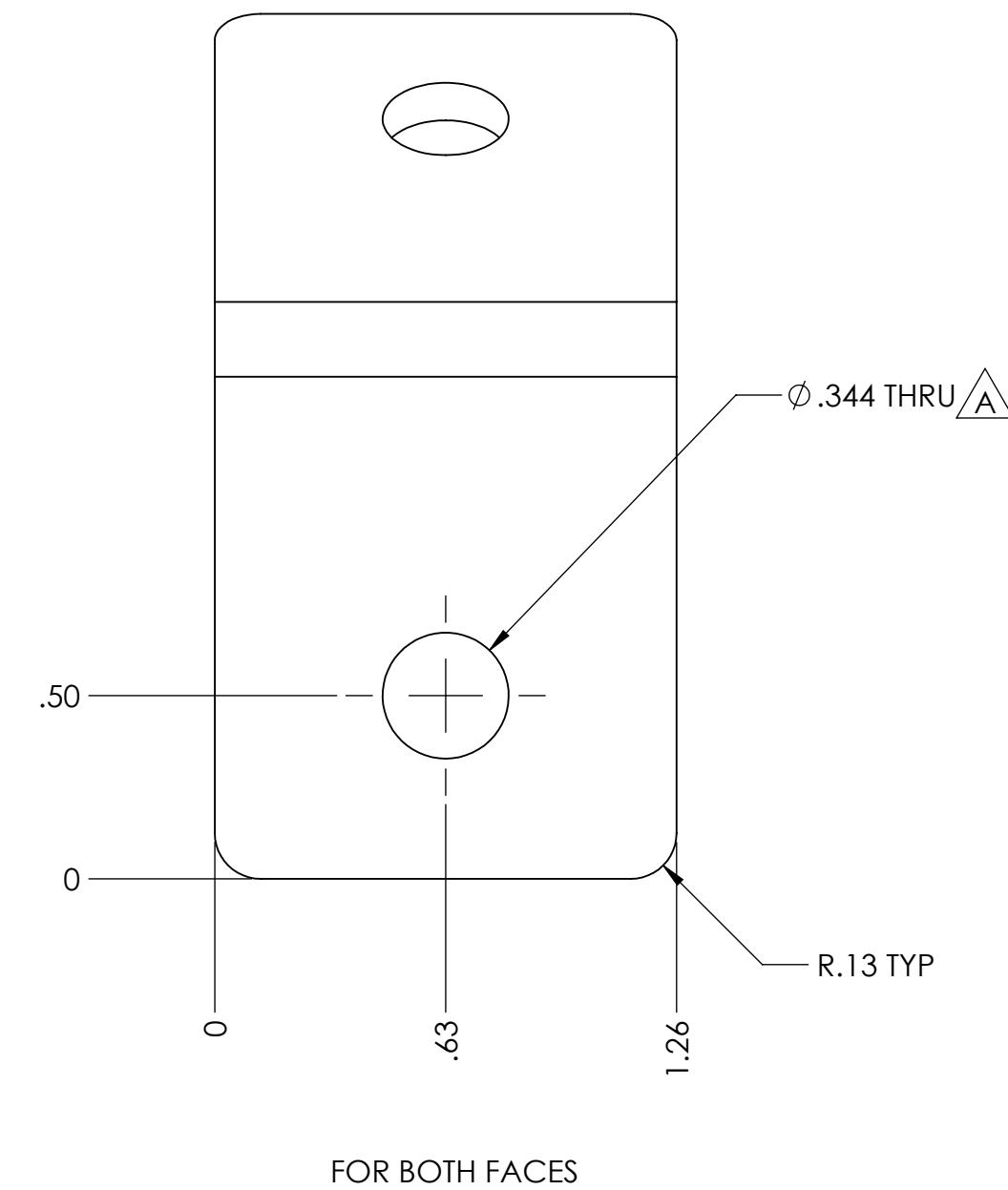
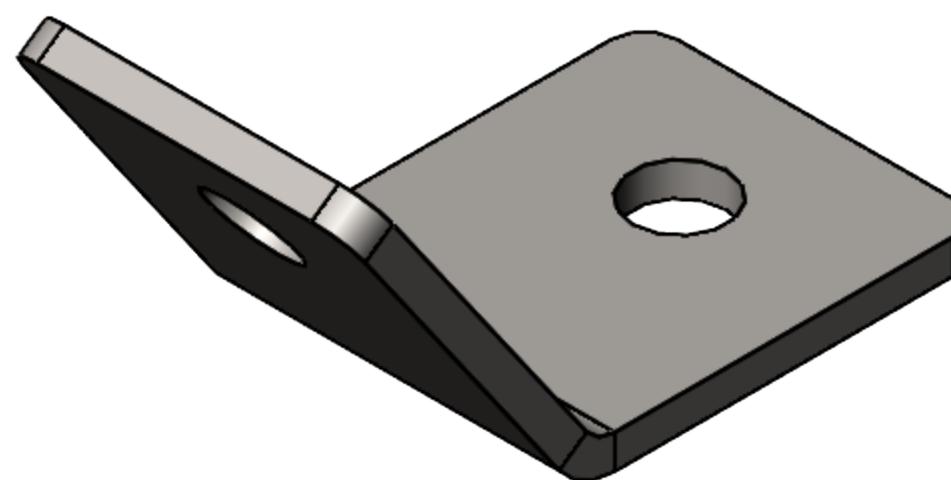
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UNLESS OTHERWISE SPECIFIED:		BEND	NAME	DATE
DIMENSIONS ARE IN INCHES		DRAWN	NAL	9/26/2022
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MATERIAL/FINISH: 11GA CRS ZINC PLATED				
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.				
DO NOT SCALE DRAWING				

FIRST ROBOTICS COMPETITION  DS SOLIDWORKS Modeling Solutions Partner

TITLE: Light Cover Angled Bracket
SIZE DWG. NO. REV
C GE-23064

SCALE: 2:1 SHEET 1 OF 1

4

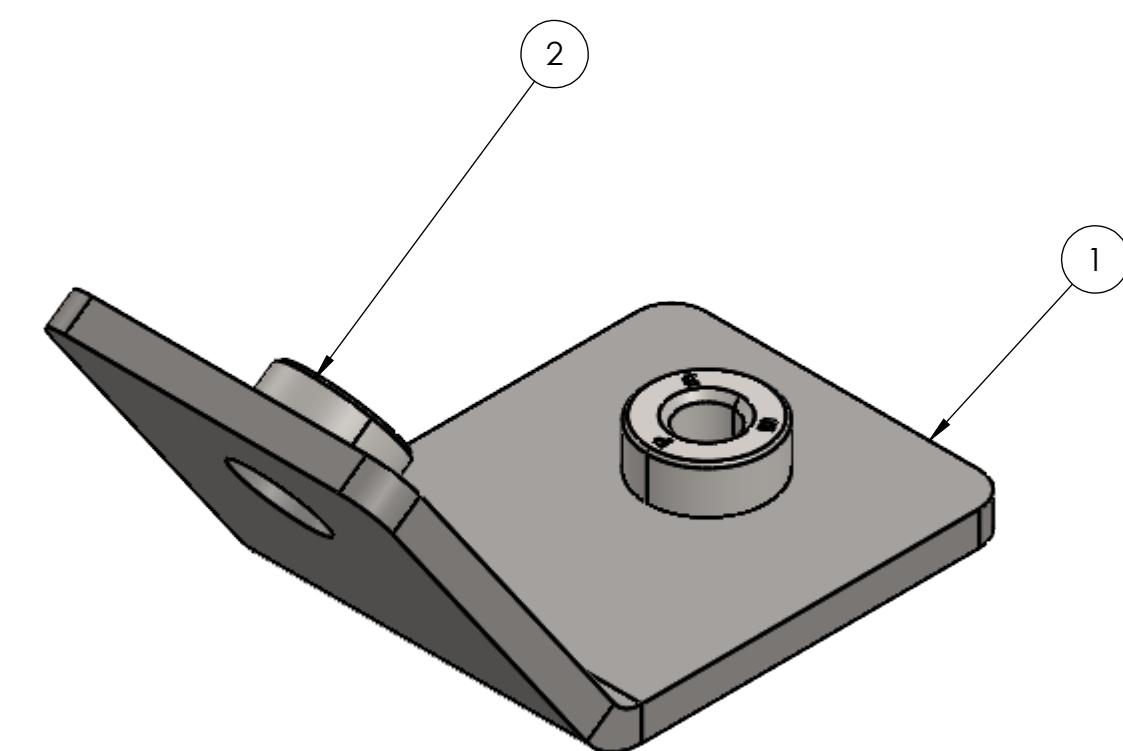
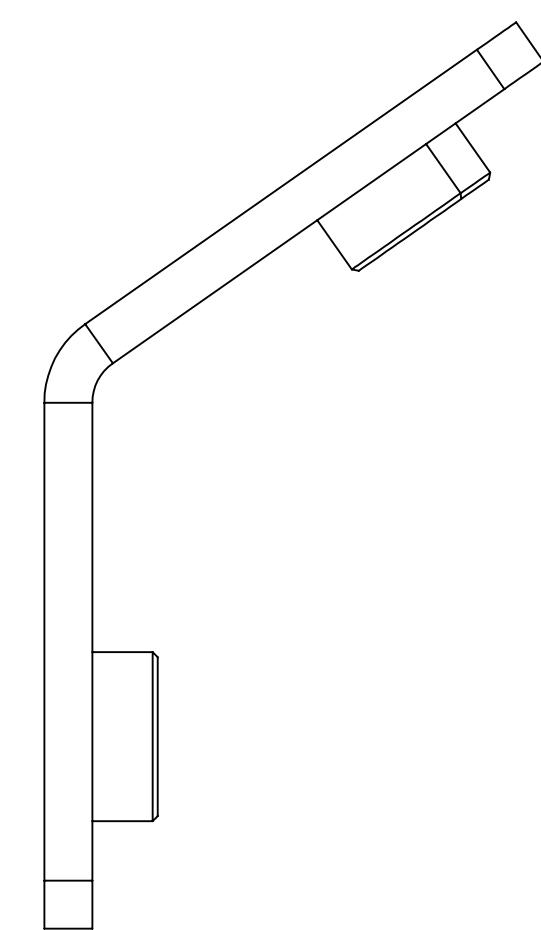
3

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ITEM NO.	PART NUMBER	Description	QTY.
1	GE-23064	Light Cover Angled Bracket	1
2	pem_clinchnut_.25_20_.054	1/4-20 PEM nut	2

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UNLESS OTHERWISE SPECIFIED:	BEND	NAME	DATE	 FIRST ROBOTICS COMPETITION
DIMENSIONS ARE IN INCHES	DRAWN	NAL	9/29/2022	
TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$	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.			
TWO PLACE DECIMAL $\pm .02$ THREE PLACE DECIMAL $\pm .010$				
MATERIAL/FINISH:	COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING				

4

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REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
A2, C3, C4	A	Style of Qty callouts, changed hole size from .391 to .344 for PEM nuts instead of Riv-nuts, Block Tolerance	9/26/2022	JO

D

D

C

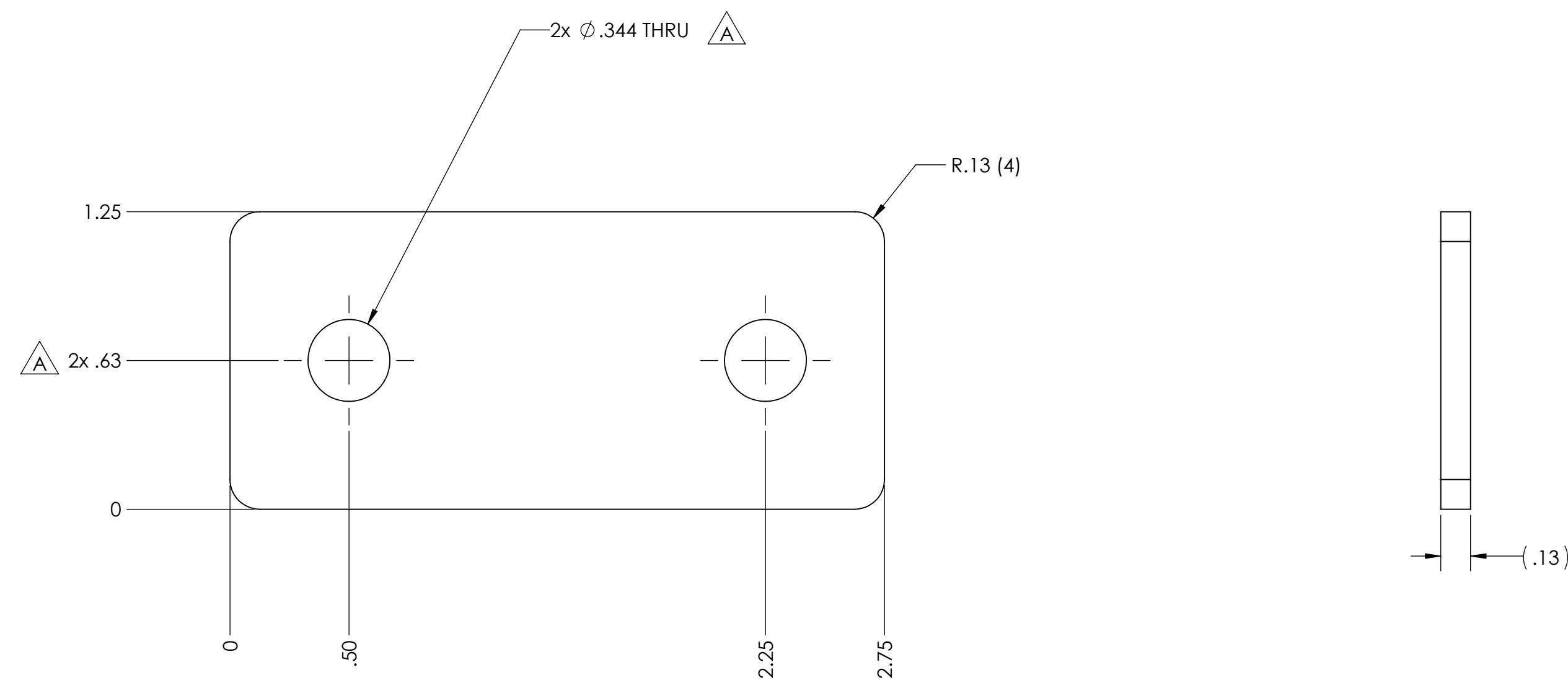
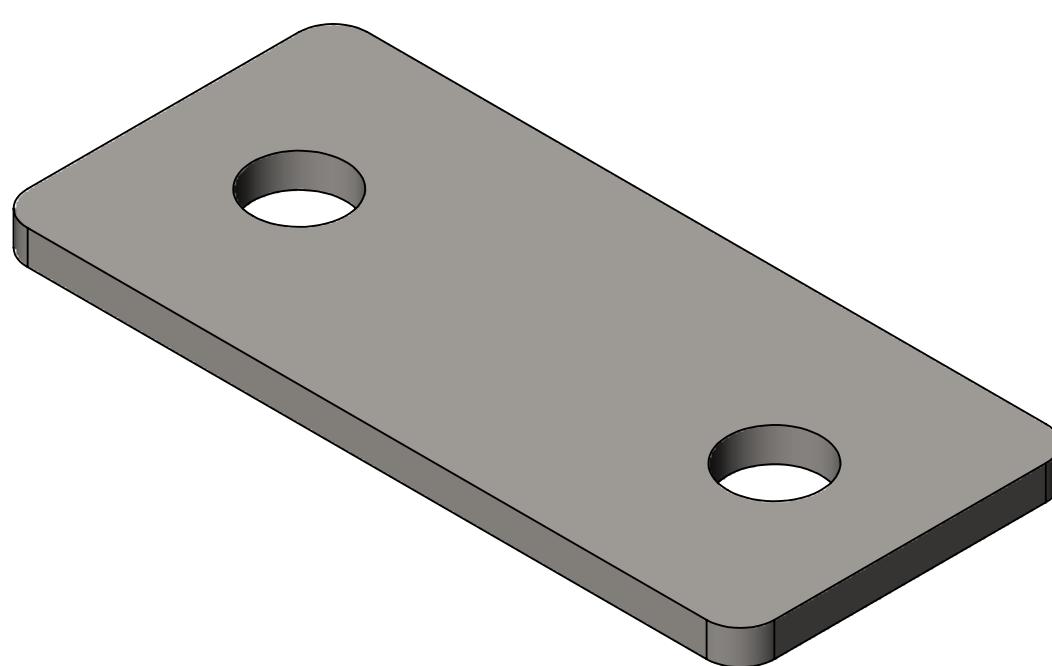
C

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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 $\pm .005$

VEND NAME DATE

DRAWN NAL 9/26/2022



TITLE: Light Cover Flat Bracket

SIZE DWG. NO. REV

C GE-23067

SCALE: 2:1 SHEET 1 OF 1

PROPRIETARY AND CONFIDENTIAL

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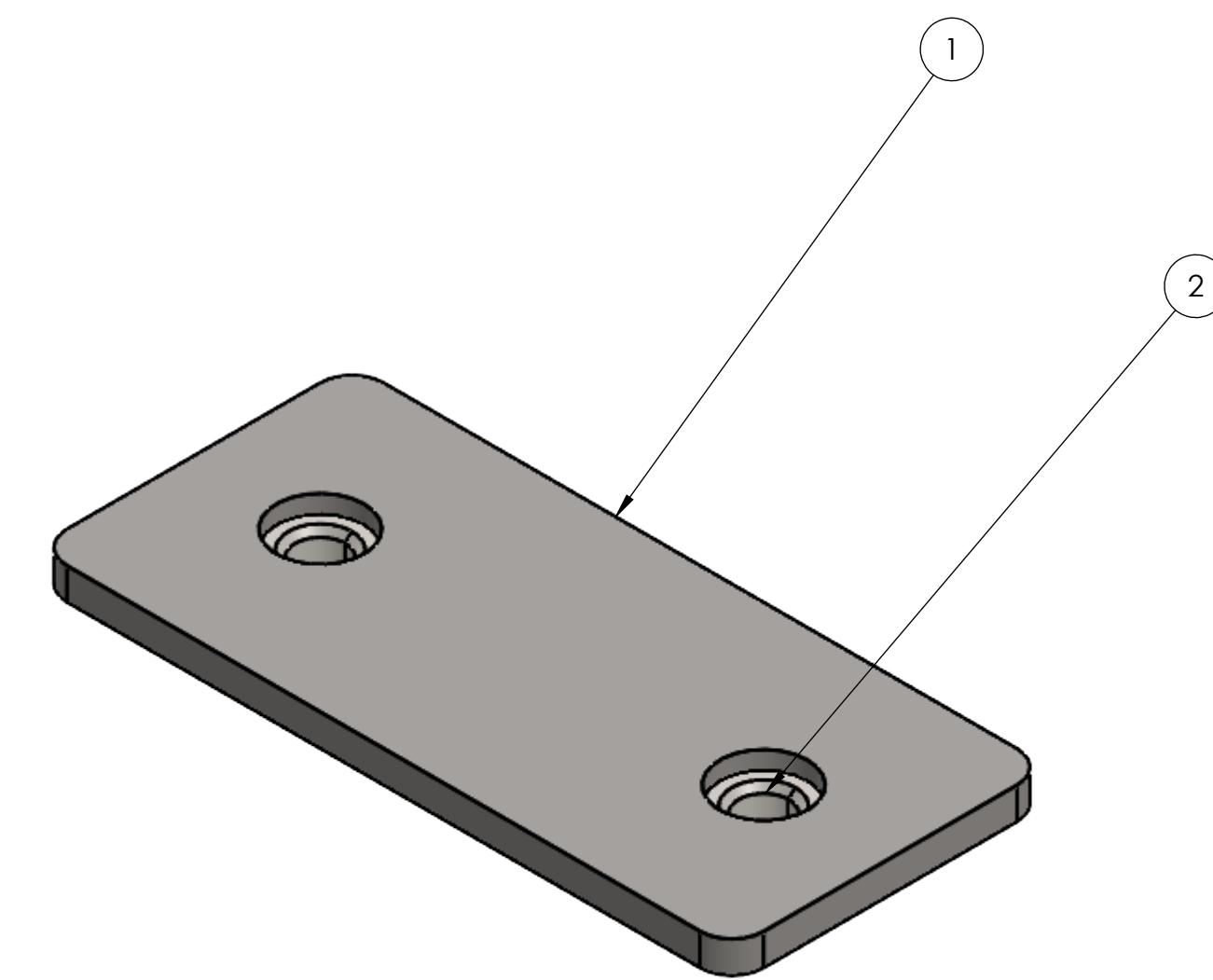
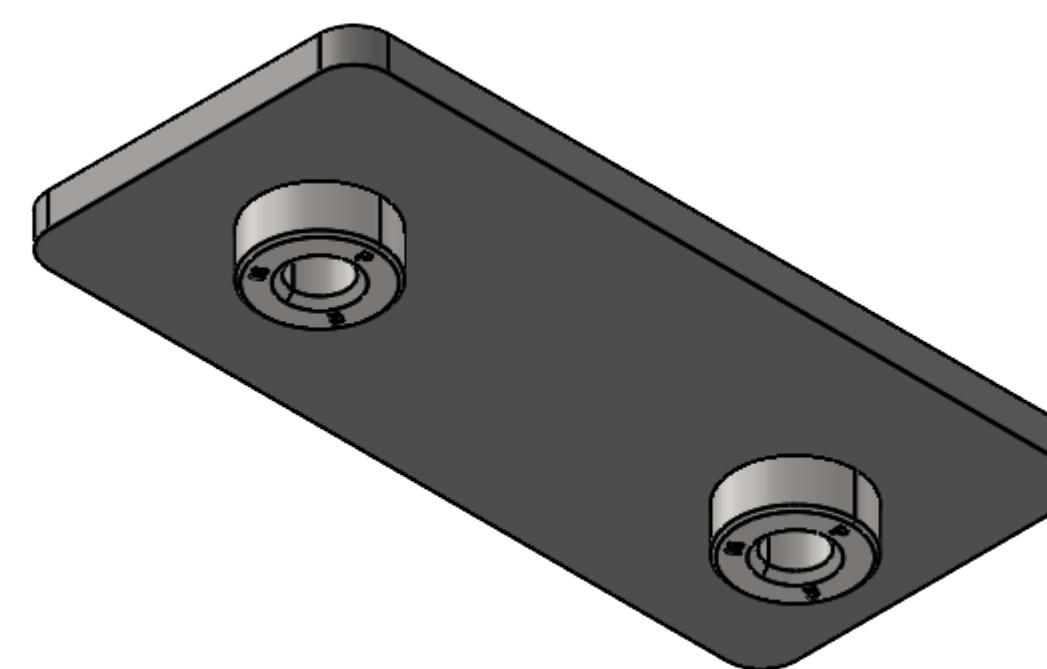
MATERIAL/FINISH:

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DO NOT SCALE DRAWING

COMMENTS:
REMOVE ALL BURRS AND SHARP EDGES.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23067	Light Mount Flat Bracket	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	JO	9/29/2022
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:	COMMENTS:		
REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST ROBOTICS COMPETITION SOLIDWORKS Modeling Solutions Partner

TITLE: Light Cover Flat Bracket with PemNuts

SIZE DWG. NO. REV

C GE-23068

SCALE: 2:1 SHEET 1 OF 1

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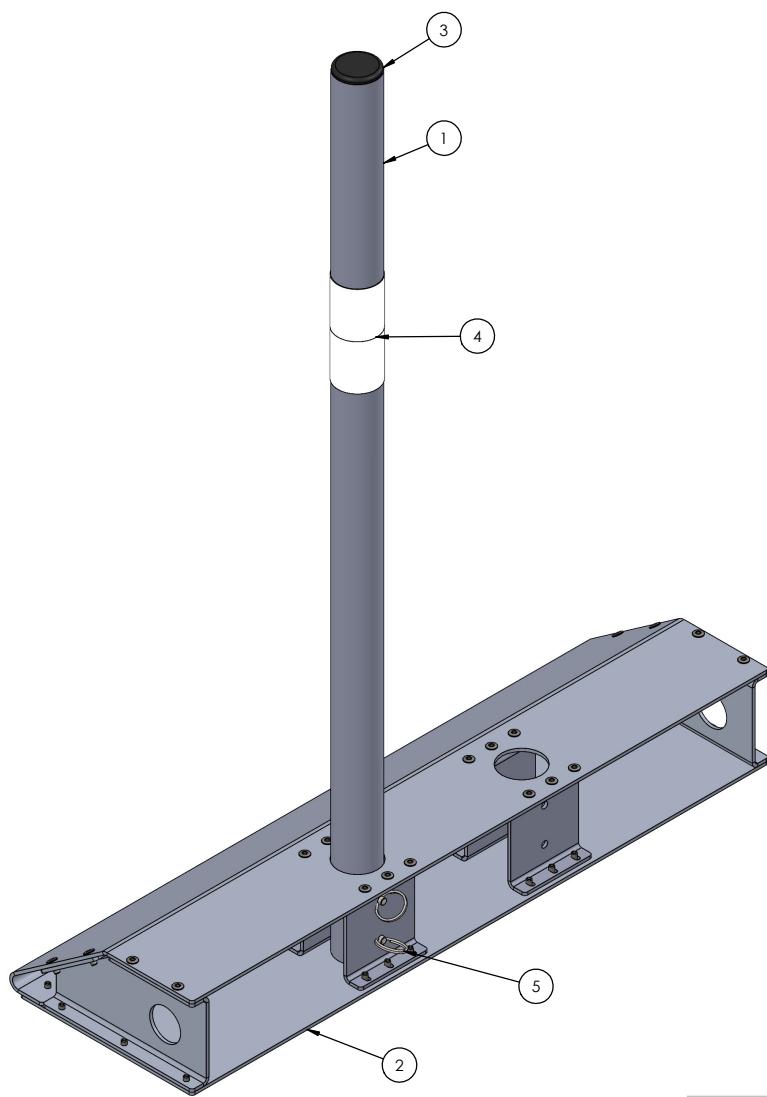
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23016	Lower Pole	1
2	GE-23073	Lower Pole End Base Sheetmetal	1
3	CCF-RT-13-1	Pole Cap	1
4	tape_VISIONTARGET	tape_VISIONTARGET	2
5	pin_quick_ring_.25_2.5	Pin, Ring-Grip Quick-Release with SS Ring, 1/4" Diameter, 2.5" Usable Length	2

UNLESS OTHERWISE SPECIFIED:	BEND DRAWN	NAME NAL	DATE 9/29/2022
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:	Various		
DO NOT SCALE DRAWING	SIZE C	DWG. NO. GE-23070	REV
	SCALE: 1:3	SHEET 1 OF 1	

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
**Lower Pole
End Base**

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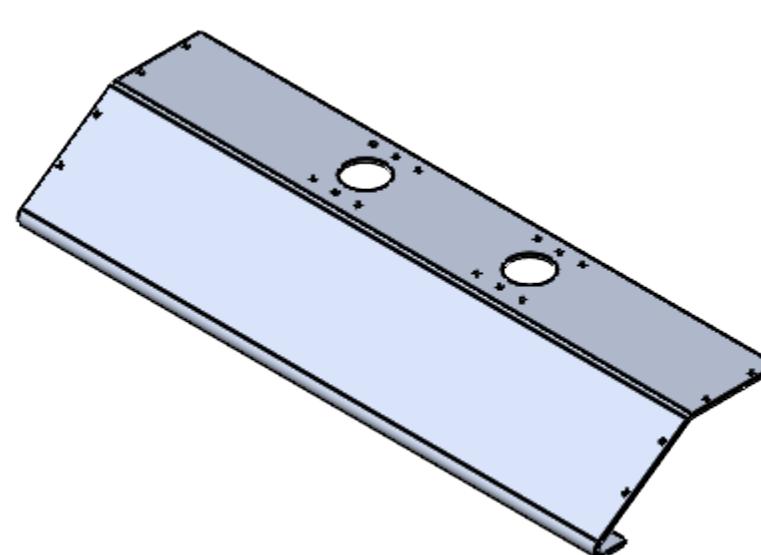
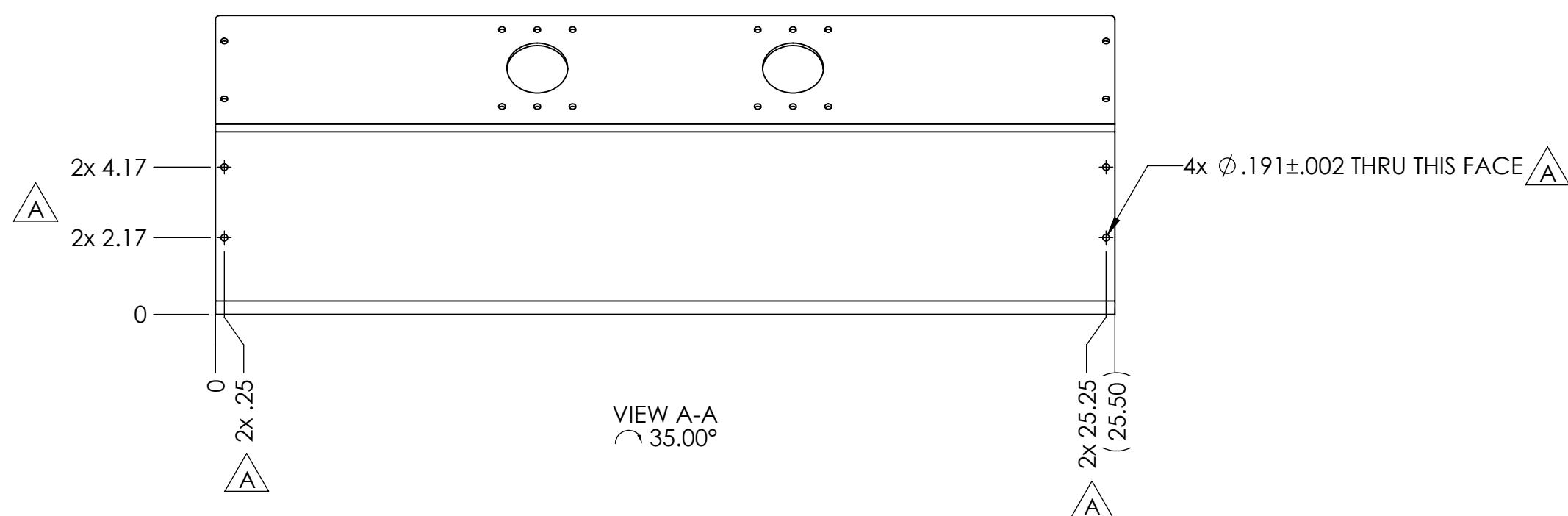
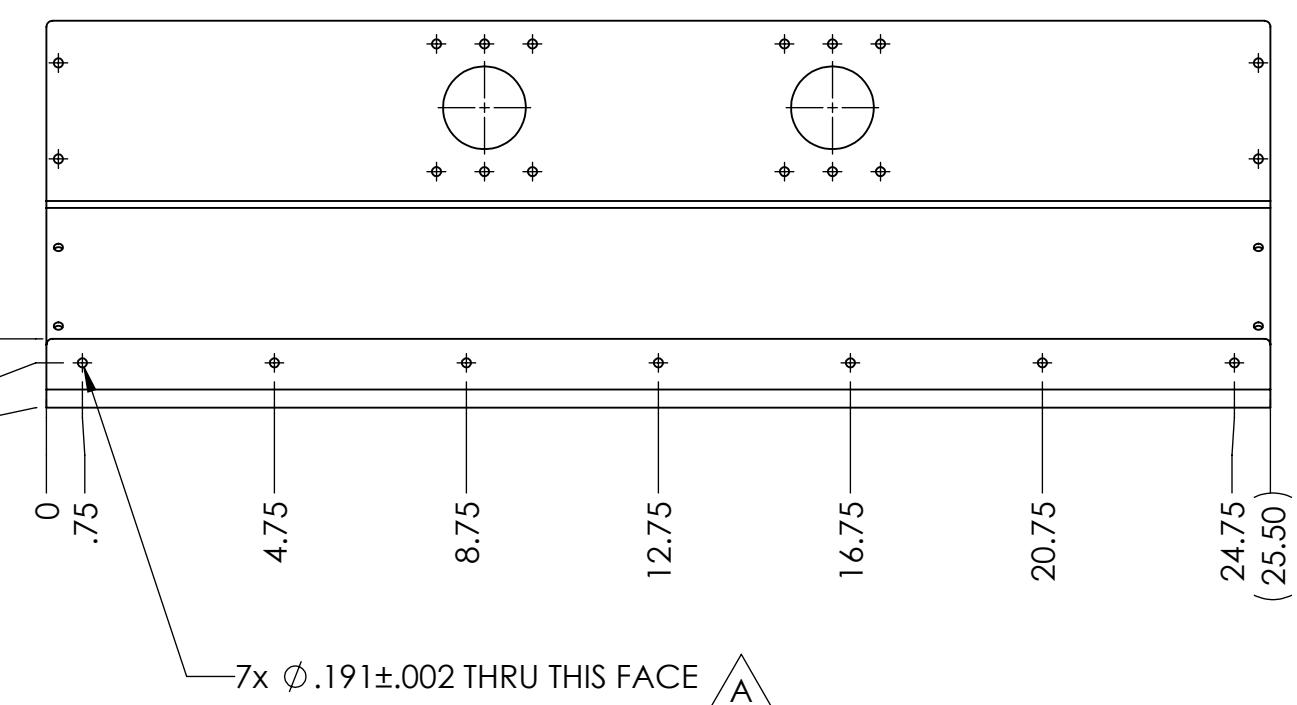
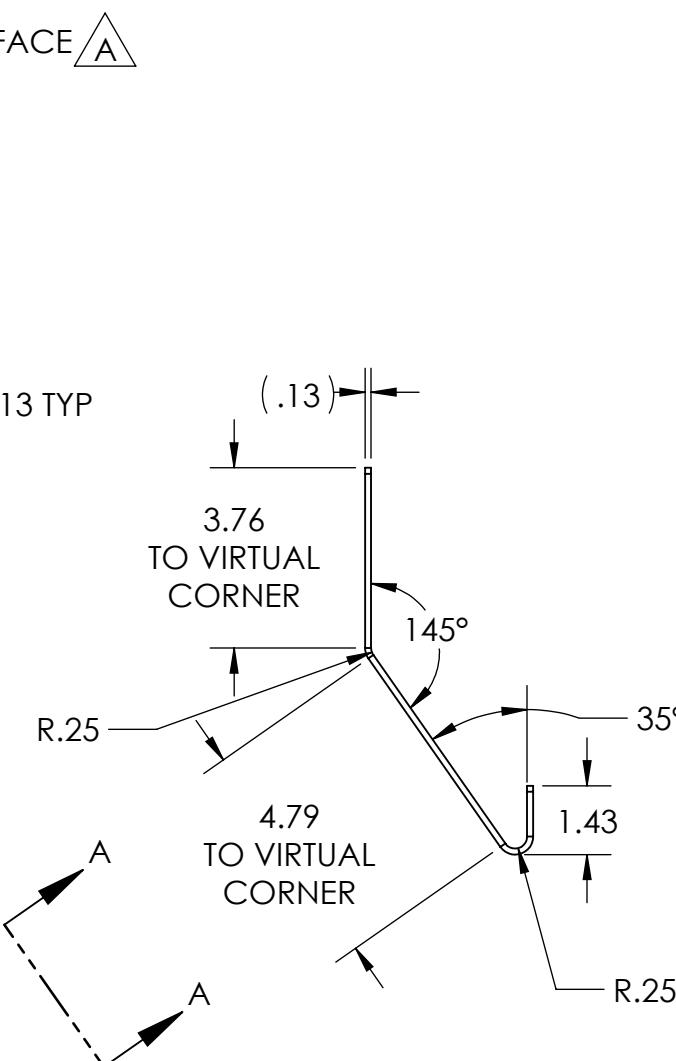
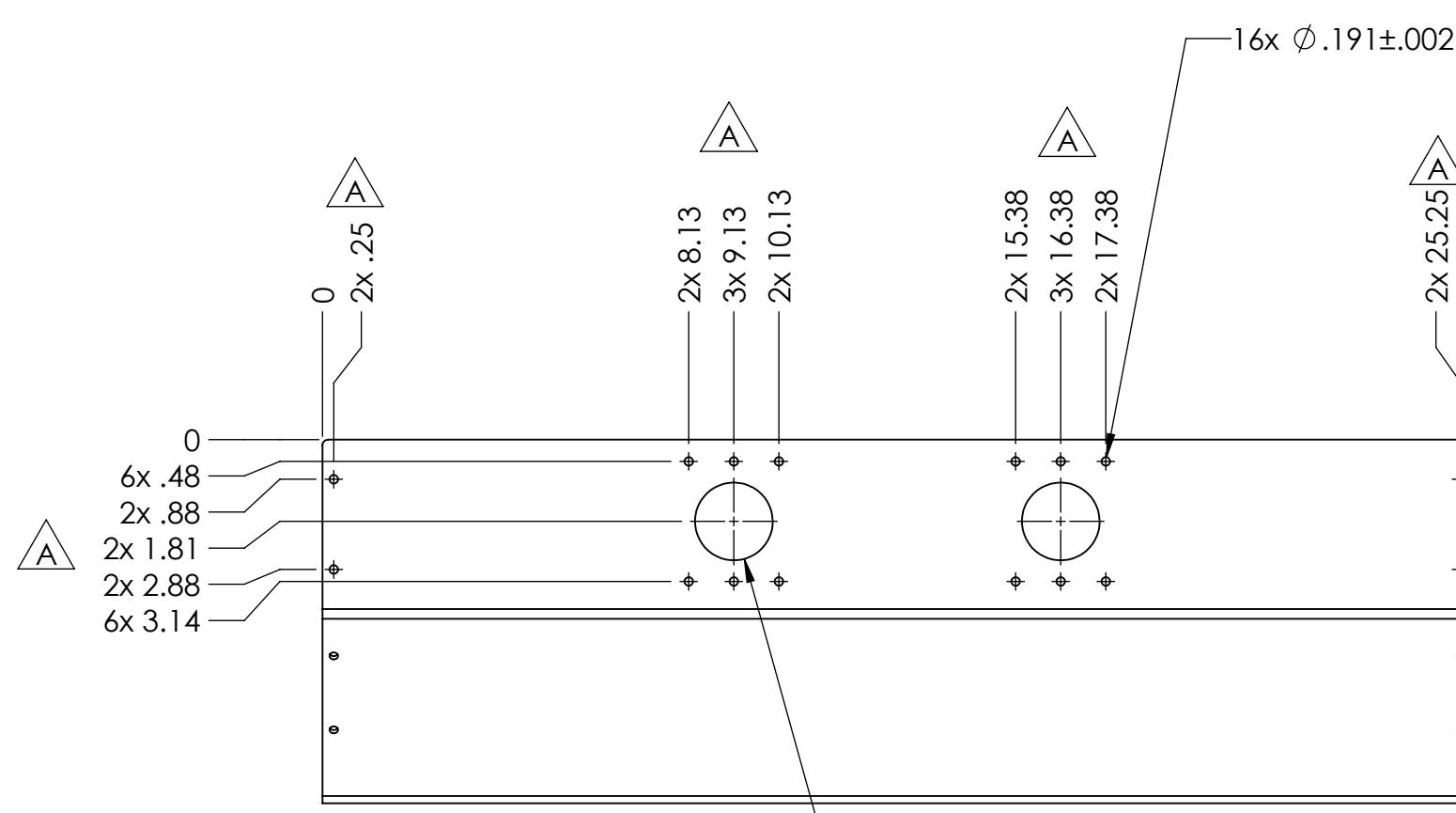
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UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL $\pm 1/16$
ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$
TWO PLACE DECIMAL $\pm .02$
THREE PLACE DECIMAL $\pm .010$

DO NOT SCALE DRAWING

BEND NAME DATE
DRAWN NAL 9/23/2022

PROPRIETARY AND CONFIDENTIAL

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COMMENTS:

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FIRST
ROBOTICS
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SOLIDWORKS
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TITLE:
**Lower Pole
End Base Top**

SIZE DWG. NO. REV
C GE-23071

SCALE: 1:4 SHEET 1 OF 1

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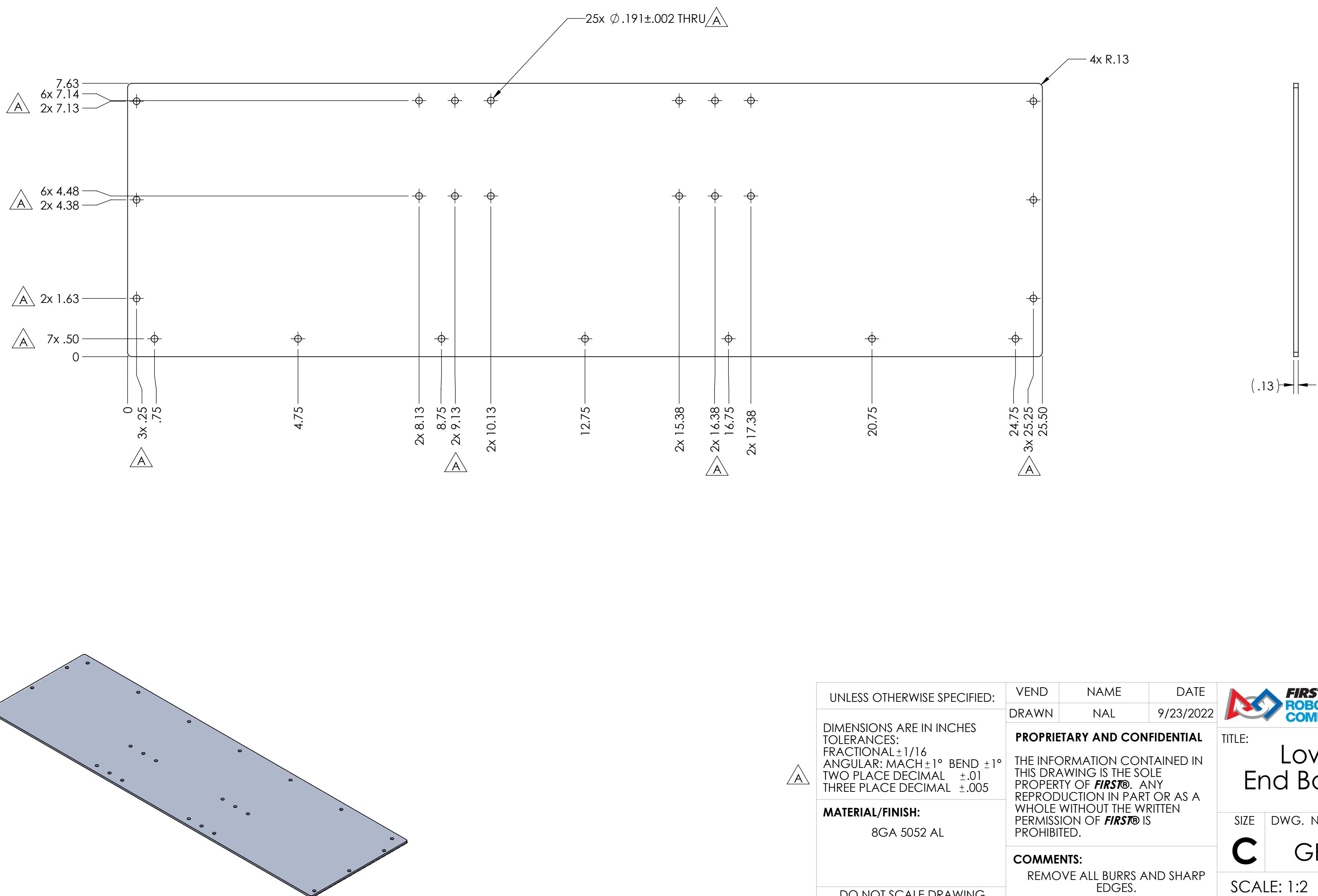
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UNLESS OTHERWISE SPECIFIED:

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 $\pm .005$

VEND NAME DATE

DRAWN NAL 9/23/2022

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MATERIAL/FINISH:

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FIRST[®] ROBOTICS COMPETITION DS SOLIDWORKS Modeling Solutions Partner

TITLE: Lower Pole End Base Bottom

SIZE DWG. NO. REV

C GE-23072

SCALE: 1:2 SHEET 1 OF 1

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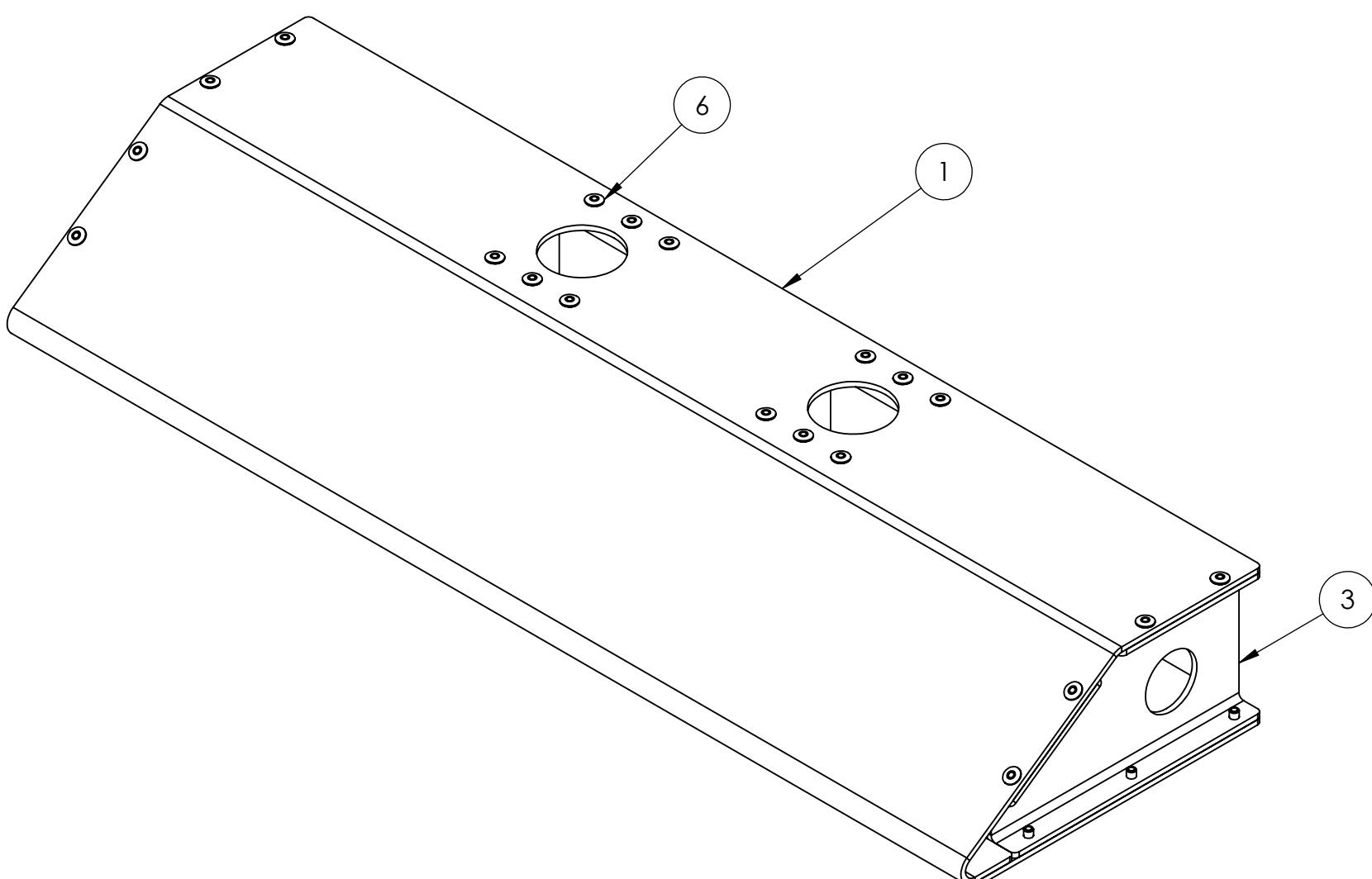
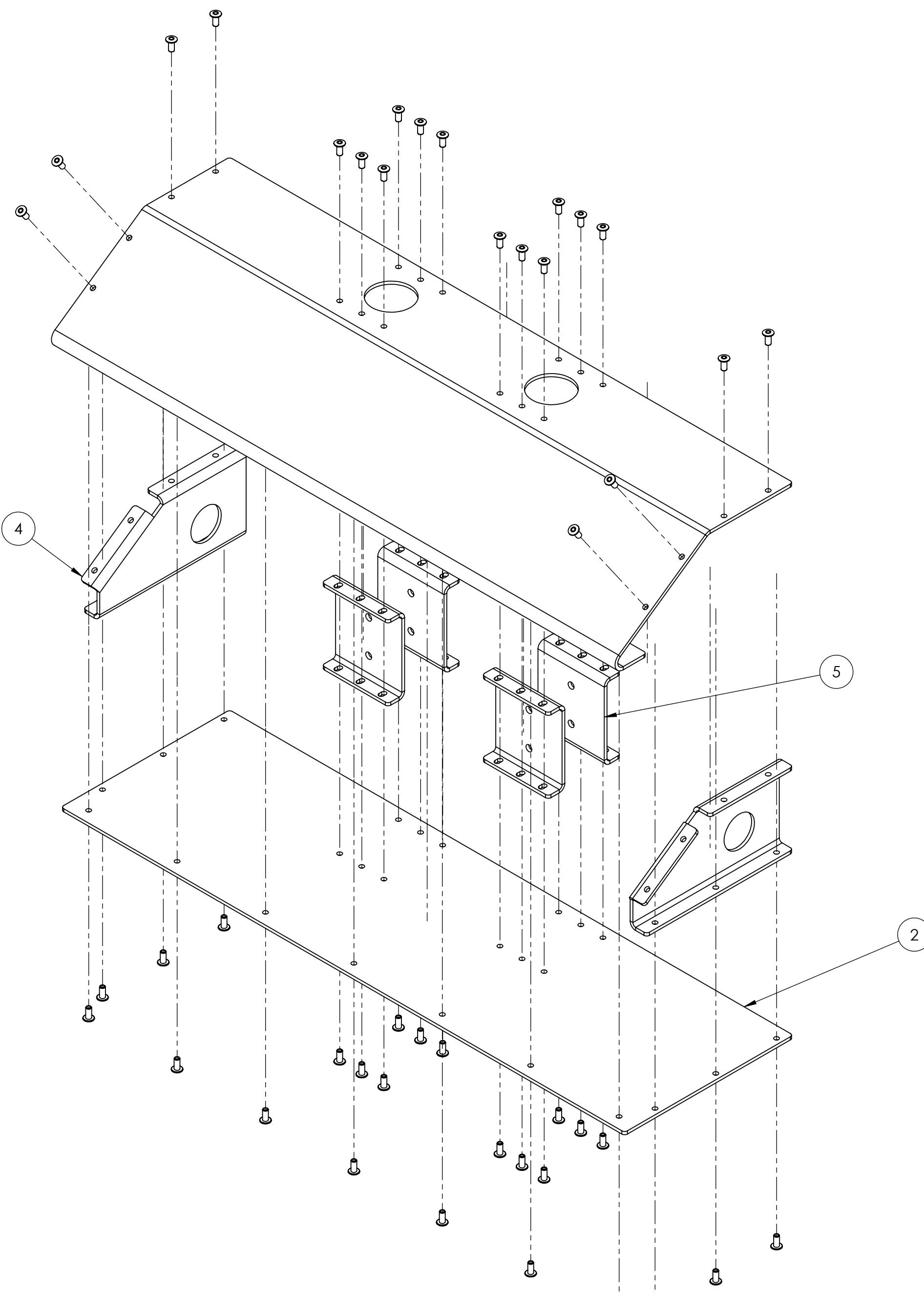
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Notes:

1. Label Assembly with Part Number
 2. 1-1/4" SCH 40 Pipe (1.66" OD) Fits between the two (5) brackets.
 Use a Pipe during assembly to get a slip fit between the brackets.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23071	Lower Pole End Base Top	1
2	GE-23072	Lower Pole End Base Bottom	1
3	GE-23013	Lower Pole Base Side A	1
4	GE-23014	Lower Pole Base Side B	1
5	GE-23015	Lower Pole Pipe Brace	4
6	187 pop rivet	3/16" Steel Rivet	45

UNLESS OTHERWISE SPECIFIED:			VEND	NAME	DATE
DIMENSIONS ARE IN INCHES			DRAWN	JO	9/30/2022
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: Lower Pole End
Base
Sheetmetal

SIZE DWG. NO. REV

C GE-23073 A

SCALE: 1:8 SHEET 1 OF 1

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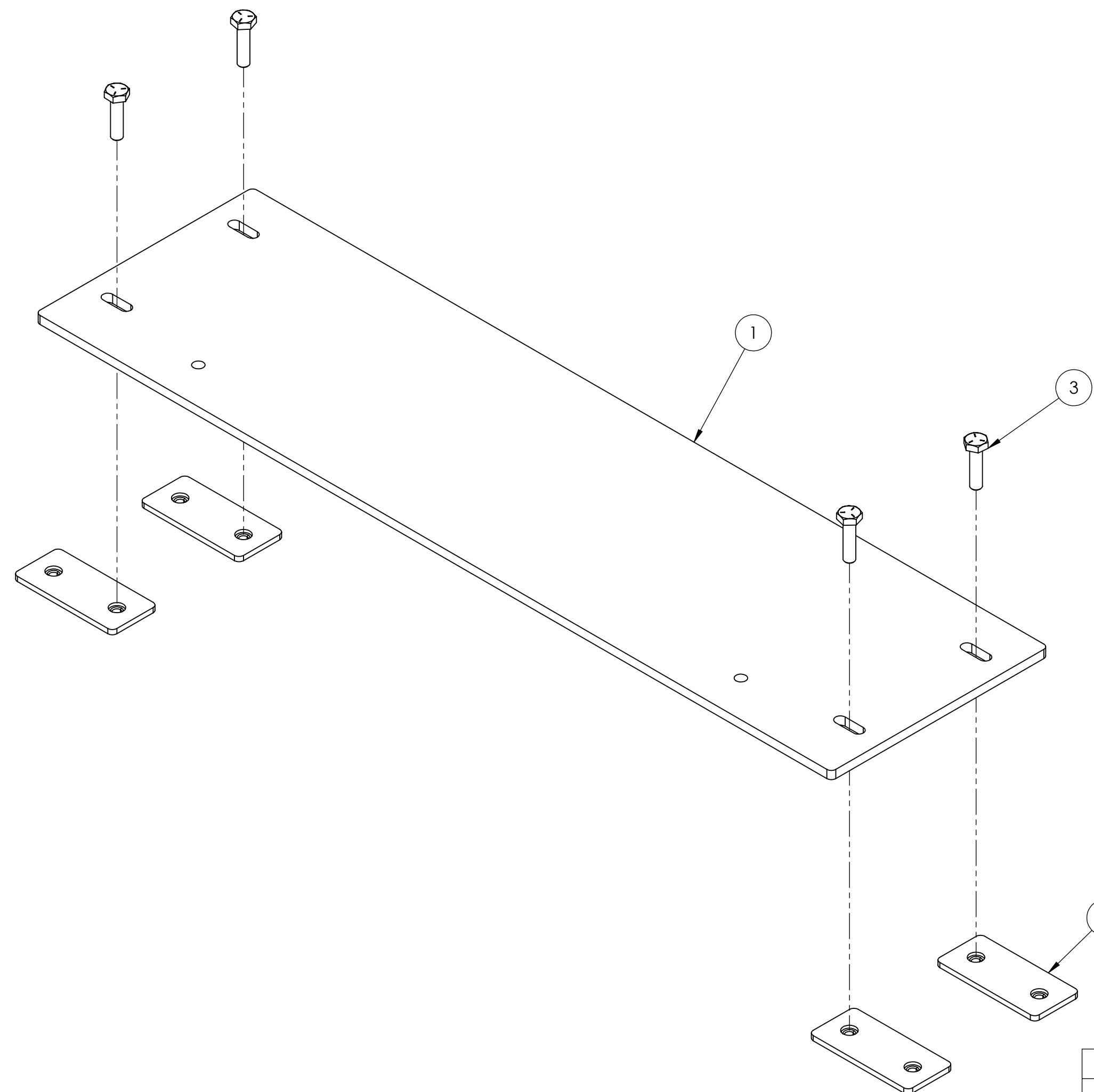
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23039	Upper Shelf Top Cover	1
2	GE-23068	Light Cover Flat Bracket with PemNuts	4
3	hex_.25_20_1	Steel Hex Head Screw, 1/4"-20 x 1" long, fully threaded	4

FIELD	NAME	DATE
DRAWN	JO	12/27/2022

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COMMENTS:
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TITLE:

Upper Shelf Cube Light

SIZE DWG. NO. REV
C GE-23075

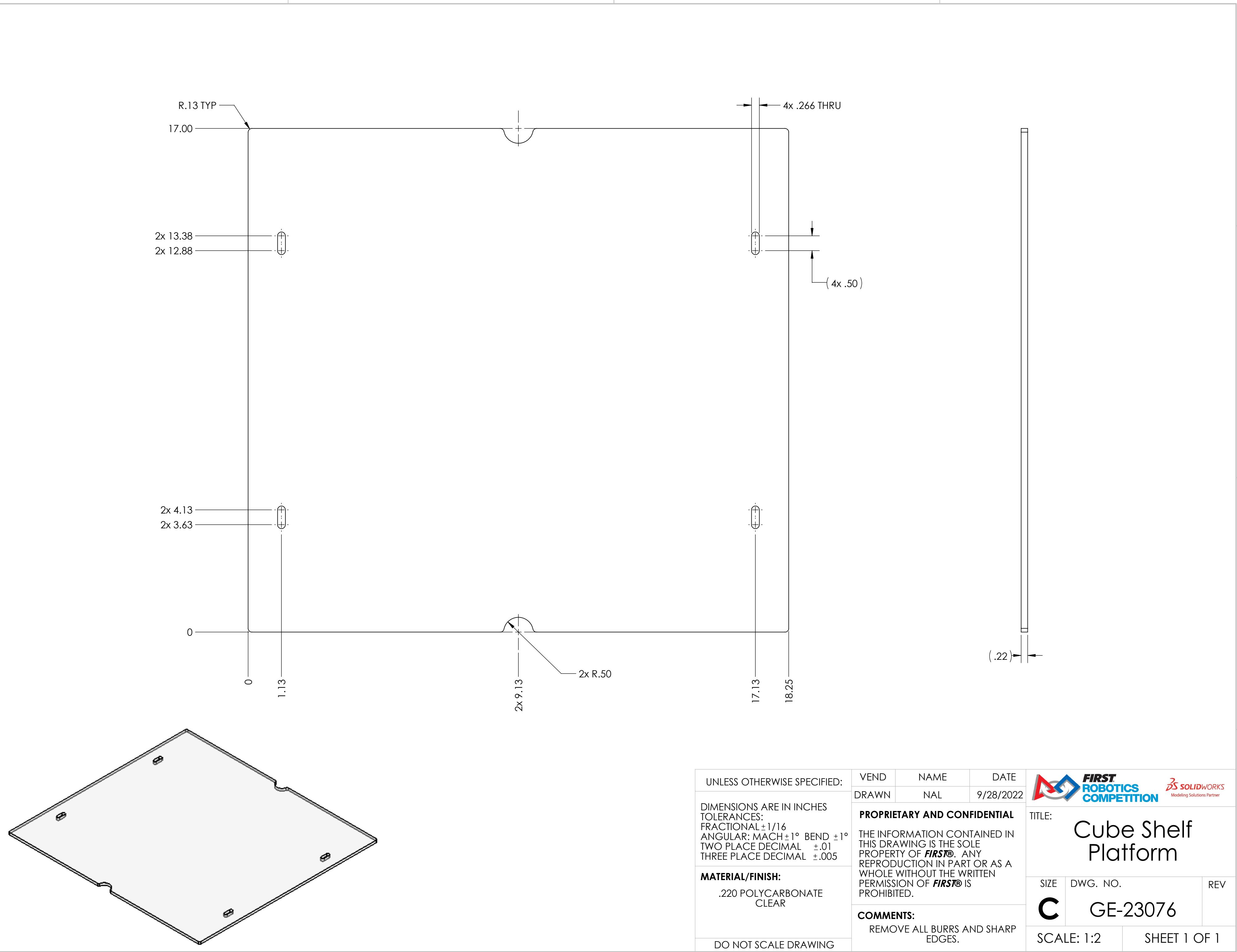
SCALE: 1:2 SHEET 1 OF 1

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DIMENSIONS ARE IN INCHES	DRAWN	NAL	9/28/2022
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH: .220 POLYCARBONATE CLEAR			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

 **FIRST ROBOTICS COMPETITION**  SOLIDWORKS
Modeling Solutions Partner

TITLE:
Cube Shelf Platform

SIZE DWG. NO. REV

C GE-23076

SCALE: 1:2 SHEET 1 OF 1

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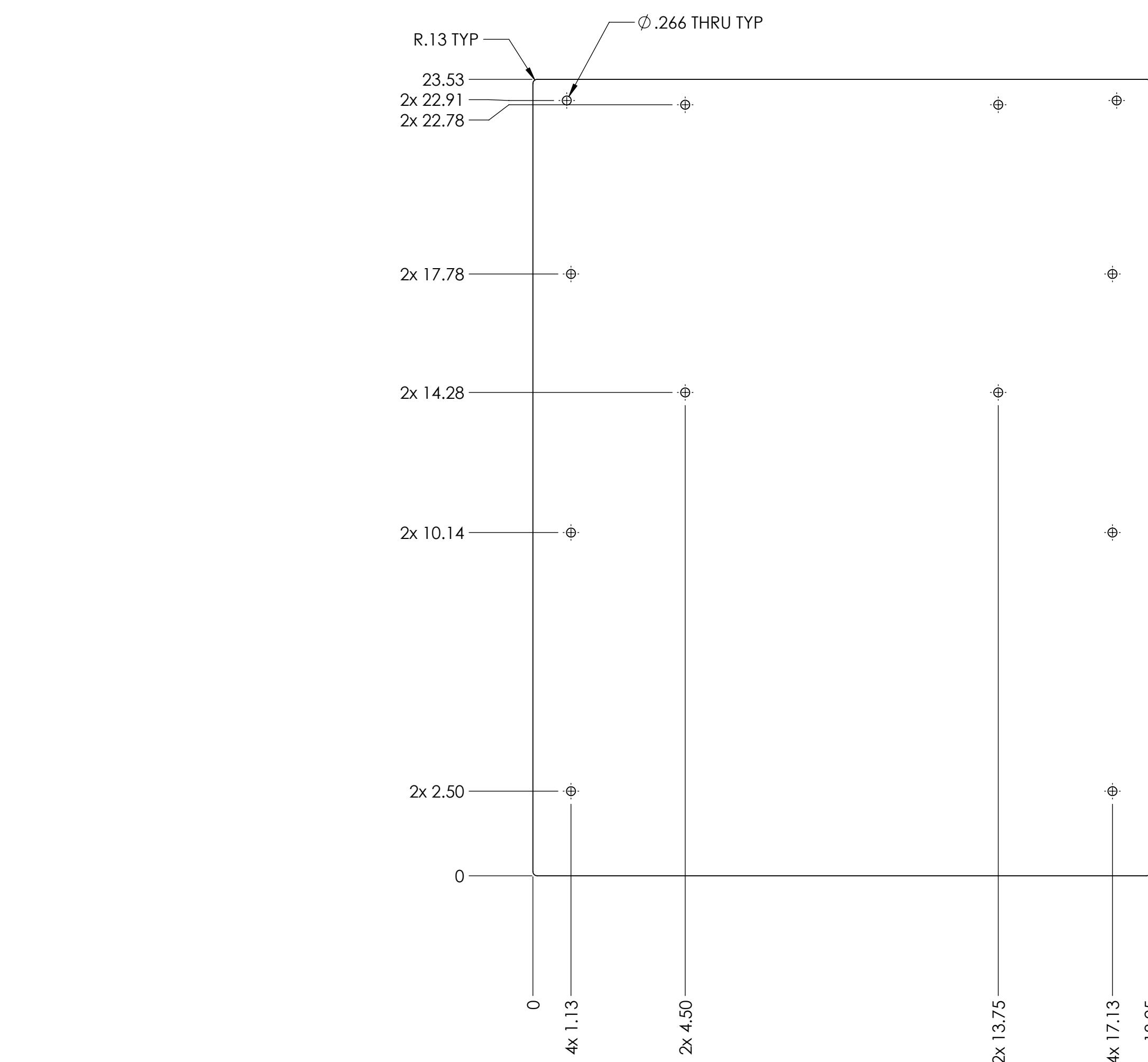
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UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	NAL	9/28/2022	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH: .220 POLYCARBONATE CLEAR			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			



TITLE: Cube Shelf Lower Front Panel

SIZE DWG. NO. REV C GE-23077

SCALE: 1:3 SHEET 1 OF 1

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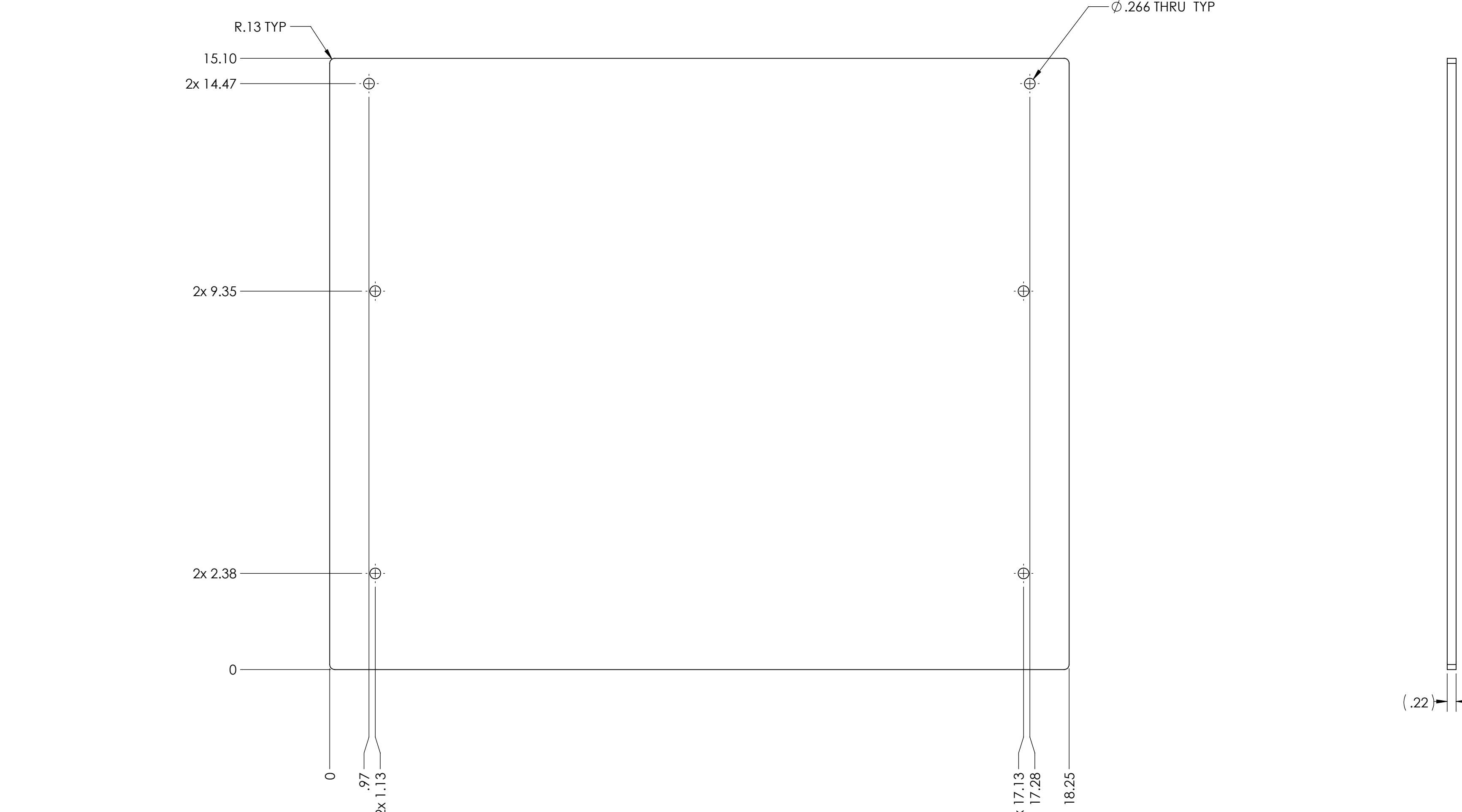
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UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	NAL	9/28/2022
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:	SIZE	DWG. NO.	REV
.220 POLYCARBONATE CLEAR	C	GE-23079	
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING	SCALE: 1:2	SHEET 1 OF 1	

 FIRST ROBOTICS COMPETITION  SOLIDWORKS
Modeling Solutions Partner

TITLE:
Cube Shelf
Upper Front Panel

SIZE DWG. NO. REV
C GE-23079

SCALE: 1:2 SHEET 1 OF 1

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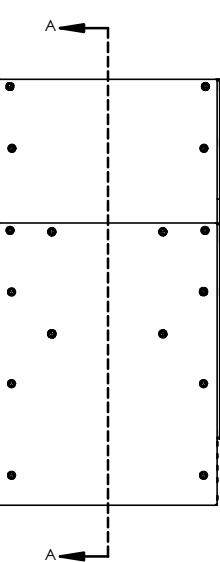
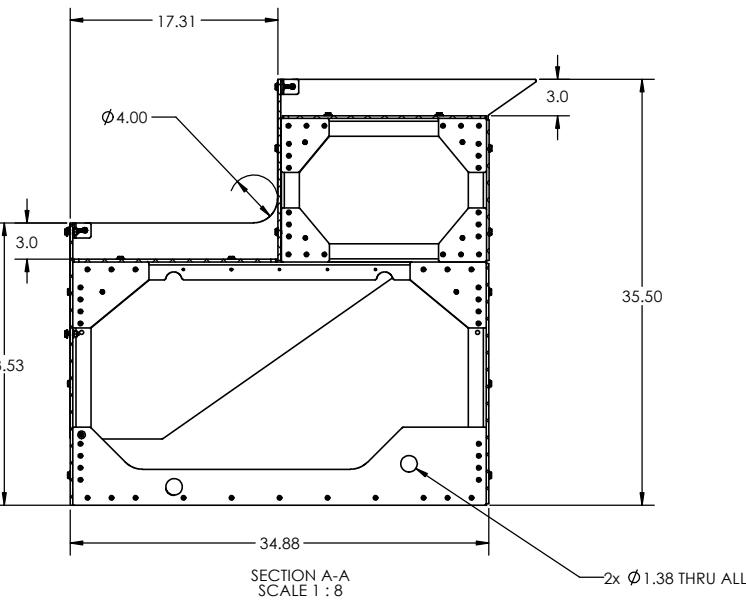
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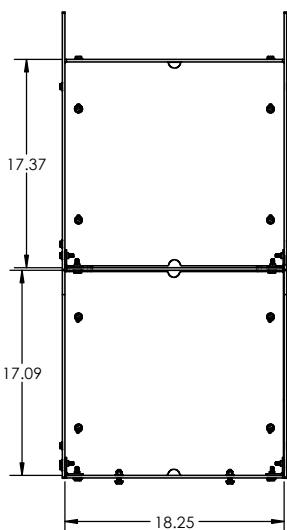
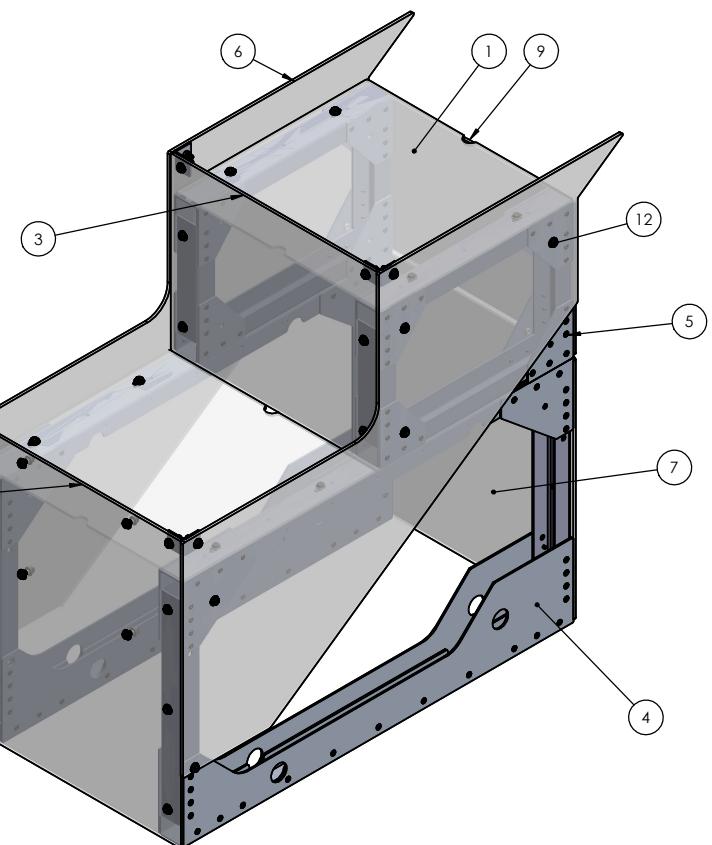
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23076	Cube Shelf Platform	2
2	GE-23077	Cube Shelf Lower Front Panel	1
3	GE-23079	Cube Shelf Upper Front Panel	1
4	GE-23087	Cube Shelf Lower Hoop	2
5	GE-23088	Cube Shelf Upper Hoop	2
6	GE-23089	Cube Shelf Side Poly	2
7	GE-23094	Cube Shelf Lower Rear Panel	1
8	GE-23095	Cube Shelf Inside Corner with PemNuts	4
9	GE-23098	Cube Shelf Upper Back Panel	1
10	1/4-20 NyLock Nut	1/4-20 Nylock	8
11	250 Washer	1/4" Washer	8
12	92865A542 and 250 Washer	1/4-20 x 1" Hex Head Bolt with Washer	54

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

FIELD NAME DATE
DRAWN JO 9/29/2022**PROPRIETARY AND CONFIDENTIAL**

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COMMENTS:
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TITLE:

Cube Shelf

SIZE DWG. NO.

REV

C GE-23080 A

SCALE: 1:6 SHEET 1 OF 4

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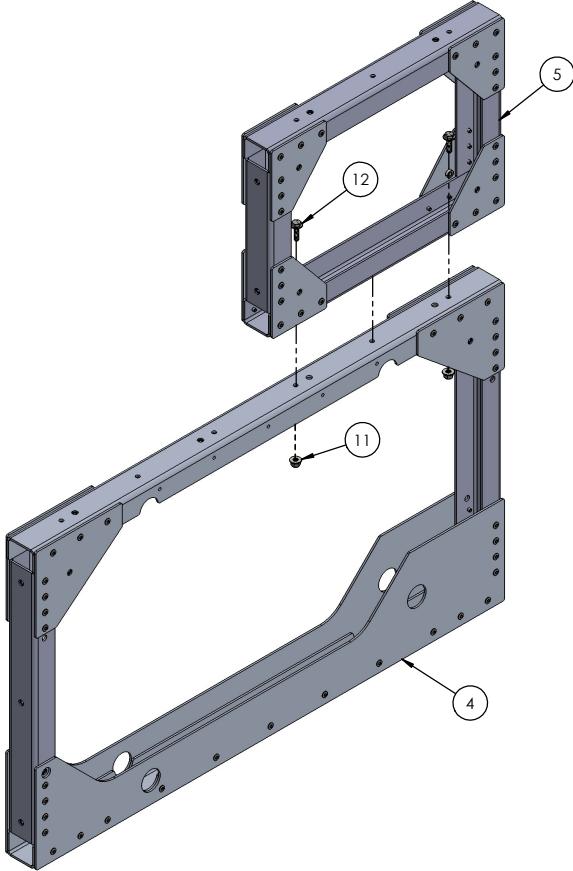
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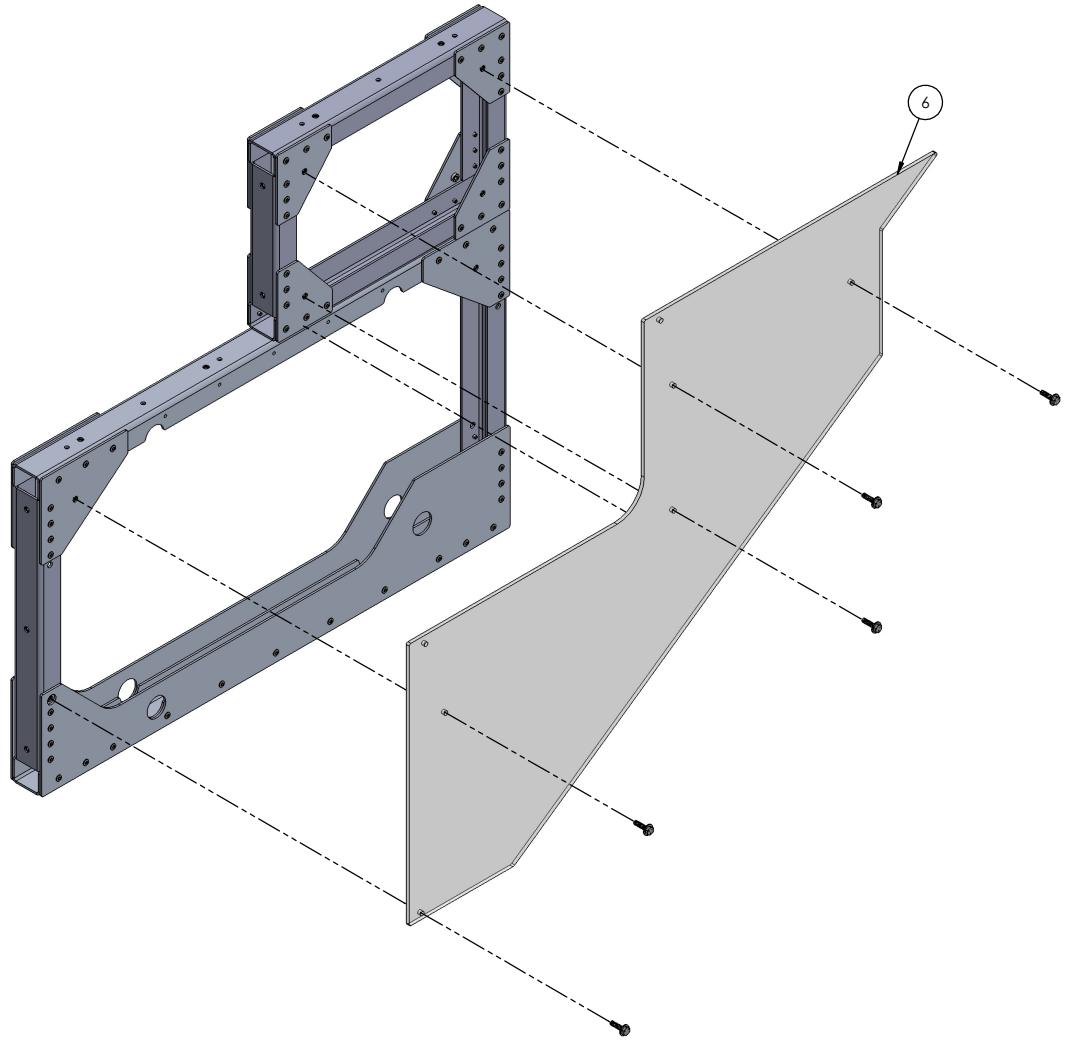
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Step 1: Bolt **(4)** and **(5)** together with 1/4-20 x 1" bolts **(12)** and 1/4-20 locknuts **(11)**. Quantity 2x



Step 2: Bolt **(6)** onto side of assembly with 1/4-20 x 1" bolts and washers into the existing PEM Nuts. Put the plastic on as shown for one assembly, and on the opposite side on the other assembly, so there is a "Left" and "Right"

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

FIELD

DRAWN

NAME

JO

DATE

9/29/2022

ROBOTICS
COMPETITION

Modeling Solutions Partner

TITLE:

Cube Shelf

SIZE

DWG. NO.

REV

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GE-23080

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SCALE: 1:5

SHEET 2 OF 4

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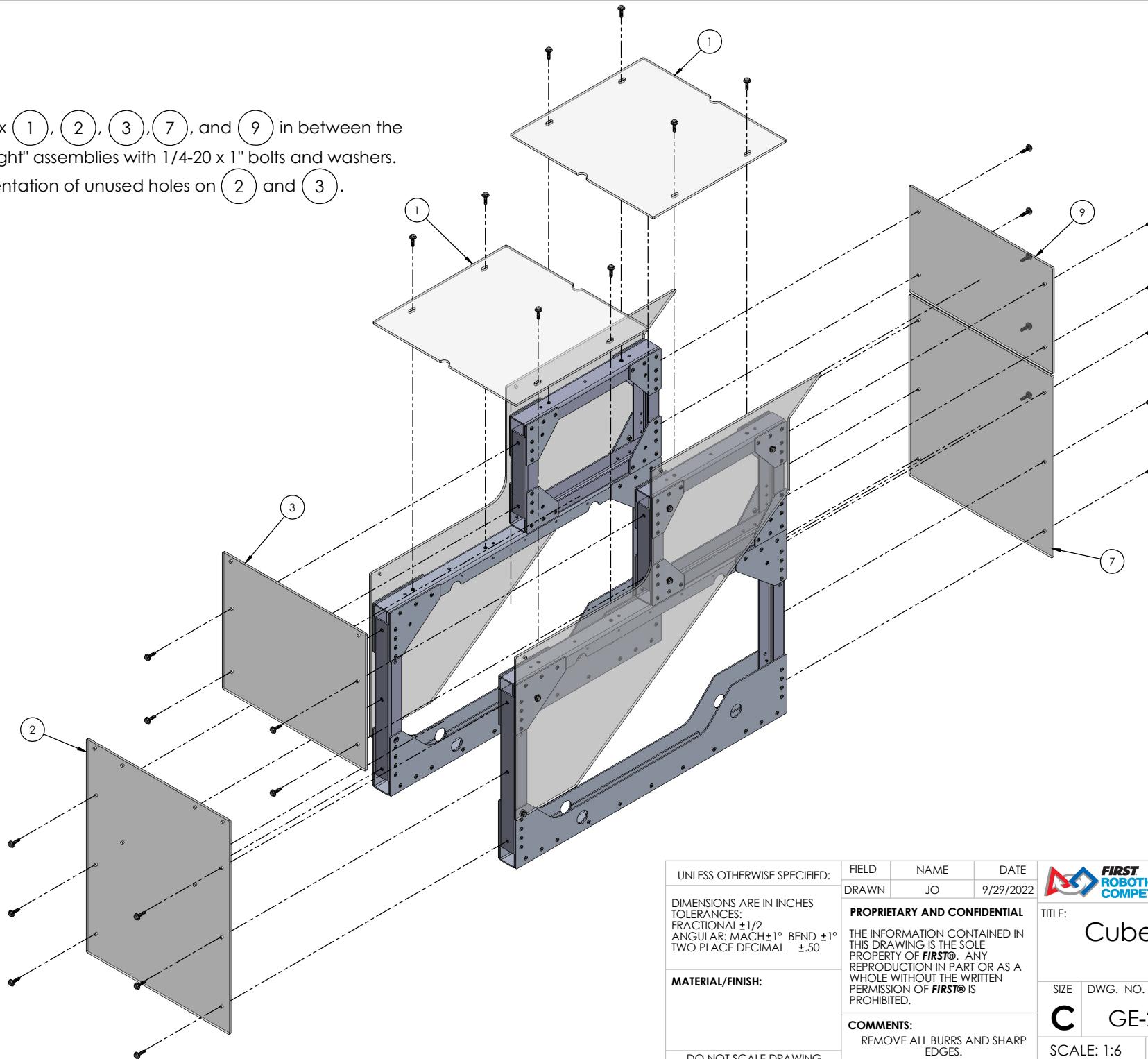
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Step 3: Bolt 2x (1), (2), (3), (7), and (9) in between the "Left" and "Right" assemblies with 1/4-20 x 1" bolts and washers. Note the orientation of unused holes on (2) and (3).



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:

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COMMENTS:

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DO NOT SCALE DRAWING

FIELD

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DRAWN JODATE
9/29/2022

TITLE:

Cube Shelf

SIZE DWG. NO.

REV

C GE-23080 A

SCALE: 1:6 SHEET 3 OF 4

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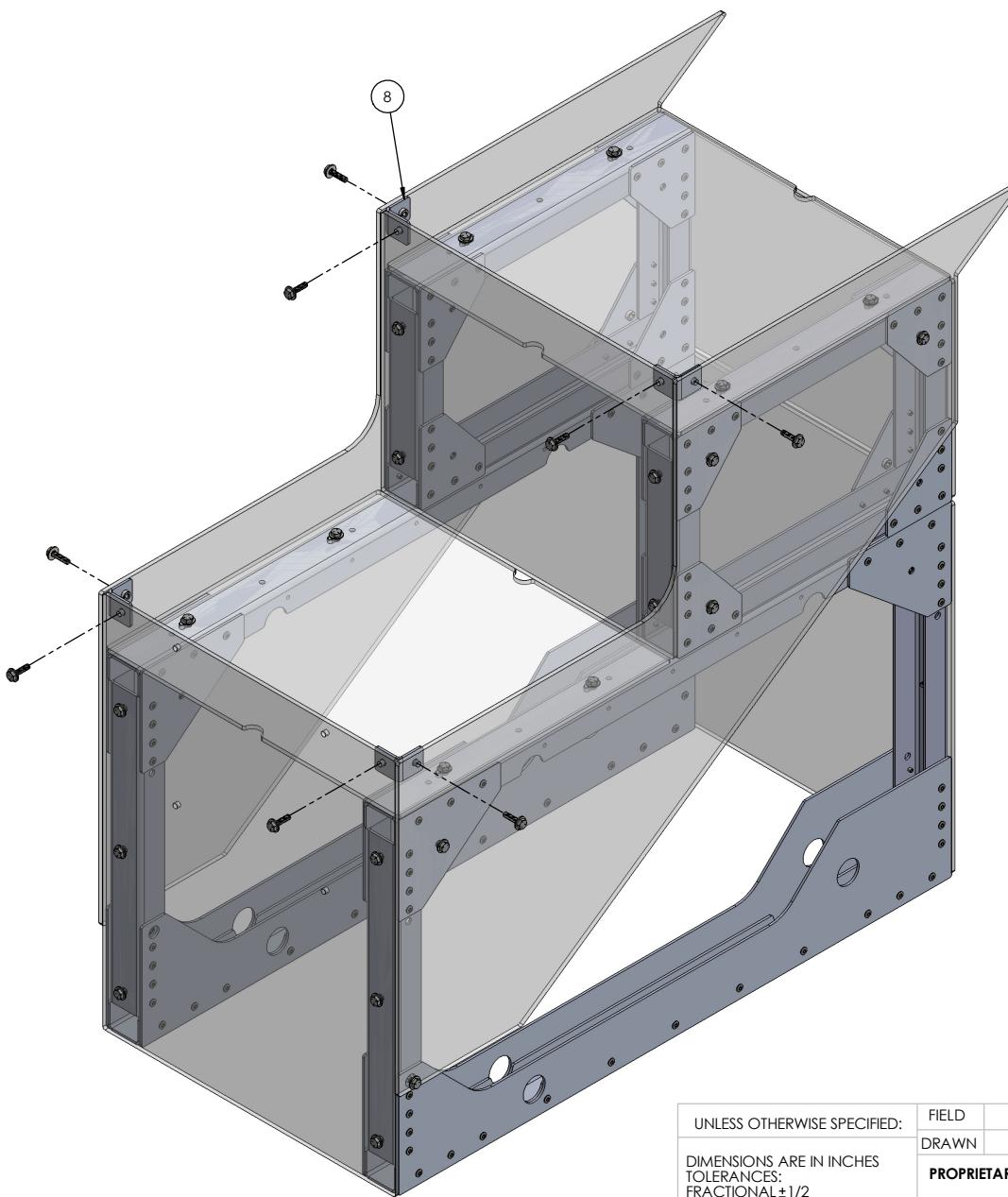
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Step 4: Attach (8) brackets into the front corners with 1/4-20 x 1" bolts and washers.

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:

FIELD NAME DATE
DRAWN JO 9/29/2022

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ROBOTICS COMPETITION
SOLIDWORKS
Modeling Solutions Partner

TITLE:

Cube Shelf

SIZE DWG. NO.

REV

C GE-23080 **A**

SCALE: 1:4 SHEET 4 OF 4

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REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
B4, C1, C2, C3, C4	A	Style of Qty callouts, changed hole size from .391 to .344 for PEM nuts instead of Riv-nuts, Rivet Hole Tolerances	9/23/2022	JO

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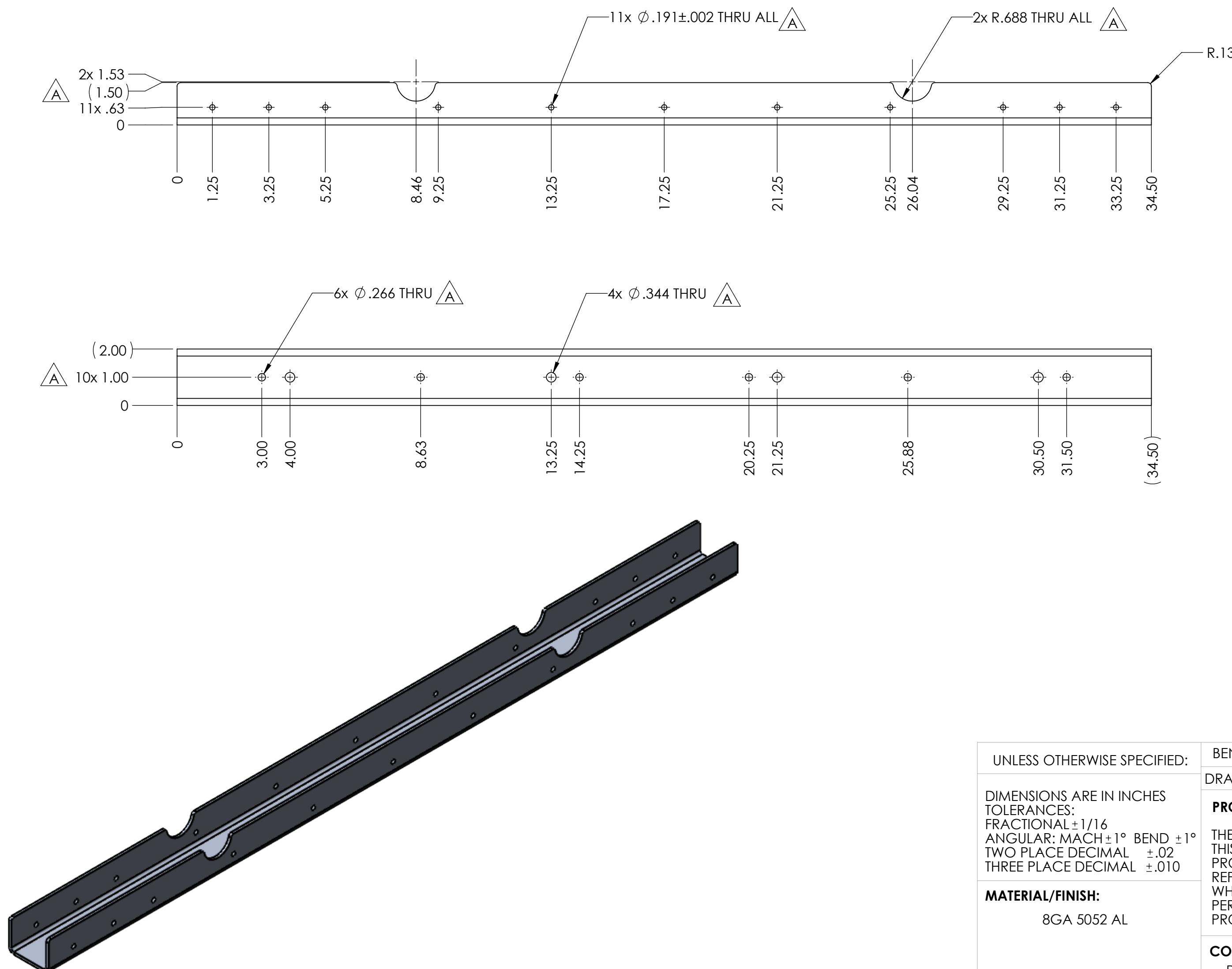
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UNLESS OTHERWISE SPECIFIED:

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:

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BEND NAME DATE

DRAWN NAL 9/23/2022

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COMMENTS:

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 FIRST
ROBOTICS
COMPETITION

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Modeling Solutions Partner

TITLE:
Cube Shelf
Long Horizontal
Channel

SIZE DWG. NO. REV

C GE-23081

SCALE: 1:3 SHEET 1 OF 1

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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23081	Cube Shelf Long Horizontal Channel	1
2	pem_clinchnut_.25_20_.054	1/4-20 self-clinching nut, .054 shank	2

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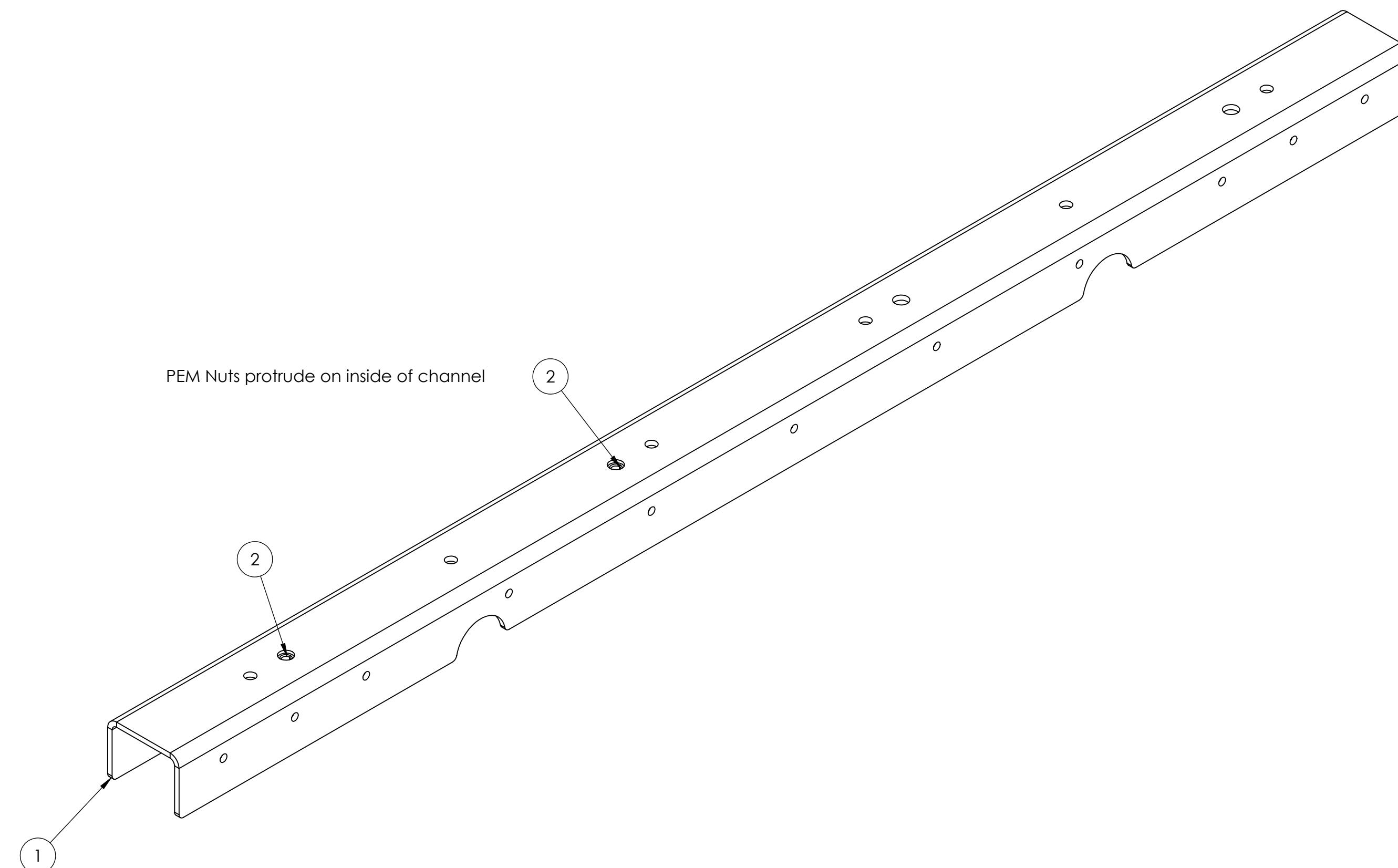
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UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	JO	10/4/2022
TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$	PROPRIETARY AND CONFIDENTIAL		
TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .005$	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:	COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.		
DO NOT SCALE DRAWING			

FIRST ROBOTICS COMPETITION SOLIDWORKS Modeling Solutions Partner

TITLE: Cube Shelf Long Horizontal Channel Config 1

SIZE DWG. NO. REV

C GE-23081-01

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

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REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
B4, C1, C2, C3, C4	A	Style of Qty callouts, changed hole size from .391 to .344 for PEM nuts instead of Riv-nuts, Rivet Hole Tolerance	9/23/2022	JO

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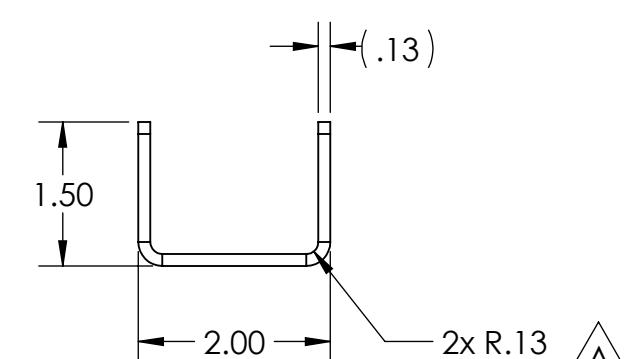
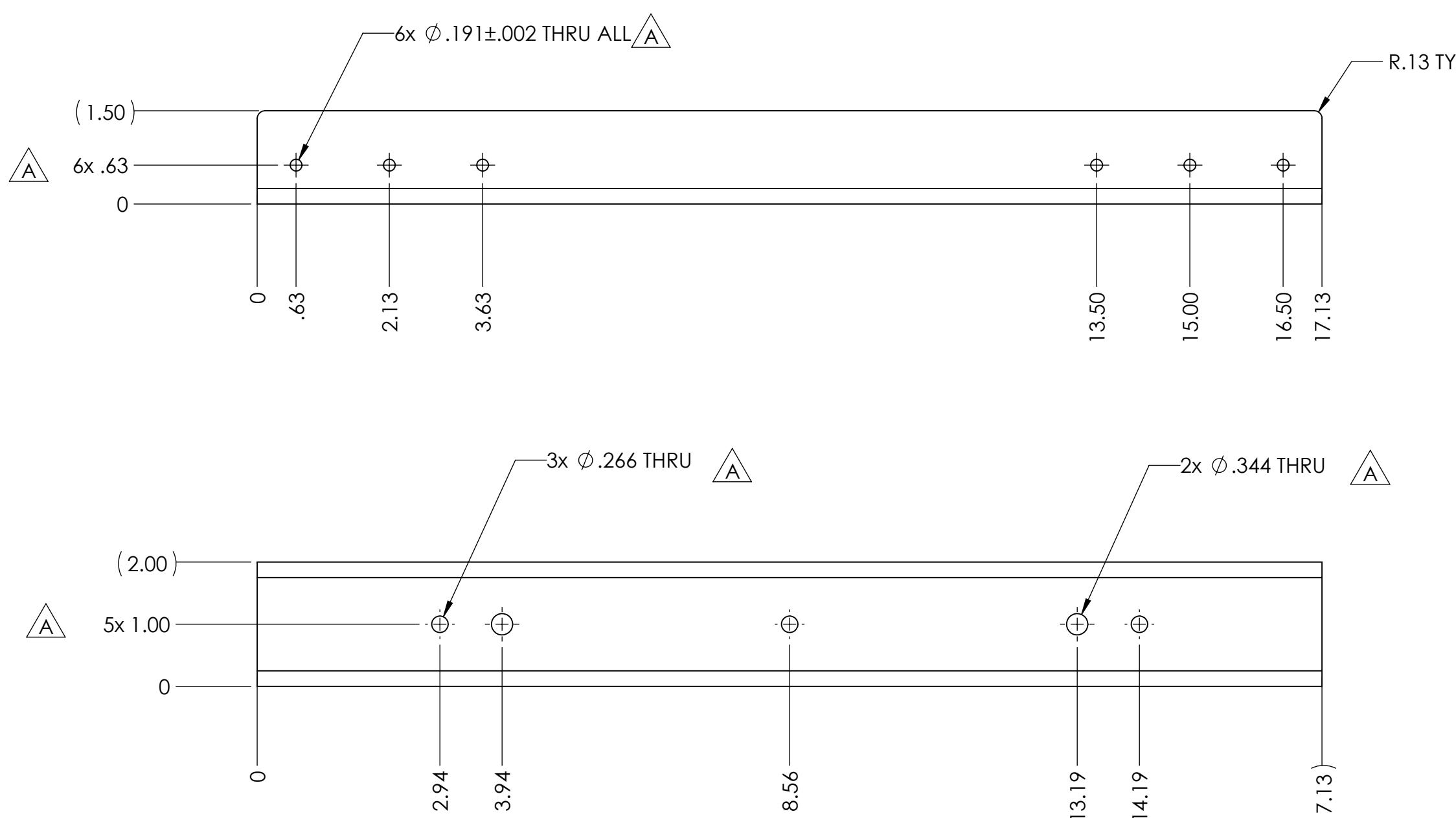
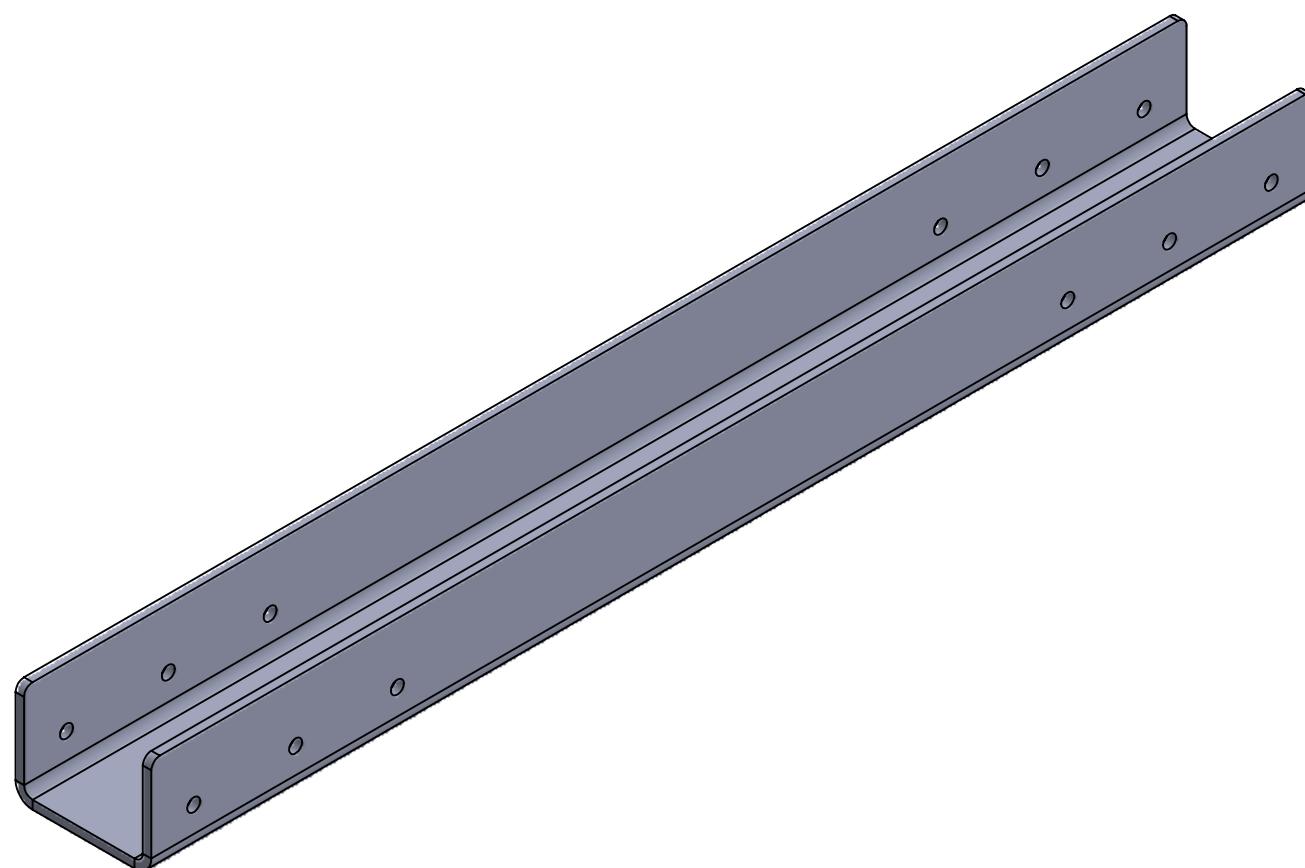
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UNLESS OTHERWISE SPECIFIED:

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:

8GA 5052 AL

DO NOT SCALE DRAWING

BEND	NAME	DATE
DRAWN	NAL	9/23/2022

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COMMENTS:

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 FIRST ROBOTICS COMPETITION  SOLIDWORKS Modeling Solutions Partner

TITLE: Cube Shelf
Short Horizontal
Channel

SIZE DWG. NO. REV

C GE-23082

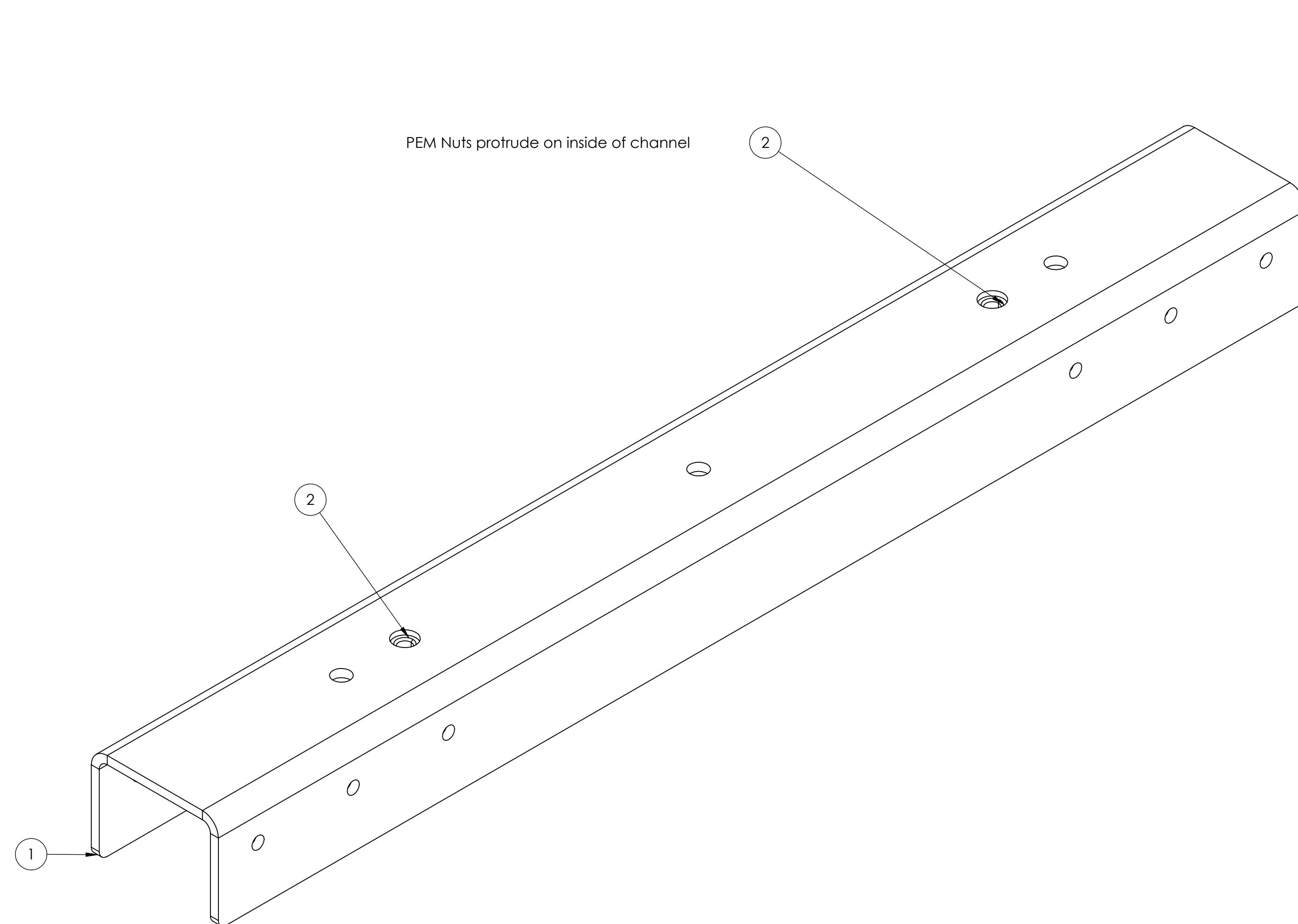
SCALE: 1:2 SHEET 1 OF 1

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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23082	Cube Shelf Short Horizontal Channel	1
2	pem_clinchnut_25_20_.054	1/4-20 self-clinching nut, .054 shank	2

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UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	JO	10/4/2022
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:	COMMENTS:		
REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			



TITLE: Cube Shelf Short Horizontal Channel Config 1
SIZE DWG. NO. REV
C GE-23082-01

SCALE: 1:2 SHEET 1 OF 1

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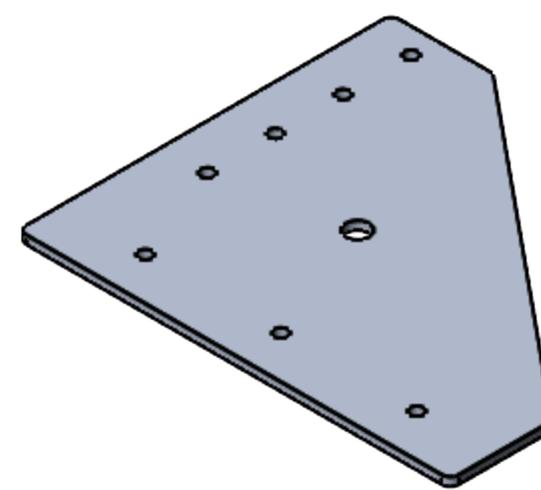
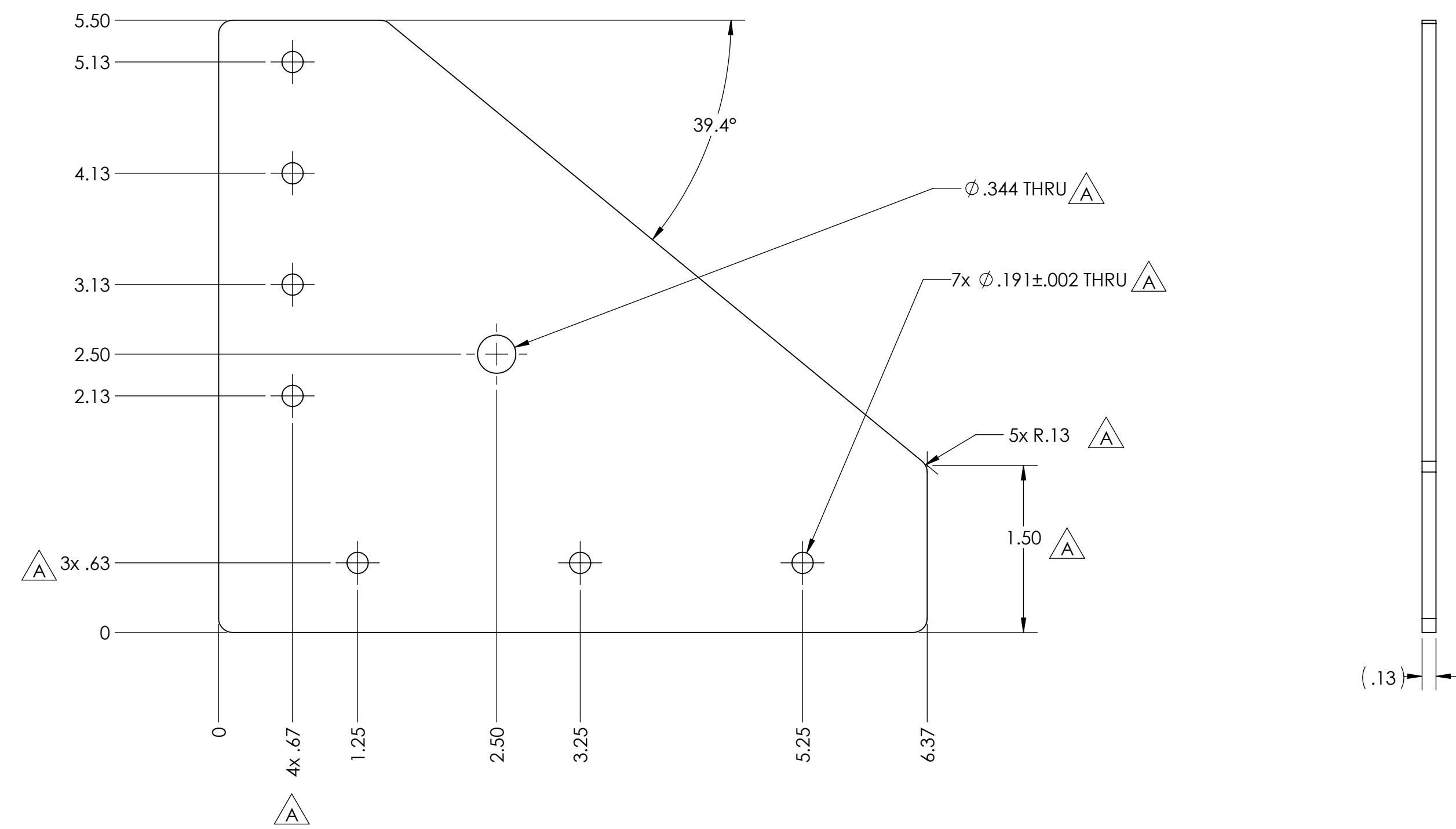
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UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .005$	DRAWN	NAL	9/23/2022
PROPRIETARY AND CONFIDENTIAL			
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 AL			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
Cube Shelf
Corner Gusset

SIZE DWG. NO. REV
C GE-23084

SCALE: 1:1 SHEET 1 OF 1

4

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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23084	Cube Shelf Corner Gusset	1
2	pem_clinchnut_.25_20 .054	1/4-20 self-clinching nut, .054 shank	1

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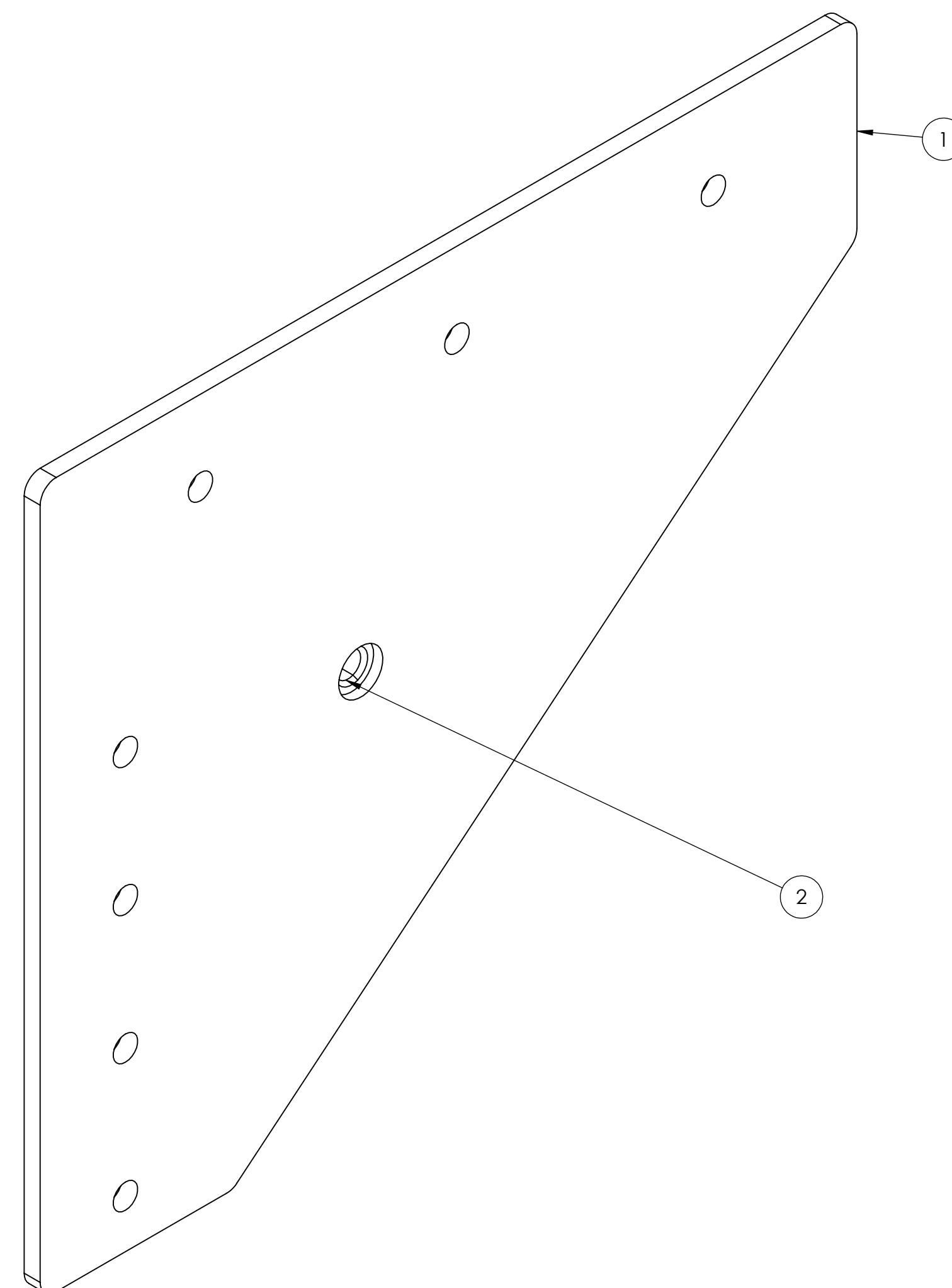
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PEM nut in opposite side of GE-23084-02

UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	JO	10/4/2022	
PROPRIETARY AND CONFIDENTIAL			
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COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			
SIZE DWG. NO. REV			
C GE-23084-01			
SCALE: 1:2 SHEET 1 OF 1			

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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23084	Cube Shelf Corner Gusset	1
2	pem_clinchnut_.25_20 .054	1/4-20 self-clinching nut, .054 shank	1

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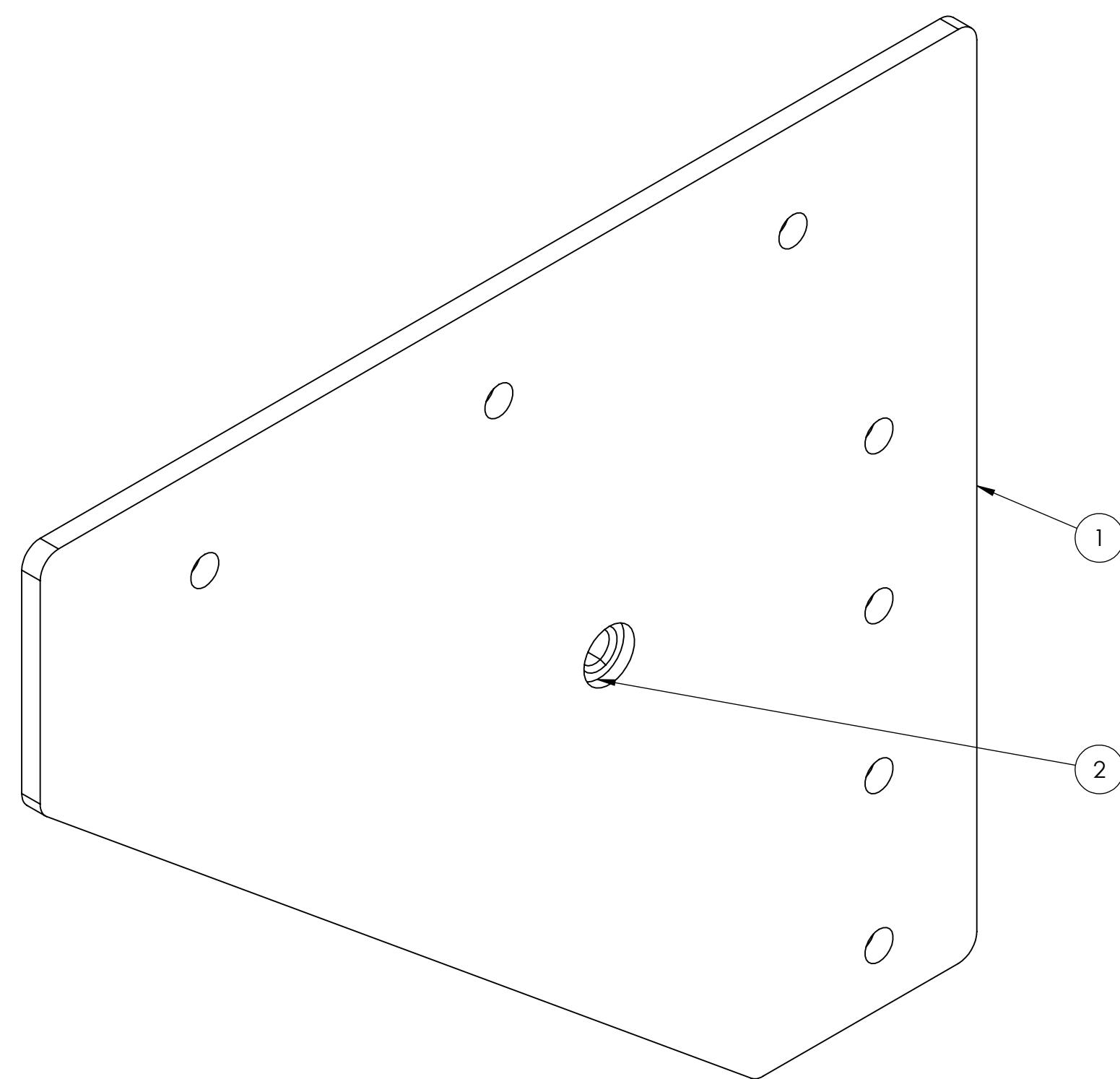
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PEM nut in opposite side from GE-23084-01

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 10/4/2022

PROPRIETARY AND CONFIDENTIAL

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COMMENTS:

REMOVE ALL BURRS AND SHARP EDGES.



TITLE: Cube Shelf Corner Gusset Config 2
SIZE: DWG. NO. REV
C GE-23084-02

SCALE: 1:2 SHEET 1 OF 1

4

3

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REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
B3, B4, C2, C3, C4	A	Style of Qty Callout, changed hole size from .391 to .344 for PEM nuts instead of Riv-nuts, Rivet Hole Tolerance	9/23/2022	JO

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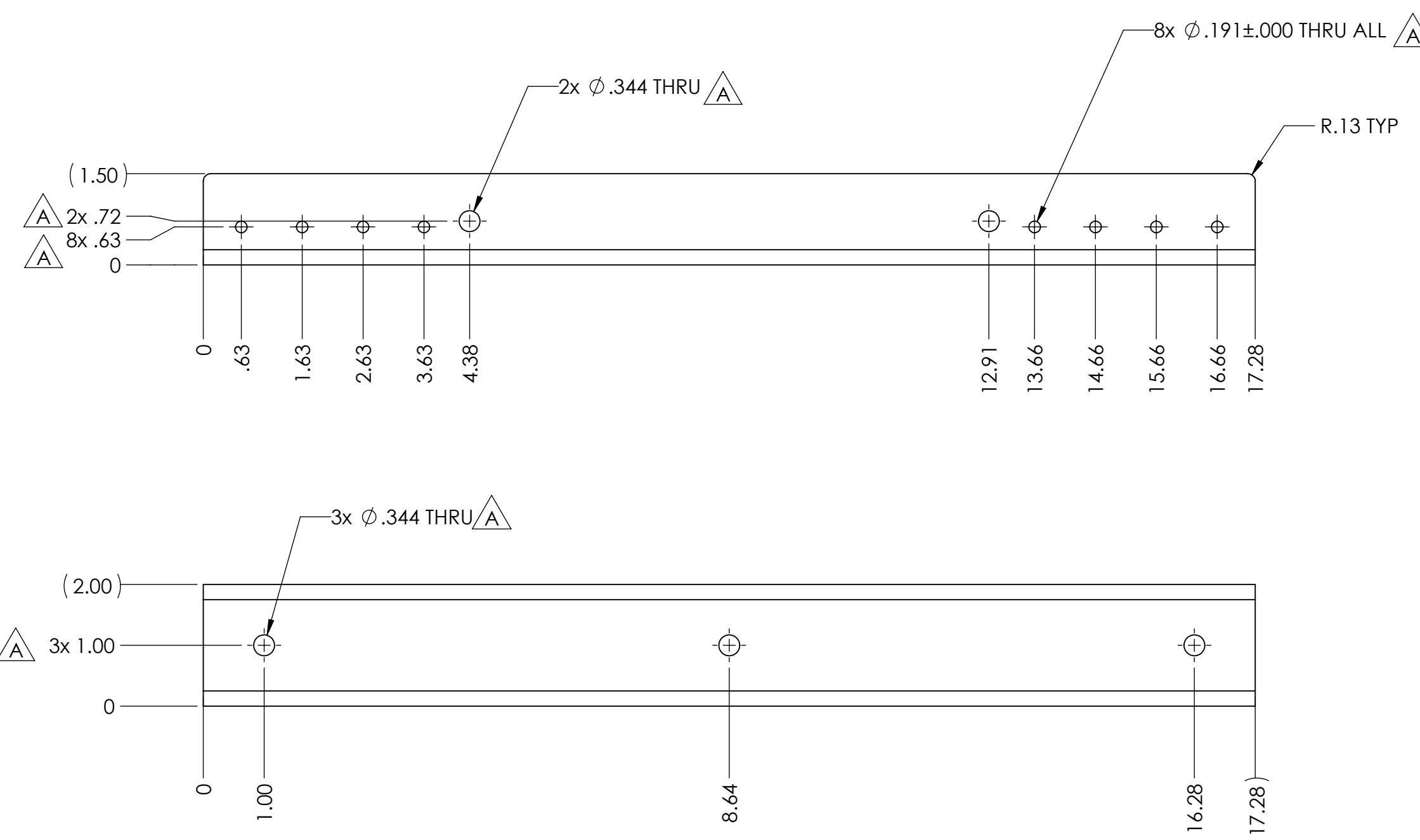
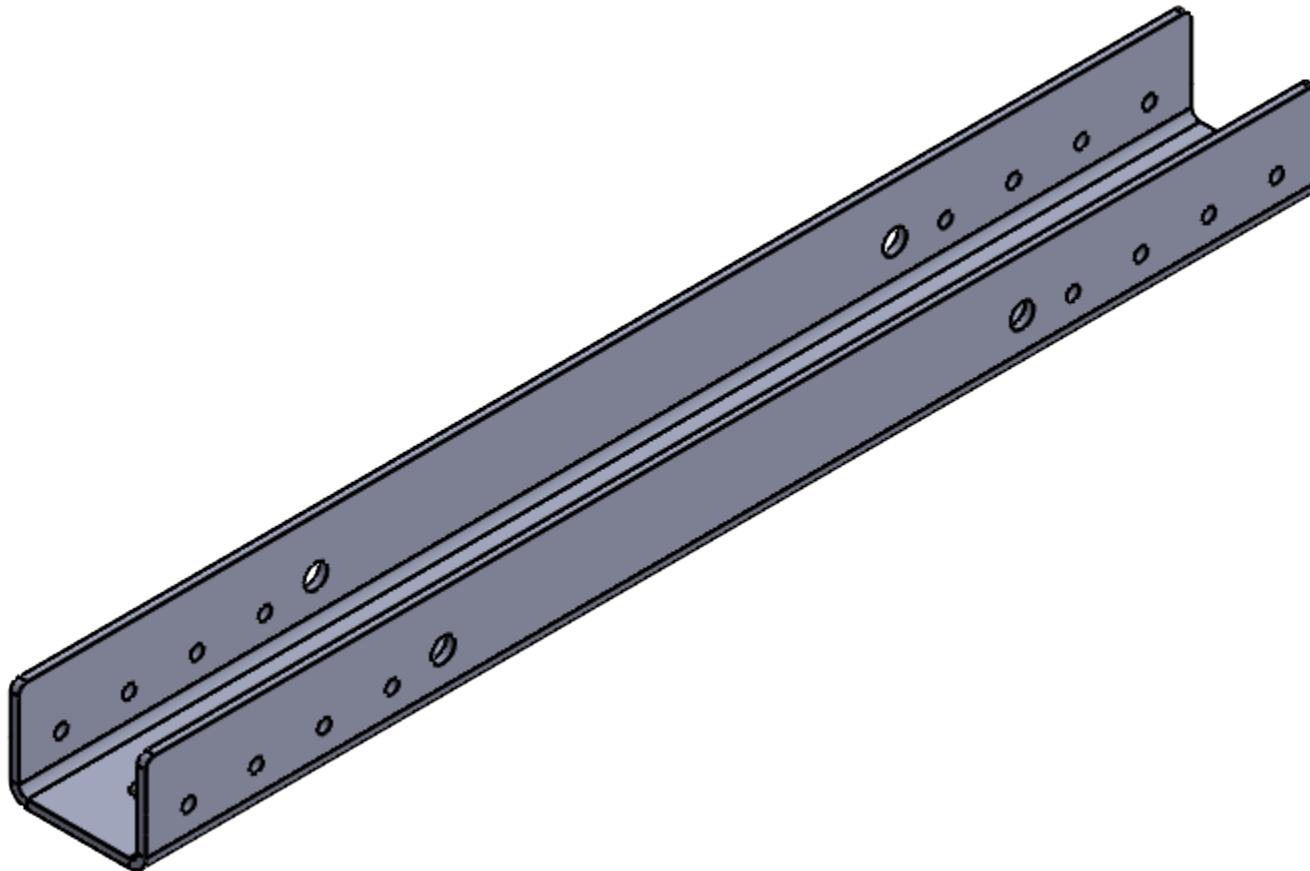
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UNLESS OTHERWISE SPECIFIED:

BEND NAME DATE

DRAWN NAL 9/23/2022

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

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PERMISSION OF FIRST® IS
PROHIBITED.

MATERIAL/FINISH:

8GA 5052 AL

COMMENTS:
REMOVE ALL BURRS AND SHARP
EDGES.
DO NOT SCALE DRAWING
 FIRST ROBOTICS COMPETITION

 SOLIDWORKS
Modeling Solutions Partner

TITLE: Cube Shelf
Lower Vertical
Channel

SIZE DWG. NO. REV

C GE-23085

SCALE: 1:2 SHEET 1 OF 1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23085	Cube Shelf Lower Vertical Channel	1
2	pem_clinchnut_25_20 .054	1/4-20 self-clinching nut, .054 shank	3

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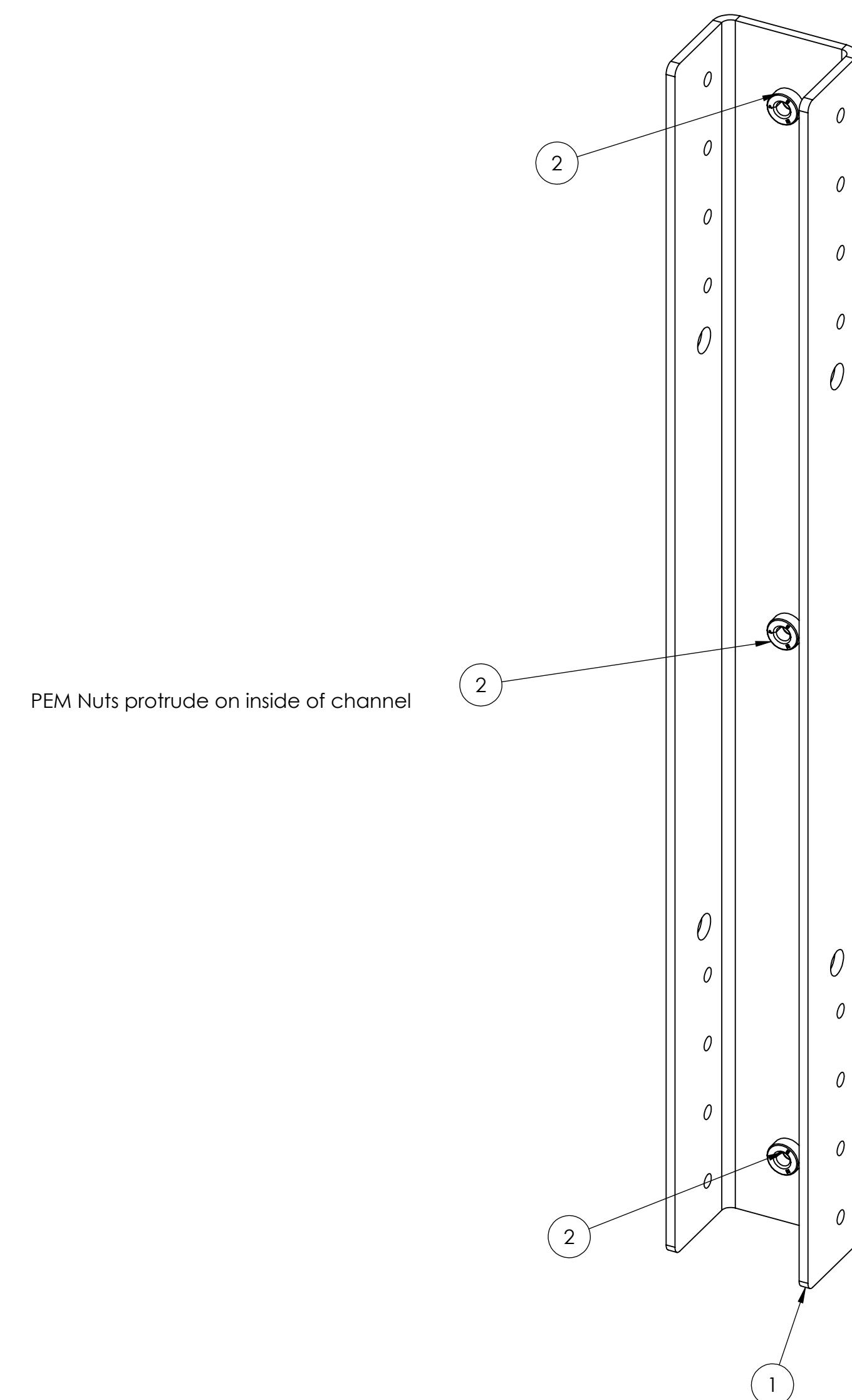
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UNLESS OTHERWISE SPECIFIED:

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:

DO NOT SCALE DRAWING

VEND NAME DATE

DRAWN JO 10/4/2022

PROPRIETARY AND CONFIDENTIAL

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COMMENTS:

REMOVE ALL BURRS AND SHARP EDGES.


**FIRST
ROBOTICS
COMPETITION**

SOLIDWORKS
Modeling Solutions Partner

TITLE: Cube Shelf Lower Vertical Channel Config 1

SIZE	DWG. NO.	REV
C	GE-23085-01	

SCALE: 1:4 SHEET 1 OF 1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23085	Cube Shelf Lower Vertical Channel	1
2	pem_clinchnut_25_20 .054	1/4-20 self-clinching nut, .054 shank	5

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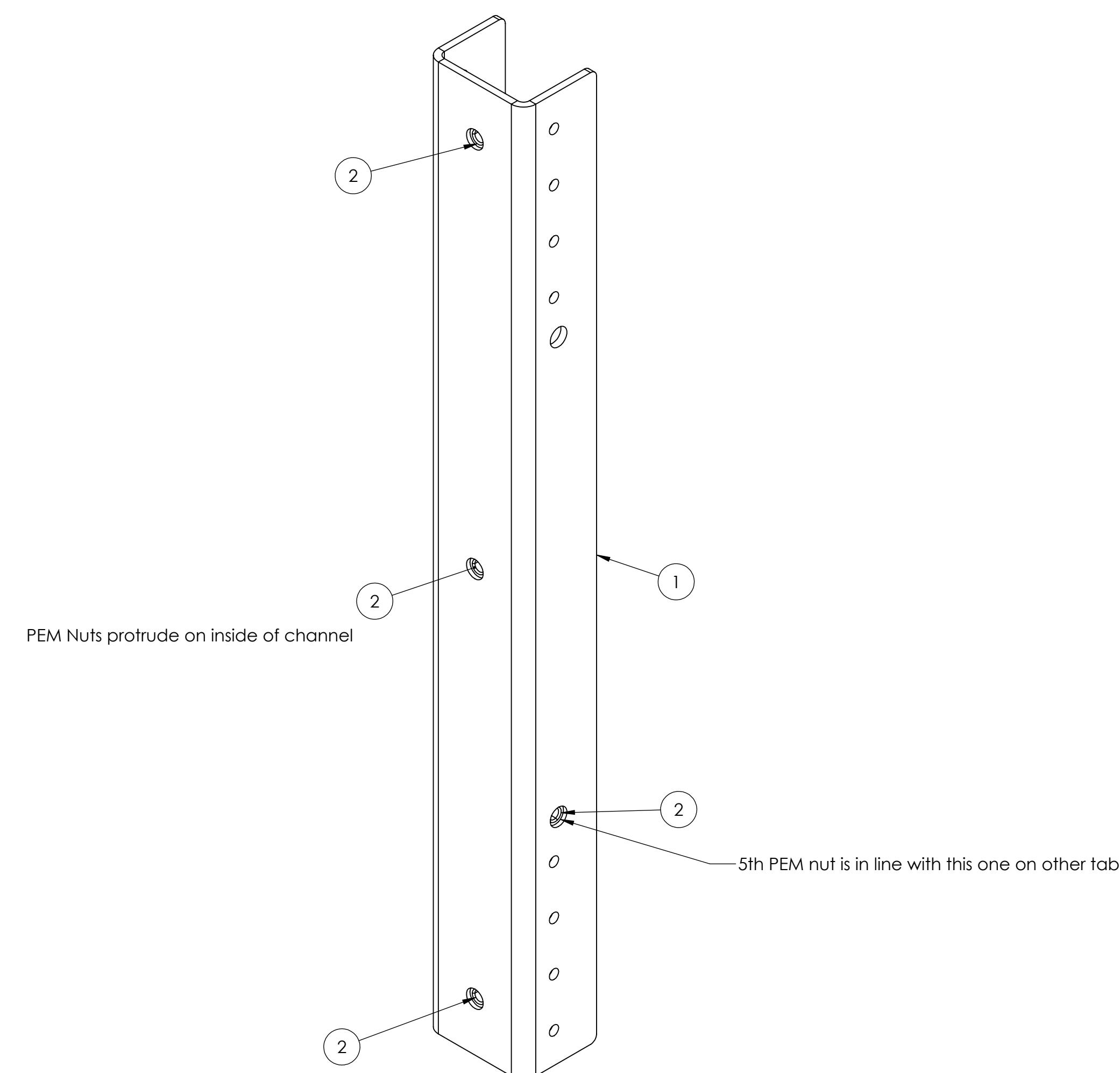
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UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	JO	10/4/2022	
PROPRIETARY AND CONFIDENTIAL			
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COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			
TITLE: Cube Shelf Lower Vertical Channel Config 2			
SIZE DWG. NO. REV			
C GE-23085-02			
SCALE: 1:4 SHEET 1 OF 1			

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
B3, B4, C2, C4, D3	A	Style of Qty Callouts, changed hole size from .391 to .344 for PEM nuts instead of Riv-nuts, Rivet Hole Tolerance	9/23/2022	JO

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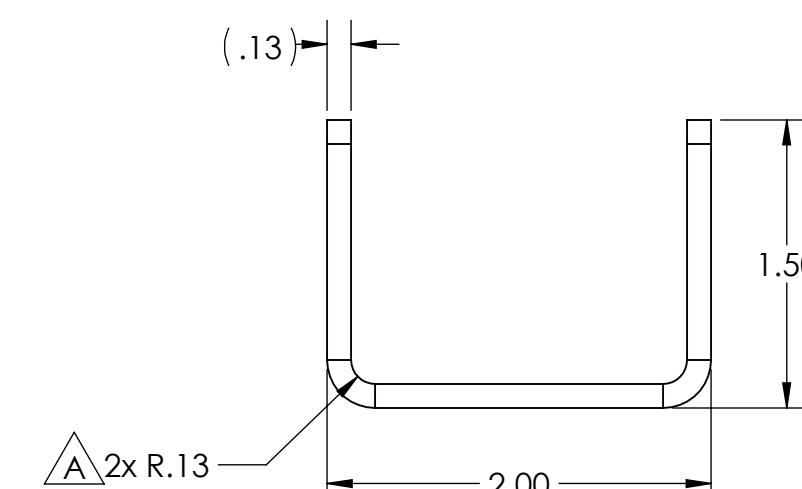
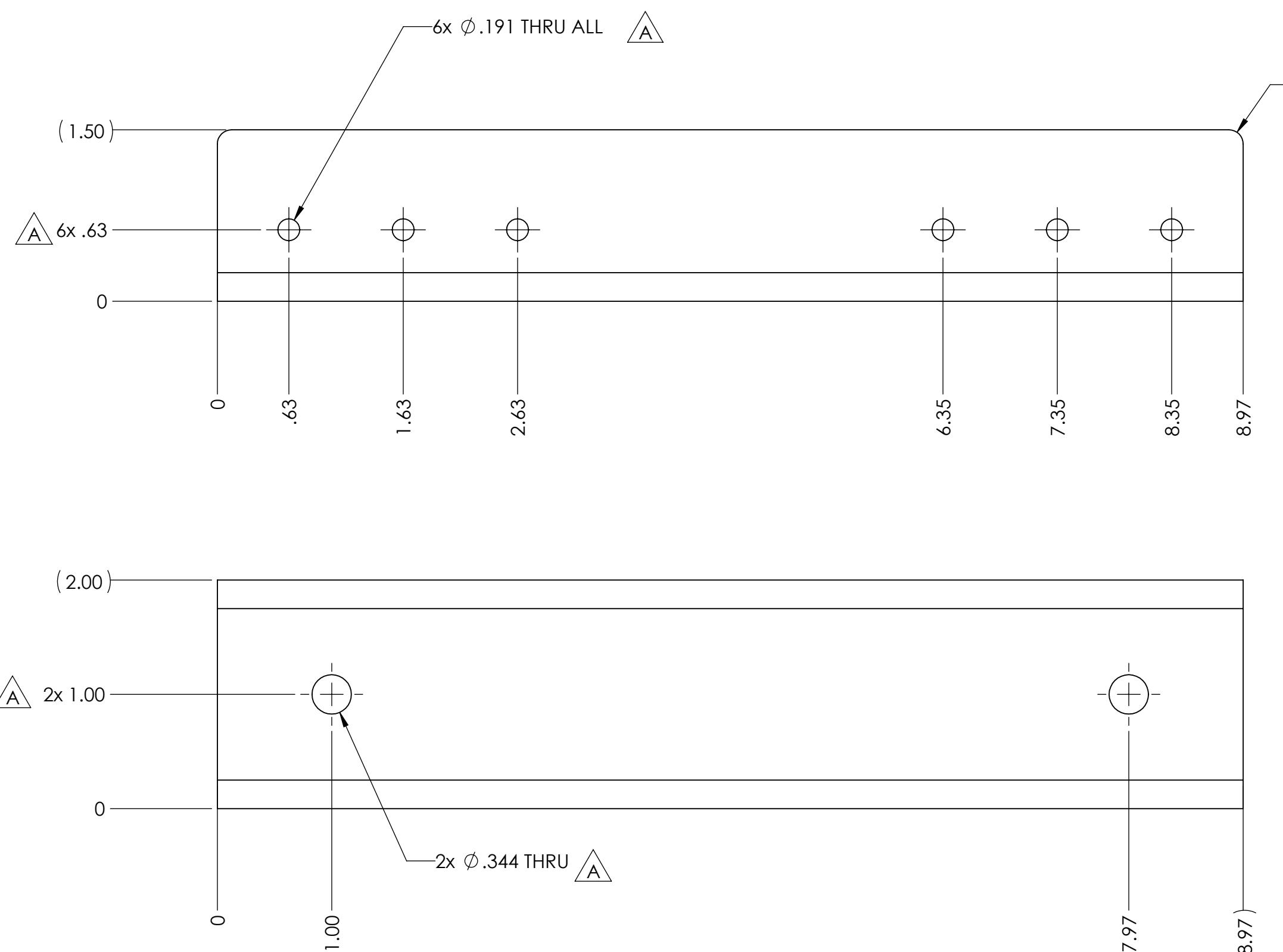
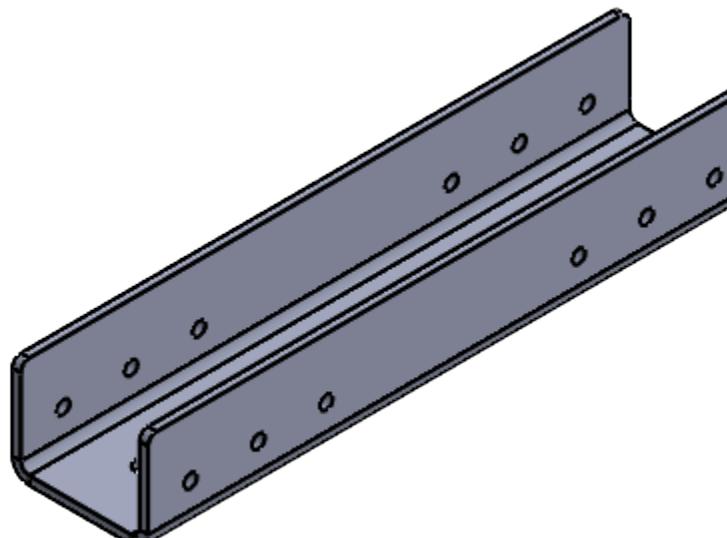
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UNLESS OTHERWISE SPECIFIED:

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 $\pm .010$

BEND NAME DATE

DRAWN NAL 9/23/2022

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MATERIAL/FINISH:

8GA 5052 AL

COMMENTS:

REMOVE ALL BURRS AND SHARP EDGES.

DO NOT SCALE DRAWING

FIRST ROBOTICS COMPETITION
 DS SOLIDWORKS
Modeling Solutions Partner

TITLE:
**Cube Shelf
Upper Vertical
Channel**

SIZE DWG. NO. REV
C GE-23086

SCALE: 1:1 SHEET 1 OF 1

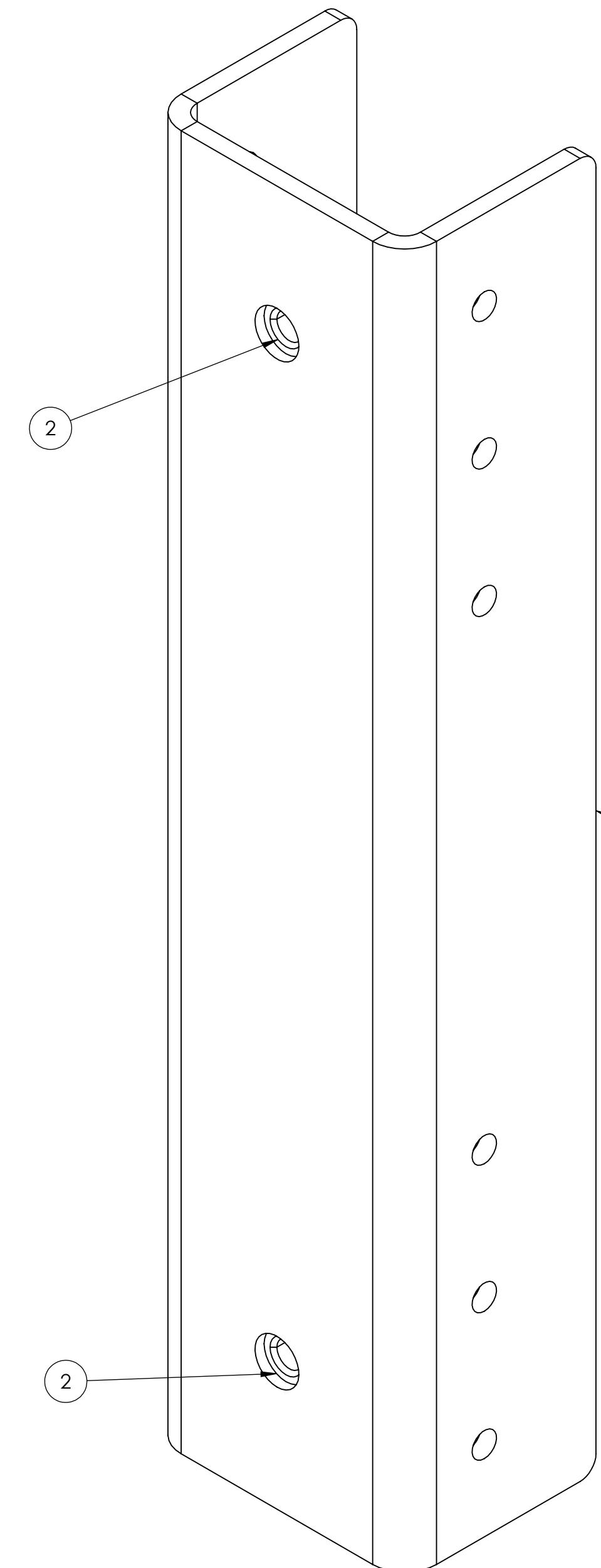
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PEM Nuts protrude on inside of channel



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23086	Cube Shelf Upper Vertical Channel	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:

DO NOT SCALE DRAWING

VEND NAME DATE

DRAWN JO 10/4/2022

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COMMENTS:

REMOVE ALL BURRS AND SHARP EDGES.

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

TITLE: Cube Shelf Upper Vertical Channel Config 1
SIZE DWG. NO. REV
C GE-23086-01

SCALE: 1:2 SHEET 1 OF 1

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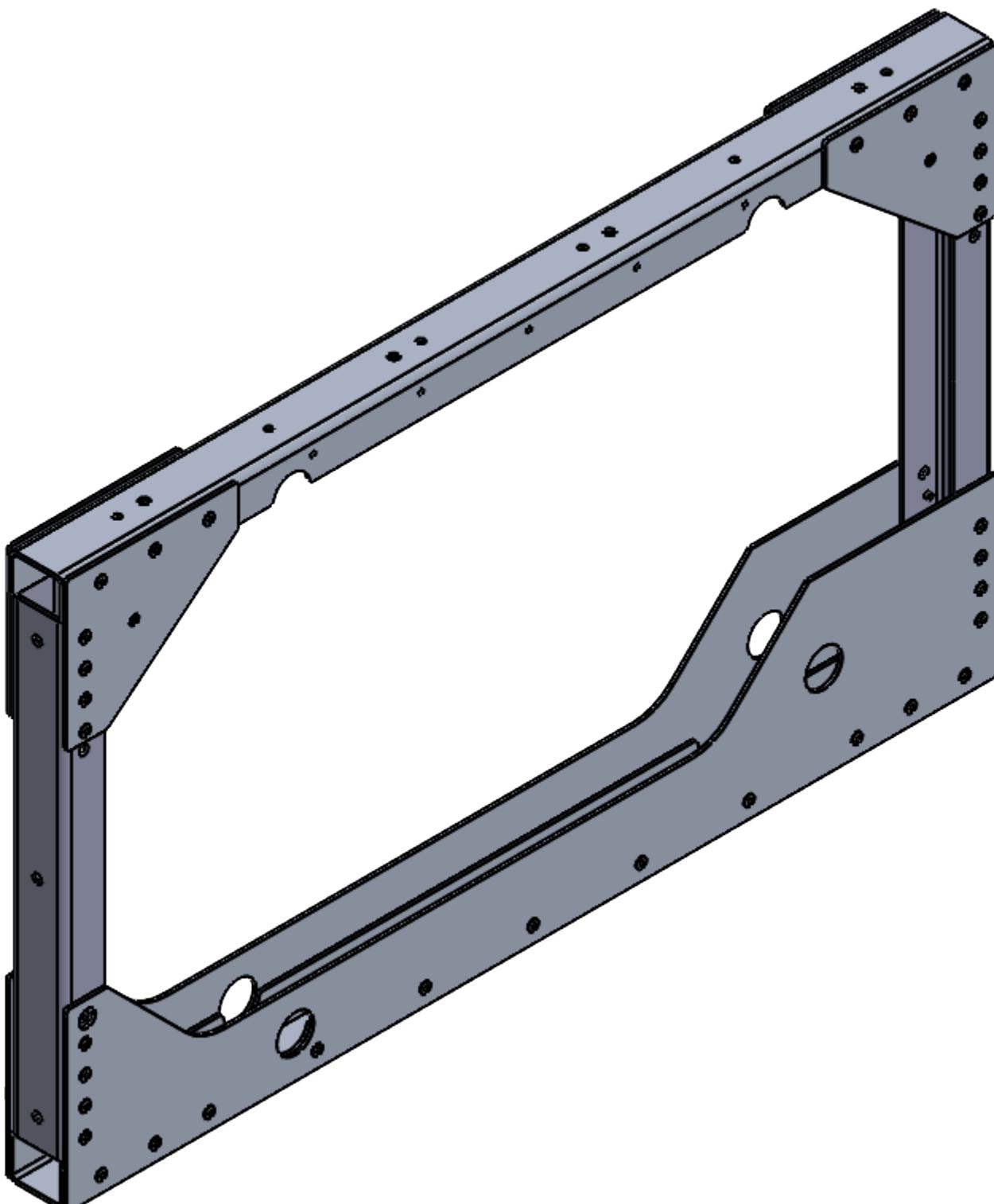
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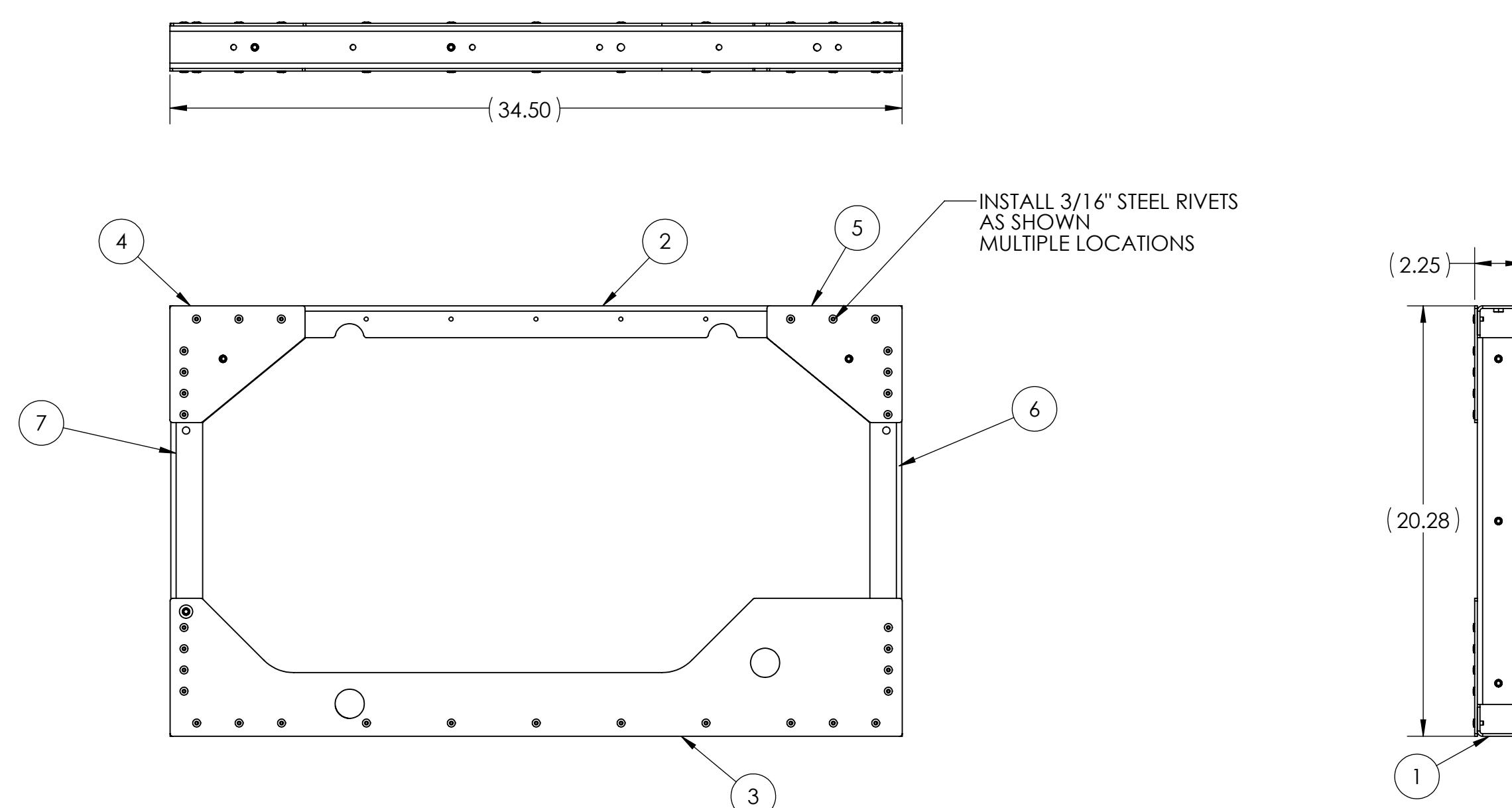
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ITEM NO.	PART NUMBER	Description	QTY.
1	GE-23081	Cube Shelf Long Horizontal Channel	1
2	GE-23081-01	Cube Shelf Long Horizontal Channel Config 1	1
3	GE-23083	Cube Shelf Lower Pin Socket Plate	2
4	GE-23084-01	Cube Shelf Corner Gusset Config 1	2
5	GE-23084-02	Cube Shelf Corner Gusset Config 2	2
6	GE-23085-01	Cube Shelf Lower Vertical Channel Config 1	1
7	GE-23085-02	Cube Shelf Lower Vertical Channel Config 2	1
8	187 pop rivet	3/16" Steel Rivet	66



NOTE: LABEL ASSEMBLY WITH PART NUMBER



UNLESS OTHERWISE SPECIFIED:	BEND	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	NAL	9/29/2022
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:	COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.		
DO NOT SCALE DRAWING			

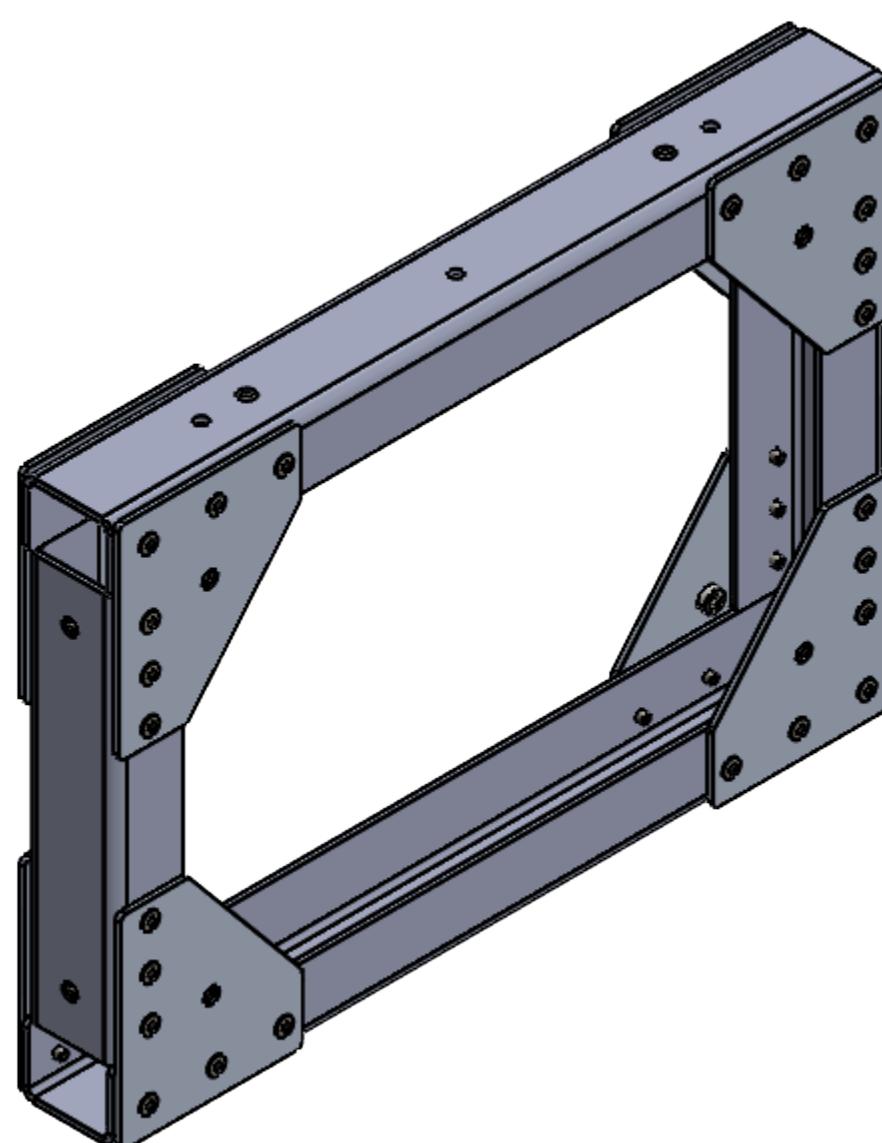
FIRST ROBOTICS COMPETITION SOLIDWORKS Modeling Solutions Partner

Cube Shelf Lower Hoop

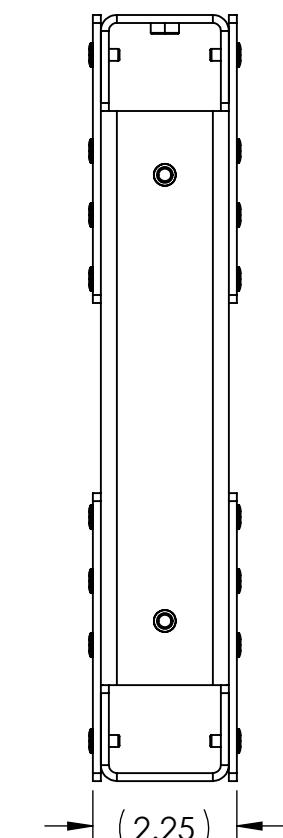
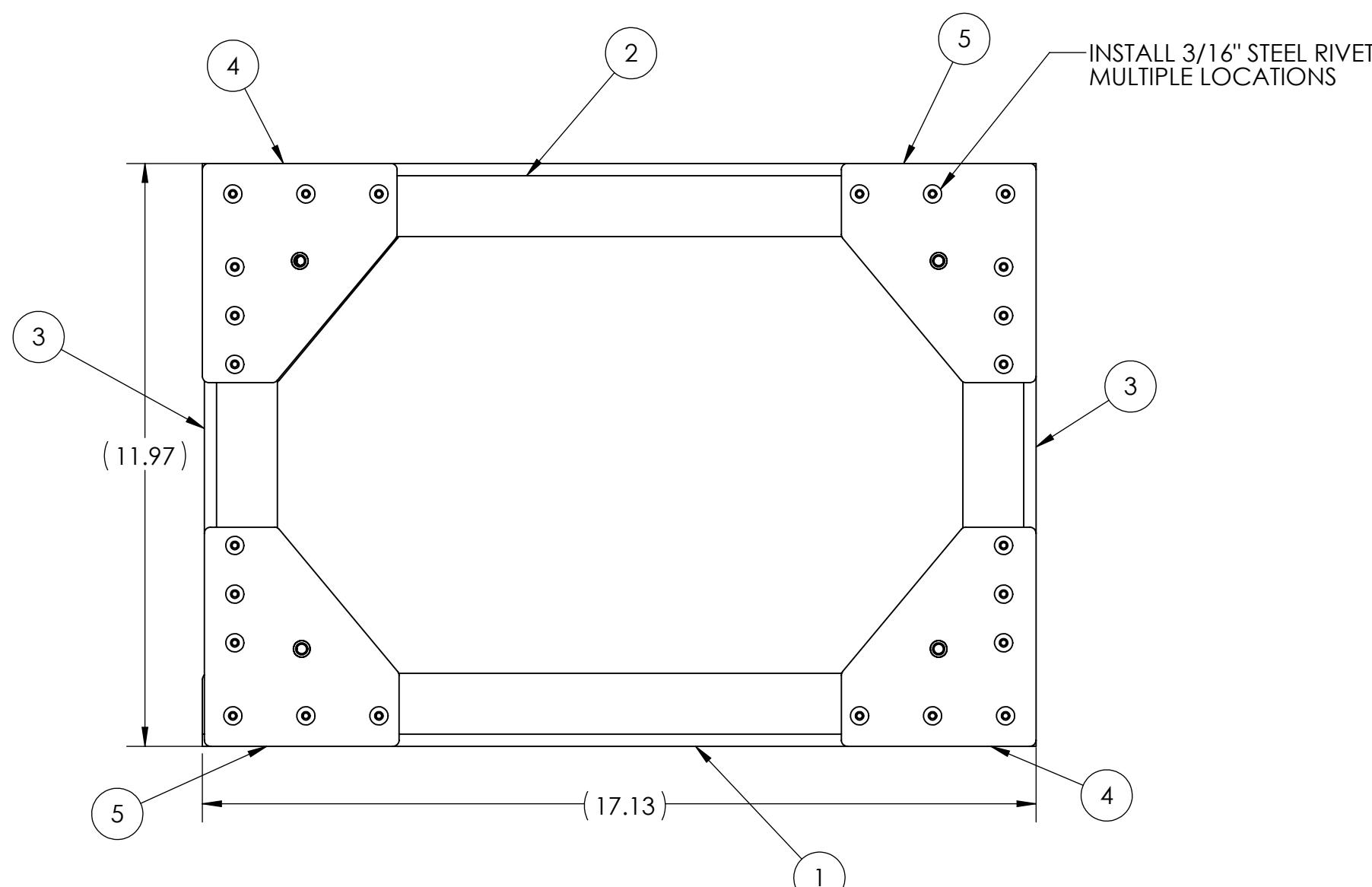
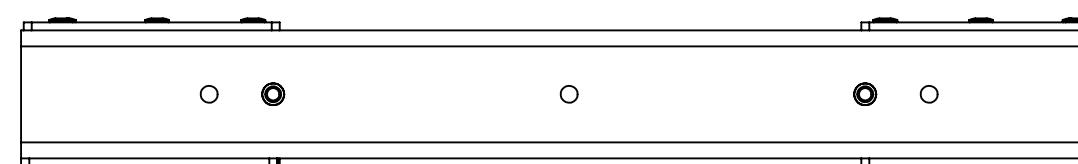
SIZE DWG. NO. REV
C GE-23087

SCALE: 1:4 SHEET 1 OF 1

ITEM NO.	PART NUMBER	Description	QTY.
1	GE-23082	Cube Shelf Horizontal Channel	1
2	GE-23082-01	Cube Shelf Short Horizontal Channel Config 1	1
3	GE-23086-01	Cube Shelf Upper Vertical Channel Config 1	2
4	GE-23093-01	Cube Shelf Upper Corner Gusset Config 1	4
5	GE-23093-02	Cube Shelf Upper Corner Gusset Config 2	4
6	187 pop rivet	3/16 Steel Rivet	48



NOTE: LABEL ASSEMBLY WITH PART NUMBER



UNLESS OTHERWISE SPECIFIED:	BEND	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	NAL	9/29/2022
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:	COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.		
DO NOT SCALE DRAWING			

FIRST ROBOTICS COMPETITION SOLIDWORKS Modeling Solutions Partner

Cube Shelf Upper Hoop

SIZE DWG. NO. REV
C GE-23088

SCALE: 1:3 SHEET 1 OF 1

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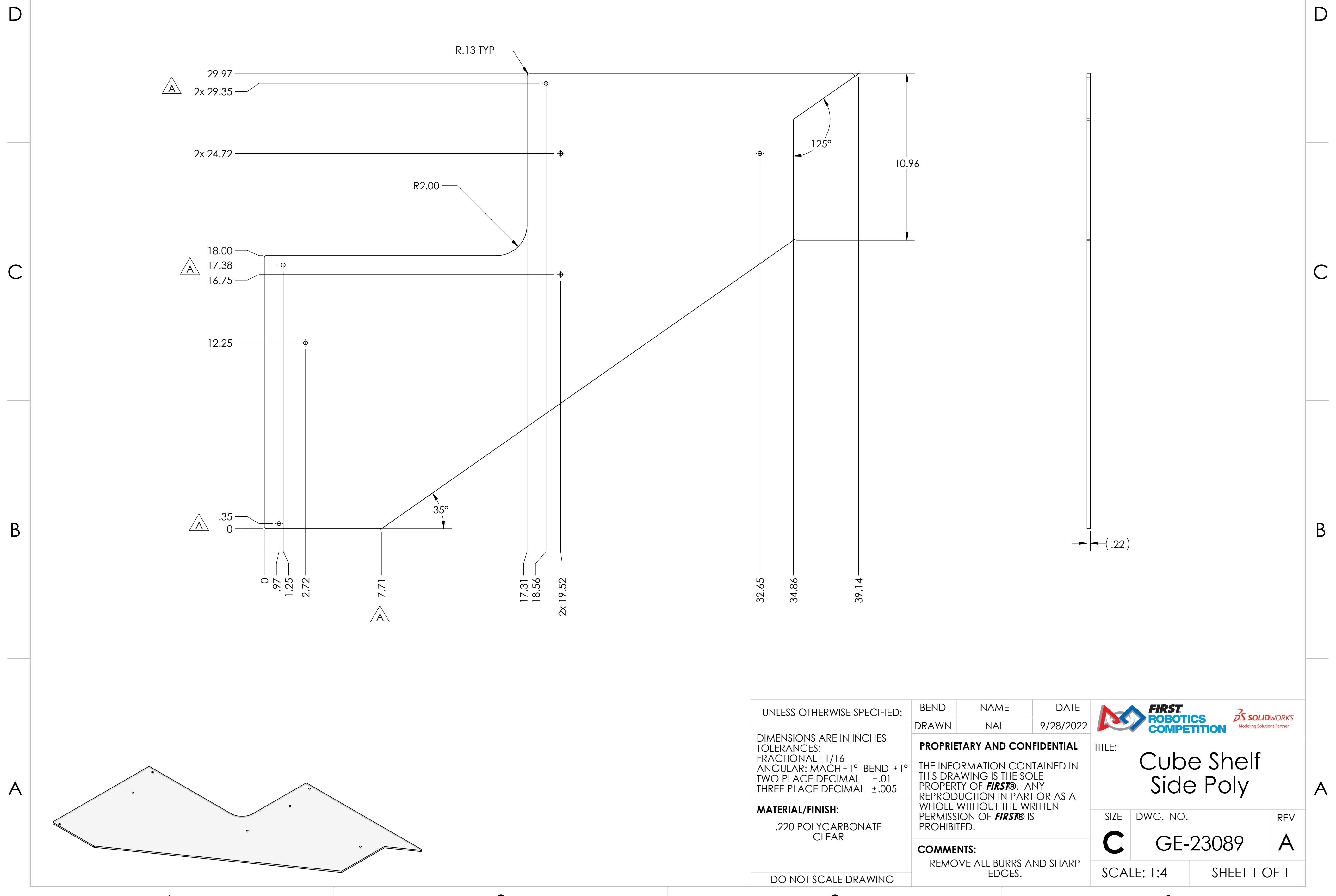
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REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
B3, B4, C4, D4	A	Cut 1/2" off the bottom, changed all vertical dimensions	12/6/2022	JRO



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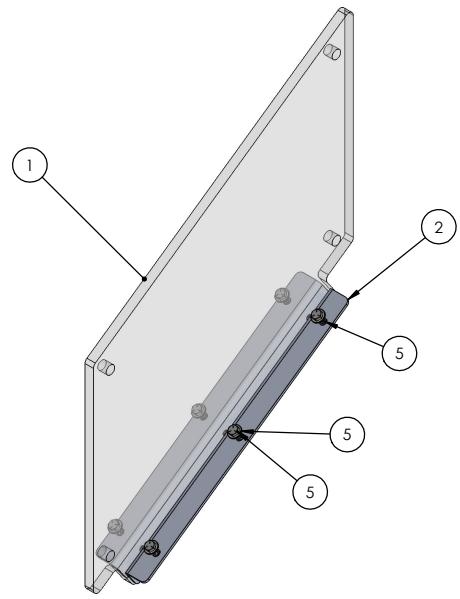
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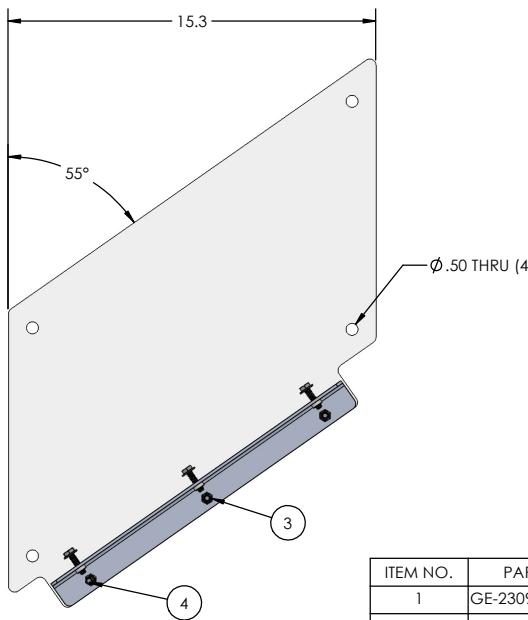


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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23091	Shark Fin Poly	1
2	GE-23097	Shark Fin Bracket with PEM Nuts installed	2
3	90566A029	1/4-20 Locknut	3
4	92865A542	Medium-Strength Grade 5 Steel Hex Head Screw	3
5	92865A542 and 250 Washer	1/4-20 x 1" Bolt and Washer	6

UNLESS OTHERWISE SPECIFIED:	BEND	NAME	DATE
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	NAL	9/29/2022
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: Various			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			
 FIRST ROBOTICS COMPETITION  SOLIDWORKS Modeling Solutions Partner			
TITLE: Shark Fin			
SIZE DWG. NO. REV			
C GE-23090			
SCALE: 1:4 SHEET 1 OF 1			

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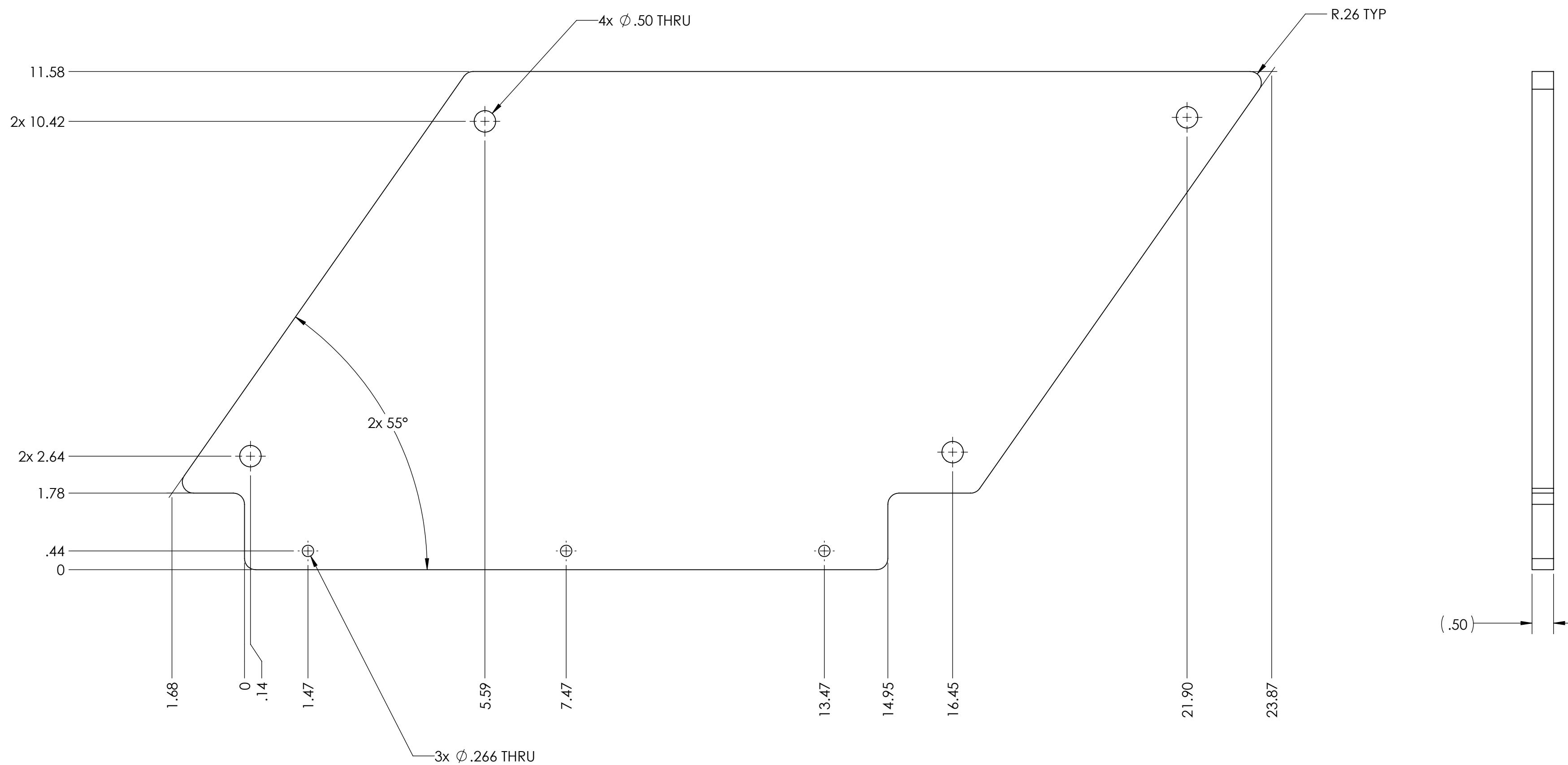
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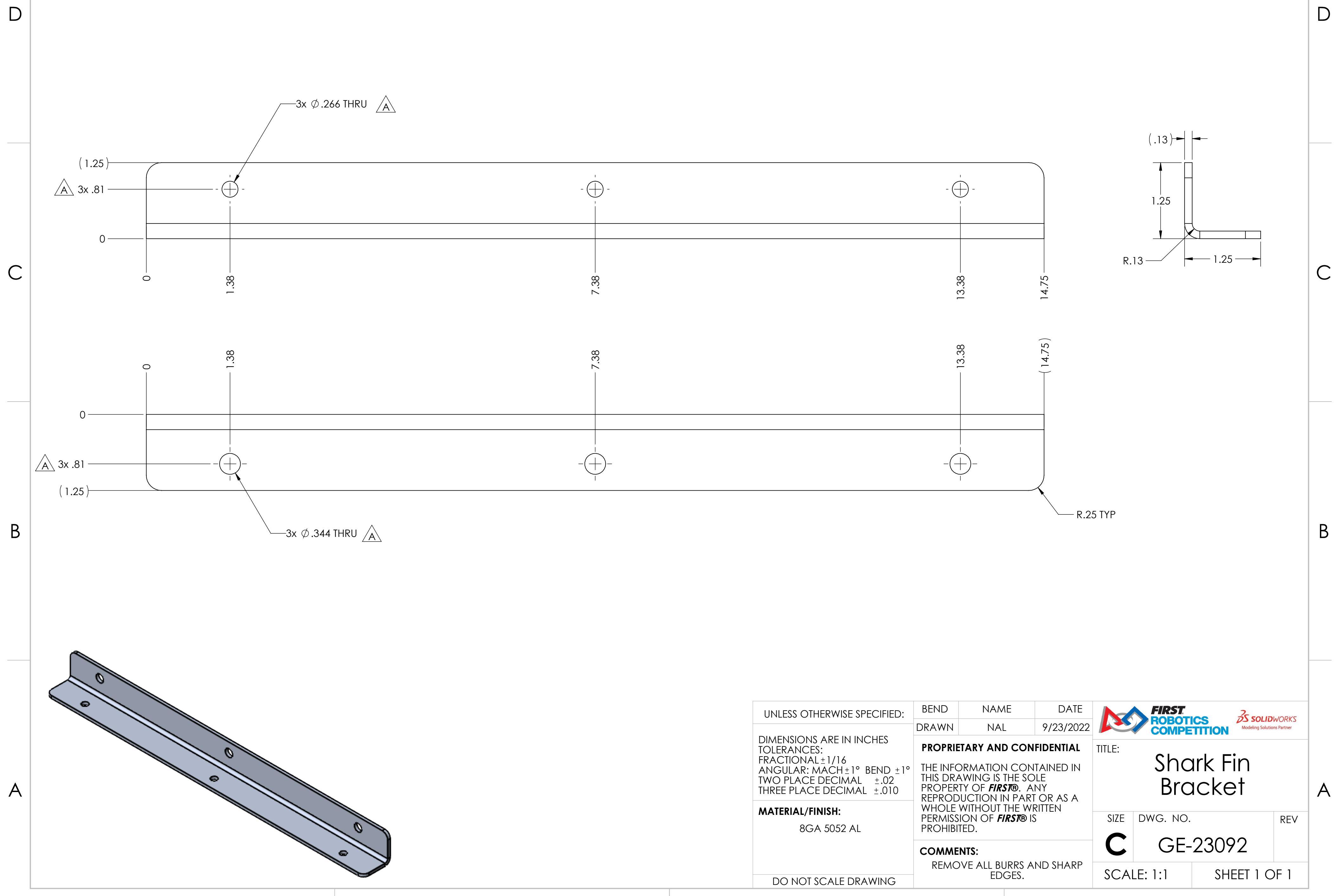
UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	NAL	9/23/2022
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:	SIZE	DWG. NO.	REV
1/2" POLYCARBONATE CLEAR	C	GE-23091	
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING	SCALE: 1:2	SHEET 1 OF 1	

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

**Shark Fin
Poly**

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
B3, B4, C4, D3	A	Style of Qty callouts, changed hole size from .391 to .344 for PEM nuts instead of Riv-nuts	9/23/2022	JO



UNLESS OTHERWISE SPECIFIED:

BEND NAME DATE

DRAWN NAL 9/23/2022

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 AL

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COMMENTS:
REMOVE ALL BURRS AND SHARP EDGES.

DO NOT SCALE DRAWING

FIRST ROBOTICS COMPETITION
SOLIDWORKS
Modeling Solutions Partner

TITLE: Shark Fin Bracket

SIZE DWG. NO. REV
C GE-23092

SCALE: 1:1 SHEET 1 OF 1

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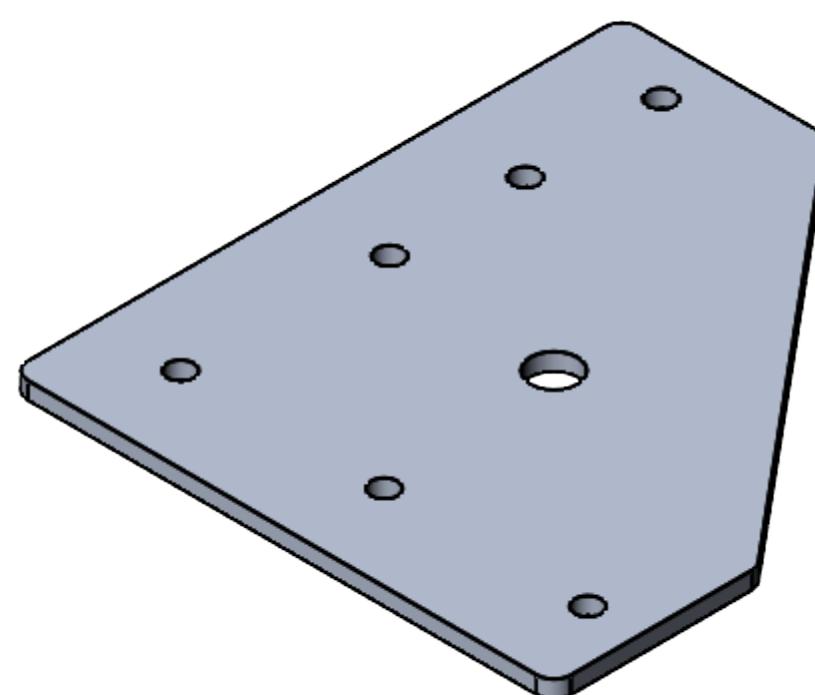
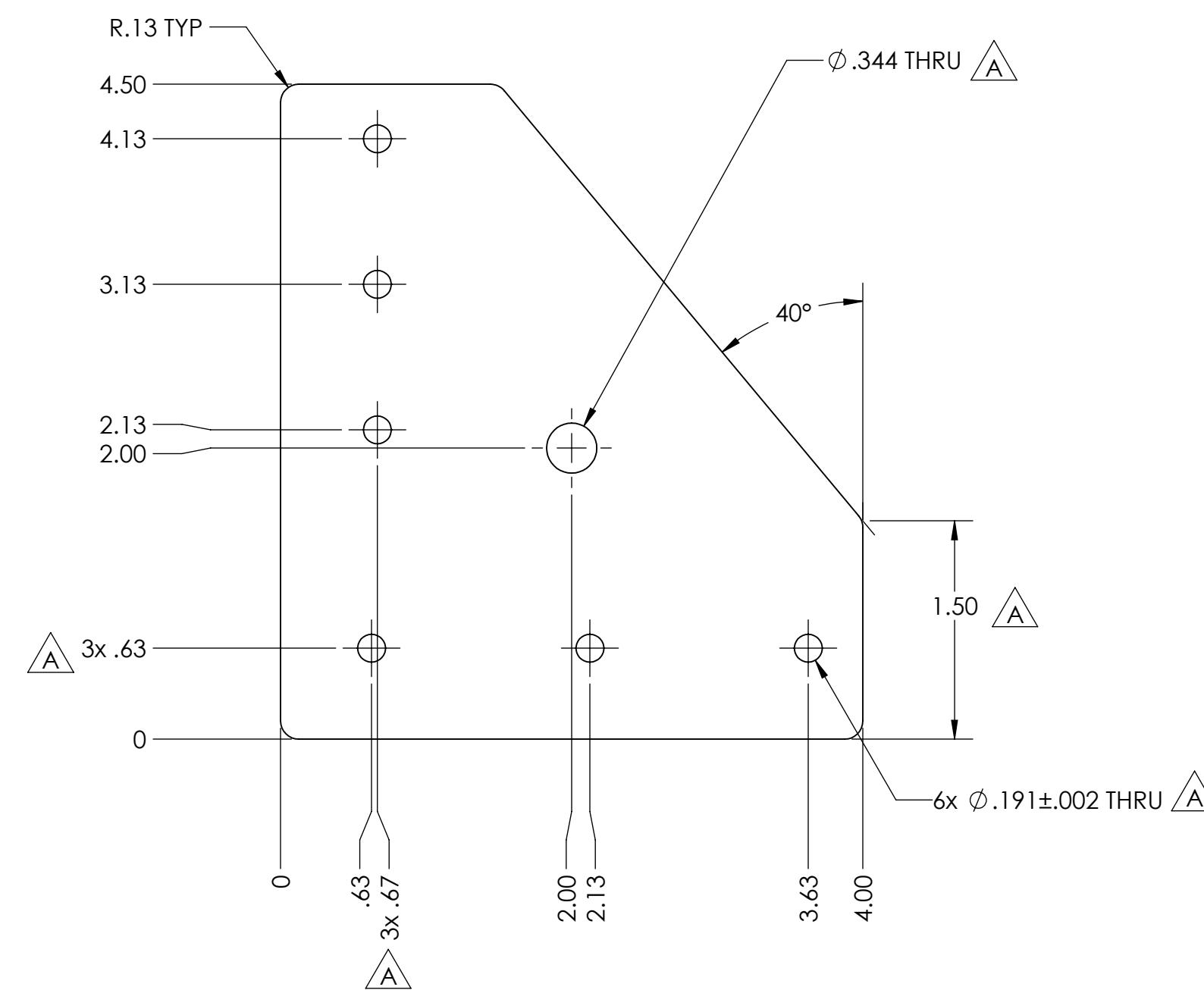
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UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL $\pm 1/16$
ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$
TWO PLACE DECIMAL $\pm .01$
THREE PLACE DECIMAL $\pm .005$

DO NOT SCALE DRAWING

VEND NAME DATE
DRAWN NAL 9/23/2022

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PROHIBITED.

MATERIAL/FINISH:
8GA 5052 AL

COMMENTS:
REMOVE ALL BURRS AND SHARP
EDGES.

FIRST[®] ROBOTICS COMPETITION
SOLIDWORKS
Modeling Solutions Partner

TITLE: Cube Shelf
Upper Corner Gusset

SIZE DWG. NO. REV
C GE-23093

SCALE: 1:1 SHEET 1 OF 1

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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23093	Cube Shelf Upper Corner Gusset	1
2	pem_clinchnut_.25_20 .054	1/4-20 self-clinching nut, .054 shank	1

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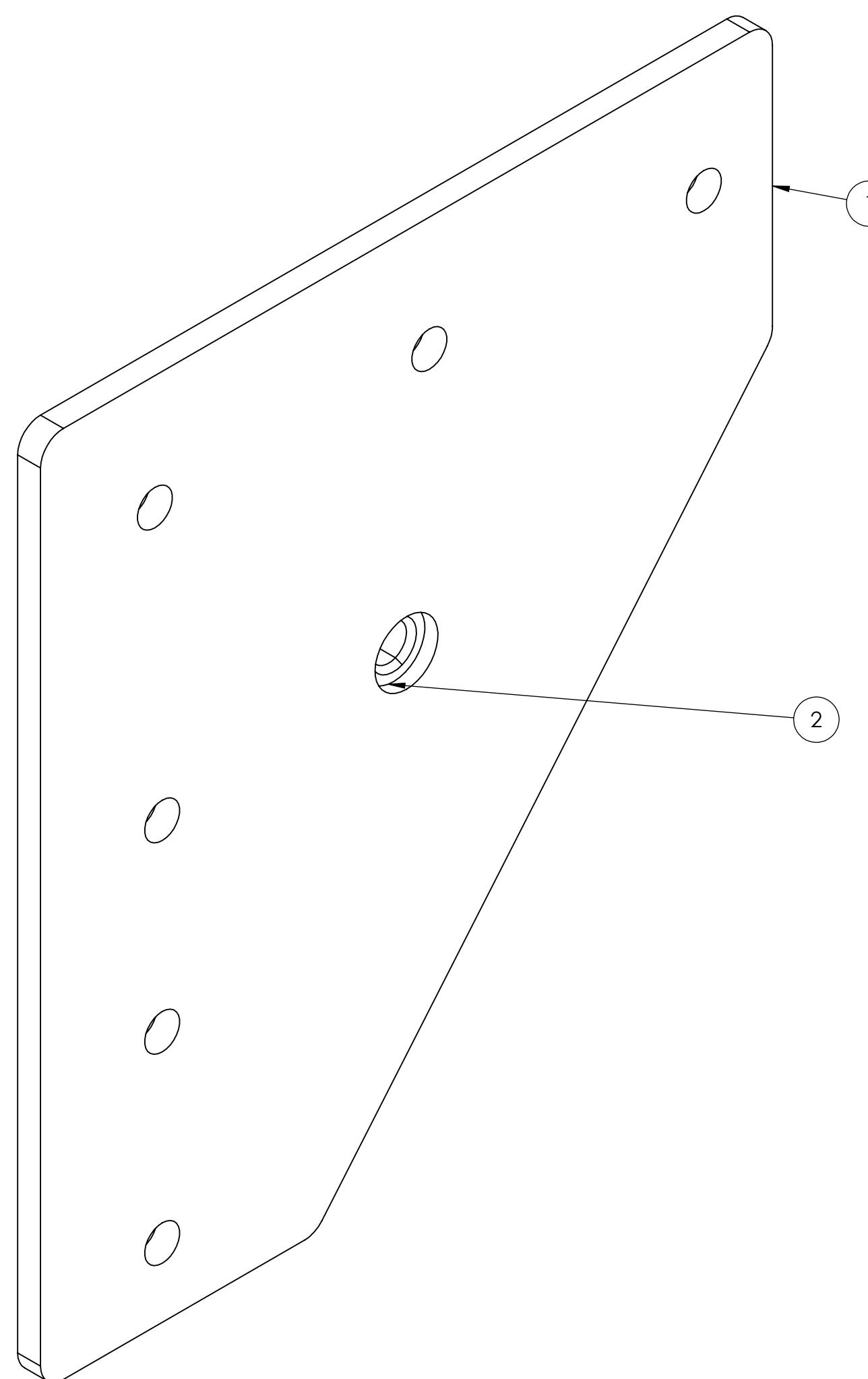
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PEM nut is opposite of GE-23093-02

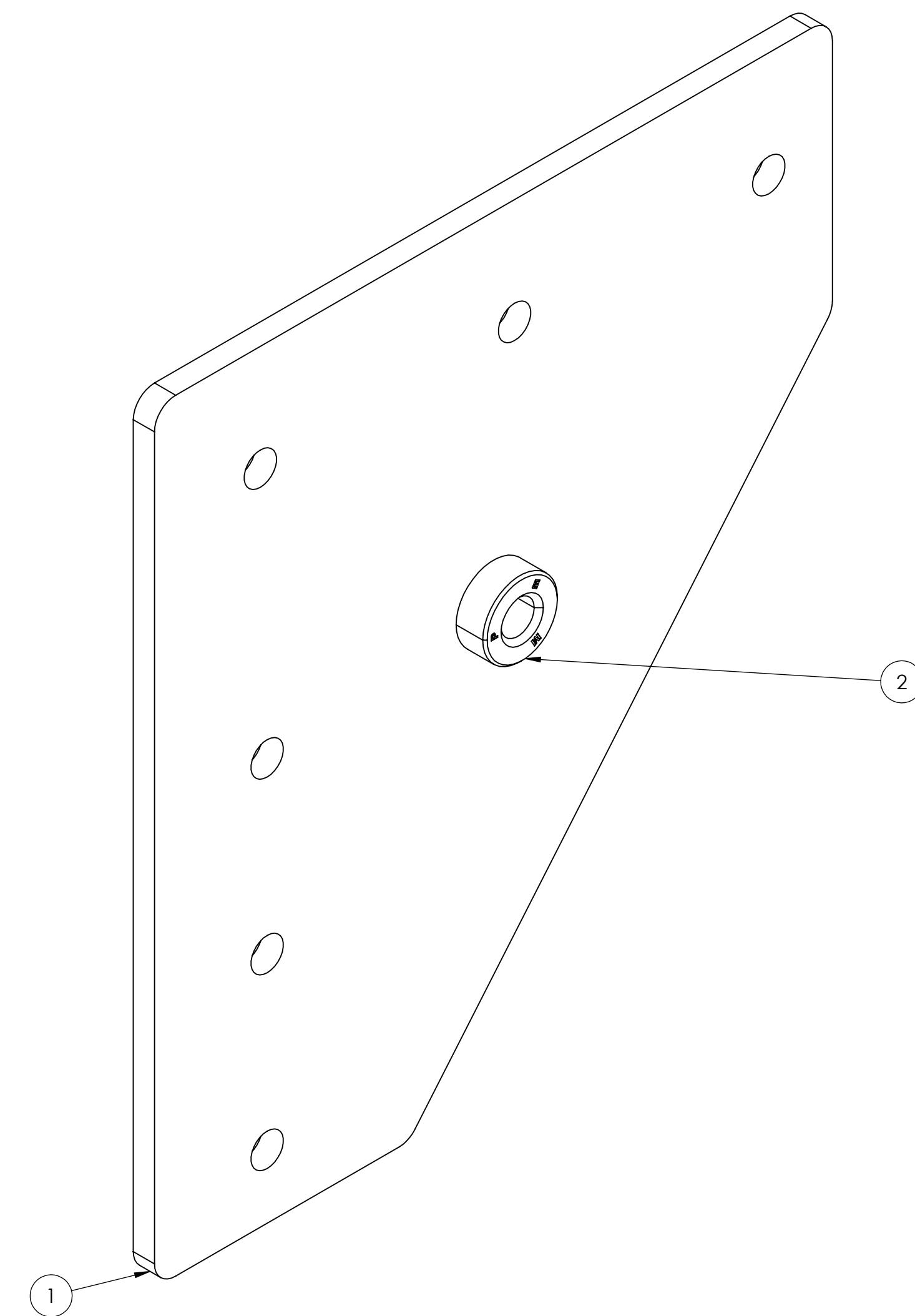
UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
	DRAWN	JO	10/4/2022
PROPRIETARY AND CONFIDENTIAL			
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COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

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

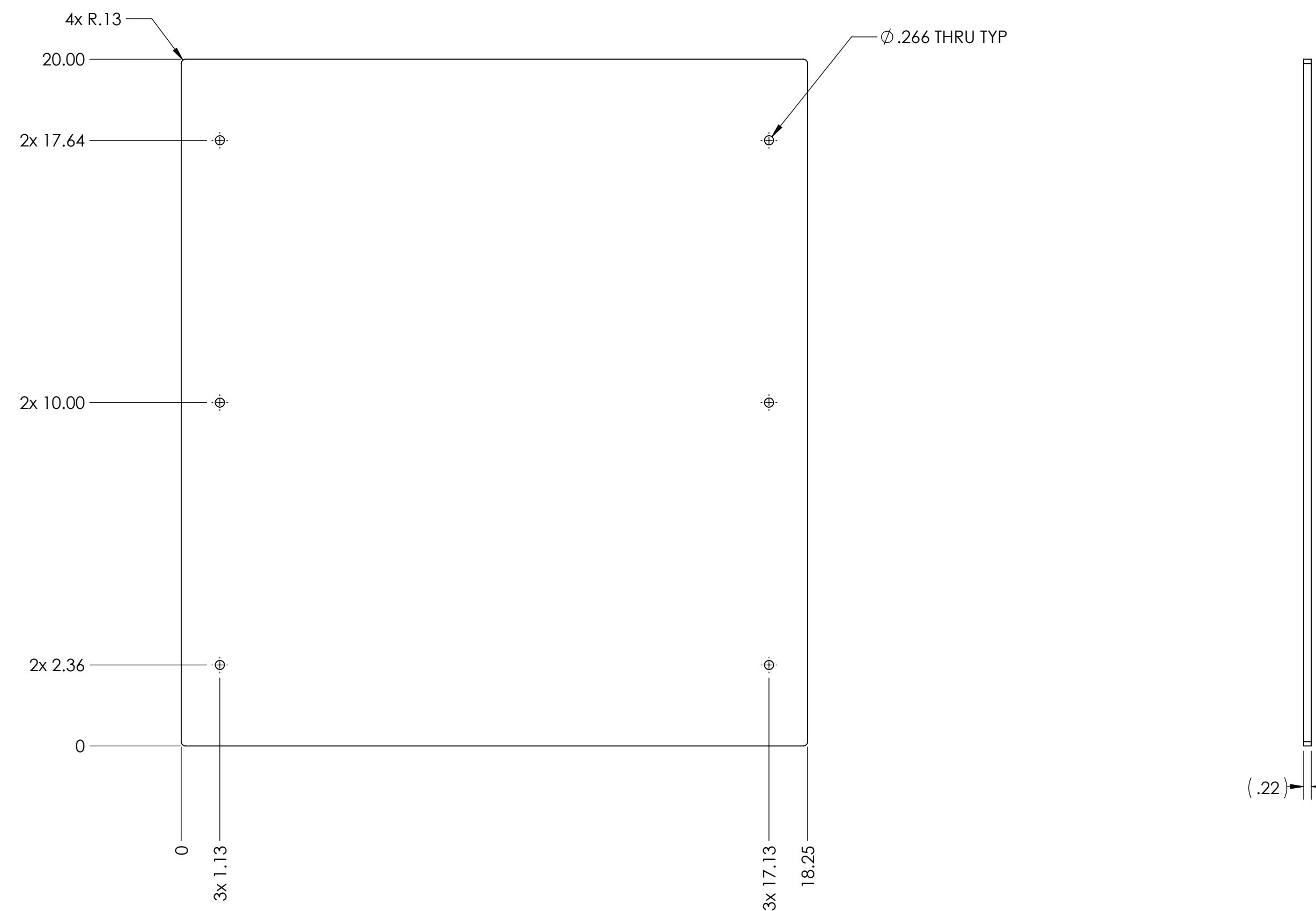
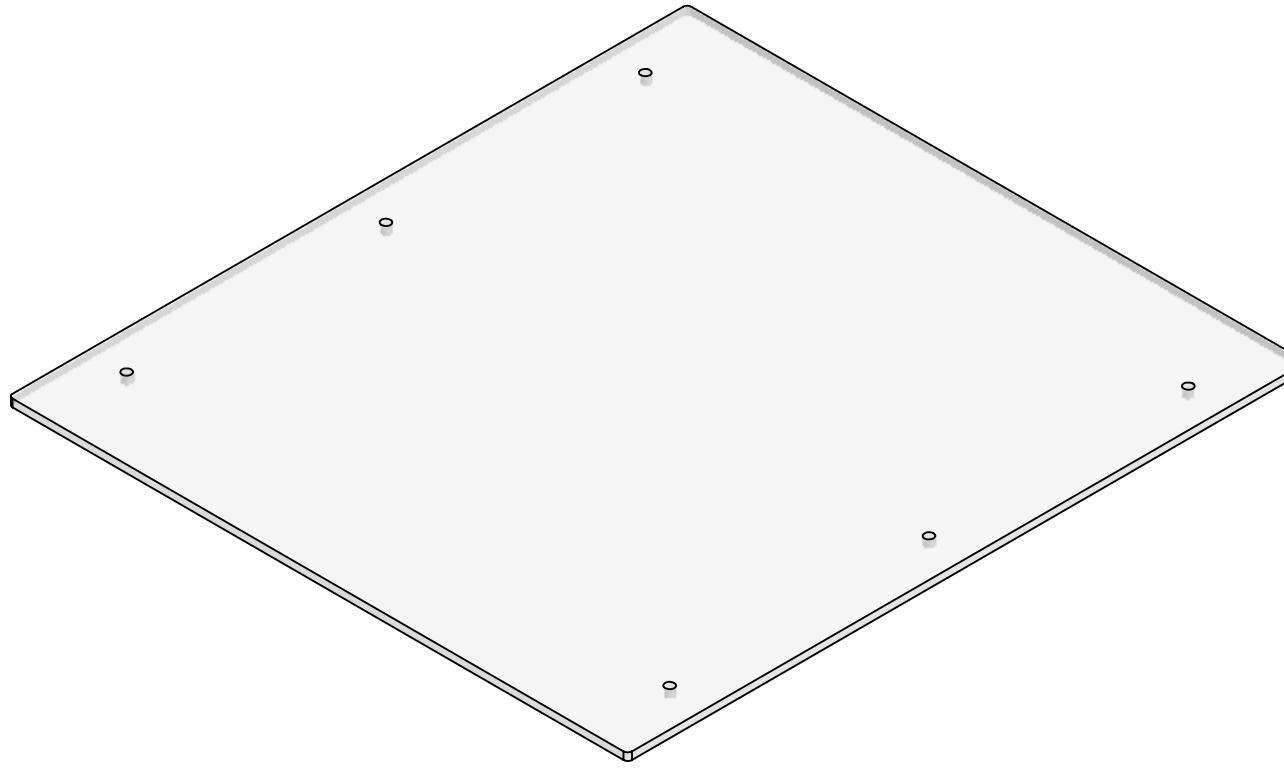
TITLE: **Cube Shelf
Upper Corner
Gusset Config 1**
SIZE DWG. NO. REV
C GE-23093-01

SCALE: 1:1 SHEET 1 OF 1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23093	Cube Shelf Upper Corner Gusset	1
2	pem_clinchnut_.25_20 .054	1/4-20 self-clinching nut, .054 shank	1



UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	JO	10/4/2022	
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: Cube Shelf Upper Corner Gusset Config 2			
SIZE	DWG. NO.	REV	
C	GE-23093-02		
SCALE: 1:1		SHEET 1 OF 1	



UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	NAL	9/28/2022
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:	.220 POLYCARBONATE CLEAR		
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST
ROBOTICS
COMPETITION

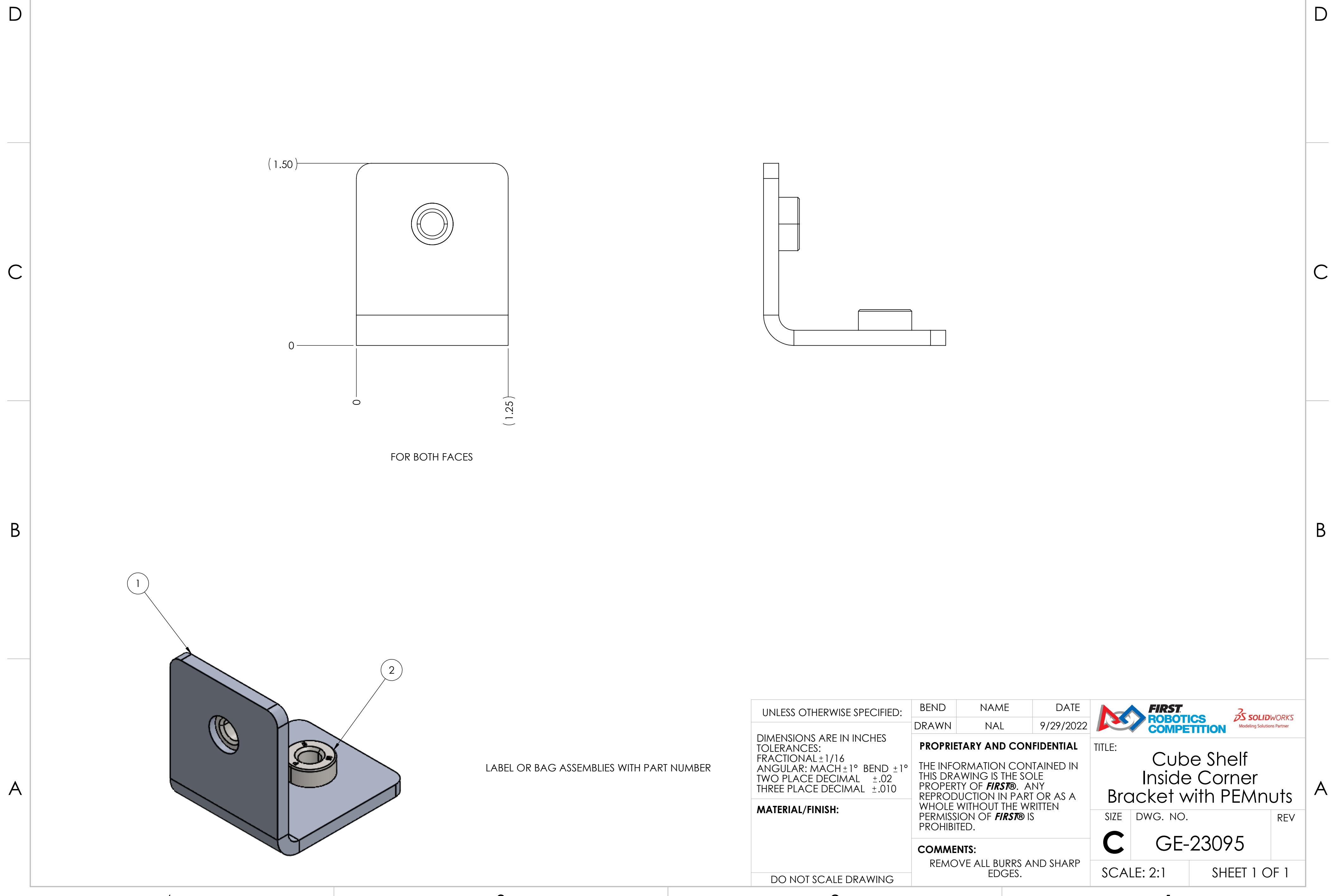
SOLIDWORKS
Modeling Solutions Partner

TITLE:
Cube Shelf
Lower Rear Panel

SIZE DWG. NO. REV
C GE-23094

SCALE: 1:3 SHEET 1 OF 1

ITEM NO.	PART NUMBER	Description	QTY.
1	GE-23096	Inside Corner Bracket	1
2	peM_clinchnut_.25_20 .054	1/4-20 PEM nuts	2



FIRST ROBOTICS COMPETITION DS SOLIDWORKS Modeling Solutions Partner

Cube Shelf Inside Corner Bracket with PEMnuts

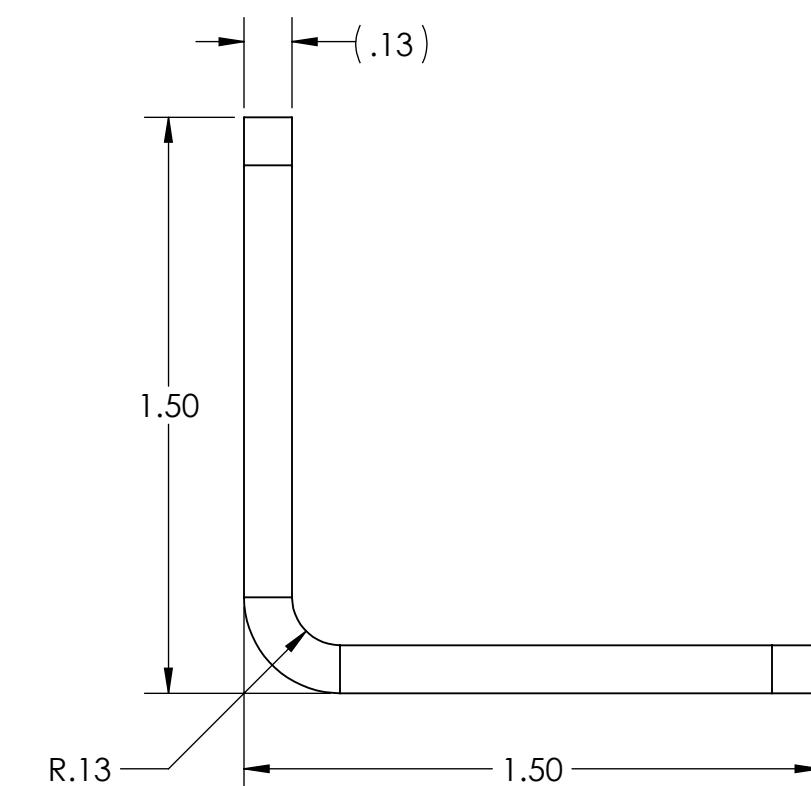
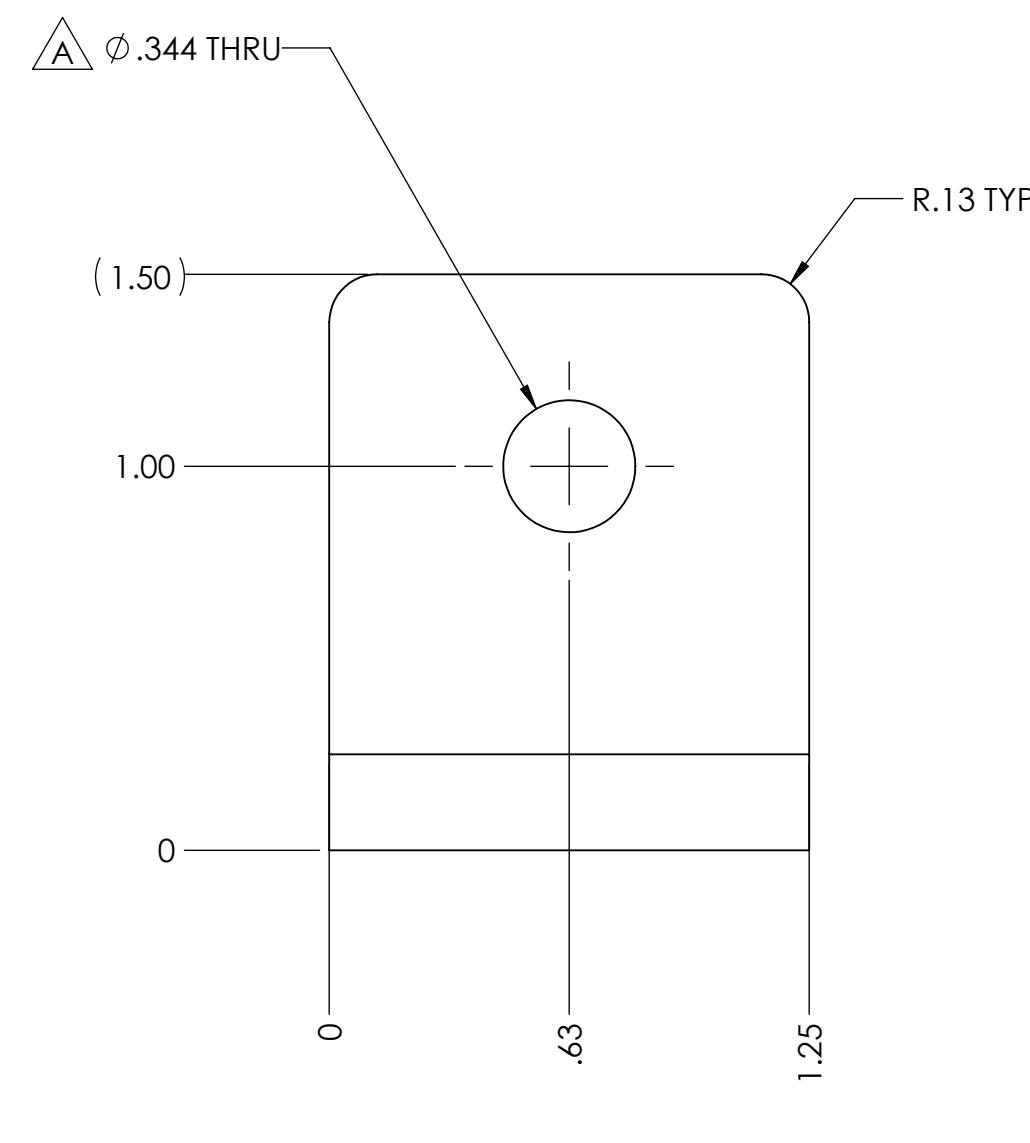
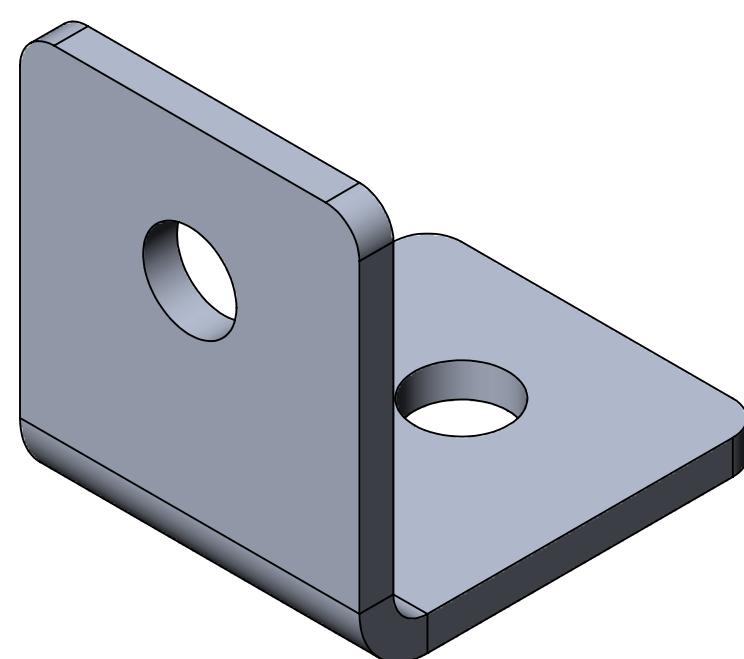
SIZE DWG. NO. REV

C GE-23095

SCALE: 2:1 SHEET 1 OF 1

D

D



REVISIONS		
ZONE	REV.	DESCRIPTION
C4	A	Changed hole size from .391 to .344 for PEM nuts instead of Riv-nuts
TITLE:		
C	GE-23096	
SIZE DWG. NO. REV		
SCALE: 2:1	SHEET 1 OF 1	

UNLESS OTHERWISE SPECIFIED: BEND NAME DATE
DRAWN NAL 9/23/2022

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 $\pm .010$

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MATERIAL/FINISH:
11GA CRS
ZINC PLATED

COMMENTS:
REMOVE ALL BURRS AND SHARP EDGES.

DO NOT SCALE DRAWING

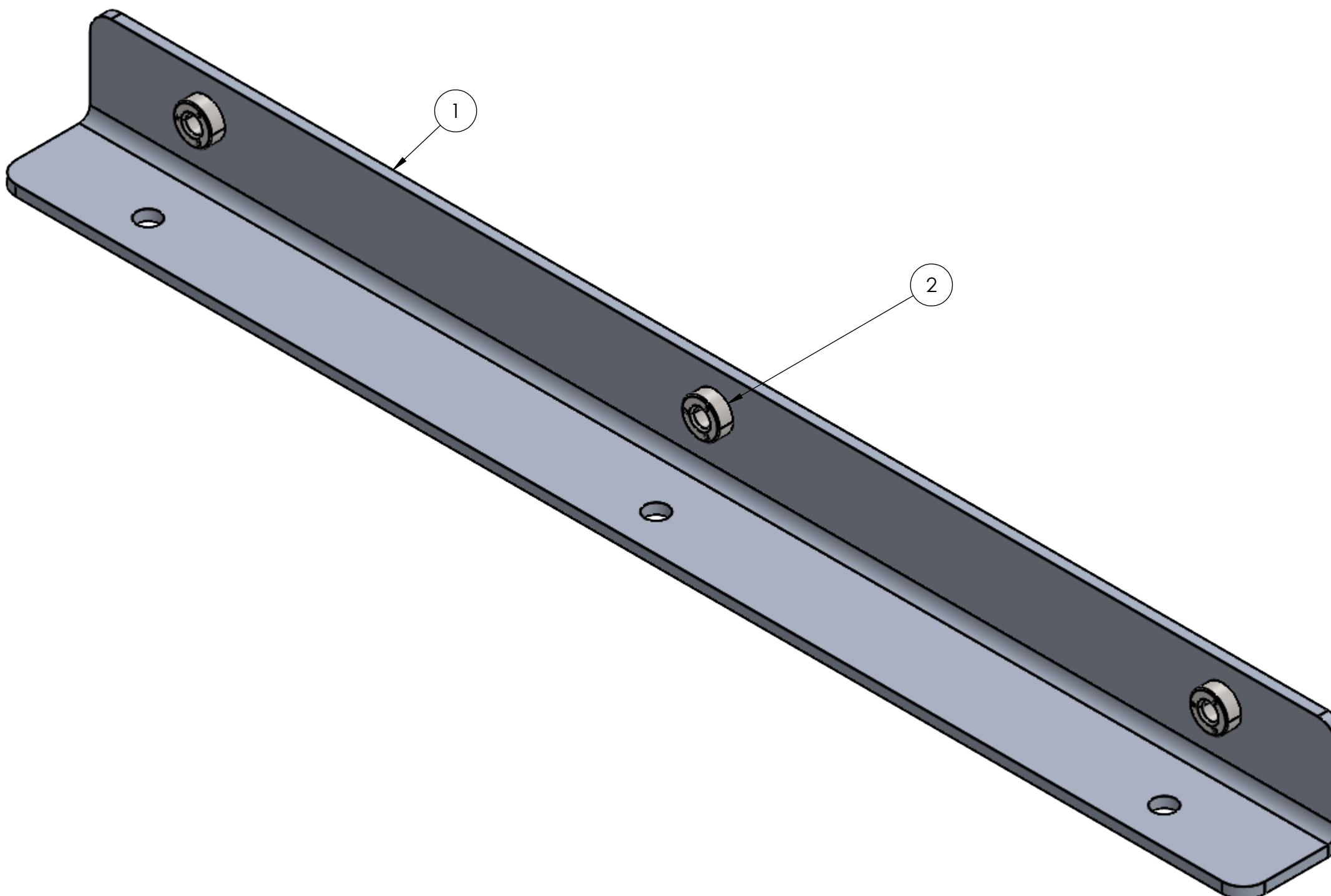
FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE:
**Cube Shelf
Inside Corner
Bracket**

SIZE DWG. NO. REV
C GE-23096

SCALE: 2:1 SHEET 1 OF 1

ITEM NO.	PART NUMBER	Description	QTY.
1	GE-23092	Shark Fin Bracket	1
2	perm_clinchnut_.25_20 .054	1/4-20 PEM Nut	3



LABEL ASSEMBLY WITH PART NUMBER

UNLESS OTHERWISE SPECIFIED:	BEND	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	NAL	9/29/2022
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:	COMMENTS:		
REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST ROBOTICS COMPETITION SOLIDWORKS Modeling Solutions Partner

TITLE: Shark Fin Bracket With PEM nuts Installed

SIZE DWG. NO. REV

C GE-23097

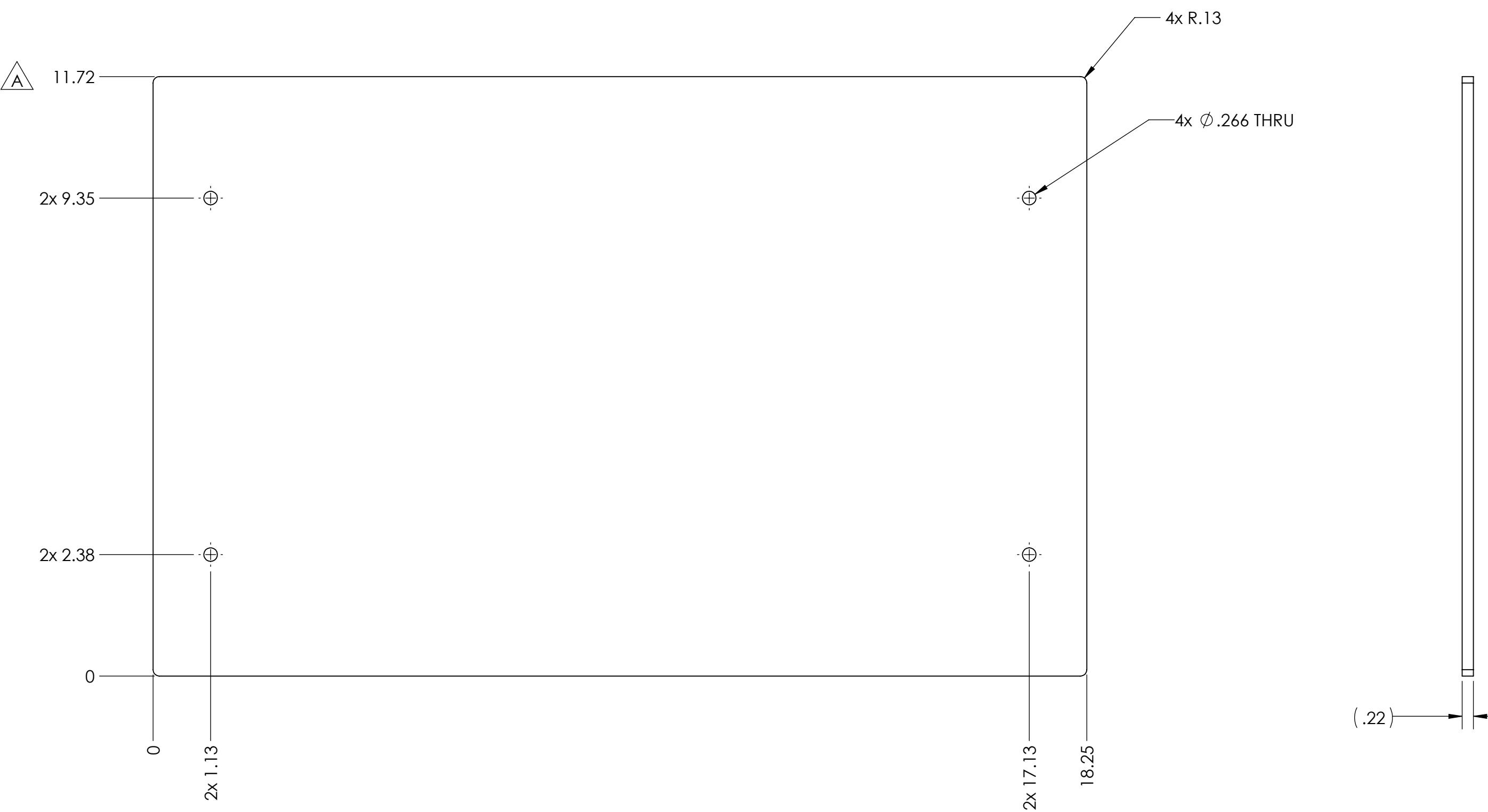
SCALE: 1:2 SHEET 1 OF 1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
C4	A	Trimmed .375" off of top edge	12/14/2022	JO

D

D



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C

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B

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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 $\pm .005$

PROPRIETARY AND CONFIDENTIAL

DRAWN

NAME

DATE

JO

9/30/2022

MATERIAL/FINISH:

.220 Clear Polycarbonate

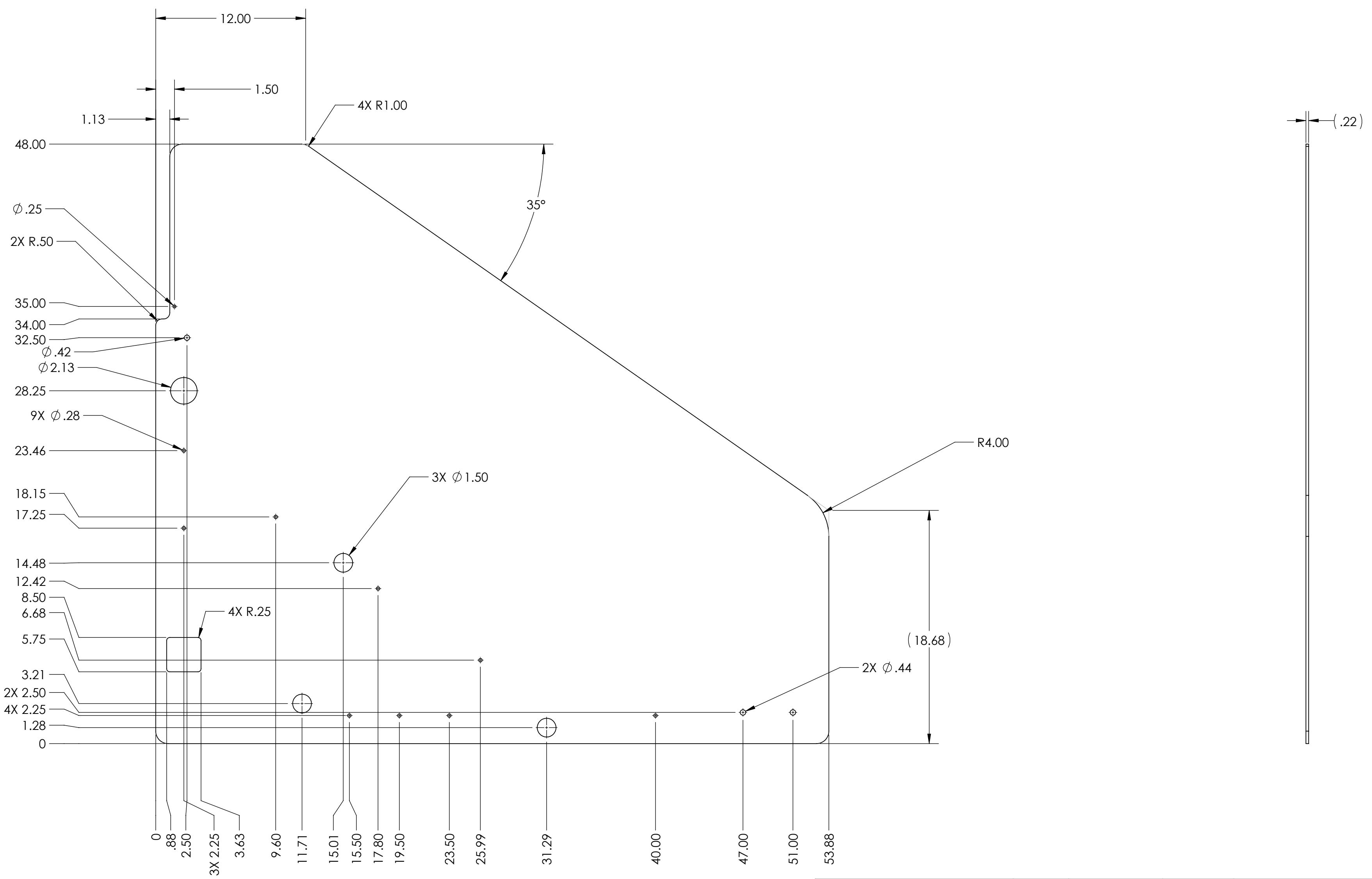
COMMENTS:

REMOVE ALL BURRS AND SHARP EDGES.

DO NOT SCALE DRAWING

FIRST
ROBOTICS
COMPETITION
SOLIDWORKS
Modeling Solutions Partner
TITLE: Cube Shelf
Upper Back
Panel

SIZE DWG. NO. REV
C GE-23098 **A**
SCALE: 1:4 SHEET 1 OF 1



UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	NE	9/28/2022
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:			
0.220" Polycarbonate Clear			
COMMENTS:	REMOVE ALL BURRS AND SHARP EDGES.		
DO NOT SCALE DRAWING			

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

TITLE:	Goal Side Wall		
SIZE	DWG. NO.	REV	
C	GE-23099		
SCALE: 1:8		SHEET 1 OF 1	

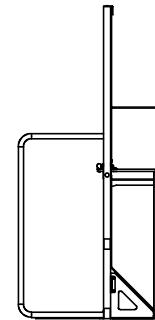
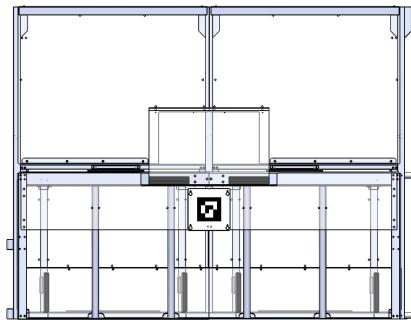
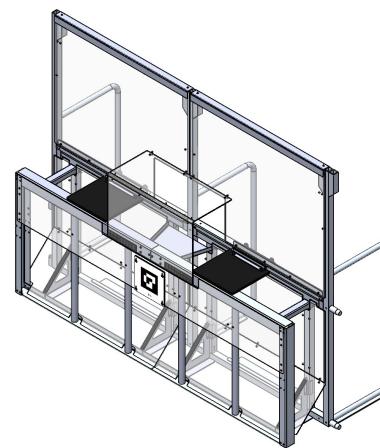
4

3

2

1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	FE-00001	Drivers Station Support	2
2	FE-00002_Right	Corner Supports, Right	1
3	GE-23122	GE-23101 and GE-23102 riveted	2
4	GE-23106	top rail assembly	2
5	GE-23110	slide assembly	2
6	GE-23107	Loading station lower plastic	2
7	GE-23123	GE-23113 w/ hook	1
8	GE-23124	GE-23114 w/ hook	1
9	GE-23127	GE-23111 w/ hook	4
10	GE-23112	Ramp plastic	2
11	GE-23120	Grill, brace to frame	2
12	GE-23116	Grill, front connector plate	1
13	GE-23117	connector plate to frame	1
14	GE-23104	Loading station top plastic assembly (left)	1
15	GE-23104	Loading station top plastic assembly (right)	1
16	GE-23126	GE-23108 w/ hook	1
17	GE-23118	front grill plastic	1
18	FE-00071	FE-00070 w/ hook	2
19	washer_flat_.25	Flat Washer for 1/4" Screw	19
20	nylock_.25_20	Steel Nylon-Insert Locknut, 1/4"-20	19
21	pin_quick_ring_.25_.5	Pin, Ring-Grip Quick-Release with SS Ring, 1/4" Diameter, 0.5" Usable Length	4
22	91772A540	Pan head .25_20	19
23	pin_quick_ring_.25_2.0_625	Pin, Ring-Grip Quick-Release with SS Ring, 1/4" Diameter, 2.0625" Usable Length	4
24	FE-00081-ID4	AprilTag Target	1



UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	NW	12/27/2022
TOLERANCES: FRACTIONAL: ±1/2 ANGULAR: MACH ±1° BEND ±1° TWO PLACE DECIMAL: ±.50	PROPRIETARY AND CONFIDENTIAL		
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MATERIAL/FINISH:	COMMENTS:		
REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			
SCALE: 1:24		SHEET 1 OF 11	

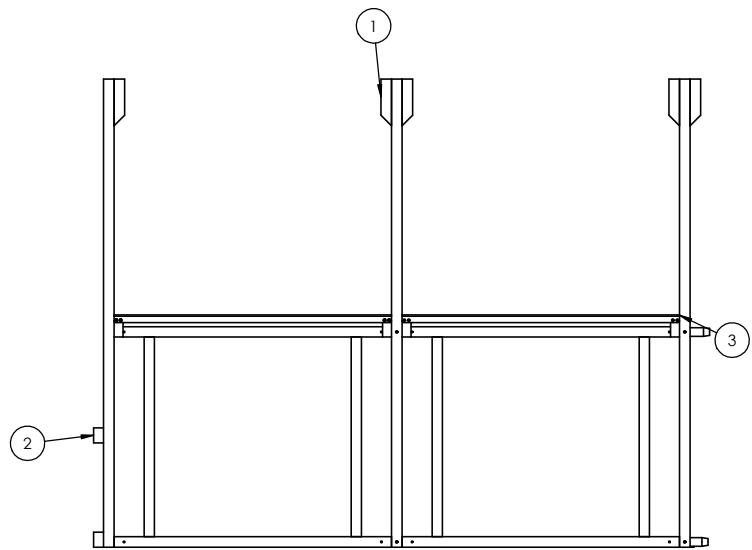
FIRST ROBOTICS COMPETITION DS SOLIDWORKS Modeling Solutions Partner

Title: Double Substation

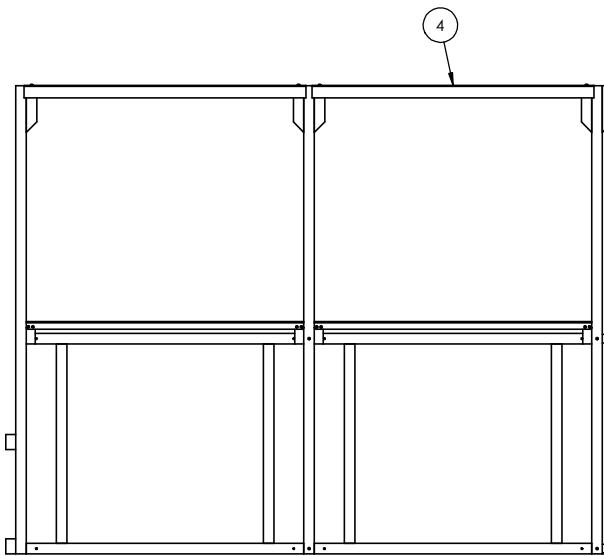
Size: DWG. NO. REV

C GE-23100

Step 1.



Step 2.



Notes:

1. slide the opening of 3 into 1 that is attached to the Driver Station Diamond Plate.
2. slide 1 into the other end of 3 .
3. repeat step 1.
4. Slide 2 into 3 .
5. ** Andymark field border pin 3 to uprights.

Notes:

1. Insert 4 into the openings on top of the uprights in two locations.

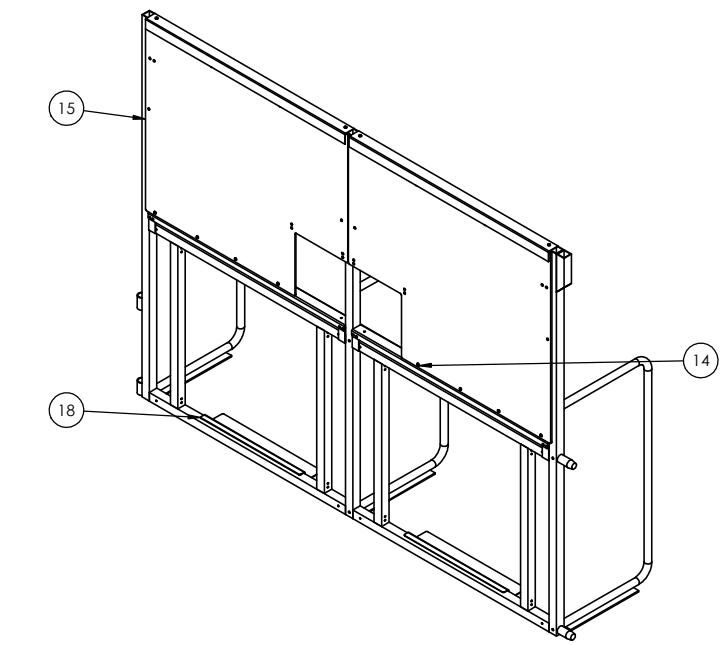
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/2$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .50$	FIELD DRAWN NAME NW DATE 12/27/2022	DATE 12/27/2022
PROPRIETARY AND CONFIDENTIAL		
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MATERIAL/FINISH:		
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.		
DO NOT SCALE DRAWING	SIZE C	DWG. NO. GE-23100 REV
	SCALE: 1:16	SHEET 2 OF 11



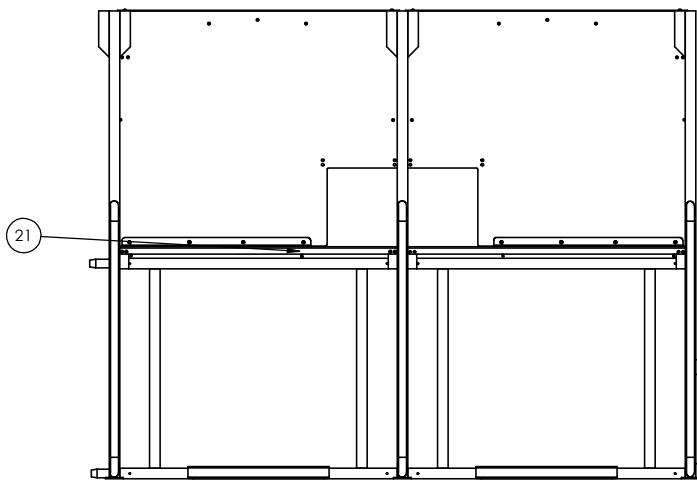
**Double
Substation**

Step 3.

D



C



B

Notes:

1. Place (18) centered on the frame flush and to the carpet.
2. Insert (14) and (15) under step 2 and resting on the frame.
3. Pin using (21).

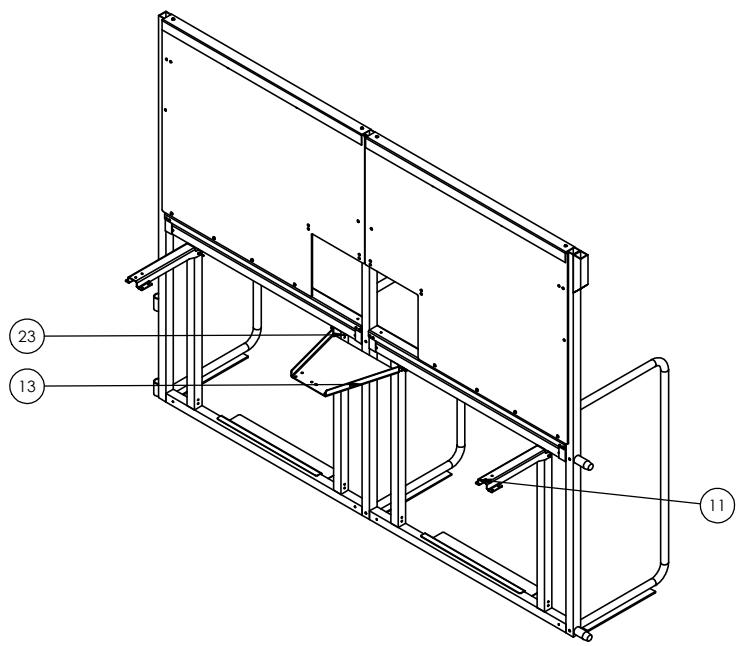
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UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/2$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .50$	FIELD DRAWN	NAME NW	DATE 12/27/2022
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING	SIZE	DWG. NO.	REV
C	GE-23100		
SCALE: 1:16	SHEET 3 OF 11		



Title:
**Double
Substation**

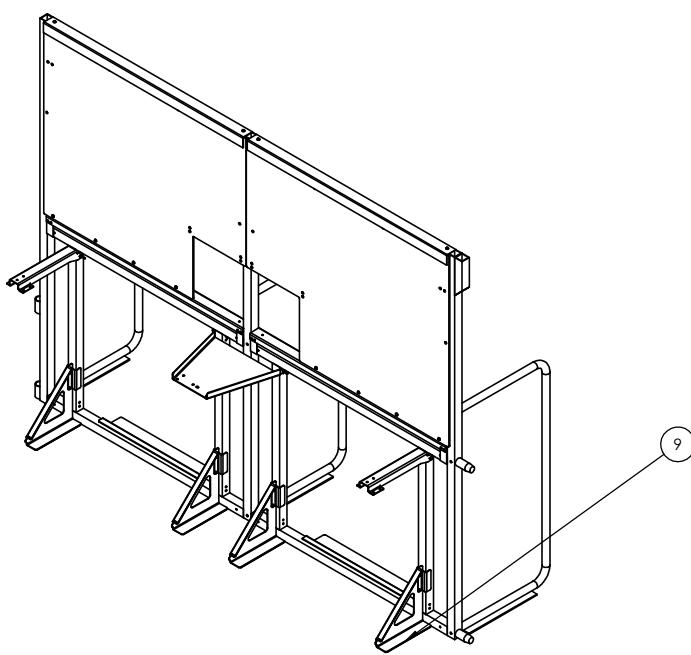
Step 4.



Notes:

1. Place (13) and pin with (23) at the center location using the top set of holes.
2. Place (11) and pin with (23) in two locations using the bottom set of holes.

Step 5.

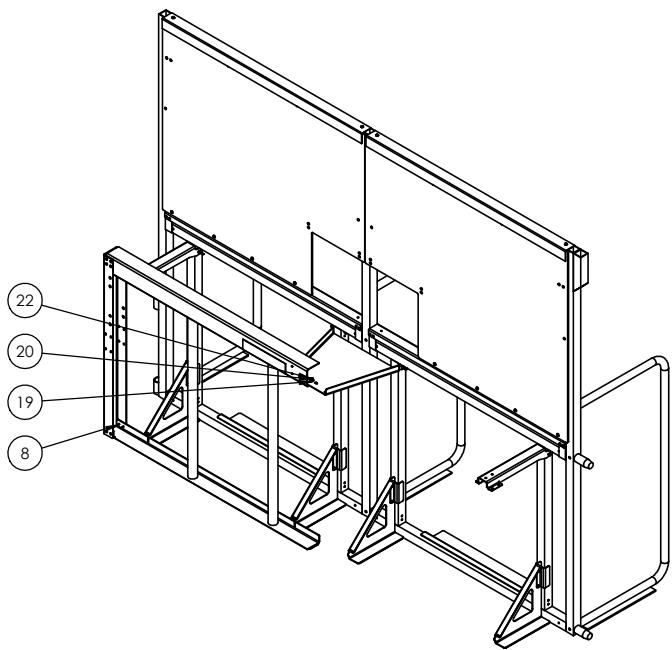


Notes:

1. Place (9) on the floor in 4 locations centered and flush to the frame uprights.

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 NW	DATE 12/27/2022
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-23100		
SCALE: 1:16	SHEET 4 OF 11		

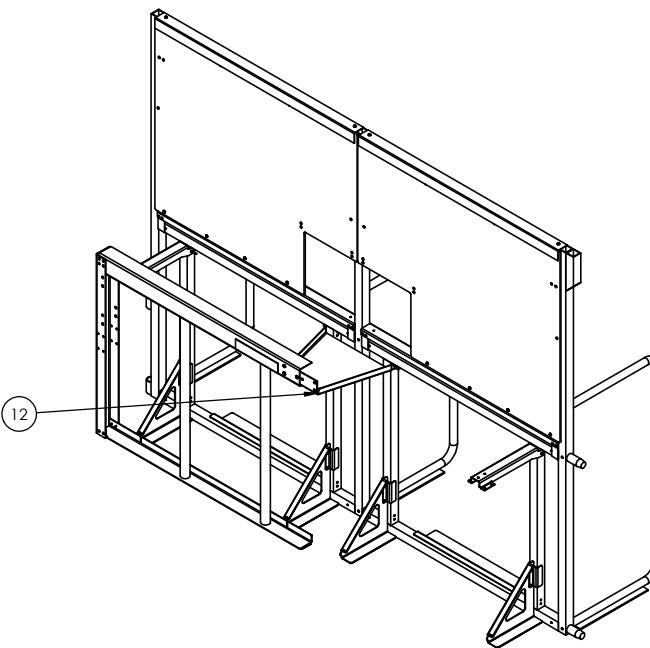
Step 6.



Notes:

1. Place (8) in place aligning tabs and bolt hole locations with step 4 and 5.
2. Bolt step 4 to (8) with (19), (20), and (22) in 7 locations. bolting up.

Step 7.



Notes:

1. Insert and bolt (12) to step 6 in 3 locations bolting away from field.

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 NW	DATE 12/27/2022
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-23100		
SCALE: 1:16	SHEET 5 OF 11		



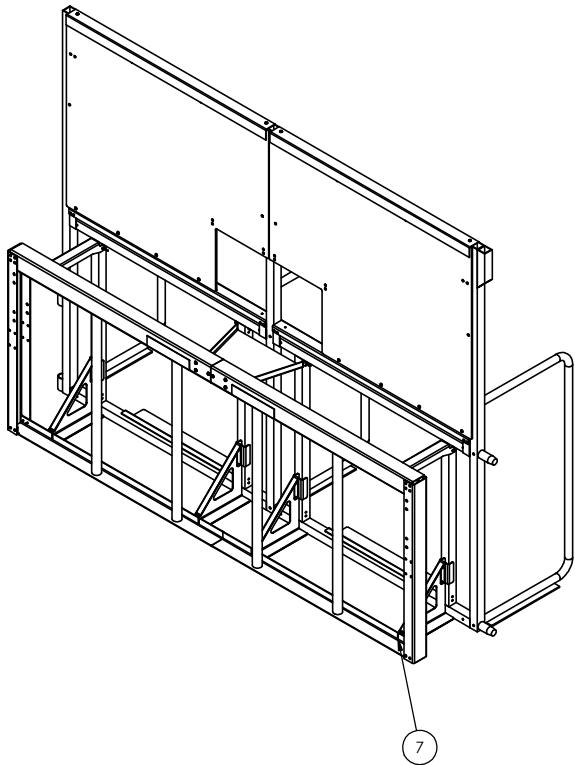
TITLE: Double Substation

SIZE DWG. NO. REV

C GE-23100

SCALE: 1:16 SHEET 5 OF 11

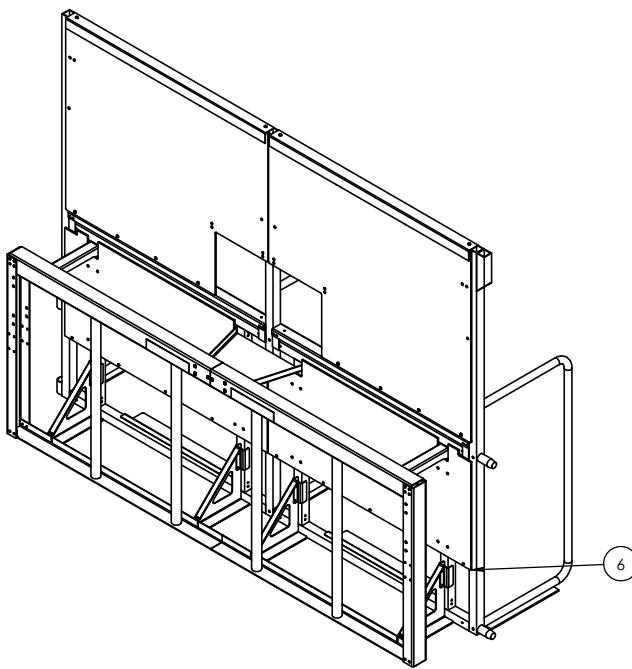
Step 8.



Notes:

1. Place (7) together like step 6 in 7 locations.
2. Repeat part of step 7 bolting in remaining 3 locations of step 7.

Step 9.



Notes:

1. Insert (6) in two locations and attach with 120lb cable ties.

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 NW	DATE 12/27/2022
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MATERIAL/FINISH:			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING	SIZE	DWG. NO.	REV
C	GE-23100		
SCALE: 1:16	SHEET 6 OF 11		



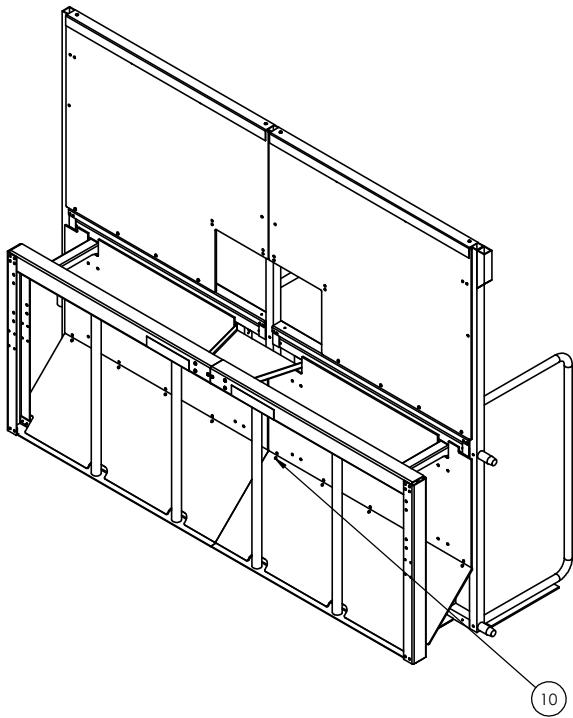
TITLE: Double Substation

SIZE DWG. NO. REV

C GE-23100

SCALE: 1:16 SHEET 6 OF 11

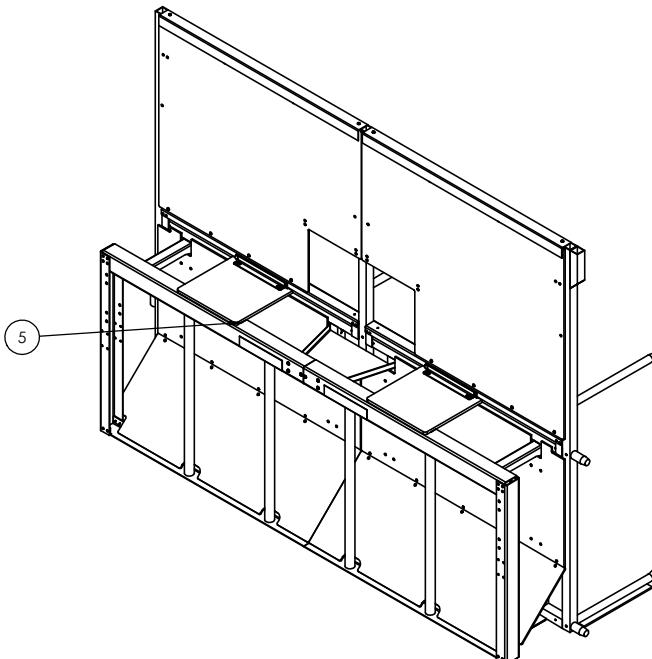
Step 10.



Notes:

1. Lay (10) on to step 5 attached with hook and loop.

Step 11.



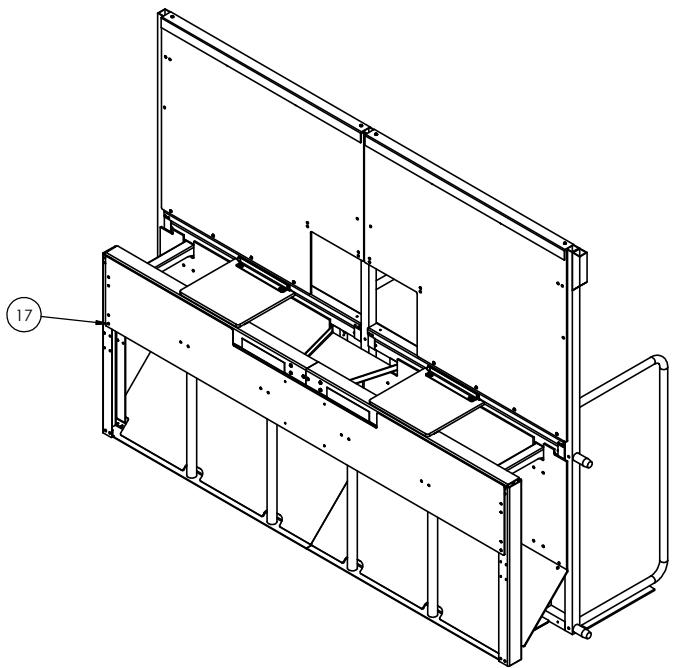
Notes:

1. Insert (5) in two locations in the frames of Step 1 and resting on the front frames.
2. Adjust tension as needed. Slide should be retained and move easily.

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 NW	DATE 12/27/2022
PROPRIETARY AND CONFIDENTIAL			
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COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING	SIZE C	DWG. NO. GE-23100	REV
SCALE: 1:16	SHEET 7 OF 11		

D

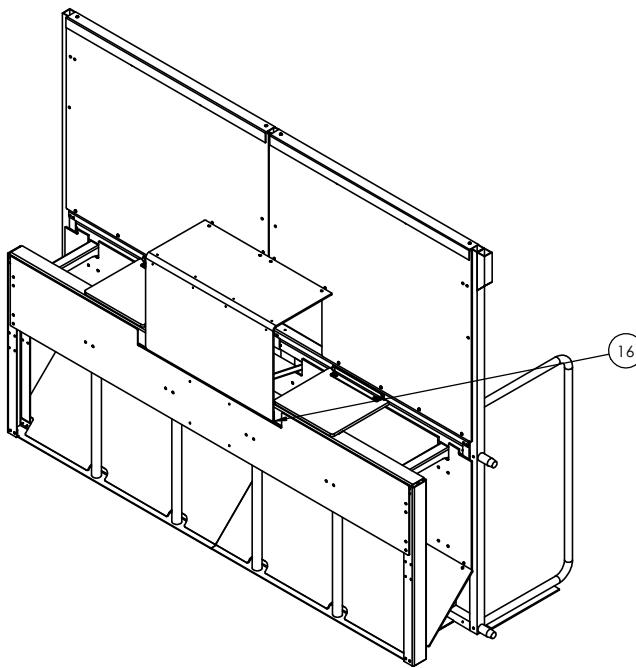
Step 12.



Notes:

1. Attach (17) to the front with 120lb cable ties.

Step 13.

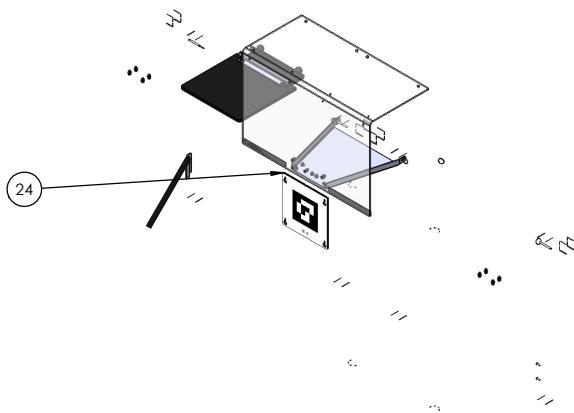


Notes:

1. Attach (16) to the front frames with hook and loop.
2. Attach the back to the plastic with 120lb cable ties..

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 NW DATE 12/27/2022
PROPRIETARY AND CONFIDENTIAL	
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MATERIAL/FINISH:	
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.	
DO NOT SCALE DRAWING	REV

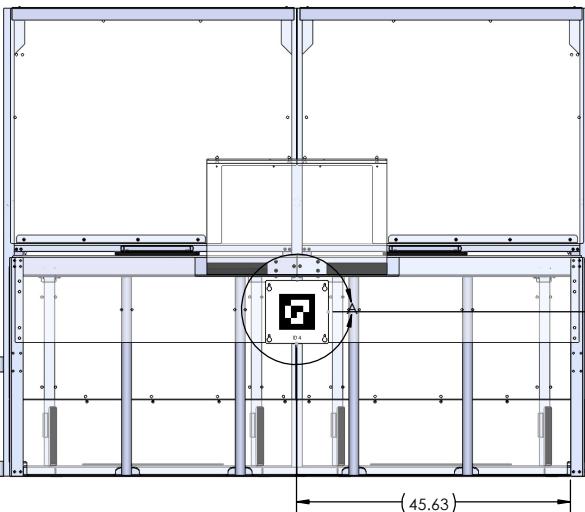
Step 14.



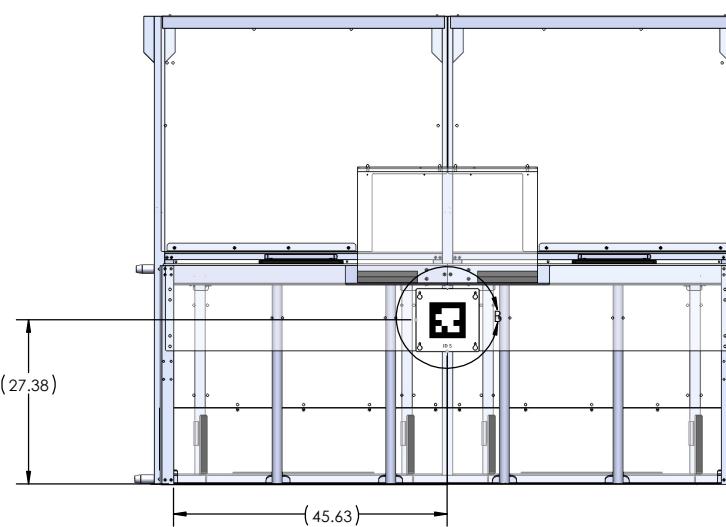
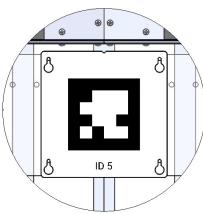
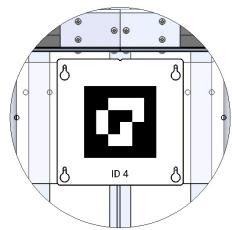
Notes:

1. Attach (24) to step 13 with .25-20 hardware.

Blue Double Substation

DETAIL A
SCALE 1 : 8

Red Double Substation

DETAIL B
SCALE 1 : 8

For more details on how this assembly interacts with the rest of the field, see FE-2023

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 NW DATE 12/27/2022
PROPRIETARY AND CONFIDENTIAL	
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COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.	
DO NOT SCALE DRAWING	SIZE DWG. NO. REV C GE-23100
SCALE: 1:16 SHEET 9 OF 11	

DS SOLIDWORKS
Modeling Solutions Partner

TITLE:

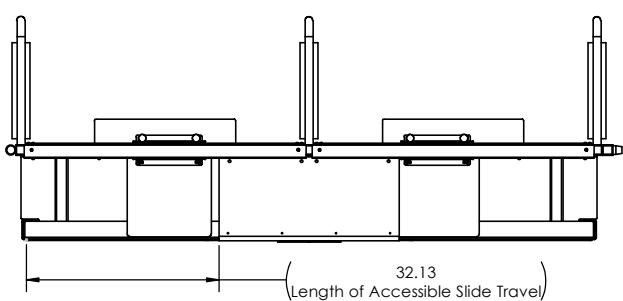
Double
Substation

SIZE DWG. NO. REV

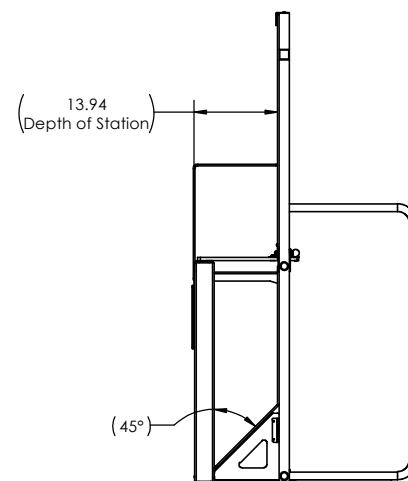
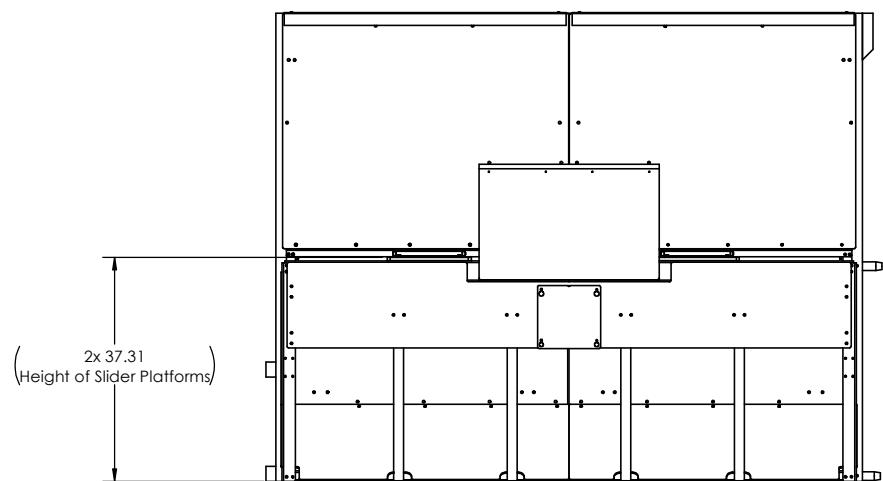
C GE-23100

SCALE: 1:16 SHEET 9 OF 11

D



C

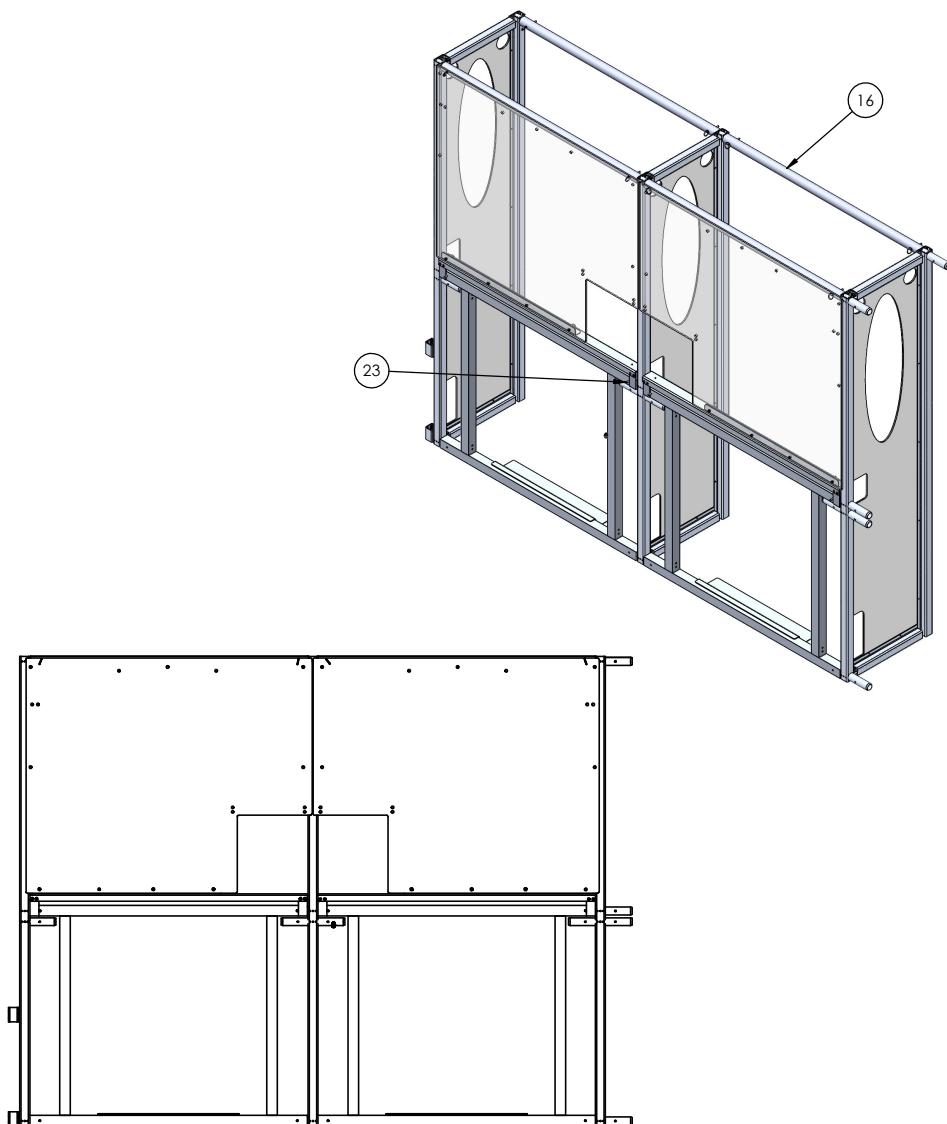


For more details on how this assembly interacts with the rest of the field, see FE-2023

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	12/27/2022
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: Double Substation			
SIZE DWG. NO. REV			
C GE-23100			
SCALE: 1:16 SHEET 10 OF 11			

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23122	GE-23101 and GE-23102 riveted	2
2	GE-23110	slide assembly	2
3	GE-23107	Loading station lower plastic	2
4	GE-23123	GE-23113 w/ hook	1
5	GE-23124	GE-23114 w/ hook	1
6	GE-23127	GE-23111 w/ hook	4
7	GE-23112	Ramp plastic	2
8	End Upright Right	End Upright Right AM	1
9	GE-23120	Grill, brace to frame	2
10	GE-23116	Grill, front connector plate	1
11	GE-23117	connector plate to frame	1
12	GE-23104	Loading station top plastic assembly (left)	1
13	GE-23104	Loading station top plastic assembly (right)	1
14	GE-23126	GE-23108 w/ hook	1
15	Middle Upright	Middle Upright AM	2
16	GE-23109	AndyMark Top Rail	4
17	GE-23118	front grill plastic	1
18	FE-00071	FE-00070 w/ hook	2
19	washer_flat_.25	Flat Washer for 1/4" Screw	20
20	nylock_.25_20	Steel Nylon-Insert Locknut, 1/4"-20	20
21	pin_quick_ring_.25_.5	Pin, Ring-Grip Quick-Release with SS Ring, 1/4" Diameter, 0.5" Usable Length	4
22	91772A540	Pan head .25_20	20
23	pin_quick_ring_.25_2	Pin, Quick-Release with SS Ring, 1/4" Diameter, 2" Long	12
24	pin_quick_ring_.25_2.0 625	Pin, Ring-Grip Quick-Release with SS Ring, 1/4" Diameter, 2.0625" Usable Length	4
25	FE-00081-ID4	AprilTag Target	1

Note changes to the assembly if being built on an AndyMark field border.



UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	NW	12/27/2022
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			
SCALE: 1:16		SHEET 11 OF 11	

FIRST ROBOTICS COMPETITION DS SOLIDWORKS Modeling Solutions Partner

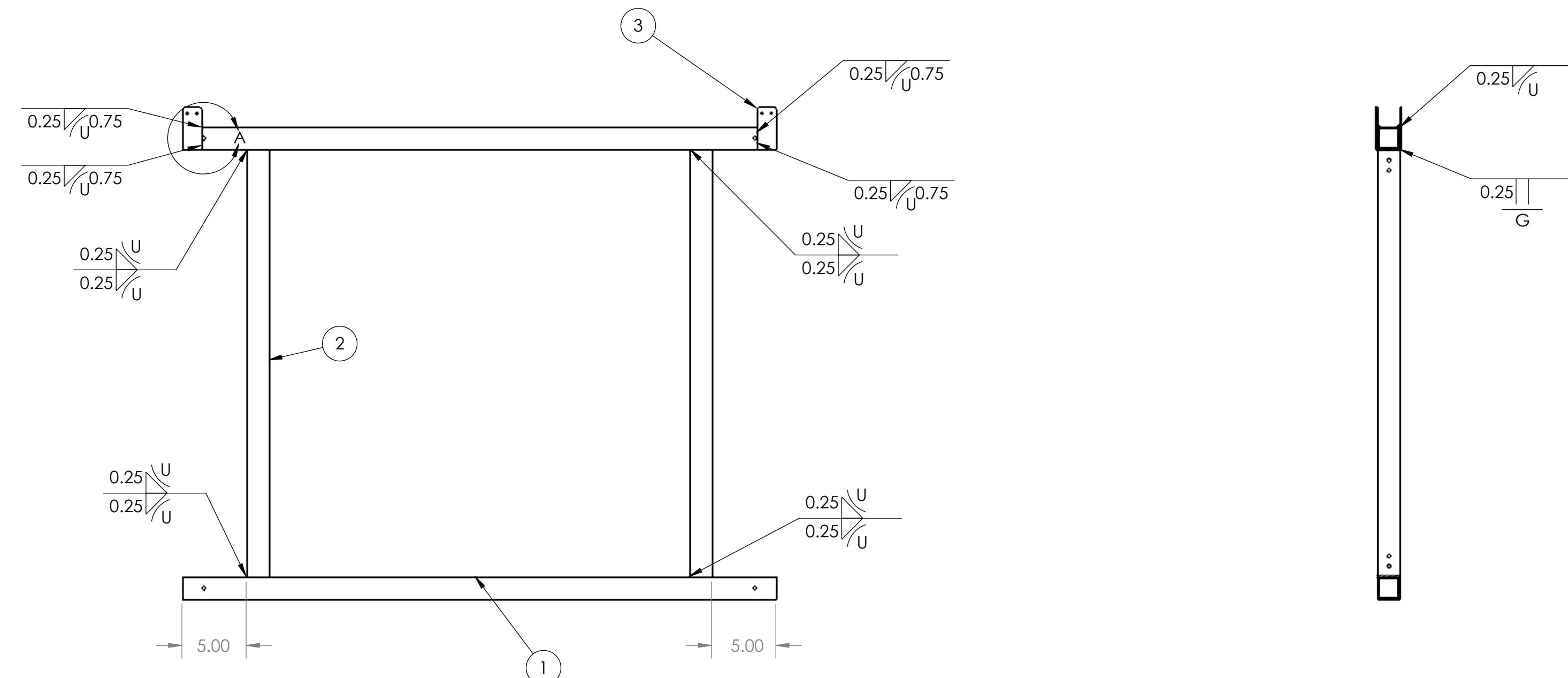
Title: Double Substation

Size: DWG. NO. REV

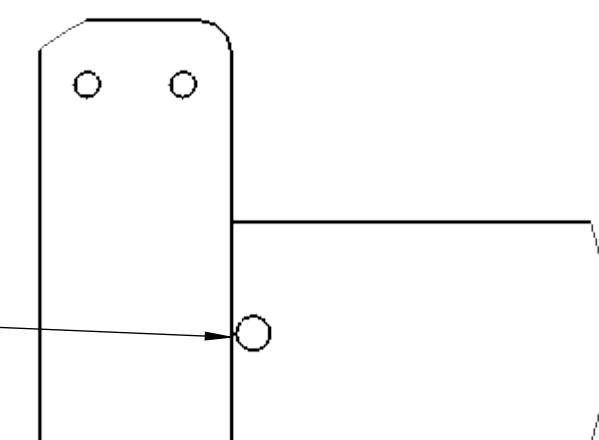
C GE-23100

ITEM NO.	WELD SIZE	SYMBOL	WELD LENGTH	WELD MATERIAL	QTY.
1	0.25	△	3.5		8
2	0.25	△	1.5		4
3	0.25	△	0.75		9
4	0.25		1.5		4
5	0.25	△			4

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23101-01	Frame, Horizontal	2
2	GE-23101-02	Frame, Vertical	2
3	GE-23101-03	Frame, Spacer tab	4



notes:
1. No weld allowed at hole location.



DETAIL A
SCALE 1 : 1.5

UNLESS OTHERWISE SPECIFIED:	WELD	NAME	DATE
DRAWN	NW	6/28/2022	
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: HP lower frame (welded)

SIZE DWG. NO. REV

C GE-23101

SCALE: 1:8 SHEET 1 OF 1

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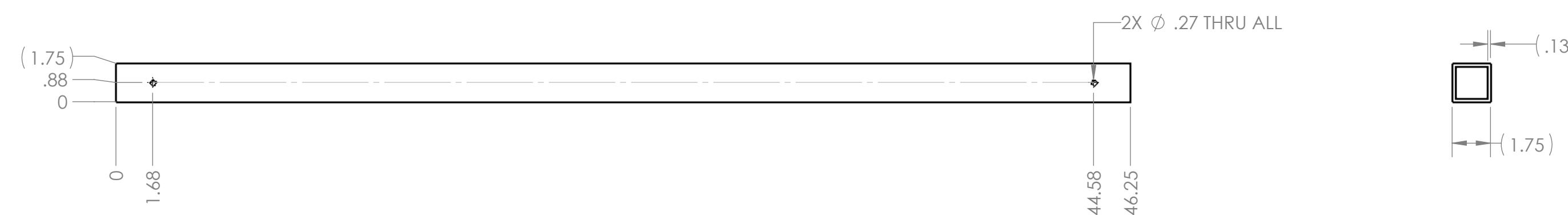
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UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .005$	DRAWN	NW	6/28/2022
PROPRIETARY AND CONFIDENTIAL			
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" square tubing 6061	SIZE	DWG. NO.	REV
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.	C	GE-23101-01	
DO NOT SCALE DRAWING	SCALE: 1:5	SHEET 1 OF 1	

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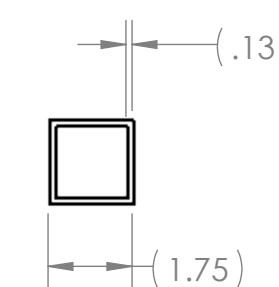
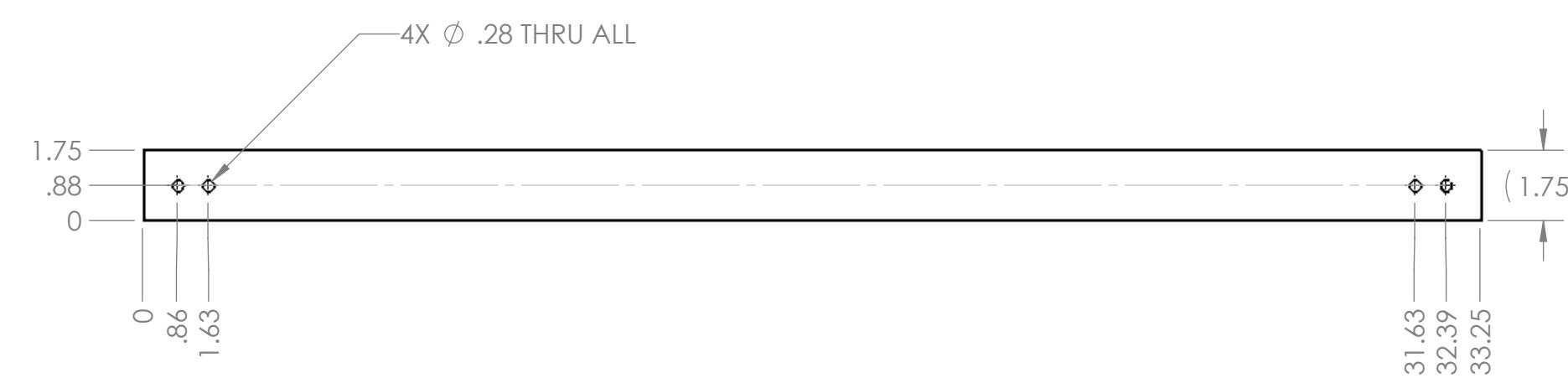
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UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	NW	6/28/2022	
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH:	SIZE	DWG. NO.	REV
1.75" x .125" Square Tubing 6061A	C	GE-23101-02	
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING	SCALE: 1:4	SHEET 1 OF 1	

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FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
Frame, Vertical

SIZE DWG. NO. REV
C GE-23101-02

SCALE: 1:4 SHEET 1 OF 1

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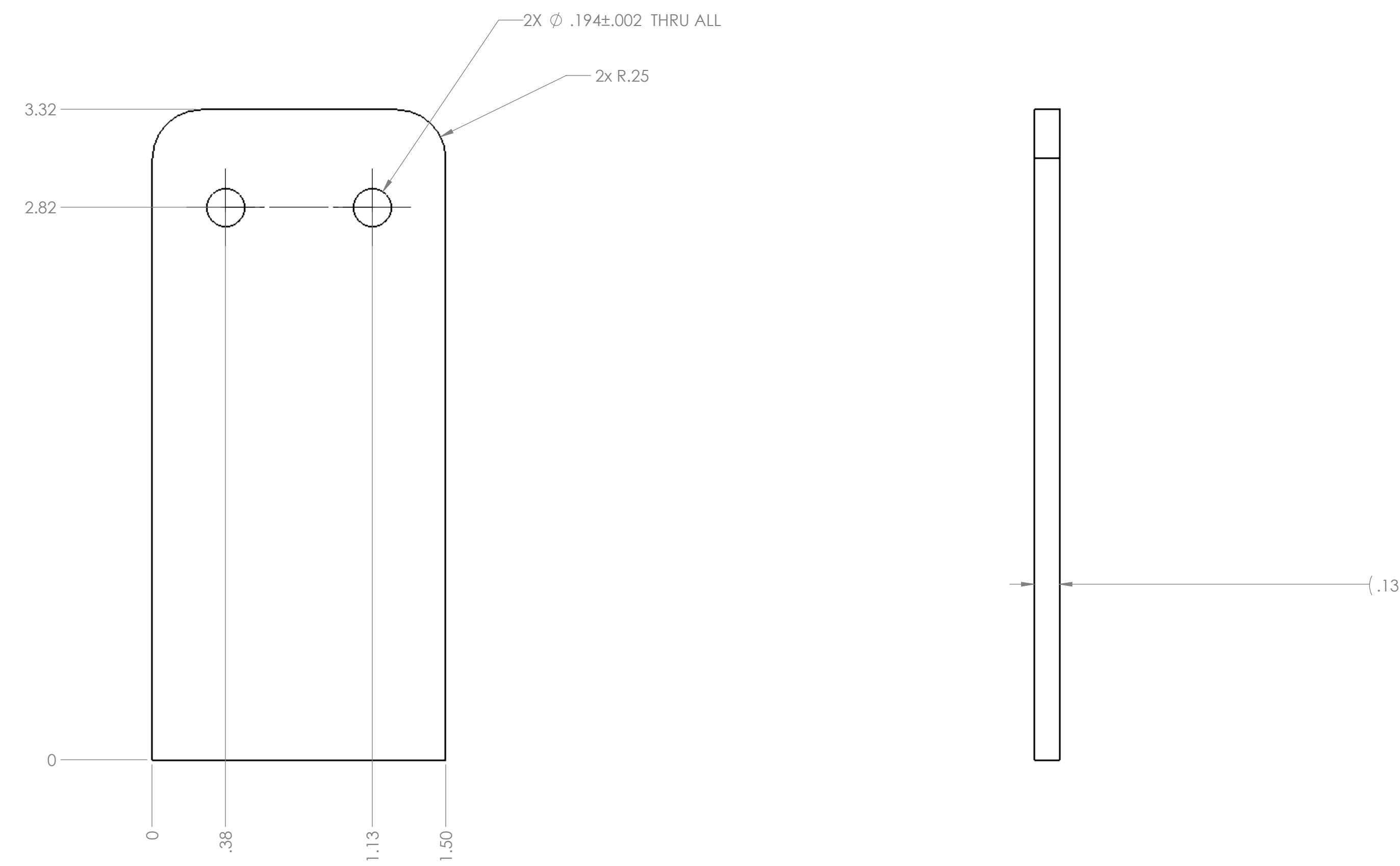
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UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	NW	7/11/2022	
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH:	SIZE	DWG. NO.	REV
8 ga AL 6061 or 5052	C	GE-23101-03	
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING	SCALE: 2:1	SHEET 1 OF 1	

4

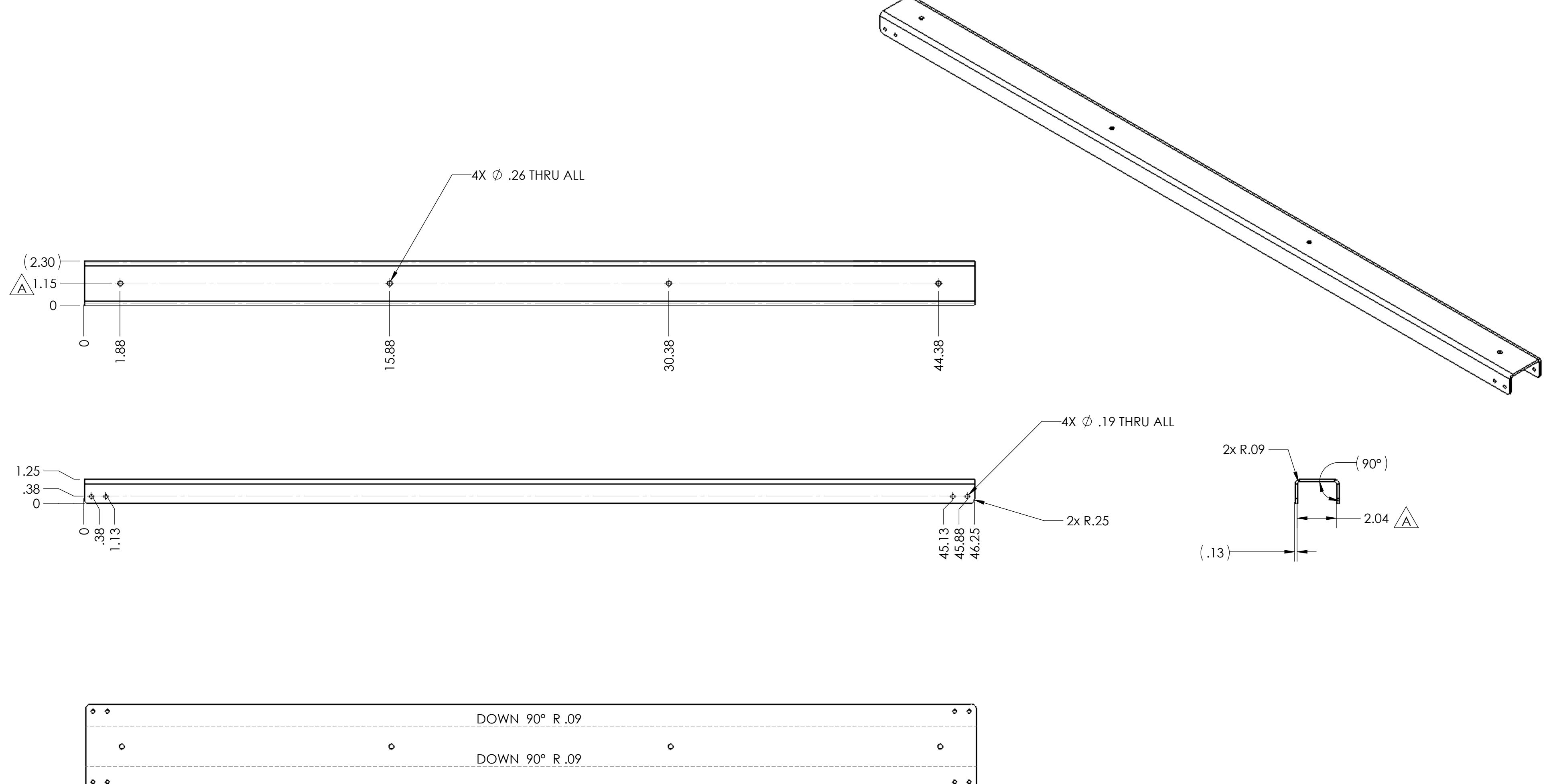
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REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
B1, C4	A	Channel made wider to fit, controlled with new dimension	10/20/2022	JO



UNLESS OTHERWISE SPECIFIED:	BEND	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	NW	6/28/2022
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: .125" AL 6061 or 5052	COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.		
DO NOT SCALE DRAWING			

FIRST ROBOTICS COMPETITION SOLIDWORKS Modeling Solutions Partner

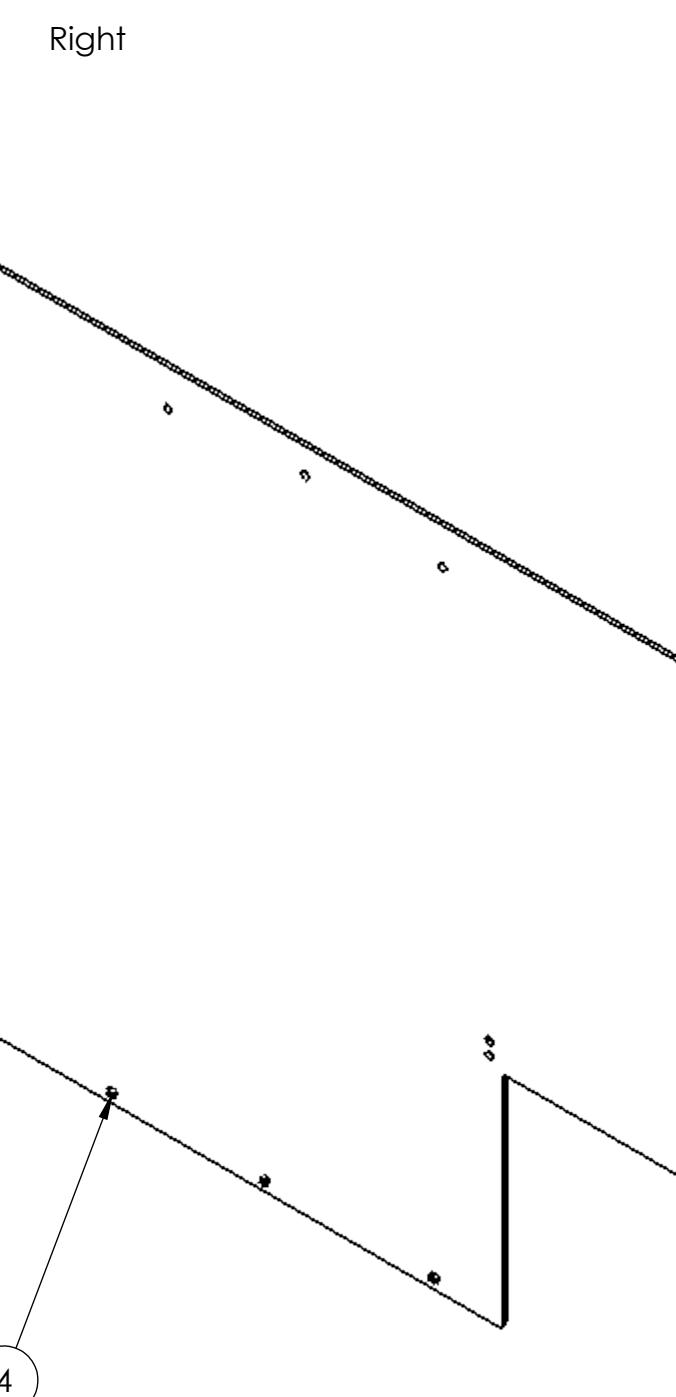
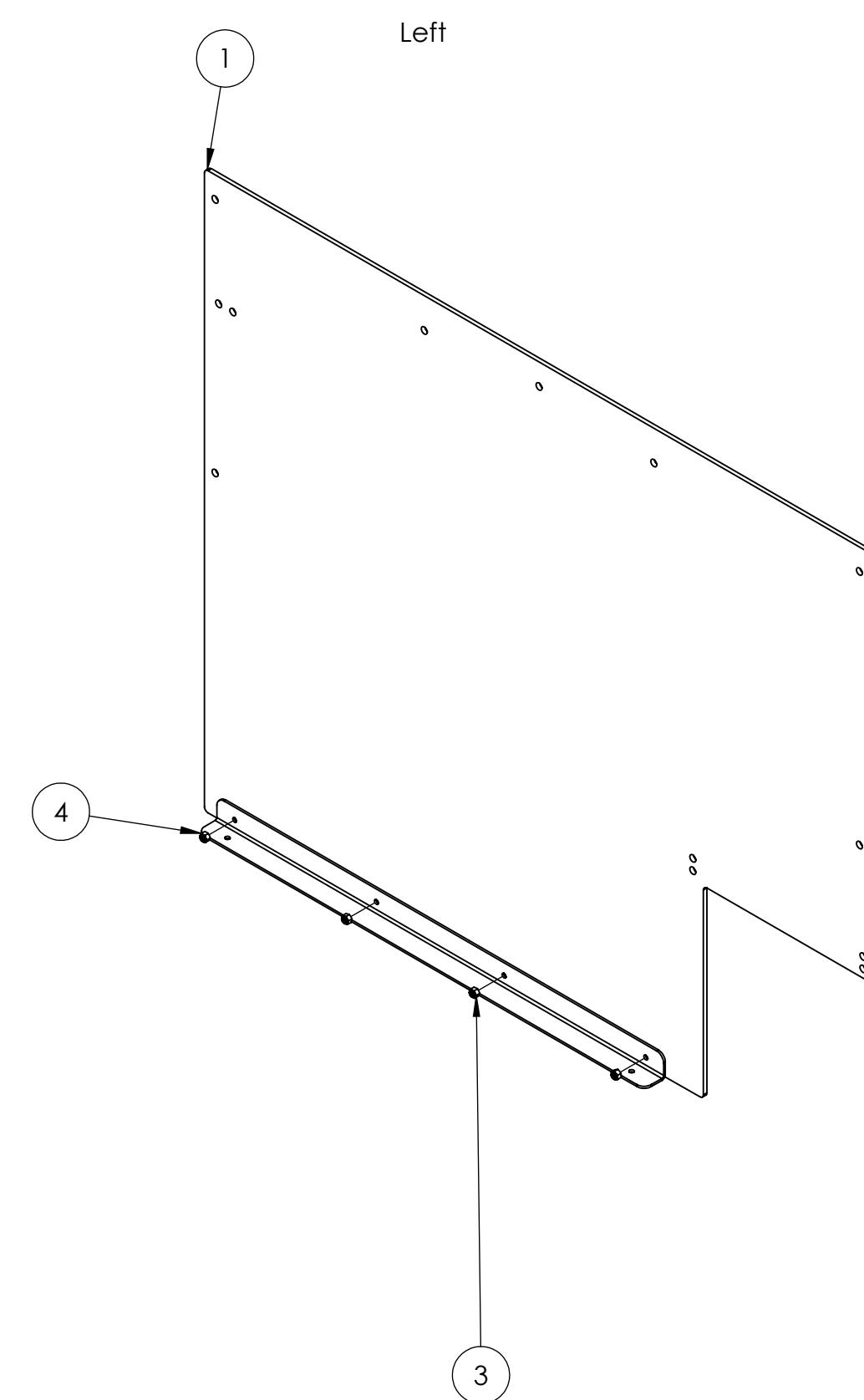
slide retainer

SIZE DWG. NO. REV
C GE-23102 **A**

SCALE: 1:4 SHEET 1 OF 1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23105	1.5" Angle Bracket	1
2	GE-23121	Loading station top plastic	1
3	nylock_.25_20	Steel Nylon-Insert Locknut, 1/4"-20	4
4	round_hex_.25_20_.75	Steel Button Head Hex Drive Screw, 1/4"-20 x 3/4" long, fully threaded	4

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UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	NW	7/13/2022
TOLERANCES: FRACTIONAL $\pm 1/2$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .50$	PROPRIETARY AND CONFIDENTIAL		
MATERIAL/FINISH:	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: Loading station top plastic assembly (right)

SIZE DWG. NO. REV

C GE-23104

SCALE: 1:8 SHEET 1 OF 1

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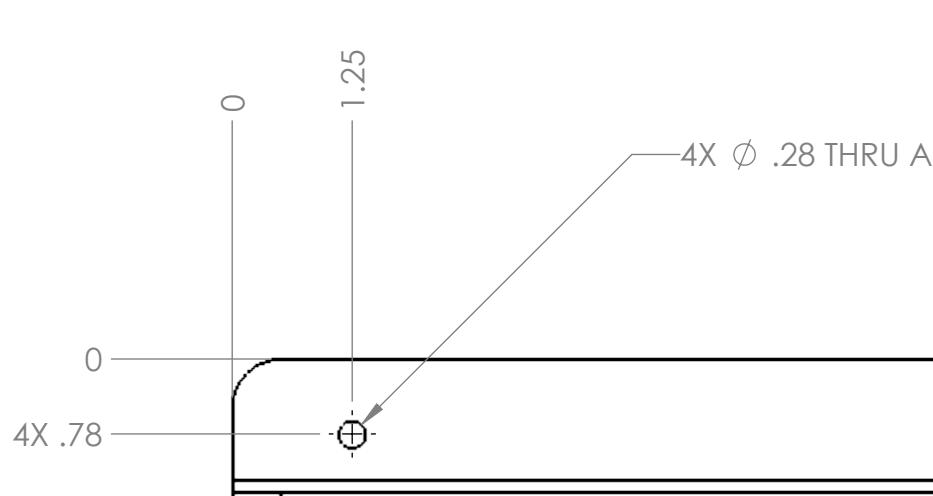
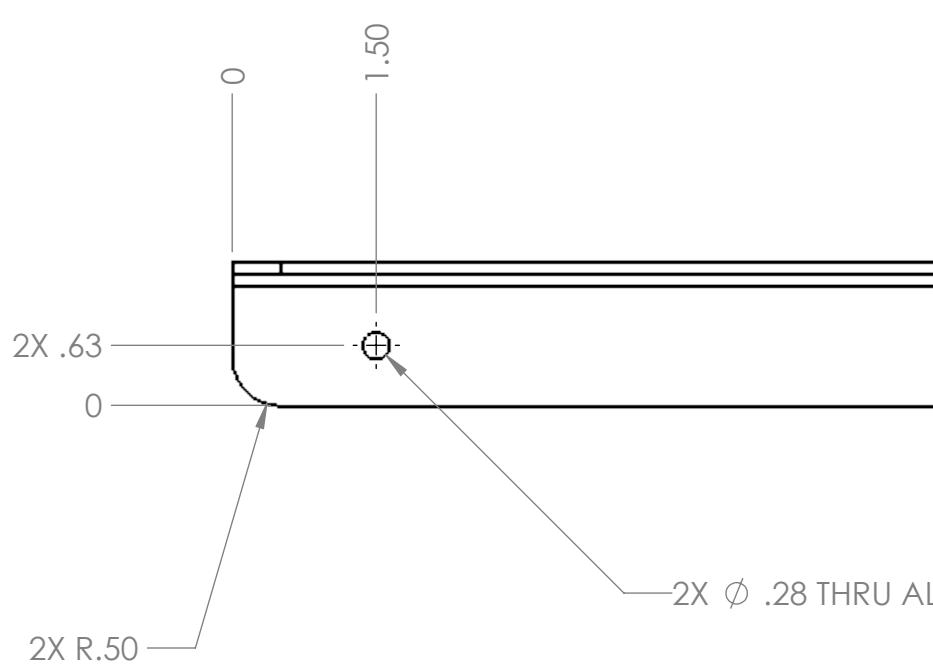
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UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	NW	7/26/2022	
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH:	SIZE	DWG. NO.	REV
8 GA 5052 AL	C	GE-23105	
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING		SCALE: 1:2	SHEET 1 OF 1

 **FIRST
ROBOTICS
COMPETITION**  SOLIDWORKS
Modeling Solutions Partner

TITLE: **1.5" Angle Bracket**

SIZE DWG. NO. REV
C GE-23105

SCALE: 1:2 SHEET 1 OF 1

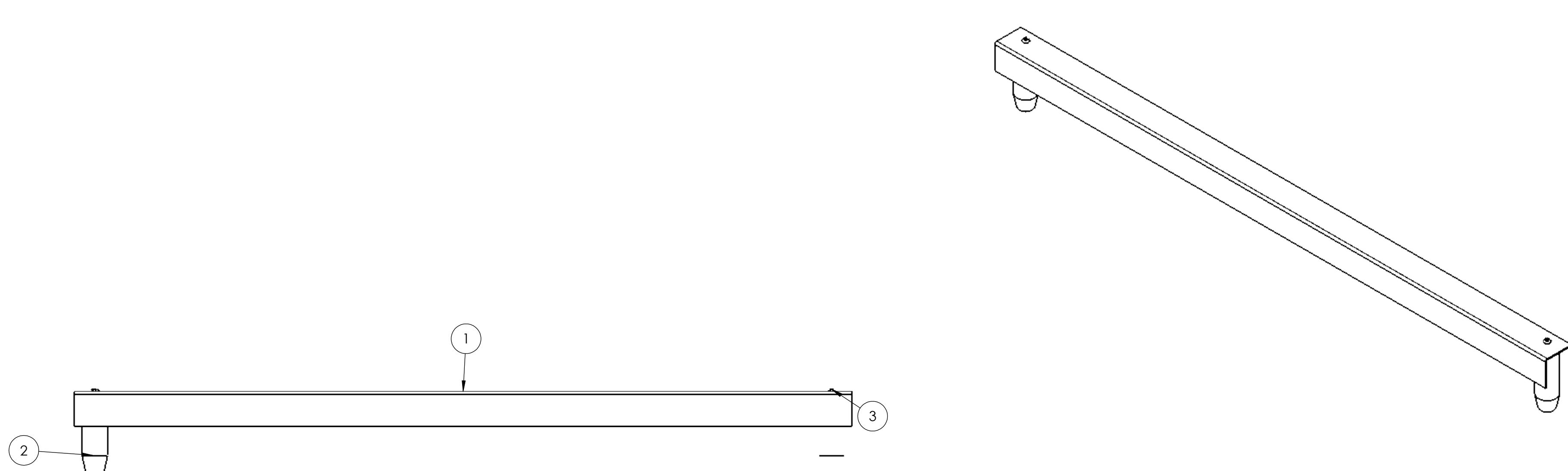
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23106-01	Top Rail, Angle	1
2	FE-00060	Top Rail, Post	2
3	round_hex_25_20_62	Steel Button Head Hex Drive Screw, 1/4"-20 x 5/8" long, fully threaded	2



UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	NW	6/28/2022
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: top rail assembly		
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.	SIZE	DWG. NO.	REV
	C	GE-23106	
DO NOT SCALE DRAWING	SCALE: 1:5 SHEET 1 OF 2		

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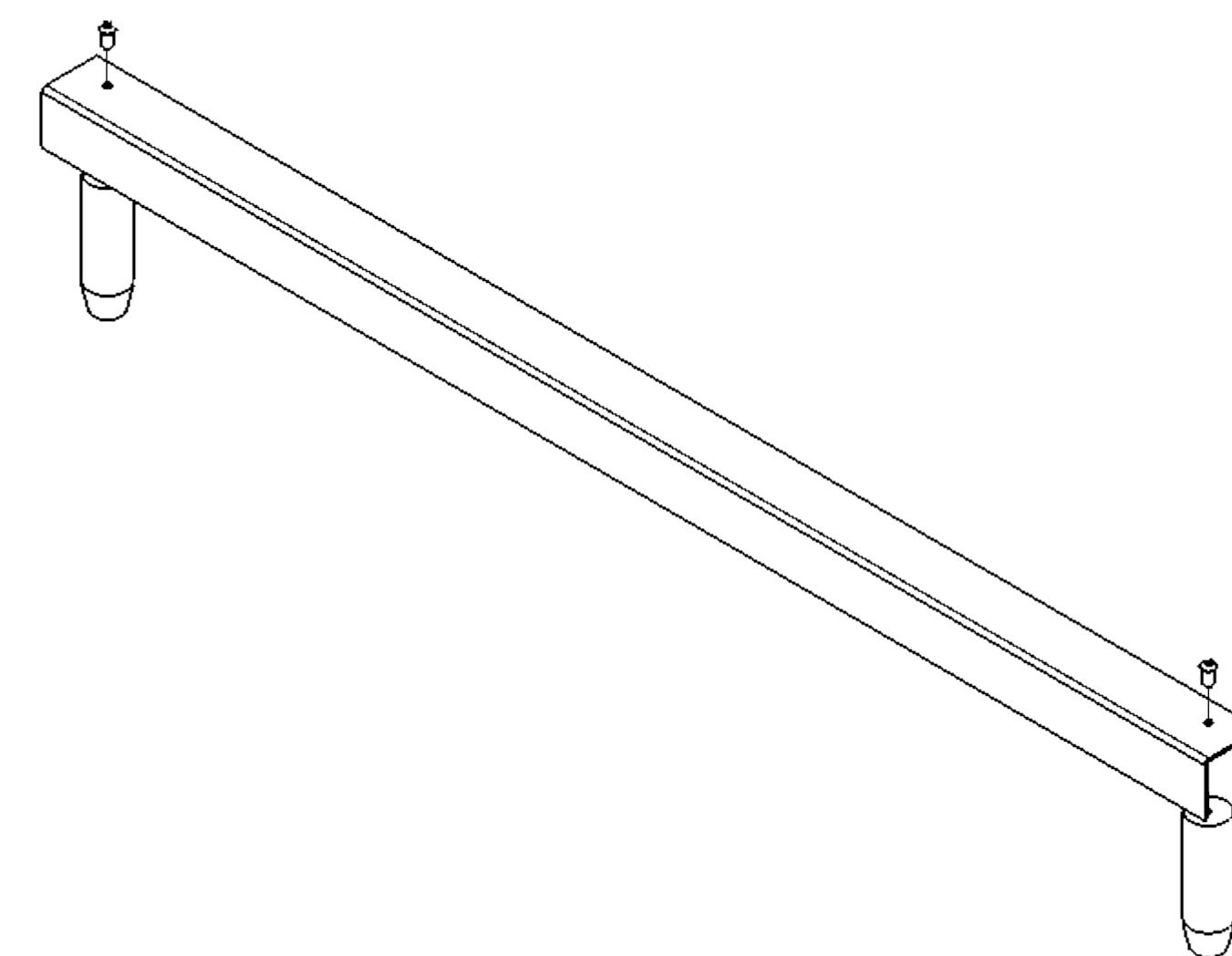
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UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/2$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .50$	DRAWN	NW	6/28/2022
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED 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:
top rail assembly

SIZE DWG. NO. REV
C GE-23106

SCALE: 1:5 SHEET 2 OF 2

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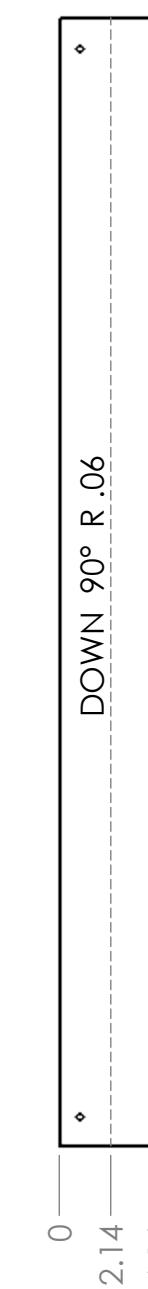
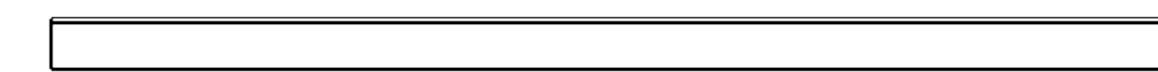
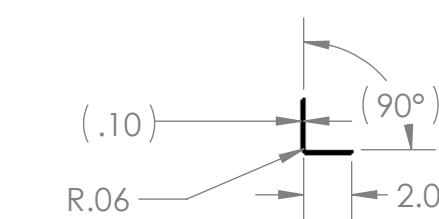
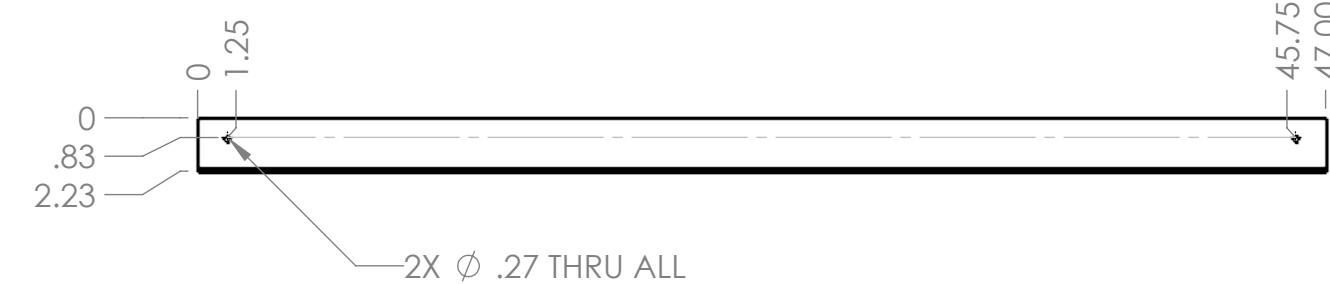
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UNLESS OTHERWISE SPECIFIED:	BEND	NAME	DATE
DRAWN	NW	6/28/2022	
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH: 10 ga AL 6061 or 5052			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
Top Rail, Angle

SIZE DWG. NO. REV
C GE-23106-01

SCALE: 1:8 SHEET 1 OF 1

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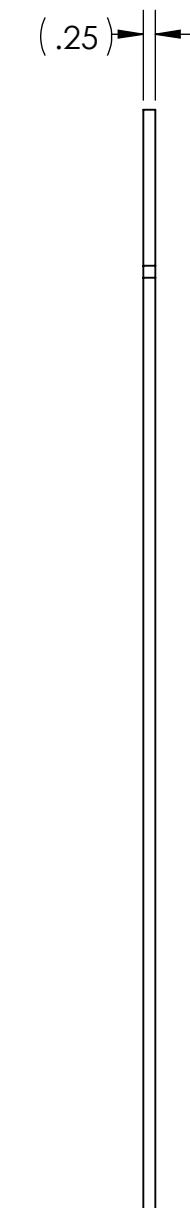
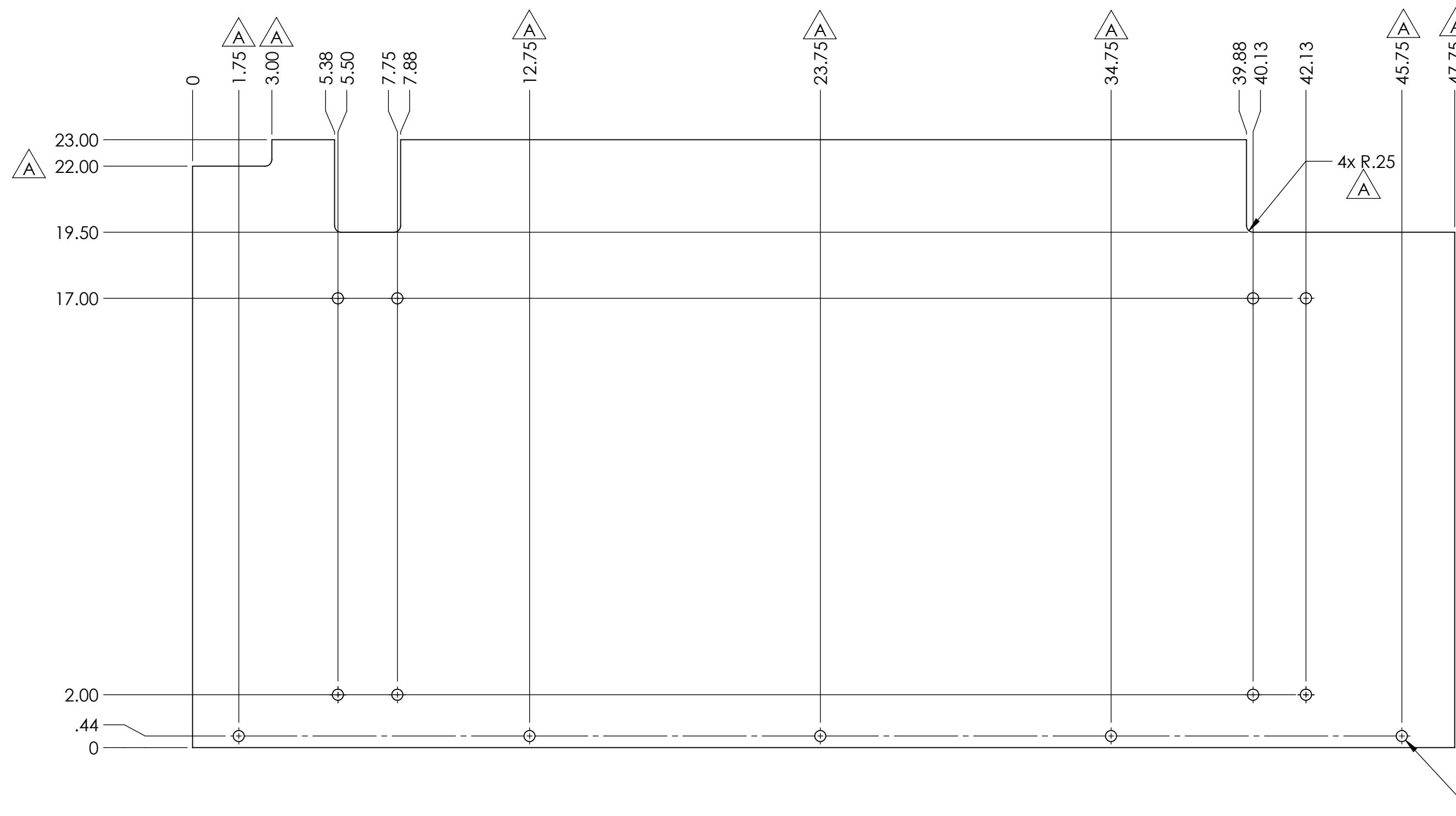
2

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REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
C2, C4, D2, D3, D4	A	Added cutout in corner, trimmed side of panel, moved holes after trimming	10/20/2022	JO

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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:

0.25" polycarbonate, clear

DO NOT SCALE DRAWING

VEND	NAME	DATE
DRAWN	DF	7/18/2022

PROPRIETARY AND CONFIDENTIAL

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COMMENTS:

REMOVE ALL BURRS AND SHARP EDGES.

FIRST	ROBOTICS	COMPETITION
SOLIDWORKS	Modeling Solutions Partner	

TITLE:
Loading station lower plastic

SIZE	DWG. NO.	REV
C	GE-23107	A

SCALE: 1:4	SHEET 1 OF 1
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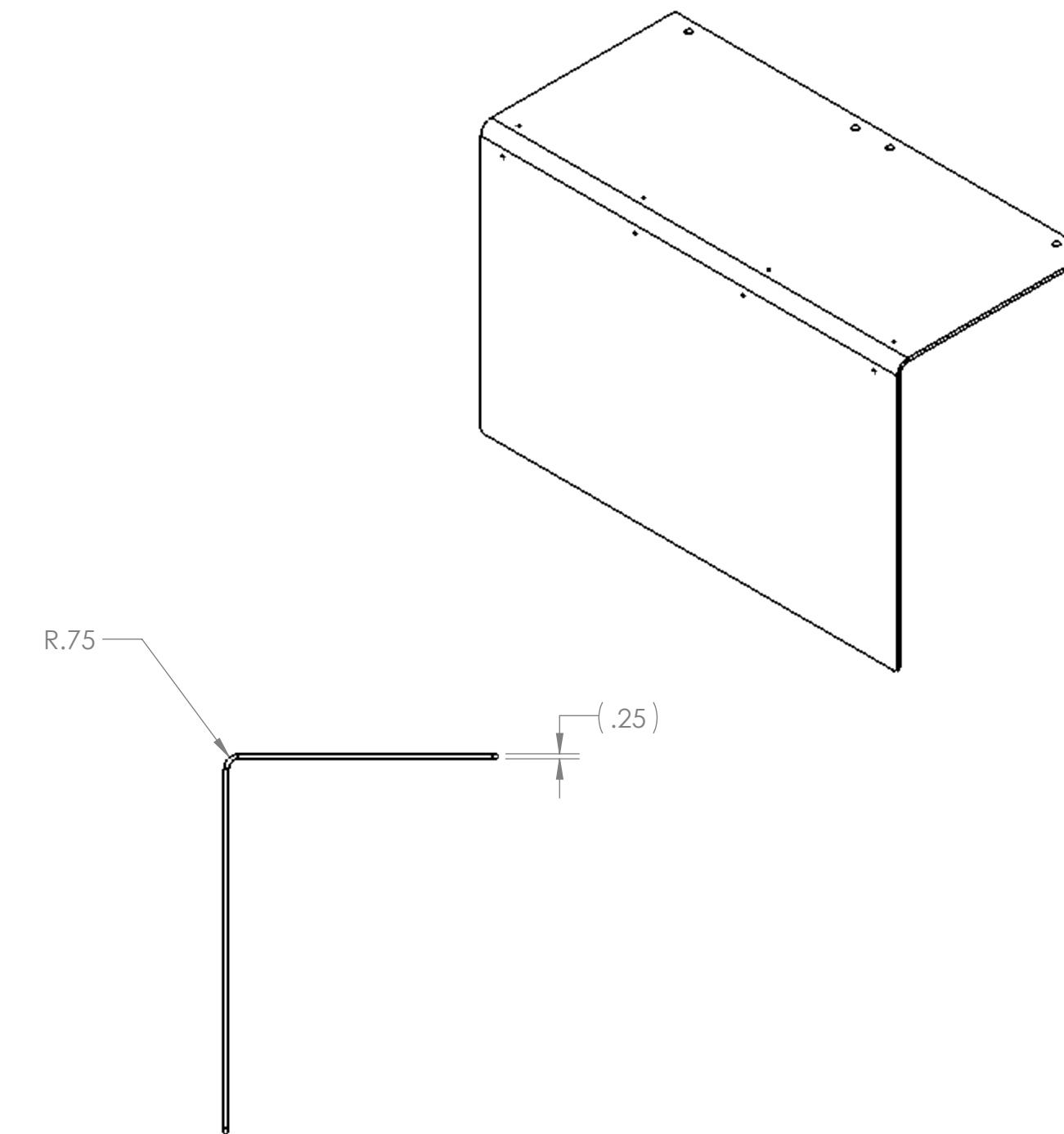
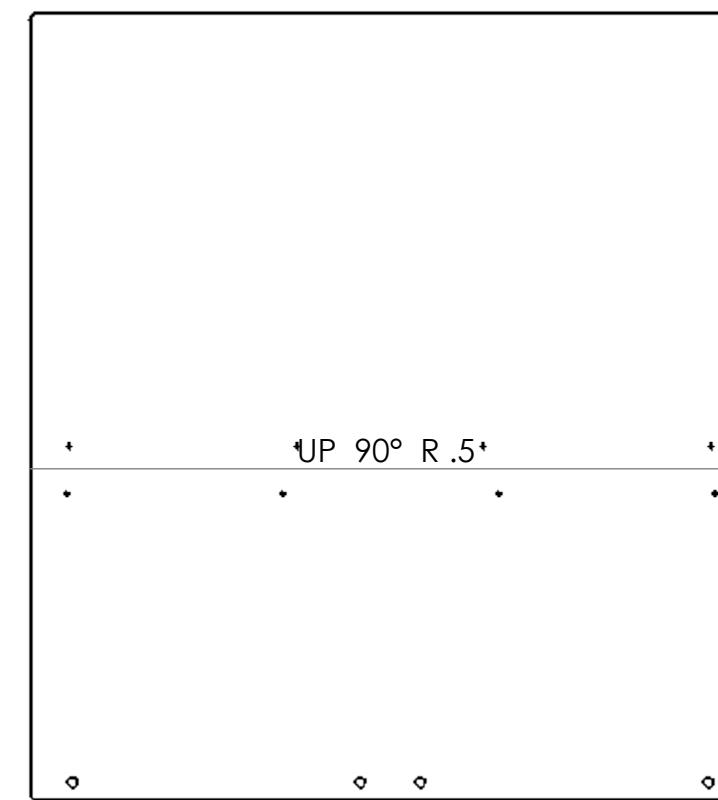
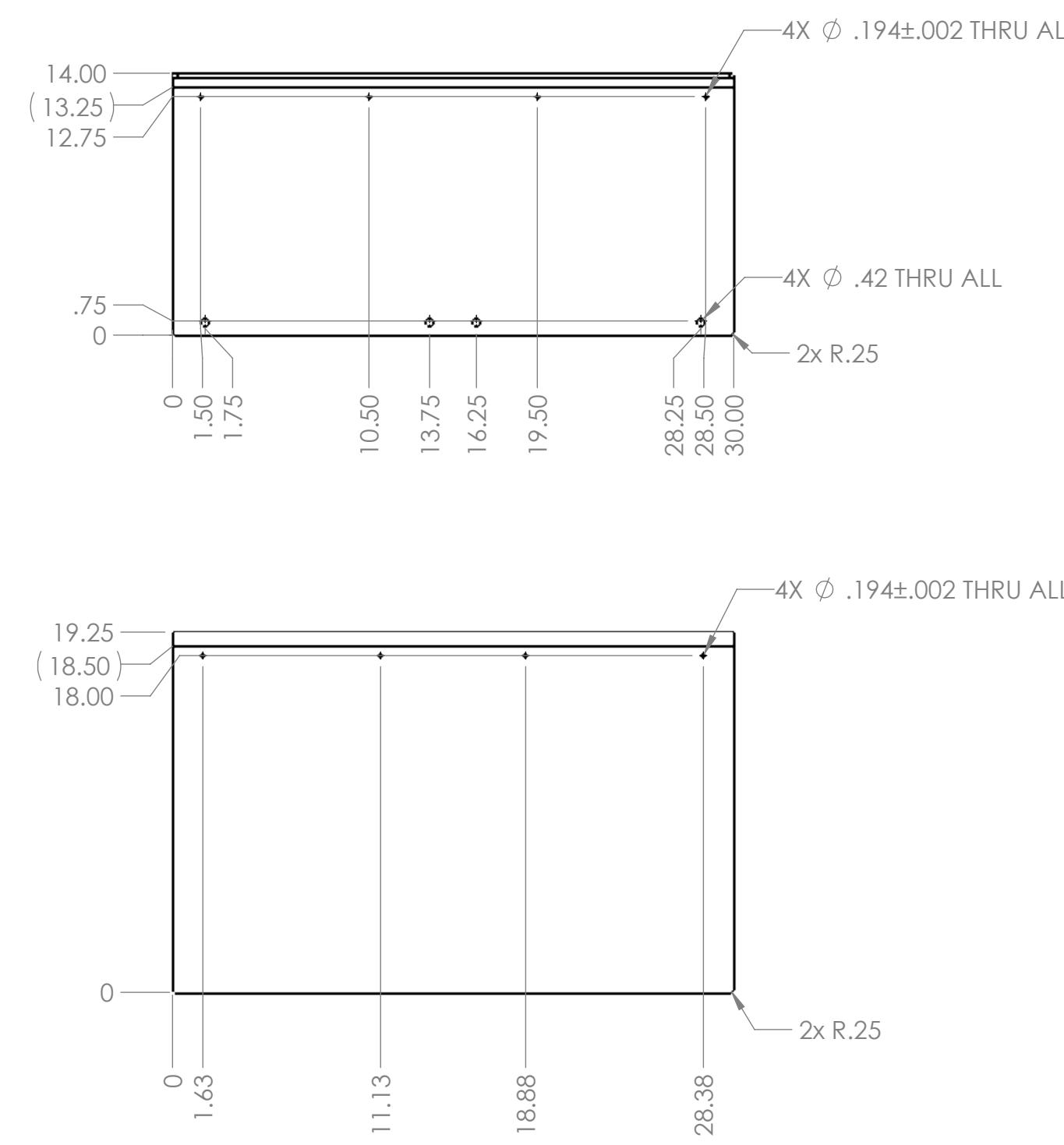
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UNLESS OTHERWISE SPECIFIED:

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:

0.25" polycarbonate, clear

DO NOT SCALE DRAWING

VEND NAME DATE

DRAWN NW 8/22/2022

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:
loading station front safety

SIZE DWG. NO. REV
C GE-23108

SCALE: 1:8 SHEET 1 OF 1

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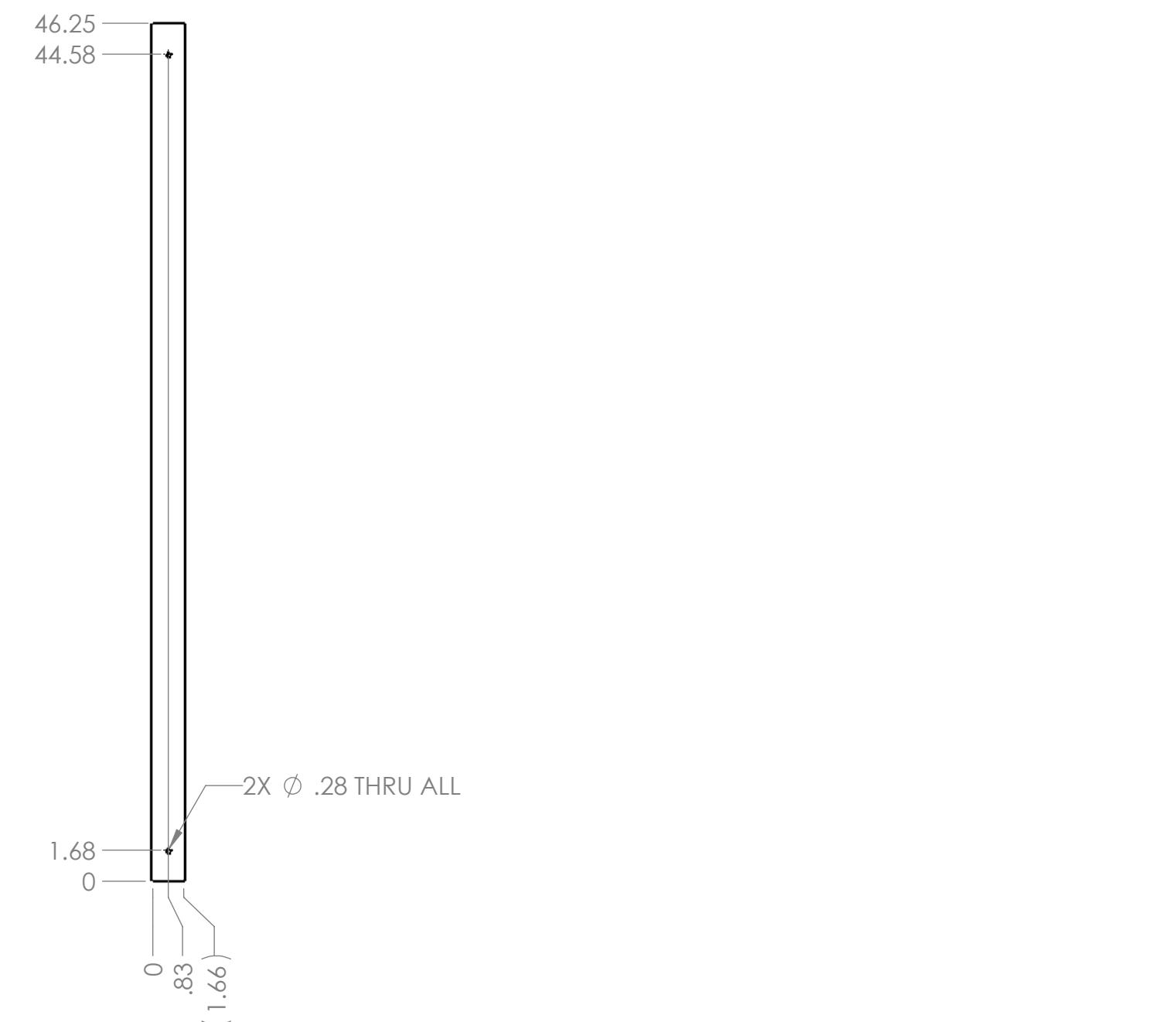
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UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	NW	7/13/2022
TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$			
TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .005$			
PROPRIETARY AND 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:			
1.25 sched 40 AL			
COMMENTS:			
REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
Andymark Top
Rail

SIZE DWG. NO. REV
C GE-23109

SCALE: 1:8 SHEET 1 OF 1

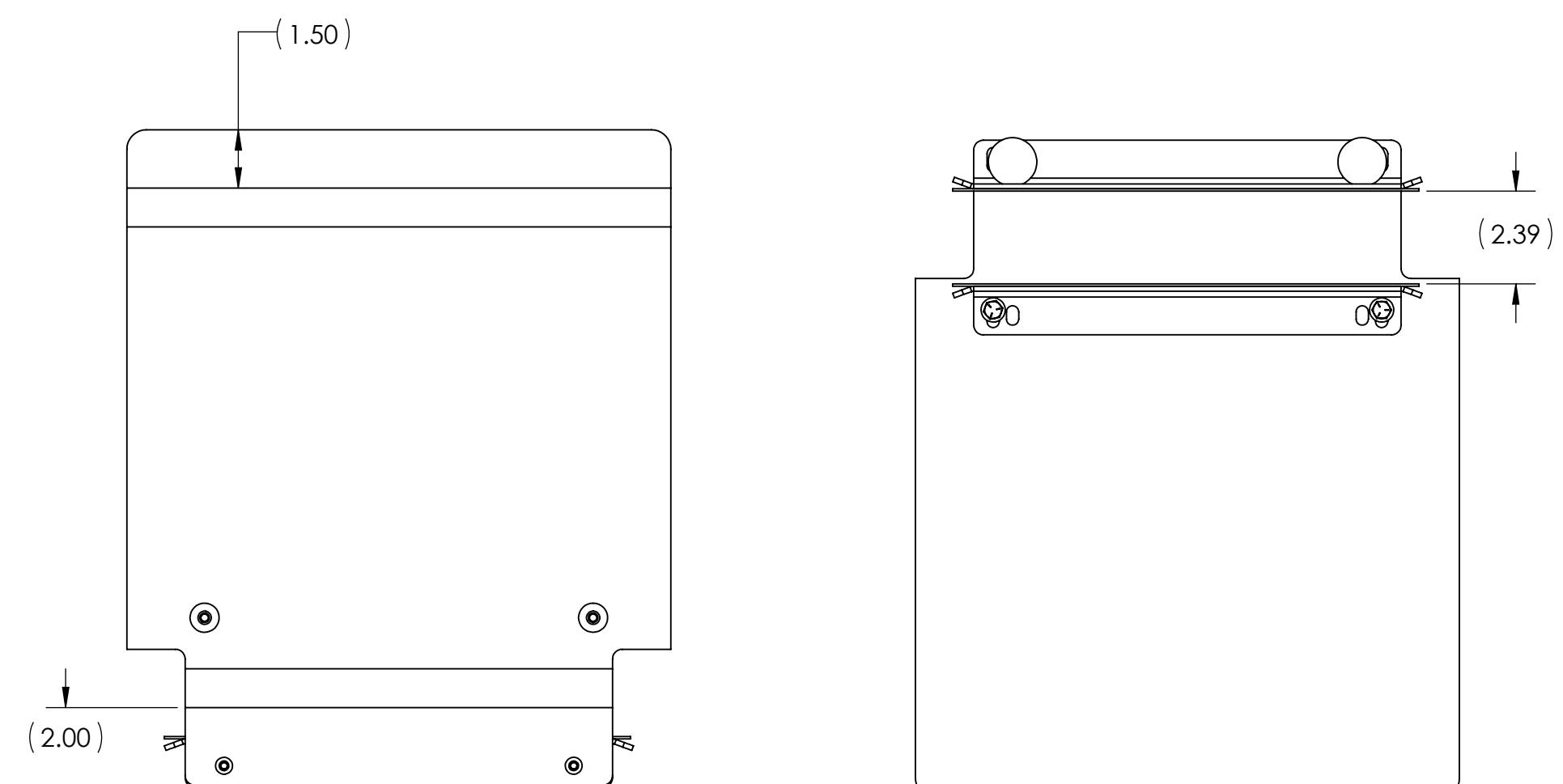
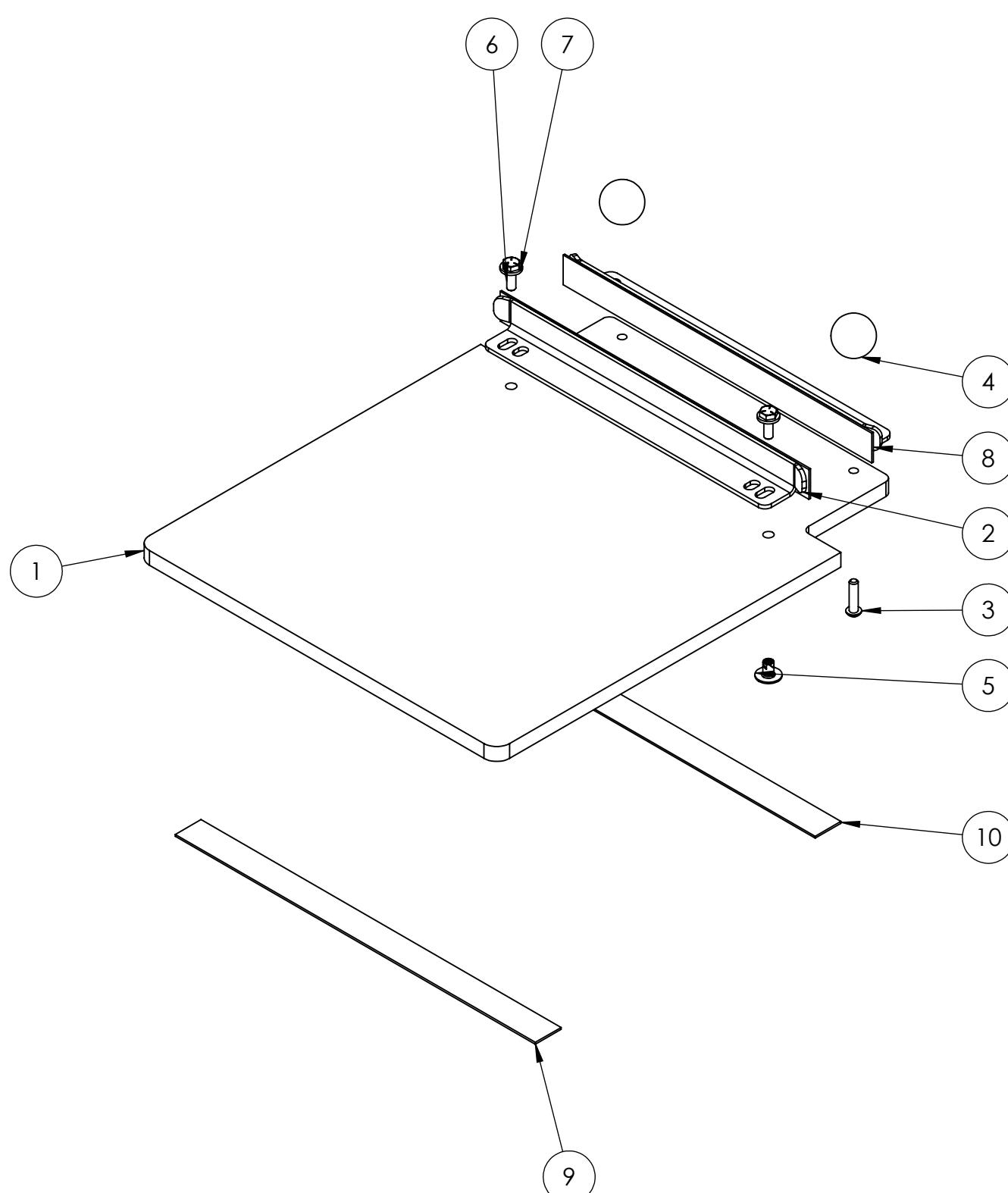
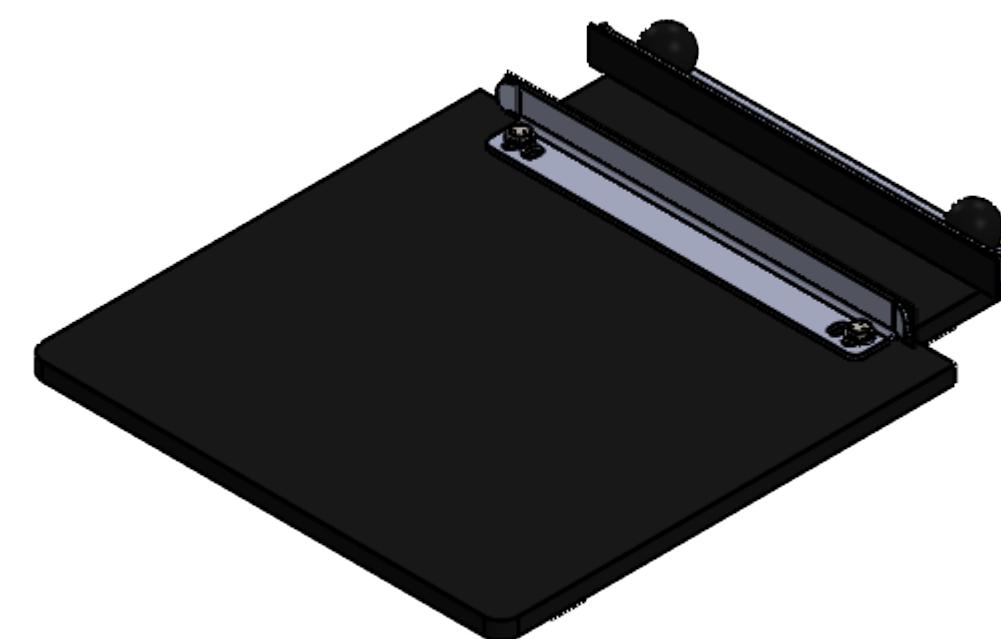
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23110-01	Base,Slide	1
2	GE-23110-02	Angle capture, Slide	2
3	round_hex_.25_20_1_fu	Steel Button Head Hex Drive Screw, 1/4"-20 x 1" long, fully threaded	2
4	knob_round_threaded_hole_.25_20	Comfort-Grip Plastic Ball Knob	2
5	TeeNut_ultra_split_rst_.25_20	.25-20 TeeNut ultra split resistant	2
6	hex_.25_20_0.75	Steel Hex Head Screw, 1/4"-20 x 0.75" long, fully threaded	2
7	washer_flat_.25	Flat Washer for 1/4" Screw	2
8	Loop_1_12	1" x 13" Loop, Adhesive Backed	2
9	Loop_1_14	1" x 14" Loop, Adhesive Backed	1
10	Loop_1_11	11" x 1" loop adhesive backed	1



Note:

1. Spacing between (2) may vary per field set to slide easily per double substation.
2. Range for spacing on (9) and (10) may vary per field set to land at any point on the frame.

UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DRAWN	NW	12/29/2022	
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

slide assembly

SIZE	DWG. NO.	REV
C	GE-23110	
SCALE: 1:4	SHEET 1 OF 1	

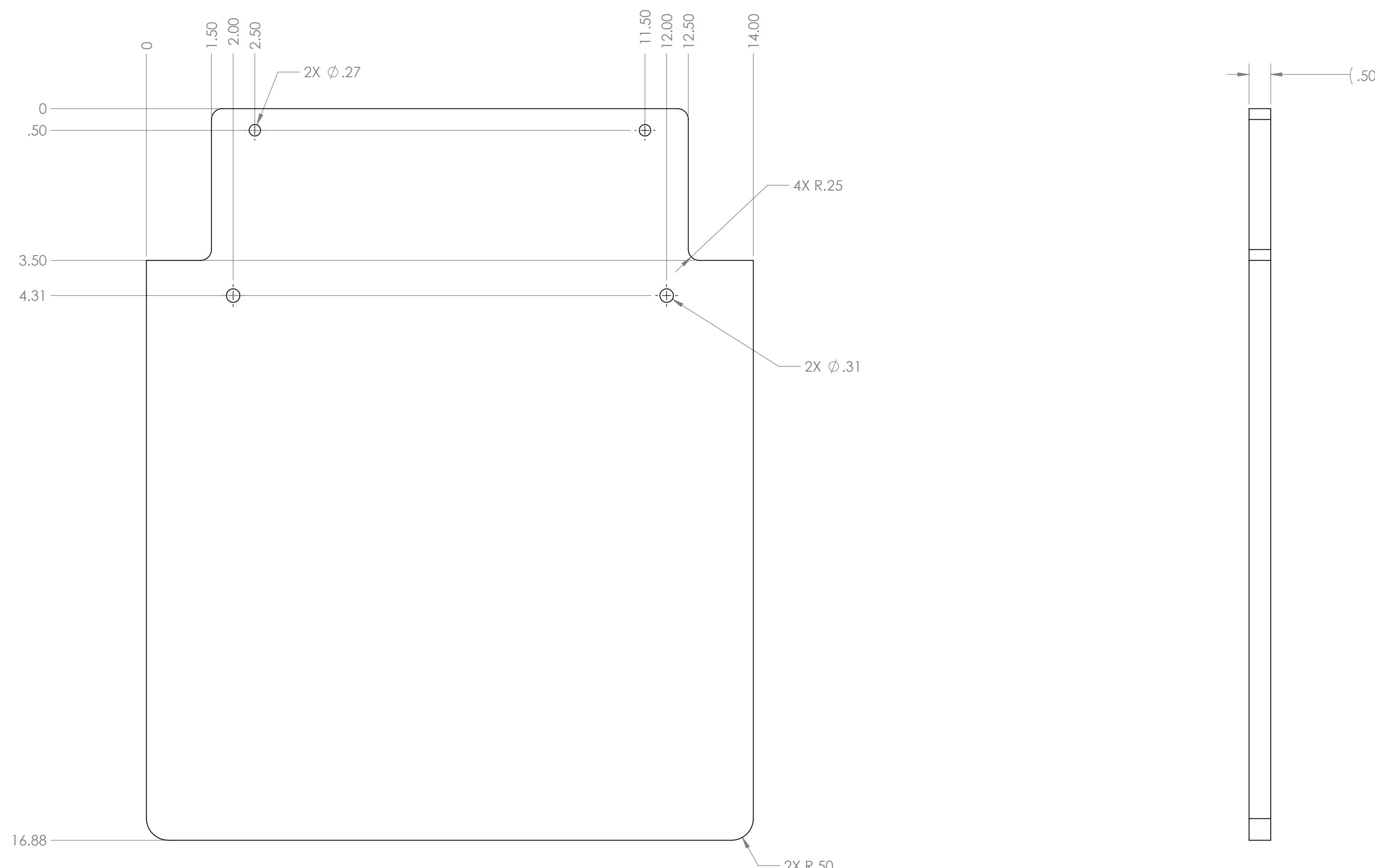
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UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	DF	7/18/2022	
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH:	SIZE	DWG. NO.	REV
.5" HDPE, Black Texture	C	GE-23110-01	
COMMENTS:		SCALE: 1:2	
REMOVE ALL BURRS AND SHARP EDGES.		SHEET 1 OF 1	
DO NOT SCALE DRAWING			

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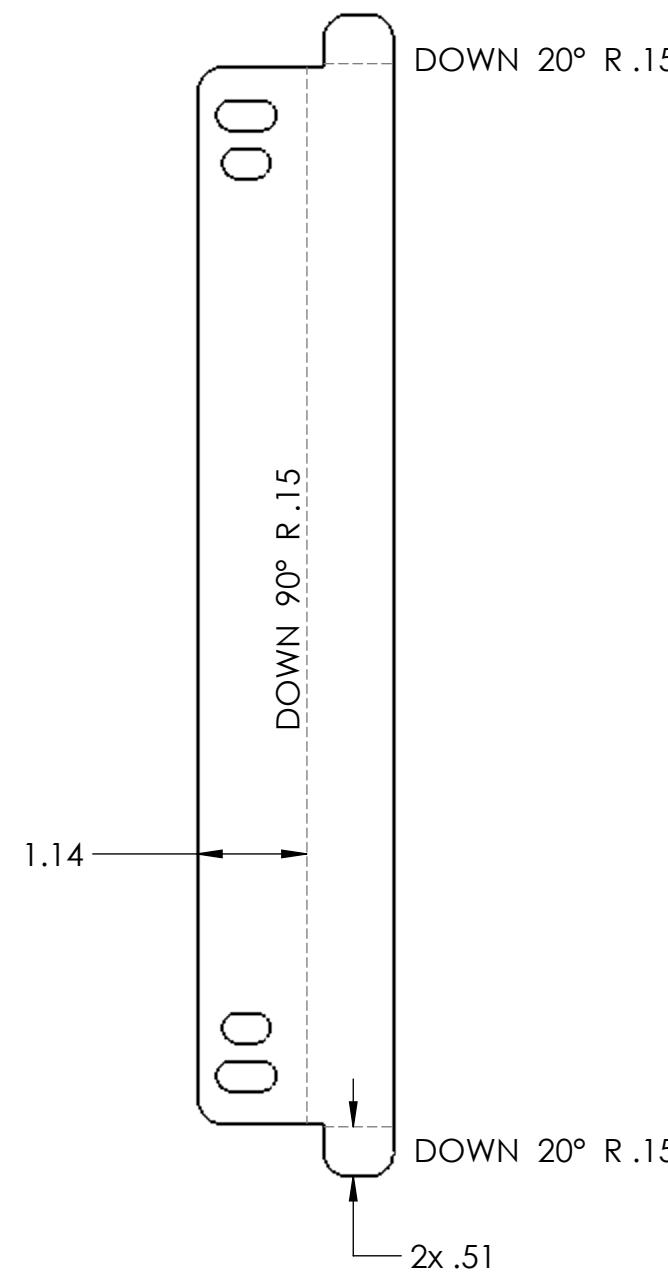
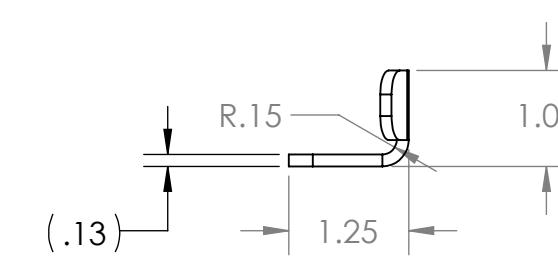
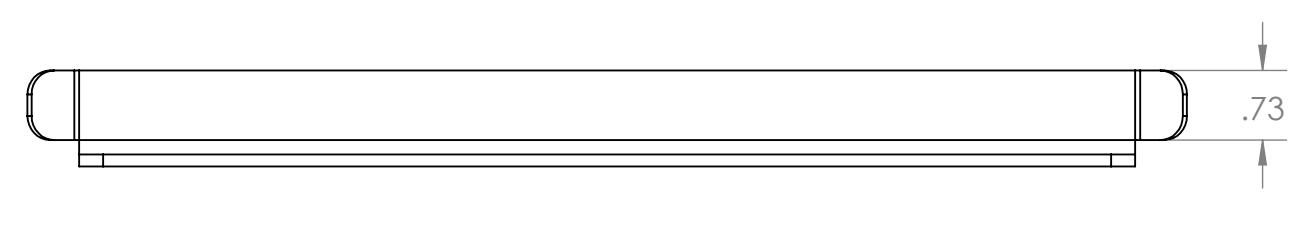
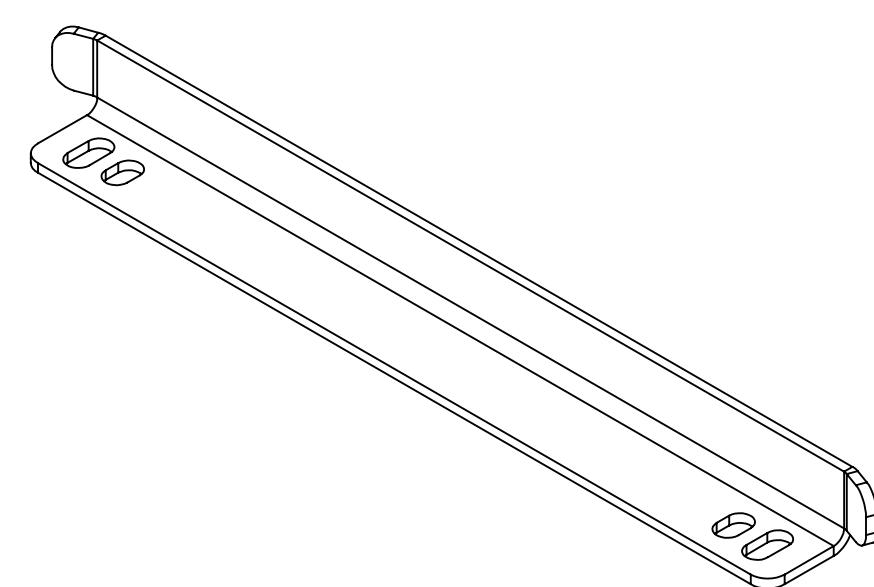
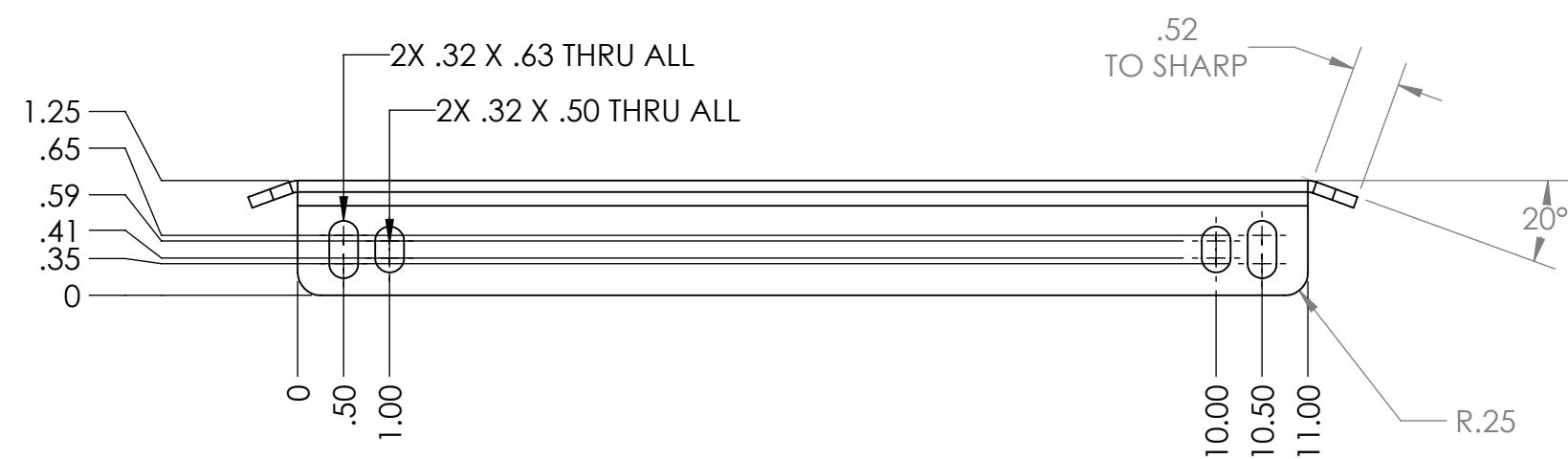
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UNLESS OTHERWISE SPECIFIED:	BEND	NAME	DATE
DRAWN	DF	7/18/2022	
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH: .125 AL 6061			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
Angle capture,
Slide

SIZE DWG. NO. REV
C GE-23110-02

SCALE: 1:2 SHEET 1 OF 1

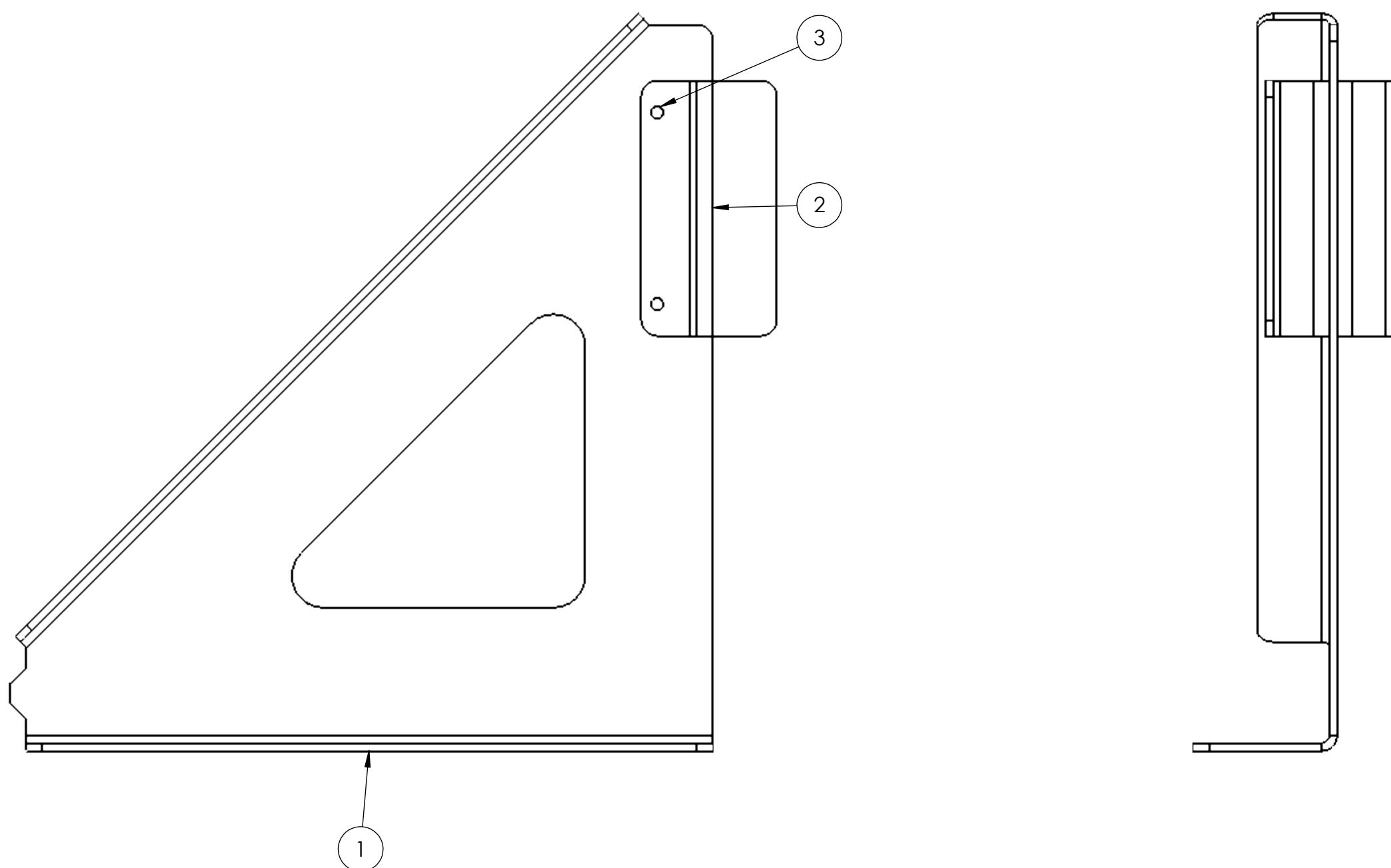
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23111-01	Brace, foot/ramp	1
2	GE-23111-03	brace, Z bracket	2
3	rivet_.1875_.376-.5	3/16" Aluminum Rivet, .376-.5 Grip Range	2



Notes:

1. Rivet (2) QTY 2 to (1).

UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	NW	8/23/2022
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			

FIRST ROBOTICS COMPETITION SOLIDWORKS Modeling Solutions Partner

Grill, Brace foot/ramp

SIZE DWG. NO. REV
C GE-23111

SCALE: 1:2 SHEET 1 OF 1

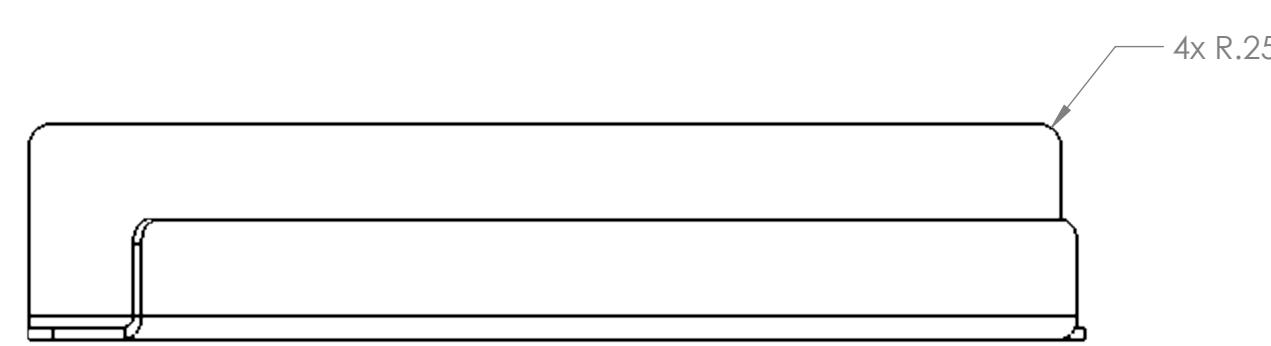
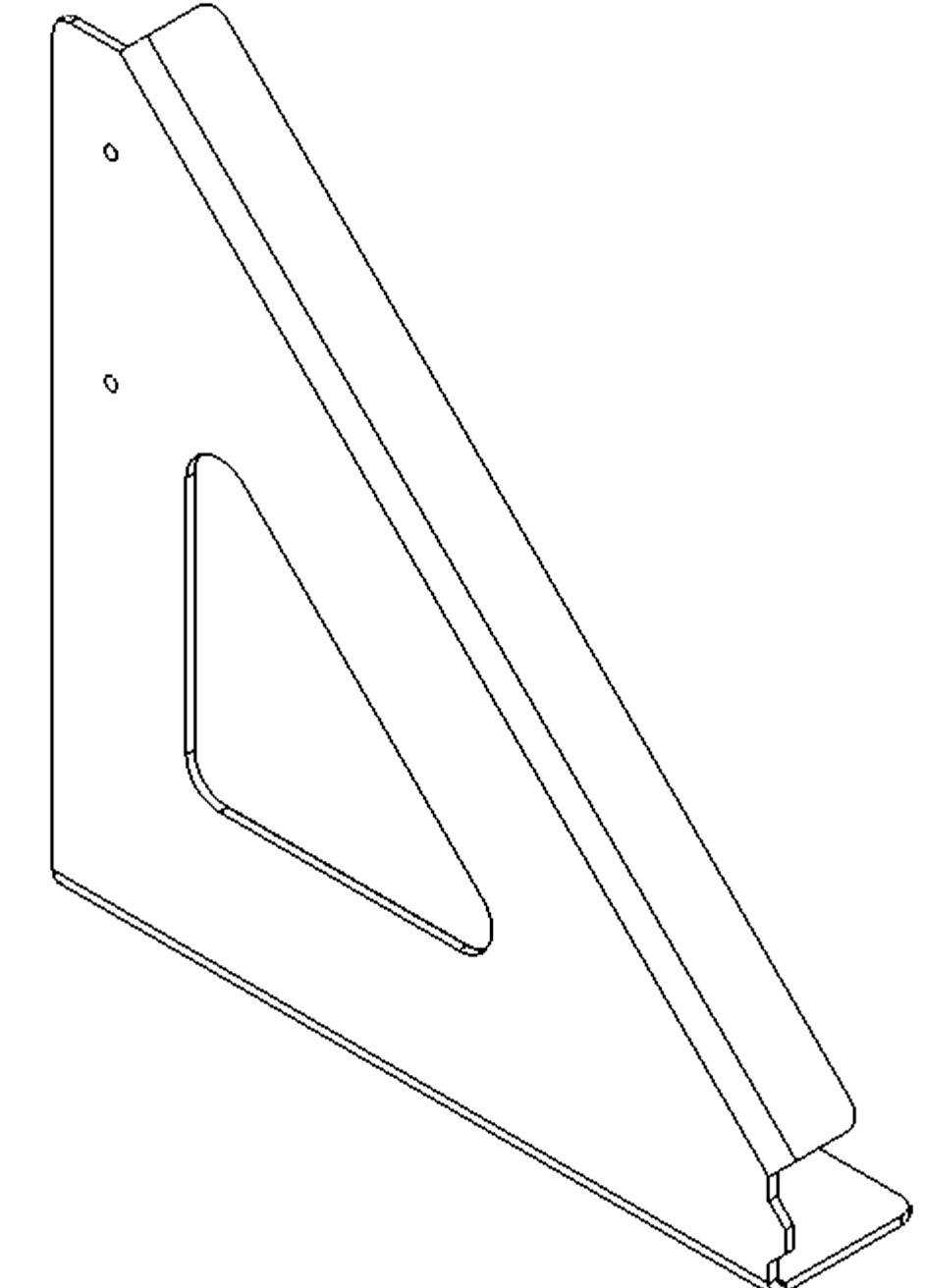
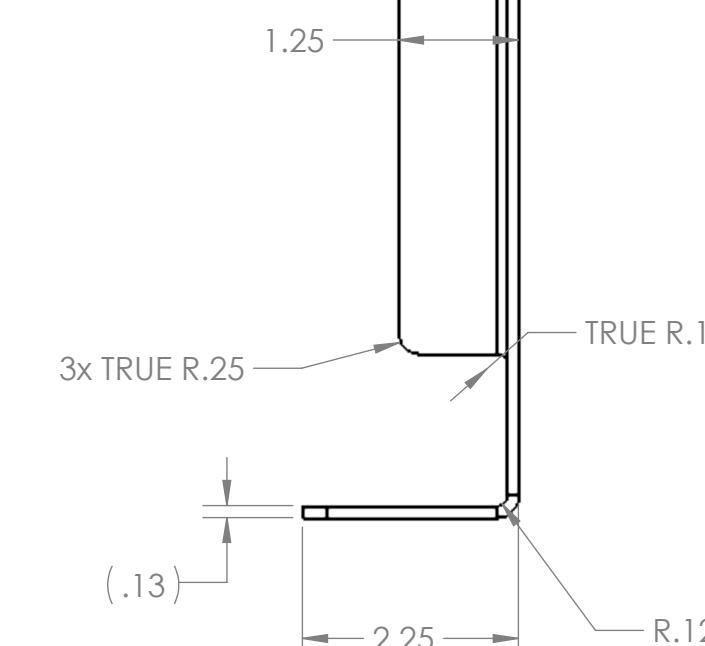
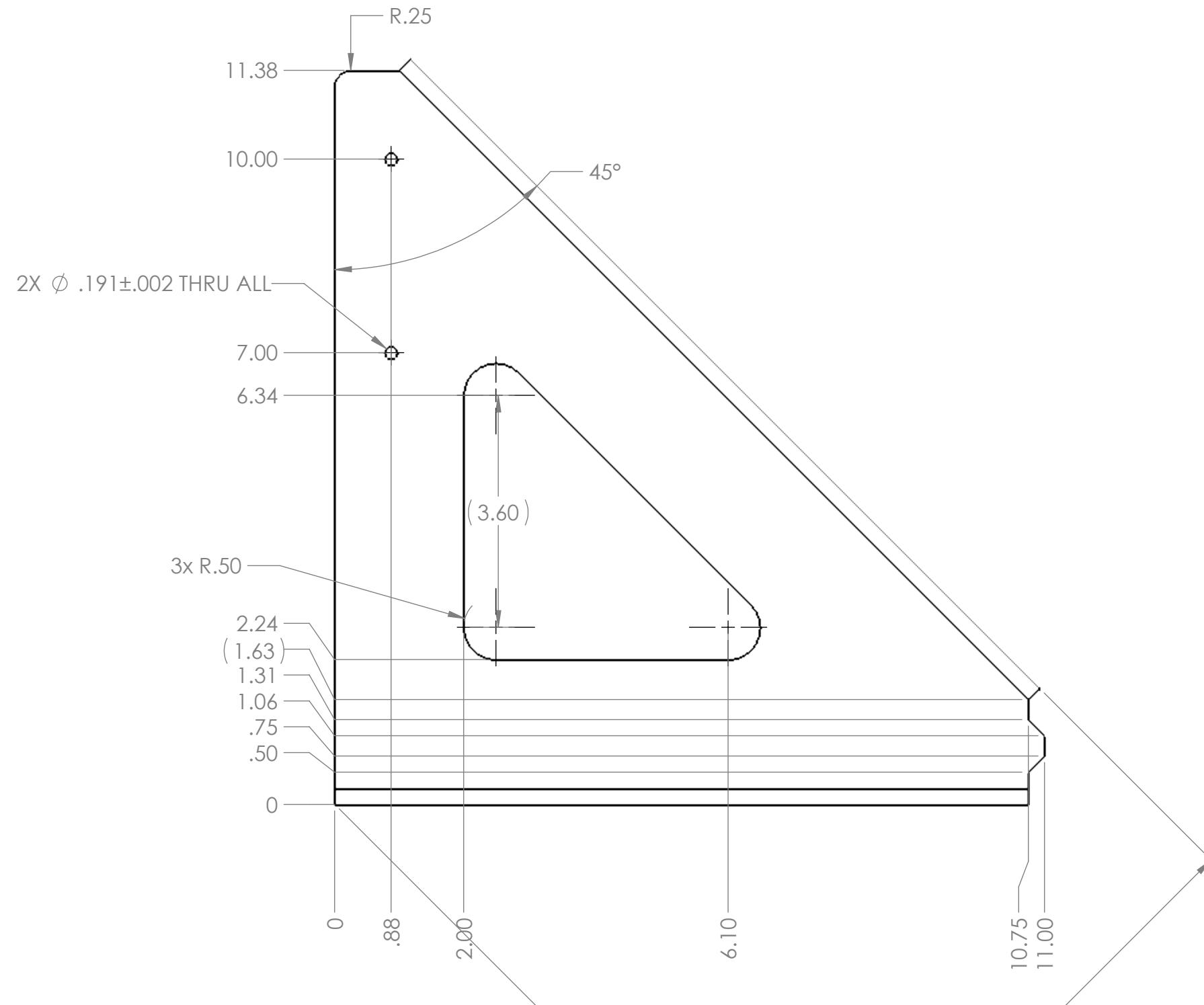
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UNLESS OTHERWISE SPECIFIED:	BEND	NAME	DATE
DRAWN	NW	8/23/2022	
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH:	.125 AL 6061 or 5052		
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			
FIRST ROBOTICS COMPETITION			
SOLIDWORKS Modeling Solutions Partner			
TITLE:	Brace, foot/ramp		
SIZE	DWG. NO.	REV	
C	GE-23111-01		
SCALE: 1:2	SHEET 1 OF 1		

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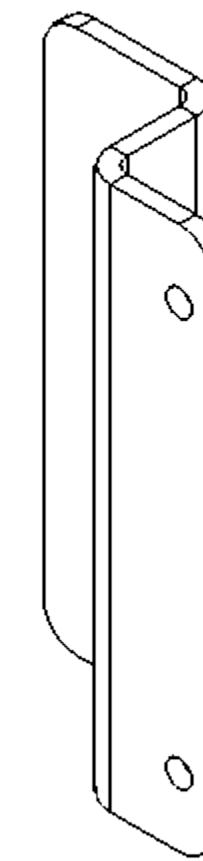
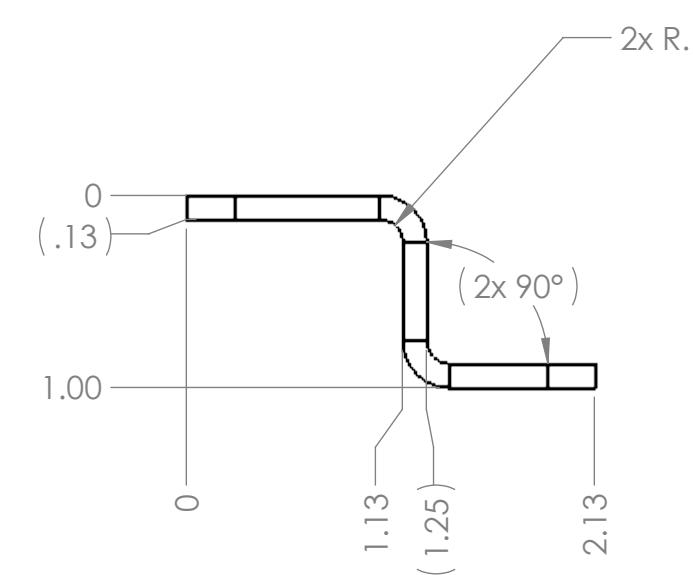
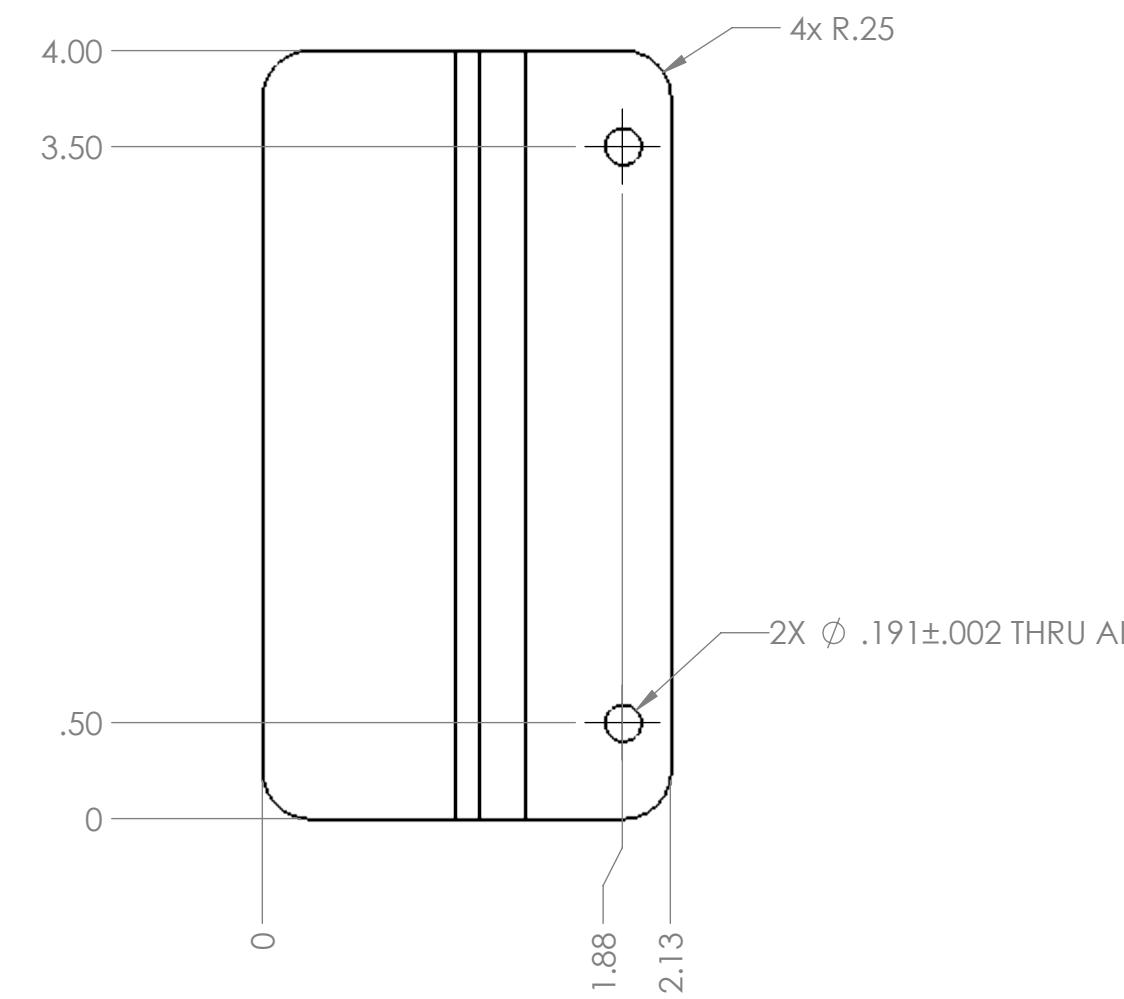
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UNLESS OTHERWISE SPECIFIED:	BEND	NAME	DATE
DRAWN	NW	8/23/2022	
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH:			
.125 AL 6061 or 5052			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

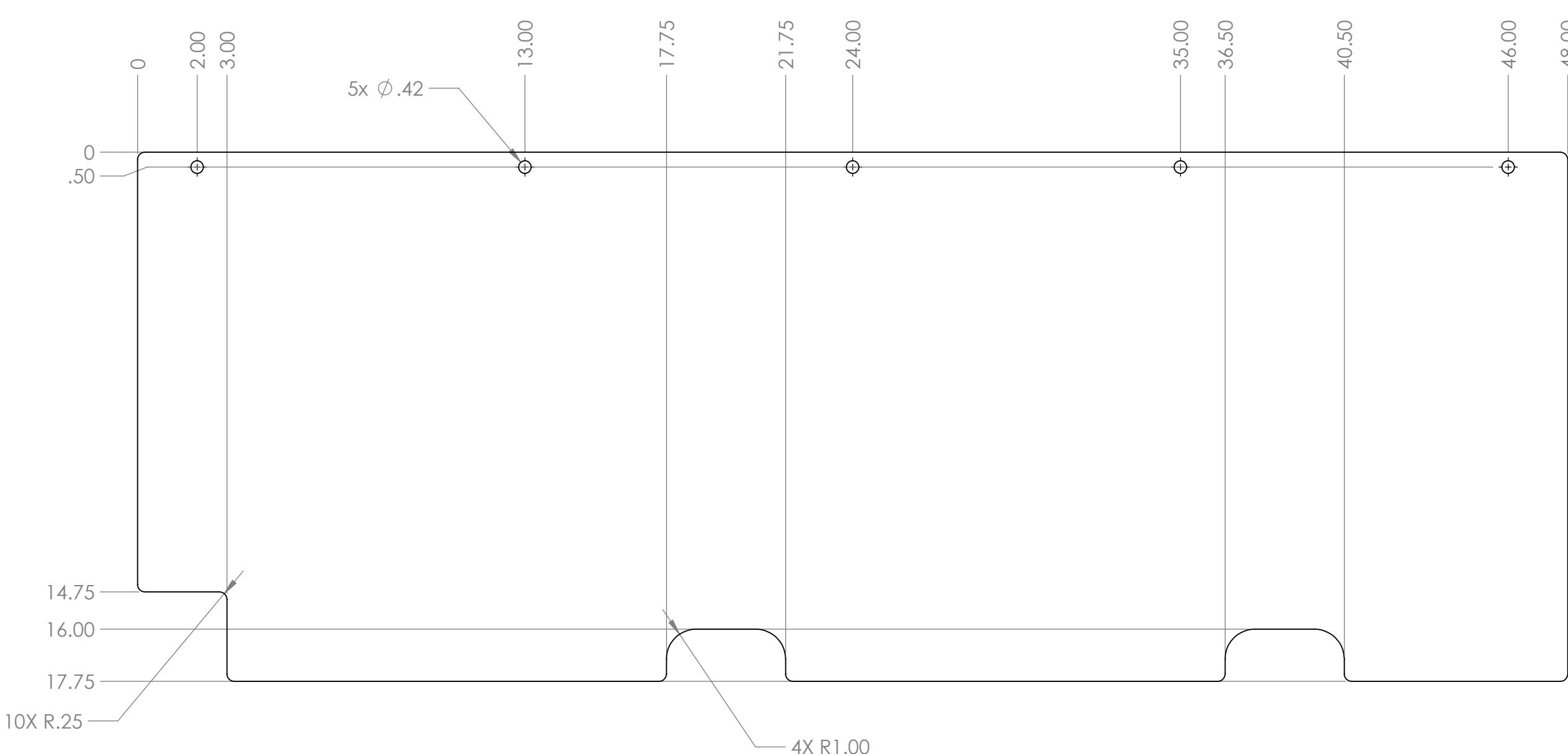
FIRST ROBOTICS COMPETITION	SOLIDWORKS Modeling Solutions Partner
TITLE:	brace, Z bracket
SIZE	DWG. NO.
C	GE-23111-03
REV	
SCALE: 1:1	SHEET 1 OF 1

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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	DF	7/19/2022
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
.25" polycarbonate, clear	C	GE-23112	
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:
Ramp plastic

SIZE DWG. NO. REV

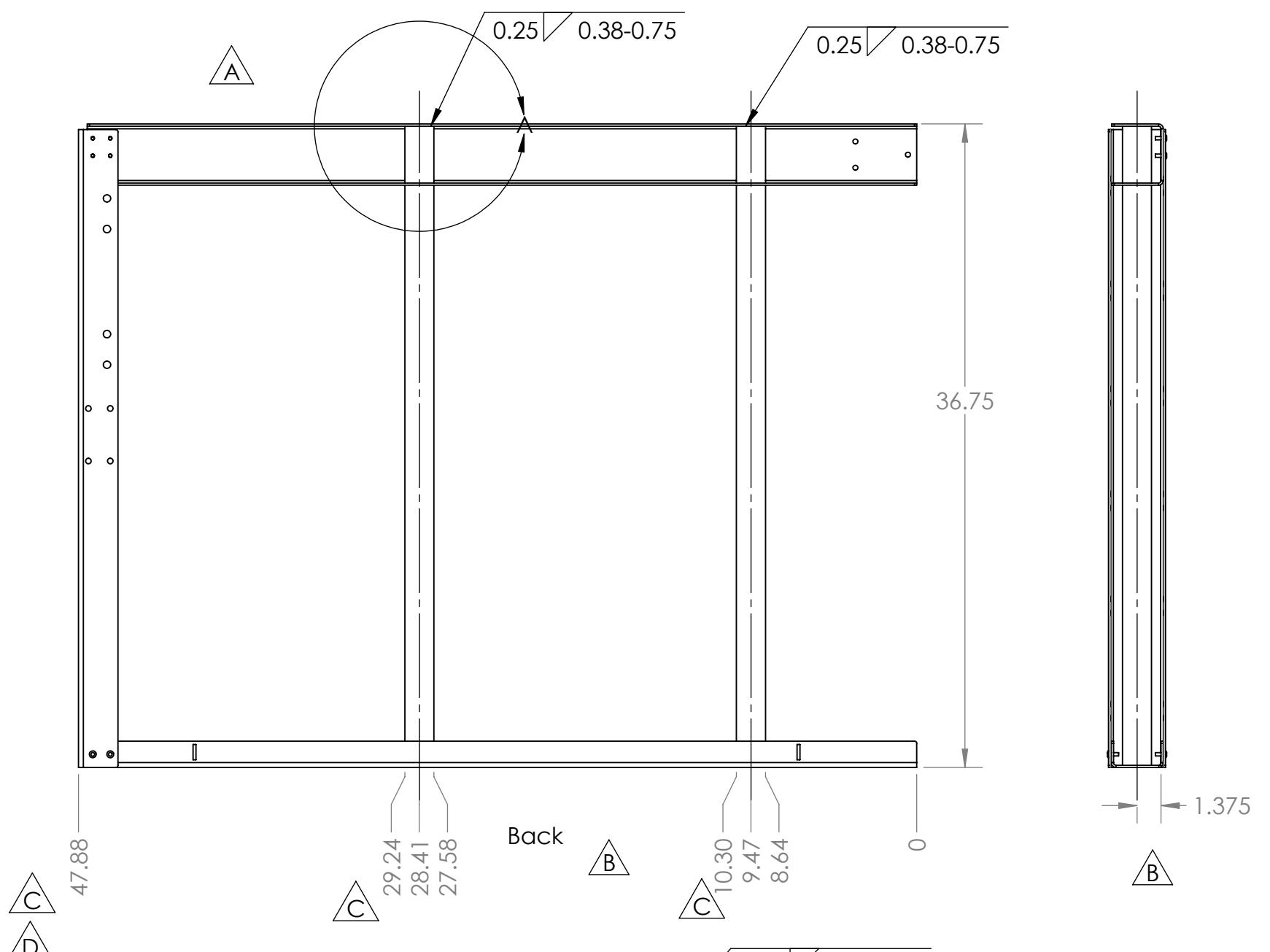
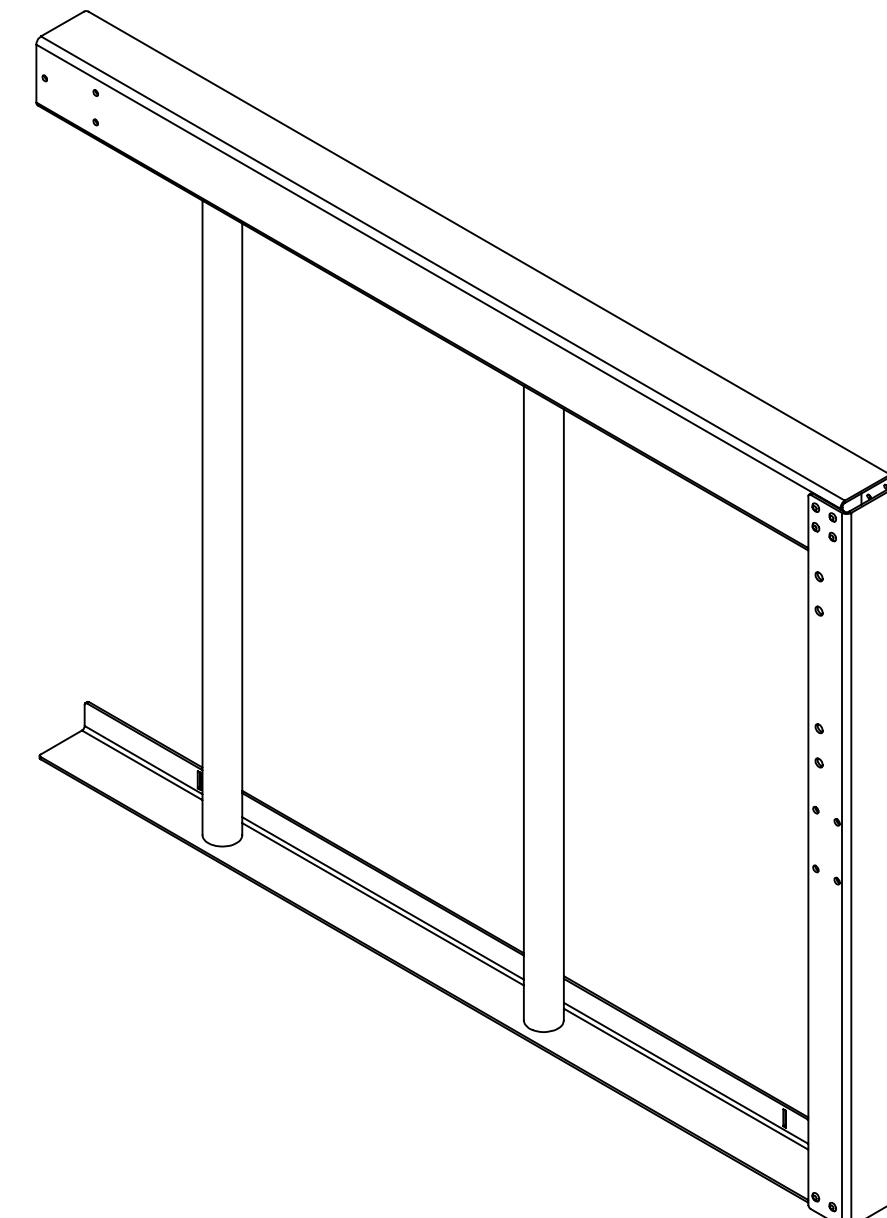
C GE-23112

SCALE: 1:4 SHEET 1 OF 1

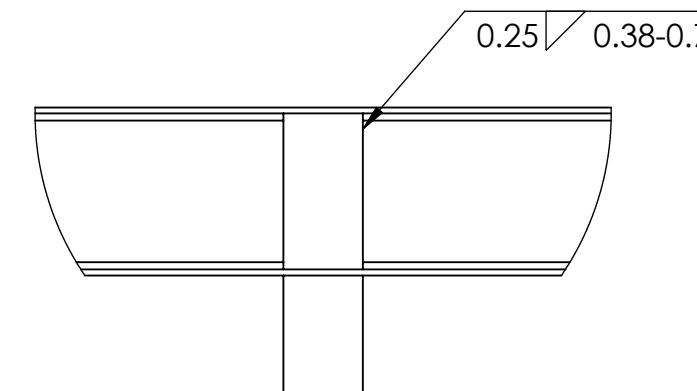
ITEM NO.	WELD SIZE	SYMBOL	WELD LENGTH	WELD MATERIAL	QTY.
1	0.25	△	0.38-0.75{1.5}		4

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23113-01	grill, base (field)	1
2	GE-23113-02	Grill, Bar 2	2
3	GE-23113-03	Grill, Top 2	1
4	GE-23113-04	Grill, Side 2	1
5	rivet_.1875_.251-.375	3/16" Aluminum Rivet, .251-.375 Grip Range	8

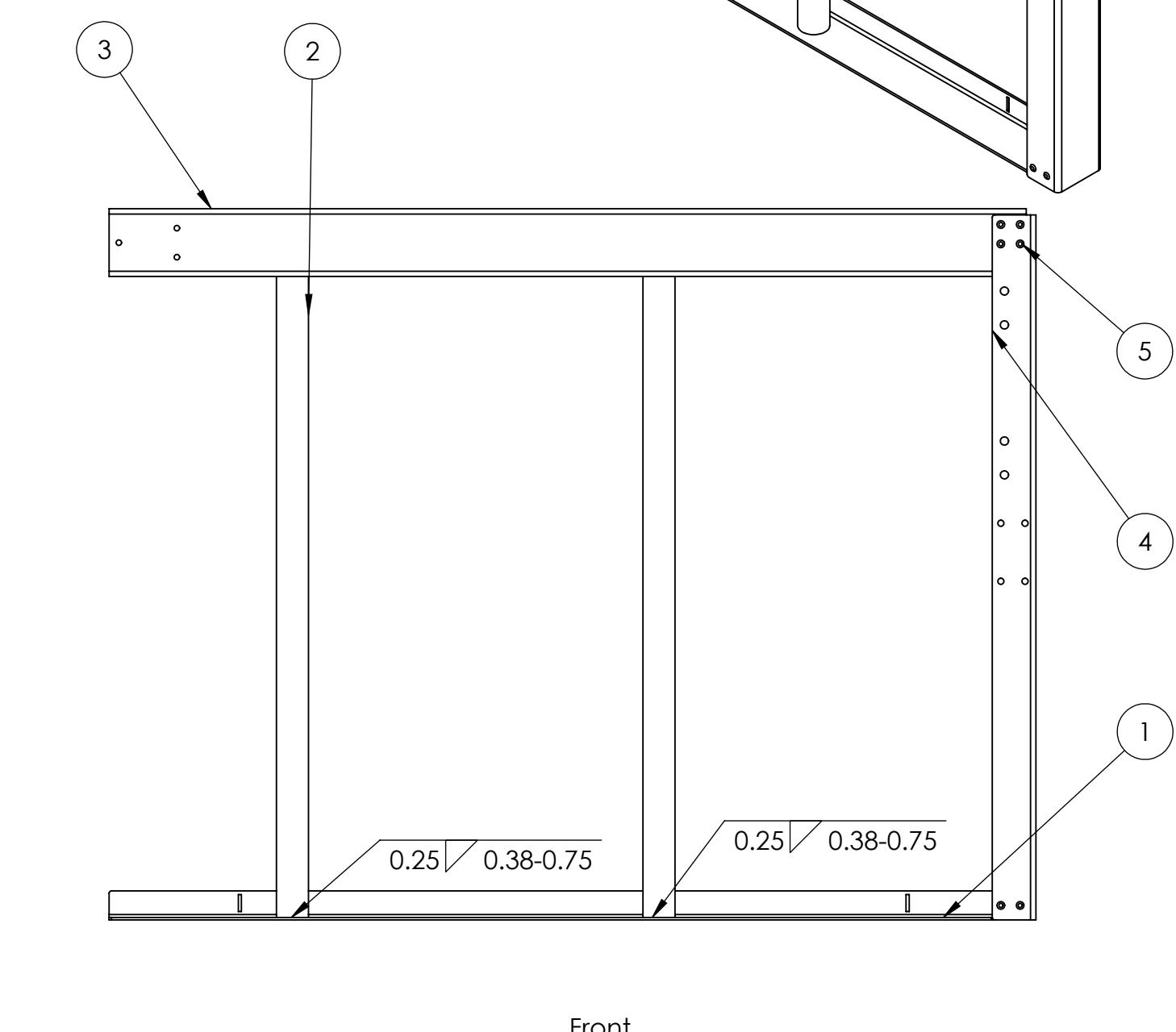
REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
C4	A	Removed holes, and now welds flat to under surface.	9/12/2022	NTW
B2, B3	B	removed bottom hole for weld and dims. for jig	10/26/2022	NTW
A3, B4	C	Added dimensions to back view.	11/17/2022	CPO
A4	D	overall length change -1"	12/6/2022	NTW



Notes:
1. Weld intermittent to keep from warping.
2. Rivet in 8 places prior to welding.



DETAIL A
SCALE 1 : 4



UNLESS OTHERWISE SPECIFIED:	WELD	NAME	DATE
DRAWN	NW	7/27/2022	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:			
DO NOT SCALE DRAWING			

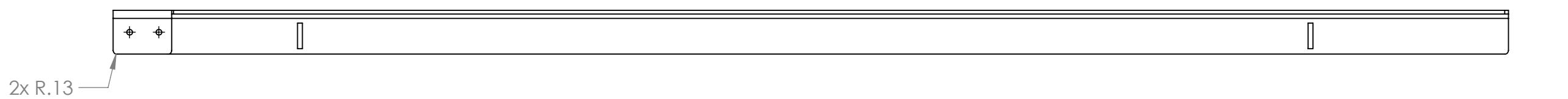
FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Grill, Loading Station (field)

SIZE	DWG. NO.	REV
C	GE-23113	D
SCALE: 1:8		SHEET 1 OF 1

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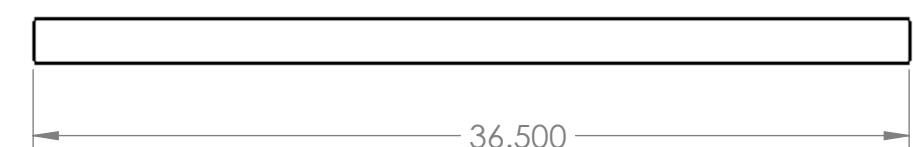
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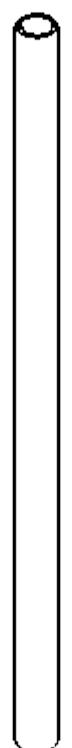
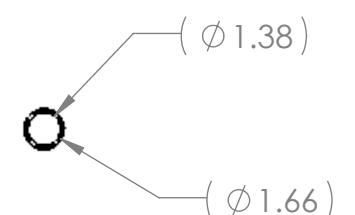
C

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A B



REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
C3	A	36.625 was 37.5	9/12/2022	NTW
C3	B	36.625 now 36.5	10/26/2022	NTW

C

C

B

B

A

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:

1.25 sch 40, 6061 AL

DO NOT SCALE DRAWING

VEND DATE
DRAWN NW 8/30/2022

PROPRIETARY AND CONFIDENTIAL

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COMMENTS:

REMOVE ALL BURRS AND SHARP EDGES.

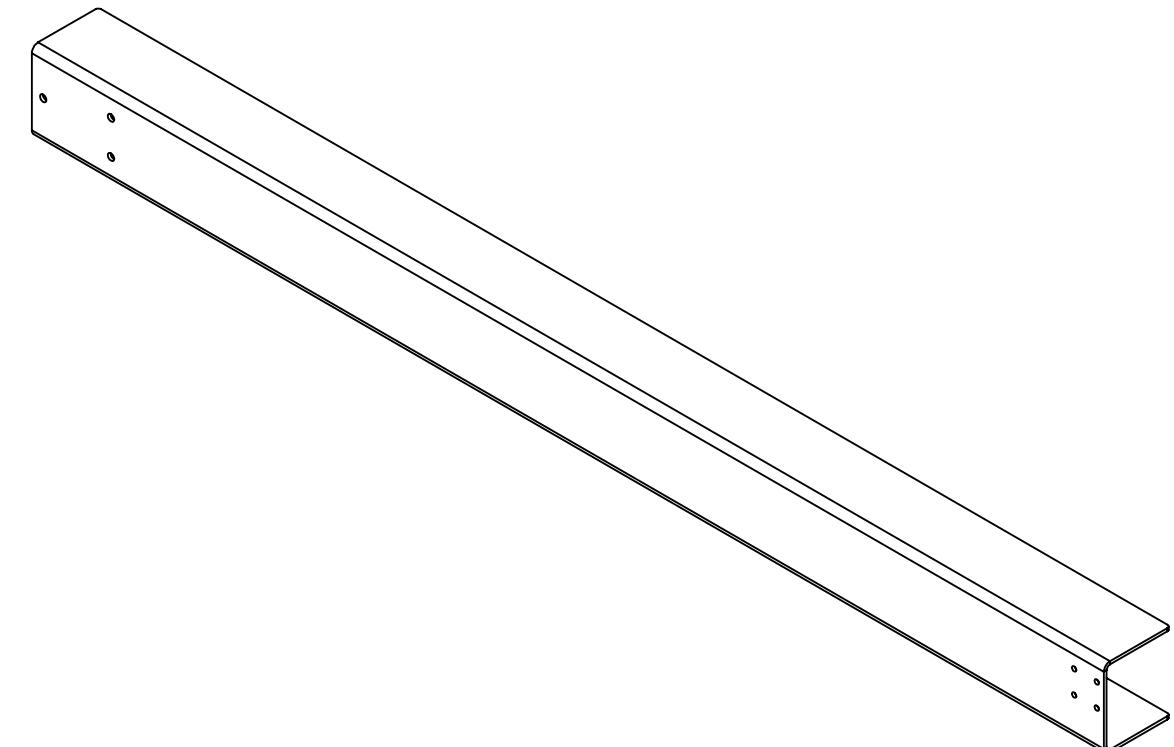
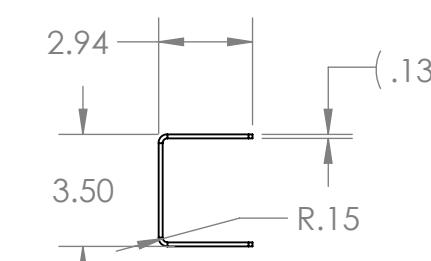
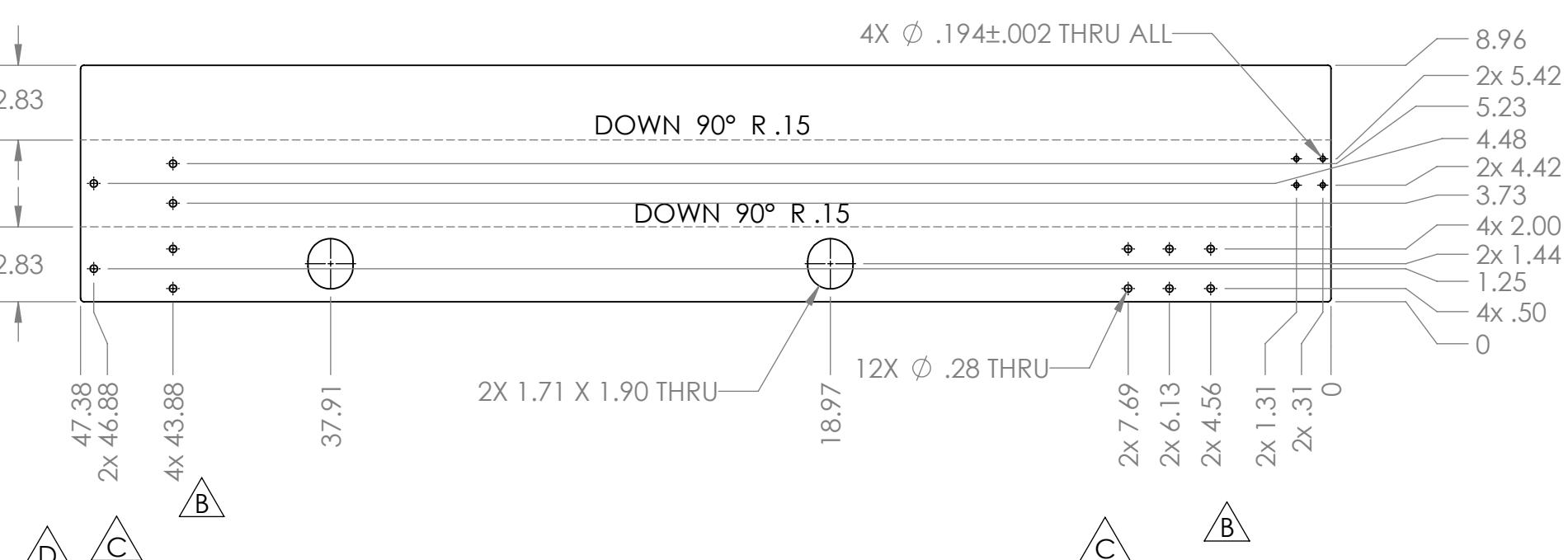
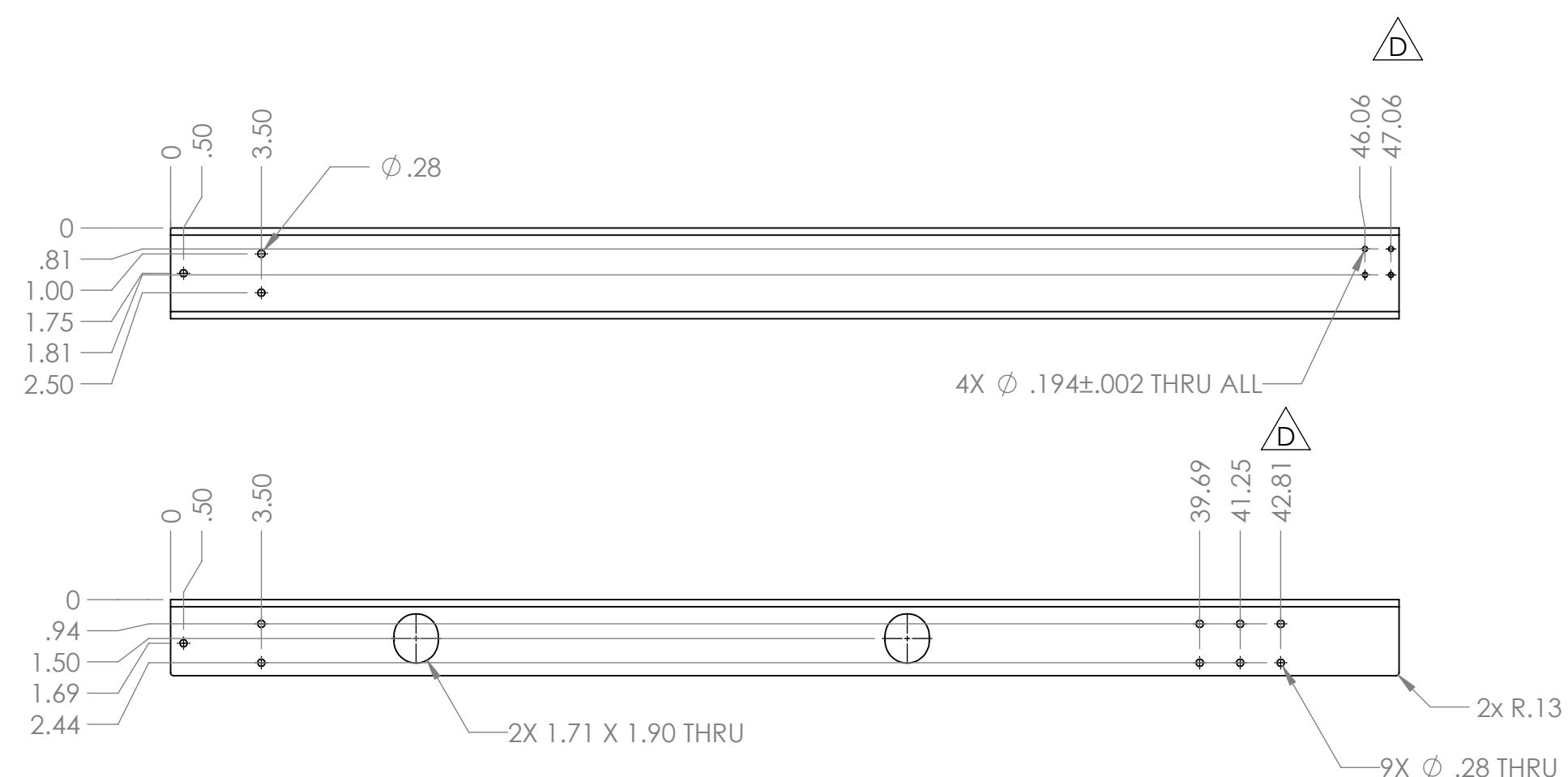
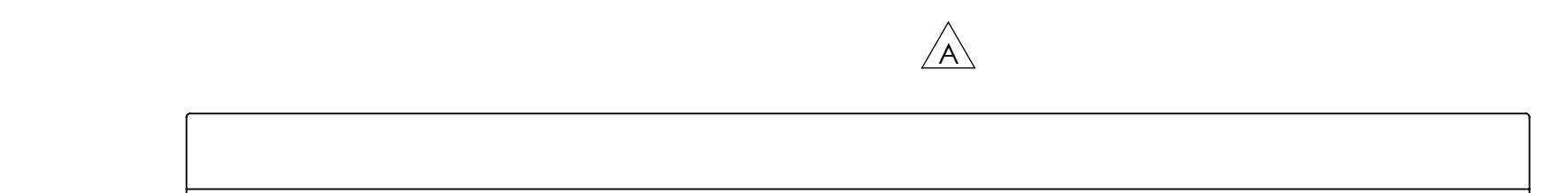
FIRST ROBOTICS COMPETITION
SOLIDWORKS
Modeling Solutions Partner

TITLE:
Grill, Bar 2

SIZE DWG. NO. REV
C GE-23113-02 B

SCALE: 1:8 SHEET 1 OF 1

D



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:**

.125 AL 6061 or 5052

DO NOT SCALE DRAWING

BEND NAME DATE

DRAWN DF 7/20/2022

PROPRIETARY AND CONFIDENTIAL

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COMMENTS:

REMOVE ALL BURRS AND SHARP EDGES.

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
D3	A	Removed 1.71 holes from top face for weld surface	9/12/2022	NTW
A3, A4, B2	B	Added various dimensions to part flat pattern.	11/2/2022	CPO
A3, A4	C	Modified part overall length.	11/17/2022	CPO
A4, C3, D3	D	Changed to reflect removing 1"	12/6/2022	NTW

 FIRST ROBOTICS COMPETITION

 SOLIDWORKS

TITLE:

Grill, Top 2

SIZE DWG. NO.

REV

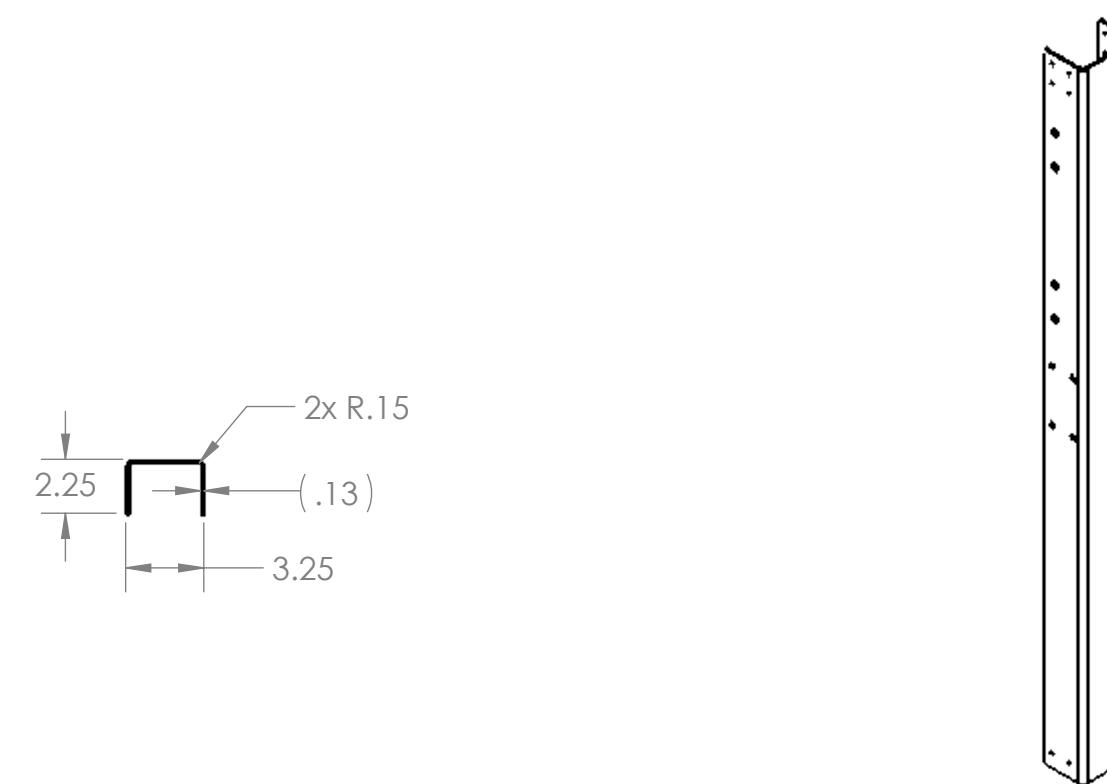
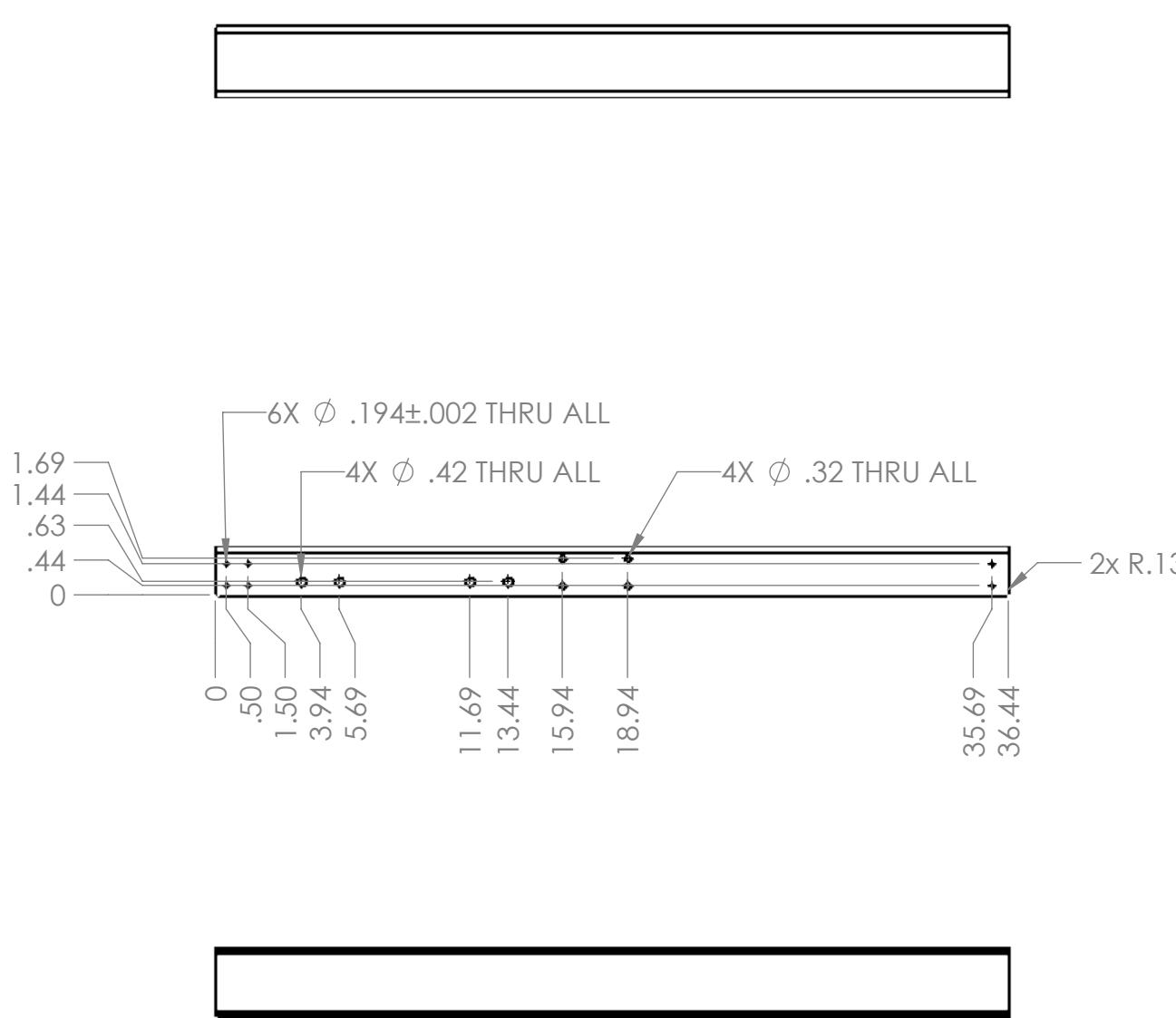
C GE-23113-03 D

SCALE: 1:6 SHEET 1 OF 1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
A3, A4, B3, B4	A	Added various dimensions to flat pattern.	11/2/2022	CPO

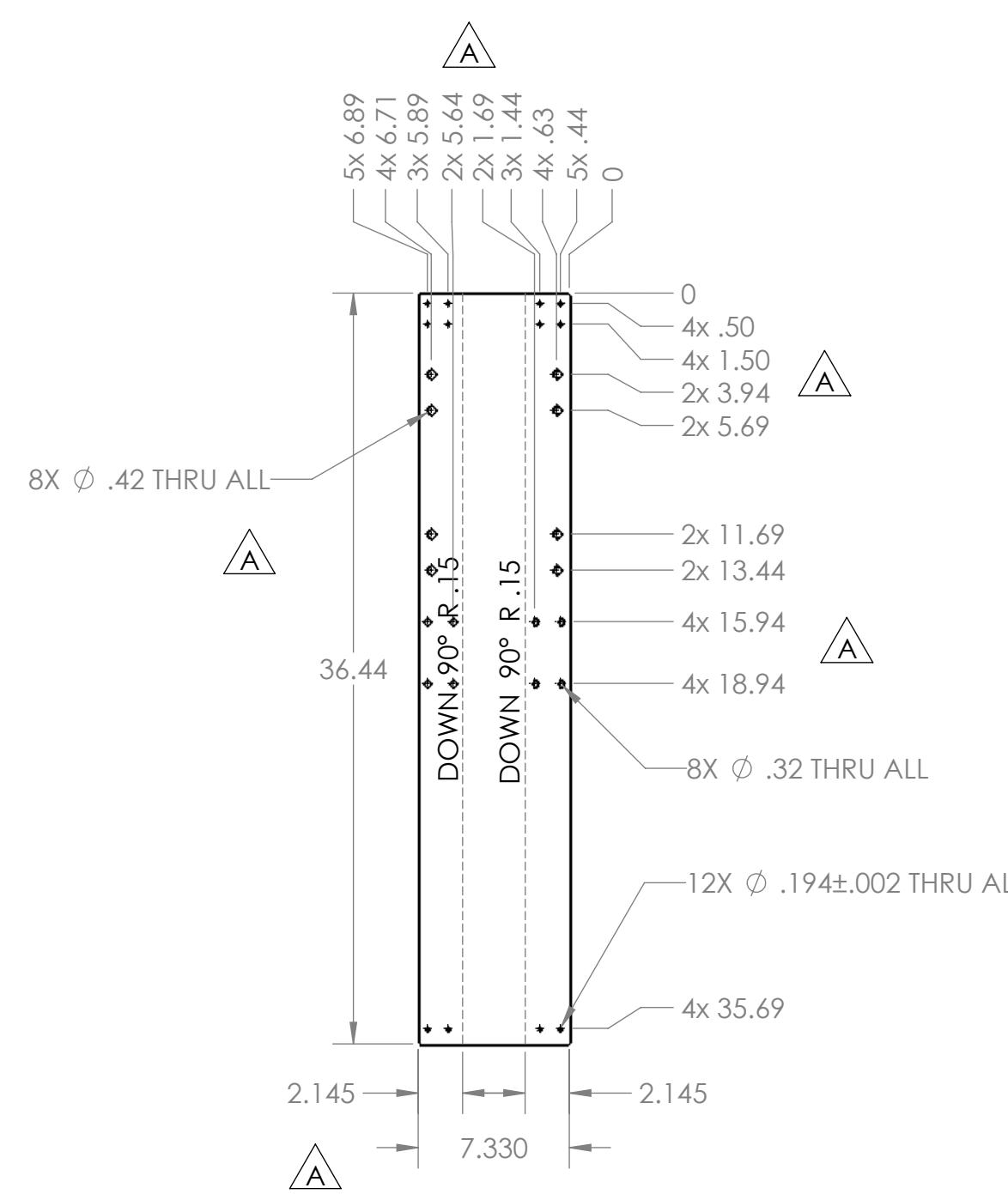
D



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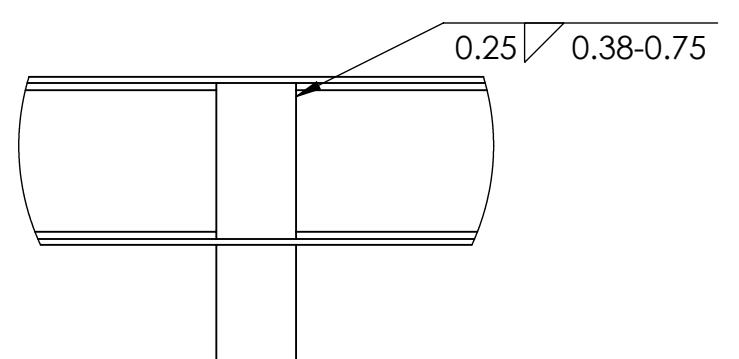
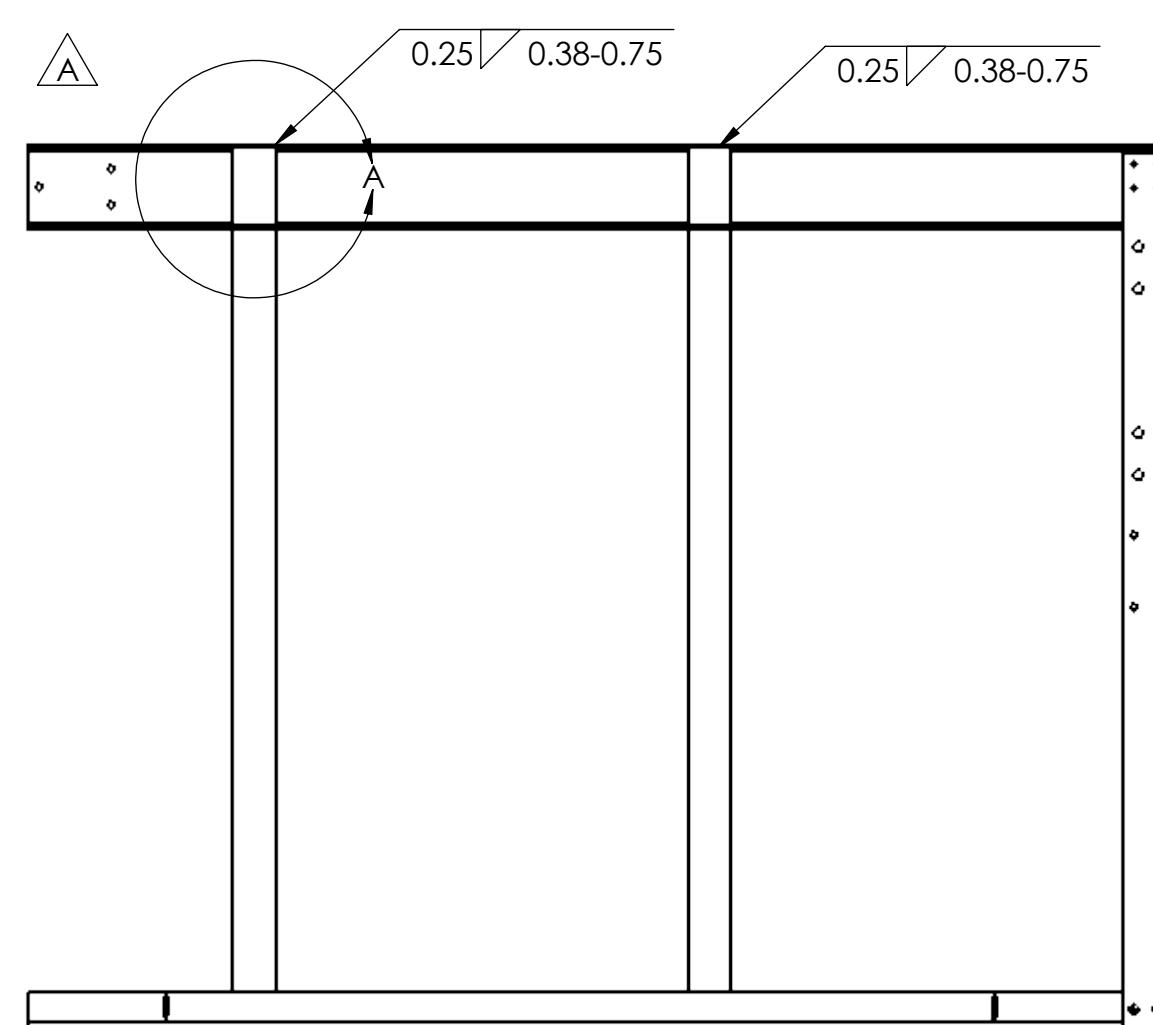
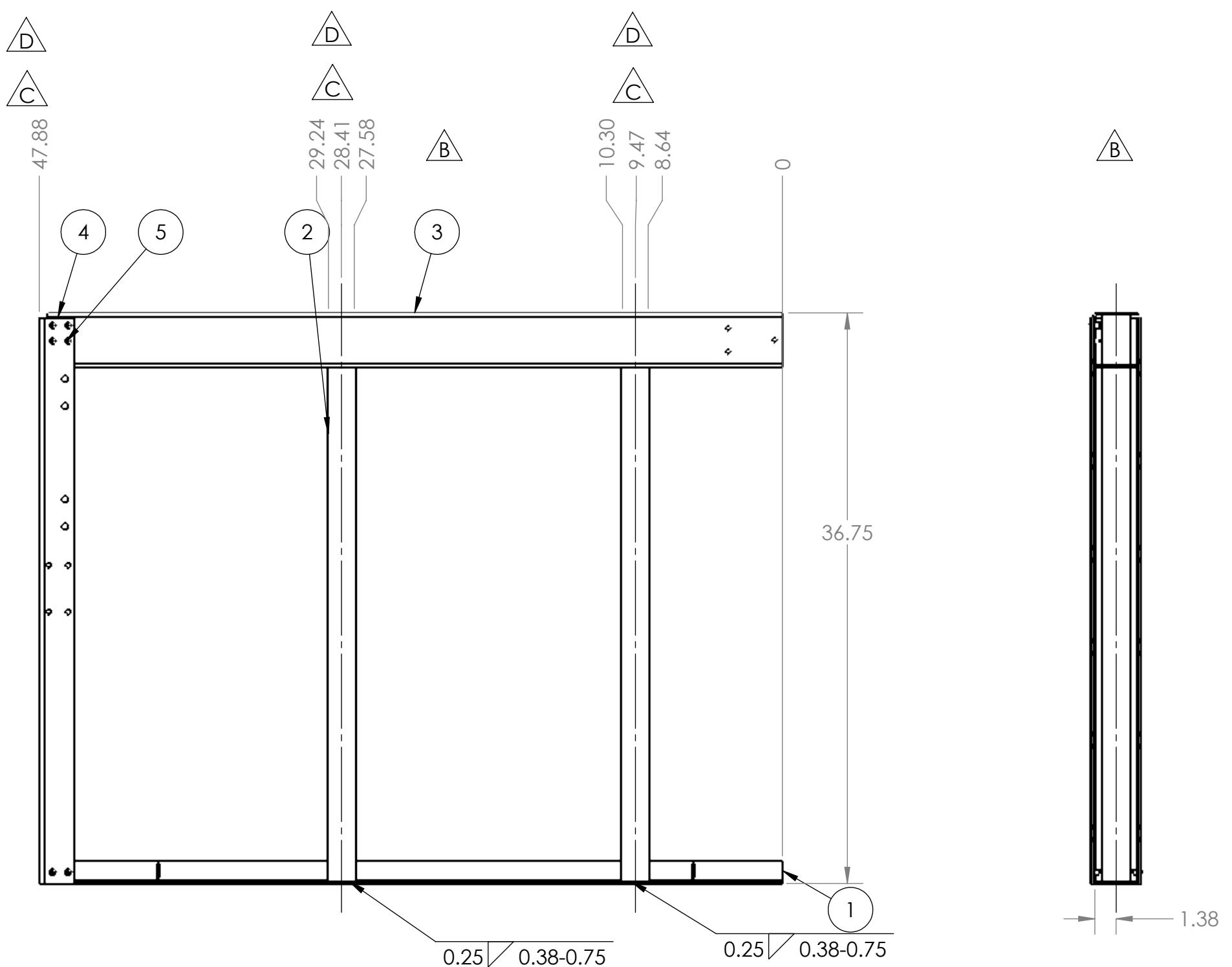
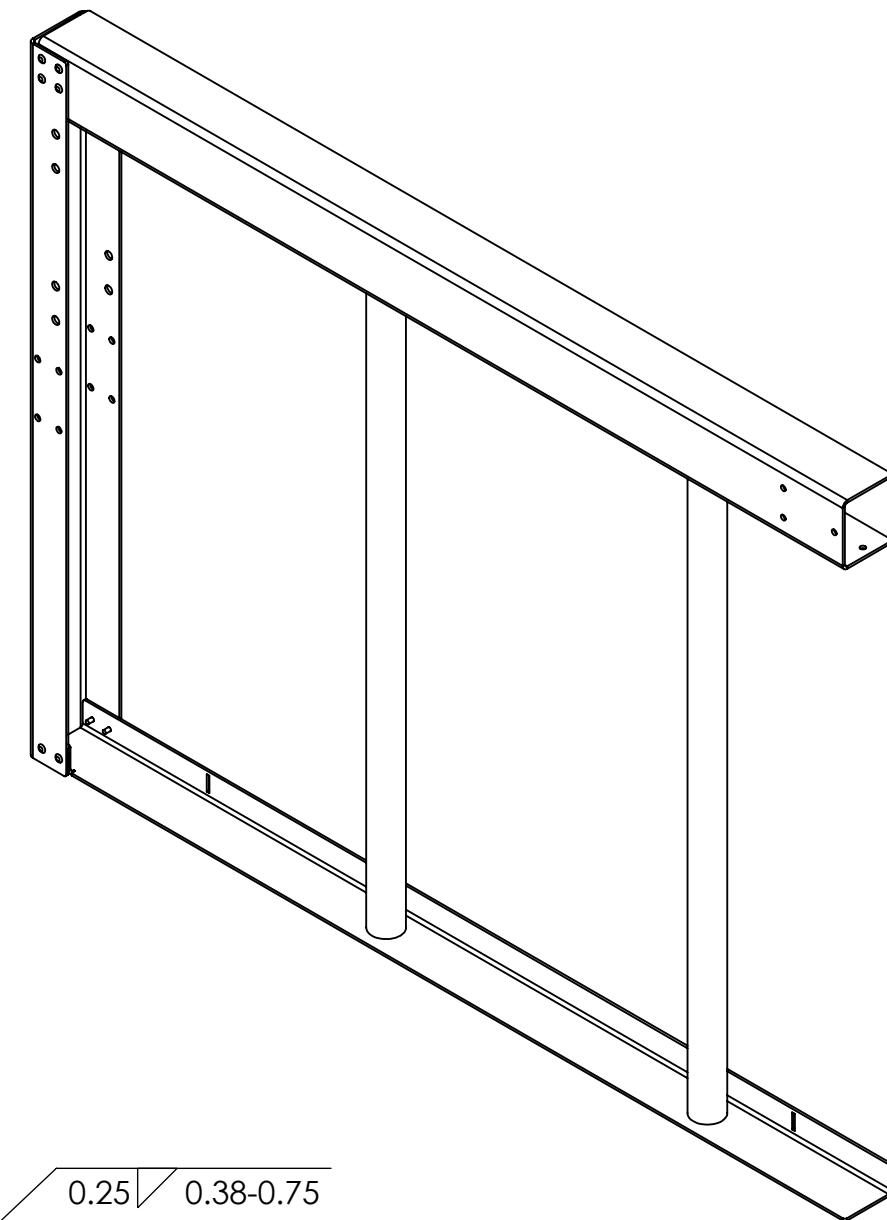


UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .02$ THREE PLACE DECIMAL $\pm .010$	BEND	NAME	DATE
	DRAWN	NW	8/30/2022
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH: .125 AL 6061 or 5052			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			
FIRST ROBOTICS COMPETITION   TITLE: Grill, Side 2			
SIZE	DWG. NO.	REV.	
C	GE-23113-04	A	
SCALE: 1:8	SHEET 1 OF 1		

ITEM NO.	WELD SIZE	SYMBOL	WELD LENGTH	WELD MATERIAL	QTY.
1	0.25	△	0.38-0.75{1.5}		4

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23114-01	Grill, lower	1
2	GE-23114-02	Grill, Pipe	2
3	GE-23114-03	Grill, Upper horizontal	1
4	GE-23114-04	Grill, Vertical	1
5	rivet_1875_251-375	3/16" Aluminum Rivet, .251-.375 Grip Range	8

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
C2	A	Removed holes, and now welds flat to under surface.	9/12/2022	NTW
C3, C4	B	removed hole for welding on -01 and add dims for jig	10/26/2022	NTW
C3, C4	C	Added more dimensions to view for clarity for manufacturing.	11/17/2022	CPO
C3, C4	D	Updated dims for removing length	12/6/2022	NTW



Notes:
1. Weld intermittent to keep from warping.
2. Rivet in 8 places prior to welding.

DETAIL A
SCALE 1:4

UNLESS OTHERWISE SPECIFIED:	WELD	NAME	DATE
	DRAWN	NW	8/24/2022
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:

Grill Outer,
Loading Station

SIZE DWG. NO. REV

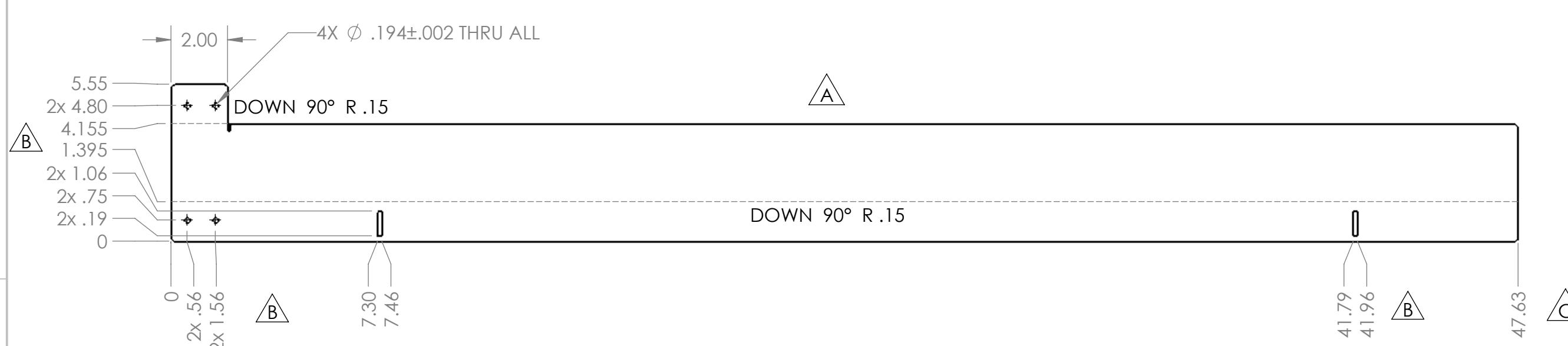
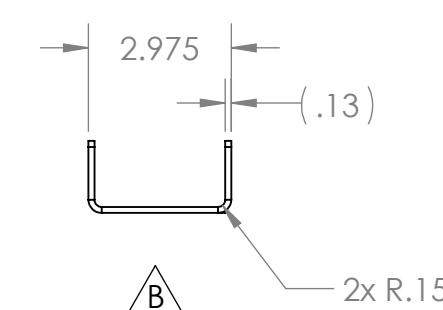
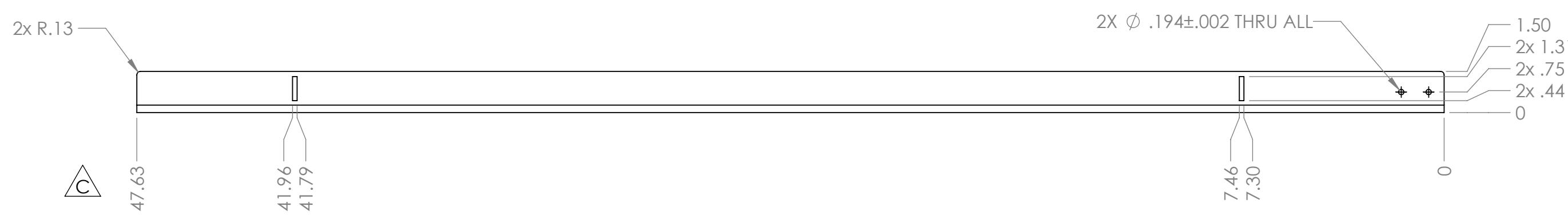
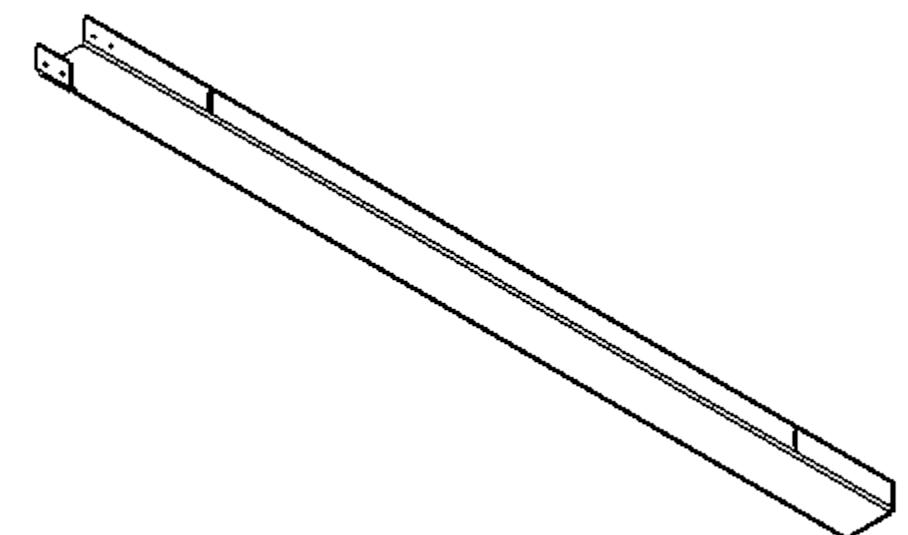
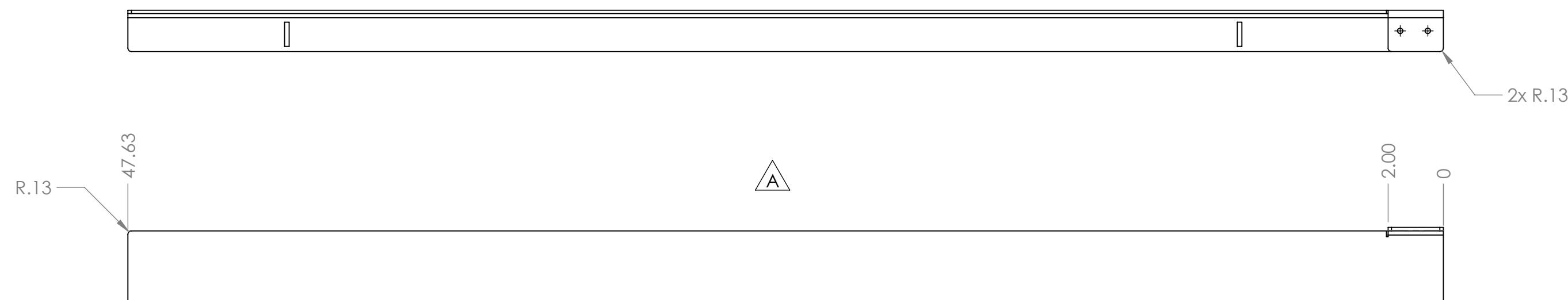
C GE-23114 **D**

SCALE: 1:8 SHEET 1 OF 1

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
B3, C3	A	Remove Hole for welding	10/26/2022	NTW
A2, A4, B1, B4	B	Adjusted profile width to increase assembly tolerance. Added dimensions to flat pattern. Reorganized drawing to better align with GE-23113-01.	11/16/2022	CPO
A2, B4	C	Changed over all length minus 1"	12/6/2022	NTW

D

D



UNLESS OTHERWISE SPECIFIED:	BEND	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	NW	7/21/2022
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:	.125 AL 6061 or 5052		
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Grill, lower

SIZE DWG. NO. REV

C GE-23114-01 **C**

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

4

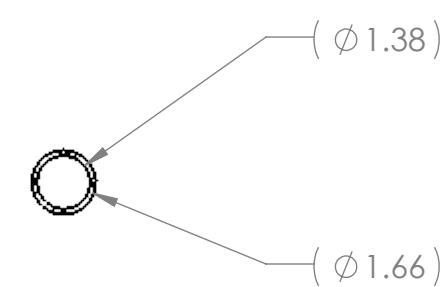
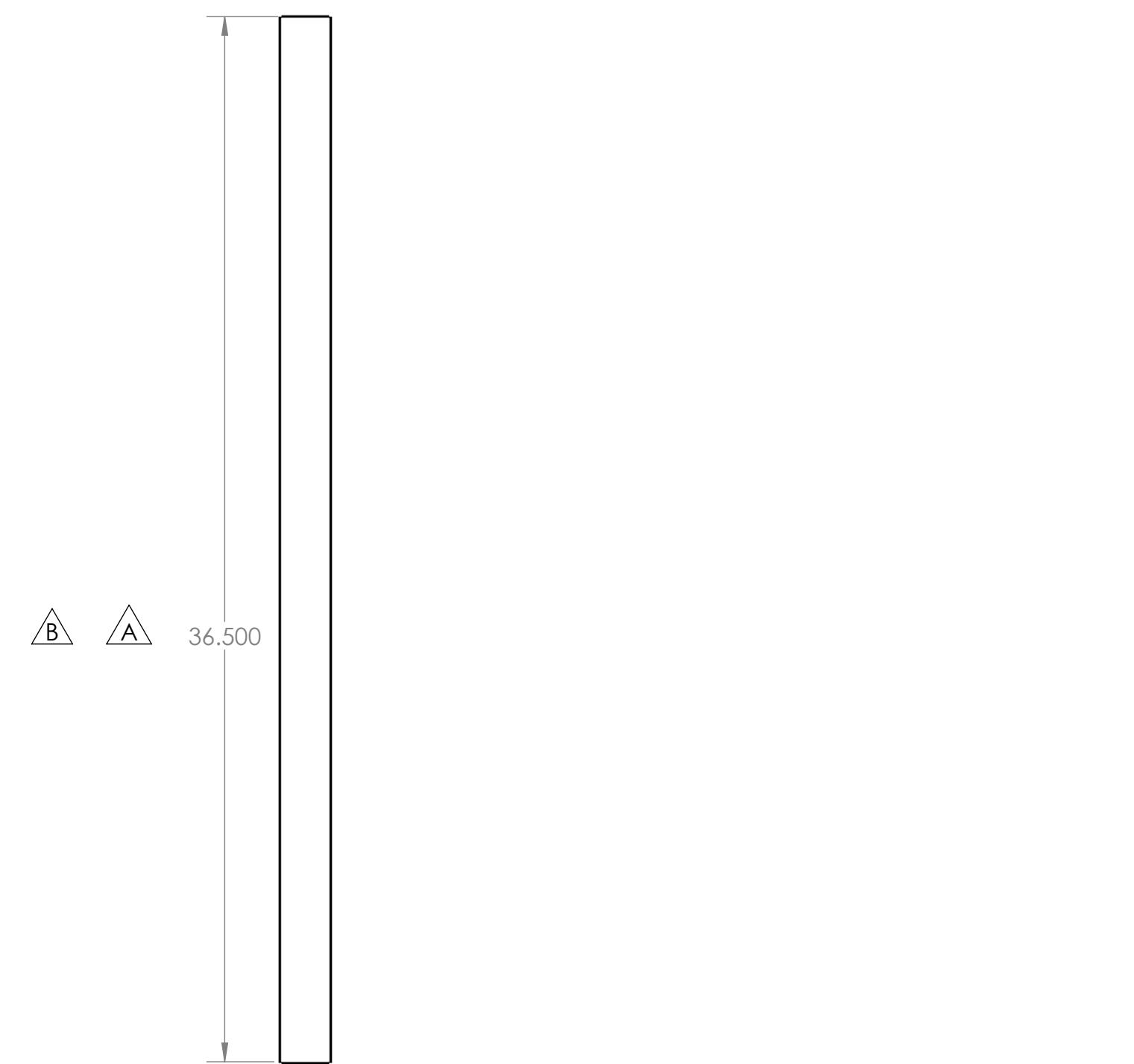
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UNLESS OTHERWISE SPECIFIED:

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:
1.25 sch 40, 6061 AL

DO NOT SCALE DRAWING

VEND NAME DATE
DRAWN NW 7/21/2022**PROPRIETARY AND CONFIDENTIAL**THE INFORMATION CONTAINED IN
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PROHIBITED.**COMMENTS:**
REMOVE ALL BURRS AND SHARP
EDGES.FIRST[®] ROBOTICS COMPETITION
SOLIDWORKS
Modeling Solutions Partner

TITLE: Grill, Pipe

SIZE DWG. NO. REV
C GE-23114-02 **B**

SCALE: 1:5 SHEET 1 OF 1

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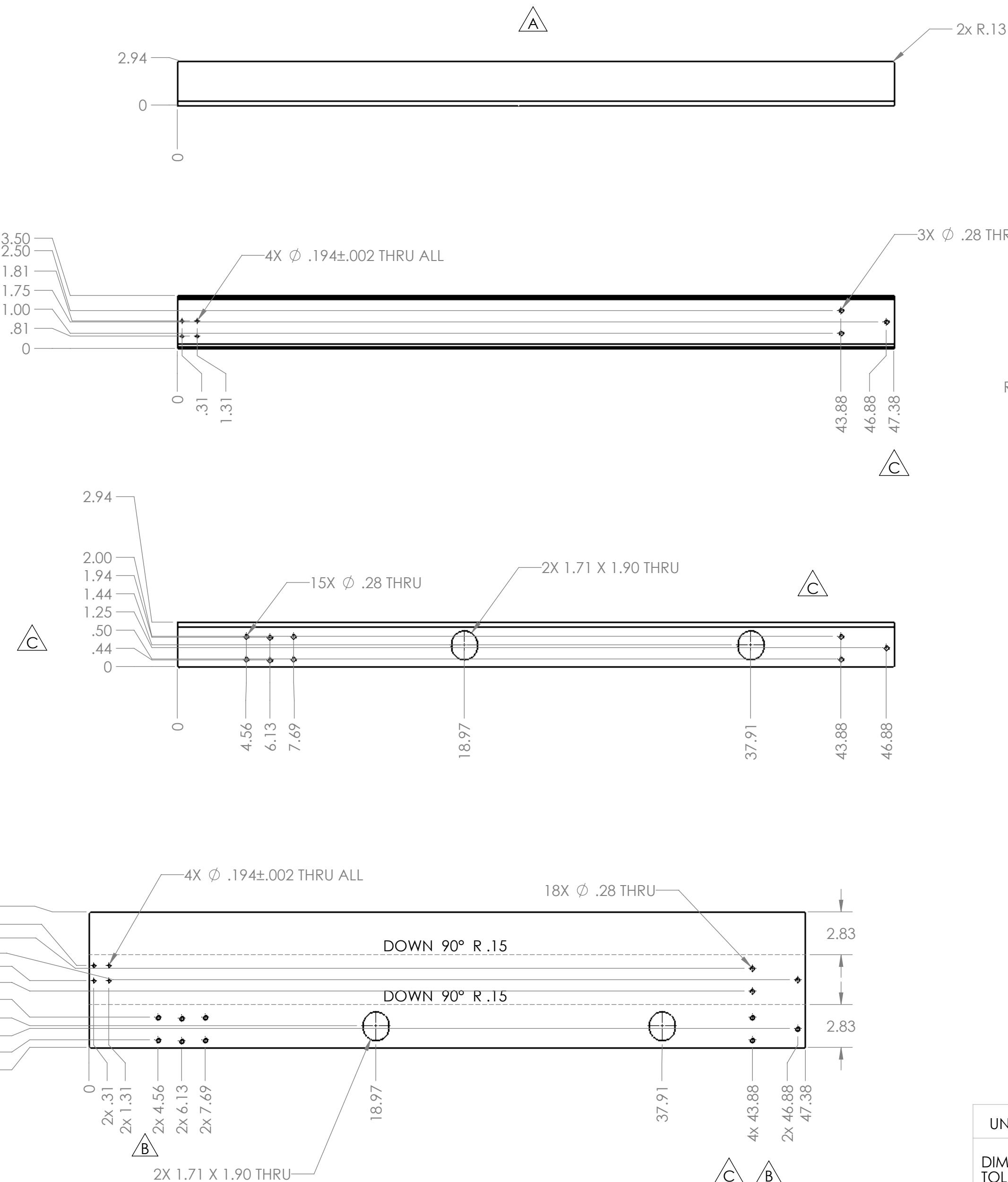
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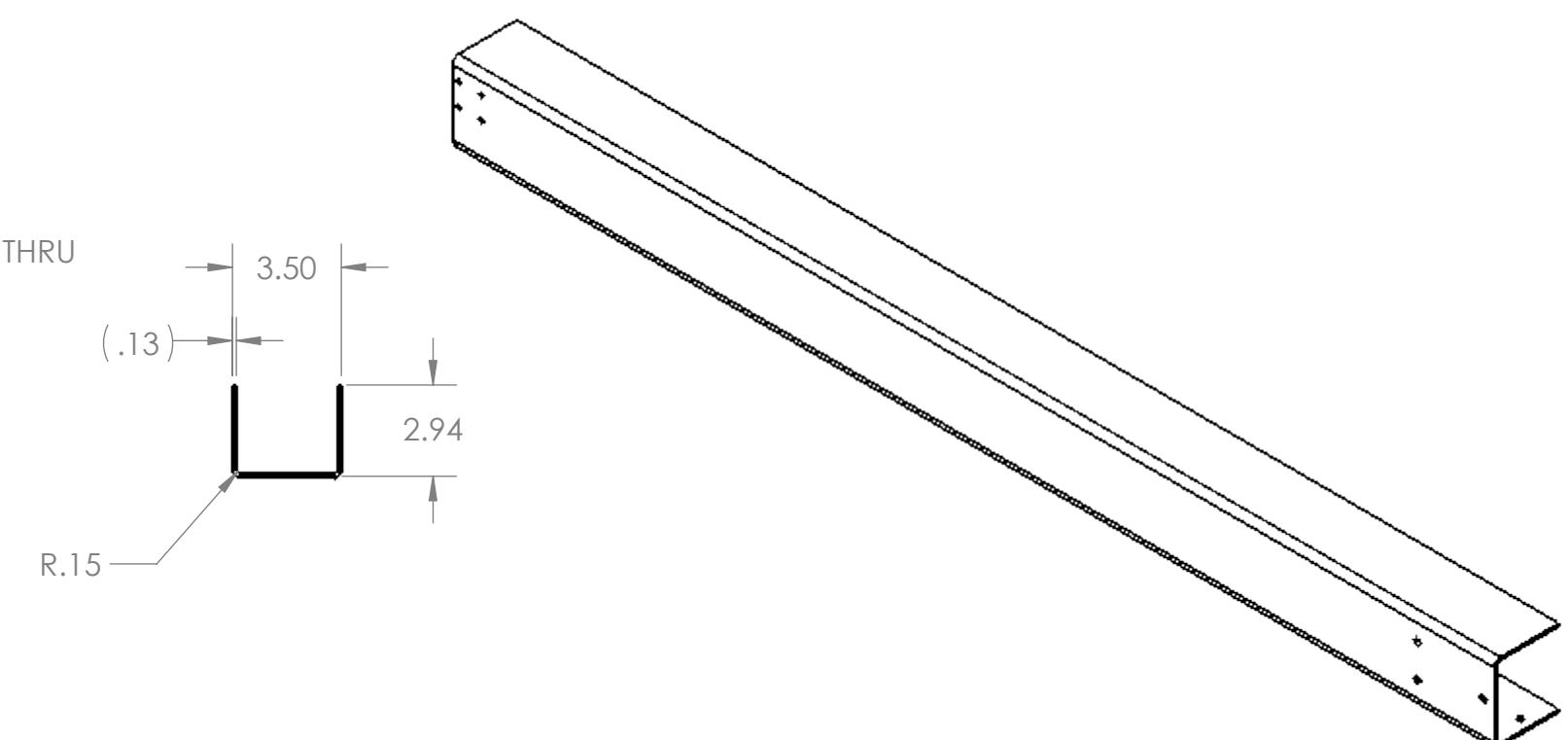
1

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REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
D3	A	Removed holes from top face for welding	9/12/2022	NTW
A3, A4, B4, C3	B	Added various dimensions to flat pattern.	11/16/2022	CPO
A3, C2, C3, C4	C	Removed 1" over all and holes	12/6/2022	NTW



UNLESS OTHERWISE SPECIFIED:	BEND	NAME	DATE
	DRAWN	NW	7/21/2022
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			
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MATERIAL/FINISH: .125 AL 6061 or 5052			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
Grill, Upper
horizontal

SIZE DWG. NO. REV
C GE-23114-03 **C**

SCALE: 1:6 SHEET 1 OF 1

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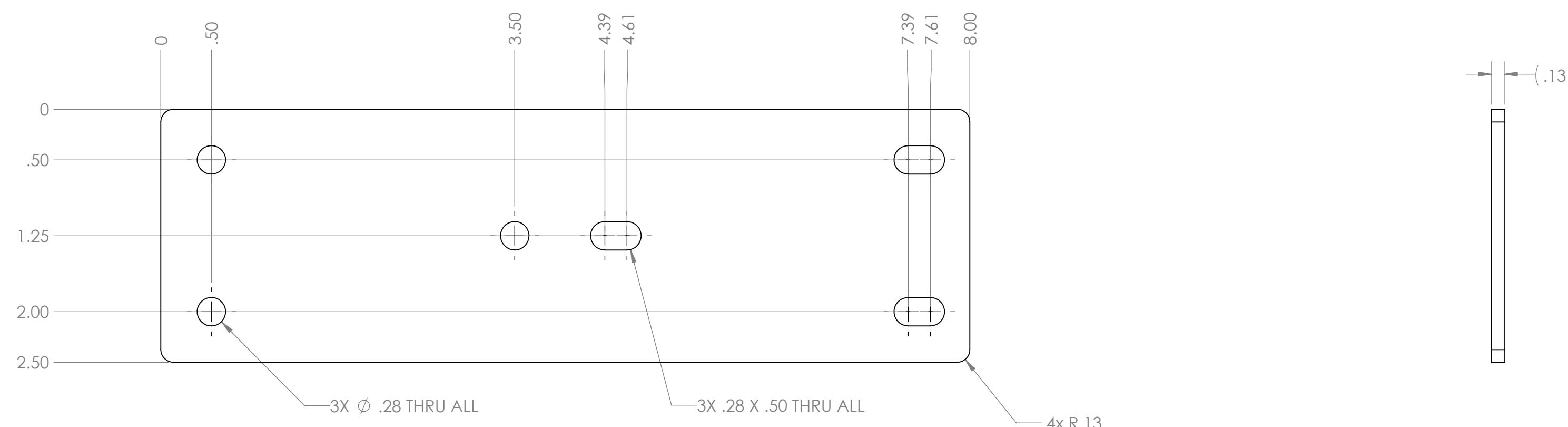
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UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	DF	7/18/2022	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:	SIZE	DWG. NO.	REV
.125" AL 6061 or 5052	C	GE-23116	
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING		SCALE: 1:1	SHEET 1 OF 1

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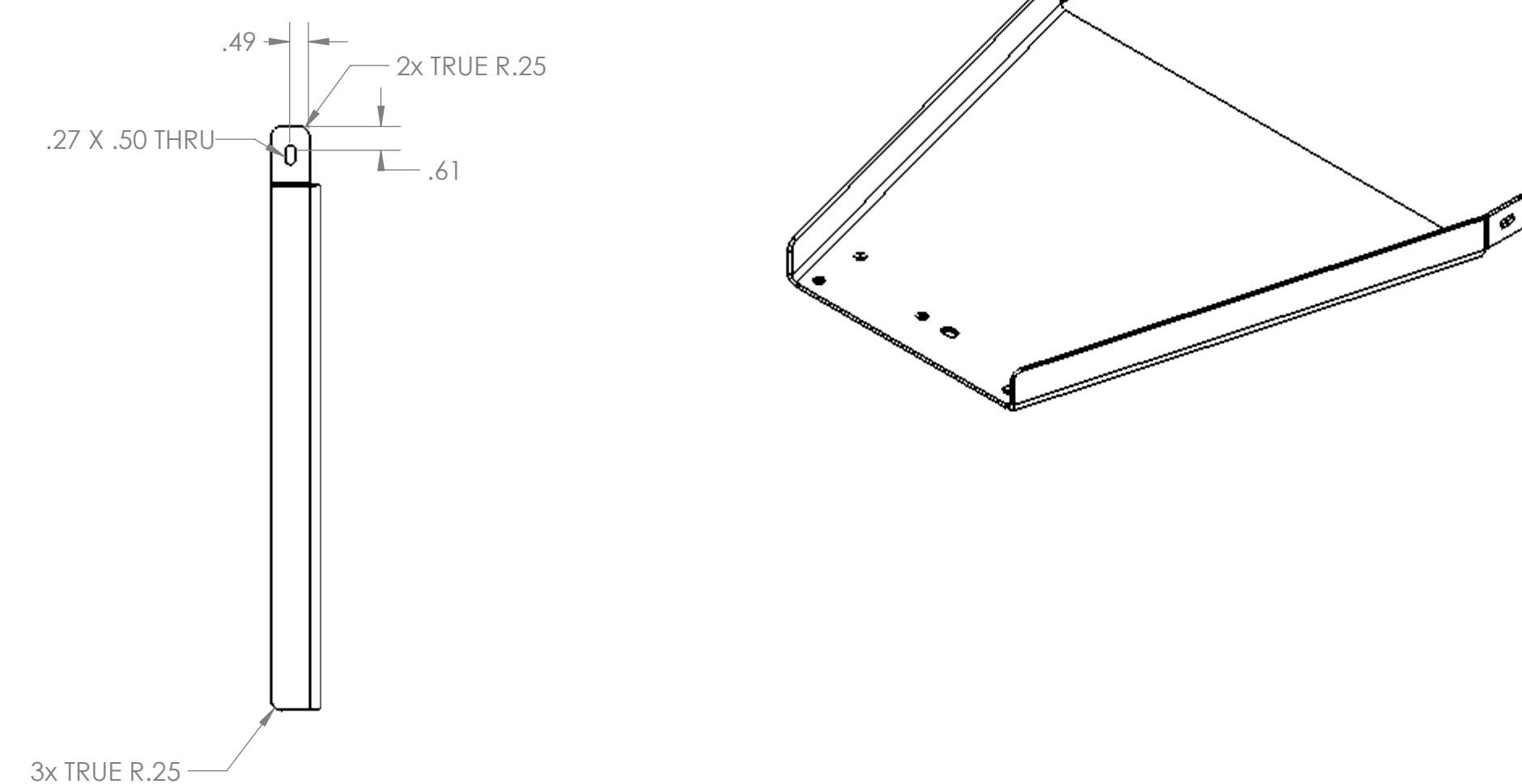
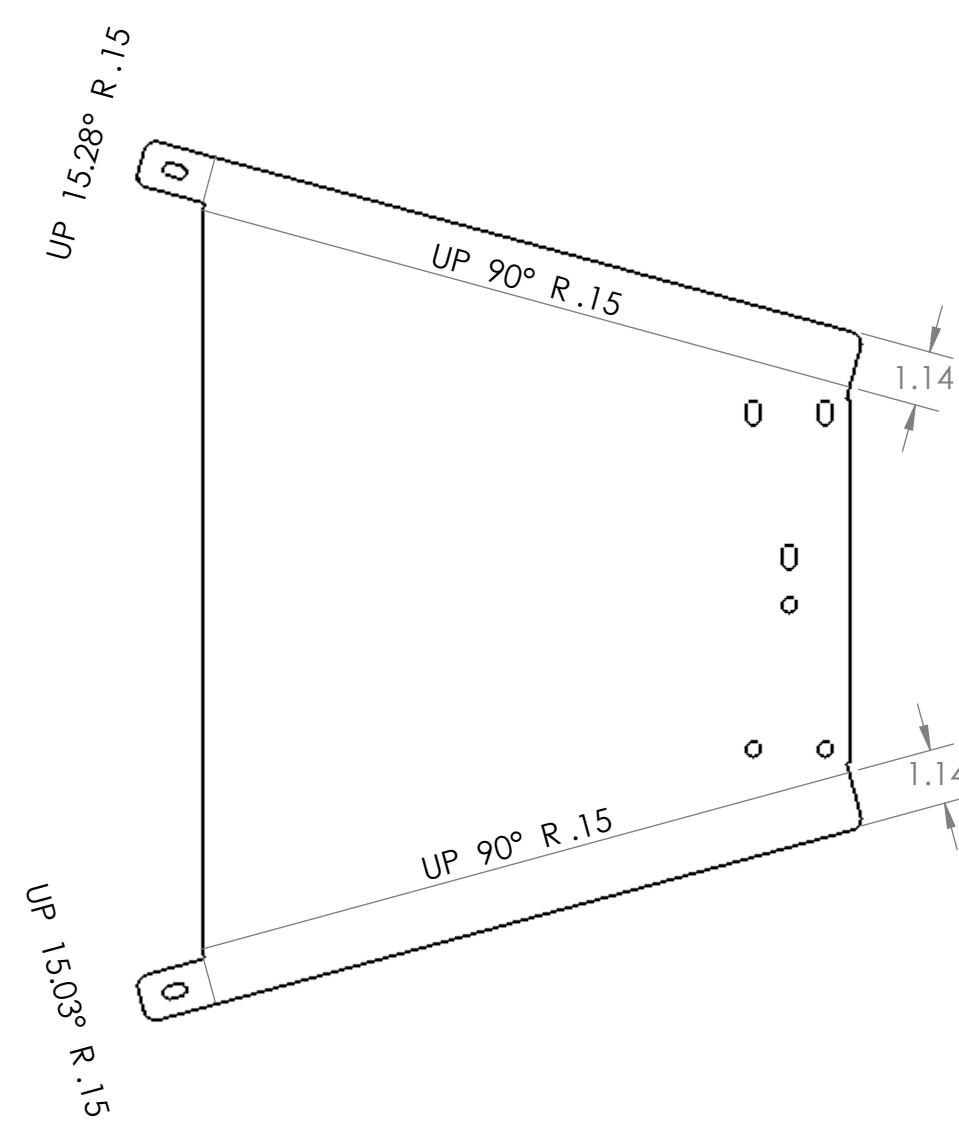
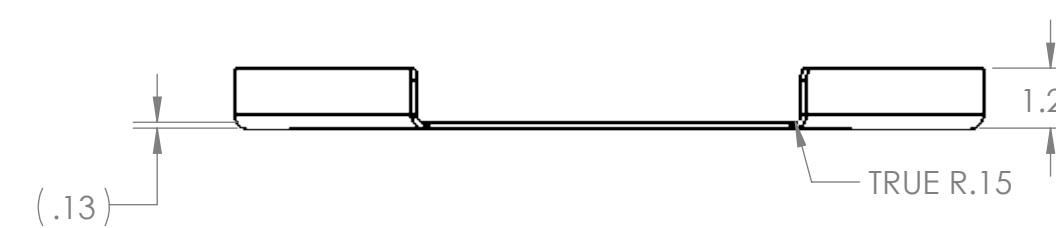
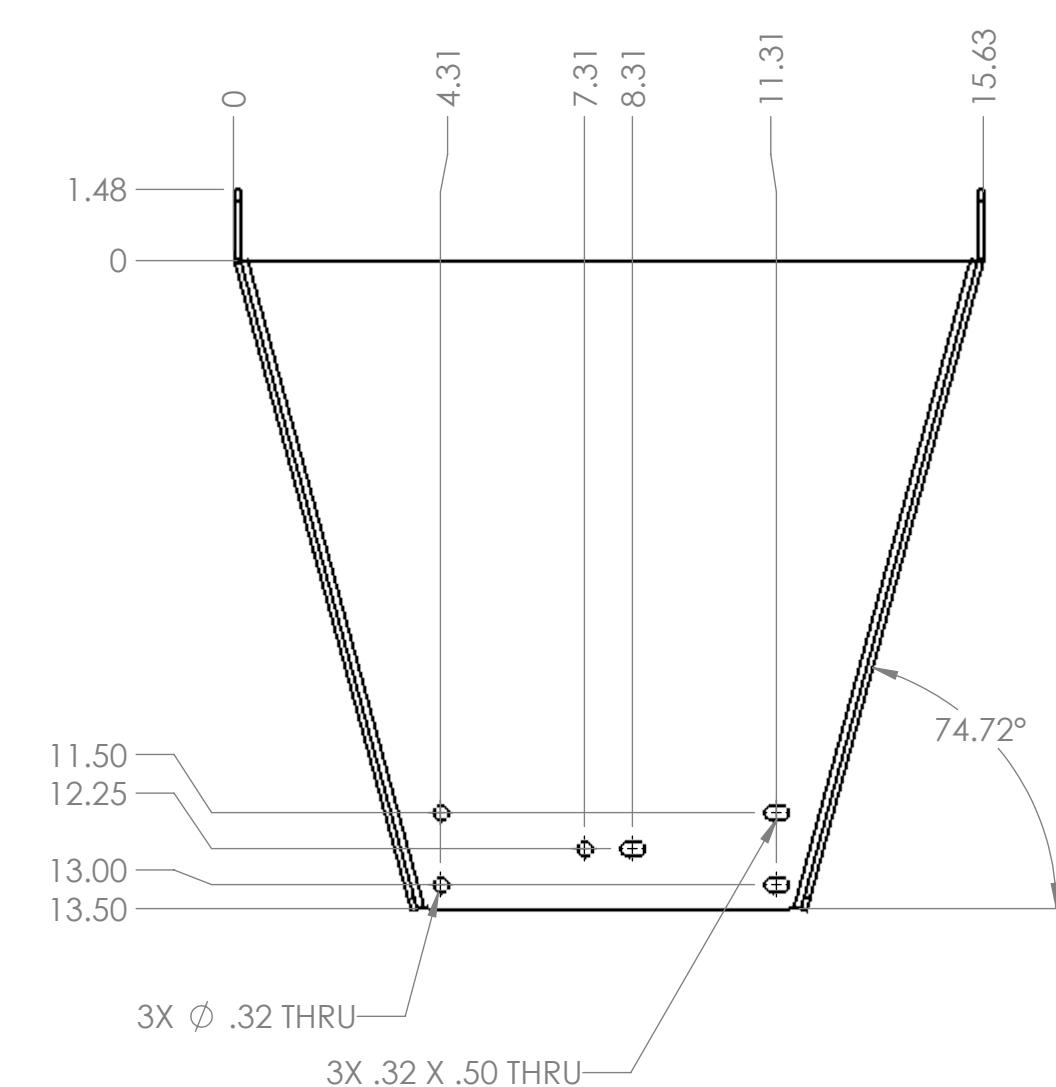
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UNLESS OTHERWISE SPECIFIED:	BEND	NAME	DATE
DRAWN	NW	7/21/2022	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH: .125" AL 6061 or 5052			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
connector plate
to frame

SIZE DWG. NO. REV
C GE-23117

SCALE: 1:4 SHEET 1 OF 1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
B2	A	cut over all length and adjusted holes	12/6/2022	NTW

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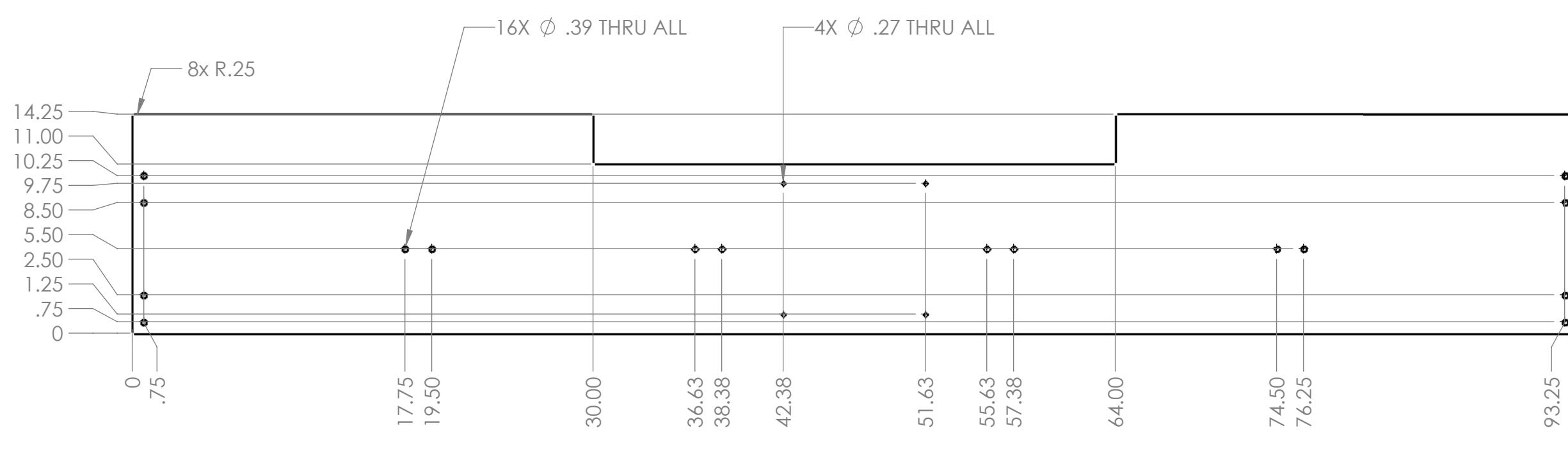
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UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	NW	8/30/2022
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH:	SIZE	DWG. NO.	REV
.125 polycarbonate, clear	C	GE-23118	A
COMMENTS:		SCALE: 1:8	
REMOVE ALL BURRS AND SHARP EDGES.		SHEET 1 OF 1	
DO NOT SCALE DRAWING			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
front grill plastic

4

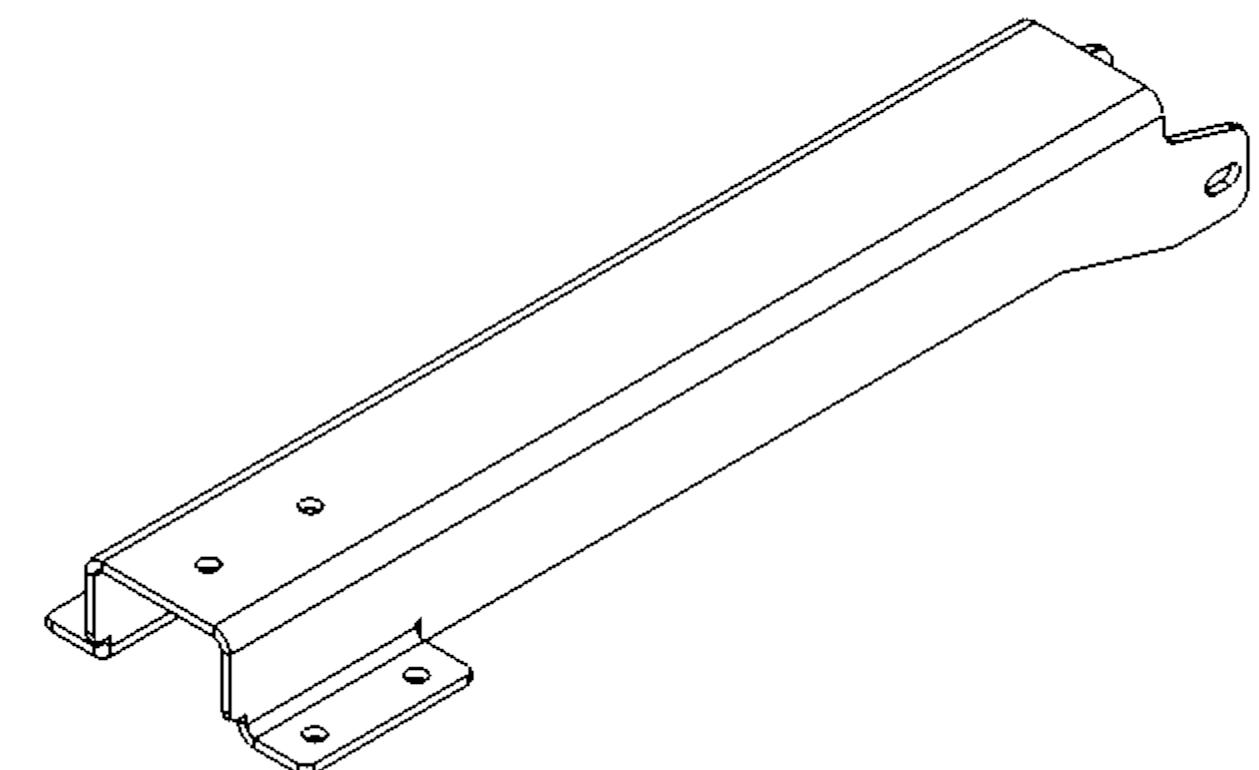
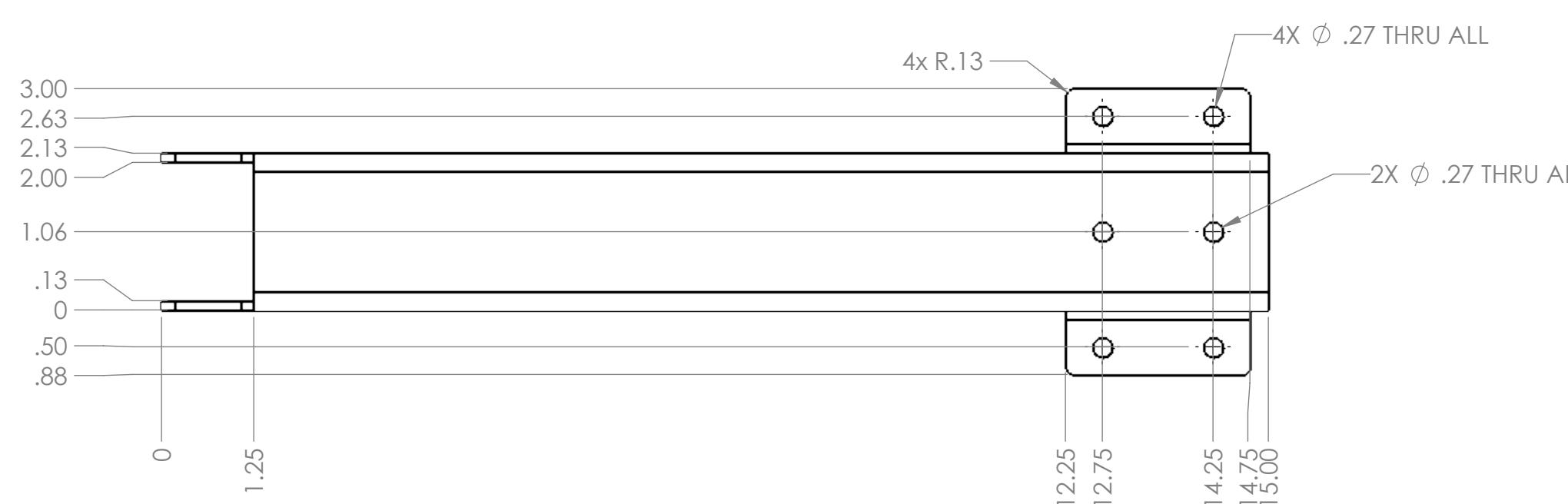
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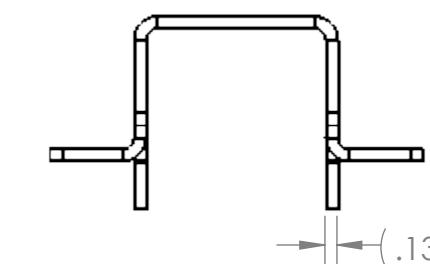
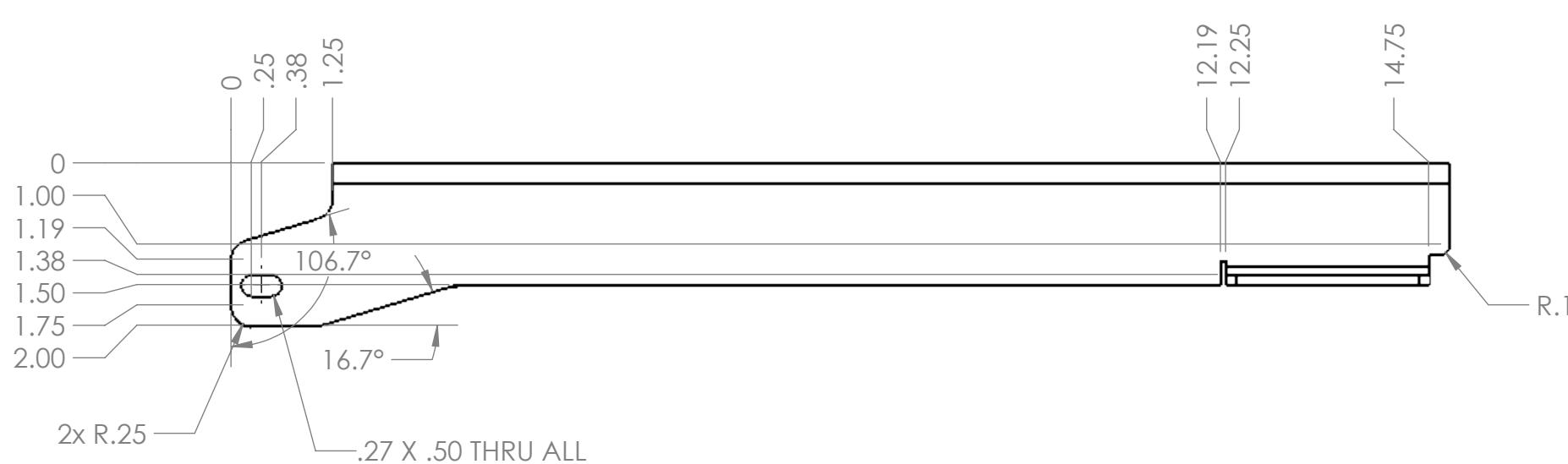
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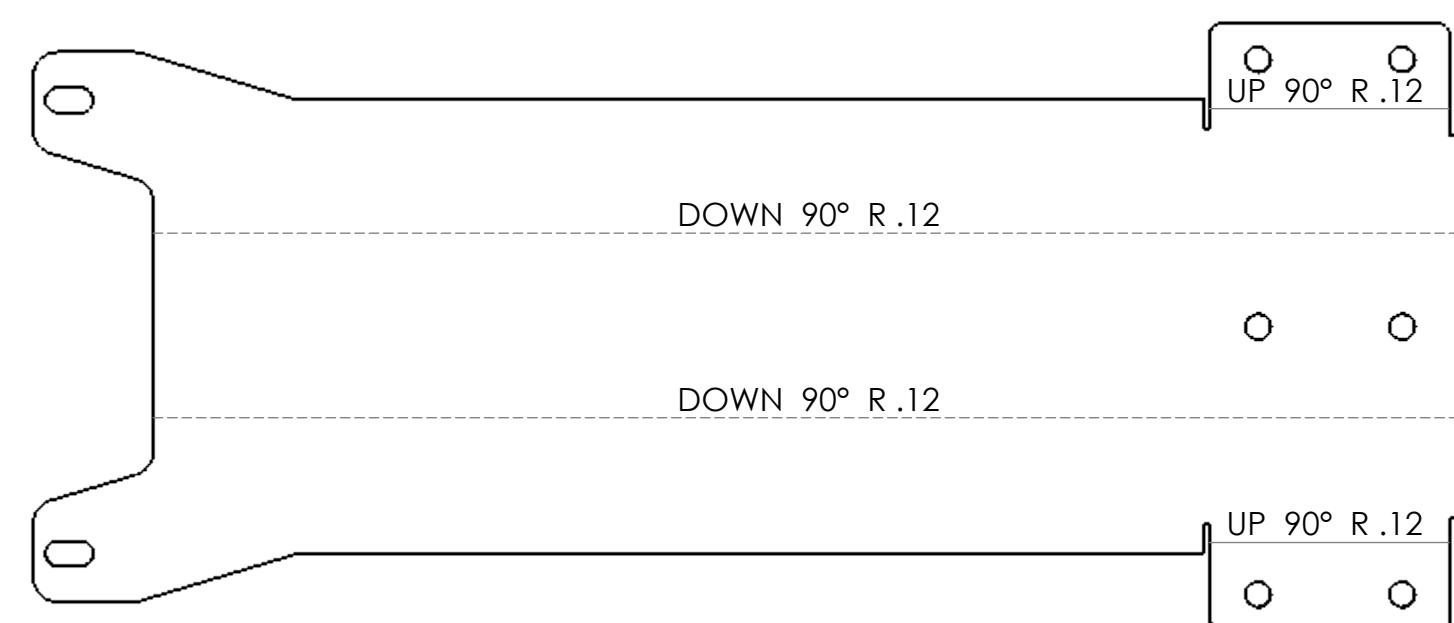
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C



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UNLESS OTHERWISE SPECIFIED:	BEND	NAME	DATE
DRAWN	NW	7/21/2022	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH: .125 AL 6061 or 5052			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
Grill, brace to
frame

SIZE DWG. NO. REV
C GE-23120

SCALE: 1:2 SHEET 1 OF 1

4

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REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
B2, B3, B4, C2, C4	A	Trimmed 2 sides and extended 1, all Dims adjusted as a result. Simplified Hole callouts	10/20/2022	JO

D

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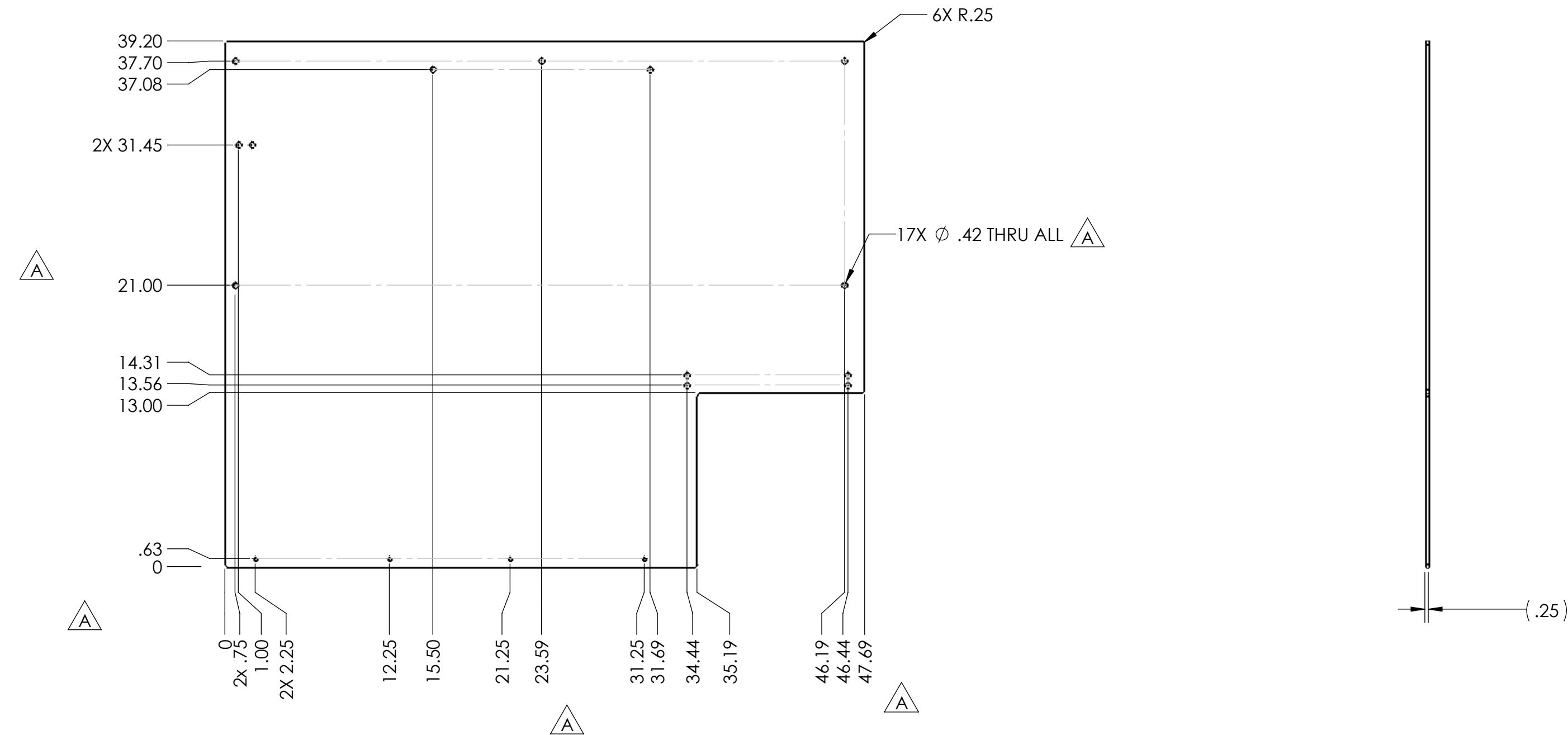
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UNLESS OTHERWISE SPECIFIED:

DRAWN

VEND NAME DATE

NW 7/13/2022



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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 WHOLE WITHOUT THE WRITTEN
 PERMISSION OF FIRST IS
 PROHIBITED.

MATERIAL/FINISH:

0.25" polycarbonate, clear

DO NOT SCALE DRAWING

TITLE:

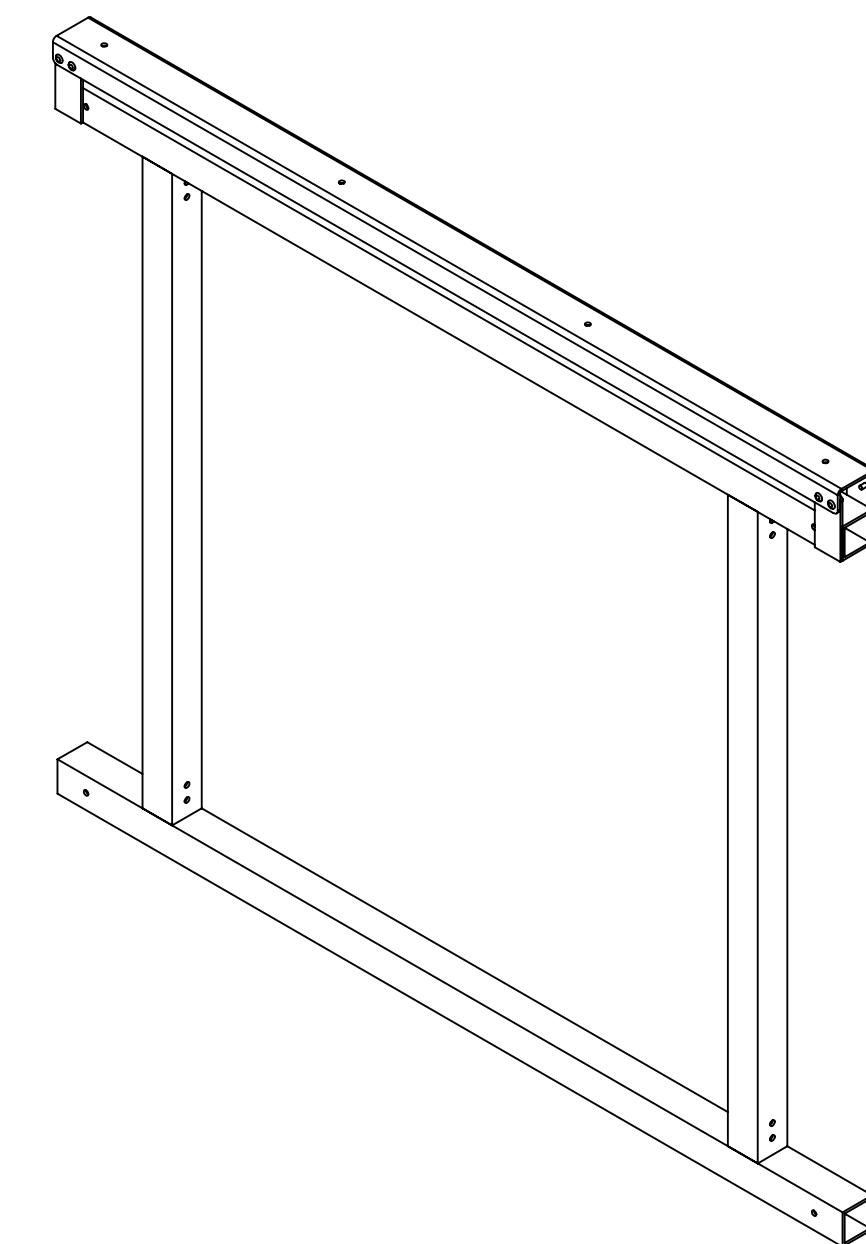
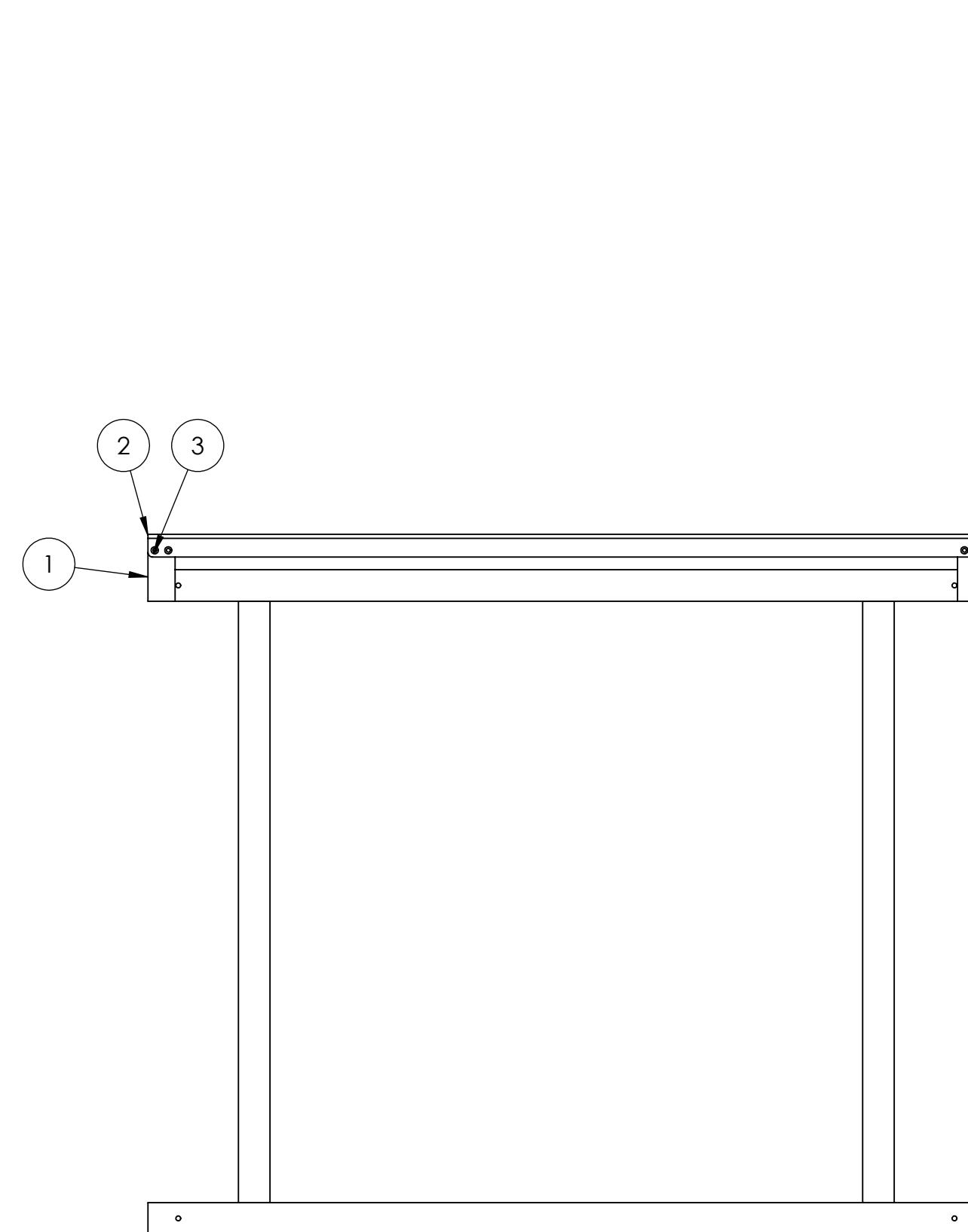
Loading station
top plastic

SIZE DWG. NO.

C GE-23121 A

SCALE: 1:8 SHEET 1 OF 1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23101	HP lower frame (welded)	1
2	GE-23102	slide retainer	1
3	rivet_.1875_.251-.375	3/16" Aluminum Rivet, .251-.375 Grip Range	8



UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	NW	10/3/2022
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:	SIZE DWG. NO. REV		
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST ROBOTICS COMPETITION SOLIDWORKS Modeling Solutions Partner

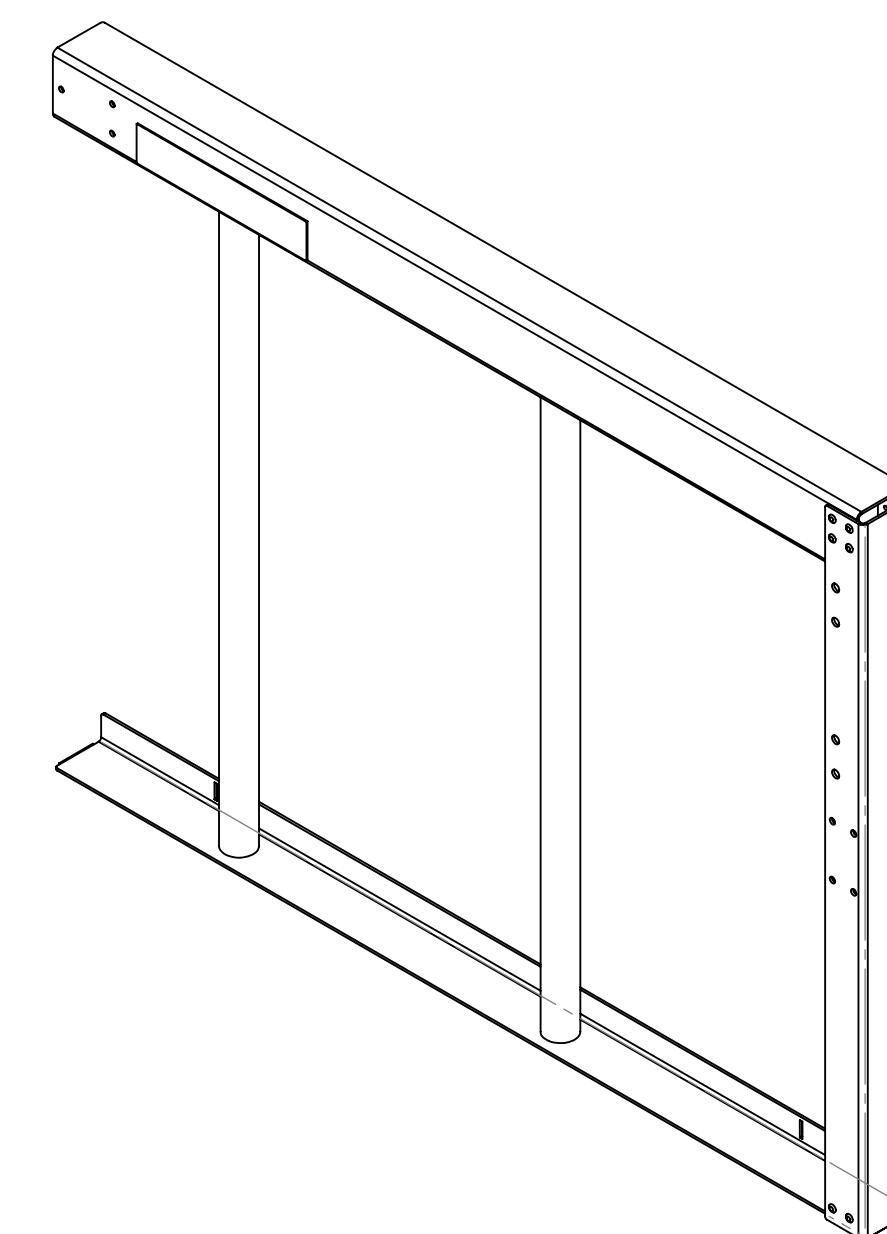
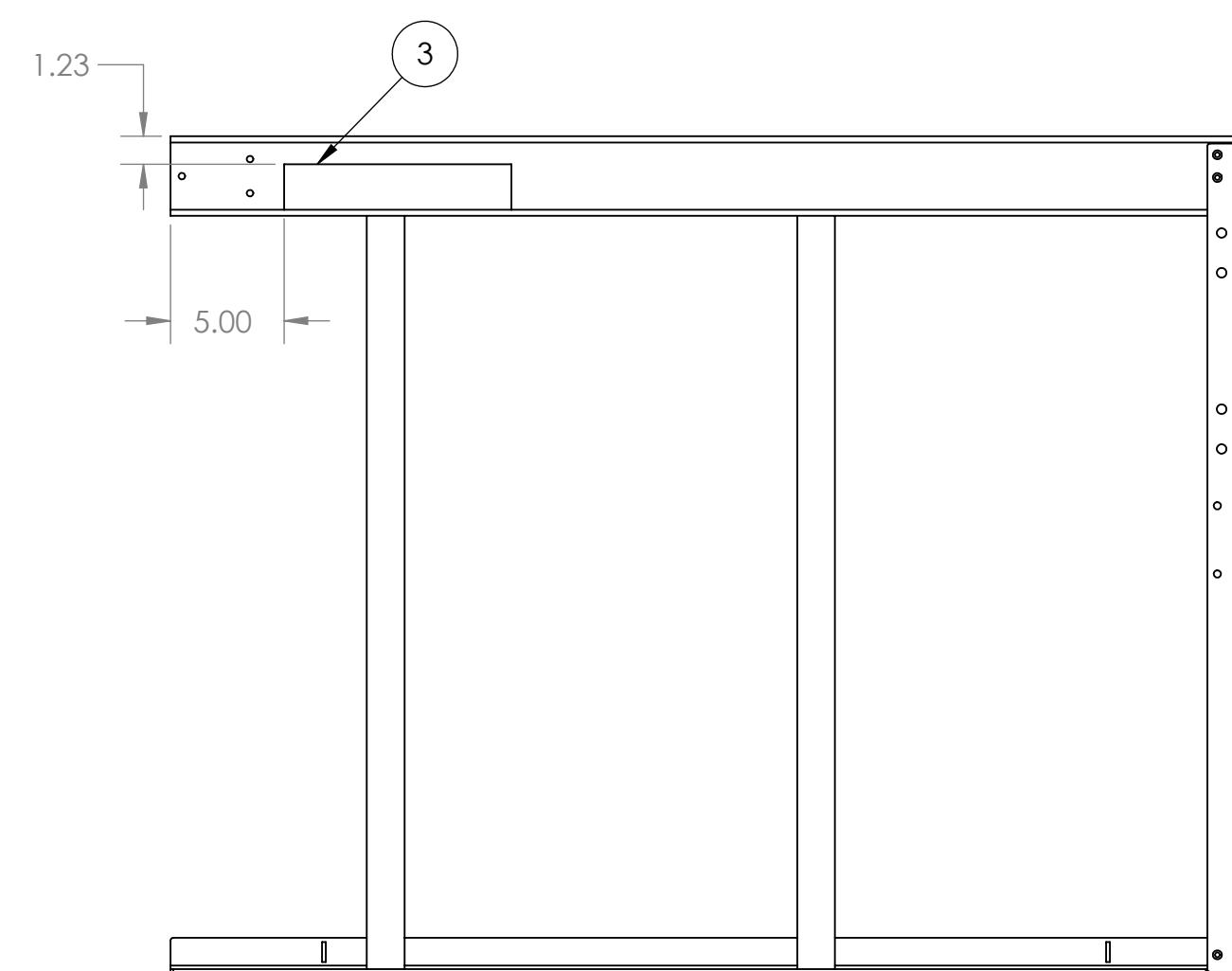
GE-23101 and GE-23102 riveted

C **GE-23122**

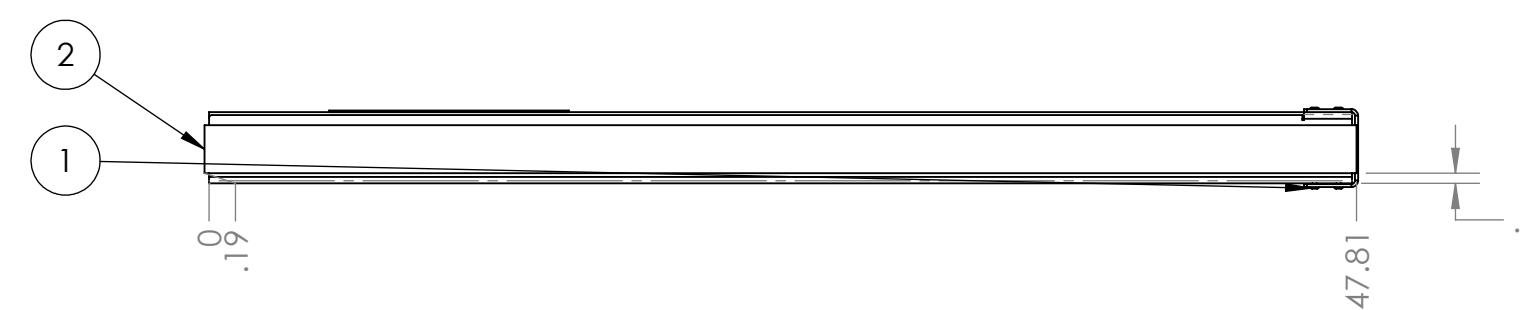
SCALE: 1:8 SHEET 1 OF 1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23113	Grill, Loading Station (field)	1
2	Hook_2_48	2" x 48" Hook, Adhesive Backed	1
3	Hook_2_10	2" x 10" Hook, Adhesive Backed	1

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UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	NW	10/3/2022
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:	SIZE DWG. NO. REV		
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.	C GE-23123		
DO NOT SCALE DRAWING	SCALE: 1:8 SHEET 1 OF 1		

FIRST ROBOTICS COMPETITION SOLIDWORKS Modeling Solutions Partner

TITLE: GE-23113 w/ hook

SIZE DWG. NO. REV

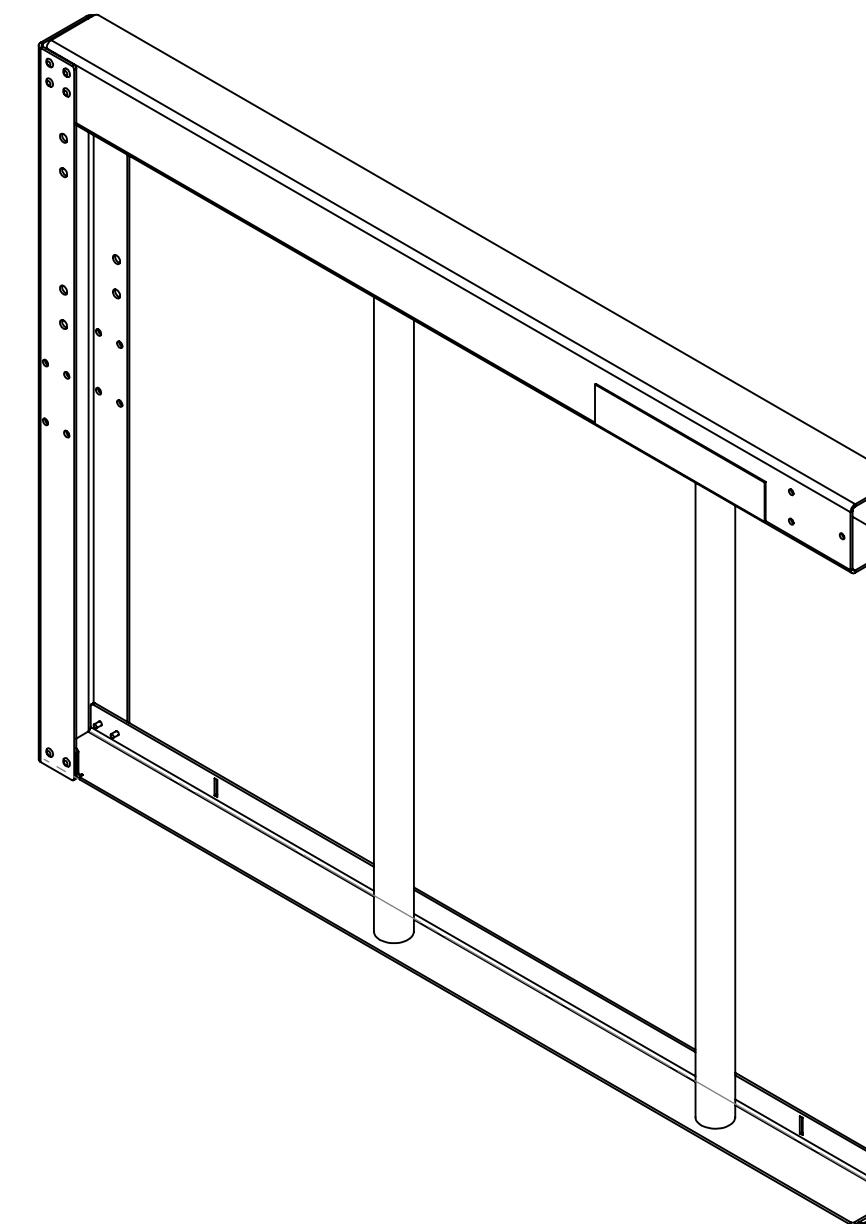
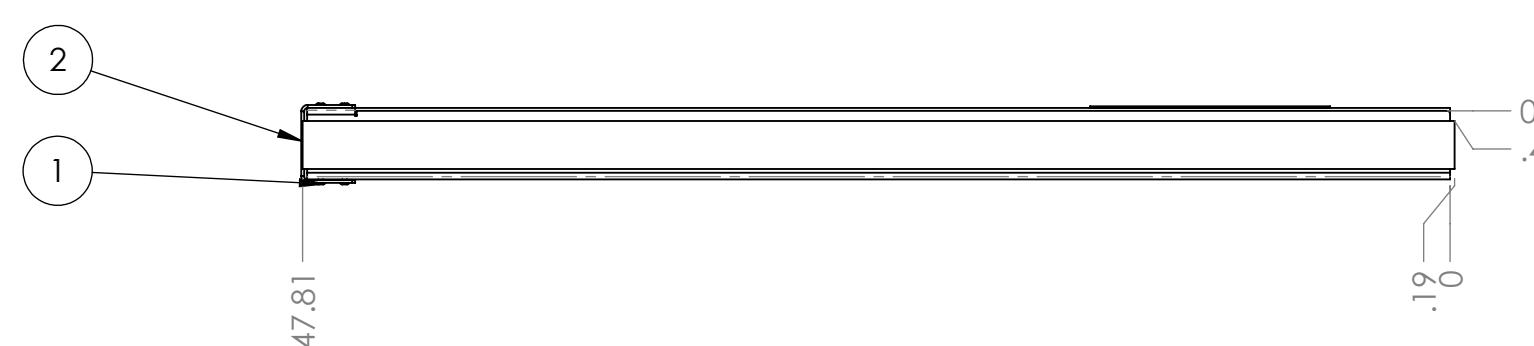
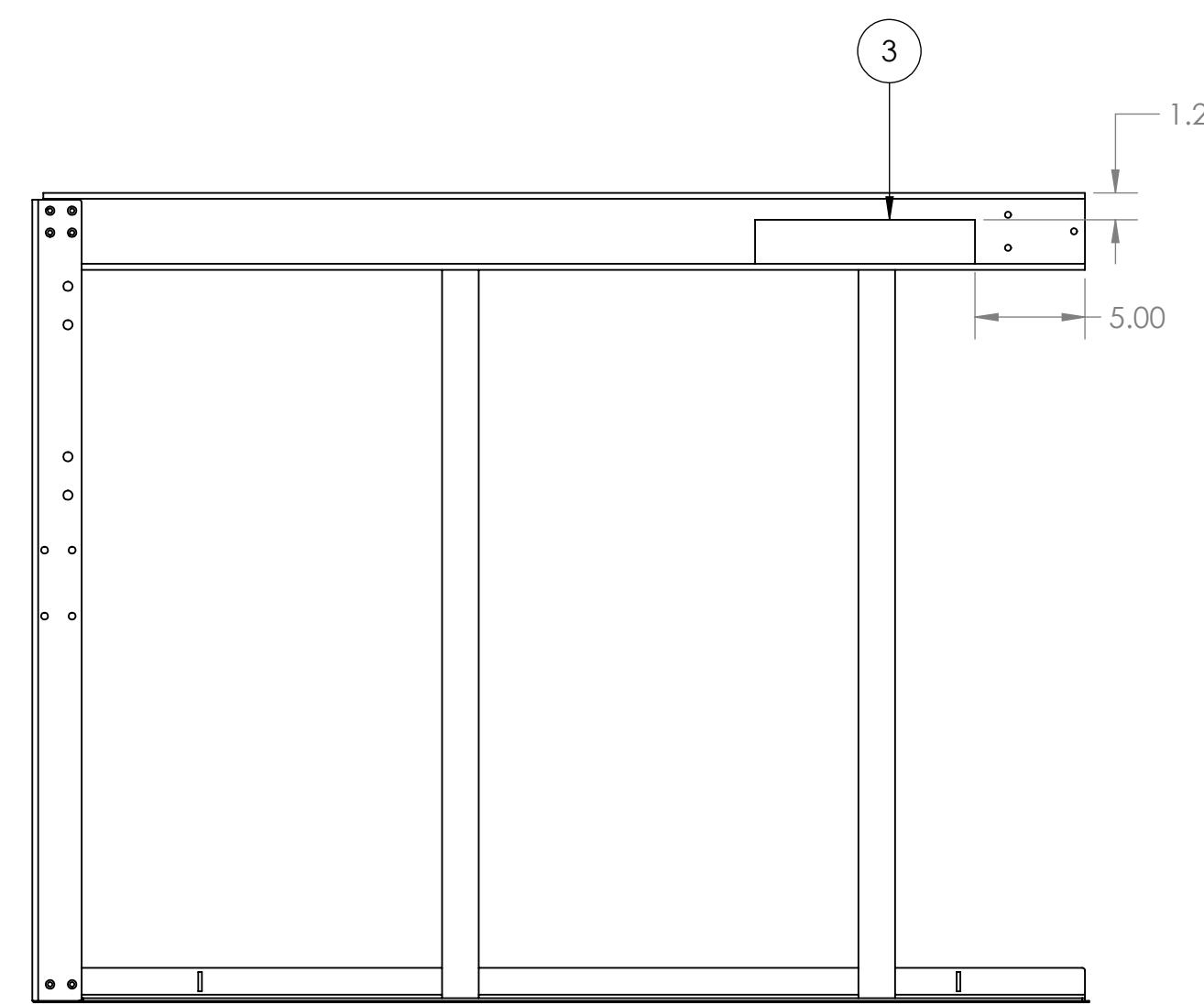
C GE-23123

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

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23114	Grill Outer, Loading Station	1
2	Hook_2_48	2" x 48" Hook, Adhesive Backed	1
3	Hook_2_10	2" x 10" Hook, Adhesive Backed	1

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UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	NW	10/3/2022
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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COMMENTS:	REMOVE ALL BURRS AND SHARP EDGES.		
DO NOT SCALE DRAWING			

FIRST ROBOTICS COMPETITION SOLIDWORKS Modeling Solutions Partner

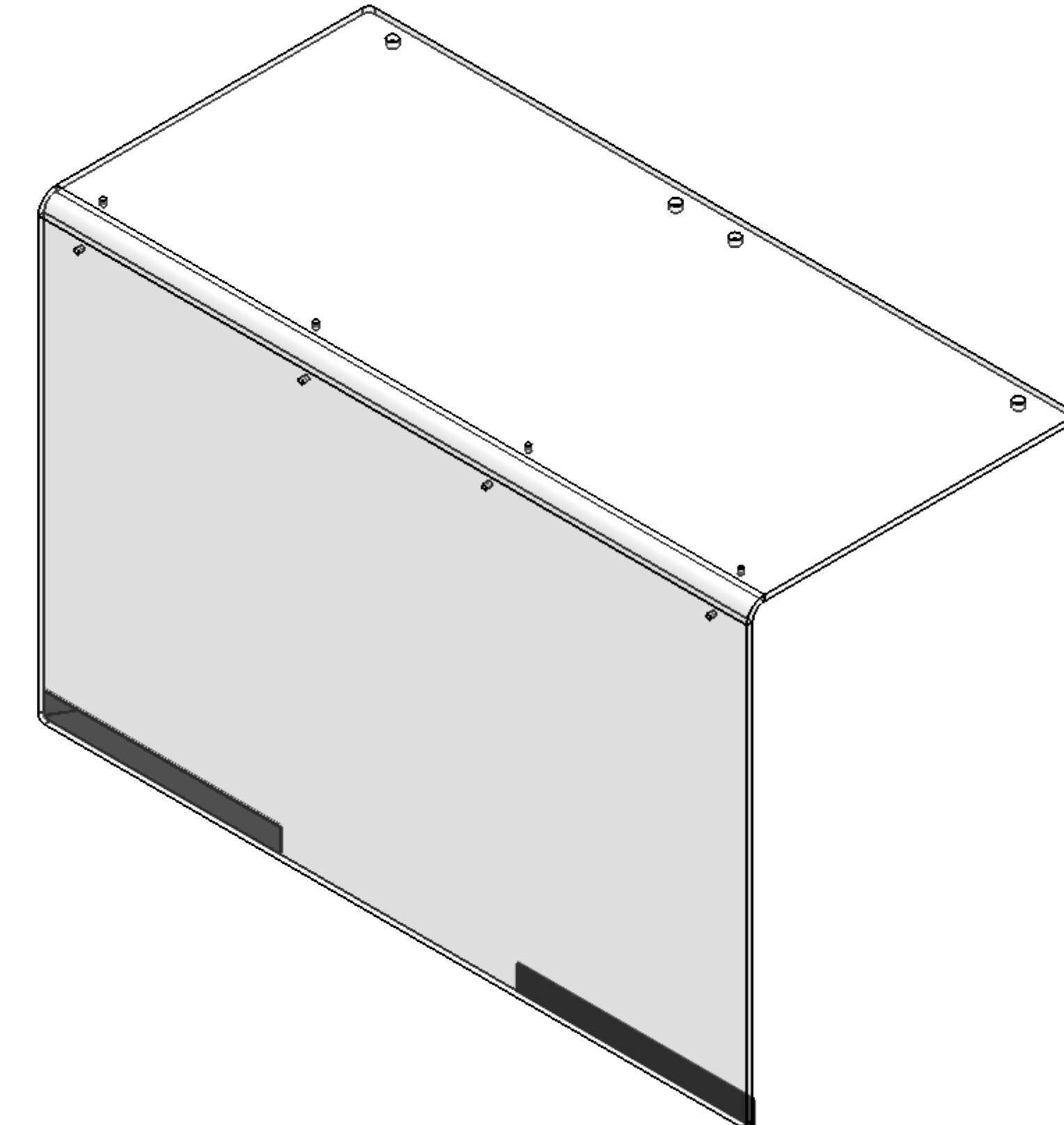
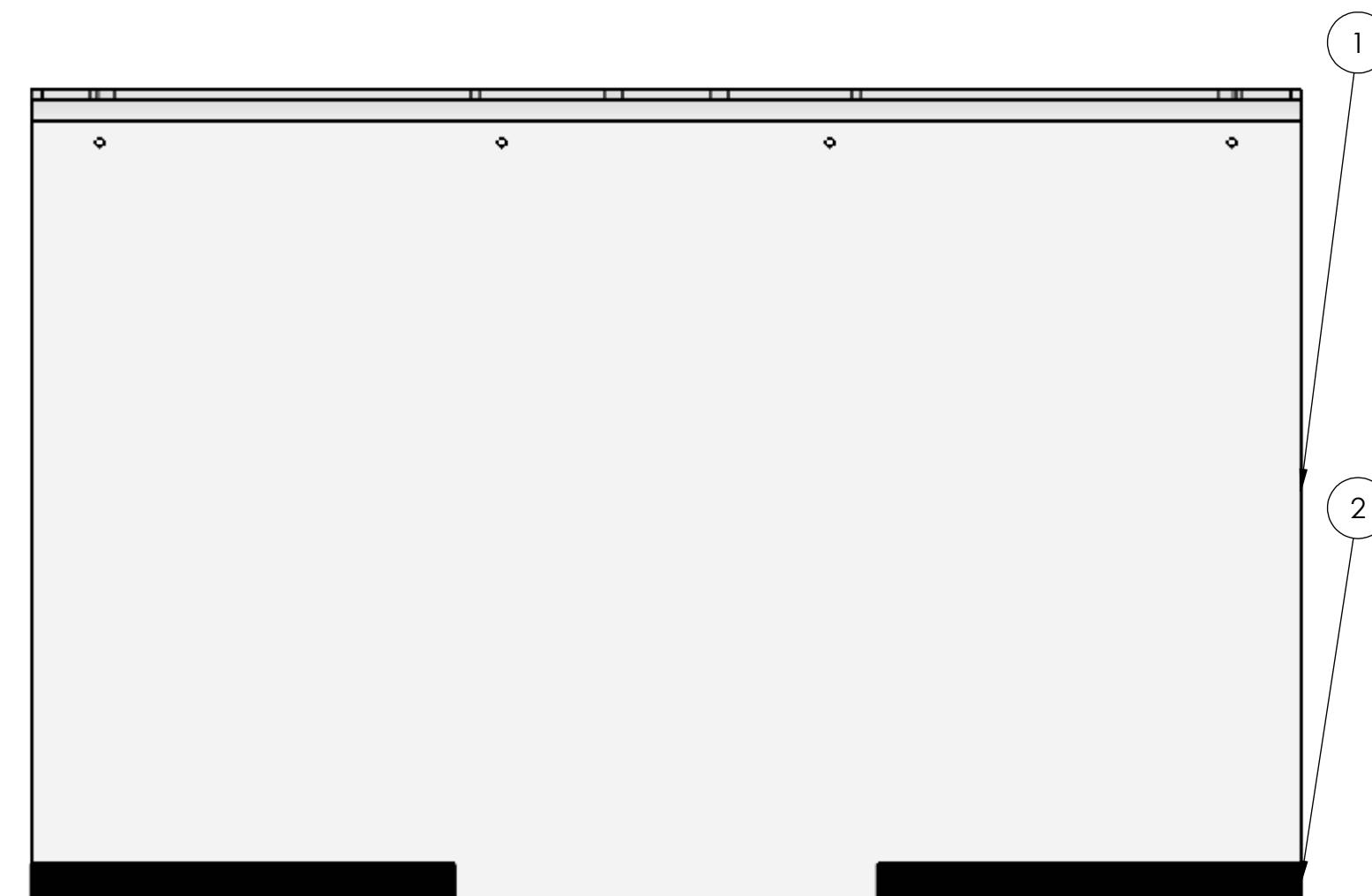
TITLE: GE-23114 w/
hook

SIZE DWG. NO. REV

C GE-23124

SCALE: 1:8 SHEET 1 OF 1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23108	loading station front safety	1
2	Loop_1_10	3M 1" adhesive backed loop	2



UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	NW	10/3/2022
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

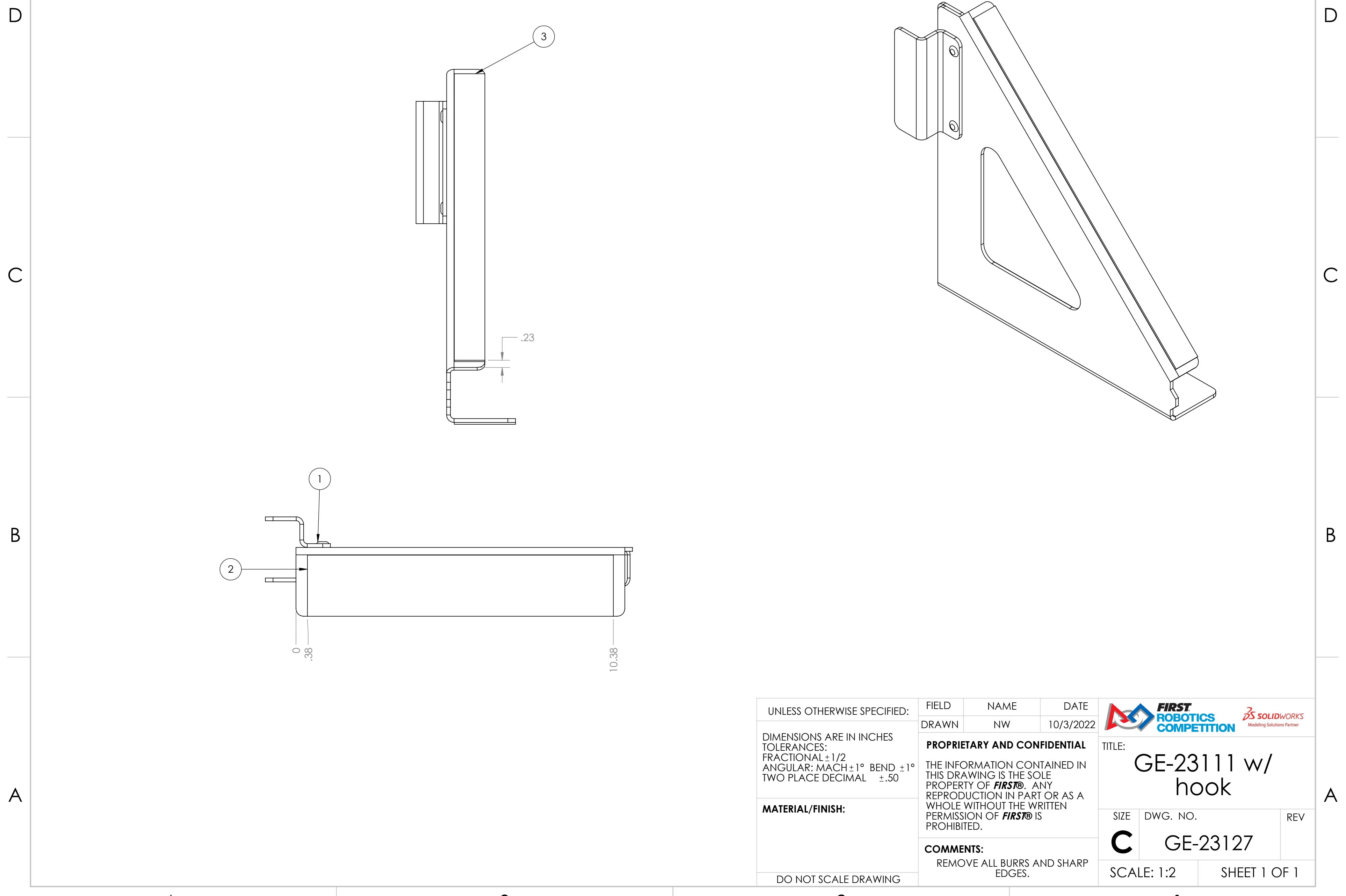
TITLE: GE-23108 w/
hook

SIZE DWG. NO. REV

C GE-23126

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

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23111	Grill, Brace foot/ramp	1
2	Hook_2_10	2" x 10" Hook, Adhesive Backed	1
3	Hook_1_13.25	1" x 13" Hook, Adhesive Backed	1



UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	NW	10/3/2022
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.		
TITLE: GE-23111 w/ hook			
SIZE	DWG. NO.	REV	
C	GE-23127		
SCALE: 1:2		SHEET 1 OF 1	

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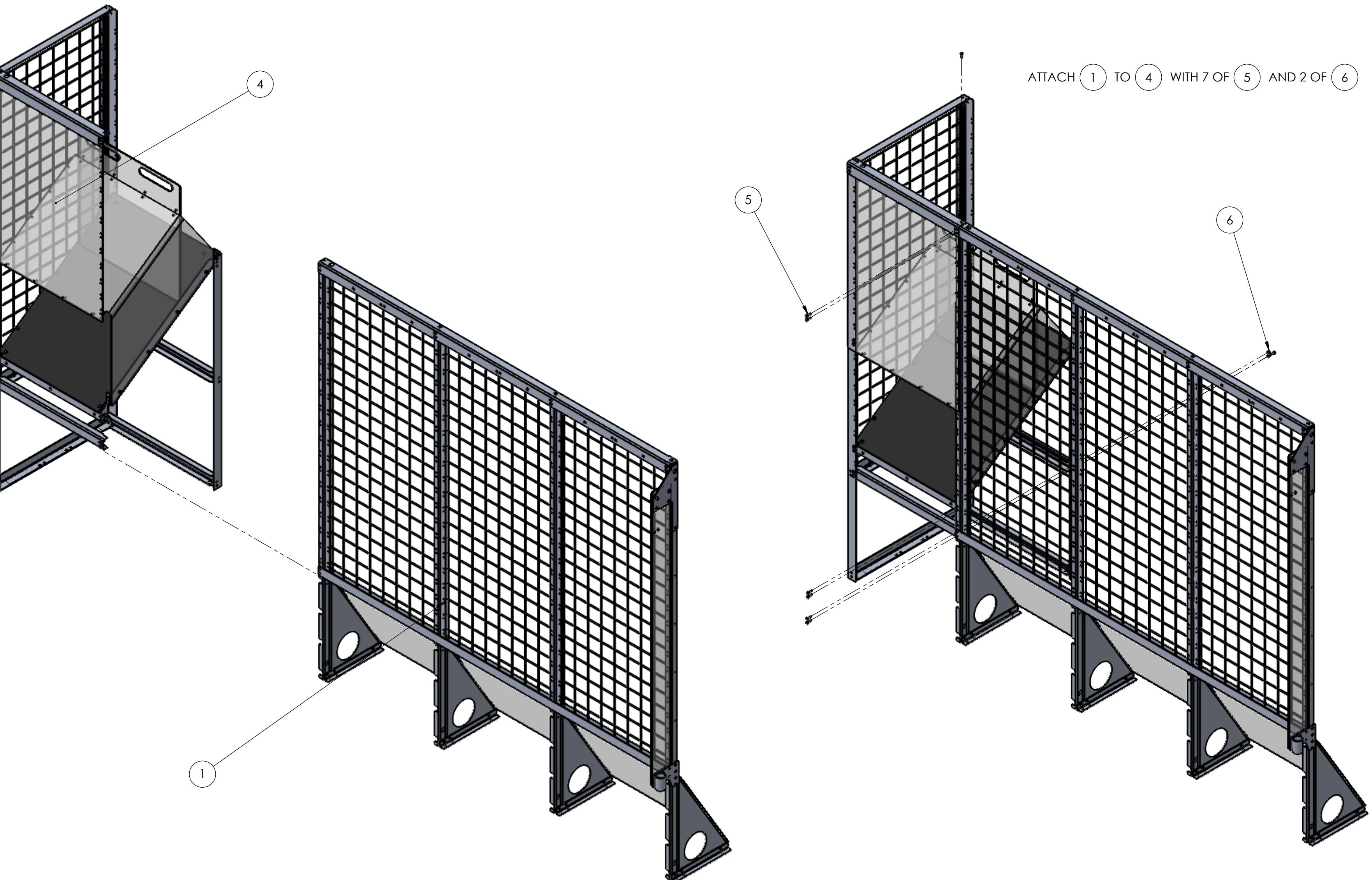
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23210	Blue Fence	1
2	GE-23214	Chute Guard	1
3	GE-23235	Extended Pin	1
4	GE-23240	Blue Chute	1
5	hex_.25_20_0.75	Steel Hex Head Screw, 1/4"-20 x 0.75" long, fully threaded	7
6	nylock_.25_20	Steel Nylon-Insert Locknut, 1/4"-20	2

UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DRAWN	NE	12/21/2022	
PROPRIETARY AND CONFIDENTIAL			
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COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			
FIRST ROBOTICS COMPETITION   Modeling Solutions Partner			
TITLE: Blue Single Substation			
SIZE DWG. NO. REV			
C GE-23200			
SCALE: 1:10 SHEET 1 OF 4			



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	NE	12/21/2022
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: Blue Single Substation

SIZE	DWG. NO.	REV
C	GE-23200	

SCALE: 1:12 SHEET 2 OF 4

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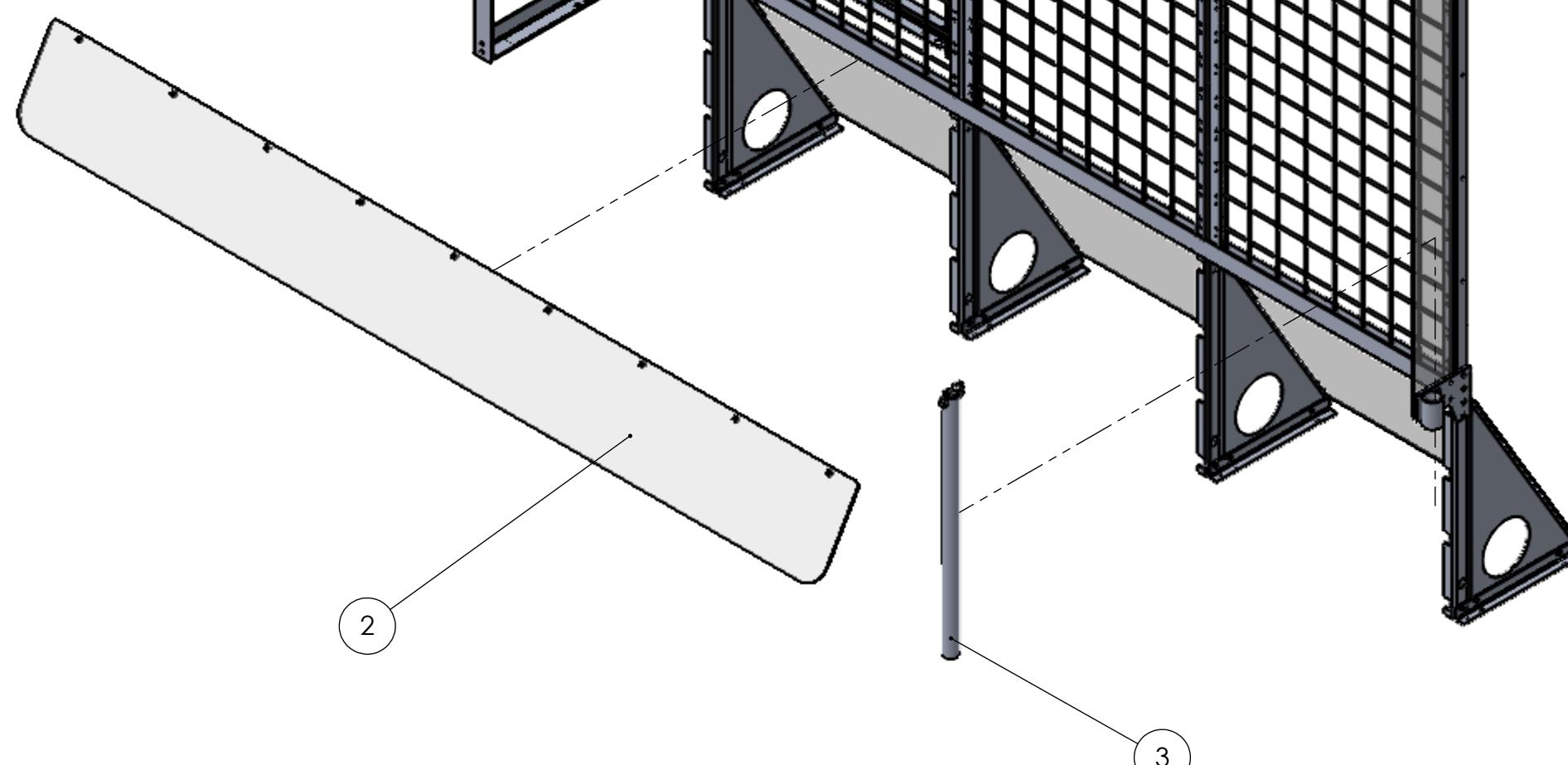
B

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USE 120LB CABLE TIES TO ATTACH
 ② TO ASSEMBLY, STARTING
 WITH HOLES BEHIND THE CHUTE.



③ REPLACES THE CORNER PIN OF THE FIELD PERIMETER



UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DRAWN	NE	12/21/2022	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:			
DO NOT SCALE DRAWING			
FIRST ROBOTICS COMPETITION			
SOLIDWORKS Modeling Solutions Partner			
TITLE: Blue Single Substation			
SIZE DWG. NO. REV			
C GE-23200			
SCALE: 1:12 SHEET 3 OF 4			

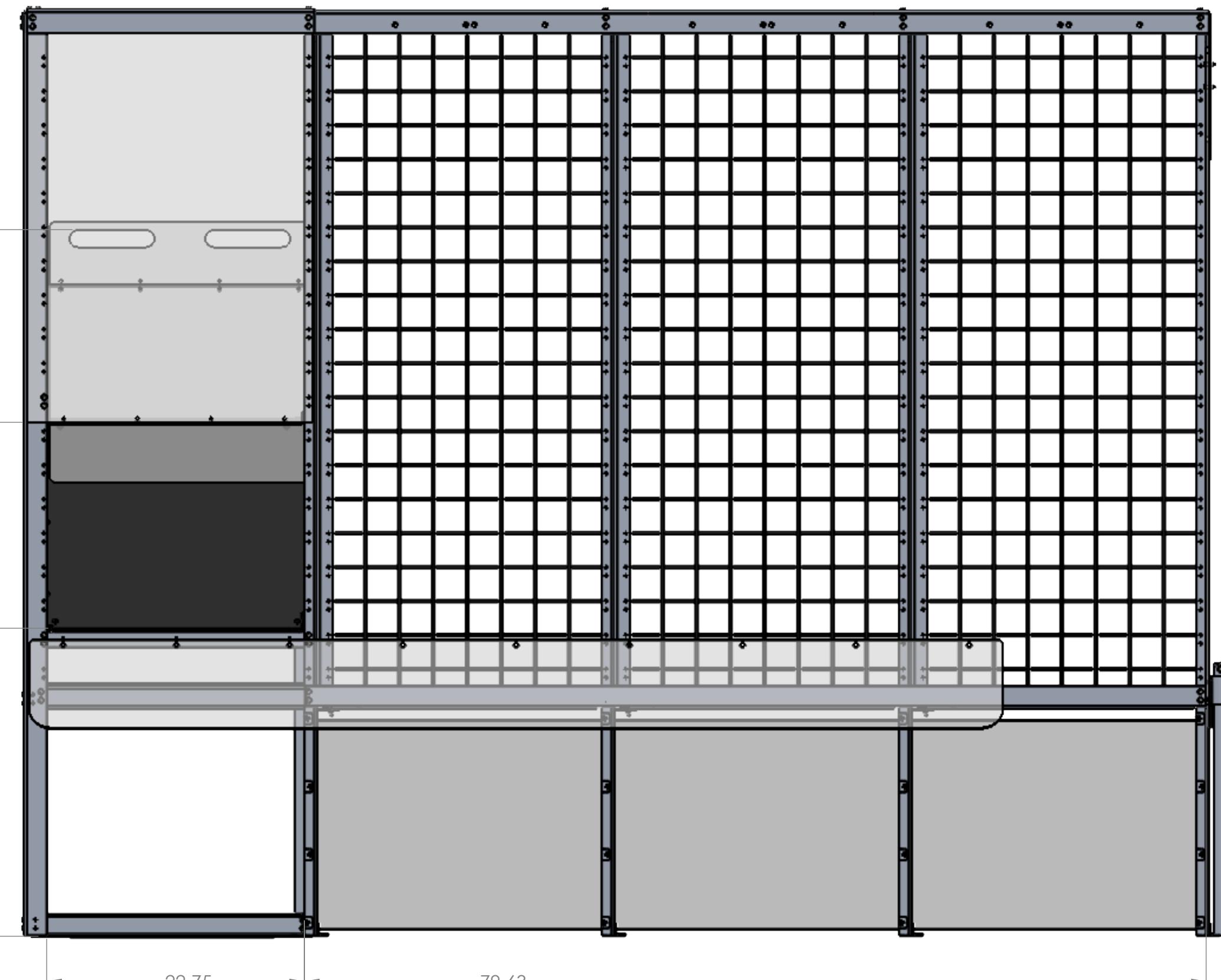
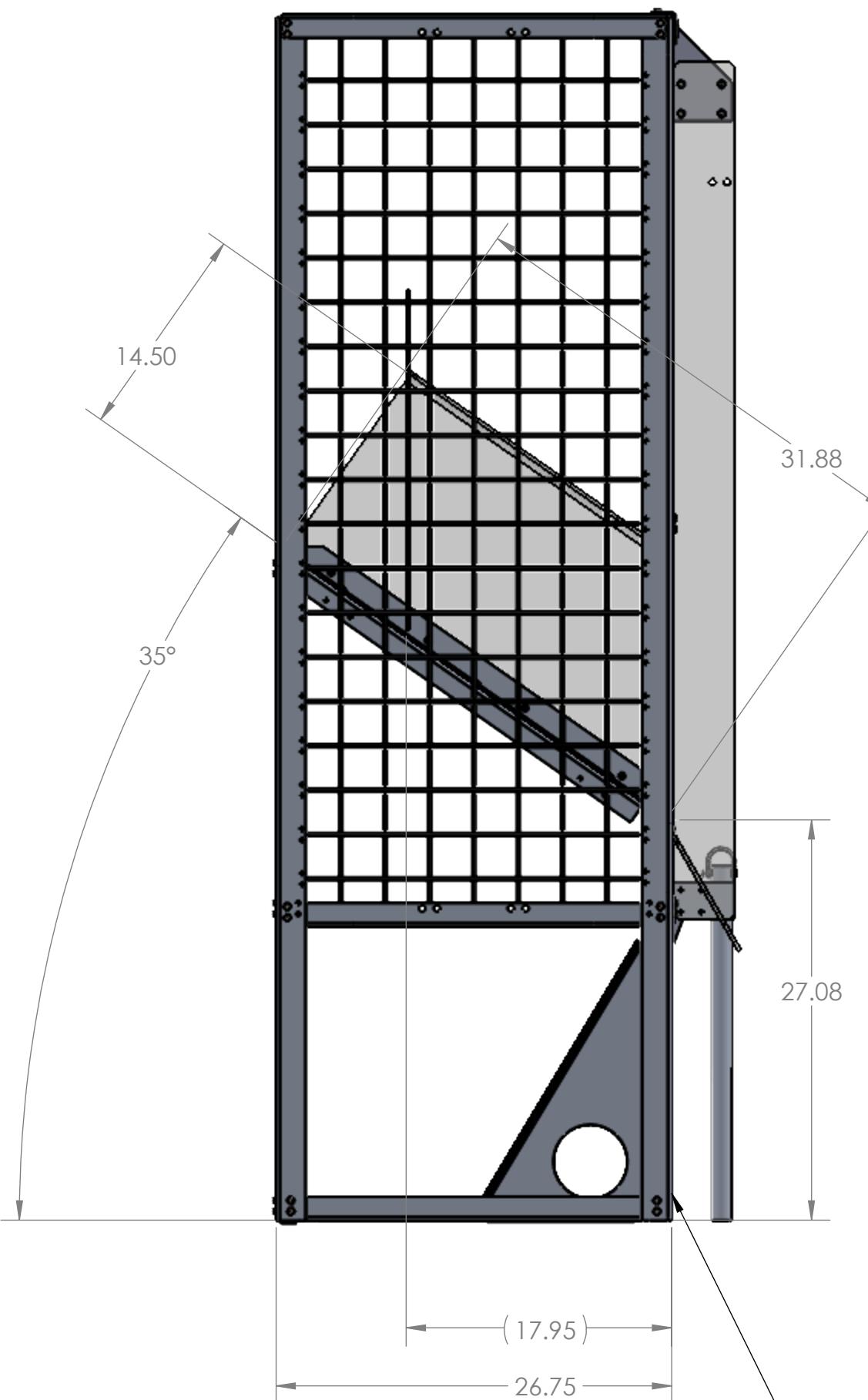
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UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DRAWN	NE	12/21/2022	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST
ROBOTICS
COMPETITION

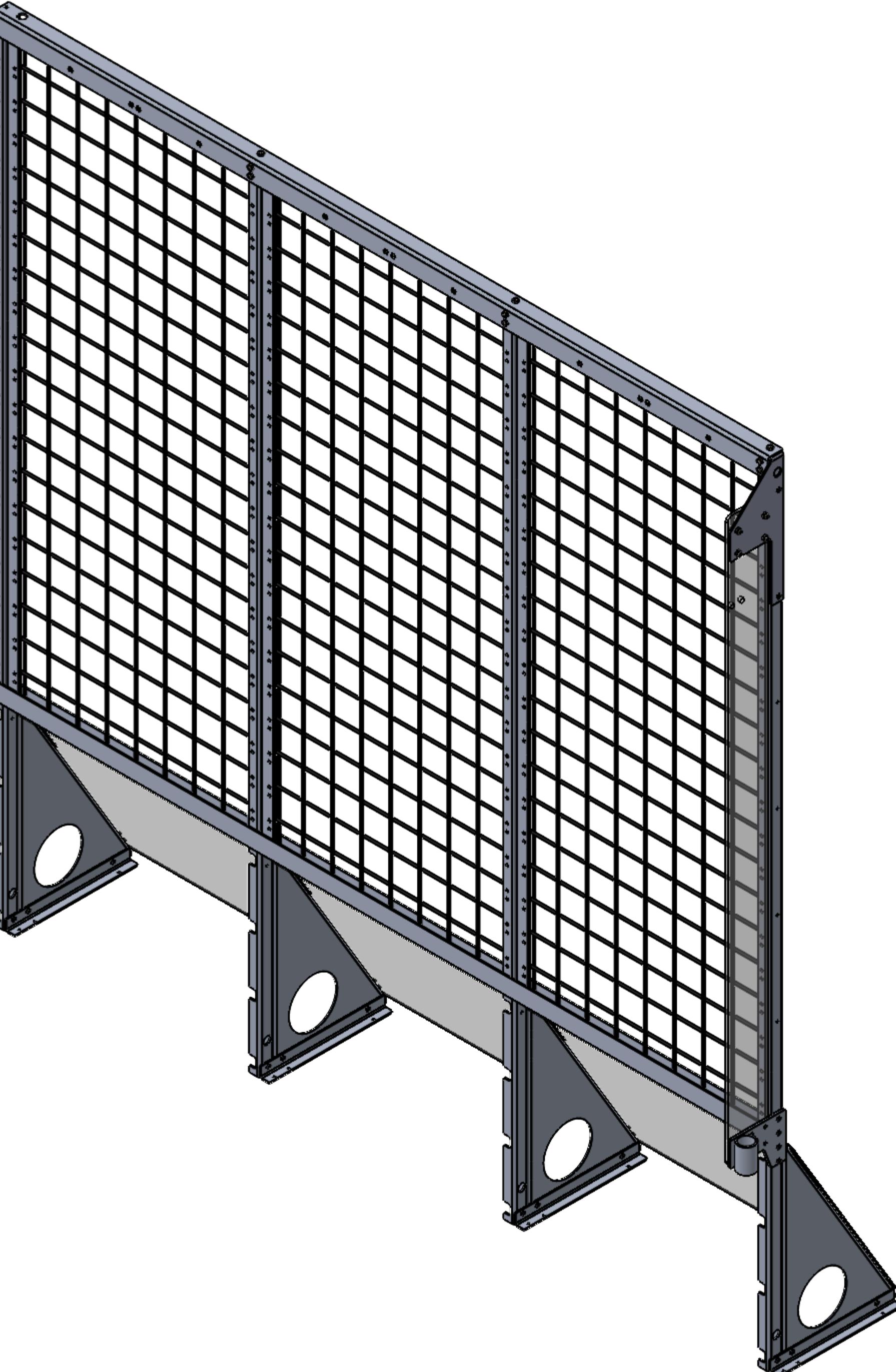
SOLIDWORKS
Modeling Solutions Partner

TITLE:
**Blue Single
Substation**

SIZE DWG. NO. REV

C GE-23200

SCALE: 1:10 SHEET 4 OF 4



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23211	Blue Bottom Channel	1
2	GE-23212	Blue Top Channel	1
3	GE-23216	Shin Guard W Loop	1
4	GE-23225	Blue Standard Fence Vertical With Hook	3
5	GE-23230	Blue Corner Fence Vertical	1
6	GE-23266	ULINE Grid	3
7	hex_.25_20_0.75	Steel Hex Head Screw, 1/4"-20 x 0.75" long, fully threaded	18
8	nylock_.25_20	Steel Nylon-Insert Locknut, 1/4"-20	2

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

FIELD NAME DATE
DRAWN NE 12/21/2022

 FIRST
ROBOTICS
COMPETITION
SOLIDWORKS
Modeling Solutions Partner

TITLE:
Blue Fence

SIZE DWG. NO. REV
C GE-23210

SCALE: 1:7 SHEET 1 OF 6

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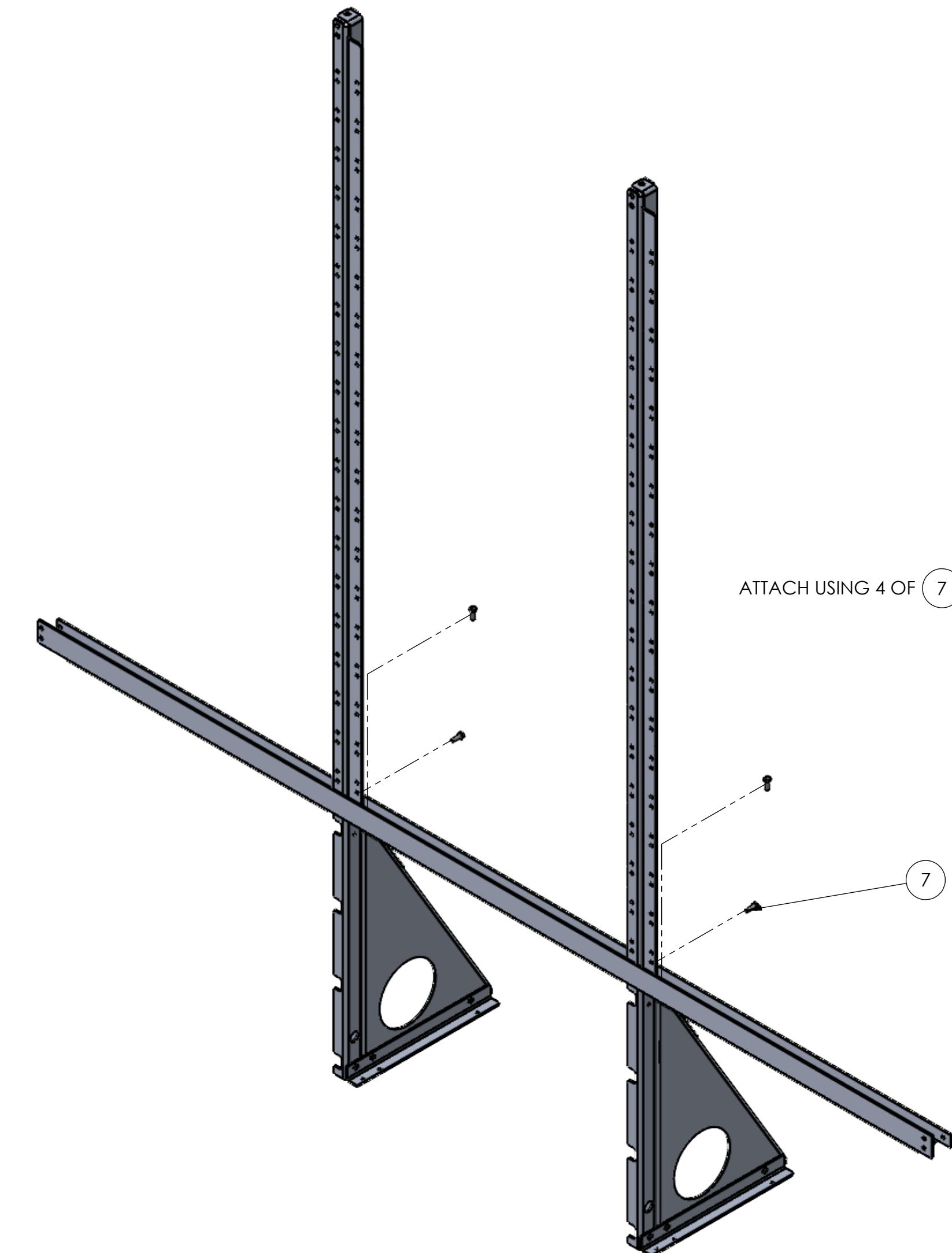
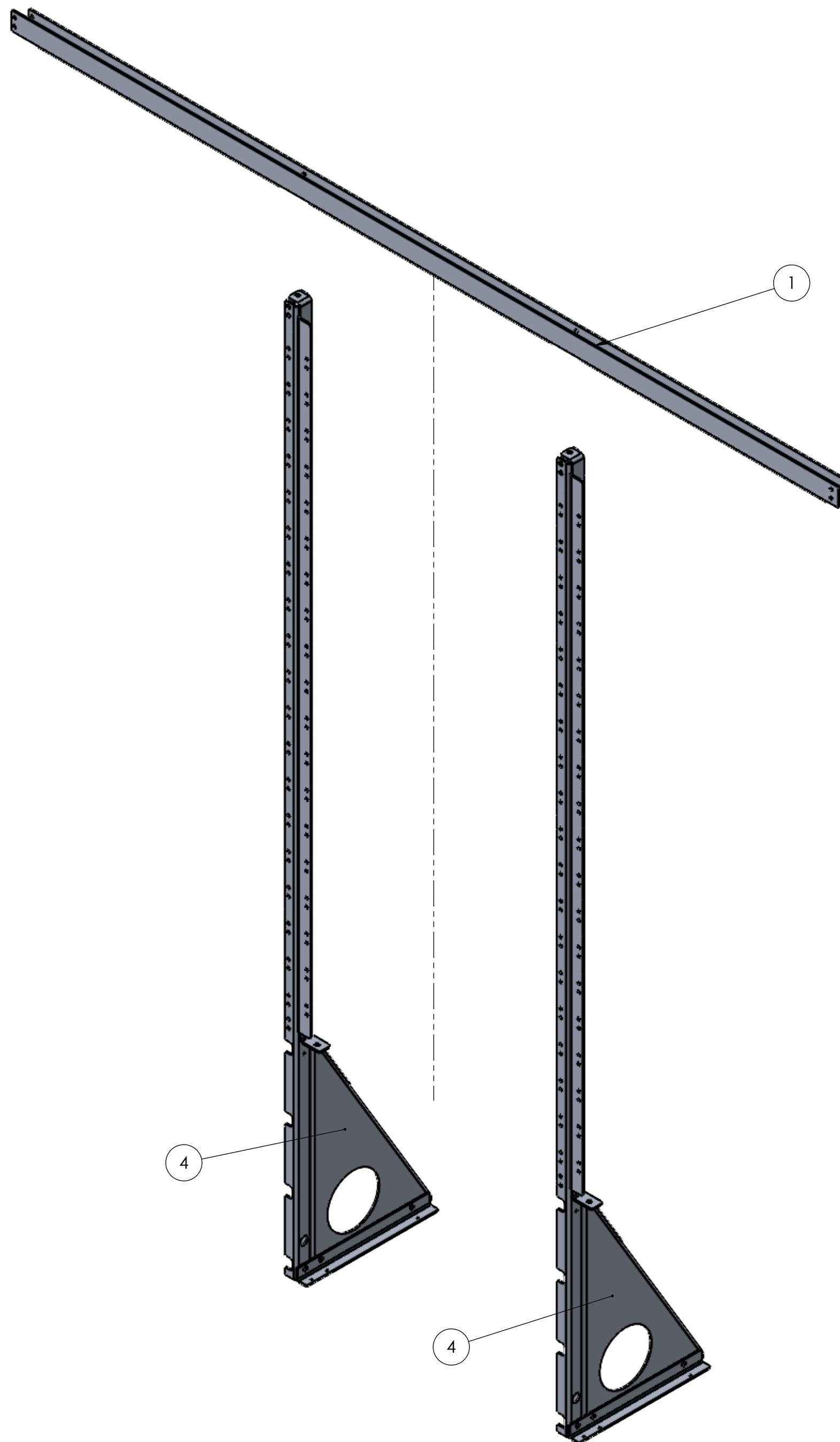
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UNLESS OTHERWISE SPECIFIED:

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

MATERIAL/FINISH:

FIELD	NAME	DATE
DRAWN	NE	12/21/2022
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: **Blue Fence**

SIZE DWG. NO. REV

C GE-23210

SCALE: 1:7 SHEET 2 OF 6

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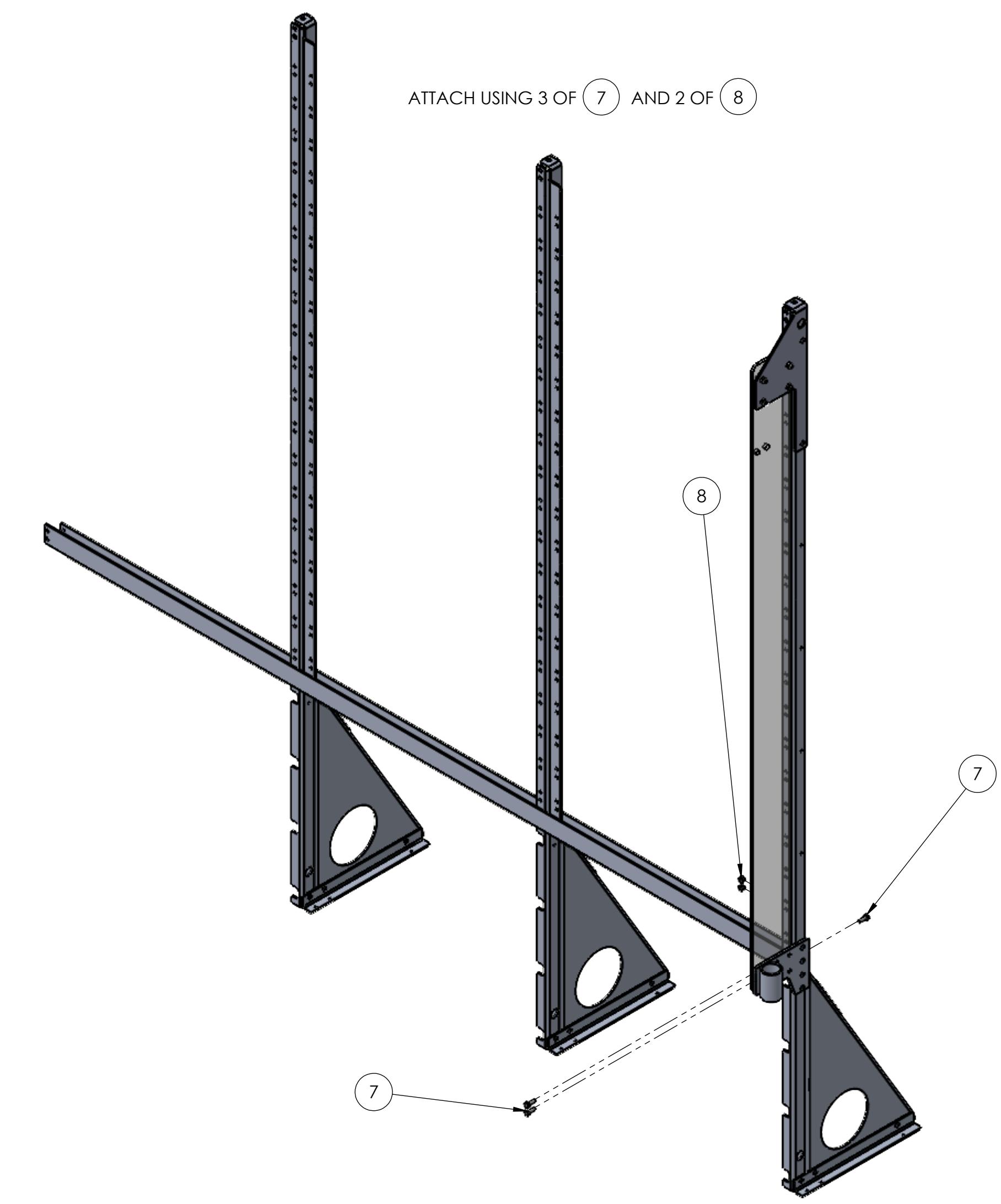
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UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DRAWN	NE	12/21/2022	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

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

TITLE:
Blue Fence

SIZE DWG. NO. REV
C GE-23210

SCALE: 1:8 SHEET 3 OF 6

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UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DRAWN	NE	12/21/2022	
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:
Blue Fence

SIZE DWG. NO. REV
C GE-23210

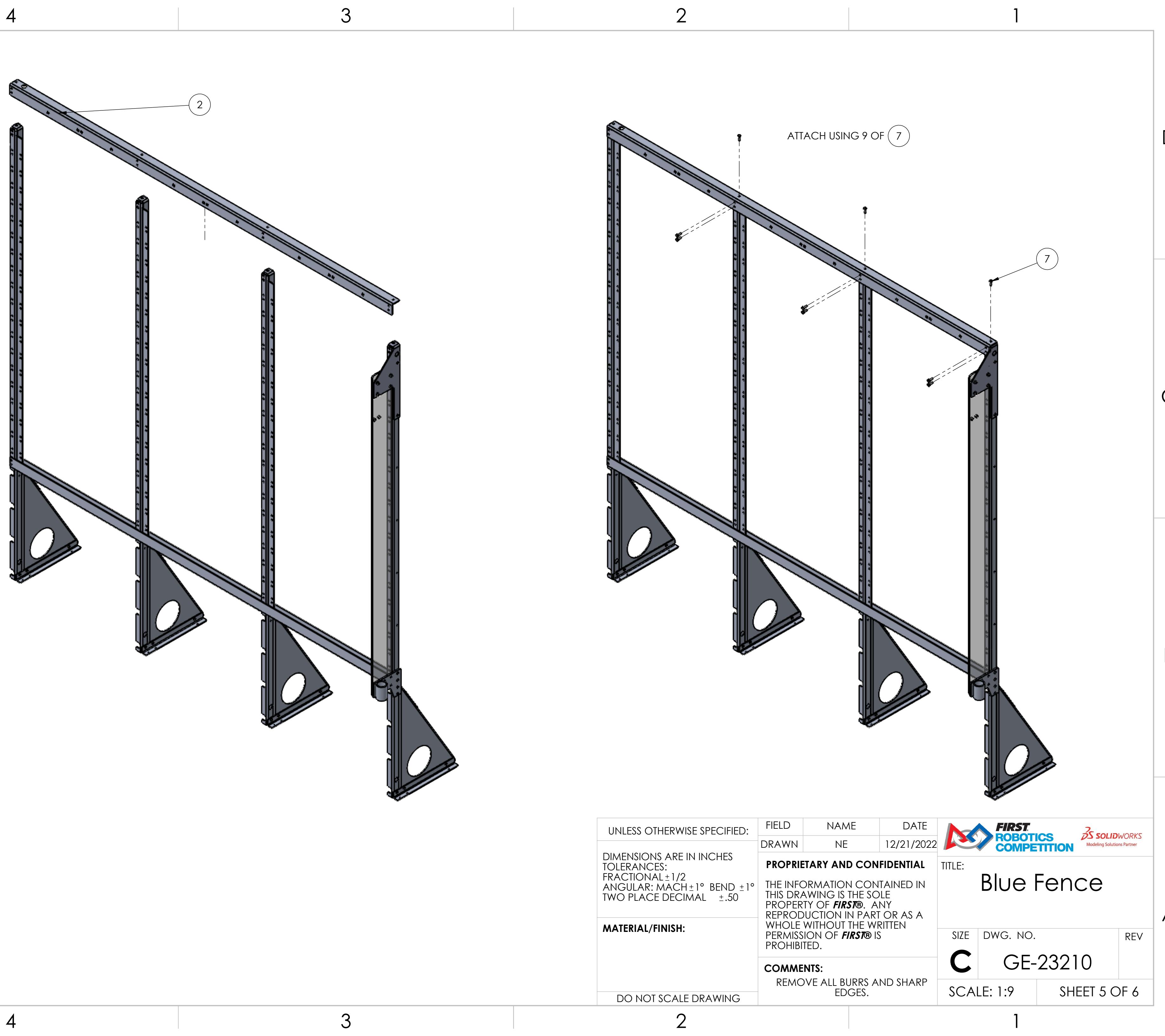
SCALE: 1:9 SHEET 4 OF 6

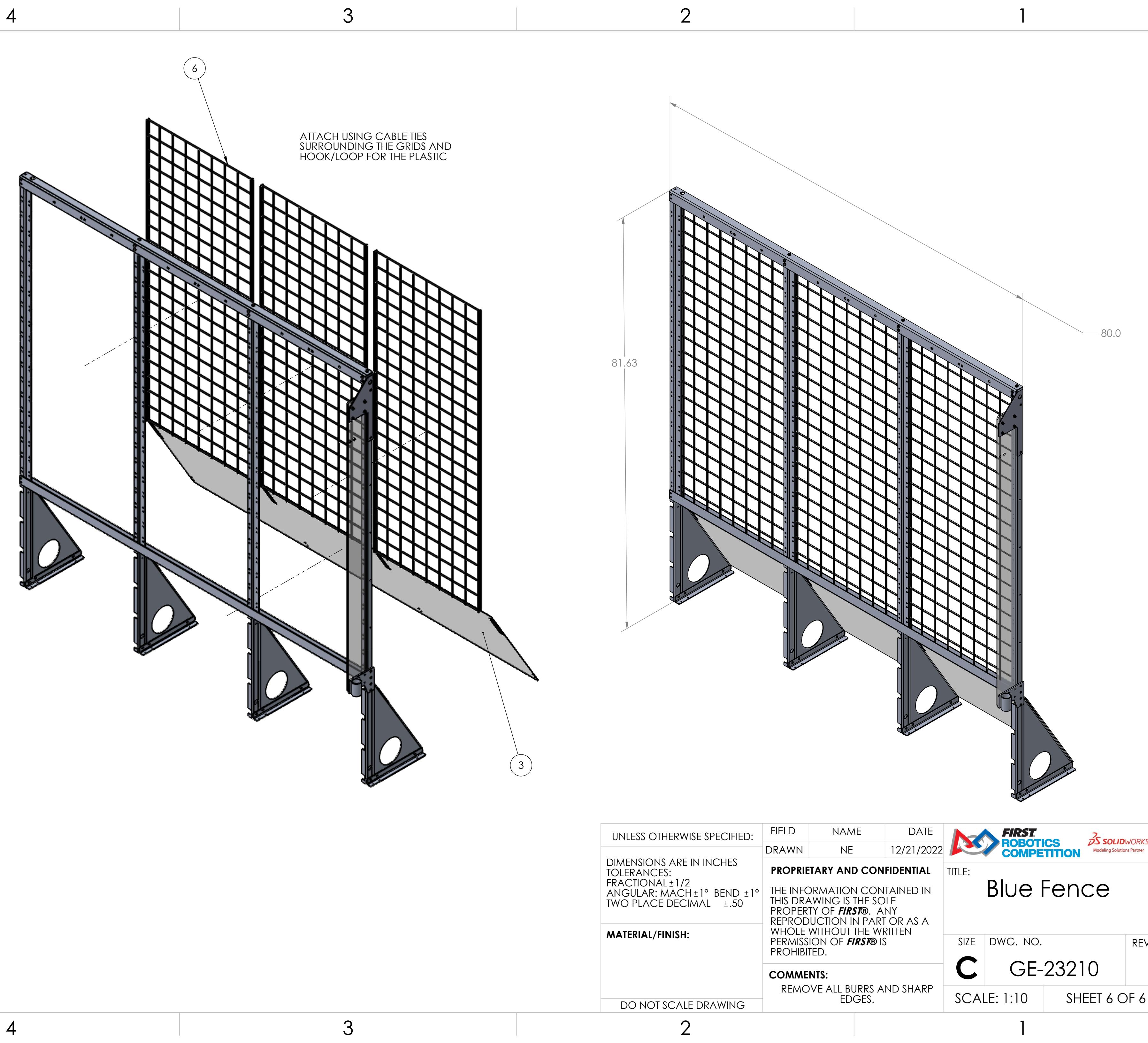
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UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DRAWN	NE	12/21/2022	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST ROBOTICS COMPETITION Modeling Solutions Partner

TITLE: Blue Fence

SIZE DWG. NO. REV

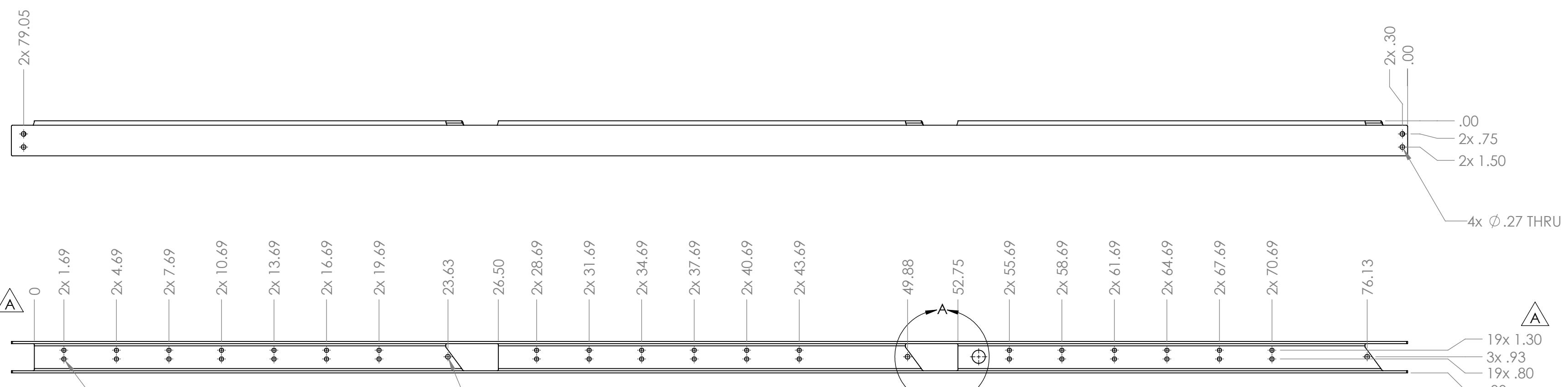
C GE-23210

SCALE: 1:10 SHEET 6 OF 6

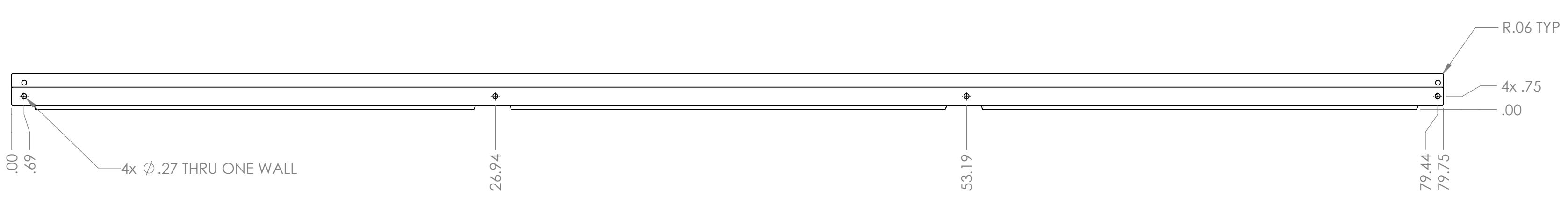
REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
A3, C1, C4	A	New Hole Locations, Cutout Sizes and Shape	10/11/2022	JO

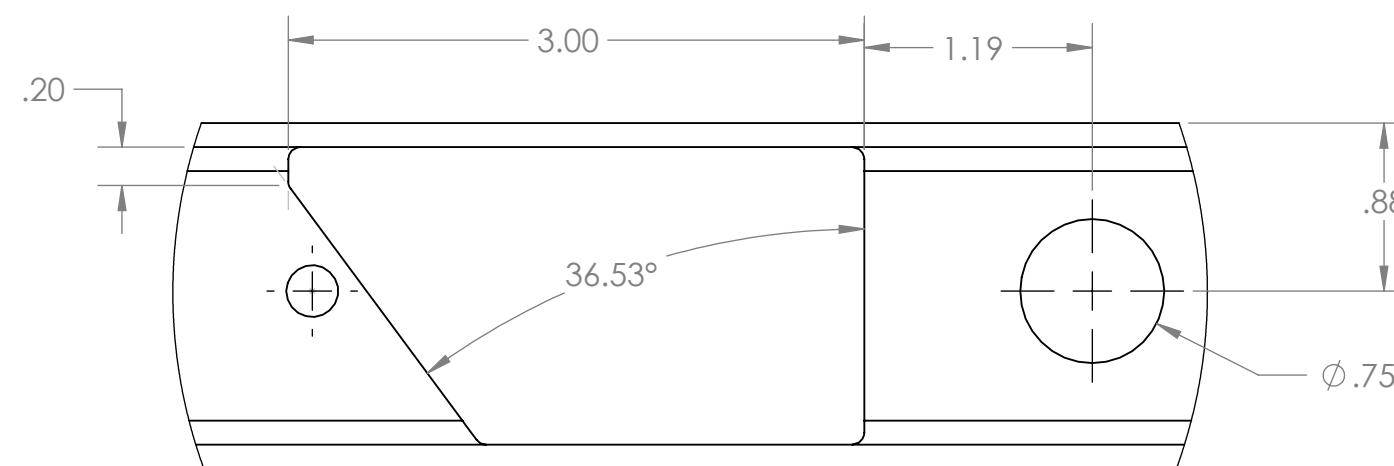
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DETAIL A
SCALE 1:1
Use DIMs for all instances



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 Al

DO NOT SCALE DRAWING

VEND NAME DATE
DRAWN JO 9/13/2022

PROPRIETARY AND CONFIDENTIAL

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COMMENTS:
REMOVE ALL BURRS AND SHARP EDGES.

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
Blue Bottom
Channel

SIZE DWG. NO. REV
C GE-23211 A

SCALE: 1:5 SHEET 1 OF 1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
C1, C2	A	Identification Hole Added	10/11/2022	JO

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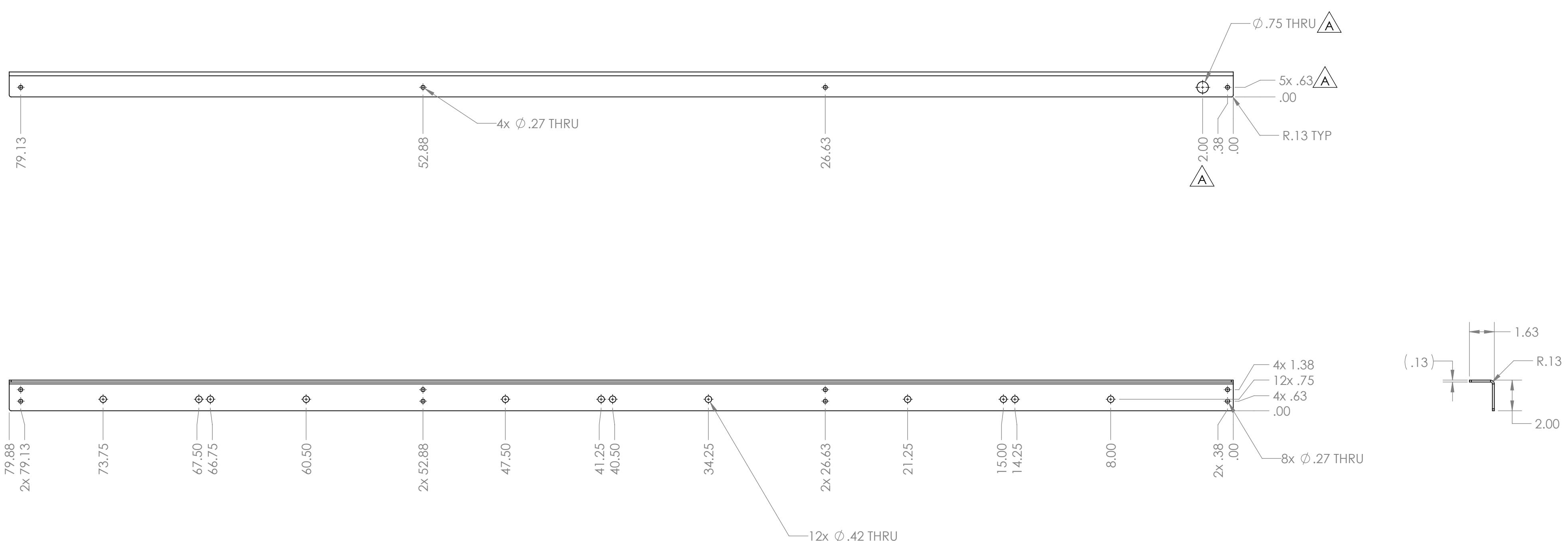
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UNLESS OTHERWISE SPECIFIED:

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:

8GA 5052 Al

DO NOT SCALE DRAWING

VEND DATE
DRAWN JO 9/13/2022

PROPRIETARY AND CONFIDENTIAL

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COMMENTS:
REMOVE ALL BURRS AND SHARP EDGES.

FIRST ROBOTICS COMPETITION

SOLIDWORKS

Modeling Solutions Partner

TITLE: Blue Top Channel

SIZE DWG. NO. REV
C GE-23212 A

SCALE: 1:8 SHEET 1 OF 1

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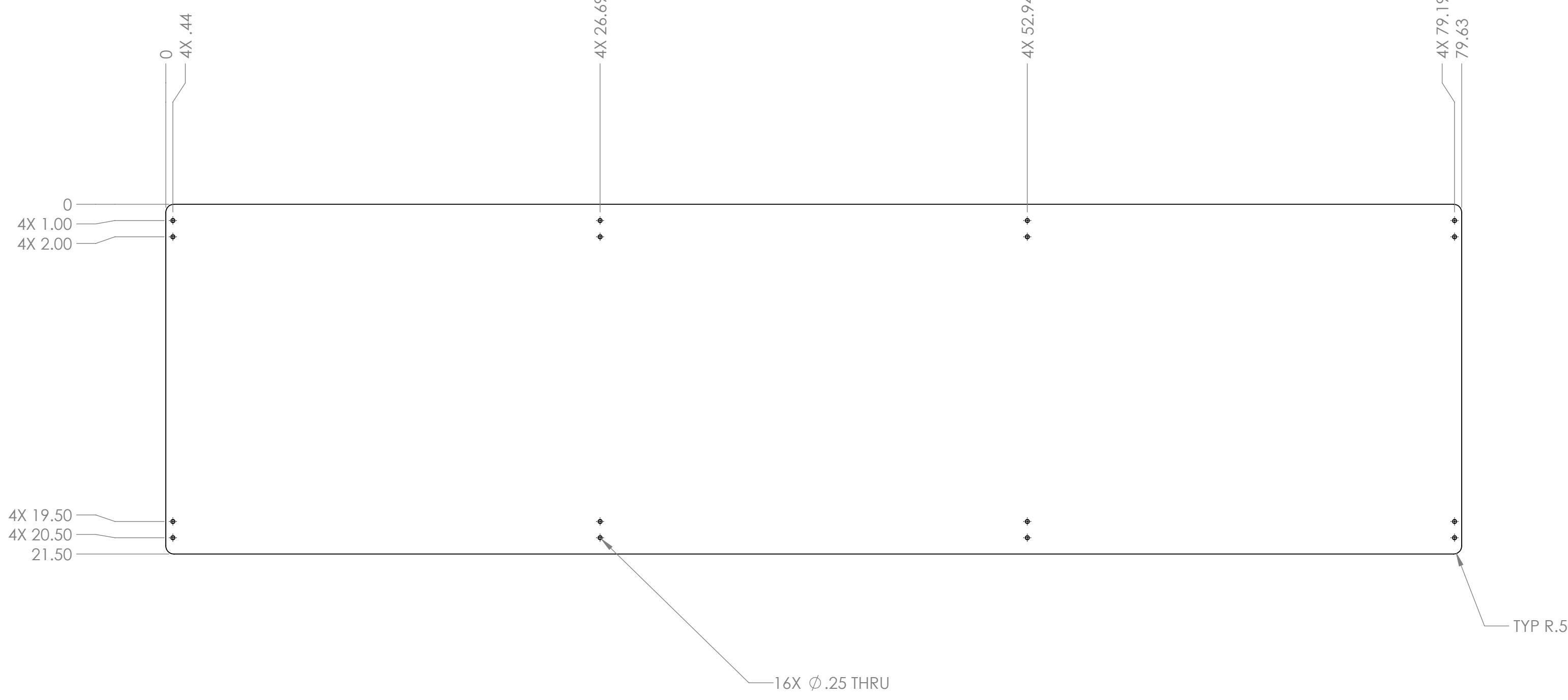
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UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	NE	10/17/2022
TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$	PROPRIETARY AND CONFIDENTIAL		
TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .005$	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: 0.125" Polycarbonate	SIZE	DWG. NO.	REV
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.	C	GE-23213	
DO NOT SCALE DRAWING	SCALE: 1:6	SHEET 1 OF 1	

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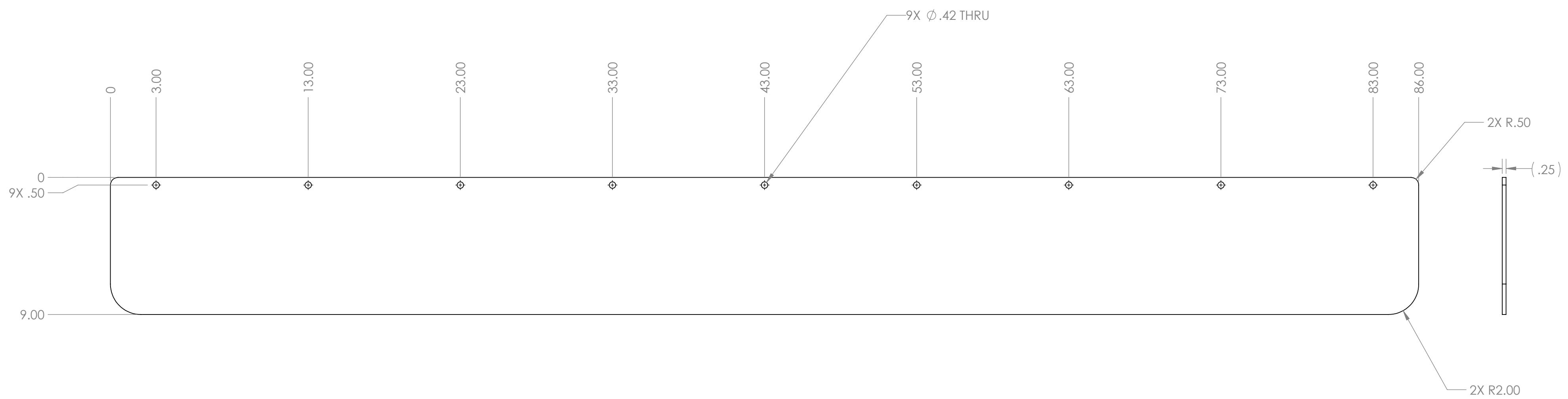
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UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	NE	10/17/2022	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:	SIZE	DWG. NO.	REV
0.25" Polycarbonate	C	GE-23214	
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING	SCALE: 1:5	SHEET 1 OF 1	

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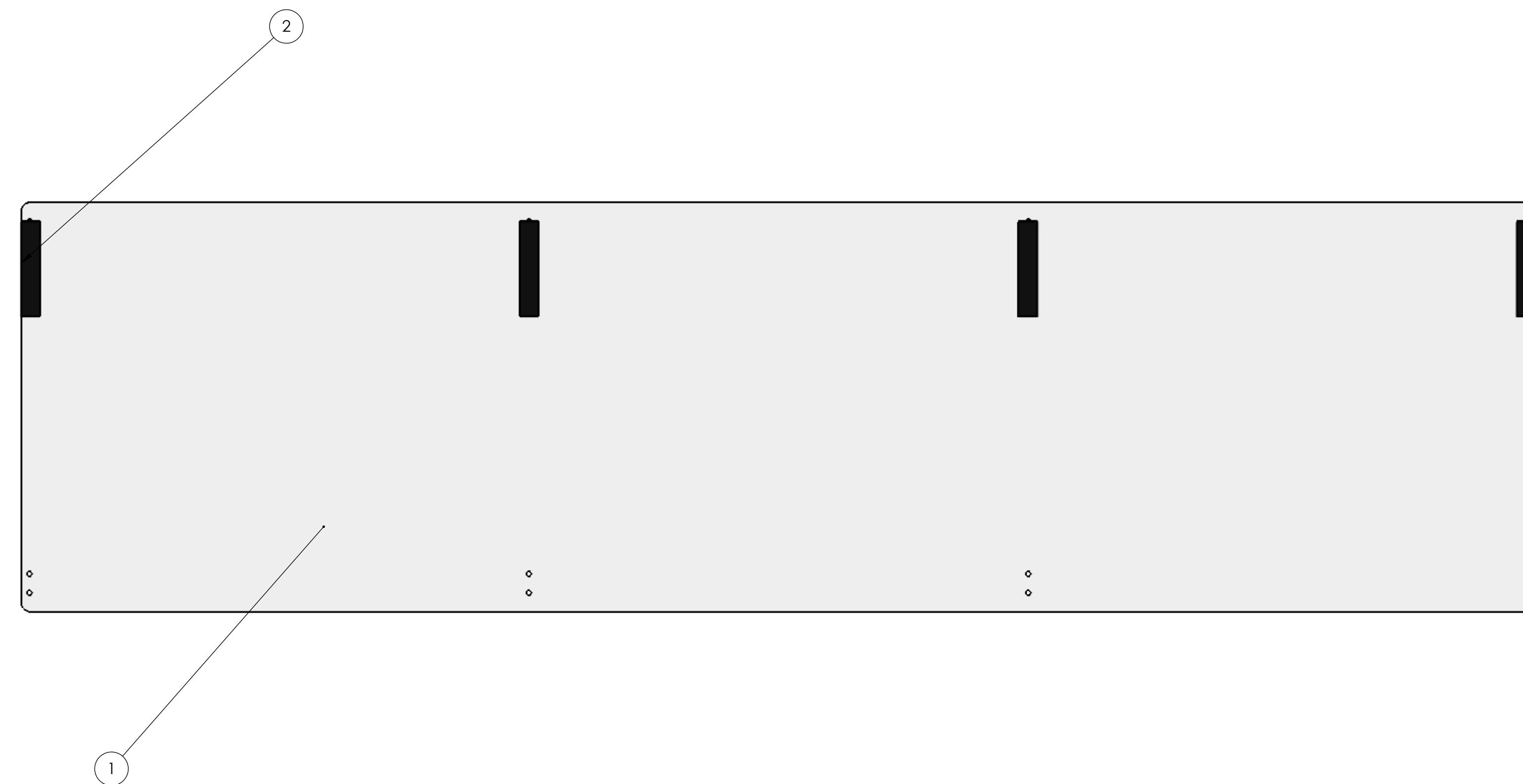
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23213	Shin Guard	1
2	Loop_1_5	1" x 5" Loop, Adhesive Backed	4

UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DRAWN	NE	1/3/2023	

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COMMENTS:
REMOVE ALL BURRS AND SHARP EDGES.

DO NOT SCALE DRAWING

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

TITLE:
Shin Guard W Loop

SIZE DWG. NO. REV
C GE-23216

SCALE: 1:5 SHEET 1 OF 1

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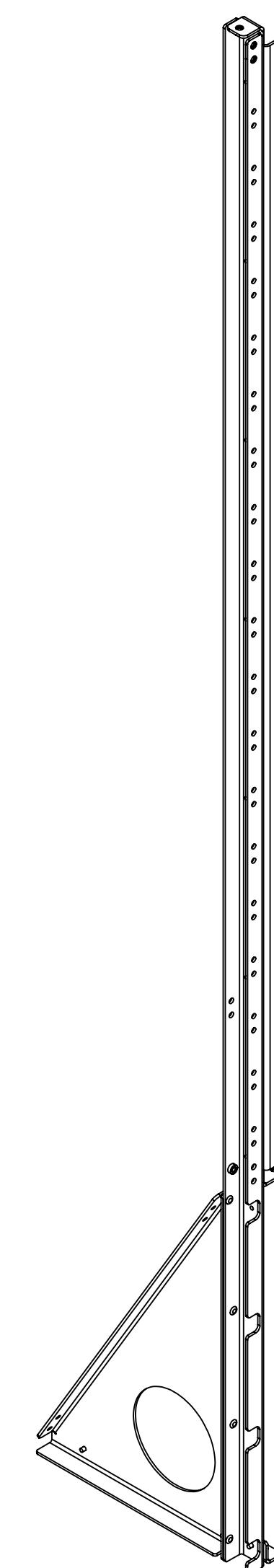
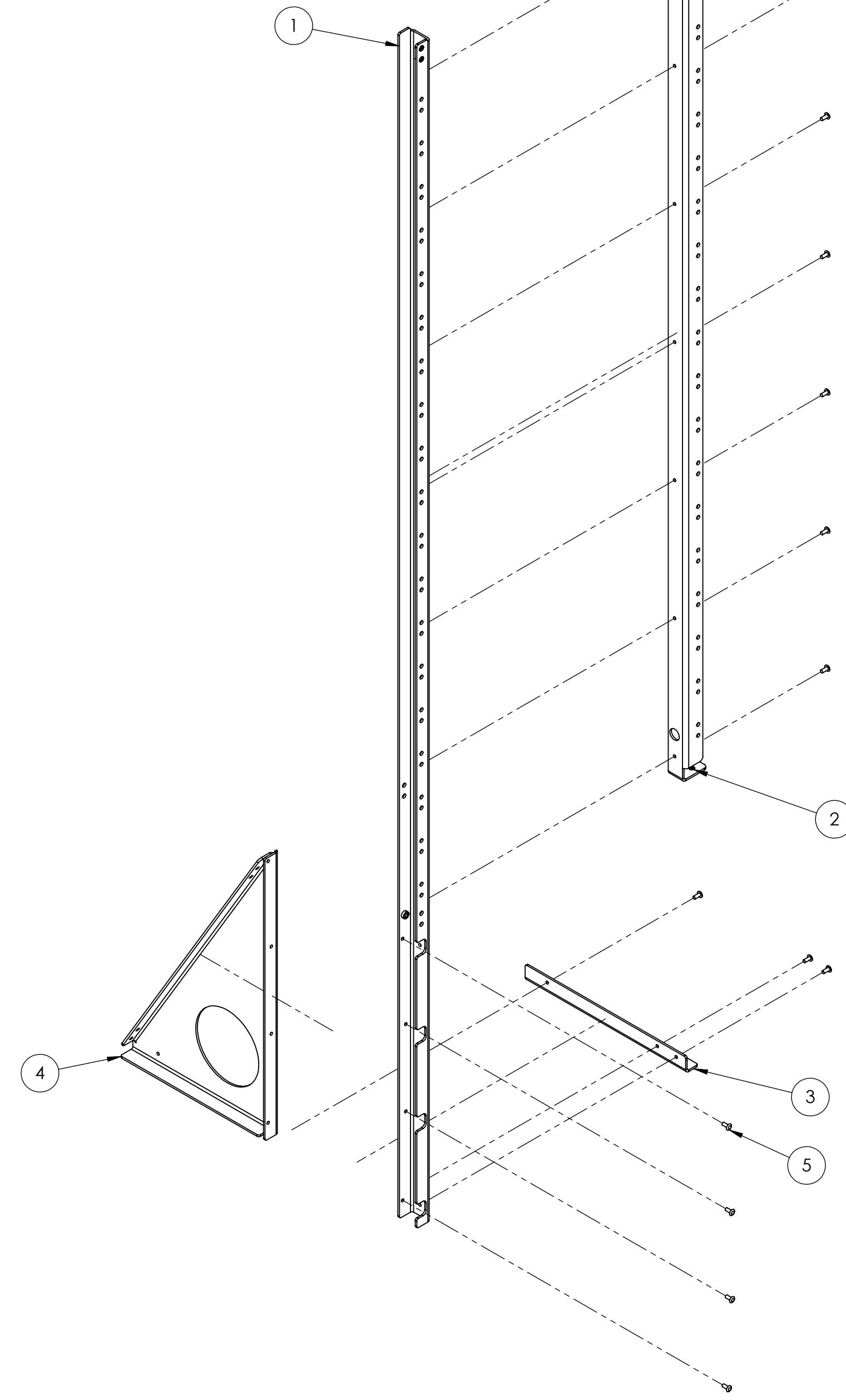
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23221	Blue Primary Vertical with PEMs	1
2	GE-23222	Blue Secondary Vertical with PEMs	1
3	GE-23223	Floor Anchor	1
4	GE-23224	Blue Lower Corner Bracket	1
5	rivet_.1875_.126-.25	3/16" Rivet, .126-.25 Grip Range	14



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 10/11/2022

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

FIRST ROBOTICS COMPETITION SOLIDWORKS Modeling Solutions Partner

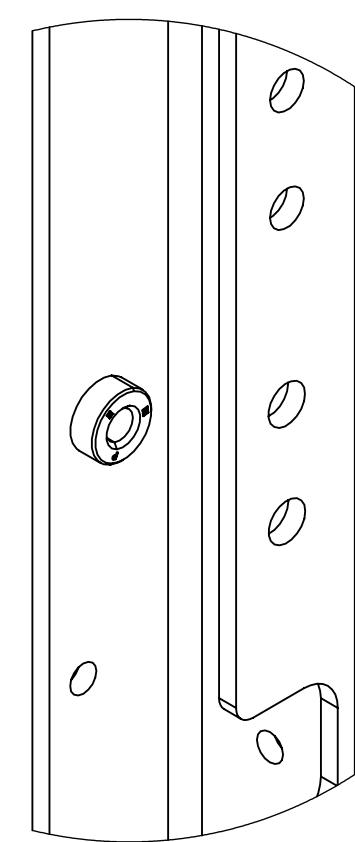
TITLE: Blue Standard Vertical

SIZE DWG. NO. REV

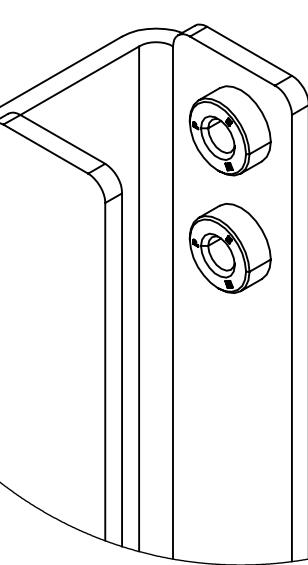
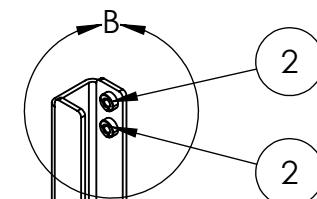
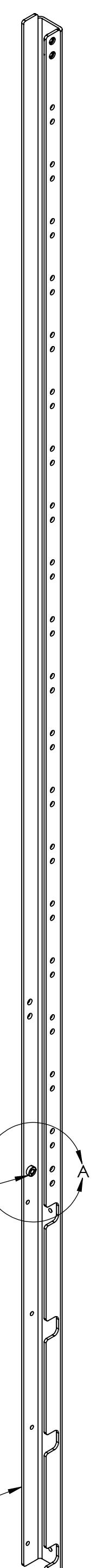
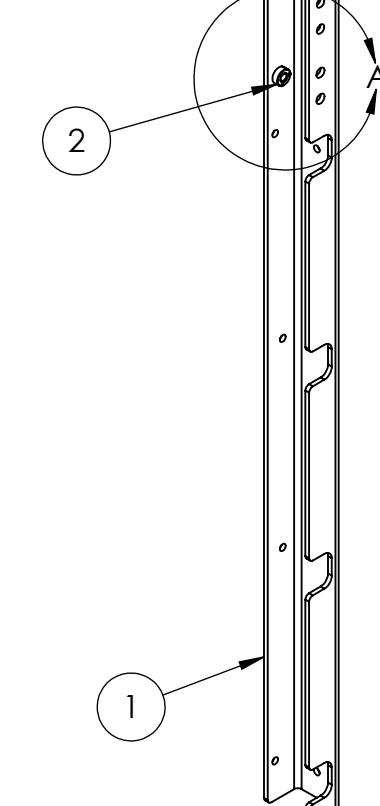
C GE-23220

SCALE: 1:6 SHEET 1 OF 1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23221-01	Blue Primary Vertical	1
2	pem_clinchnut_.25_20 .054	1/4-20 self-clinching nut, .054 shank	3



DETAIL A
SCALE 1 : 1



DETAIL B
SCALE 1 : 1

Insert PEM nuts as shown, protruding inwards

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 10/11/2022

PROPRIETARY AND CONFIDENTIAL

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COMMENTS:
REMOVE ALL BURRS AND SHARP EDGES.

FIRST
ROBOTICS
COMPETITION
SOLIDWORKS
Modeling Solutions Partner

TITLE: Blue Primary Vertical with PEMs

SIZE	DWG. NO.	REV
C	GE-23221	A

SCALE: 1:12 SHEET 1 OF 1

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This technical drawing illustrates the cross-sectional profile of a mechanical component. The top horizontal line represents the top surface, with a height of 81.50 above the baseline. A note "R.13 TYP" indicates a rounded corner at the left end. The bottom horizontal line represents the bottom surface, with a height of 0.00 above the baseline. A note "R.25 TYP" indicates a rounded corner at the right end.

The component features several vertical slots and holes:

- Top Surface Features:**
 - Two vertical slots labeled "2x Ø.27 THRU ONE WALL" are located near the center, with a depth of 28.88.
 - A single vertical slot labeled "Ø.34 THRU ONE WALL" is located further to the right.
 - Four vertical slots labeled "4x Ø.193±.002 THRU ONE WALL" are located at the far right edge.
- Middle Section:**
 - Two vertical slots labeled "12x Ø.193±.002 THRU" are located in the middle section.
 - A vertical slot labeled "Ø.75 THRU" is located on the right side of the middle section.
 - Material thicknesses are specified as "7x .88" and "5x .75" along the right edge of the middle section.
- Bottom Surface Features:**
 - Two vertical slots labeled "2x Ø.34 THRU" are located on the left side.
 - Forty vertical slots labeled "40x Ø.25 THRU ONE WALL" are located in the middle section.
 - Material thicknesses are specified as "4x 1.00" and "4x .3" along the right edge of the bottom section.

Vertical dimensions are indicated by tick marks along the left and right edges, ranging from 0.00 to 81.50. Horizontal dimensions are indicated by tick marks along the top and bottom edges, ranging from 0.00 to 42x.

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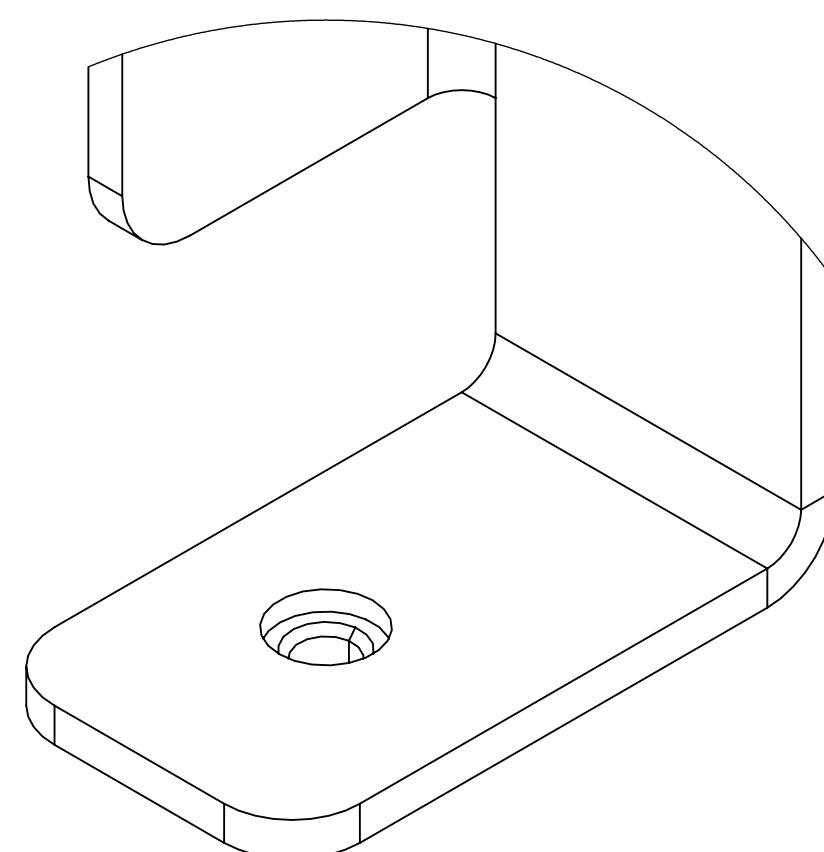
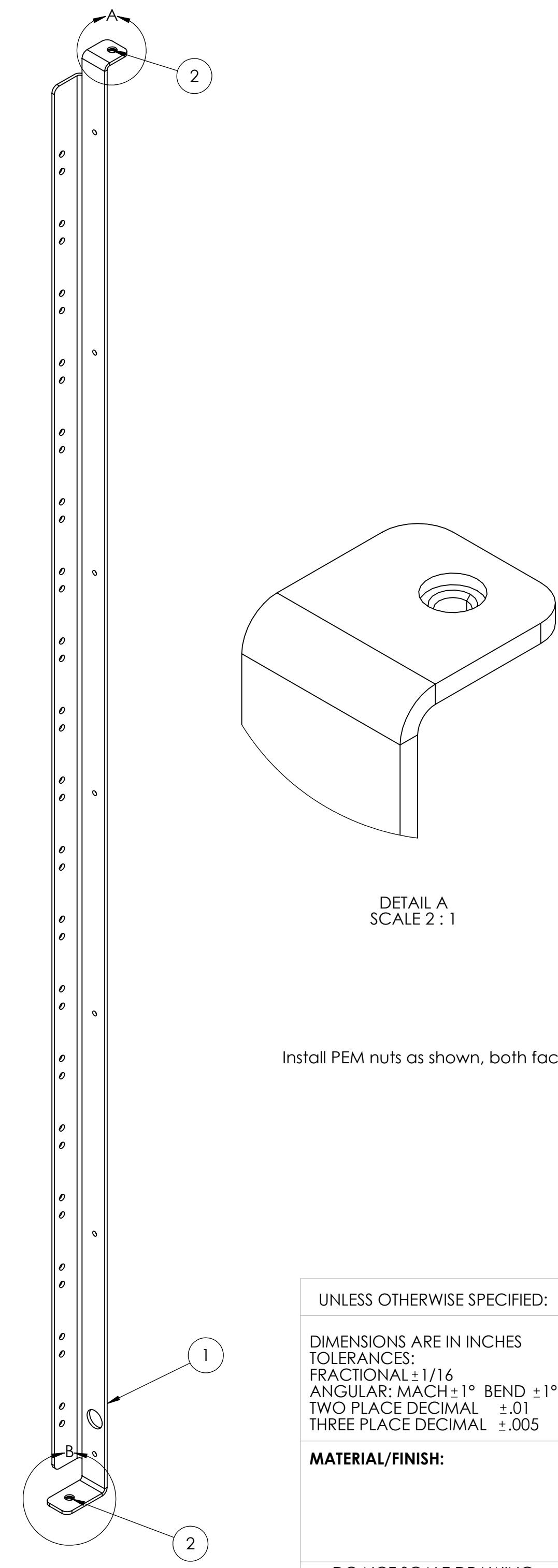
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UNLESS OTHERWISE SPECIFIED:		BEND	NAME	DATE
		DRAWN	JO	9/14/2022
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .02$ THREE PLACE DECIMAL $\pm .010$		PROPRIETARY AND CONFIDENTIAL 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: 8GA 5052 Al		COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.		
DO NOT SCALE DRAWING		TITLE: Blue Primary Vertical		
		SIZE	DWG. NO.	REV
		C	GE-23221-01	A
		SCALE: 1:12		SHEET 1 OF 1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23222-01	Blue Secondary Vertical	1
2	pem_clinchnut_.25_20 .054	1/4-20 self-clinching nut, .054 shank	2

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A	This Part # is now used for PEM nut installation	10/11/2022	JO

DETAIL B
SCALE 2 : 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

VEND NAME DATE
DRAWN JO 10/11/2022

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COMMENTS:
REMOVE ALL BURRS AND SHARP EDGES.

FIRST ROBOTICS COMPETITION SOLIDWORKS Modeling Solutions Partner

TITLE: Blue Secondary Vertical with PEMs

SIZE DWG. NO. REV
C GE-23222 **A**

SCALE: 1:8 SHEET 1 OF 1

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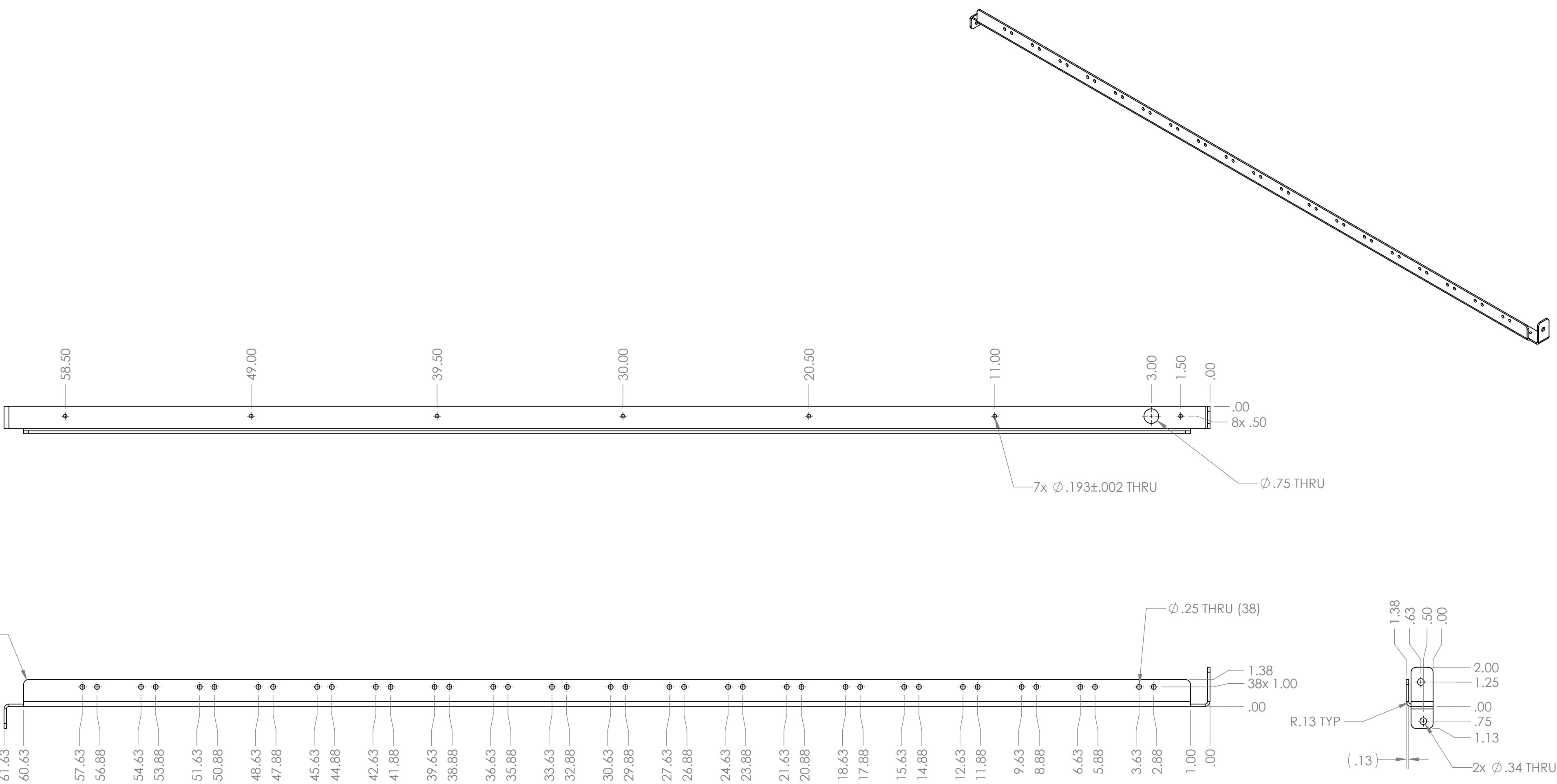
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UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	JO	9/14/2022	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH: 8GA 5052 Al			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

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

TITLE:
**Blue Secondary
Vertical**

SIZE DWG. NO. REV
C GE-23222-01 A

SCALE: 1:8 SHEET 1 OF 1

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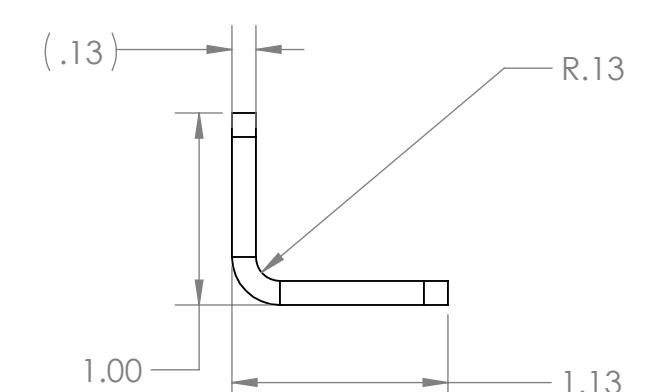
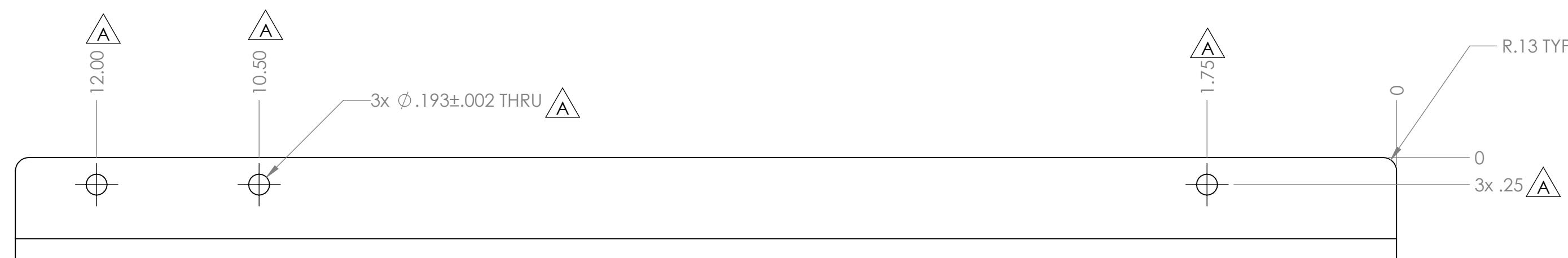
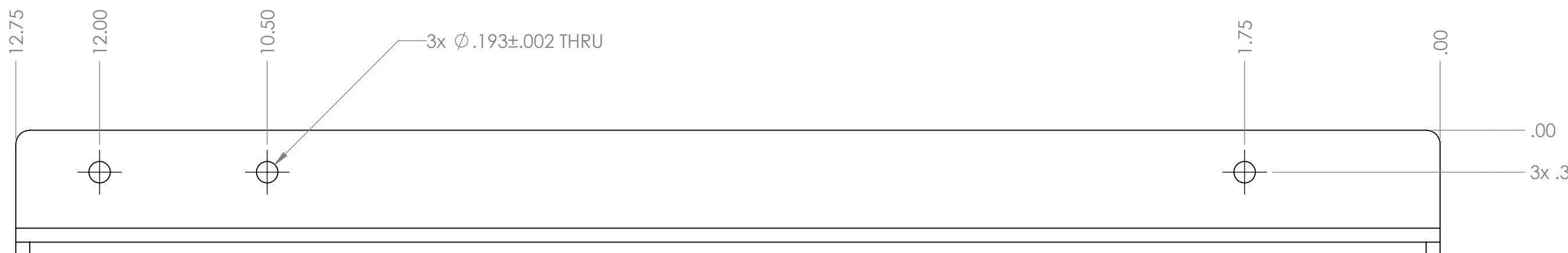
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REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
B2, B3, C2, C4	A	Holes added to second flange	10/11/2022	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:
8 GA 5052 AL

DO NOT SCALE DRAWING

VEND NAME DATE
DRAWN JO 9/14/2022

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PROHIBITED.

COMMENTS:
REMOVE ALL BURRS AND SHARP
EDGES.

FIRST
ROBOTICS
COMPETITION
SOLIDWORKS
Modeling Solutions Partner

TITLE:
Floor Anchor

SIZE DWG. NO. REV
C GE-23223 A

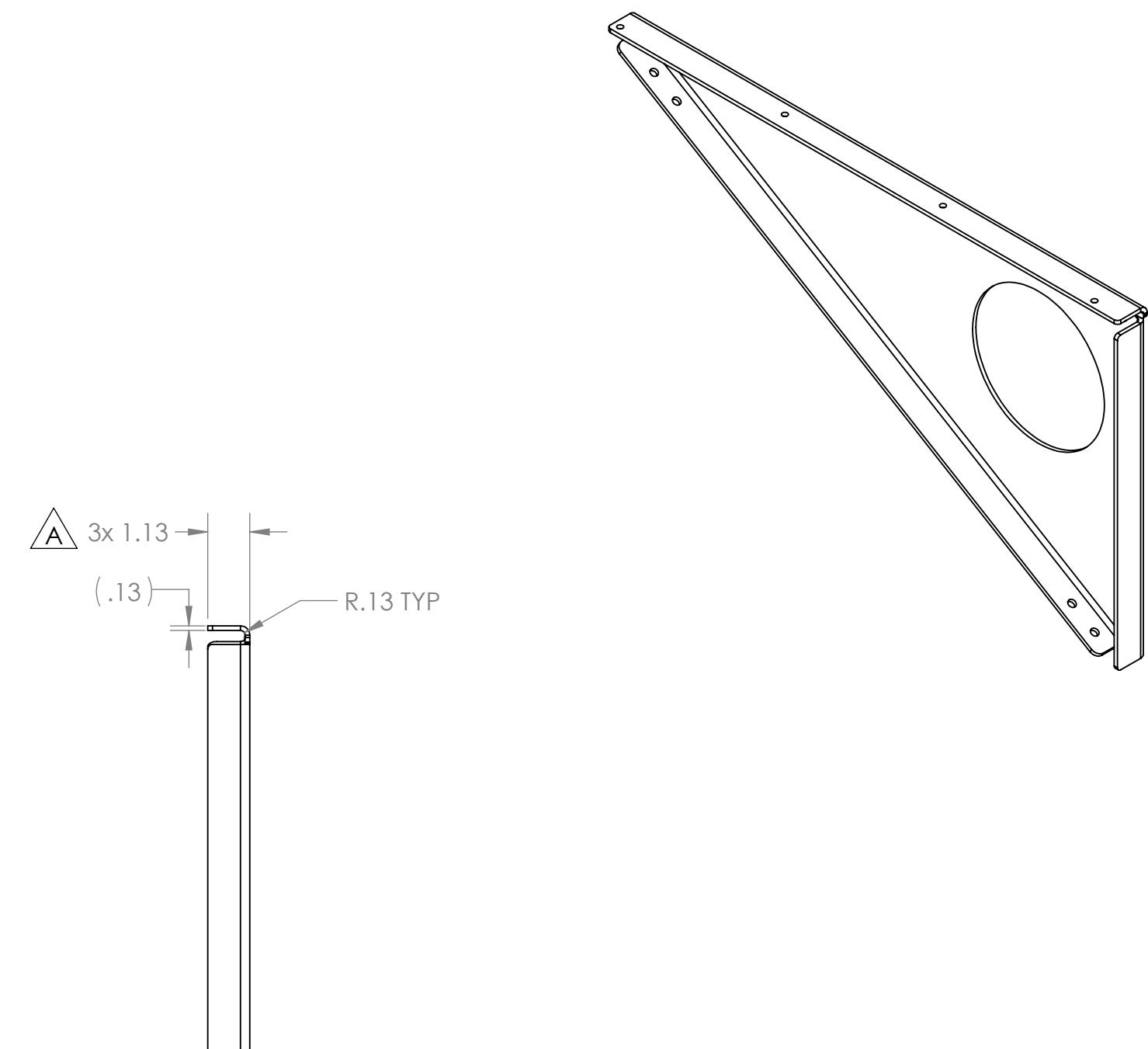
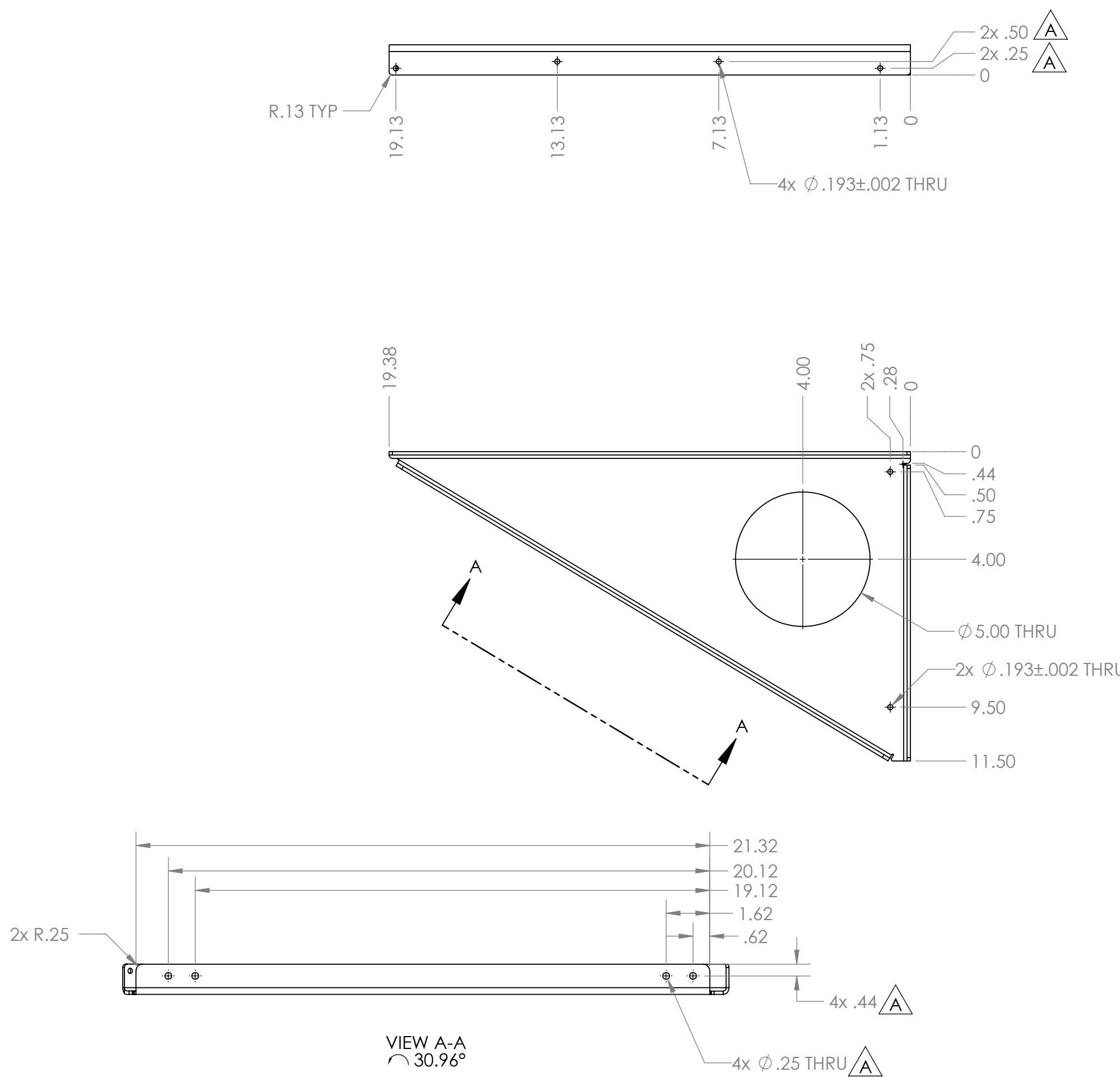
SCALE: 1:2 SHEET 1 OF 1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
A3, B3, C2, D3	A	Style of Qty callouts, moved two holes on flange .25"	10/11/2022	JO

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UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	JO	9/14/2022	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH: 8GA 5052 Al			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
**Blue Lower
Corner Bracket**

SIZE DWG. NO. REV
C GE-23224 A

SCALE: 1:4 SHEET 1 OF 1

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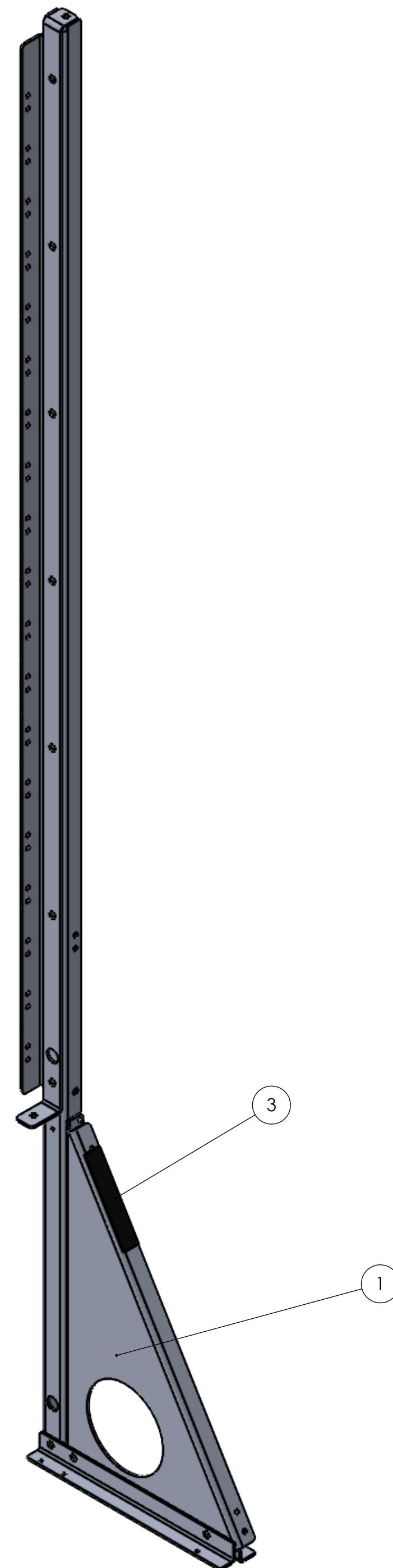
C

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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23220	Blue Standard Vertical	1
2	Hook_2_10	2" x 10" Hook, Adhesive Backed	1
3	Hook_1_5	1" x 5" Hook, Adhesive Backed	1

UNLESS OTHERWISE SPECIFIED: FIELD NAME DATE
DRAWN NE 1/3/2023

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

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE: Blue Standard
Fence Vertical
With Hook

SIZE DWG. NO. REV
C GE-23225

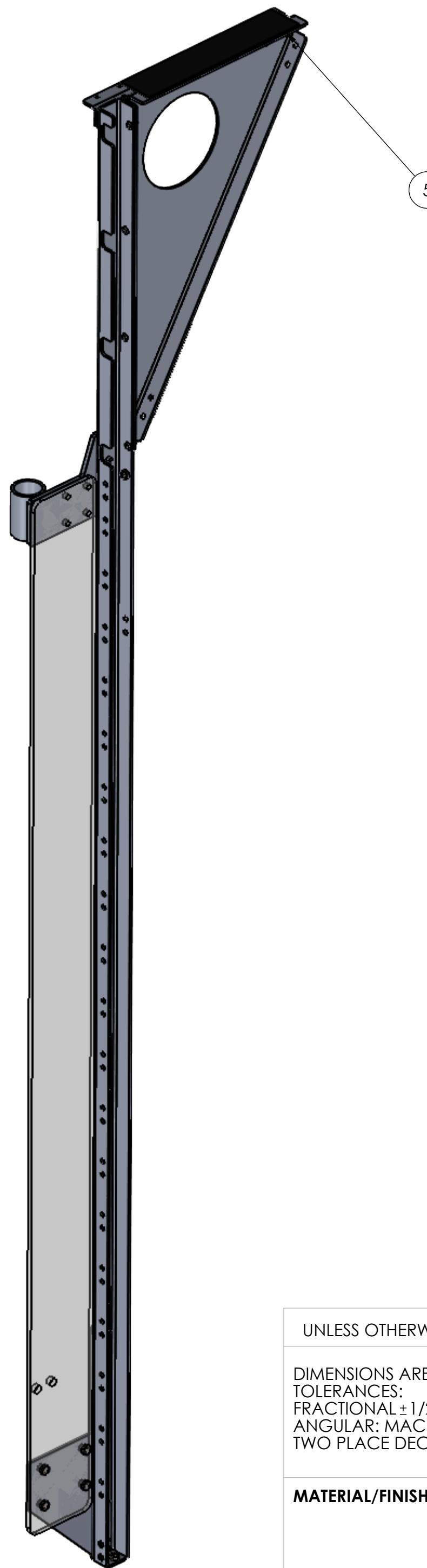
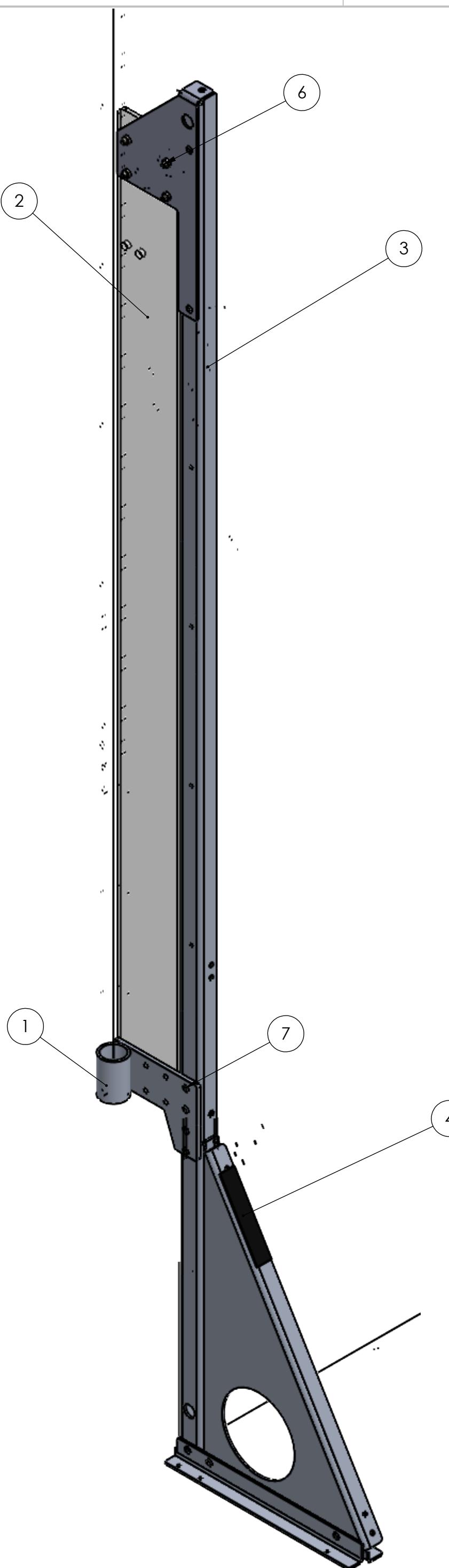
SCALE: 1:5 SHEET 1 OF 1

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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23232	Blue Pin Anchor	1
2	GE-23236	Corner Guard Plastic	1
3	GE-23237	Blue Corner Vertical W/O Pin	1
4	Hook_1_5	1" x 5" Hook, Adhesive Backed	1
5	Hook_2_10	2" x 10" Hook, Adhesive Backed	1
6	hex_.25_20_0.75	Steel Hex Head Screw, 1/4"-20 x 0.75" long, fully threaded	4
7	rivet_.1875_.251-.375	3/16" Aluminum Rivet, .251-.375 Grip Range	4

UNLESS OTHERWISE SPECIFIED: FIELD NAME DATE
DRAWN NE 1/3/2023

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
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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:
**Blue Corner
Fence Vertical**

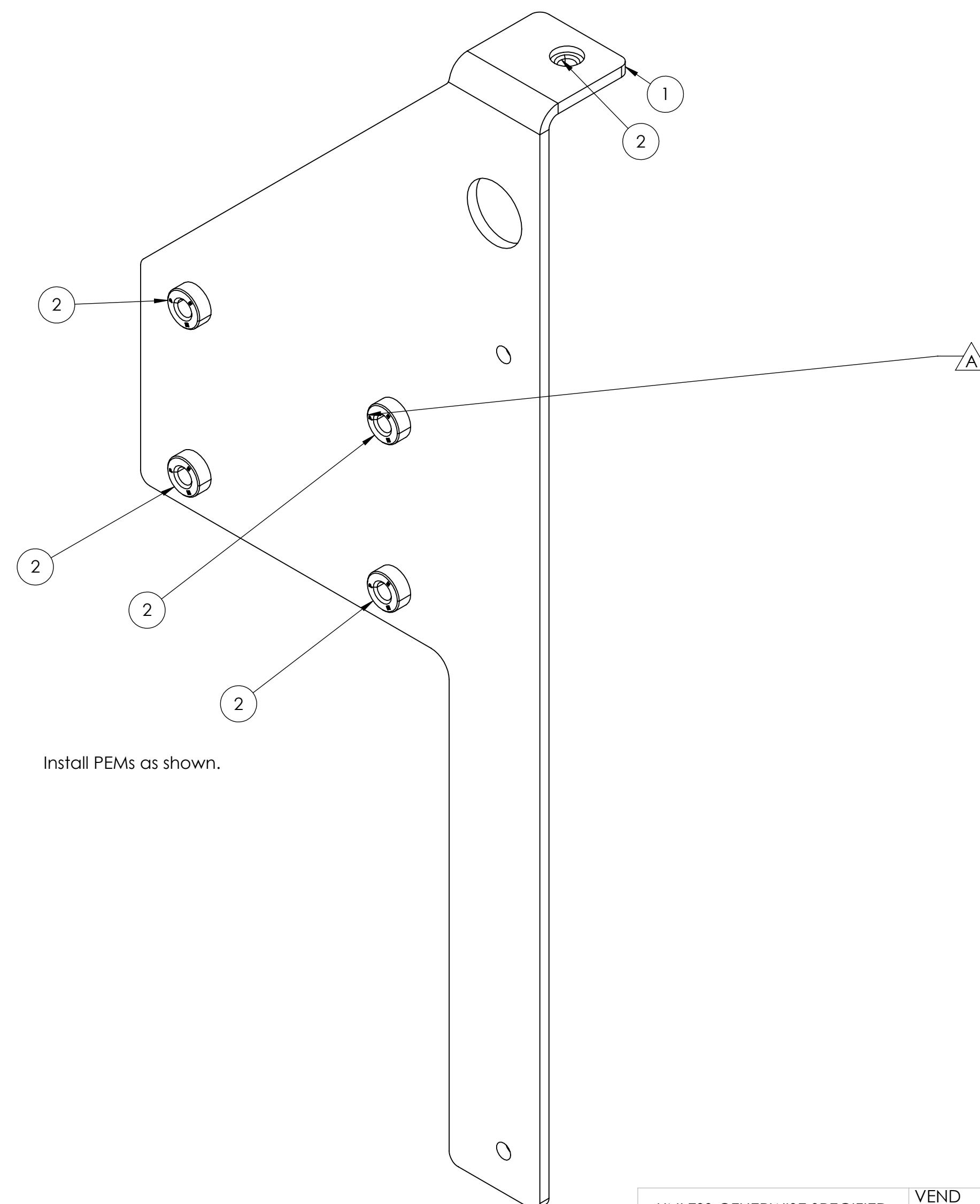
SIZE DWG. NO. REV

C GE-23230

SCALE: 1:5 SHEET 1 OF 1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23231-01	Blue Tertiary Vertical	1
2	pem_clinchnut_.25_20 .054	1/4-20 self-clinching nut, .054 shank	5

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
C2	A	PEM NUTS ADDED	10/14/2022	NE



UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	JO	10/11/2022
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:	COMMENTS:		
REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST ROBOTICS COMPETITION Modeling Solutions Partner

TITLE: Tertiary Vertical with PEMs

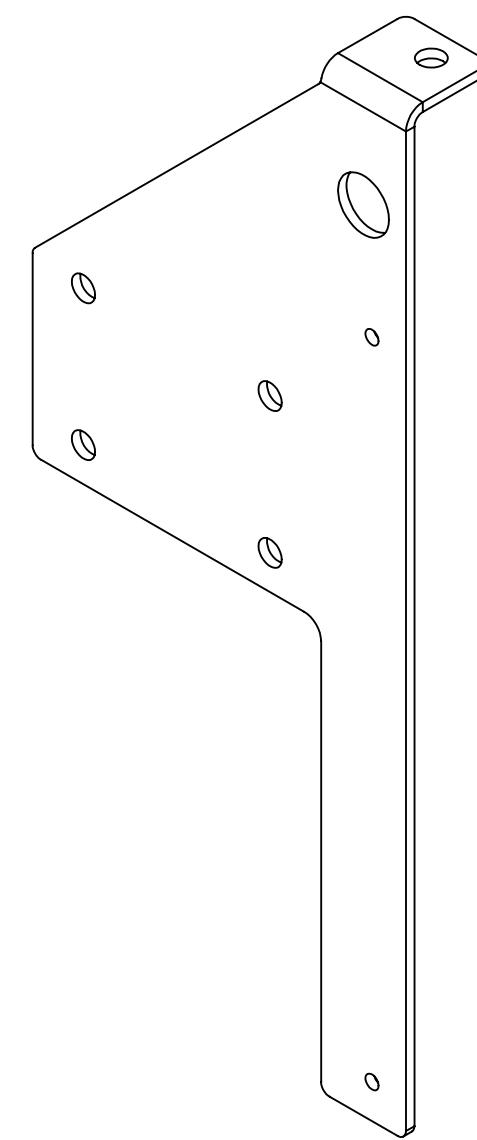
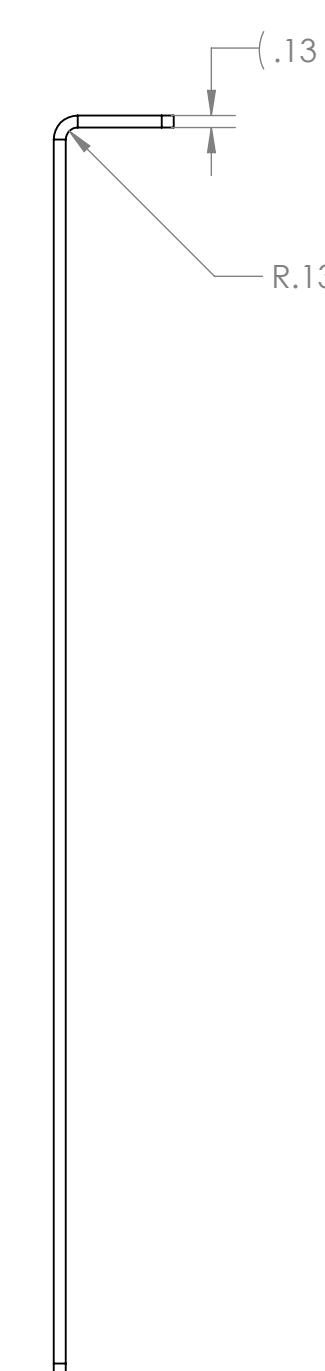
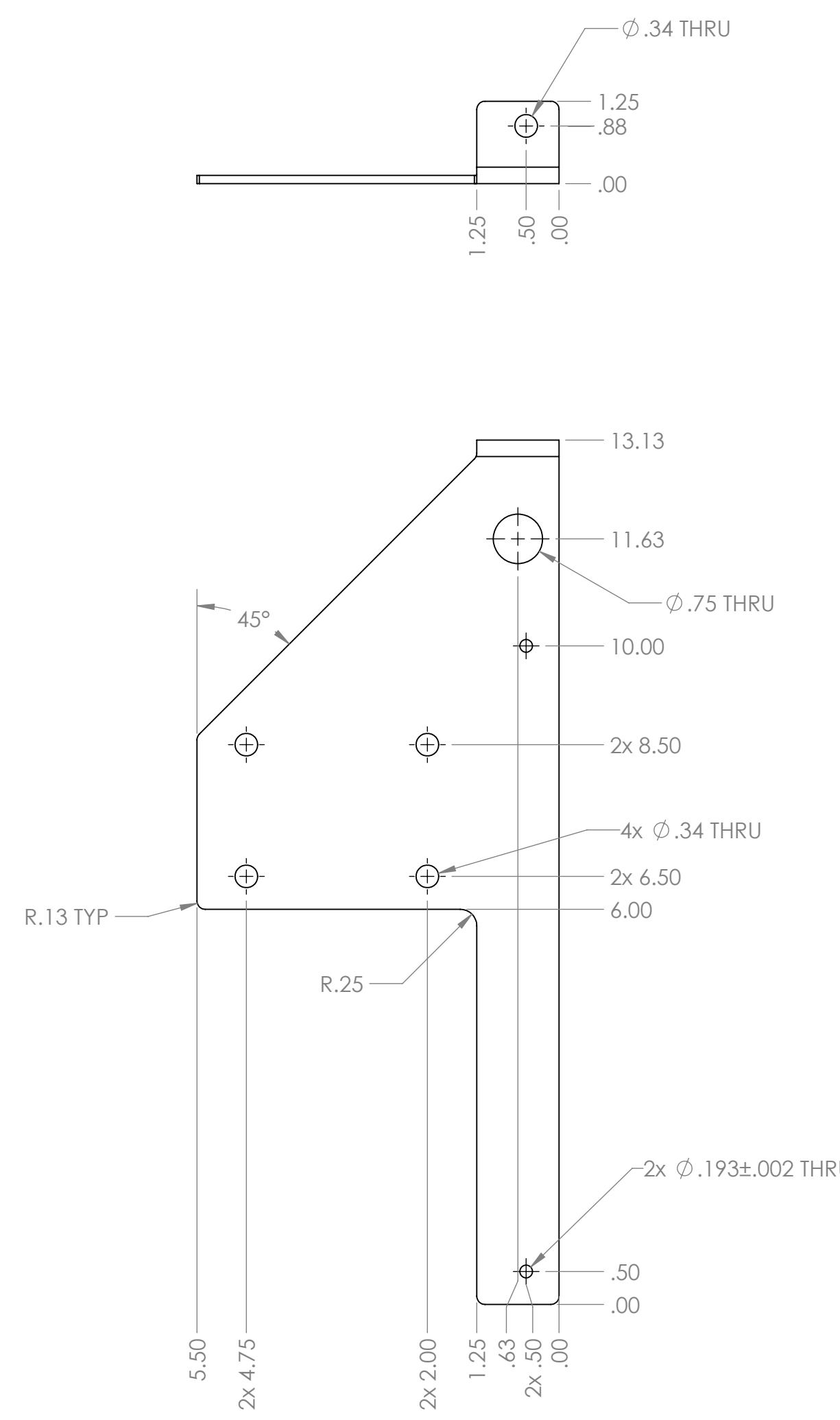
SIZE DWG. NO. REV

C GE-23231 **A**

SCALE: 1:1 SHEET 1 OF 1

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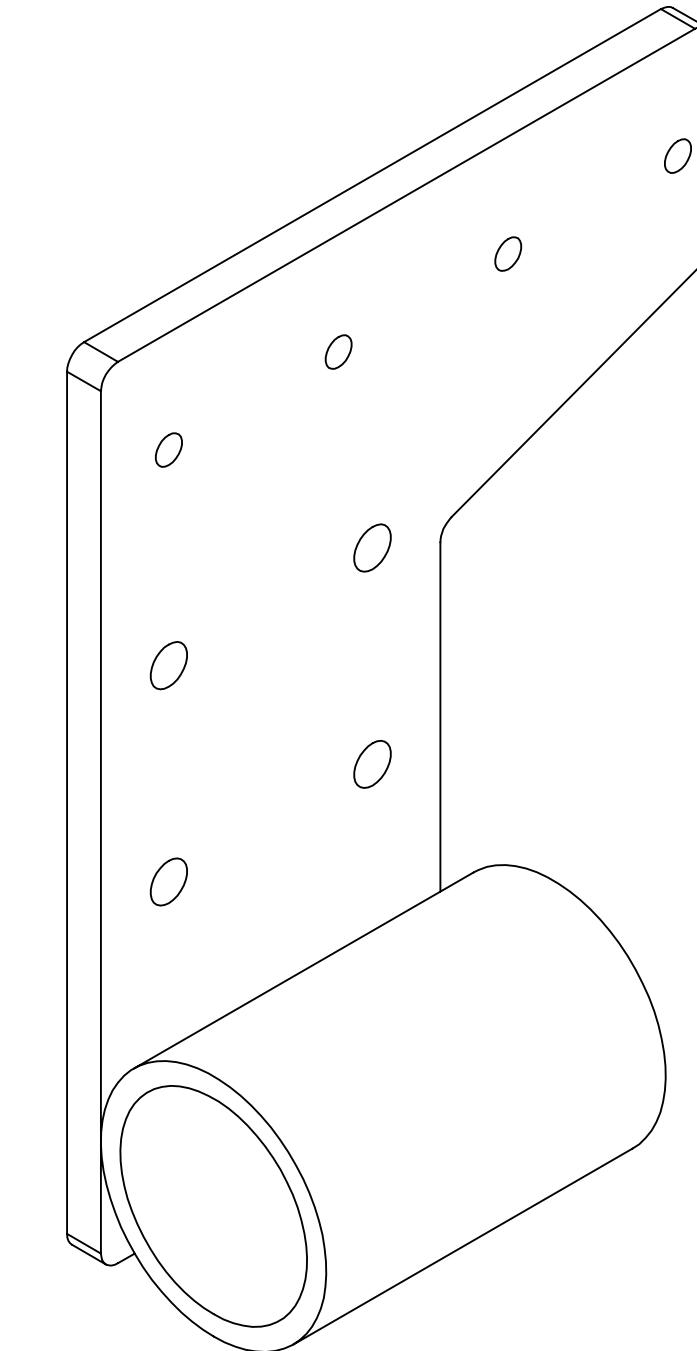
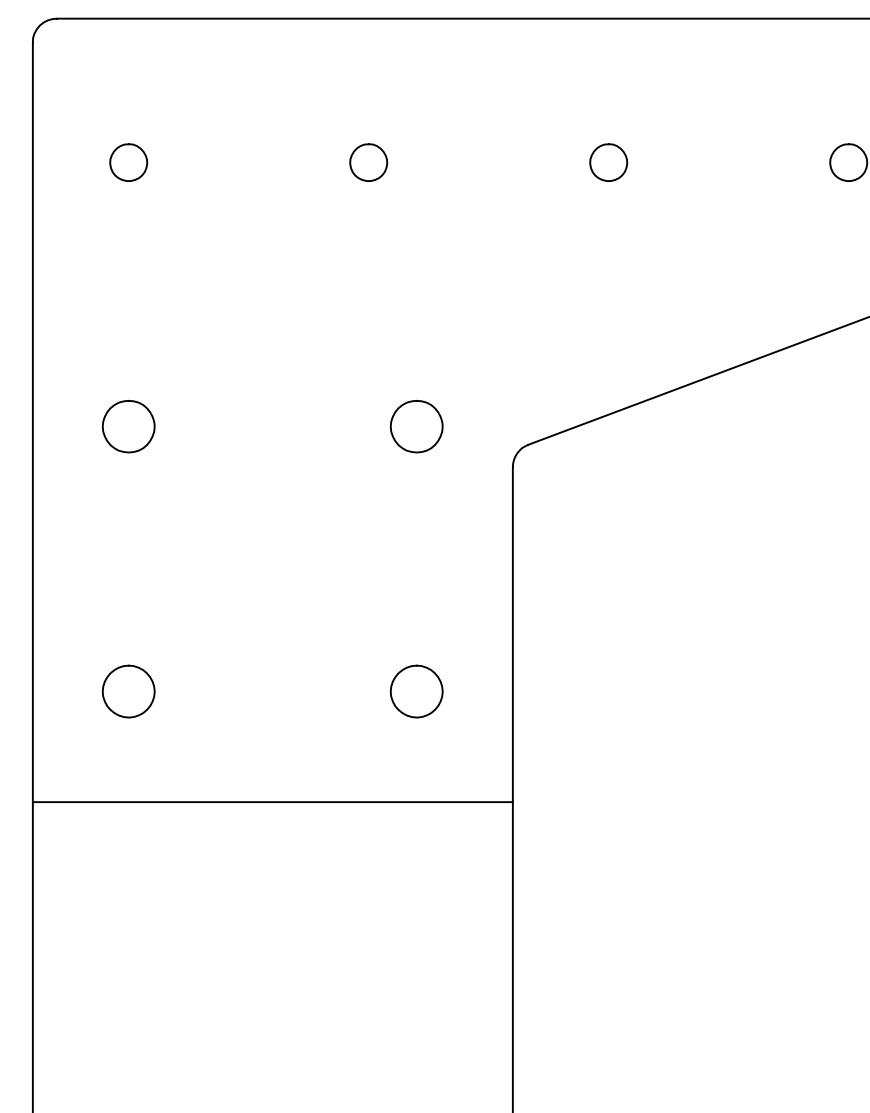
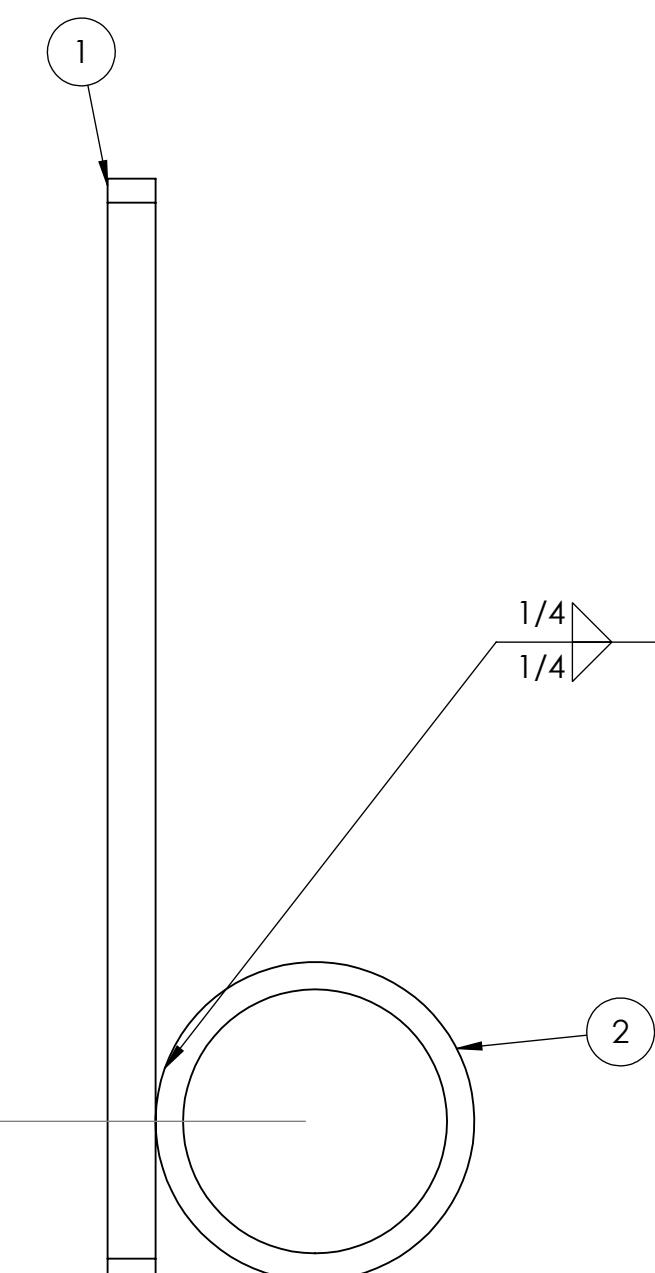
UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	JO	9/14/2022	
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH:	SIZE	DWG. NO.	REV
8GA 5052 Al	C	GE-23231-01	A
COMMENTS:		SCALE: 1:2	
REMOVE ALL BURRS AND SHARP EDGES.		SHEET 1 OF 1	
DO NOT SCALE DRAWING			

 FIRST
ROBOTICS
COMPETITION

 SOLIDWORKS
Modeling Solutions Partner

TITLE:
Blue Tertiary Vertical

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23233	Pin Anchor Plate	1
2	GE-23234	Pin Anchor Tube	1



NO WELD PERMISSIBLE IN TUBE

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:

DO NOT SCALE DRAWING

WELD NAME DATE

DRAWN JO 10/11/2022

PROPRIETARY AND CONFIDENTIAL

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COMMENTS:
REMOVE ALL BURRS AND SHARP EDGES.

FIRST ROBOTICS COMPETITION SOLIDWORKS Modeling Solutions Partner

TITLE: Blue Pin Anchor

SIZE DWG. NO. REV

C GE-23232

SCALE: 1:1 SHEET 1 OF 1

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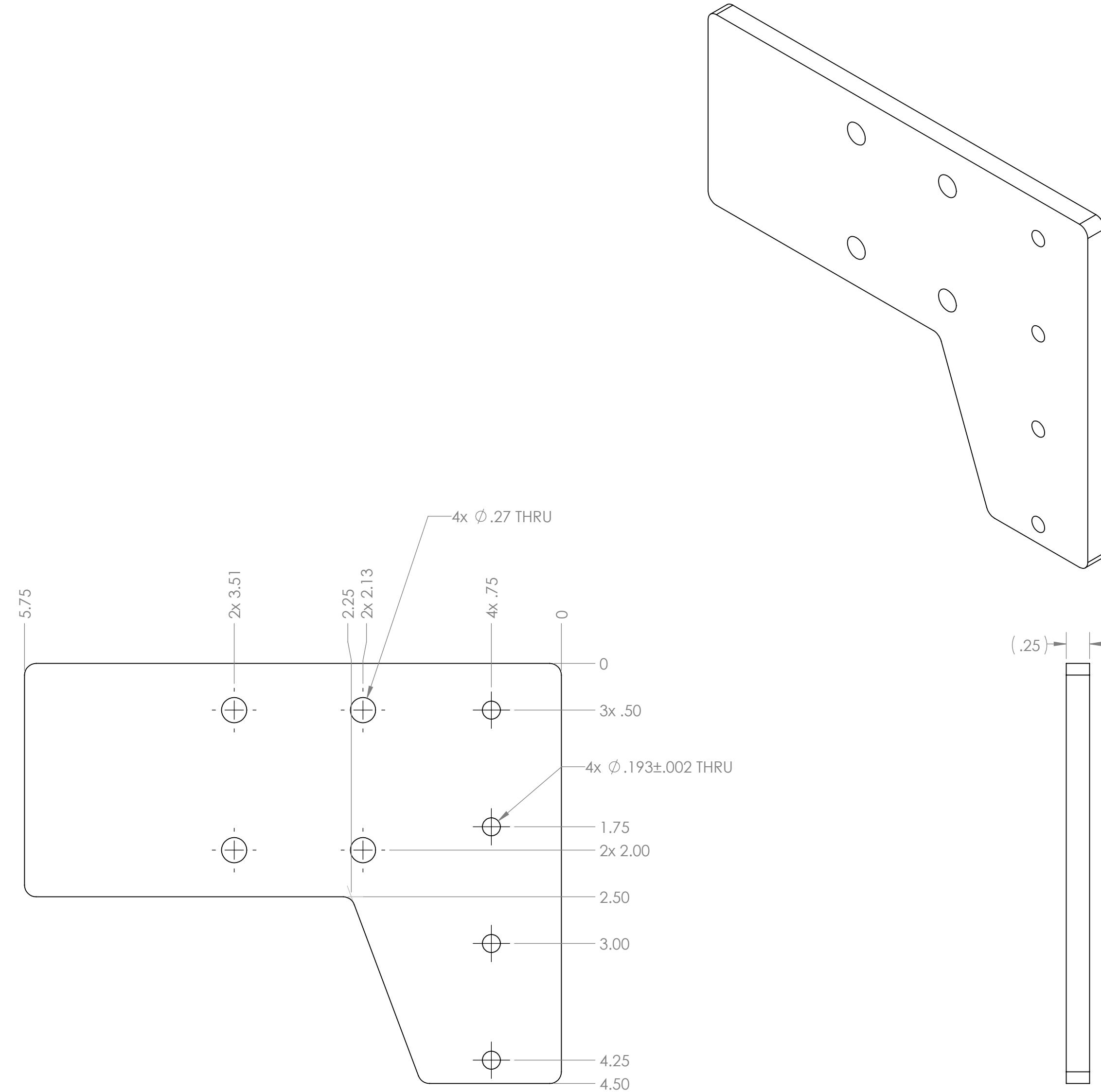
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UNLESS OTHERWISE SPECIFIED:

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:

6061 AL 1/4" Plate

DO NOT SCALE DRAWING

VEND NAME DATE

DRAWN JO 10/11/2022



TITLE: Pin Anchor Plate

SIZE DWG. NO. REV

C GE-23233

SCALE: 1:1 SHEET 1 OF 1

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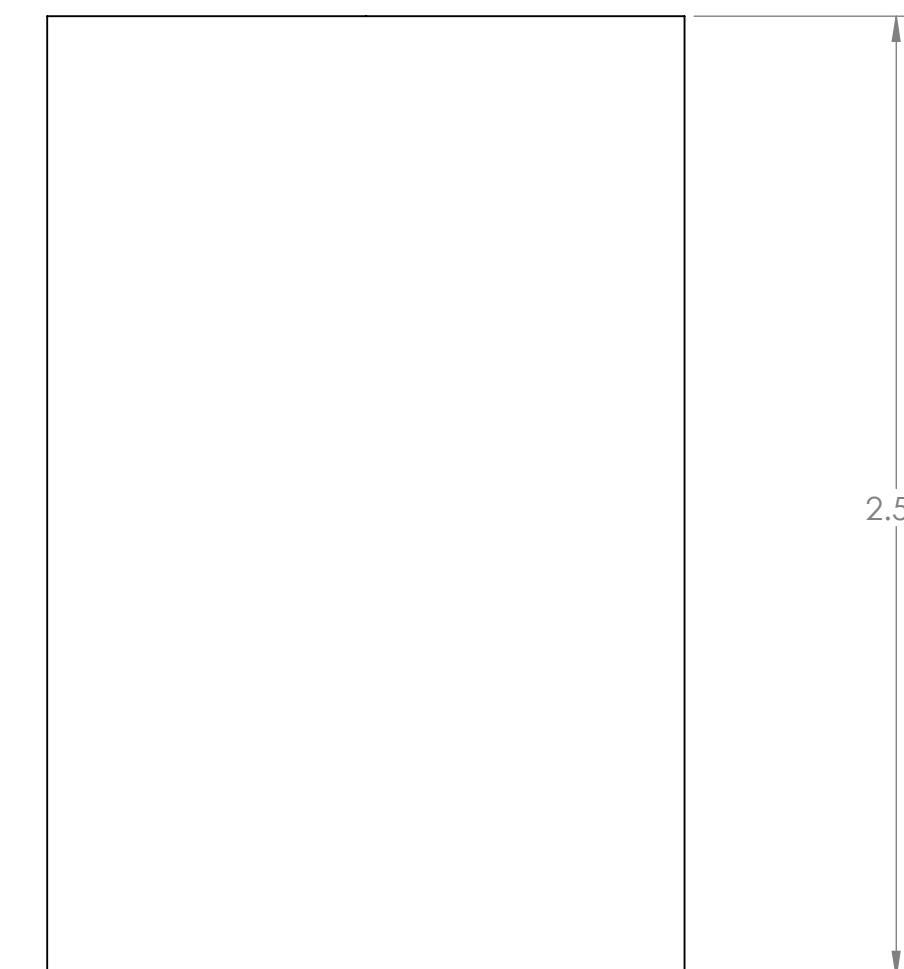
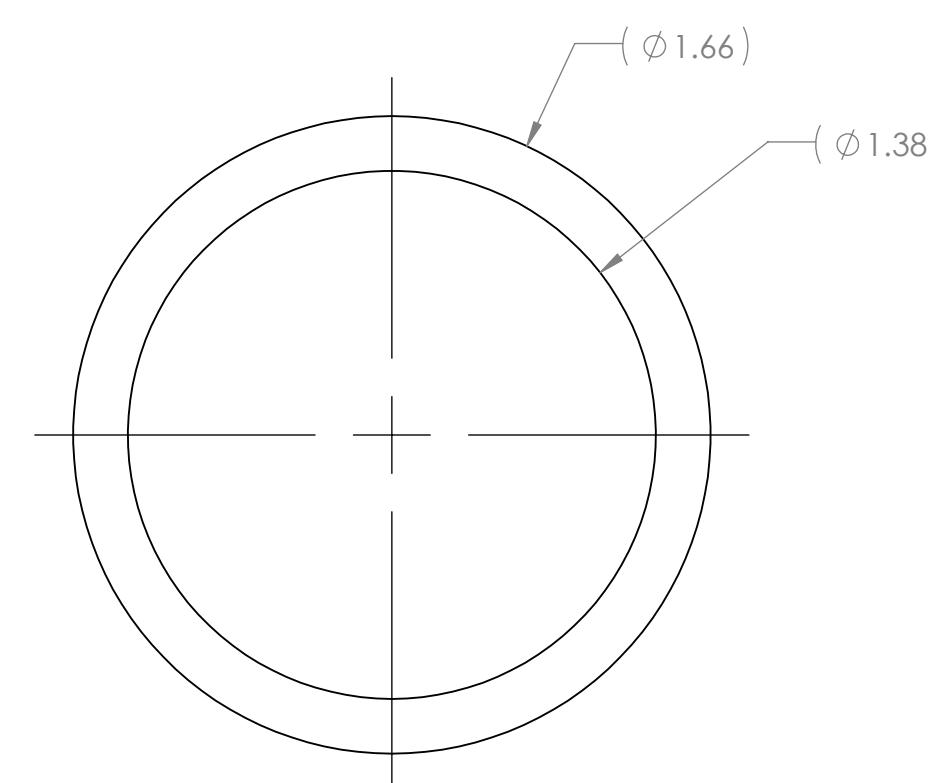
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UNLESS OTHERWISE SPECIFIED:

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:
6061 AL SCH 40 Tube

DO NOT SCALE DRAWING

VEND NAME DATE

DRAWN JO 10/11/2022

PROPRIETARY AND CONFIDENTIAL

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COMMENTS:

REMOVE ALL BURRS AND SHARP EDGES.



TITLE:

Pin Anchor Tube

SIZE DWG. NO. REV

C	GE-23234	
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SCALE: 2:1 SHEET 1 OF 1

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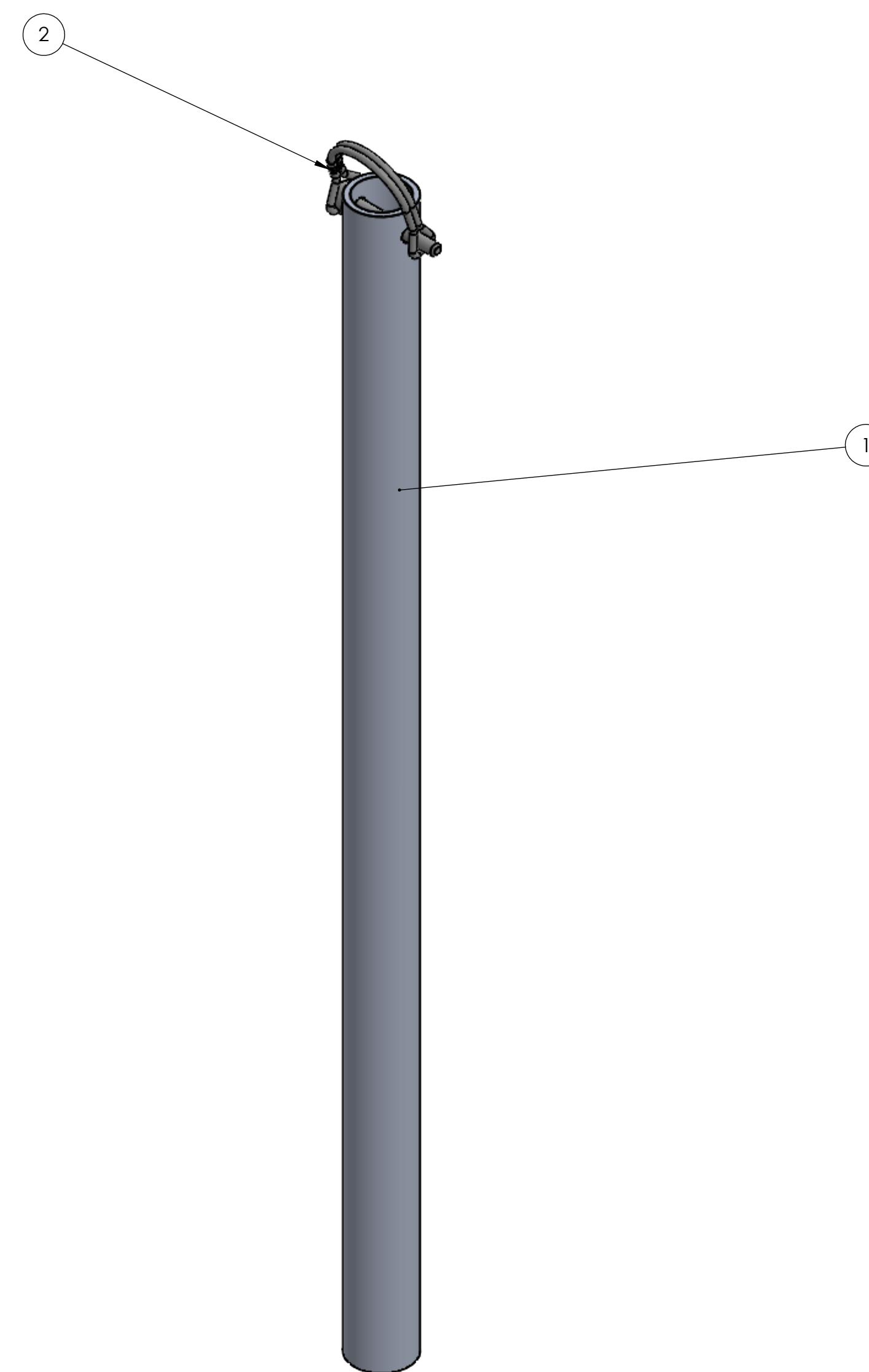
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23235-01	Extended Corner Pin	1
2	pin_25_2.375_wireloc_kclevis	Wire-Lock Clevis Pin	1

UNLESS OTHERWISE SPECIFIED: FIELD NAME DATE
DRAWN NE 1/3/2023

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
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WHOLE WITHOUT THE WRITTEN
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PROHIBITED.

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

DO NOT SCALE DRAWING

FIRST[®]
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
Extended Pin

SIZE DWG. NO. REV
C GE-23235

SCALE: 1:2 SHEET 1 OF 1

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UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DRAWN	NE	11/15/2022	
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 AL 1" Sch 40 Pipe			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			



TITLE: Extended Corner Pin

SIZE DWG. NO. REV
C GE-23235-01

SCALE: 1:2 SHEET 1 OF 1

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REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
C1, C2, C4	A	OVERALL PART LENGTH HAS CHANGED, AS WELL AS ALL REFERENCE DIMENSIONS ALONG THAT AXIS	11/7/2022	NE

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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:

0.25" Polycarbonate

DO NOT SCALE DRAWING

VEND NAME DATE

DRAWN NE 10/17/2022



TITLE:

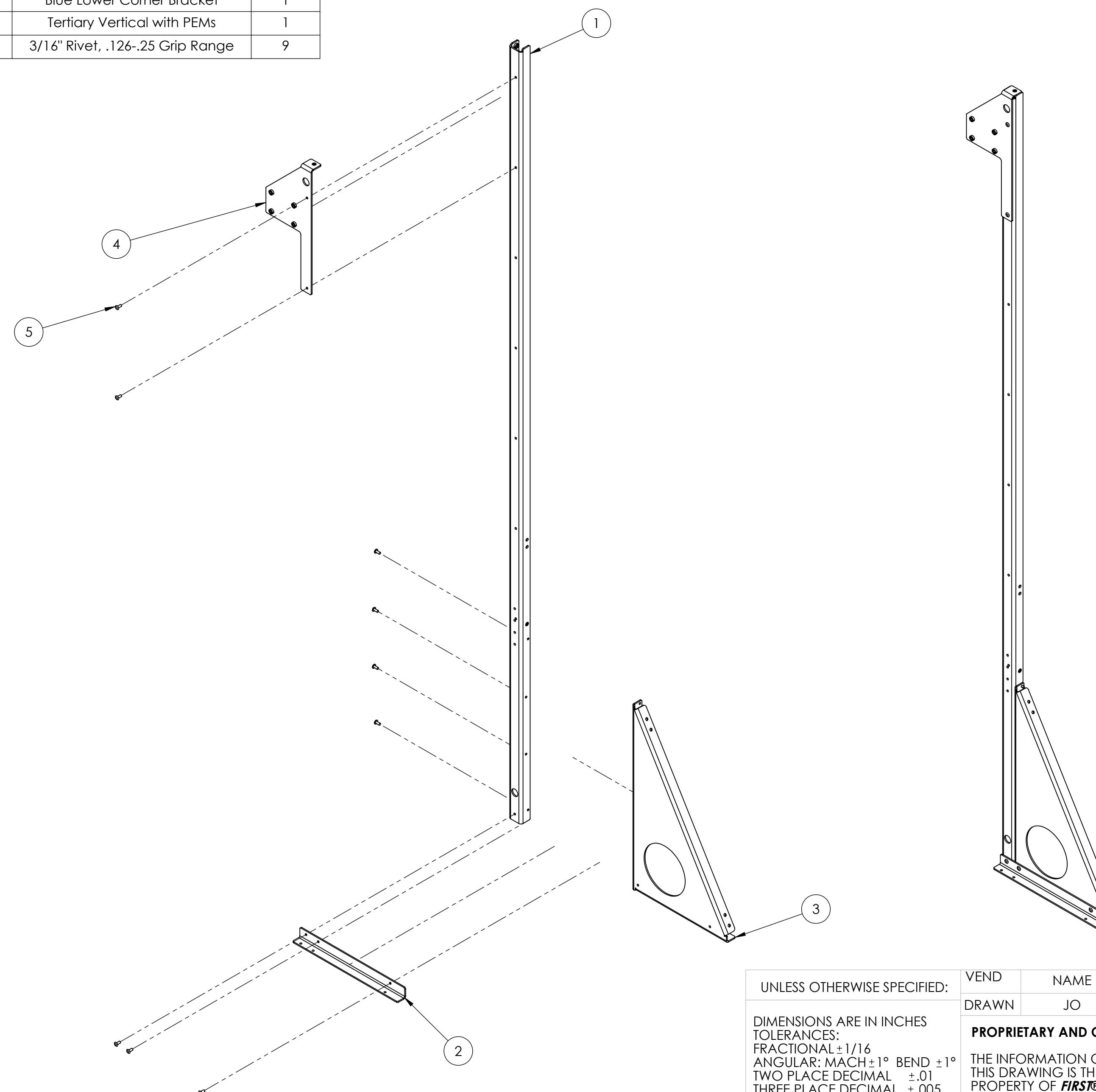
Corner Guard
Plastic

SIZE DWG. NO. REV

C GE-23236 A

SCALE: 1:4 SHEET 1 OF 1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23221	Blue Primary Vertical with PEMs	1
2	GE-23223	Floor Anchor	1
3	GE-23224	Blue Lower Corner Bracket	1
4	GE-23231	Tertiary Vertical with PEMs	1
5	rivet_.1875_.126-.25	3/16" Rivet, .126-.25 Grip Range	9



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 $\pm .005$

DO NOT SCALE DRAWING

VEND NAME DATE
DRAWN JO 10/11/2022

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MATERIAL/FINISH:

COMMENTS:
REMOVE ALL BURRS AND SHARP EDGES.

FIRST ROBOTICS COMPETITION SOLIDWORKS Modeling Solutions Partner

TITLE: Blue Corner Vertical W/O Pin

SIZE	DWG. NO.	REV
C	GE-23237	
SCALE: 1:7		SHEET 1 OF 1

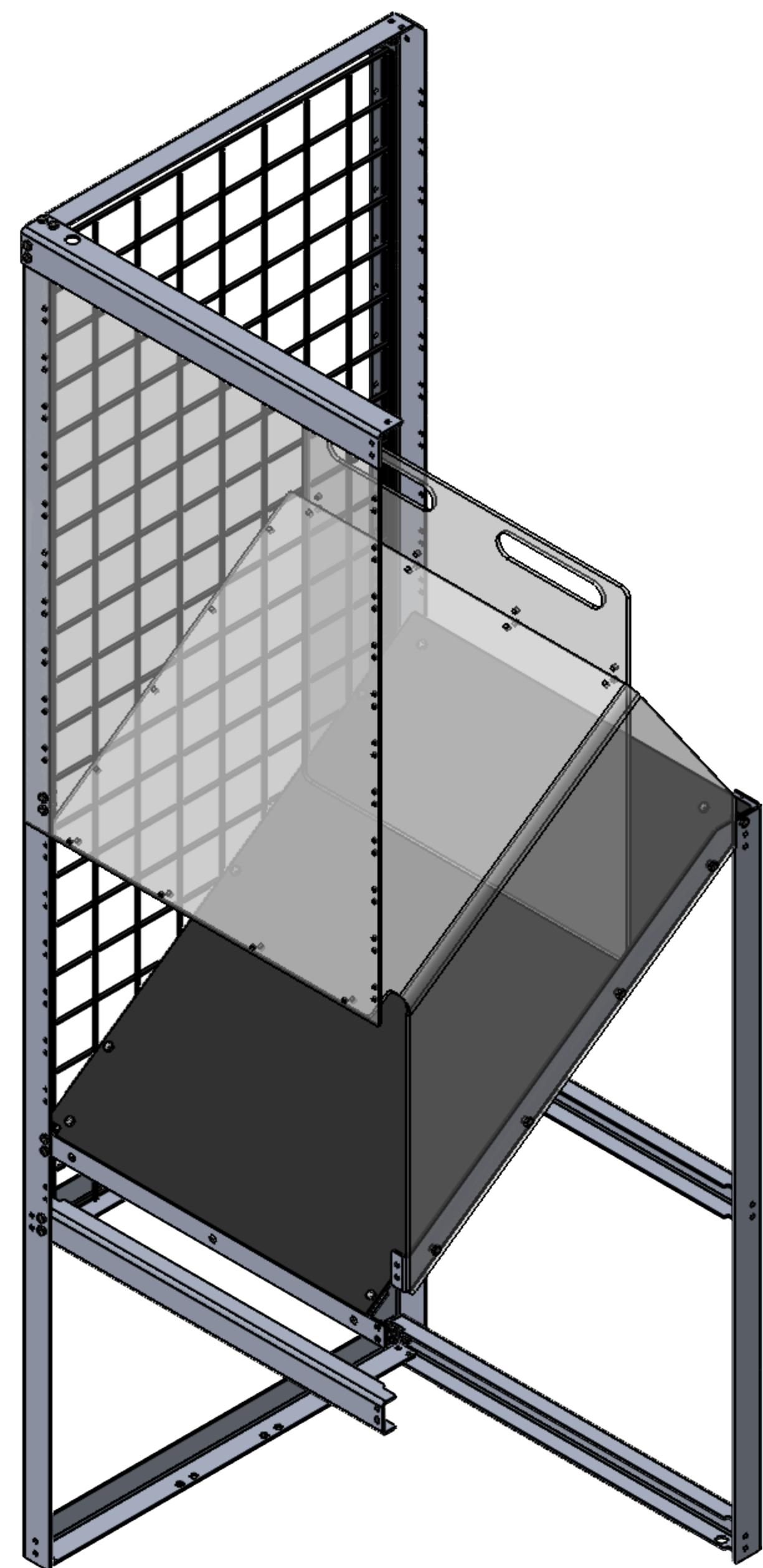
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23241	HP Protection Plastic	1
2	GE-23242	Blue Chute Cover	1
3	GE-23243	Blue Chute Top Connector	1
4	GE-23244	Blue Crossbeam	2
5	GE-23245	Short Chute Vertical	1
6	GE-23246	Chute Door	1
7	GE-23247	Blue Crossbeam With Loop	1
8	GE-23250	Side Fence	1
9	GE-23260	Blue Ramp Assembly	1
10	hex_.25_20_0.75	Steel Hex Head Screw, 1/4"-20 x 0.75" long, fully threaded	27
11	nylock_.25_20	Steel Nylon-Insert Locknut, 1/4"-20	17

UNLESS OTHERWISE SPECIFIED: FIELD NAME DATE
DRAWN NE 12/22/2022

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

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE: Blue Chute

SIZE DWG. NO. REV

C GE-23240

SCALE: 1:6 SHEET 1 OF 6

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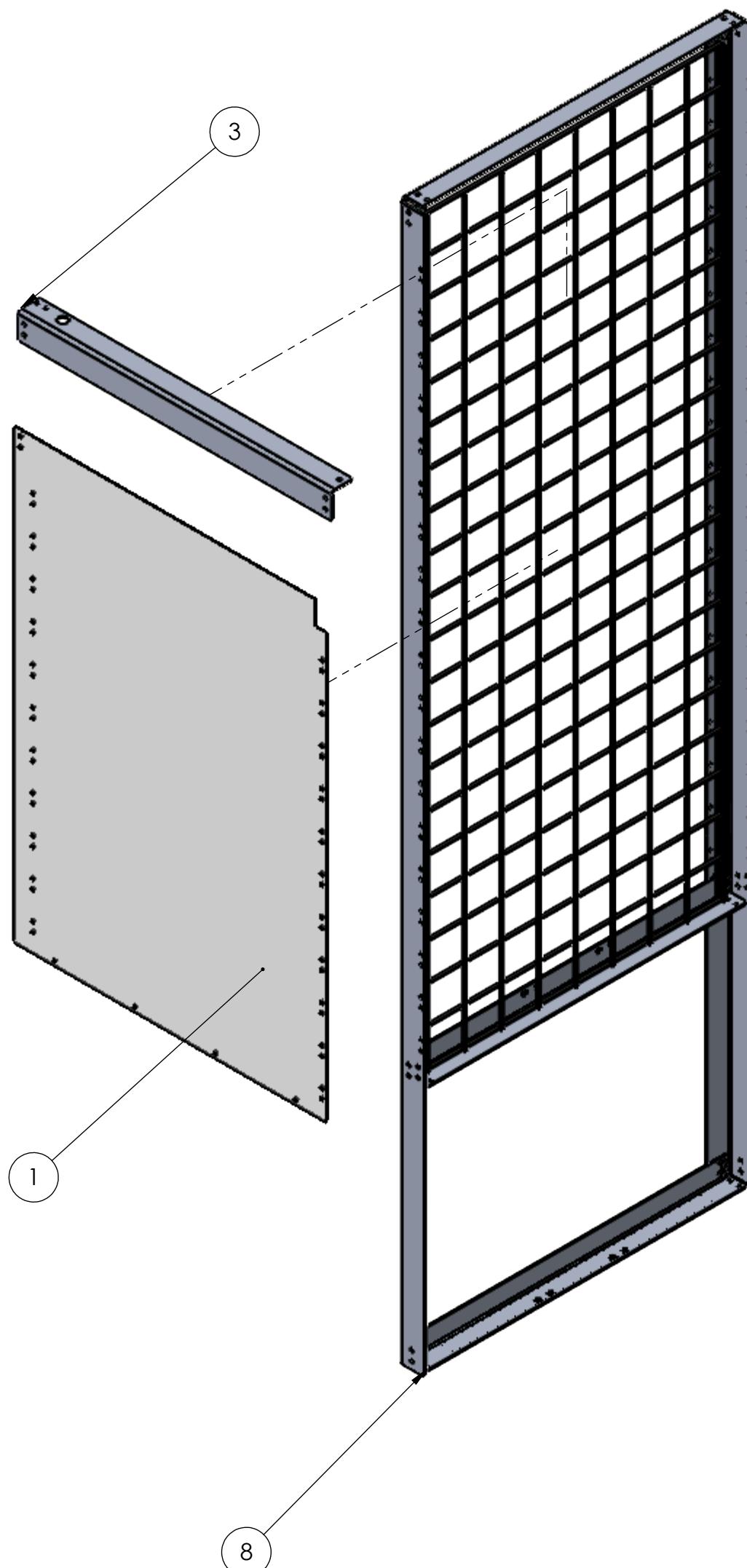
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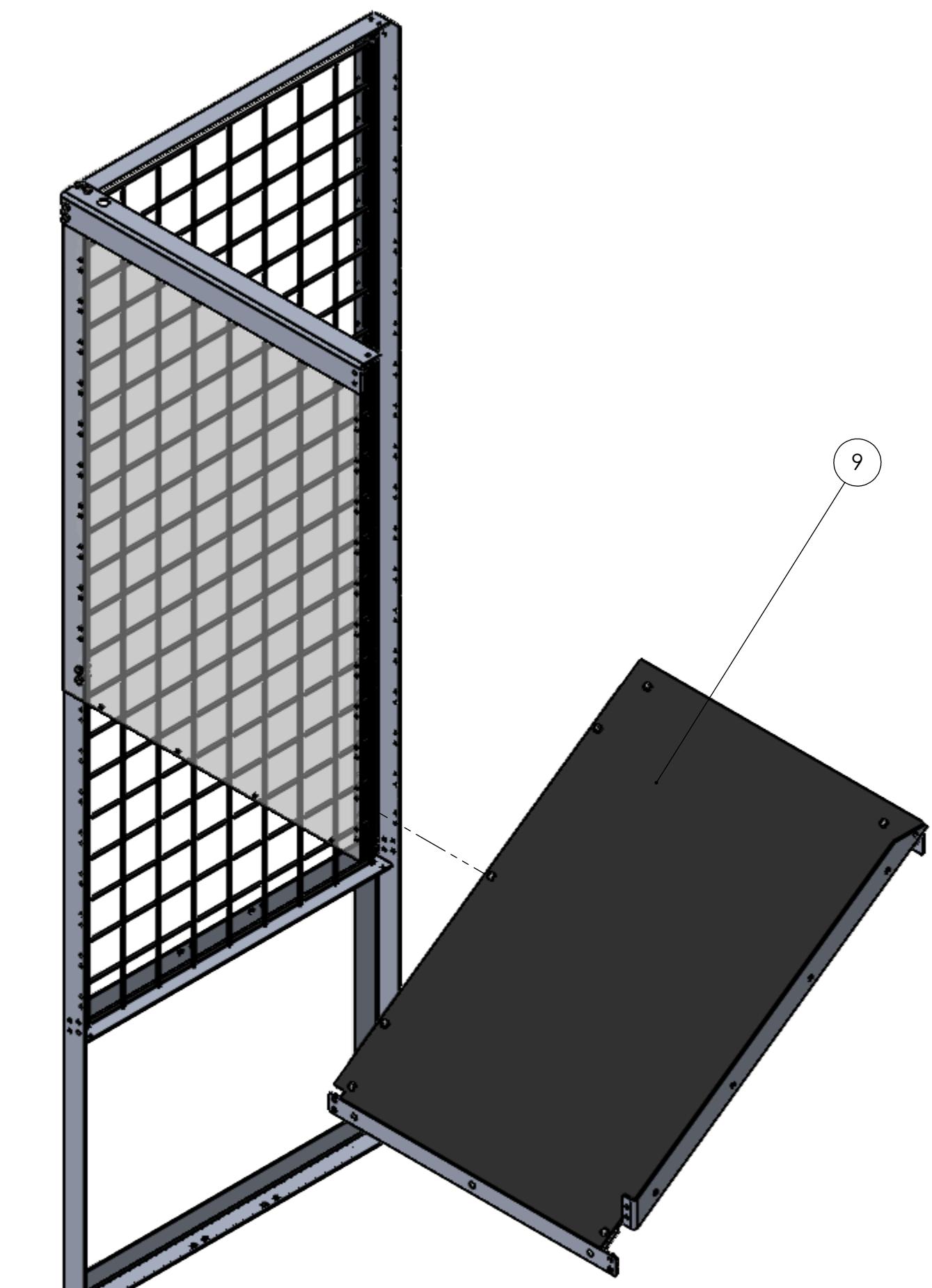
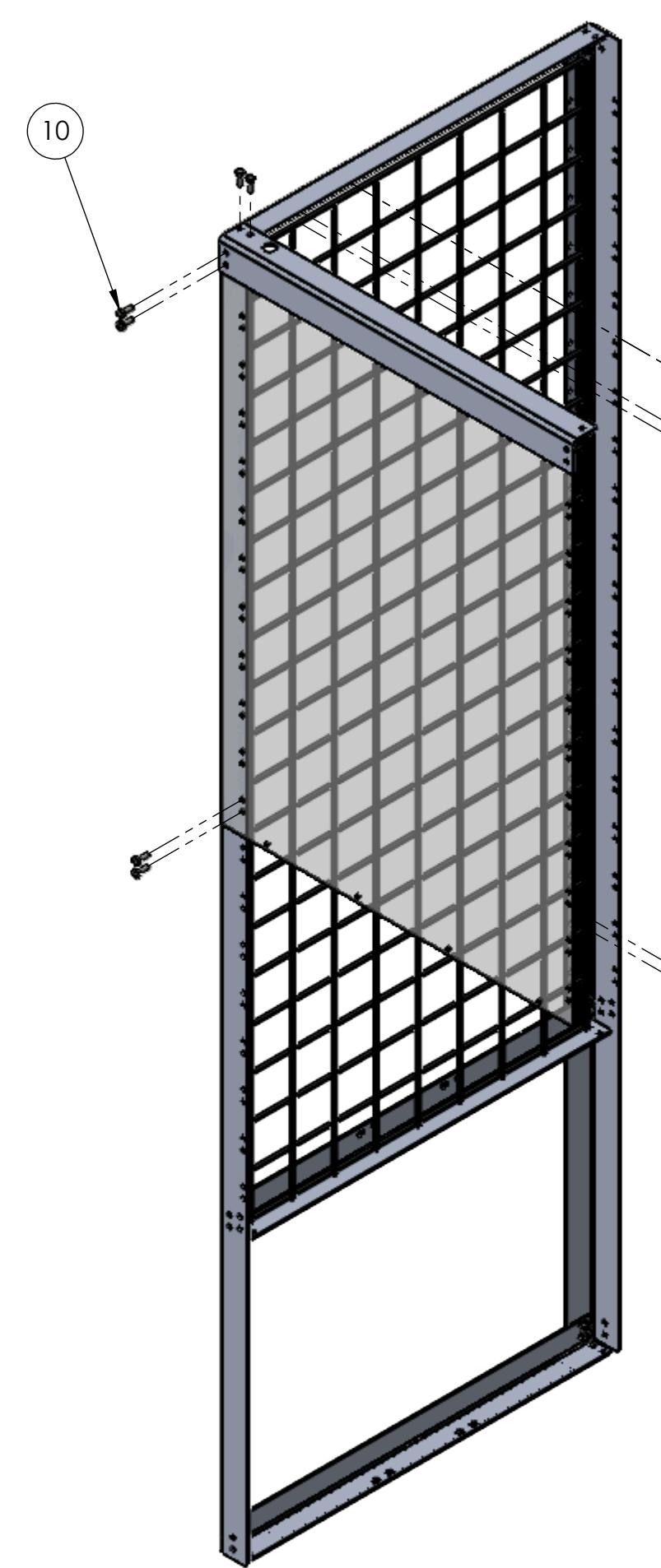
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LAYER PLASTIC BETWEEN (3) AND (8). ATTACH WITH 6 OF (10) AND 6 OF (11)



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

FIELD

NAME

DATE

DRAWN

NE

12/22/2022



TITLE:

Blue Chute

SIZE

DWG. NO.

REV

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GE-23240

SCALE: 1:8

SHEET 2 OF 6

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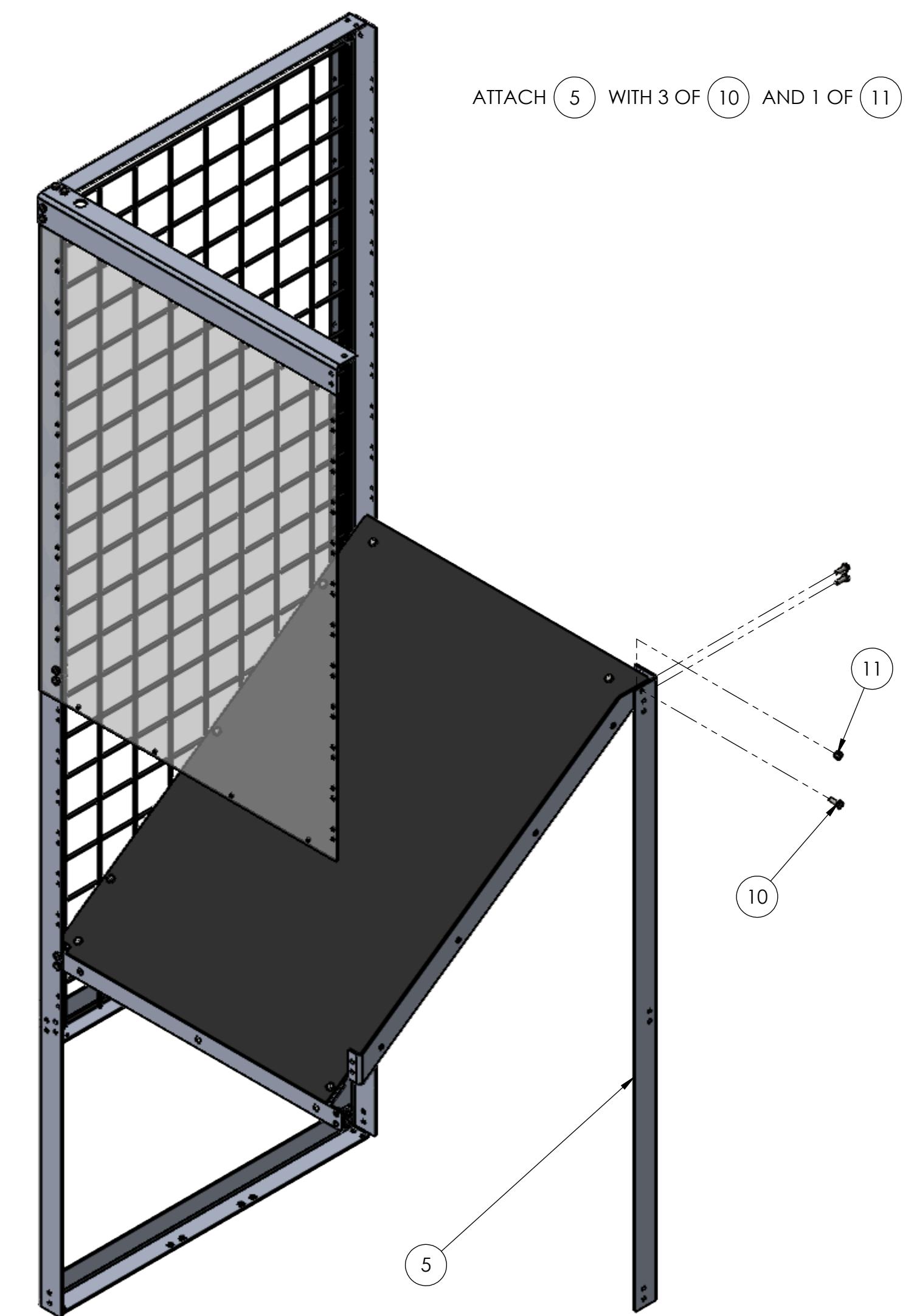
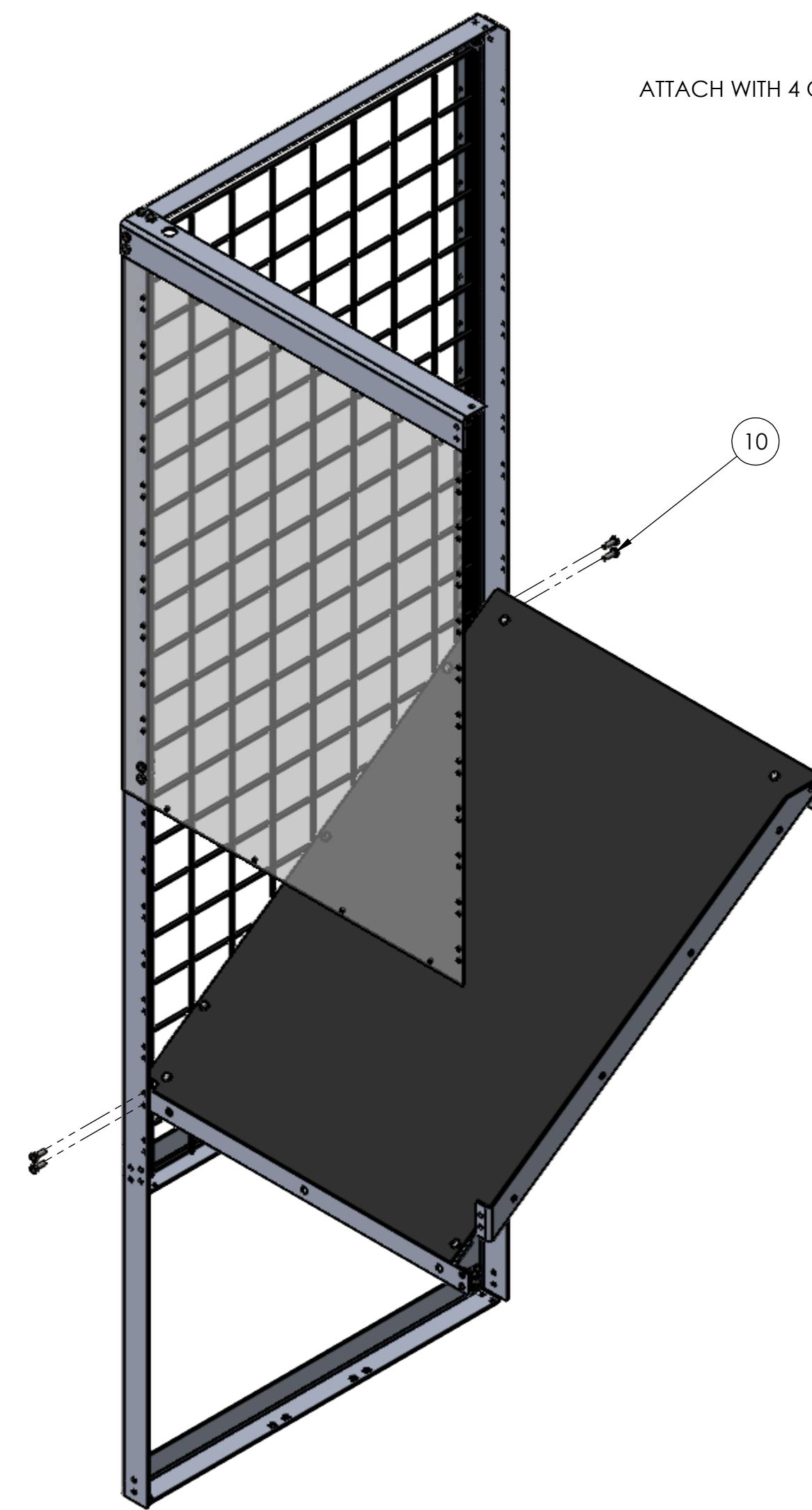
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UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm\frac{1}{2}$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .50$	DRAWN	NE	12/22/2022
PROPRIETARY AND CONFIDENTIAL			
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COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

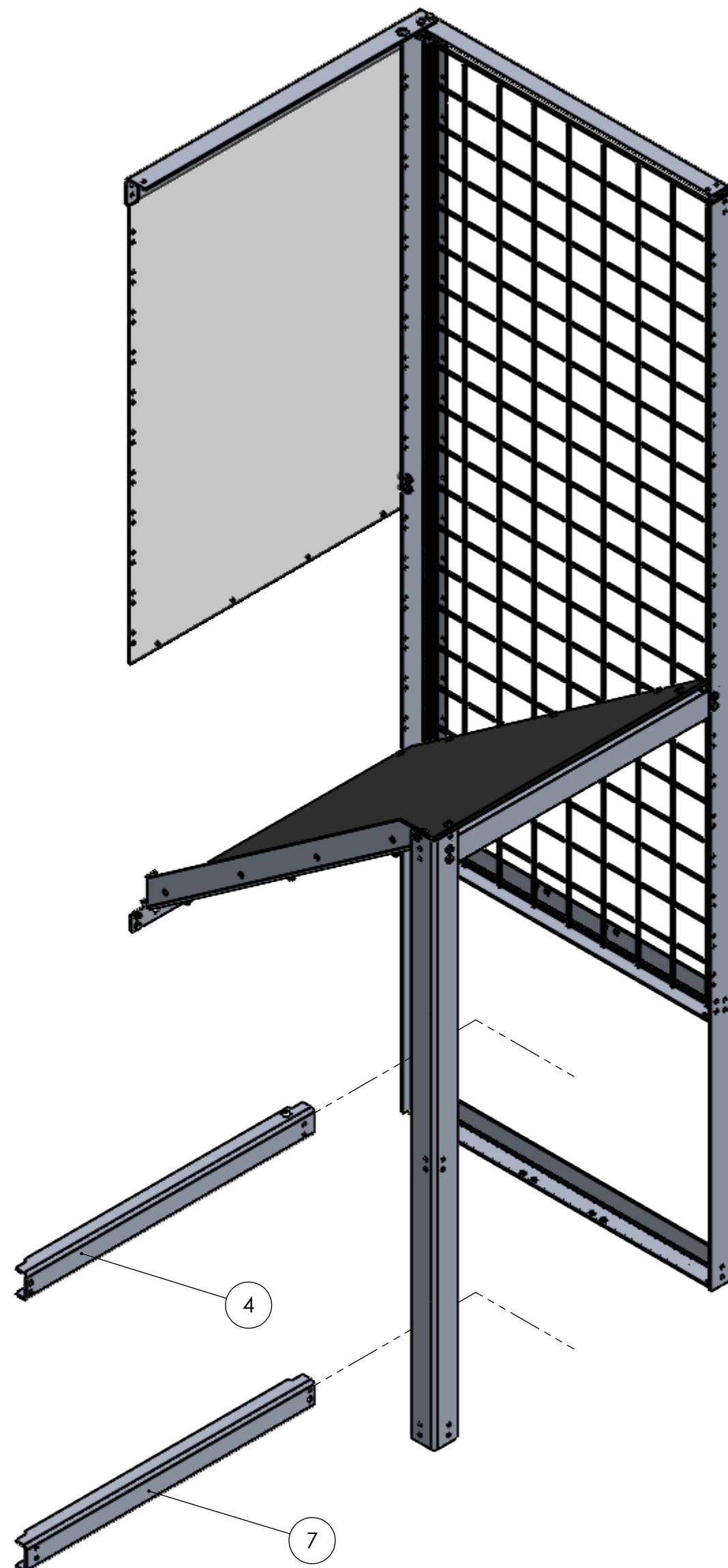
 **FIRST
ROBOTICS
COMPETITION**  **SOLIDWORKS**
Modeling Solutions Partner

TITLE: **Blue Chute**

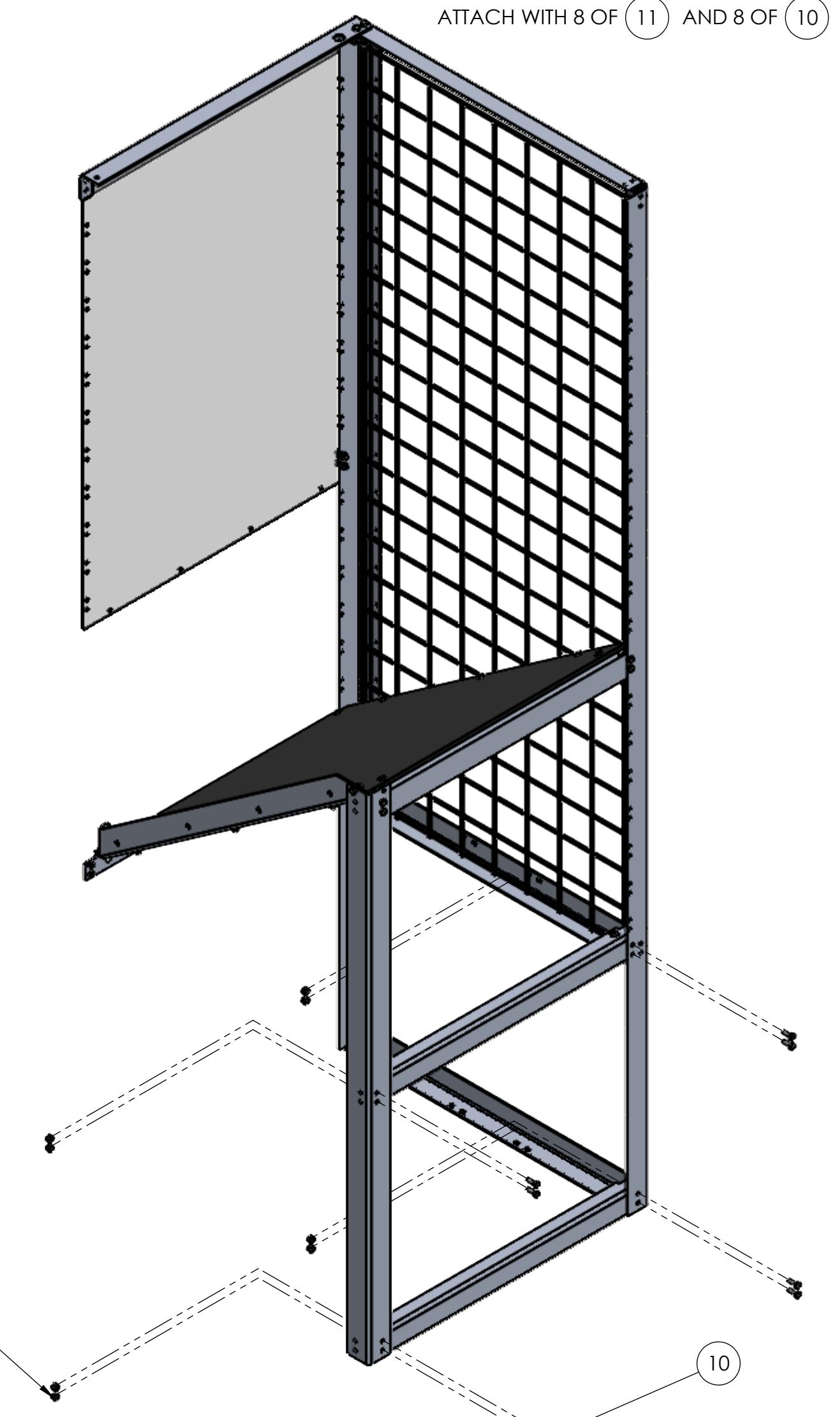
SIZE DWG. NO. REV
C GE-23240

SCALE: 1:7 SHEET 3 OF 6

(ROTATED 90 DEGREES FOR VISIBILITY)



NOTE: (7) IS THE SAME PART AS (4)
WITH LOOP ON ONE FACE. LOOP IS
DOWNWARD FACING IN ASSEMBLY TO
INTERACT WITH THE FLOOR



UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	NE	12/22/2022
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:
Blue Chute

SIZE DWG. NO. REV
C GE-23240

SCALE: 1:8 SHEET 4 OF 6

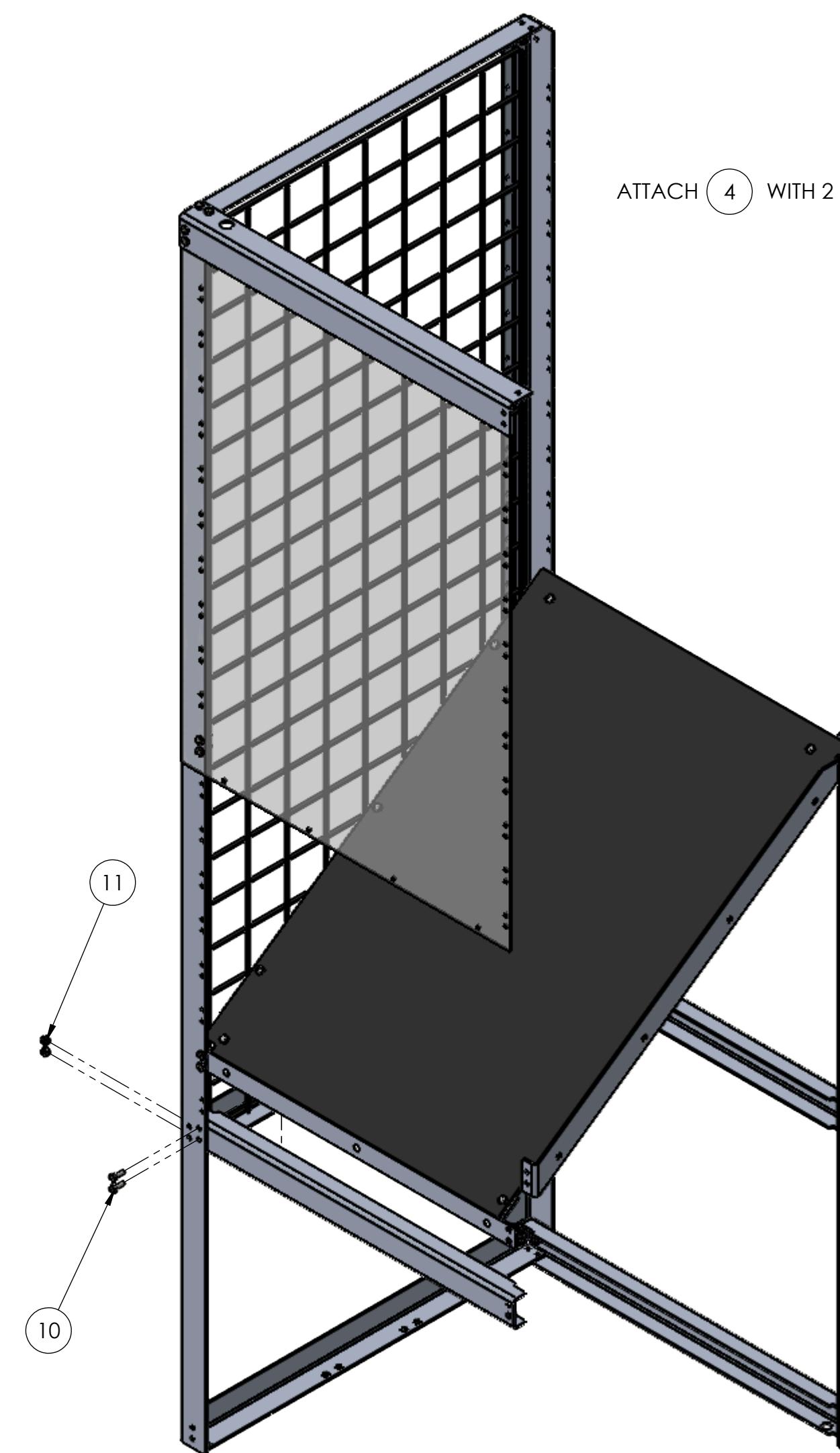
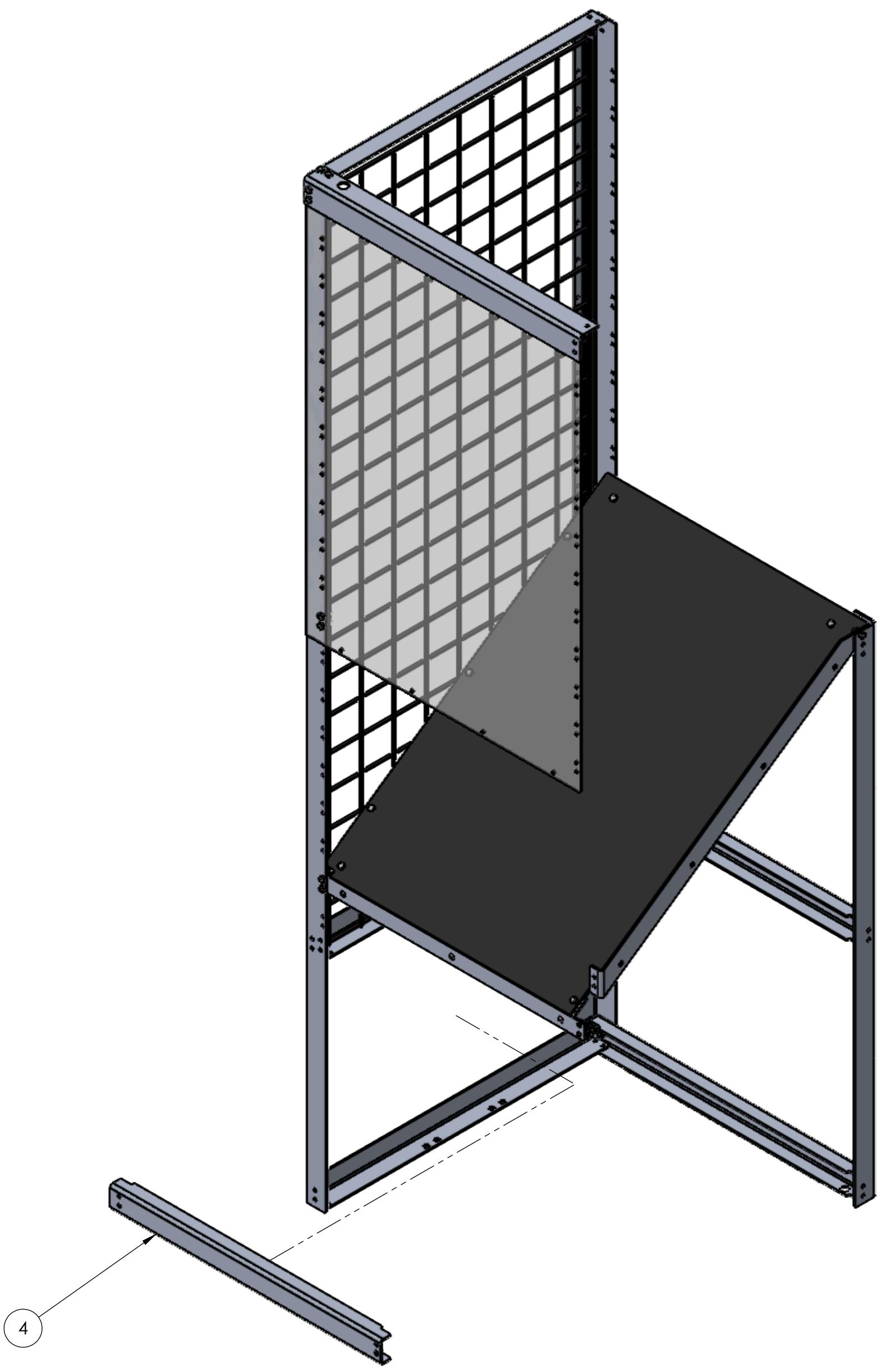
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(ROTATED BACK TO ORIGINAL ORIENTATION)



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

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**FIRST
ROBOTICS
COMPETITION**
SOLIDWORKS
Modeling Solutions Partner
TITLE: Blue Chute

SIZE DWG. NO. REV

C GE-23240

SCALE: 1:7 SHEET 5 OF 6

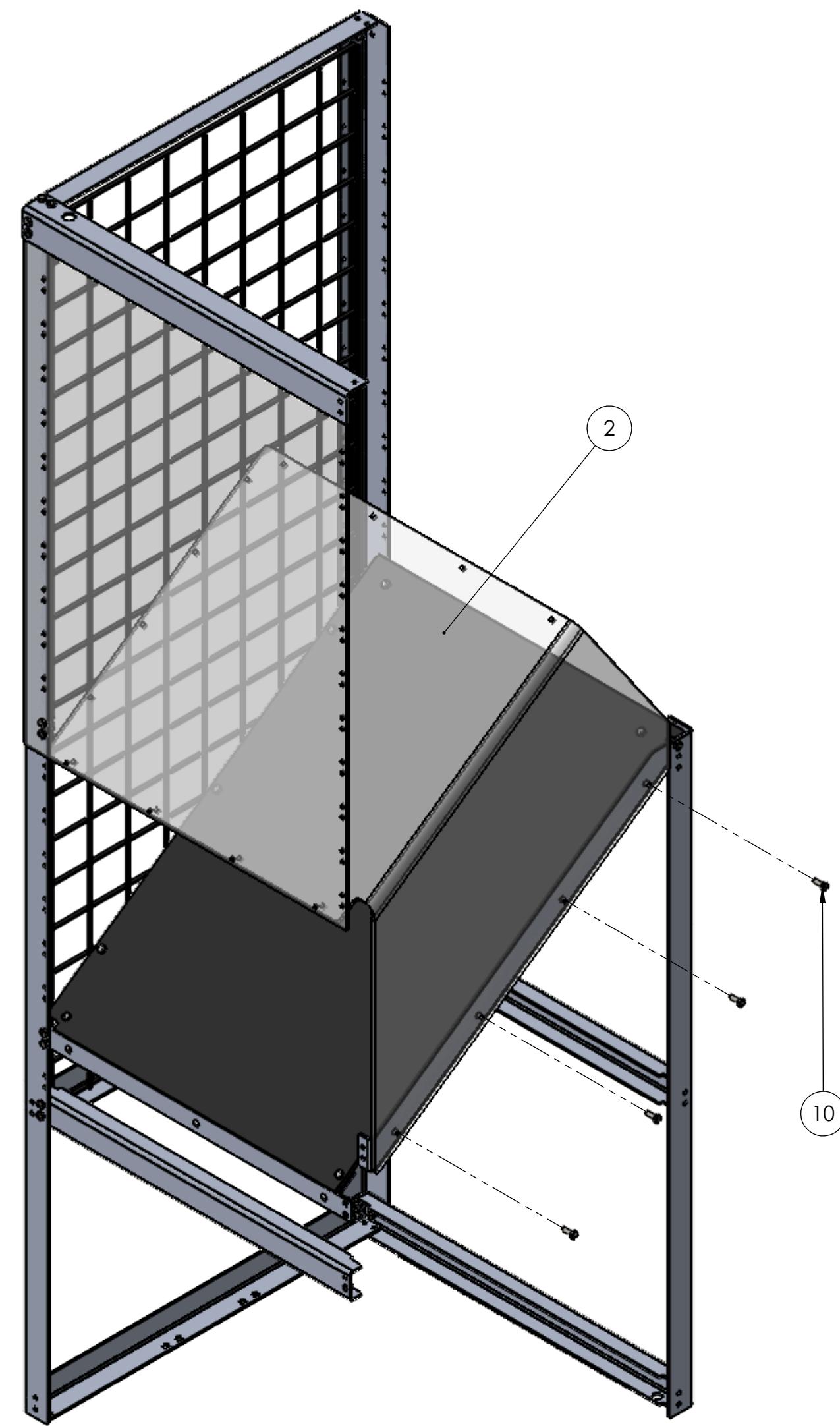
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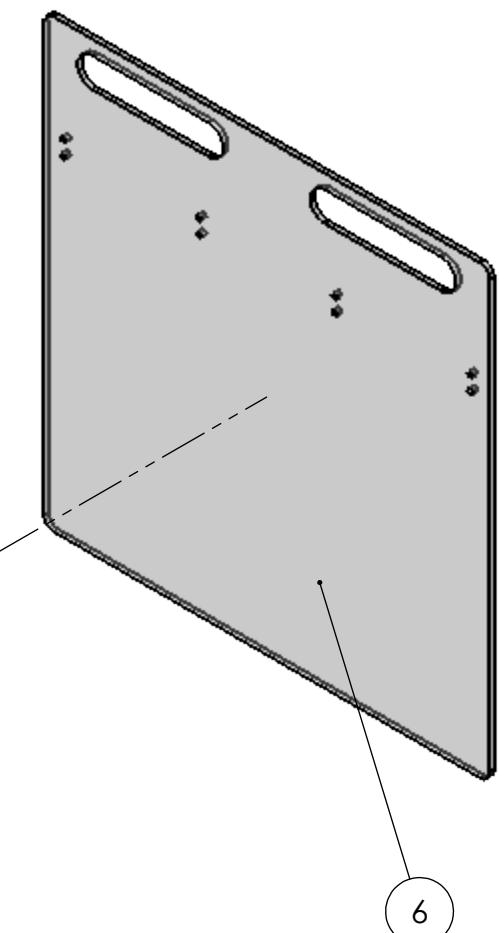
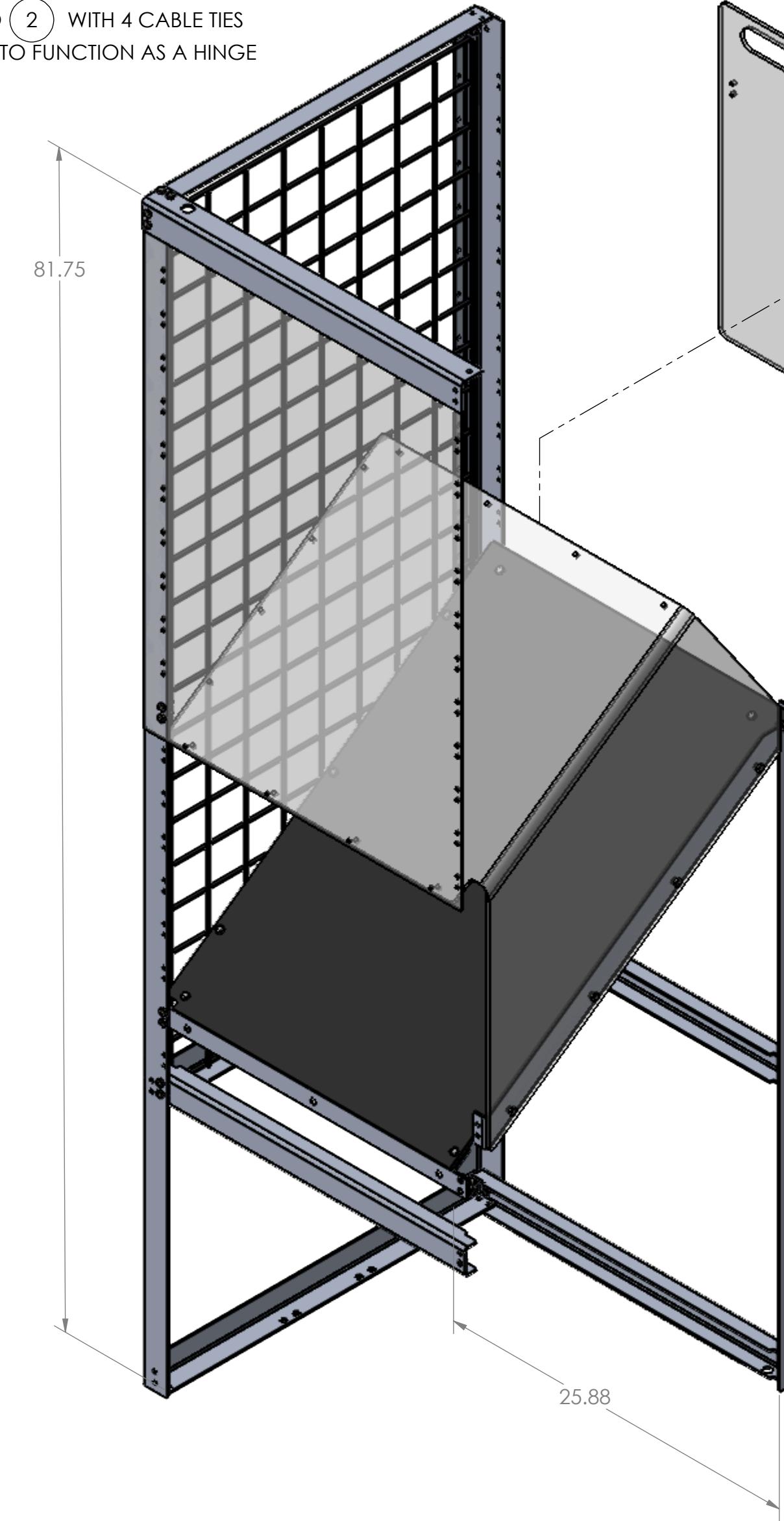
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ATTACH (2) TO THE OUTSIDE OF THE RAMP WITH 4 OF (10)

ATTACH (6) TO (2) WITH 4 CABLE TIES
LOOSE ENOUGH TO FUNCTION AS A HINGE



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	NE	12/22/2022
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 <small>Modeling Solutions Partner</small>			
TITLE: Blue Chute			
SIZE DWG. NO. REV			
C GE-23240			
SCALE: 1:7 SHEET 6 OF 6			

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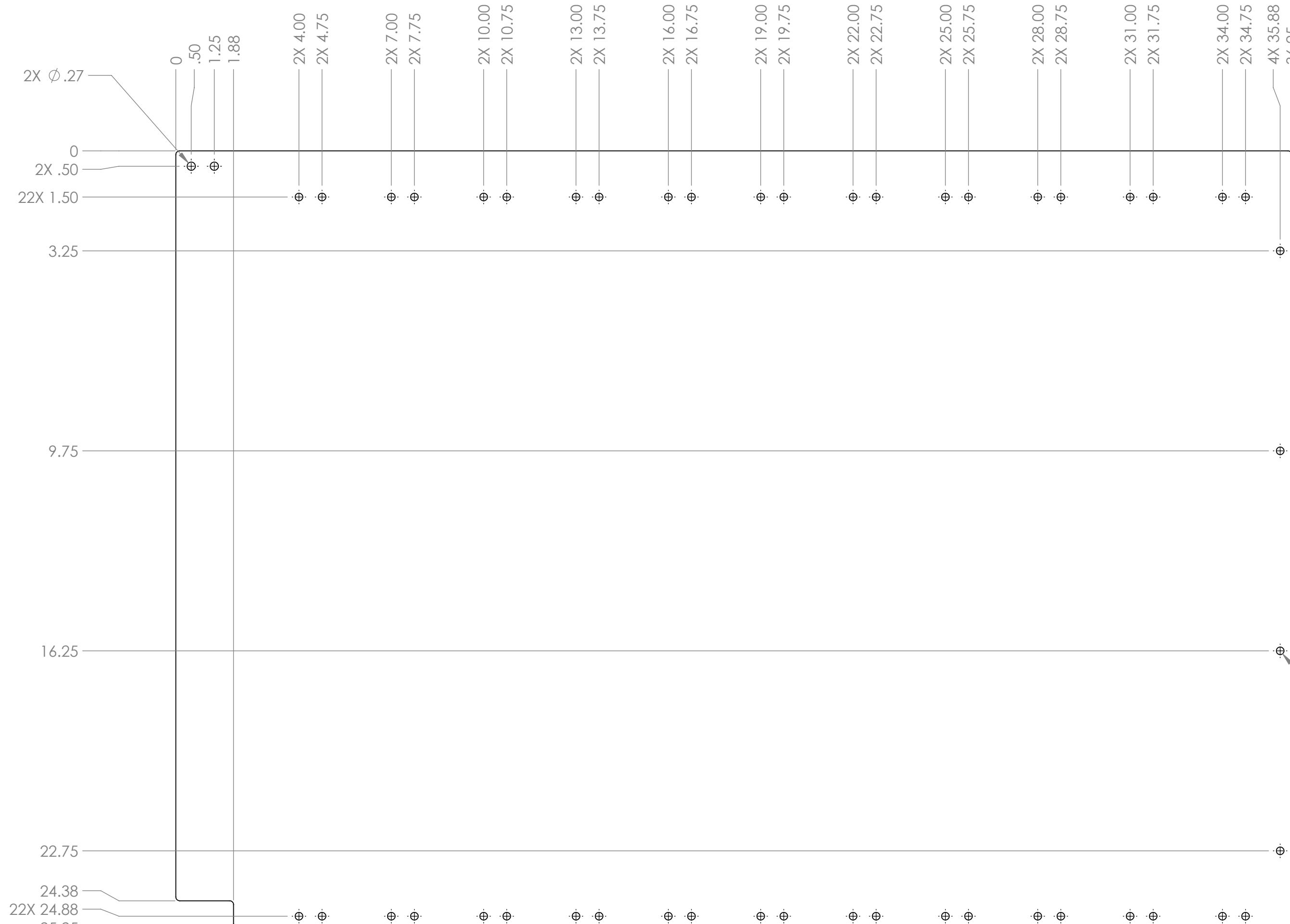
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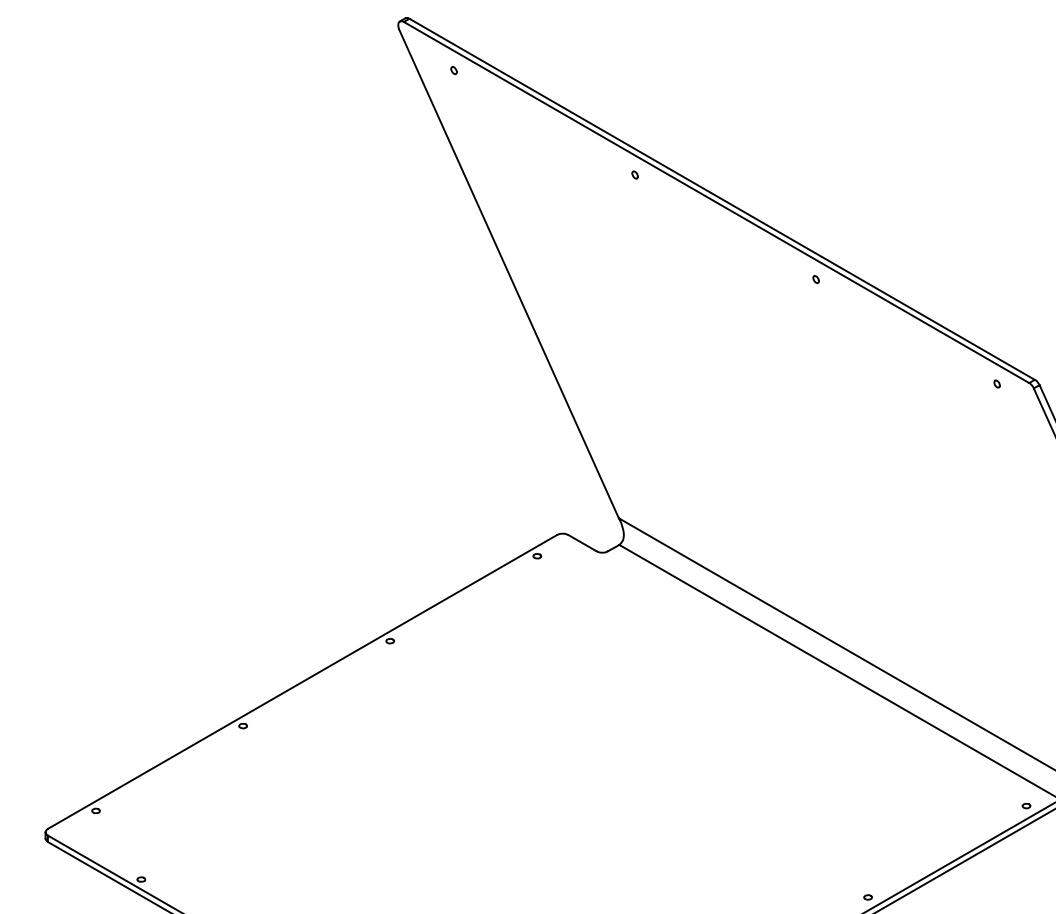
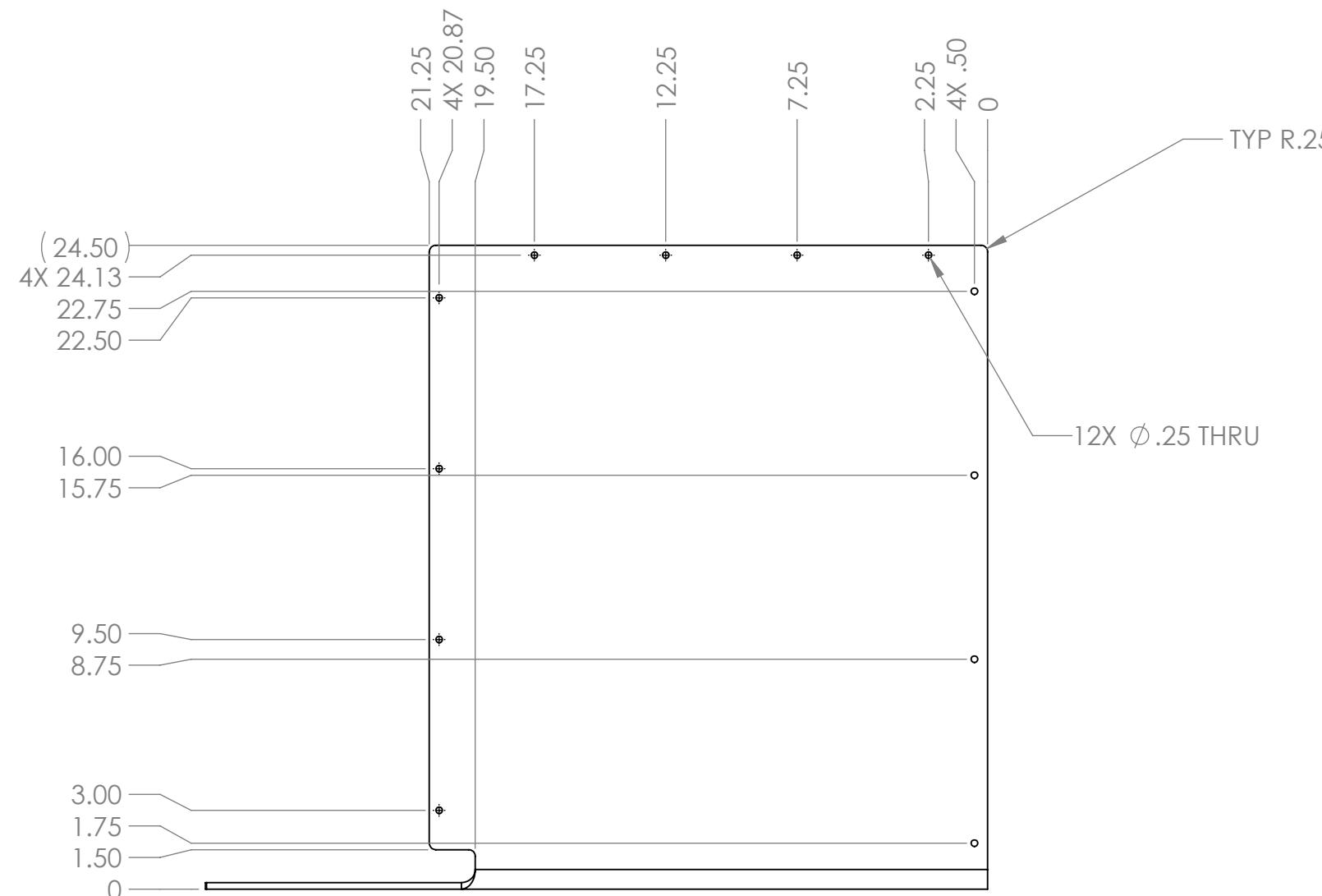
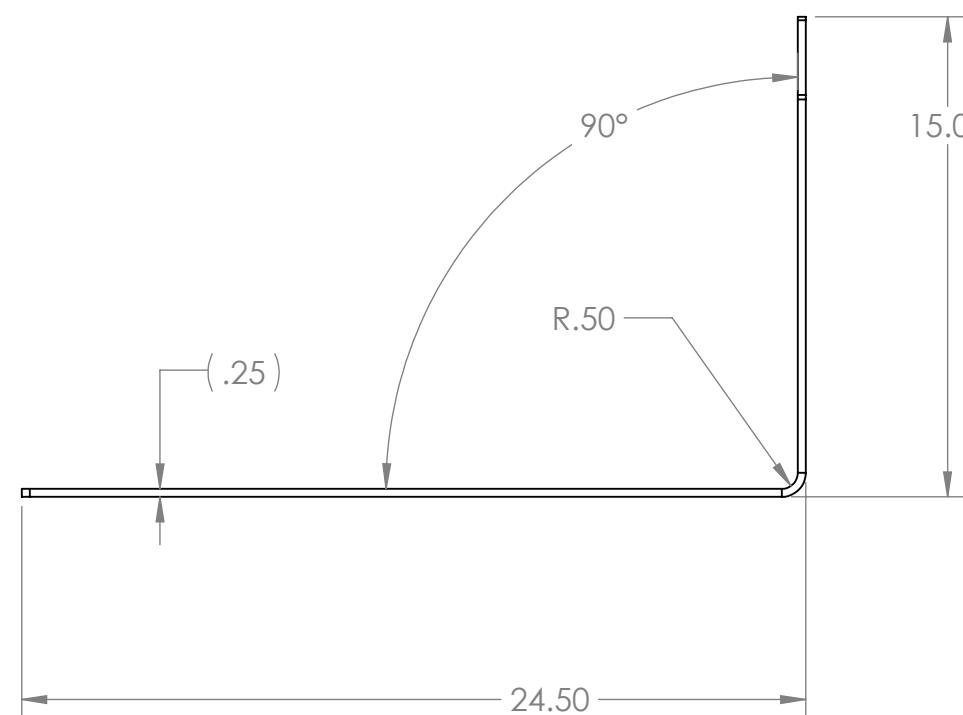
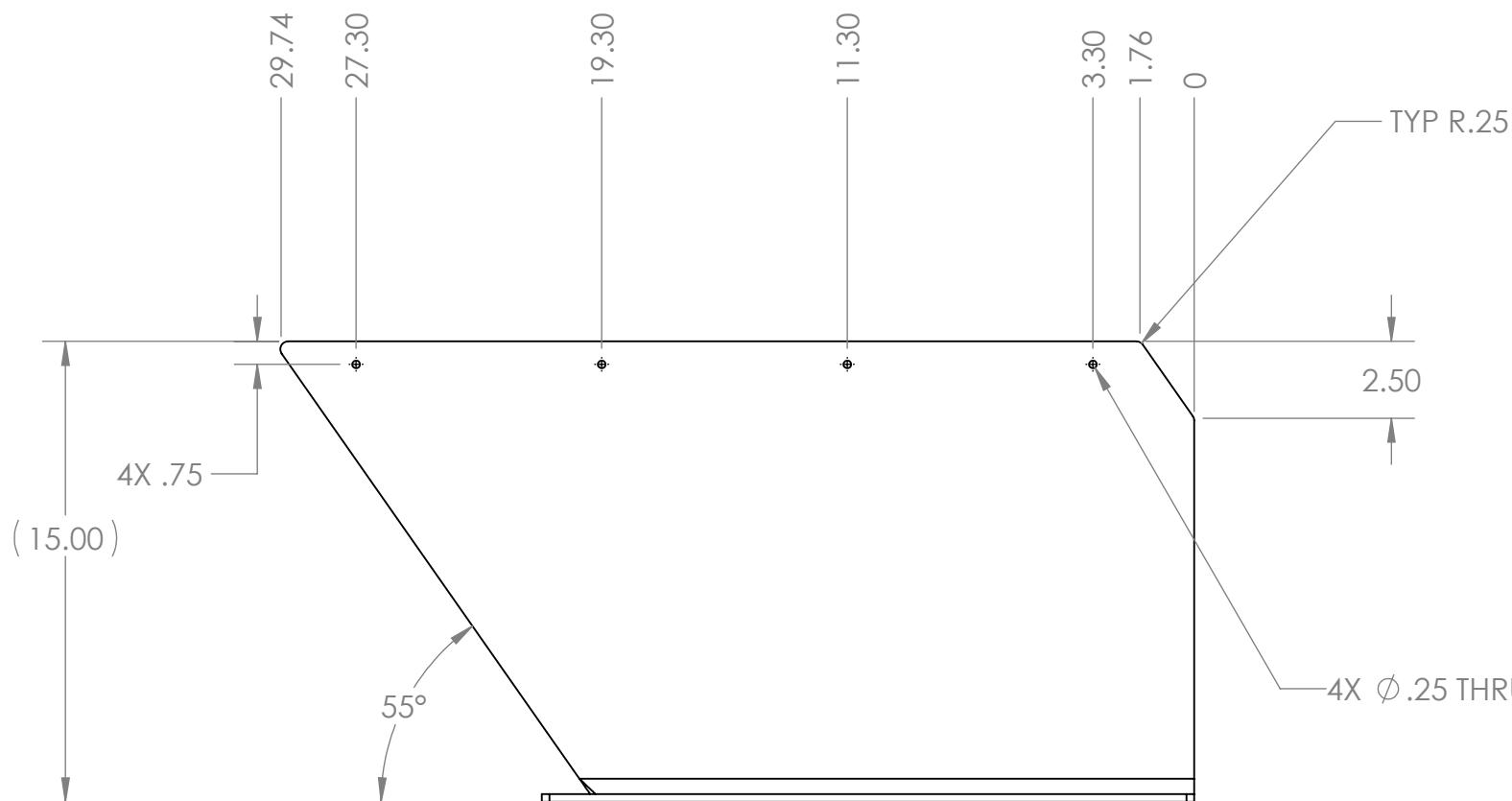
UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	NE	10/17/2022	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH: 0.125" Polycarbonate			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			
 FIRST ROBOTICS COMPETITION  SOLIDWORKS Modeling Solutions Partner			
TITLE: HP Protection Plastic			
SIZE	DWG. NO.	REV	
C	GE-23241		
SCALE: 1:3	SHEET 1 OF 1		

4

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UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	NE	9/19/2022	
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
0.25" Polycarbonate	C	GE-23242	
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING		SCALE: 1:6	SHEET 1 OF 1

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

TITLE:
**Blue Chute
Cover**

SIZE DWG. NO. REV

C GE-23242

SCALE: 1:6 SHEET 1 OF 1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
B3, B4	A	Added 2 more holes	10/11/2022	JO

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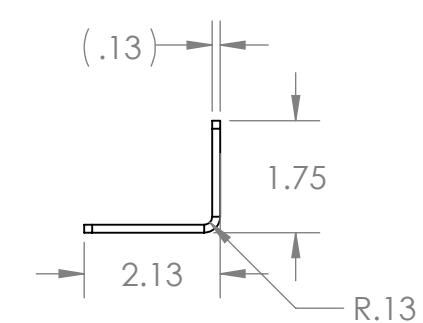
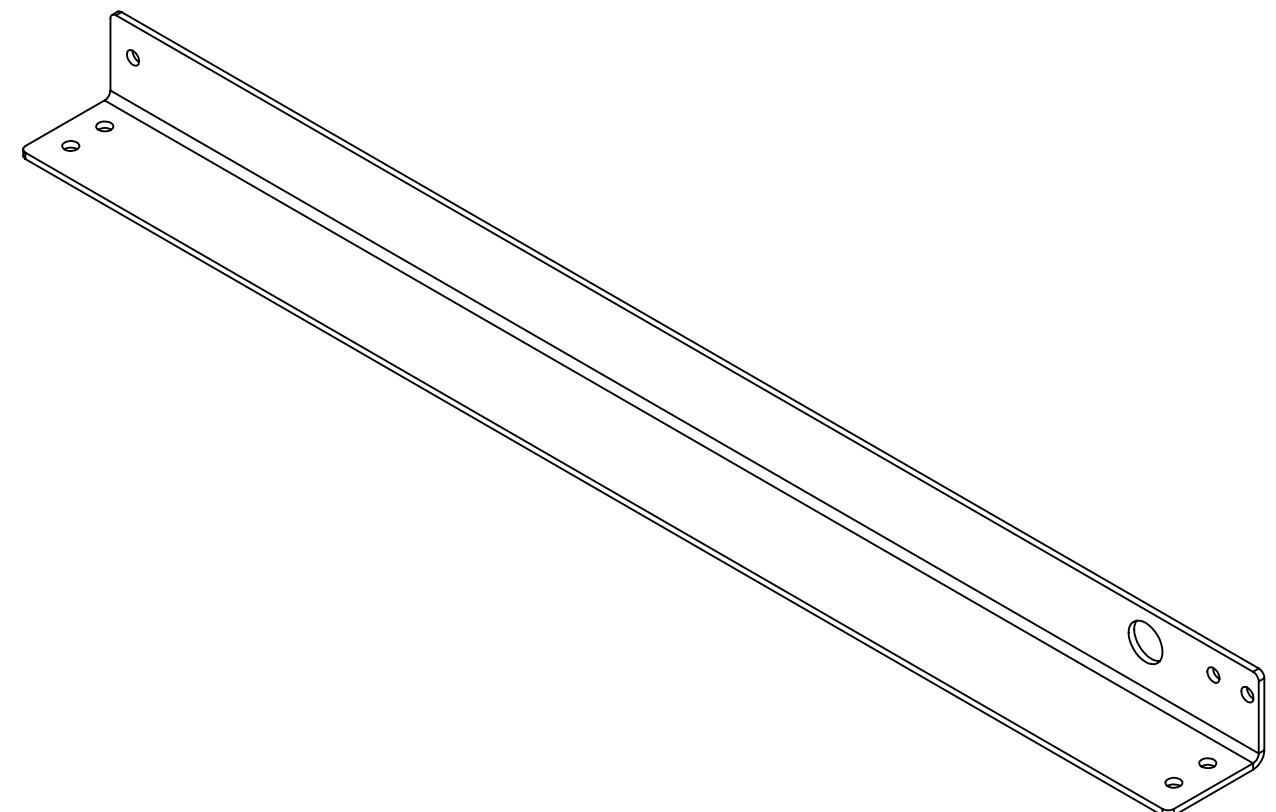
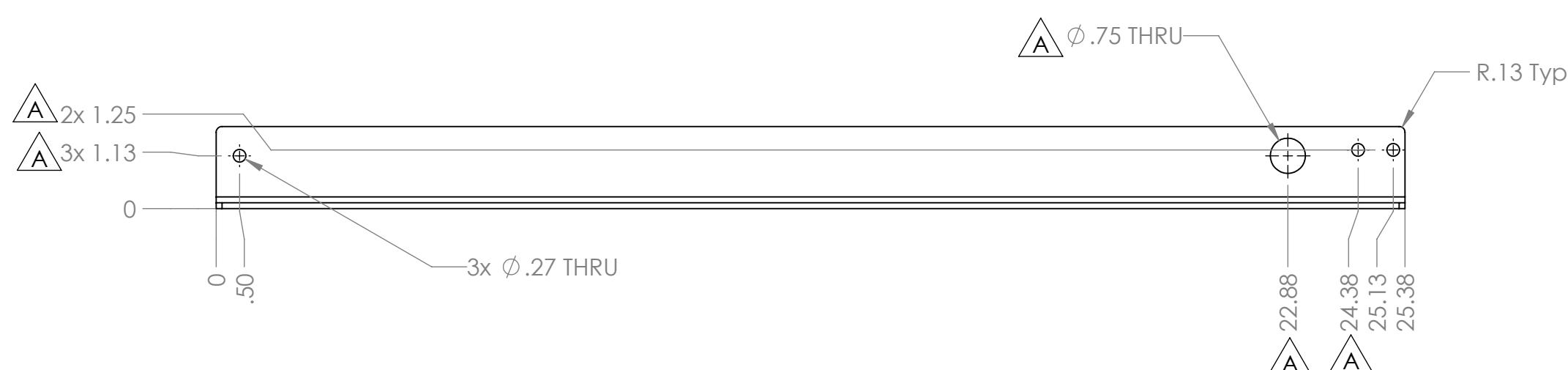
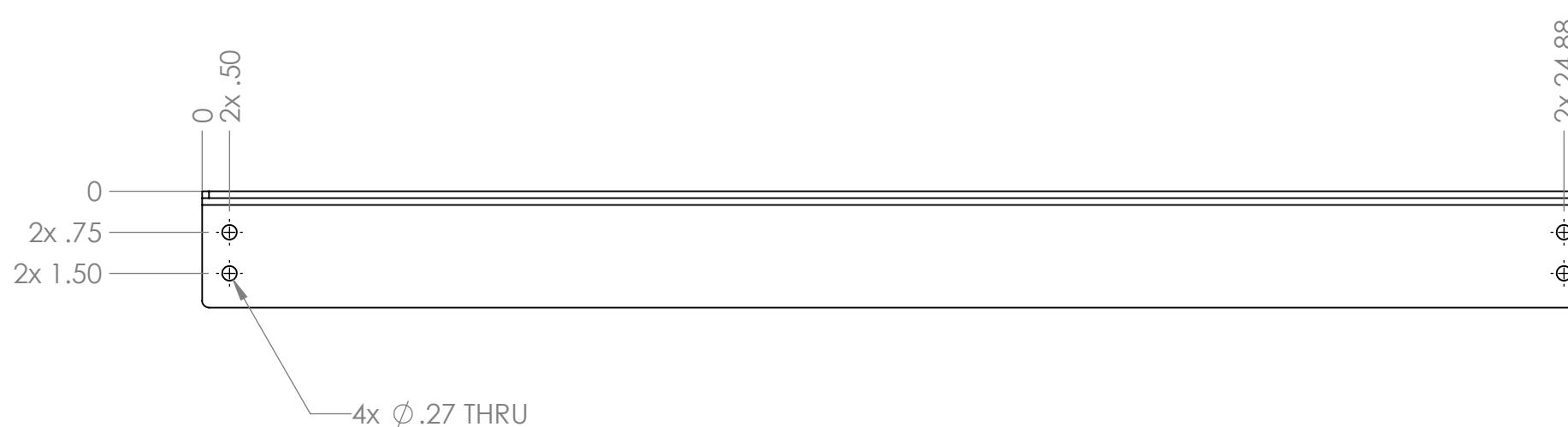
C

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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 $\pm .010$	BEND	NAME	DATE
	DRAWN	CO	9/14/2022
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
8 GA Aluminum 5052	C	GE-23243	A
COMMENTS:	SCALE: 1:3	SHEET 1 OF 1	
REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
Blue Chute Top
Connector

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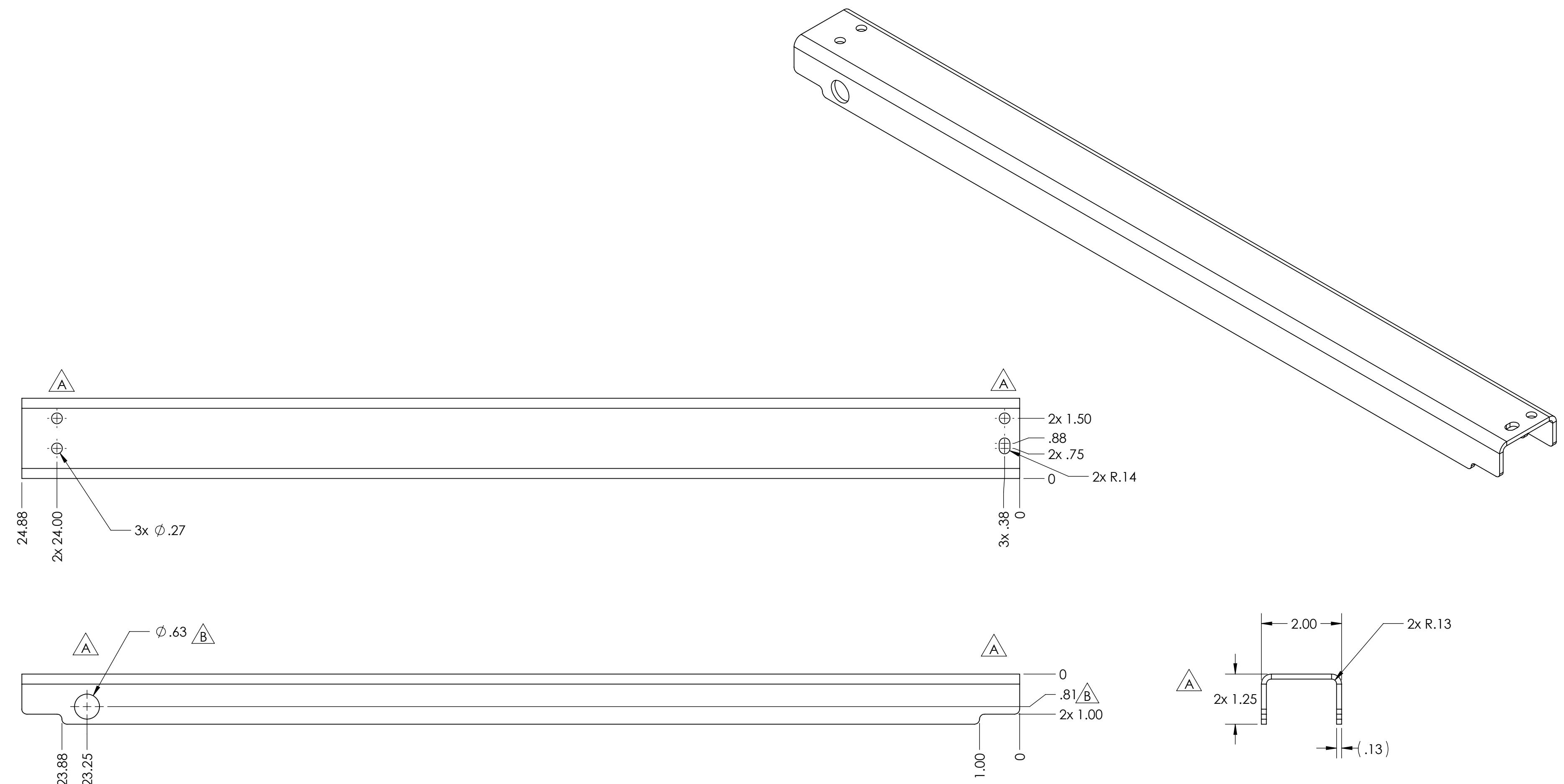
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UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .02$ THREE PLACE DECIMAL $\pm .010$	BEND	NAME	DATE
	DRAWN	CO	9/14/2022
PROPRIETARY AND CONFIDENTIAL			
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 Aluminum 5052			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
Blue Crossbeam

SIZE DWG. NO. REV
C GE-23244 **B**

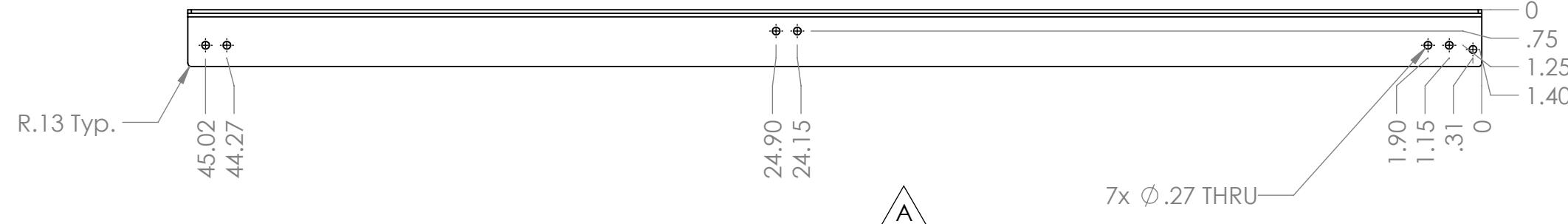
SCALE: 1:2 SHEET 1 OF 1

REVISIONS

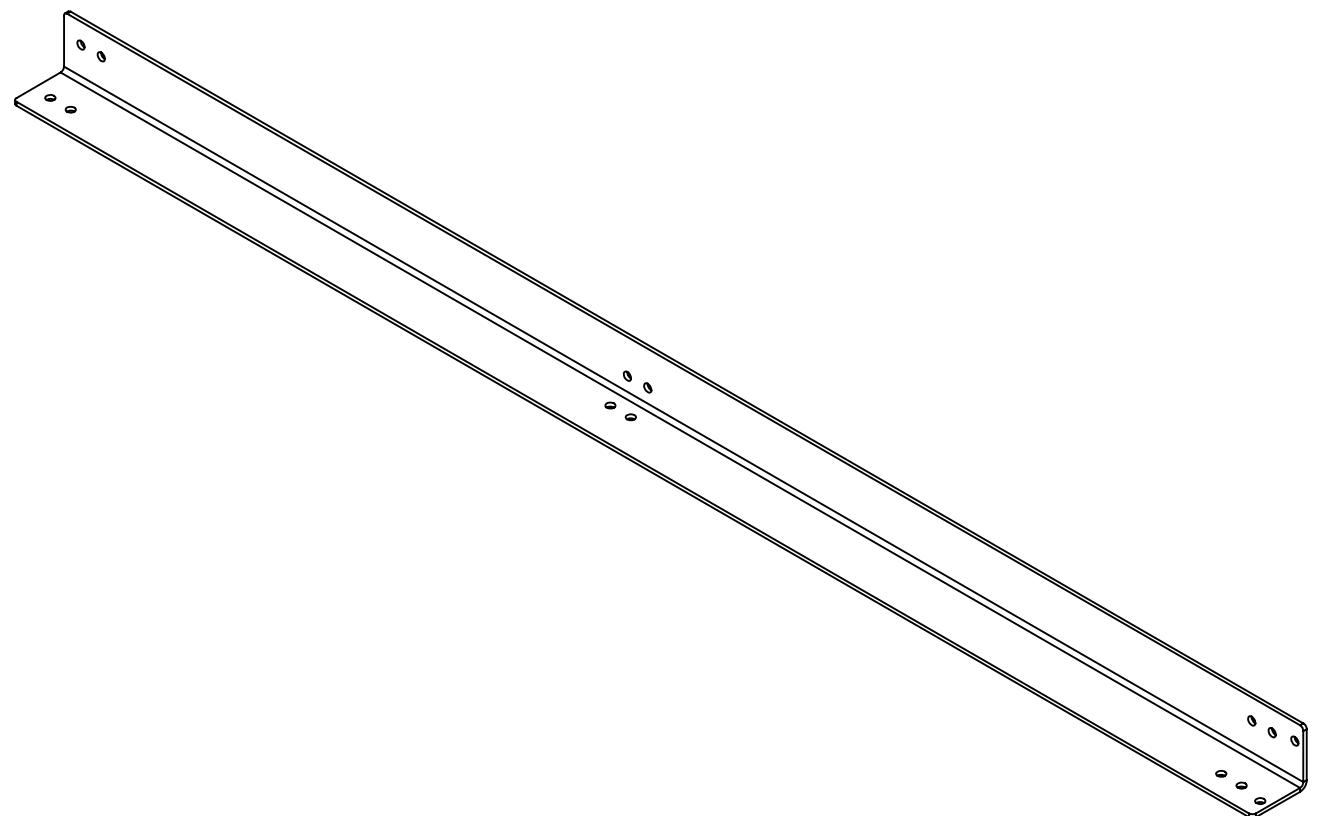
ZONE	REV.	DESCRIPTION	DATE	APPROVED
B3, C3	A	Added holes to both faces	10/11/2022	JO

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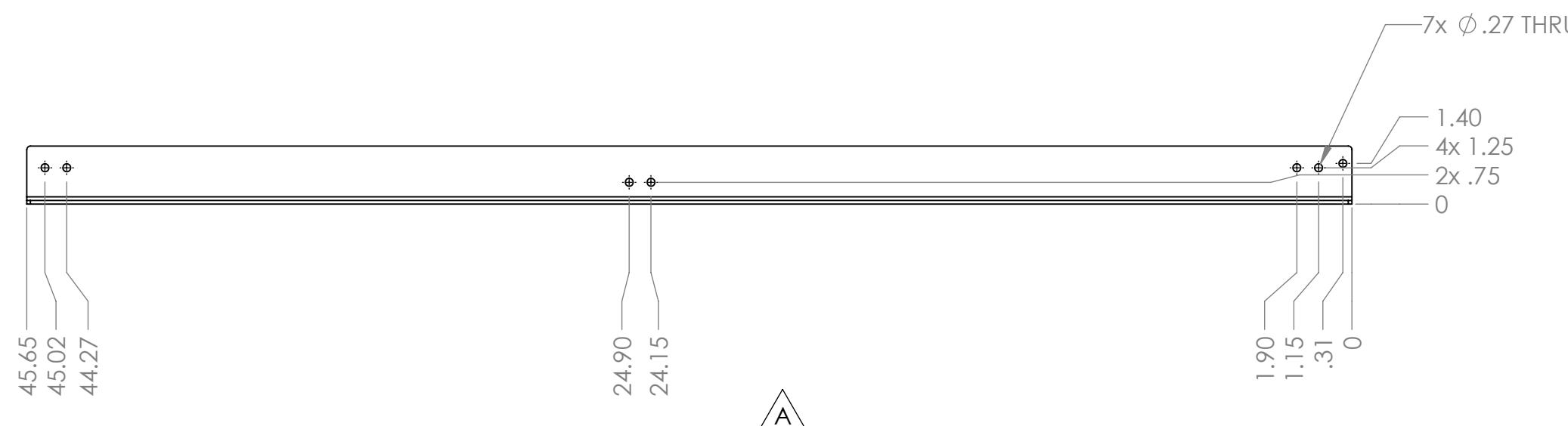


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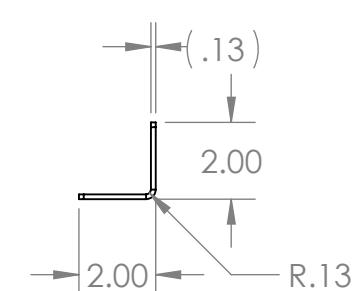
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UNLESS OTHERWISE SPECIFIED:	BEND	NAME	DATE
DRAWN	CO	9/14/2022	
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH: 8 GA Aluminum 5052			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			
TITLE: Short Chute Vertical			
SIZE DWG. NO. REV			
C	GE-23245	A	
SCALE: 1:5 SHEET 1 OF 1			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

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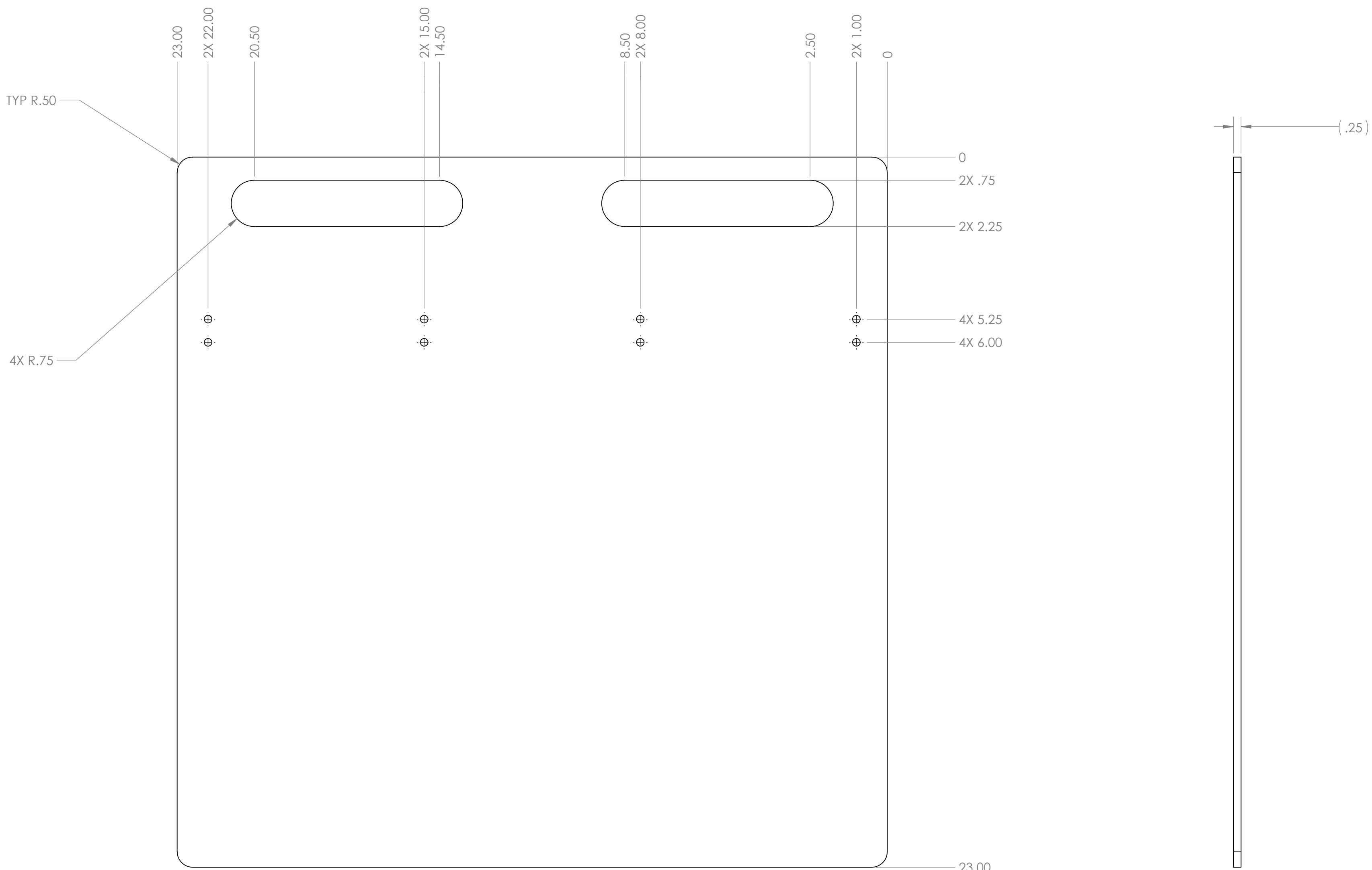
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UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	NE	10/17/2022
TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .005$	PROPRIETARY AND CONFIDENTIAL		
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:			
0.25" Polycarbonate			
COMMENTS:			
REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			



TITLE: Chute Door

SIZE DWG. NO. REV
C GE-23246

SCALE: 2:5 SHEET 1 OF 1

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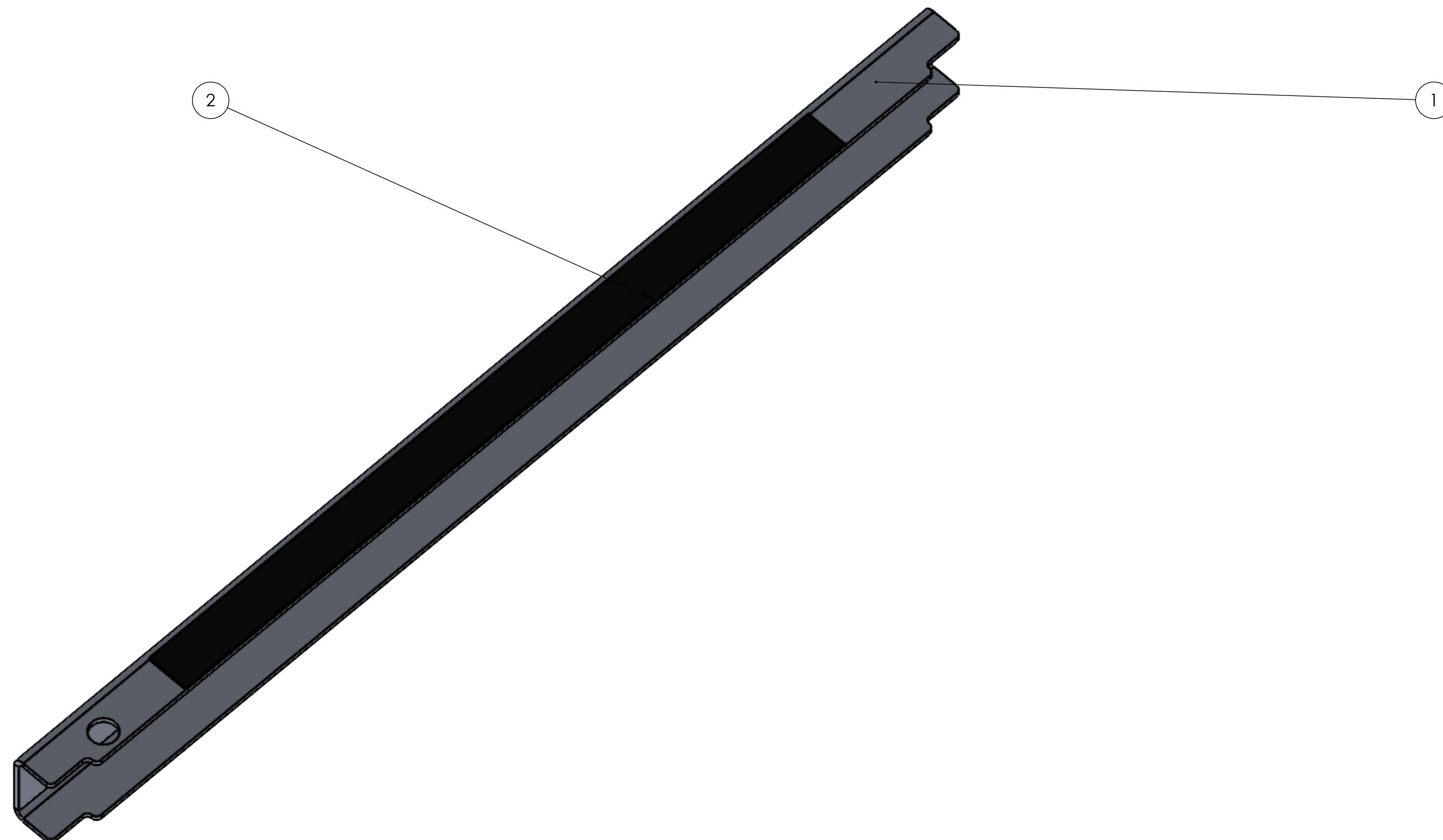
C

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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23244	Blue Crossbeam	1
2	Loop_1_18	1" x 18" Loop, Adhesive Backed	1

UNLESS OTHERWISE SPE

ED:	FIELD	NAME	DATE
	DRAWN	NE	1/3/2023



Blue Crossbeam With Loop

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

PROPRIETARY AND CONFIDENTIAL

± 1°
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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:

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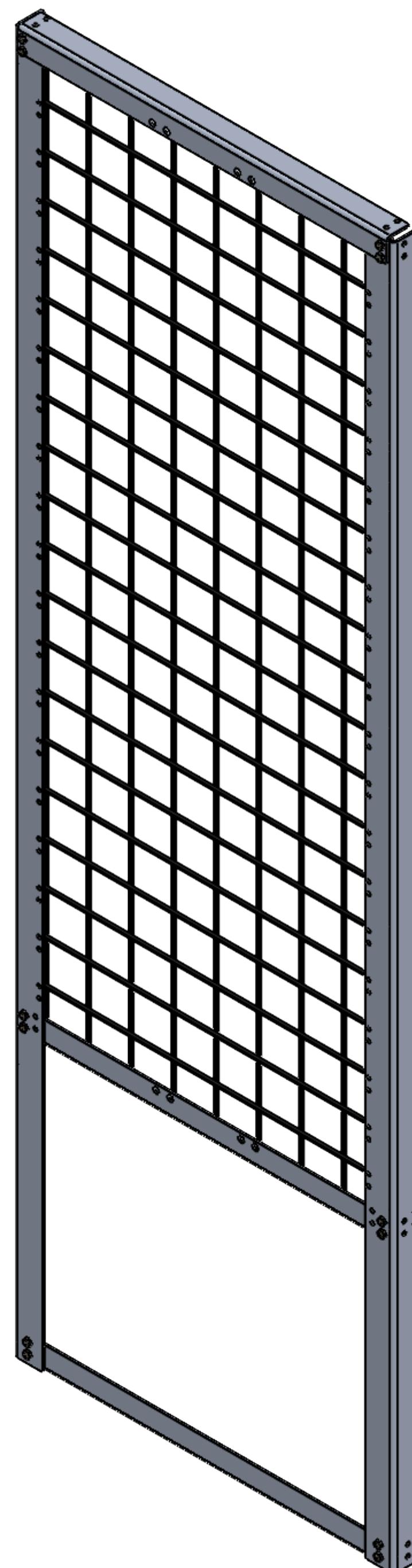
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23251	Side Fence Horizontal	2
2	GE-23252	Side Fence Vertical	2
3	GE-23253	Side Fence Horizontal With Hook	1
4	GE-23266	ULINE Grid	1
5	hex_.25_20_0.75	Steel Hex Head Screw, 1/4"-20 x 0.75" long, fully threaded	12
6	nylock_.25_20	Steel Nylon-Insert Locknut, 1/4"-20	12

UNLESS OTHERWISE SPECIFIED:

FIELD NAME DATE

DRAWN NE 12/22/2022

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 $\pm .50$

MATERIAL/FINISH:

PROPRIETARY AND CONFIDENTIAL
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DO NOT SCALE DRAWING

TITLE:
Side Fence

SIZE DWG. NO. REV

C GE-23250

SCALE: 2:11 SHEET 1 OF 3

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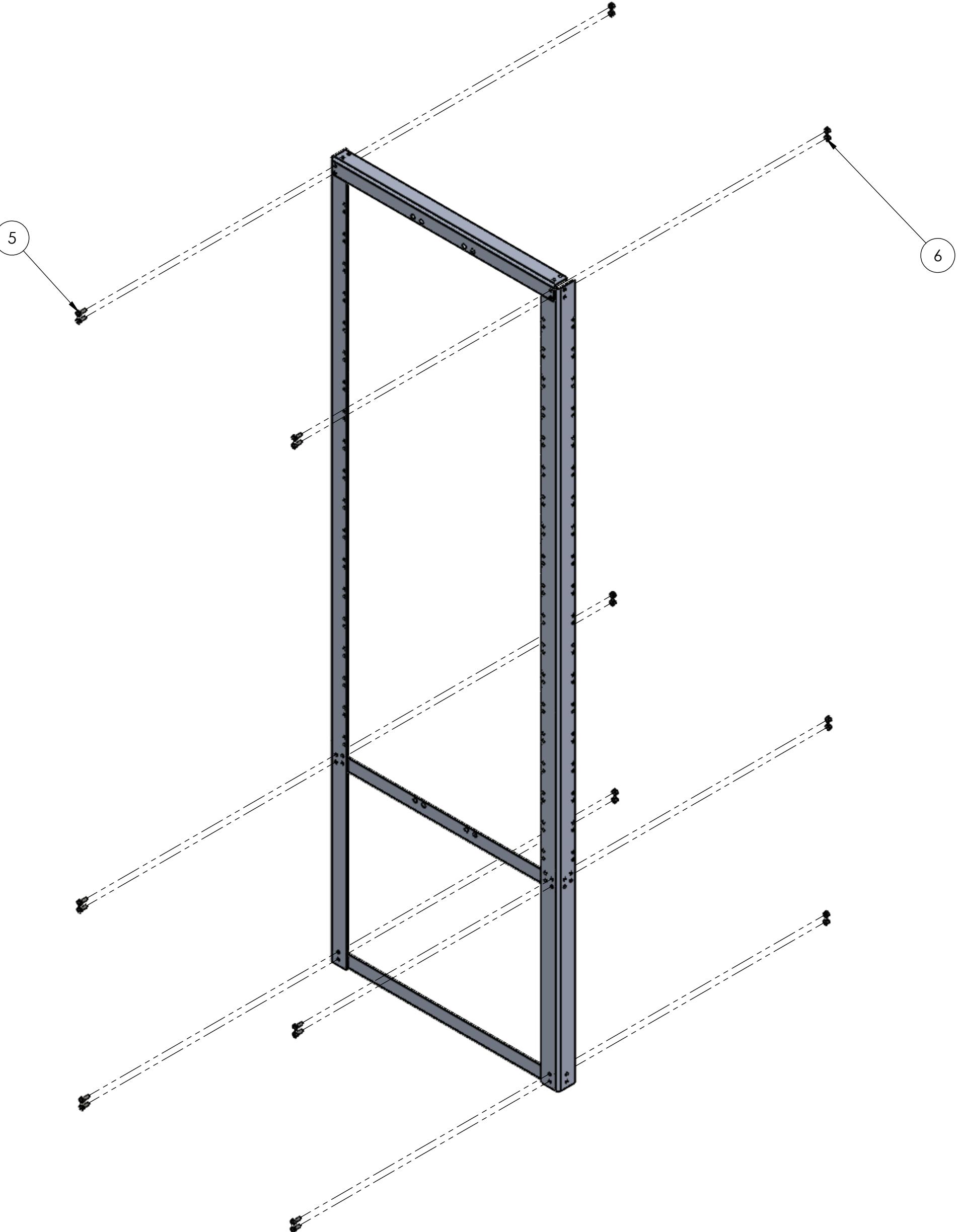
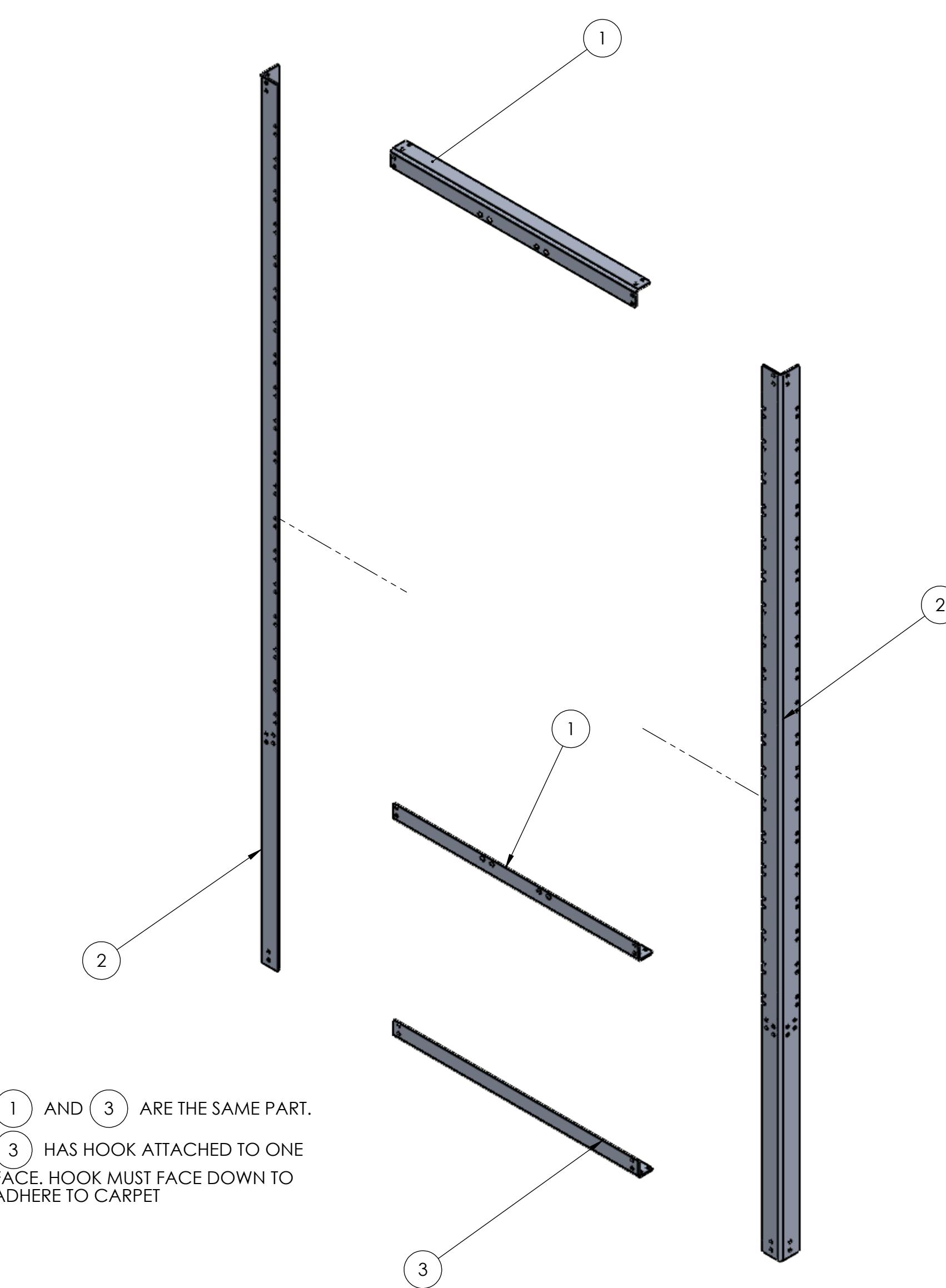
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ATTACH (1) AND (3) TO (2) WITH 12 OF (5) AND 12 OF (6)



UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DRAWN	NE	12/22/2022	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:			
DO NOT SCALE DRAWING			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
FIRST ROBOTICS COMPETITION			
SOLIDWORKS Modeling Solutions Partner			
TITLE: Side Fence			
SIZE DWG. NO. REV			
C GE-23250			
SCALE: 1:8 SHEET 2 OF 3			

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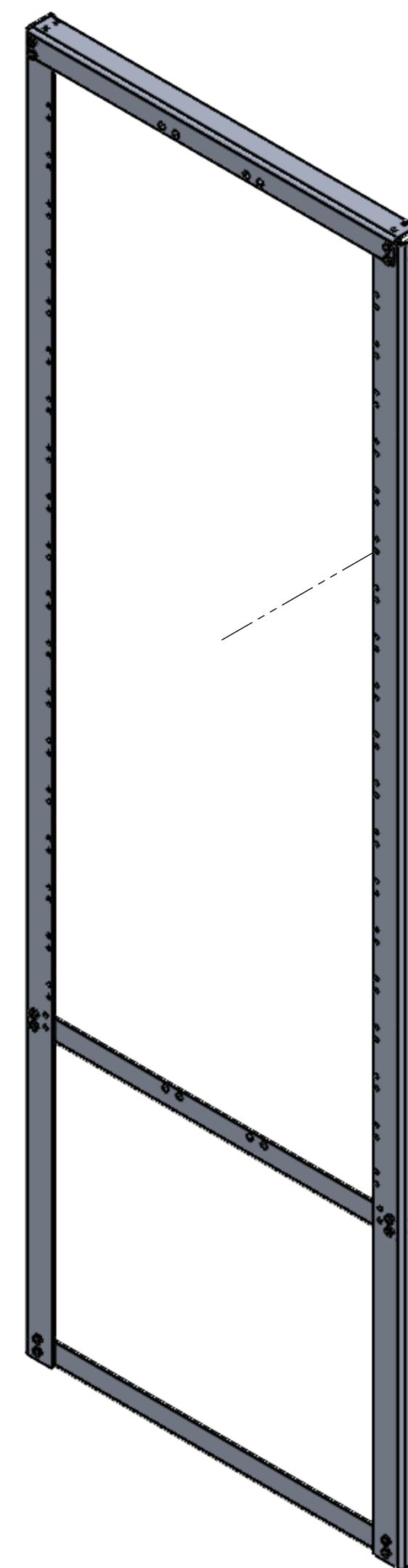
C

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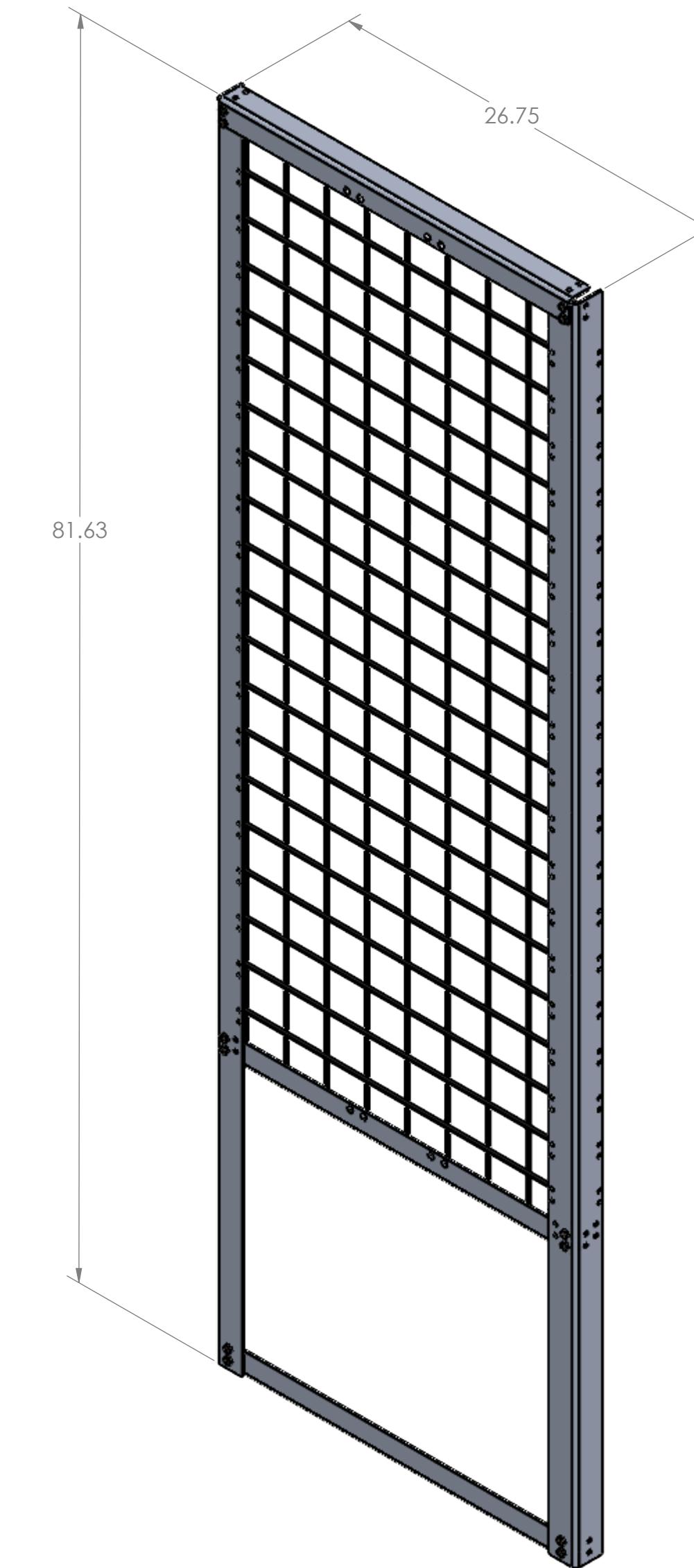
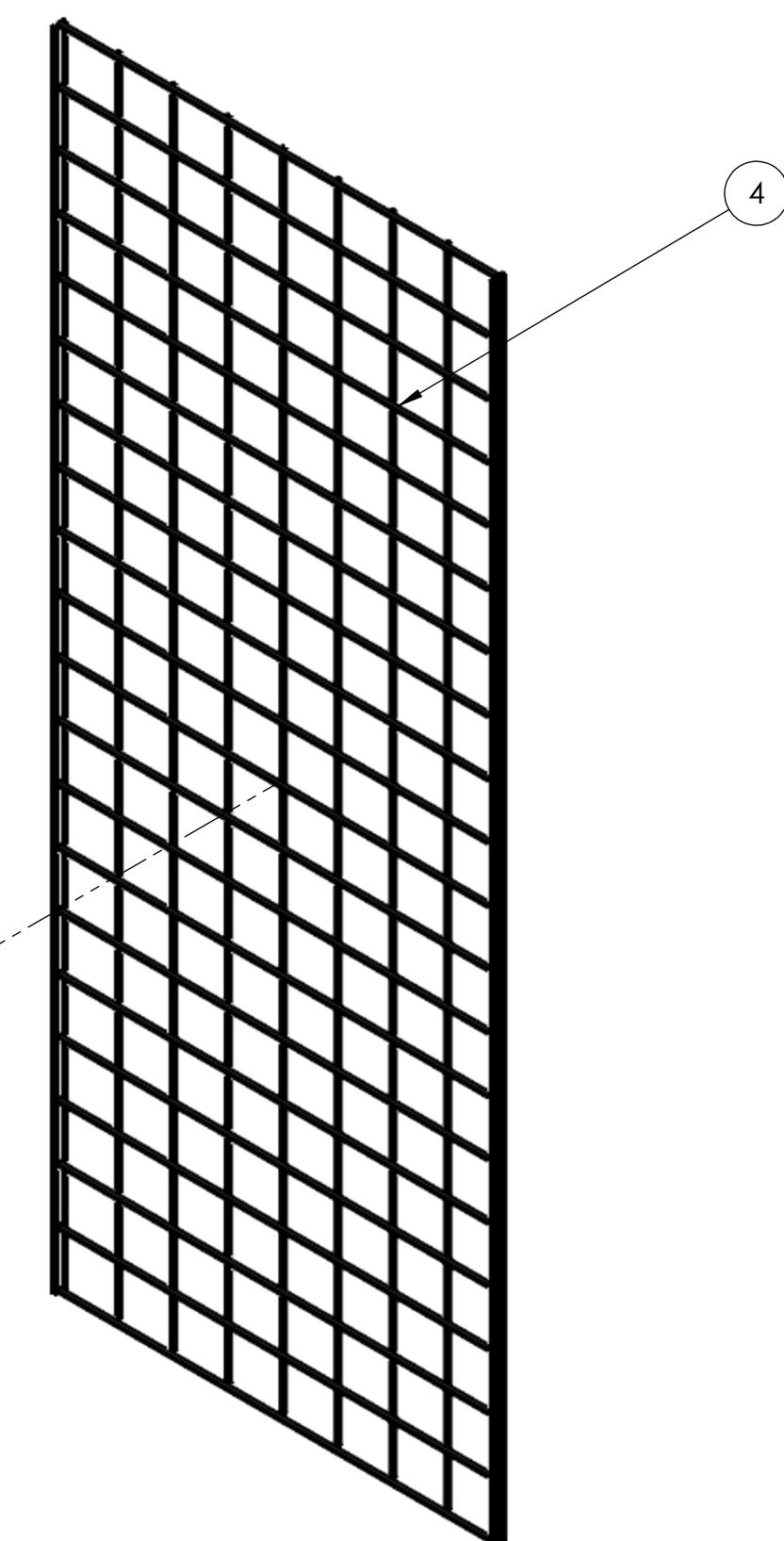
B

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ATTACH (4) WITH CABLE TIES ON ALL SIDES



UNLESS OTHERWISE SPECIFIED:

FIELD	NAME	DATE
DRAWN	NE	12/22/2022

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:
DO NOT SCALE DRAWING

REMOVE ALL BURRS AND SHARP EDGES.

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

TITLE: **Side Fence**

SIZE DWG. NO. REV

C GE-23250

SCALE: 1:7 SHEET 3 OF 3

4

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REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
B3, C3	A	Changed Numerous Hole Locations	10/11/2022	JO

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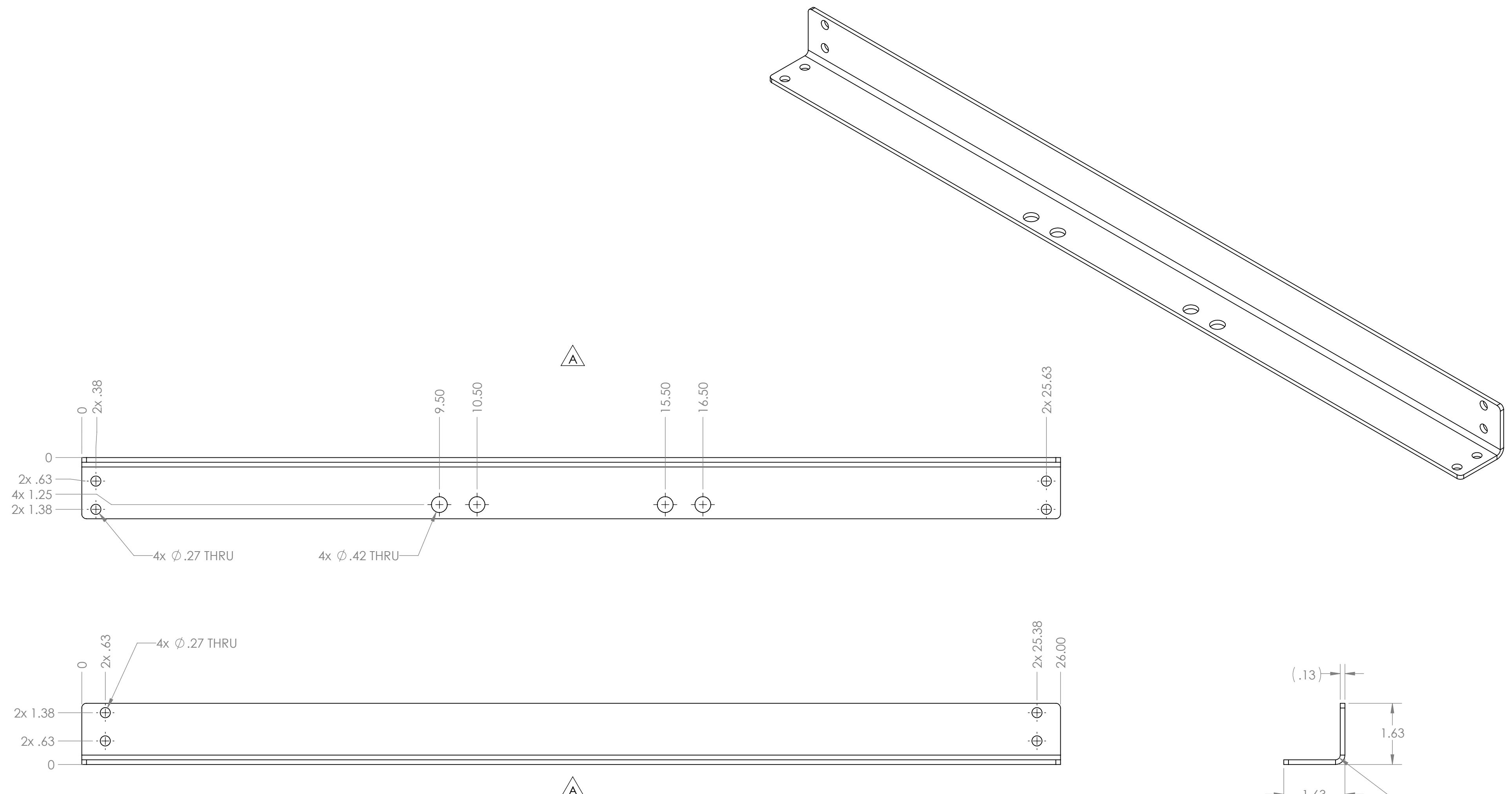
C

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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:

8 GA Aluminum 5052

DO NOT SCALE DRAWING

BEND

NAME

DATE

DRAWN

CO

9/14/2022

PROPRIETARY AND CONFIDENTIAL

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COMMENTS:

REMOVE ALL BURRS AND SHARP EDGES.



TITLE:
Side Fence
Horizontal

SIZE DWG. NO. REV
C GE-23251 **A**

SCALE: 1:2 SHEET 1 OF 1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
B2, B3, B4, C2, C3, C4	A	Added and Moved various holes	10/11/2022	JO

D

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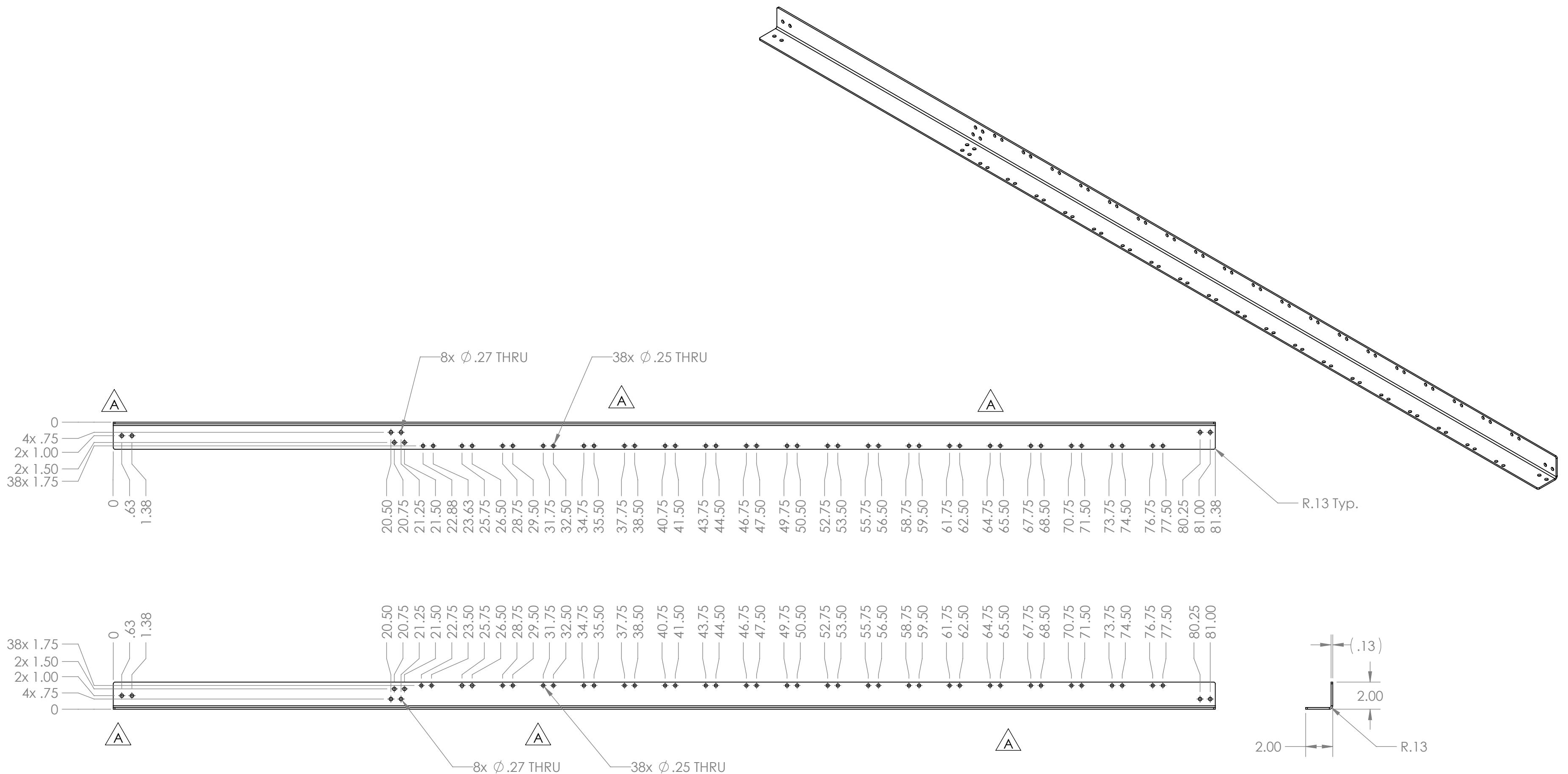
C

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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 $\pm .010$	BEND	NAME	DATE
	DRAWN	CO	9/14/2022
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH: 8 GA Aluminum 5052			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

 FIRST
ROBOTICS
COMPETITION

 SOLIDWORKS
Modeling Solutions Partner

TITLE:
Side Fence
Vertical

SIZE DWG. NO. REV
C GE-23252 **A**

SCALE: 1:6 SHEET 1 OF 1

4

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C

C

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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23251	Side Fence Horizontal	1
2	Hook_1_21	1" x 21" Hook, Adhesive Backed	1

UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DRAWN	NE	1/3/2023	

PROPRIETARY AND CONFIDENTIAL

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COMMENTS:
REMOVE ALL BURRS AND SHARP EDGES.

DO NOT SCALE DRAWING

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

TITLE: Side Fence Horizontal With Hook

SIZE DWG. NO. REV

C GE-23253

SCALE: 2:3 SHEET 1 OF 1

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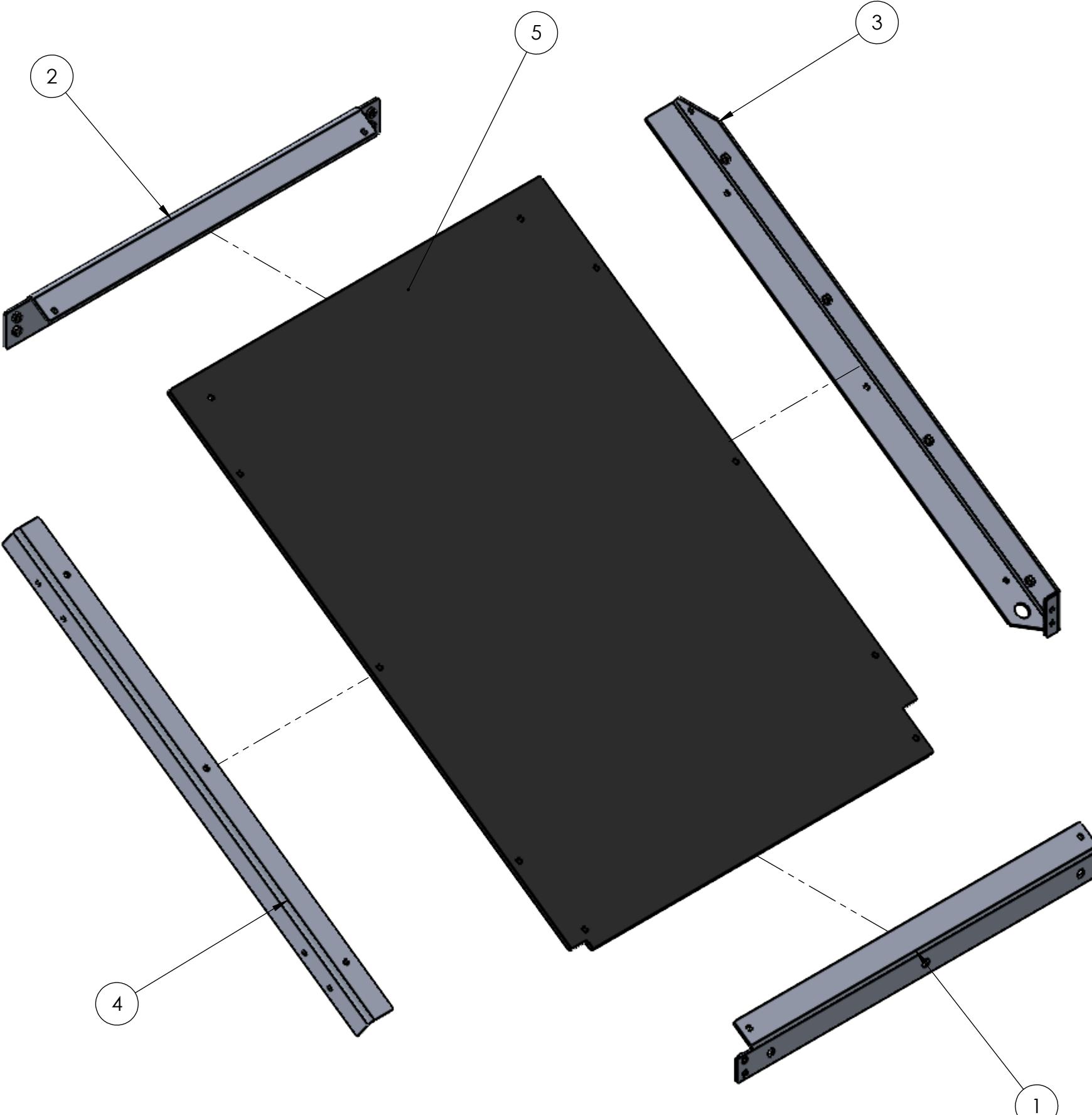
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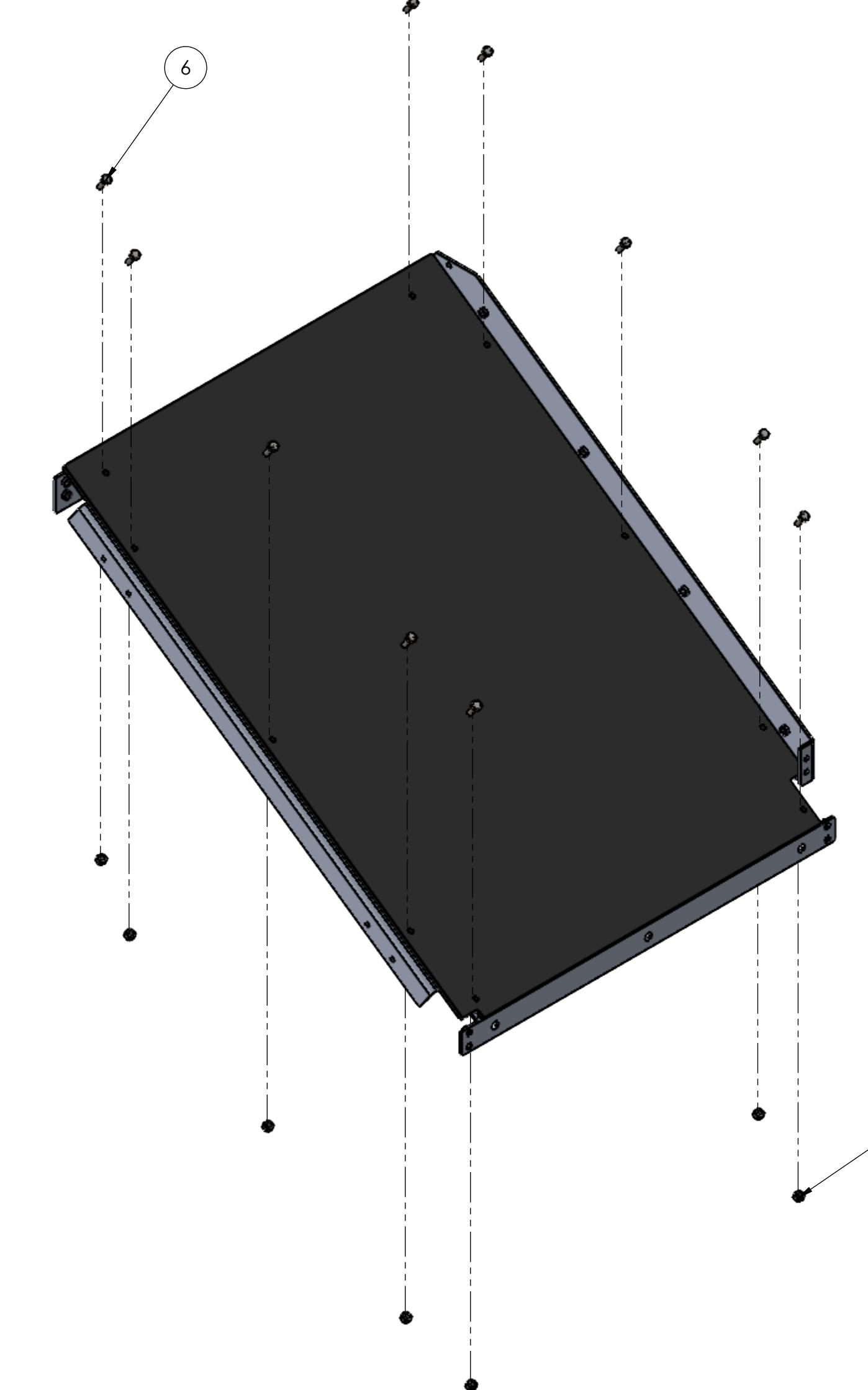


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23261	Ramp Front Rail with PEMs	1
2	GE-23262	Ramp Back Rail with PEMs	1
3	GE-23263	Blue Ramp HP Side with PEMs	1
4	GE-23264	Ramp Side Fence Rail	1
5	GE-23265	Chute Floor	1
6	hex_.25_20_0.75	Steel Hex Head Screw, 1/4"-20 x 0.75" long, fully threaded	10
7	nylock_.25_20	Steel Nylon-Insert Locknut, 1/4"-20	10

UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE	 FIRST ROBOTICS COMPETITION
DRAWN	NE	12/22/2022		
PROPRIETARY AND CONFIDENTIAL				
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MATERIAL/FINISH:	SIZE	DWG. NO.	REV	
DO NOT SCALE DRAWING	C	GE-23260		
COMMENTS:		SCALE: 1:3 SHEET 1 OF 2		
REMOVE ALL BURRS AND SHARP EDGES.				



ATTACH (1), (2), (3), AND (4) TO (5) WITH 10 OF (6) AND 10 OF (7)



UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DRAWN	NE	12/22/2022	
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

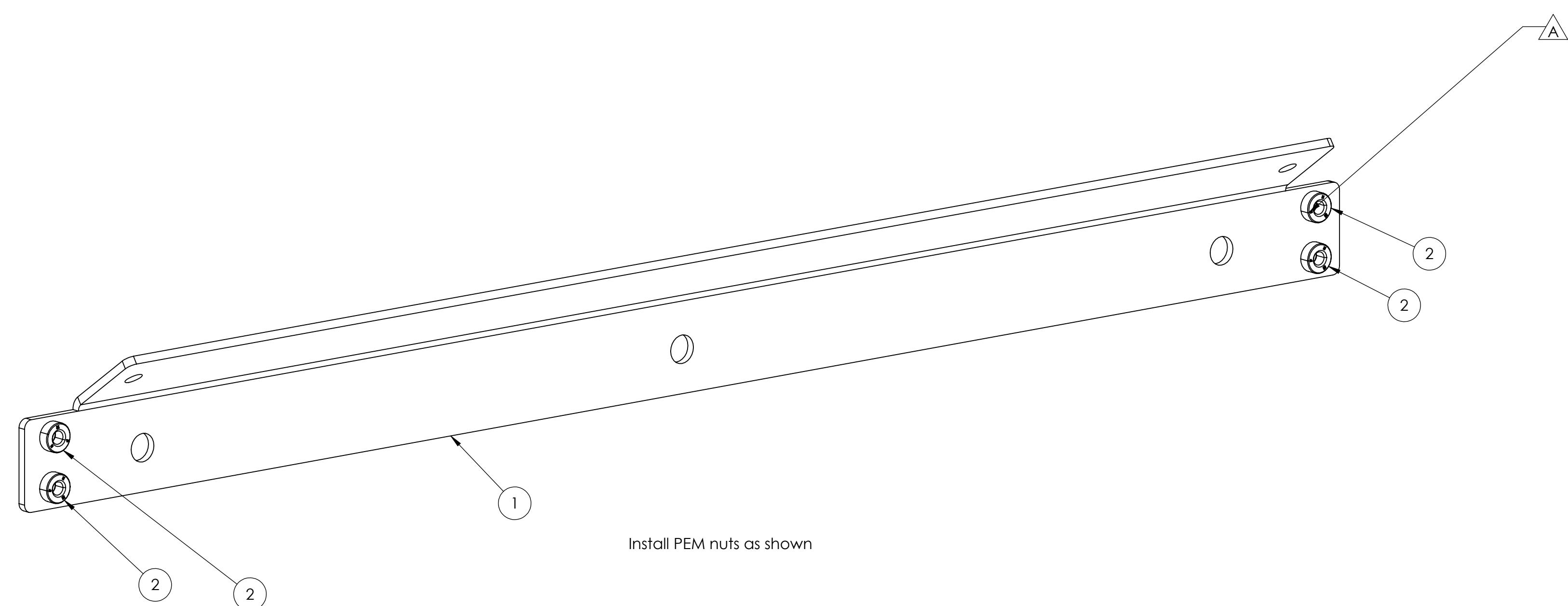
TITLE:
**Blue Ramp
Assembly**

SIZE DWG. NO. REV
C GE-23260

SCALE: 2:11 SHEET 2 OF 2

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23261-01	Ramp Front Rail	1
2	pem_clinchnut_.25_20 .054	1/4-20 self-clinching nut, .054 shank	4

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
C1	A	PEM NUTS ADDED TO 4 OUTER HOLE LOCATIONS	10/14/2022	NE



UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	JO	10/11/2022	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:	SIZE	DWG. NO.	REV
	C	GE-23261	A
DO NOT SCALE DRAWING	SCALE: 3:4	SHEET 1 OF 1	

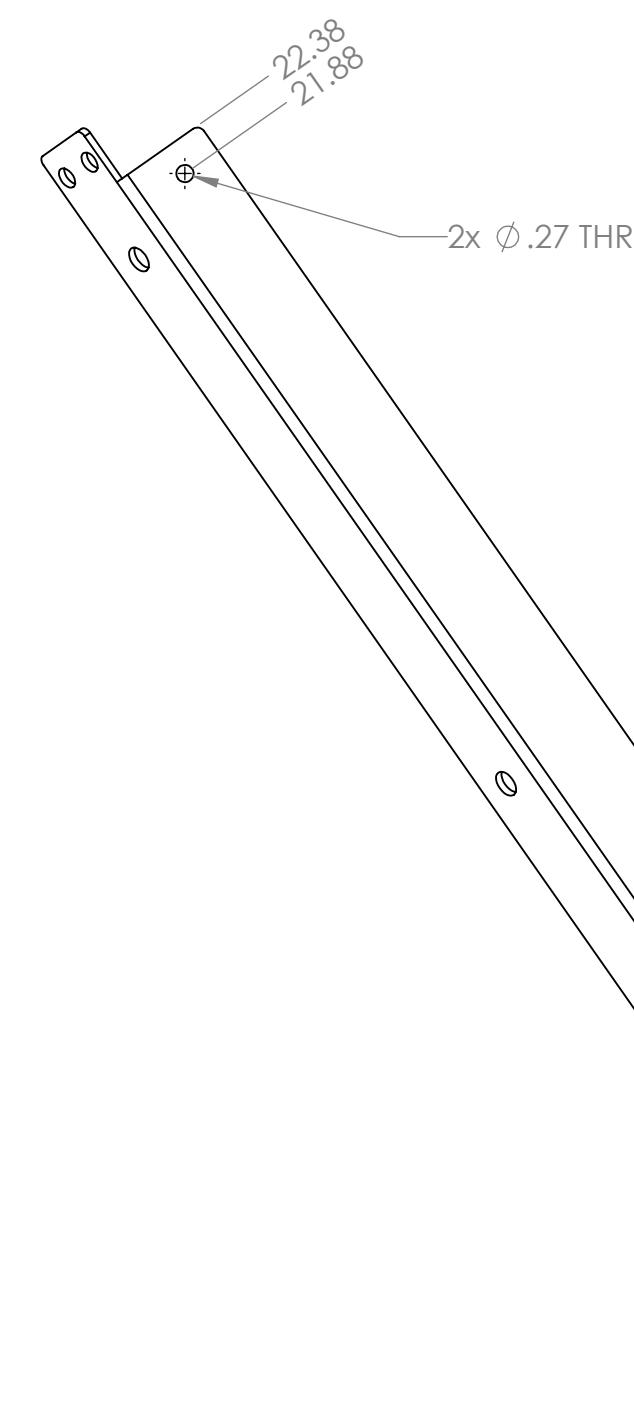
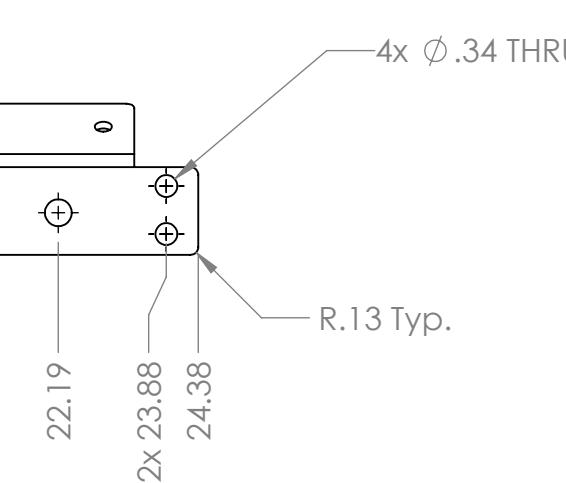
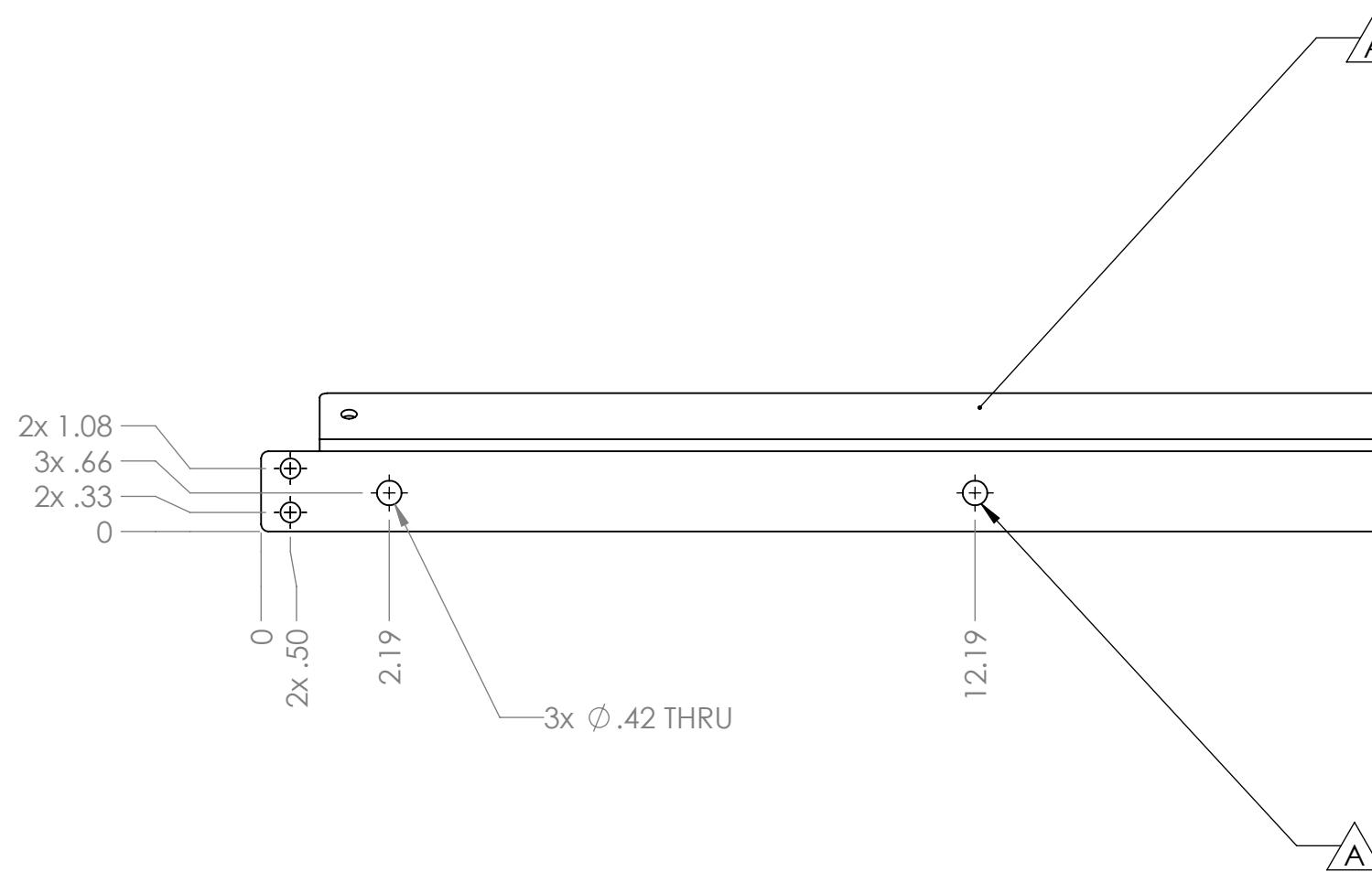
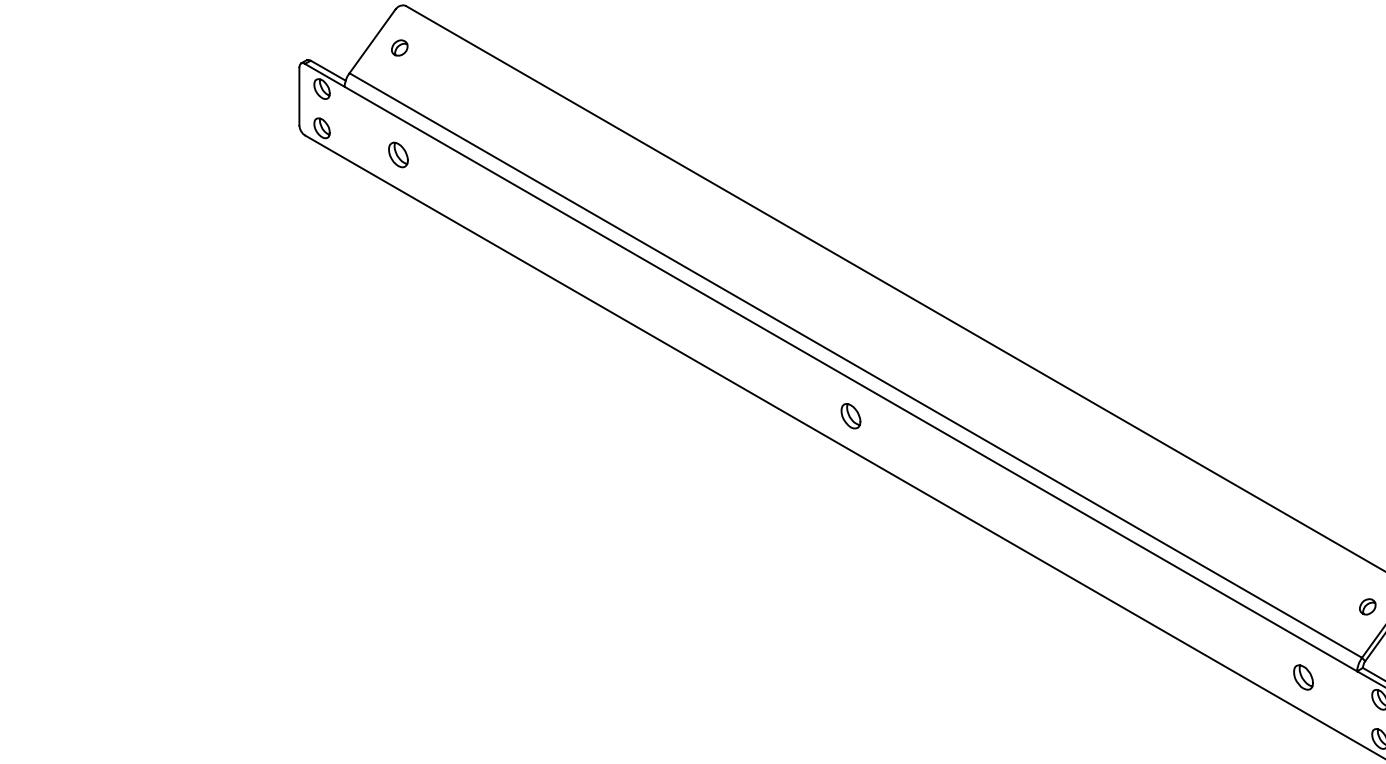
FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

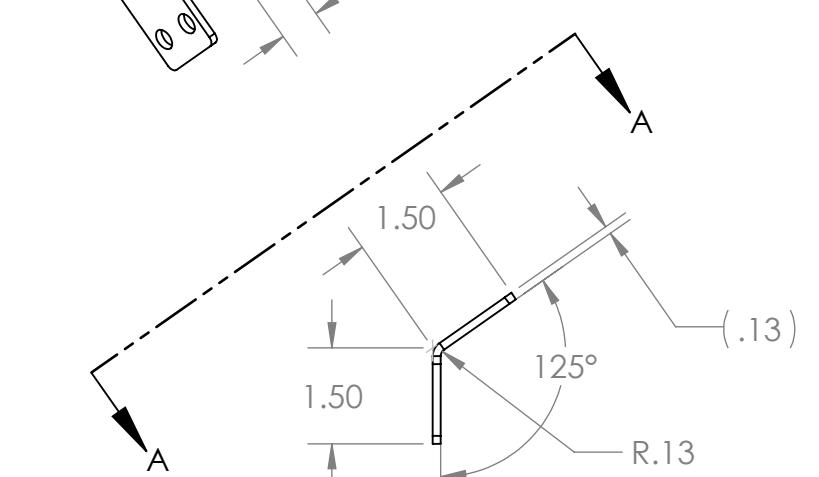
TITLE:
**Ramp Front Rail
with PEMs**

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VIEW A-A



REVISIONS		
ZONE	REV.	DESCRIPTION
A3	A	ADDED 3 LARGER HOLES AND REMOVED CENTERED SMALLER HOLE. EXISTING HOLE LOCATIONS MAY HAVE MINOR LOCATIONAL CHANGES
		10/14/2022 NE

UNLESS OTHERWISE SPECIFIED:	BEND	NAME	DATE		
DRAWN	CO	9/14/2022			
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 Aluminum 5052				
COMMENTS:	REMOVE ALL BURRS AND SHARP EDGES.				
DO NOT SCALE DRAWING					

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

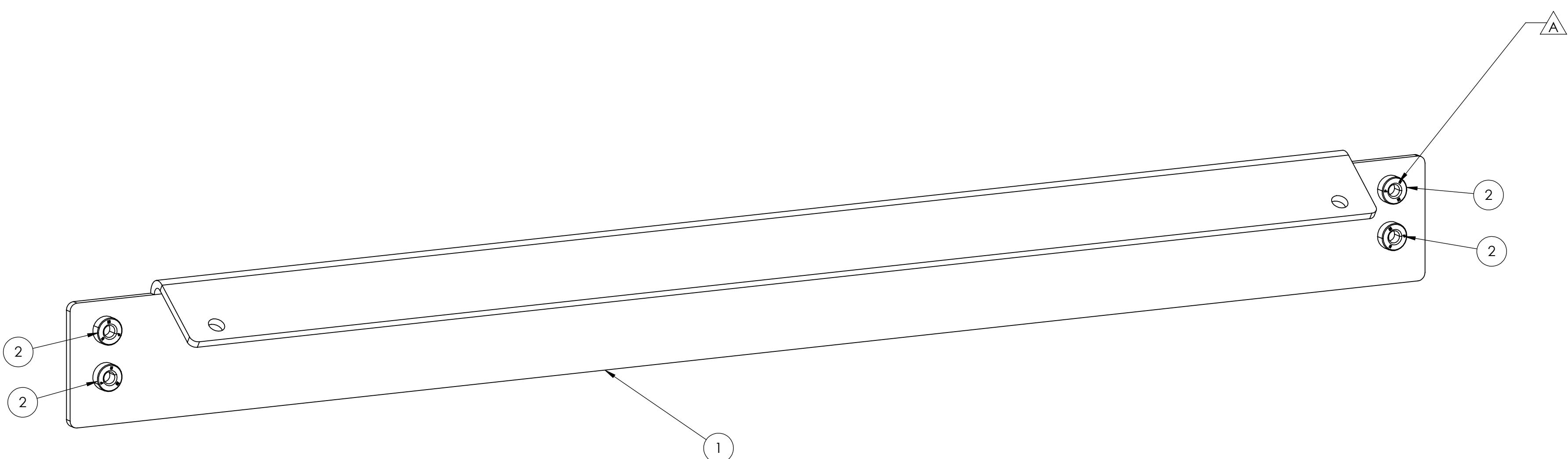
TITLE:
Ramp Front Rail

SIZE DWG. NO. REV
C GE-23261-01 A

SCALE: 1:3 SHEET 1 OF 1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23262-01	Ramp Back Rail	1
2	pem_clinchnut_.25_20 .054	1/4-20 self-clinching nut, .054 shank	4

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
C1	A	PEM NUT ADDED TO OUTSIDE HOLES	10/14/2022	NE



Install PEMs as shown

UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	JO	10/11/2022
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:	COMMENTS:		
REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST ROBOTICS COMPETITION SOLIDWORKS Modeling Solutions Partner

TITLE:
Ramp Back Rail with PEMs

SIZE DWG. NO. REV
C GE-23262 **A**

SCALE: 3:4 SHEET 1 OF 1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
B3, C2	A	REMOVAL OF SMALLER CENTER HOLE, MINOR LOCATIONAL DIFFERENCES WITH OUTER HOLE LOCATIONS	10/14/2022	NE

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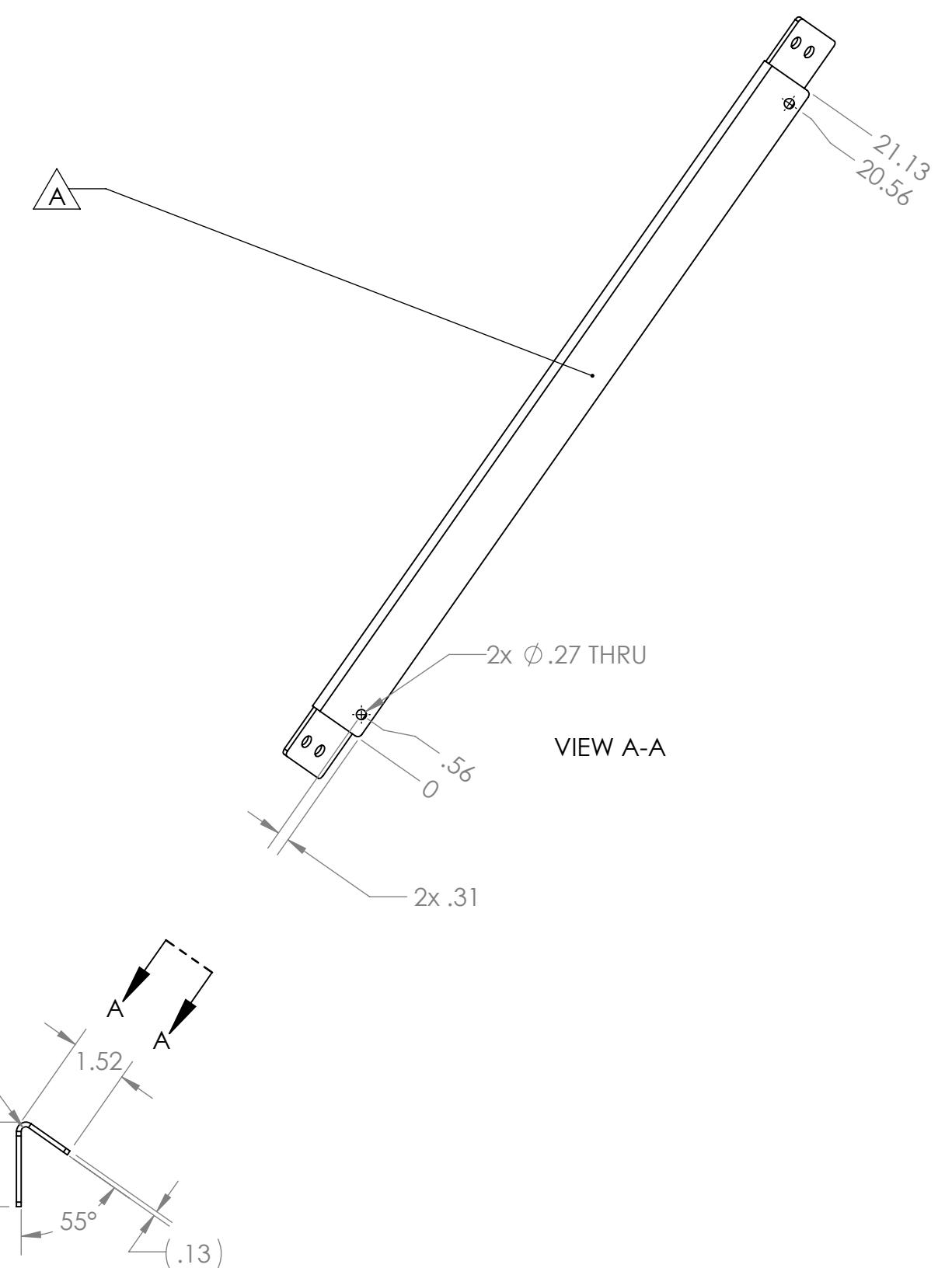
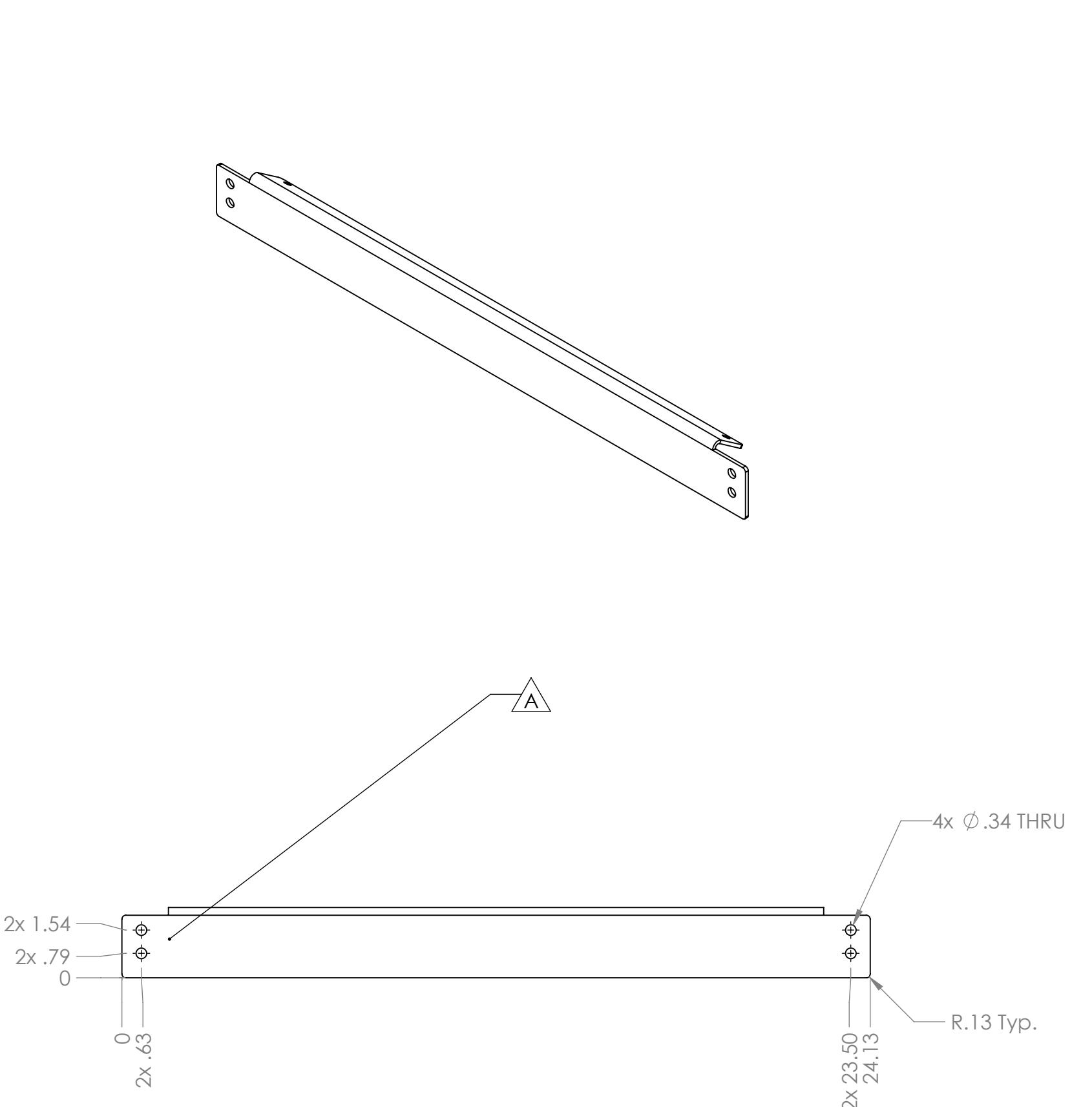
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UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .02$ THREE PLACE DECIMAL $\pm .010$	BEND	NAME	DATE
	DRAWN	CO	9/14/2022
PROPRIETARY AND CONFIDENTIAL			
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. Aluminum 5052			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST ROBOTICS COMPETITION  SOLIDWORKS 
Modeling Solutions Partner

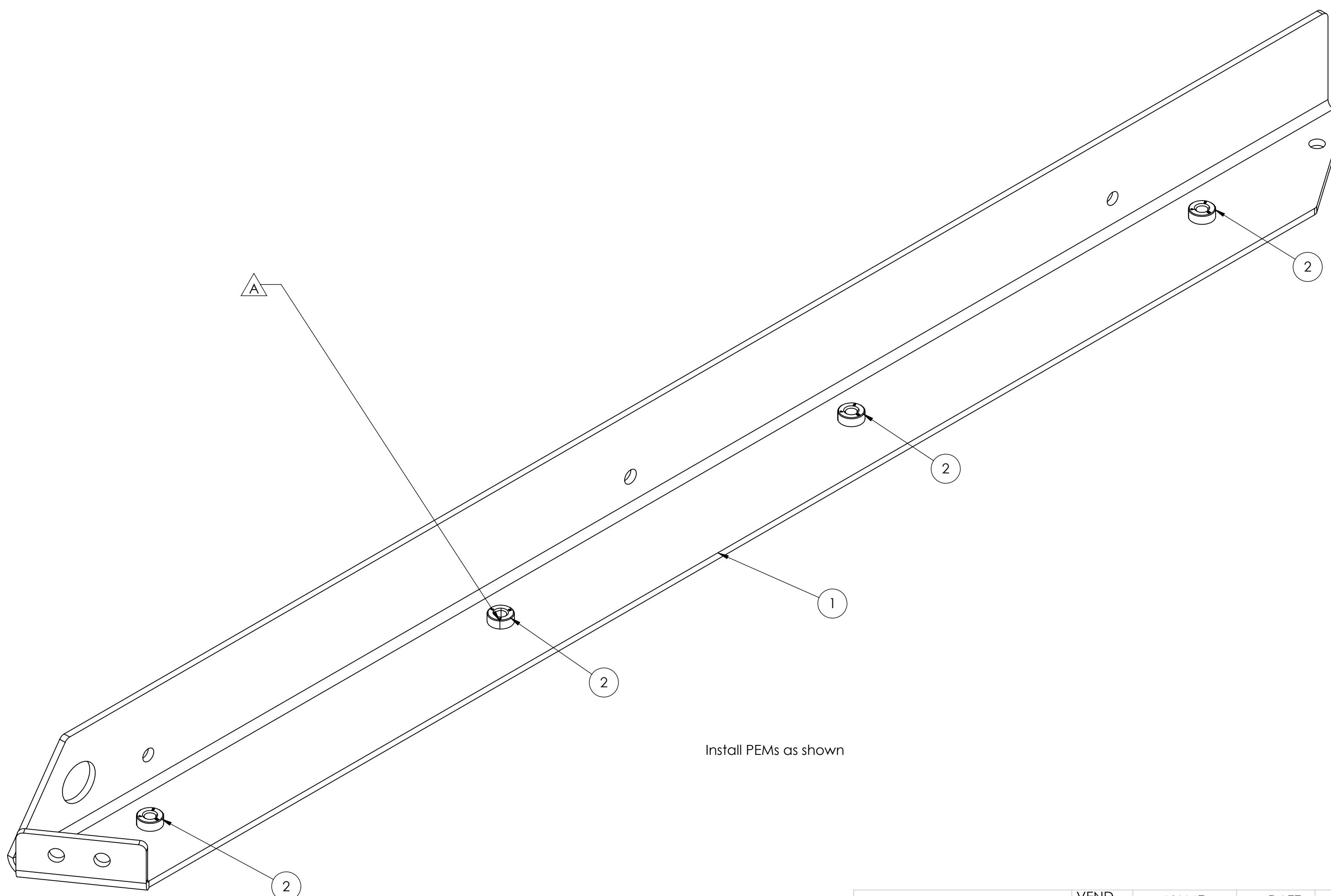
TITLE: Ramp Back Rail

SIZE DWG. NO. REV
C GE-23262-01 **A**

SCALE: 1:4 SHEET 1 OF 1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23263-01	Blue Ramp HP Side Rail	1
2	pem_clinchnut_.25_20 .054	1/4-20 self-clinching nut, .054 shank	4

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
C4	A	PEM NUTS ADDED TO 4 LOCATIONS	10/14/2022	NE



Install PEMs 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

VEND NAME DATE

DRAWN JO 10/11/2022

PROPRIETARY AND CONFIDENTIAL

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COMMENTS:

REMOVE ALL BURRS AND SHARP EDGES.



TITLE:
**Blue Ramp HP
Side with PEMs**

SIZE DWG. NO. REV

C GE-23263 **A**

SCALE: 3:4 SHEET 1 OF 1

4

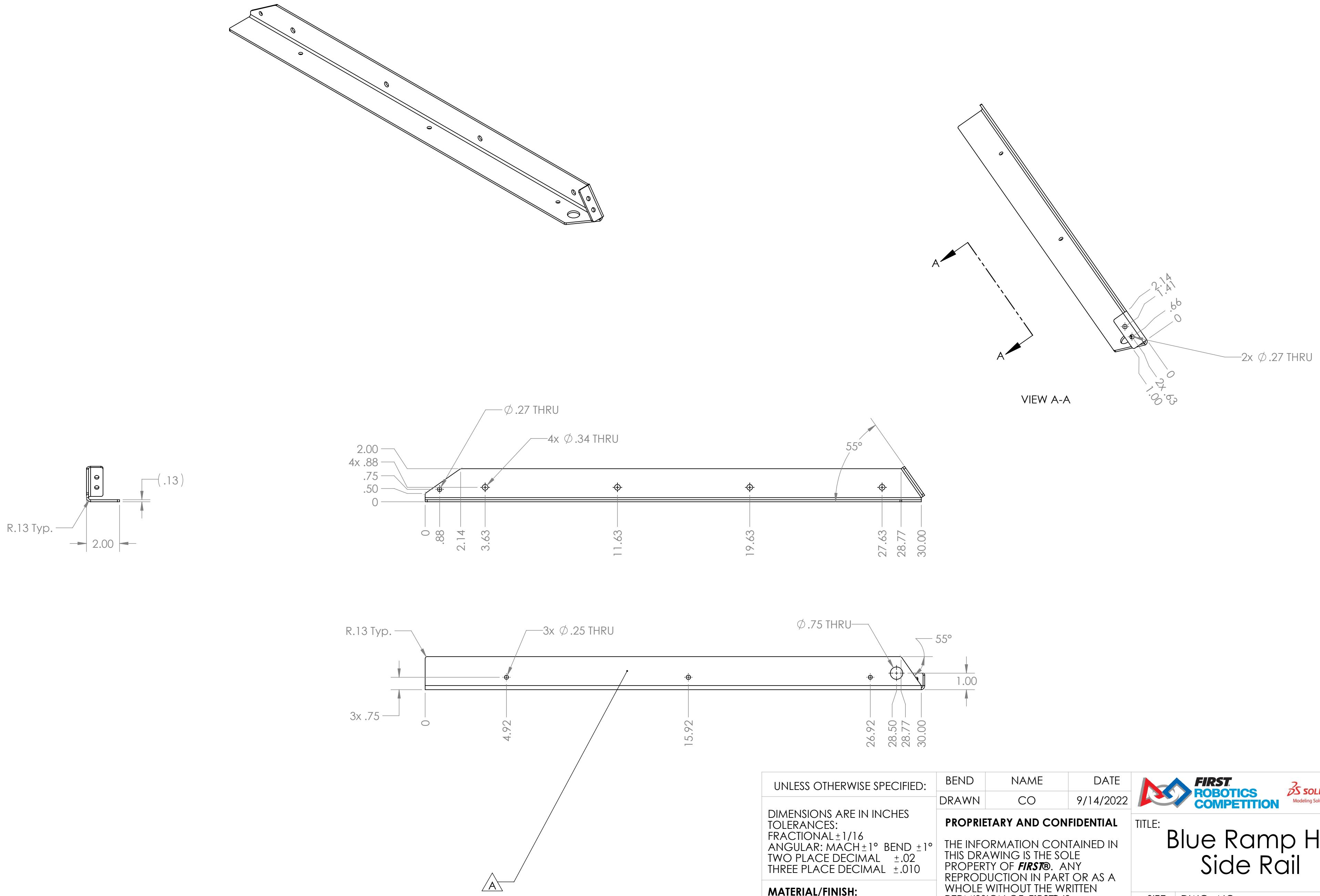
3

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REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
A3	A	HOLE PATTERN HAS CHANGED	10/14/2022	NE



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 $\pm .02$ THREE PLACE DECIMAL $\pm .010$ **MATERIAL/FINISH:**

8 GA Aluminum 5052

DO NOT SCALE DRAWING

BEND NAME DATE
DRAWN CO 9/14/2022**PROPRIETARY AND CONFIDENTIAL**

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COMMENTS:
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FIRST[®] ROBOTICS COMPETITION SOLIDWORKS[®]
Modeling Solutions Partner

TITLE: Blue Ramp HP
Side Rail

SIZE DWG. NO. REV
C GE-23263-01 **A**

SCALE: 1:4 SHEET 1 OF 1

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REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
A3, C2	A	HOLE LOCATIONS HAVE CHANGES	10/14/2022	NE

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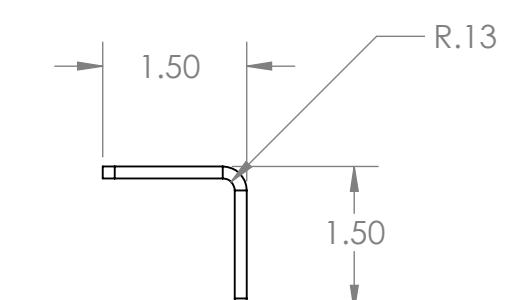
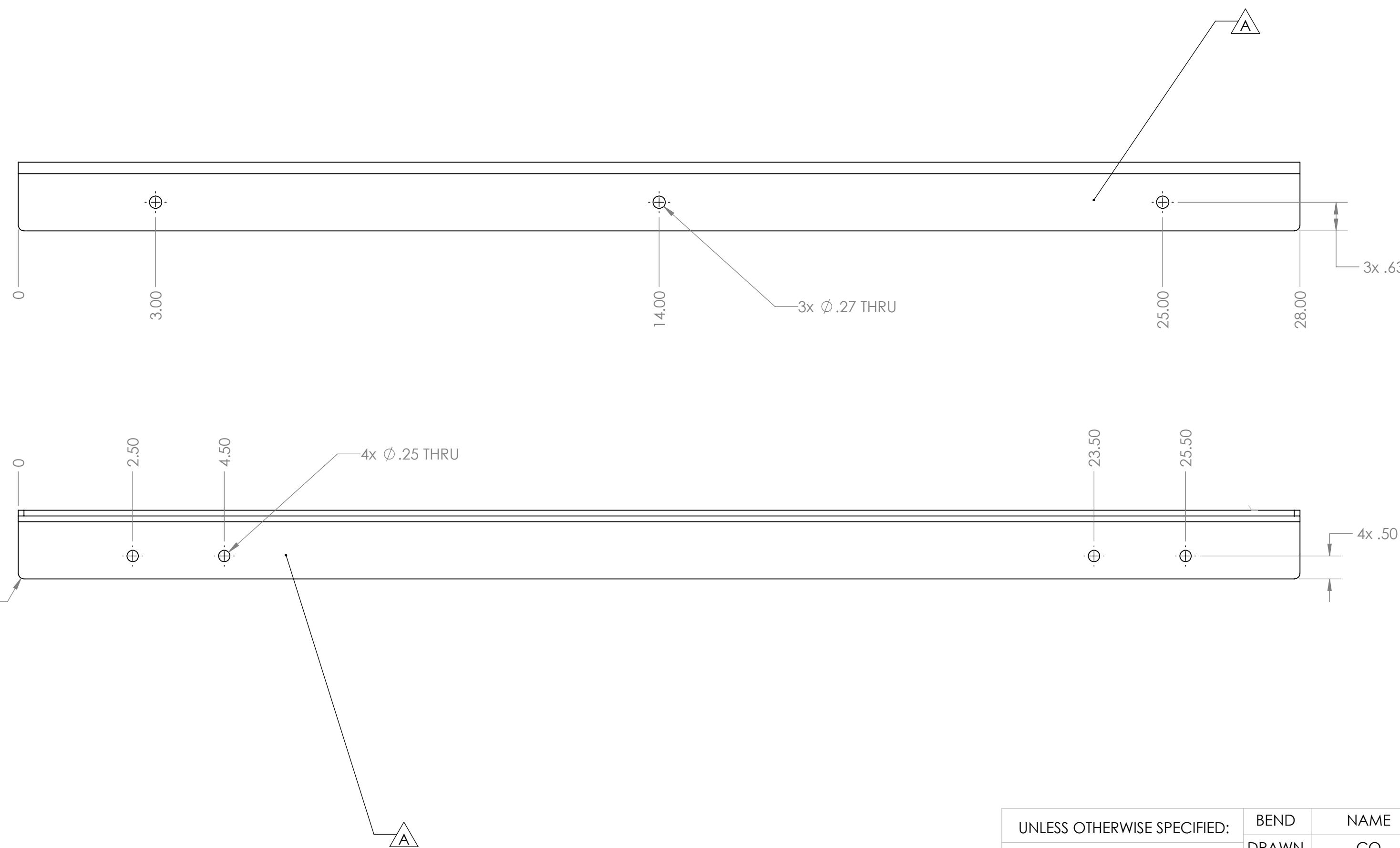
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UNLESS OTHERWISE SPECIFIED:

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

CO

DATE

9/14/2022

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COMMENTS:

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SOLIDWORKS
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TITLE:

Ramp Side
Fence Rail

SIZE

DWG. NO.

REV

C

GE-23264

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SCALE: 1:2

SHEET 1 OF 1

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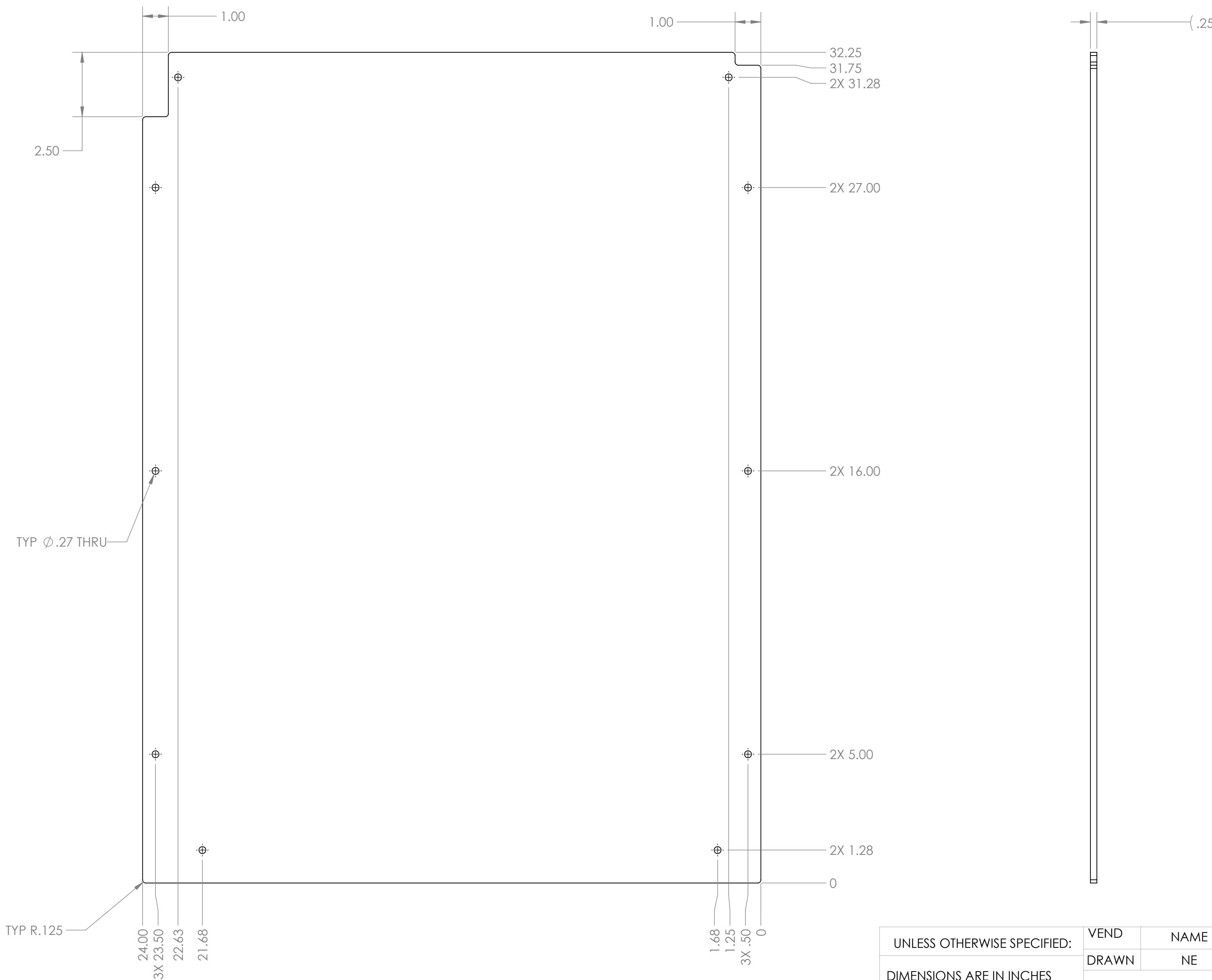
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UNLESS OTHERWISE SPECIFIED:

VEND

NAME

DATE

DIMENSIONS ARE IN INCHES

DRAWN

NE

10/17/2022

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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PROHIBITED.

MATERIAL/FINISH:

COMMENTS:

REMOVE ALL BURRS AND SHARP
EDGES.

DO NOT SCALE DRAWING



TITLE: Chute Floor

SIZE DWG. NO. REV

C GE-23265

SCALE: 1:3 SHEET 1 OF 1

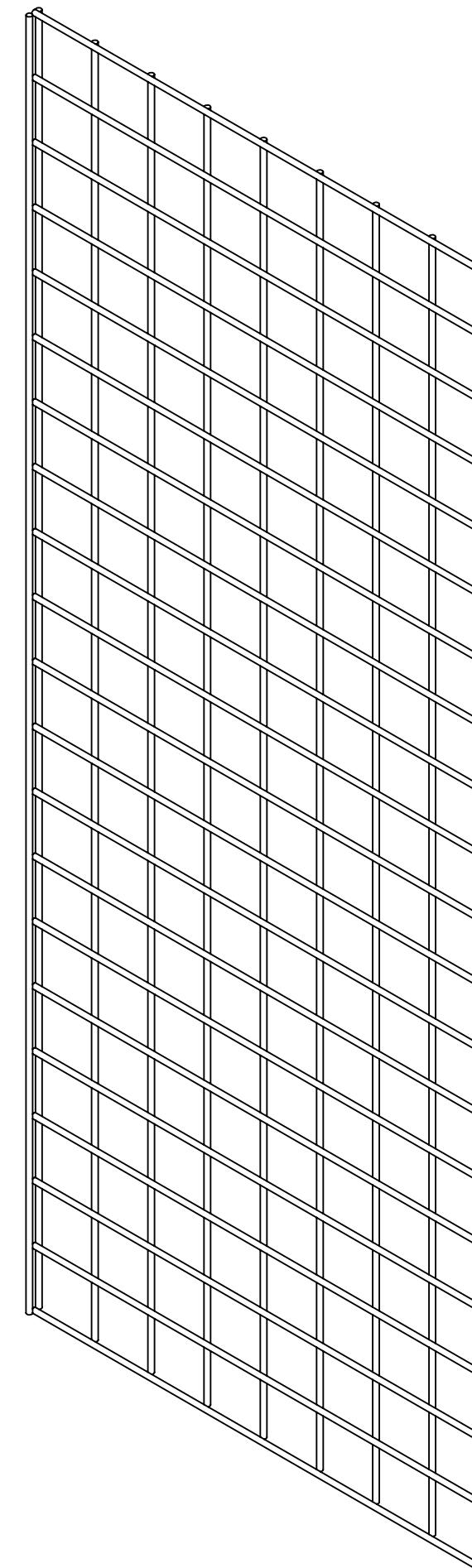
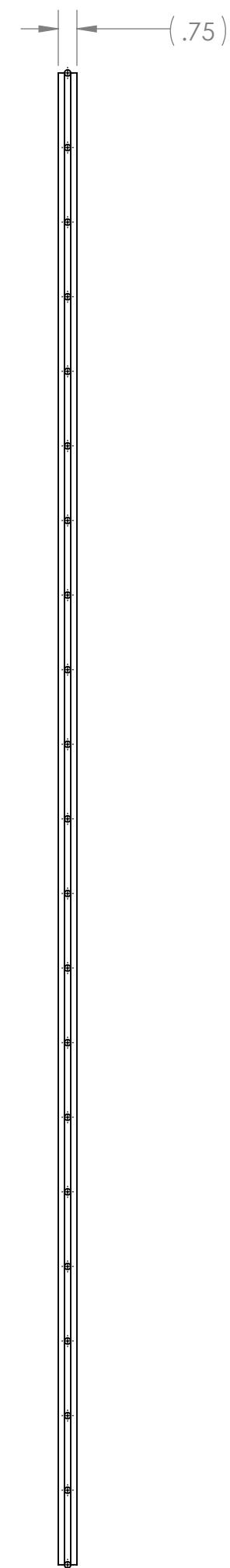
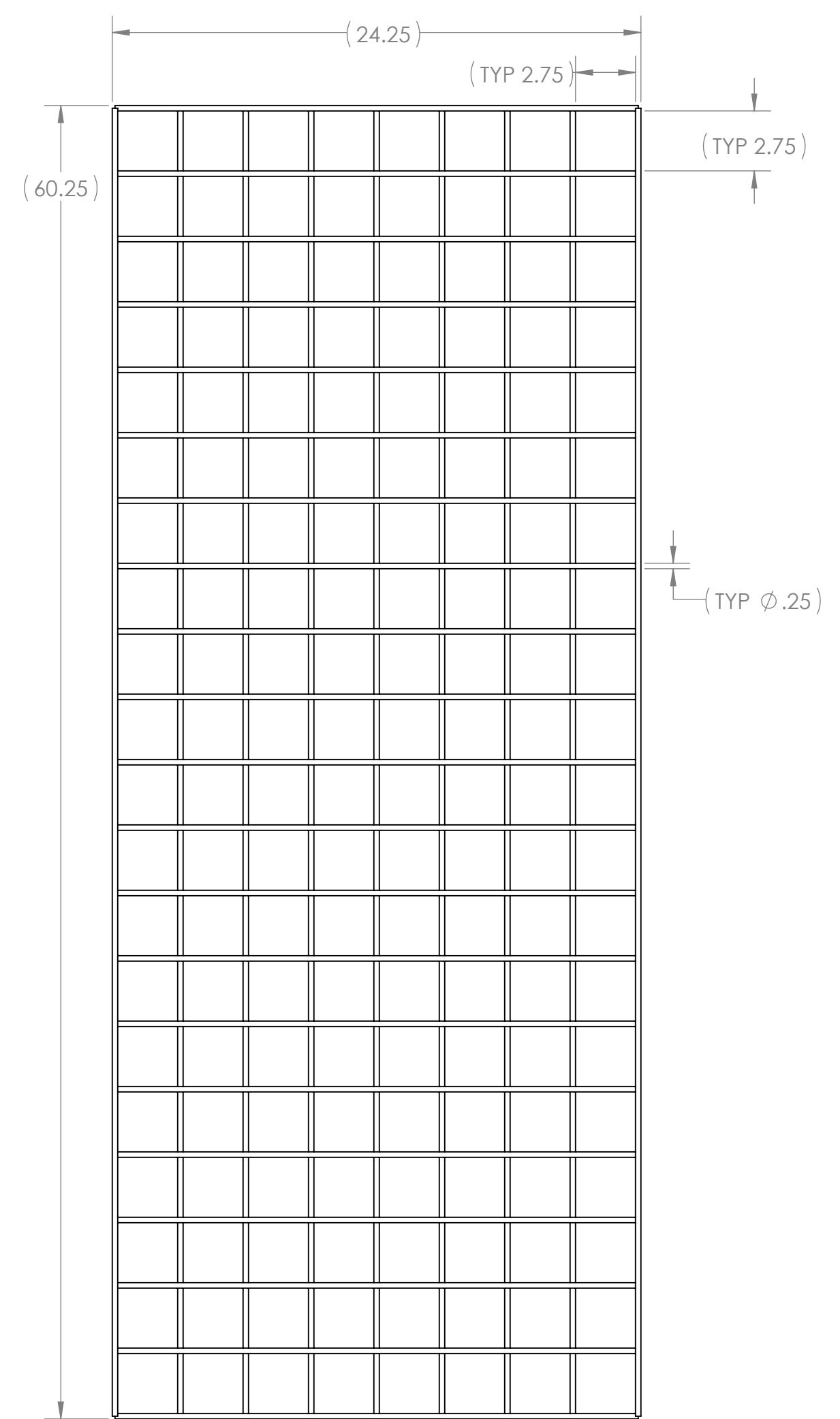
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NOTES:
 1. DESCRIPTION: 3" STANDARD GRID, GRIDWALL PANEL - 2X5', BLACK
 2. SOURCE: ULINE
 3. ITEM #: H-6277BL
 4. EQUIVALENT SUBSTITUTIONS ALLOWED

UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	NE	10/17/2022
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:	SIZE	DWG. NO.	REV
Steel Wire	C	GE-23266	
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING	SCALE: 1:6	SHEET 1 OF 1	

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
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TITLE:
ULINE Grid

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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23214	Chute Guard	1
2	GE-23235	Extended Pin	1
3	GE-23280	Red Fence	1
4	GE-23290	Red Chute	1
5	hex_.25_20_0.75	Steel Hex Head Screw, 1/4"-20 x 0.75" long, fully threaded	7
6	nylock_.25_20	Steel Nylon-Insert Locknut, 1/4"-20	2

UNLESS OTHERWISE SPECIFIED

DIMENSIONS ARE IN INCHES

TOLERANCES:
FRACTIONAL $\pm \frac{1}{2}$
ANGULAR: MACH $\pm 1^\circ$ BEND
TWO PLACE DECIMAL $\pm .5$

MATERIAL/FINISH

	PERMISSION OF FIRST® IS PROHIBITED.
DO NOT SCALE DRAWING	COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.



TITLE: Red Single Substation

SIZE	DWG. NO.	REV
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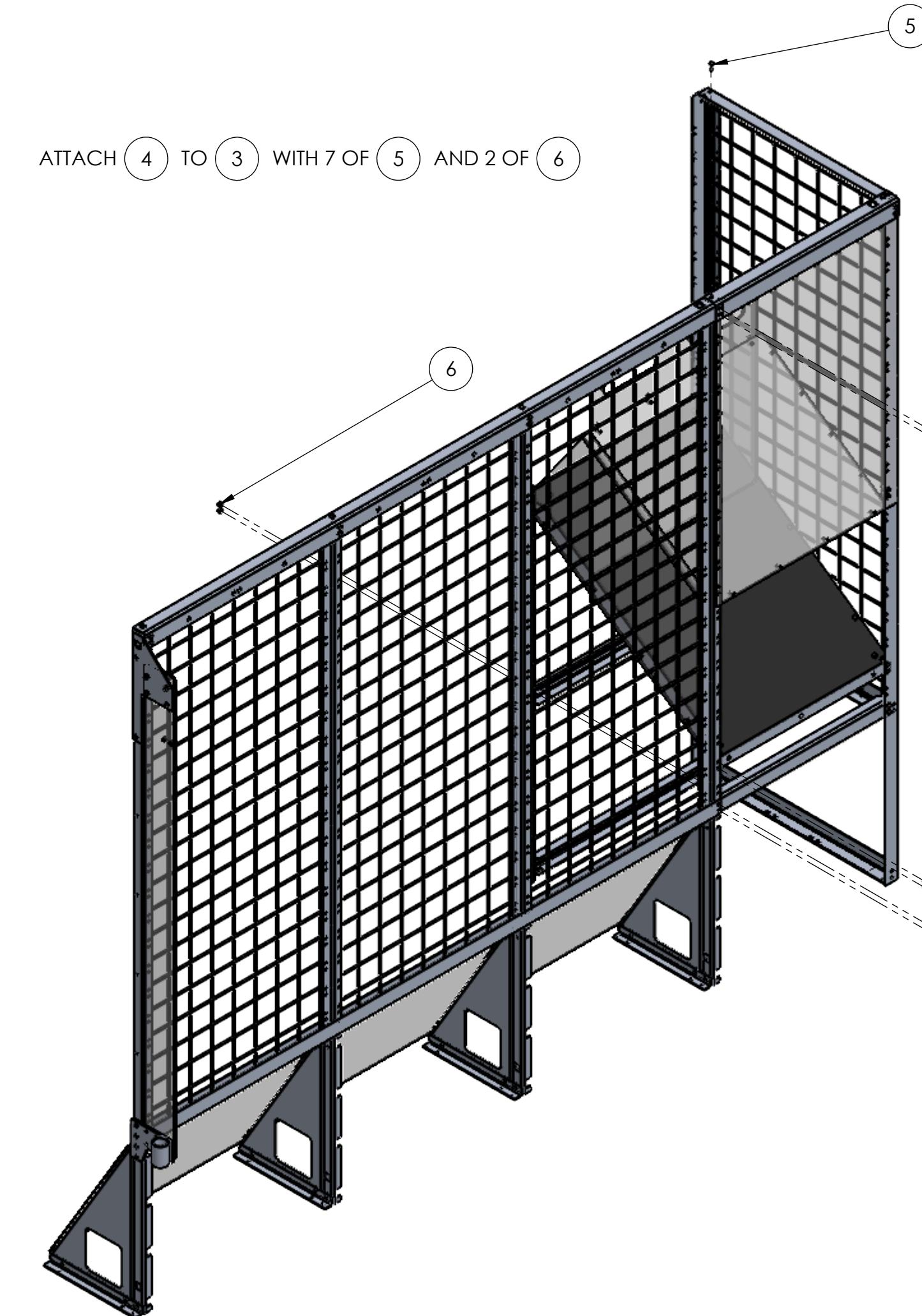
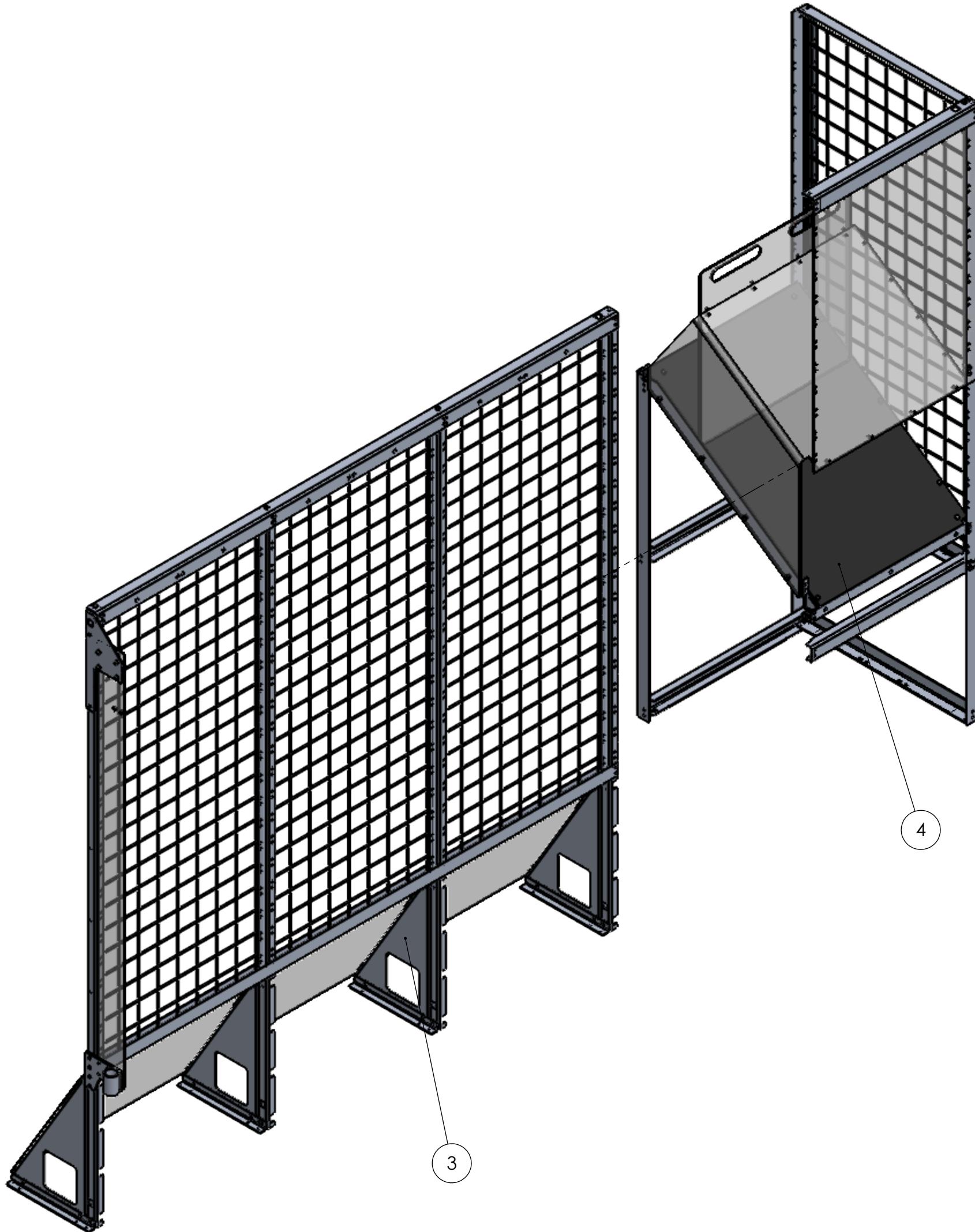
SCALE: 1:10 SHEET 1 OF 4

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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	NE	12/29/2022	 SOLIDWORKS Modeling Solutions Partner
PROPRIETARY AND CONFIDENTIAL				
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MATERIAL/FINISH:	SIZE	DWG. NO.	REV	TITLE:
	C	GE-23270		Red Single Substation
DO NOT SCALE DRAWING	SCALE: 1:12	SHEET 2 OF 4		

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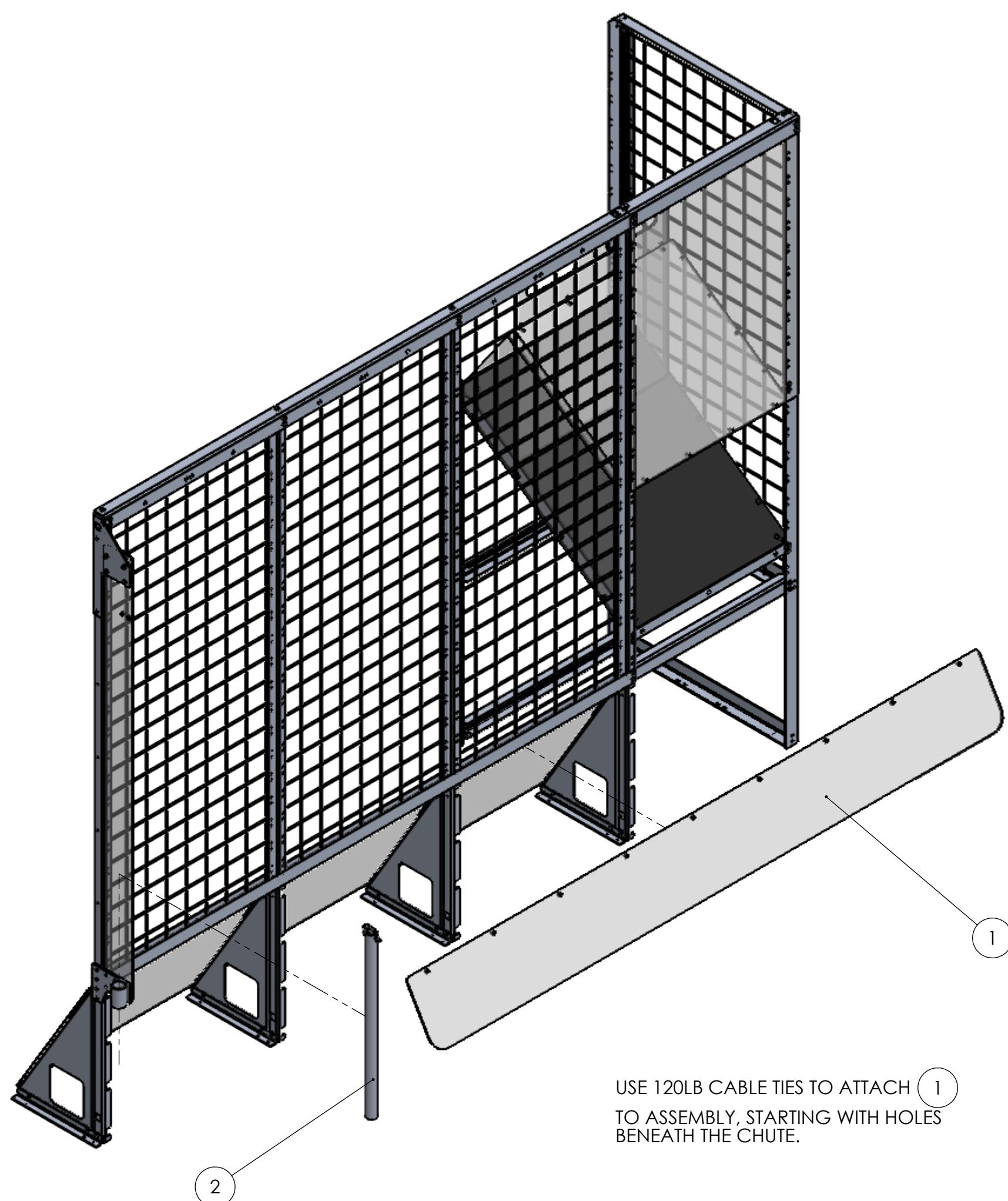
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② REPLACES FIELD PERIMETER PIN WHEN ATTACHING TO THE FIELD



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DRAWN	NE	12/29/2022	
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COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
**Red Single
Substation**

SIZE DWG. NO. REV
C GE-23270

SCALE: 1:12 SHEET 3 OF 4

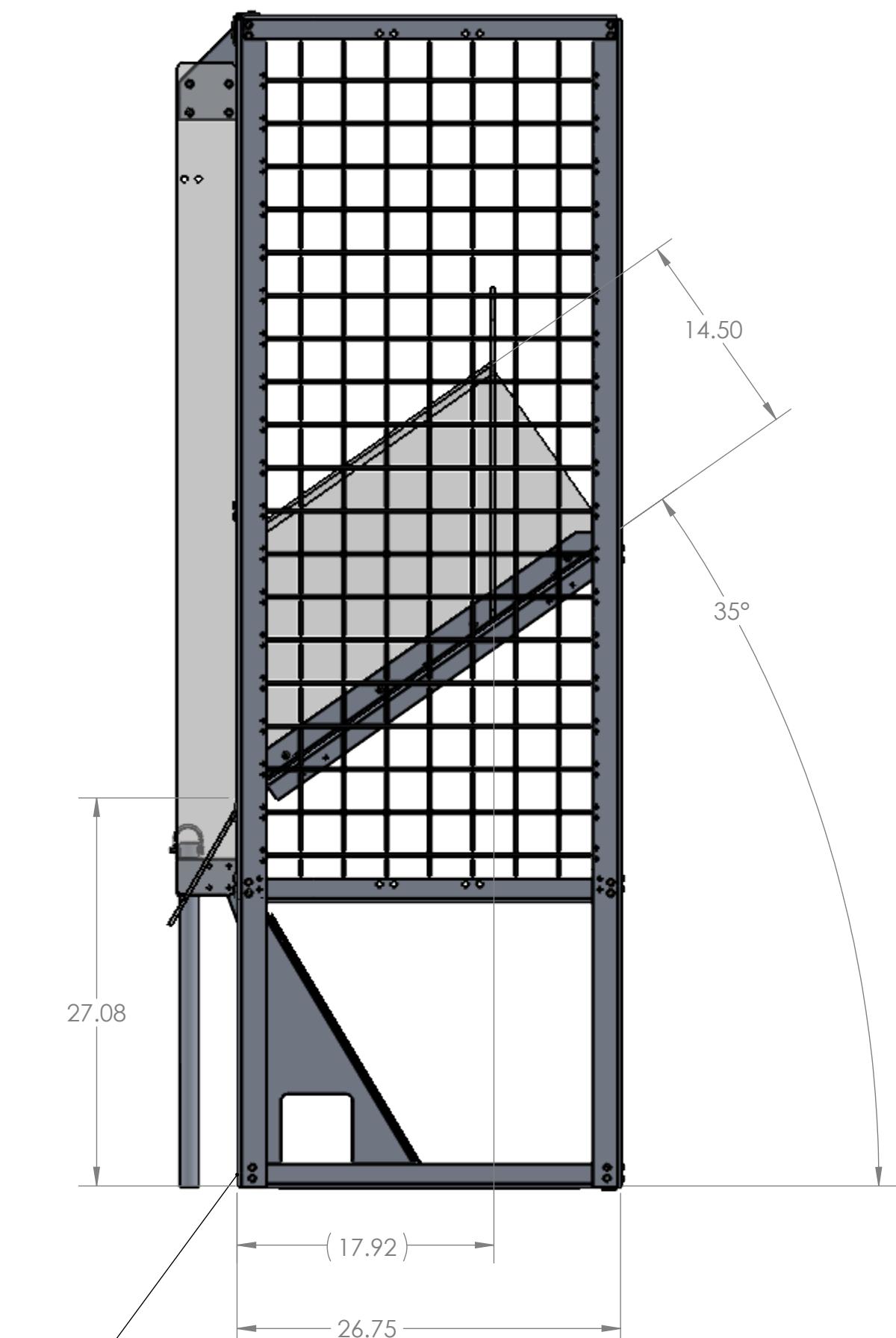
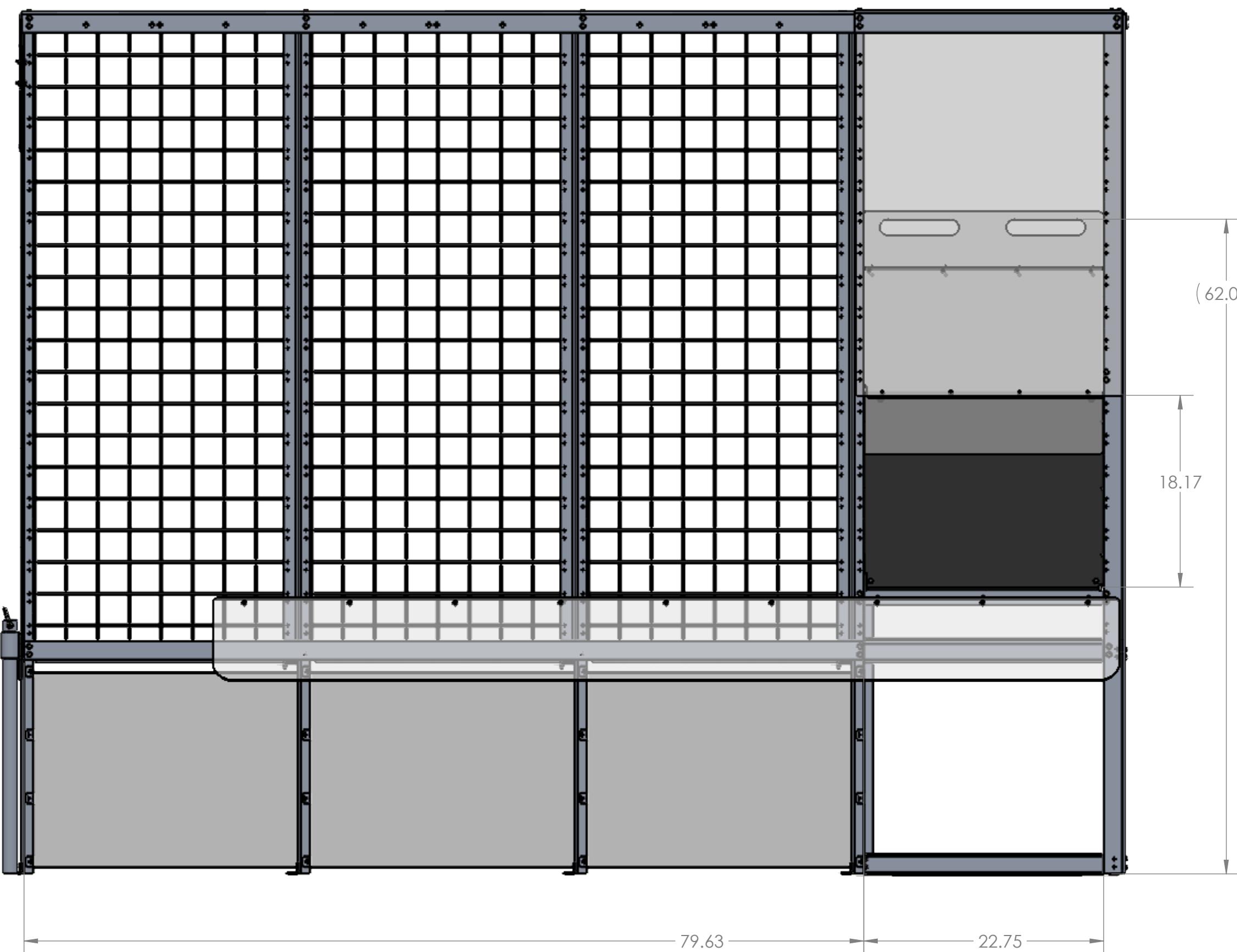
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NOTE: THE DISTANCE BETWEEN THIS FACE AND THE INSIDE
OF THE FIELD PERIMETER CHANGES A SMALL AMOUNT
DEPENDING ON THE FIELD PERIMETER MANUFACTURER

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

FIELD NAME DATE

DRAWN NE 12/29/2022

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Modeling Solutions Partner

**Red Single
Substation**

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

C **GE-23270**

SCALE: 1:10 **SHEET 4 OF 4**

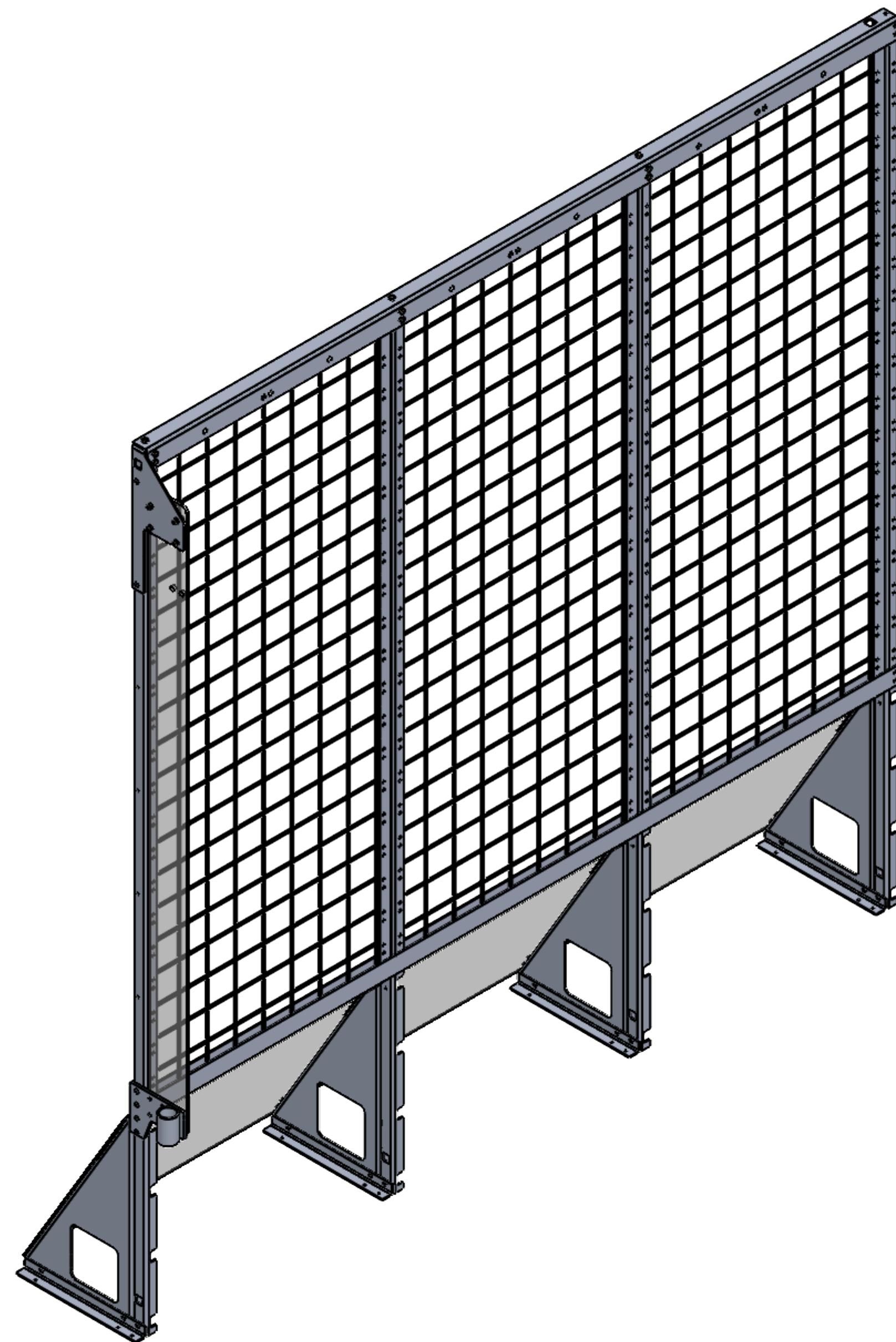
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23216	Shin Guard W Loop	1
2	GE-23266	ULINE Grid	3
3	GE-23281	Red Bottom Channel	1
4	GE-23282	Red Top Channel	1
5	GE-23287	Red Corner Fence Vertical	1
6	GE-23298	Red Standard Vertical With Hook	3
7	hex_.25_20_0.75	Steel Hex Head Screw, 1/4"-20 x 0.75" long, fully threaded	18
8	nylock_.25_20	Steel Nylon-Insert Locknut, 1/4"-20	2

UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE	 
DRAWN	NE	12/28/2022		
PROPRIETARY AND CONFIDENTIAL				
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MATERIAL/FINISH:	SIZE	DWG. NO.	REV	
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.	C	GE-23280		
DO NOT SCALE DRAWING	SCALE: 1:8	SHEET 1 OF 6		

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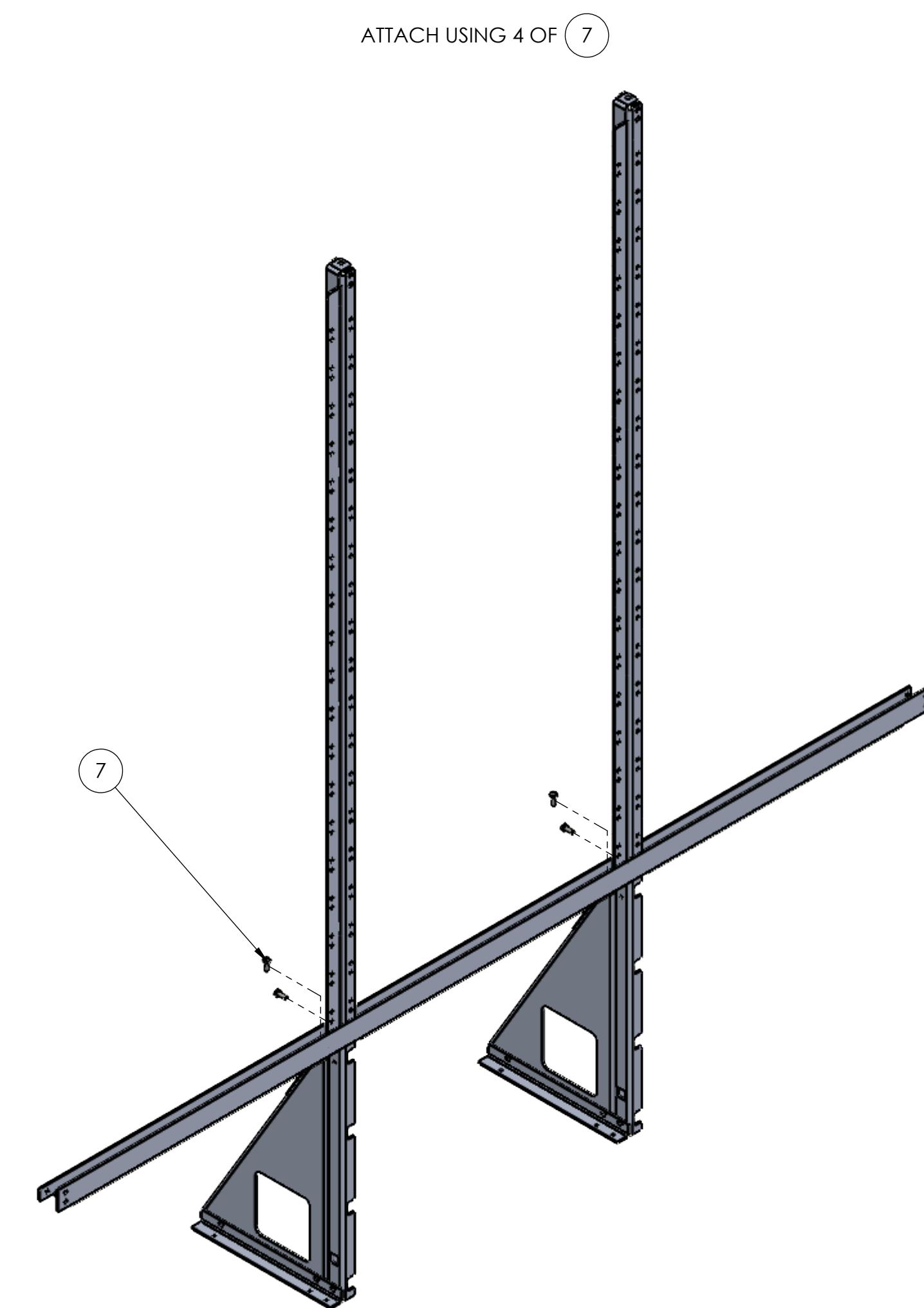
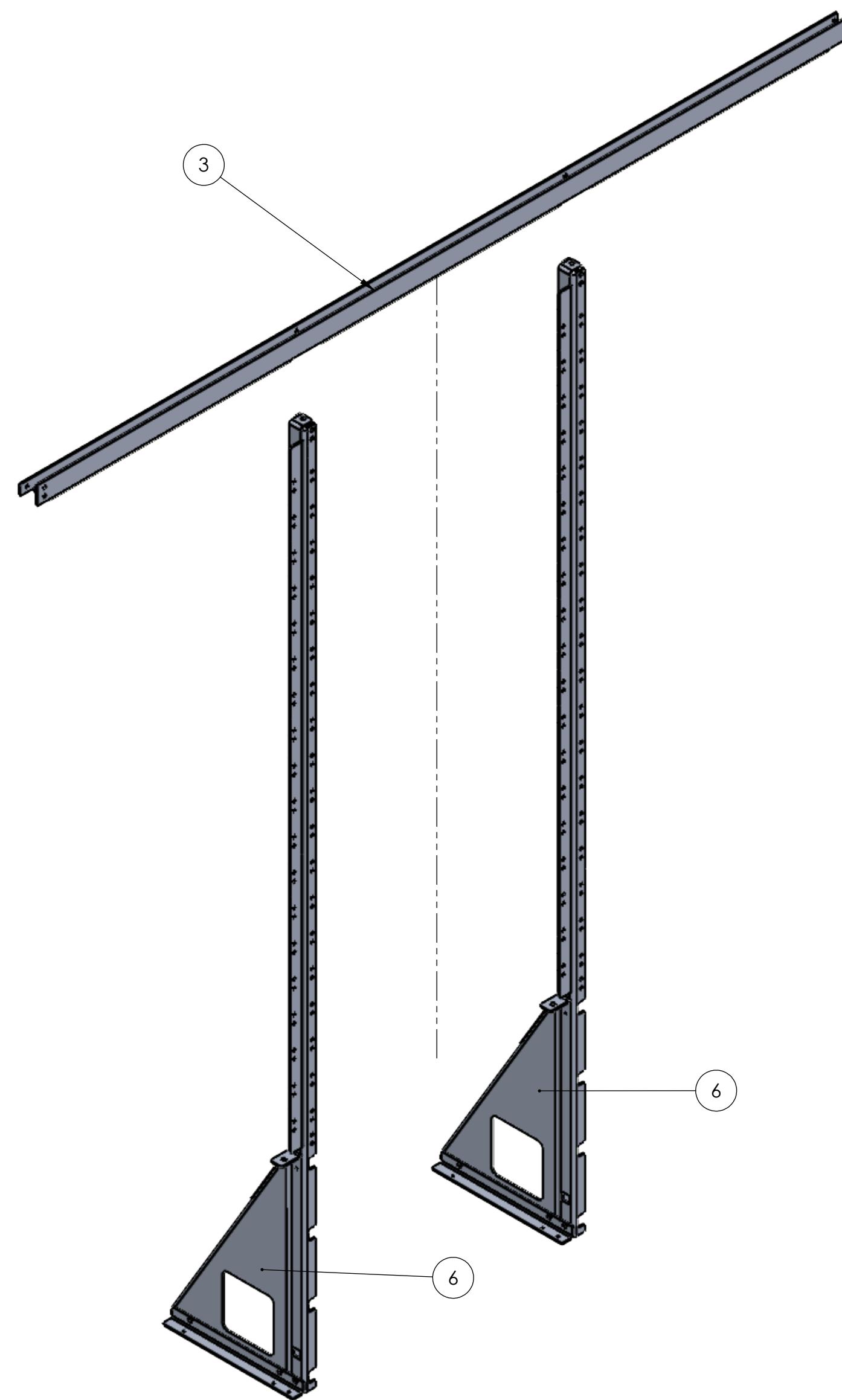
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UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DRAWN	NE	12/28/2022	
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MATERIAL/FINISH:			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

 **FIRST
ROBOTICS
COMPETITION**  **SOLIDWORKS**
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TITLE:
Red Fence

SIZE DWG. NO. REV
C GE-23280

SCALE: 1:8 SHEET 2 OF 6

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UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DRAWN	NE	12/28/2022	
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MATERIAL/FINISH:			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

 **FIRST
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TITLE:
Red Fence

SIZE DWG. NO. REV
C GE-23280

SCALE: 1:8 SHEET 3 OF 6

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UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DRAWN	NE	12/28/2022	
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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:
Red Fence

SIZE DWG. NO. REV
C GE-23280

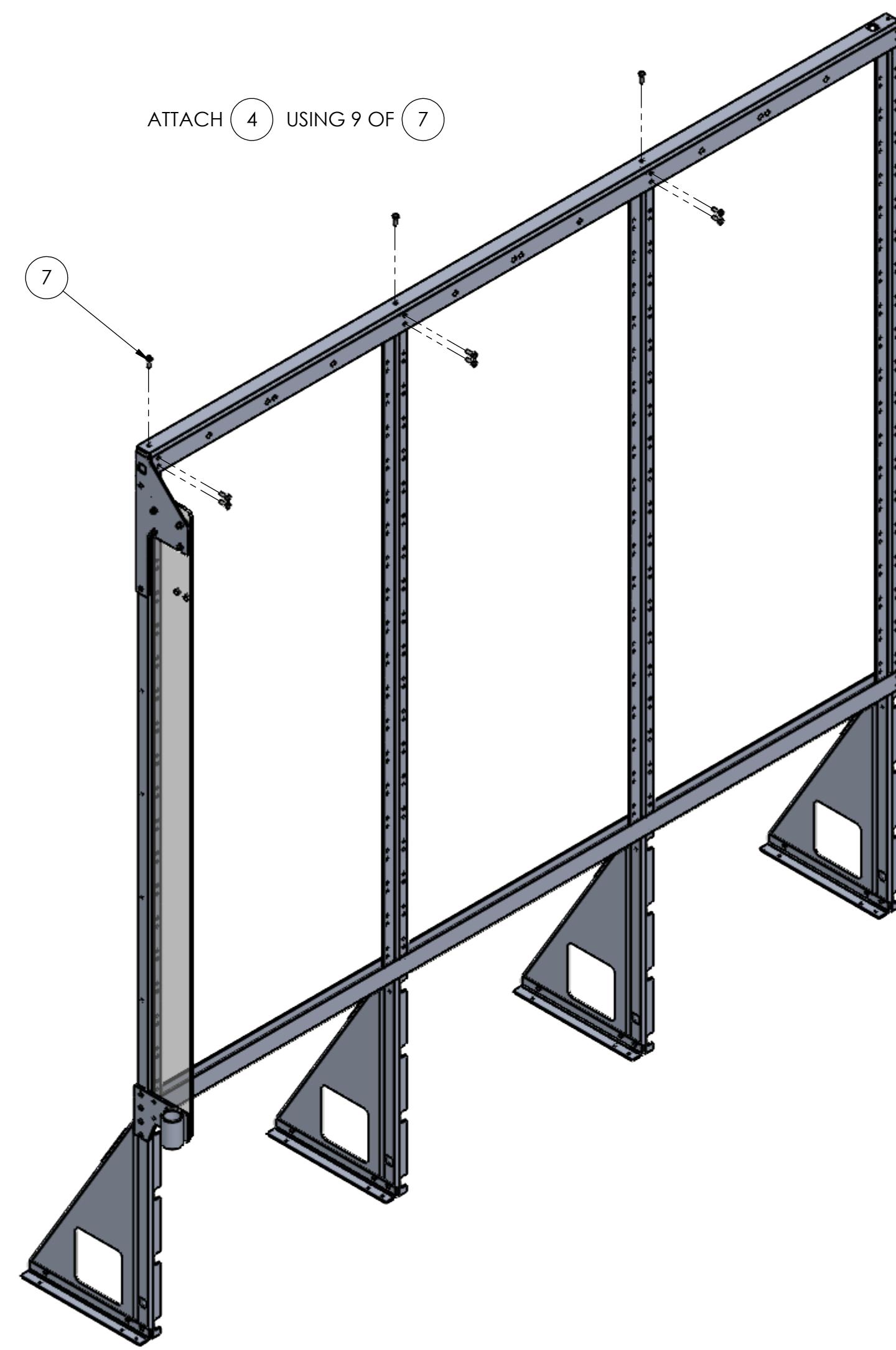
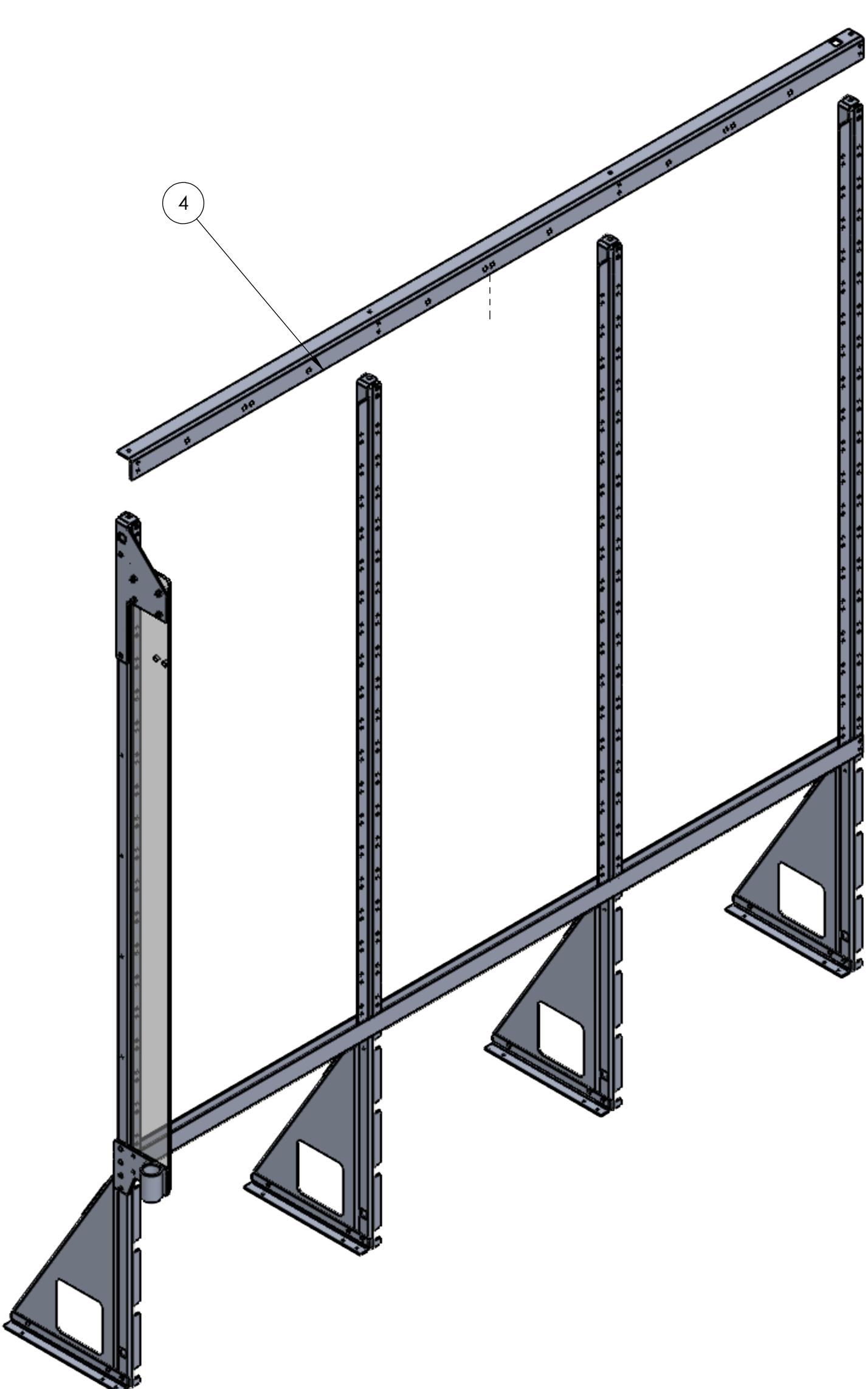
SCALE: 1:9 SHEET 4 OF 6

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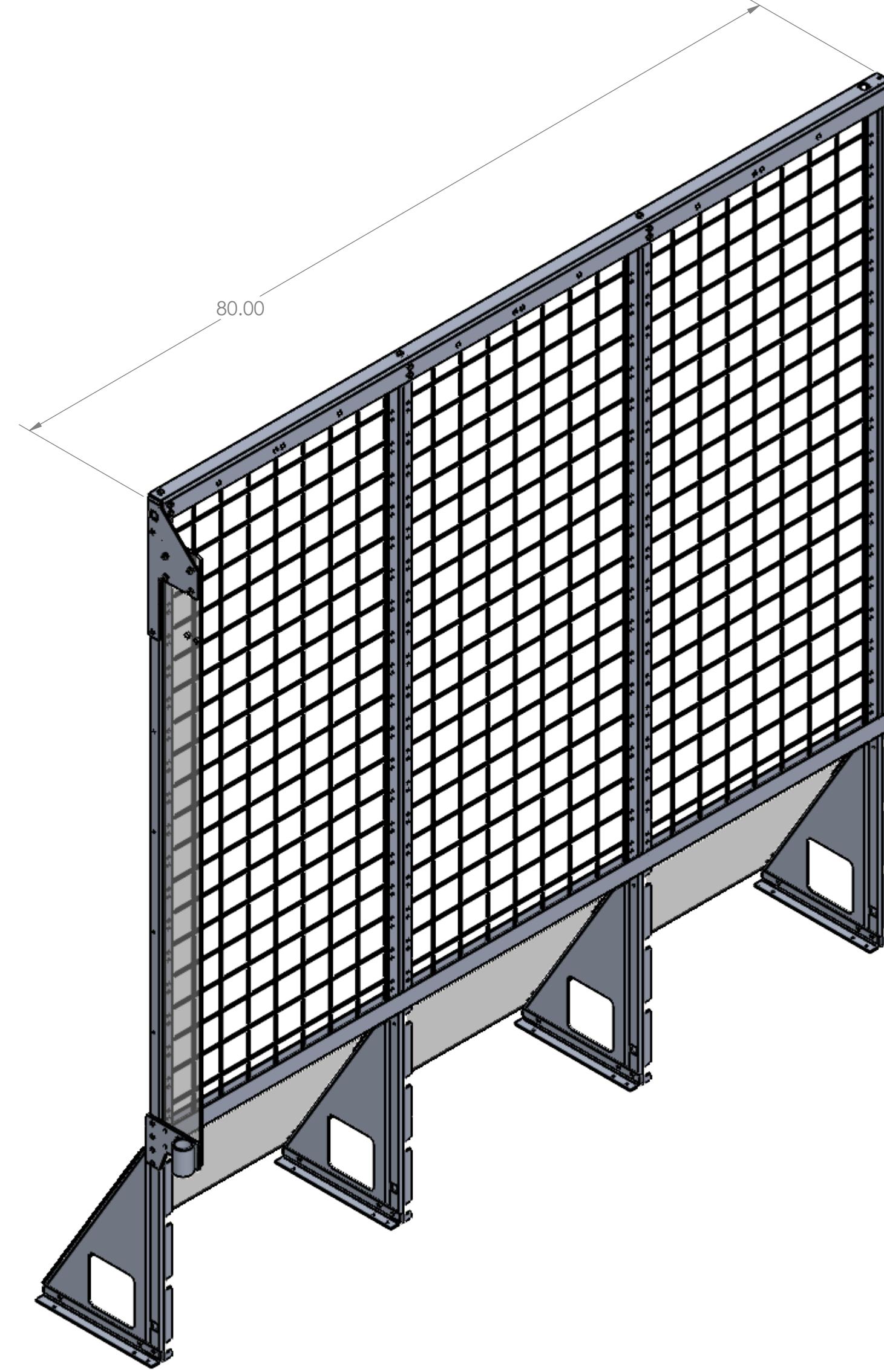
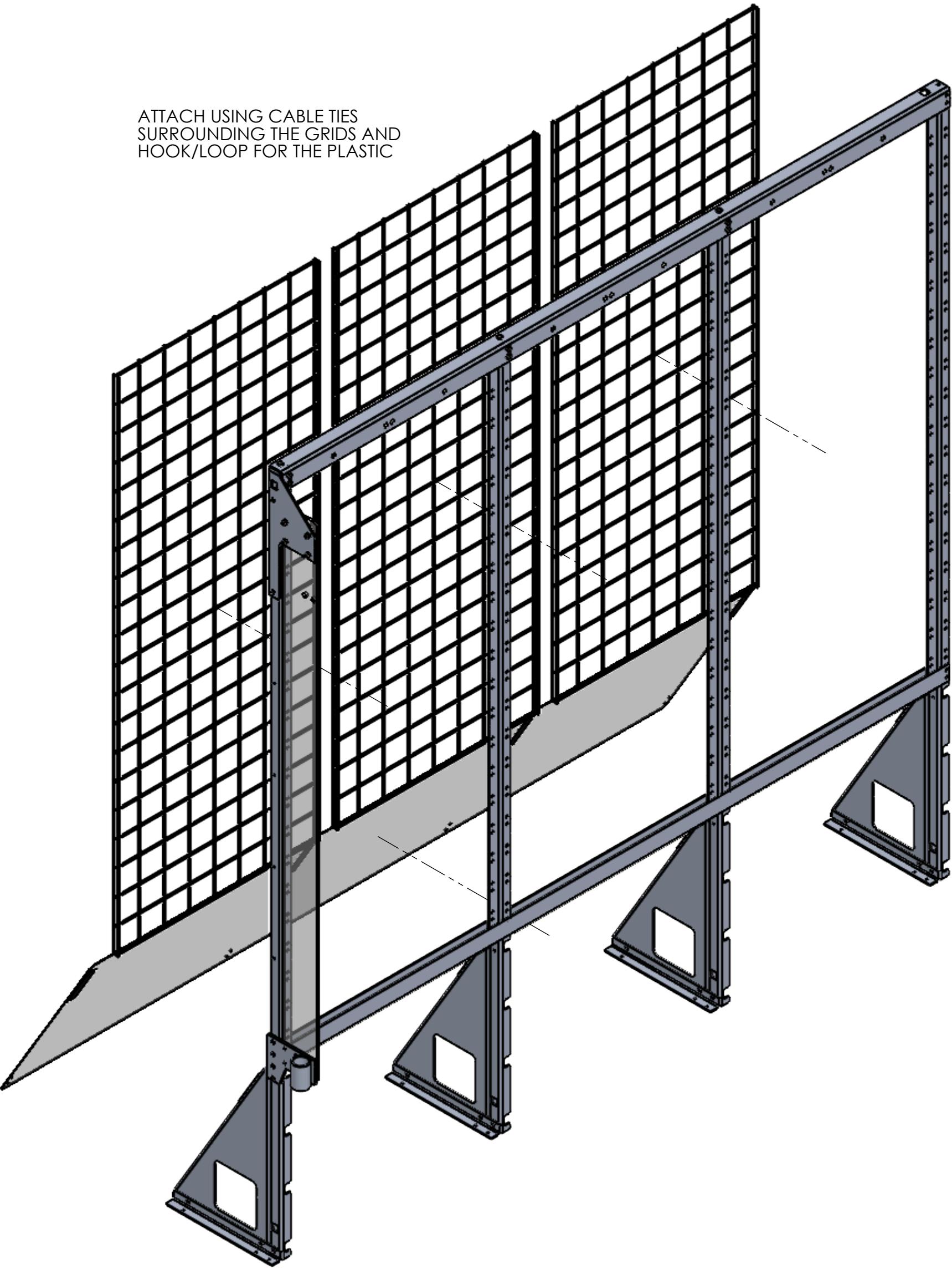
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UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE	 FIRST ROBOTICS COMPETITION
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm\frac{1}{2}$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .50$	DRAWN	NE	12/28/2022	 SOLIDWORKS Modeling Solutions Partner
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MATERIAL/FINISH:	SIZE	DWG. NO.	REV	TITLE: Red Fence
	C	GE-23280		
COMMENTS:	REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING	SCALE: 1:9	SHEET 5 OF 6		



UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE	 FIRST ROBOTICS COMPETITION
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/2$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .50$	DRAWN	NE	12/28/2022	 SOLIDWORKS Modeling Solutions Partner
PROPRIETARY AND CONFIDENTIAL				
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MATERIAL/FINISH:	SIZE	DWG. NO.	REV	TITLE: Red Fence
	C	GE-23280		
DO NOT SCALE DRAWING	SCALE: 1:9	SHEET 6 OF 6		

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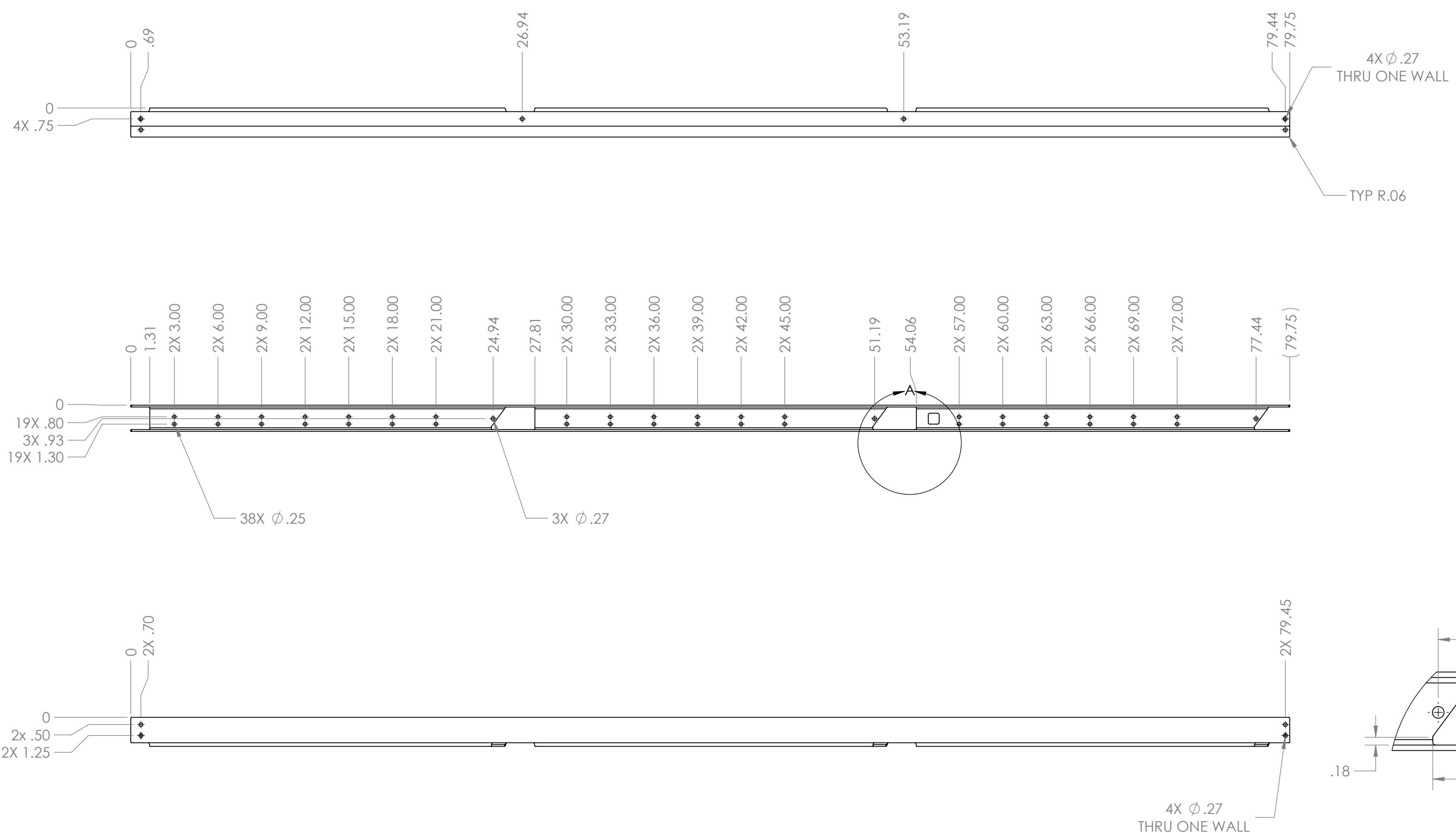
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LABEL WITH PART NUMBER



UNLESS OTHERWISE SPECIFIED:	BEND	NAME	DATE
DRAWN	NE	10/11/2022	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH: 8 GA 5052 AL			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			
TITLE: Red Bottom Channel			
SIZE	DWG. NO.	REV	
C	GE-23281		
SCALE: 1:6	SHEET 1 OF 1		

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(79.88)
79.1379.88
2x 79.13

73.75

67.50

66.75

60.50

2X 52.88

52.88

47.50

40.50

41.25

34.25

2X 26.63

21.25

26.63

4X Ø .27 THRU

15.00

14.25

8.00

2X .38

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4X .63

12X .75

4X 1.38

8X Ø .27 THRU

2.38
1.63
.38
0

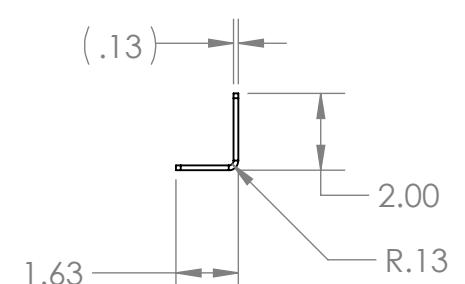
1.00

4X .63

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0

TYP R.13



LABEL WITH PART NUMBER

UNLESS OTHERWISE SPECIFIED:	BEND	NAME	DATE
DRAWN	NE	10/11/2022	 FIRST ROBOTICS COMPETITION
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:	8 GA 5052 AL		
COMMENTS:	REMOVE ALL BURRS AND SHARP EDGES.		
DO NOT SCALE DRAWING	SCALE: 1:5	SHEET 1 OF 1	

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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23223	Floor Anchor	1
2	GE-23284	Red Primary Vertical With PEMs	1
3	GE-23285	Red Secondary Vertical With PEMs	1
4	GE-23286	Red Lower Corner Bracket	1
5	rivet_.1875_.126-.25	3/16" Rivet, .126-.25 Grip Range	14

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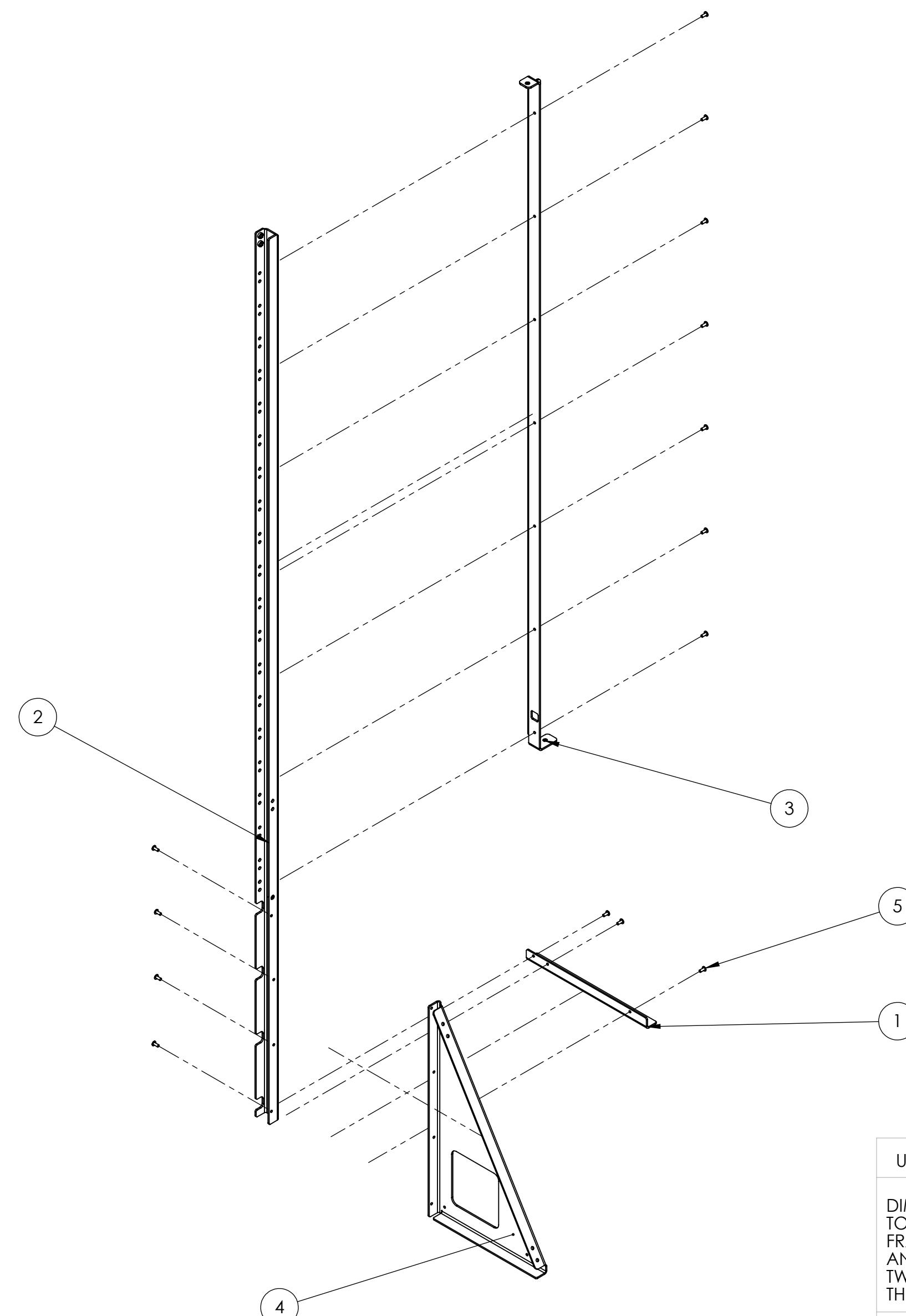
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UNLESS OTHERWISE SPECIFIED:

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:

DO NOT SCALE DRAWING

VEND

DRAWN

NAME

NE

DATE

10/12/2022

TITLE:

Red Standard
Vertical

SIZE

C

GE-23283

DWG. NO.

1

REV

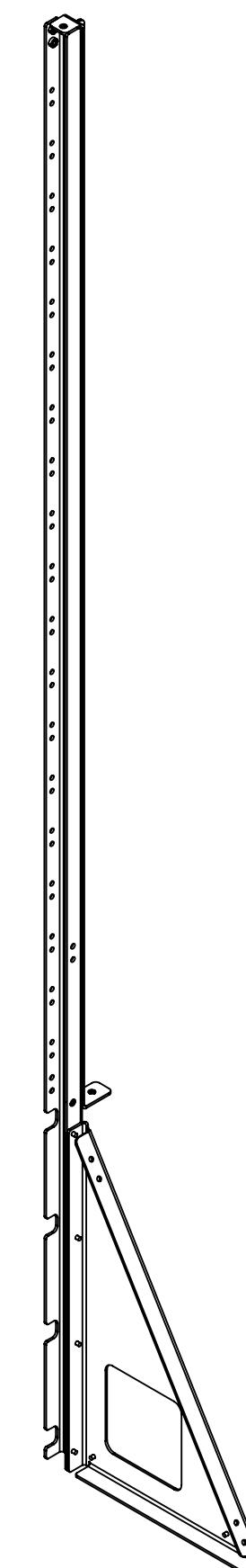
FIRST ROBOTICS COMPETITION

SOLIDWORKS

Modeling Solutions Partner

SCALE: 1:8

SHEET 1 OF 1



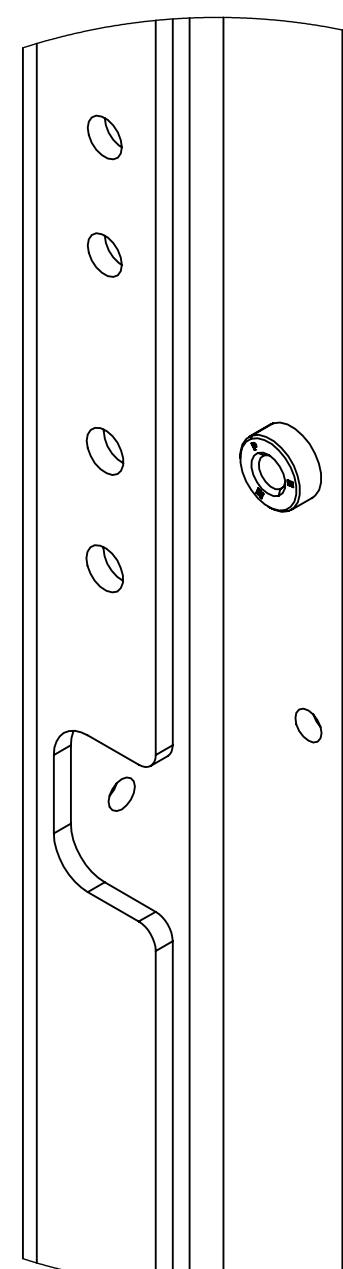
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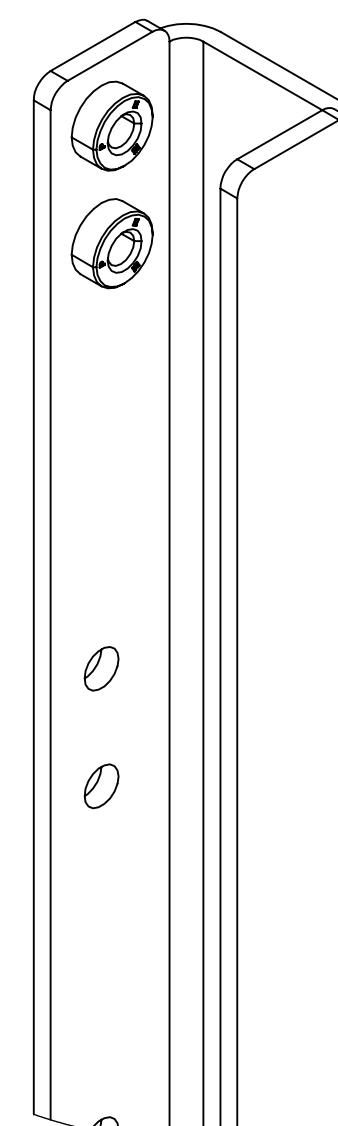
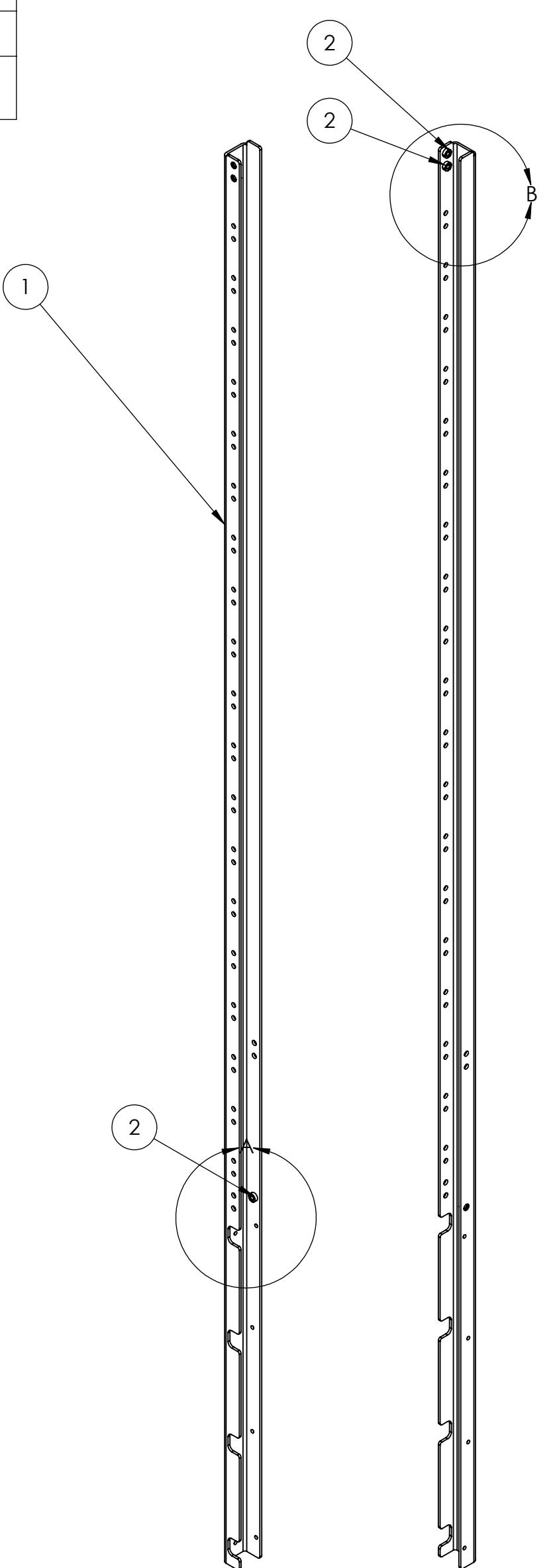
2

1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23284-01	Red Primary Vertical	1
2	pem_clinchnut_.25_20_.054	1/4-20 self-clinching nut, .054 shank	3



DETAIL A
SCALE 1 : 1



DETAIL B
SCALE 1 : 1

INSERT PEM NUTS AS SHOWN, PROTRUDING INWARD

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 NE 10/11/2022

PROPRIETARY AND CONFIDENTIAL

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COMMENTS:

REMOVE ALL BURRS AND SHARP EDGES.

FIRST	ROBOTICS	COMPETITION
SOLIDWORKS	Modeling Solutions Partner	
TITLE: Red Primary Vertical With PEMs		
SIZE	DWG. NO.	REV
C	GE-23284	
SCALE: 1:6		SHEET 1 OF 1

4

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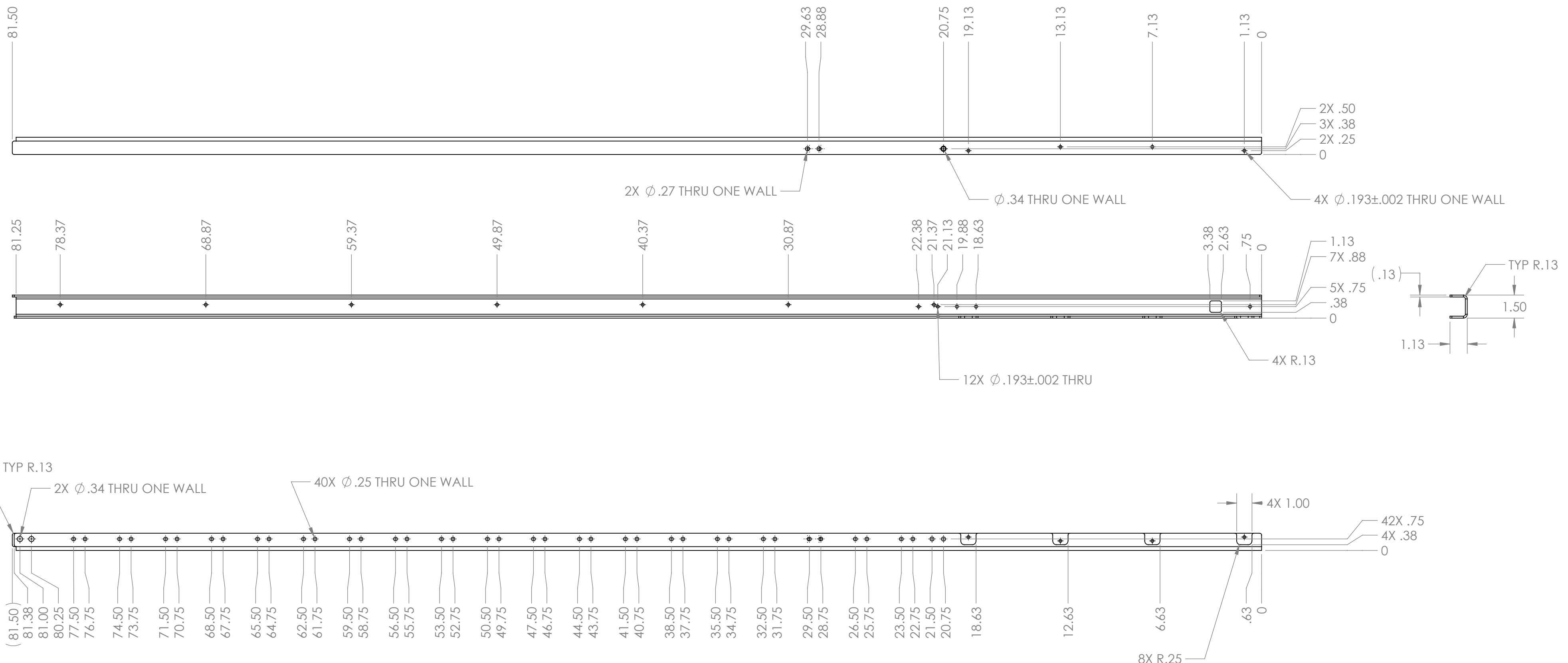
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UNLESS OTHERWISE SPECIFIED:	BEND	NAME	DATE
DRAWN	NE	10/11/2022	
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH: 8 GA 5052 AL			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			
TITLE: Red Primary Vertical			
SIZE	DWG. NO.	REV	
C	GE-23284-01		
SCALE: 1:5	SHEET 1 OF 1		

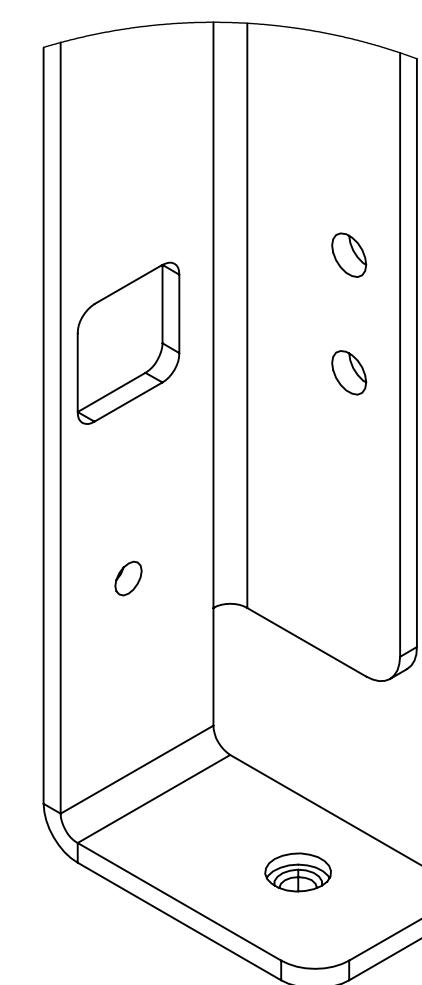
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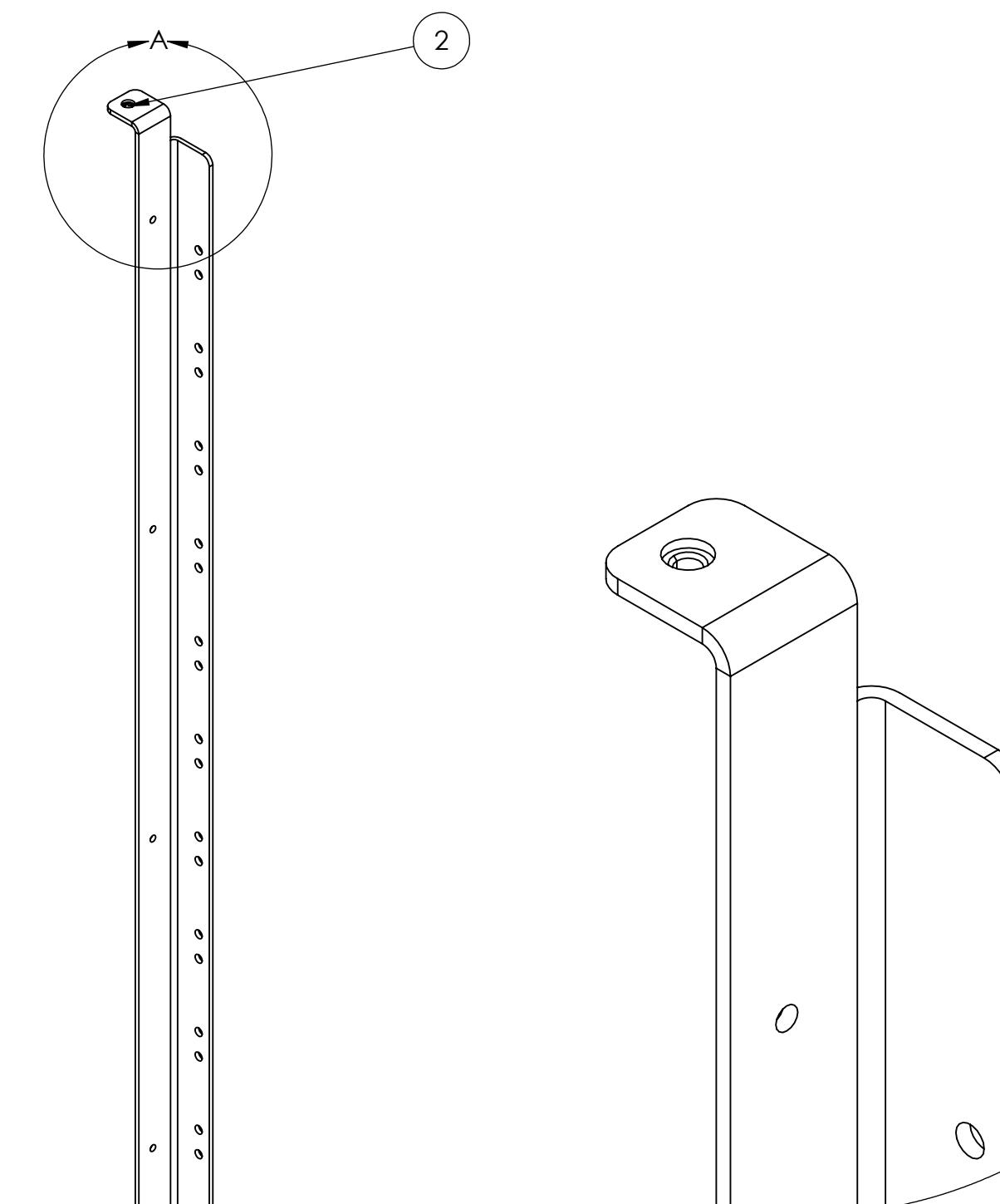
2

1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23285-01	Red Secondary Vertical	1
2	pem_clinchnut_.25_20 .054	1/4-20 self-clinching nut, .054 shank	2

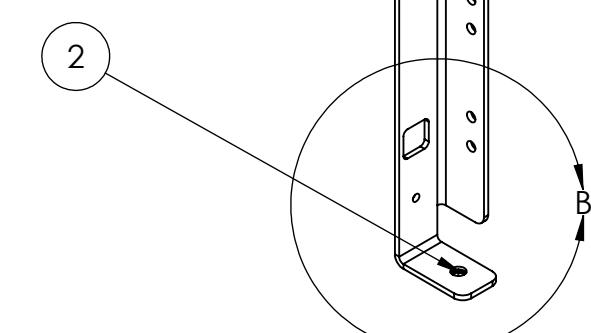


DETAIL B
SCALE 1 : 1



DETAIL A
SCALE 1 : 1

INSTALL PEM NUTS AS SHOWN, BOTH FACING THE SAME DIRECTION



UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	NE	10/12/2022	
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: Red Secondary Vertical With PEMs		
SIZE	DWG. NO.	REV
C	GE-23285	
SCALE: 1:4		SHEET 1 OF 1

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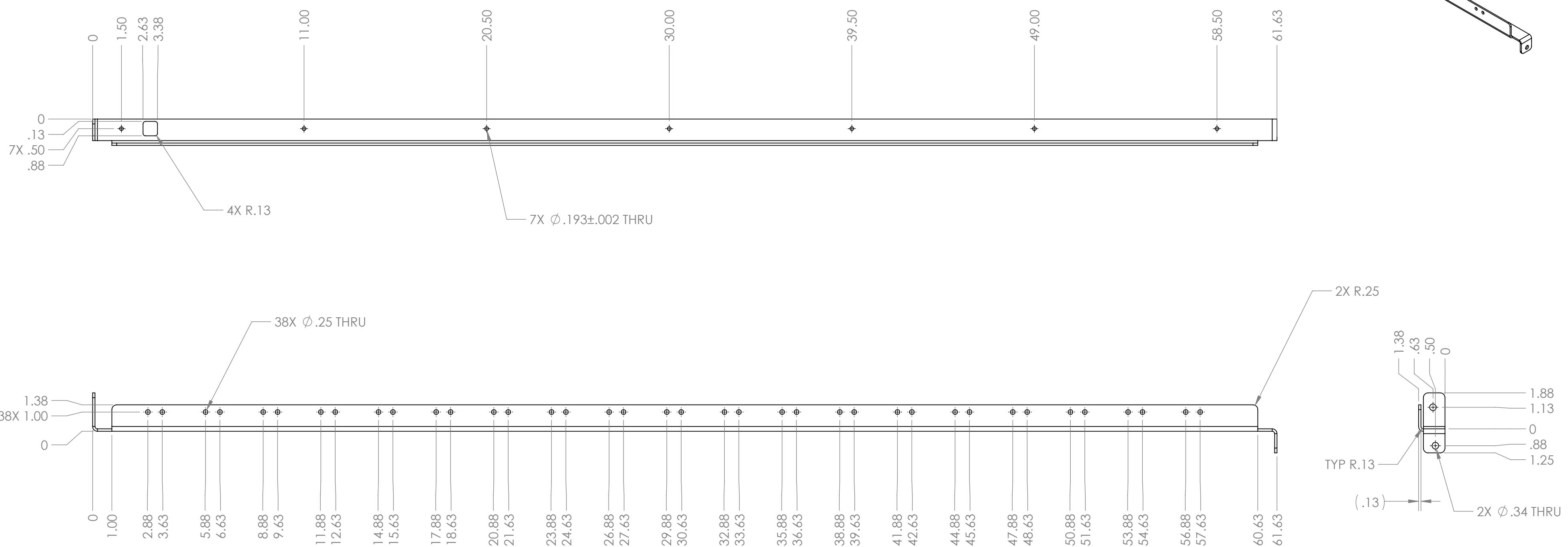
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UNLESS OTHERWISE SPECIFIED:	BEND	NAME	DATE
DRAWN	NE	10/12/2022	
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH: 8 GA 5052 AL			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
Red Secondary
Vertical

SIZE DWG. NO. REV
C GE-23285-01

SCALE: 1:4 SHEET 1 OF 1

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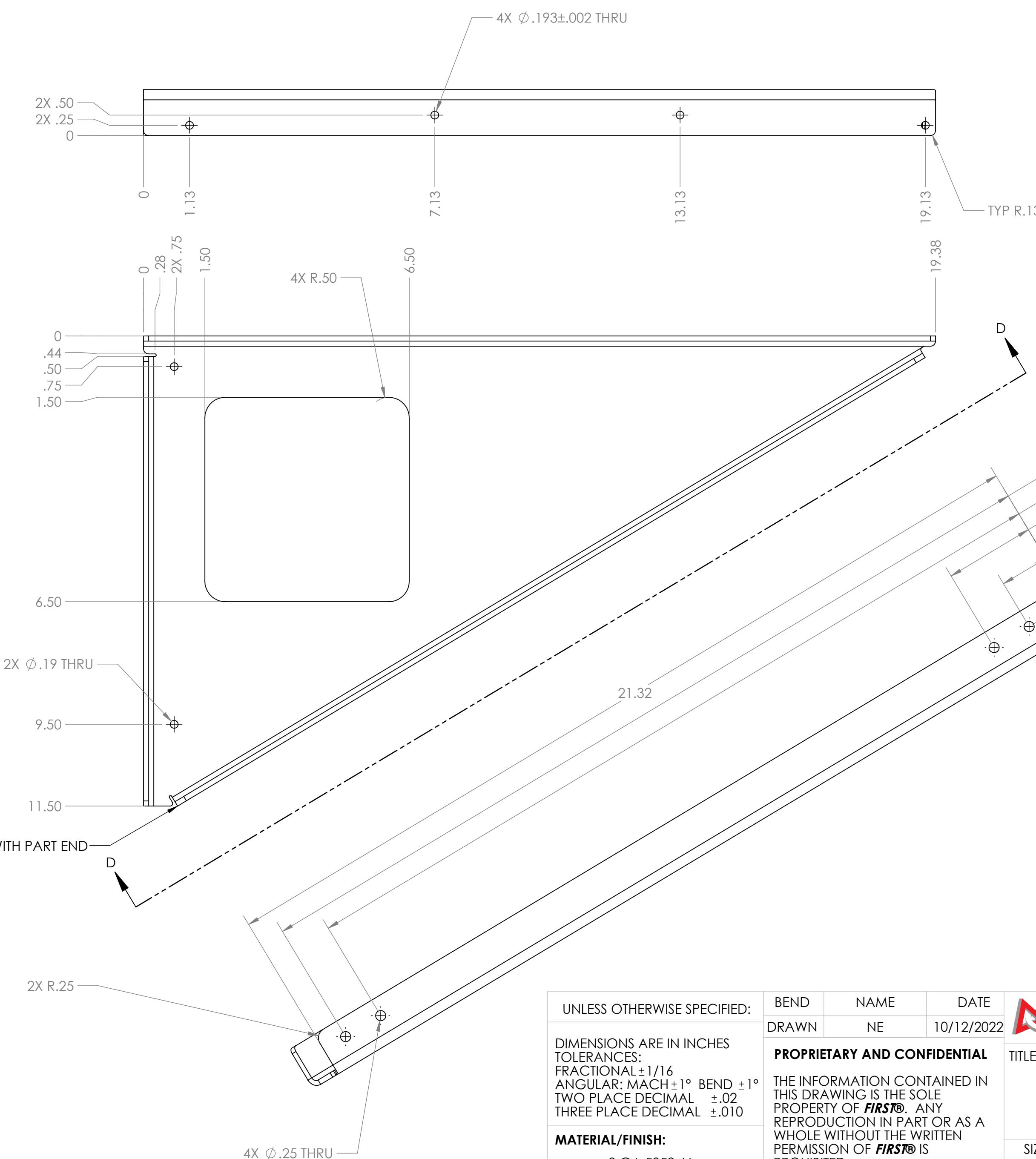
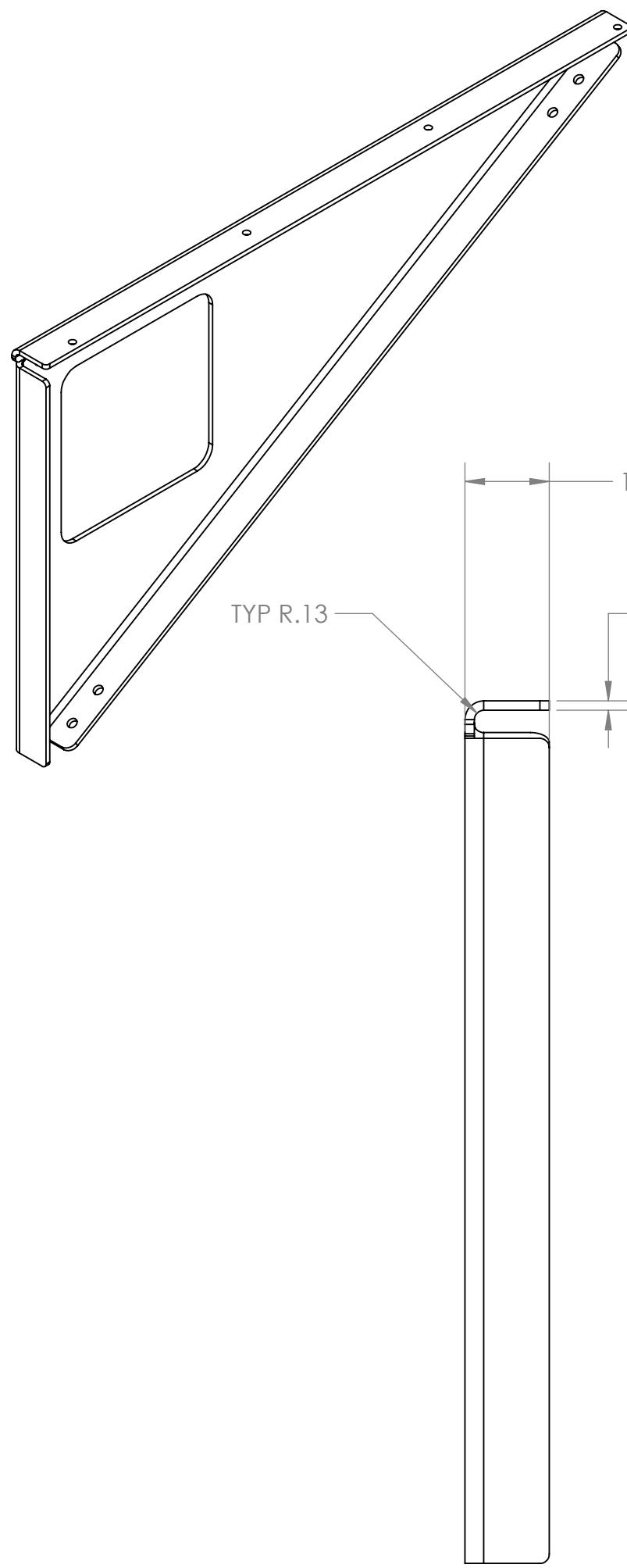
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UNLESS OTHERWISE SPECIFIED:

BEND NAME DATE

DRAWN NE 10/12/2022

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**

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MATERIAL/FINISH:

8 GA 5052 AL

DO NOT SCALE DRAWING

TITLE: FIRST ROBOTICS COMPETITION

SOLIDWORKS

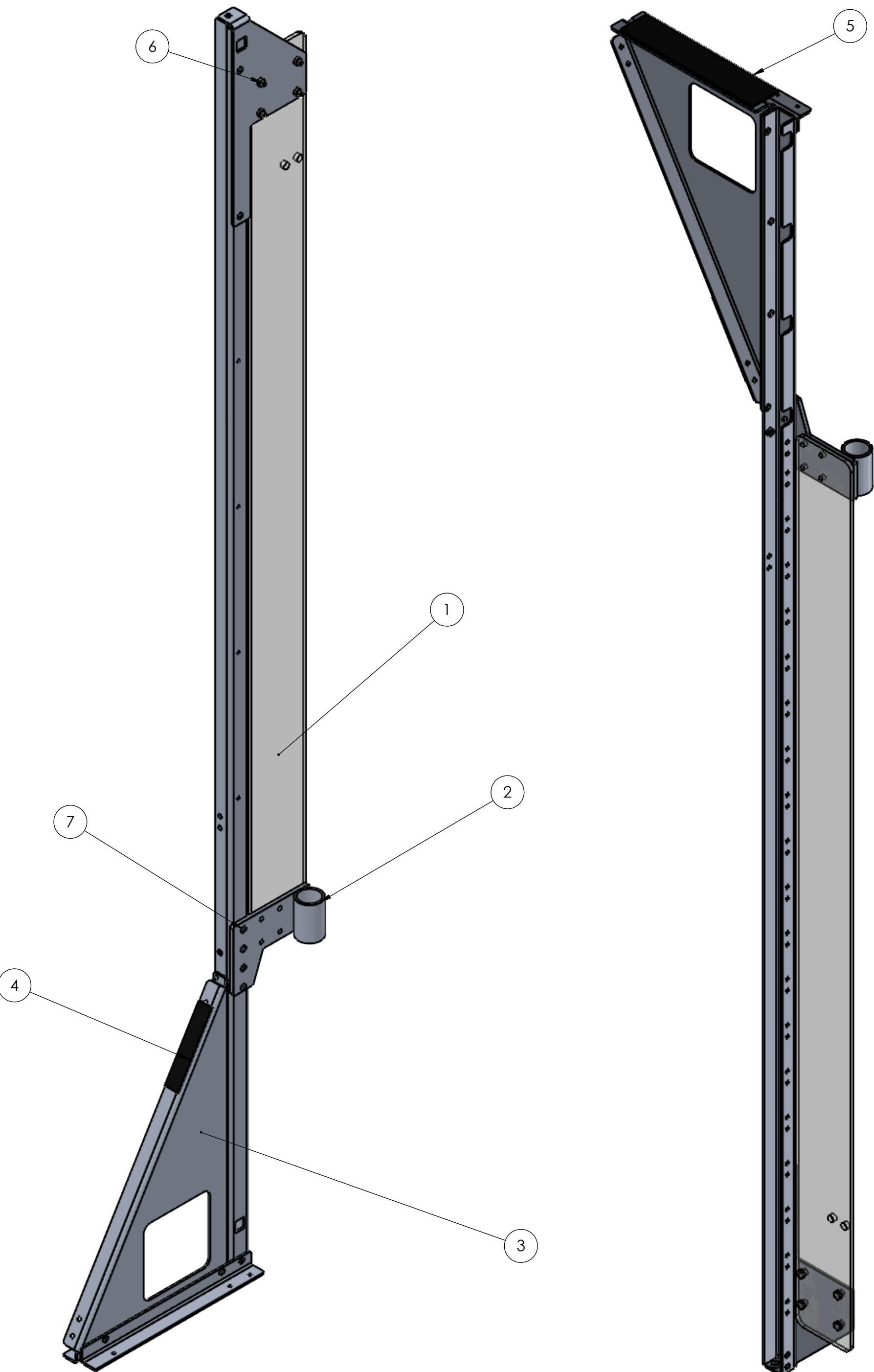
Modeling Solutions Partner

REV

SIZE DWG. NO.

C GE-23286

SCALE: 1:2 SHEET 1 OF 1



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23236	Corner Guard Plastic	1
2	GE-23289	Red Pin Anchor	1
3	GE-23297	Red Corner Vertical W/O Pin	1
4	Hook_1_5	1" x 5" Hook, Adhesive Backed	1
5	Hook_2_10	2" x 10" Hook, Adhesive Backed	1
6	hex_25_20_0.75	Steel Hex Head Screw, 1/4"-20 x 0.75" long, fully threaded	4
7	rivet_.1875_.251-.375	3/16" Aluminum Rivet, .251-.375 Grip Range	4

UNLESS OTHERWISE SPECIFIED: FIELD NAME DATE
DRAWN NE 1/3/2023

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

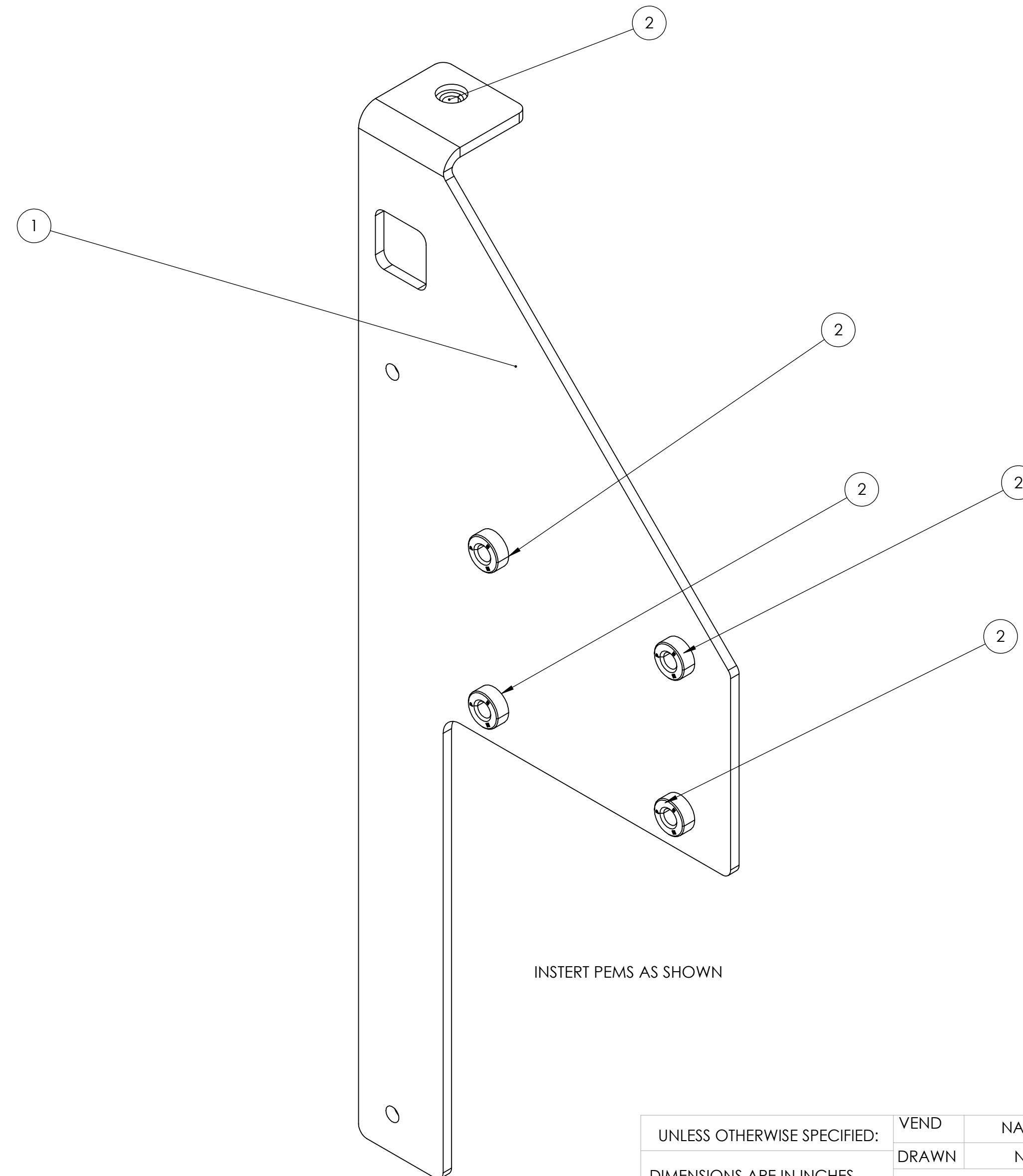
TITLE:
**Red Corner
Fence Vertical**

SIZE DWG. NO. REV

C GE-23287

SCALE: 1:5 SHEET 1 OF 1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23288-01	Red Tertiary Vertical	1
2	pem_clinchnut_.25_20 .054	1/4-20 self-clinching nut, .054 shank	5



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 NE 10/13/2022

PROPRIETARY AND CONFIDENTIAL

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COMMENTS:

REMOVE ALL BURRS AND SHARP EDGES.

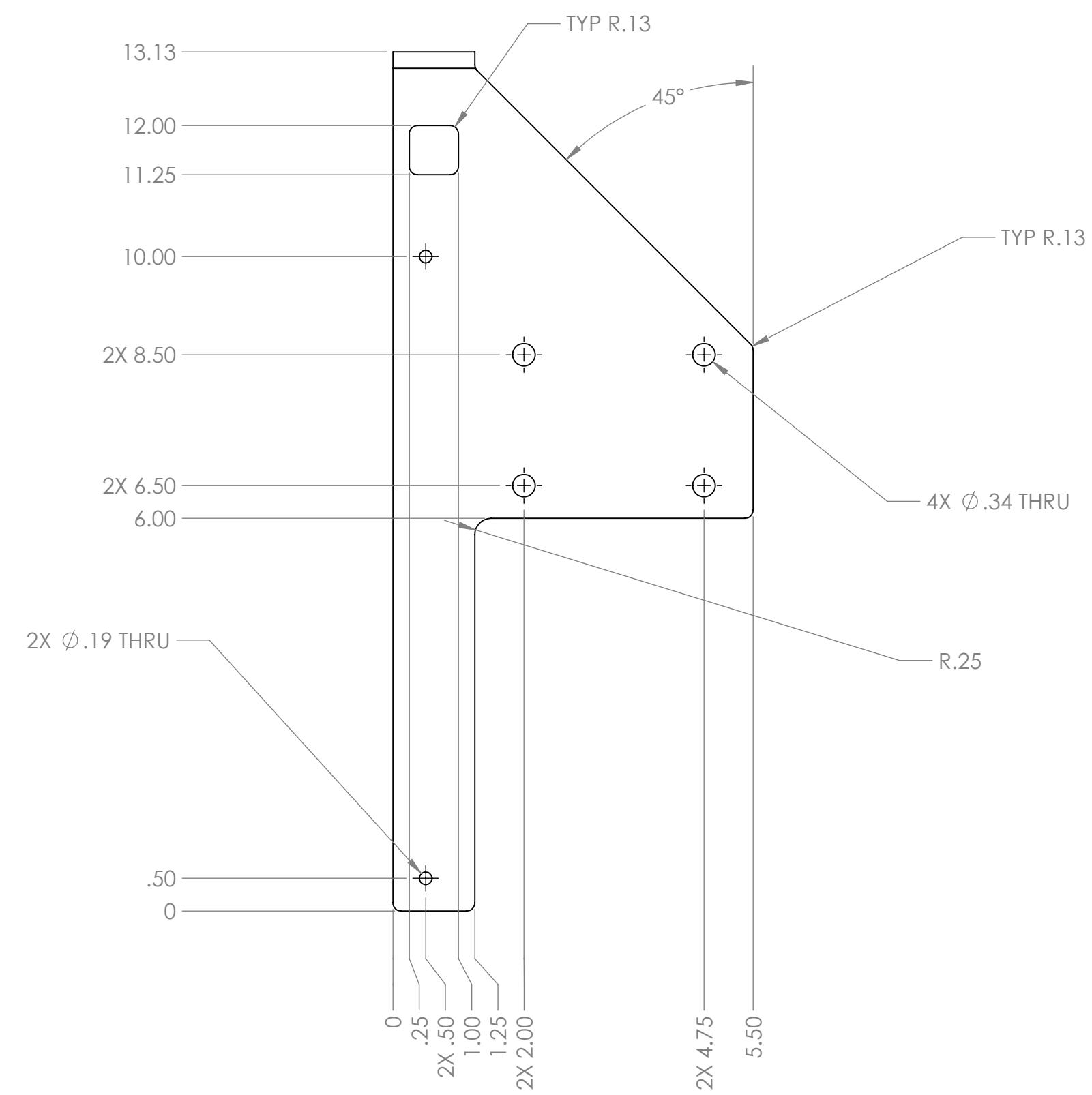
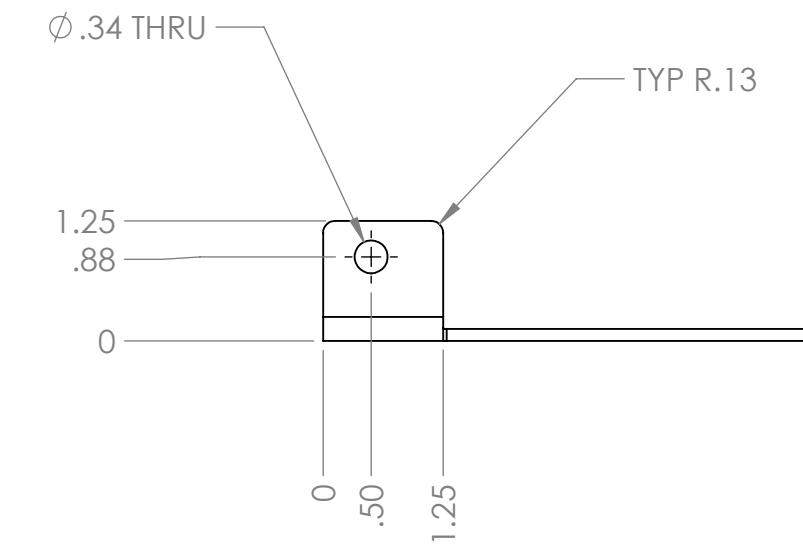
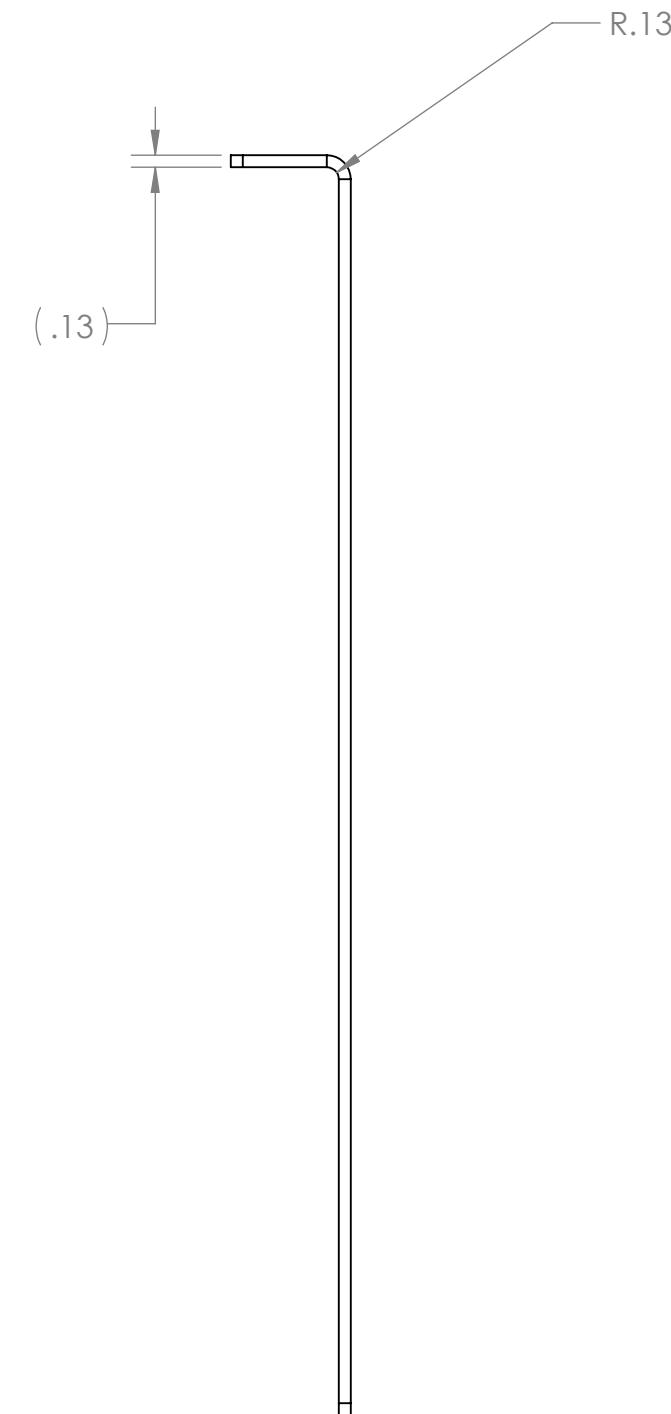
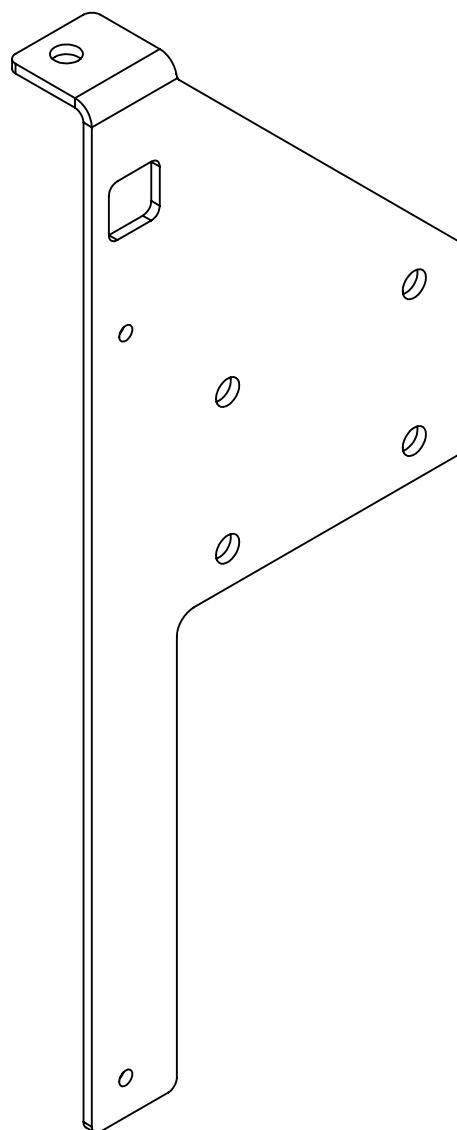
FIRST ROBOTICS COMPETITION SOLIDWORKS Modeling Solutions Partner

TITLE: Red Tertiary Vertical With PEMs

SIZE DWG. NO. REV

C GE-23288

SCALE: 1:1 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 AL

BEND NAME DATE

DRAWN NE 10/13/2022

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

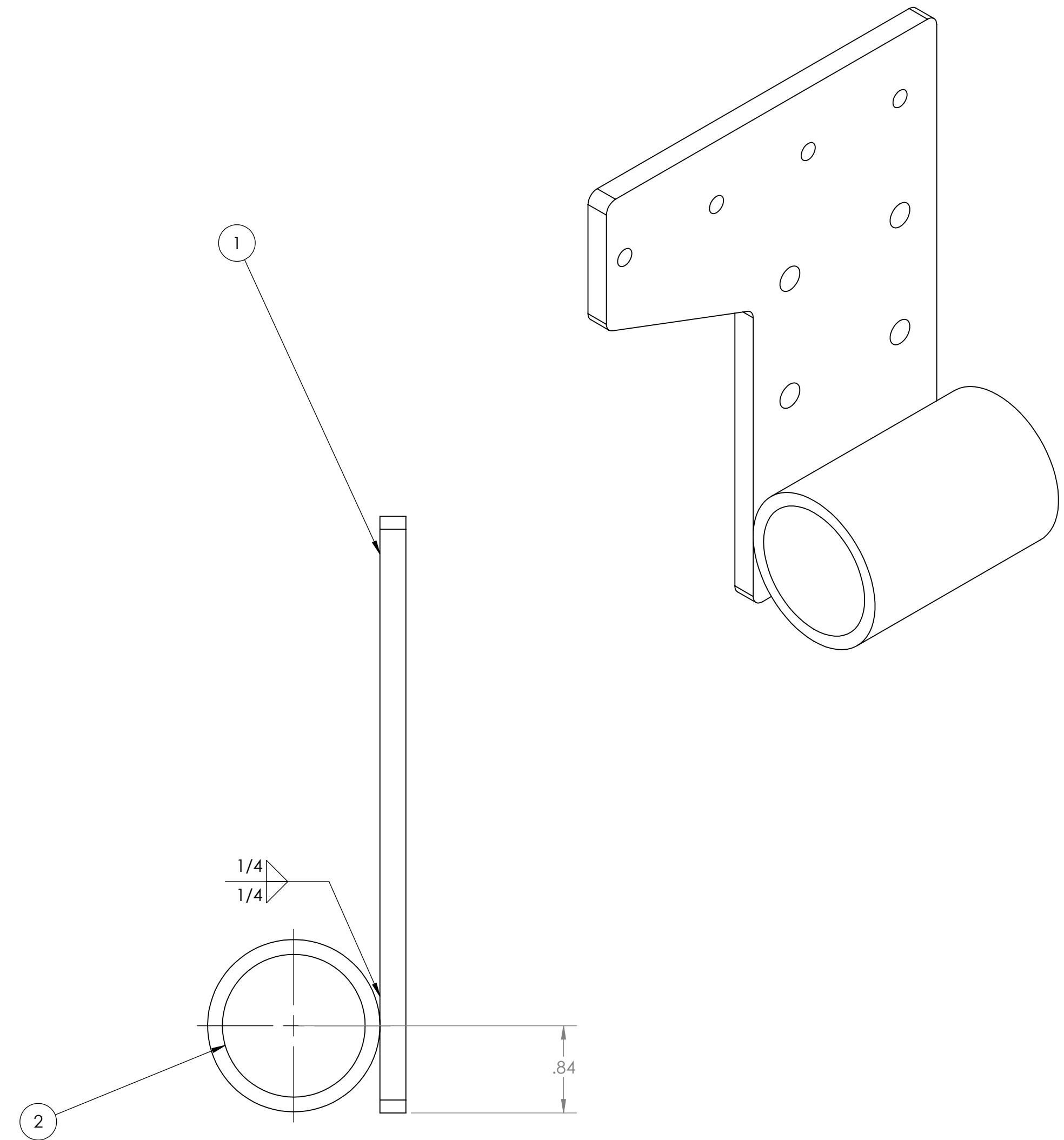
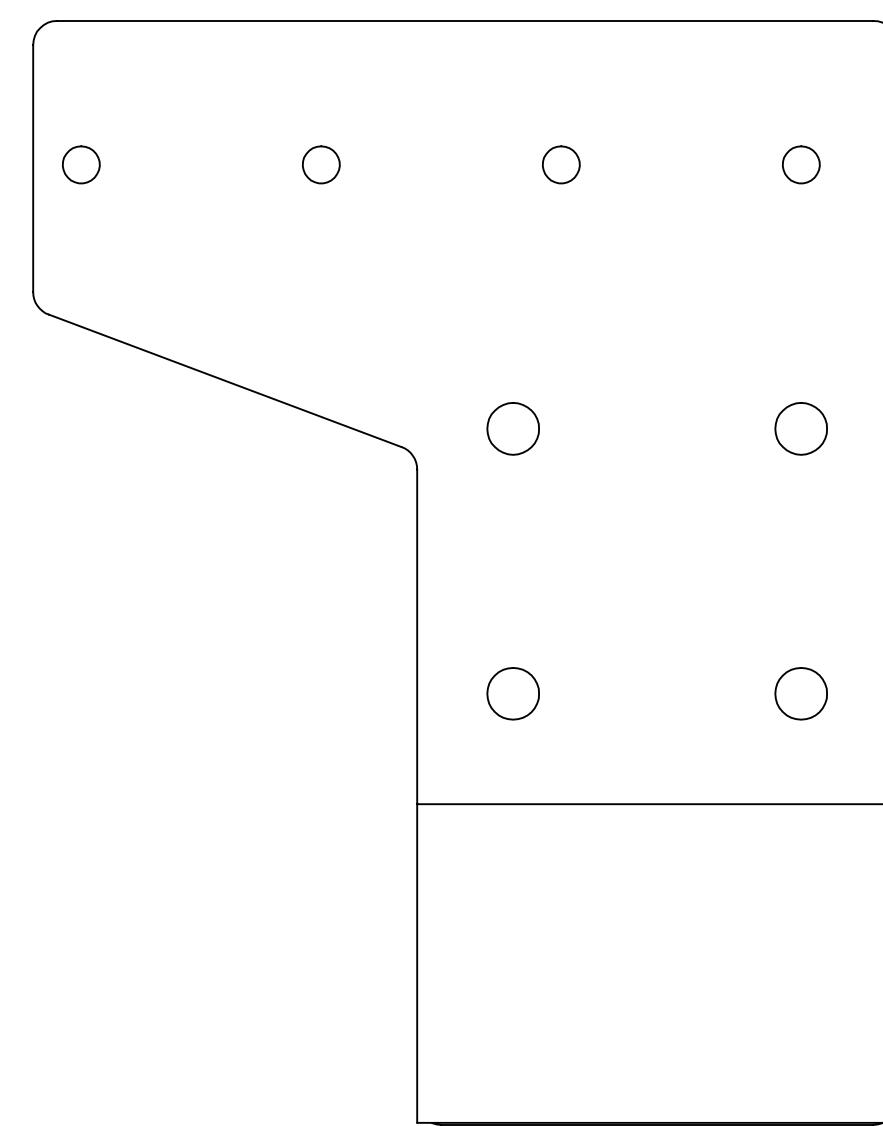
Red Tertiary Vertical

SIZE DWG. NO. REV

C GE-23288-01

SCALE: 1:2 SHEET 1 OF 1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23233	Pin Anchor Plate	1
2	GE-23234	Pin Anchor Tube	1



NO WELD PERMISSIBLE INSIDE TUBE

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:

DO NOT SCALE DRAWING

WELD NAME DATE
DRAWN NE 10/13/2022

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COMMENTS:
REMOVE ALL BURRS AND SHARP EDGES.

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE: Red Pin Anchor

SIZE DWG. NO. REV

C GE-23289

SCALE: 1:1 SHEET 1 OF 1

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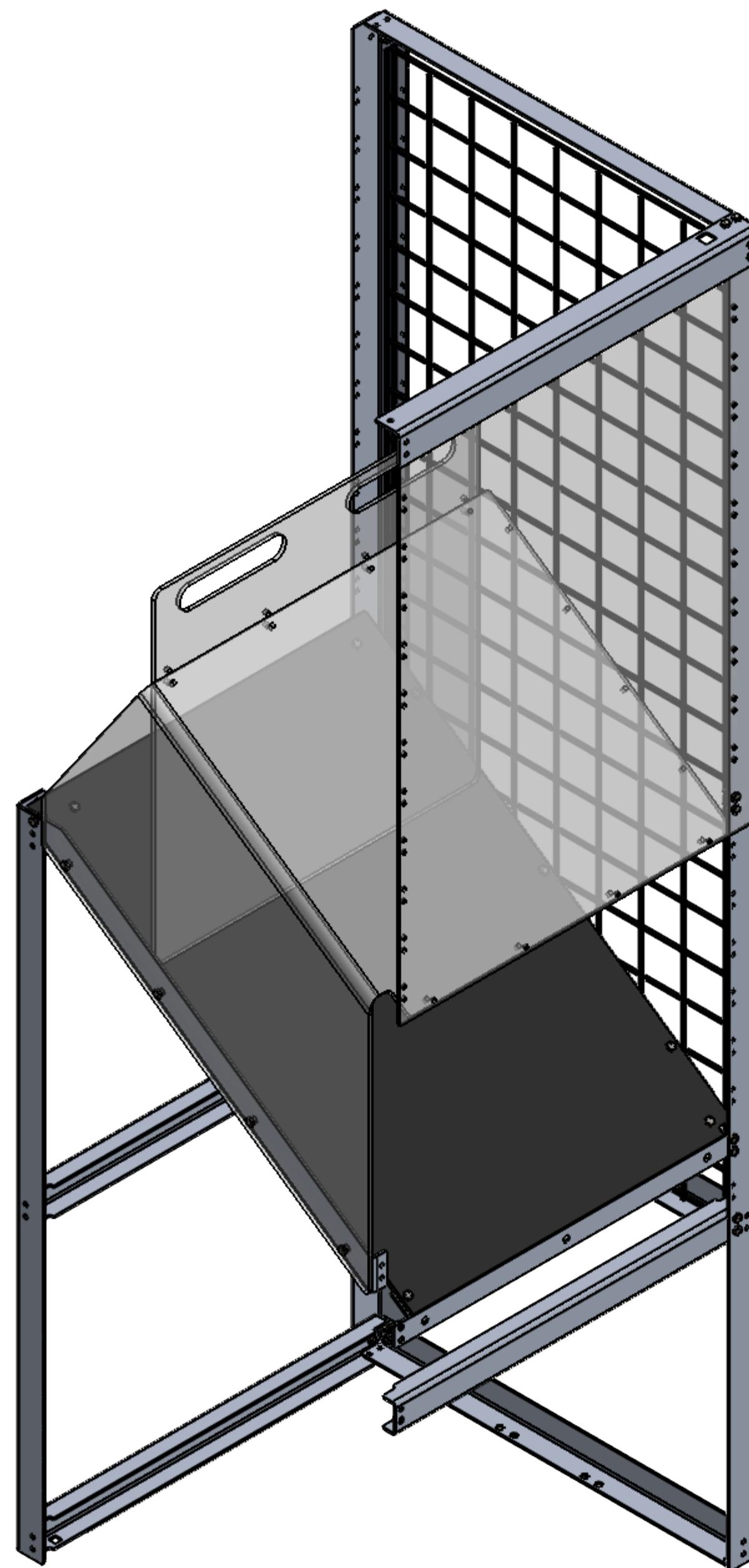
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23241	HP Protection Plastic	1
2	GE-23245	Short Chute Vertical	1
3	GE-23246	Chute Door	1
4	GE-23250	Side Fence	1
5	GE-23291	Red Chute Cover	1
6	GE-23292	Red Chute Top Connector	1
7	GE-23293	Red Crossbeam	2
8	GE-23294	Red Ramp Assembly	1
9	GE-23299	Red Crossbeam With Loop	1
10	hex_.25_20_0.75	Steel Hex Head Screw, 1/4"-20 x 0.75" long, fully threaded	27
11	nylock_.25_20	Steel Nylon-Insert Locknut, 1/4"-20	17

UNLESS OTHERWISE SPECIFIED:

FIELD NAME DATE

DRAWN NE 12/27/2022


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 $\pm .50$ **MATERIAL/FINISH:**

PROPRIETARY AND CONFIDENTIAL
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COMMENTS:

REMOVE ALL BURRS AND SHARP EDGES.

DO NOT SCALE DRAWING

TITLE:

Red Chute

SIZE DWG. NO.

C GE-23290

REV

SCALE: 1:6

SHEET 1 OF 6

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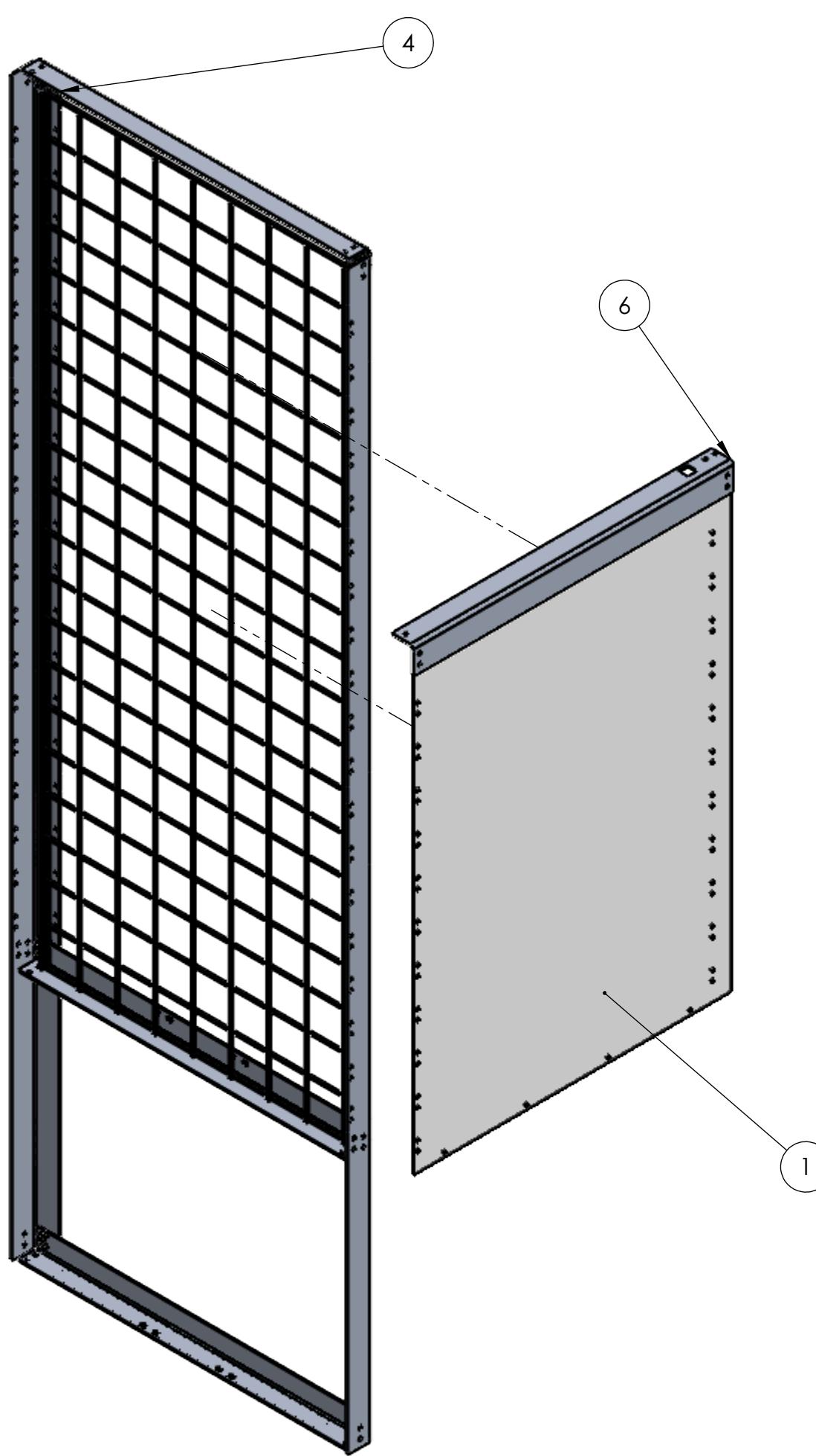
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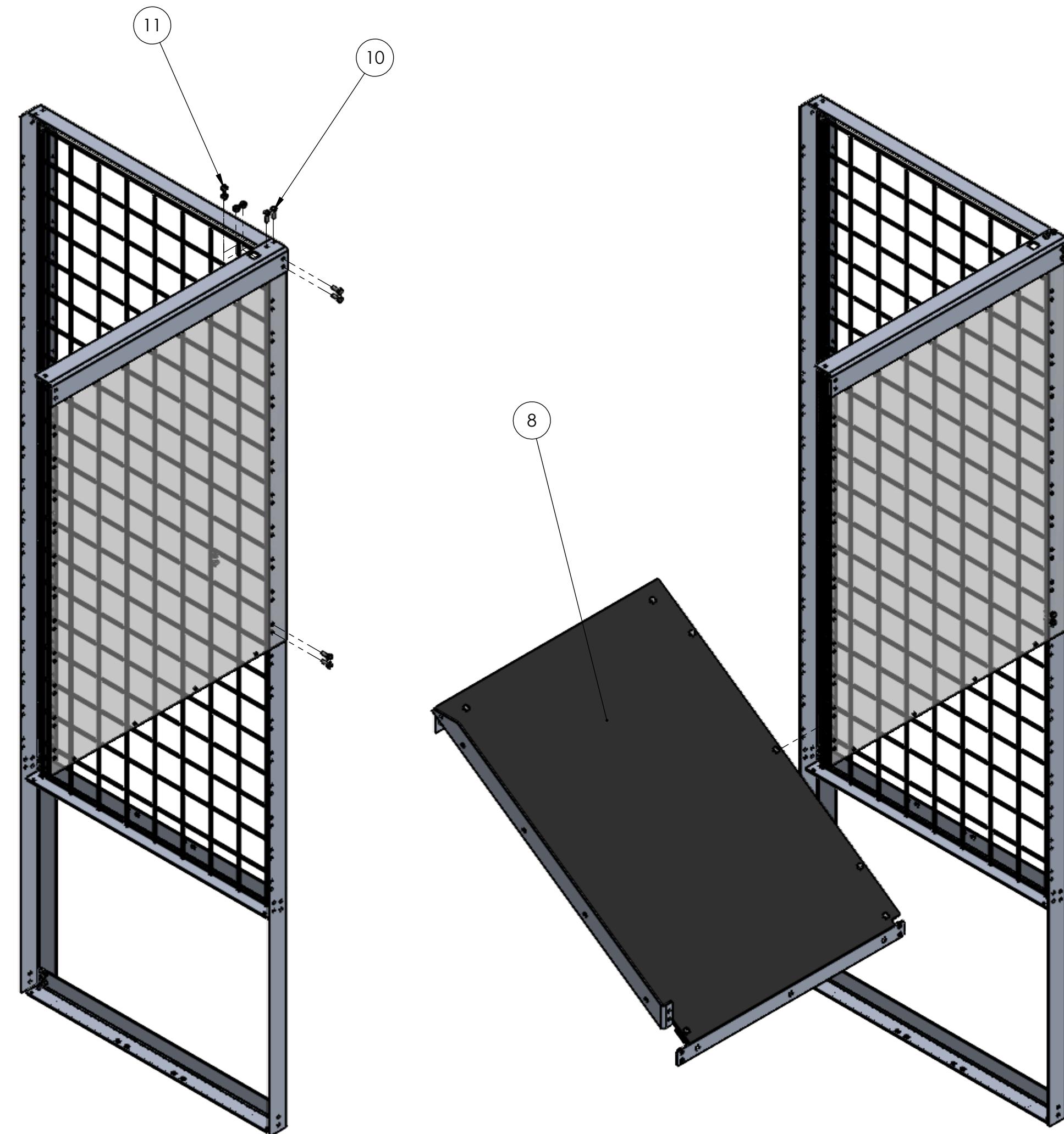
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LAYER PLASTIC BETWEEN (4) AND (6). ATTACH WITH 6 OF (11) AND 6 OF (10)



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	NE	12/27/2022
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:	SIZE	DWG. NO.	REV
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.	C	GE-23290	
DO NOT SCALE DRAWING	SCALE: 1:8	SHEET 2 OF 6	

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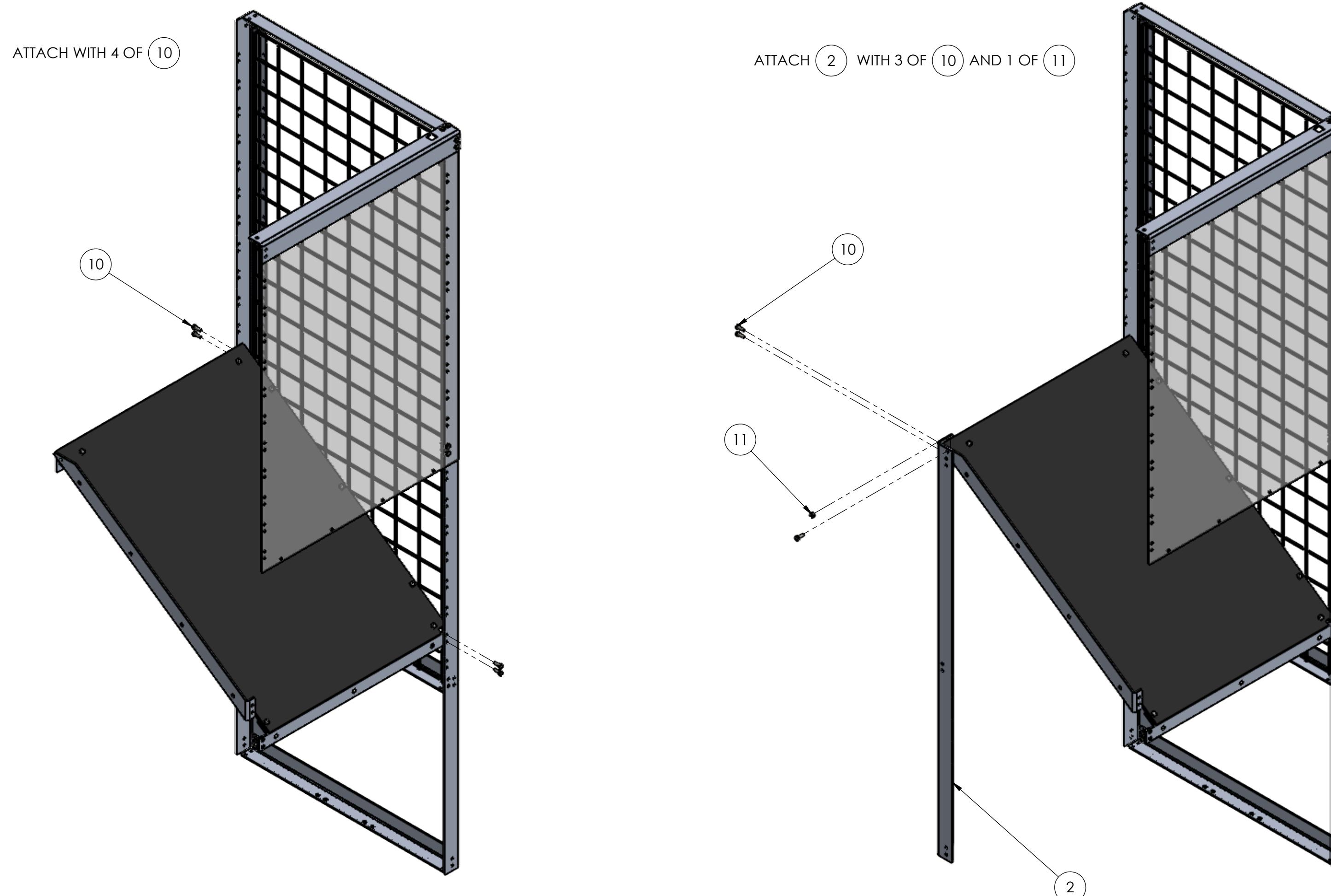
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UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DRAWN	NE	12/27/2022	
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MATERIAL/FINISH:			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
Red Chute

SIZE DWG. NO. REV
C GE-23290

SCALE: 1:8 SHEET 3 OF 6

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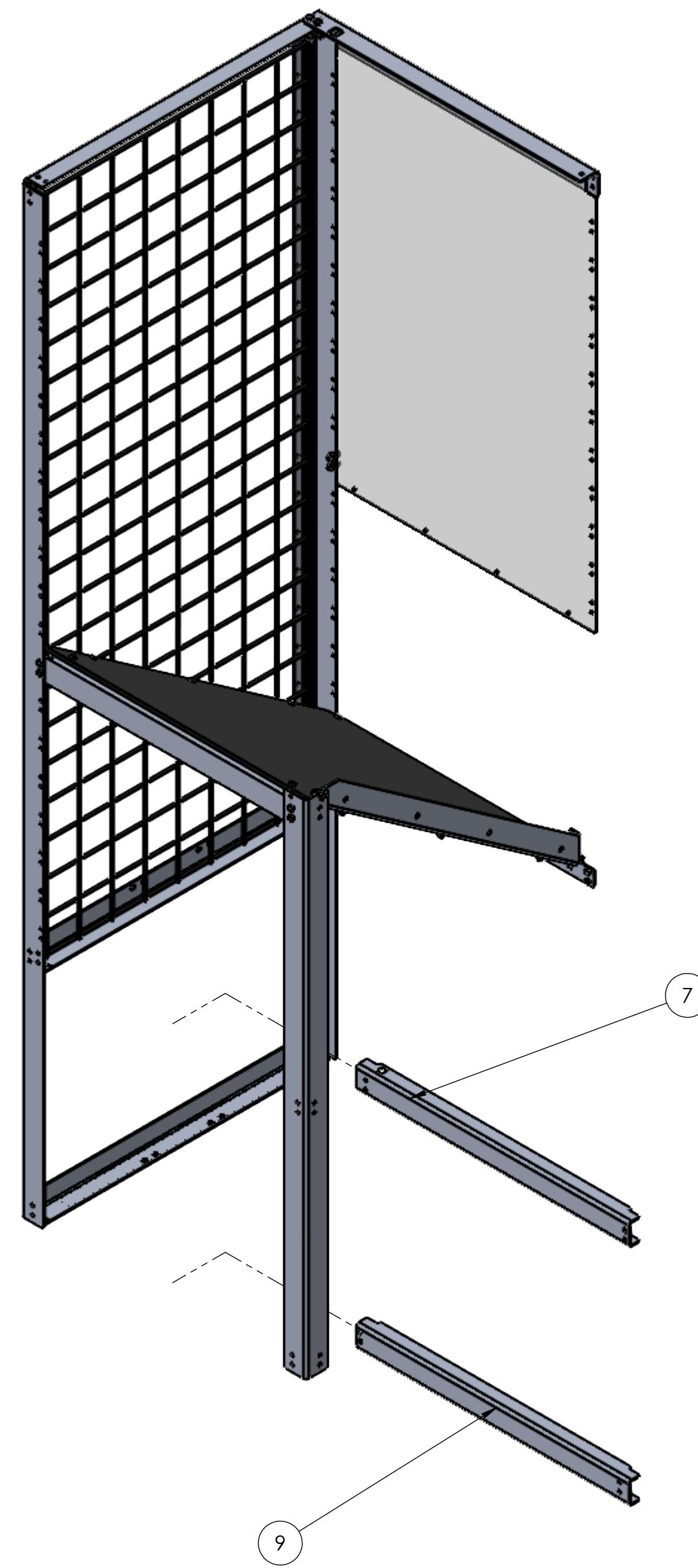
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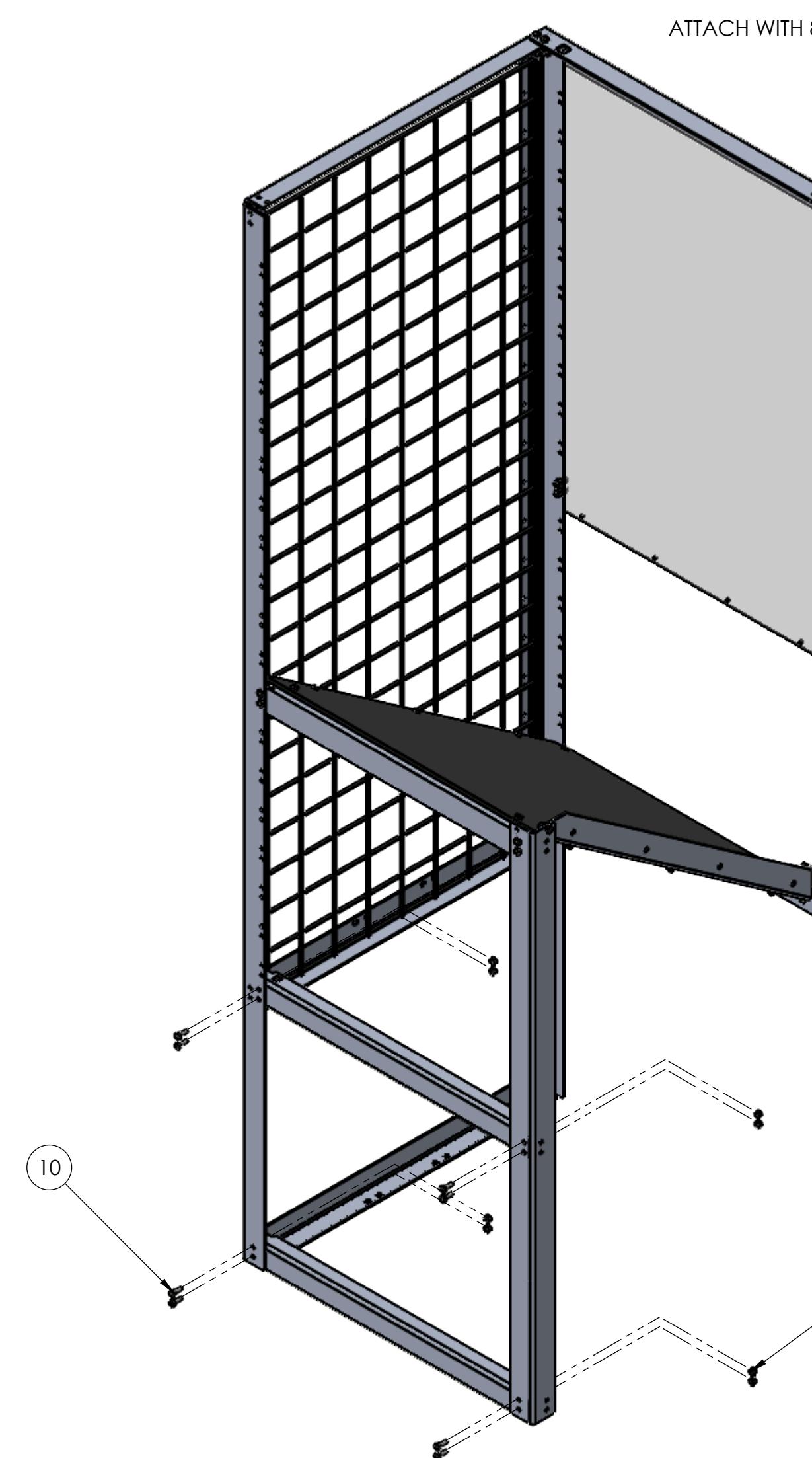
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(ROTATED 90 DEGREES FOR VISIBILITY)



NOTE: (9) IS THE SAME PART AS (7)
WITH LOOP ON ONE FACE. LOOP IS
DOWNWARD FACING IN ASSEMBLY TO
INTERACT WITH THE FLOOR



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:

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PROHIBITED.

COMMENTS:

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EDGES.

DO NOT SCALE DRAWING

FIELD NAME DATE

DRAWN NE 12/27/2022



TITLE:
Red Chute

SIZE DWG. NO. REV

C GE-23290

SCALE: 1:8 SHEET 4 OF 6

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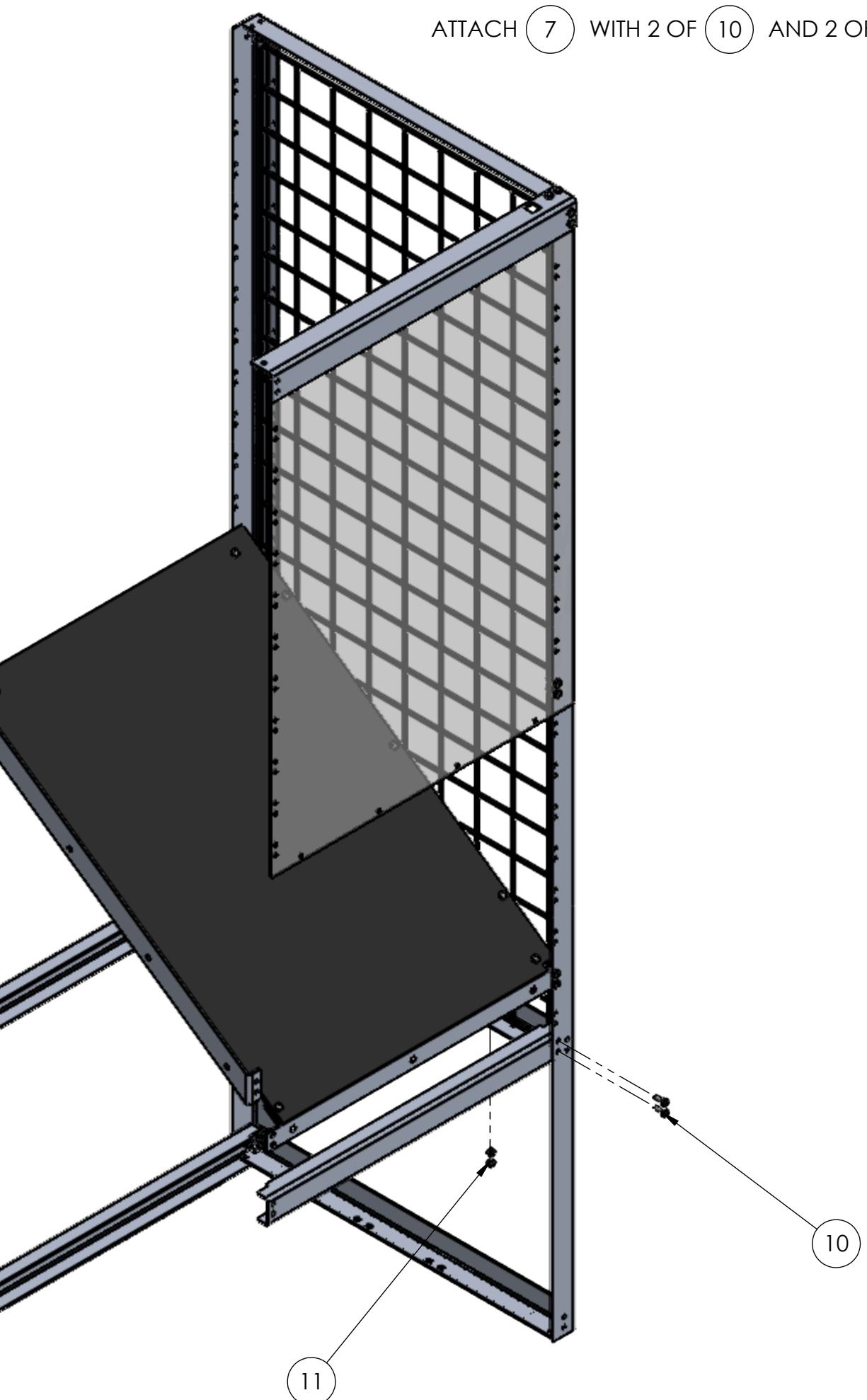
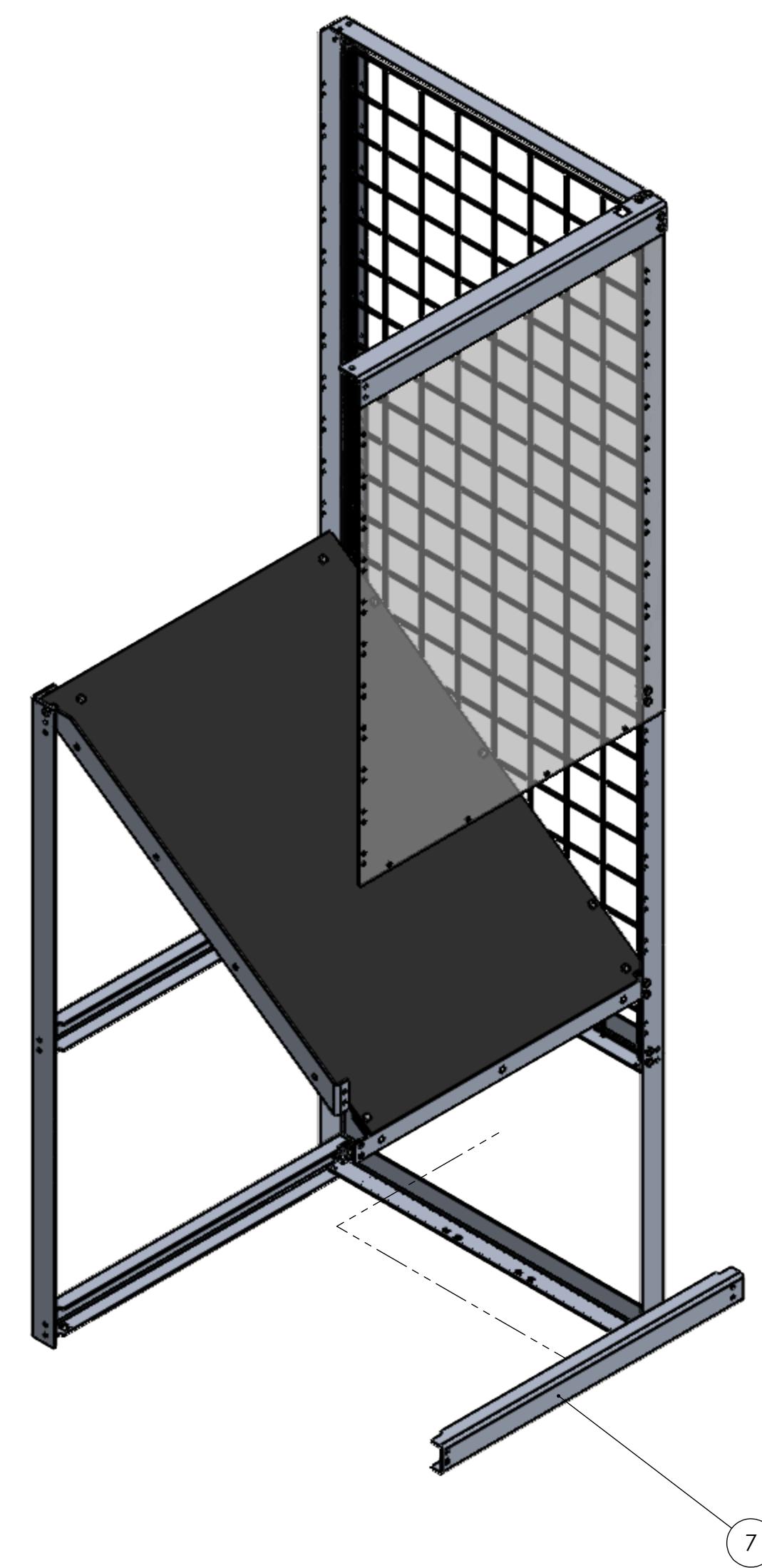
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(ROTATED BACK TO ORIGINAL ORIENTATION)



UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE	 FIRST ROBOTICS COMPETITION
DIMENSIONS ARE IN INCHES	DRAWN	NE	12/27/2022	 SOLIDWORKS Modeling Solutions Partner
PROPRIETARY AND CONFIDENTIAL				
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MATERIAL/FINISH:	SIZE	DWG. NO.	REV	
COMMENTS:	C	GE-23290		
DO NOT SCALE DRAWING	SCALE: 1:8	SHEET 5 OF 6		

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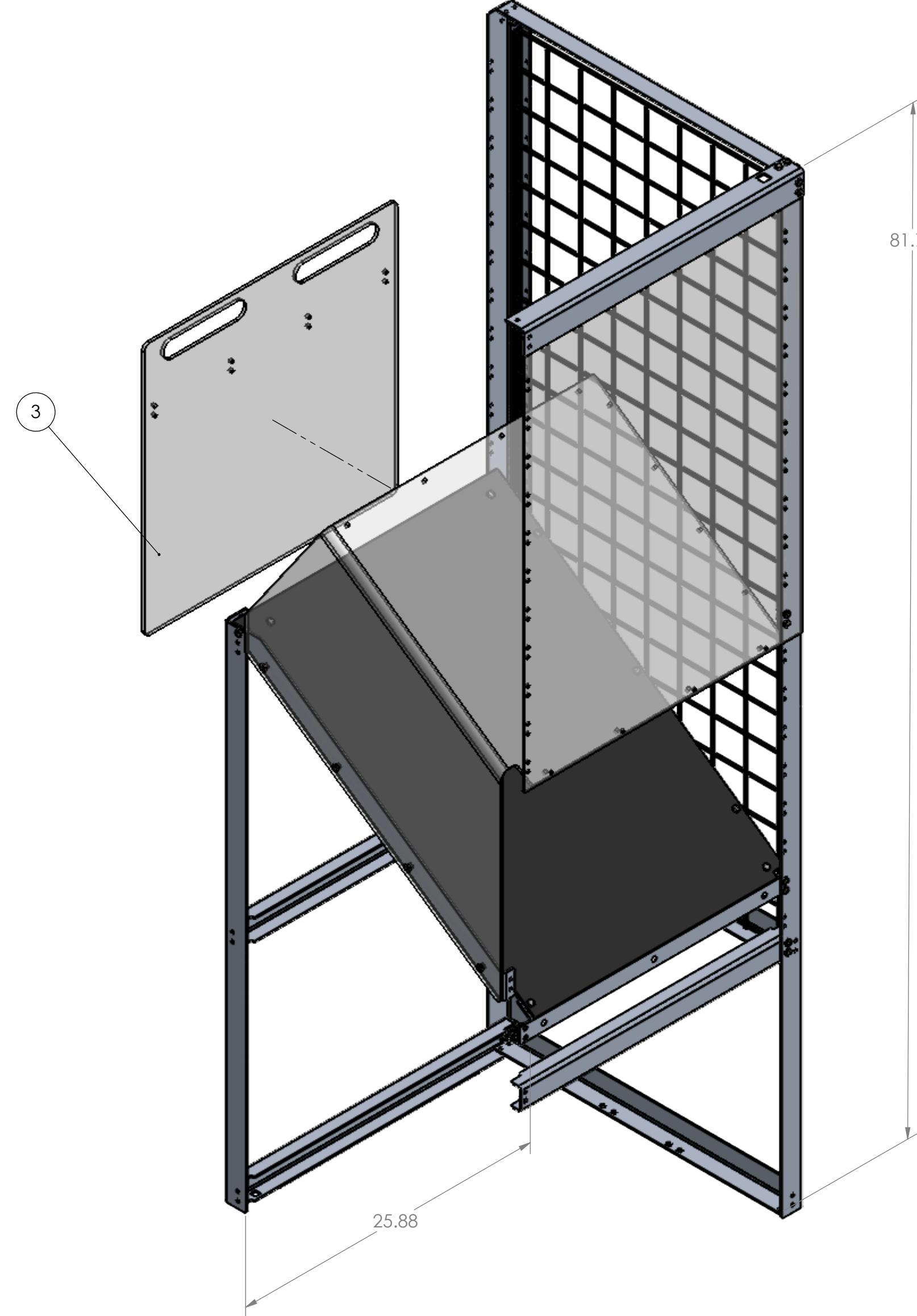
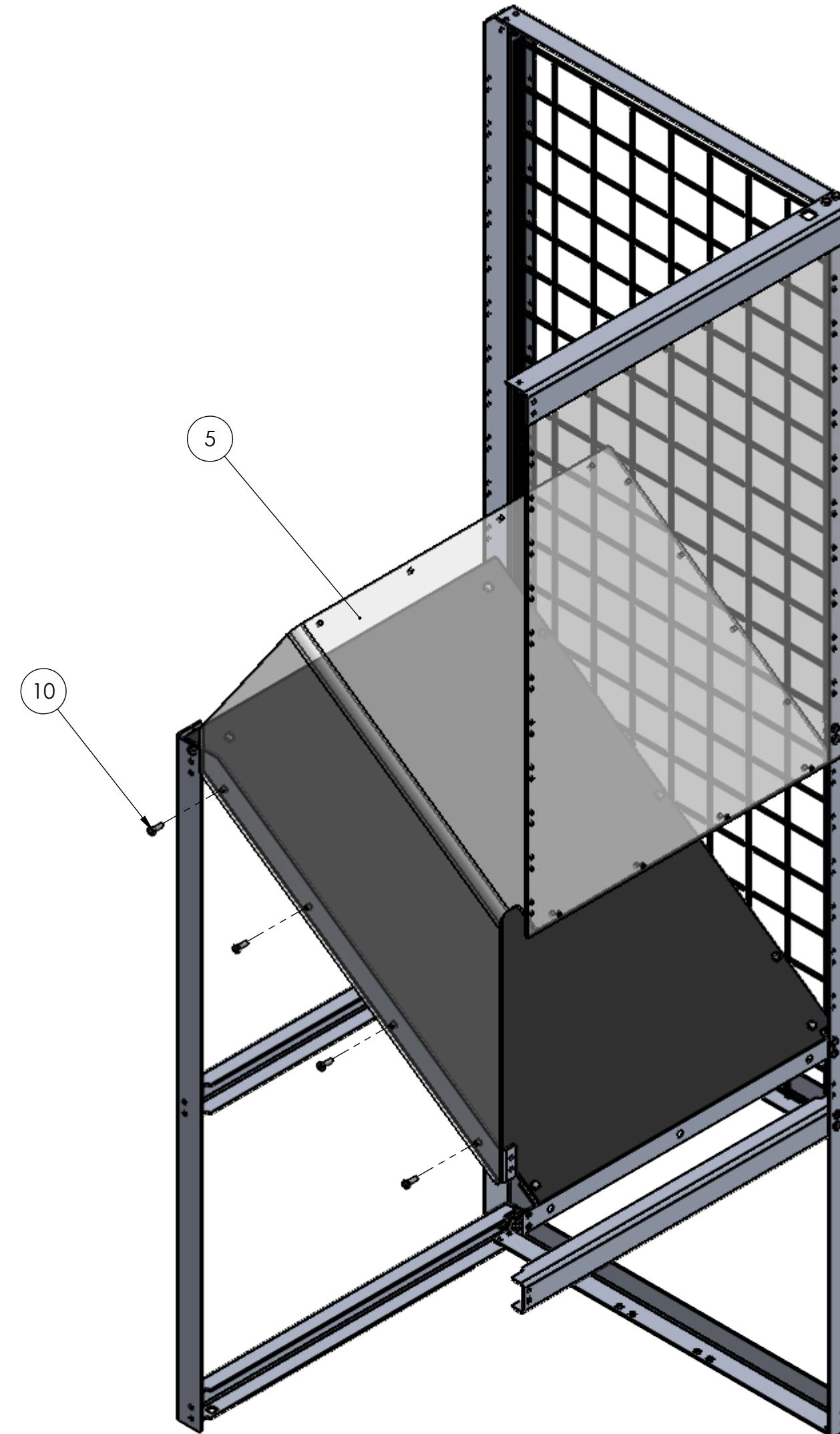
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ATTACH (5) TO THE OUTSIDE OF THE RAMP WITH 4 OF (10)

ATTACH (3) TO (5) WITH 4 CABLE TIES LOOSE ENOUGH TO FUNCTION AS A HINGE



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	NE	12/27/2022
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: **Red Chute**

SIZE DWG. NO. REV
C GE-23290

SCALE: 1:7 SHEET 6 OF 6

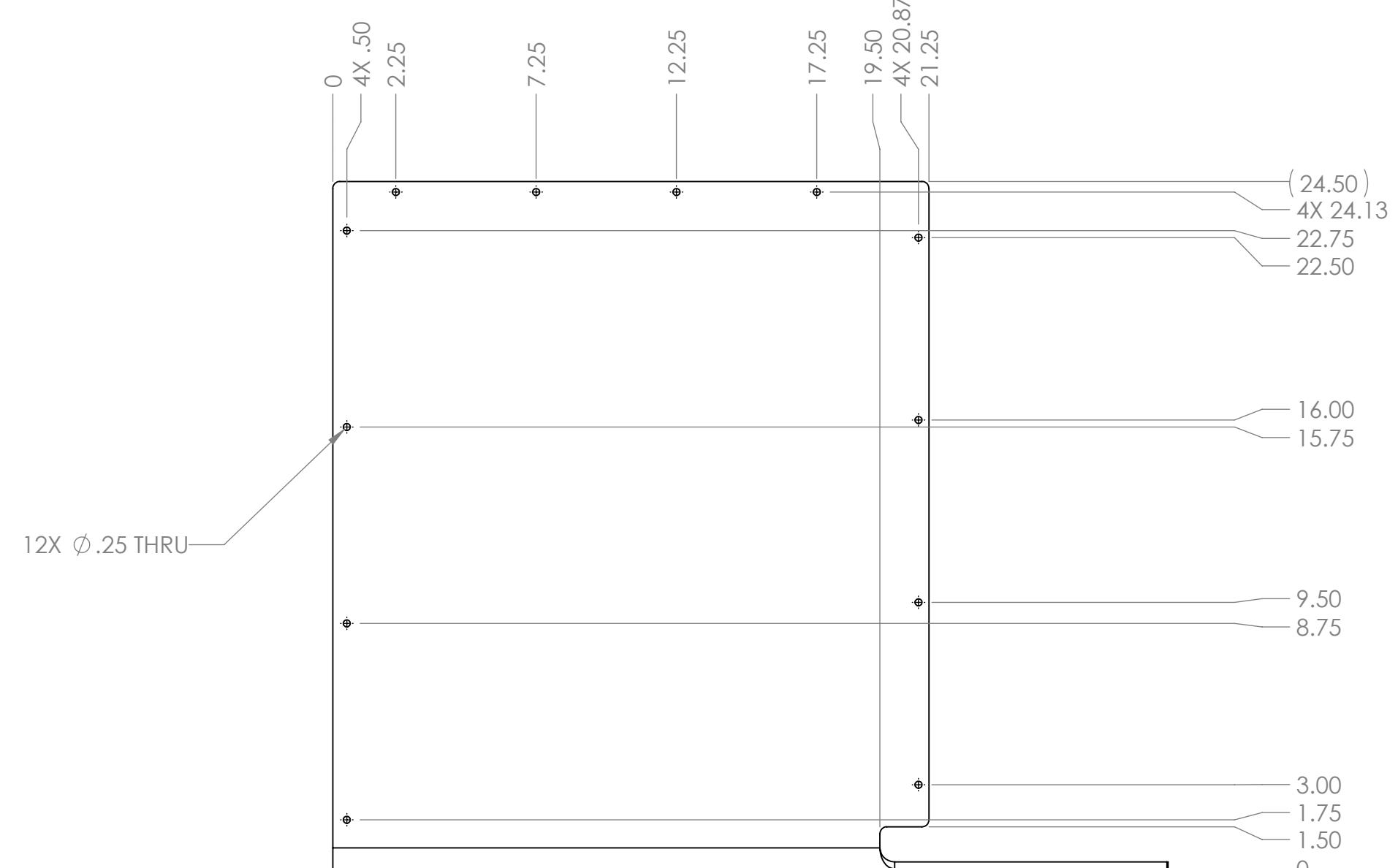
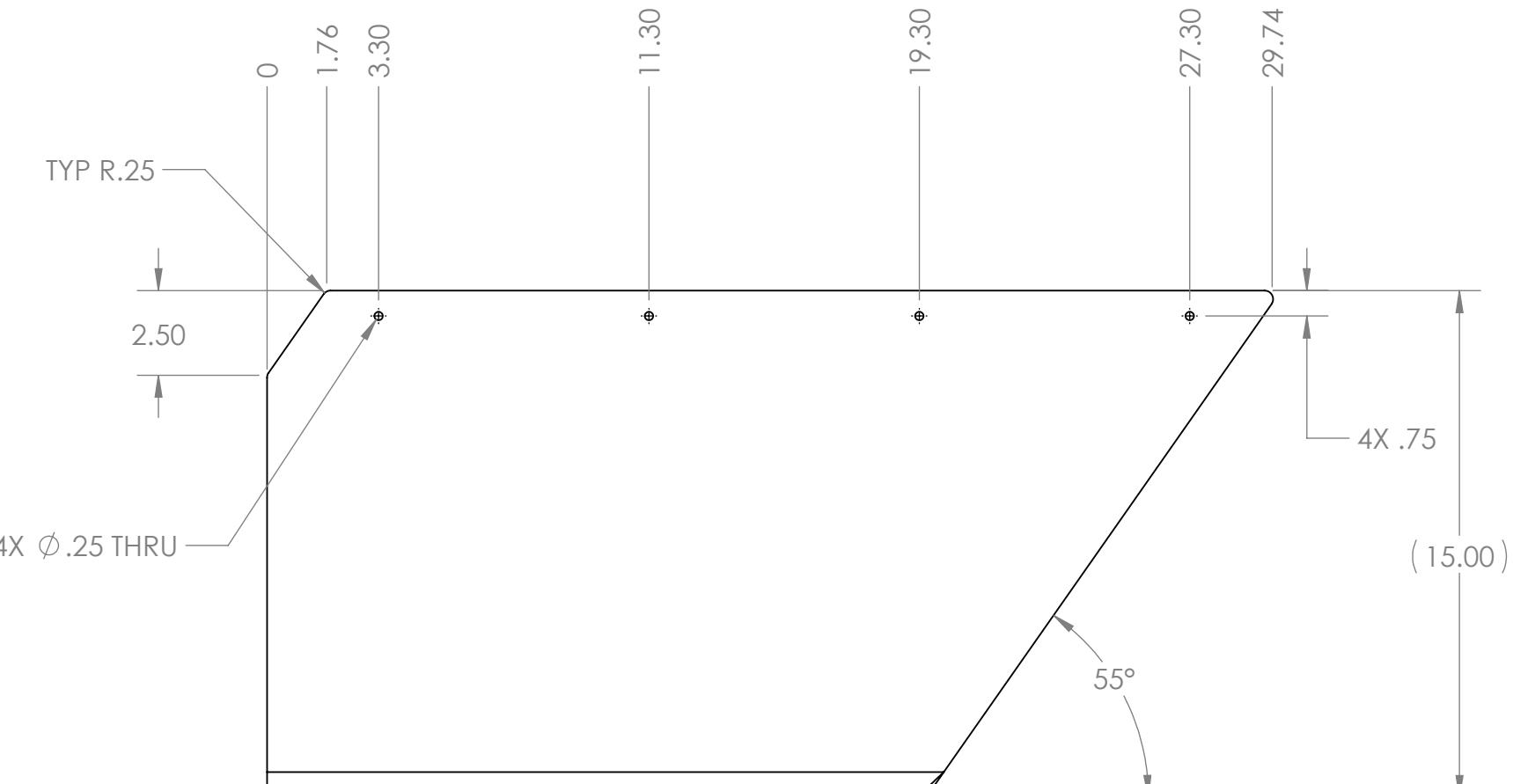
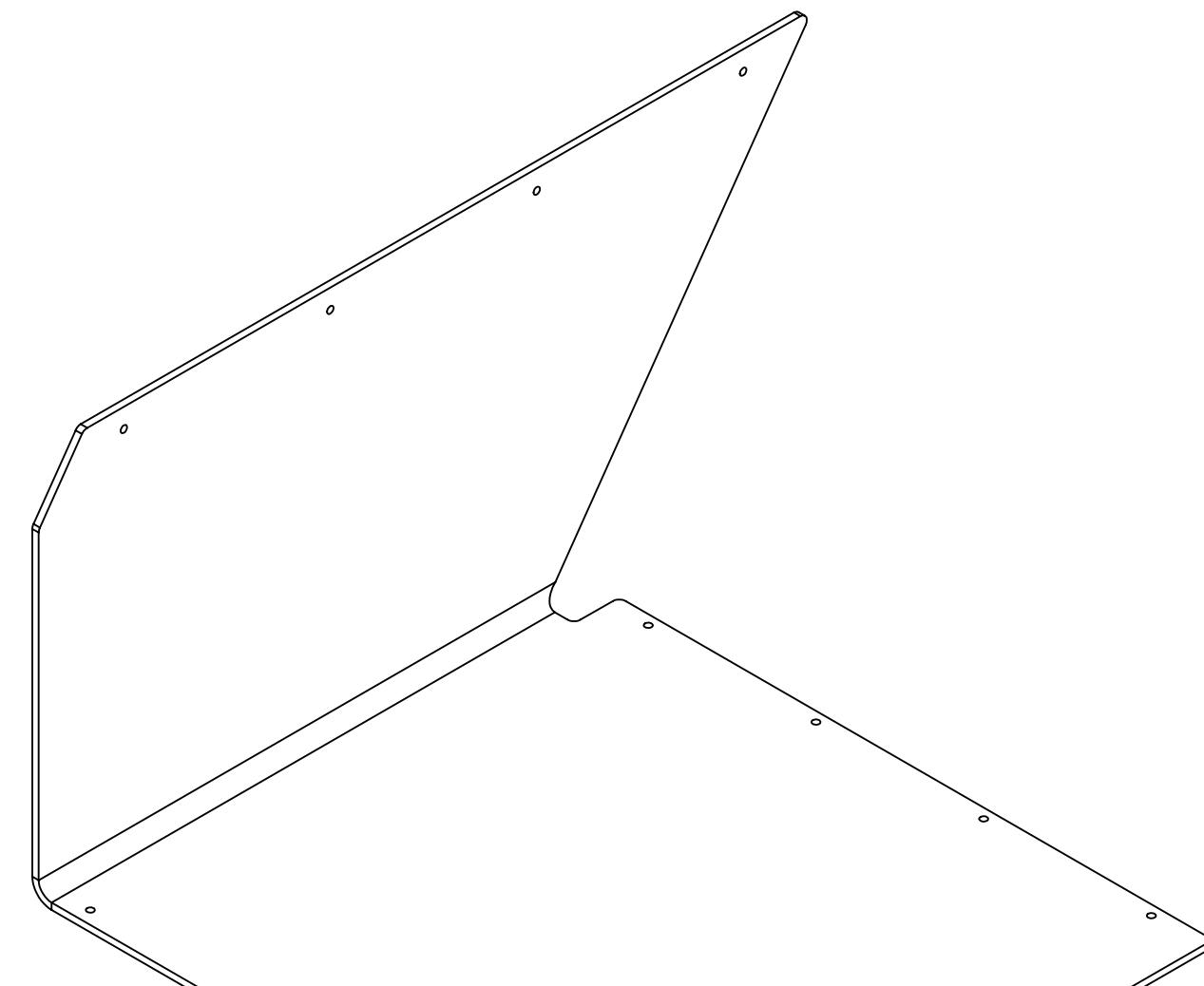
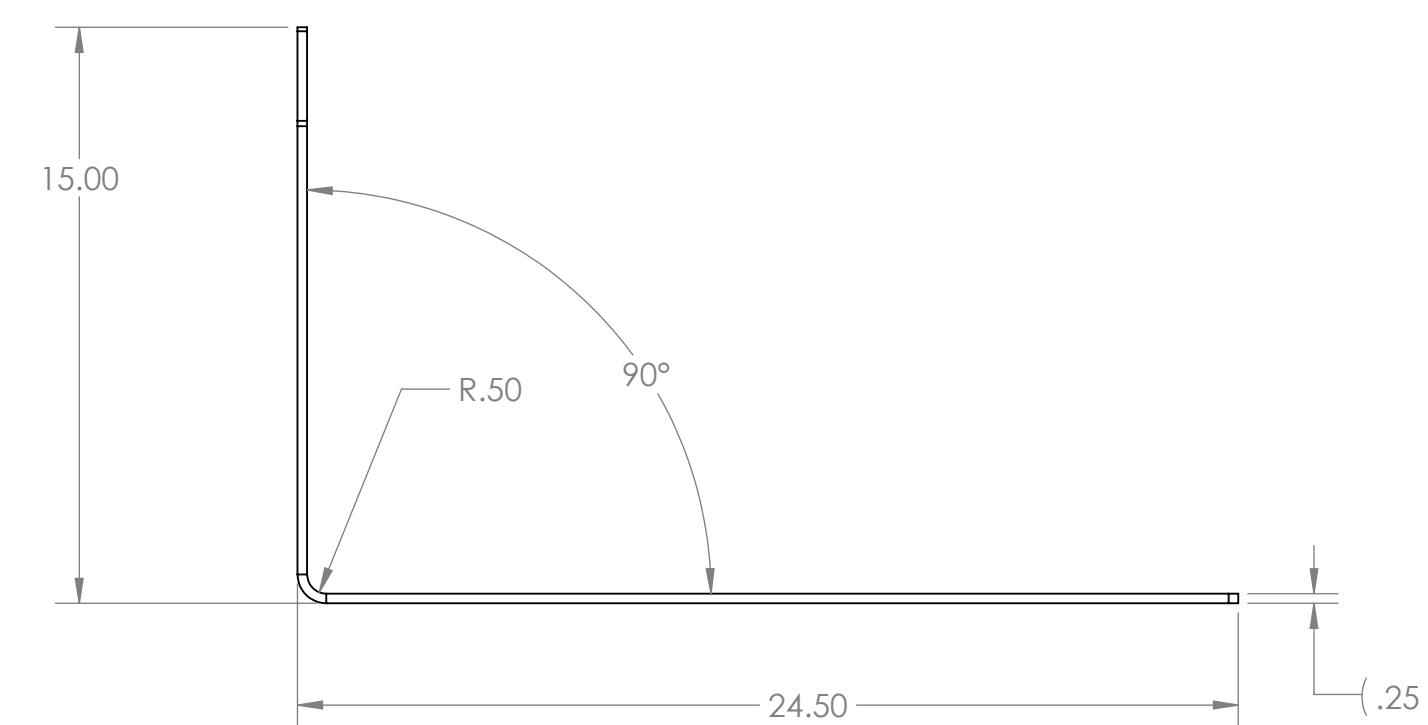
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UNLESS OTHERWISE SPECIFIED:

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:**

0.25" Polycarbonate

VEND

NAME

DATE

DRAWN

NE

10/17/2022



SOLIDWORKS

Modeling Solutions Partner

TITLE: Red Chute Cover

SIZE DWG. NO. REV

C GE-23291

SCALE: 1:5 SHEET 1 OF 1

DO NOT SCALE DRAWING

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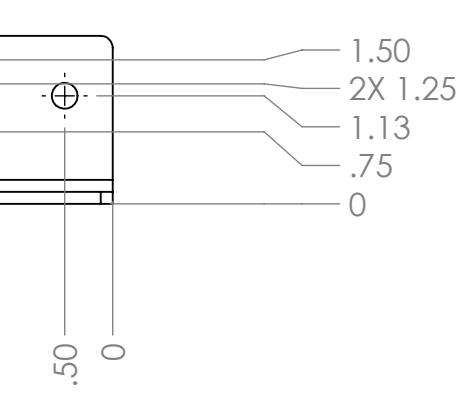
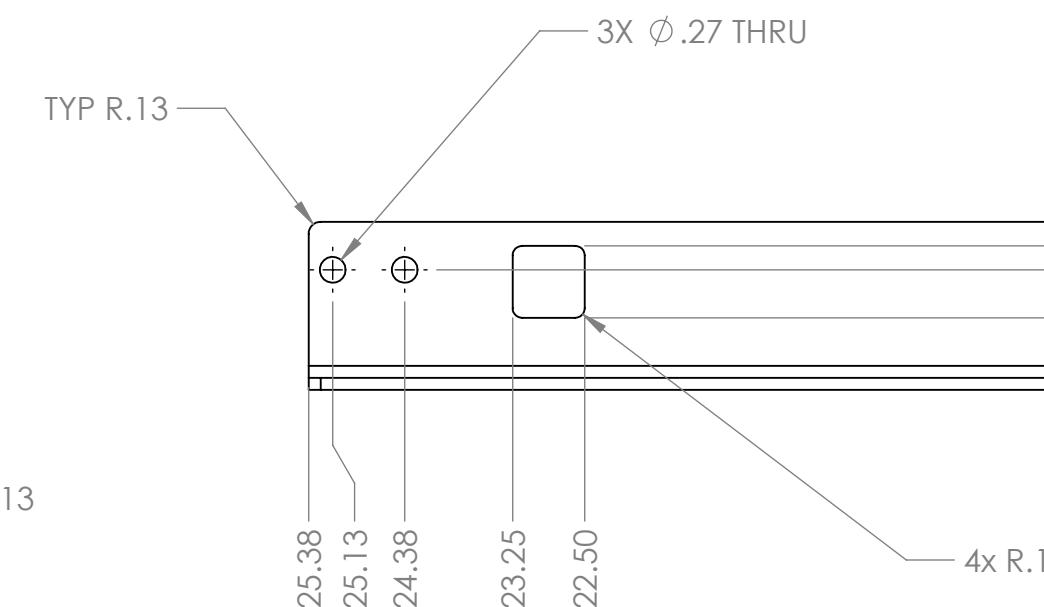
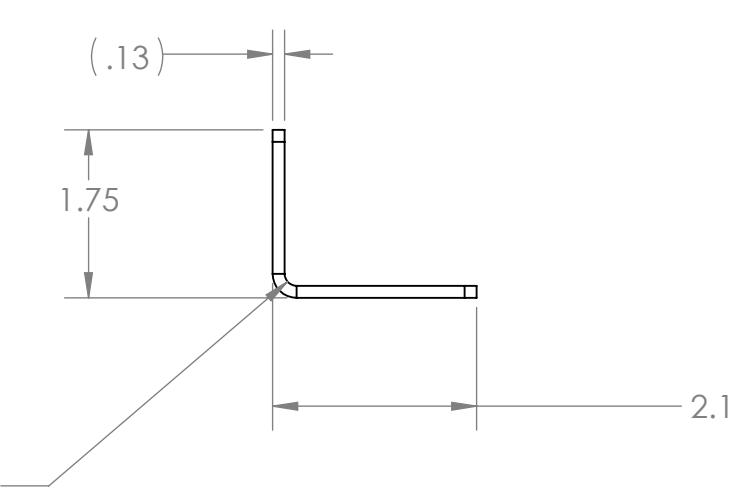
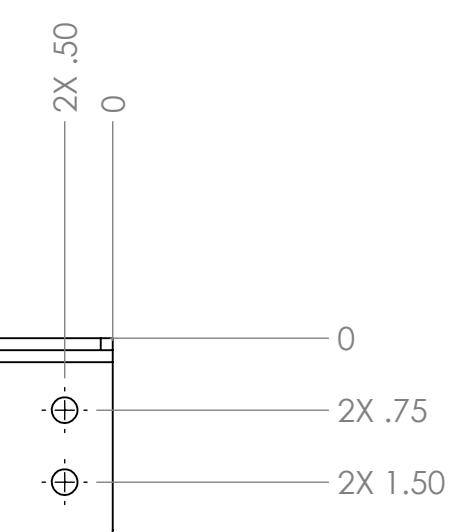
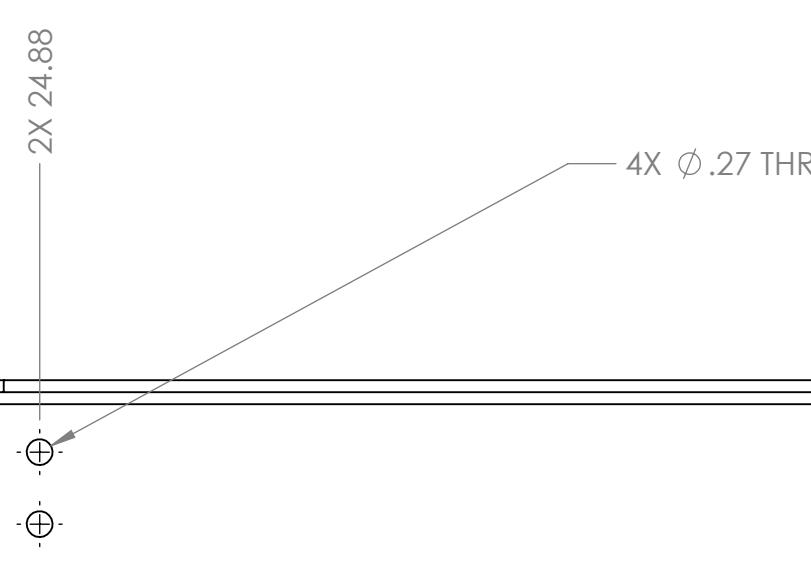
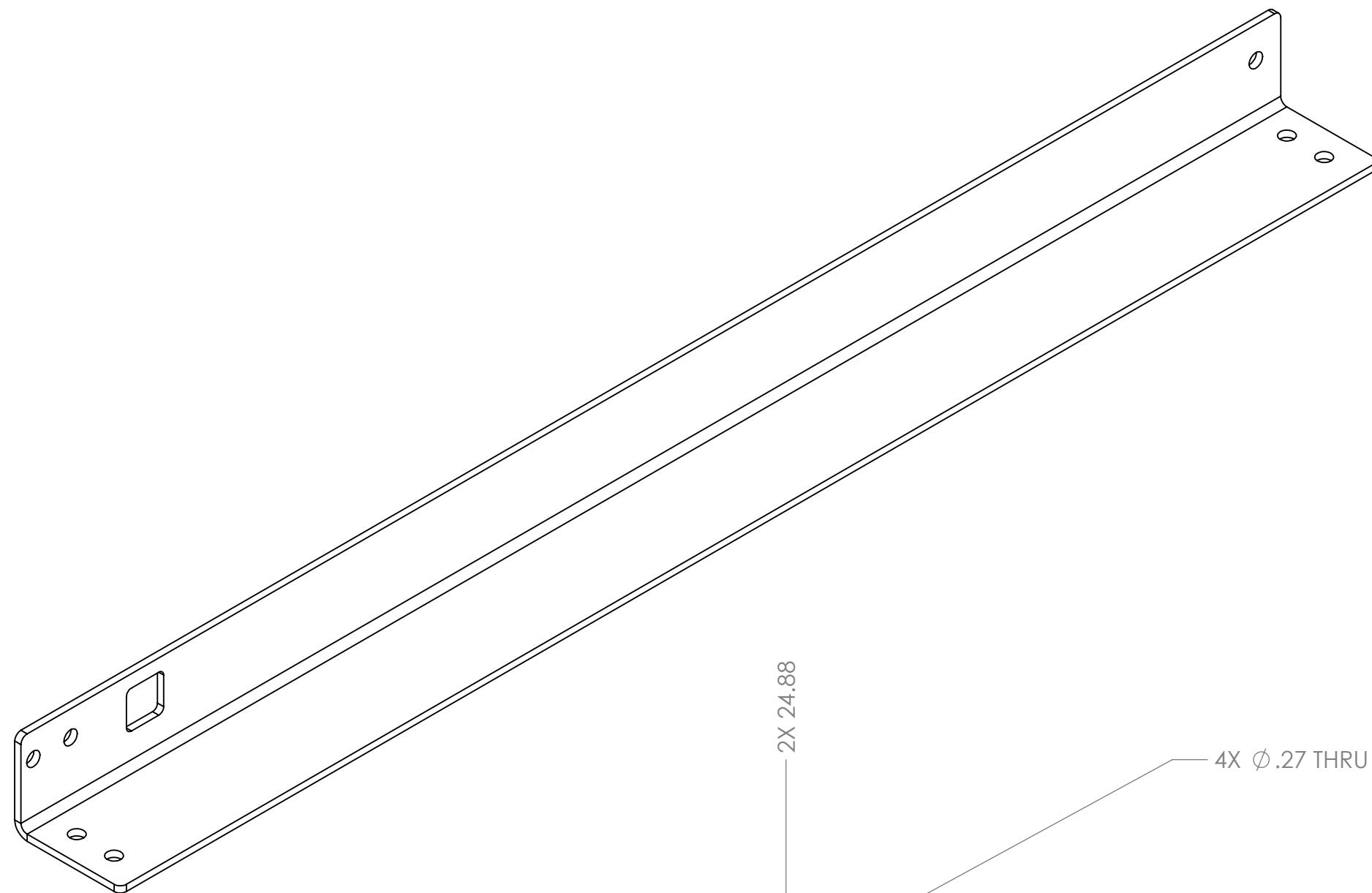
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LABEL WITH PART NUMBER

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 $\pm .010$

MATERIAL/FINISH:

8 GA 5052 AL

DO NOT SCALE DRAWING

BEND NAME DATE

DRAWN NE 10/13/2022

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COMMENTS:

REMOVE ALL BURRS AND SHARP EDGES.

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS

Modeling Solutions Partner

TITLE: Red Chute Top Connector

SIZE DWG. NO. REV

C GE-23292

SCALE: 1:2 SHEET 1 OF 1

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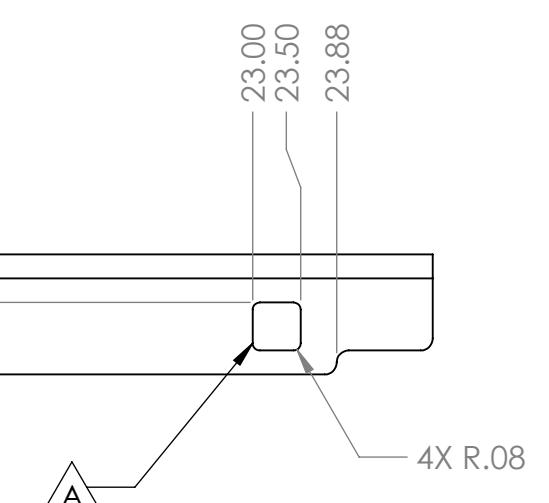
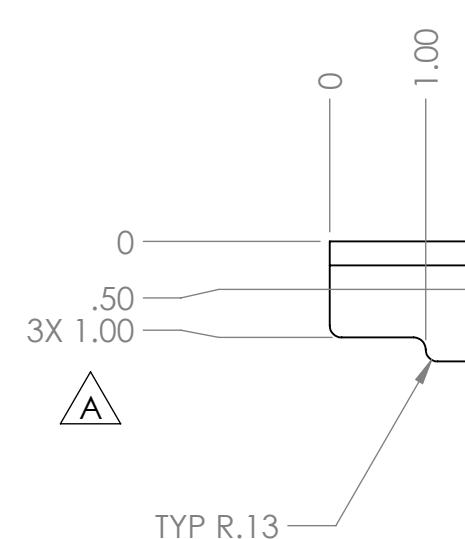
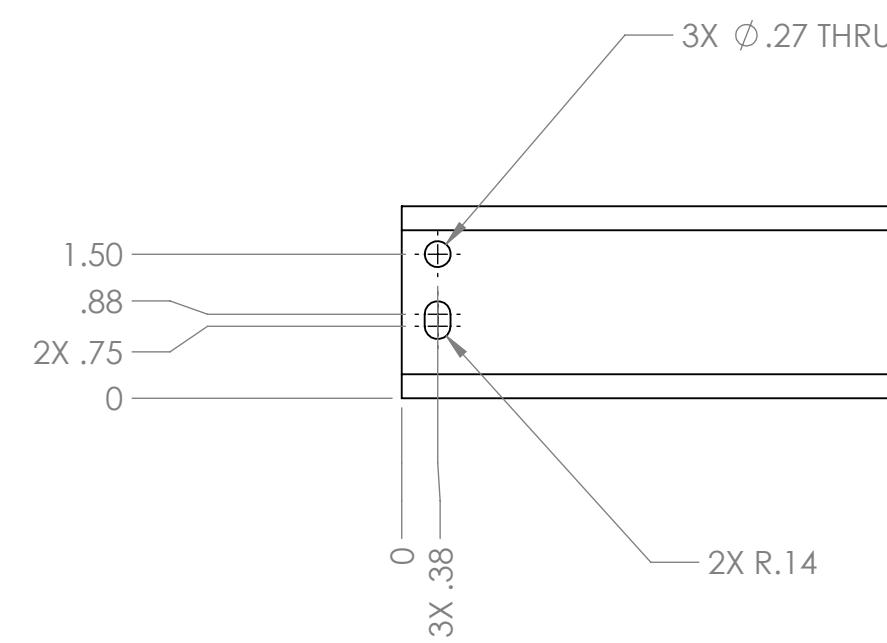
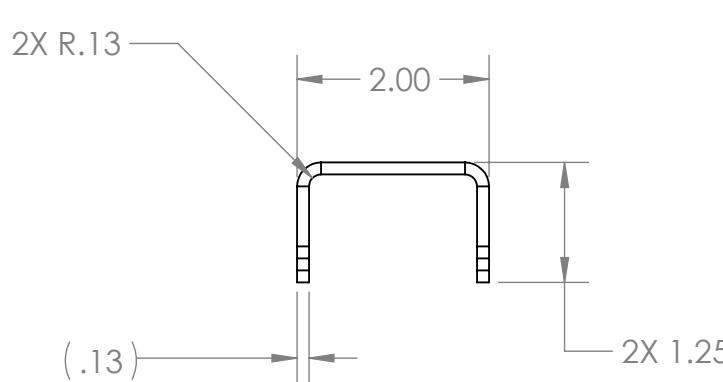
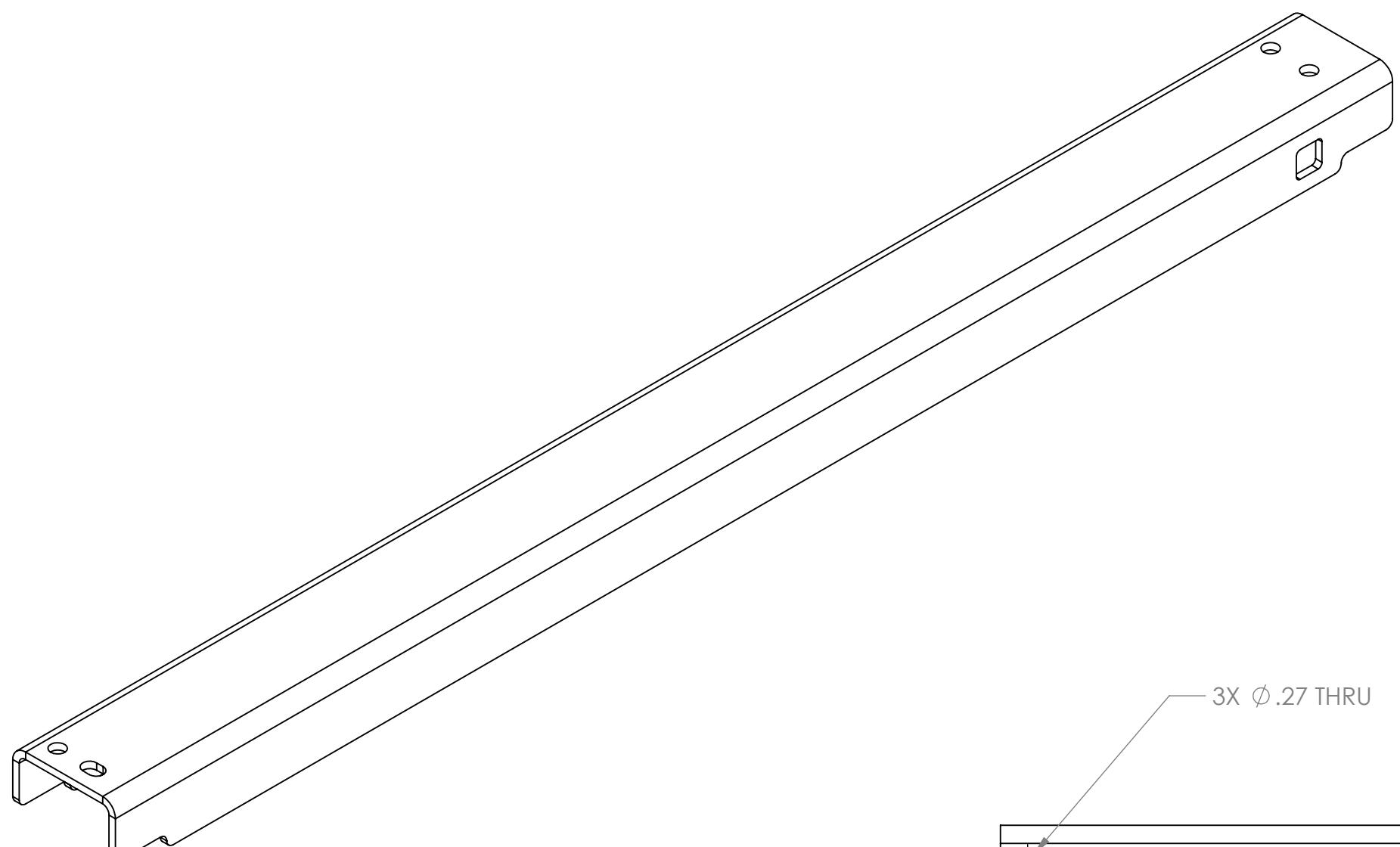
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LABEL WITH PART NUMBER



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 $\pm .010$ **MATERIAL/FINISH:**

8 GA 5052 AL

DO NOT SCALE DRAWING

BEND NAME DATE

DRAWN NE 10/13/2022

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SOLIDWORKS Modeling Solutions Partner

TITLE: Red Crossbeam

SIZE DWG. NO. REV

C GE-23293 A

SCALE: 1:2 SHEET 1 OF 1

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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23261	Ramp Front Rail with PEMs	1
2	GE-23262	Ramp Back Rail with PEMs	1
3	GE-23264	Ramp Side Fence Rail	1
4	GE-23265	Chute Floor	1
5	GE-23295	Red Ramp HP Side With PEMs	1
6	hex_.25_20_0.75	Steel Hex Head Screw, 1/4"-20 x 0.75" long, fully threaded	10
7	nylock_.25_20	Steel Nylon-Insert Locknut, 1/4"-20	10

UNLESS OTHERWISE SPECIFIED: FIELD NAME DATE
DRAWN NE 12/27/2022

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:
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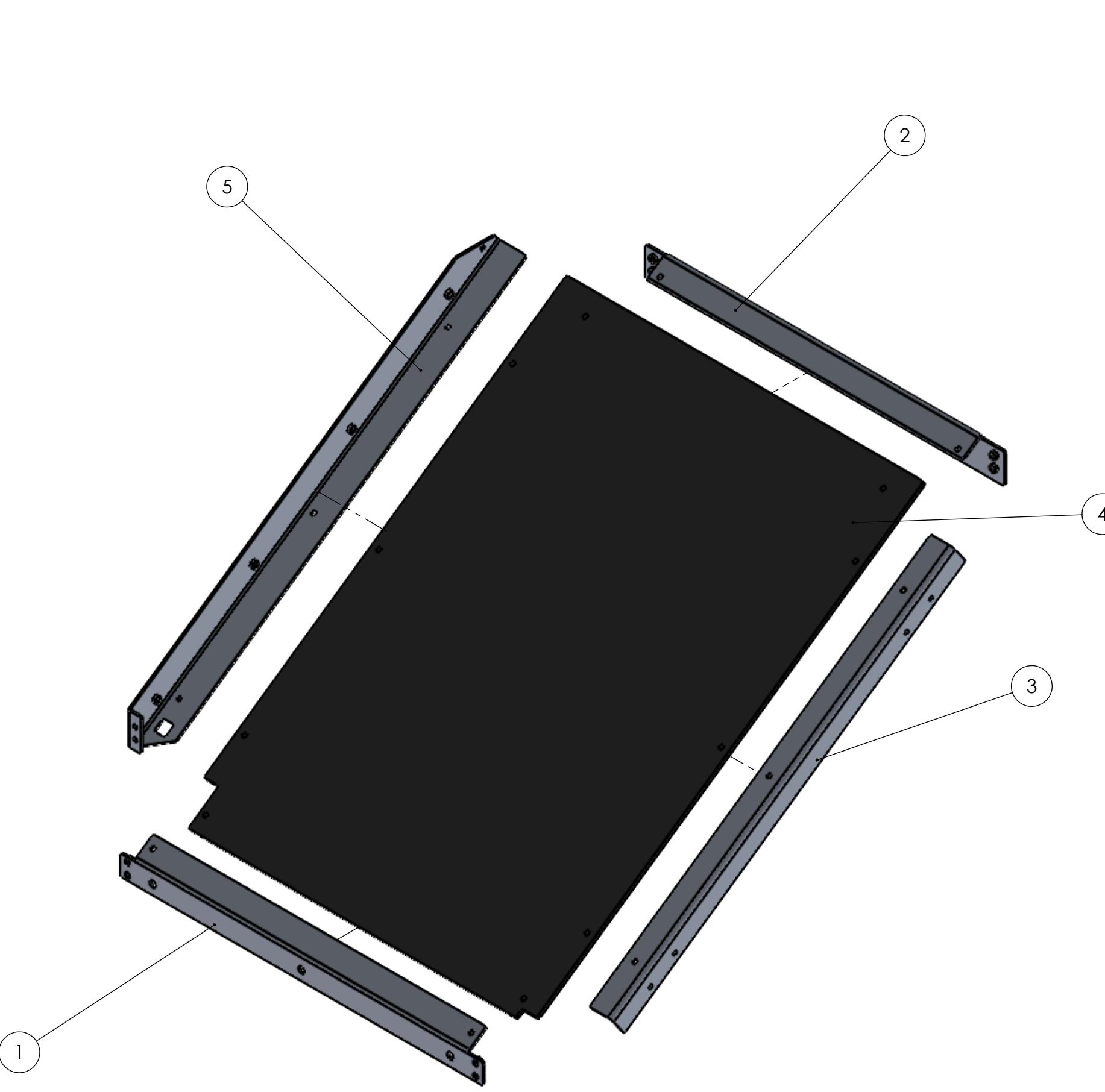
DO NOT SCALE DRAWING

FIRST ROBOTICS COMPETITION
SOLIDWORKS
Modeling Solutions Partner

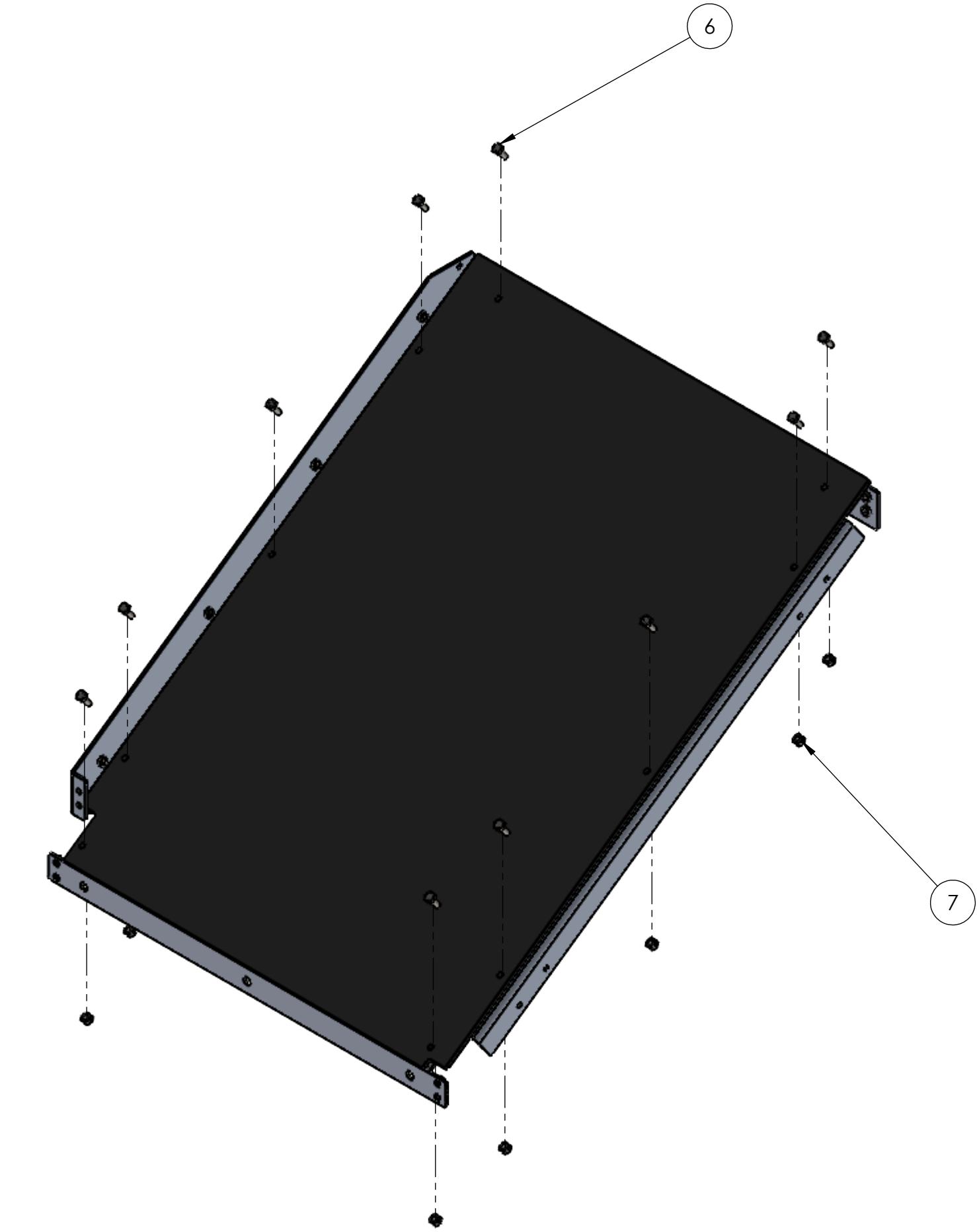
TITLE: Red Ramp Assembly

SIZE DWG. NO. REV
C GE-23294

SCALE: 1:3 SHEET 1 OF 2



ATTACH (1), (2), (3), AND (5) TO (4) WITH 10 OF (6) AND 10 OF (7)



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	NE	12/27/2022

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

TITLE:
**Red Ramp
Assembly**

SIZE DWG. NO. REV

C GE-23294

SCALE: 2:11 SHEET 2 OF 2

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23295-01	Red Ramp HP Side	1
2	pem_clinchnut_.25_20 .054	1/4-20 self-clinching nut, .054 shank	4

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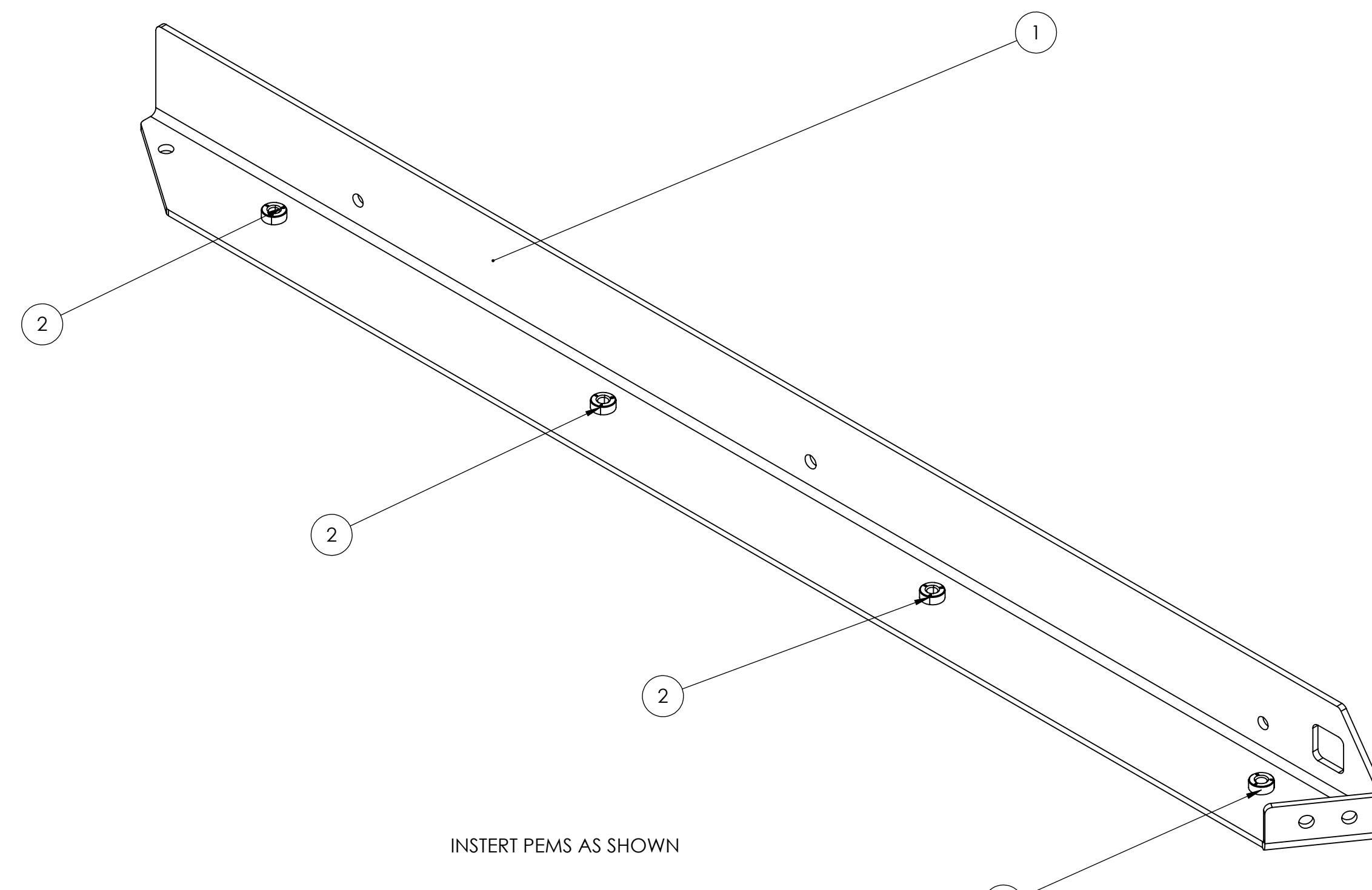
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LABEL WITH PART NUMBER

UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	NE	10/13/2022
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:	COMMENTS:		
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DO NOT SCALE DRAWING			

FIRST ROBOTICS COMPETITION Modeling Solutions Partner

Red Ramp HP Side With PEMs

C GE-23295

SCALE: 1:2 SHEET 1 OF 1

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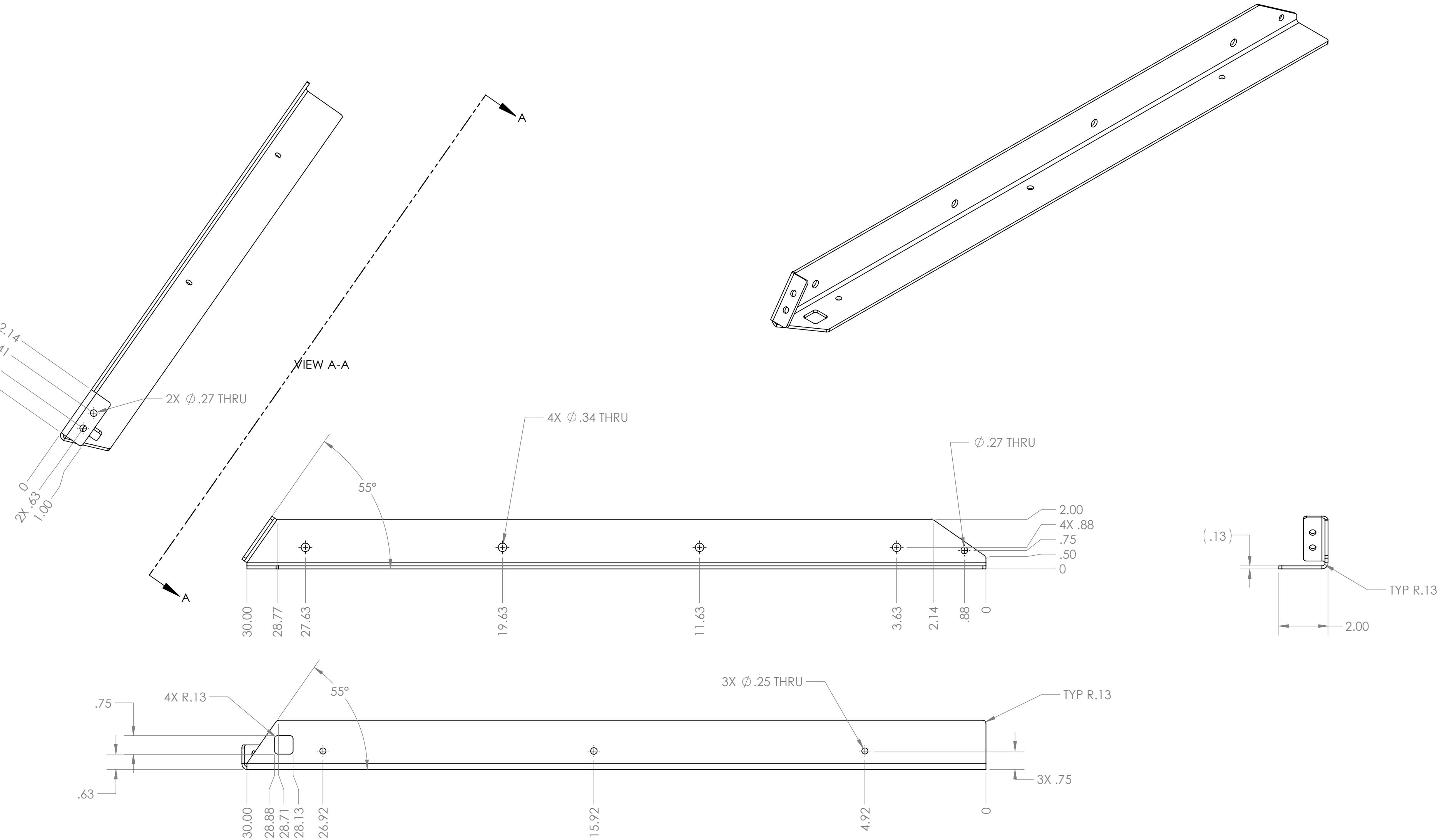
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DRAWN	NE	10/13/2022	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH: 8 GA 5052 AL			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
Red Ramp HP
Side

SIZE DWG. NO. REV
C GE-23295-01

SCALE: 1:3 SHEET 1 OF 1

4

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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23223	Floor Anchor	1
2	GE-23284	Red Primary Vertical With PEMs	1
3	GE-23286	Red Lower Corner Bracket	1
4	GE-23288	Red Tertiary Vertical With PEMs	1
5	rivet_.1875_.126-.25	3/16" Rivet, .126-.25 Grip Range	9

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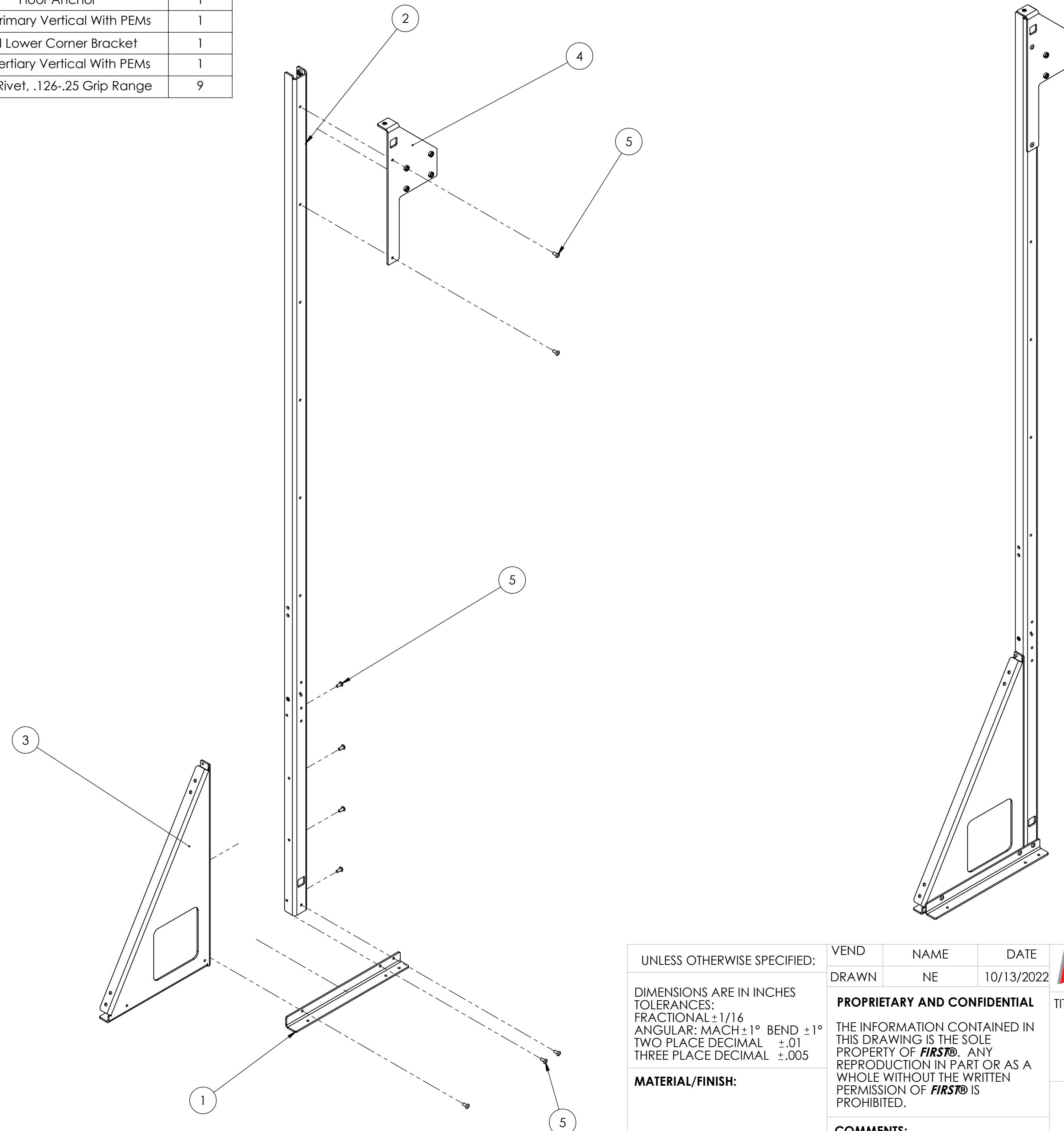
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UNLESS OTHERWISE SPECIFIED:

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:

DO NOT SCALE DRAWING

VEND NAME DATE

DRAWN NE 10/13/2022

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COMMENTS:

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FIRST ROBOTICS COMPETITION SOLIDWORKS Modeling Solutions Partner

TITLE: **Red Corner Vertical W/O Pin**

SIZE DWG. NO. REV
C GE-23297

SCALE: 1:6 SHEET 1 OF 1

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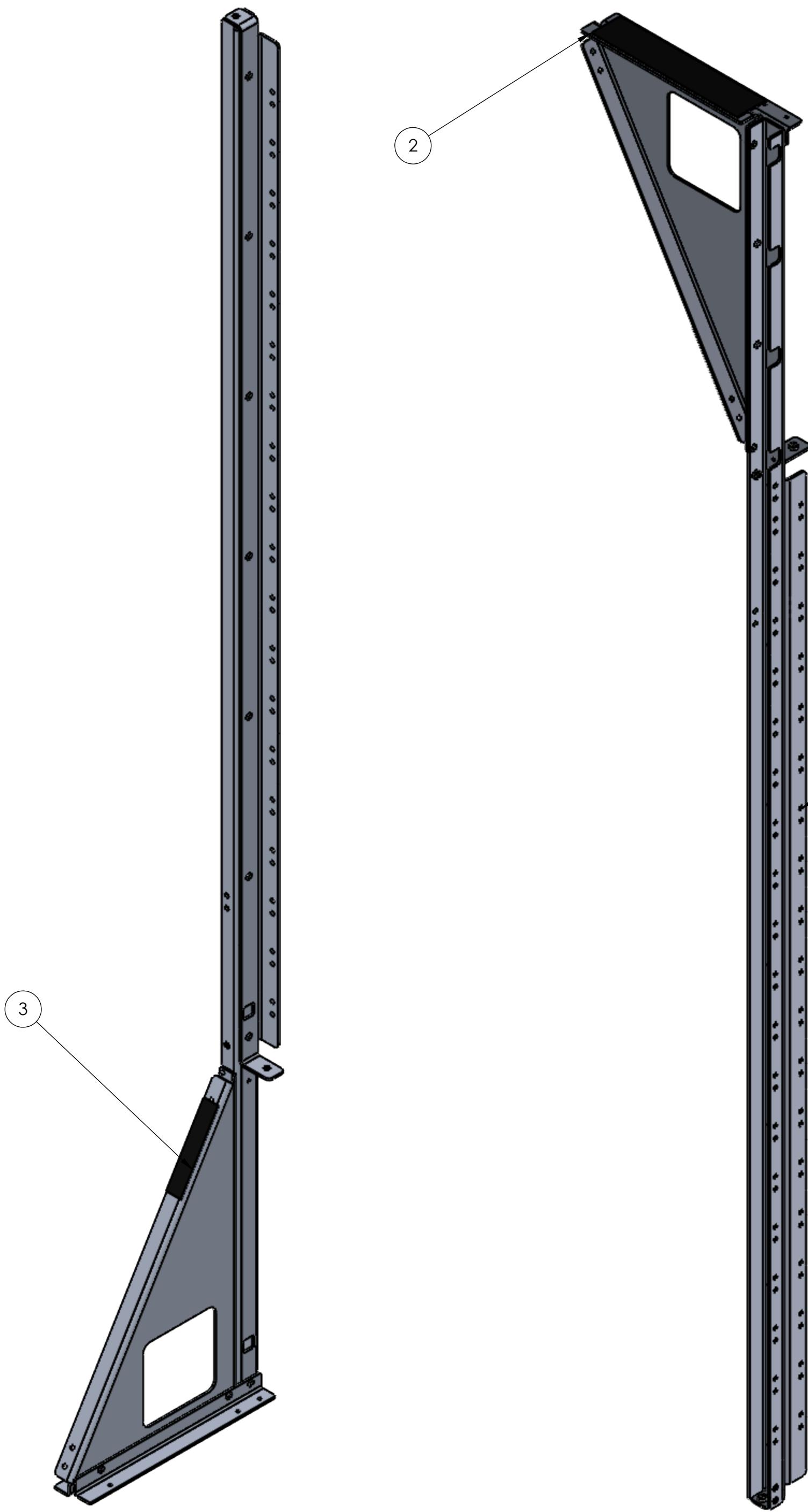
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23283	Red Standard Vertical	1
2	Hook_2_10	2" x 10" Hook, Adhesive Backed	1
3	Hook_1_5	1" x 5" Hook, Adhesive Backed	1

UNLESS OTHERWISE SPECIFIED:			FIELD	NAME	DATE
			DRAWN	NE	1/3/2023
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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: Red Standard Vertical With Hook
 SIZE DWG. NO. REV
C GE-23298
 SCALE: 1:5 SHEET 1 OF 1

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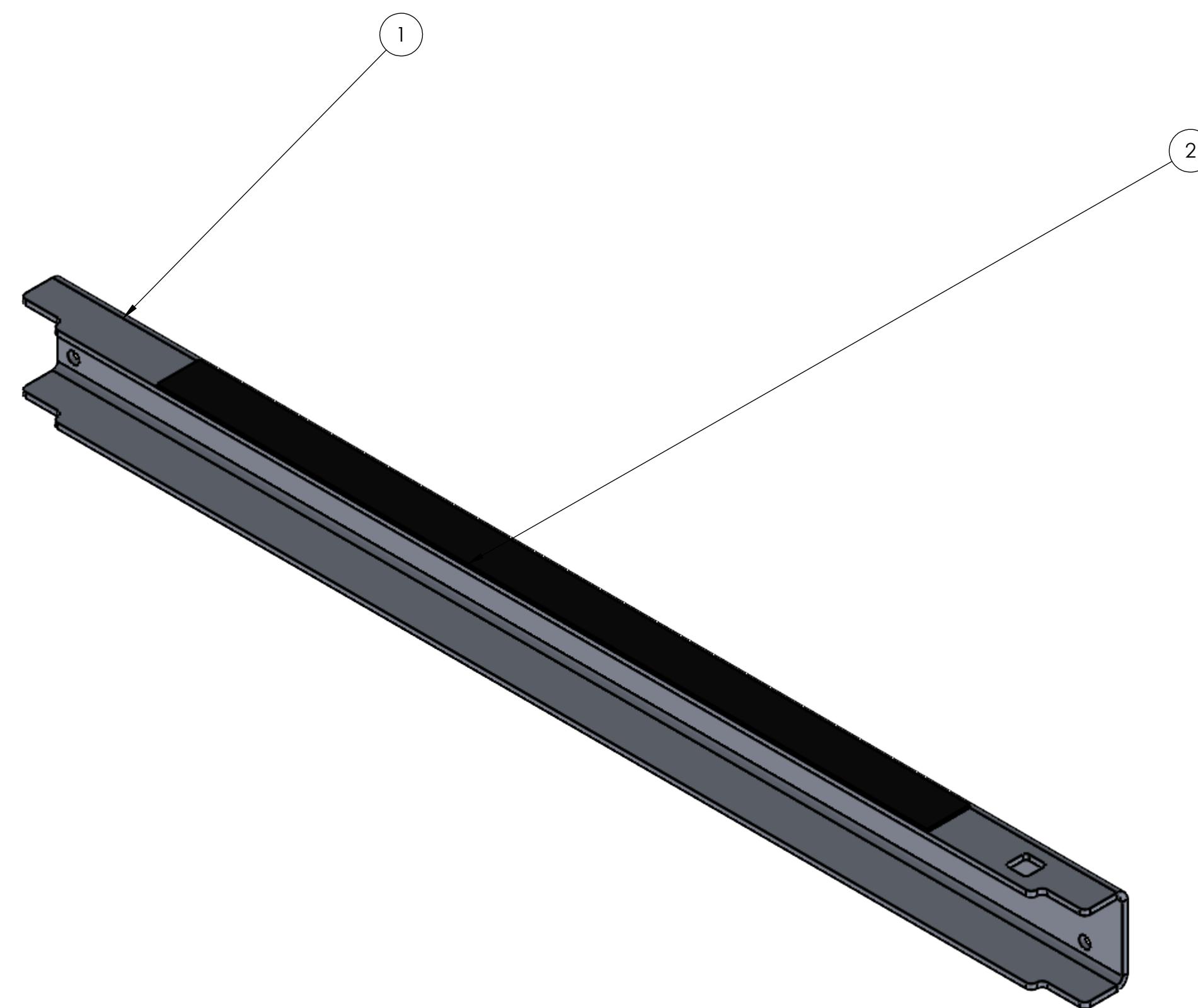
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23293	Red Crossbeam	1
2	Loop_1_18	1" x 18" Loop, Adhesive Backed	1

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	NE	1/3/2023

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

TITLE: **Red Crossbeam
With Loop**

SIZE DWG. NO. REV
C GE-23299

SCALE: 1:2 SHEET 1 OF 1

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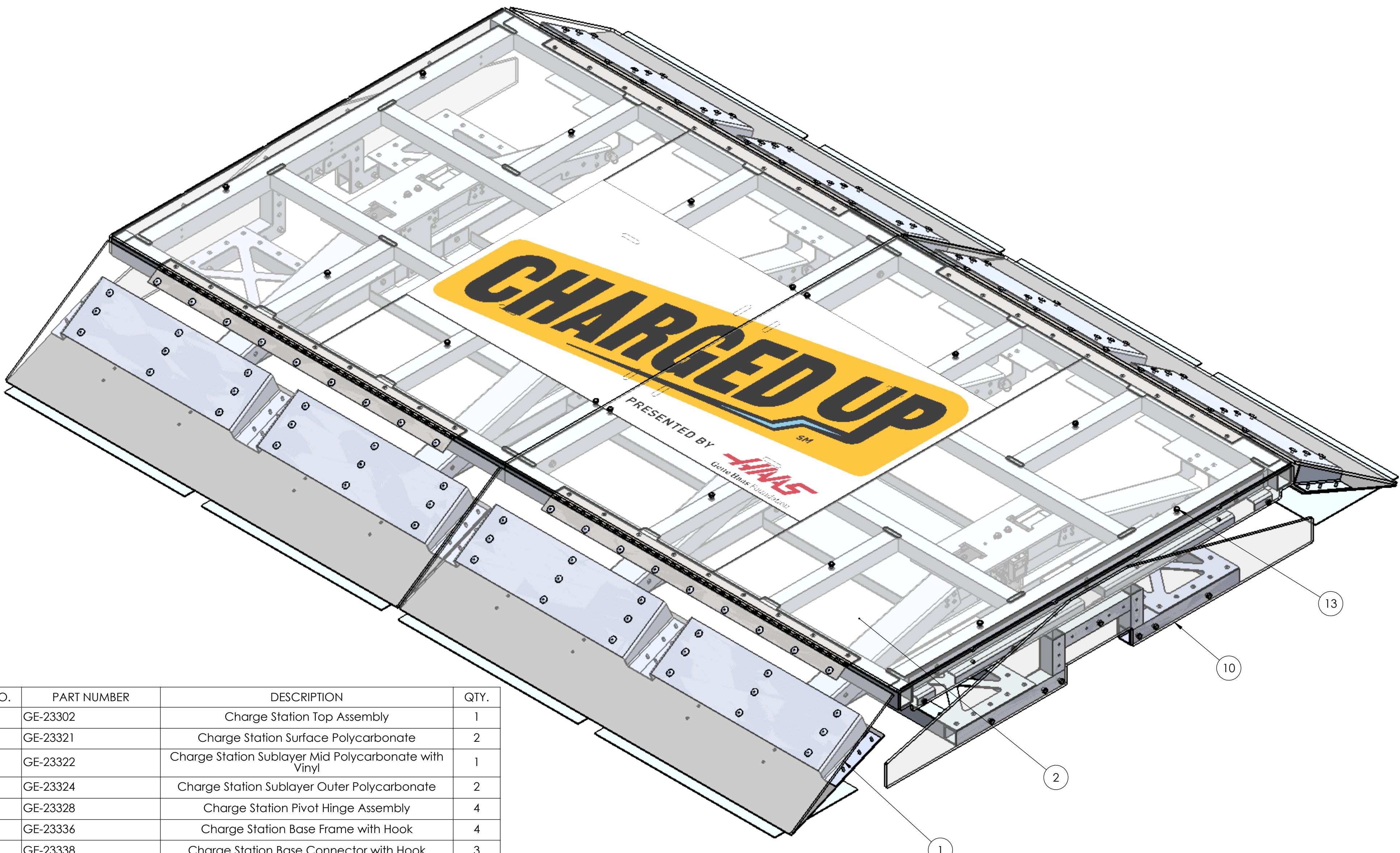
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23302	Charge Station Top Assembly	1
2	GE-23321	Charge Station Surface Polycarbonate	2
3	GE-23322	Charge Station Sublayer Mid Polycarbonate with Vinyl	1
4	GE-23324	Charge Station Sublayer Outer Polycarbonate	2
5	GE-23328	Charge Station Pivot Hinge Assembly	4
6	GE-23336	Charge Station Base Frame with Hook	4
7	GE-23338	Charge Station Base Connector with Hook	3
8	GE-23340	Charge Station Ramp Support with Hook	8
9	GE-23342	Charge Station Sensor Assembly	2
10	GE-23346	Charge Station Side Plastic Assembly	2
11	GE-23353	Charge Station Side Plastic Locator	4
12	hex_.25_20_0.75	Steel Hex Head Screw, 1/4"-20 x 0.75" long, fully threaded	12
13	hex_.25_20_1	Steel Hex Head Screw, 1/4"-20 x 1" long, fully threaded	26
14	hex_.25_20_1.75_partial	Steel Hex Head Screw, 1/4"-20 x 1.75" long, partially threaded	16
15	nylock_.25_20	Steel Nylon-Insert Locknut, 1/4"-20	16
16	pin_quick_ring_.25_3.5	Pin, Ring-Grip Quick-Release with SS Ring, 1/4" Diameter, 3.5" Usable Length	8
17	washer_flat_.25	Flat Washer for 1/4" Screw	16

UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	CO	12/12/2022
TOLERANCES: FRACTIONAL $\pm 1/2$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .50$	PROPRIETARY AND CONFIDENTIAL		
MATERIAL/FINISH:	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

Charge Station

C GE-23300

SCALE: 1:6 SHEET 1 OF 6

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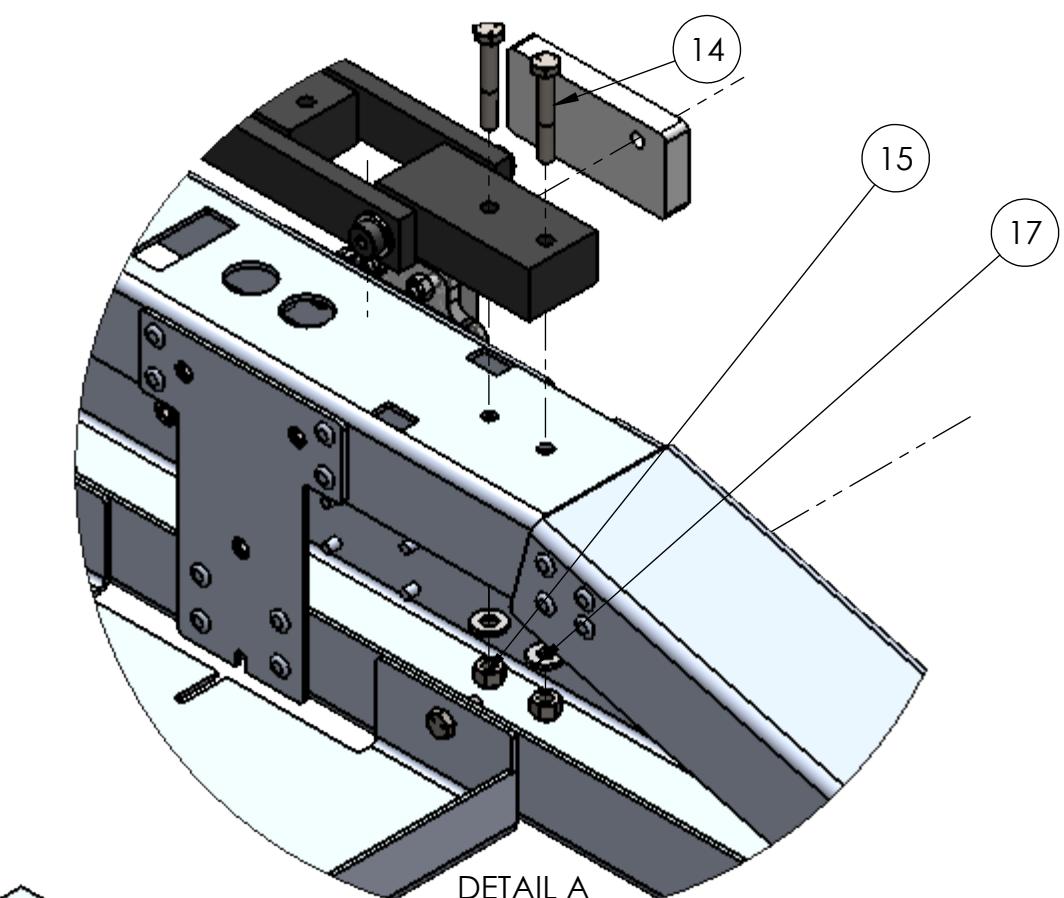
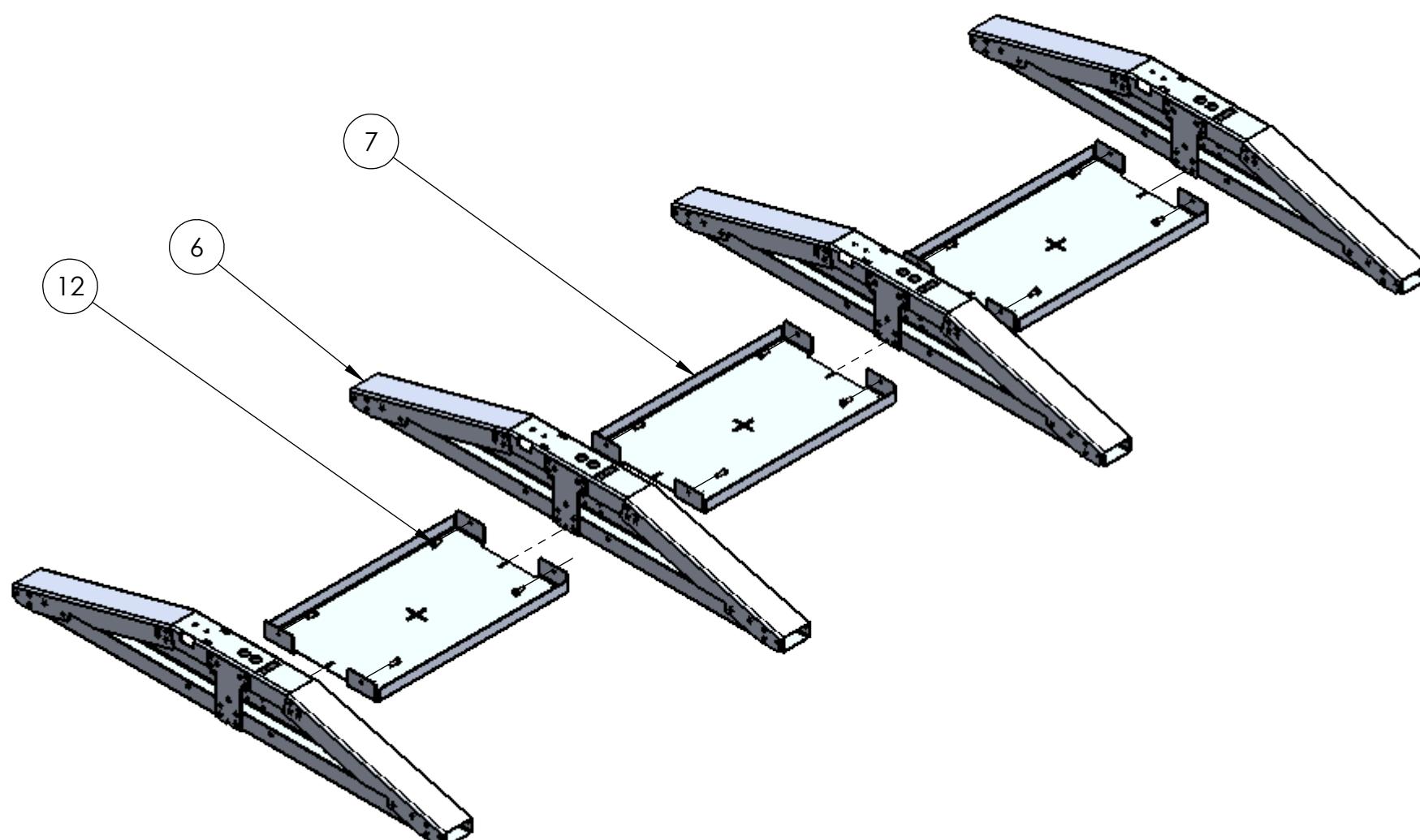
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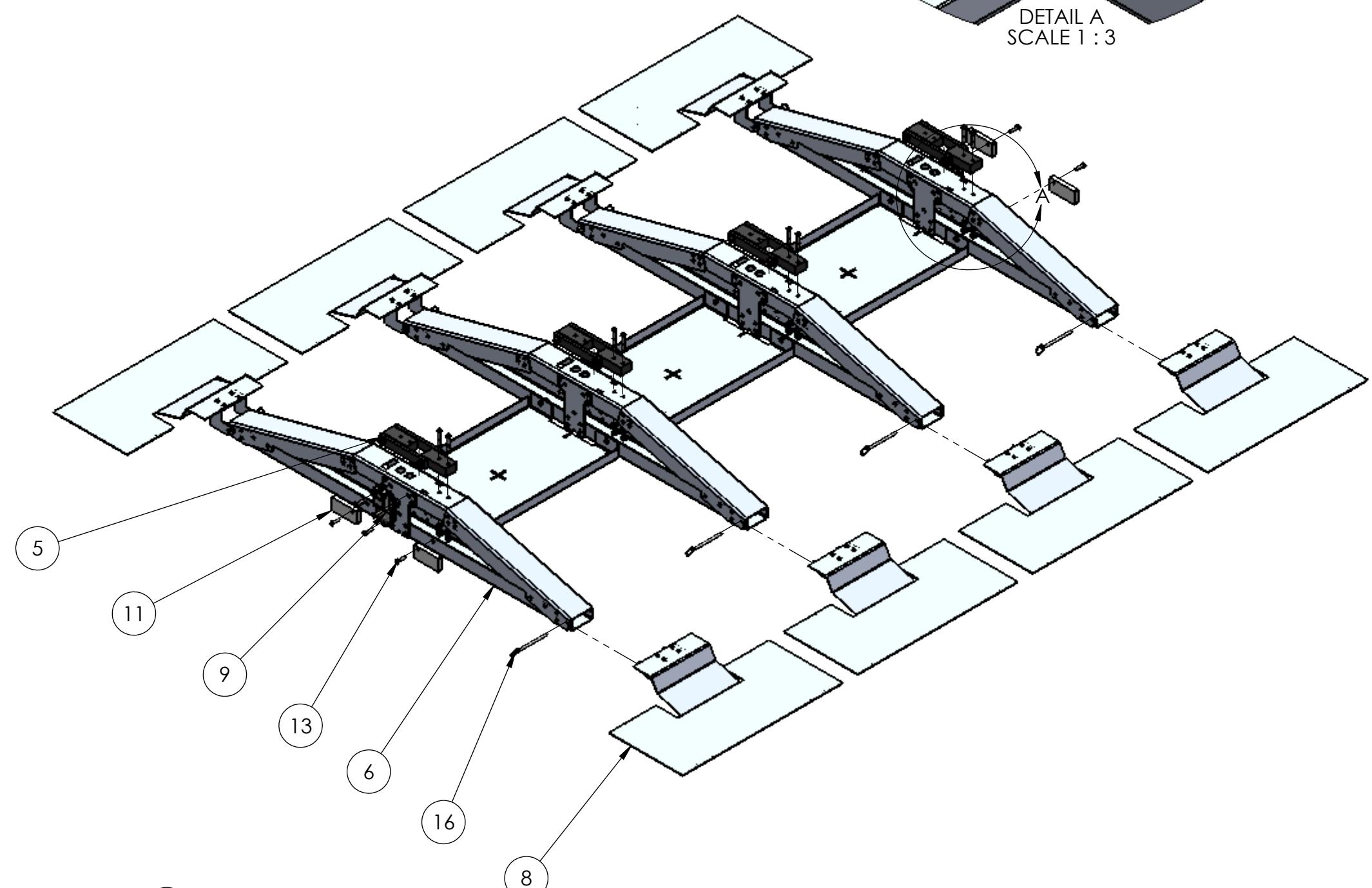


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Notes:

1. Attach (6) to (7) using (12).



Notes:

1. Attach (9) on each end of the assembly using (13).
2. Attach 2x (11) on each end of the assembly using (13).
3. Attach (8) using (16).
4. Attach (5) using (14), (15), and (17). Note orientation of (5) and cutouts on (6).

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	CO	12/12/2022
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MATERIAL/FINISH:	SIZE	DWG. NO.	REV
	C	GE-23300	
COMMENTS:	REMOVE ALL BURRS AND SHARP EDGES.		
DO NOT SCALE DRAWING	SCALE: 1:12 SHEET 2 OF 6		

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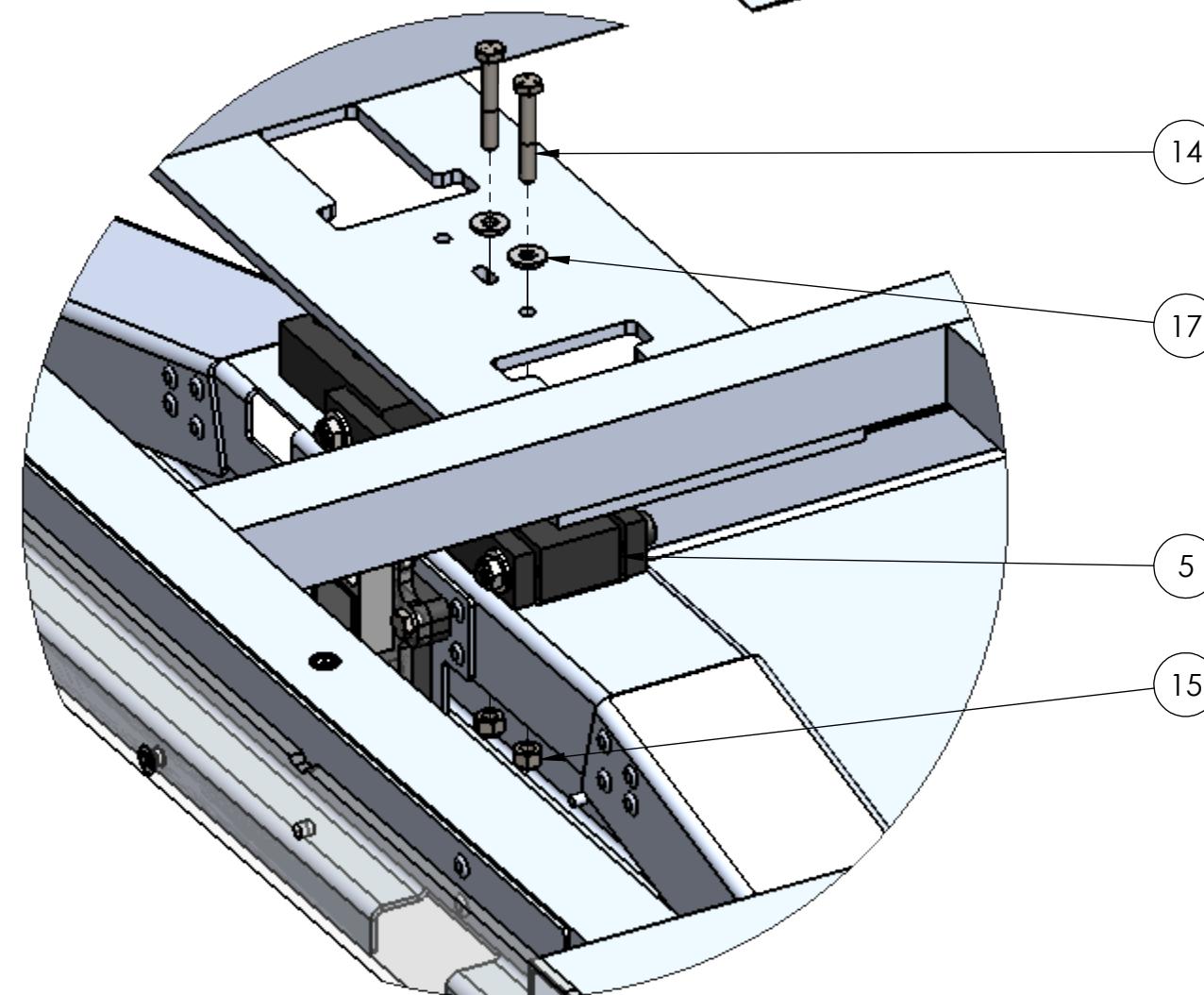
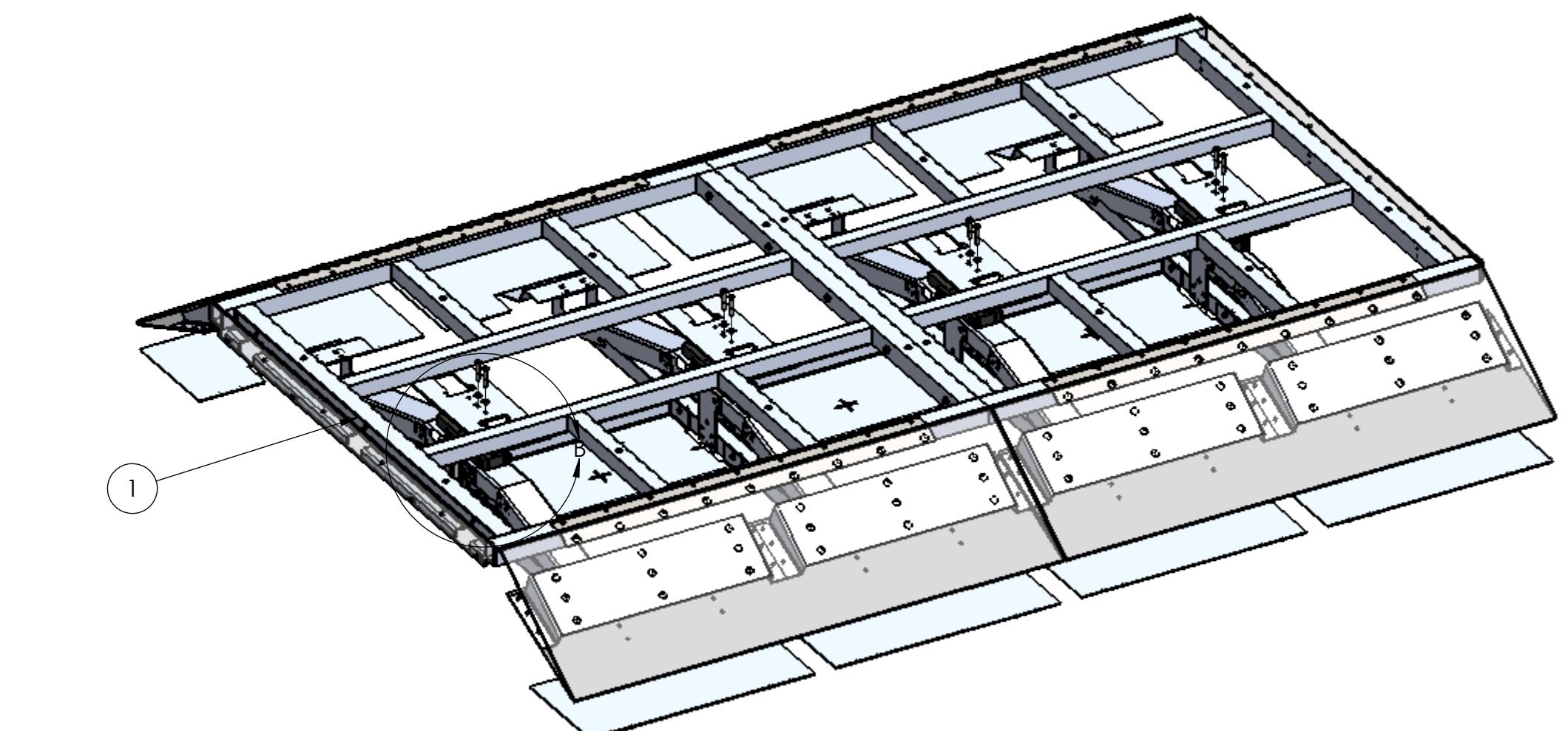
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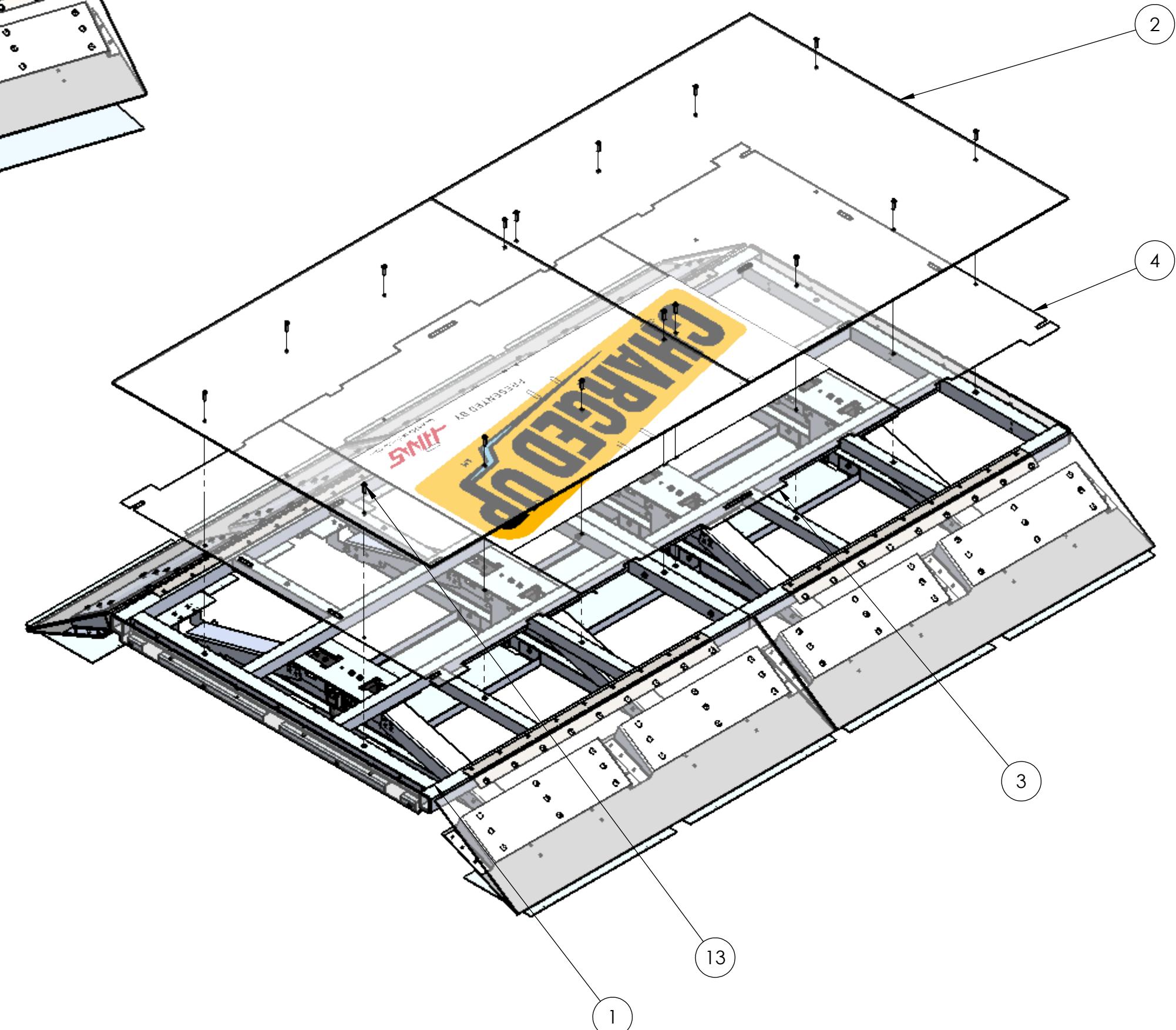
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DETAIL B
SCALE 1 : 3

Notes:

1. Attach (1) to assembly via (5) using (14), (17), and (15).



Notes:

1. Attach (2), (3), and (4) to (1) using (13).

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	CO	12/12/2022
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FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
Charge Station

SIZE DWG. NO. REV

C GE-23300

SCALE: 1:12 SHEET 3 OF 6

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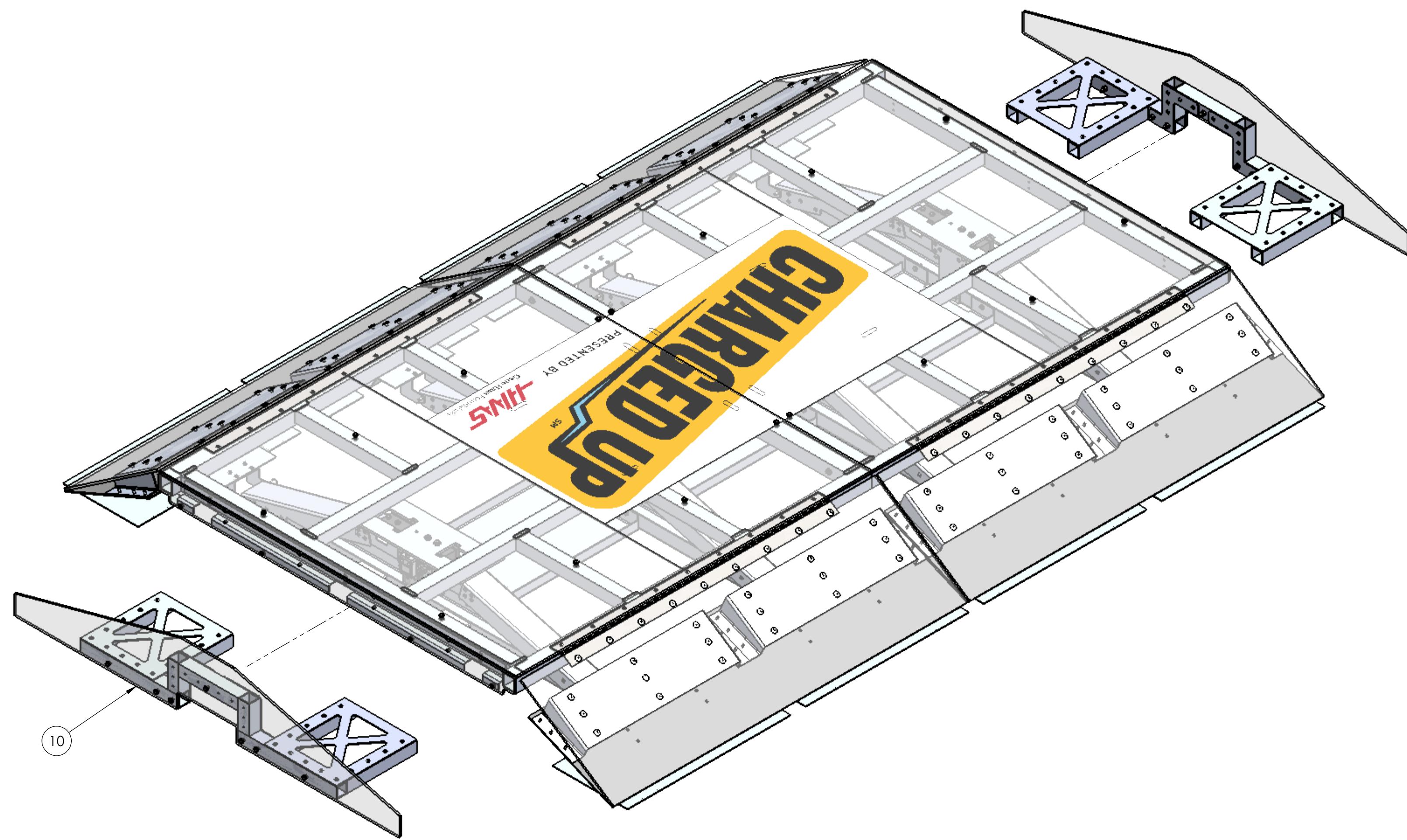
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Notes:

- Slide ⑩ into place on each side of the assembly.

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	CO	12/12/2022
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COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
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 **FIRST
ROBOTICS
COMPETITION**  SOLIDWORKS
Modeling Solutions Partner

TITLE:
Charge Station

SIZE DWG. NO. REV

C GE-23300

SCALE: 1:8 SHEET 4 OF 6

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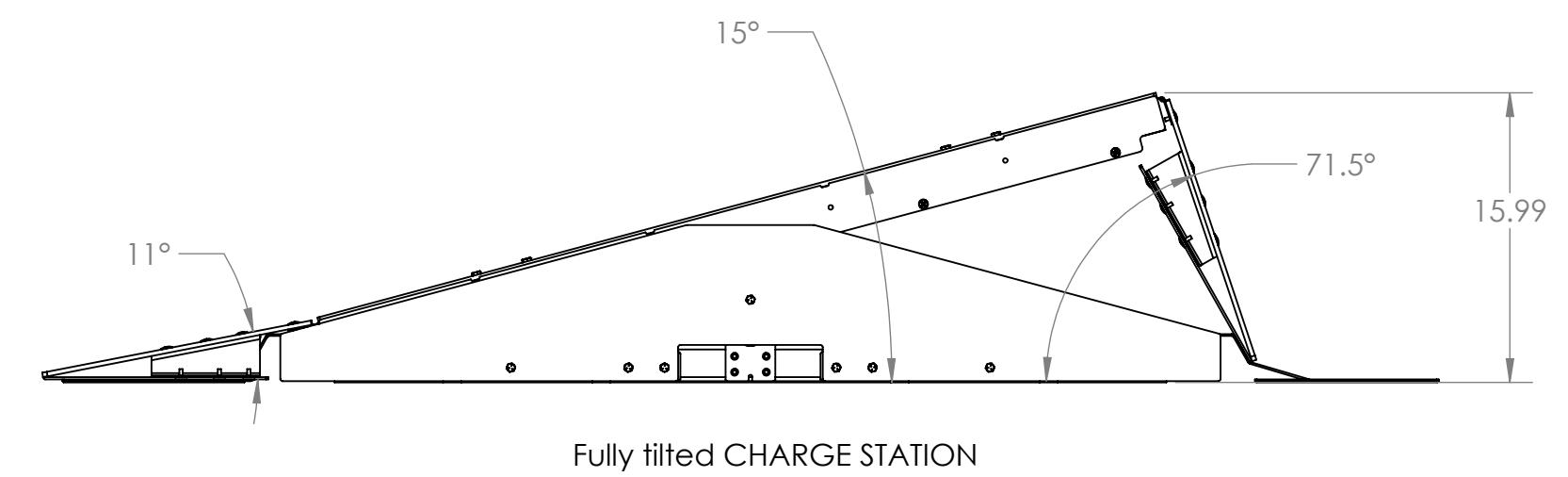
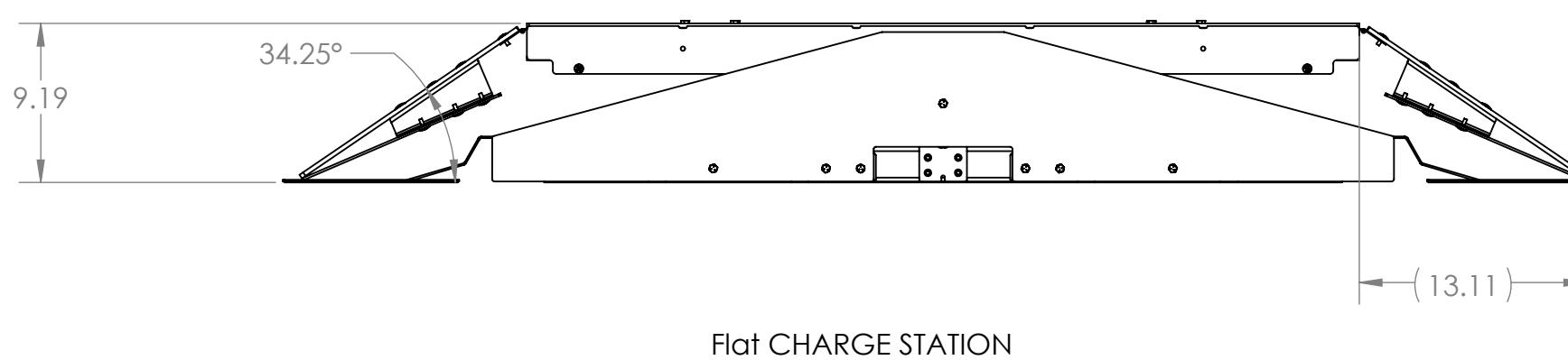
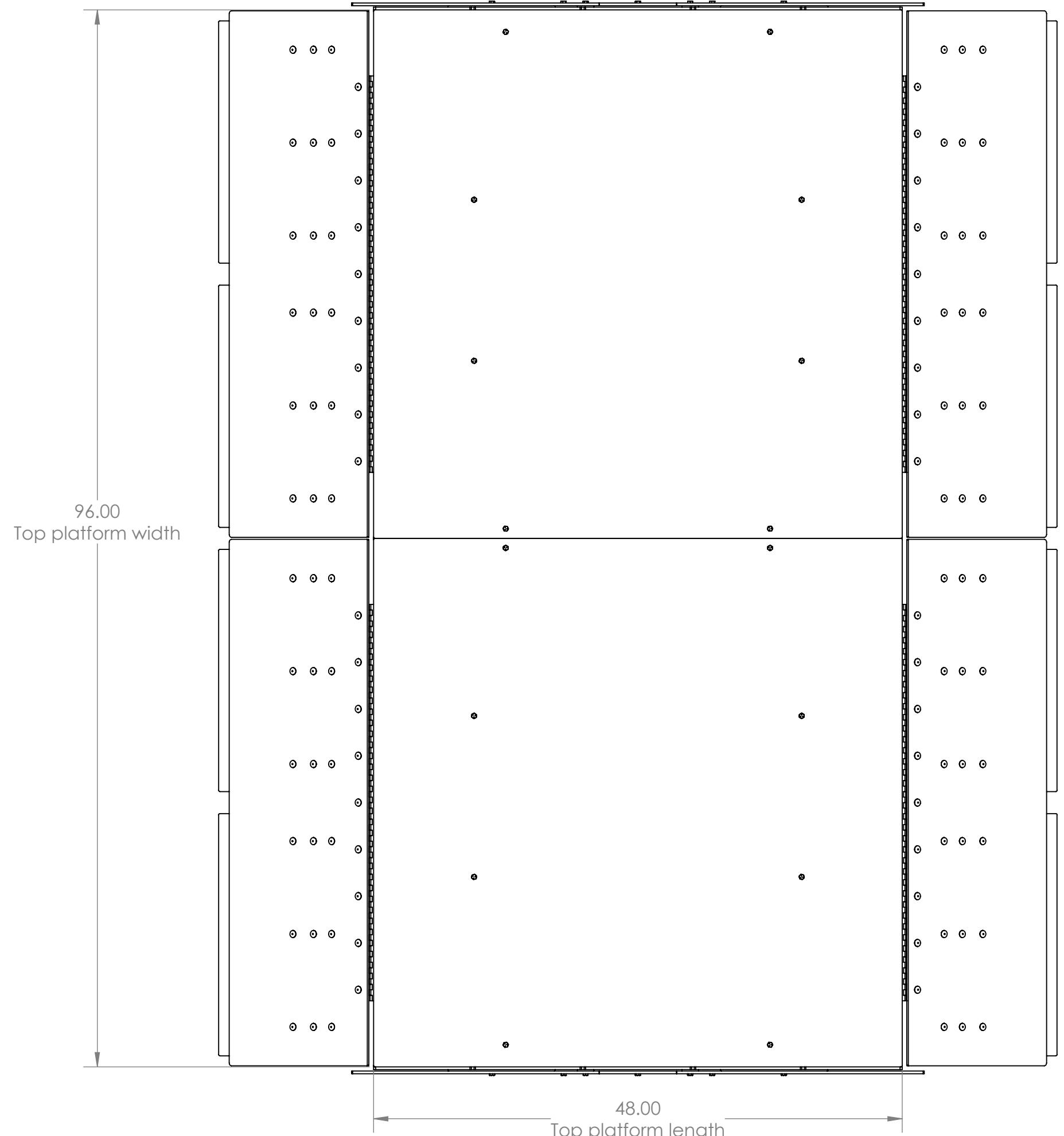
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DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL $\pm 1/2$
ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$
TWO PLACE DECIMAL $\pm .50$

MATERIAL/FINISH:
DO NOT SCALE DRAWING

FIELD NAME DATE
DRAWN CO 12/12/2022

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FIRST ROBOTICS COMPETITION
SOLIDWORKS
Modeling Solutions Partner

TITLE:
Charge Station

SIZE DWG. NO. REV

C GE-23300

SCALE: 1:10 SHEET 5 OF 6

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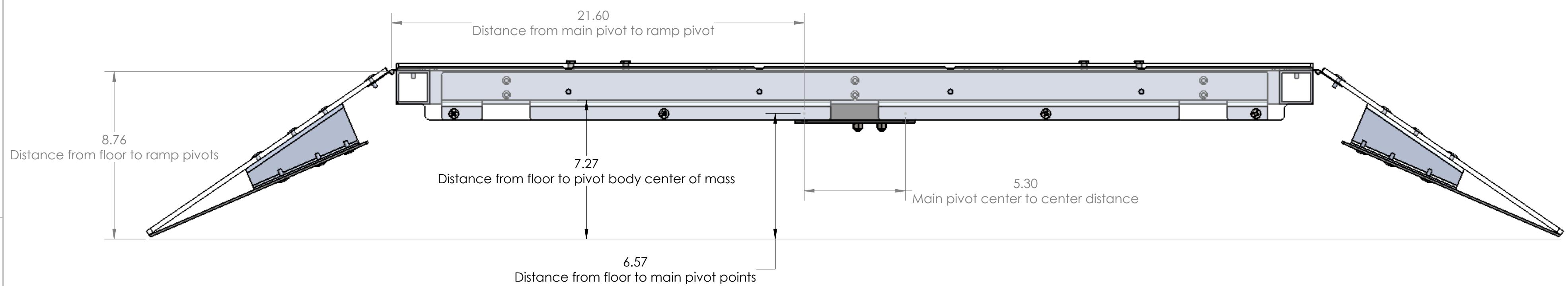
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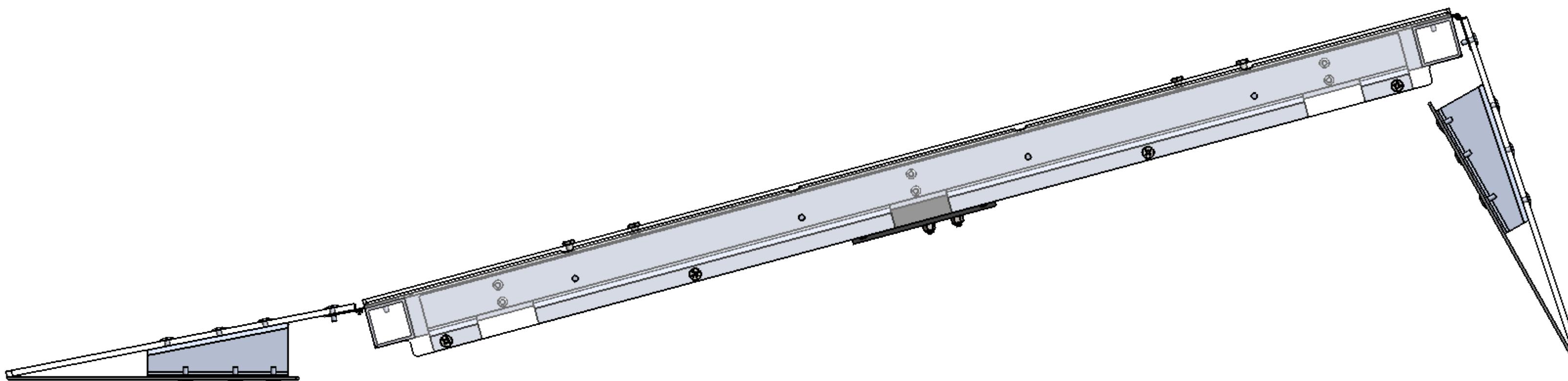
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**Notes:**

1. CAD-estimated weight of all pivoting components: 209 lbs.
2. CAD-estimated moment of inertia, calculated in orientation shown, rotating about center of mass: 84,156 lbs-in²
3. CAD-estimated moment of inertia, calculated in orientation shown, rotating about a double-hinge pivot: 85,788 lbs-in²

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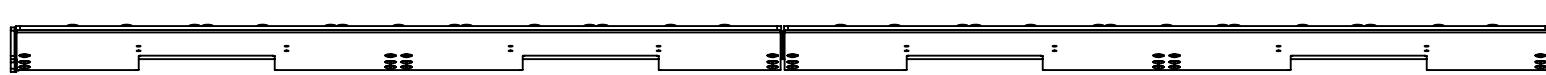
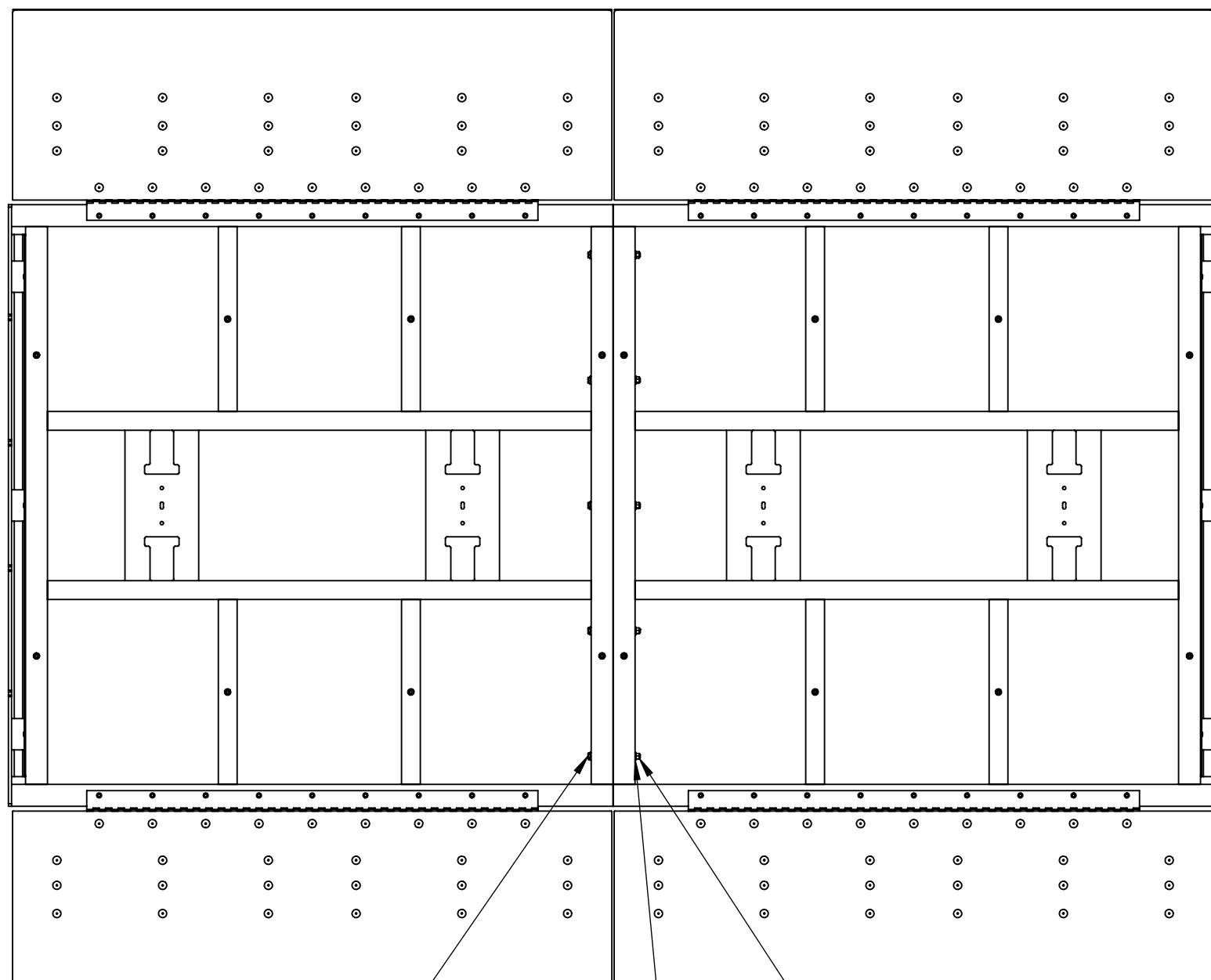
Notes:

1. CAD-estimated moment of inertia, calculated in orientation shown, rotating about active double-hinge pivot: 79024 lbs-in²

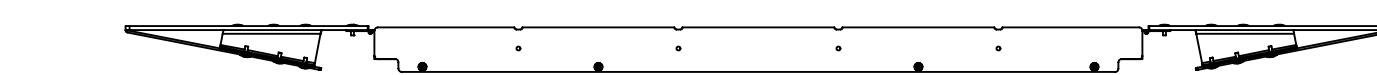
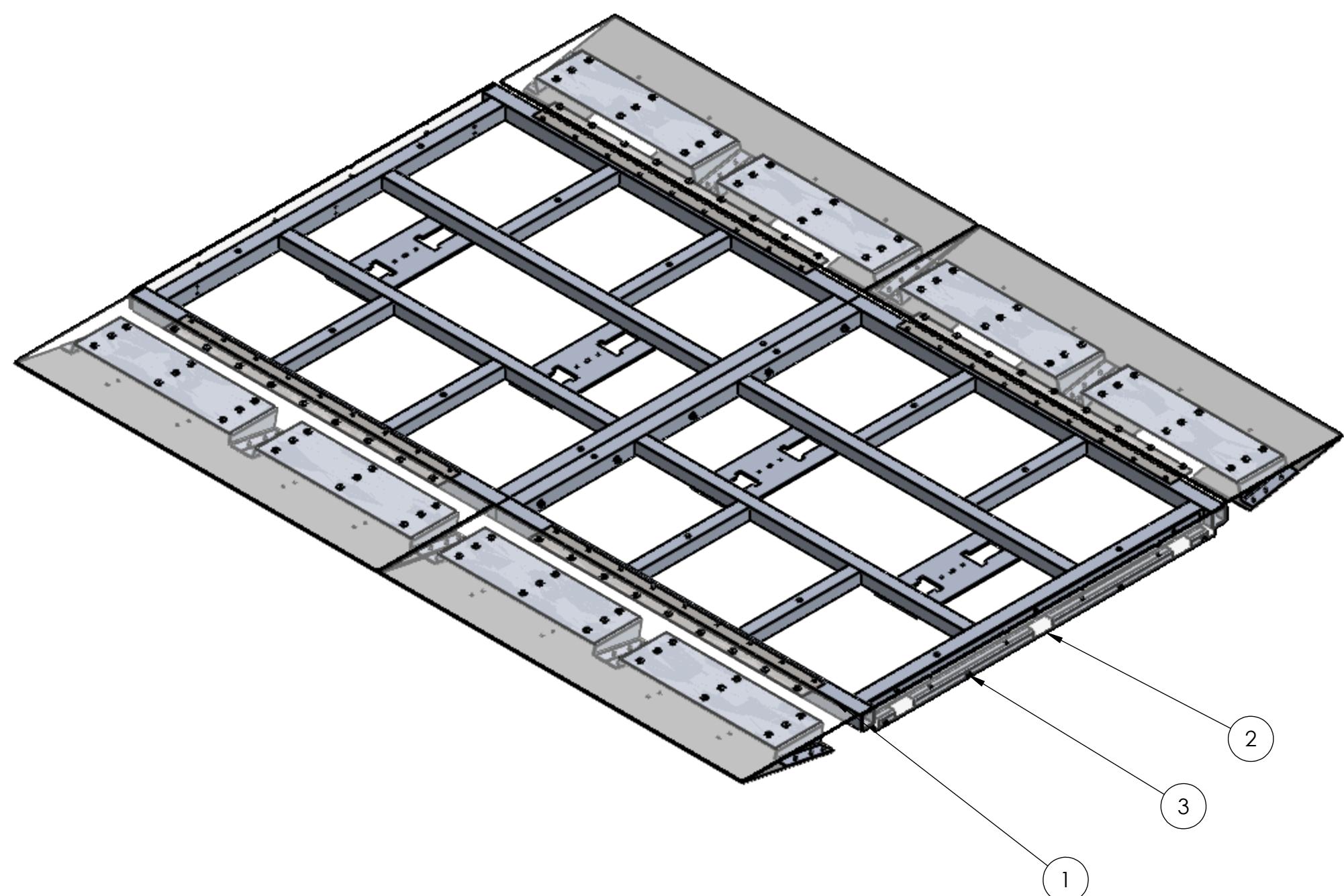
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UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DRAWN	CO	12/12/2022	
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MATERIAL/FINISH:			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			
FIRST ROBOTICS COMPETITION			
SOLIDWORKS Modeling Solutions Partner			
TITLE: Charge Station			
SIZE DWG. NO. REV			
C GE-23300			
SCALE: 1:4 SHEET 6 OF 6			



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23303	Charge Station Top Frame with Ramps	2
2	GE-23320	Charge Station Light Cover	2
3	flat_phil_.25_20_.625	Steel Phillips Flat Head Screw, 1/4"x20 x 5/8" long, fully threaded	8
4	hex_.25_20_4_partial	Steel Hex Head Bolt, 1/4-20 x 4", partially threaded	5
5	nylock_.25_20	Steel Nylon-Insert Locknut, 1/4"-20	5
6	washer_flat_.25	Flat Washer for 1/4" Screw	10



UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	CO	12/12/2022
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:	REV		
COMMENTS:	C GE-23302		
DO NOT SCALE DRAWING		SCALE: 1:12 SHEET 1 OF 2	

FIRST ROBOTICS COMPETITION SOLIDWORKS Modeling Solutions Partner

Title: Charge Station Top Assembly

Size: DWG. NO. **Rev:**

Comments: REMOVE ALL BURRS AND SHARP EDGES.

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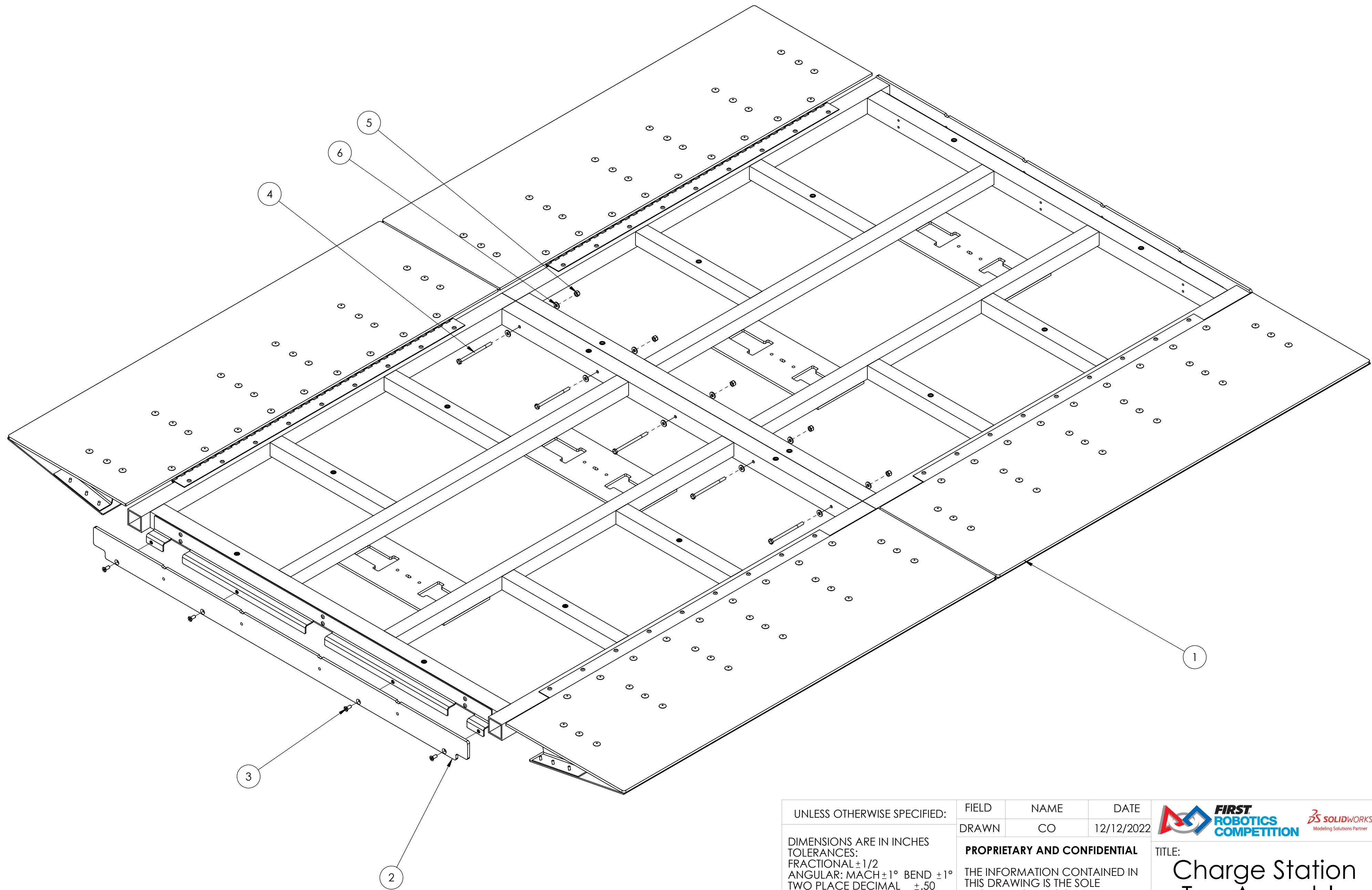
C

B

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A



Attach (1) frames together using (4), (5), and (6).

Attach (2) to each side of assembly using (3).

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	CO	12/12/2022
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:
**Charge Station
Top Assembly**

SIZE DWG. NO. REV

C GE-23302

SCALE: 1:6 SHEET 2 OF 2

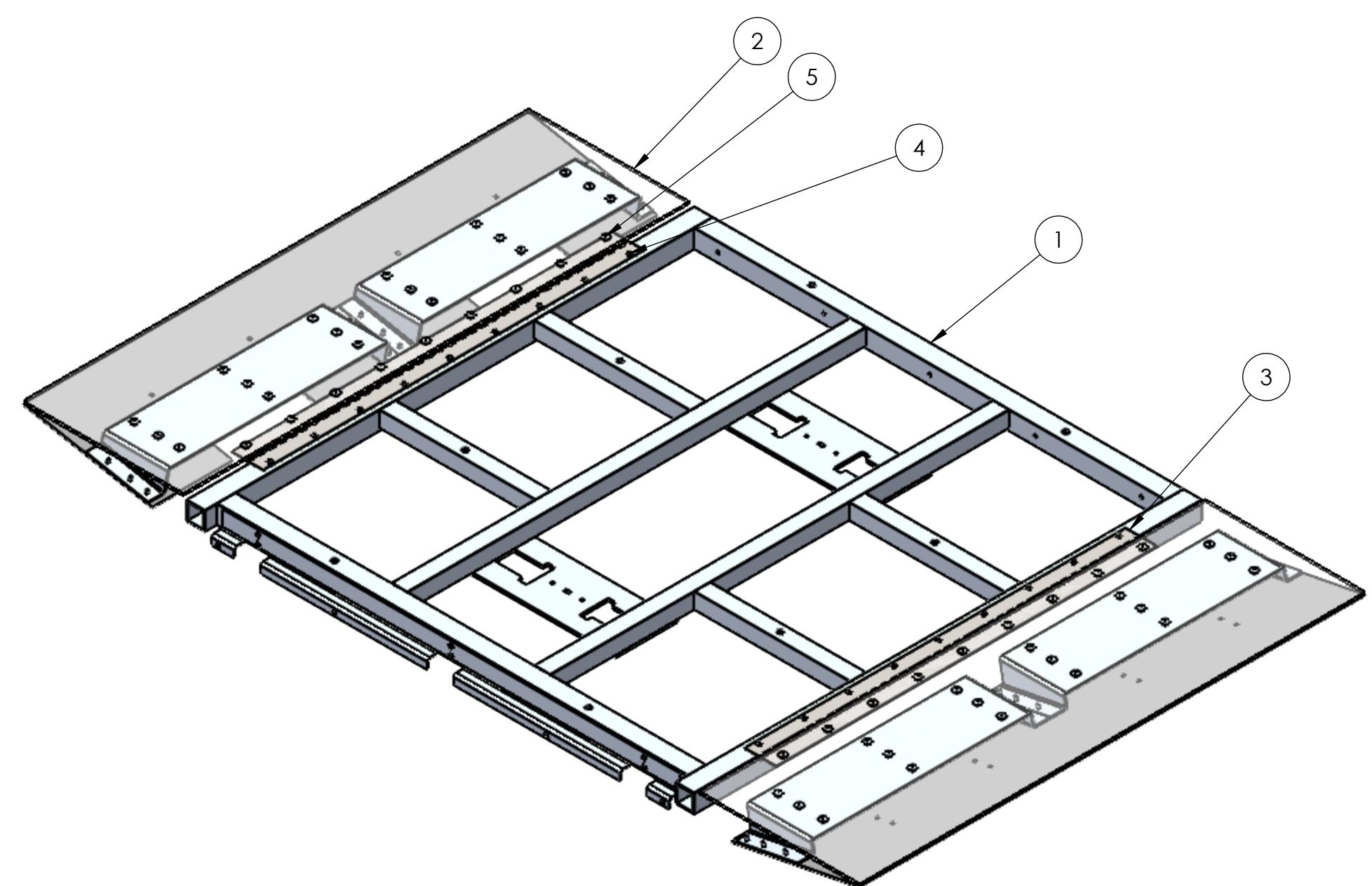
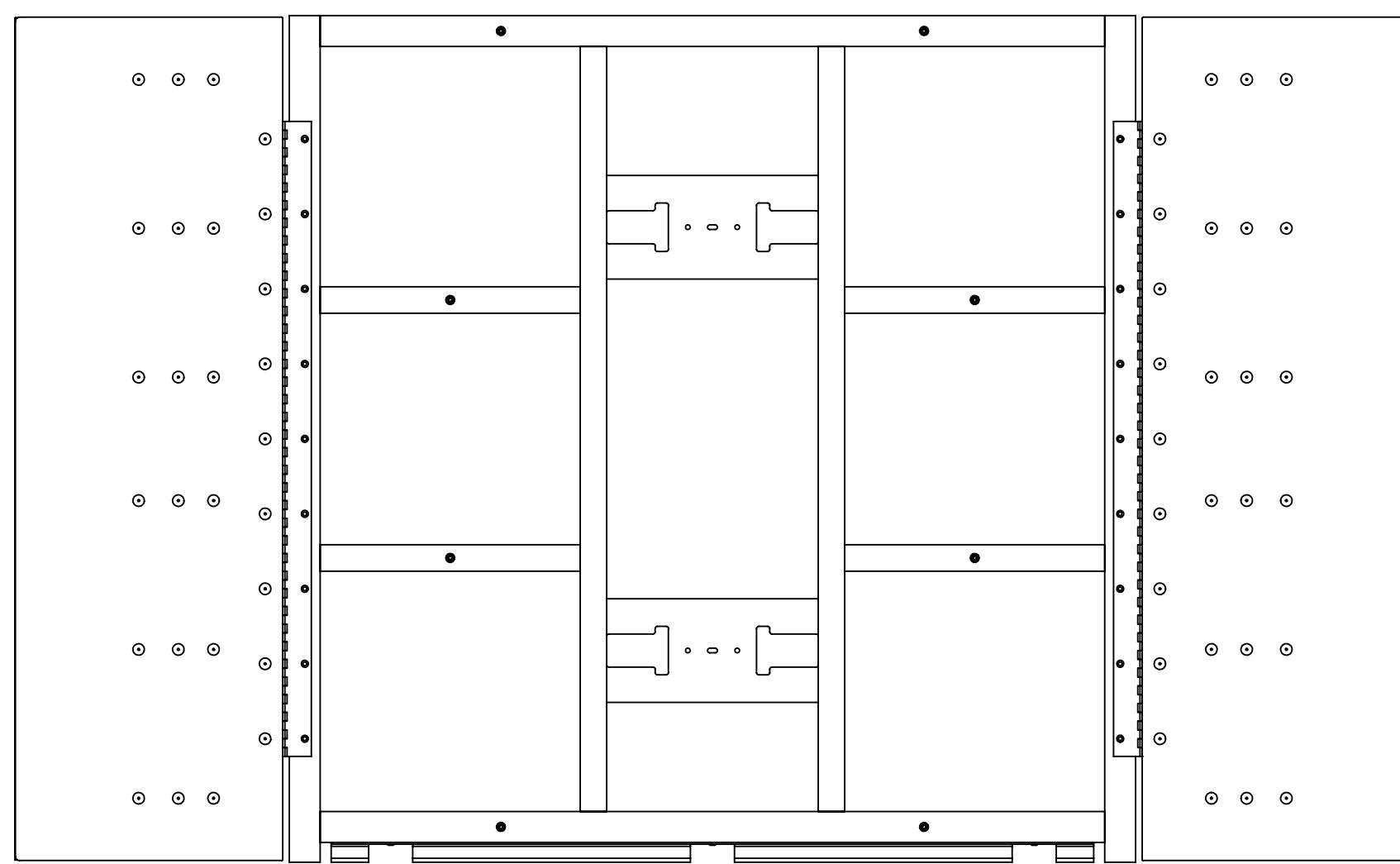
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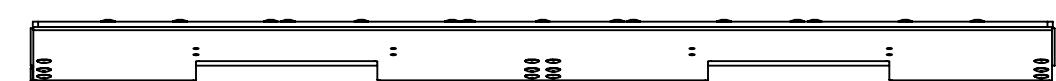
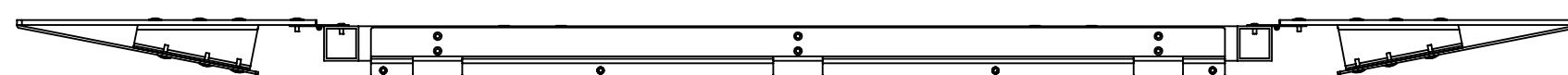
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B

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23305	Charge Station Top Frame	1
2	GE-23314	Charge Station Ramp Assembly	2
3	GE-23318	Charge Station Ramp Hinge	2
4	rivet_.1875_.126-.25	3/16" Rivet, .126-.25 Grip Range	18
5	rivet_.1875_.251-.375_largeHead	3/16" Large Head Aluminum Rivet, .251-.375 Grip Range	18

UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	CO	12/12/2022
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: Charge Station Top Frame with Ramps

C **GE-23303**

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

SCALE: 1:9 **SHEET 1 OF 3**

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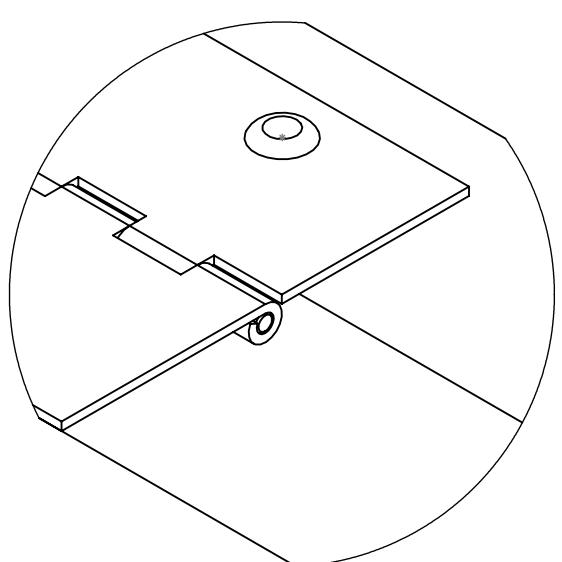
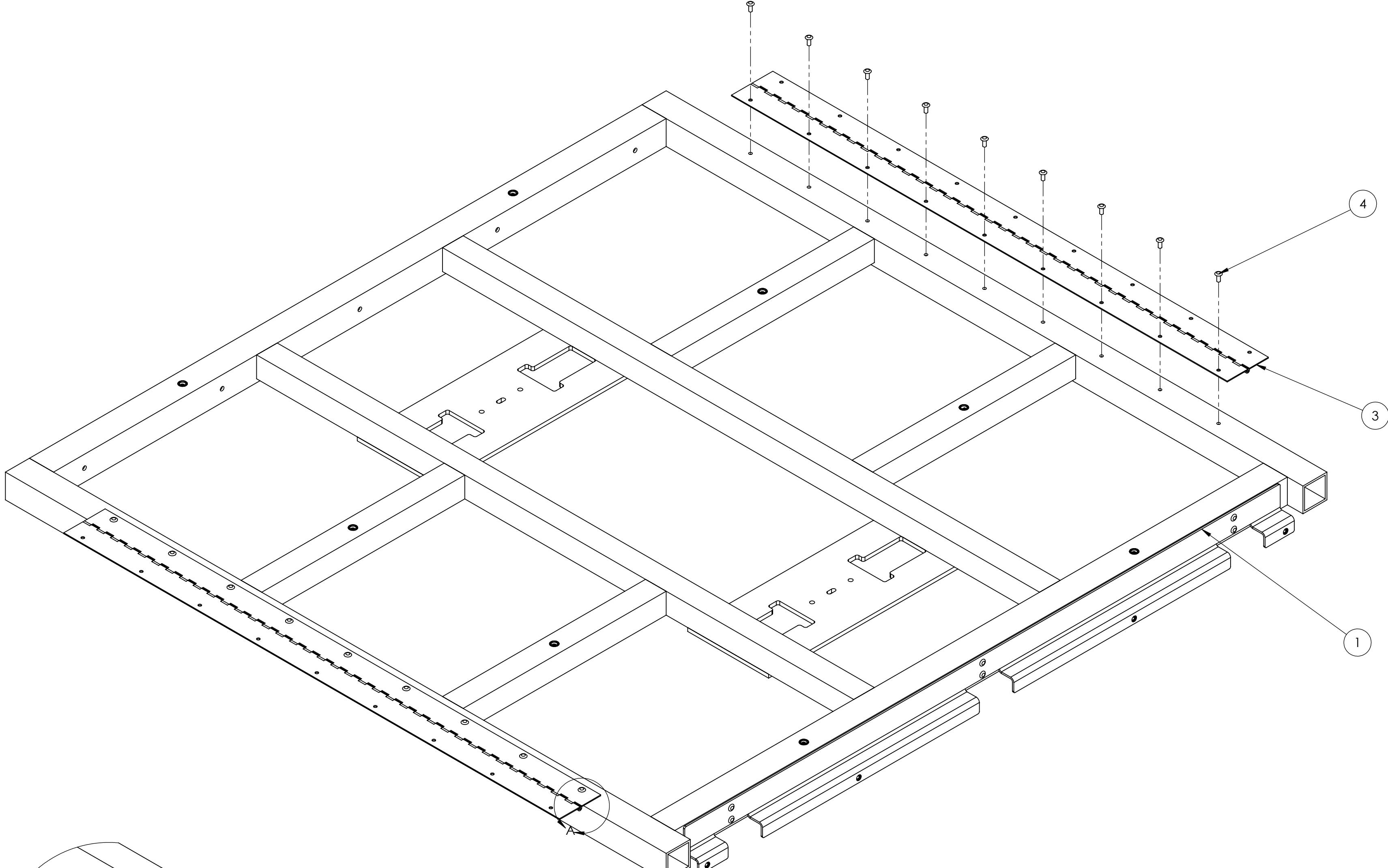
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DETAIL A
SCALE 1 : 1

Attach **3** to **1** using **4**.
Note orientation of hinge knuckle.

UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DRAWN	CO	12/12/2022	
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: Charge Station
Top Frame with
Ramps

SIZE DWG. NO. REV
C GE-23303

SCALE: 1:4 SHEET 2 OF 3

4

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D

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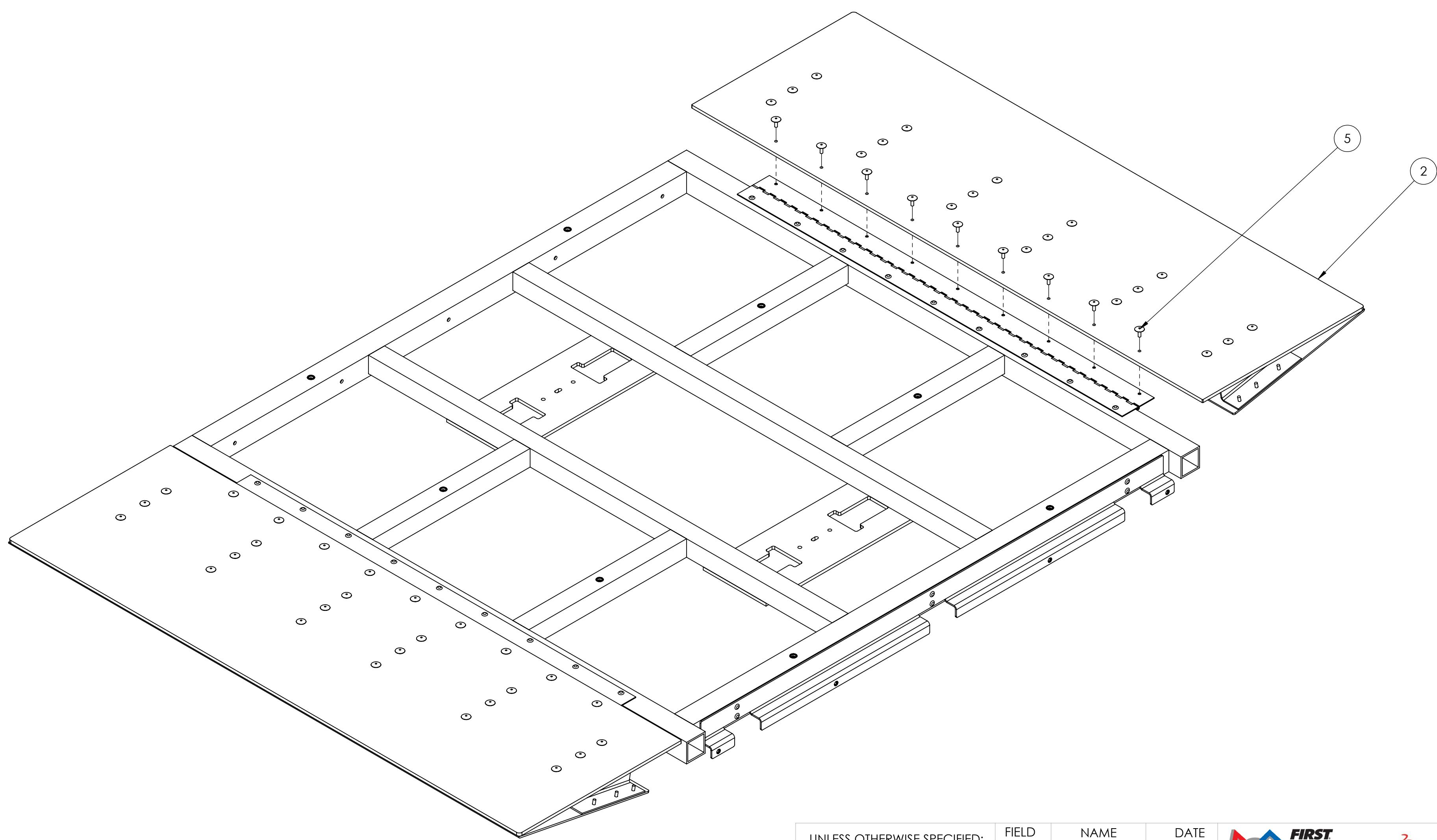
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Attach (2) to assembly from previous step using (5).

UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DRAWN	CO	12/12/2022	
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: Charge Station
Top Frame with
Ramps

SIZE DWG. NO. REV

C GE-23303

SCALE: 1:5 SHEET 3 OF 3

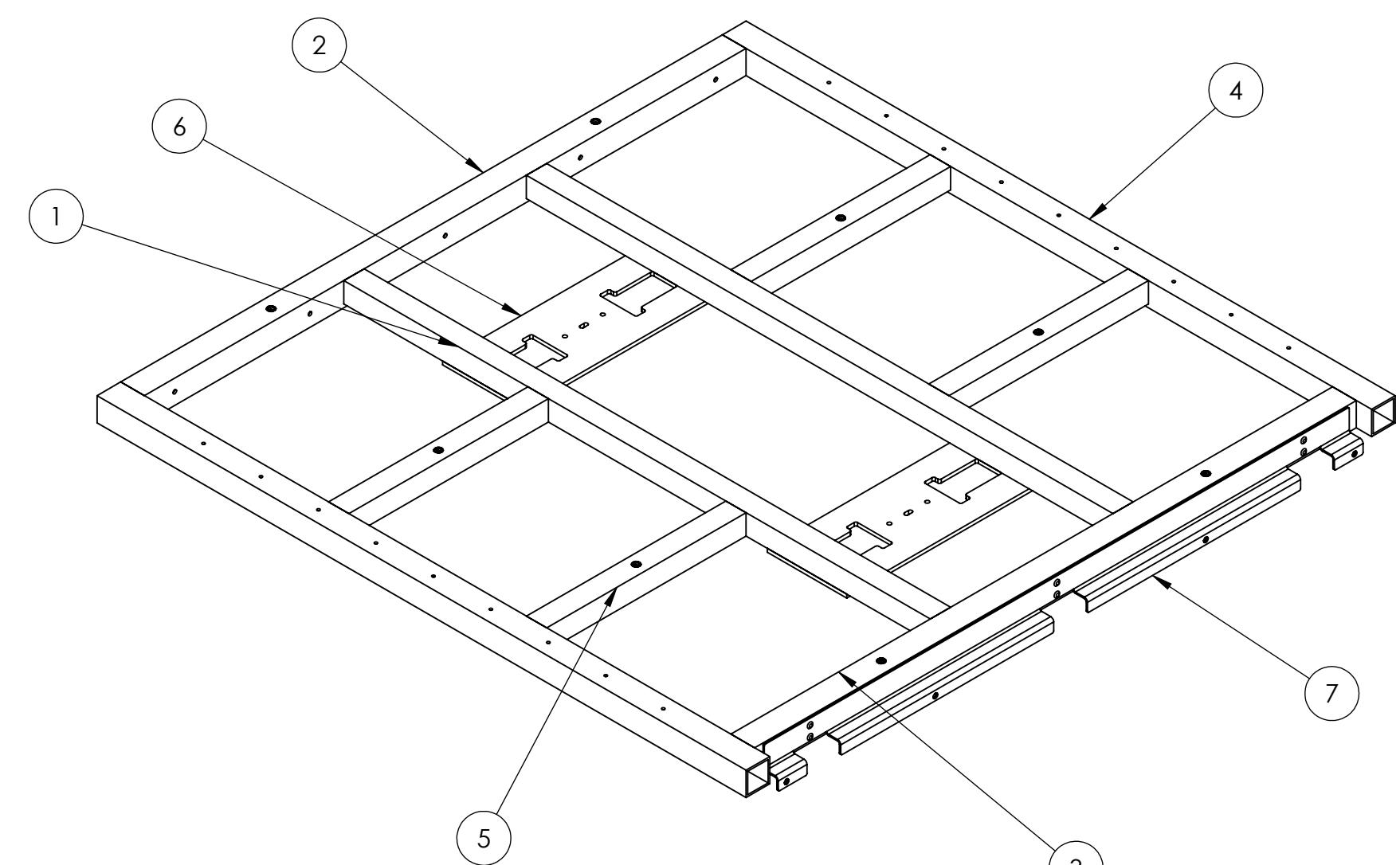
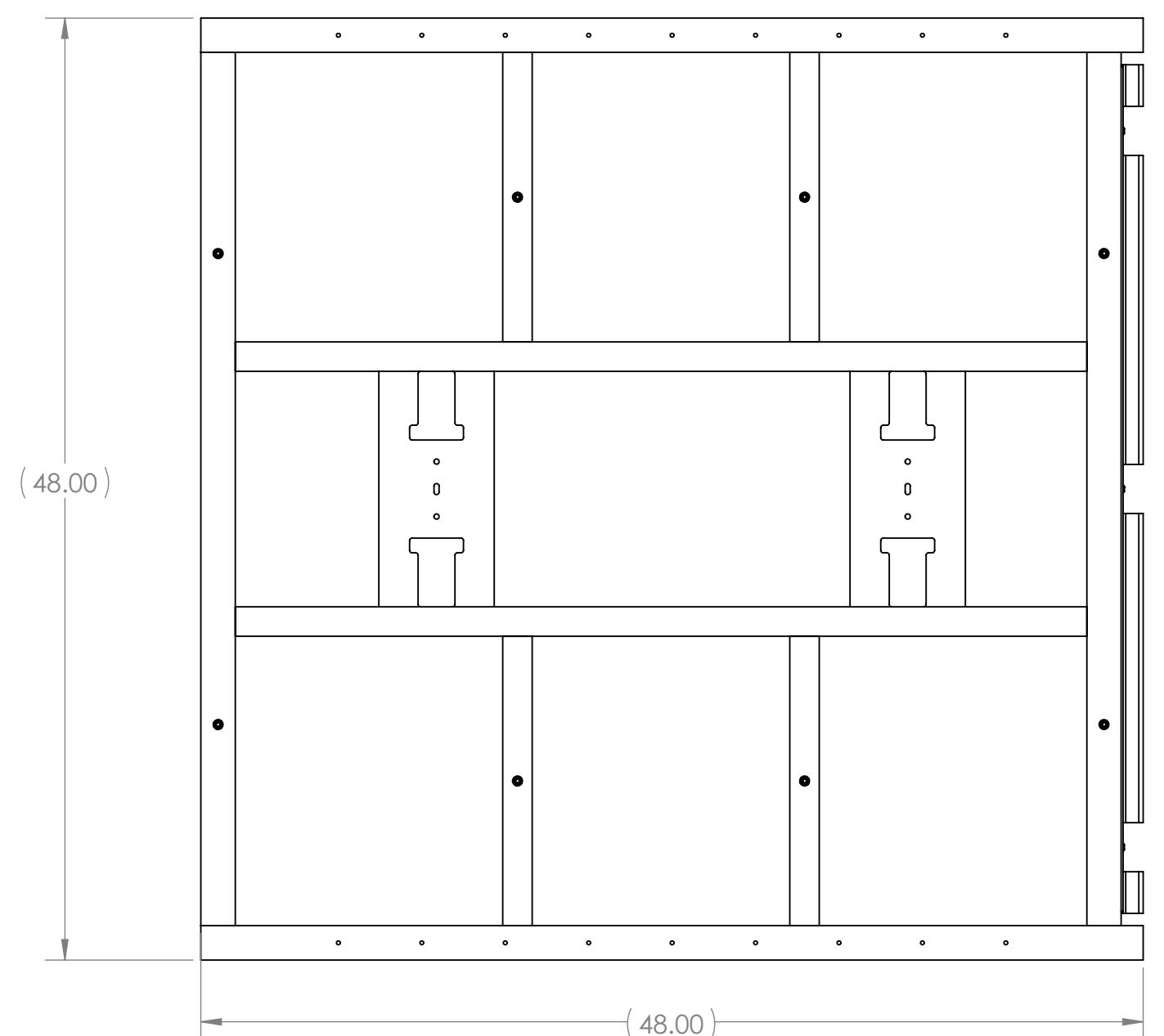
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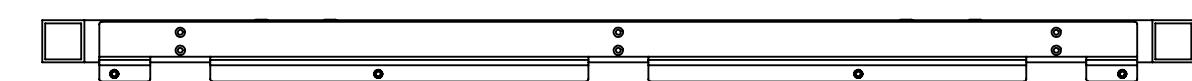
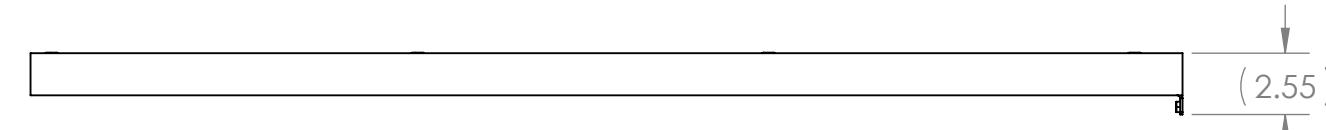
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B



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23305-01	1.5" x .125" thk. Square Tubing, 6061 Aluminum	2
2	GE-23305-02	1.75" x .125" thk. Square Tubing, 6061 Aluminum	1
3	GE-23305-03	1.75" x .125" thk. Square Tubing, 6061 Aluminum	1
4	GE-23305-04	1.75" x .125" thk. Square Tubing, 6061 Aluminum	2
5	GE-23305-05	1.5" x .125" thk. Square Tubing, 6061 Aluminum	4
6	GE-23305-06	1/4" thk. 6061 Aluminum Plate	2
7	GE-23305-07	10 ga. Aluminum 5052	1
8	pem_clinchnut_.25_20_.054	1/4-20 self-clinching nut, .054 shank	4
9	rivet_.1875_.126-.25	3/16" Rivet, .126-.25 Grip Range	6
10	rivnut_.25_20_.027-.165	Rivnut, 1/4"-20 bolt, material thickness: .027"-.165"	8

UNLESS OTHERWISE SPECIFIED:	WELD	NAME	DATE	TITLE: Charge Station Top Frame
DIMENSIONS ARE IN INCHES	DRAWN	CO	9/25/2022	
TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .02$ THREE PLACE DECIMAL $\pm .015$				SIZE DWG. NO. REV C GE-23305
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		SCALE: 1:8		SHEET 1 OF 5

D

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C

B

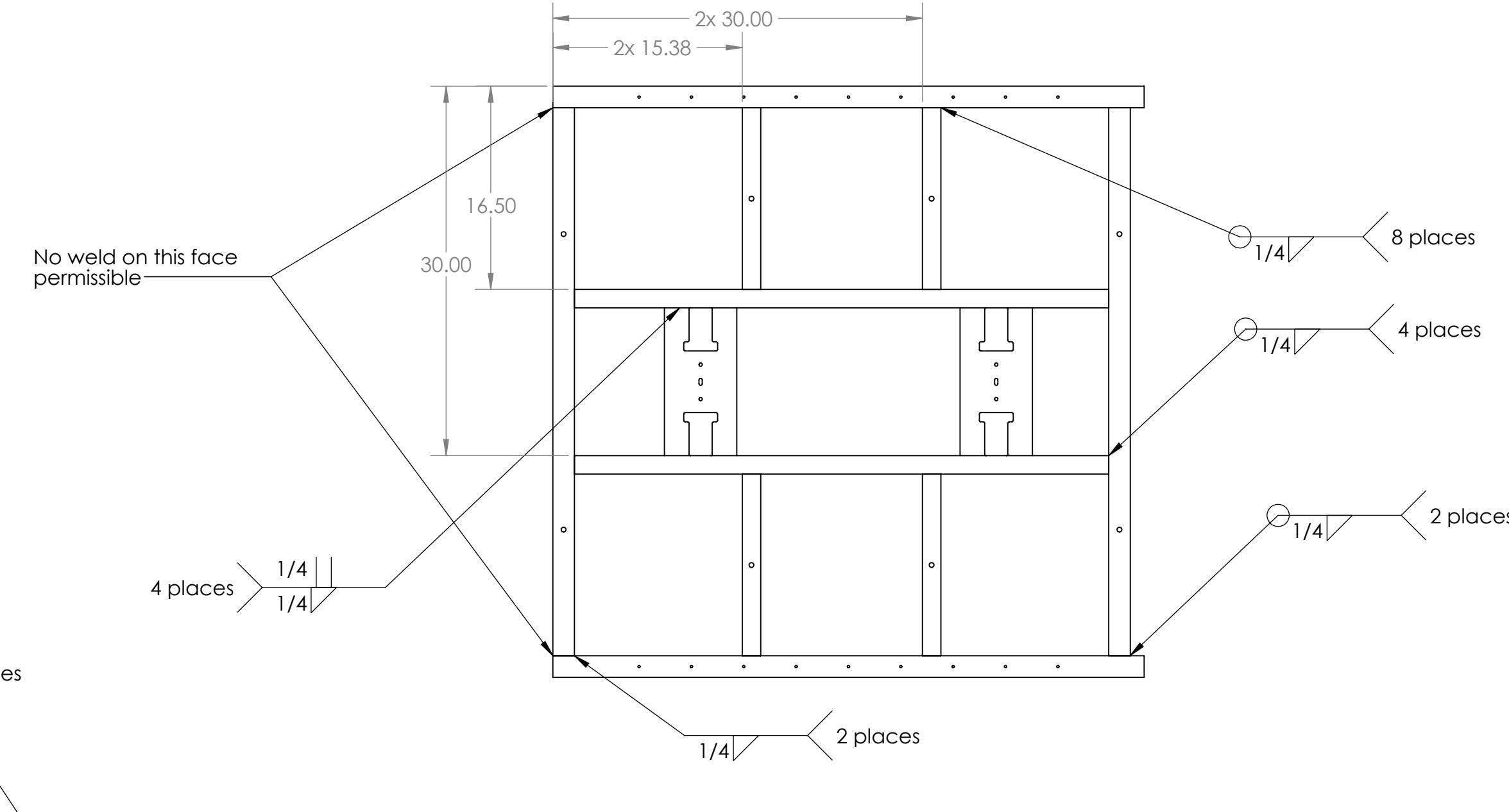
B

A

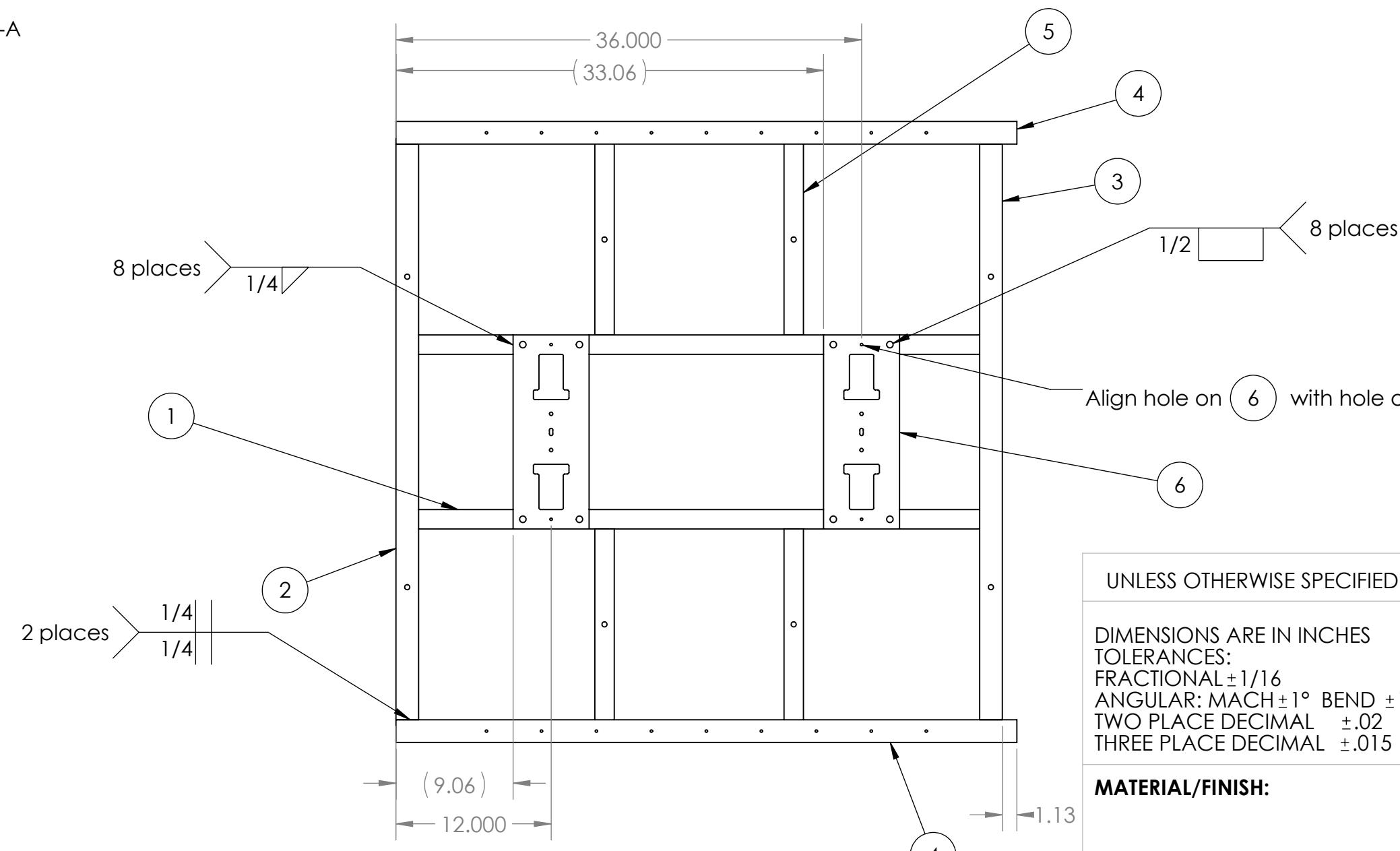
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Notes:
1. Only weldment shown in this view.

Note orientation of (1) to ensure these dimensions.



SECTION A-A



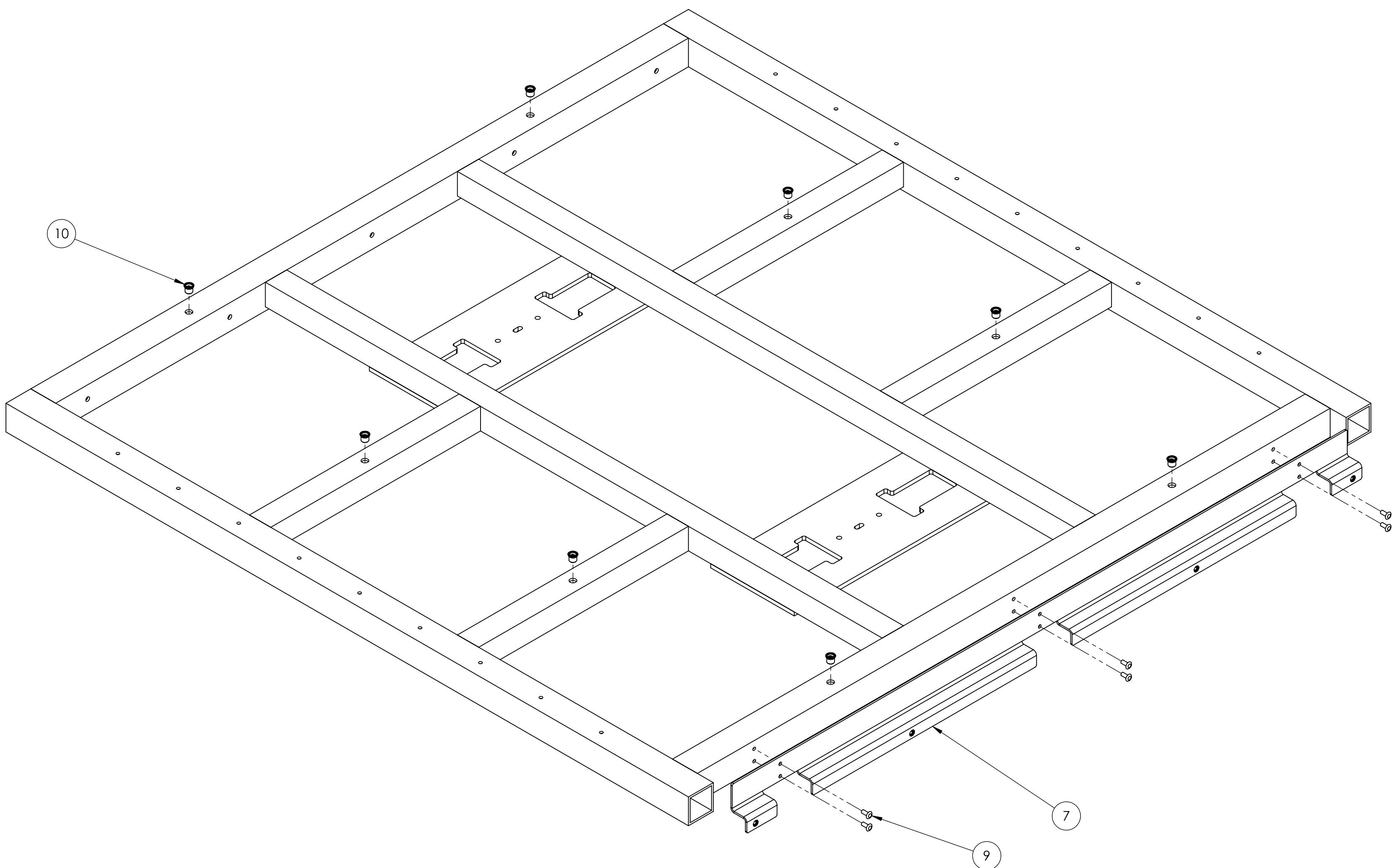
SECTION B-B

UNLESS OTHERWISE SPECIFIED:		WELD	NAME	DATE			
DRAWN	CO	9/25/2022					
PROPRIETARY AND CONFIDENTIAL							
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MATERIAL/FINISH:							
COMMENTS:		REMOVE ALL BURRS AND SHARP EDGES.					
DO NOT SCALE DRAWING							

**Charge Station
Top Frame**

SIZE DWG. NO. REV
C GE-23305

SCALE: 1:10 SHEET 2 OF 5



Notes:

1. Attach 7 to assembly using 9, oriented as shown.
2. Install 8x 10 in top surface holes 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 $\pm .015$	WELD	NAME	DATE
	DRAWN	CO	9/25/2022
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:			
COMMENTS:	REMOVE ALL BURRS AND SHARP EDGES.		
DO NOT SCALE DRAWING			

**Charge Station
Top Frame**

SIZE DWG. NO. REV

C GE-23305

SCALE: 1:4 SHEET 3 OF 5

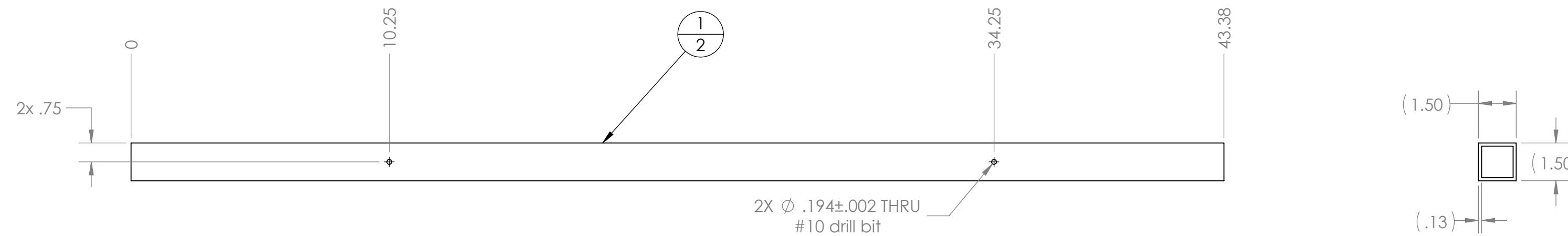
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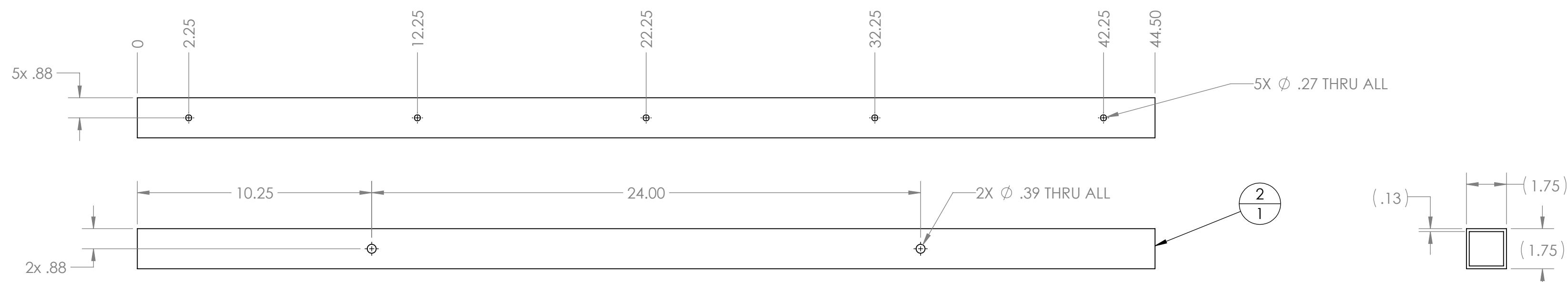
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1

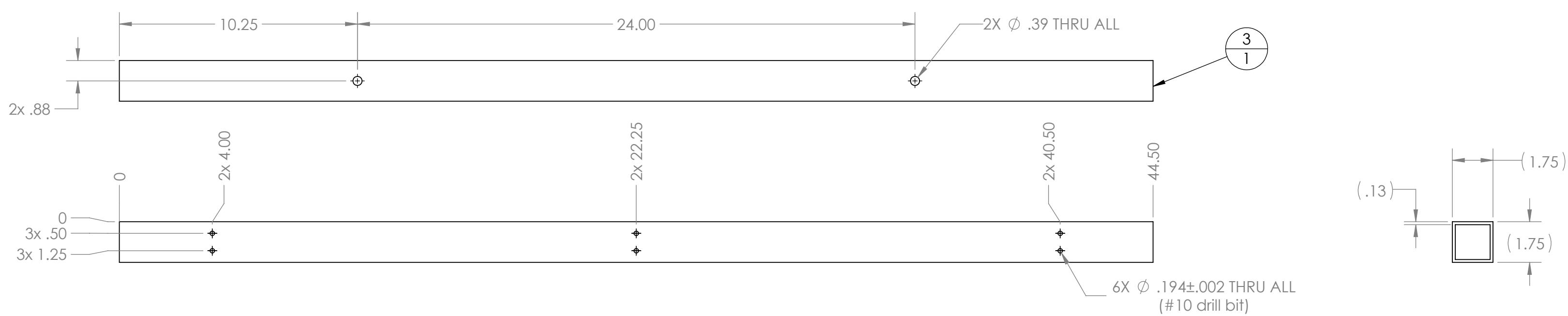
D



C



B



A

UNLESS OTHERWISE SPECIFIED:	WELD	NAME	DATE
DRAWN	CO	9/25/2022	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			
TITLE: Charge Station Top Frame			
SIZE	DWG. NO.	REV	
C	GE-23305		
SCALE: 1:4		SHEET 4 OF 5	

4

3

2

1

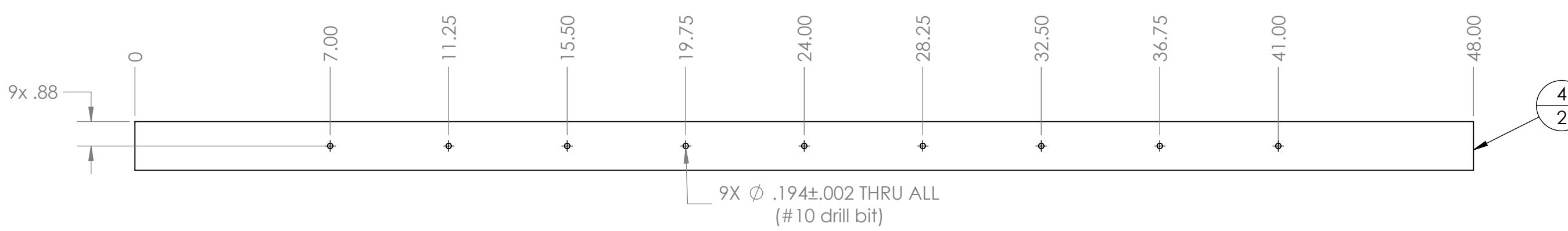
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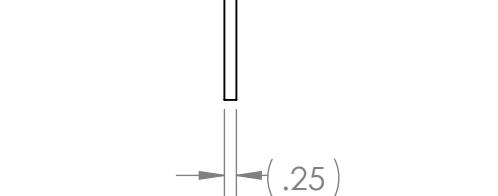
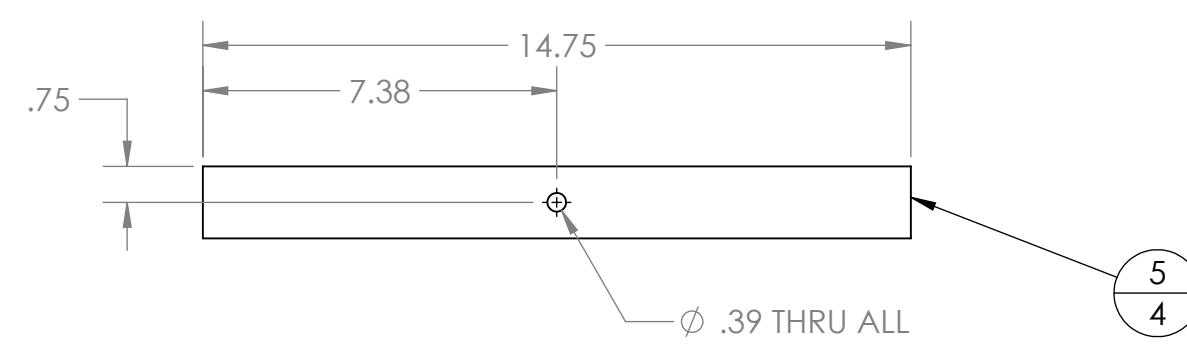
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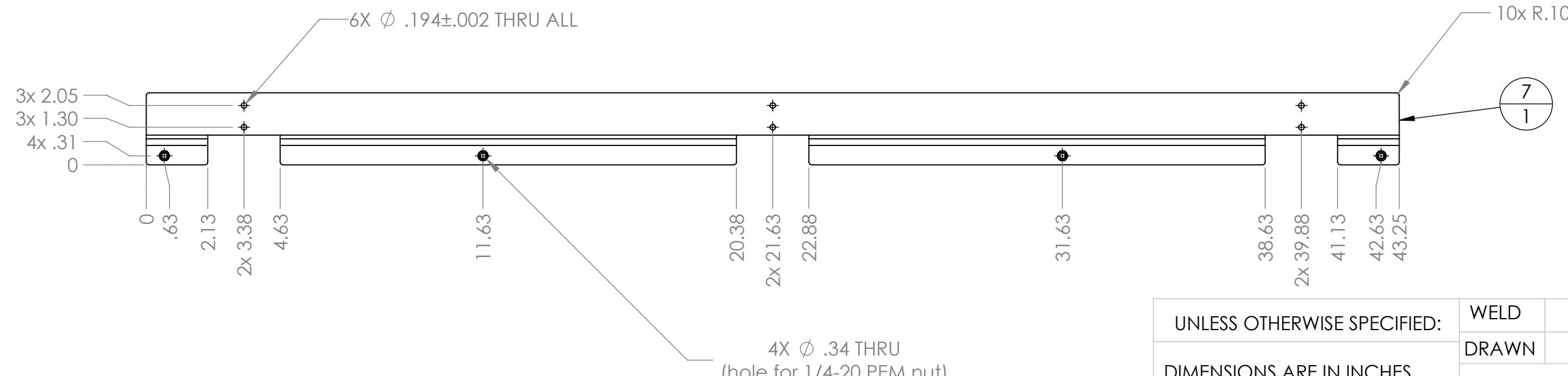
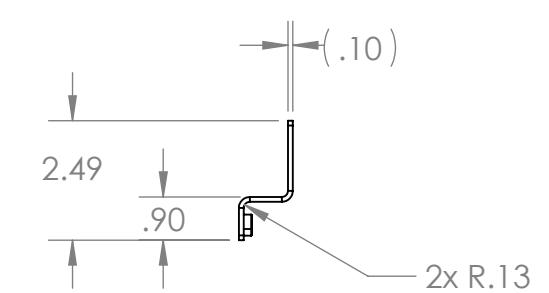
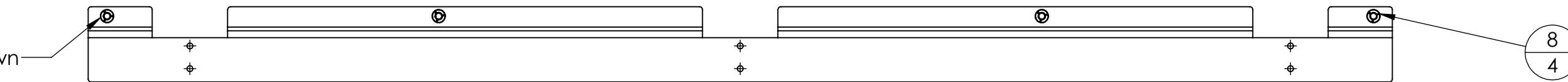


1

C



4x PEM nuts installed as shown



UNLESS OTHERWISE SPECIFIED:	WELD	NAME	DATE
DRAWN	CO	9/25/2022	
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:
**Charge Station
Top Frame**

SIZE DWG. NO. REV

C GE-23305

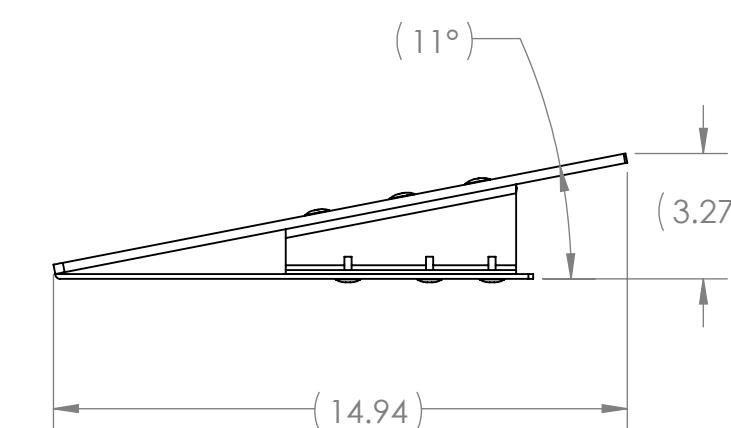
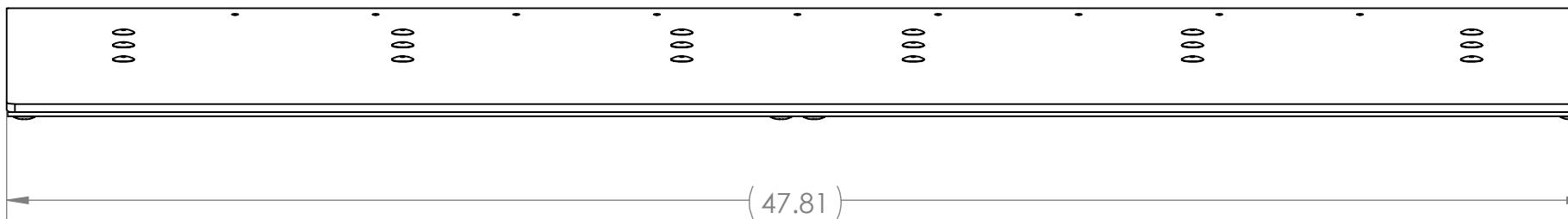
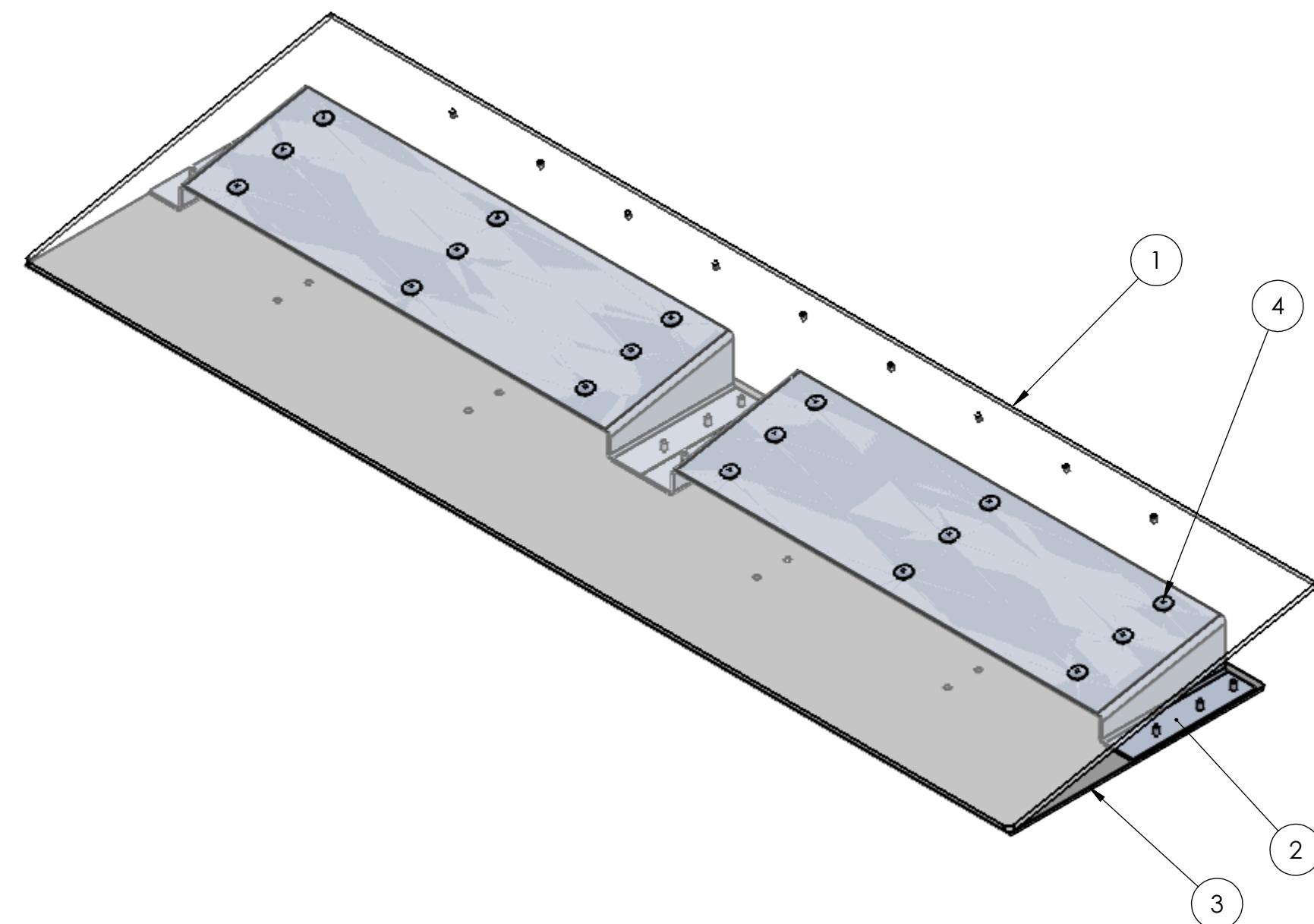
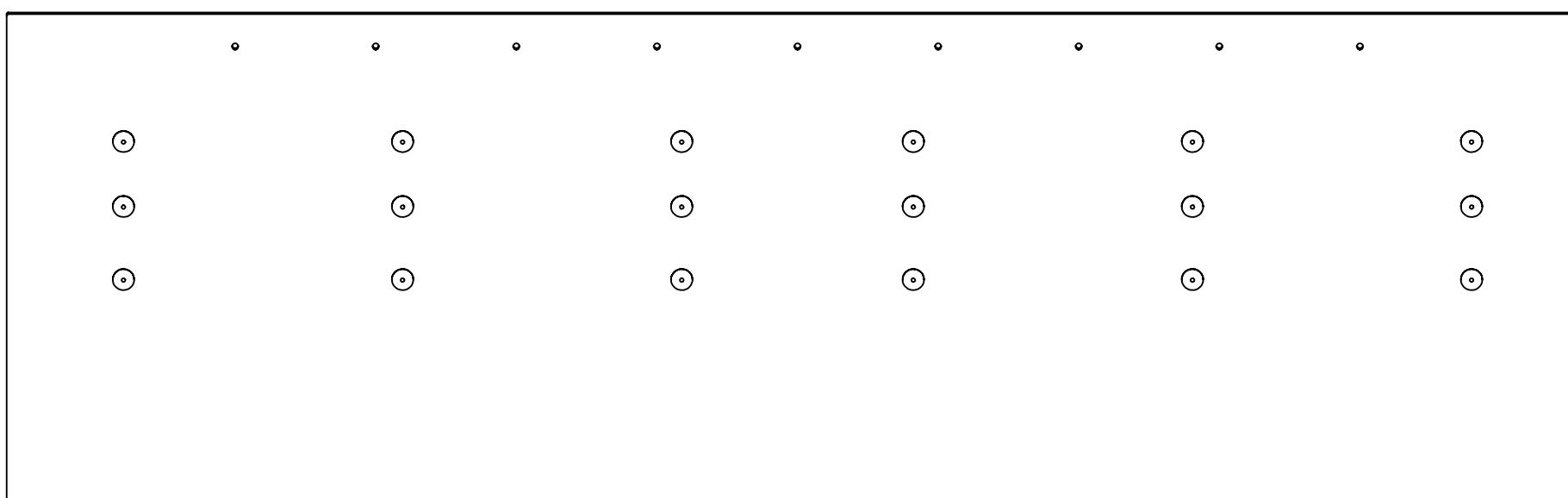
SCALE: 1:4 SHEET 5 OF 5

4

3

2

1



Notes:
1. Approximate weight: 13.33 lbs

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23315	Charge Station Ramp Polycarbonate	1
2	GE-23316	Charge Station Ramp Brace	2
3	GE-23317	Charge Station Ramp HDPE	1
4	rivet_.1875_.251-.375_largeHead	3/16" Large Head Aluminum Rivet, .251-.375 Grip Range	30

UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	CO	12/12/2022
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

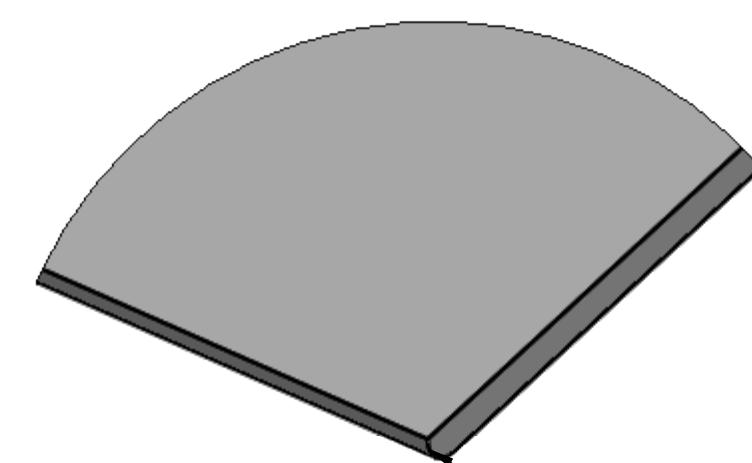
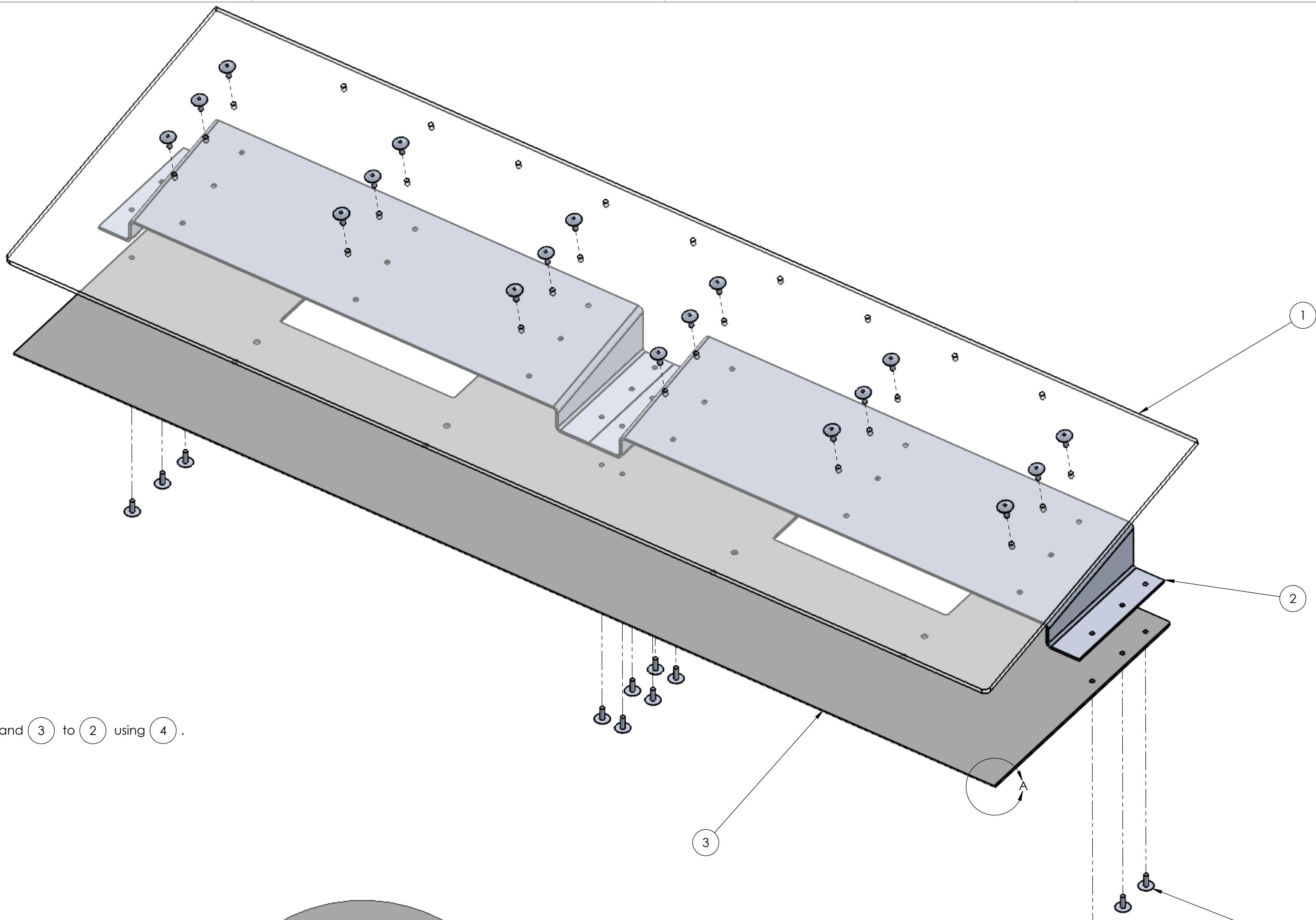
Charge Station Ramp Assembly

C GE-23314

SCALE: 1:5 SHEET 1 OF 2

4 3 2 1

D



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	CO	12/12/2022
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: Charge Station Ramp Assembly

SIZE DWG. NO. REV

C GE-23314

SCALE: 1:3 SHEET 2 OF 2

4 3 2 1

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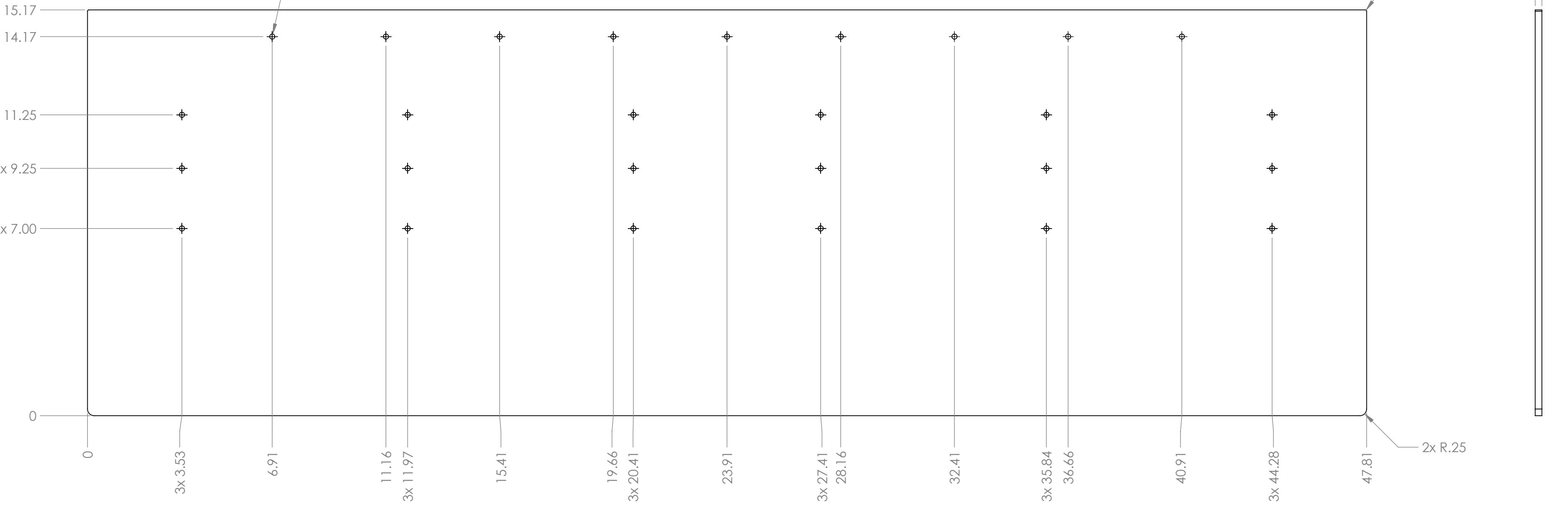
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Notes:
1. Tag or label with part number.

-27x ϕ .194±.002 THRU ALL



UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	CO	8/17/2022
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: Charge Station
Ramp
Polycarbonate
SIZE DWG. NO. REV
C GE-23315

SCALE: 1:3 SHEET 1 OF 1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
A3, B2, B3, C3, D3	A	Changed overall width and adjusted profile angle. Changed part name.	9/28/2022	CPO

D

6X $\emptyset .194 \pm .002$ THRU ALL

6.00
2x 5.38
2x 3.75
2x 1.63
0
3x .50



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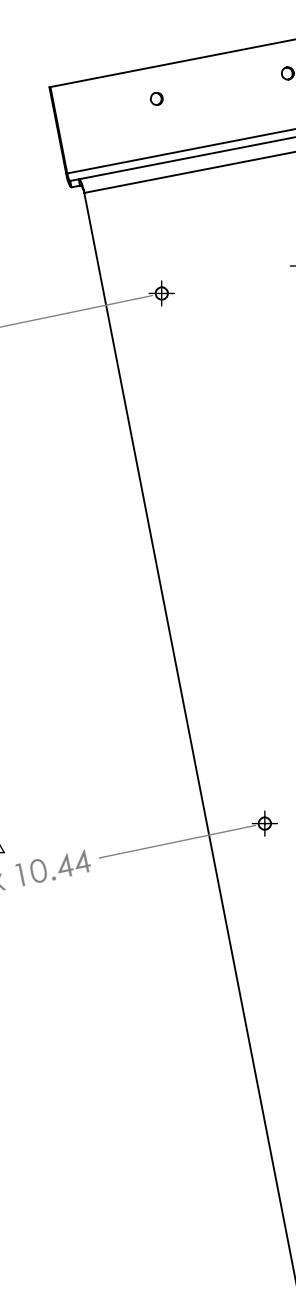
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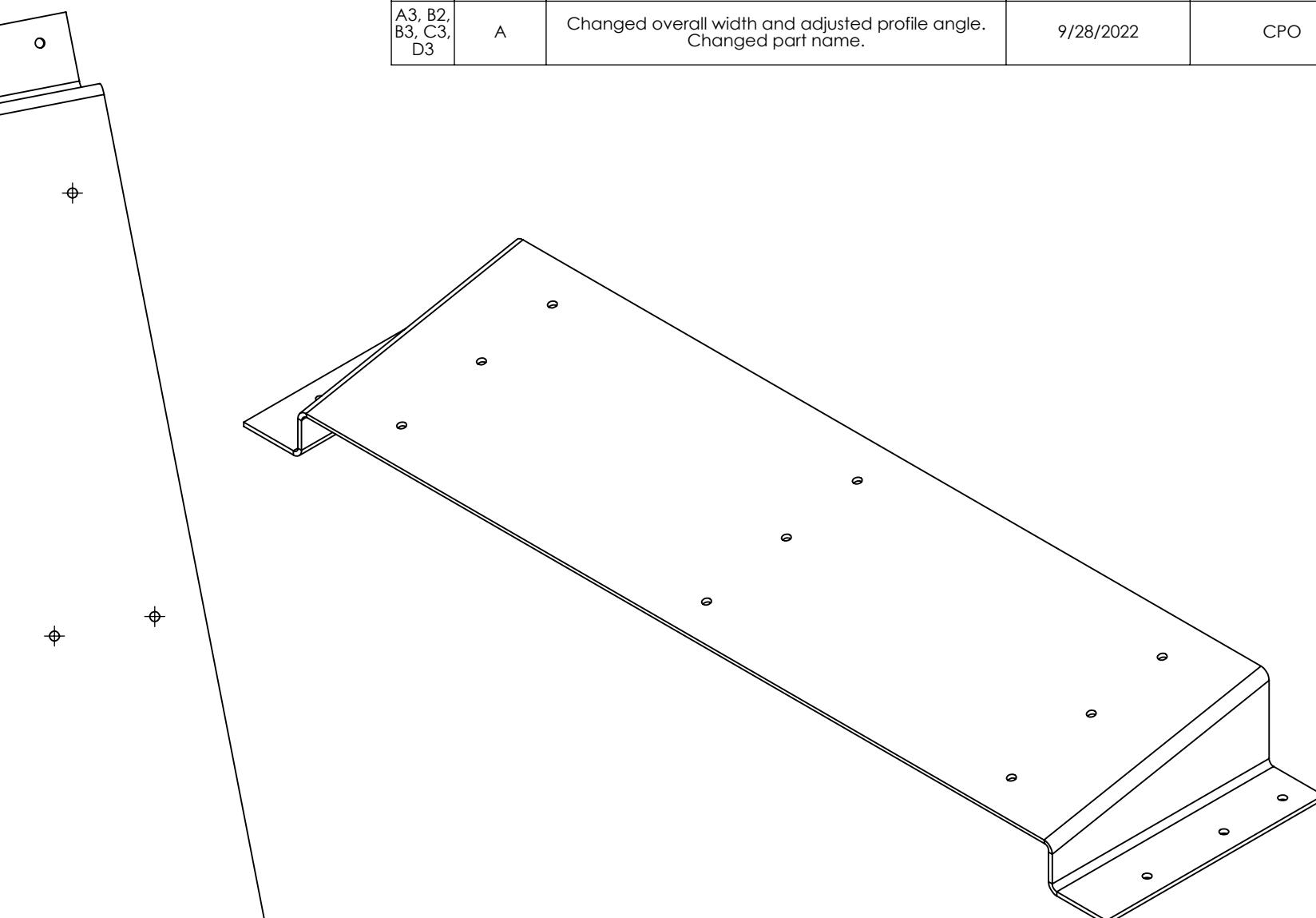
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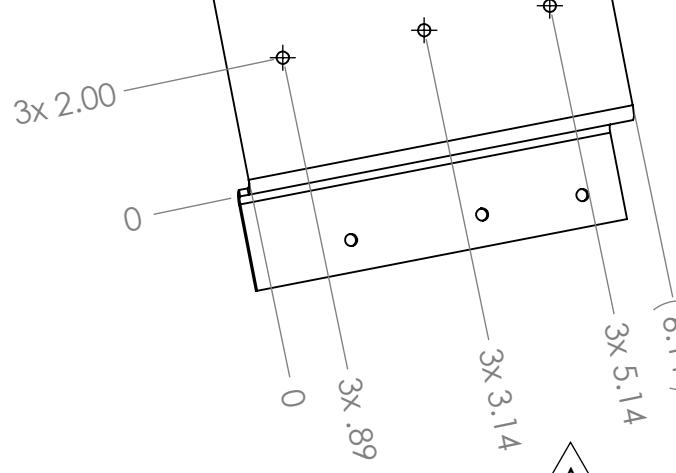


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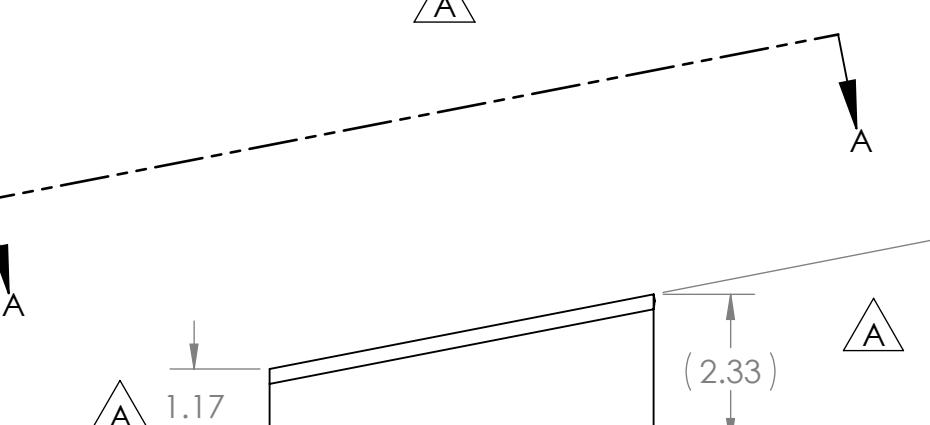


VIEW A-A



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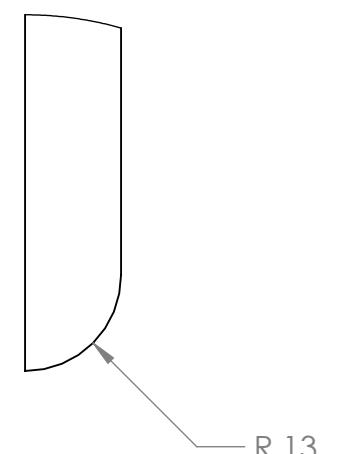
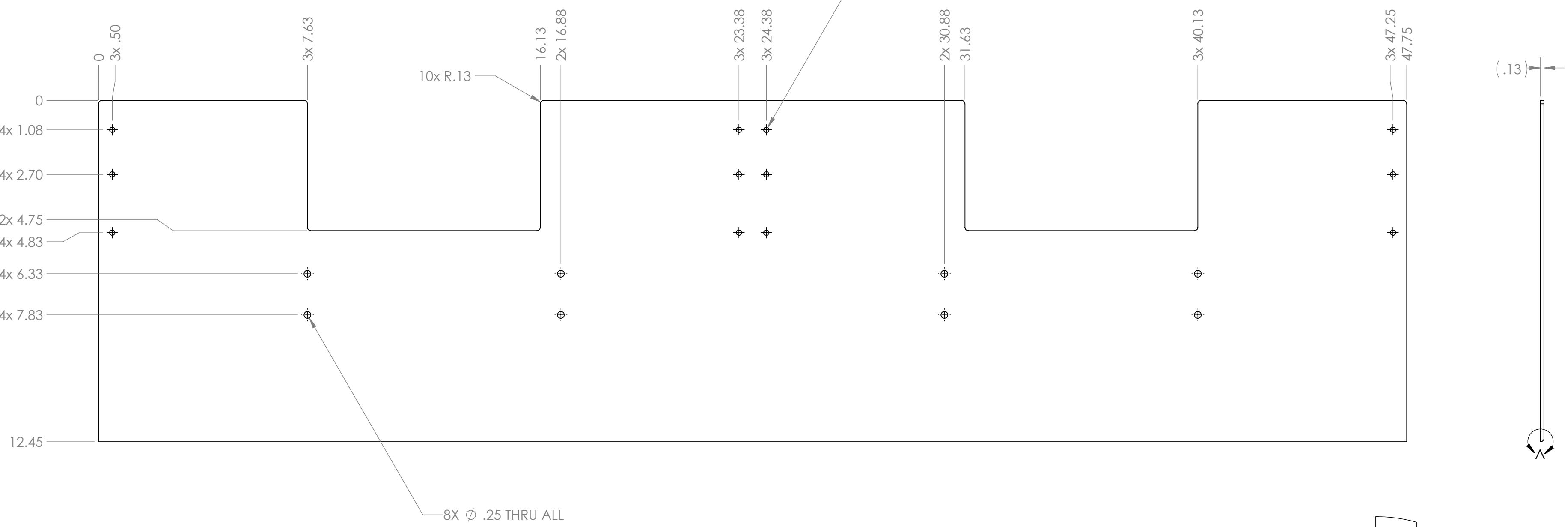
C

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A



Notes:
1. Tag or label with part number.

UNLESS OTHERWISE SPECIFIED:		VEND	NAME	DATE
DIMENSIONS ARE IN INCHES		DRAWN	CO	8/22/2022
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, natural/smooth		
COMMENTS:		REMOVE ALL BURRS AND SHARP EDGES.		
DO NOT SCALE DRAWING				

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
Charge Station
Ramp HDPE

SIZE DWG. NO. REV
C GE-23317

SCALE: 1:3 SHEET 1 OF 1

4

3

2

1

4

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2

1

D

D

C

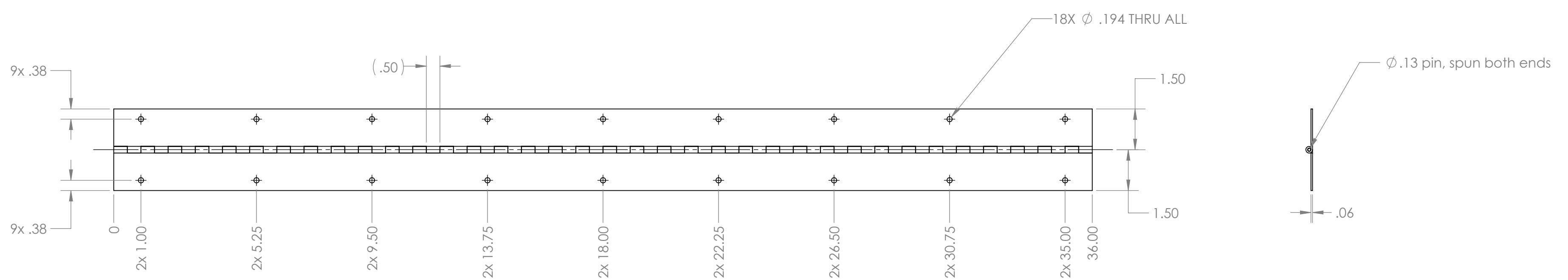
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UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	CO	12/30/2022	
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH:	SIZE	DWG. NO.	REV
Plated Steel	C	GE-23318	
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING		SCALE: 1:3	SHEET 1 OF 1

4

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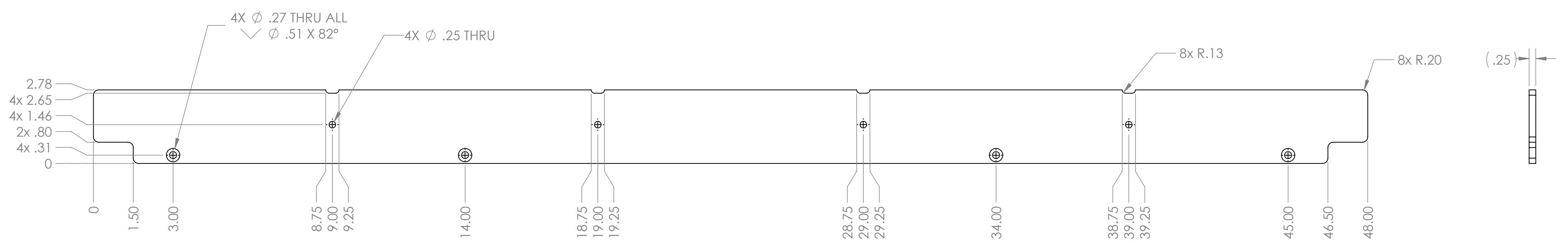
C

B

B

A

A



Notes:

1. Tag or label with part number.

UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	CO	8/17/2022	
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			
TITLE: Charge Station Light Cover			
SIZE DWG. NO. REV			
C GE-23320			
SCALE: 1:3 SHEET 1 OF 1			

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
D2	A	Increased hole diameter.	12/6/2022	CPO

D

48.00

2x 38.88

2x 36.00

2x 12.00

2x 9.13

0

0

2x 16.13

2x 30.75

2x 46.00

4x R.13

8X ϕ .28 THRU ALL A

(.25)

Notes:
1. 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

VEND DATE

DRAWN CO

8/17/2022

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: Charge Station Surface Polycarbonate

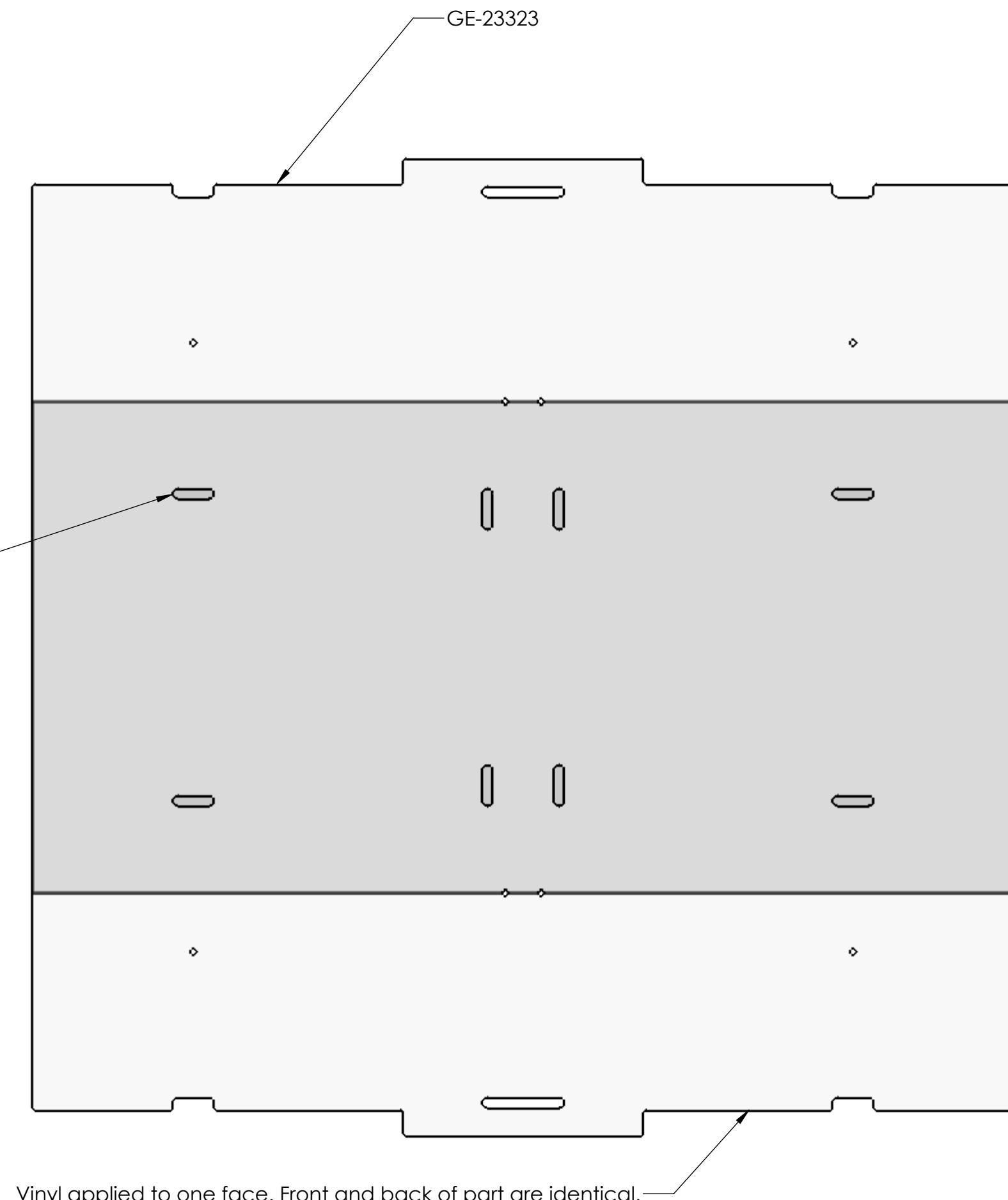
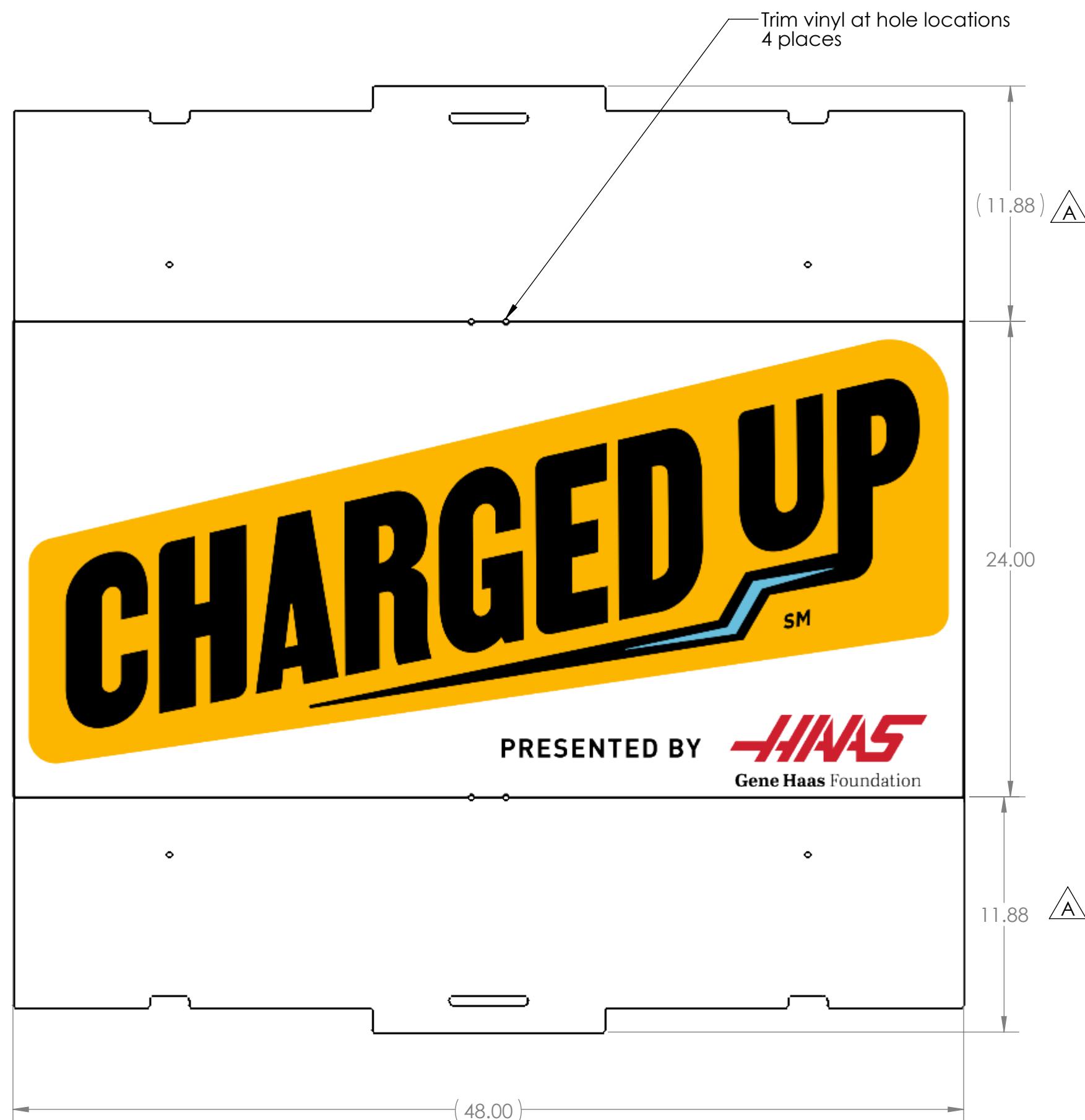
SIZE DWG. NO. REV

C GE-23321 A

SCALE: 1:5 SHEET 1 OF 1

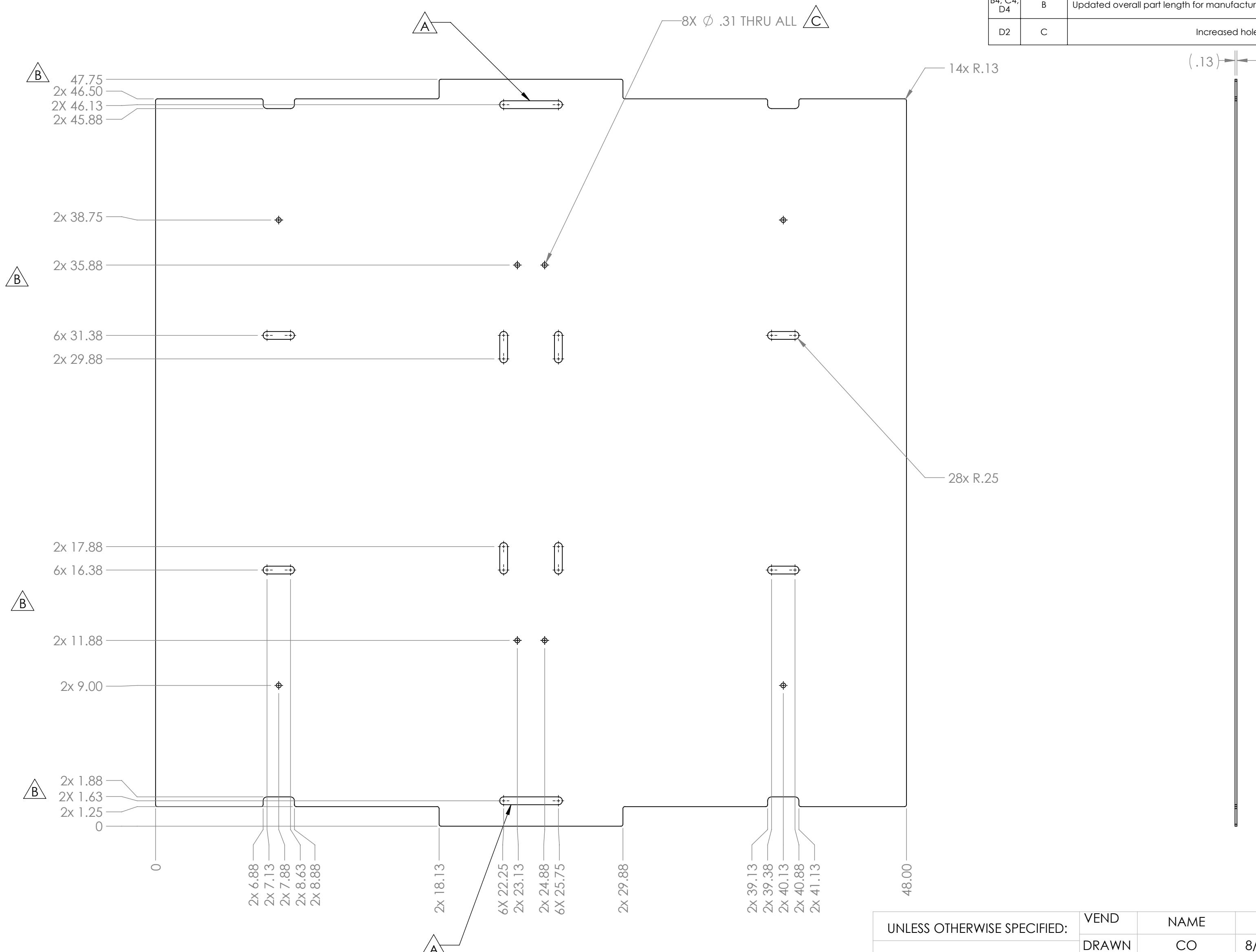
REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
B3, C3	A	Dimensions updated to match change made to base plastic part.	11/2/2022	CPO



Notes:
1. QTY per field: 2

UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DRAWN	CO	10/31/2022	
PROPRIETARY AND CONFIDENTIAL			
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COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			
FIRST ROBOTICS COMPETITION   TITLE: Charge Station Sublayer Mid Polycarbonate with Vinyl SIZE DWG. NO. REV C GE-23322 A SCALE: 1:6 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:
1/8" Polycarbonate, Clear

DO NOT SCALE DRAWING

VEND NAME DATE
DRAWN CO 8/17/2022

PROPRIETARY AND CONFIDENTIAL

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COMMENTS:
REMOVE ALL BURRS AND SHARP EDGES.



TITLE: Charge Station
Sublayer Mid
Polycarbonate

SIZE DWG. NO. REV

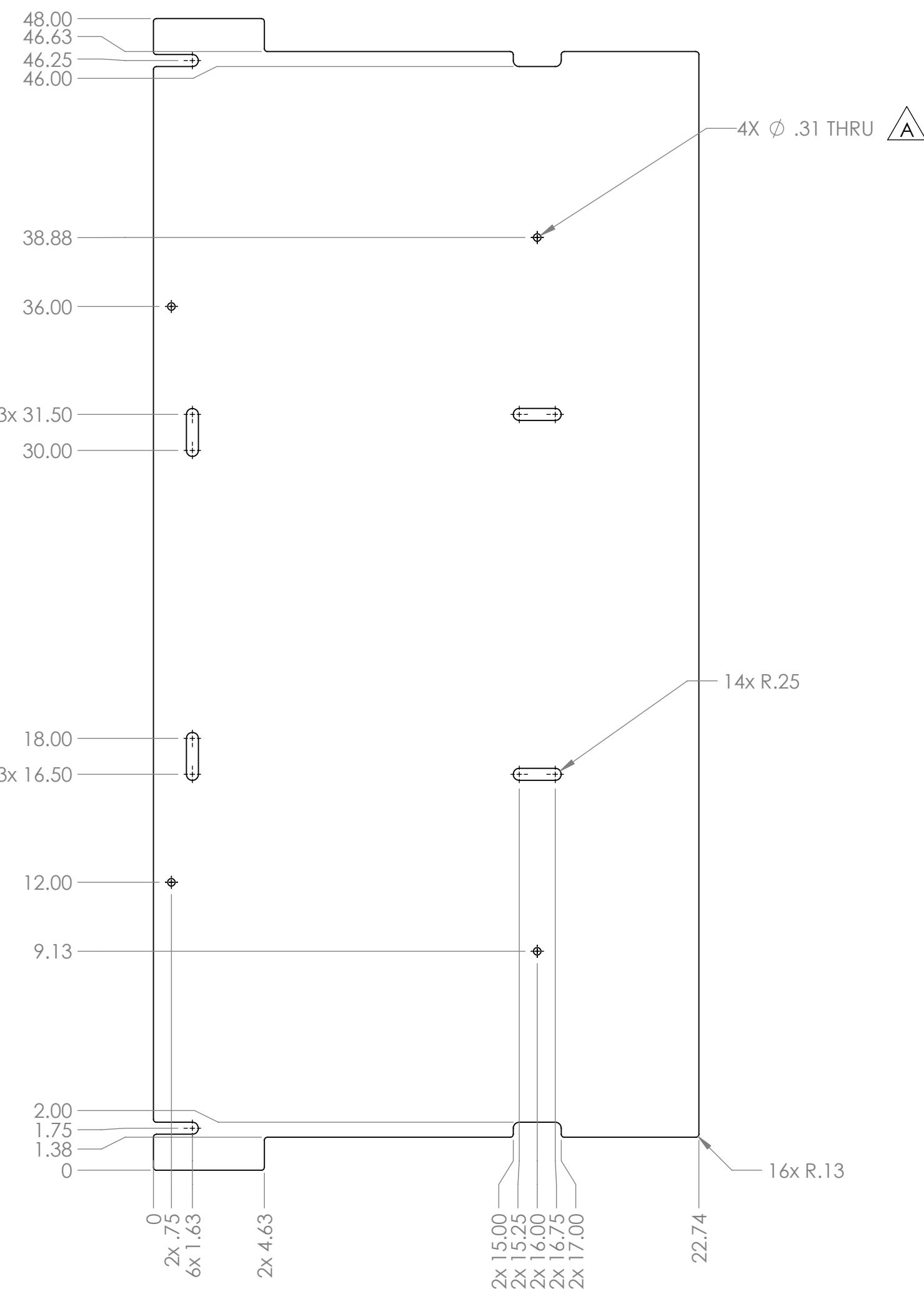
C GE-23323 C

SCALE: 1:5 SHEET 1 OF 1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
D3	A	Increased hole diameter.	12/6/2022	CPO

D D



Notes:
1. Tag or label with part number.

UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
	DRAWN	CO	8/17/2022
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			



TITLE: Charge Station Sublayer Outer Polycarbonate

SIZE DWG. NO. REV
C GE-23324 **A**

SCALE: 1:5 SHEET 1 OF 1

4

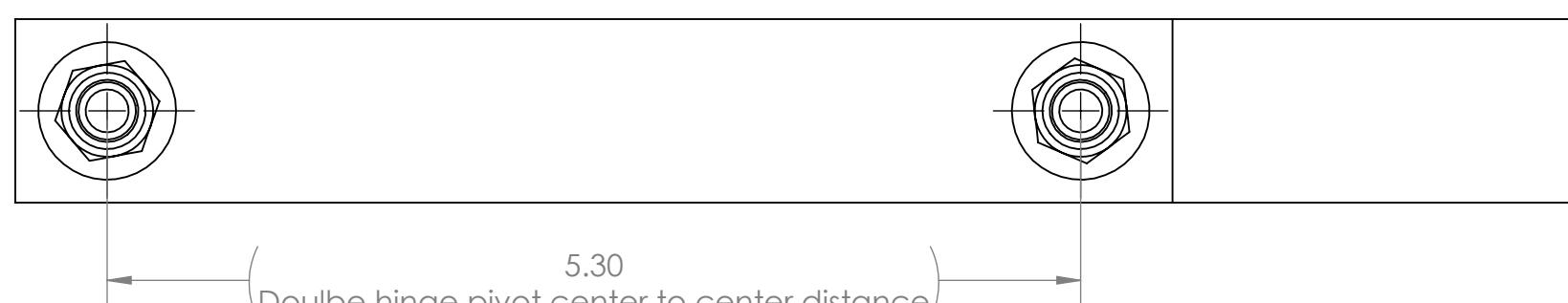
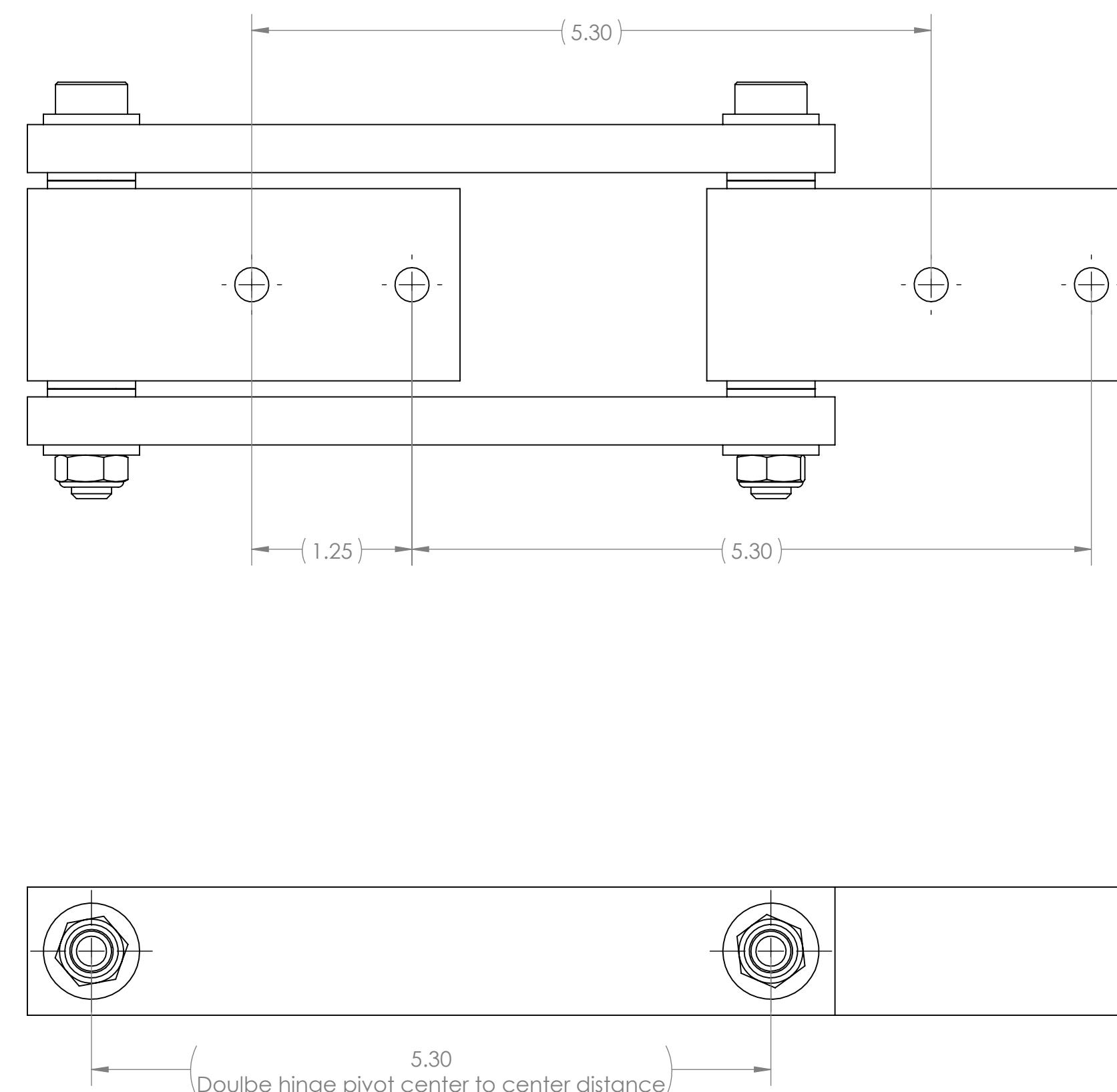
3

2

1

D

D



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23329	Charge Station Hinge Outer Bar	2
2	GE-23331	Charge Station Hinge Drilled Block	2
3	GE-23332	Charge Station Hinge Bushing	8
4	nylock_thin_3125_18	Thin Steel Nylon-Insert Locknut, 5/16"-18	2
5	shoulderbolt_375_2.5	5/16-18 Socket Head Shoulder Screw, 3/8" x 2-1/2" Shoulder	2
6	washer_flat_.375	Flat Washer for 3/8" Screw	4

UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DRAWN	CO	12/12/2022	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:			
DO NOT SCALE DRAWING			

FIRST ROBOTICS COMPETITION SOLIDWORKS Modeling Solutions Partner

TITLE: Charge Station Pivot Hinge Assembly

SIZE DWG. NO. REV

C GE-23328

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

4

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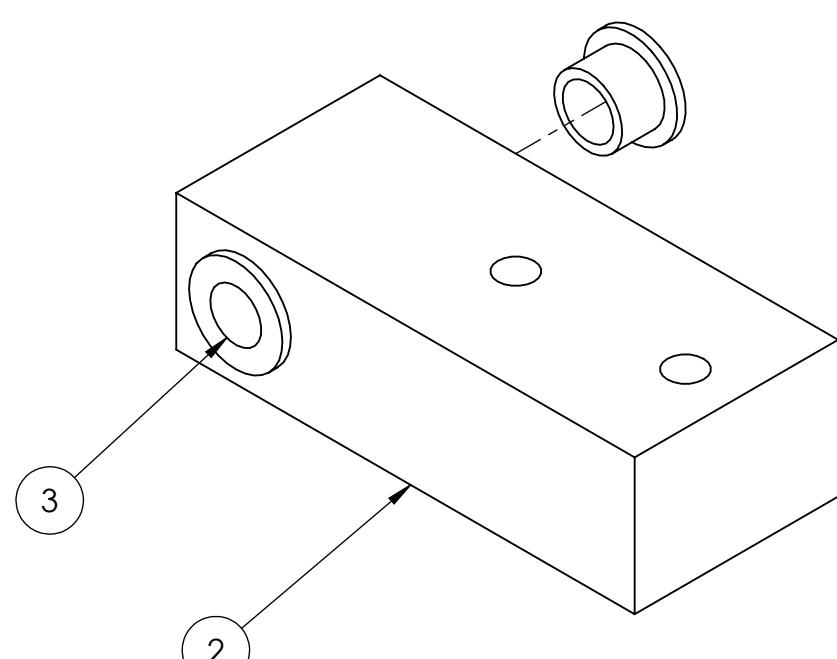
C

B

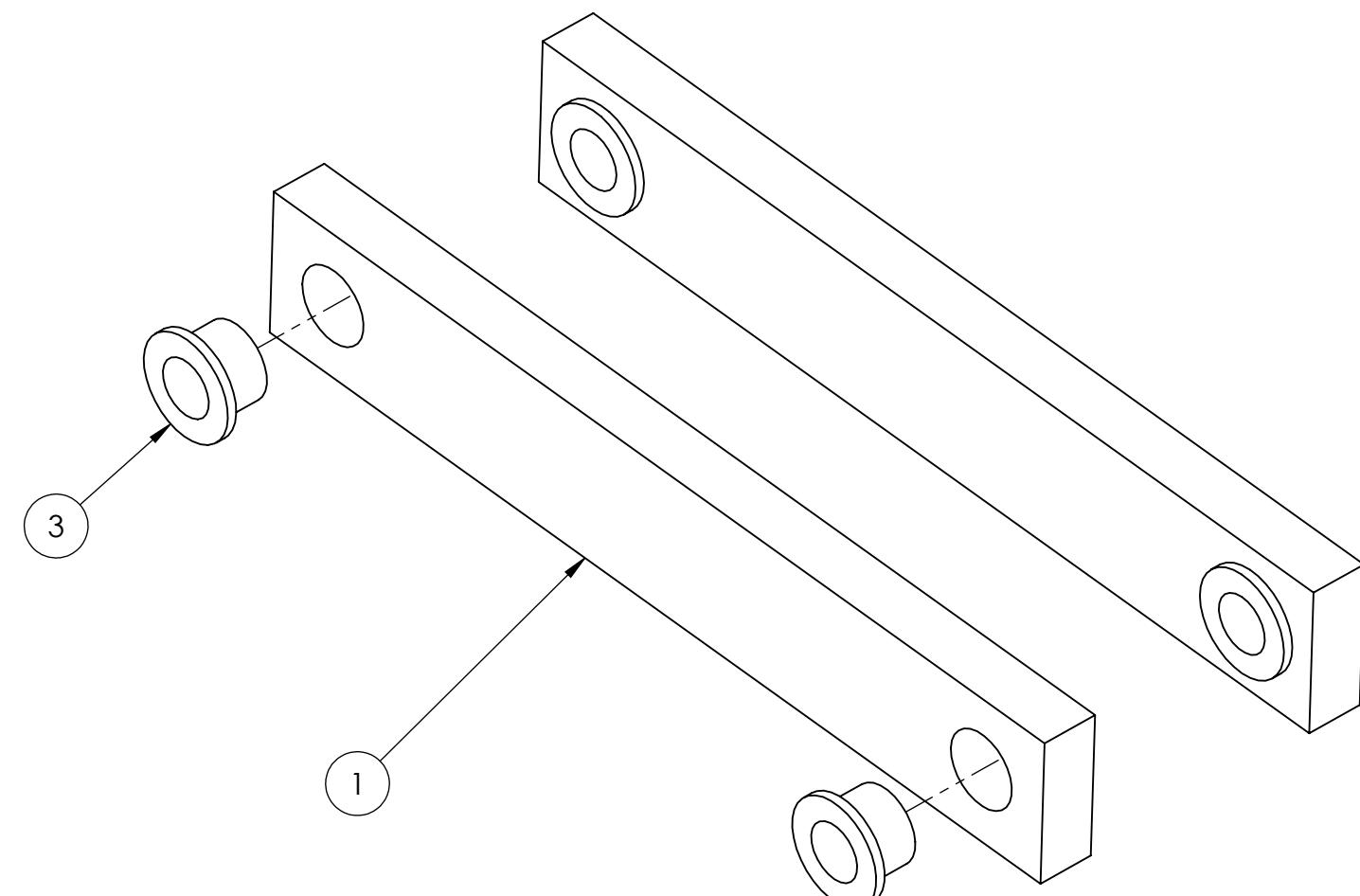
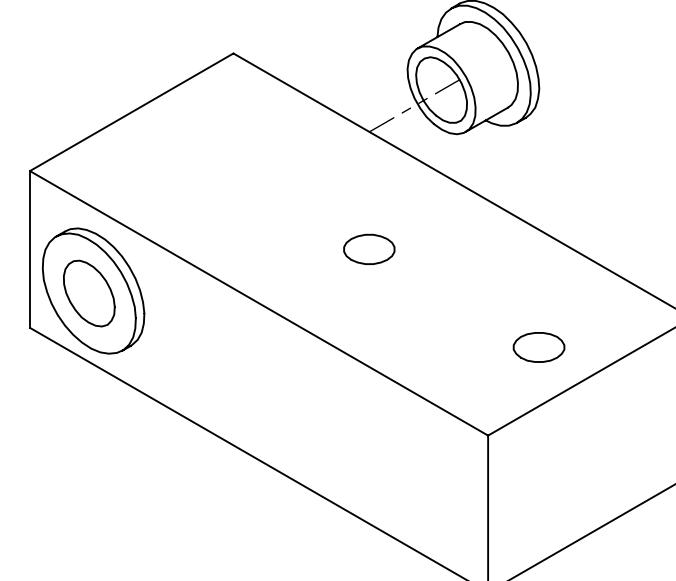
B

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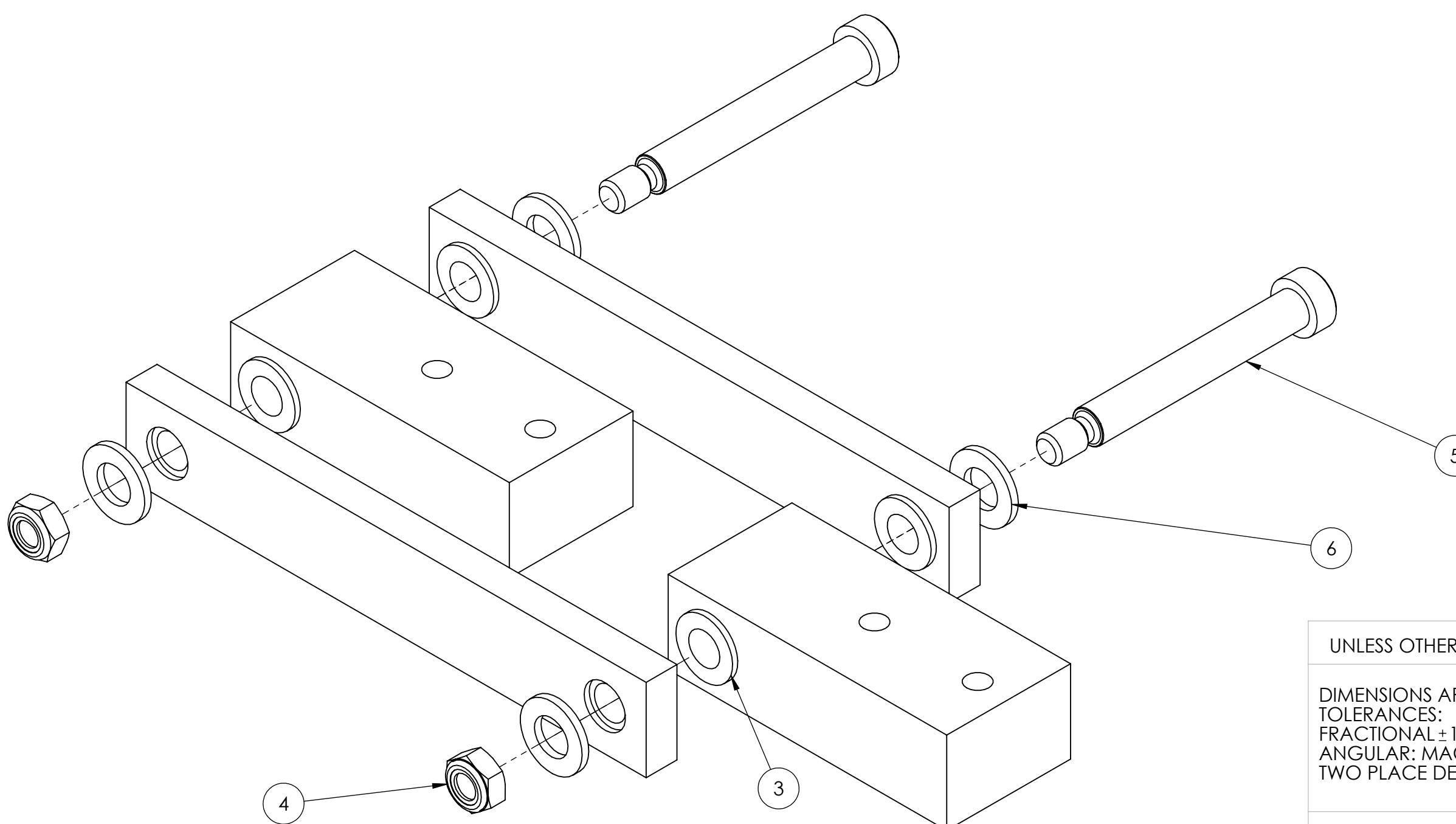
A



Step 1:
Press (3) into both sides of (2).



Step 2:
Press (3) into each hole of (1).



Step 3:
Fasten items from Step 2 to items from Step 1 using (4), (5), and (6).
Note orientation of (3). Do not overtighten. (2) should freely rotate.

UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	CO	12/12/2022
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: Charge Station
Pivot Hinge
Assembly

SIZE DWG. NO. REV

C GE-23328

SCALE: 1:1 SHEET 2 OF 2

4

3

2

1

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D

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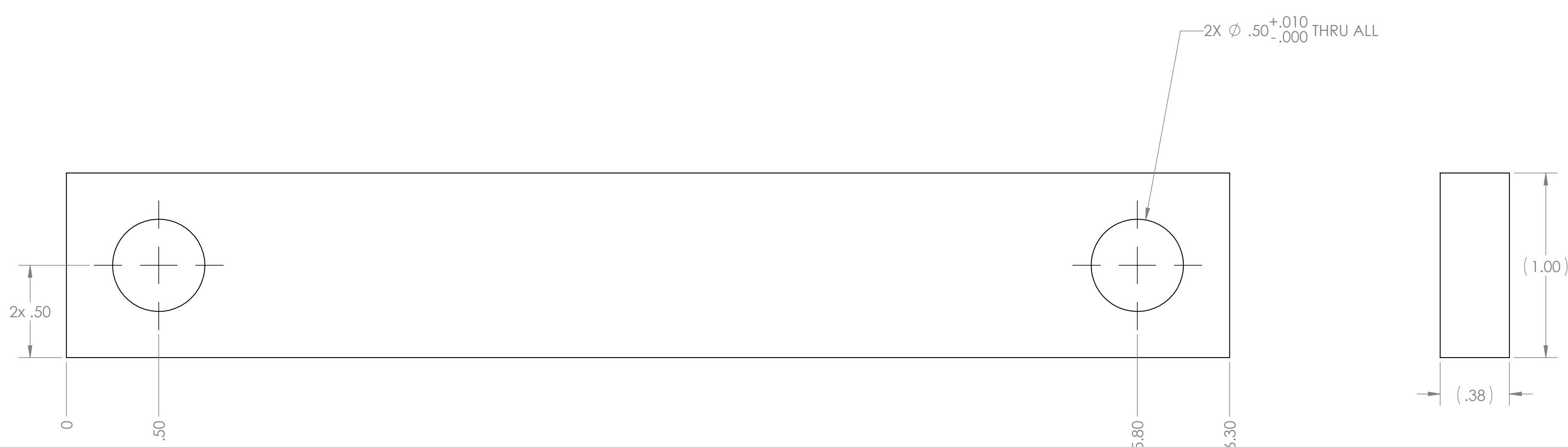
C

B

B

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Notes:

1. Tag or label with part number.

UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	CO	8/17/2022	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:	SIZE	DWG. NO.	REV
3/8" x 1" A36 HR Steel, black oxidized	C	GE-23329	
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING	SCALE: 2:1	SHEET 1 OF 1	

4

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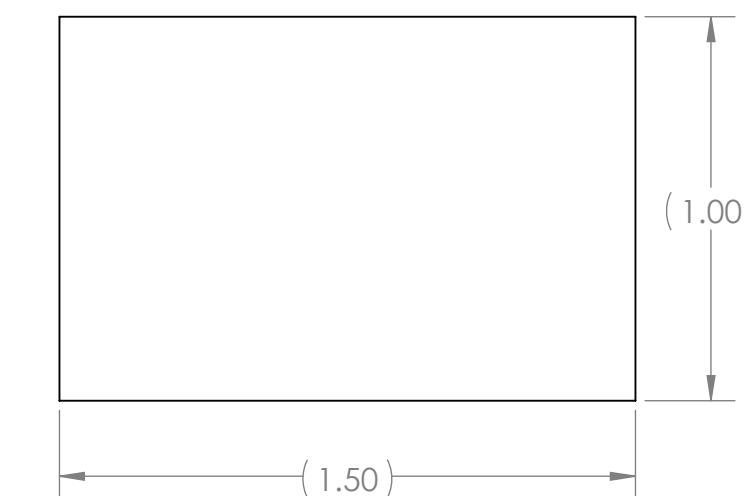
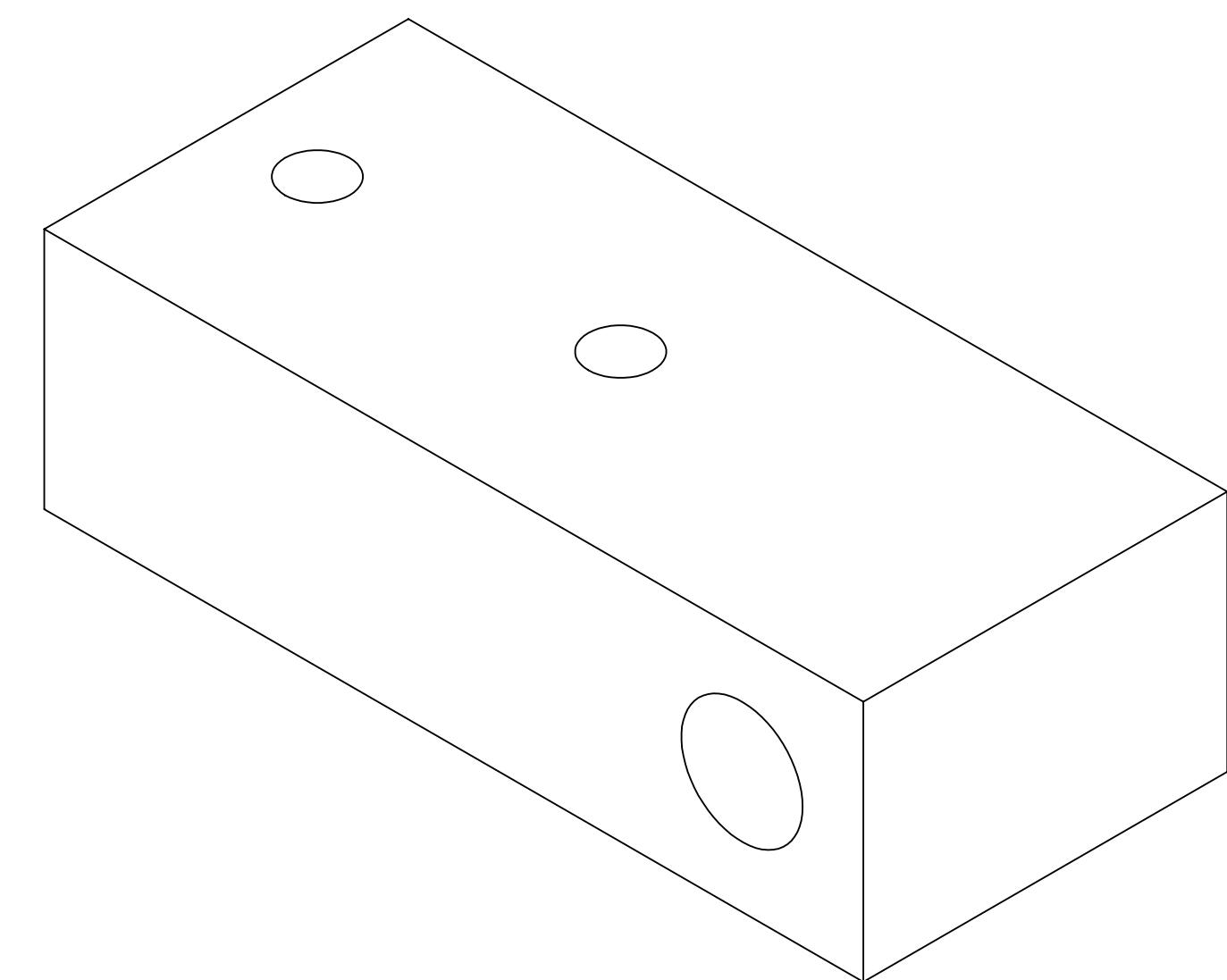
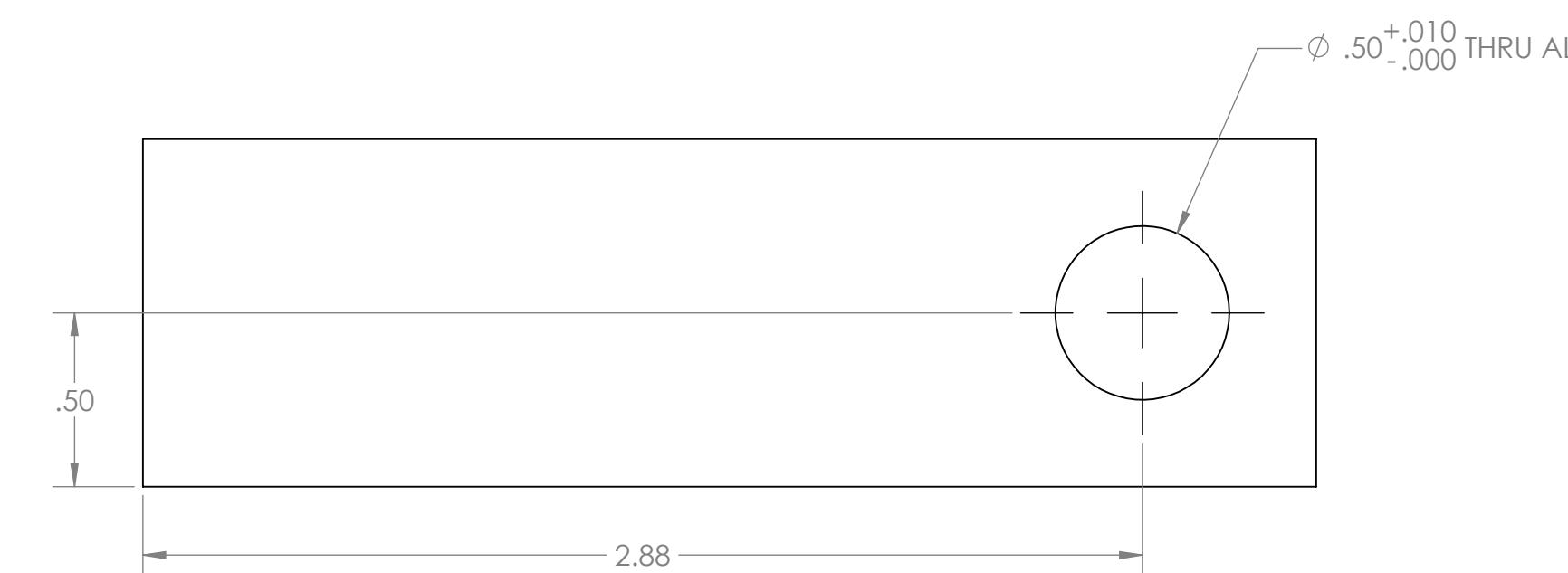
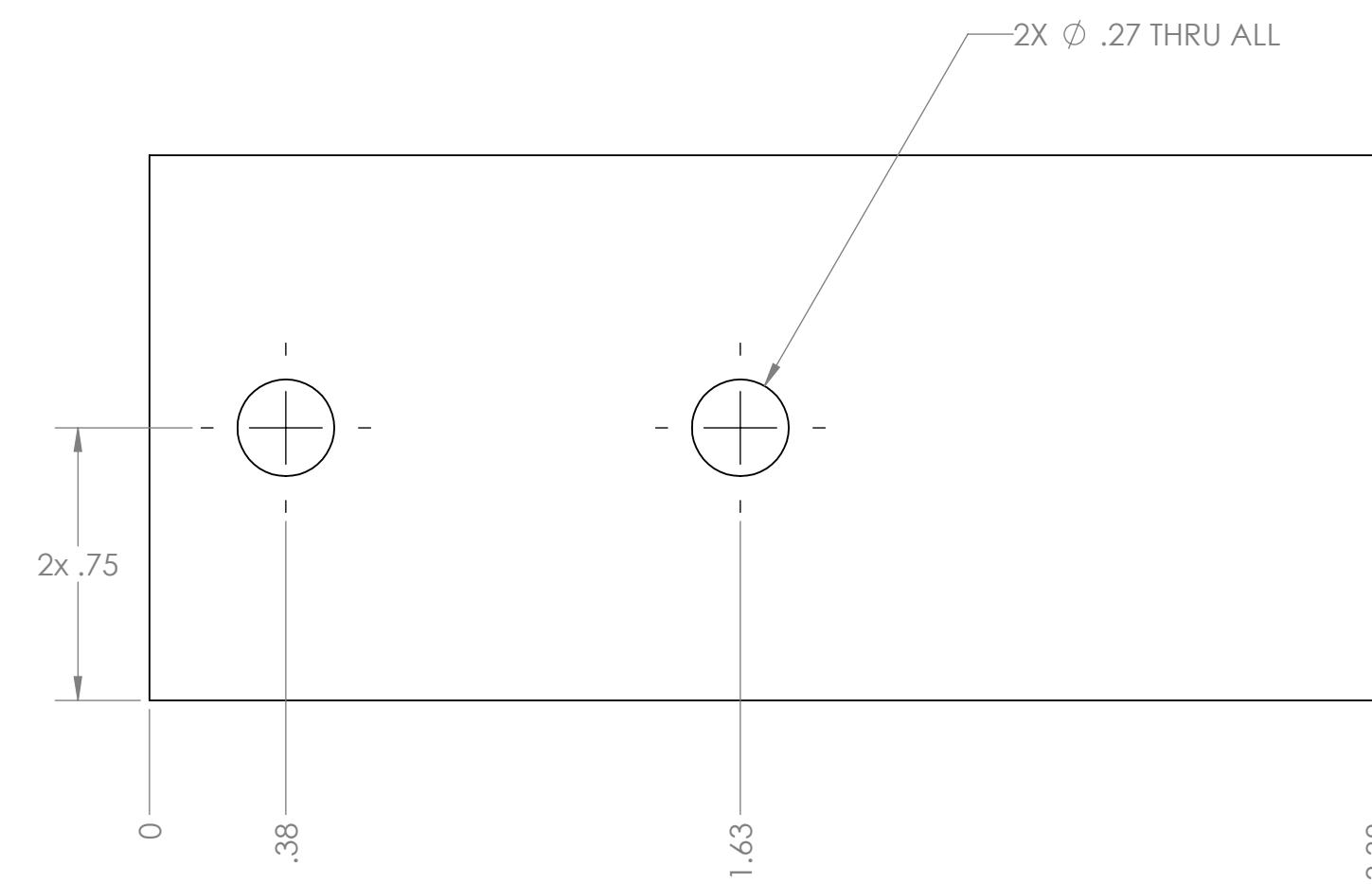
C

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Notes:
1. Tag or label with part number.

UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	CO	8/17/2022	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH: 1.5" x 1" A36 HR Steel, black oxidized			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE: Charge Station
Hinge Drilled
Block

SIZE DWG. NO. REV
C GE-23331

SCALE: 2:1 SHEET 1 OF 1

4

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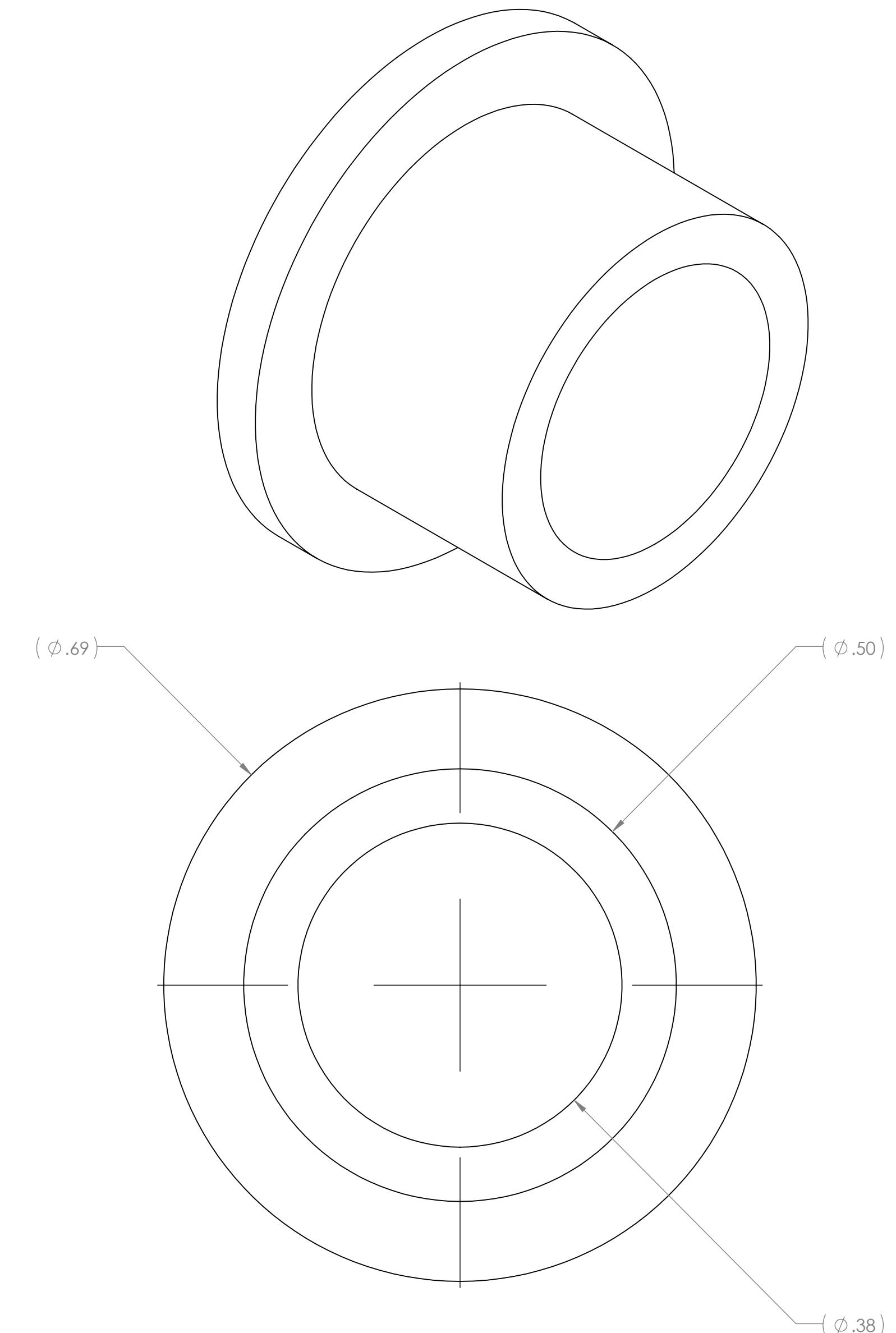
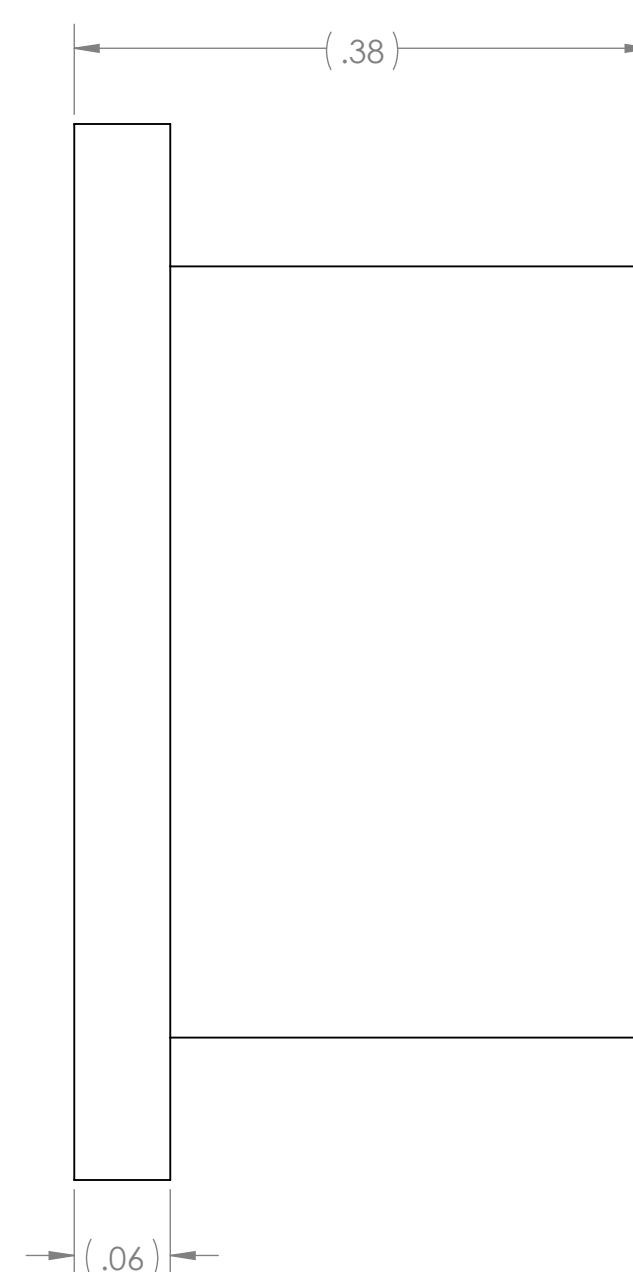
C

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Description: Ultra-Low-Friction Oil-Embedded Sleeve Bearing, Flanged, for 3/8" Shaft Diameter and 1/2" Housing ID, 3/8" Long

Vendor: McMaster-Carr

Part Number: 1677K325

Note: Equivalent Substitutions Allowed

UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	CO	12/9/2022	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH: 841 Bearing Bronze			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

 **FIRST
ROBOTICS
COMPETITION**  SOLIDWORKS
Modeling Solutions Partner

TITLE:
**Charge Station
Hinge Bushing**

SIZE DWG. NO. REV

C GE-23332

SCALE: 8:1 SHEET 1 OF 1

4

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C

C

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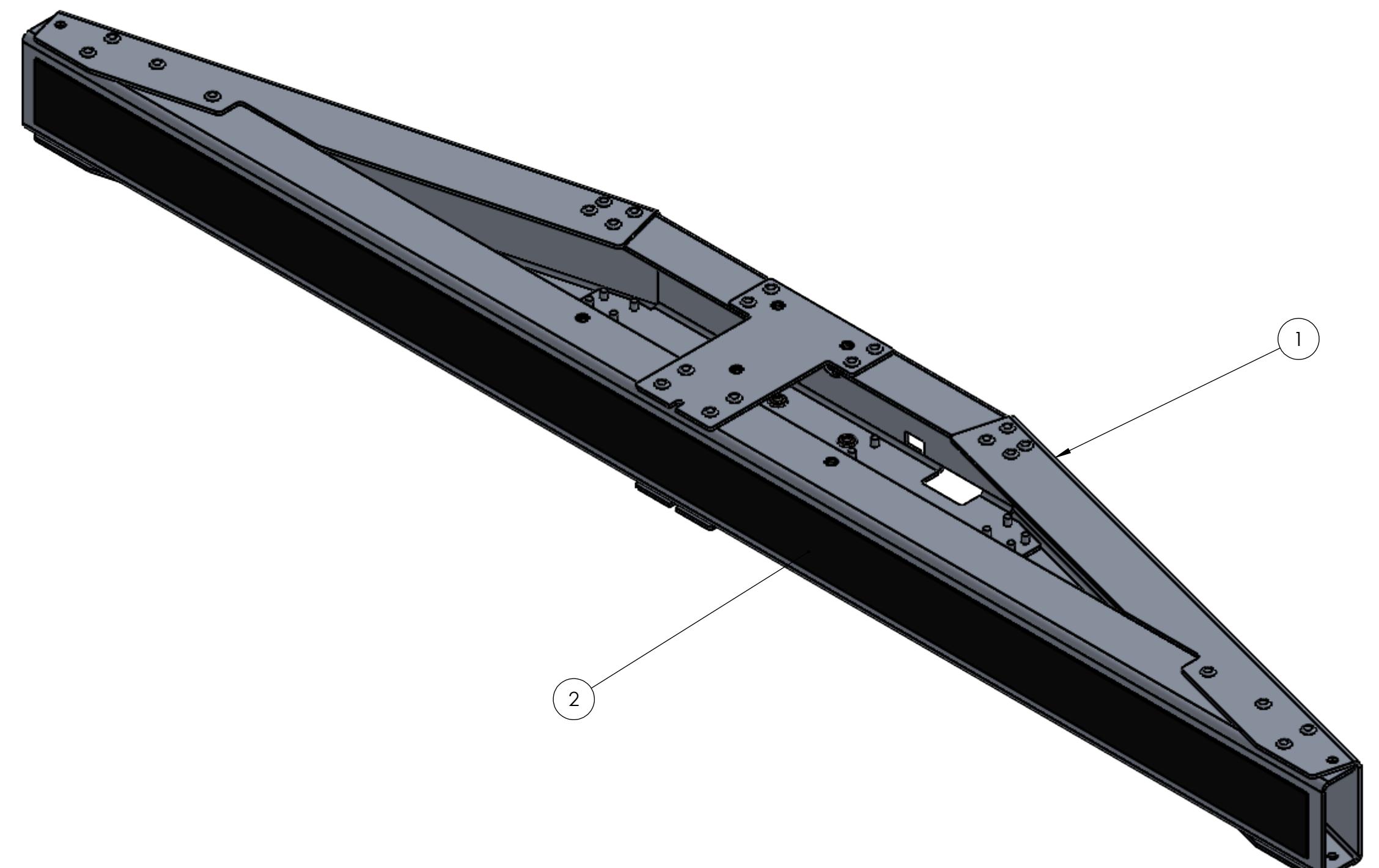
A

A

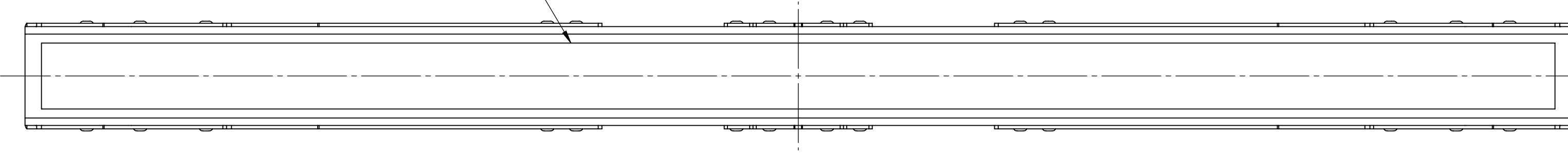
Notes:

1. Make sure surface of (1) is clean prior to hook application.
2. Attach (2) to (1) in locations shown.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23337	Charge Station Base Frame	1
2	Hook_2_46	2" X 46" Hook, Adhesion Backed	1



(2) Centered on bottom of (1).



UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	CO	12/9/2022
TOLERANCES: FRACTIONAL $\pm 1/2$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .50$	PROPRIETARY AND CONFIDENTIAL		
MATERIAL/FINISH:	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.
		C	GE-23336
		REV	
		SCALE: 1:3	
		SHEET 1 OF 1	

FIRST
ROBOTICS
COMPETITION

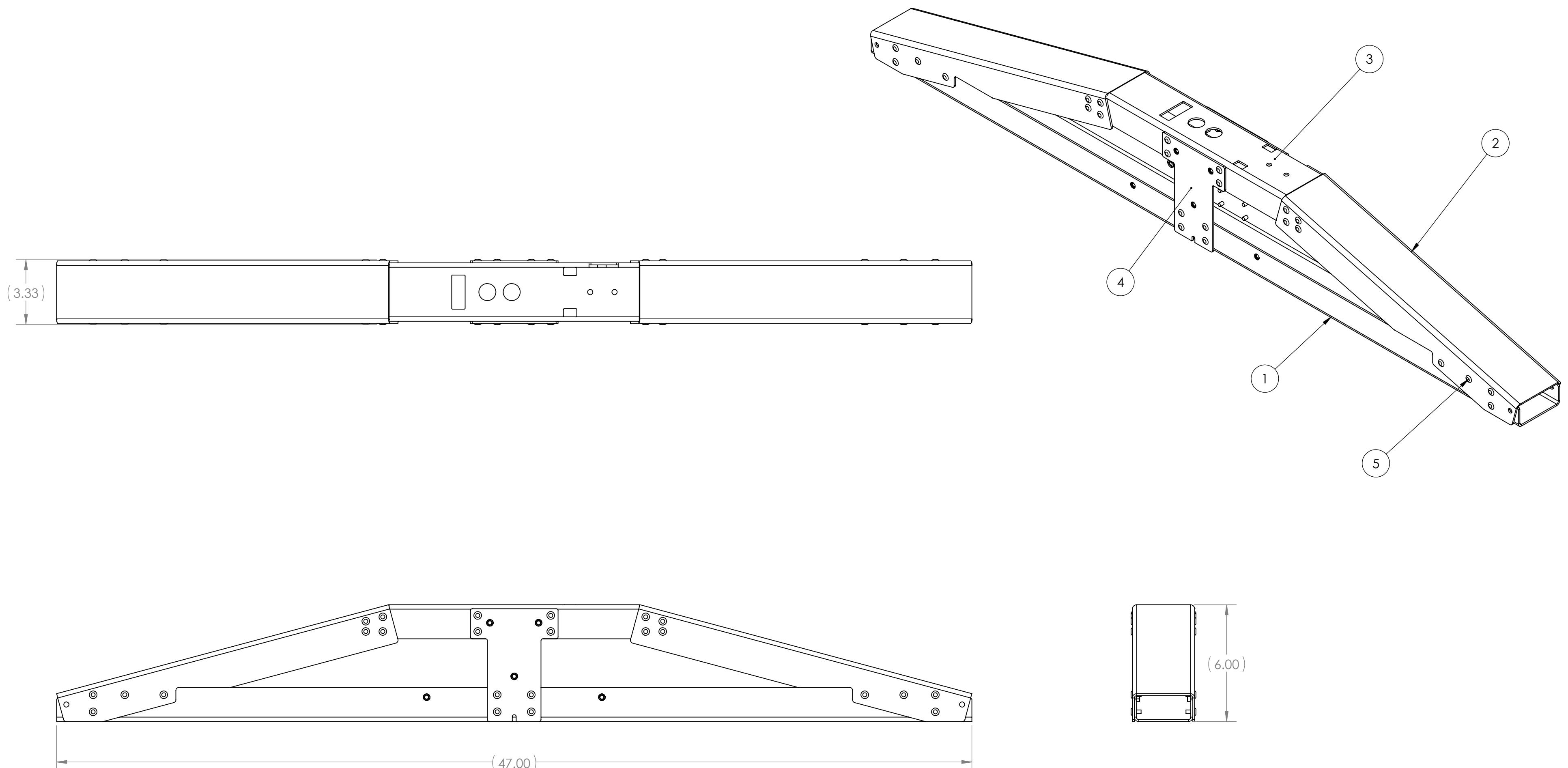
SOLIDWORKS
Modeling Solutions Partner

Title: Charge Station
Base Frame
with Hook

Size DWG. NO.

C GE-23336

REV



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23337-01	Charge Station Base Bot	1
2	GE-23337-03	Charge Station Base Diag	2
3	GE-23337-05	Charge Station Base Top	1
4	GE-23337-06	Charge Station Base Support	2
5	rivet_.1875_.126-.25	3/16" Rivet, .126-.25 Grip Range	48

UNLESS OTHERWISE SPECIFIED:		BEND	NAME	DATE
		DRAWN	CO	9/29/2022
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: Charge Station Base Frame

SIZE DWG. NO. REV

C GE-23337

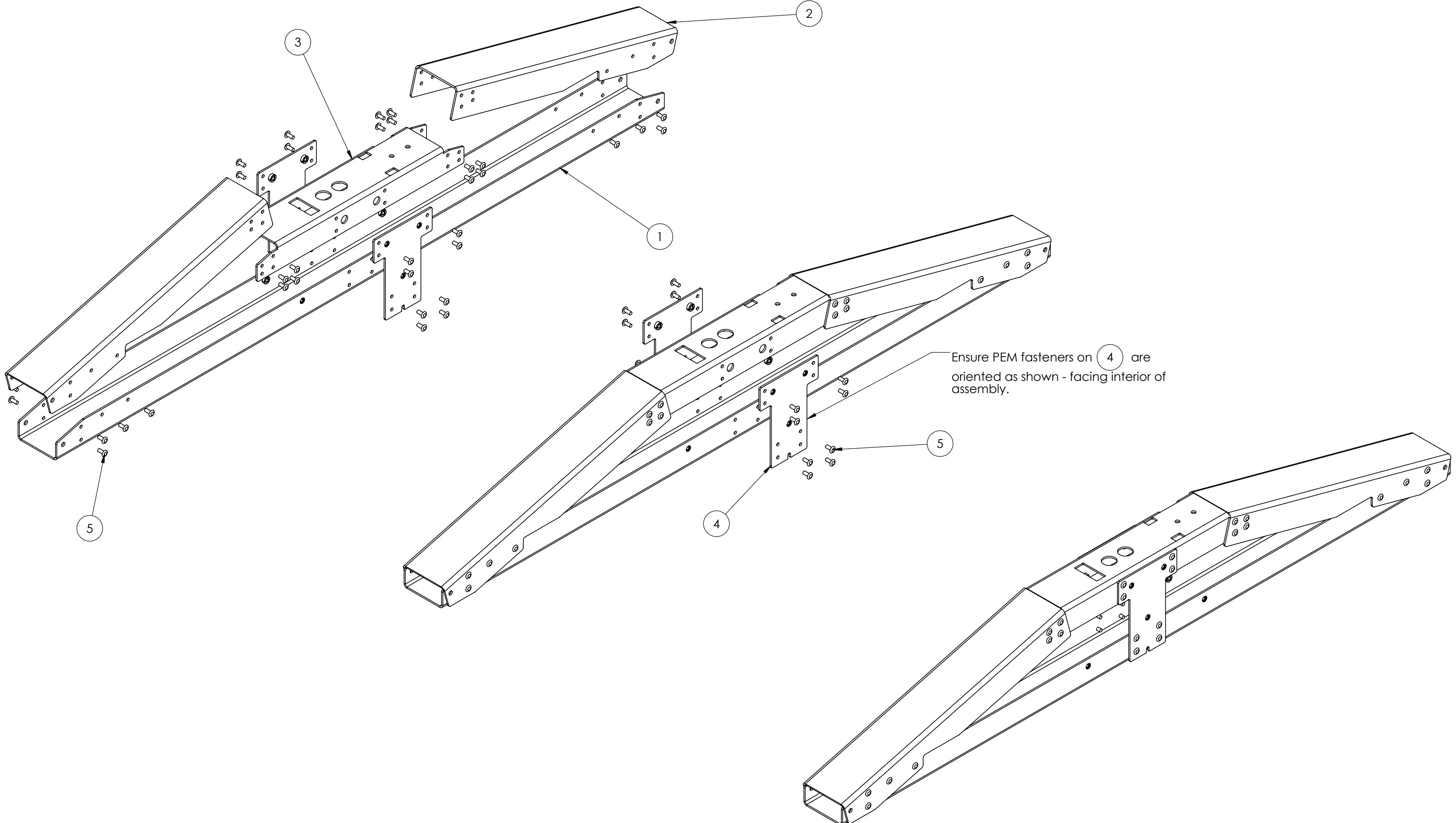
SCALE: 1:4 SHEET 1 OF 2

4

3

2

1



UNLESS OTHERWISE SPECIFIED:	BEND	NAME	DATE
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	CO	9/29/2022
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:	SIZE	DWG. NO.	REV
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.	C	GE-23337	
DO NOT SCALE DRAWING	SCALE: 1:4	SHEET 2 OF 2	

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

TITLE:
**Charge Station
Base Frame**

4

3

2

1

REVISIONS

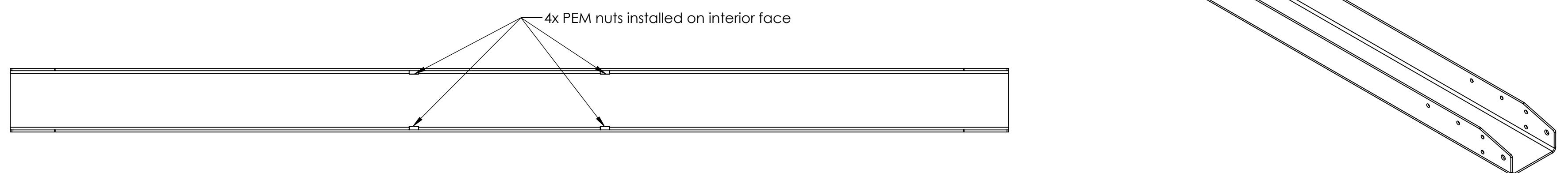
ZONE	REV.	DESCRIPTION	DATE	APPROVED
A2, A4, B2	A	Removed 2x .27" holes. Some hole locations updated. Part name changed.	9/29/2022	CPO

D

D

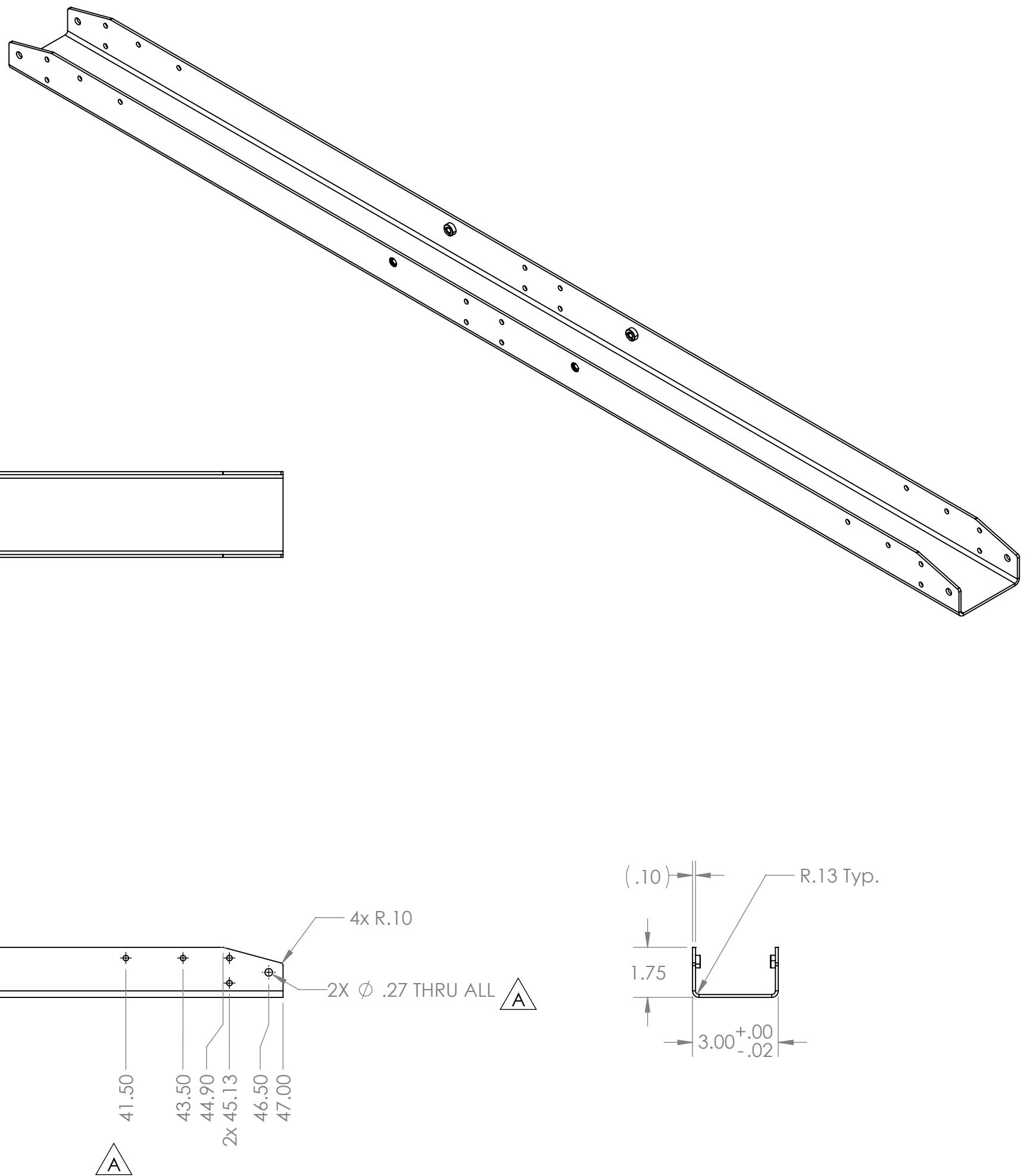
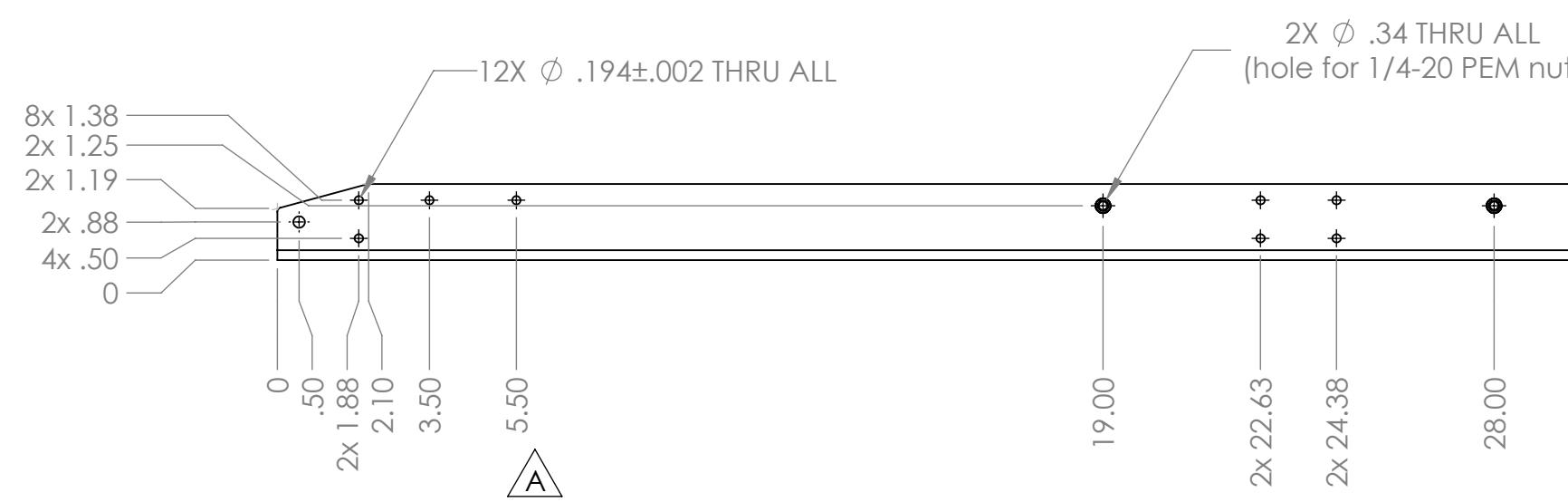
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C



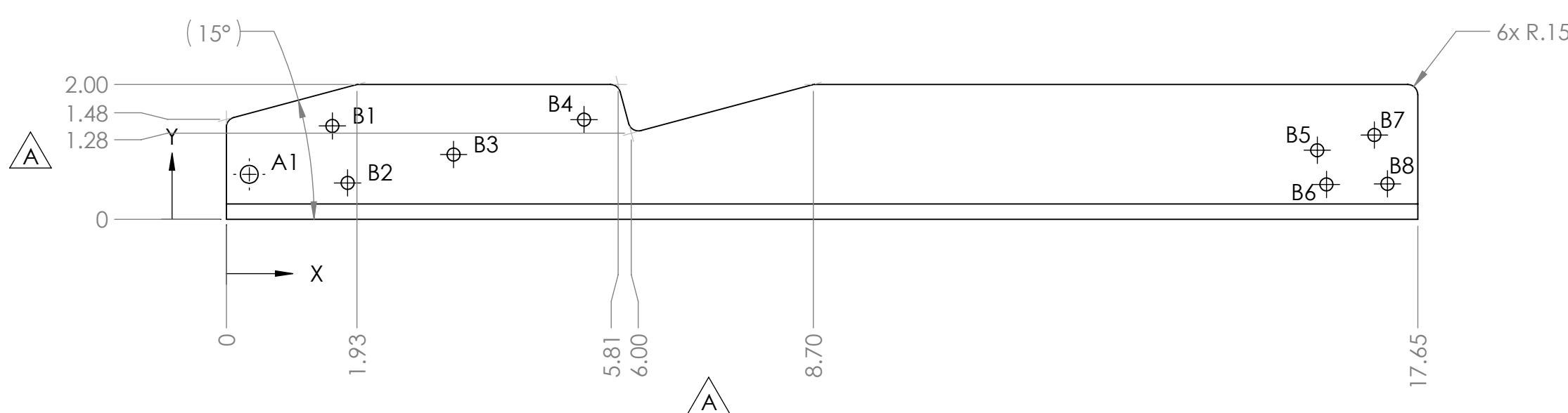
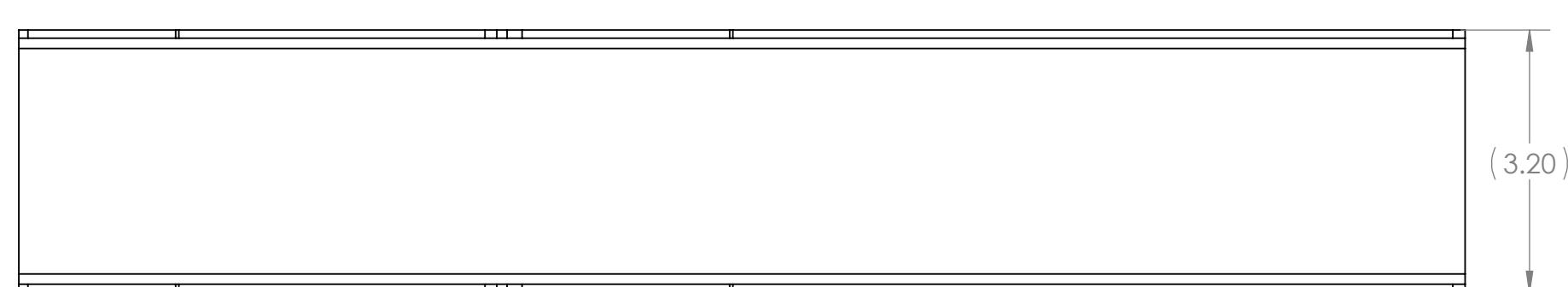
B

B



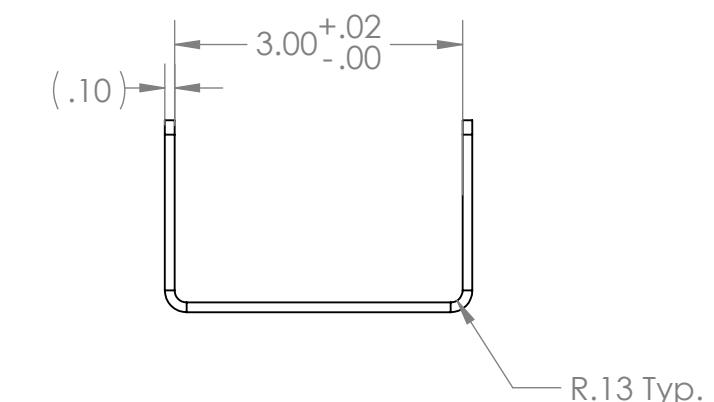
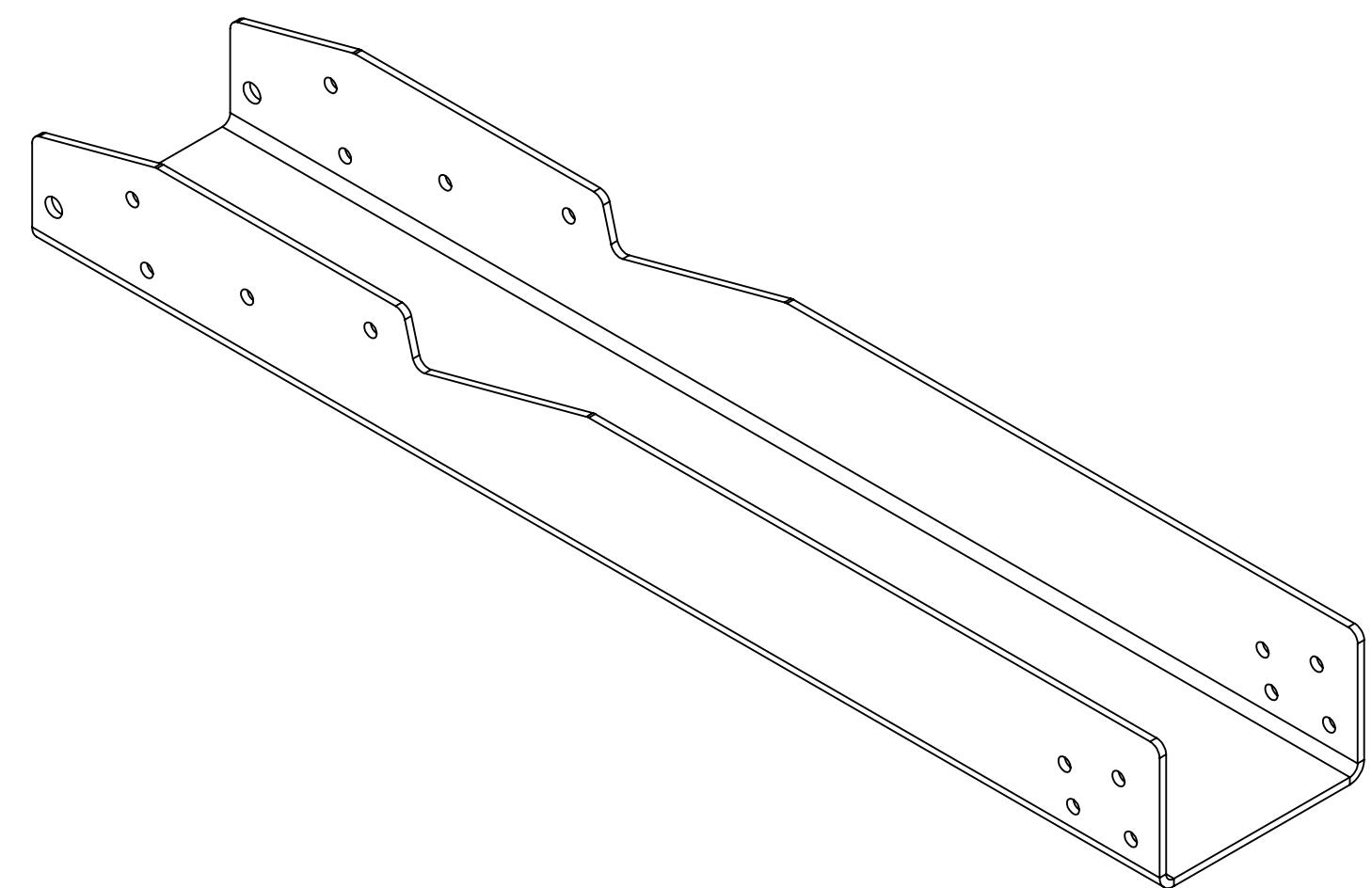
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23337-02	10 ga. Aluminum 5052	1
2	pem_clinchnut_.25_20 .054	1/4-20 self-clinching nut, .054 shank	4

UNLESS OTHERWISE SPECIFIED:	BEND	NAME	DATE
DRAWN	CO	8/29/2022	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH: 10 ga. Aluminum 5052			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			
FIRST ROBOTICS COMPETITION			
SOLIDWORKS Modeling Solutions Partner			
TITLE: Charge Station Base Bot			
SIZE DWG. NO. REV			
C GE-23337-01 A			
SCALE: 1:4 SHEET 1 OF 1			



TAG	X LOC	Y LOC	SIZE
A1	.34	.67	ϕ .27 THRU ALL
B1	1.57	1.38	ϕ .194±.002 THRU ALL
B2	1.80	.54	ϕ .194±.002 THRU ALL
B3	3.37	.96	ϕ .194±.002 THRU ALL
B4	5.30	1.48	ϕ .194±.002 THRU ALL
B5	16.16	1.02	ϕ .194±.002 THRU ALL
B6	16.30	.52	ϕ .194±.002 THRU ALL
B7	17.01	1.25	ϕ .194±.002 THRU ALL
B8	17.20	.53	ϕ .194±.002 THRU ALL

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
A3, B3, B4	A	Notch location moved. Location of hole B4 updated. File name updated.	9/29/2022	CPO



UNLESS OTHERWISE SPECIFIED:			BEND	NAME	DATE
			DRAWN	CO	8/29/2022
PROPRIETARY AND CONFIDENTIAL					
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MATERIAL/FINISH: 10 ga. Aluminum 5052					
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.					
DO NOT SCALE DRAWING					

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

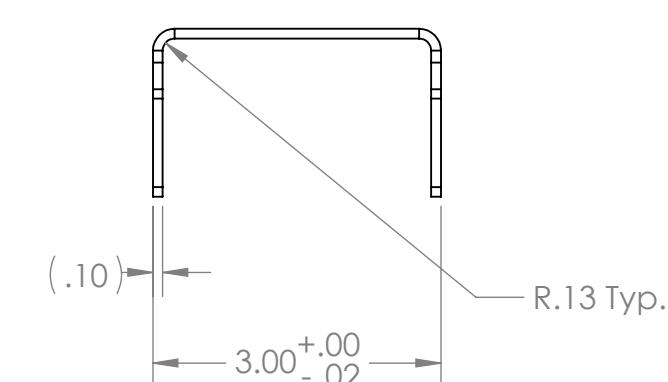
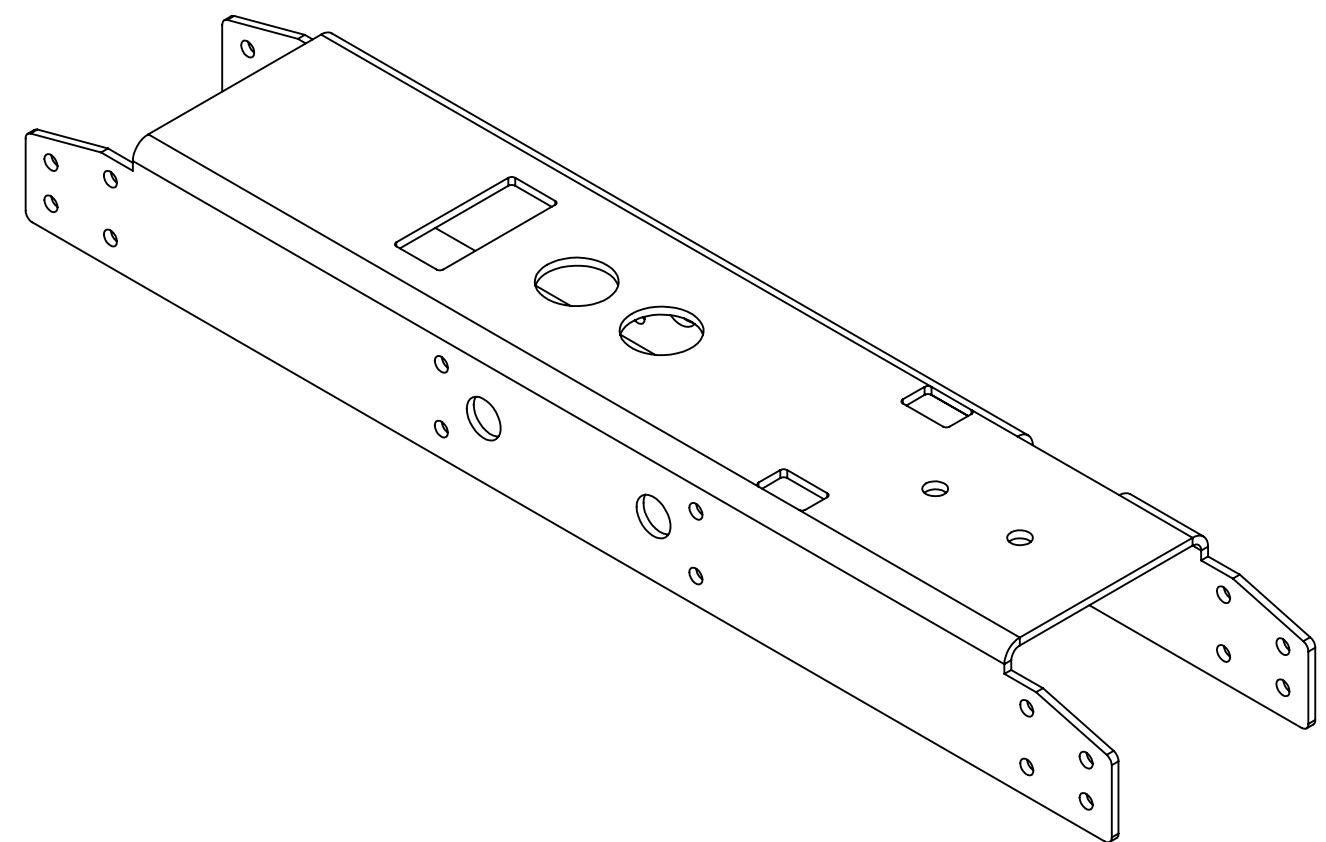
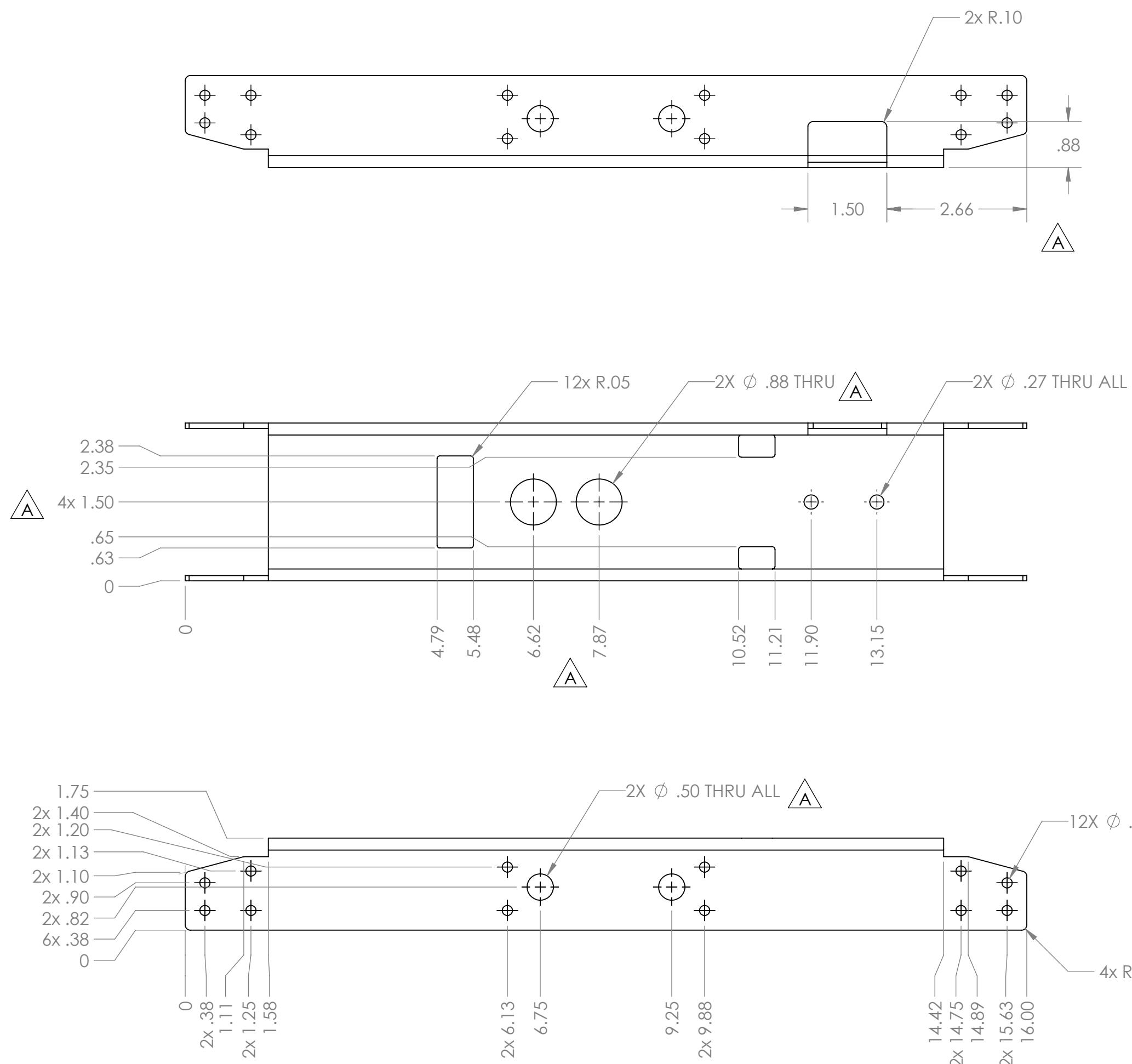
TITLE:
**Charge Station
Base Diag**

SIZE DWG. NO. REV
C GE-23337-03 A

SCALE: 1:2 SHEET 1 OF 1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
B3, C2, C3, C4	A	Hole diameters of some holes updated. New .88" diameter holes added on face. Cutout added. Part name updated.	9/29/2022	CPO



UNLESS OTHERWISE SPECIFIED:	BEND	NAME	DATE
DRAWN	CO	8/29/2022	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH: 10 ga. Aluminum 5052			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			
FIRST ROBOTICS COMPETITION			
SOLIDWORKS Modeling Solutions Partner			
TITLE: Charge Station Base Top			
SIZE	DWG. NO.	REV	
C	GE-23337-05	A	
SCALE: 1:2	SHEET 1 OF 1		

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
A3, B2, B4	A	Clearance holes changed to PEM nuts. Part name and number adjusted.	9/30/2022	CPO

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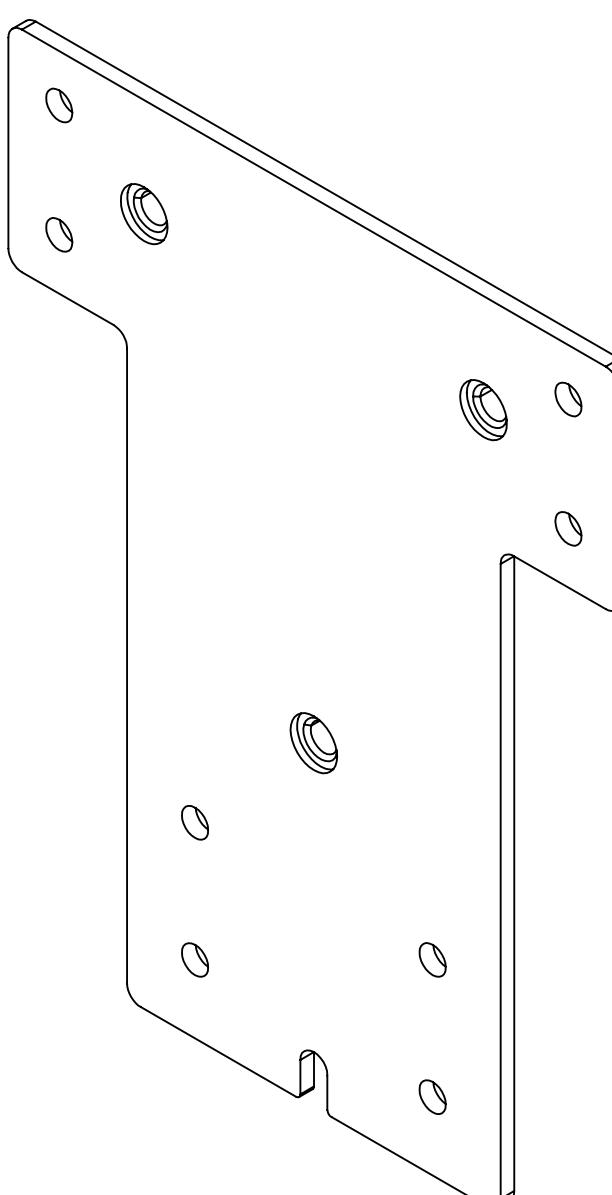
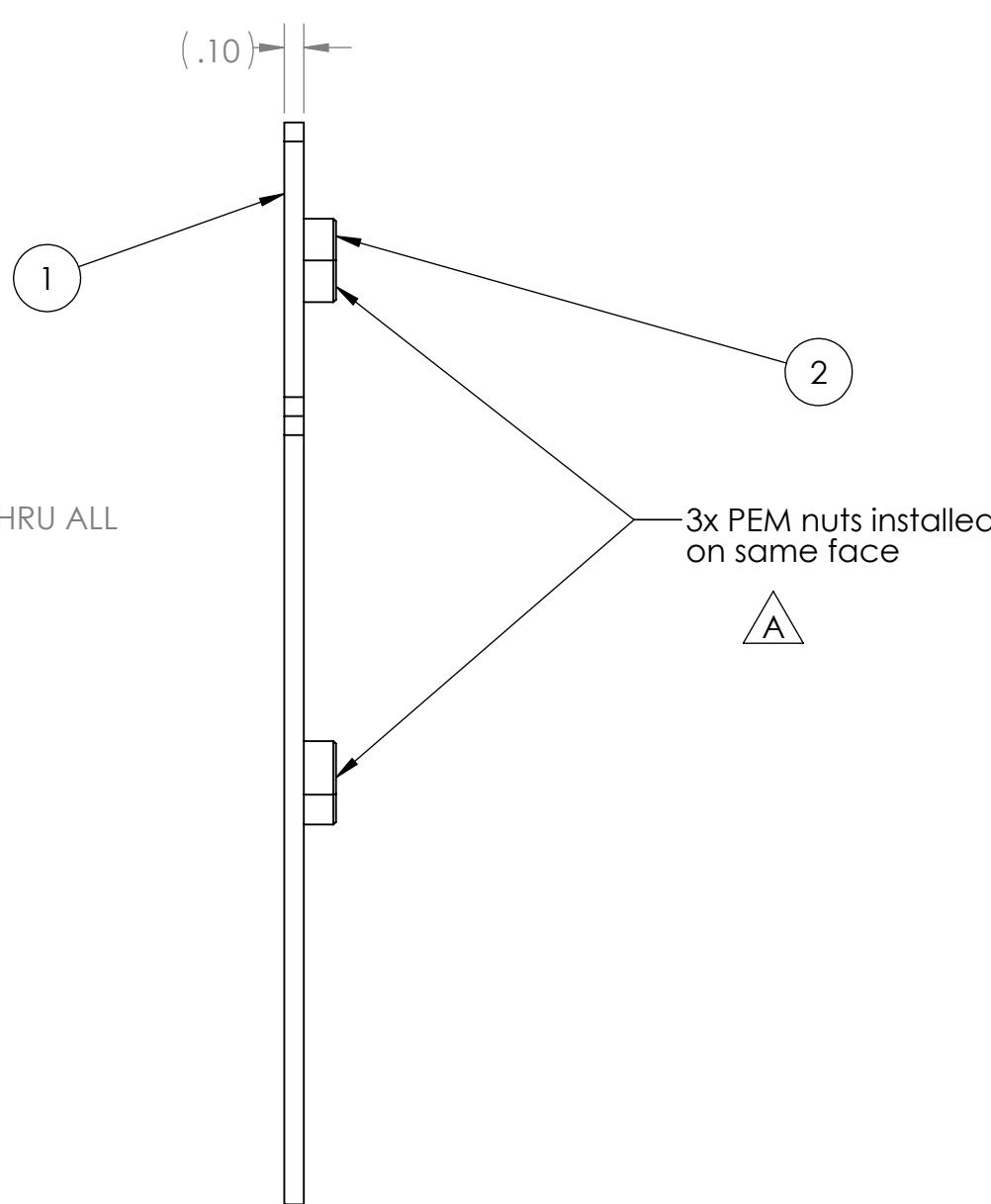
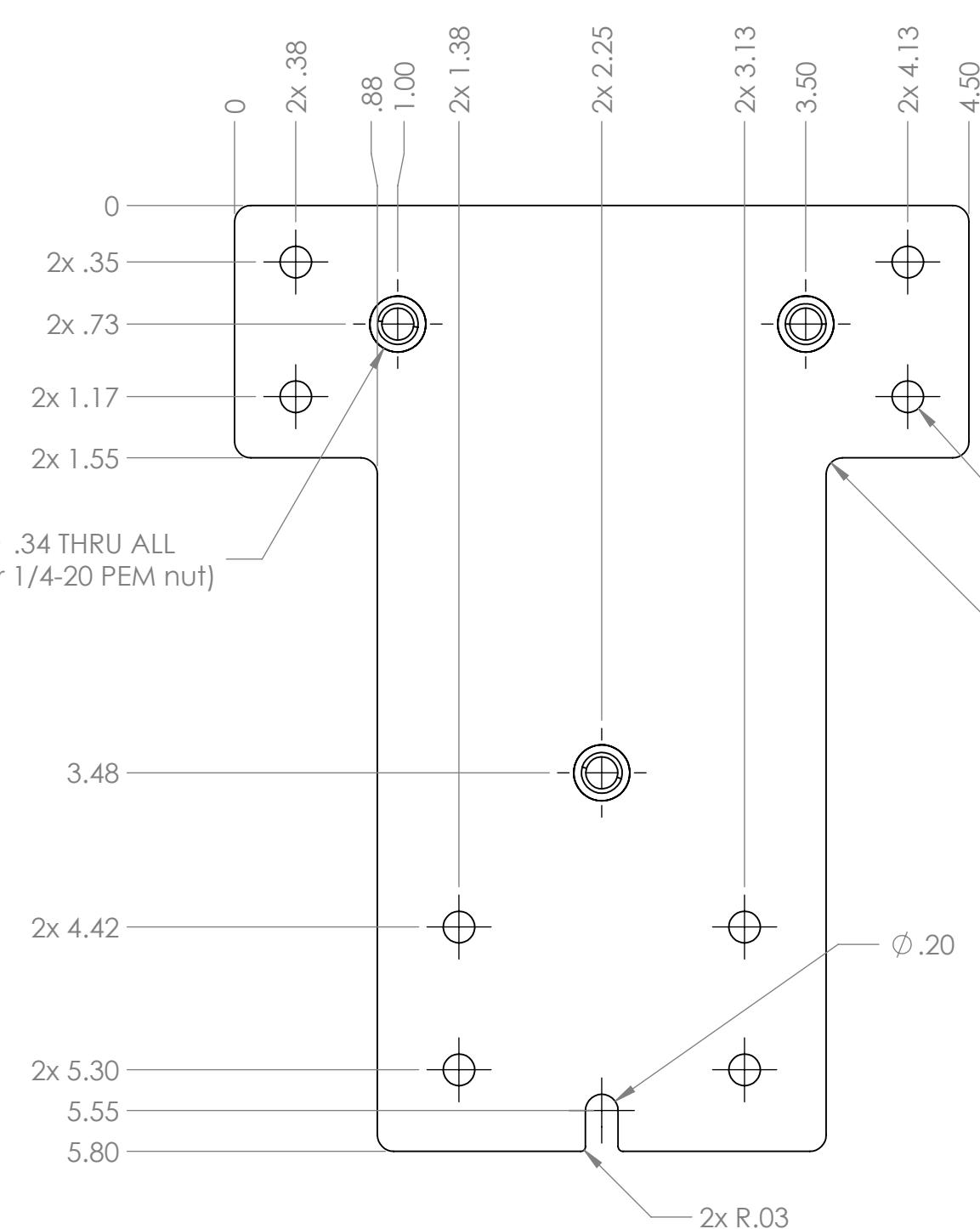
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23337-04	10 ga. Aluminum 5052	1
2	pem_clinchnut_.25_20_.054	1/4-20 self-clinching nut, .054 shank	3

A

UNLESS OTHERWISE SPECIFIED:	BEND	NAME	DATE
DRAWN	CO	9/29/2022	
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: 10 ga. Aluminum 5052			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			
TITLE: Charge Station Base Support			
SIZE DWG. NO. REV			
C GE-23337-06 A			
SCALE: 1:1 SHEET 1 OF 1			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

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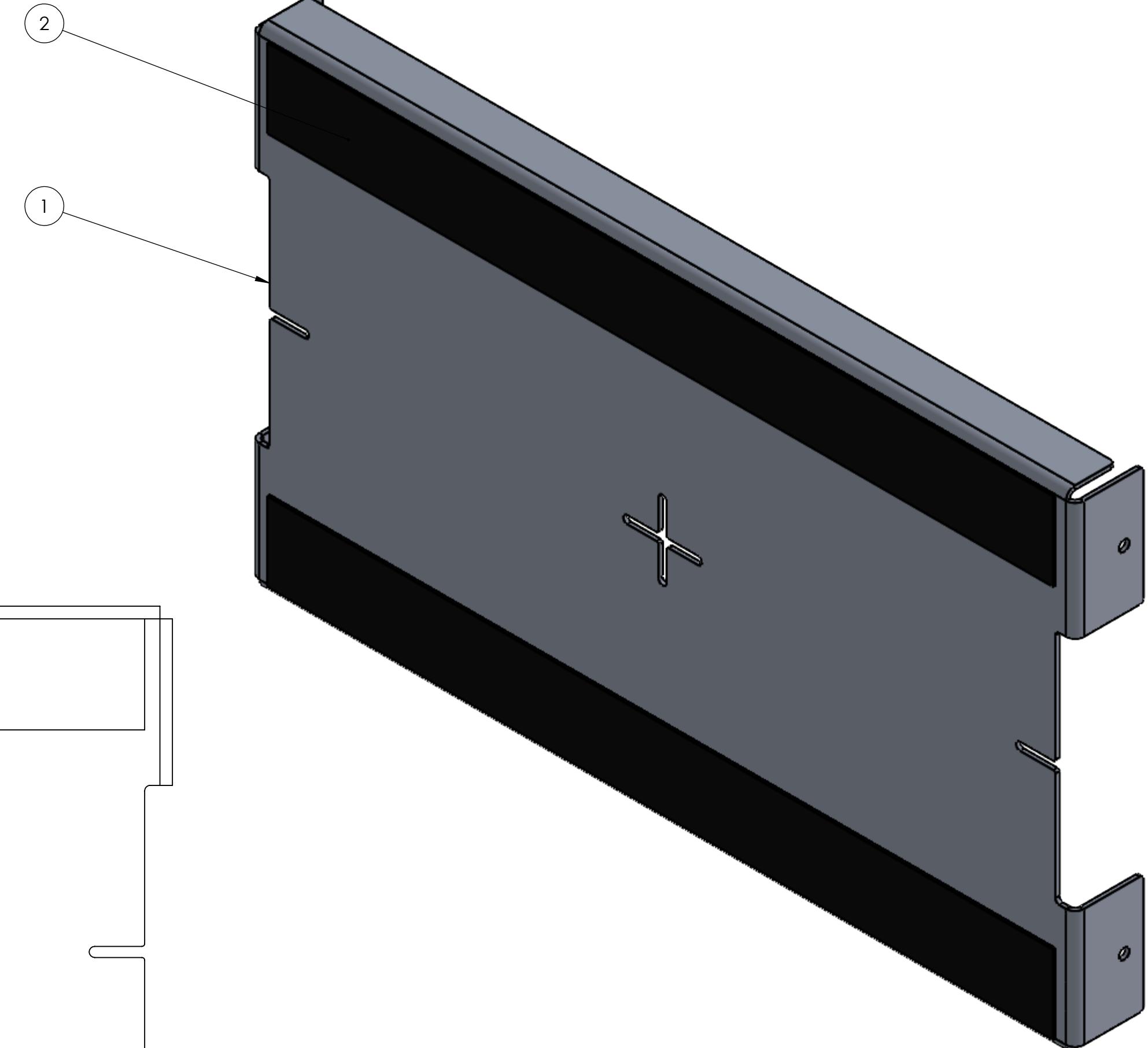
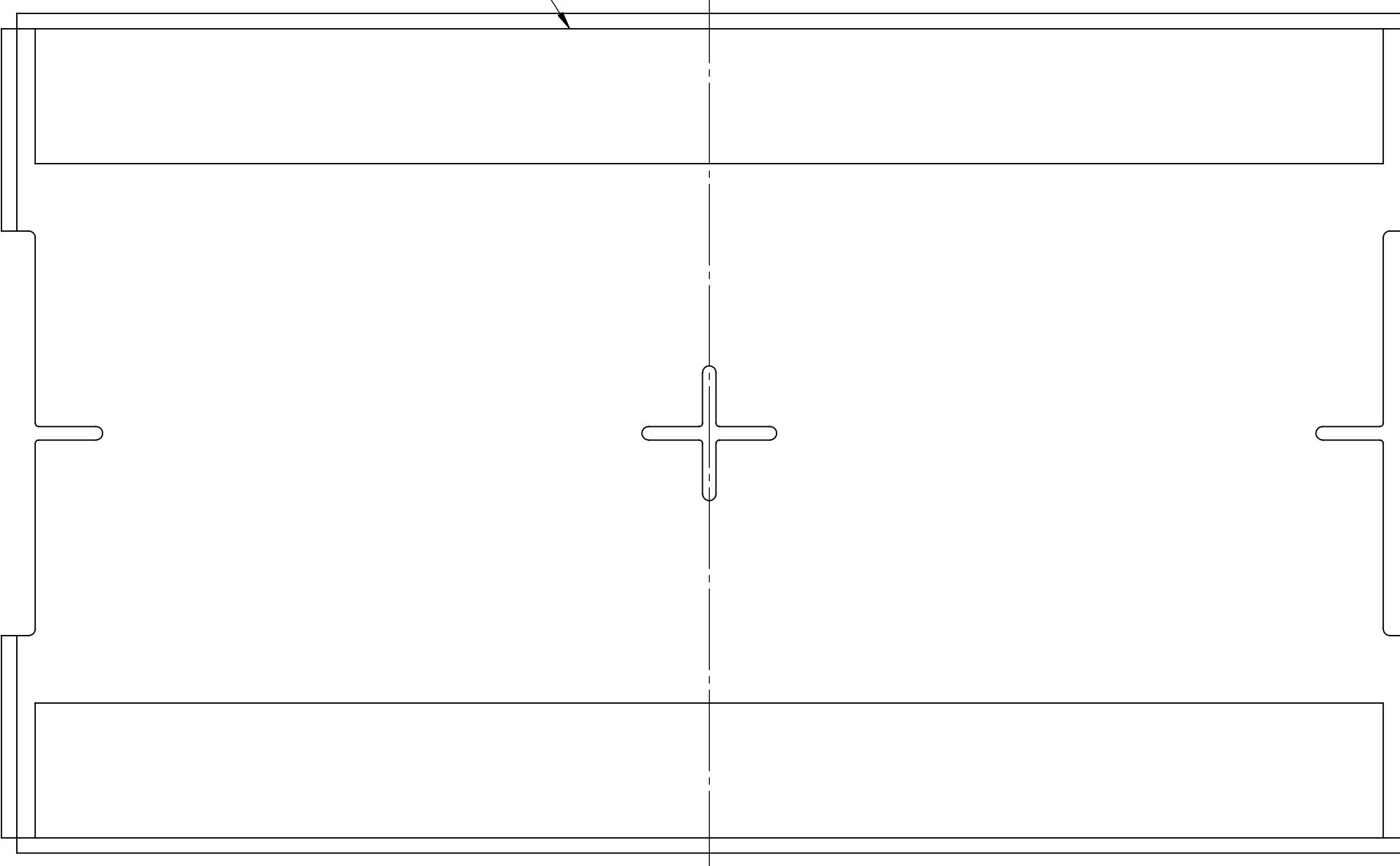
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Notes:

1. Make sure surface of (1) is clean prior to hook application.
2. Attach (2) to (1) in locations shown.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23339	Charge Station Base Connector	1
2	Hook_2_20	2" x 22" Hook, Adhesive Backed	2

UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	CO	12/9/2022
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: Charge Station
Base Connector
with Hook
SIZE DWG. NO. REV
C GE-23338

SCALE: 1:2 SHEET 1 OF 1

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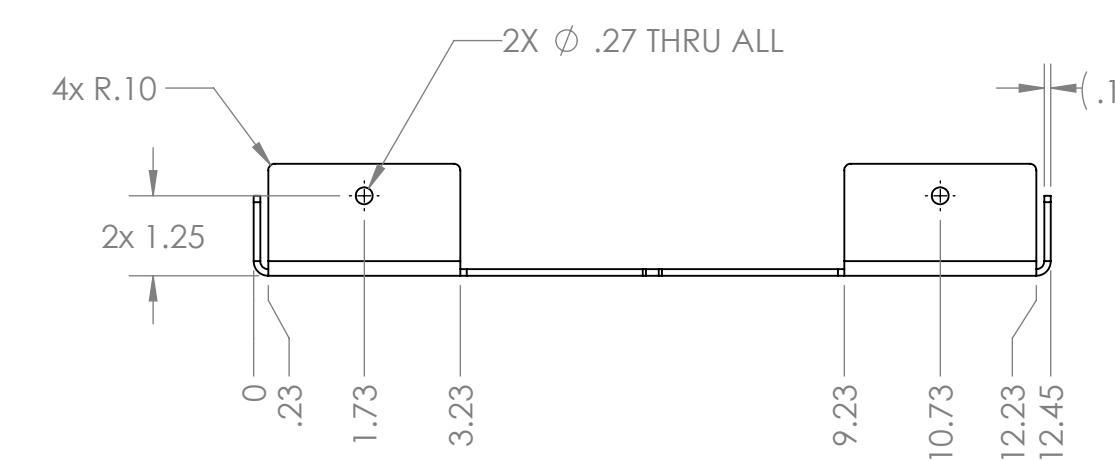
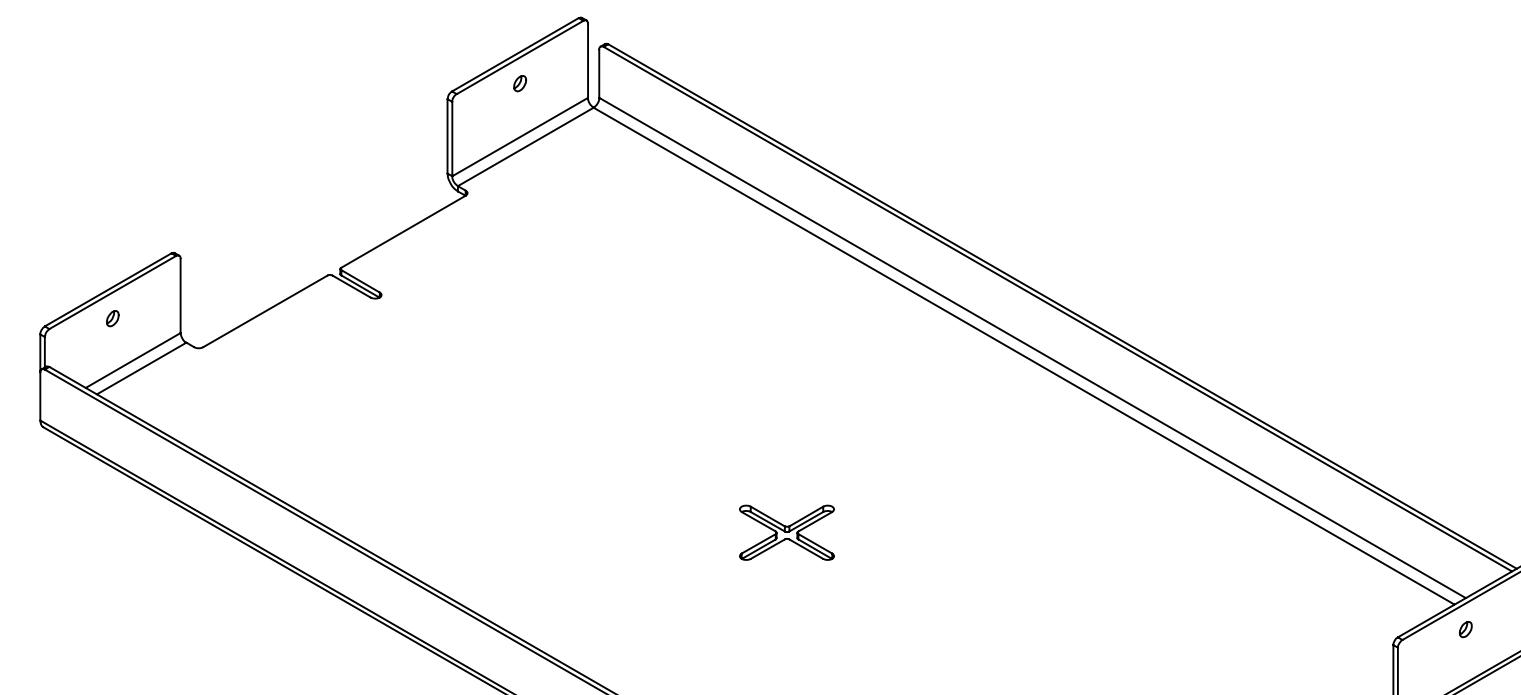
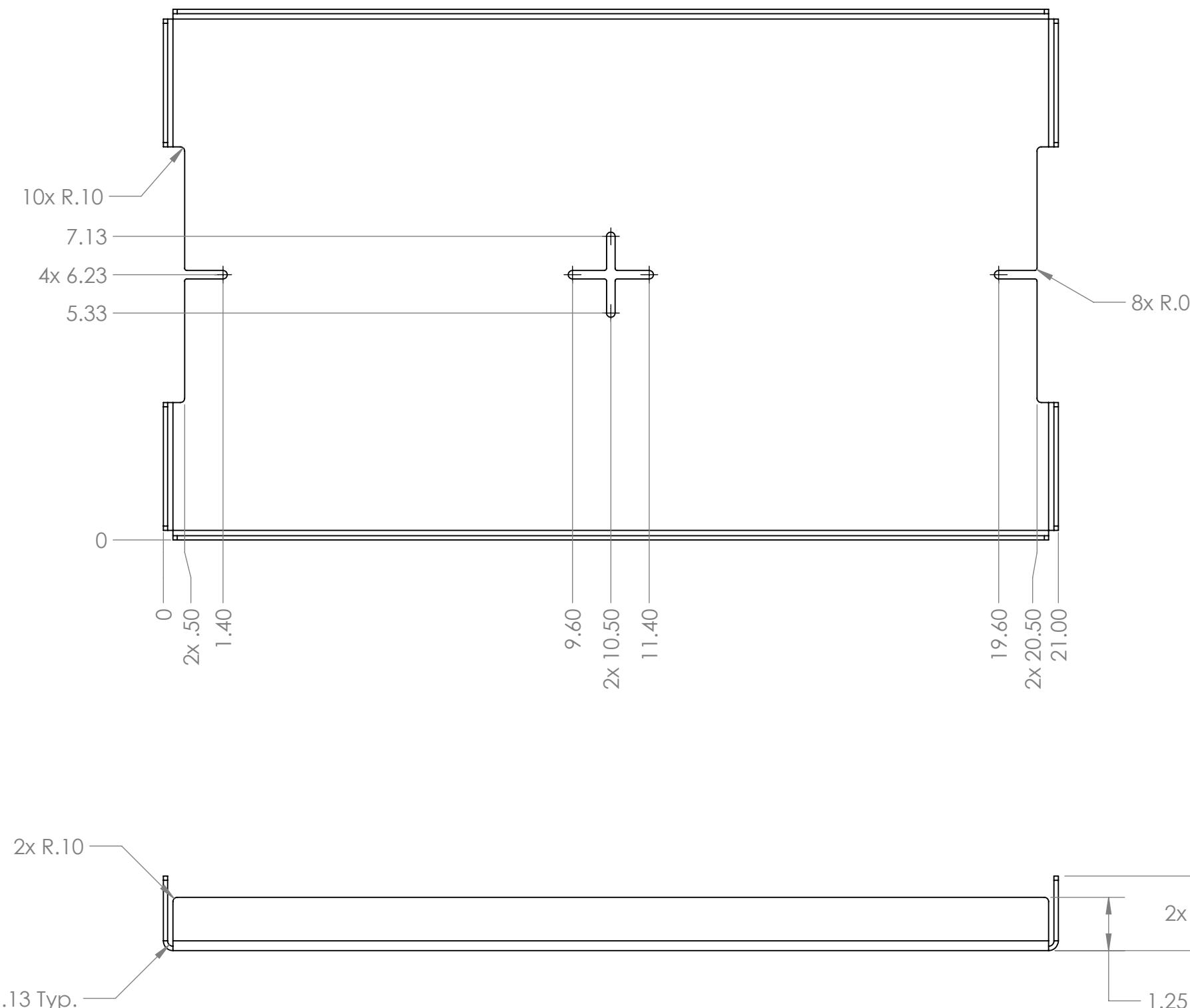
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Notes:
1. Tag or label with part number.

UNLESS OTHERWISE SPECIFIED:	BEND	NAME	DATE
	DRAWN	CO	8/18/2022
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: 10 ga. Aluminum 5052			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
**Charge Station
Base Connector**

SIZE DWG. NO. REV
C GE-23339

SCALE: 1:3 SHEET 1 OF 1

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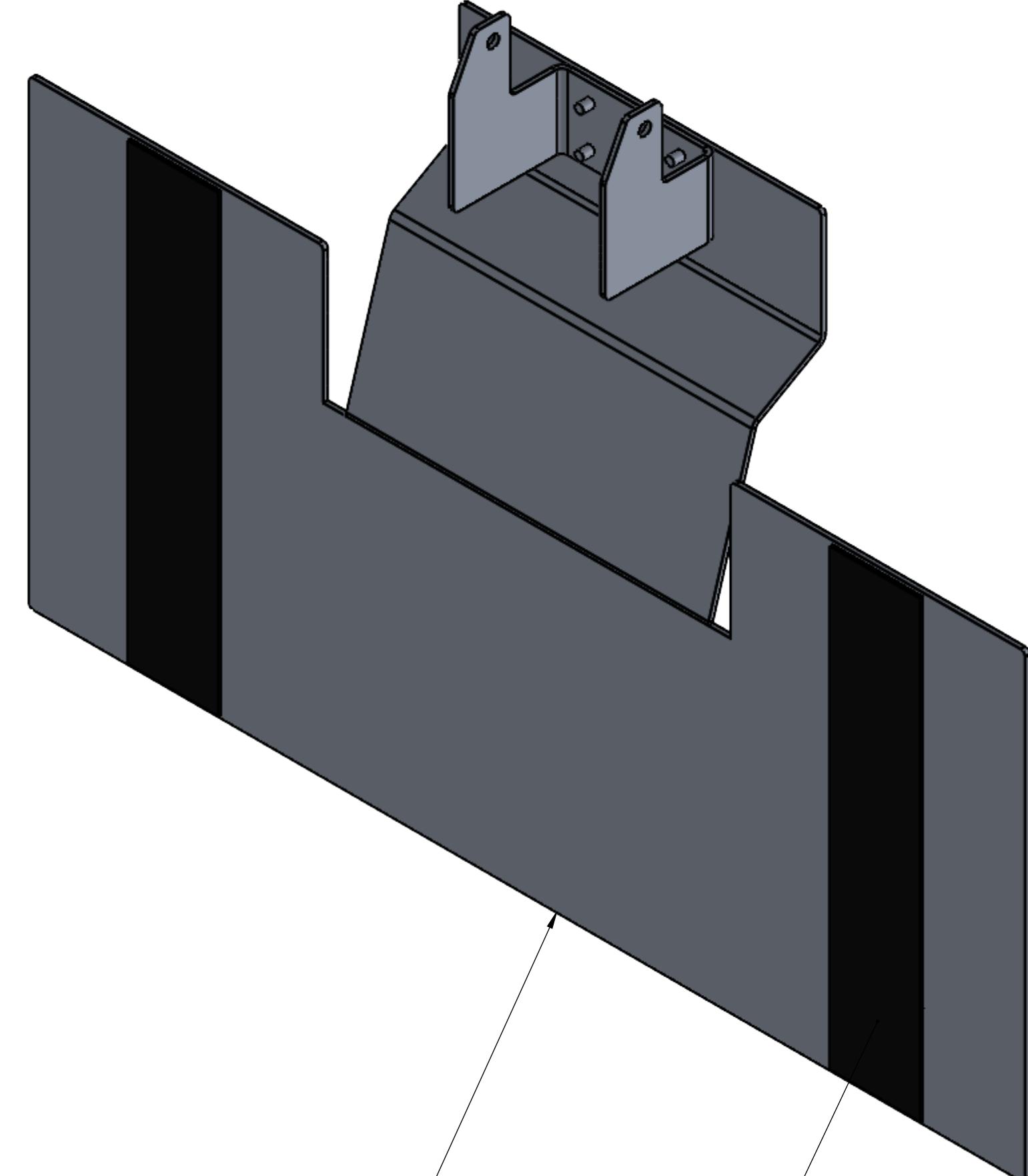
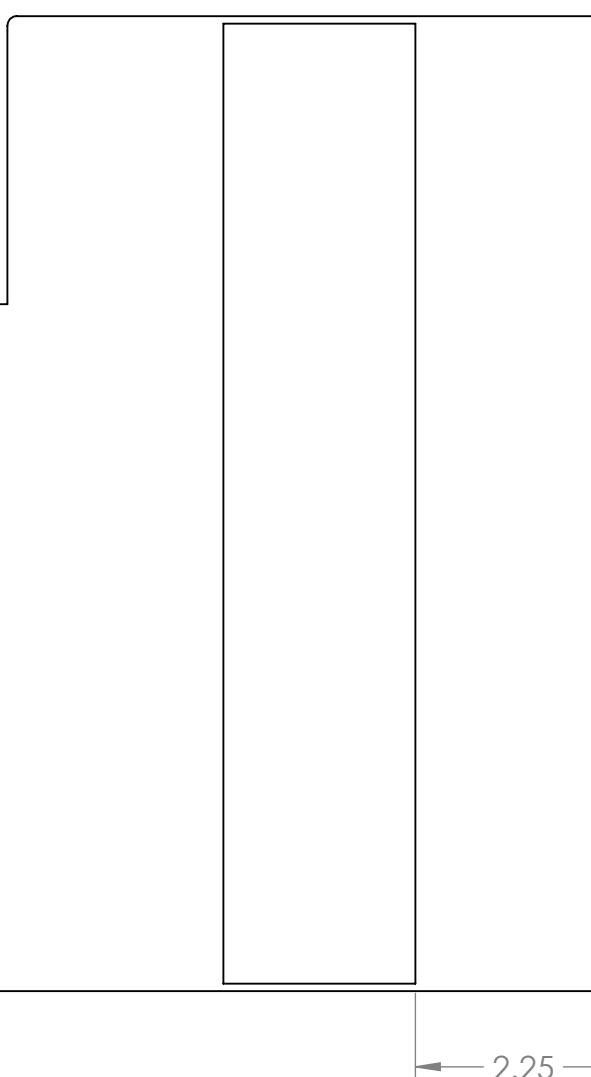
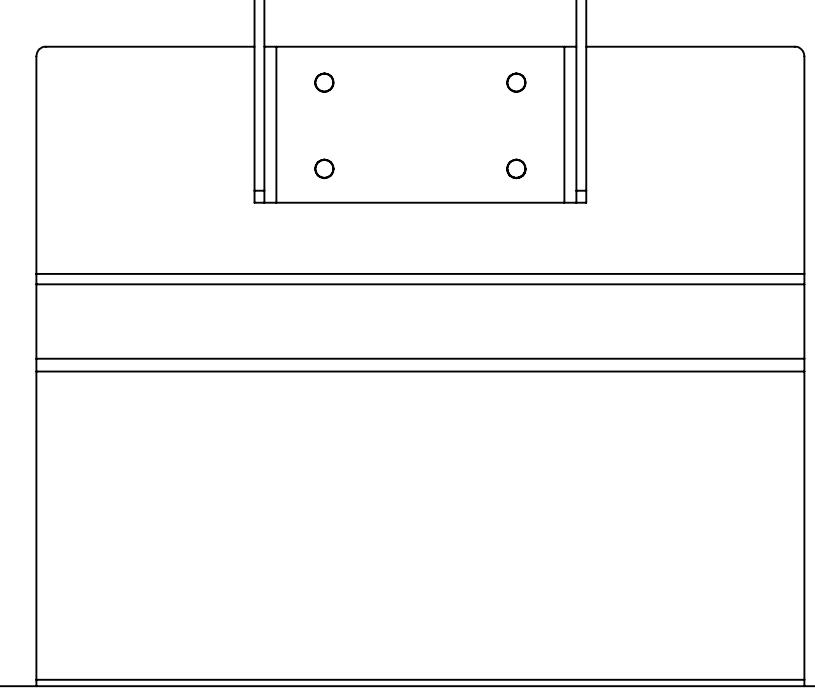
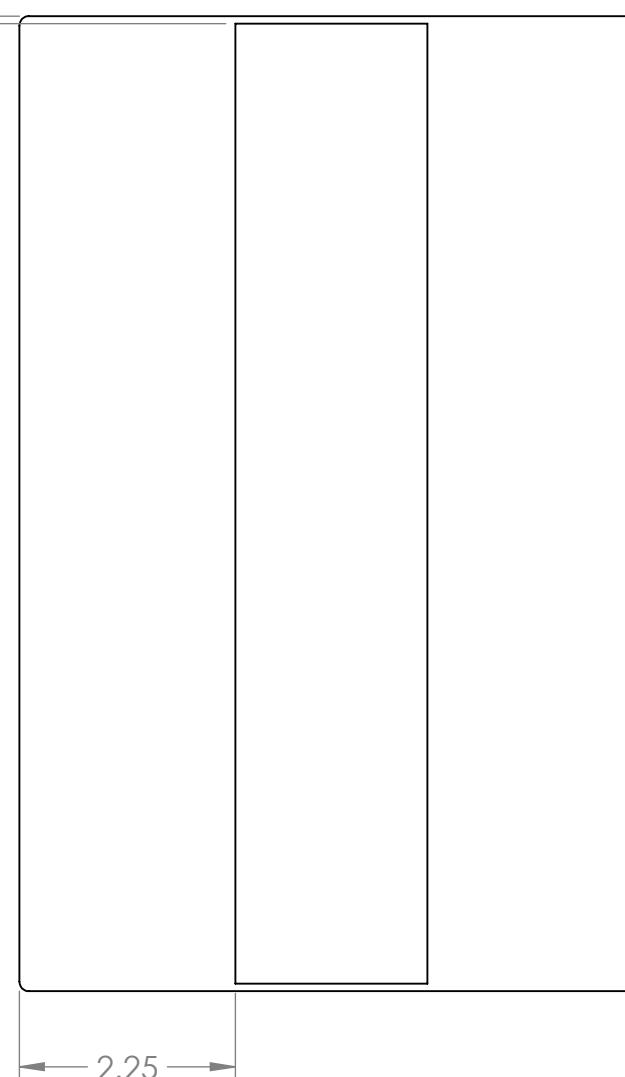
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2x .08



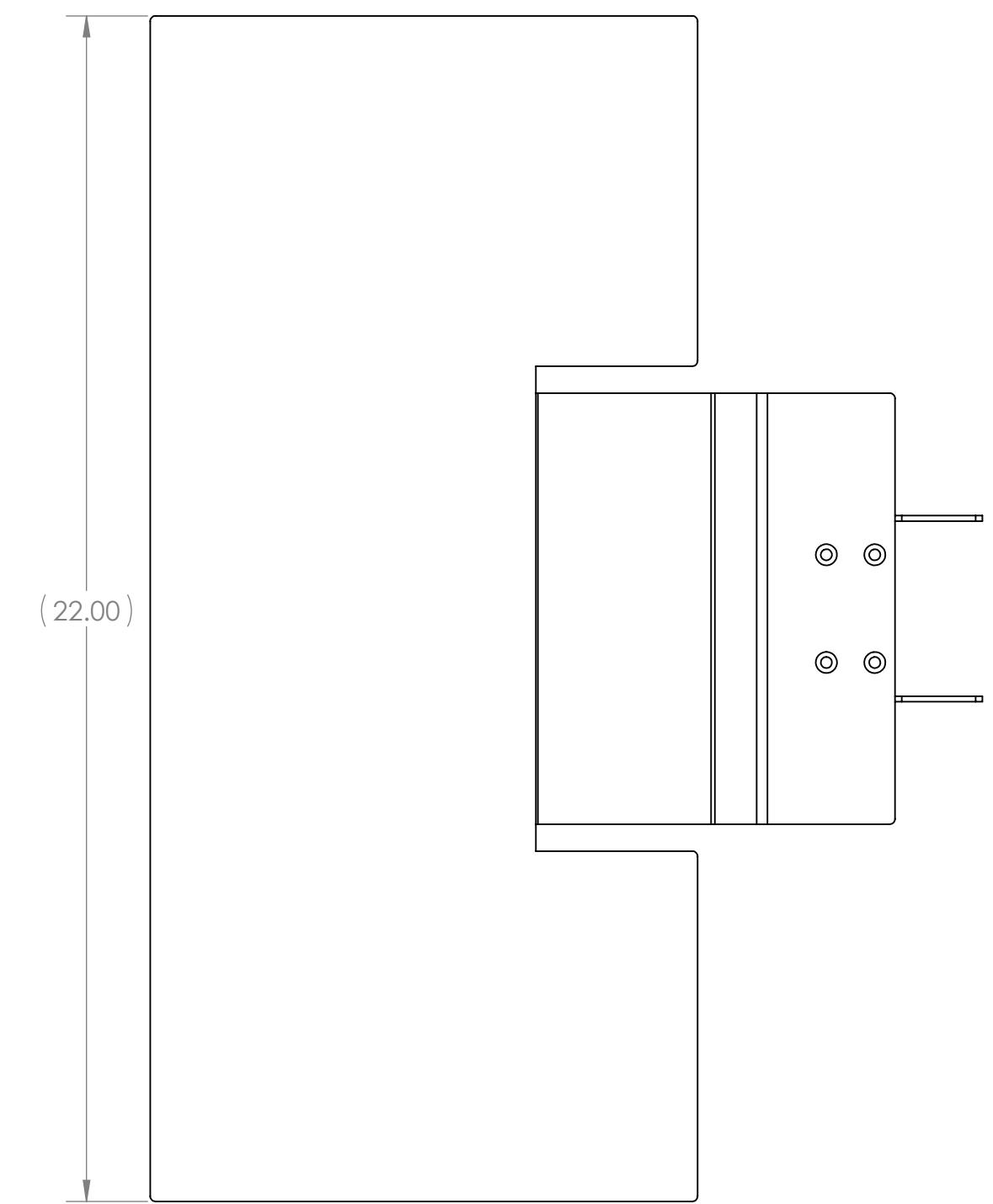
Notes:

1. Make sure surface of (1) is clean prior to hook application.
2. Attach (2) to (1) in locations shown.

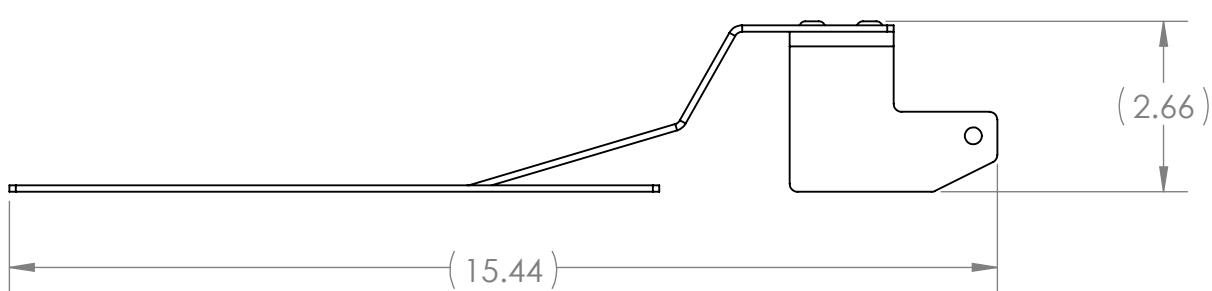
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23341	Charge Station Ramp Support	1
2	Hook_2_10	2" x 10" Hook, Adhesive Backed	2

UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DRAWN	CO	12/9/2022	
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   TITLE: Charge Station Ramp Support with Hook SIZE: C DWG. NO. GE-23340 REV: C SCALE: 1:2 SHEET 1 OF 1			

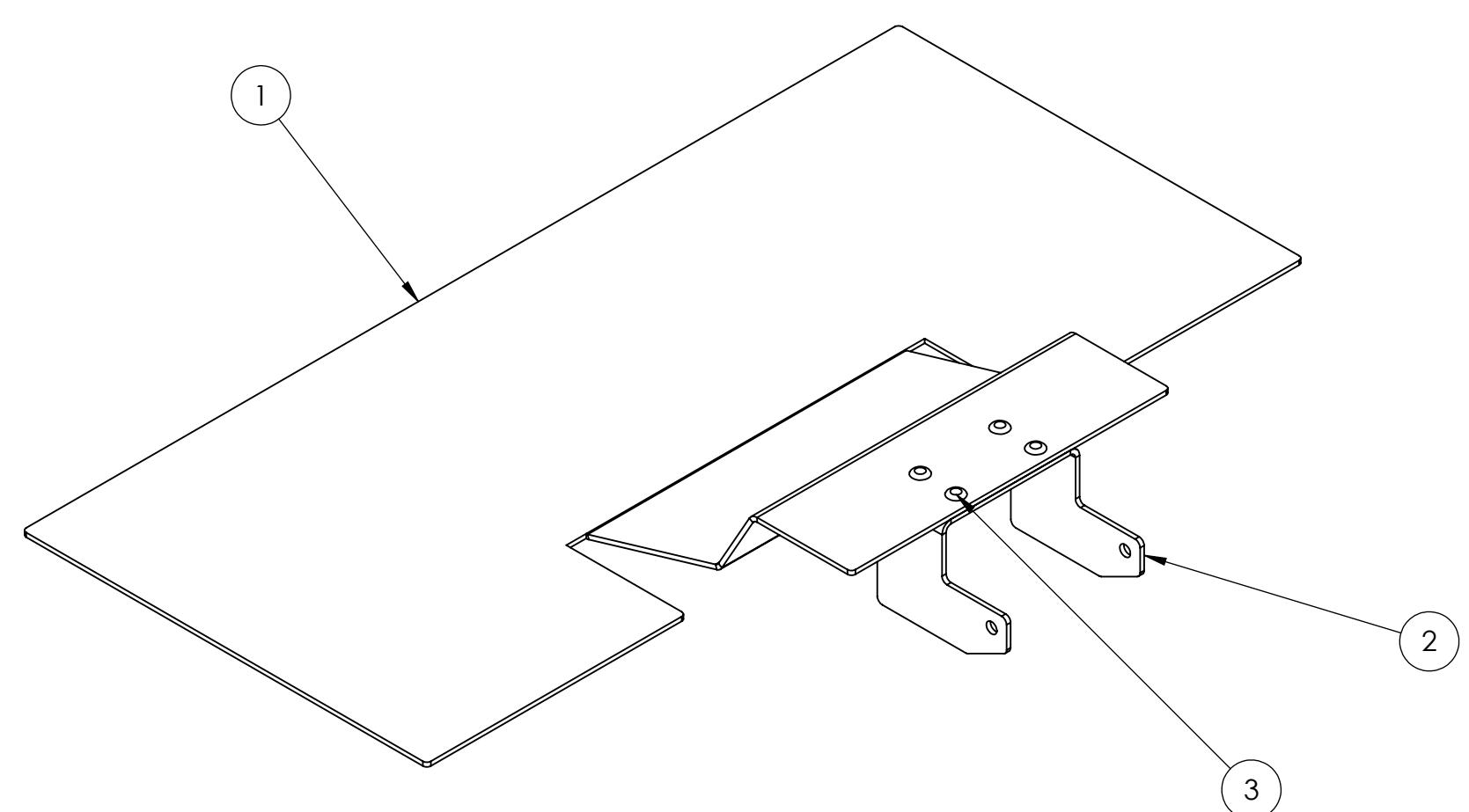
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Notes:
1. Tag or label with part number.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23341-01	10 ga. 5052 Aluminum	1
2	GE-23341-02	10 ga. 5052 Aluminum	1
3	rivet_.1875_.126-.25	.3/16" Rivet, .126-.25 Grip Range	4

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
3-B3	A	Corrected location of a pair of holes on GE-23341-01	11/16/2022	CPO

UNLESS OTHERWISE SPECIFIED:	BEND	NAME	DATE
DRAWN	CO	9/28/2022	
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:	10 ga. 5052 Aluminum		
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING		SCALE: 1:3	SHEET 1 OF 4

 FIRST
ROBOTICS
COMPETITION  SOLIDWORKS
Modeling Solutions Partner

TITLE:
**Charge Station
Ramp Support**

SIZE DWG. NO. REV
C GE-23341 A

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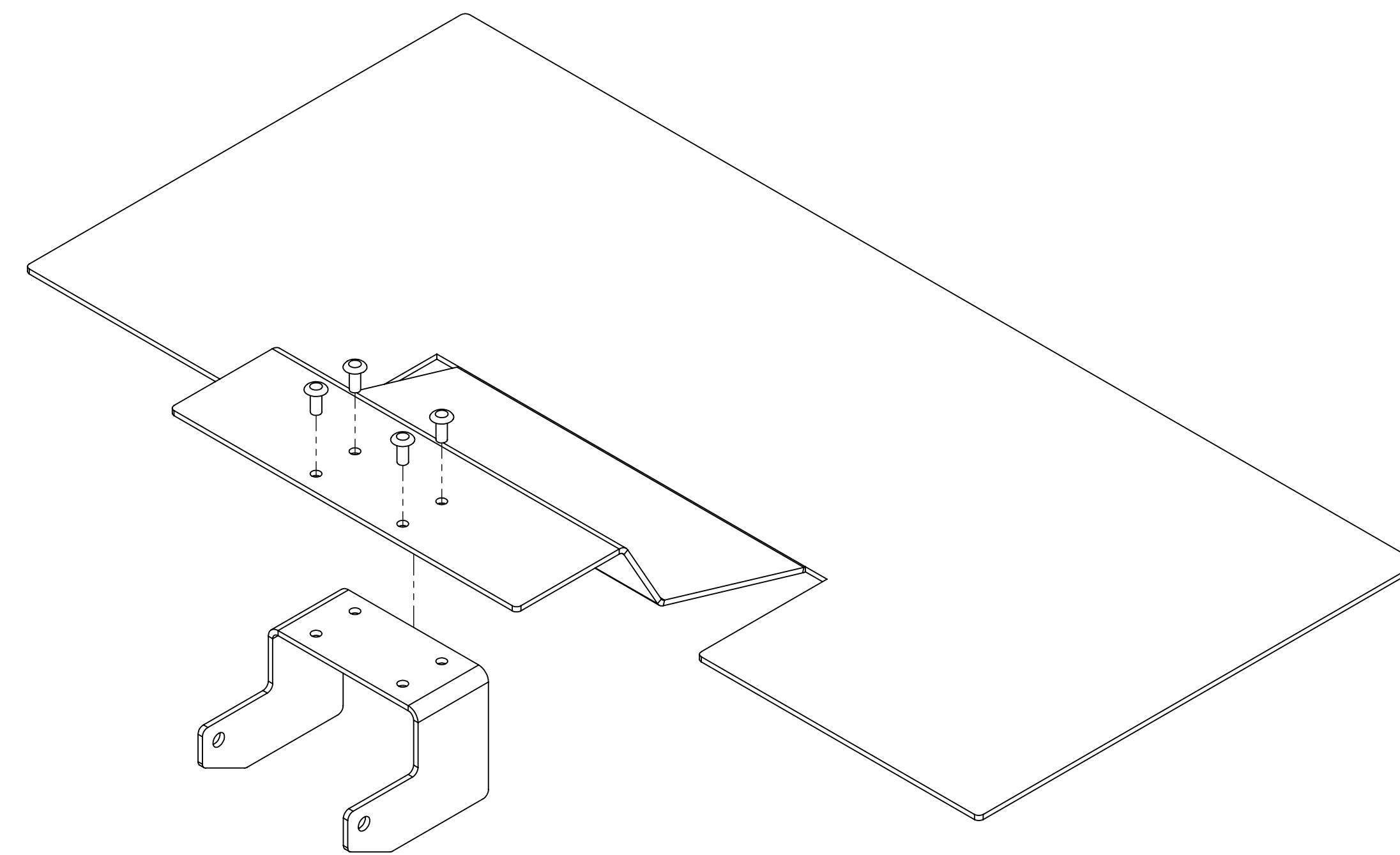
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UNLESS OTHERWISE SPECIFIED:	BEND	NAME	DATE
DRAWN	CO	9/28/2022	
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH: 10 ga. 5052 Aluminum			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

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

TITLE:
**Charge Station
Ramp Support**

SIZE DWG. NO. REV
C GE-23341 A

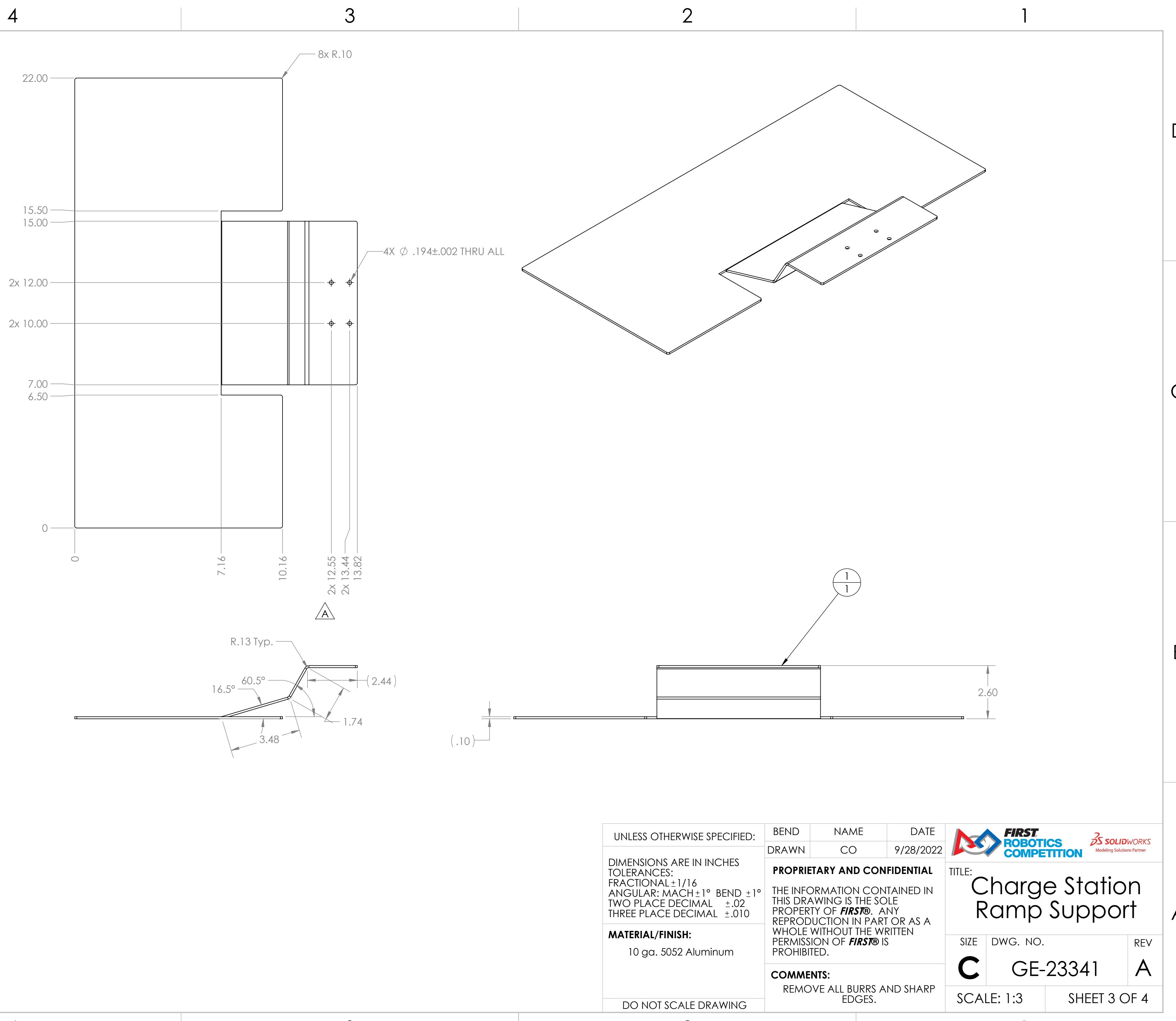
SCALE: 1:2 SHEET 2 OF 4

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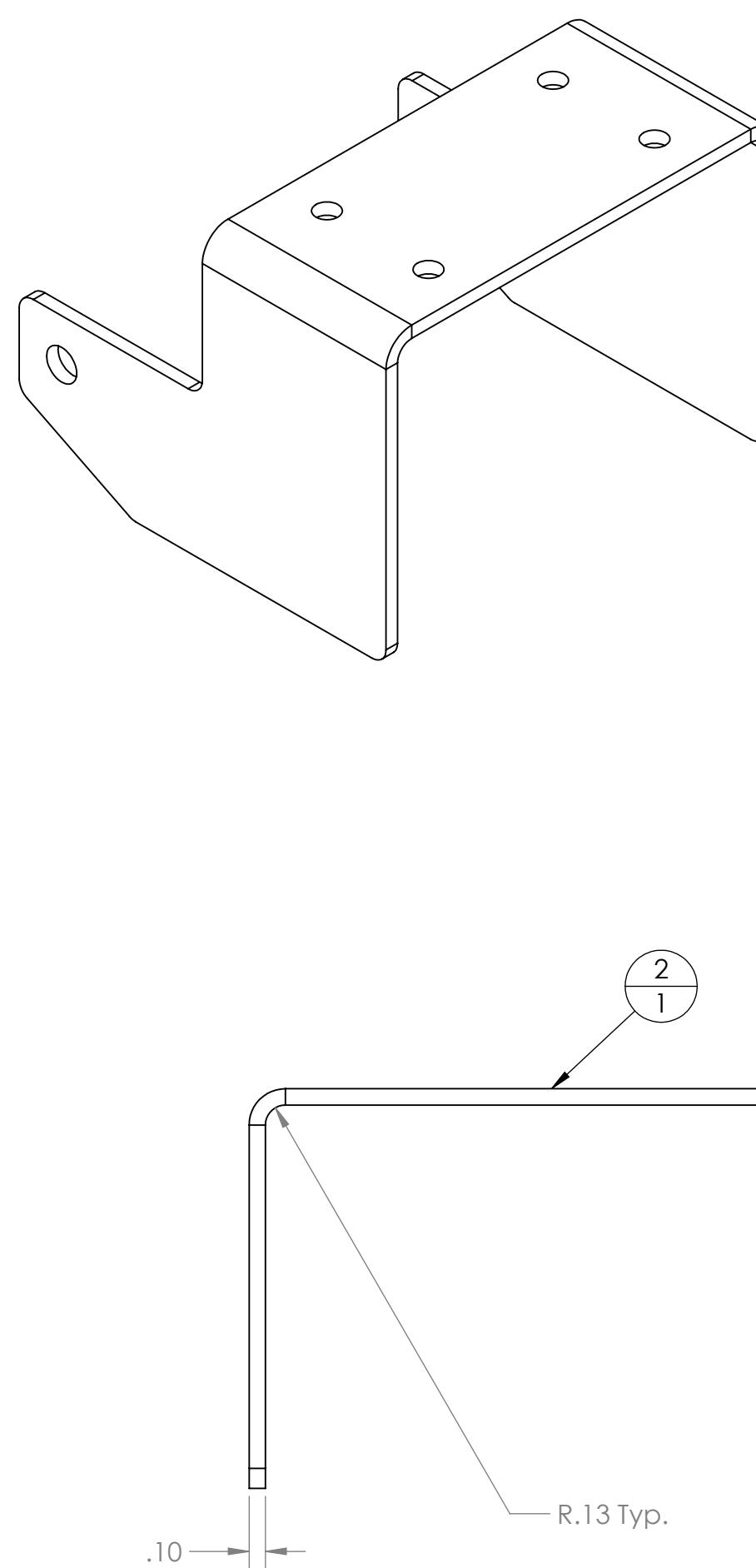
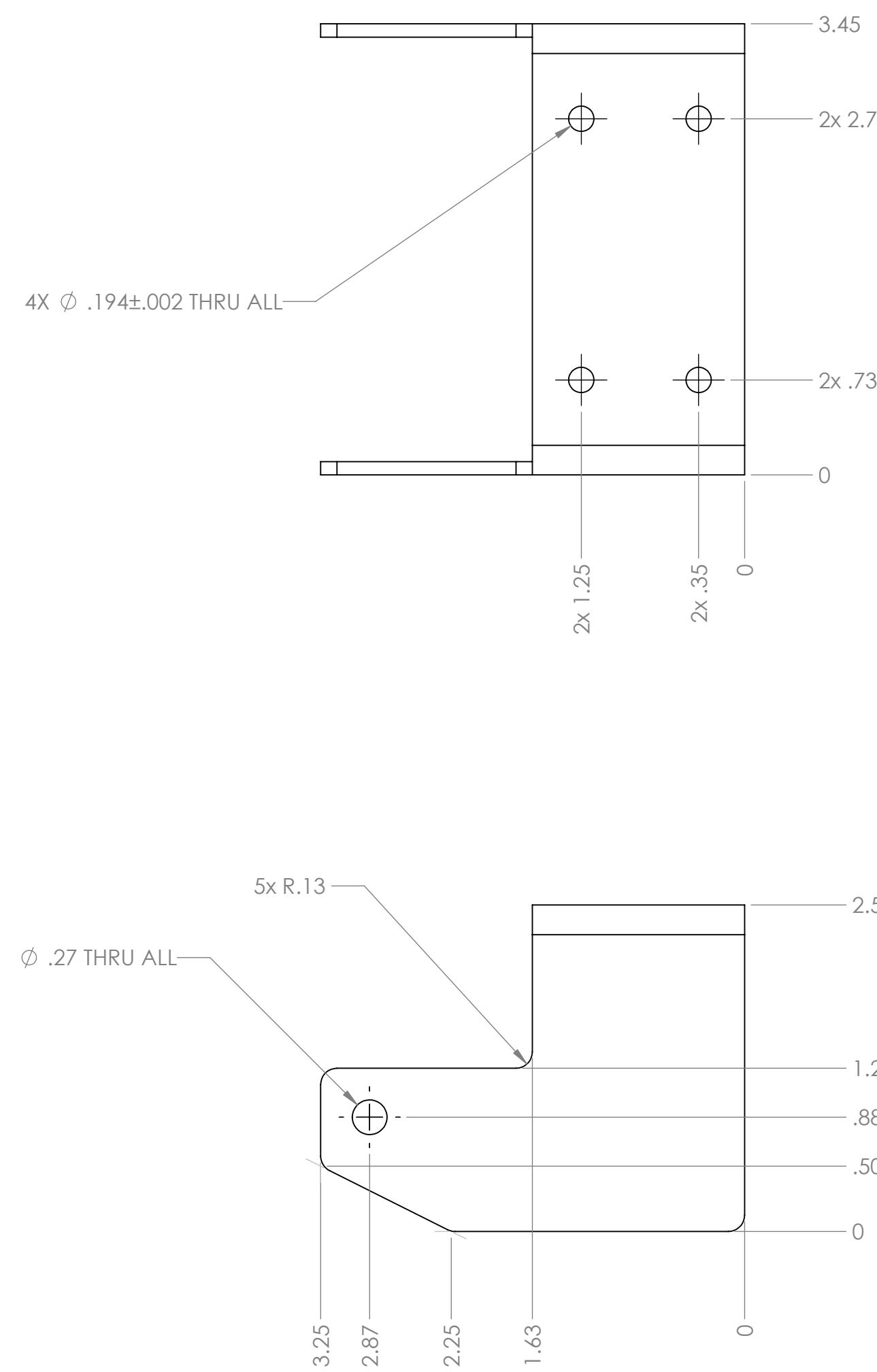
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UNLESS OTHERWISE SPECIFIED:	BEND	NAME	DATE
DRAWN	CO	9/28/2022	
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH: 10 ga. 5052 Aluminum			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
**Charge Station
Ramp Support**

SIZE DWG. NO. REV
C GE-23341 A

SCALE: 1:1 SHEET 4 OF 4

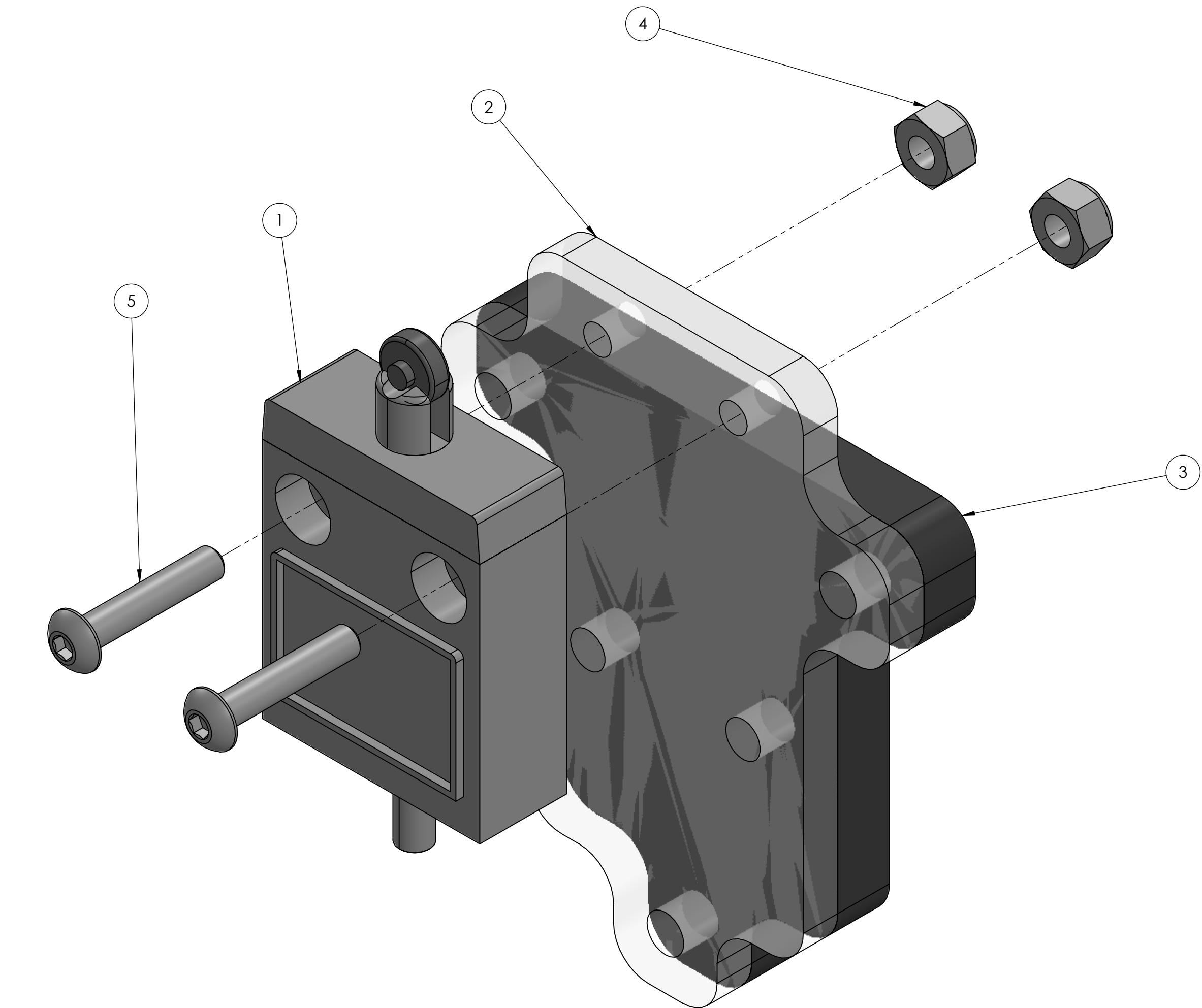
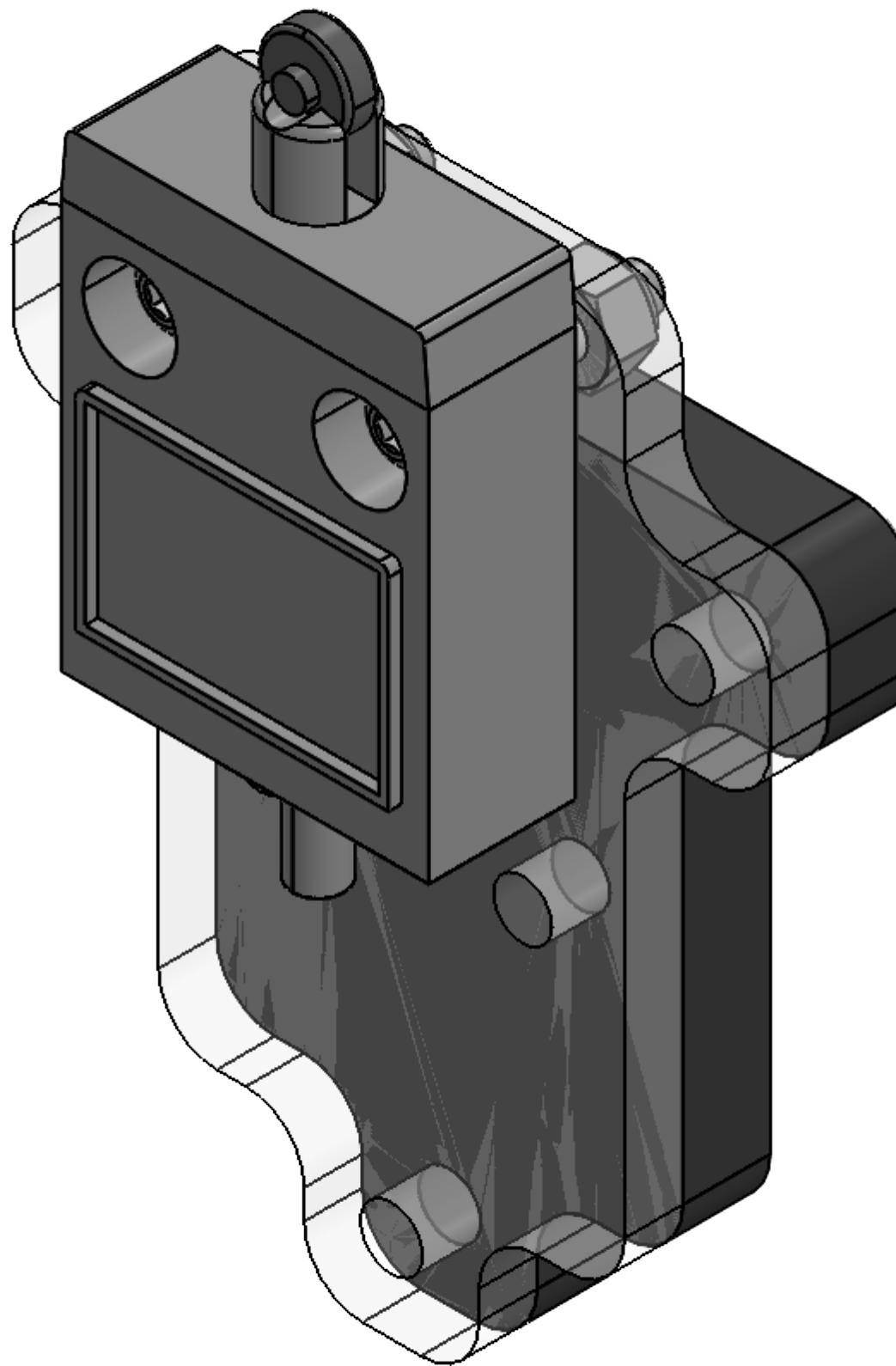
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Notes:

1. Attach (2) to (3) using 50 lb. cable tie in center two holes.
2. Attach (1) to (2) using (5) and (4).

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	802BLimitSwitch	Limit Switch	1
2	GE-23343	Charge Station Sensor Mount	1
3	GE-23344	Charge Station Sensor Spacer	1
4	nylock_10_32	Low-Strength Steel Nylon-Insert Locknut, Zinc-Plated, 10-32 Thread Size	2
5	round_hex_10_32_1_full	Round Head Hex, 10-32 x 1.00" long, fully threaded	2

UNLESS OTHERWISE SPECIFIED:		FIELD	NAME	DATE
		DRAWN	CO	12/9/2022
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:				
REMOVE ALL BURRS AND SHARP EDGES.				
DO NOT SCALE DRAWING				

FIRST ROBOTICS COMPETITION SOLIDWORKS Modeling Solutions Partner

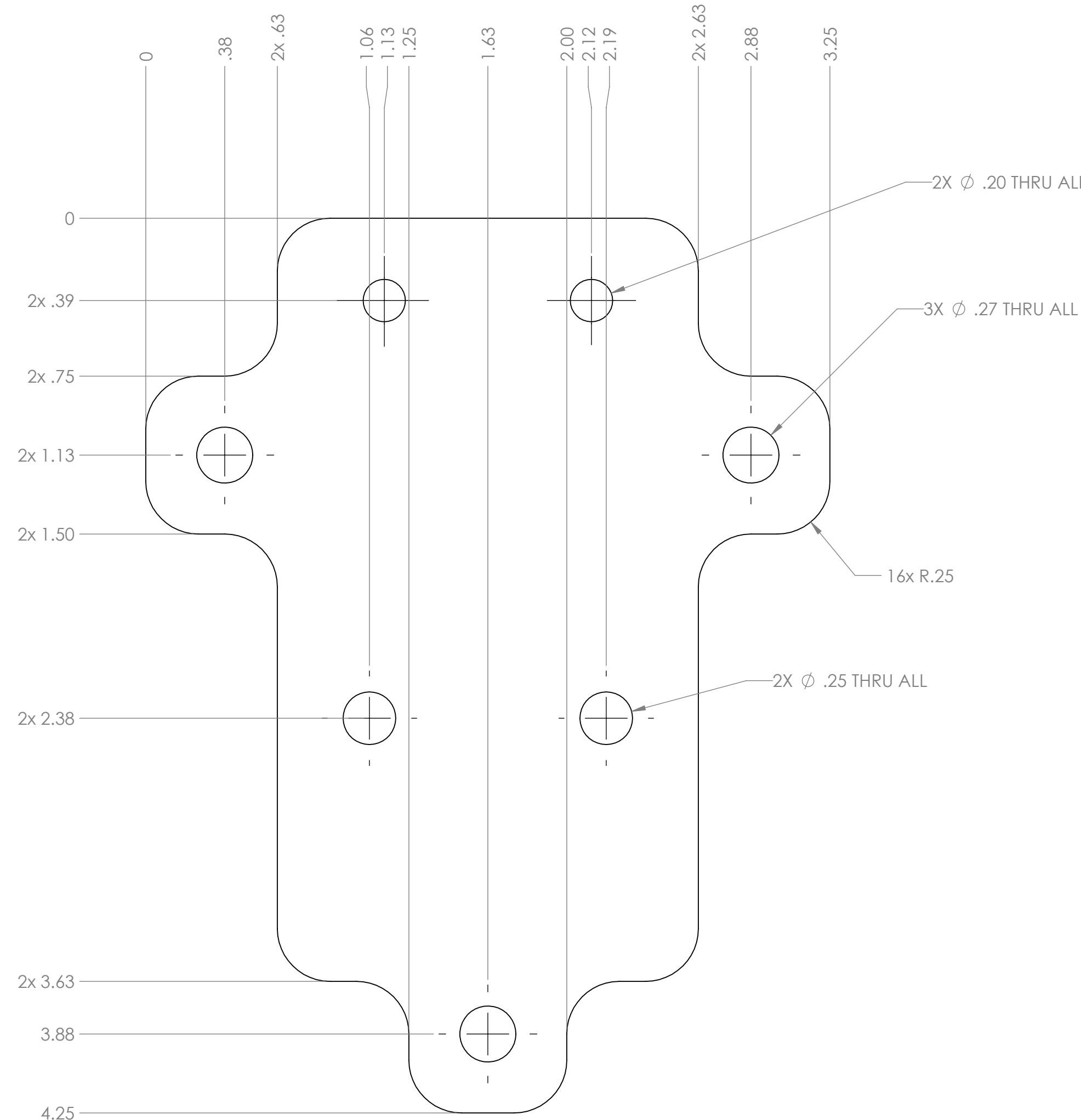
TITLE: Charge Station Sensor Assembly

C **GE-23342**

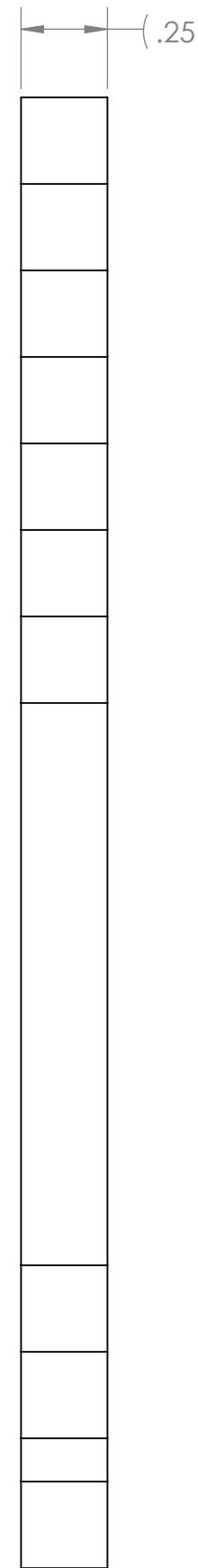
SIZE **DWG. NO.** **REV**

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

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REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
A1	A	Changed part name.	12/9/2022	CPO



UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	CO	8/18/2022	
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:
**Charge Station
Sensor Mount**

SIZE DWG. NO. REV
C GE-23343 A
SCALE: 2:1 SHEET 1 OF 1

4

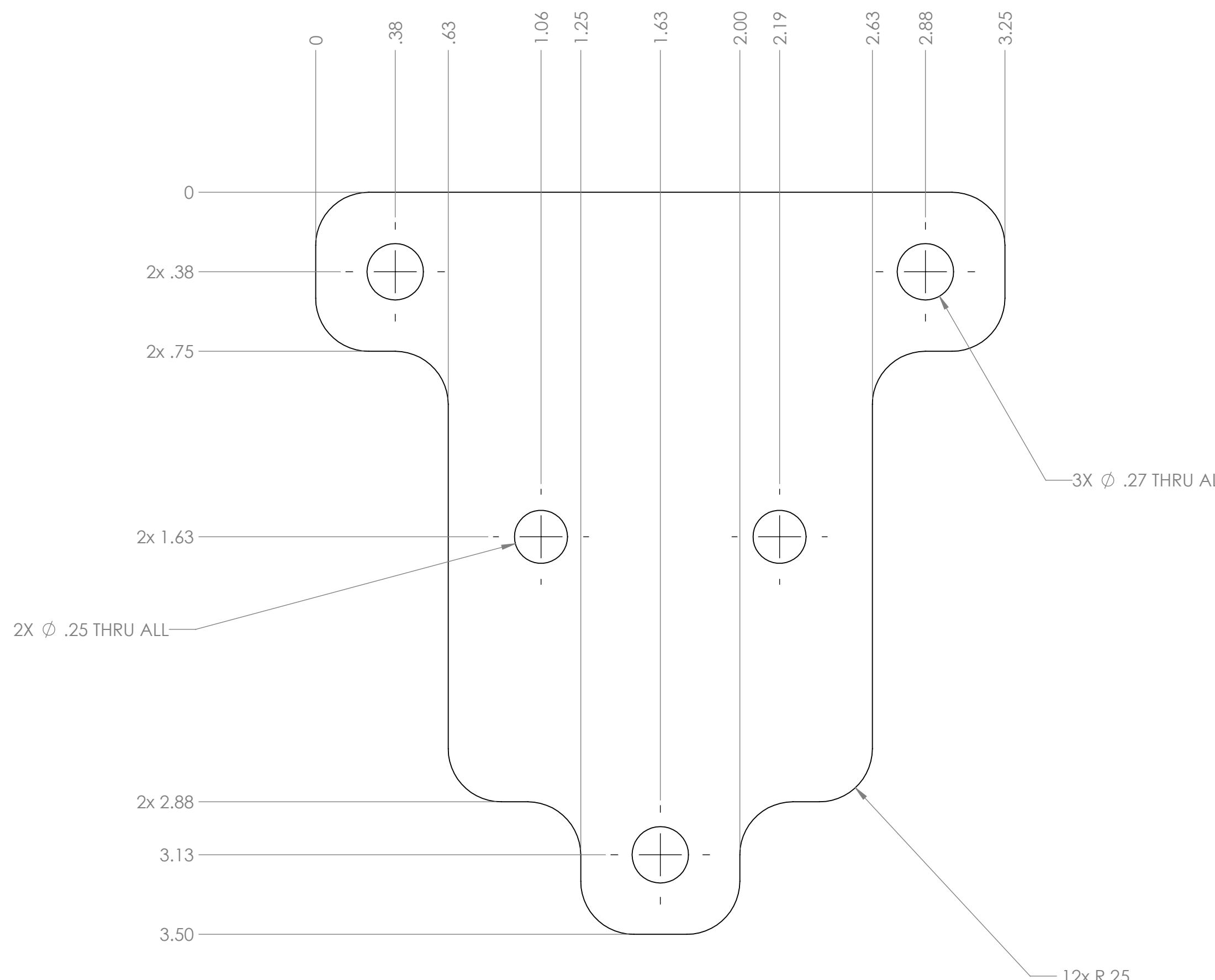
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Notes:
1. Tag or label with part number.

UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	CO	8/18/2022	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH: 3/8" HDPE, black, smooth			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
A1	A	Changed part name.	12/9/2022	CPO

		FIRST ROBOTICS COMPETITION	
		SOLIDWORKS	Modeling Solutions Partner
TITLE:		Charge Station Sensor Spacer	
SIZE	DWG. NO.	REV	
C	GE-23344	A	
SCALE: 2:1	SHEET 1 OF 1		

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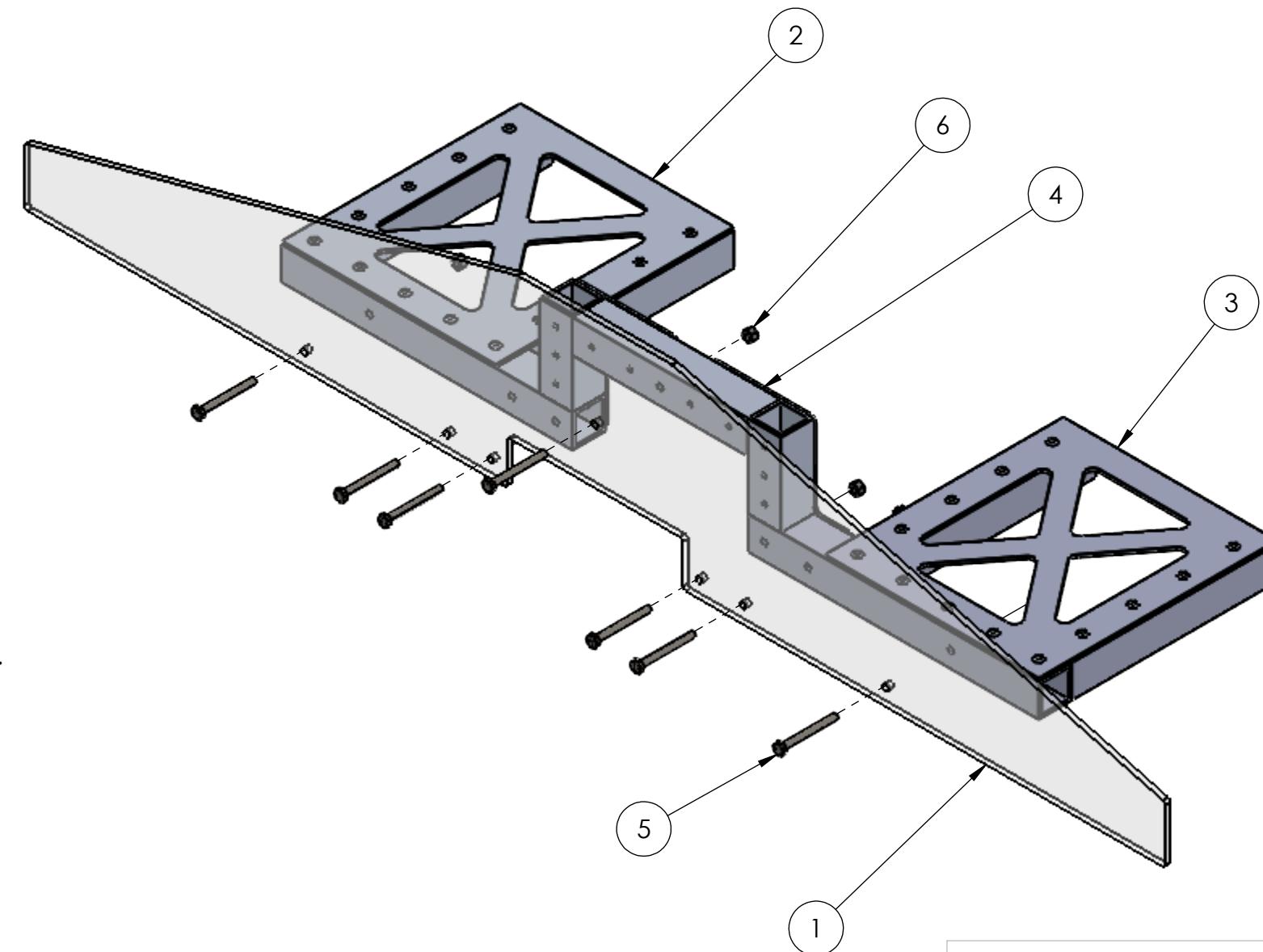
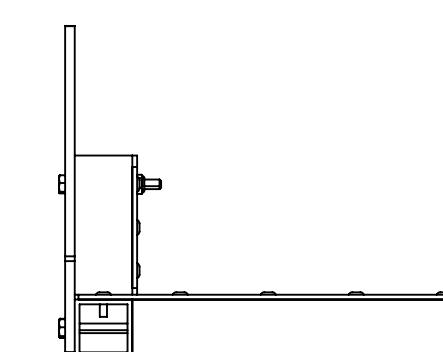
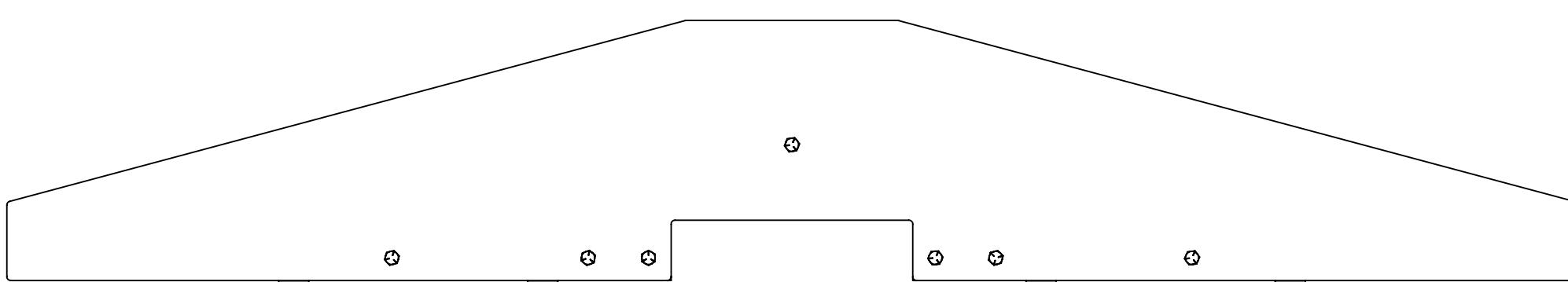
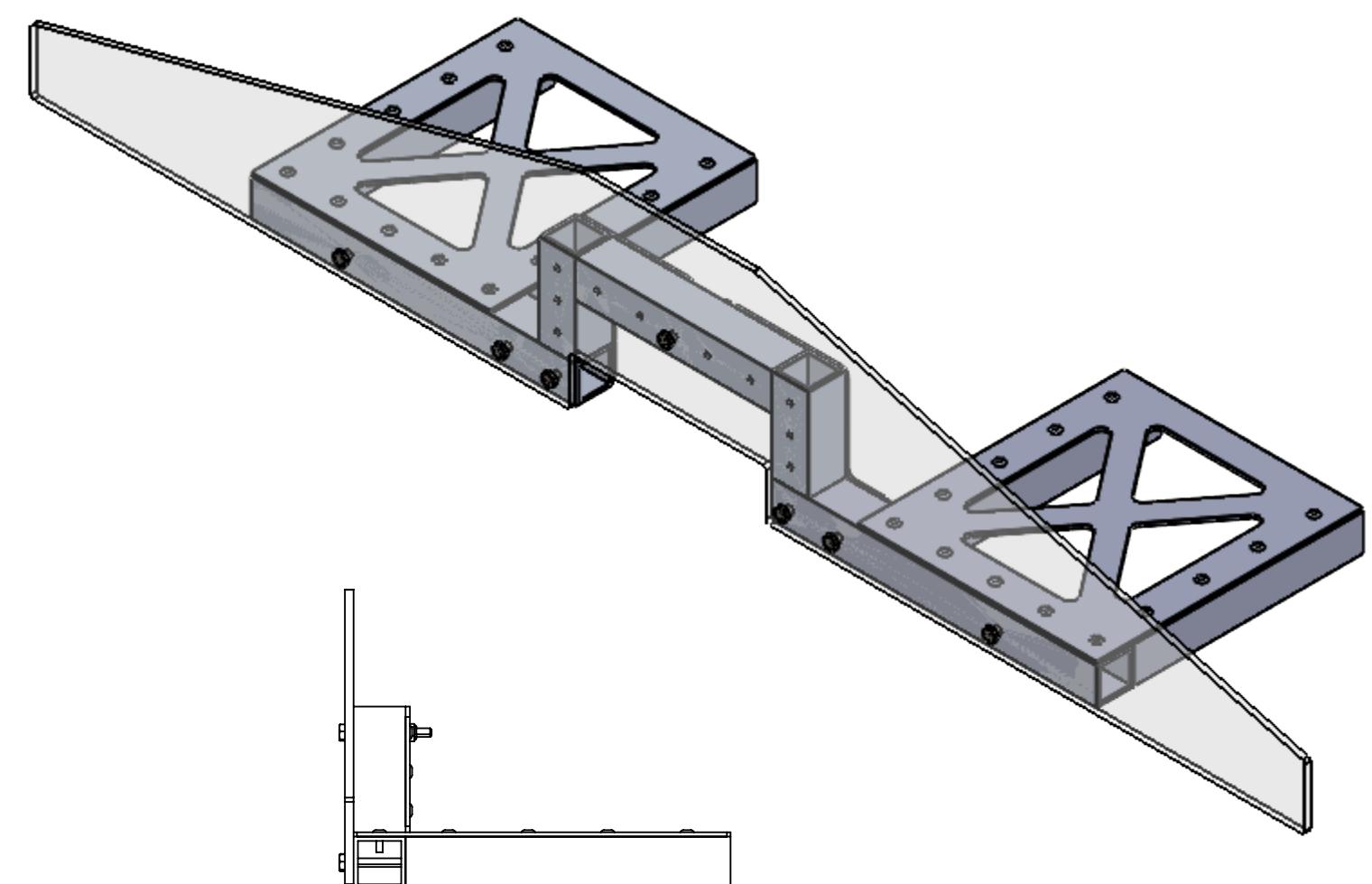
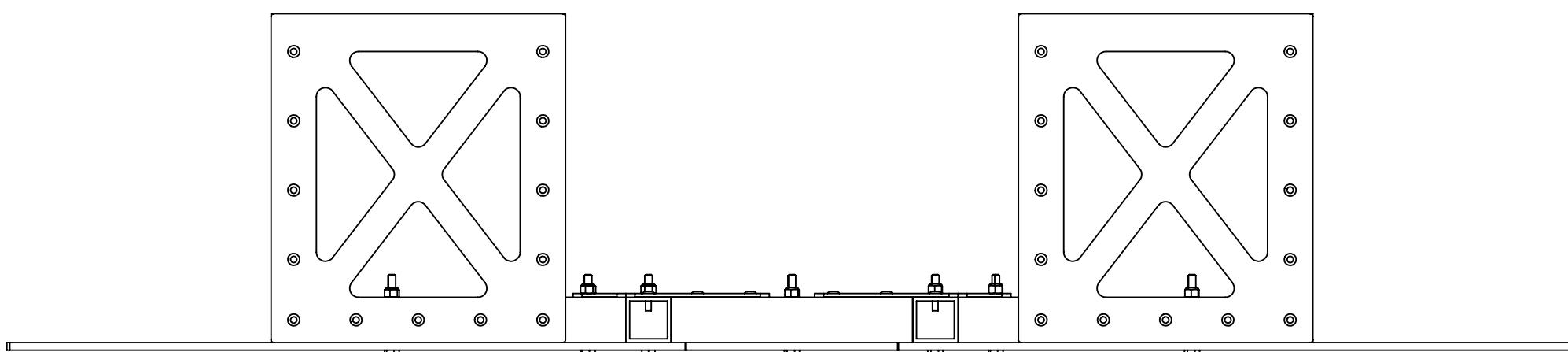
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23347	Charge Station Side Plastic	1
2	GE-23348	Charge Station Side Left Brace with Hook	1
3	GE-23350	Charge Station Side Right Brace with Hook	1
4	GE-23352	Charge Station Side Top Brace	1
5	hex_.25_20_2.5_partial	Steel Hex Head Screw, 1/4"-20 x 2-1/2" long, partially threaded	7
6	nylock_.25_20	Steel Nylon-Insert Locknut, 1/4"-20	7

UNLESS OTHERWISE SPECIFIED:

FIELD NAME DATE

DRAWN CO 12/12/2022

FIRST
ROBOTICS
COMPETITION
SOLIDWORKS
Modeling Solutions Partner

TITLE: Charge Station Side Plastic Assembly
SIZE: DWG. NO. **C** GE-23346 **REV:**

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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DO NOT SCALE DRAWING

COMMENTS:
REMOVE ALL BURRS AND SHARP EDGES.

SCALE: 1:5 SHEET 1 OF 1

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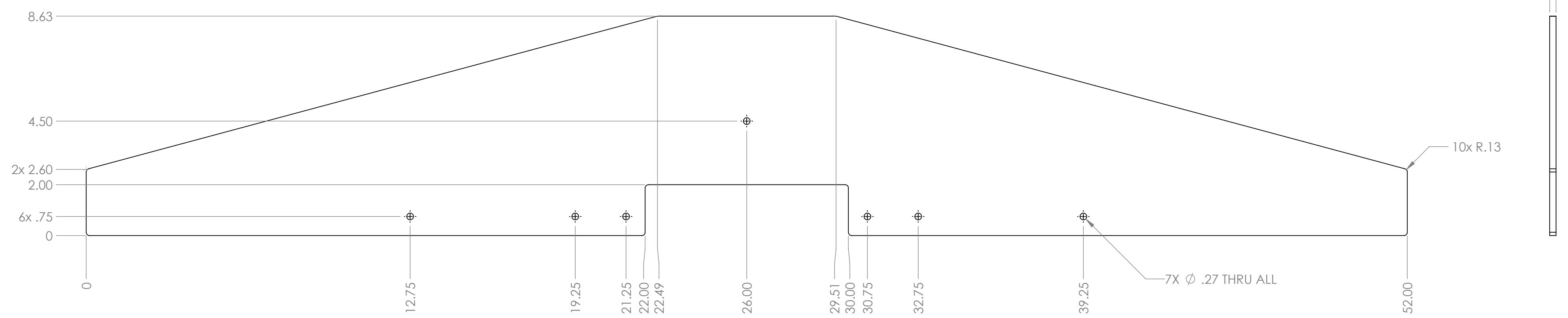
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UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	CO	9/29/2022
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN 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:
**Charge Station
Side Plastic**

SIZE DWG. NO. REV
C GE-23347

SCALE: 1:3 SHEET 1 OF 1

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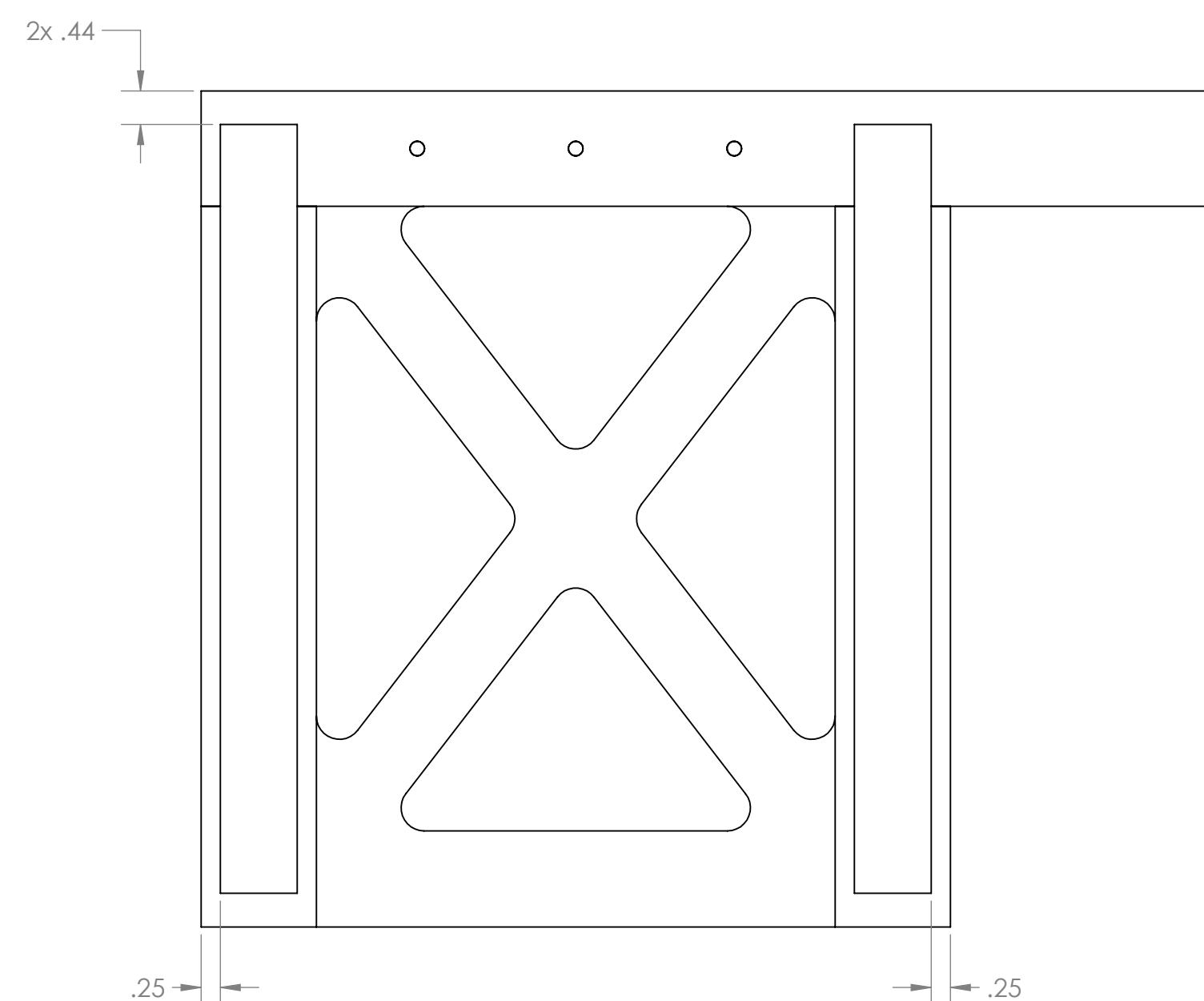
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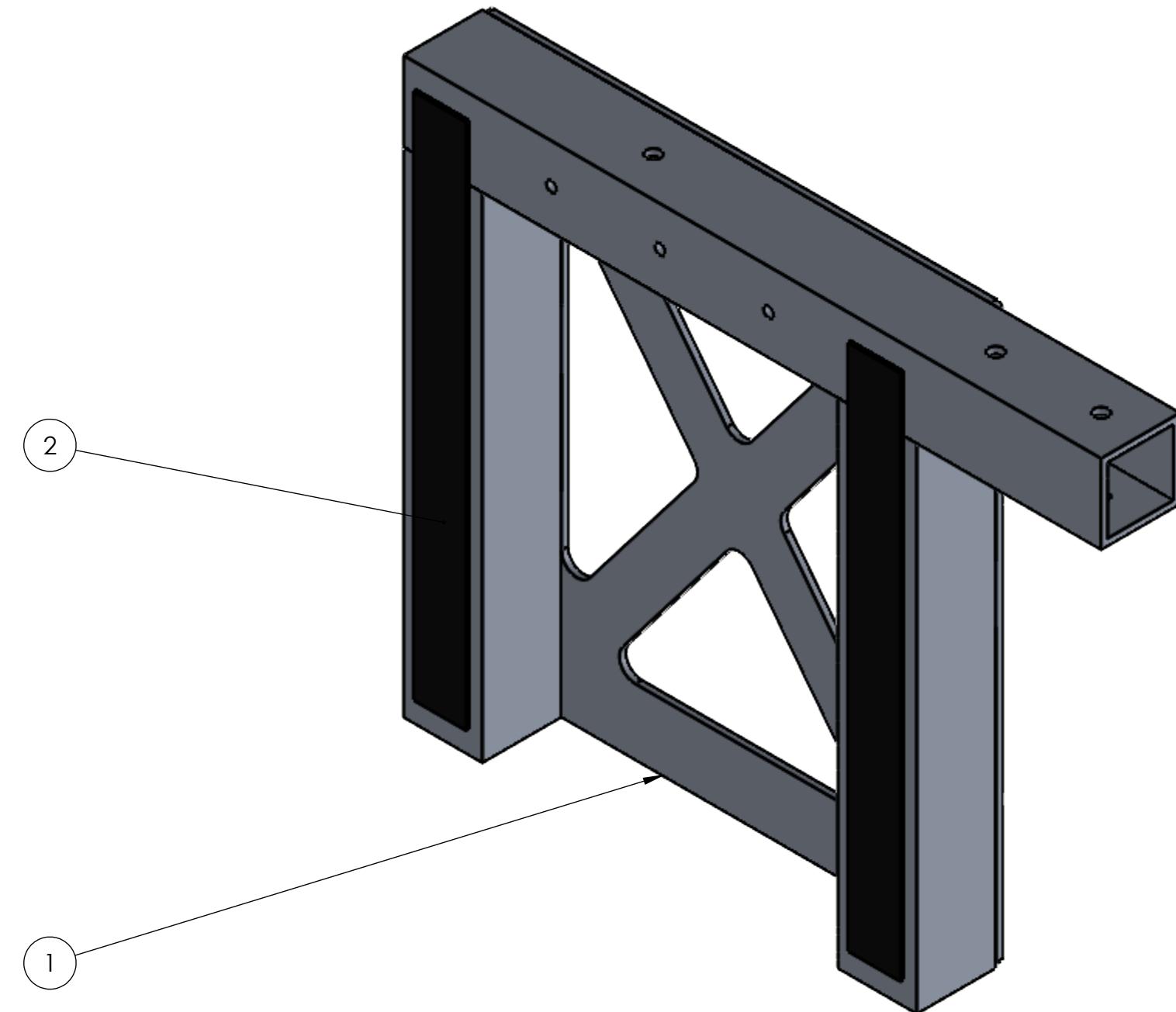
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Notes:

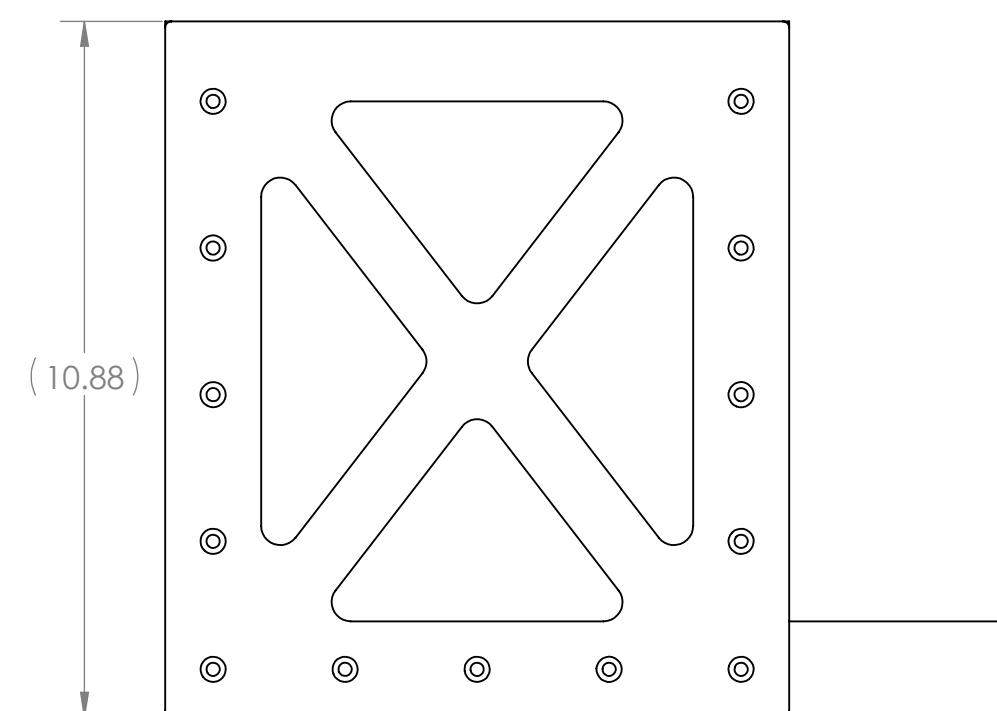
1. Make sure surface of (1) is clean prior to hook application.
2. Attach (2) to (1) in locations shown.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23349	Charge Station Side Left Brace	1
2	Hook_1_10	1" x 10" Hook, Adhesive Backed	2

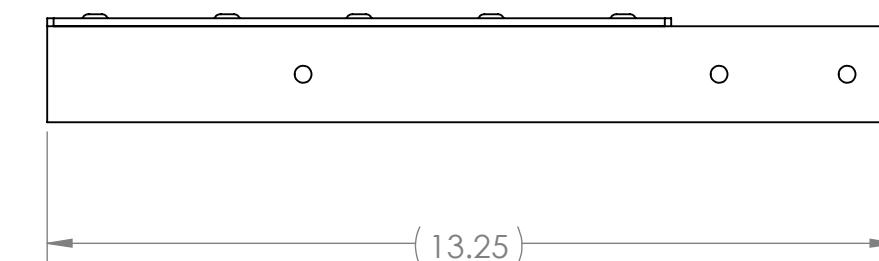


UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DRAWN	CO	12/9/2022	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:			
DO NOT SCALE DRAWING			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
FIRST ROBOTICS COMPETITION <small>SOLIDWORKS Modeling Solutions Partner</small>			
TITLE: Charge Station Side Left Brace with Hook			
SIZE DWG. NO. REV			
C	GE-23348		
SCALE: 1:2 SHEET 1 OF 1			

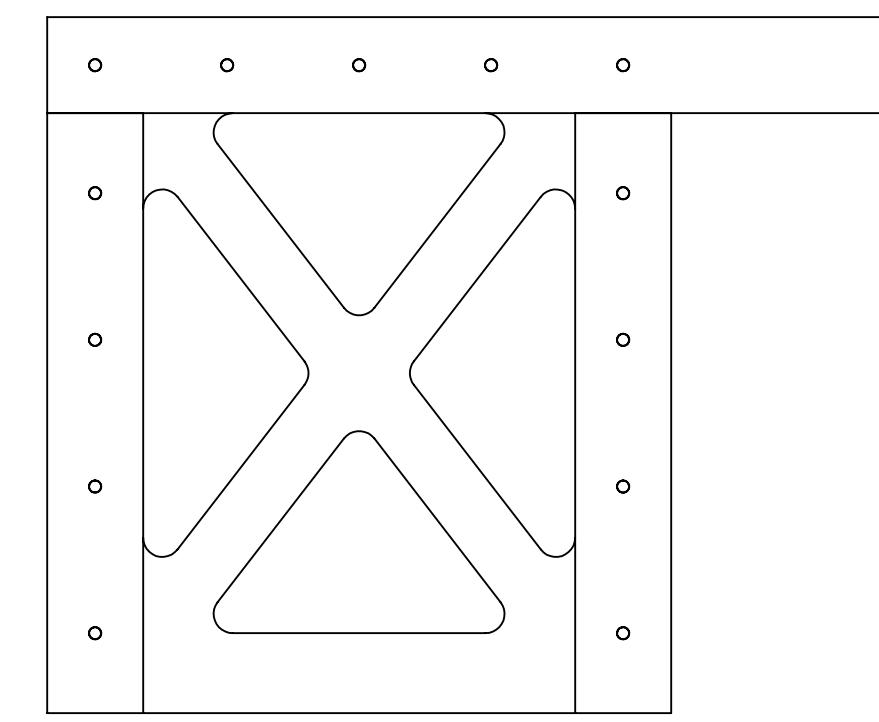
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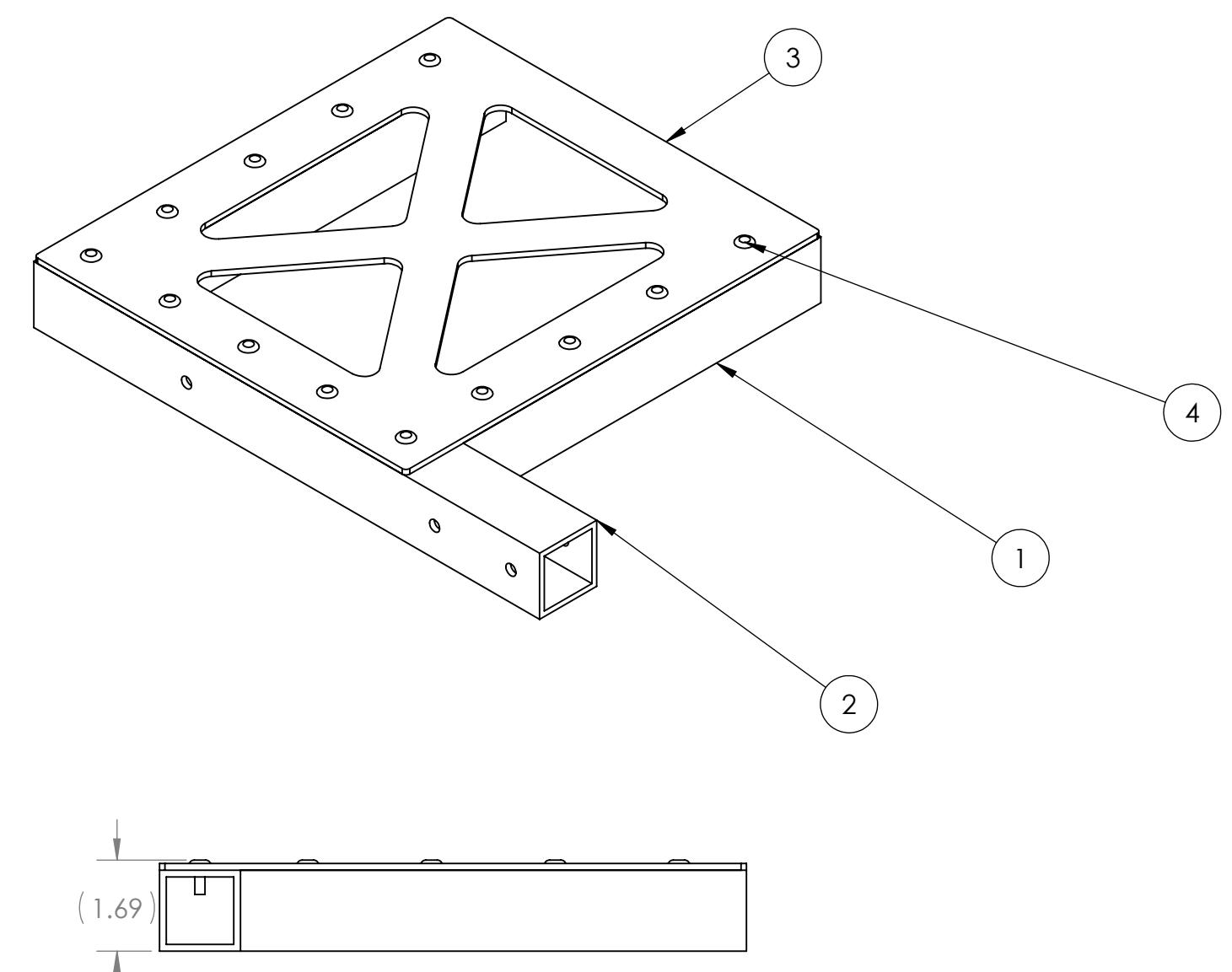
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Notes:
1. Tag or label with part number.
2. Assembly is a mirror of GE-23351. Parts are the same, assembly orientation differs.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23349-01	1.5" x .125" thk. Square Tube, 6061 Aluminum	2
2	GE-23349-02	1.5" x .125" thk. Square Tube, 6061 Aluminum	1
3	GE-23349-03	.125" thk. 6061 Aluminum Plate	1
4	rivet_.1875_.251-.375	3/16" Aluminum Rivet, .251-.375 Grip Range	13



UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	CO	9/29/2022	 
PROPRIETARY AND CONFIDENTIAL			
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COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING	SIZE	DWG. NO.	REV
C	GE-23349		
SCALE: 1:3		SHEET 1 OF 2	

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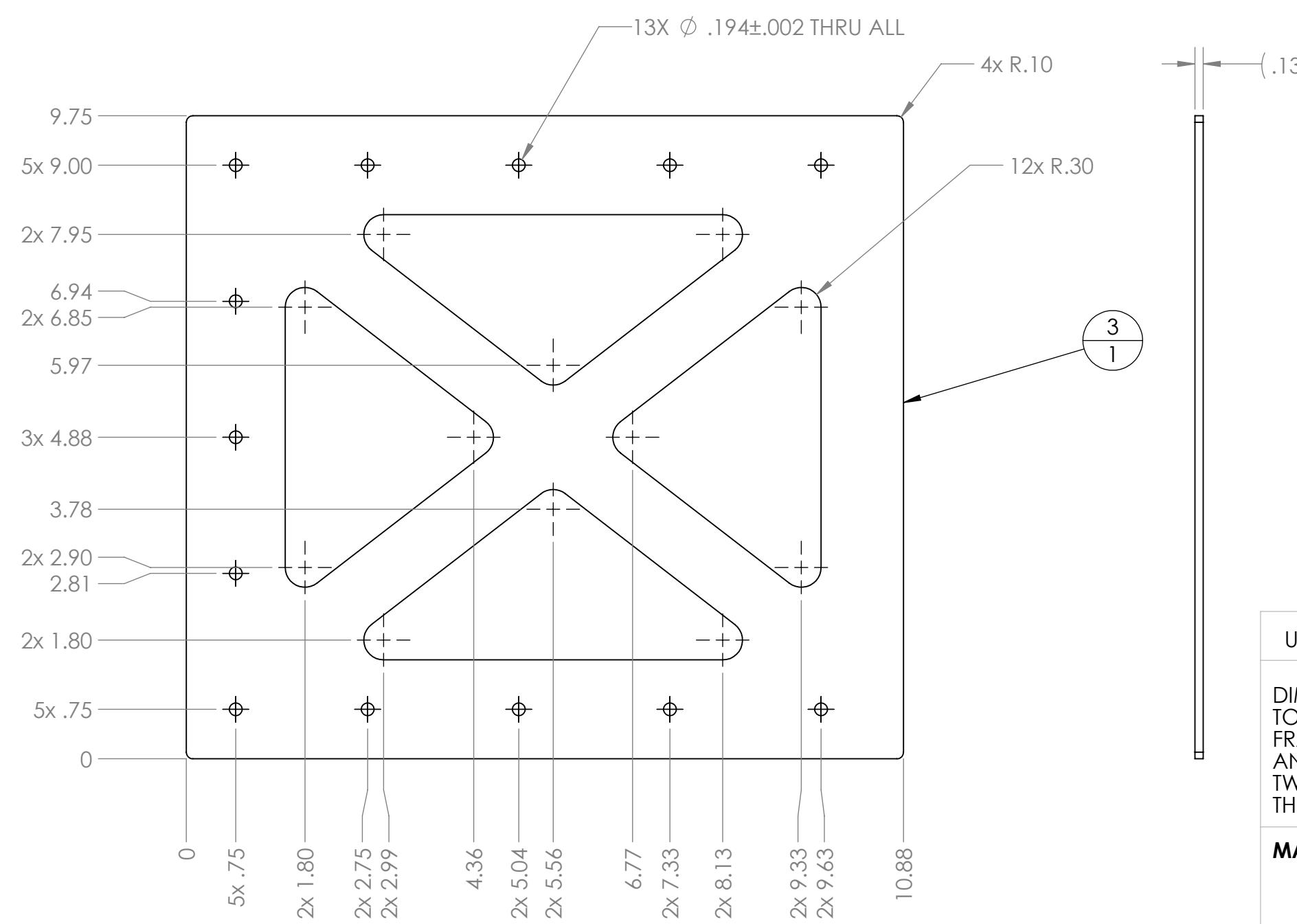
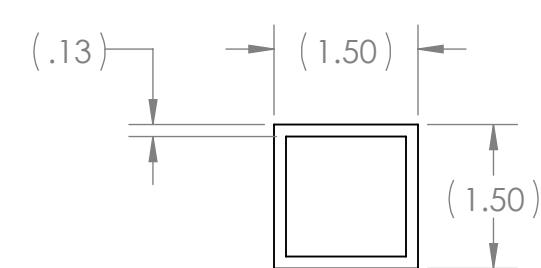
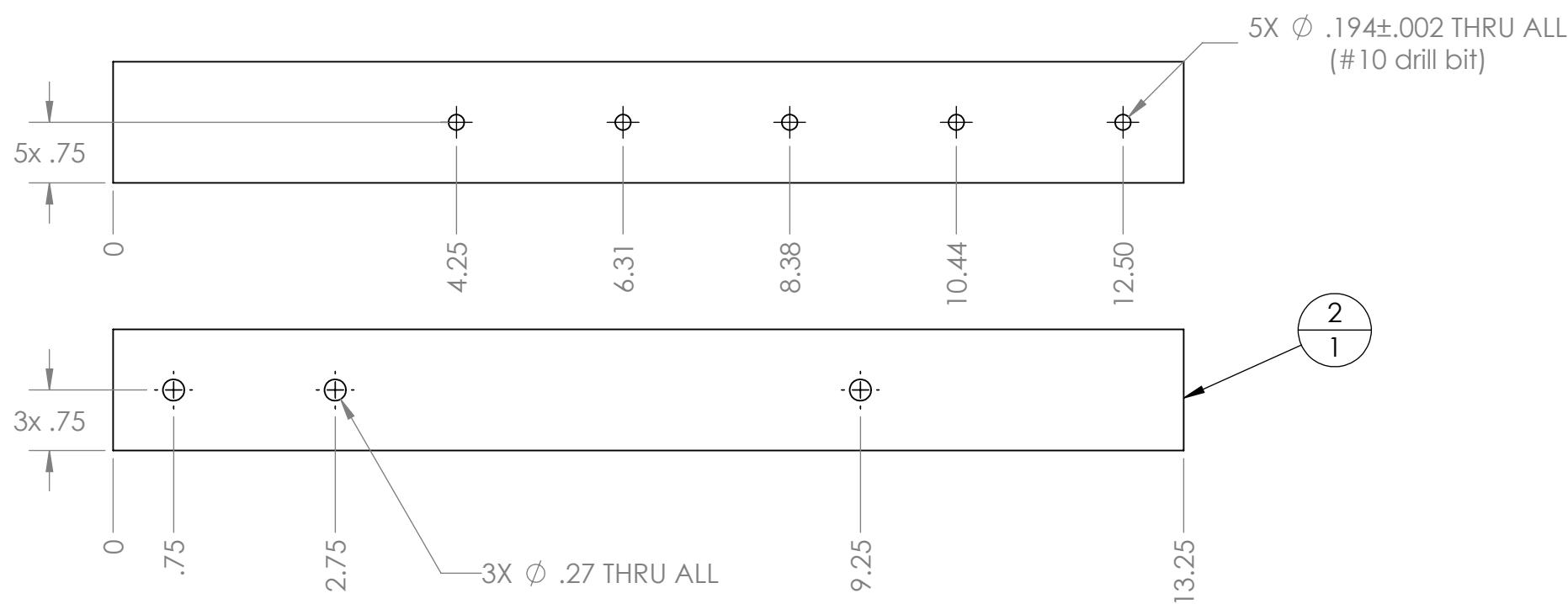
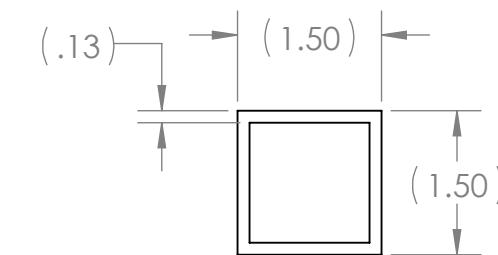
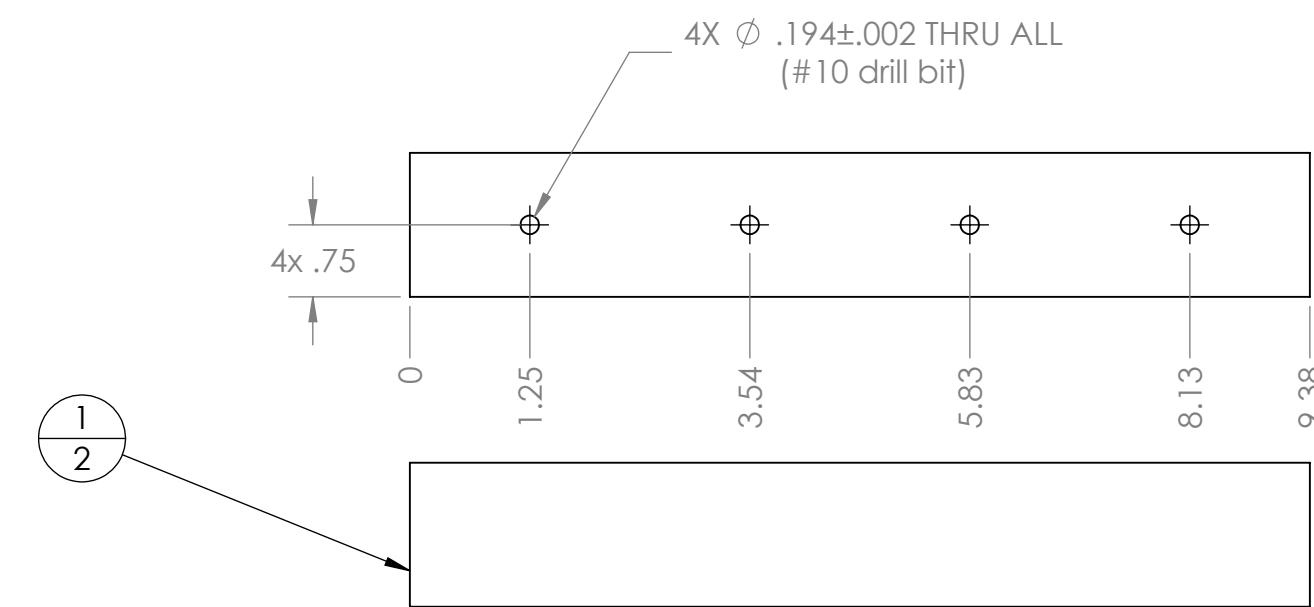
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UNLESS OTHERWISE SPECIFIED:

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 $\pm .005$ **MATERIAL/FINISH:**

DO NOT SCALE DRAWING

VEND

NAME

DATE

DRAWN

CO

9/29/2022

SOLIDWORKS
Modeling Solutions Partner

TITLE:

Charge Station
Side Left Brace

SIZE DWG. NO. REV

C GE-23349

SCALE: 1:2 SHEET 2 OF 2

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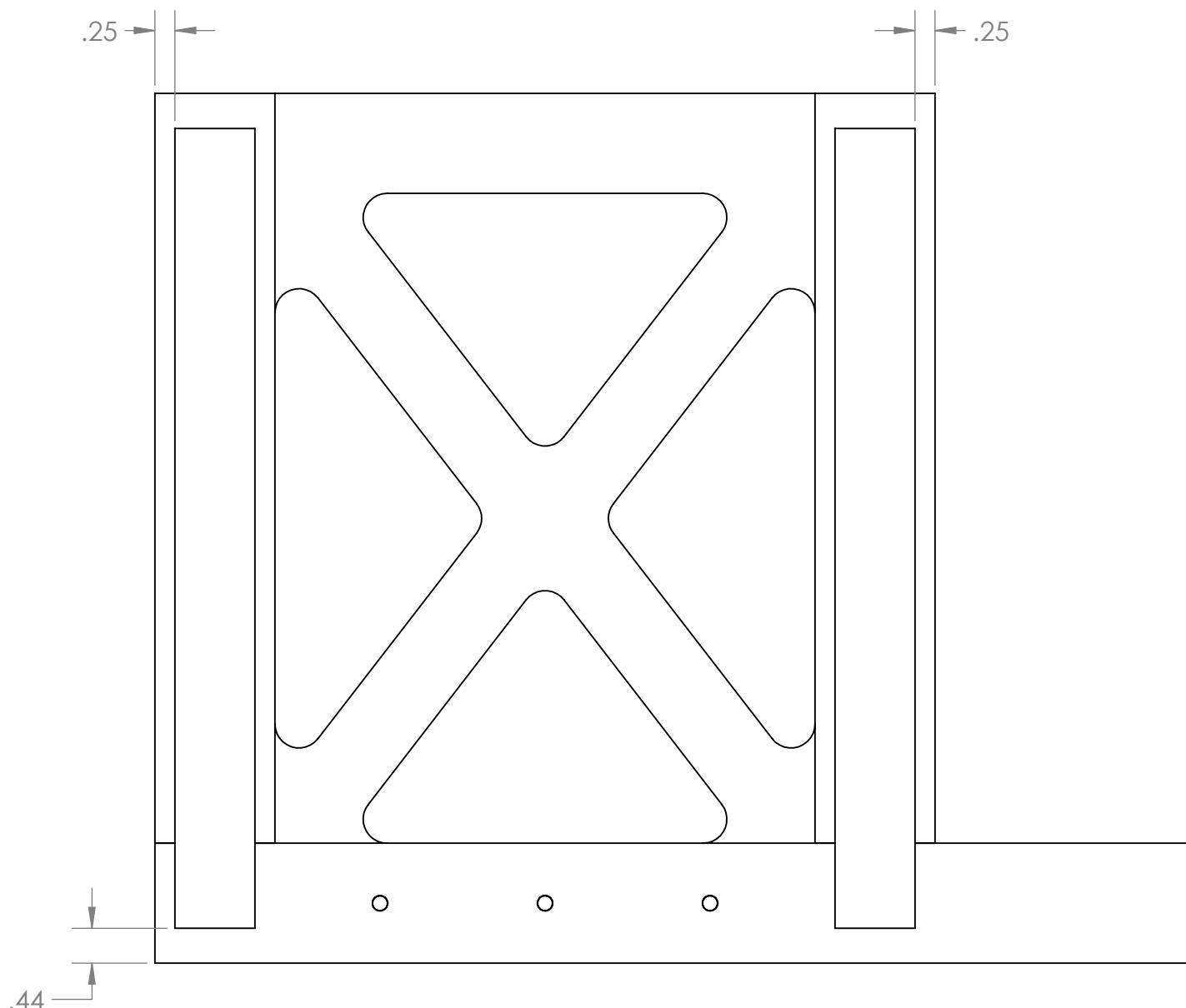
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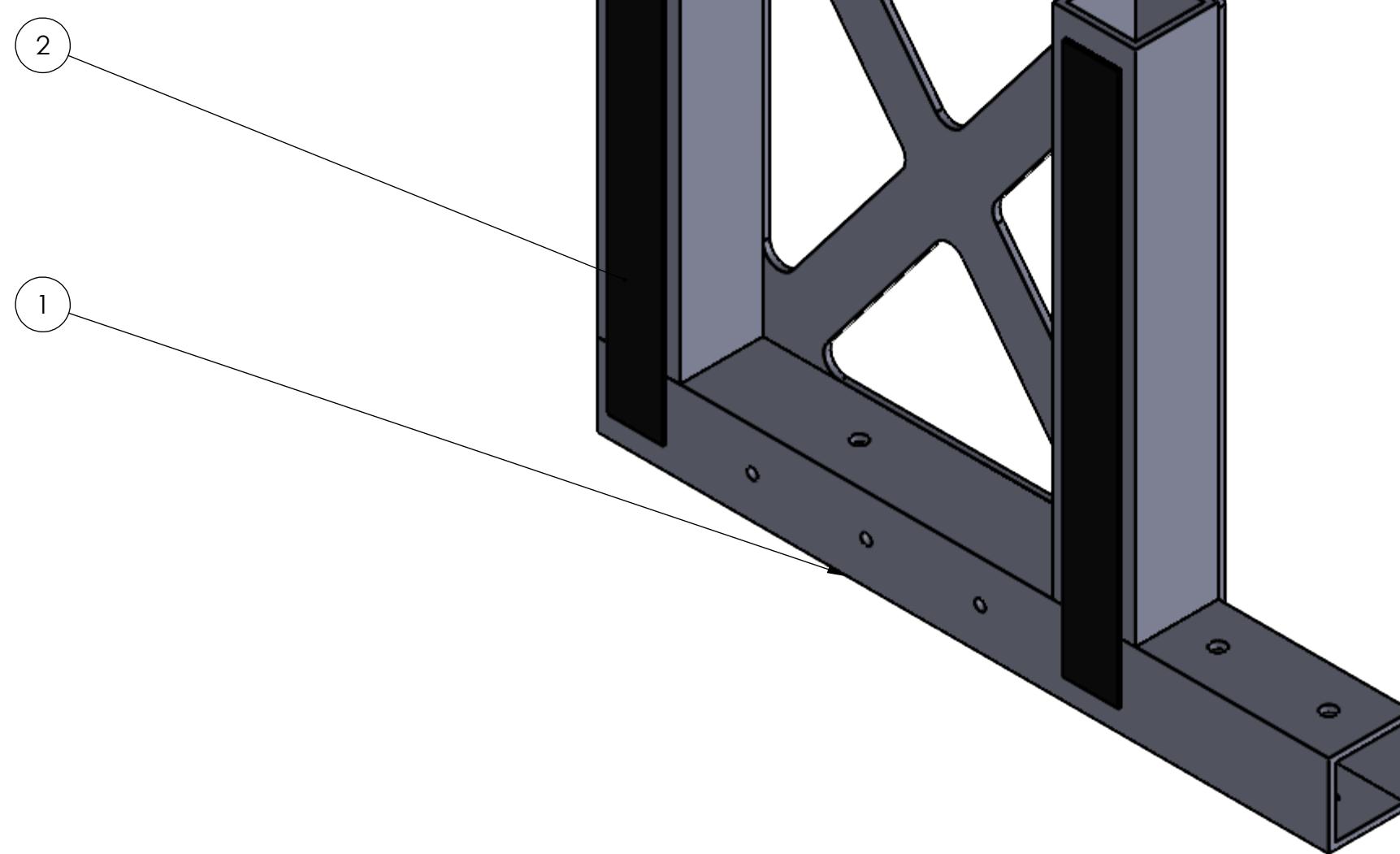
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Notes:

1. Make sure surface of (1) is clean prior to hook application.
2. Attach (2) to (1) in locations shown.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23351	Charge Station Side Right Brace	1
2	Hook_1_10	1" x 10" Hook, Adhesive Backed	2



UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	CO	12/9/2022
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

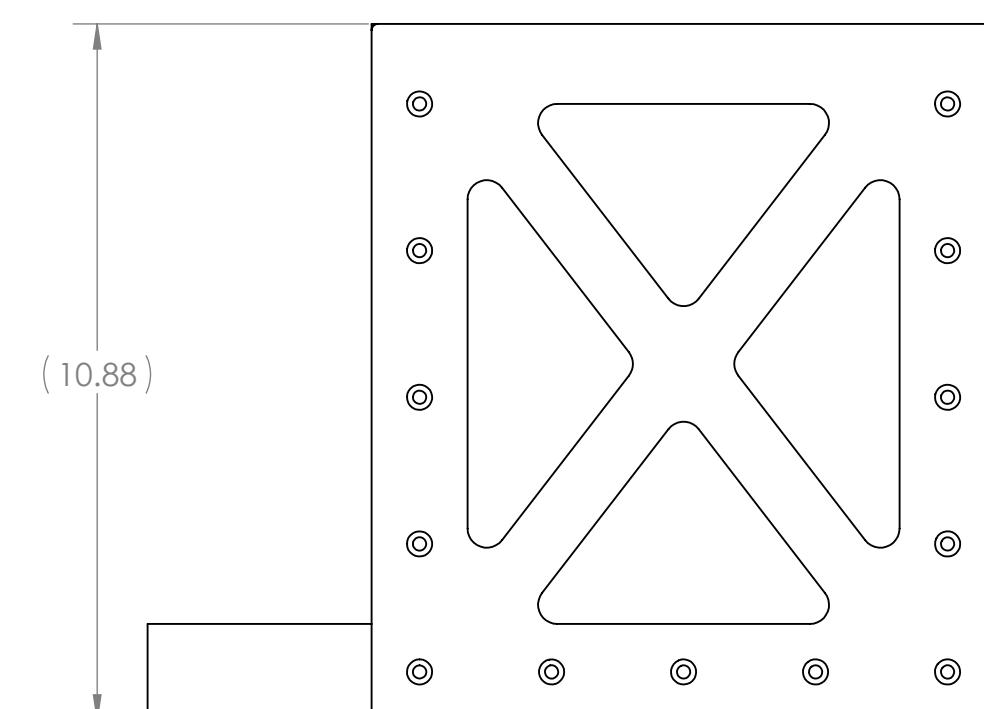
TITLE: Charge Station Side Right Brace with Hook

SIZE DWG. NO. REV

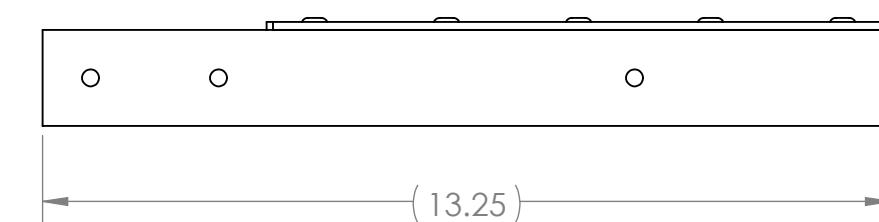
C GE-23350

SCALE: 1:2 SHEET 1 OF 1

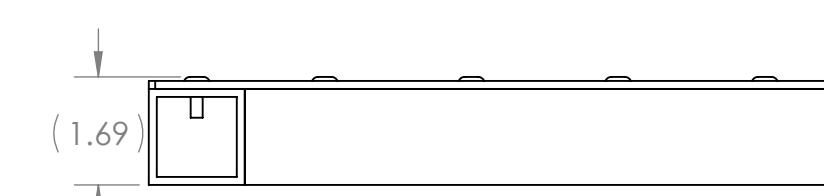
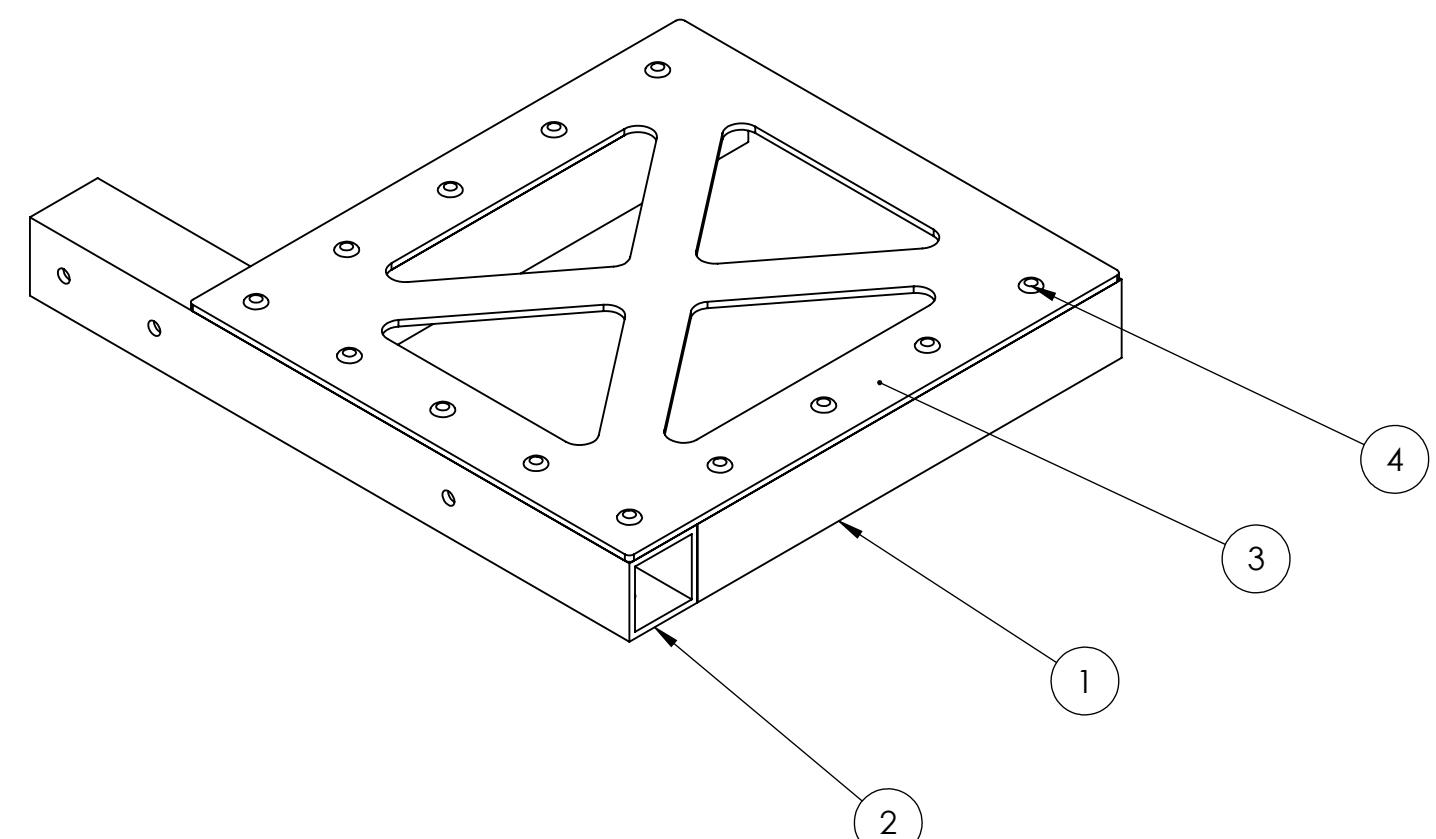
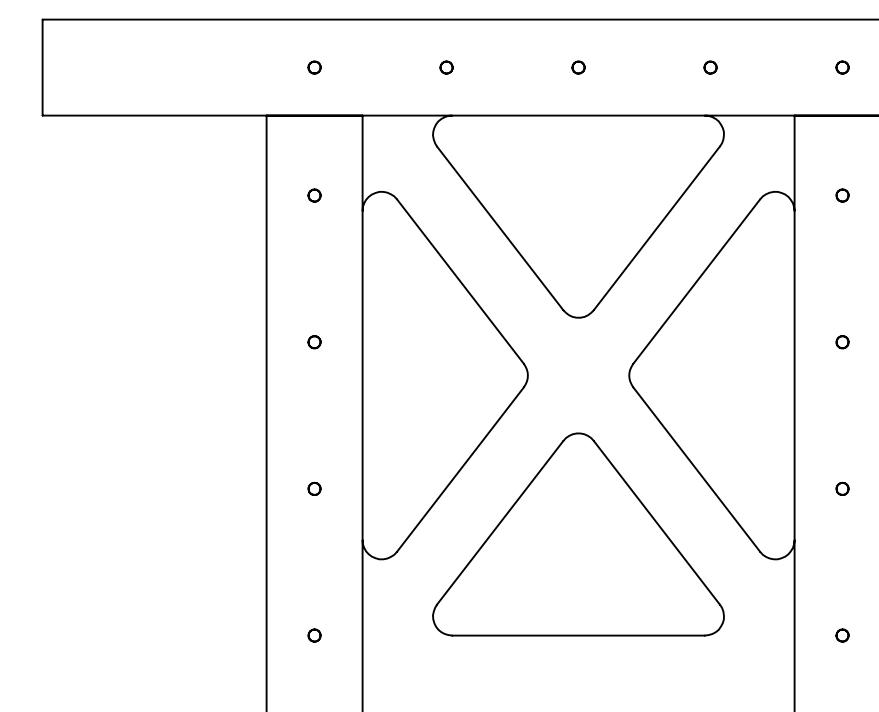
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- Notes:
1. Tag or label with part number.
 2. Assembly is a mirror of GE-23349. Parts are the same, assembly orientation differs.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23351-01	1.5" x .125" thk. Square Tube, 6061 Aluminum	2
2	GE-23351-02	1.5" x .125" thk. Square Tube, 6061 Aluminum	1
3	GE-23351-03	.125" thk. 6061 Aluminum Plate	1
4	rivet_.1875_.251-.375	3/16" Aluminum Rivet, .251-.375 Grip Range	13

UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	CO	9/29/2022	 
PROPRIETARY AND CONFIDENTIAL			
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COMMENTS:			
REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING		SCALE: 1:3 SHEET 1 OF 2	

Charge Station Side Right Brace

SIZE DWG. NO. REV
C GE-23351

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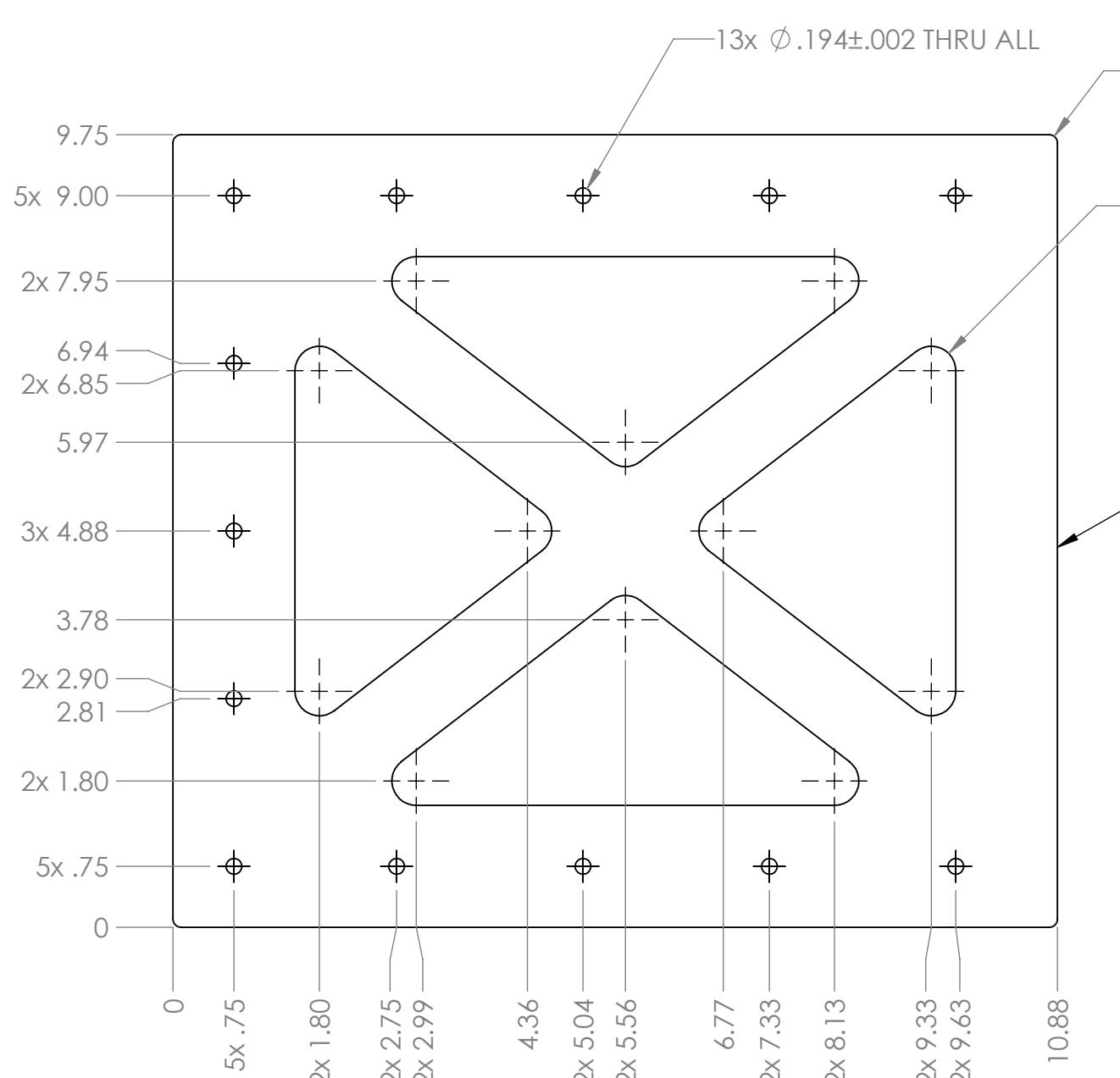
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VEND	NAME	DATE
DRAWN	CO	9/29/2022
PROPRIETARY AND CONFIDENTIAL		
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.		
MATERIAL/FINISH:		
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.		
DO NOT SCALE DRAWING		

TITLE: Charge Station Side Right Brace		
SIZE	DWG. NO.	REV
C	GE-23351	
SCALE: 1:2		SHEET 2 OF 2

4

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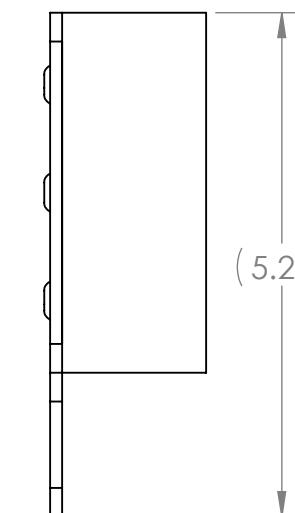
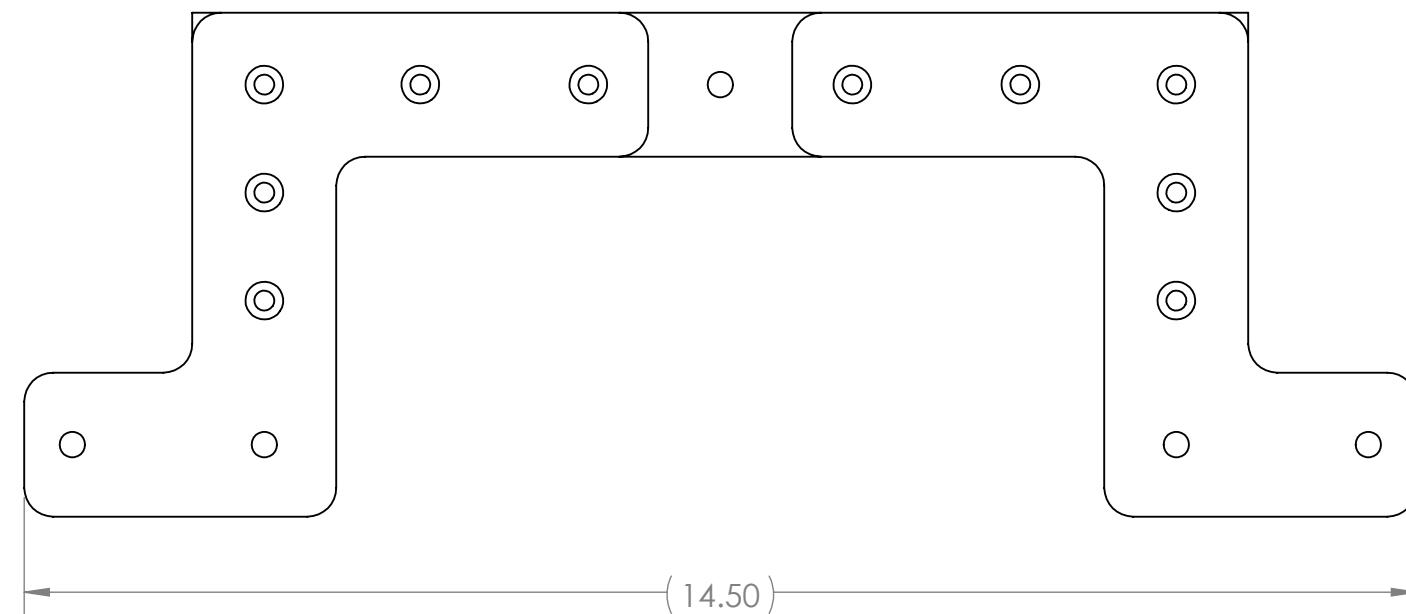
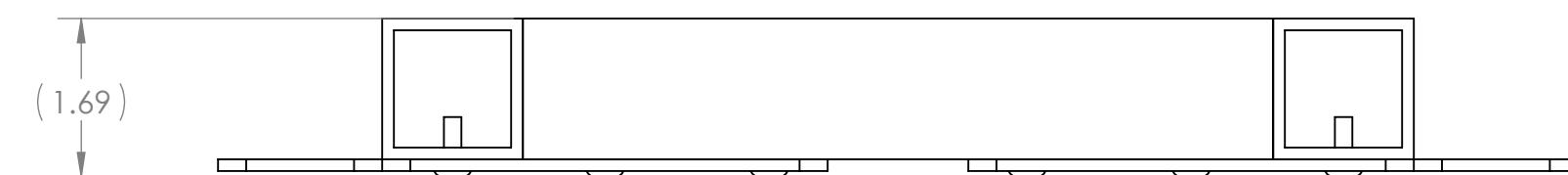
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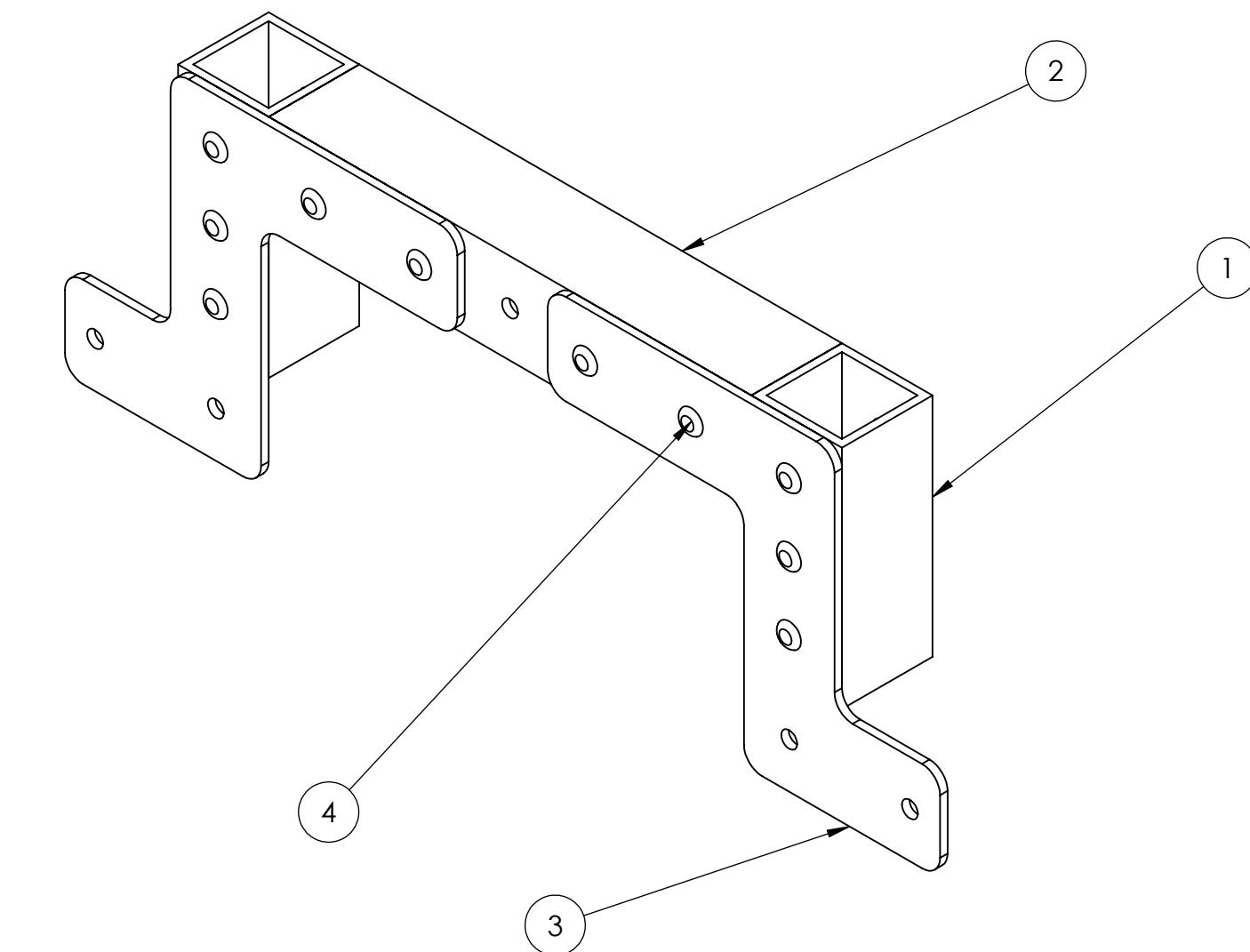
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Notes:
1. Tag or label with part number

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23352-01	1.5" x .125" thk. Square Tube, 6061 Aluminum	2
2	GE-23352-02	1.5" x .125" thk. Square Tube, 6061 Aluminum	1
3	GE-23352-03	.125" thk. 6061 Aluminum Plate	2
4	rivet_.1875_.251-.375	3/16" Aluminum Rivet, .251-.375 Grip Range	10



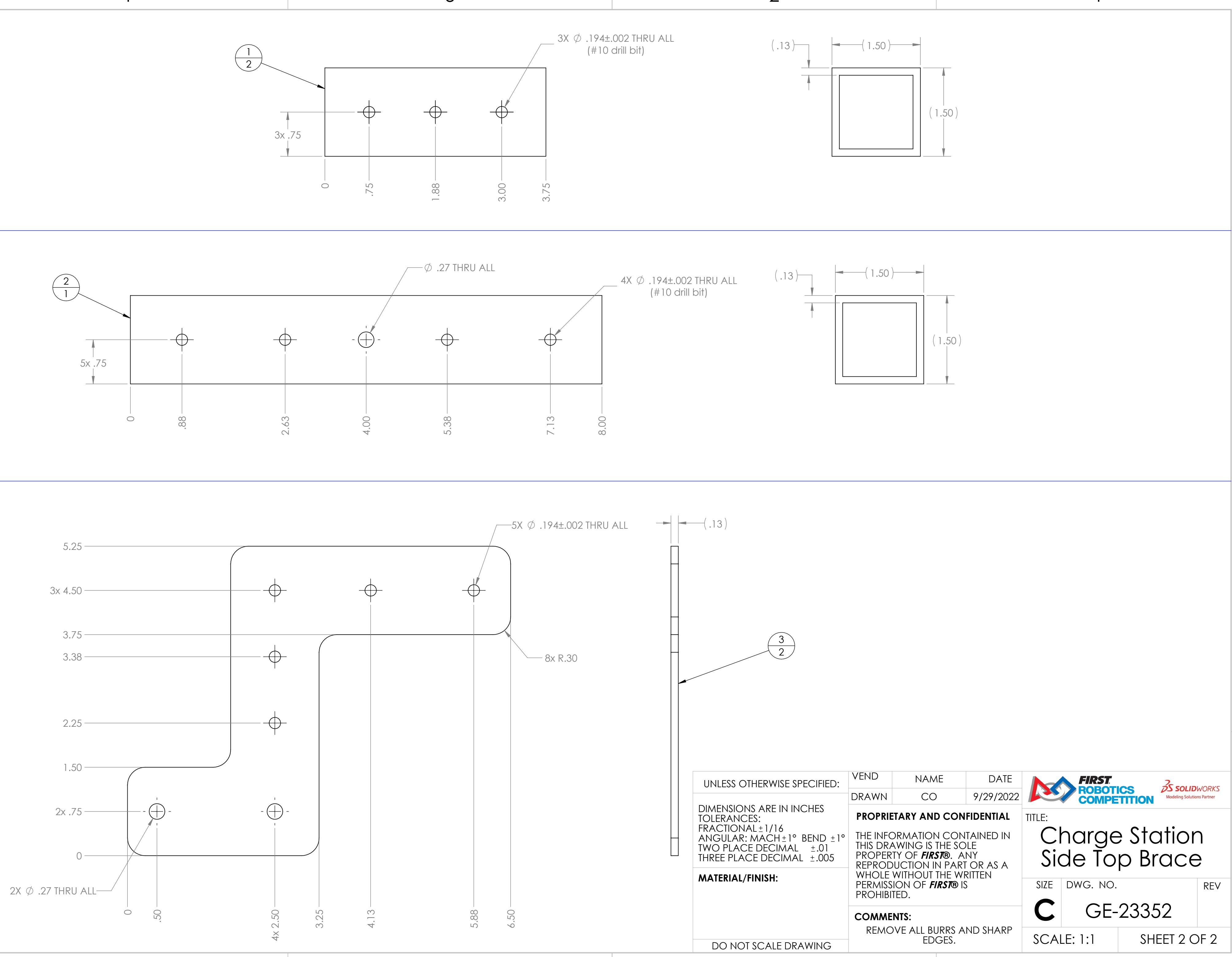
UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	CO	9/29/2022
TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .005$	PROPRIETARY AND CONFIDENTIAL THE INFORMATION CONTAINED IN THIS DRAWING IS 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			

FIRST ROBOTICS COMPETITION SOLIDWORKS Modeling Solutions Partner

Charge Station Side Top Brace

SIZE	DWG. NO.	REV
C	GE-23352	

SCALE: 1:2 SHEET 1 OF 2



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	CO	9/29/2023
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.			
DO NOT SCALE DRAWING			

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- Notes:
 1. Tag or label with part number.
 2. Other colors or textures acceptable.

UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	CO	10/11/2022	
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" HDPE, natural smooth			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

 FIRST
ROBOTICS
COMPETITION

 SOLIDWORKS
Modeling Solutions Partner

TITLE: Charge Station
Side Plastic
Locater
SIZE DWG. NO. REV
C GE-23353

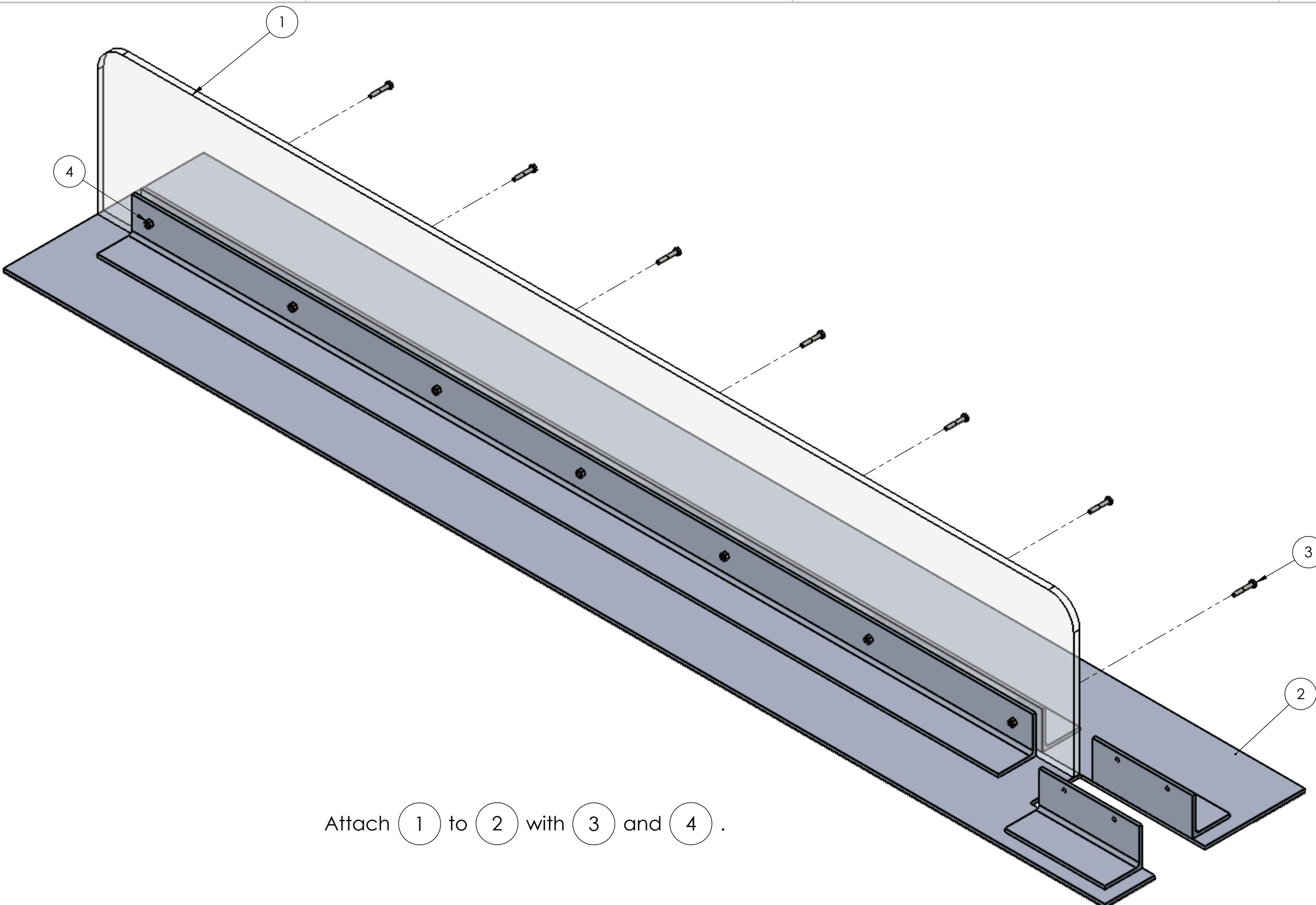
SCALE: 4:1 SHEET 1 OF 1

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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23402	Plastic Wall	1
2	GE-23403	Red Divider Wall Weldment with Hook	1
3	hex_.25_20_1.5_partial	Steel Hex Head Screw, 1/4"-20 x 1-1/2" long, partially threaded	7
4	nylock_.25_20	Steel Nylon-Insert Locknut, 1/4"-20	7

UNLESS OTHERWISE SPECIFIED:		
VEND	NAME	DATE
DRAWN	JO	8/23/2022
PROPRIETARY AND CONFIDENTIAL		
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COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.		
DO NOT SCALE DRAWING		

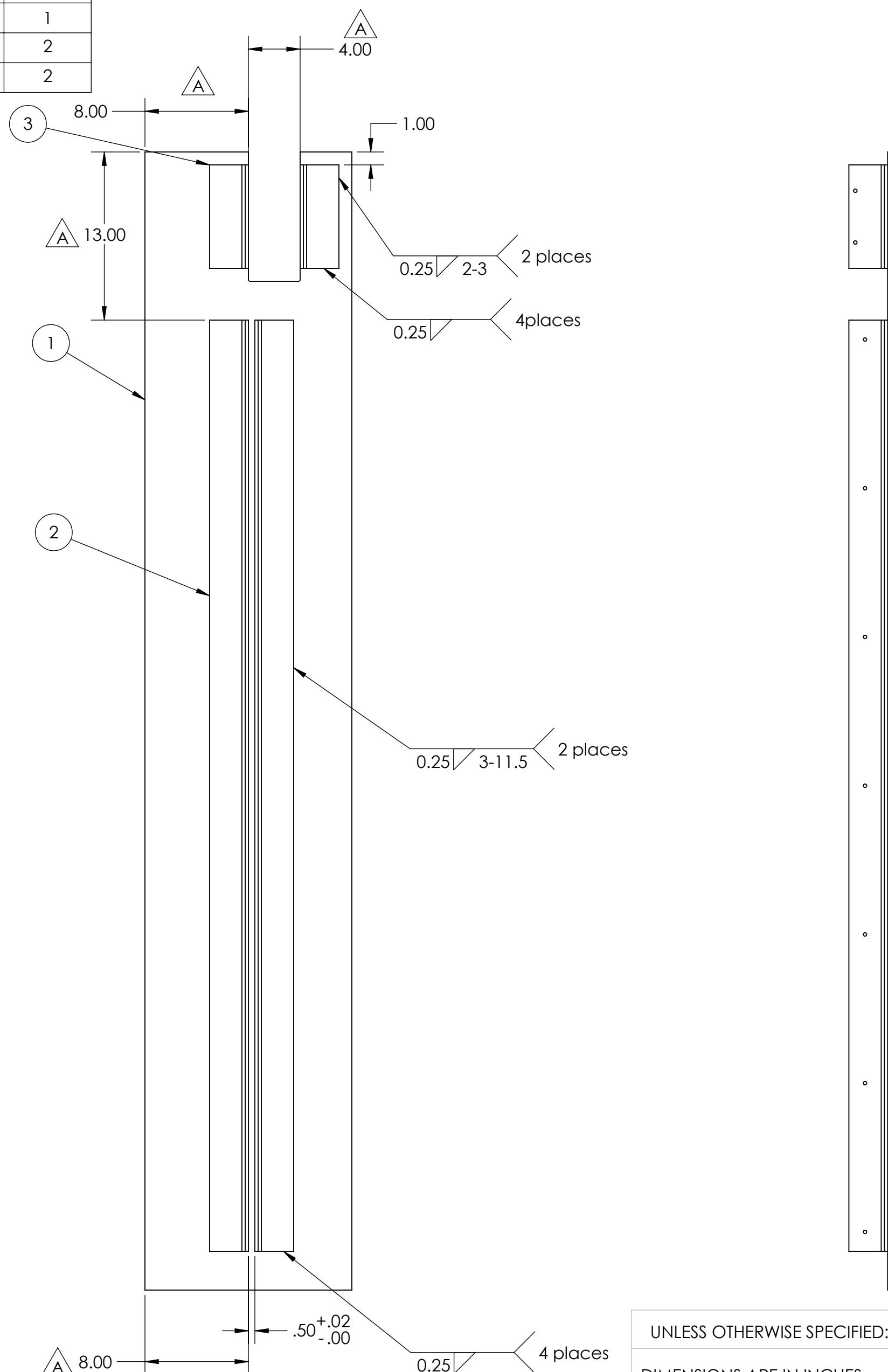
FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
 Modeling Solutions Partner

TITLE: Red Divider Wall
 SIZE DWG. NO. REV
C GE-23400

SCALE: 1:12 SHEET 1 OF 1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23401-01	Base Plate	1
2	GE-23401-02	Wall Angle	2
3	GE-23401-03	Goal Angle	2



Notes:
1. Tag or Label with Part Number

UNLESS OTHERWISE SPECIFIED:			WELD	NAME	DATE
			DRAWN	JO	8/23/2022
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: Red Divider Wall Weldment

SIZE	DWG. NO.	REV
C	GE-23401	A
SCALE: 1:12		SHEET 1 OF 1

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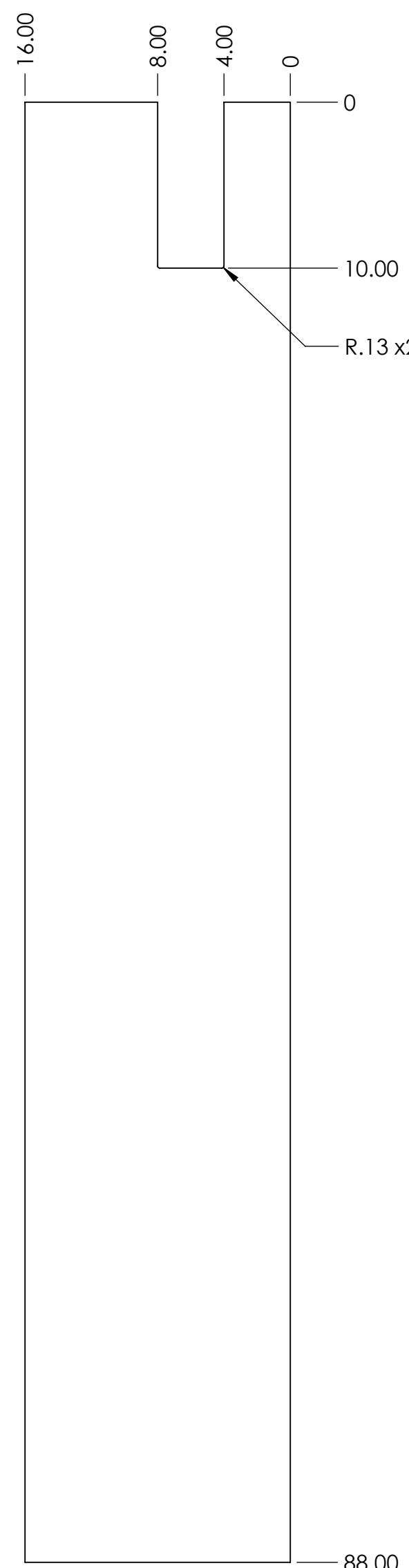
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REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
A2	A	Loosened Tolerancing	9/20/2022	JO

UNLESS OTHERWISE SPECIFIED:

VEND NAME DATE



DRAWN JO 8/23/2022

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 $\pm .01$

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REPRODUCTION IN PART OR AS A

WHOLE WITHOUT THE WRITTEN

PERMISSION OF FIRST® IS

PROHIBITED.

MATERIAL/FINISH:

1/4" 6061 Aluminum Plate

COMMENTS:

REMOVE ALL BURRS AND SHARP
EDGES.

DO NOT SCALE DRAWING

TITLE:

Base Plate

SIZE DWG. NO. REV

C GE-23401-01 A

SCALE: 1:12 SHEET 1 OF 1

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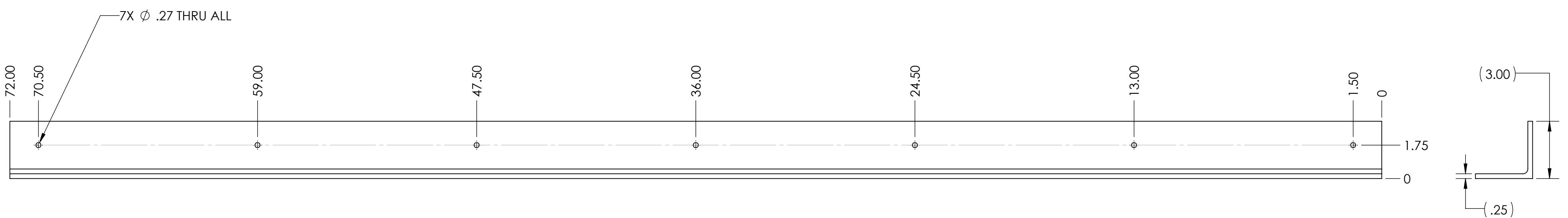
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UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	JO	8/23/2022	
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH:	SIZE	DWG. NO.	REV
3" x 3" x 1/4" 6061 Aluminum Angle	C	GE-23401-02	
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING	SCALE: 1:12	SHEET 1 OF 1	

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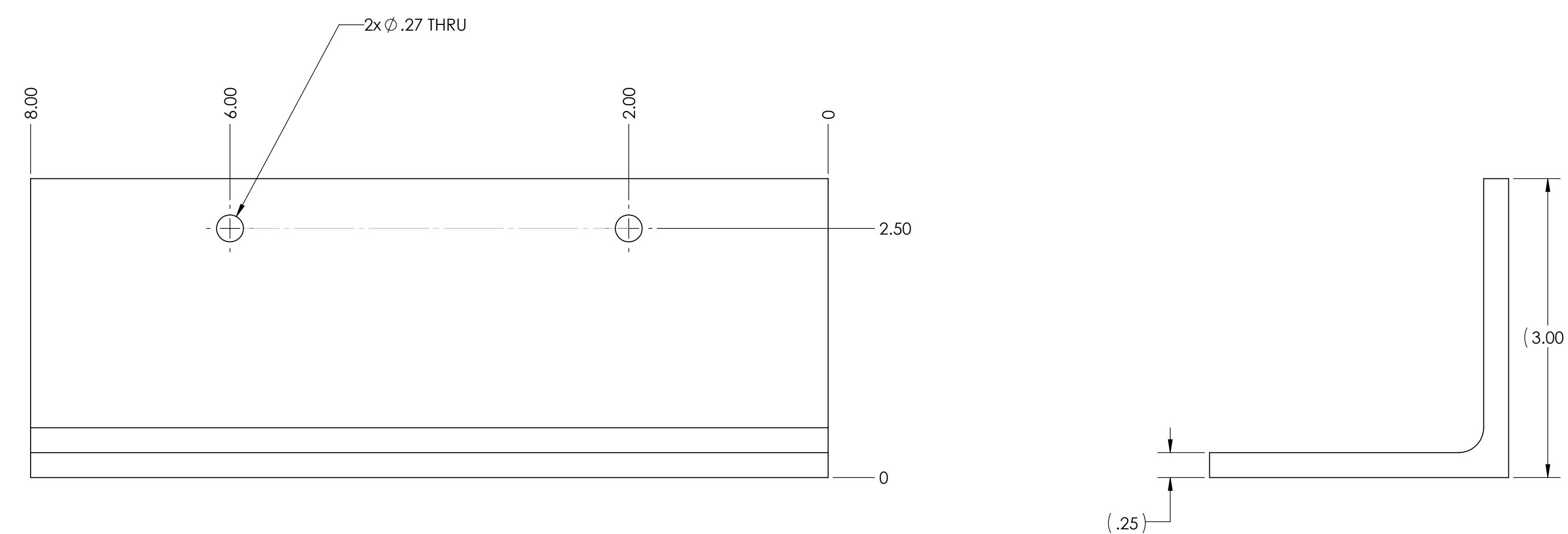
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UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	JO	8/23/2022	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH: 3" x 3" x 1/4" 6061 Aluminum Angle			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			



TITLE:
Goal Angle

SIZE DWG. NO. REV
C GE-23401-03

SCALE: 1:2 SHEET 1 OF 1

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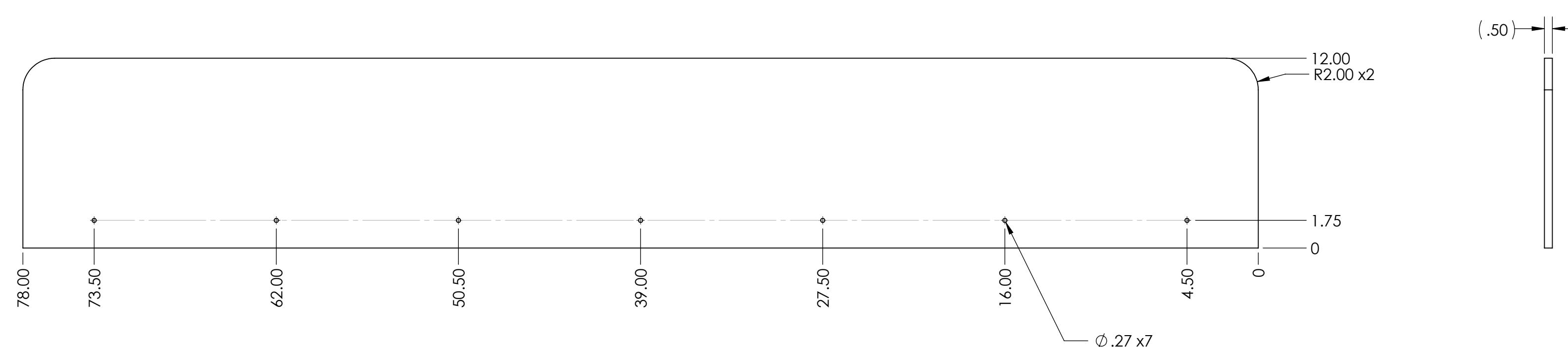
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Notes:
1. Tag or Label with Part Number

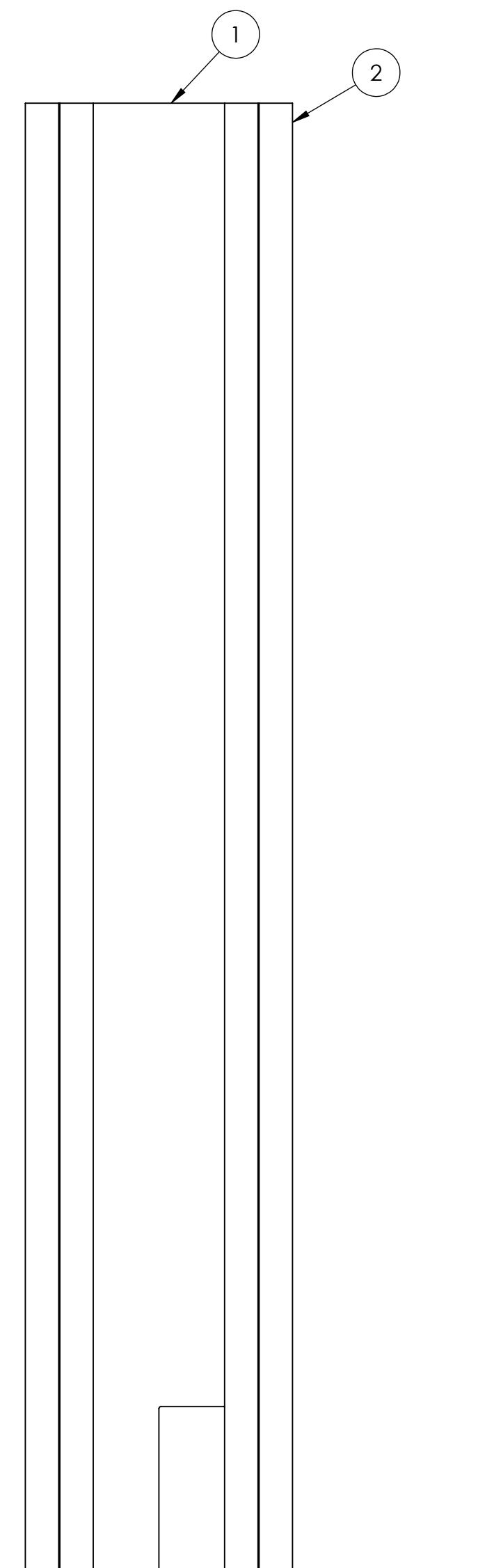
UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	JO	8/23/2022
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH:	SIZE	DWG. NO.	REV
1/2" Polycarbonate Sheet	C	GE-23402	
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING	SCALE: 1:12	SHEET 1 OF 1	

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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23401	Red Divider Wall Weldement	1
2	Hook_2_88	2" x 88" Hook, Adhesive Backed	4

Apply Hook as shown. 4" wide hook is also acceptable.

UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	JO	8/23/2022
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:	COMMENTS:		
REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST ROBOTICS COMPETITION SOLIDWORKS Modeling Solutions Partner

TITLE: Red Divider Wall Weldment with Hook

SIZE DWG. NO. REV

C GE-23403

SCALE: 1:12 SHEET 1 OF 1

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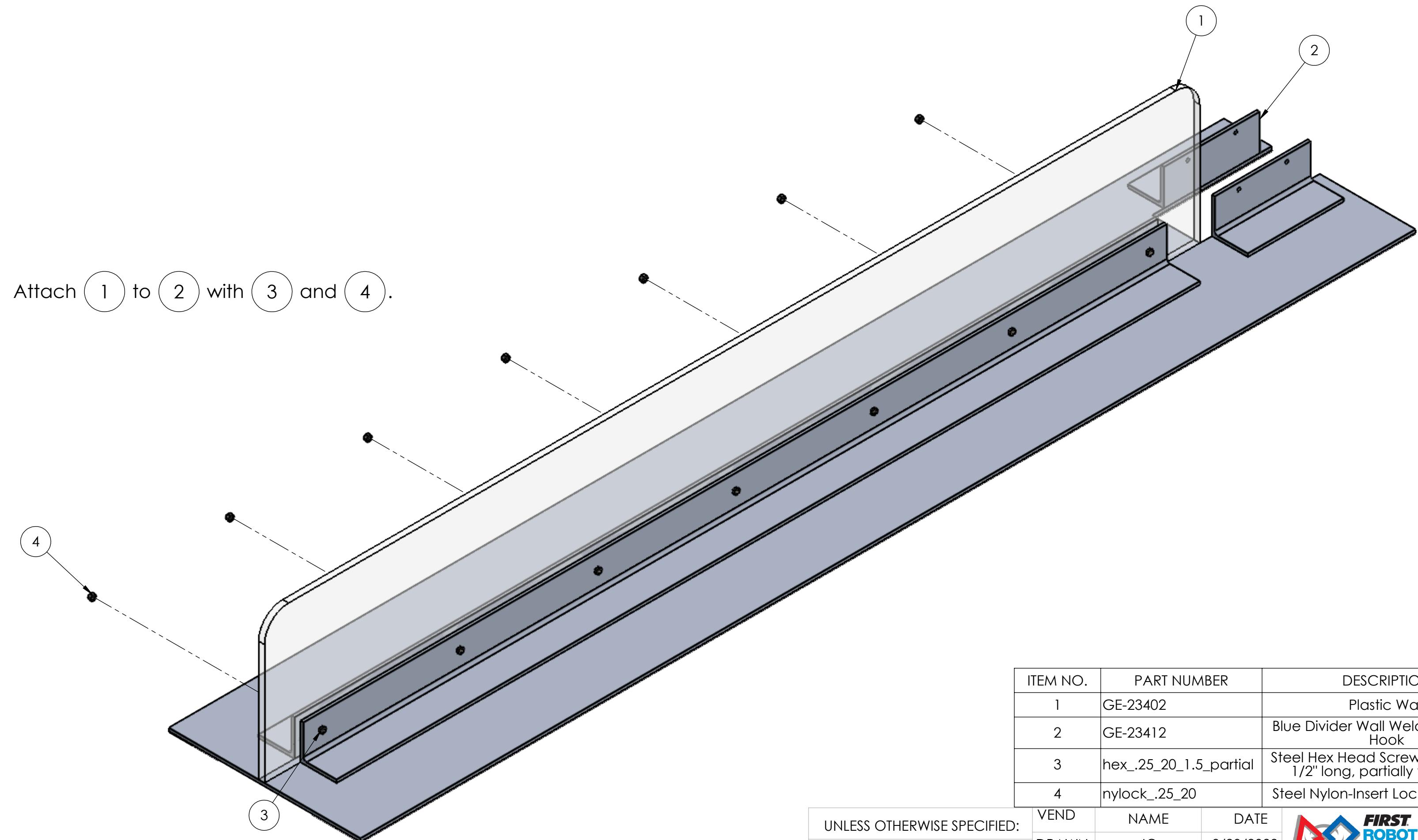
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UNLESS OTHERWISE SPECIFIED:

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:

DO NOT SCALE DRAWING

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COMMENTS:
REMOVE ALL BURRS AND SHARP EDGES.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23402	Plastic Wall	1
2	GE-23412	Blue Divider Wall Weldment with Hook	1
3	hex_.25_20_1.5_partial	Steel Hex Head Screw, 1/4"-20 x 1-1/2" long, partially threaded	7
4	nylock_.25_20	Steel Nylon-Insert Locknut, 1/4"-20	7

VEND NAME DATE
DRAWN JO 8/23/2022

FIRST[®] ROBOTICS COMPETITION DS SOLIDWORKS
Modeling Solutions Partner

TITLE:
Blue Divider Wall

SIZE DWG. NO. REV
C GE-23410

SCALE: 1:12 SHEET 1 OF 1

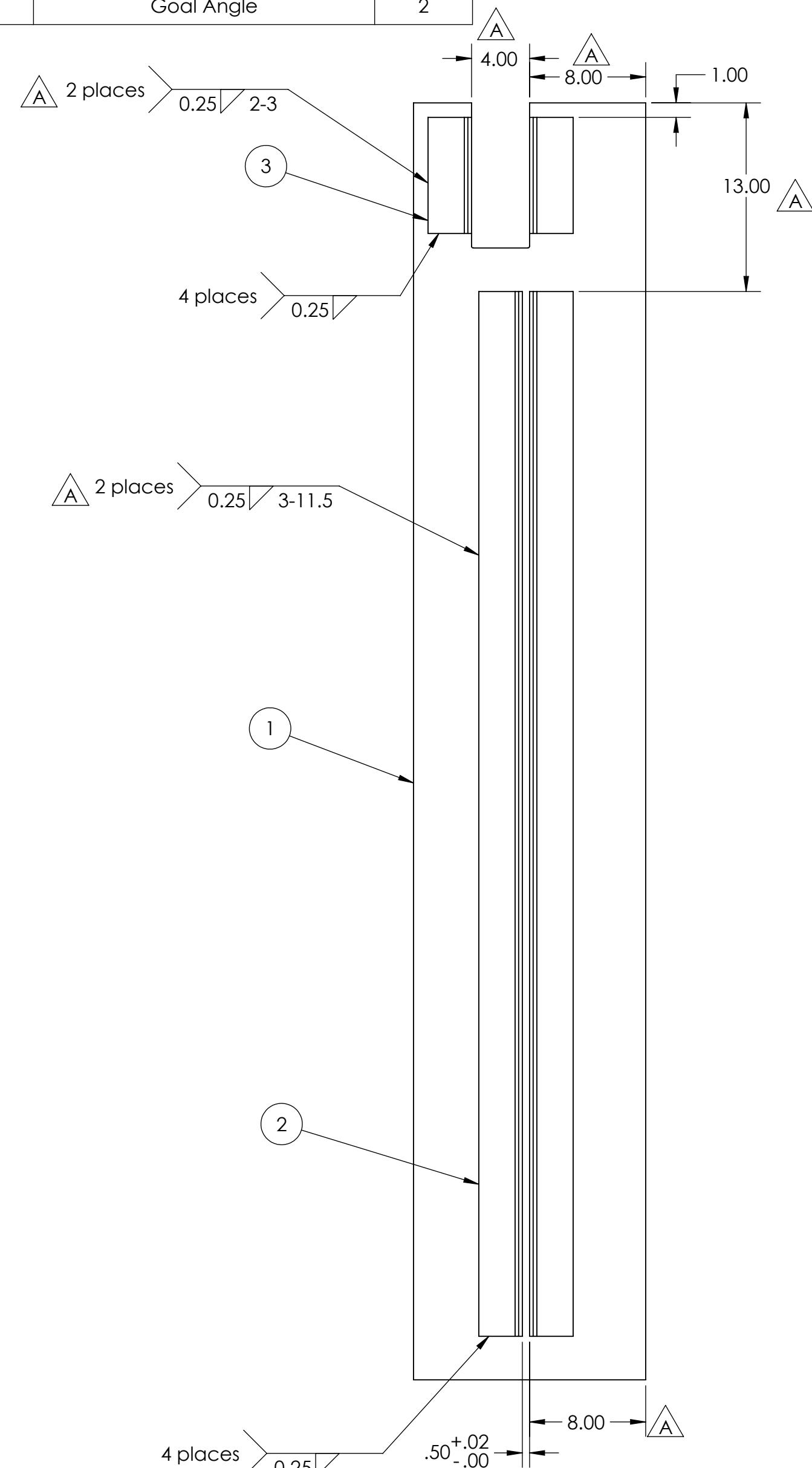
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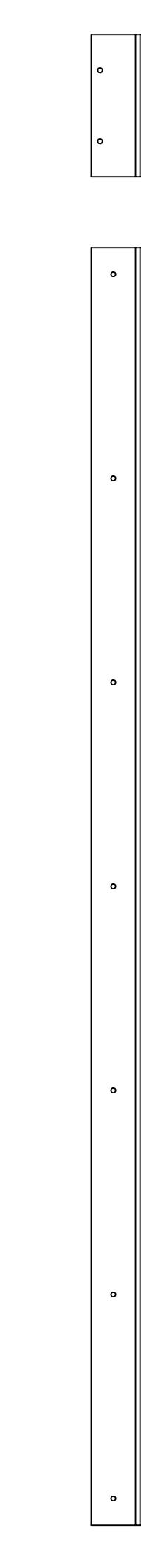
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23401-01	Base Plate	1
2	GE-23401-02	Wall Angle	2
3	GE-23401-03	Goal Angle	2



REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
A3, C4, D3, D4	A	Moved Dimensions to more useful side for welding, added width dimension for wider spaced angle brackets, two weld quantities added (previously missing)	11/9/2022	JO



UNLESS OTHERWISE SPECIFIED:	WELD	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	JO	8/23/2022
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:			
COMMENTS:	REMOVE ALL BURRS AND SHARP EDGES.		
DO NOT SCALE DRAWING			

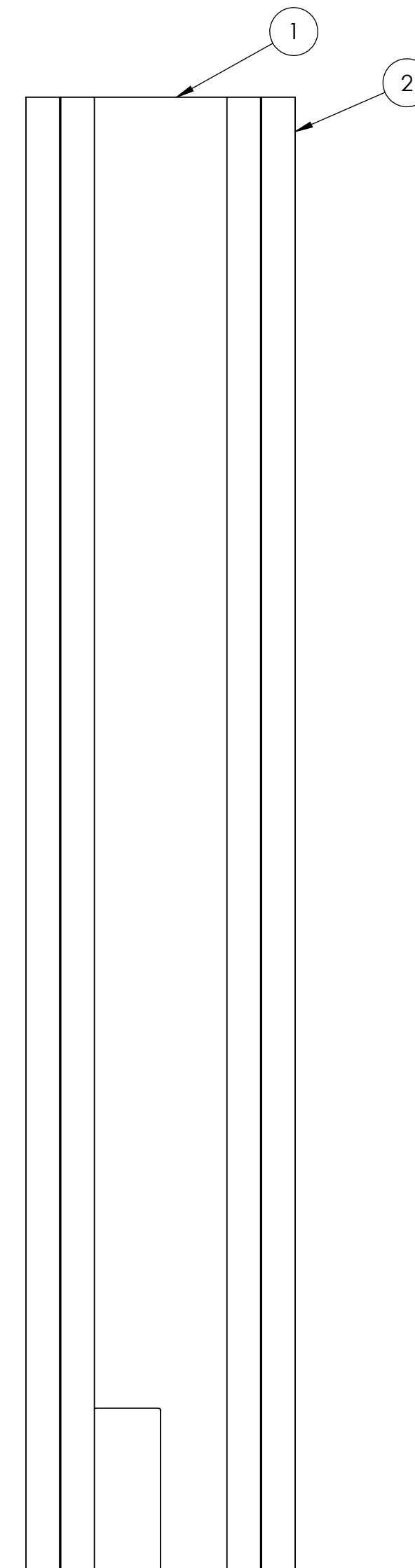
FIRST ROBOTICS COMPETITION SOLIDWORKS Modeling Solutions Partner

TITLE: Blue Divider Wall Weldment

SIZE DWG. NO. REV

C GE-23411 **A**

SCALE: 1:12 SHEET 1 OF 1



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23411	Blue Divider Wall Weldement	1
2	Hook_2_88	2" x 88" Hook, Adhesive Backed	4

Apply Hook as shown. 4" wide hook is also acceptable.

UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	JO	8/23/2022
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:	COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.		
DO NOT SCALE DRAWING			

FIRST ROBOTICS COMPETITION SOLIDWORKS Modeling Solutions Partner

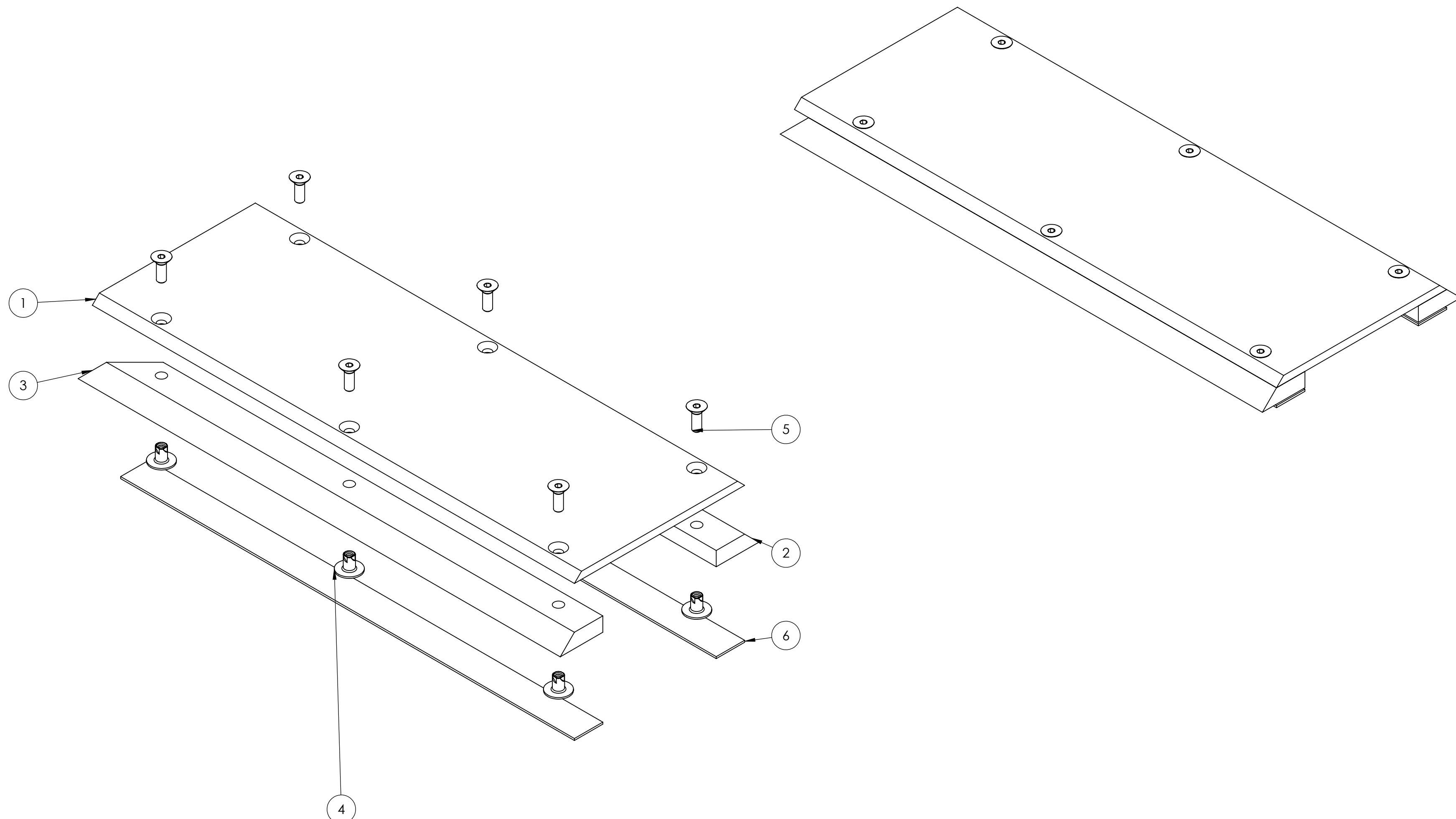
TITLE: Blue Divider Wall Weldement with Hook

SIZE DWG. NO. REV

C GE-23412

SCALE: 1:12 SHEET 1 OF 1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23501	2023 protector top	1
2	GE-23502	2023 protector right side	1
3	GE-23503	2023 protector left side	1
4	TeeNut_ultra_split_rst_.25_20	.25-20 TeeNut ultra split resistant	6
5	Flat Hex .25_20_.75	Flat Hex .25_20_.75	6
6	Hook_1_16	1" x 16" Hook, Adhesive Backed	2



Notes:

1. Insert (4) into predrilled holes in (2) and (3).
2. Attach (1) to (2) and (3) with (5).
3. Apply (6) post production.

UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	NW	9/28/2022
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:	COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.		
DO NOT SCALE DRAWING			

FIRST ROBOTICS COMPETITION SOLIDWORKS Modeling Solutions Partner

TITLE: 2023 cable protector section

SIZE DWG. NO. REV

C GE-23500

SCALE: 1:2 SHEET 1 OF 1

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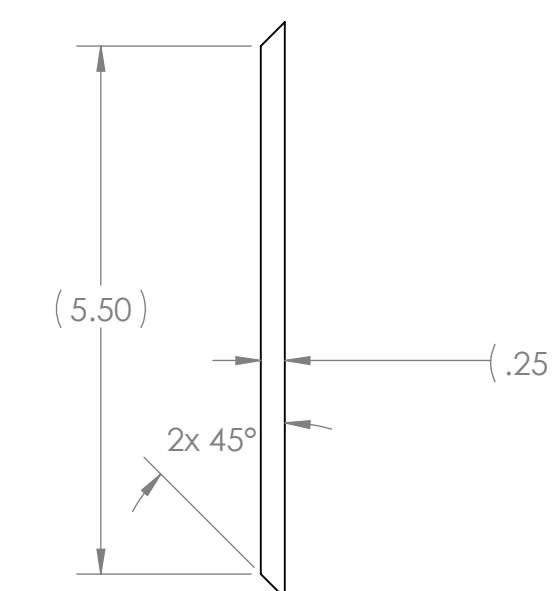
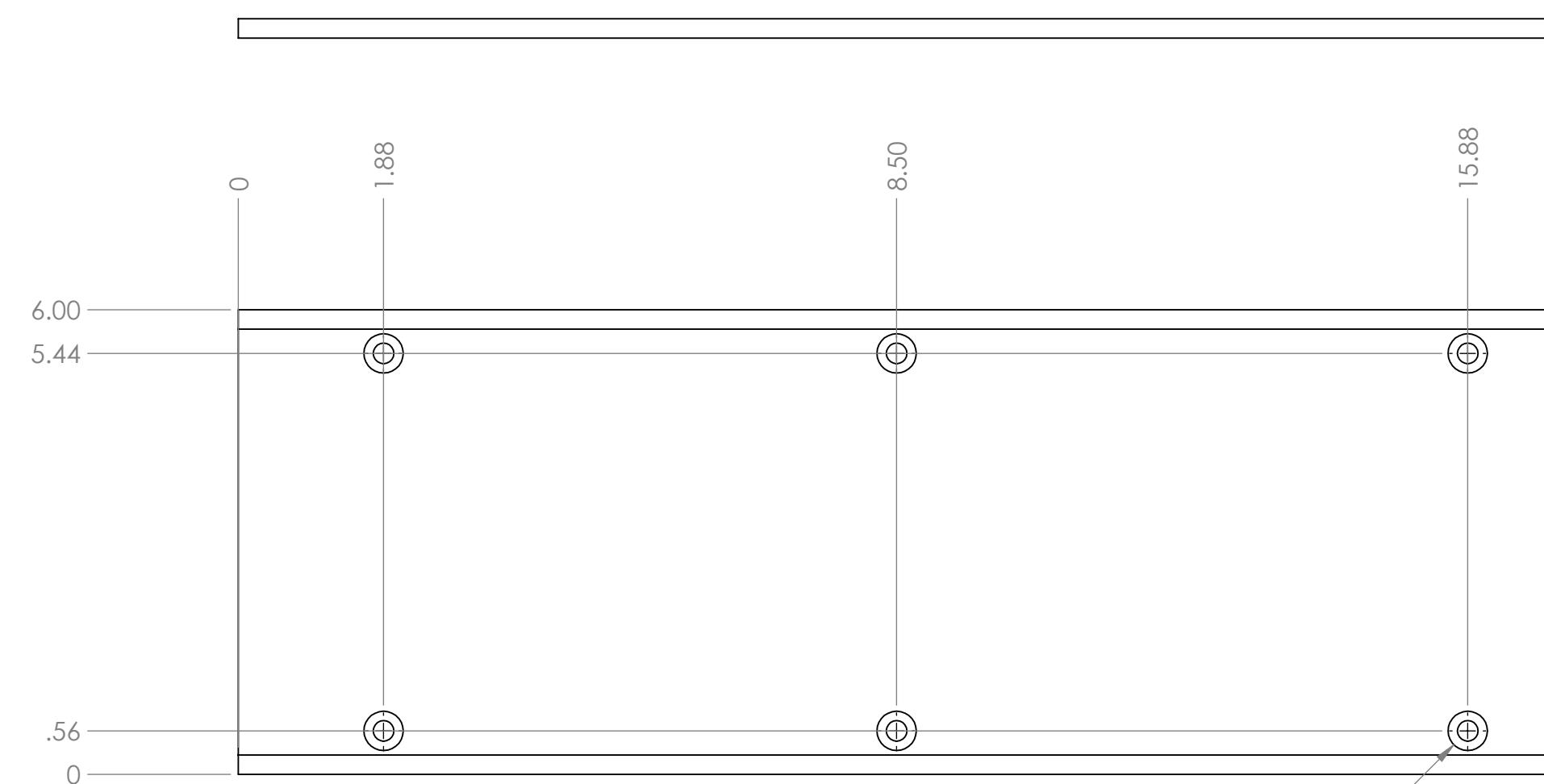
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UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES

TOLERANCES:

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

MATERIAL/FINISH:

.25" HDPE, smooth black

DO NOT SCALE DRAWING

VEND	NAME	DATE
DRAWN	NW	9/28/2022

PROPRIETARY AND CONFIDENTIAL

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COMMENTS:

REMOVE ALL BURRS AND SHARP EDGES.

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SOLIDWORKS

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TITLE:

2023 protector
top

SIZE DWG. NO. REV

C GE-23501

SCALE: 1:2 SHEET 1 OF 1

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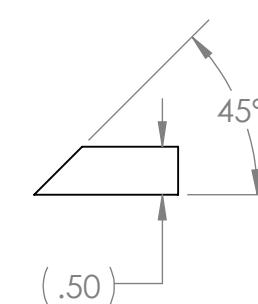
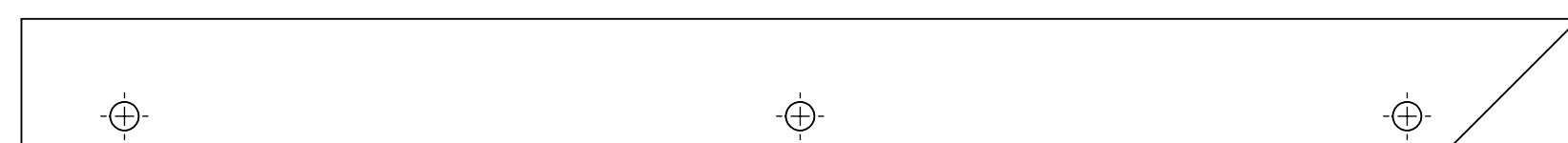
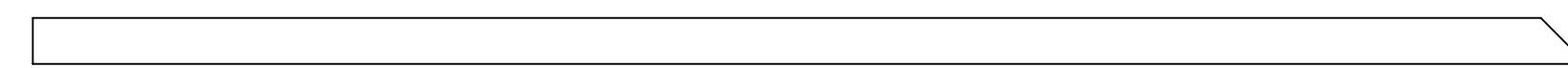
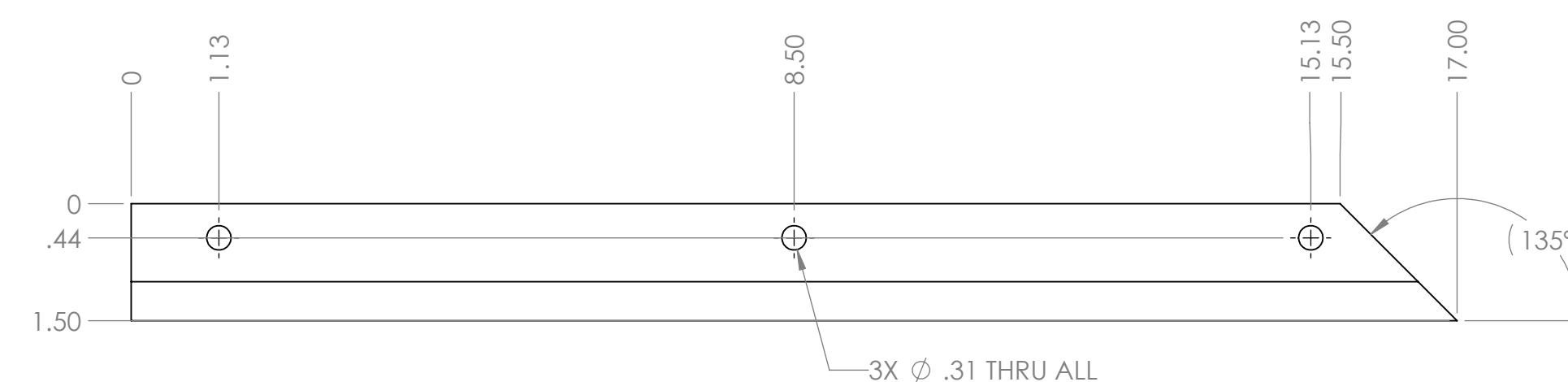
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UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	NW	9/28/2022
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:	SIZE	DWG. NO.	REV
0.5" HDPE, smooth black	C	GE-23502	
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING	SCALE: 1:2	SHEET 1 OF 1	

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
2023 protector
right side

SIZE DWG. NO. REV
C GE-23502

SCALE: 1:2 SHEET 1 OF 1

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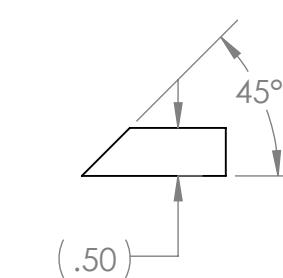
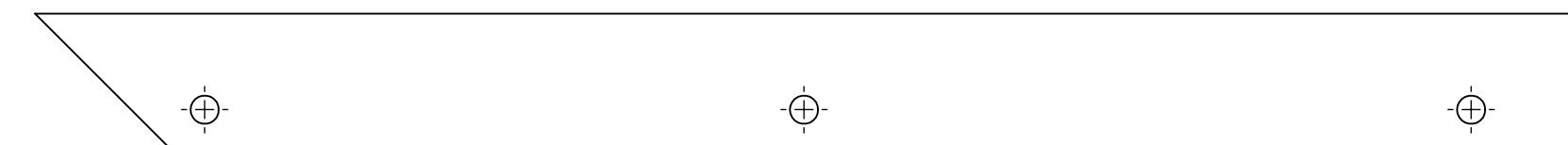
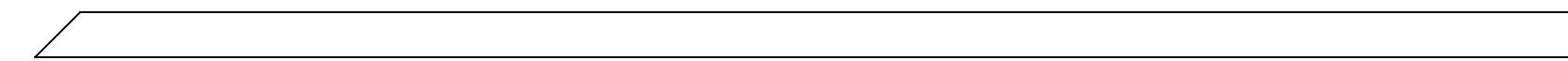
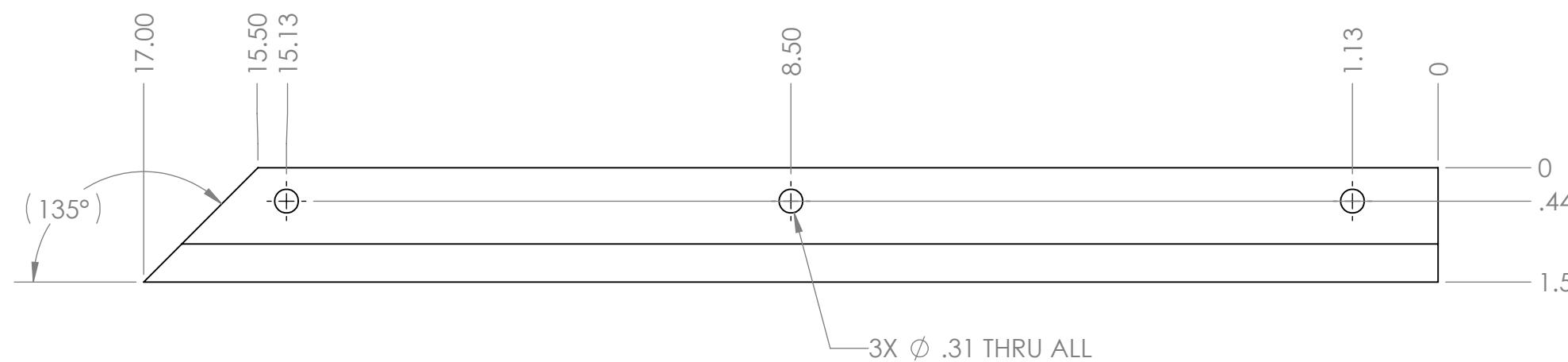
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UNLESS OTHERWISE SPECIFIED:	VEND	NAME	DATE
DRAWN	NW	9/28/2022	
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MATERIAL/FINISH:	SIZE	DWG. NO.	REV
0.5" HDPE, Smooth black	C	GE-23503	
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING	SCALE: 1:2	SHEET 1 OF 1	

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
2023 protector
left side

SIZE DWG. NO. REV
C GE-23503

SCALE: 1:2 SHEET 1 OF 1

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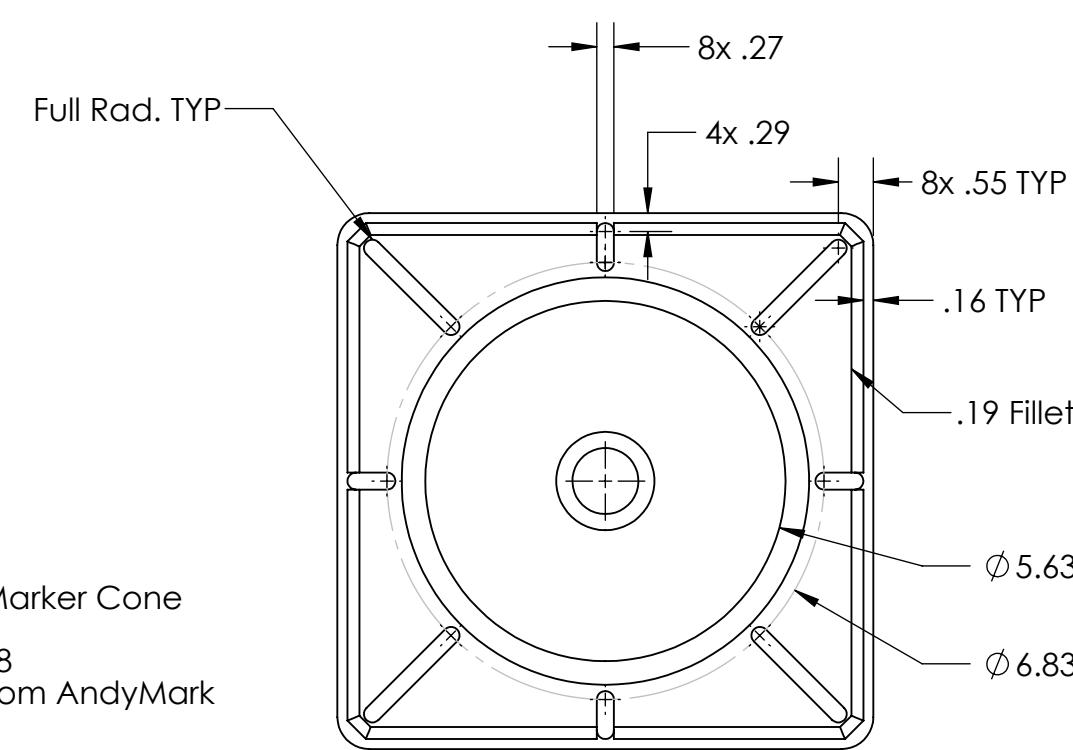
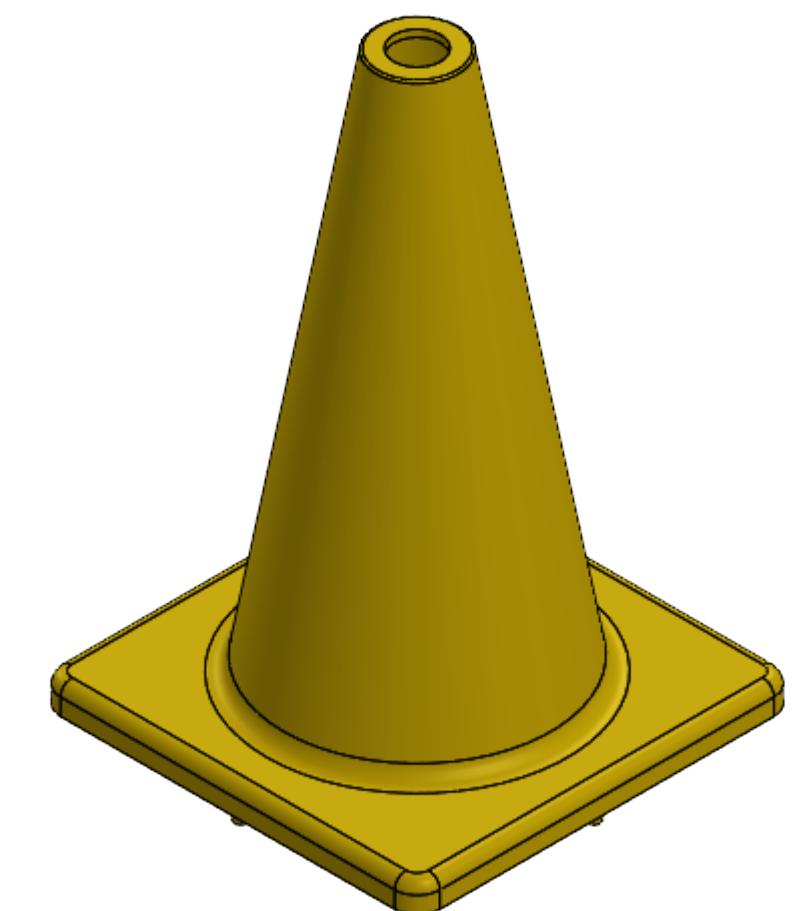
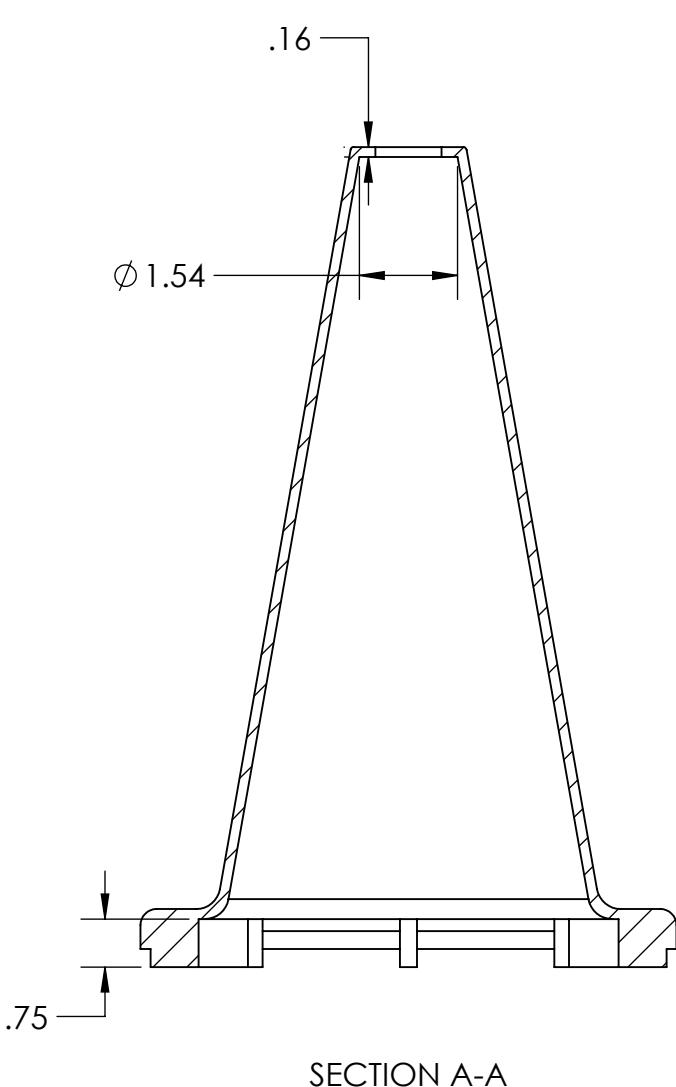
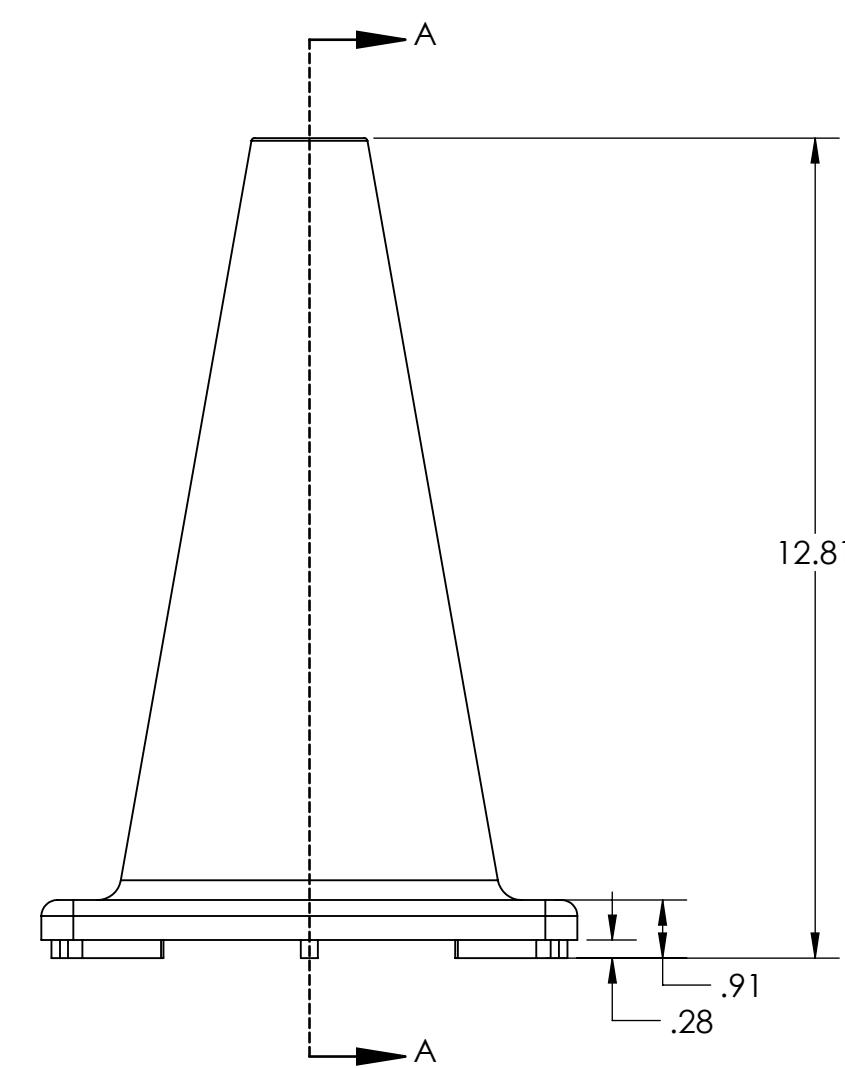
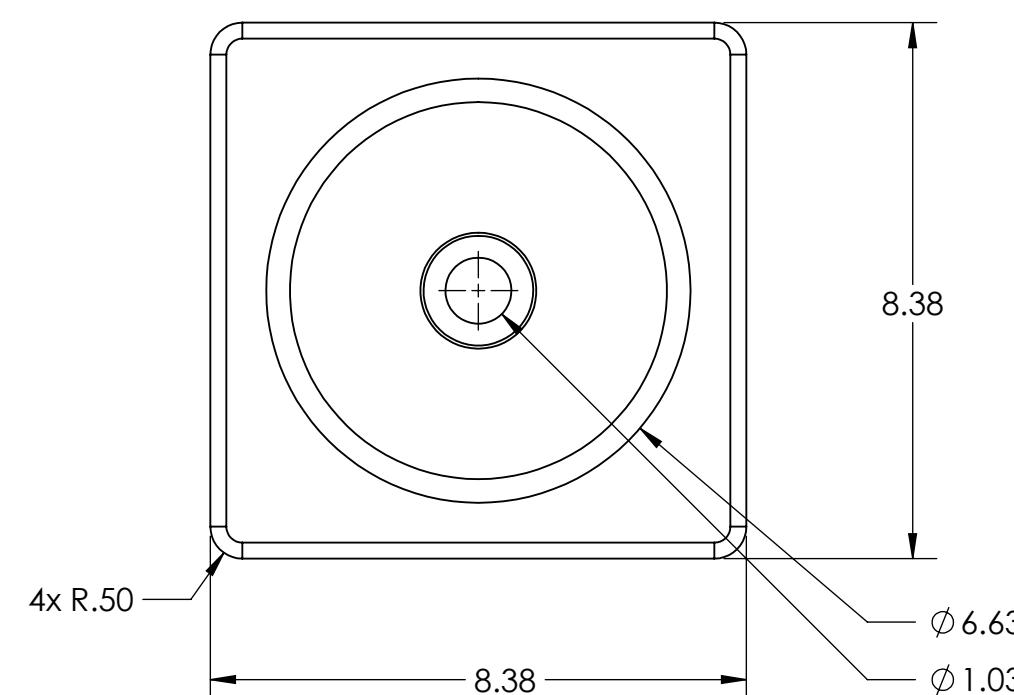
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- Notes:
1. Description: 1ft. 13/16in. tall Rubber Marker Cone
 2. Source: Flaghouse
 3. Closest Item# sold by Flaghouse: 4158
 4. Available to teams as am-4700_syc from AndyMark

UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE
	DRAWN	JO	12/28/2022
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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: CONE

SIZE DWG. NO. REV

C GE-23700

SCALE: 1:3 SHEET 1 OF 1

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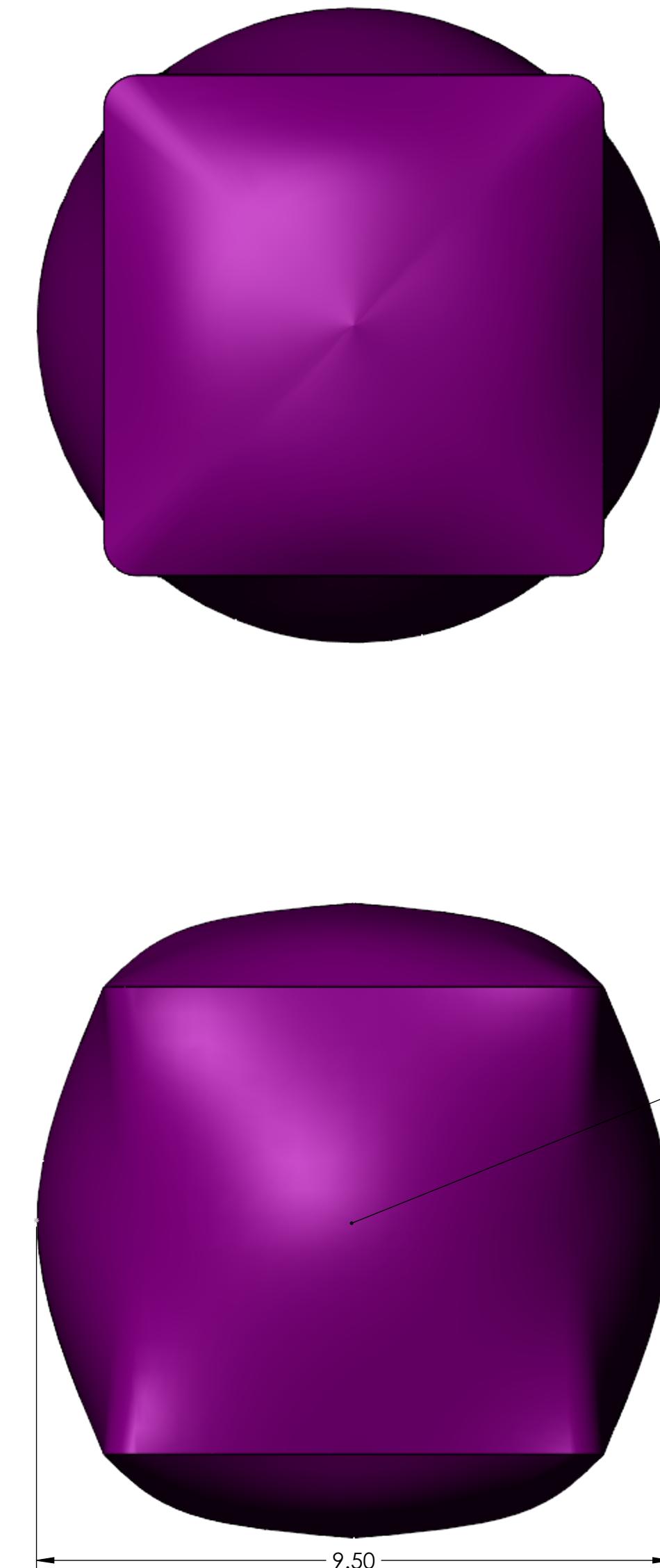
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- Notes:
1. Description: Inflatable Move Cube
 2. Source: Flaghouse
 3. Closest Item# sold by Flaghouse: 17810
 4. Available to teams as am-4700_bpc from AndyMark

UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE	 FIRST ROBOTICS COMPETITION
DIMENSIONS ARE IN INCHES	DRAWN	JO	12/28/2022	 SOLIDWORKS Modeling Solutions Partner
PROPRIETARY AND CONFIDENTIAL				
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-23701		
	SCALE: 1:2	SHEET 1 OF 1		

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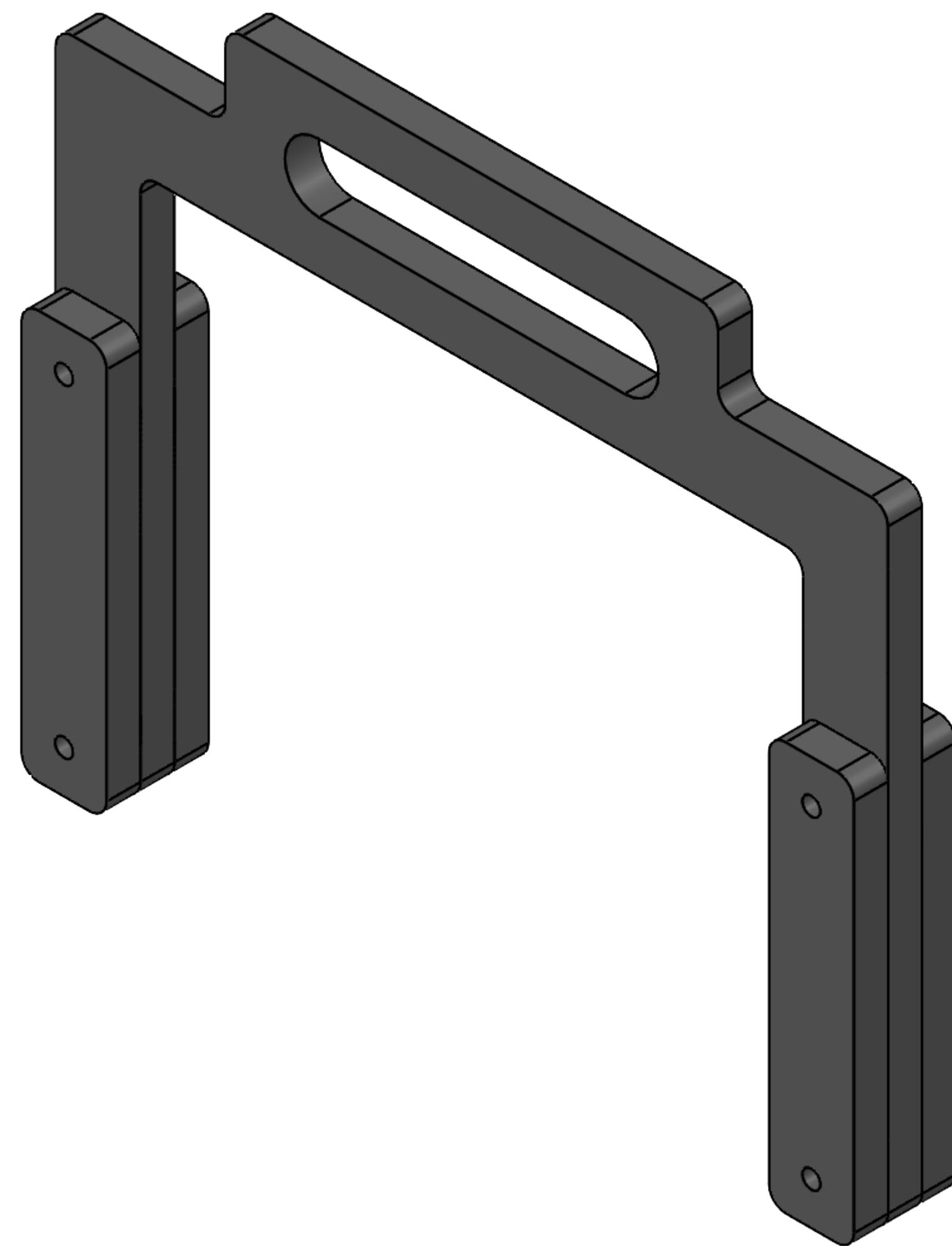
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-23703	CMJ Middle	1
2	GE-23704	CMJ Side	4
3	hex_.25_20_1.75_parti al	Steel Hex Head Screw, 1/4"-20 x 1.75" long, partially threaded	4
4	nylock_.25_20	Steel Nylon-Insert Locknut, 1/4"-20	4

UNLESS OTHERWISE SPECIFIED:

FIELD NAME DATE

DRAWN NE 12/30/2022

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PROHIBITED.

MATERIAL/FINISH:

DO NOT SCALE DRAWING

TITLE:

Cube Measuring Jig

SIZE DWG. NO. REV

C GE-23702

SCALE: 4:5 SHEET 1 OF 2

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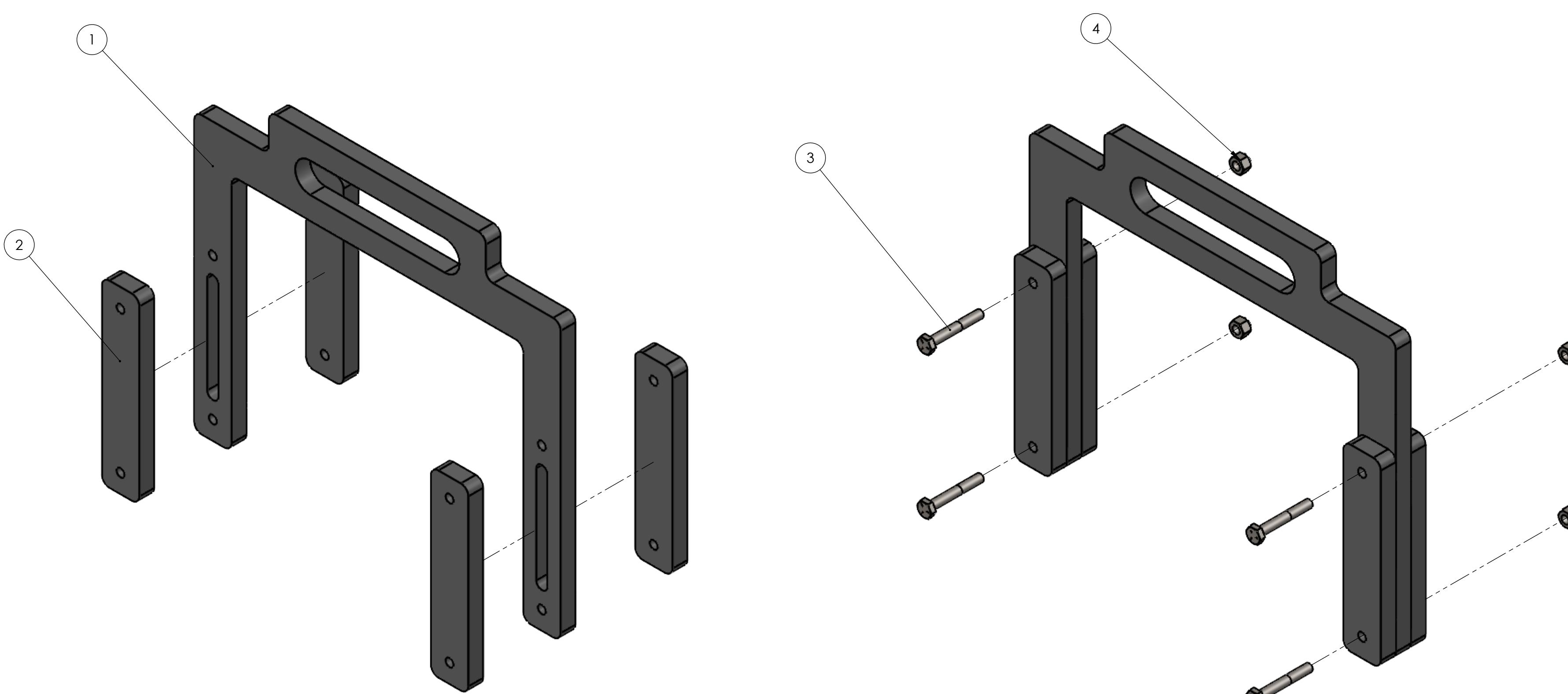
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NOTE: TARGET MASS FOR THE CUBE MEASURING JIG IS 20 OUNCES.
ADD WASHERS/REMOVING MATERIAL TO ACHIEVE TARGET MASS WILL
PRODUCE CUBES THAT ARE MOST SIMILAR TO MATCH CONDITIONS

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	NE	12/30/2022
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:
**Cube
Measuring Jig**

SIZE DWG. NO. REV
C GE-23702

SCALE: 1:2 SHEET 2 OF 2

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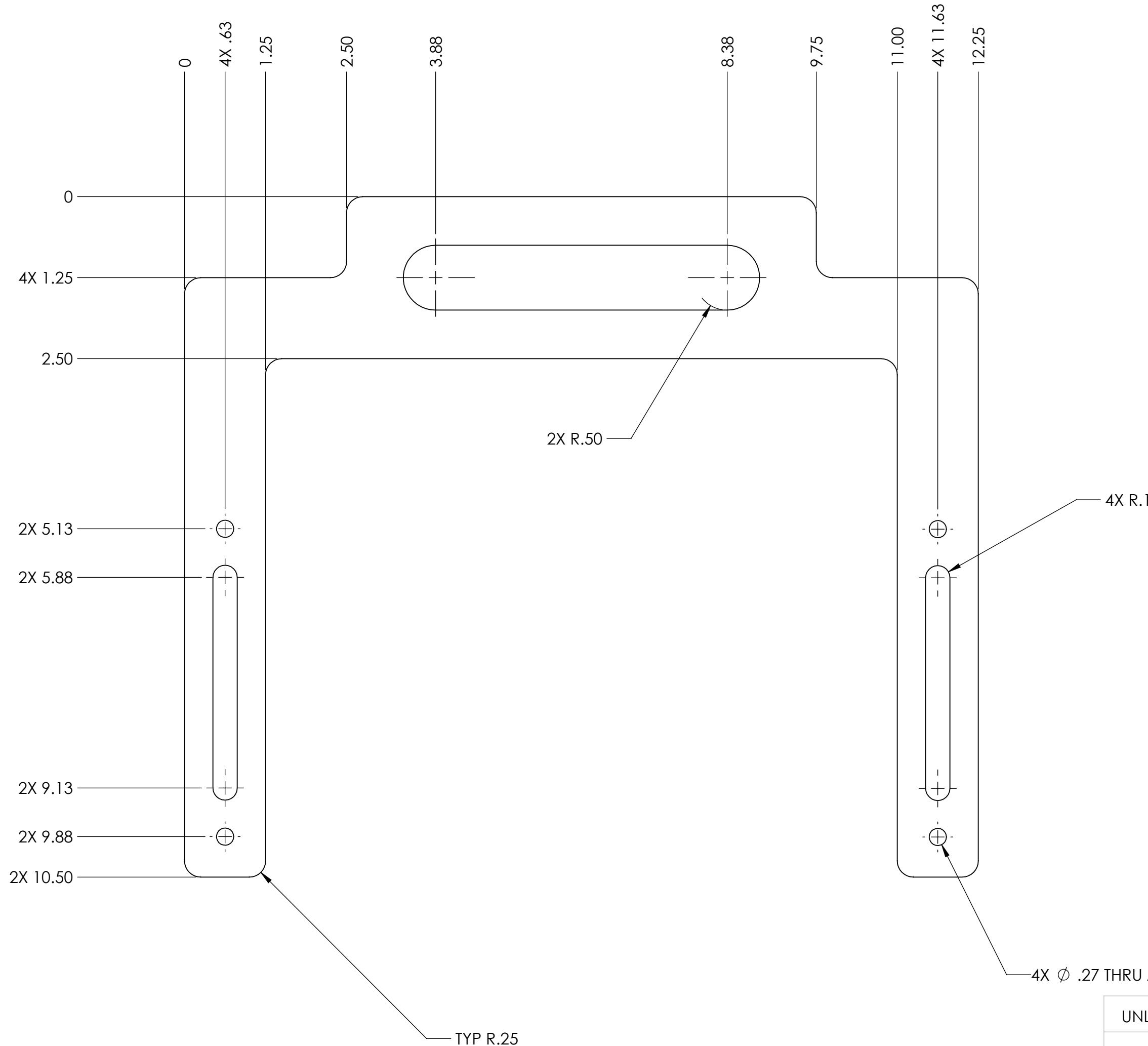
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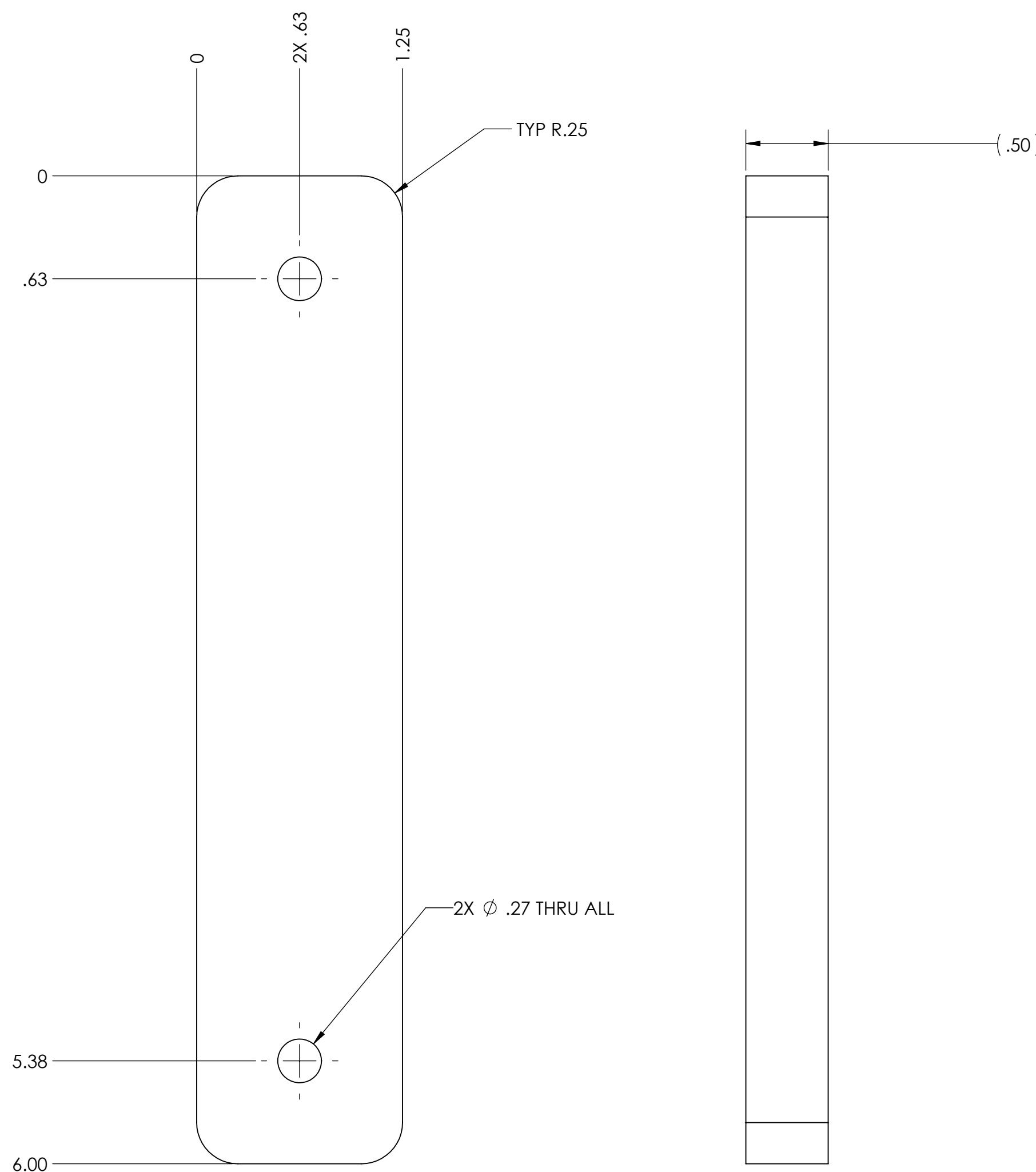
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UNLESS OTHERWISE SPECIFIED:	FIELD	NAME	DATE	 FIRST ROBOTICS COMPETITION
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/2$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .50$	DRAWN	NE	12/30/2022	
PROPRIETARY AND CONFIDENTIAL				
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MATERIAL/FINISH:	1/2" HDPE			
COMMENTS:	REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING				

TITLE:	CMJ Side	
SIZE	DWG. NO.	REV
C	GE-23704	
SCALE: 3:2	SHEET 1 OF 1	