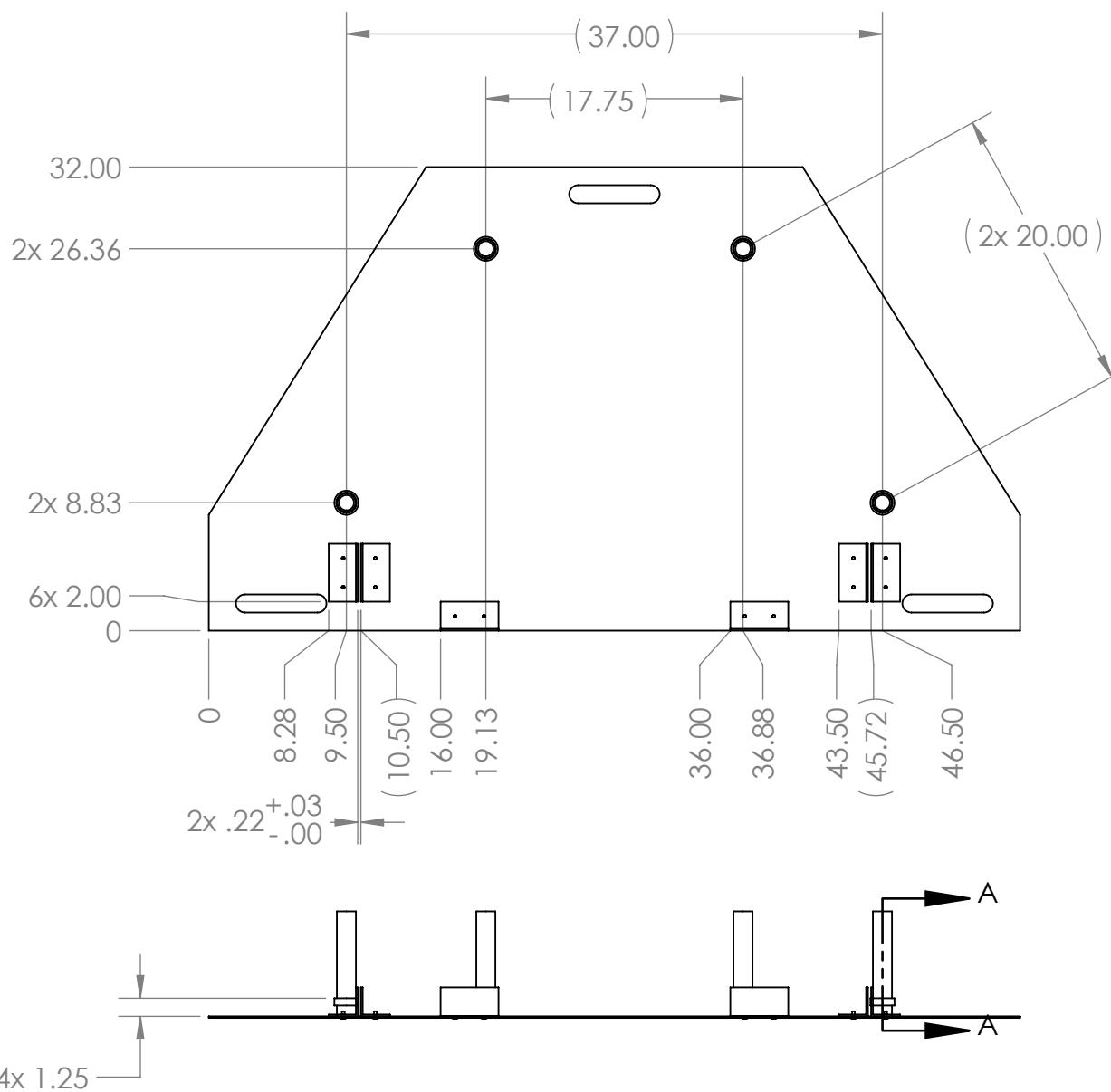


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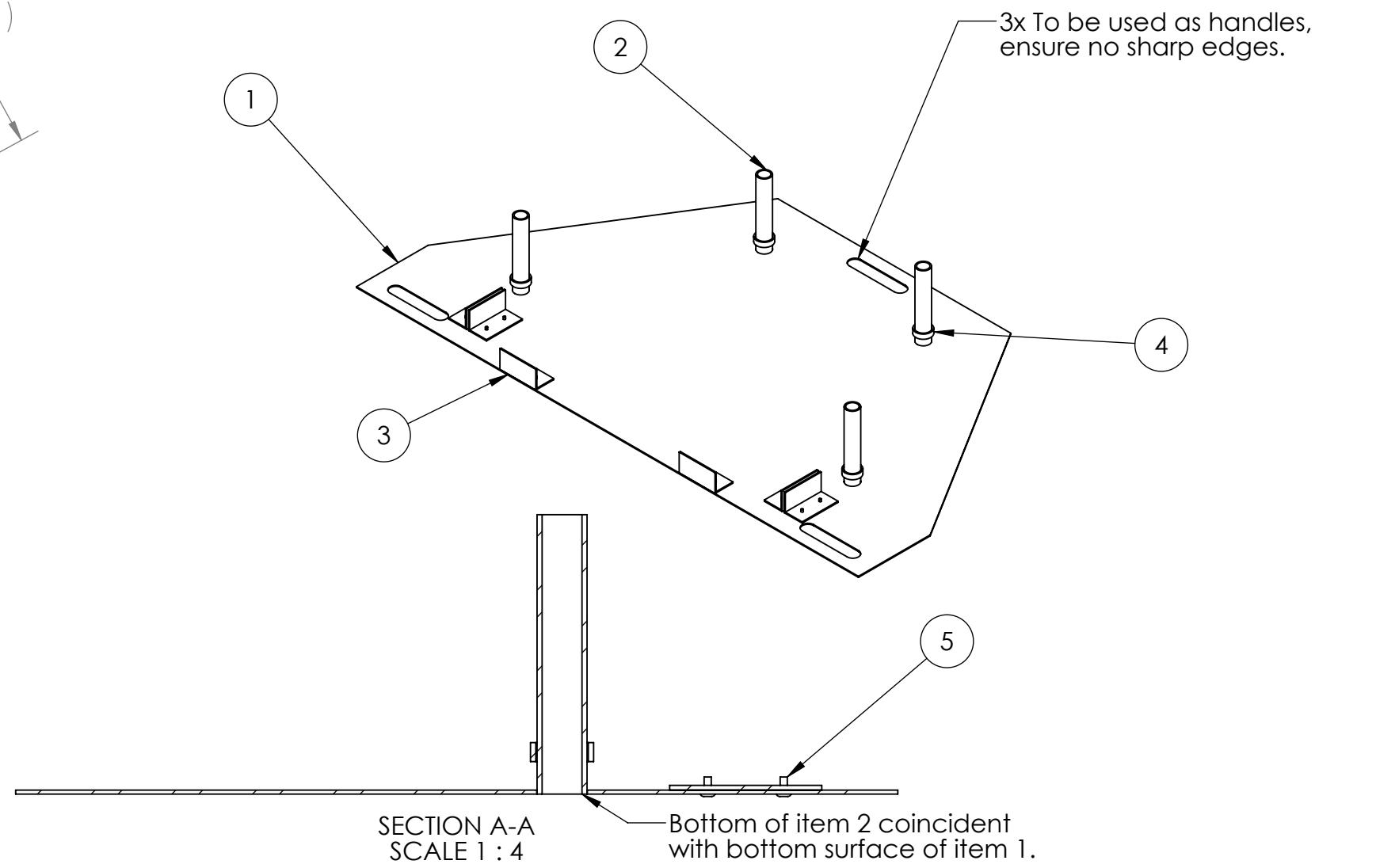
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-19015-01	12 gauge A-366/1008 Cold Roll Steel	1
2	GE-19015-02	1" Schedule 40 A500 Steel	4
3	GE-19015-03	2" x 2" x .125" thk. A-36 Steel Angle	6
4	GE-19015-04	1.25" Schedule 40 A500 Steel	4
5	rivet_.1875_.126-.25	3/16" Rivet, .126-.25 Grip Range	12

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REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A	Initial Release	9/24/2018	CPO
A4, 2-A4, 2-B1, 3-A3, 3-B4	B	Changes made to rivet GE-19015-03 instead of welding. Material painting specified. Weld for GE-19015-04 changed.	12/11/2018	CPO



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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Rocket Base

SIZE DWG. NO. REV
B GE-19015 **B**

SCALE: 1:12 WEIGHT: SHEET 1 OF 3

4

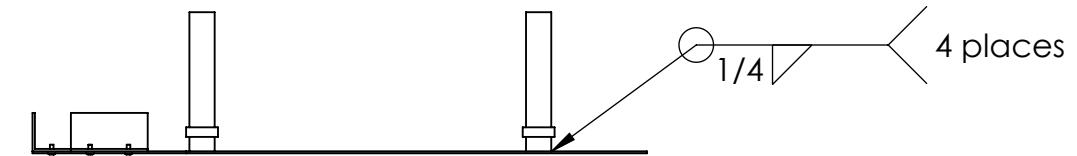
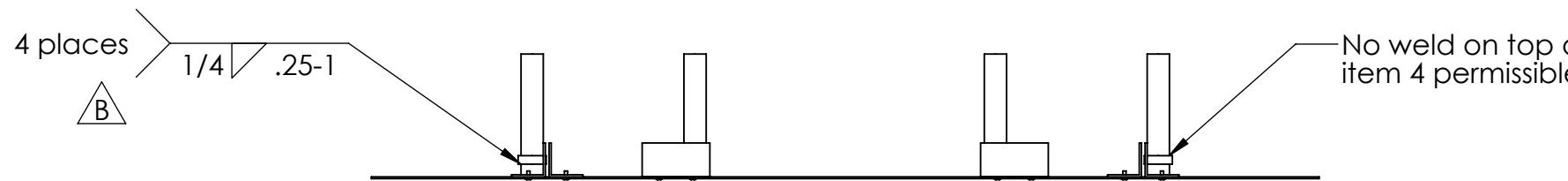
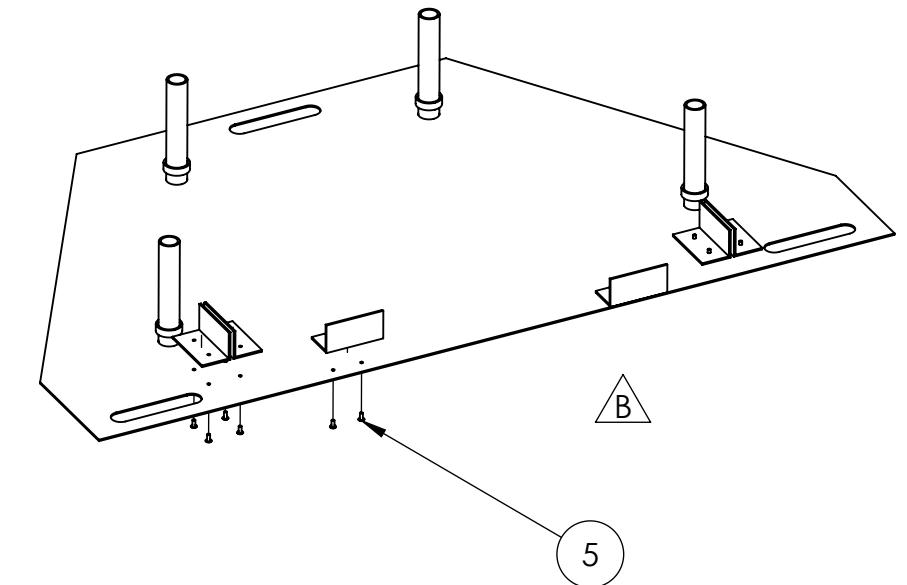
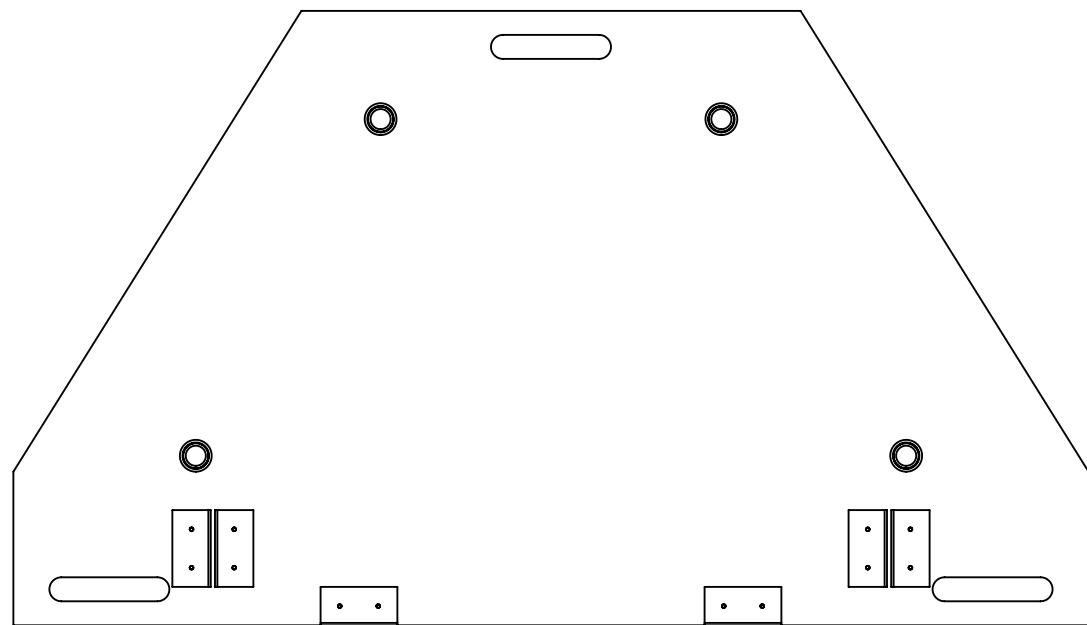
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B



A

A

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

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
Rocket Base

SIZE DWG. NO. REV
B **GE-19015** **B**
SCALE: 1:10 WEIGHT: SHEET 2 OF 3

4

3

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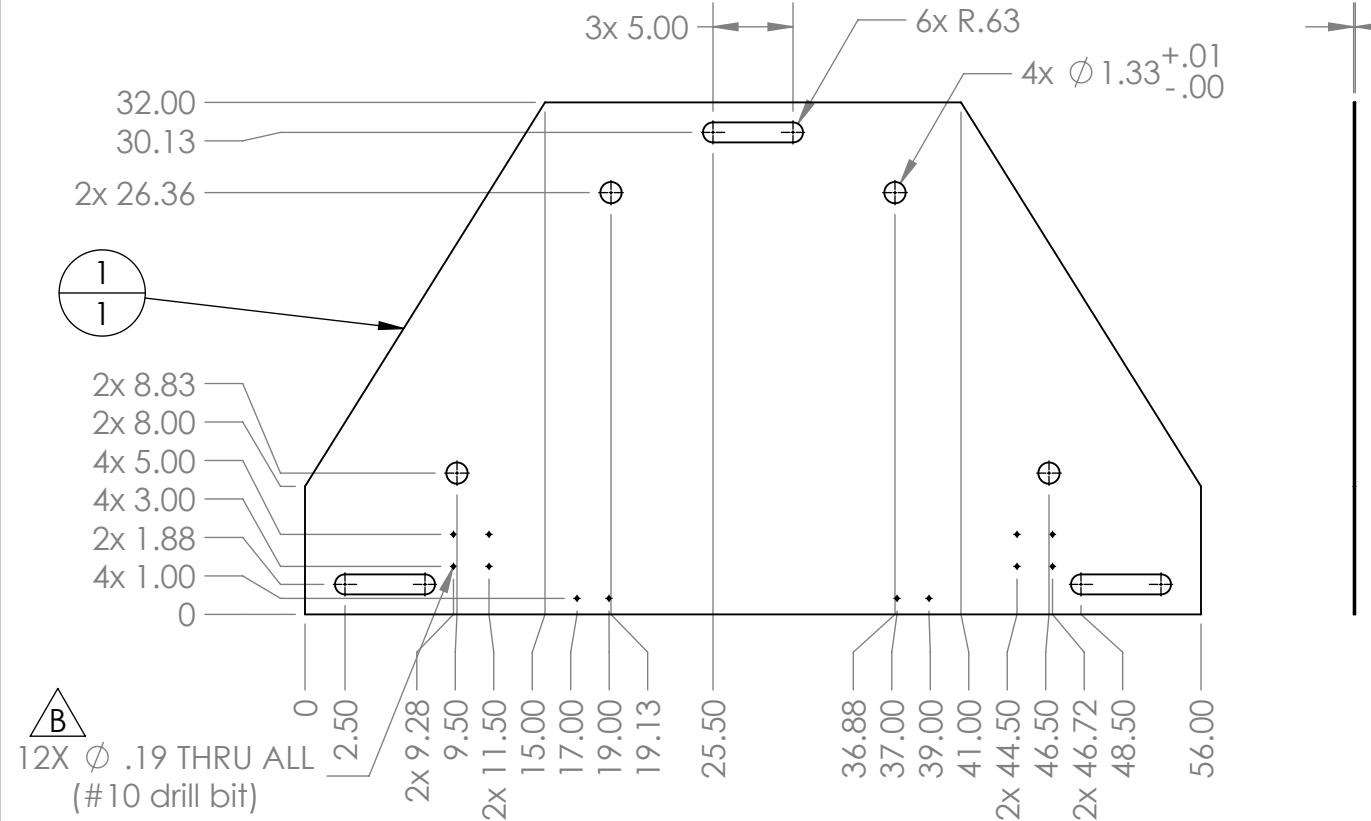
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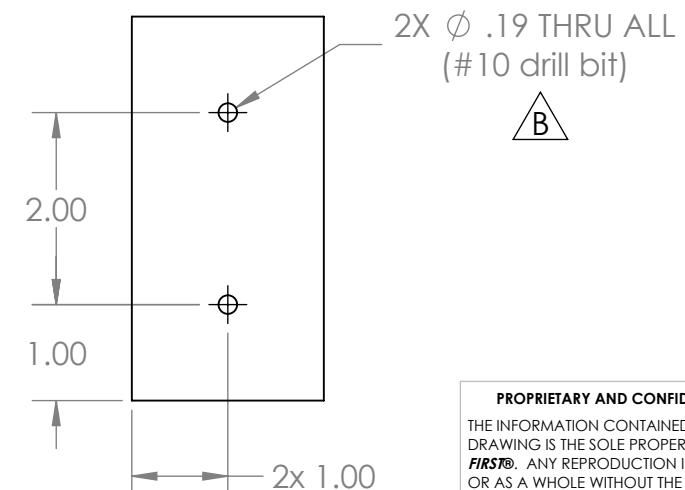
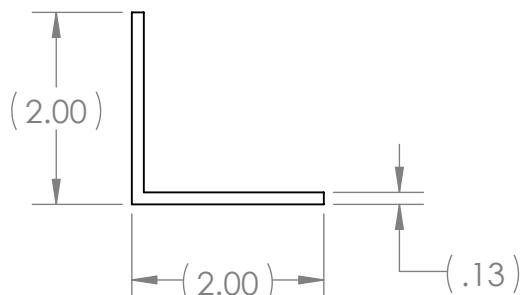
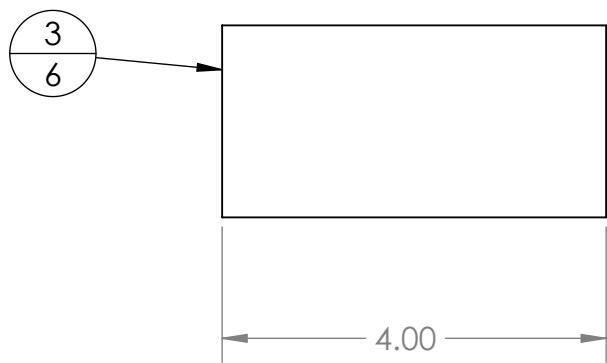
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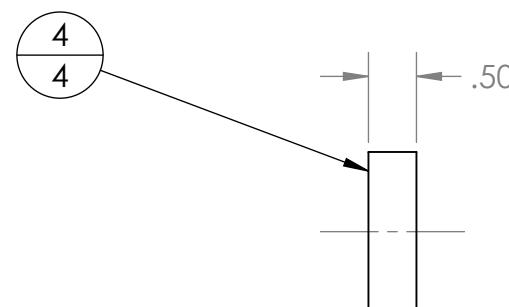
B



Material: 1" Schedule 40 A500 Steel
Scale: 1:2



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Material: 1.25" Schedule 40 A500 Steel
Scale: 1:2

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Rocket Base

SIZE **DWG. NO.** **REV**
B **GE-19015** **B**

WEIGHT: **SHEET 3 OF 3**

4

3

2

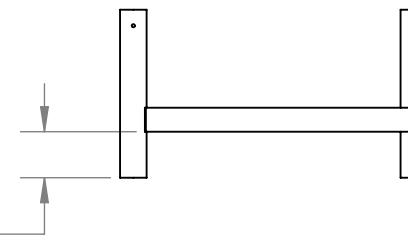
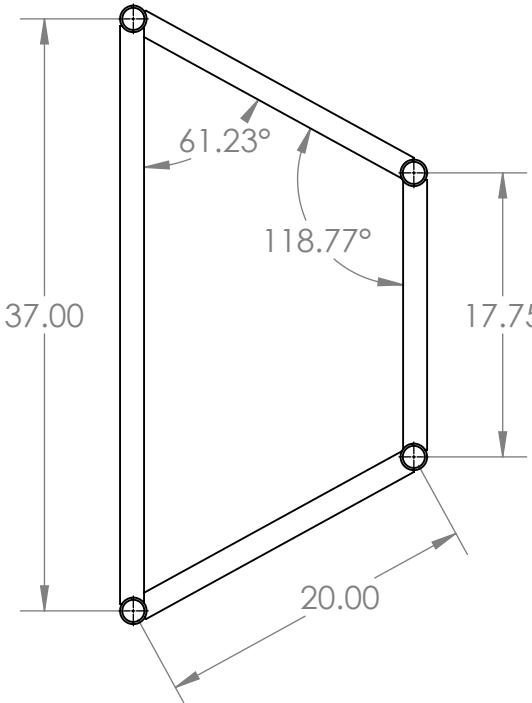
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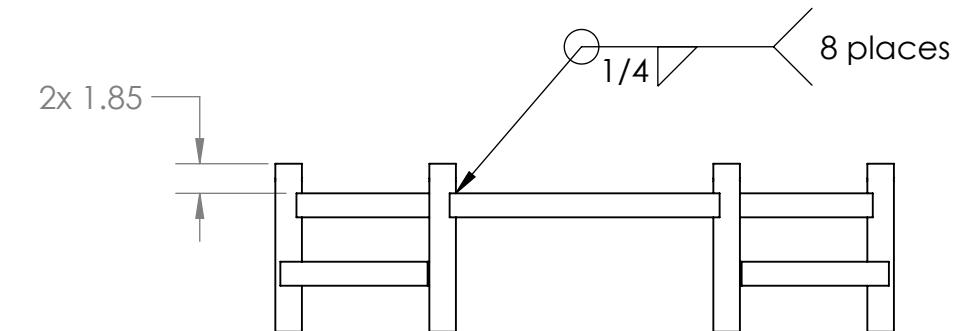
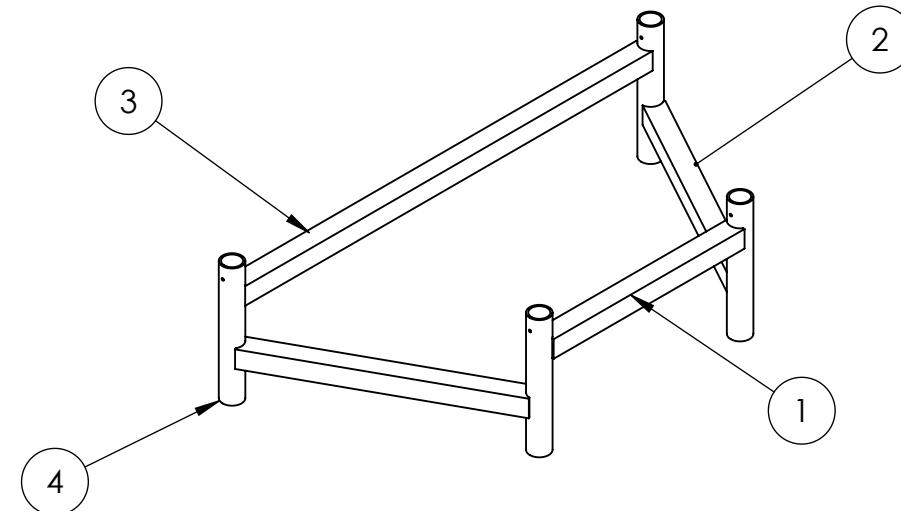
3

2

1



No weld penetration on inside of round tubes.



Notes:

1. Tag or label with part number.
2. Remove burrs and sharp edges.

ITEM NO.	PART NUMBER	DESCRIPTION	Default/ QTY.
1	GE-19016-01	1.5" x .125" thk. Square Tube, 6063 Aluminum	1
2	GE-19016-02	1.5" x .125" thk. Square Tube, 6063 Aluminum	2
3	GE-19016-03	1.5" x .125" thk. Square Tube, 6063 Aluminum	1
4	GE-19016-04	1.25" Schedule 40 Pipe, 6061 Aluminum	4

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		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL: ±1/16 ANGULAR: MACH ±1° BEND ±1° TWO PLACE DECIMAL: ±.01 THREE PLACE DECIMAL: ±.001	NAME	DATE
		DRAWN		
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
		MATERIAL		
		FINISH		
		APPLICATION	DO NOT SCALE DRAWING	
SIZE	DWG. NO.	REV		
B	GE-19016			
SCALE: 1:12	WEIGHT:	SHEET 1 OF 2		

 FIRST
ROBOTICS
COMPETITION  SOLIDWORKS
Modeling Solutions Partner

TITLE:
**Rocket Frame
Slice**

4

3

2

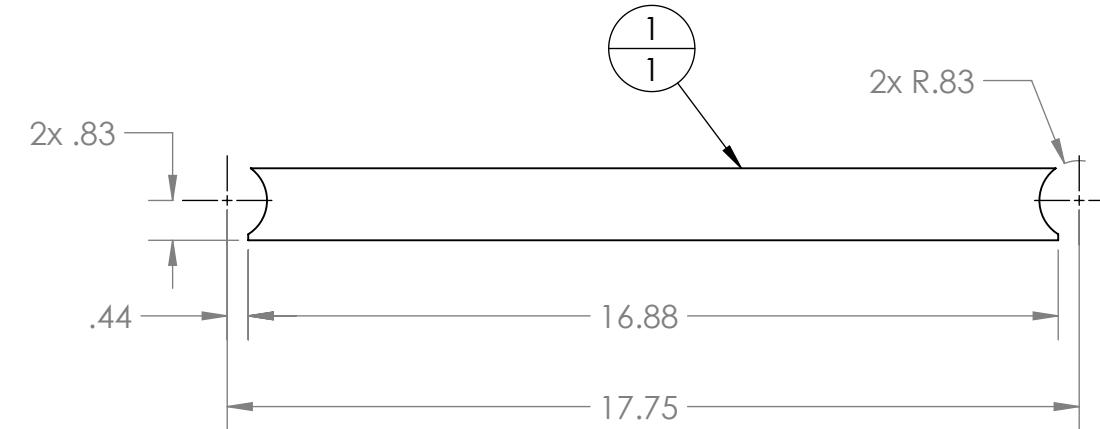
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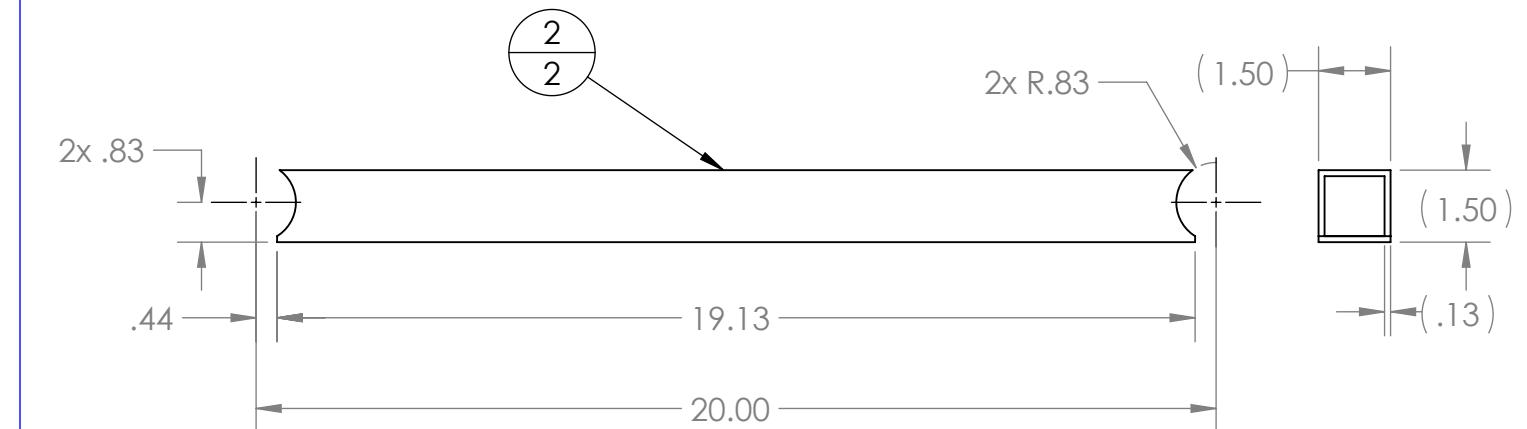
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2

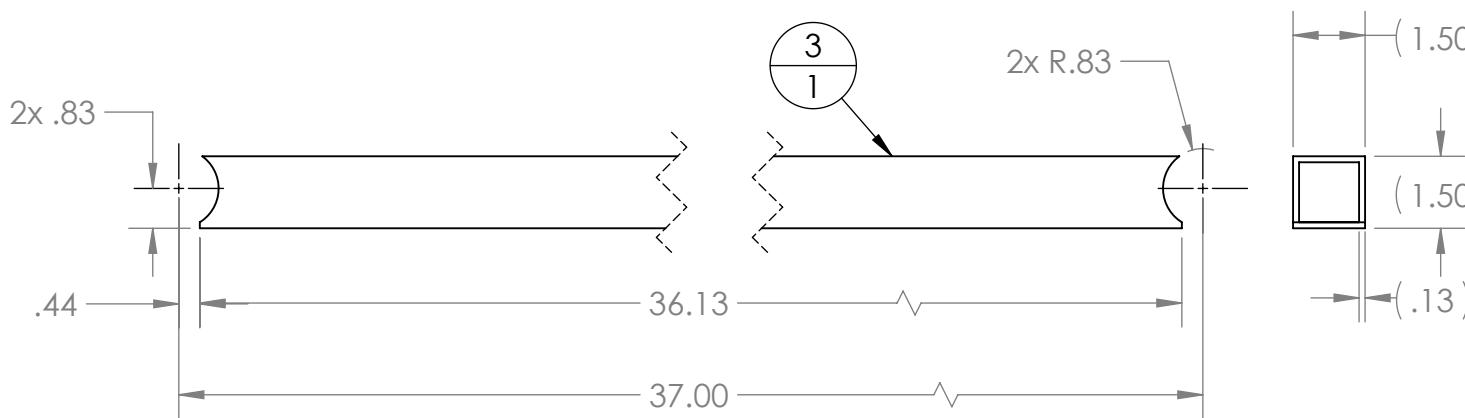
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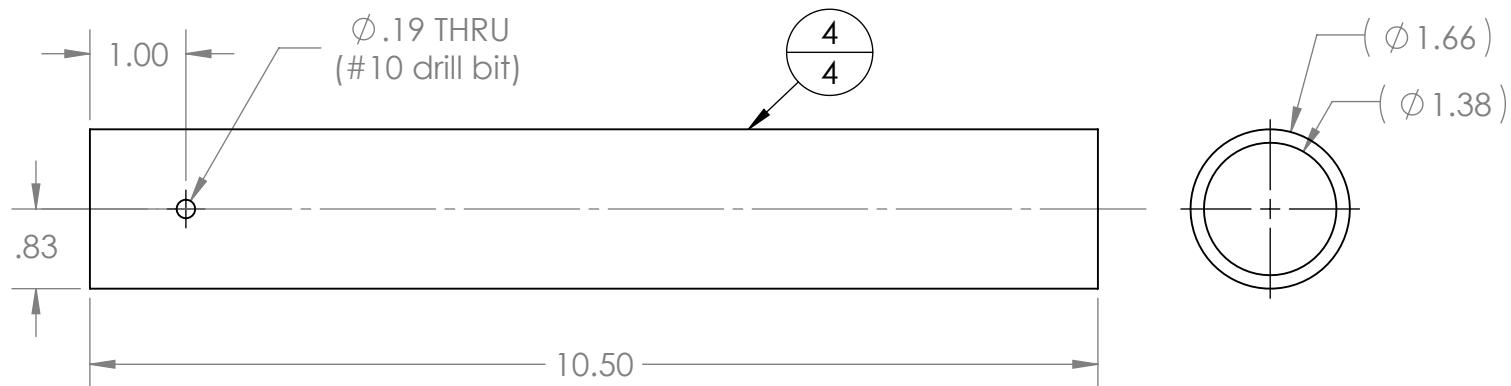
Material: 1.5" x .125" thk. Square Tube, 6063 Aluminum
Scale: 1:4



Material: 1.5" x .125" thk. Square Tube, 6063 Aluminum
Scale: 1:4



Material: 1.5" x .125" thk. Square Tube, 6063 Aluminum
Scale: 1:4



Material: 1.25" Schedule 40 Pipe, 6061 Aluminum
Scale: 1:2

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		UNLESS OTHERWISE SPECIFIED:	NAME	DATE
DIMENSIONS ARE IN INCHES				
TOLERANCES:				
FRACTIONAL: ±1/16				
ANGULAR: MACH ±1° BEND ±1°				
TWO PLACE DECIMAL: ±.01				
THREE PLACE DECIMAL: ±.001				
INTERPRET GEOMETRIC TOLERANCING PER:				
MATERIAL				
NEXT ASSY	USED ON	FINISH		
APPLICATION		DO NOT SCALE DRAWING		
SCALE: 1:4		WEIGHT:	SHEET 2 OF 2	

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:

Rocket Frame
Slice

SIZE DWG. NO. REV
B GE-19016

SCALE: 1:4 WEIGHT: SHEET 2 OF 2

4

3

2

1

4

3

2

1

B

B



Notes:

1. Material: 1.25" Schedule 40 Pipe, 6061 Aluminum
2. Remove all burrs and sharp edges
3. Tag or label with part number.

A

A

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE:
Rocket Support Tube

SIZE	DWG. NO.	REV
B	GE-19017	
SCALE: 1:2	WEIGHT:	SHEET 1 OF 1

4

3

2

1

4

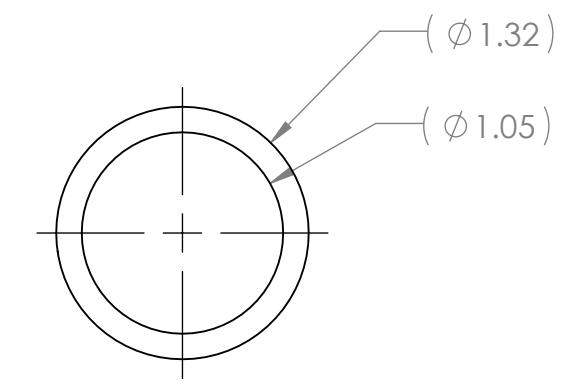
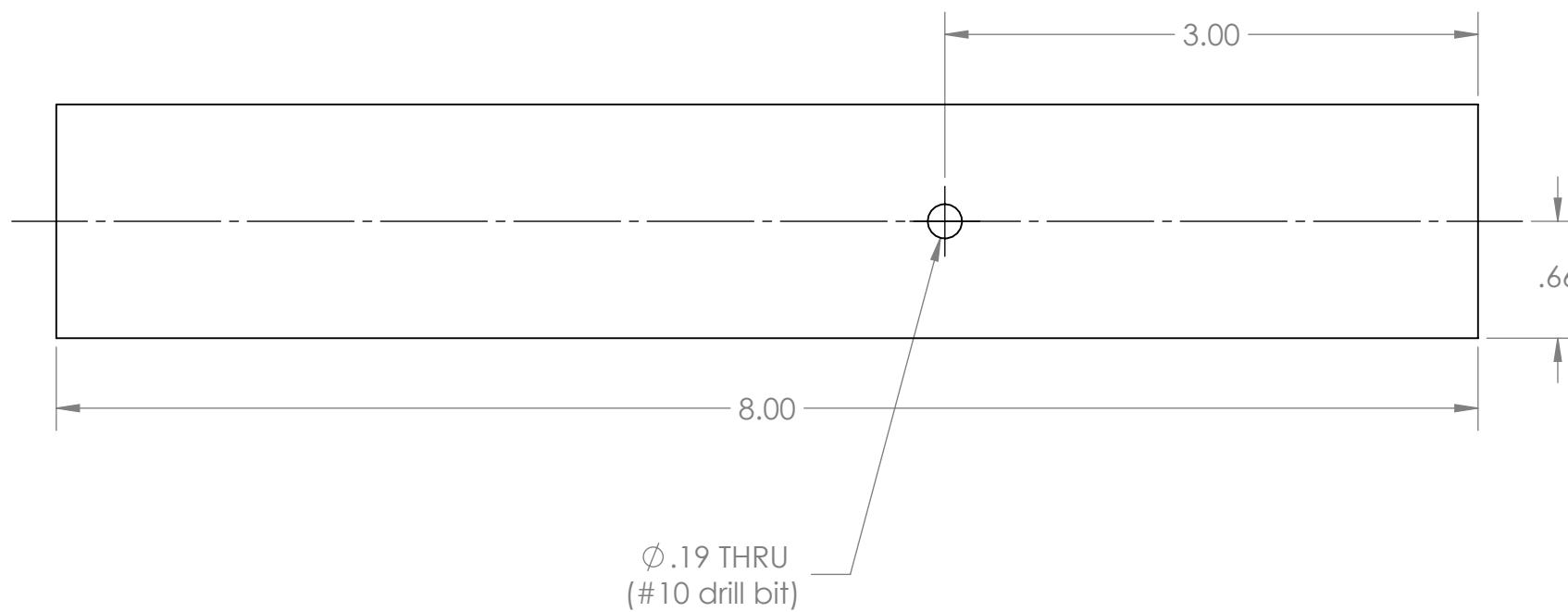
3

2

1

B

B



Notes:

1. Material: 1" Schedule 40 Pipe, 6061 Aluminum.
2. Remove all burrs and sharp edges.
3. Tag or label with part number.

A

A

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		DRAWN		
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
		MATERIAL		
		NEXT ASSY	USED ON	FINISH
		APPLICATION		DO NOT SCALE DRAWING
B	GE-19018			
SCALE: 1:1	WEIGHT:		SHEET 1 OF 1	

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner
TITLE: Rocket Insert Tube
SIZE DWG. NO. REV
B GE-19018
SCALE: 1:1 WEIGHT: SHEET 1 OF 1

4

3

2

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4

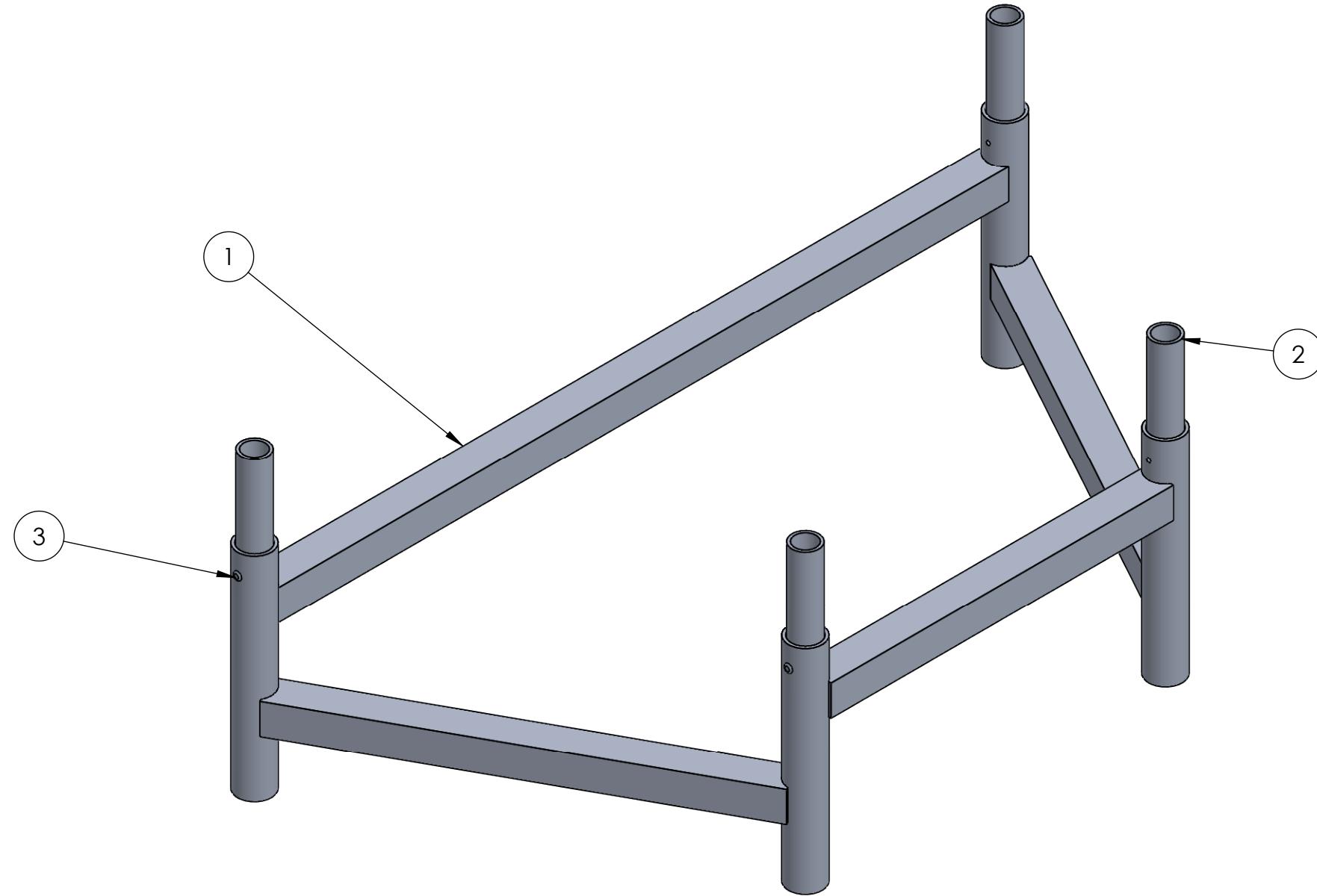
3

2

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B

B



A

A

ITEM NO.	PART NUMBER	DESCRIPTION	Default/ QTY.
1	GE-19016	Rocket Frame Slice	1
2	GE-19018	Rocket Insert Tube	4
3	rivet_.1875_.251-.375	3/16" Aluminum Rivet, .251-.375 Grip Range	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 $\pm .001$		NAME	DATE
		DRAWN			
		CHECKED			
		ENG APPR.			
		MFG APPR.			
		Q.A.			
		COMMENTS:			
		MATERIAL			
		INTERPRET GEOMETRIC TOLERANCING PER:			
		NEXT ASSY	USED ON	FINISH	
		APPLICATION		DO NOT SCALE DRAWING	

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Rocket Frame Slice Assembly

SIZE DWG. NO. REV
B GE-19019

SCALE: 1:5 WEIGHT: SHEET 1 OF 2

4

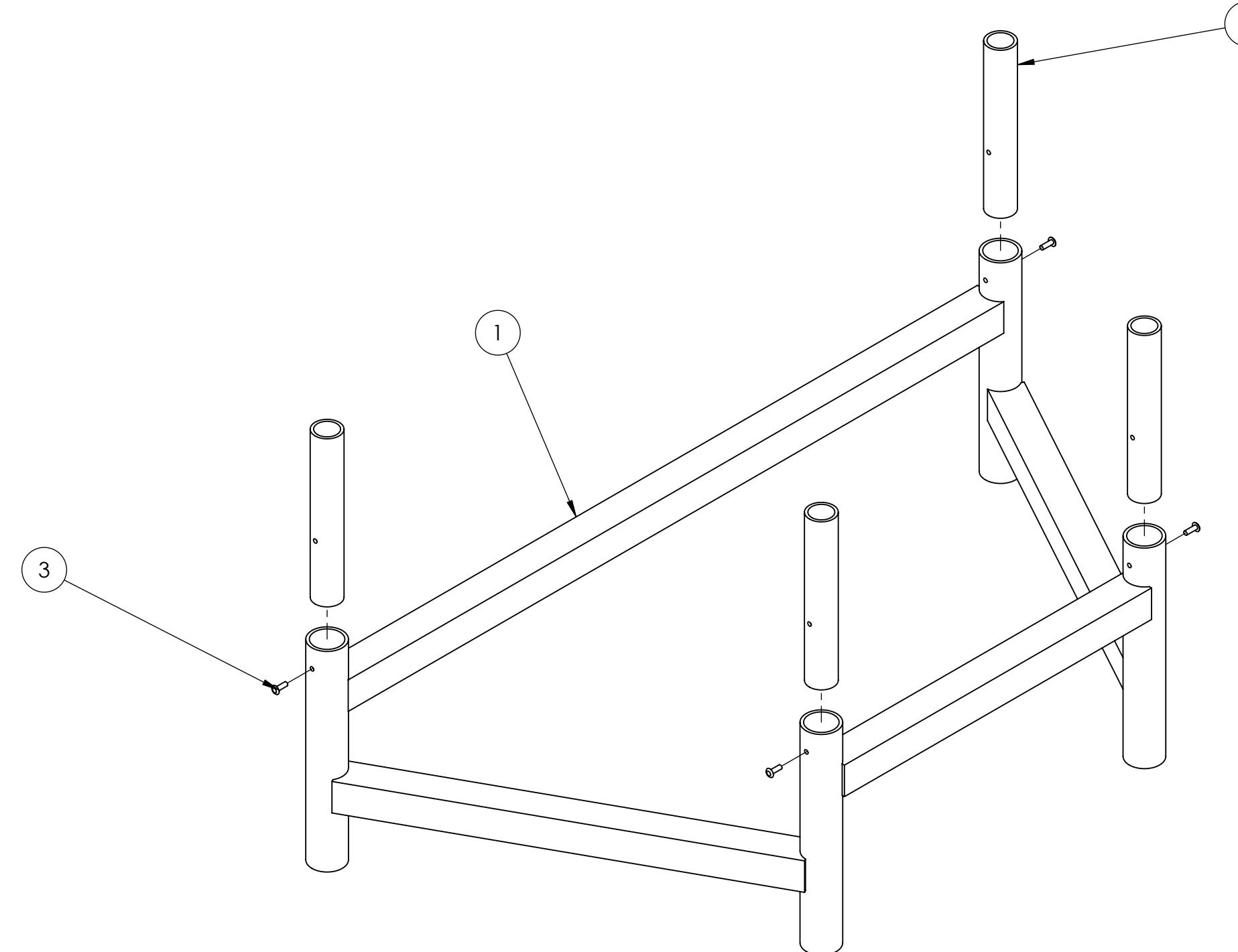
3

2

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B

B



Notes:

- Fasten Item 2 (qty: 4) to Item 1, using item 3 (qty: 4).

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Rocket Frame Slice Assembly

SIZE	DWG. NO.	REV
B	GE-19019	
SCALE: 1:5	WEIGHT:	SHEET 2 OF 2

4

3

2

1

4

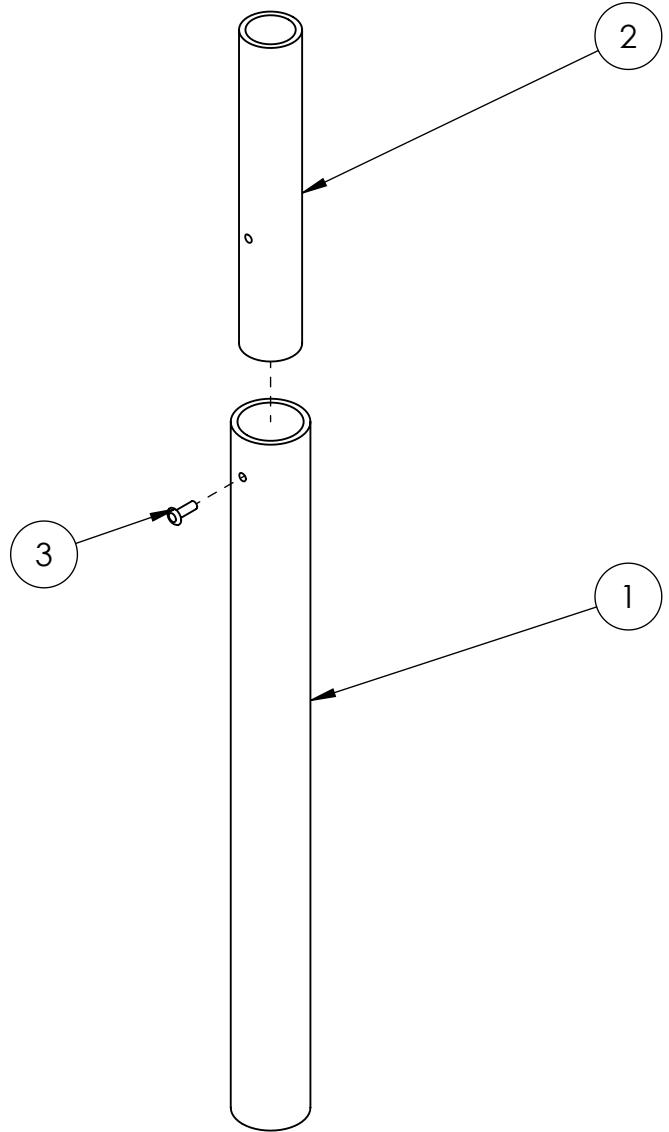
3

2

1

B

B



Notes:

- Fasten Item 2 to Item 1, using Item 3.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-19017	Rocket Support Tube	1
2	GE-19018	Rocket Insert Tube	1
3	rivet_.1875_.251-.375	3/16" Aluminum Rivet, .251-.375 Grip Range	1

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Rocket Support Tube Assembly

SIZE	DWG. NO.	REV
B	GE-19024	
SCALE: 1:4	WEIGHT:	SHEET 1 OF 1

4

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4

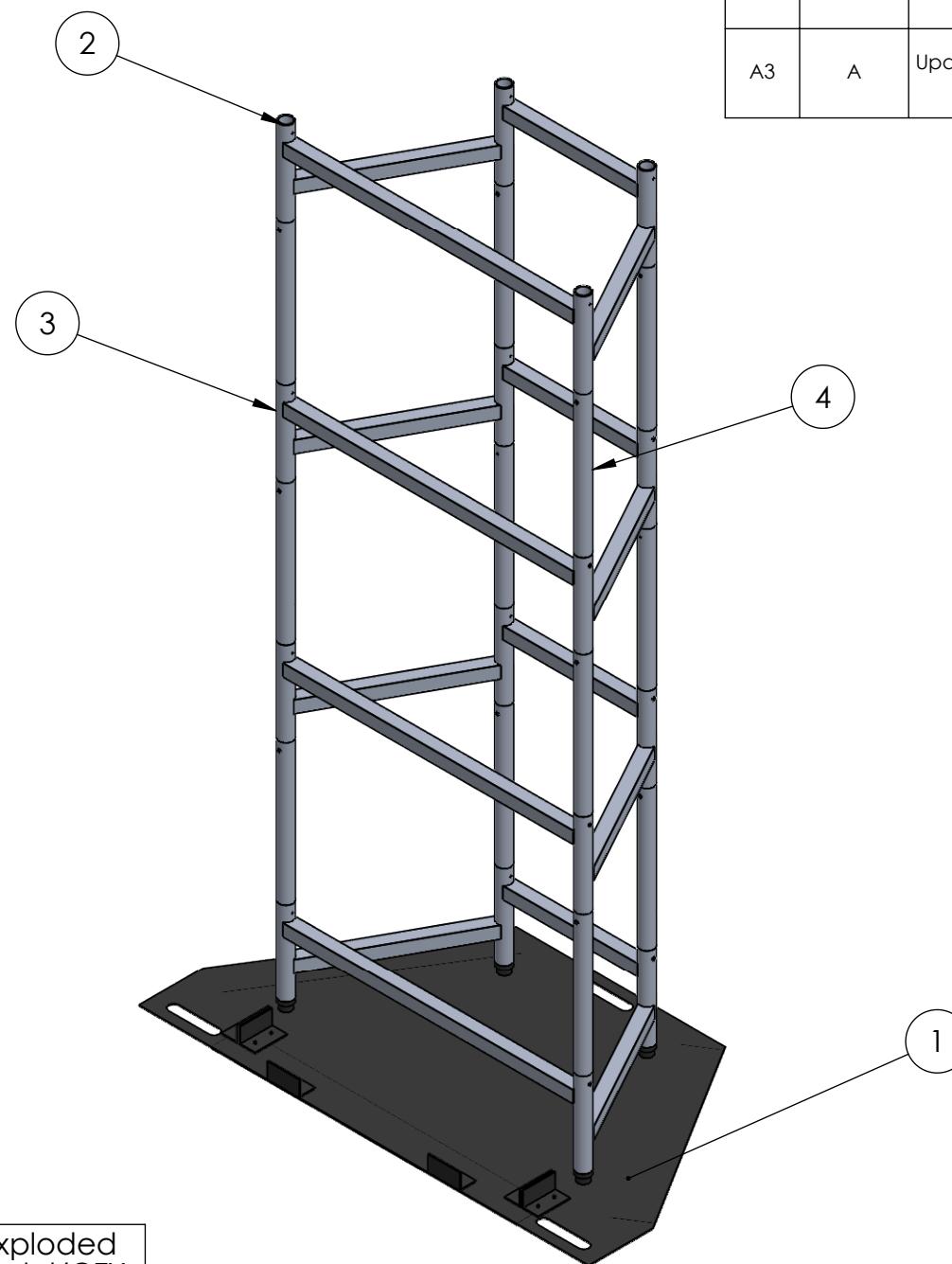
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2

1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
A3	A	Updated assembly to use GE-19016 at otp of assembly instead of GE-19019.	12/26/2018	CPO



ITEM NO.	PART NUMBER	DESCRIPTION	Exploded Model/QTY.
1	GE-19015	Rocket Base	1
2	GE-19016	Rocket Frame Slice	1
3	GE-19019	Rocket Frame Slice Assembly	3
4	GE-19024	Rocket Support Tube Assembly	12
5	Hook_4_27	4" x 27" Hook, Adhesive Backed	2
6	Hook_4_38	4" x 38" Hook, Adhesive Backed	1

A

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Rocket Frame Assembly

B **GE-19025** **A**

SIZE DWG. NO. REV.
SCALE: 1:16 WEIGHT: SHEET 1 OF 2

4

3

2

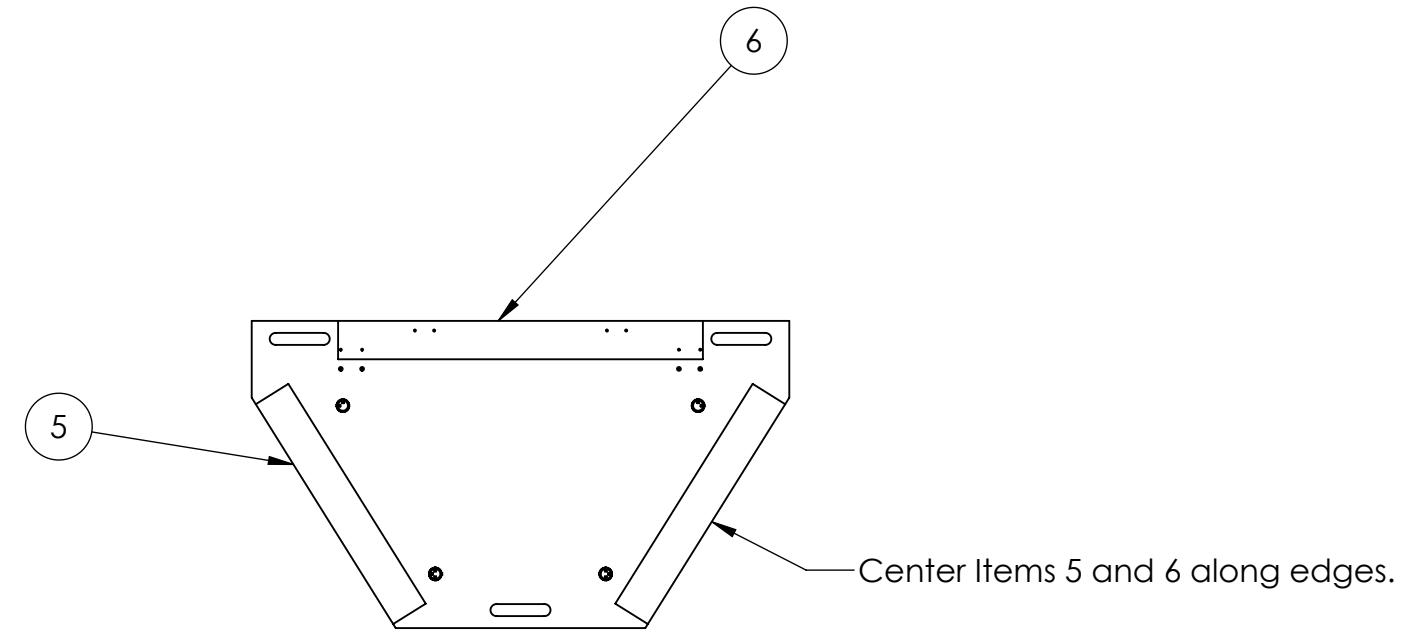
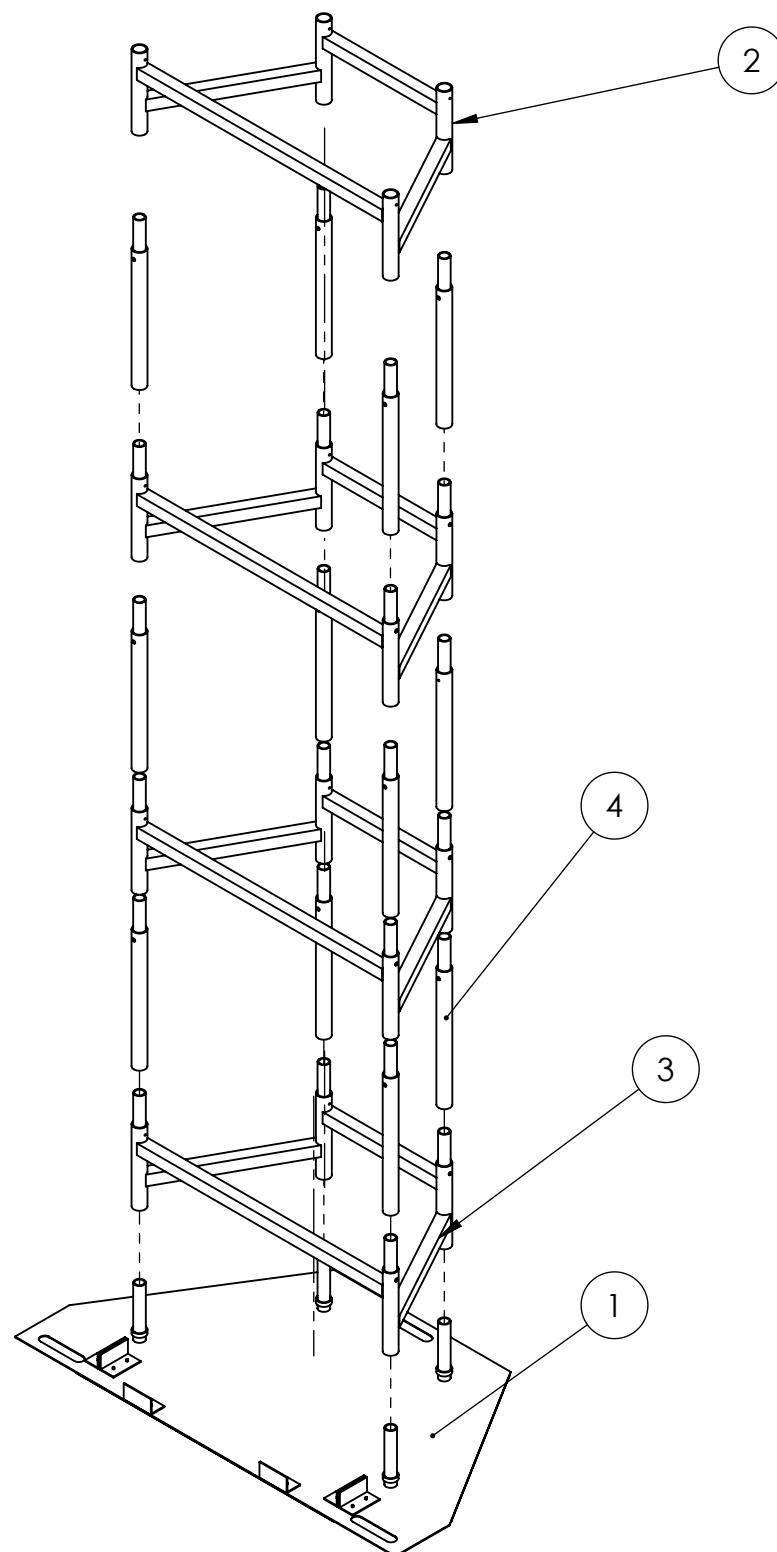
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		UNLESS OTHERWISE SPECIFIED:	NAME	DATE
DIMENSIONS ARE IN INCHES				
TOLERANCES:				
FRACTIONAL: $\pm\frac{1}{16}$				
ANGULAR: MACH $\pm 1^\circ$				
BEND $\pm 1^\circ$				
TWO PLACE DECIMAL $\pm .01$				
THREE PLACE DECIMAL $\pm .001$				
INTERPRET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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Rocket Frame Assembly

SIZE	DWG. NO.	REV
B	GE-19025	A
SCALE: 1:20	WEIGHT:	SHEET 2 OF 2

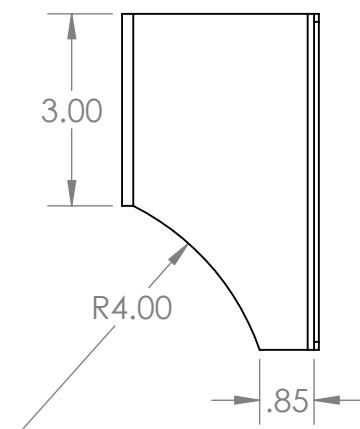
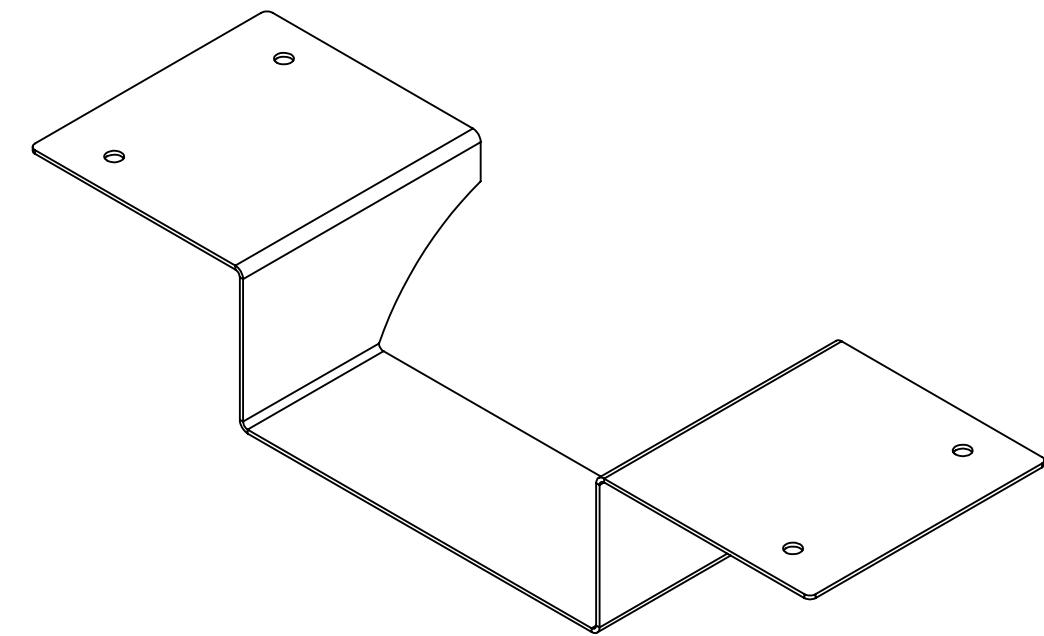
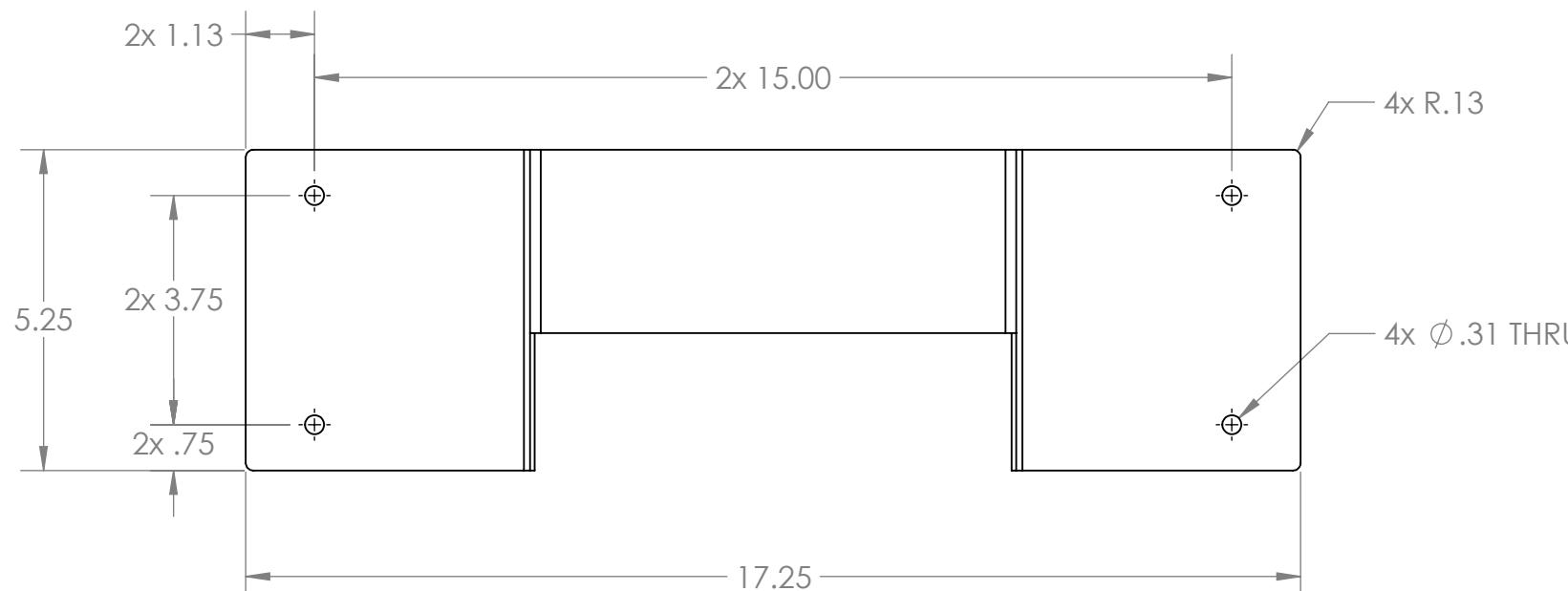
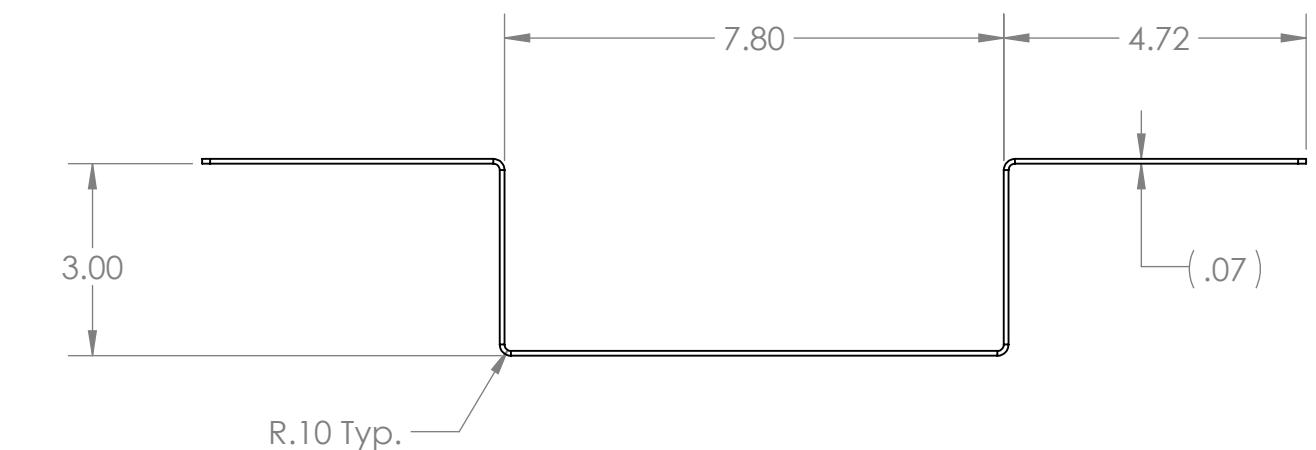
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3

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B



A

Notes:

1. Material: 14 gauge A-366/1008 Pre-Plated Steel.
2. Remove all burrs and sharp edges.
3. Tag or label with part number.

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Keyhole Insert

SIZE	DWG. NO.	REV
B	GE-19026	A
SCALE: 1:3	WEIGHT:	SHEET 1 OF 1

4

3

2

1

4

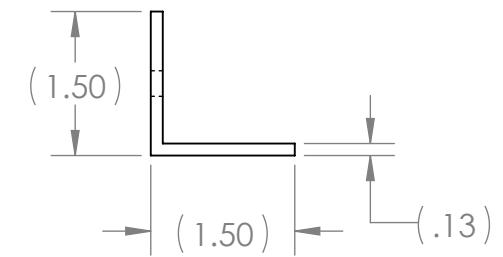
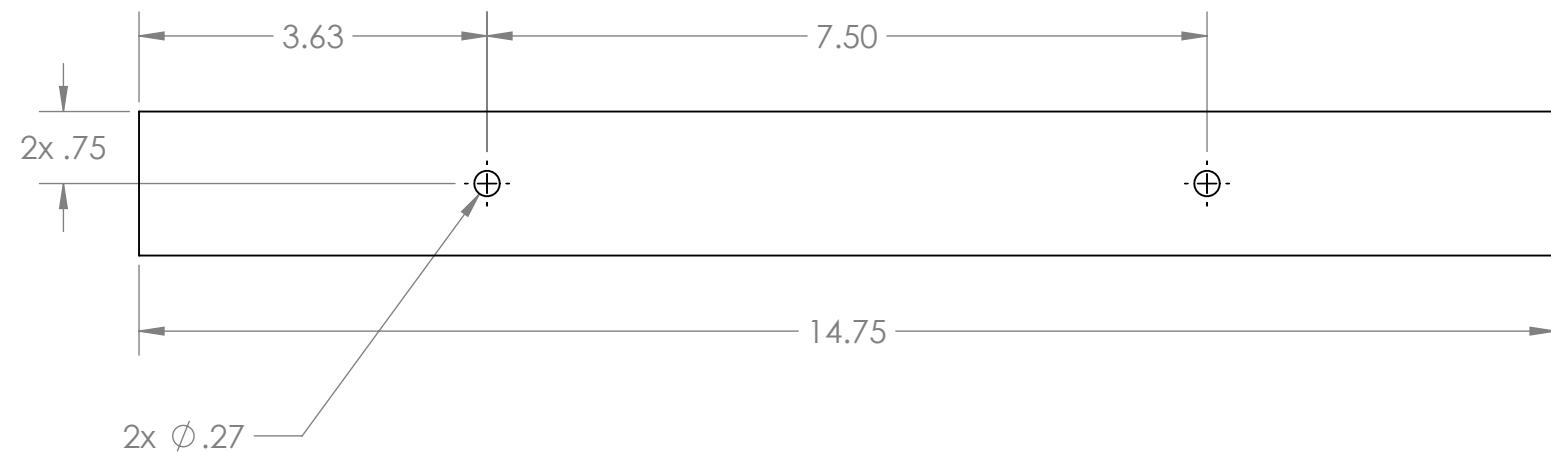
3

2

1

B

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Notes:

1. Material: 1.5" x 1.5" x .125" thk. Angle, 6061 Aluminum.
2. Remove all burrs and sharp edges.
3. Tag or label with part number.

4

3

2

1

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner
TITLE: Rocket Ramp Support Back
SIZE DWG. NO. REV
B GE-19028
SCALE: 1:2 WEIGHT: SHEET 1 OF 1

4

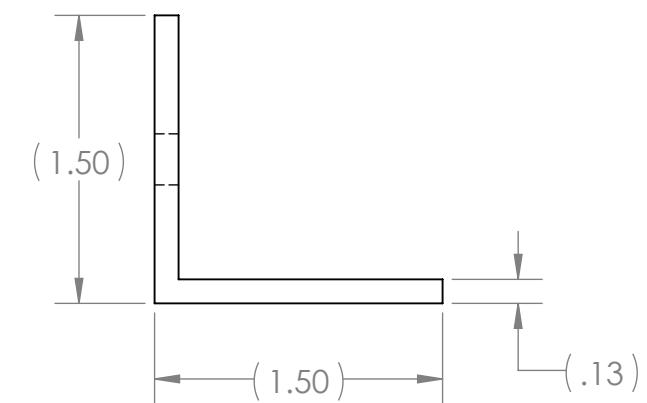
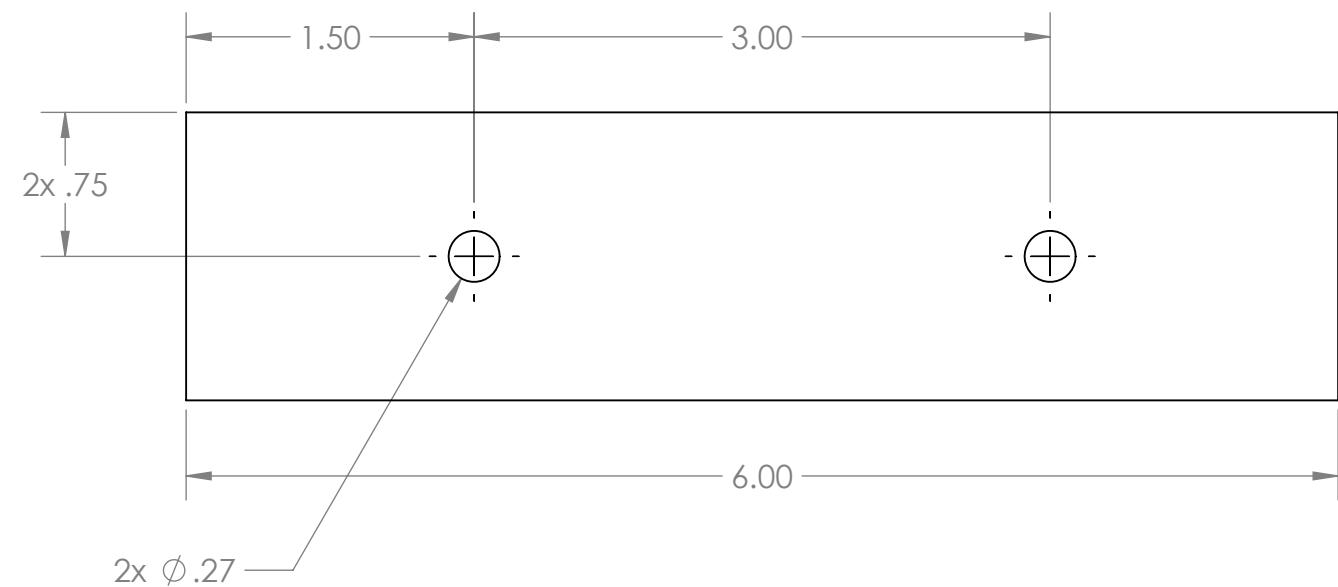
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2

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B

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**Notes:**

1. Material: 1.5" x 1.5" x .125" thk. Angle, 6061 Aluminum.
2. Remove all burrs and sharp edges.
3. Tag or label with part number.

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Rocket Ramp Support Front

B	GE-19029	
SIZE	DWG. NO.	REV
SCALE: 1:1	WEIGHT:	SHEET 1 OF 1

4

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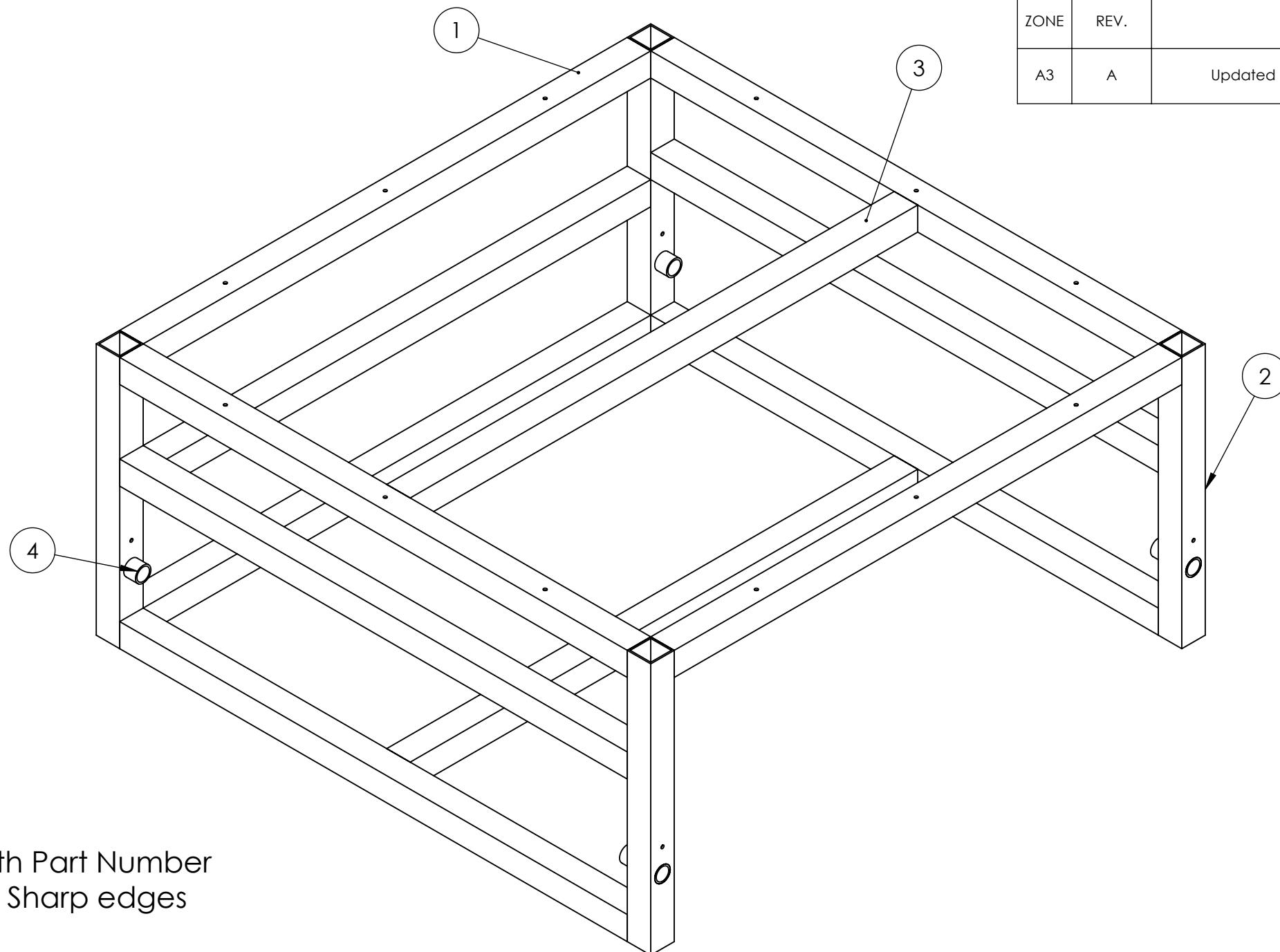
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1



Notes:
Tag or Label With Part Number
Remove Burrs & Sharp edges

A

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-19030-01	2"x.125" Thick 6061 Aluminum Square Tube	4
2	GE-19030-02	2"x.125" Thick 6061 Aluminum Square Tube	4
3	GE-19030-03	2"x .125" Thick 6061 Aluminum Square Tube	8
4	GE-19030-04	1" Schedule 40 Pipe 6061 Aluminum	4

A

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
 Modeling Solutions Partner

HAB Level 3 Frame

SIZE **B** DWG. NO. **GE-19030** REV. **A**
 SCALE: 1:8 WEIGHT: SHEET 1 OF 6

4

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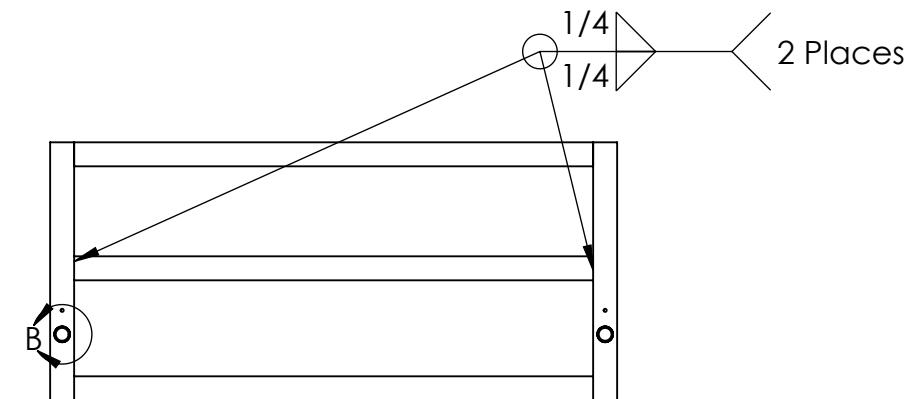
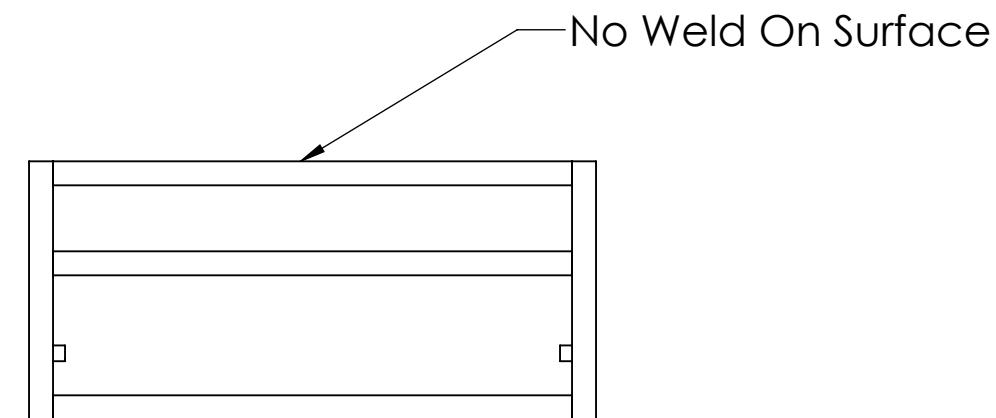
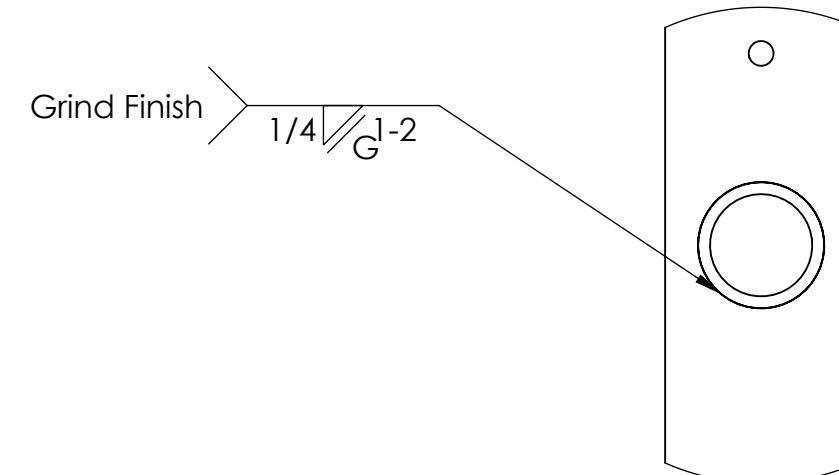
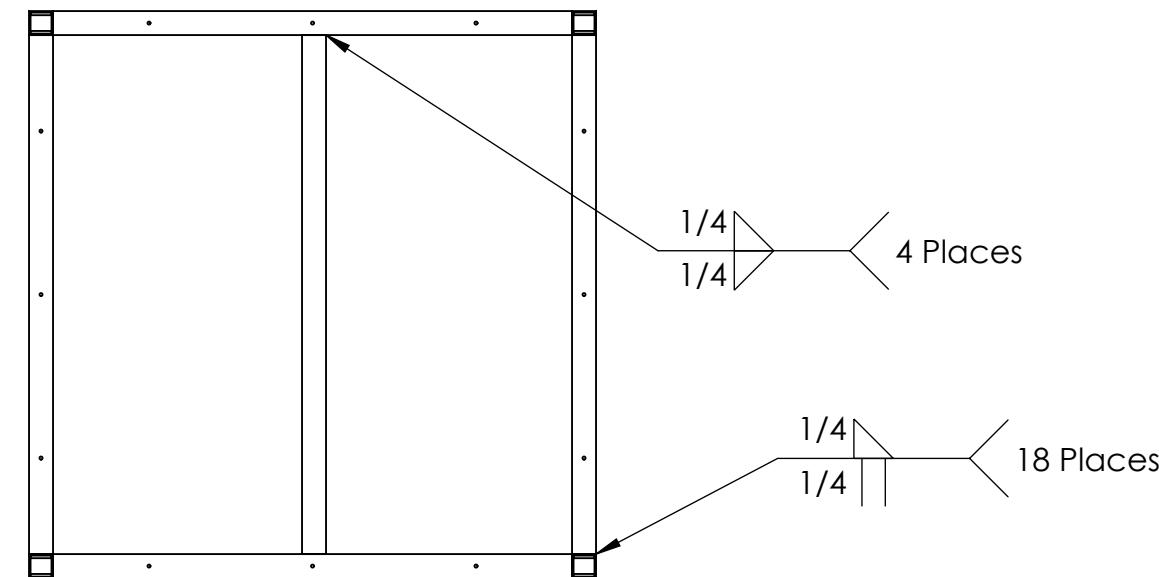
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Notes:
Remove Burrs & Sharp edges

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

FIRST ROBOTICS COMPETITION
SOLIDWORKS
Modeling Solutions Partner

TITLE: HAB Level 3 Frame

SIZE DWG. NO. REV
B GE-19030 **A**

SCALE: 1:16 WEIGHT: SHEET 2 OF 6

4

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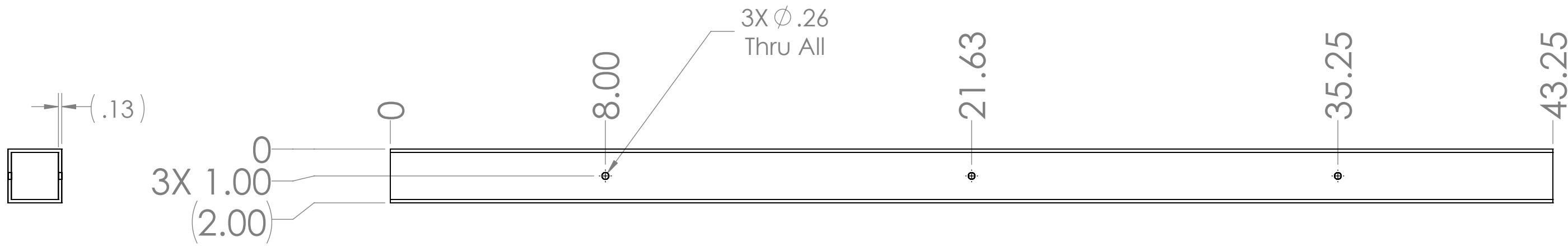
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B

**Notes:**

Part: GE-19030-01

Material: 2"x .125" 6061 Thick Aluminum Square Tube

Remove Burrs & Sharp Edges

A

A

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

HAB Level 3 Frame

B	GE-19030	A
SIZE	DWG. NO.	REV
SCALE: 1:8	WEIGHT:	SHEET 3 OF 6

4

3

2

1

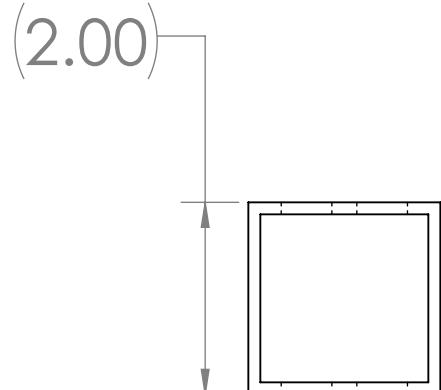
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B



21.50

B

Note:

Part: GE-19030-02

Material: 2"x .125" Thick 6061 Aluminumn Square Tube

Remove Burrs & Sharp Edges

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

HAB Level 3 Frame

SIZE	DWG. NO.	REV
B	GE-19030	A
SCALE: 1:2	WEIGHT:	SHEET 4 OF 6

4

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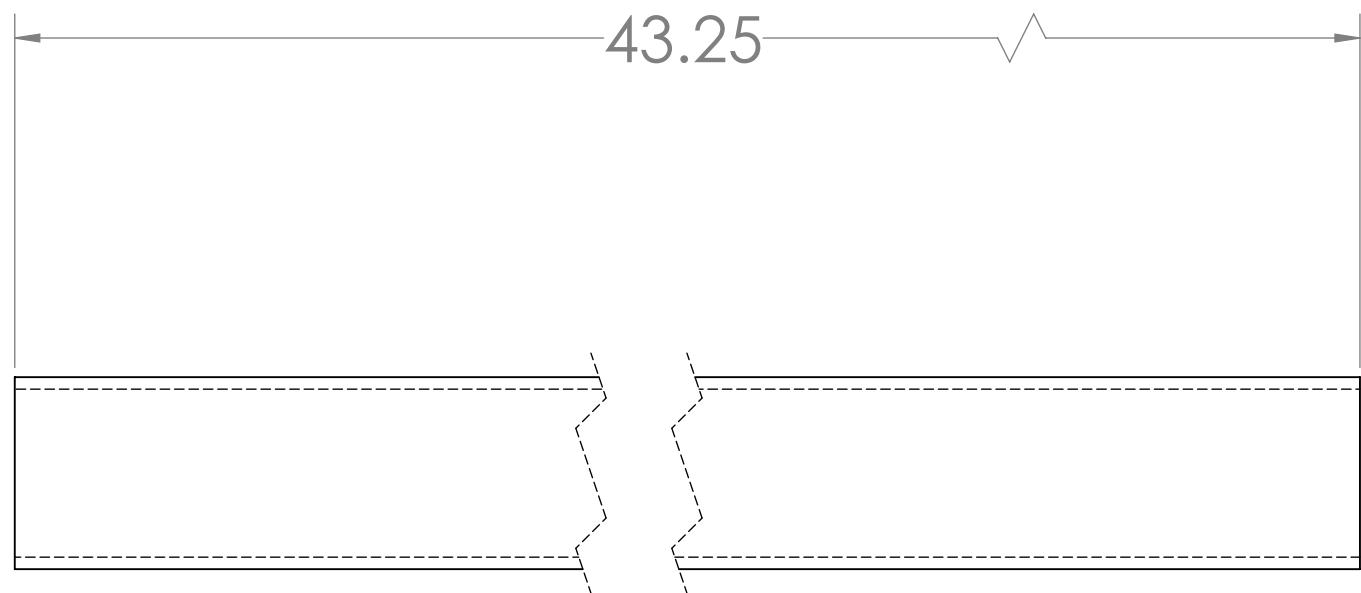
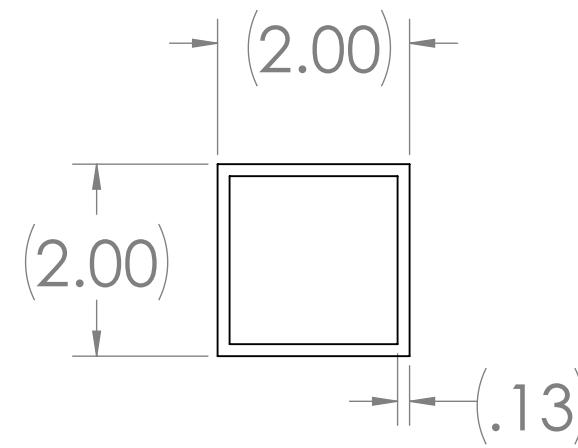
3

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Notes:

Part Number: GE-19030-03

Material: 2"x .125" Thick 6061 Aluminum Square Tube

Remove Burrs & Sharp Edges

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

HAB Level 3 Frame

SIZE	DWG. NO.	REV
B	GE-19030	A
SCALE: 1:2	WEIGHT:	SHEET 5 OF 6

4

3

2

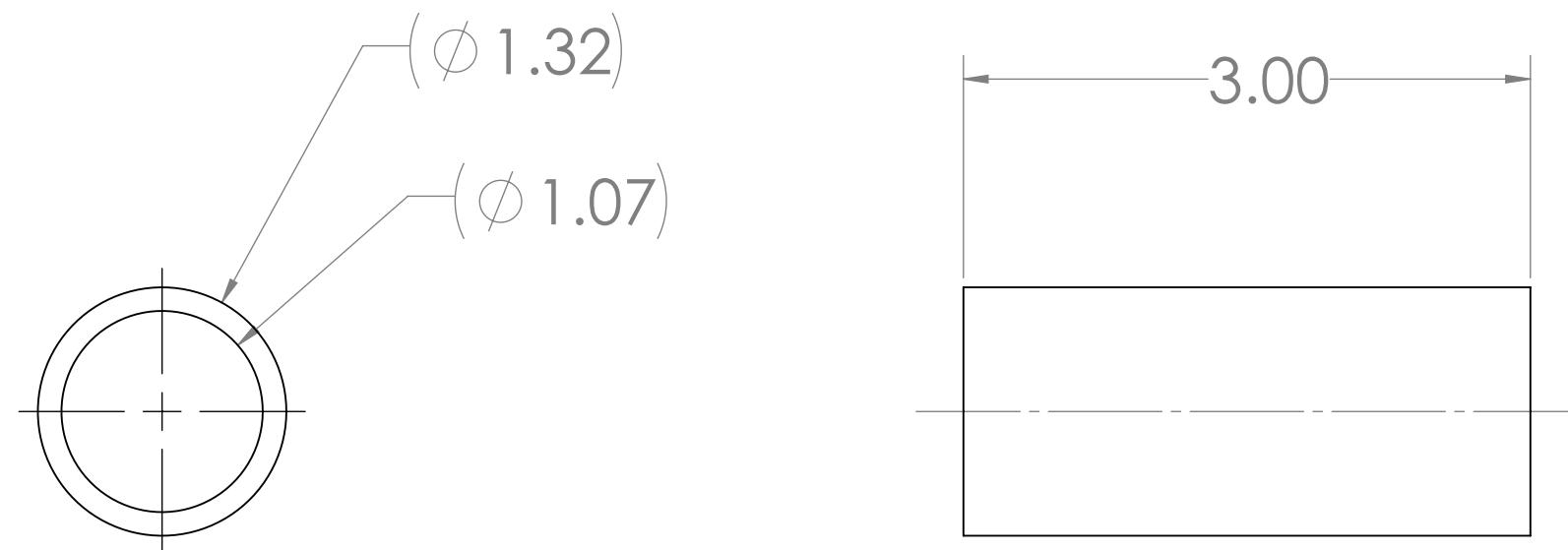
1

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B

B

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A

Notes:

Part Number: GE-19030-04

Material: 1" Schedule 40 Pipe 6061 Aluminum

Remove Burrs & Sharp Edges

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		DRAWN			
		CHECKED			
		ENG APPR.			
		MFG APPR.			
		Q.A.			
		COMMENTS:			
		MATERIAL			
	NEXT ASSY	USED ON	FINISH		
		APPLICATION	DO NOT SCALE DRAWING		
TITLE:	HAB Level 3 Frame				
SIZE	DWG. NO.		REV		
B	GE-19030		A		
SCALE: 1:1	WEIGHT:		SHEET 6 OF 6		

4

3

2

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4

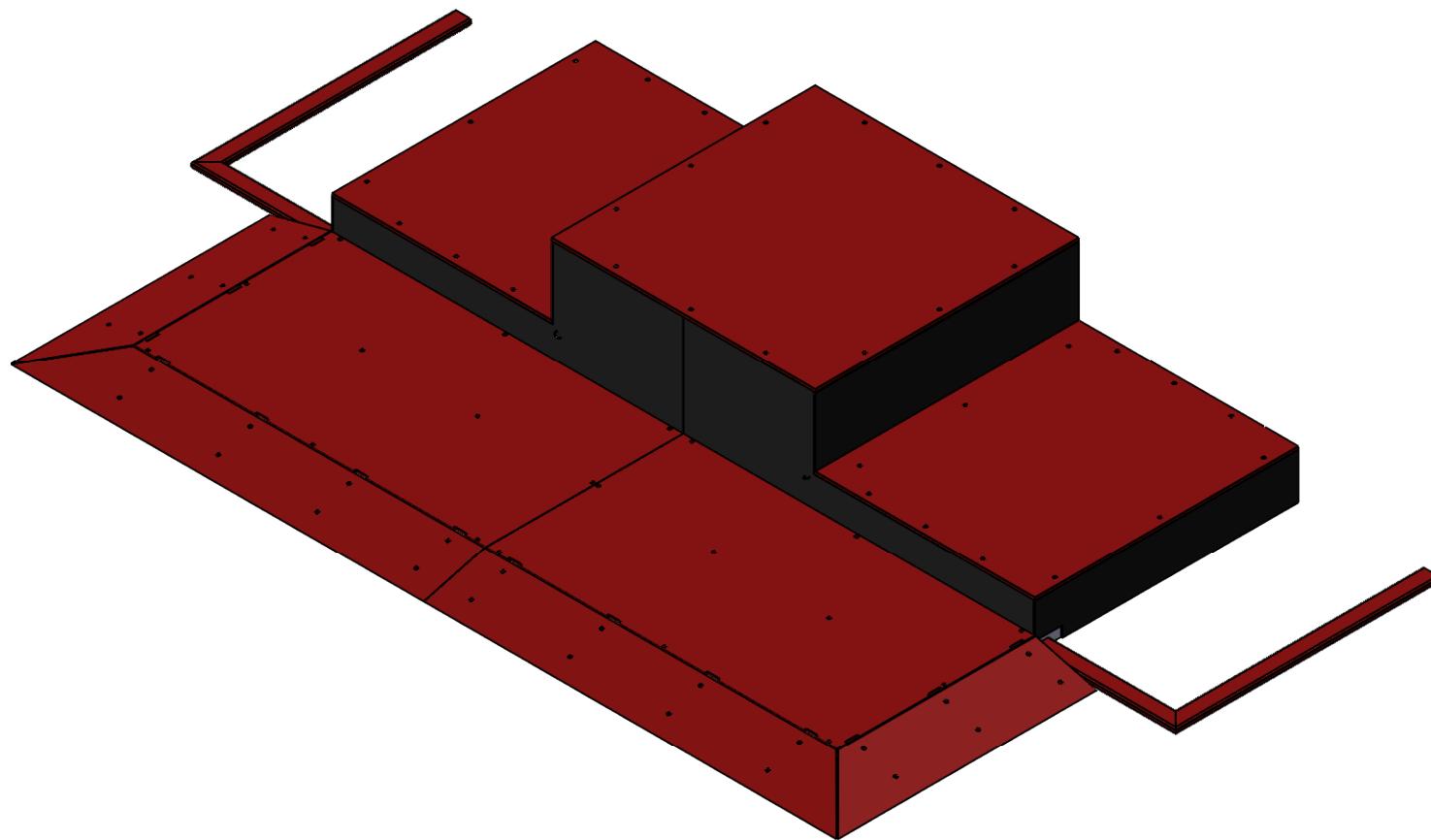
3

2

1

B

B



ITEM NO.	PART NUMBER	DESCRIPTION	Default/QTY.
1	GE-19033	HAB Front Plastic	2
2	GE-19037	Level 3 Side	2
3	GE-19044	Level 2 Side	2
4	GE-19062	Level 1 - Assembly	1
5	GE-19069	Hab 3 Fastener Assembly	1
6	GE-19167	Corral Tube Left Small Fastener Assembly	1
7	GE-19168	Corral Tube Right Fastener Assembly	1
8	GE-19169	Corral Tube Right Small Fastener Assembly	1
9	GE-19176	Hab 2 Fastener Assembly	2
10	GE-19182	Corral Tube Left Fastener Assembly	1
11	Loop_1_23	1" Loop, 23" Long	4
12	Loop_1_36	1" x 36" Loop Fastener, Adhesive Backed	2
13	Loop_1_46	1" x 46" Loop Fastener, Adhesive Backed	6
14	pin_quick_ring_.25_2.5	SS Ring-Grip Quick-Release Pin, 1/4" diameter, 2.5" long	2

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
 Modeling Solutions Partner
 TITLE: Full Hab Assembly
 SIZE B DWG. NO. GE-19031 REV
 SCALE: 1:24 WEIGHT: SHEET 1 OF 4

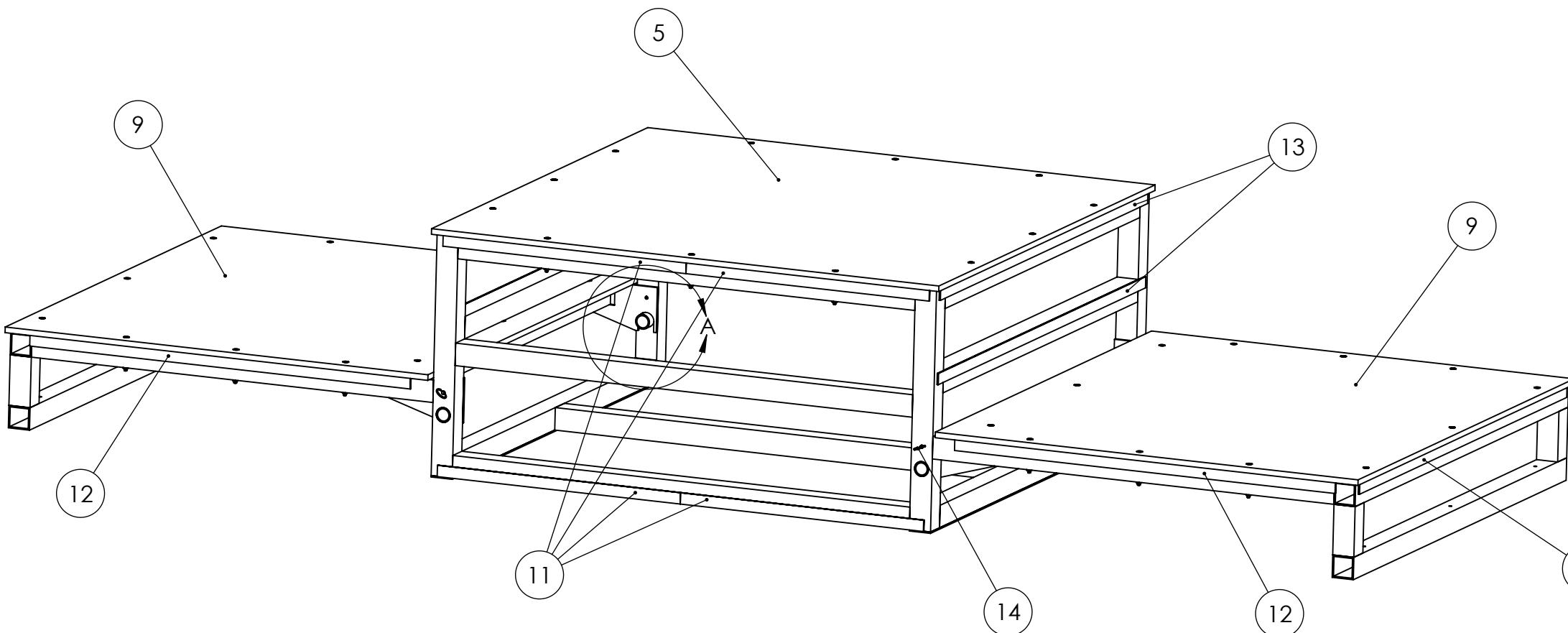
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4

3

2

1



1. Place Item 9 so that the grooves in the plates are resting on the pipes in Item 5 as shown in Detail A. Secure with Item 14 at two locations.
2. Attach loop fastener as shown. Peel off the protective backing.

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		DIMENSIONS ARE IN INCHES		DRAWN	
		TOLERANCES:		CHECKED	
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		ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$		MFG APPR.	
		TWO PLACE DECIMAL $\pm .01$		Q.A.	
		THREE PLACE DECIMAL $\pm .001$		COMMENTS:	
		INTERPRET GEOMETRIC TOLERANCING PER:			
		MATERIAL			
	NEXT ASSY	USED ON	FINISH		
		APPLICATION	DO NOT SCALE DRAWING		

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Full Hab Assembly

B **GE-19031**

SIZE DWG. NO. REV
SCALE: 1:48 WEIGHT: SHEET 2 OF 4

4

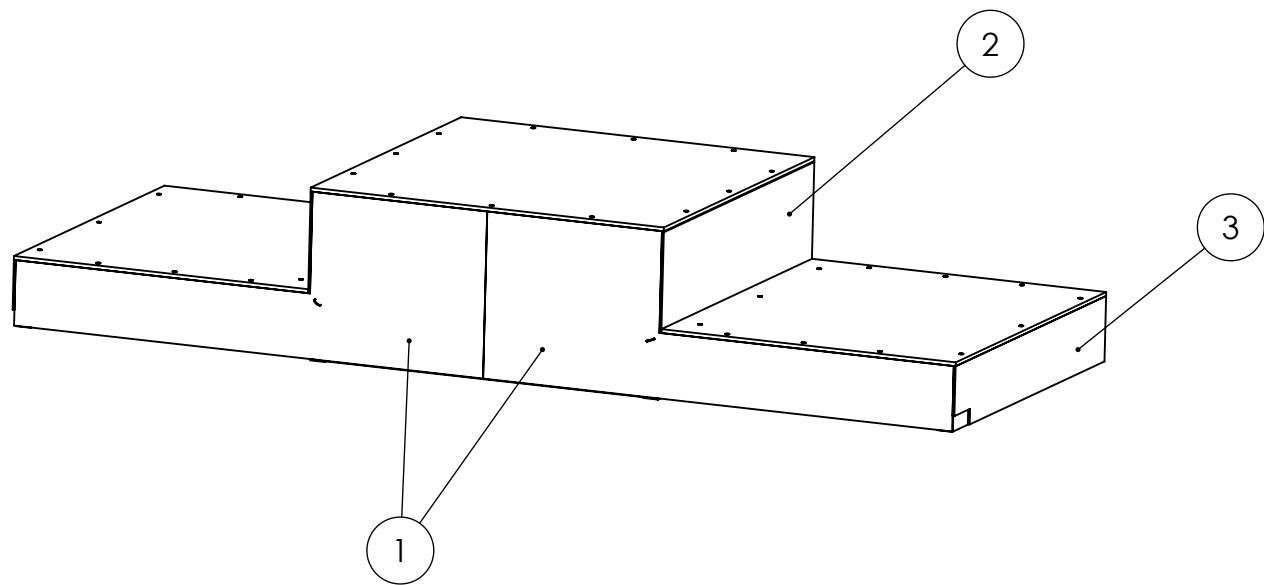
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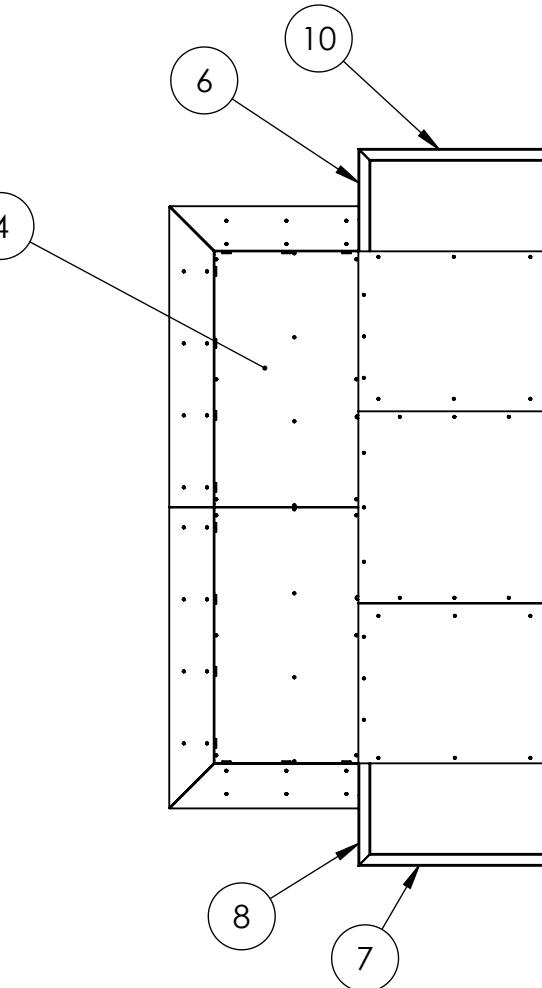
1

B

A



3. Place Items 1, 3, 2 as shown. Press firmly to ensure the loop fastener adheres to plastic.



4. Place Items 4, 6, 10, 7, 8 as shown.

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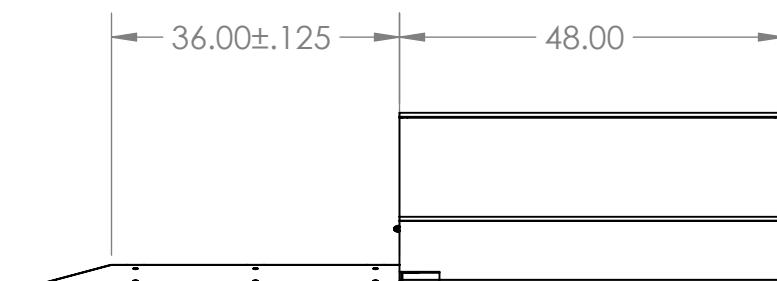
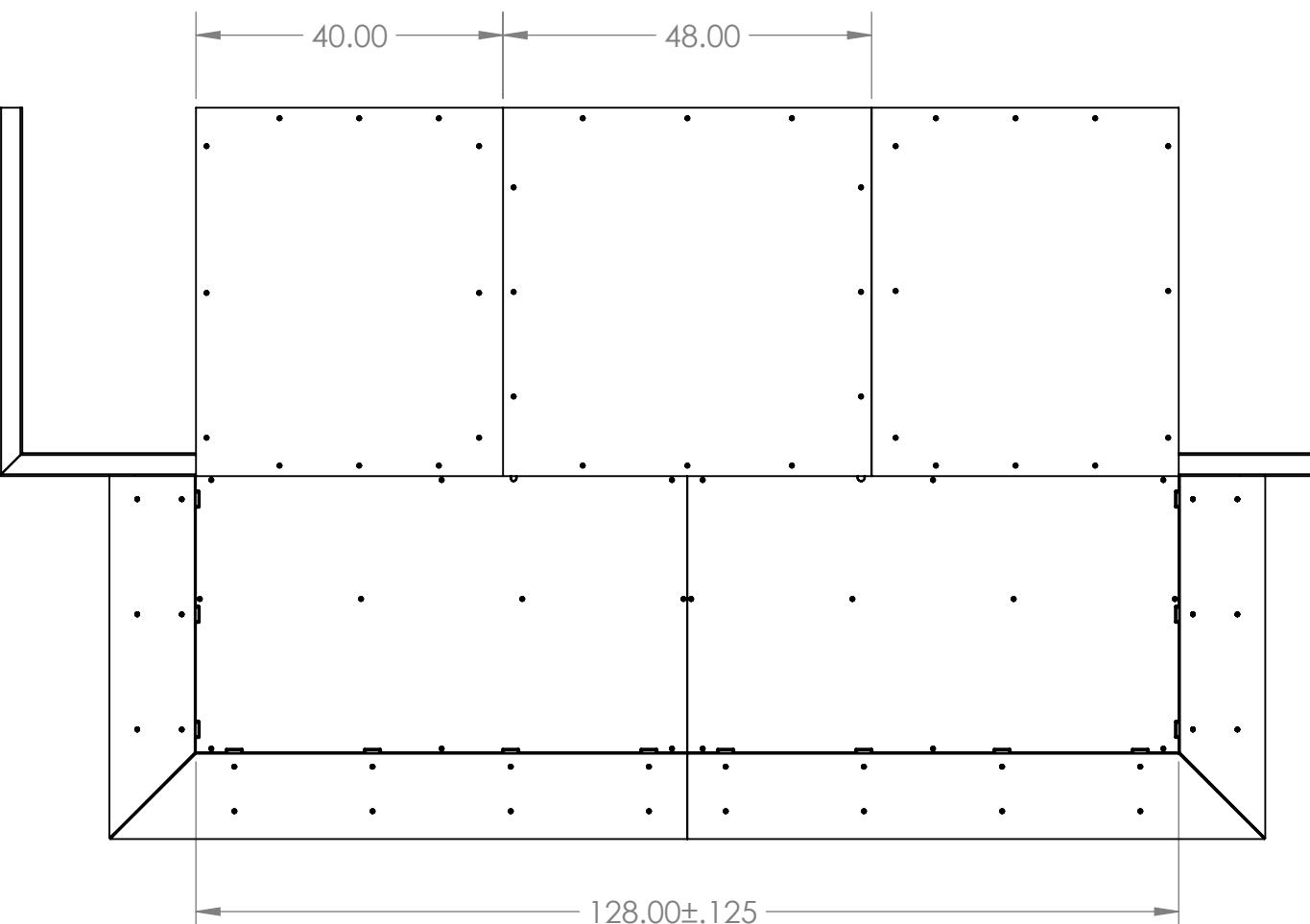
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			MFG APPR.			
			Q.A.			
		INTERPRET GEOMETRIC TOLERANCING PER:	COMMENTS:			
		MATERIAL				
NEXT ASSY	USED ON	FINISH				
APPLICATION		DO NOT SCALE DRAWING				

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		DRAWN			
		CHECKED			
		ENG APPR.			
		MFG APPR.			
		Q.A.			
		COMMENTS:			
		MATERIAL			
		NEXT ASSY	USED ON	FINISH	
		APPLICATION		DO NOT SCALE DRAWING	
B	GE-19031				
SCALE: 1:48	WEIGHT:	SHEET 4 OF 4			

FIRST
ROBOTICS
COMPETITION 
Modeling Solutions Partner

Full Hab Assembly

4

3

2

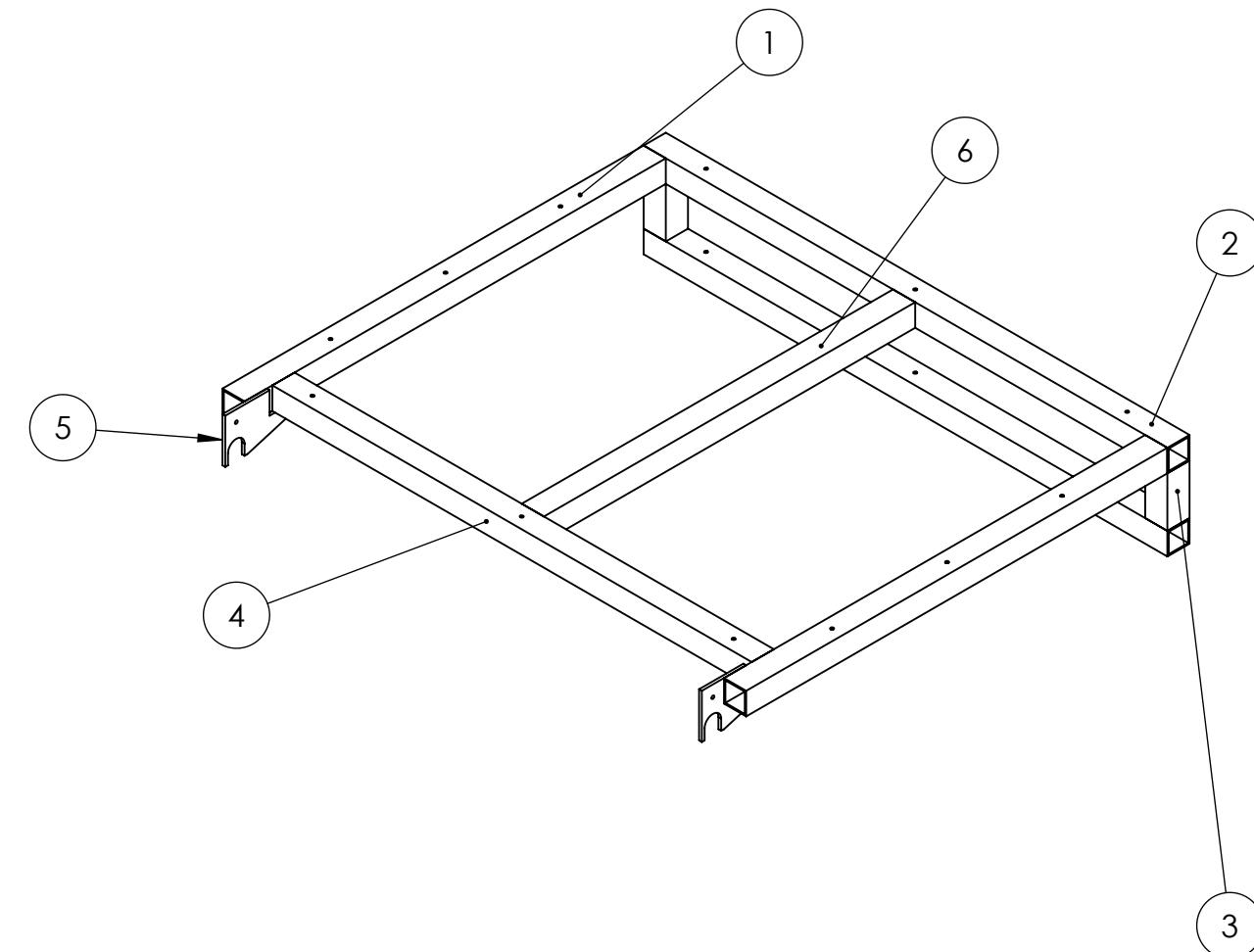
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REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
2-B3, 4-A3, 5-A3	E	Added 8.75 dimension, $\phi 0.26$ was $\phi 0.25$, added detail view of GE-19032-06.	10/19/2018	DAF

B

B



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-19032-01	2"x .125" Thick 6061 Aluminium Square Tube	2
2	GE-19032-02	2"x .125" Thick 6061 Aluminium Square Tube	2
3	GE-19032-03	2"x .125" Thick 6061 Aluminium Square Tube	2
4	GE-19032-04	2"x .125" Thick 6061 Aluminium Square Tube	1
5	GE-19032-05	.25" Thick 6061 Aluminum Plate	2
6	GE-19032-06	2"x .125" Thick 6061 Aluminium Square Tube	1

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		DIMENSIONS ARE IN INCHES	DRAWN		
		TOLERANCES:	CHECKED		
		FRACTIONAL $\pm 1/16$	ENG APPR.		
		ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$	MFG APPR.		
		TWO PLACE DECIMAL $\pm .01$	Q.A.		
		THREE PLACE DECIMAL $\pm .001$	COMMENTS:		
		INTERPRET GEOMETRIC TOLERANCING PER:			
		MATERIAL			
		NEXT ASSY	USED ON	FINISH	
		APPLICATION		DO NOT SCALE DRAWING	
SIZE	DWG. NO.			REV	
B	GE-19032			E	
SCALE: 1:12	WEIGHT:			SHEET 1 OF 5	

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

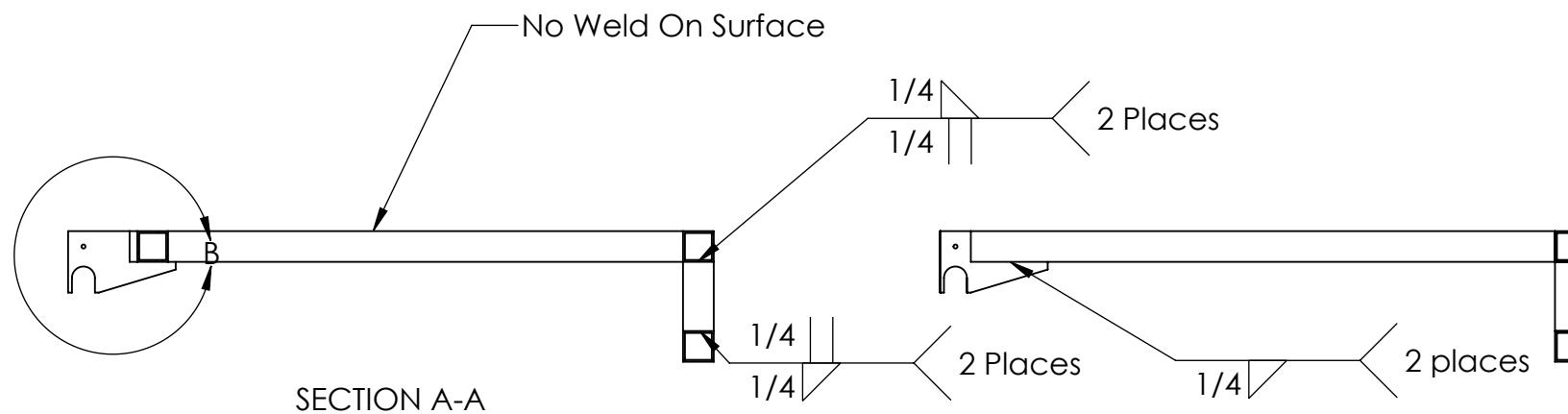
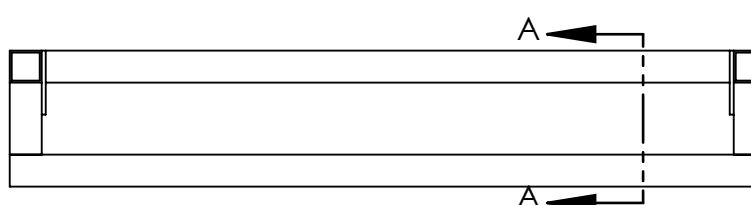
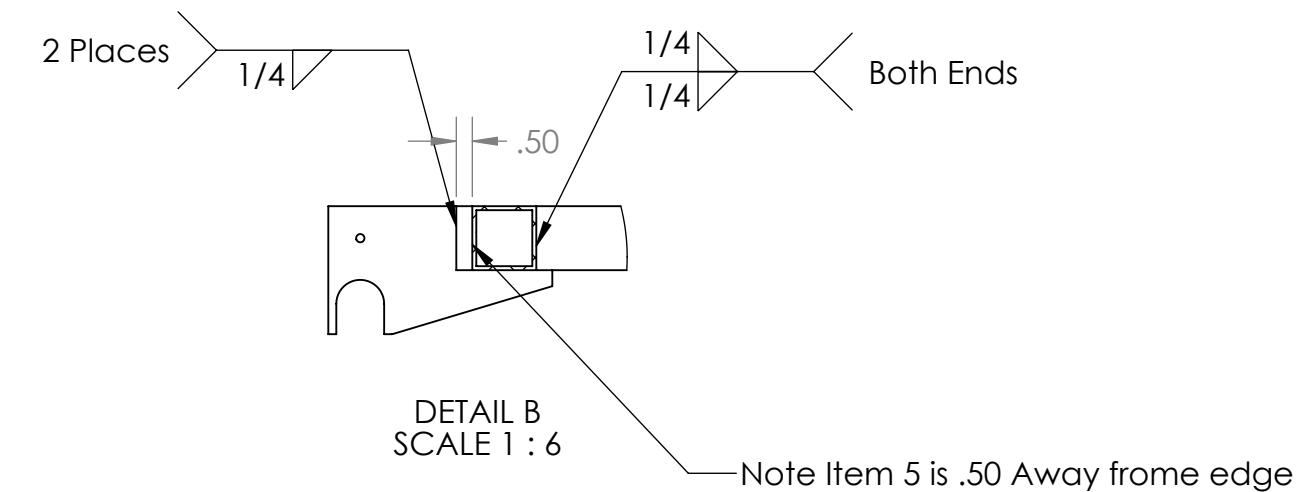
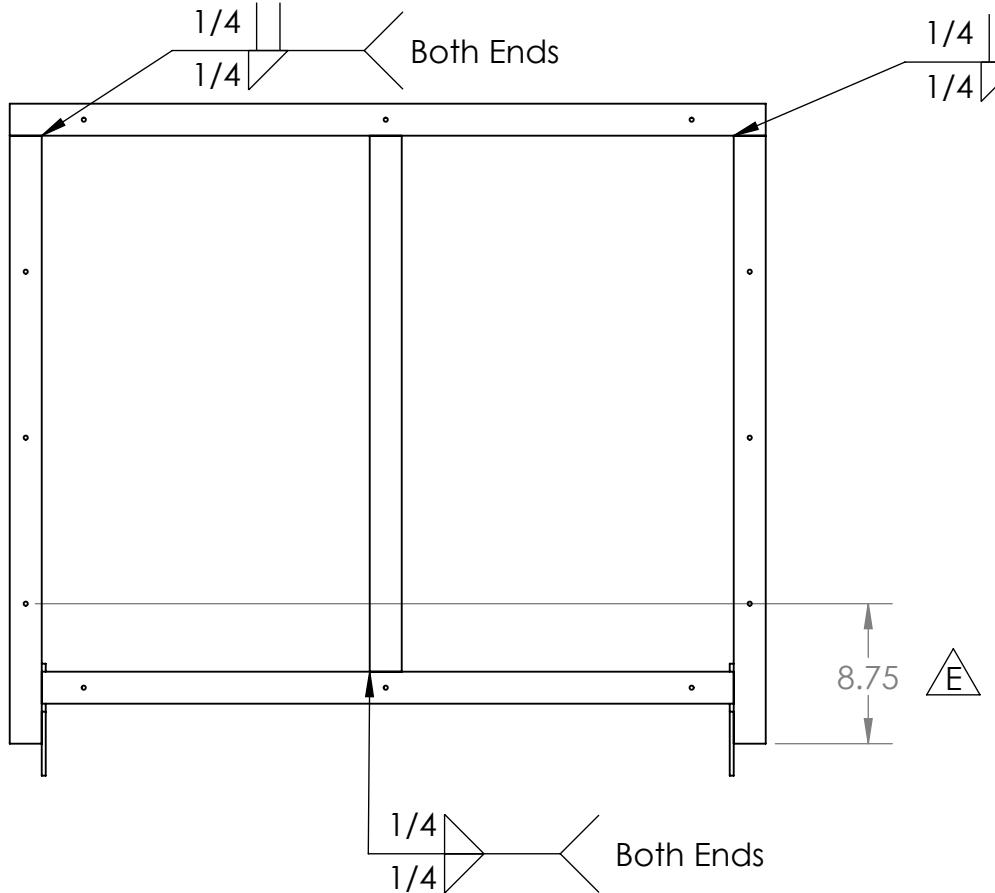
**HAB Level 2
Frame**

4

3

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1



SECTION A-A

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		DRAWN		
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
NEXT ASSY	USED ON	MATERIAL		
APPLICATION	FINISH			
	DO NOT SCALE DRAWING			
SCALE: 1:12	WEIGHT:			SHEET 2 OF 5

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

**HAB Level 2
Frame**

SIZE DWG. NO. **B** GE-19032 **E**

REV

4

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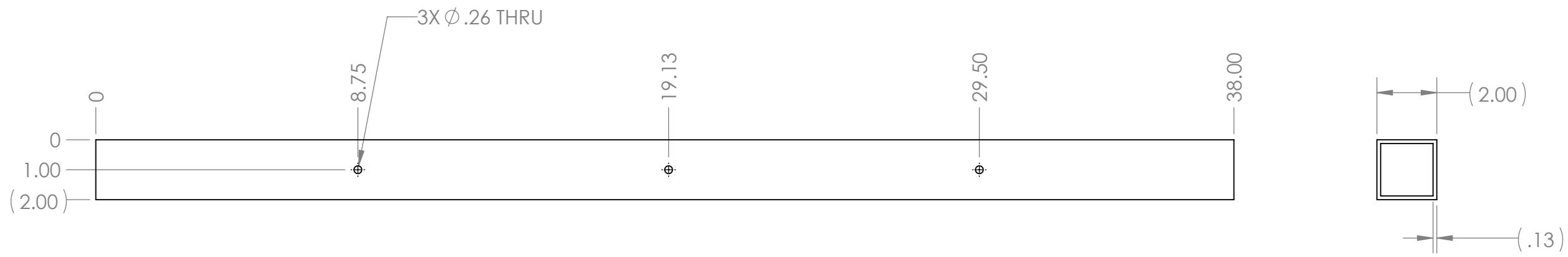
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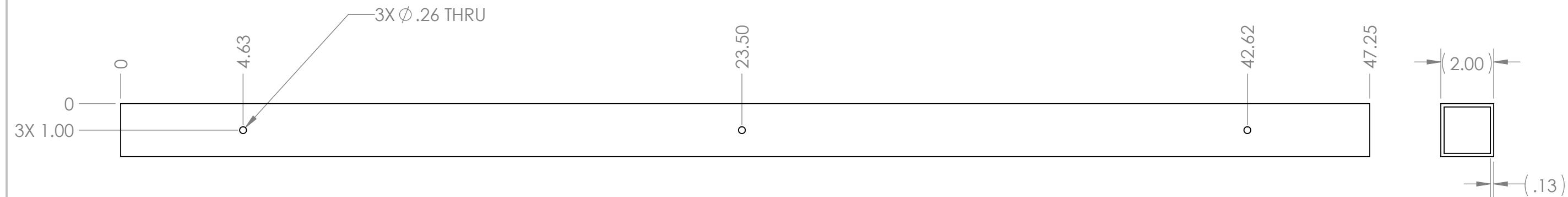
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B

B



Notes:
 Part Material: GE-19032-01
 Material: 2"x .125" Thick 6061 Aluminum Square Tube



Notes:
 Part Material: GE-19032-02
 Material: 2"x .125" Thick 6061 Aluminum Square Tube

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

HAB Level 2 Frame

SIZE	DWG. NO.	REV
B	GE-19032	E
SCALE: 1:8	WEIGHT:	SHEET 3 OF 5

4

3

2

1

4

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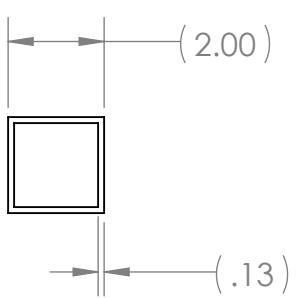
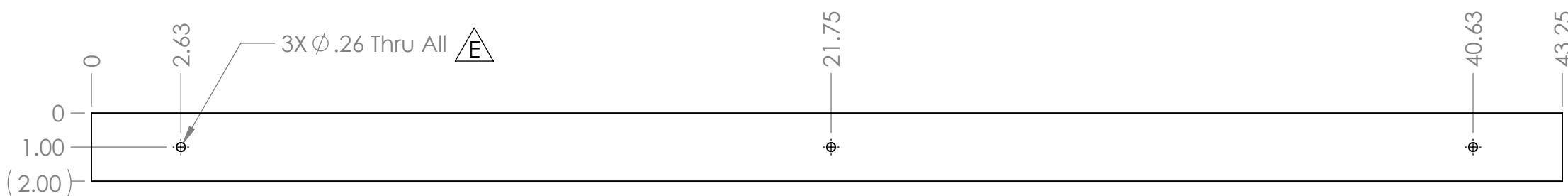
2

1

**Notes:**

Part Material: GE-19032-03

Material: 2"x .125" Thick 6061 Aluminumn Square Tube

**Notes:**

Part Material: GE-19032-04

Material: 2"x .125" Thick 6061 Aluminumn Square Tube

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

HAB Level 2 Frame

SIZE	DWG. NO.	REV
B	GE-19032	E
SCALE: 1:4	WEIGHT:	SHEET 4 OF 5

4

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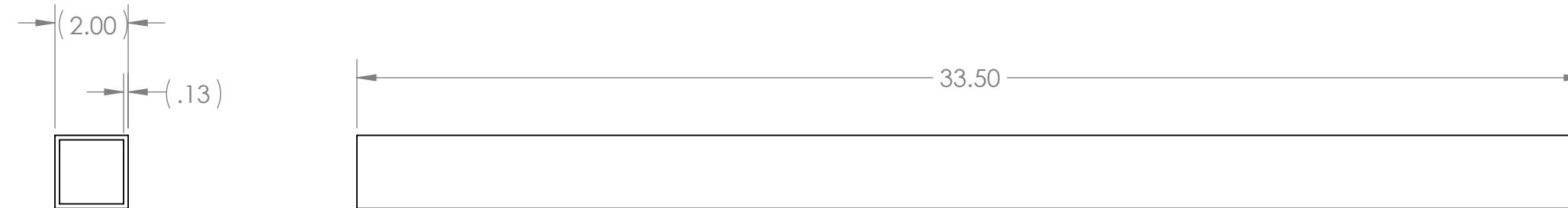
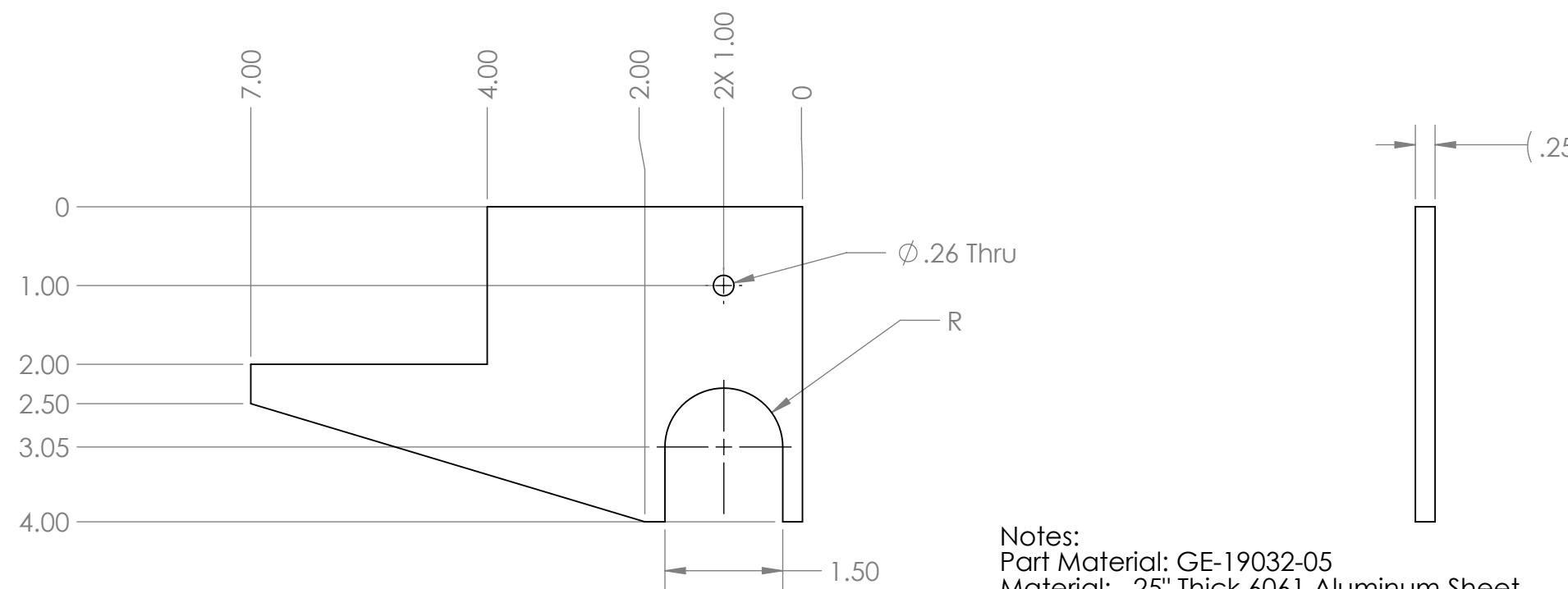
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Notes:
Part Material: GE-19032-06
Material: 2"x .125" Thick 6061 Aluminum Square Tube

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
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HAB Level 2 Frame

SIZE	DWG. NO.	REV
B	GE-19032	E
SCALE: 1:4	WEIGHT:	SHEET 5 OF 5

4

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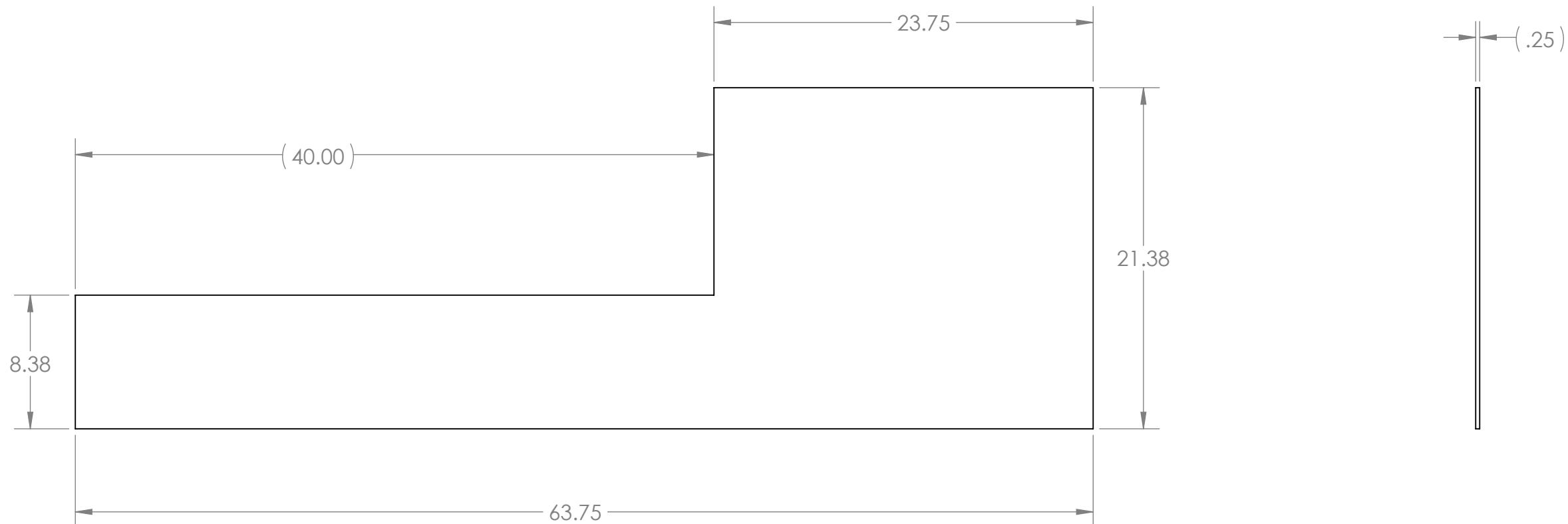
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2

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B

B



A

A

Note:
 Material: 1/4" Thick HDPE Sheet, Black
 Finish: Orange Peel
 Remove Sharp Edges and Burrs
 Tag Or Label With Part Number

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
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HAB Front Plastic

SIZE	DWG. NO.	REV
B	GE-19033	A
SCALE: 1:8	WEIGHT:	SHEET 1 OF 1

4

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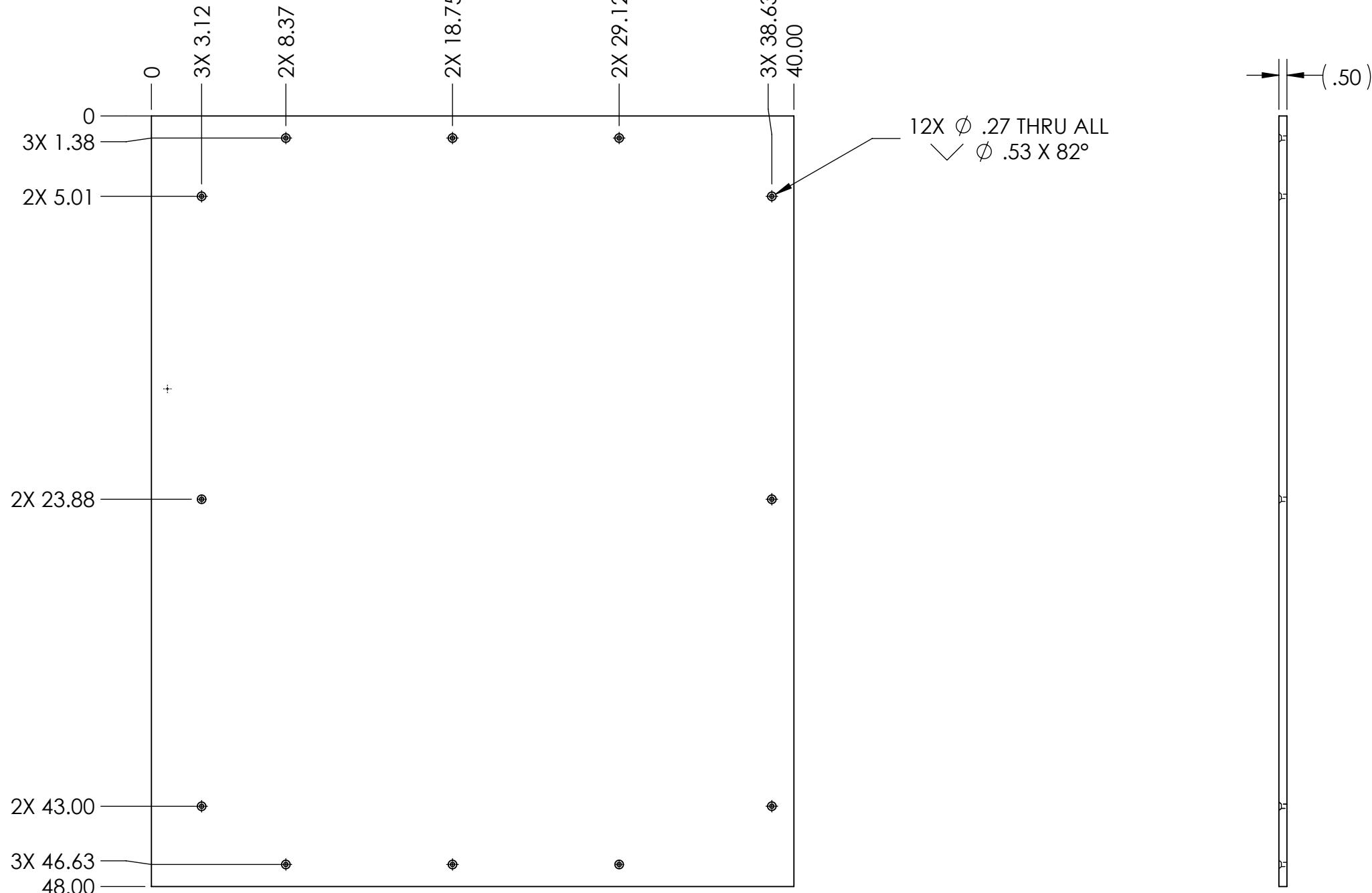
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B

B



Note:
Material: 1/2" Thick HDPE Sheet
Finish: Orange Peel
Tag Or Label With Part Number
Remove Sharp Edges Or Burrs

Part Number	Color
GE-19035-BLK	BLACK
GE-19035-RED	RED
GE-19035-BLU	BLUE

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		DIMENSIONS ARE IN INCHES	DRAWN		
		TOLERANCES:	CHECKED		
		FRACTIONAL $\pm 1/16$	ENG APPR.		
		ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$	MFG APPR.		
		TWO PLACE DECIMAL $\pm .01$	Q.A.		
		THREE PLACE DECIMAL $\pm .001$	COMMENTS:		
		INTERPRET GEOMETRIC TOLERANCING PER:			
		MATERIAL			
		NEXT ASSY	USED ON	FINISH	
		APPLICATION		DO NOT SCALE DRAWING	
SOLIDWORKS	TITLE: Level 2 Top HDPE				
	SIZE	DWG. NO.	REV		
B	GE-19035				
SCALE: 1:8	WEIGHT:	SHEET 1 OF 1			

4

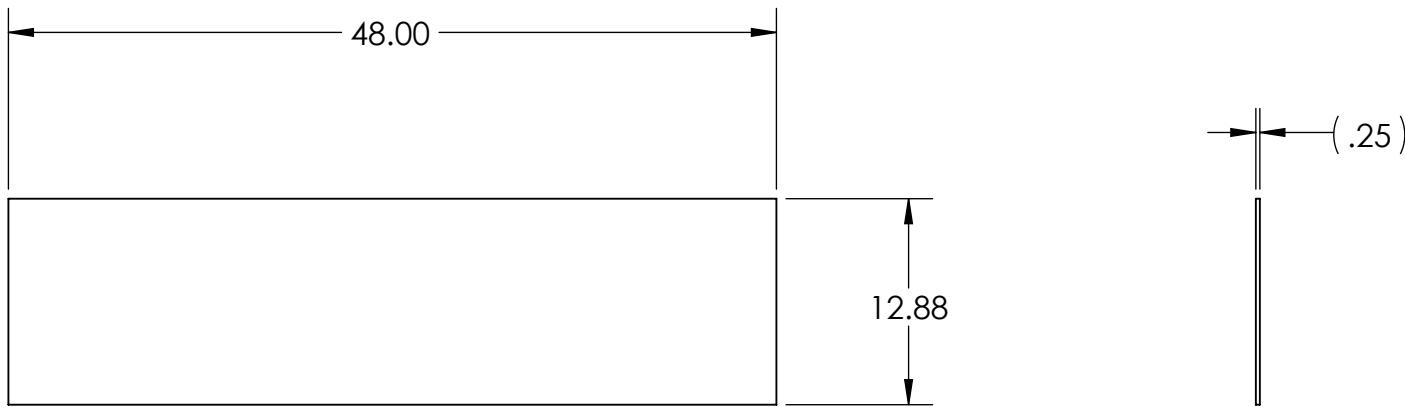
3

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B

B

**Note:**

Material: 1/4" Thick HDPE Black
 Finish: Orange Peel
 Tag Or Label With Part Number
 Remove Sharp Edges and Burrs

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		INTERPRET GEOMETRIC TOLERANCING PER: MATERIAL	DRAWN		
			CHECKED		
			ENG APPR.		
			MFG APPR.		
			Q.A.		
		COMMENTS:			
NEXT ASSY	USED ON	FINISH	SIZE	DWG. NO.	REV
	APPLICATION	DO NOT SCALE DRAWING	A	GE-19037	
			SCALE: 1:12	WEIGHT:	SHEET 1 OF 1



SOLIDWORKS
Modeling Solutions Partner

Level 3 Side

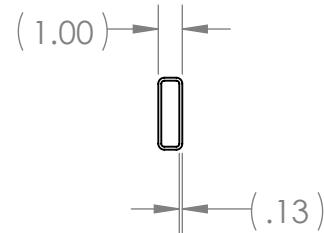
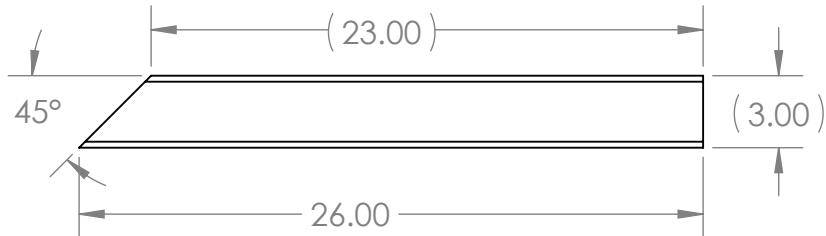
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REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
A2	A	FIXED MATERIAL CALLOUT	12/26/2018	DAF

B

B



Notes:
Material: 1" x 3" x .125" A513 Rectangular Tube
Finish: Tiger Drylac Powder Coating, Or Equivalent
Remove All Sharp Edges and Burrs



Part Number	Color
GE-19038-RED	Bengal Red 49/33333
GE-19038-BLU	Mercury Blue 59/40653

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

DRAWN	NAME	DATE
CHECKED		
ENG APPR.		
MFG APPR.		
Q.A.		
COMMENTS:		

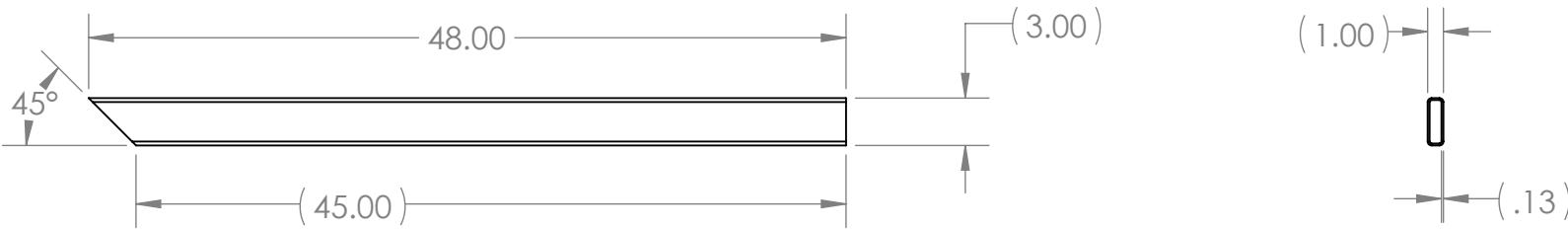
Corral Tube
Small

SIZE	DWG. NO.	REV
A	GE-19038	A
SCALE: 1:8	WEIGHT:	SHEET 1 OF 1

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
A2	A	FIXED MATERIAL CALLOUT	12/26/2018	DAF

B

B



Notes:

GE-19039

Material: 1"x 3" x .125" A513 Rectangular Tube
 Finish: Tiger Drylac Powder Coating, Or Equivalent
 Remove Burrs and Sharp Edges

A

Part Number	Color
GE-19039-Blu	Bengal Red 49/33333
GE-19039-Red	Mercury Blue 59/40653


SOLIDWORKS
 Modeling Solutions Partner

TITLE:

Corral Tube Long

SIZE	DWG. NO.	REV
A	GE-19039	A
SCALE: 1:12	WEIGHT:	SHEET 1 OF 1

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

4

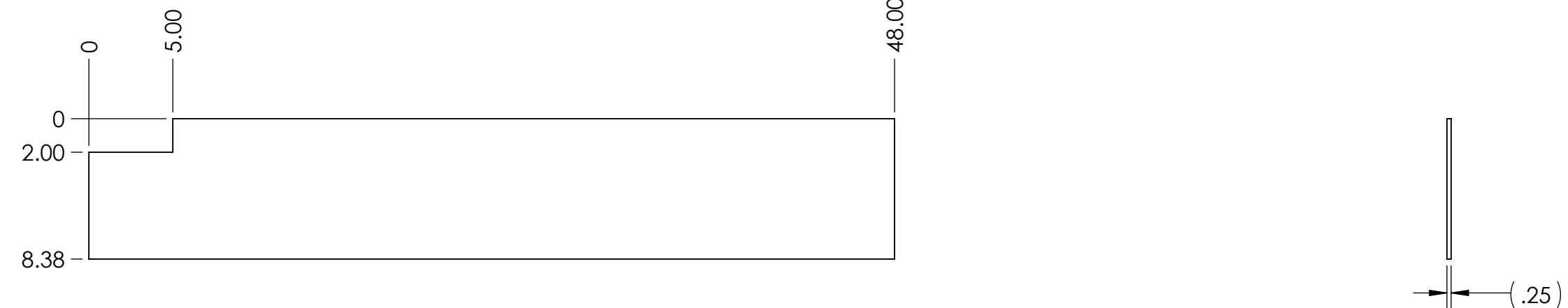
3

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B

B



Notes:

Material: 1/4" Thick HDPE Black
Finish: Orange Peel

Tag Or Label With Part Number
Remove Sharp Edges And Burrs

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		UNLESS OTHERWISE SPECIFIED:		NAME	DATE
		DIMENSIONS ARE IN INCHES	DRAWN		
		TOLERANCES:	CHECKED		
		FRACTIONAL $\pm 1/16$	ENG APPR.		
		ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$	MFG APPR.		
		TWO PLACE DECIMAL $\pm .01$	Q.A.		
		THREE PLACE DECIMAL $\pm .001$	COMMENTS:		
		INTERPRET GEOMETRIC TOLERANCING PER:			
		MATERIAL			
	NEXT ASSY	USED ON	FINISH		
	APPLICATION		DO NOT SCALE DRAWING		
	SCALE: 1:8		WEIGHT:	SHEET 1 OF 1	
B		GE-19044		SIZE	REV

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

TITLE:
Level 2 Side

4

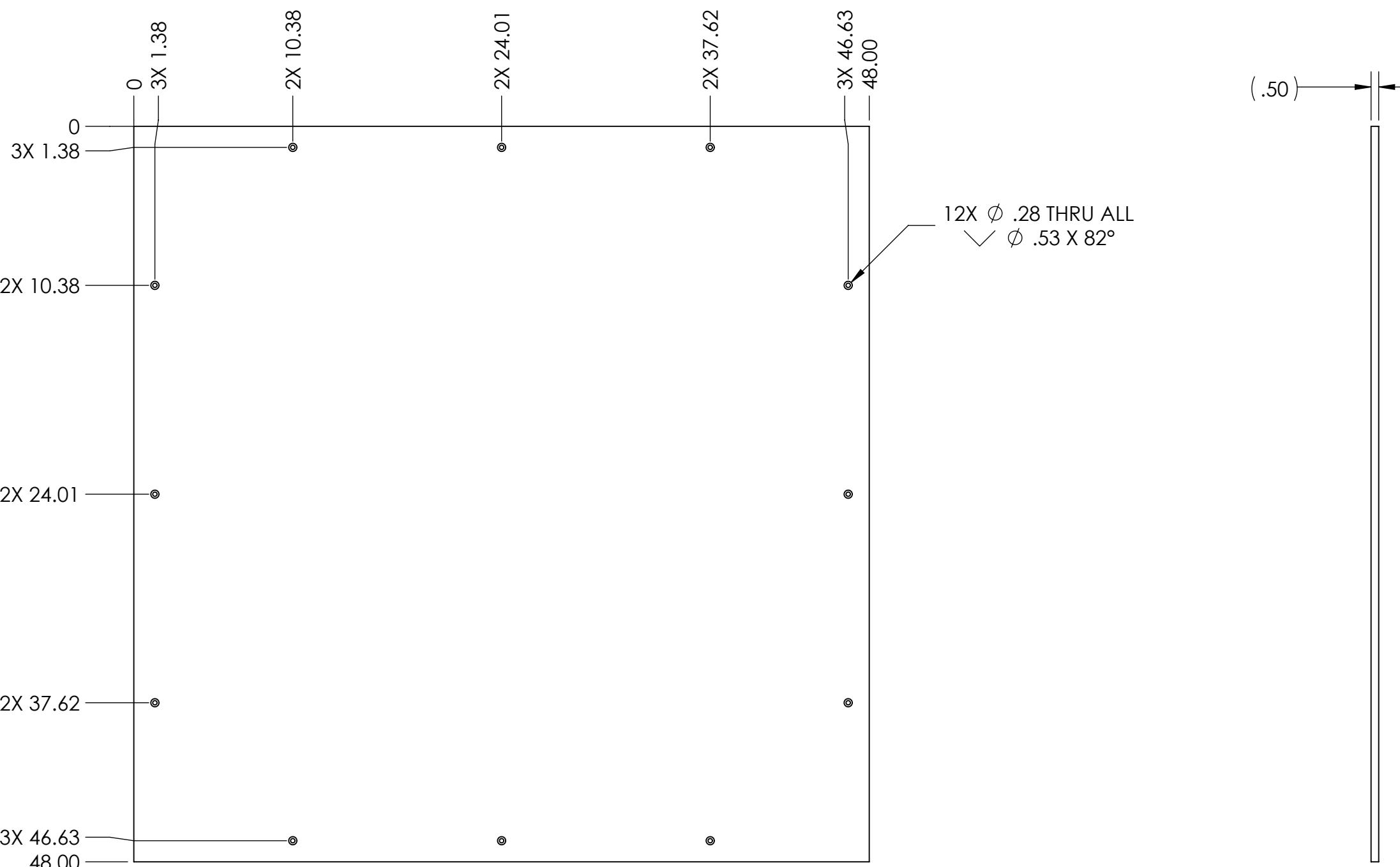
3

2

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B

B



Notes:
Material: 1/2" HDPE Sheet
Finish: Orange Peel
Tag Or Label With Part Number
Remove Sharp Edges and Burrs

Part Number	Color
GE-19045-RED	1/2" THK HDPE RED
GE-19045-BLU	1/2" THK HDPE BLUE
GE-19045-BLK	1/2" THK HDPE BLACK

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UNLESS OTHERWISE SPECIFIED:	DRAWN	NAME	DATE
DIMENSIONS ARE IN INCHES	CHECKED		
TOLERANCES: FRACTIONAL ±1/16	ENG APPR.		
ANGULAR: MACH ±1° BEND ±1°	MFG APPR.		
TWO PLACE DECIMAL ±.01	Q.A.		
THREE PLACE DECIMAL ±.001	COMMENTS:		
INTERPRET GEOMETRIC TOLERANCING PER:	MATERIAL		
	NEXT ASSY	USED ON	FINISH
	APPLICATION	DO NOT SCALE DRAWING	
	SCALE: 1:8	WEIGHT:	SHEET 1 OF 1
	SIZE B	DWG. NO. GE-19045	REV

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1

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

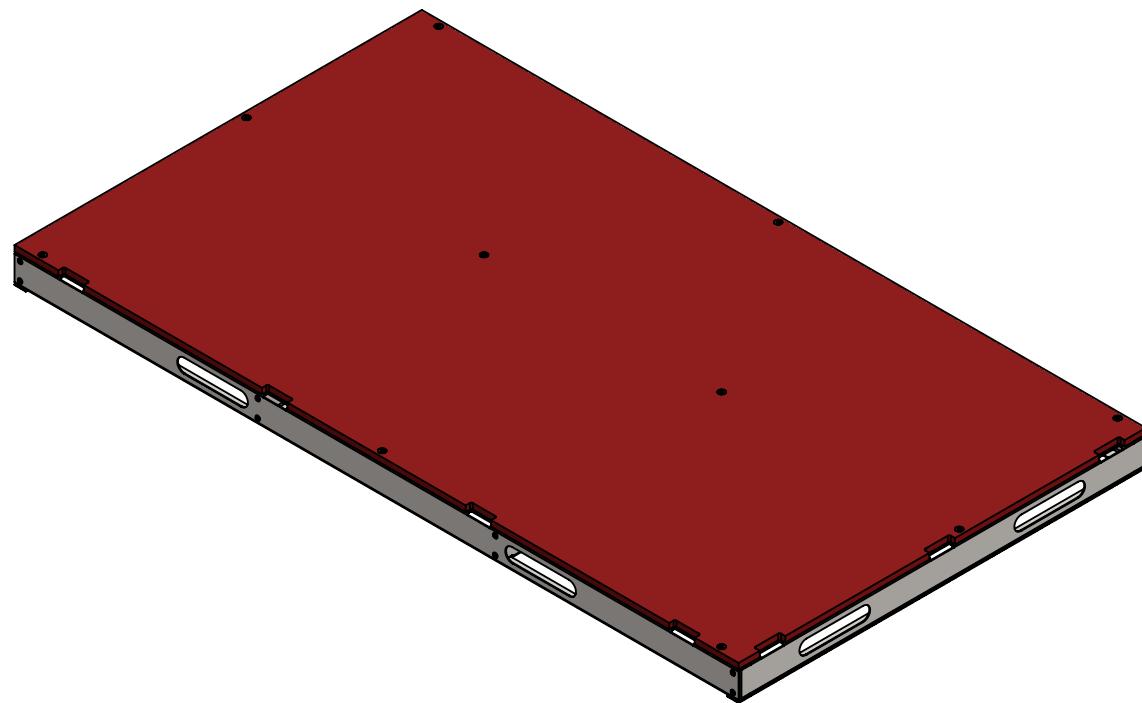
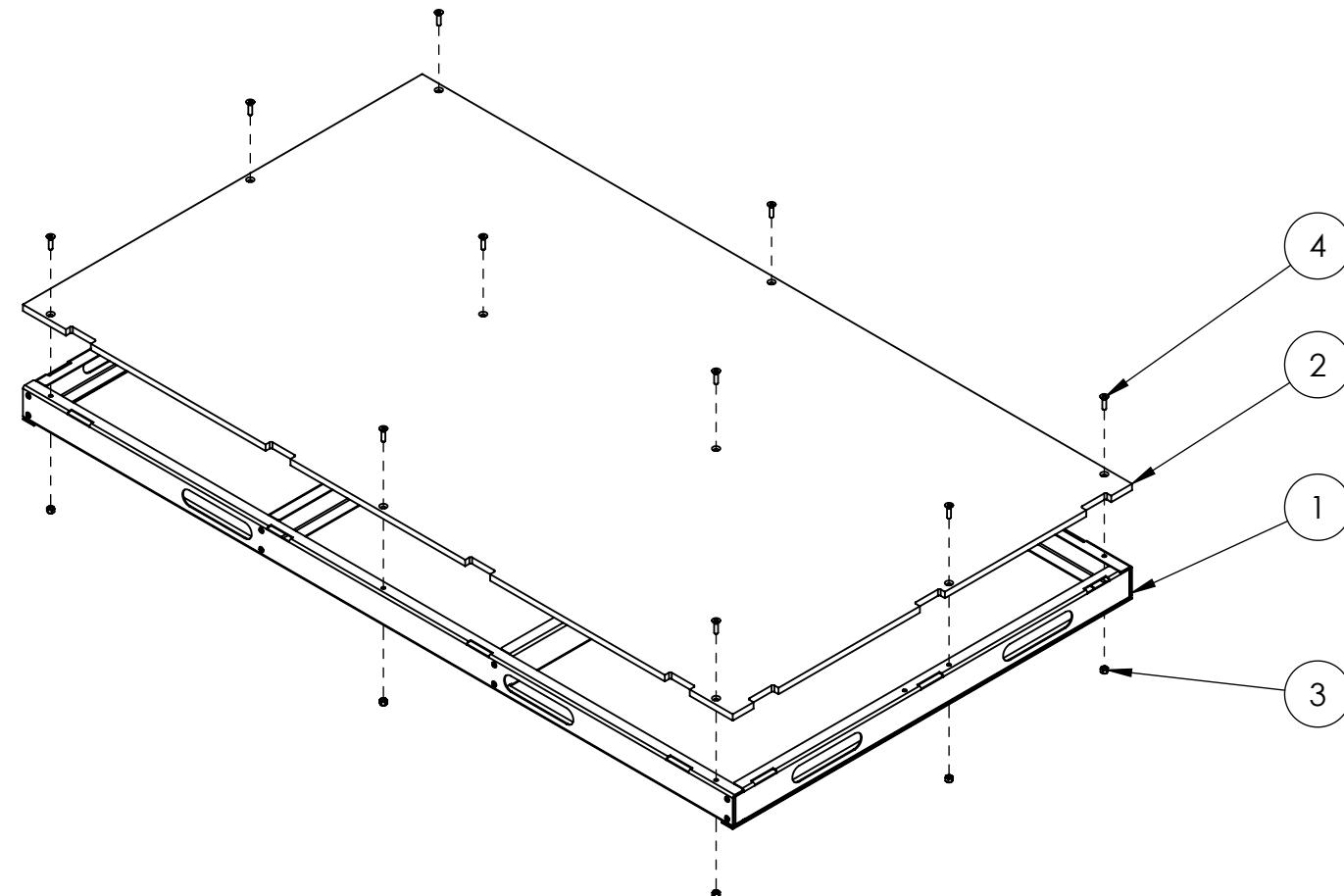
TITLE:
HDPE Top Level
3

4

3

2

1



ITEM NO.	PART NUMBER	DESCRIPTION	Default/QTY.
1	GE-19063	Level 1 - Frame	1
2	GE-19052	Level 1 - Top Right	1
3	nylock_.25_20	Steel Nylon-Insert Locknut, 1/4"-20	10
4	flat_hex_.25_20_1	Steel Hex Flat Head Screw, 1/4"-20 x 1" long, fully threaded	10
5	Hook_1_36	1" x 36" Hook, Adhesive Backed	2

		UNLESS OTHERWISE SPECIFIED:		NAME	DATE
		DIMENSIONS ARE IN INCHES	DRAWN	DAF	9/8/16
		TOLERANCES:	CHECKED		
		FRACTIONAL 1/16	ENG APPR.		
		ANGULAR: MACH 1° BEND 1°	MFG APPR.		
		TWO PLACE DECIMAL .01	Q.A.		
		THREE PLACE DECIMAL .001	COMMENTS:		
		INTERPRET GEOMETRIC TOLERANCING PER:			
		MATERIAL			
		NEXT ASSY	USED ON	FINISH	
		APPLICATION	DO NOT SCALE DRAWING		

FIRST
ROBOTICS
COMPETITION
SOLIDWORKS
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LEVEL 1 - Platform Right

SIZE	DWG. NO.	REV
B	GE-19051	
SCALE: 1:12	WEIGHT:	SHEET 1 OF 2

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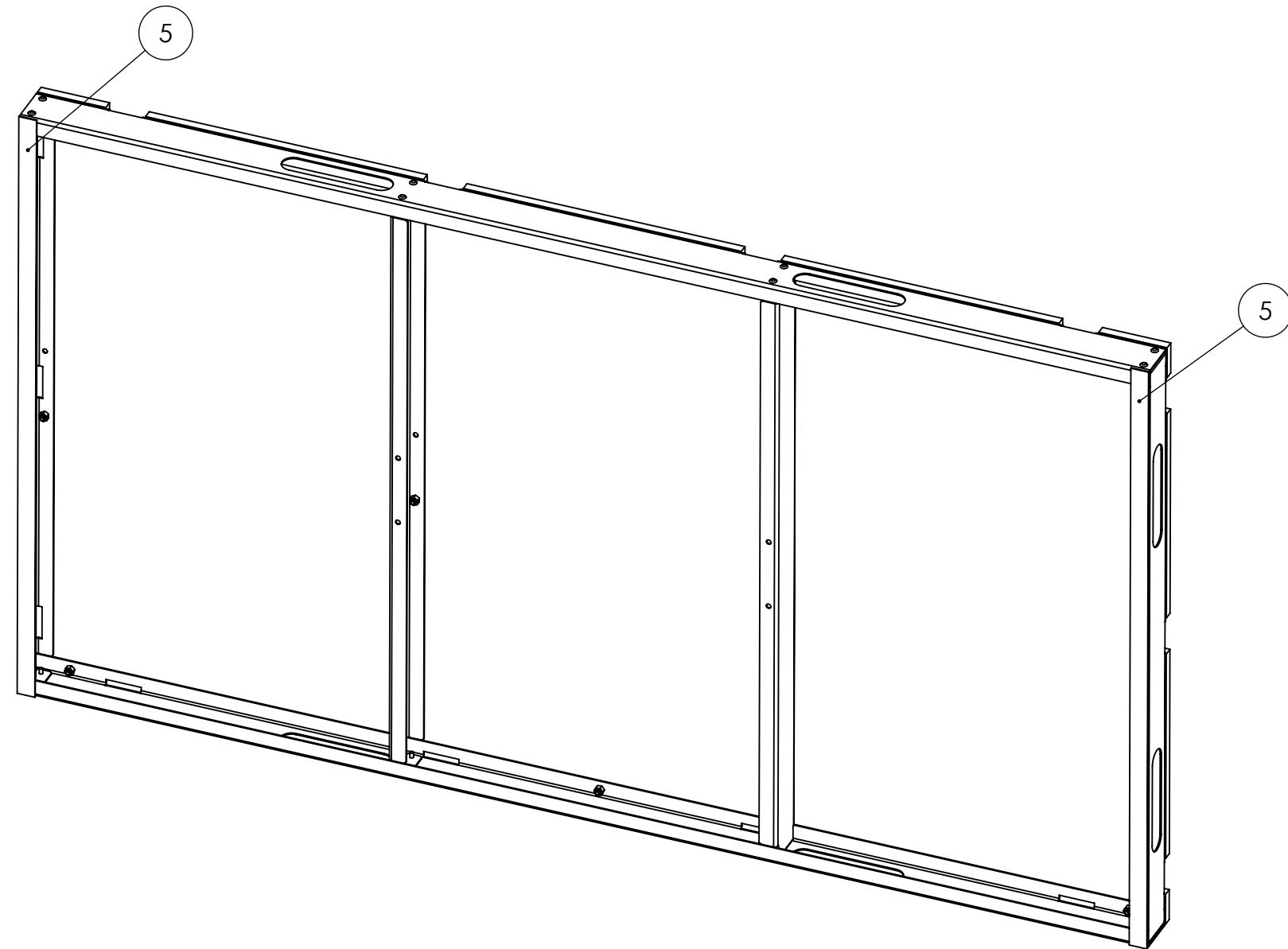
3

2

1

B

B



A

A

Notes:

- Clean steel surface prior to application of hook.

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		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL 1/16 ANGULAR: MACH 1° BEND 1° TWO PLACE DECIMAL .01 THREE PLACE DECIMAL .001	NAME	DATE
		DRAWN	DAF	9/8/16
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
		MATERIAL		
	NEXT ASSY	USED ON	FINISH	
		APPLICATION	DO NOT SCALE DRAWING	
SIZE	DWG. NO.		REV	
B	GE-19051			
SCALE: 1:12	WEIGHT:		SHEET 2 OF 2	

4

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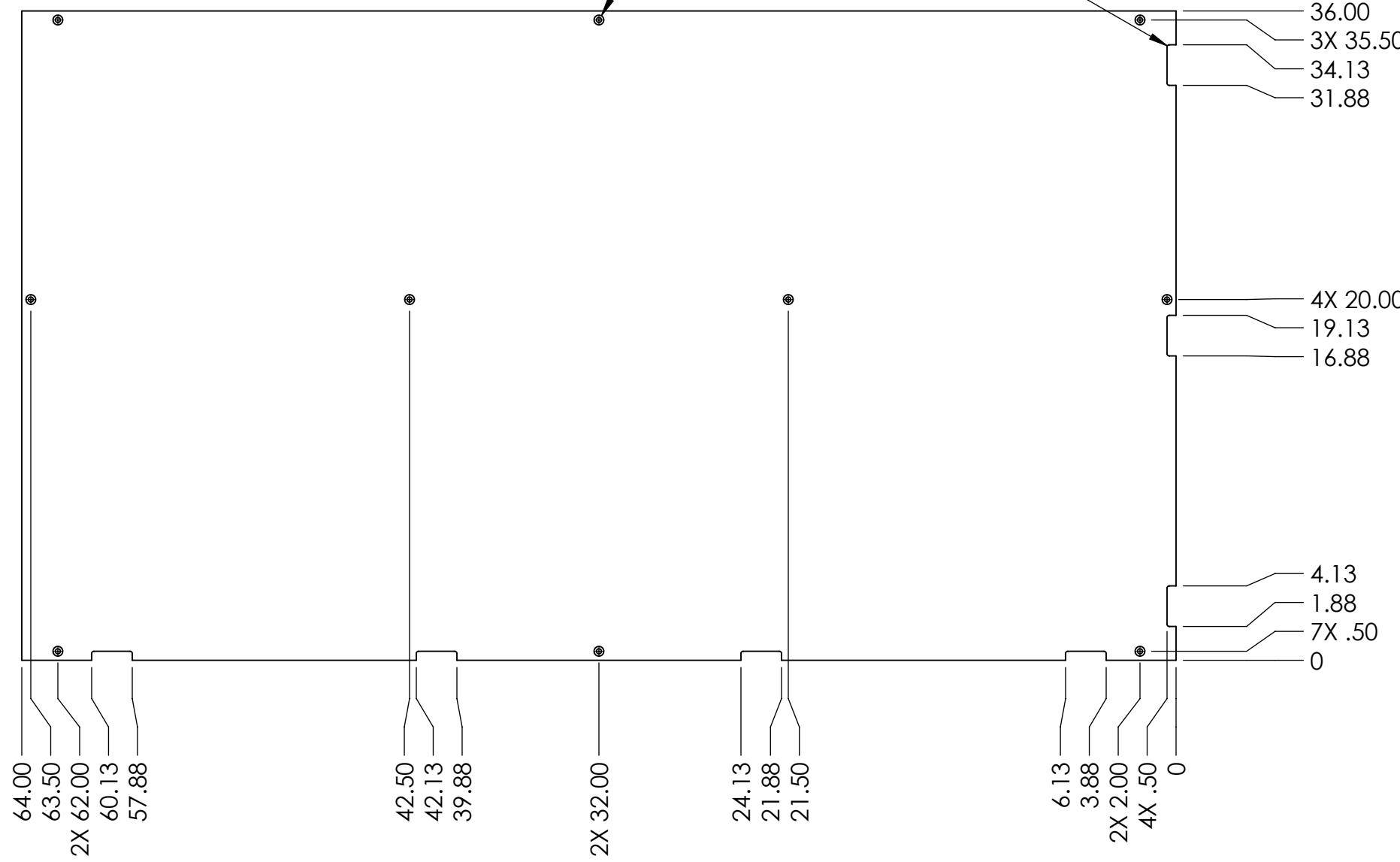
3

2

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B

B



- Notes:
1. Finish: Orange Peel Texture
 2. Remove all burrs and sharp edges.
 3. Tag or label with part number.

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		DRAWN			
		CHECKED			
		ENG APPR.			
		MFG APPR.			
		Q.A.			
		COMMENTS:			
		MATERIAL			
NEXT ASSY	USED ON	FINISH			
	APPLICATION	DO NOT SCALE DRAWING			
SCALE: 1:8	WEIGHT:	SHEET 1 OF 1	SIZE	DWG. NO.	REV
			B	GE-19052	



TITLE:
Level 1 - Top
Right

4

3

2

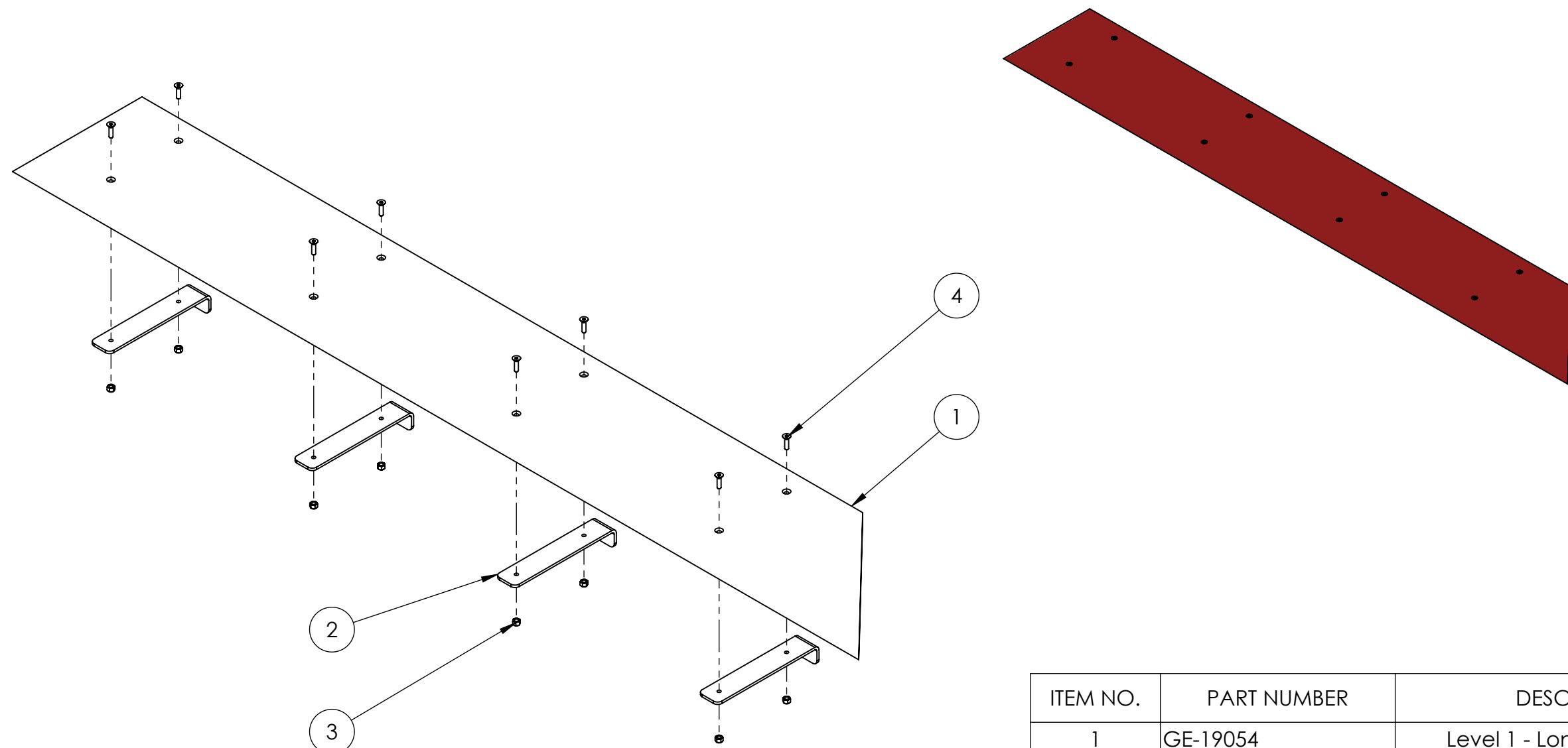
1

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1



ITEM NO.	PART NUMBER	DESCRIPTION	Default/QTY.
1	GE-19054	Level 1 - Long Ramp, Right	1
2	GE-19055	Level 1 - Ramp Support	4
3	nylock_.25_20	Steel Nylon-Insert Locknut, 1/4"-20	8
4	flat_hex_.25_20_1	Steel Hex Flat Head Screw, 1/4"-20 x 1" long, fully threaded	8

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Level 1 - Long Ramp Assembly, Right

SIZE DWG. NO. **B** GE-19053 **REV**

SCALE: 1:8 WEIGHT: SHEET 1 OF 1

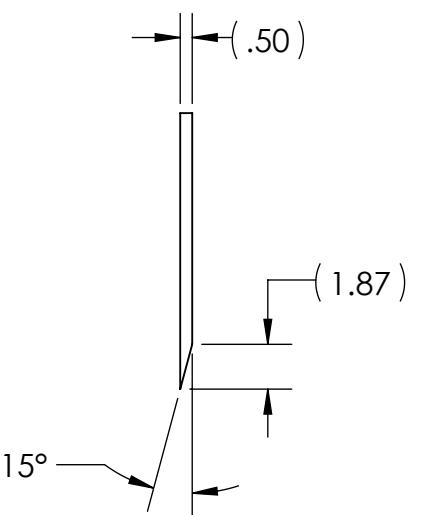
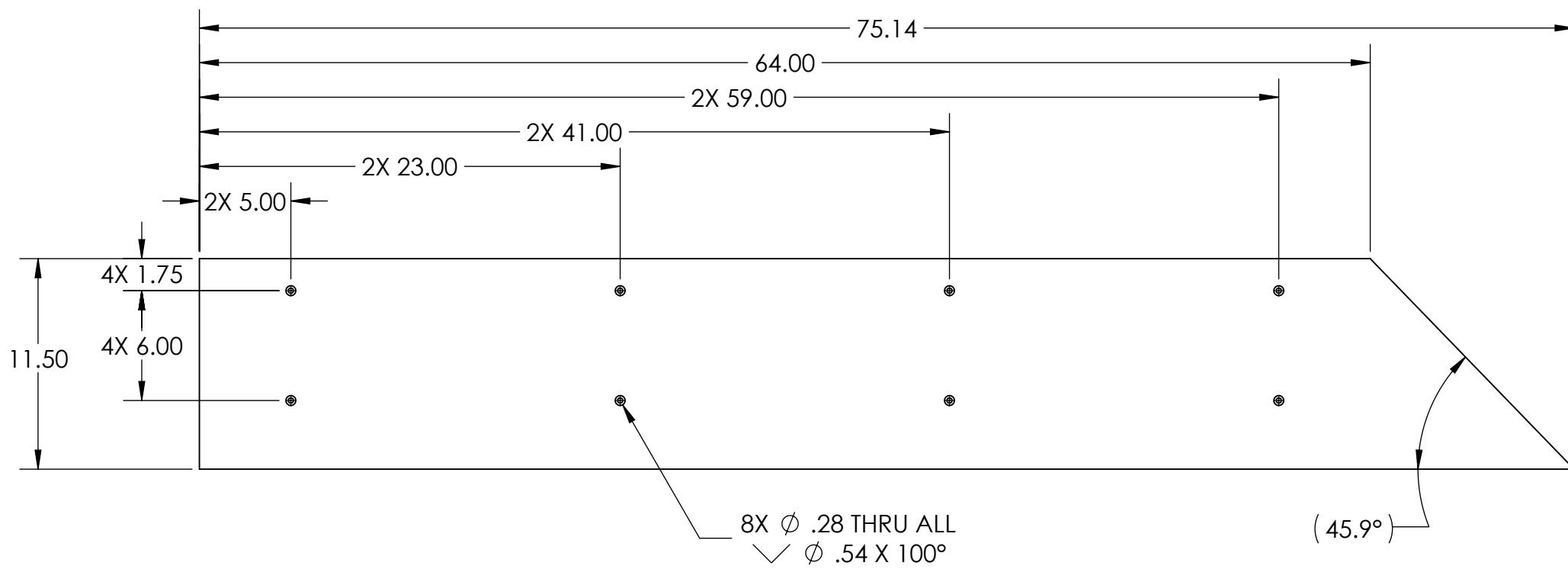
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1



Color Variations	
Part Number	Material
GE-19054-red	1/2" HDPE, Red
GE-19054-blu	1/2" HDPE, Blue
GE-19054-blk	1/2" HDPE, Black

Notes:

1. Finish: Orange Peel Texture
2. Remove all burrs and sharp edges.
3. Tag or label with part number.

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		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL: ±1/16 ANGULAR: MACH ±1° BEND ±1° TWO PLACE DECIMAL: ±.01 THREE PLACE DECIMAL: ±.001	NAME	DATE
DRAWN	DAF	9/7/18		
CHECKED				
ENG APPR.				
MFG APPR.				
Q.A.				
COMMENTS:				
NEXT ASSY	USED ON	MATERIAL		
APPLICATION		FINISH		
DO NOT SCALE DRAWING				

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Level 1 - Long Ramp, Right

SIZE DWG. NO. **B** GE-19054 **REV**

SCALE: 1:8 WEIGHT: SHEET 1 OF 1

4

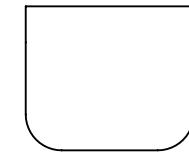
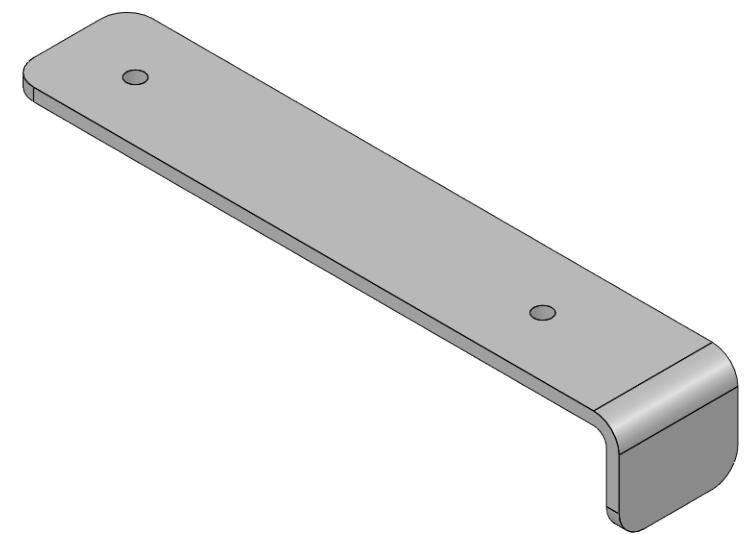
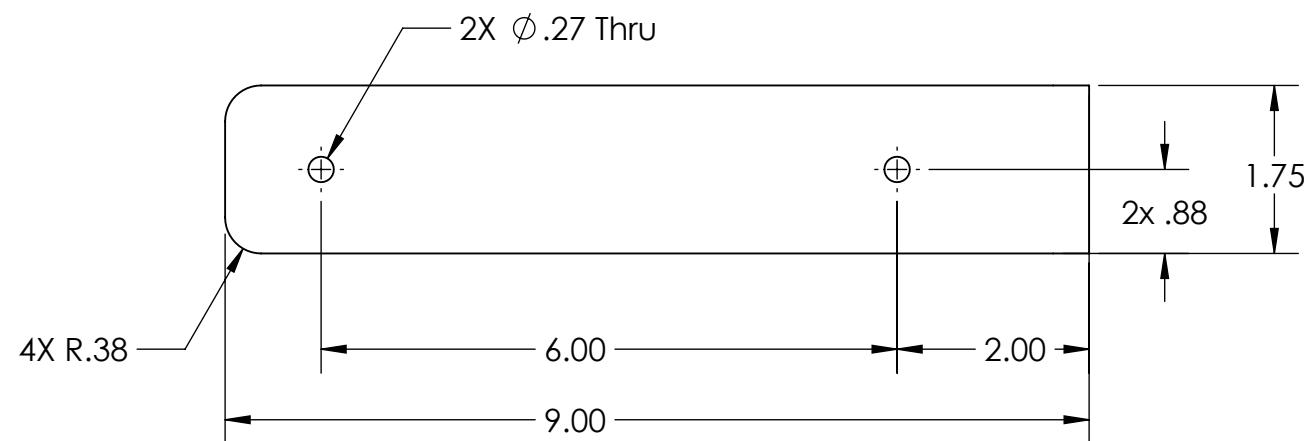
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B

B



NOTES:

- MATERIAL: 6 Ga. Preplated Steel
- Remove all burrs and sharp edges.
- Package or Tag with part number.

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		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL: ±1/16 ANGULAR: MACH ±1° BEND ±1° TWO PLACE DECIMAL ±.01 THREE PLACE DECIMAL ±.001	DRAWN	DAF 6/28/19
			CHECKED	
			ENG APPR.	
			MFG APPR.	
			Q.A.	
			COMMENTS:	
			MATERIAL	
	NEXT ASSY	USED ON	FINISH	
	APPLICATION		DO NOT SCALE DRAWING	

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Level 1 - Ramp Support

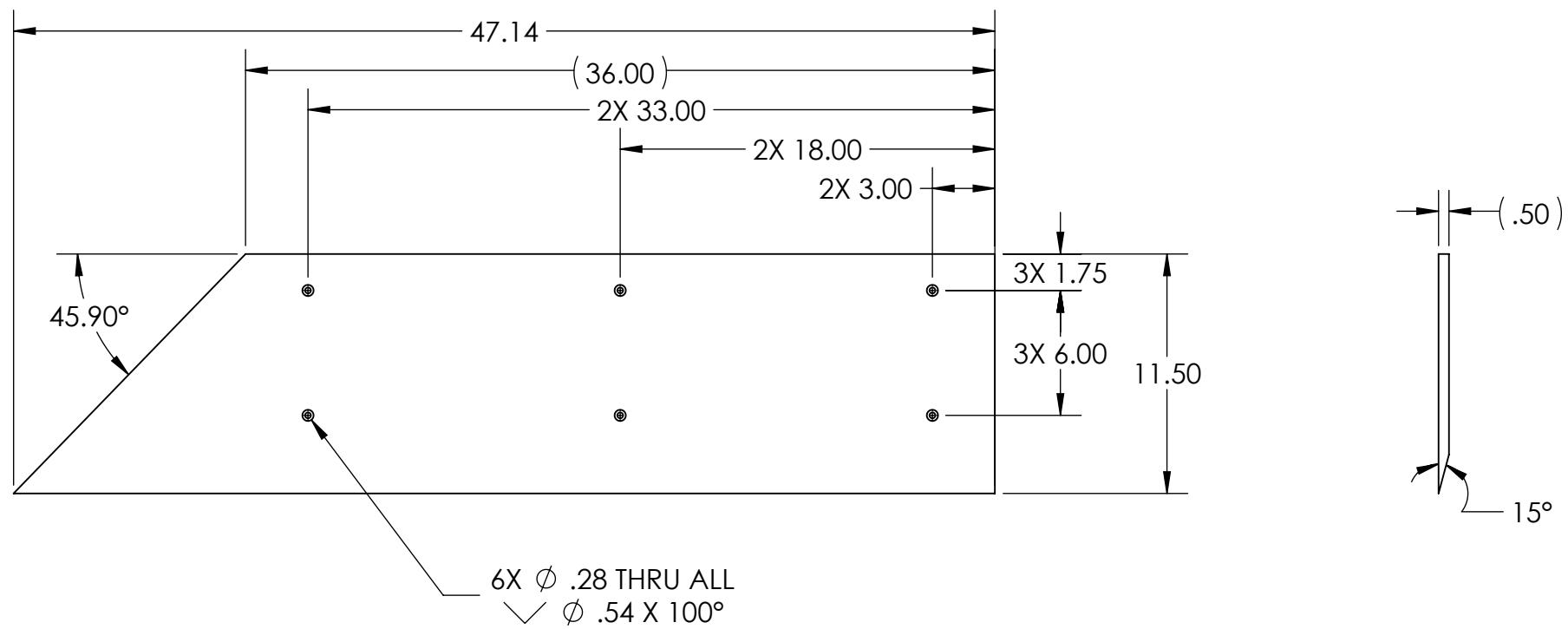
SIZE	DWG. NO.	REV
B	GE-19055	
SCALE: 1:2	WEIGHT:	SHEET 1 OF 1

4

3

2

1



Color Variations	
Part Number	Material
GE-19056-blu	1/2" HDPE, Blue
GE-19056-blk	1/2" HDPE, Black
GE-19056-red	1/2" HDPE, Red

- Notes:
1. Finish: Orange Peel Texture
 2. Tag or label with part number
 3. Remove all burrs and sharp edges

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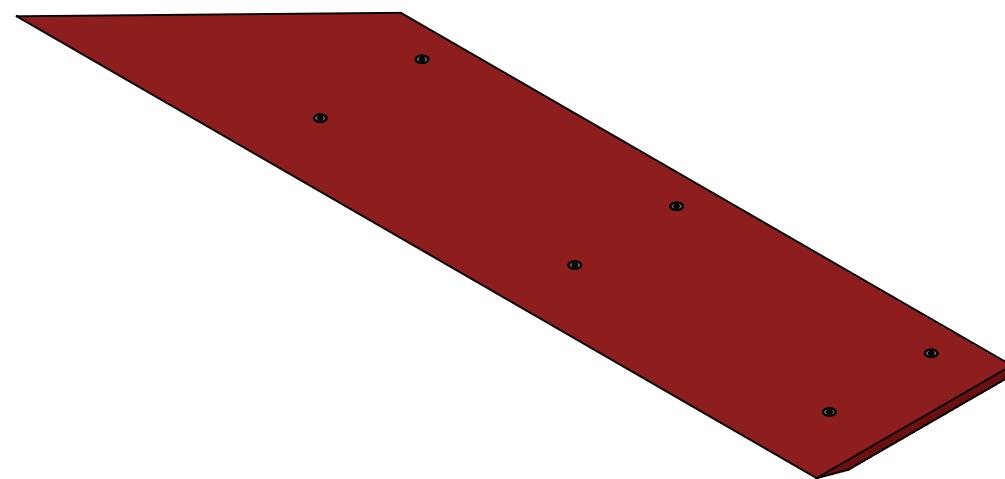
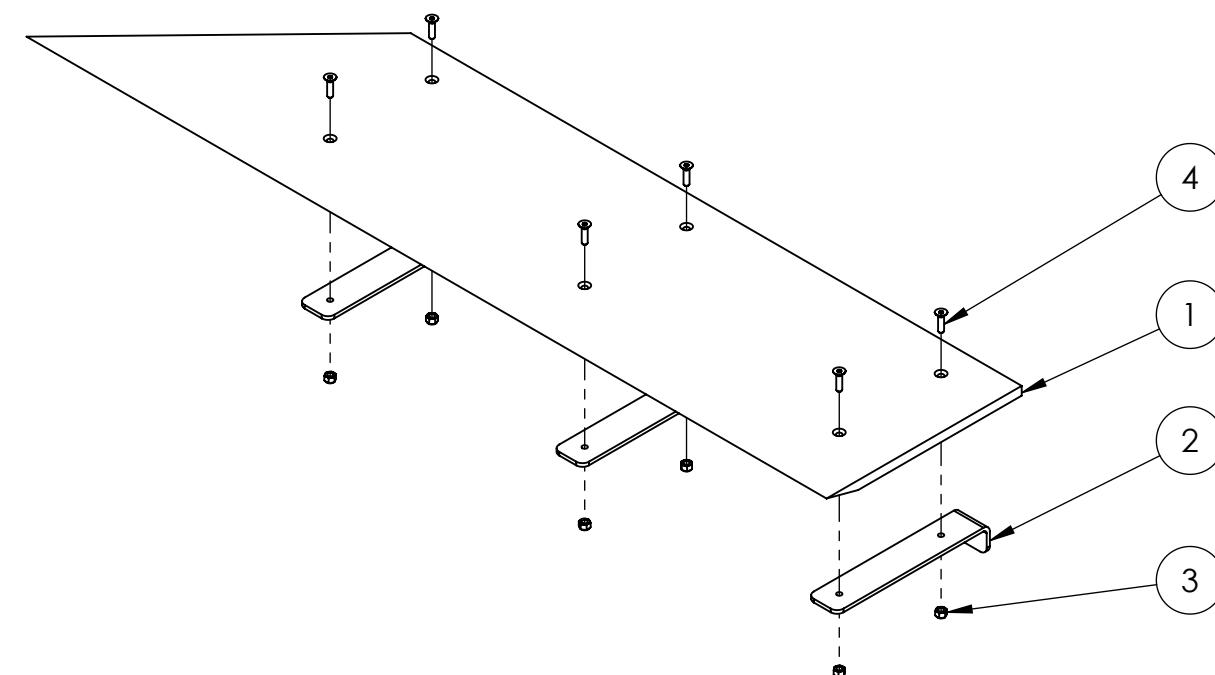
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		DRAWN		
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
		MATERIAL		
		NEXT ASSY	USED ON	FINISH
		APPLICATION	DO NOT SCALE DRAWING	
SIZE	DWG. NO.	REV		
B	GE-19056			
SCALE: 1:8	WEIGHT:	SHEET 1 OF 1		

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1



ITEM NO.	PART NUMBER	DESCRIPTION	Default/QTY.
1	GE-19056	Level 1 - Short Ramp, Right	1
2	GE-19055	Level 1 - Ramp Support	3
3	nylock_.25_20	Steel Nylon-Insert Locknut, 1/4"-20	6
4	flat_hex_.25_20_1	Steel Hex Flat Head Screw, 1/4"-20 x 1" long, fully threaded	6

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
 Modeling Solutions Partner

TITLE: Level 1 - Short Ramp Assembly, Right

SIZE DWG. NO. **B** GE-19057 **REV**

SCALE: 1:8 WEIGHT: SHEET 1 OF 1

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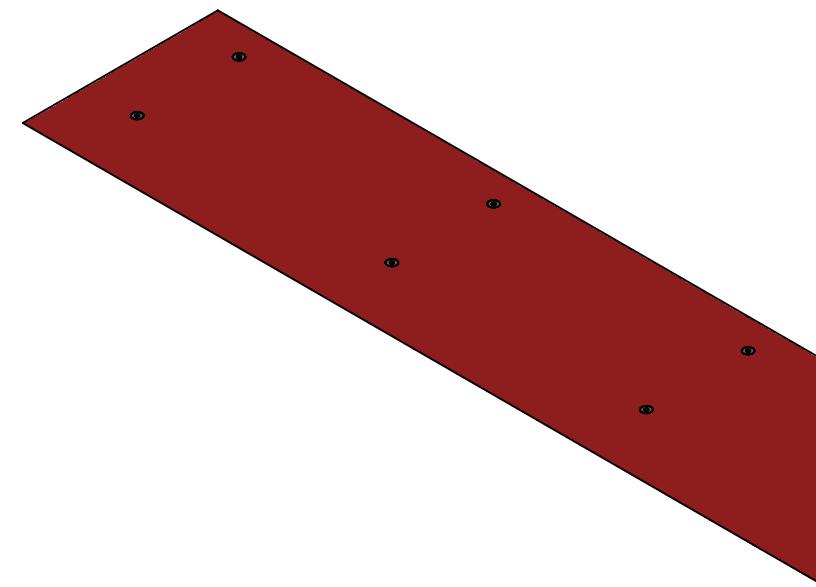
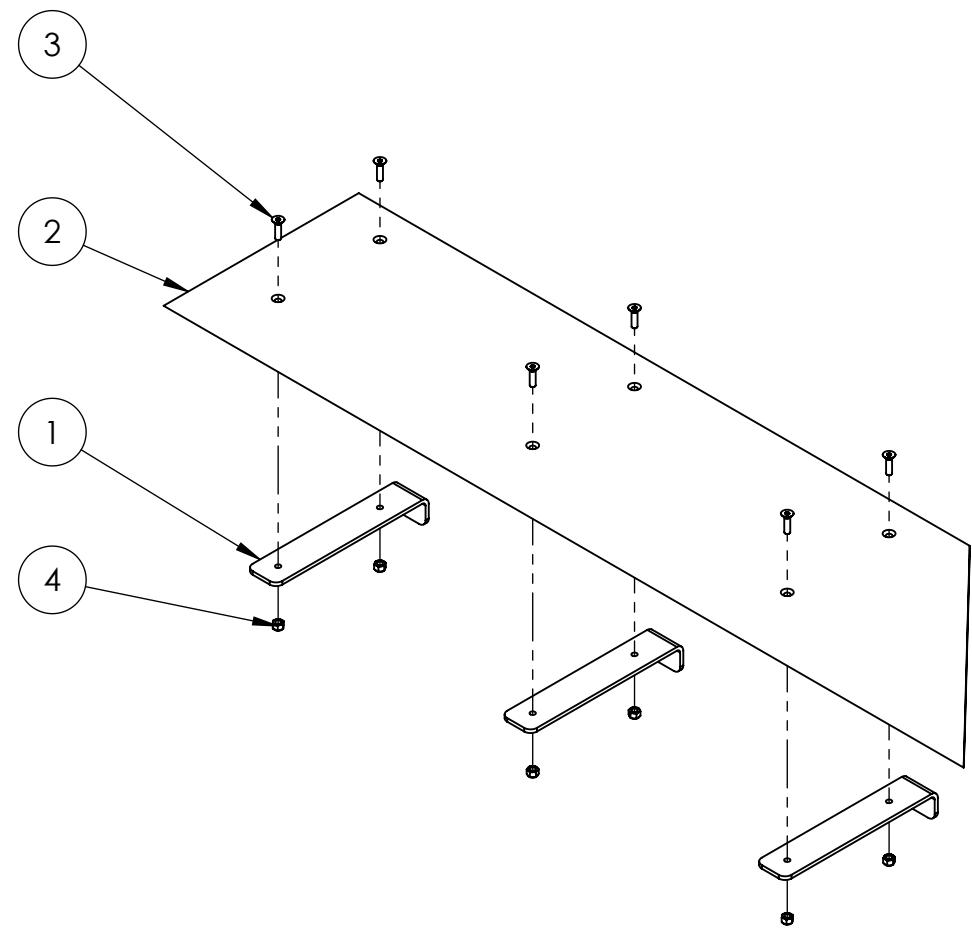
A

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1



B

B

A

A

ITEM NO.	PART NUMBER	DESCRIPTION	Default/QTY.
1	GE-19055	Level 1 - Ramp Support	3
2	GE-19059	Level 1 - Short Ramp, Left	1
3	flat_hex_.25_20_1	Steel Hex Flat Head Screw, 1/4"-20 x 1" long, fully threaded	6
4	nylock_.25_20	Steel Nylon-Insert Locknut, 1/4"-20	6

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Level 1 - Short Ramp Assembly, Left

SIZE DWG. NO. **B** GE-19058 **REV**

SCALE: 1:8 WEIGHT: SHEET 1 OF 1

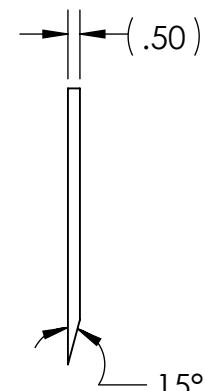
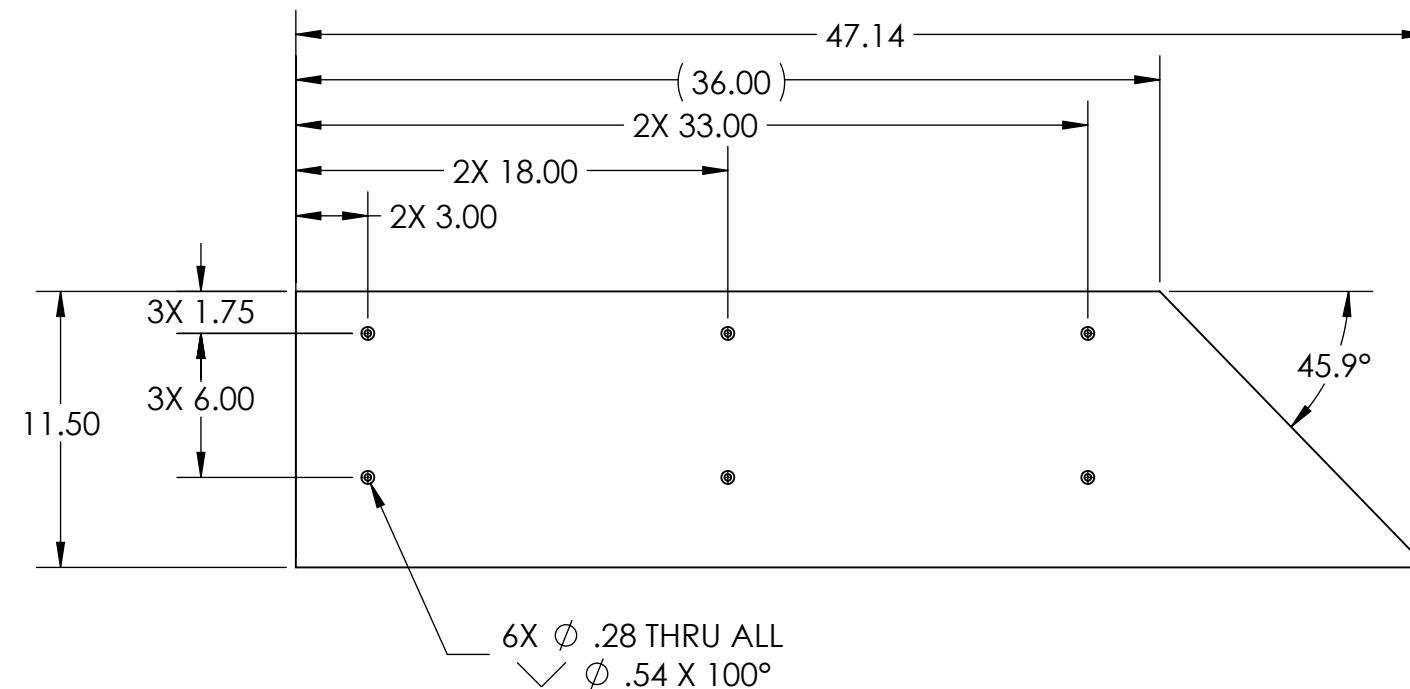
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PERMISSION OF **FIRST** IS PROHIBITED.

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3

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1



Color Variations	
Part Number	Material
GE-19059-blk	1/2" HDPE, Black
GE-19059-blu	1/2" HDPE, Blue
GE-19059-red	1/2" HDPE, Red

- Notes:
1. Finish: Orange Peel Texture
 2. Tag or label with part number
 3. Remove all burrs and sharp edges

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		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL: ±1/16 ANGULAR: MACH ±1° BEND ±1° TWO PLACE DECIMAL: ±.01 THREE PLACE DECIMAL: ±.001	NAME	DATE
		DRAWN	DAF	9/10/18
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
		MATERIAL		
NEXT ASSY	USED ON	FINISH		
APPLICATION		DO NOT SCALE DRAWING		
SCALE: 1:8	WEIGHT:	SHEET 1 OF 1		

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Level 1 - Short Ramp, Left

B **GE-19059** **REV**

4

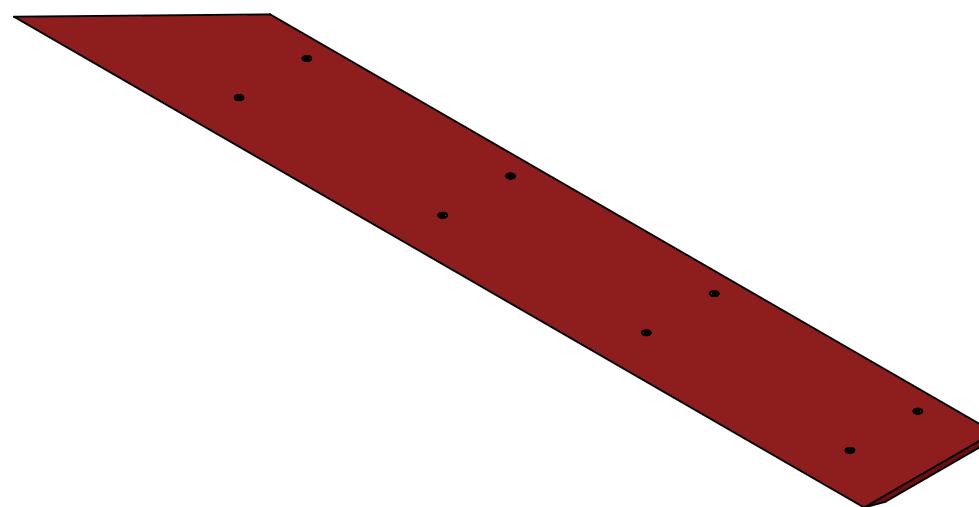
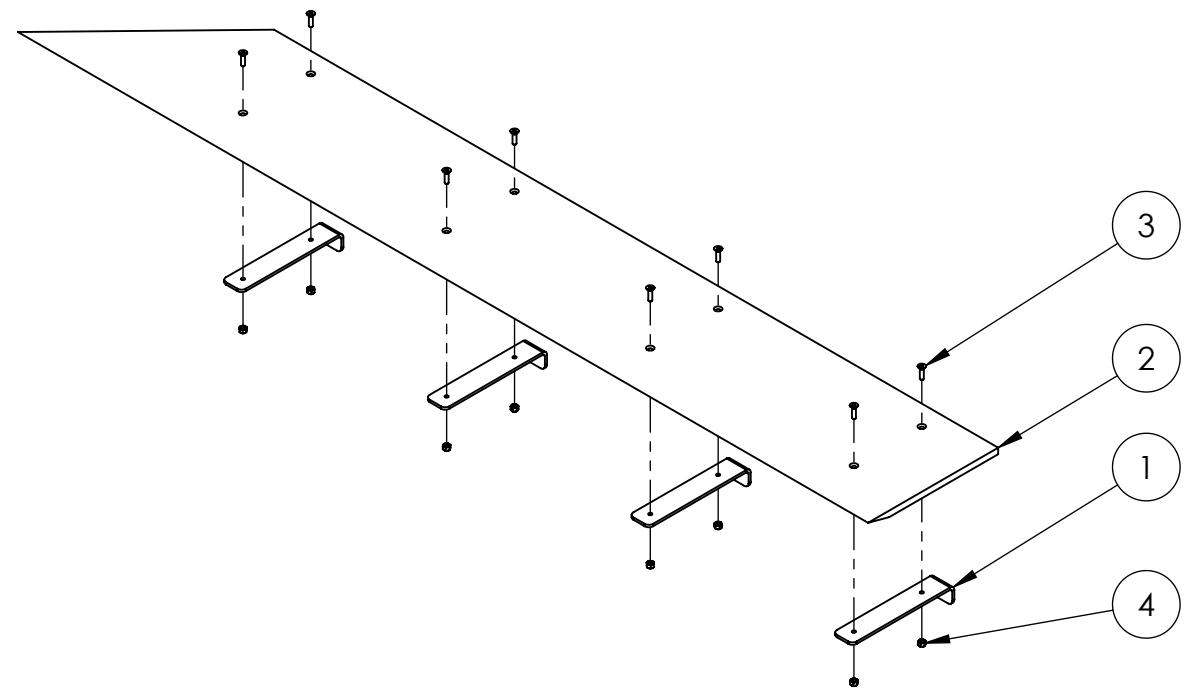
3

2

1

B

B



ITEM NO.	PART NUMBER	DESCRIPTION	Default/QTY.
1	GE-19055	Level 1 - Ramp Support	4
2	GE-19061	Level 1 - Long Ramp, Left	1
3	flat_hex_.25_20_1	Steel Hex Flat Head Screw, 1/4"-20 x 1" long, fully threaded	8
4	nylock_.25_20	Steel Nylon-Insert Locknut, 1/4"-20	8

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
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TITLE: Level 1 - Long Ramp Assembly, Left

SIZE DWG. NO. **B** GE-19060 **REV**

SCALE: 1:12 WEIGHT: SHEET 1 OF 1

4

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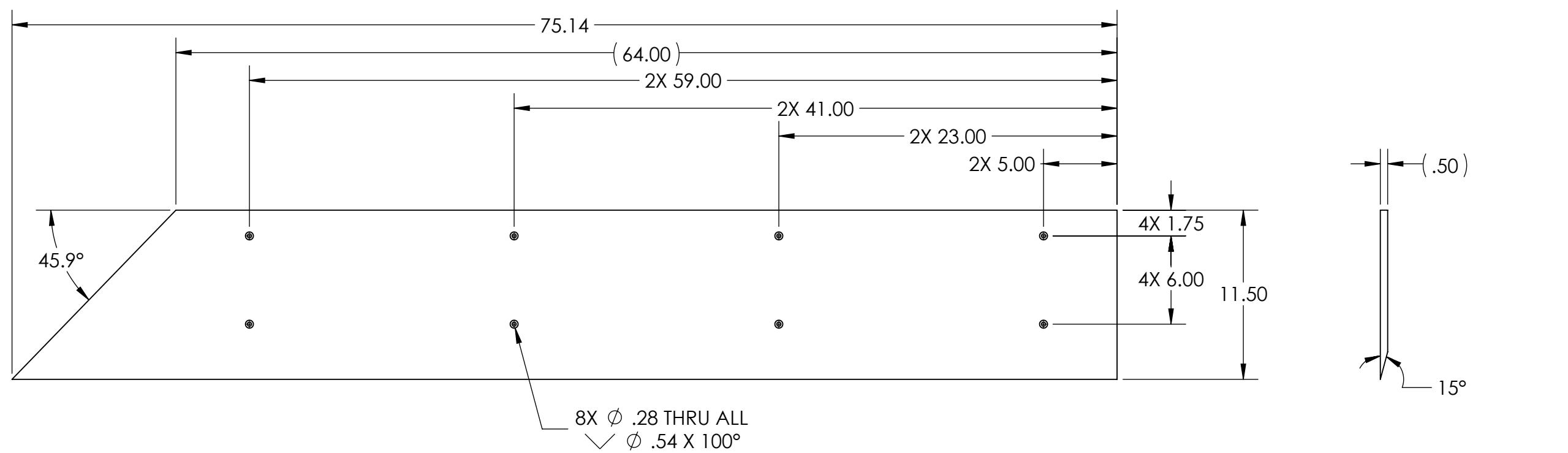
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4

3

2

1



Color Variations	
Part Number	Material
GE-19061-blk	1/2" HDPE, Black
GE-19061-blu	1/2" HDPE, Blue
GE-19061-red	1/2" HDPE, Red

- Notes:
1. Finish: Orange Peel Texture
 2. Tag or label with part number
 3. Remove all burrs and sharp edges

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		DRAWN	DAF	9/10/18
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
		MATERIAL		
NEXT ASSY	USED ON	FINISH		
APPLICATION		DO NOT SCALE DRAWING		
SCALE: 1:8		WEIGHT:	SHEET 1 OF 1	

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
**Level 1 - Long
Ramp, Left**

SIZE DWG. NO. REV
B GE-19061

4

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4

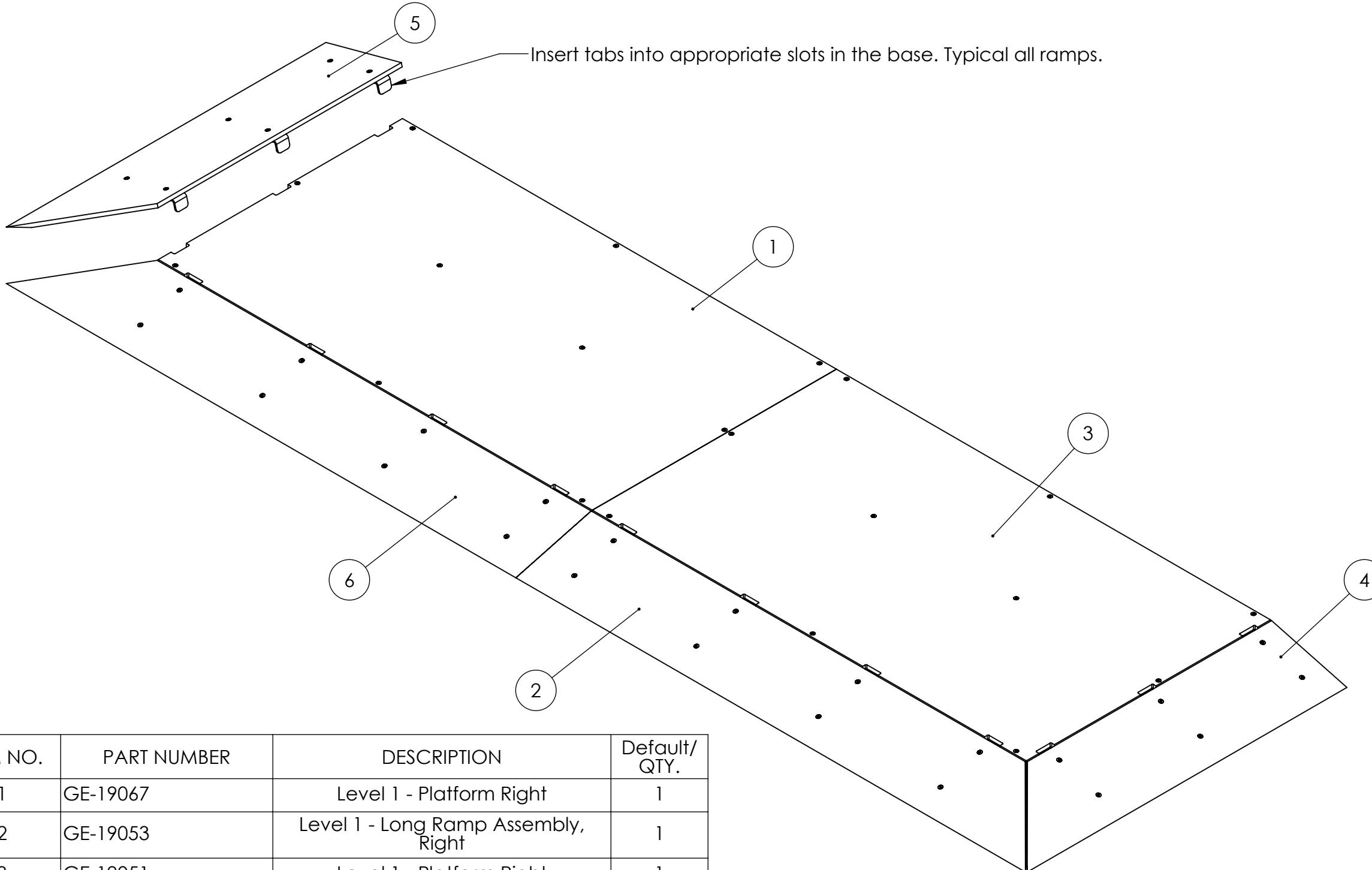
3

2

1

B

B



ITEM NO.	PART NUMBER	DESCRIPTION	Default/QTY.
1	GE-19067	Level 1 - Platform Right	1
2	GE-19053	Level 1 - Long Ramp Assembly, Right	1
3	GE-19051	Level 1 - Platform Right	1
4	GE-19057	Level 1 - Short Ramp Assembly, Right	1
5	GE-19058	Level 1 - Short Ramp Assembly, Left	1
6	GE-19060	Level 1 - Long Ramp Assembly, Left	1

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		UNLESS OTHERWISE SPECIFIED:	NAME	DATE
		DIMENSIONS ARE IN INCHES	DRAWN	DAF
		TOLERANCES:		9/10/18
		FRACTIONAL 1/16	CHECKED	
		ANGULAR: MACH 1° BEND 1°	ENG APPR.	
		TWO PLACE DECIMAL .01	MFG APPR.	
		THREE PLACE DECIMAL .001	Q.A.	
			COMMENTS:	
		INTERPRET GEOMETRIC TOLERANCING PER:		
		MATERIAL		
		NEXT ASSY	USED ON	FINISH
		APPLICATION	DO NOT SCALE DRAWING	
SIZE	DWG. NO.	REV		
B	GE-19062			
SCALE: 1:12	WEIGHT:	SHEET 1 OF 1		

 FIRST ROBOTICS COMPETITION  SOLIDWORKS
Modeling Solutions Partner

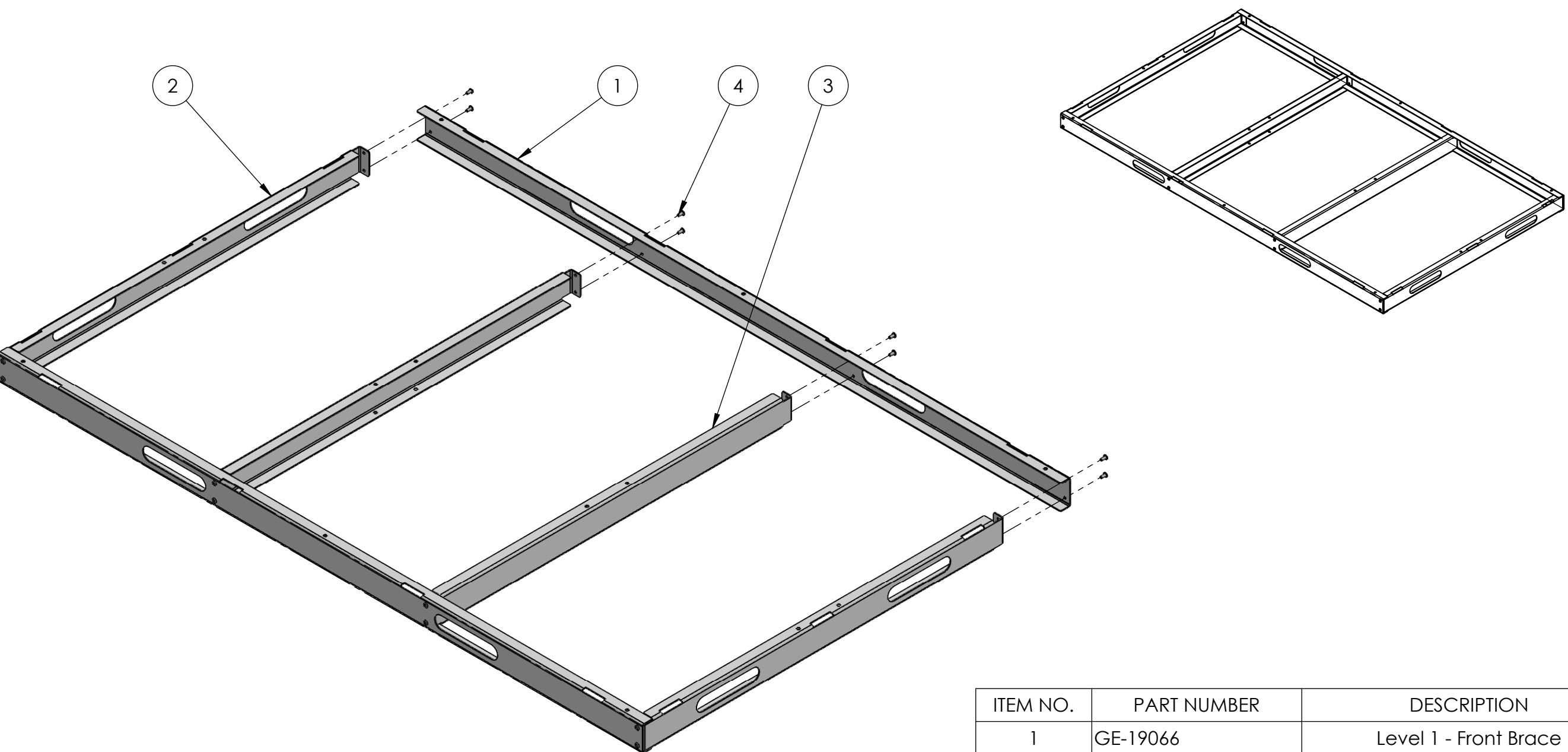
Level 1 - Assembly

4

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2

1



Notes:

1. Rivets should be plated or stainless steel.
2. Tag or label with part number.

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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-19066	Level 1 - Front Brace	2
2	GE-19064	Level 1 - Side Brace	2
3	GE-19065	Level 1 - Middle Brace	2
4	rivet_.1875_.126-.25	3/16" Rivet, .126-.25 Grip Range	16

		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL: ±1/16 ANGULAR: MACH ±1° BEND ±1° TWO PLACE DECIMAL ±.01 THREE PLACE DECIMAL ±.001		NAME	DATE
		DRAWN			
		CHECKED			
		ENG APPR.			
		MFG APPR.			
		Q.A.			
		COMMENTS:			
SIZE	DWG. NO.			REV	
B	GE-19063				
SCALE: 1:8	WEIGHT:			SHEET 1 OF 1	

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
Level 1 - Frame

4

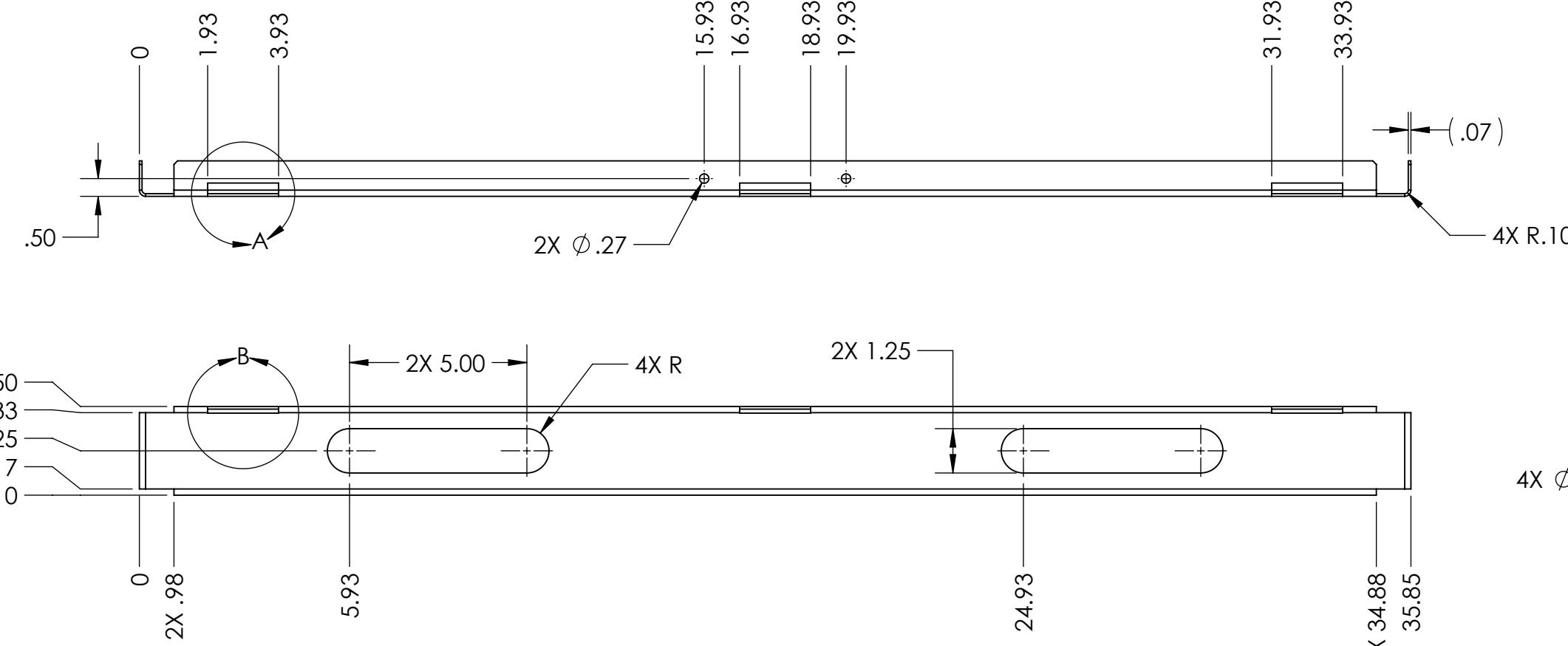
3

2

1

B

B

DETAIL A
SCALE 1 : 2DETAIL B
SCALE 1 : 2

- Notes:
1. Material: 14 Ga. Pre-plated steel
 2. Remove all burrs and sharp edges.

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		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL: ±1/16 ANGULAR: MACH ±1° BEND ±1° TWO PLACE DECIMAL ±.01 THREE PLACE DECIMAL ±.001	DRAWN	NAME	DATE
			CHECKED		
			ENG APPR.		
			MFG APPR.		
			Q.A.		
			COMMENTS:		
			MATERIAL		
	NEXT ASSY	USED ON	FINISH		
			APPLICATION	DO NOT SCALE DRAWING	
SIZE	DWG. NO.	REV			
B	GE-19064				
SCALE: 1:4	WEIGHT:	SHEET 1 OF 1			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:

Level 1 - Side
Brace

4

3

2

1

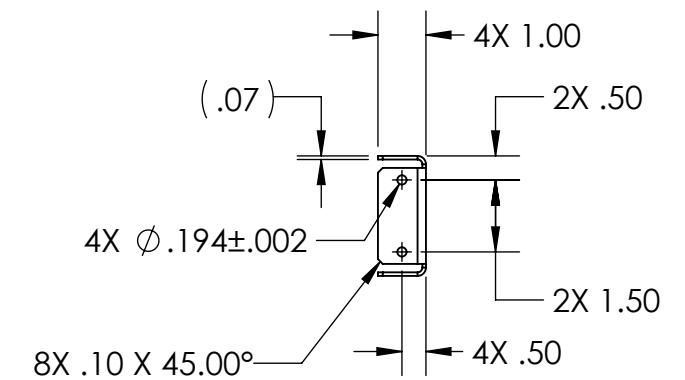
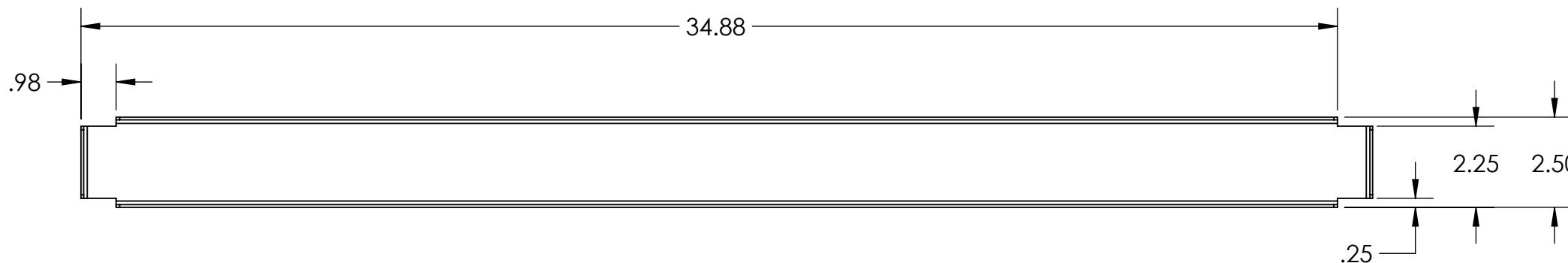
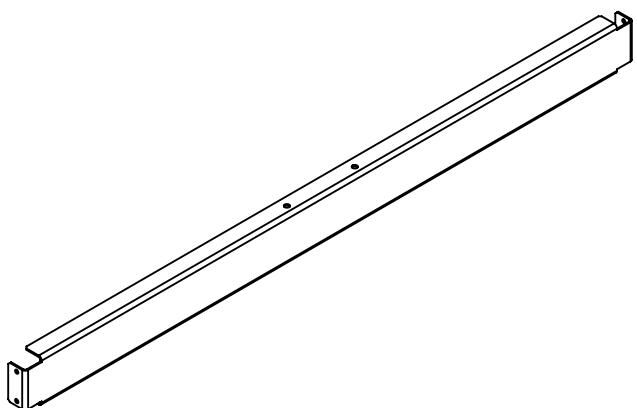
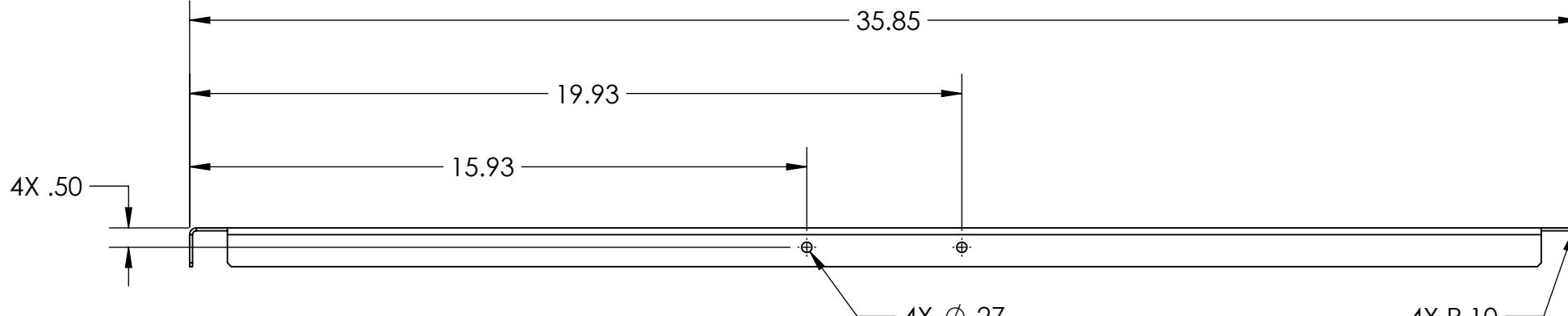
4

3

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1

B



- Notes:
1. Material: 14 GA. Preplated Steel.
 2. Remove all burrs and sharp edges

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		DRAWN	DAF	9/6/18
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
MATERIAL				
NEXT ASSY	USED ON	FINISH		
APPLICATION		DO NOT SCALE DRAWING		

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Level 1 - Middle Brace

SIZE	DWG. NO.	REV
B	GE-19065	

SCALE: 1:4 WEIGHT: SHEET 1 OF 1

4

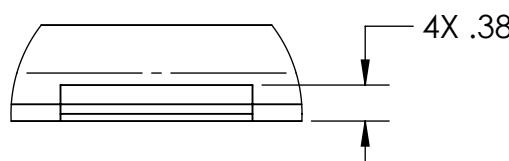
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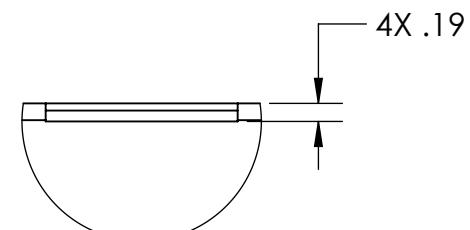
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B

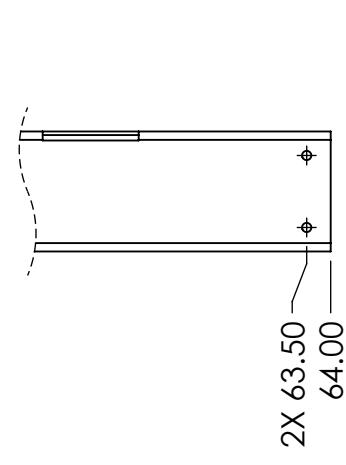
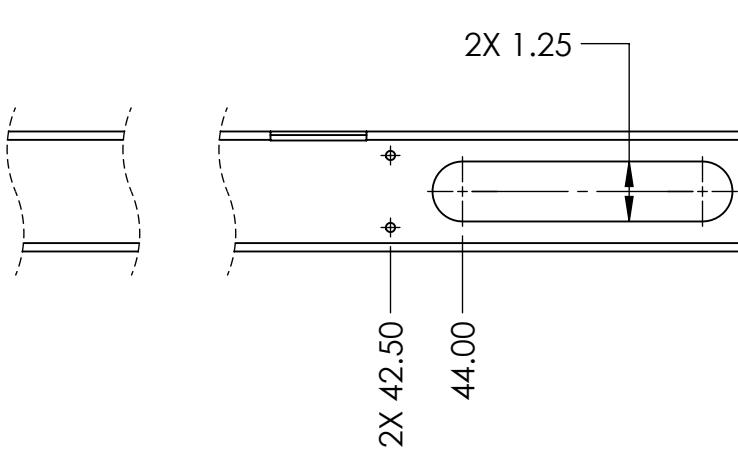
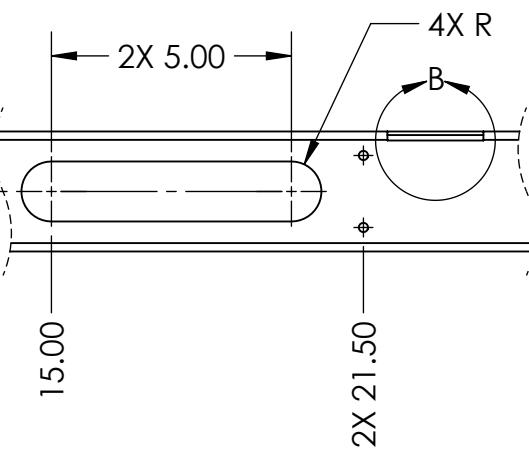
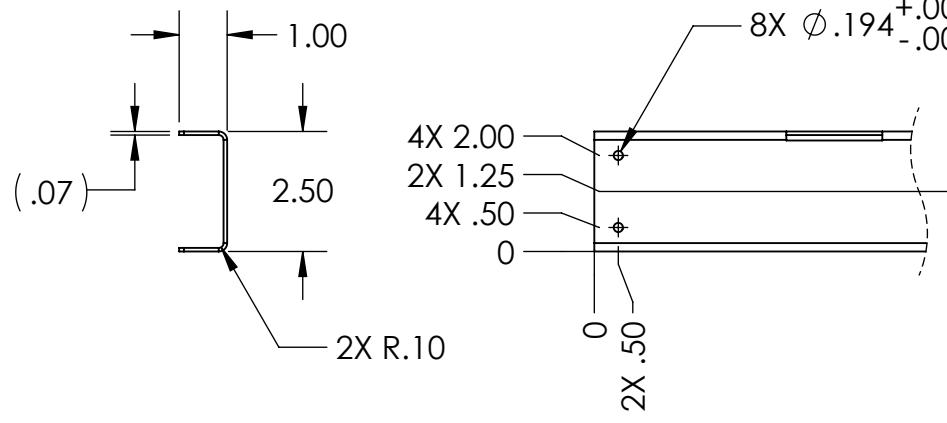
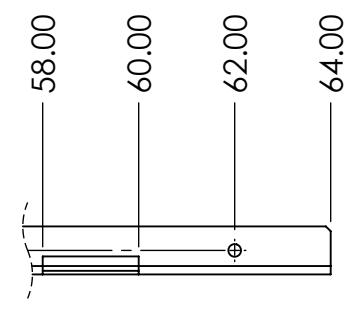
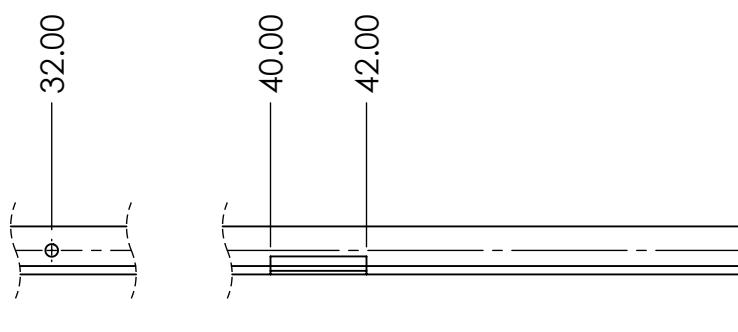
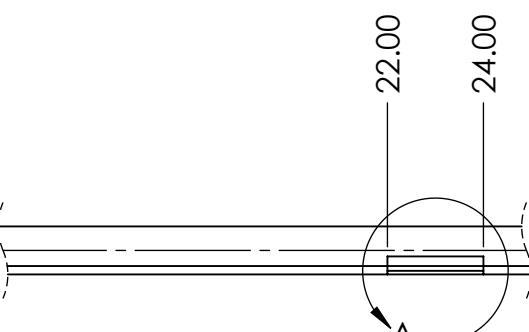
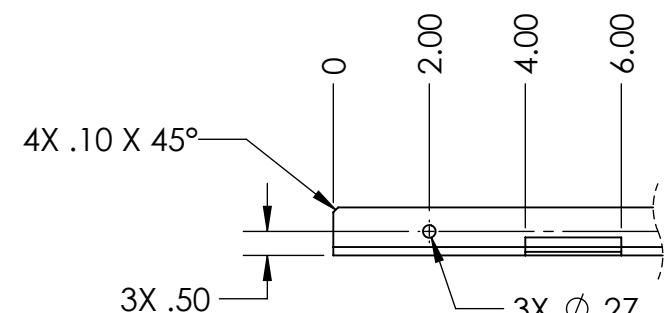
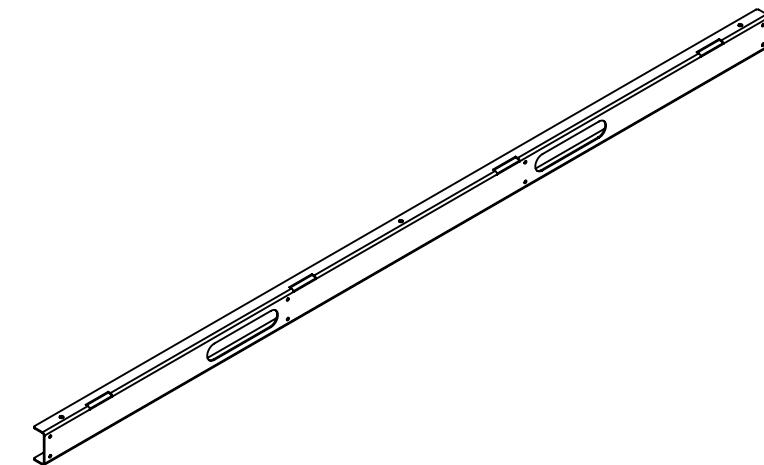
B



DETAIL A
SCALE 1 : 2



DETAIL B
SCALE 1 : 2



- Notes:
1. Material: 14 GA, Preplated Steel.
 2. Remove all burrs and sharp edges.

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		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
		MATERIAL		
	NEXT ASSY	USED ON	FINISH	
		APPLICATION	DO NOT SCALE DRAWING	
SIZE	DWG. NO.		REV	
B	GE-19066			
SCALE: 1:4	WEIGHT:	SHEET 1 OF 1		

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
**Level 1 - Front
Brace**

4

3

2

1

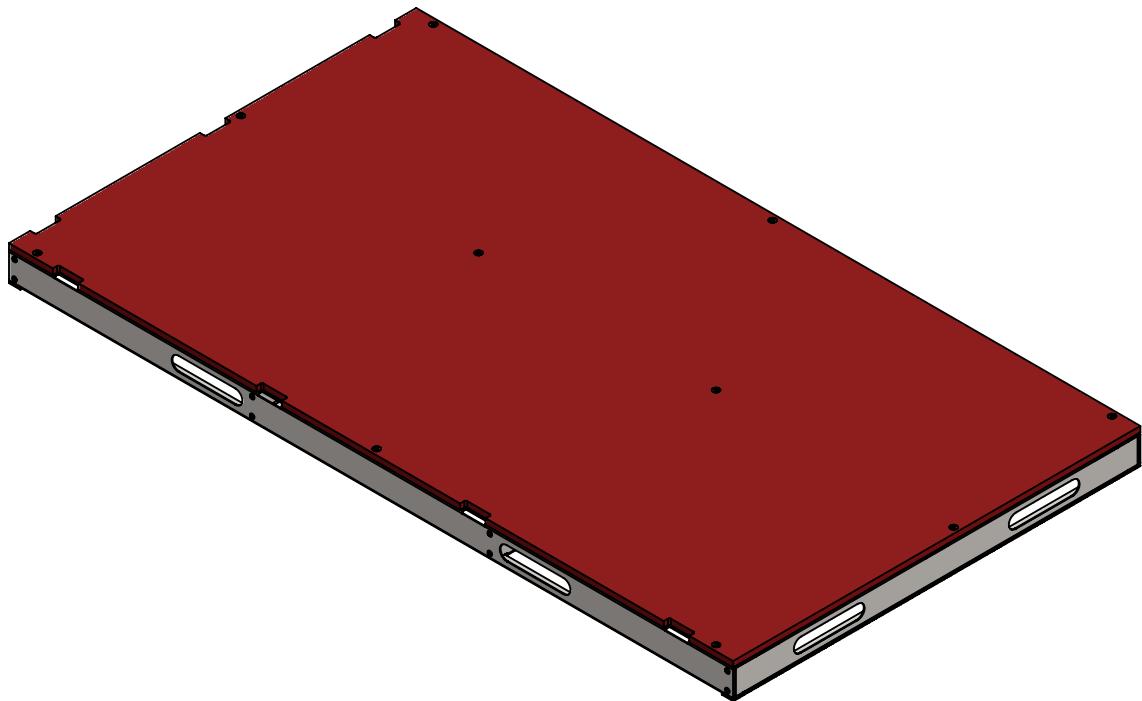
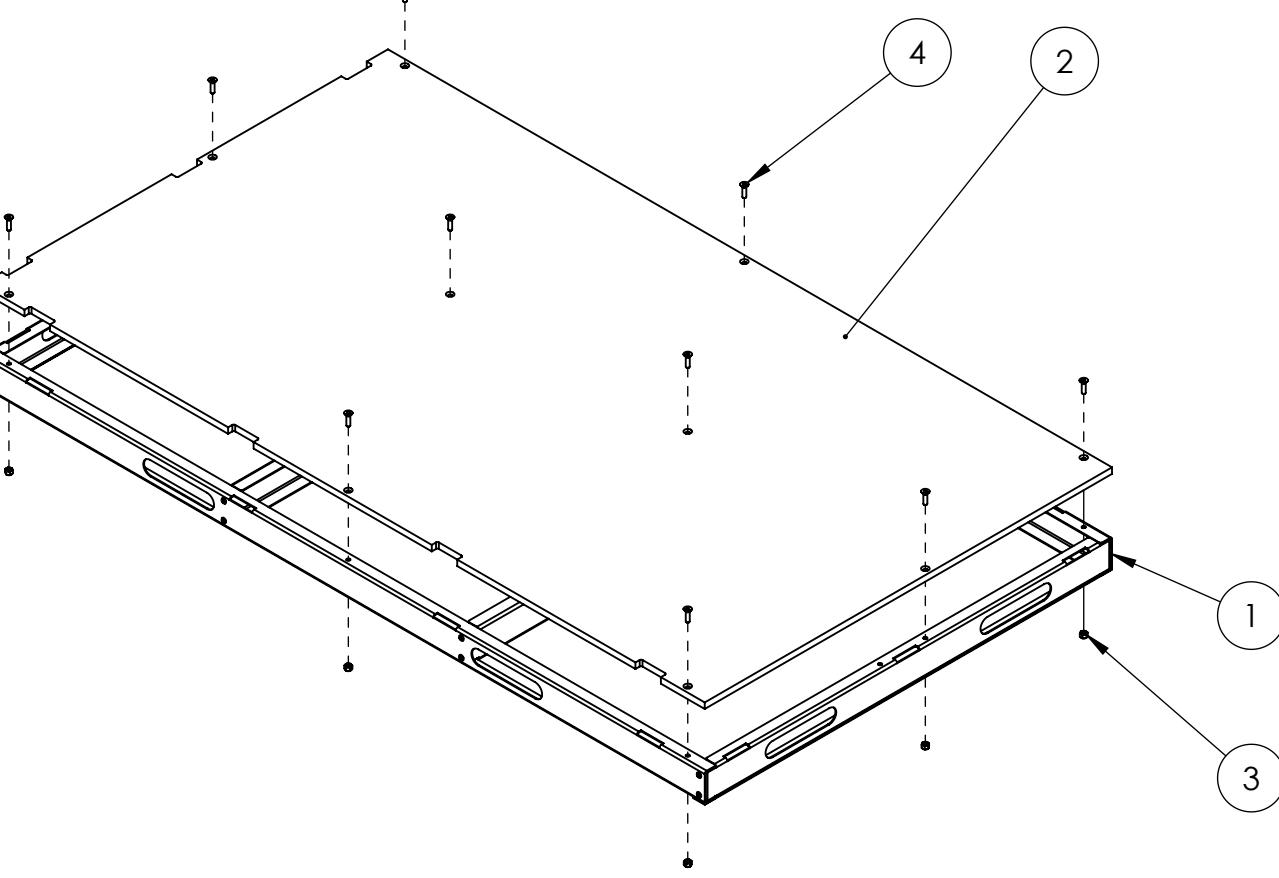
4

3

2

1

B



B

A

A

ITEM NO.	PART NUMBER	DESCRIPTION	GE-19067/QTY.
1	GE-19063	Level 1 - Frame	1
2	GE-19068	Level 1 - Top Left	1
3	nylock_.25_20	Steel Nylon-Insert Locknut, 1/4"-20	10
4	flat_hex_.25_20_1	Steel Hex Flat Head Screw, 1/4"-20 x 1" long, fully threaded	10
5	Hook_1_36	1" x 36" Hook, Adhesive Backed	2

		UNLESS OTHERWISE SPECIFIED:		NAME	DATE
		DIMENSIONS ARE IN INCHES	DRAWN		
		TOLERANCES:	CHECKED		
		FRACTIONAL 1/16	ENG APPR.		
		ANGULAR: MACH 1° BEND 1°	MFG APPR.		
		TWO PLACE DECIMAL .01	Q.A.		
		THREE PLACE DECIMAL .001	COMMENTS:		
		INTERPRET GEOMETRIC			
		TOLERANCING PER:			
		MATERIAL			
		NEXT ASSY	USED ON	FINISH	
		APPLICATION	DO NOT SCALE DRAWING		
SIZE	DWG. NO.	REV			
B	GE-19067				
SCALE: 1:12	WEIGHT:	SHEET 1 OF 2			

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FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:

**Level 1 -
Platform Left**

SIZE DWG. NO. REV
B GE-19067

SCALE: 1:12 WEIGHT: SHEET 1 OF 2

4

3

2

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4

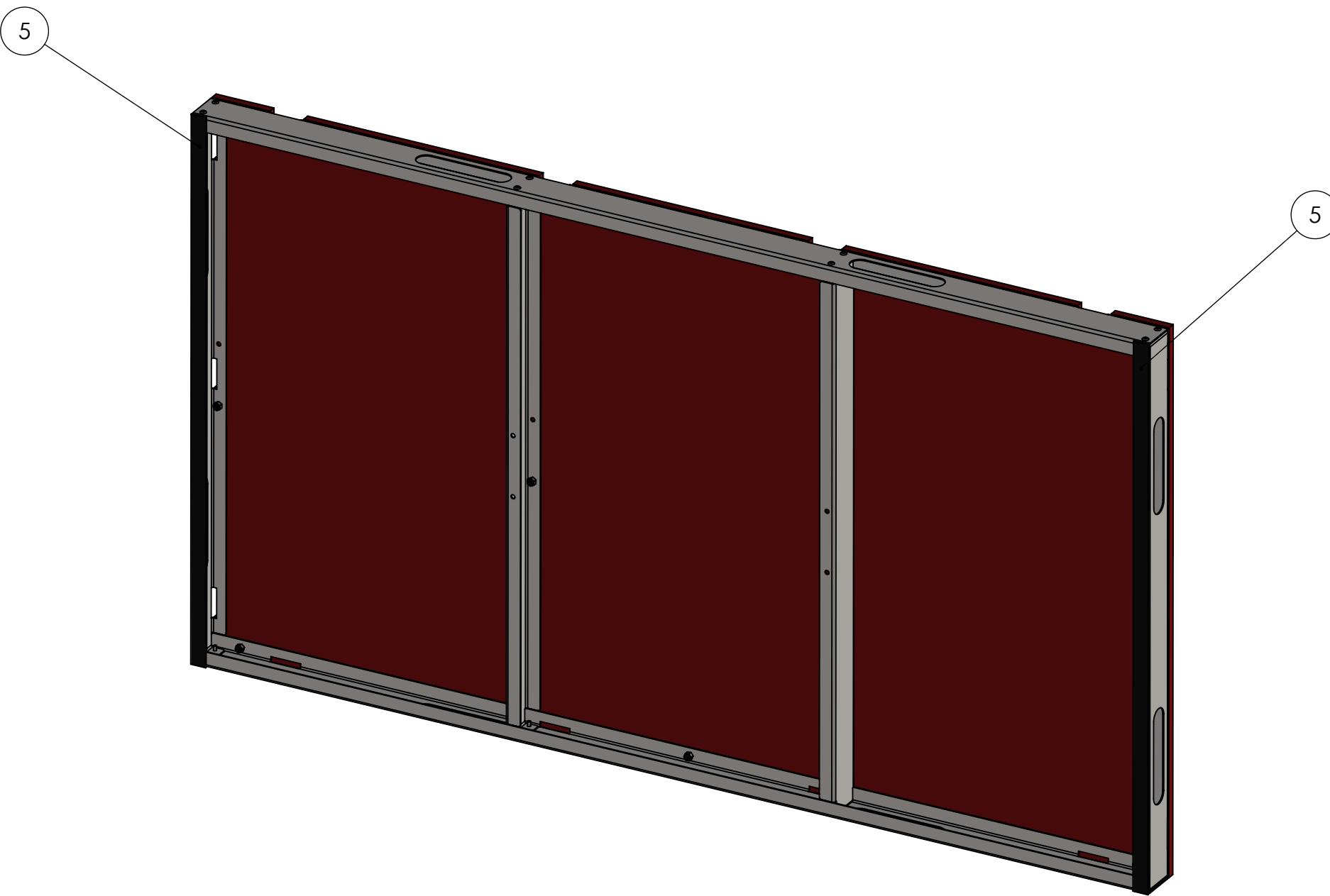
3

2

1

B

B



- Notes:
1. Clean surface of metal underneath Item 5 prior to application.

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Level 1 - Platform Left

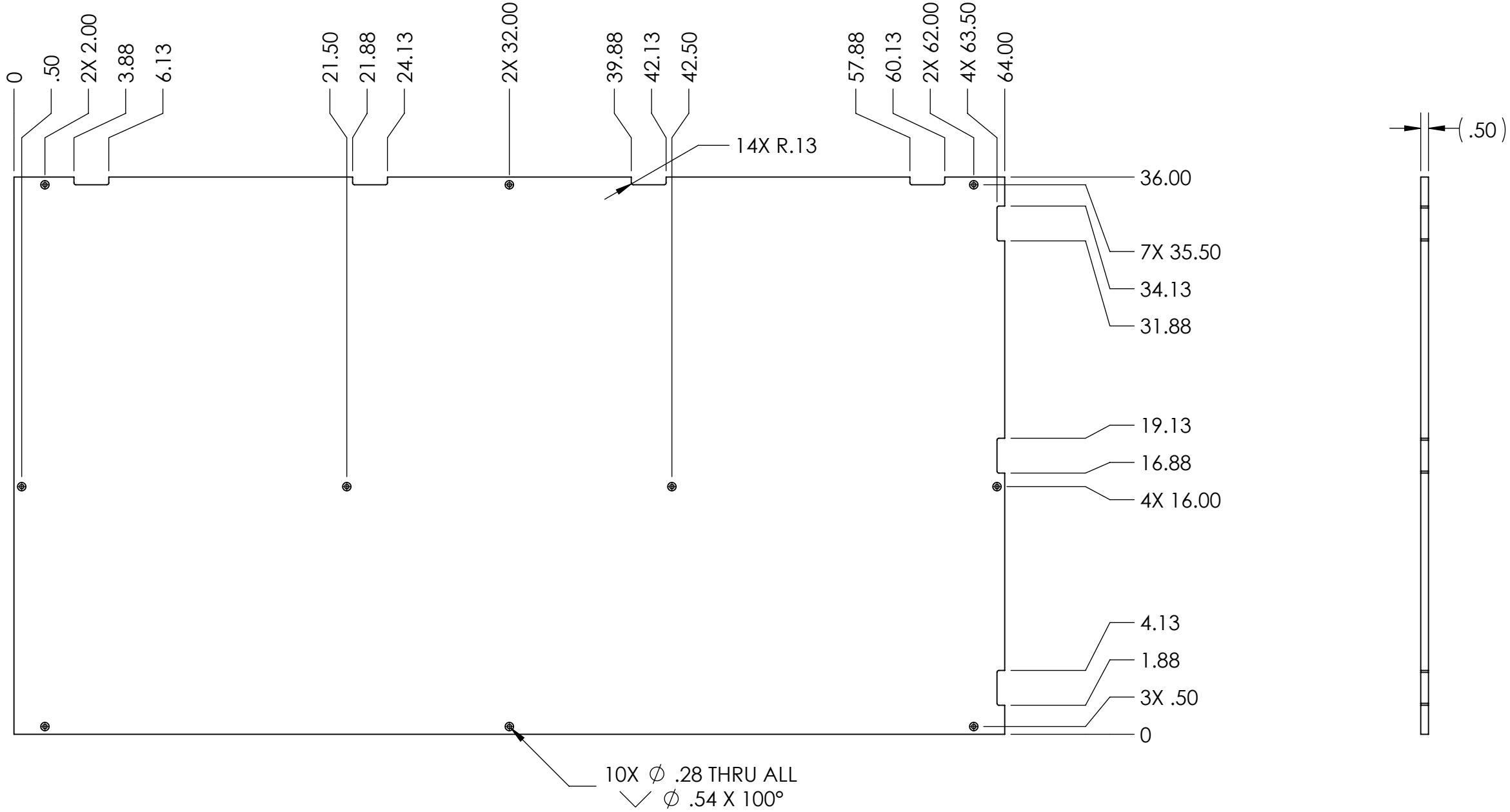
SIZE	DWG. NO.	REV
B	GE-19067	
SCALE: 1:12	WEIGHT:	SHEET 2 OF 2

4

3

2

1



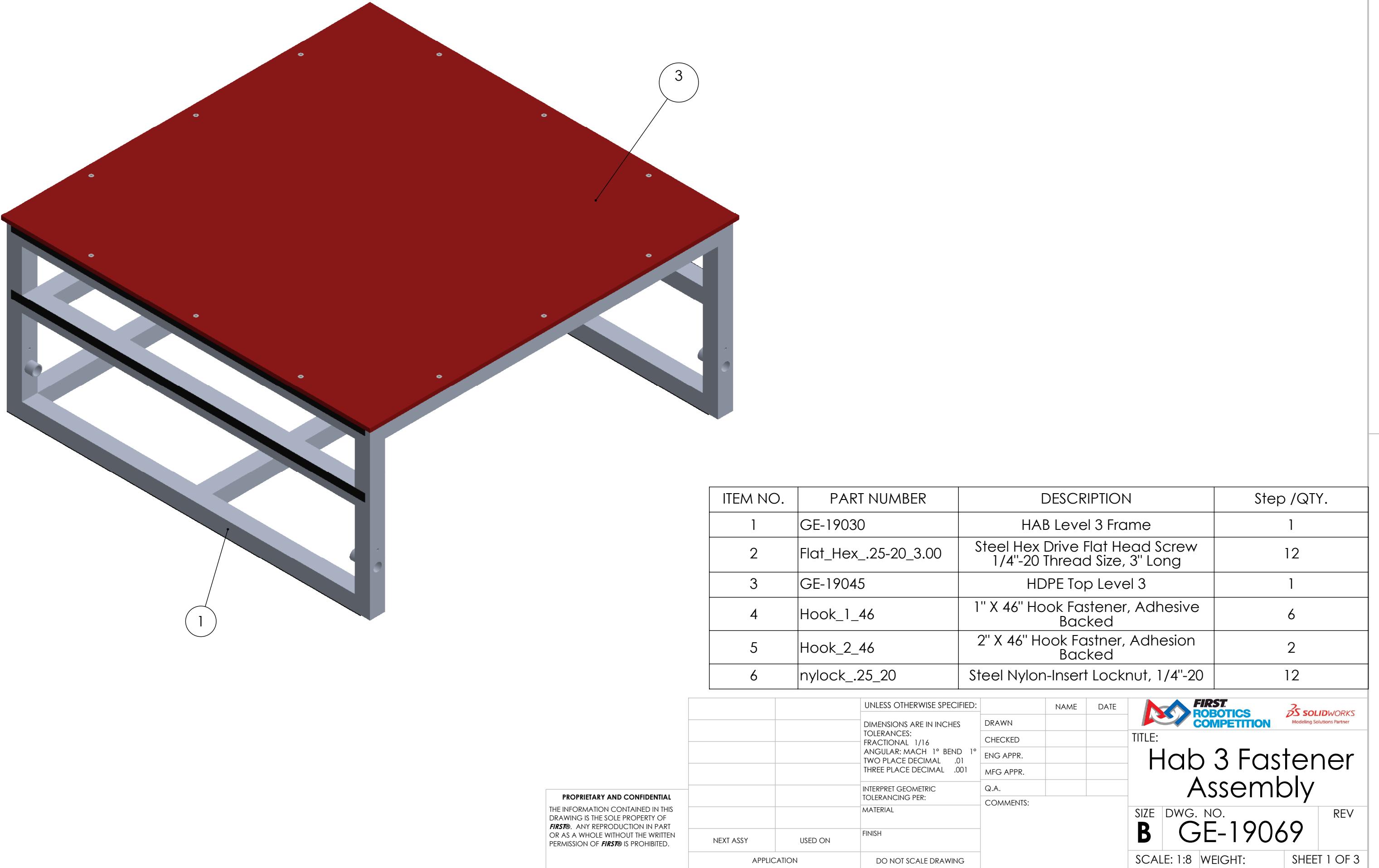
Color Variations	
Part Number	Material
GE-19068-red	1/2" HDPE, Red
GE-19068-blu	1/2" HDPE, Blue
GE-19068-blk	1/2" HDPE, Black

Notes:

1. Finish: Orange Peel Texture
 2. Remove all burrs and sharp edges.
 3. Tag or label with part number.

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		UNLESS OTHERWISE SPECIFIED:		NAME	DATE	 FIRST ROBOTICS COMPETITION  SOLIDWORKS Modeling Solutions Partner
		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$	DRAWN	DAF	9/7/18	
		TWO PLACE DECIMAL $\pm .01$	CHECKED			
		THREE PLACE DECIMAL $\pm .001$	ENG APPR.			
			MFG APPR.			
		INTERPRET GEOMETRIC TOLERANCING PER:	Q.A.			
		MATERIAL	COMMENTS:			
NEXT ASSY	USED ON	FINISH				
APPLICATION		DO NOT SCALE DRAWING				
SCALE: 1:8	WEIGHT:	SHEET 1 OF 1				



4

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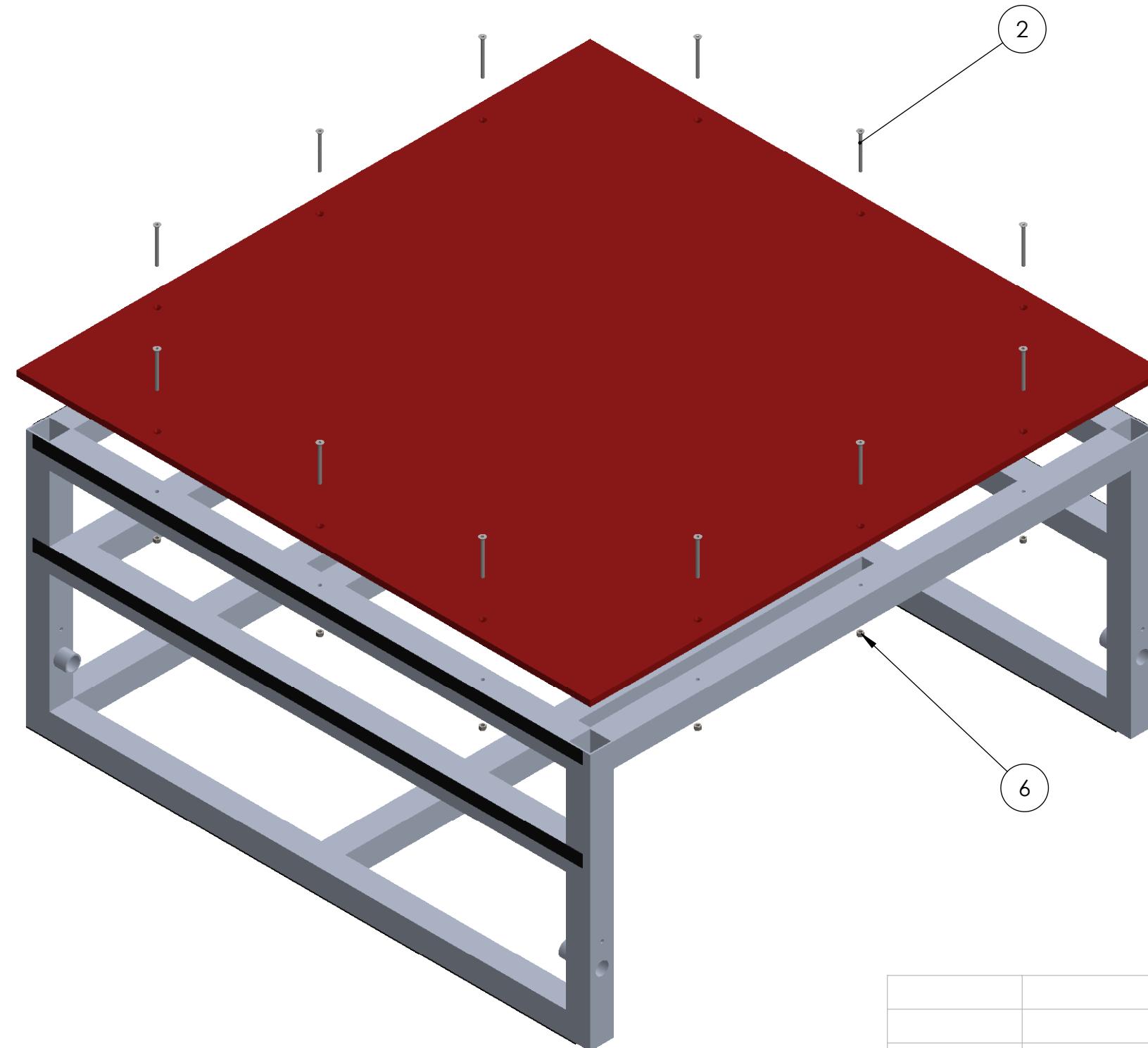
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B



A

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Hab 3 Fastener Assembly

B **GE-19069**

SIZE DWG. NO. REV
SCALE: 1:8 WEIGHT: SHEET 2 OF 3

4

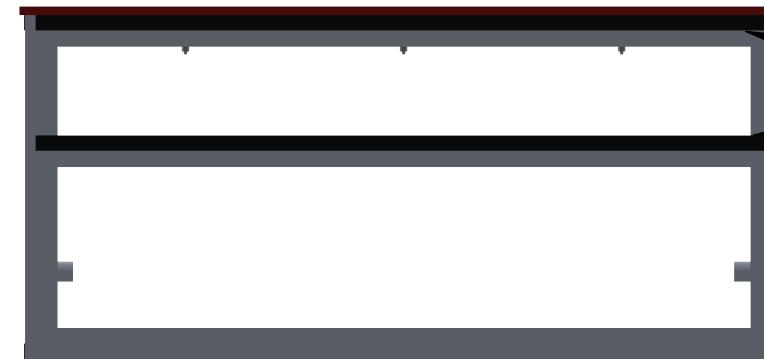
3

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4
Mirror on opposite side



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

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

Hab 3 Fastener
Assembly

B GE-19069

SIZE DWG. NO. REV
SCALE: 1:16 WEIGHT: SHEET 3 OF 3

4

3

2

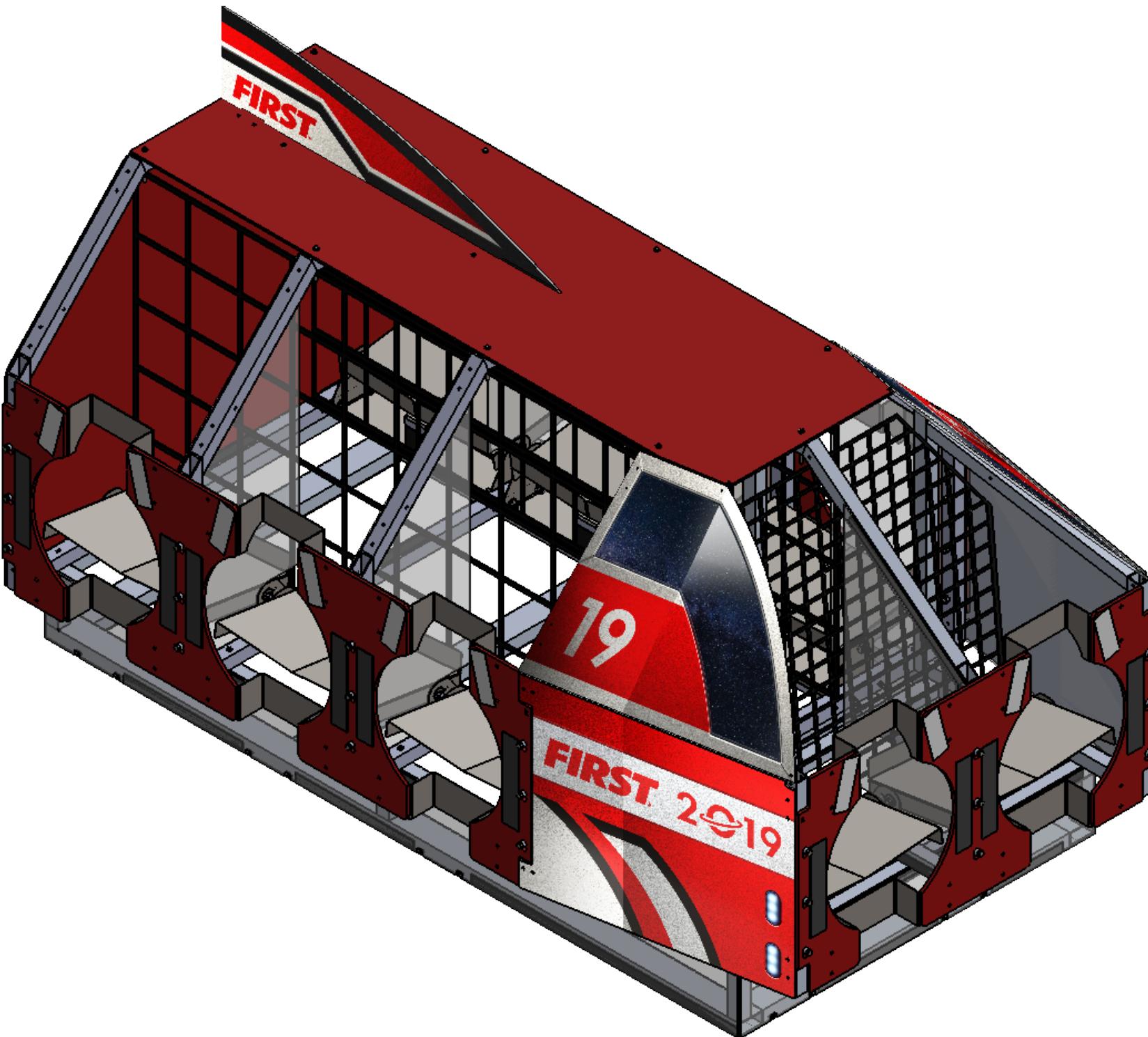
1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-19026	Keyhole Insert	8
2	GE-19071-Assembly	Cargo Ship Base, with Hook	1
3	GE-19072-Assembly	Cargo Ship Main Frame	4
4	GE-19074-Assembly	Cargo Ship Frame Front	1
5	GE-19075	Cargo Ship Nose Side	2
6	GE-19078	Cargo Ship Top Plastic	1
7	GE-19079-Left-Red	Cargo Ship Front Side Plastic, Left Red	1
8	GE-19079-Right-Red	Cargo Ship Front Side Plastic, Right Red	1
9	GE-19080-Left-Red	Cargo Ship Front Top Plastic Left Red	1
10	GE-19080-Right-Red	Cargo Ship Front Top Plastic Right Red	1
11	GE-19081-Assembly	Cargo Ship Back Plastic	1
12	GE-19082-Red	Cargo Ship Fin, Red	1
13	GE-19088-Left-Assembly	Cargo Ship Divider Side, Left	3
14	GE-19088-Right-Assembly	Cargo Ship Divider Side, Right	3
15	GE-19089-Assembly	Cargo Ship Divider Front	1
16	GE-19092	Cargo Ship Tray Assembly	8
17	GE-19098	Keyhole Insert Bottom	8
18	GE-19103	Cargo Net Side	2
19	GE-19104	Cargo Net Front	1
20	GE-19106	Light Sub Assembly	1
21	GE-19165	Panel Plastic Full Assembly	6
22	GE-19166	Panel Plastic Half Assembly, Left	3
23	GE-19195	Cargo Ship Corner Bracket	4
24	GE-19217	Panel Plastic Half Assembly, Right	3
25	GE-19229-Assembly	Cargo Ship Bumper Plastic Front	1
26	GE-19228-Assembly	Cargo Ship Bumper Plastic Side	2
27	hex_.25_20_.75	Steel Hex Head Screw, 1/4"-20 x 3/4" long, fully threaded	6
28	nylock_.25_20	Steel Nylon-Insert Locknut, 1/4"-20	22
29	hex_.25_20_3.5	Steel Hex Head Screw, 1/4"-20 x 3.5 long, fully threaded	25
30	spacer_.375_.625_.375	Spacer, 3/8" ID, 5/8" OD, 3/8" thk	33
31	hex_.375_16_3_partial	Steel Hex Head Screw, 3/8"-16, 3" long	33
32	nylock_.375_16	Steel Nylon-Insert Locknut, 3/8"-16	33
33	wing_.25_20	Steel Wing Nut, 1/4"-20, 31/64" Base Diameter	9
34	washer_split_.26_.487	Steel Split Lock Washer for 1/4" Screw	9
35	pin_quick_ring_.25_2.5	SS Ring-Grip Quick-Release Pin, 1/4" diameter, 2.5" long	22

Notes:

There are red/blue variants for Items 6-12, 21-22, 24. Only red shown here.

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		DRAWN		
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
		MATERIAL		
		FINISH		
NEXT ASSY	USED ON			
APPLICATION		DO NOT SCALE DRAWING		
SCALE: 1:24		WEIGHT:	SHEET 1 OF 8	
SIZE	DWG. NO.	REV		
B	GE-19070			

Cargo Ship Full Assembly

FIRST
ROBOTICS
COMPETITION

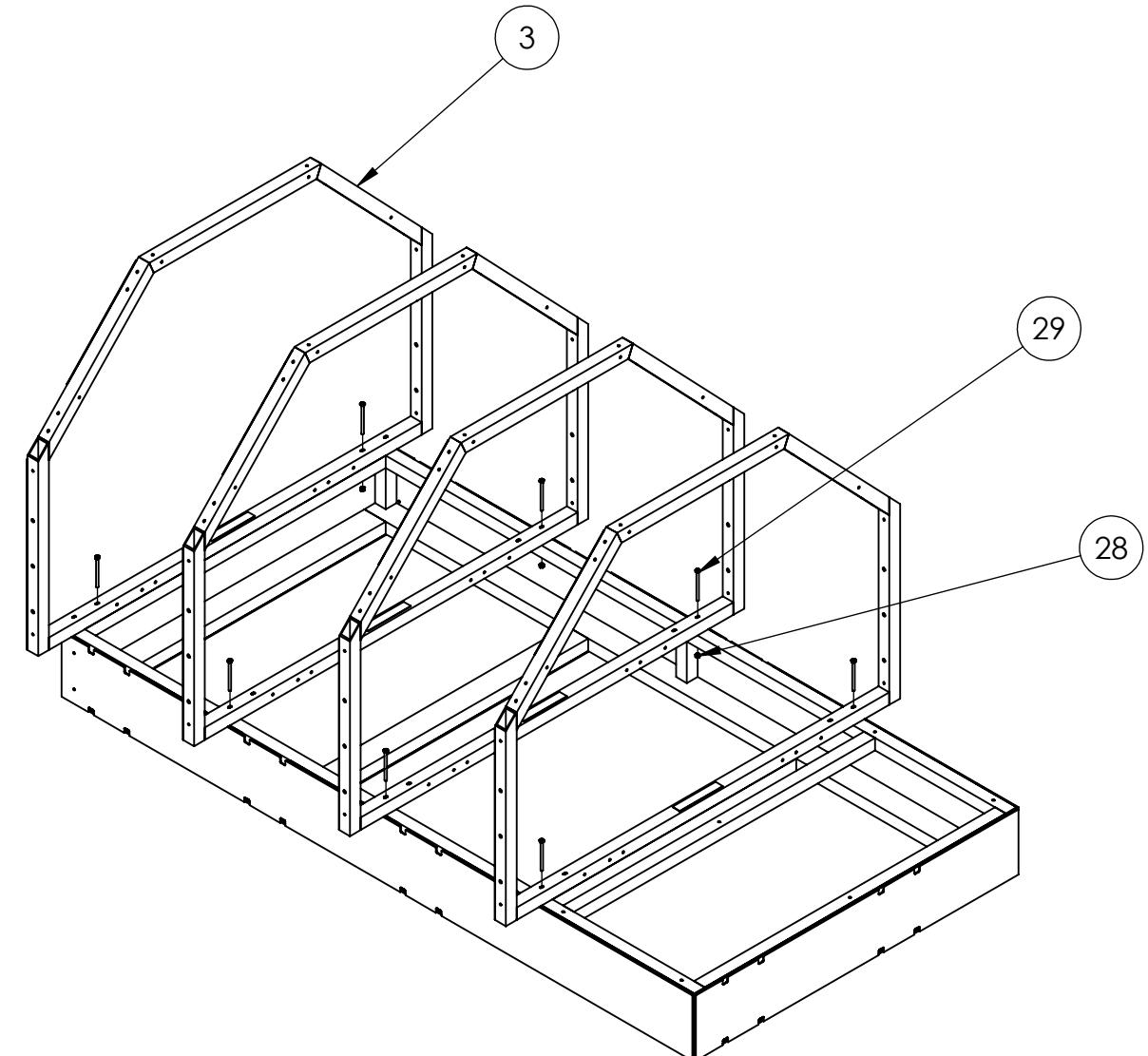
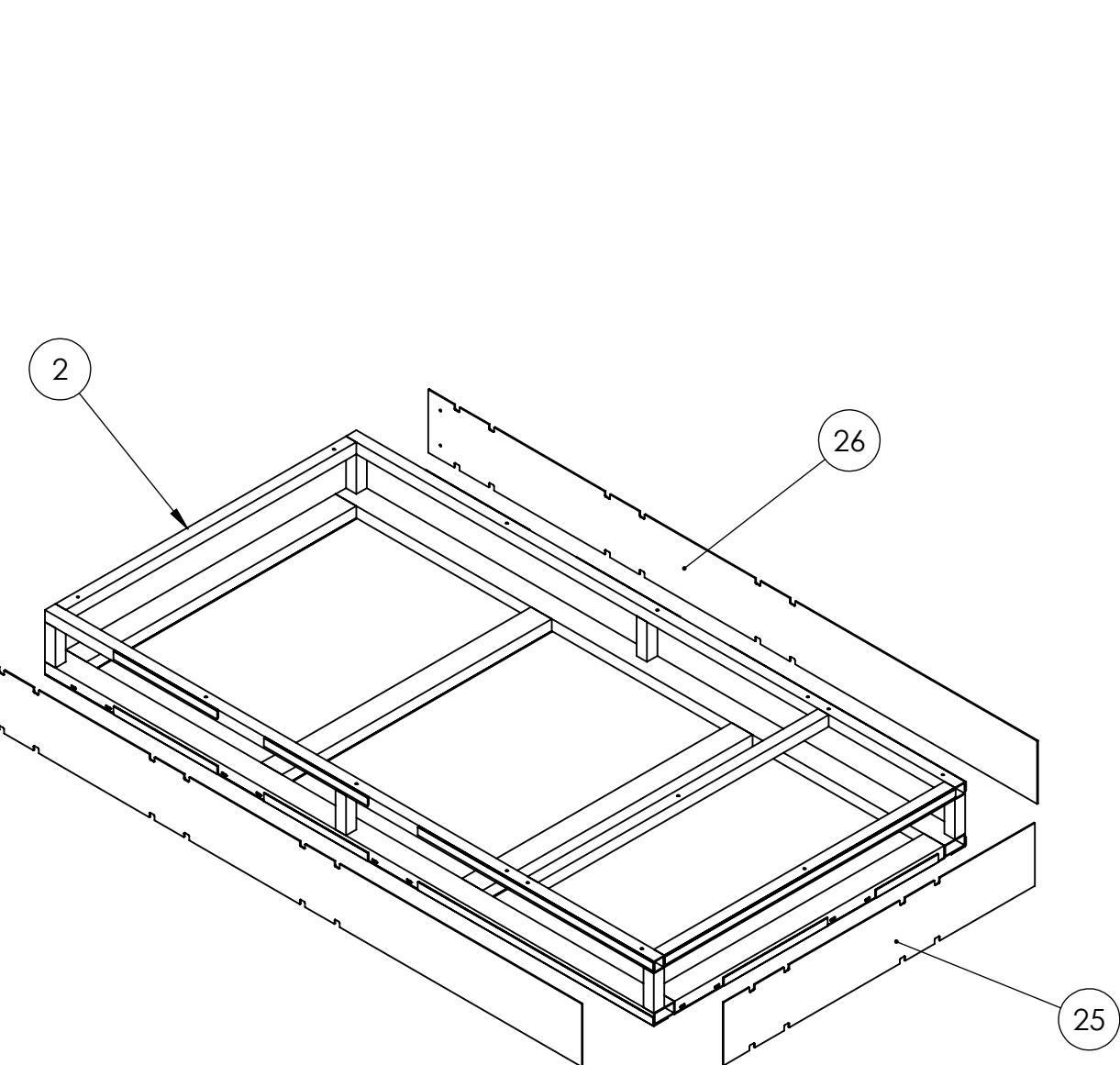
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DIMENSIONS ARE IN INCHES		DRAWN		
TOLERANCES:		CHECKED		
FRACTIONAL: ±1/16		ENG APPR.		
ANGULAR: MACH ±1° BEND ±1°		MFG APPR.		
TWO PLACE DECIMAL: ±.01		Q.A.		
THREE PLACE DECIMAL: ±.001		COMMENTS:		
		INTERPRET GEOMETRIC TOLERANCING PER:		
		MATERIAL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

**FIRST
ROBOTICS
COMPETITION** **SOLIDWORKS**
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TITLE:

Cargo Ship Full Assembly

SIZE DWG. NO. REV
B **GE-19070**

SCALE: 1:18 WEIGHT: SHEET 2 OF 8

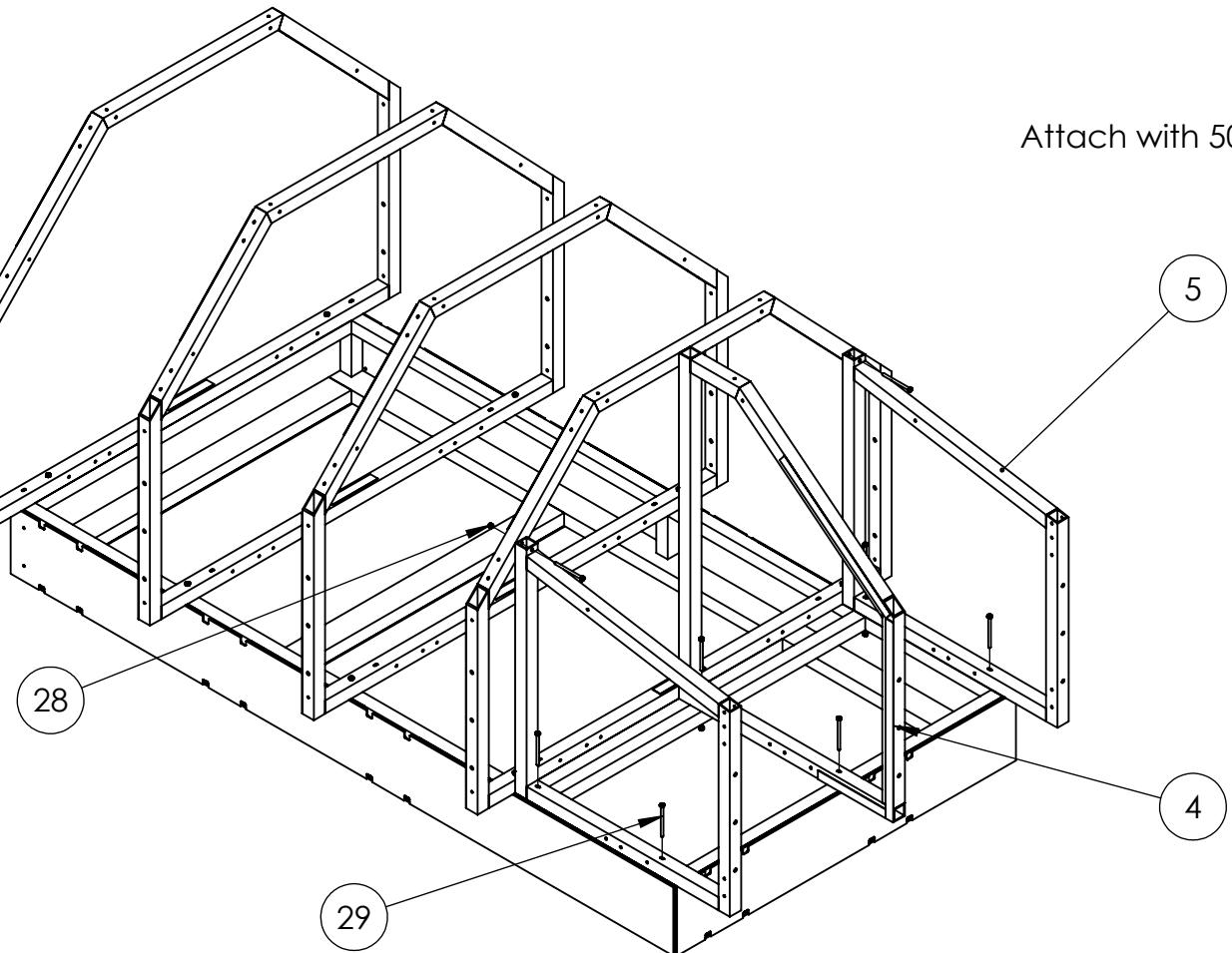
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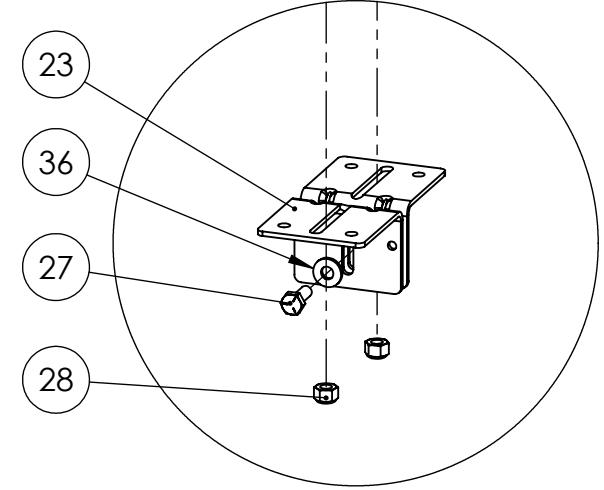
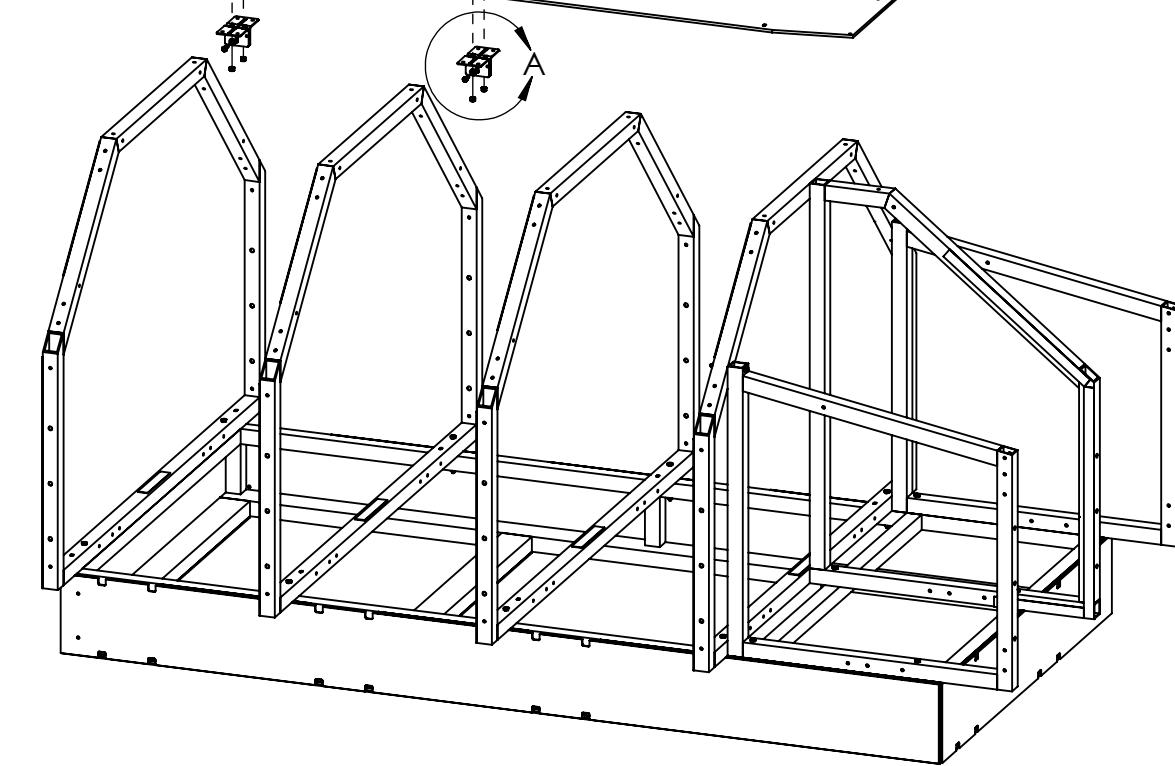
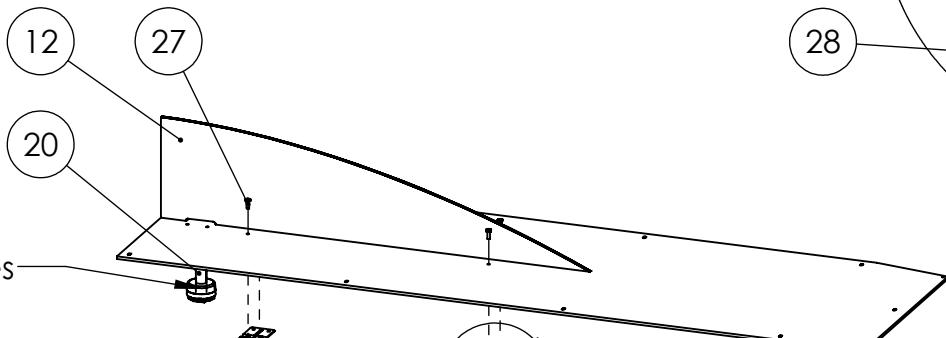
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B



Attach with 50-lb cable ties

DETAIL A
SCALE 1 : 4

4

3

2

1

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		DRAWN		
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
NEXT ASSY	USED ON	MATERIAL		
		FINISH		
APPLICATION		DO NOT SCALE DRAWING		
SCALE: 1:18	WEIGHT:		SHEET 3 OF 8	
B	GE-19070			REV

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

Cargo Ship Full Assembly

4

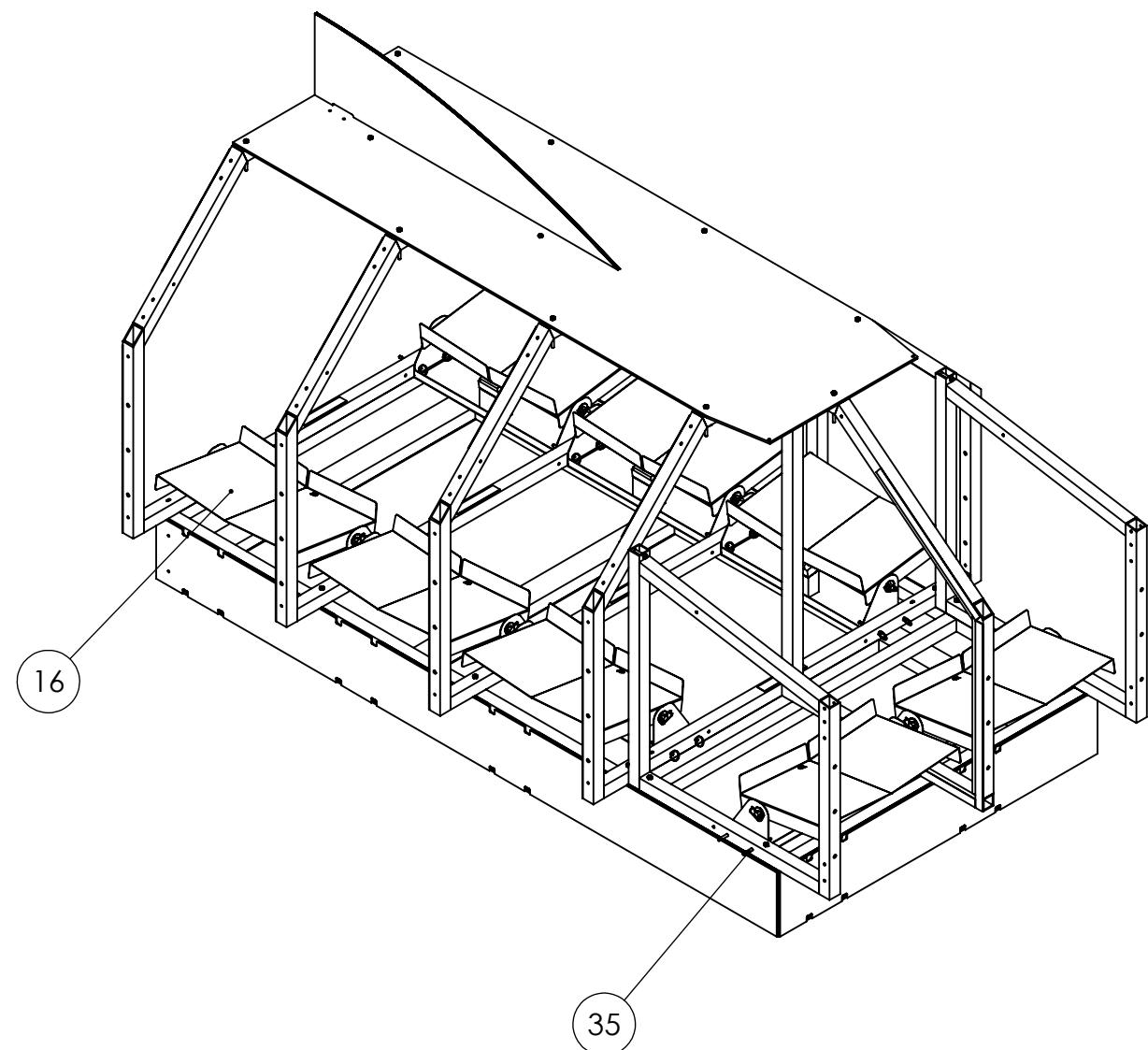
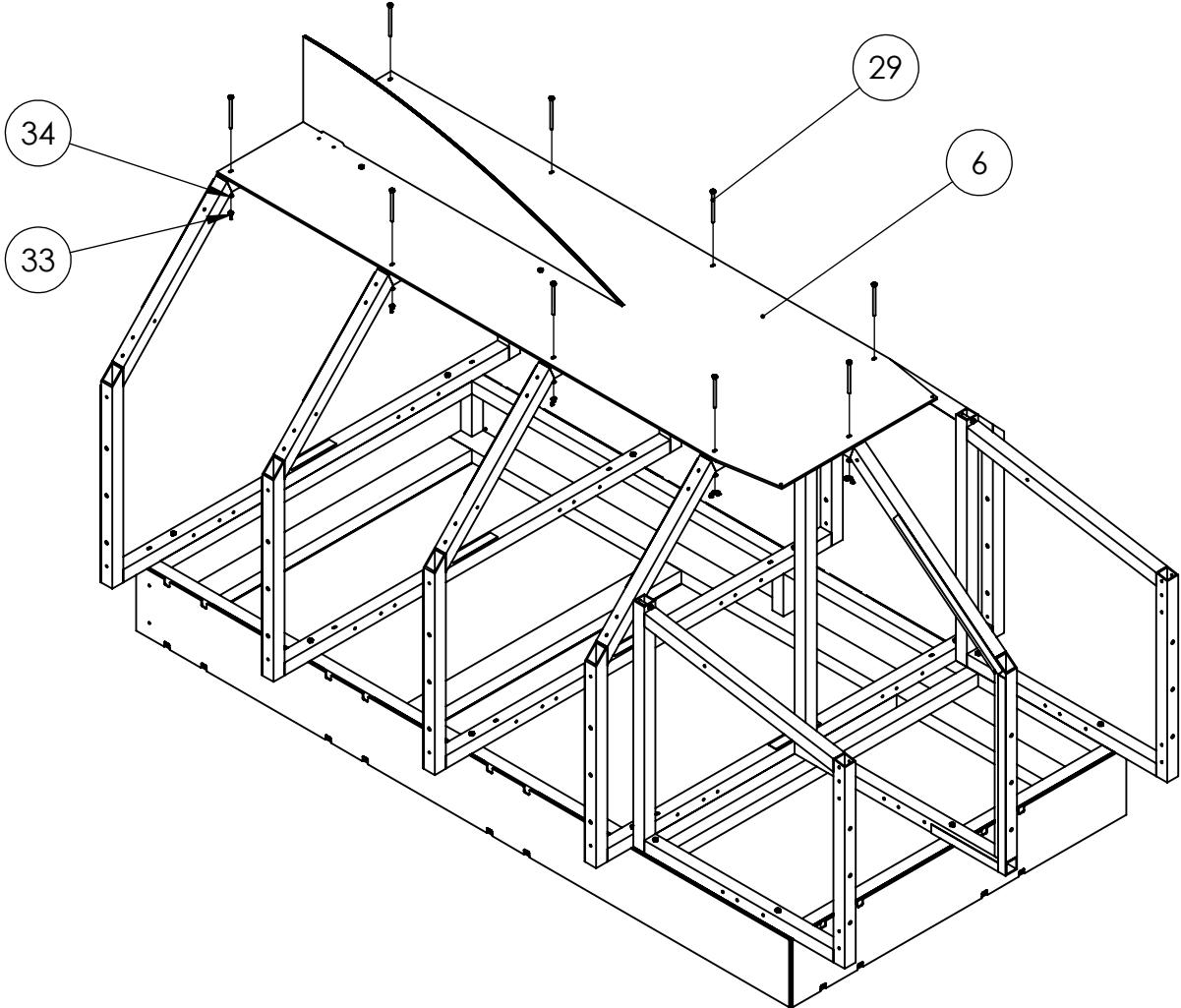
3

2

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B

B



Notes:
Place Item 16 (QTY: 8) and secure using Items 35 (QTY: 22)
through the matching holes in the frame

4

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		TOLERANCES:	CHECKED		
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		ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$	MFG APPR.		
		TWO PLACE DECIMAL $\pm .01$	Q.A.		
		THREE PLACE DECIMAL $\pm .001$	COMMENTS:		
		INTERPRET GEOMETRIC TOLERANCING PER:			
		MATERIAL			
	NEXT ASSY	USED ON	FINISH		
		APPLICATION	DO NOT SCALE DRAWING		

FIRST
ROBOTICS
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Modeling Solutions Partner

TITLE:

Cargo Ship Full Assembly

SIZE DWG. NO. REV
B GE-19070

SCALE: 1:18 WEIGHT: SHEET 4 OF 8

4

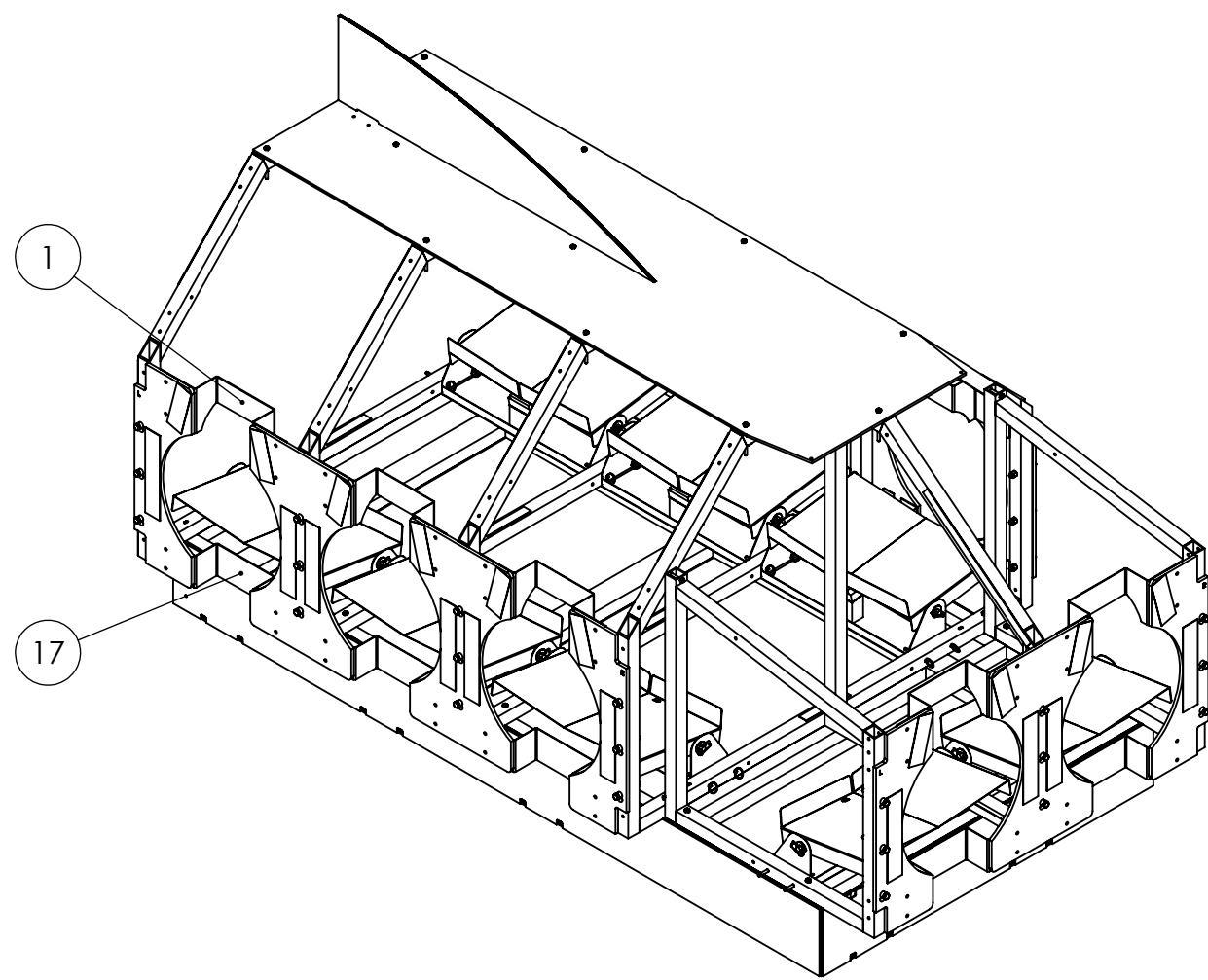
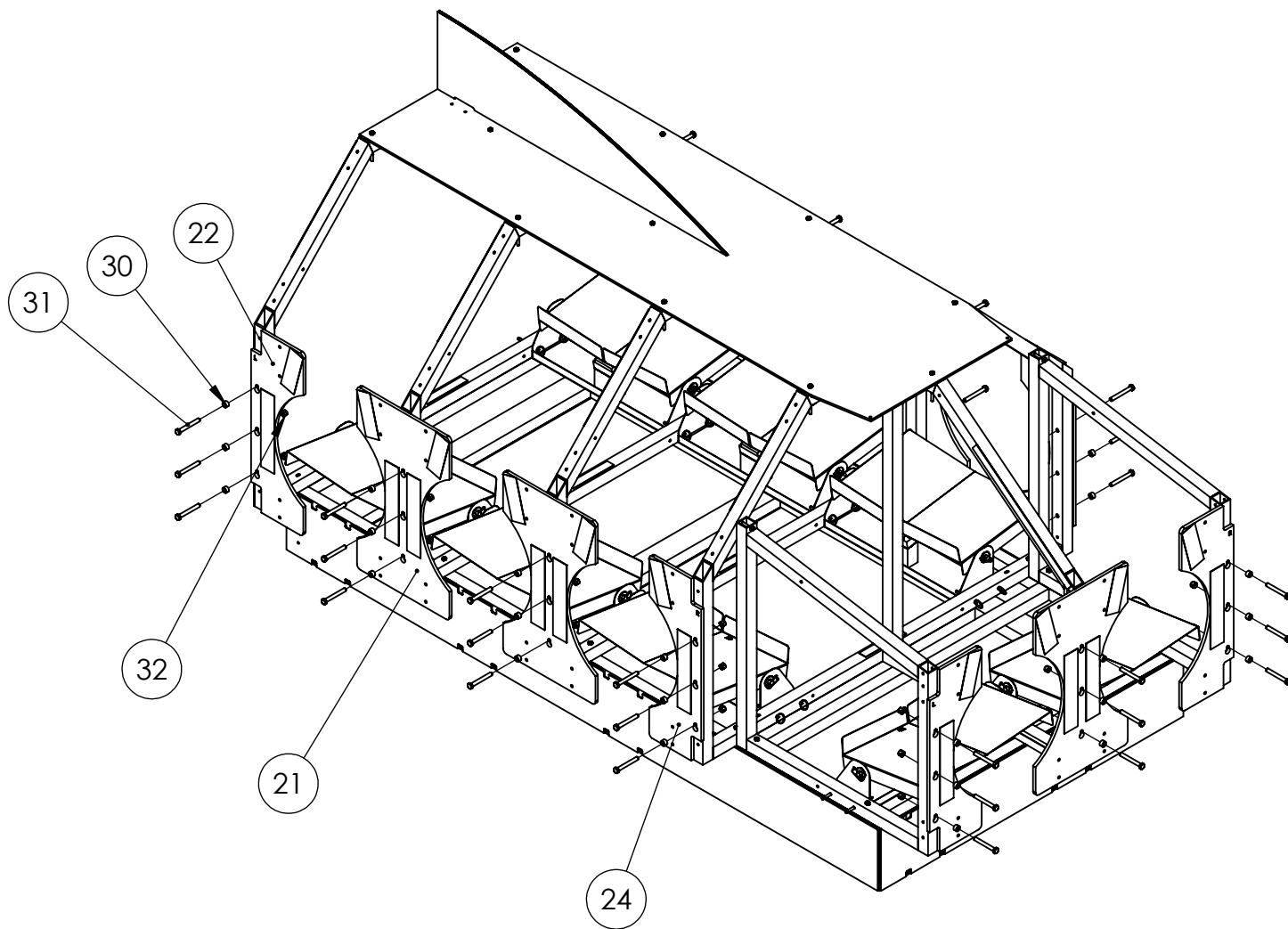
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B

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Notes:
Attach Items 1 (QTY: 8) and Items 17 (QTY: 8) using 120-lb cable ties.

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		DRAWN			
		CHECKED			
		ENG APPR.			
		MFG APPR.			
		Q.A.			
		COMMENTS:			
		MATERIAL			
		FINISH			
NEXT ASSY	USED ON				
APPLICATION	DO NOT SCALE DRAWING				
Cargo Ship Full Assembly					
SIZE	DWG. NO.			REV	
B	GE-19070				
SCALE: 1:18	WEIGHT:			SHEET 5 OF 8	

4

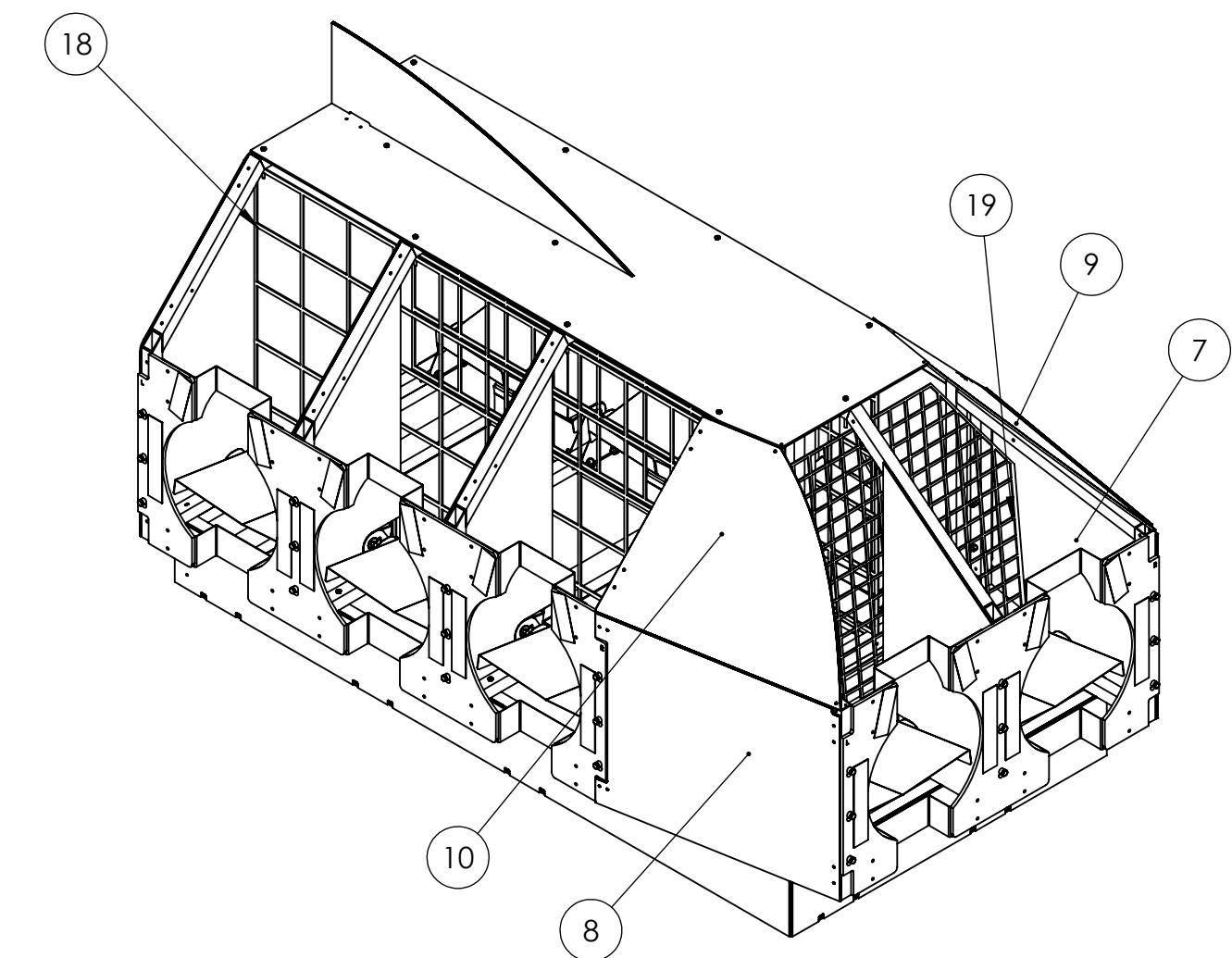
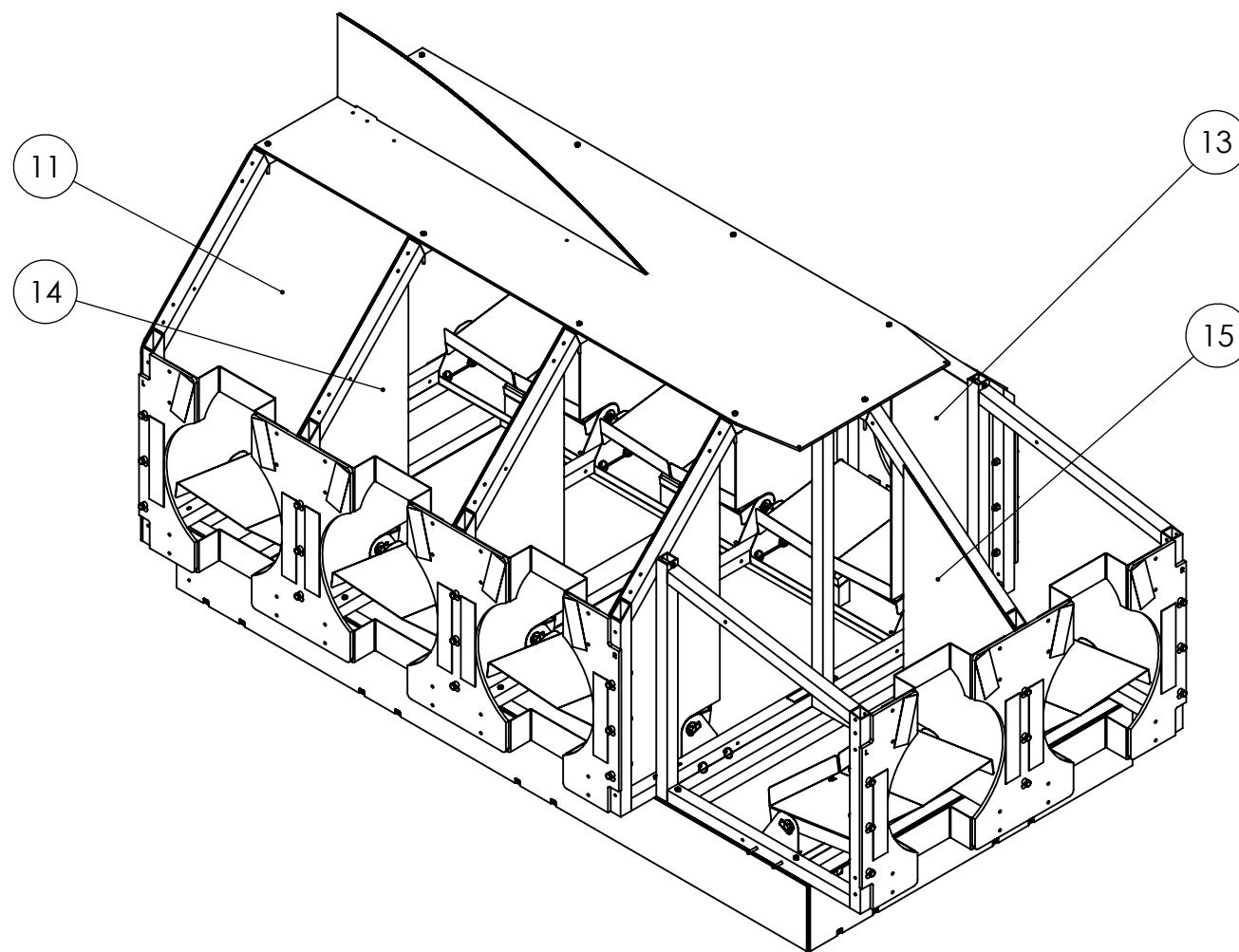
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B

B



Notes:

Attach Item 15, Items 13 (QTY: 3), Items 14 (QTY: 3) and Item 11 using hook and loop.

Notes:

Attach Items 7, 8, 9 and 10 using 50-lb cable ties. Attach nets using 50-lb cable ties.

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Cargo Ship Full Assembly

SIZE	DWG. NO.	REV
B	GE-19070	
SCALE: 1:18	WEIGHT:	SHEET 6 OF 8

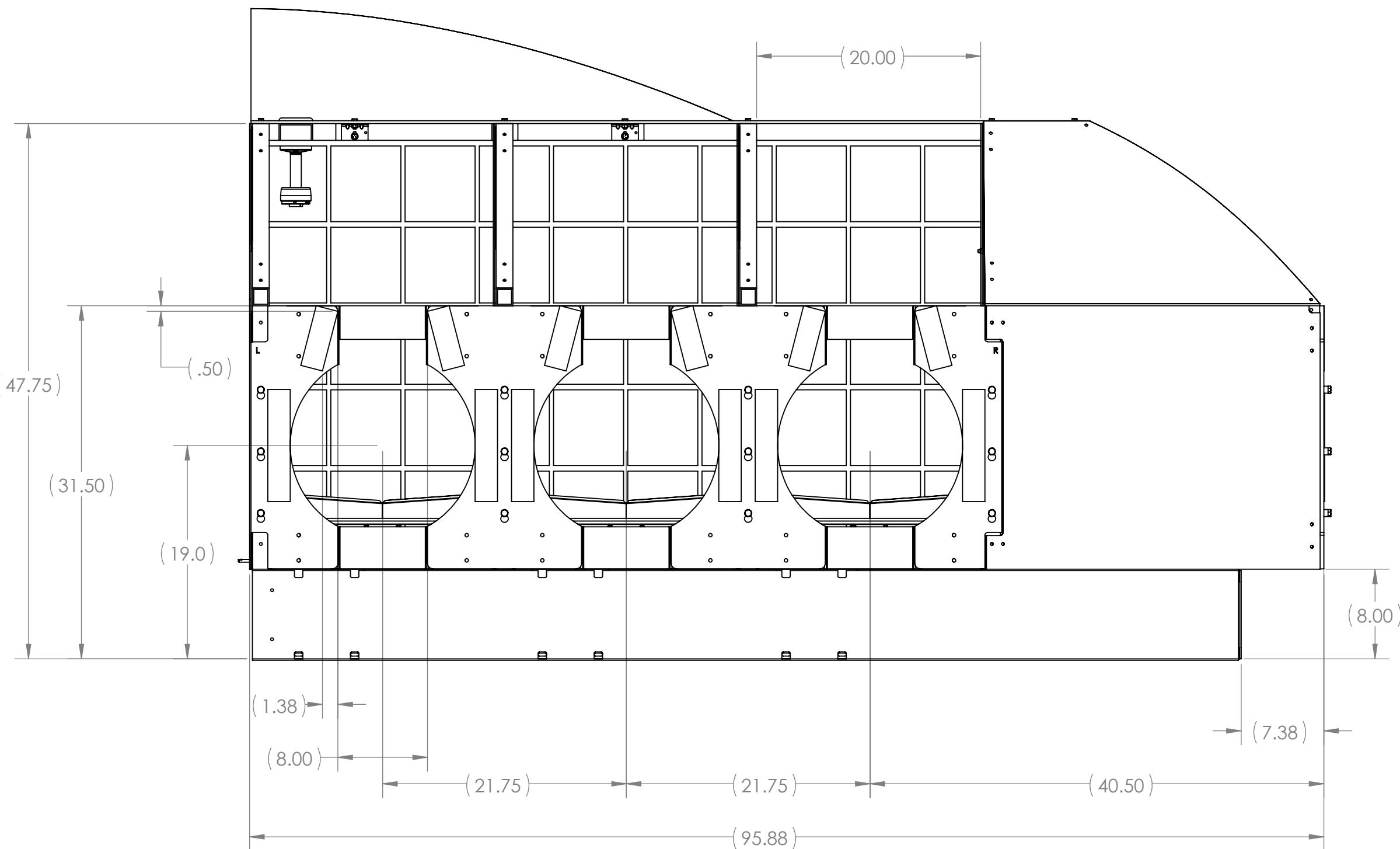
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B



A

B

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		DRAWN		
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
		MATERIAL		
		FINISH		
NEXT ASSY	USED ON			
APPLICATION	DO NOT SCALE DRAWING			
SCALE: 1:10	WEIGHT:			SHEET 7 OF 8
B	GE-19070			REV

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

Cargo Ship Full Assembly

4

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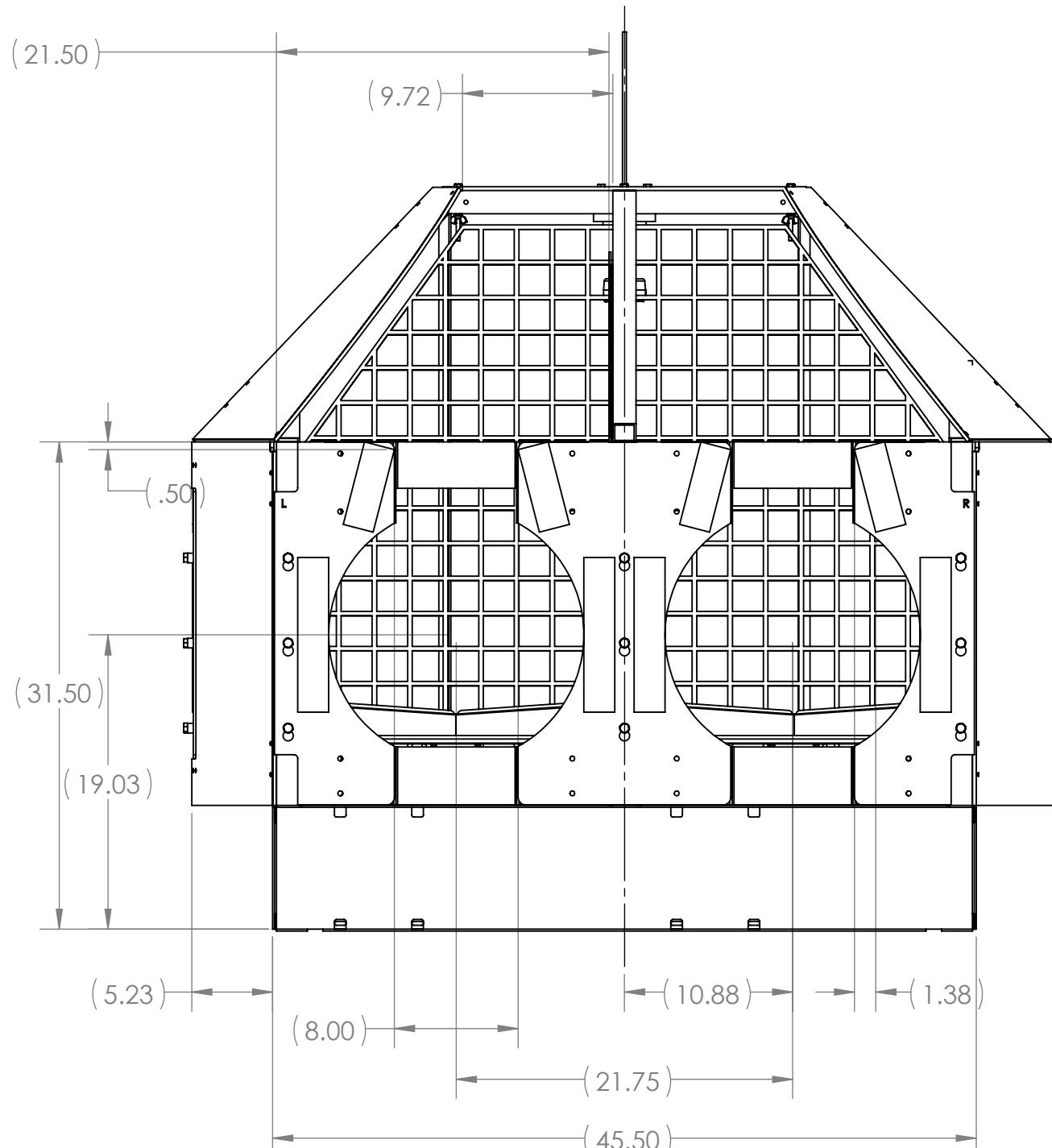
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		DRAWN			
		CHECKED			
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		MFG APPR.			
		Q.A.			
		COMMENTS:			
		MATERIAL			
		FINISH			
NEXT ASSY	USED ON				
APPLICATION	DO NOT SCALE DRAWING				

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Cargo Ship Full Assembly

SIZE	DWG. NO.	REV
B	GE-19070	
SCALE: 1:10	WEIGHT:	SHEET 8 OF 8

4

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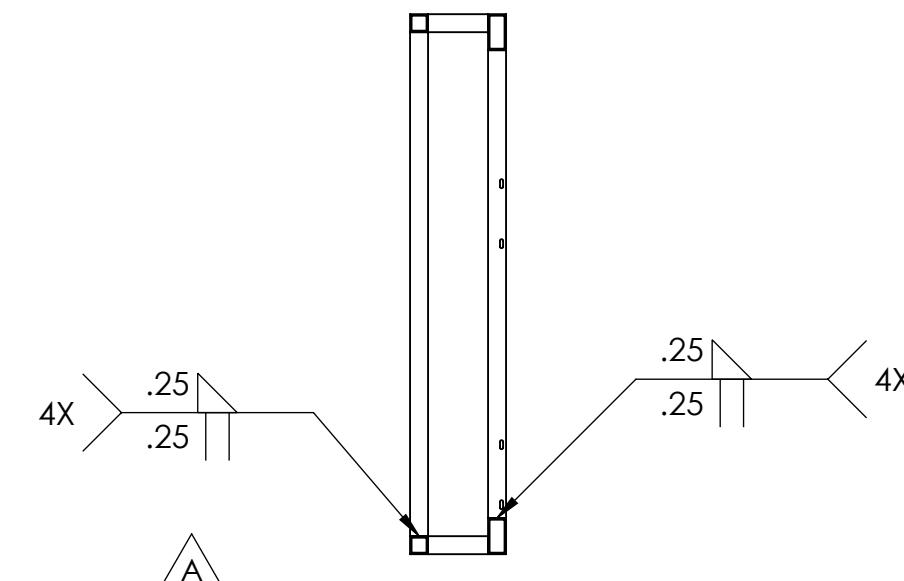
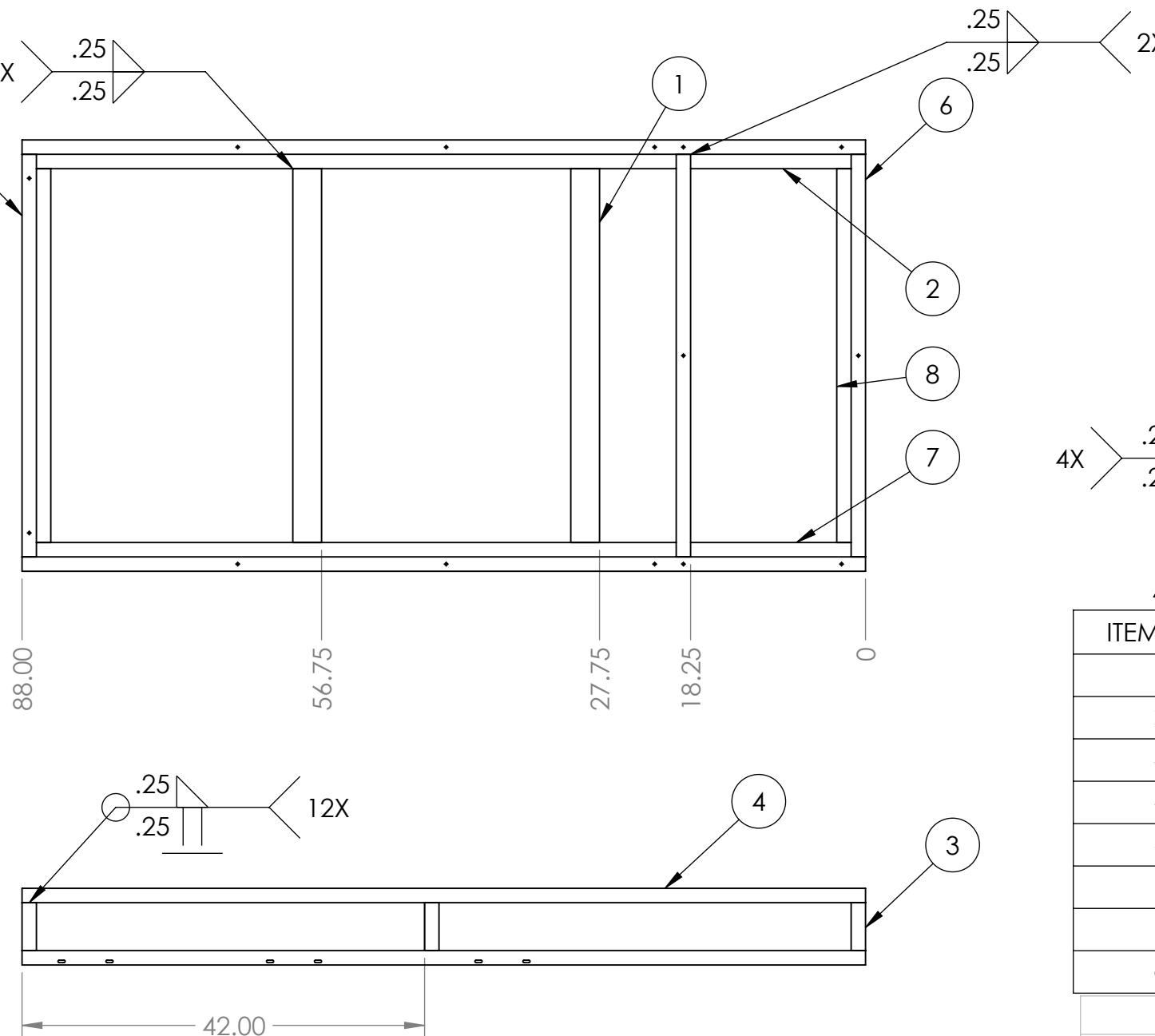
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1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
A2	A	Added material table	10/5/2018	DAF
	B	Redrawn and redimensioned	10/10/2018	DAF

B



ITEM NO.	QTY.	DESCRIPTION	LENGTH
1	3	1-1/2" x 3" x .125" Rectangular Tubing, 6061 Aluminum	39
2	1	1-1/2" x 3" x .125" Rectangular Tubing, 6061 Aluminum	88
3	6	1-1/2" x .125" Square Tubing, 6061 Aluminum	5
4	2	1-1/2" x .125" Square Tubing, 6061 Aluminum	88
5	1	1-1/2" x .125" Square Tubing, 6061 Aluminum	42
6	2	1-1/2" x .125" Square Tubing, 6061 Aluminum	42
7	1	1-1/2" x 3" x .125" Rectangular Tubing, 6061 Aluminum	88
8	1	1-1/2" x 3" x .125" Rectangular Tubing, 6061 Aluminum	39

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		UNLESS OTHERWISE SPECIFIED:	NAME	DATE
		DIMENSIONS ARE IN INCHES		
		TOLERANCES:	DRAWN	CHECKED
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		ANGULAR: MACH ±1° BEND ±1°	ENG APPR.	MFG APPR.
		TWO PLACE DECIMAL ±.01		
		THREE PLACE DECIMAL ±.001	Q.A.	COMMENTS:
		INTERPRET GEOMETRIC TOLERANCING PER:		
		MATERIAL		
NEXT ASSY	USED ON	FINISH		
APPLICATION		DO NOT SCALE DRAWING		
SIZE	DWG. NO.		REV	
B	GE-19071		B	
SCALE: 1:16		WEIGHT:	SHEET 1 OF 3	

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
Cargo Ship Base

4

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2

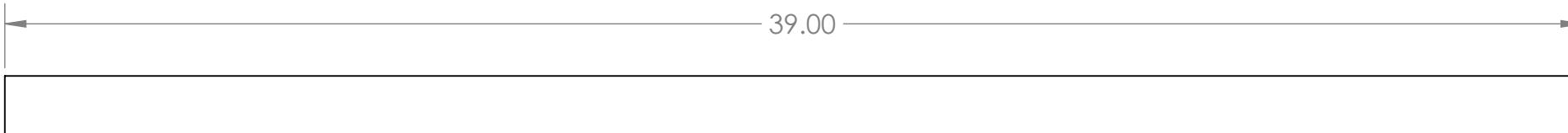
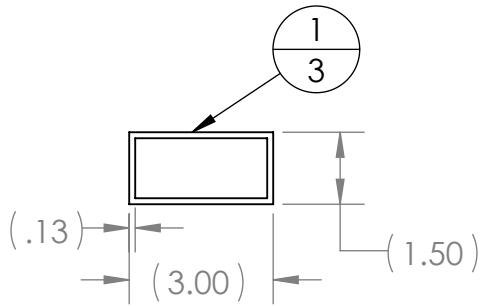
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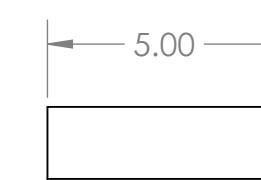
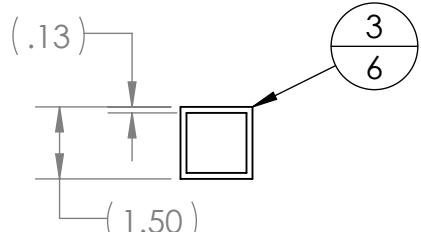
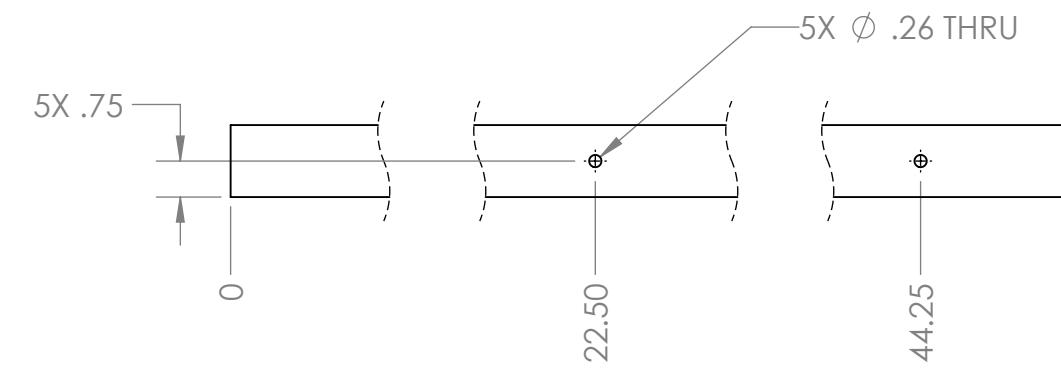
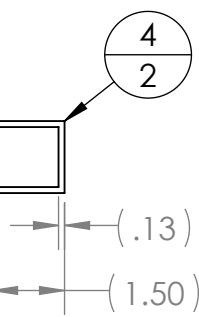
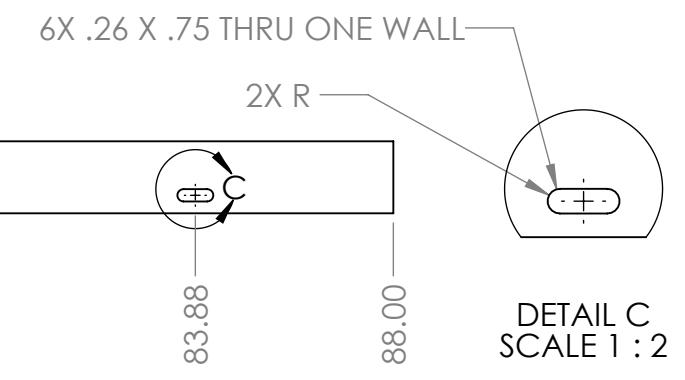
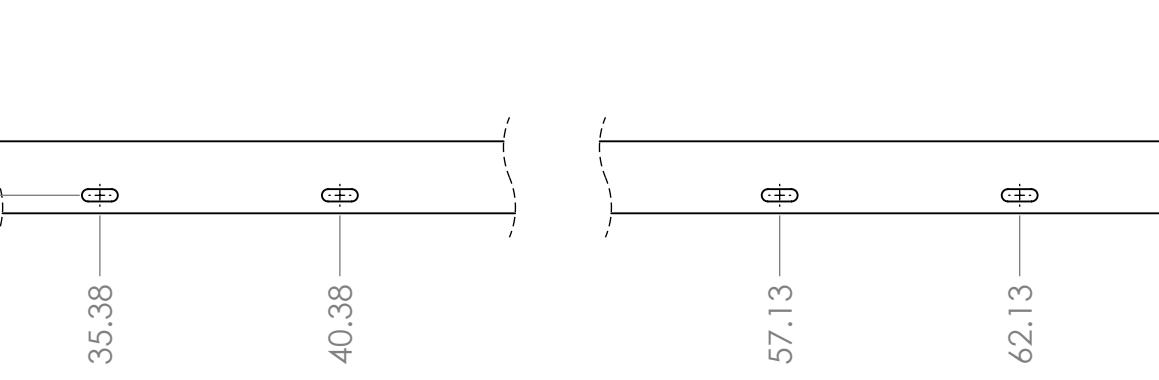
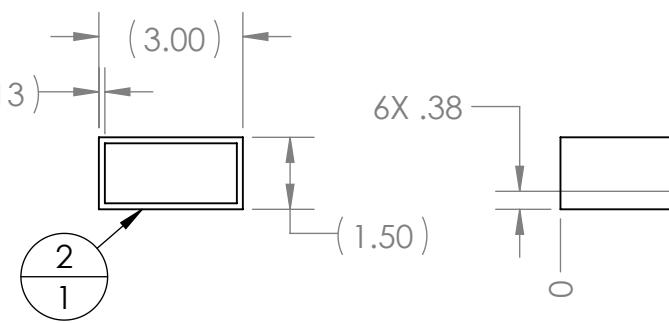
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DRAWN		DIMENSIONS ARE IN INCHES		
CHECKED		TOLERANCES: FRACTIONAL ±1/16		
ENG APPR.		ANGULAR: MACH ±1° BEND ±1°		
MFG APPR.		TWO PLACE DECIMAL ±.01		
Q.A.		THREE PLACE DECIMAL ±.001		
INTERPRET GEOMETRIC TOLERANCING PER:		COMMENTS:		
MATERIAL				
NEXT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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Cargo Ship Base

SIZE	DWG. NO.	REV
B	GE-19071	B
SCALE: 1:16	WEIGHT:	SHEET 2 OF 3

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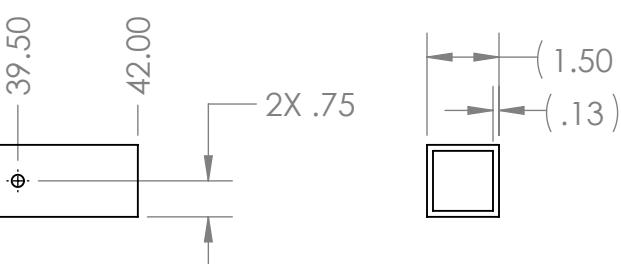
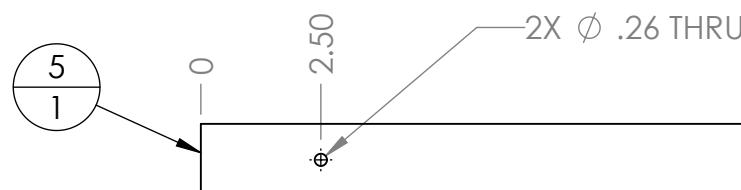
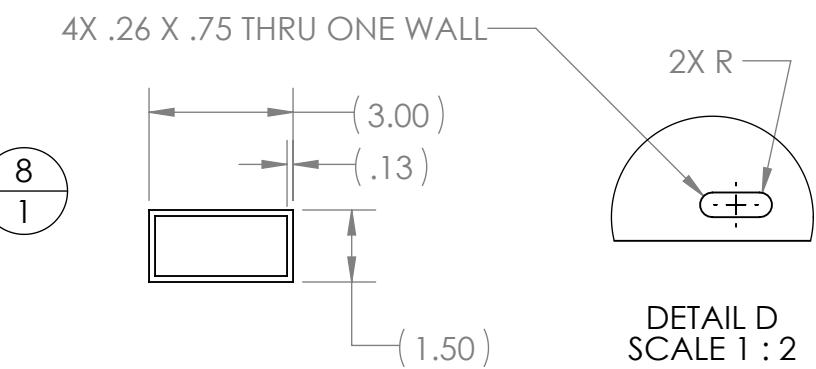
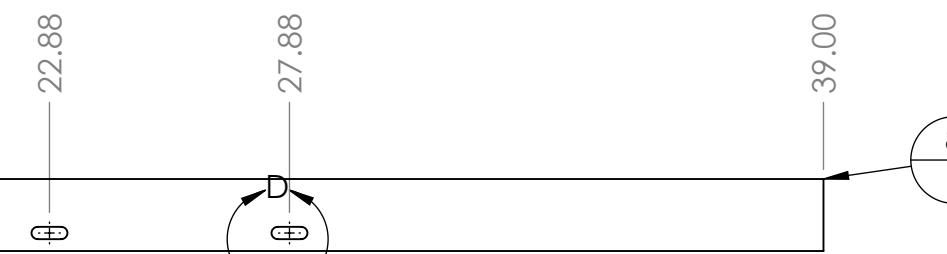
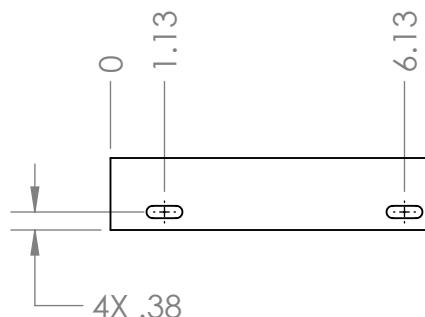
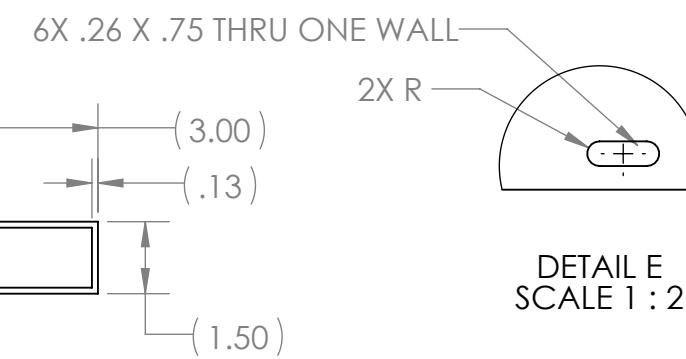
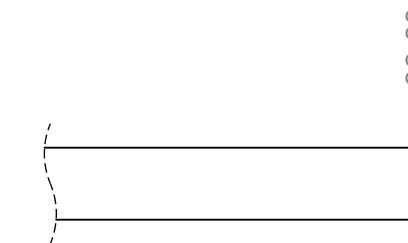
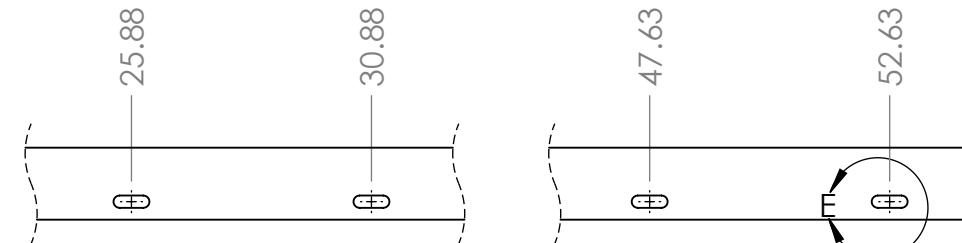
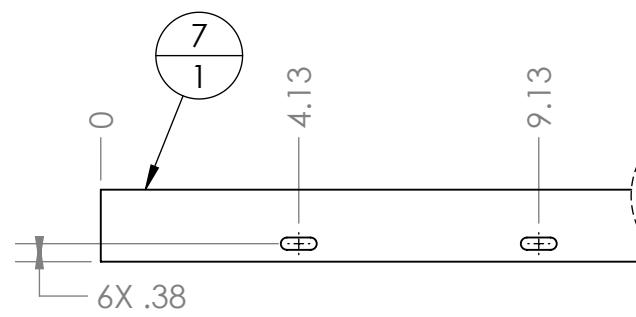
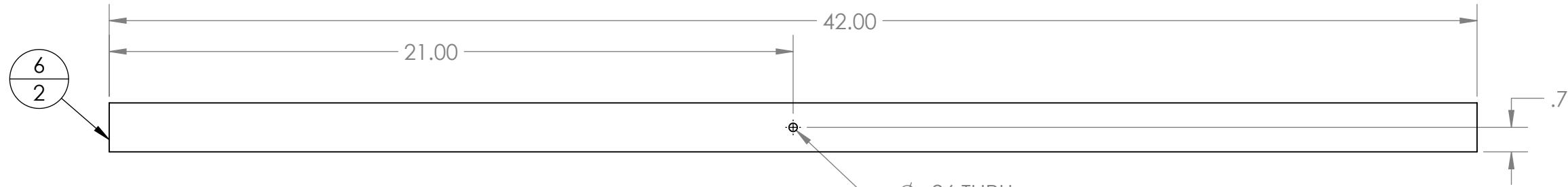
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CHECKED		TWO PLACE DECIMAL $\pm .01$		
ENG APPR.		THREE PLACE DECIMAL $\pm .001$		
MFG APPR.				
Q.A.		INTERPRET GEOMETRIC TOLERANCING PER:		
COMMENTS:		MATERIAL		
NEXT ASSY	USED ON	FINISH		
APPLICATION		DO NOT SCALE DRAWING		
SIZE	DWG. NO.	REV		
B	GE-19071	B		
SCALE: 1:16	WEIGHT:	SHEET 3 OF 3		

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

Cargo Ship Base

4

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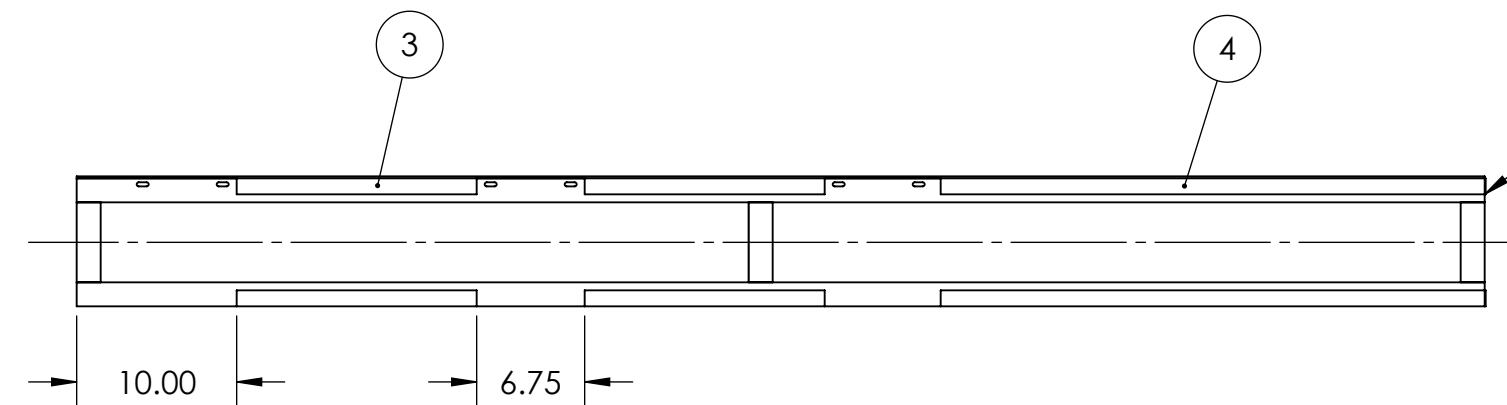
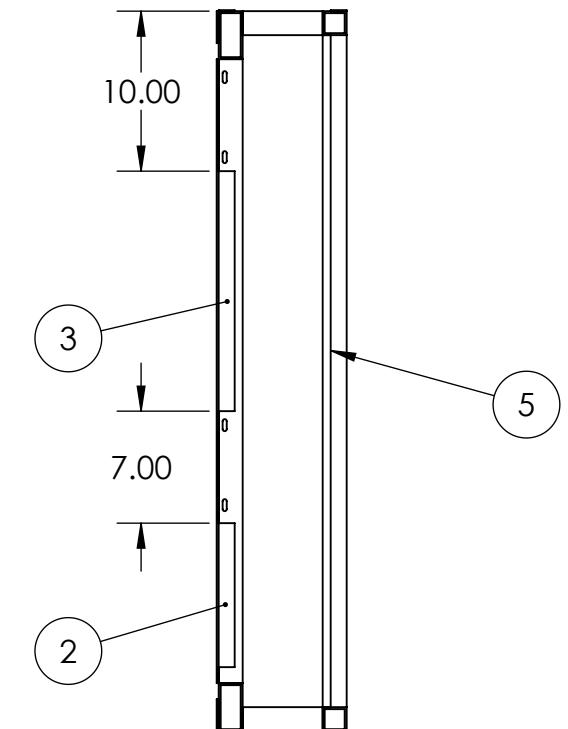
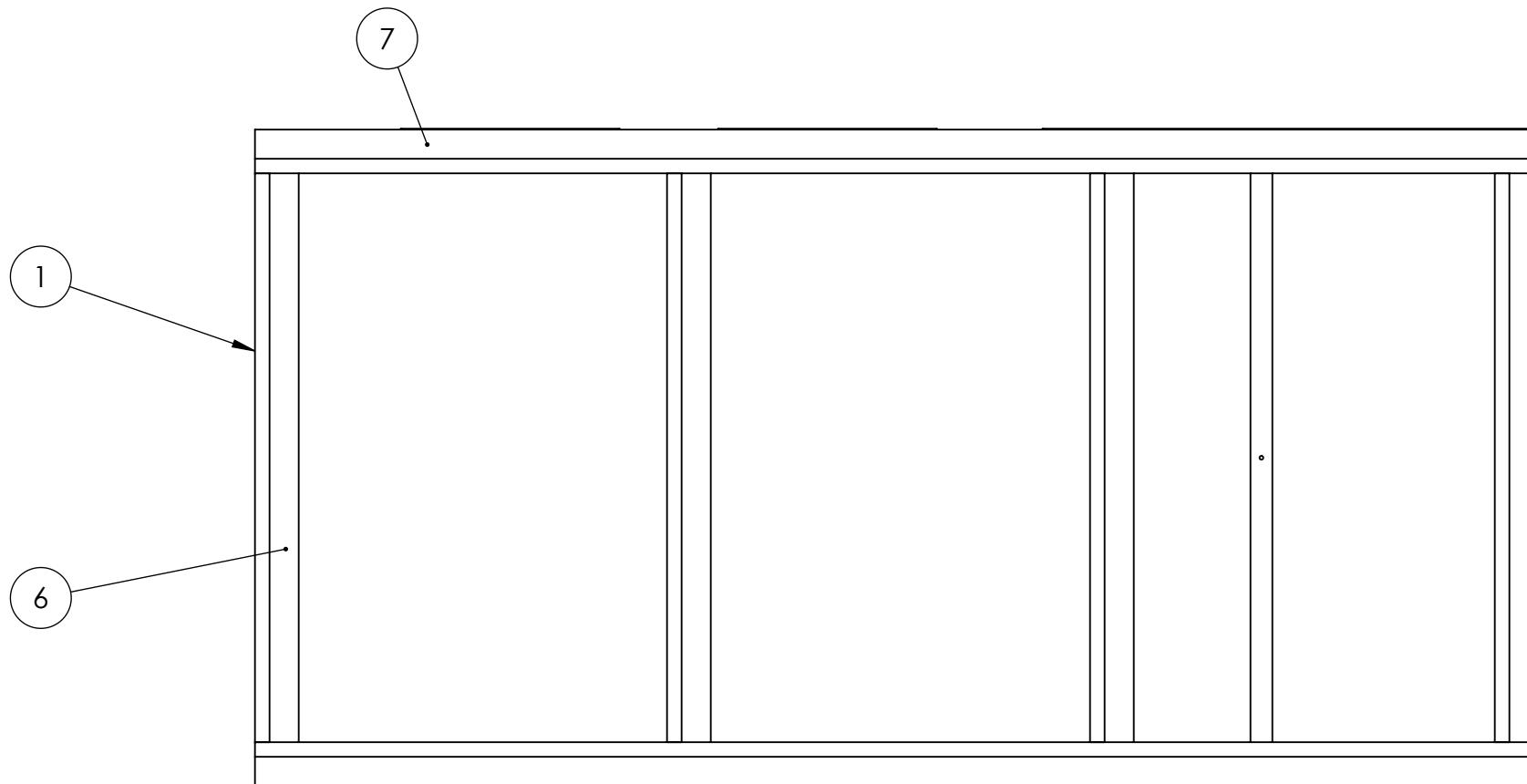
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-19071	Cargo Ship Base	1
2	Hook_1_9	1" x 9" Hook, Adhesive Backed	1
3	Hook_1_15	1" x 15" Hook, Adhesive Backed	9
4	Hook_1_34	1" x 34" Hook, Adhesive Backed	4
5	Hook_1_42	1" x 42" Hook, Adhesive Backed	1
6	Hook_2_39	2" x 39" Hook, Adhesive Backed	4
7	Hook_2_88	2" x 88" Hook, Adhesive Backed	2

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		DRAWN		
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
		MATERIAL		
		FINISH		
NEXT ASSY	USED ON	APPLICATION	DO NOT SCALE DRAWING	
SCALE: 1:12 WEIGHT: SHEET 1 OF 1				

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: GE-19071, with Hook

SIZE DWG. NO. REV
B GE-19071-Assembly

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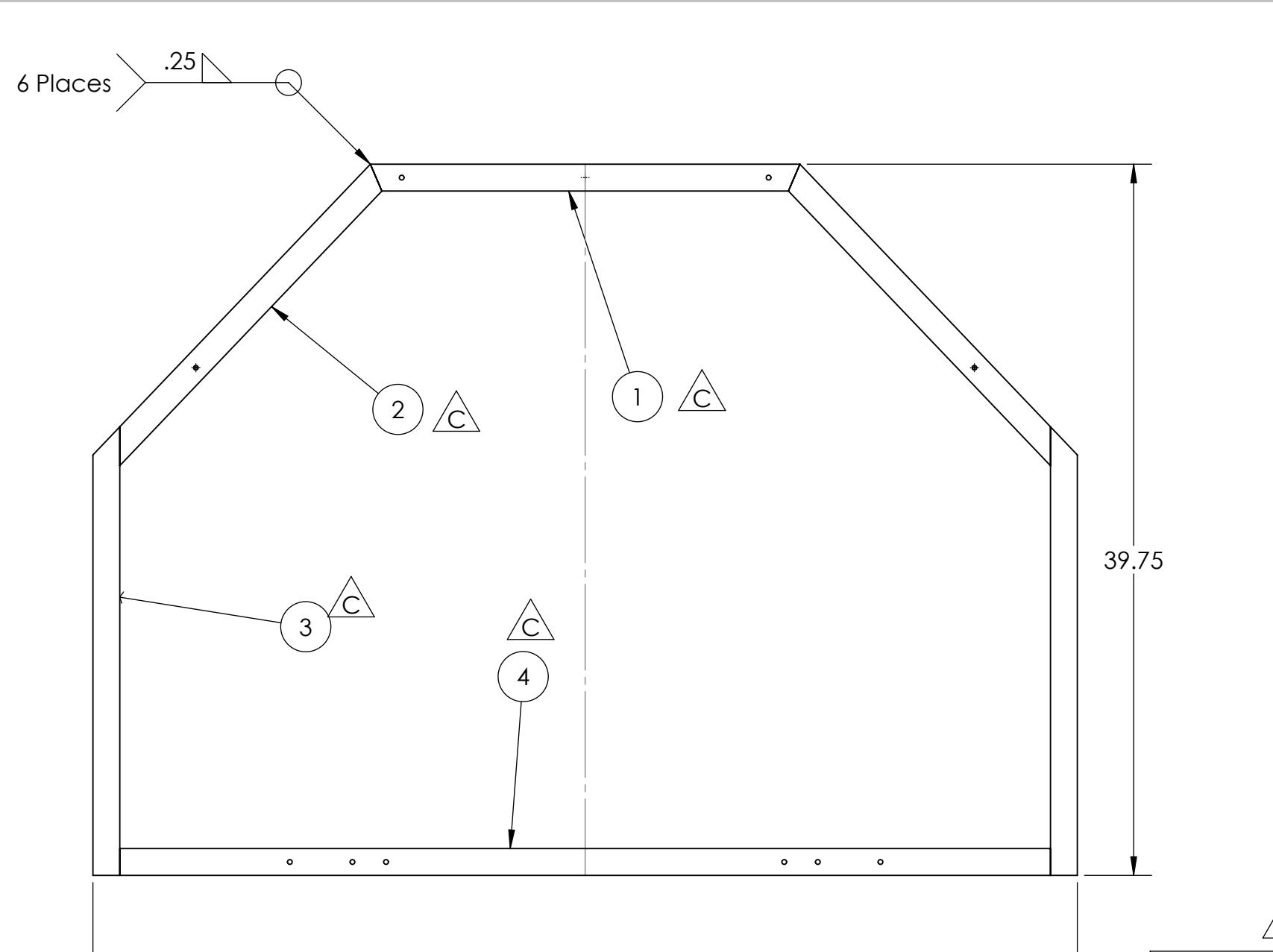
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REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A	Redrawn	10/5/2018	JF
A2	B	Added Material Table	10/5/2018	DAF
B3, B4	C	Fixed Item numbers	10/9/2018	DAF

ITEM NO.	QTY.	DESCRIPTION	LENGTH
1	1	1-1/2" x .125" Square tubing, 6061 Aluminum	24
2	2	1-1/2" x .125" Square tubing, 6061 Aluminum	21.86
3	2	1-1/2" x .125" Square tubing, 6061 Aluminum	25.07
4	1	1-1/2" x .125" Square tubing, 6061 Aluminum	52

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Cargo Ship Body Frame

SIZE	DWG. NO.	REV
B	GE-19072	C
SCALE: 1:8		WEIGHT:
		SHEET 1 OF 3

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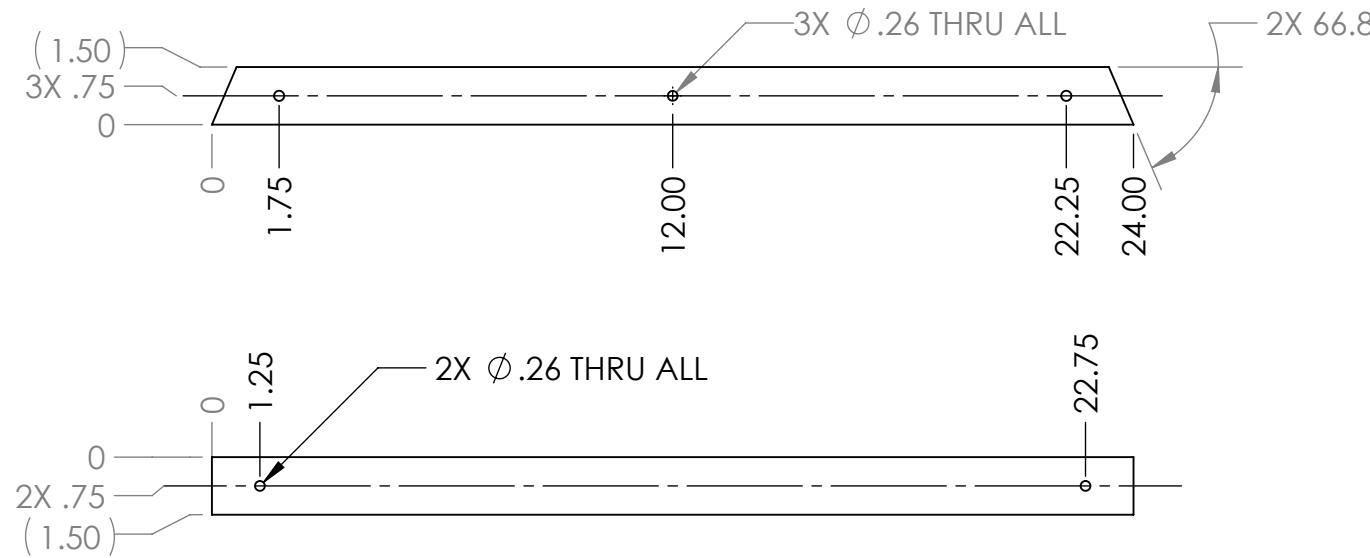
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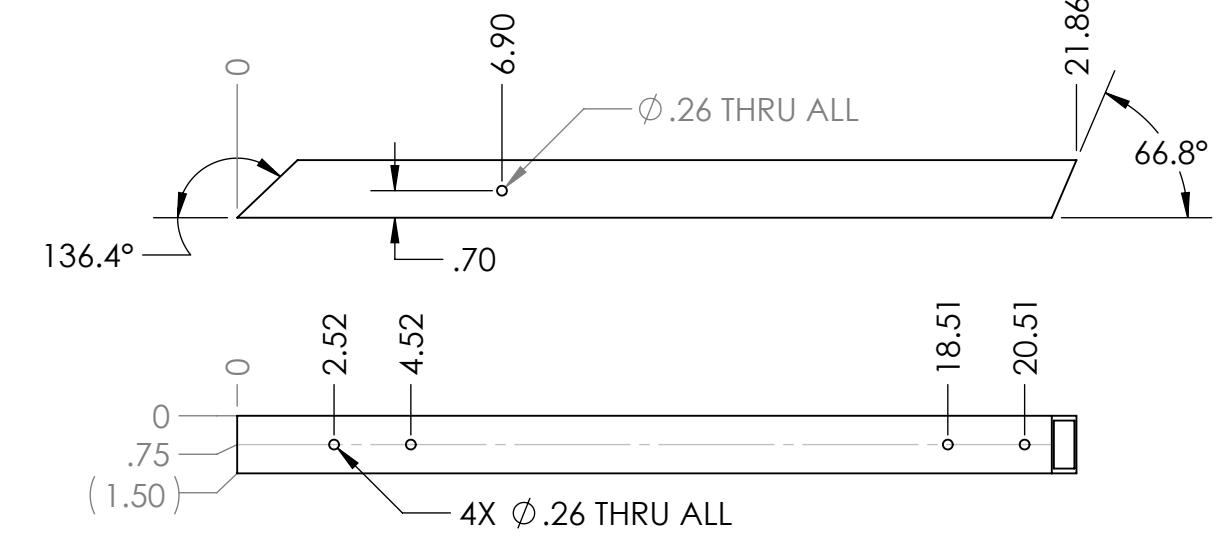
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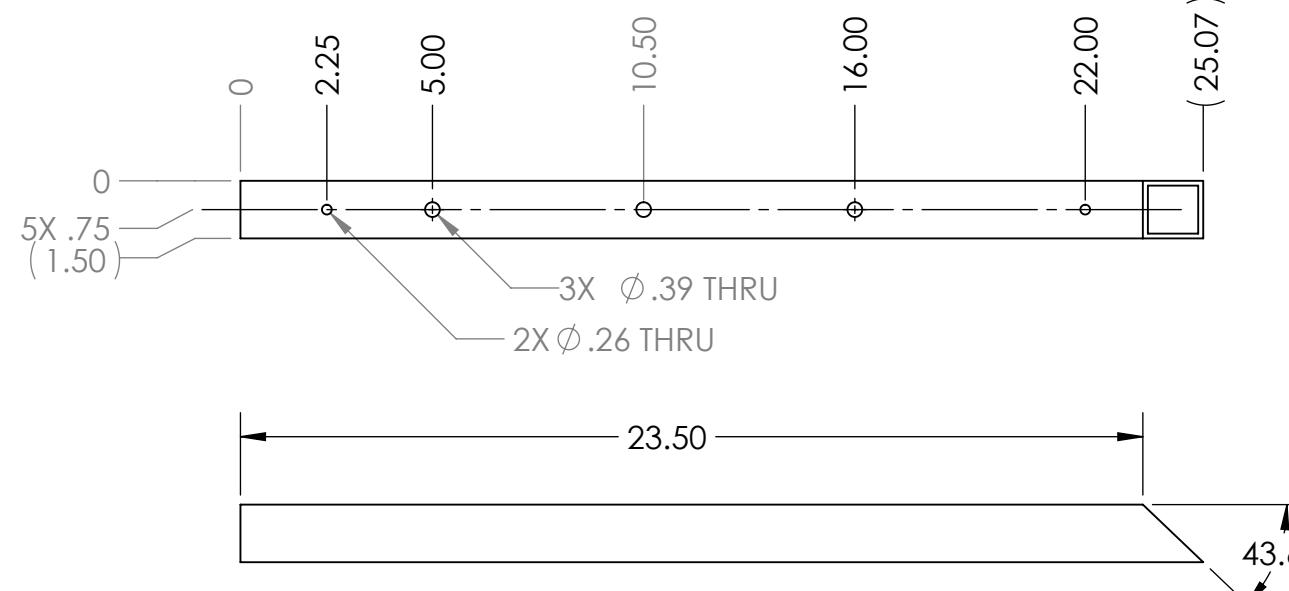
B



Item 1
Material: 1.5" x .125" thk Square Tubing, 6061 aluminum
QTY: 1



Item 2
Material: 1.5" x .125" thk Square Tubing, 6061 aluminum
QTY: 2



Item 3
Material: 1.5" x .125" thk Square Tubing, 6061 aluminum
QTY: 2

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		DRAWN		
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
NEXT ASSY	USED ON	MATERIAL		
		FINISH		
APPLICATION		DO NOT SCALE DRAWING		
SCALE: 1:5	WEIGHT:	SHEET 2 OF 3		

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

Cargo Ship Body Frame

SIZE DWG. NO. REV
B GE-19072 C

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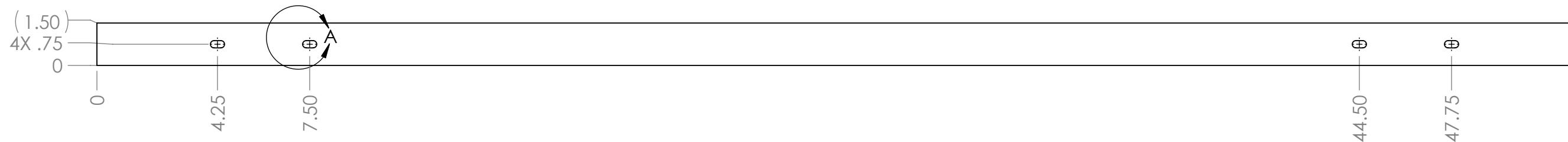
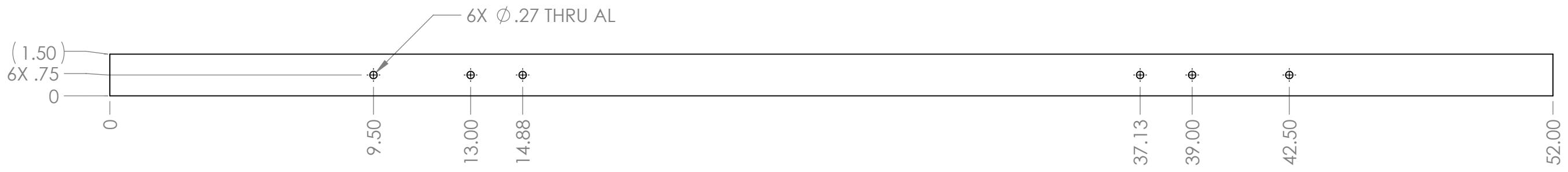
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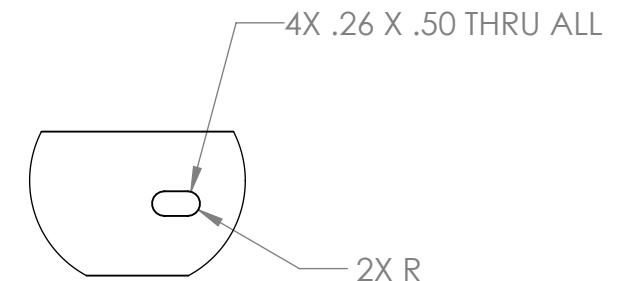
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Item 4
Material: 1.5" x .125" thk Square Tubing, 6061 aluminum
QTY: 1

DETAIL A
SCALE 1 : 2



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		DRAWN		
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
		MATERIAL		
	NEXT ASSY	USED ON	FINISH	
		APPLICATION	DO NOT SCALE DRAWING	
SIZE	DWG. NO.	REV		
B	GE-19072	C		
SCALE: 1:5	WEIGHT:	SHEET 3 OF 3		

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

Cargo Ship Body Frame

4

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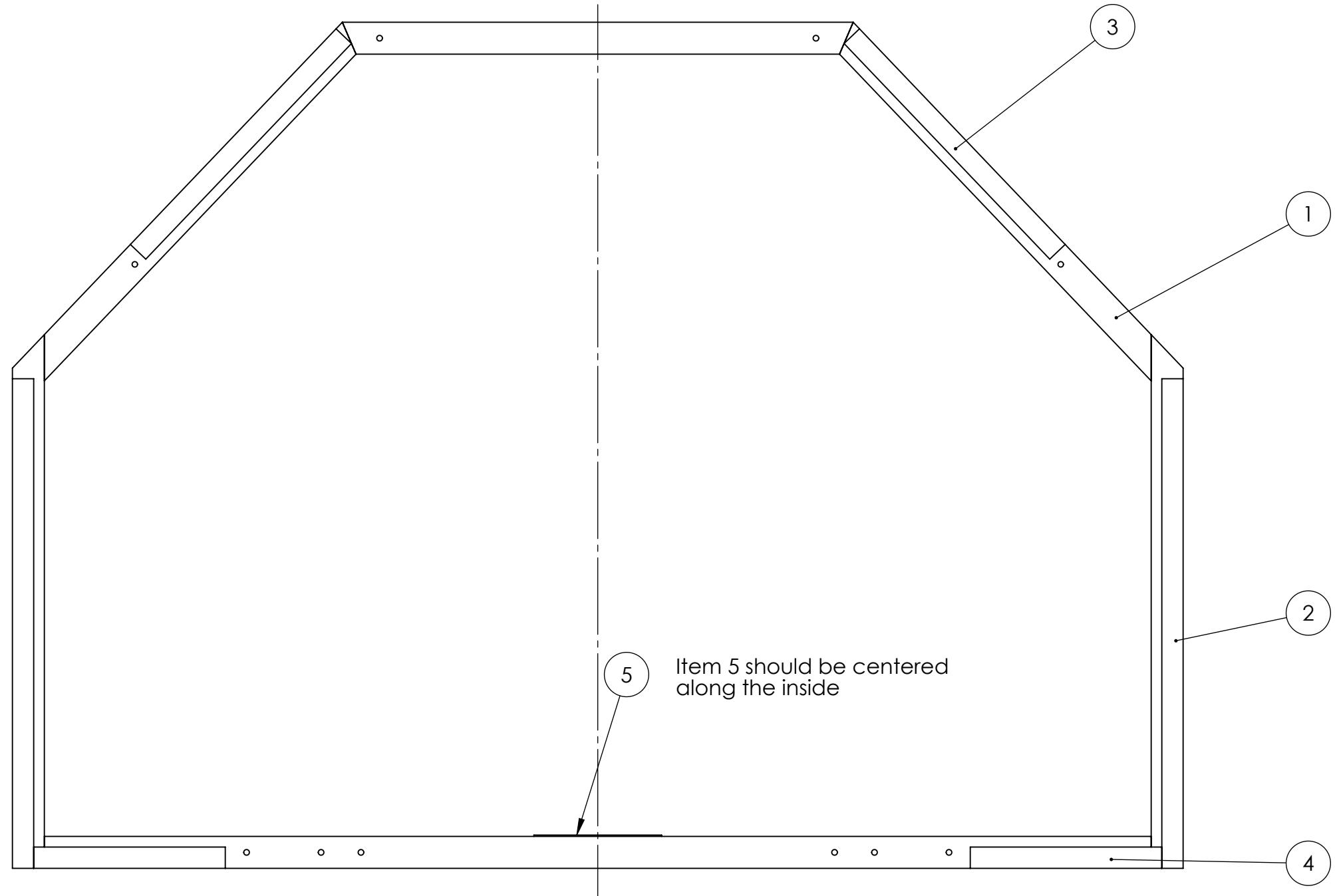
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B

B



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-19072	Cargo Ship Body Frame	1
2	Hook_1_23	1" Hook, 23" Long	2
3	Hook_1_14	1" x 14" Hook, Adhesive Backed	2
4	Hook_1_9	1" x 9" Hook, Adhesive Backed	2
5	Hook_1_6	1" x 6" Hook, Adhesive Backed	1

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: GE-19072, With Hook

SIZE DWG. NO. **REV**
B GE-19072-Assembly

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

4

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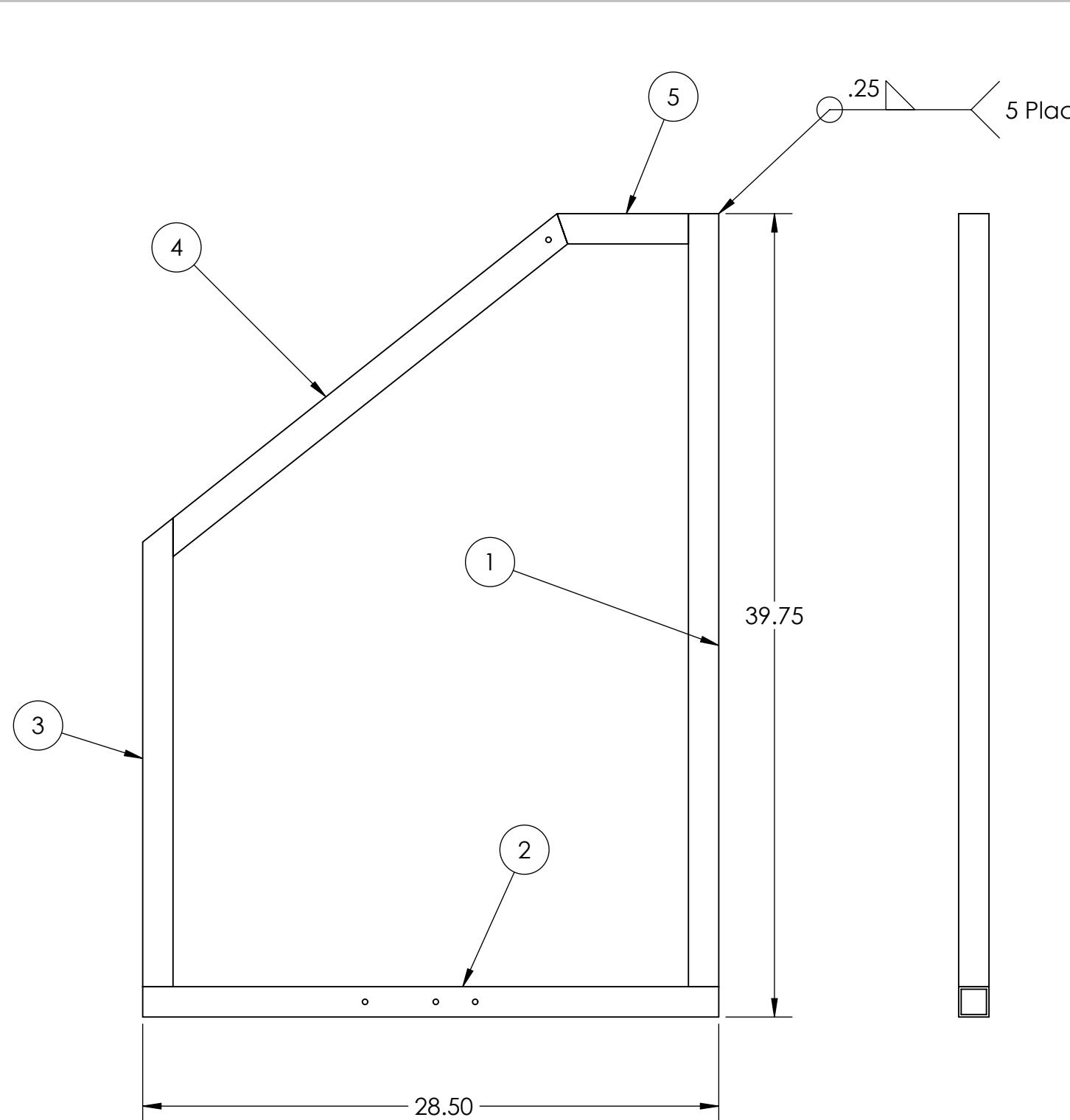
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REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A		10/5/2018	
A2	B	Added Material Table	10/5/2018	DAF
2-B4	C	Corrected slot size from .26 x .38 to .26 x .5	11/15/2018	

ITEM NO.	QTY.	DESCRIPTION	LENGTH
1	1	1-1/2" x .125" Square Tubing, 6061 Aluminum	38.25
2	1	1-1/2" x .125" Square Tubing, 6061 Aluminum	28.5
3	1	1-1/2" x .125" Square Tubing, 6061 Aluminum	23.19
4	1	1-1/2" x .125" Square Tubing, 6061 Aluminum	25.43
5	1	1-1/2" x .125" Square Tubing, 6061 Aluminum	6.5

		UNLESS OTHERWISE SPECIFIED:	
		DRAWN	NAME _____ DATE _____
		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$	
		CHECKED	ENG APPR.
		INTERPRET GEOMETRIC TOLERANCING PER:	
		MFG APPR.	Q.A.
		COMMENTS:	
		MATERIAL	FINISH
NEXT ASSY	USED ON	SIZE DWG. NO. REV	
APPLICATION		B GE-19074 C	
		SCALE: 1:7	WEIGHT: SHEET 1 OF 3

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

Cargo Ship Front Frame

4

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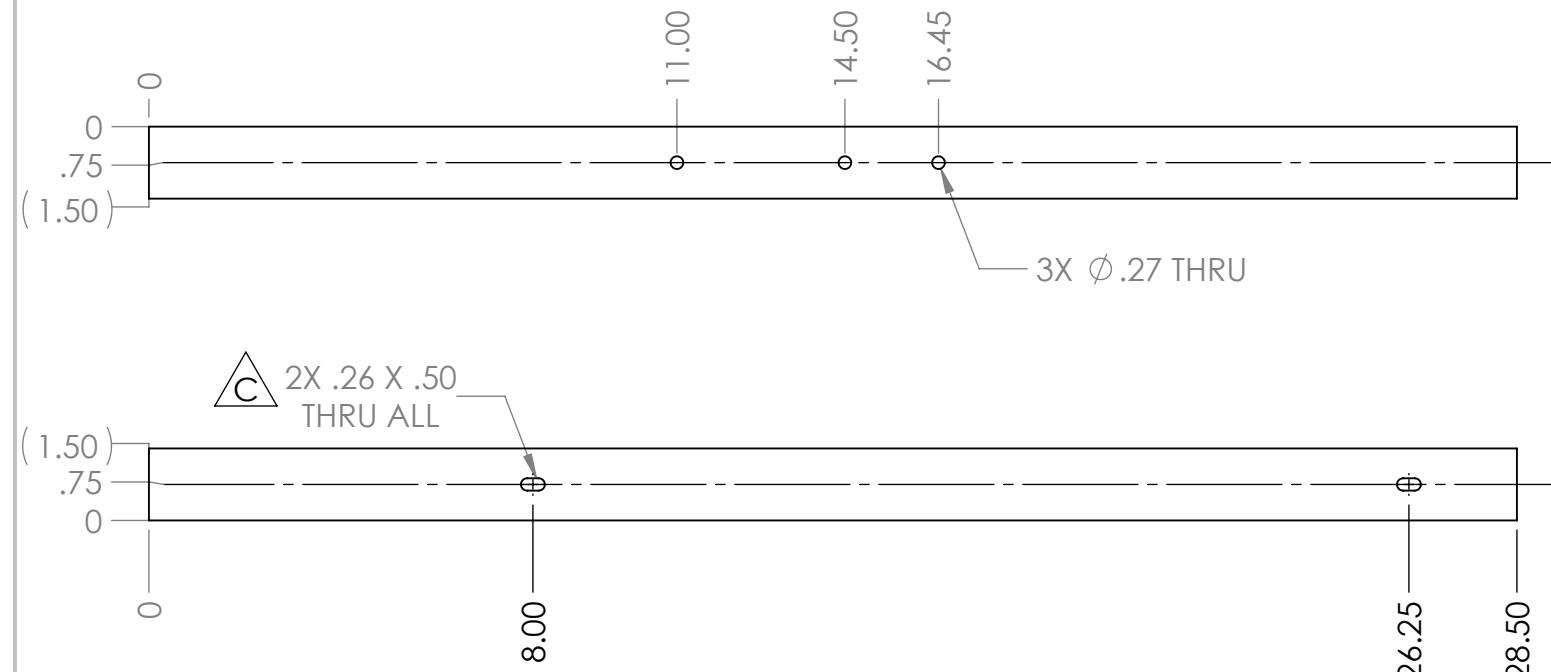
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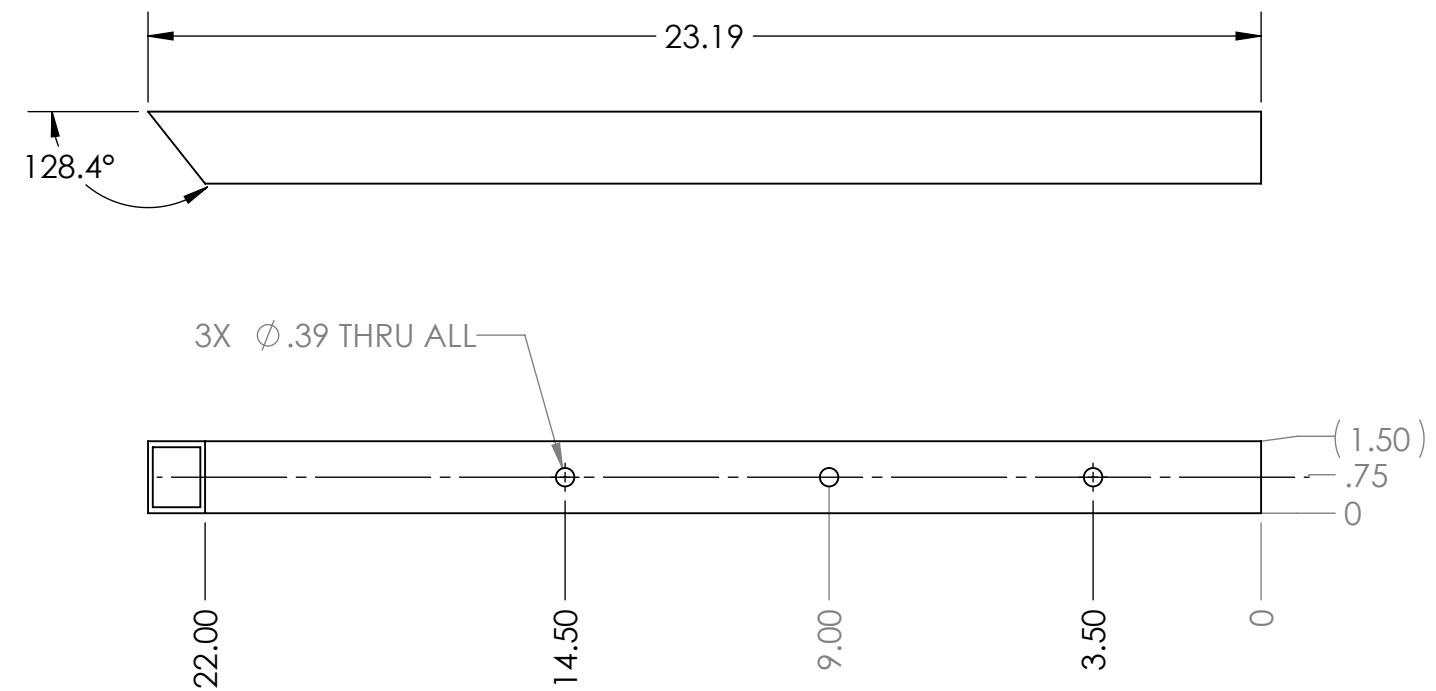
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		UNLESS OTHERWISE SPECIFIED:	NAME	DATE
DIMENSIONS ARE IN INCHES				
TOLERANCES:				
FRACTIONAL $\pm 1/16$				
ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$				
TWO PLACE DECIMAL $\pm .01$				
THREE PLACE DECIMAL $\pm .001$				
INTERPRET GEOMETRIC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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Cargo Ship Front Frame

SIZE	DWG. NO.	REV
B	GE-19074	C
SCALE: 1:4	WEIGHT:	SHEET 2 OF 3

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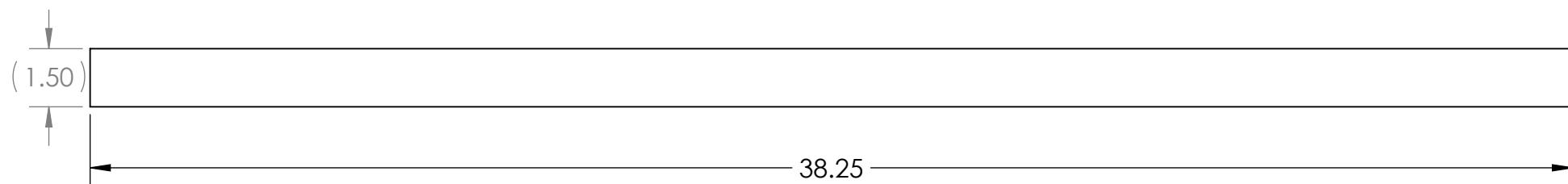
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B

B



Item 1
Material: 1.5" x .125" thk. Square Tubing, 6061 Aluminum
QTY: 1

A

A

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Cargo Ship Front Frame

SIZE	DWG. NO.	REV
B	GE-19074	C
SCALE: 1:4	WEIGHT:	SHEET 3 OF 3

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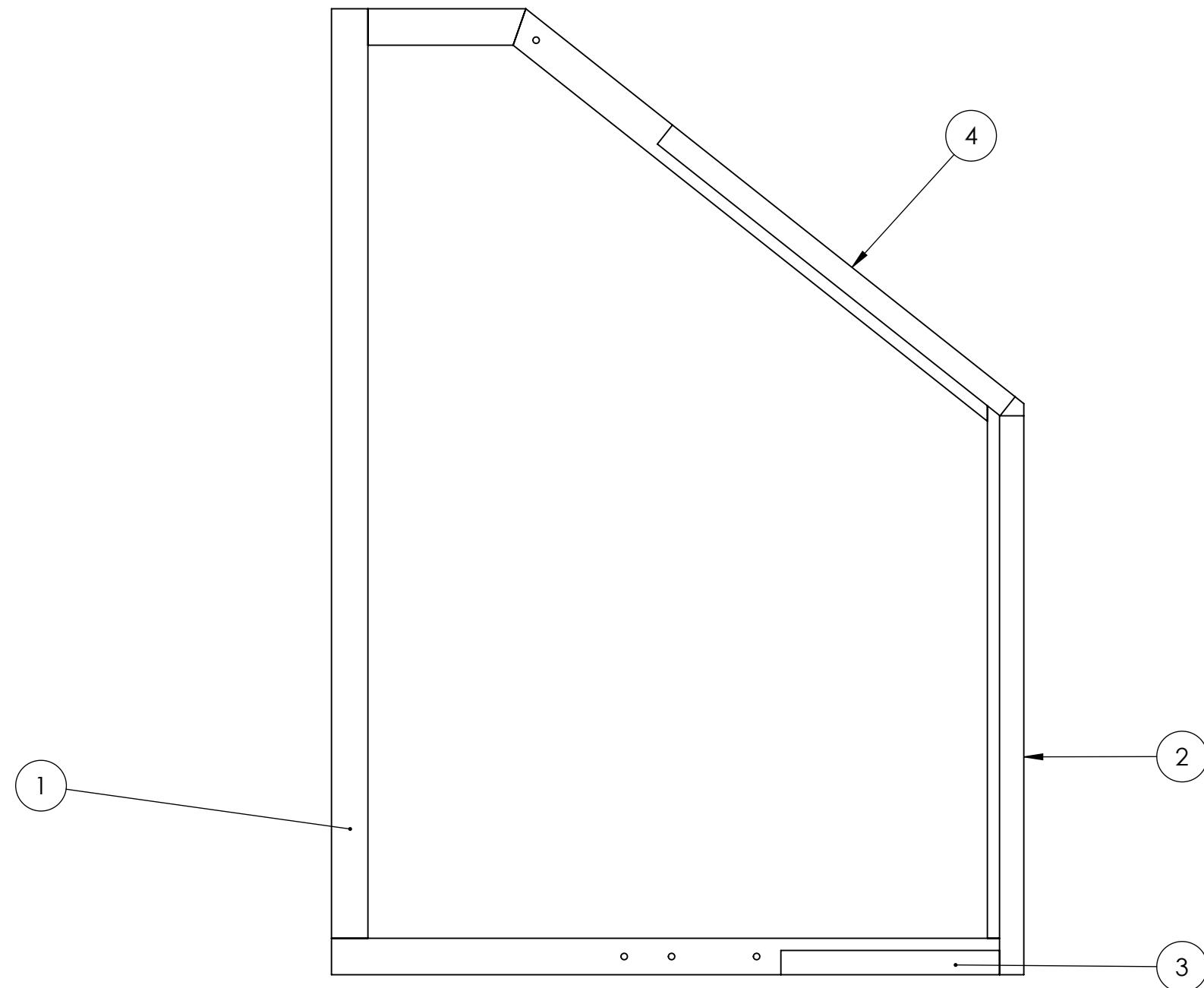
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B



A

A

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-19074	Cargo Ship Front Frame	1
2	Hook_1_23	1" Hook, 23" Long	1
3	Hook_1_9	1" x 9" Hook, Adhesive Backed	1
4	Hook_1_18	1" x 18" Hook, Adhesive Backed	1

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		DIMENSIONS ARE IN INCHES	
		TOLERANCES:	
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		TWO PLACE DECIMAL ±.01	
		THREE PLACE DECIMAL ±.001	
		INTERPRET GEOMETRIC TOLERANCING PER:	COMMENTS: _____
		MATERIAL	
NEXT ASSY	USED ON	FINISH	
APPLICATION		DO NOT SCALE DRAWING	

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: GE-19074, with Hook

SIZE DWG. NO. **REV**
B GE-19074-Assembly

SCALE: 1:8 WEIGHT: SHEET 1 OF 1

4

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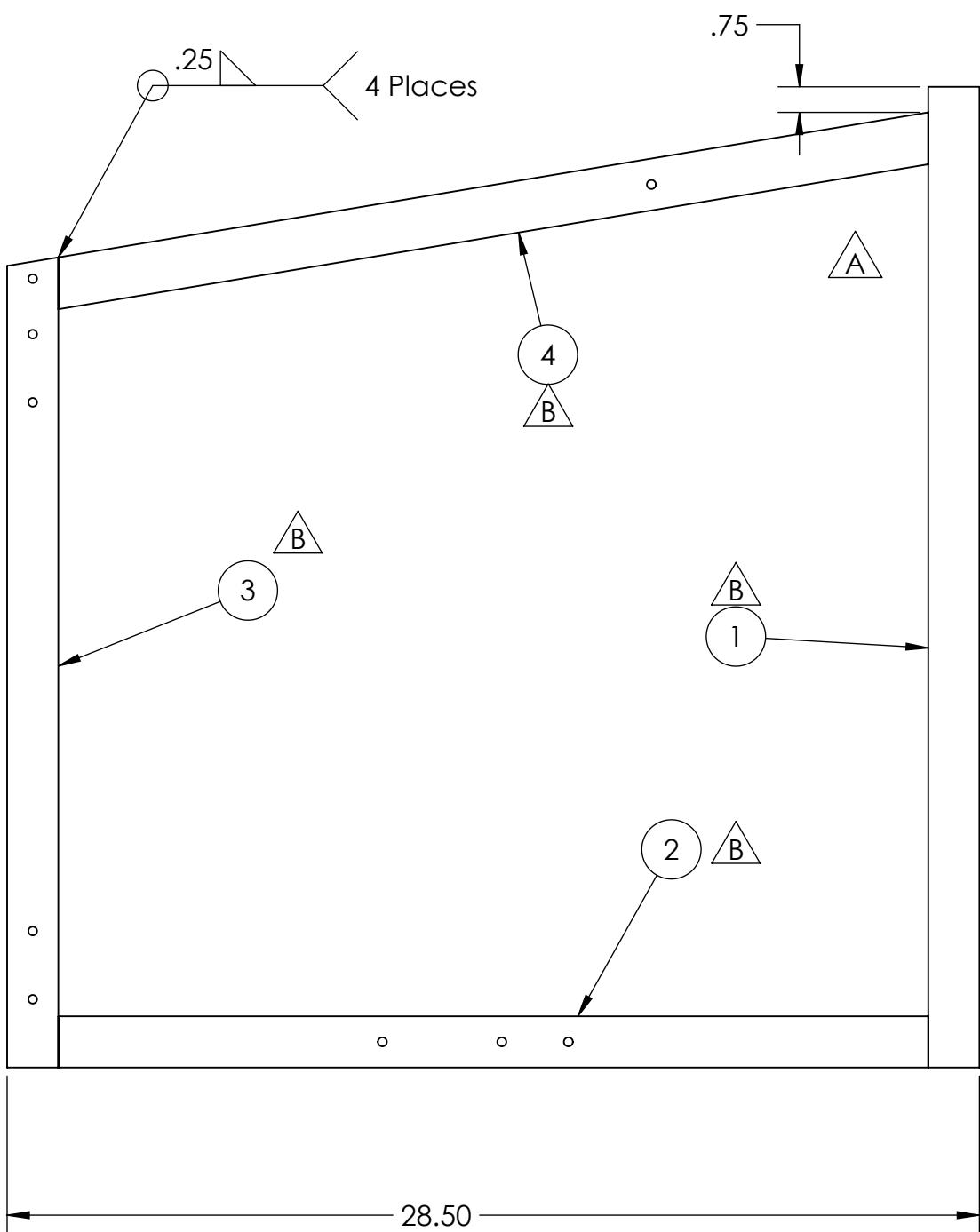
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REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
B3	A	Redrawn and redesigned	10/10/2018	DAF
A2, A3, B3, B4	B	Renumbered and added material table	10/10/2018	DAF
2-B1	C	Corrected slot size from .26 x .38 to .26 x .5	11/15/2018	JRF
2-B1	D	Added a THRU ALL note to slot	11/15/2018	JRF

ITEM NO.	QTY.	DESCRIPTION	LENGTH
1	1	1.5" x .125" thk Square Tubing, 6061 Aluminum	28.75
2	1	1.5" x .125" thk Square Tubing, 6061 Aluminum	25.5
3	1	1.5" x .125" thk Square Tubing, 6061 Aluminum	23.75
4	1	1.5" x .125" thk Square Tubing, 6061 Aluminum	26.1

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE:
Cargo Ship Nose Side

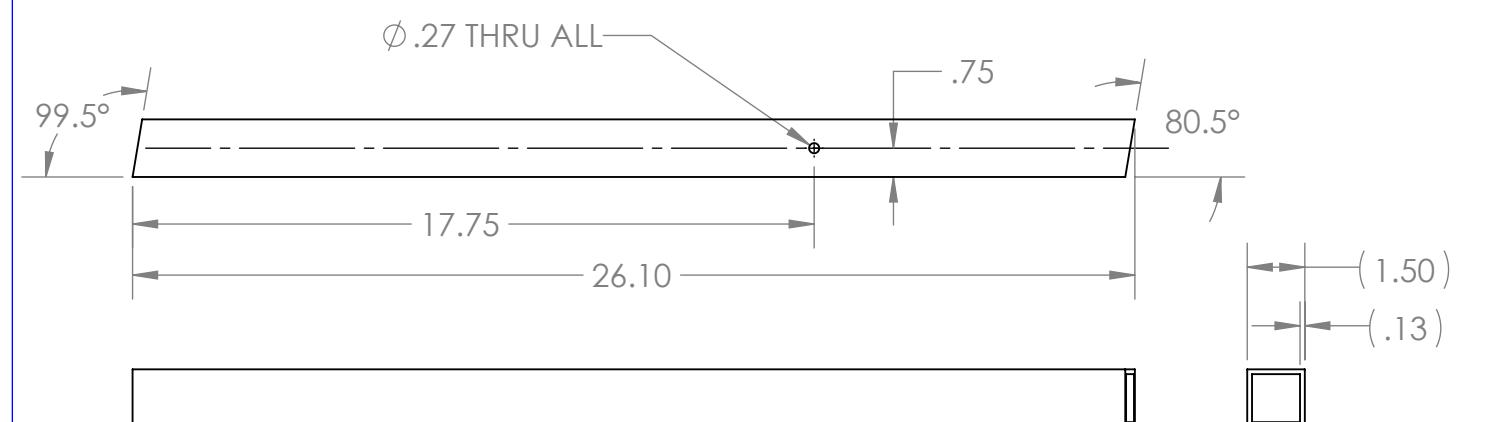
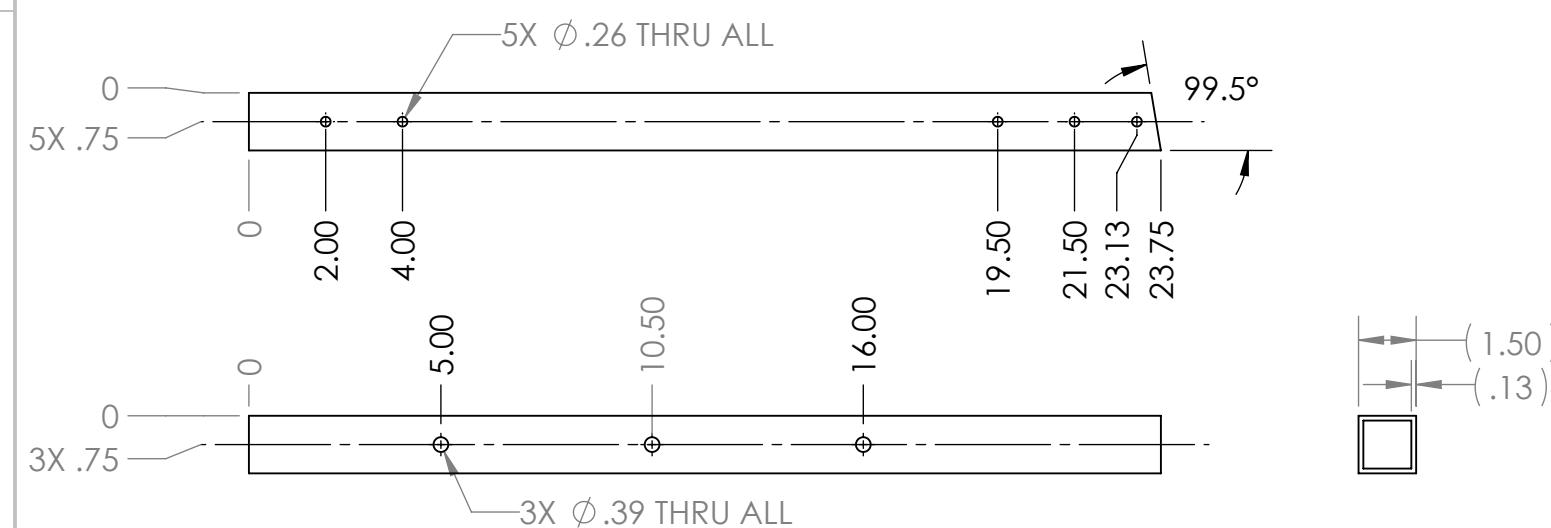
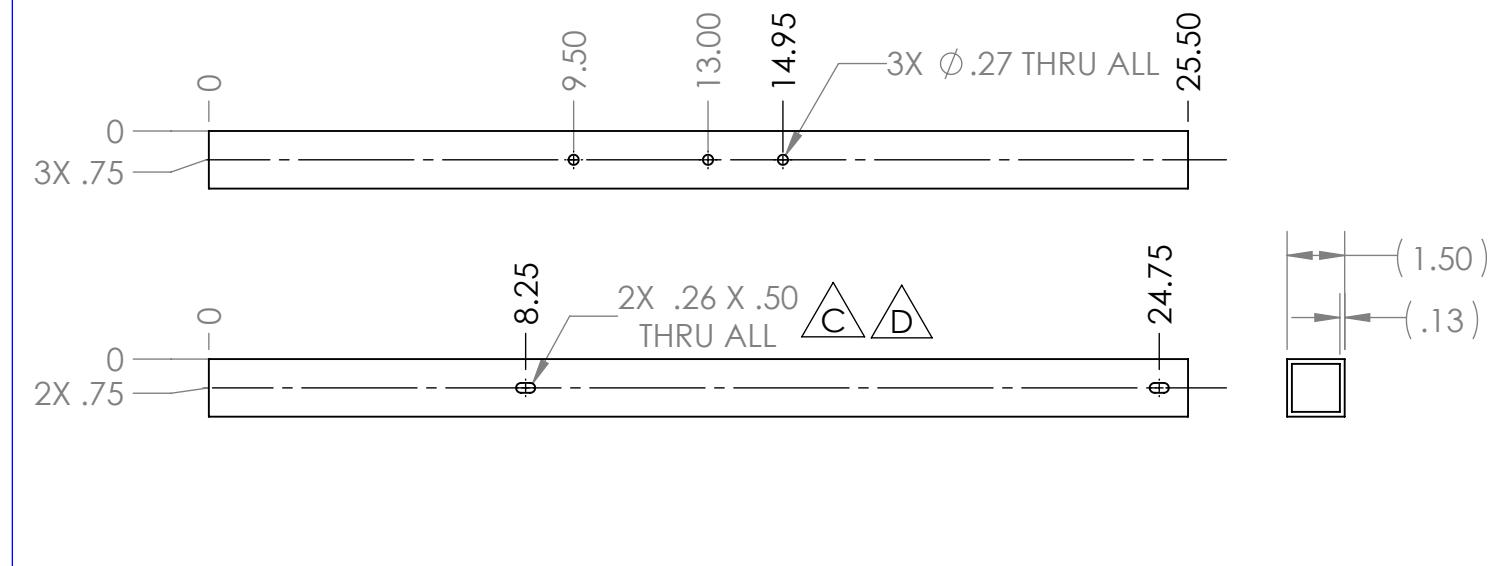
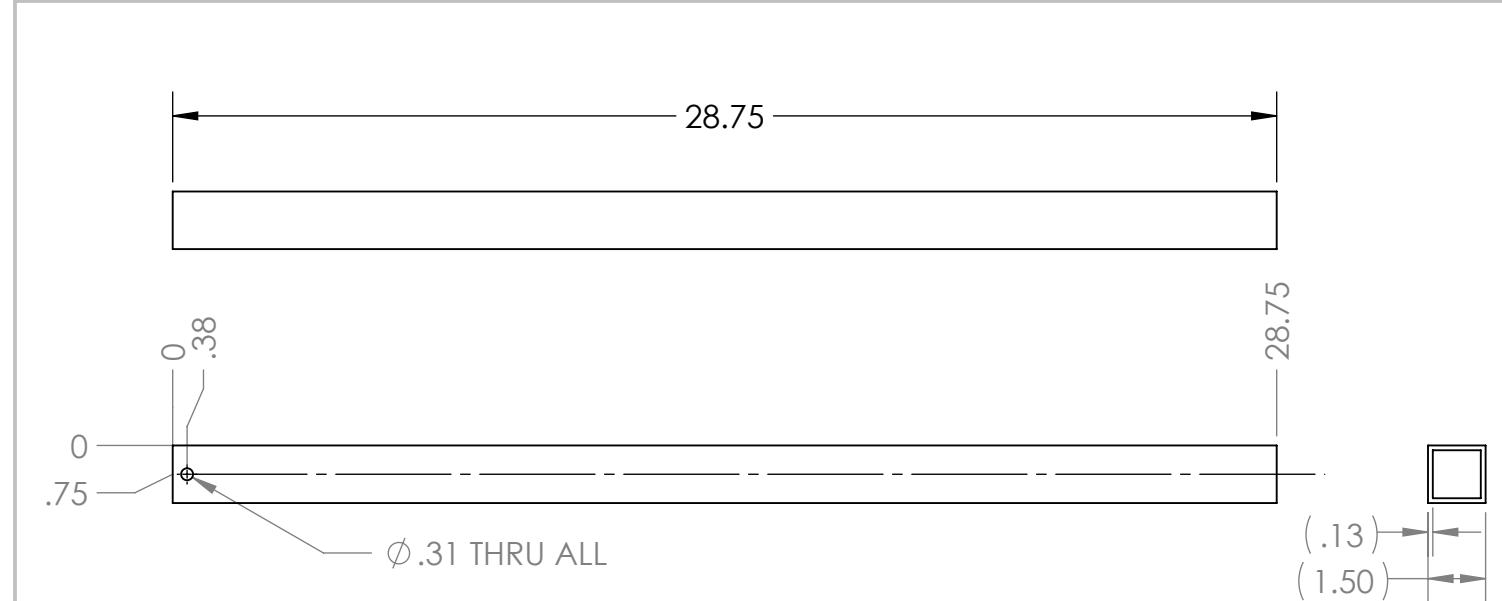
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B	GE-19075	D
SCALE: 1:5	WEIGHT:	SHEET 1 OF 2

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	DRAWN			
	CHECKED			
	ENG APPR.			
	MFG APPR.			
	Q.A.			
	COMMENTS:			
NEXT ASSY	USED ON	MATERIAL		
		FINISH		
APPLICATION		DO NOT SCALE DRAWING		
SCALE: 1:5	WEIGHT:	SHEET 2 OF 2		

FIRST
ROBOTICS
COMPETITION

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TITLE:
Cargo Ship Nose Side

SIZE DWG. NO. REV
B GE-19075 D

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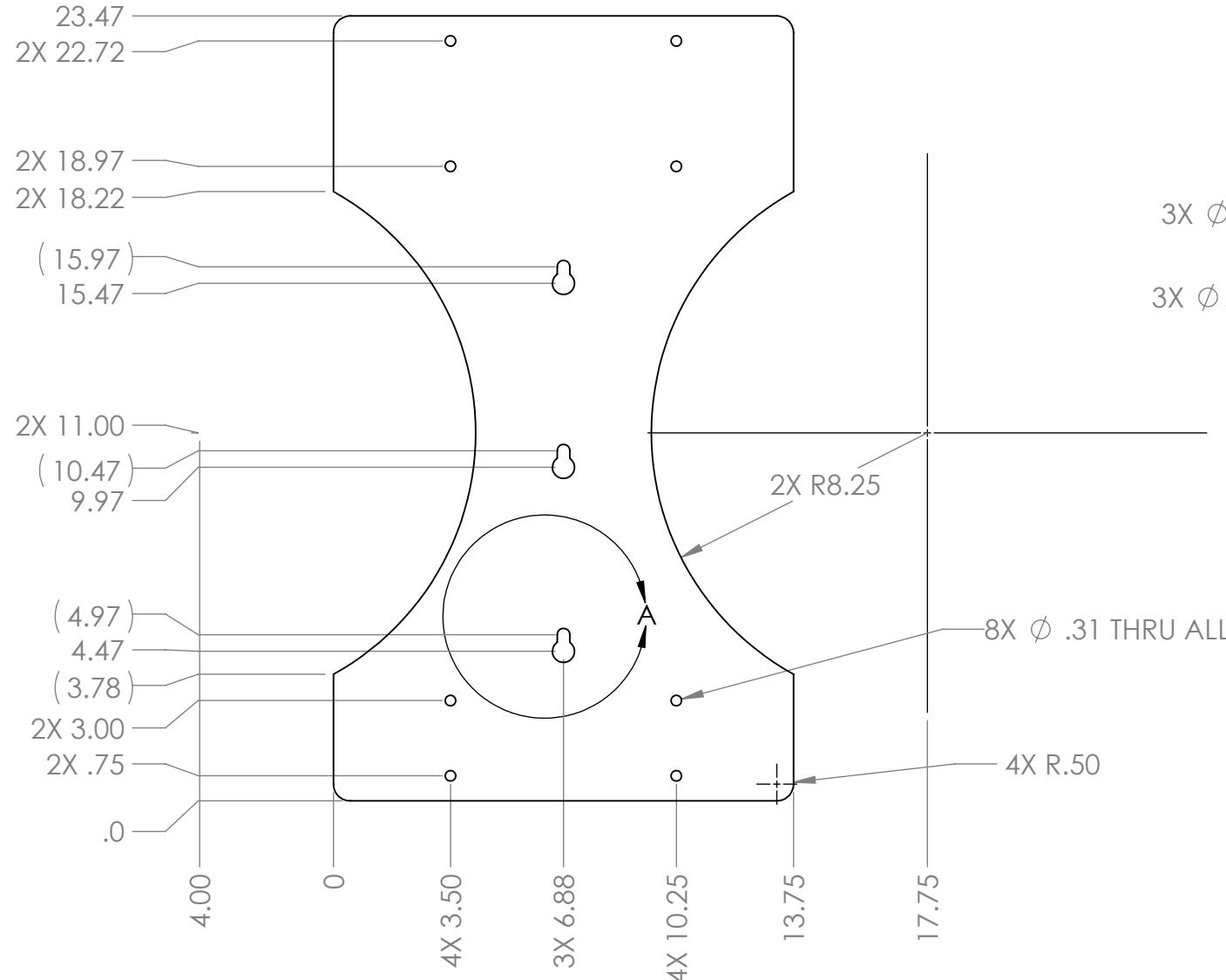
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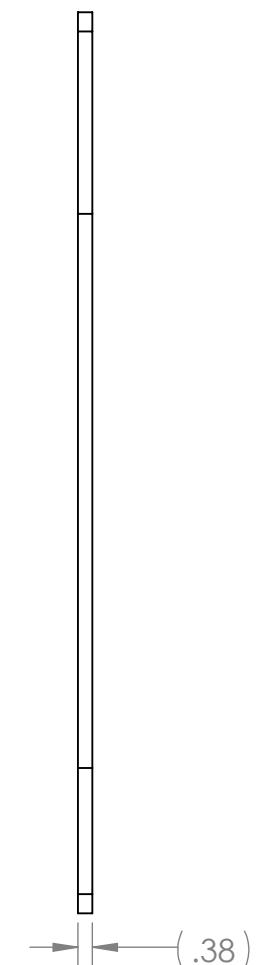
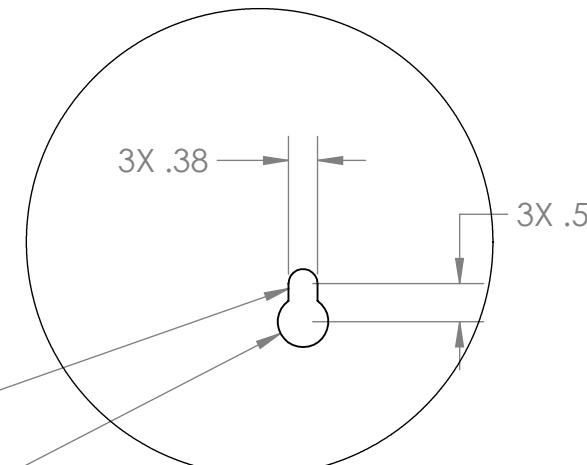
1

B

B



DETAIL A
SCALE 2 : 5



Part Number	Color
GE-19076-RED	RED
GE-19076-BLU	BLUE

Note:
Material: 3/8" Thick Polycarbonate Sheet Clear
Finish: Apply red or blue screen print to one side
Tag or Label With Part Number
Remove sharp edges and burrs

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

FIRST ROBOTICS COMPETITION
SOLIDWORKS
Modeling Solutions Partner

Cargo Ship
Panel Plastic Full

SIZE DWG. NO. REV
B GE-19076 **B**

SCALE: 1:5 WEIGHT: SHEET 1 OF 1

4

3

2

1

4

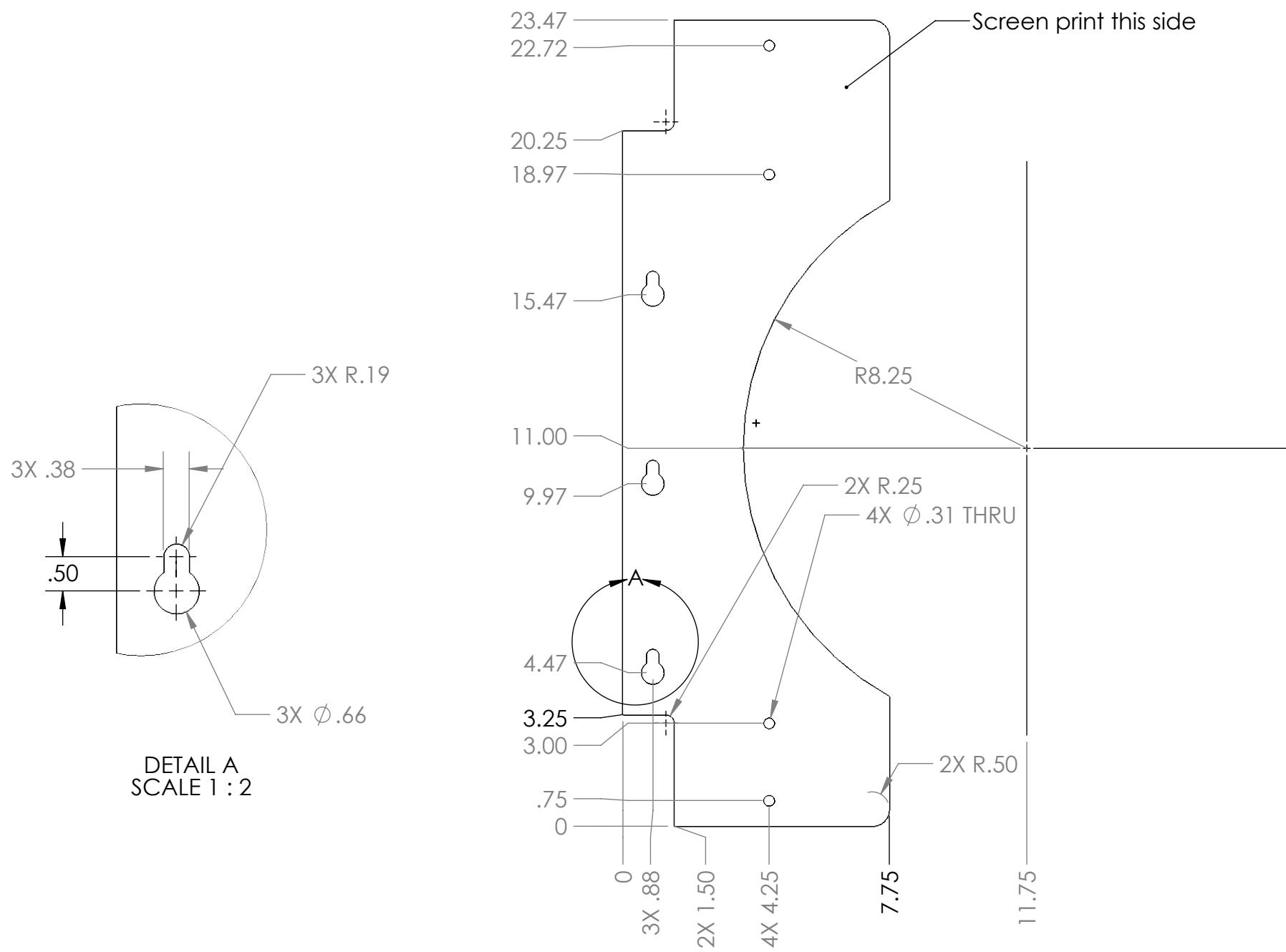
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2

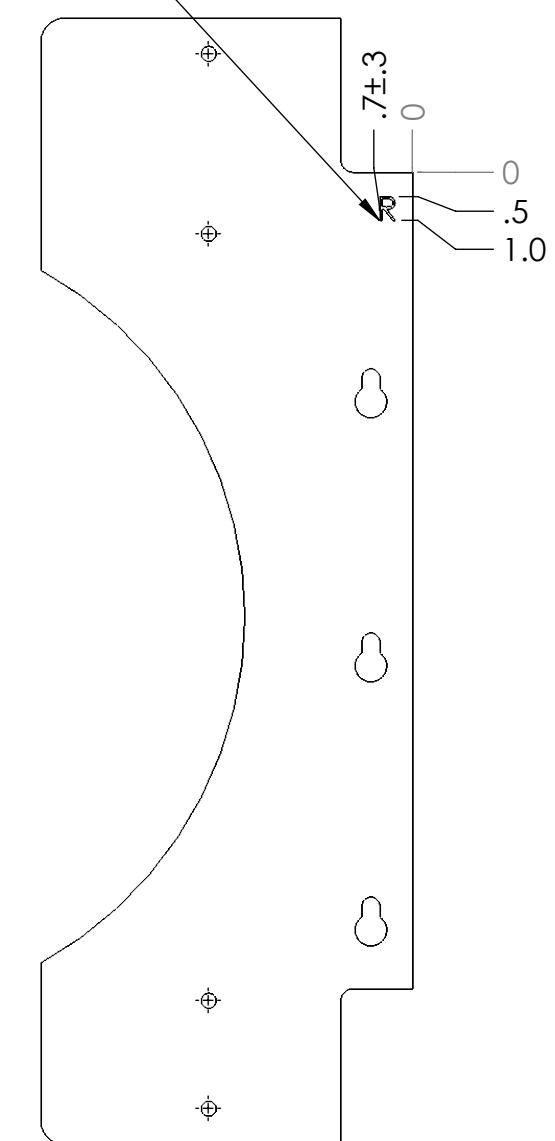
1

B

B



Engrave "R" in
specified location



Part Number	Color
GE-19077-RED	RED
GE-19077-BLU	BLUE

Note:
Material: 3/8" Thick Polycarbonate Sheet Clear
Finish: Apply red or blue screen print to indicated side
Tag or Label With Part Number
Remove sharp edges and burrs

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		UNLESS OTHERWISE SPECIFIED:	NAME	DATE
		DIMENSIONS ARE IN INCHES		
		TOLERANCES:		
		FRACTIONAL ±1/16		
		ANGULAR: MACH ±1° BEND ±1°		
		TWO PLACE DECIMAL ±.01		
		THREE PLACE DECIMAL ±.001		
		INTERPRET GEOMETRIC TOLERANCING PER:		
		MATERIAL		
		NEXT ASSY	USED ON	FINISH
		APPLICATION	DO NOT SCALE DRAWING	
			SCALE: 1:4	WEIGHT:
			SHEET 1 OF 1	

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Cargo Ship Panel Plastic Right

B **GE-19077** **A**

4

3

2

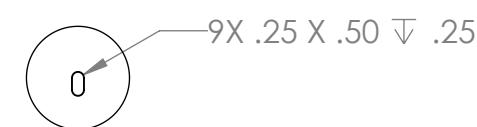
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4

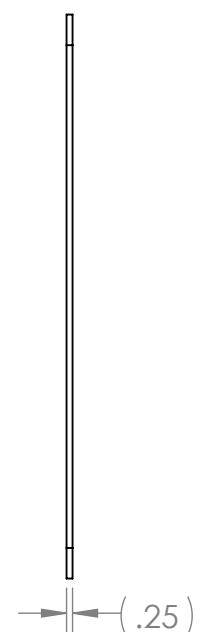
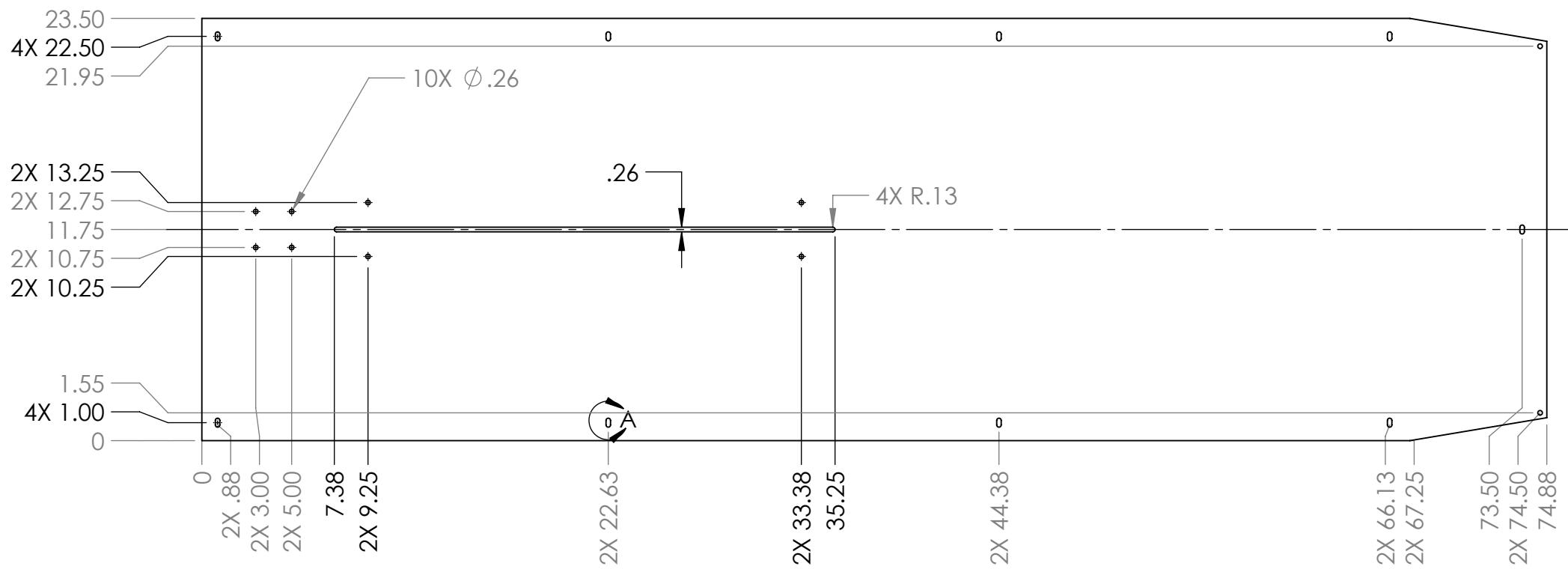
3

2

1



DETAIL A
SCALE 1 : 4



Part Number	Color
GE-19078-RED	RED
GE-19078-BLU	BLUE

Note:
Material: 1/4" Thick Polycarbonate Sheet Clear
Finish: Apply red or blue screen print to one side
Tag and Label With Part Number
Remove Sharp Edges and Burrs

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

Cargo Ship Top Plastic

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

SIZE DWG. NO. REV
B GE-19078 B

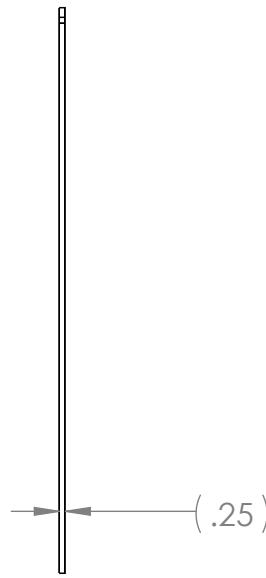
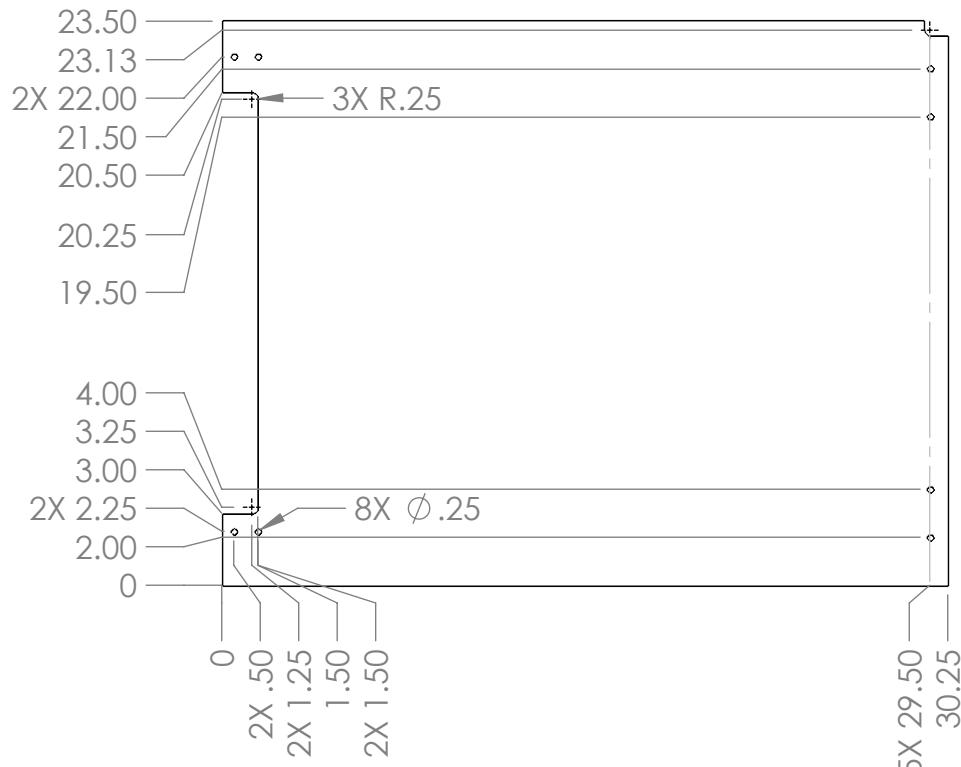
SCALE: 1:8 WEIGHT: SHEET 1 OF 1

2

1

B

B



Note:

Material: 1/4" Thick Polycarbonate Sheet Clear
 Finish: Vinyl applied to plastic
 Tag or Label With Part Number
 Remove sharp edges and burrs

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

Q.A.
COMMENTS:

SIZE	DWG. NO.	REV
A	GE-19079	A
SCALE: 1:8	WEIGHT:	SHEET 1 OF 1

2

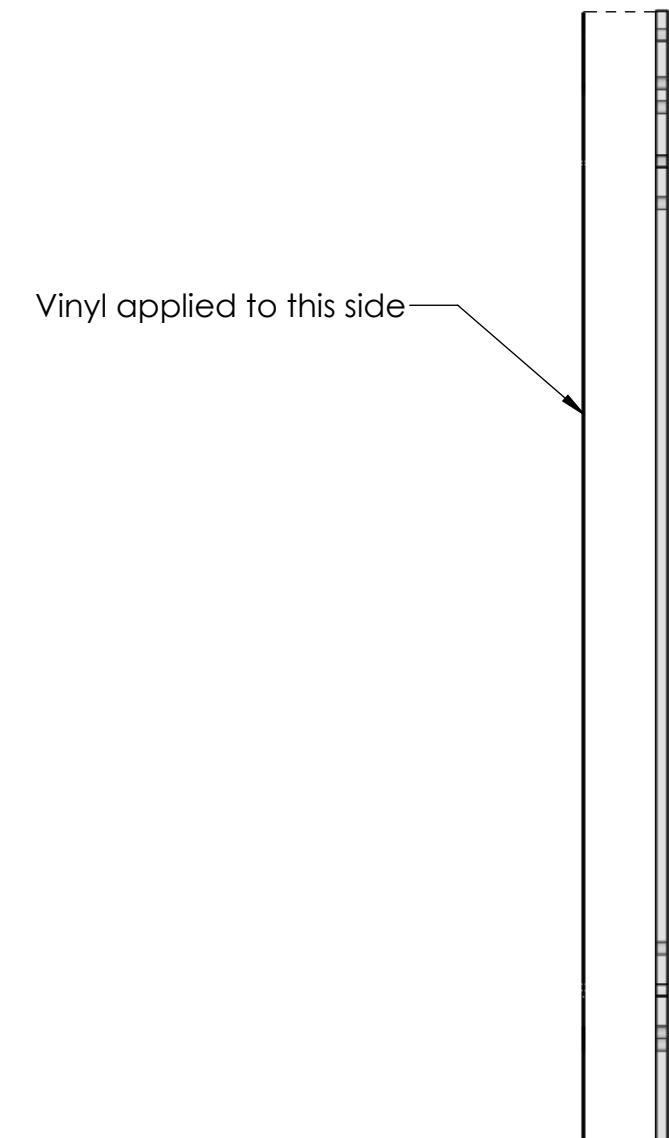
1

4

3

2

1



Notes:
Quantity per field: 1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-19079	Cargo Ship Front Side Plastic	1
2	GE-19079-Left-Blue-Vinyl	GE-19079 Left Blue Vinyl	1

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Cargo Ship Front Side Plastic, Left Blue

SIZE **B** DWG. NO. **GE-19079-Left-Blue** REV **1**

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

4

3

2

1



Vinyl applied to this side



Notes:
Quantity per field: 1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-19079	Cargo Ship Front Side Plastic	1
2	GE-19079-Left-Red-Vinyl	GE-19079 Left Red Vinyl	1

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		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$	DRAWN		
			CHECKED		
			ENG APPR.		
			MFG APPR.		
		INTERPRET GEOMETRIC TOLERANCING PER:	Q.A.		
		MATERIAL	COMMENTS:		
	NEXT ASSY	USED ON	FINISH		
	APPLICATION		DO NOT SCALE DRAWING		
SIZE	DWG. NO.	REV			
B	GE-19079-Left-Red				
SCALE: 1:4	WEIGHT:	SHEET 1 OF 1			

FIRST
ROBOTICS
COMPETITION **SOLIDWORKS**
Modeling Solutions Partner
TITLE: Cargo Ship Front
Side Plastic, Left
Red
SIZE DWG. NO. REV
B GE-19079-Left-Red
SCALE: 1:4 WEIGHT: SHEET 1 OF 1

4

3

2

1



B

B

A

A

Notes:
Quantity per field: 1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-19079	Cargo Ship Front Side Plastic	1
2	GE-19079-Right-Blue-Vinyl	GE-19079 Right Blue Vinyl	1

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Cargo Ship Front Side Plastic Right Blue
SIZE: DWG. NO. **B** GE-19079-Right-Blue **REV:**

SCALE: 1:4 **WEIGHT:** **Sheet 1 of 1**

4

3

2

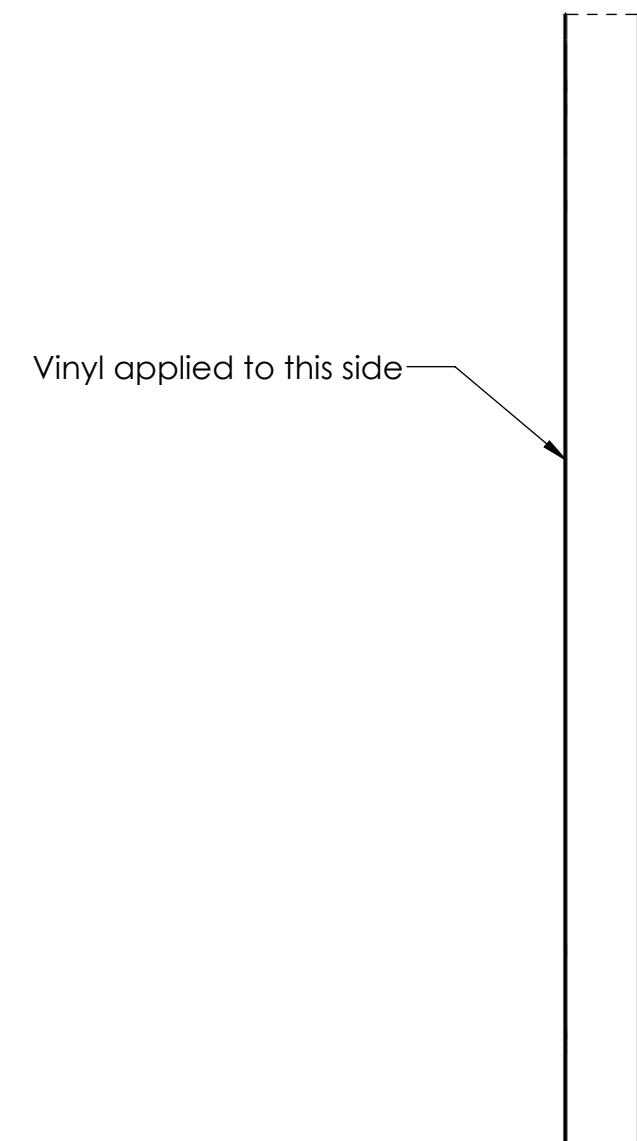
1

4

3

2

1



Notes:
Quantity per field: 1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-19079	Cargo Ship Front Side Plastic	1
2	GE-19079-Right-Red-Vinyl	GE-19079 Right Red Vinyl	1

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Cargo Ship Front Side Plastic, Right Red

SIZE DWG. NO. REV
B GE-19079-Right-Red

SCALE: 1:4 WEIGHT: SHEET 1 OF 1

4

3

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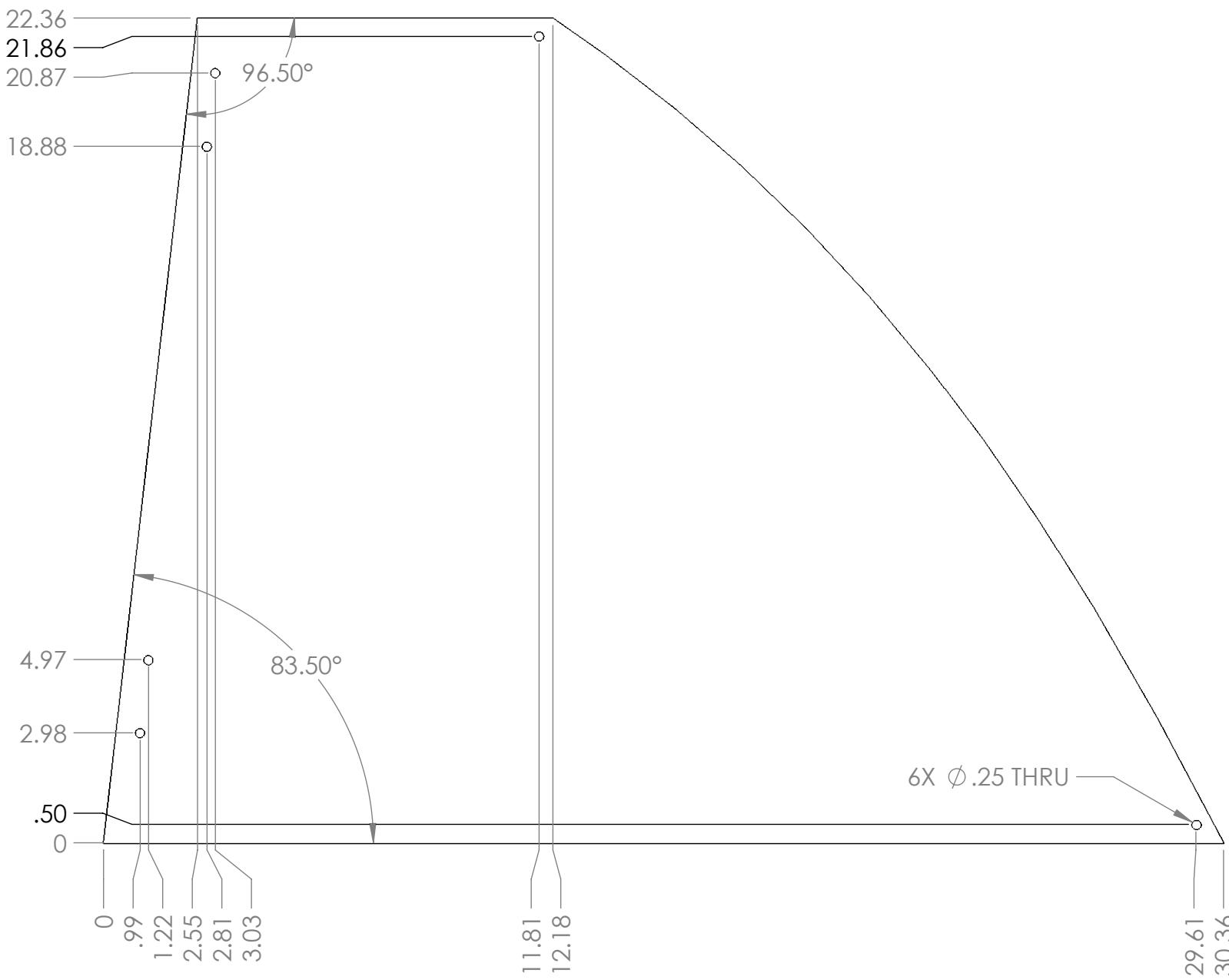
3

2

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B

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Note:
 Material: 1/4" Thick Polycarbonate Sheet Clear
 Finish: Vinyl applied to plastic
 Tag or Label With Part Number
 Remove sharp edges and burrs

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		DRAWN		
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
		MATERIAL		
	NEXT ASSY	USED ON	FINISH	
	APPLICATION		DO NOT SCALE DRAWING	
SIZE	DWG. NO.		REV	
B	GE-19080			
SCALE: 1:4	WEIGHT:		SHEET 1 OF 1	

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
 Modeling Solutions Partner

TITLE:
Cargo Ship Front Top Plastic

4

3

2

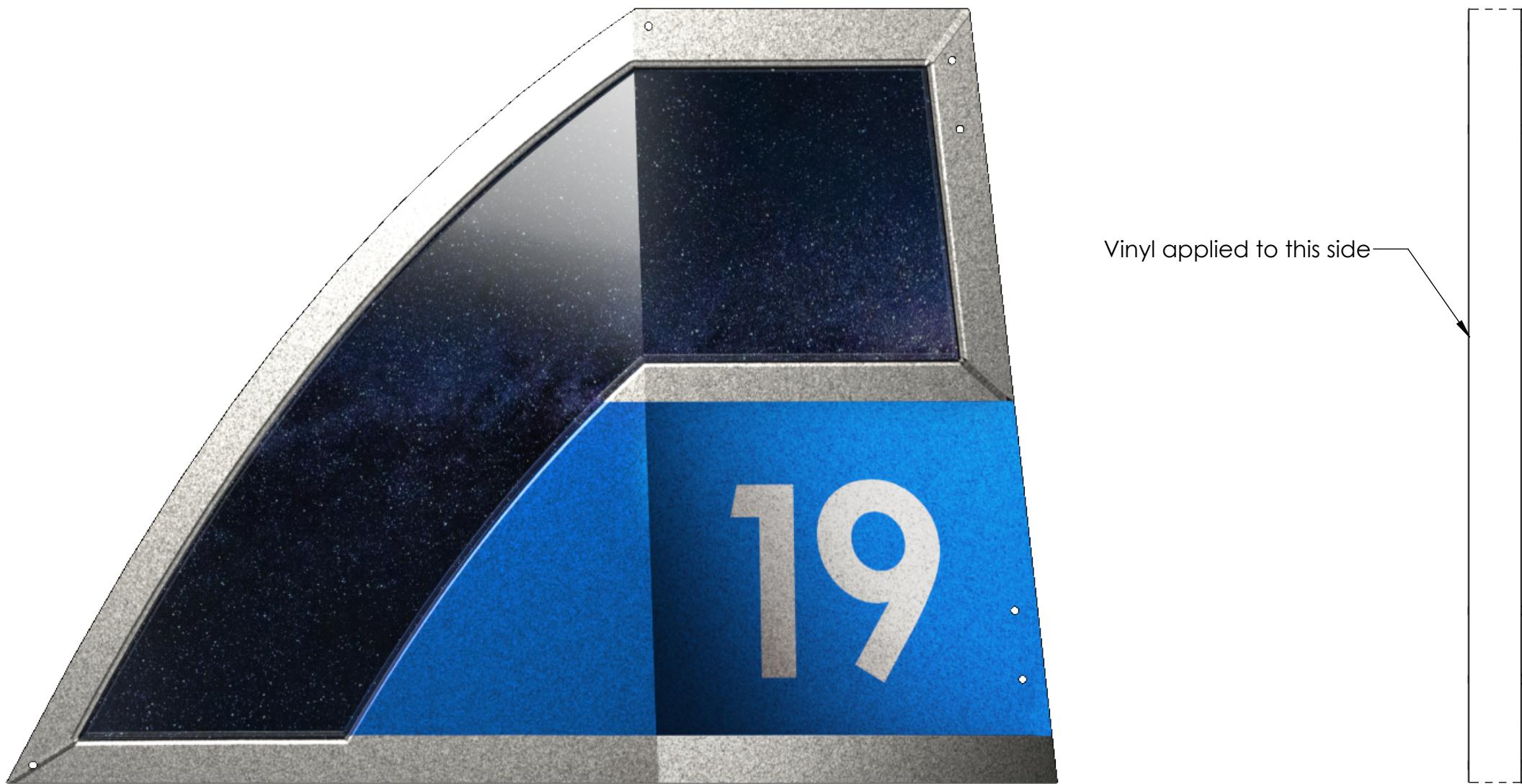
1

4

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2

1



B

B

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A

Notes:
Quantity per field: 1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-19080	Cargo Ship Front Top Plastic	1
2	GE-19080-Left-Blue-Vinyl	GE-19080 Left Blue Vinyl	1

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

**Cargo Ship Front
Top Plastic Left Blue**

SIZE DWG. NO. REV
B GE-19080-Left-Blue

SCALE: 1:4 WEIGHT: SHEET 1 OF 1

4

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1

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1



B

B

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A

Notes:
Quantity per field: 1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-19080	Cargo Ship Front Top Plastic	1
2	GE-19080-Left-Red-Vinyl	GE-19080 Left Red Vinyl	1

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Cargo Ship Front Top Plastic Left Red

SIZE	DWG. NO.	REV
B	GE-19080-Left-Red	

SCALE: 1:4 WEIGHT: SHEET 1 OF 1

4

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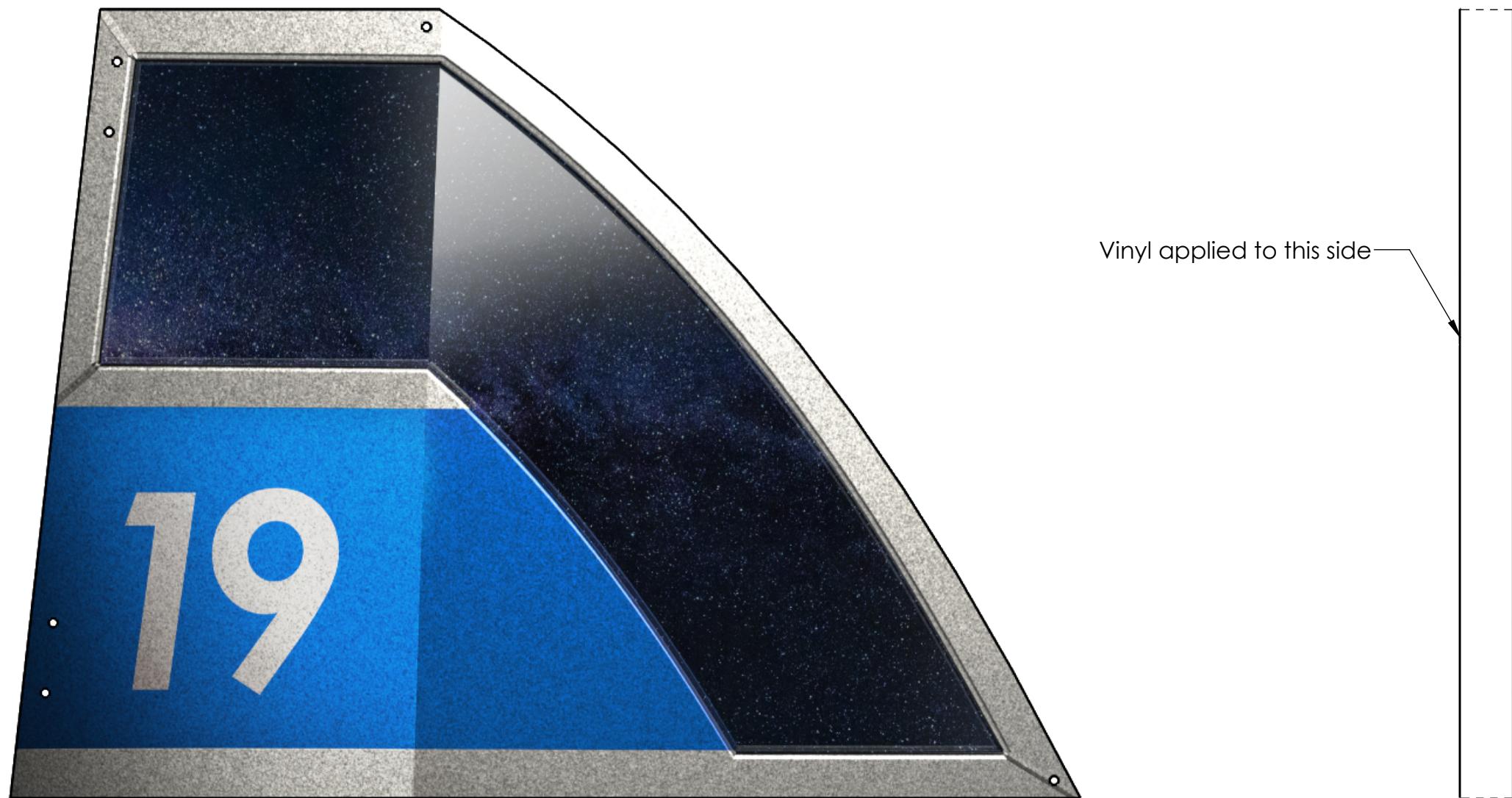
3

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B

B



Notes:
Quantity per field: 1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-19080	Cargo Ship Front Top Plastic	1
2	GE-19080-Right-Blue-Vinyl	GE-19080 Right Blue Vinyl	1

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Cargo Ship Front Top Plastic, Right Blue
SIZE: DWG. NO. **B** GE-19080-Right-Blue **REV:**

SCALE: 1:4 **WEIGHT:** **Sheet 1 of 1**

4

3

2

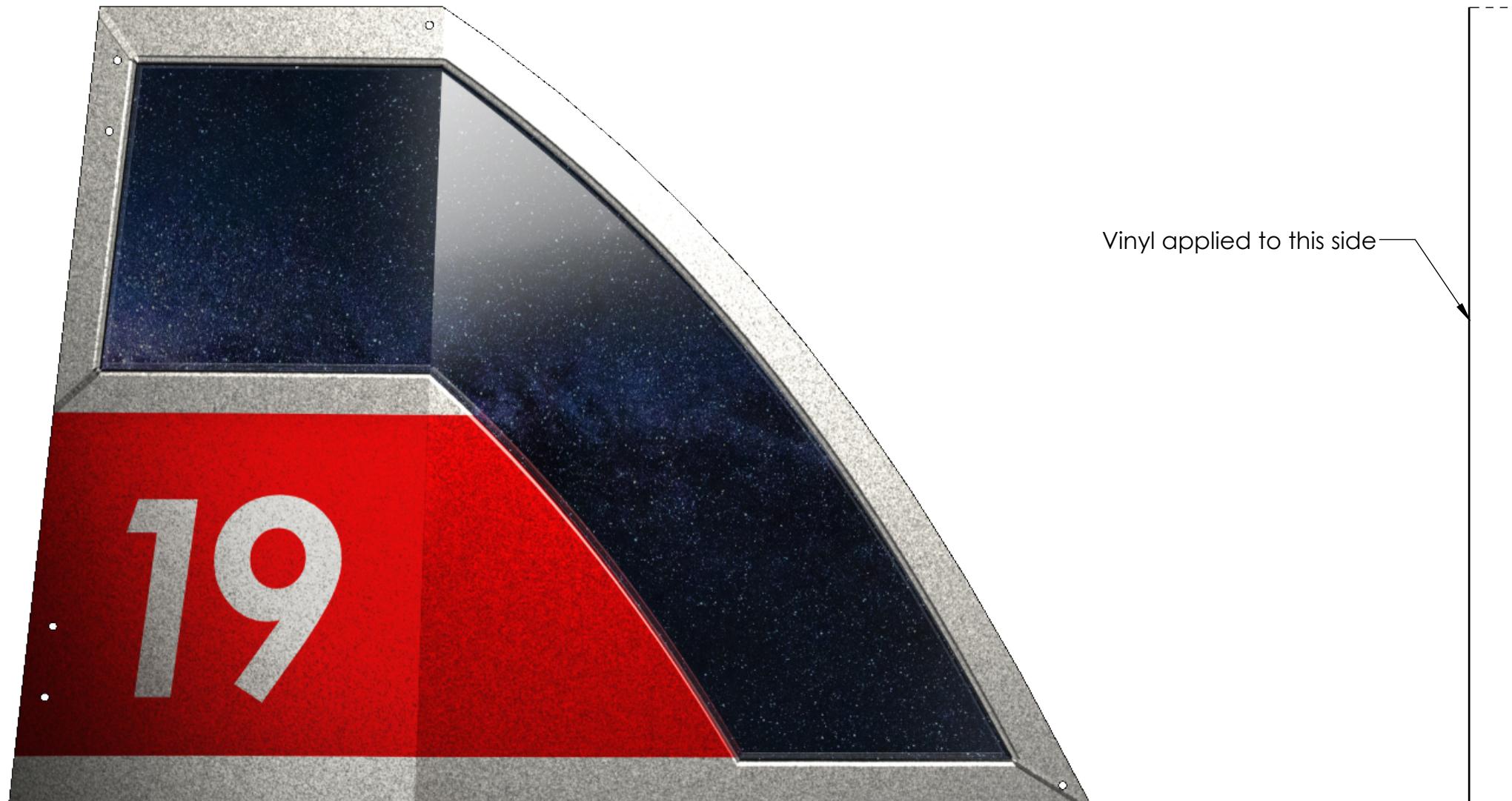
1

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B

B

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A

Notes:
Quantity per field: 1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-19080	Cargo Ship Front Top Plastic	1
2	GE-19080-Right-Red-Vinyl	GE-19080 Right Red Vinyl	1

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Cargo Ship Front Top Plastic Right Red

SIZE DWG. NO. REV
B GE-19080-Right-Red

SCALE: 1:4 WEIGHT: SHEET 1 OF 1

4

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4

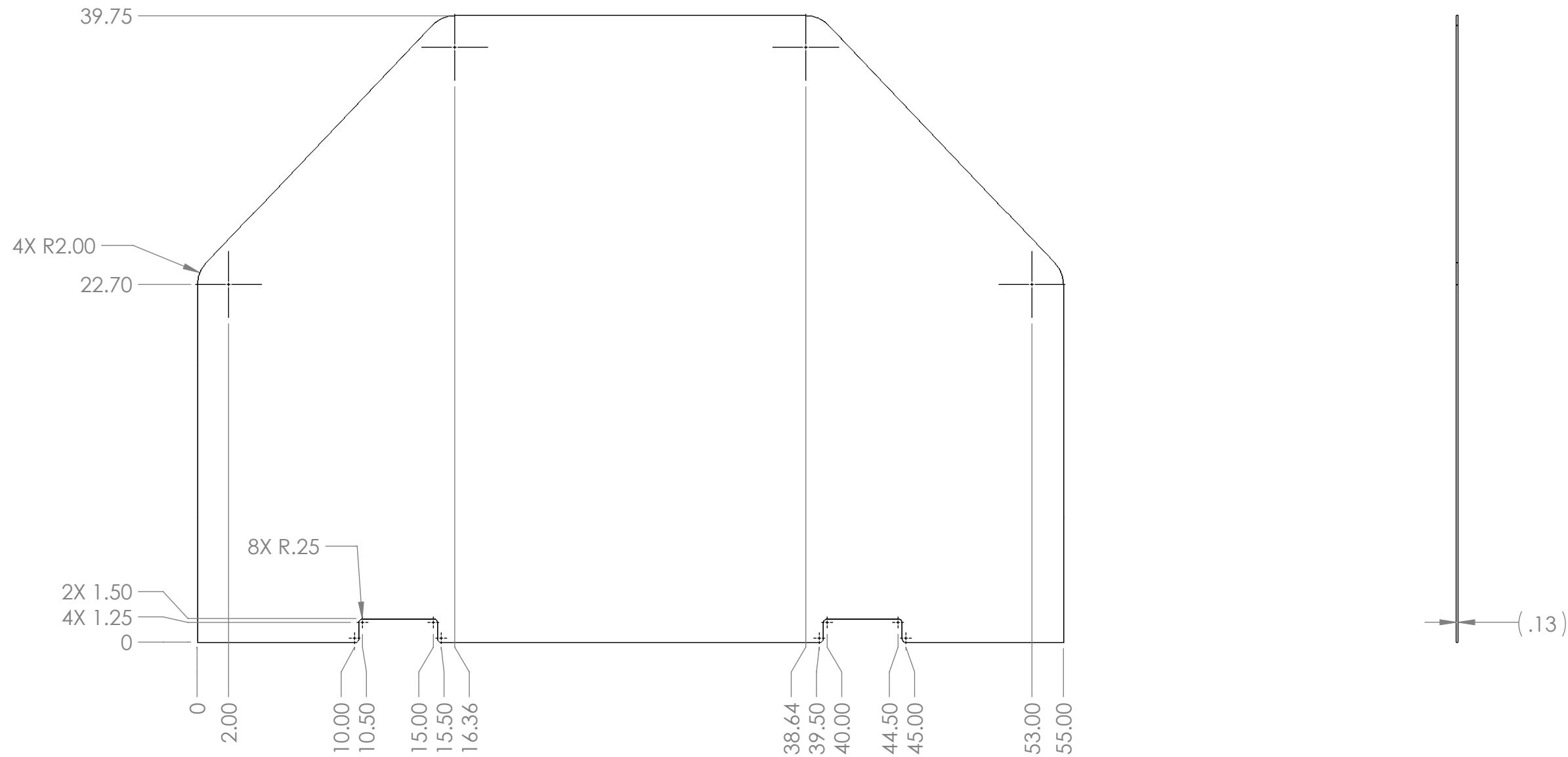
3

2

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B

B



A

A

Note:
 Material: 1/8" Thick HDPE
 Tag or Label With Part Number
 Remove sharp edges and burrs

Part Number	Color
GE-19081-RED	RED
GE-19081-BLU	BLUE

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		DIMENSIONS ARE IN INCHES			
		TOLERANCES:			
		FRACTIONAL $\pm 1/16$			
		ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$			
		TWO PLACE DECIMAL $\pm .01$			
		THREE PLACE DECIMAL $\pm .001$			
		INTERPRET GEOMETRIC TOLERANCING PER:			
		ENG APPR.			
		MFG APPR.			
		Q.A.			
		COMMENTS:			
		MATERIAL			
		NEXT ASSY	USED ON	FINISH	
		APPLICATION		DO NOT SCALE DRAWING	
SIZE	DWG. NO.	REV			
B	GE-19081	A			
SCALE: 1:8	WEIGHT:	SHEET 1 OF 1			

4

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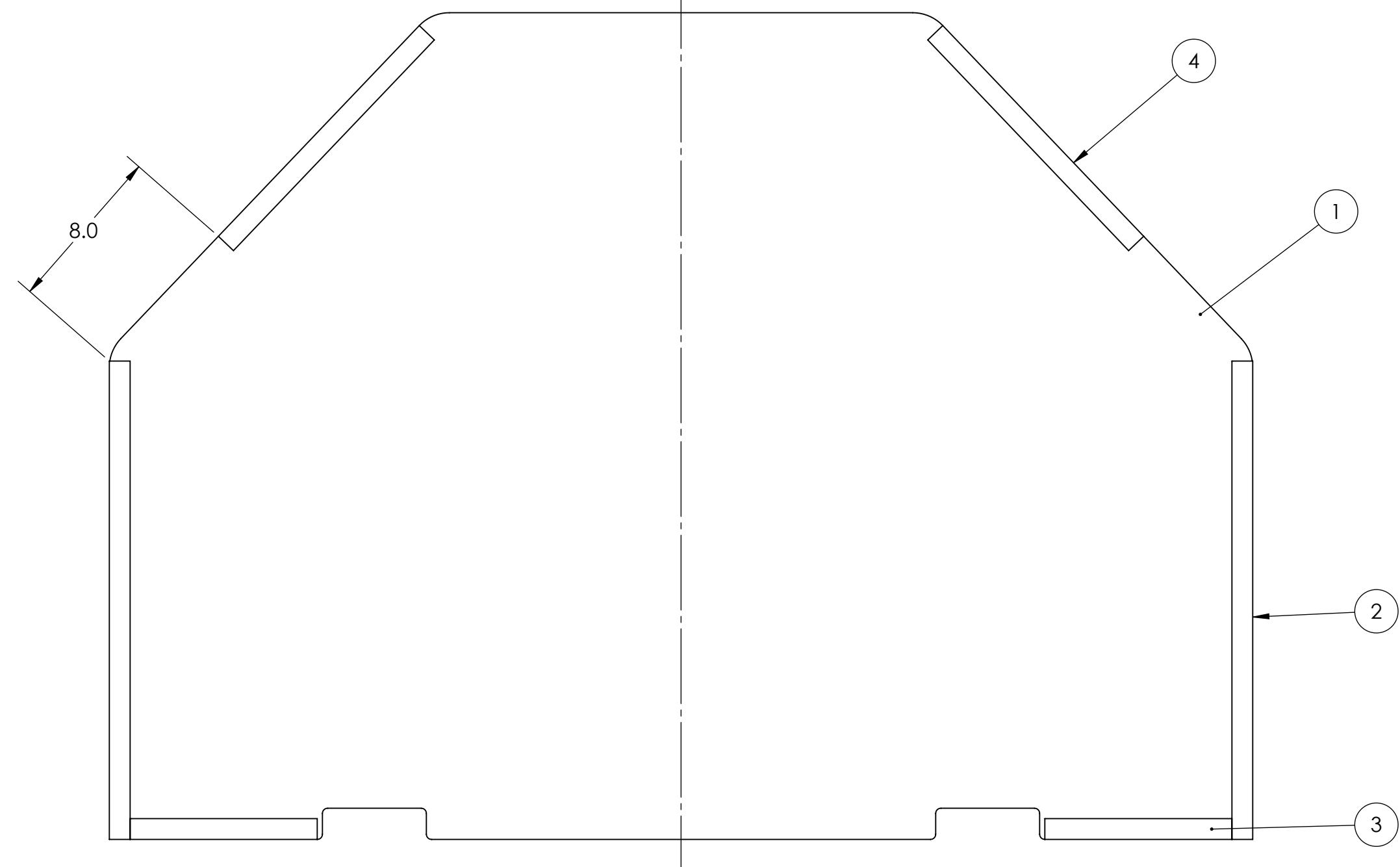
3

2

1

B

B



A

A

Notes:

1. Assembly exists in red and blue configurations.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	GE-19081	Cargo Ship Back Plastic	1
2	Loop_1_23	1" Loop, 23" Long	2
3	Loop_1_9	1" x 9" Loop, Adhesive Backed	2
4	Loop_1_14	1" x 14" Loop, Adhesive Backed	2

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		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL: ±1/16 ANGULAR: MACH ±1° BEND ±1° TWO PLACE DECIMAL ±.01 THREE PLACE DECIMAL ±.001	NAME	DATE
		DRAWN		
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
		MATERIAL		
		FINISH		
NEXT ASSY	USED ON			
	APPLICATION	DO NOT SCALE DRAWING		
SIZE	DWG. NO.		REV	
B	GE-19081-Assembly			
SCALE: 1:8	WEIGHT:		SHEET 1 OF 1	

4

3

2

1

4

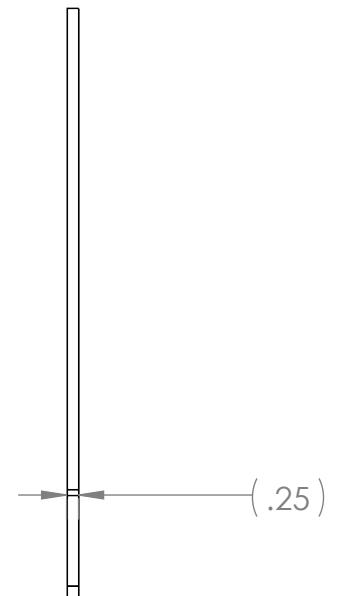
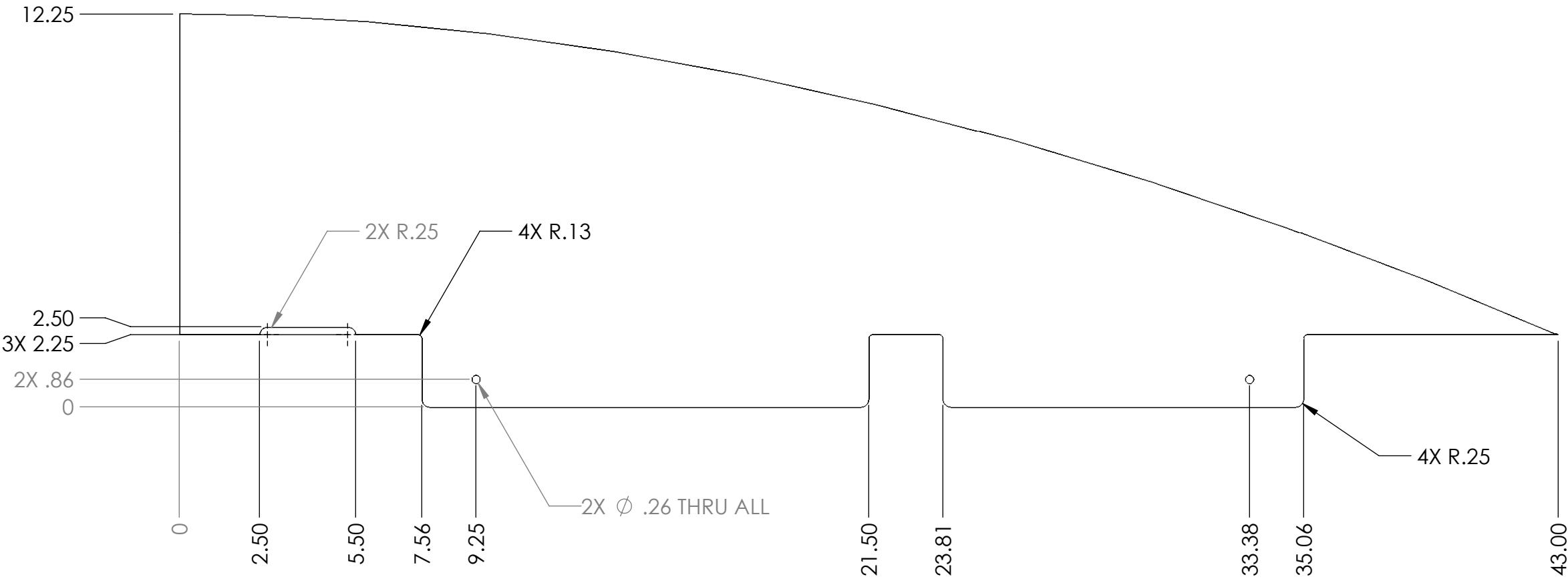
3

2

1

B

B



Notes:

Material: 1/4" Thick Clear Polycarbonate Sheet
 Finish: Vinyl applied to plastic
 Remove all sharp edges and burrs
 Tag Or Label With Part Number

A

A

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
 Modeling Solutions Partner

Cargo Ship Fin

SIZE	DWG. NO.	REV
B	GE-19082	
SCALE: 1:8	WEIGHT:	SHEET 1 OF 1

4

3

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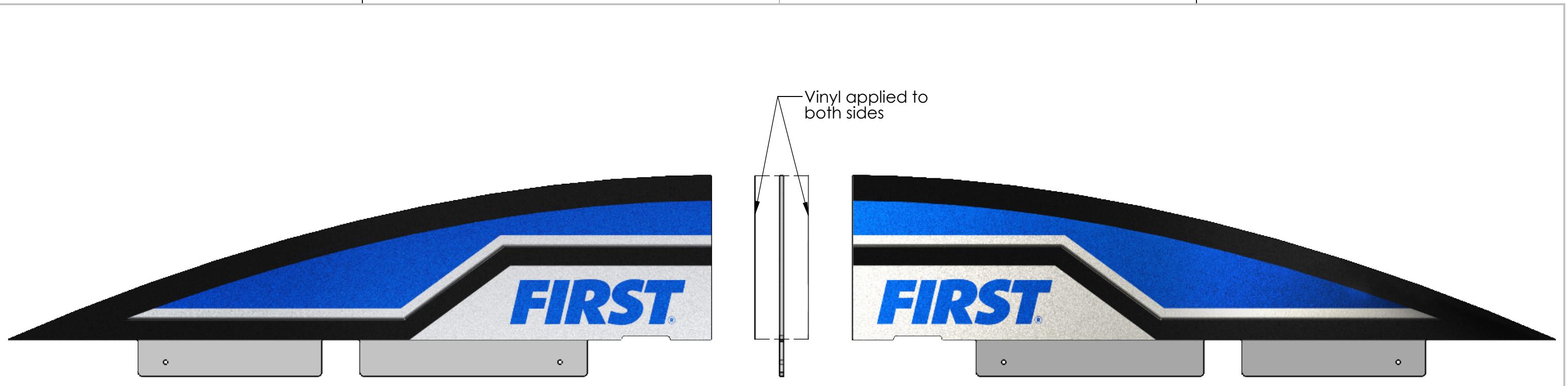
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Notes:
Quantity per field: 1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-19082	Cargo Ship Fin	1
2	GE-19082-Left-Blue-Vinyl	GE-19082 Blue Left Vinyl	1
3	GE-19082-Right-Blue-Vinyl	GE-19082 Blue Right Vinyl	1

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			CHECKED		
			ENG APPR.		
			MFG APPR.		
		INTERPRET GEOMETRIC TOLERANCING PER:	Q.A.		
			MATERIAL	COMMENTS:	
			FINISH		
NEXT ASSY	USED ON				
APPLICATION		DO NOT SCALE DRAWING			
SCALE: 1:6		WEIGHT:	SHEET 1 OF 1		

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Cargo Ship Fin, Blue

B **GE-19082-Blue**

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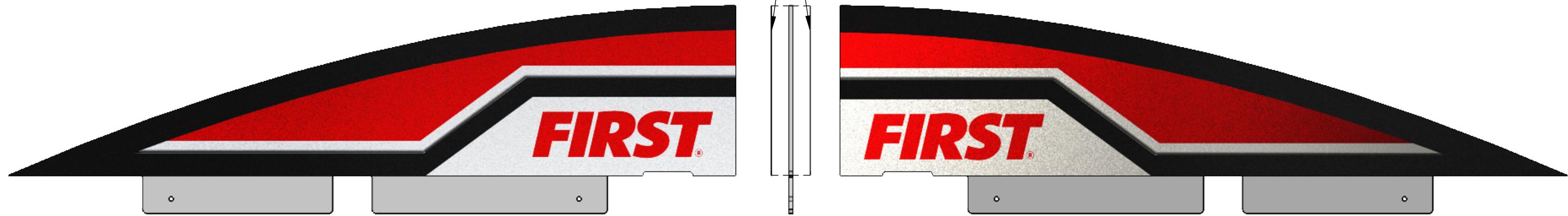
3

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B

B



Vinyl applied to
both sides

Notes:
Quantity per field: 1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	GE-19082	Cargo Ship Fin	1
2	GE-19082-Left-Red-Vinyl	GE-19082 Left Red Vinyl	1
3	GE-19082-Right-Red-Vinyl	GE-19082 Right Red Vinyl	1

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		DIMENSIONS ARE IN INCHES	DRAWN			
		TOLERANCES:	CHECKED			
		FRACTIONAL $\pm 1/16$	ENG APPR.			
		ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$	MFG APPR.			
		TWO PLACE DECIMAL $\pm .01$	Q.A.			
		THREE PLACE DECIMAL $\pm .001$	COMMENTS:			
		INTERPRET GEOMETRIC TOLERANCING PER:				
		MATERIAL				
NEXT ASSY	USED ON	FINISH				
APPLICATION		DO NOT SCALE DRAWING				
TITLE: Cargo Ship Fin, Red						
SIZE		DWG. NO. GE-19082-Red			REV	
					B	
SCALE: 1:6		WEIGHT:		SHEET 1 OF 1		

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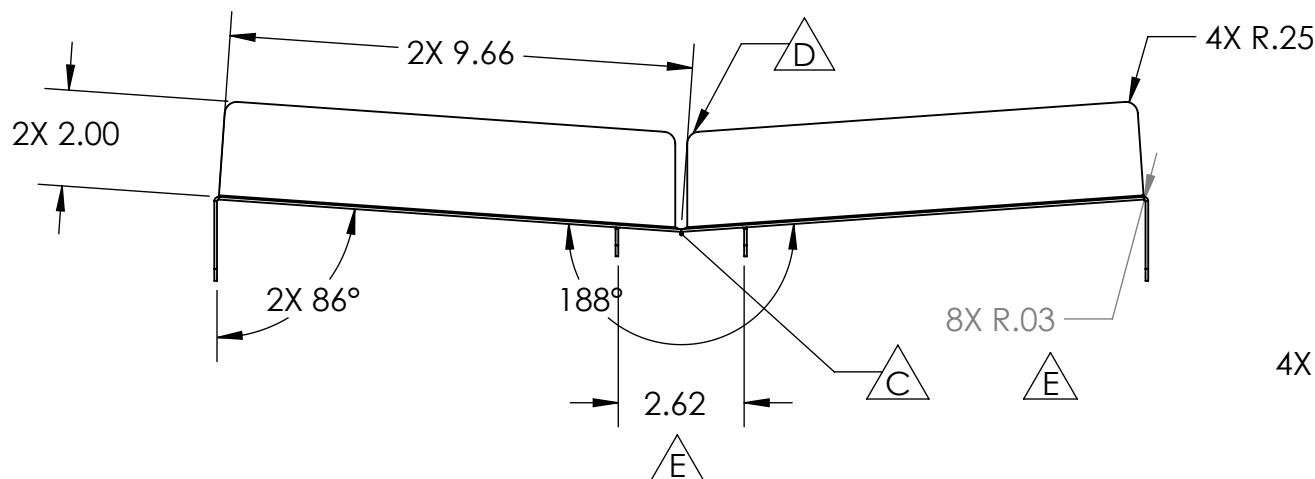
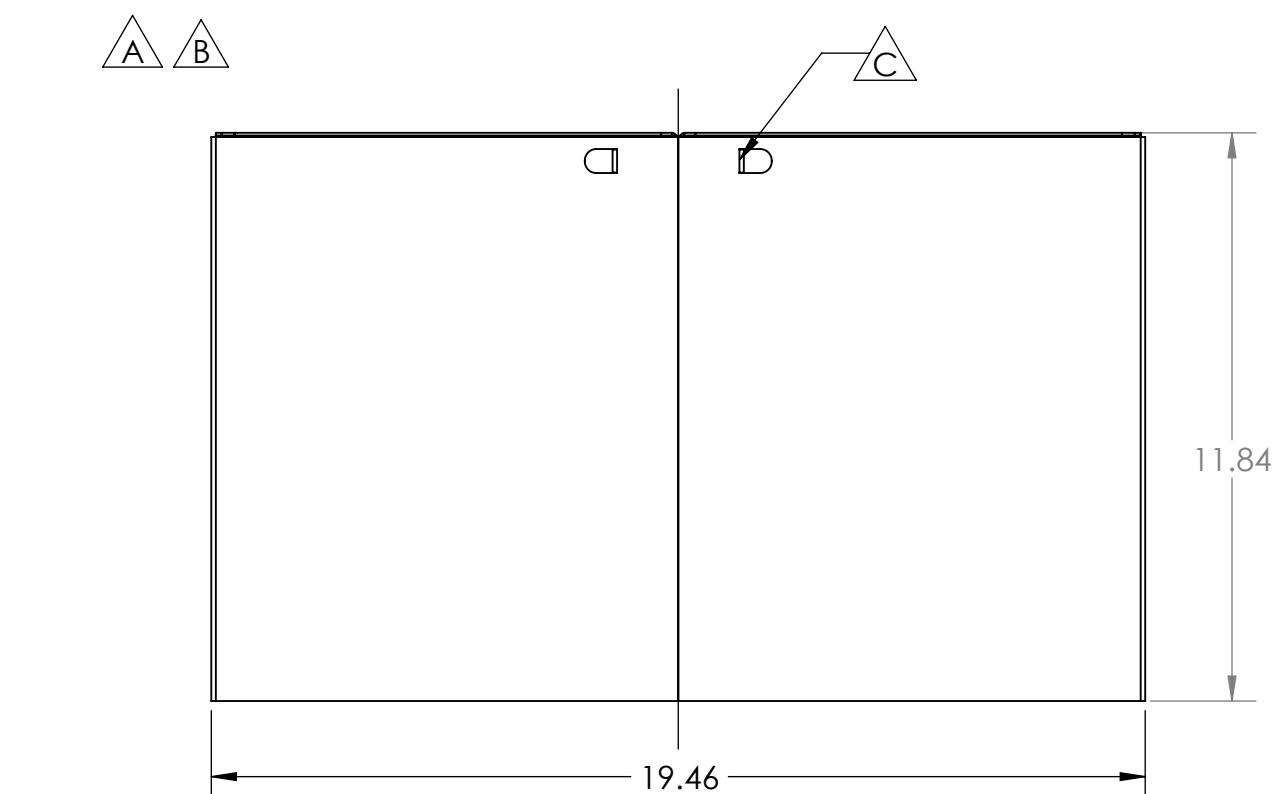
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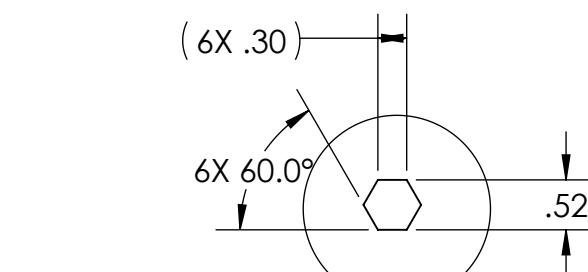
REVISIONS				
ONE	REV.	DESCRIPTION	DATE	APPROVED
B4	A	General redesign of part	7/13/2018	JRF
B4	B	General redesign of part	8/13/2018	JRF
.3, B3	C	Added tabs, change bend profile	09/27/2018	JRF
.3, 2- A1	D	Tab geometry modified; added fillets	10/16/2018	JRF
.3, 2- B3	E	Modified bend radius, added missing dimension	11/2/2018	JRF
2-A1	F	Tab geometry modified; slot size increased	11/7/2018	JRF



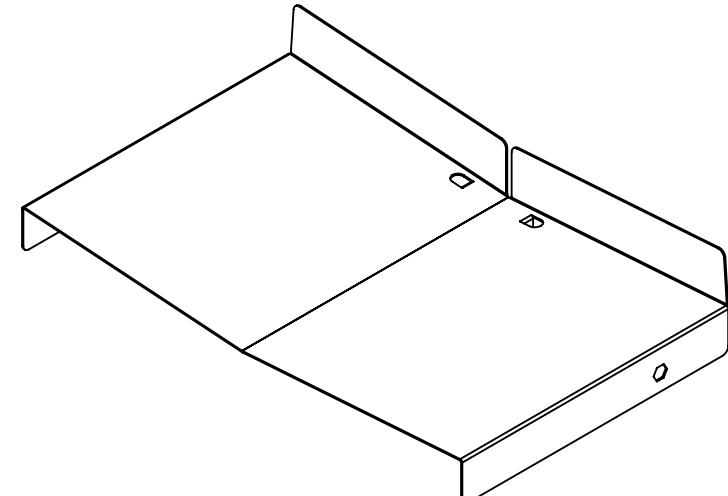
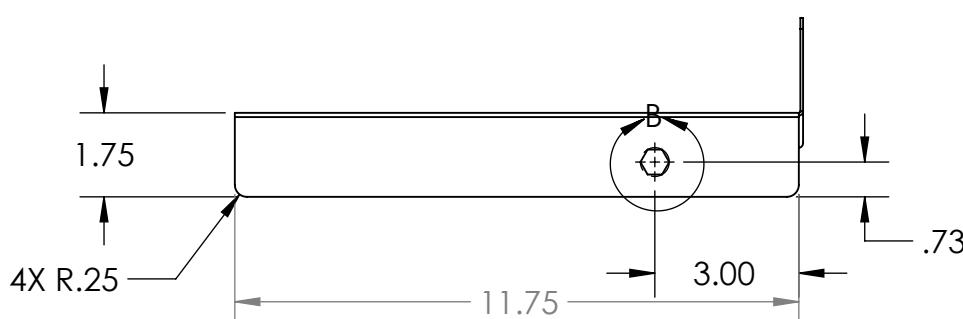
Notes:

1. Remove all sharp edges and burrs
 2. Material: 16 Gauge Steel, galvanized/Preplated or similar
 3. Tag with part number

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DETAIL B
SCALE 1 : 2



		UNLESS OTHERWISE SPECIFIED:		NAME	DATE	 FIRST ROBOTICS COMPETITION	TITLE: <h1>Tray Flip Plate</h1>	
		DIMENSIONS ARE IN INCHES	DRAWN					
		TOLERANCES:	CHECKED					
		FRACTIONAL $\pm 1/16$	ENG APPR.					
		ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$	MFG APPR.					
		TWO PLACE DECIMAL $\pm .01$	Q.A.					
		THREE PLACE DECIMAL $\pm .001$	COMMENTS:					
		MATERIAL						
NEXT ASSY	USED ON	FINISH						
APPLICATION		DO NOT SCALE DRAWING						
						SIZE	DWG. NO.	REV
						B	GE-19085	F
						SCALE: 1:4	WEIGHT:	SHEET 1 OF 2

Tray Flip Plate

FIRST
ROBOTICS
COMPETITION

 SOLIDWORKS
Modeling. Simulation. Design.

4

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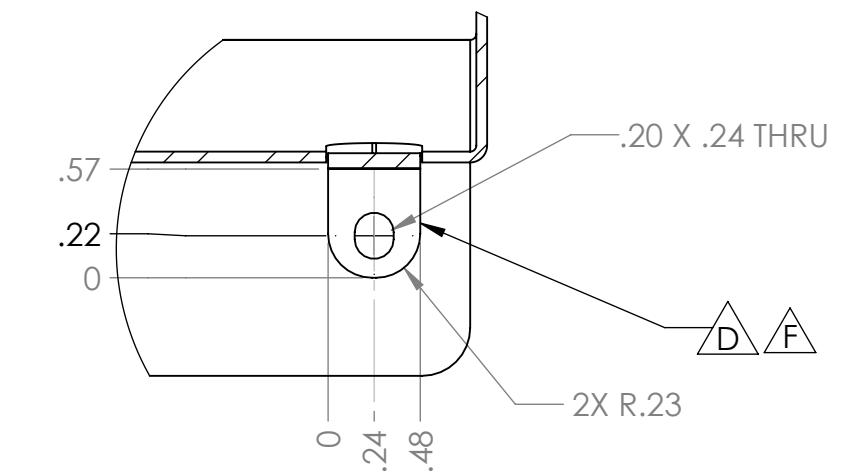
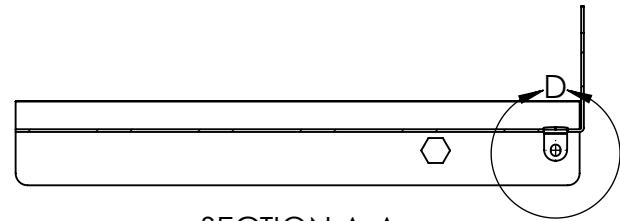
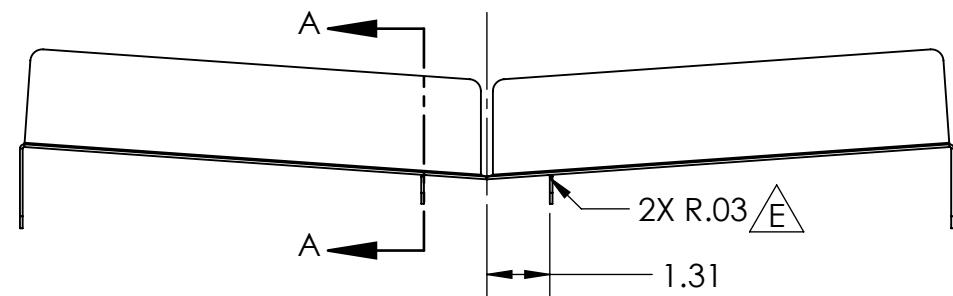
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DETAIL D
SCALE 1 : 1

B

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		DRAWN			
		CHECKED			
		ENG APPR.			
		MFG APPR.			
		Q.A.			
		COMMENTS:			
		MATERIAL			
		NEXT ASSY	USED ON	FINISH	
		APPLICATION		DO NOT SCALE DRAWING	
B	GE-19085	F			
SCALE: 1:4	WEIGHT:	SHEET 2 OF 2			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

Tray Flip Plate

4

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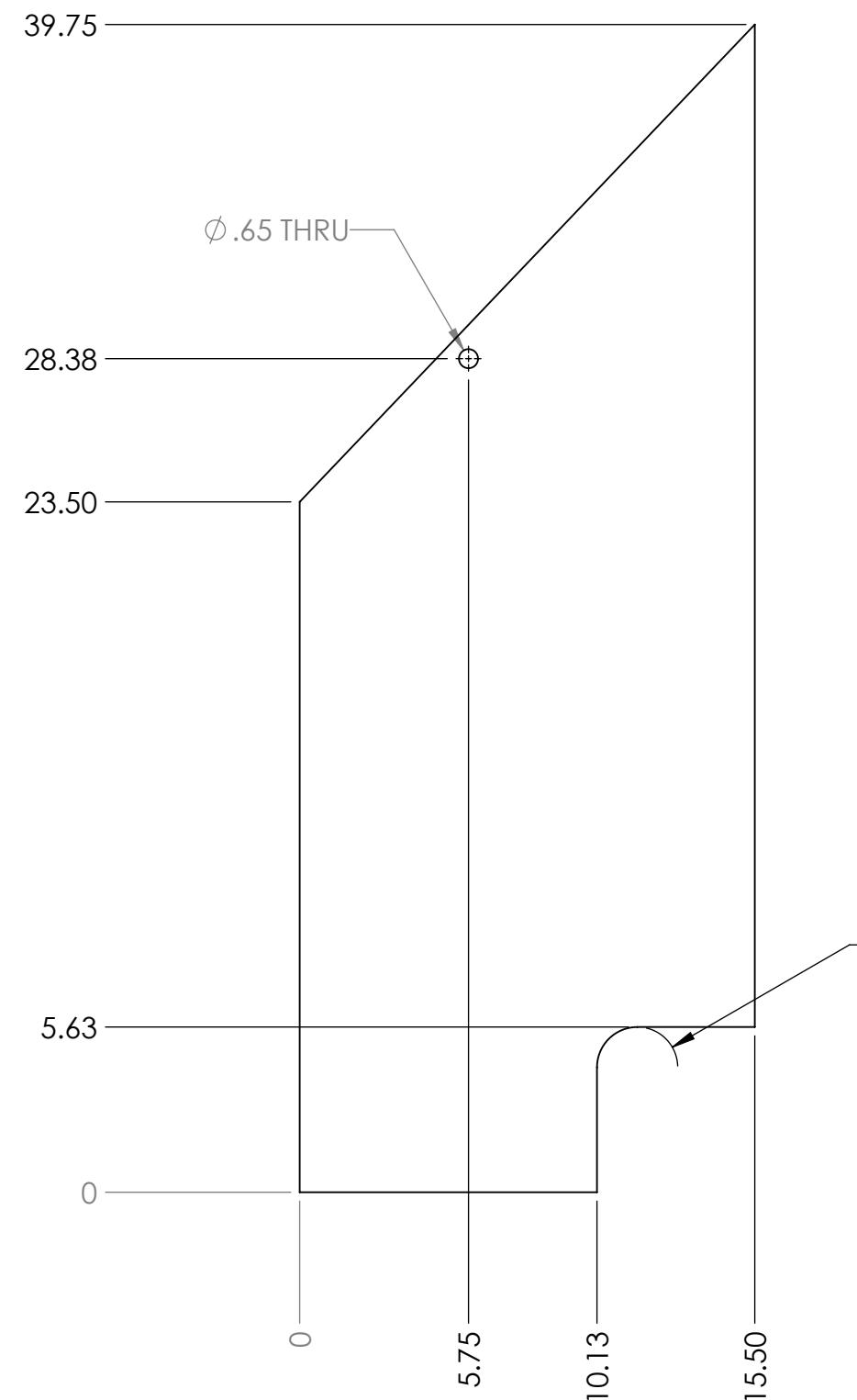
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B

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- Notes:
1. Material: 1/8" Thick Clear Polycarbonate Sheet
 2. Remove all sharp edges and burrs
 3. Tag Or Label With Part Number

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

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE: Cargo Ship Divider Side

SIZE **B** DWG. NO. **GE-19088** REV **A**

SCALE: 1:8 WEIGHT: SHEET 1 OF 1

4

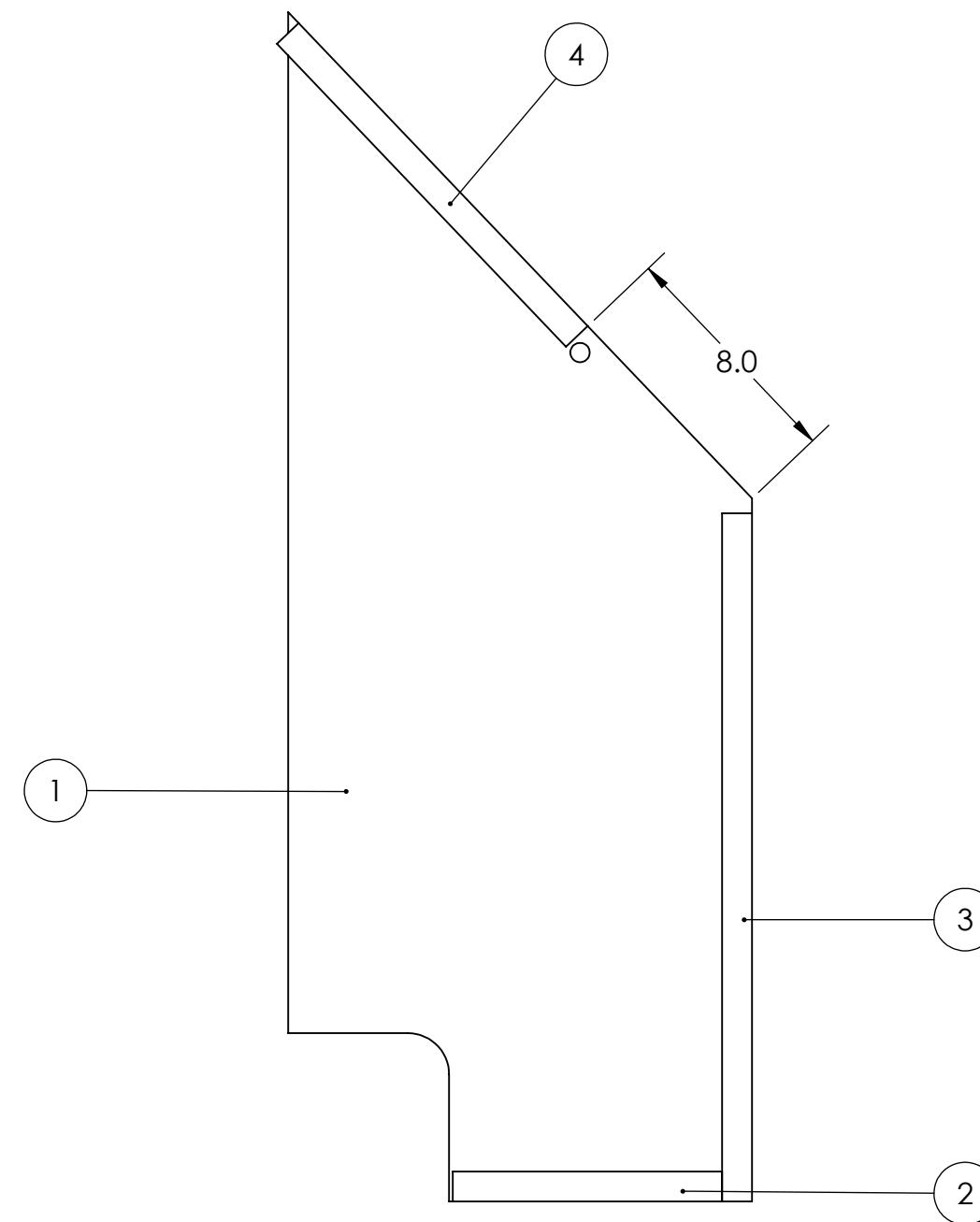
3

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1

B

B



ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	GE-19088	Cargo Ship Divider Side	1
2	Loop_1_9	1" x 9" Loop, Adhesive Backed	1
3	Loop_1_23	1" Loop, 23" Long	1
4	Loop_1_14	1" x 14" Loop, Adhesive Backed	1

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

**Cargo Ship
Divider Side, Left**

SIZE DWG. NO. REV
B GE-19088-Left-Assembly

SCALE: 1:8 WEIGHT: SHEET 1 OF 1

4

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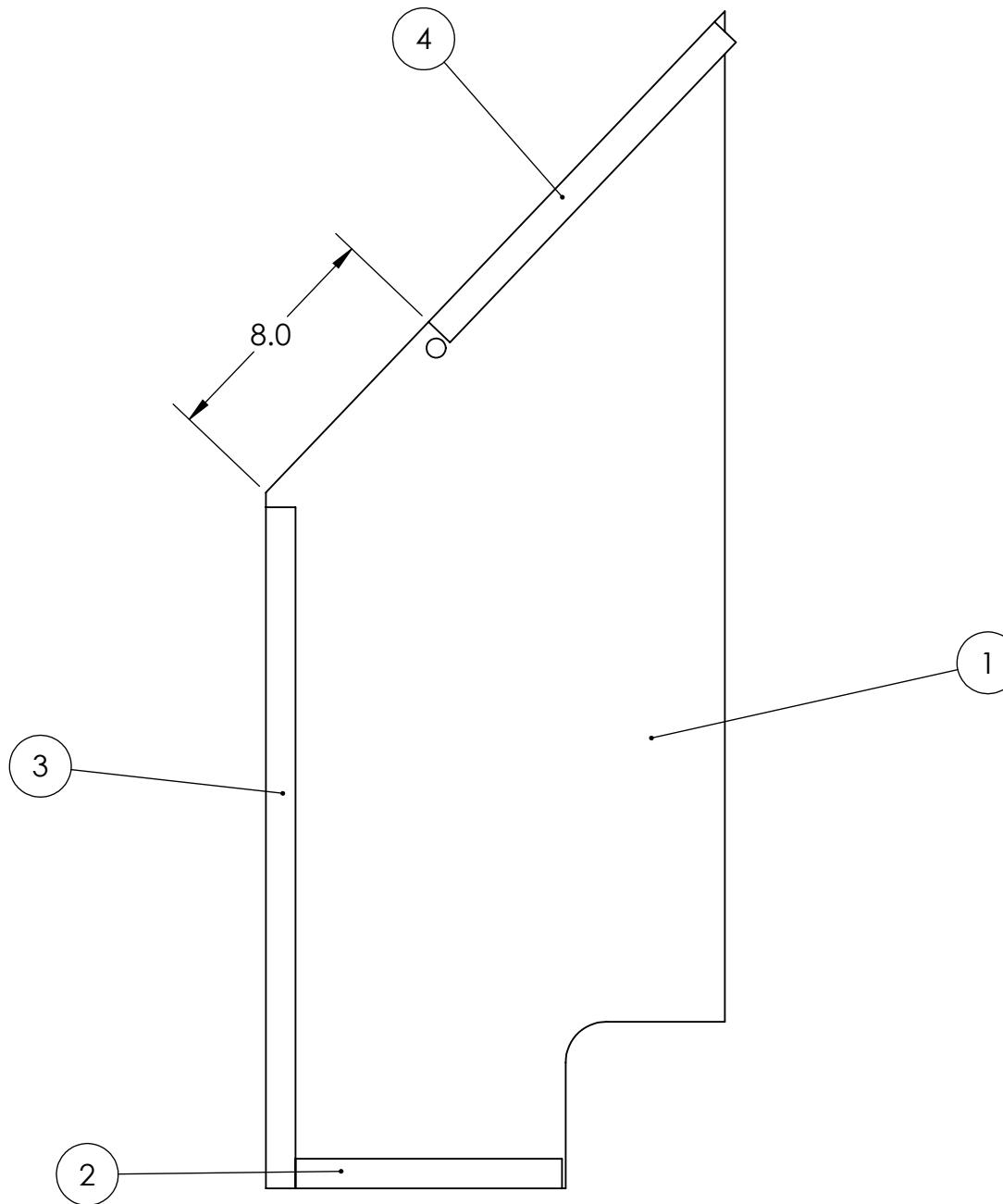
3

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B

B



A

A

ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	GE-19088	Cargo Ship Divider Side	1
2	Loop_1_9	1" x 9" Loop, Adhesive Backed	1
3	Loop_1_23	1" Loop, 23" Long	1
4	Loop_1_14	1" x 14" Loop, Adhesive Backed	1

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Cargo Ship Divider Side, Right

SIZE	DWG. NO.	REV
B	GE-19088-Right-Assembly	
SCALE: 1:8	WEIGHT:	SHEET 1 OF 1

4

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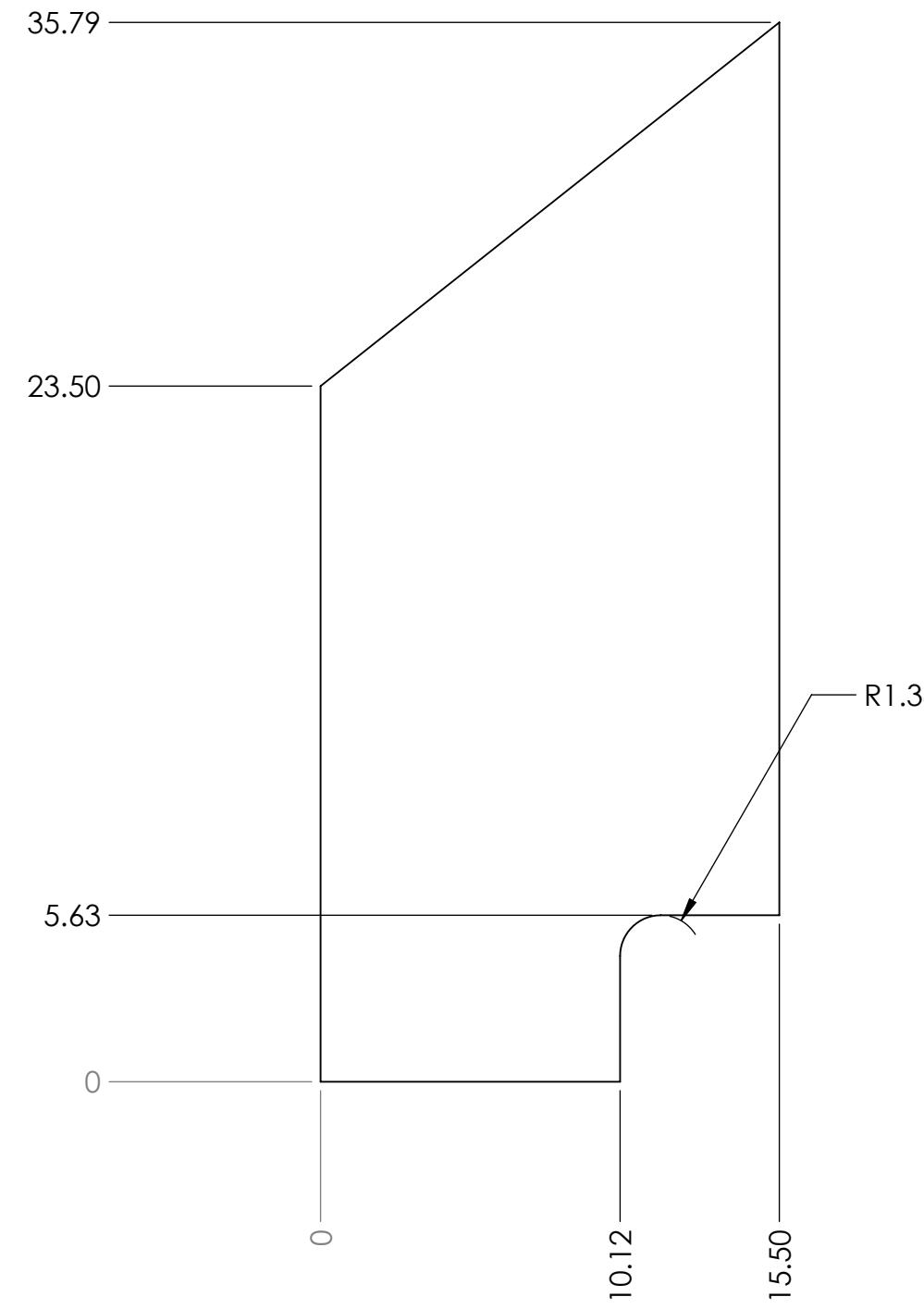
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		UNLESS OTHERWISE SPECIFIED:		TITLE: FIRST ROBOTICS COMPETITION SOLIDWORKS Modeling Solutions Partner	
		DIMENSIONS ARE IN INCHES			
		TOLERANCES:			
		FRACTIONAL $\pm 1/16$			
		ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$			
		TWO PLACE DECIMAL $\pm .01$			
		THREE PLACE DECIMAL $\pm .001$			
		INTERPRET GEOMETRIC TOLERANCING PER:		COMMENTS:	
		MATERIAL			
		NEXT ASSY			
		USED ON			
		FINISH			
		APPLICATION			
		DO NOT SCALE DRAWING			

**Cargo Ship
Divider Front**

B **GE-19089** **A**

SCALE: 1:8 WEIGHT: SHEET 1 OF 1

4

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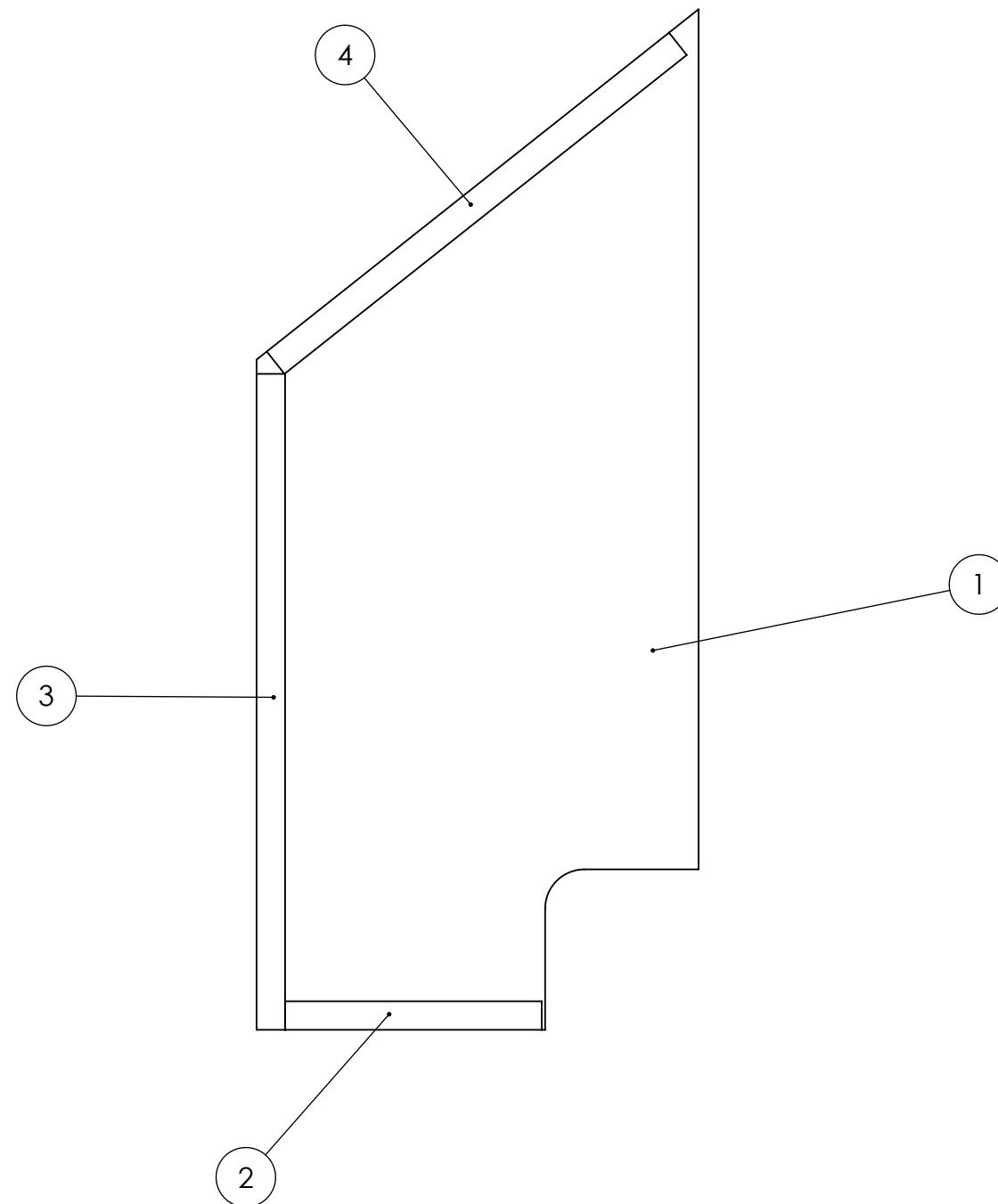
1

B

B

A

A



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-19089	Cargo Ship Divider Front	1
2	Loop_1_9	1" x 9" Loop, Adhesive Backed	1
3	Loop_1_23	1" Loop, 23" Long	1
4	Loop_1_18	1" x 18" Loop, Adhesive Backed	1

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		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$	DRAWN				
			CHECKED				
			ENG APPR.				
			MFG APPR.				
			Q.A.				
		INTERPRET GEOMETRIC TOLERANCING PER:	COMMENTS:				
		MATERIAL					
NEXT ASSY	USED ON	FINISH					
APPLICATION		DO NOT SCALE DRAWING					
			SCALE: 1:8	WEIGHT:	SHEET 1 OF 1		

4

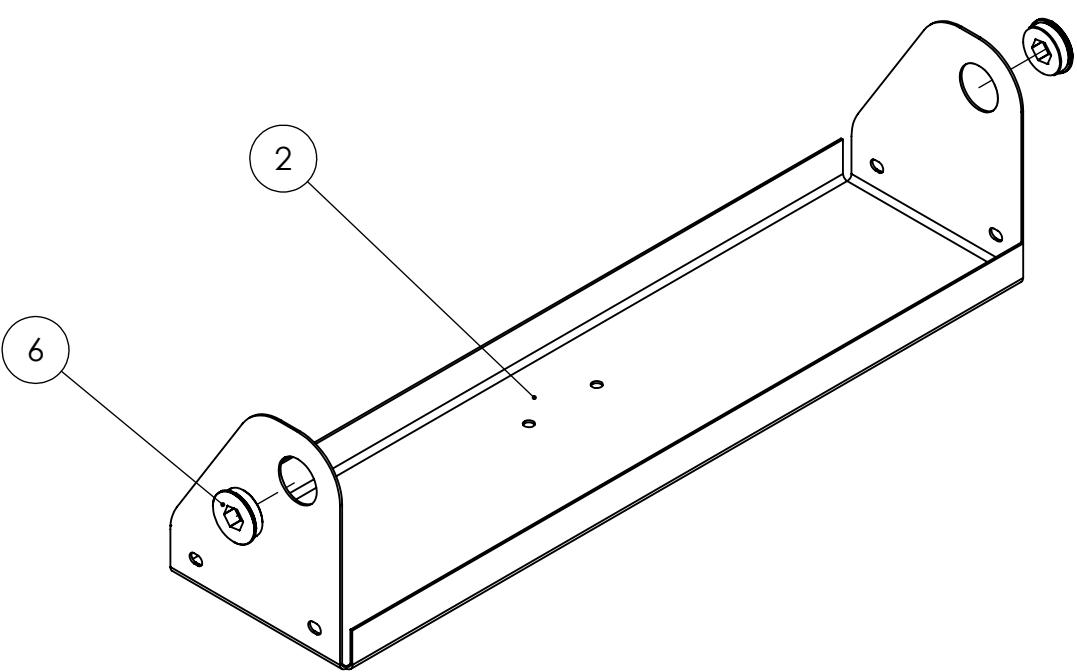
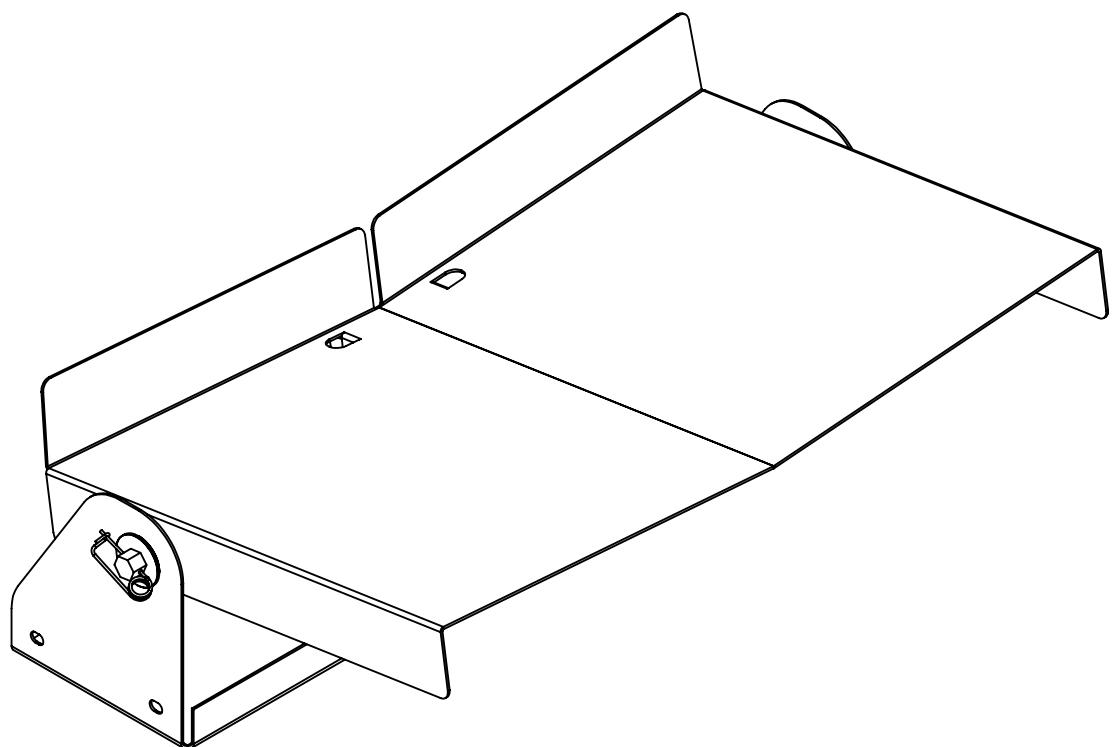
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-19085	Tray Flip Plate	1
2	GE-19095	Tray Bracket	1
3	GE-19096	Tray Hex Shaft	1
4	GE-19097	Tray Magnet Block	1
5	GE-19099	Tray Steel Block	1
6	GE-19215	1/2" Hex Bearing	2
7	hex_.25_20_.75	Steel Hex Head Screw, 1/4"-20 x 3/4" long, fully threaded	2
8	round_hex_10_32_.625_full	Round Hex Head, #10-32 x 5/8" long, fully threaded	2
9	pin_bentwire_.0625_1.0_625	Bent Wire Locking Pin, 1/16" diameter, 1-1/16" usable length	2
10	VHB_Tape	VHB Tape, 2.5" Long	2
11	Magnet	Magnet	1

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		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$	DRAWN			
			CHECKED			
			ENG APPR.			
			MFG APPR.			
		INTERPRET GEOMETRIC TOLERANCING PER:	Q.A.			
		MATERIAL	COMMENTS:			
NEXT ASSY	USED ON	FINISH				
APPLICATION		DO NOT SCALE DRAWING				
			SCALE: 1:12	WEIGHT:		SHEET 1 OF 3

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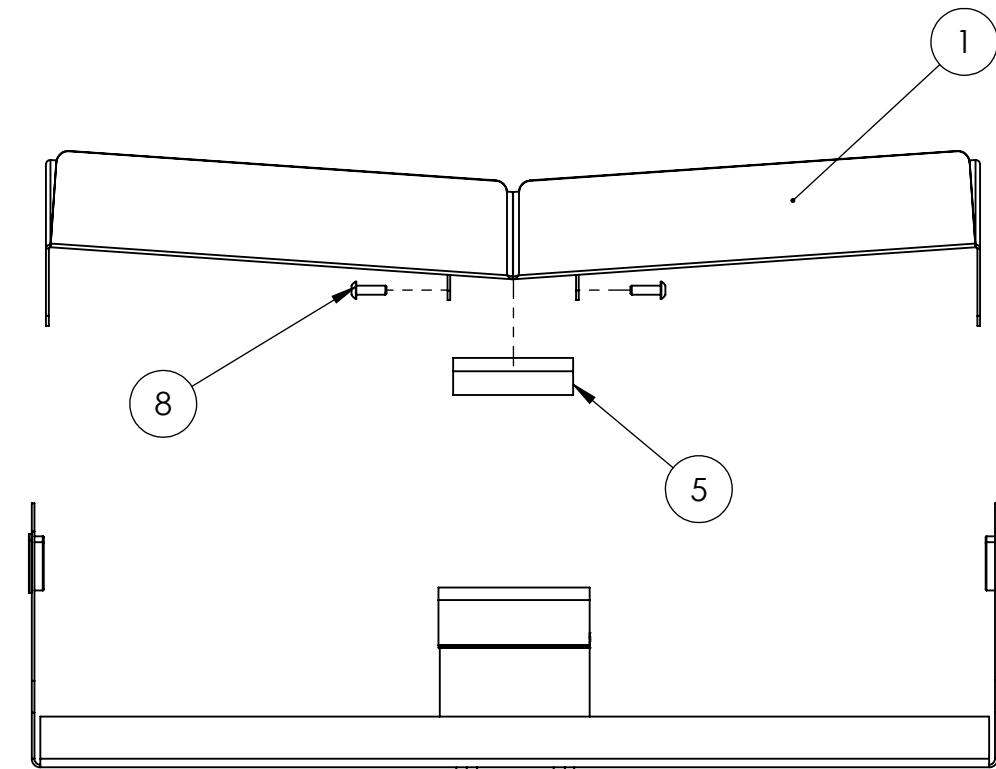
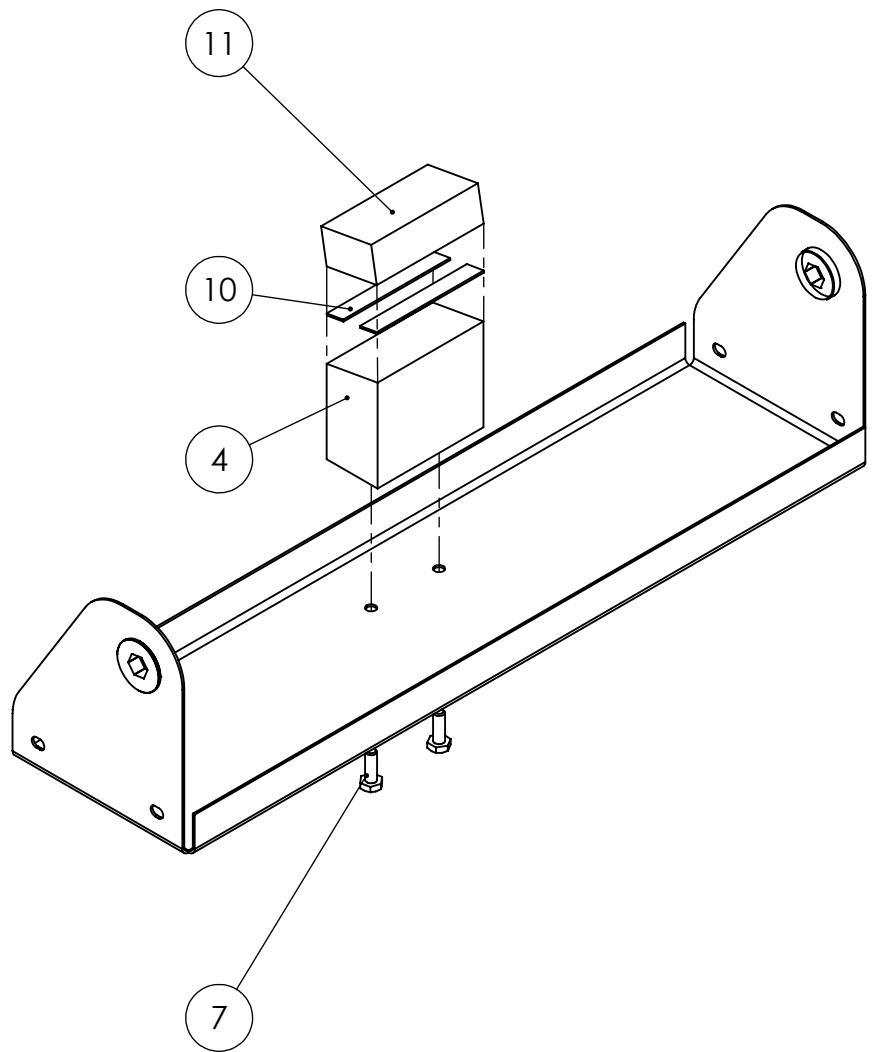
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**Notes:**

Do not fully tighten bolts. Item 5 should be able to spin freely.

A

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		DRAWN			
		CHECKED			
		ENG APPR.			
		MFG APPR.			
		Q.A.			
		COMMENTS:			
		MATERIAL			
		FINISH			
NEXT ASSY	USED ON				
APPLICATION	DO NOT SCALE DRAWING				
B	GE-19092				
SCALE: 1:4	WEIGHT:				
		SHEET 2 OF 3			

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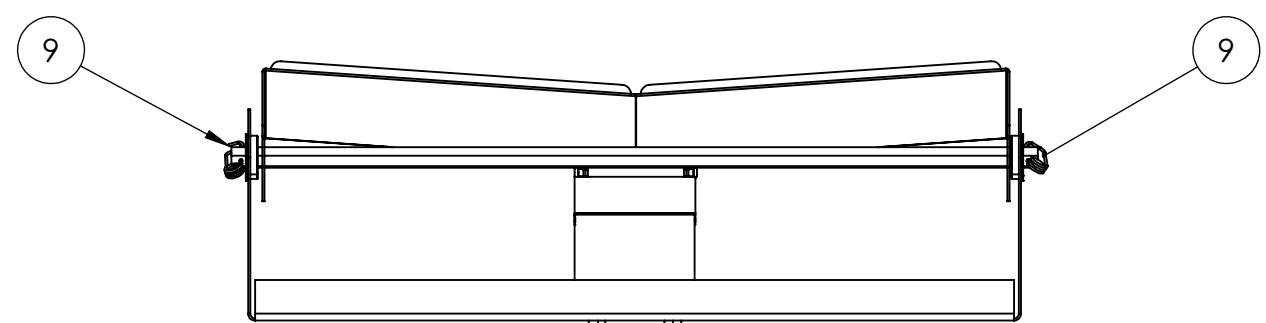
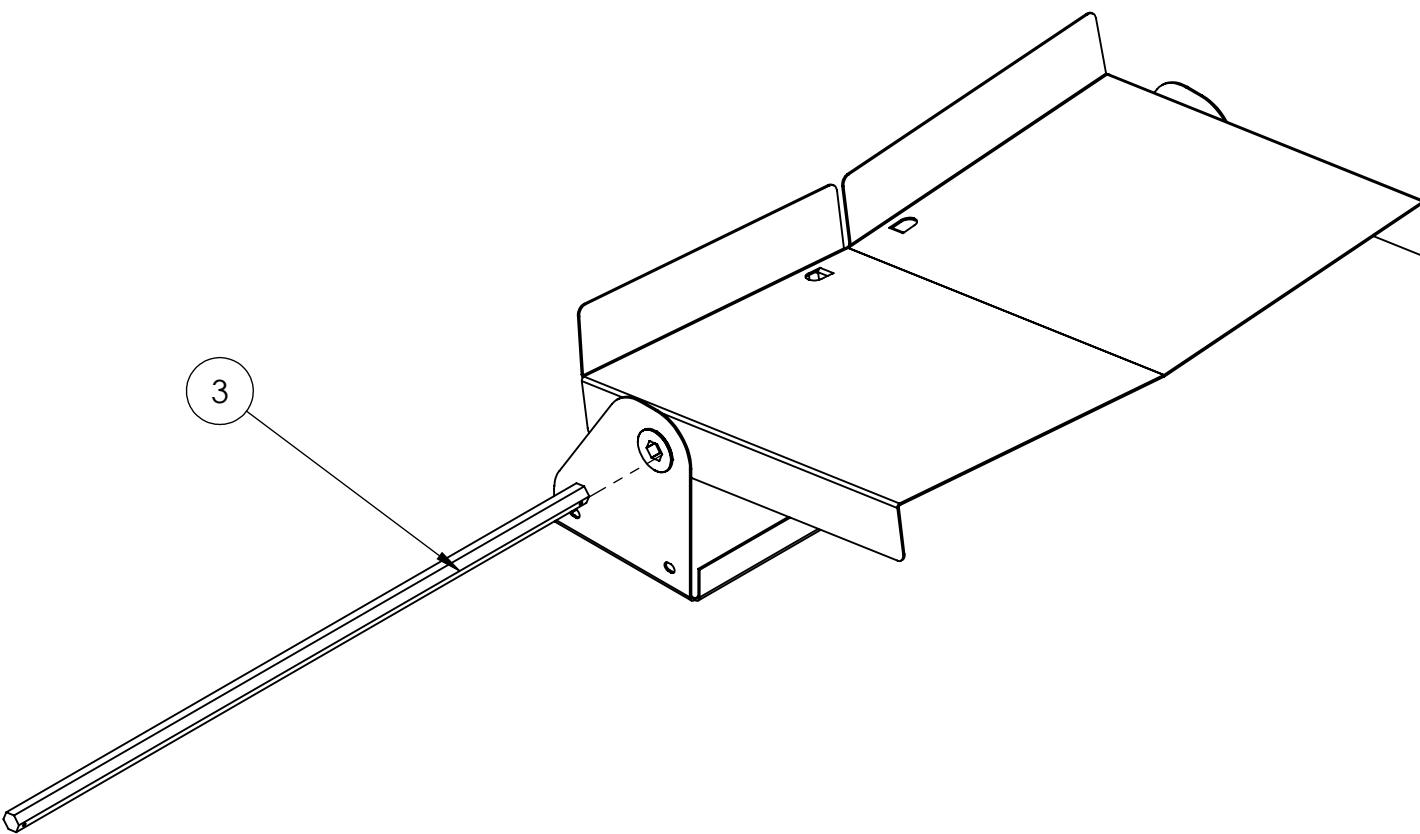
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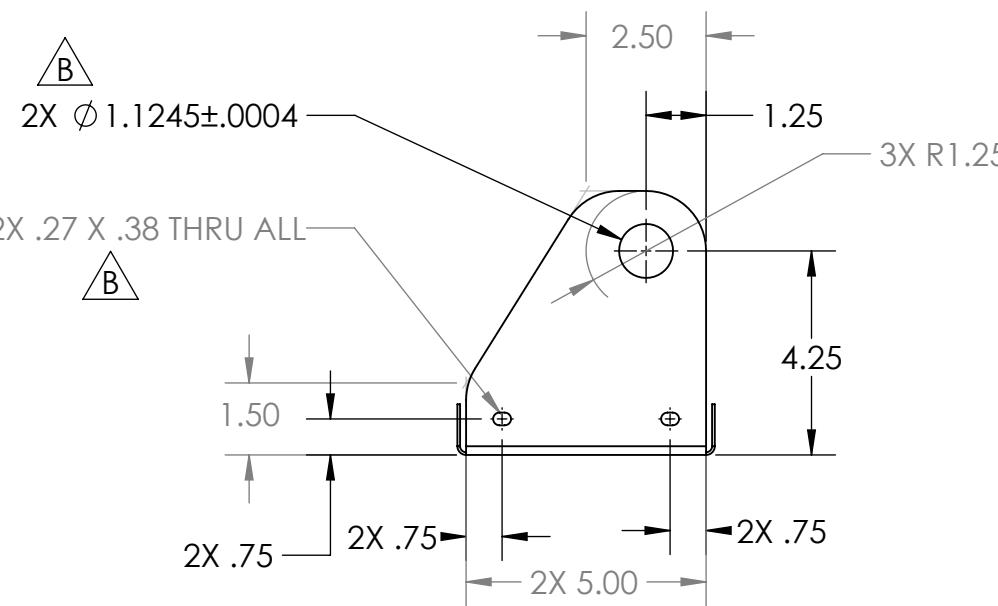
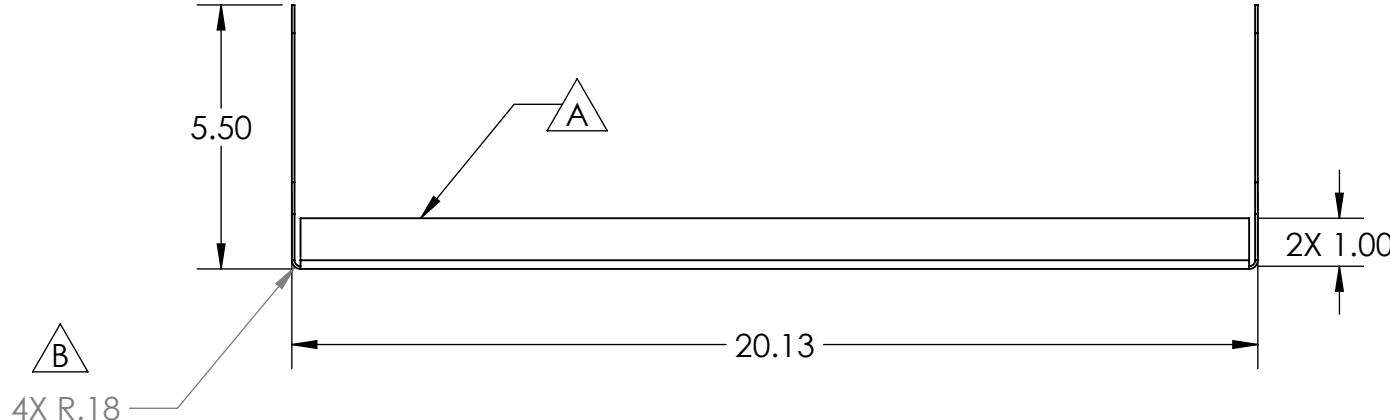
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		DRAWN			
		CHECKED			
		ENG APPR.			
		MFG APPR.			
		Q.A.			
		COMMENTS:			
		MATERIAL			
		FINISH			
NEXT ASSY	USED ON				
APPLICATION	DO NOT SCALE DRAWING				

FIRST
ROBOTICS
COMPETITION 
SOLIDWORKS
 Modeling Solutions Partner
 TITLE:
Cargo Ship Tray
Assembly
 SIZE DWG. NO. REV
B GE-19092
 SCALE: 1:5 WEIGHT: SHEET 3 OF 3

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
B4	A	Added flange	10/4/2018	JRF
A3, B2, B4	B	Holes changed to slots; changed tolerance on 1.12" hole; added second flange, decreased bend radius	10/30/2018	JRF

B



A

- Notes:
- Material: 16 Gauge Steel, galvanized
 - Remove all sharp edges and burrs
 - Tag with part number

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

TITLE: **Tray Bracket**

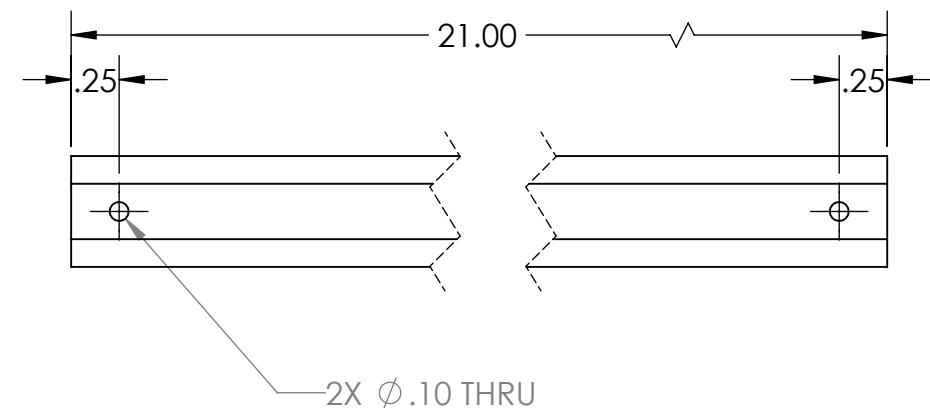
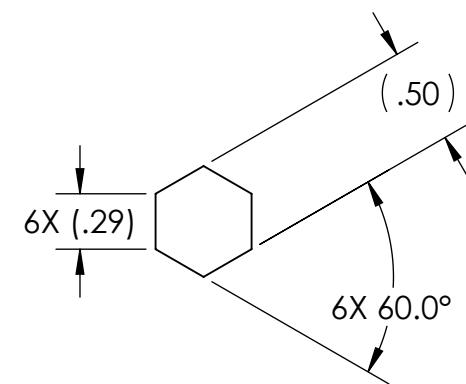
SIZE	DWG. NO.	REV
B	GE-19095	B
SCALE: 1:4	WEIGHT:	SHEET 1 OF 1

4

3

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1



- Notes:
1. Remove all sharp edges and burrs
 2. Material: AndyMark Aluminum Hex Shaft, 1/2 in. width (am-2291)
 3. Tag with part number

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		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL: ±1/16 ANGULAR: MACH ±1° BEND ±1° TWO PLACE DECIMAL ±.01 THREE PLACE DECIMAL ±.001	NAME	DATE
		DRAWN		
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
		MATERIAL		
		FINISH		
NEXT ASSY	USED ON			
APPLICATION	DO NOT SCALE DRAWING			
SIZE DWG. NO. REV		B GE-19096 A		
SCALE: 1:4		WEIGHT:		SHEET 1 OF 1

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Tray Hex Shaft

4

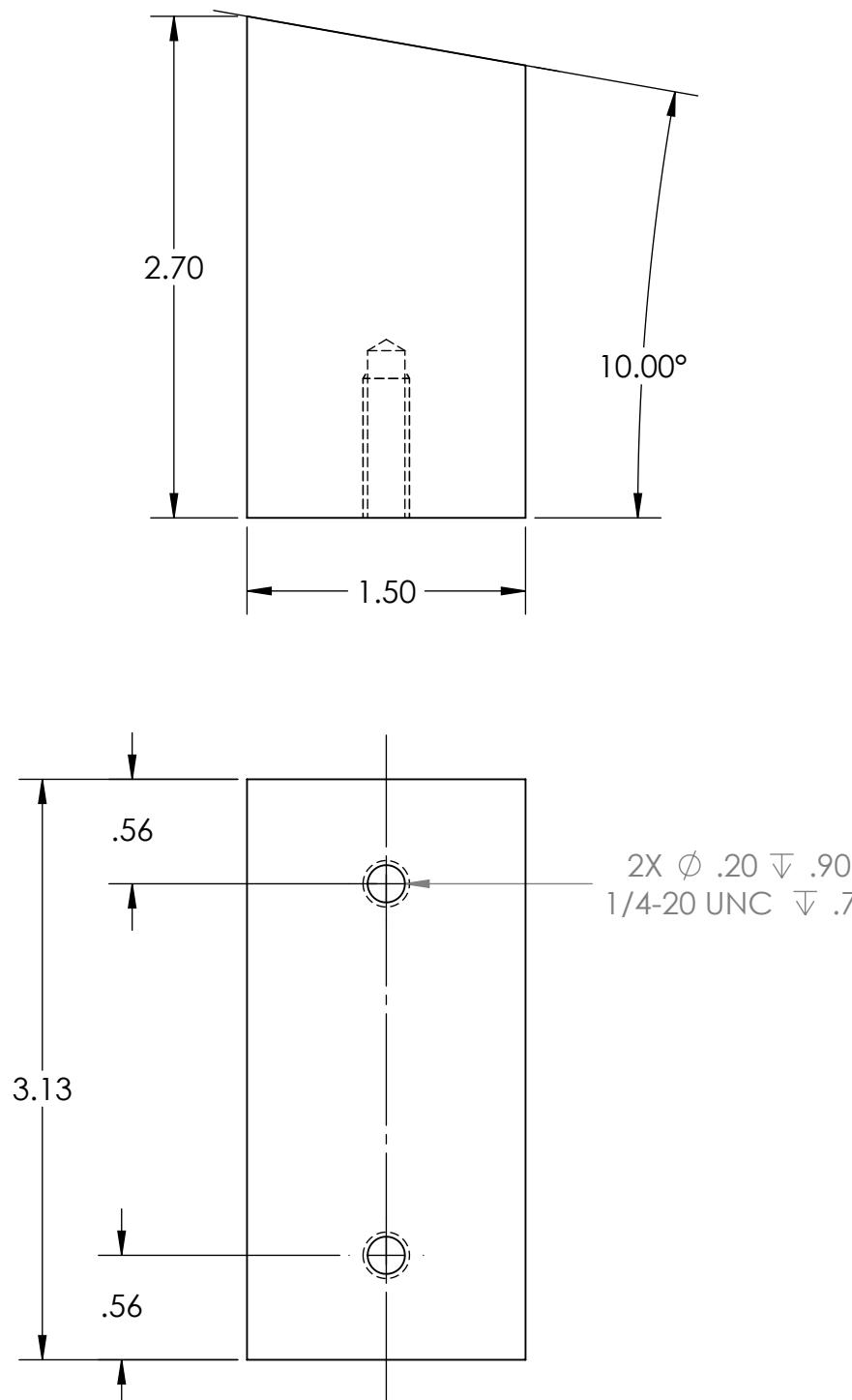
3

2

1

B

B



- Notes:
1. Remove all sharp edges and burrs
 2. Material: ABS Plastic, smooth, any color
 3. Tag or label with part number

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Tray Magnet Block

SIZE DWG. NO. REV
B GE-19097

SCALE: 1:1 WEIGHT: SHEET 1 OF 1

4

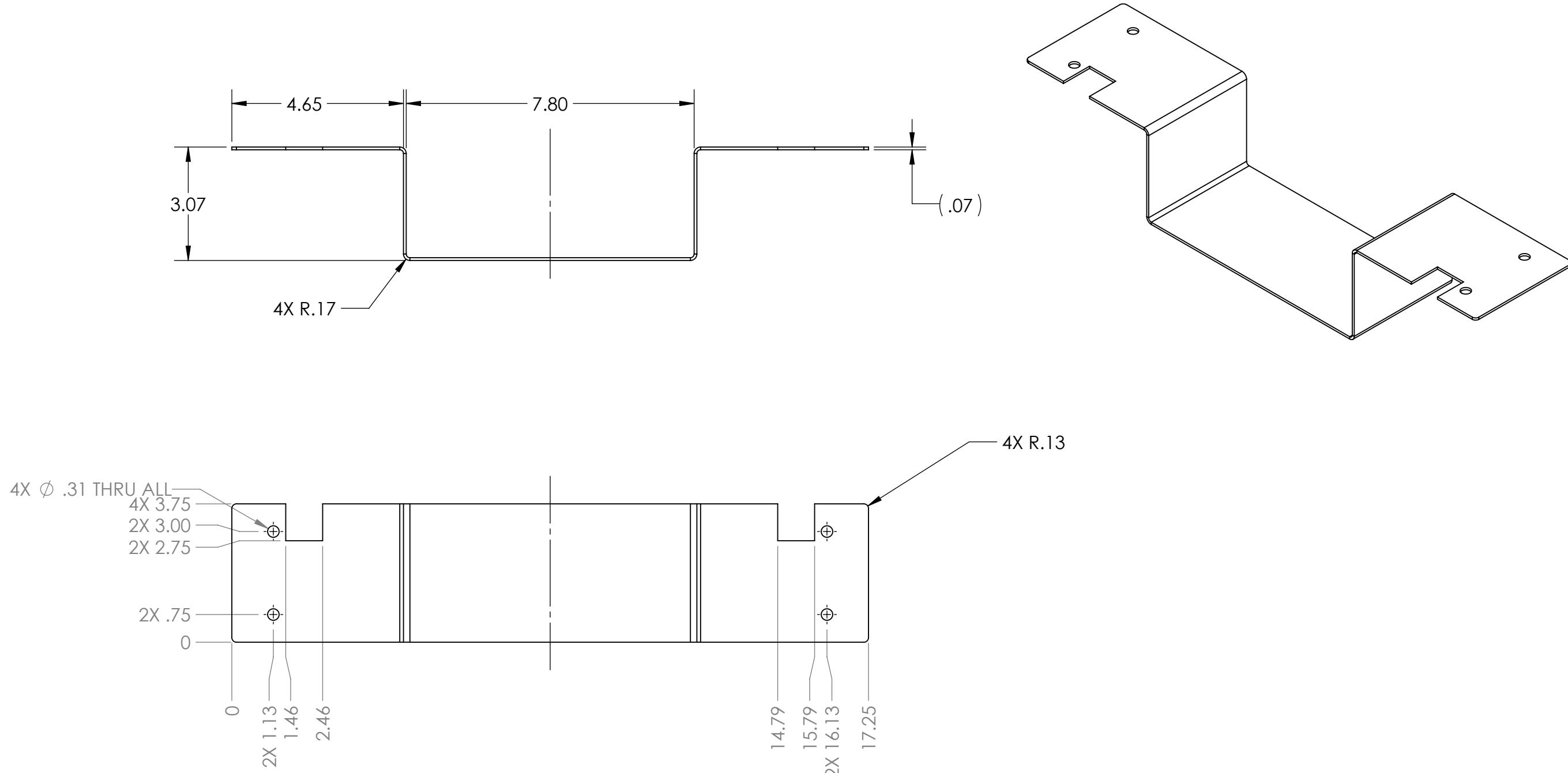
3

2

1

B

B



Notes:

- Material: 14 gauge A-366/1008 Pre-Plated Steel.
- Remove all burrs and sharp edges.
- Tag or label with part number.

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Keyhole Insert Bottom

SIZE	DWG. NO.	REV
B	GE-19098	A
SCALE: 1:4	WEIGHT:	SHEET 1 OF 1

4

3

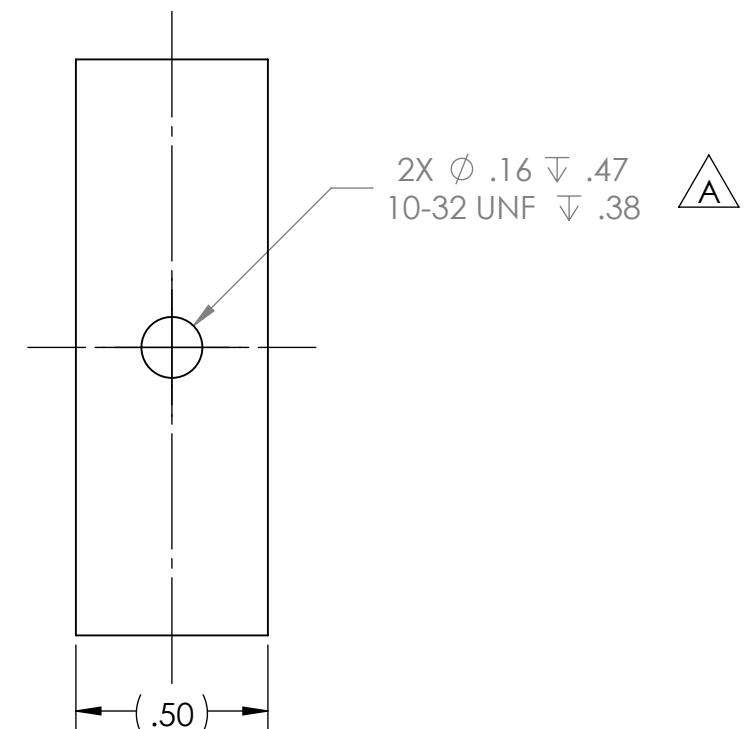
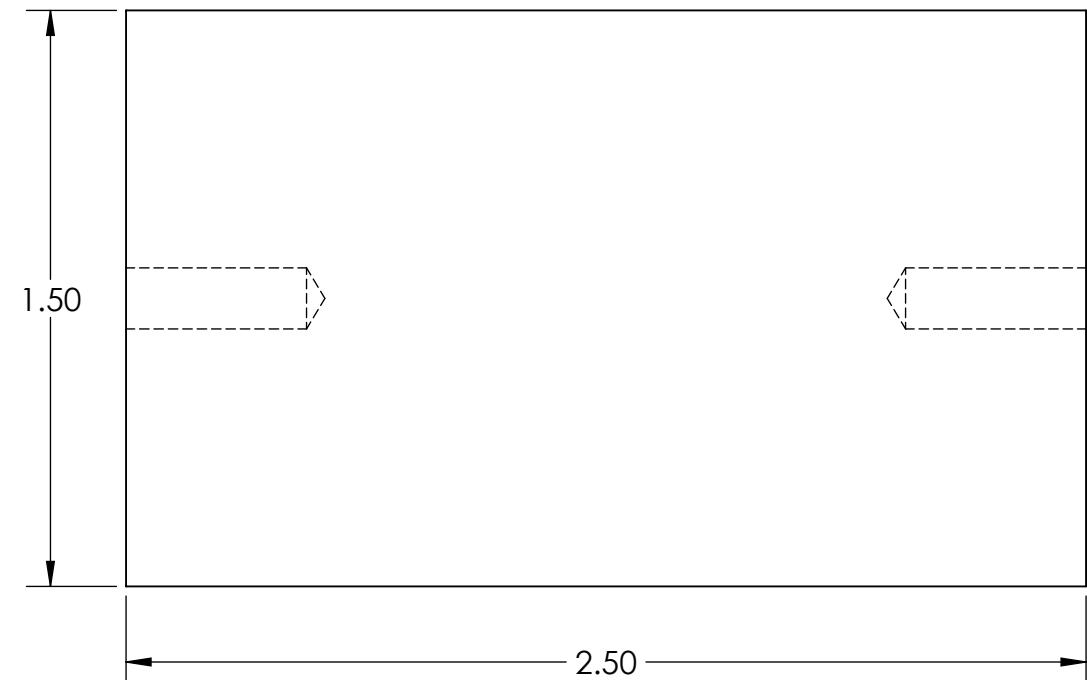
2

1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
A4, B1	A	Changed thru hole to two tapped #10-32 holes	11/7/2018	JRF

B



Notes:

1. Remove all sharp edges and burrs
2. Material: 0.5" Galvanized steel/ preplated or similar

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		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL: ±1/16 ANGULAR: MACH ±1° BEND ±1° TWO PLACE DECIMAL ±.01 THREE PLACE DECIMAL ±.001	NAME	DATE
		DRAWN		
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
		MATERIAL		
		FINISH		
NEXT ASSY	USED ON			
APPLICATION	DO NOT SCALE DRAWING			
SIZE	DWG. NO.			REV
B	GE-19099			A
SCALE: 2:1	WEIGHT:			SHEET 1 OF 1

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
Tray Steel Block

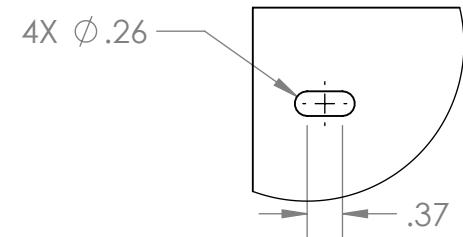
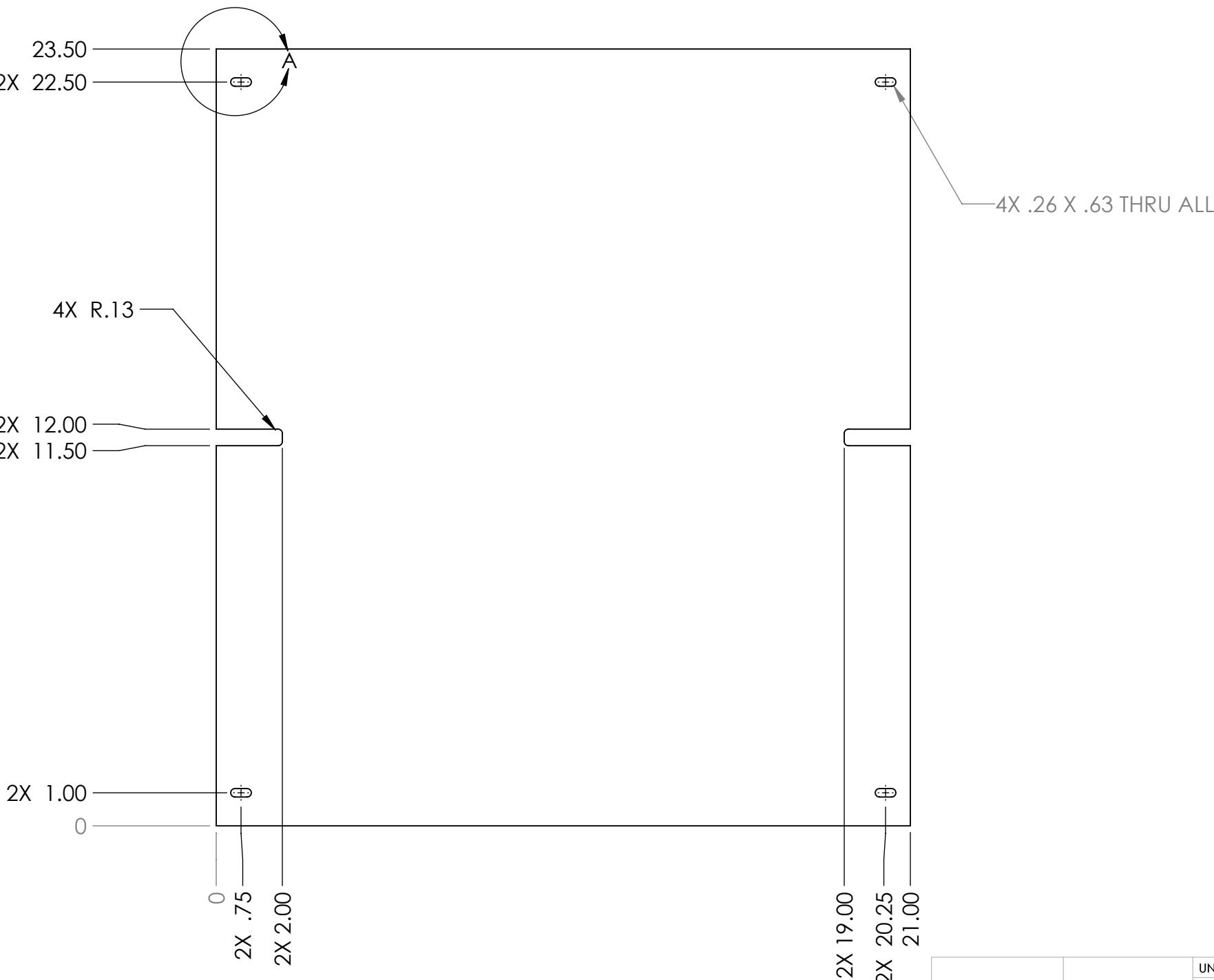
4

3

2

1

B



DETAIL A
SCALE 1 : 2

B

A

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

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
**Bridge Plastic
Top**

SIZE DWG. NO. REV
B GE-19100

SCALE: 1:8 WEIGHT: SHEET 1 OF 1

4

3

2

1

4

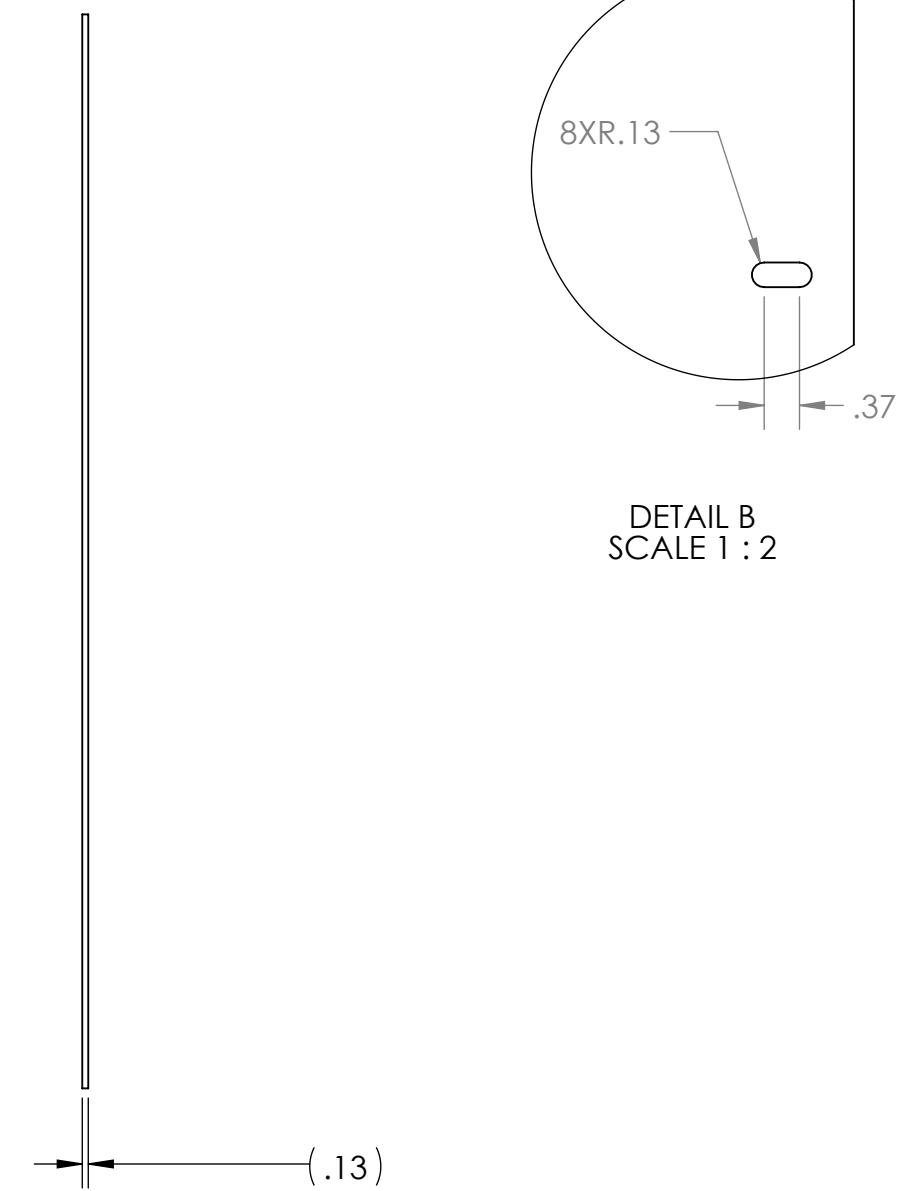
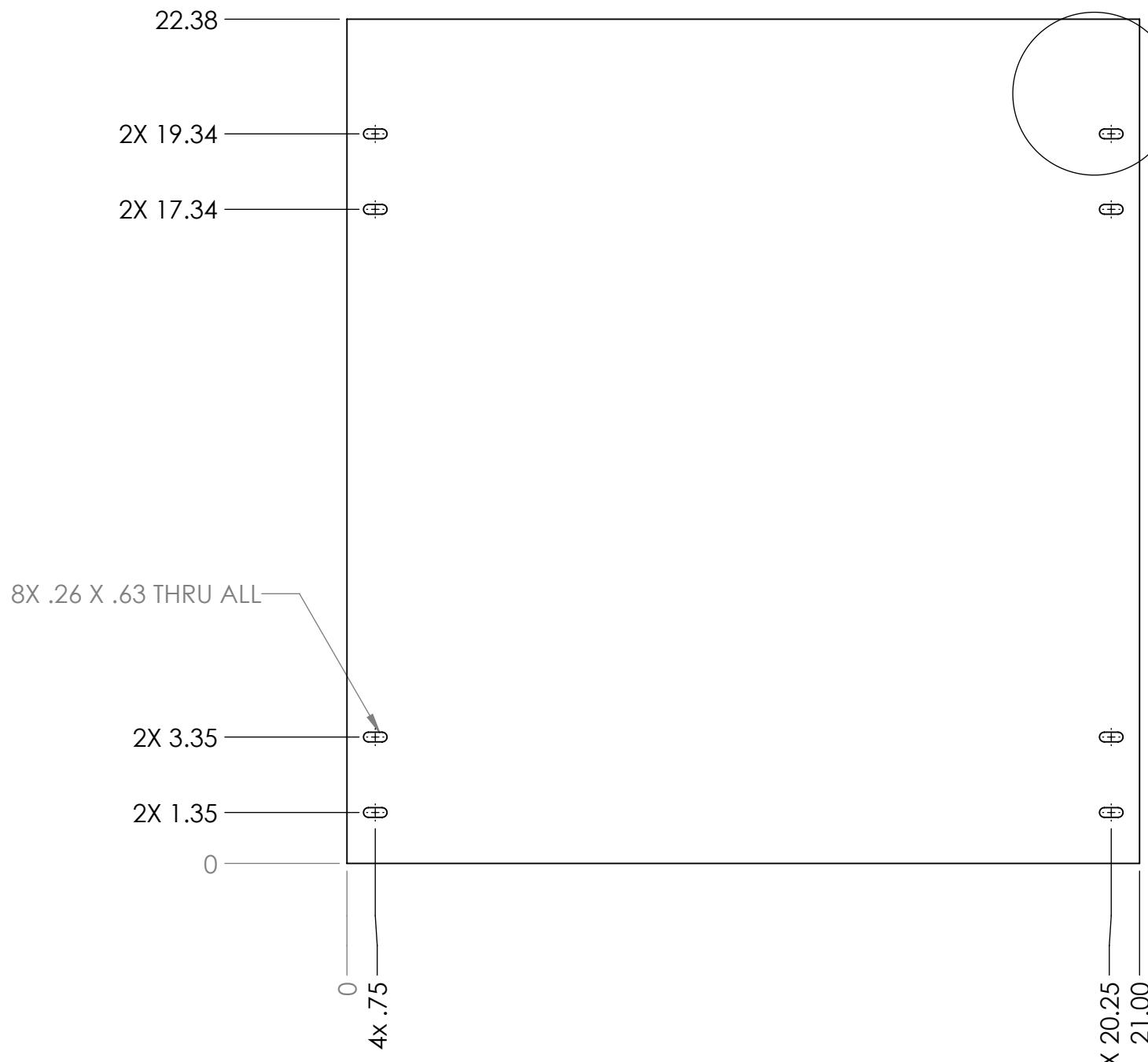
3

2

1

B

B



- Notes:
1. Material: 1/8" Thick Clear Polycarbonate Sheet
 2. Remove all sharp edges and burrs
 3. Tag Or Label With Part Number

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		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$	NAME	DATE
		DRAWN		
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
		MATERIAL		
		FINISH		
NEXT ASSY	USED ON			
APPLICATION	DO NOT SCALE DRAWING			
SIZE	DWG. NO.		REV	
B	GE-19101			
SCALE: 1:8	WEIGHT:		SHEET 1 OF 1	

 **FIRST**
ROBOTICS
COMPETITION

 **SOLIDWORKS**
Modeling Solutions Partner

Bridge Plastic Top Side

4

3

2

1

4

3

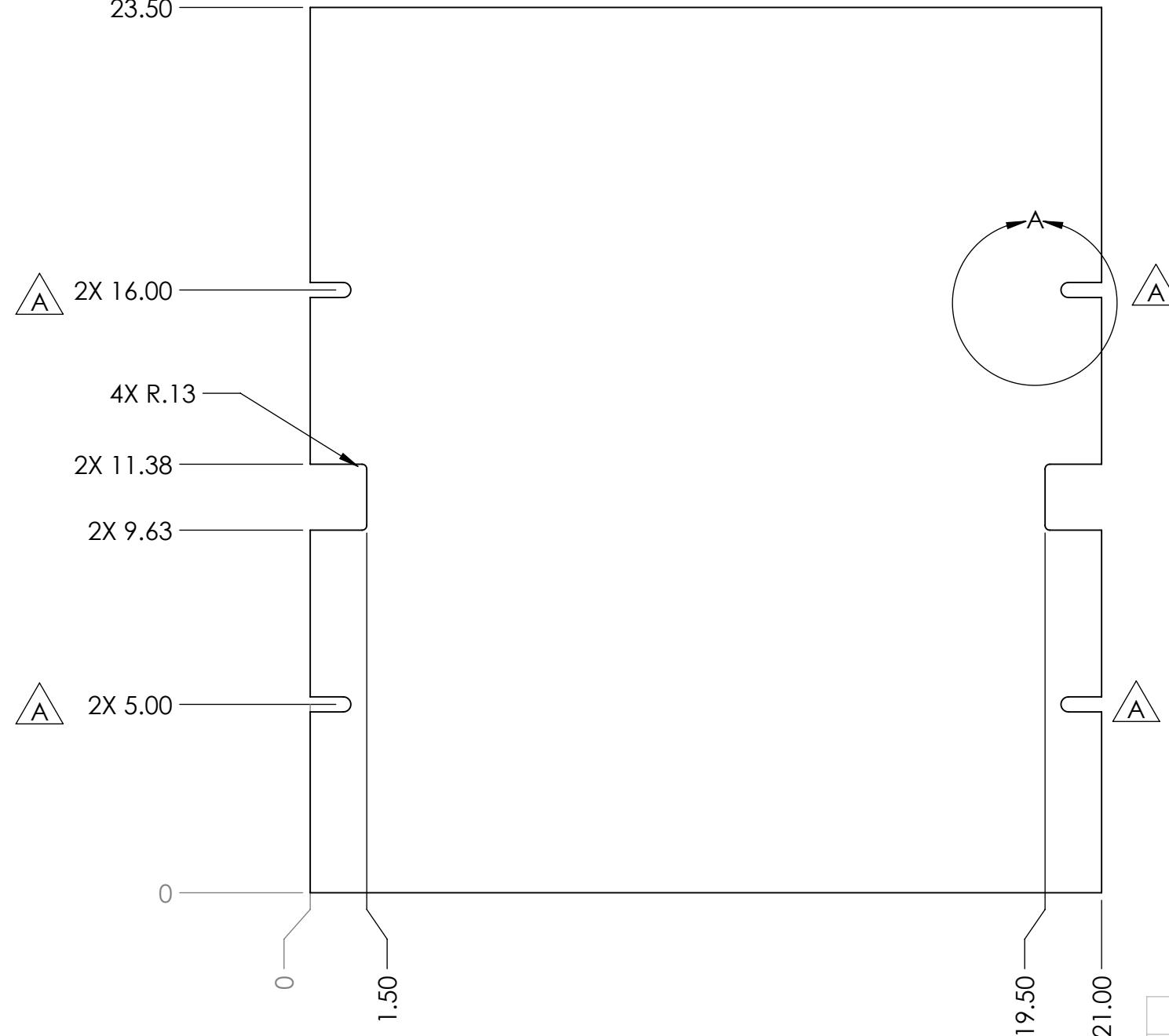
2

1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
A2, A4, B2, B4	A	Updated slots	11/15/2018	

23.50



- Notes:
1. Material: 1/8" Thick Clear Polycarbonate Sheet
 2. Remove all sharp edges and burrs
 3. Tag Or Label With Part Number

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Bridge Plastic Side

B **GE-19102** **A**

SIZE DWG. NO. REV
SCALE: 1:8 WEIGHT: SHEET 1 OF 1

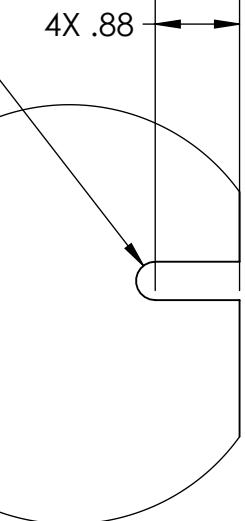
4

3

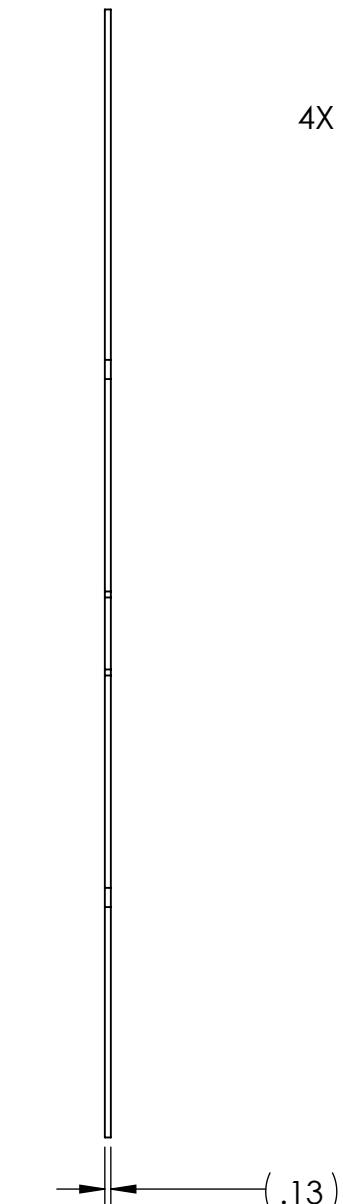
2

1

B

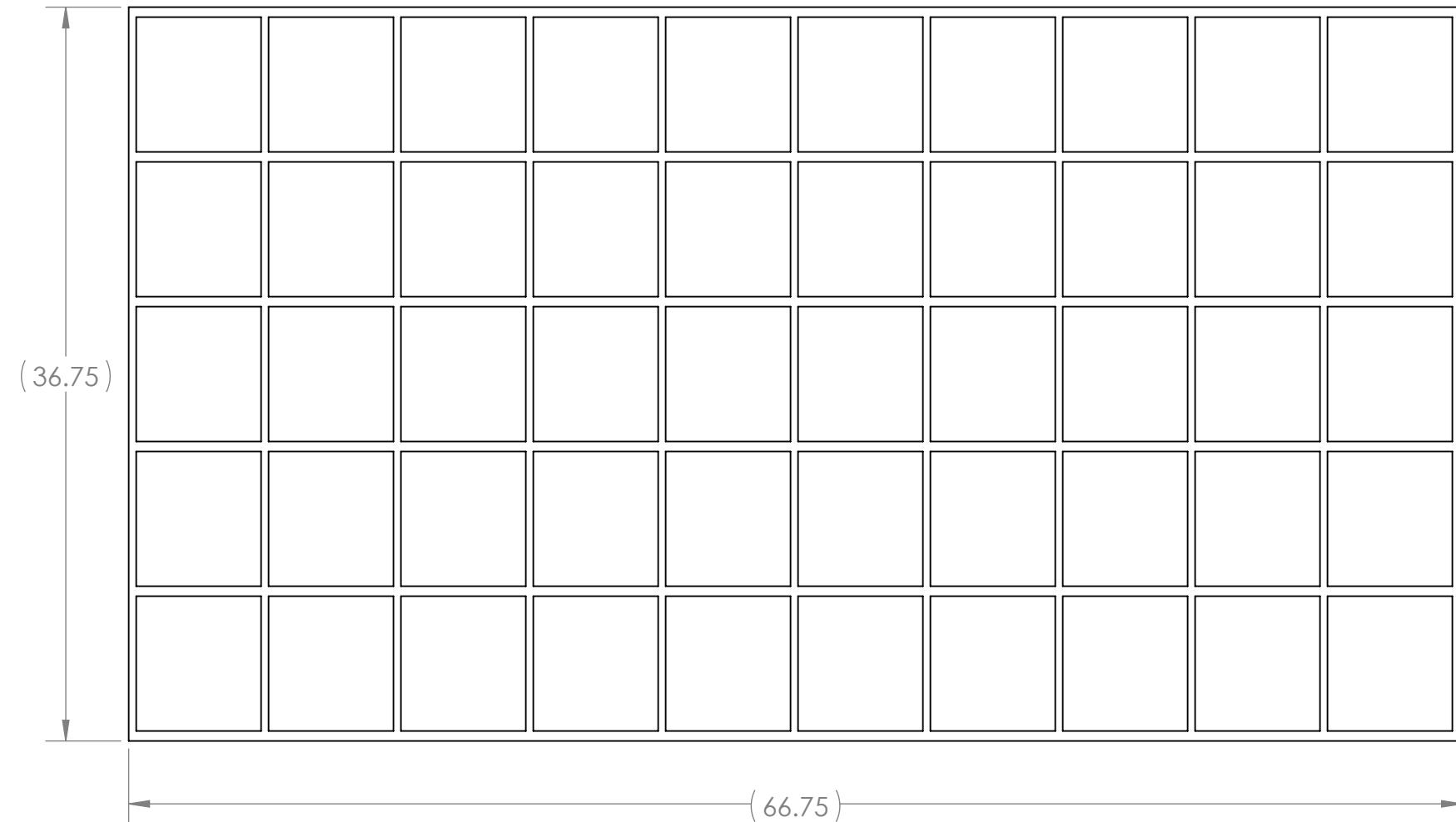


DETAIL A
SCALE 1 : 2



B

B



Notes:

1. 36 in. x 60 in. (unstretched) Extended Bed Mini-Truck Cargo Net
2. Source: Harbor Freight
3. Part Number: 69618
4. Equivalent Substitutions Allowed

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

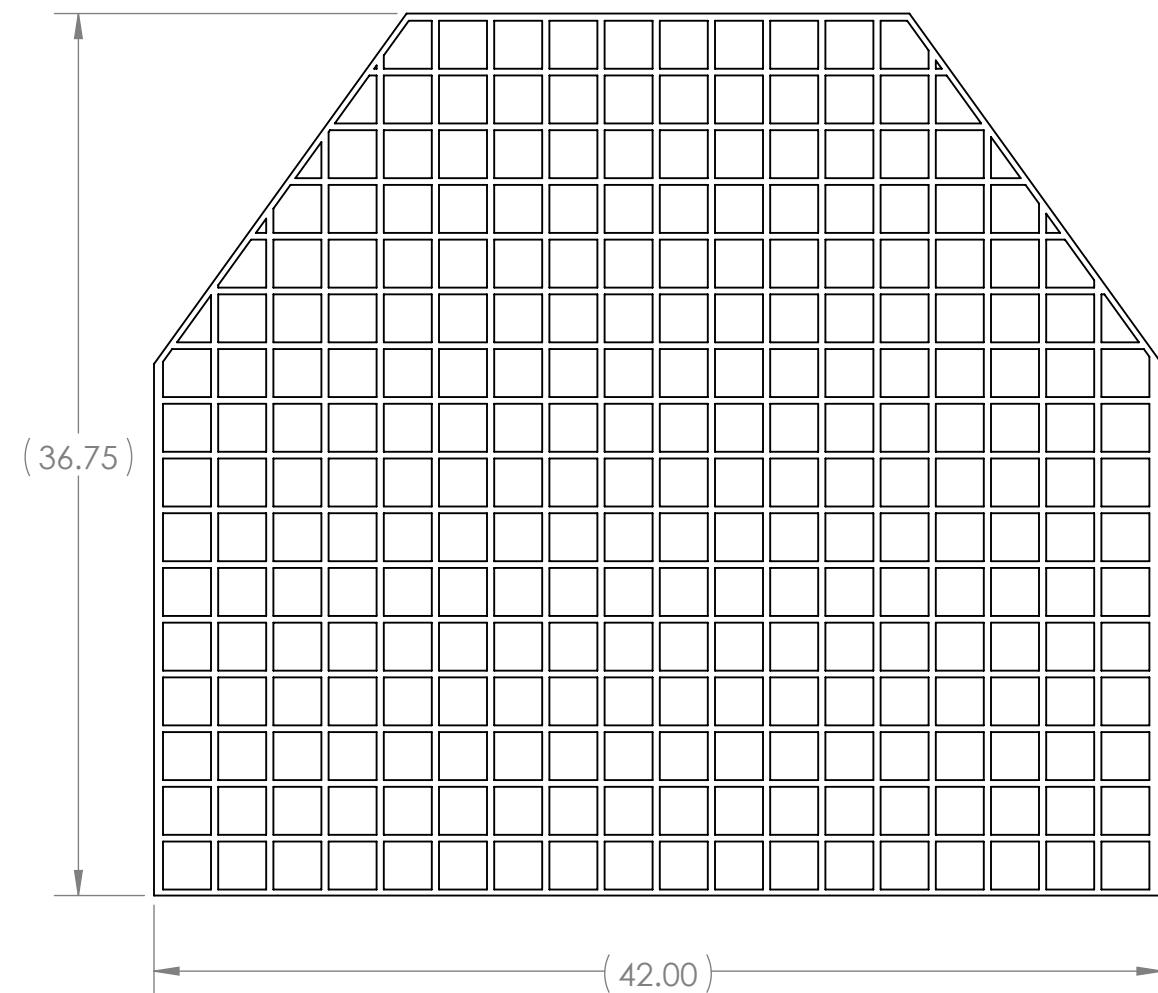
FIRST ROBOTICS COMPETITION **SOLIDWORKS**
 Modeling Solutions Partner

Cargo Net Side

SIZE	DWG. NO.	REV
B	GE-19103	
SCALE: 1:8	WEIGHT:	SHEET 1 OF 1

B

B



Notes:

1. 24"x36" (unstretched) PowerTye® Mfg Extra Large Cargo Net featuring 10 Adjustable Hooks & Tight 2"x2" Mesh, Black
2. Source: PowerTye
3. Part Number: 50362
4. Equivalent Substitutions Allowed

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		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$		NAME	DATE
		DRAWN			
		CHECKED			
		ENG APPR.			
		MFG APPR.			
		Q.A.			
		COMMENTS:			
		MATERIAL			
		FINISH			
NEXT ASSY	USED ON				
APPLICATION	DO NOT SCALE DRAWING				
B	GE-19104				
SCALE: 1:8	WEIGHT:				
		SHEET 1 OF 1			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

Cargo Net Front

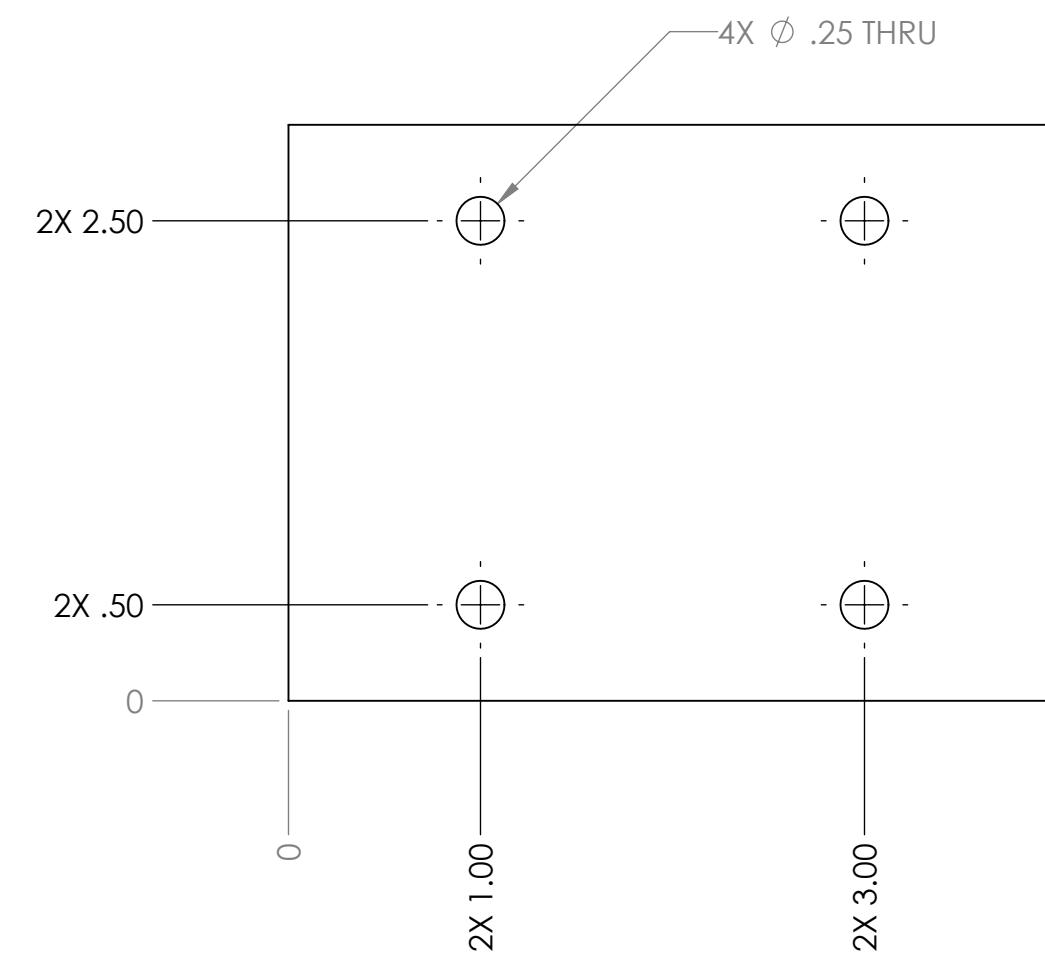
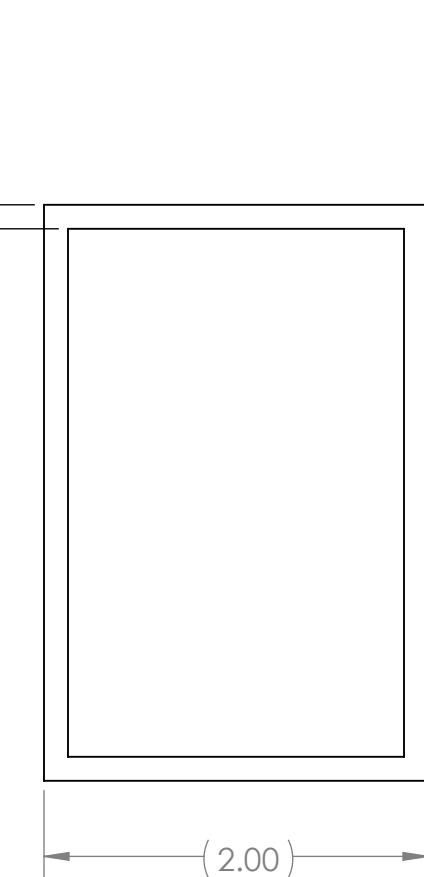
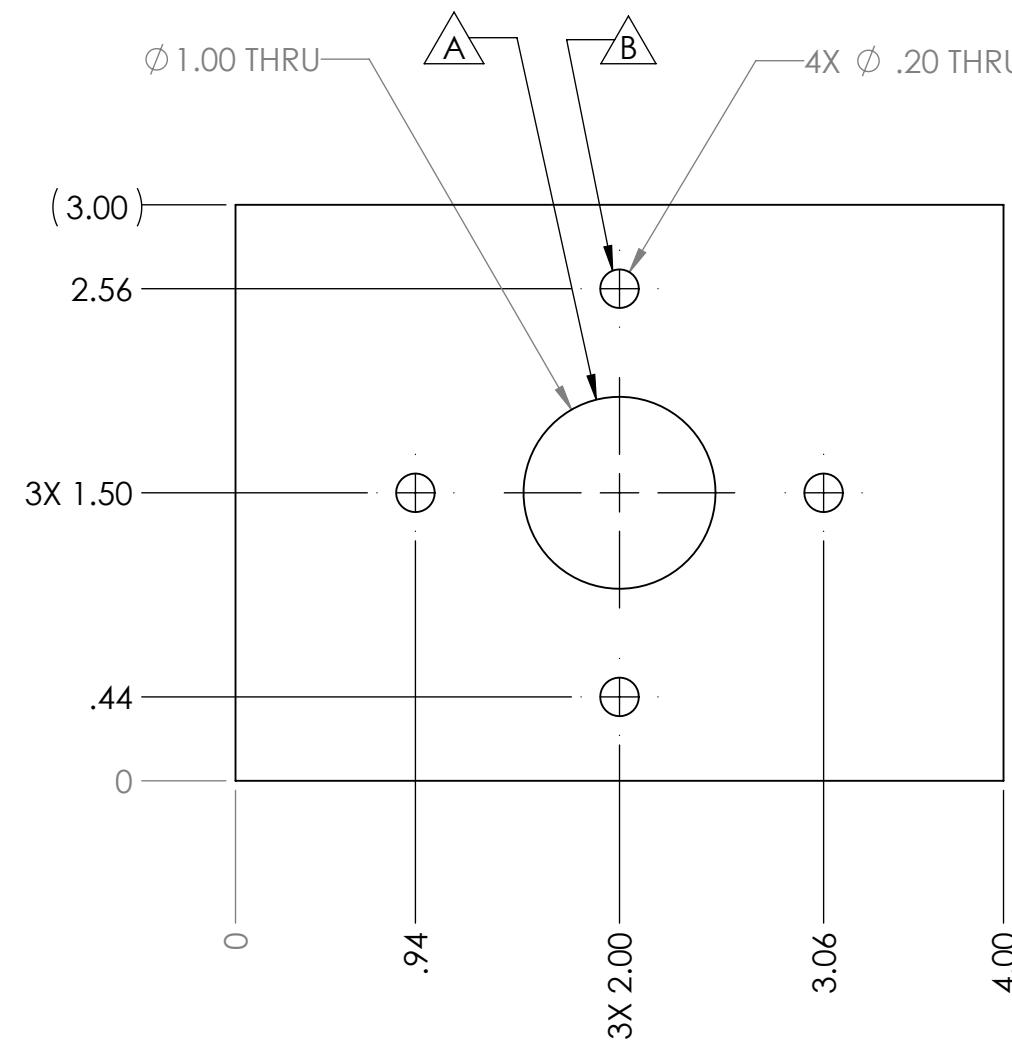
4

3

2

1

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
B4	A	Added 1" hole	10/22/2018	JRF
B4	B	Modified hole size, from .23 to .20	10/24/2018	JRF



Notes:

1. Material: 3" x 2" x .125" thk. Rectan
2. Remove all sharp edges and burrs
3. Tag Or Label With Part Number

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		UNLESS OTHERWISE SPECIFIED:		NAME	DATE	 FIRST ROBOTICS COMPETITION	TITLE: <h1>Light Mount</h1>
		DIMENSIONS ARE IN INCHES	DRAWN				
		TOLERANCES:	CHECKED				
		FRACTIONAL $\pm 1/16$	ENG APPR.				
		ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$	MFG APPR.				
		TWO PLACE DECIMAL $\pm .01$	Q.A.				
		THREE PLACE DECIMAL $\pm .001$	COMMENTS:				
		MATERIAL				SIZE DWG. NO. B GE-19105	REV B
NEXT ASSY	USED ON	FINISH					
APPLICATION		DO NOT SCALE DRAWING		SCALE: 1:1	WEIGHT:	SHEET 1 OF 1	

4

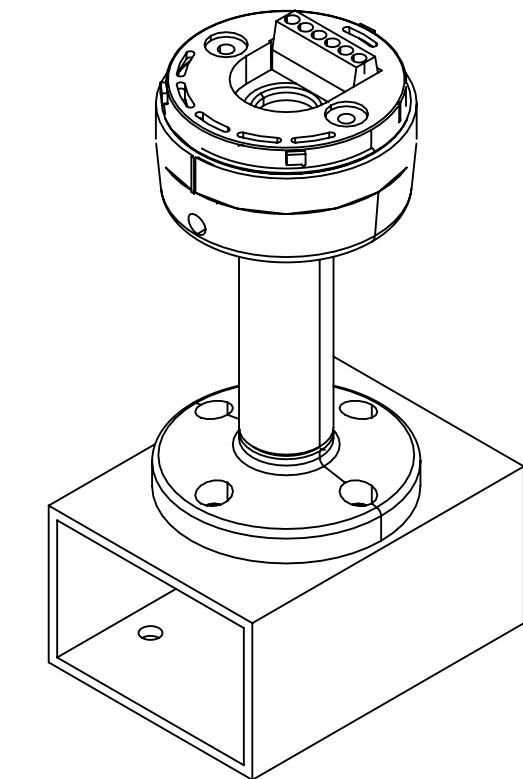
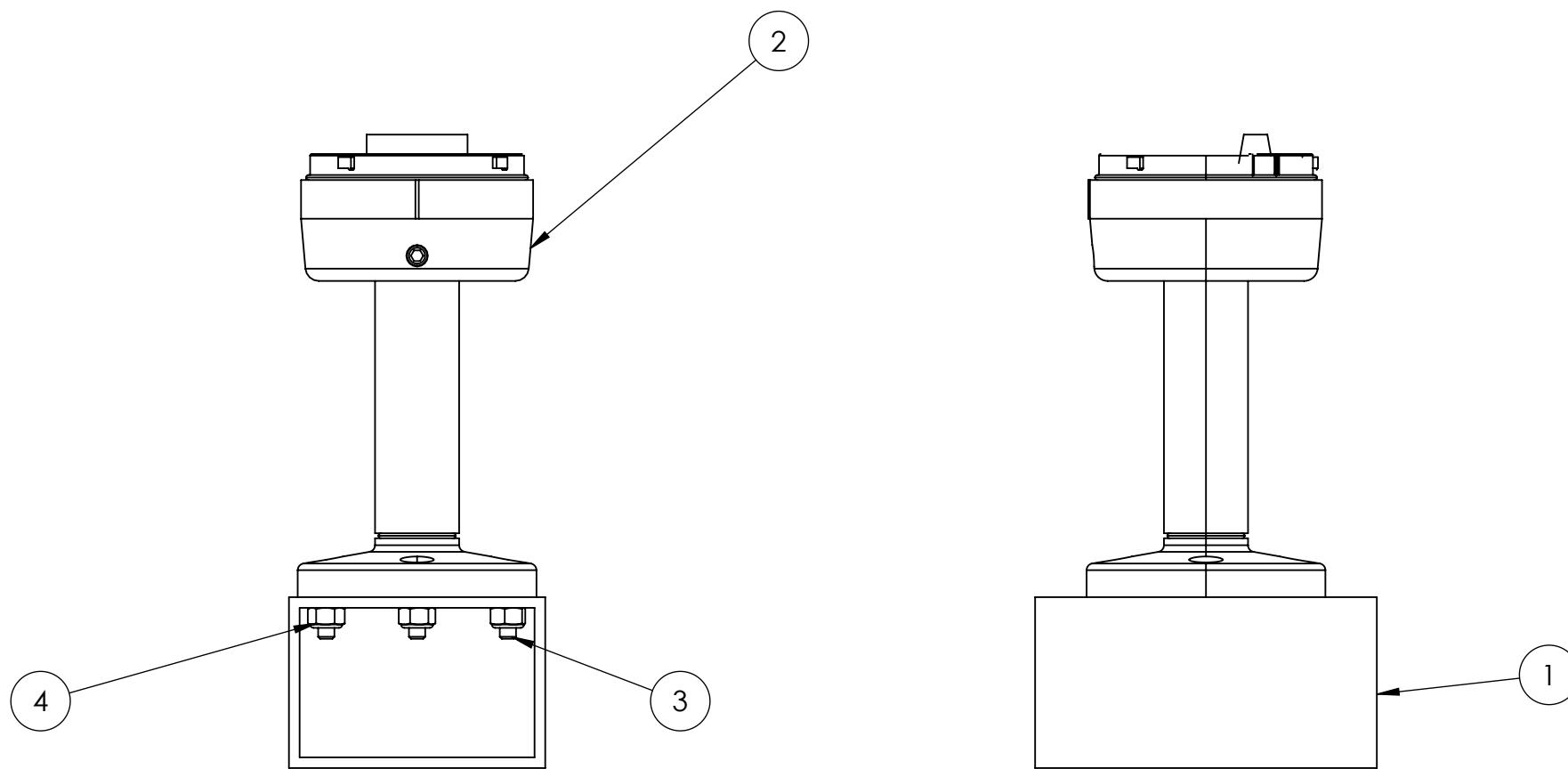
3

2

1

B

B



Notes:

- Stack light not shown, but is part of the assembly.

A

A

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-19105	Light Mount	1
2	855t-bpm10	Stack Light Mount with pole	1
3	round_hex_10_32_.625_full	Round Hex Head, #10-32 x 5/8" long, fully threaded	4
4	nylock_10_32	Low-Strength Steel Nylon-Insert Locknut, Zinc-Plated, 10-32 Thread Size	4

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

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

Light Sub Assembly

TITLE:

SIZE DWG. NO. REV

B GE-19106

SCALE: 1:2 WEIGHT: SHEET 1 OF 1

4

3

2

1

4

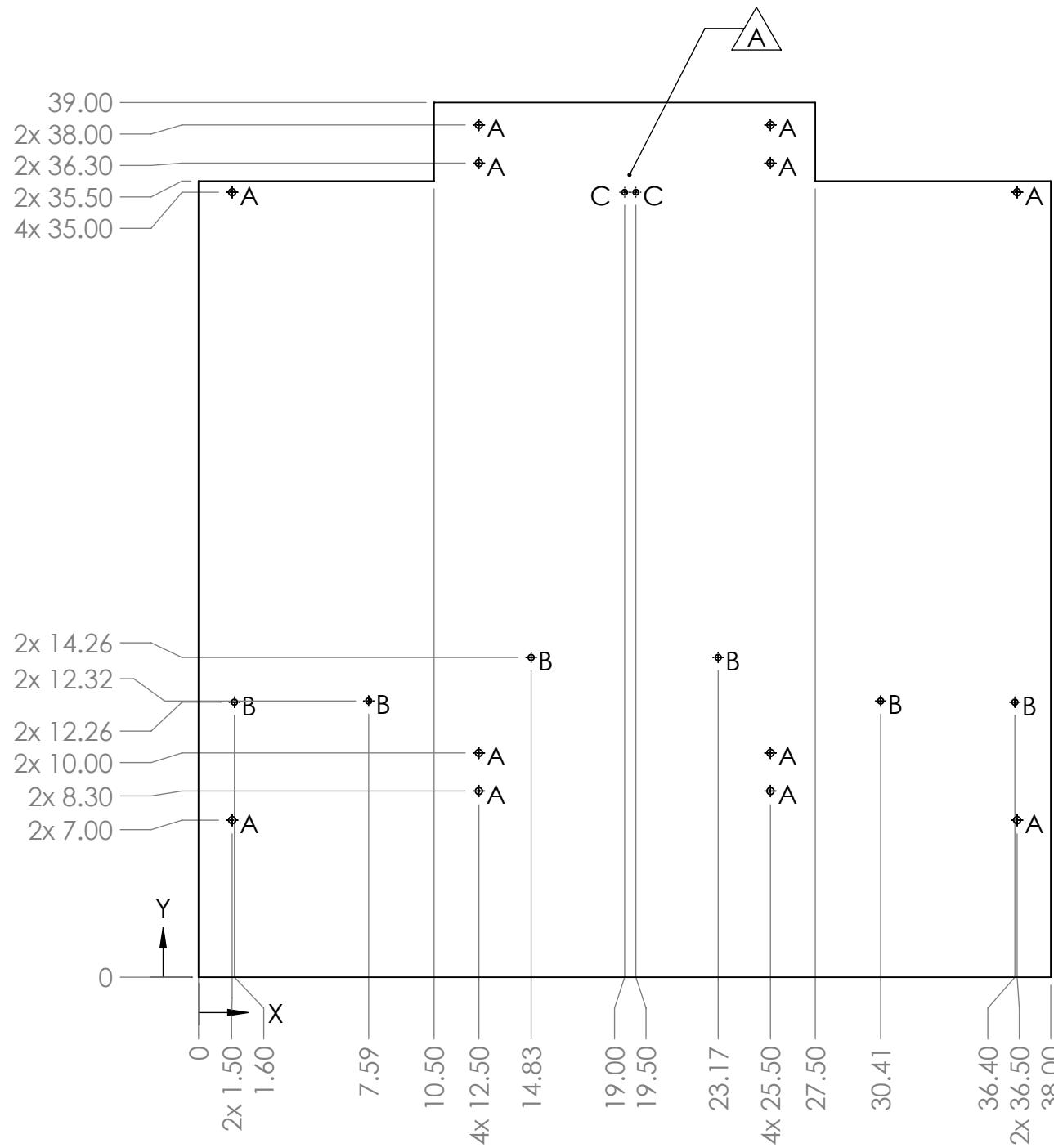
3

2

1

B

B



Notes:

1. Material: 1/8" thick, clear polycarbonate.
2. Remove all burrs and sharp edges.
3. Tag or label with part number.

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		UNLESS OTHERWISE SPECIFIED:			TITLE: Rocket Back Plastic Bottom
		DIMENSIONS ARE IN INCHES			
		TOLERANCES:			
		FRACTIONAL $\pm 1/16$			
		ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$			
		TWO PLACE DECIMAL $\pm .01$			
		THREE PLACE DECIMAL $\pm .001$			
		INTERPRET GEOMETRIC TOLERANCING PER:			
		MATERIAL			
NEXT ASSY		USED ON		FINISH	
APPLICATION		DO NOT SCALE DRAWING			
DRAWN	NAME	DATE			
CHECKED					
ENG APPR.					
MFG APPR.					
Q.A.	COMMENTS:				
SIZE	DWG. NO.	REV			
B	GE-19109	A			
SCALE: 1:7	WEIGHT:	SHEET 1 OF 1			

4

3

2

1

4

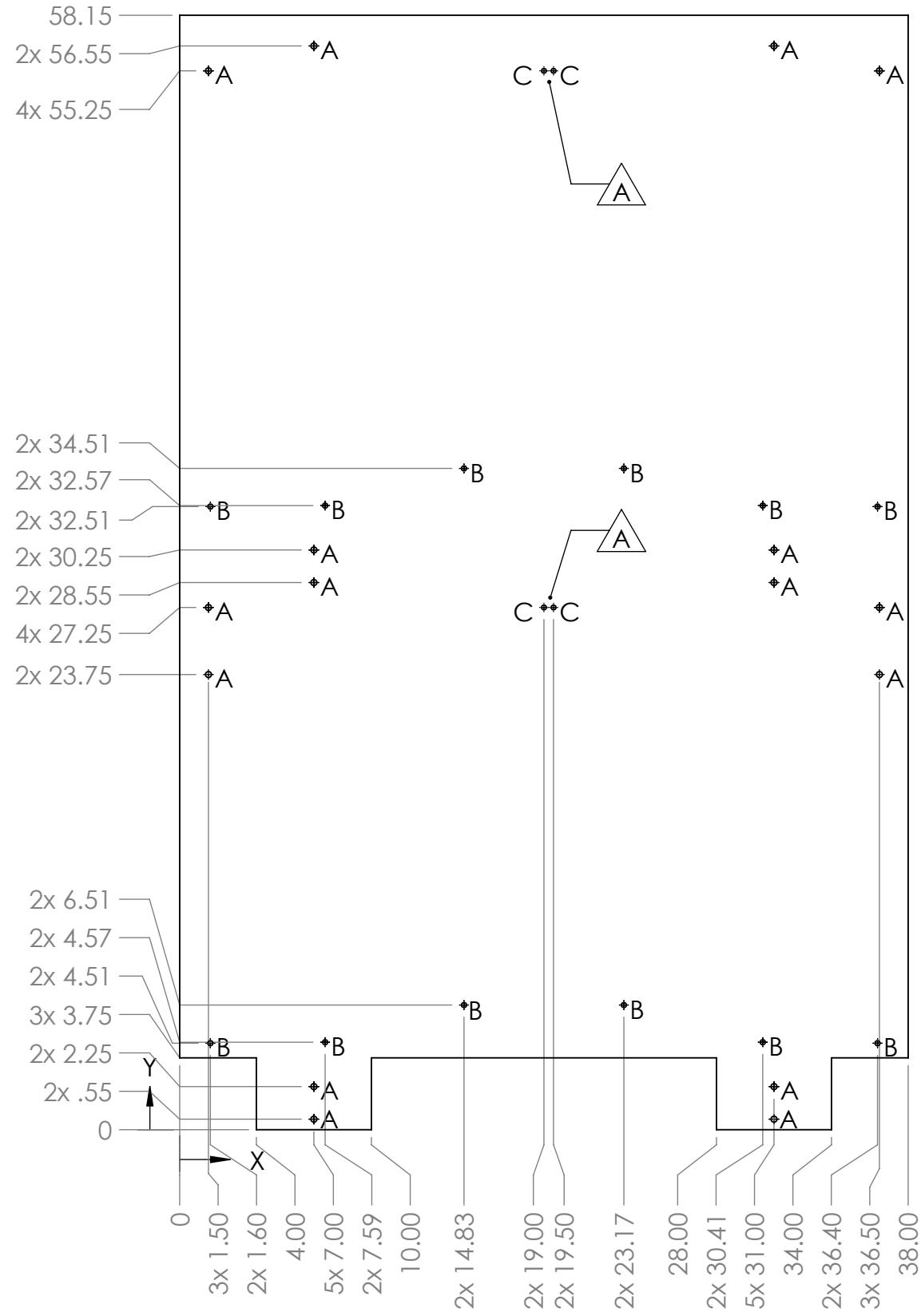
3

2

1

B

B



- Notes:
- Material: 1/8" thick, clear polycarbonate.
 - Remove all burrs and sharp edges.
 - Tag or label with part number.

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REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
B3	A	1/4" diameter holes added.	10/29/2018	CPO

TAG	SIZE	QUANTITY
A	$\phi .31$ THRU ALL	16
B	$\phi .27$ THRU ALL	12
C	$\phi .25$ THRU ALL	4

	UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$	NAME	DATE
	DRAWN		
	CHECKED		
	ENG APPR.		
	MFG APPR.		
	Q.A.		
	COMMENTS:		
NEXT ASSY	USED ON	FINISH	
APPLICATION	DO NOT SCALE DRAWING		
SCALE: 1:10		WEIGHT:	SHEET 1 OF 1

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Rocket Panel Plastic Top

SIZE DWG. NO. REV
B GE-19110 A

4

3

2

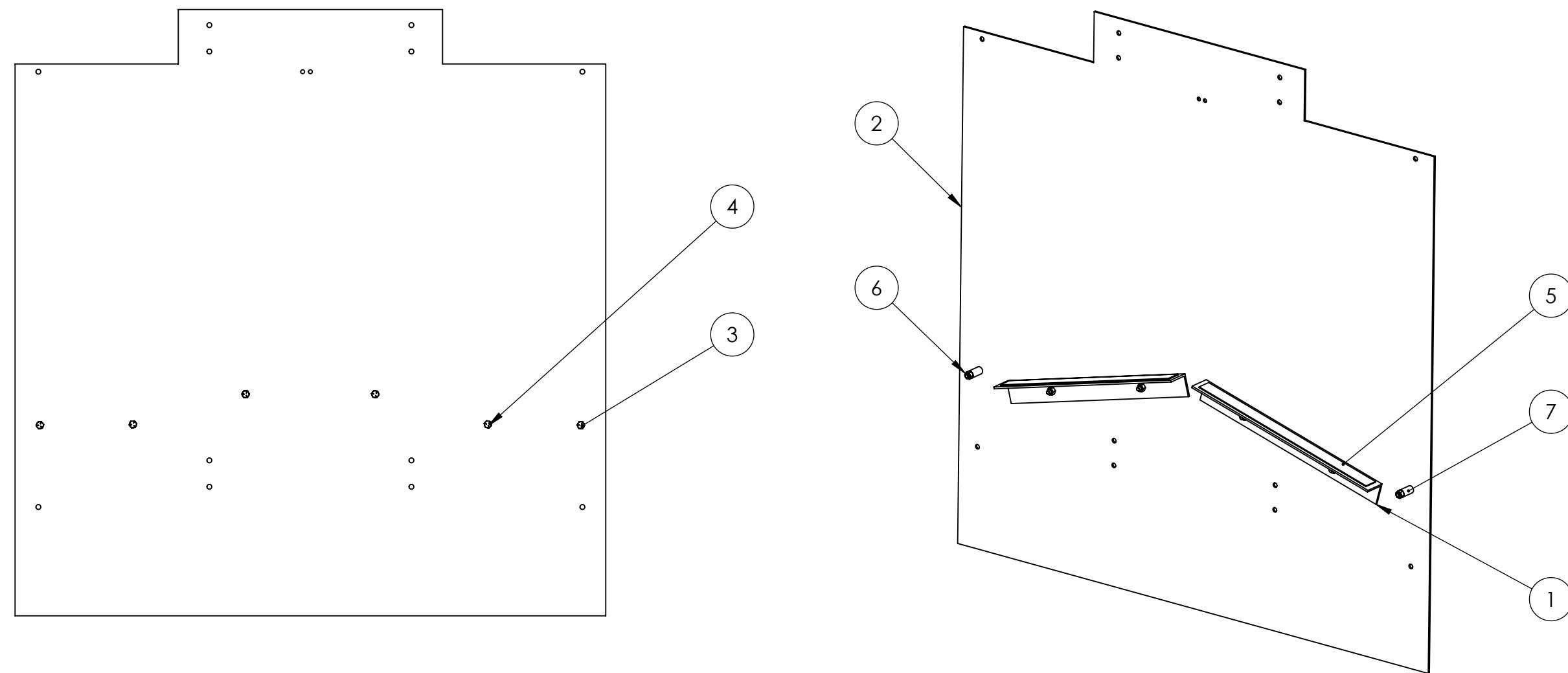
1

4

3

2

1



B

B

A

A

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-19028	Rocket Ramp Support Back	2
2	GE-19109	Rocket Back Plastic Bottom	1
3	hex_.25_20_1.5	Steel Hex Head Screw, 1/4"-20 x 1-1/2" long, fully threaded	2
4	hex_.25_20_.75	Steel Hex Head Screw, 1/4"-20 x 3/4" long, fully threaded	4
5	Hook_1_14	1" x 14" Hook, Adhesive Backed	2
6	nylock_.25_20	Steel Nylon-Insert Locknut, 1/4"-20	6
7	spacer_.257_1_.5	Spacer, .257" ID, 1/2" OD, 1" thk	2

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		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL: ±1/16 ANGULAR: MACH ±1° BEND ±1° TWO PLACE DECIMAL: ±.01 THREE PLACE DECIMAL: ±.001	NAME	DATE
		DRAWN		
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
		MATERIAL		
		FINISH		
NEXT ASSY	USED ON	APPLICATION	DO NOT SCALE DRAWING	
SCALE: 1:8 WEIGHT: SHEET 1 OF 1				

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE: Rocket Back
Bottom Assembly

SIZE DWG. NO. REV
B GE-19113

SCALE: 1:8 WEIGHT: SHEET 1 OF 1

4

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4

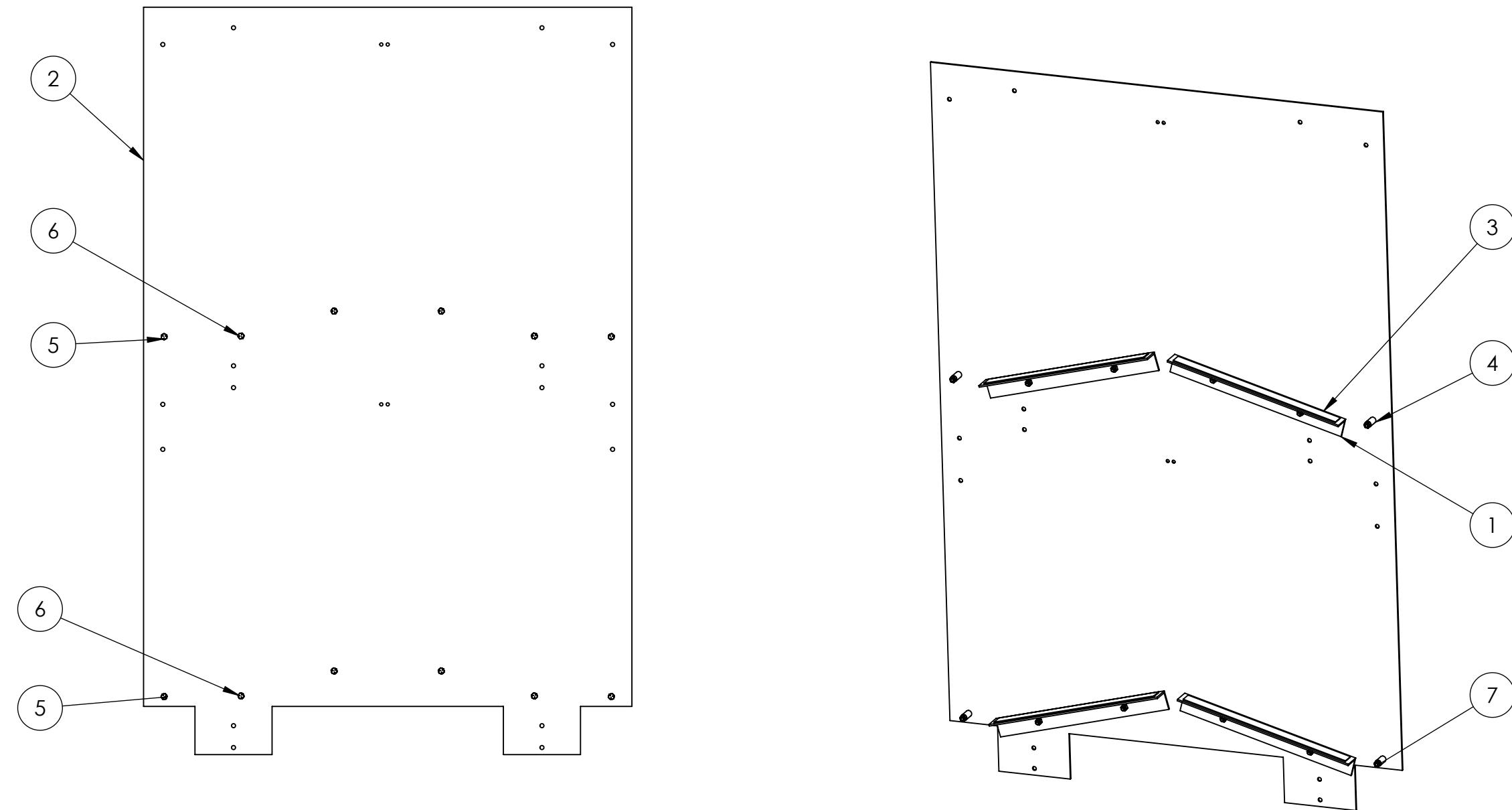
3

2

1

B

B



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-19028	Rocket Ramp Support Back	4
2	GE-19110	Rocket Panel Plastic Top	1
3	Hook_1_14	1" x 14" Hook, Adhesive Backed	4
4	spacer_.257_1_.5	Spacer, .257" ID, 1/2" OD, 1" thk	4
5	hex_.25_20_1.5	Steel Hex Head Screw, 1/4"-20 x 1-1/2" long, fully threaded	4
6	hex_.25_20_.75	Steel Hex Head Screw, 1/4"-20 x 3/4" long, fully threaded	8
7	nylock_.25_20	Steel Nylon-Insert Locknut, 1/4"-20	12

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Notes:
1. Item 3 attaches to the top of item 1, centered.

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE:
Rocket Back Top Assembly

SIZE **DWG. NO.** **REV**
B **GE-19114**

SCALE: 1:10 **WEIGHT:** **SHEET 1 OF 1**

4

3

2

1

4

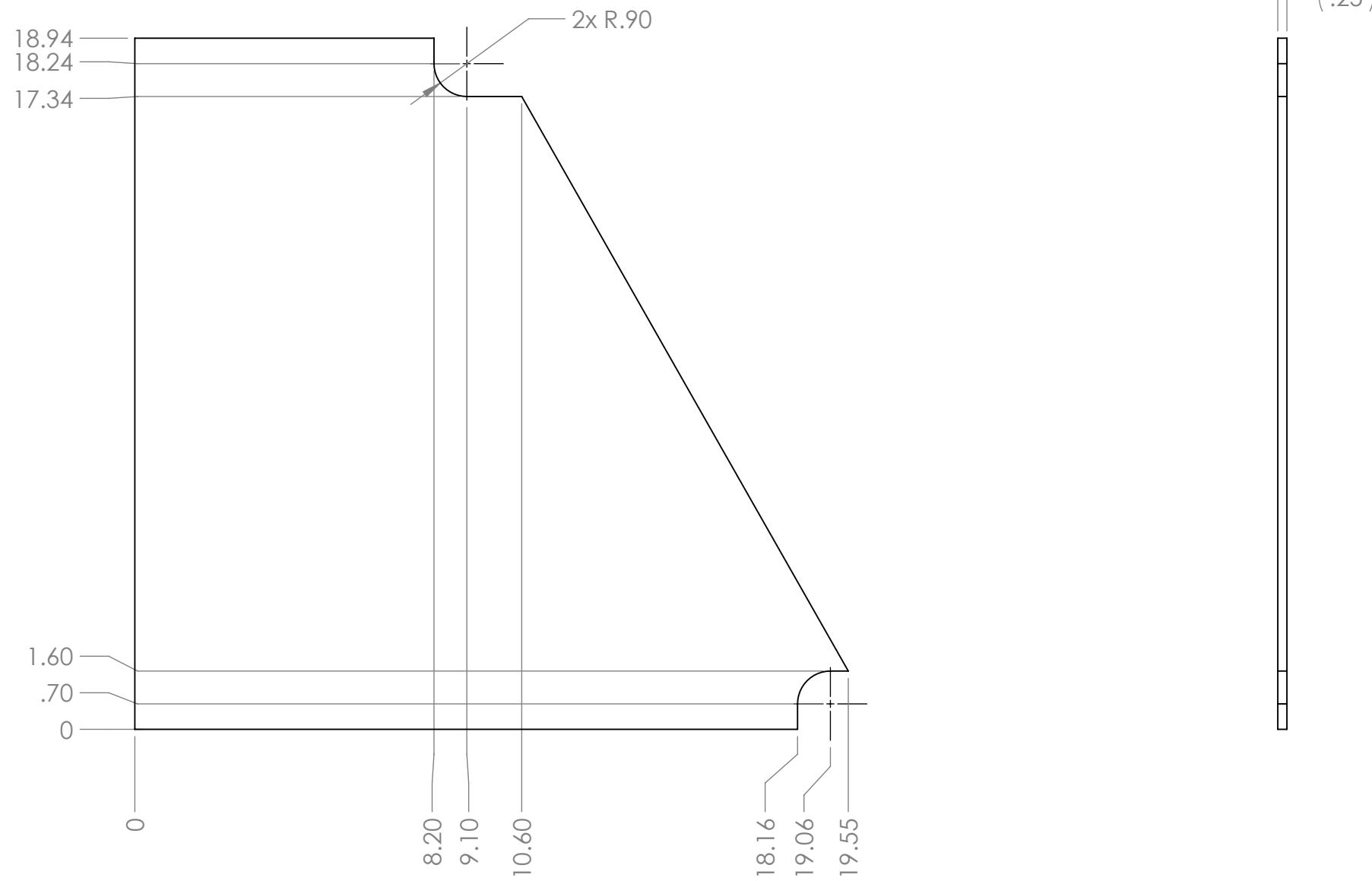
3

2

1

B

B



A

A

Notes:

1. Material: 1/4" thick, clear polycarbonate.
2. Remove all burrs and sharp edges.
3. Tag or label with part number.

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		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$	NAME	DATE
		DRAWN		
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
		MATERIAL		
		FINISH		
NEXT ASSY	USED ON			
APPLICATION	DO NOT SCALE DRAWING			
SIZE	DWG. NO.	REV		
B	GE-19115			
SCALE: 1:4	WEIGHT:	SHEET 1 OF 1		

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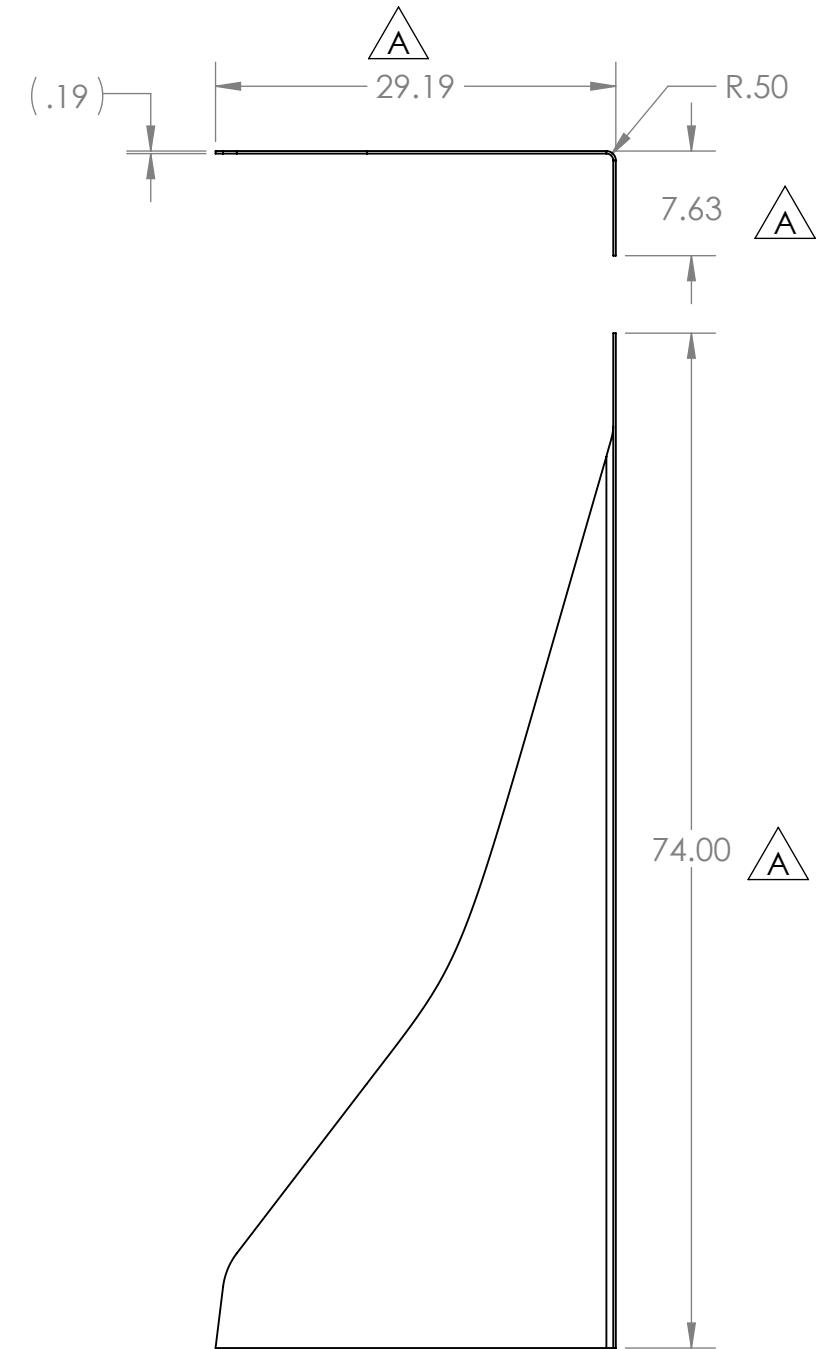
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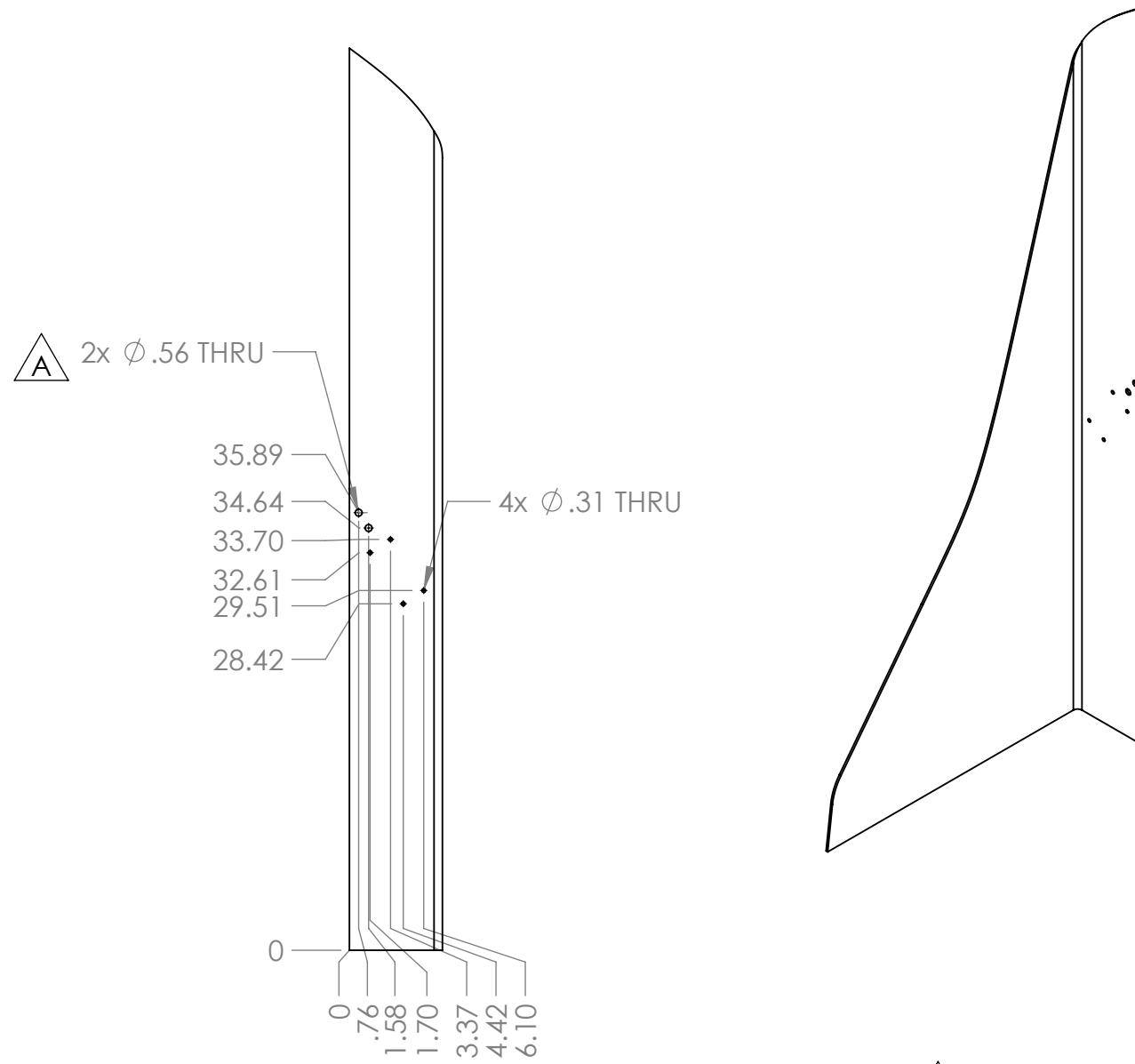
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1



REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
A1, A3, B3	A	Overall dimensions changed to make part larger. 2 clearance holes added. Notes updated. Part name and number updated.	9/25/2018	CPO



- Notes:
1. Material: 3/16" thick, clear polycarbonate.
 2. Remove all burrs and sharp edges.
 3. Tag or label with part number.
 4. Finish: Vinyl applied to face.

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		DRAWN		
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
SIZE	DWG. NO.		REV	
B	GE-19116	A		
SCALE: 1:14	WEIGHT:	SHEET 1 OF 1		

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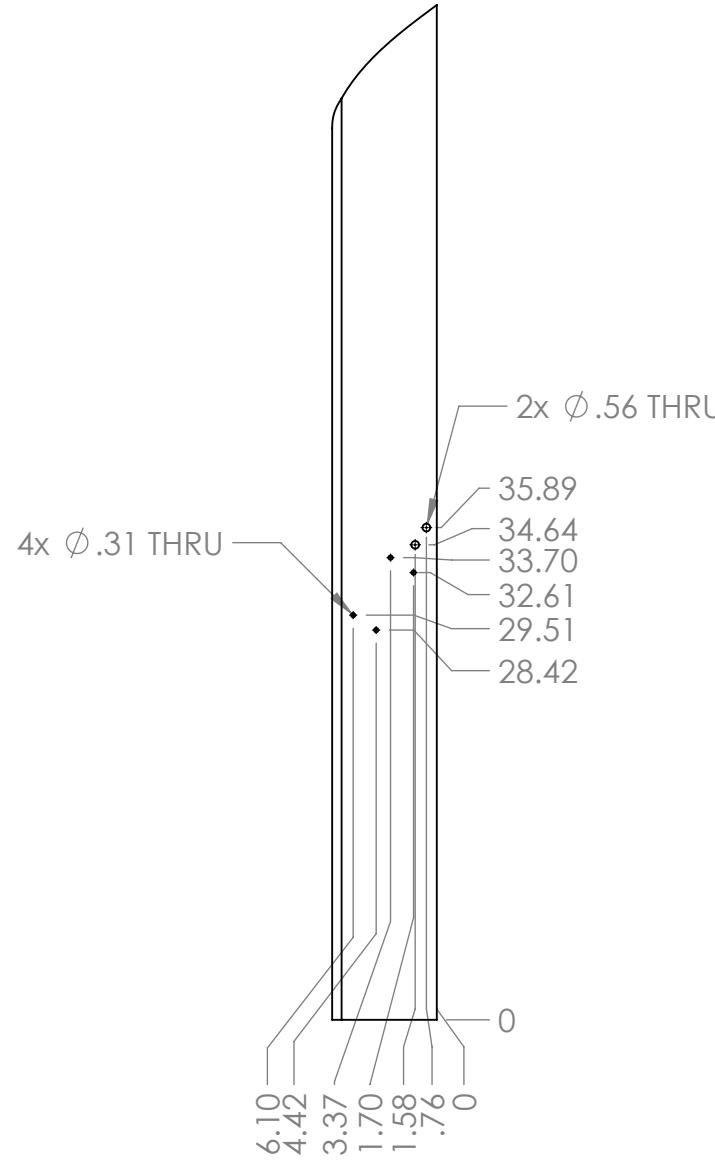
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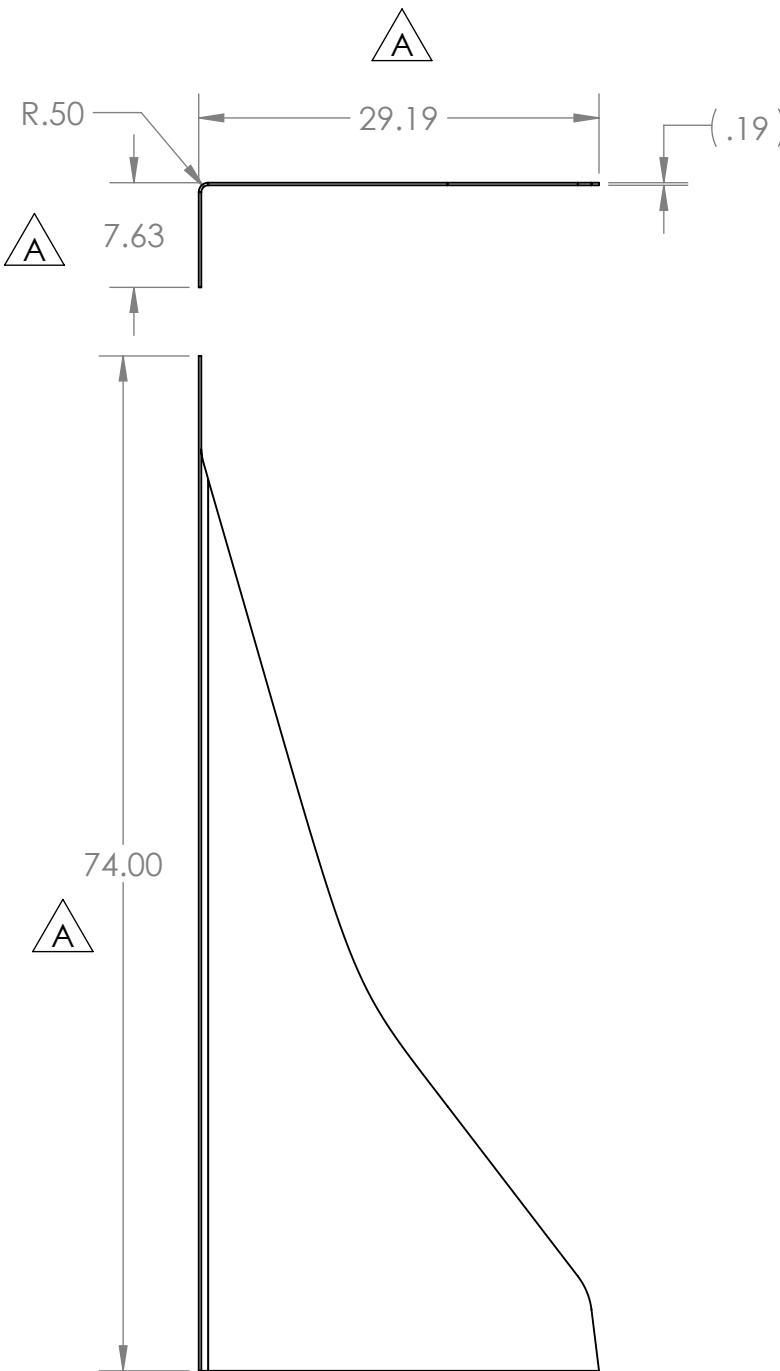
B

B



- Notes:
1. Material: 3/16" thick, clear polycarbonate.
 2. Remove all burrs and sharp edges.
 3. Tag or label with part number.
 4. Finish: Vinyl applied to face.

A



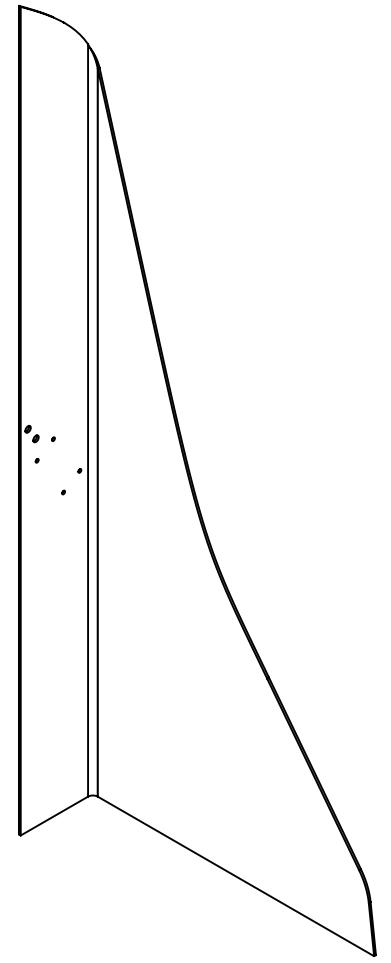
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2

1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
A1, A3, B3	A	Overall dimensions changed to make part larger. 2 clearance holes added. Notes updated. Part name and number updated.	9/25/2018	CPO



A

A

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		DRAWN		
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
SIZE	DWG. NO.			
B	GE-19117	A		
SCALE: 1:14		WEIGHT:	SHEET 1 OF 1	

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

Fin, Right

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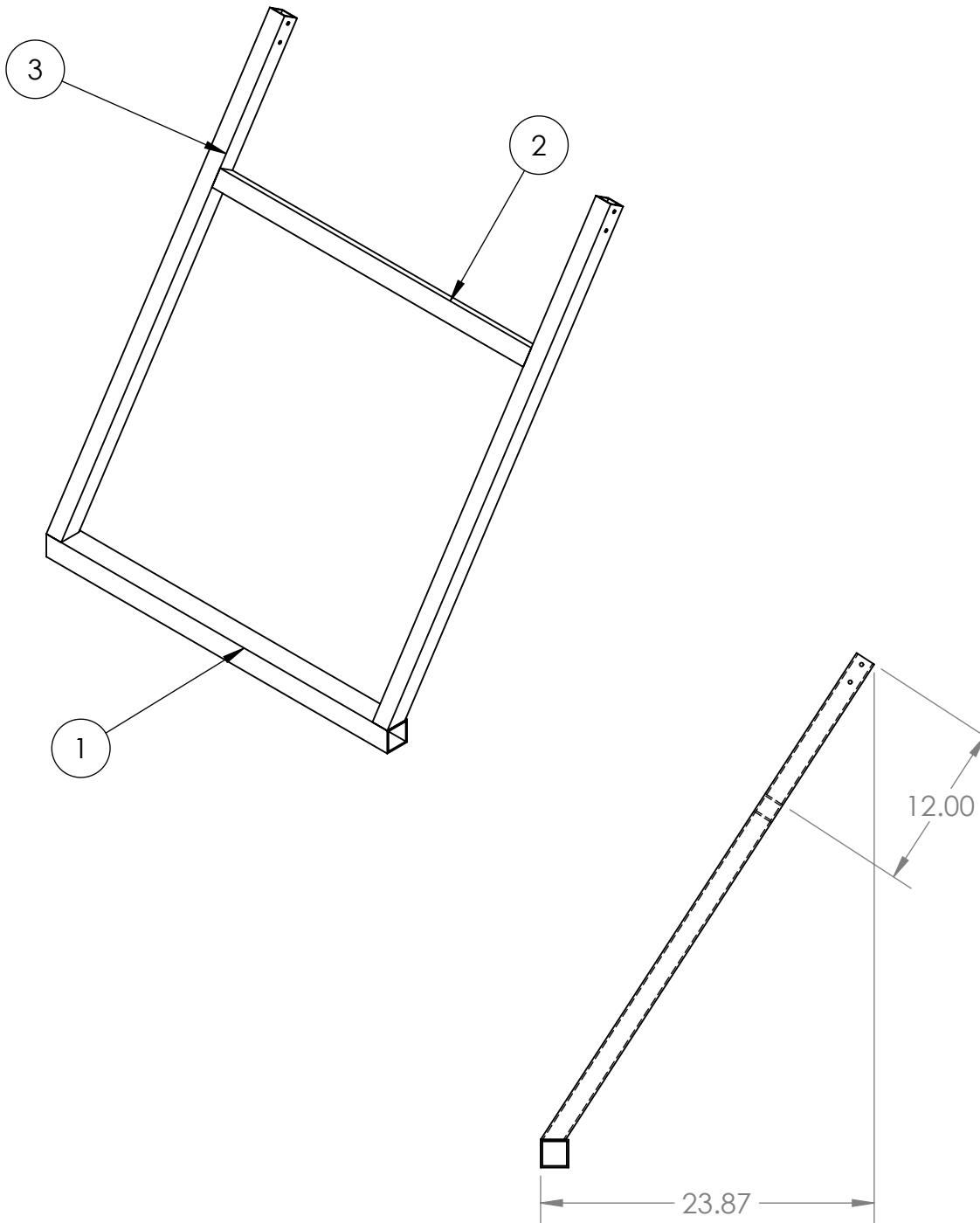
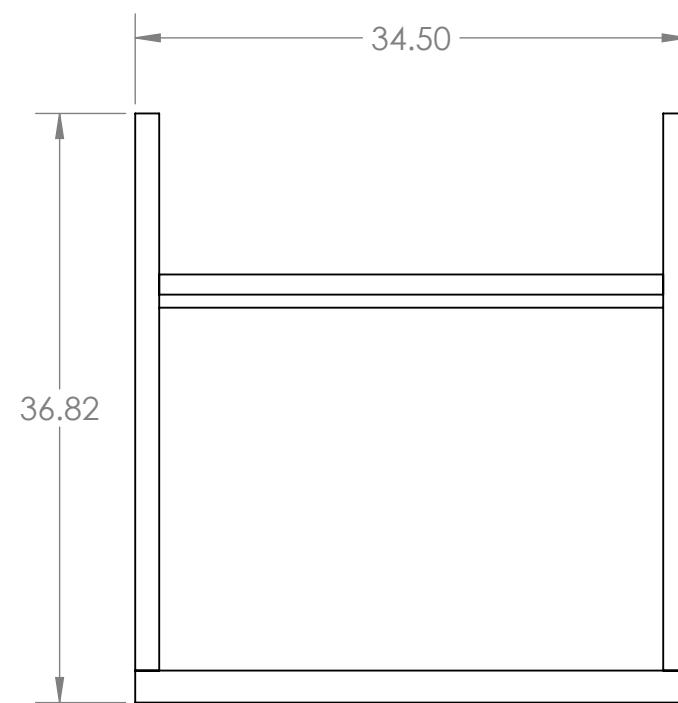
3

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B

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Notes:

1. Tag or label with part number.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-19118-01	2" x .125" thk. Square Tube, 6063 Aluminum	1
2	GE-19118-02	1.5" x .125" thk. Square Tube, 6063 Aluminum	1
3	GE-19118-03	1.5" x .125" thk. Square Tube, 6063 Aluminum	2

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		DRAWN		
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
		MATERIAL		
		FINISH		
		APPLICATION	DO NOT SCALE DRAWING	
SIZE	DWG. NO.		REV	
B	GE-19118			
SCALE: 1:12	WEIGHT:		SHEET 1 OF 3	

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

Rocket Outrigger

4

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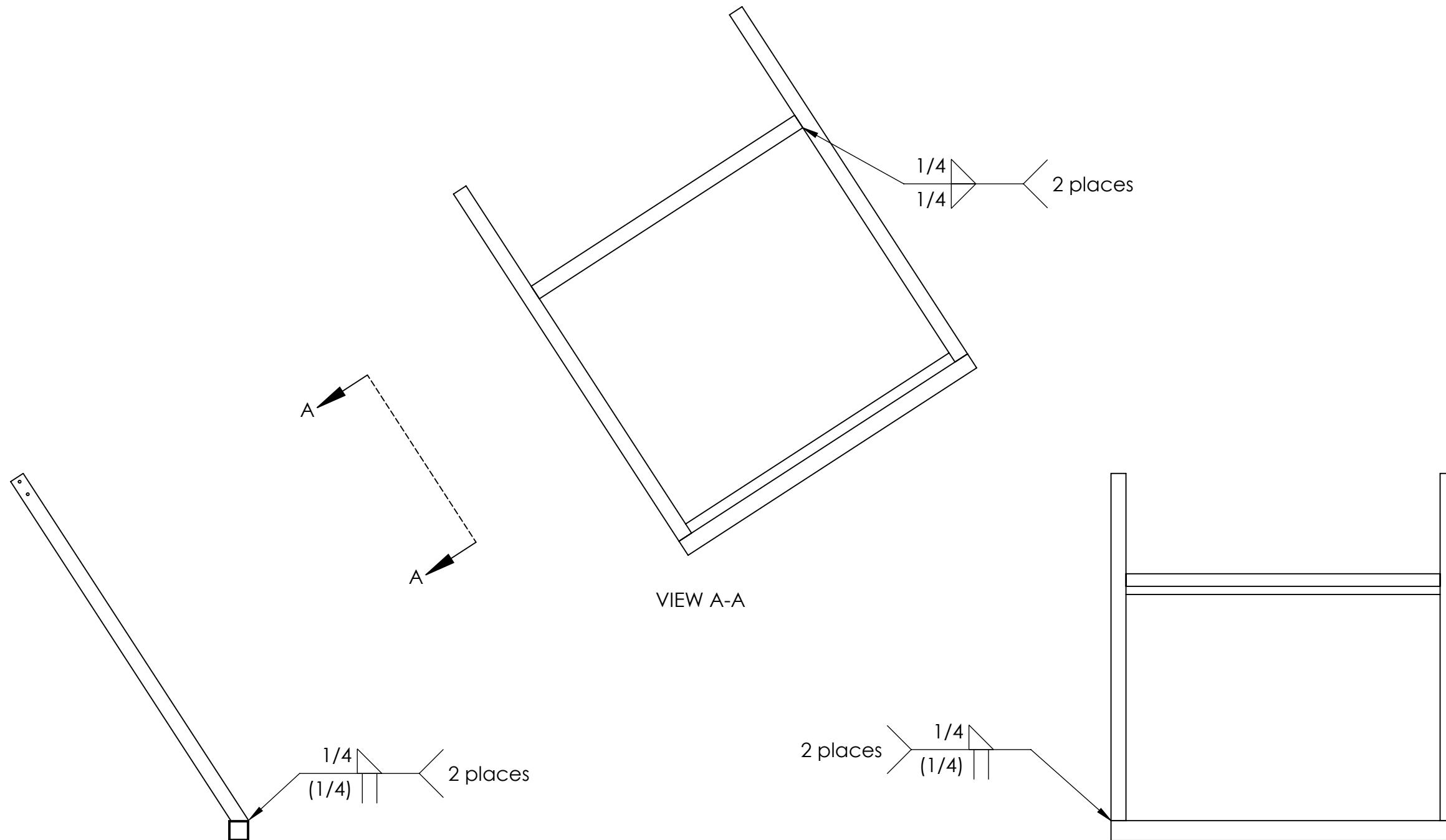
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		DRAWN			
		CHECKED			
		ENG APPR.			
		MFG APPR.			
		Q.A.			
		COMMENTS:			
		MATERIAL			
		FINISH			
NEXT ASSY	USED ON				
APPLICATION	DO NOT SCALE DRAWING				

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Rocket Outrigger

B **GE-19118**

SIZE DWG. NO. REV
SCALE: 1:12 WEIGHT: SHEET 2 OF 3

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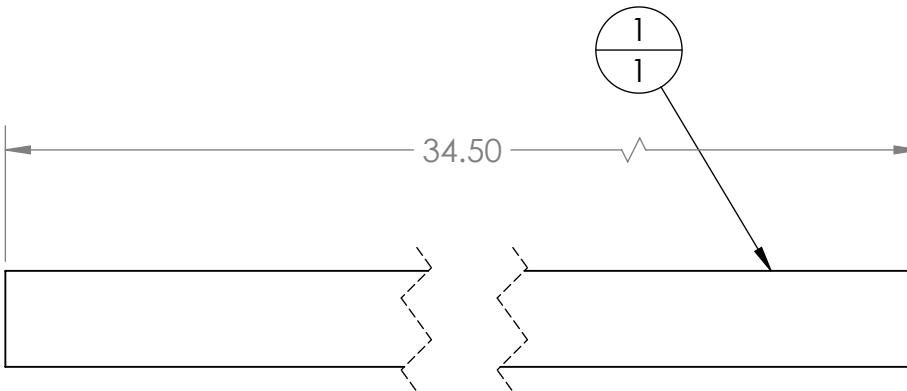
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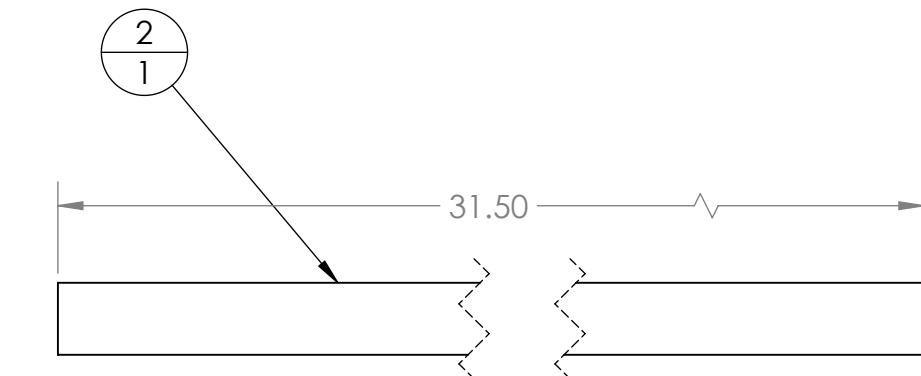
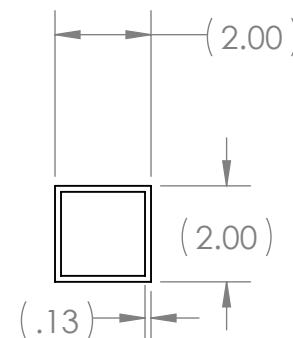
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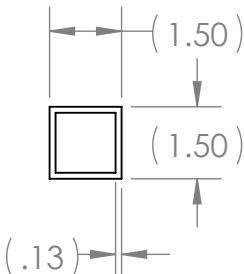
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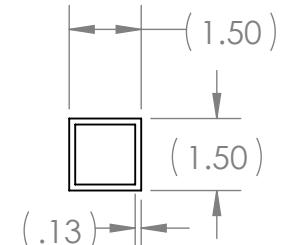
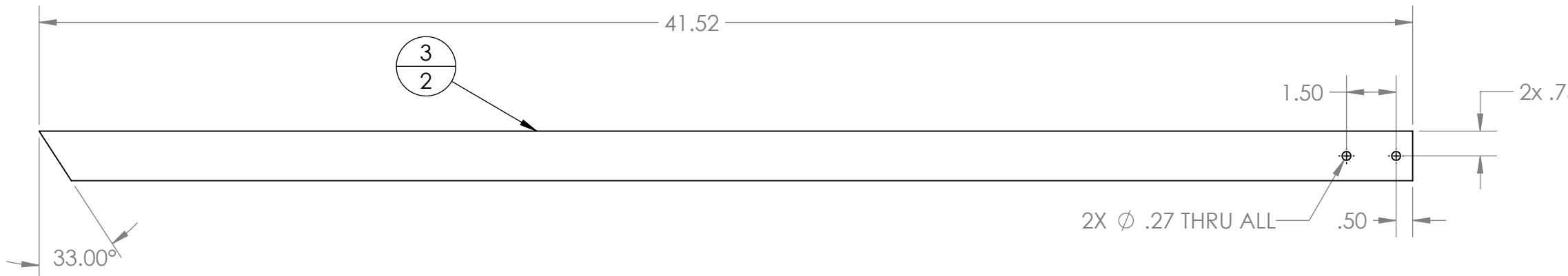
Material: 2" x 2" x .125" thk. Rectangular Tube, 6063 Aluminum
Scale: 1:4



Material: 1.5" x .125" thk. Square Tube, 6063 Aluminum
Scale: 1:4



B



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Material: 1.5" x .125" thk. Square Tube, 6063 Aluminum
Scale: 1:4

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		INTERPRET GEOMETRIC TOLERANCING PER:	ENG APPR.	MFG APPR.
		MATERIAL	COMMENTS:	
NEXT ASSY	USED ON	FINISH		
APPLICATION		DO NOT SCALE DRAWING		

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Rocket Outrigger

SIZE	DWG. NO.	REV
B	GE-19118	
SCALE: 1:4	WEIGHT:	SHEET 3 OF 3

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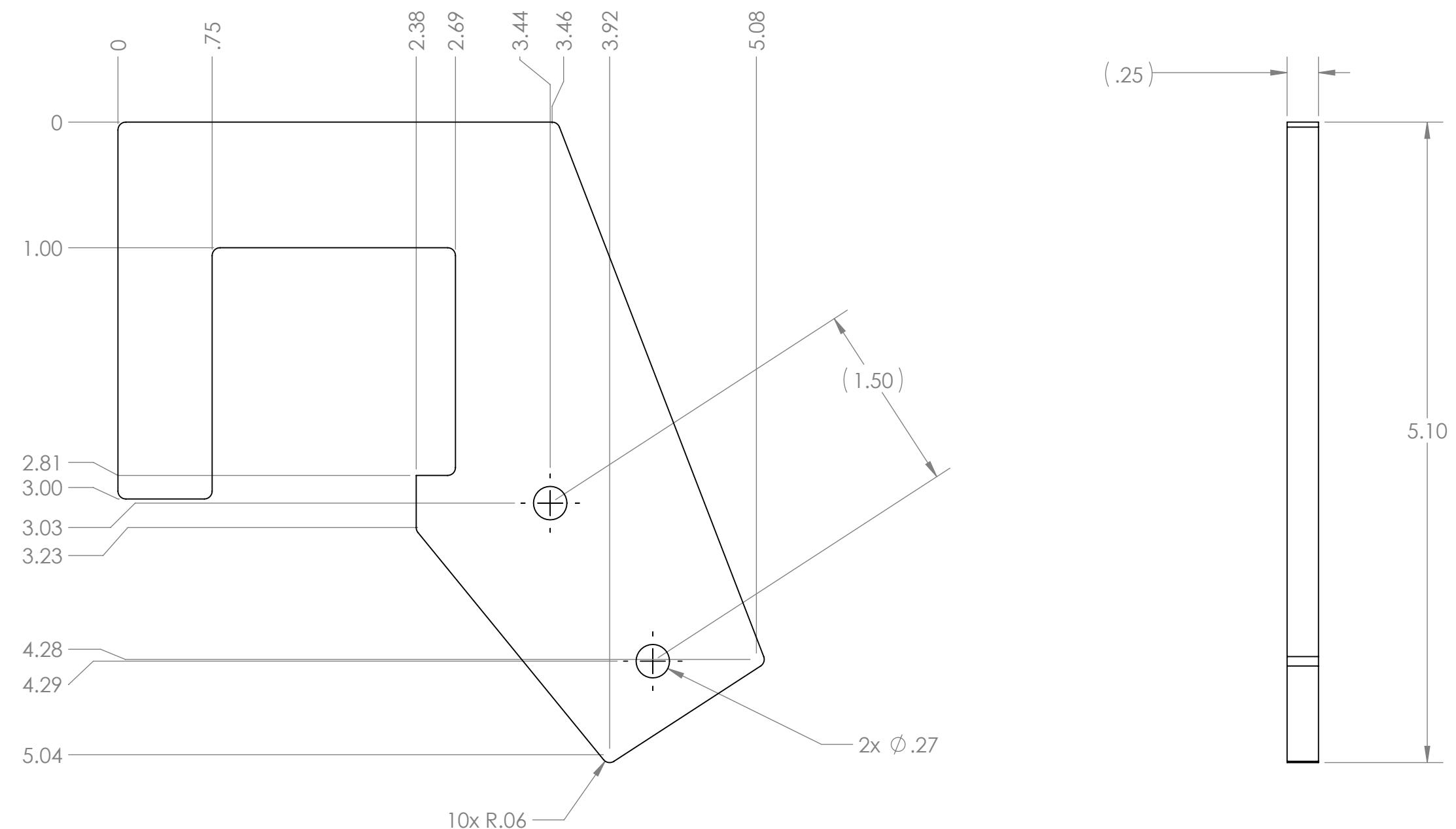
3

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B

B

**Notes:**

1. Material: 1/4" thick, clear polycarbonate.
2. Remove all burrs and sharp edges.
3. Tag or label with part number.

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		UNLESS OTHERWISE SPECIFIED:		NAME _____ DATE _____	
		DIMENSIONS ARE IN INCHES			
		TOLERANCES:			
		FRACTIONAL: ±1/16			
		ANGULAR: MACH ±1° BEND ±1°			
		TWO PLACE DECIMAL: ±.01			
		THREE PLACE DECIMAL: ±.001			
		INTERPRET GEOMETRIC TOLERANCING PER:		TITLE: Rocket Outrigger Gusset	
		MATERIAL			
		NEXT ASSY			
		USED ON		SIZE DWG. NO. B GE-19119 REV	
		FINISH			
		APPLICATION			
		DO NOT SCALE DRAWING		SCALE: 1:1 WEIGHT: SHEET 1 OF 1	

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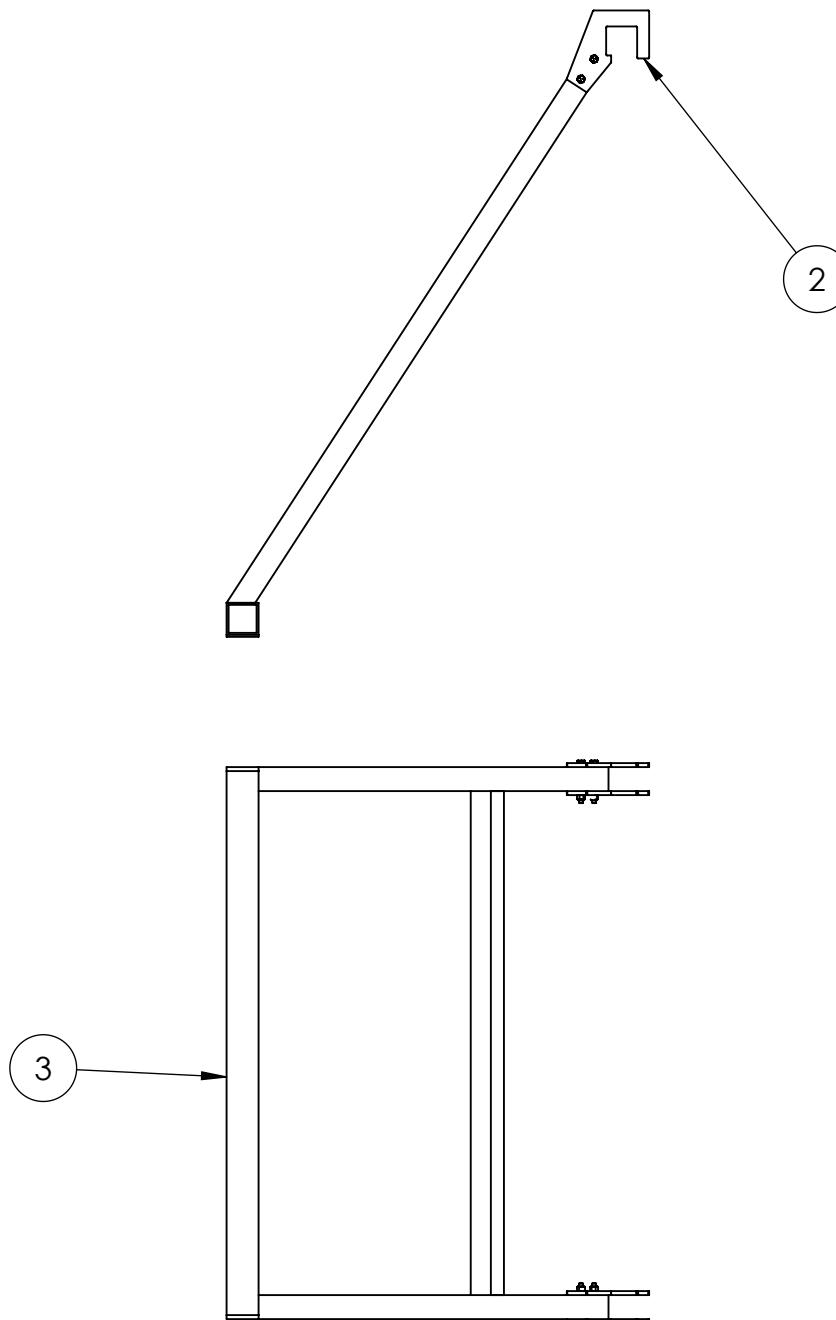
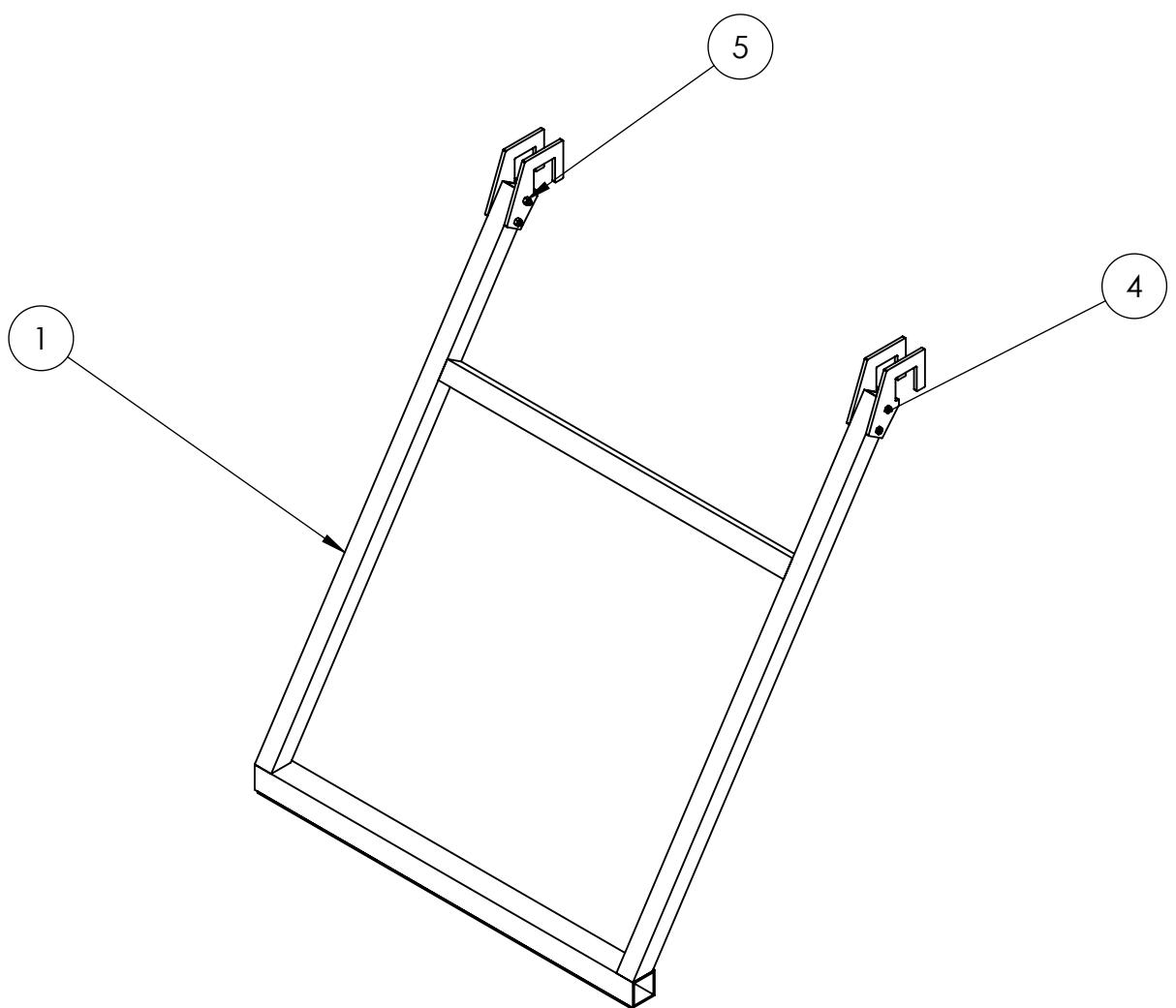
1

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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-19118	Rocket Outrigger	1
2	GE-19119	Rocket Outrigger Gusset	4
3	Hook_2_34	Hook_2_34	1
4	hex_.25_20_2.5_partial	Steel Hex Head Screw, 1/4"-20 x 2-1/2" long, partially threaded	4
5	nylock_.25_20	Steel Nylon-Insert Locknut, 1/4"-20	4

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		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$			
		INTERPRET GEOMETRIC TOLERANCING PER:		Q.A.	COMMENTS:
		MATERIAL			
NEXT ASSY	USED ON	FINISH			
APPLICATION		DO NOT SCALE DRAWING	SIZE DWG. NO. REV B GE-19120		
			SCALE: 1:12	WEIGHT:	SHEET 1 OF 1

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
**Rocket Outrigger
Assembly**

SIZE DWG. NO. REV
B GE-19120

SCALE: 1:12 WEIGHT: SHEET 1 OF 1

4

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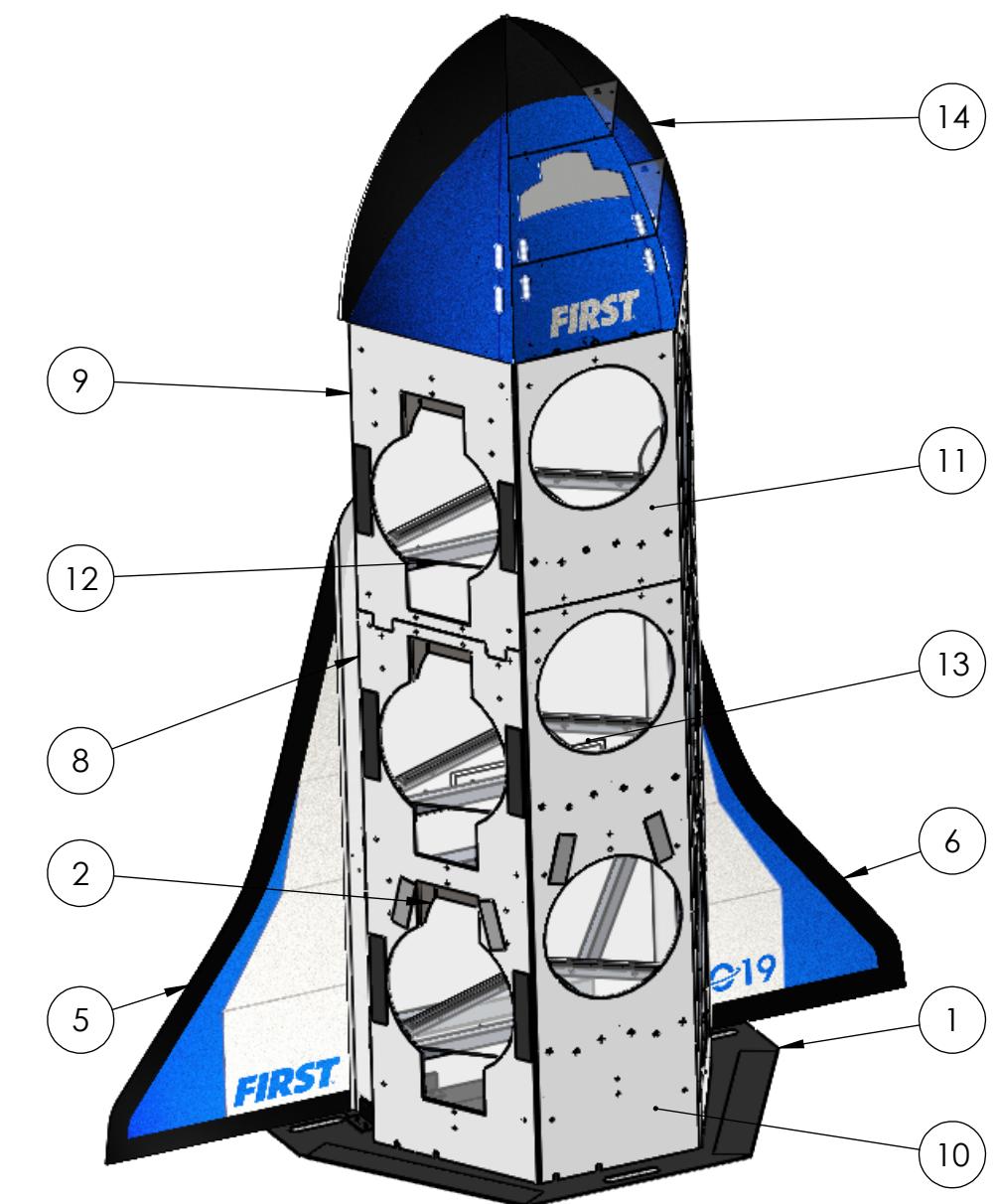
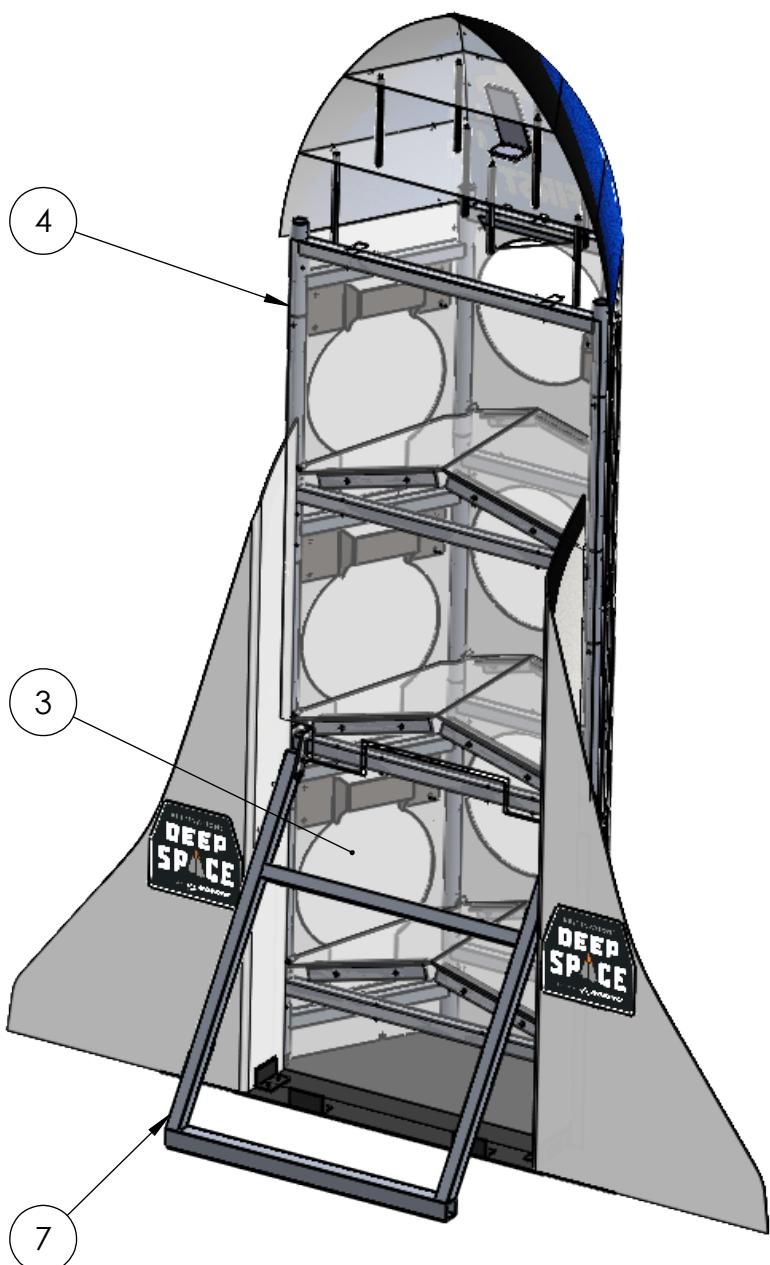
1

B

B

Notes:
1. This assembly exists in Red and Blue configurations, only blue is shown here.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-19025	Rocket Frame Assembly	1
2	GE-19026	Keyhole Insert	6
3	GE-19113	Rocket Back Bottom Assembly	1
4	GE-19114	Rocket Back Top Assembly	1
5	GE-19116	Rocket Fin Left	1
6	GE-19117	Rocket Fin Right	1
7	GE-19120	Rocket Outrigger Assembly	1
8	GE-19126	Rocket Panel Bottom Assembly	2
9	GE-19127	Rocket Panel Top Assembly	2
10	GE-19128	Rocket Cargo Bottom Assembly	1
11	GE-19129	Rocket Cargo Top Assembly	1
12	GE-19180	Rocket Ramp Left	3
13	GE-19181	Rocket Ramp Right	3
14	GE-19202	Nose Cone Assembly	1



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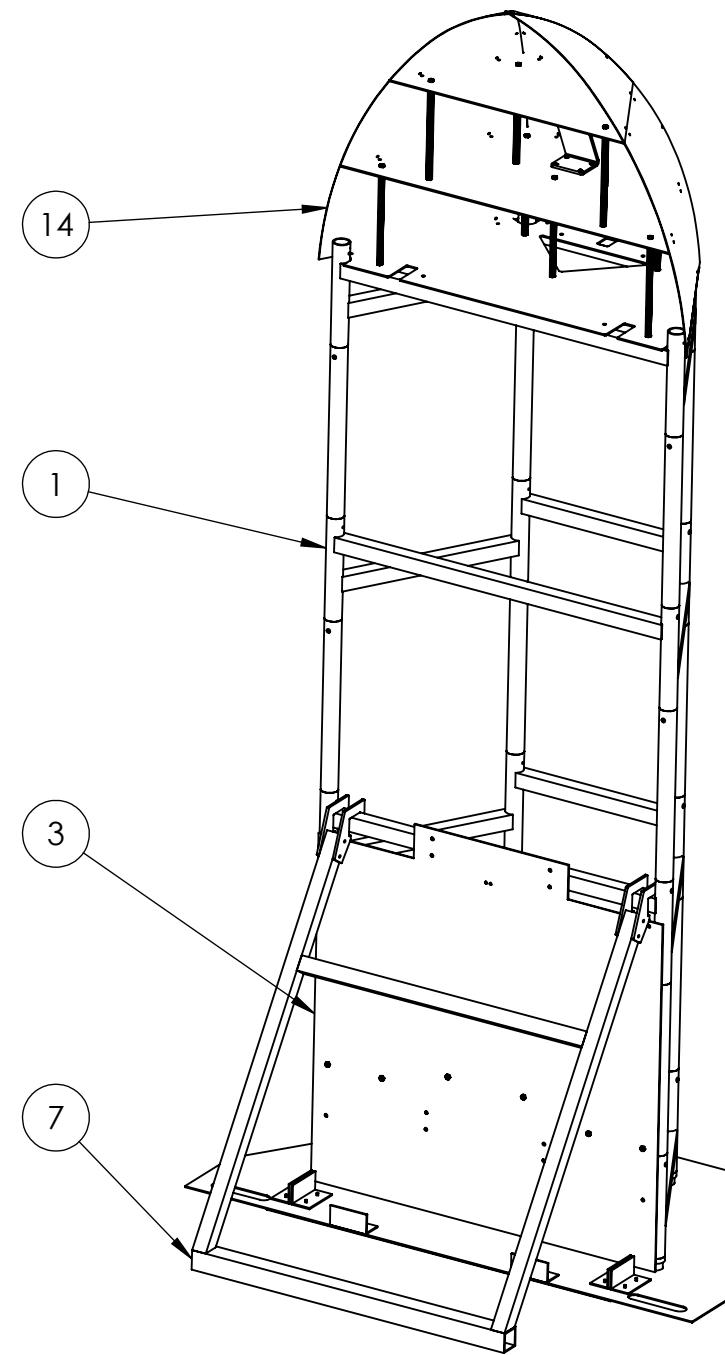
		UNLESS OTHERWISE SPECIFIED:		NAME	DATE	 FIRST ROBOTICS COMPETITION
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			CHECKED			
			ENG APPR.			
			MFG APPR.			
		INTERPRET GEOMETRIC TOLERANCING PER:	Q.A.			
		MATERIAL	COMMENTS:			
NEXT ASSY	USED ON	FINISH				
APPLICATION		DO NOT SCALE DRAWING				
SCALE: 1:20 WEIGHT: GE-19121 SHEET 1 OF 4						

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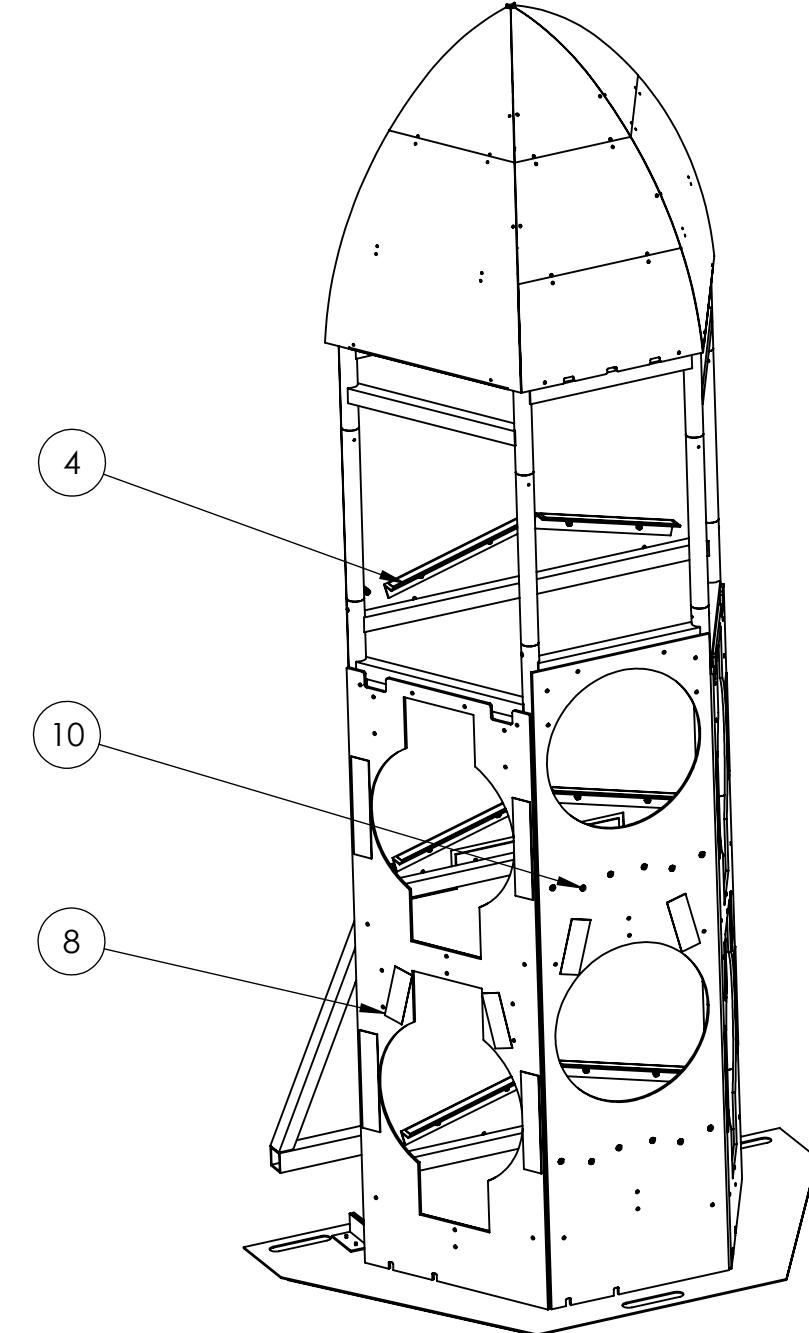
2

1



B

B



Notes:

1. Attach item 14 to item 1 using 120-lb cable ties.
2. Attach item 3 to item 1 using 120-lb cable ties, making sure not to use the holes along the side edges.
3. Place item 7 over the crossbar of item 1 as shown.

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		DRAWN			
		CHECKED			
		ENG APPR.			
		MFG APPR.			
		Q.A.			
		COMMENTS:			
		MATERIAL			
		FINISH			
NEXT ASSY	USED ON				
APPLICATION	DO NOT SCALE DRAWING				
SIZE	DWG. NO.				REV
B	GE-19121				
SCALE: 1:18	WEIGHT:				SHEET 2 OF 4

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner
Rocket Assembly
SIZE DWG. NO. REV
B GE-19121
SCALE: 1:18 WEIGHT: SHEET 2 OF 4

4

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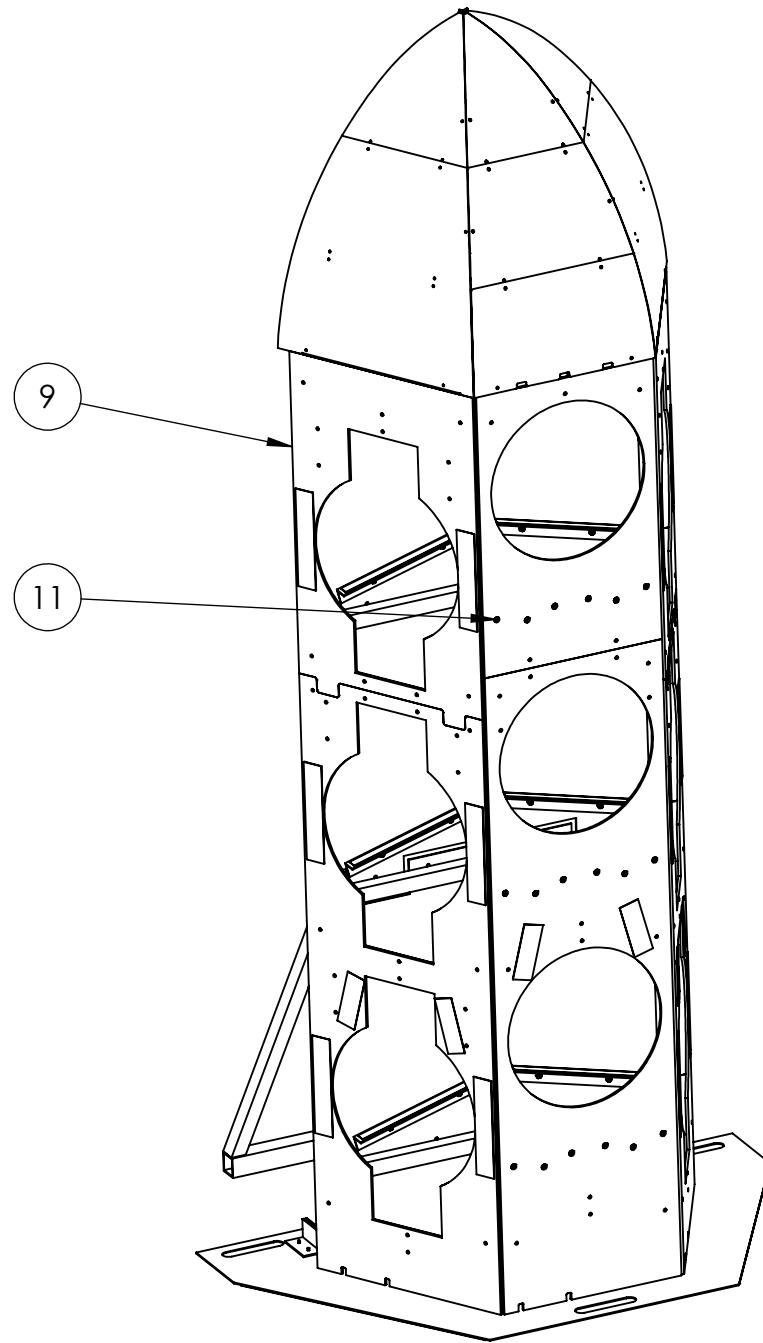
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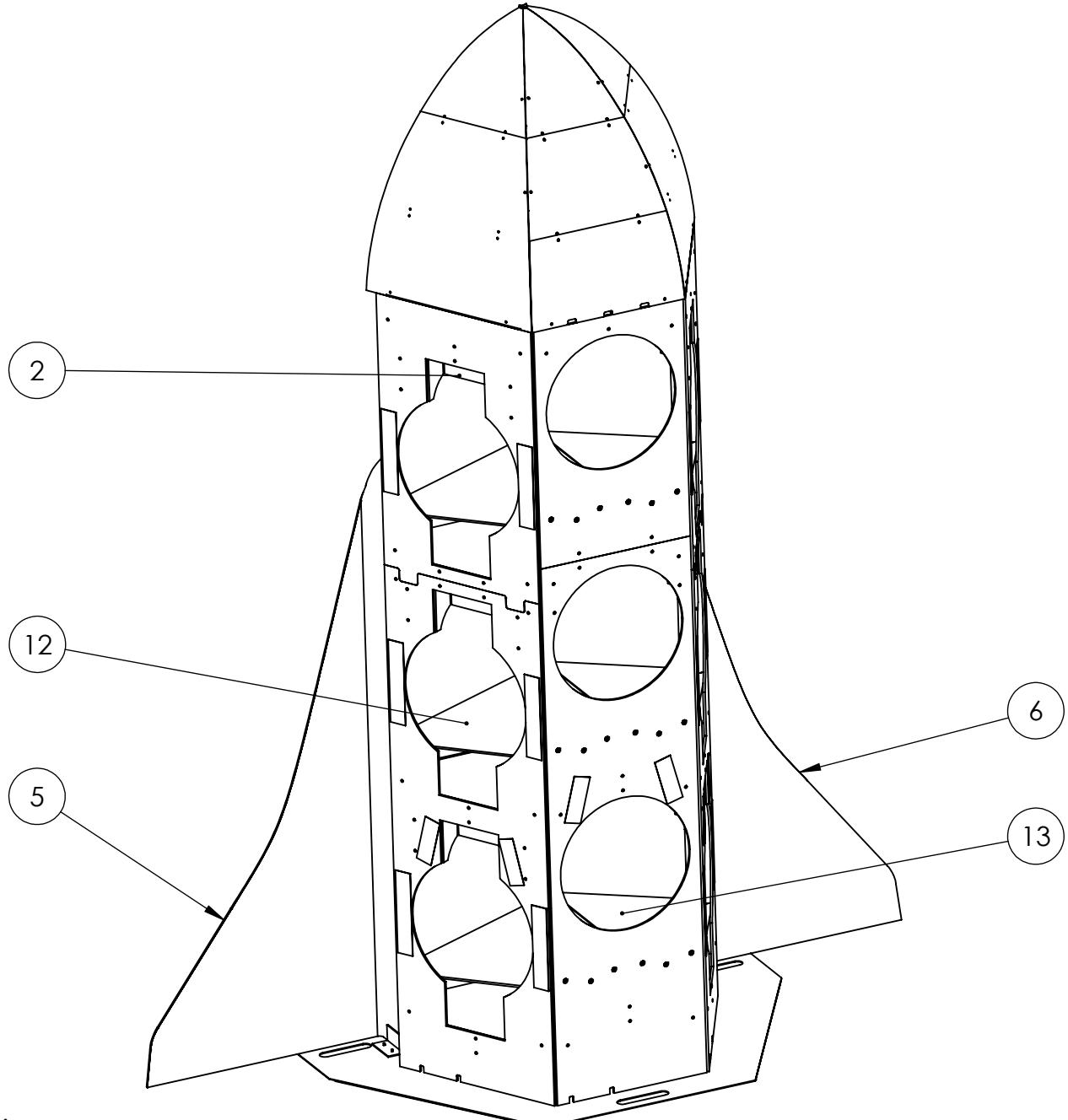
2

1



Notes:

1. Attach item 9 and 11 to the assembly using 120-lb cable ties.
2. Ensure all cable tie holes have been used to connect plastic side faces to frame and each other.



Notes:

1. Attach item 2 (qty. 6) to the assembly using 120-lb cable ties.
2. Place items 12 (qty. 3) and 13 (qty. 3) into the assembly, affixing using the hook and loop fastener. Make sure they sit under the spacers attached to the back of Items 8 and 9.
3. Place items 5 and 6 into the notches on the assembly, and attach to item 7 using 120-lb cable ties.

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Rocket Assembly

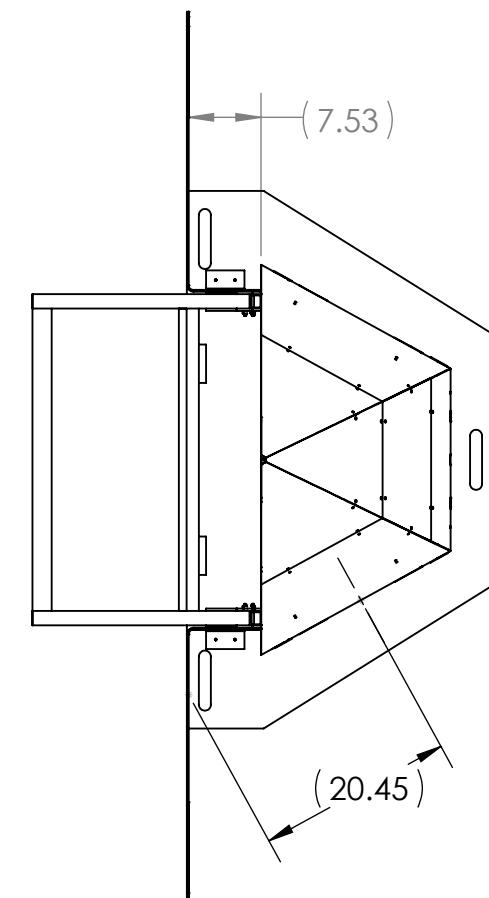
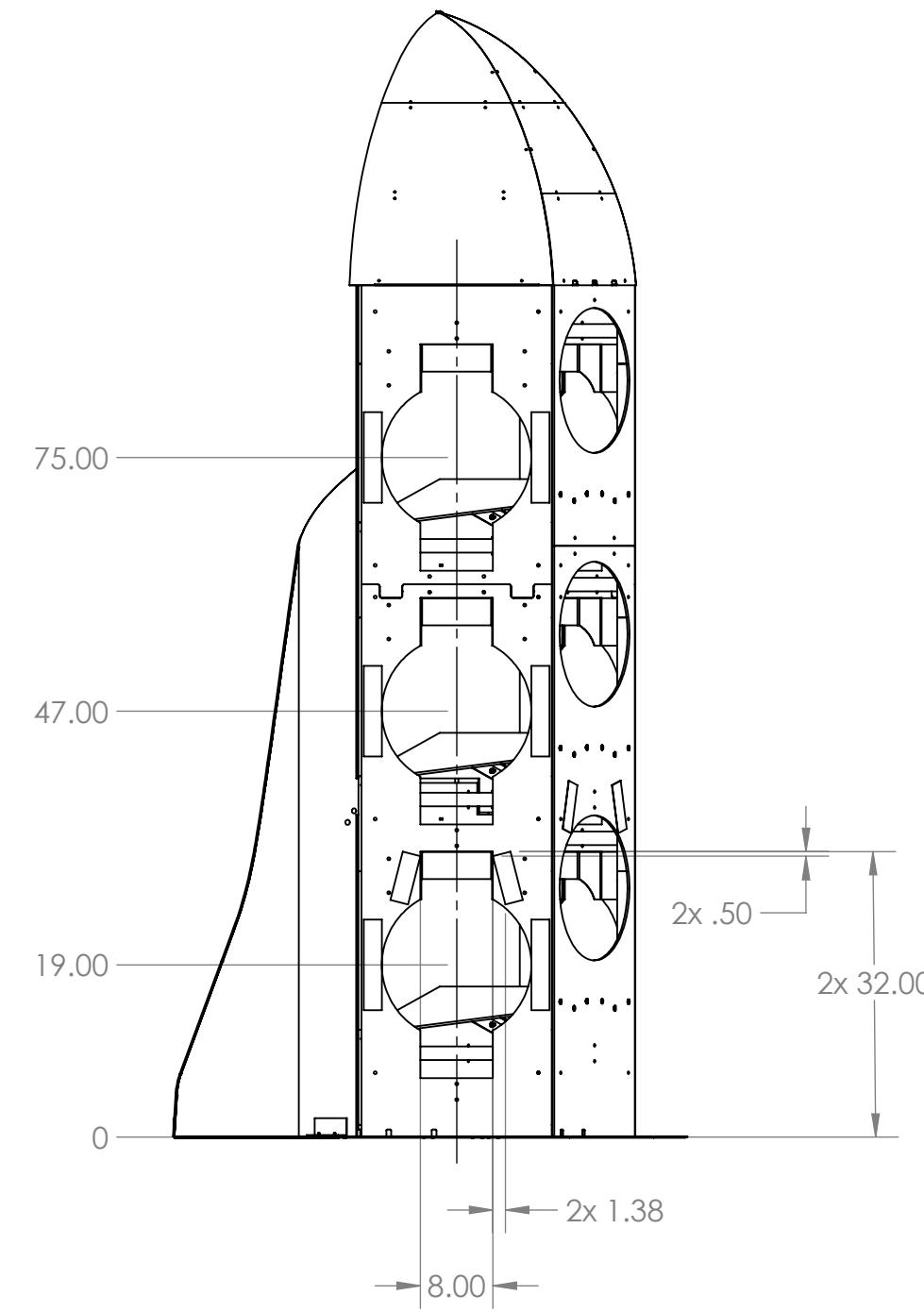
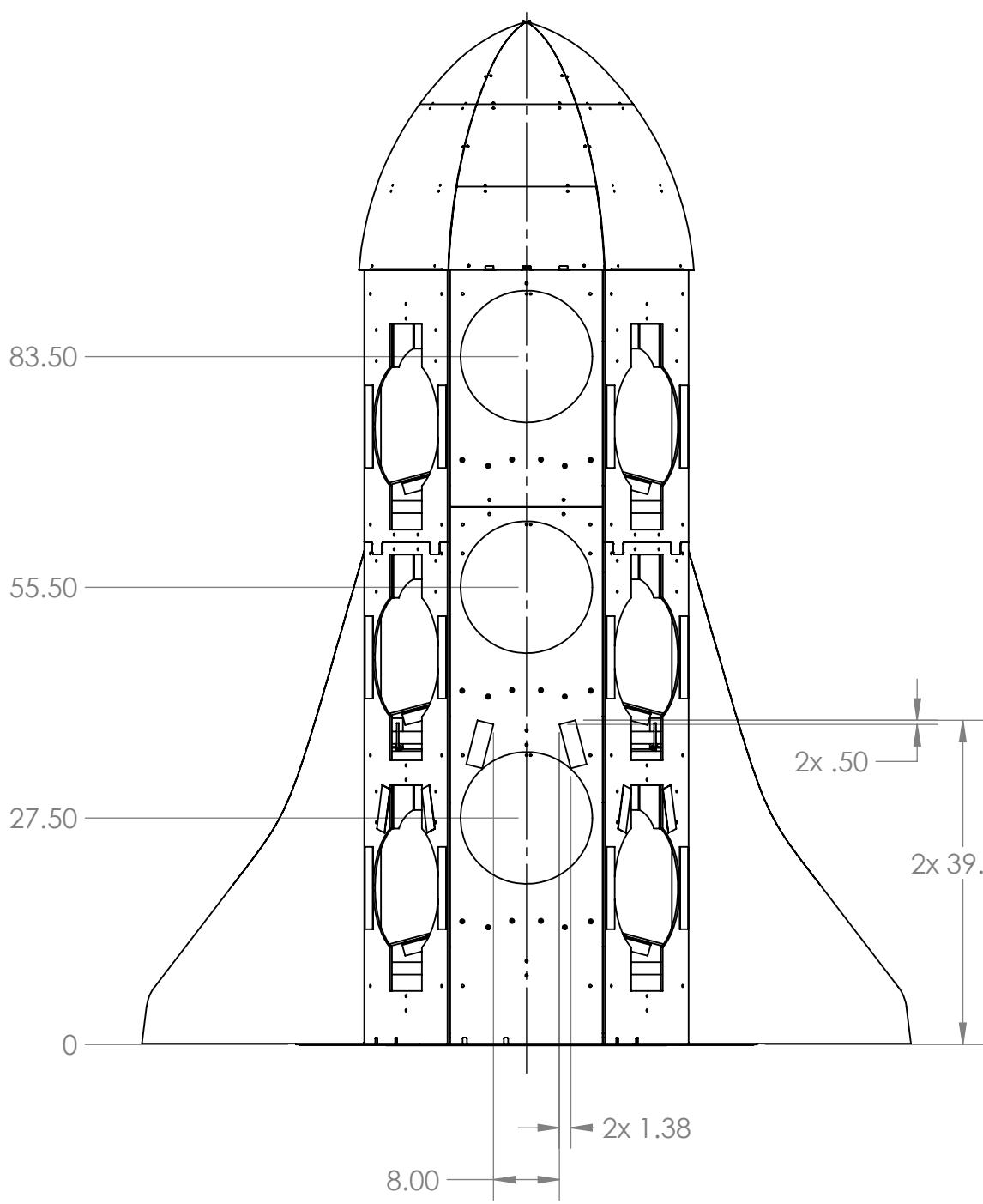
SIZE	DWG. NO.	REV
B	GE-19121	
SCALE: 1:18	WEIGHT:	SHEET 3 OF 4

4

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		UNLESS OTHERWISE SPECIFIED:		NAME	DATE	 FIRST ROBOTICS COMPETITION	TITLE: <h1>Rocket Assembly</h1>	
		DIMENSIONS ARE IN INCHES	DRAWN					
		TOLERANCES:	CHECKED					
		FRACTIONAL $\pm 1/16$	ENG APPR.					
		ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$	MFG APPR.					
		TWO PLACE DECIMAL $\pm .01$	Q.A.					
		THREE PLACE DECIMAL $\pm .001$	COMMENTS:					
		MATERIAL				SIZE DWG. NO. B GE-19121	REV	
NEXT ASSY	USED ON	FINISH						
APPLICATION		DO NOT SCALE DRAWING				SCALE: 1:20	WEIGHT:	SHEET 4 OF 4

4

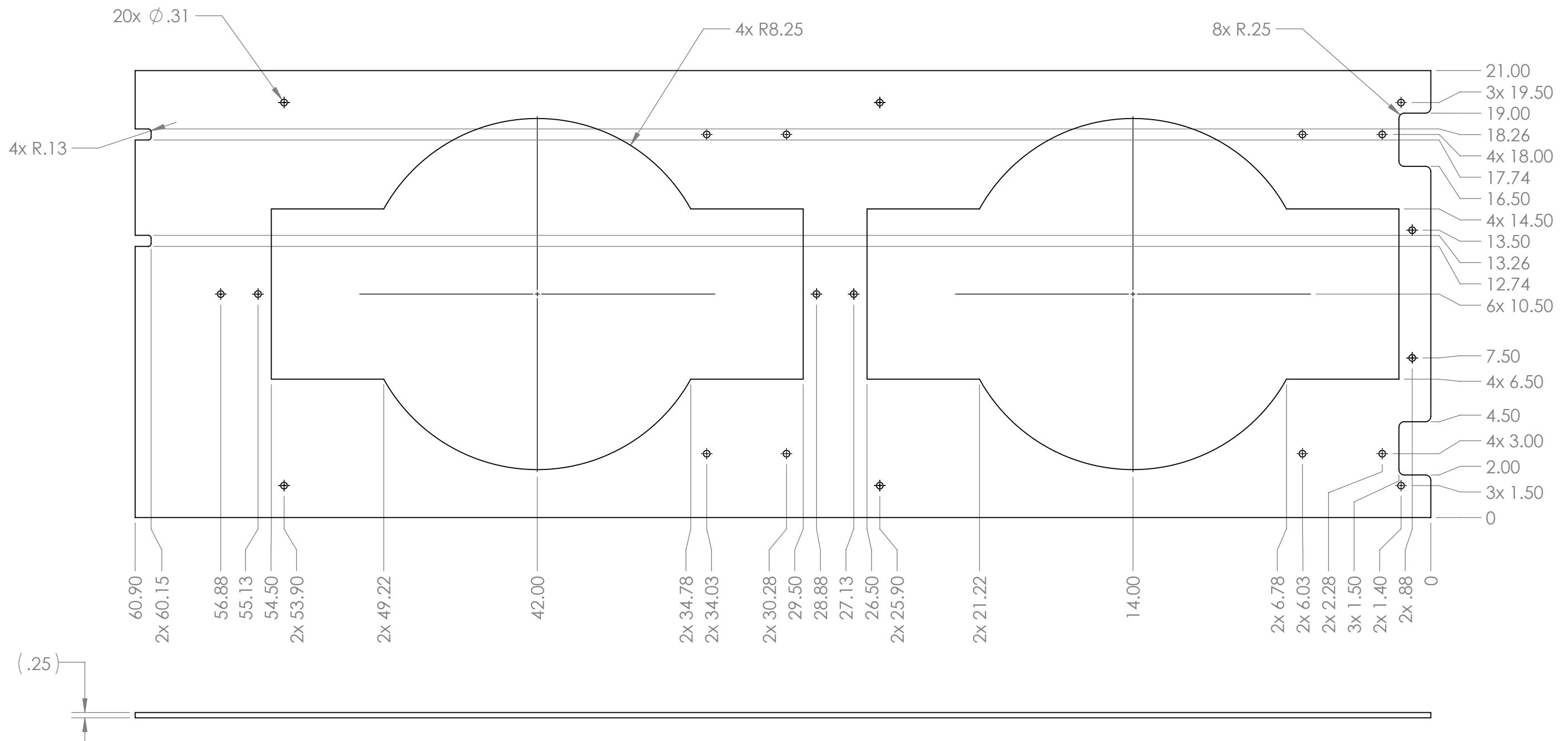
3

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A

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Notes:

1. Material: 1/4" thick, clear polycarbonate.
2. Finish: Apply screen print to one side.
3. Remove all burrs and sharp edges.
4. Tag or label with part number.

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
 Modeling Solutions Partner

TITLE: Rocket Panel Plastic Bottom

SIZE	DWG. NO.	REV
B	GE-19122	
SCALE: 1:5	WEIGHT:	SHEET 1 OF 1

4

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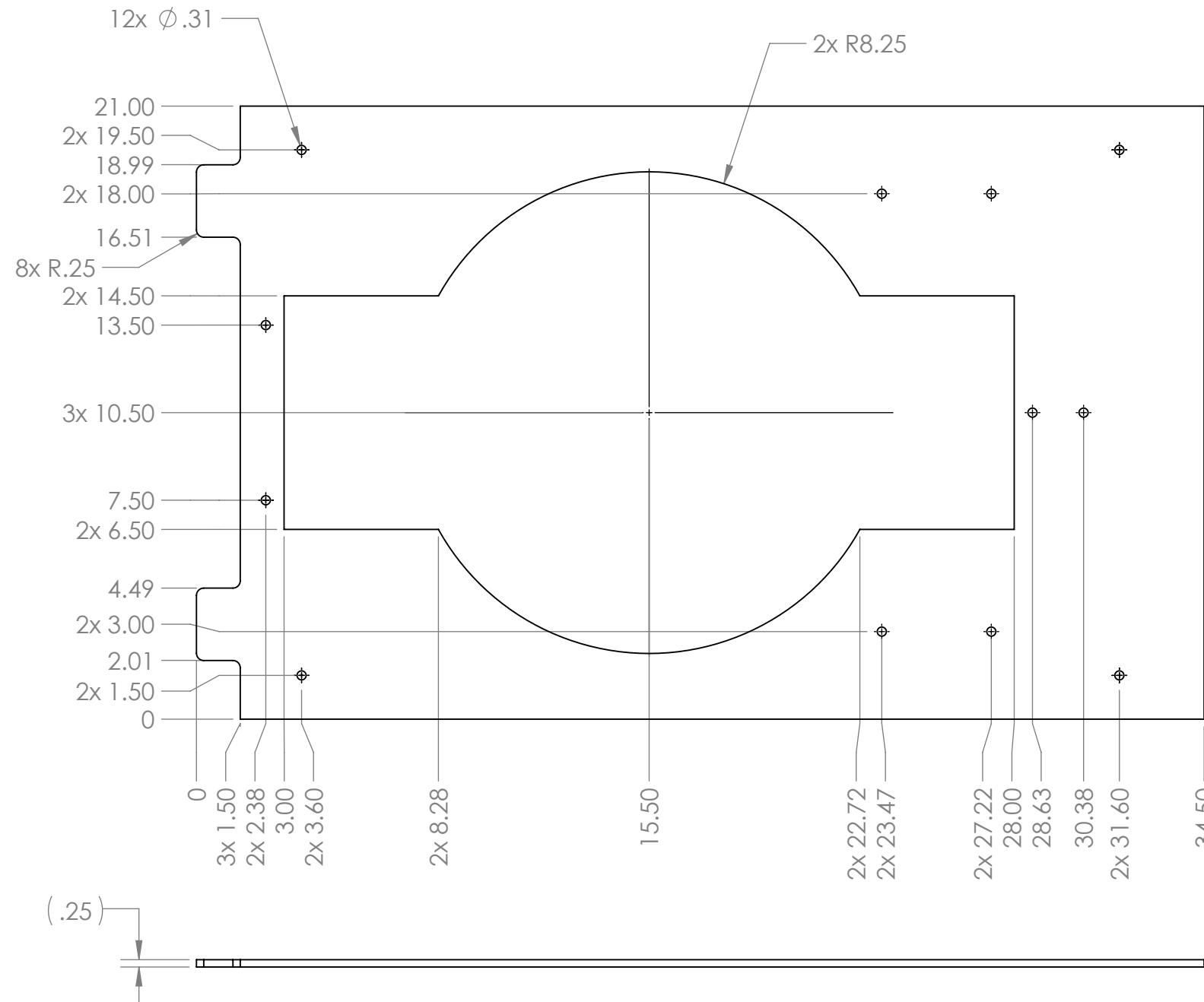
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**Notes:**

1. Material: 1/4" thick, clear polycarbonate.
2. Finish: Apply screen print to one side.
3. Remove all burrs and sharp edges.
4. Tag or label with part number.

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Rocket Panel Plastic Top

SIZE	DWG. NO.	REV
B	GE-19123	
SCALE: 1:5	WEIGHT:	SHEET 1 OF 1

4

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B

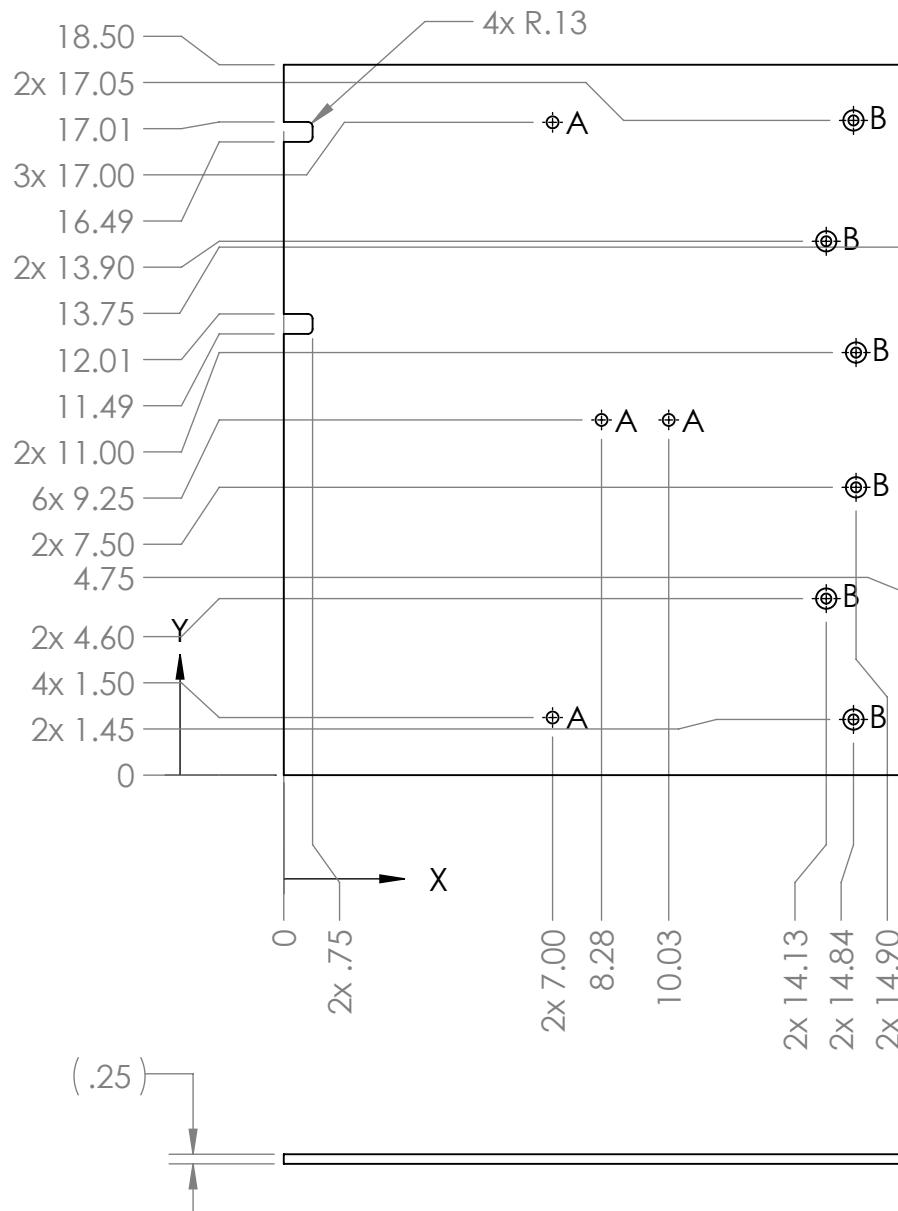
A

TAG	SIZE	QUANTITY
A	ϕ .31 THRU ALL	14
B	ϕ .27 THRU ALL $\checkmark \phi$.53 X 82°	12
C	ϕ 16.00 THRU	2

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
A3	A	Added note about screen print	10/30/2018	JRF

B



- Notes:
- Material: 1/4" thick, clear polycarbonate.
 - Finish: Apply screen print to back side (side without countersinks).
 - Remove all burrs and sharp edges.
 - Tag or label with part number.

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Rocket Cargo Plastic Bottom

SIZE DWG. NO. REV
B GE-19124 A

SCALE: 1:5 WEIGHT: SHEET 1 OF 1

4

3

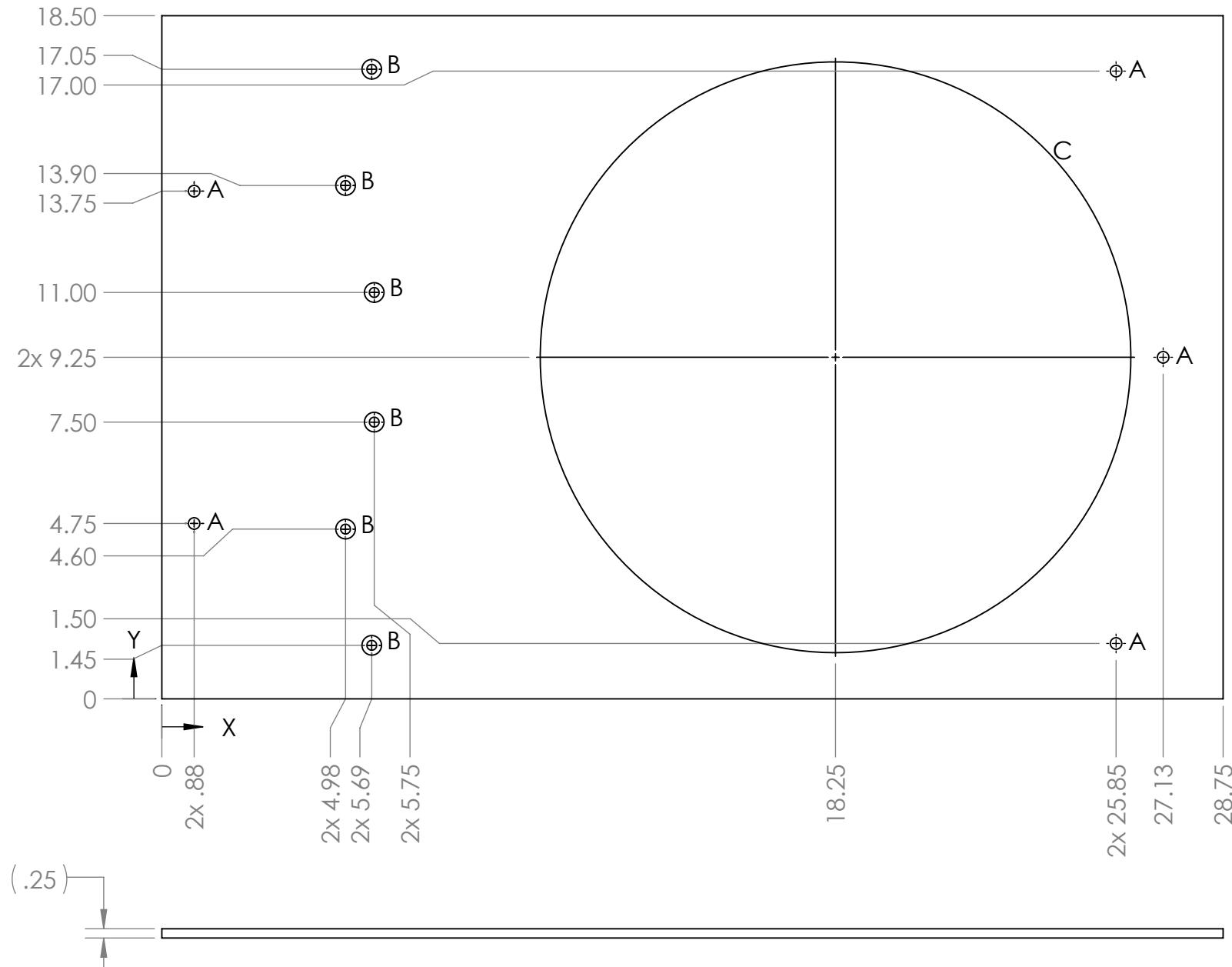
2

1

TAG	SIZE	QUANTITY
A	ϕ .31 THRU ALL	5
B	ϕ .27 THRU ALL $\checkmark \phi$.53 X 82°	6
C	ϕ 16.00 THRU	1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
A3	A	Added note about screen print	10/30/2018	JRF



Notes:

- Material: 1/4" thick, clear polycarbonate
- Finish: Apply screen print to back side (side without countersinks)
- Remove all burrs and sharp edges
- Tag or label with part number

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		DRAWN		
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
		MATERIAL		
		INTERPRET GEOMETRIC TOLERANCING PER:		
		NEXT ASSY	USED ON	FINISH
		APPLICATION	DO NOT SCALE DRAWING	
SIZE	DWG. NO.	REV		
B	GE-19125	A		
SCALE: 1:4	WEIGHT:	SHEET 1 OF 1		



TITLE:

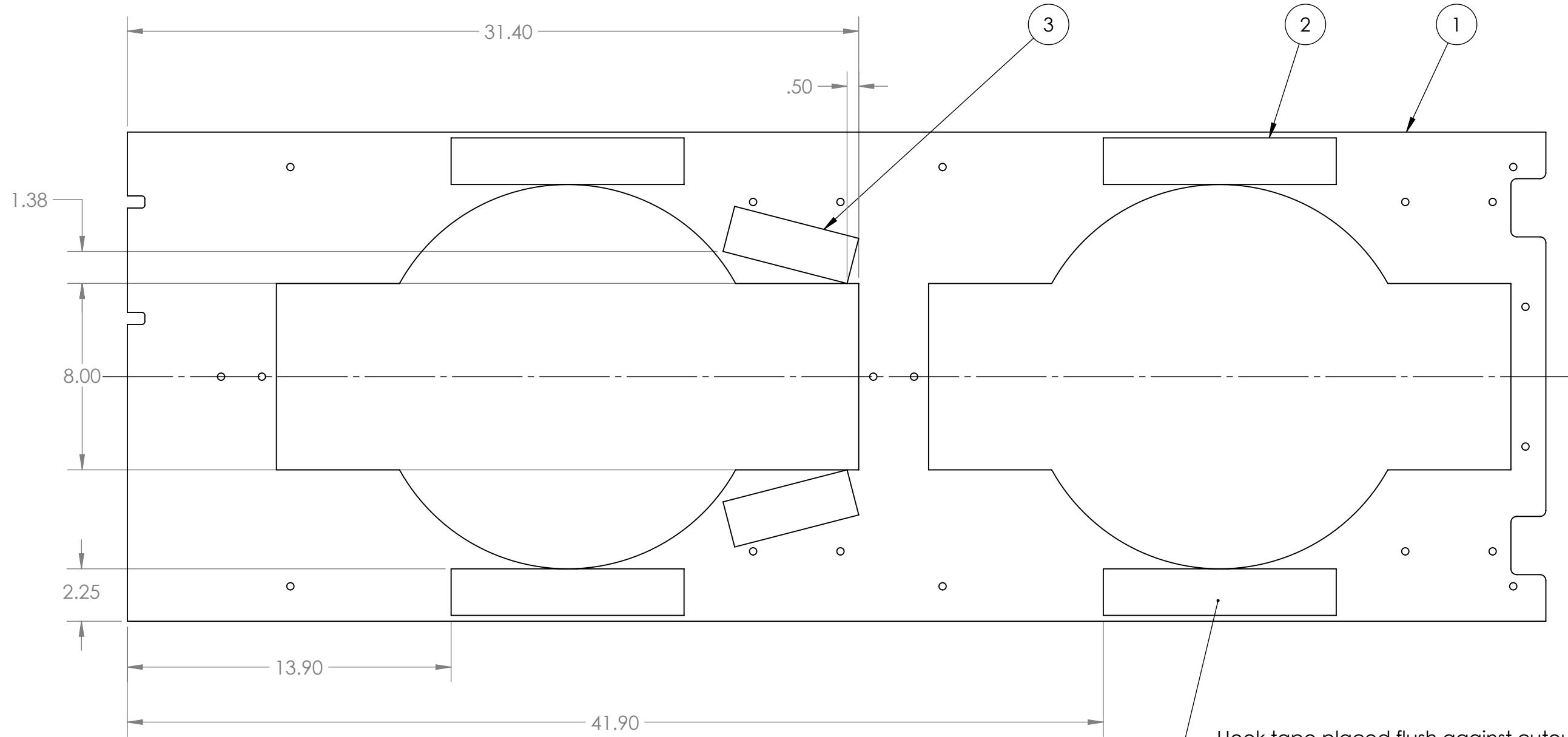
Rocket Cargo
Plastic Top

4

3

2

1



Hook tape placed flush against cutout, centered.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-19122	Rocket Panel Plastic Bottom	1
2	Hook_2_10	2" x 10" Hook, Adhesive Backed	4
3	VisionTape	2" x 5.5" Retroreflective tape	2

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



TITLE: Rocket Panel

Bottom Assembly

SIZE DWG. NO. REV

B GE-19126

SCALE: 1:5 WEIGHT: SHEET 1 OF 1

4

3

2

1

4

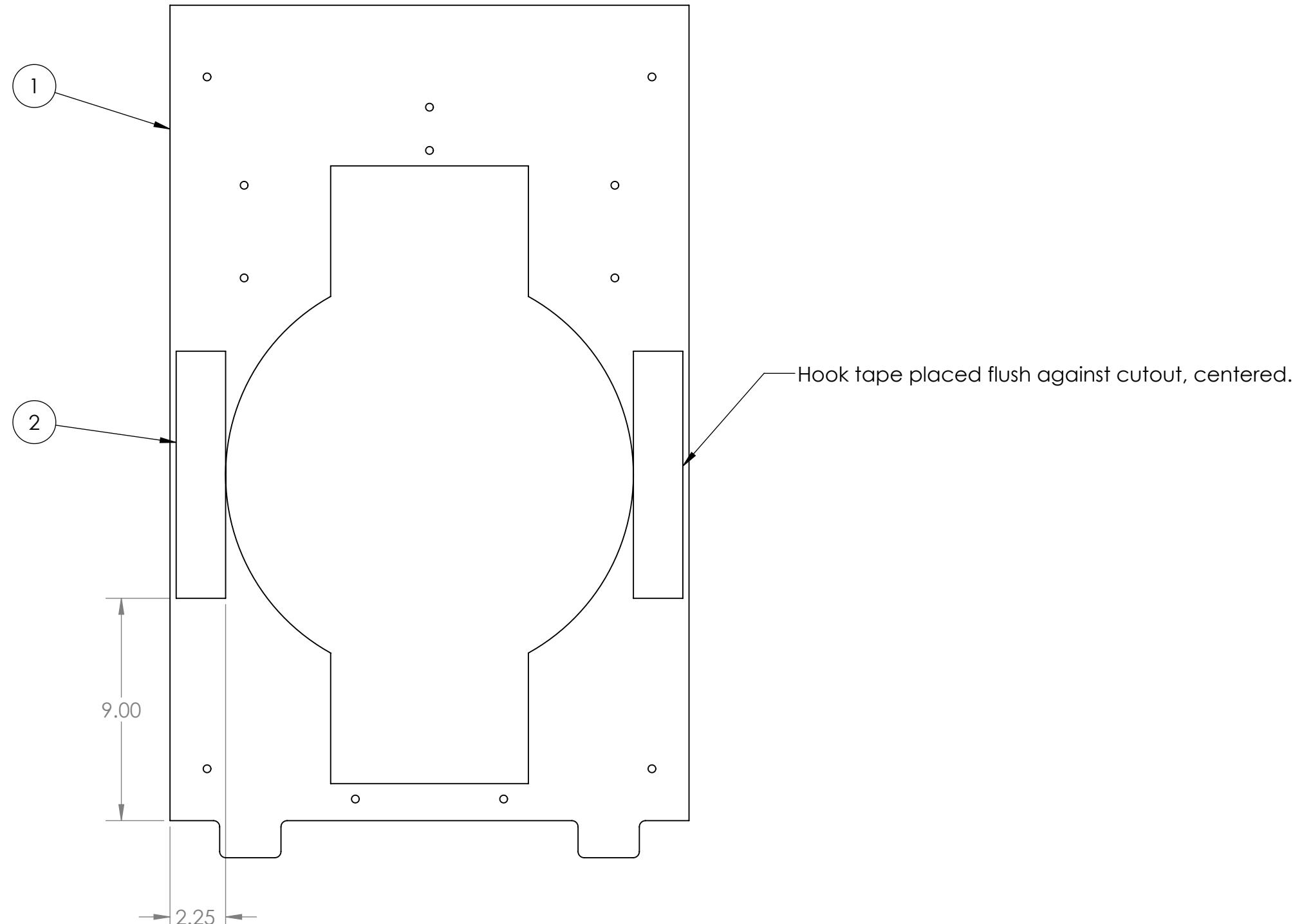
3

2

1

B

B



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-19123	Rocket Panel Plastic Top	1
2	Hook_2_10	2" x 10" Hook, Adhesive Backed	2

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Rocket Panel Top Assembly

SIZE DWG. NO. REV
B GE-19127

SCALE: 1:5 WEIGHT: SHEET 1 OF 1

4

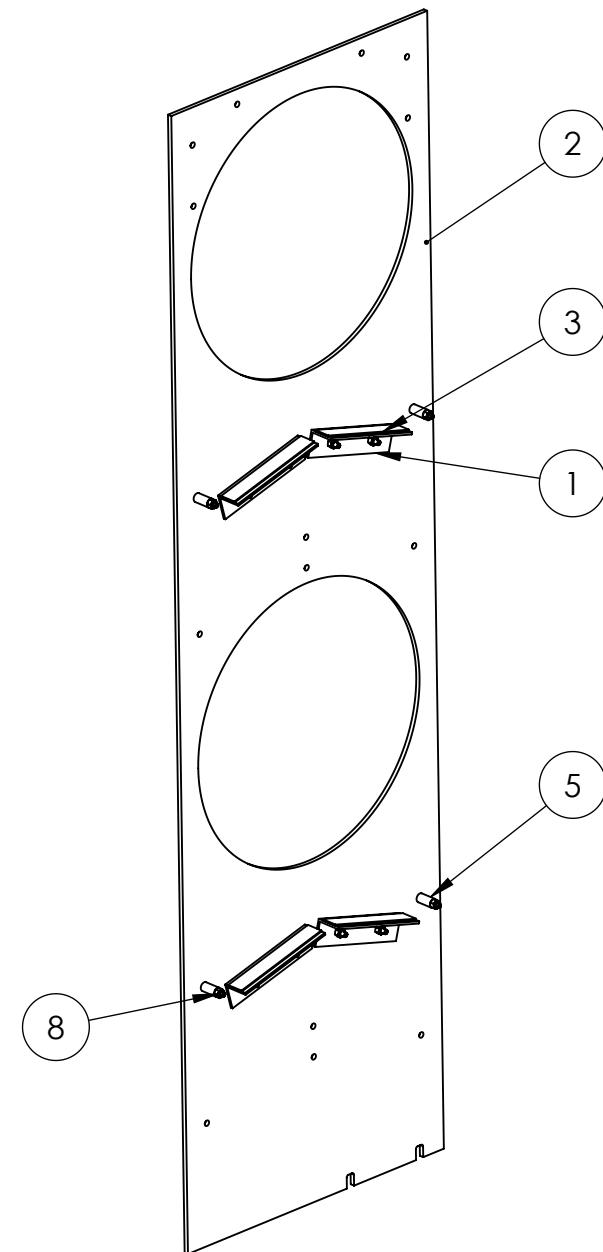
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B



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-19029	Rocket Ramp Support Front	4
2	GE-19124	Rocket Cargo Plastic Bottom	1
3	Hook_1_6	1" x 6" Hook, Adhesive Backed	4
4	VisionTape	2" x 5.5" Retroreflective tape	2
5	spacer_.257_1_.5	Spacer, .257" ID, 1/2" OD, 1" thk	4
6	flat_hex_.25_20_1.75	Steel Hex Flat Head Screw, 1/4"-20 x1.75" long, partially threaded	4
7	flat_hex_.25_20_1	Steel Hex Flat Head Screw, 1/4"-20 x 1" long, fully threaded	8
8	nylock_.25_20	Steel Nylon-Insert Locknut, 1/4"-20	12

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

Notes:
1. Item 3 attaches to the top of item 1, centered.

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:

Rocket Cargo Bottom Assembly

SIZE DWG. NO. REV
B GE-19128

SCALE: 1:10 WEIGHT: SHEET 1 OF 1

4

3

2

1

4

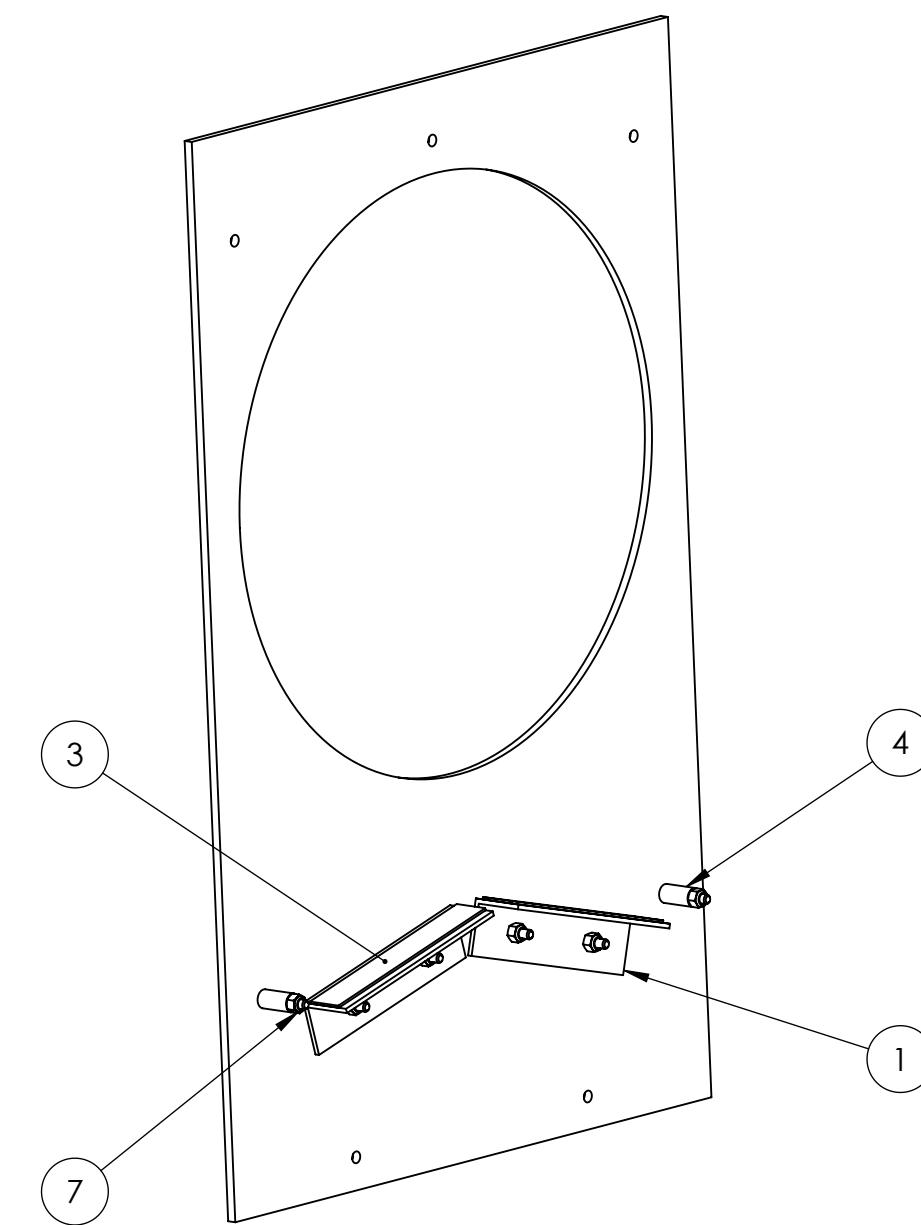
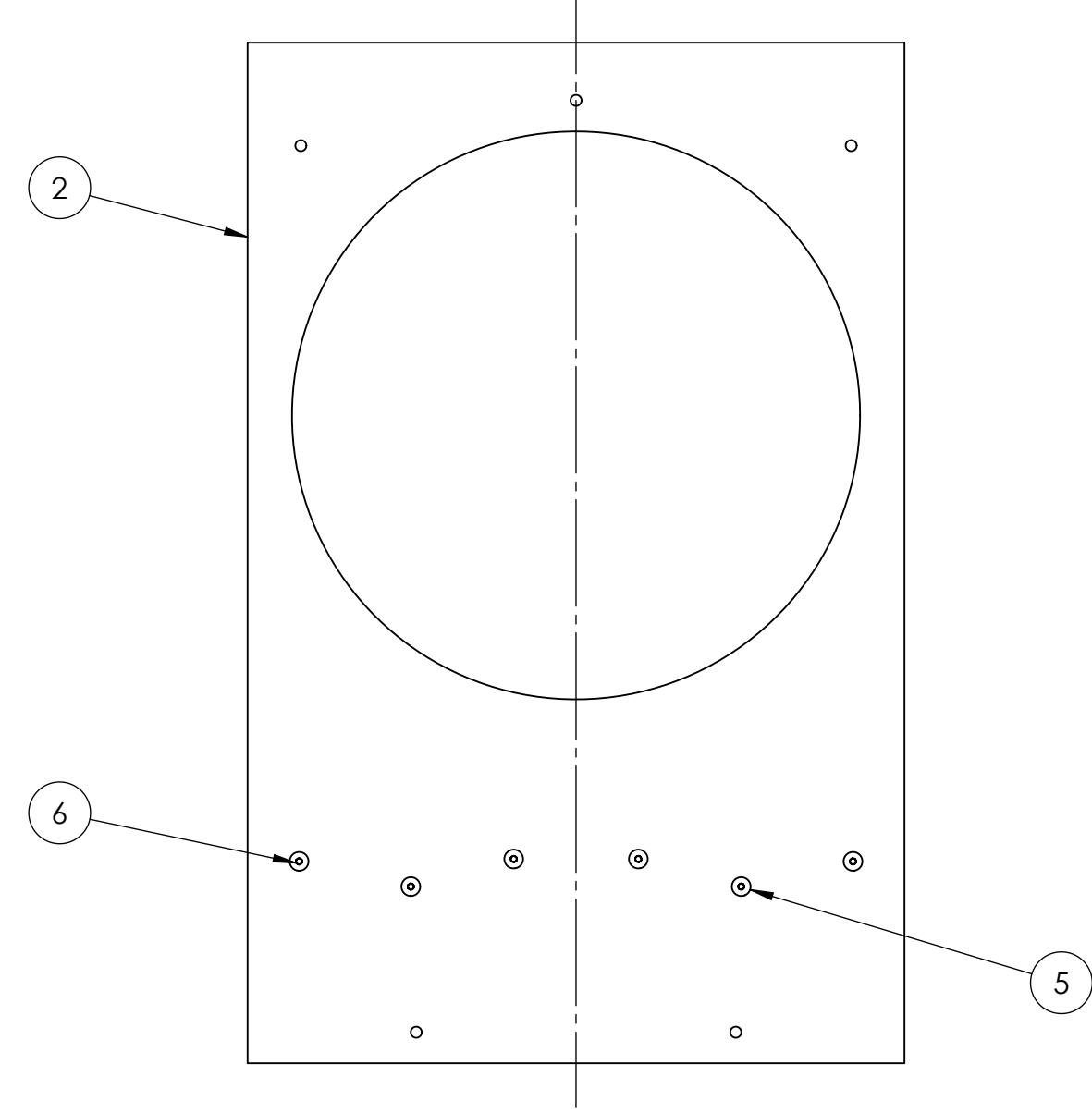
3

2

1

B

B



Notes:

1. Item 3 attaches to the top of item 1, centered.

A

A

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-19029	Rocket Ramp Support Front	2
2	GE-19125	Rocket Cargo Plastic Top	1
3	Hook_1_6	1" x 6" Hook, Adhesive Backed	2
4	spacer_.257_1_.5	Spacer, .257" ID, 1/2" OD, 1" thk	2
5	flat_hex_.25_20_1	Steel Hex Flat Head Screw, 1/4"-20 x 1" long, fully threaded	4
6	flat_hex_.25_20_1.75	Steel Hex Flat Head Screw, 1/4"-20 x 1.75" long, partially threaded	2
7	nylock_.25_20	Steel Nylon-Insert Locknut, 1/4"-20	6

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		DRAWN		
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
		MATERIAL		
		FINISH		
	NEXT ASSY	USED ON		
		APPLICATION	DO NOT SCALE DRAWING	
SIZE	DWG. NO.	REV		
B	GE-19129			
SCALE: 1:5	WEIGHT:	SHEET 1 OF 1		

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

Rocket Cargo Top Assembly

4

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4

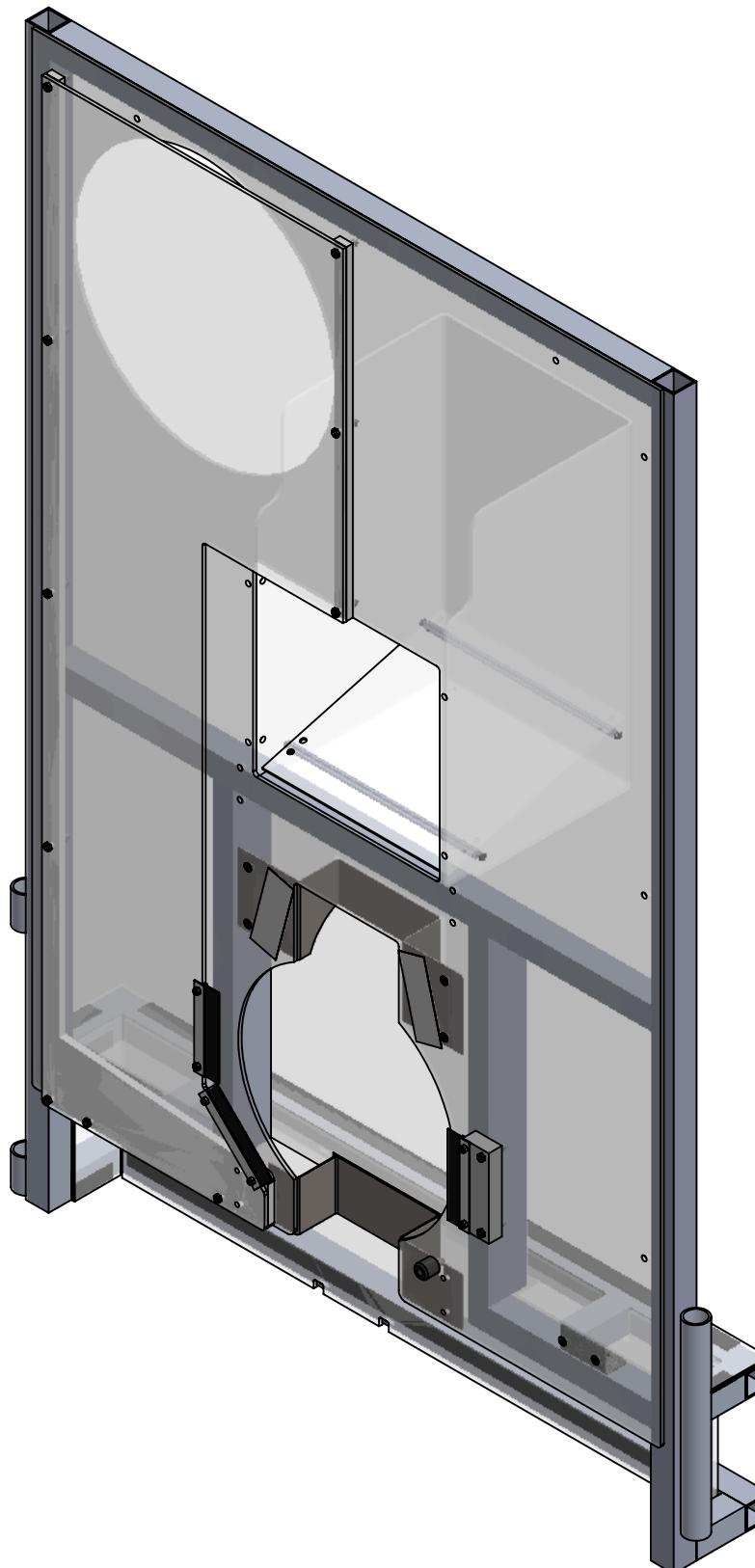
3

2

1

B

B



ITEM NO.	PART NUMBER	DESCRIPTION	Default/QTY.
1	GE-19026	Keyhole Insert	1
2	GE-19098	Keyhole Insert Bottom	1
3	GE-19137	Plastic Assembly, Loading Station, Right	1
4	GE-19141	Loading Station Frame, Right	1
5	GE-19143	Chute Assembly	1
6	GE-19147	Keyhole Backing	1
7	GE-19148	Bumper Back	1
8	GE-19149	Bumper Top	1
9	GE-19154	Bumper Side	2
10	Hook_1_28	1" x 28" Hook Fastener, Adhesive Backed	1
11	Hook_1_3	1" x 3" Hook Fastener, Adhesive Backed	6
12	Hook_1_45	1" X 45" Hook Fastener, Adhesive Backed	2
13	Loop_1_28	1" x 28" Loop Fastener, Adhesive Backed	1
14	Loop_1_3	1" x 3" Loop Fastener, Adhesive Backed	6
15	Loop_1_45	1" x 45" Loop Fastener, Adhesive Backed	2
16	flat_hex_.25_20_1	Steel Hex Flat Head Screw, 1/4"-20 x 1" long, fully threaded	4
17	hex_.25_20_.75	Steel Hex Head Screw, 1/4"-20 x 3/4" long, fully threaded	4
18	nylock_.25_20	Steel Nylon-Insert Locknut, 1/4"-20	4

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		UNLESS OTHERWISE SPECIFIED:		NAME	DATE	 FIRST ROBOTICS COMPETITION
		DIMENSIONS ARE IN INCHES	DRAWN			
		TOLERANCES:	CHECKED			
		FRACTIONAL $\pm 1/16$	ENG APPR.			
		ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$	MFG APPR.			
		TWO PLACE DECIMAL $\pm .01$	Q.A.			
		THREE PLACE DECIMAL $\pm .001$	COMMENTS:			
		MATERIAL				
NEXT ASSY	USED ON	FINISH				
APPLICATION		DO NOT SCALE DRAWING				
			SCALE: 1:10	WEIGHT:	SHEET 1 OF 4	

Feeder Station Assembly

SIZE B	DWG. NO. GE-19130	REV
------------------	-----------------------------	-----

SCALE: 1:10 WEIGHT: SHEET 1 OF 4

4

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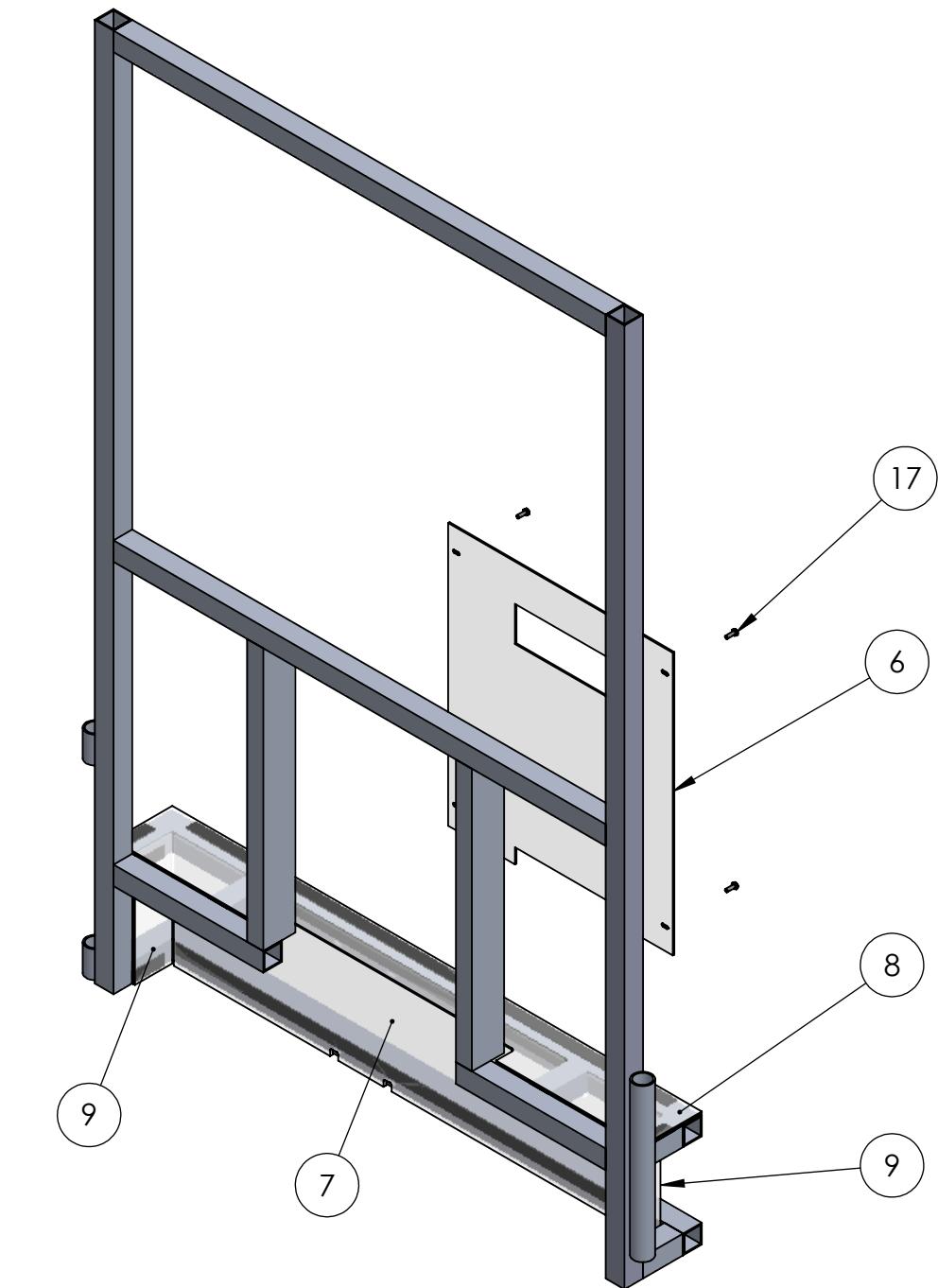
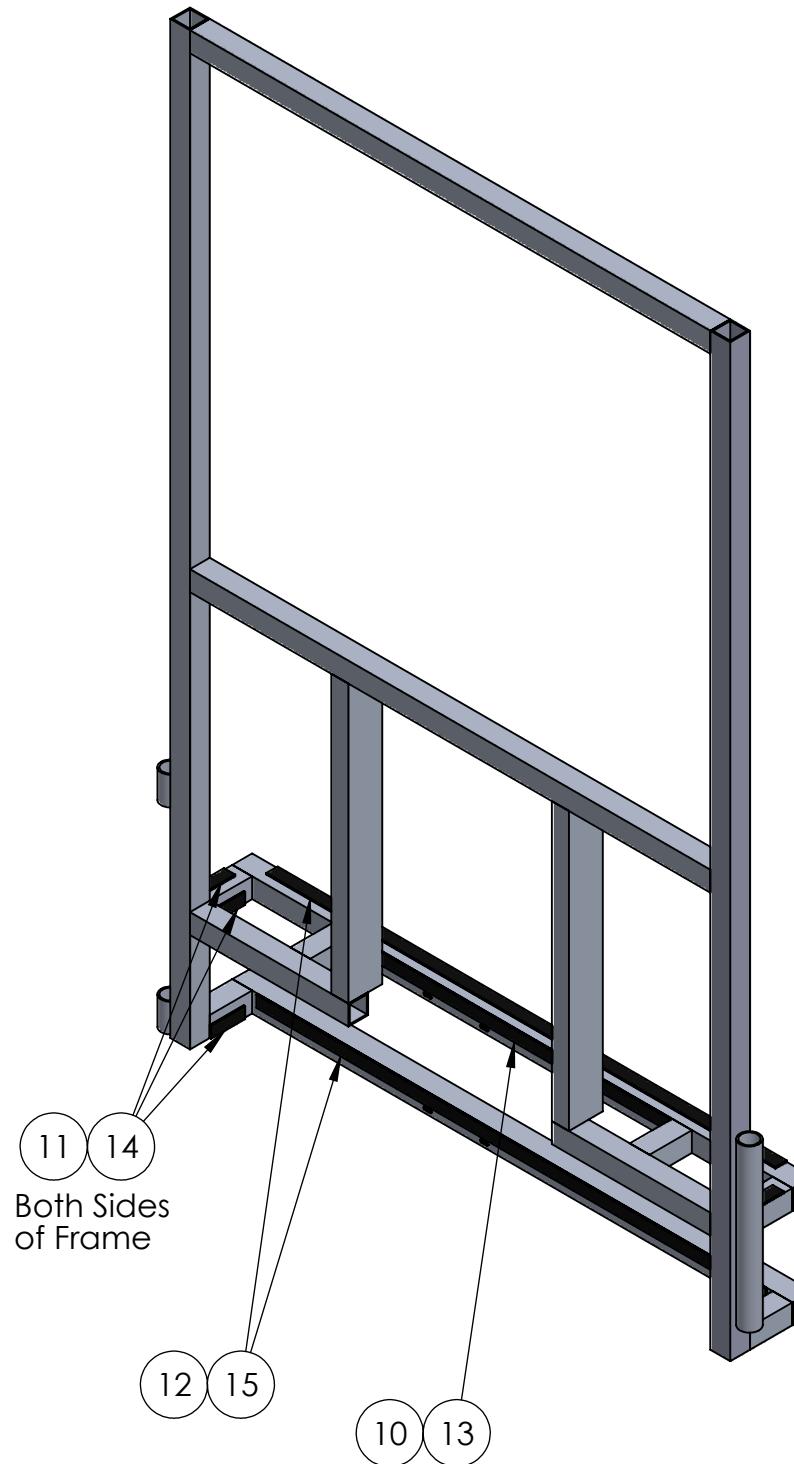
3

2

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B

B



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Notes:

1. Apply the hook fastener to the aluminum frame.
2. Attach the loop fastener to the hook.
3. Peel the protective backing off the loop.

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Feeder Station Assembly

SIZE	DWG. NO.	REV
B	GE-19130	
SCALE: 1:12	WEIGHT:	SHEET 2 OF 4

4

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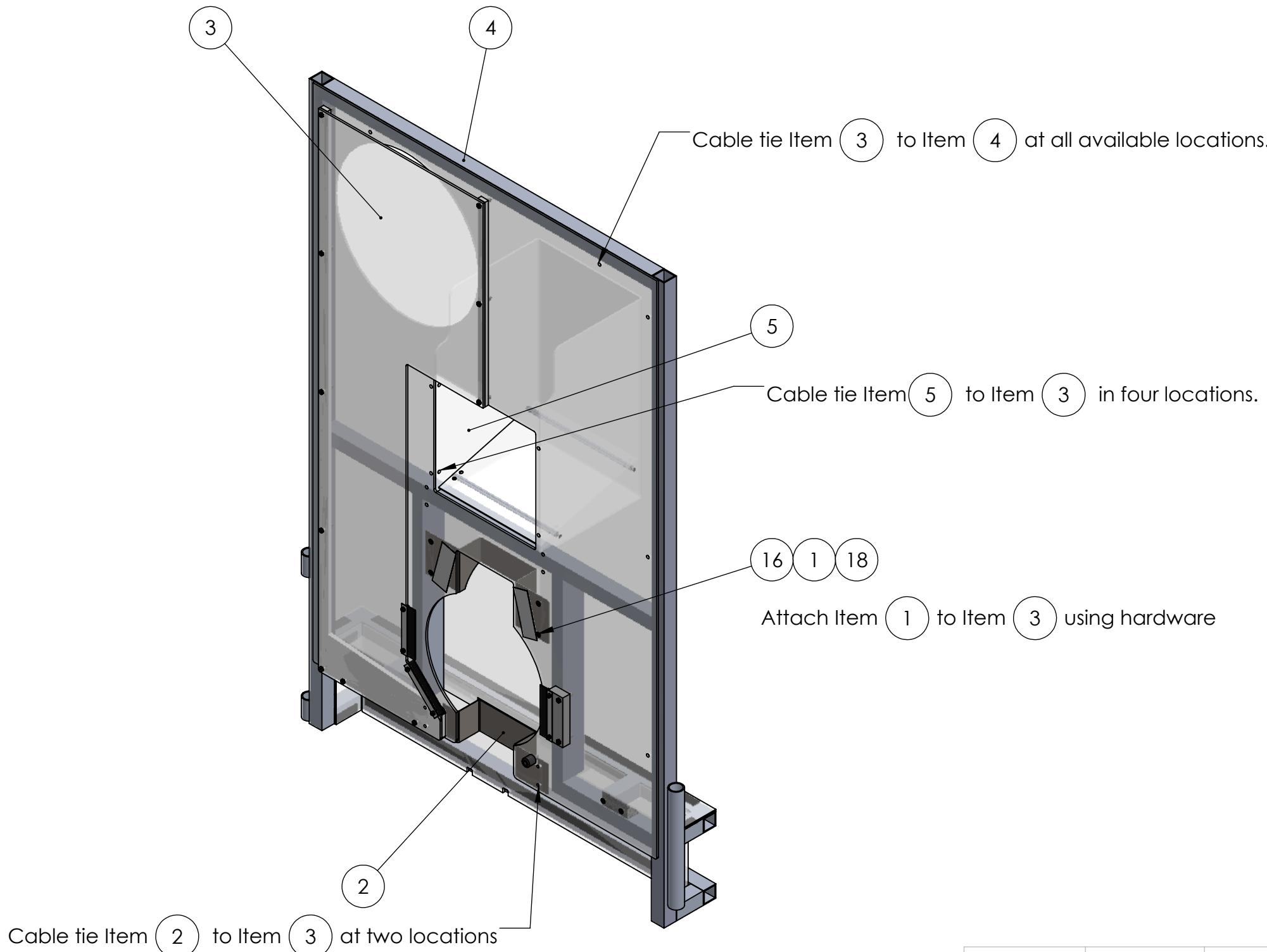
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2

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B

B



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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Feeder Station Assembly

SIZE	DWG. NO.	REV
B	GE-19130	
SCALE: 1:12	WEIGHT:	SHEET 3 OF 4

4

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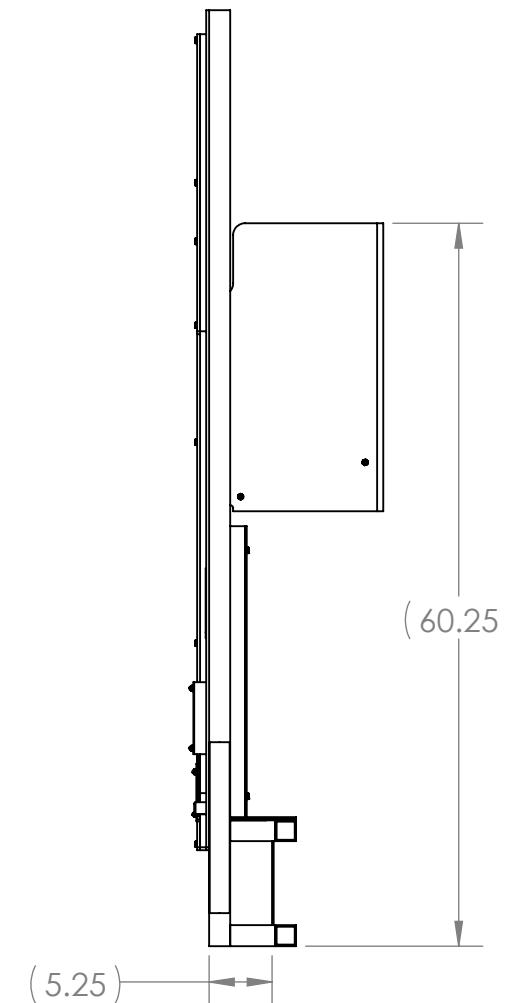
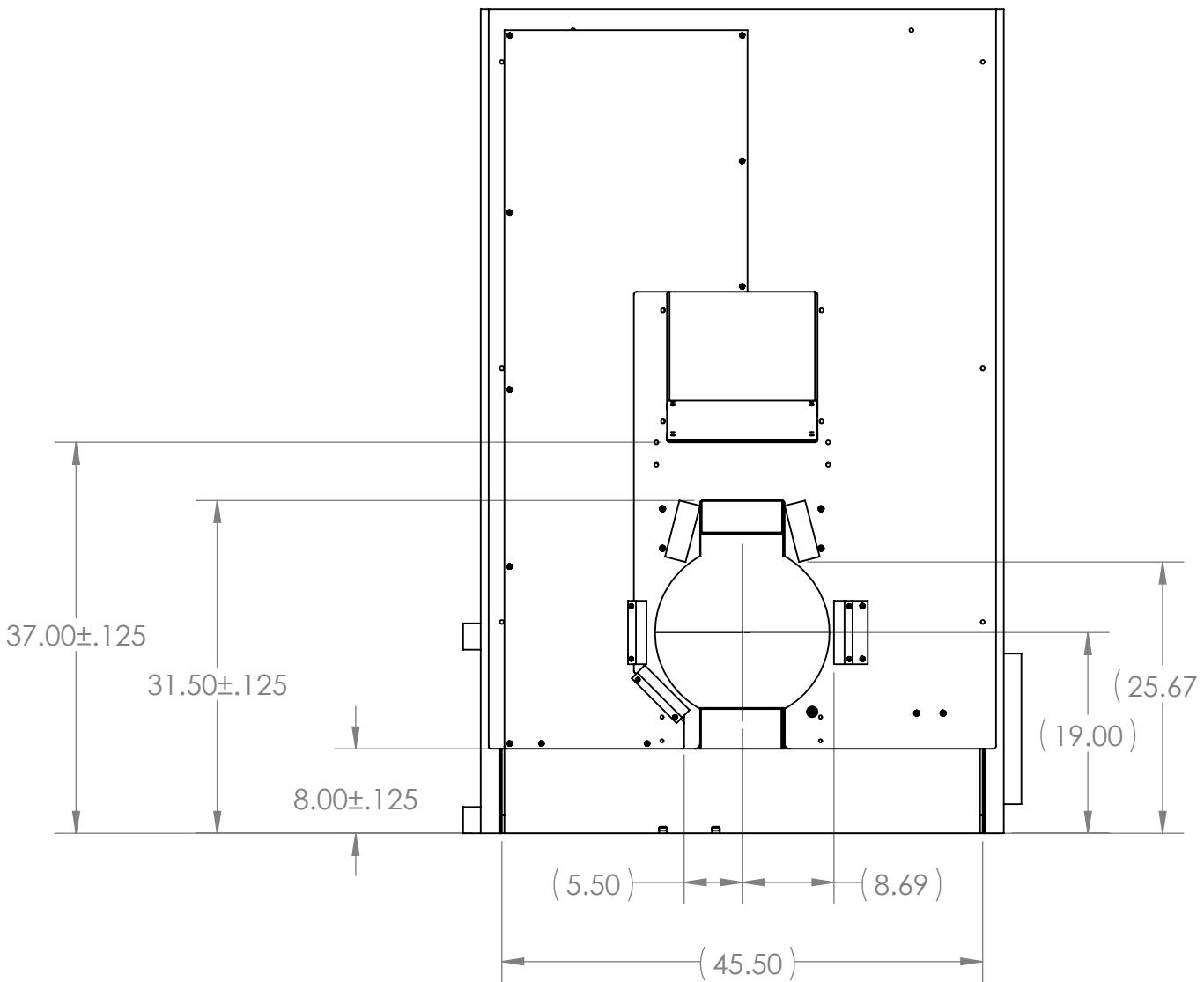
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B



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		DRAWN			
		CHECKED			
		ENG APPR.			
		MFG APPR.			
		Q.A.			
		COMMENTS:			
		MATERIAL			
		FINISH			
NEXT ASSY	USED ON				
APPLICATION	DO NOT SCALE DRAWING				
TITLE: Feeder Station Assembly					
SIZE B	DWG. NO. GE-19130	REV			
SCALE: 1:16	WEIGHT:	SHEET 4 OF 4			

4

3

2

1

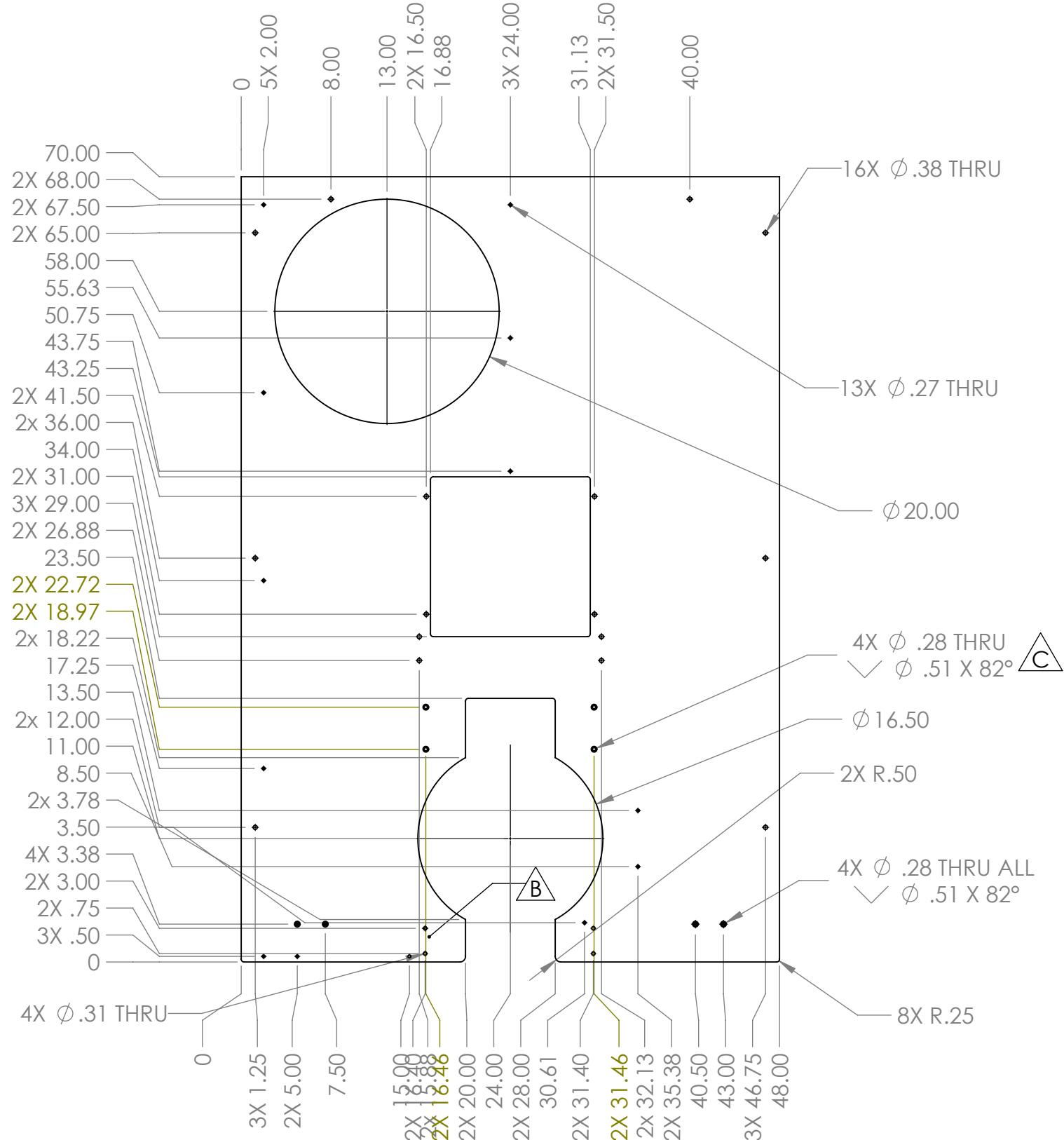
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B



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REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
A1	A	Corrected part name.	10/10/2018	CPO
A3	B	Added 8X .31 Holes	10/17/2018	MXS
B3	C	Ø .31 Holes changed to C'Sink (4 places)	11/15/2018	DAF
B2	D	Corrected Table Error	11/15/2018	DAF

- Notes:
 1. Material: 1/4" Clear Polycarbonate.
 2. Remove all burrs and sharp edges.
 3. Label or tag with part number.

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Title: Loading Station Panel, Right

Size: DWG. NO. **B** GE-19131 **Rev:** **E**
Scale: 1:12 **Weight:** **Sheet 1 of 1**

4

3

2

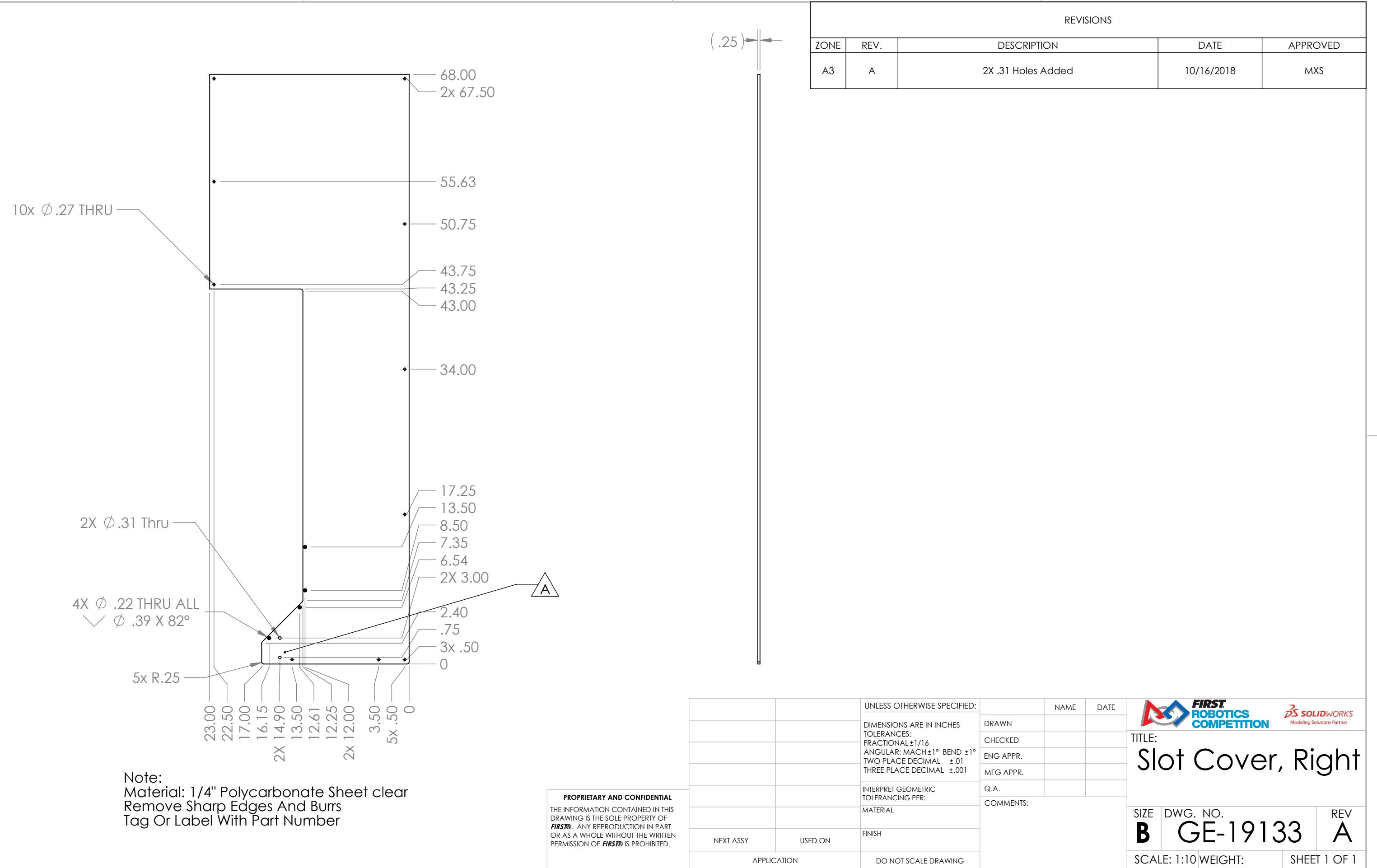
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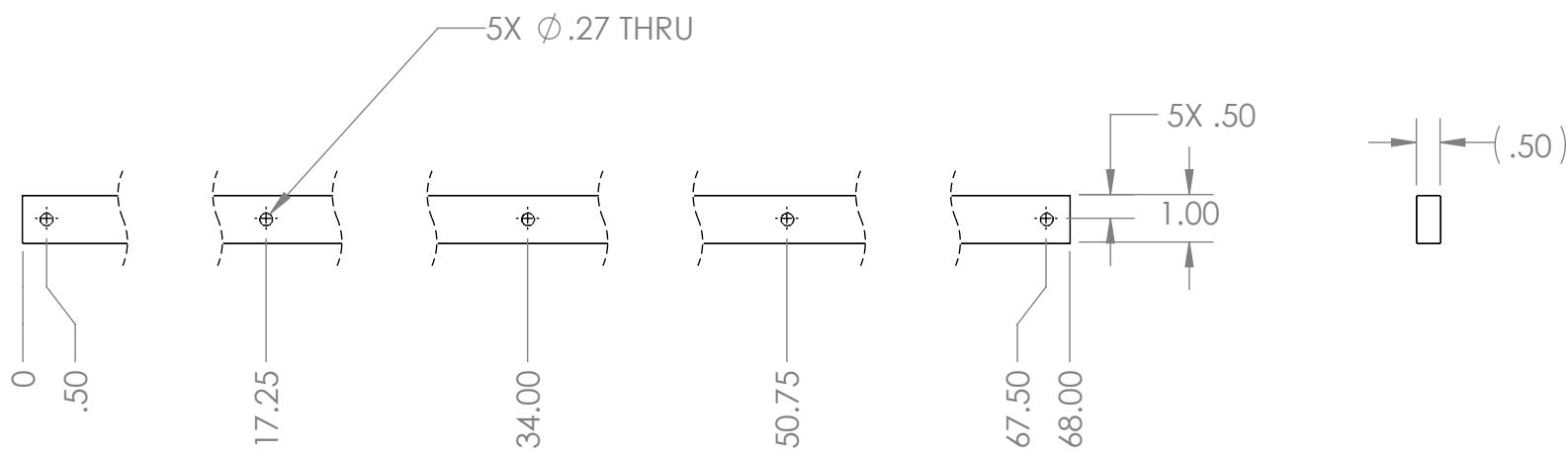
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B

B



Notes:

1. Material: 1/2" HDPE, White
2. Surface: Smooth texture
3. Remove all burrs and sharp edges.
4. Tag or label with part number.

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



TITLE:

Slot Guide, Large

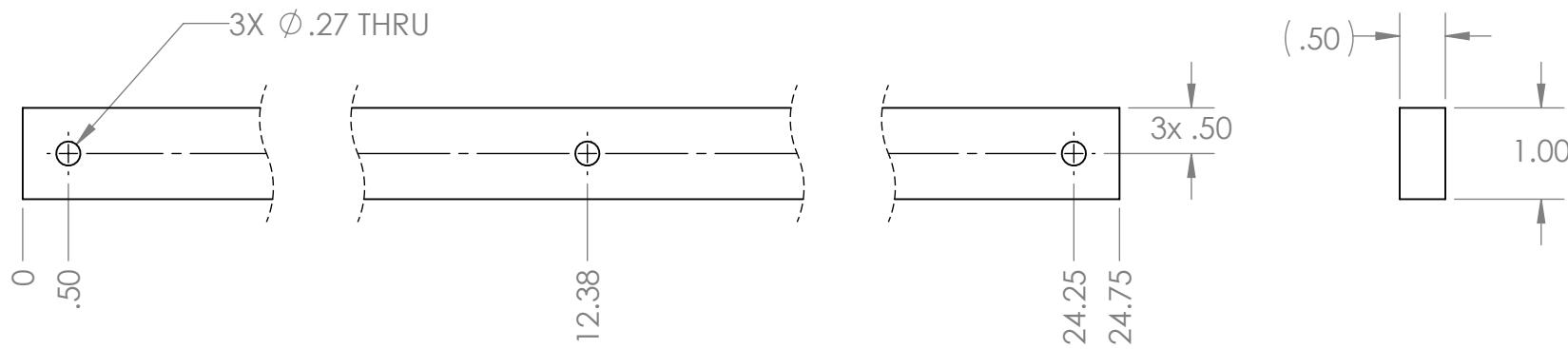
SIZE	DWG. NO.	REV
A	GE-19134	
SCALE: 1:4	WEIGHT:	SHEET 1 OF 1

2

1

B

B



Notes:

1. 1/2" HDPE, White
2. Surface: Smooth Texture
3. Remove all burrs and sharp edges.
4. Tag or label with part number.

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



SOLIDWORKS
Modeling Solutions Partner

TITLE:
Slot Guide, Small

SIZE	DWG. NO.	REV
A	GE-19135	
SCALE: 1:2	WEIGHT:	SHEET 1 OF 1

2

1

A

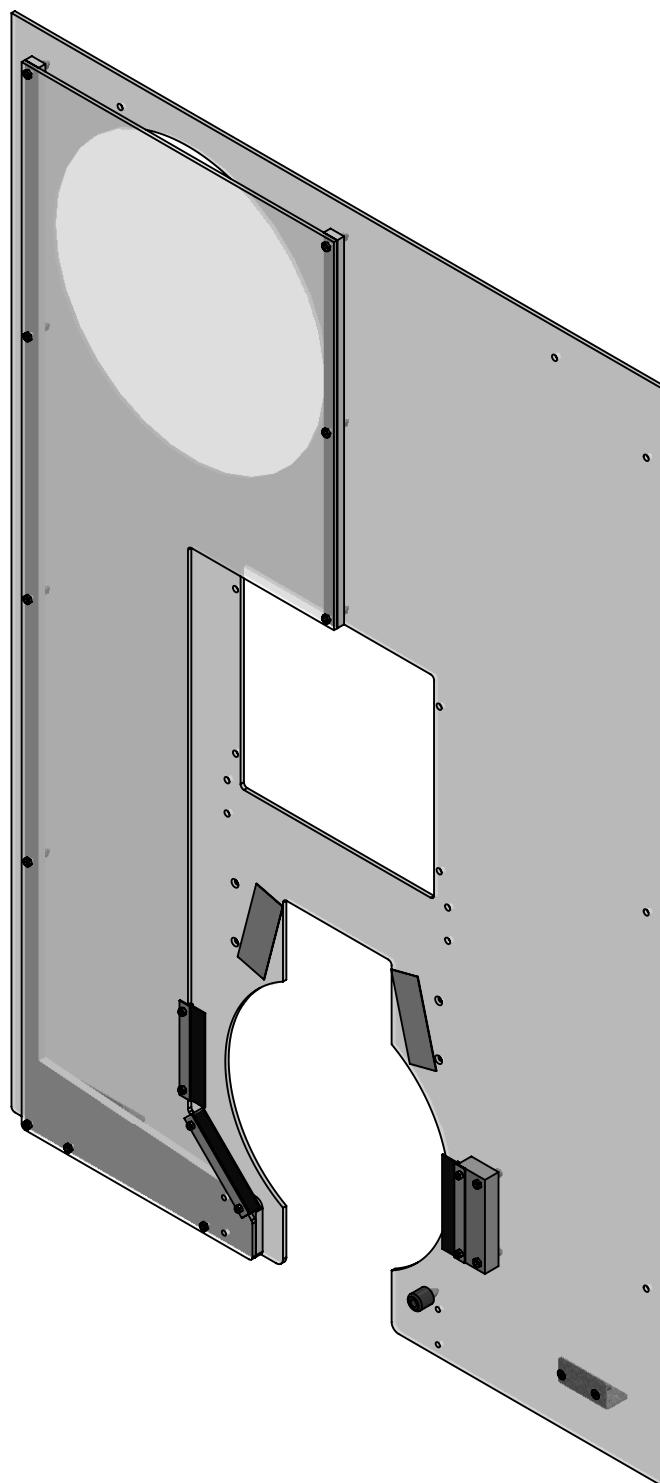
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-19131	Loading Station Panel, Right	1
2	GE-19133	Slot Cover, Right	1
3	GE-19134	Slot Guide, Large	1
4	GE-19135	Slot Guide, Small	1
5	GE-19138	Slot Guide, Angled	1
6	GE-19139	Slot Stop	1
7	GE-19140	Bumper, Rubber	1
8	GE-19142	Angle, Support	2
9	GE-19190	6" brush	3
10	VisionTape	2" x 5.5" Retroreflective tape	2
11	button_hex_.25_20_1.25	Button Head, Hex, 1/4-20 x 1.25	1
12	flat_hex_.25_20_1	Steel Hex Flat Head Screw, 1/4"-20 x 1" long, fully threaded	4
13	flat_hex_10_32_1.375	Flat Head, Hex, 10-32 x 1.375"	2
14	flat_hex_10_32_.625	Flat Head, Hex, 10-32 x .625"	4
15	hex_.25_20_1.5	Steel Hex Head Screw, 1/4"-20 x 1-1/2" long, fully threaded	12
16	nylock_.25_20	Steel Nylon-Insert Locknut, 1/4"-20	17
17	nylock_10_32	Low-Strength Steel Nylon-Insert Locknut, Zinc-Plated, 10-32 Thread Size	6

	UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL: ±1/16 ANGULAR: MACH ±1° BEND ±1° TWO PLACE DECIMAL ±.01 THREE PLACE DECIMAL ±.001	NAME	DATE
	DRAWN		
	CHECKED		
	ENG APPR.		
	MFG APPR.		
	Q.A.		
	COMMENTS:		
NEXT ASSY	USED ON	INTERPRET GEOMETRIC TOLERANCING PER:	
		MATERIAL	
APPLICATION	FINISH	COMMENTS:	
	DO NOT SCALE DRAWING		
SIZE	DWG. NO.	REV	
B	GE-19137		
SCALE: 1:10	WEIGHT:	SHEET 1 OF 2	

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
**Plastic Assembly,
Loading Station, Right**

4

3

2

1

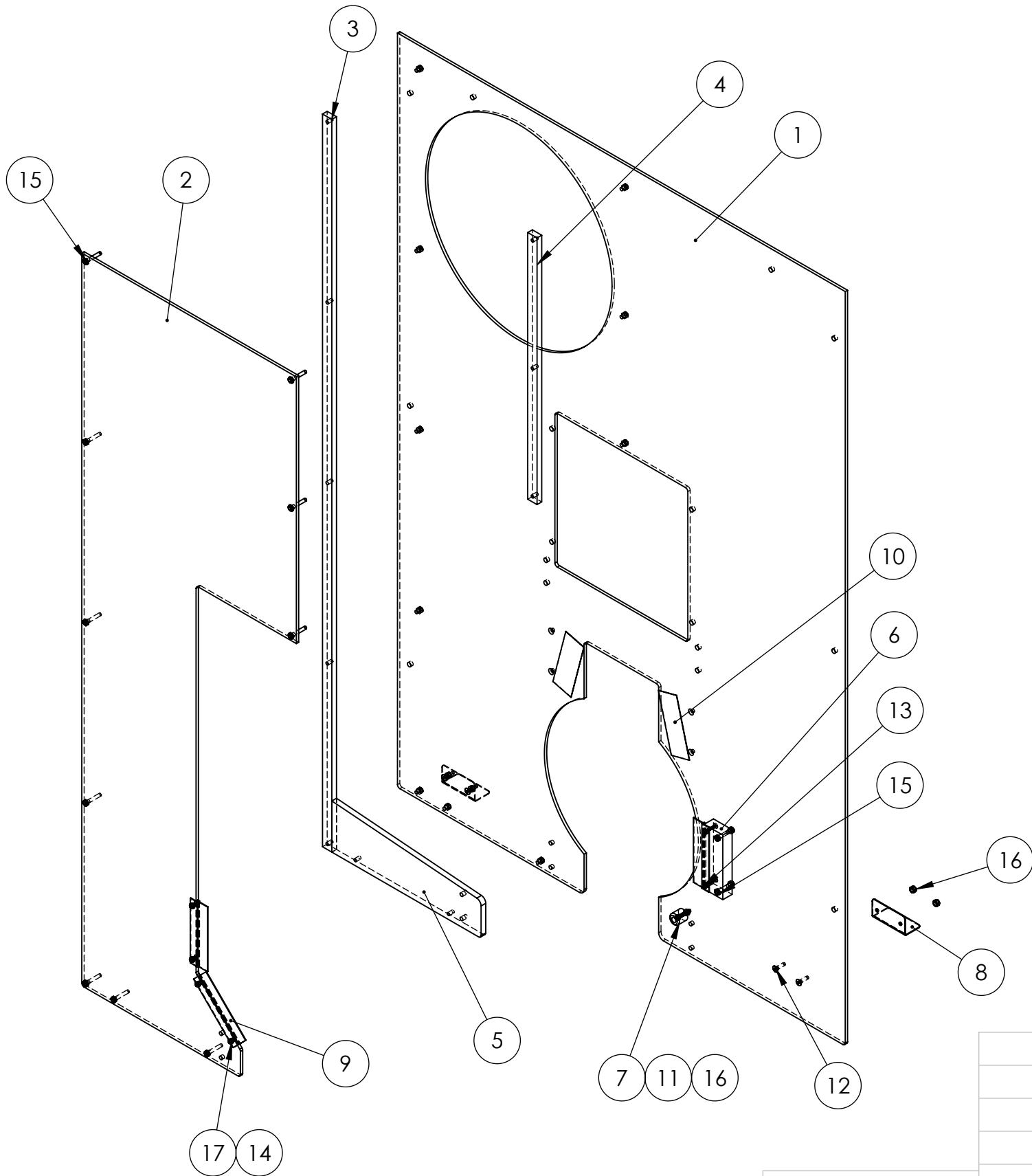
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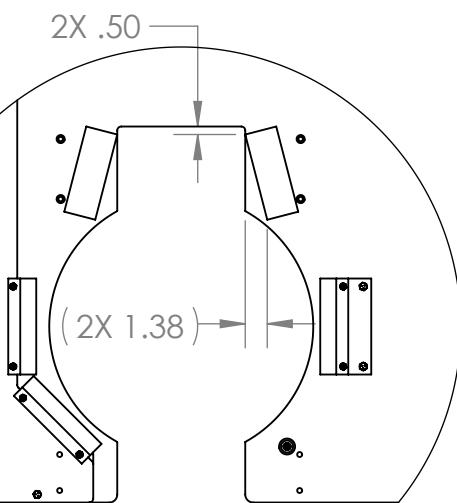
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1

B



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DETAIL A
SCALE 1 : 12

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Plastic Assembly,
Loading Station, Right

SIZE DWG. NO. **B** GE-19137 **REV**

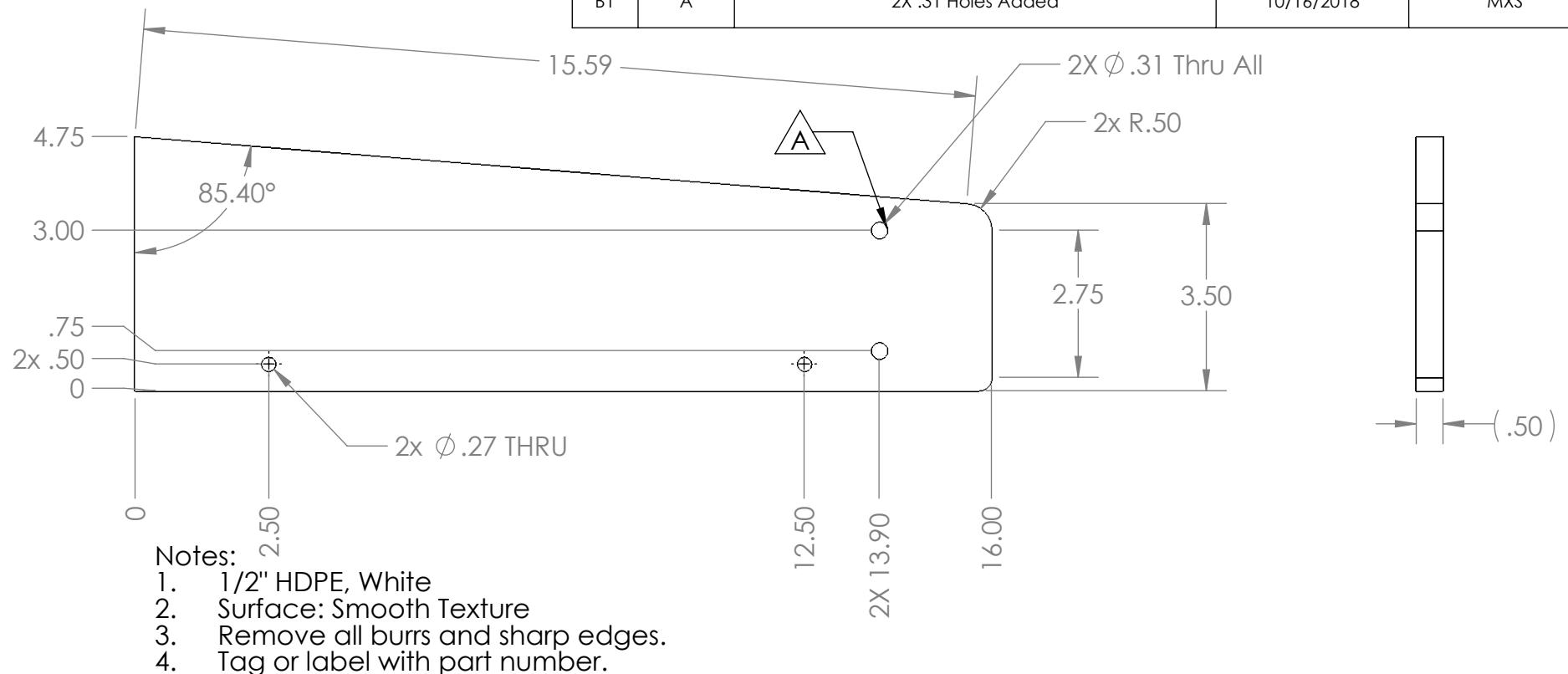
SCALE: 1:10 WEIGHT: SHEET 2 OF 2

2

1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
B1	A	2X .31 Holes Added	10/16/2018	MXS



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



A
Slot Guide,
Angled

SIZE	DWG. NO.	REV
A	GE-19138	A
SCALE: 1:3	WEIGHT:	SHEET 1 OF 1

2

1

B

A

4

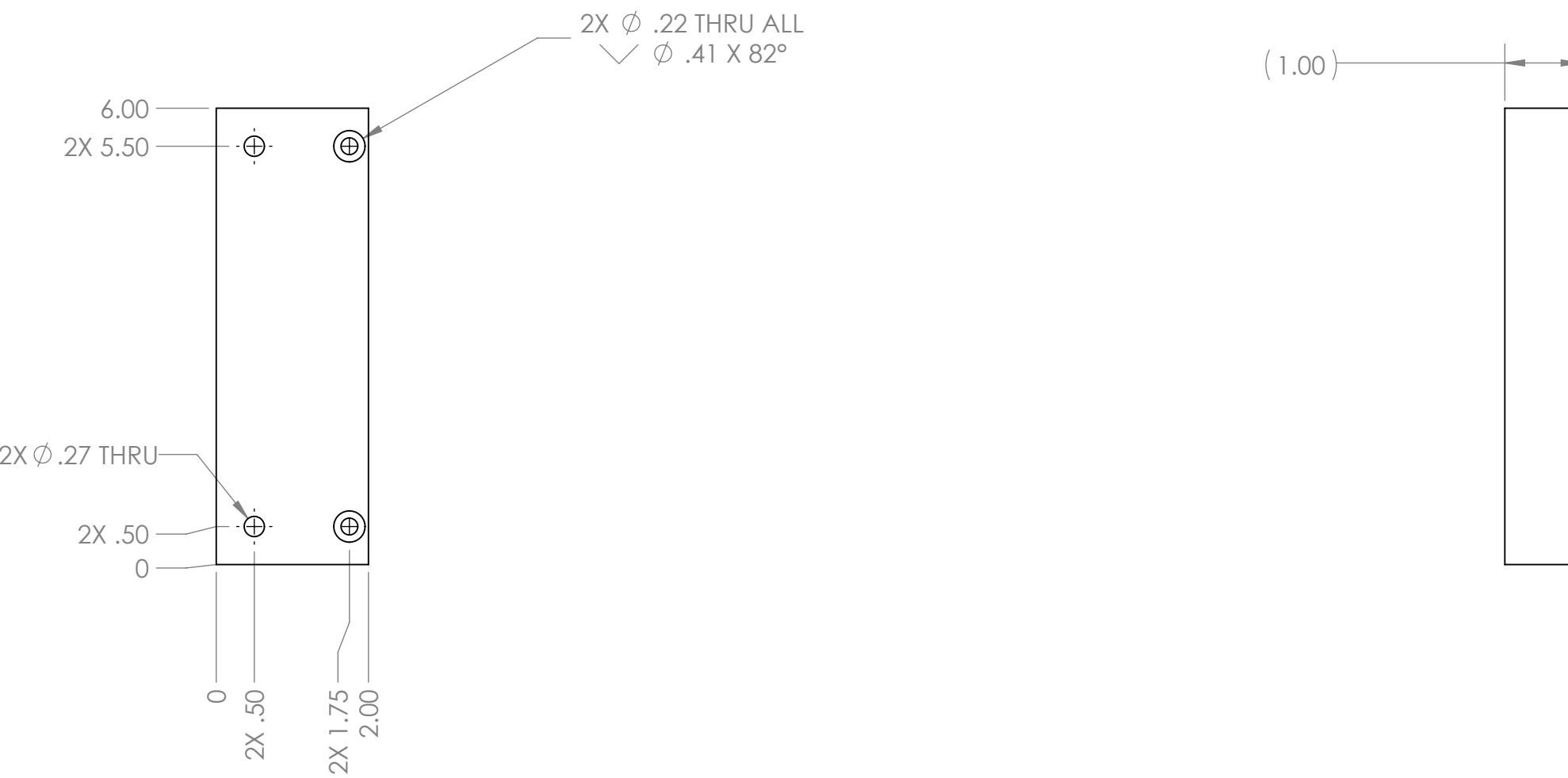
3

2

1

B

B



A

A

Note:

Material: 1" Thick HDPE Sheet White
 Texture: Smooth
 Remove Sharp Edges And Burrs
 Tag Or Label With Part Number

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		DRAWN		
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
		MATERIAL		
		FINISH		
NEXT ASSY	USED ON			
APPLICATION	DO NOT SCALE DRAWING			
SIZE	DWG. NO.		REV	
B	GE-19139			
SCALE: 1:2	WEIGHT:		SHEET 1 OF 1	

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
 Modeling Solutions Partner

TITLE:
Slot Stop

4

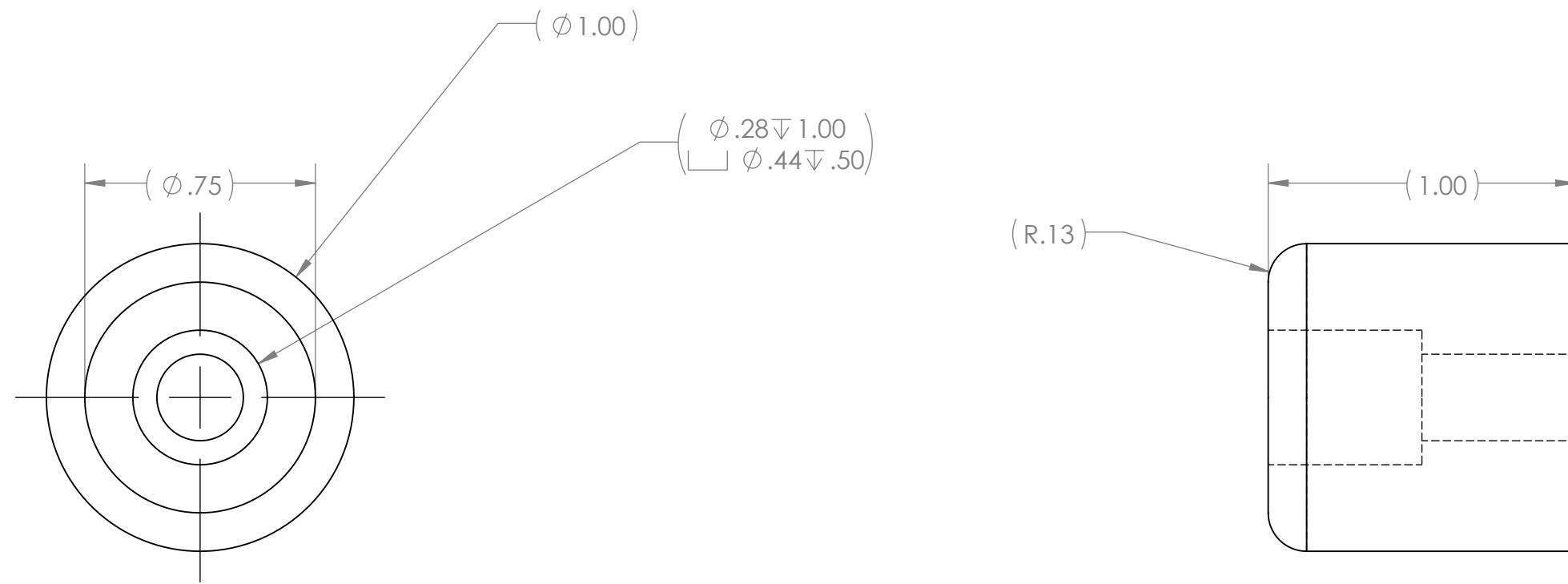
3

2

1

B

B



Note:

1" Rubber Bumper with Unthreaded Hole

Source: McMaster-Carr

Item #: 9540K953

Equivalent substitutions allowed

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Bumper, Rubber

SIZE	DWG. NO.	REV
B	GE-19140	
SCALE: 2:1	WEIGHT:	SHEET 1 OF 1

4

3

2

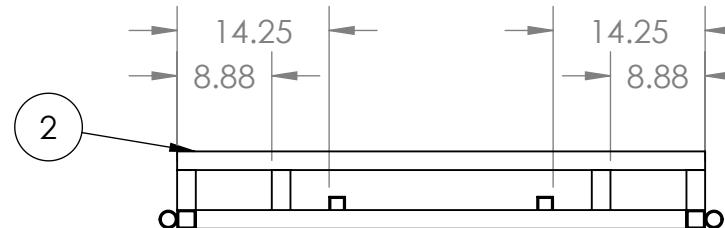
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4

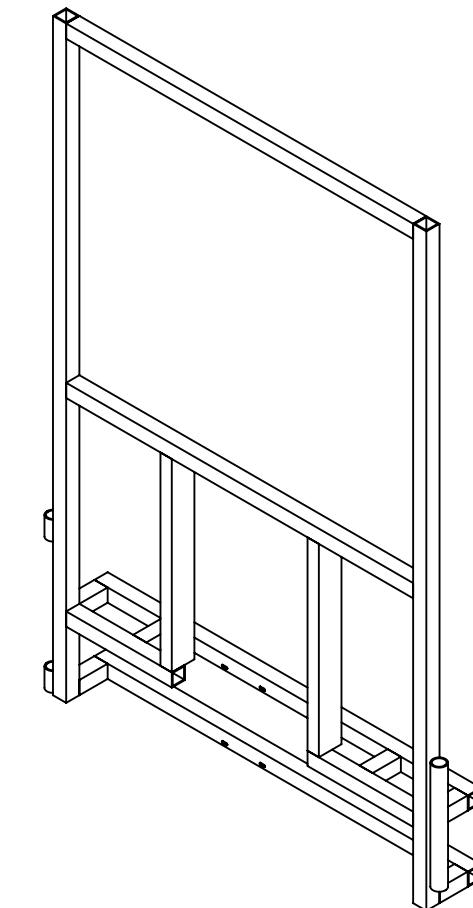
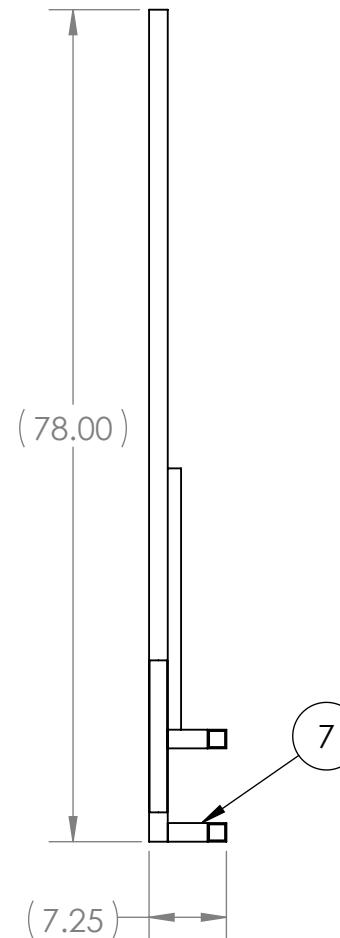
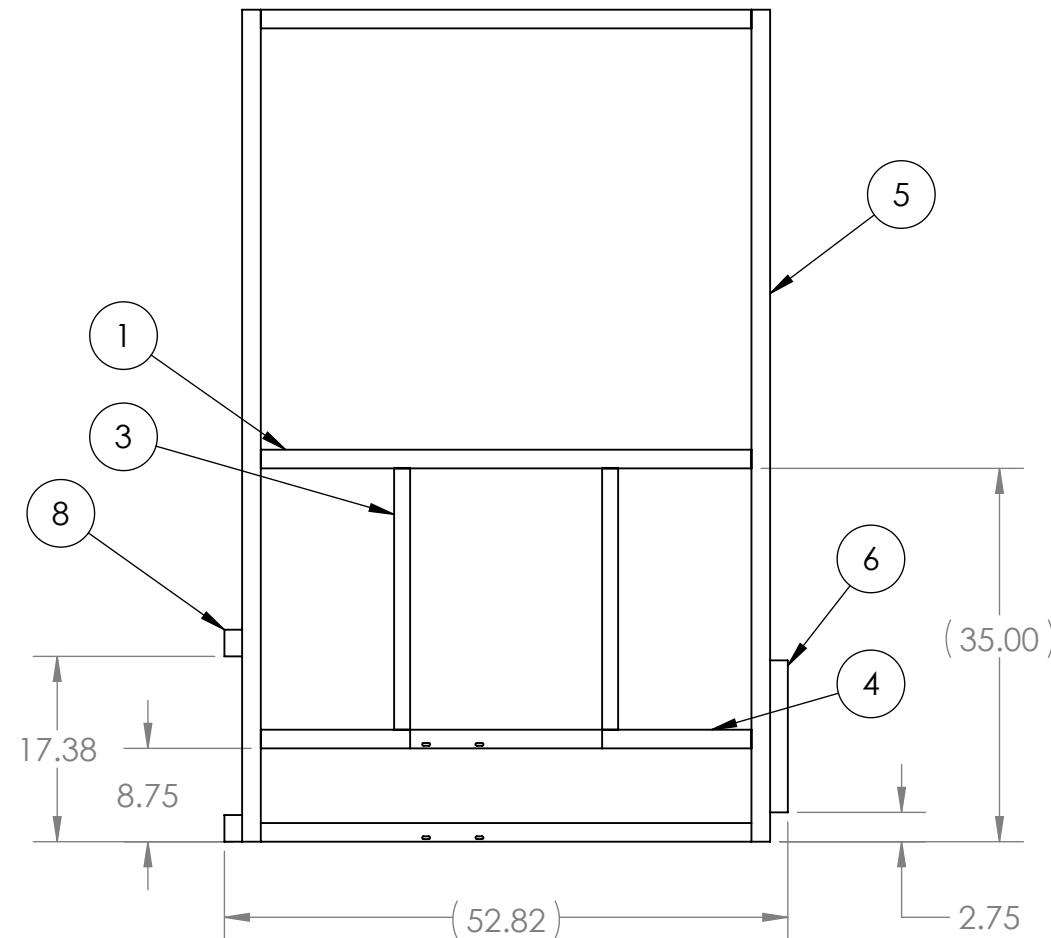
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2

1



REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A	Initial Release	10/19/2018	DAF
A3	B	Corrected Item 3 Material Description	10/31/2018	DAF



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-19141-01	1-3/4" x .125" thk. Square Tubing, 6063 Aluminum	2
2	GE-19141-02	1-3/4" x .125" thk. Square Tubing, 6063 Aluminum	2
3	GE-19141-03	1.5" x 3" x .125" Rectangular Tubing, 6061 Aluminum	2
4	GE-19141-04	1-3/4" x .125" thk. Square Tubing, 6063 Aluminum	2
5	GE-19141-05	1-3/4" x .125" thk. Square Tubing, 6063 Aluminum	2
6	GE-19141-06	1-1/4" Schedule 40 Pipe, 6061 Aluminum	1
7	GE-19141-07	1-3/4" x .125" thk. Square Tubing, 6063 Aluminum	6
8	GE-19141-08	1-1/4" Schedule 40 Pipe, 6061 Aluminum	2



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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Title: Loading Station Frame, Right

SIZE	DWG. NO.	REV
B	GE-19141	B
SCALE: 1:18	WEIGHT:	SHEET 1 OF 4

4

3

2

1

4

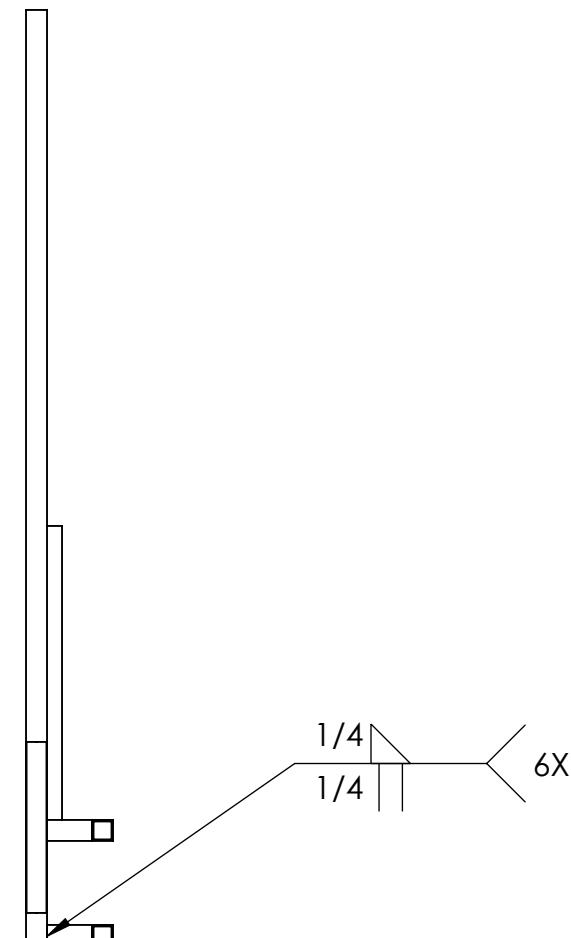
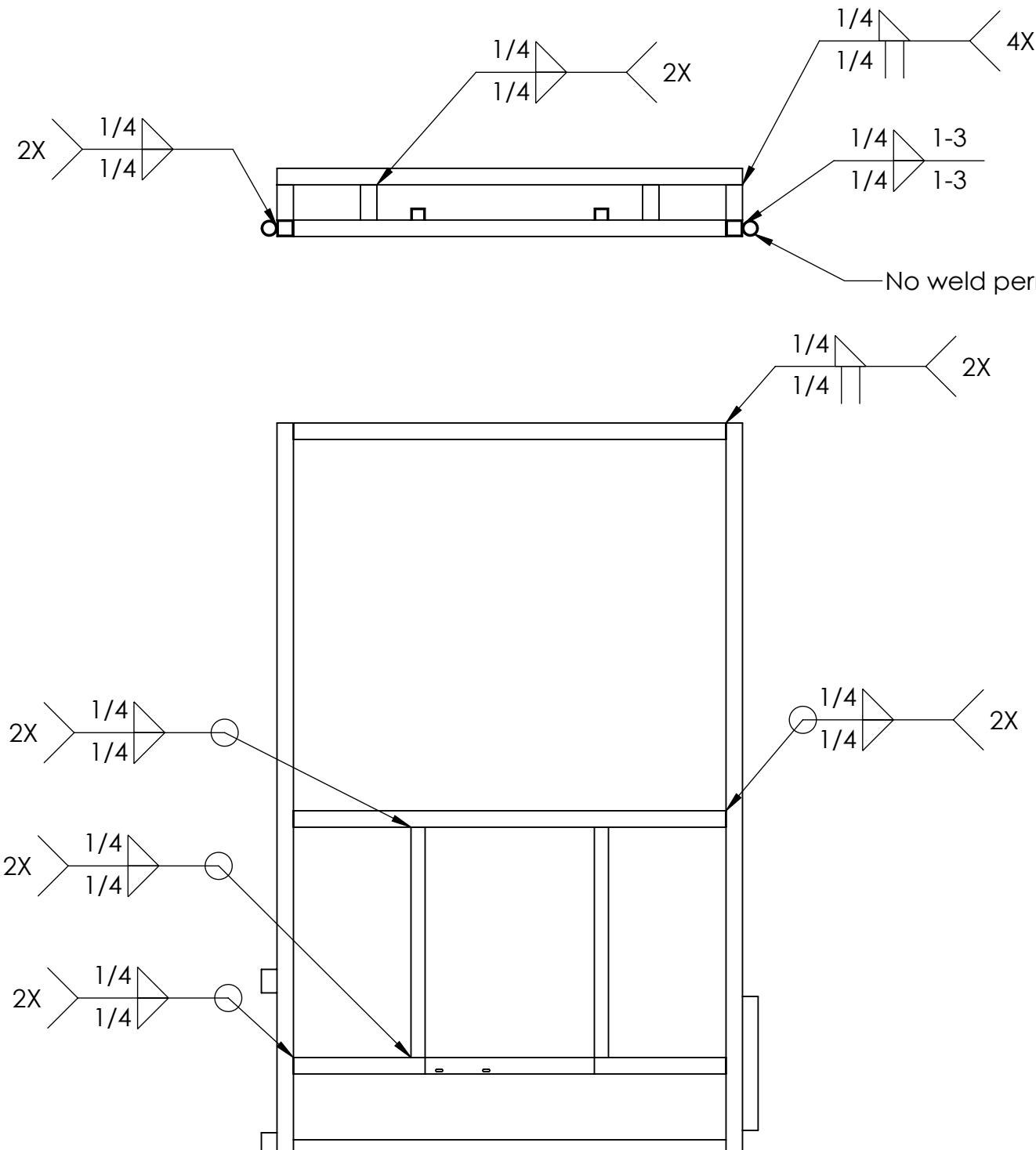
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2

1

B

B



A

A

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		UNLESS OTHERWISE SPECIFIED:		NAME _____ DATE _____ DRAWN _____ CHECKED _____ ENG APPR. _____ MFG APPR. _____ Q.A. _____ COMMENTS: _____	
		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$			
		INTERPRET GEOMETRIC TOLERANCING PER:			
		MATERIAL			
NEXT ASSY	USED ON	FINISH			
APPLICATION		DO NOT SCALE DRAWING			
SIZE		DWG. NO.	REV		
B		GE-19141	B		
SCALE: 1:16		WEIGHT:	SHEET 2 OF 4		

4

3

2

1

4

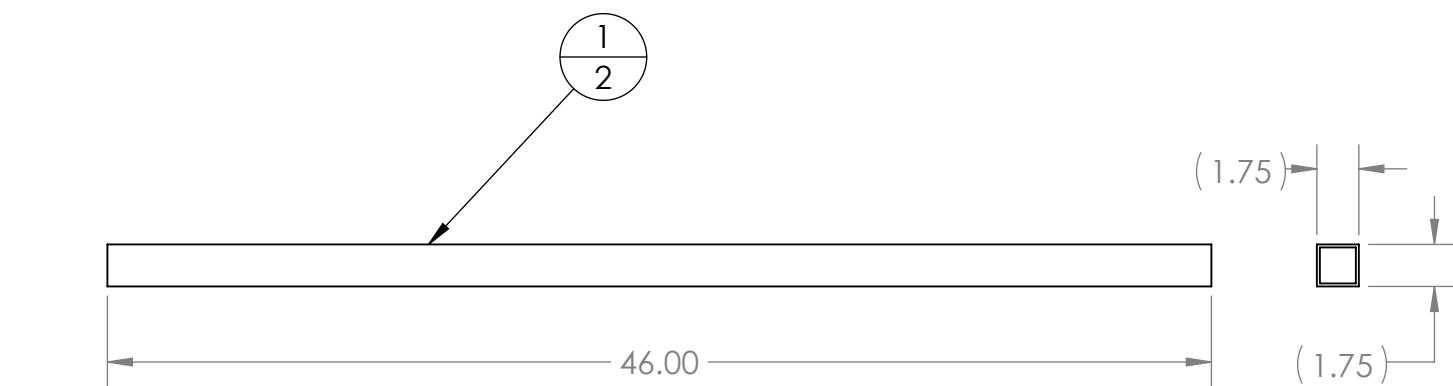
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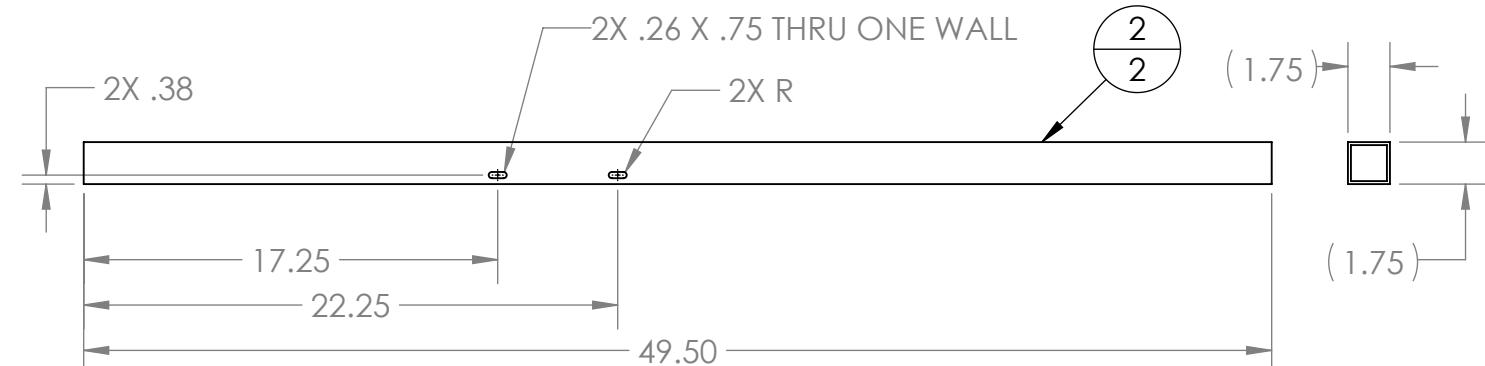
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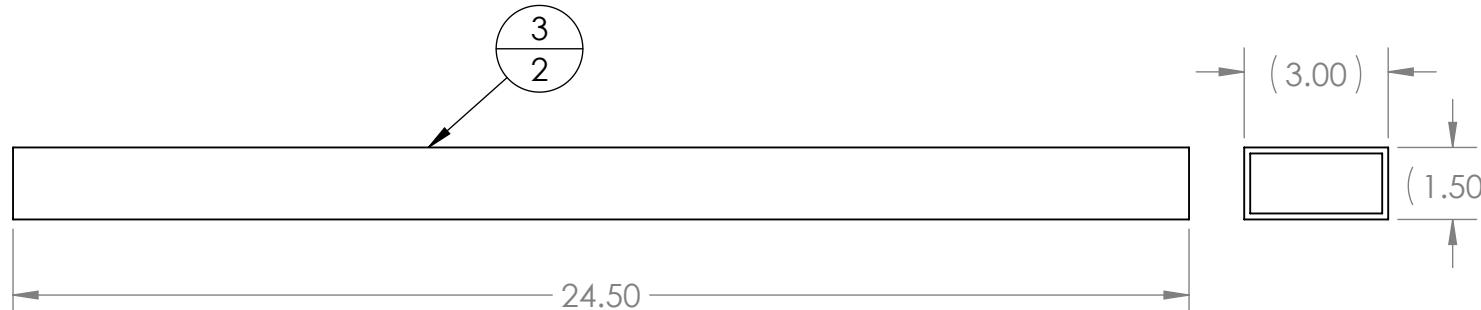
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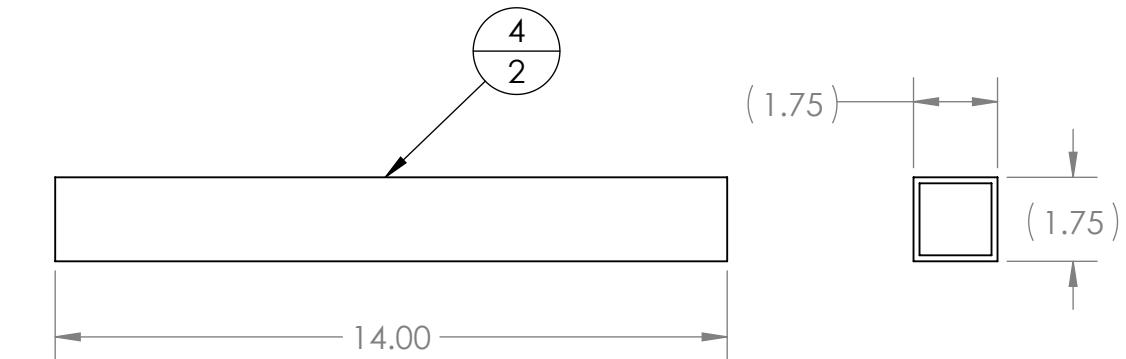
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Scale: 1:8



Scale: 1:4



Scale: 1:4

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Loading Station Frame, Right

SIZE	DWG. NO.	REV
B	GE-19141	B
	WEIGHT:	SHEET 3 OF 4

4

3

2

1

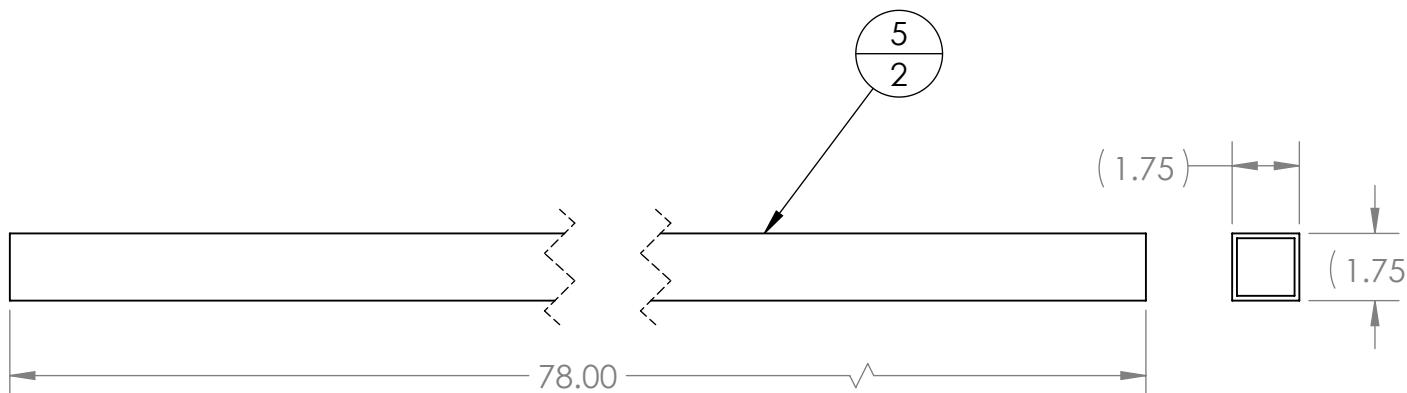
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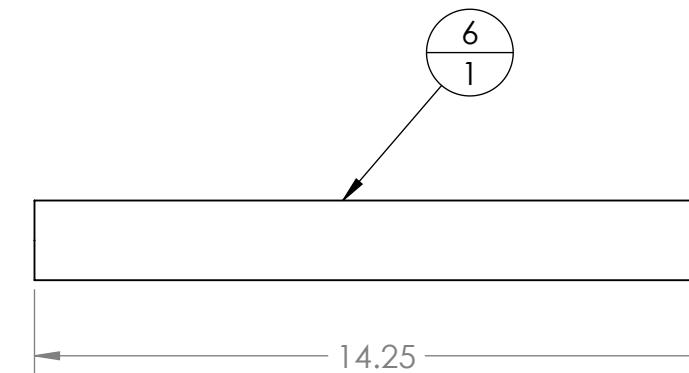
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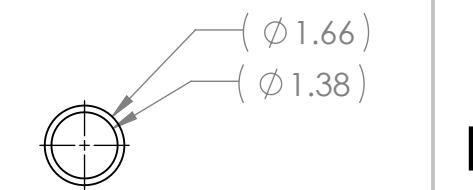
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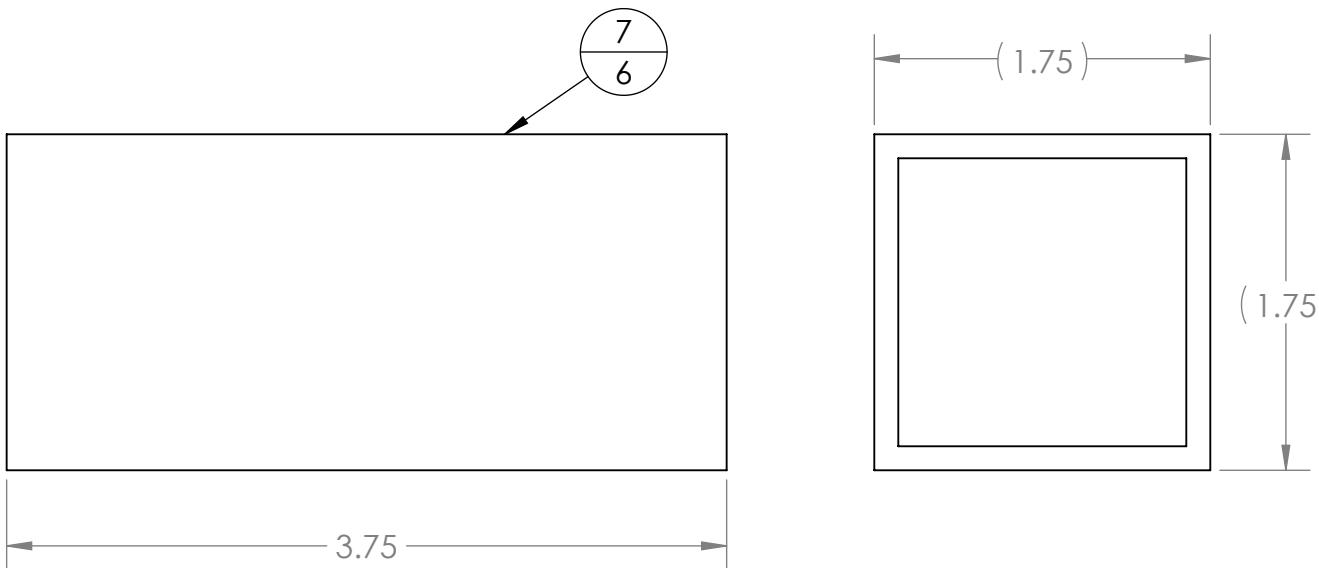
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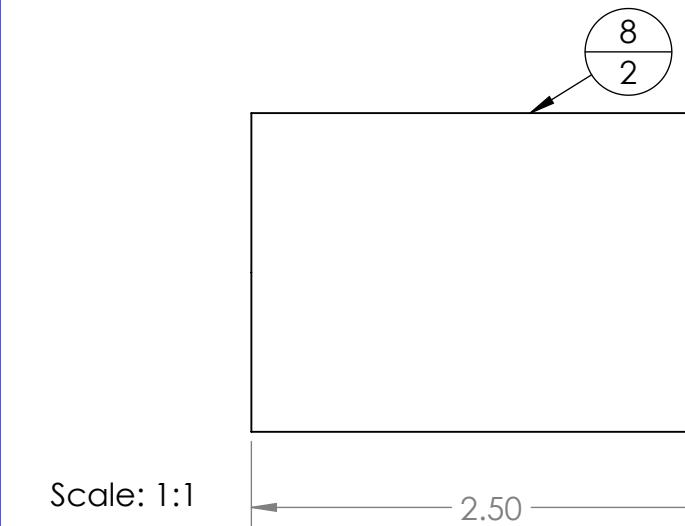
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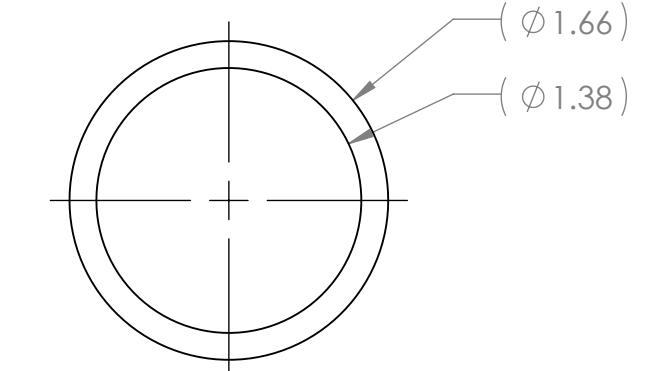
A



Scale: 1:1



Scale: 1:1



B

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Loading Station Frame, Right

SIZE	DWG. NO.	REV
B	GE-19141	B

SCALE: 1:5 **WEIGHT:** **SHEET 4 OF 4**

4

3

2

1

4

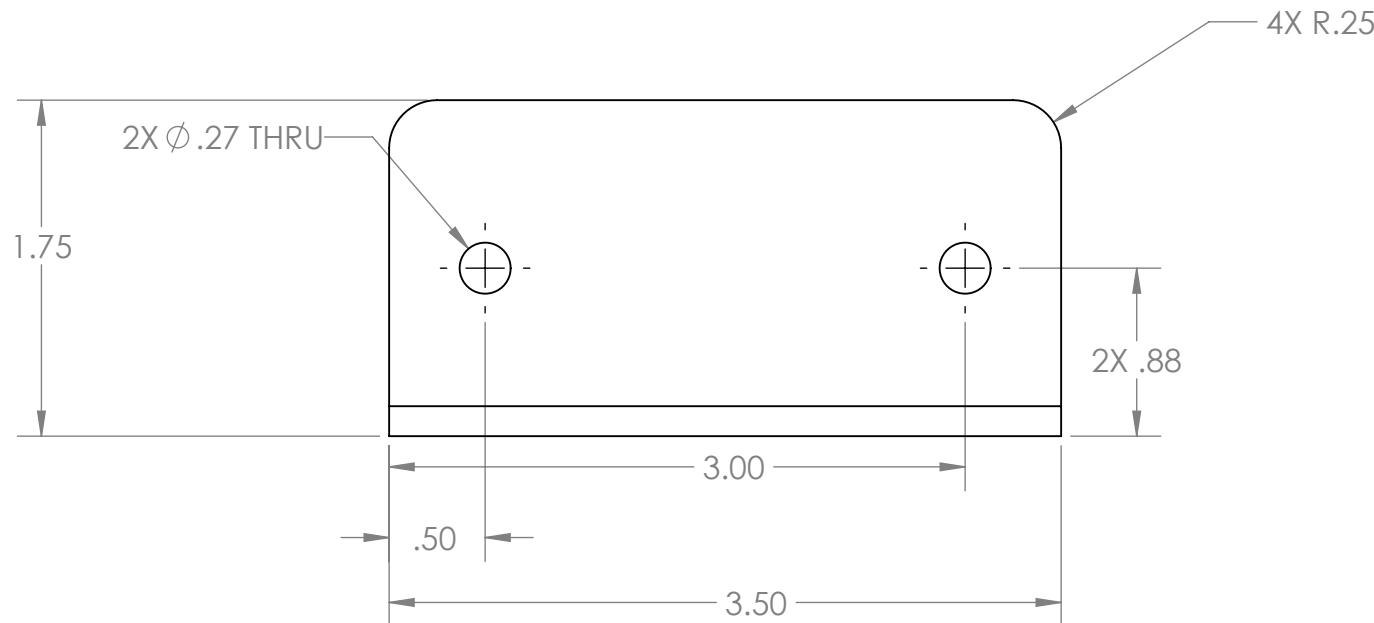
3

2

1

B

B



Note:
Material: #14 Galvanized Steel, Plated or Similar
Remove Sharp Edges Anb Burrs
Tag or Label With Part Number

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Angle, Support

SIZE	DWG. NO.	REV
B	GE-19142	
SCALE: 1:1	WEIGHT:	SHEET 1 OF 1

4

3

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4

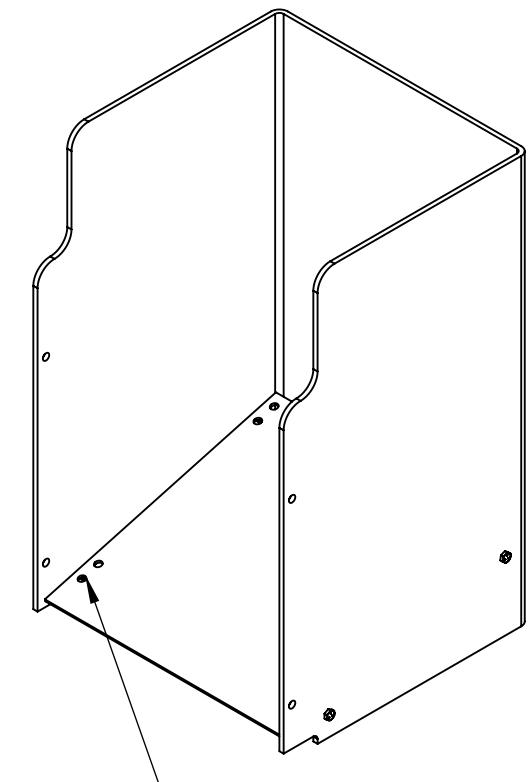
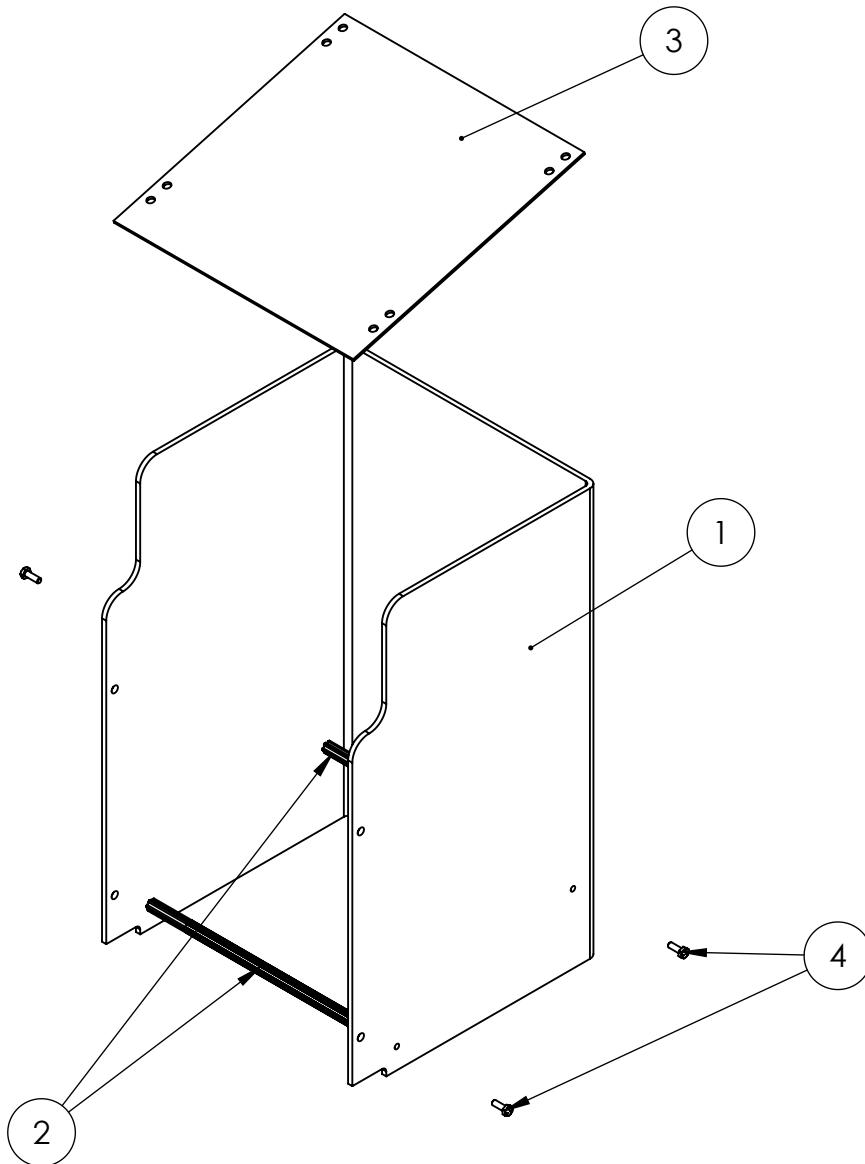
3

2

1

B

B



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-19144	Chute	1
2	GE-19145	Churro	2
3	GE-19146	Bottom	1
4	hex_.25_20_.75	Steel Hex Head Screw, 1/4"-20 x 3/4" long, fully threaded	4

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		DIMENSIONS ARE IN INCHES	DRAWN	
		TOLERANCES:	CHECKED	
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		ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$	MFG APPR.	
		TWO PLACE DECIMAL $\pm .01$	Q.A.	
		THREE PLACE DECIMAL $\pm .001$	COMMENTS:	
		INTERPRET GEOMETRIC TOLERANCING PER:		
		MATERIAL		
NEXT ASSY	USED ON	FINISH		
APPLICATION		DO NOT SCALE DRAWING		
			SIZE	DWG. NO.
			B	GE-19143
			REV	
			SCALE: 1:8	WEIGHT:
			SHEET 1 OF 1	

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

Chute Assembly

4

3

2

1

4

3

2

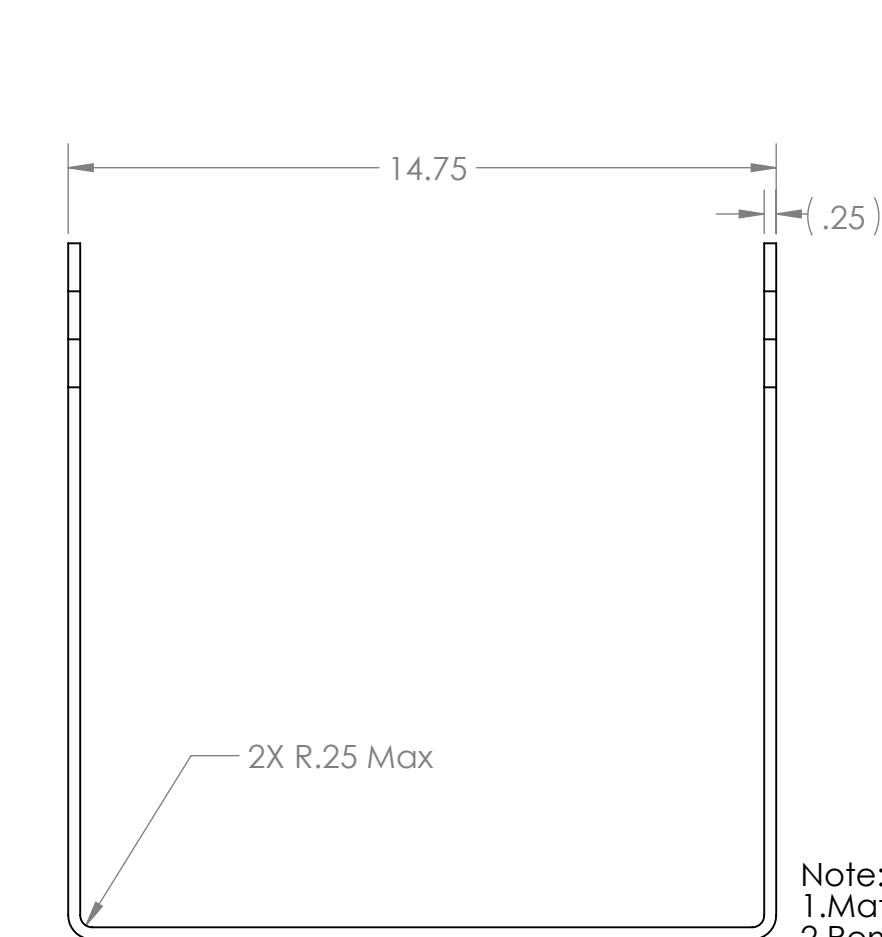
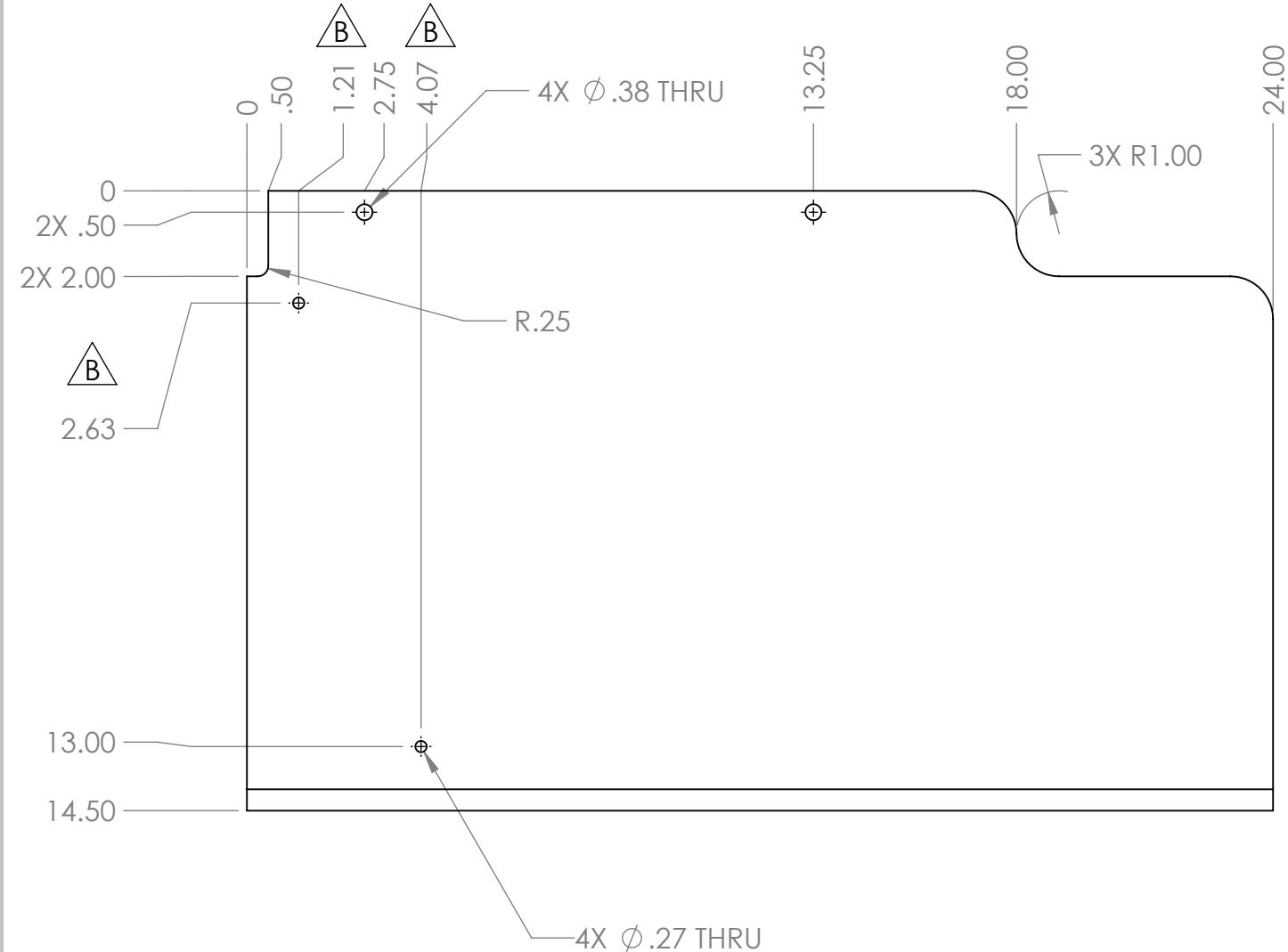
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REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A	Cosmetic Changes to Model	11/01/2018	DAF
B4	B	1.21 was .56, 4.07 was 2.07, 2.63 was 2.25	11/21/2018	DAF

B

B



Note:
 1. Material: 1/4" Thick Polycarbonate Sheet Clear
 2. Remove Sharp Edges And Burrs
 3. Tag Or Label With Part Number

		UNLESS OTHERWISE SPECIFIED:	NAME	DATE
		DIMENSIONS ARE IN INCHES		
		TOLERANCES:		
		FRACTIONAL $\pm 1/16$		
		ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$		
		TWO PLACE DECIMAL $\pm .01$		
		THREE PLACE DECIMAL $\pm .001$		
		INTERPRET GEOMETRIC		
		TOLERANCING PER:		
		MATERIAL		
		NEXT ASSY	USED ON	FINISH
		APPLICATION	DO NOT SCALE DRAWING	
			SIZE	DWG. NO.
			B	GE-19144
			REV	B
			SCALE: 1:4	WEIGHT:
			SHEET 1 OF 1	

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FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
 Modeling Solutions Partner

TITLE:

Chute

4

3

2

1

4

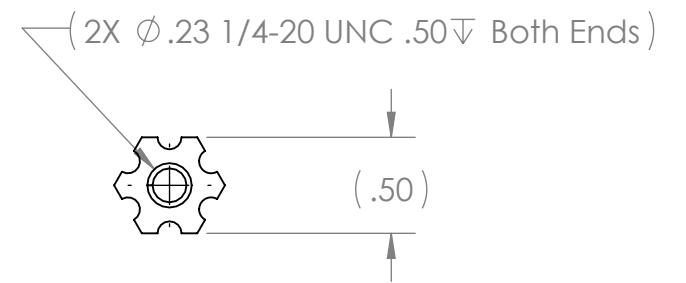
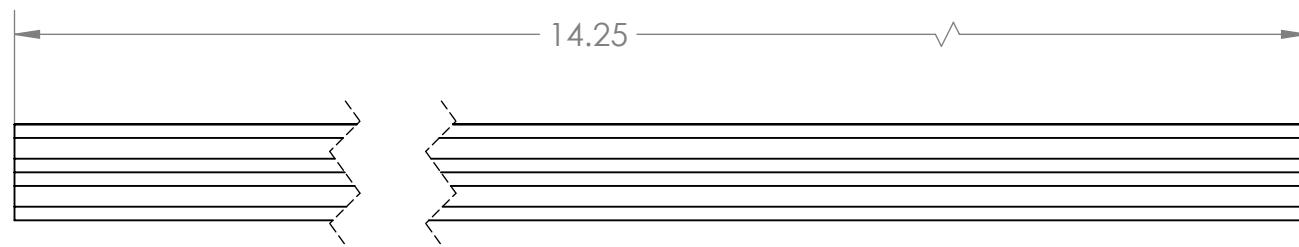
3

2

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B

B



Note:

1. Make from Andymark Part AM-2241
2. Remove Sharp Edges And Burrs
3. Label Or Tag With Part Number

A

A

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		DRAWN			
		CHECKED			
		ENG APPR.			
		MFG APPR.			
		Q.A.			
		COMMENTS:			
		MATERIAL			
		FINISH			
NEXT ASSY	USED ON				
	APPLICATION	DO NOT SCALE DRAWING			
B	GE-19145				
SCALE: 1:1	WEIGHT:	SHEET 1 OF 1			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

Churro

4

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4

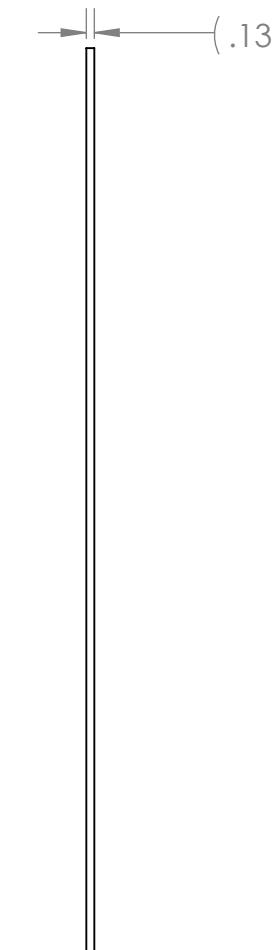
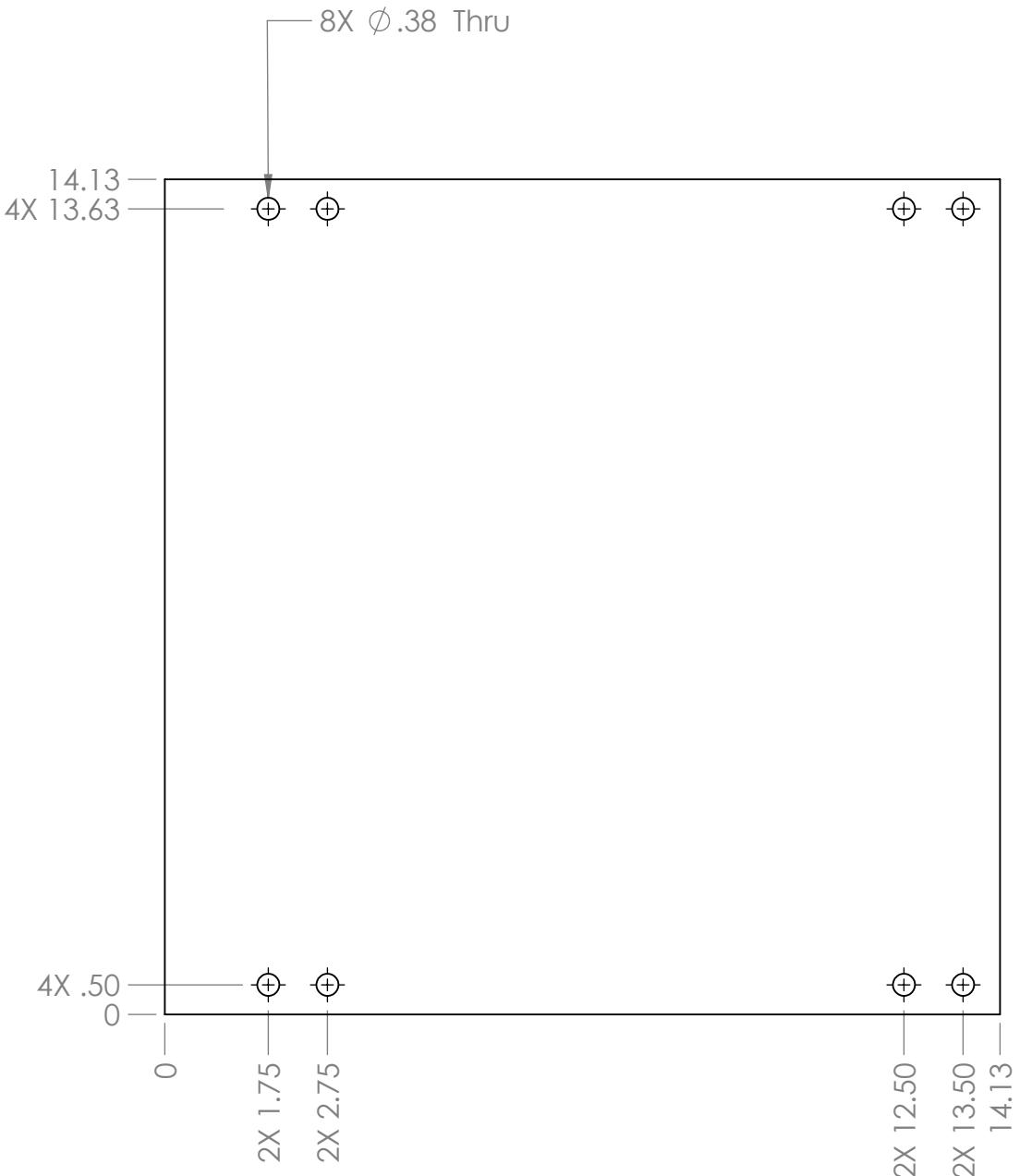
3

2

1

B

B



Note:
 1. Material: 1/8" Thick Polycarbonate Sheet Clear
 2. Remove Sharp Edges and Burrs
 3. Tag or Label With Part Number

A

A

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
 Modeling Solutions Partner

Bottom

B	GE-19146	REV
SCALE: 1:3	WEIGHT:	SHEET 1 OF 1

4

3

2

1

4

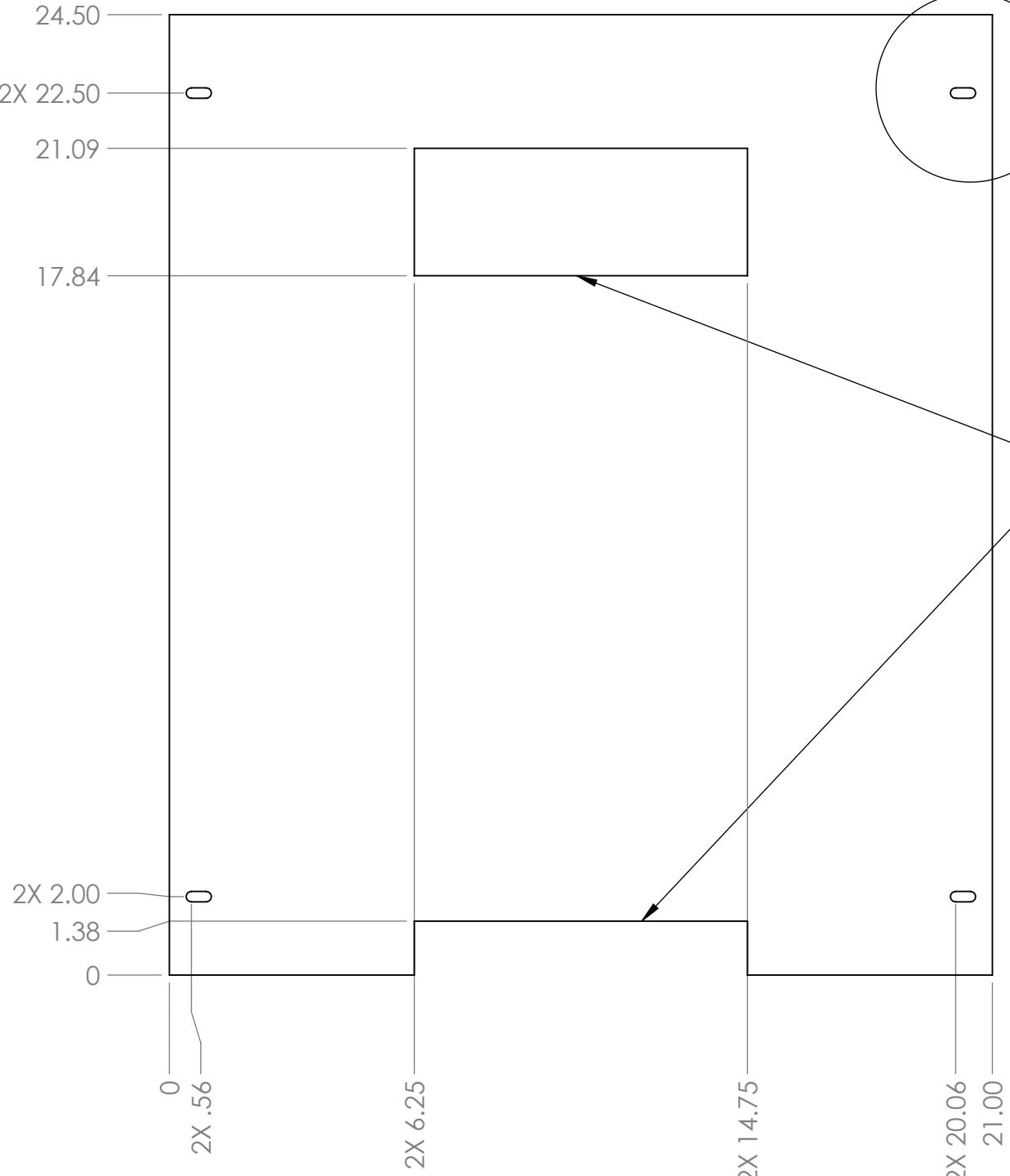
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2

1

B

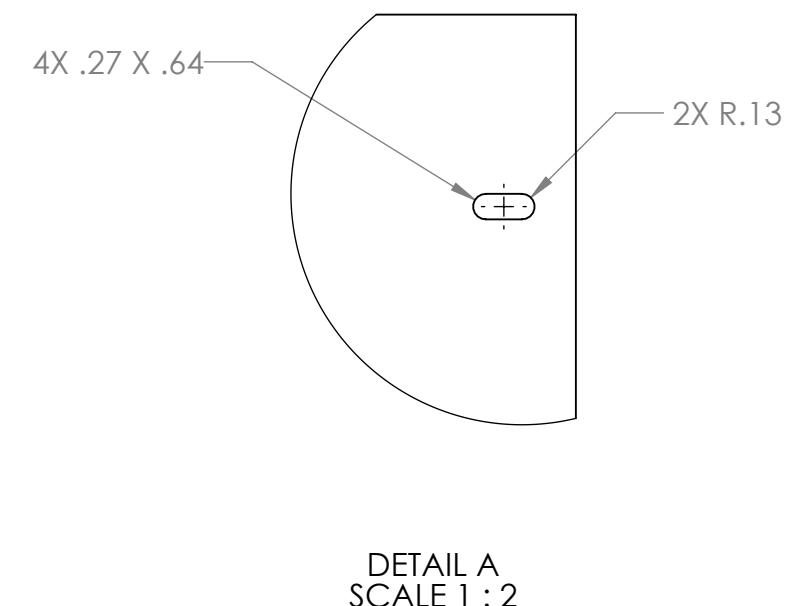
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Note:
Material: 1/8" Thick Polycarbonate Sheet Clear
Remove Sharp Edges and Burrs
Tag and Label With Part Number

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REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
B3	A	Added Hole And Slot 2X 14.75 2X 14.75	10/19/2018	MXS



		UNLESS OTHERWISE SPECIFIED:	NAME	DATE
		DIMENSIONS ARE IN INCHES		
		TOLERANCES:		
		FRACTIONAL: ±1/16		
		ANGULAR: MACH ±1° BEND ±1°		
		TWO PLACE DECIMAL ±.01		
		THREE PLACE DECIMAL ±.001		
		INTERPRET GEOMETRIC		
		TOLERANCING PER:		
		MATERIAL		
		FINISH		
		APPLICATION	DO NOT SCALE DRAWING	

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE:
Keyhole Backing

SIZE	DWG. NO.	REV
B	GE-19147	A
SCALE: 1:4	WEIGHT:	SHEET 1 OF 1

4

3

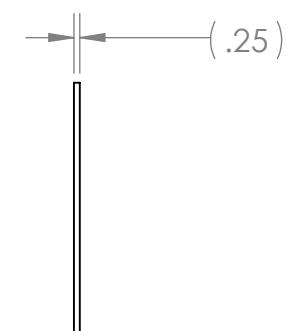
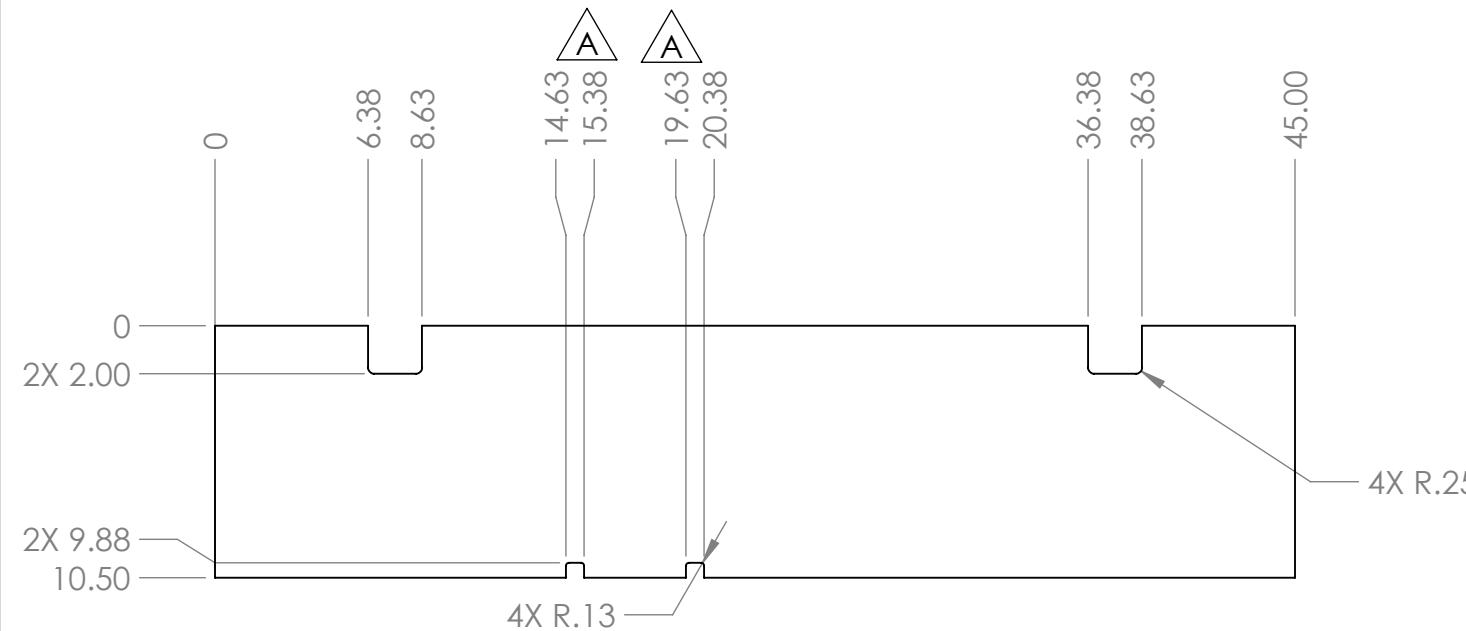
2

1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
B-4	A	Added slots	12/27/2018	DAF

B



Note:

Material: 1/4" Thick Polycarbonate Sheet Clear
Remove Sharp Edges And Burrs
Tag Or Label With Part Number

A

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		DRAWN		
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
		MATERIAL		
		FINISH		
NEXT ASSY	USED ON			
APPLICATION	DO NOT SCALE DRAWING			
SIZE DWG. NO.		REV		
B GE-19148		A		
SCALE: 1:8		WEIGHT:	SHEET 1 OF 1	

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
Bumper Back

4

3

2

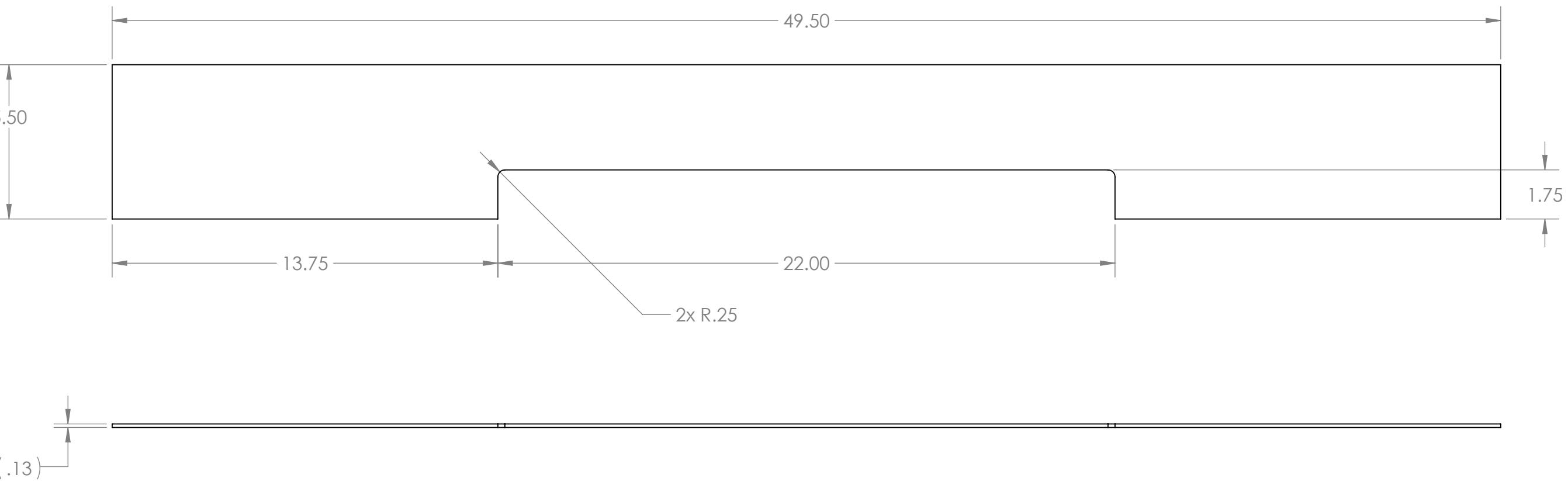
1

4

3

2

1



Notes:

1. Material: 1/8" thick polycarbonate, clear
2. Remove all burrs and sharp edges
3. Tag or label with part number.

4

3

2

1

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
 Modeling Solutions Partner

Bumper Top

SIZE	DWG. NO.	REV
B	GE-19149	
SCALE: 1:4	WEIGHT:	SHEET 1 OF 1

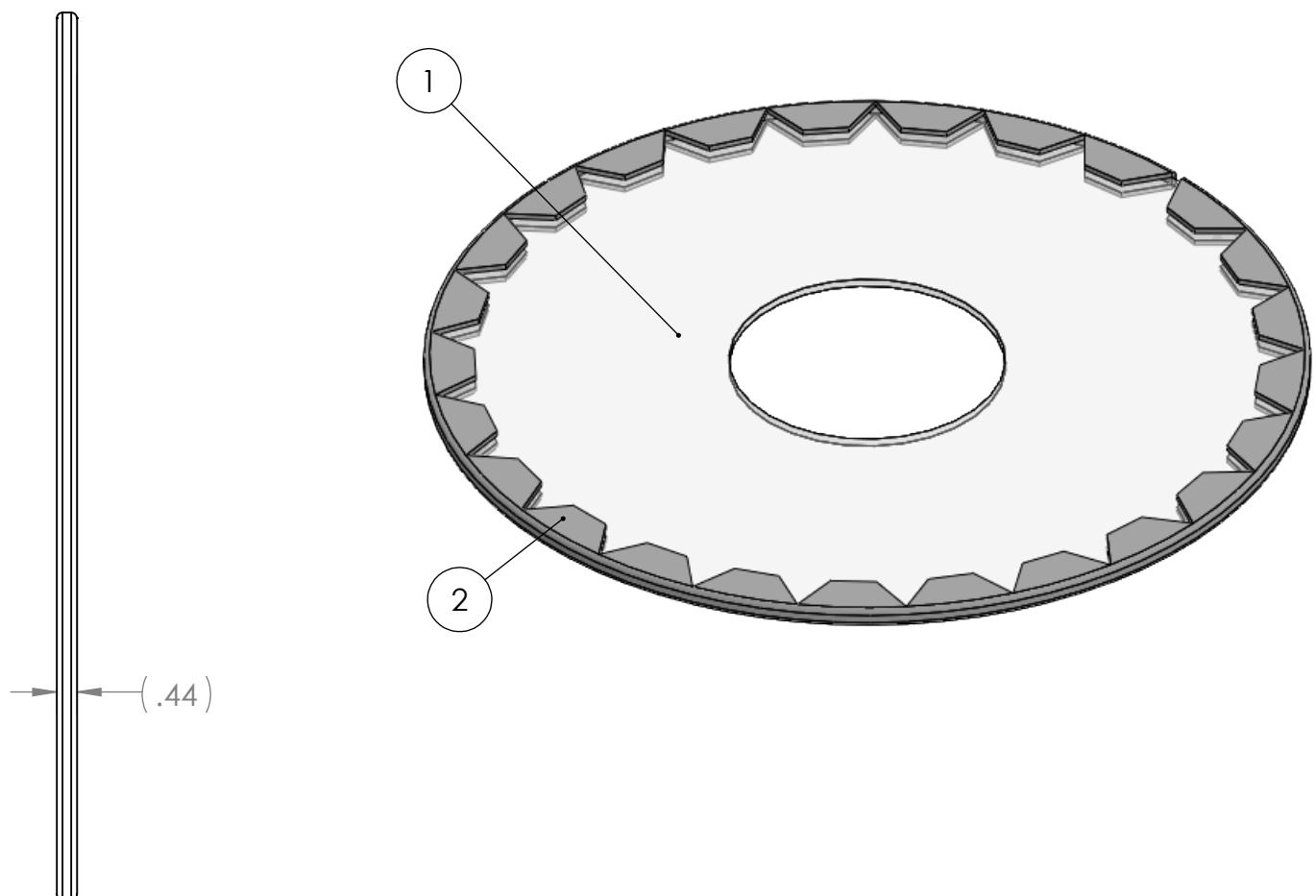
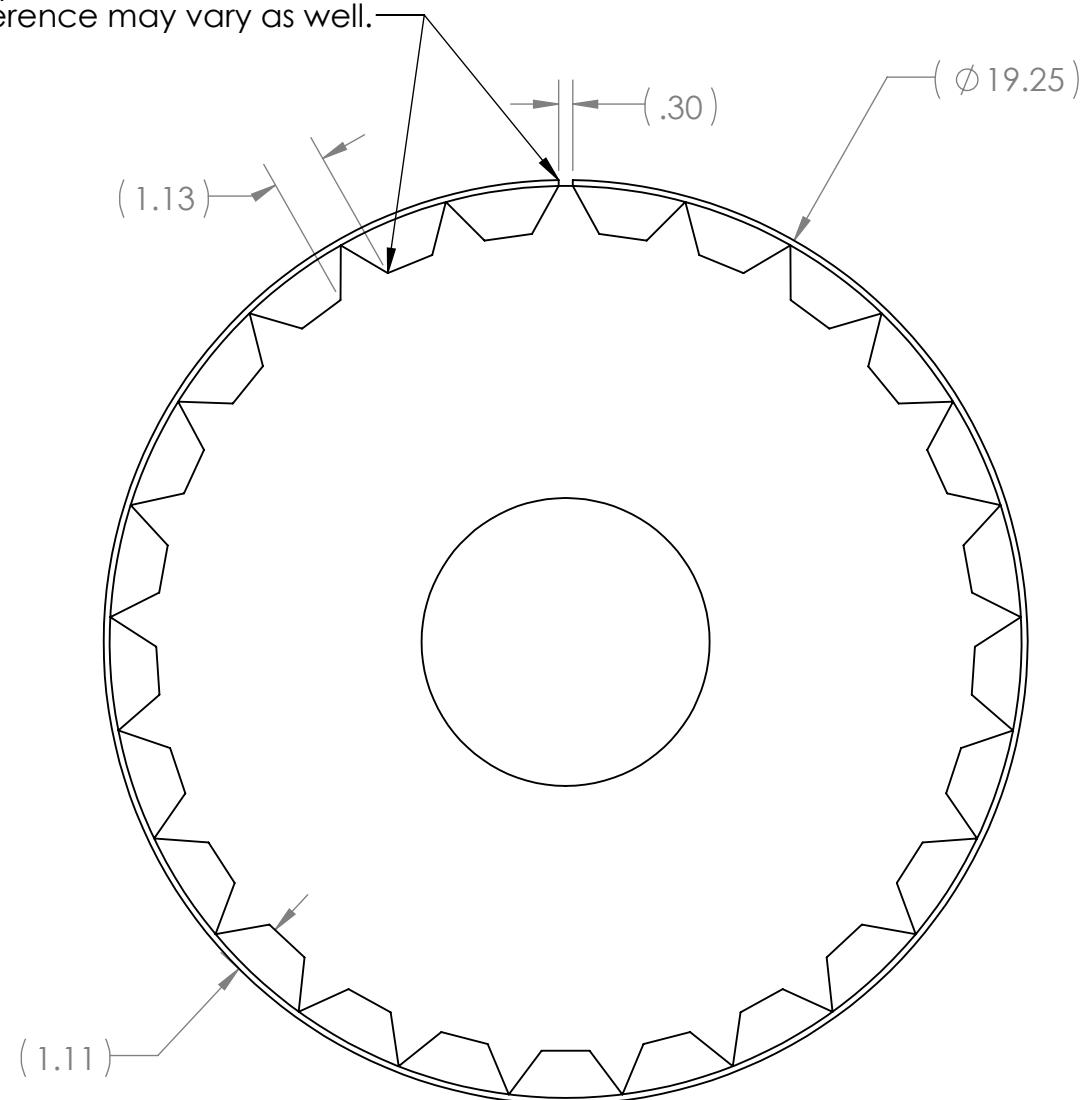
4

3

2

1

Gap sizes are approximate and may vary. Location on the circumference may vary as well.



Notes:
1. Assembly available to teams from VEXpro as item # 217-6562

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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-19151	Panel, Polycarbonate	1
2	GE-19153	Loop, Panel	1

		UNLESS OTHERWISE SPECIFIED:		NAME	DATE
		DIMENSIONS ARE IN INCHES		DRAWN	DAF
		TOLERANCES:		CHECKED	
		FRACTIONAL: ±1/16		ENG APPR.	
		ANGULAR: MACH ±1° BEND ±1°		MFG APPR.	
		TWO PLACE DECIMAL ±.01		Q.A.	
		THREE PLACE DECIMAL ±.001		COMMENTS:	
		INTERPRET GEOMETRIC			
		TOLERANCING PER:			
		MATERIAL			
		NEXT ASSY	USED ON	FINISH	
		APPLICATION		DO NOT SCALE DRAWING	
SIZE	DWG. NO.		REV		
B	GE-19150				
SCALE: 1:4	WEIGHT:		SHEET 1 OF 1		

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

TITLE:
Panel Assembly

4

3

2

1

4

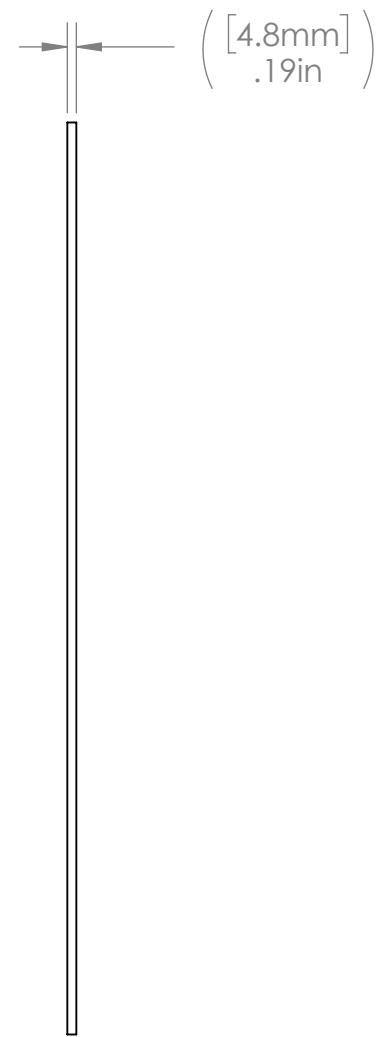
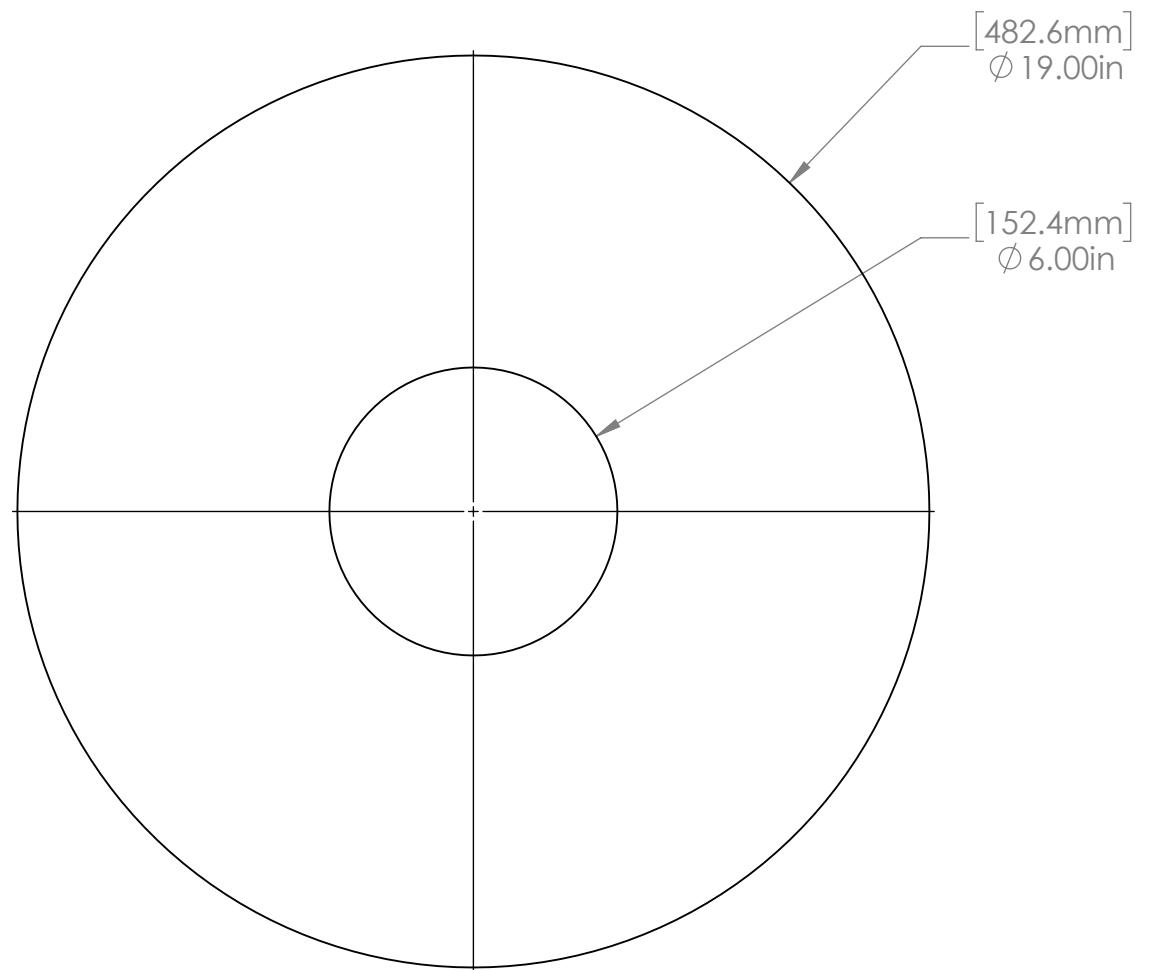
3

2

1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
A3	A	Note about screen printing added.	12/31/2018	CPO



Note:

1. Material: 3/16 Polycarbonate, Clear
2. Remove all burrs and sharp edges.
3. Screen print applied to both faces.



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		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL: ±1/16 ANGULAR: MACH ±1° BEND ±1° TWO PLACE DECIMAL ±.01 THREE PLACE DECIMAL ±.001	NAME DRAWN DAF 8/20/18	DATE
		INTERPRET GEOMETRIC TOLERANCING PER: MATERIAL	CHECKED ENG APPR. MFG APPR.	
	NEXT ASSY	USED ON FINISH	Q.A. COMMENTS:	
	APPLICATION	DO NOT SCALE DRAWING		

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Panel, Polycarbonate

SIZE	DWG. NO.	REV
B	GE-19151	A
SCALE: 1:4	WEIGHT:	SHEET 1 OF 1

4

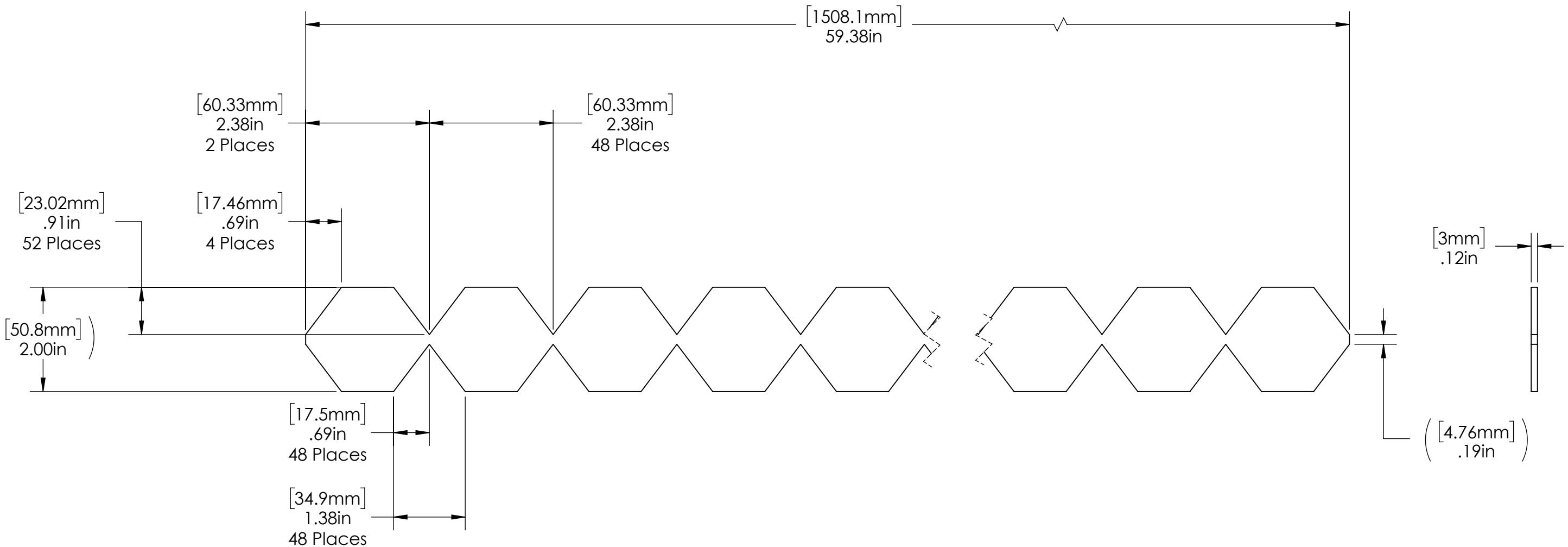
3

2

1

B

B

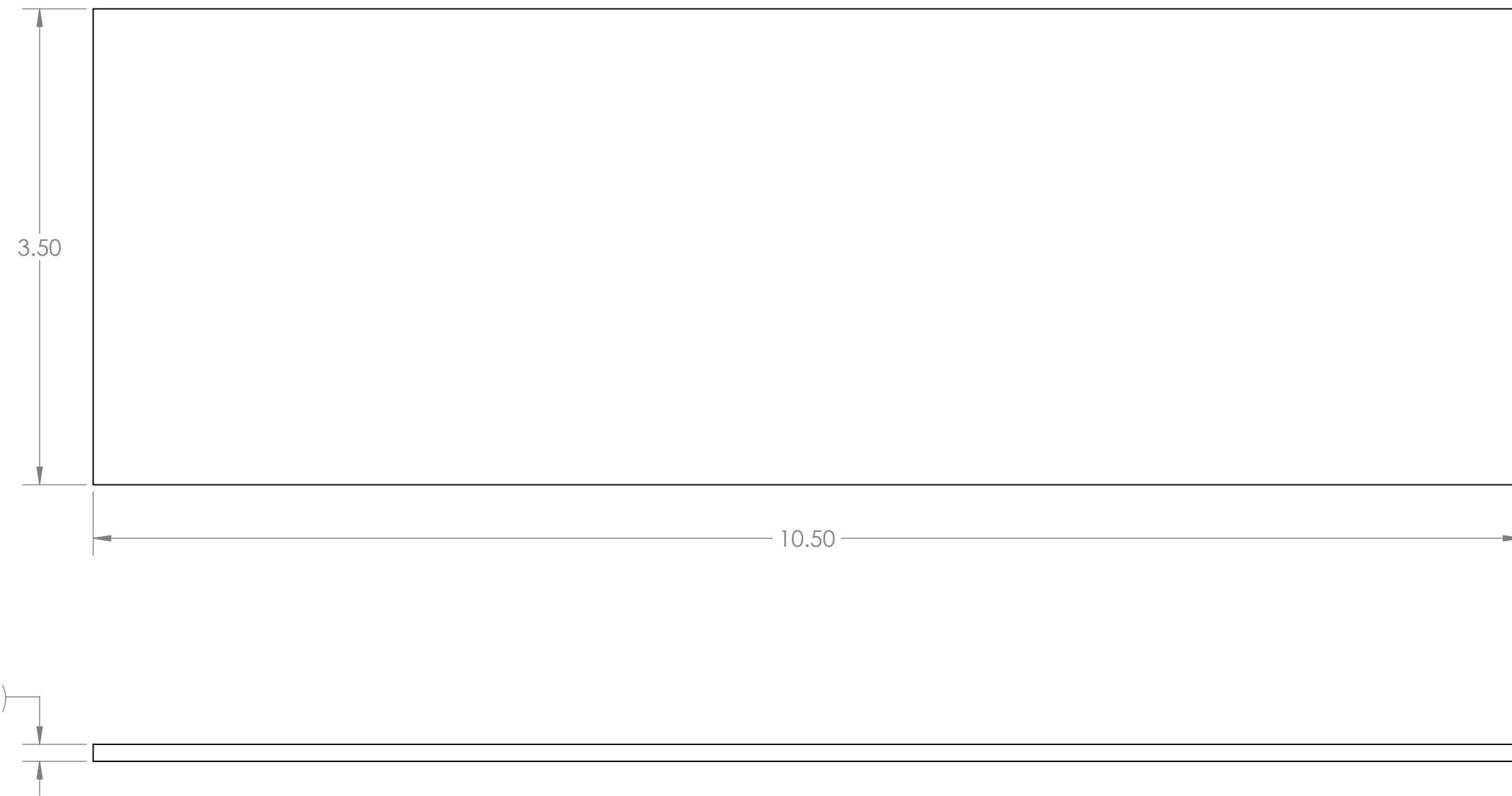


Notes:

1. Material: 2" Loop Fastener, Adhesive Backed. 3M Product SJ3571.
2. Color: White
3. Adhesive: Acrylic Pressure Sensitive Adhesive

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	DRAWN			
	CHECKED			
	ENG APPR.			
	MFG APPR.			
	Q.A.			
	COMMENTS:			
SIZE	DWG. NO.			REV
B	GE-19153			A
SCALE: 1:2	WEIGHT:			SHEET 1 OF 1



Notes:

1. Material: 1/8" thick polycarbonate, clear
2. Remove all burrs and sharp edges.
3. Tag or label with part number.

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Bumper Side

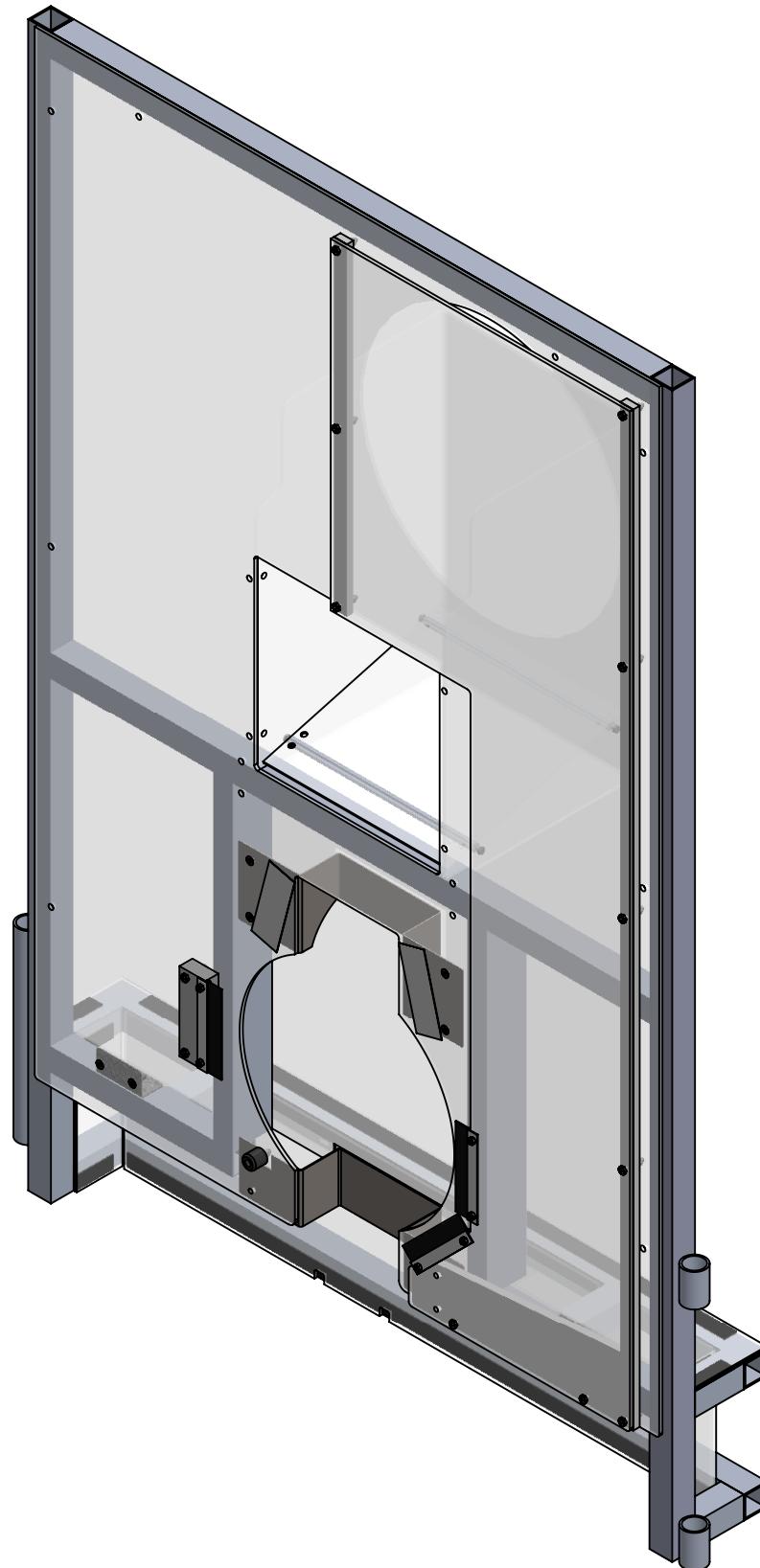
SIZE	DWG. NO.	REV
B	GE-19154	
SCALE: 1:1	WEIGHT:	SHEET 1 OF 1

4

3

2

1



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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-19026	Keyhole Insert	1
2	GE-19098	Keyhole Insert Bottom	1
3	GE-19143	Chute Assembly	1
4	GE-19147	Keyhole Backing	1
5	GE-19148	Bumper Back	1
6	GE-19149	Bumper Top	1
7	GE-19154	Bumper Side	2
8	GE-19156	Plastic Assembly, Loading Station, Left	1
9	GE-19159	Feeder Station Frame	1
10	Hook_1_28	1" x 28" Hook Fastener, Adhesive Backed	1
11	Hook_1_3	1" x 3" Hook Fastener, Adhesive Backed	6
12	Hook_1_45	1" X 45" Hook Fastener, Adhesive Backed	2
13	Loop_1_28	1" x 28" Loop Fastener, Adhesive Backed	1
14	Loop_1_3	1" x 3" Loop Fastener, Adhesive Backed	6
15	Loop_1_45	1" x 45" Loop Fastener, Adhesive Backed	2
16	flat_hex_.25_20_1	Steel Hex Flat Head Screw, 1/4"-20 x 1" long, fully threaded	4
17	hex_.25_20_.75	Steel Hex Head Screw, 1/4"-20 x 3/4" long, fully threaded	4
18	nylock_.25_20	Steel Nylon-Insert Locknut, 1/4"-20	4

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE:
Loading Station Assembly, Left

SIZE	DWG. NO.	REV
B	GE-19155	
SCALE: 1:10	WEIGHT:	SHEET 1 OF 4

4

3

2

1

4

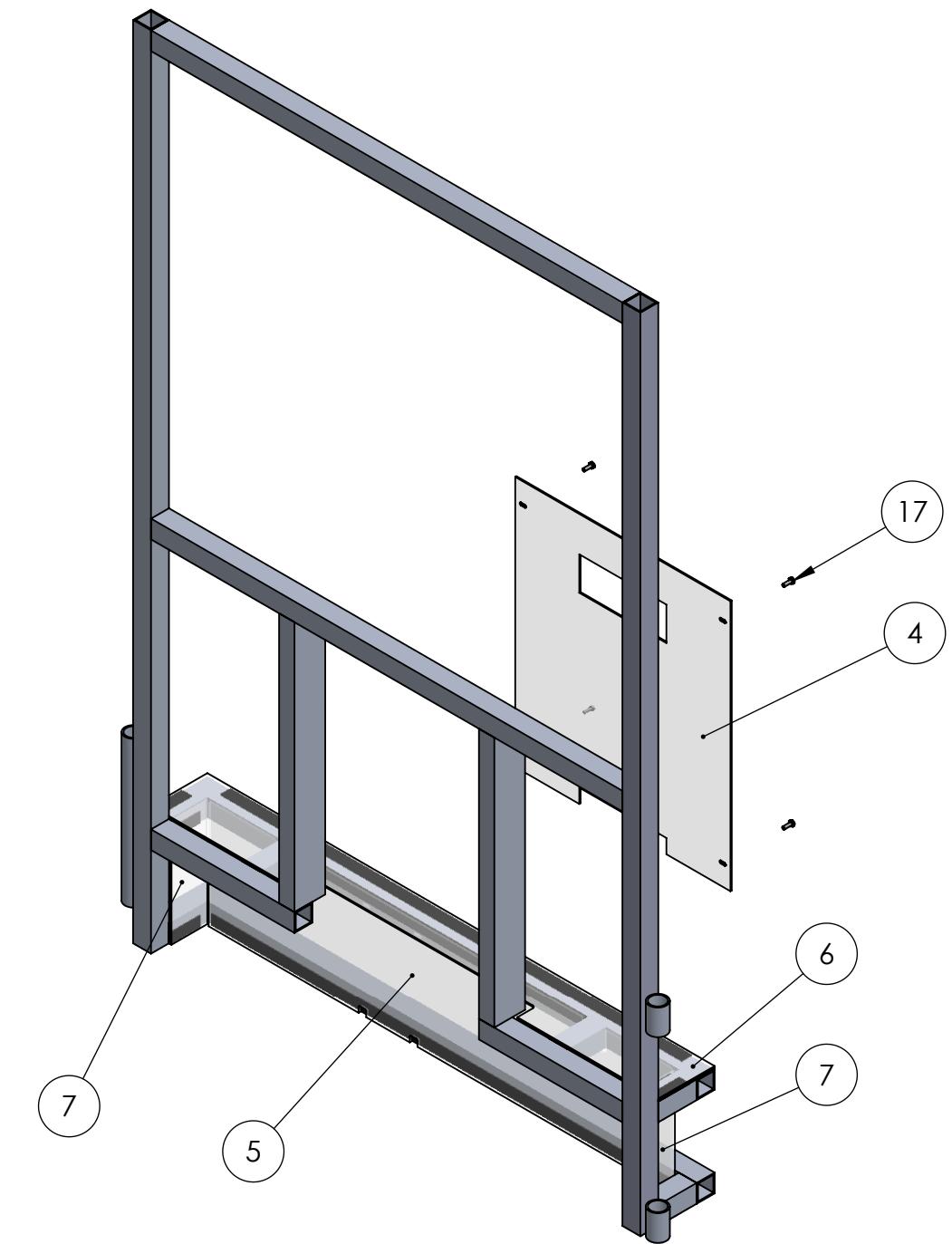
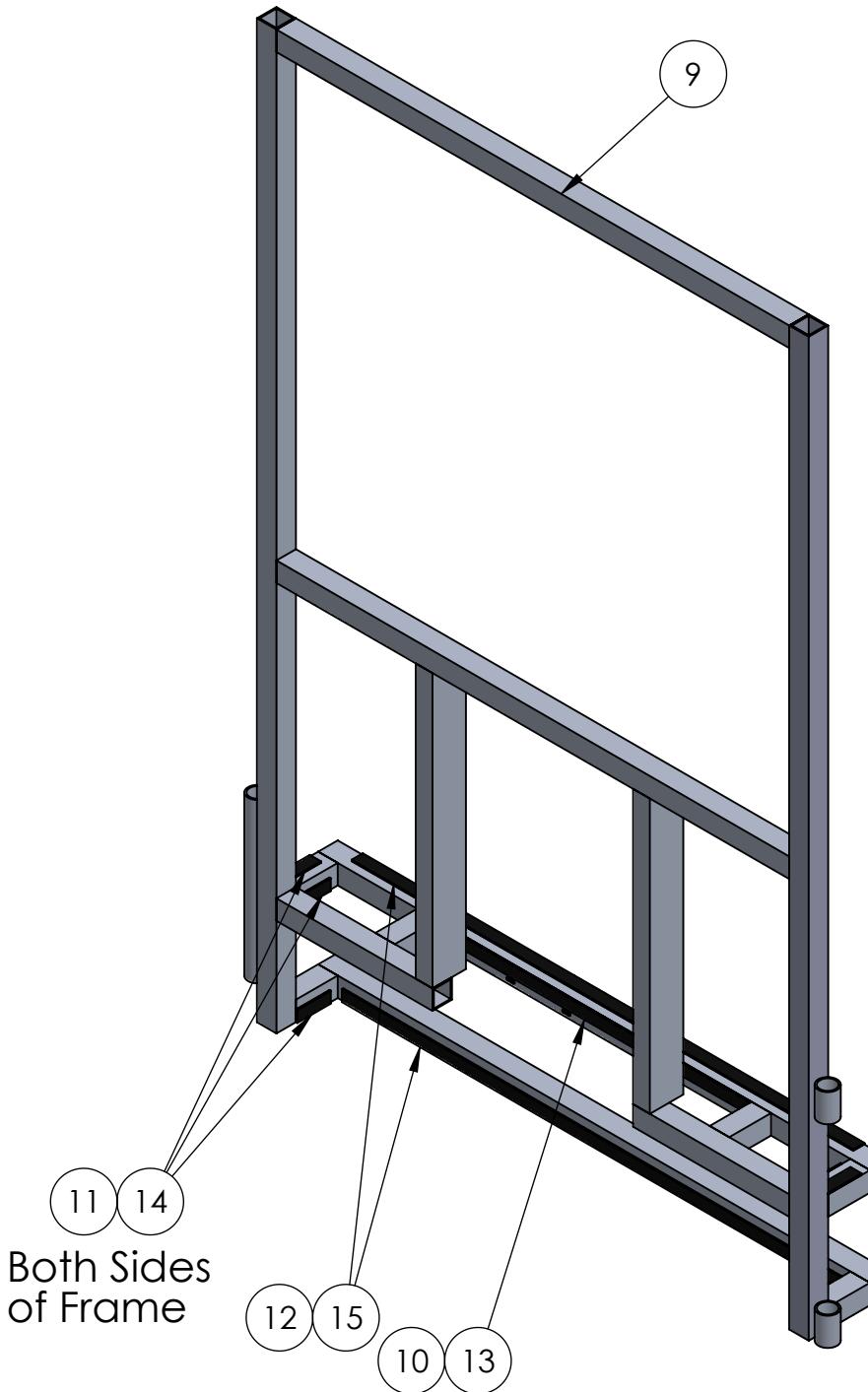
3

2

1

B

B

Both Sides
of Frame

Notes:

1. Apply the hook fastener to the aluminum frame.
2. Attach the loop fastener to the hook.
3. Peel the protective backing off the loop.

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Loading Station Assembly, Left

SIZE	DWG. NO.	REV
B	GE-19155	

SCALE: 1:12 WEIGHT: SHEET 2 OF 4

4

3

2

1

4

3

2

1

B

B

Cable tie Item (3) to Item (8) at four places.

3

8

9

Cable tie Item (8) to Item (9) at all available locations.

Attach (1) to Item (8) with hardware. 4 places

(18 1 16)

2

Cable tie Item (2) to Item (8) at two locations

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		UNLESS OTHERWISE SPECIFIED:	NAME	DATE
DIMENSIONS ARE IN INCHES				
TOLERANCES:				
FRACTIONAL $\pm 1/16$				
ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$				
TWO PLACE DECIMAL $\pm .01$				
THREE PLACE DECIMAL $\pm .001$				
INTERPRET GEOMETRIC TOLERANCING PER:				
MATERIAL				
NEXT ASSY	USED ON	FINISH		
APPLICATION		DO NOT SCALE DRAWING		
TITLE: Loading Station Assembly, Left				
SIZE	DWG. NO.		REV	
B	GE-19155			
SCALE: 1:12	WEIGHT:		SHEET 3 OF 4	

4

3

2

1

4

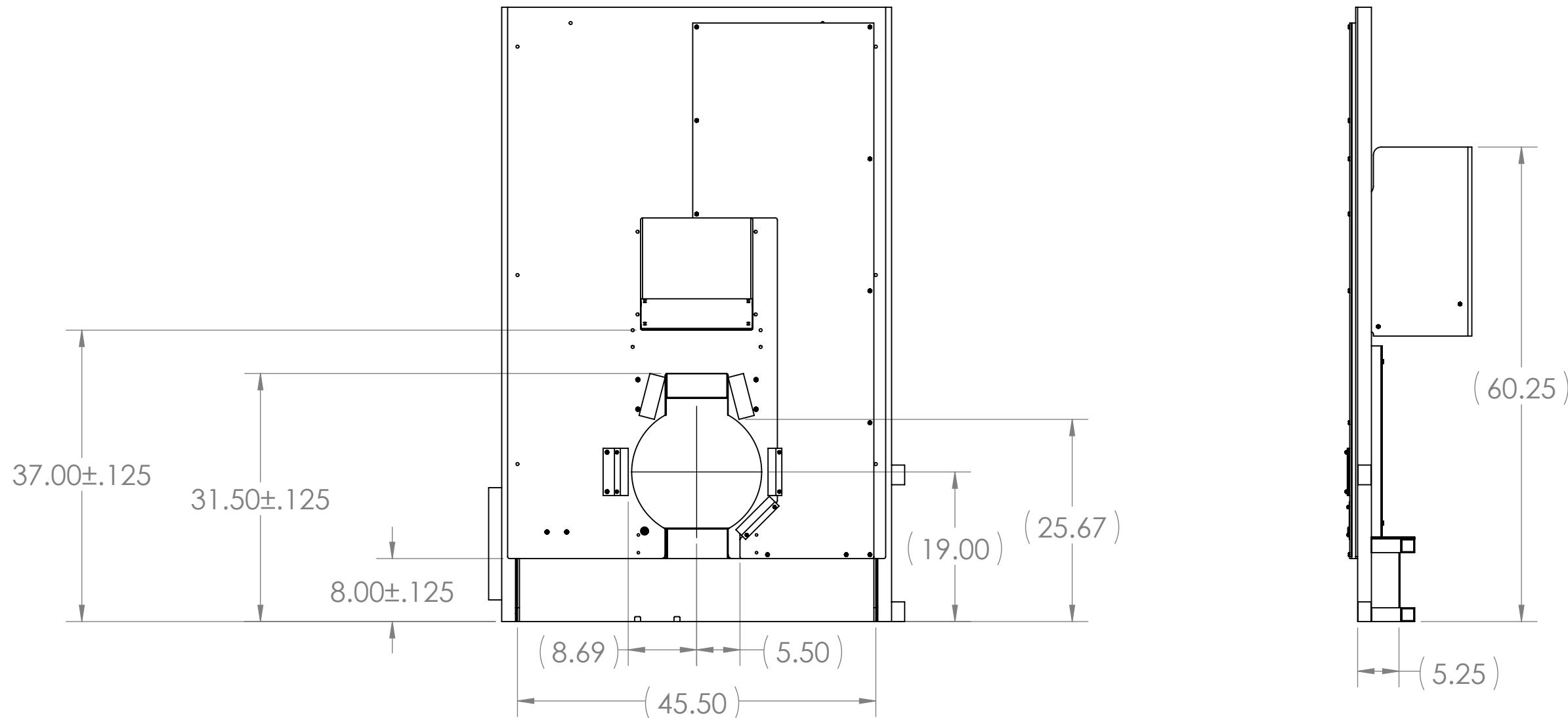
3

2

1

B

B



A

A

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Loading Station Assembly, Left

SIZE	DWG. NO.	REV
B	GE-19155	
SCALE: 1:16	WEIGHT:	SHEET 4 OF 4

4

3

2

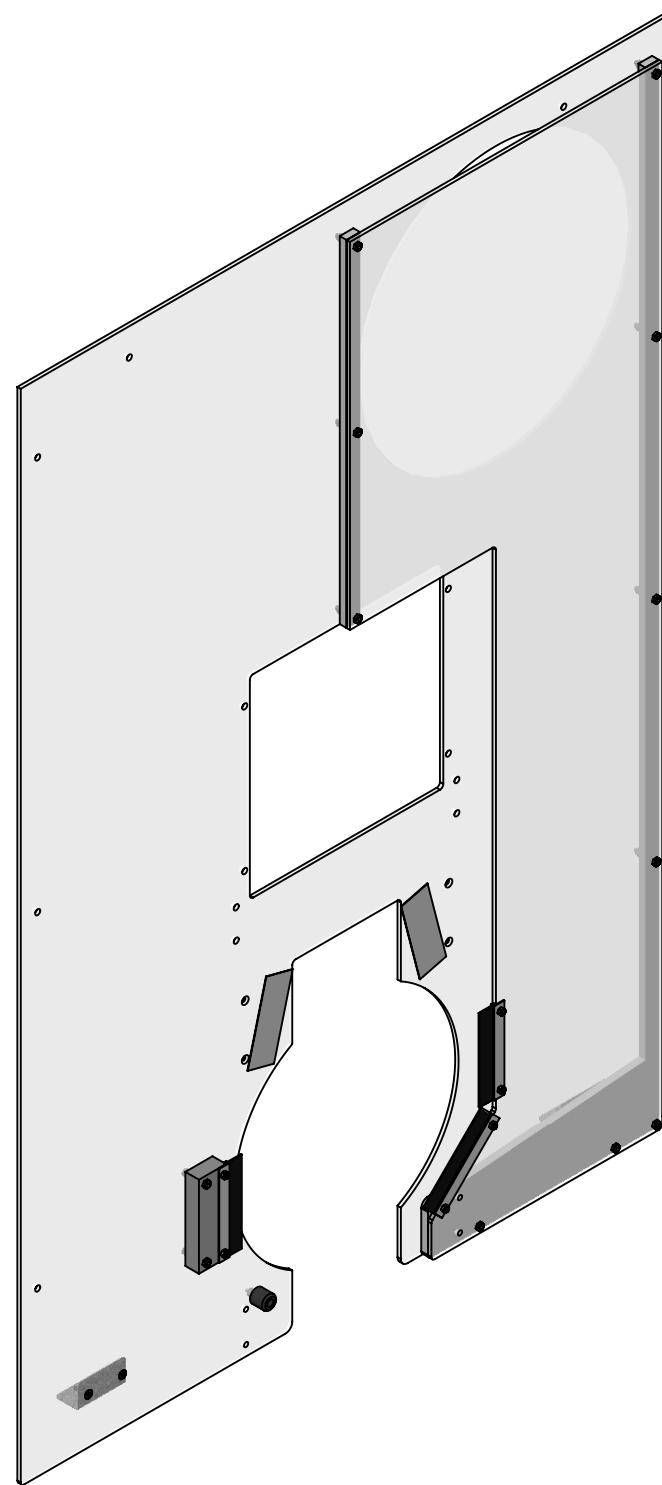
1

4

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2

1



B

B

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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-19134	Slot Guide, Large	1
2	GE-19135	Slot Guide, Small	1
3	GE-19138	Slot Guide, Angled	1
4	GE-19139	Slot Stop	1
5	GE-19140	Bumper, Rubber	1
6	GE-19142	Angle, Support	2
7	GE-19157	Loading Station Panel, Left	1
8	GE-19158	Slot Cover	1
9	GE-19190	6" brush	3
10	VisionTape	2" x 5.5" Retroreflective tape	2
11	button_hex_.25_20_1.25	Button Head, Hex, 1/4-20 x 1.25	1
12	flat_hex_.25_20_1	Steel Hex Flat Head Screw, 1/4"-20 x 1" long, fully threaded	4
13	flat_hex_10_32_1.375	Flat Head, Hex, 10-32 x 1.375"	2
14	flat_hex_10_32_.625	Flat Head, Hex, 10-32 x .625"	4
15	hex_.25_20_1.5	Steel Hex Head Screw, 1/4"-20 x 1-1/2" long, fully threaded	12
16	nylock_.25_20	Steel Nylon-Insert Locknut, 1/4"-20	17
17	nylock_10_32	Low-Strength Steel Nylon-Insert Locknut, Zinc-Plated, 10-32 Thread Size	6

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Plastic Assembly, Loading Station, Left

SIZE DWG. NO. **REV**
B **GE-19156**

SCALE: 1:16 WEIGHT: SHEET 1 OF 2

4

3

2

1

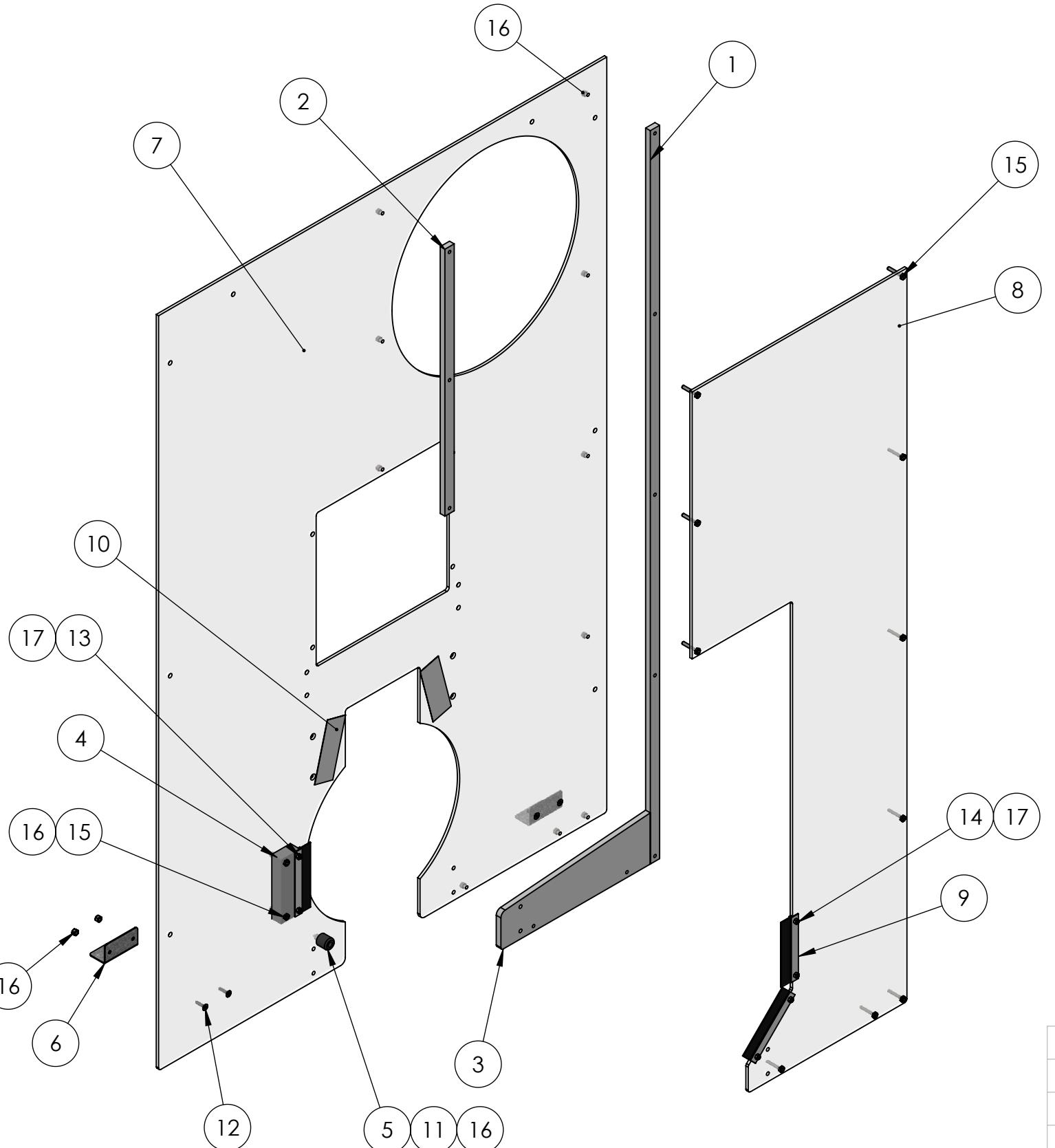
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3

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1

B



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		DETAIL A		NAME	DATE
		DIMENSIONS ARE IN INCHES			
		TOLERANCES:			
		FRACTIONAL: $\pm 1/16$			
		ANGULAR: MACH $\pm 1^\circ$	BEND $\pm 1^\circ$		
		TWO PLACE DECIMAL $\pm .01$			
		THREE PLACE DECIMAL $\pm .001$			
		INTERPRET GEOMETRIC			
		TOLERANCING PER:			
		MATERIAL			
		NEXT ASSY	USED ON	FINISH	
		APPLICATION		DO NOT SCALE DRAWING	
SCALE: 1:10		WEIGHT:		SHEET 2 OF 2	

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

DETAIL A
TITLE:
Plastic Assembly,
Loading Station, Left

B DWG. NO. **GE-19156** REV

4

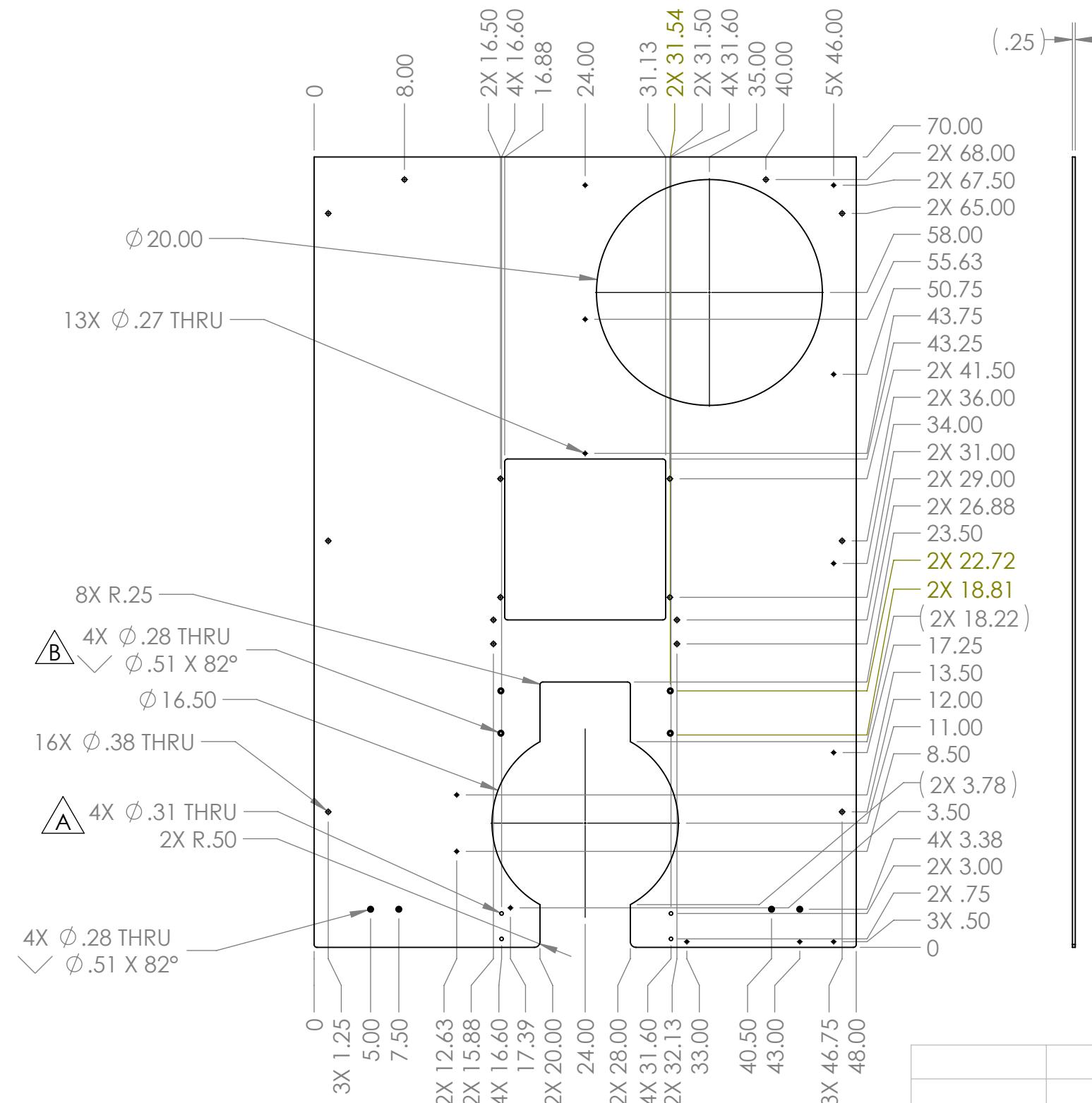
3

2

1

B

B



A

A

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REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
A4	A	Added 8 .31 Holes	10/17/2018	MXS
A4	B	4X Ø.31 changed to C'sink	11/15/2018	DAF

- Notes:
- Material: 1/4" Polycarbonate, Clear
 - Remove all burrs and sharp edges.
 - 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 $\pm .001$	NAME	DATE
	DRAWN		
	CHECKED		
	ENG APPR.		
	MFG APPR.		
	Q.A.		
	COMMENTS:		
	INTERPRET GEOMETRIC TOLERANCING PER: MATERIAL		
	NEXT ASSY	USED ON	FINISH
	APPLICATION	DO NOT SCALE DRAWING	

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Title: Loading Station Panel, Left

Size: DWG. NO. **B** **GE-19157** **Rev:** **B**
Scale: 1:12 **Weight:** **Sheet 1 of 1**

4

3

2

1

4

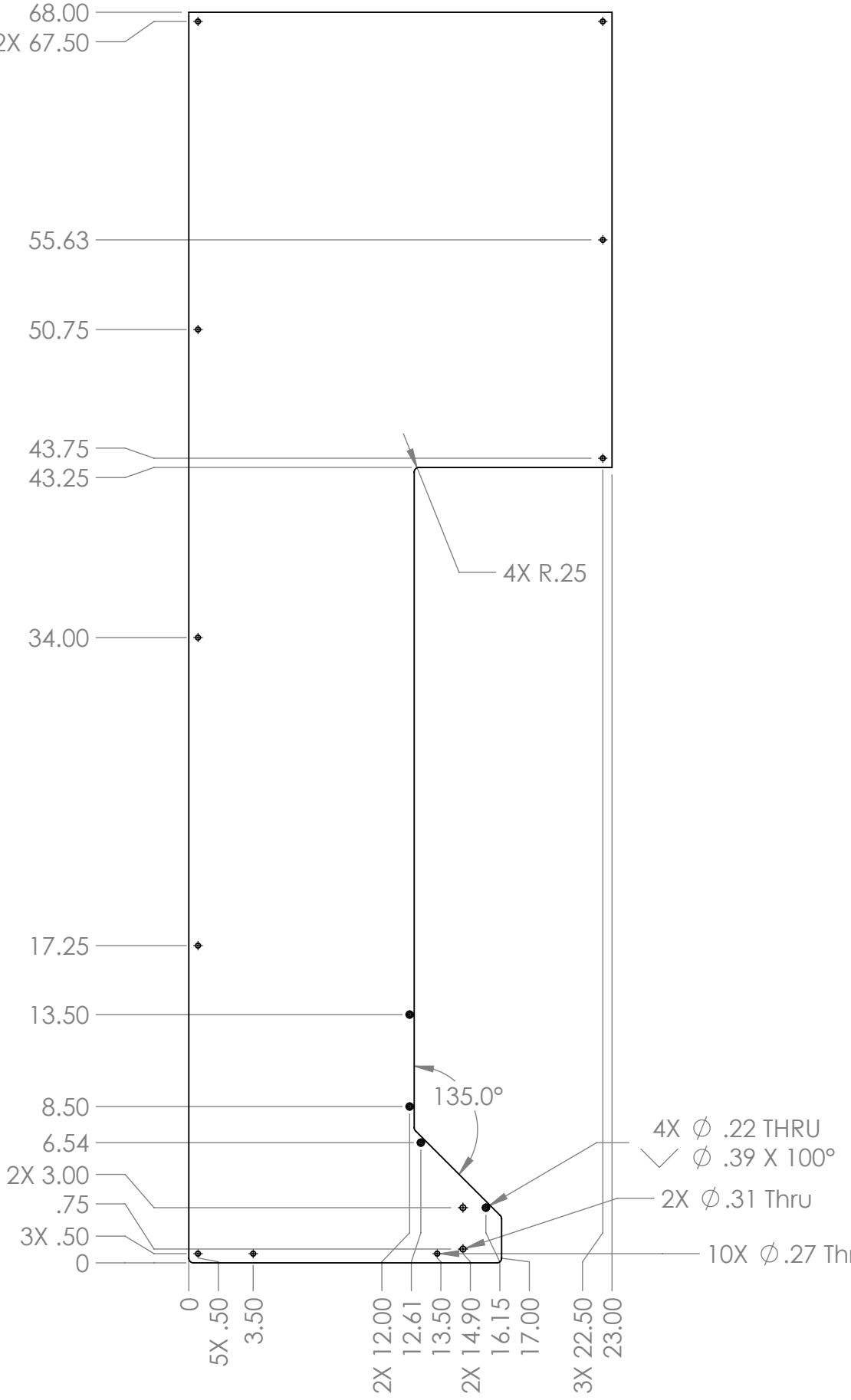
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B

B



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		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$	NAME	DATE
		DRAWN		
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
		MATERIAL		
		FINISH		
	NEXT ASSY	USED ON		
	APPLICATION	DO NOT SCALE DRAWING		
SIZE	DWG. NO.	REV		
B	GE-19158			
SCALE: 1:8	WEIGHT:	SHEET 1 OF 1		

Note:

1. Material: 1/4" Thick Polycarbonate Sheet Clear
2. Remove Sharp Edges and Burrs
3. Tag or Label With Part Number

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

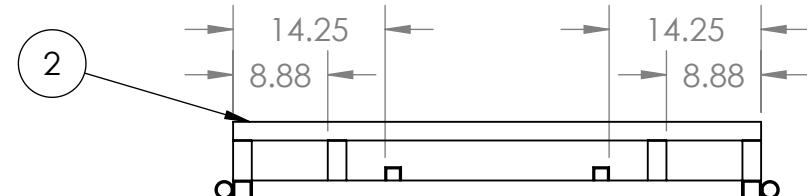
TITLE: **Slot Cover**

4

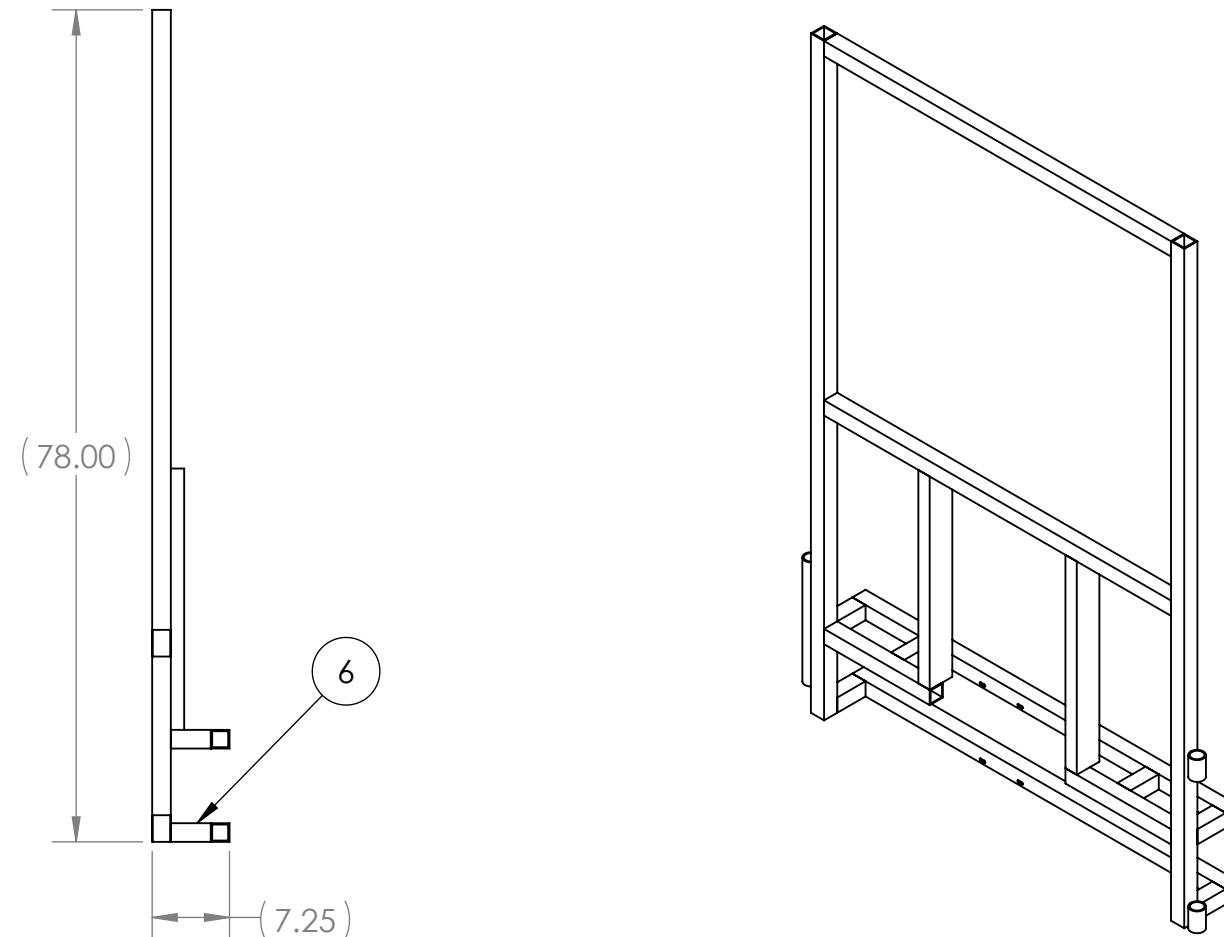
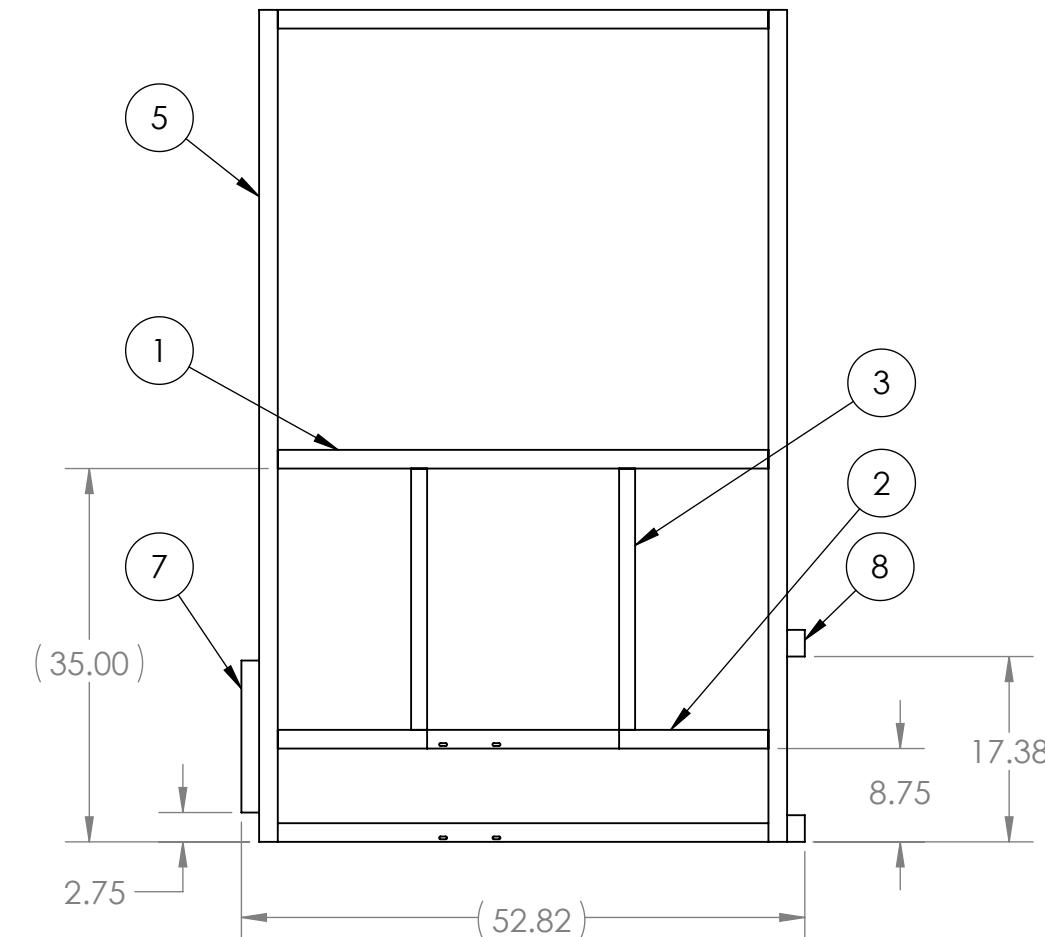
3

2

1



REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
A3	A	Corrected Item 3 Material Description	10/30/2018	DAF



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-19159-01	1-3/4" x .125" thk. Square Tubing, 6063 Aluminum	2
2	GE-19159-02	1-3/4" x .125" thk. Square Tubing, 6063 Aluminum	2
3	GE-19159-03	1.5" x 3" x .125" Rectangular Tubing, 6061 Aluminum	2
4	GE-19159-04	1-3/4" x .125" thk. Square Tubing, 6063 Aluminum	2
5	GE-19159-05	1-3/4" x .125" thk. Square Tubing, 6063 Aluminum	2
6	GE-19159-07	1-3/4" x .125" thk. Square Tubing, 6063 Aluminum	6
7	GE-19159-06	1-1/4" Schedule 40 Pipe, 6061 Aluminum	1
8	GE-19159-08	1-1/4" Schedule 40 Pipe, 6061 Aluminum	2

A

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

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
**Loading Station
Frame, Left**

SIZE DWG. NO. REV
B GE-19159 A

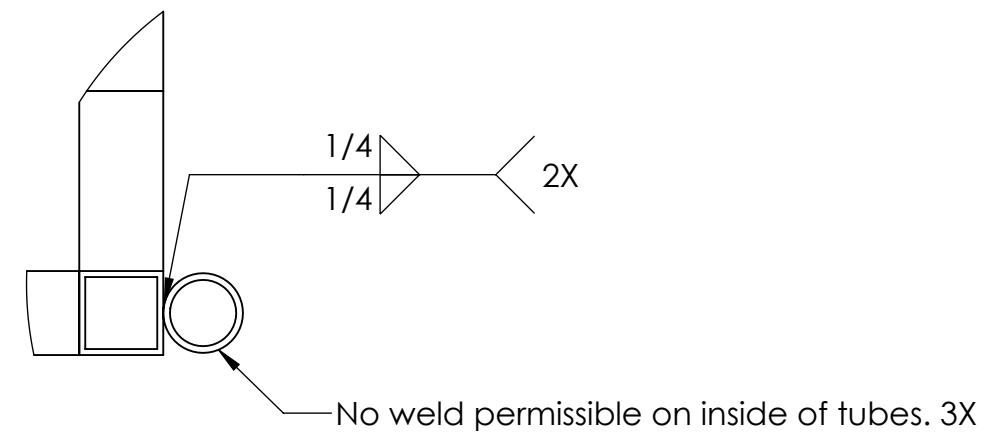
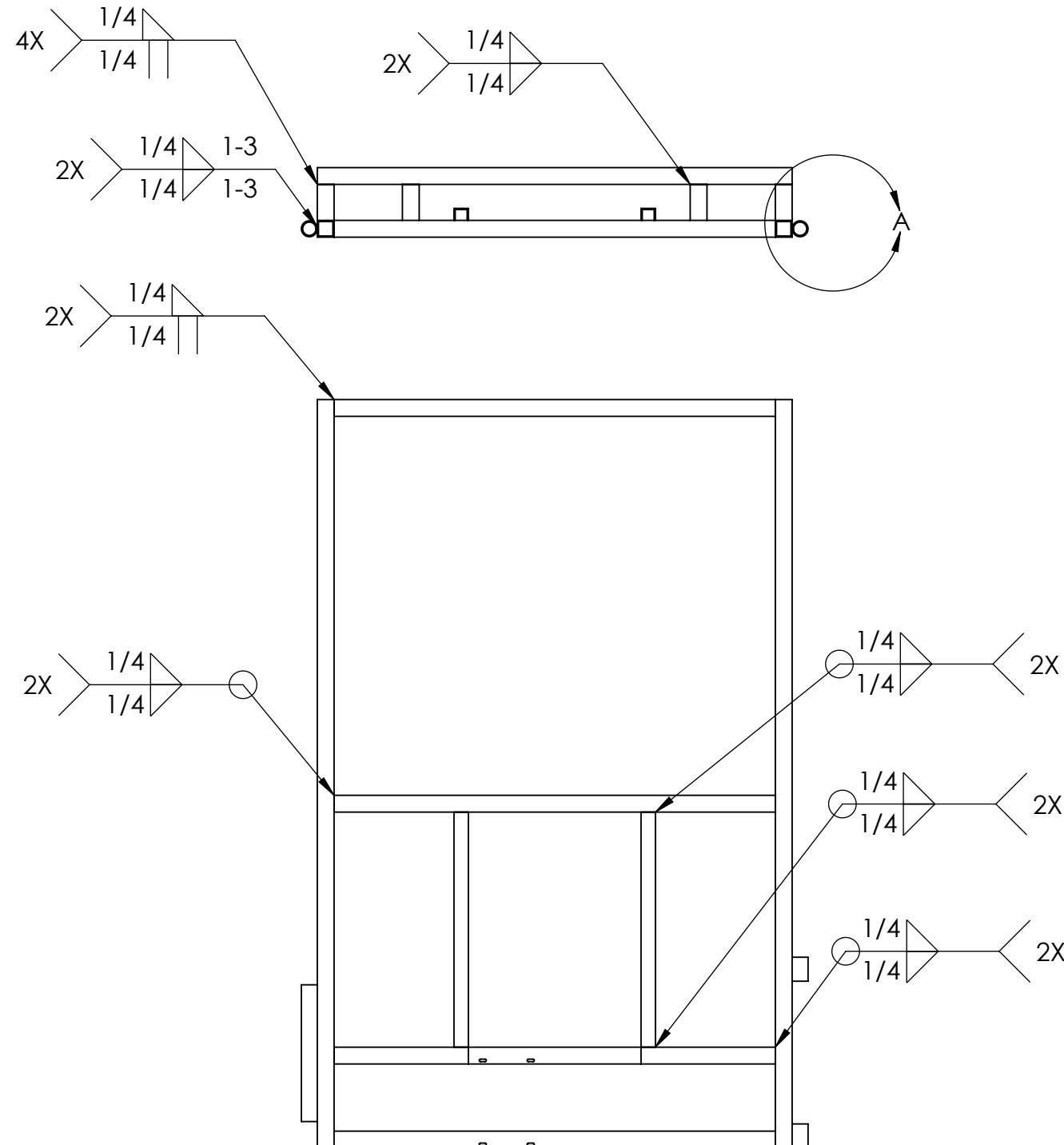
SCALE: 1:18 WEIGHT: SHEET 1 OF 4

4

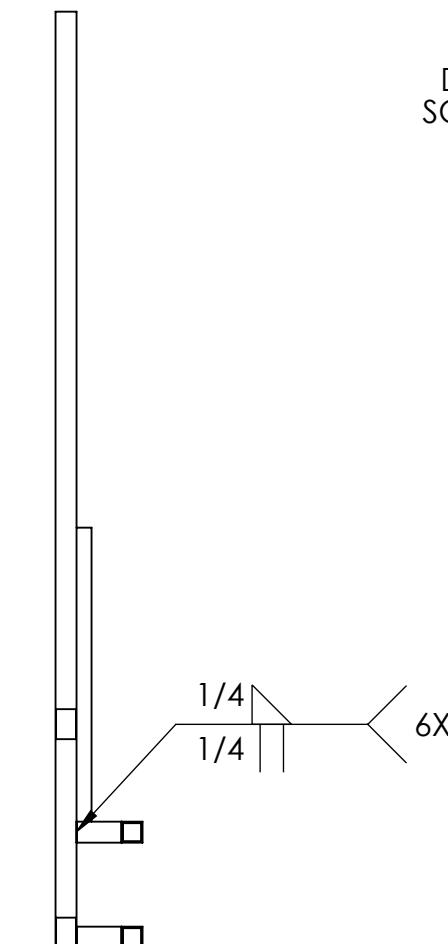
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DETAIL A
SCALE 1 : 4



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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE:
Loading Station Frame, Left

SIZE DWG. NO. REV
B GE-19159 A

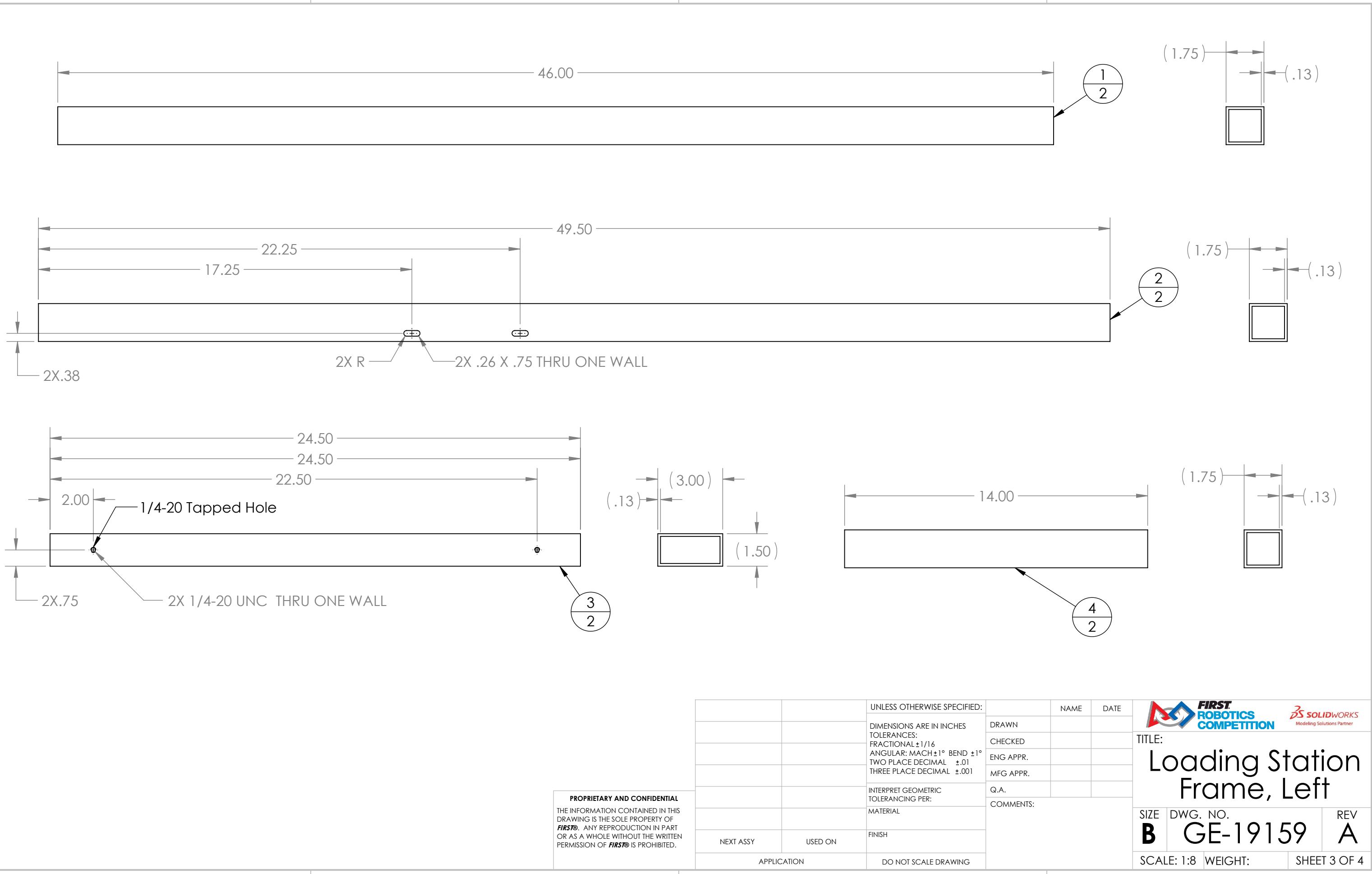
SCALE: 1:16 WEIGHT: SHEET 2 OF 4

4

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Title: Loading Station Frame, Left

Size: B **Dwg. No.:** GE-19159 **Rev.:** A

Scale: 1:8 **Weight:** **Sheet 3 of 4**

4

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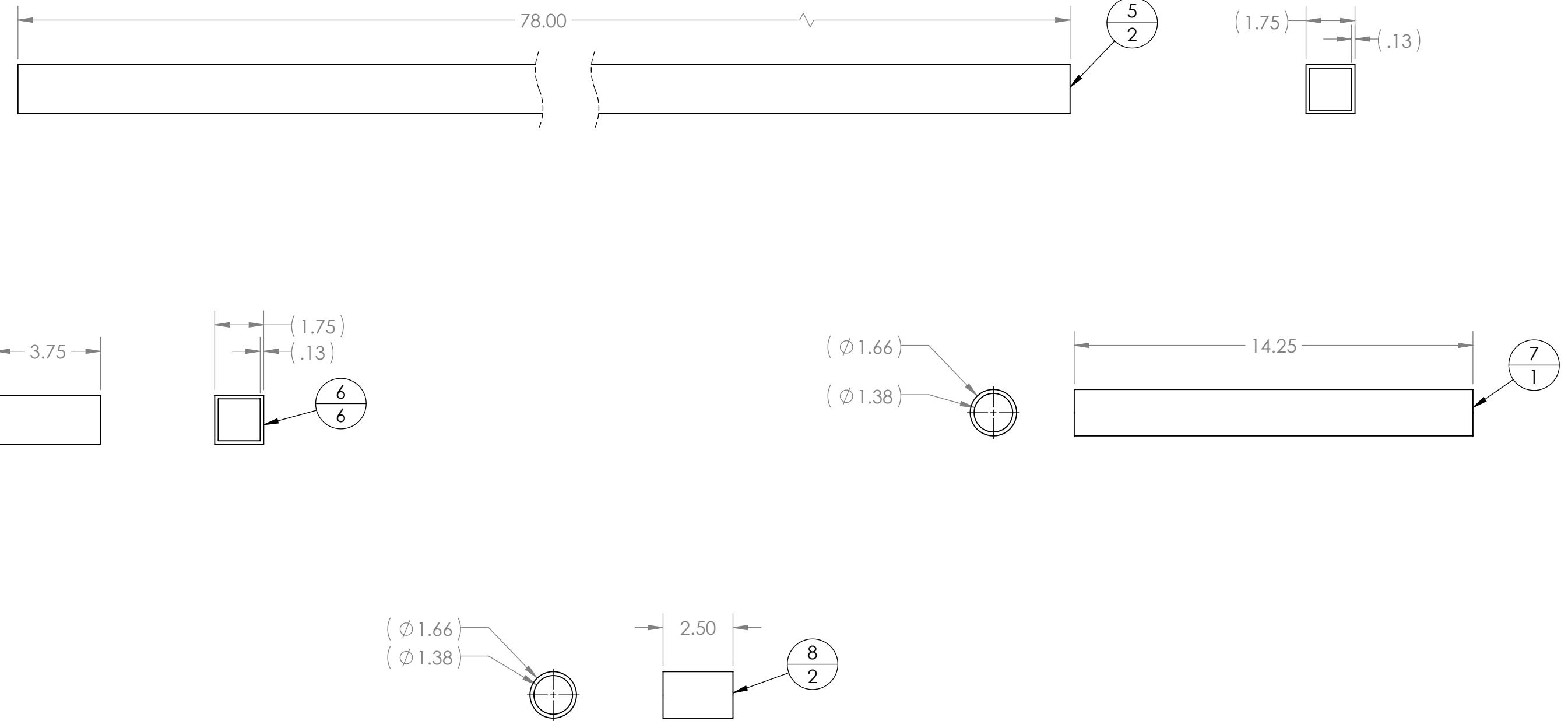
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		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$		NAME	DATE
		DRAWN			
		CHECKED			
		ENG APPR.			
		MFG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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Title: Loading Station Frame, Left

Size: DWG. NO. **B** GE-19159 **Rev:** **A**

Scale: 1:12 **Weight:** **Sheet 4 of 4**

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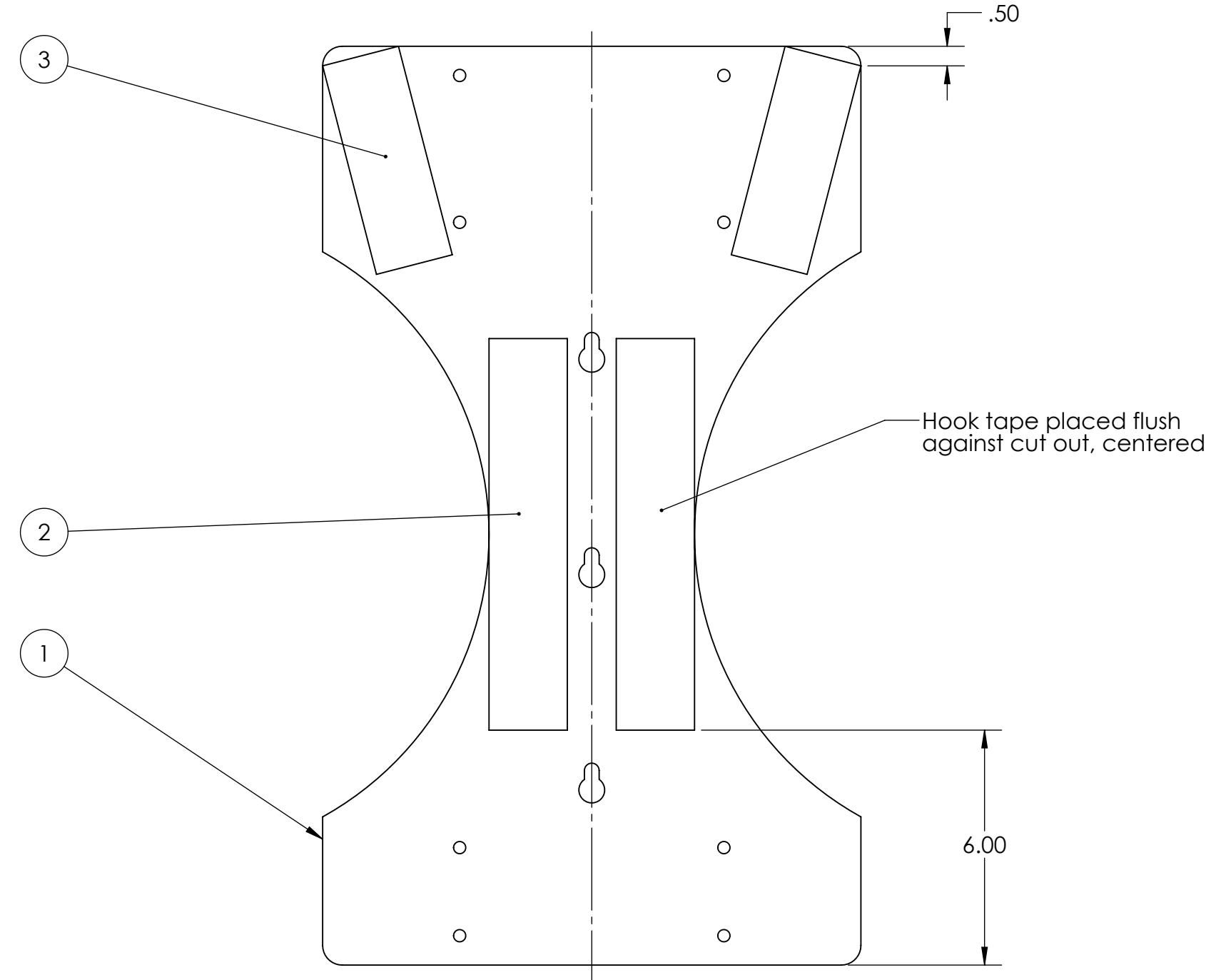
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B

B



Notes:
1. Assembly exists in red and blue configurations.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.	PROPRIETARY AND CONFIDENTIAL
1	GE-19076	Cargo Ship Panel Plastic Full	1	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.
2	Hook_2_10	2" x 10" Hook, Adhesive Backed	2	
3	VisionTape	2" x 5.5" Retroreflective tape	2	

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Panel Plastic Full Assembly

SIZE **DWG. NO.** **REV**
B **GE-19165**

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

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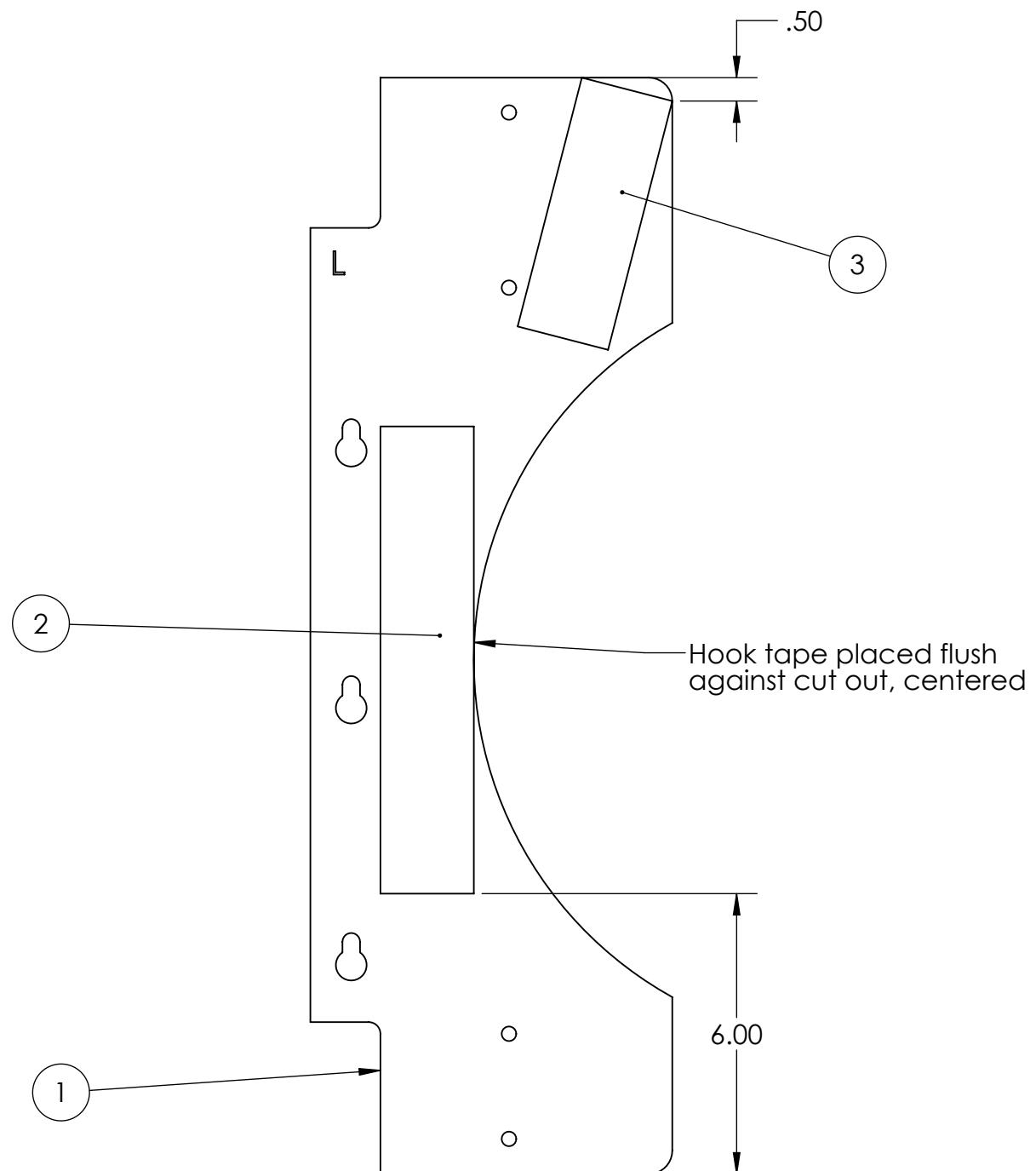
3

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Notes:
1. Assembly exists in red and blue configurations.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY	PROPRIETARY AND CONFIDENTIAL
1	GE-19210	Cargo Ship Panel Plastic Left	1	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.
2	Hook_2_10	2" x 10" Hook, Adhesive Backed	1	
3	VisionTape	2" x 5.5" Retroreflective tape	1	

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Panel Plastic Half Assembly, Left

SIZE	DWG. NO.	REV
B	GE-19166	
SCALE: 1:8	WEIGHT:	SHEET 1 OF 1

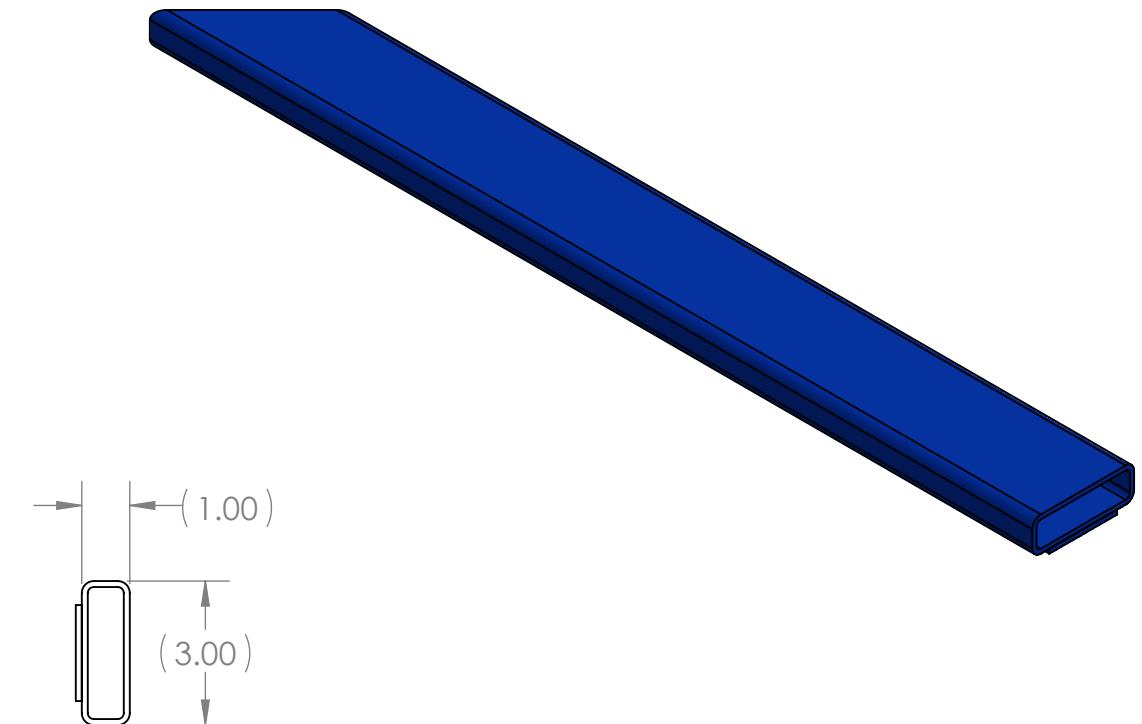
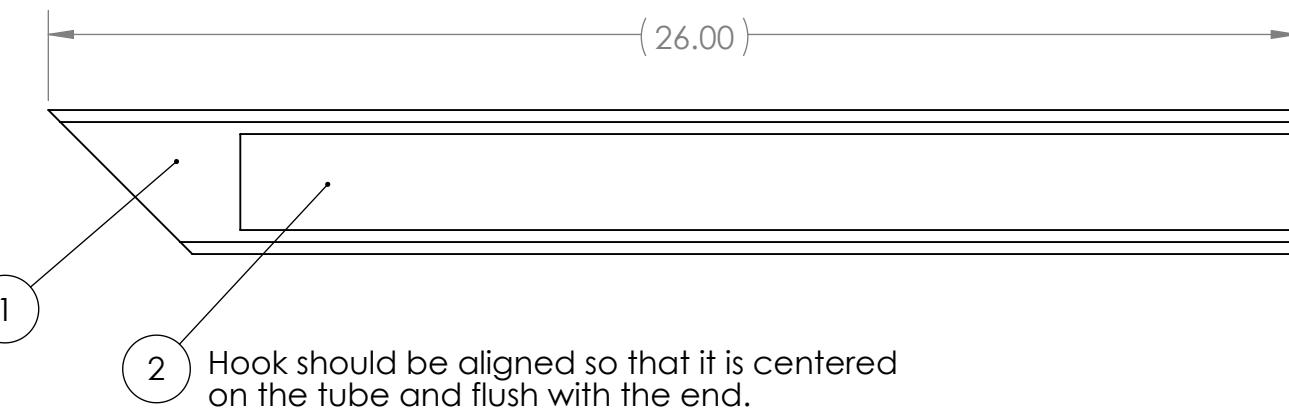
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B

Note: Item 1 can be either blue or red. Please see part drawing for more details.

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ITEM NO.	PART NUMBER	DESCRIPTION	Default/QTY.
1	GE-19038	Corral Tube Small	1
2	Hook_2_22	2" x 22" Hook Fastener, Adhesive Backed	1

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE:
Corral Tube Left Small Fastener Assembly

SIZE	DWG. NO.	REV
B	GE-19167	
SCALE: 1:4	WEIGHT:	SHEET 1 OF 1

4

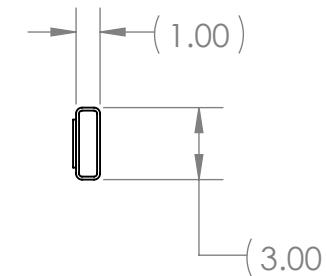
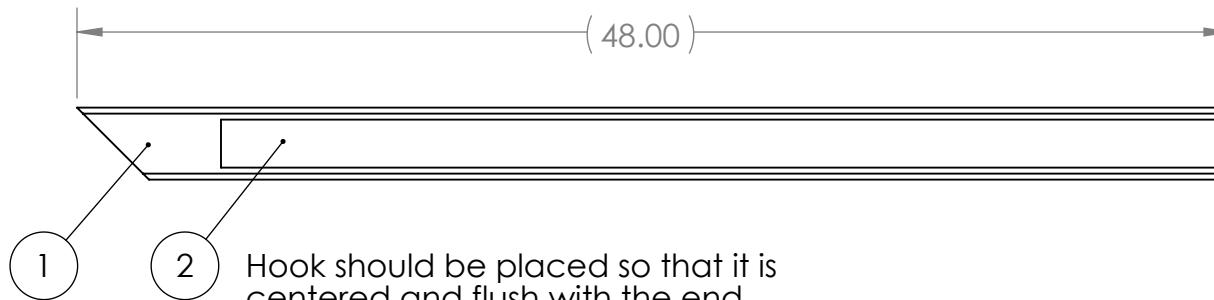
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Note: Item (1) can be either blue or red. Please see part drawing for more details.

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ITEM NO.	PART NUMBER	DESCRIPTION	Default/QTY.
1	GE-19039	Corral Tube Long	1
2	Hook_2_42	2" x 42" Hook Fastener, Adhesive Backed	1

	UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL 1/16 ANGULAR: MACH 1° BEND 1° TWO PLACE DECIMAL .01 THREE PLACE DECIMAL .001	NAME	DATE
	DRAWN		
	CHECKED		
	ENG APPR.		
	MFG APPR.		
	Q.A.		
	COMMENTS:		
NEXT ASSY	USED ON	MATERIAL	
		FINISH	
APPLICATION		DO NOT SCALE DRAWING	
SIZE	DWG. NO.	REV	
B	GE-19168		
SCALE: 1:8	WEIGHT:	SHEET 1 OF 1	

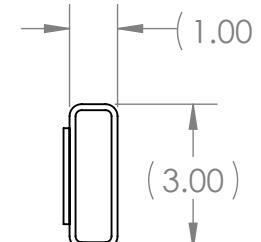
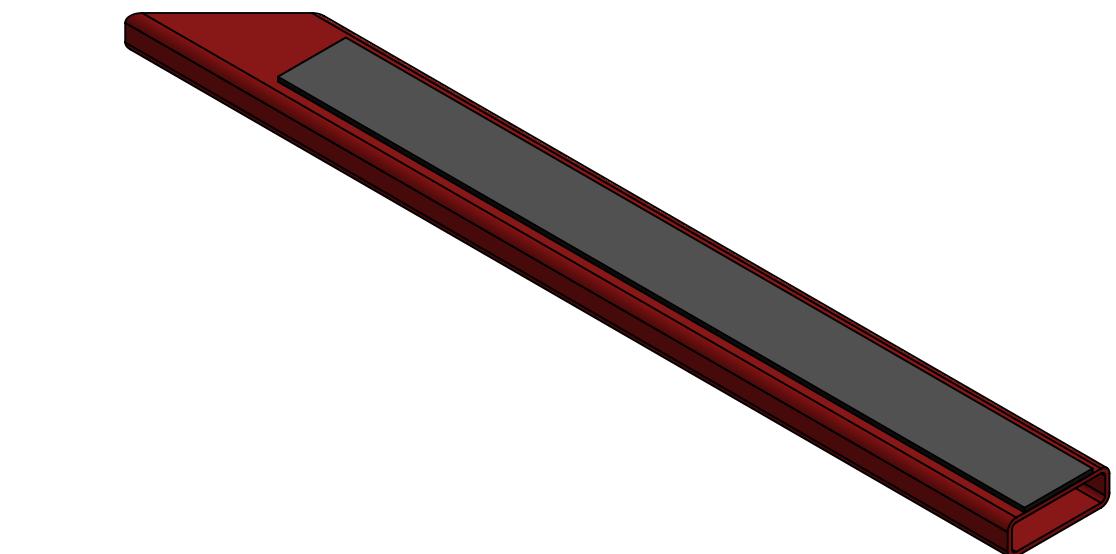
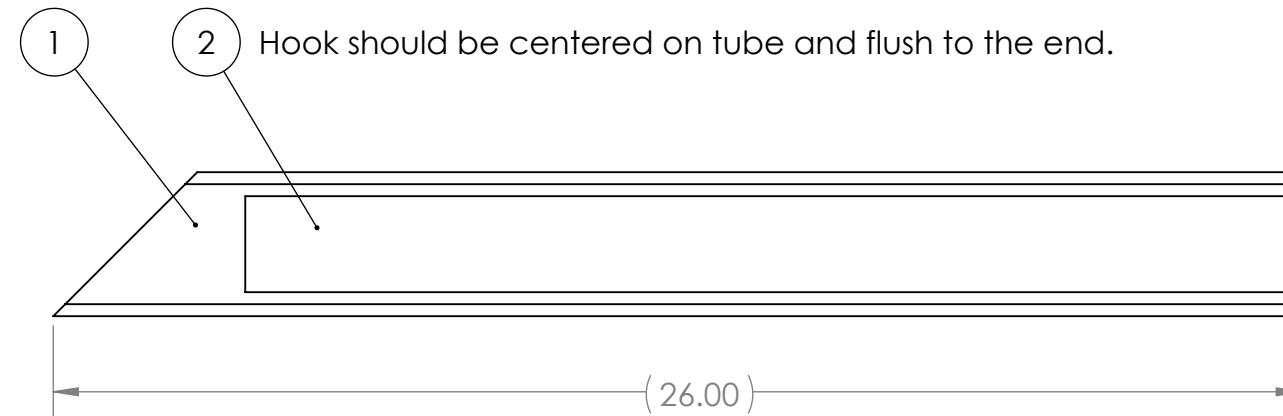
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Notes: Item 1 can be either blue or red. Refer to part drawing for more details.

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ITEM NO.	PART NUMBER	DESCRIPTION	Default/QTY.
1	GE-19038	Corral Tube Small	1
2	Hook_2_22	2" x 22" Hook Fastener, Adhesive Backed	1

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
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TITLE: Corral Tube Right Small Fastener Assembly

SIZE DWG. NO. **B** GE-19169 **REV**

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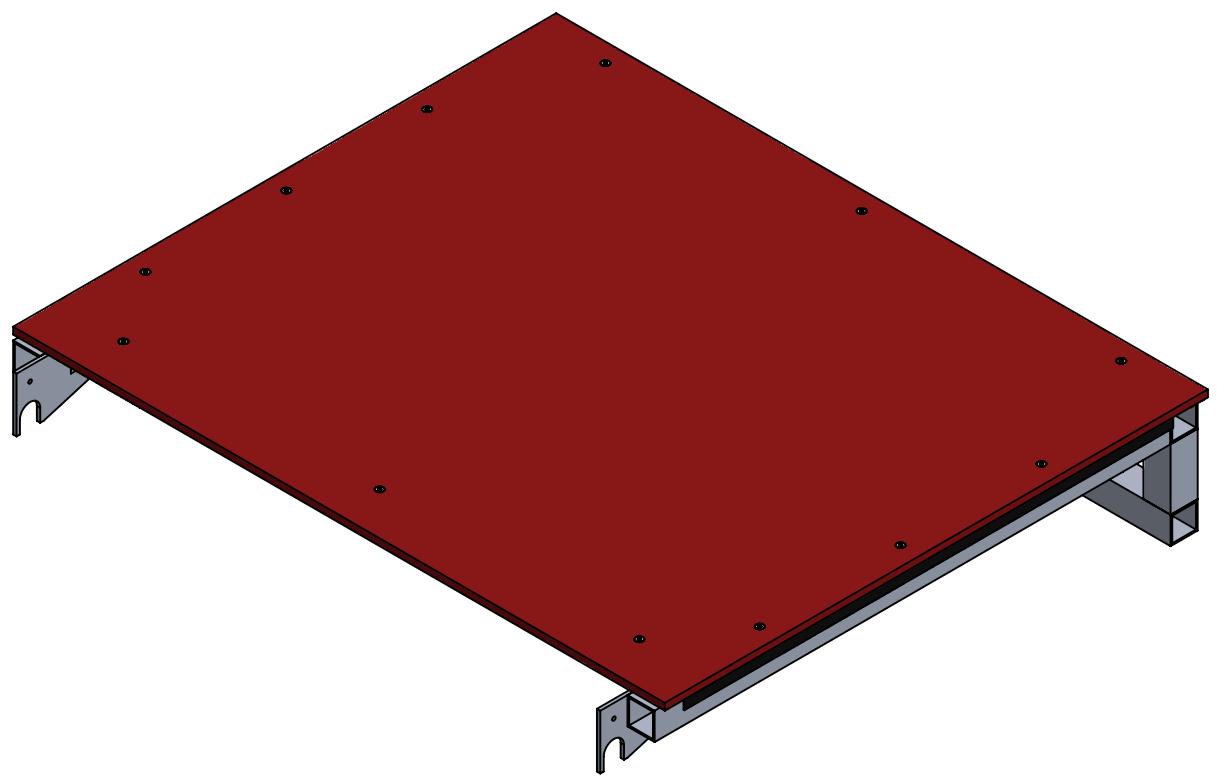
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ITEM NO.	PART NUMBER	DESCRIPTION	Default/QTY.
1	GE-19032	HAB Level 2 Frame	1
2	GE-19035	Level 2 Top HDPE	1
3	Hook_1_46	1" X 46" Hook Fastener, Adhesive Backed	1
4	nylock_.25_20	Steel Nylon-Insert Locknut, 1/4"-20	12
5	Hook_1_36	1" x 36" Hook, Adhesive Backed	2
6	Flat_Hex_.25-20_3.00	Steel Hex Drive Flat Head Screw 1/4"-20 Thread Size, 3" Long	12

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Hab 2 Fastener Assembly

B **GE-19176**

SIZE DWG. NO. REV
SCALE: 1:12 WEIGHT: SHEET 1 OF 3

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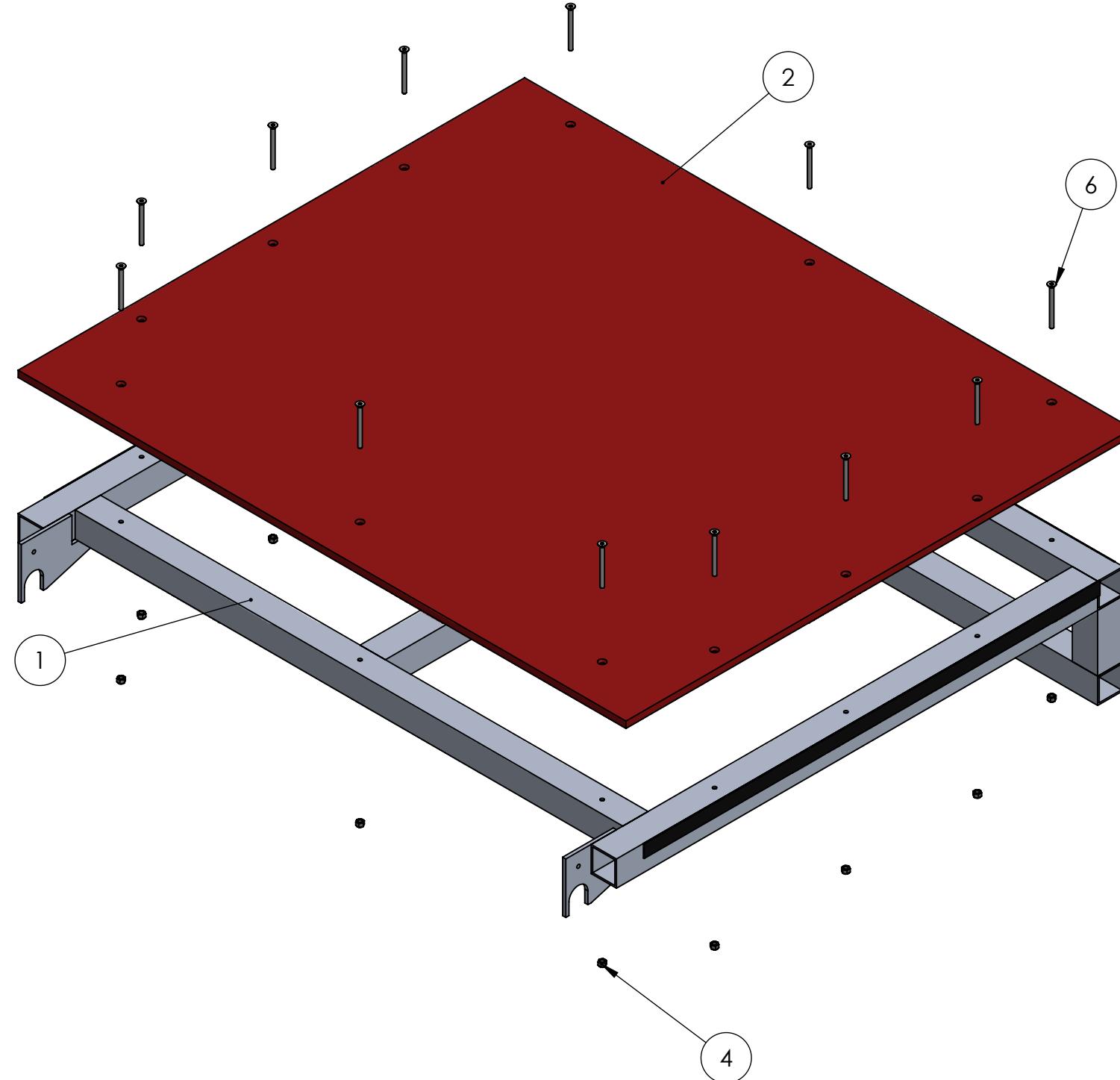
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		UNLESS OTHERWISE SPECIFIED:	NAME	DATE
DIMENSIONS ARE IN INCHES		DRAWN		
TOLERANCES:		CHECKED		
FRACTIONAL 1/16		ENG APPR.		
ANGULAR: MACH 1° BEND 1°		MFG APPR.		
TWO PLACE DECIMAL .01		Q.A.		
THREE PLACE DECIMAL .001		COMMENTS:		
		INTERPRET GEOMETRIC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

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

Hab 2 Fastener Assembly

SIZE	DWG. NO.	REV
B	GE-19176	
SCALE: 1:12	WEIGHT:	SHEET 2 OF 3

4

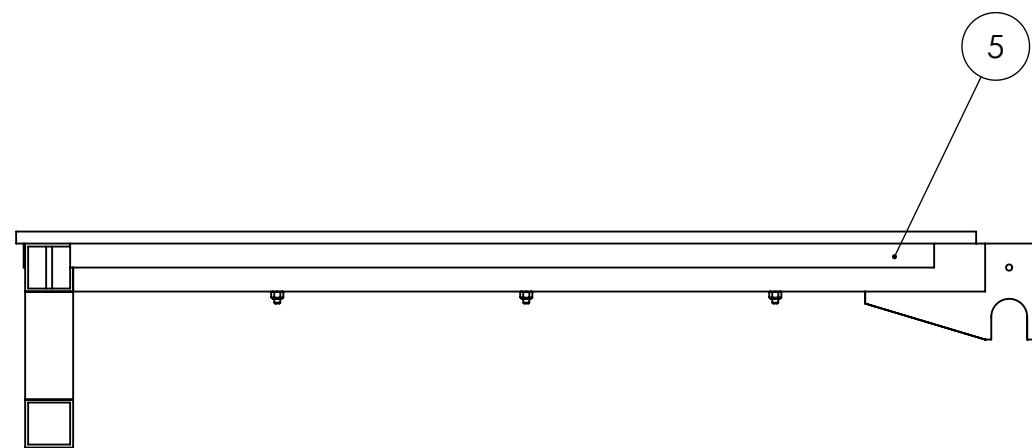
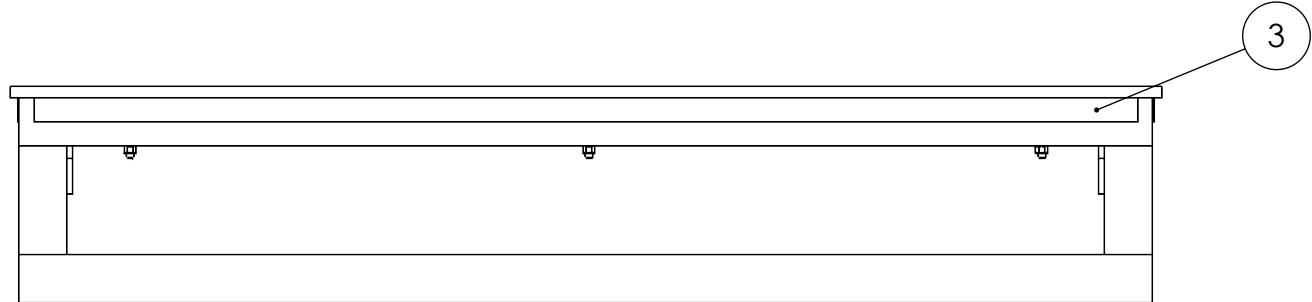
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Note:
Repeat on opposite side

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		UNLESS OTHERWISE SPECIFIED:		NAME	DATE
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		ANGULAR: MACH 1° BEND 1°			
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		INTERPRET GEOMETRIC			
		TOLERANCING PER:			
		MATERIAL			
NEXT ASSY	USED ON	FINISH			
APPLICATION		DO NOT SCALE DRAWING			

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Hab 2 Fastener Assembly

SIZE	DWG. NO.	REV
B	GE-19176	
SCALE: 1:12	WEIGHT:	SHEET 3 OF 3

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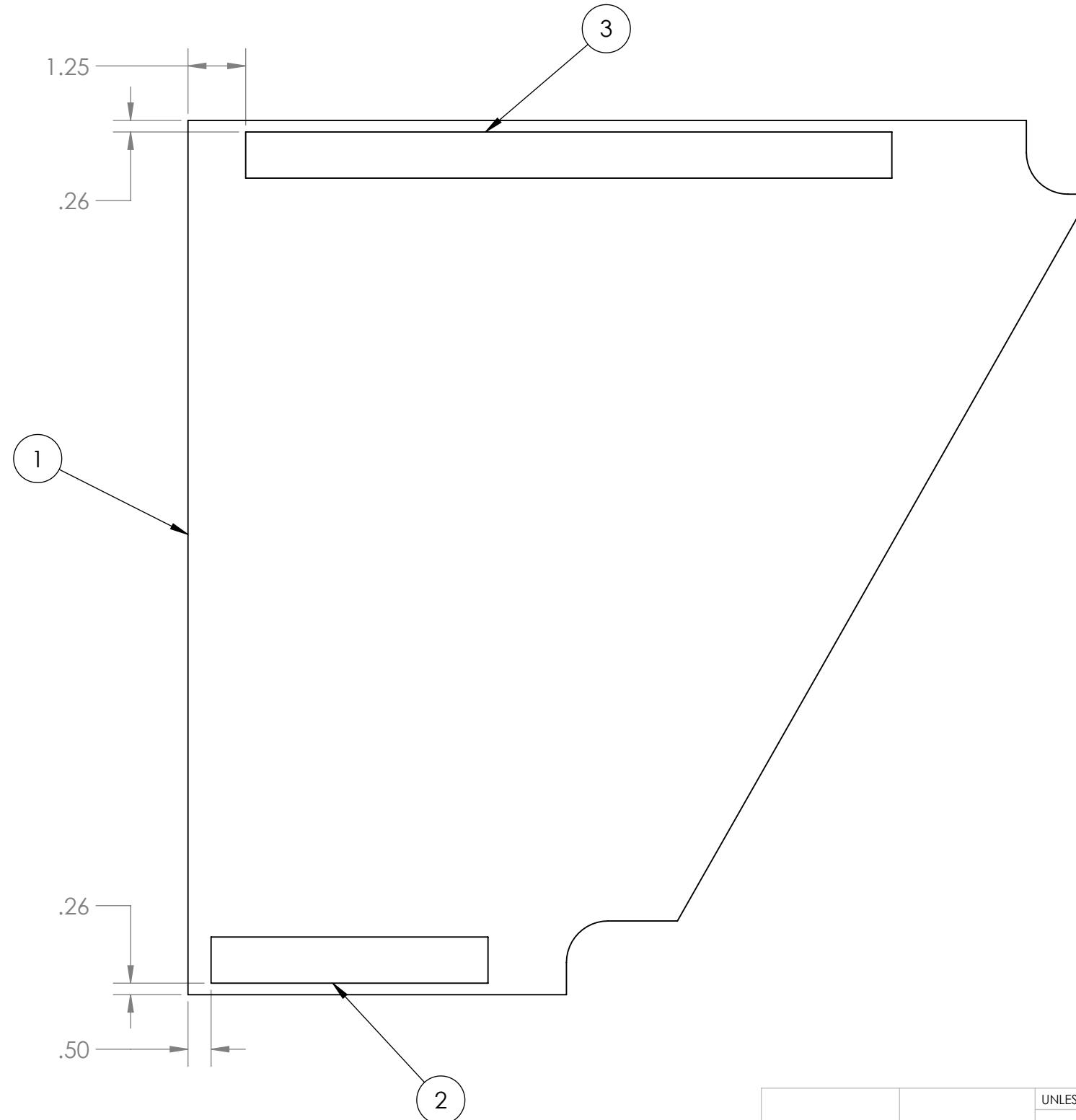
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-19115	Rocket Ramp	1
2	Loop_1_6	1" x 6" Loop, Adhesive Backed	1
3	Loop_1_14	1" x 14" Loop, Adhesive Backed	1

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Rocket Ramp Left
SIZE **DWG. NO.** **REV**
B **GE-19180**

SCALE: 1:3 WEIGHT: SHEET 1 OF 1

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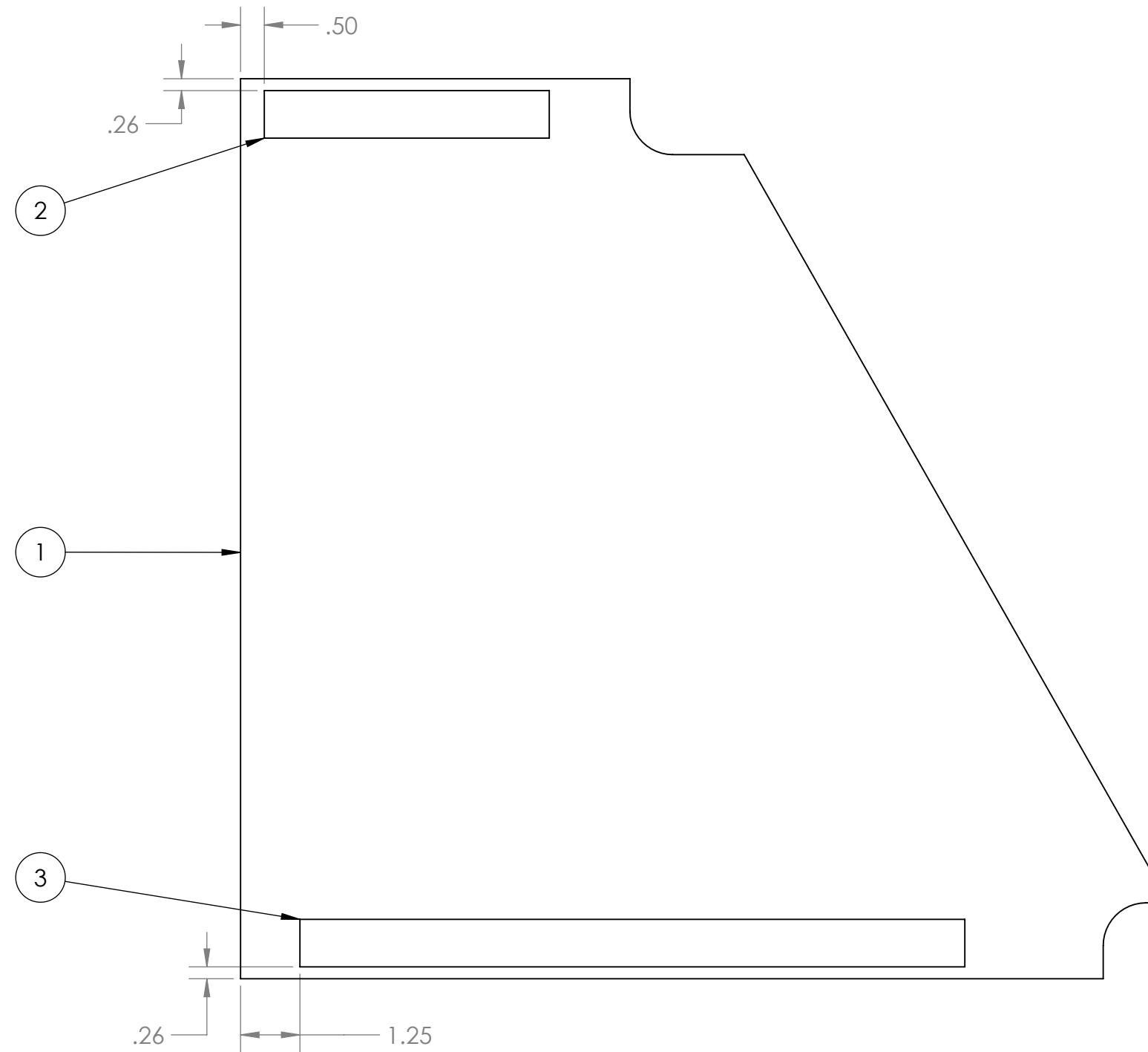
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-19115	Rocket Ramp	1
2	Loop_1_6	1" x 6" Loop, Adhesive Backed	1
3	Loop_1_14	1" x 14" Loop, Adhesive Backed	1

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Rocket Ramp Right
SIZE **DWG. NO.** **REV**
B **GE-19181**

SCALE: 1:3 WEIGHT: SHEET 1 OF 1

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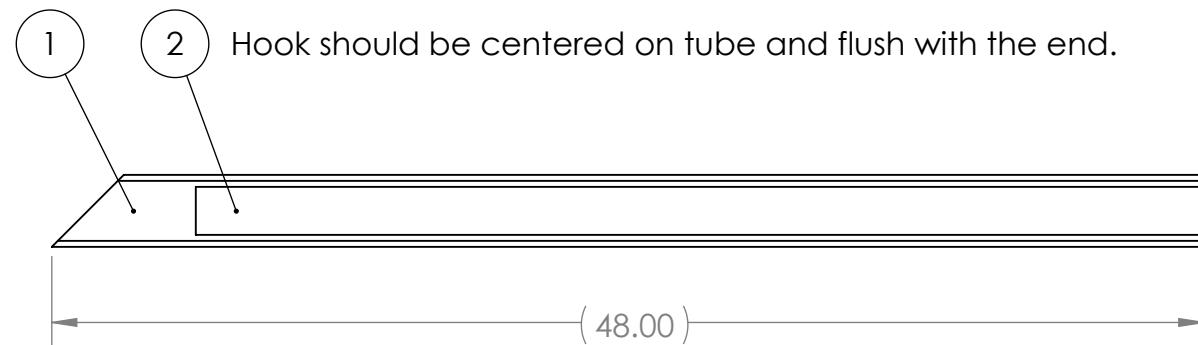
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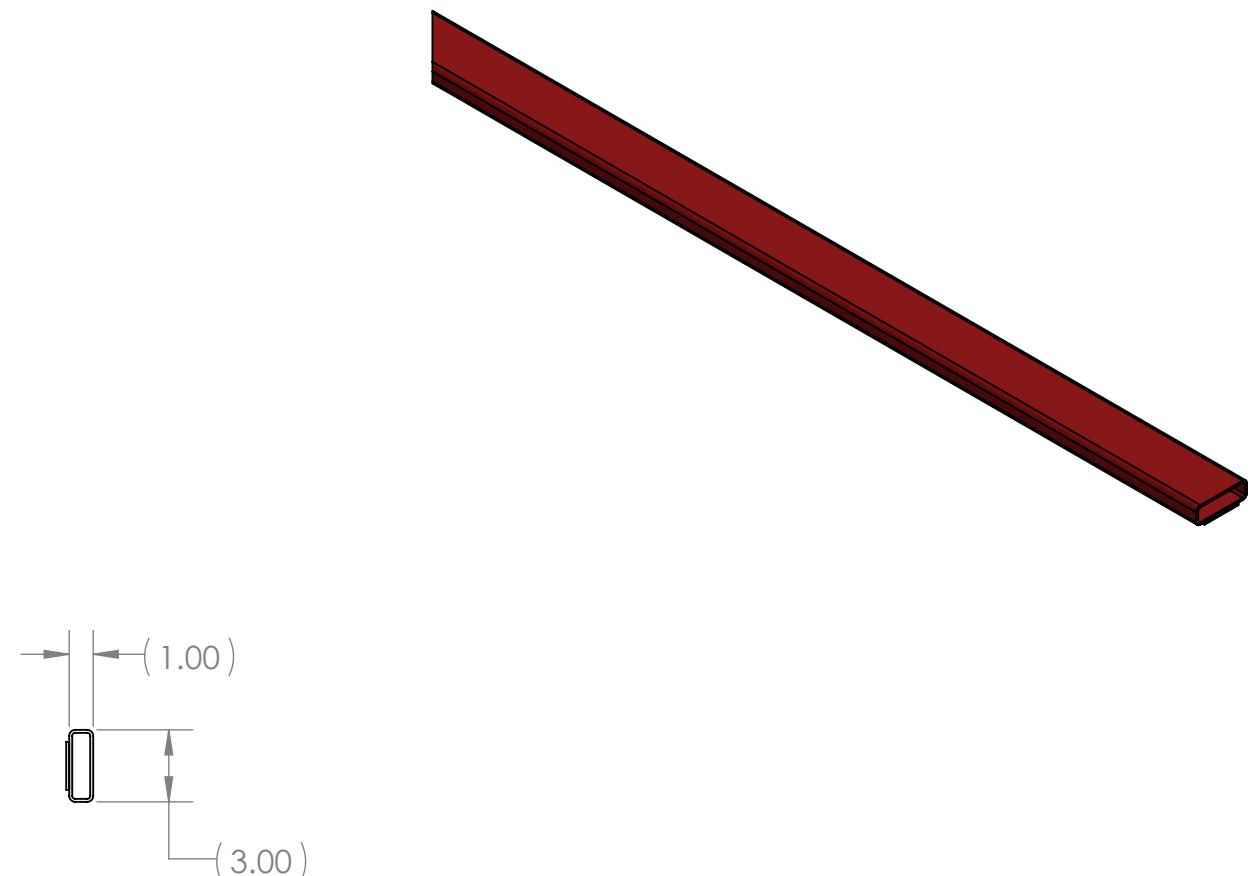
1

B

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Hook should be centered on tube and flush with the end.



Notes: Item ① can be either blue or red. Refer to part drawing for more details.

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ITEM NO.	PART NUMBER	DESCRIPTION	Default/QTY.
1	GE-19039	Corral Tube Long	1
2	Hook_2_42	2" x 42" Hook Fastener, Adhesive Backed	1

		UNLESS OTHERWISE SPECIFIED:	NAME	DATE
		DIMENSIONS ARE IN INCHES	DRAWN	
		TOLERANCES:	CHECKED	
		FRACTIONAL 1/16	ENG APPR.	
		ANGULAR: MACH 1° BEND 1°	MFG APPR.	
		TWO PLACE DECIMAL .01	Q.A.	
		THREE PLACE DECIMAL .001	COMMENTS:	
		INTERPRET GEOMETRIC TOLERANCING PER:		
		MATERIAL		
NEXT ASSY	USED ON	FINISH		
APPLICATION		DO NOT SCALE DRAWING		
SIZE	DWG. NO.		REV	
B	GE-19182			
SCALE: 1:8		WEIGHT:	SHEET 1 OF 1	

FIRST[®]
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
**Corral Tube Left
Fastener Assembly**

4

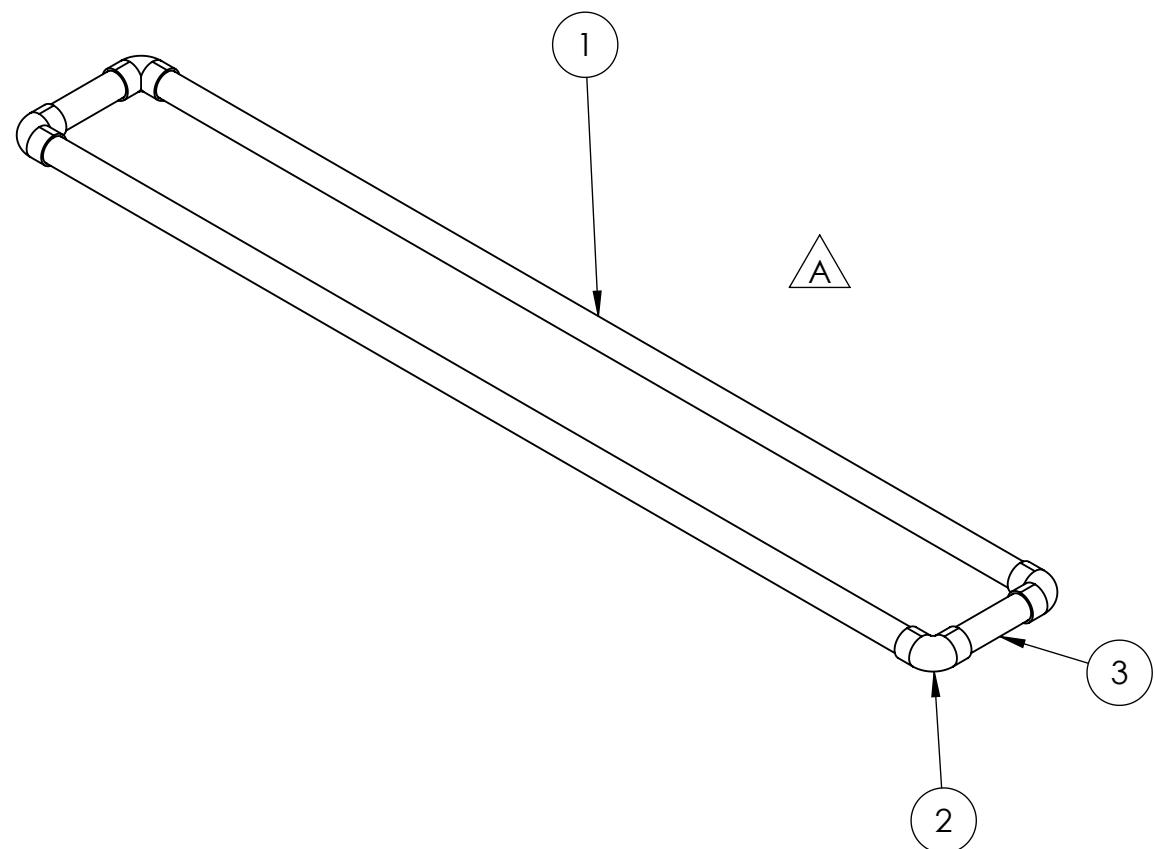
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REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
B3	A	Changed Dimension to 78"	11/19/2018	MXS
2-B3	B	Added Overall Dimension	11/19/2018	MXS



Note:
All Lettering to face down

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	UNLESS OTHERWISE SPECIFIED:	NAME	DATE
	DIMENSIONS ARE IN INCHES	DRAWN	
	TOLERANCES:	CHECKED	
	FRACTIONAL $\pm 1/16$	ENG APPR.	
	ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$	MFG APPR.	
	TWO PLACE DECIMAL $\pm .01$	Q.A.	
	THREE PLACE DECIMAL $\pm .001$	COMMENTS:	
	INTERPRET GEOMETRIC TOLERANCING PER:		
	MATERIAL		
NEXT ASSY	USED ON	FINISH	
APPLICATION		DO NOT SCALE DRAWING	
SIZE	DWG. NO.	REV	
B	GE-19183	B	
SCALE: 1:12	WEIGHT:	SHEET 1 OF 5	

 FIRST
ROBOTICS
COMPETITION  SOLIDWORKS
Modeling Solutions Partner

Cargo Hold Assembly

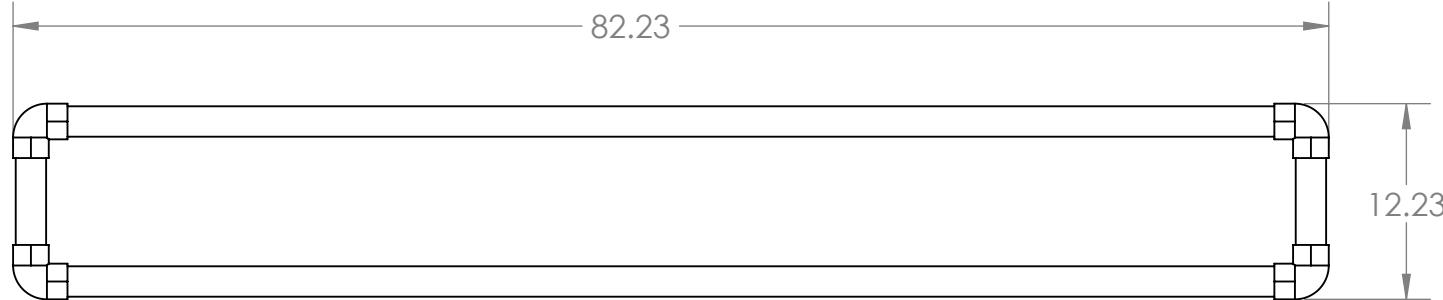
REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
1-B3	A	Changed Dimension to 78"	11/19/2018	MXS
B3	B	Added Overall Dimension	11/19/2018	MXS

B

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		DRAWN		
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
NEXT ASSY	USED ON	INTERPRET GEOMETRIC TOLERANCING PER: MATERIAL		
		FINISH		
APPLICATION		DO NOT SCALE DRAWING		
		SCALE: 1:12	WEIGHT:	
		SHEET 2 OF 5		

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Cargo Hold Assembly

SIZE DWG. NO. REV
B **GE-19183** **B**

4

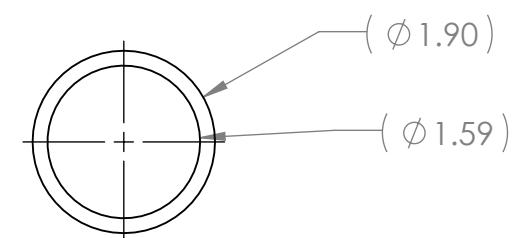
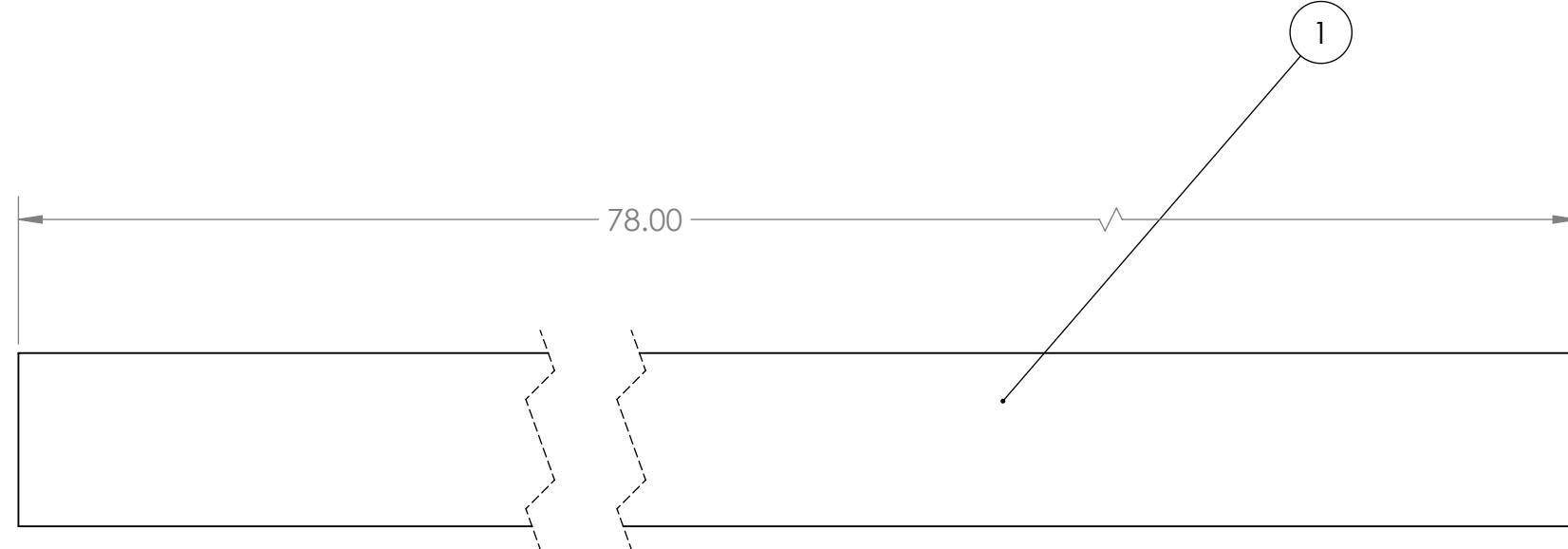
3

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Note

1. Material: 1 1/2" Thick Schedule 40 PVC Pipe
2. Remove Sharp Edges and Burrs
3. Tag or Label With Part Number

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Cargo Hold Assembly

B	GE-19183	B
SIZE	DWG. NO.	REV
SCALE: 1:2	WEIGHT:	SHEET 3 OF 5

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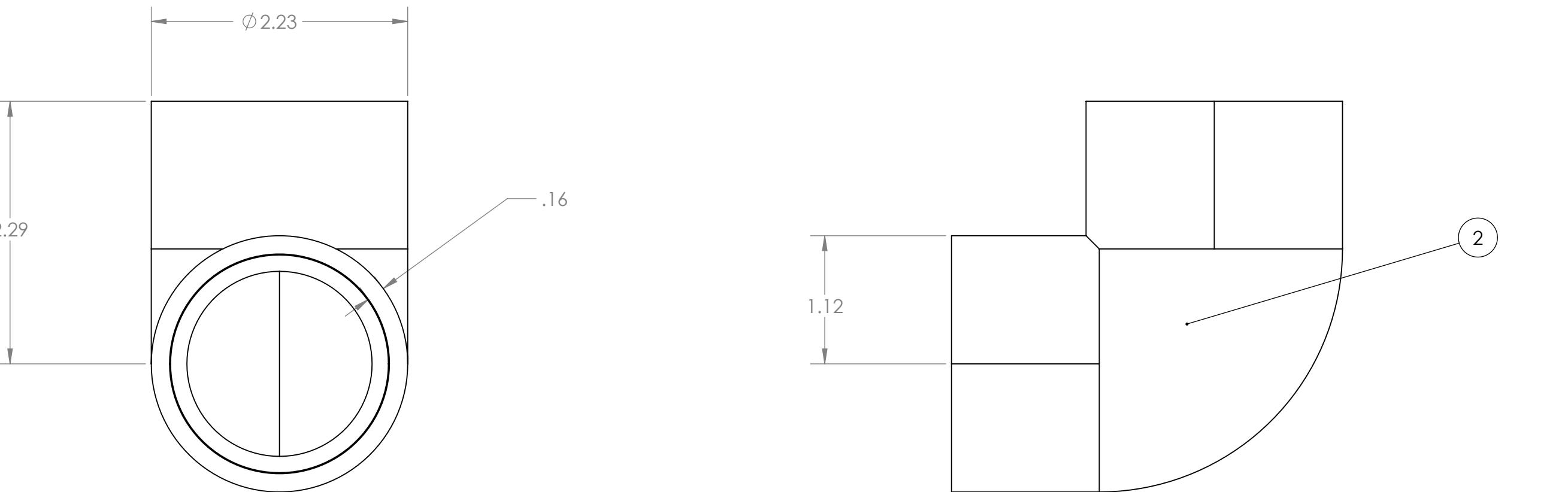
1

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**Note:**

1. Standard-Wall PVC Pipe Fitting for Water
2. 90 Degree Elbow Connector, White, 1-1/2 Socket Female
3. McMaster-Carr 4880K25
4. Tag or Label With Part Number

A

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Cargo Hold Assembly

SIZE	DWG. NO.	REV
B	GE-19183	B
SCALE: 1:2	WEIGHT:	SHEET 4 OF 5

4

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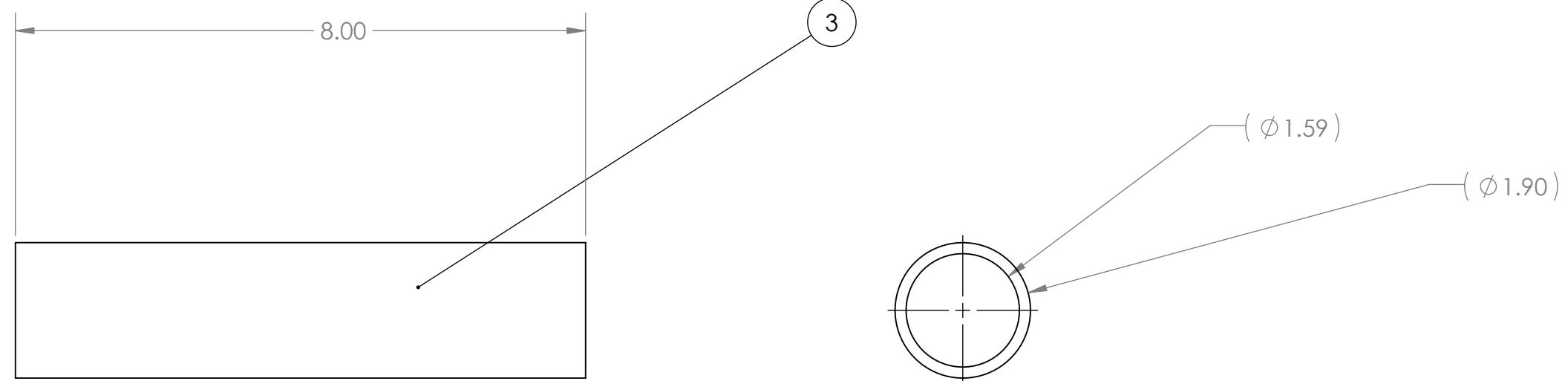
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**Note**

1. Material: 1 1/2" Thick Schedule 40 PVC Pipe
2. Remove Sharp Edges and Burrs
3. Tag or Label With Part Number

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Cargo Hold Assembly

SIZE	DWG. NO.	REV
B	GE-19183	B
SCALE: 1:2	WEIGHT:	SHEET 5 OF 5

4

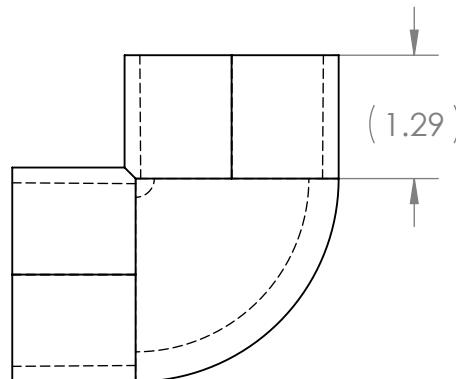
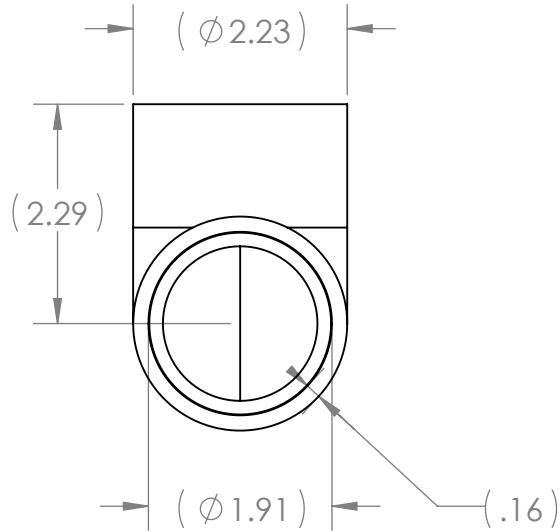
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Note:
 1. Vendor: McMaster-Carr
 2. 4880K25

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		INTERPRET GEOMETRIC TOLERANCING PER:			
		MATERIAL			
NEXT ASSY	USED ON	FINISH			
APPLICATION		DO NOT SCALE DRAWING			



TITLE:

90 Degree Elbow

SIZE	DWG. NO.	REV
A	GE-19184	B
SCALE: 1:2	WEIGHT:	SHEET 1 OF 1

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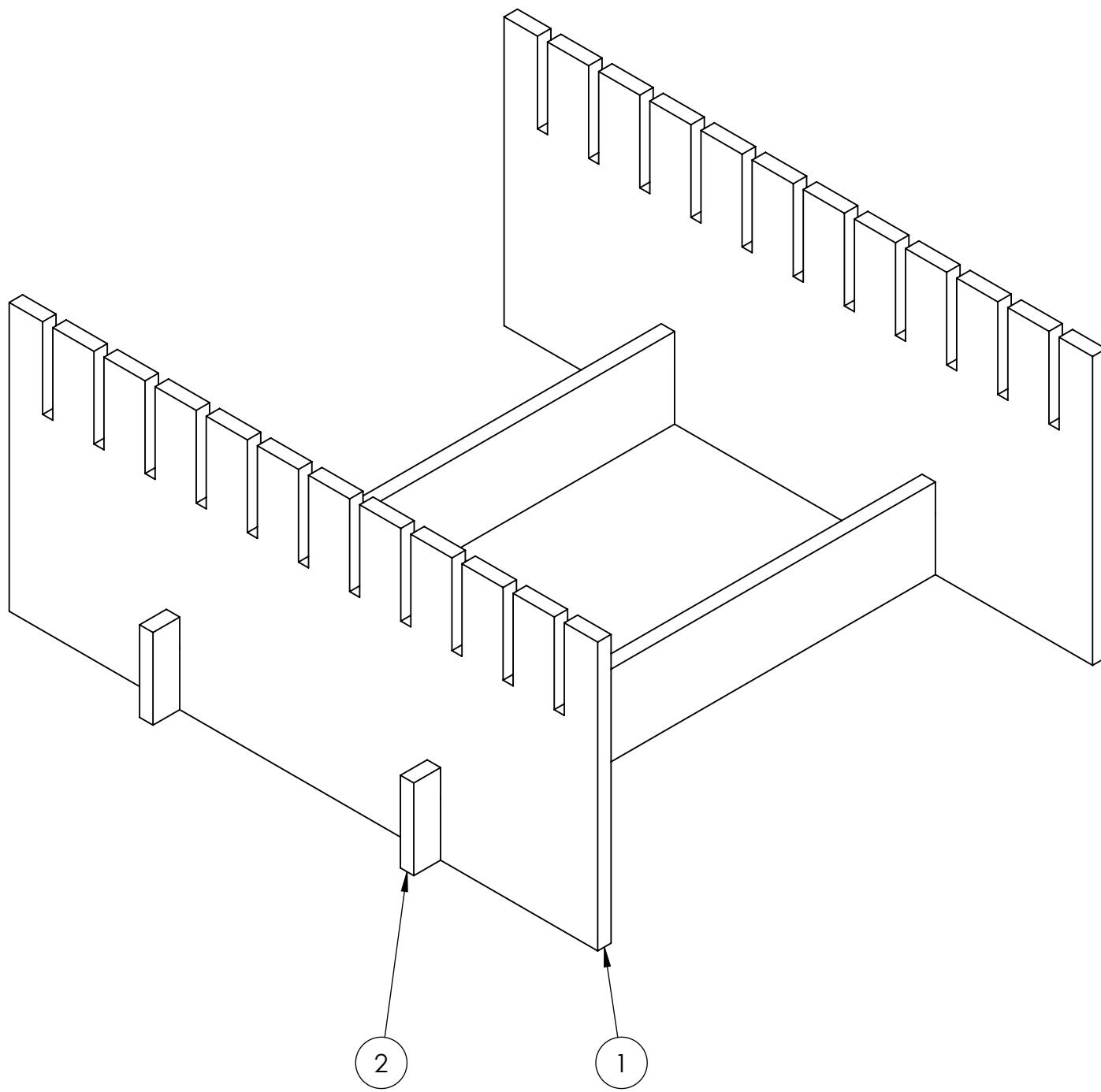
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-19186-02	1/2" Thick HDPE Sheet White	2
2	GE-19186-01	1/2" Thick HDPE Sheet White	2

	UNLESS OTHERWISE SPECIFIED:		TITLE: Panel Hold Assembly			
	DIMENSIONS ARE IN INCHES					
	TOLERANCES:					
	FRACTIONAL: $\pm 1/16$					
	ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$					
	TWO PLACE DECIMAL $\pm .01$					
THREE PLACE DECIMAL $\pm .001$		SIZE DWG. NO. B GE-19186				
INTERPRET GEOMETRIC TOLERANCING PER:						
MATERIAL						
NEXT ASSY						
USED ON						
FINISH						
APPLICATION		DO NOT SCALE DRAWING				
SCALE: 1:4		WEIGHT:				
SHEET 1 OF 3						

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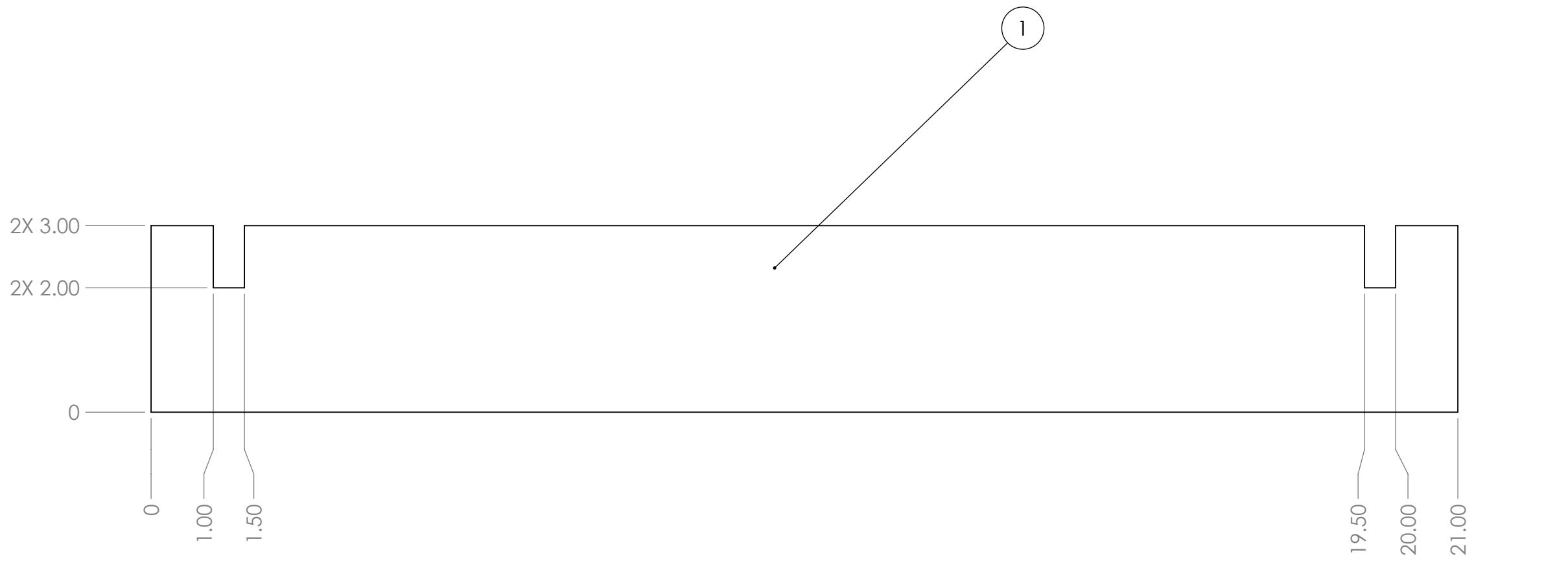
3

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**Note:**

1. Material: 1/2" Thick HDPE Sheet White
2. Finish: Smooth
3. Remove Sharp Edges and Burrs
4. Tag and Label With Part Number

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Panel Hold Assembly

SIZE **DWG. NO.** **REV**
B **GE-19186**

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

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1.25
1.633.16
3.545.07
5.45
5.88
6.38
6.99
7.368.90
9.2710.81
11.1912.72
13.1014.63
15.01
15.63
16.13
16.55
16.9218.46
18.8320.37
20.75

22.00

0

11X 3.00

2X 8.00

10.00

Note:

1. Material: 1/2" Thick HDPE Sheet White
2. Finish: Smooth
3. Remove Sharp Edges and Burrs
4. Tag and Label With Part Number

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		UNLESS OTHERWISE SPECIFIED:		NAME	DATE
		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$			
		INTERPRET GEOMETRIC TOLERANCING PER:		DRAWN	CHECKED
MATERIAL	Q.A.	ENG APPR.		ENG APPR.	MFG APPR.
NEXT ASSY	USED ON	MATERIAL		Q.A.	COMMENTS:
		FINISH			
APPLICATION	DO NOT SCALE DRAWING				
B	GE-19186				
SCALE: 1:2	WEIGHT:				
					SHEET 3 OF 3



TITLE: Panel Hold Assembly

SIZE **B** DWG. NO. **GE-19186** REV

SCALE: 1:2 WEIGHT: SHEET 3 OF 3

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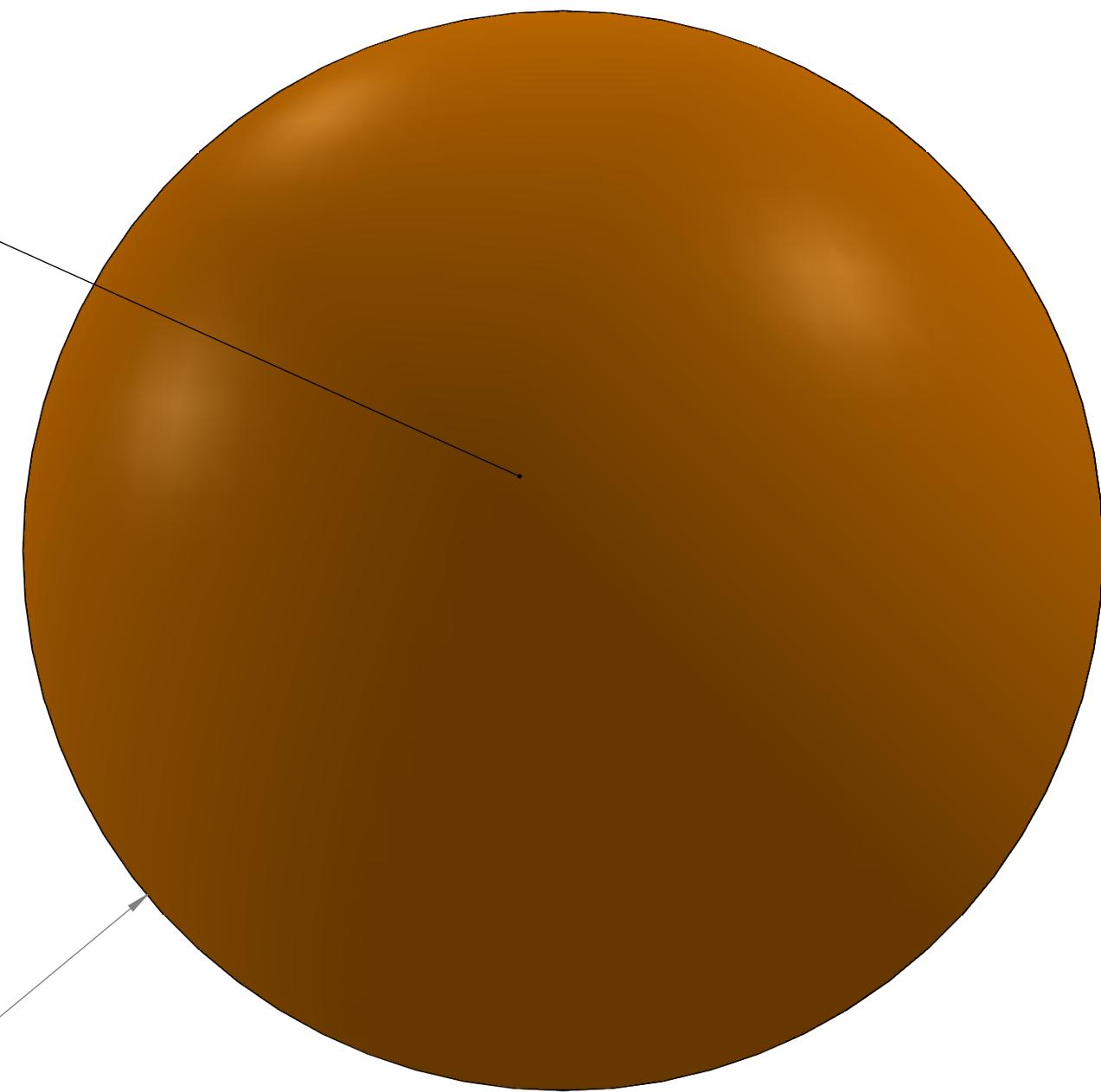
2

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FIRST logo applied on face.

 $\phi 13.00$ 

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Notes:

1. Description: Sportime Playground Ball, 13 Inches
2. Source: Sportime
3. Item #: 1623139E
4. Available to teams as am-4000_cargo from AndyMark
5. Closest Item # sold by Sportime: 1293618

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Cargo

B	GE-19187	REV
SCALE: 1:2	WEIGHT:	SHEET 1 OF 1

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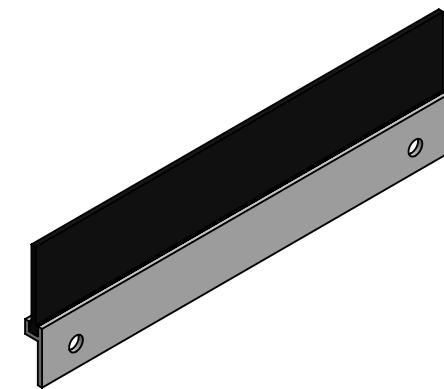
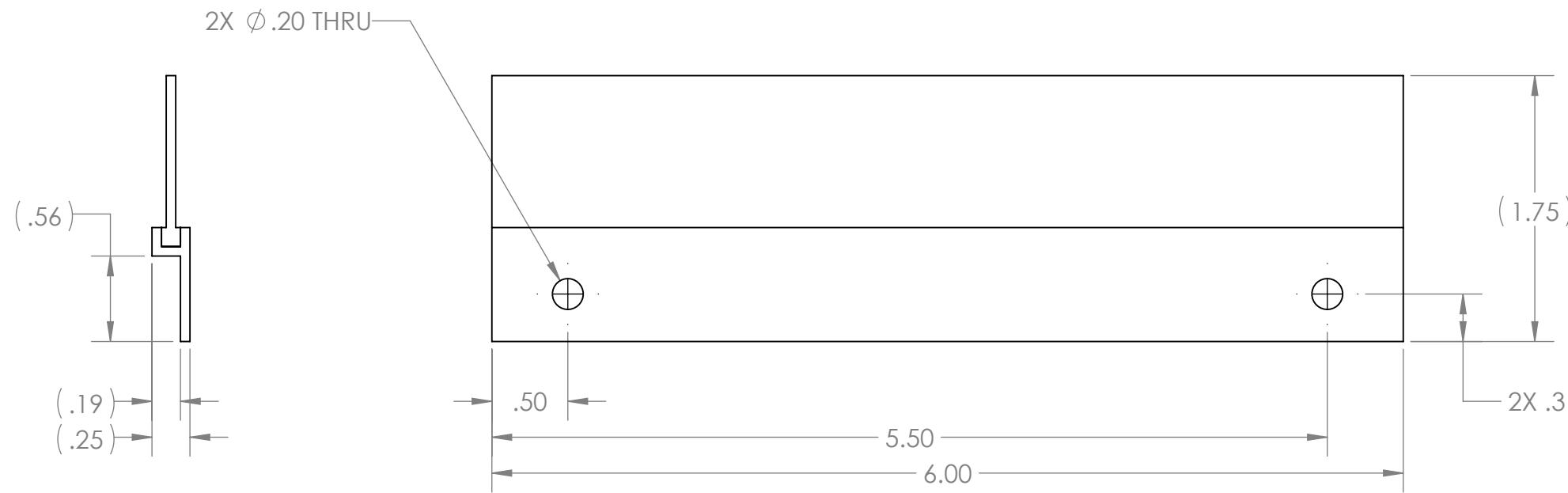
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Notes:

1. Supplier: Home Depot
2. Brand: Frost King
3. Description: 1-3/4 in. x 36 in. White Plastic and Brush Door Sweep
4. Model #: C35PH
5. Home Depot SKU: 291722
6. Remove all burrs and sharp edges.
7. Bag or tag with part number.

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Brush Assembly 6", Loading Station

SIZE	DWG. NO.	REV
B	GE-19190	
SCALE: 1:1	WEIGHT:	SHEET 1 OF 1

4

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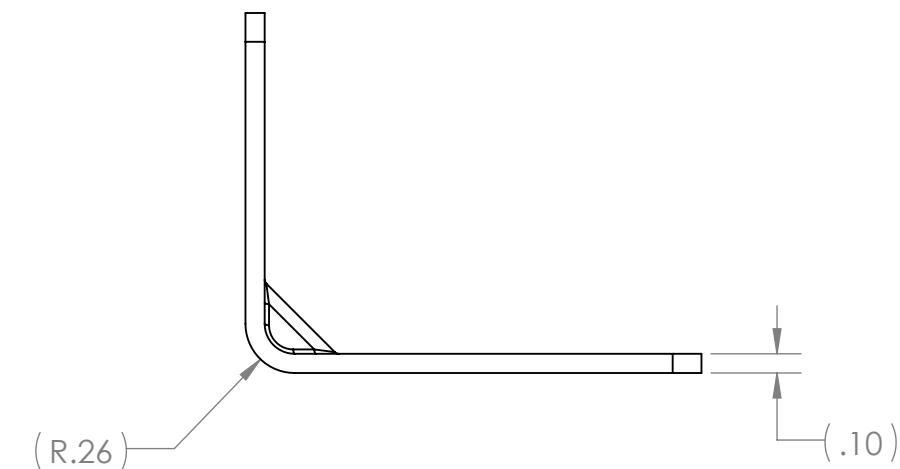
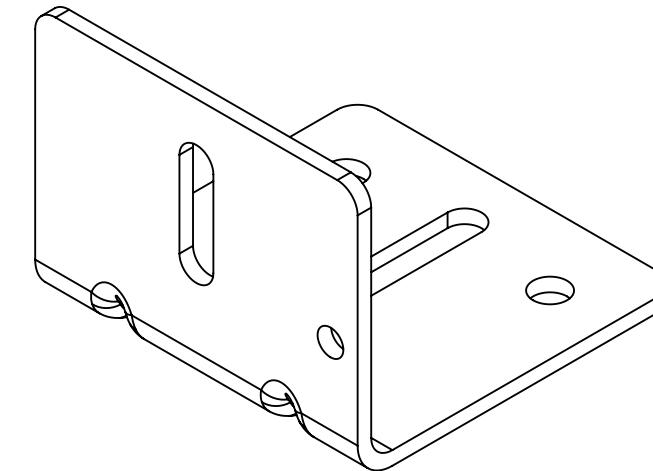
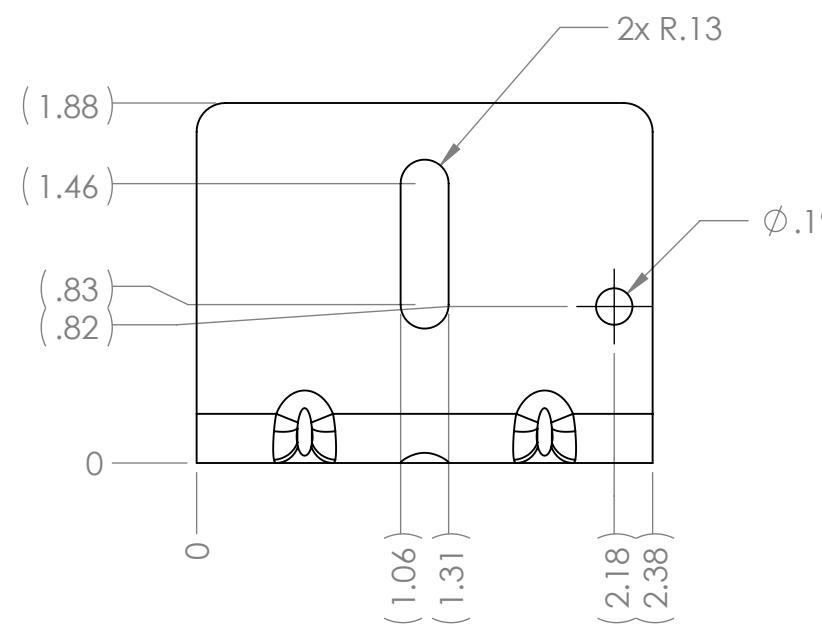
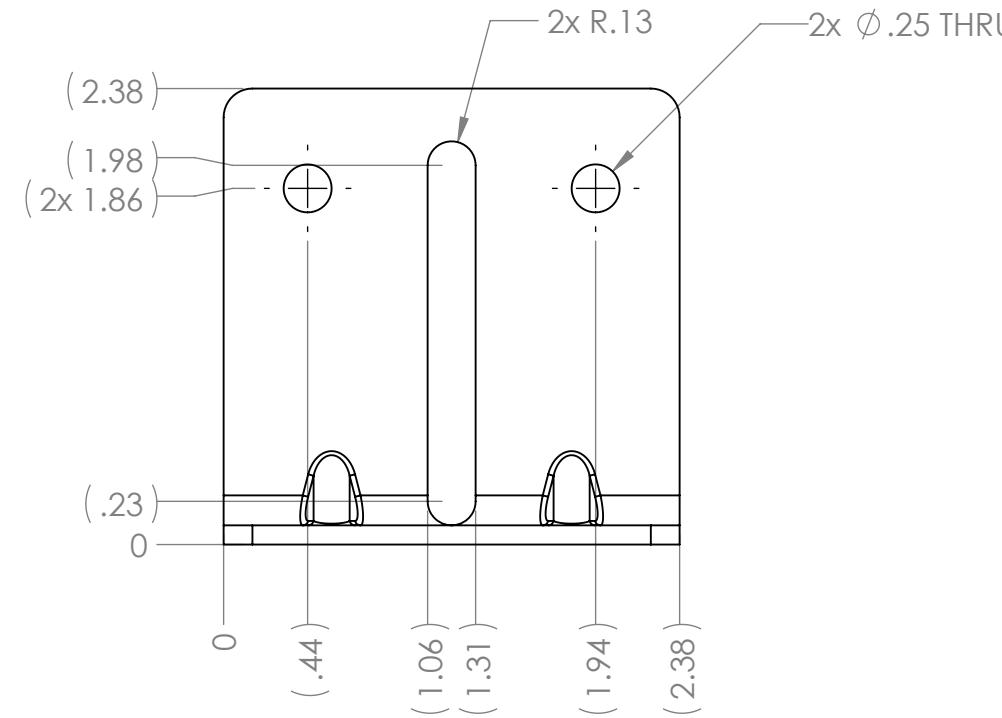
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- Notes:
1. Corner Bracket, Galvanized Steel, 1-7/8" x 2-3/8" x 2-3/8"
 2. Source: McMaster-Carr
 3. Part Number: 15275A63
 4. Equivalent Substitutions Allowed

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

**Cargo Ship
Corner Bracket**

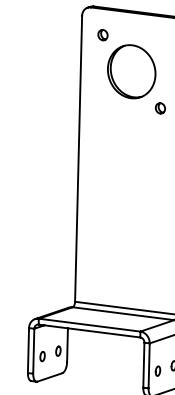
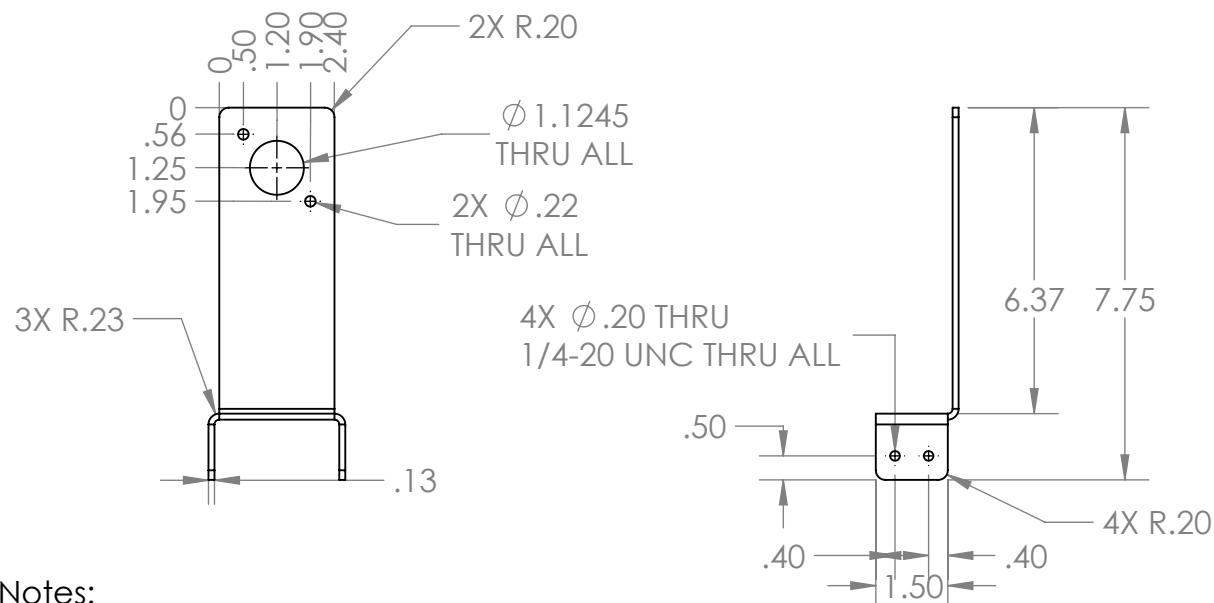
SIZE	DWG. NO.	REV
B	GE-19195	
SCALE: 1:1	WEIGHT:	SHEET 1 OF 1

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		INTERPRET GEOMETRIC TOLERANCING PER: MATERIAL		COMMENTS:												
NEXT ASSY	USED ON	FINISH														
APPLICATION		DO NOT SCALE DRAWING														
FIRST	SOLIDWORKS	Modeling Solutions Partner														
TITLE: Shutter Motor Bracket																
SIZE	DWG. NO.															
A	GE-19196															
REV																
SCALE: 1:4 WEIGHT: SHEET 1 OF 1																

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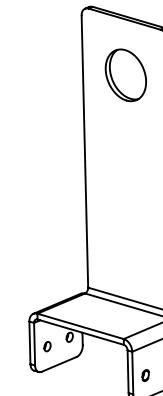
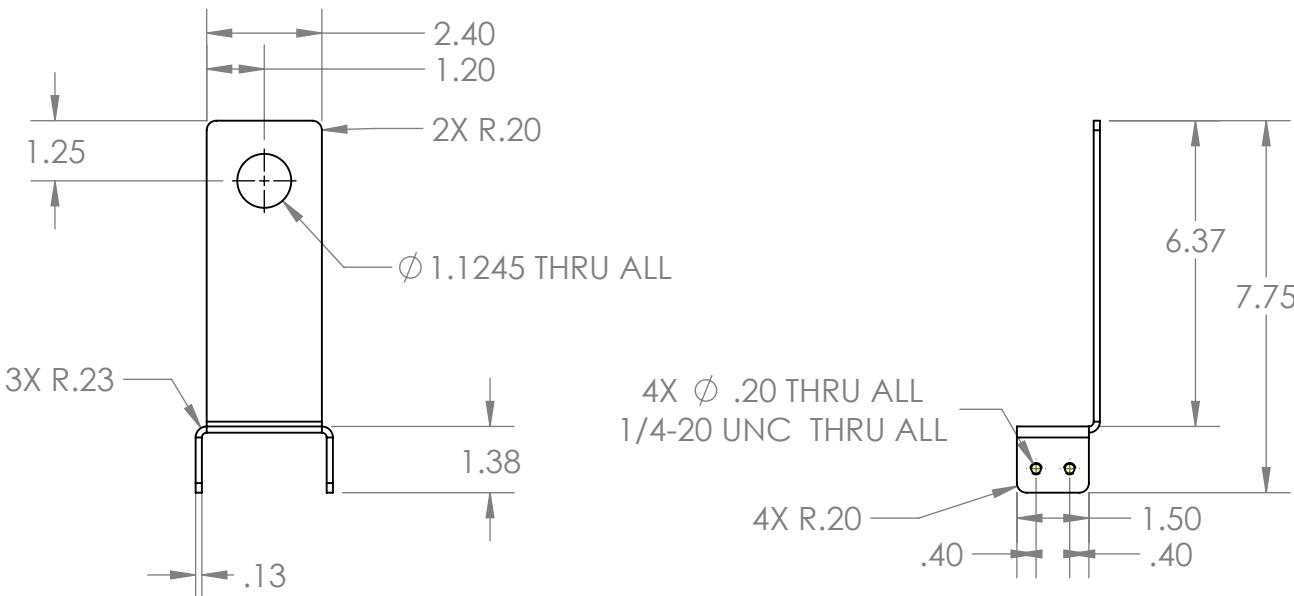
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Notes:

Material: 11 GA Galvanized Steel Sheet Metal
Remove all burrs and sharp edges

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



SOLIDWORKS
Modeling Solutions Partner

TITLE:

Shutter Bracket

SIZE	DWG. NO.	REV
A	GE-19197	
SCALE: 1:4	WEIGHT:	SHEET 1 OF 1

2

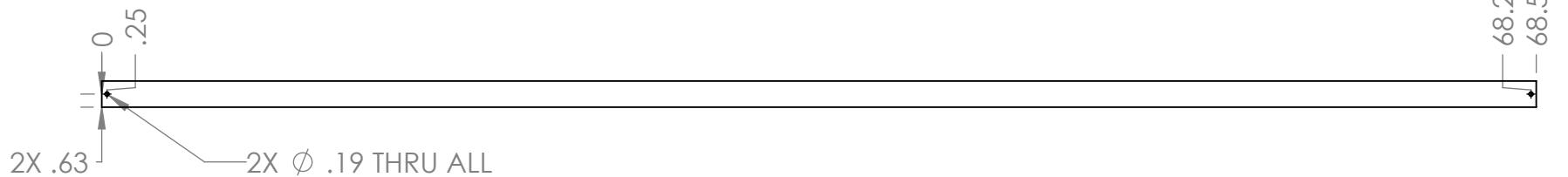
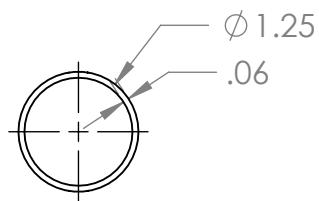
1

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**Notes:**

Material: VersaRoller Tube, 1-1/4" OD x 1-1/8" ID x 1/16" Wall

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		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL ±1/16 ANGULAR: MACH ±1° BEND ±1° TWO PLACE DECIMAL ±.01 THREE PLACE DECIMAL ±.001			
		INTERPRET GEOMETRIC TOLERANCING PER:			
		MATERIAL			
NEXT ASSY		FINISH			
APPLICATION		DO NOT SCALE DRAWING			



TITLE:

Shutter Pipe

SIZE	DWG. NO.	REV
A	GE-19198	
SCALE: 1:16	WEIGHT:	SHEET 1 OF 1

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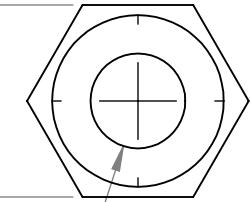
2.80

2.90

3.50

R.10

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Notes:

Material: 7075-T6 Aluminum Black Anodized 1/2" Hex Shaft

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



SOLIDWORKS
Modeling Solutions Partner

TITLE:

Shutter Middle Axe

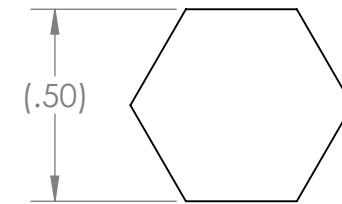
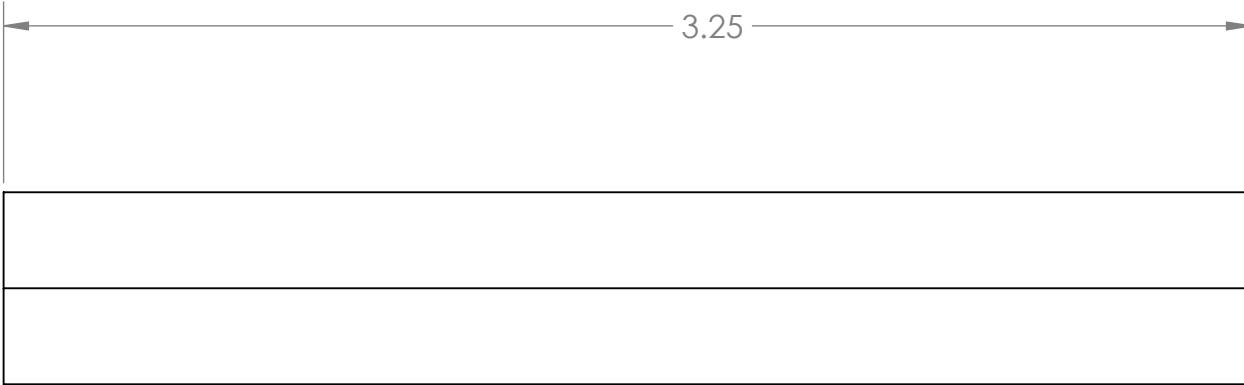
SIZE	DWG. NO.	REV
A	GE-19199	
SCALE: 2:1	WEIGHT:	SHEET 1 OF 1

2

1

B

B



Notes:

Material: 7075-T6 Aluminum Black Anodized Hex Shaft 1/2"

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PERMISSION OF **FIRST[®]** IS PROHIBITED.

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

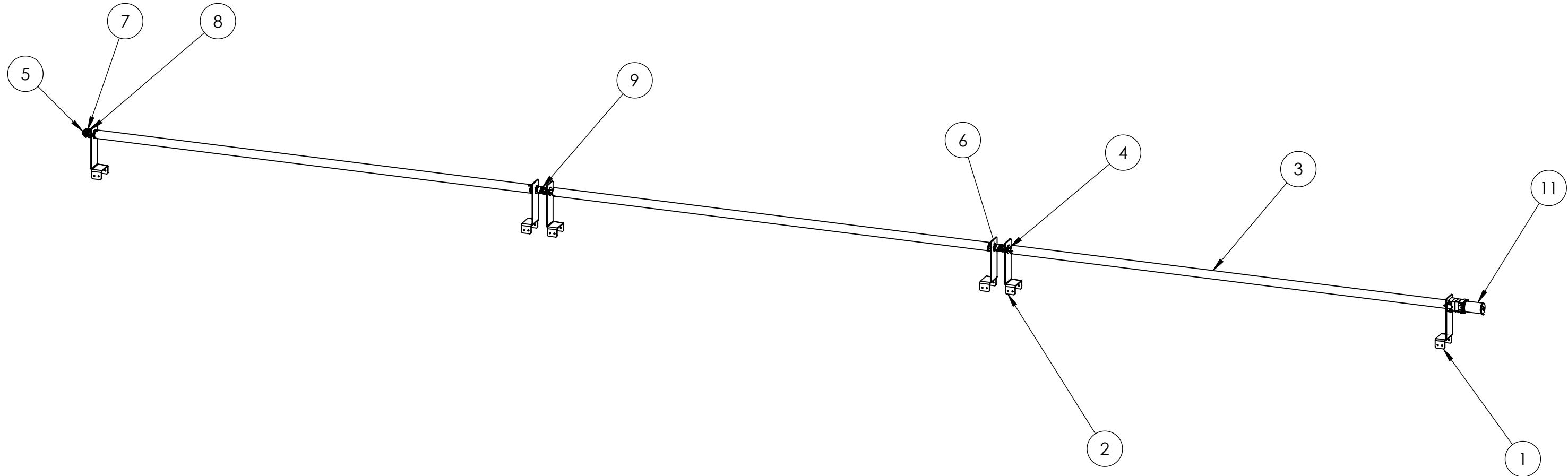
 **FIRST
ROBOTICS
COMPETITION**  **SOLIDWORKS**
Modeling Solutions Partner

TITLE:
Shutter End Axle

SIZE	DWG. NO.	REV
A	GE-19200	
SCALE: 2:1		WEIGHT:
SHEET 1 OF 1		

B

B



ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	GE-19196	Shutter Motor Bracket	1
2	GE-19197	Shutter Bracket	5
3	GE-19198	Shutter Pipe	3
4	GE-19199	Shutter Middle Axle	4
5	GE-19200	Shutter End Axle	1
6	GE-19215	1/2" Hex Bearing	5
7	GE-19235	HTD Timing Pulley, 18 Tooth	1
8	GE-19237	Hex Shaft Collar	2
9	GE-19243	Coupler Assembly	2
10	GE-19248	Versa Hub	6
11	217-3351/217-4973/217-2816/217-2820	Bag Motor w/ 50:1 gear reduction and hex output	1

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		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL: ±1/16 ANGULAR: MACH ±1° BEND ±1° TWO PLACE DECIMAL: ±.01 THREE PLACE DECIMAL: ±.001	NAME	DATE
		DRAWN		
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
		MATERIAL		
		FINISH		
NEXT ASSY	USED ON			
APPLICATION	DO NOT SCALE DRAWING			
SIZE DWG. NO.		REV		
B GE-19201				
SCALE: 1:24	WEIGHT:	SHEET 1 OF 2		

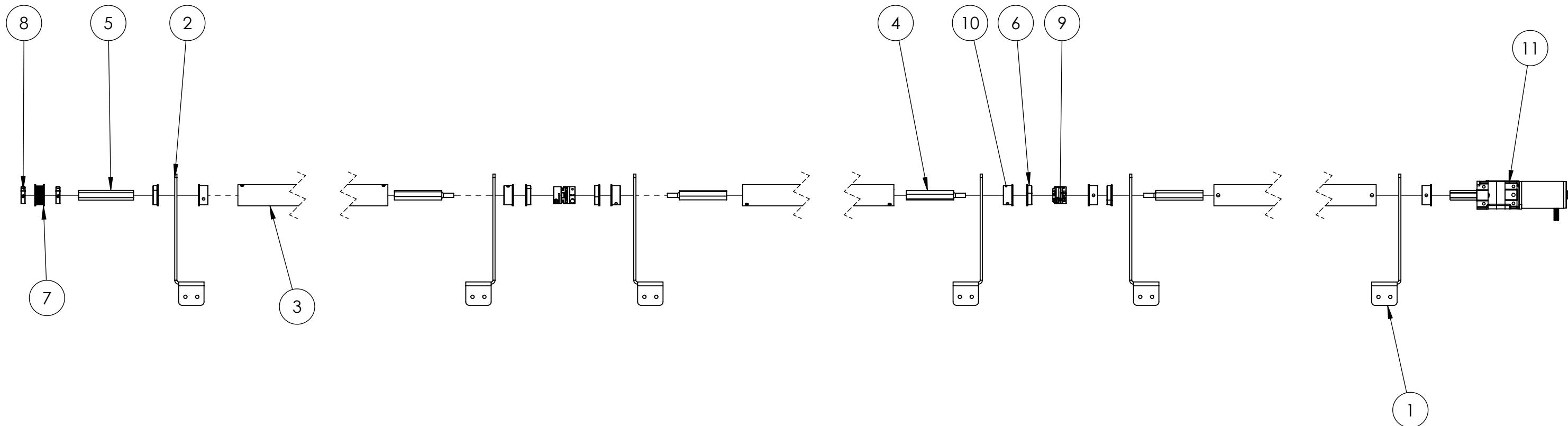
4

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B



B

A

A

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

FIRST
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TITLE:
Shutter Assembly

SIZE DWG. NO. **B** GE-19201 **REV**

SCALE: 1:32 WEIGHT: SHEET 2 OF 2

4

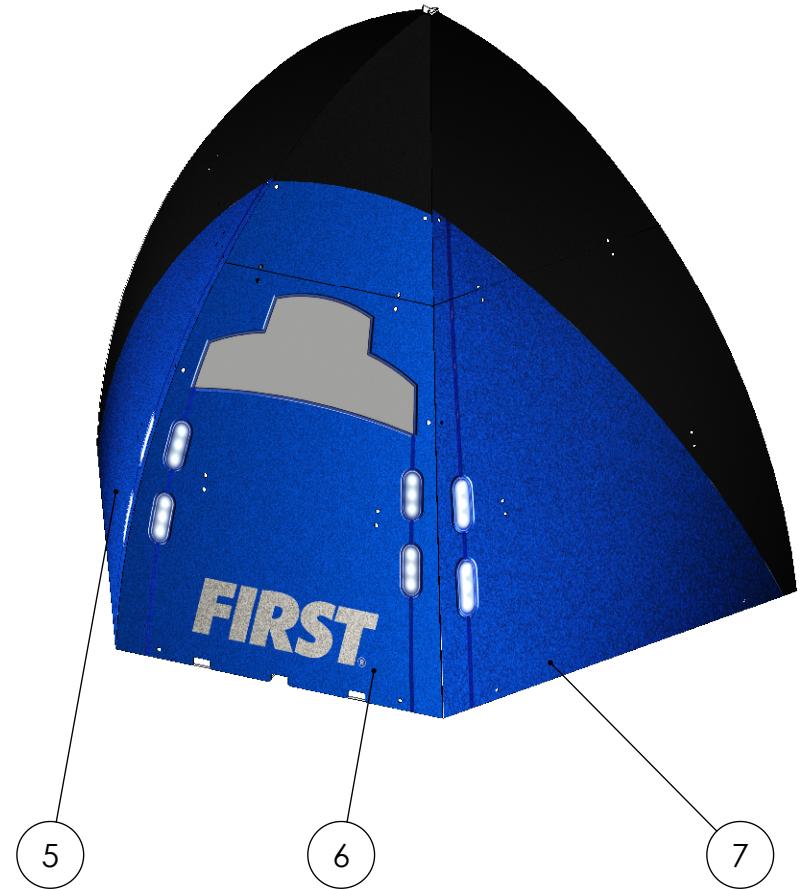
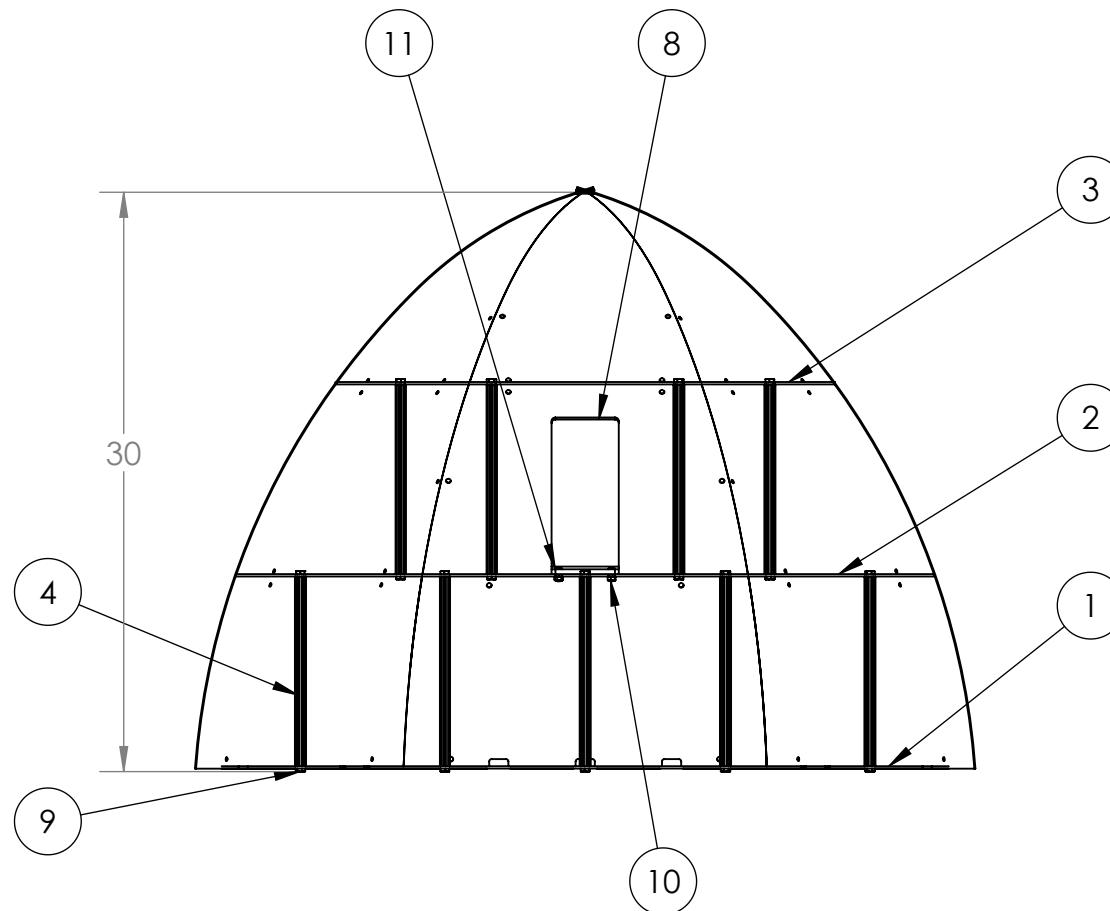
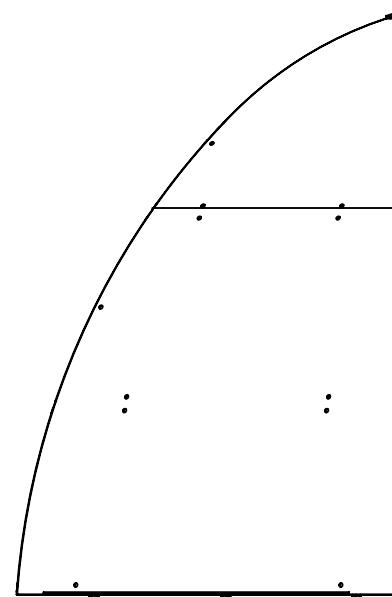
3

2

1

B

B



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-19203	Nose Cone Bottom Shelf	1
2	GE-19204	Nose Cone Middle Shelf	1
3	GE-19205	Nose Cone Top Shelf	1
4	GE-19206	Nose Cone Churro	9
5	GE-19207	Nose Cone Left Face	1
6	GE-19208	Nose Cone Center Face	1
7	GE-19209	Nose Cone Right Face	1
8	GE-19216	Light Mounting Bracket	1
9	hex_.25_20_.75	Steel Hex Head Screw, 1/4"-20 x 3/4" long, fully threaded	18
10	nylock_10_32	Low-Strength Steel Nylon-Insert Locknut, Zinc-Plated, 10-32 Thread Size	4
11	round_hex_10_32_.625_full	Round Hex Head, #10-32 x 5/8" long, fully threaded	4

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DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL: ±1/16
ANGULAR: MACH ±1° BEND ±1°
TWO PLACE DECIMAL ±.01
THREE PLACE DECIMAL ±.001

INTERPRET GEOMETRIC
TOLERANCING PER:

NEXT ASSY USED ON FINISH
APPLICATION DO NOT SCALE DRAWING

		NAME	DATE
DRAWN			
CHECKED			
ENG APPR.			
MFG APPR.			
Q.A.			
COMMENTS:			
SIZE	DWG. NO.	REV	
B	GE-19202		
SCALE: 1:10	WEIGHT:	SHEET 1 OF 2	

Notes:

1. Assembly exists in red and blue configurations.

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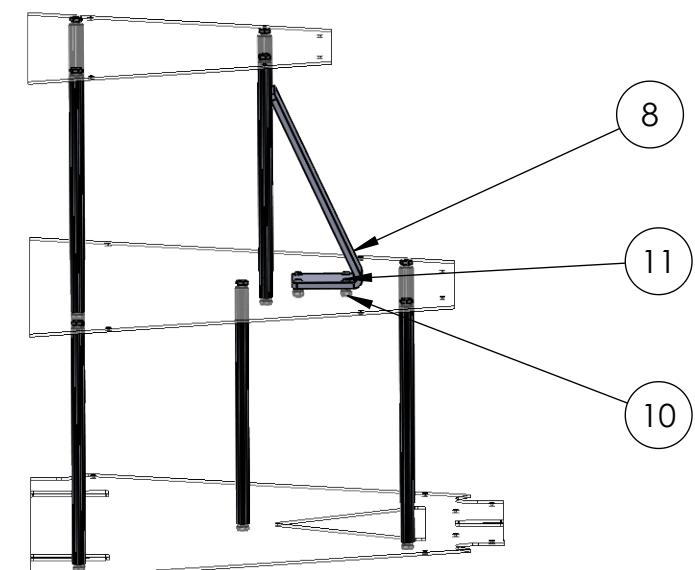
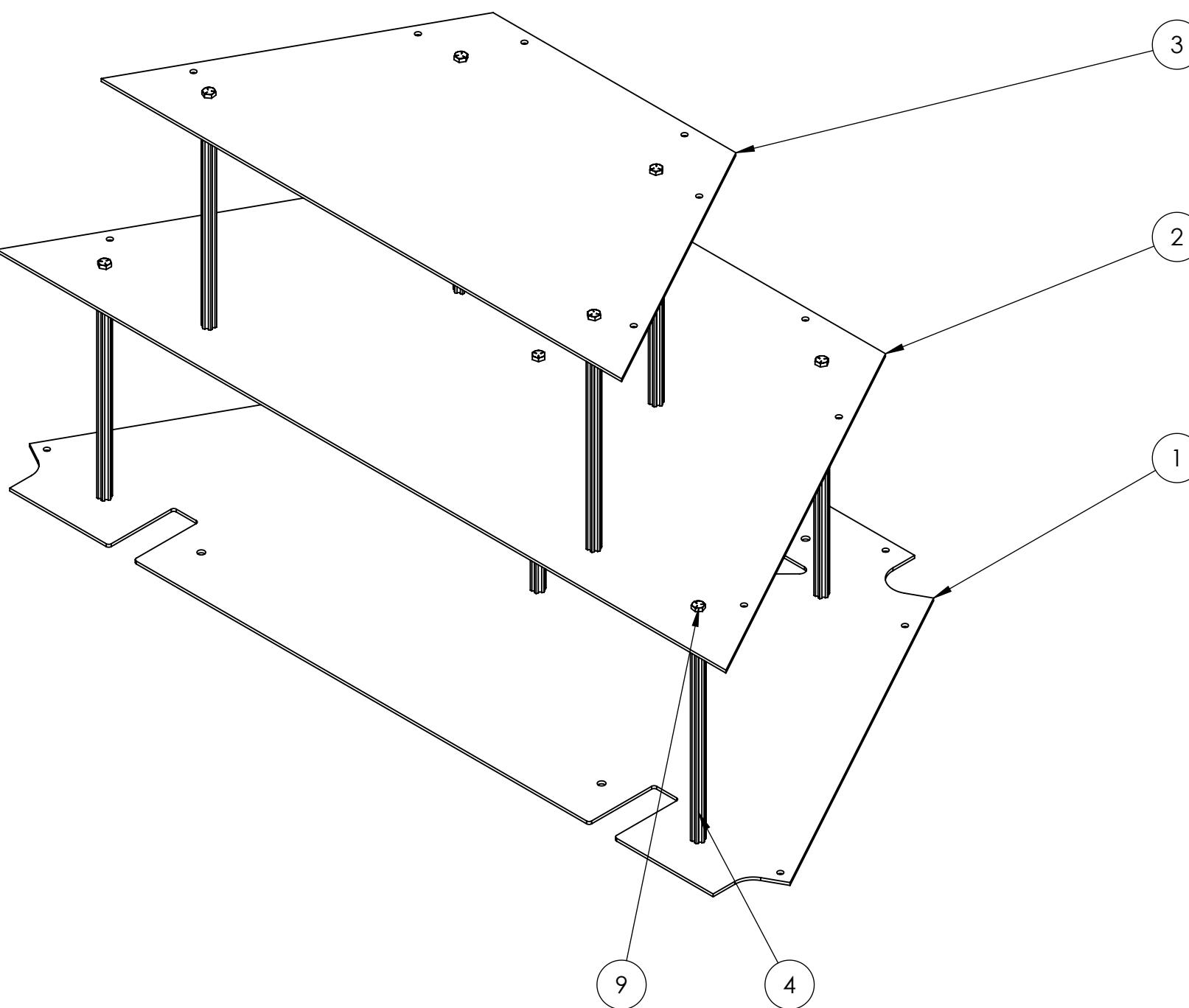
Nose Cone Assembly

4

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1



Notes:

1. Assemble base frame with items 1, 2, 3, 4 (qty. 9), and 9 (qty 18).
2. Attach item 8 to the assembly using items 10 and 11 (4x each).
3. Attach items 5, 6, and 7 using black cable ties.

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		DRAWN			
		CHECKED			
		ENG APPR.			
		MFG APPR.			
		Q.A.			
		COMMENTS:			
		MATERIAL			
		NEXT ASSY	USED ON	FINISH	
		APPLICATION		DO NOT SCALE DRAWING	
SIZE	DWG. NO.	REV			
B	GE-19202				
SCALE: 1:5	WEIGHT:	SHEET 2 OF 2			

FIRST
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Nose Cone Assembly

4

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1

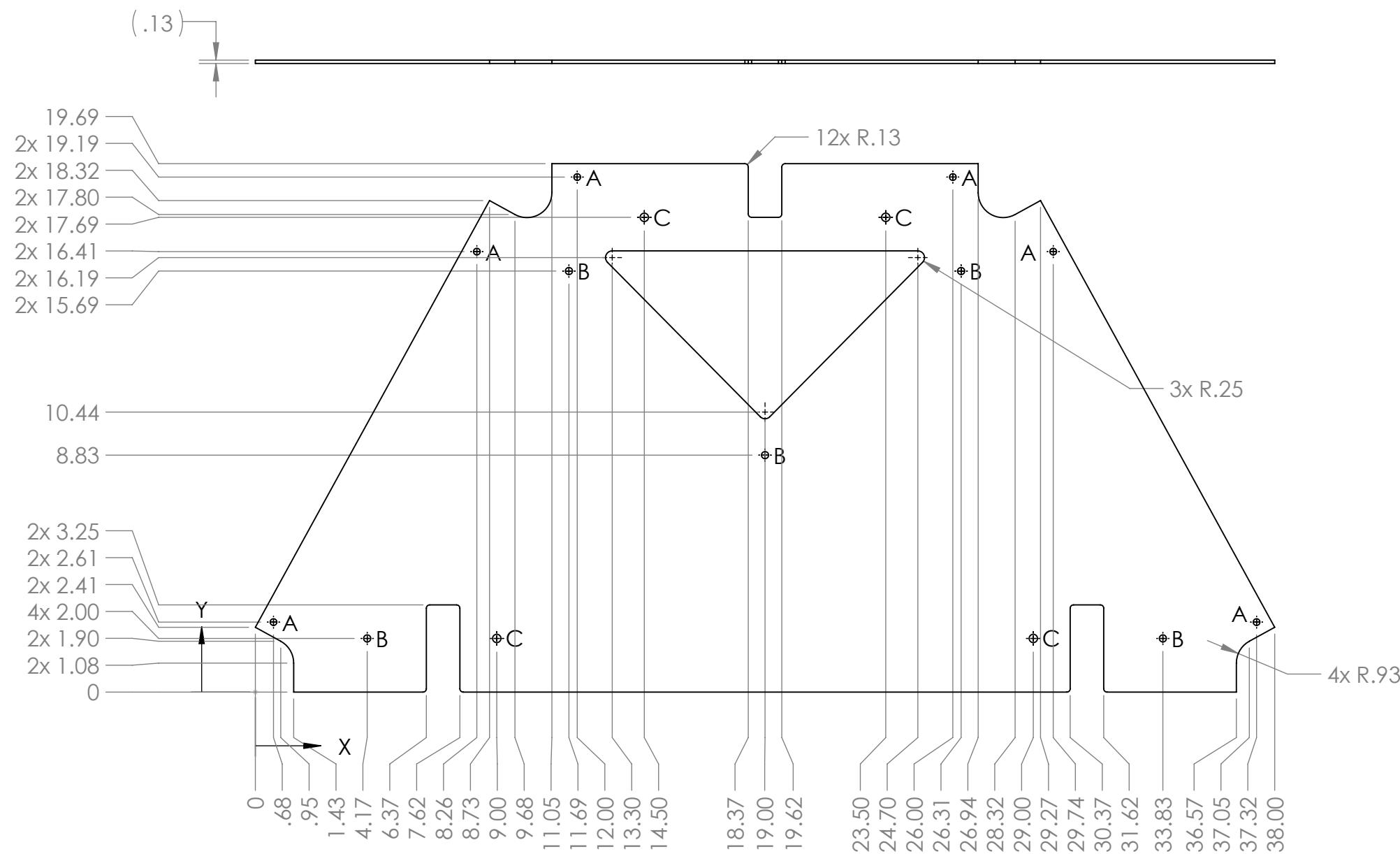
4

3

2

1

TAG	SIZE	QUANTITY
A	$\phi .25$ THRU ALL	6
B	$\phi .27$ THRU ALL	5
C	$\phi .31$ THRU ALL	4



Notes:

- Material: 1/8" thick, clear polycarbonate.
- Remove all burrs and sharp edges.
- Tag or label with part number.

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		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$	NAME	DATE
		DRAWN		
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
		MATERIAL		
		FINISH		
NEXT ASSY	USED ON			
APPLICATION	DO NOT SCALE DRAWING			
SCALE: 1:5		WEIGHT:	SHEET 1 OF 1	
SIZE DWG. NO. B GE-19203		REV		
TITLE: Nose Cone Bottom Shelf				



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4

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1

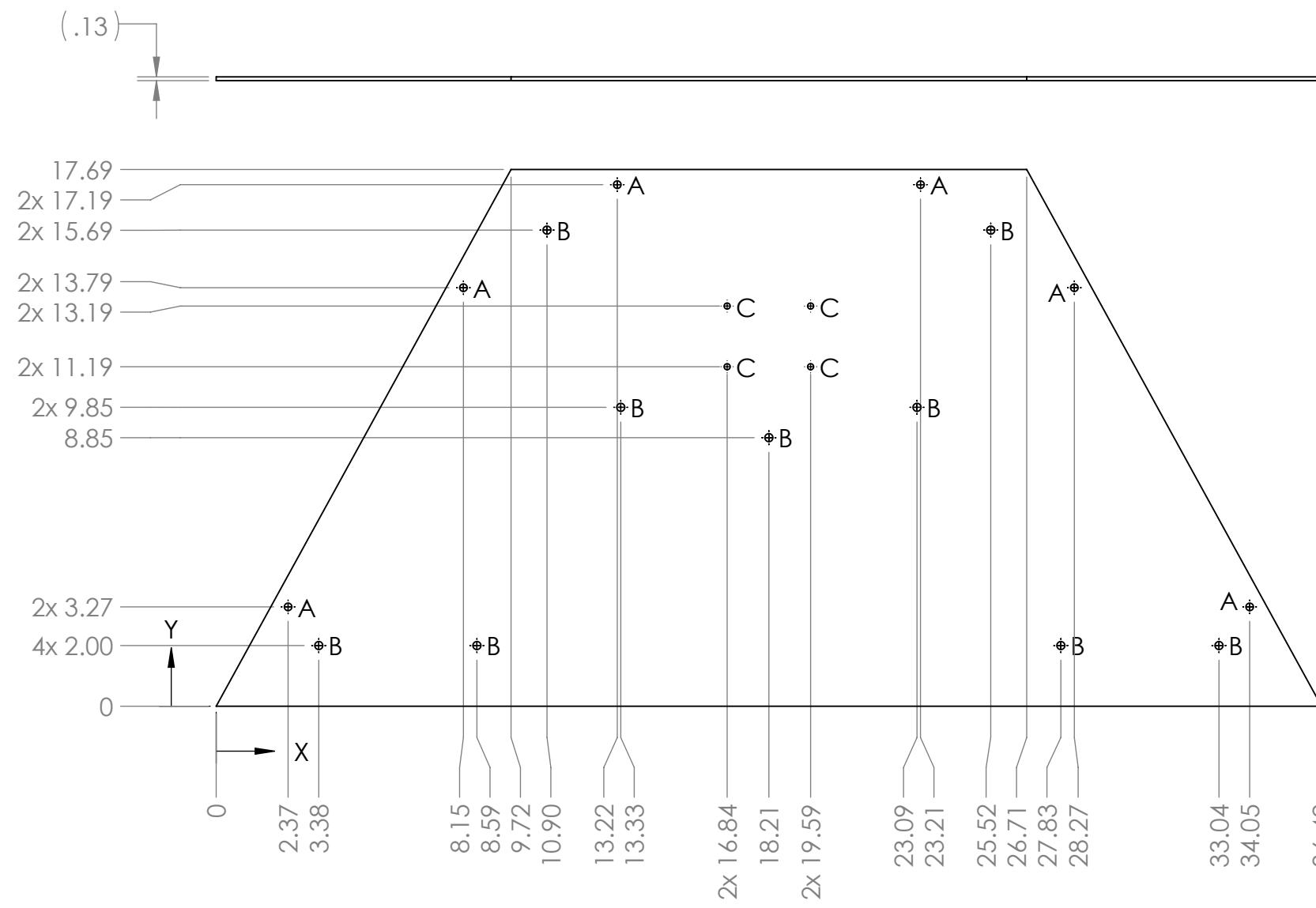
4

3

2

1

TAG	SIZE	QUANTITY
A	$\phi .25$ THRU ALL	6
B	$\phi .27$ THRU ALL	9
C	$\phi .20$ THRU ALL	4



- Notes:
1. Material: 1/8" thick, clear polycarbonate.
 2. Remove all burrs and sharp edges.
 3. Tag or label with part number.

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		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$	NAME	DATE
		DRAWN		
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
		MATERIAL		
		FINISH		
NEXT ASSY	USED ON			
APPLICATION	DO NOT SCALE DRAWING			
SIZE	DWG. NO.	REV		
B	GE-19204			
SCALE: 1:5	WEIGHT:	SHEET 1 OF 1		

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
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Title: Nose Cone Middle Shelf

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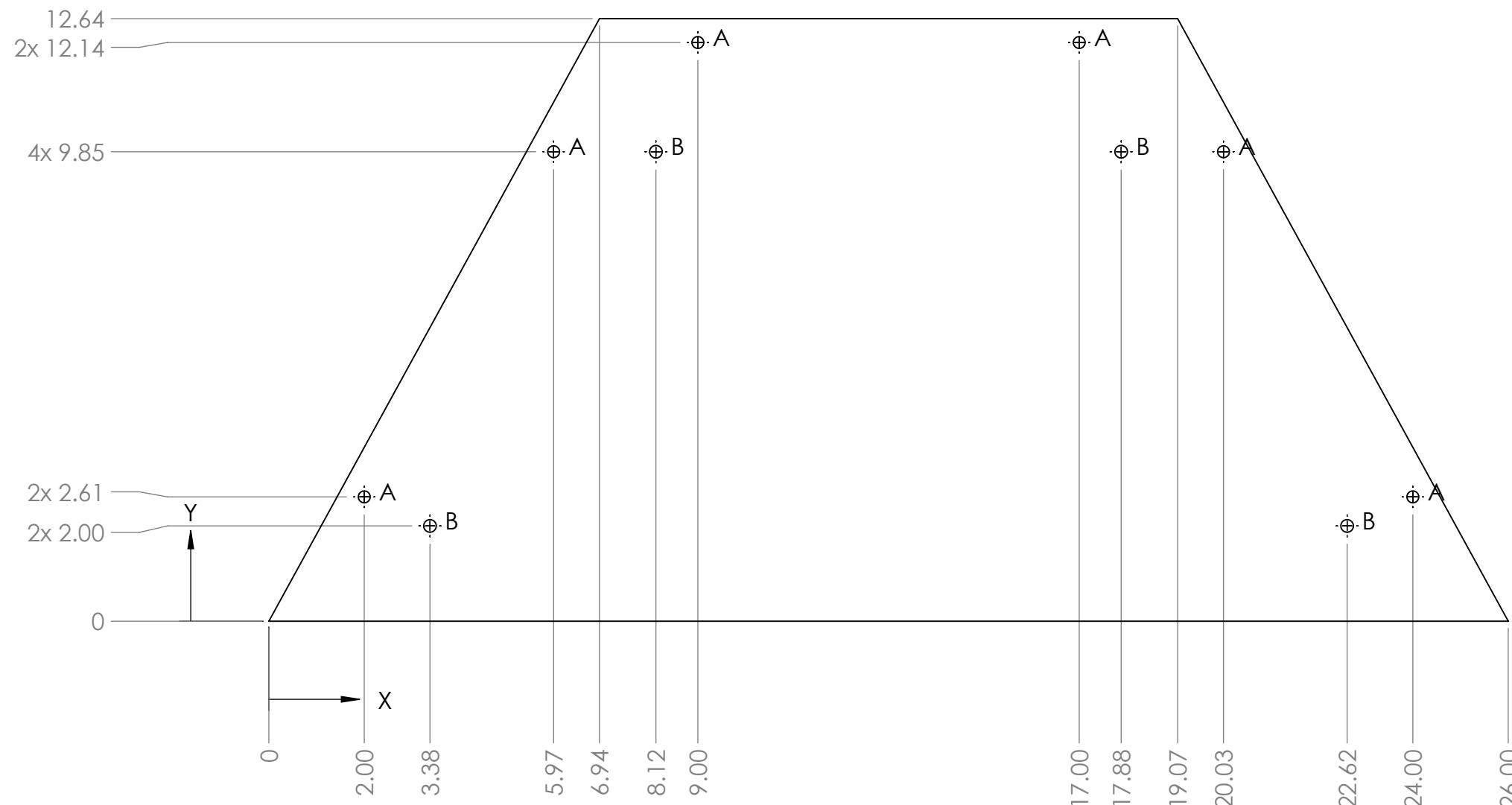
4

3

2

1

TAG	SIZE	QUANTITY
A	$\phi .25$ THRU ALL	6
B	$\phi .27$ THRU ALL	4



Notes:

- Material: 1/8" thick, clear polycarbonate.
- Remove all burrs and sharp edges.
- Tag or label with part number.

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		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$	NAME	DATE
		DRAWN		
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
		MATERIAL		
		FINISH		
NEXT ASSY	USED ON			
APPLICATION	DO NOT SCALE DRAWING			
SIZE DWG. NO.		REV		
B GE-19205				
SCALE: 1:3		WEIGHT:	SHEET 1 OF 1	

FIRST
ROBOTICS
COMPETITION

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TITLE:
Nose Cone Top Shelf

4

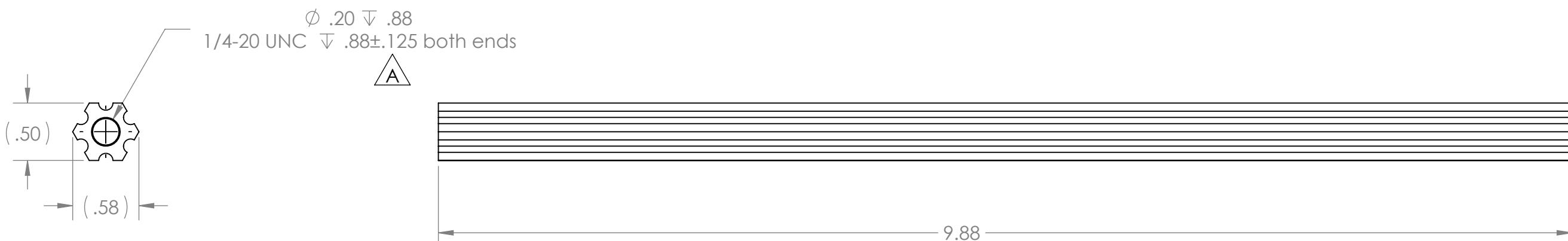
3

2

1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
B3	A	Added tolerance to tap depth.	11/1/2018	CPO



Note:

1. Make from AndyMark Part AM-3101-6 or equivalent.
2. Remove Sharp Edges and Burrs.
3. Label or tag with Part Number.

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
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TITLE: Nose Cone Churro

SIZE DWG. NO. **B** GE-19206 **REV** **A**

SCALE: 1:1 WEIGHT: SHEET 1 OF 1

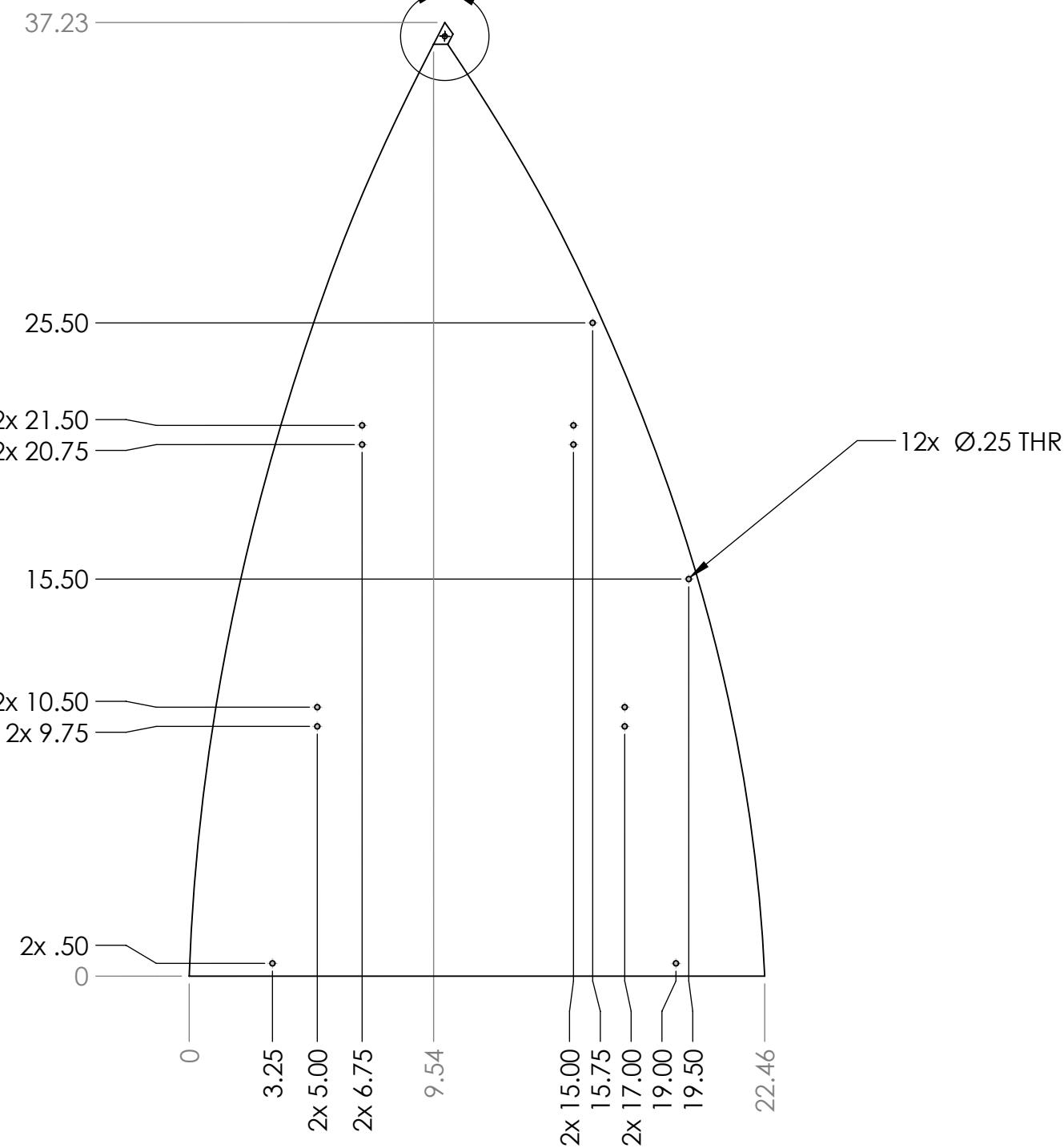
4

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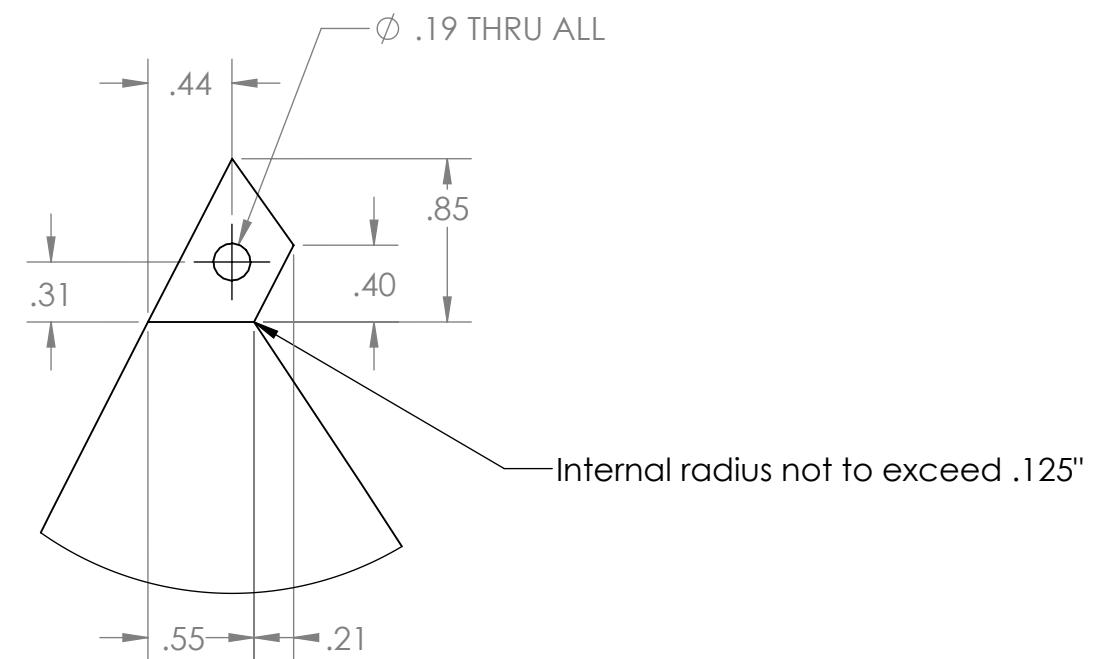
1

B



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DETAIL A
SCALE 1 : 1



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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
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TITLE: Nose Cone Left Face

SIZE	DWG. NO.	REV
B	GE-19207	
SCALE: 1:6	WEIGHT:	SHEET 1 OF 1

4

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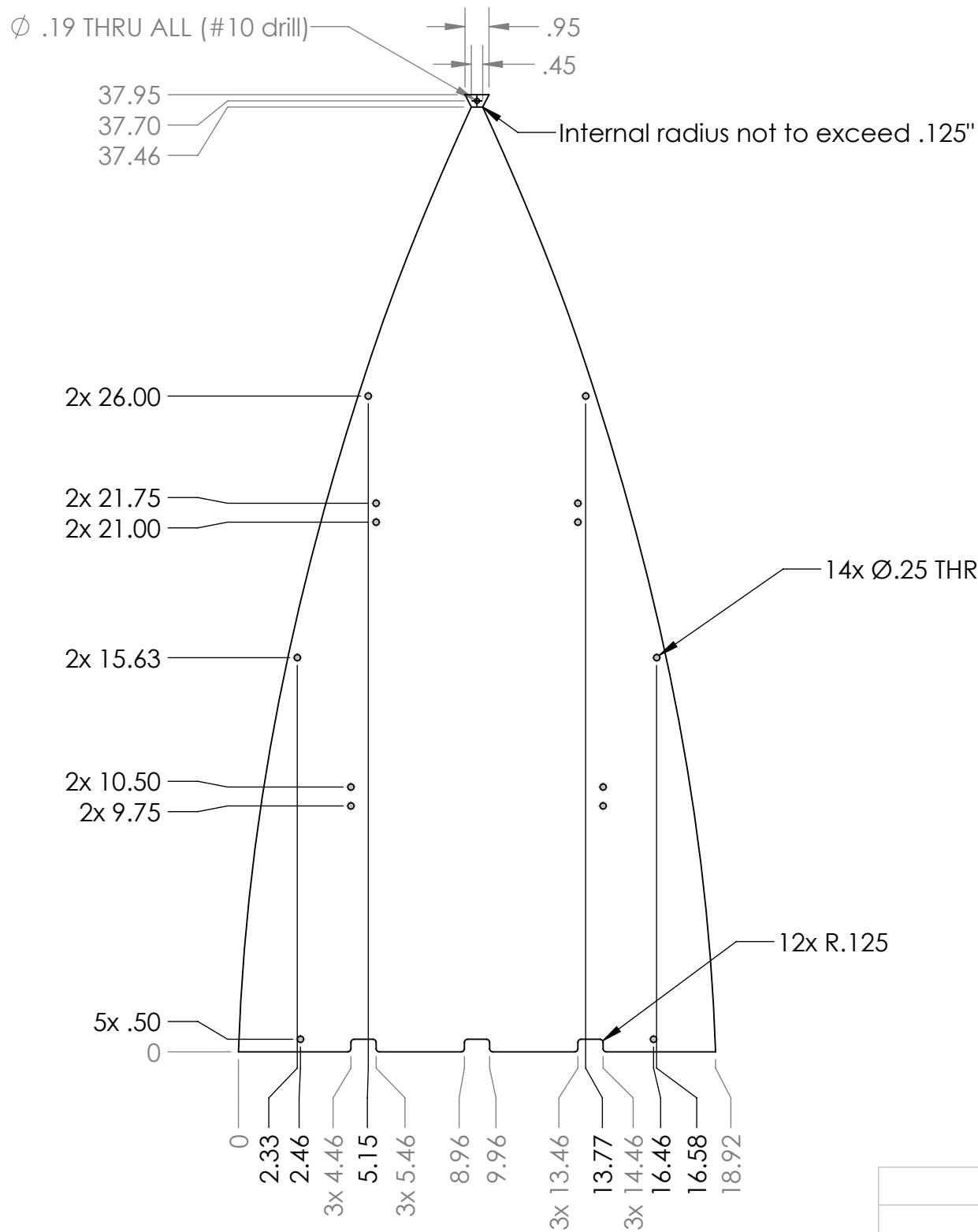
3

2

1

B

B



- Notes:
1. Material: 1/16" thick polycarbonate, clear.
 2. Remove all burrs and sharp edges.
 3. Vinyl to be applied to face.
 4. Tag or label with part number.

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		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$	NAME	DATE
		DRAWN		
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
		MATERIAL		
		FINISH		
NEXT ASSY	USED ON			
APPLICATION	DO NOT SCALE DRAWING			
SCALE: 1:6	WEIGHT:			SHEET 1 OF 1



Nose Cone Center Face

SIZE DWG. NO. REV
B GE-19208

4

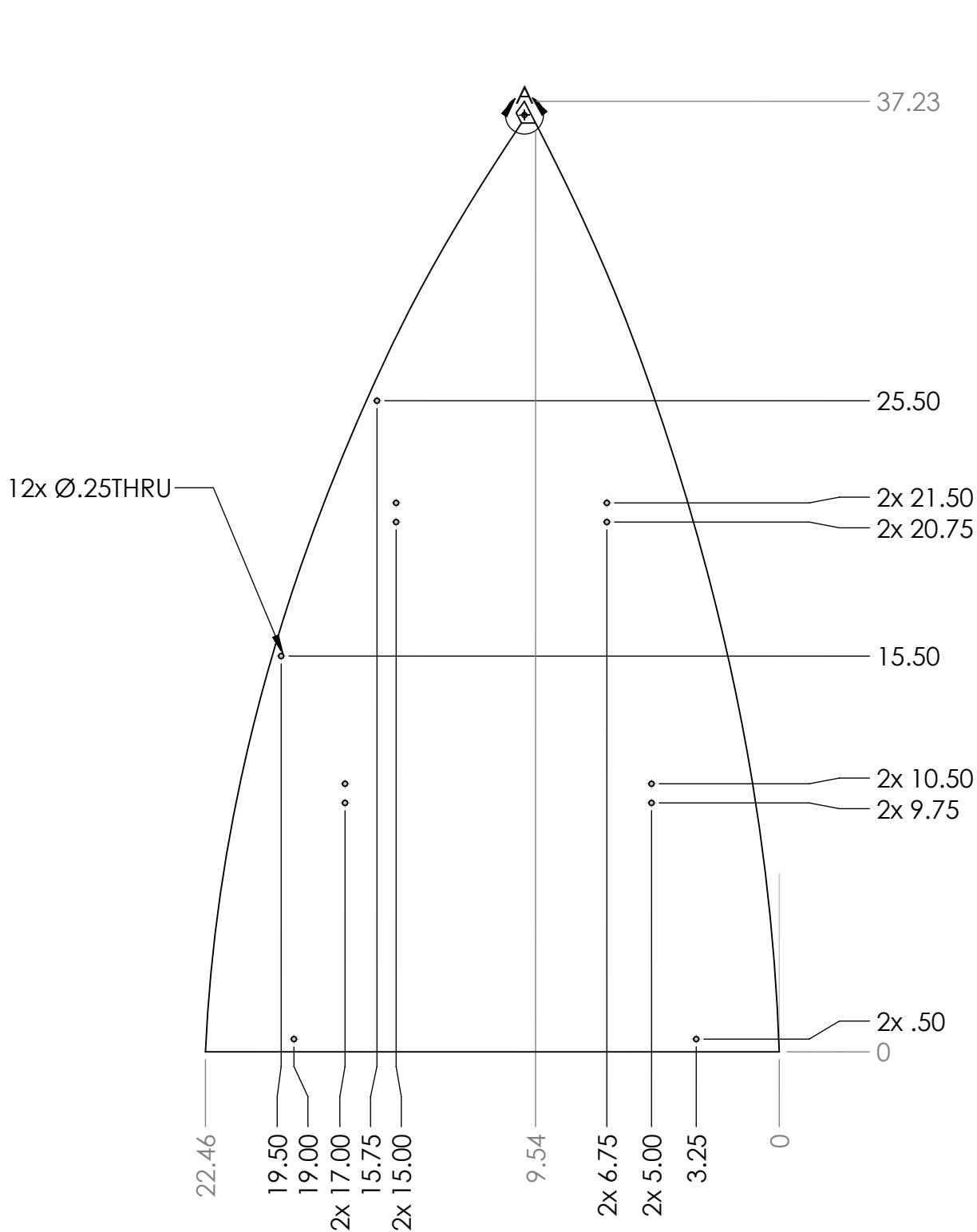
3

2

1

B

B



- Notes:
- Material: 1/16" thick polycarbonate, clear.
 - Remove all burrs and sharp edges.
 - Vinyl to be applied to face.
 - Tag or label with part number.

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
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TITLE: Nose Cone Right Face

SIZE DWG. NO. REV
B GE-19209

SCALE: 1:6 WEIGHT: SHEET 1 OF 1

4

3

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B

B

A technical drawing of a circular part. In the center is a smaller circle with a crosshair inside. Three horizontal slots extend from the top edge of the large circle towards the center, each ending in a small arrowhead pointing towards the center. The distance between the centers of the central hole and the left slot is labeled as 3X .50. The distance between the centers of the central hole and the top slot is labeled as 3X .38. The radius of the large circle is labeled as 3X R.19. The bottom right corner of the drawing features a large, semi-transparent watermark that reads "DRAFT" in bold capital letters.

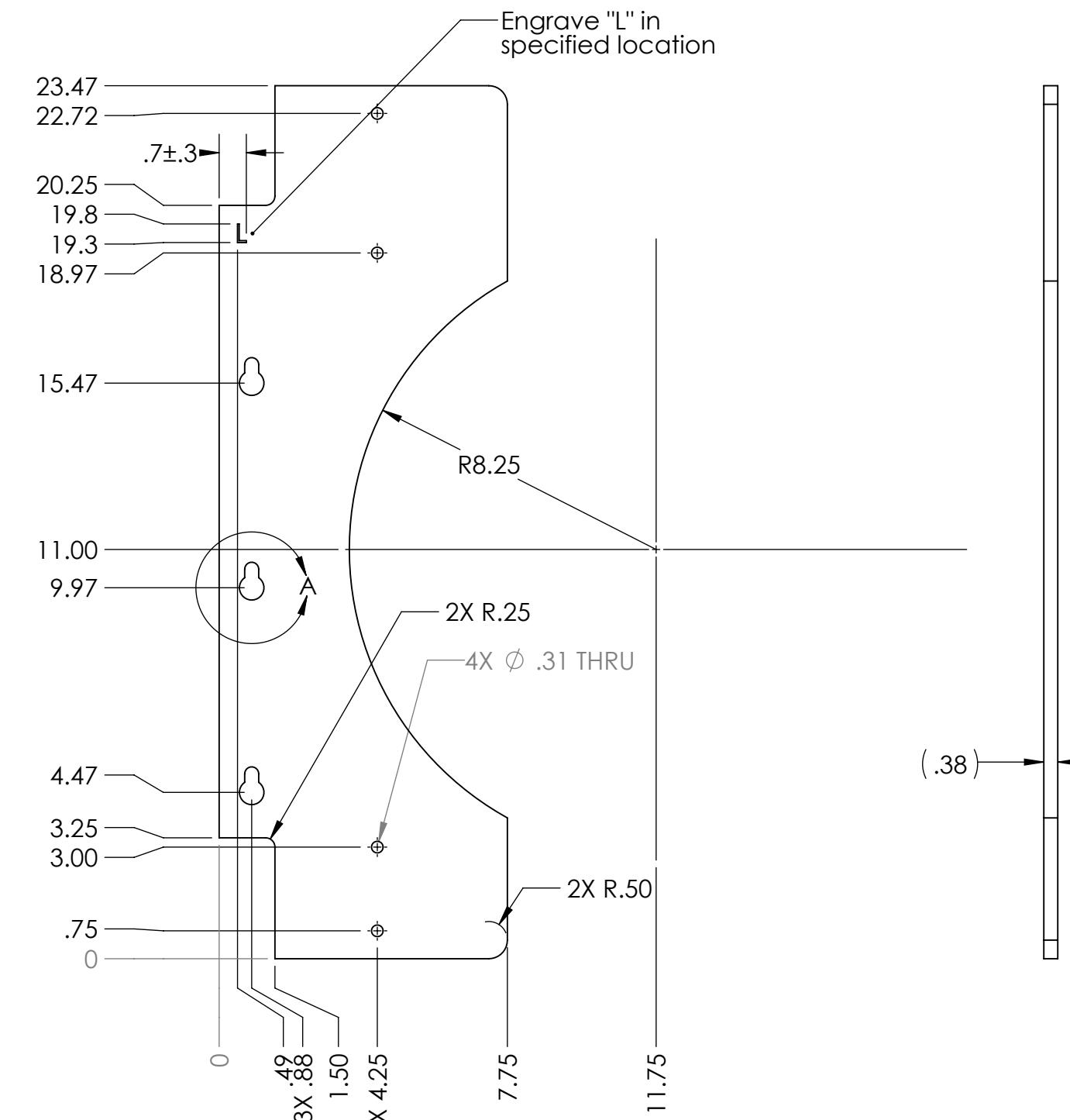
DETAIL A
SCALE 1 : 2

Part Number	Color
GE-19210-BLU	BLUE
GE-19210-RED	RED

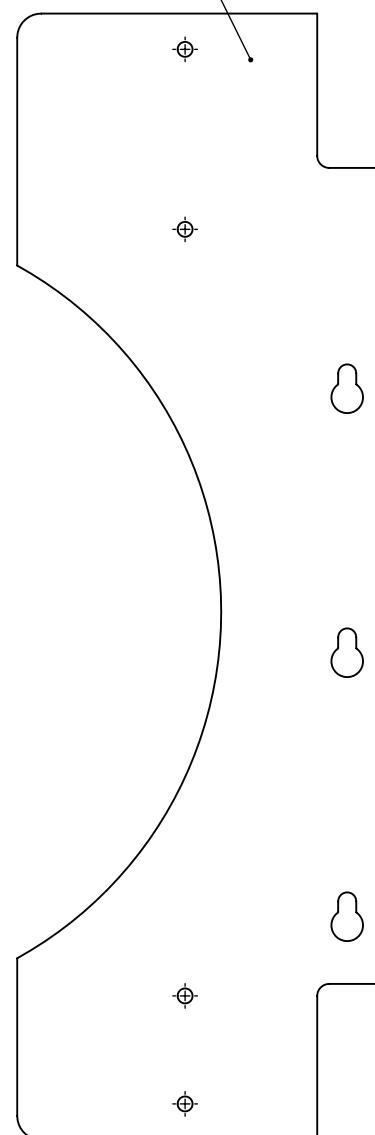
Note:
Dimensions are identical to GE-19077

Dimensions are identical to CE 1907
Material: 3/8" Thick Polycarbonate Sheet Clear
Finish: Apply red or blue screen print to indicated side
Tag or Label With Part Number
Remove sharp edges and burrs

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Screen print this side-



		UNLESS OTHERWISE SPECIFIED:		NAME	DATE	 FIRST ROBOTICS COMPETITION
		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$	DRAWN			
			CHECKED			
			ENG APPR.			
			MFG APPR.			
		INTERPRET GEOMETRIC TOLERANCING PER:	Q.A.			
		MATERIAL	COMMENTS:			
NEXT ASSY	USED ON	FINISH				
APPLICATION		DO NOT SCALE DRAWING	SCALE: 1:4		WEIGHT:	SHEET 1 OF 1

TITLE: Cargo Ship Panel Plastic Left
SIZE DWG. NO. REV.

4

3

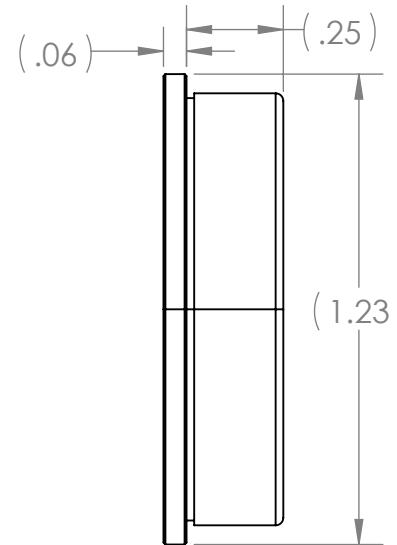
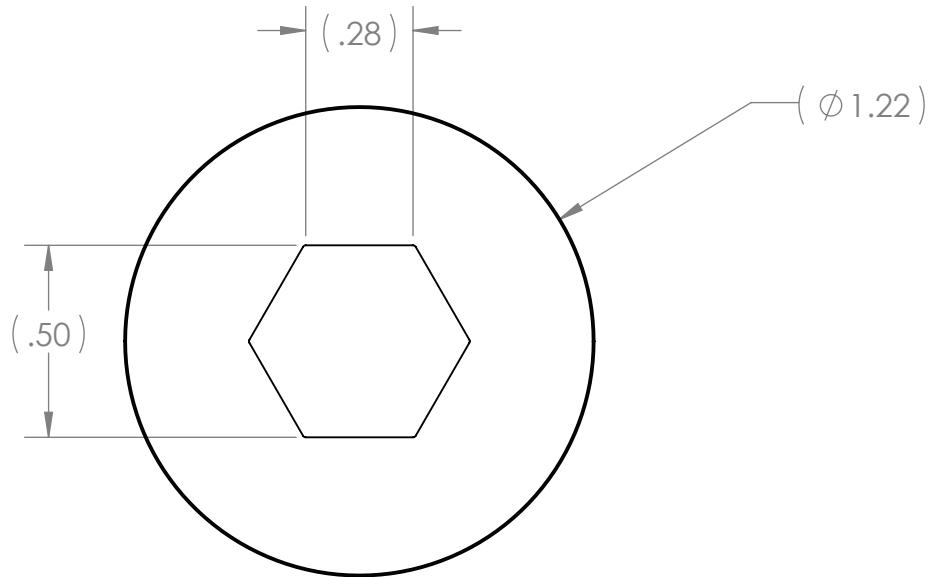
2

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B



B

Note:**Part Number:**

1/2 in. Bore Hex Bearing, Flanged, Heavy Duty Inner Race (FR8ZZ-HexHD)

A

A

		UNLESS OTHERWISE SPECIFIED:		DRAWN	NAME	DATE	TITLE: 1/2" Hex Bearing	
		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$		CHECKED				
		INTERPRET GEOMETRIC TOLERANCING PER:		ENG APPR.				
		MATERIAL		MFG APPR.				
NEXT ASSY		Q.A.		COMMENTS:				
USED ON								
APPLICATION		FINISH						
DO NOT SCALE DRAWING								
SIZE	DWG. NO.						REV	
A	GE-19215							
SCALE: 2:1		WEIGHT:		SHEET 1 OF 1				

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2

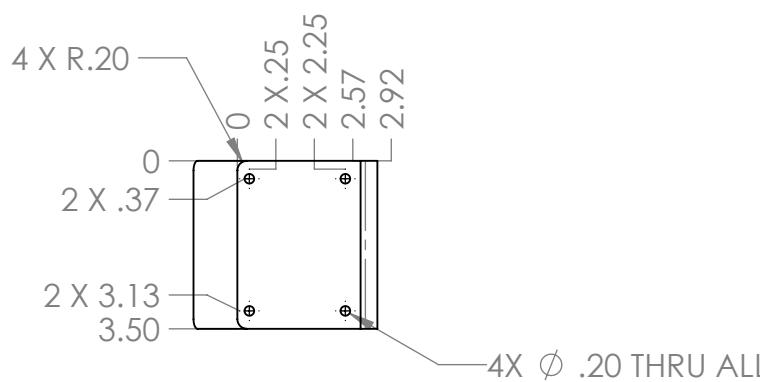
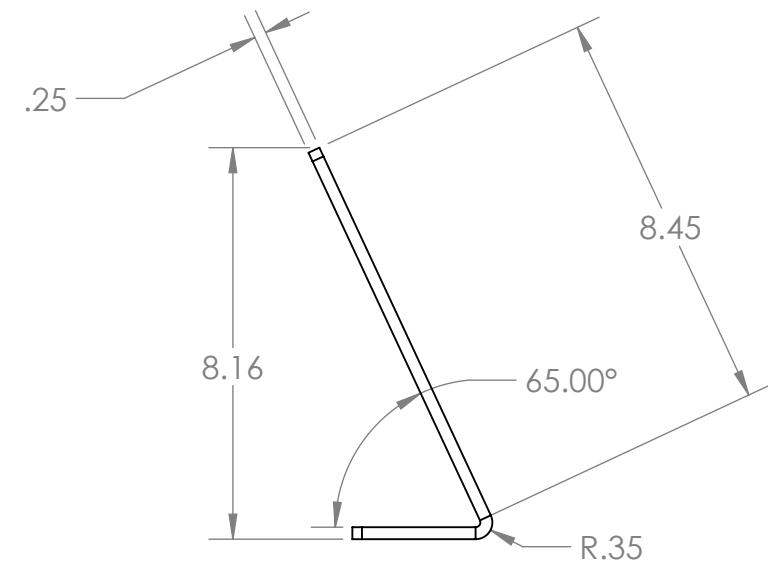
1

4

3

2

1



Notes:
 1: Material: .25" Clear Polycarbonate
 2: Remove all burrs and sharp edges
 3: Label Part with Part Number

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
 Modeling Solutions Partner

Title: Light Mounting Bracket

Size: DWG. NO. **B** **GE-19216** **Rev:**

Scale: 1:4 **Weight:**

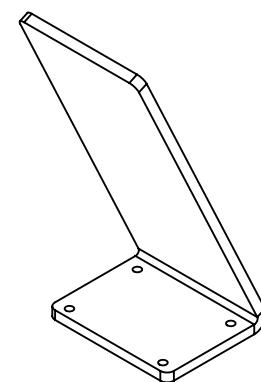
Sheet 1 of 1

4

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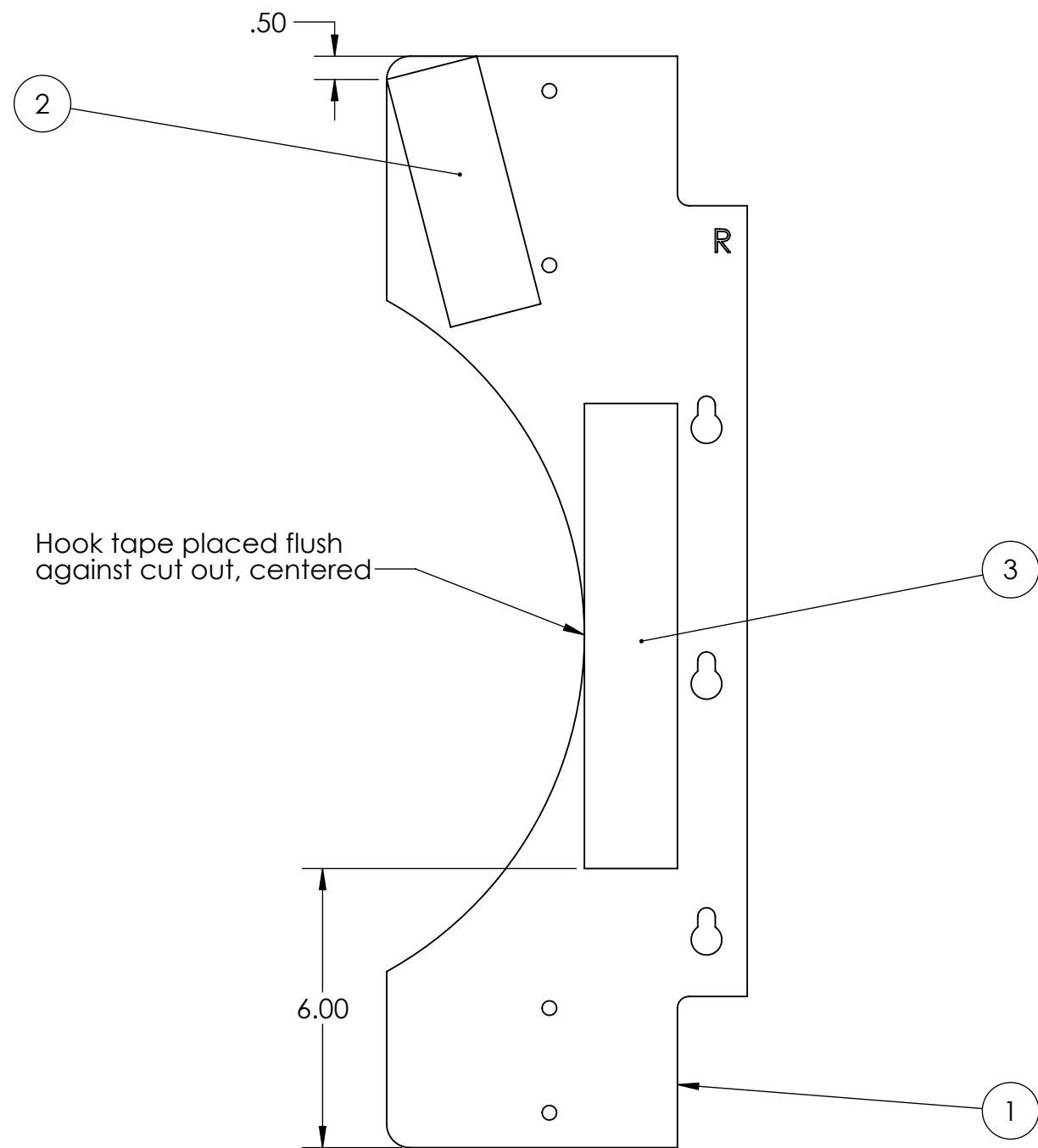
3

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B

B



Notes:
1. Assembly exists in red and blue configurations.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	GE-19077	Cargo Ship Panel Plastic Right	1
2	VisionTape	2" x 5.5" Retroreflective tape	1
3	Hook_2_10	2" x 10" Hook, Adhesive Backed	1

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Panel Plastic Half Assembly, Right

B **GE-19217**

SIZE DWG. NO. REV
SCALE: 1:8 WEIGHT: SHEET 1 OF 1

4

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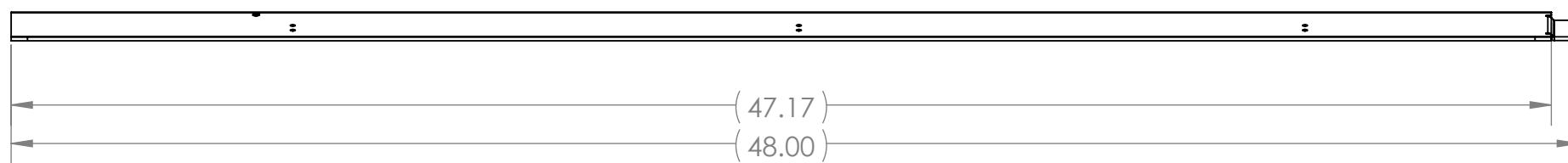
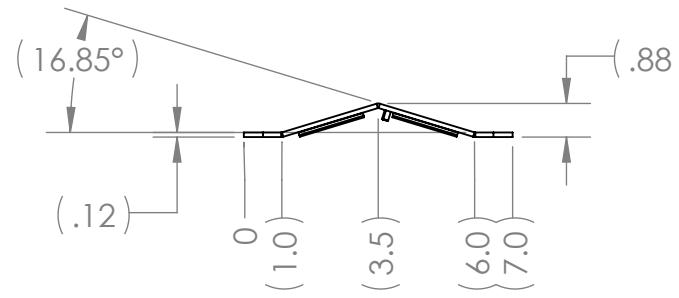
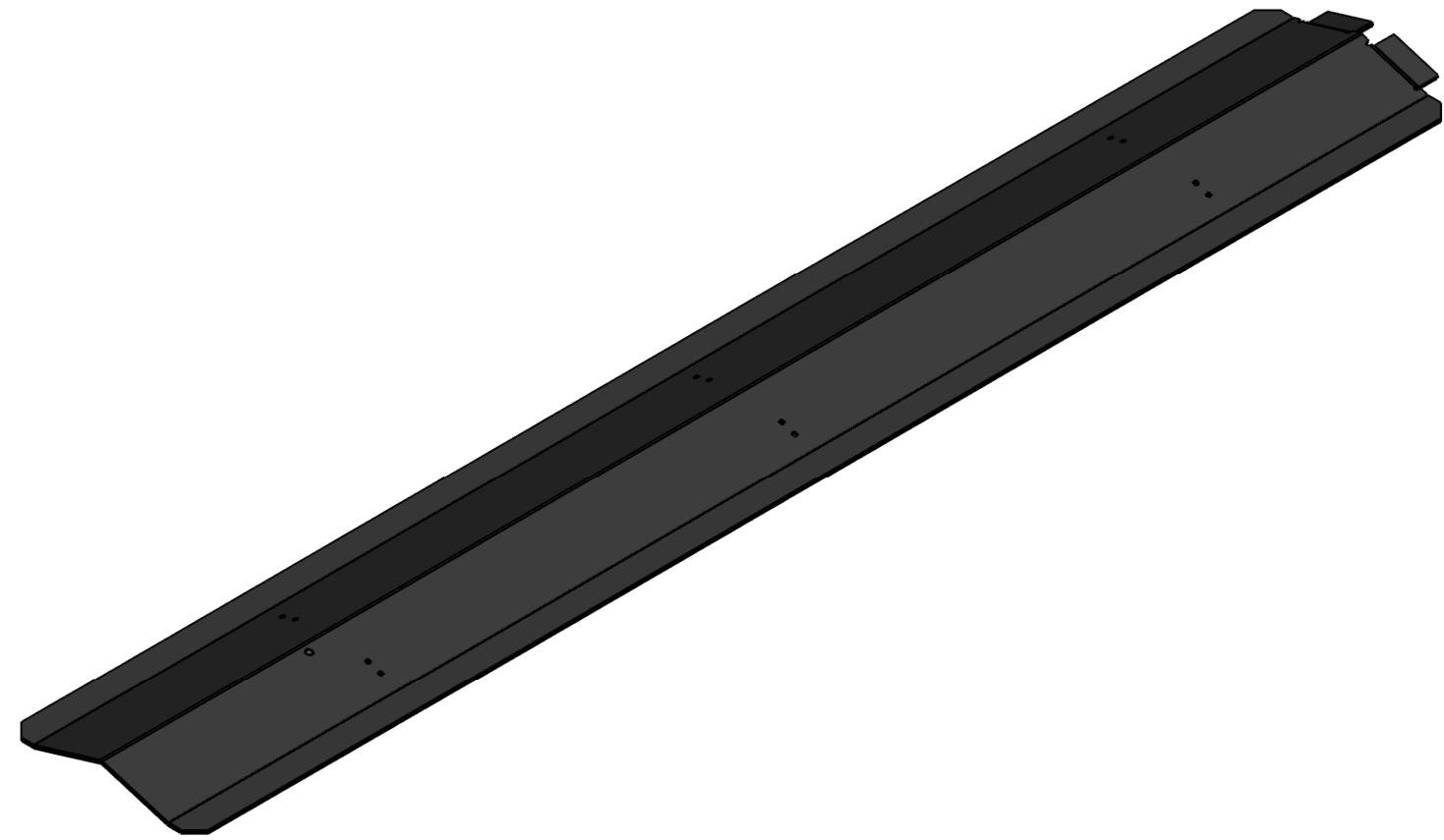
1

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Notes:

1. Description: Cable Protector Long Segment
2. Source: VEXpro
3. Item #: 217-6294-001

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

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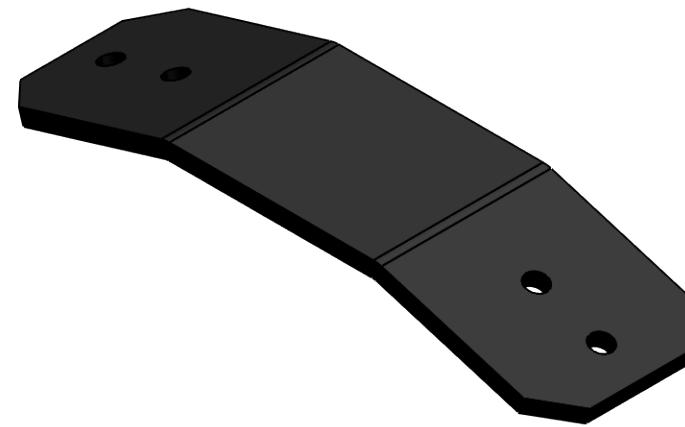
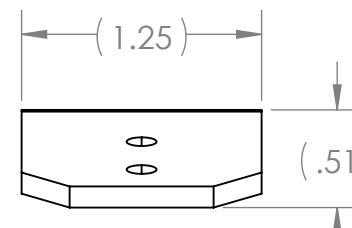
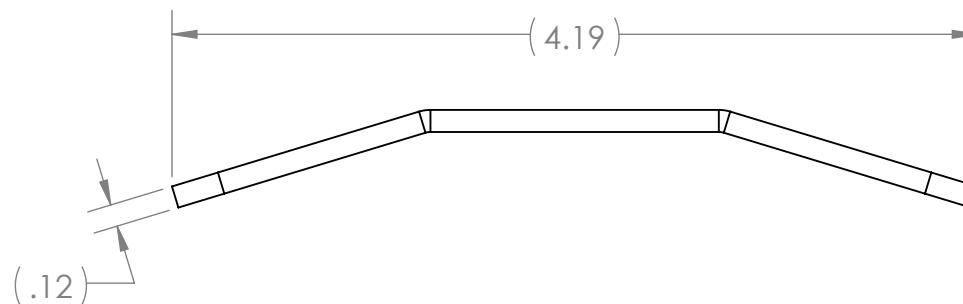
3

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Notes:

1. Description: Cable Protector Strap
2. Source: VEXpro
3. Item #: 217-6294-003

4

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

FIRST
ROBOTICS
COMPETITION

Cable Protector
Strap

B GE-19224

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

4

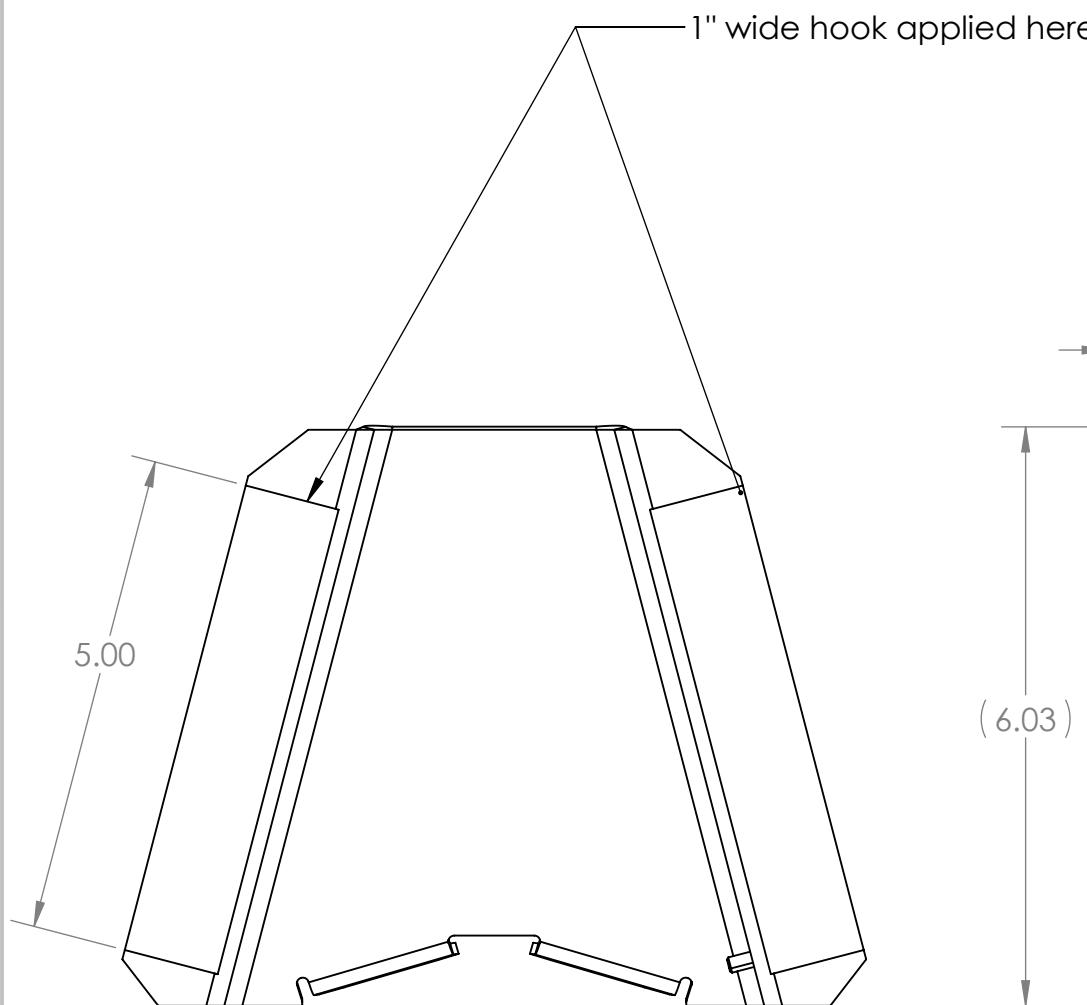
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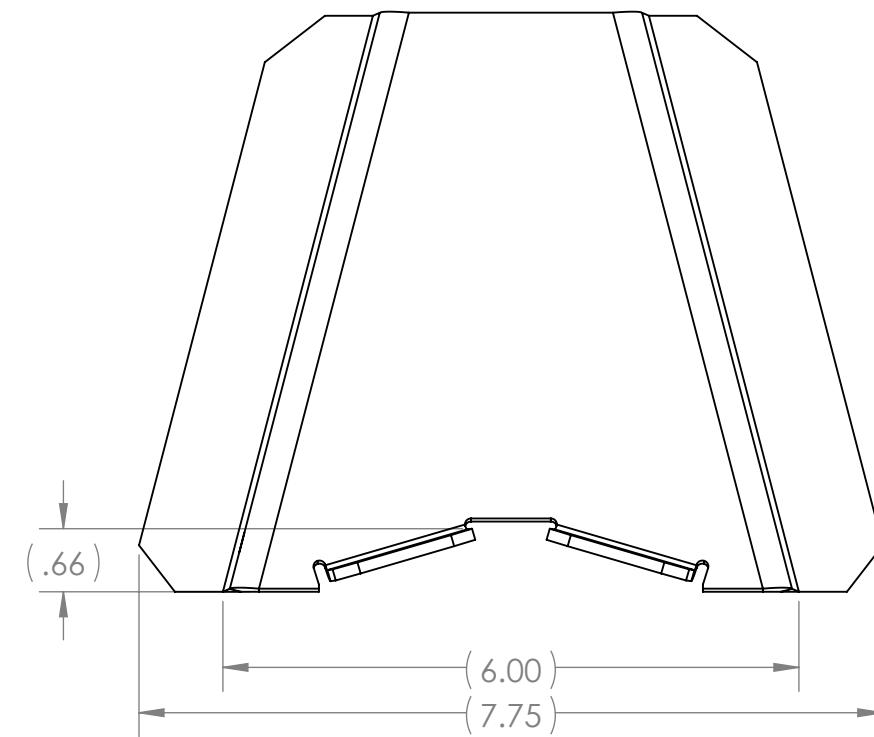
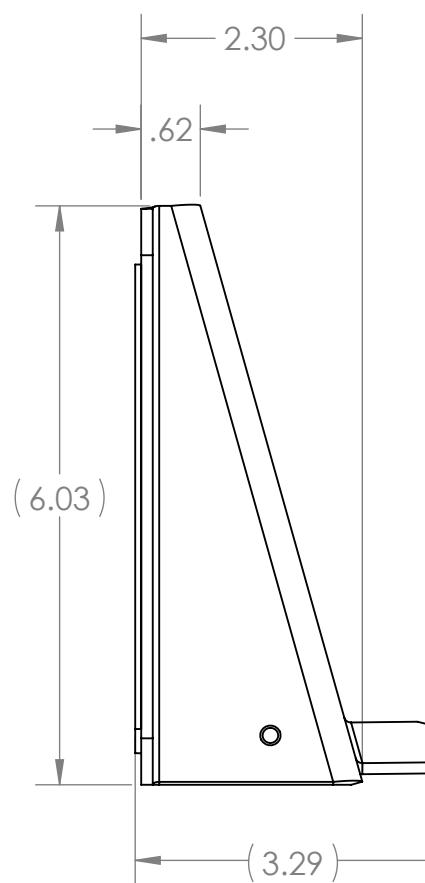
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B

B



5.00

**Notes:**

1. Description: Cable Protector Exit Segment
2. Source: VEXpro
3. Item #: 217-6294-002

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

**Cable Protector
Exit Segment**

SIZE	DWG. NO.	REV
B	GE-19225	
SCALE: 1:2	WEIGHT:	SHEET 1 OF 1

4

3

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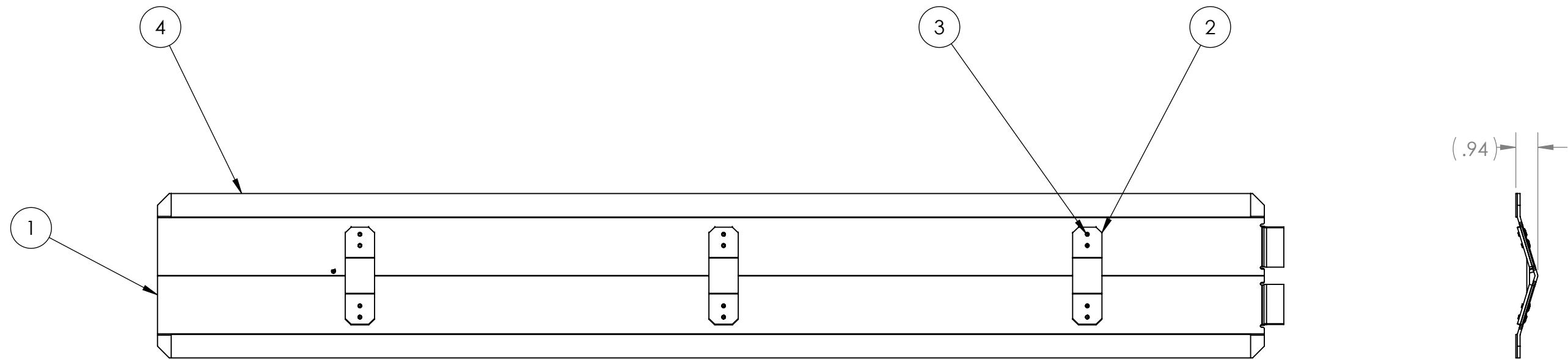
3

2

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B

B



Notes:

1. Item 2 (qty. 3) attached to item 1 using Item 3 (qty. 12).
2. Attach item 4 (qty. 2) as shown.

A

A

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-19223	Cable Protector Long Segment	1
2	GE-19224	Cable Protector Strap	3
3	rivet_.1563_.1875-.25	5/32" Aluminum Rivet, .1875-.25 Grip Range	12
4	Hook_1_46	1" X 46" Hook Fastener, Adhesive Backed	2

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

FIRST ROBOTICS COMPETITION
SOLIDWORKS
Modeling Solutions Partner

TITLE: **Cable Protector Long Assembly**

SIZE DWG. NO. REV
B GE-19226

SCALE: 1:5 WEIGHT: SHEET 1 OF 1

4

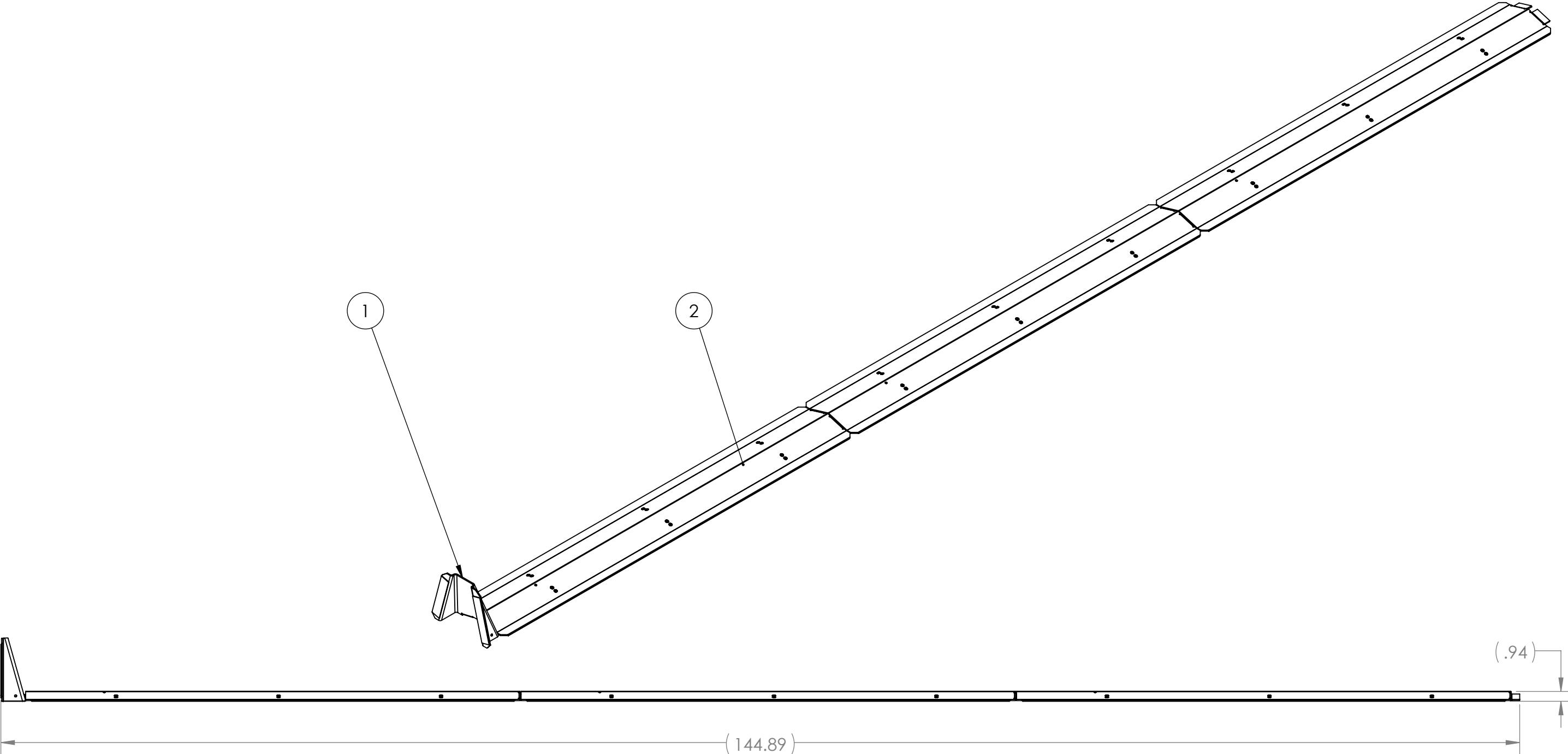
3

2

1

B

B



Notes:

1. Place item 1 onto the side border of the field, centered, scoring table side.
2. Place item 2 on top of the tabs of item 1.
3. Place each of the remaining item 2 pieces on top of the tabs of the previous part as shown.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-19225	Cable Protector Exit Segment	1
2	GE-19226	Cable Protector Long Assembly	3

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		DRAWN			
		CHECKED			
		ENG APPR.			
		MFG APPR.			
		Q.A.			
		COMMENTS:			
		MATERIAL			
		INTERPRET GEOMETRIC TOLERANCING PER:			
		NEXT ASSY	USED ON	FINISH	
		APPLICATION		DO NOT SCALE DRAWING	
SIZE	DWG. NO.	REV			
B	GE-19227				
SCALE: 1:10	WEIGHT:	SHEET 1 OF 1			

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

Cable Protector Assembly

4

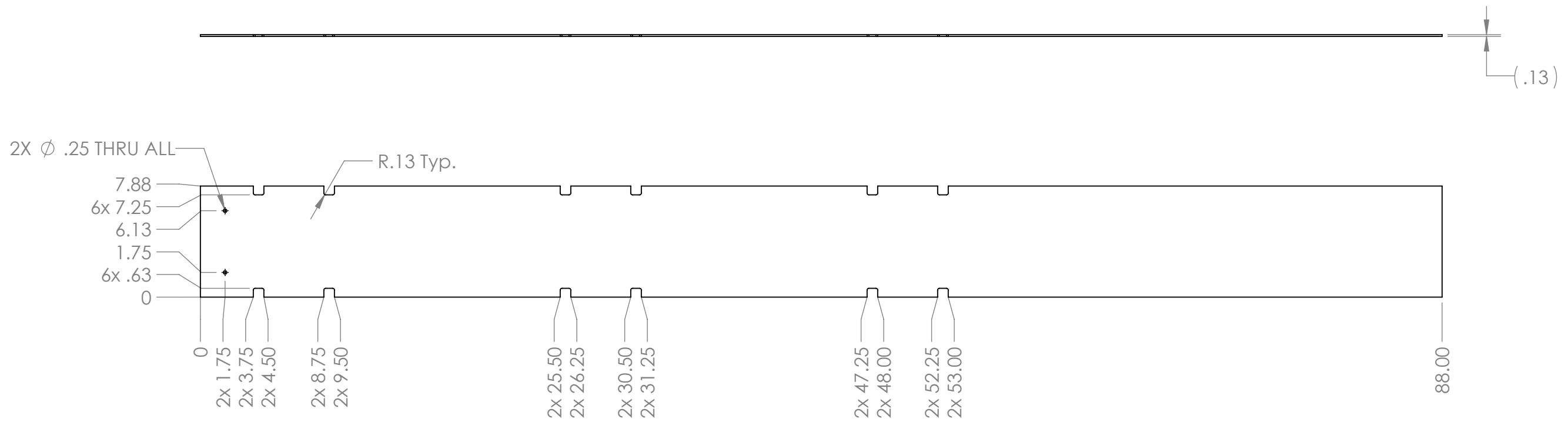
3

2

1

B

B



Notes:

1. Remove burrs and sharp edges.
2. Material: 1/8" thk., clear polycarbonate
3. Tag or label with part number.

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		DRAWN		
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
		MATERIAL		
		FINISH		
NEXT ASSY	USED ON			
APPLICATION	DO NOT SCALE DRAWING			
SIZE	DWG. NO.	REV		
B	GE-19228	A		
SCALE: 1:8	WEIGHT:	SHEET 1 OF 1		



TITLE:

Cargo Ship Bumper Plastic Side

4

3

2

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4

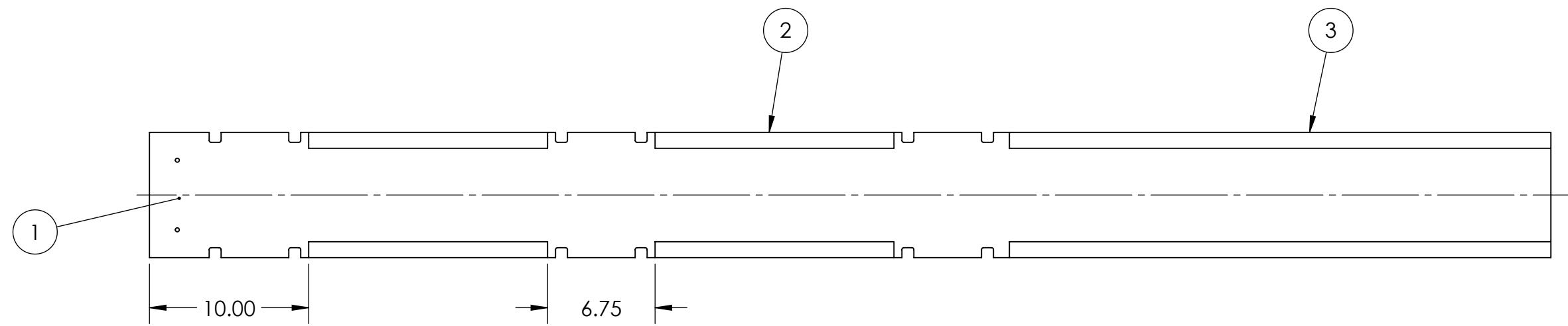
3

2

1

B

B



ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	GE-19228	Cargo Ship Bumper Plastic Side	1
2	Loop_1_15	1" Adhesive-Backed Loop, 15" Long	4
3	Loop_1_34	1" x 34" Loop, Adhesive Backed	2

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: **GE-19228, with Loop**

SIZE **B** DWG. NO. **GE-19228-Assembly** REV **1**

SCALE: 1:12 WEIGHT: **1** SHEET 1 OF 1

4

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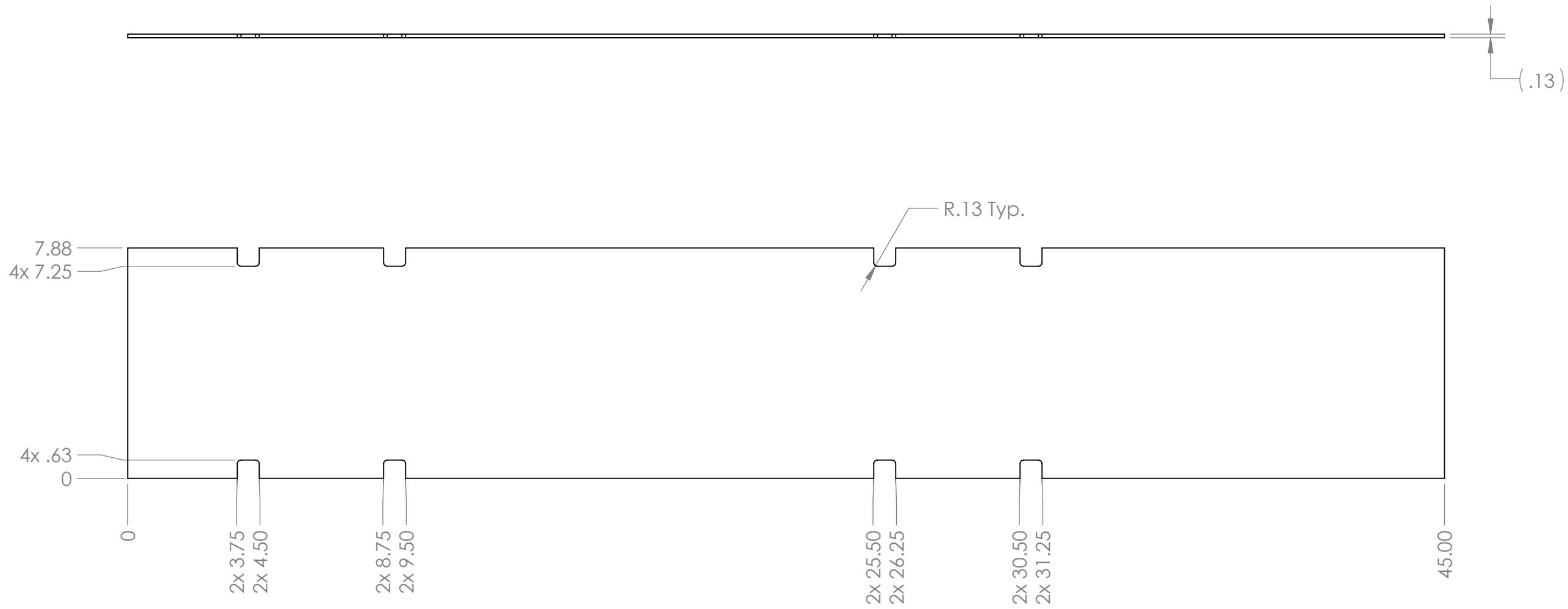
3

2

1

B

B



A

A

Notes:

1. Remove all burrs and sharp edges.
2. Material: 1/8" thk., clear polycarbonate
3. Tag or label with part number.

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		DRAWN		
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
		MATERIAL		
		FINISH		
NEXT ASSY	USED ON			
APPLICATION	DO NOT SCALE DRAWING			
SIZE	DWG. NO.	REV		
B	GE-19229	A		
SCALE: 1:4	WEIGHT:	SHEET 1 OF 1		

4

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4

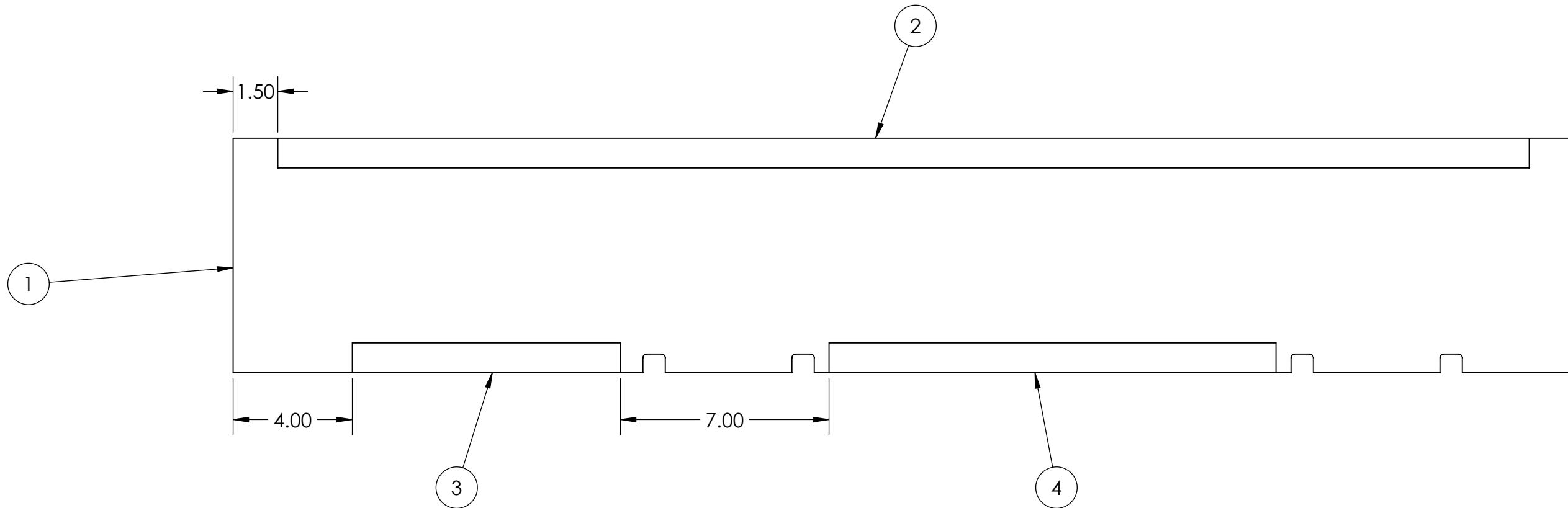
3

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1

B

B



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-19229	Cargo Ship Bumper Plastic Front	1
2	Loop_1_42	1" x 42" Loop, Adhesive Backed	1
3	Loop_1_9	1" x 9" Loop, Adhesive Backed	1
4	Loop_1_15	1" Adhesive-Backed Loop, 15" Long	1

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		DRAWN		
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
		MATERIAL		
		FINISH		
NEXT ASSY	USED ON			
APPLICATION		DO NOT SCALE DRAWING		
SCALE: 1:8	WEIGHT:	SHEET 1 OF 1		

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: GE-19229, with loop

SIZE DWG. NO. **REV**
B GE-19229-Assembly

4

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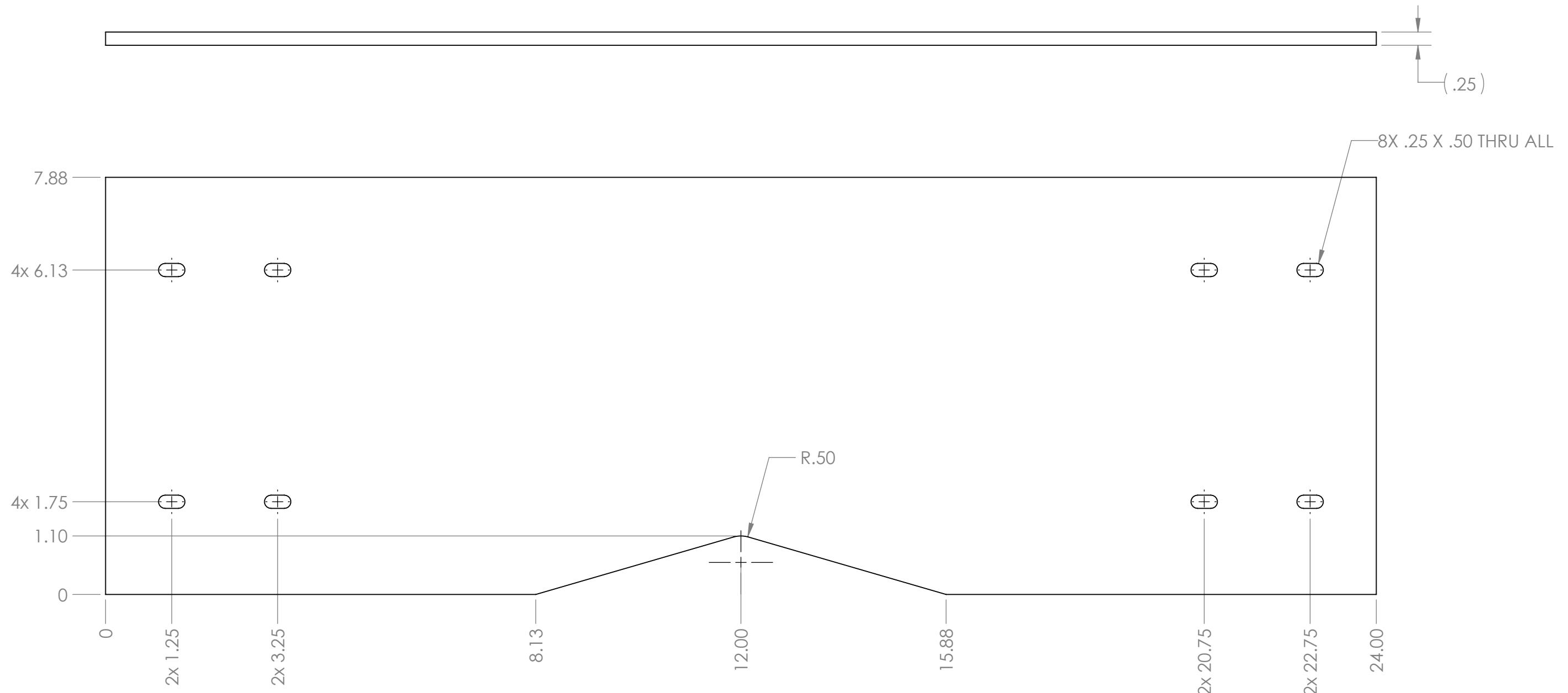
3

2

1

B

B



Notes:

1. Remove all burrs and sharp edges.
2. Material: 1/4" thk., clear polycarbonate
3. Tag or label with part number

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Cargo Ship Bumper Bridge

B	GE-19230	REV
SCALE: 1:2	WEIGHT:	SHEET 1 OF 1

4

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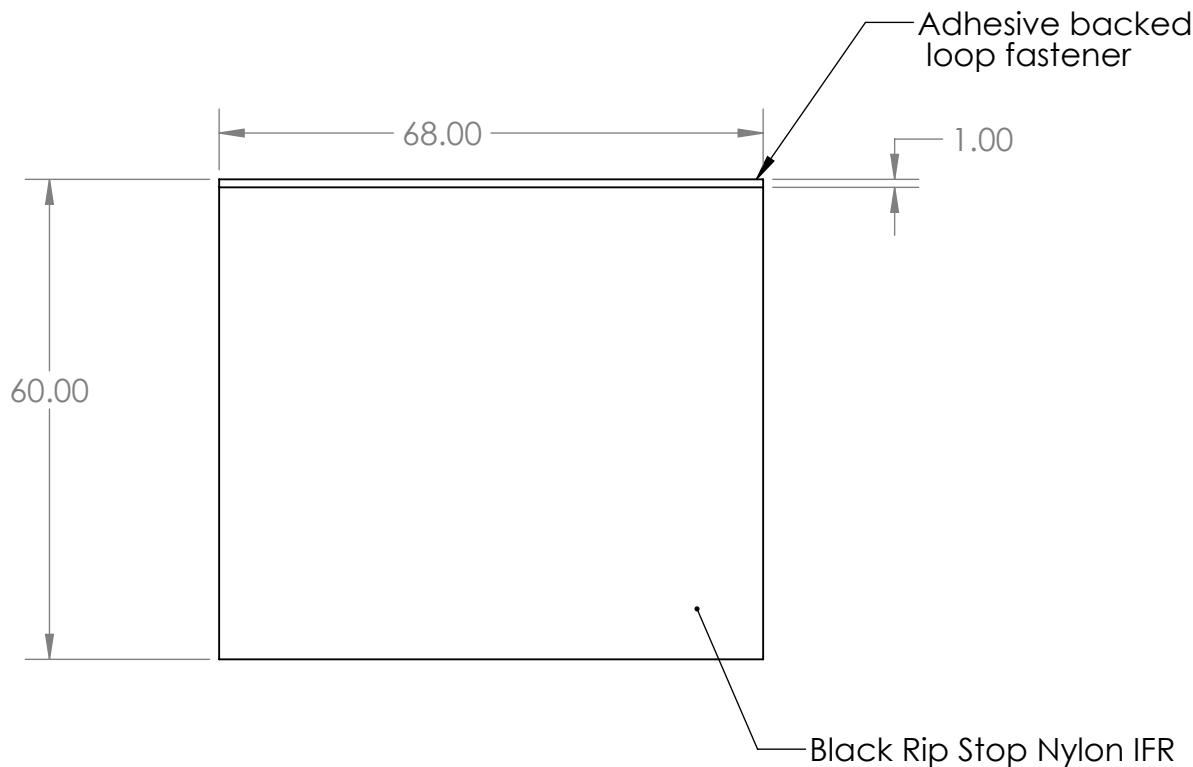
1

2

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B

B



Note: Cut Edges need to be hemmed

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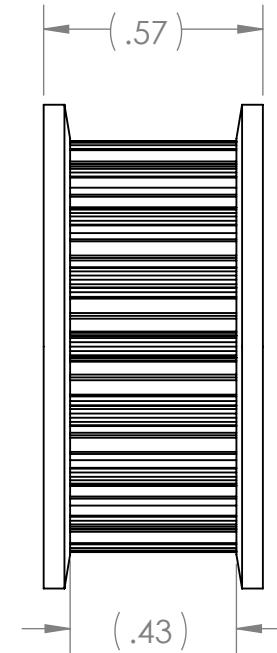
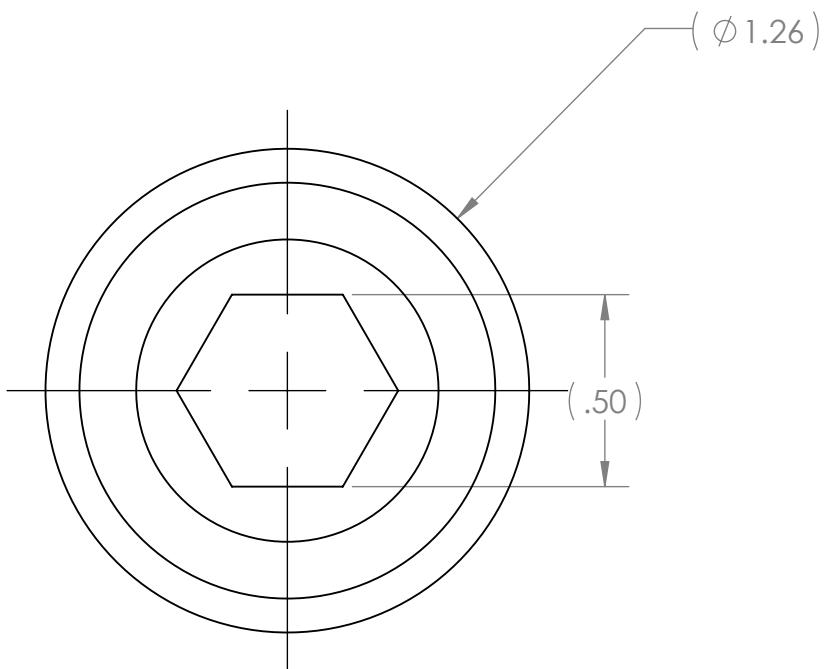
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INTERPRET GEOMETRIC TOLERANCING PER: MATERIAL						COMMENTS:
NEXT ASSY	USED ON	FINISH				
APPLICATION	DO NOT SCALE DRAWING		SIZE	DWG. NO.	REV	
	A GE-19231					
	SCALE: 1:24		WEIGHT:	SHEET 1 OF 1		

1

2

2

1



Note:

1. Description: HD Timing Pulley 18 Tooth
2. Source: VEXpro
3. Item# 217-3225
4. Equivalent Substitutions allowed

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

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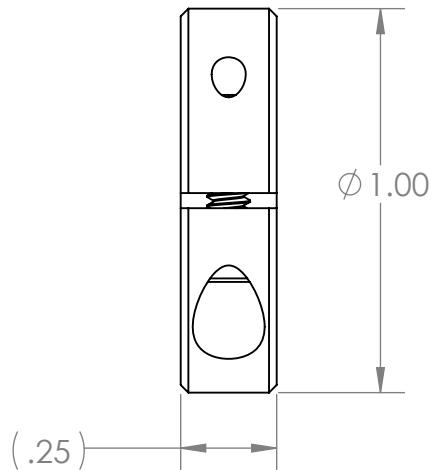
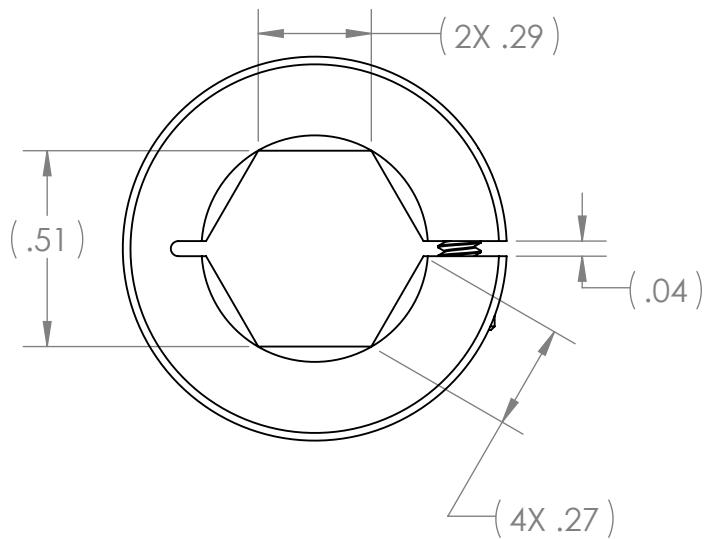
TITLE:

HTD Timing Pulley, 18 Tooth

SIZE	DWG. NO.	REV
A	GE-19235	
SCALE: 2:1	WEIGHT:	SHEET 1 OF 1

2

1



Notes:

1. Description: Clamping Shaft Collar - 1/2" Hex ID
2. Source: Vex Pro
3. Item# 217-2737
4. Equivalent Substitutions allowed

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


**FIRST
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COMPETITION**

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Modeling Solutions Partner

TITLE:

Hex Shaft Collar

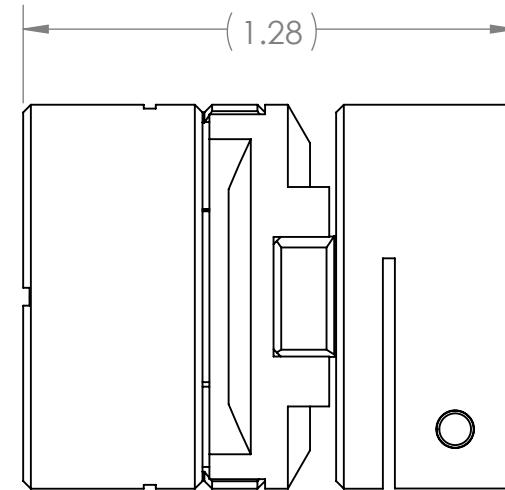
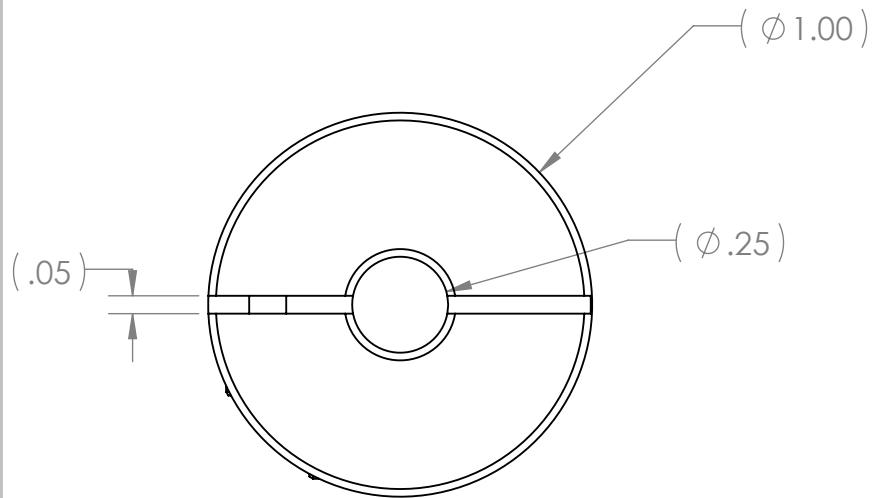
SIZE	DWG. NO.	REV
A	GE-19237	
SCALE: 2:1		WEIGHT:
		SHEET 1 OF 1

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2

1

B



B

Notes:

1. Description: Oldham Coupler Assembly
2. Source: Ruland
3. Item: Ruland OCT16-4-A and OD16/25-AT
4. Equivalent Substitutions allowed

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

2

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

TITLE: Coupler Assembly

SIZE	DWG. NO.	REV
A	GE-19243	
SCALE: 2:1	WEIGHT:	SHEET 1 OF 1

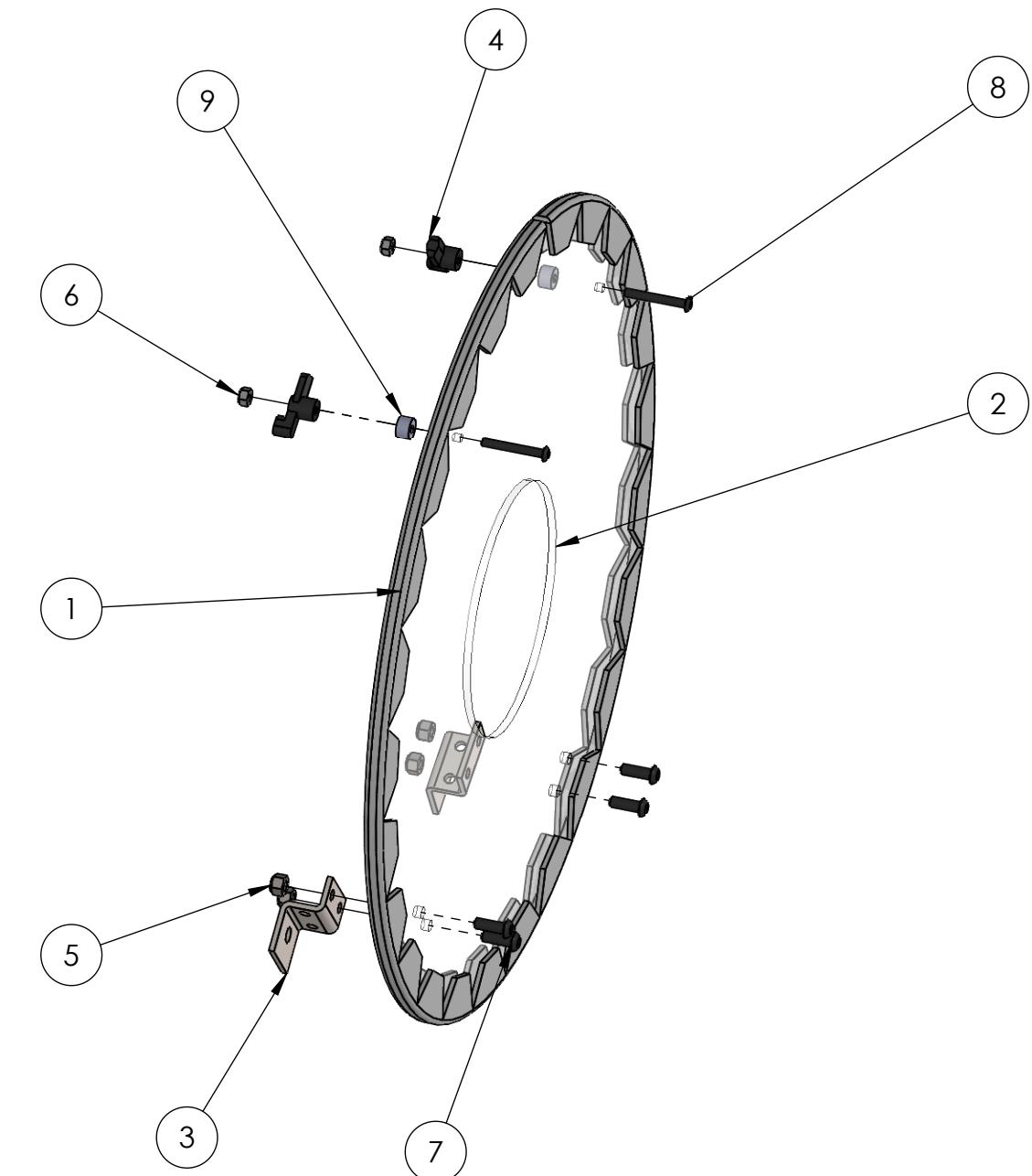
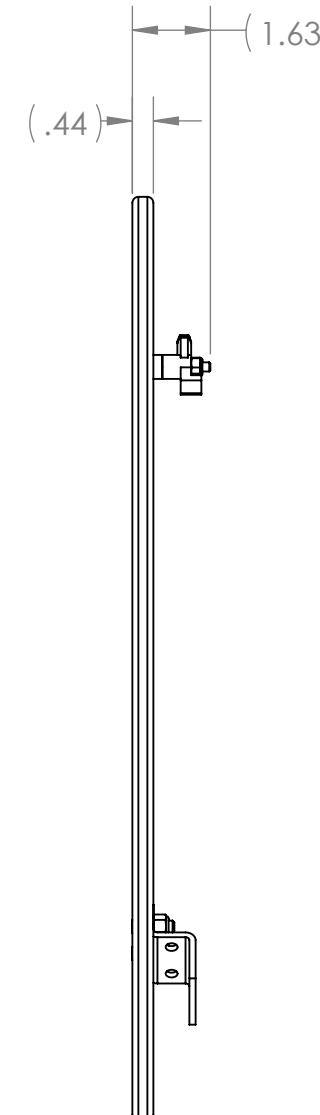
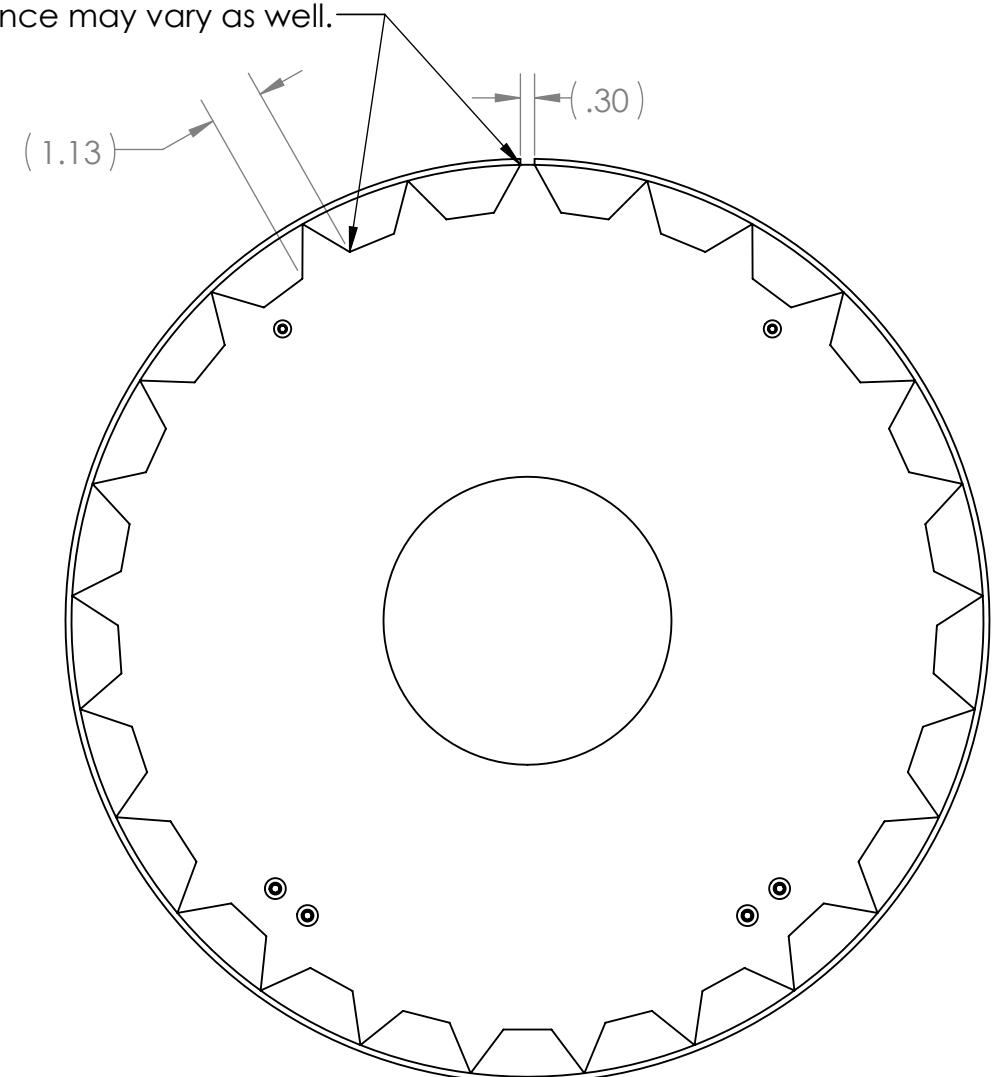
4

3

2

1

Gap sizes are approximate and may vary. Location on the circumference may vary as well.



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-19153	Loop, Panel	1
2	GE-19245	Null Panel, Polycarbonate	1
3	GE-19246	Null Offset Bracket	2
4	GE-19247	Null Knob	2
5	nylock_.25_20	Steel Nylon-Insert Locknut, 1/4"-20	4
6	nylock_10_32	Low-Strength Steel Nylon-Insert Locknut, Zinc-Plated, 10-32 Thread Size	2
7	round_hex_.25_20_.75	Steel Button Head Hex Drive Screw, 1/4"-20 x 3/4" long, fully threaded	4
8	round_hex_10_32_1.5_	Steel Button Head Hex Screw, 10-32 x 1.5" long, partially threaded	2
9	spacer_.192_.5_.3125	Spacer, .192" ID, .5" OD, .3125" thk	2

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		UNLESS OTHERWISE SPECIFIED:		NAME	DATE
		DIMENSIONS ARE IN INCHES		DRAWN	
		TOLERANCES:		CHECKED	
		FRACTIONAL: ±1/16		ENG APPR.	
		ANGULAR: MACH ±1° BEND ±1°		MFG APPR.	
		TWO PLACE DECIMAL ±.01		Q.A.	
		THREE PLACE DECIMAL ±.001		COMMENTS:	
		INTERPRET GEOMETRIC TOLERANCING PER:			
		MATERIAL			
		NEXT ASSY	USED ON	FINISH	
		APPLICATION		DO NOT SCALE DRAWING	
SIZE	DWG. NO.			REV	
B	GE-19244				
SCALE: 1:4	WEIGHT:			SHEET 1 OF 1	

 FIRST
ROBOTICS
COMPETITION  SOLIDWORKS
Modeling Solutions Partner

Null Panel Assembly

4

3

2

1

4

3

2

1

B

B

A

A

2X ϕ .20 THRU ALL

2x 5.10

 ϕ 19.00

(.19)

2x 6.08

 ϕ 6.00

2x 5.58

2x 6.14

4X ϕ .27 THRU ALL

2x 5.25

2x 4.58

Note:

1. Material: 3/16 Polycarbonate, Clear
2. Remove all burrs and sharp edges.
3. Screen print applied to both faces.

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
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**Null Panel,
Polycarbonate**

SIZE	DWG. NO.	REV
B	GE-19245	
SCALE: 1:3	WEIGHT:	SHEET 1 OF 1

4

3

2

1

4

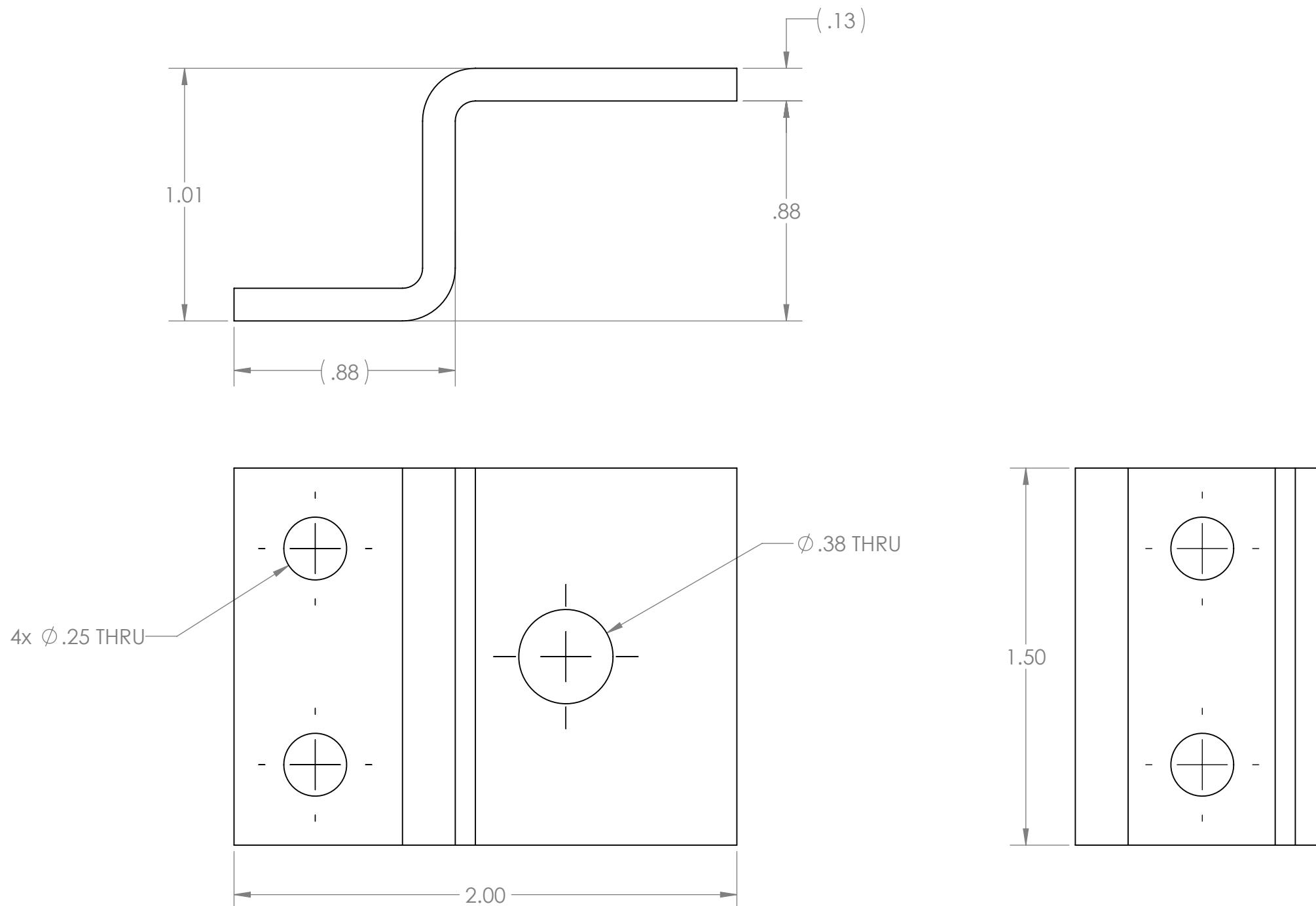
3

2

1

B

B



- Notes:
1. Description: Offset-Surface Bracket, 3/4" x 1-1/4" x 1-1/2"
 2. Source: McMaster-Carr
 3. Item #: 1030A11
 4. Equivalent substitutions allowed

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Null Offset Bracket

SIZE	DWG. NO.	REV
B	GE-19246	
SCALE: 2:1	WEIGHT:	SHEET 1 OF 1

4

3

2

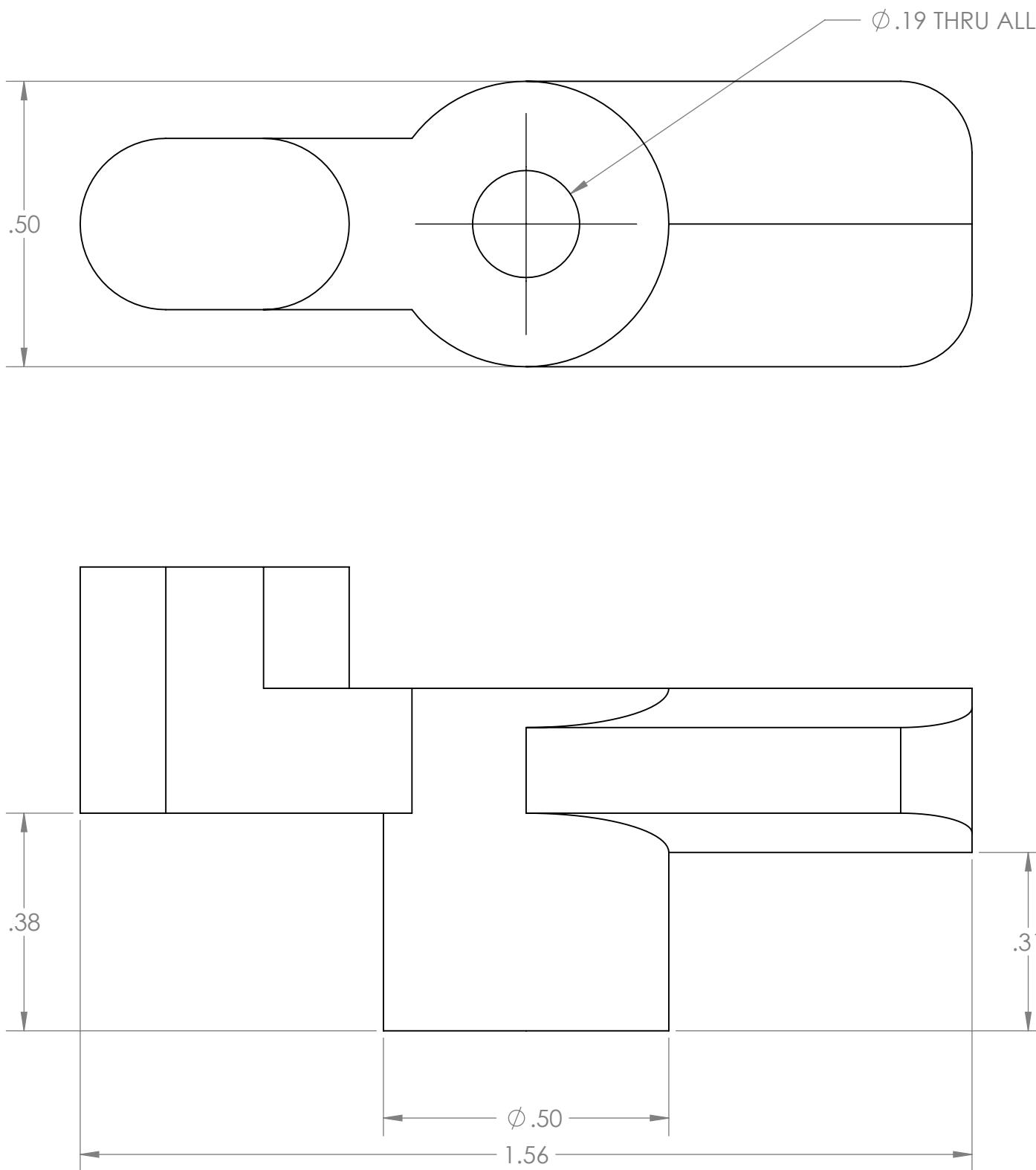
1

4

3

2

1



- Notes:
1. Description: Black Plastic Turn Latch, 1-9/16" Long Arm
 2. Source: McMaster-Carr
 3. Item #: 1579N11
 4. Equivalent substitutions allowed

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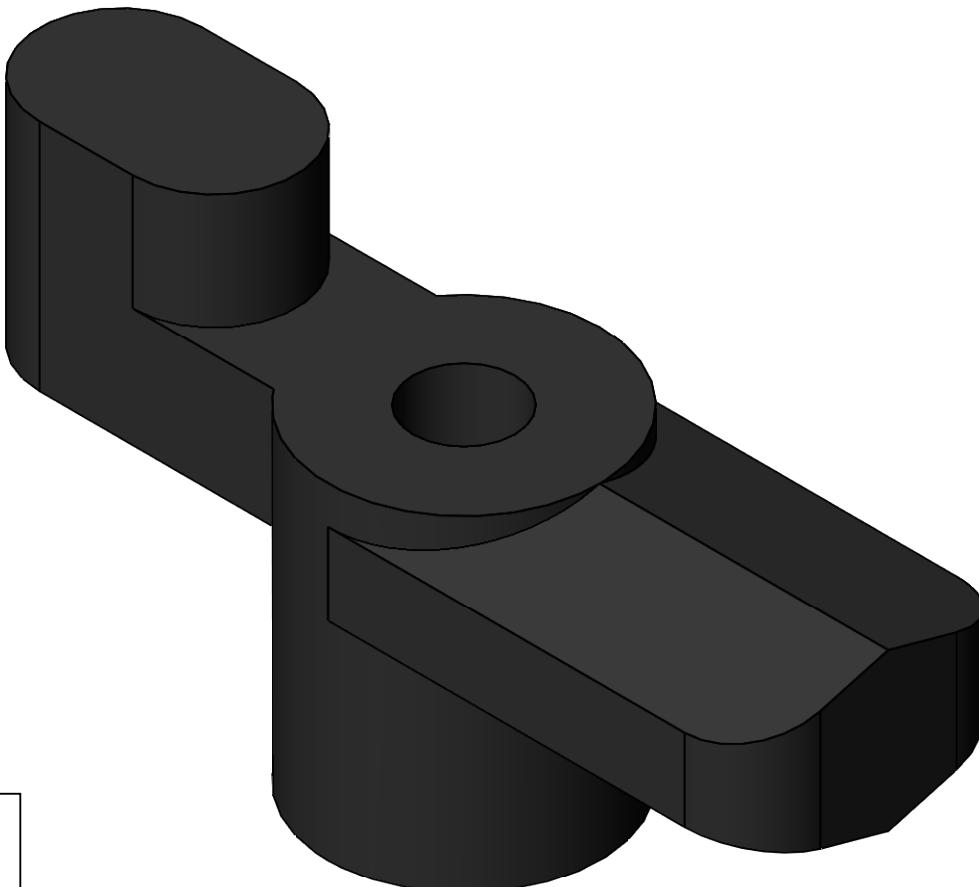
		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$	NAME	DATE
		DRAWN		
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
		MATERIAL		
		FINISH		
NEXT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

 FIRST
ROBOTICS
COMPETITION  SOLIDWORKS
Modeling Solutions Partner

TITLE:
Null Knob

SIZE DWG. NO. REV
B GE-19247

SCALE: 4:1 WEIGHT: SHEET 1 OF 1



4

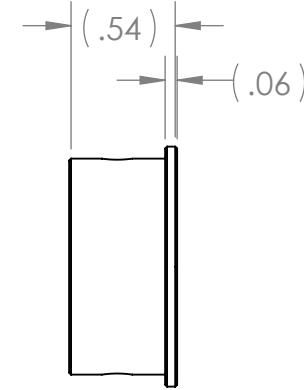
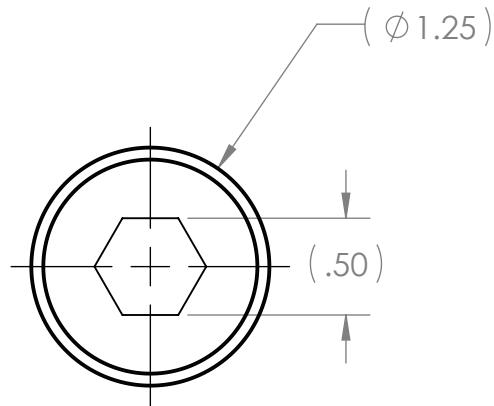
3

2

1

B

B



Note:

1. Description: Versa Hub
2. Source: VEXpro
3. Item#: 217-5895
4. Equivalent Substitutions Allowed



TITLE:

Versa Hub

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

SIZE	DWG. NO.	REV
A	GE-19248	
SCALE: 1:1	WEIGHT:	SHEET 1 OF 1