

4

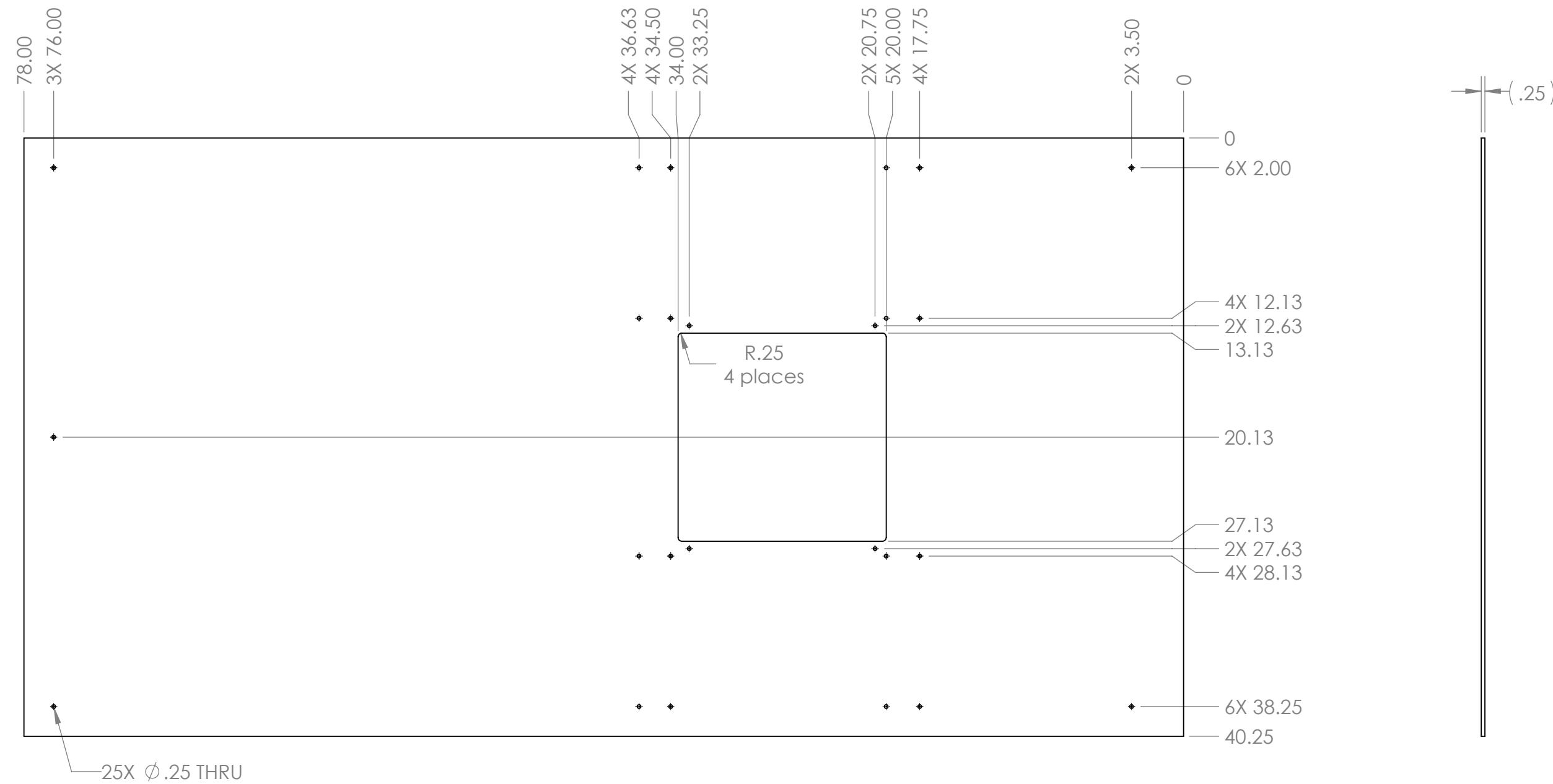
3

2

1

B

B



Notes:  
 1. Material: 1/4" thick, clear polycarbonate.  
 2. Remove all burrs and sharp edges

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 PROHIBITED.

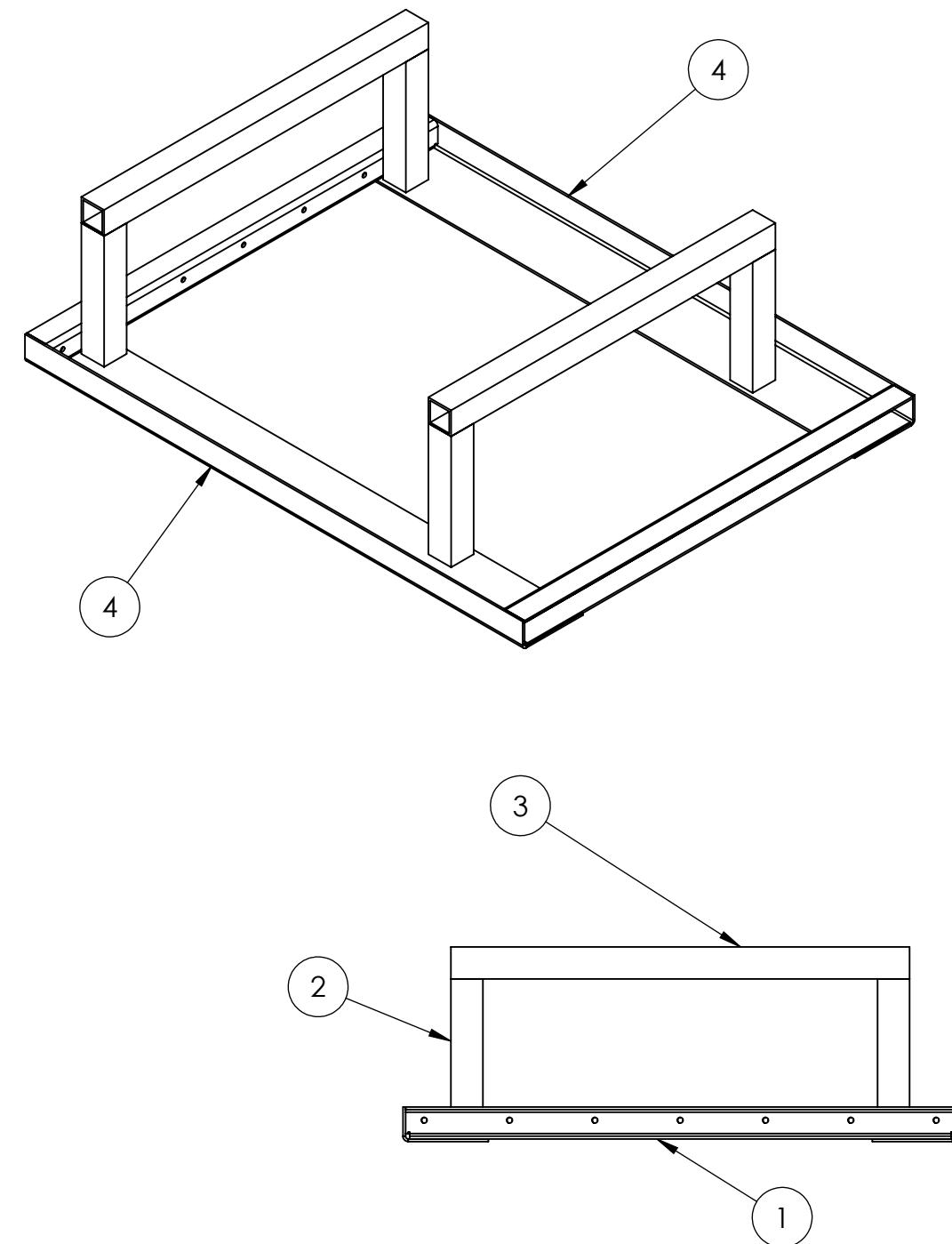
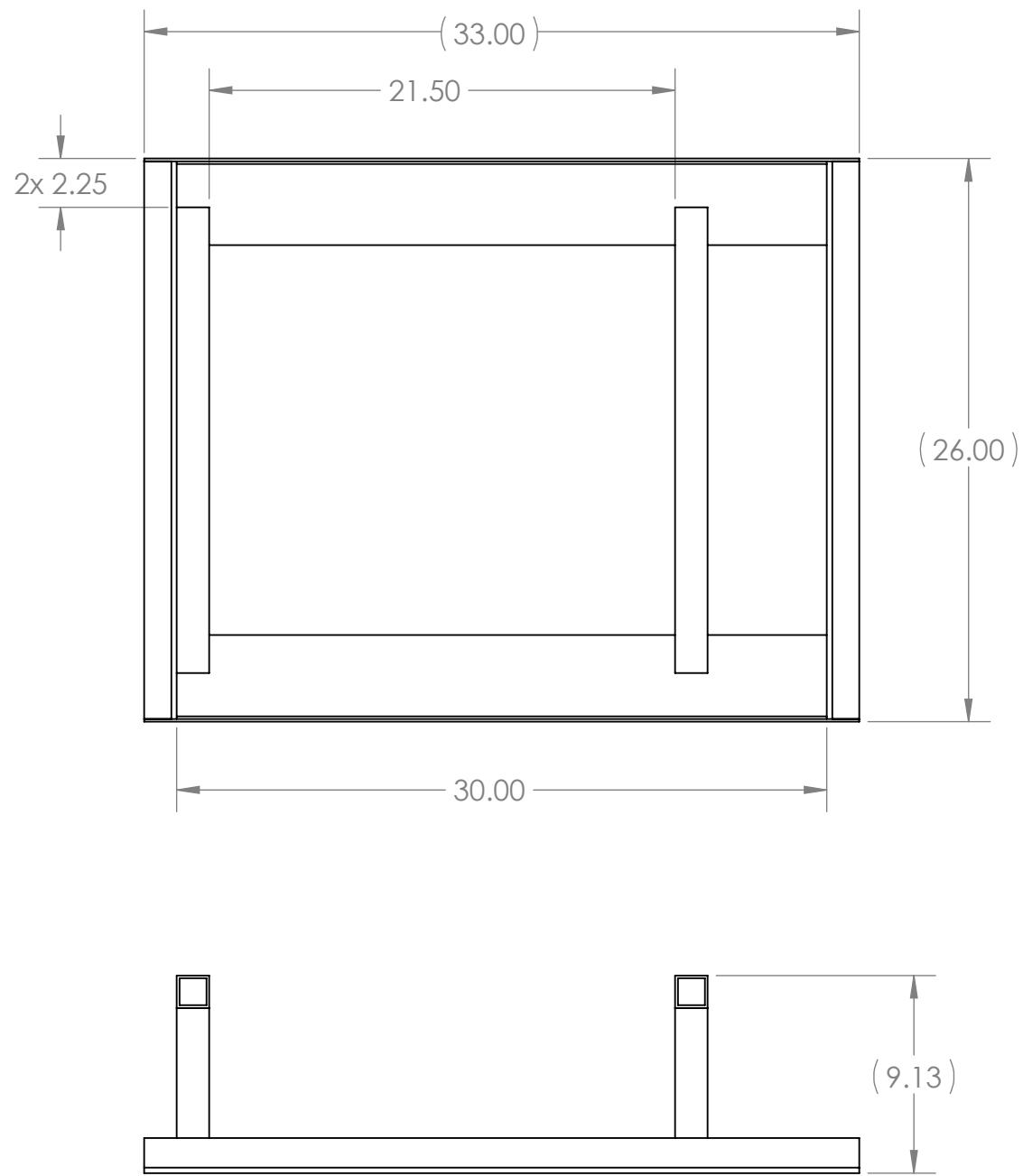
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		DRAWN			
		CHECKED			
		ENG APPR.			
		MFG APPR.			
		Q.A.			
		COMMENTS:			
		MATERIAL			
		FINISH			
		APPLICATION	DO NOT SCALE DRAWING		
SIZE	DWG. NO.			REV	
<b>B</b>	<b>GE-18004</b>				
SCALE: 1:8	WEIGHT:			SHEET	1 OF 1

4

3

2

1



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-18006-01	1/8" thk., 5052 Aluminum Sheet	2
2	GE-18006-02	1.5" x .125" thk. Square Tubing, 6063 Aluminum	4
3	GE-18006-03	1.5" x .125" thk. Square Tubing, 6063 Aluminum	2
4	GE-18006-04	1/8" thk., 5052 Aluminum Sheet	2

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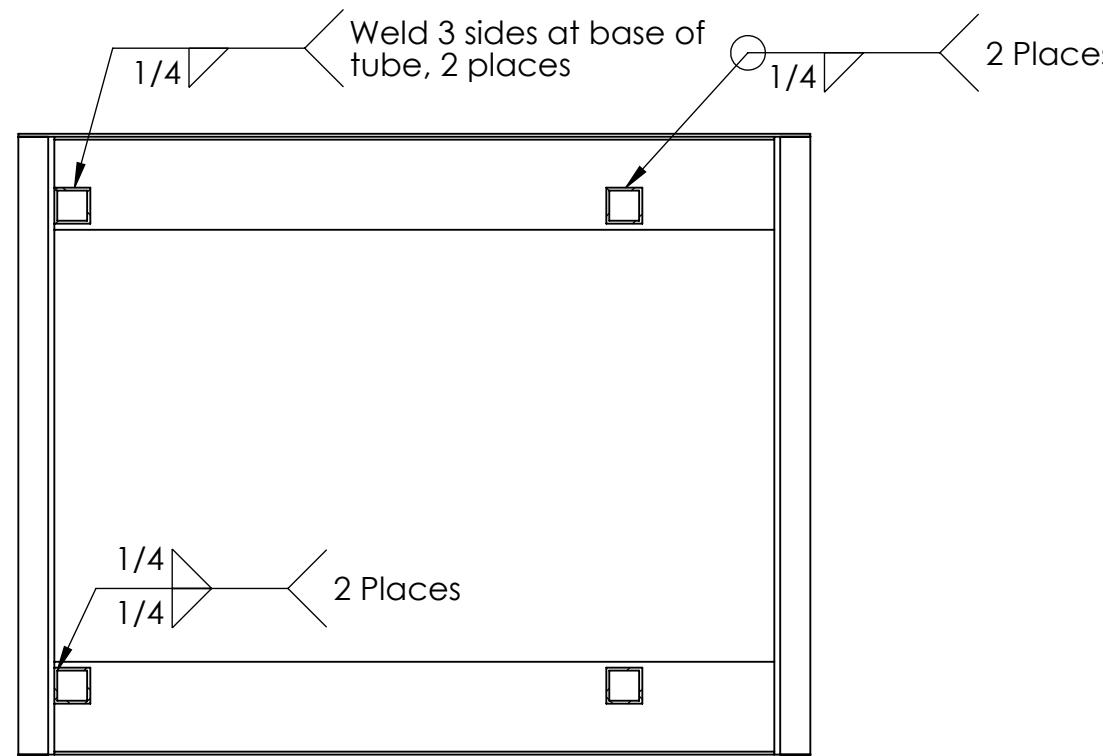
		UNLESS OTHERWISE SPECIFIED:		NAME	DATE	 <b>FIRST ROBOTICS COMPETITION</b> <b>SOLIDWORKS</b> <small>Modeling Solutions Partner</small>
		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$	DRAWN			
			CHECKED			
			ENG APPR.			
			MFG APPR.			
			Q.A.			
		INTERPRET GEOMETRIC TOLERANCING PER:	COMMENTS:			
		MATERIAL				
NEXT ASSY	USED ON	FINISH				
APPLICATION		DO NOT SCALE DRAWING				
SIZE    DWG. NO.    REV <b>B</b> <b>GE-18006</b> <b></b>						
SCALE: 1:8    WEIGHT:    SHEET 1 OF 3						

4

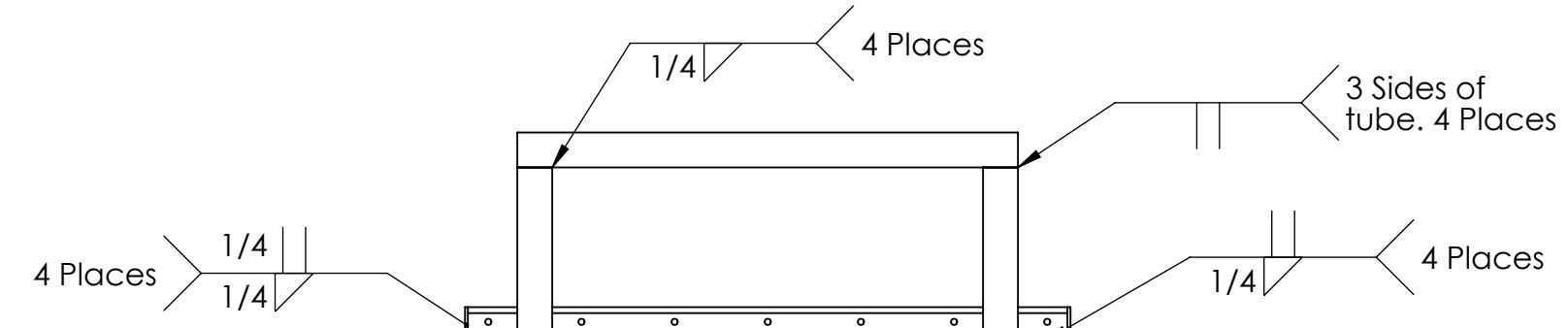
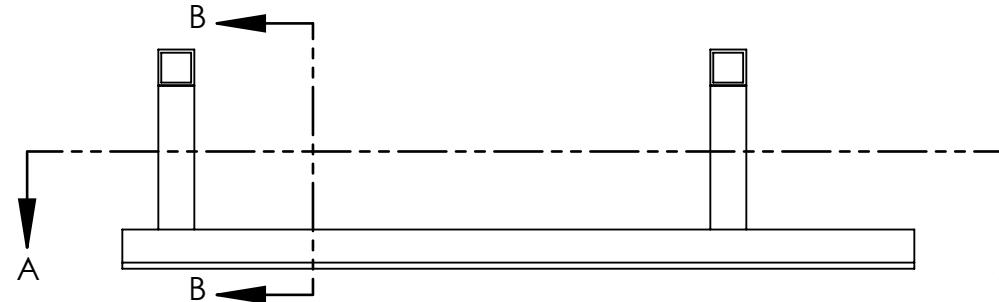
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SECTION A-A



SECTION B-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	

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

**ROLLER BASE**

**SIZE** DWG. NO. **B** **GE-18006** **REV**

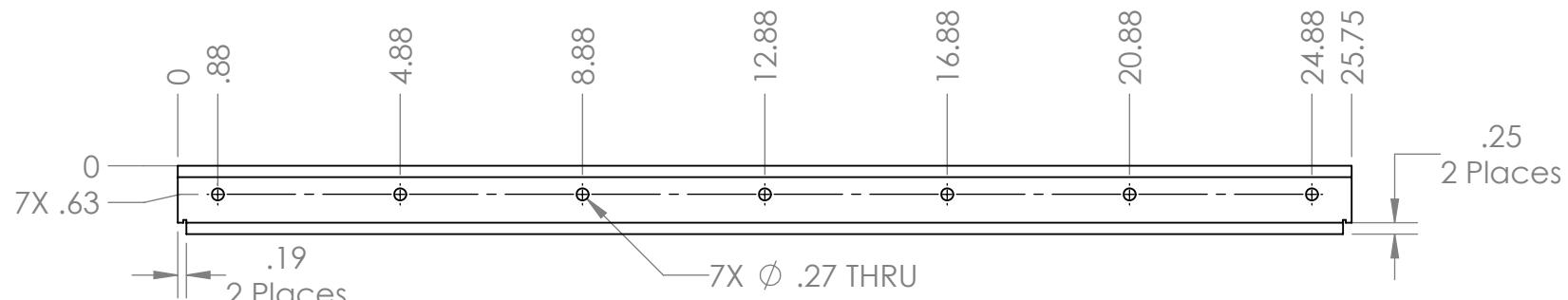
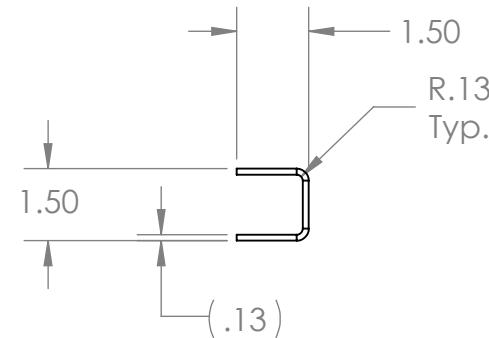
SCALE: 1:8 WEIGHT: SHEET 2 OF 3

4

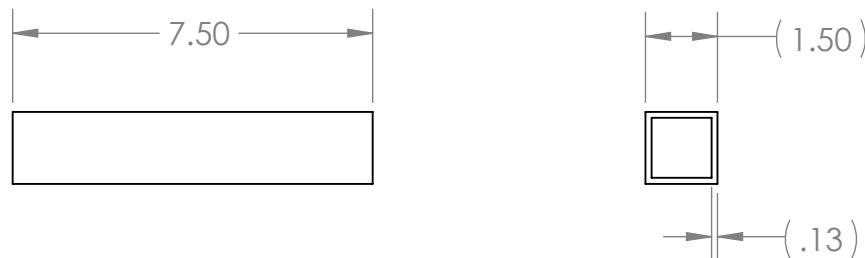
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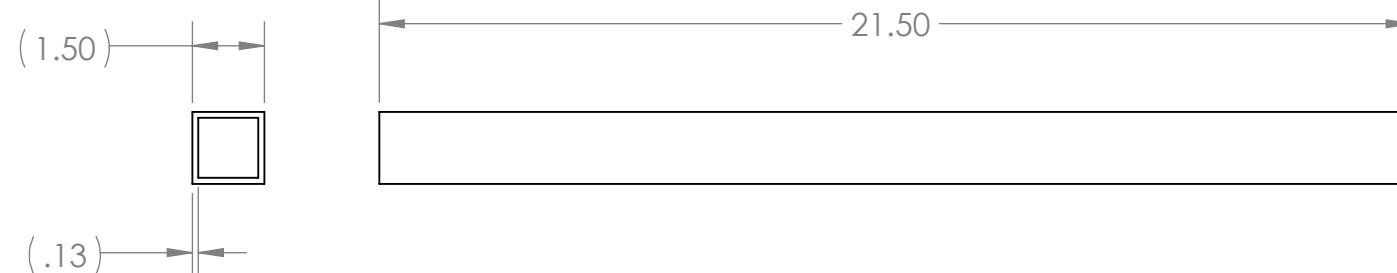
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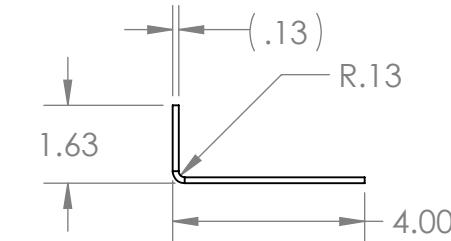
Item 1: GE-18006-01  
Quantity: 2  
Material: 1/8" Thick, 5052 Aluminum Sheet



Item 2: GE-18006-02  
Quantity: 4  
Material 1-1/2" x .125" thick. Square Tubing, 6063 Aluminum



Item 3: GE 18006-03  
Quantity: 4  
Material 1-1/2" x .125" thick. Square Tubing, 6063 Aluminum



Item 4: GE18006-04  
Quanitity: 2  
Material: 1/8" Thick, 5052 Aluminum Sheet

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		UNLESS OTHERWISE SPECIFIED:		NAME	DATE	 <b>FIRST</b> <b>ROBOTICS</b> <b>COMPETITION</b>	<b>TITLE:</b>  <h1>Roller Base</h1>
		<b>DIMENSIONS ARE IN INCHES</b> <b>TOLERANCES:</b> <b>FRACTIONAL <math>\pm 1/16</math></b> <b>ANGULAR: MACH <math>\pm 1^\circ</math> BEND <math>\pm 1^\circ</math></b> <b>TWO PLACE DECIMAL <math>\pm .01</math></b> <b>THREE PLACE DECIMAL <math>\pm .001</math></b>	DRAWN				
			CHECKED				
			ENG APPR.				
			MFG APPR.				
			Q.A.				
		INTERPRET GEOMETRIC TOLERANCING PER:	COMMENTS:				
		MATERIAL				<b>SIZE</b> <b>DWG. NO.</b> <b>B</b> <b>GE-18006</b>	<b>REV</b>
NEXT ASSY	USED ON	FINISH					
APPLICATION		DO NOT SCALE DRAWING		SCALE: 1:8	WEIGHT:	SHEET 3 OF 3	

## Roller Base

4

3

2

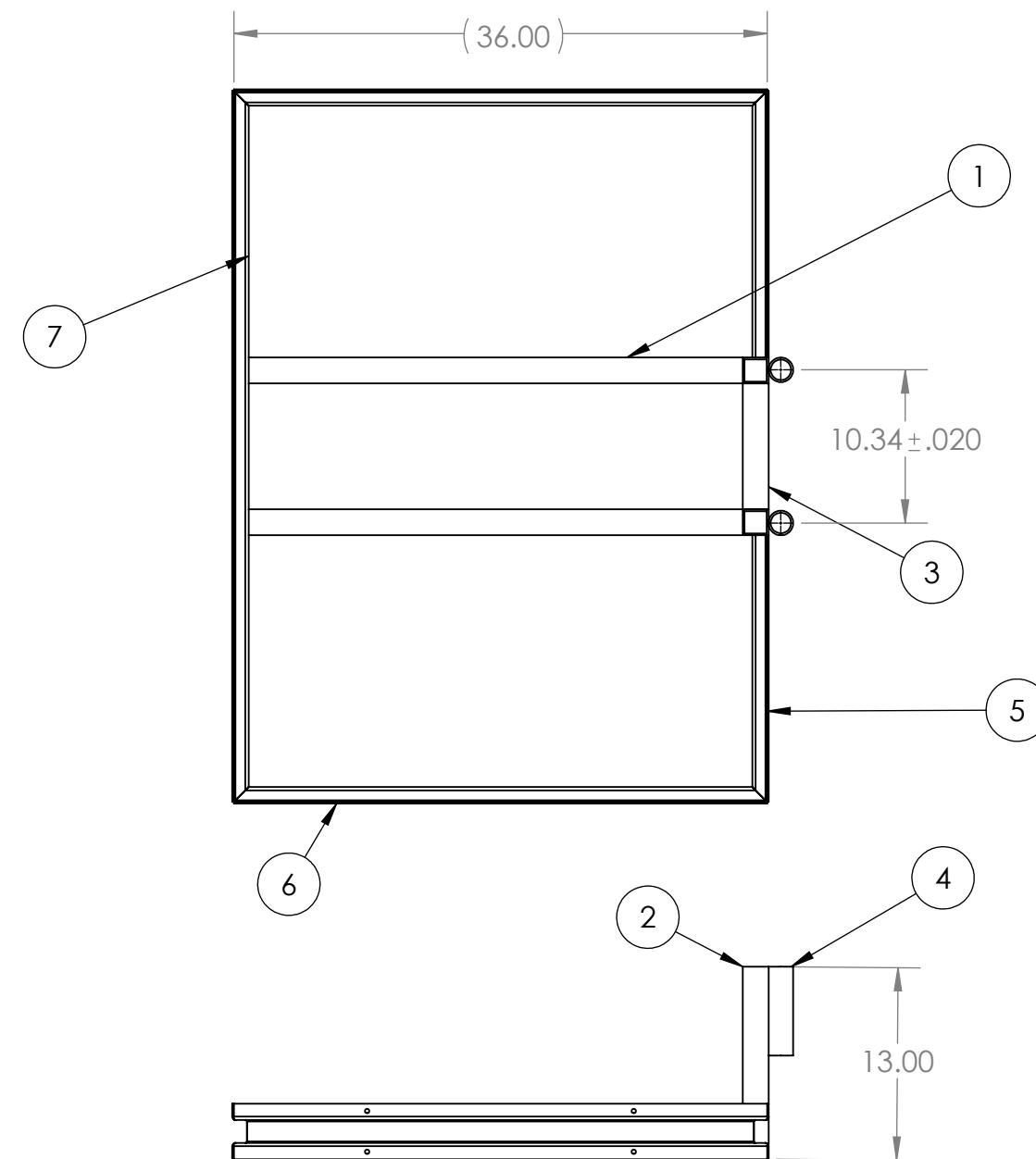
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4

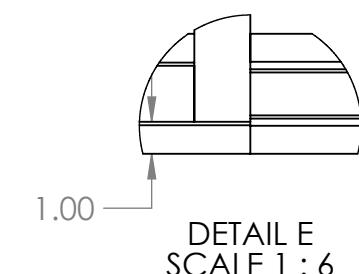
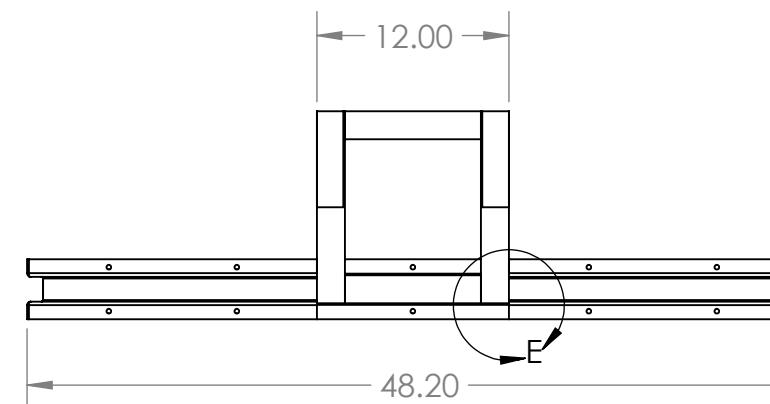
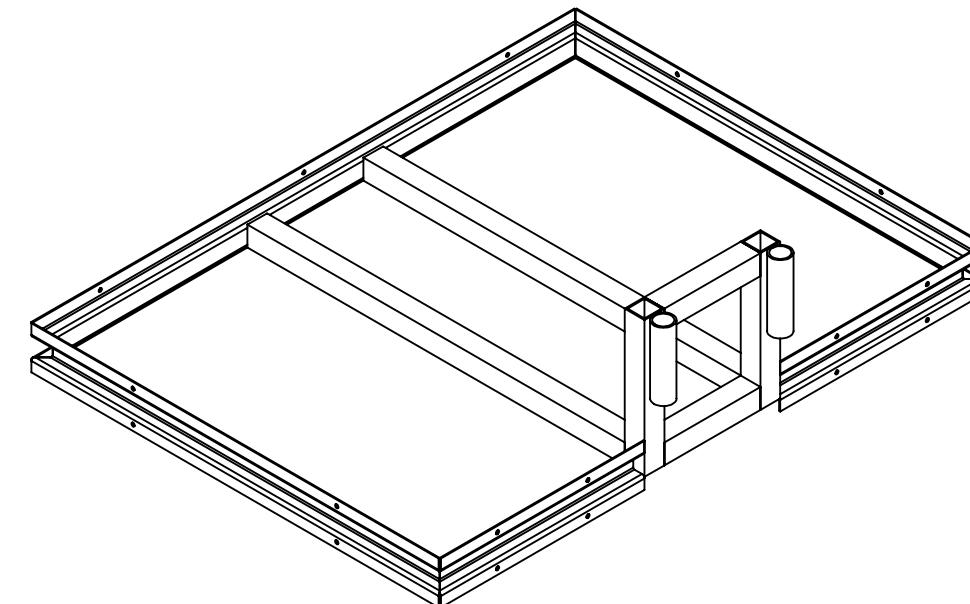
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2

1



REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
2-B1	A	Weld note added	12/7/2017	CPO



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-18007-1	1.75" x .125" thk. Square Tube, 6063 Aluminum	2
2	GE-18007-2	1.75" x .125" thk. Square Tube, 6063 Aluminum	2
3	GE-18007-3	1.75" x .125" Thk. Square Tube, 6063 Aluminum	2
4	GE-18007-4	1.25" Schedule 40 Pipe, 6061 Aluminum	2
5	GE-18007-5	10 Gauge 5052 Aluminum Sheet	2
6	GE-18007-6	10 Gauge 5052 Aluminum Sheet	2
7	GE-18007-7	10 Gauge 5052 Aluminum Sheet	1

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

FIRST  
ROBOTICS  
COMPETITION

SOLIDWORKS  
Modeling Solutions Partner

Scale Plate

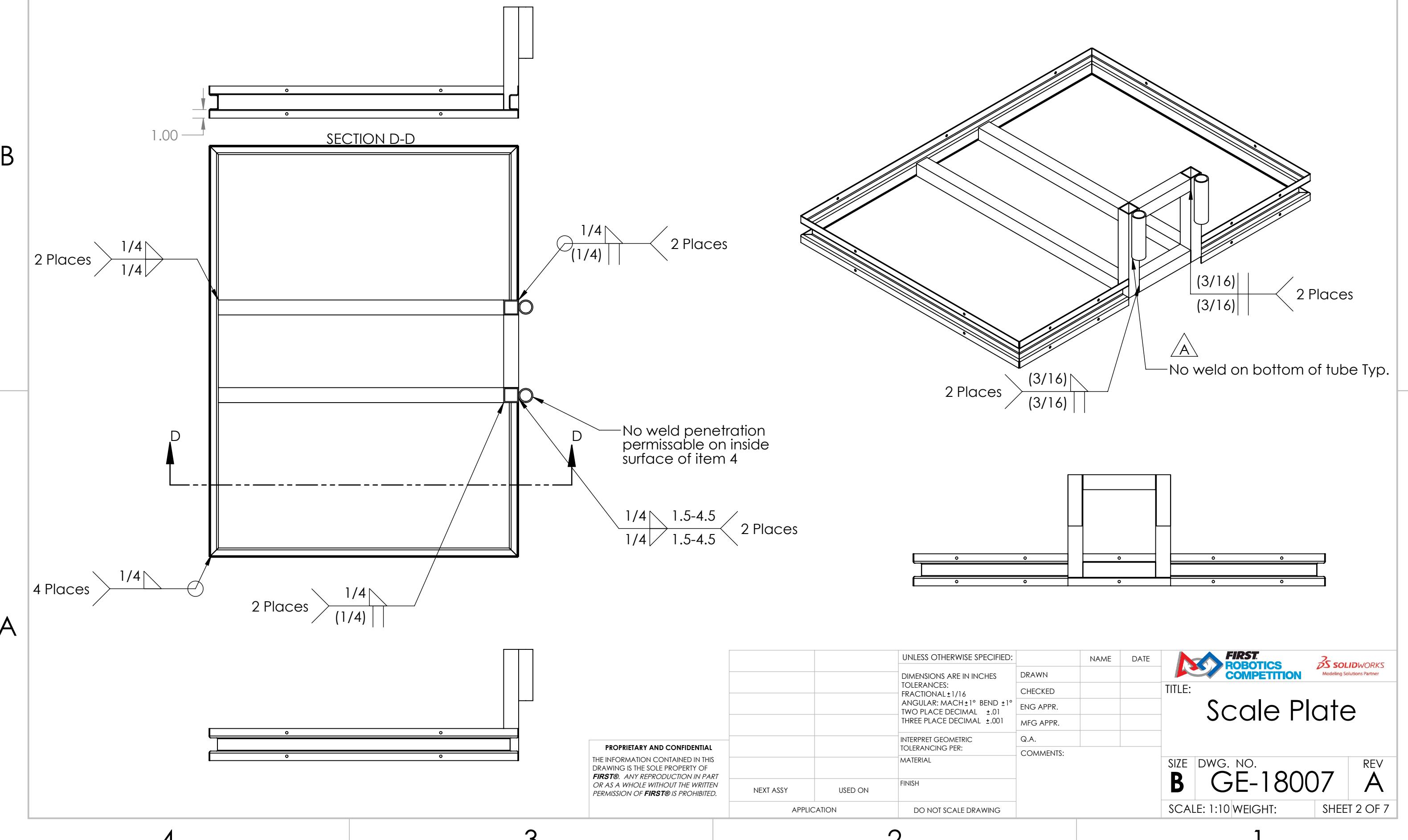
SIZE DWG. NO. REV  
**B** GE-18007 **A**  
SCALE: 1:12 WEIGHT: SHEET 1 OF 7

4

3

2

1



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		<b>DIMENSIONS ARE IN INCHES</b> <b>TOLERANCES:</b> <b>FRACTIONAL <math>\pm 1/16</math></b> <b>ANGULAR: MACH <math>\pm 1^\circ</math></b> BEND $\pm 1^\circ$ <b>TWO PLACE DECIMAL <math>\pm .01</math></b> <b>THREE PLACE DECIMAL <math>\pm .001</math></b>	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: 1:10	WEIGHT:		SHEET 2 OF 7	

4

3

2

1

4

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2

1

B

B

Item: GE-18007-01  
Material: 1.75" x .125" thk. Square Tube, 6063 Aluminum  
Scale 1:1  
QTY: 2

A technical drawing of a rectangular frame. The outer dimensions are indicated by arrows: the top width is labeled  $(1.75)$ , the right height is labeled  $(.13)$ , and the left height is labeled  $(1.75)$ . The frame is represented by a thick black line.

Item: GE-18007-02  
Material: 1.75" x .125" thk. Square Tube, 6063 Aluminum  
Scale 1:1  
QTY: 2

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		UNLESS OTHERWISE SPECIFIED:		NAME	DATE	 <b>FIRST ROBOTICS COMPETITION</b>	<b>TITLE:</b>  <b>Scale Plate</b>
		<b>DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL <math>\pm 1/16</math> ANGULAR: MACH <math>\pm 1^\circ</math> BEND <math>\pm 1^\circ</math> TWO PLACE DECIMAL <math>\pm .01</math> THREE PLACE DECIMAL <math>\pm .001</math></b>	DRAWN				
			CHECKED				
			ENG APPR.				
			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>B</b>	<b>GE-18007</b>		<b>A</b>	
			SCALE: 1:1	WEIGHT:	SHEET 3 OF 7		

4

3

2

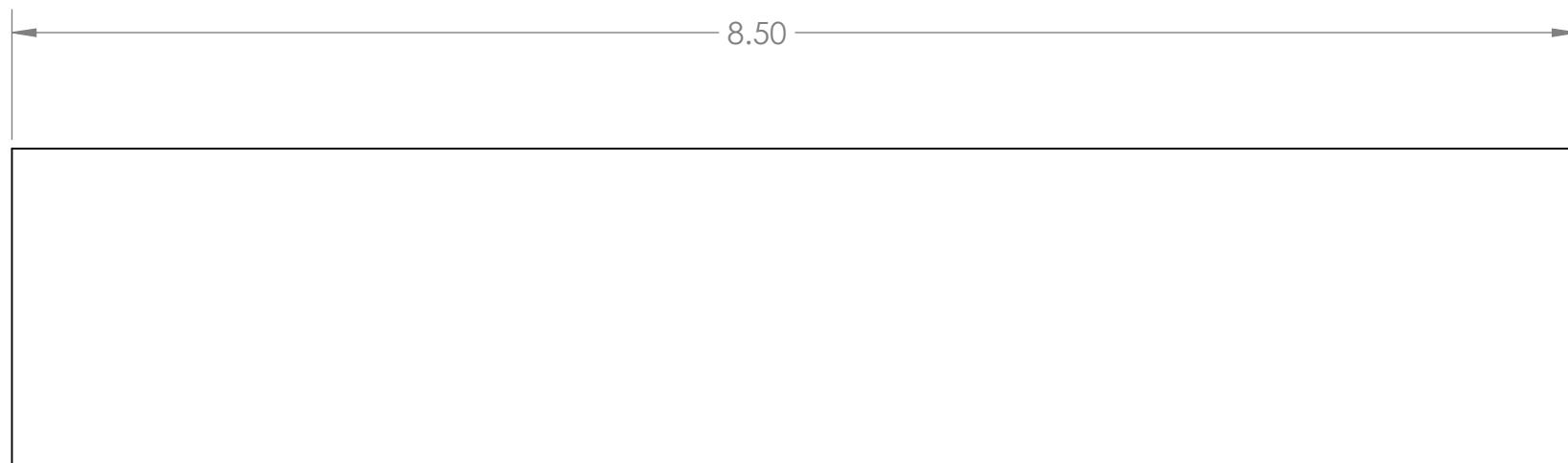
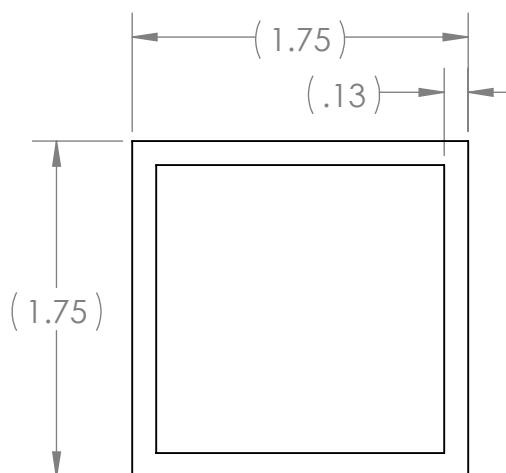
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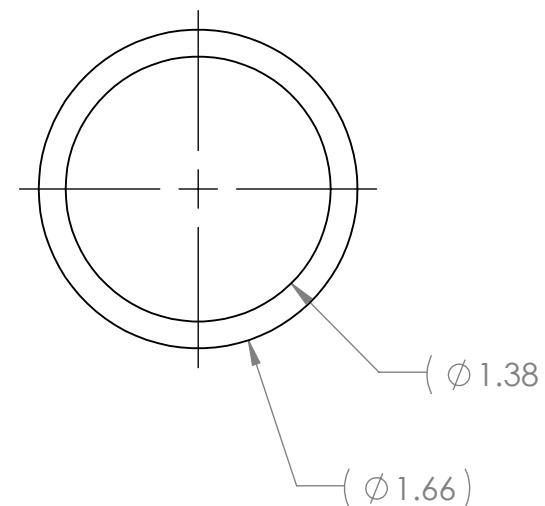
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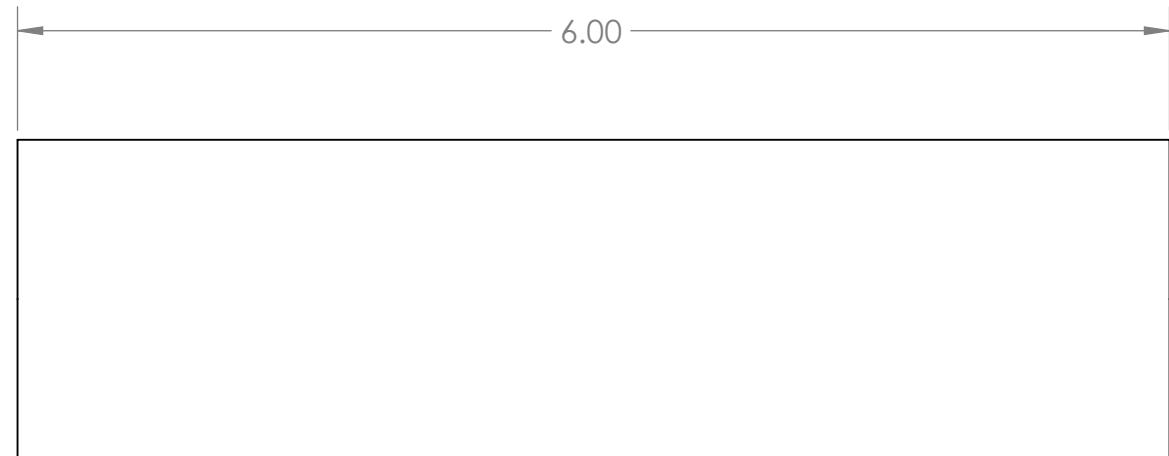
B

B

Item: GE-18007-03  
 Material 1.75" x .125" thk. Square Tube, 6063 Aluminum  
 Scale 1:1  
 QTY: 2



Item: GE-18007-04  
 Material: 1.25" Schedule 40 Pipe, 6061 Aluminum  
 Scale 1:1  
 QTY: 2



A

A

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

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

**Scale Plate**

**SIZE** DWG. NO. REV  
**B** **GE-18007** **A**

SCALE: 1:1 WEIGHT: SHEET 4 OF 7

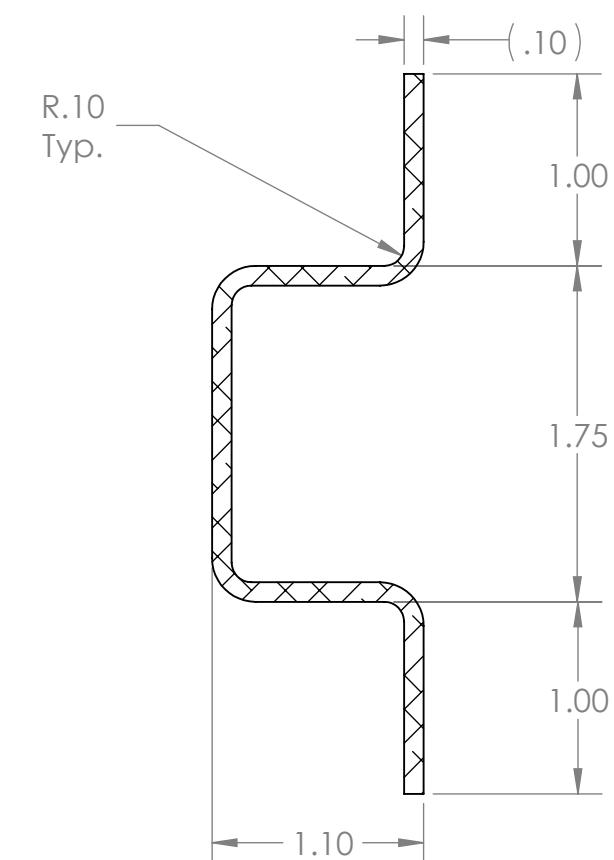
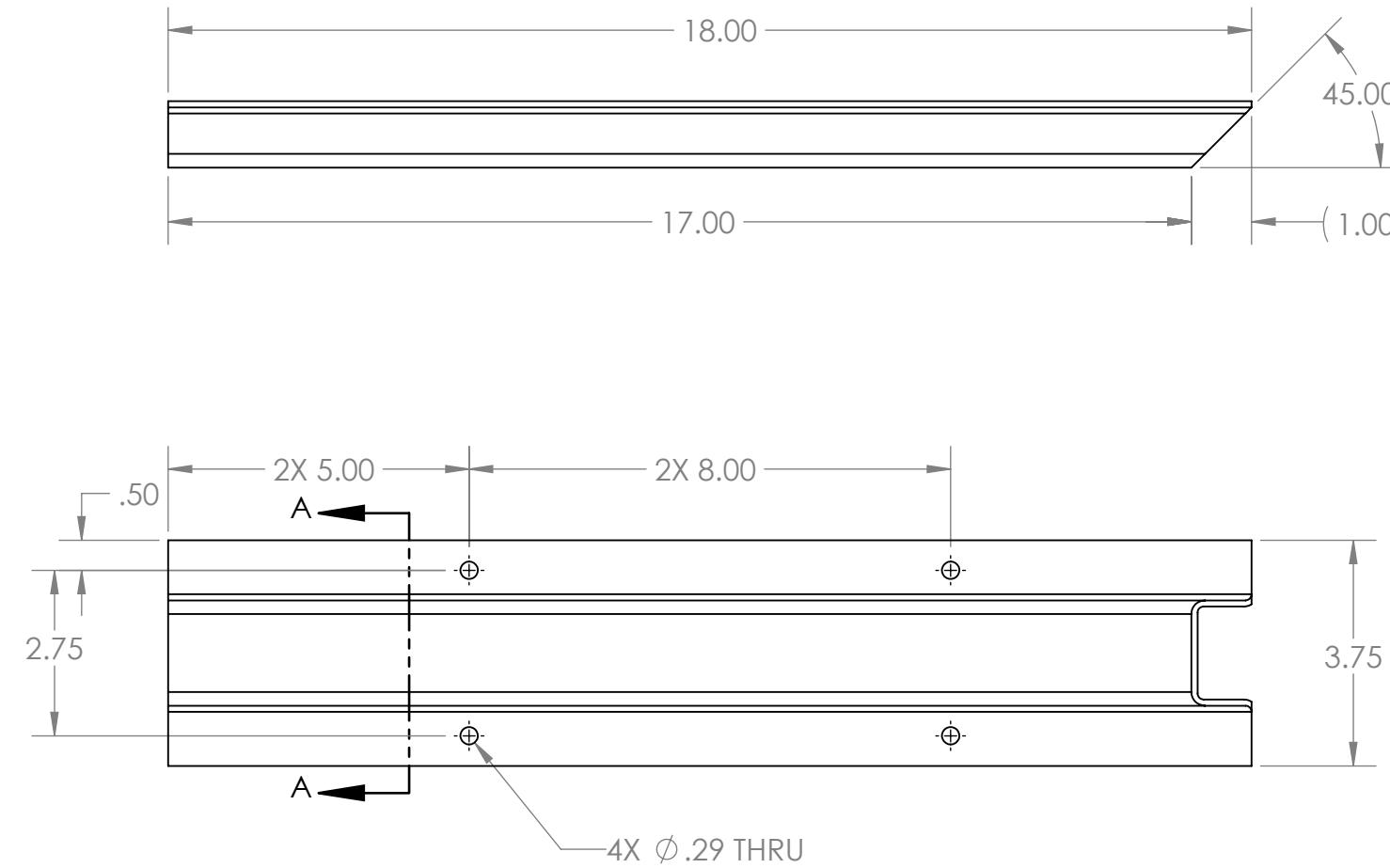
4

3

2

1

B



SECTION A-A  
SCALE 1 : 1

A

Item: GE-18007-05  
Material: 10 Gauge 5052 Aluminum Sheet  
Scale 1:3  
Qty: 2

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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	

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

**Scale Plate**

**SIZE** DWG. NO. **REV**  
**B** **GE-18007** **A**

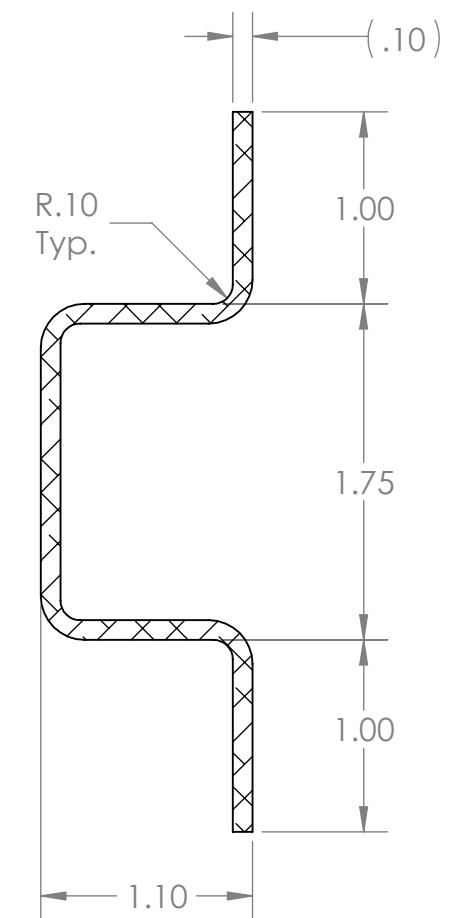
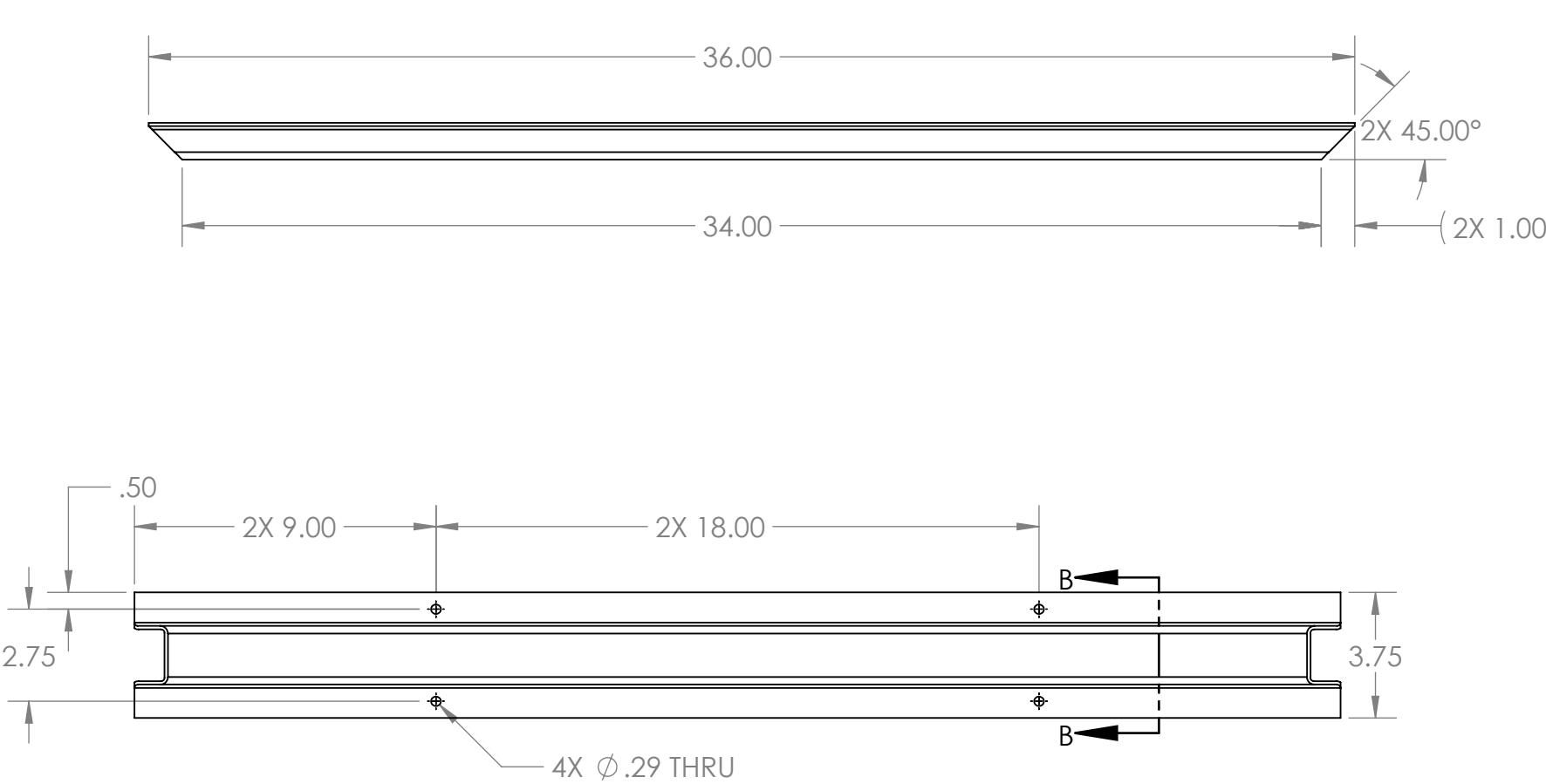
SCALE: 1:3 WEIGHT: SHEET 5 OF 7

4

3

2

1



SECTION B-B  
SCALE 1 : 1

Item: GE-18007-06  
Material: 10 Gauge 5052 Aluminum Sheet  
Scale 1:5  
Qty: 2

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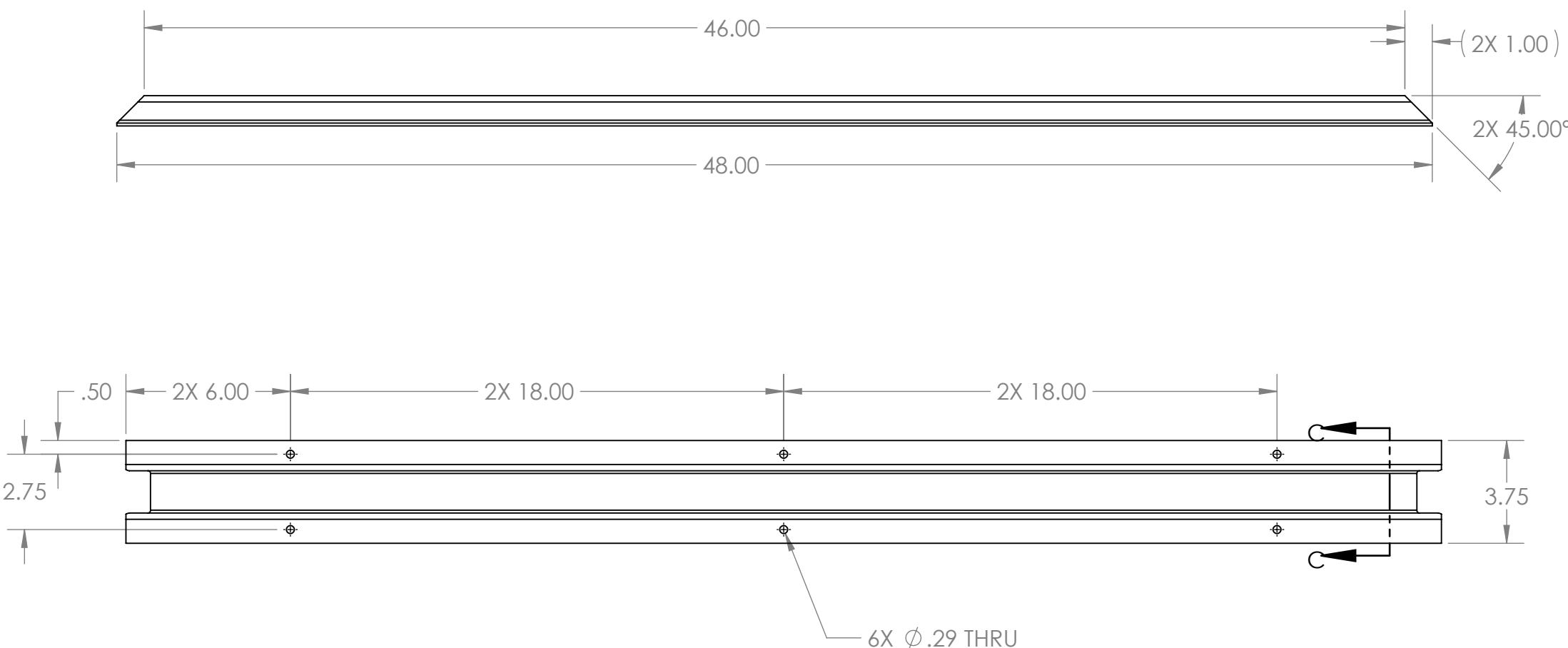
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		DRAWN			
		CHECKED			
		ENG APPR.			
		MFG APPR.			
		Q.A.			
		COMMENTS:			
		MATERIAL			
		NEXT ASSY	USED ON	FINISH	
		APPLICATION		DO NOT SCALE DRAWING	
SIZE	DWG. NO.		REV		
<b>B</b>	<b>GE-18007</b>		<b>A</b>		
SCALE: 1:5	WEIGHT:		SHEET 6 OF 7		

4

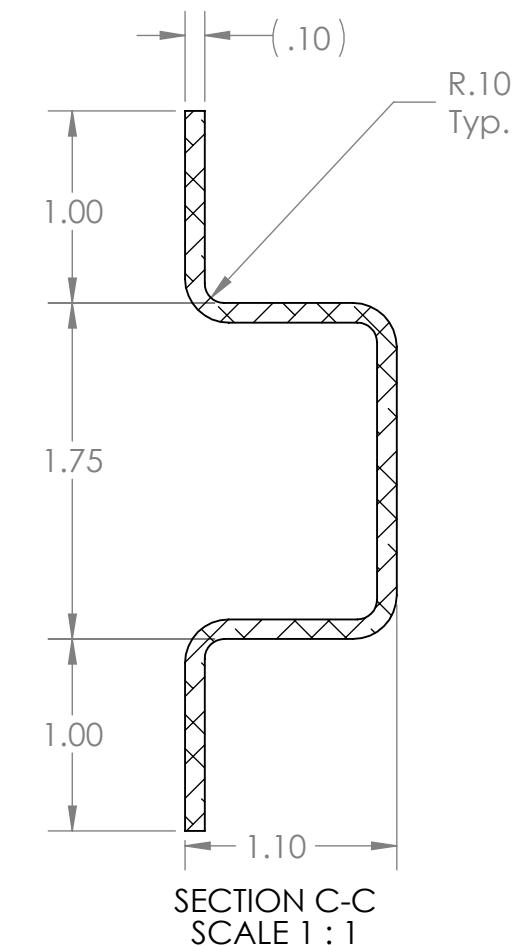
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Item: GE-18007-07  
 Material: 10 Gauge 5052 Aluminum Sheet  
 Scale 1:5  
 Qty: 1



		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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**Scale Plate**

**SIZE** DWG. NO. REV  
**B** **GE-18007** **A**

SCALE: 1:5 WEIGHT: SHEET 7 OF 7

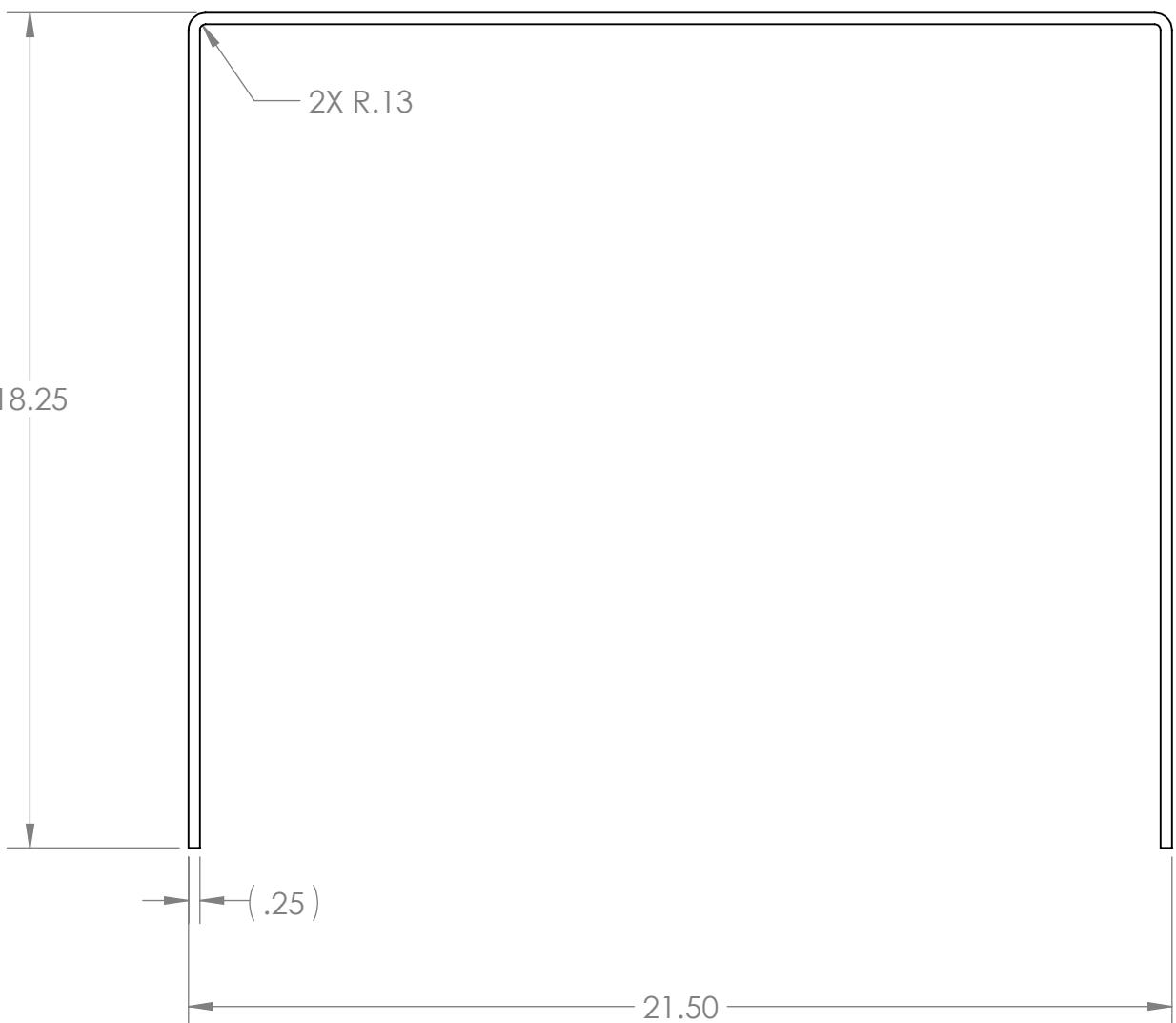
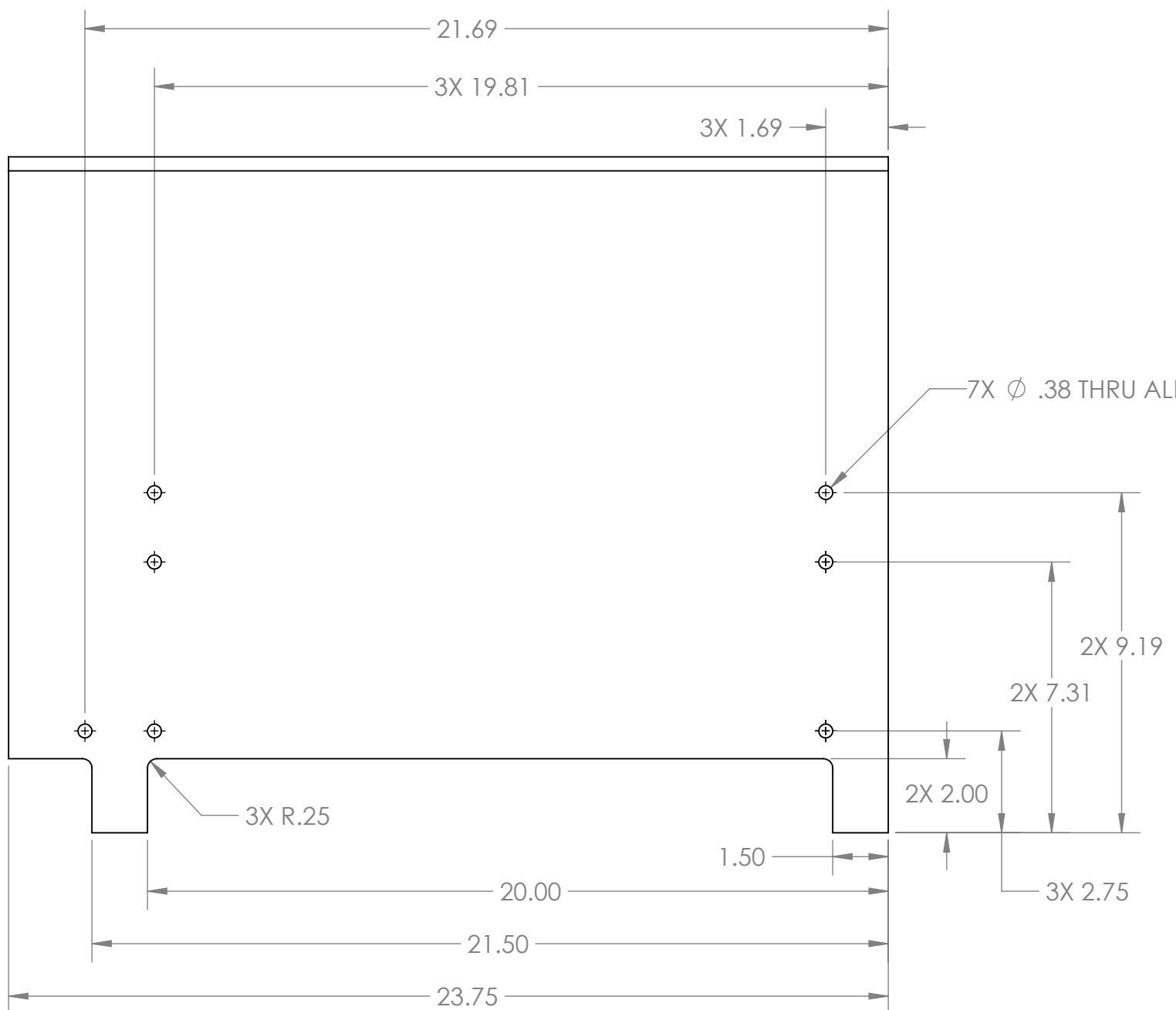
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- Notes:
1. Material: 1/4" thk. clear polycarbonate
  2. Remove all burrs and sharp edges

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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**  
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**ROLLER TUNNEL**

SIZE DWG. NO. REV  
**B** GE-18008

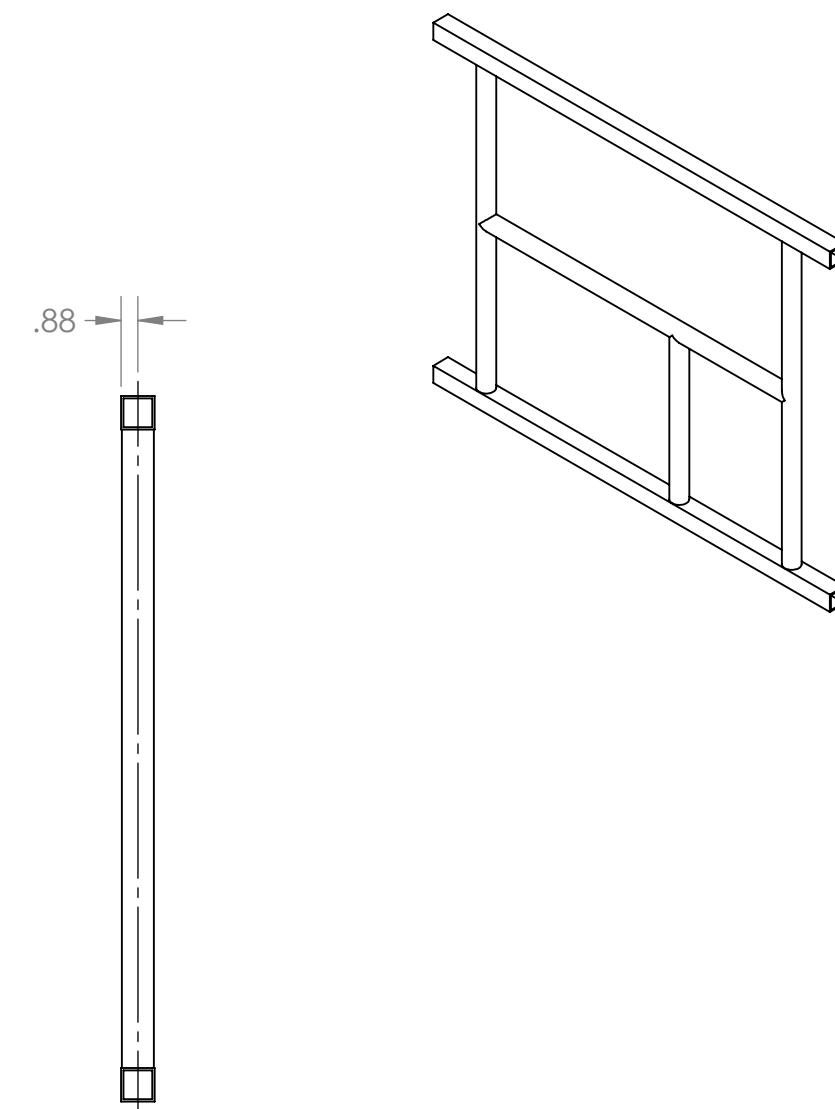
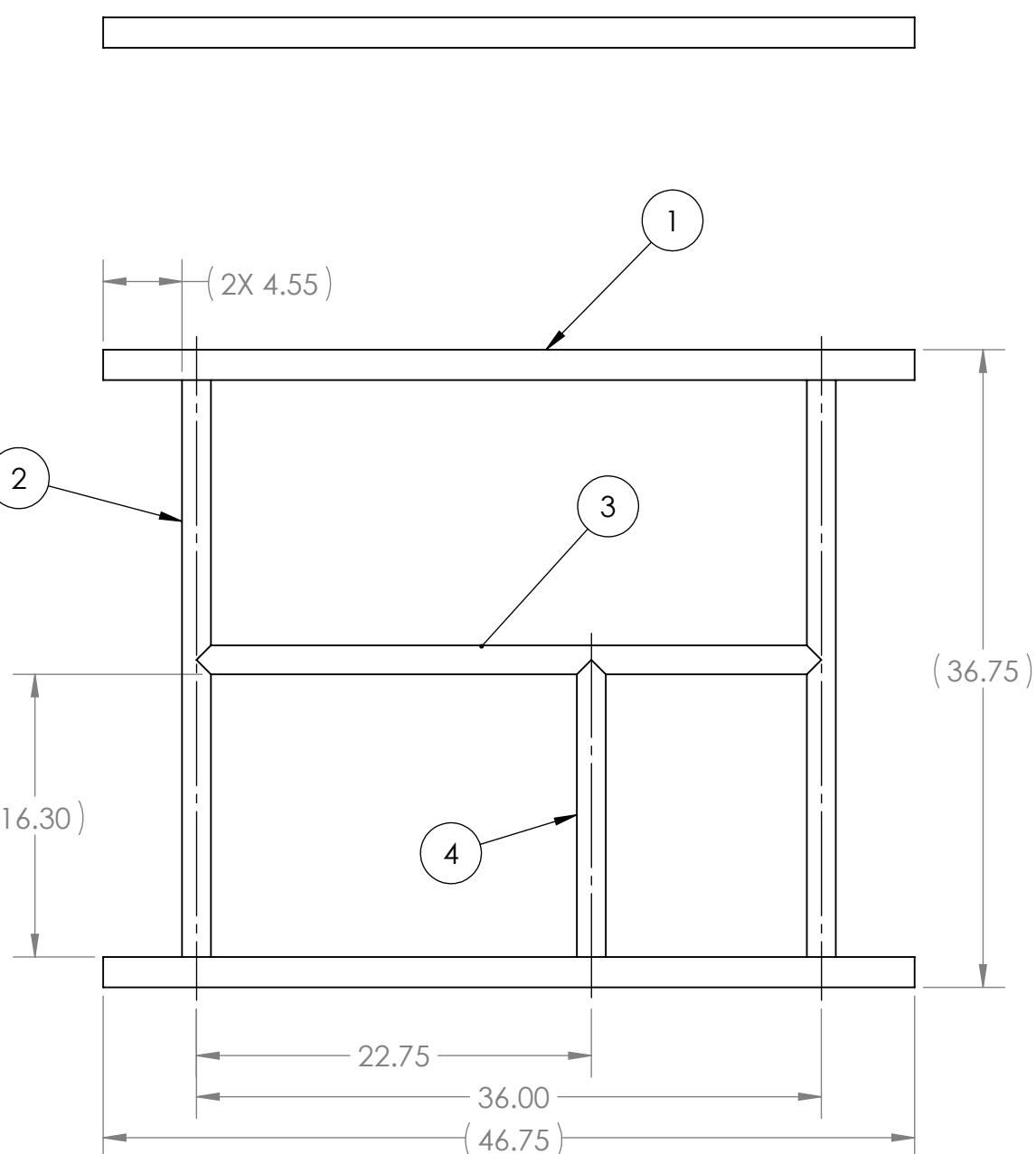
SCALE: 1:8 WEIGHT: SHEET 1 OF 1

4

3

2

1



B

B

A

A

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-18009-01	1.75" x .125" thk. Square Tube, 6063 Aluminum	2
2	GE-18009-02	1-1/4" Schedule 40 Pipe, 6061 Aluminum	2
3	GE-18009-03	1-1/4" Schedule 40 Pipe, 6061 Aluminum	1
4	GE-18009-04	1-1/4" Schedule 40 Pipe, 6061 Aluminum	1

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

**FIRST<sup>®</sup> ROBOTICS COMPETITION** **SOLIDWORKS**  
Modeling Solutions Partner

**EXCHANGE FRAME**

**SIZE** DWG. NO. **B** **GE-18009** **REV**

SCALE: 1:10 WEIGHT: **SHEET 1 OF 3**

4

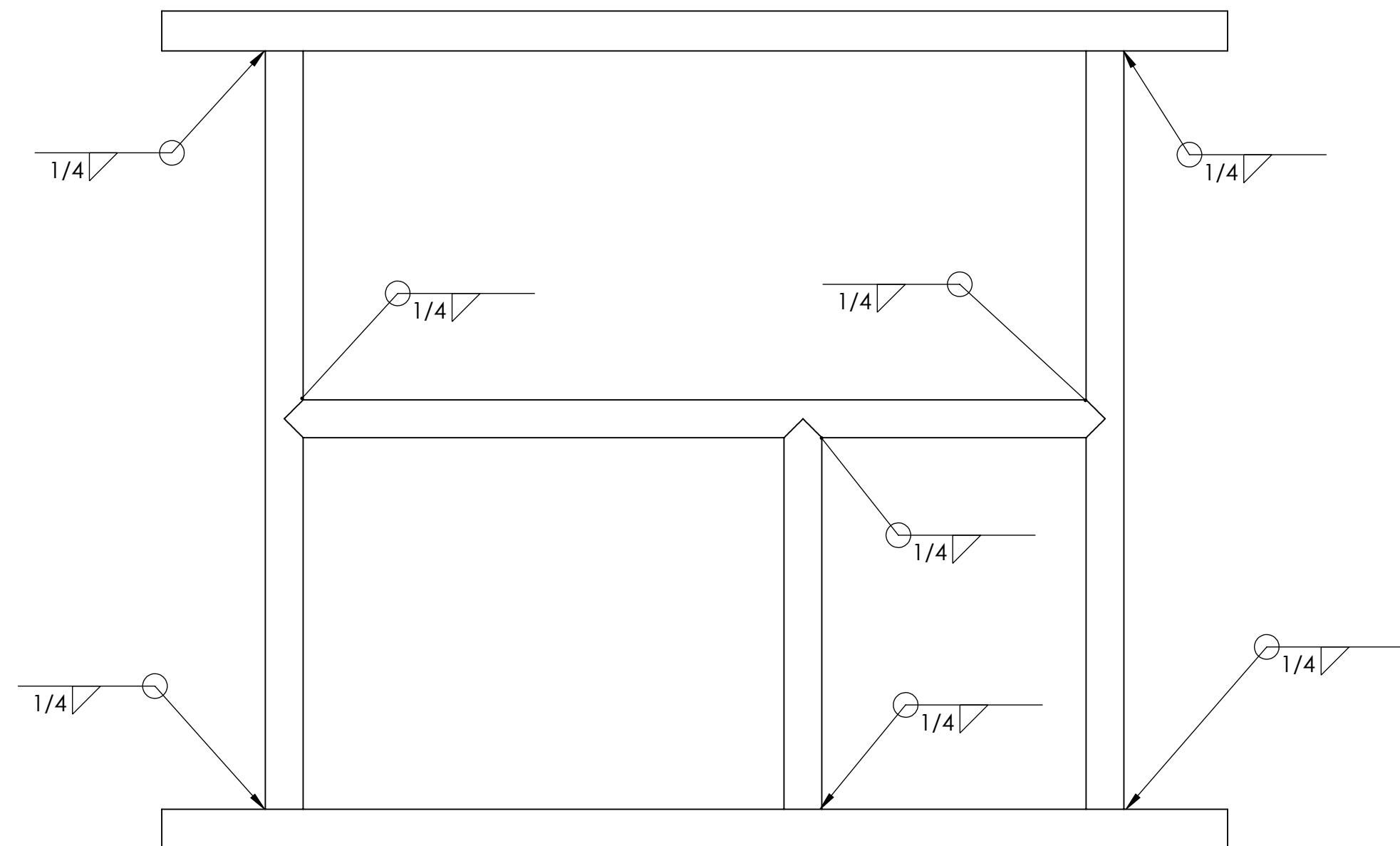
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B

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A

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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

**Exchange  
Frame**

**SIZE** DWG. NO. **B** **GE-18009** **REV**

SCALE: 1:10 WEIGHT: SHEET 2 OF 3

4

3

2

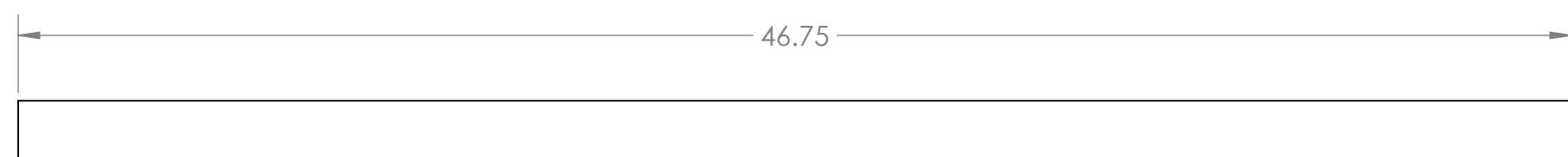
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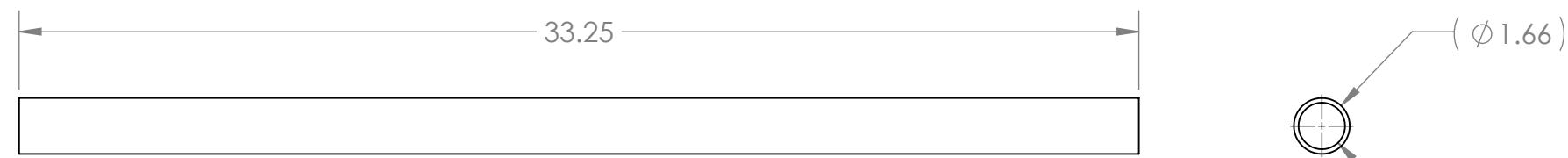
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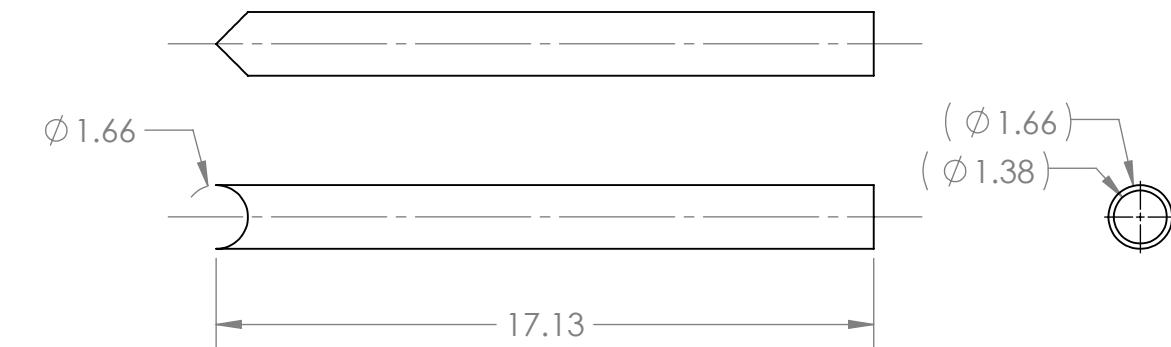
Item: GE-18009-01  
 Quantity: 2  
 Material: 1.75" x .125" thk. Square Tube, 6063 Aluminum



Item: GE-18009-02  
 Quantity: 2  
 Material: 1-1/4" Schedule 40 Pipe, 6061 Aluminum



Item: GE-18009-03  
 Quantity: 1  
 Material: 1-1/4" Schedule 40 Pipe, 6061 Aluminum



Item: GE-18009-04  
 Quantity: 1  
 Material: 1-1/4" Schedule 40 Pipe, 6061 Aluminum

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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

**Exchange Frame**

SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-18009</b>	
SCALE: 1:5	WEIGHT:	SHEET 3 OF 3

4

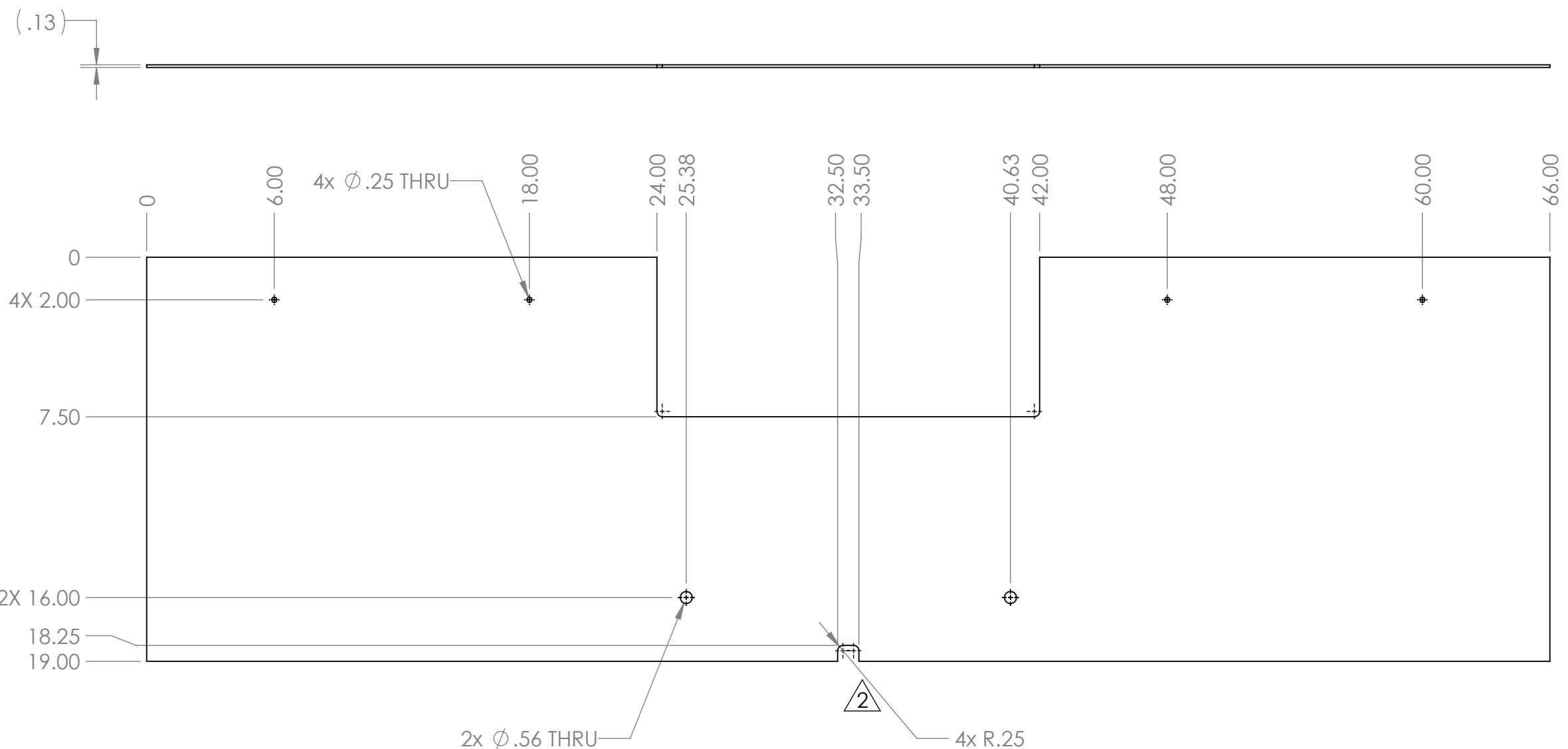
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2

1

## REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
A2	2	Added cutout	11/17/2017	CPO



## Notes:

1. Material: 1/8" thick, clear polycarbonate.
2. Remove all burrs and sharp edges.

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

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

**Switch Base Cover**  
**Polycarbonate**

**SIZE** DWG. NO. **REV**  
**B** **GE-18024** **2**

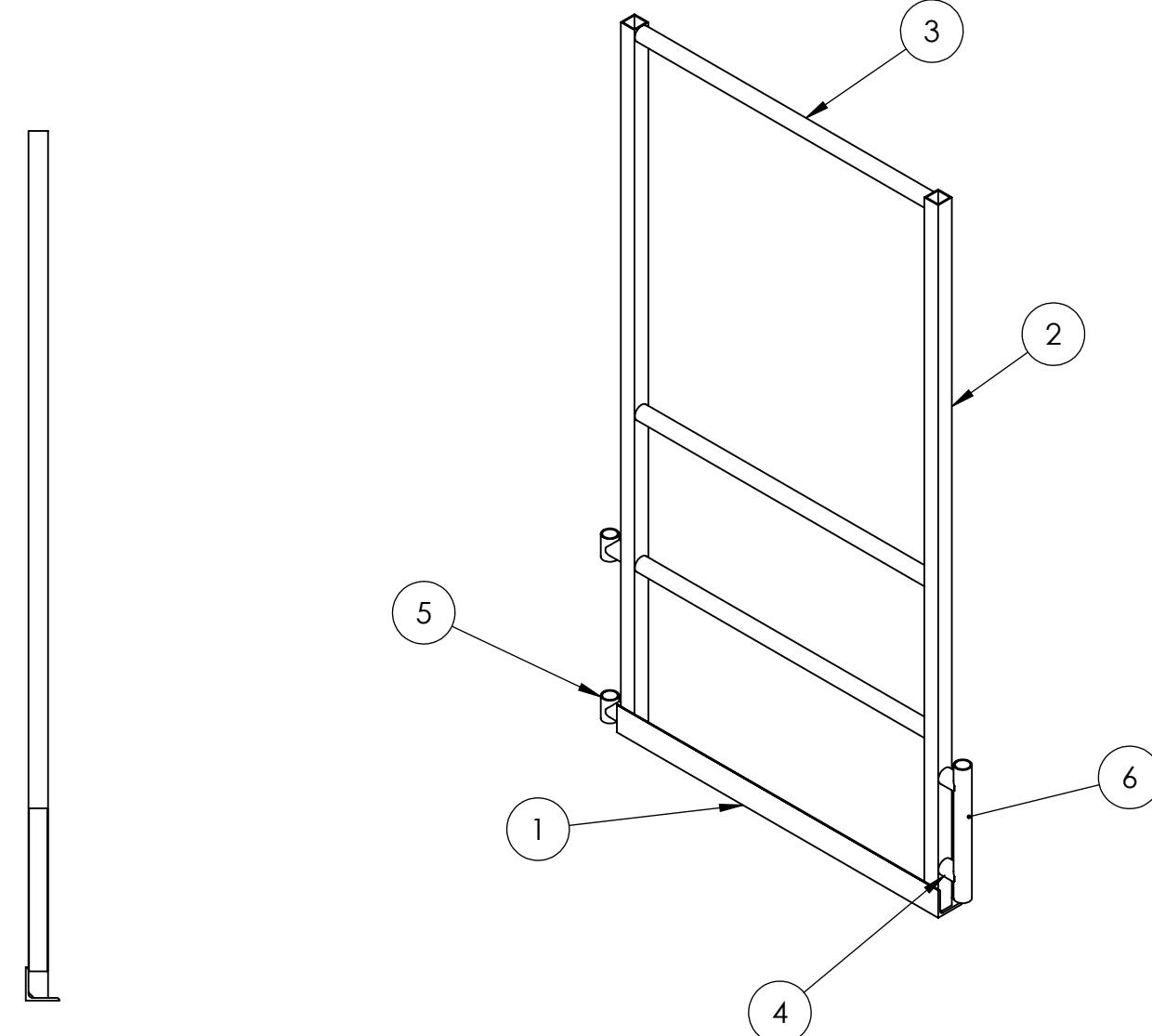
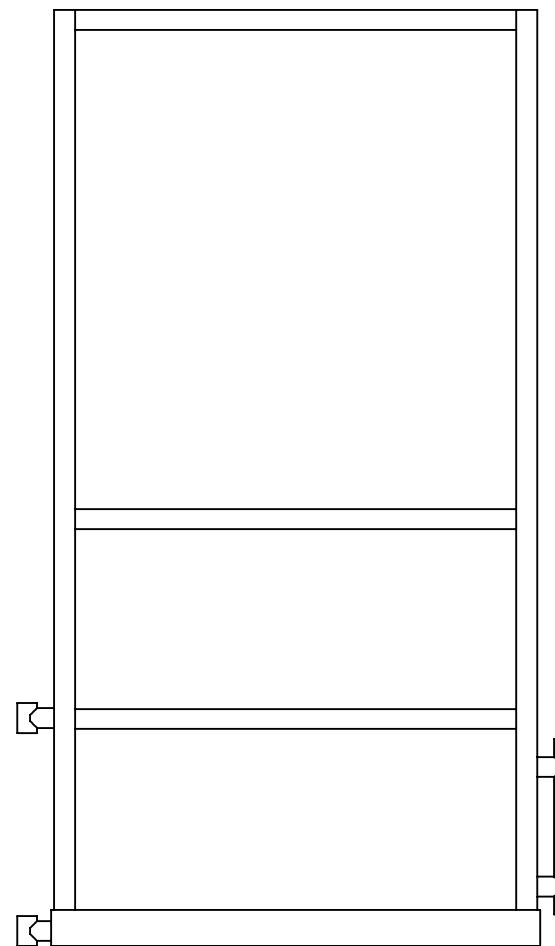
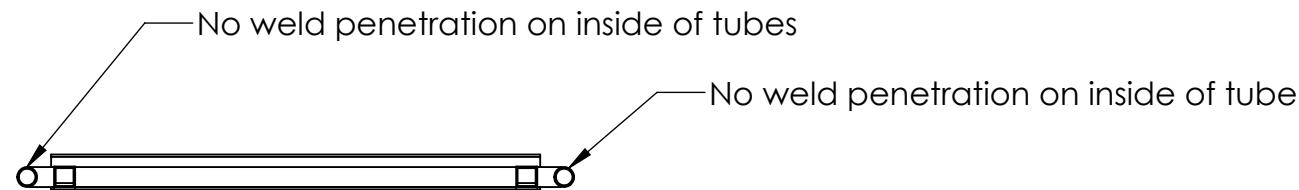
SCALE: 1:6 WEIGHT: SHEET 1 OF 1

4

3

2

1



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-18011-01	3" x .25" thk. Angle, 6061 Aluminum	1
2	GE-18011-02	1.75" x .125" thk. Square Tube, 6061 Aluminum	2
3	GE-18011-03	1-1/4" Schedule 40 Pipe, 6061 Aluminum	3
4	GE-18011-04	1-1/4" Schedule 40 Pipe, 6061 Aluminum	4
5	GE-18011-05	1-1/4" Schedule 40 Pipe, 6061 Aluminum	2
6	GE-18011-06	1-1/4" Schedule 40 Pipe, 6061 Aluminum	1

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

**FIRST<sup>®</sup> ROBOTICS COMPETITION** **SOLIDWORKS**  
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**TITLE:** Portal Frame - Left

**SIZE** **DWG. NO.** **REV**  
**B** **GE-18011**

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

4

3

2

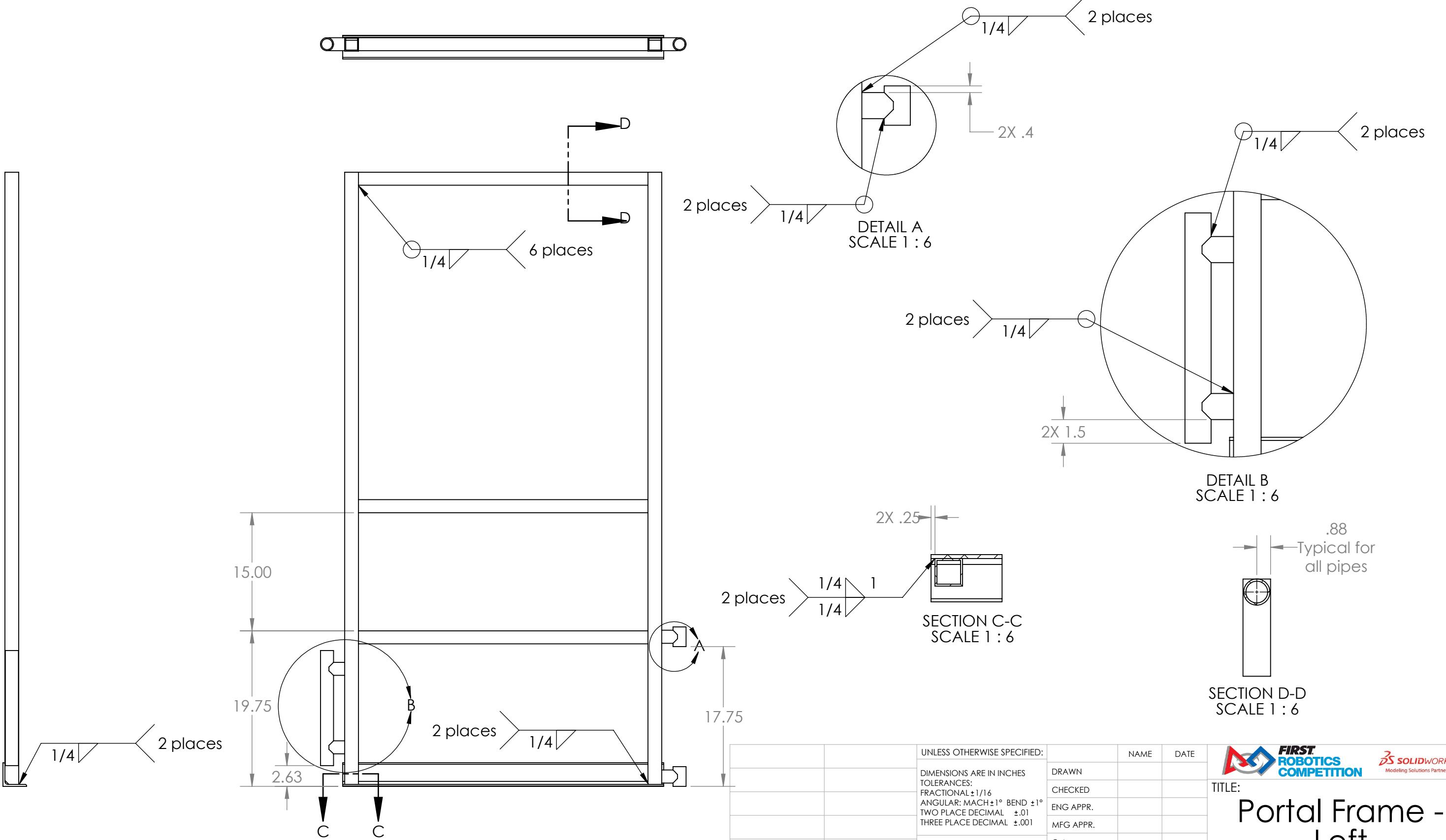
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4

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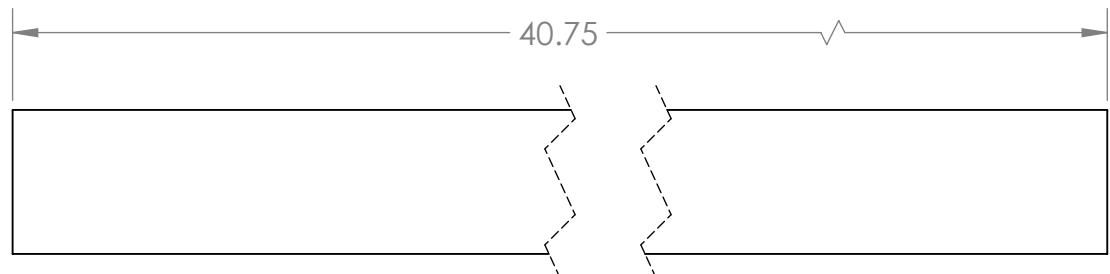
		UNLESS OTHERWISE SPECIFIED:		NAME	DATE	 <b>FIRST</b> <b>ROBOTICS</b> <b>COMPETITION</b>	<b>TITLE:</b>  <h1>Portal Frame - Left</h1>	
		<b>DIMENSIONS ARE IN INCHES</b> <b>TOLERANCES:</b> <b>FRACTIONAL <math>\pm 1/16</math></b> <b>ANGULAR: MACH <math>\pm 1^\circ</math></b> <b>BEND <math>\pm 1^\circ</math></b> <b>TWO PLACE DECIMAL <math>\pm .01</math></b> <b>THREE PLACE DECIMAL <math>\pm .001</math></b>	DRAWN					
			CHECKED					
			ENG APPR.					
			MFG APPR.					
			Q.A.					
		INTERPRET GEOMETRIC TOLERANCING PER:	COMMENTS:					
		MATERIAL				<b>SIZE</b> <b>DWG. NO.</b> <b>REV</b> <b>B</b> <b>GE-18011</b>		
NEXT ASSY	USED ON	FINISH						
APPLICATION		DO NOT SCALE DRAWING				SCALE: 1:12	WEIGHT:	SHEET 2 OF 3

4

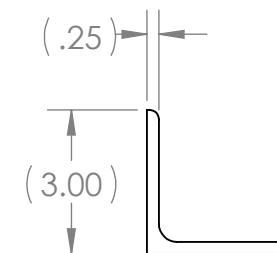
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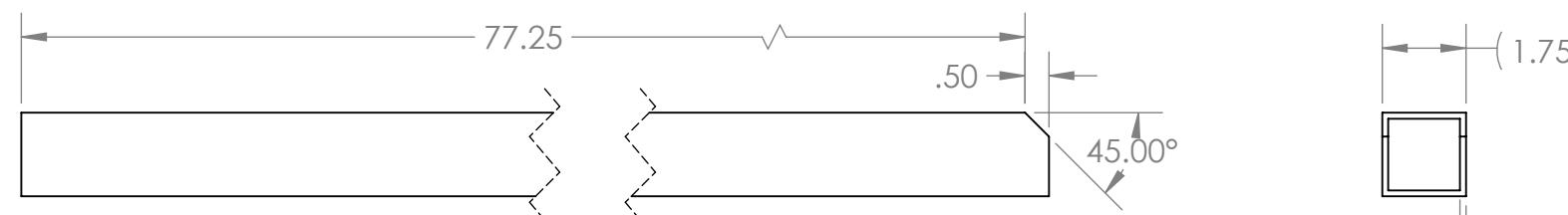
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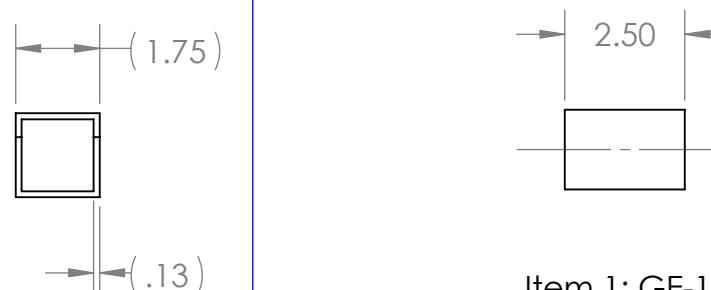
Item 1: GE-18011-01  
Qty: 1  
Material: 3" x .25" thk. Angle, 6061 Aluminum



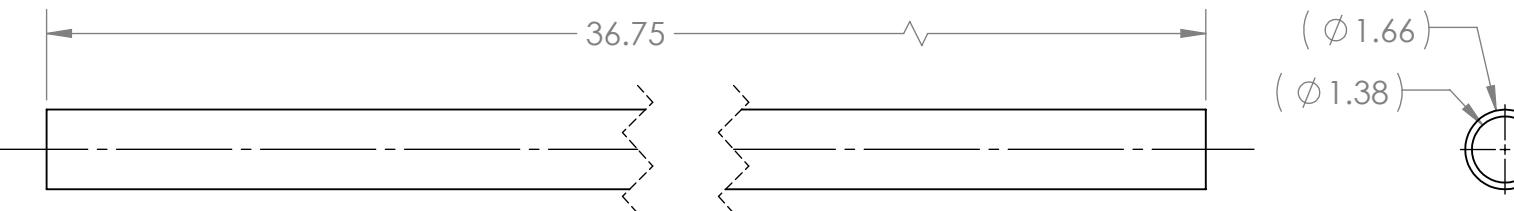
Item 1: GE-18011-04  
Qty: 4  
Material: 1-1/4" Schedule 40 Pipe, 6061 Aluminum



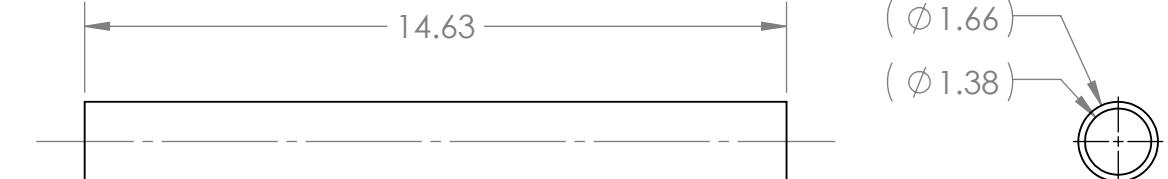
Item 1: GE-18011-02  
Qty: 2  
Material: 1.75" x .125" thk. Square Tube, 6063 Aluminum



Item 1: GE-18011-05  
Qty: 2  
Material: 1-1/4" Schedule 40 Pipe, 6061 Aluminum



Item 1: GE-18011-03  
Qty: 3  
Material: 1-1/4" Schedule 40 Pipe, 6061 Aluminum



Item 1: GE-18011-06  
Qty: 1  
Material: 1-1/4" Schedule 40 Pipe, 6061 Aluminum

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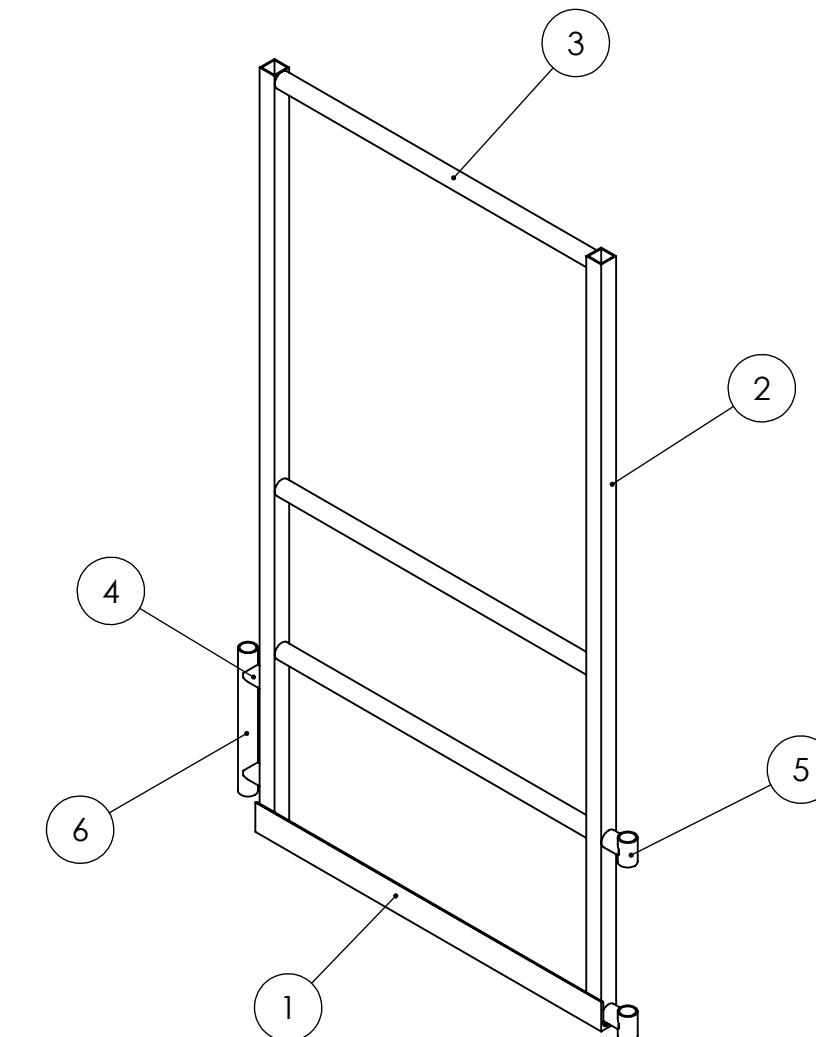
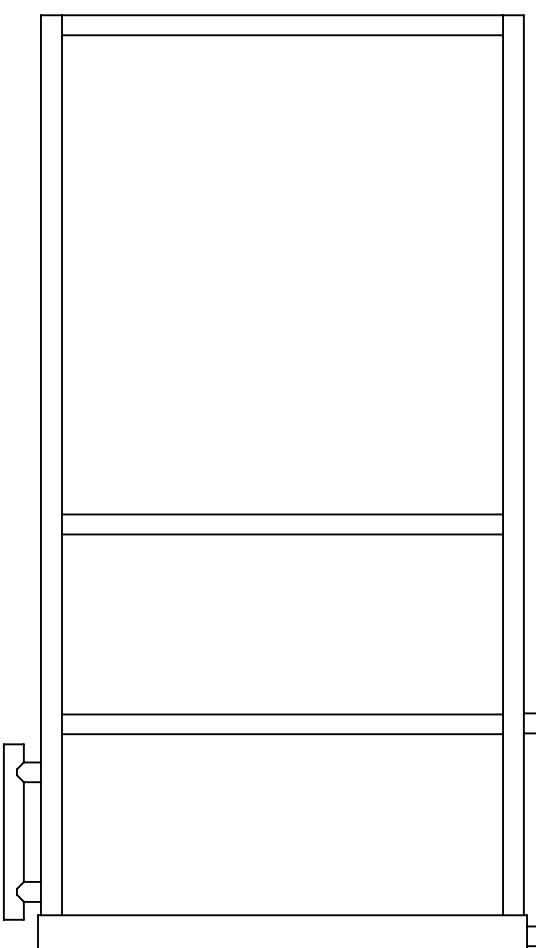
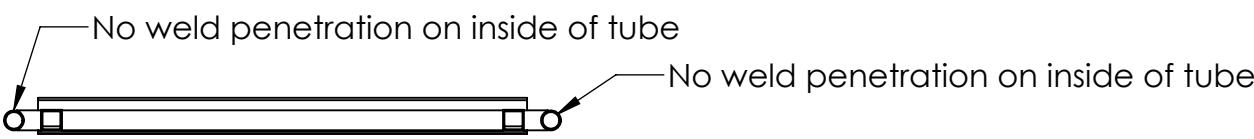
		UNLESS OTHERWISE SPECIFIED:		NAME	DATE	 <b>FIRST</b> <b>ROBOTICS</b> <b>COMPETITION</b>	<b>TITLE:</b>  <b>Portal Frame - Left</b>
		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$	DRAWN				
			CHECKED				
			ENG APPR.				
			MFG APPR.				
			Q.A.				
		INTERPRET GEOMETRIC TOLERANCING PER:	COMMENTS:				
		MATERIAL					
NEXT ASSY	USED ON	FINISH					
APPLICATION		DO NOT SCALE DRAWING					
			SCALE: 1:4	WEIGHT:	SHEET 3 OF 3		
					SIZE	DWG. NO.	REV
					<b>B</b>	<b>GE-18011</b>	

4

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1



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-18012-01	3" x .25" thk. Angle, 6061 Aluminum	1
2	GE-18012-02	1.75" x .125 thk. Square Tubing, 6061 Aluminum	2
3	GE-18012-03	1-1/4" Schedule 40 Pipe, 6061 Aluminum	3
4	GE-18012-04	1-1/4" Schedule 40 Pipe, 6061 Aluminum	4
5	GE-18012-05	1-1/4" Schedule 40 Pipe, 6061 Aluminum	2
6	GE-18012-06	1-1/4" Schedule 40 Pipe, 6061 Aluminum	1

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		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL: $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$		NAME	DATE
		DRAWN			
		CHECKED			
		ENG APPR.			
		MFG APPR.			
		Q.A.			
		COMMENTS:			
		MATERIAL			
		FINISH			
		APPLICATION	DO NOT SCALE DRAWING		
SIZE	DWG. NO.	REV			
<b>B</b>	<b>GE-18012</b>				
SCALE: 1:16	WEIGHT:	SHEET 1 OF 3			

4

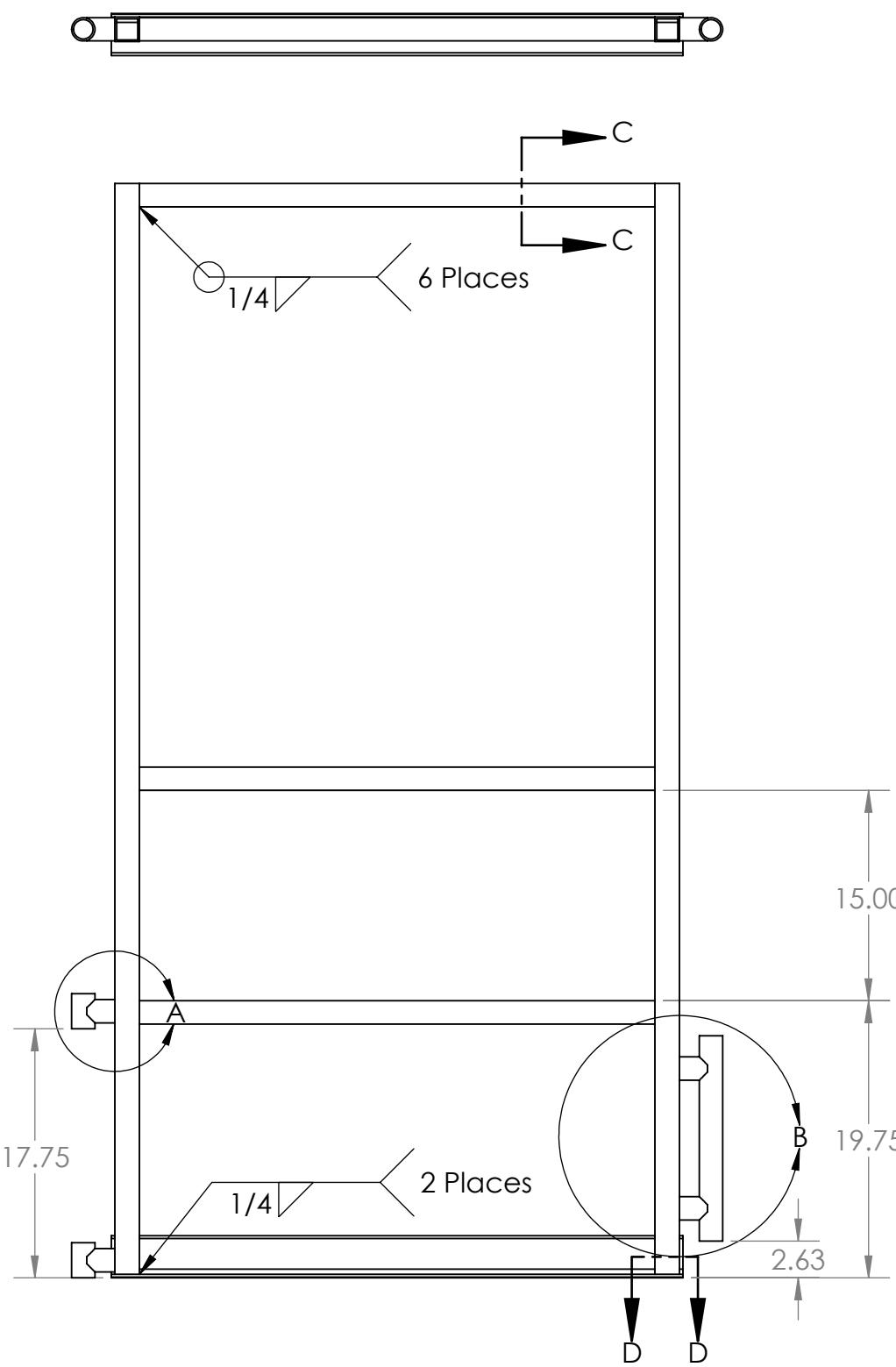
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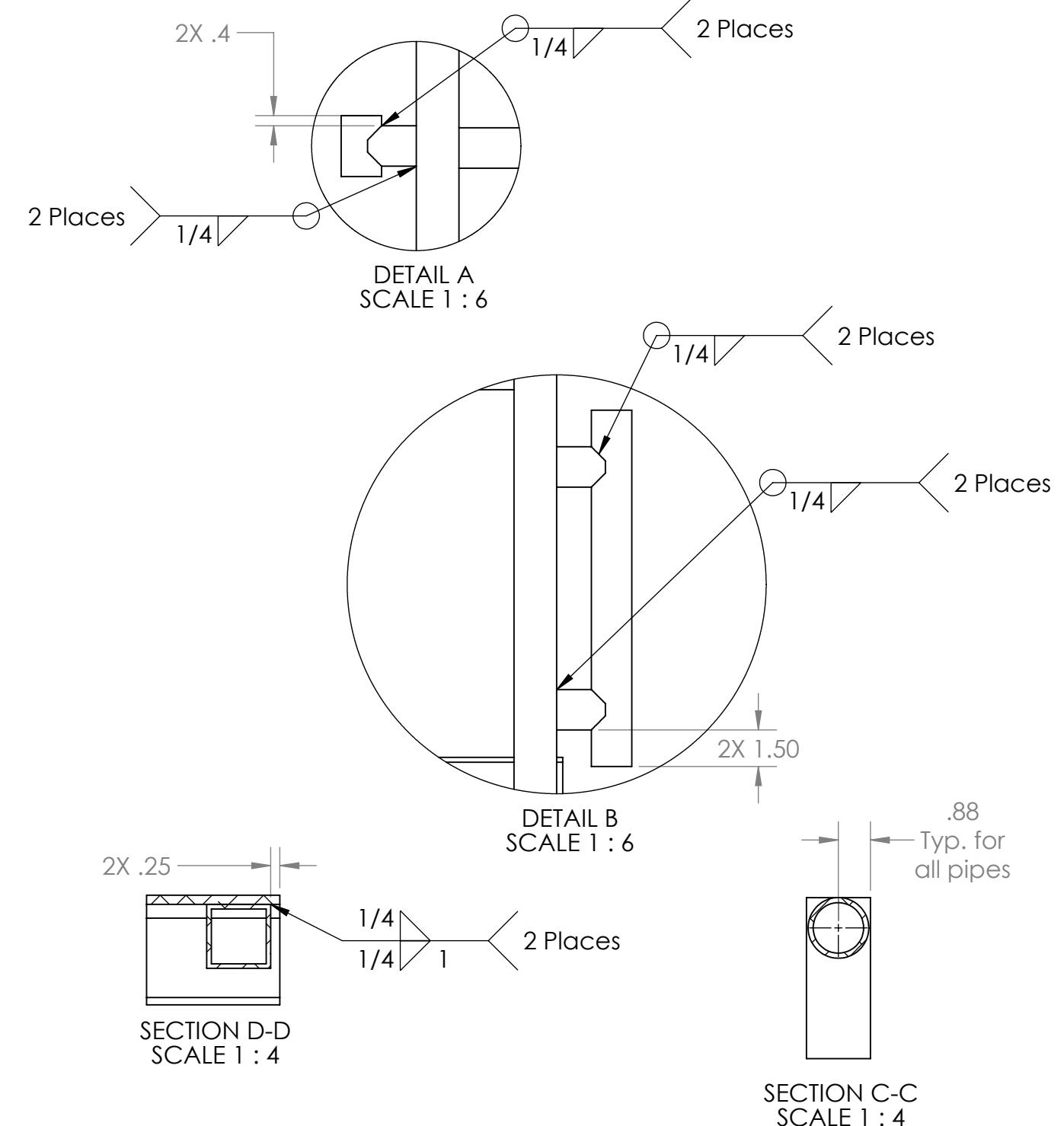
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	DRAWN		
	CHECKED		
	ENG APPR.		
	MFG APPR.		
	INTERPRET GEOMETRIC TOLERANCING PER:		
	MATERIAL		
NEXT ASSY	USED ON	FINISH	
	APPLICATION	DO NOT SCALE DRAWING	

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Modeling Solutions Partner

**Portal Frame - Right**

SIZE DWG. NO. REV  
**B** GE-18012

SCALE: 1:12 WEIGHT: SHEET 2 OF 3



4

3

2

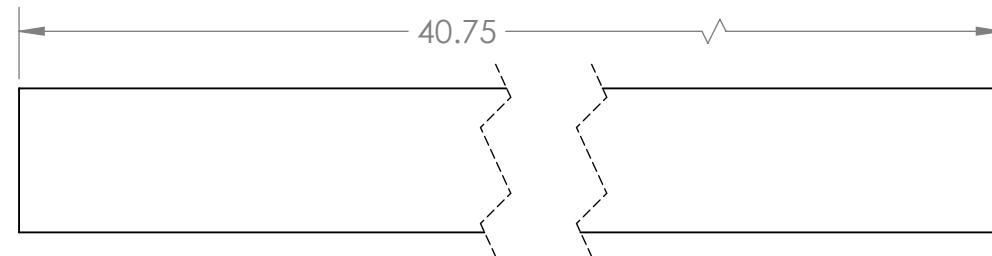
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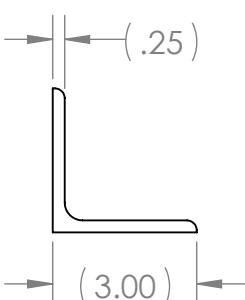
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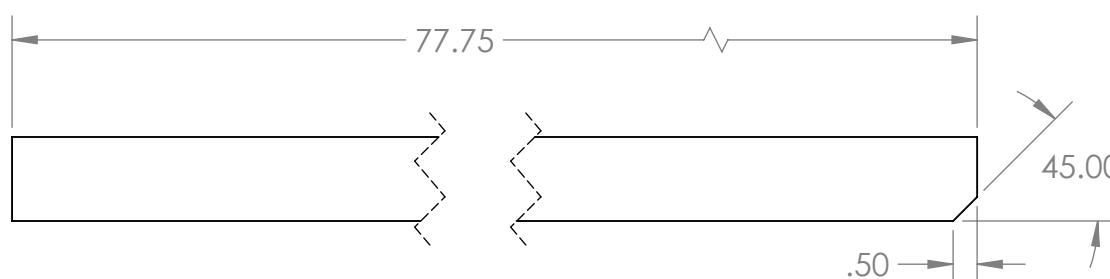
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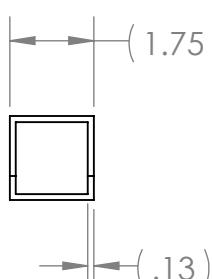
Item: GE18012-01  
Qty: 1  
Material 3" x .25" thick Angle, 6061 Aluminum



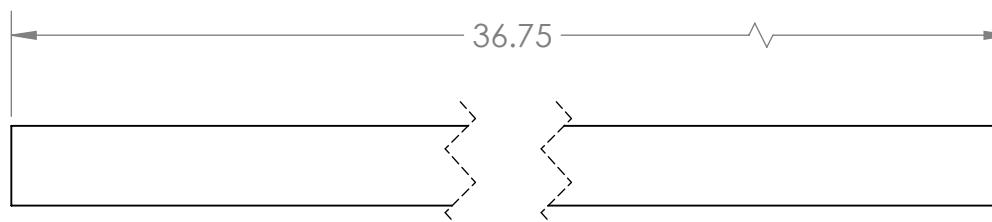
Item: GE18012-04  
Qty: 4  
Material 1-1/4" Schedule 40 Pipe, 6061 Aluminum



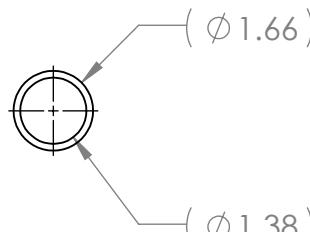
Item: GE18012-02  
Qty: 2  
Material 1.75" x .125" thick Square Tubing, 6061 Aluminum



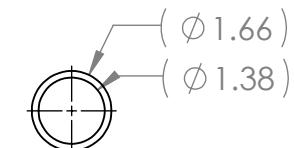
Item: GE18012-05  
Qty: 2  
Material 1-1/4" Schedule 40 Pipe, 6061 Aluminum



Item: GE18012-03  
Qty: 3  
Material 1-1/4" Schedule 40 Pipe, 6061 Aluminum



Item: GE18012-06  
Qty: 1  
Material 1-1/4" Schedule 40 Pipe, 6061 Aluminum



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

FIRST<sup>®</sup> ROBOTICS  
COMPETITION

SOLIDWORKS  
Modeling Solutions Partner

TITLE:  
Portal Frame -  
Right

SIZE DWG. NO. REV  
**B** GE-18012

SCALE: 1:4 WEIGHT: SHEET 3 OF 3

4

3

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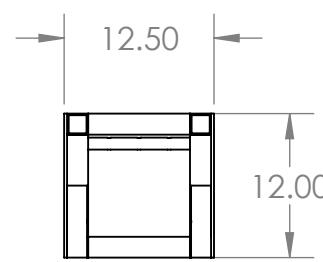
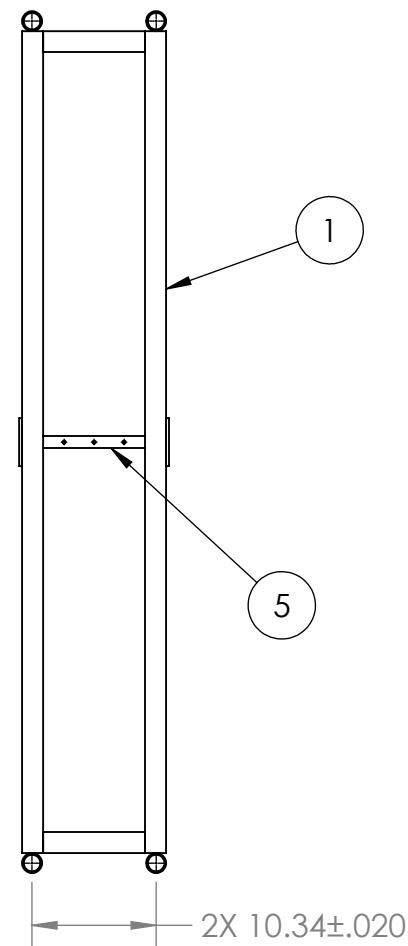
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REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
2-B3	2	Added weld note	11/17/17	CPO

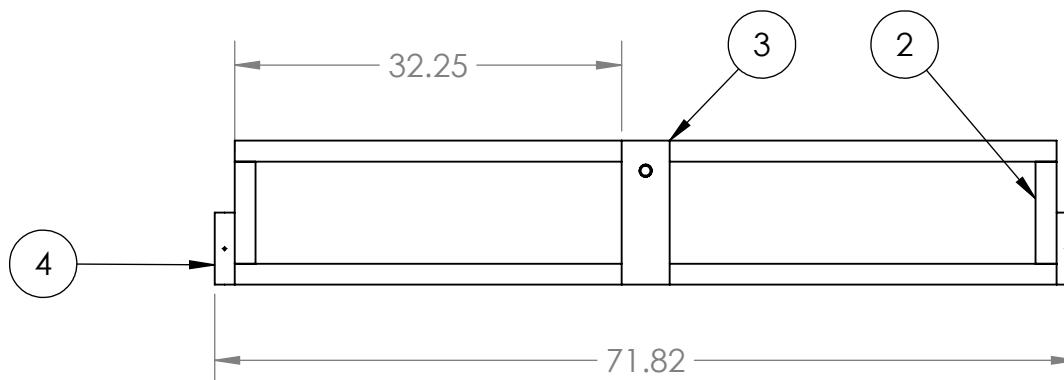
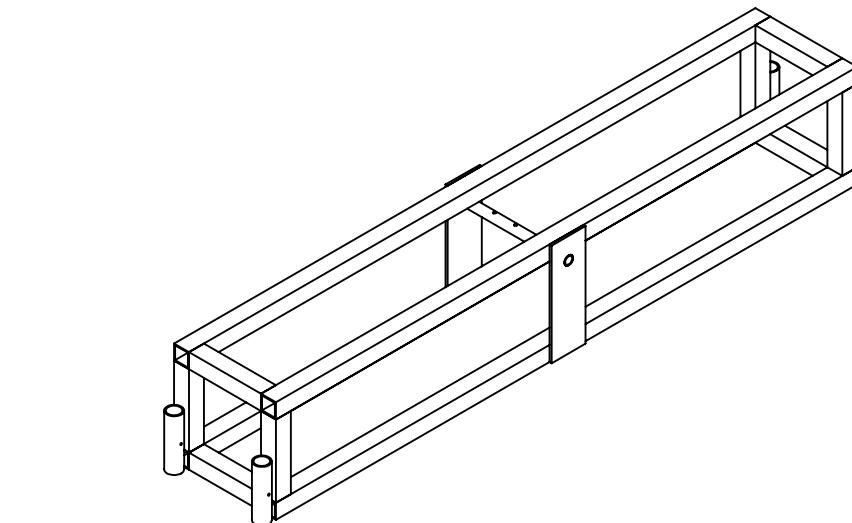
B

B



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-18013-1	1.75" x .125" thk. Square Tube, 6063 Aluminum	4
2	GE-18013-2	1.75" x .125" thk. Square Tube, 6063 Aluminum	8
3	GE-18013-3	.25" thk. Plate, 6061 Aluminum	2
4	GE-18013-4	1.25" Schedule 40 Pipe, 6061 Aluminum	4
5	GE-18013-5	1" OD x 0.095" thk. Tube, 6061 Aluminum	1

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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	
FINISH	
DO NOT SCALE DRAWING	

 **FIRST**  
ROBOTICS  
COMPETITION

# Switch Arm

SIZE <b>B</b>	DWG. NO. <b>GE-18013</b>	REV <b>2</b>
SCALE: 1:16 WEIGHT:		SHEET 1 OF 5

4

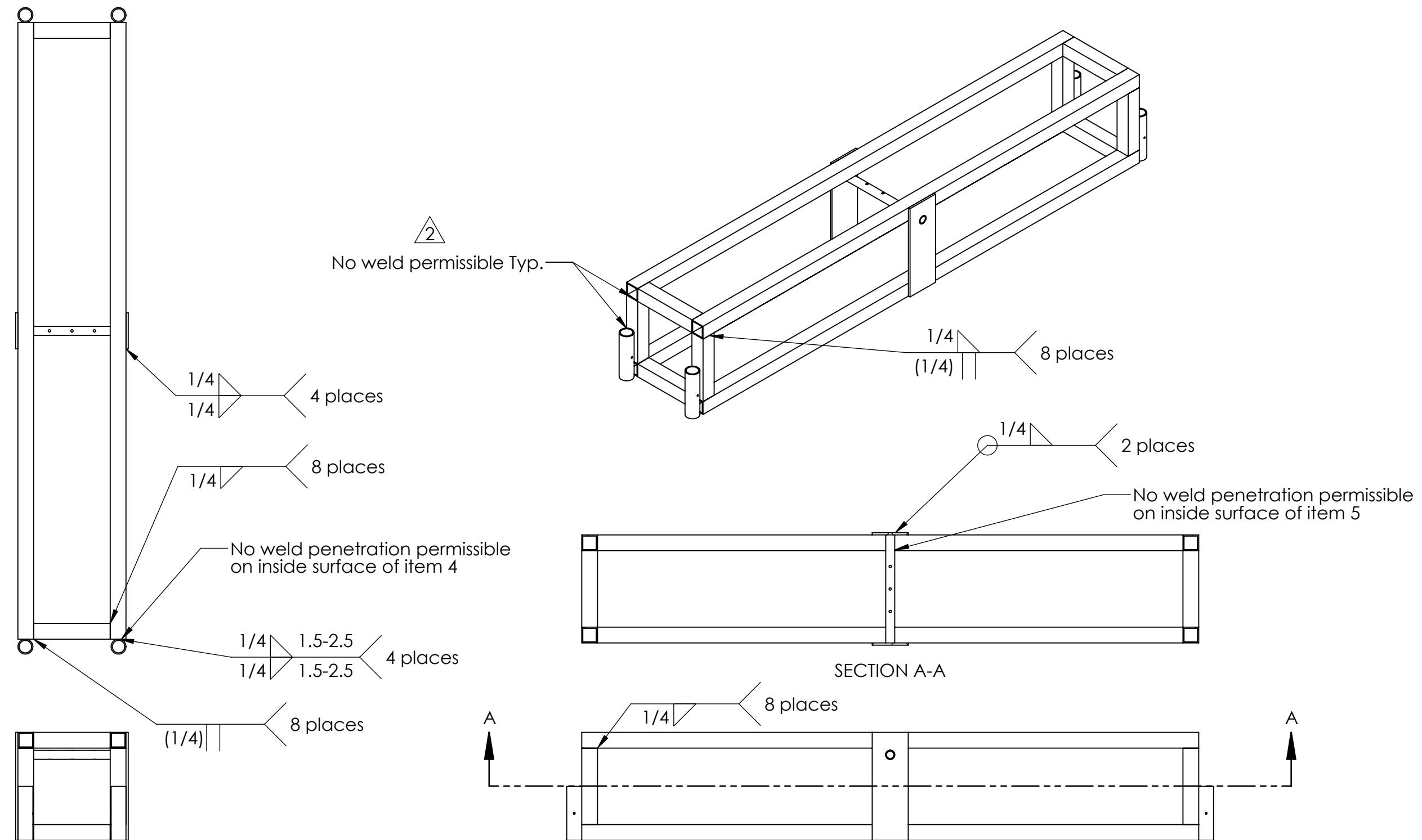
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	DRAWN		
	CHECKED		
	ENG APPR.		
	MFG APPR.		
	Q.A.		
	COMMENTS:		
	MATERIAL		
	FINISH		
NEXT ASSY	USED ON		
APPLICATION	DO NOT SCALE DRAWING		
SIZE	DWG. NO.	REV	
<b>B</b>	<b>GE-18013</b>	<b>2</b>	
SCALE: 1:12	WEIGHT:	SHEET 2 OF 5	

FIRST  
ROBOTICS  
COMPETITION

SOLIDWORKS  
Modeling Solutions Partner

**Switch Arm**

4

3

2

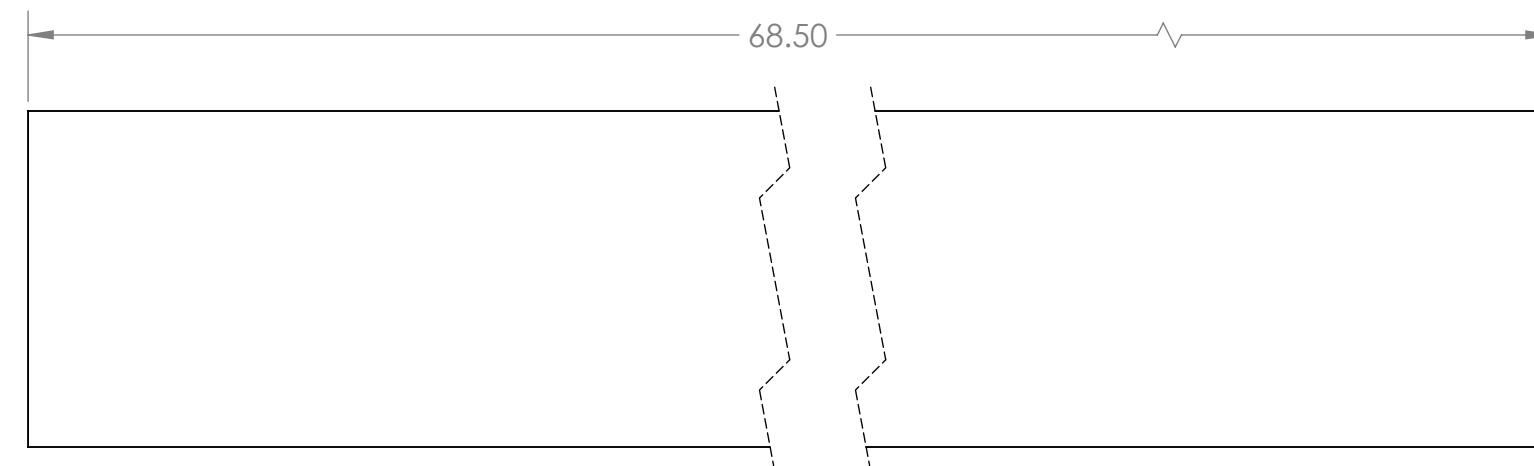
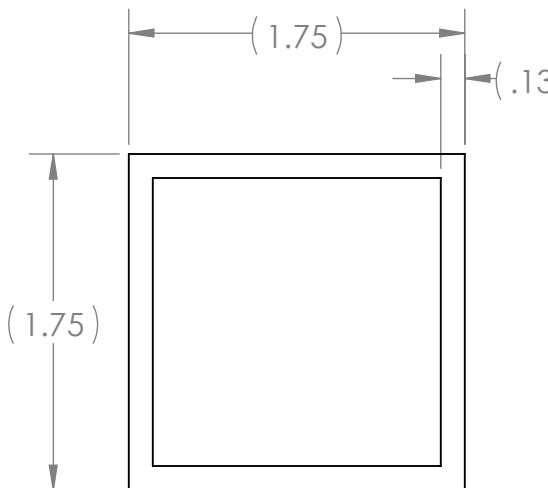
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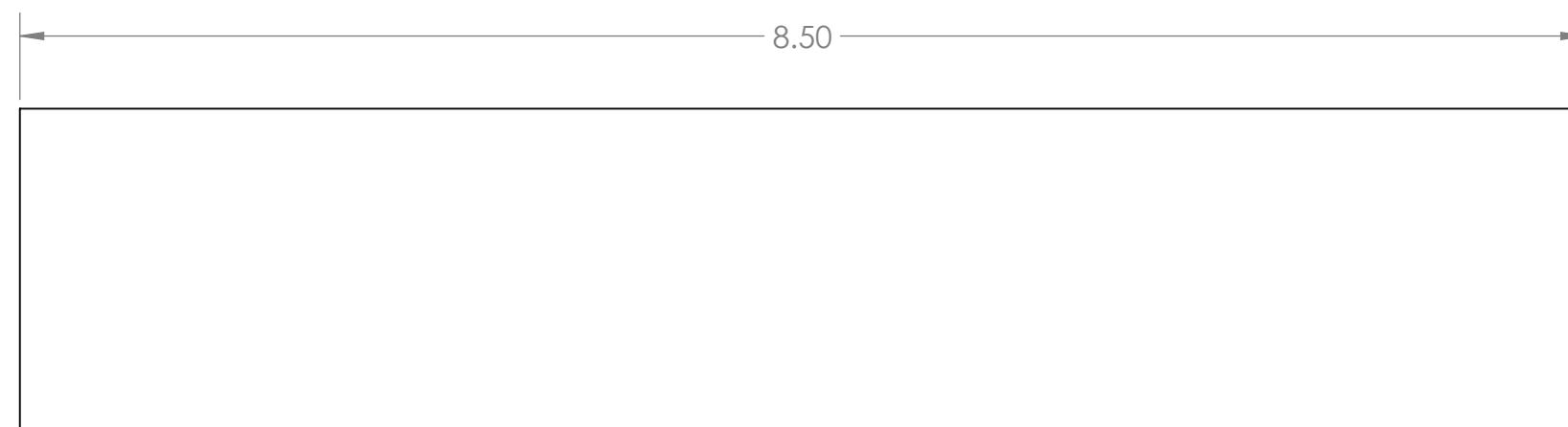
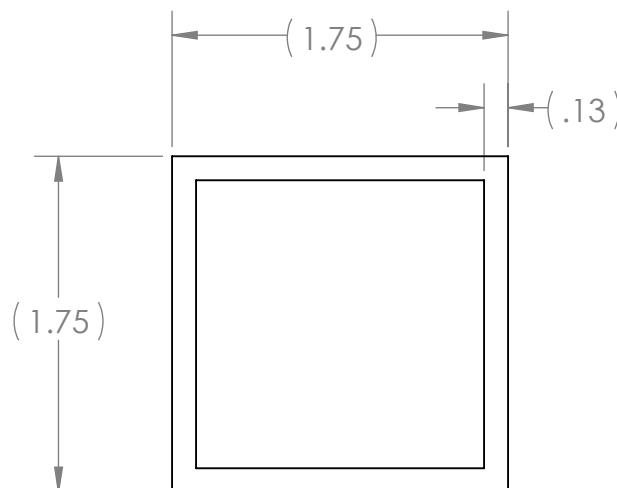
3

2

1



Item: GE-18013-1  
Material: 1.75" x .125" thk. Square Tube, 6063 Aluminum  
QTY: 4



A

A

Item: GE-18013-2  
Material: 1.75" x .125" thk. Square Tube, 6063 Aluminum  
QTY: 8

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		UNLESS OTHERWISE SPECIFIED:		NAME	DATE	 <b>FIRST ROBOTICS COMPETITION</b>	<b>TITLE:</b>  <b>Switch Arm</b>
		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					
			SIZE	DWG. NO.		REV	
			<b>B</b>	<b>GE-18013</b>		<b>2</b>	
			SCALE: 1:1	WEIGHT:	SHEET 3 OF 5		

# Switch Arm

 FIRST  
ROBOTICS  
COMPETITION

 SOLIDWORKS  
Modeling Solutions Partner

4

3

2

1

4

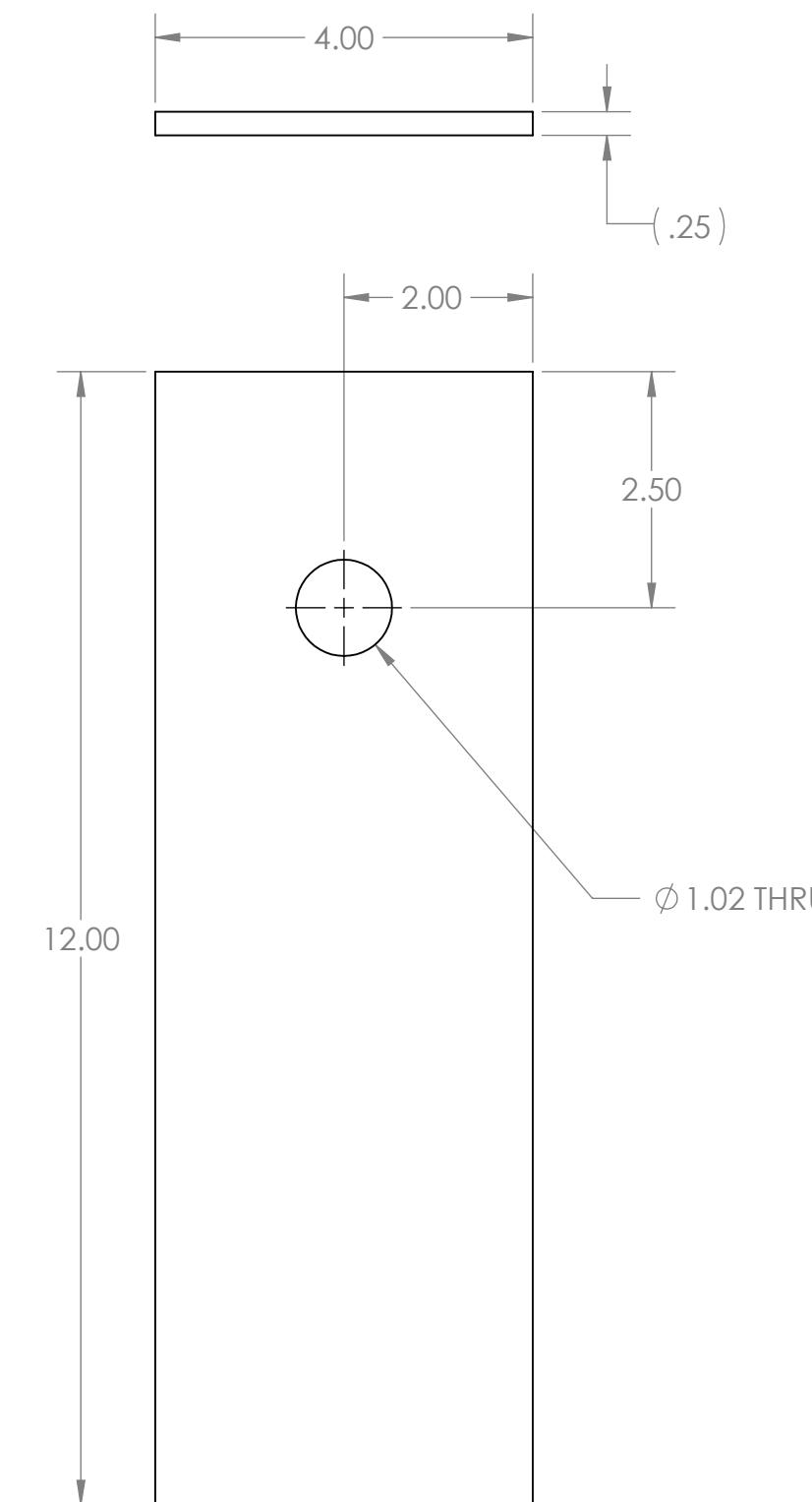
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2

1

B

B



Item: GE-18013-4  
Material: 1.25" Schedule 40 Pipe, 6061 Aluminum  
QTY: 4

		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	

**Switch Arm**

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

SIZE DWG. NO. REV  
**B** GE-18013 2

SCALE: 1:2 WEIGHT: SHEET 4 OF 5

4

3

2

1

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4

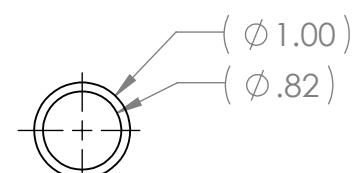
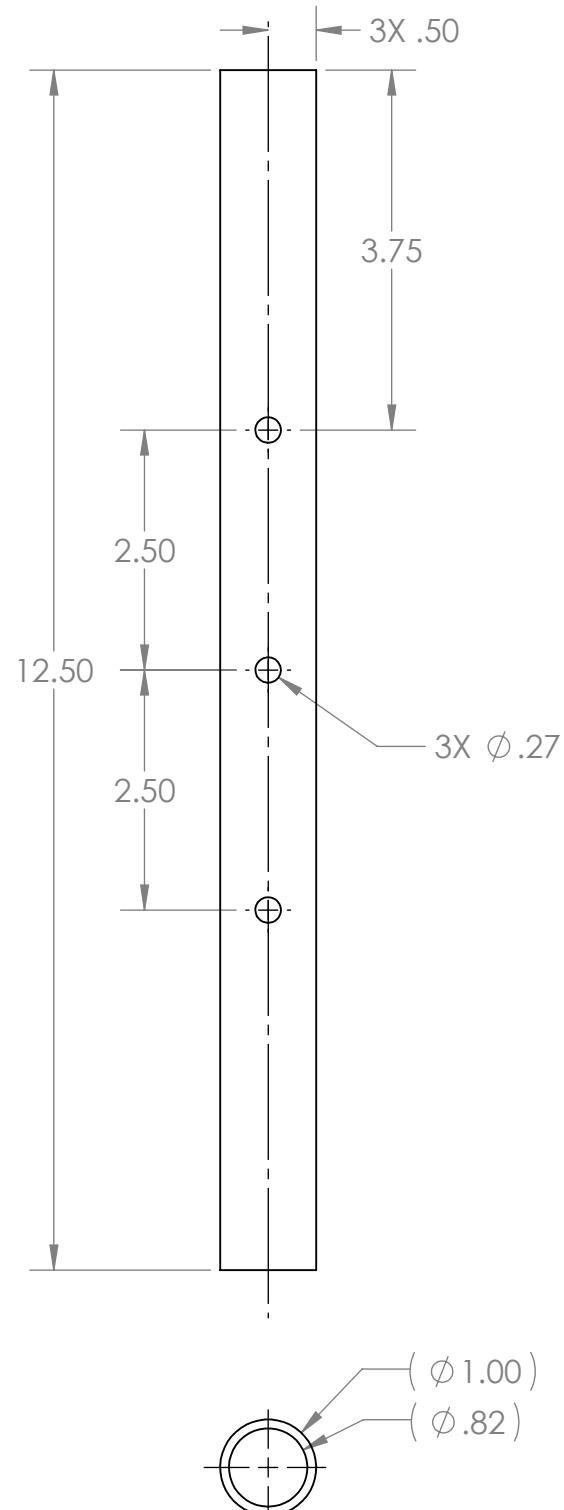
3

2

1

B

B



Item: GE-18013-5  
 Material: 1" OD x 0.095" thk. tube, 6061 Aluminum  
 QTY: 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

**Switch Arm**

**SIZE** **DWG. NO.** **REV**  
**B** **GE-18013** **2**

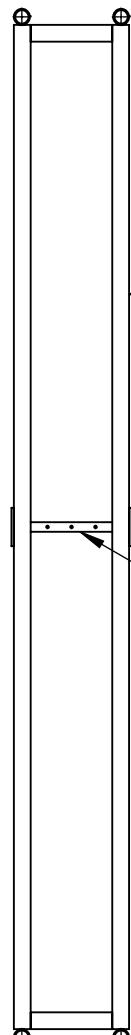
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4

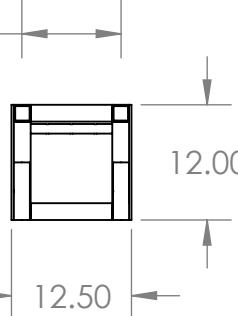
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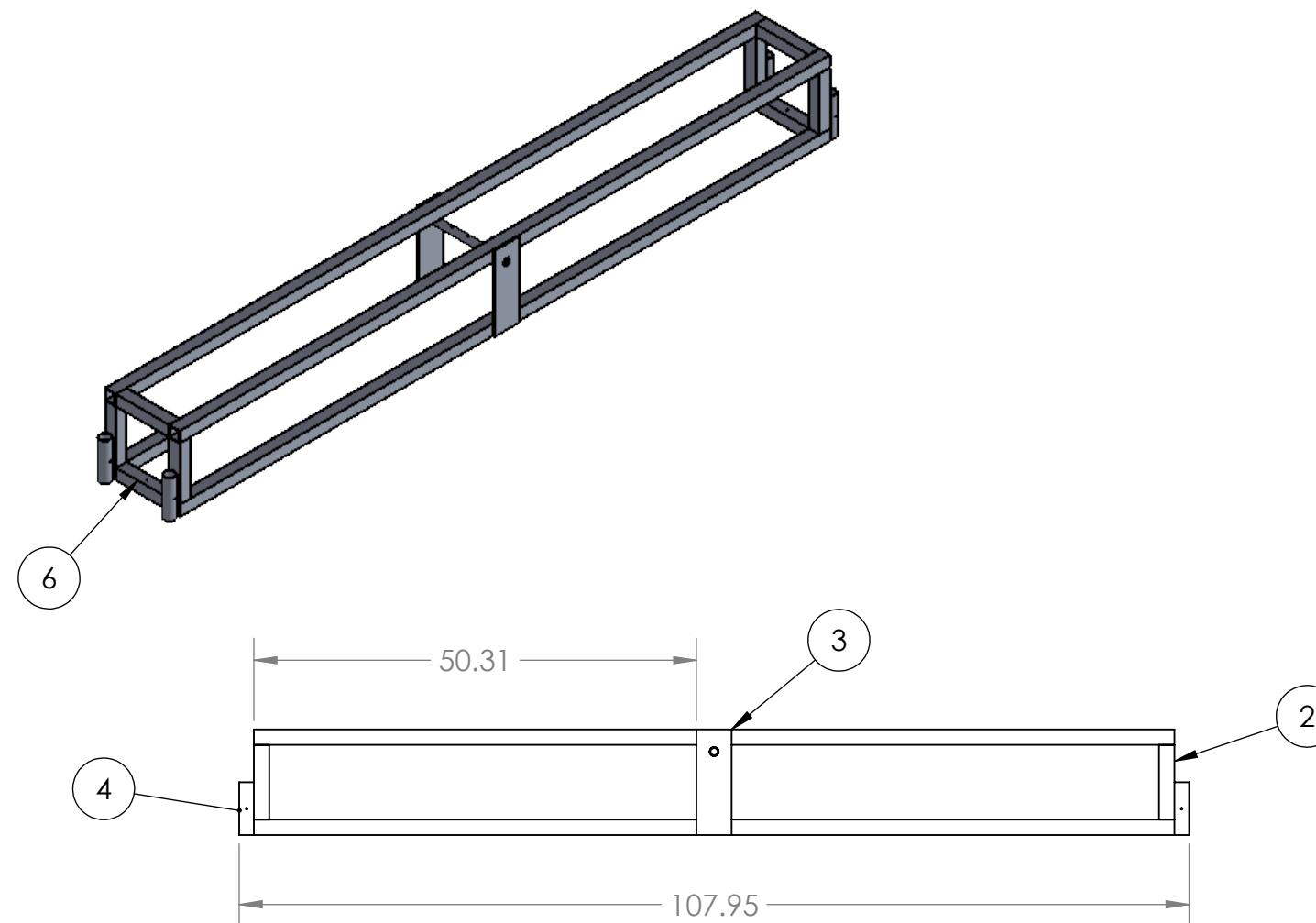
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1



5



2x 10.34 ±.020

12.00

12.50

50.31

107.95

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-18014-1	1.75" x .125" thk. Square Tube, 6063 Aluminum	4
2	GE-18014-2	1.75" x .125" thk. Square Tube, 6063 Aluminum	6
3	GE-18014-3	0.25" thk. plate, 6061 Aluminum	2
4	GE-18014-4	1.25" Schedule 40 Pipe, 6061 Aluminum	4
5	GE-18014-5	1" OD x 0.095" thk. Tube, 6061 Aluminum	1
6	GE-18014-6	1.75" x .125" thk. Square Tube, 6063 Aluminum	2

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REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
5-B3, 5-B4	2	Added locating dimensions for holes on GE-18014-5	11/9/2017	CPO
2-B3	3	Added weld note	11/17/2017	CPO

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

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

**TITLE:** Scale Arm

**SIZE** **DWG. NO.** **REV.**  
**B** **GE-18014** **3**

**SCALE:** 1:20 **WEIGHT:** **SHEET 1 OF 5**

4

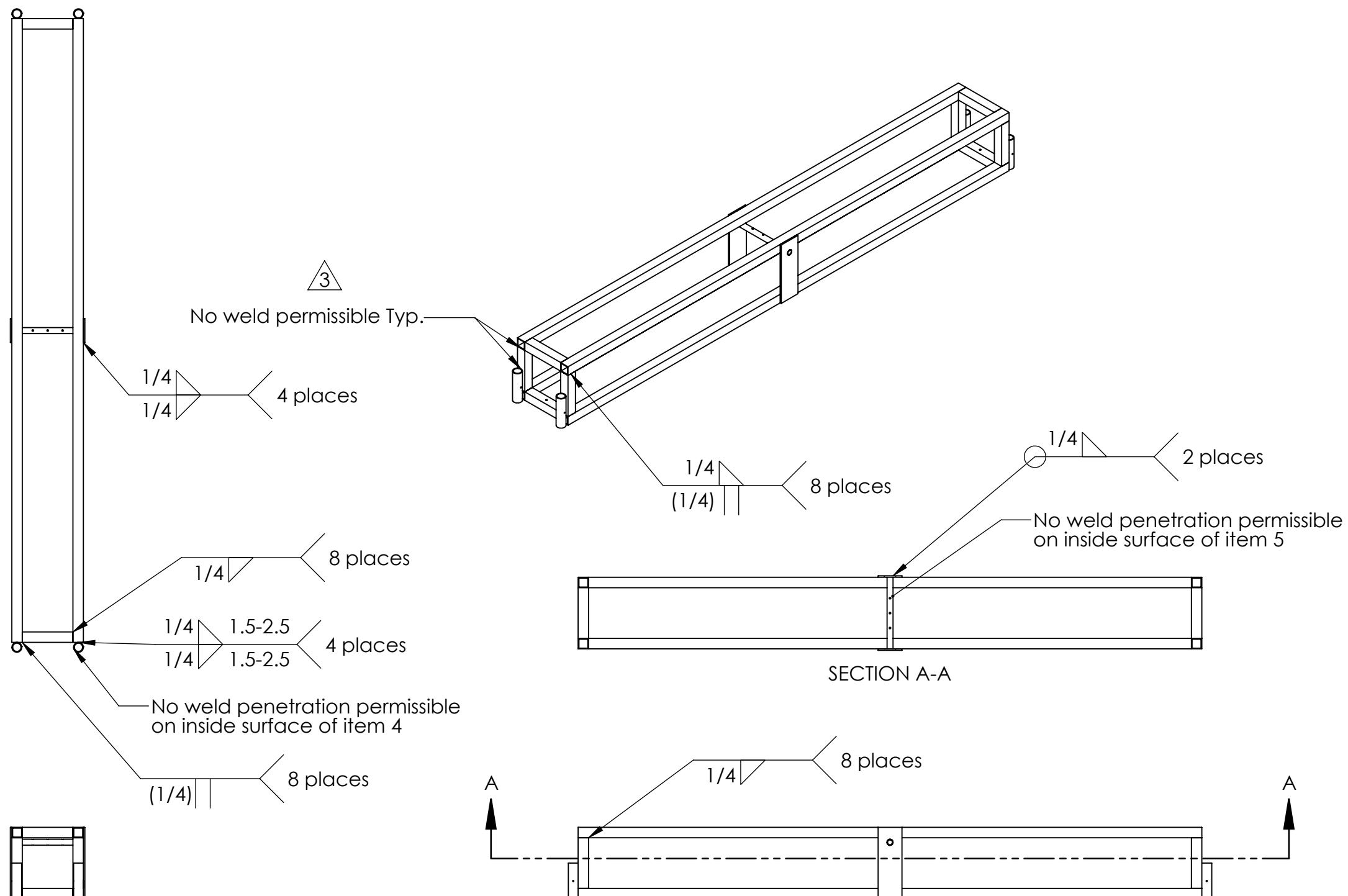
3

2

1

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 $\pm .001$	DRAWN CHECKED ENG AP MFG AP
		INTERPRET GEOMETRIC TOLERANCING PER:	Q.A. COMM
		MATERIAL	
NEXT ASSY	USED ON	FINISH	
APPLICATION		DO NOT SCALE DRAWING	



## Scale Arm

 SOLIDWORKS  
Modeling Solutions Partner

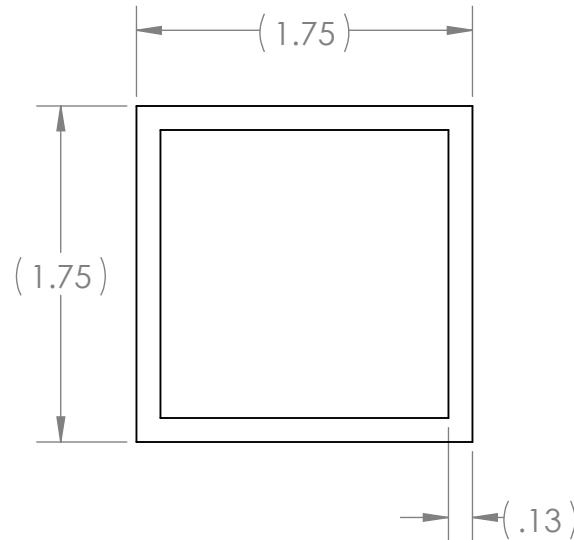
DWG. NO. **GE-18014** REV **3**  
E: 1:20 WEIGHT: **SHEET 2 OF 5**

4

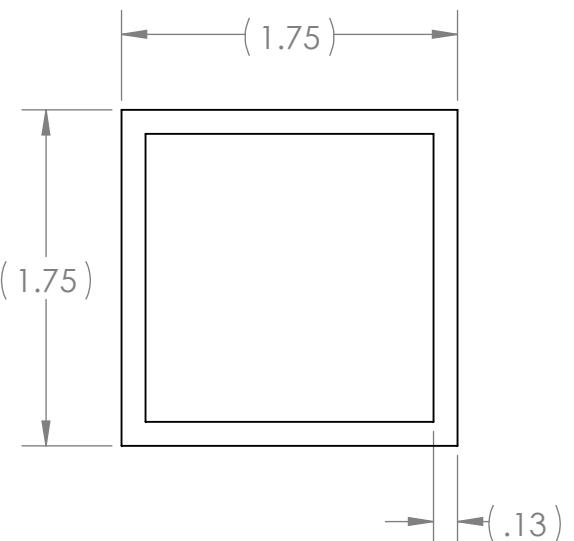
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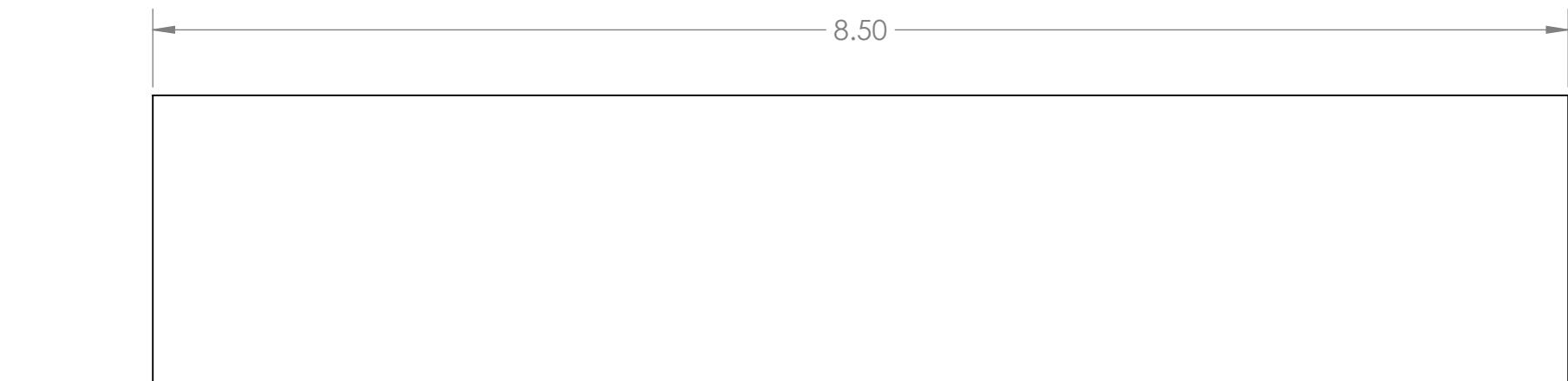
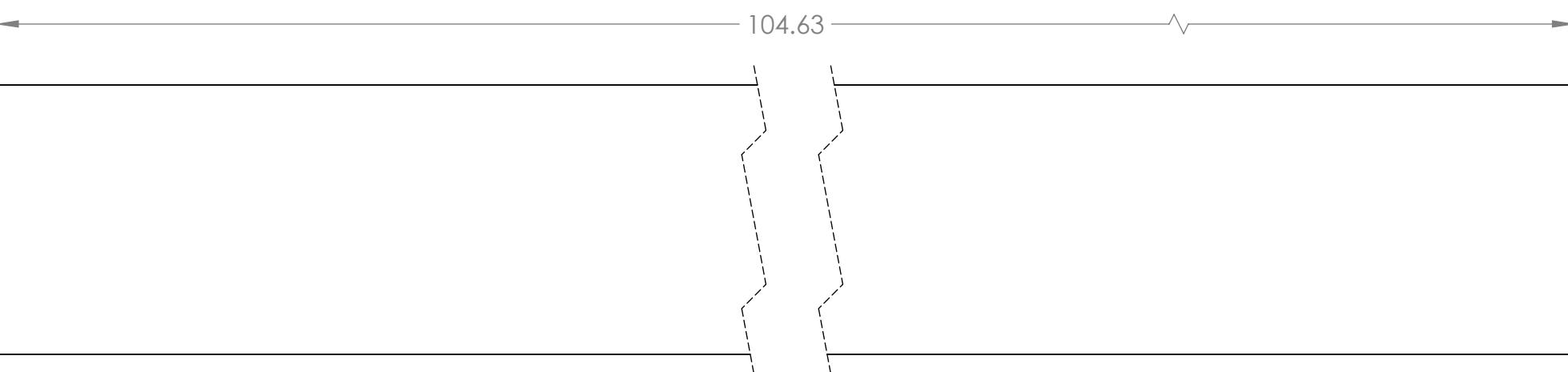
1



Item: GE-18014-1  
 Material: 1.75" x .125" thk. Square Tube, 6063 Aluminum  
 Scale: 1:1  
 QTY: 4



Item: GE-18014-2  
 Material: 1.75" x .125" thk. Square Tube, 6063 Aluminum  
 Scale: 1:1  
 QTY: 6



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

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

**Scale Arm**

**SIZE** **DWG. NO.** **REV**  
**B** **GE-18014** **3**

**SCALE:** 1:1 **WEIGHT:** **SHEET 3 OF 5**

4

3

2

1

4

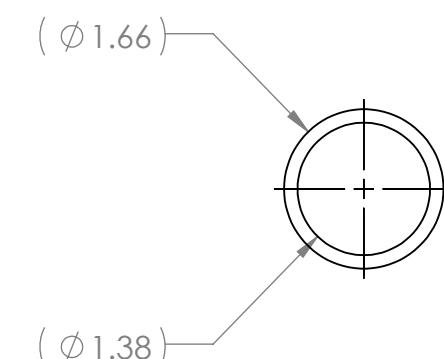
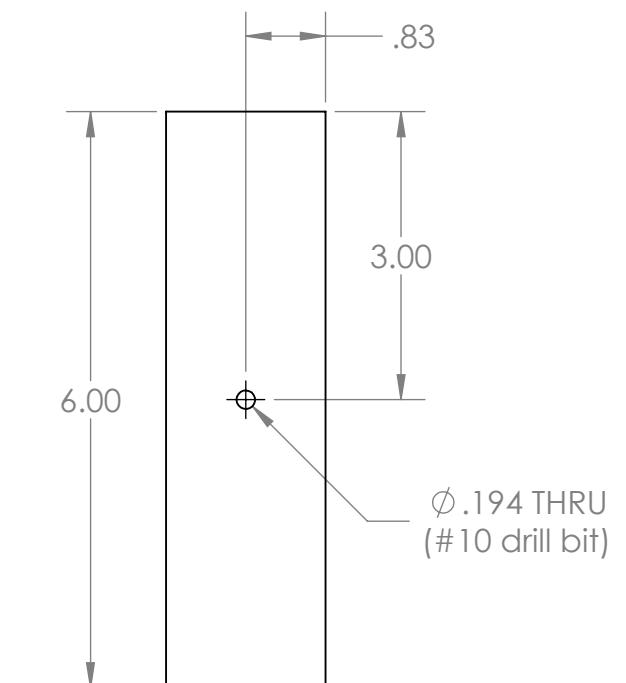
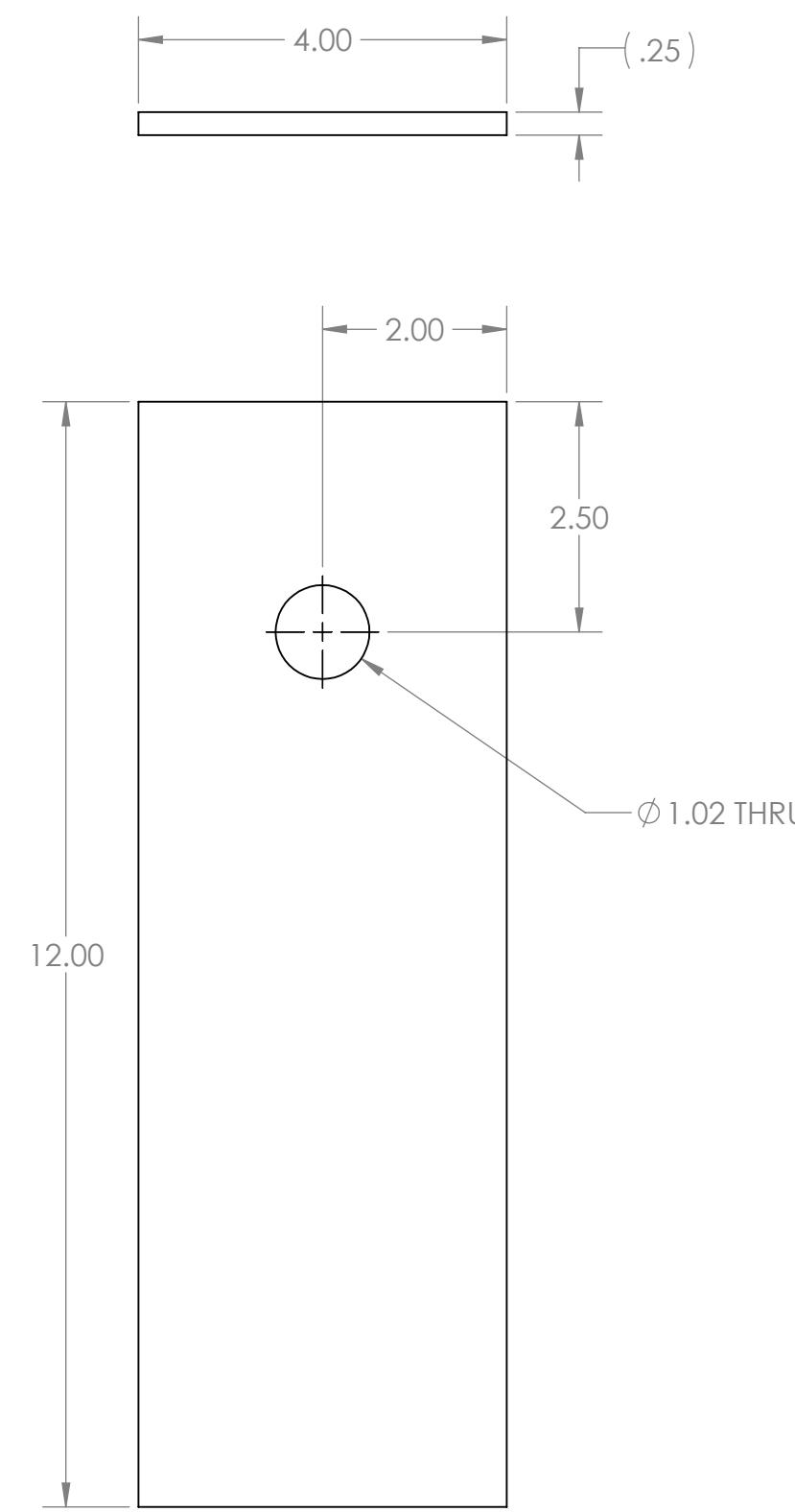
3

2

1

B

B



Item: GE-18014-4  
Material: 1.25" Schedule 40 Pipe, 6061 Aluminum  
Scale: 1:2  
QTY: 4

		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>B</b>	<b>GE-18014</b>	<b>3</b>
SCALE: 1:2	WEIGHT:	SHEET 4 OF 5

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SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-18014</b>	<b>3</b>
SCALE: 1:2	WEIGHT:	SHEET 4 OF 5

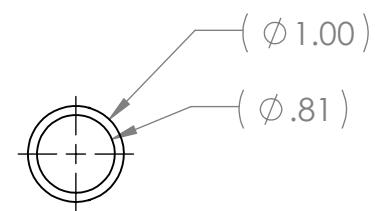
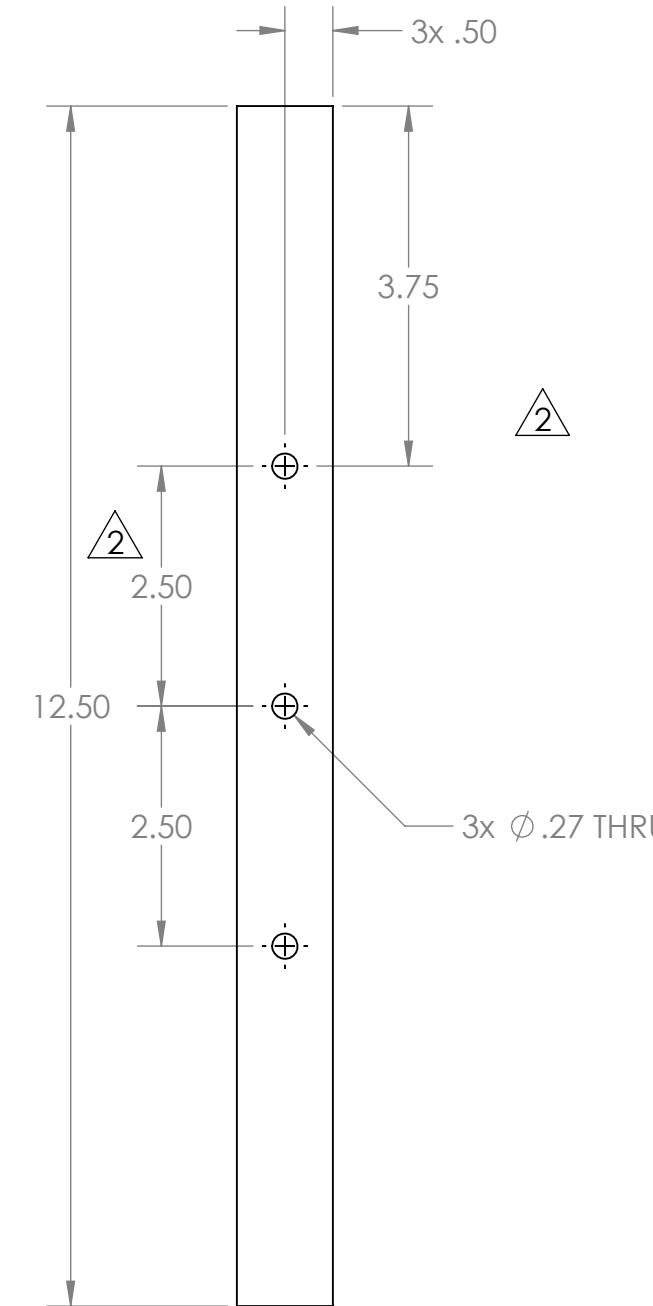
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<b>B</b>	<b>GE-18014</b>	<b>3</b>
SCALE: 1:2	WEIGHT:	SHEET 4 OF 5

4

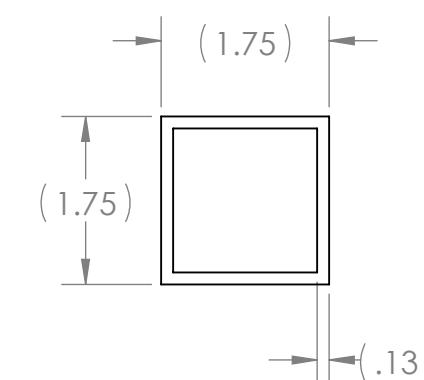
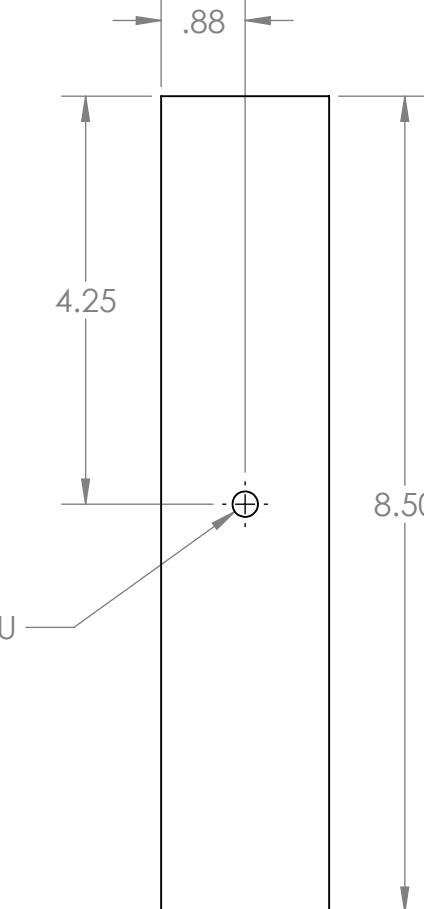
3

2

1



Item: GE-18014-5  
 Material: 1" OD x 0.095" thk. Tube, 6061 Aluminum  
 Scale: 1:2  
 QTY: 4



Item: GE-18014-6  
 Material: 1.75" x .125" thk. Square Tube, 6063 Aluminum  
 Scale: 1:2  
 QTY: 2

		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			

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

**Scale Arm**

**SIZE** DWG. NO. REV  
**B** **GE-18014** **3**

SCALE: 1:2 WEIGHT: SHEET 5 OF 5

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4

3

2

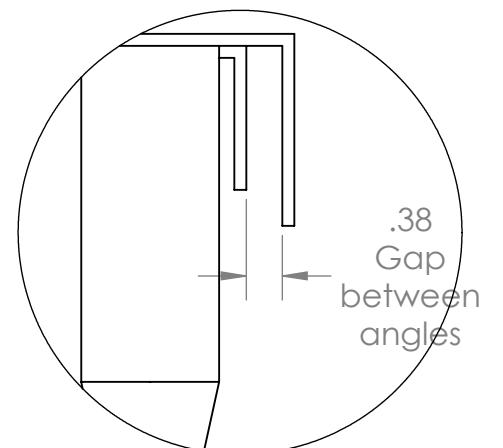
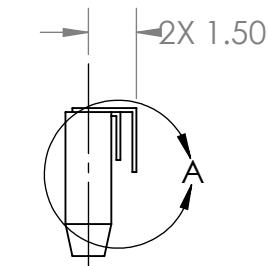
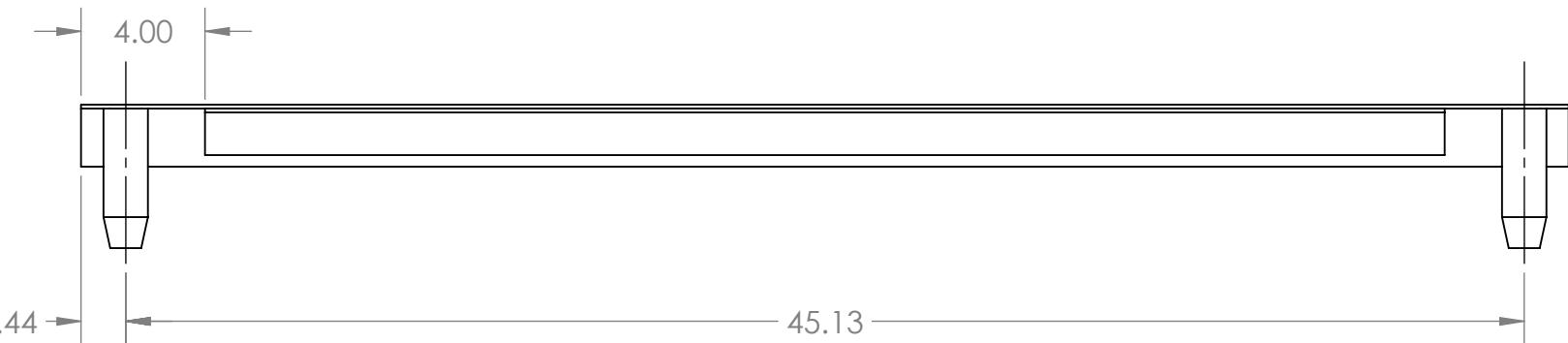
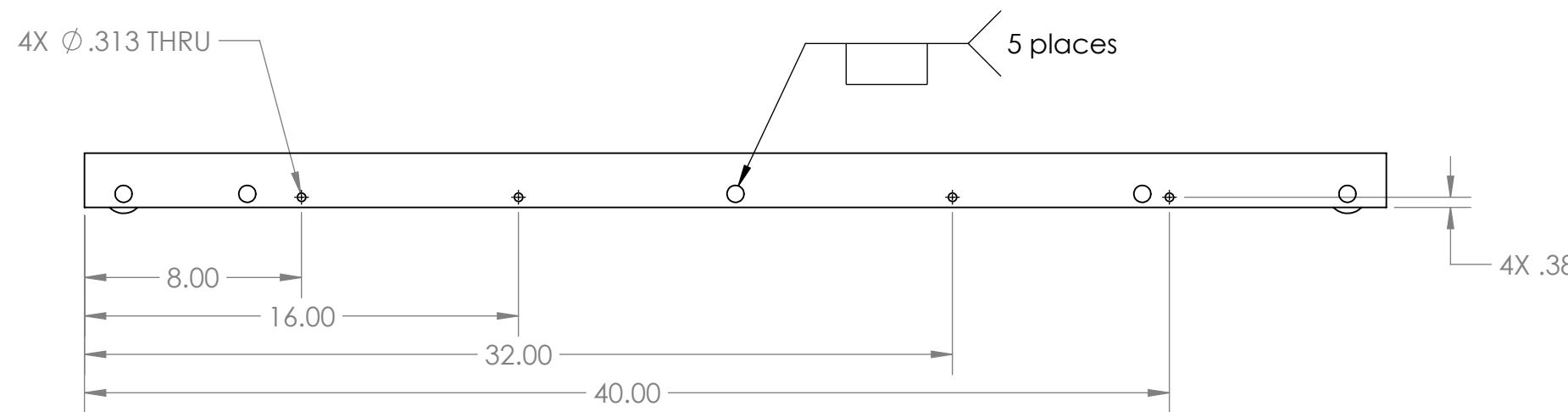
1

4

3

2

1



DETAIL A  
SCALE 1:2

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-18015-01	2" x .125" thk. Angle, 6063 Aluminum	1
2	GE-18015-02	1-7/16" Round Bar, 6061 Aluminum	2
3	GE-18015-03	1-1/2" x .125" thk. Angle, 6063 Aluminum	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	

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Modeling Solutions Partner

**Top Rail,  
Exchange**

**B** **GE-18015**

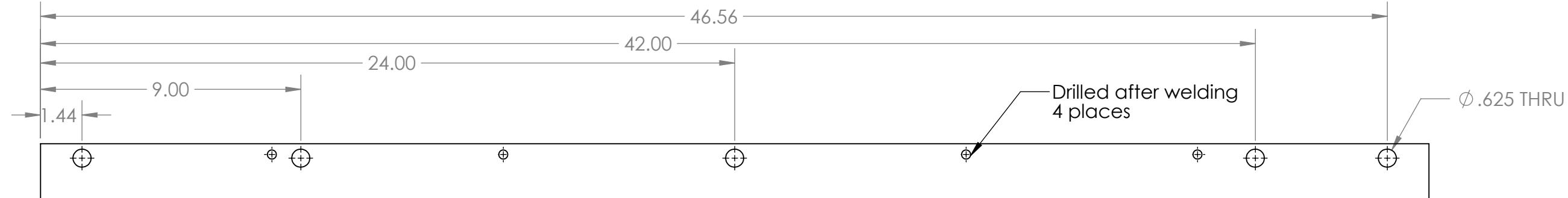
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SCALE: 1:6 WEIGHT: SHEET 1 OF 2

4

3

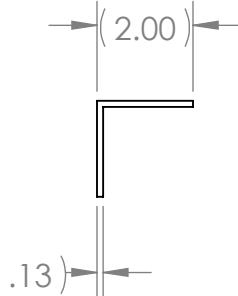
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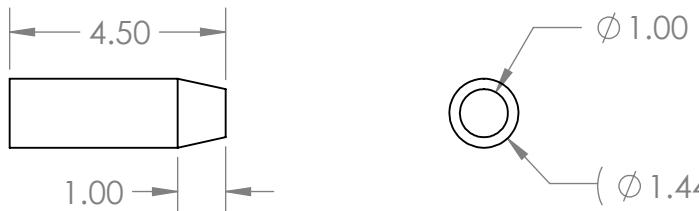


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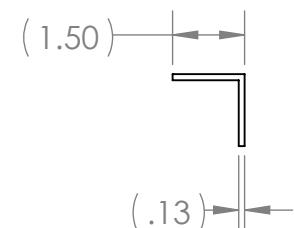
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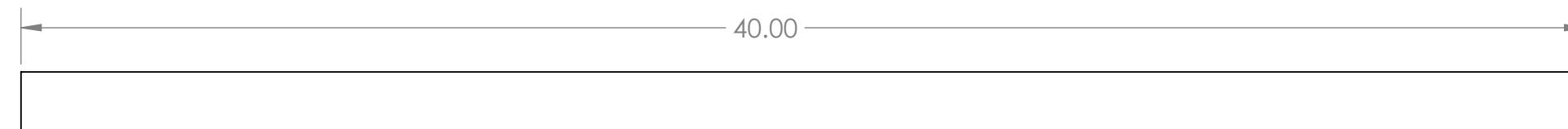
Item: GE-18015-01  
 Qty: 1  
 Material: 2" x .125" thk. Angle, 6063 Aluminum



Item: GE-18015-02  
 Qty: 2  
 Material: 1-7/16" Round Bar, 6061 Aluminum



Item: GE-18015-03  
 Qty: 1  
 Material: 1-1/2" x .125" thk. Angle, 6063 Aluminum



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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

**Top Rail, Exchange**

**SIZE** **DWG. NO.** **REV**  
**B** **GE-18015**

**SCALE:** 1:4 **WEIGHT:** **SHEET 2 OF 2**

4

3

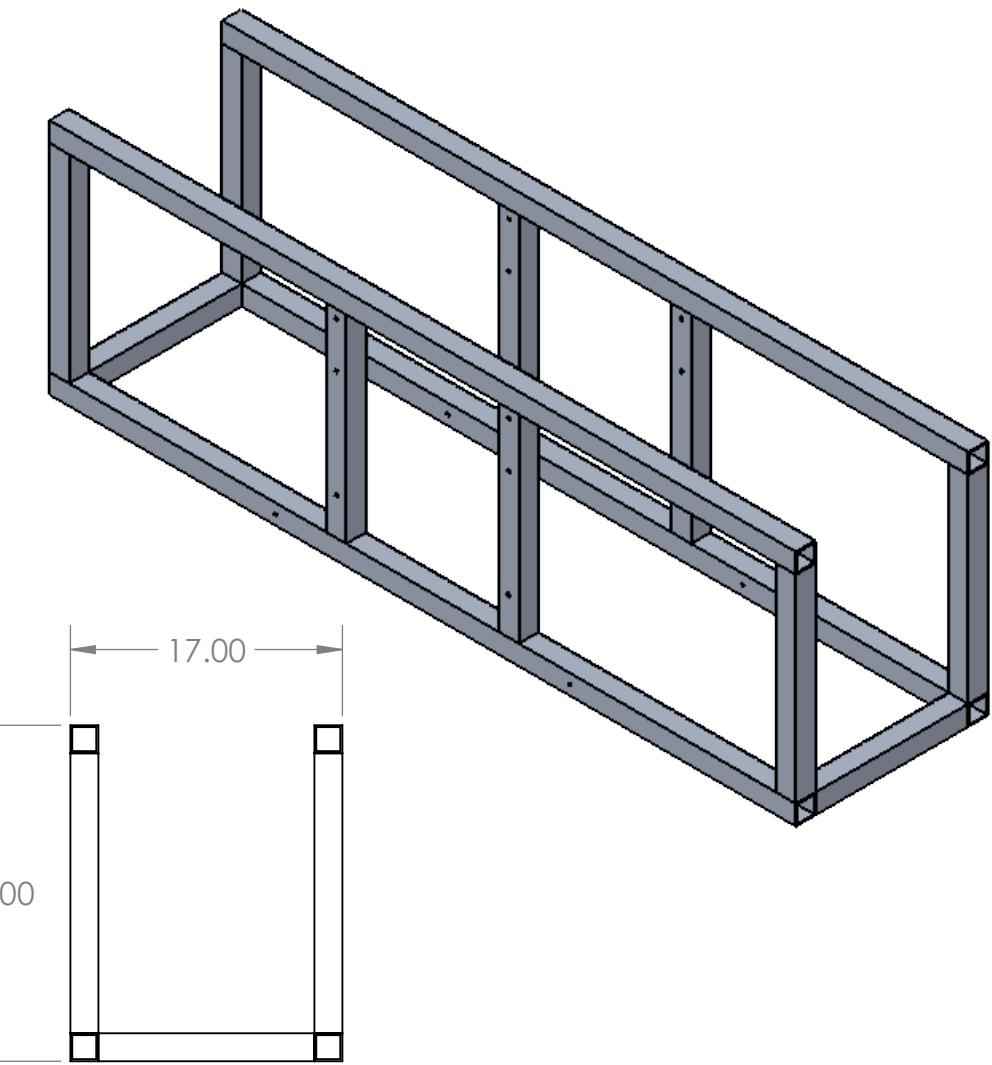
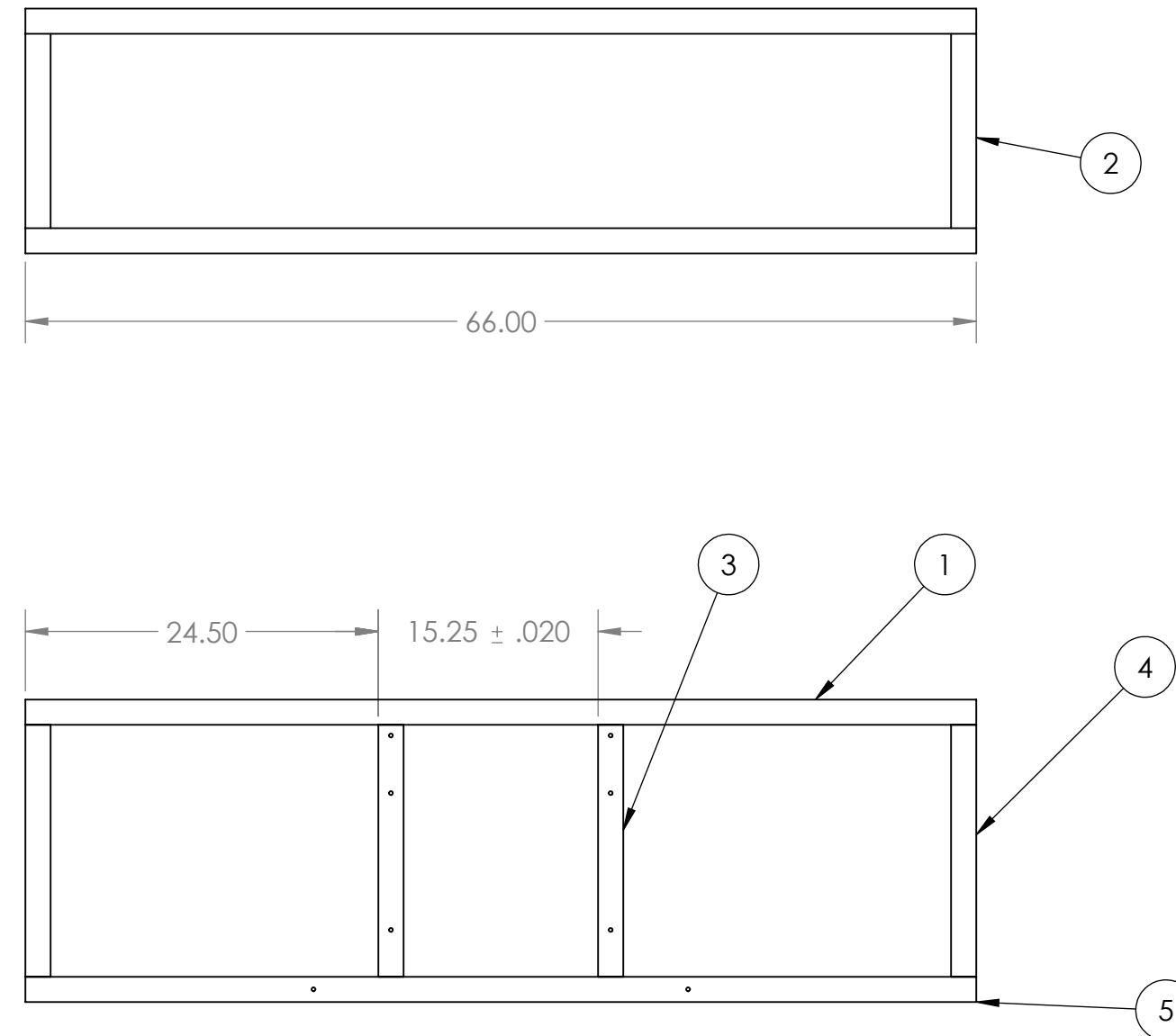
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1

## REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
4-B3	2	Added hole to GE-18016-3	11/6/2017	CPO
A4, 3-B4, 5-B3	3	Added two of part GE-18016-5 to replace two GE-18016-1	11/21/2017	CPO

B



A

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-18016-1	1.75" x .125" thk. Square Tube, 6063 Aluminum	2
2	GE-18016-2	1.75" x .125" thk. Square Tube, 6063 Aluminum	2
3	GE-18016-3	1.75" x .125" thk. Square Tube, 6063 Aluminum	4
4	GE-18016-4	1.75" x .125" thk. Square Tube, 6063 Aluminum	4
5	GE-18016-5	1.75" x .125" thk. Square Tube, 6063 Aluminum	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			
		APPLICATION	DO NOT SCALE DRAWING		

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

**Switch Frame**

**SIZE** **DWG. NO.** **REV**  
**B** **GE-18016** **3**

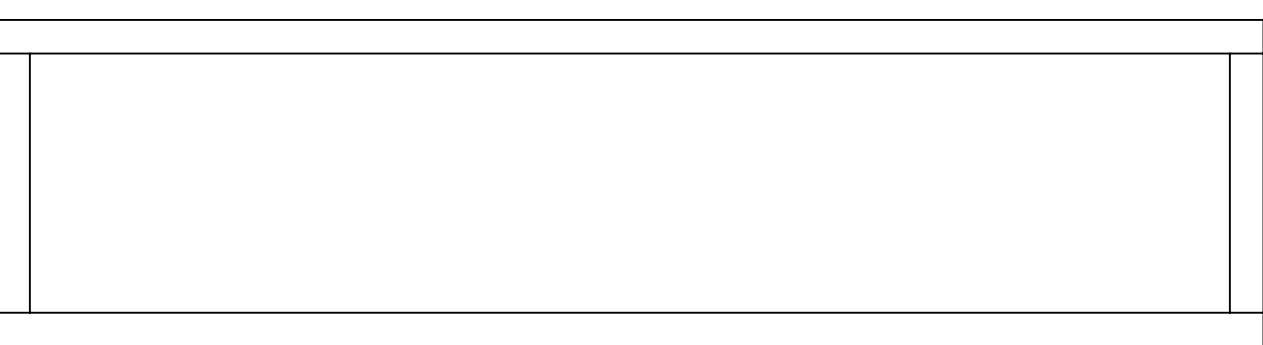
SCALE: 1:12 WEIGHT: **SHEET 1 OF 5**

4

3

2

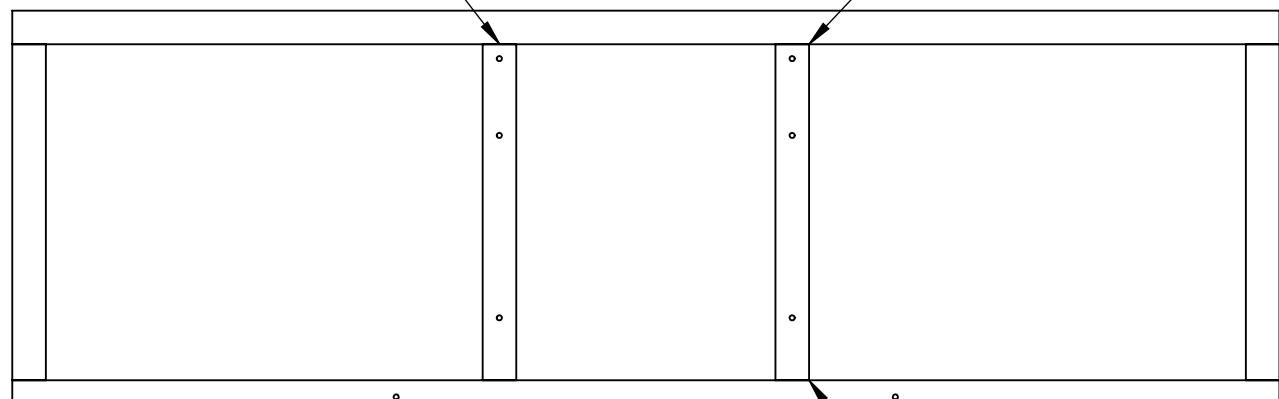
1



No weld permissible  
on face of item 3 (4x)

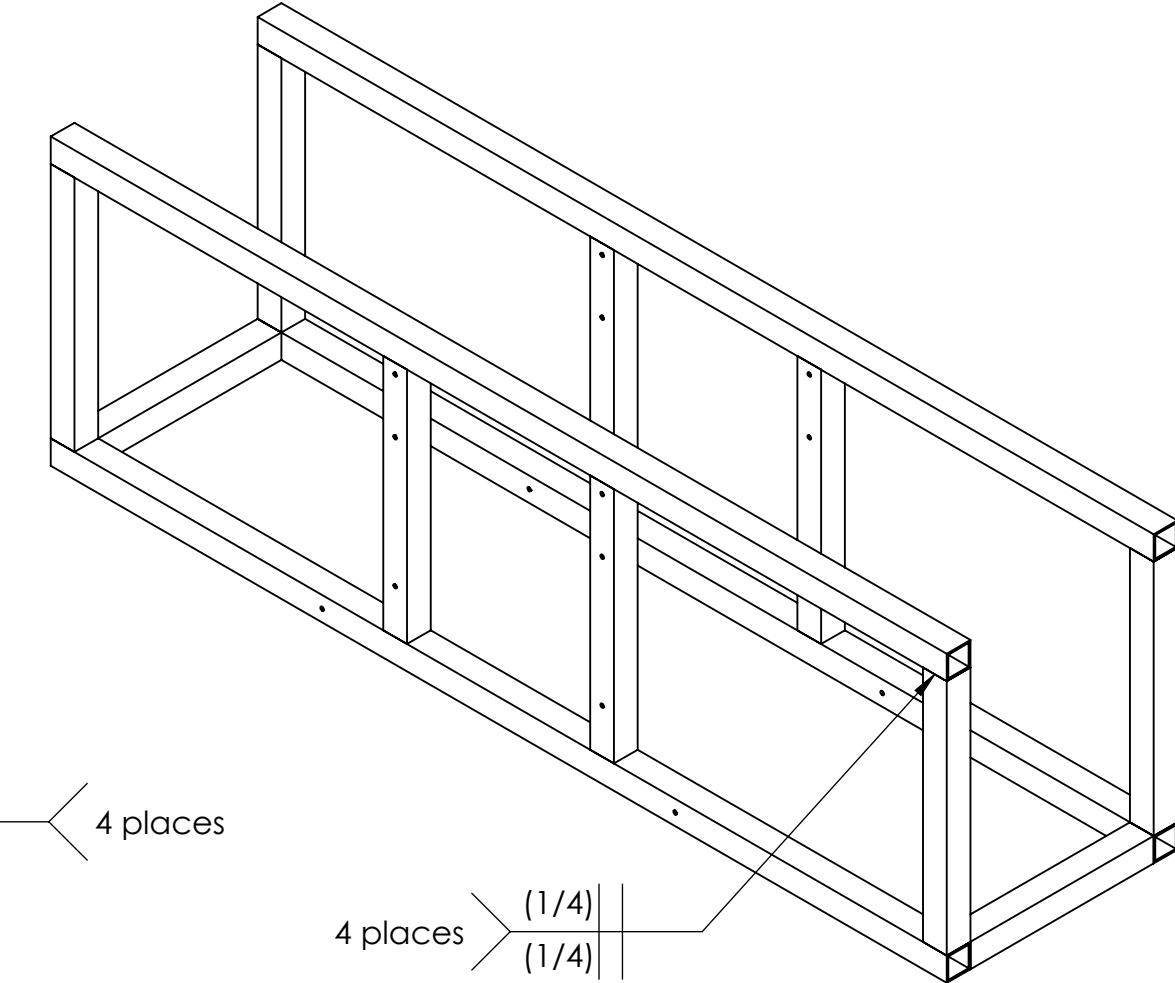
1/4  
1/4  
4 places

1/4  
(1/4)  
4 places

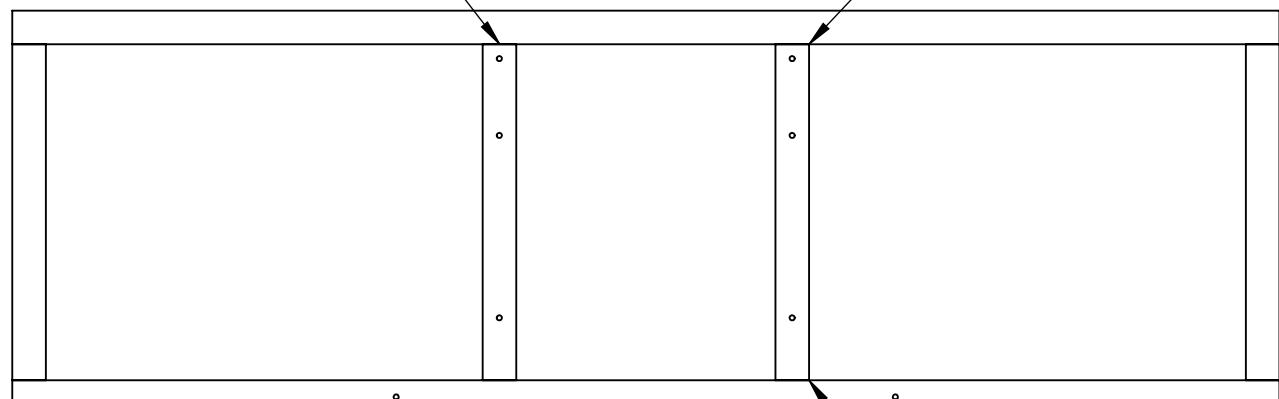


1/4  
1/4  
4 places

1/4  
(1/4)  
4 places

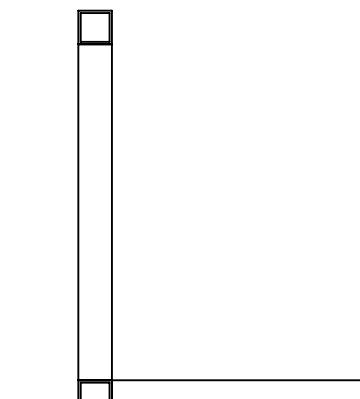


4 places  
(1/4)  
(1/4)



1/4  
1/4  
4 places

1/4  
(1/4)  
4 places



1/4  
(1/4)  
4 places

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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 $\pm .001$			
		INTERPRET GEOMETRIC TOLERANCING PER:			
		MATERIAL			
		FINISH			
		APPLICATION	DO NOT SCALE DRAWING		
NEXT ASSY		USED ON			
APPLICATION		DO NOT SCALE DRAWING			
TITLE: <b>Switch Frame</b>					
SIZE <b>B</b>		DWG. NO. <b>GE-18016</b>	REV <b>3</b>		
SCALE: 1:10		WEIGHT:		SHEET 2 OF 5	

4

3

2

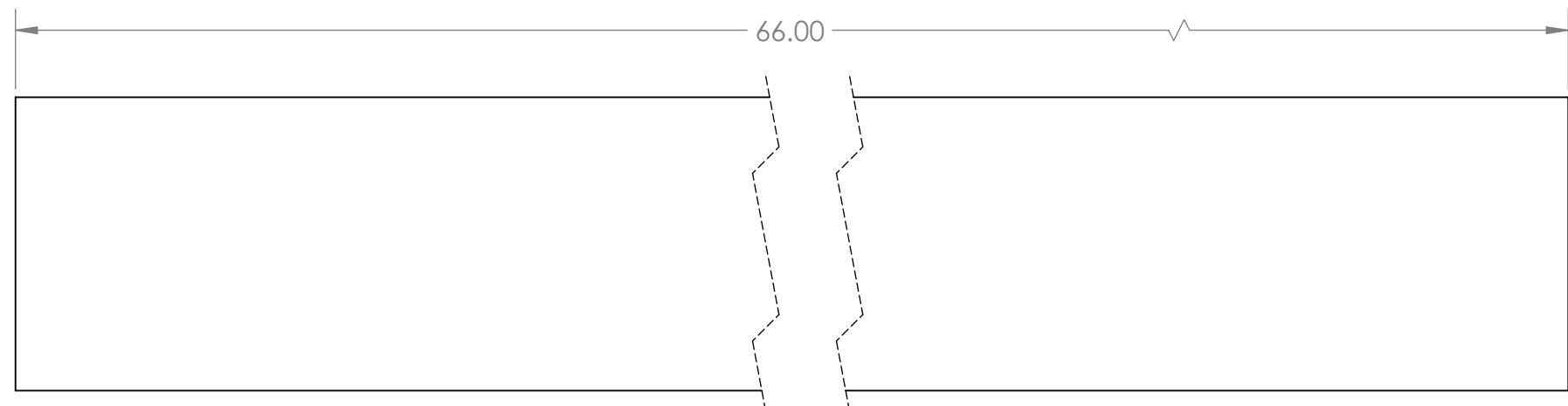
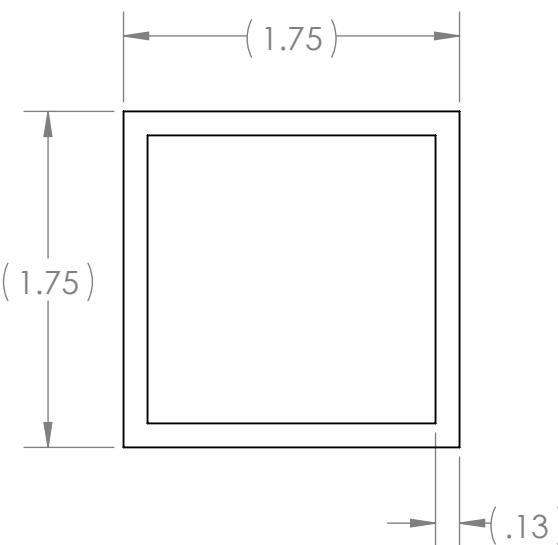
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4

3

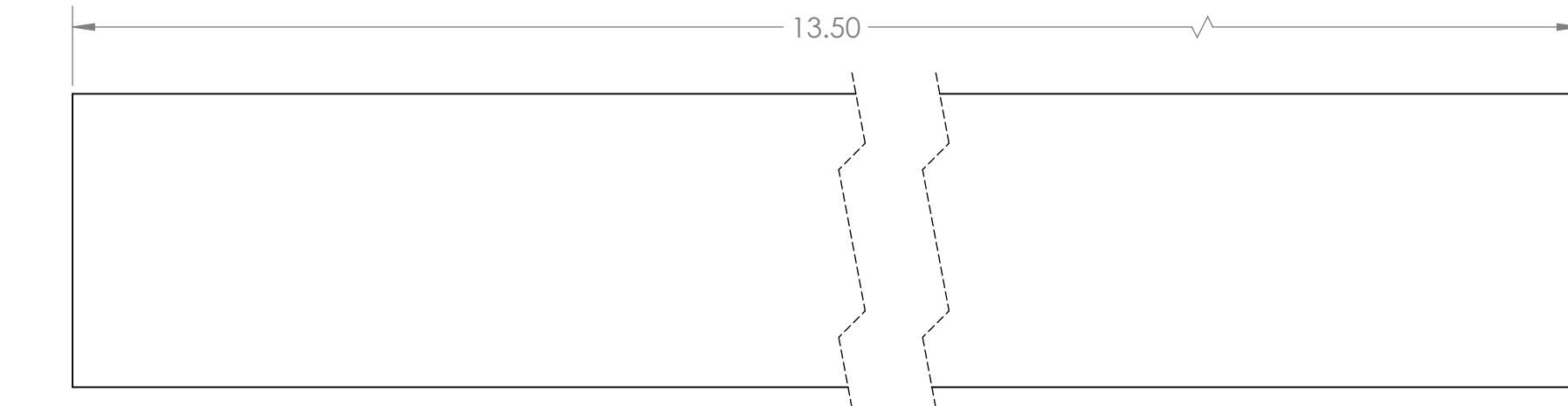
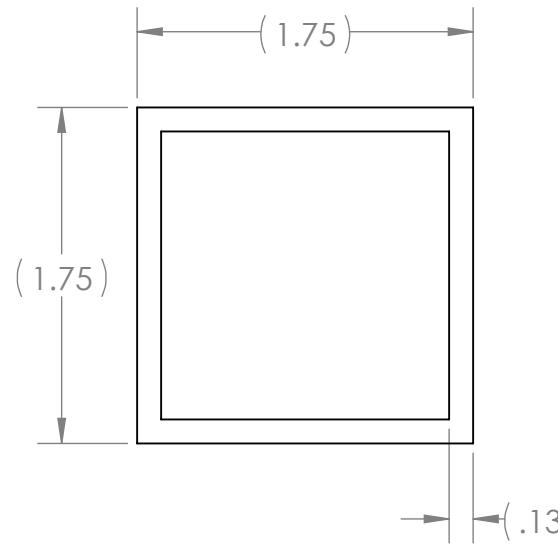
2

1



Item: GE-18016-1  
 Material: 1.75" x .125" thk. Square Tube, 6063 Aluminum  
 Scale: 1:1  
 QTY: 2

3



Item: GE-18016-2  
 Material: 1.75" x .125" thk. Square Tube, 6063 Aluminum  
 Scale: 1:1  
 QTY: 2

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		UNLESS OTHERWISE SPECIFIED:			TITLE: <b>Switch Frame</b>	
		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 APPLICATION      FINISH DO NOT SCALE DRAWING				
SIZE	DWG. NO.	REV	<b>B</b> GE-18016      3			
SCALE: 1:1	WEIGHT:	SHEET 3 OF 5				

4

3

2

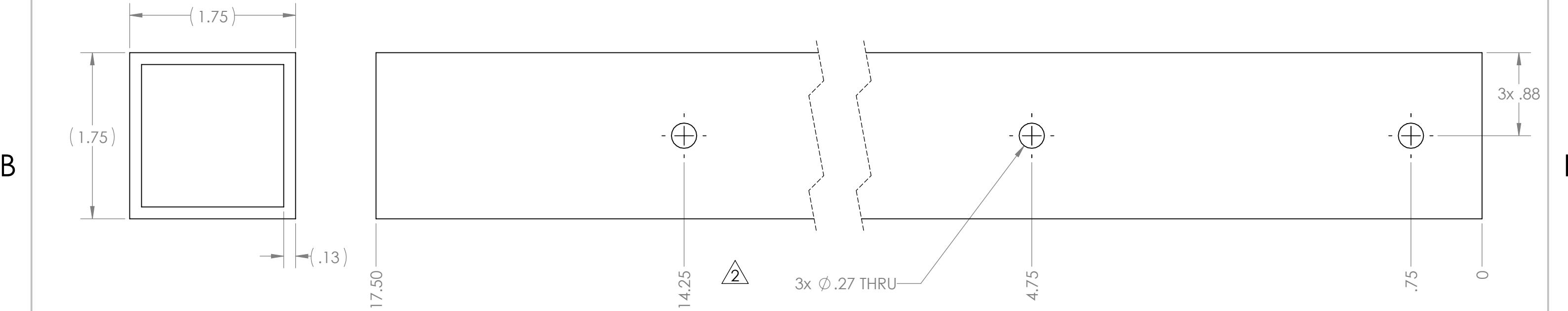
1

4

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2

1



Item: GE-18016-3  
Material: 1.75" x .125" thk. Square Tube, 6063 Aluminum  
Scale: 1:1  
QTY: 4

A diagram showing a large square frame with a central rectangle. The top horizontal dimension is labeled  $(1.75)$  with arrows at both ends. The left vertical dimension is labeled  $(1.75)$  with arrows at both ends. The bottom right corner of the frame has a dimension of  $(.13)$  with arrows pointing to the right and down.

Item: GE-18016-4  
Material: 1.75" x .125" thk. Square Tube, 6063 Aluminum  
Scale: 1:1  
QTY: 4

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

## Switch Frame



 SOLIDWORKS  
Modeling Solutions Partner

4

3

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1

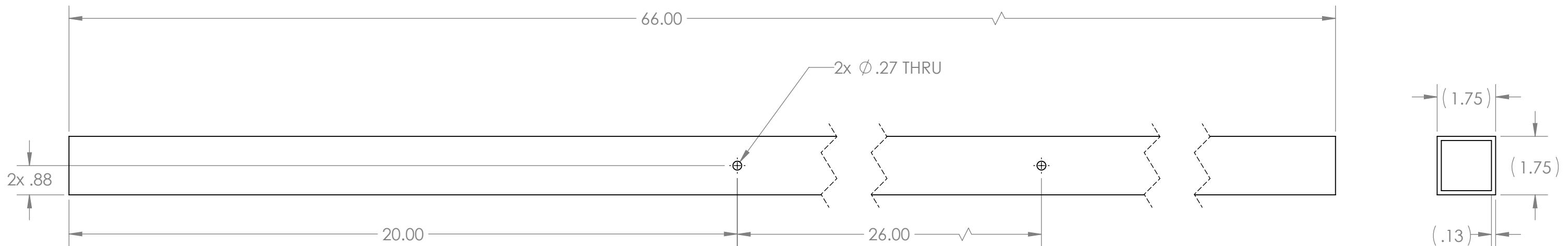
4

3

2

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B



Item: GE-18016-5  
 Material: 1.75" x .125" thk. Square Tube, 6063 Aluminum  
 Scale: 1:3  
 QTY: 2

3

A

A

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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>B</b>	<b>GE-18016</b>	<b>3</b>			
SCALE: 1:3	WEIGHT:	SHEET 5 OF 5			

4

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B

B

8x  $\phi$ .27 THRU

0

2x 5.00

2x 13.00

16.88

2x R.25

31.13

2x 35.00

2x 43.00

48.00

40

4x .50  
4x 3.25  
018.00  
13.13

(.25)

A

A

## Notes:

1. Material: 1/4" thick, clear polycarbonate.
2. Remove all burrs and sharp edges.

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		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$	NAME	DATE
		DRAWN		
		CHECKED		
		ENG APPR.		
		MFG APPR.		
		Q.A.		
		COMMENTS:		
		MATERIAL		
		FINISH		
		APPLICATION	DO NOT SCALE DRAWING	
SIZE	DWG. NO.		REV	
<b>B</b>	<b>GE-18017</b>			
SCALE: 1:4	WEIGHT:		SHEET 1 OF 1	

 FIRST  
ROBOTICS  
COMPETITION

 SOLIDWORKS  
Modeling Solutions Partner

TITLE:  
**Plate Back Wall**

4

3

2

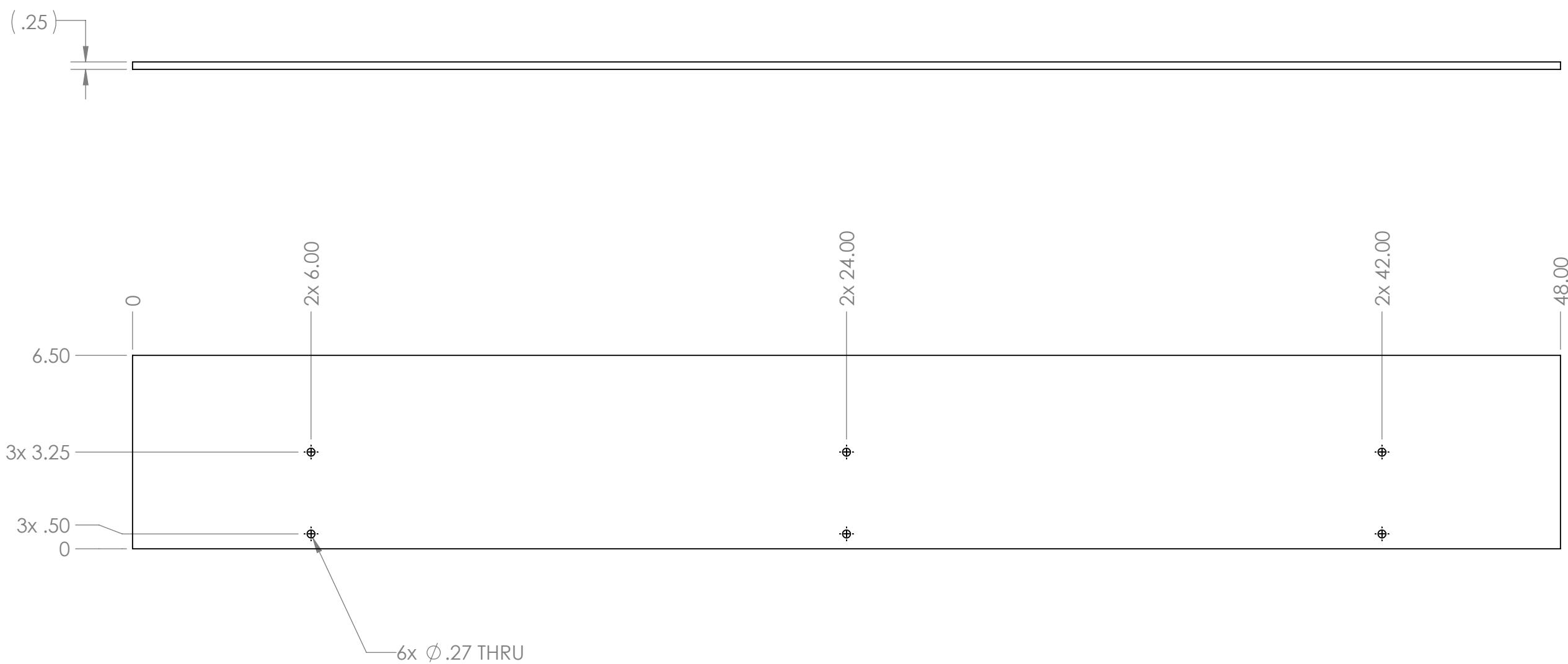
1

4

3

2

1



## Notes:

1. Material: 1/4" thick, clear polycarbonate
  2. Remove all burrs and sharp edges.

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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>B</b>	<b>GE-18018</b>			
			SCALE: 1:4	WEIGHT:	SHEET 1 OF 1		

4

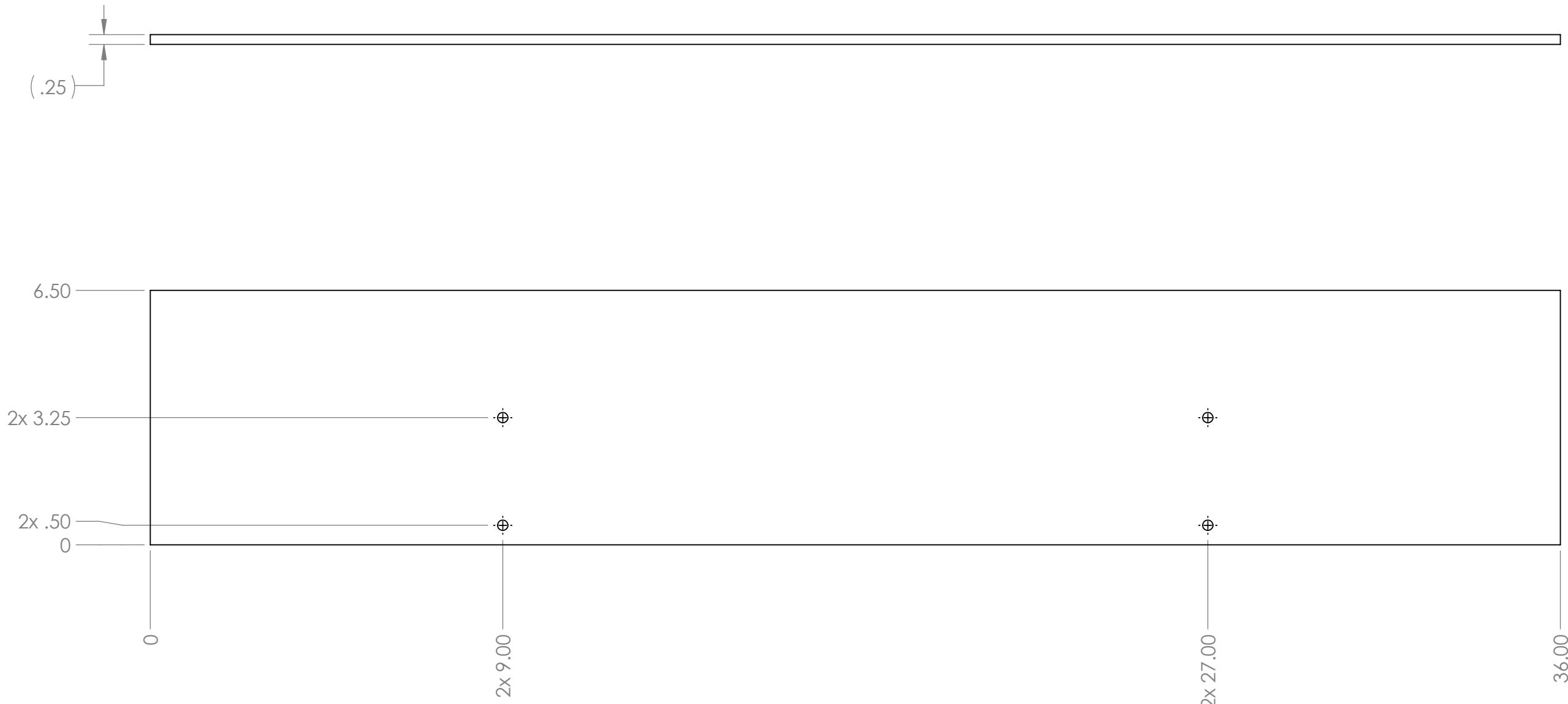
3

2

1

B

B



## Notes:

1. Material: 1/4" thick, clear polycarbonate.
2. Remove all burrs and sharp edges.

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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>B</b>		<b>GE-18019</b>			
SCALE: 1:3		WEIGHT:	SHEET 1 OF 1		

**FIRST**  
ROBOTICS  
COMPETITION

**SOLIDWORKS**  
Modeling Solutions Partner

**Plate Side Wall**

4

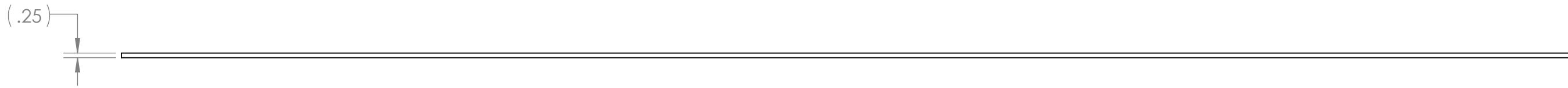
3

2

1

## REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
A1, B1	2	Moved location of 4 countersunk holes. Removed 8 holes.	11/17/2017	CPO



## Notes:

1. Material: 1/4" thick, clear polycarbonate.
2. Remove all burrs and sharp edges.

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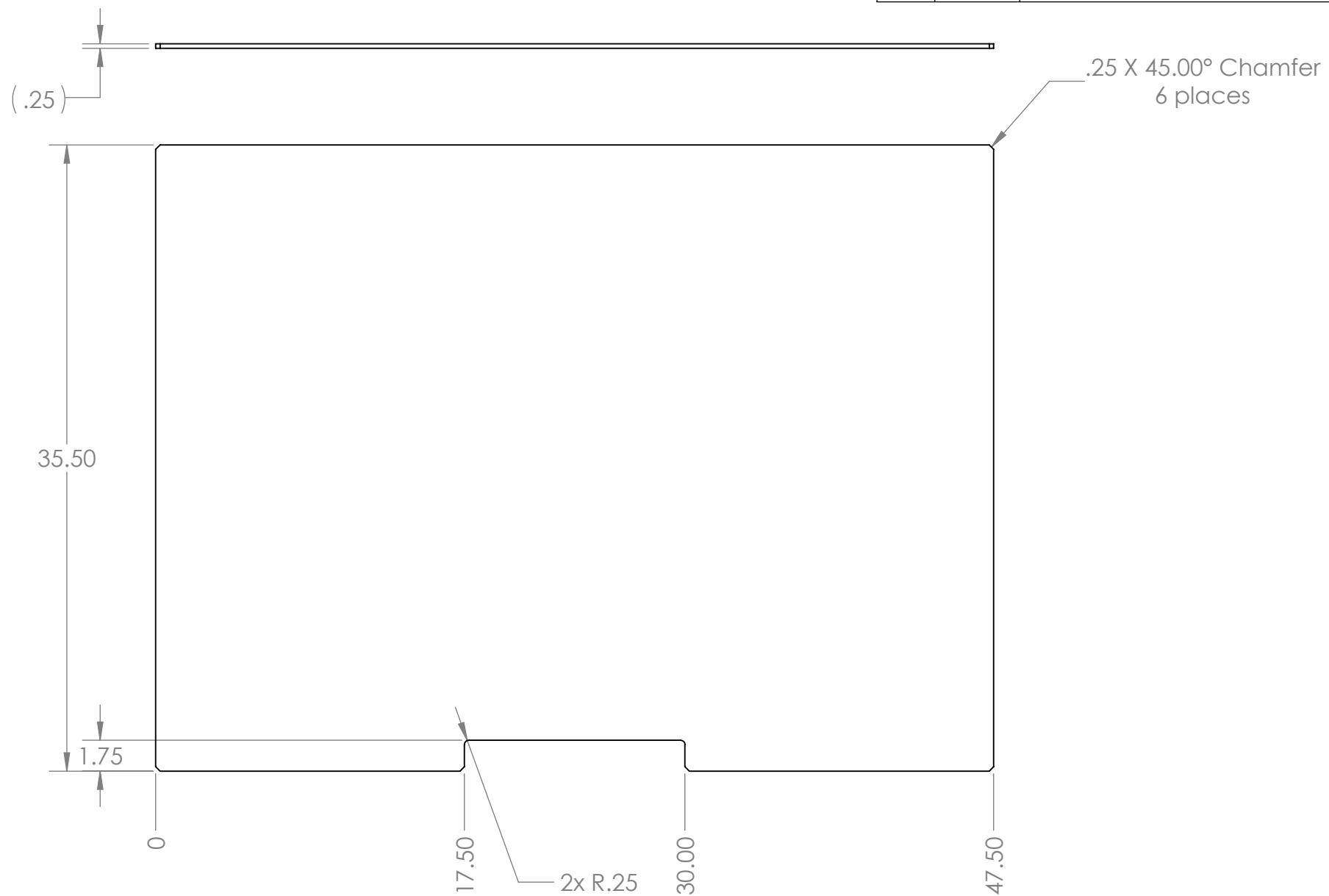
		UNLESS OTHERWISE SPECIFIED:	TITLE: <b>Scale Side Cover Polycarbonate</b>	NAME	DATE
		DIMENSIONS ARE IN INCHES		DRAWN	
		TOLERANCES:		CHECKED	
		FRACTIONAL: ±1/16		ENG APPR.	
		ANGULAR: MACH ±1° BEND ±1°		MFG APPR.	
		TWO PLACE DECIMAL ±.01		Q.A.	
		THREE PLACE DECIMAL ±.001		COMMENTS:	
		INTERPRET GEOMETRIC TOLERANCING PER:		MATERIAL	
				FINISH	
NEXT ASSY	USED ON			APPLICATION	DO NOT SCALE DRAWING
				SCALE: 1:6	WEIGHT:
				SHEET 1 OF 1	

## REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
A4	2	Changed material thickness in note to match part dimension	12/7/2017	CPO

B

B



## Notes:

1. Material: 1/4" thick, black HDPE
2. Surface: Textured, Orange Peel
3. Remove all burrs and sharp edges

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

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

**Scale and Switch Basket, Plate**

SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-18021</b>	<b>2</b>
SCALE: 1:8	WEIGHT:	SHEET 1 OF 1

4

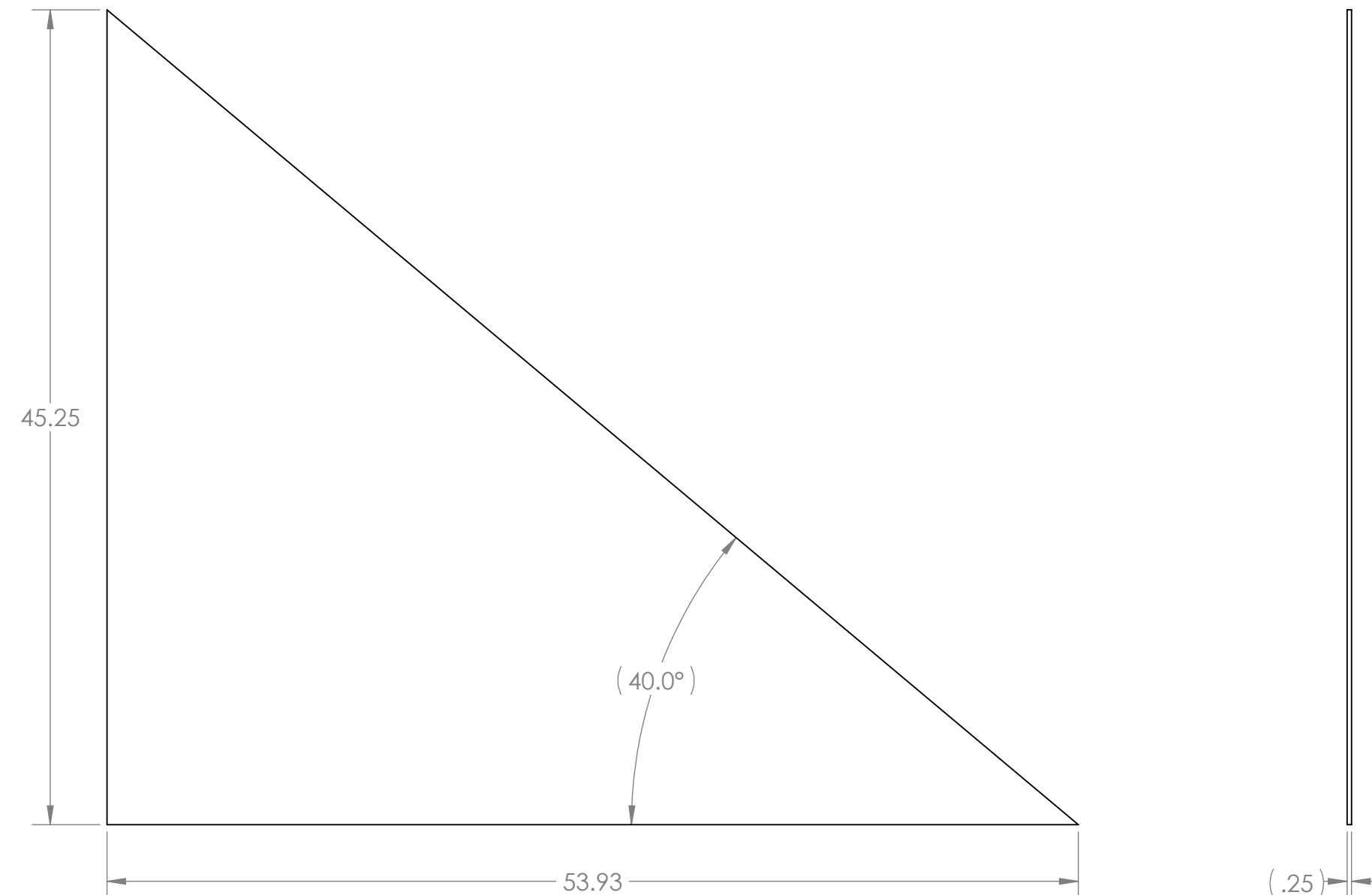
3

2

1

B

B



A

A

## Notes:

1. Material: 1/4" thick, clear polycarbonate.
2. Remove all burrs and 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 $\pm .001$					
		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: Scale Outrigger  
Side Cover  
Polycarbonate

SIZE DWG. NO. REV  
**B** GE-18022  
SCALE: 1:8 WEIGHT: SHEET 1 OF 1

4

3

2

1

4

3

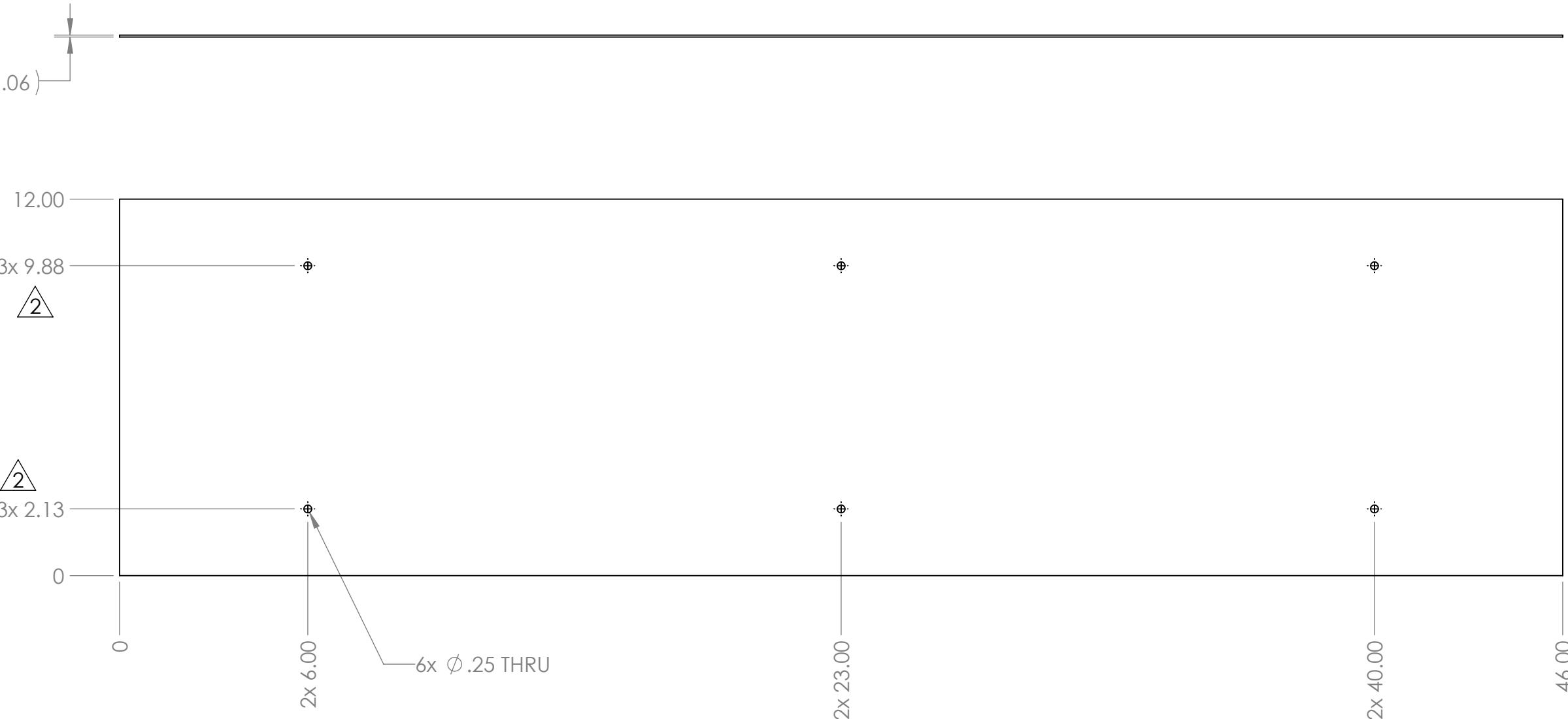
2

1

## REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
A4, B4	2	Hole location of 6 holes changed.	11/17/2017	CPO

B



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		DRAWN			
		CHECKED			
		ENG APPR.			
		MFG APPR.			
		Q.A.			
		COMMENTS:			
		MATERIAL			
		FINISH			
		APPLICATION	DO NOT SCALE DRAWING		
		SCALE: 1:4	WEIGHT:	SHEET 1 OF 1	

FIRST  
ROBOTICS  
COMPETITION

SOLIDWORKS  
Modeling Solutions Partner

TITLE:

Scale Arm Cover  
Polycarbonate

SIZE DWG. NO. REV  
**B** GE-18023 2

4

3

2

1

4

3

2

1

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
A2	2	Added cutout	11/17/2017	CPO

## Notes

1. Material: 1/8" thick, clear polycarbonate
  2. Remove all burrs and sharp edges.

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		UNLESS OTHERWISE SPECIFIED:		NAME	DATE	 <b>FIRST ROBOTICS COMPETITION</b>	<b>TITLE:</b>  <b>Switch Base Cover Polycarbonate</b>
		<b>DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL <math>\pm 1/16</math> ANGULAR: MACH <math>\pm 1^\circ</math> BEND <math>\pm 1^\circ</math> TWO PLACE DECIMAL <math>\pm .01</math> THREE PLACE DECIMAL <math>\pm .001</math></b>	DRAWN				
			CHECKED				
			ENG APPR.				
			MFG APPR.				
			Q.A.				
		INTERPRET GEOMETRIC TOLERANCING PER:	COMMENTS:				
		MATERIAL				<b>SIZE</b> <b>DWG. NO.</b> <b>B</b> <b>GE-18024</b> <b>REV</b> <b>2</b>	
NEXT ASSY	USED ON	FINISH					
APPLICATION		DO NOT SCALE DRAWING					

4

3

2

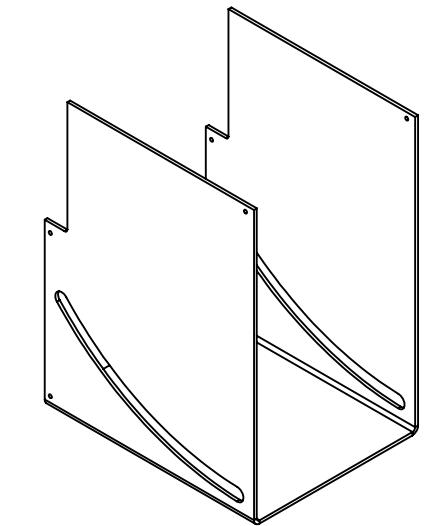
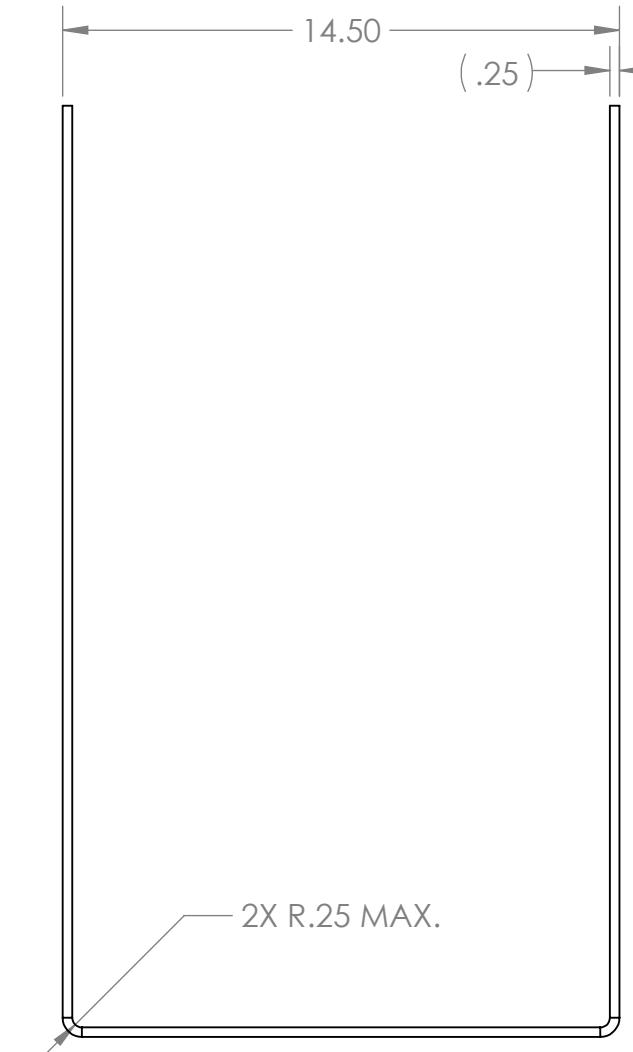
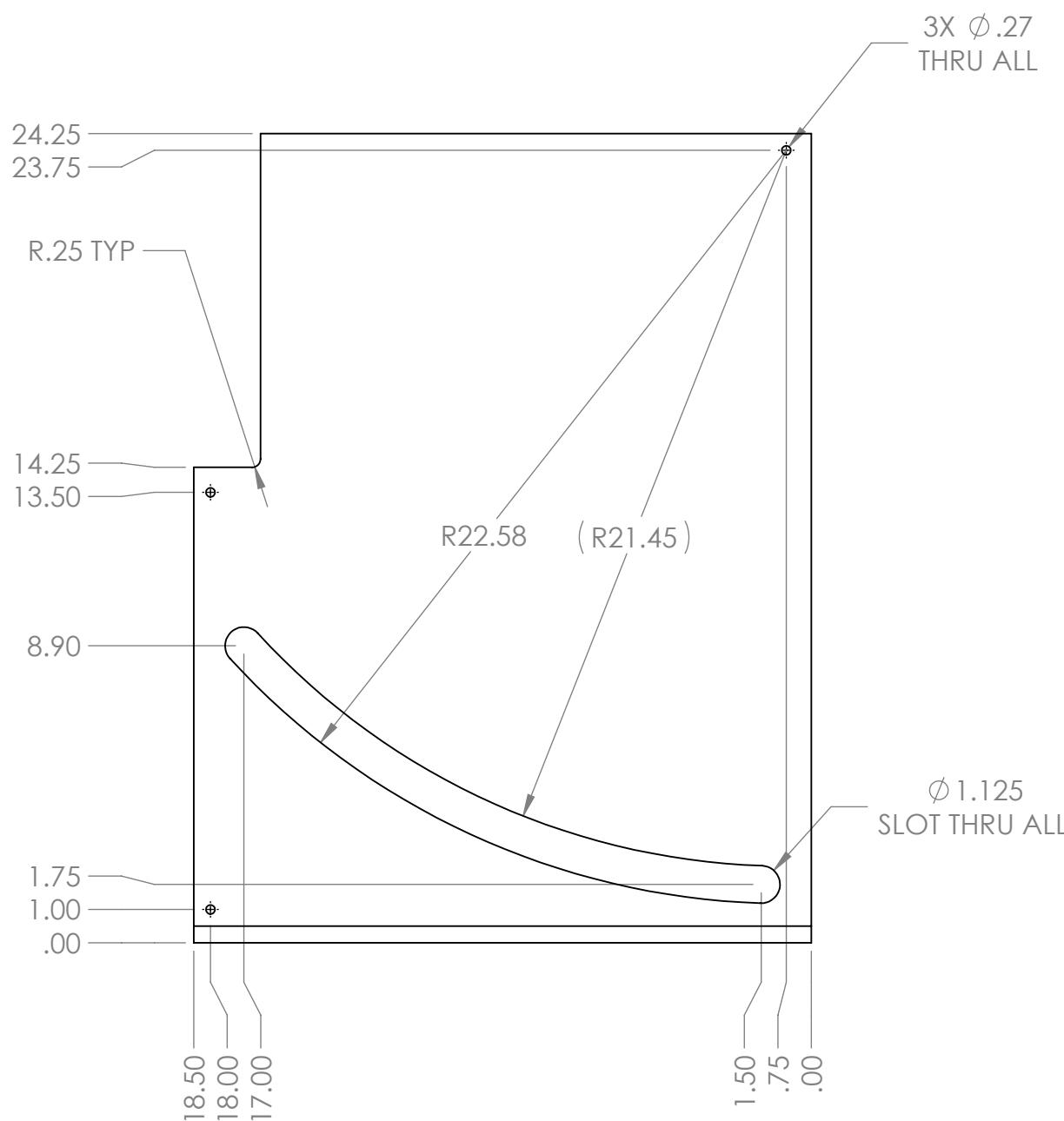
1

4

3

2

1



Notes:

1. Material: 1/4" thick, clear polycarbonate
2. Remove all burrs and sharp edges

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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					
		FINISH					
NEXT ASSY	USED ON						
APPLICATION		DO NOT SCALE DRAWING					
<b>SIZE</b> <b>DWG. NO.</b> <b>REV</b> <b>B</b> <b>GE-18025</b>							
<b>SCALE: 1:5</b> <b>WEIGHT:</b>							
<b>SHEET 1 OF 1</b>							

## Chute Body

 **FIRST.  
ROBOTICS  
COMPETITION**

 **FIRST**  
ROBOTICS  
COMPETITION

DWG. NO. **GF-18025** REV

SCALE: 1:5 WEIGHT: SHEET 1 OF 1

4

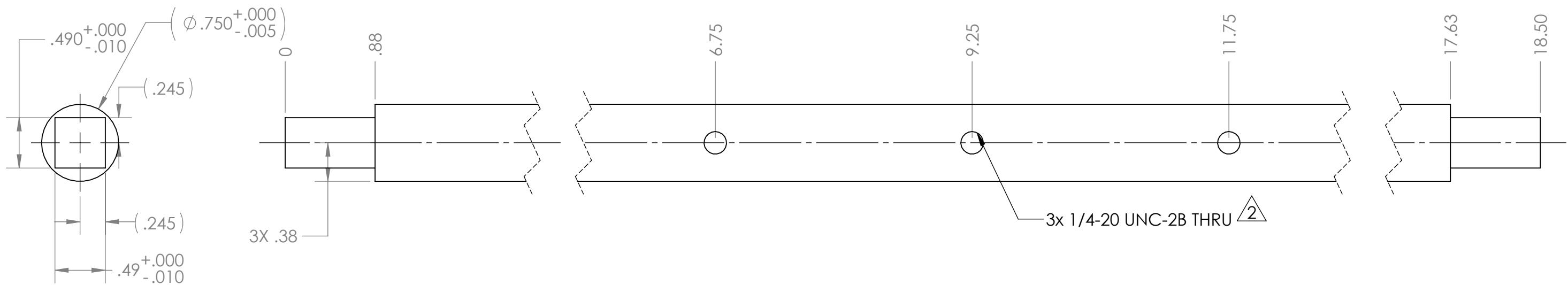
3

2

1

B

B



Notes:  
 1. Material: 3/4" Rotary Shaft, 1045 Steel  
 2. Finish: Clear Zinc

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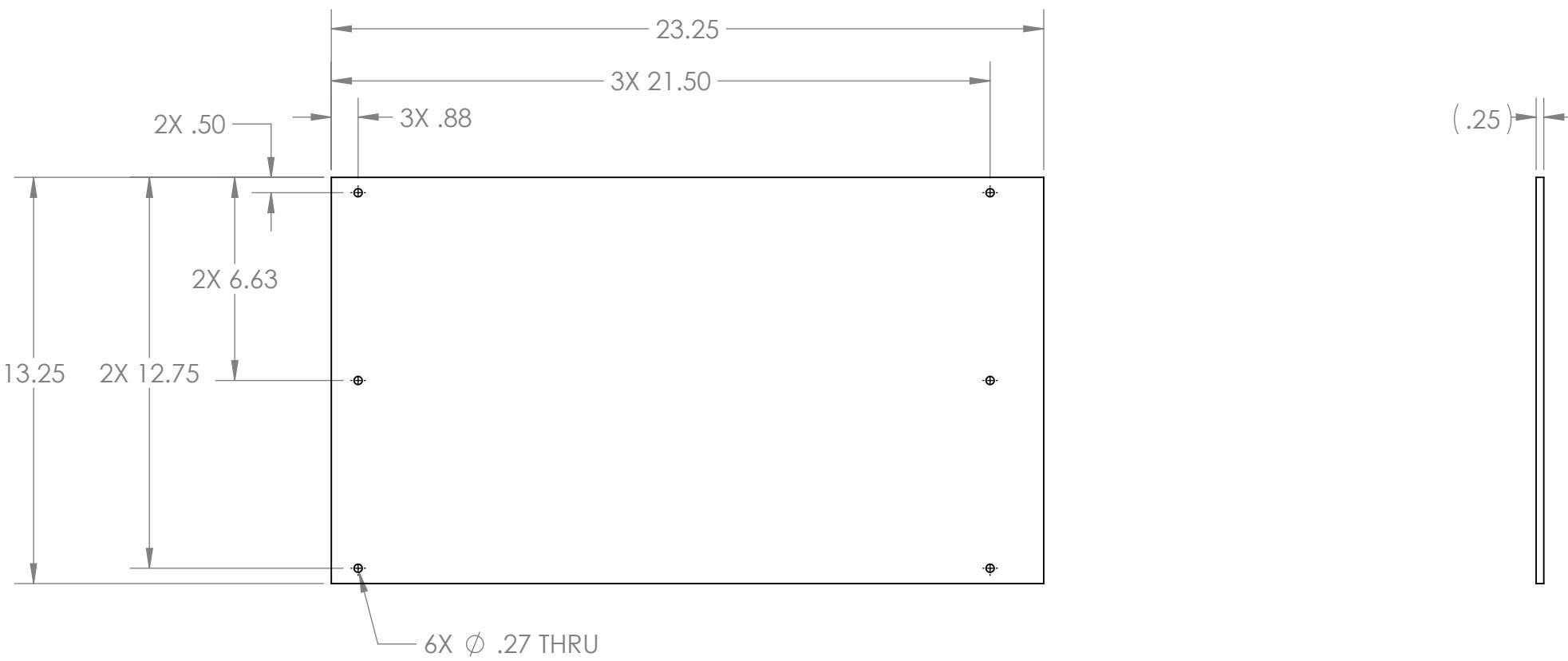
		UNLESS OTHERWISE SPECIFIED:	NAME	DATE
		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$	DRAWN	
			CHECKED	
			ENG APPR.	
			MFG APPR.	
		INTERPRET GEOMETRIC TOLERANCING PER:	Q.A.	
		MATERIAL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

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

**Switch/Scale Arm Shaft**

**SIZE** **DWG. NO.** **REV**  
**B** **GE-18026** **2**

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



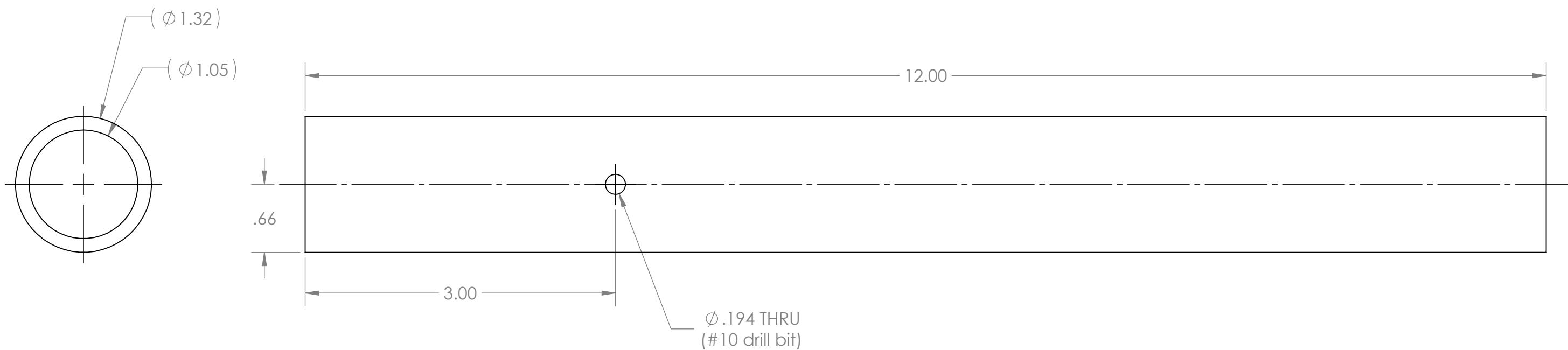
- Notes:
1. Material: 1/4" thick, clear polycarbonate
  2. Remove all burrs and sharp edges

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		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$		NAME	DATE
		DRAWN			
		CHECKED			
		ENG APPR.			
		MFG APPR.			
		Q.A.			
		COMMENTS:			
		MATERIAL			
		FINISH			
		APPLICATION	DO NOT SCALE DRAWING		
<b>SIZE</b>	<b>DWG. NO.</b>			<b>REV</b>	
<b>B</b>	<b>GE-18027</b>				
SCALE: 1:5	WEIGHT:			SHEET 1 OF 1	

B

B



## Notes:

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

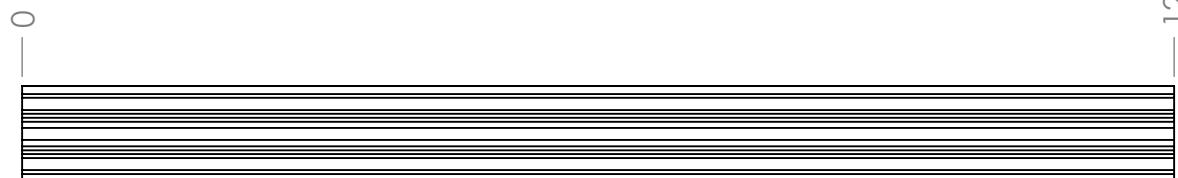
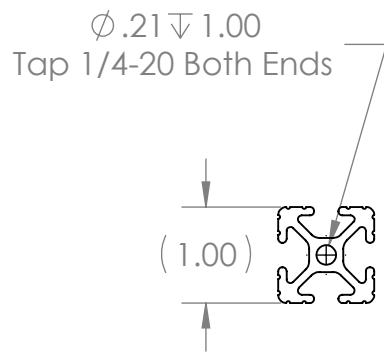
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		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$		NAME	DATE
		DRAWN			
		CHECKED			
		ENG APPR.			
		MFG APPR.			
		Q.A.			
		COMMENTS:			
		MATERIAL			
		FINISH			
		APPLICATION	DO NOT SCALE DRAWING		
SIZE	DWG. NO.			REV	
<b>B</b>	<b>GE-18028</b>				
SCALE: 1:1	WEIGHT:			SHEET 1 OF 1	

 FIRST  
ROBOTICS  
COMPETITION

 SOLIDWORKS  
Modeling Solutions Partner

TITLE:  
**Plate Mount Pin**



## Note:

1. 80-20 aluminum extrusion
2. 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				

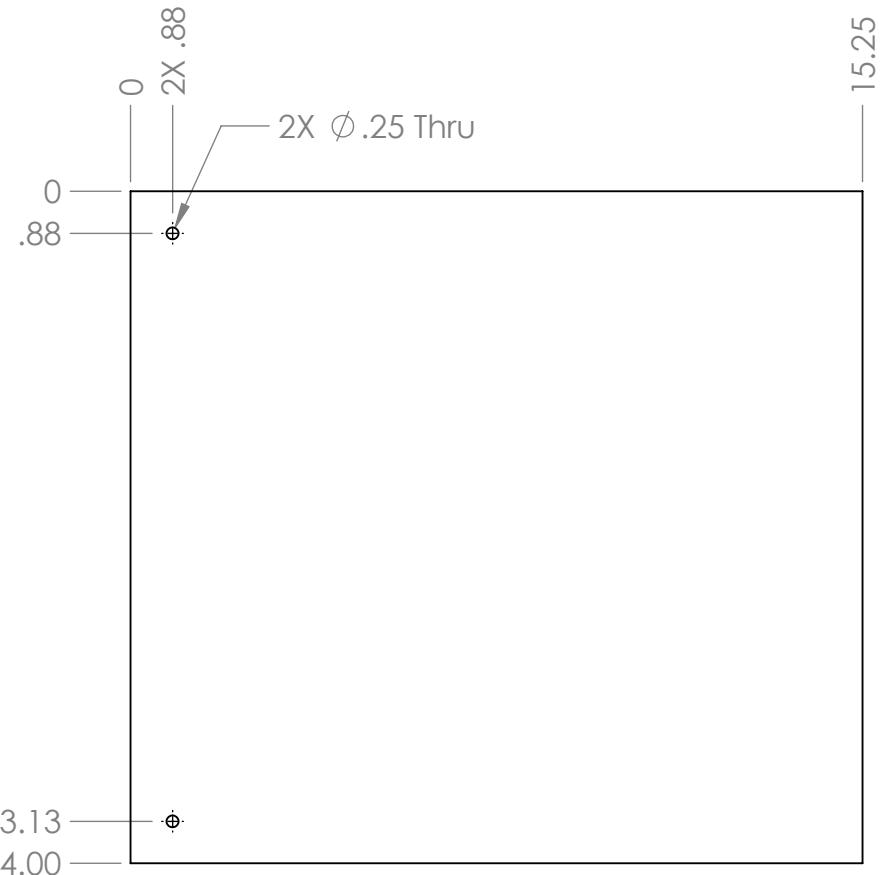


TITLE:

80-20 Extrusion

SIZE DWG. NO. REV  
**A GE-18030**

SCALE: 1:4 WEIGHT: SHEET 1 OF 1



(.13)

Notes:

1. 1/8" smooth HDPE, red or blue
2. Remove burrs and sharp edges

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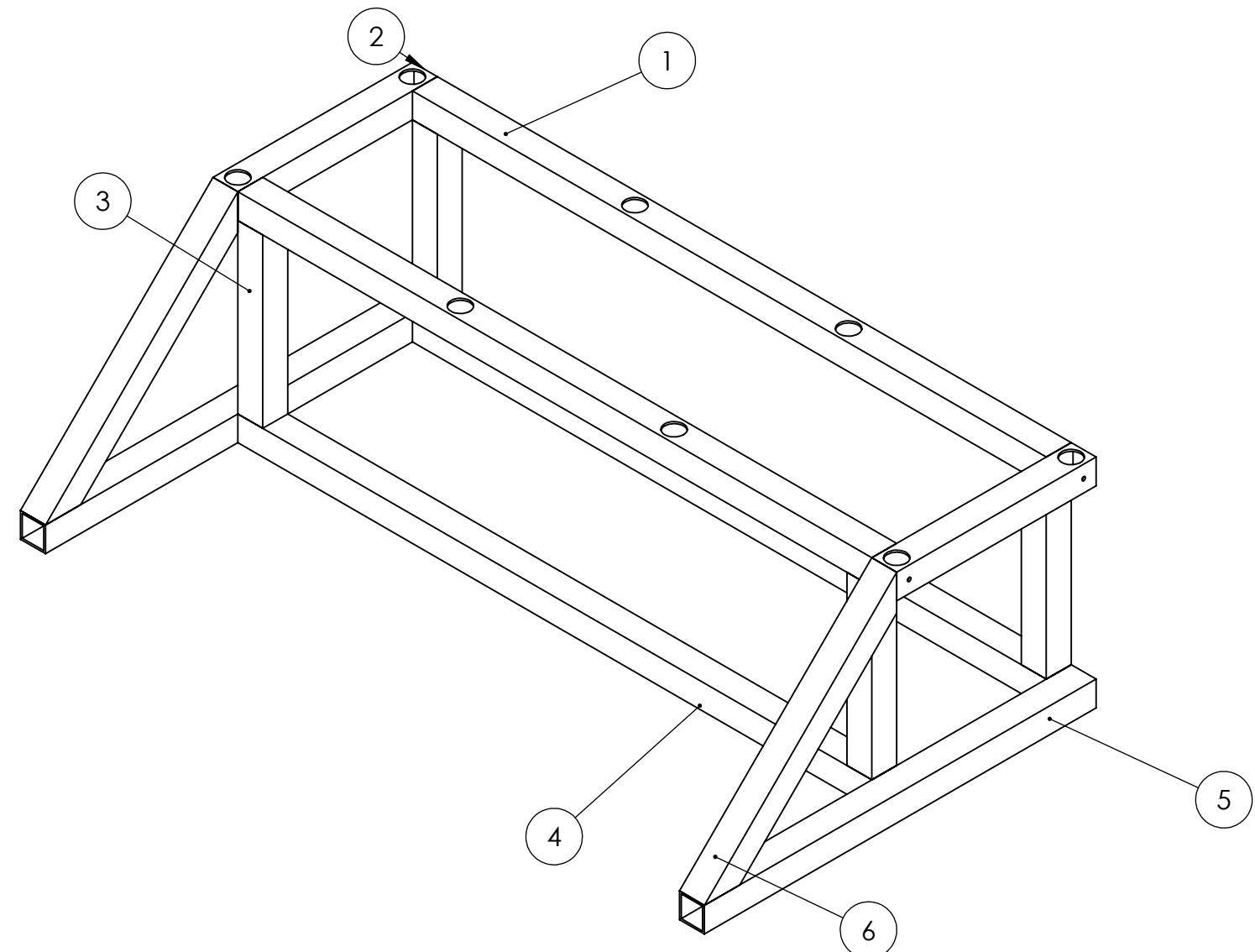
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		DIMENSIONS ARE IN INCHES	DRAWN		
		TOLERANCES:	CHECKED		
		FRACTIONAL $\pm 1/16$	ENG APPR.		
		ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$	MFG APPR.		
		TWO PLACE DECIMAL $\pm .01$	Q.A.		
		THREE PLACE DECIMAL $\pm .001$	COMMENTS:		
		INTERPRET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



TITLE:

# Vault HDPE Bottom Side

SIZE	DWG. NO.	REV
A	GE-18031	
SCALE: 1:4	WEIGHT:	SHEET 1 OF 1



## **Bill of Material**

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-18032-01	1 3/4", 1/8" Thick Square Tube 6063 Aluminum	2
2	GE-18032-02	1 3/4", 1/8" Thick Square Tube 6063 Aluminum	2
3	GE-18032-03	1 3/4", 1/8" Thick Square Tube 6063 Aluminum	4
4	GE-18032-05	1 3/4", 1/8" Thick Square Tube 6063 Aluminum	2
5	GE-18032-04	1 3/4", 1/8" Thick Square Tube 6063 Aluminum	2
6	GE-18032-06	1 3/4", 1/8" Thick Square Tube 6063 Aluminum	2

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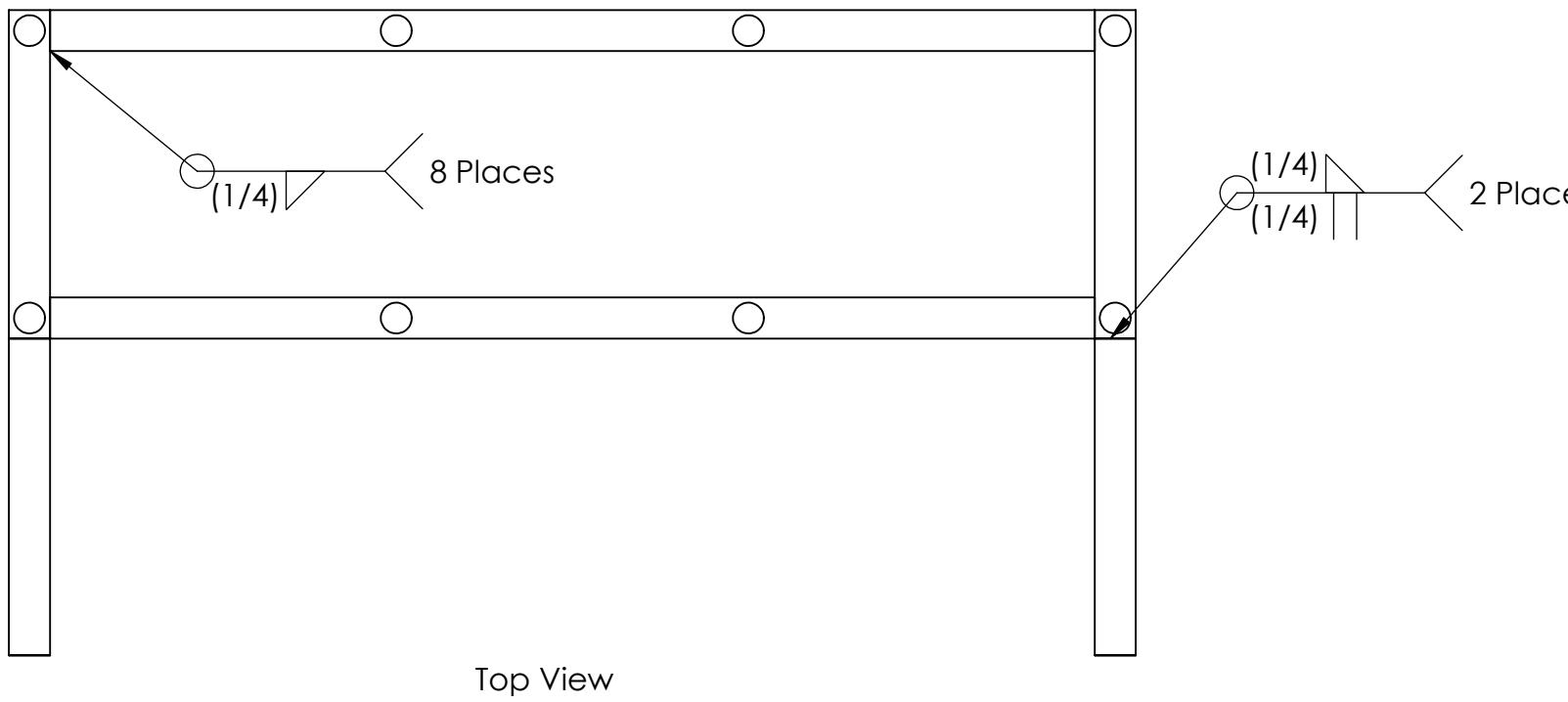
		UNLESS OTHERWISE SPECIFIED:		NAME	DATE	 
		DIMENSIONS ARE IN INCHES	DRAWN			
		TOLERANCES:	CHECKED			
		FRACTIONAL $\pm 1/16$	ENG APPR.			
		ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$	MFG APPR.			
		TWO PLACE DECIMAL $\pm .01$	Q.A.			
		THREE PLACE DECIMAL $\pm .001$	COMMENTS:			
		INTERPRET GEOMETRIC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

4

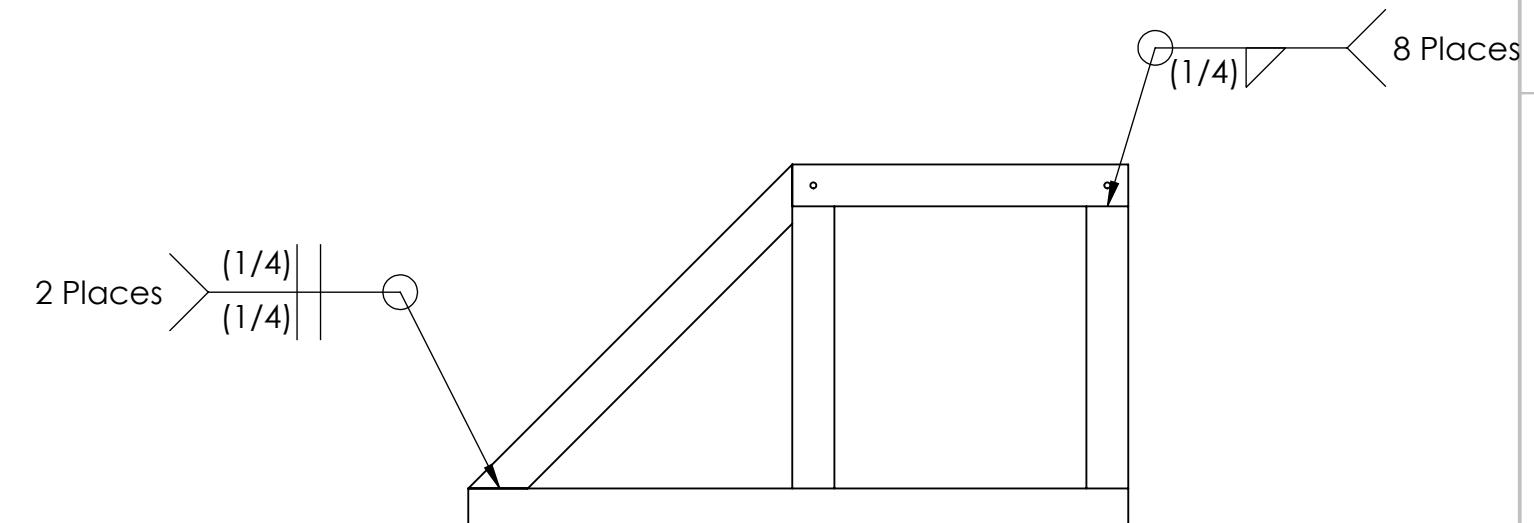
3

2

1



### Top View



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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: 1:8	WEIGHT:	SHEET 2 OF 7

# Vault Base

4

3

2

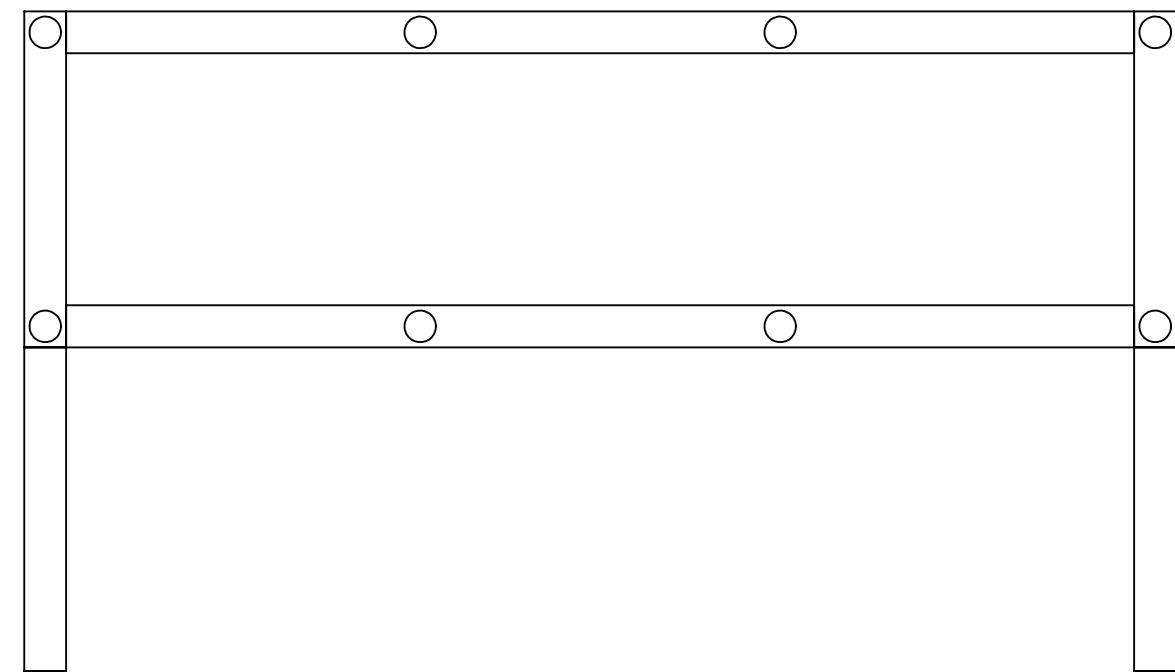
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4

3

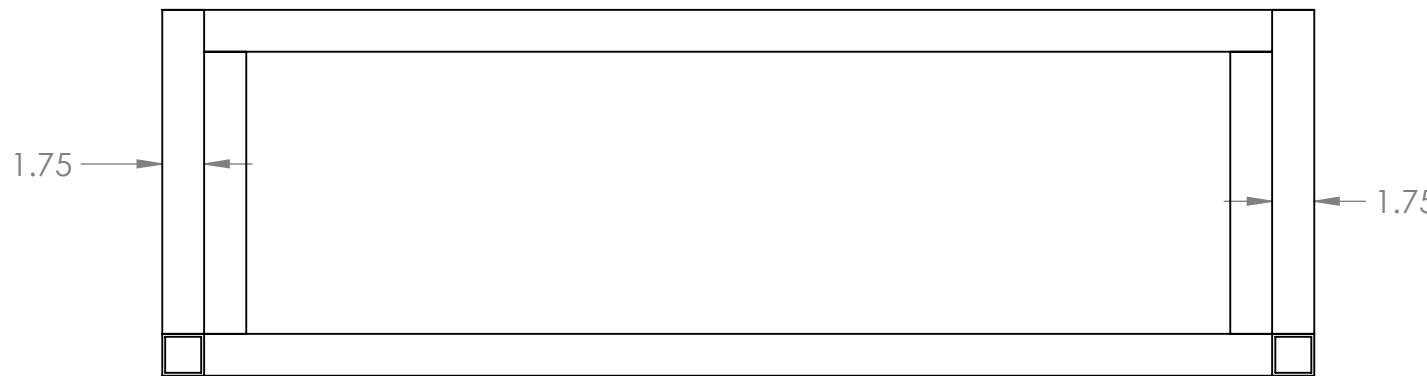
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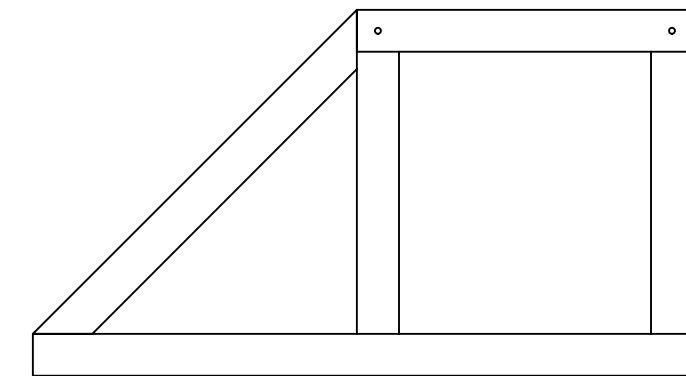
B

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

**TITLE:** Vault Base

**SIZE** DWG. NO. **B** GE-18032 **REV**

SCALE: 1:8 WEIGHT: SHEET 3 OF 7

4

3

2

1

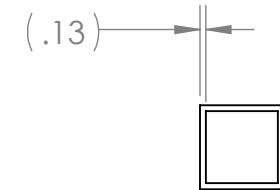
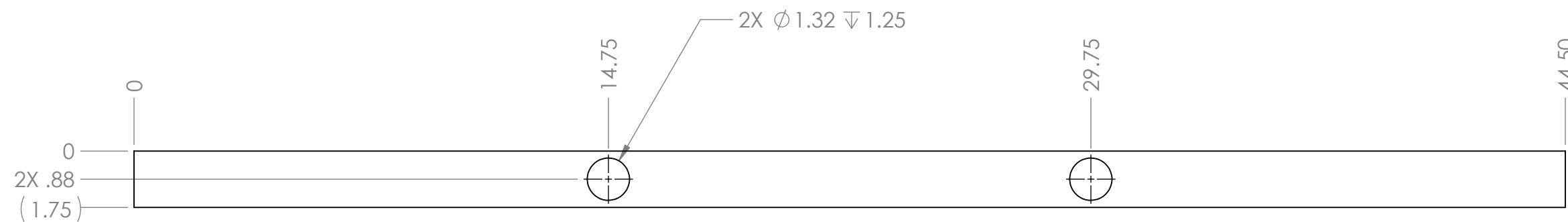
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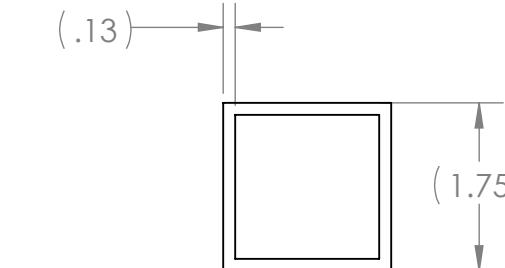
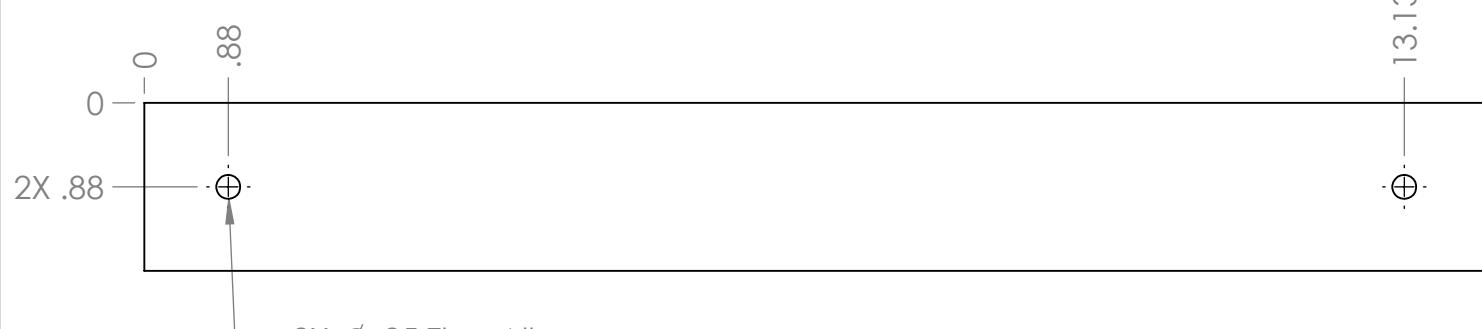
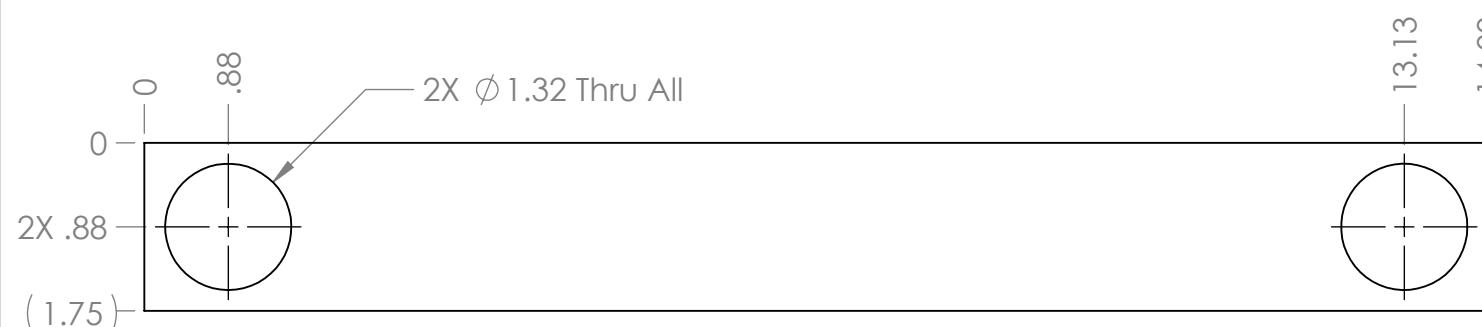
2

1

B



Item Number: GE-18032-01  
 Material: 1 3/4", 1/8" Thick Square Tube 6063 Aluminum  
 Remove Sharp Edges and Burrs  
 QTY:2



Item Number: GE-18032-02  
 Material: 1 3/4", 1/8" Thick Square Tube 6063 Aluminum  
 Remove Sharp Edges and Burrs  
 QTY:2

		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
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COMPETITION

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Vault Base

SIZE DWG. NO. REV  
**B** GE-18032  
 SCALE: 1:2 WEIGHT: SHEET 4 OF 7

4

3

2

1

B

A

4

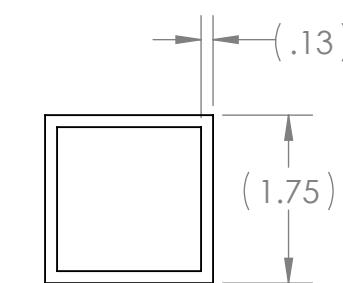
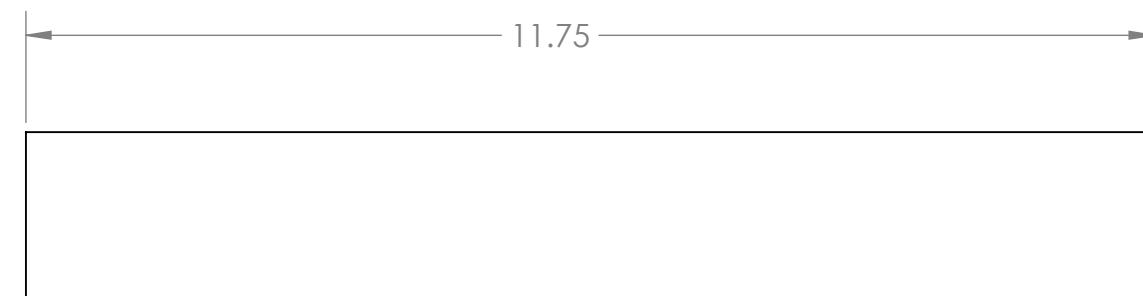
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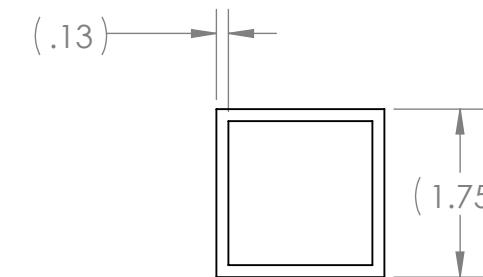
B

B



Item Number: GE-18032-03  
Material: 1 3/4" 6063 Aluminum Square Tube  
Remove Sharp Edges and Burrs  
QTY:4

A technical drawing of a rectangular component. The width of the rectangle is indicated by a horizontal dimension line with arrows at the ends, labeled "27.50". A dashed line extends from the right edge of the rectangle, forming a zigzag pattern that ends with a small V-shaped cutout.



Item Number: GE-18032-04  
Material: 1 3/4" 6063 Aluminum Square Tube  
Remove Sharp Edges and Burrs  
QTY: 2

A

A

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		UNLESS OTHERWISE SPECIFIED:		NAME	DATE	 <b>FIRST</b> <b>ROBOTICS</b> <b>COMPETITION</b>	<b>TITLE:</b>  <b>Vault Base</b>	
		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				<b>SIZE</b> <b>DWG. NO.</b> <b>B</b> <b>GE-18032</b>	<b>REV</b>	
NEXT ASSY	USED ON	FINISH						
APPLICATION		DO NOT SCALE DRAWING				SCALE: 1:2	WEIGHT:	SHEET 5 OF 7

4

3

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4

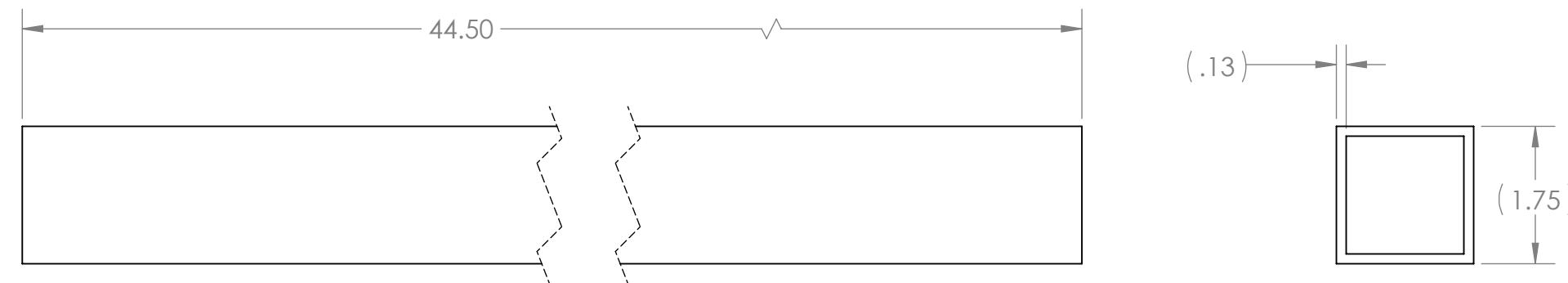
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2

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B

B



Item Number: GE-18032-05  
 Material: 1 3/4" 6063 Aluminum Square Tube  
 Remove Sharp Edges and Burs  
 QTY:2

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: Vault Base  
 SIZE DWG. NO. REV  
**B** GE-18032  
 SCALE: 1:2 WEIGHT: SHEET 6 OF 7

4

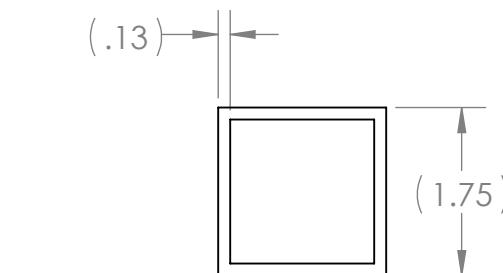
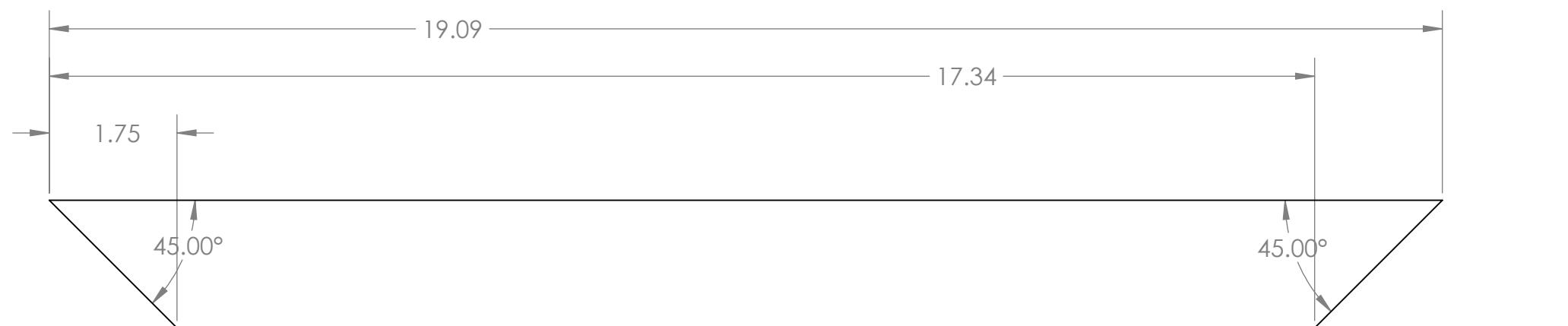
3

2

1

B

B



Item Number: GE-18032-06  
 Material: 1 3/4" 6063 Aluminum Square Tube  
 Remove Sharp Edges and Burs  
 QTY:2

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: Vault Base

SIZE DWG. NO. REV  
**B** GE-18032

SCALE: 1:2 WEIGHT: SHEET 7 OF 7

4

3

2

1

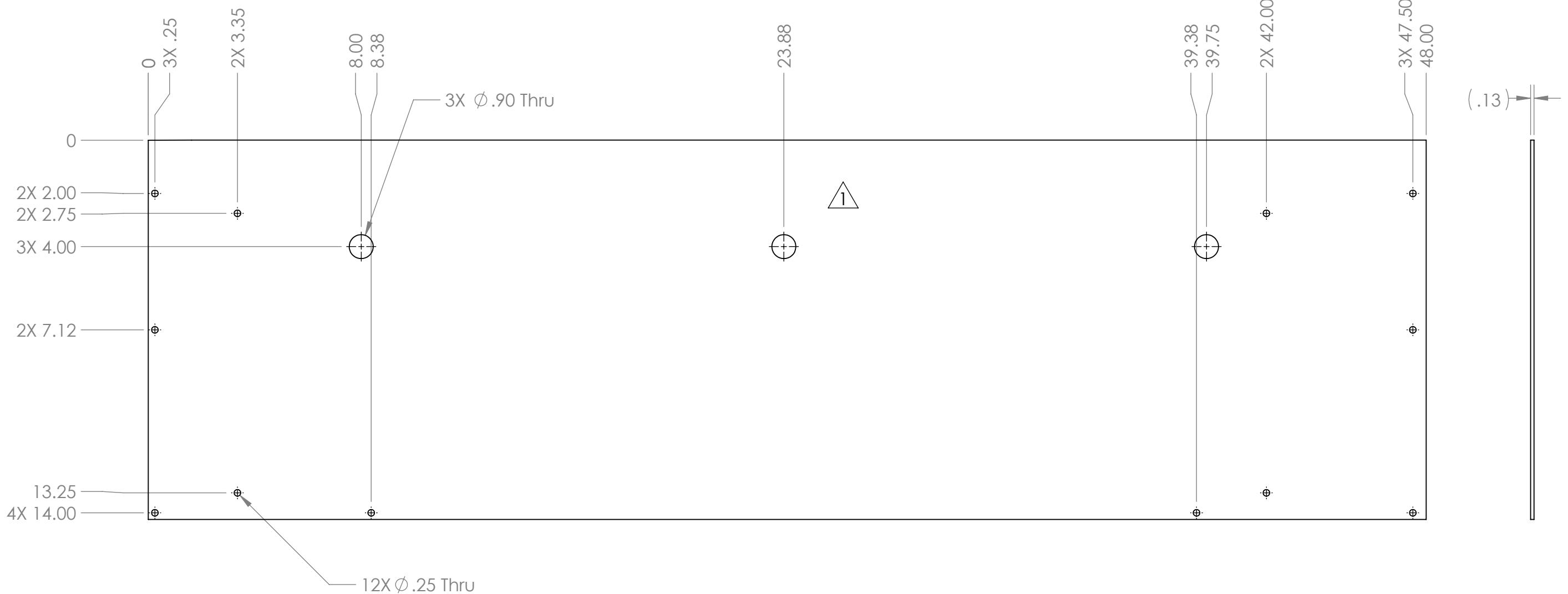
4

3

2

1

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
B2	1	Removed holes and added holes at 3.35 and 42.00	11/20/2017	MXS



### Note

1. 1/8" thk. clear Polycarbonate
  2. Remove sharp edges and burrs

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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: 1:8	WEIGHT:	SHEET 1 OF 1	
			SIZE <b>B</b>	DWG. NO. <b>GE-18033</b>	REV <b>1</b>	

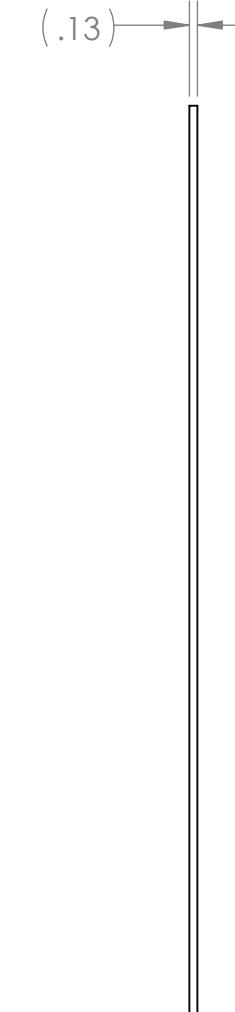
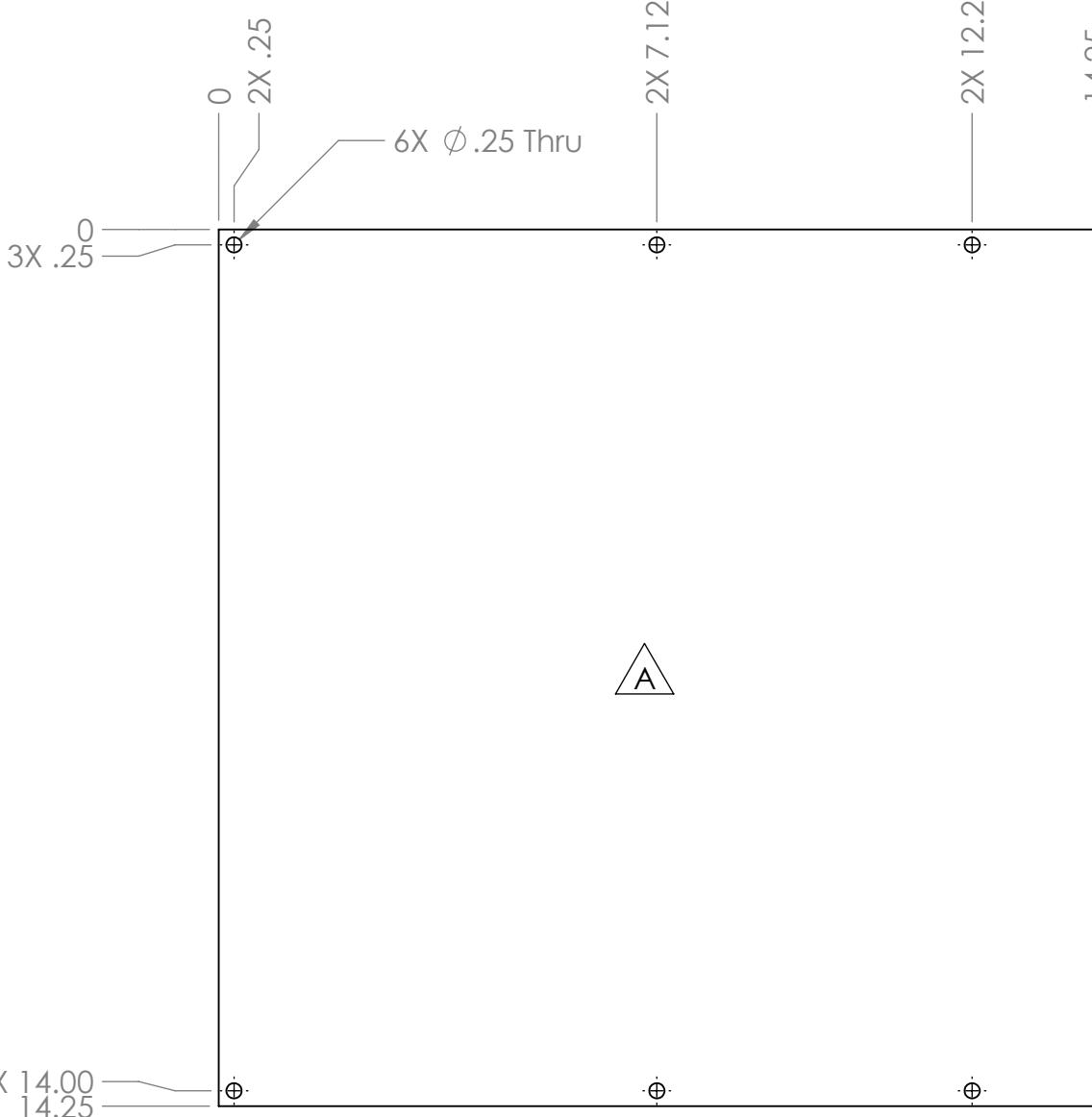
4

3

2

1

B



**Note**  
 1. 1/8" thk. smooth HDPE, blue or red  
 2. 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	COMMENTS:	

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**TITLE:** Vault HDPE Top Side

**SIZE** DWG. NO. **B** GE-18034 **REV** **A**

SCALE: 1:3 WEIGHT: SHEET 1 OF 1

4

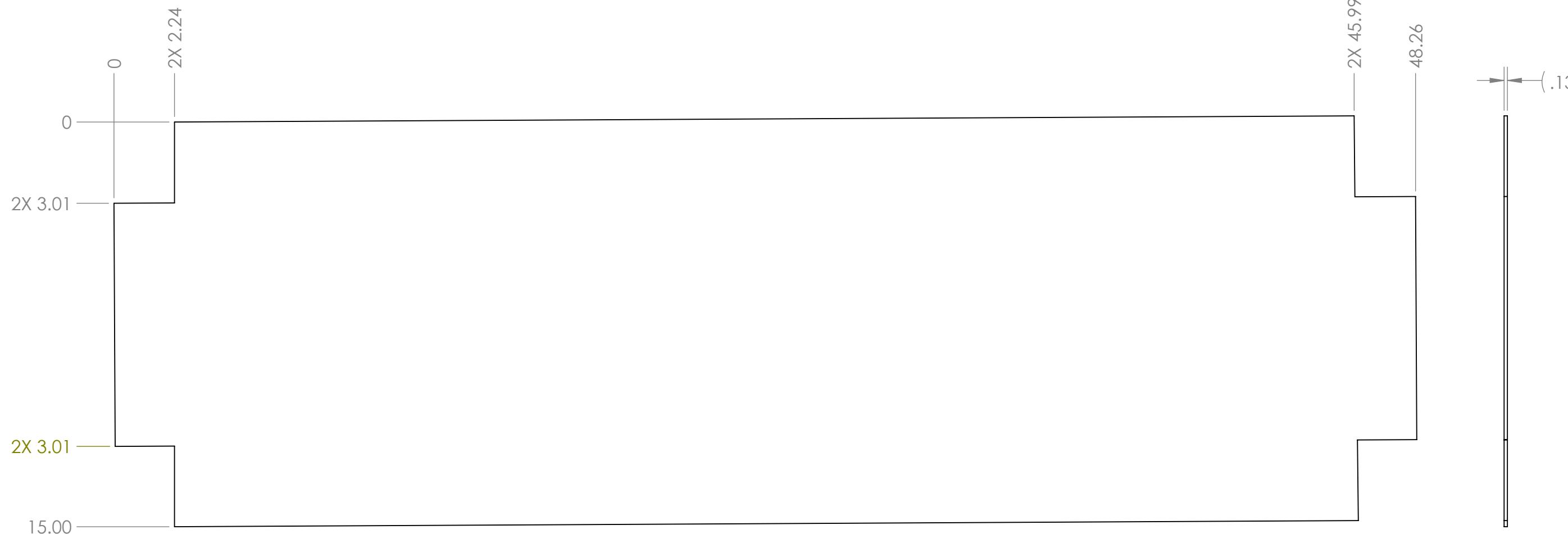
3

2

1

B

B



A

A

- Notes:
1. 1/8" thk. smooth HDPE, red or blue
  2. Remove sharp edges and burrs

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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:** Vault HDPE Bottom Back

**SIZE** DWG. NO. **REV**  
**B** **GE-18035**

SCALE: 1:4 WEIGHT: SHEET 1 OF 1

4

3

2

1

4

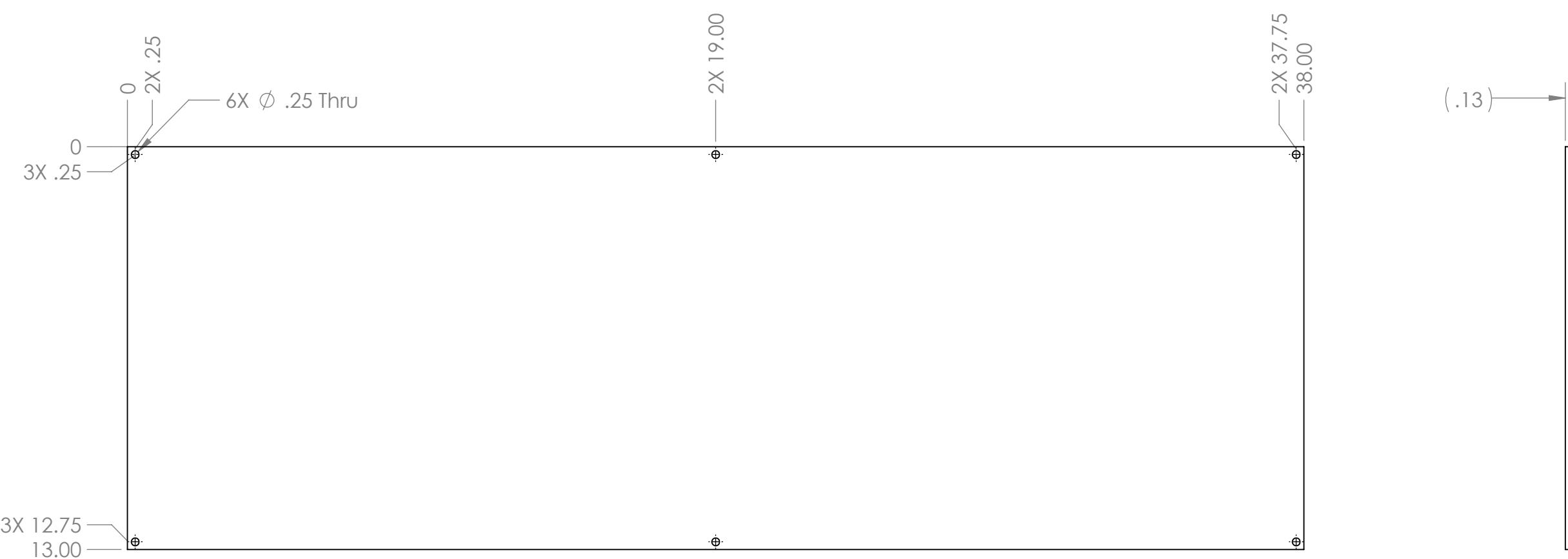
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2

1

B

B



A

A

## Notes:

1. 1/8" thk. clear polycarbonate
2. Remove all sharp edges and burrs

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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			
TITLE:		<b>FIRST</b> <b>ROBOTICS</b> <b>COMPETITION</b>			
SIZE		DWG. NO. <b>B</b> <b>GE-18036</b>			
REV					
SCALE: 1:4		WEIGHT:			
SHEET 1 OF 1					

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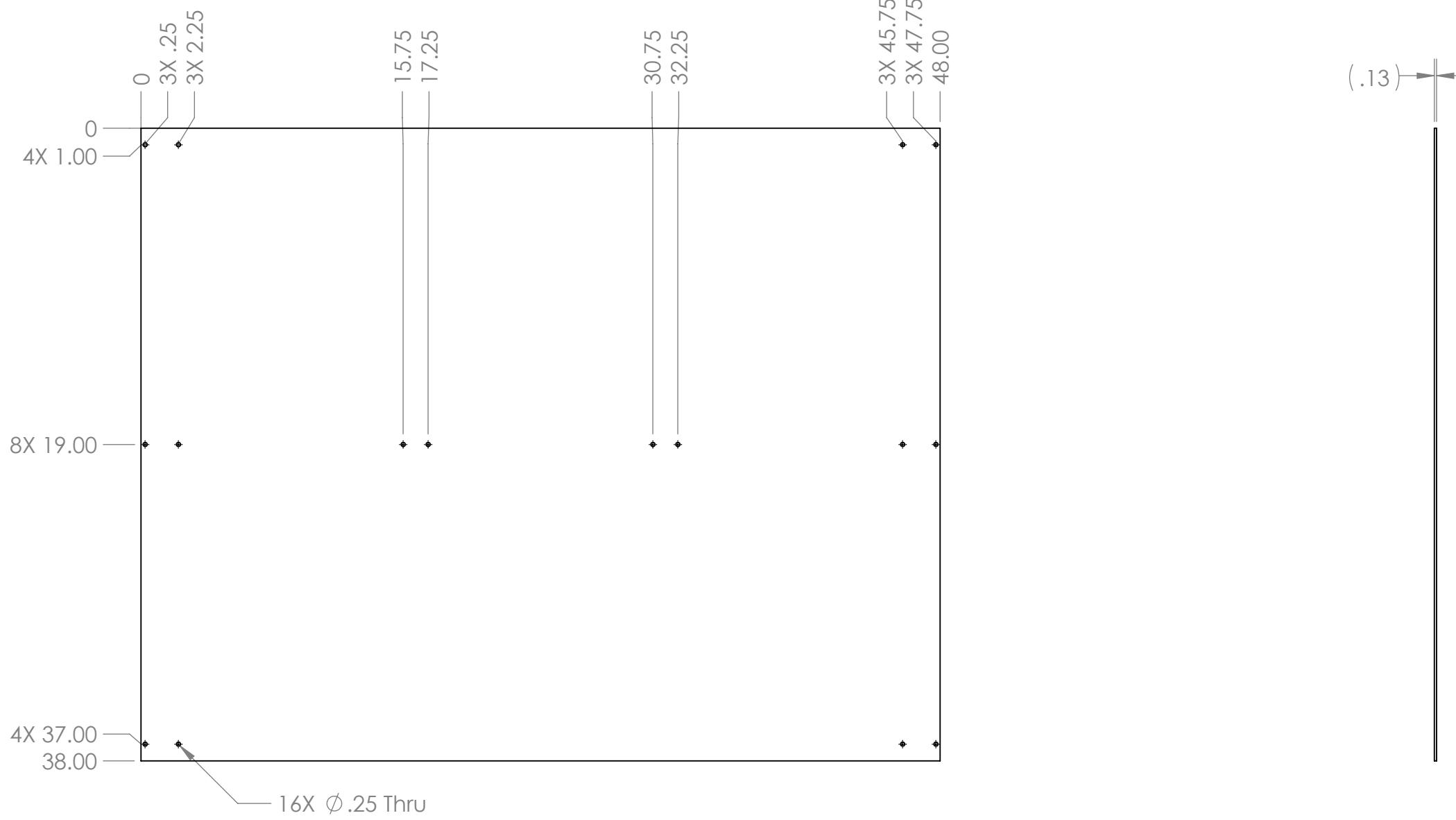
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Notes  
 1. 1/8" thk. clear polycarbonate  
 2. Remove all sharp edges and burrs

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

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

**TITLE:** Vault Polycarbonate Backstop

**SIZE** DWG. NO. **B** GE-18037 **REV**

SCALE: 1:8 WEIGHT: SHEET 1 OF 1

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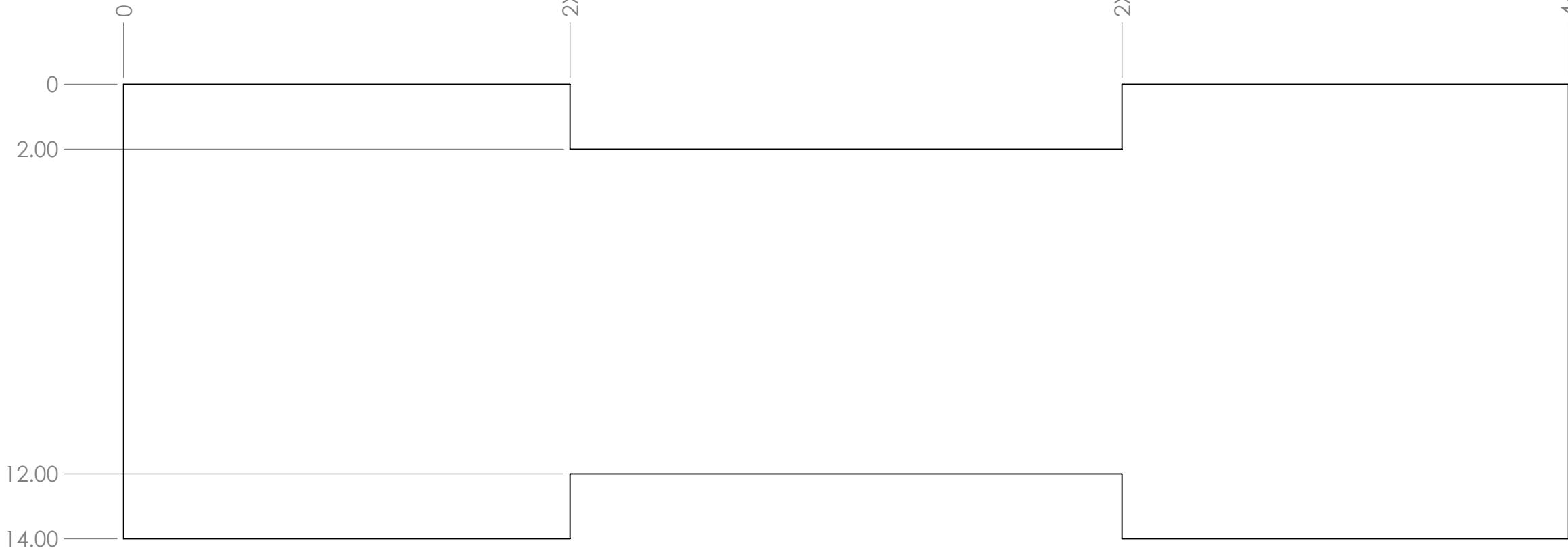
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## Notes:

1. 1/4" thk. clear polycarbonate
2. Remove all sharp edges and burrs

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		DRAWN			
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		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:** Vault  
Polycarbonate  
Bottom Floor

**SIZE** DWG. NO. **REV**  
**B** **GE-18038**

SCALE: 1:4 WEIGHT: SHEET 1 OF 1

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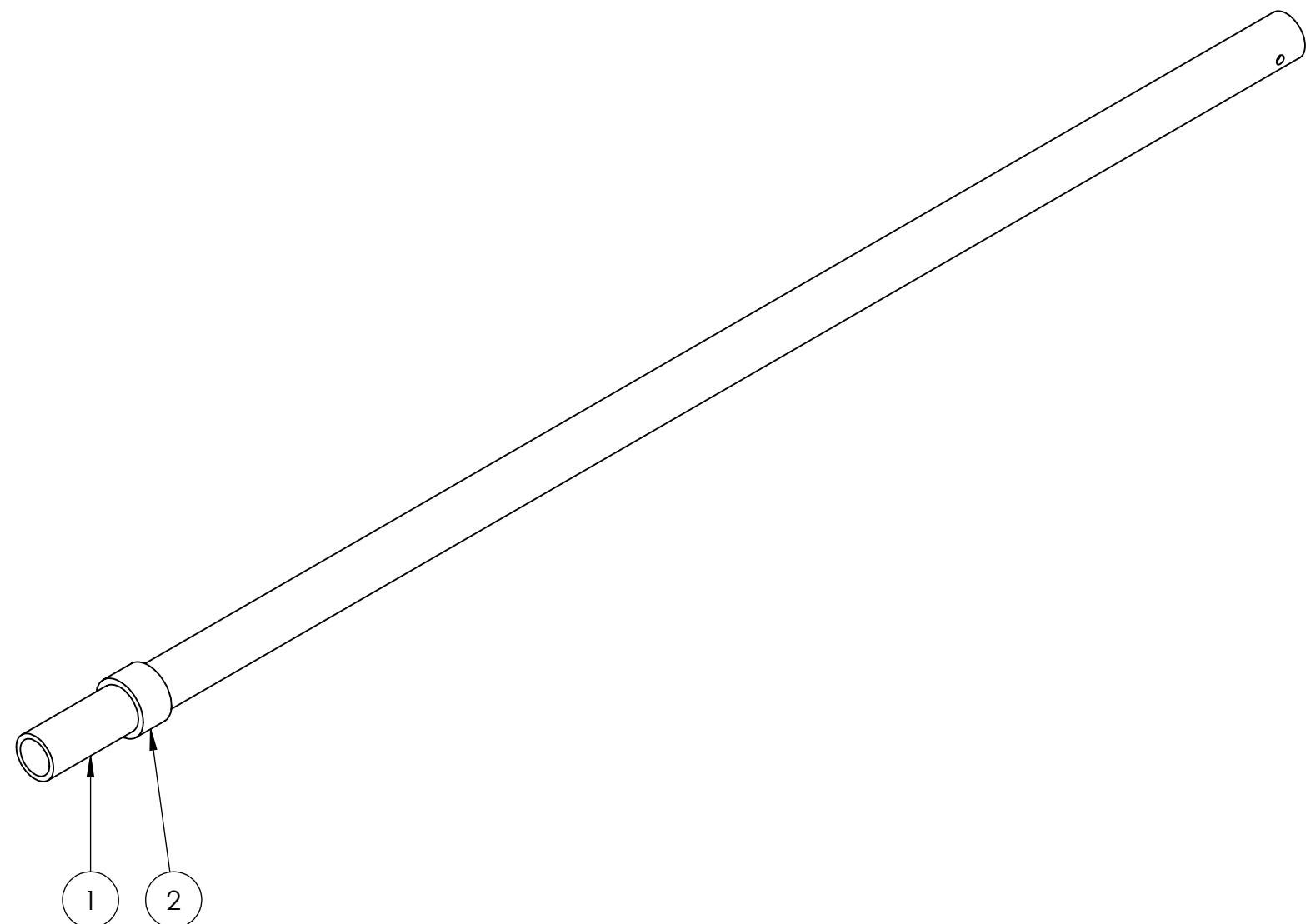
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-18039-01	1" Schedule 40 Aluminum Pipe	1
2	GE-18039-02	1 1/4" Schedule 40 Aluminum Pipe	1

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		ENG APPR.			
		MFG APPR.			
		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:** Vault Support Pipes

**SIZE** **DWG. NO.** **REV**  
**B** **GE-18039**

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

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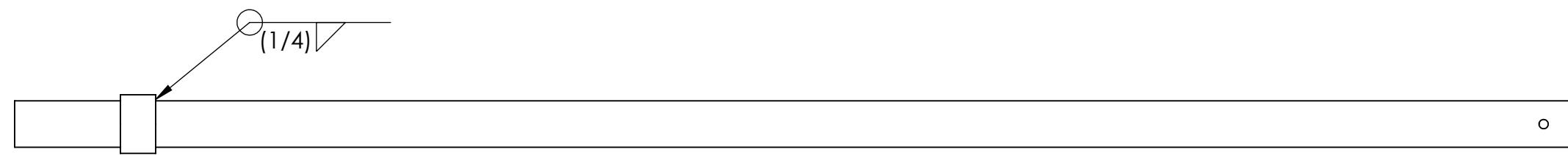
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		DRAWN			
		CHECKED			
		ENG APPR.			
		MFG APPR.			
		Q.A.			
		COMMENTS:			
		MATERIAL			
		FINISH			
NEXT ASSY	USED ON				
	APPLICATION	DO NOT SCALE DRAWING			

 FIRST  
ROBOTICS  
COMPETITION

 SOLIDWORKS  
Modeling Solutions Partner

TITLE: Vault Support Pipes  
 SIZE B DWG. NO. GE-18039 REV

SCALE: 1:8 WEIGHT: SHEET 2 OF 5

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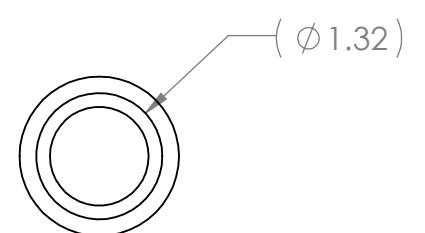
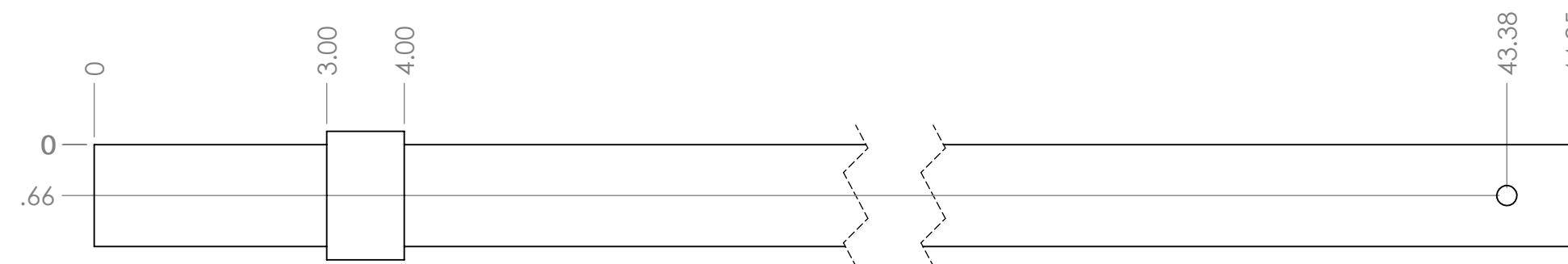
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		UNLESS OTHERWISE SPECIFIED:		NAME DATE  DRAWN CHECKED ENG APPR. MFG APPR.  Q.A. COMMENTS:	
		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$			
		INTERPRET GEOMETRIC TOLERANCING PER:			
		MATERIAL			
NEXT ASSY		FINISH			
APPLICATION		DO NOT SCALE DRAWING			
B		GE-18039		REV	
SCALE: 1:8		WEIGHT:		SHEET 3 OF 5	

 FIRST  
ROBOTICS  
COMPETITION  SOLIDWORKS  
Modeling Solutions Partner

TITLE: Vault Support Pipes

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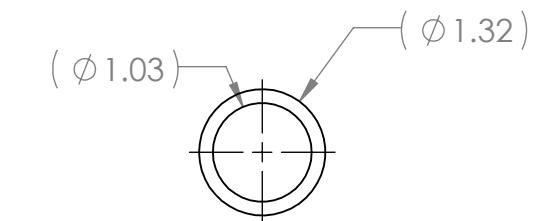
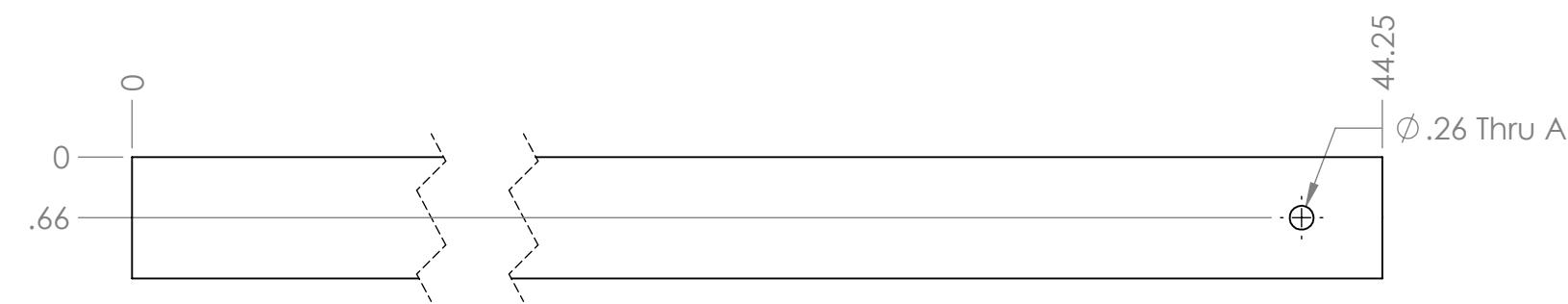
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## Notes:

1. GE-18039-01
2. 1" Schedule 40 Aluminum Pipe

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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:** Vault Support Pipes

**SIZE** **DWG. NO.** **REV**  
**B** **GE-18039**

**SCALE:** 1:8 **WEIGHT:** **SHEET 4 OF 5**

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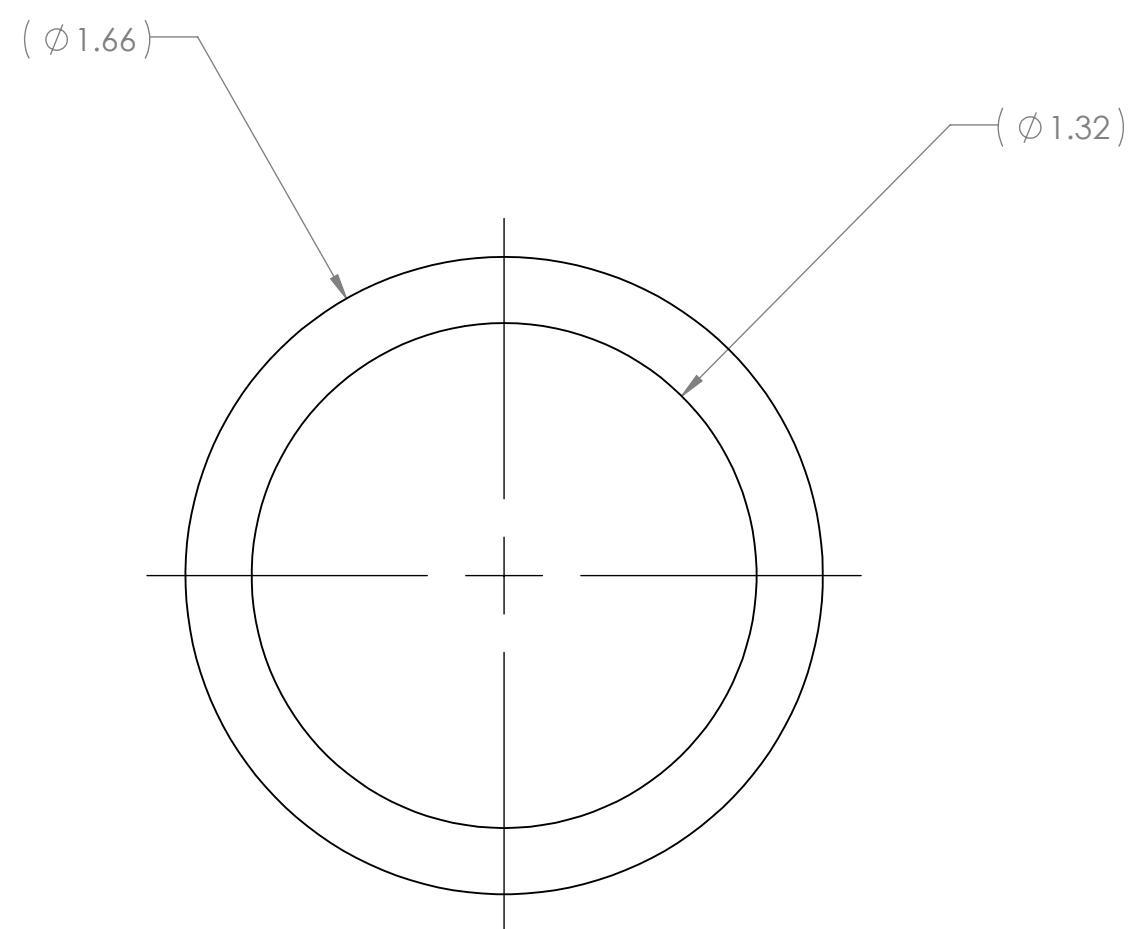
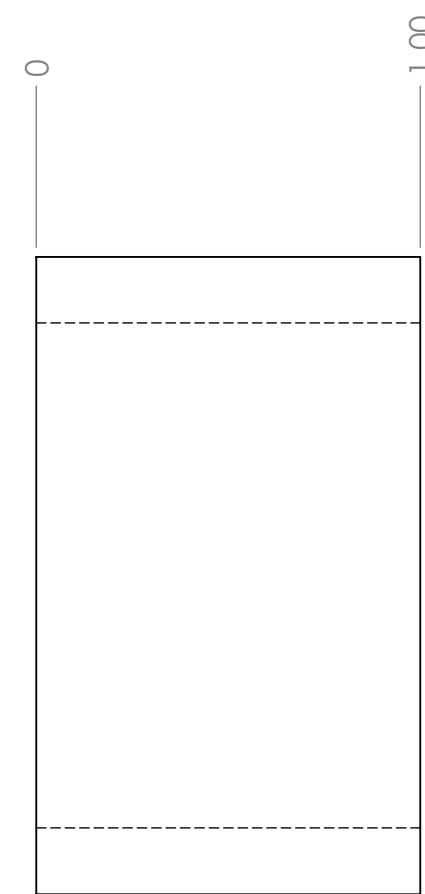
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## Notes:

1. GE-18039-01
2. 1 1/4" Schedule 40 Aluminum Pipe

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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:** Vault Support Pipes

SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-18039</b>	

SCALE: 1:8 WEIGHT: SHEET 5 OF 5

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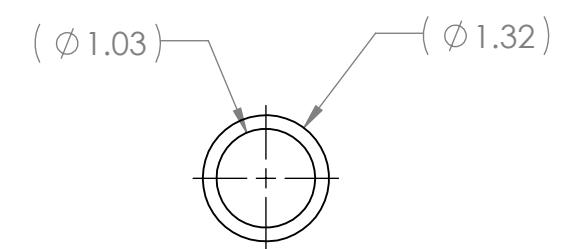
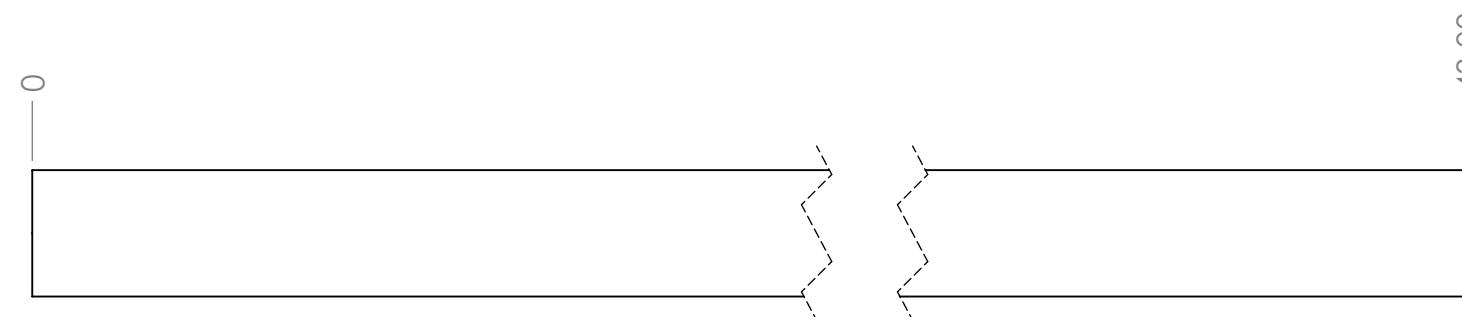
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## Notes:

1. 1.1" Schedule 40 Aluminum Pipe
2. Remove all sharp edges and burrs

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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  
 TITLE: Vault Middle Support Pipes  
 SIZE DWG. NO. REV  
**B** GE-18040  
 SCALE: 1:2 WEIGHT: SHEET 1 OF 1

4

3

2

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## REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
B2, B4	1	Added holes are 3.35 and 42	11/20/2017	MXS

B

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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

**TITLE:** Vault  
Polycarbonate Top  
Backside

**SIZE** DWG. NO. **REV**  
**B** **GE-18041** **1**

SCALE: 1:4 WEIGHT: SHEET 1 OF 1

4

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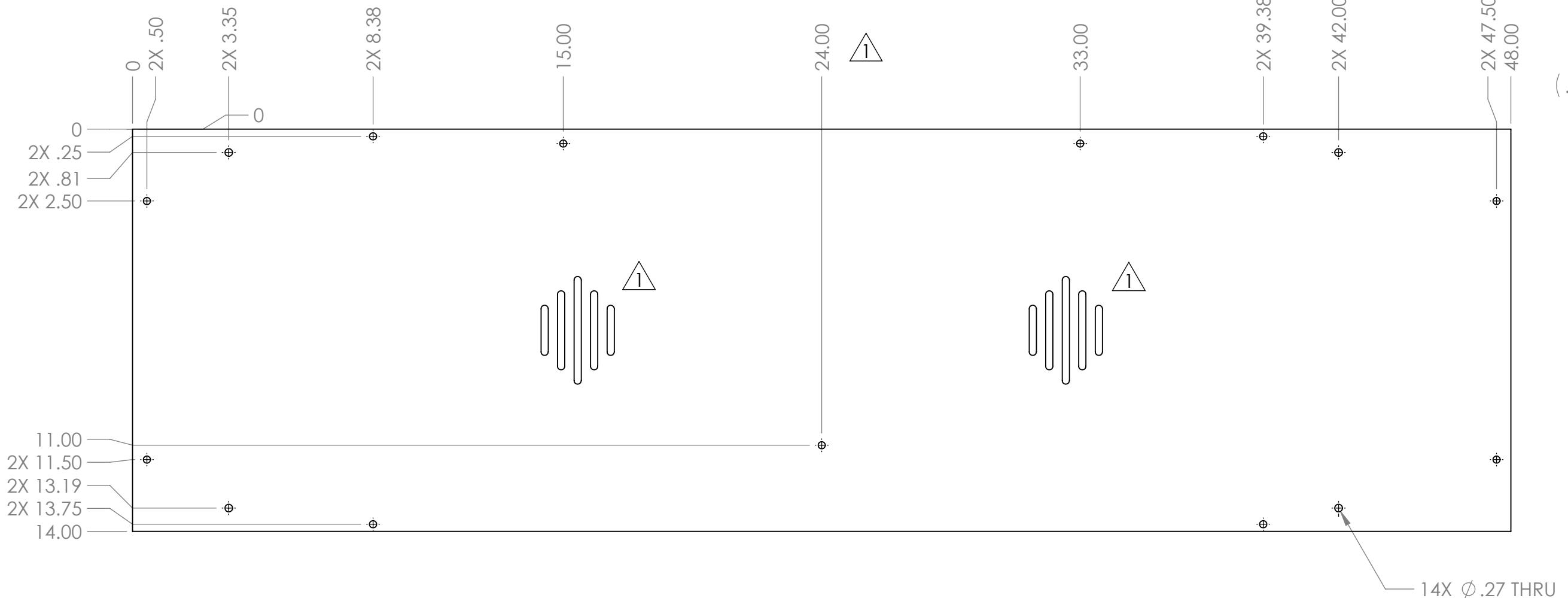
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## REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
B2, B3	1	Moved hole at 23.53 to center, added vent holes	11/16/2017	MXS

B



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Notes:

1. 1/4" thk. smooth HDPE, red or blue
2. Remove all sharp edges and burrs

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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>B</b>	<b>GE-18044</b>	<b>1</b>		
SCALE: 1:4	WEIGHT:	SHEET 1 OF 2		

 FIRST  
ROBOTICS  
COMPETITION  SOLIDWORKS  
Modeling Solutions Partner  
TITLE:  
**Vault HDPE Top**

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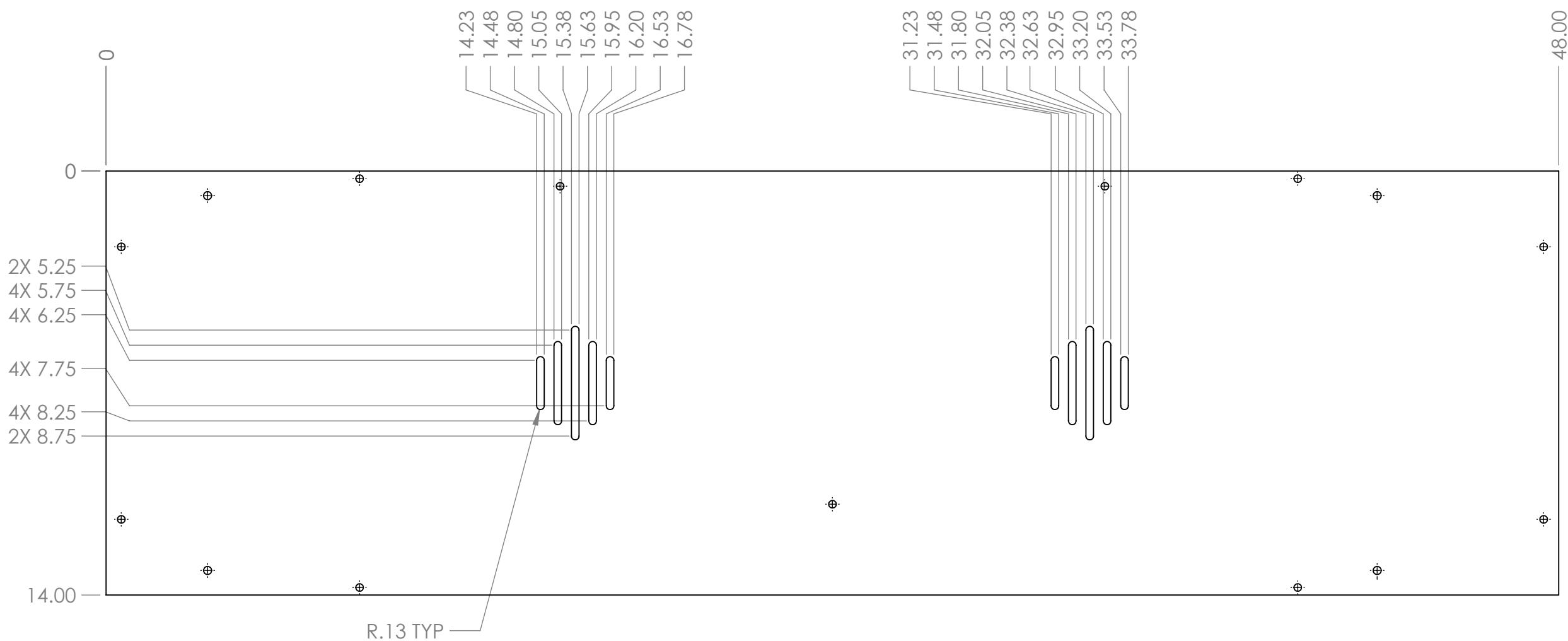
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		DRAWN			
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		ENG APPR.			
		MFG APPR.			
		Q.A.			
		COMMENTS:			
		MATERIAL			
		NEXT ASSY	USED ON	FINISH	
		APPLICATION		DO NOT SCALE DRAWING	
SIZE	DWG. NO.		REV		
<b>B</b>	<b>GE-18044</b>		<b>1</b>		
SCALE: 1:4	WEIGHT:		SHEET 2 OF 2		

 FIRST  
ROBOTICS  
COMPETITION

 SOLIDWORKS  
Modeling Solutions Partner

TITLE:  
**Vault HDPE Top**

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## Notes:

1. 1/8" thk. clear polycarbonate
2. Remove all sharp edges and burrs

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

**FIRST** ROBOTICS COMPETITION   
TITLE: Vault Polycarbonate Bottom Front  
SIZE **B** DWG. NO. **GE-18045** REV  
SCALE: 1:4 WEIGHT: SHEET 1 OF 1

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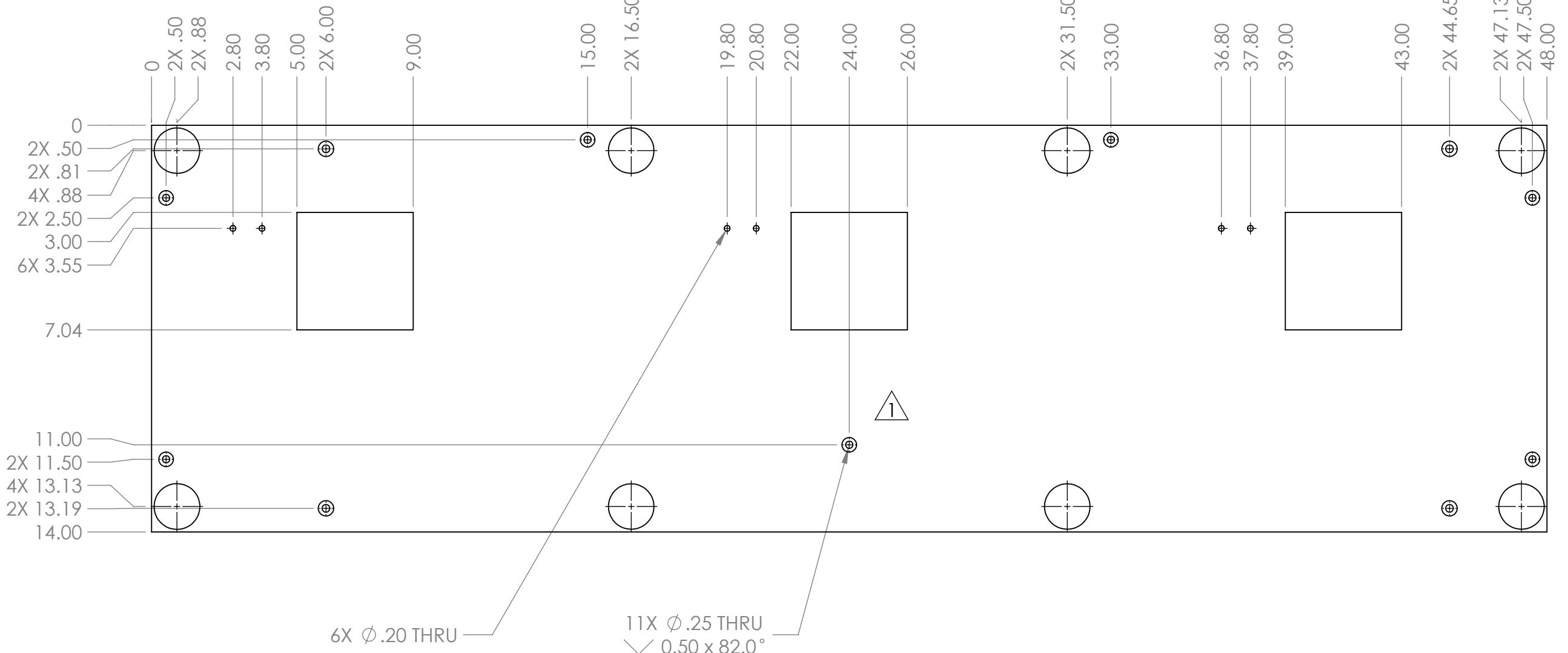
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Notes:  
 1. 1/4" thk. clear polycarbonate  
 2. Remove all sharp edges and burrs

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REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
A3	1	Hole moved to 24" (centered); countersunk all .25" holes	11/16/2017	MXS

		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: Vault  
 Polycarbonate Top  
 Base

SIZE DWG. NO. REV  
**B GE-18046 1**

SCALE: 1:4 WEIGHT: SHEET 1 OF 2

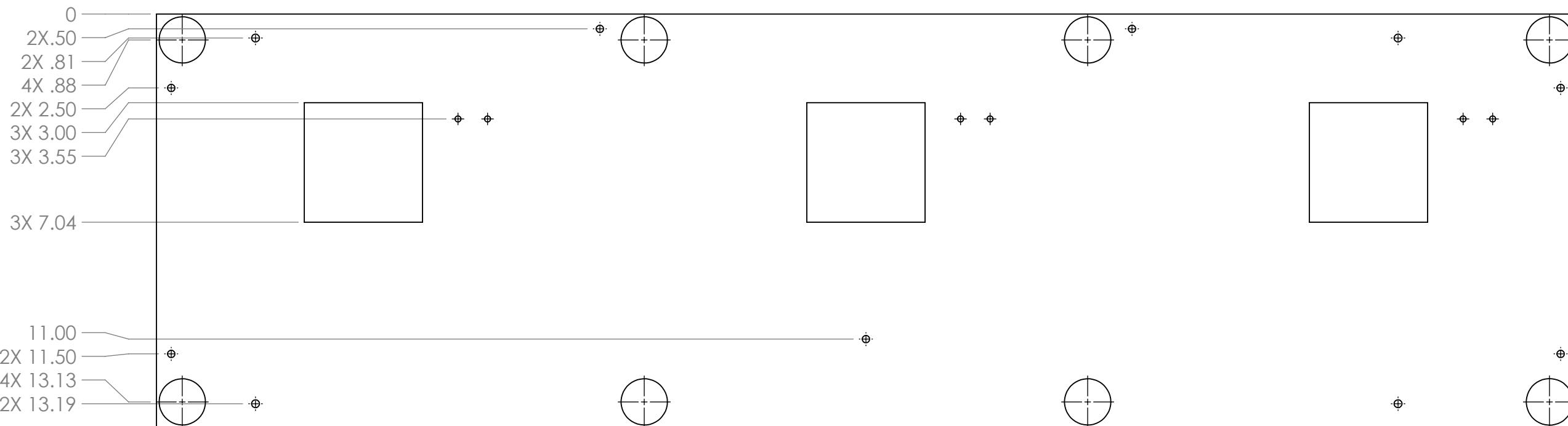
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		DRAWN			
		CHECKED			
		ENG APPR.			
		MFG APPR.			
		Q.A.			
		COMMENTS:			
		MATERIAL			
		FINISH			
	NEXT ASSY	USED ON	APPLICATION	DO NOT SCALE DRAWING	

FIRST  
ROBOTICS  
COMPETITION

SOLIDWORKS  
Modeling Solutions Partner

TITLE: Vault  
Polycarbonate Top  
Base

SIZE DWG. NO. REV  
**B** GE-18046 1

SCALE: 1:4 WEIGHT: SHEET 2 OF 2

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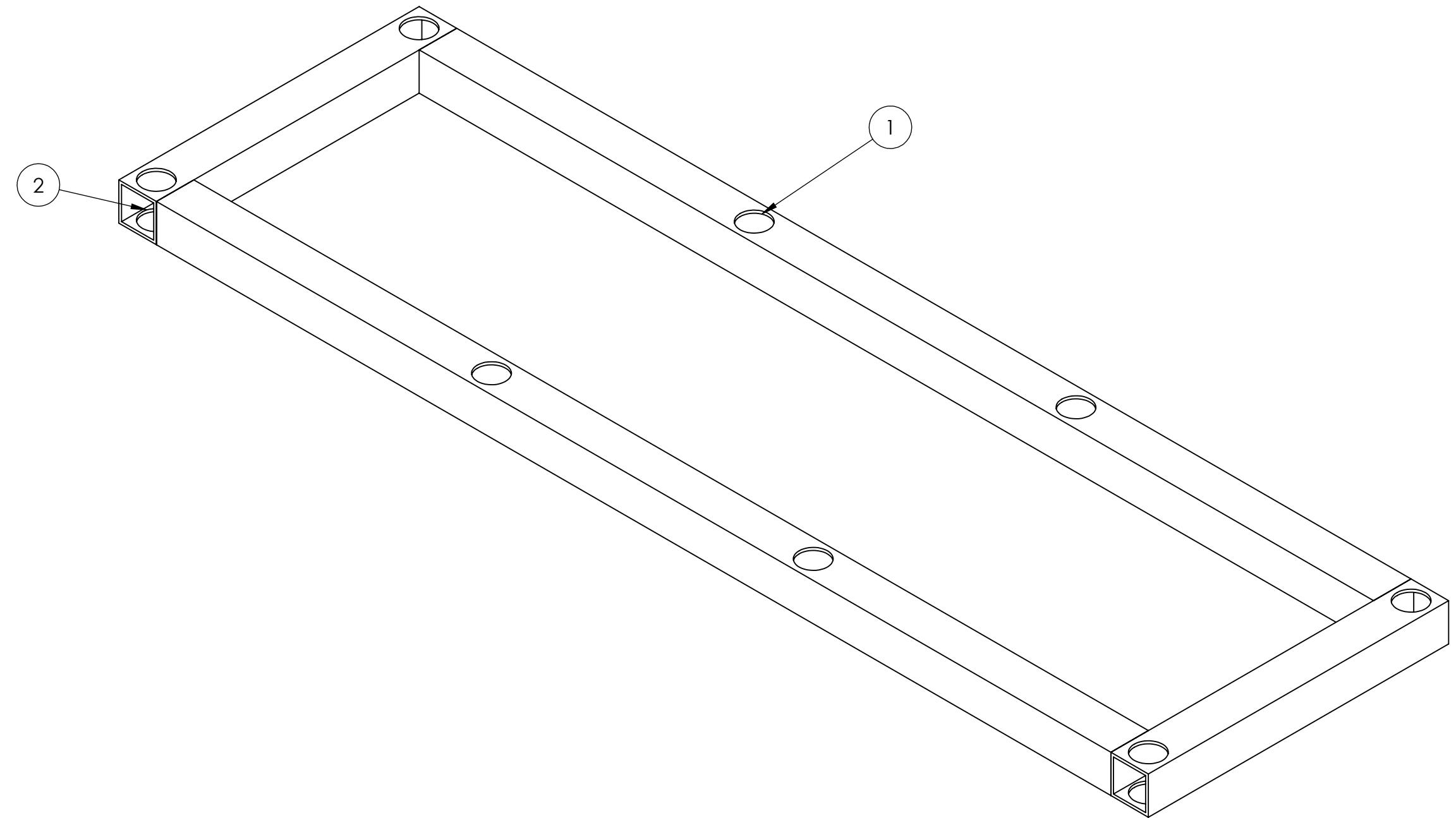
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-18047-01	1 3/4", 1/8" Thick Square Tube, 6063 Aluminum	2
2	GE-18047-02	1 3/4", 1/8" Thick Square Tube, 6063 Aluminum	2

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

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

**TITLE:** Vault Top Frame

**SIZE** **DWG. NO.** **REV**  
**B** **GE-18047**

**SCALE:** 1:4 **WEIGHT:** **SHEET 1 OF 3**

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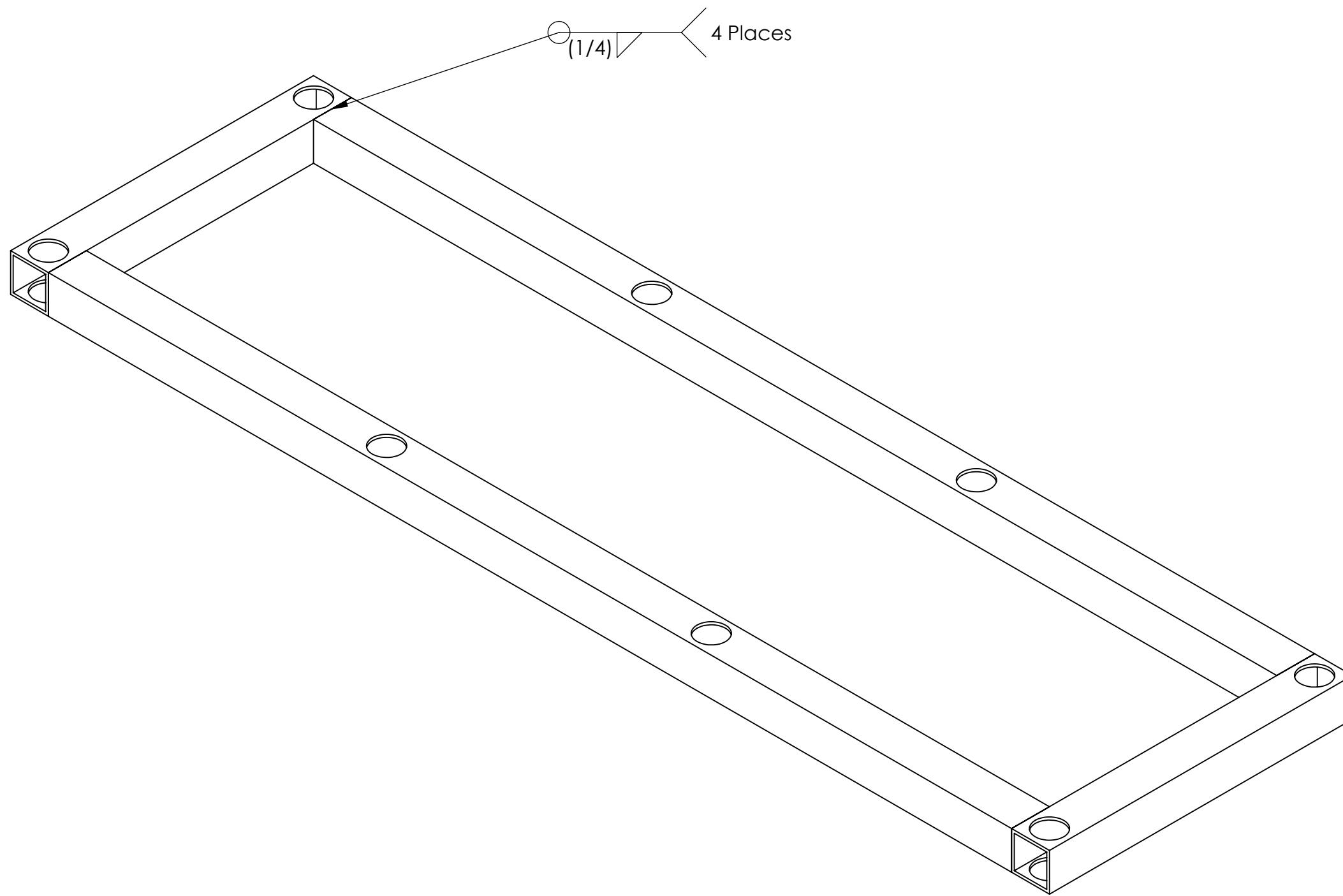
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-18047-01	1 3/4", 1/8" Thick Square Tube, 6063 Aluminum	2
2	GE-18047-02	1 3/4", 1/8" Thick Square Tube, 6063 Aluminum	2

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

FIRST ROBOTICS COMPETITION  
SOLIDWORKS  
Modeling Solutions Partner  
TITLE: Vault Top Frame  
SIZE B DWG. NO. GE-18047 REV  
SCALE: 1:8 WEIGHT: SHEET 2 OF 3

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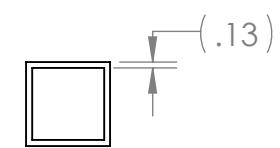
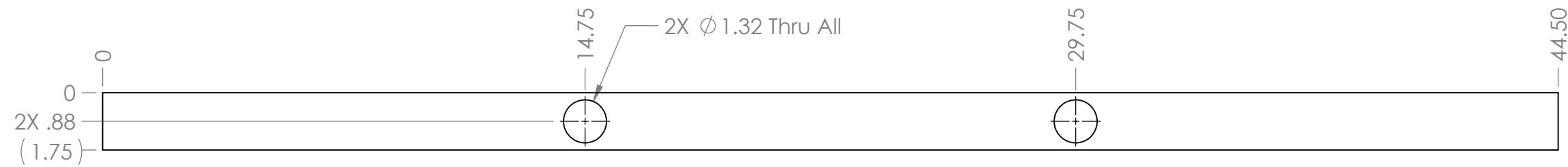
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2

1

B

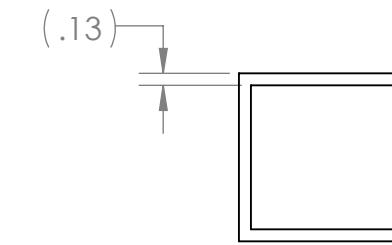
B



Item Number: GE-18047-01  
Material: 1 3/4", 1/8" Thick Square Tube, 6063 Aluminum  
Qty: 2

Item Number: GE-18047-02  
Material: 1 3/4", 1/8" Thick Square Tube, 6063 Aluminum  
Qty: 2

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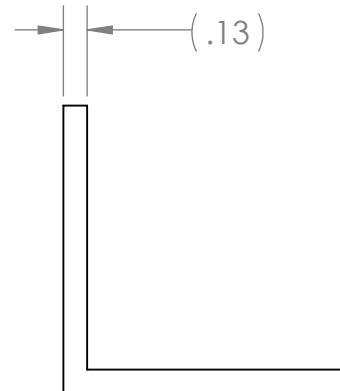
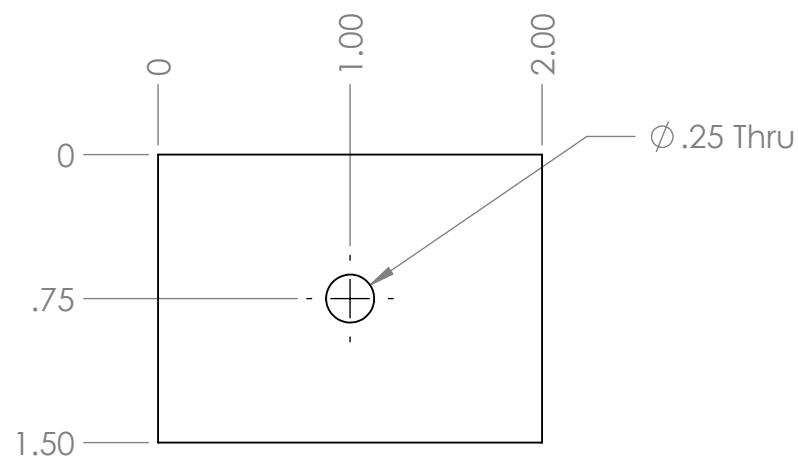
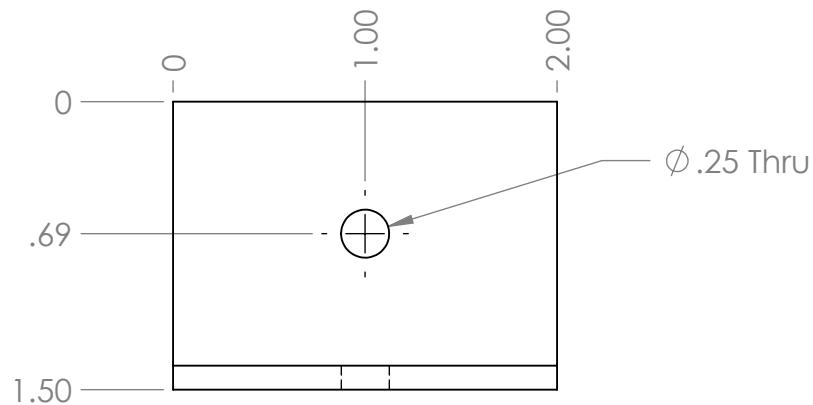
A

A

		UNLESS OTHERWISE SPECIFIED:		NAME	DATE	 <b>FIRST</b> <b>ROBOTICS</b> <b>COMPETITION</b>	<b>TITLE:</b>  <h1>Vault Top Frame</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:				
		INTERPRET GEOMETRIC TOLERANCING PER:					
		MATERIAL					
NEXT ASSY	USED ON	FINISH					
APPLICATION		DO NOT SCALE DRAWING					
			SCALE: 1:8	WEIGHT:	SHEET 3 OF 3		

B

B



Notes:  
 1. Material: 1-1/2" 1/8" Thick  
 Aluminum Angle  
 2. Remove all burrs and sharp edges

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



TITLE:

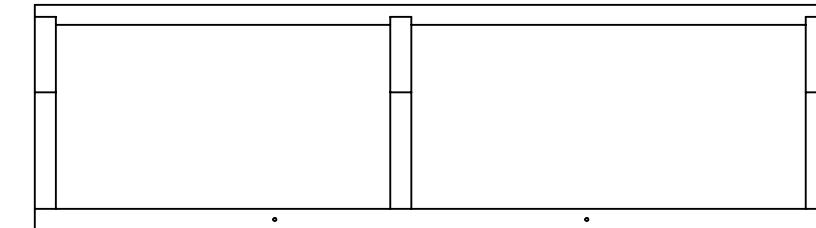
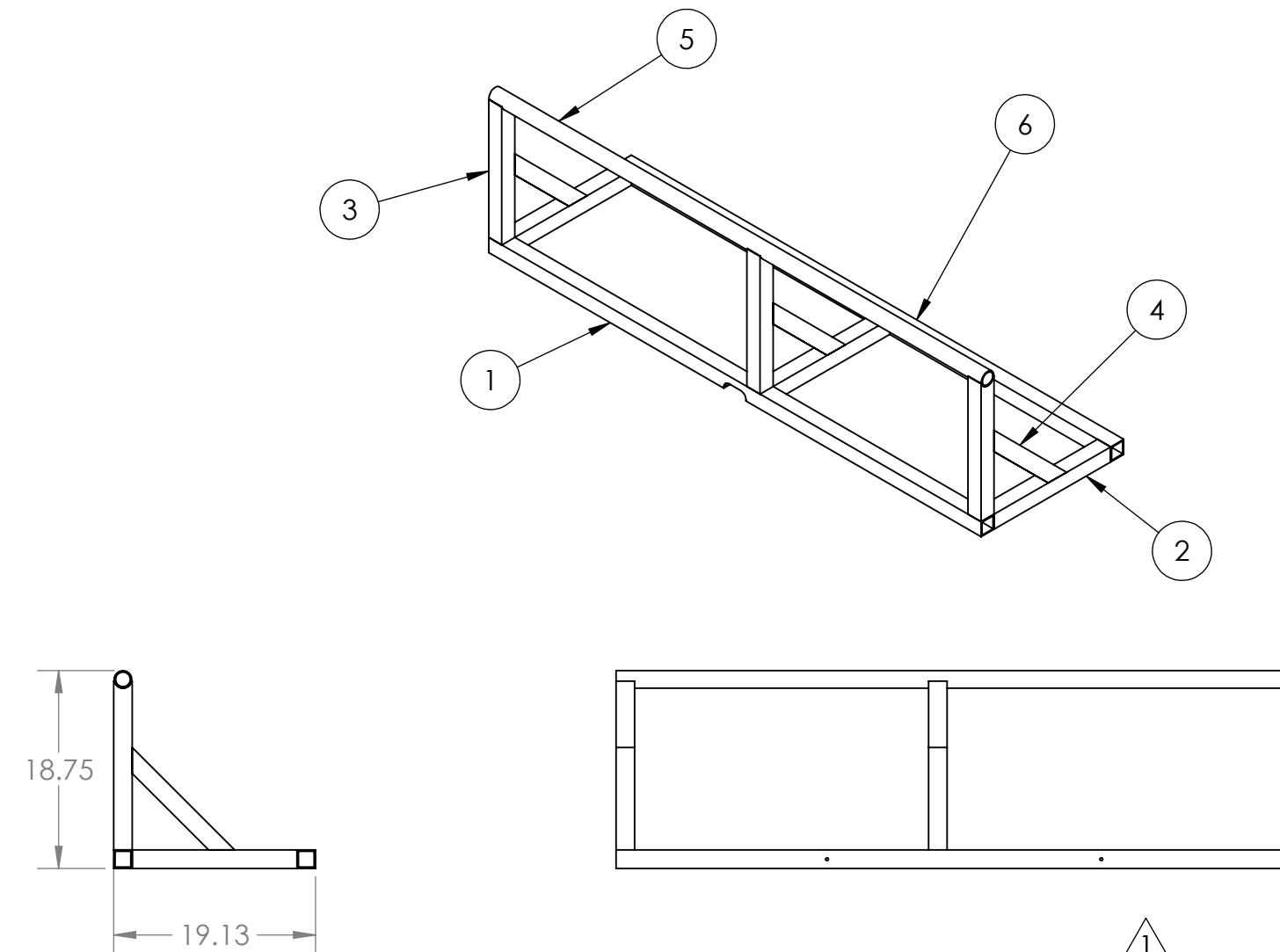
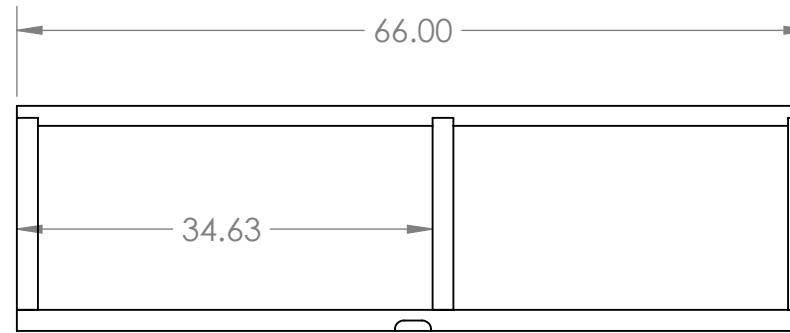
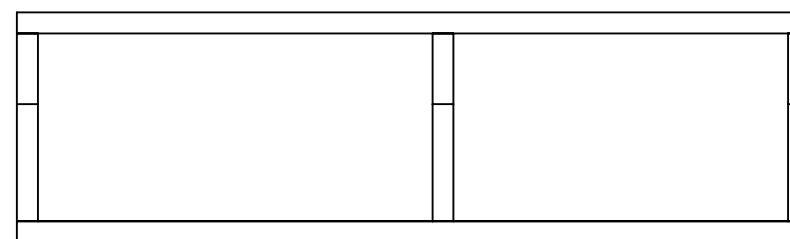
# Vault Bracket

SIZE	DWG. NO.	REV
A	GE-18048	
SCALE: 1:1	WEIGHT:	SHEET 1 OF 1

## REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
A1, 3- A2	1	Added two holes to GE-18051-06	11/21/17	CPO

B



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-18051-01	1.75" x .125" thk. Square Tube, 6061 Aluminum	1
2	GE-18051-02	1.75" x .125" thk. Square Tube, 6061 Aluminum	3
3	GE-18051-03	1.75" x .125" thk. Square Tube, 6061 Aluminum	3
4	GE-18051-04	1.75" x .125" thk. Square Tube, 6061 Aluminum	3
5	GE-18051-05	1-1/4" Schedule 40 Pipe, 6061 Aluminum	1
6	GE-18051-06	1.75" x .125" thk. Square Tube, 6061 Aluminum	1

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		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL: $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$		NAME	DATE
		DRAWN			
		CHECKED			
		ENG APPR.			
		MFG APPR.			
		Q.A.			
		COMMENTS:			
		MATERIAL			
		FINISH			
		APPLICATION	DO NOT SCALE DRAWING		
SIZE	DWG. NO.	REV			
<b>B</b>	<b>GE-18051</b>	<b>1</b>			
SCALE: 1:16	WEIGHT:	SHEET 1 OF 3			

1

# Side Frame, Fence

 FIRST<sup>®</sup> ROBOTICS COMPETITION  SOLIDWORKS  
Modeling Solutions Partner

TITLE:

DWG. NO.

B

GE-18051

1

SCALE: 1:16

WEIGHT:

SHEET 1 OF 3

4

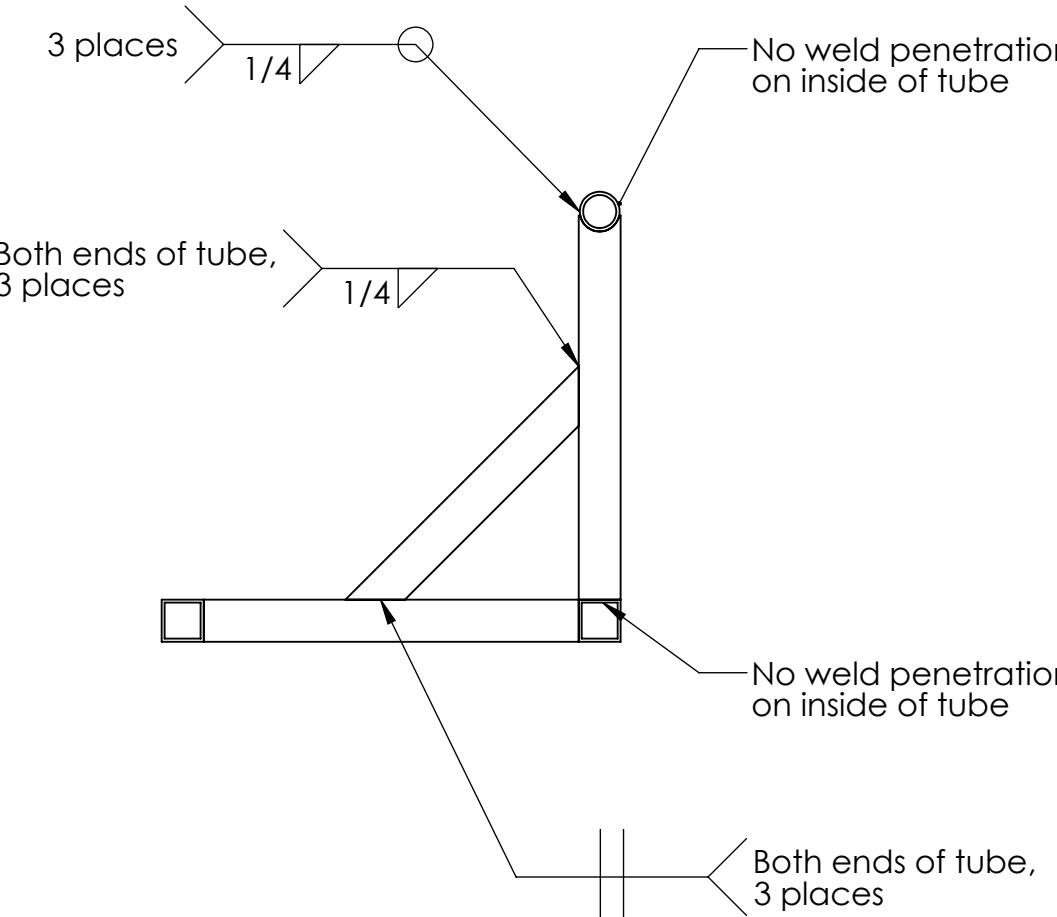
3

2

1

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			
		APPLICATION	DO NOT SCALE DRAWING		

FIRST  
ROBOTICS  
COMPETITION

SOLIDWORKS  
Modeling Solutions Partner

TITLE: Side Frame, Fence

SIZE B DWG. NO. GE-18051 REV 1

SCALE: 1:8 WEIGHT: SHEET 2 OF 3

4

3

2

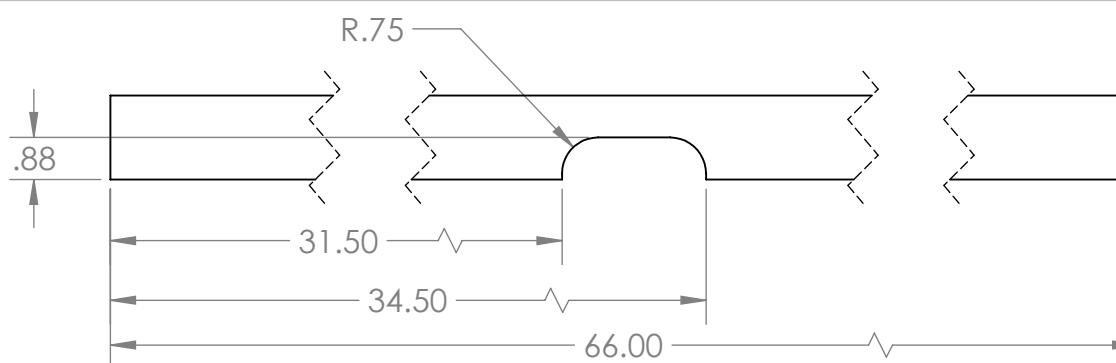
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4

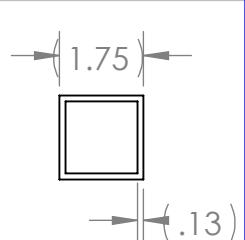
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2

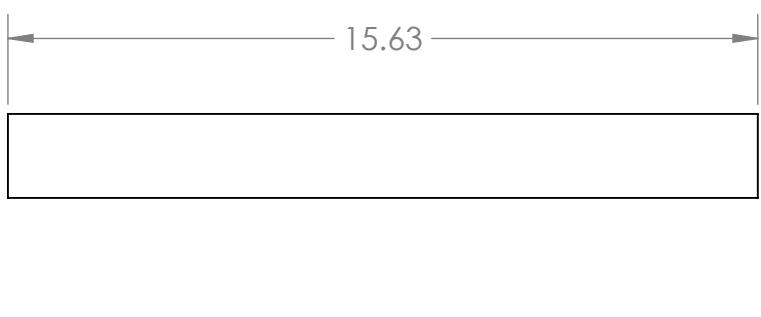
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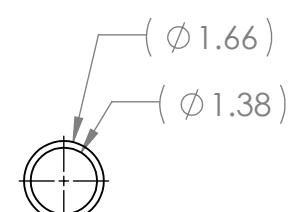
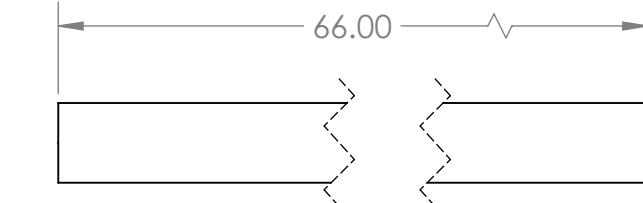
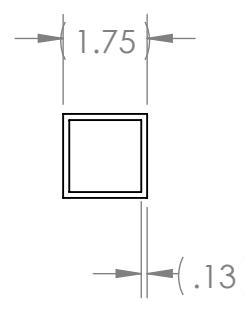
Item: GE-18051-01  
Qty: 1  
Material: 1.75" x .125" thk. Square Tube, 6061 Aluminum



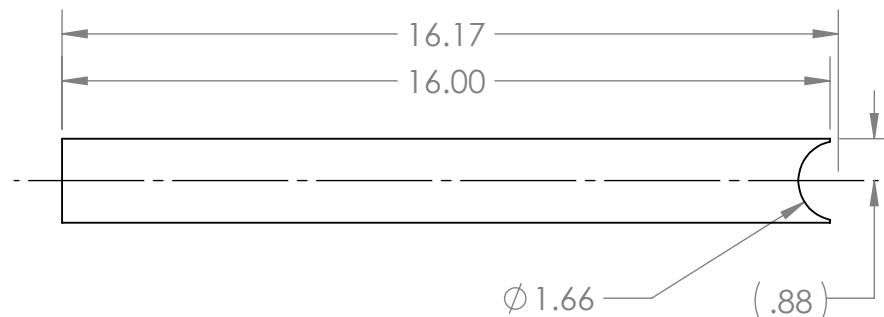
Item: GE-18051-04  
Qty: 3  
Material: 1.75" x .125" thk. Square Tube, 6061 Aluminum



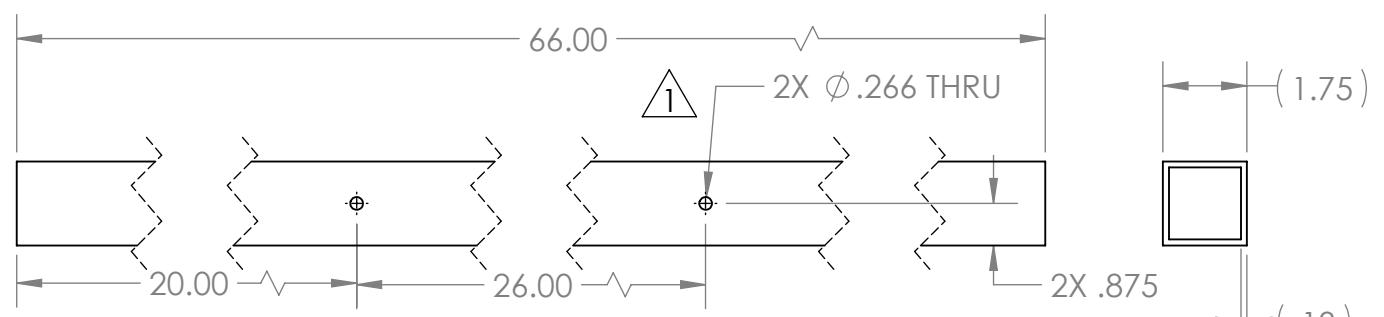
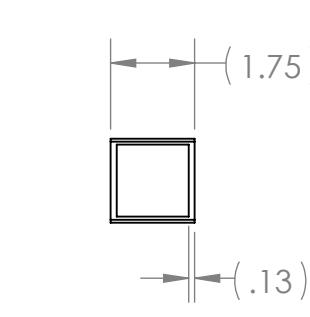
Item: GE-18051-02  
Qty: 3  
Material: 1.75" x .125" thk. Square Tube, 6061 Aluminum



Item: GE-18051-05  
Qty: 1  
Material: 1-1/4" Schedule 40 Pipe, 6061 Aluminum



Item: GE-18051-03  
Qty: 3  
Material: 1.75" x .125" thk. Square Tube, 6061 Aluminum



Item: GE-18051-06  
Qty: 1  
Material: 1.75" x .125" thk. Square Tube, 6061 Aluminum

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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:

Side Frame,  
Fence

SIZE DWG. NO. REV  
**B** GE-18051 1

SCALE: 1:4 WEIGHT: SHEET 3 OF 3

4

3

2

1

4

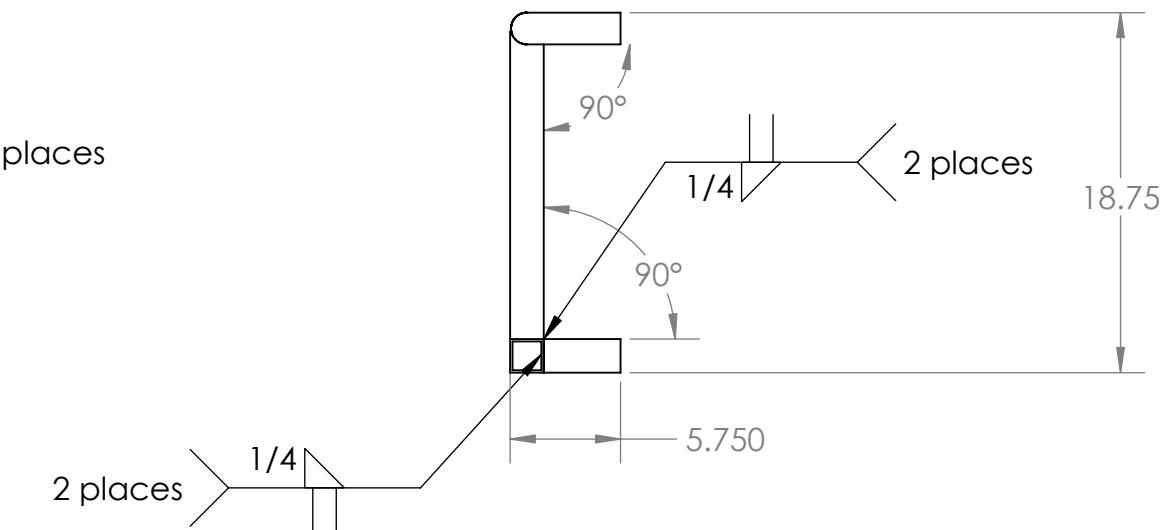
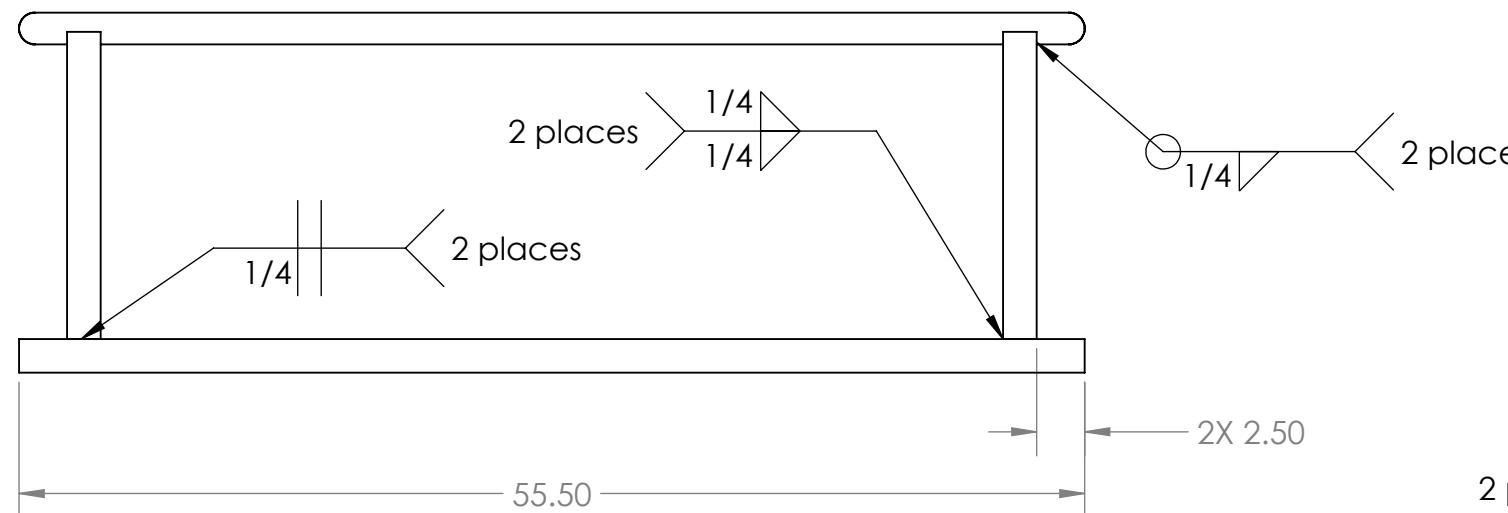
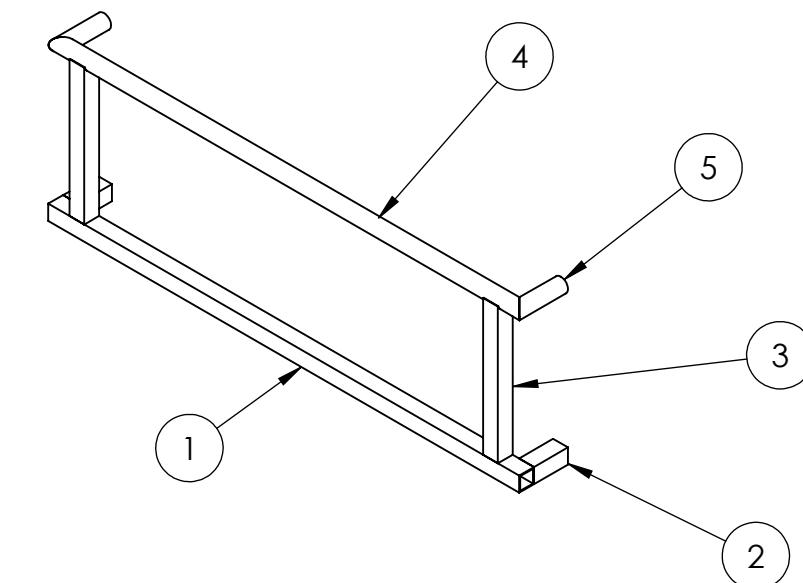
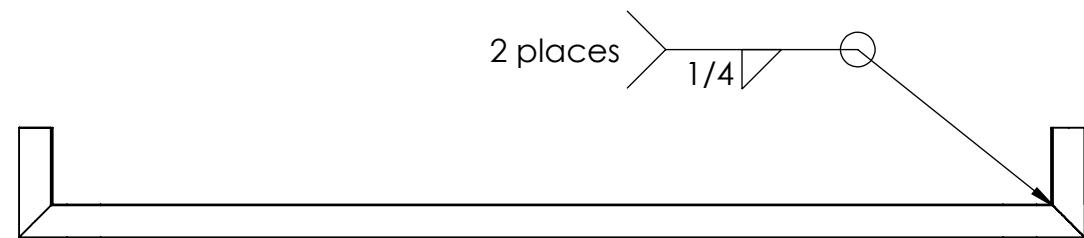
3

2

1

B

B



A

A

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-18052-01	1.75" x .125" thk. Square Tube, 6061 Aluminum	1
2	GE-18052-02	1.75" x .125" thk. Square Tube, 6061 Aluminum	2
3	GE-18052-03	1.75" x .125" thk. Square Tube, 6061 Aluminum	2
4	GE-18052-04	1-1/4" Schedule 40 Pipe, 6061 Aluminum	1
5	GE-18052-05	1-1/4" Schedule 40 Pipe, 6061 Aluminum	2

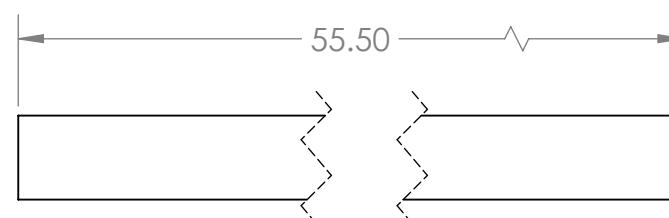
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4

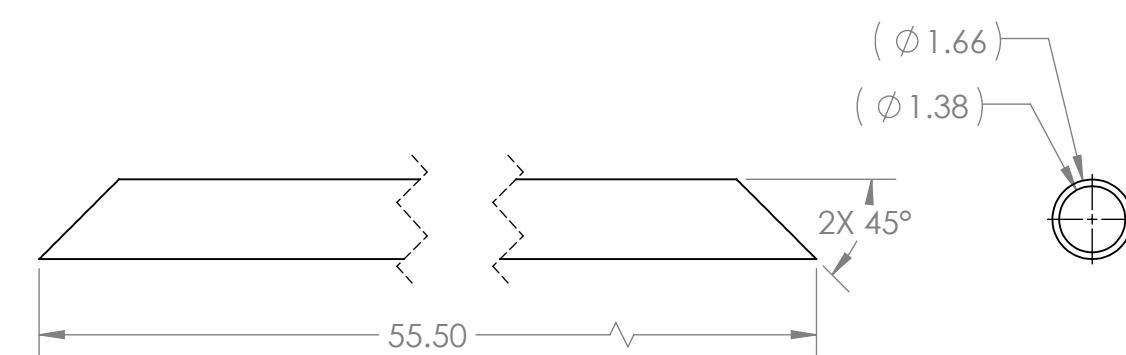
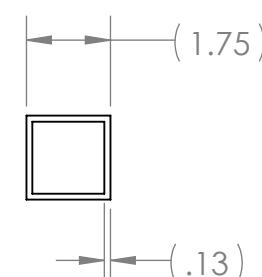
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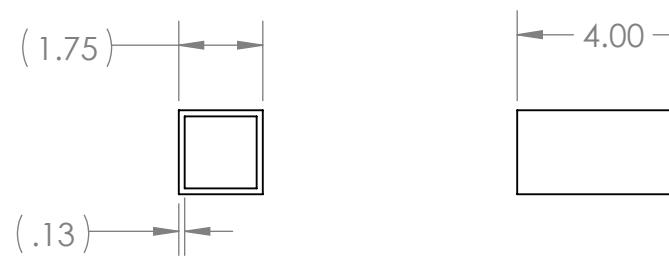
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Item: GE-18052-01  
Qty: 1  
Material: 1.75" x .125" thk. Square Tube, 6061 Aluminum

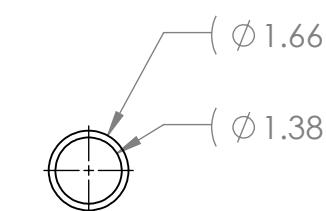
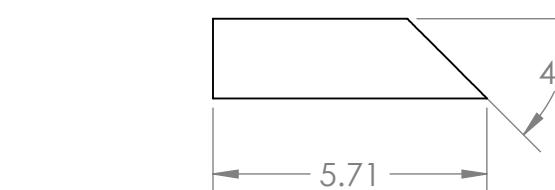
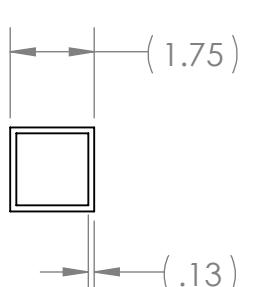


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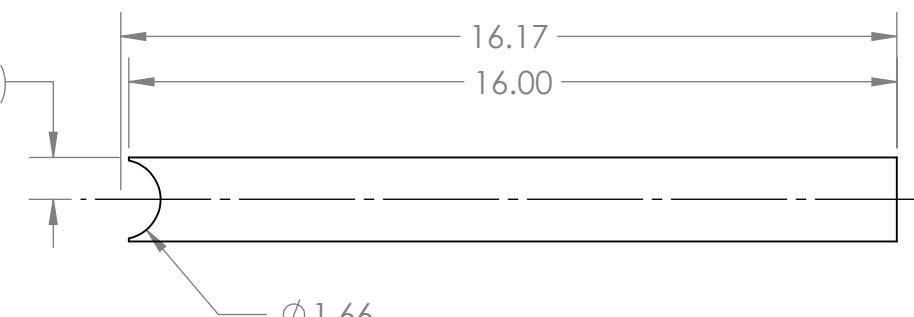


Item: GE-18052-02  
Qty: 2  
Material: 1.75" x .125" thk. Square Tube, 6061 Aluminum

Item: GE-18052-04  
Qty: 1  
Material: 1-1/4" Schedule 40 Pipe, 6061 Aluminum



Item: GE-18052-05  
Qty: 2  
Material: 1-1/4" Schedule 40 Pipe, 6061 Aluminum



Item: GE-18052-03  
Qty: 2  
Material: 1.75" x .125" thk. Square Tube, 6061 Aluminum

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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		
			FINISH		
NEXT ASSY	USED ON		APPLICATION	DO NOT SCALE DRAWING	

FIRST  
ROBOTICS  
COMPETITION

SOLIDWORKS  
Modeling Solutions Partner

End Frame,  
Fence

SIZE DWG. NO. REV  
**B** GE-18052  
SCALE: 1:4 WEIGHT: SHEET 2 OF 2

4

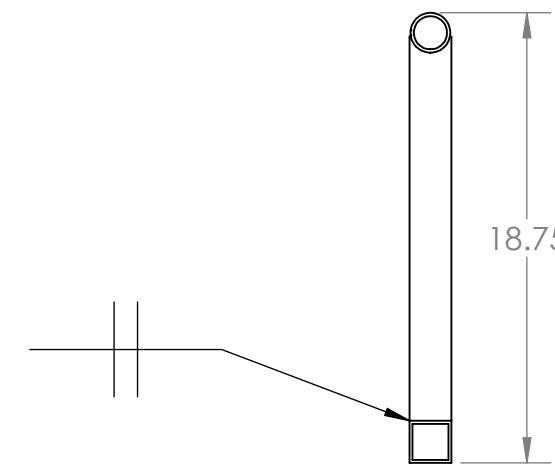
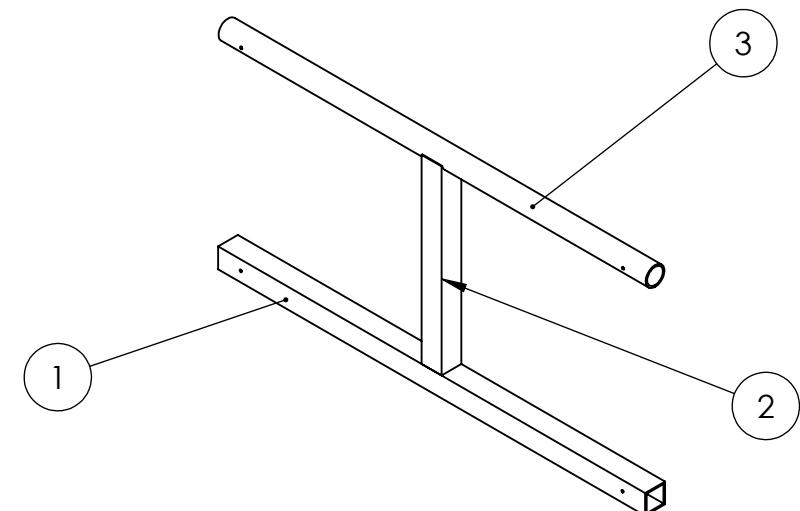
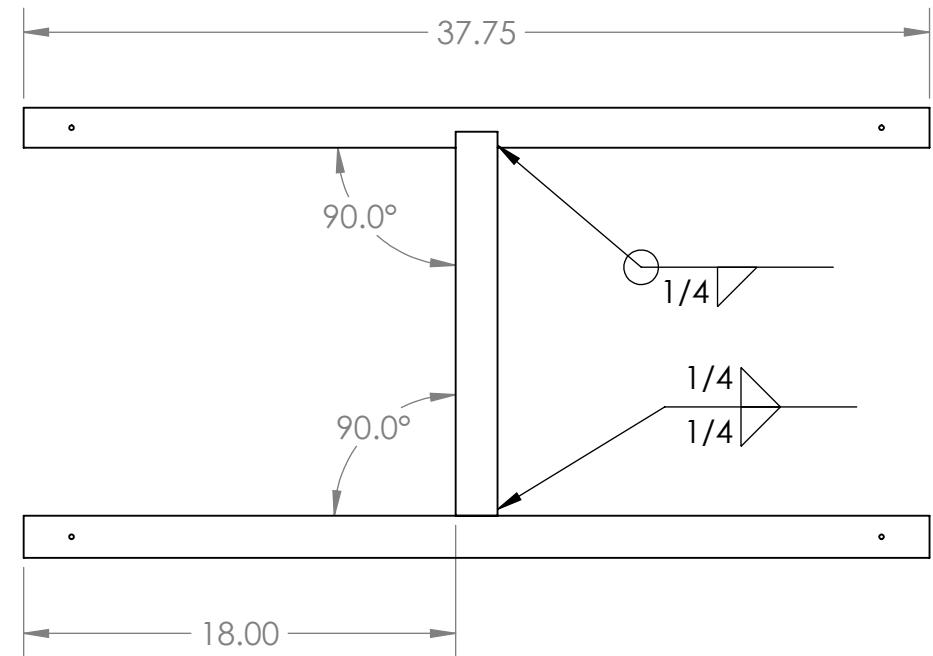
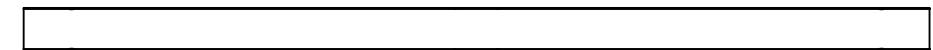
3

2

1

B

B



A

A

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-18053-01	1.75" x .125" thk. Square Tube, 6061 Aluminum	1
2	GE-18053-02	1.75" x .125" thk. Square Tube, 6061 Aluminum	1
3	GE-18053-03	1-1/4" Schedule 40 Pipe, 6061 Aluminum	1

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

**FIRST<sup>®</sup> ROBOTICS COMPETITION** **SOLIDWORKS**  
Modeling Solutions Partner

**Connecting Frame, Fence**

**SIZE** **DWG. NO.** **REV**  
**B** **GE-18053**

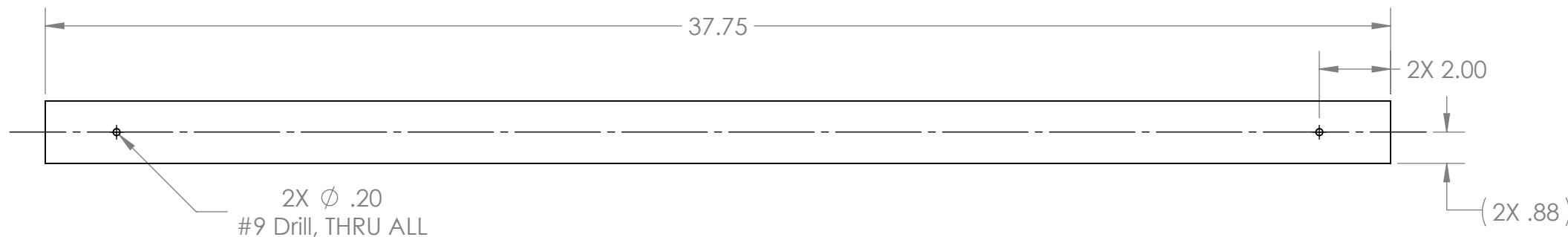
**SCALE: 1:8** **WEIGHT:** **SHEET 1 OF 2**

4

3

2

1

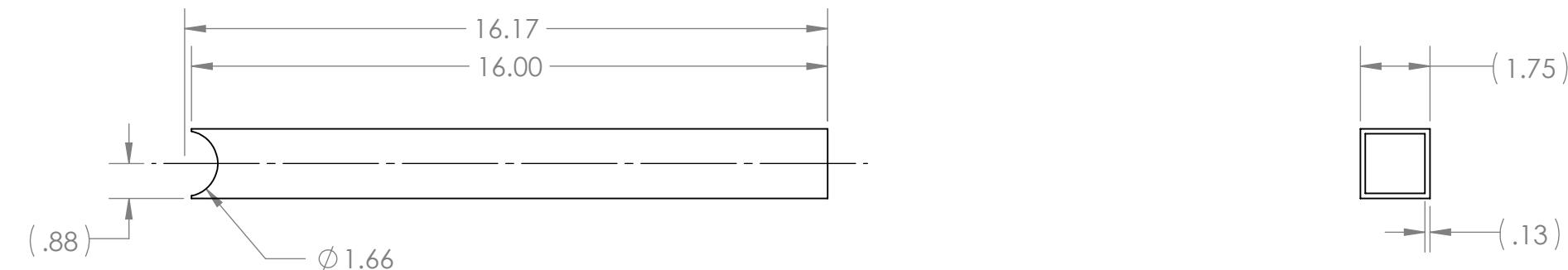


Item: GE-18053-01

Qty: 1

Material: 1.75" x .125" thk. Square Tube, 6061 Aluminum

B

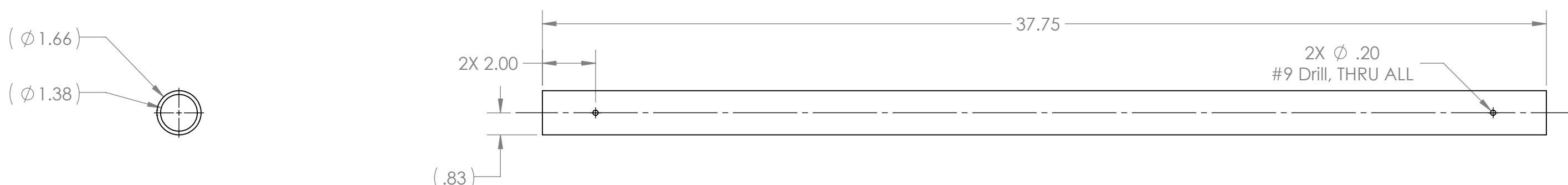


Item: GE-18053-02

Qty: 1

Material: 1.75" x .125" thk. Square Tube, 6061 Aluminum

B



A

Item: GE-18053-03

Qty: 1

Material: 1-1/4" Schedule 40 Pipe, 6061 Aluminum

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

**Connecting Frame, Fence**

**SIZE** DWG. NO. REV  
**B** **GE-18053**

SCALE: 1:4 WEIGHT: SHEET 2 OF 2

4

3

2

1

4

3

2

1

D

D

C

C

B

B

Technical drawing showing a component with various dimensions and labeled parts. The top part shows a horizontal bar with a total width of 38.00. The middle section shows a rectangular frame with a total width of 8.50 and a height of 12.00. The bottom section shows a vertical structure with a total height of 84.00, divided into segments of 52.75 and 31.25. Callouts point to specific features: callout 3 points to the bottom-most horizontal line; callout 4 points to a small horizontal protrusion on the left side; callout 6 points to a vertical line on the right side; and callout 7 points to a vertical line on the right side of the middle section.

DETAIL A  
SCALE 1:6

Top of item 6 tangent to top face of item 7

A technical drawing showing a vertical column with a horizontal top plate. A dimension line at the top indicates a width of 17.00. A callout 'A' points to a detail of the top corner where a square cutout is shown. The column has several circular holes along its length, and a horizontal plate is attached to the bottom.

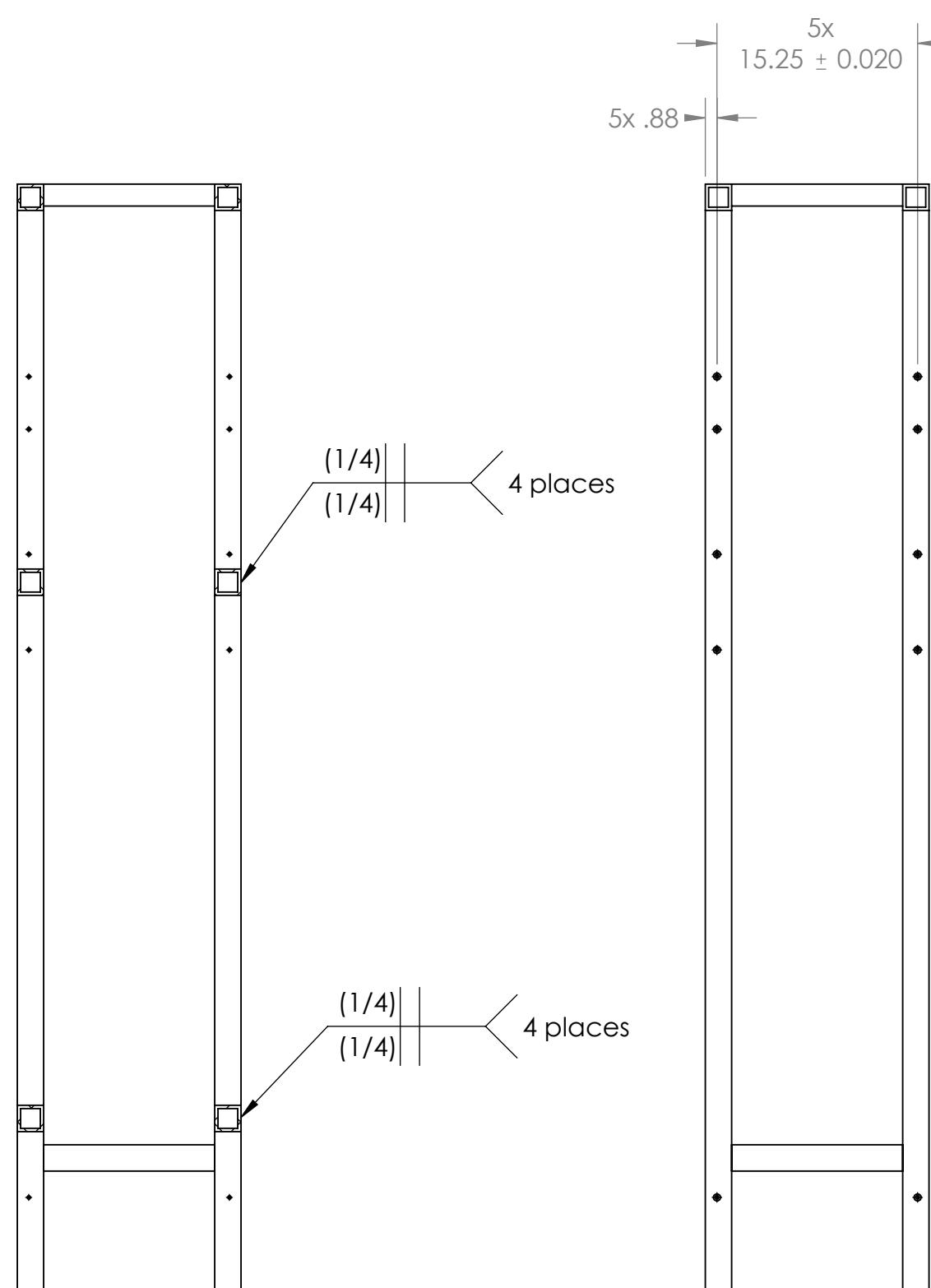
A 3D perspective view of a metal frame structure, likely a ladder or step stool. The frame is constructed from dark grey metal rods. It features a vertical leg on the left, a vertical support on the right, and a diagonal brace connecting them. A horizontal top rail and a horizontal cross rail provide stability. Callouts with numbers 1 and 2 point to specific parts of the frame: callout 1 points to the vertical support on the right, and callout 2 points to the diagonal brace.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-18054-1	2" x .25" thk. Square Tube, 6061 Aluminum	2
2	GE-18054-2	2" x .25" thk. Square Tube, 6061 Aluminum	2
3	GE-18054-3	2" x .25" thk. Square Tube, 6061 Aluminum	2
4	GE-18054-4	2" x .25" thk. Square Tube, 6061 Aluminum	2
5	GE-18054-5	2" x .25" thk. Square Tube, 6061 Aluminum	2
6	GE-18054-6	1-1/4" Schedule 40 Pipe, 6061 Aluminum	2
7	GE-18054-7	2" x .25" thk. Square Tube, 6061 Aluminum	2

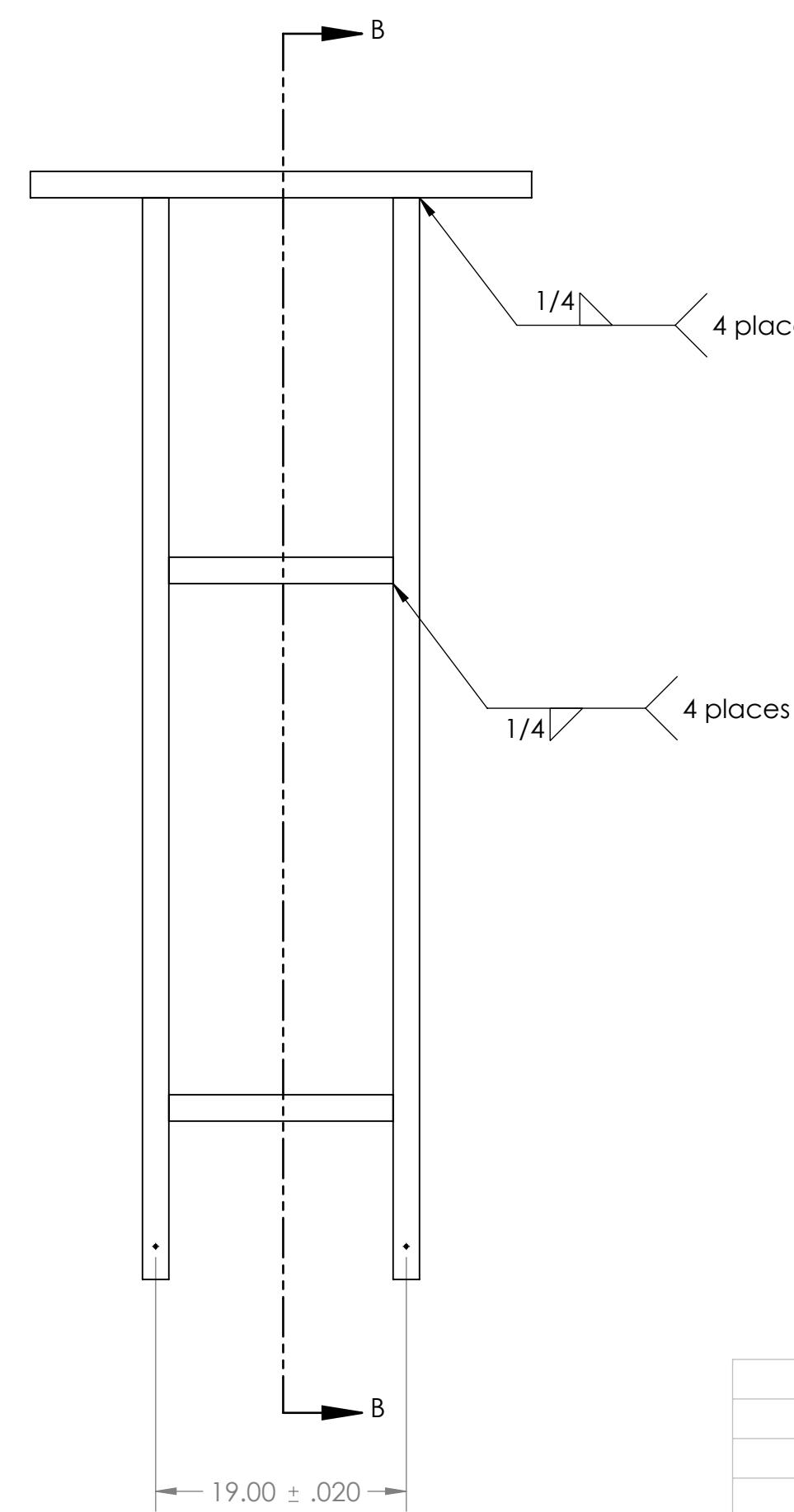
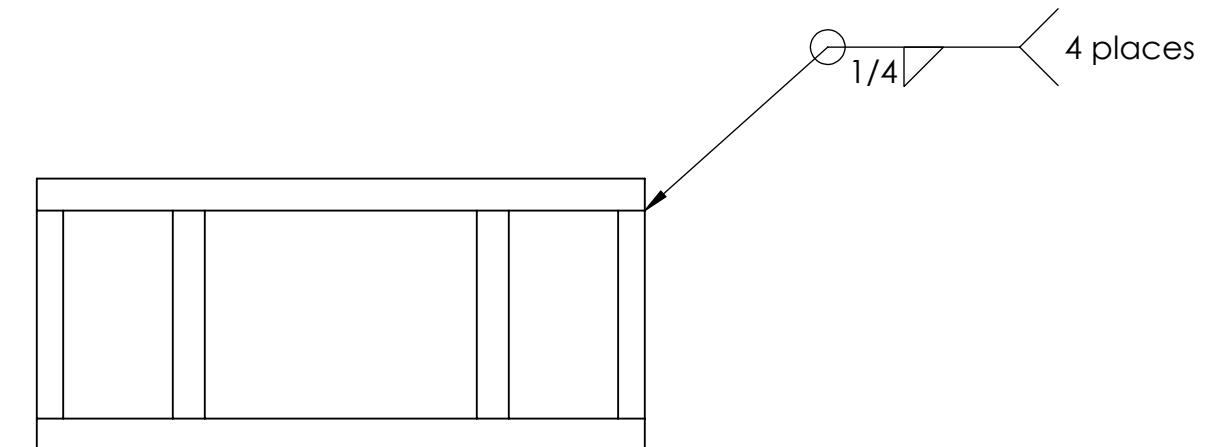
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		DIMENSIONS ARE IN INCHES	DRAWN					
		TOLERANCES:	CHECKED					
		FRACTIONAL $\pm 1/16$	ENG APPR.					
		ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$	MFG APPR.					
		TWO PLACE DECIMAL $\pm .01$	Q.A.					
		THREE PLACE DECIMAL $\pm .001$	COMMENTS:					
		INTERPRET GEOMETRIC TOLERANCING PER:						
		MATERIAL						
NEXT ASSY	USED ON	FINISH						
APPLICATION		DO NOT SCALE DRAWING						
						SIZE	DWG. NO.	REV
						<b>C</b>	<b>GE-18054</b>	
						SCALE: 1:12	WEIGHT:	SHEET 1 OF 6

D



SECTION B-B



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

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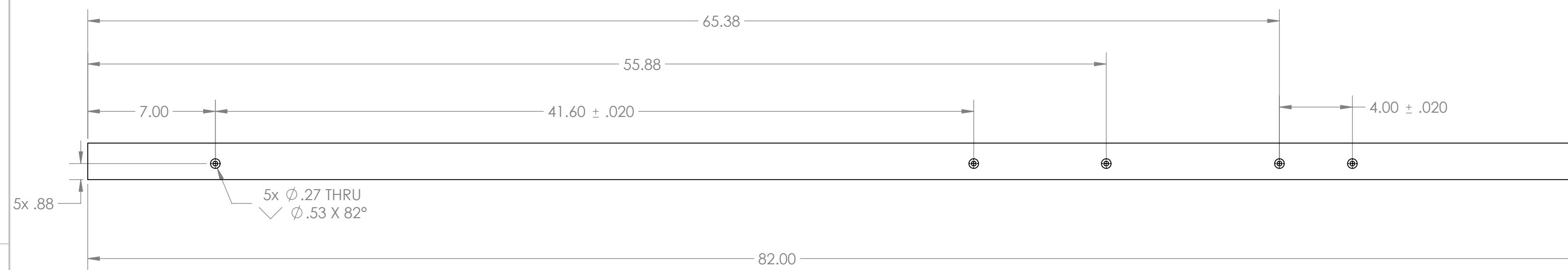
**Scale Frame**

**SIZE** DWG. NO. **C** **GE-18054** **REV**

SCALE: 1:12 WEIGHT: **1** SHEET 2 OF 6

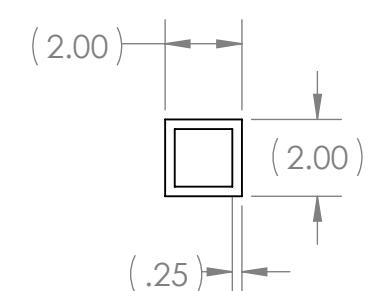
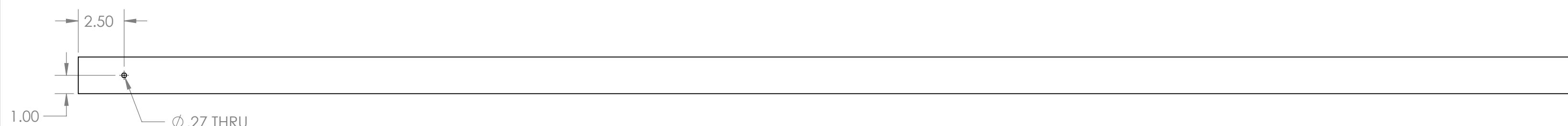
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D



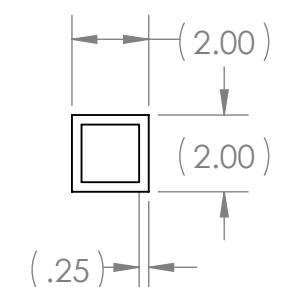
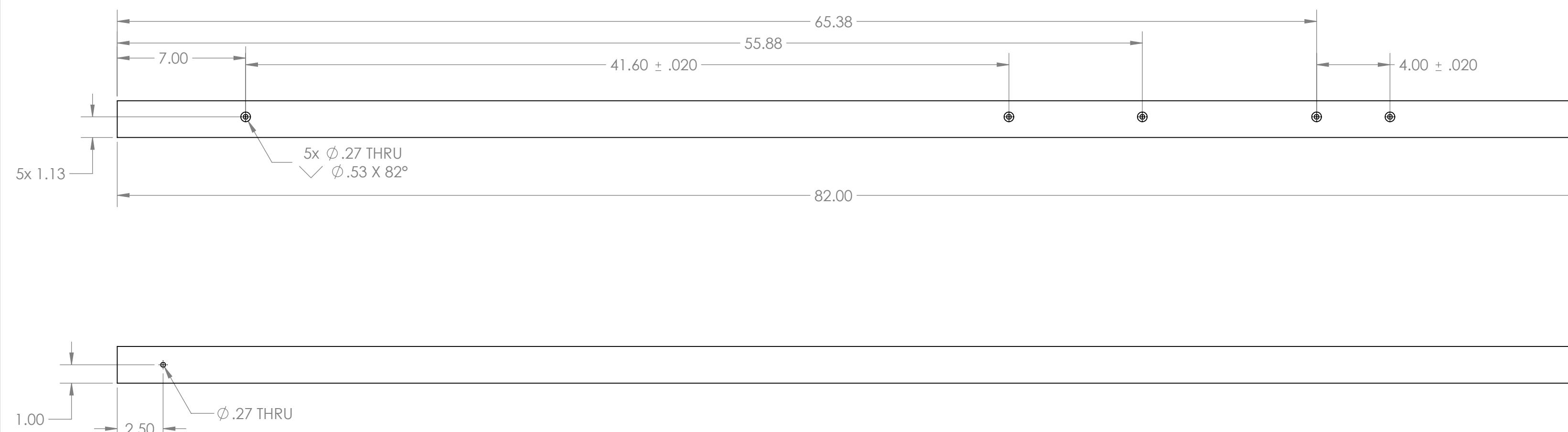
C

C



B

B



A

A

Item: GE-18054-1  
Material: 2" x .25" thk. Square Tube, 6061 Aluminum  
Scale: 1:5  
QTY: 2

Item: GE-18054-2  
Material: 2" x .25" thk. Square Tube, 6061 Aluminum  
Scale: 1:6  
QTY: 2

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

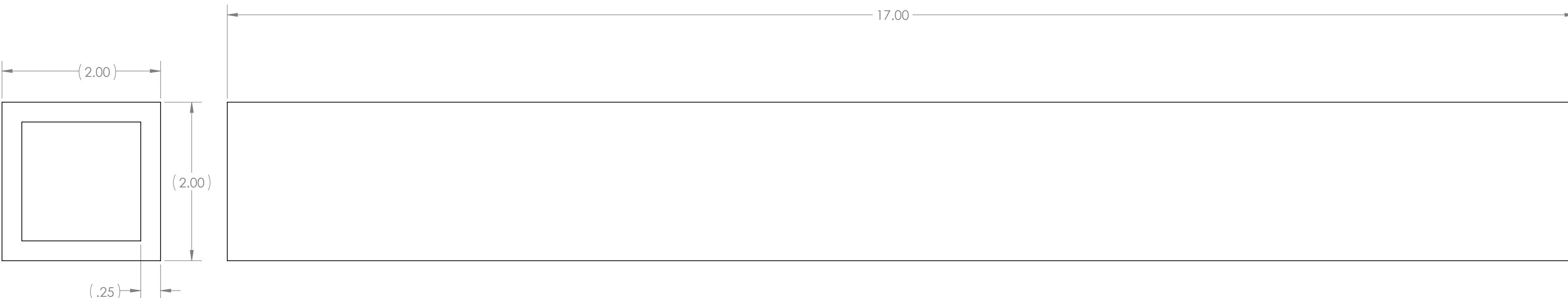
FIRST  
ROBOTICS  
COMPETITION  
SOLIDWORKS  
Modeling Solutions Partner

TITLE: Scale Frame

SIZE DWG. NO. REV  
C GE-18054

SCALE: 1:5 WEIGHT: SHEET 3 OF 6

D



Item: GE-18054-3  
 Material: 2" x .25" thk. Square Tube, 6061 Aluminum  
 Scale: 1:1  
 QTY: 2

B



Item: GE-18054-4  
 Material: 2" x .25" thk. Square Tube, 6061 Aluminum  
 Scale: 1:1  
 QTY: 2

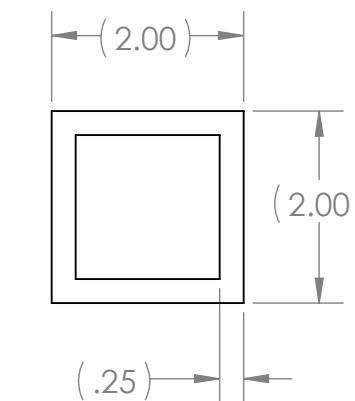
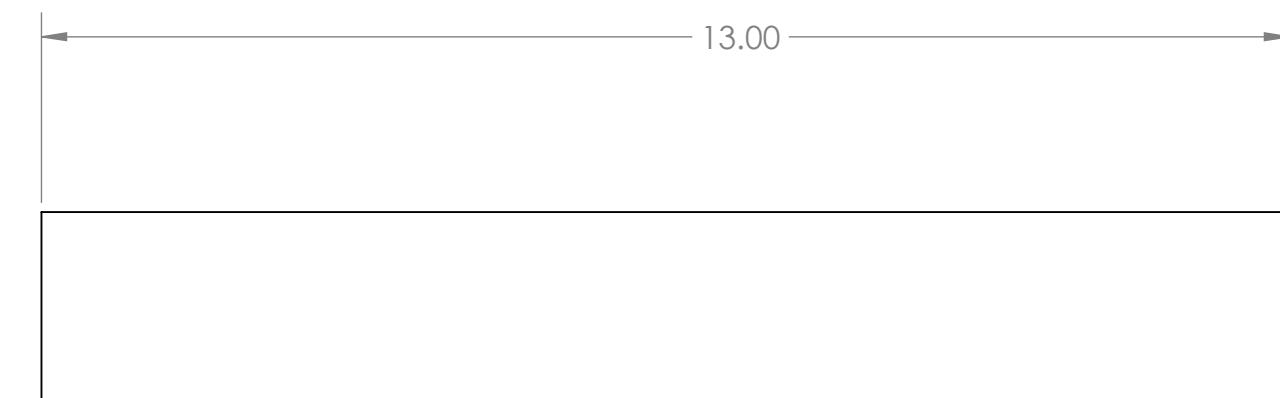
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		TOLERANCES	CHECKED		
		FRACTIONAL: $\pm 1/16$	ENG APPR.		
		ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$	MFG APPR.		
		TWO PLACE DECIMAL $\pm .01$	Q.A.		
		THREE PLACE DECIMAL $\pm .001$	COMMENTS:		
		INTERPRET GEOMETRIC TOLERANCING PER:	MATERIAL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

**Scale Frame**  
 FIRST<sup>®</sup> ROBOTICS<sup>®</sup> COMPETITION  
 SOLIDWORKS<sup>®</sup>  
 Modeling Solutions Partner  
 SIZE DWG. NO. REV  
**C GE-18054**  
 SCALE: 1:1 WEIGHT: SHEET 4 OF 6

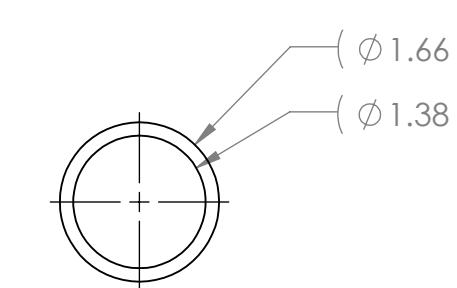
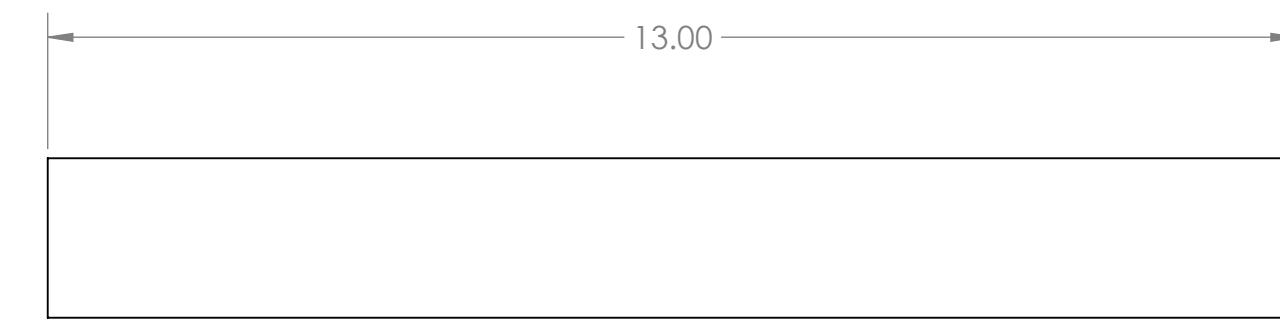
D



C

Item: GE-18054-5  
 Material: 2" x .25" thk. Square Tube, 6061 Aluminum  
 Scale: 1:1  
 QTY: 2

B



A

Item: GE-18054-6  
 Material: 1-1/4" Schedule 40 Pipe, 6061 Aluminum  
 Scale: 1:1  
 QTY: 2

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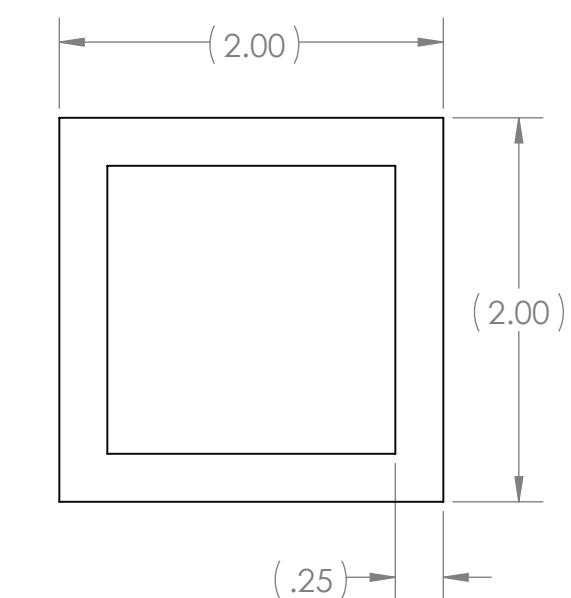
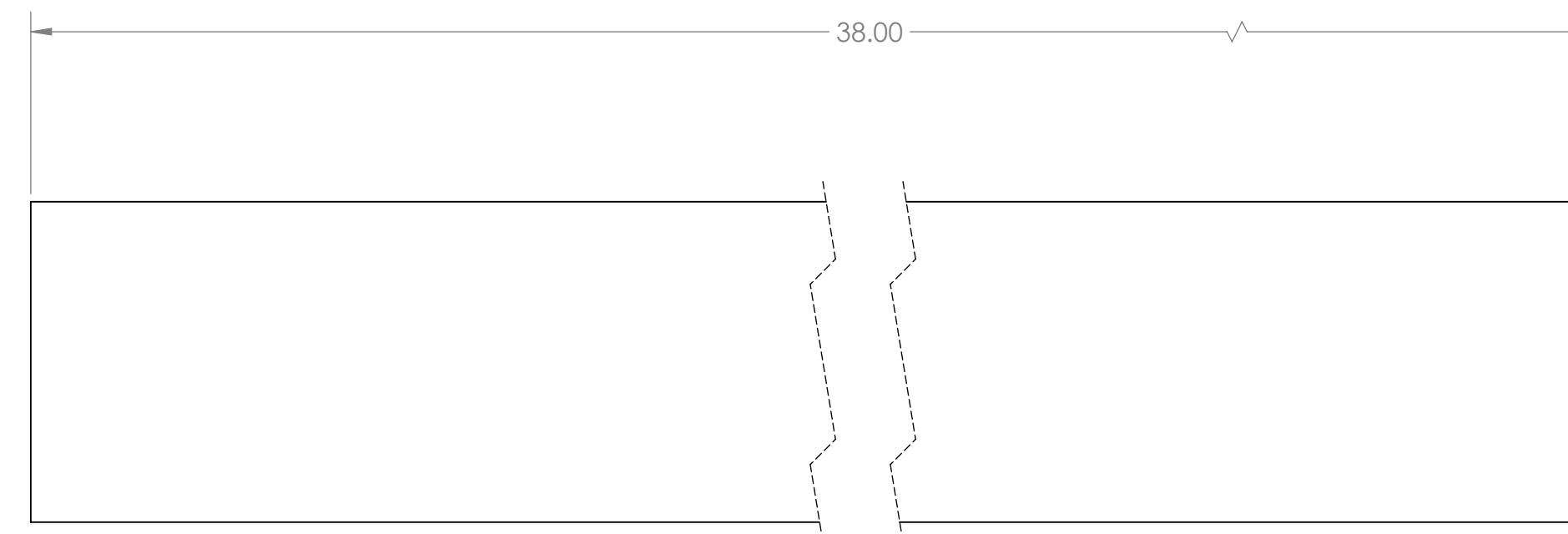
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		TOLERANCES	CHECKED		
		FRACTIONAL: $\pm 1/16$	ENG APPR.		
		ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$	MFG APPR.		
		TWO PLACE DECIMAL $\pm .01$	Q.A.		
		THREE PLACE DECIMAL $\pm .001$	COMMENTS:		
		INTERPRET GEOMETRIC TOLERANCING PER:			
		MATERIAL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

**Scale Frame**

**SIZE** DWG. NO. **REV**  
**C** **GE-18054**

SCALE: 1:2 WEIGHT: SHEET 5 OF 6

D



Item: GE-18054-7  
 Material: 2" x .25" thk. Square Tube, 6061 Aluminum  
 Scale: 1:1  
 QTY: 2

C

D

B

C

A

B

A

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		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		

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SOLIDWORKS  
 Modeling Solutions Partner

TITLE: Scale Frame

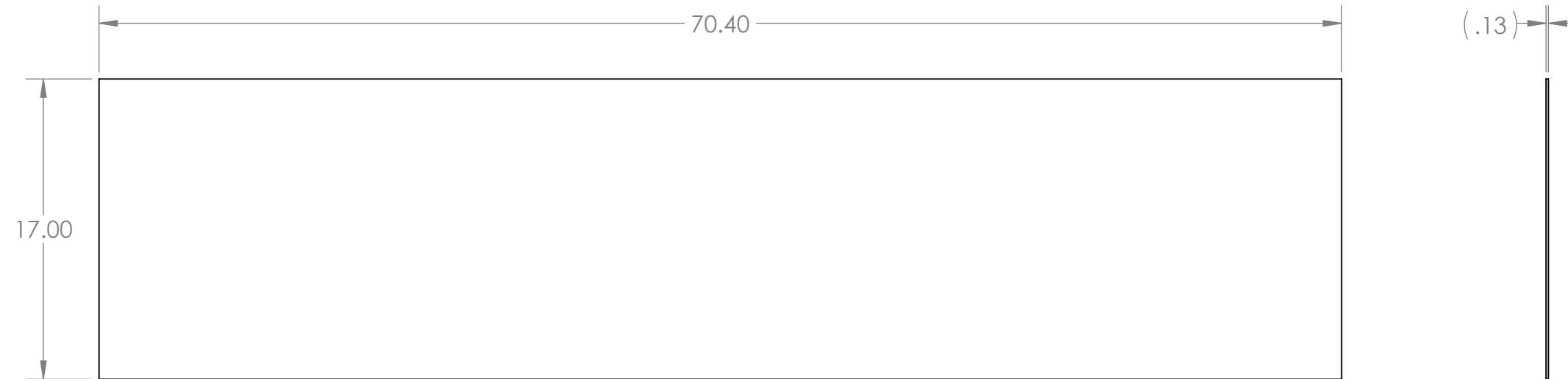
SIZE DWG. NO. REV

C GE-18054

SCALE: 1:1 WEIGHT: SHEET 6 OF 6

B

B



## Notes:

1. Material: 1/8" thick, clear polycarbonate.
2. Remove all burrs and sharp edges.

A

A

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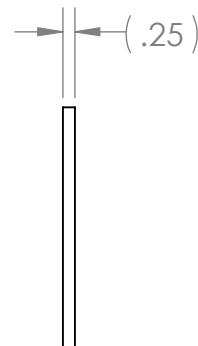
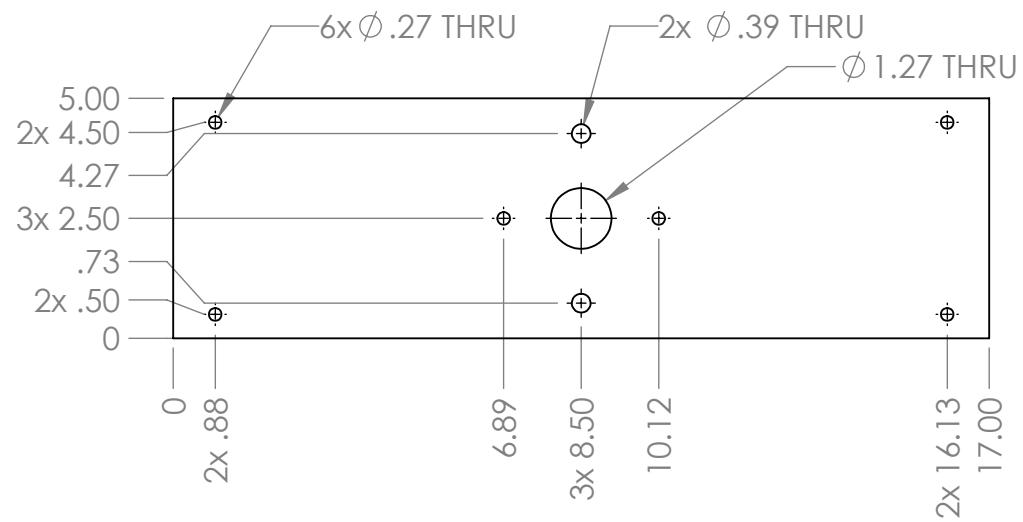
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		DRAWN			
		CHECKED			
		ENG APPR.			
		MFG APPR.			
		Q.A.			
		COMMENTS:			
		MATERIAL			
		INTERPRET GEOMETRIC TOLERANCING PER:			
		NEXT ASSY	USED ON	FINISH	
		APPLICATION		DO NOT SCALE DRAWING	

**FIRST** ROBOTICS COMPETITION **SOLIDWORKS**  
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**Outrigger Top Polycarbonate**

**B** GE-18055

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



## Notes:

1. Material: 1/4" thick, clear polycarbonate.
2. Remove all burrs and sharp edges.

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



**SOLIDWORKS**  
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TITLE:

# Bearing Damper Polycarbonate

SIZE	DWG. NO.	REV
<b>A</b>	<b>GE-18056</b>	
SCALE: 1:4	WEIGHT:	SHEET 1 OF 1

B

B



## Notes:

1. Material: 1/8" thick, black HDPE.
2. Surface: Smooth texture.
3. Remove all burrs and 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

**Scale Side HDPE**

**B** GE-18057

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

4

3

2

1



B

B

A

A

## Notes:

1. Material: 1/8" thick, black HDPE.
2. Surface: Smooth texture.
3. Remove all burrs and 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

**Scale Top HDPE**

**SIZE** DWG. NO. **B** GE-18058 **REV**

SCALE: 1:3 WEIGHT: SHEET 1 OF 1

4

3

2

1

B

B



## Notes:

1. Material: 1/8" thick, black HDPE.
2. Surface: Smooth texture.
3. Remove all burrs and 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

**Sensor Curtain**

**SIZE** DWG. NO. **REV**  
**B** **GE-18059**

SCALE: 1:2 WEIGHT: SHEET 1 OF 1

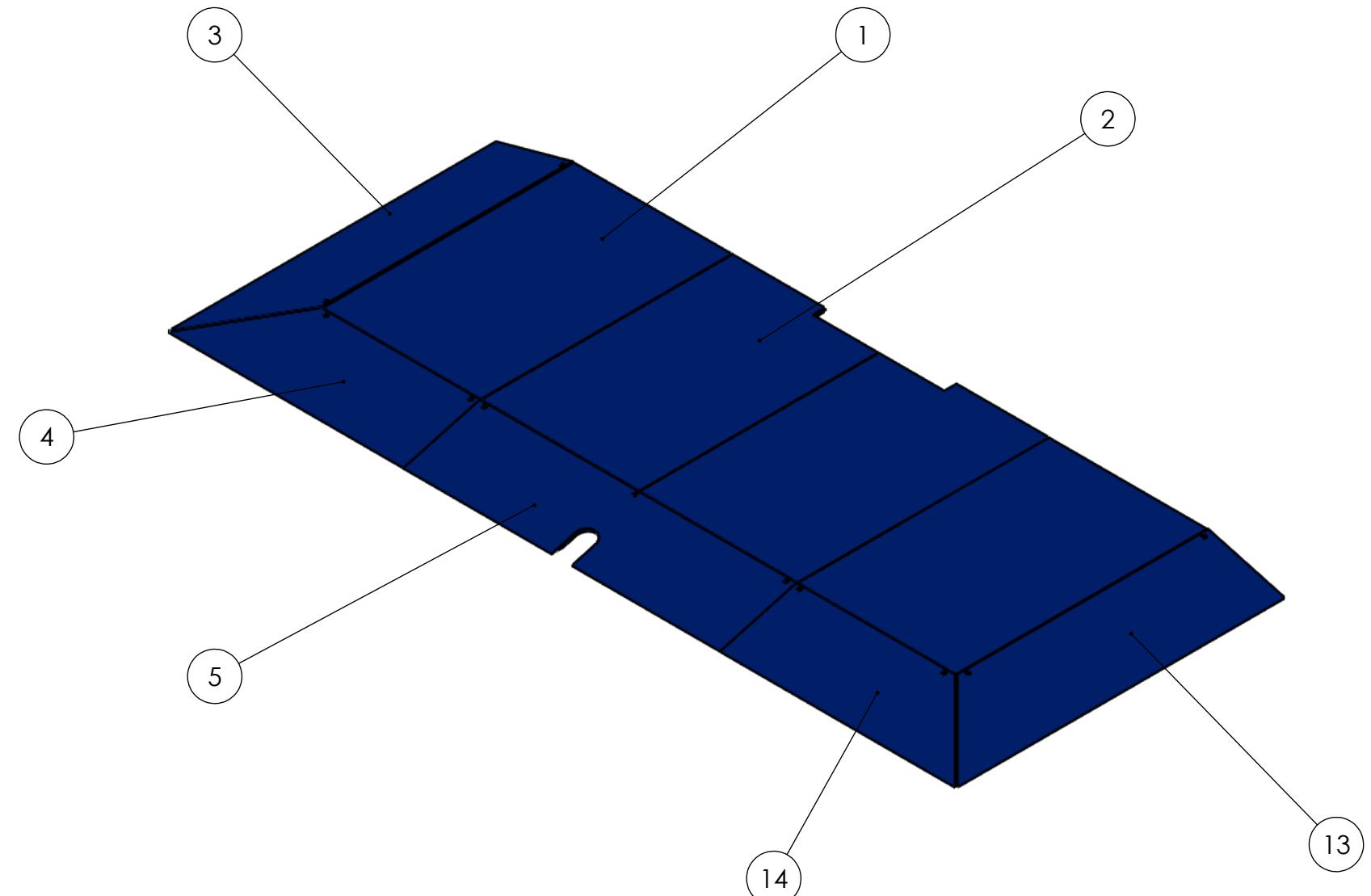
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B

ITEM NO.	PART NUMBER	DESCRIPTION	Default/ QTY.
1	GE-18061	Platform Top	2
2	GE-18062	Platform Top Notch	2
3	GE-18063	Platform Short Side	1
4	GE-18064	Platform Long Side	1
5	GE-18065	Platform Long Side Middle	1
6	GE-18066	Platform Brace, Long Side 1	4
7	GE-18067	Platform Brace, Long Side 2	2
8	GE-18068	Platform Brace, Short Side 1	6
9	GE-18069	Platform Brace, Mid Section	2
10	GE-18070	Platform Angle, Short Side	2
11	GE-18071	Platform Angle, Long Side	2
12	GE-18072	Platform Angle, Long Side Middle	1
13	GE-18073	Platform Short Side Mirrored	1
14	GE-18074	Platform Long Side Mirrored	1
15	GE-18105	Platform Brace, Short Side 2	2
16	flat_hex_.25_20_1	Steel Hex Flat Head Screw, 1/4"-20 x 1" long, fully threaded	11
17	nylock_.25_20	Steel Nylon-Insert Locknut, 1/4"-20	11

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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>B</b>	<b>GE-18060</b>			
SCALE: 1:32	WEIGHT:	SHEET 1 OF 3		

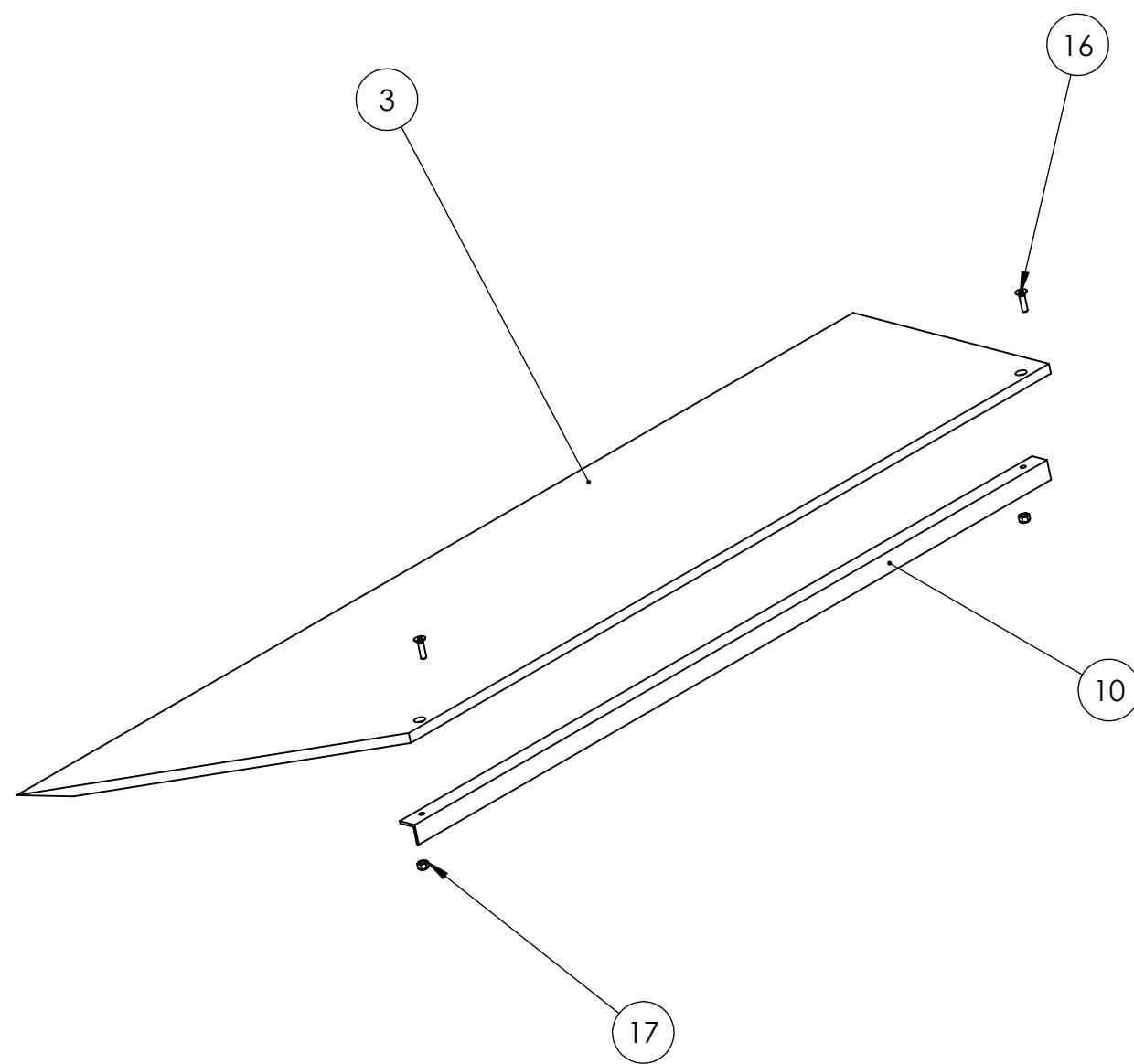


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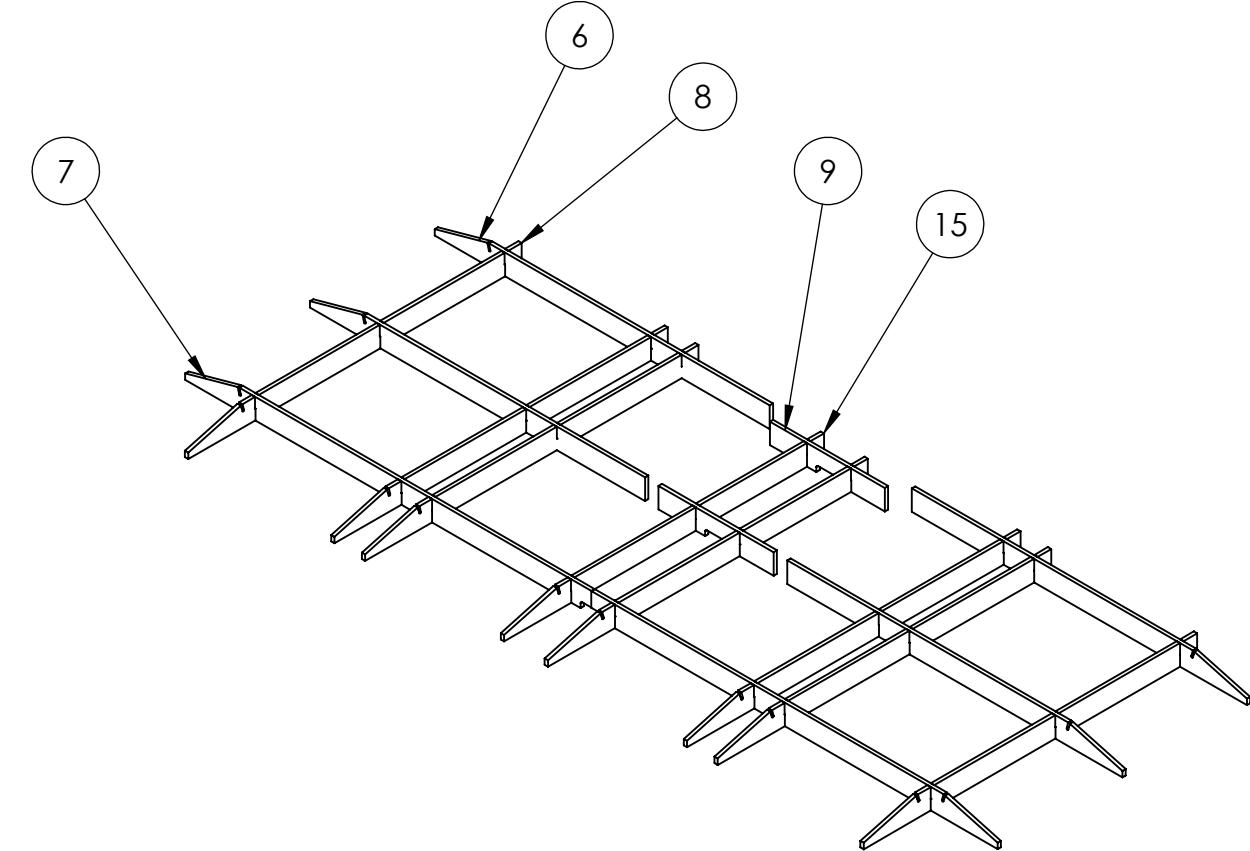
1



Notes:  
Bolt Item 10 to Item 13 using Items 16 and 17. Repeat steps for the following Items, using Items 16 and 17 to fasten:

HDPE	Aluminum Angle
Item 4	Item 11
Item 5	Item 12
Item 13	Item 10
Item 14	Item 11

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Notes:  
Slot Items 6, 7, 8, 9, 15 together.

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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>B</b>	<b>GE-18060</b>				
SCALE: 1:32	WEIGHT:	SHEET 2 OF 3			

4

3

2

1

4

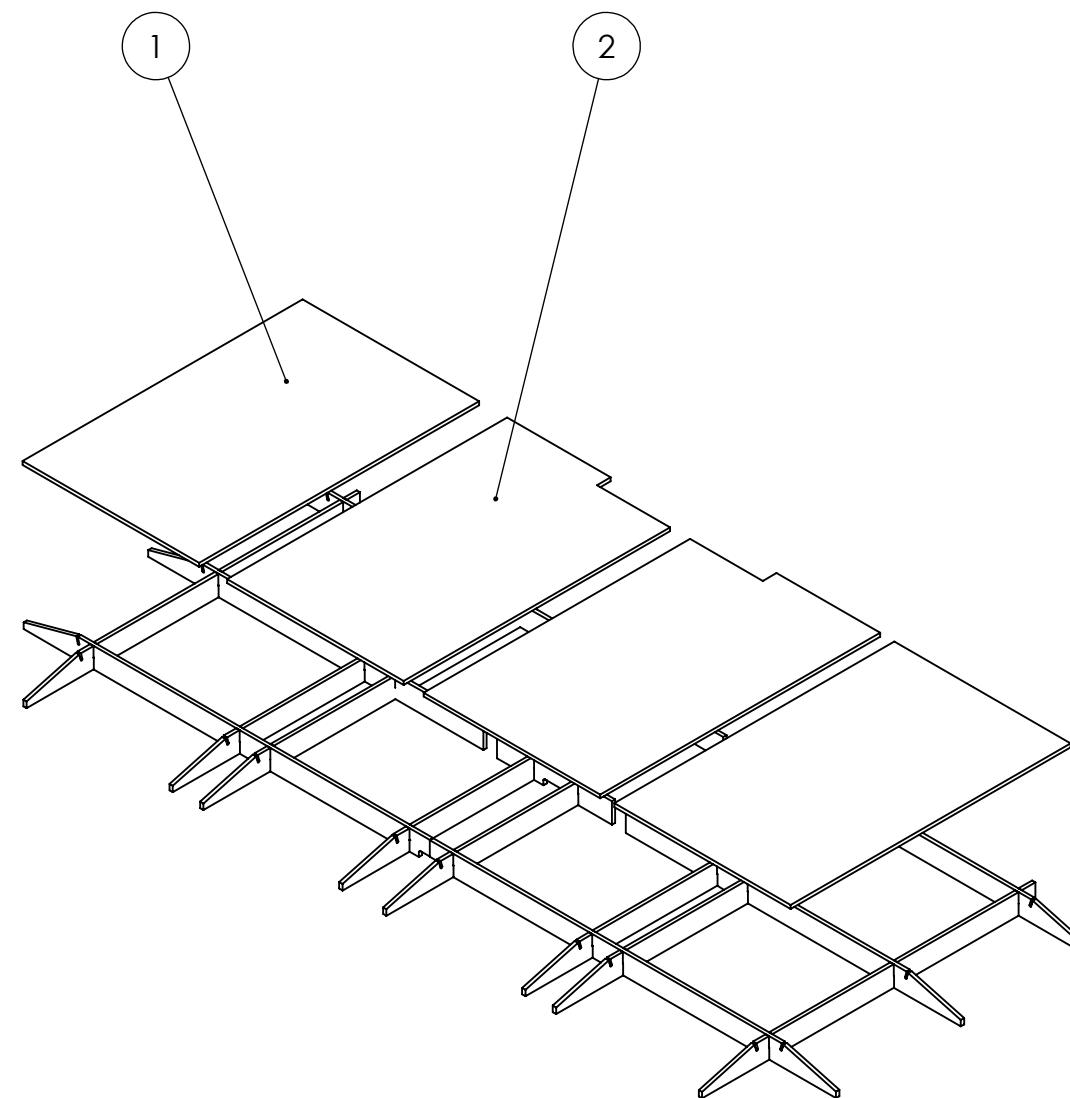
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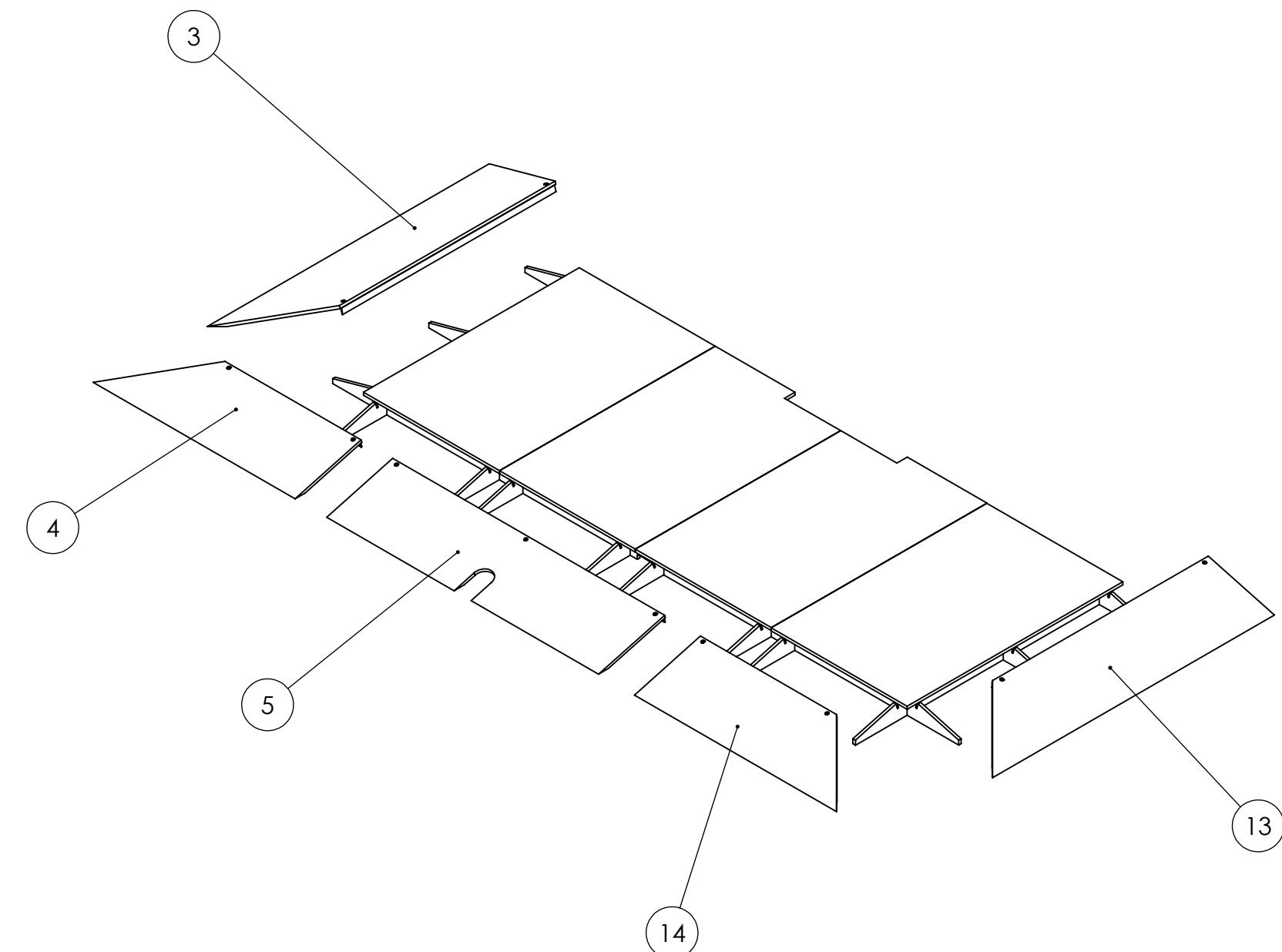
1

B

B



Notes:  
Attach Items 1 and 2 using hook and loop.



Notes:  
Attach Items 3, 4, 5, 13, and 14 by sliding the aluminum angles into the slots on Items 6, 7, 8, 9, 15.

4

3

2

1

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		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:	Platform
SIZE	DWG. NO.
<b>B</b>	<b>GE-18060</b>
REV	
SCALE: 1:32	WEIGHT:
	SHEET 3 OF 3

4

3

2

1

B

B



A

A

## Notes:

1. Material: 1/2" thk. HDPE, red or blue
2. Surface: Matte texture
3. Remove all burrs and 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

**Platform Top**

**SIZE** DWG. NO. **REV**  
**B** **GE-18061**

SCALE: 1:8 WEIGHT: SHEET 1 OF 1

4

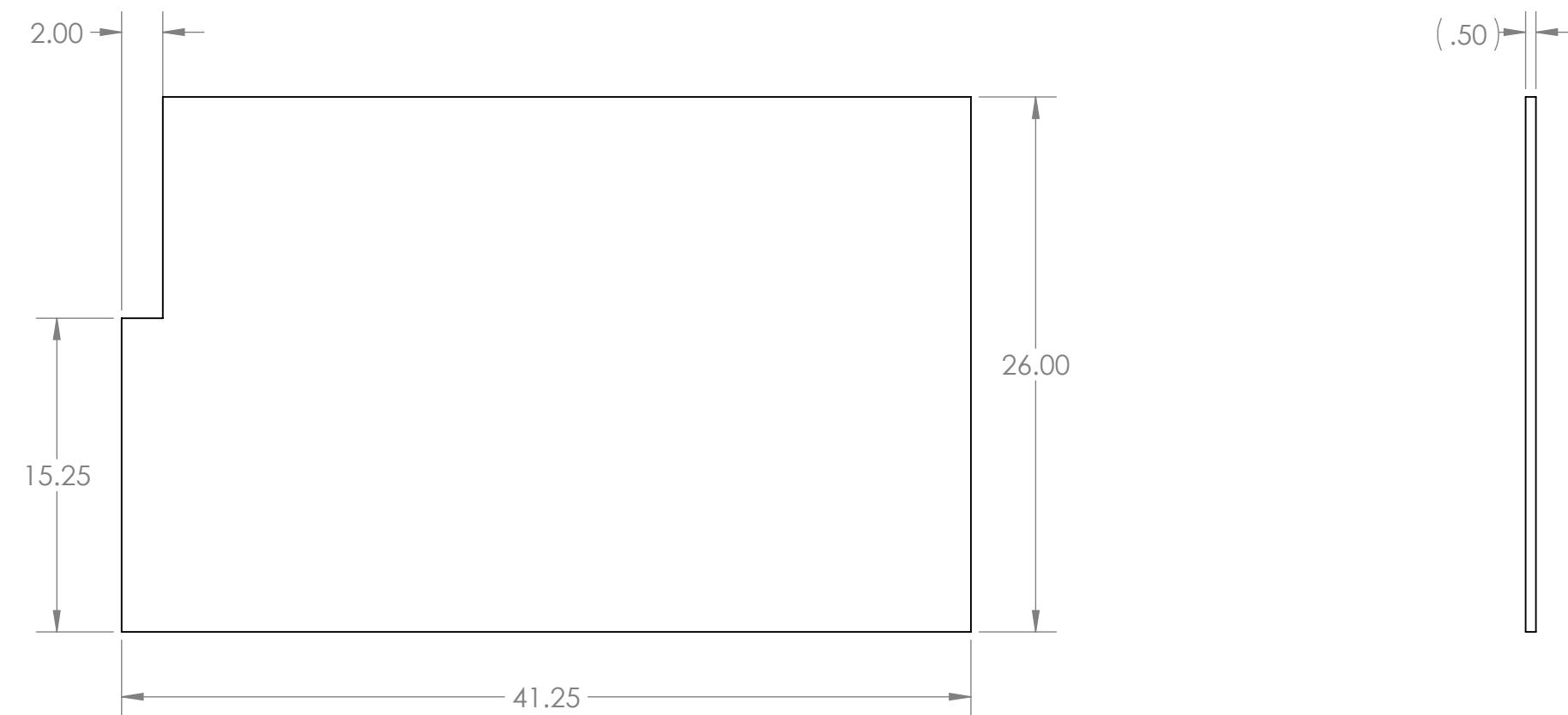
3

2

1

B

B



A

A

## Notes:

1. Material: 1/2" thk. textured HDPE, red or blue
2. Surface: Matte texture
3. Remove all burrs and 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	

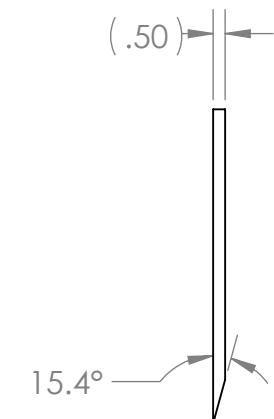
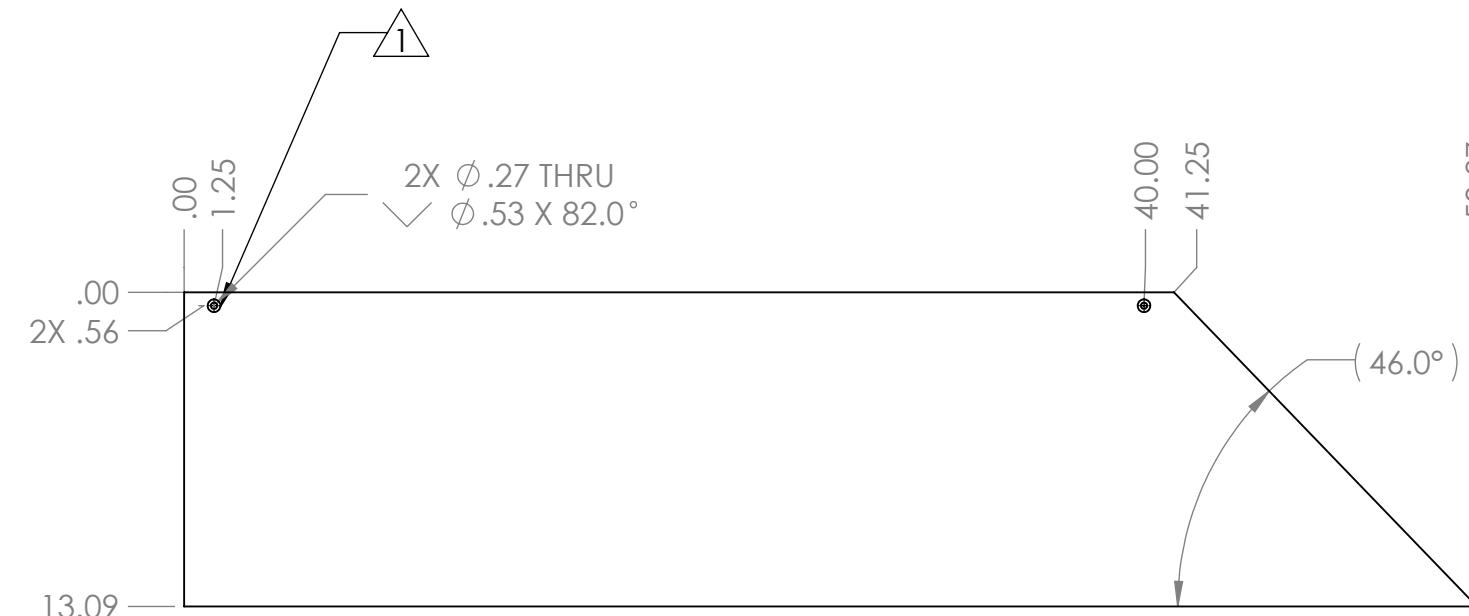
**FIRST ROBOTICS COMPETITION** **SOLIDWORKS**  
Modeling Solutions Partner

**Platform Top Notch**

SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-18062</b>	
SCALE: 1:8	WEIGHT:	SHEET 1 OF 1

## REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
B3	1	Changed number and location of holes	11/30/2017	JRF



- Notes:
1. Material: 1/2" thk. HDPE, red or blue
  2. Surface: Matte texture
  3. Remove all burrs and 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	

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

**Platform Short Side**

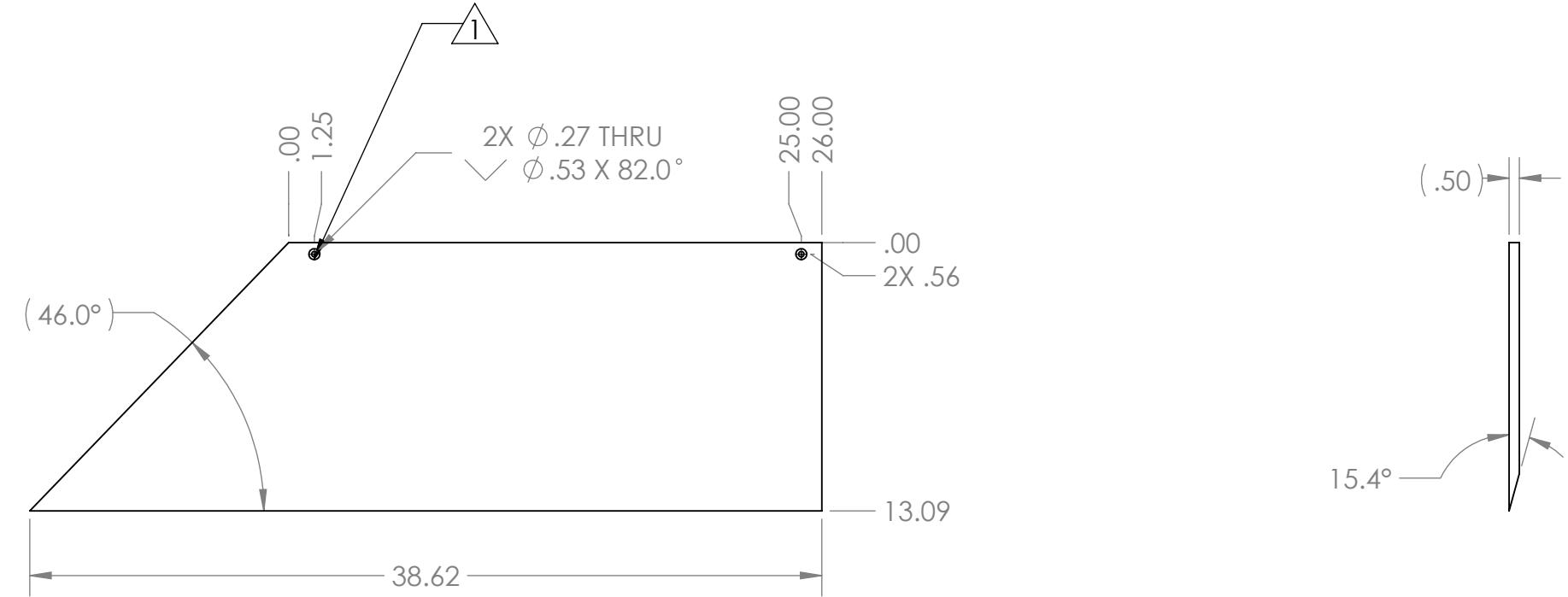
SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-18063</b>	<b>1</b>
SCALE: 1:8	WEIGHT:	SHEET 1 OF 1

## REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
B3	1	Changed number and location of holes; decreased length of part	11/30/17	JRF

B

B



A

A

## Notes:

1. Material: 1/2" thk. HDPE, red or blue
2. Surface: Matte texture
3. 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	


  
TITLE: Platform Long Side


  
SOLIDWORKS  
Modeling Solutions Partner

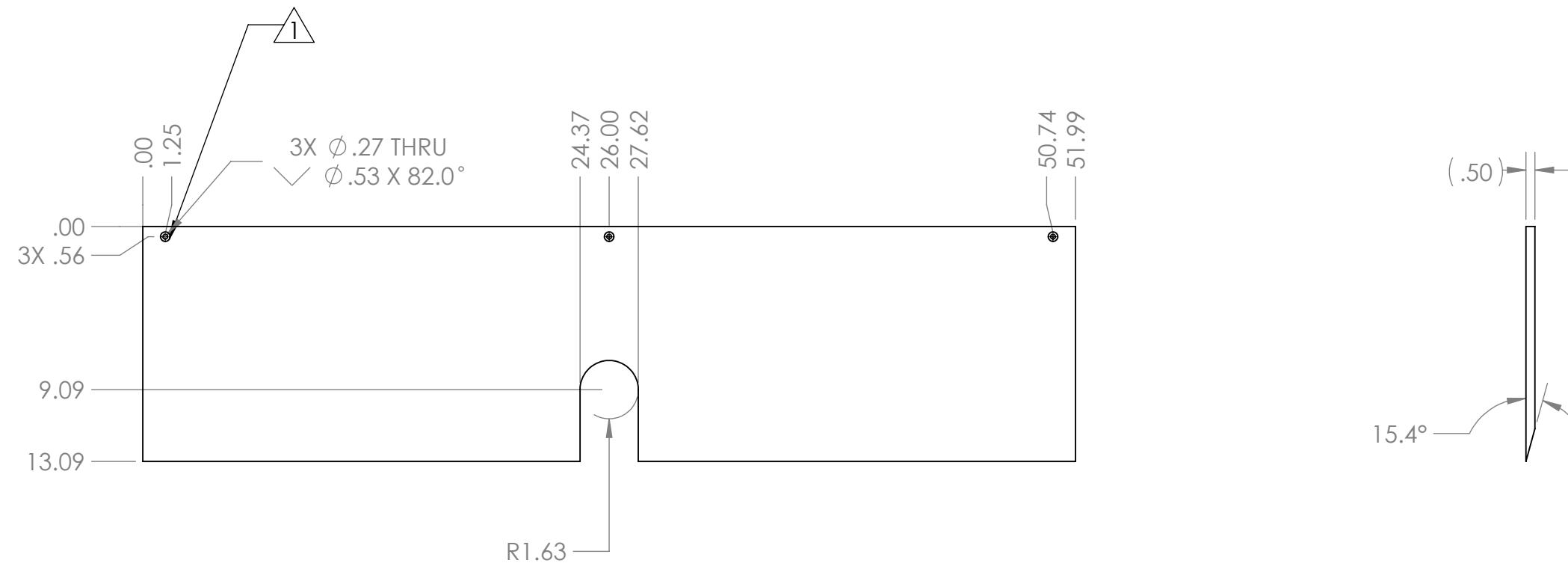
SIZE
DWG. NO.
REV

**B**
**GE-18064**
**1**

SCALE: 1:8
WEIGHT:
SHEET 1 OF 1

## REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
B3	1	Changed number and location of holes; increased length of part	11/30/17	JRF



- Notes:
1. Material: 1/2" thk. textured HDPE, red or blue
  2. Surface: Matte texture
  3. Remove all burrs and 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	

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

**Platform Long Side Middle**

SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-18065</b>	<b>1</b>
SCALE: 1:8	WEIGHT:	SHEET 1 OF 1

4

3

2

1

B

A

B

A

### Notes:

- NOTES:

  1. Material: 1/2" thk. textured HDPE, any color
  2. Surface: Smooth texture
  3. Remove all burrs and sharp edges

6X Cut relief/dogbone if necessary to maintain square corner

0.00  
3X 1.49  
3.00  
.00

13.00  
13.52  
17.49  
18.01

5

Engraved "5" near end of part

A technical drawing of a mechanical part. It features a central vertical slot with a 90.0° angle. The top edge has a radius of R.13 and a height of .25. The right edge has a height of 8.03 and a width of .88. The bottom edge has a height of 49.36 and a width of .82. The left edge has a height of 41.37 and a width of 39.52. A small feature on the left has a height of 39.00.

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		UNLESS OTHERWISE SPECIFIED:		NAME	DATE	 <b>FIRST</b> <b>ROBOTICS</b> <b>COMPETITION</b>	<b>TITLE:</b>  <b>Platform Brace, Long Side 1</b>
		<b>DIMENSIONS ARE IN INCHES</b> <b>TOLERANCES:</b> <b>FRACTIONAL <math>\pm 1/16</math></b> <b>ANGULAR: MACH <math>\pm 1^\circ</math> BEND <math>\pm 1^\circ</math></b> <b>TWO PLACE DECIMAL <math>\pm .01</math></b> <b>THREE PLACE DECIMAL <math>\pm .001</math></b>	DRAWN				
			CHECKED				
			ENG APPR.				
			MFG APPR.				
			Q.A.				
		INTERPRET GEOMETRIC TOLERANCING PER:	COMMENTS:				
		MATERIAL				<b>SIZE</b> <b>DWG. NO.</b> <b>B</b> <b>GE-18066</b>	<b>REV</b>
NEXT ASSY	USED ON	FINISH					
APPLICATION		DO NOT SCALE DRAWING	SCALE: 1:6			WEIGHT:	SHEET 1 OF 1

4

3

2

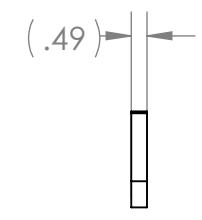
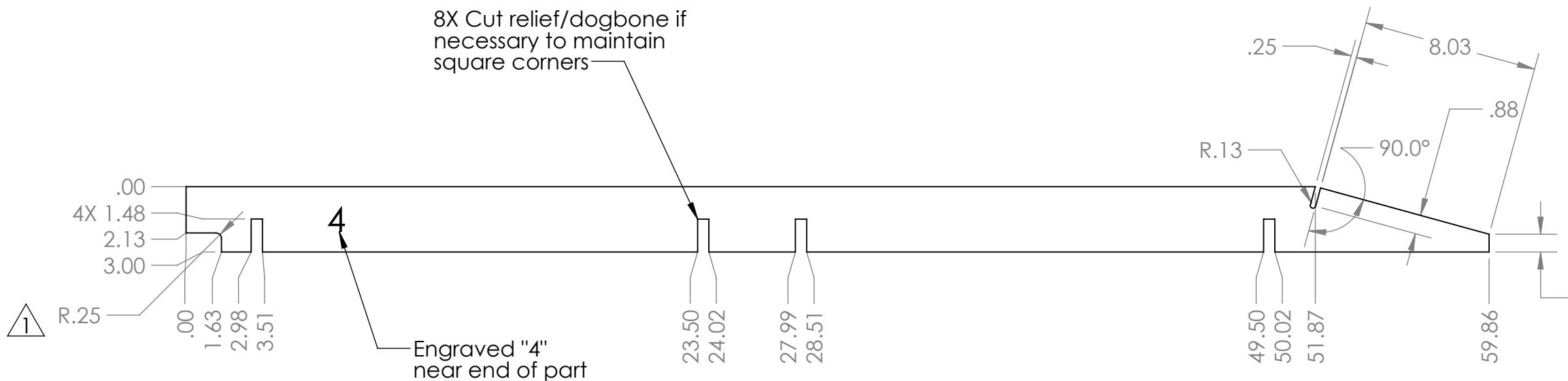
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## REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
B4	1	Added dimension to specify fillet radius.	1/3/2018	CPO

B

B



A

A

## Notes:

1. Material: 1/2" thk. HDPE, any color
2. Surface: Smooth texture
3. Remove all burrs and sharp edges

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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>B</b>	<b>GE-18067</b>	<b>1</b>		
SCALE: 1:6	WEIGHT:	SHEET 1 OF 1		

 FIRST  
ROBOTICS  
COMPETITION

 SOLIDWORKS  
Modeling Solutions Partner

**Platform Brace,  
Long Side 2**

4

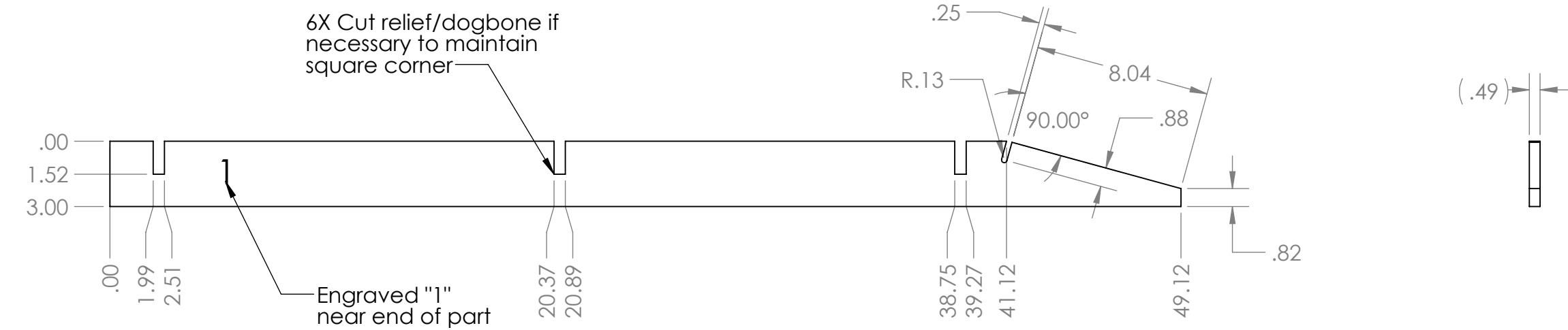
3

2

1

B

B



A

A

## Notes:

1. Material: 1/2" thk. HDPE, any color
2. Surface: Smooth texture
3. Remove all burrs and 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	

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

**Platform Brace,  
Short Side 1**

**SIZE** DWG. NO. **B** **GE-18068** **REV**

SCALE: 1:6 WEIGHT: SHEET 1 OF 1

4

3

2

1

4

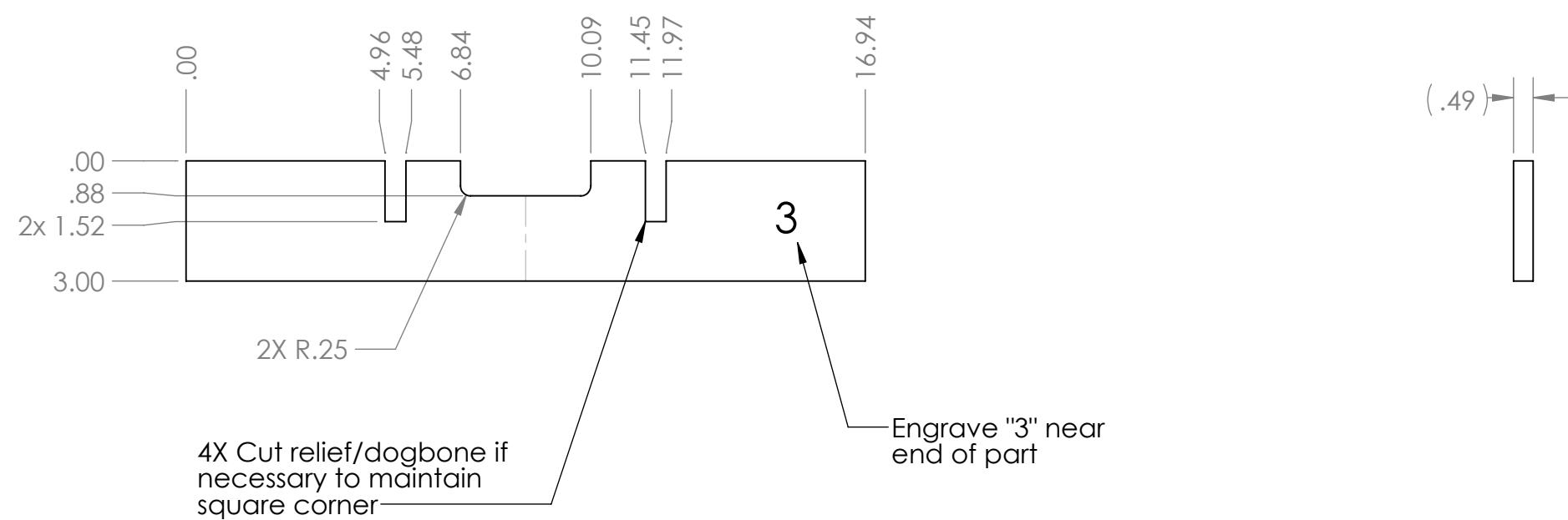
3

2

1

B

B



## Notes:

1. Material: 1/2" thk. HDPE, any color
2. Surface: Smooth texture
3. Remove all burrs and 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	

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

**Platform Brace,  
Mid Section**

**SIZE** DWG. NO. **REV**  
**B** **GE-18069**

SCALE: 1:4 WEIGHT: SHEET 1 OF 1

4

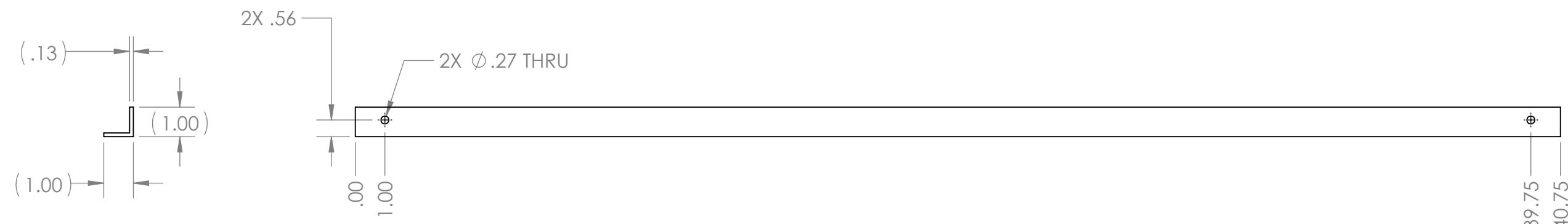
3

2

1

B

B



- Notes:
1. Material: 1" x 1" x .125" thick angle, 6061 aluminum
  2. Remove all burrs and sharp edges

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		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$			
		INTERPRET GEOMETRIC TOLERANCING PER:		Q.A.	COMMENTS:
		MATERIAL			
NEXT ASSY	USED ON	FINISH			
APPLICATION		DO NOT SCALE DRAWING			
<b>A</b>		<b>B</b>		<b>FIRST</b> ROBOTICS COMPETITION	<b>SOLIDWORKS</b> Modeling Solutions Partner
TITLE: Platform Angle, Short Side		SIZE DWG. NO. <b>B</b> GE-18070		REV	
SCALE: 1:4		WEIGHT:		SHEET 1 OF 1	

4

3

2

1

B

B

A technical drawing showing a vertical profile with a stepped base. The top section has a width of (1.00). The bottom section has a total width of (1.00) and a height of (1.00). A horizontal line with arrows at both ends is positioned above the top section, and a vertical line with arrows at both ends is positioned to the right of the bottom section.

Technical drawing of a rectangular component. The width is labeled as 2X .56. The height is labeled as .75. Two holes are located on the top edge, with a diameter of  $\phi .27$  and the text "2X THRU" indicating they are through-holes. The right edge is labeled with a dimension of 1.50. The left edge is labeled with a dimension of .525. There are also .00 and .00 labels near the bottom left corner.

A

A

## Notes

- Notes:  
1. Material: 1" x 1" x .125" thick angle, 6061 aluminum  
2. Remove all burrs and sharp edges

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		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$	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: 1:4	WEIGHT:	SHEET 1 OF 1	

4

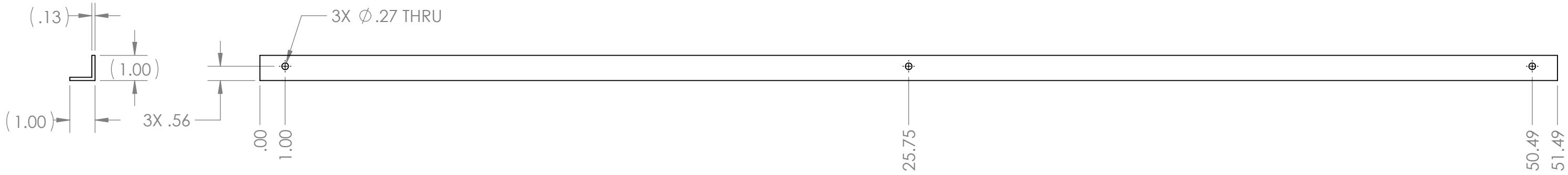
3

2

1

B

B



## Notes

1. Material: 1" x 1" x .125" thick angle, 6061 aluminum
  2. Remove all burrs and sharp edges

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		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$	DRAWN					
			CHECKED					
			ENG APPR.					
			MFG APPR.					
		INTERPRET GEOMETRIC TOLERANCING PER:	Q.A.					
		MATERIAL	COMMENTS:					
NEXT ASSY	USED ON	FINISH				<b>SIZE</b> <b>DWG. NO.</b> <b>B</b> <b>GE-18072</b>	<b>REV</b>	
APPLICATION		DO NOT SCALE DRAWING				SCALE: 1:4	WEIGHT:	SHEET 1 OF 1

4

3

2

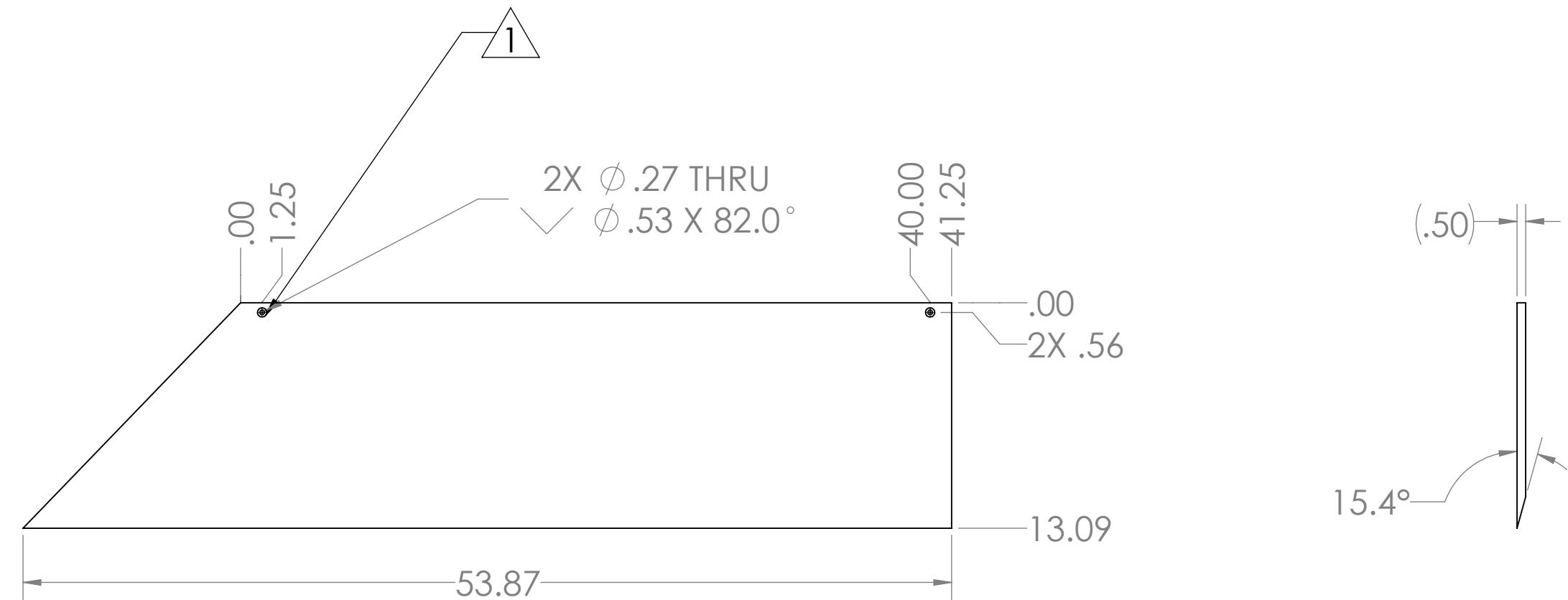
1

## REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
B3	1	Changed number and location of holes	11/30/17	JRF

B

B



A

A

## Notes:

1. Material: 1/2" thk. HDPE, red or blue
2. Surface: Matte texture
3. Remove all burrs and sharp edges

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

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

**Platform Short Side Mirrored**

**SIZE DWG. NO. REV**  
**B GE-18073 1**

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

4

3

2

1

4

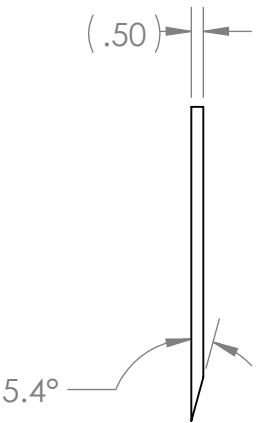
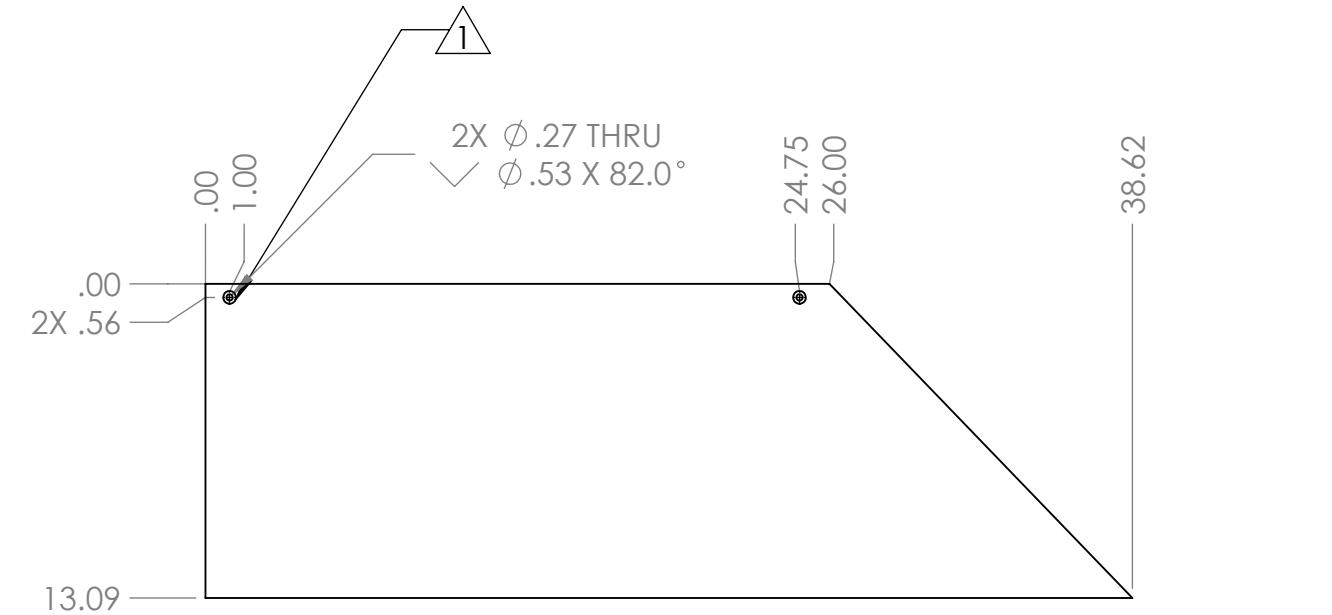
3

2

1

B

B



- Notes:
1. Material: 1/2" thk. HDPE, red or blue
  2. Surface: Matte texture
  3. Remove all burrs and 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 $\pm .001$		
		INTERPRET GEOMETRIC TOLERANCING PER:		
		MATERIAL		
		NEXT ASSY	USED ON	FINISH
		APPLICATION	DO NOT SCALE DRAWING	COMMENTS:

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

**Platform Long Side Mirrored**

**SIZE DWG. NO. REV**  
**B GE-18074 1**

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

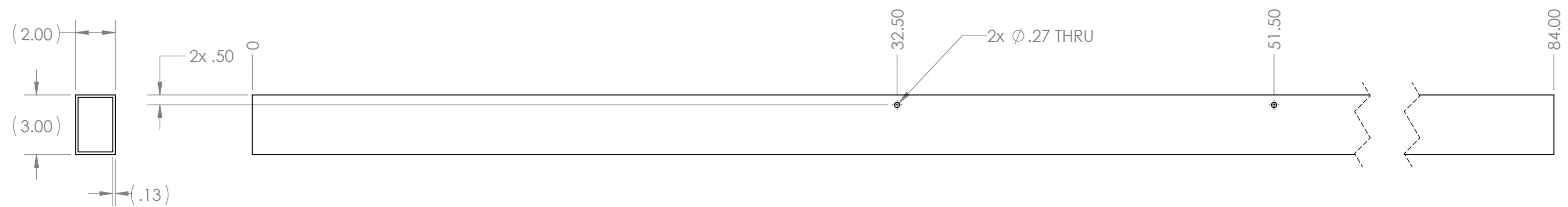
4

3

2

1

B



## Notes:

1. Material: 3" x 2" x 1/8" thk. Rectangular Tube, 6061 Aluminum.
2. Remove all burrs and sharp edges.

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

**Scale Base Outrigger**

SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-18075</b>	
SCALE: 1:5	WEIGHT:	SHEET 1 OF 1

B

4

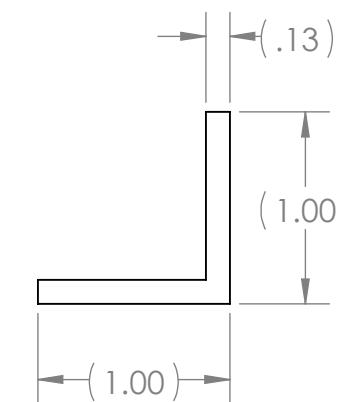
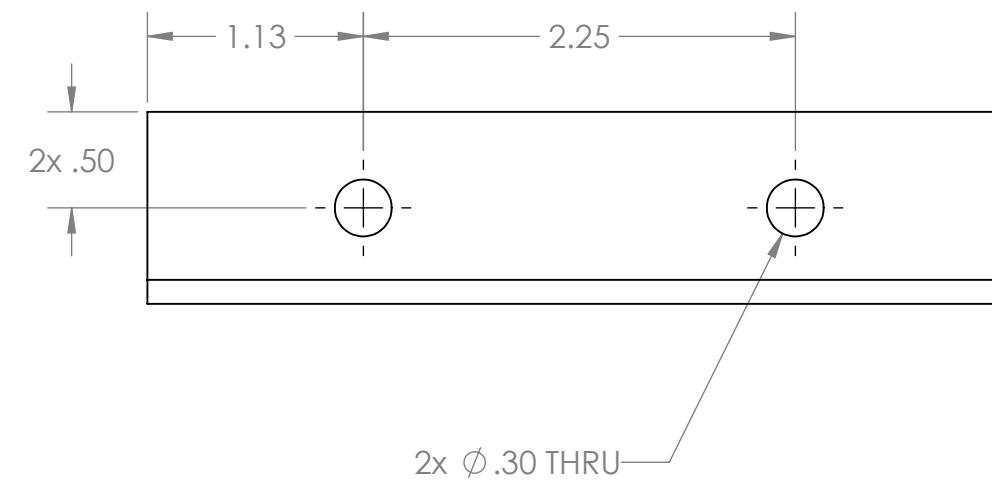
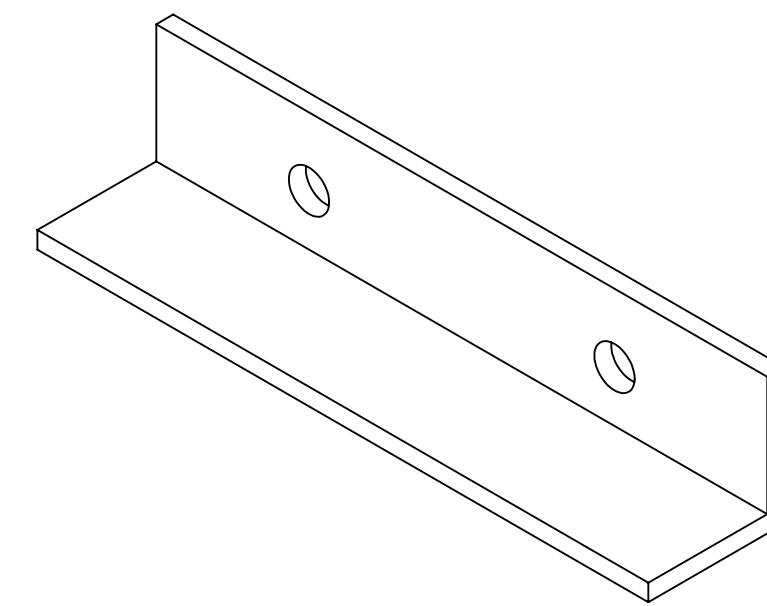
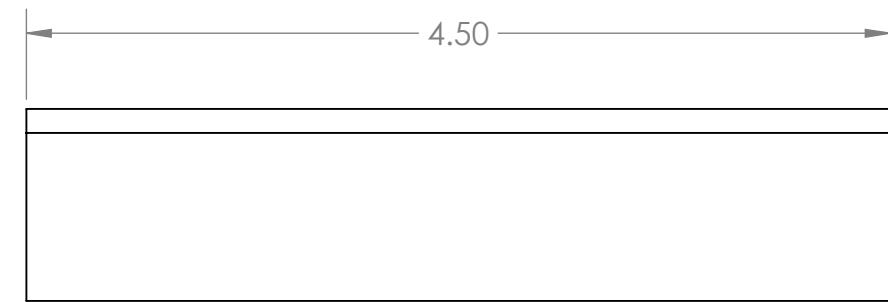
3

2

1

B

B



## Notes:

1. Material: 1" x 1" x 1/8" thk. 90 degree angle, 6061 Aluminum.
2. Remove all burrs and sharp edges.

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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

**Scale Angle Brace**

**SIZE DWG. NO. REV**  
**B GE-18076**

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

4

3

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4

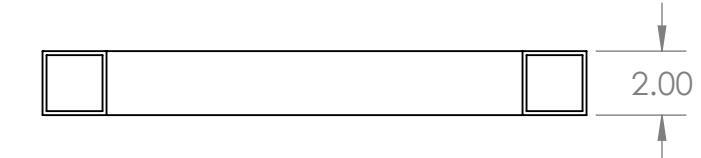
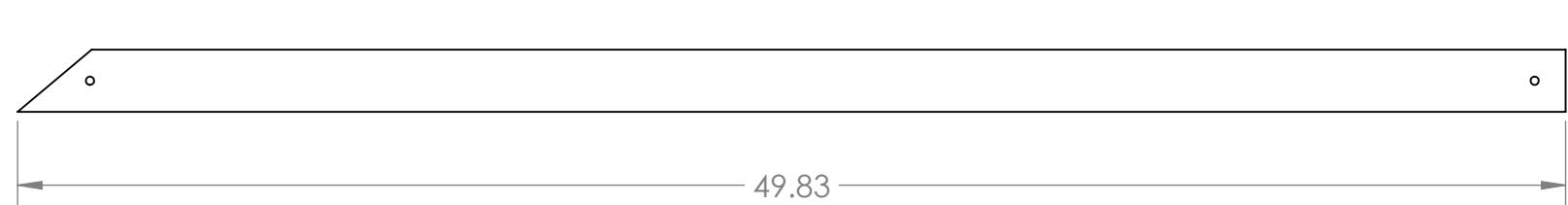
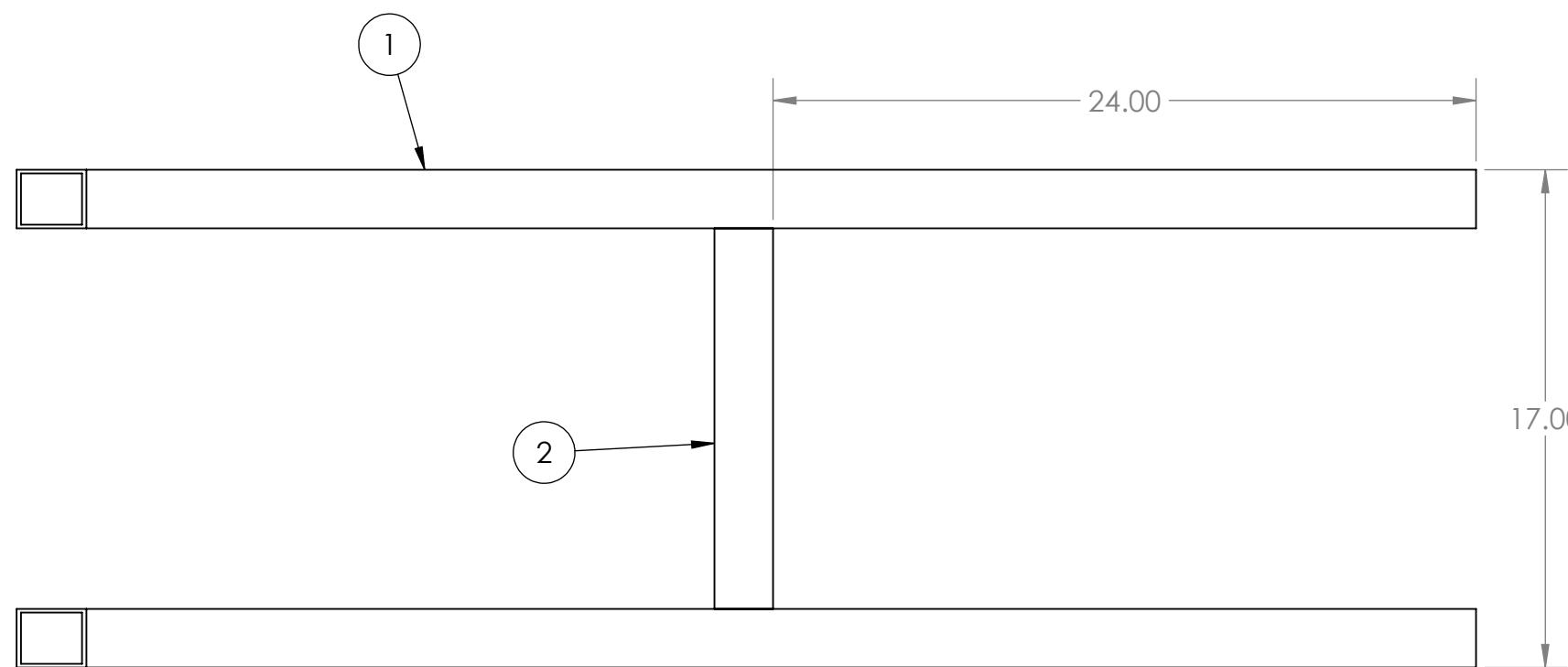
3

2

1

B

B



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-18077-1	2" x .125" thk. Square Tube, 6061 Aluminum	2
2	GE-18077-2	2" x .125" thk. Square Tube, 6061 Aluminum	1

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

FIRST  
ROBOTICS  
COMPETITION

SOLIDWORKS  
Modeling Solutions Partner

TITLE: Outrigger Wing Horizontal

SIZE: B DWG. NO. GE-18077 REV: 1

SCALE: 1:6 WEIGHT: SHEET 1 OF 3

4

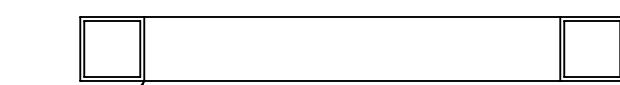
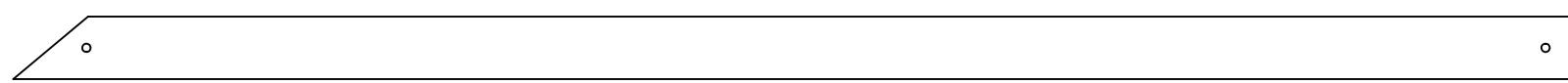
3

2

1



1/4  
1/4  
2 places



2 places  
(1/4)

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:

Outrigger Wing  
Horizontal

SIZE DWG. NO. REV  
**B** GE-18077

SCALE: 1:6 WEIGHT: SHEET 2 OF 3

4

3

2

1

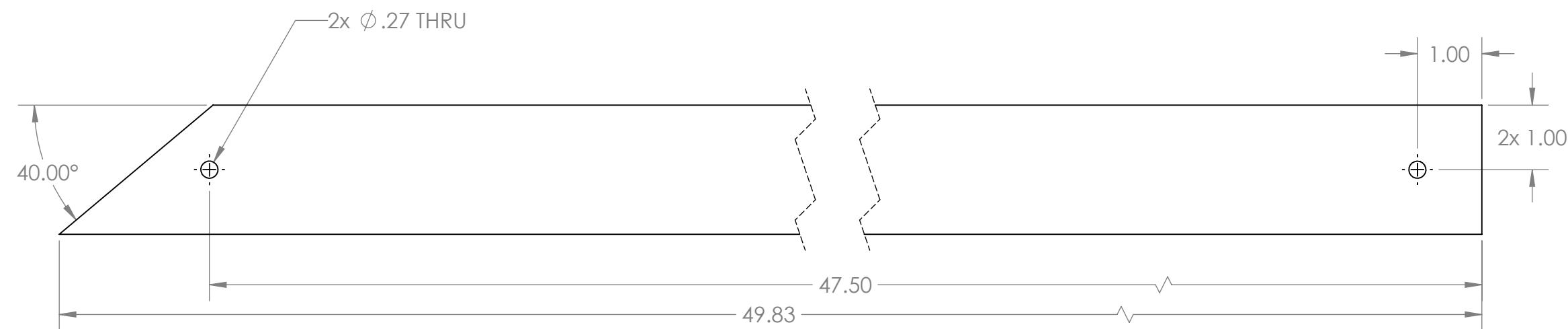
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B



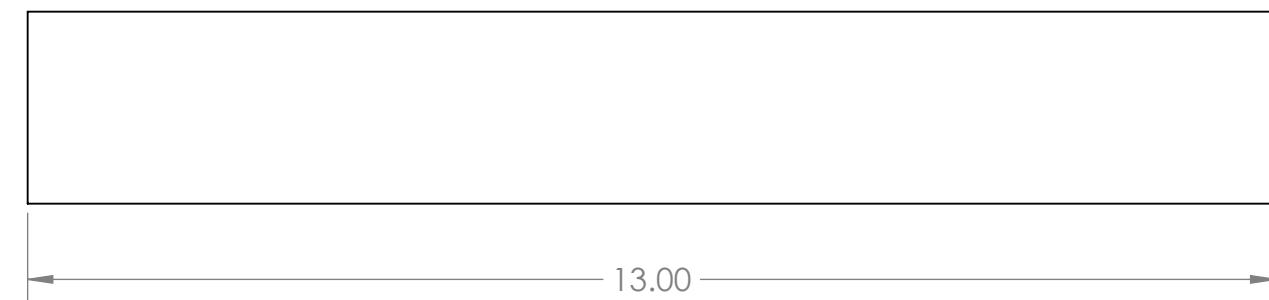
ITEM: GE-18077-1

Material: 2" x .125" thk. Square Tube, 6061 Aluminum

Scale: 1:2

QTY: 2

B



A

ITEM: GE-18077-2

Material: 2" x .125" thk. Square Tube, 6061 Aluminum

Scale: 1:2

QTY: 1

A

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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>B</b>	<b>GE-18077</b>				
SCALE: 1:2	WEIGHT:	SHEET 3 OF 3			

4

3

2

1



4

3

2

1

B

B

A diagram of a double door opening. The opening is represented by a horizontal line with two vertical lines at the ends. A vertical line is positioned in the center of the opening, creating a three-panel structure. The leftmost panel is a single door, and the rightmost panel is a double door. The central vertical line is a support column.

A diagram showing a 2x2 grid. The top-left cell contains the text "2 places". The bottom-right cell contains a scale bar with the text "1/4" above it and "(1/4)" below it. A diagonal line runs from the top-left corner of the grid to the bottom-right corner. There are three dots on this line: one near the top-left corner, one near the center, and one near the bottom-right corner. A small square is at the bottom-right corner of the grid.

2 places

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		UNLESS OTHERWISE SPECIFIED:		NAME	DATE	 <b>FIRST ROBOTICS COMPETITION</b>	<b>TITLE:</b> <h1>Outrigger Wing Diagonal</h1>
		<b>DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL <math>\pm 1/16</math> ANGULAR: MACH <math>\pm 1^\circ</math> BEND <math>\pm 1^\circ</math> TWO PLACE DECIMAL <math>\pm .01</math> THREE PLACE DECIMAL <math>\pm .001</math></b>	DRAWN				
			CHECKED				
			ENG APPR.				
			MFG APPR.				
			Q.A.				
		<b>COMMENTS:</b>  <b>INTERPRET GEOMETRIC TOLERANCING PER:</b>  <b>MATERIAL</b>					
NEXT ASSY	USED ON	FINISH			<b>SIZE</b> <b>DWG. NO.</b> <b>B</b> <b>GE-18078</b>		<b>REV</b>
APPLICATION		DO NOT SCALE DRAWING			SCALE: 1:16	WEIGHT:	SHEET 2 OF 4

## SECTION C-C

 **FIRST**  
ROBOTICS  
COMPETITION

 SOLIDWORKS  
Modeling Solutions Partner

4

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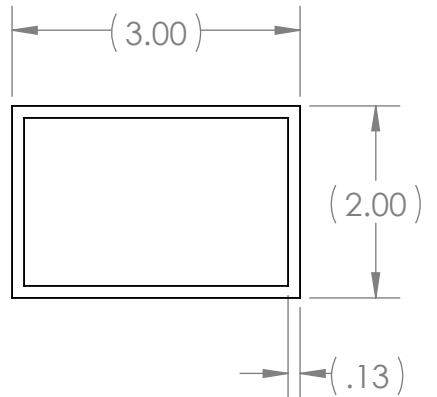
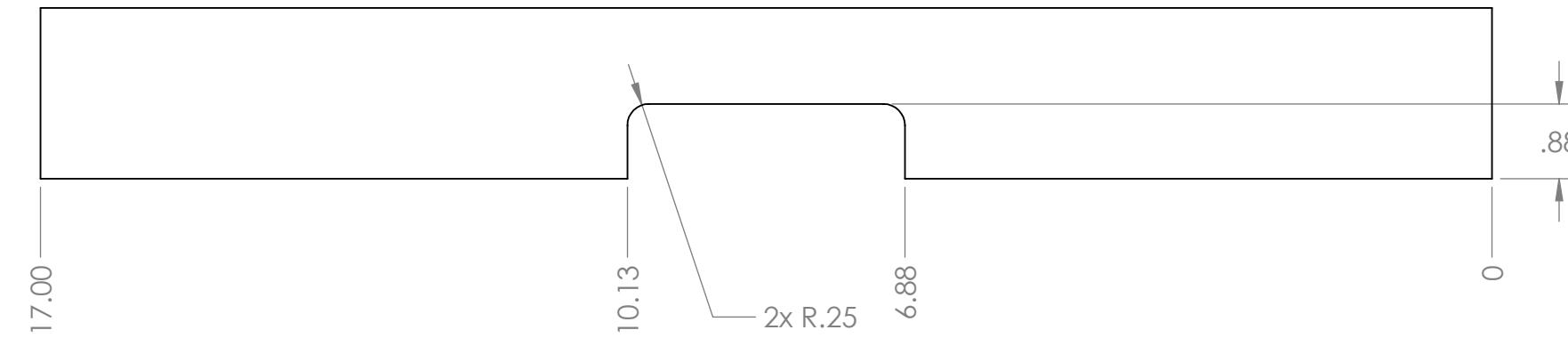
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3

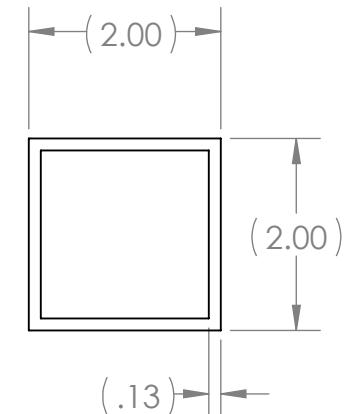
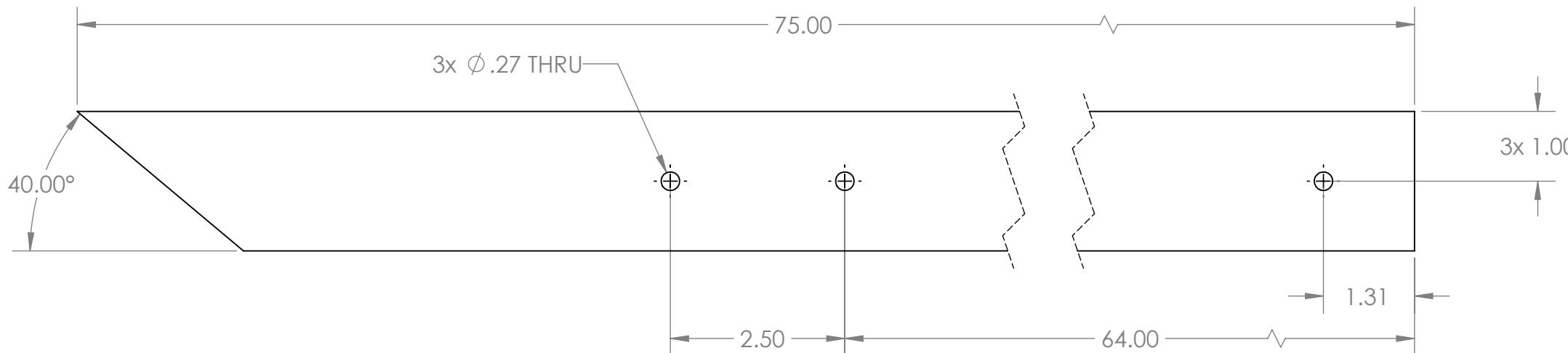
2

1

B



Item: GE-18078-1  
 Material: 3" x 2" x .125" thk. Rectangular Tube, 6061 Aluminum  
 Scale: 1:2  
 QTY: 1



Item: GE-18078-2  
 Material: 2" x .125" thk. Square Tube, 6061 Aluminum  
 Scale: 1:2  
 QTY: 2

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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:	COMMENTS:	
		MATERIAL		
NEXT ASSY	USED ON	FINISH		
APPLICATION		DO NOT SCALE DRAWING		

**FIRST ROBOTICS COMPETITION** **SOLIDWORKS**  
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**Outrigger Wing Diagonal**

**SIZE** DWG. NO. **B** **GE-18078** **REV**

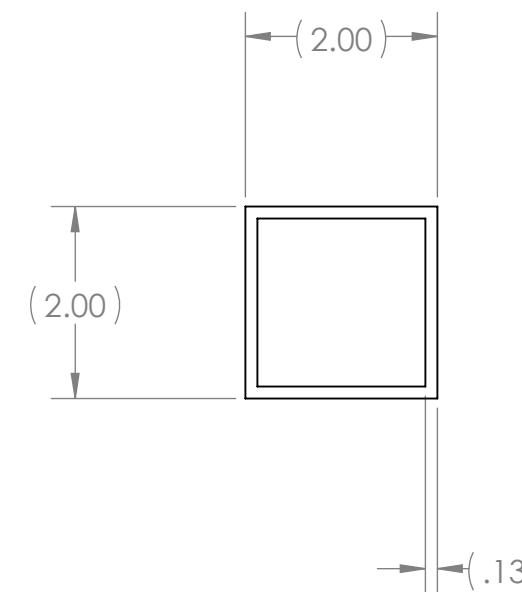
SCALE: 1:2 WEIGHT: SHEET 3 OF 4

4

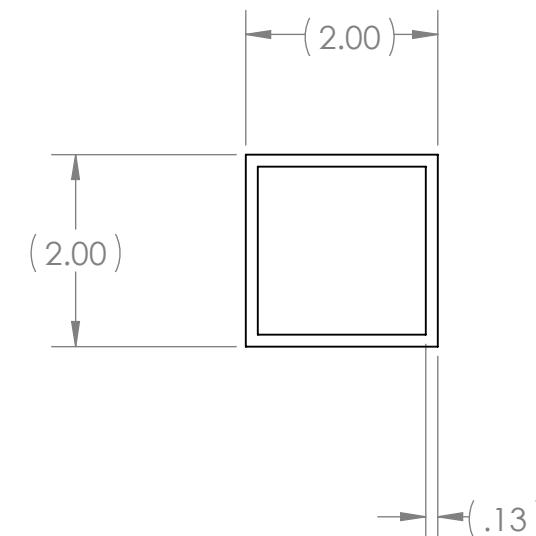
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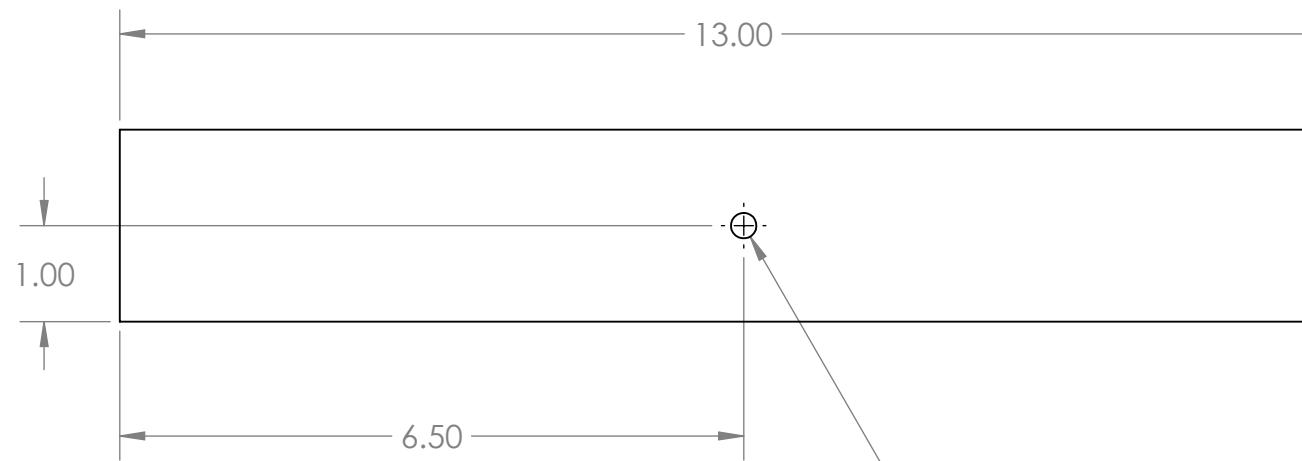
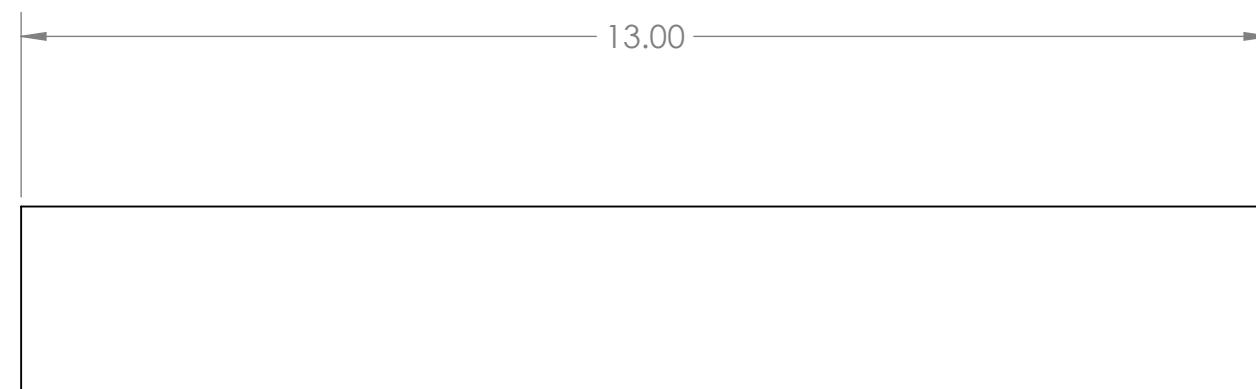
1



Item: GE-18078-3  
 Material: 2" x .125" thk. Square Tube, 6061 Aluminum  
 Scale: 1:2  
 QTY: 1



Item: GE-18078-4  
 Material: 2" x .125" thk. Square Tube, 6061 Aluminum  
 Scale: 1:2  
 QTY: 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**  
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**Outrigger Wing Diagonal**

**SIZE DWG. NO. REV**  
**B GE-18078**

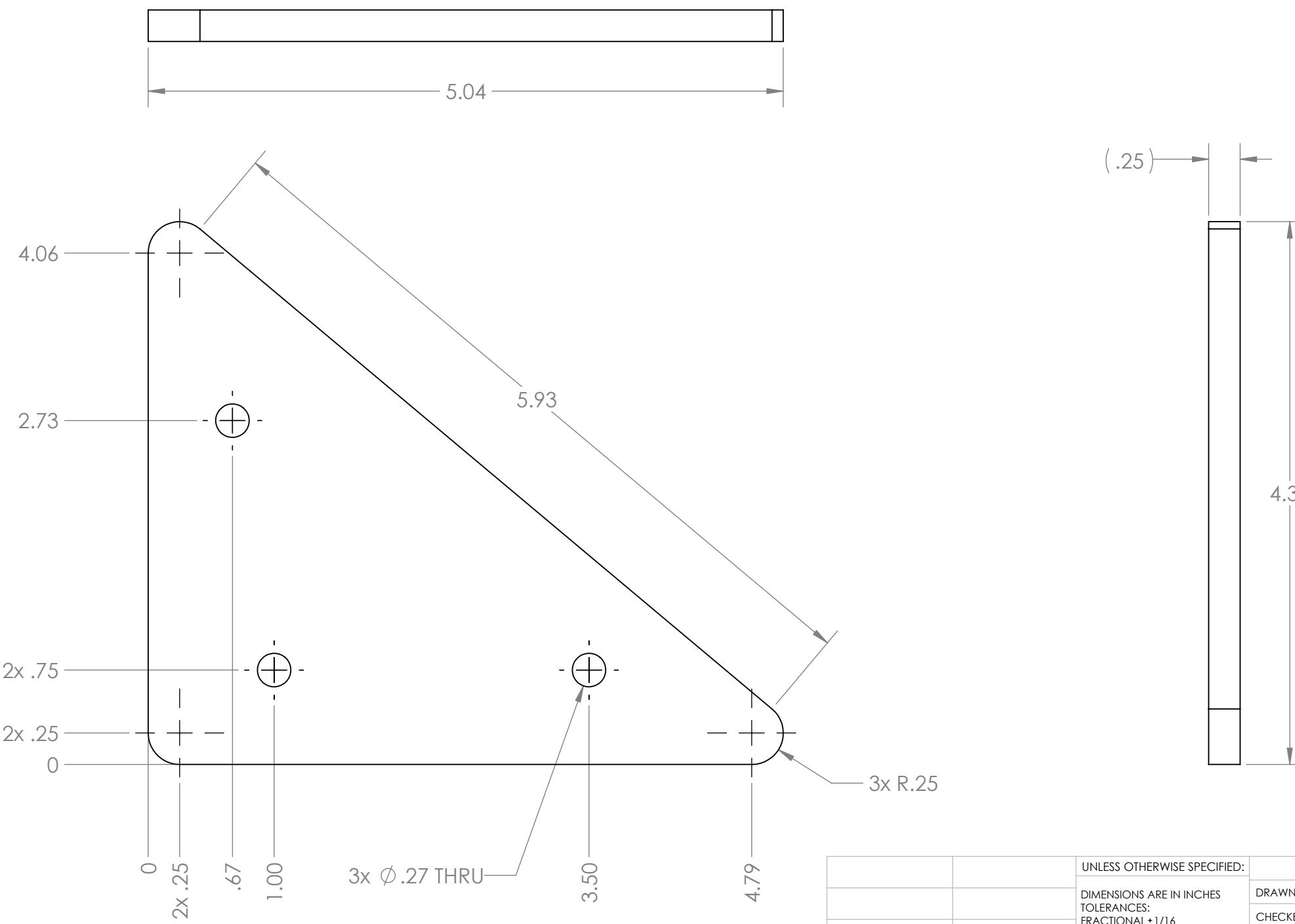
**SCALE: 1:2 WEIGHT: SHEET 4 OF 4**

4

3

2

1



Notes:

1. Material: 1/4" thick, 6061 Aluminum
2. Remove all burrs and sharp edges.

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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:				<b>SIZE</b> <b>DWG. NO.</b> <b>B</b> <b>GE-18079</b>	<b>REV</b>	
		MATERIAL						
NEXT ASSY	USED ON	FINISH						
APPLICATION		DO NOT SCALE DRAWING				SCALE: 1:1	WEIGHT:	SHEET 1 OF 1

4

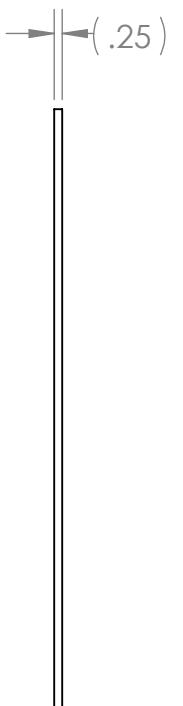
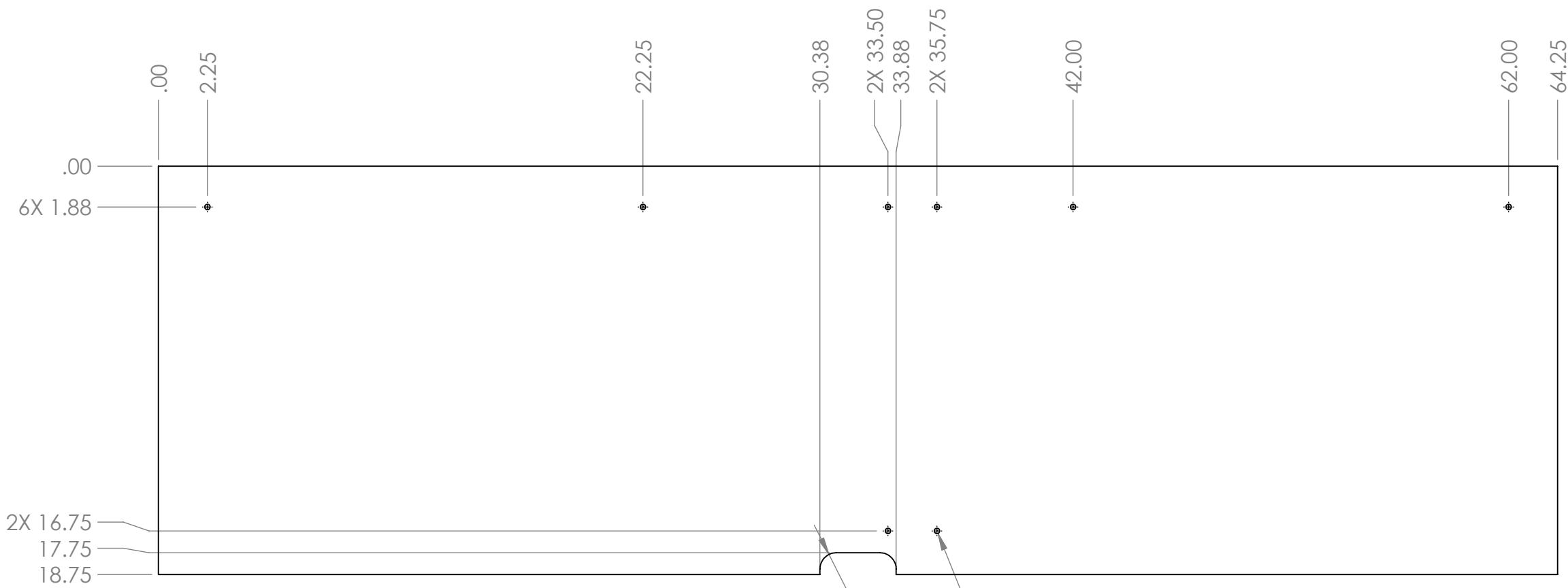
3

2

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B

B



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## Notes:

1. Material: 1/4" thick, clear polycarbonate
2. Remove all burrs and 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

**Fence Polycarb, Middle**

**SIZE** DWG. NO. **B** **GE-18080** **REV**

SCALE: 1:6 WEIGHT: SHEET 1 OF 1

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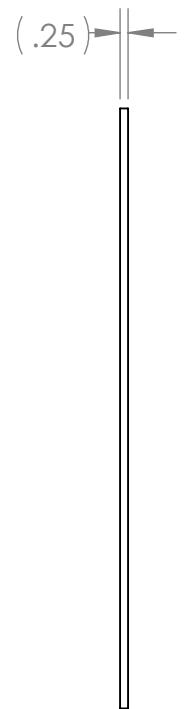
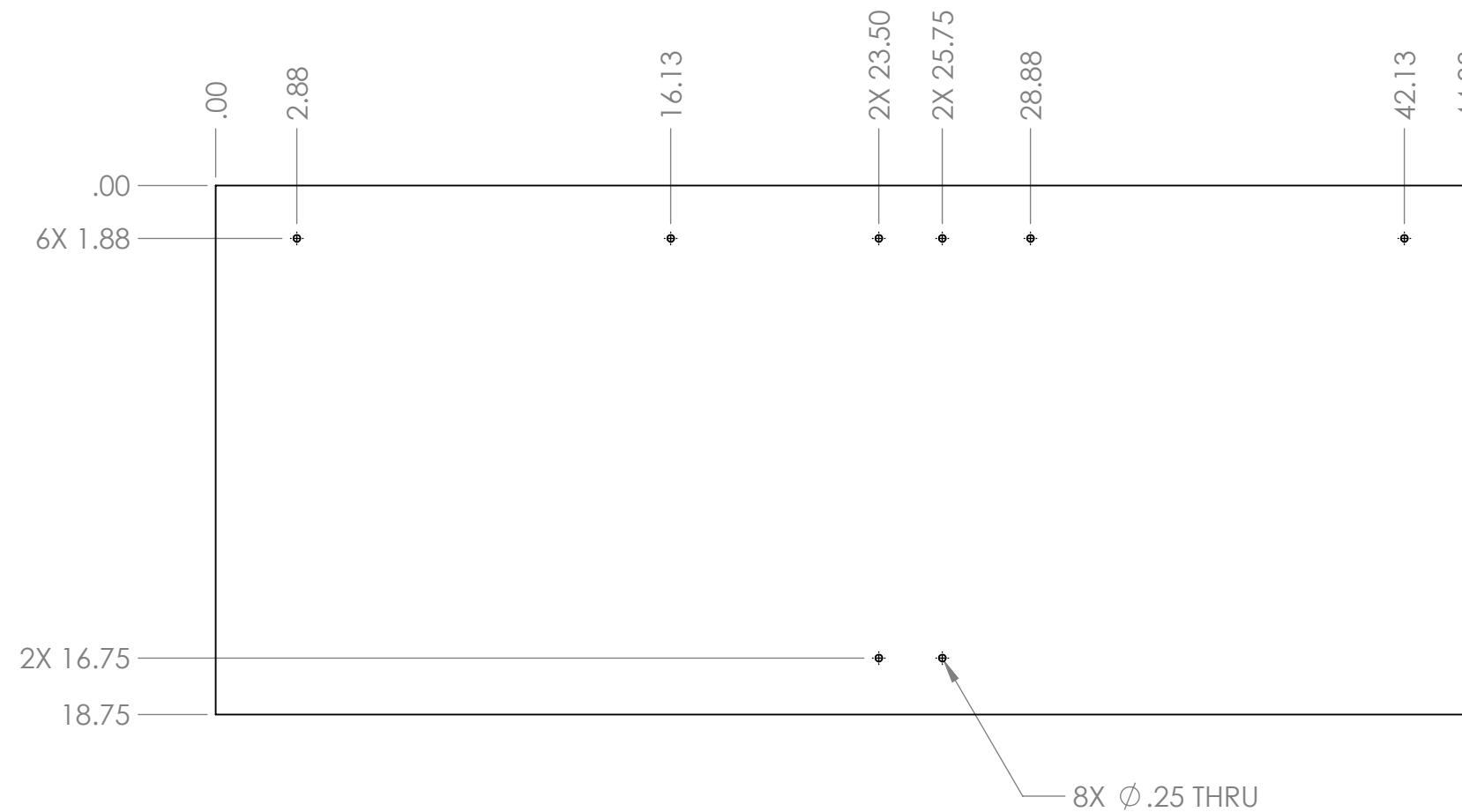
3

2

1

B

B



- Notes:
1. Material: 1/4" thick, clear polycarbonate
  2. Remove all burrs and sharp edges

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		UNLESS OTHERWISE SPECIFIED:		DRAWN	NAME	DATE					
		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$									
		INTERPRET GEOMETRIC TOLERANCING PER:		CHECKED	ENG APPR.	MFG APPR.					
		MATERIAL									
NEXT ASSY	USED ON	FINISH		Q.A. COMMENTS:							
APPLICATION		DO NOT SCALE DRAWING									
<b>FIRST</b> ROBOTICS COMPETITION	<b>SOLIDWORKS</b> Modeling Solutions Partner	TITLE: <b>Fence Polycarb, Outer Side</b>									
<b>B</b>	<b>GE-18081</b>										
SIZE	DWG. NO.	REV									
SCALE: 1:6	WEIGHT:	SHEET 1 OF 1									

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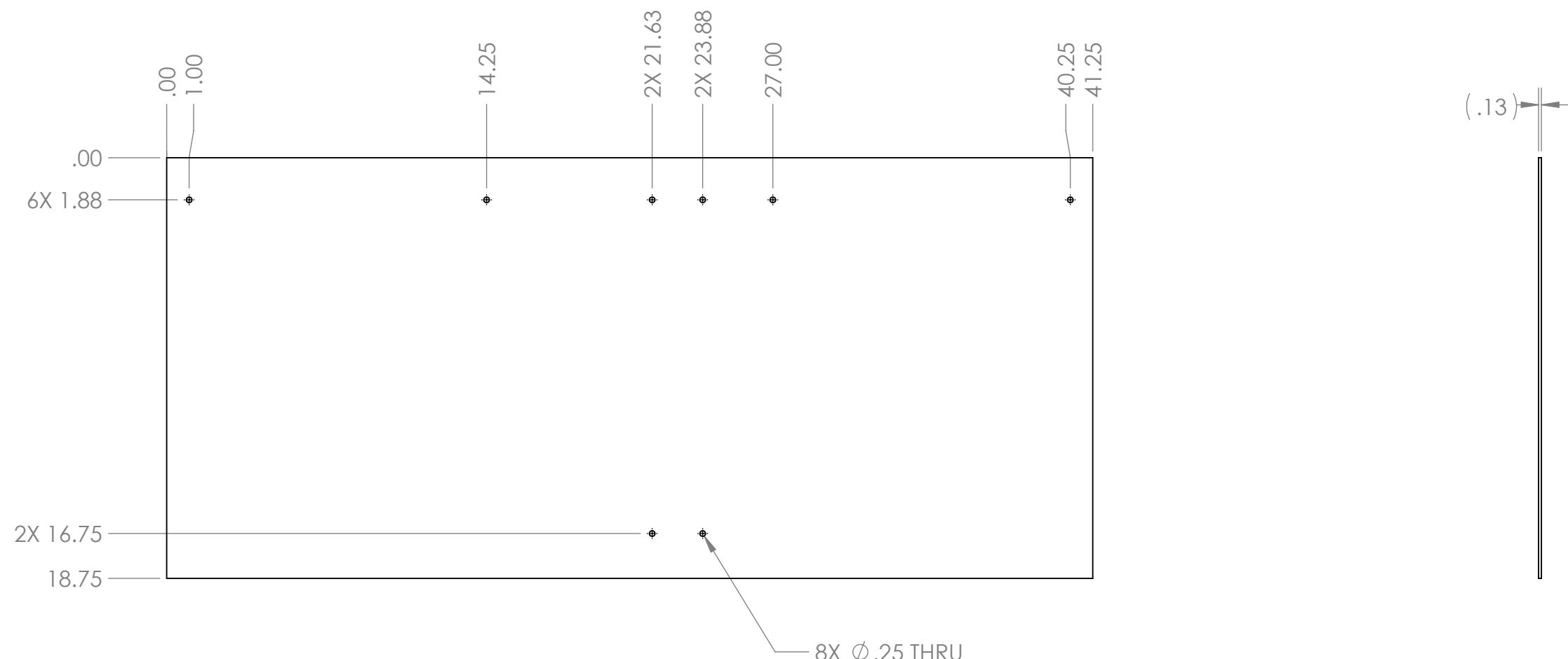
3

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## Notes:

1. Material: 1/8" thick, clear polycarbonate
2. Remove all burrs and 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	

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

**TITLE:** Fence Polycarb, Inner Side

**SIZE** DWG. NO. **B** GE-18082 **REV**

SCALE: 1:6 WEIGHT: SHEET 1 OF 1

4

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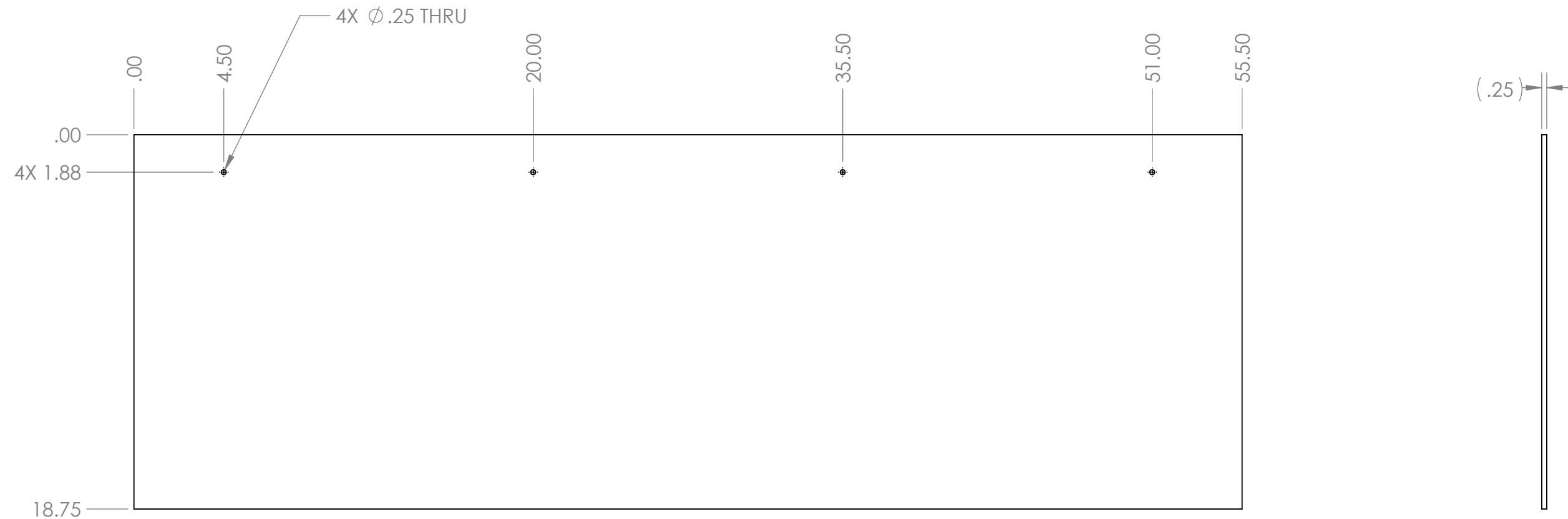
3

2

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B

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## Notes:

1. Material: 1/4" thick, clear polycarbonate
2. Remove all burrs and 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

**Fence Polycarb, Outer End**

**SIZE** DWG. NO. **REV**  
**B** **GE-18083**

SCALE: 1:6 WEIGHT: SHEET 1 OF 1

4

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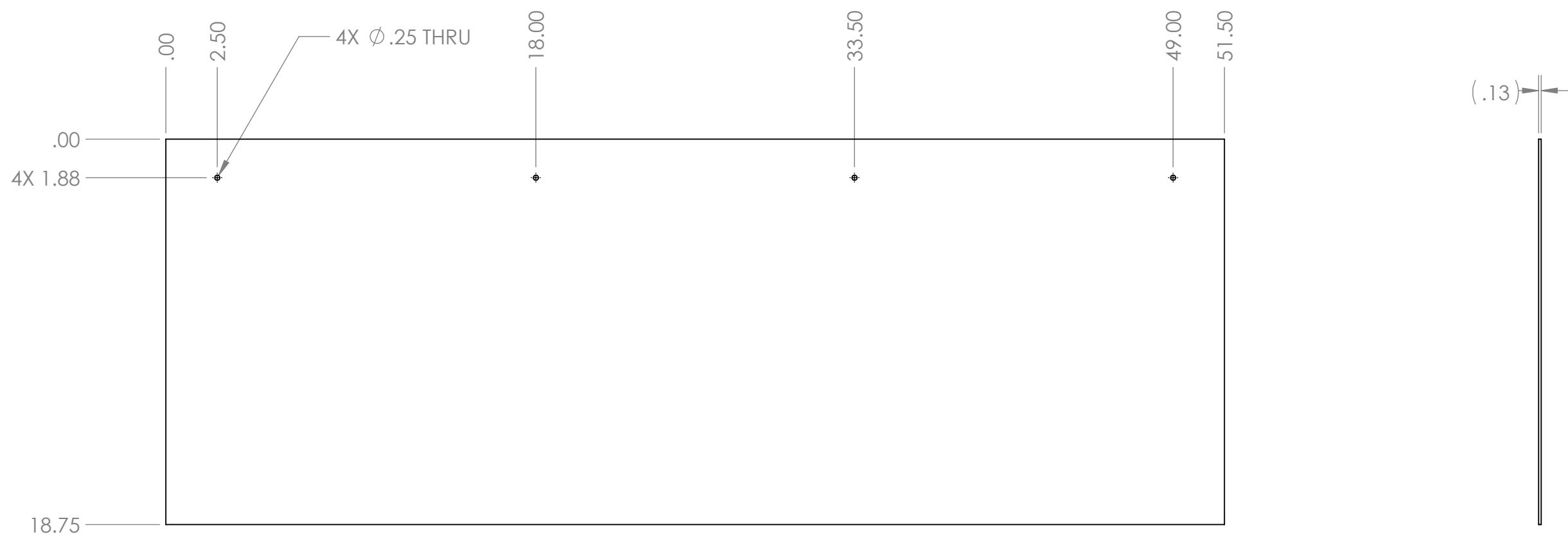
3

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## Notes:

1. Material: 1/8" thick, clear polycarbonate
2. Remove all burrs and 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

**TITLE:** Fence Polycarb, Inner End

**SIZE** DWG. NO. **REV**  
**B** GE-18084

SCALE: 1:6 WEIGHT: SHEET 1 OF 1

4

3

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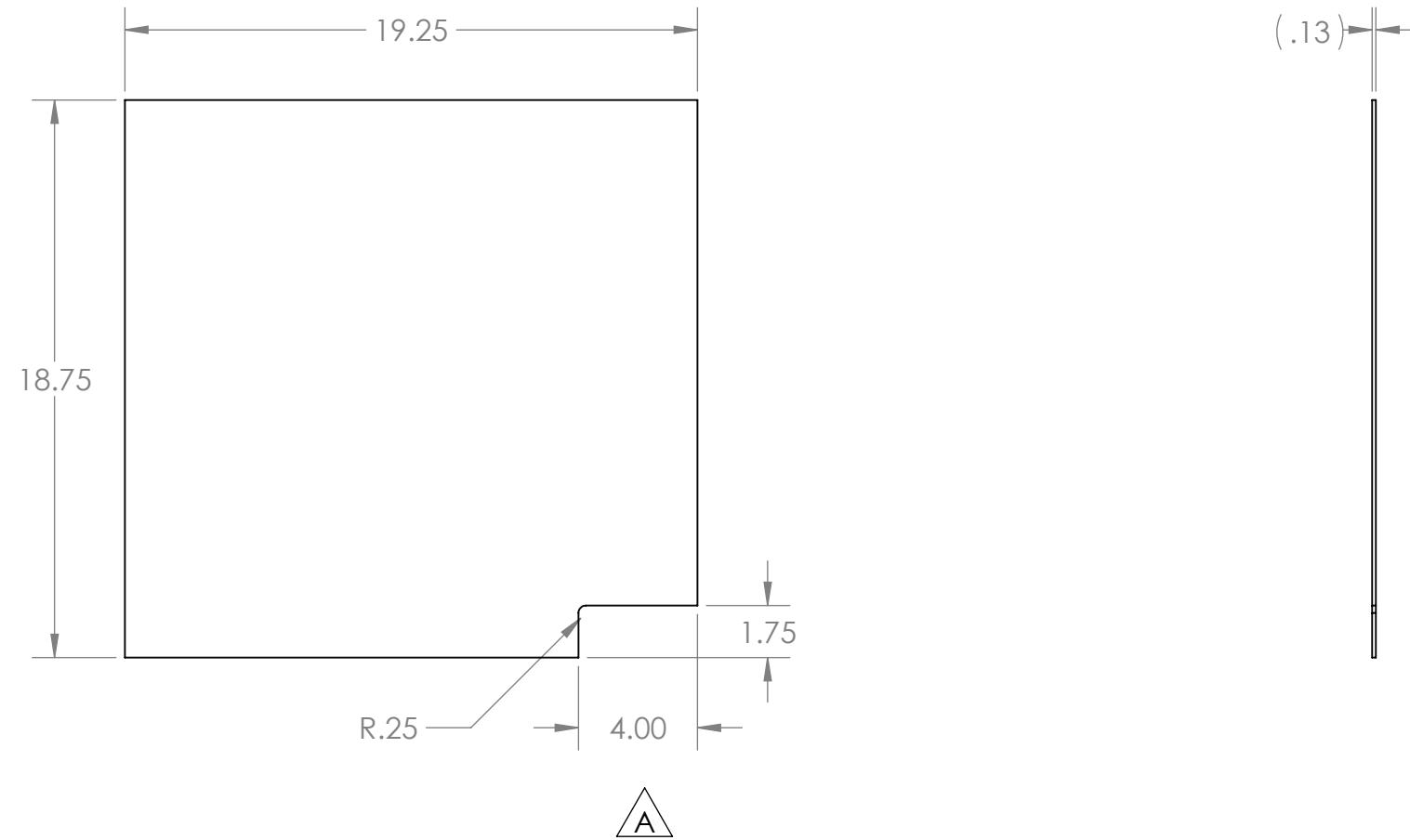
1

## REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
A3	A	Added notch	12/2/2017	DAF

B

B



A

A

## Notes:

1. Material: 1/8" thick, clear polycarbonate
2. Remove all burrs and sharp edges

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		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL: $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL: $\pm .01$ THREE PLACE DECIMAL: $\pm .001$		NAME	DATE
		DRAWN			
		CHECKED			
		ENG APPR.			
		MFG APPR.			
		Q.A.			
		COMMENTS:			
		MATERIAL			
		FINISH			
		APPLICATION	DO NOT SCALE DRAWING		
SIZE	DWG. NO.	REV			
<b>B</b>	<b>GE-18085</b>	<b>A</b>			
SCALE: 1:6	WEIGHT:	SHEET 1 OF 1			

 FIRST  
ROBOTICS  
COMPETITION  SOLIDWORKS  
Modeling Solutions Partner

TITLE:  
**Fence Polycarb,  
Guard**

4

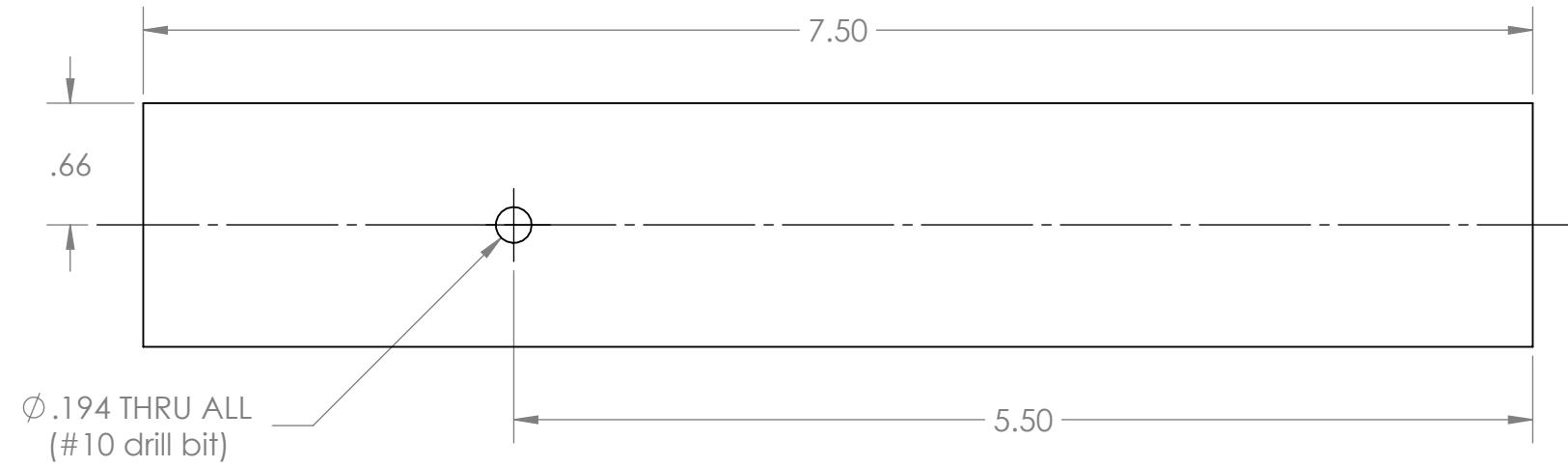
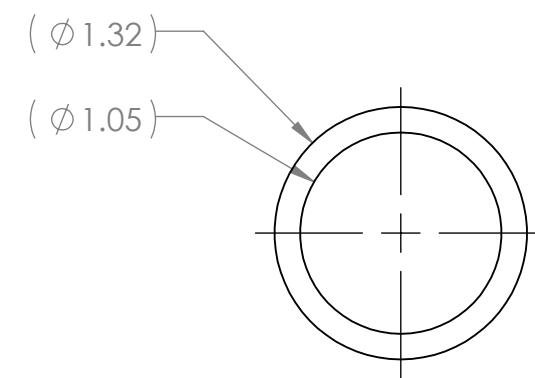
3

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## Notes:

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

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		UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$	DRAWN	NAME	DATE
			CHECKED		
			ENG APPR.		
			MFG APPR.		
			Q.A.		
			COMMENTS:		
		MATERIAL			
		FINISH			
	NEXT ASSY	USED ON			
	APPLICATION	DO NOT SCALE DRAWING			
SIZE	DWG. NO.	REV			
<b>B</b>	<b>GE-18086</b>	<b>A</b>			
SCALE: 1:1	WEIGHT:	SHEET 1 OF 1			

4

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2

1

B

B

Diagram showing a rectangular component with a total width of 51.63 and a height of 1.7. The component is divided into five horizontal sections. The first and last sections are 10 units wide, the second and fourth sections are 15 units wide, and the middle section is 11 units wide. Two small square features are located on the second and fourth sections, each 2 units wide and 2 units high. The height of the component is 1.7, indicated by a vertical dimension line on the right side.

A technical drawing showing a trapezoidal structure. The top horizontal line is divided into two segments by two vertical lines. The left segment has a dimension of 13.50, and the right segment has a dimension of 17.31. The top edge of the trapezoid is parallel to the top horizontal line. The bottom edge is a horizontal line. The left side of the trapezoid is a straight line sloping upwards to the right. The right side is a straight line sloping downwards to the right. The top and bottom edges are parallel.

A technical line drawing of a structural component, likely a bracket or support. The component is composed of several L-shaped and T-shaped metal plates. Three specific features are highlighted with callouts: callout 1 points to a vertical plate with a small rectangular cutout; callout 2 points to a vertical plate with a larger rectangular cutout; and callout 3 points to a horizontal plate with a rectangular cutout. The drawing uses fine lines and cross-hatching for shading and detail.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	GE-18087-1	1.75" x .125" thk. Square Tube, 6063 Aluminum	2
2	GE-18087-2	1.75" x .125" thk. Square Tube, 6063 Aluminum	2
3	GE-18087-3	1.75" x .125" thk. Square Tube, 6063 Aluminum	1

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		UNLESS OTHERWISE SPECIFIED:		NAME	DATE	 <b>FIRST ROBOTICS COMPETITION</b>	<b>TITLE:</b>  <b>Switch Fence Brace</b>
		<b>DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL <math>\pm 1/16</math> ANGULAR: MACH <math>\pm 1^\circ</math> BEND <math>\pm 1^\circ</math> TWO PLACE DECIMAL <math>\pm .01</math> THREE PLACE DECIMAL <math>\pm .001</math></b>	DRAWN				
			CHECKED				
			ENG APPR.				
			MFG APPR.				
			Q.A.				
		COMMENTS:					
		<b>MATERIAL</b>  <b>NEXT ASSY</b> <b>USED ON</b> <b>FINISH</b>				<b>SIZE</b> <b>DWG. NO.</b> <b>REV</b> <b>B</b> <b>GE-18087</b>	
APPLICATION		DO NOT SCALE DRAWING		SCALE: 1:8	WEIGHT:		SHEET 1 OF 3

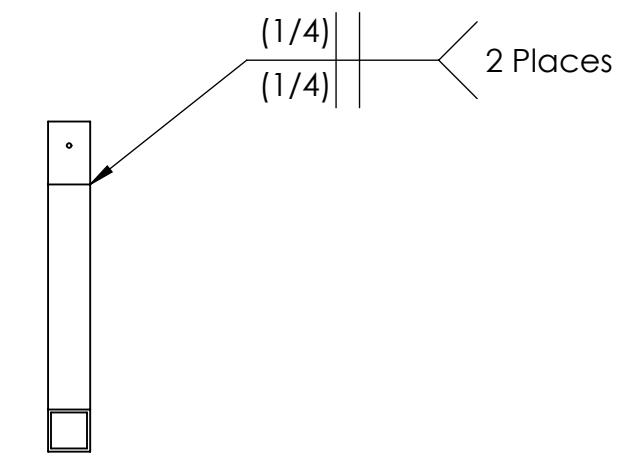
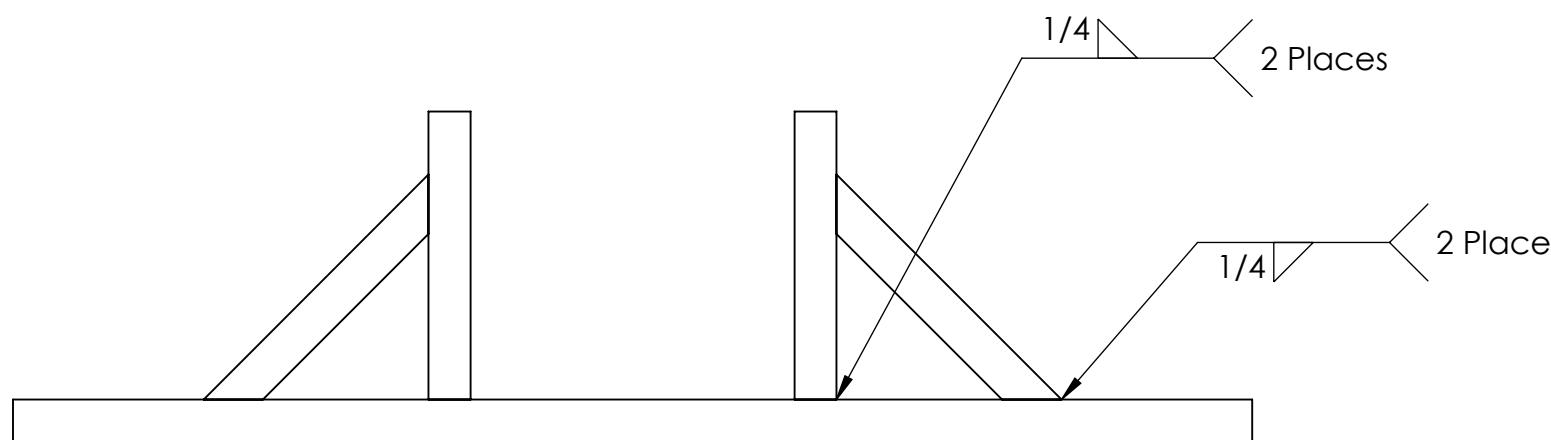
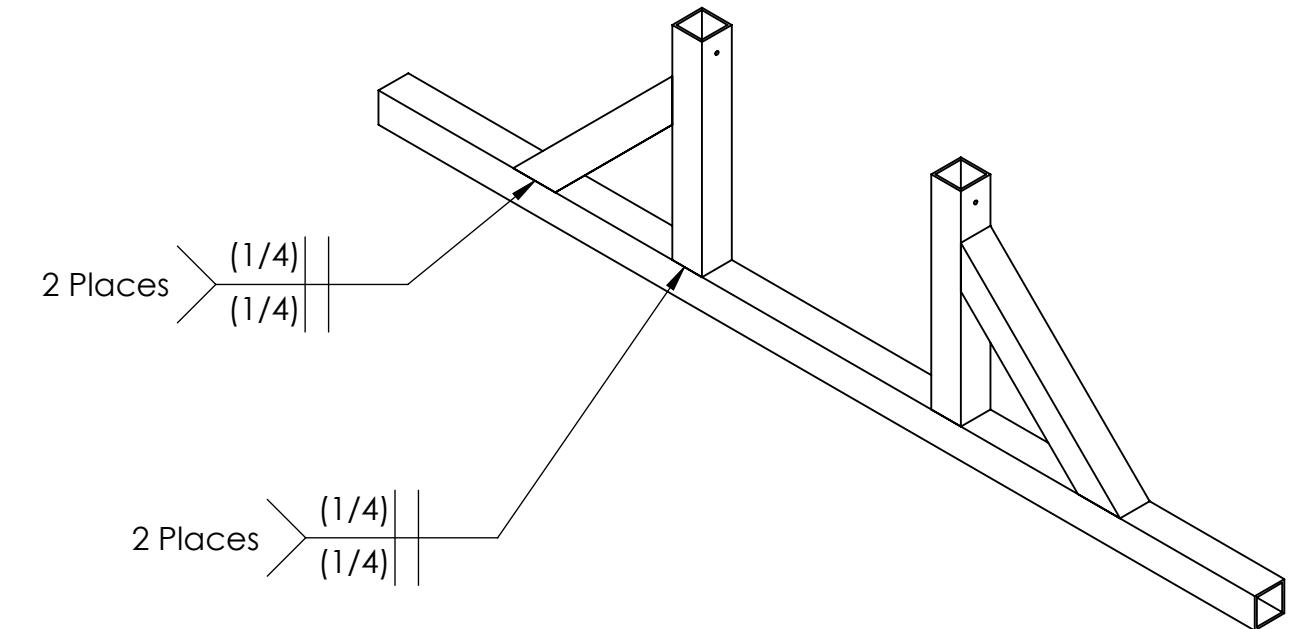
4

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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	

**FIRST ROBOTICS COMPETITION** **SOLIDWORKS**  
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**Switch Fence Brace**

**SIZE** DWG. NO. **B** **GE-18087** **REV**

SCALE: 1:8 WEIGHT: SHEET 2 OF 3

4

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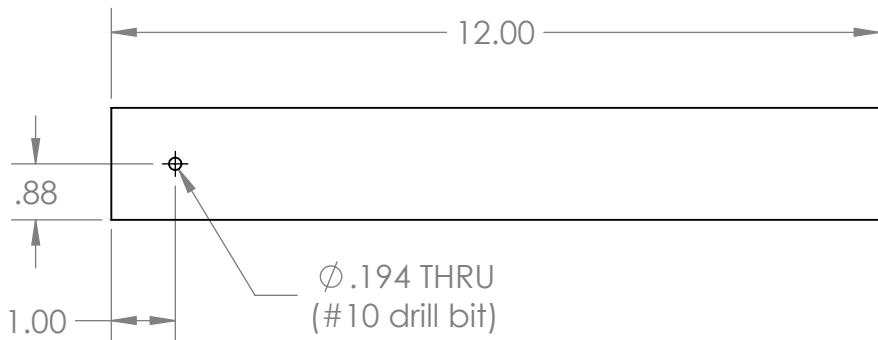
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4

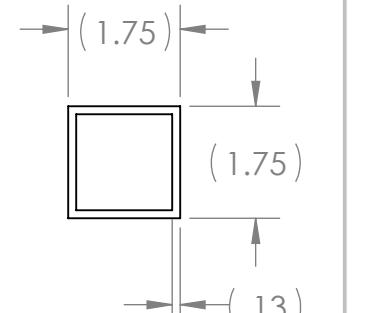
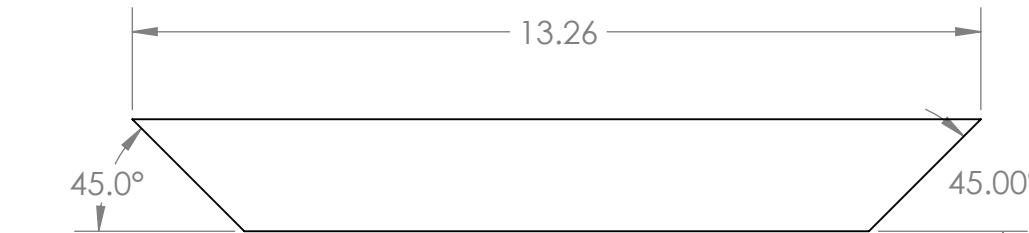
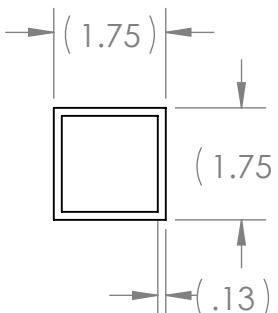
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2

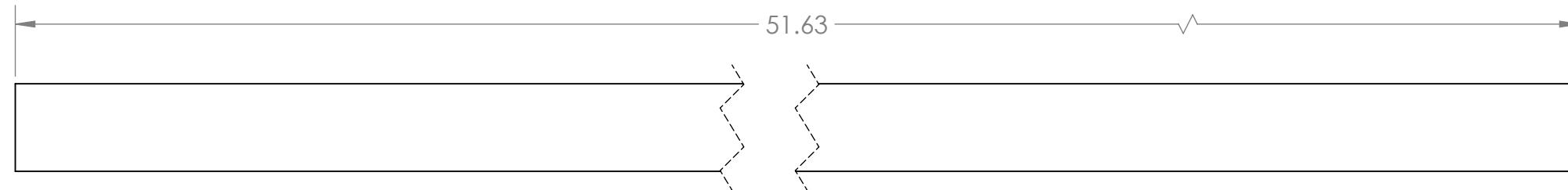
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Item: GE-18087-1  
Material: 1.75" x .125" thk. Square Tube, 6063 Aluminum  
QTY: 2



Item: GE-18087-2  
Material: 1.75" x .125" thk. Square Tube, 6063 Aluminum  
QTY: 2



Item: GE-18087-3  
Material: 1.75" x .125" thk. Square Tube, 6063 Aluminum  
QTY: 1

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

**FIRST ROBOTICS COMPETITION** **SOLIDWORKS**  
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**Switch Fence Brace**

**SIZE** DWG. NO. **REV**  
**B** **GE-18087**

SCALE: 1:3 WEIGHT: SHEET 3 OF 3

4

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2

1

4

3

2

1

B

B

Technical drawing showing a rectangular component with a central hole and a slot. The width of the component is 30.00. The central hole has a diameter of  $\phi .194$  THRU (#10 drill bit). The distance from the center of the hole to the right edge is 10.88. The height of the component is .66. A slot is located on the left side, extending from the top to the bottom edge.

A

A

### Notes:

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

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		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$	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: 1:2	WEIGHT:	SHEET 1 OF 1	

4

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B

B



A

A

## Notes:

1. Description: 1-3/8 Dia. Conveyor Roller, for 30" frame width
2. Material: Galvanized Steel
3. Source: McMaster-Carr
4. Item#: 2282T25

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		INTERPRET GEOMETRIC TOLERANCING PER:		Q.A.	TITLE:
		MATERIAL		COMMENTS:	Roller, Conveyor
	NEXT ASSY	USED ON	FINISH		SIZE DWG. NO. <b>B</b> GE-18090
		APPLICATION	DO NOT SCALE DRAWING		REV
				SCALE: 1:4	WEIGHT:
					SHEET 1 OF 1

4

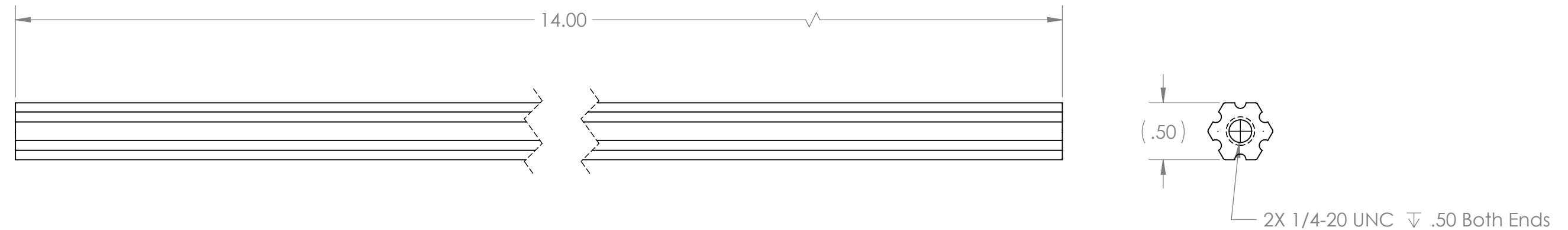
3

2

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B

B



A

A

- Notes:
1. Material: Aluminum
  2. Vendor: AndyMark
  3. Remove all burrs or sharp edges

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		DRAWN	DAF	11/26/17	
		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

**Churro, 14"**

**SIZE** DWG. NO. **REV**  
**B** **GE-18091**

SCALE: 1:1 WEIGHT: SHEET 1 OF 1

4

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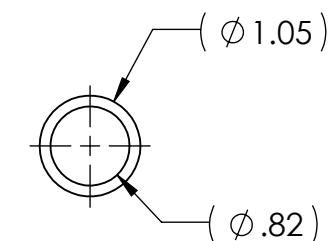
2

1

B

B

16.50



## Notes

1. Material: 3/4" Schedule 40 Pipe, White PVC
  2. Remove all burrs and sharp edges

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		UNLESS OTHERWISE SPECIFIED:		NAME	DATE	 <b>FIRST ROBOTICS COMPETITION</b>	<b>TITLE:</b>  <b>Handle, Chute</b>
		<b>DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL <math>\pm 1/16</math> ANGULAR: MACH <math>\pm 1^\circ</math> BEND <math>\pm 1^\circ</math> TWO PLACE DECIMAL <math>\pm .01</math> THREE PLACE DECIMAL <math>\pm .001</math></b>	DRAWN	DAF	11/26/17		
			CHECKED				
			ENG APPR.				
			MFG APPR.				
			Q.A.				
		COMMENTS:					
		<b>MATERIAL</b>  <b>NEXT ASSY</b> <b>USED ON</b> <b>FINISH</b>				<b>SIZE</b> <b>DWG. NO.</b> <b>REV</b> <b>B</b> <b>GE-18092</b>	
APPLICATION		DO NOT SCALE DRAWING		SCALE: 1:2	WEIGHT:		SHEET 1 OF 1

4

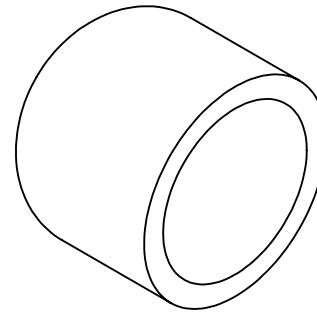
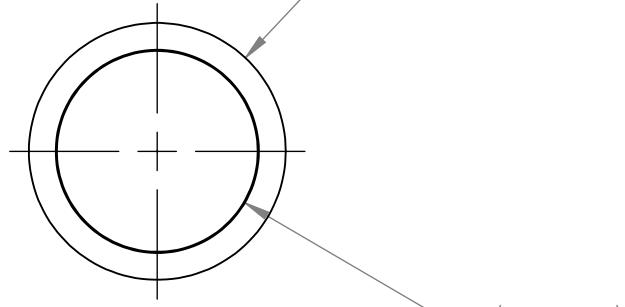
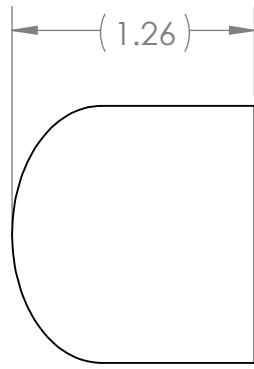
3

2

1

B

B



## Notes:

1. Description: End Cap for 3/4" Schedule 40 Pipe
2. Material: White PVC

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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				

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COMPETITION**  **SOLIDWORKS**  
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TITLE:

**End Cap, PVC**

SIZE	DWG. NO.	REV
<b>A</b>	<b>GE-18093</b>	
SCALE: 1:1	WEIGHT:	SHEET 1 OF 1

4

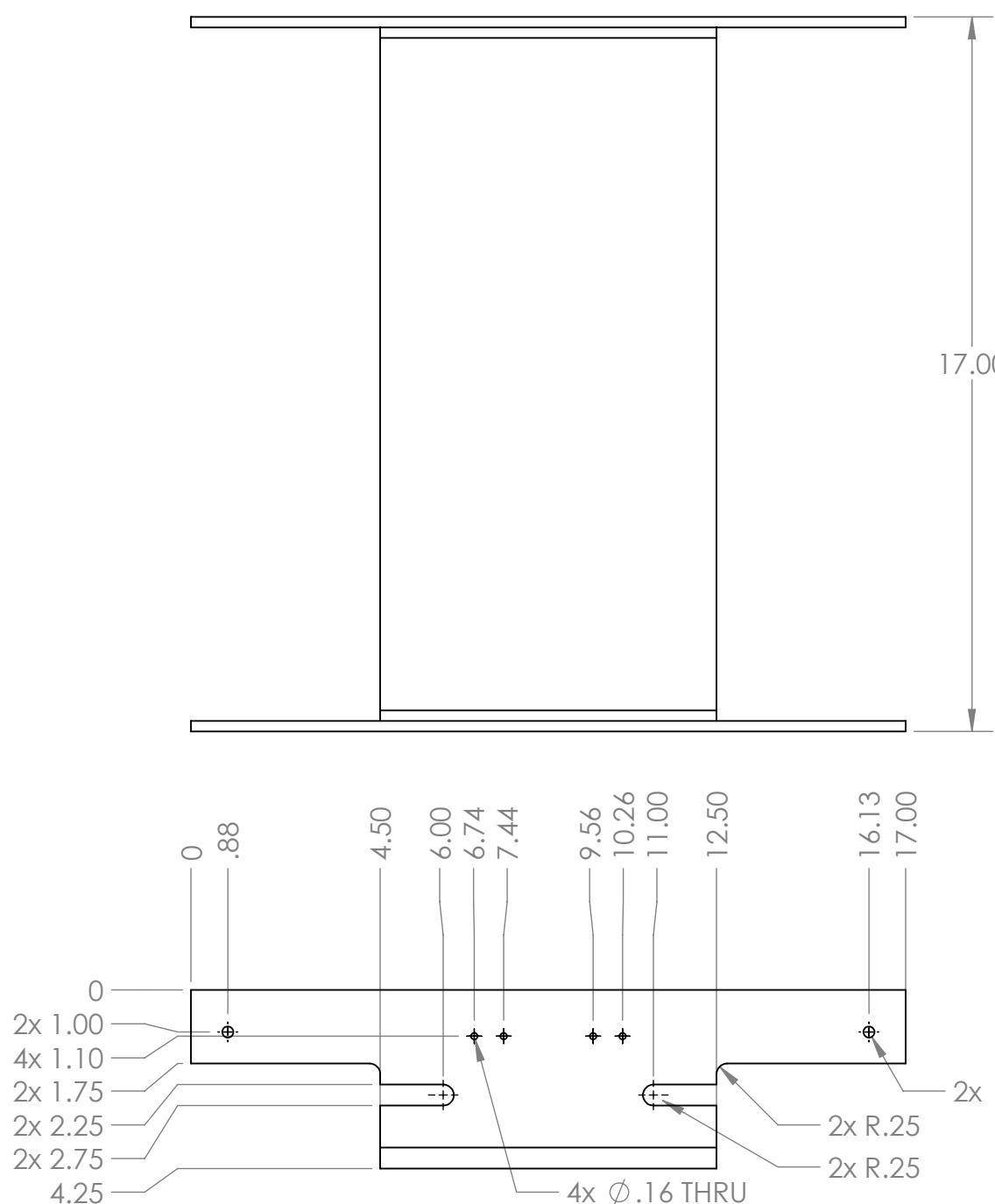
3

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B

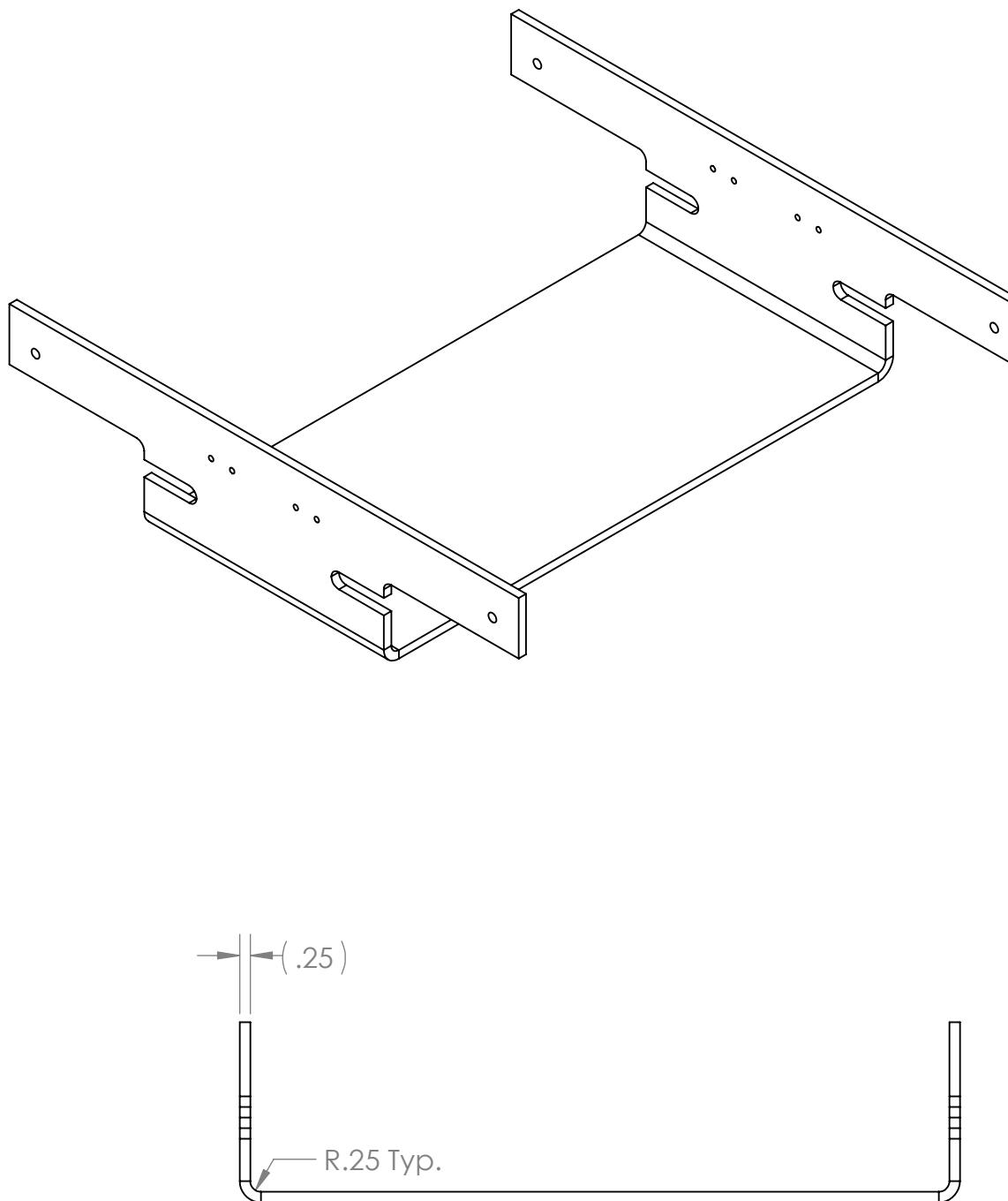
B



- Notes:
1. Material: 1/4" thick, clear polycarbonate
  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>B</b>	<b>GE-18094</b>			
SCALE: 1:4	WEIGHT:			SHEET 1 OF 1



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**FIRST**  
ROBOTICS  
COMPETITION

**SOLIDWORKS**  
Modeling Solutions Partner

**Scale Sensor  
Mount**

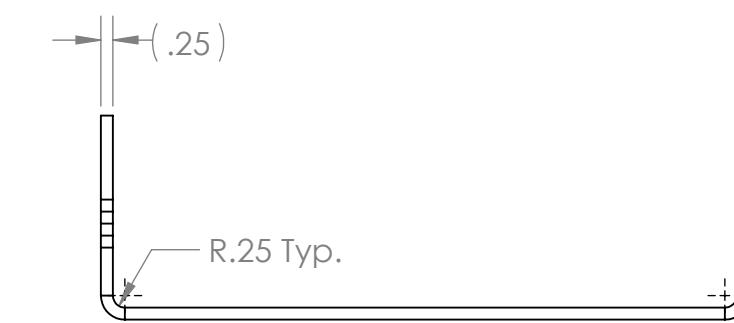
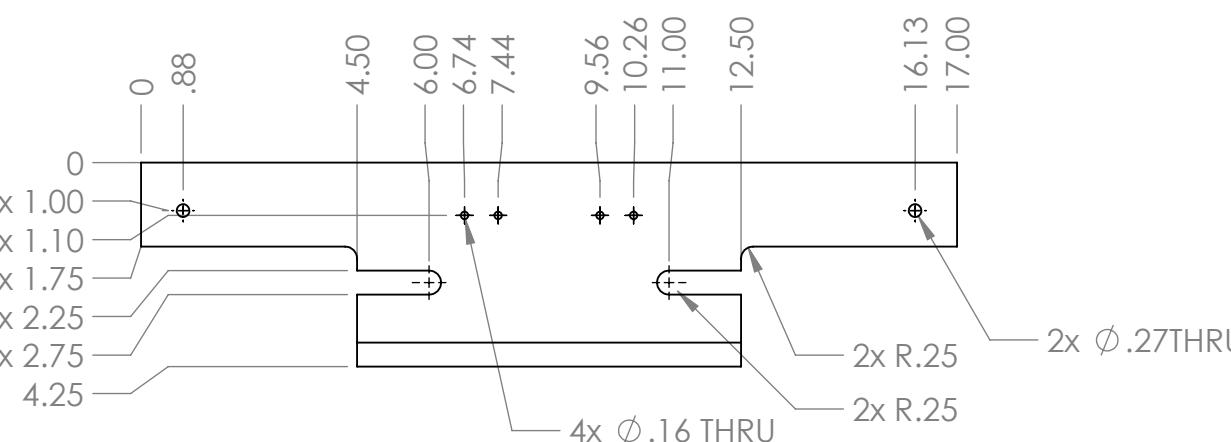
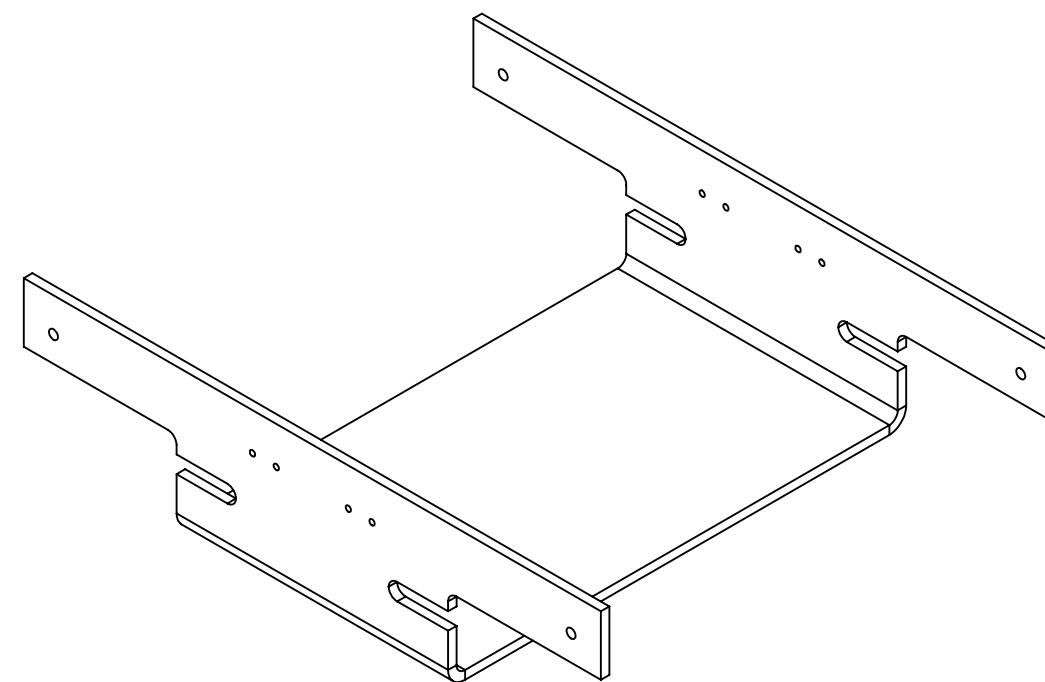
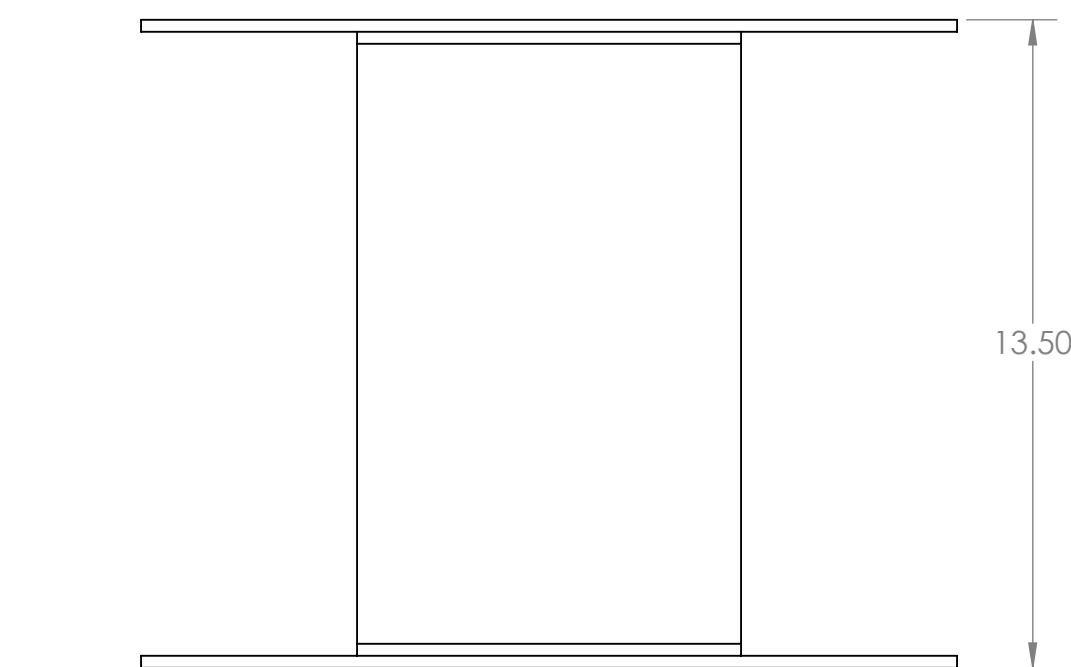
4

3

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B



- Notes:
1. Material: 1/4" thick, clear polycarbonate
  2. Remove all burrs and sharp edges.

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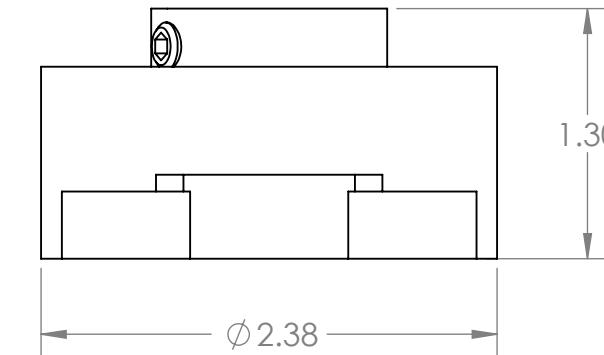
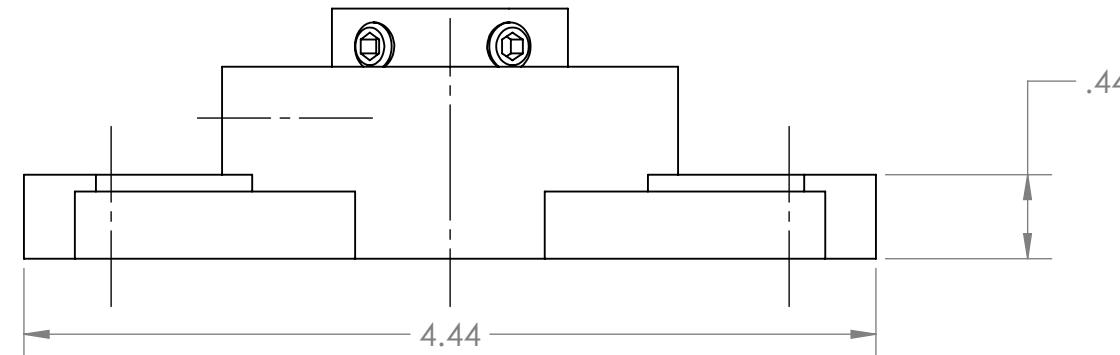
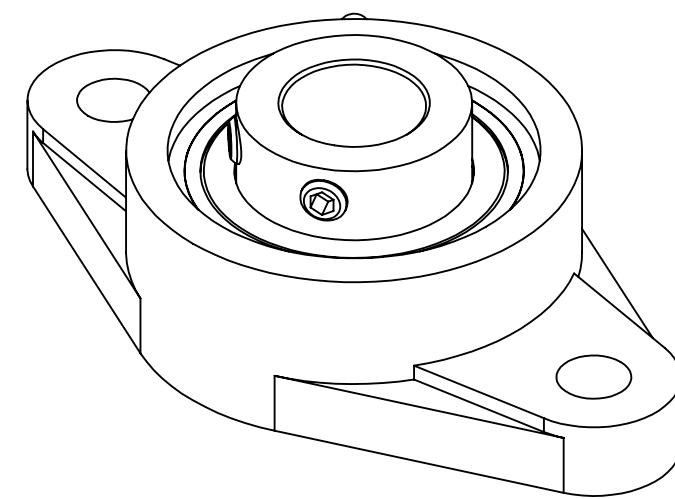
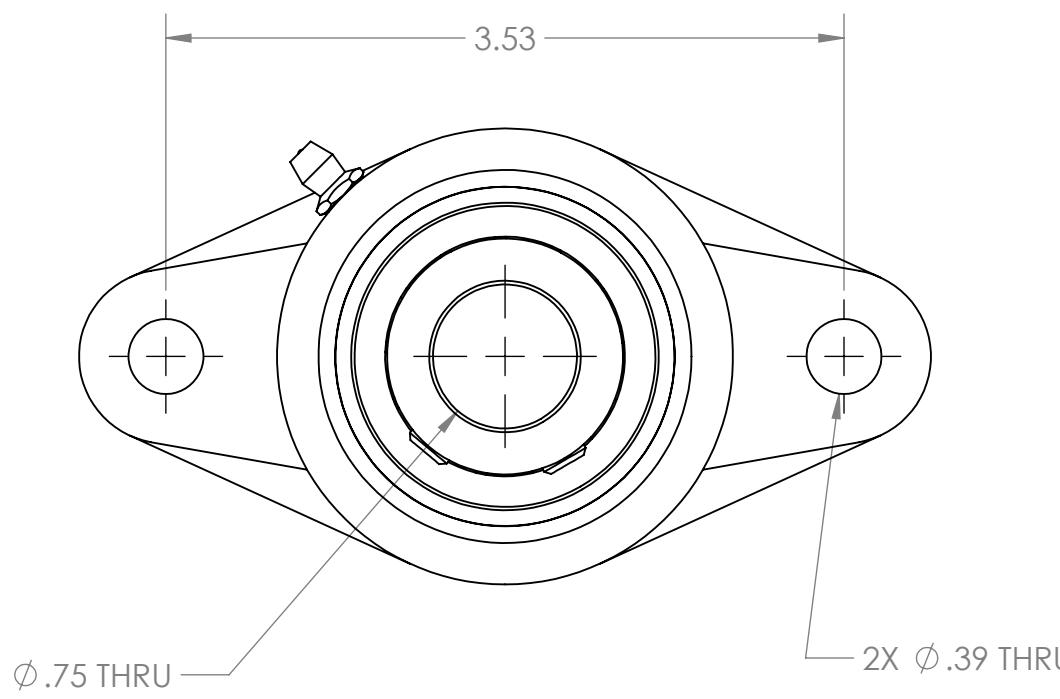
		UNLESS OTHERWISE SPECIFIED:	NAME	DATE
DRAWN	Casey O'Connor	DIMENSIONS ARE IN INCHES		11/28/2017
CHECKED		TOLERANCES:		
ENG APPR.		FRACTIONAL: $\pm 1/16$		
MFG APPR.		ANGULAR: MACH $\pm 1^\circ$		
		BEND $\pm 1^\circ$		
		TWO PLACE DECIMAL $\pm .01$		
		THREE PLACE DECIMAL $\pm .001$		
		INTERPRET GEOMETRIC TOLERANCING PER:	Q.A.	COMMENTS:
		MATERIAL		
NEXT ASSY	USED ON	FINISH		
APPLICATION		DO NOT SCALE DRAWING		
SCALE: 1:4		WEIGHT:	SHEET 1 OF 1	

FIRST  
ROBOTICS  
COMPETITION

SOLIDWORKS  
Modeling Solutions Partner

Switch Sensor  
Mount

SIZE DWG. NO. REV  
**B** GE-18095



- Notes:
1. Description: 2-Bolt Flange Bearing 3/4" Bore Dia.
  2. Source: Grainger
  3. Item #: 36UX95
  4. Equivalent substitutions allowed

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		DIMENSIONS ARE IN INCHES			
		TOLERANCES:			
		FRACTIONAL: $\pm 1/16$			
		ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$			
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		THREE PLACE DECIMAL $\pm .001$			
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		TOLERANCING PER:			
		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:** Scale/Switch Bearing

**Size:** B **Dwg. No.:** GE-18096 **Rev.:** 1

**Scale:** 1:1 **Weight:** **Sheet 1 of 1**

4

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B

B

Technical drawing of a circular component with concentric rings, two thru-holes, and a central square cutout. Dimension lines indicate outer diameter (.50), inner diameter (3.23), and hole diameter (.27). The drawing uses standard engineering conventions with leader lines and arrows.

A diagram of a beam with a rectangular cross-section. The beam has a total length of 3.74 and a height of .45. A vertical force is applied at the top center of the beam.

A diagram of a circular coil with a central diamond-shaped gap. The coil is represented by a series of concentric circles. In the center of the coil is a diamond shape formed by two intersecting lines. The top and bottom lines of the diamond are parallel to the top and bottom edges of the coil's opening, while the left and right lines are parallel to the left and right edges.

A diagram of a rectangular component. The top edge is a thick black line. The bottom edge is a thin black line. A horizontal slot is located in the center of the component, consisting of a thin black line with a small gap in the middle. A dimension line with arrows at both ends spans the width of the slot. The numerical value '2.76' is written in black text next to the dimension line.

A

A

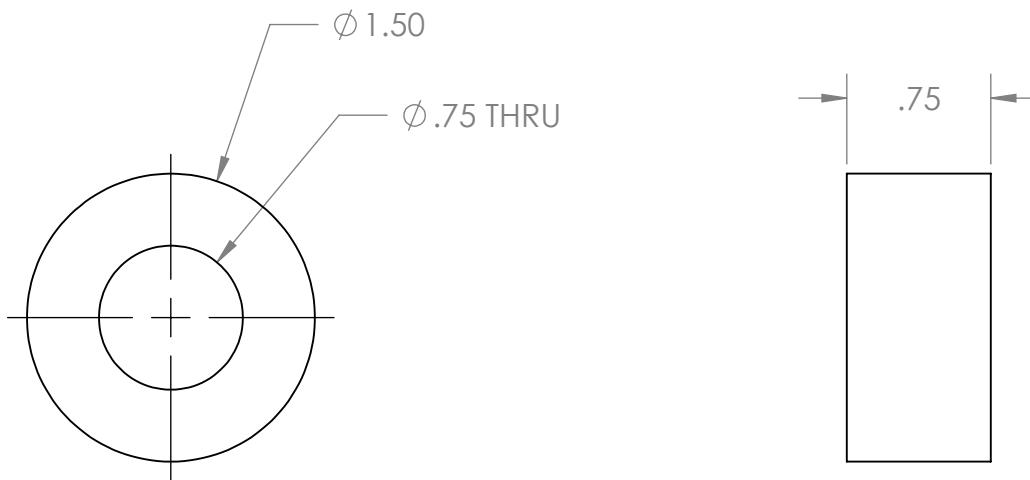
## Notes

- Notes:

  1. Description: Rotary Speed Limiter, Opening for Square shaft, 1437 in.-oz Maximum Torque
  2. Source: McMaster-Carr
  3. Item #: 6597K24
  4. Equivalent substitutions allowed

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## Notes:

1. Description: Nylon Unthreaded Spacer
2. Source: McMaster-Carr
3. Item#: 94639A891
4. Equivalent substitutions allowed

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

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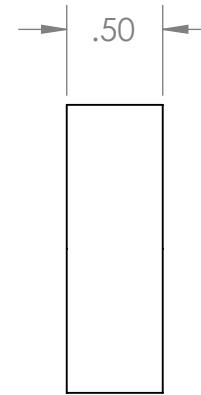
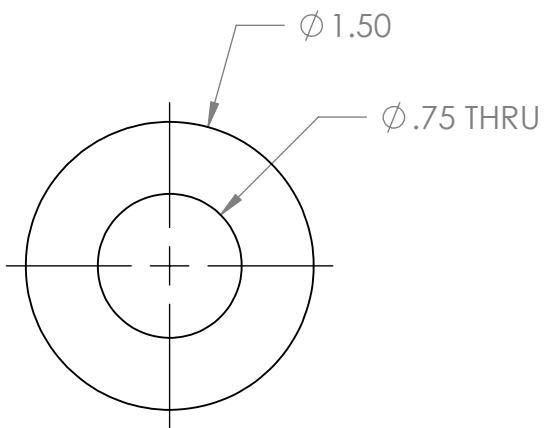
TITLE:

# Switch Shaft Spacer

SIZE	DWG. NO.	REV
<b>A</b>	<b>GE-18098</b>	
SCALE: 1:1		WEIGHT:
SHEET 1 OF 1		

B

B



## Notes:

1. Description: Nylon Unthreaded Spacer
2. Source: McMaster-Carr
3. Item#: 94639A889
4. Equivalent substitutions allowed

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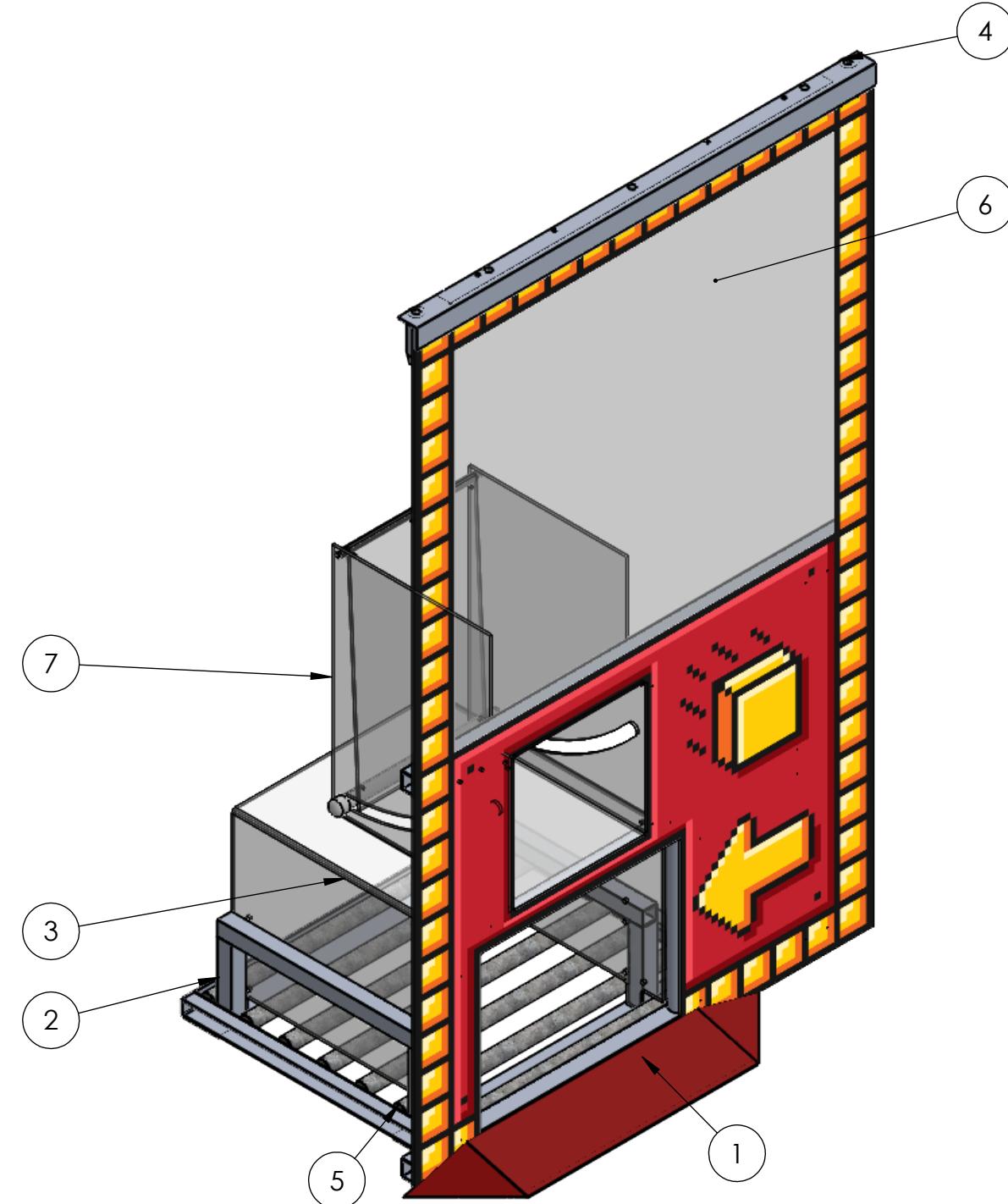
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		INTERPRET GEOMETRIC TOLERANCING PER: MATERIAL		CHECKED		
				ENG APPR.		
				MFG APPR.		
				Q.A.		
		COMMENTS:				
NEXT ASSY		USED ON				
APPLICATION		FINISH				
DO NOT SCALE DRAWING						

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TITLE:

# Scale Shaft Spacer

SIZE	DWG. NO.	REV
<b>A</b>	<b>GE-18099</b>	
SCALE: 1:1	WEIGHT:	SHEET 1 OF 1



ITEM NO.	PART NUMBER	DESCRIPTION	Default/ QTY.
1	GE-18009	Exchange Frame	1
2	GE-18006	Roller Base	1
3	GE-18008	Roller Tunnel	1
4	GE-18015	Top Rail, Exchange	1
5	2282T25	Roller, Conveyor	7
6	GE-18010	Exchange Plastic	1
7	GE-18101	Assembly, Chute	1
8	GE-18127	Ramp, Exchange	1

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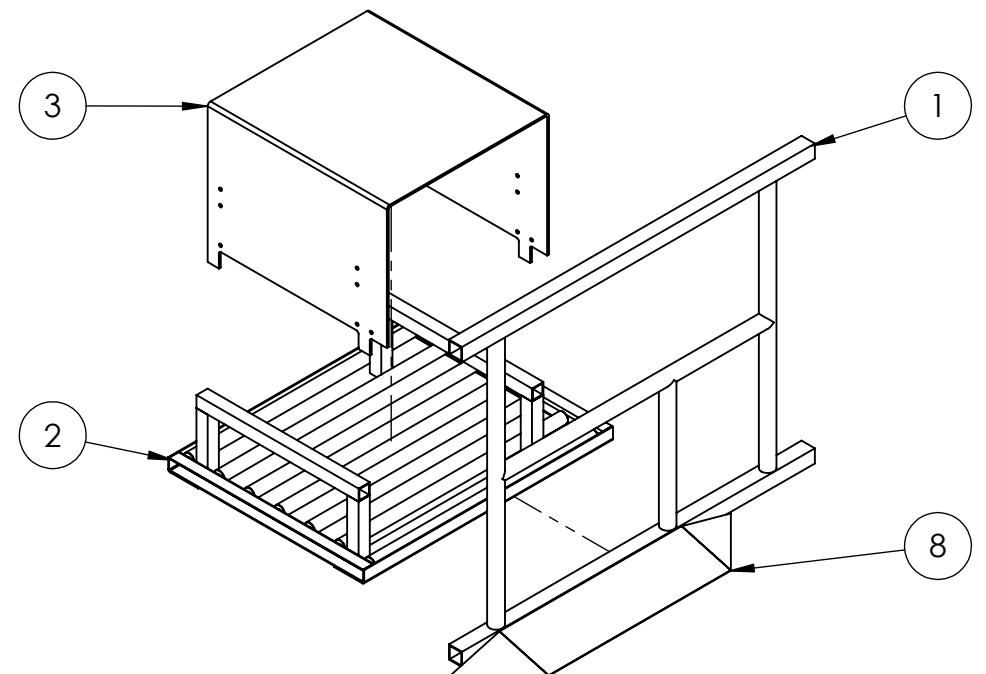
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		DRAWN			
		CHECKED			
		ENG APPR.			
		MFG APPR.			
		Q.A.			
		COMMENTS:			
		MATERIAL			
		FINISH			
		APPLICATION	DO NOT SCALE DRAWING		
SIZE	DWG. NO.	REV			
<b>B</b>	<b>GE-18100</b>				
SCALE: 1:12	WEIGHT:	SHEET 1 OF 2			

4

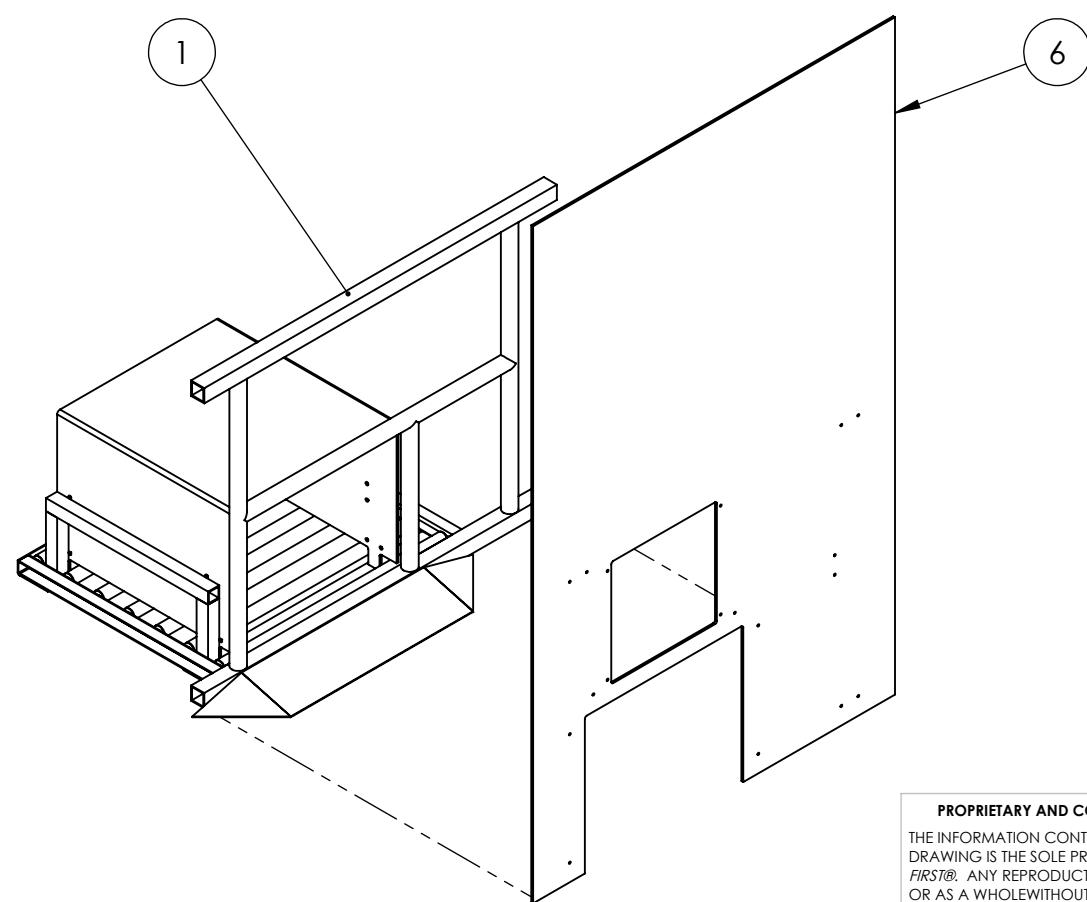
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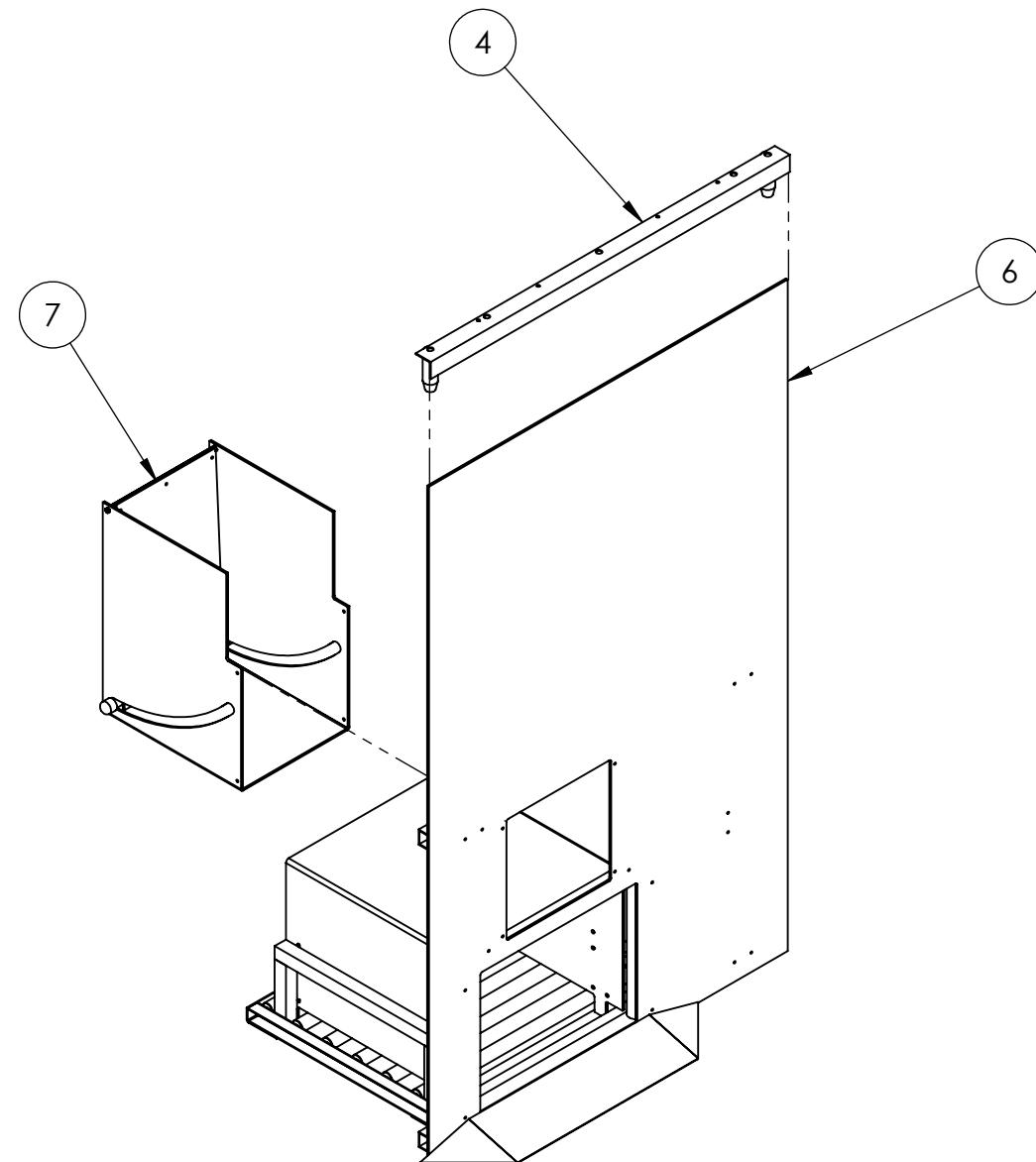


- Notes:
1. Attach Item 1 to field perimeter.
  2. Place Item 8 in front of Item 1.
  3. Place Item 2 behind Item 1, with rails centered on the opening.
  4. Center item 3 on rollers, flush with edges of guard and rail.



- Notes:
1. Attach Item 6 to Item 1 using cable ties.

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- Notes:
1. Attach Item 7 to Item 6 using cable ties.
  2. Add Item 4.

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

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**Assembly, Exchange**

**SIZE** **DWG. NO.** **REV**  
**B** **GE-18100**

**SCALE: 1:18** **WEIGHT:** **SHEET 2 OF 2**

4

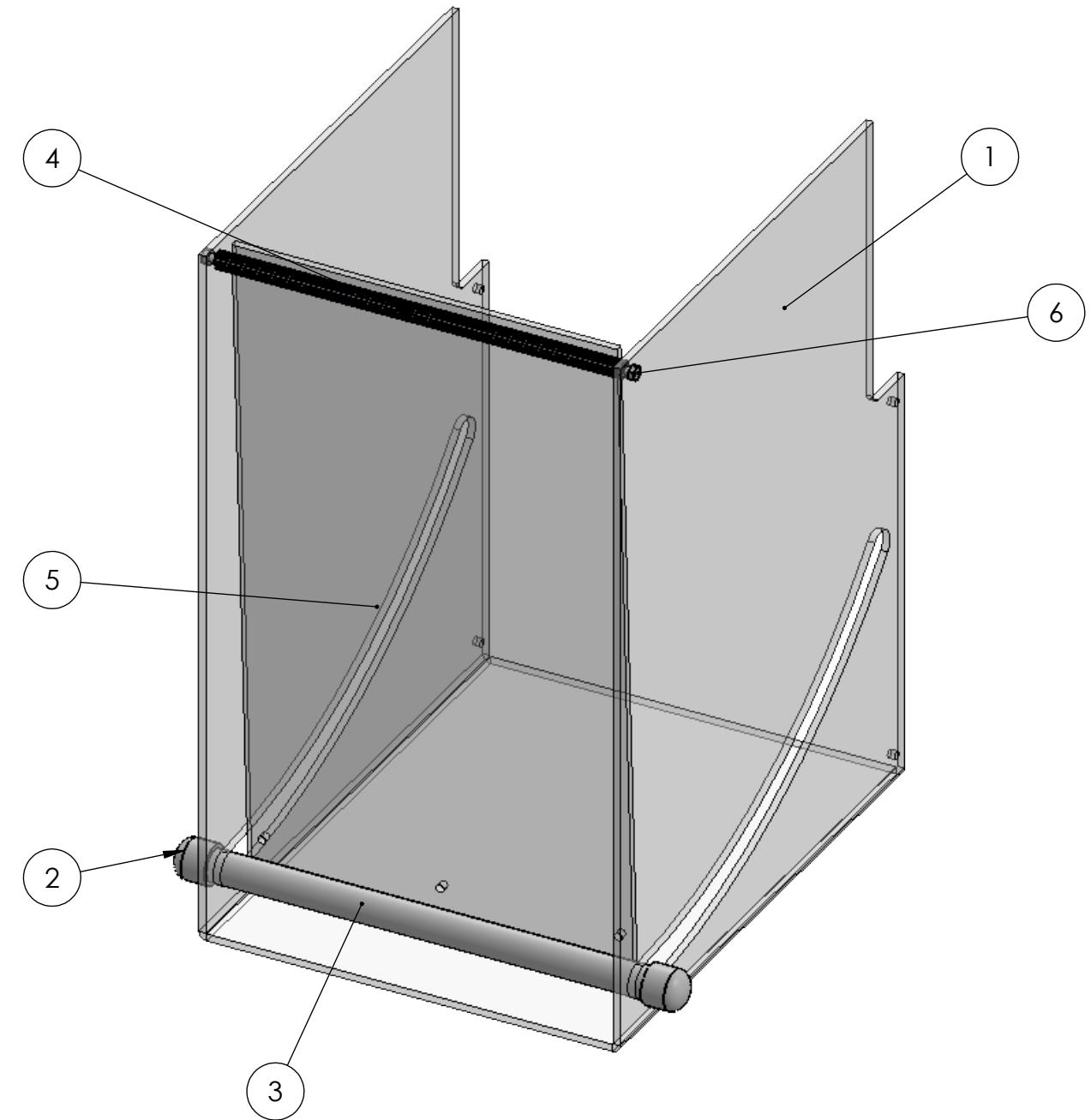
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1

B

B



A

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-18025	Chute Body	1
2	4880K52	End Cap, PVC	2
3	GE-18092	Handle, Chute	1
4	GE-18091	Churro, 14"	1
5	GE-18027	Pusher Panel	1
6	HBOLT 0.2500-20x0.25x0.25-N	1/4-20 Hex Bolt .25"	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>B</b>	<b>GE-18101</b>				
SCALE: 1:5	WEIGHT:	SHEET 1 OF 3			

4

3

2

1

A

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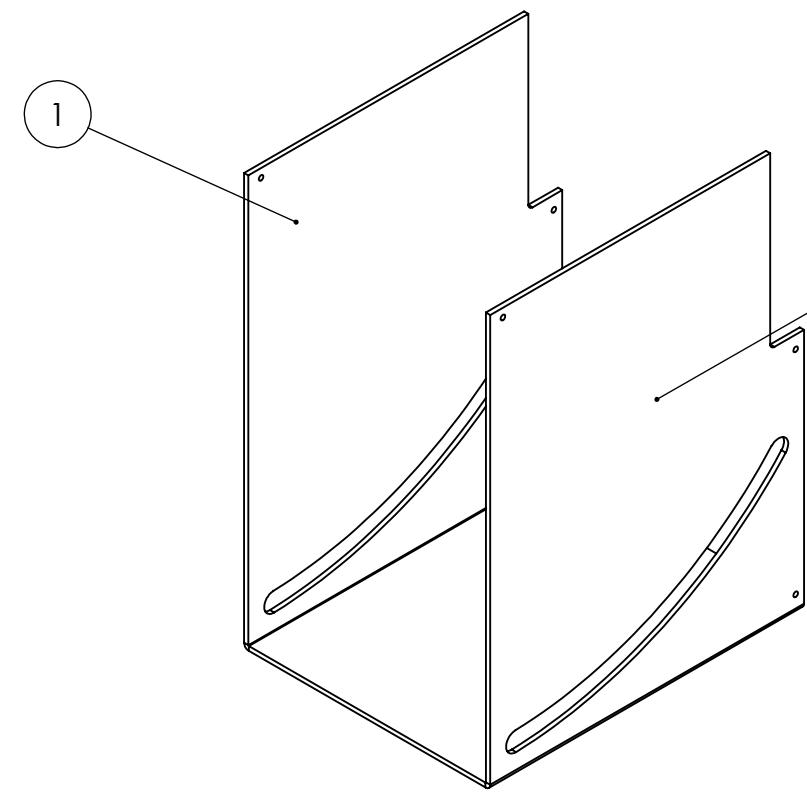
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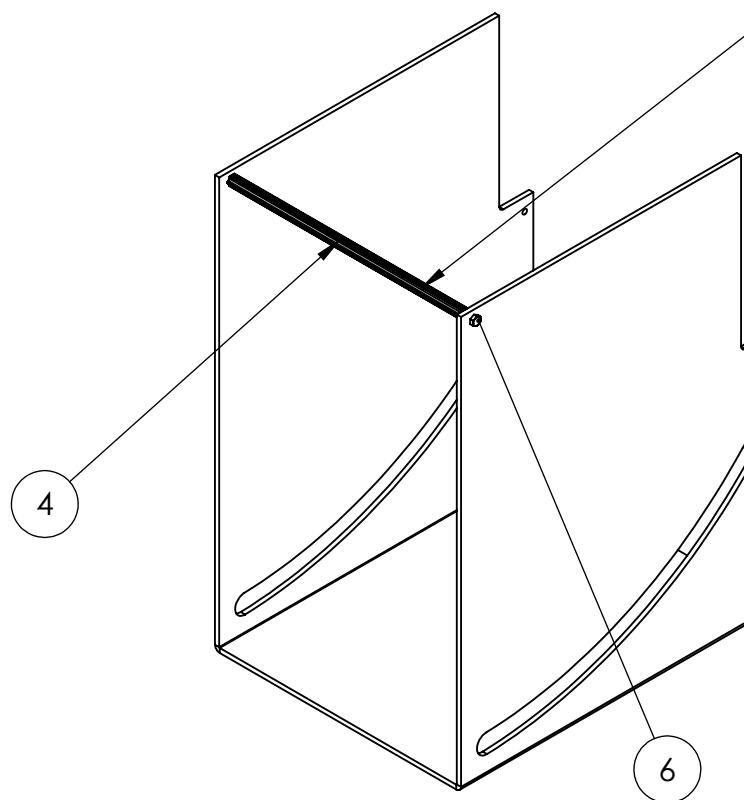
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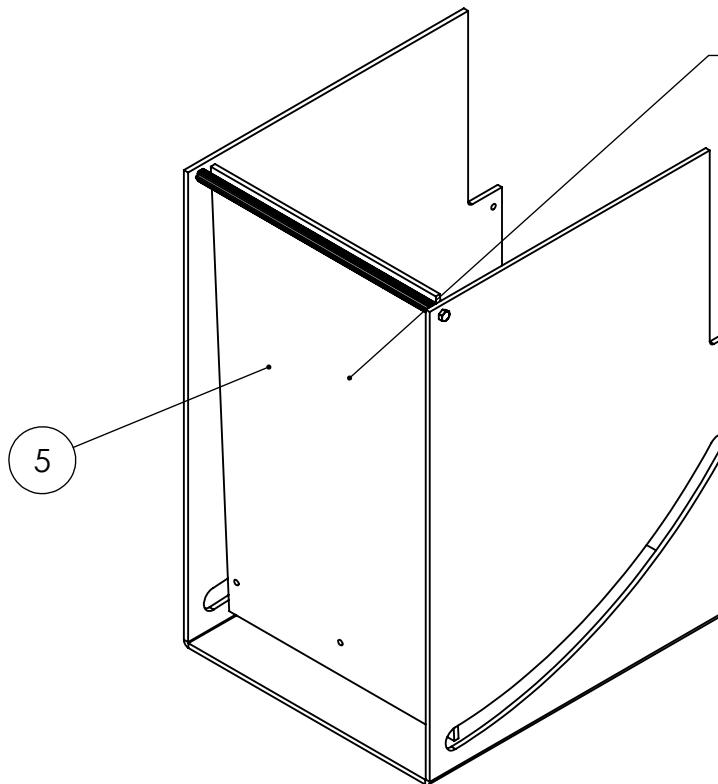
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Step 1:  
Fix Item 1 to station.



Step 2:  
Add Item 4 and attach using Item 6 (qty: 2).



Step 3:  
Attach Item 5 using cable ties to Item 4.

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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	

**FIRST ROBOTICS COMPETITION** **SOLIDWORKS**  
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**Assembly, Chute**

**SIZE** DWG. NO. **B** **GE-18101** **REV**

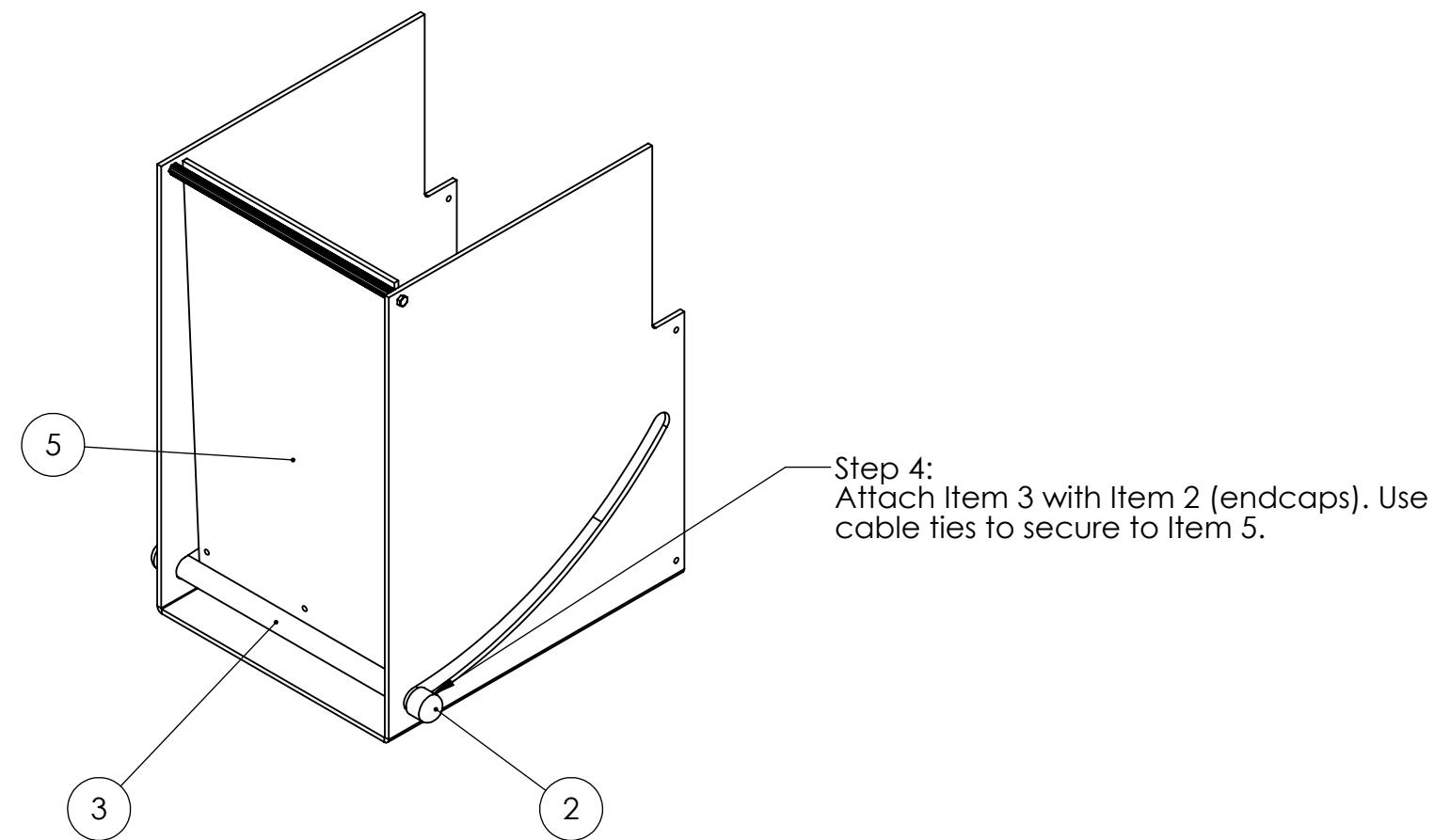
SCALE: 1:8 WEIGHT: SHEET 2 OF 3

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:  
Assembly, Chute

SIZE DWG. NO. REV  
**B** GE-18101

SCALE: 1:8 WEIGHT: SHEET 3 OF 3

4

3

2

1

B

B

6X Cut relief/dogbone  
if necessary to  
maintain square corner

.00

3X 1.52

3.00

.00  
2.00  
2.49

2

18.37  
18.89

Engrave "2" near end of part

R.13

.25

.804

.88

90.0°

36.75  
37.27  
39.12

47.12

.82

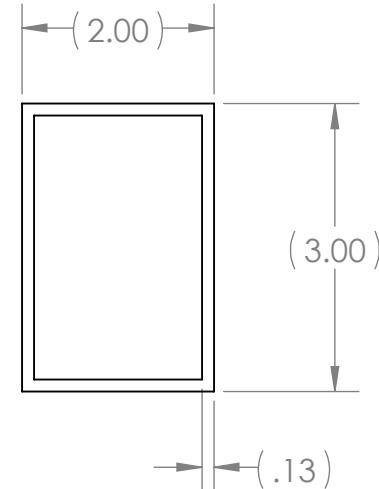
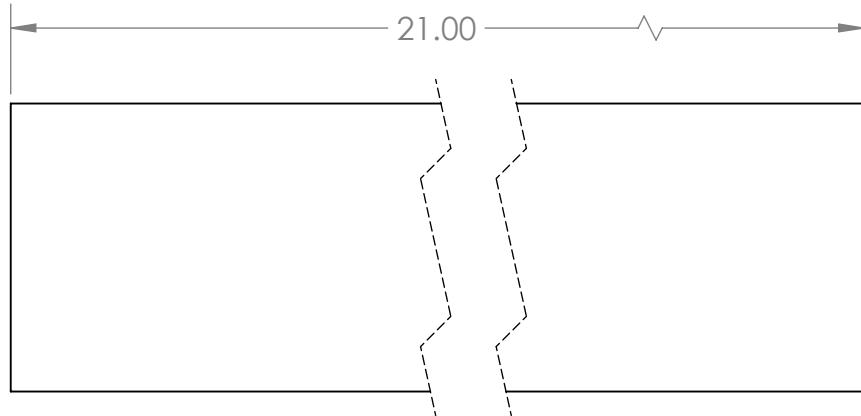
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Notes:

1. Material: 1/2" HDPE, any color
2. Surface: Smooth texture
3. Remove all burrs and sharp edge

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		DIMENSIONS ARE IN INCHES	DRAWN					<b>SOLIDWORKS</b> <small>Modeling Solutions Partner</small>
		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: 1:6	WEIGHT:	SHEET 1 OF 1			



## Notes:

1. Materials: 3" x 2" x 1/8" thk. Rectangular Tube, 6063 Aluminum
2. Remove all burrs and sharp edges

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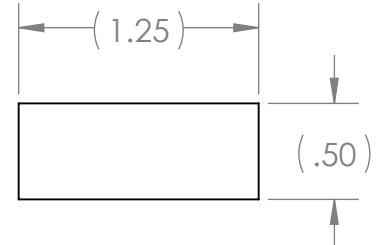
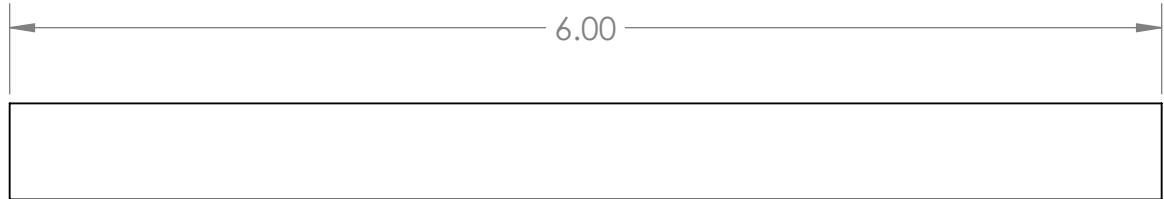
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		TOLERANCES:		CHECKED		
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		ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$		MFG APPR.		
		TWO PLACE DECIMAL $\pm .01$		Q.A.		
		THREE PLACE DECIMAL $\pm .001$		COMMENTS:		
		INTERPRET GEOMETRIC TOLERANCING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



TITLE:

# Scale Lockout Bar

SIZE	DWG. NO.	REV
A	GE-18106	
SCALE: 1:2	WEIGHT:	SHEET 1 OF 1



## Notes:

1. Material: 1.25" x .5" Low-carbon Steel Bar
2. Remove all burrs and sharp edges

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

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

TITLE:



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# Scale/Switch Counterweight

SIZE	DWG. NO.	REV
<b>A</b>	<b>GE-18107</b>	
SCALE: 1:1	WEIGHT:	SHEET 1 OF 1

4

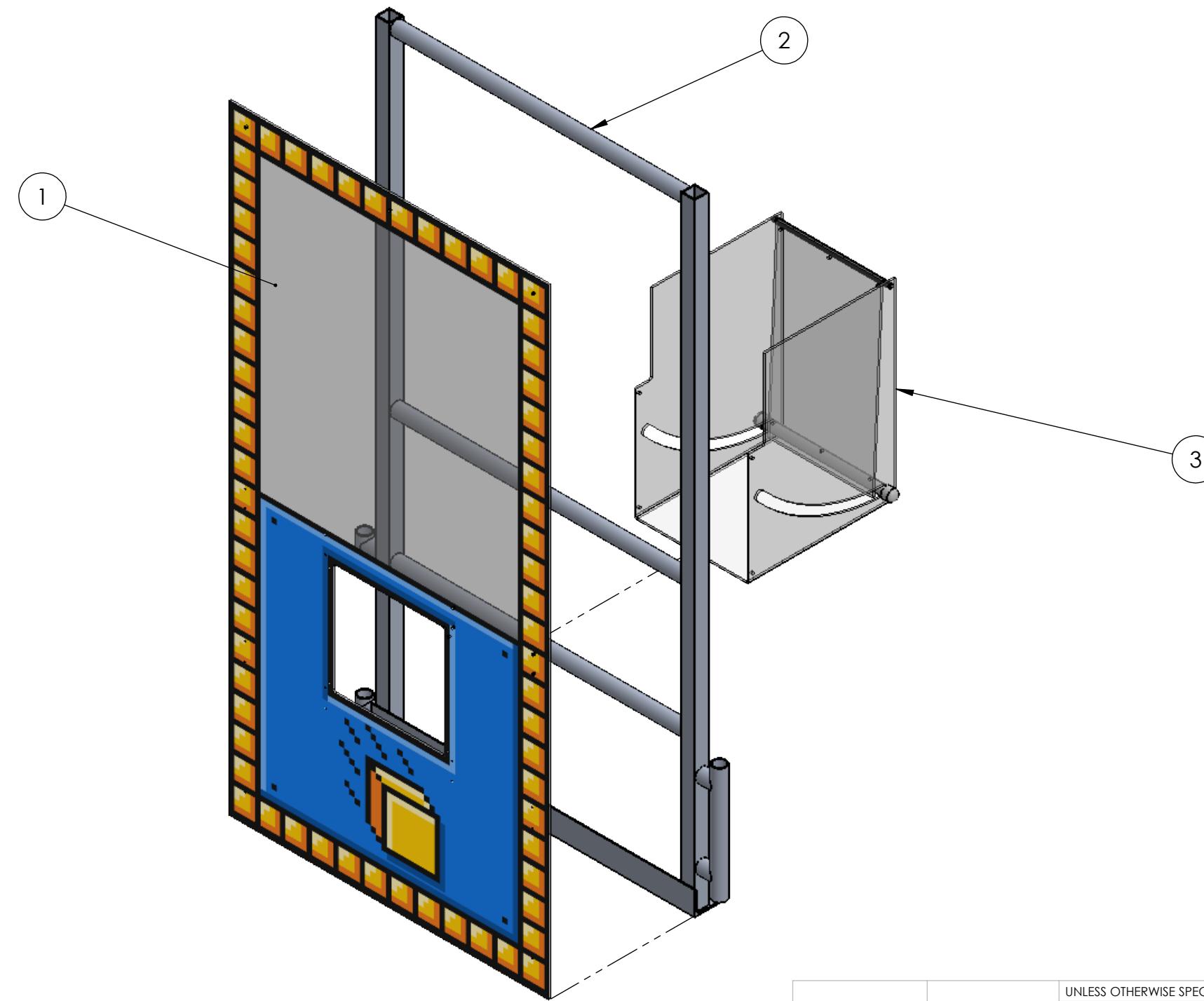
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2

1

B

B



## Notes:

1. Attach Item 2 to field perimeter.
2. Attach Item 1 to Item 2 using cable ties.
3. Attach Item 3 to Item 1 using cable ties.

ITEM NO.	PART NUMBER	DESCRIPTION	Default/ QTY.
1	GE-18004	Panel, Portal	1
2	GE-18011	Portal Frame - Left	1
3	GE-18101	Assembly, Chute	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	

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COMPETITION** **SOLIDWORKS**  
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**Portal - Left**

**SIZE** DWG. NO. **REV**  
**B** **GE-18108**

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

4

3

2

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4

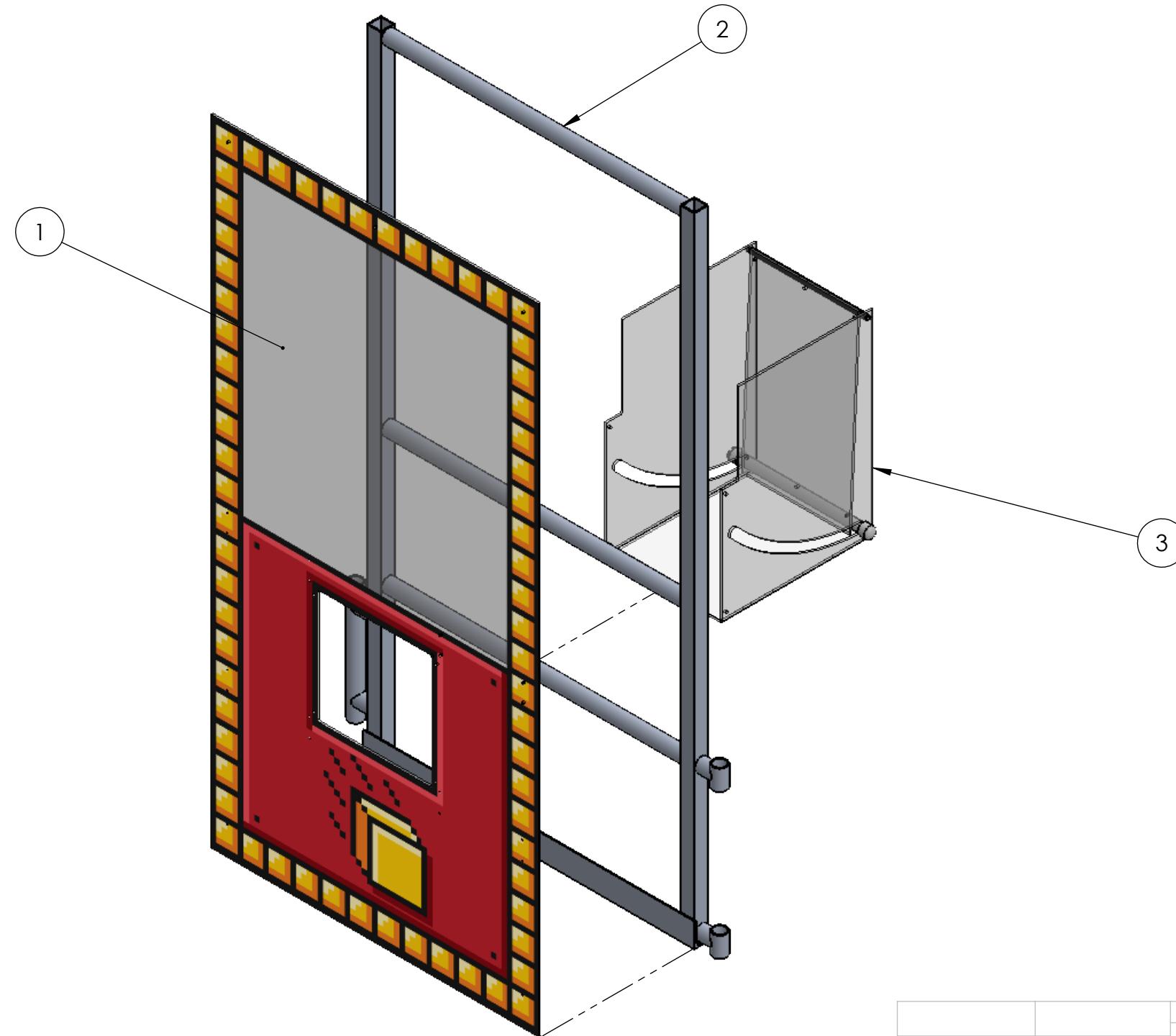
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1

B

B



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-18004	Panel, Portal	1
2	GE-18012	Portal Frame - Right	1
3	GE-18101	Assembly, Chute	1

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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	

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**Portal - Right**

**B** **GE-18109**

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

4

3

2

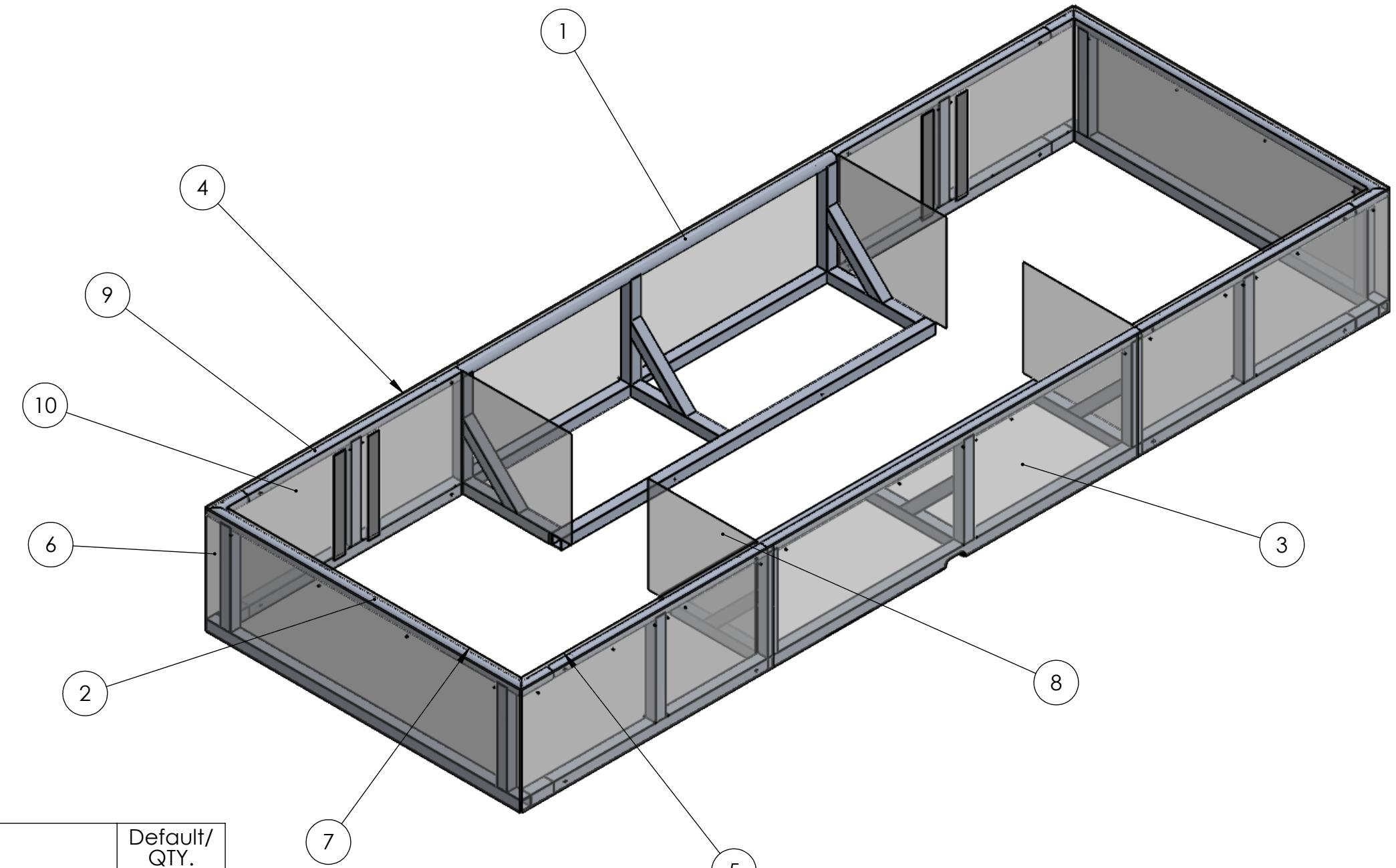
1

B

B

A

A



ITEM NO.	PART NUMBER	DESCRIPTION	Default QTY.
1	GE-18051	Side Frame, Fence	2
2	GE-18052	End Frame, Fence	2
3	GE-18080	Fence Polycarb, Middle	2
4	GE-18081	Fence Polycarb, Outer Side	4
5	GE-18082	Fence Polycarb, Inner Side	2
6	GE-18083	Fence Polycarb, Outer End	2
7	GE-18084	Fence Polycarb, Inner End	2
8	GE-18085	Fence Polycarb, Guard	4
9	GE-18111	Connecting Frame Assembly	4
10	GE-18115	Vision Fence Polycarbonate	2

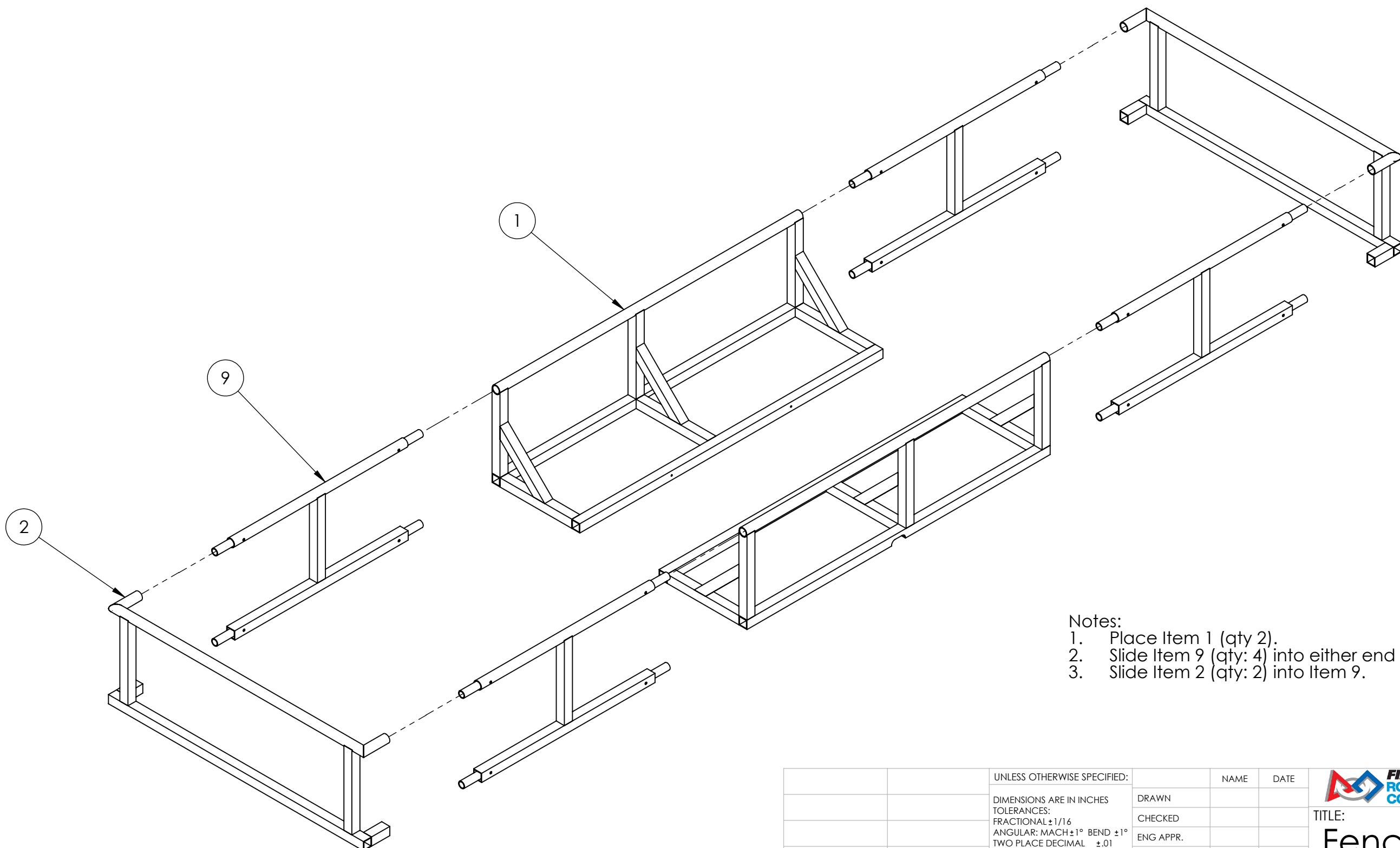
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## Notes:

1. Place Item 1 (qty 2).
2. Slide Item 9 (qty: 4) into either end of Item 1.
3. Slide Item 2 (qty: 2) into Item 9.

		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**  
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**TITLE:** Fence Assembly

**SIZE** DWG. NO. **B** GE-18110 **REV**

SCALE: 1:32 WEIGHT: SHEET 2 OF 3

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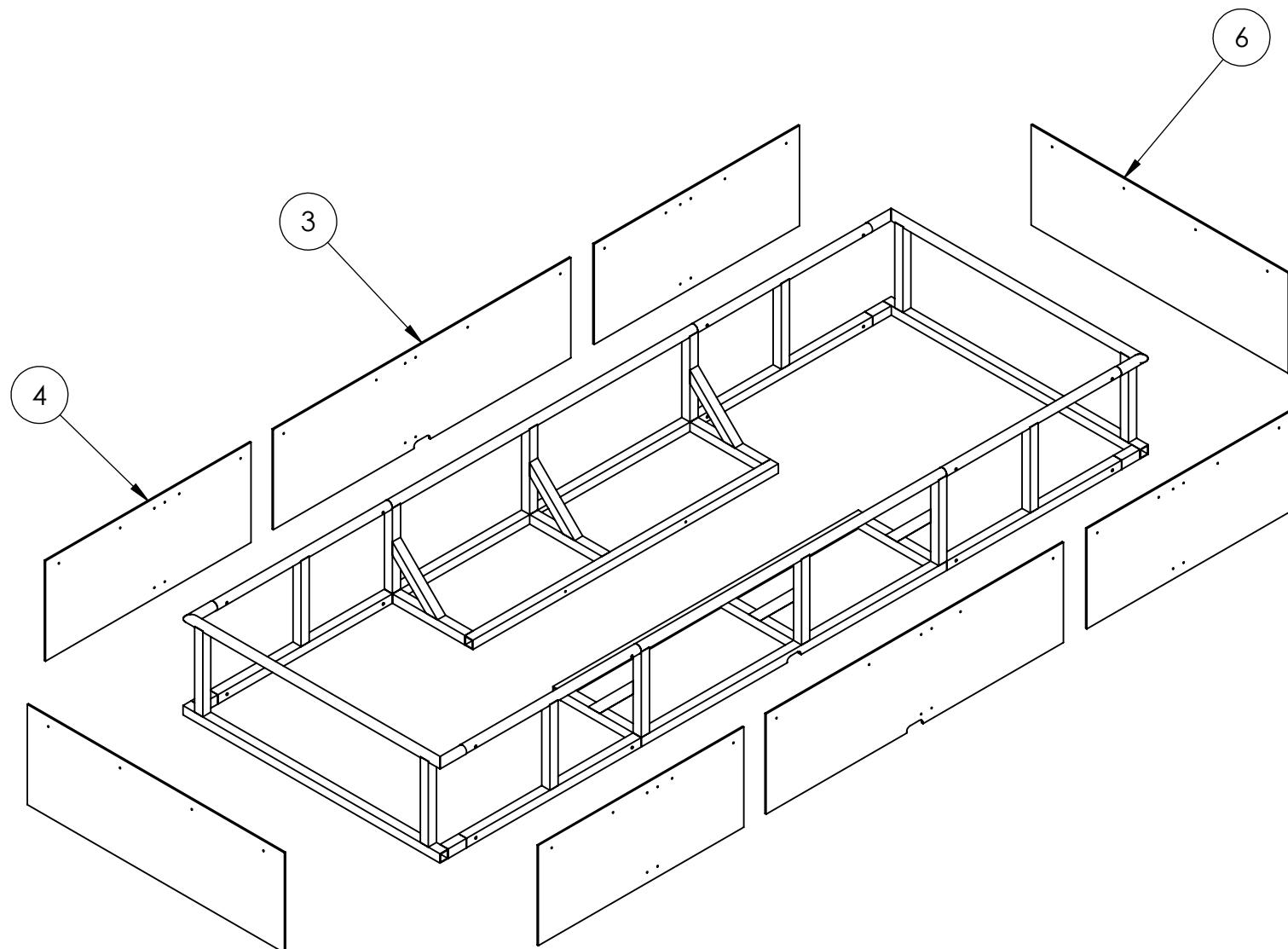
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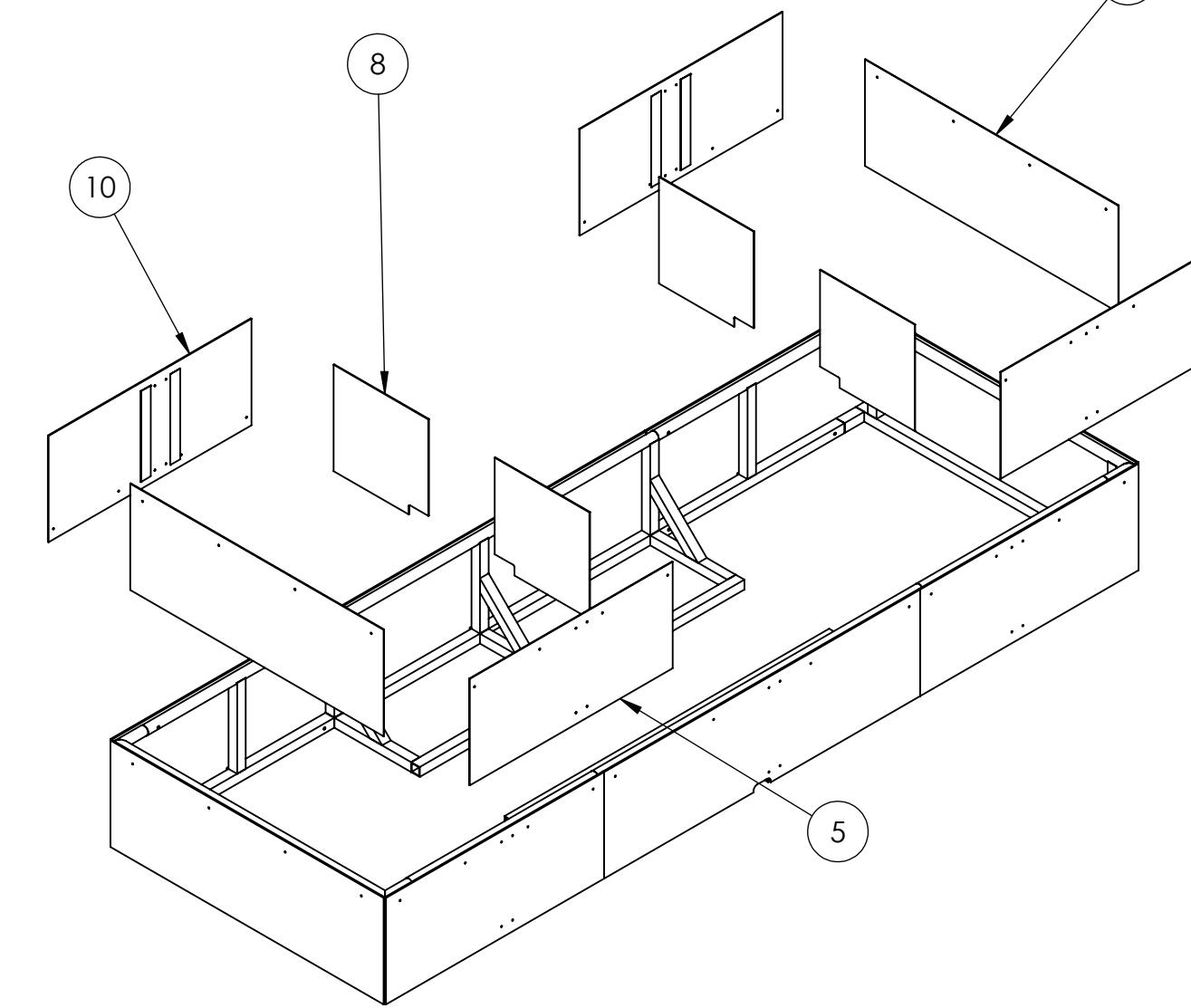
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1



Notes:

1. Attach Items 3 (qty: 2), 4 (qty: 4), 6 (qty: 2) with cable ties on top of panel and through vertical supports, and hook and loop on bottom.



Notes:

1. Attach Items 5 (qty: 2), 7 (qty: 2), 10 (qty: 2) with cable ties through top holes and around vertical supports.
2. Attach Item 8 (qty: 4) with hook and loop.

		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**  
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**TITLE:** Fence Assembly

**SIZE** DWG. NO. **B** GE-18110 **REV**

SCALE: 1:32 WEIGHT: SHEET 3 OF 3

4

3

2

1

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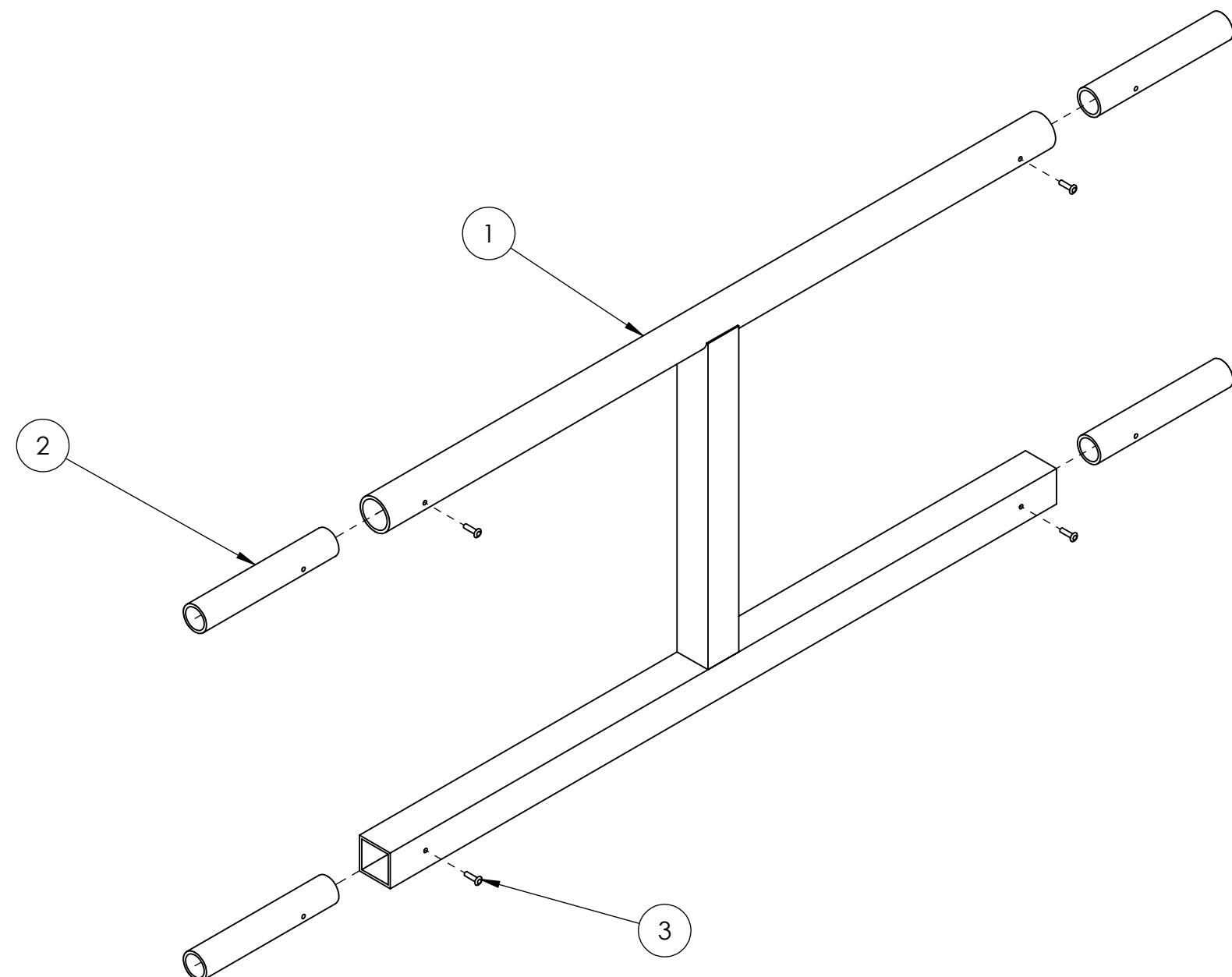
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2

1

B

B



A

A

ITEM NO.	PART NUMBER	DESCRIPTION	Default/QT Y.
1	GE-18053	Connecting Frame, Fence	1
2	GE-18086	Fence Pin	4
3	rivet_.1875_.376-.5	3/16" Aluminum Rivet, .376-.5 Grip Range	4

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

**FIRST<sup>®</sup> ROBOTICS COMPETITION** **SOLIDWORKS**  
Modeling Solutions Partner

**Connecting Frame Assembly**

**SIZE** DWG. NO. **REV**  
**B** **GE-18111**

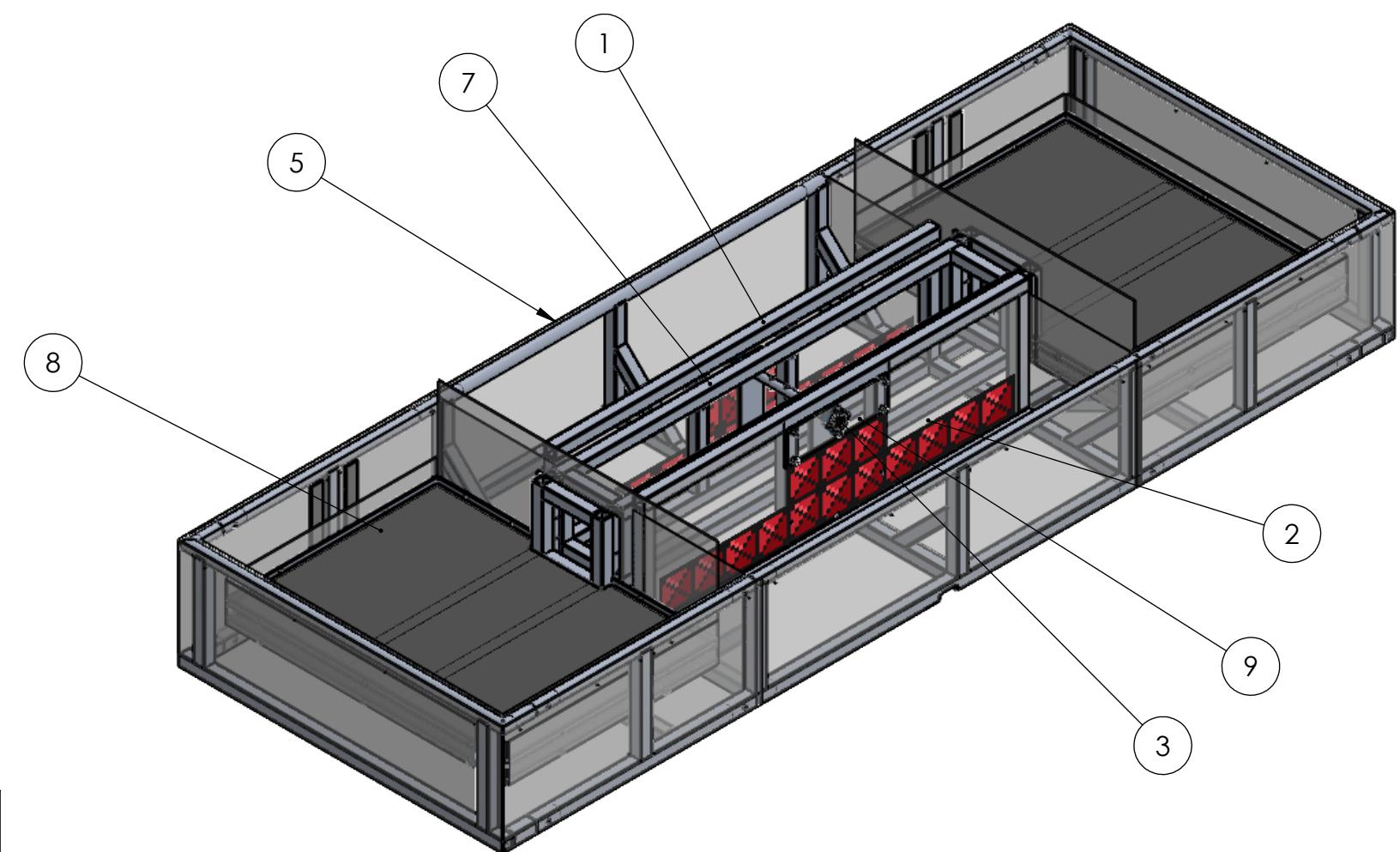
SCALE: 1:16 WEIGHT: SHEET 1 OF 1

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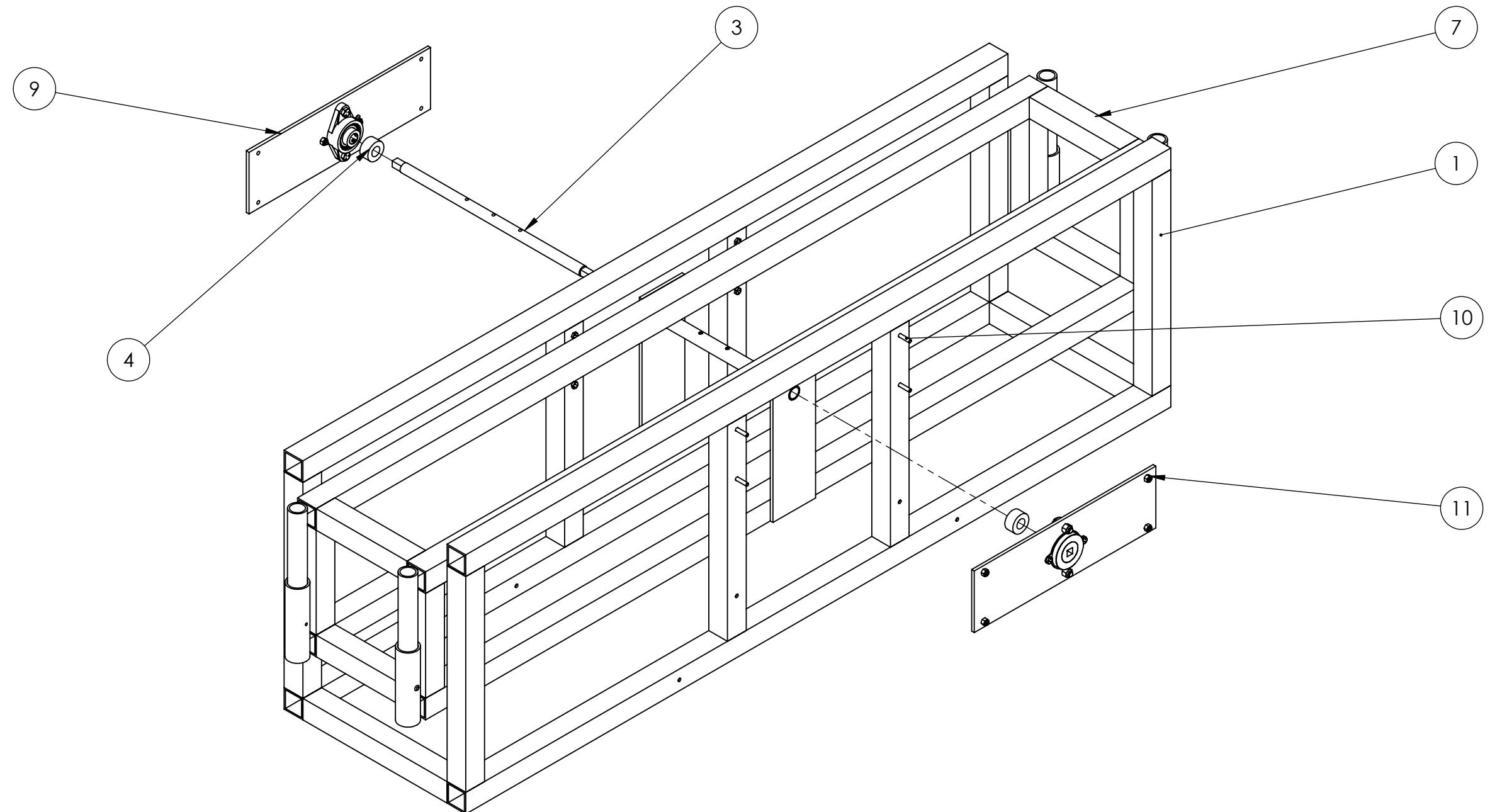
1



ITEM NO.	PART NUMBER	DESCRIPTION	Default QTY.
1	GE-18016	Switch Frame	1
2	GE-18024	Switch Base Cover Polycarbonate	2
3	GE-18026	Switch/Scale Arm Shaft	1
4	GE-18098	Switch Shaft Spacer	2
5	GE-18110	Fence Assembly	1
6	GE-18113	Switch Fence Brace Assembly	2
7	GE-18114	Switch Arm Assembly	1
8	GE-18121	Basket Assembly	2
9	GE-18122	Bearing/Damper Assembly	2
10	hex_.25_20_2.75_partial	Steel Hex Head Screw, 1/4"-20 x 2-3/4" long, partially threaded	9
11	nylock_.25_20	Steel Nylon-Insert Locknut, 1/4"-20	12
12	hex_.25_20_1.5	Steel Hex Head Screw, 1/4"-20 x 1-1/2" long, fully threaded	3

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## Notes:

1. Slide Item 3 (the shaft) through tube on Item 7. Slide Item 4 (qty: 2) to either end of Item 3.
  2. Align the shaft to the bearing and dampers of Item 9. Bolt Item 9 (qty: 2) to Item 1 using Items 10 (qty: 8) and 11 (qty: 8)

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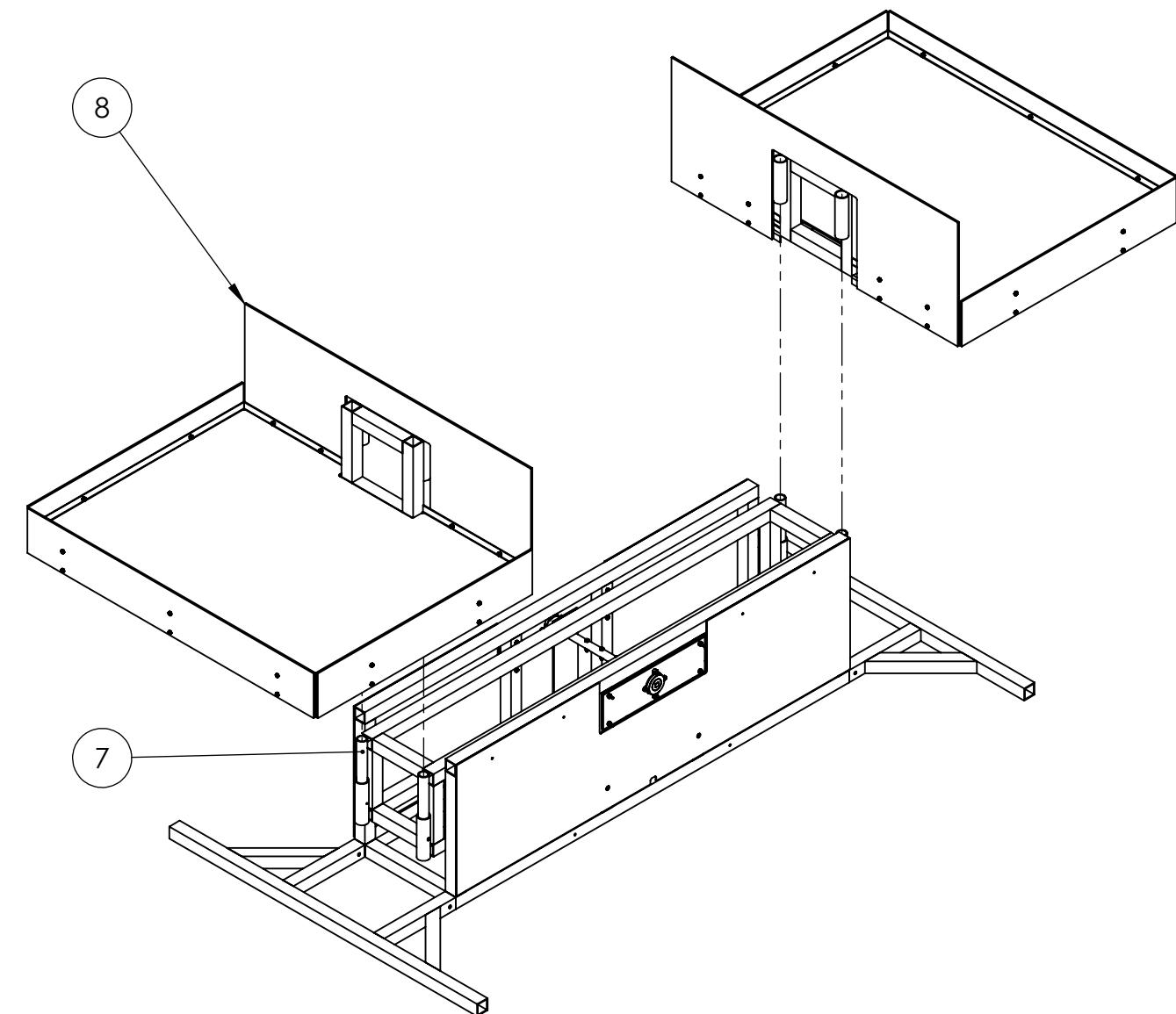
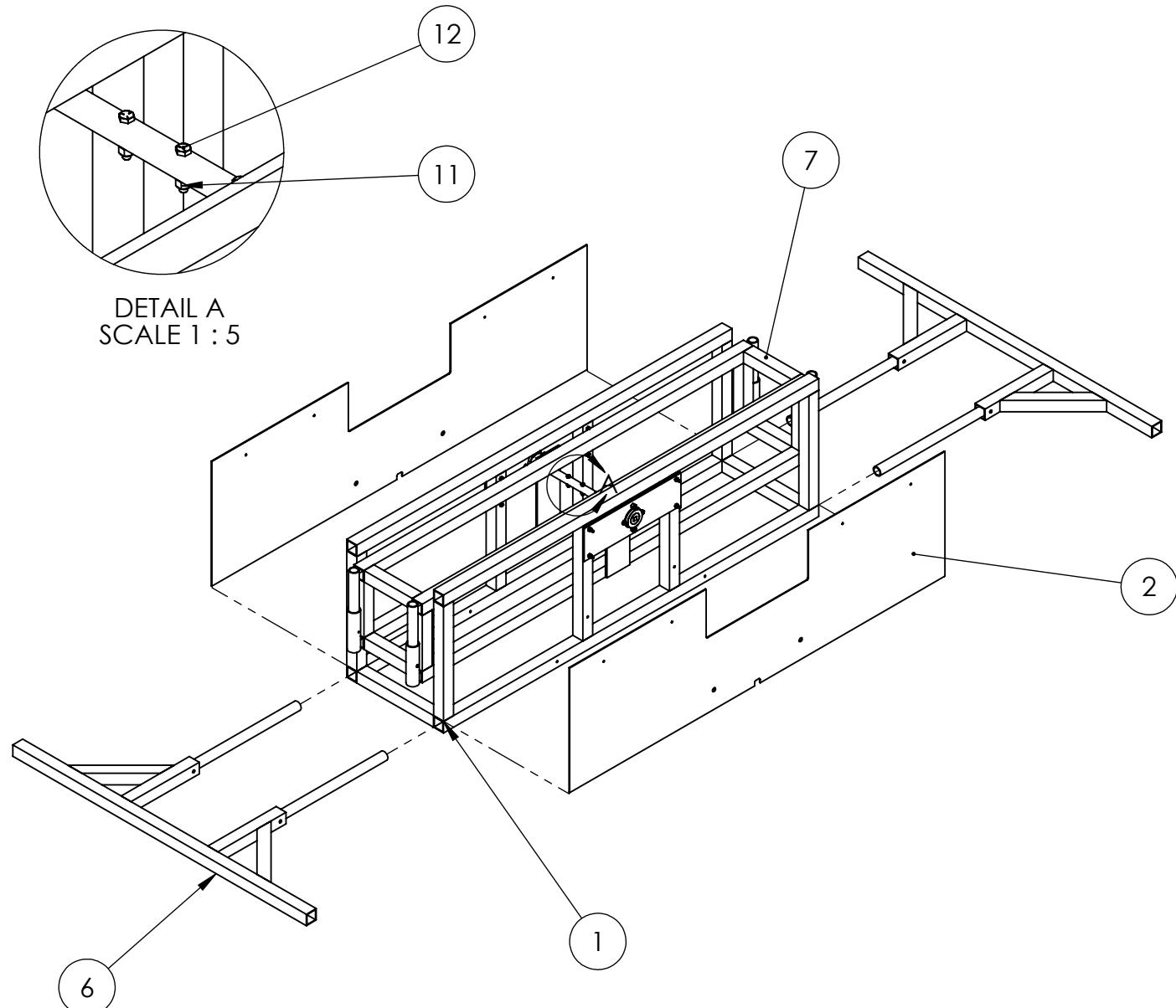
		UNLESS OTHERWISE SPECIFIED:		NAME	DATE	 <b>FIRST</b> <b>ROBOTICS</b> <b>COMPETITION</b>	<b>TITLE:</b> <h1>Switch Assembly</h1>
		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$	DRAWN				
			CHECKED				
			ENG APPR.				
			MFG APPR.				
			Q.A.				
		INTERPRET GEOMETRIC TOLERANCING PER:	COMMENTS:				
		MATERIAL				<b>SIZE</b> <b>DWG. NO.</b> <b>B</b> <b>GE-18112</b>	<b>REV</b>
NEXT ASSY	USED ON	FINISH					
APPLICATION		DO NOT SCALE DRAWING					
			SCALE: 1:32	WEIGHT:	SHEET 2 OF 3		

# TITLE: Switch Assembly

DWG. NO.  
**GE-18112**

REV

ALE: 1:32 WEIGHT: SHEET 2 OF 3



Notes:

1. Align Item 3 (the shaft) through the tube of Item 7 and secure alignment using Items 11 (qty: 3) and 12 (qty: 3).
2. Slide Item 6 (qty: 2) into Item 1.
3. Attach Items 2 to Item 1 using cable ties.

Notes:

1. Align Item 3 (the shaft) through the tube of Item 7 and secure alignment using Items 11 (qty: 3) and 12 (qty: 3).
2. Slide Item 6 (qty: 2) into Item 1.
3. Attach Items 2 to Item 1 using cable ties.

Notes:

1. Slide Item 8 (qty: 2) onto the pins on Item 7.
2. (Not pictured) Build Item 5 around the assembly, following assembly drawings for GE-18110.

		UNLESS OTHERWISE SPECIFIED:		NAME	DATE	 <b>FIRST</b> <b>ROBOTICS</b> <b>COMPETITION</b>	<b>TITLE:</b> <h1>Switch Assembly</h1>
		<b>DIMENSIONS ARE IN INCHES</b> <b>TOLERANCES:</b> <b>FRACTIONAL <math>\pm 1/16</math></b> <b>ANGULAR: MACH <math>\pm 1^\circ</math></b> BEND $\pm 1^\circ$ <b>TWO PLACE DECIMAL <math>\pm .01</math></b> <b>THREE PLACE DECIMAL <math>\pm .001</math></b>	DRAWN				
			CHECKED				
			ENG APPR.				
			MFG APPR.				
			Q.A.				
		COMMENTS:					
		MATERIAL				<b>SIZE</b> <b>DWG. NO.</b> <b>B</b> <b>GE-18112</b>	<b>REV</b>
NEXT ASSY	USED ON	FINISH					
APPLICATION		DO NOT SCALE DRAWING		SCALE: 1:32	WEIGHT:	SHEET 3 OF 3	

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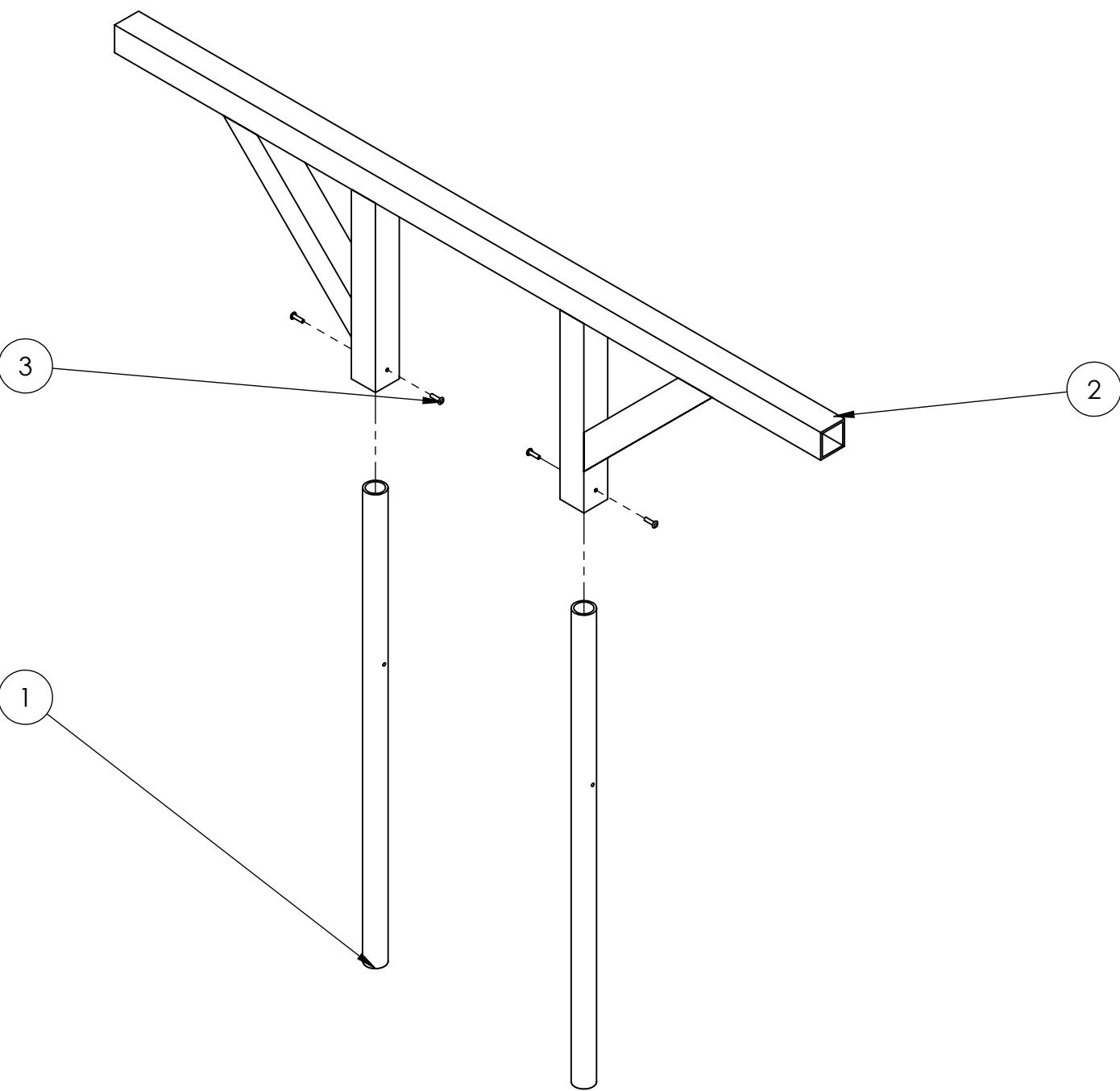
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ITEM NO.	PART NUMBER	DESCRIPTION	Default QTY.
1	GE-18088	Switch Fence Brace Pin	2
2	GE-18087	Switch Fence Brace	1
3	rivet_.1875_.376-.5	3/16" Aluminum Rivet, .376-.5 Grip Range	4

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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				<b>SIZE</b> <b>DWG. NO.</b> <b>B</b> <b>GE-18113</b> <b>REV</b>		
		TOLERANCING PER:						
		MATERIAL						
NEXT ASSY	USED ON	FINISH						
APPLICATION		DO NOT SCALE DRAWING				SCALE: 1:8	WEIGHT:	SHEET 1 OF 1

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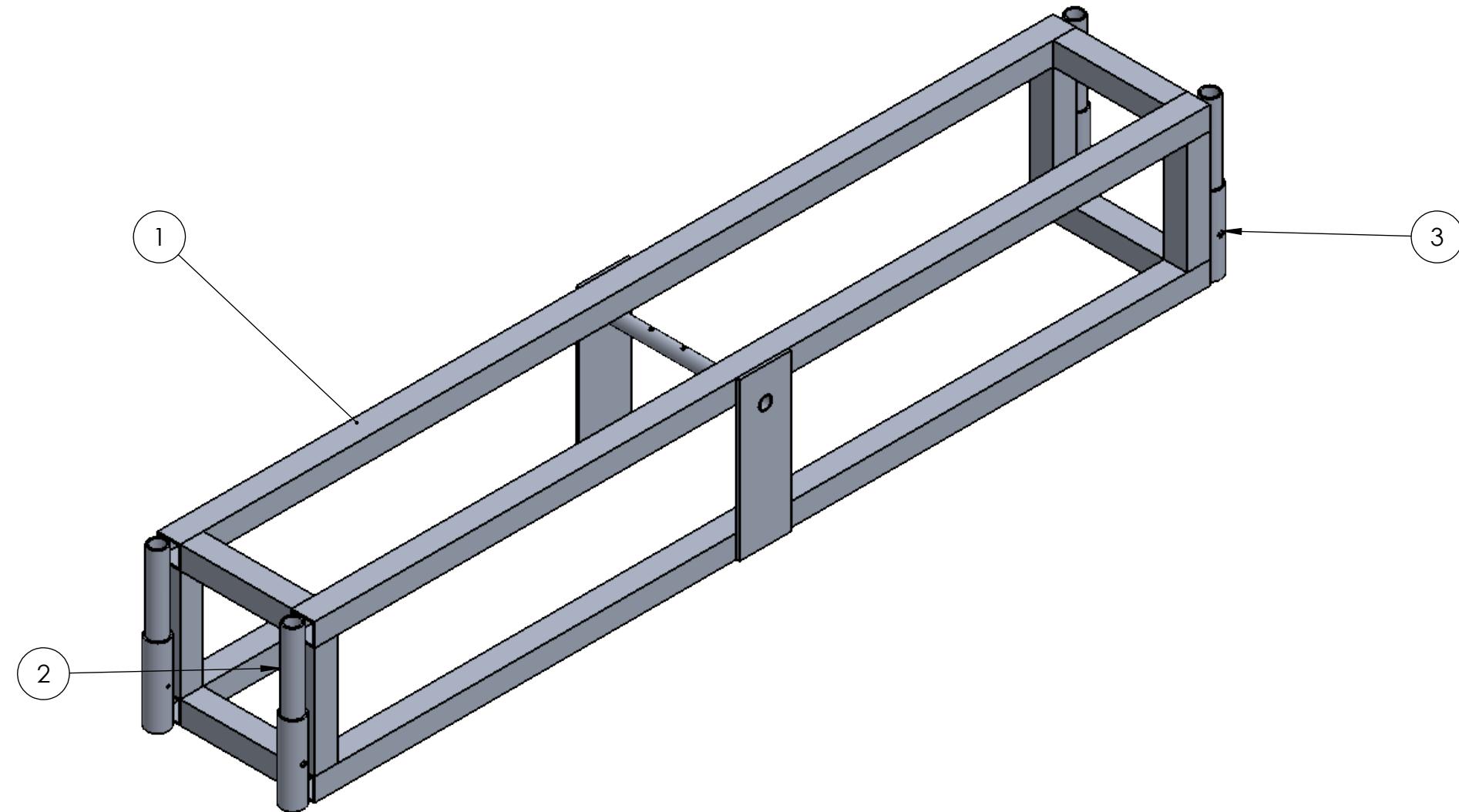
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ITEM NO.	PART NUMBER	DESCRIPTION	Default/ QTY.
1	GE-18013	Switch Arm	1
2	GE-18028	Plate Mount Pin	4
3	rivet_.1875_.251-.375	3/16" Aluminum Rivet, .251-.375 Grip Range	4

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		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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**Switch Arm Assembly**

**B** **GE-18114**

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

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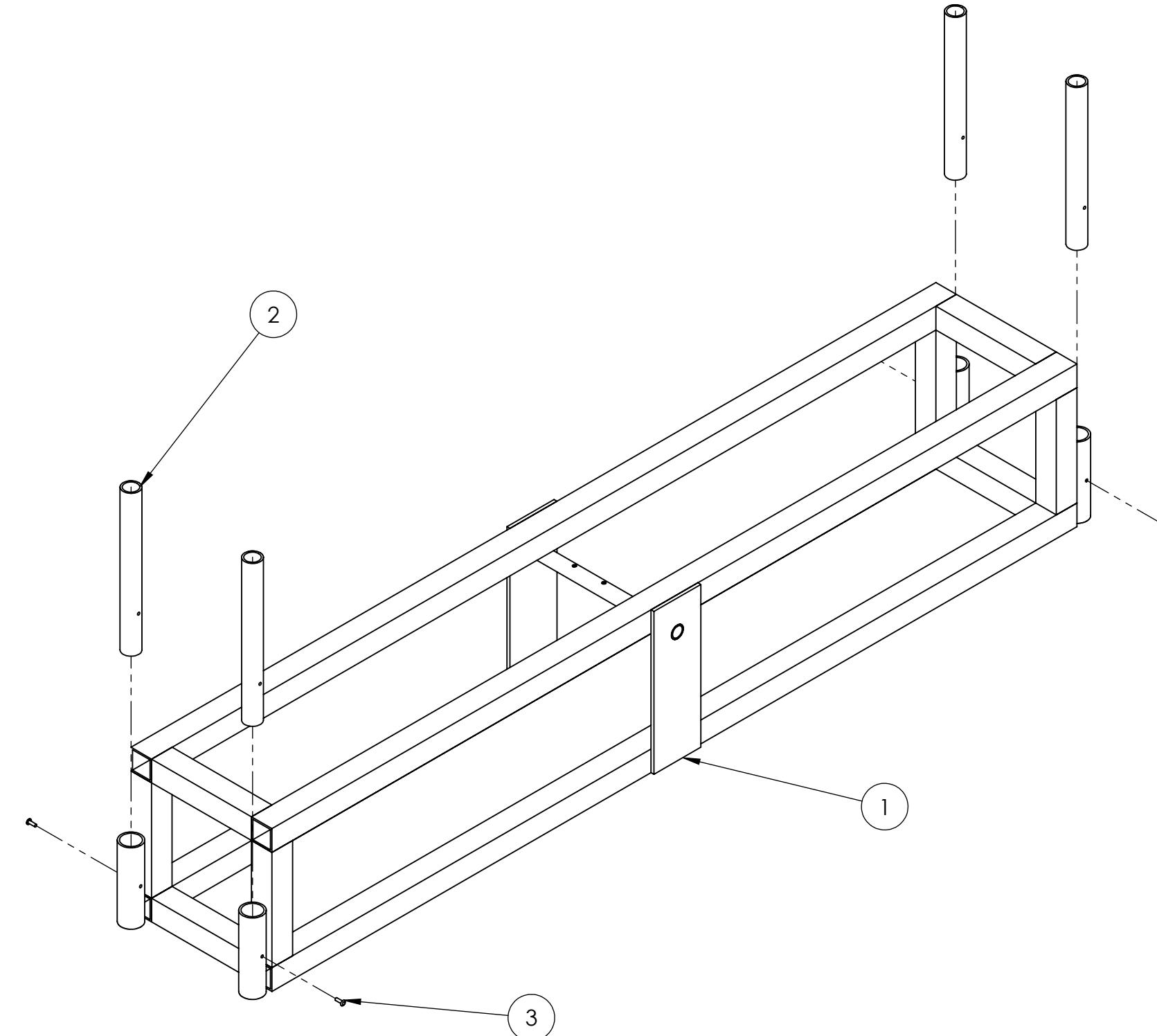
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## Notes:

1. Fasten Item 2 (qty: 4) to Item 1, using Item 3 (qty: 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:							
MATERIAL							
NEXT ASSY		USED ON		FINISH			
APPLICATION		DO NOT SCALE DRAWING					

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ROBOTICS  
COMPETITION  SOLIDWORKS  
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# Switch Arm Assembly

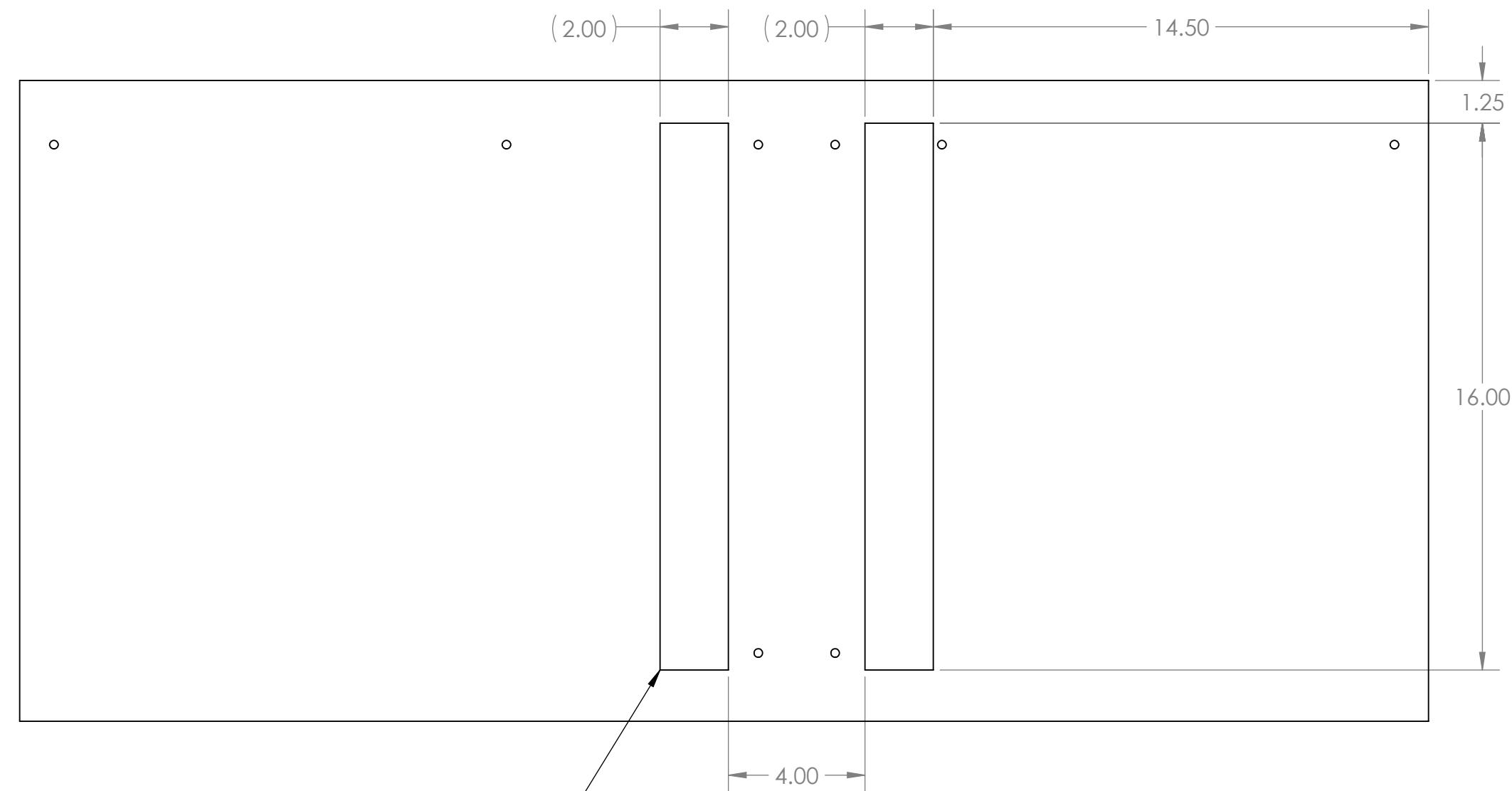
SIZE DWG. NO. REV  
**B** GE-18114  
SCALE: 1:12 WEIGHT: SHEET 2 OF 2

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## Notes:

1. Retroreflective tape to be applied to both sides of GE-18082.
2. It is expected that the top and bottom of the tape will be partially obscured during assembly. The amount of tape visible may also vary with viewing angle.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-18082	Fence Polycarb, Inner Side	1
2	VisionTape	2" wide Retroreflective tape	4

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

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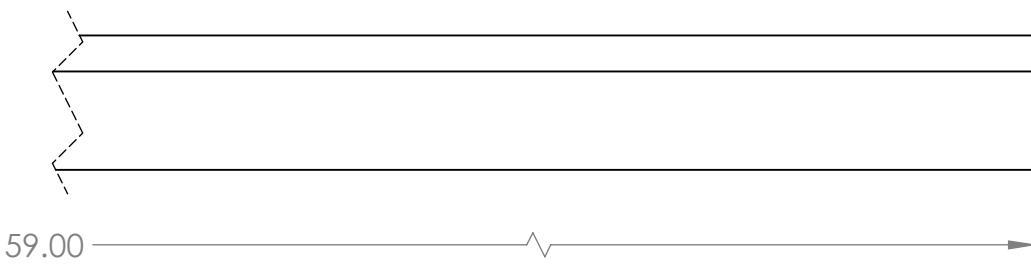
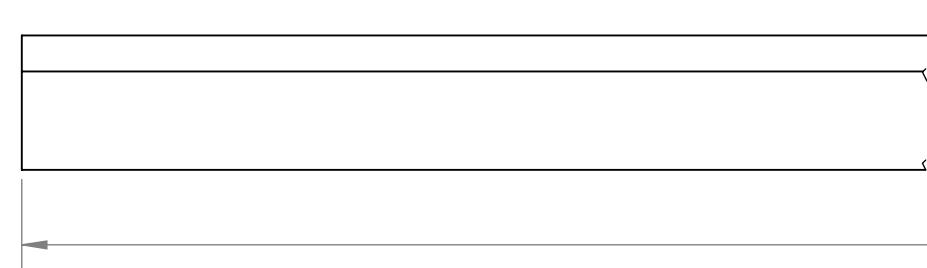
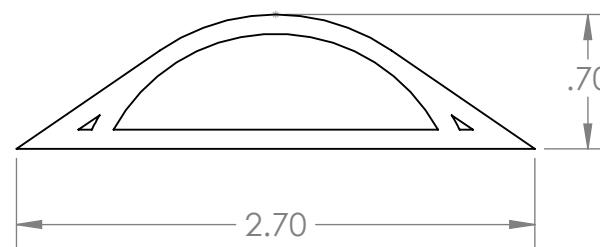
**TITLE:** Vision Fence Polycarbonate

**SIZE** DWG. NO. **REV**  
**B** **GE-18115**

SCALE: 1:4 WEIGHT: SHEET 1 OF 1

B

B



## Notes:

1. Description: Cable Shield Cord Cover
2. Source: Electriduct
3. Item #: CSX-3 Black
4. Equivalent substitutions allowed

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

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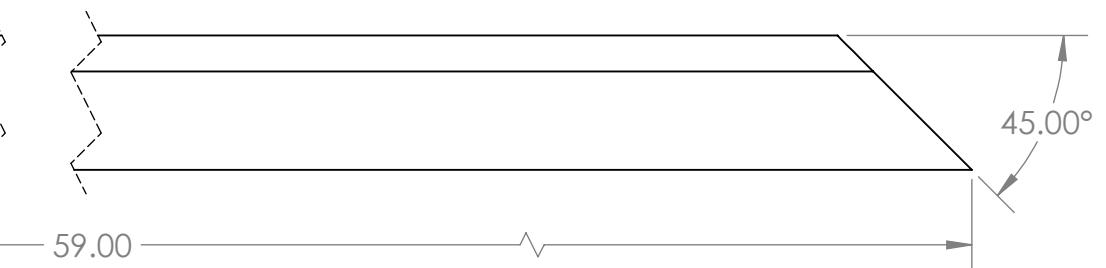
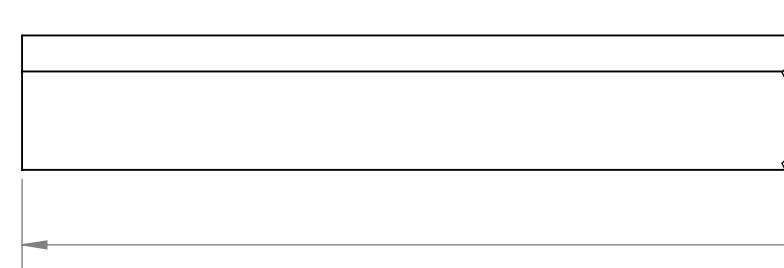
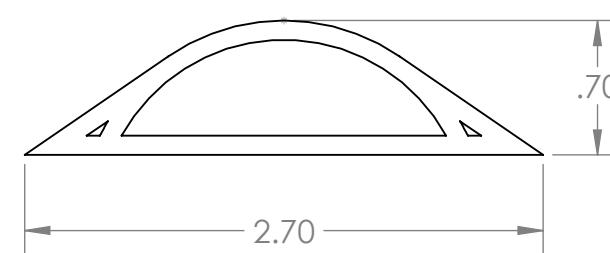
**Long Wire Protector**

**SIZE** **DWG. NO.** **REV**  
**B** **GE-18116**

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

B

B



## Notes:

1. Description: Cable Shield Cord Cover
2. Source: Electriduct
3. Item #: CSX-3 Black
4. Equivalent substitutions allowed

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		COMMENTS:			
		MATERIAL			
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	NEXT ASSY	USED ON	APPLICATION	DO NOT SCALE DRAWING	

**FIRST** ROBOTICS COMPETITION **SOLIDWORKS**  
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**Long Mitered Wire Protector**

<b>SIZE</b>	<b>DWG. NO.</b>	<b>REV</b>
<b>B</b>	<b>GE-18117</b>	
SCALE: 1:1	WEIGHT:	SHEET 1 OF 1

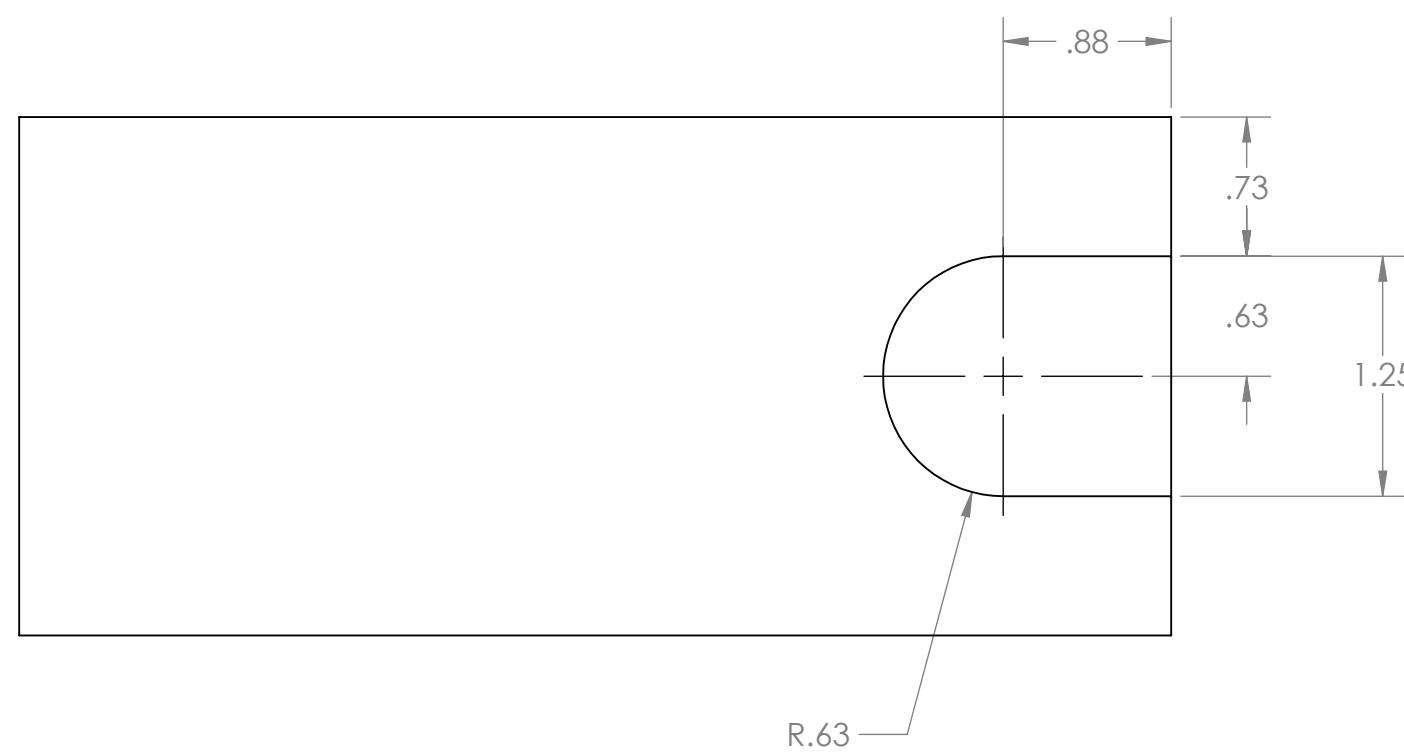
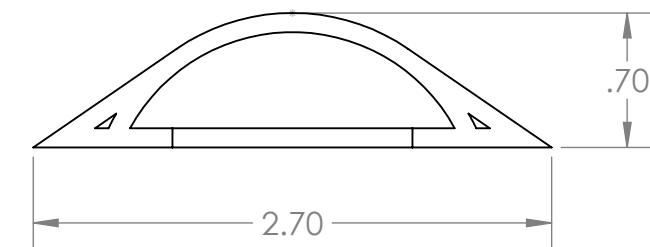
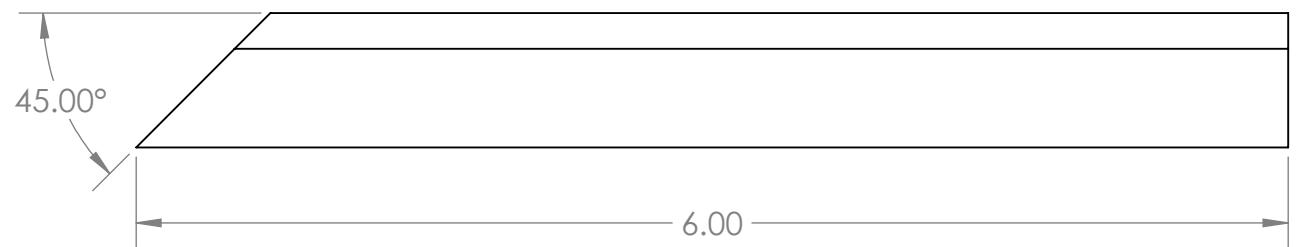
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## Notes:

1. Description: Cable Shield Cord Cover
2. Source: Electriduct
3. Item #: CSX-3 Black
4. Equivalent substitutions allowed

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

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

**Short Mitered Wire Protector**

**SIZE DWG. NO. REV**  
**B GE-18118**

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

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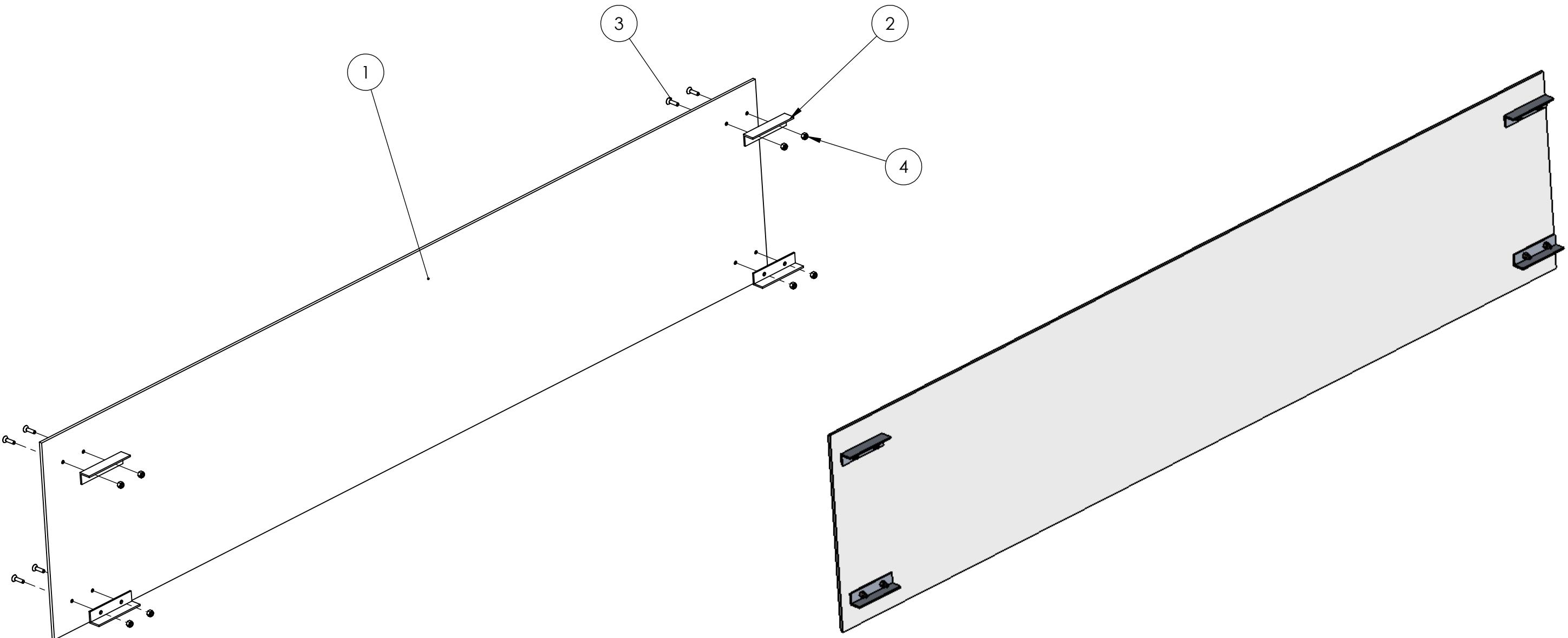
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-18020	Scale Side Cover Polycarbonate	1
2	GE-18076	Scale Angle Brace	4
3	flat_hex_.25_20_1	Steel Hex Flat Head Screw, 1/4"-20 x 1" long, fully threaded	8
4	nylock_.25_20	Steel Nylon-Insert Locknut, 1/4"-20	8

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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		
		CHECKED			
		ENG APPR.			
		MFG APPR.			
		Q.A.			
		COMMENTS:			
NEXT ASSY	USED ON	MATERIAL			
		FINISH			
APPLICATION		DO NOT SCALE DRAWING			
TITLE: Scale Side Cover Polycarbonate Sub Assembly					
SIZE	DWG. NO.	REV			
<b>B</b>	<b>GE-18119</b>				
SCALE: 1:8	WEIGHT:	SHEET 1 OF 1			

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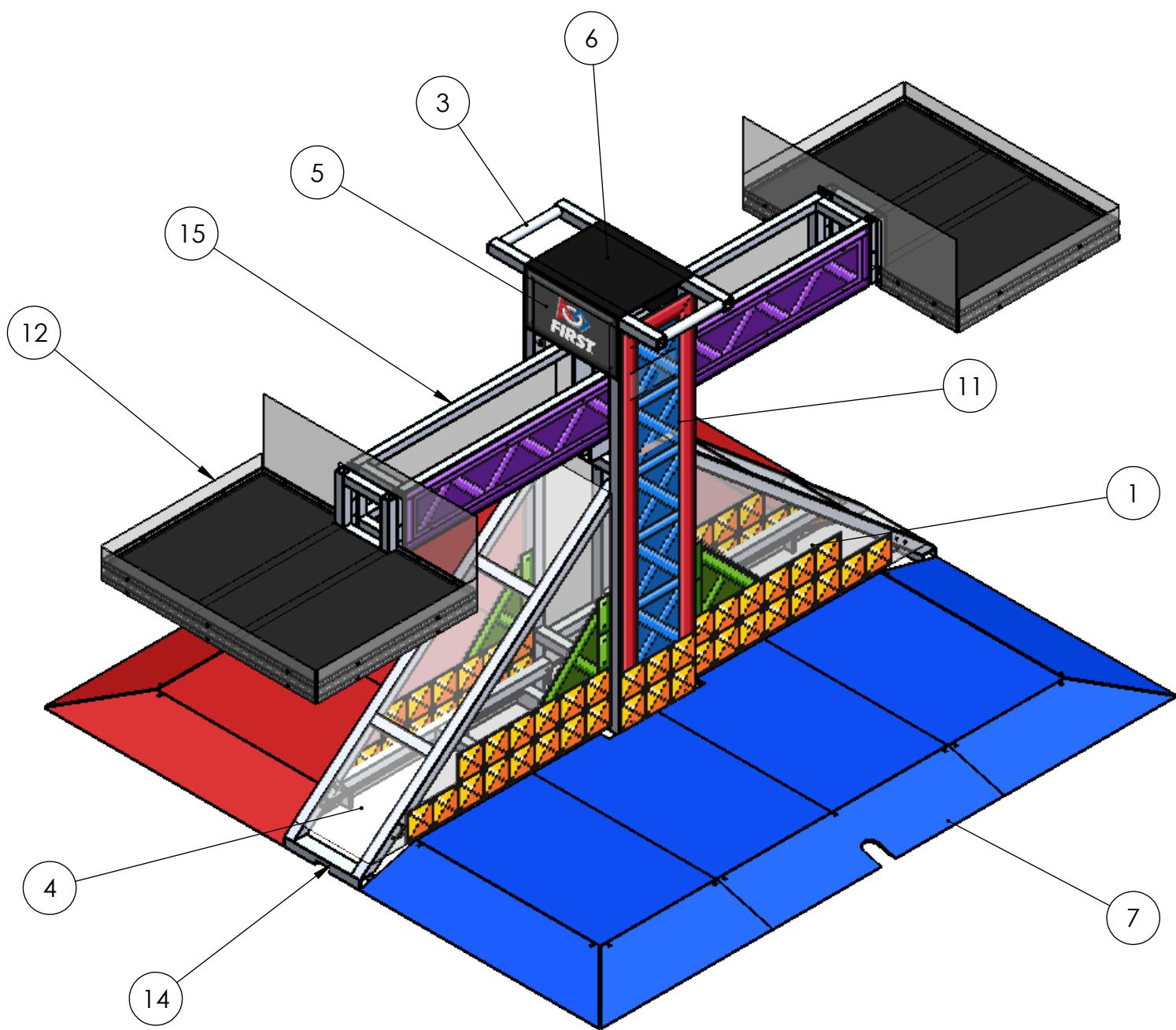
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ITEM NO.	PART NUMBER	DESCRIPTION	Default/ QTY.
1	GE-18022	Scale Outrigger Side Cover Polycarbonate	4
2	GE-18026	Switch/Scale Arm Shaft	1
3	GE-18054	Scale Frame	1
4	GE-18055	Outrigger Top Polycarbonate	2
5	GE-18057	Scale Side HDPE	2
6	GE-18058	Scale Top HDPE	1
7	GE-18060	Platform	2
8	GE-18075	Scale Base Outrigger	2
9	GE-18099	Scale Shaft Spacer	2
10	GE-18106	Scale Lockout Bar	2
11	GE-18119	Scale Side Cover Polycarbonate Sub Assembly	2
12	GE-18121	Basket Assembly	2
13	GE-18122	Bearing/Damper Assembly	2
14	GE-18123	Outrigger Assembly	2
15	GE-18125	Scale Arm Assembly	1
16	hex_.5_13_5	Steel Hex Head Screw, 1/2"-13 x 5" long, fully threaded	4
17	hexnut_.5_13	Steel Hex Nut, 1/2"-13	8
18	hex_.25_20_1.5	Steel Hex Head Screw, 1/4"-20 x 1-1/2" long, fully threaded	3
19	nylock_.25_20	Steel Nylon-Insert Locknut, 1/4"-20	15
20	hex_.25_20_4.5_partial	Steel Hex Head Screw, 1/4"-20 x 4-1/2" long, partially threaded	4
21	flat_phil_.25_20_2.75	Steel Phillips Flat Head Screw, 1/4"-20 x 2-3/4" long, fully threaded	8
22	flat_phil_.25_20_5	Steel Phillips Flat Head Screw, 1/4"-20 x 5" long, fully threaded	8
23	wing_.25_20	Steel Wing Nut, 1/4"-20, 31/64" Base Diameter	8
24	washer_split_.26_.487	Steel Split Lock Washer for 1/4" Screw	8

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		COMMENTS:			
		MATERIAL			
		FINISH			
		APPLICATION	DO NOT SCALE DRAWING		
SIZE	DWG. NO.	REV			
<b>B</b>	<b>GE-18120</b>				
SCALE: 1:48	WEIGHT:	SHEET 1 OF 5			

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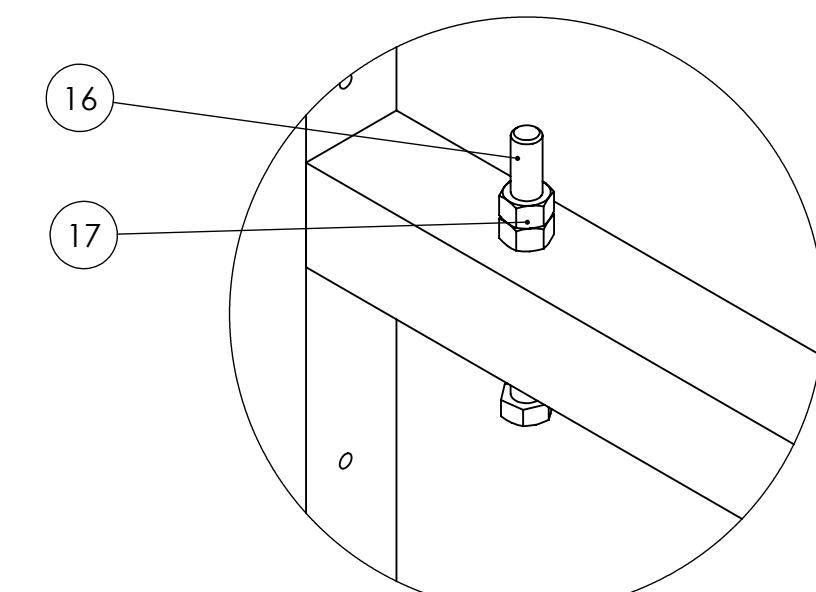
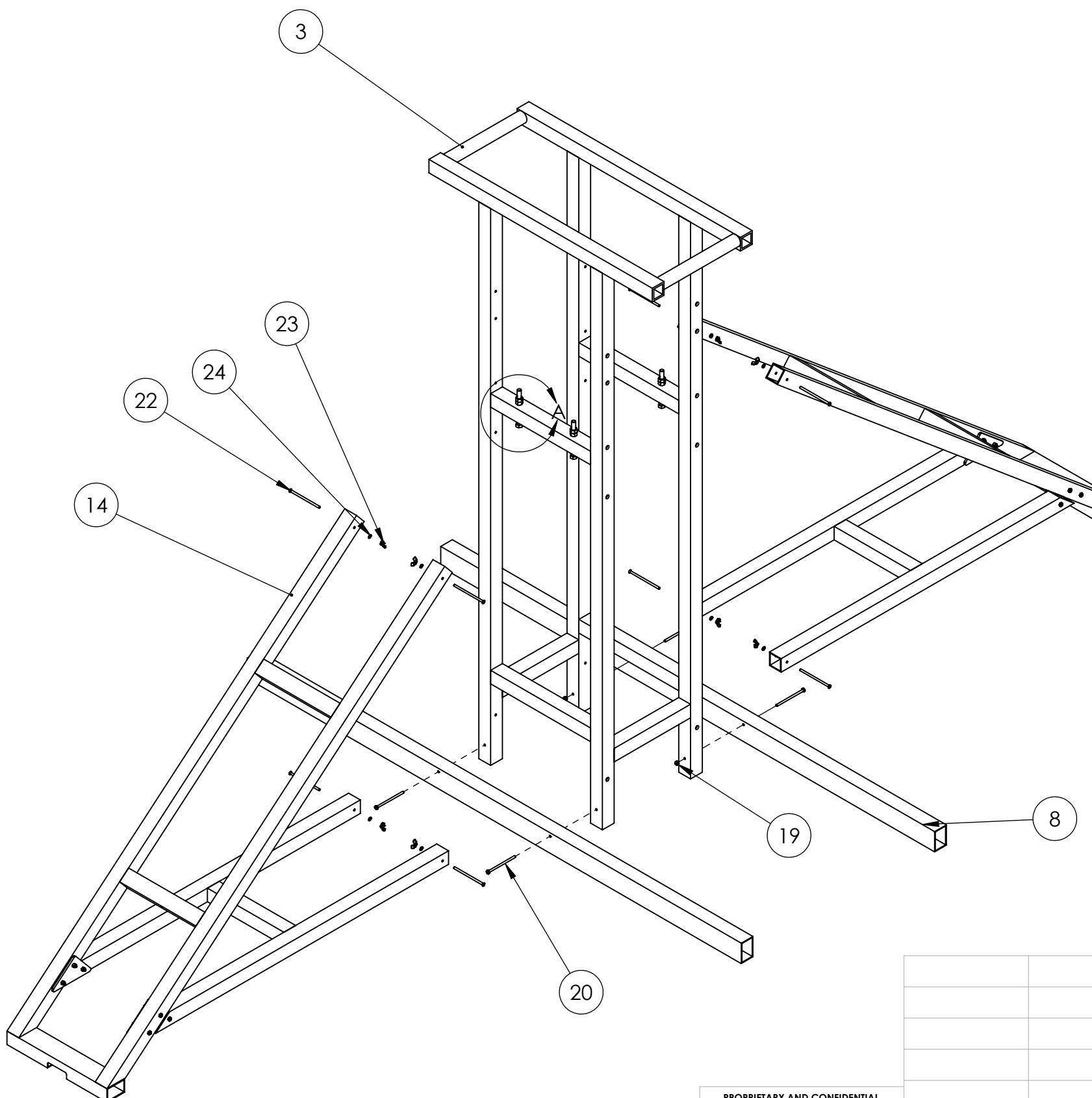
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Notes:

1. Attach Items 8 (qty: 2) to Item 3 using Items 19 and 20.
2. Attach Items 14 (qty: 2) to Item 3 using Items 22, 23 and 24.
3. Bolt Items 16 (qty: 4) and 17 (qty: 8) through Item 3.

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

**FIRST ROBOTICS COMPETITION** **SOLIDWORKS**  
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**Scale Assembly**

**B** **GE-18120**

SIZE DWG. NO. REV  
SCALE: 1:48 WEIGHT: SHEET 2 OF 5

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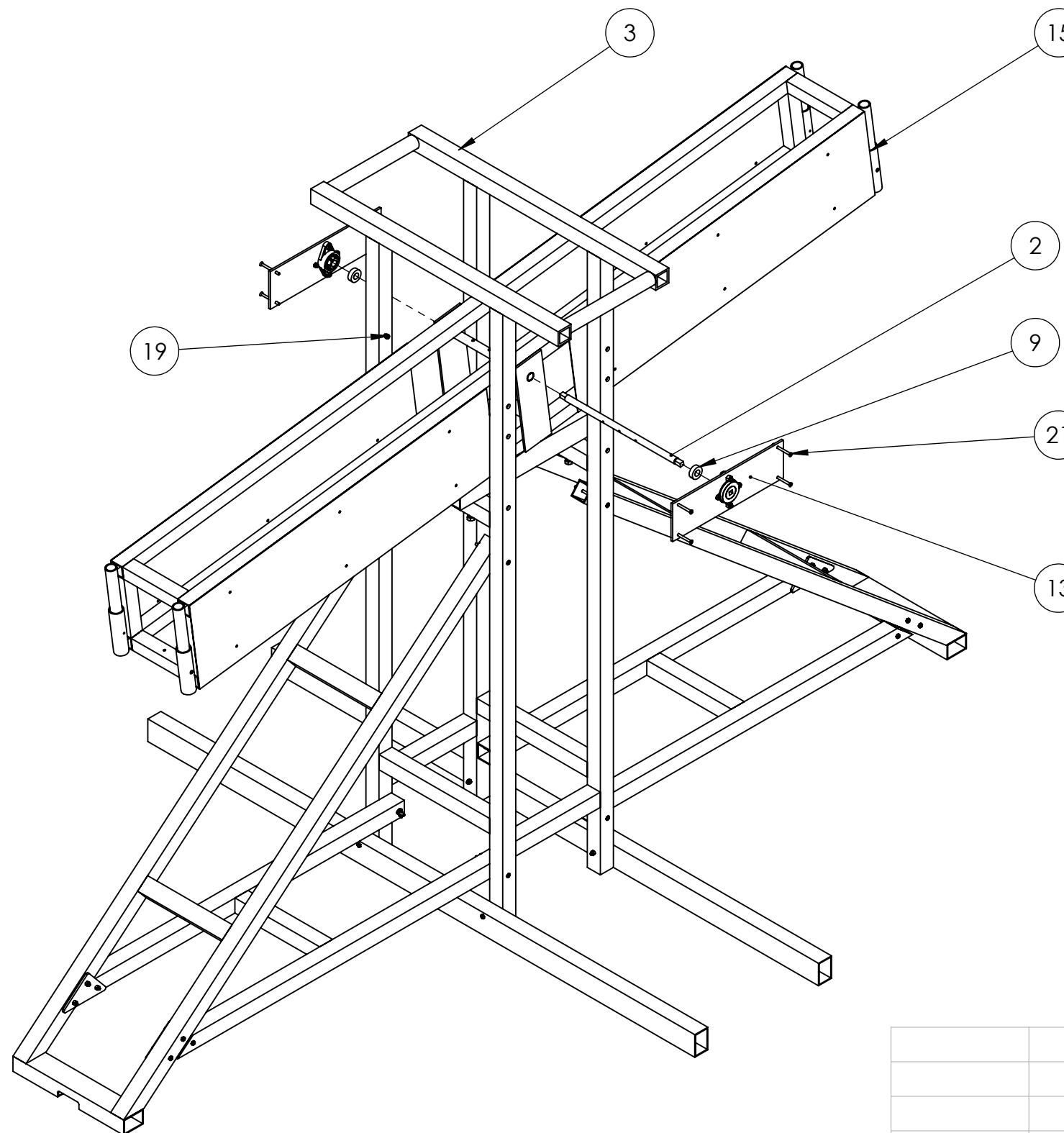
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Notes:

1. Slide item 2 (the shaft) through the tube on Item 15. Slide Items 9 (qty: 2) to either side of Item 2.
2. Align the shaft to the bearings and dampers of Item 13 (qty: 2). Bolt Items 13 to Item 3 using Items 21 and 23. Please note that Items 13 go to the inside of the frame of Item 3.

		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**  
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**Scale Assembly**

SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-18120</b>	
SCALE: 1:48	WEIGHT:	SHEET 3 OF 5

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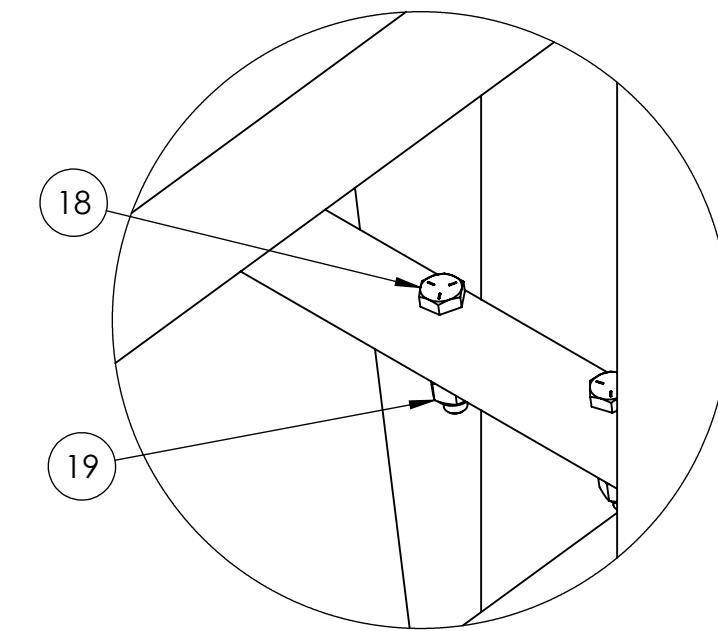
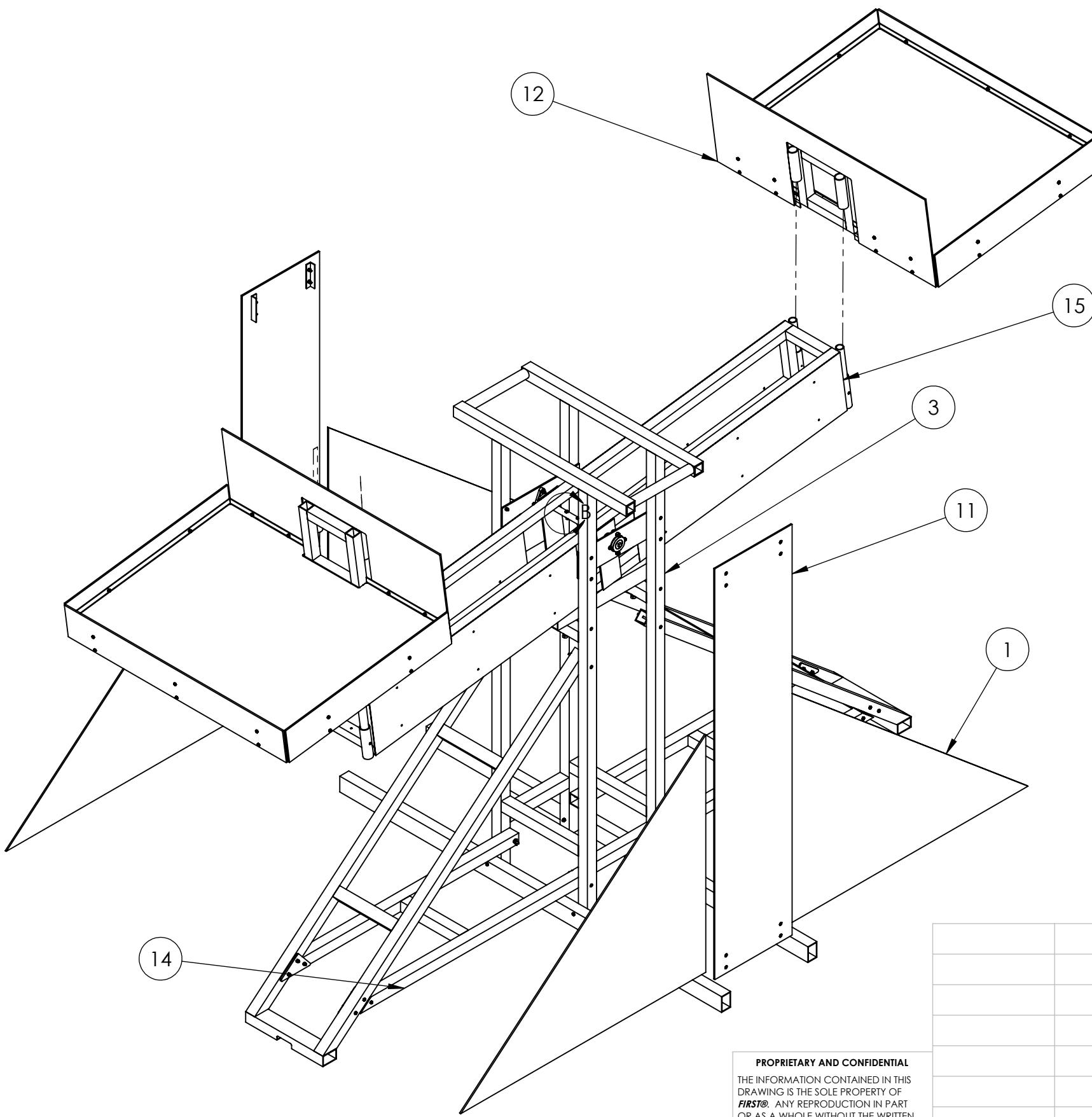
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Notes:

1. Align Item 2 (the shaft) through the tube of Item 17 and secure alignment using Items 18 (qty: 3) and 19 (qty: 3).
2. Slide Items 12 (qty: 2) onto the pins of Item 15.
3. Attach Items 11 to Item 3 using hook and loop.
4. Attach Items 1 to Items 14 using hook and loop.

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

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

**TITLE:** Scale Assembly

**SIZE** DWG. NO. **B** GE-18120 **REV**

SCALE: 1:48 WEIGHT: SHEET 4 OF 5

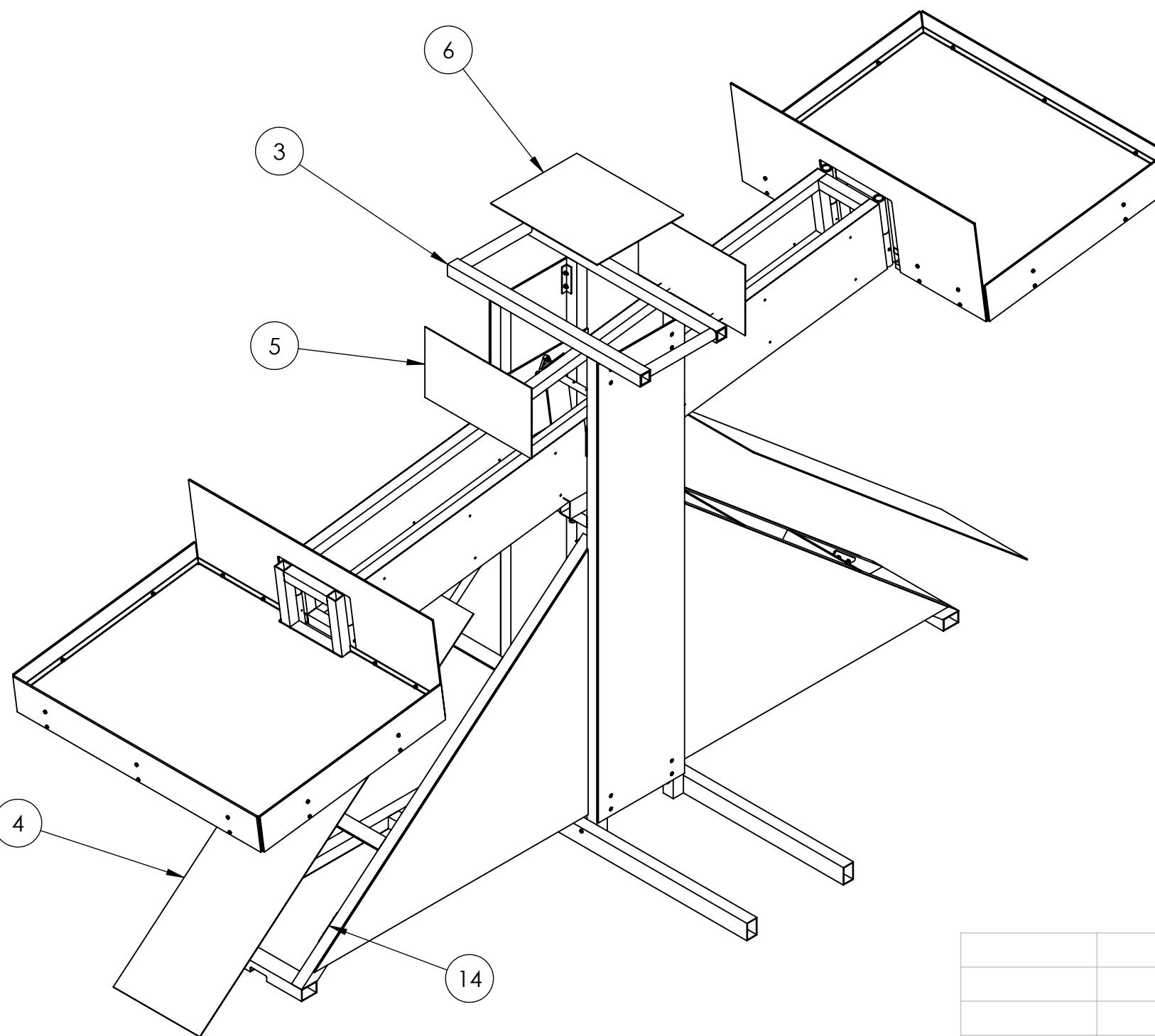
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## Notes:

1. Attach Items 5 and 6 to Item 3 using hook and loop.
2. Attach items 4 to Items 16 using hook and loop.
3. Build Items 7 (not shown) around the base of the Scale Assembly. See Assembly Drawing GE-18060 for details.

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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	

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**Scale Assembly**

**B** **GE-18120**

SIZE DWG. NO. REV  
SCALE: 1:48 WEIGHT: SHEET 5 OF 5

4

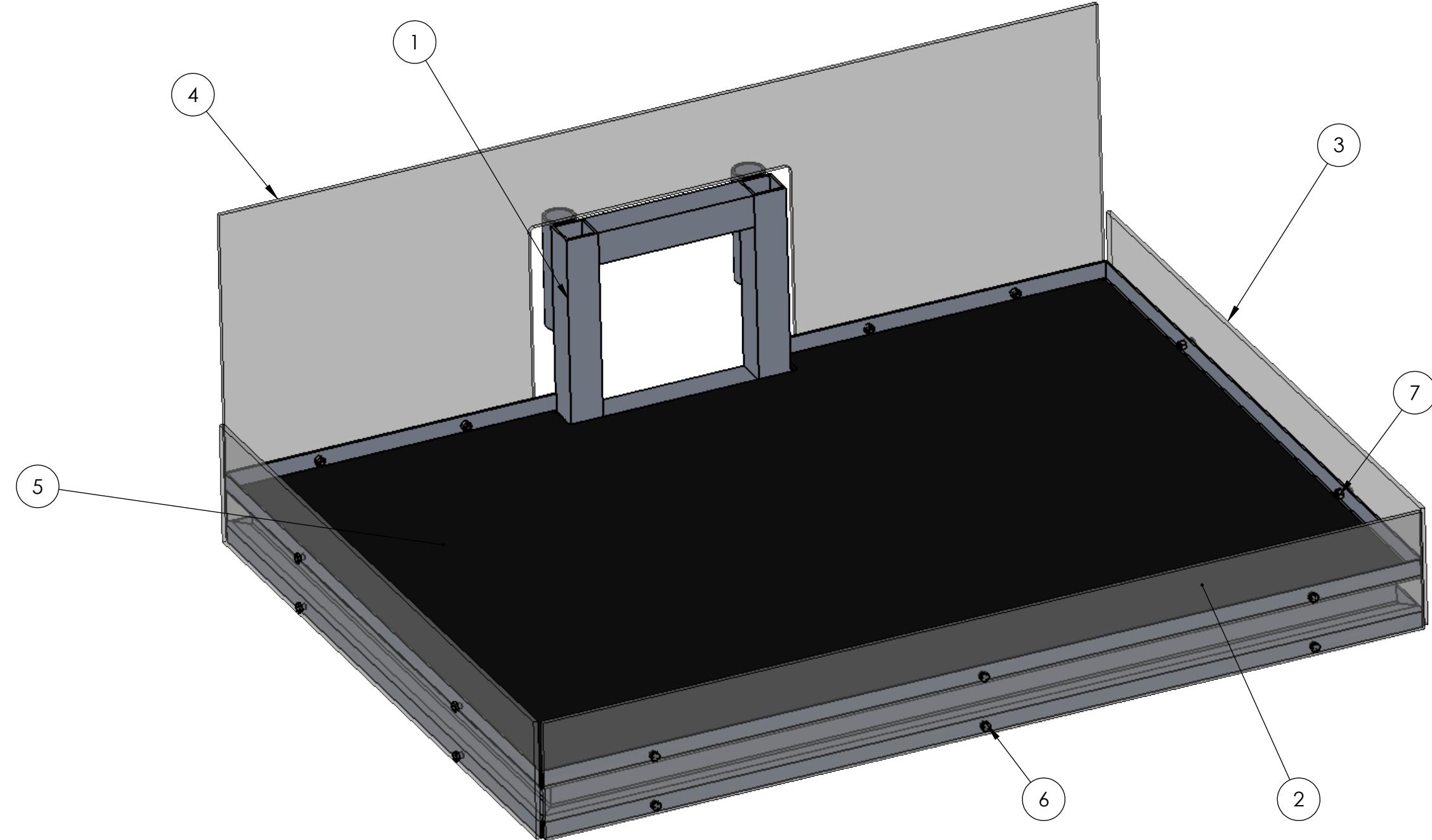
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B

B



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-18007	Scale Plate	1
2	GE-18018	Plate Front Wall	1
3	GE-18019	Plate Side Wall	2
4	GE-18017	Plate Back Wall	1
5	GE-18021	Scale and Switch Basket, Plate	1
6	hex_.25_20_.75	Steel Hex Head Screw, 1/4"-20 x 3/4" long, fully threaded	22
7	nylock_.25_20	Steel Nylon-Insert Locknut, 1/4"-20	22

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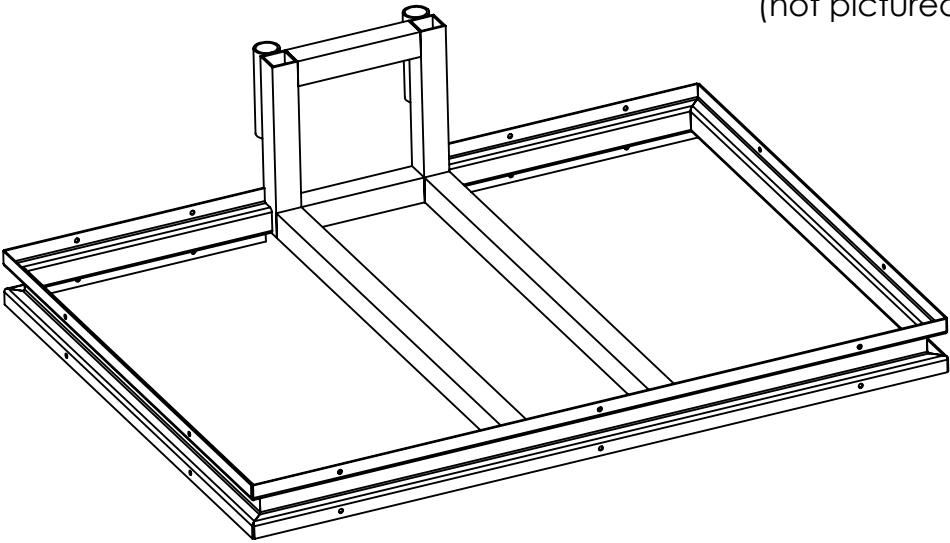
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		DRAWN			
		CHECKED			
		ENG APPR.			
		MFG APPR.			
		Q.A.			
		COMMENTS:			
		MATERIAL			
		FINISH			
		APPLICATION	DO NOT SCALE DRAWING		
SIZE	DWG. NO.			REV	
<b>B</b>	<b>GE-18121</b>				
SCALE: 1:6	WEIGHT:			SHEET 1 OF 2	

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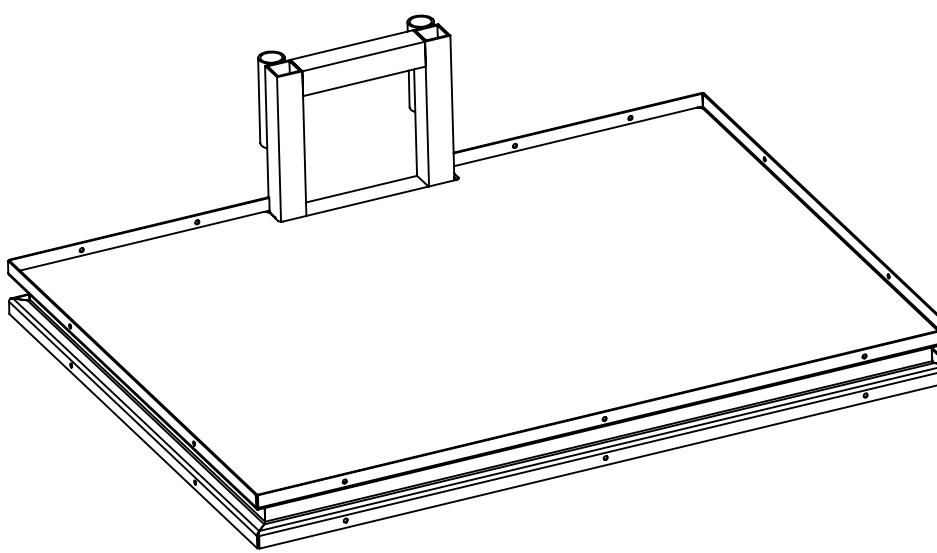
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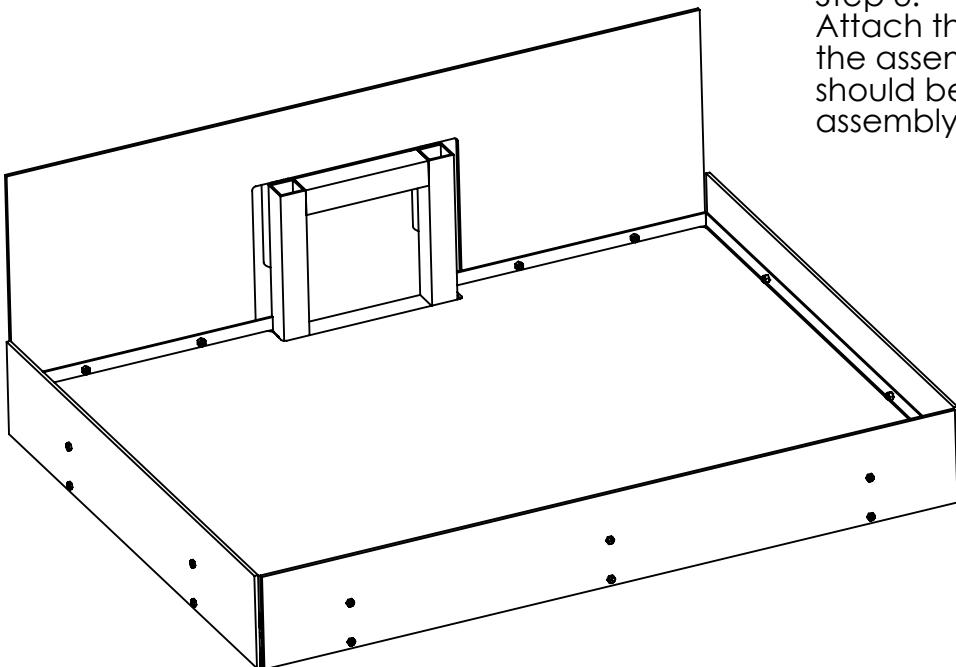
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Step 1:  
Acquire GE-18007 part.  
Confirm all lights are mounted properly  
(not pictured).



Step 2:  
Place GE-18021 onto the  
assembly, textured side up.



Step 3:  
Attach the four plate walls to  
the assembly. The bolt heads  
should be on the outside of the  
assembly.

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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	

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**Basket Assembly**

**SIZE** DWG. NO. **B** **GE-18121** **REV**

SCALE: 1:12 WEIGHT: SHEET 2 OF 2

4

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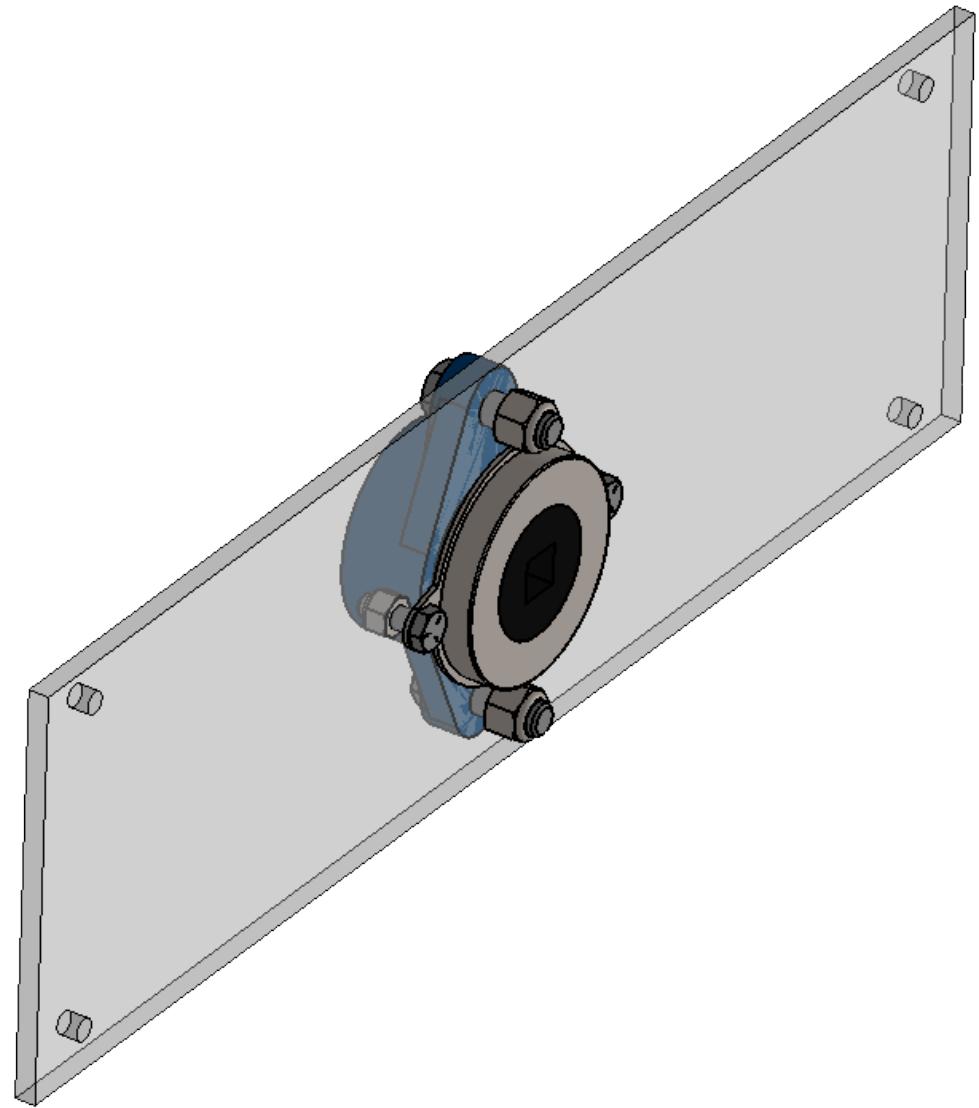
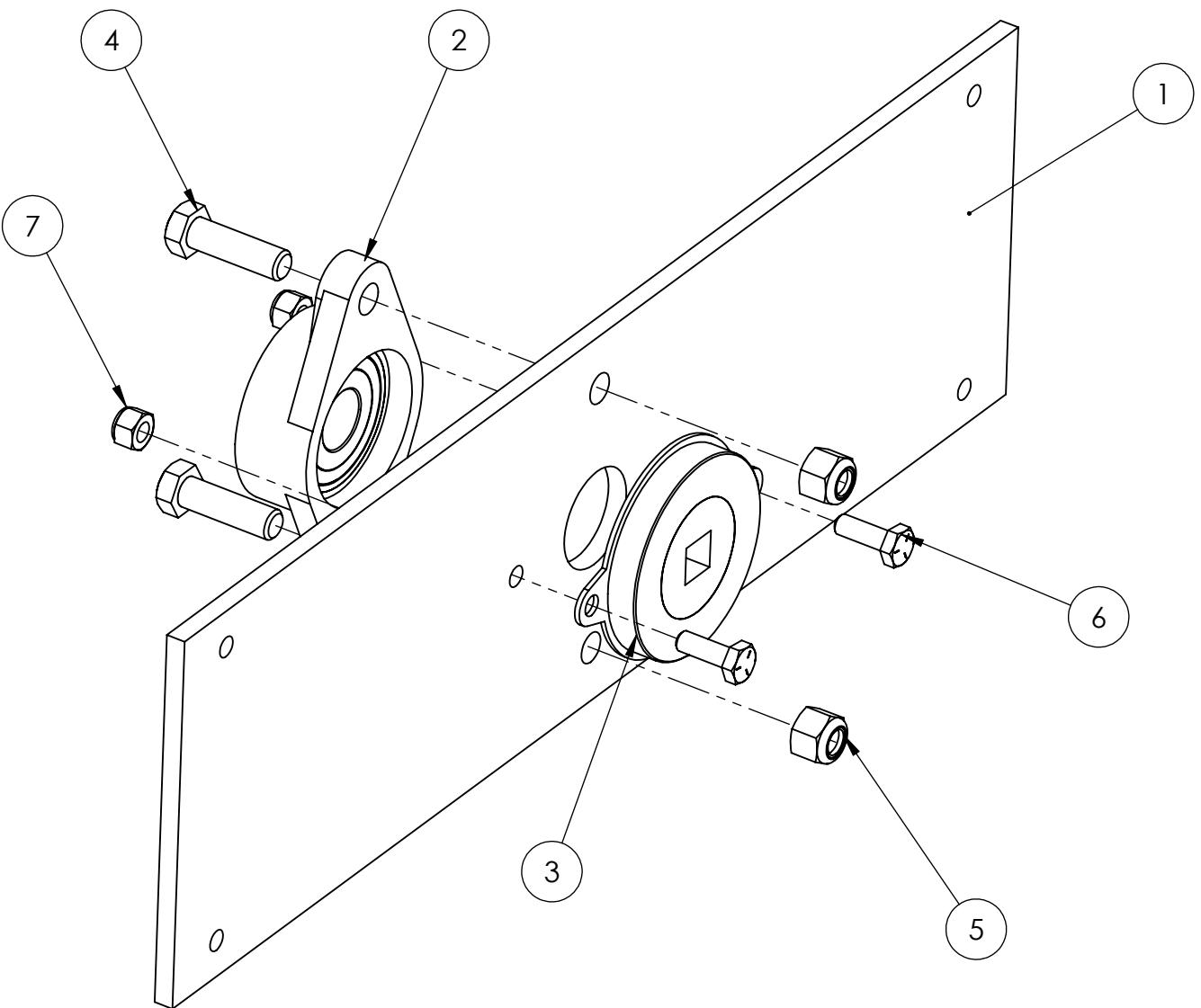
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Notes:

1. Bolts should not be fully tightened until mounted with a Switch/Scale Arm Shaft (GE-18026).

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-18056	Bearing Damper Polycarbonate	1
2	GE-18096	Scale/Switch Bearing	1
3	GE-18097	Scale/Switch Damper	1
4	hex_.375_16_1.25	Steel Hex Head Screw, 3/8"-16 x 1-1/4" long, fully threaded	2
5	nylock_.375_16	Steel Nylon-Insert Locknut, 3/8"-16	2
6	hex_.25_20_.75	Steel Hex Head Screw, 1/4"-20 x 3/4" long, fully threaded	2
7	nylock_.25_20	Steel Nylon-Insert Locknut, 1/4"-20	2

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

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TITLE:  
**Bearing/Damper  
Assembly**

SIZE DWG. NO. REV  
**B GE-18122**

SCALE: 1:2 WEIGHT: SHEET 1 OF 1

4

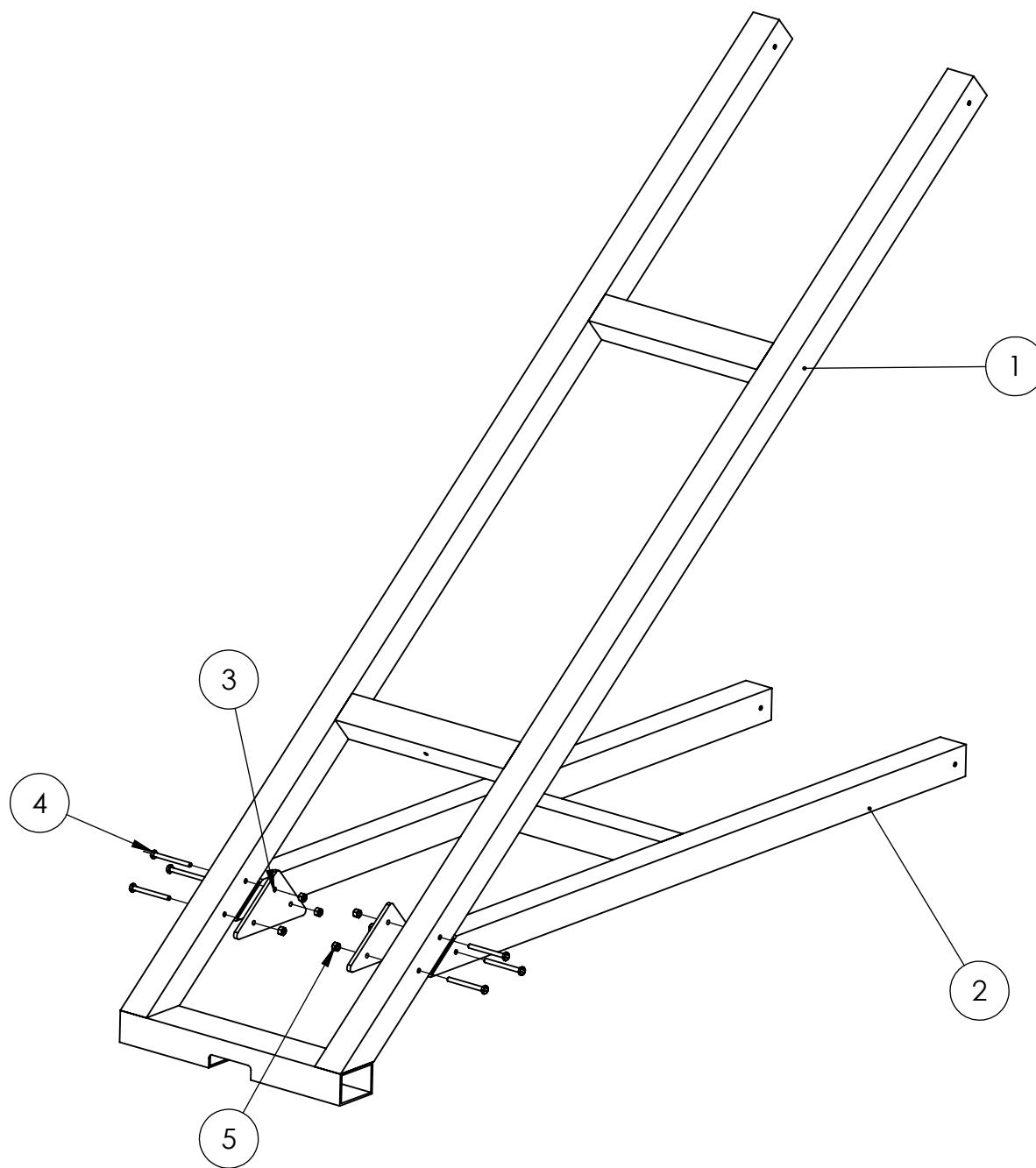
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B

B



A

A

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-18078	Outrigger Wing Diagonal	1
2	GE-18077	Outrigger Wing Horizontal	1
3	GE-18079	Outrigger Wing Plate	2
4	hex_.25_20_2.75_part ial	Steel Hex Head Screw, 1/4"-20 x 2-3/4" long, partially threaded	6
5	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			
		APPLICATION	DO NOT SCALE DRAWING		

**Outrigger Assembly**

**B** GE-18123

SIZE DWG. NO. REV

SCALE: 1:10 WEIGHT: SHEET 1 OF 1

4

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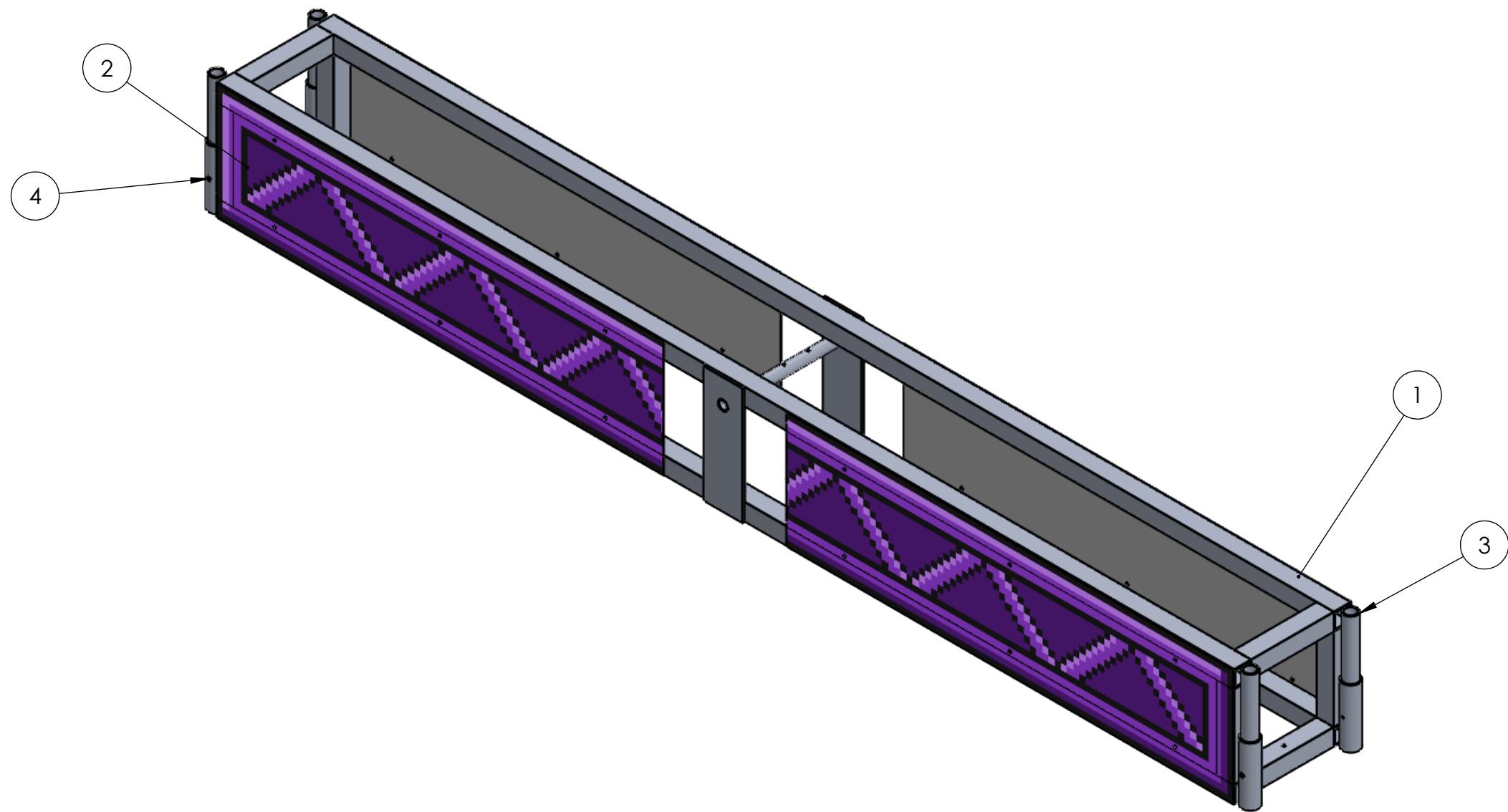
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B

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A

A

ITEM NO.	PART NUMBER	DESCRIPTION	Default/ QTY.
1	GE-18014	Scale Arm	1
2	GE-18023	Scale Arm Cover Polycarbonate	4
3	GE-18028	Plate Mount Pin	4
4	rivet_.1875_.251-.375	3/16" Aluminum Rivet, .251-.375 Grip Range	4

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

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TITLE: Scale Arm Assembly

SIZE: DWG. NO. B GE-18125 REV: 1

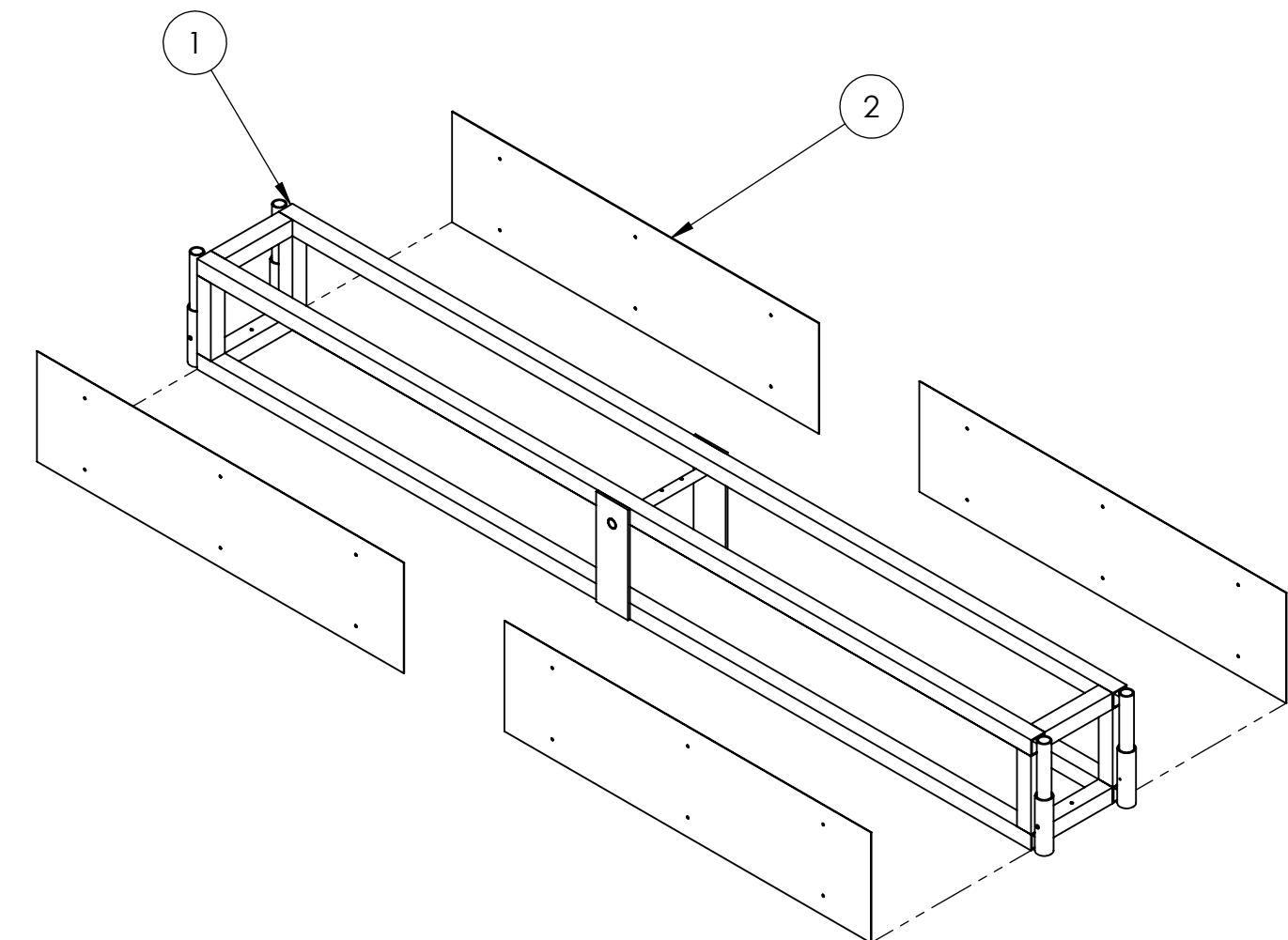
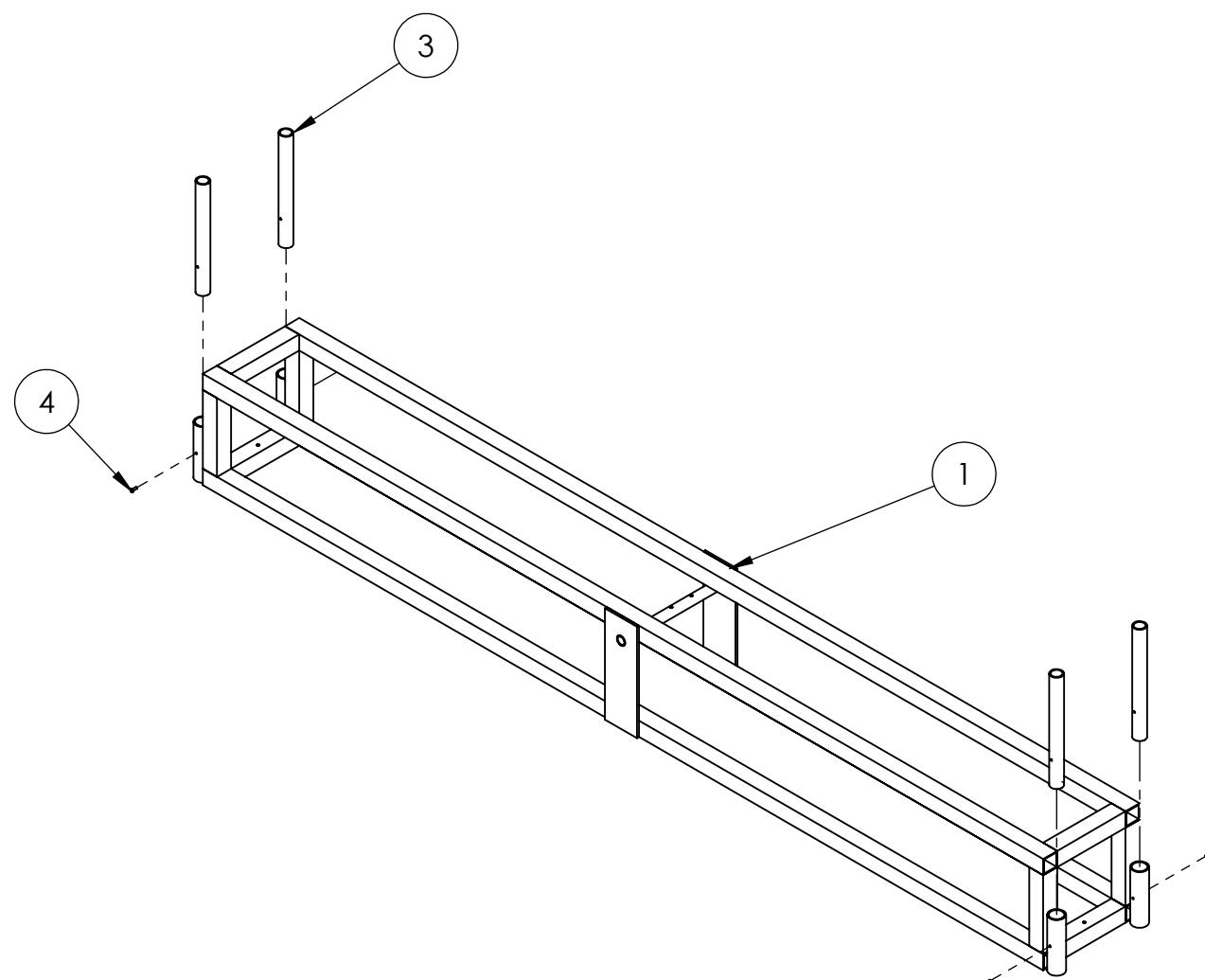
SCALE: 1:24 WEIGHT: SHEET 1 OF 2

4

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2

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Note:

1. Attach Item 3 (qty: 4) to Item 1 using Item 4 (qty: 4).

Note:

1. Attach Item 2 (qty: 4) to Item 1 with cable ties after the rest of GE-18120 is assembled.

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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			

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ROBOTICS  
COMPETITION
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TITLE: Scale Arm Assembly

SIZE B DWG. NO. GE-18125 REV

SCALE: 1:24 WEIGHT: SHEET 2 OF 2

4

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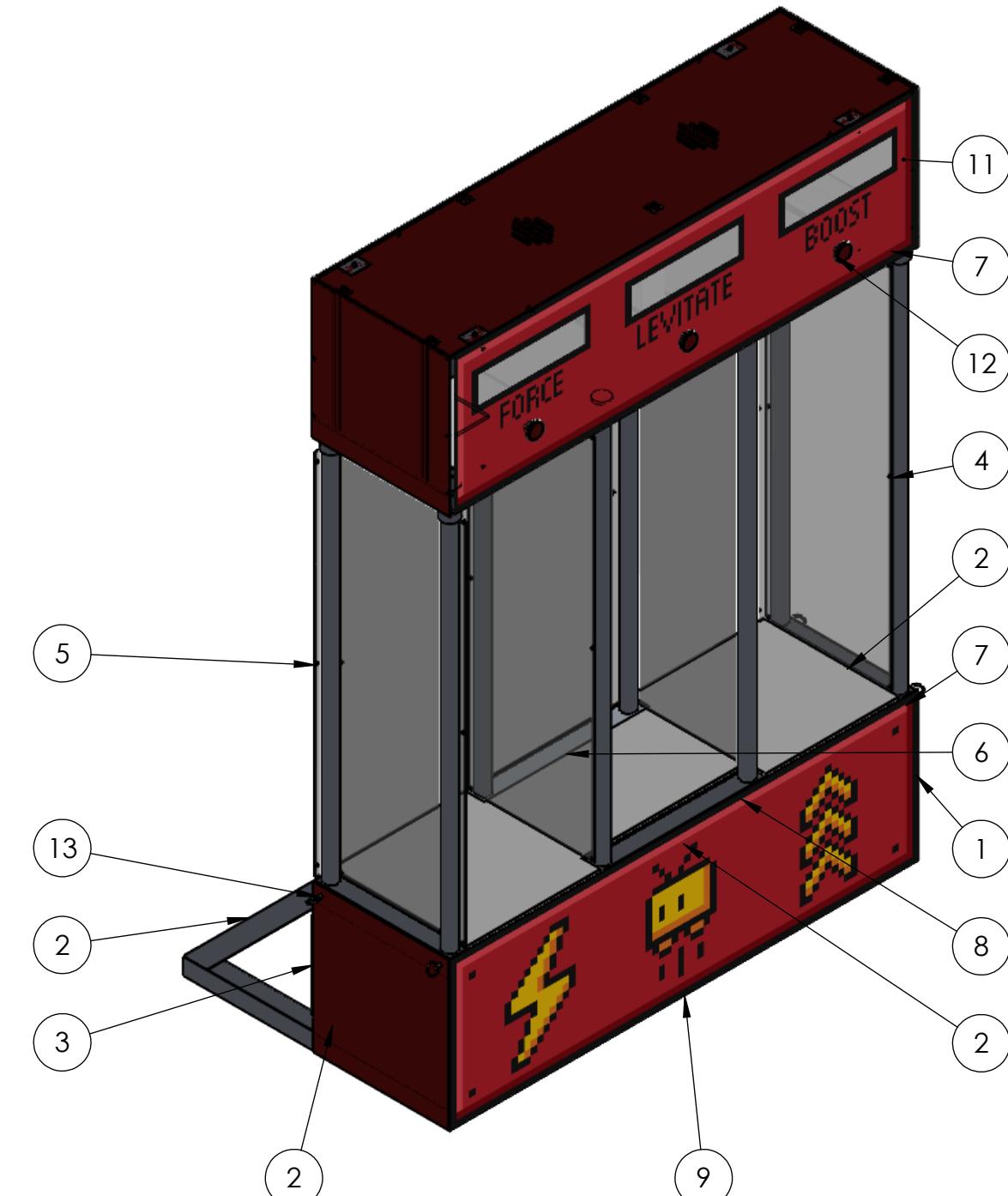
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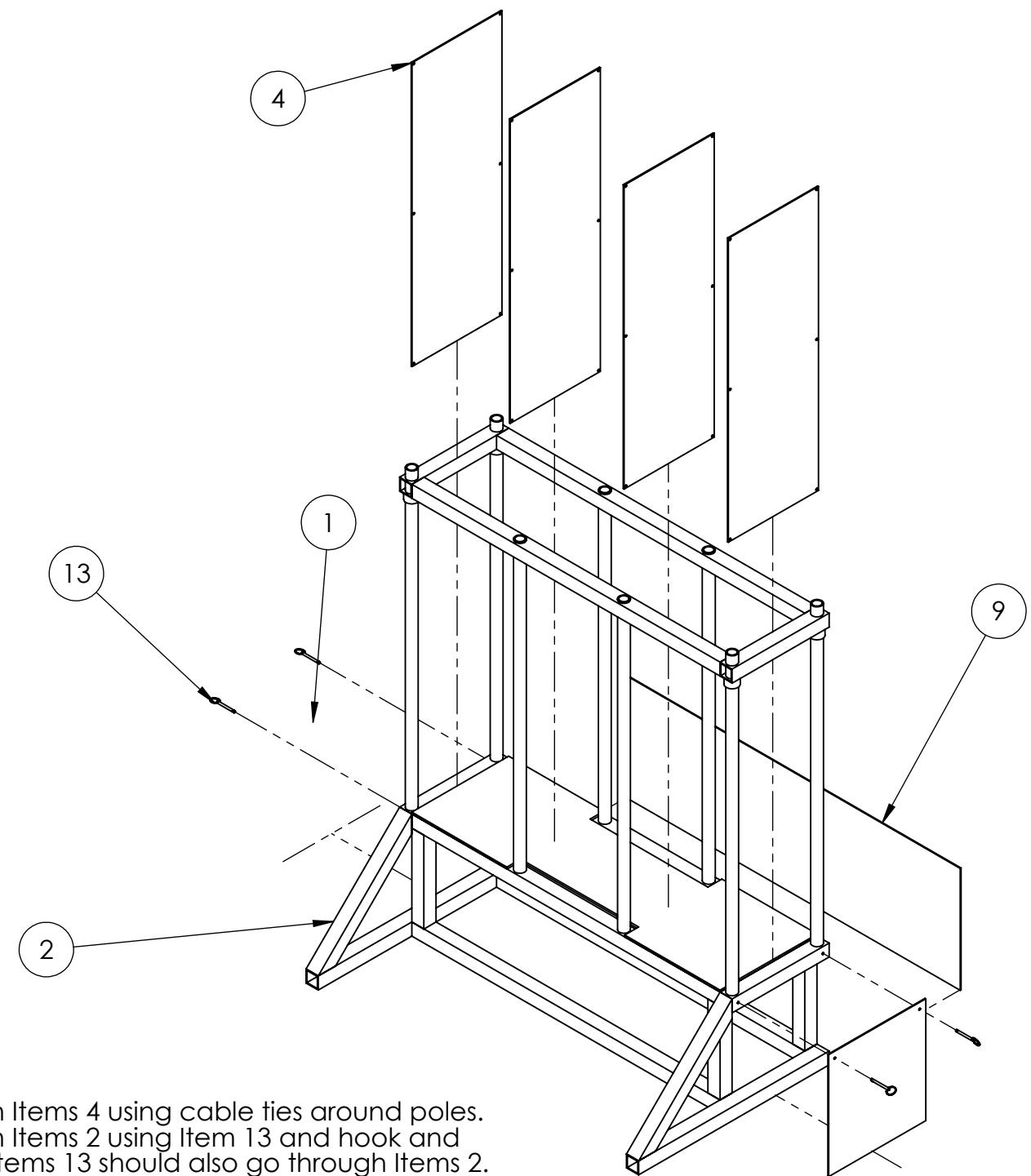
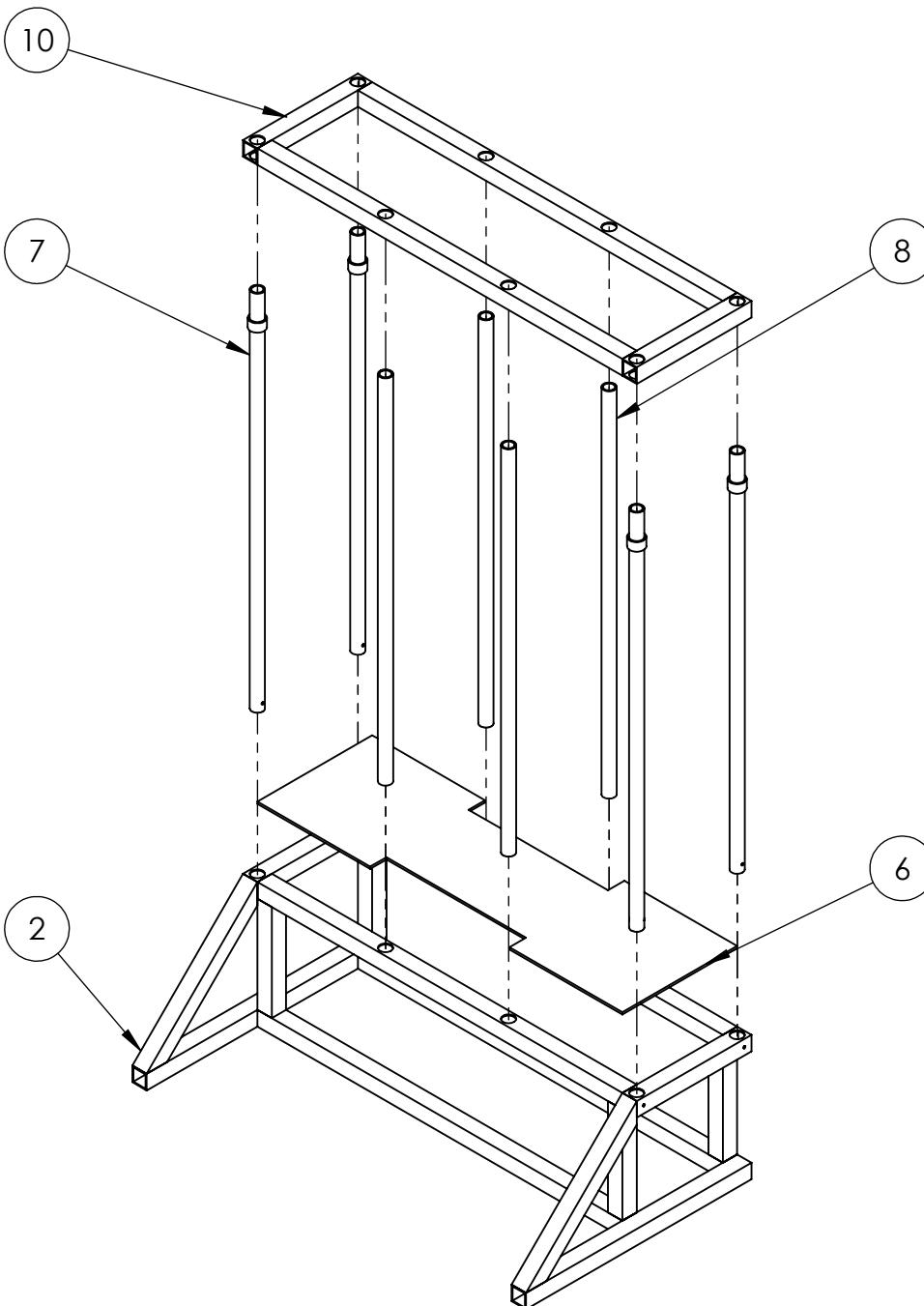
B

ITEM NO.	PART NUMBER	DESCRIPTION	Default/ QTY.
1	GE-18031	Vault HDPE Bottom Side	2
2	GE-18032	Vault Base	1
3	GE-18035	Vault HDPE Bottom Back	1
4	GE-18036	Vault Polycarbonate Middle Insert	4
5	GE-18037	Vault Polycarbonate Backstop	1
6	GE-18038	Vault Polycarbonate Bottom Floor	1
7	GE-18039	Vault Support Pipes	4
8	GE-18040	Vault Middle Support Pipes	4
9	GE-18045	Vault Polycarbonate Bottom Front	1
10	GE-18047	Vault Top Frame	1
11	GE-18129	Vault Top Assembly	1
12	Vault_Button		3
13	pin_quick_ring_.25_2	SS Ring-Grip Quick-Release Pin, 1/4" diameter, 2" long	4
14	hex_.25_20_.75	Steel Hex Head Screw, 1/4"-20 x 3/4" long, fully threaded	12
15	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		
		APPLICATION	DO NOT SCALE DRAWING	
SIZE	DWG. NO.		REV	
<b>B</b>	<b>GE-18126</b>			
SCALE: 1:12	WEIGHT:		SHEET 1 OF 3	





Notes:

1. Attach Items 4 using cable ties around poles.
2. Attach Items 2 using Item 13 and hook and loop. Items 13 should also go through Items 2.
3. Attach Item 9 using hook and loop.

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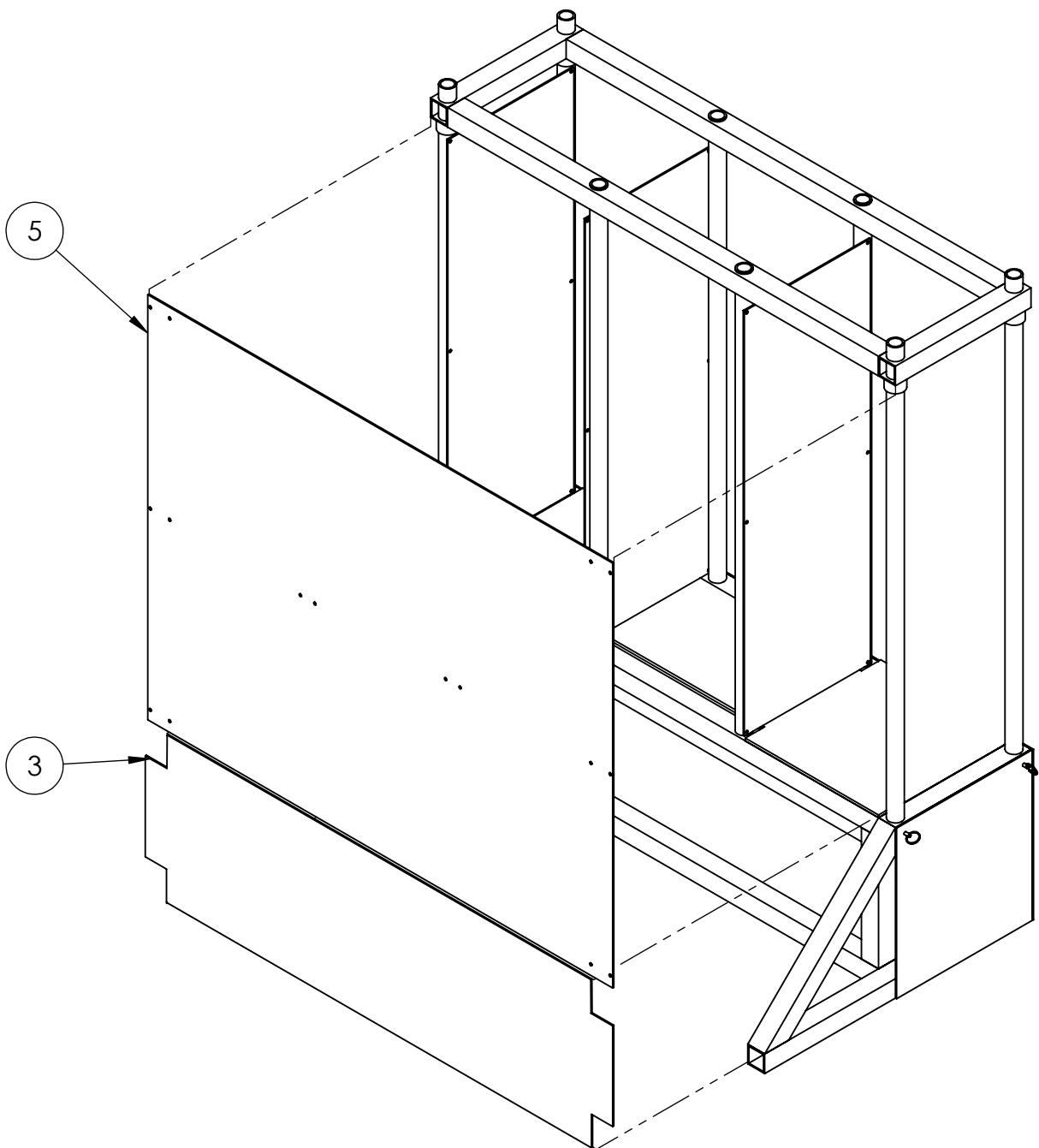
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TOLERANCES:				
FRACTIONAL: $\pm 1/16$				
ANGULAR: MACH $\pm 1^\circ$				
BEND $\pm 1^\circ$				
TWO PLACE DECIMAL $\pm .01$				
THREE PLACE DECIMAL $\pm .001$				
		INTERPRET GEOMETRIC TOLERANCING PER:		
		MATERIAL		
NEXT ASSY	USED ON	FINISH		
	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

**FIRST ROBOTICS COMPETITION** **SOLIDWORKS**  
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**TITLE:** Vault Assembly

**SIZE** DWG. NO. **B** GE-18126 **REV**

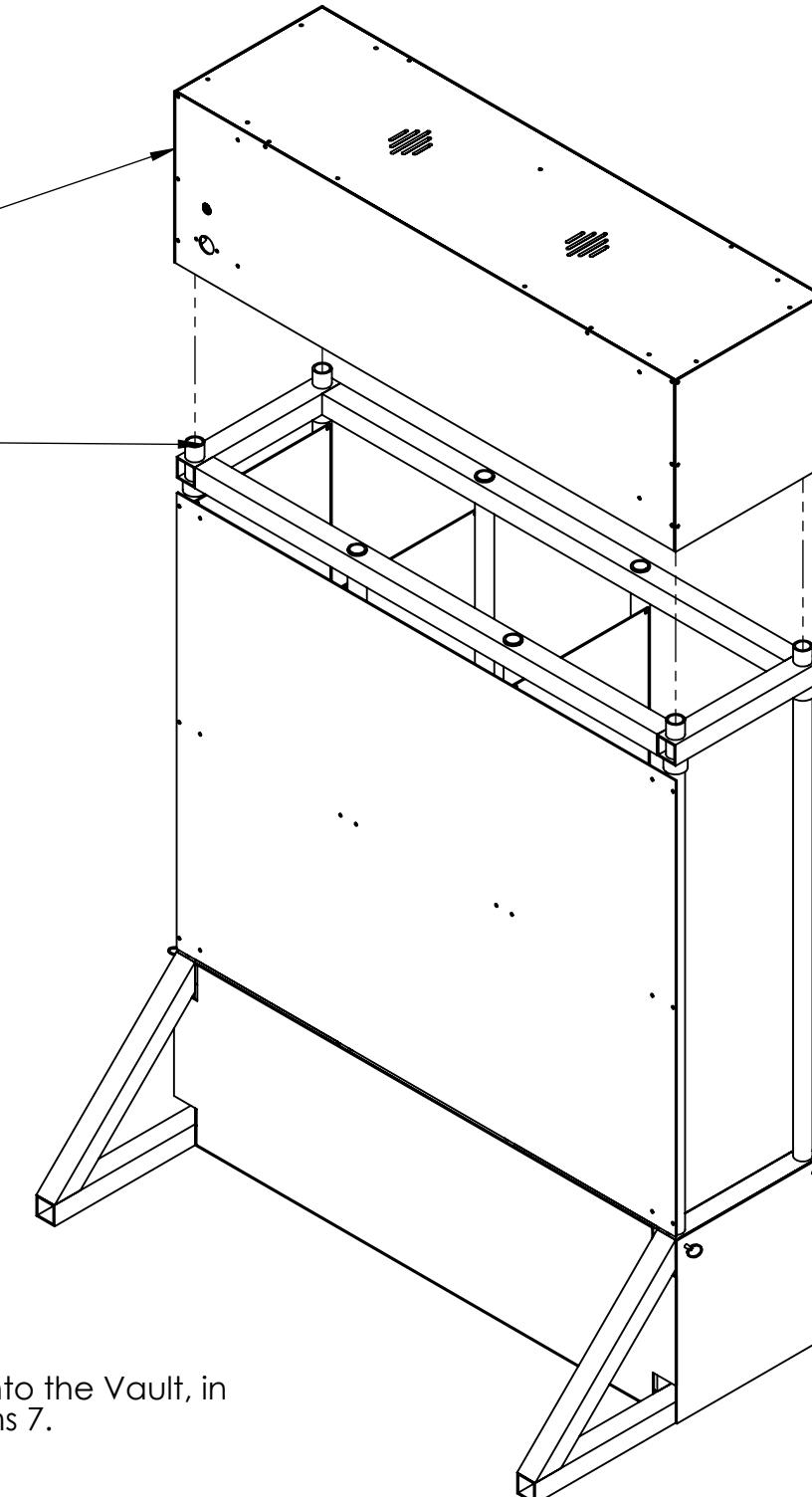
SCALE: 1:12 WEIGHT: SHEET 2 OF 3



Notes:

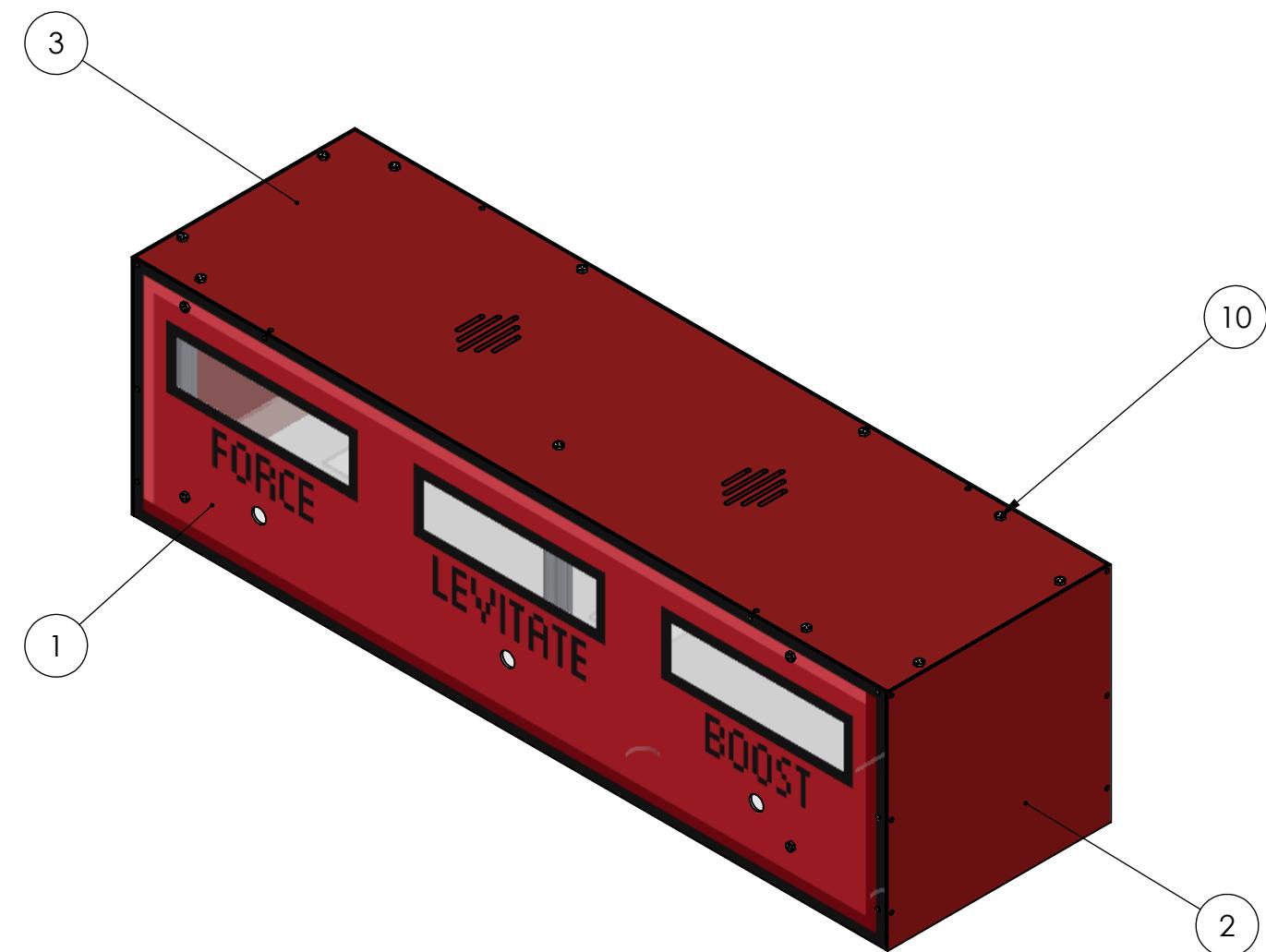
1. Attach Item 5 using cable ties around poles
2. Attach Item 3 using hook and loop.

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Notes:  
1. Place Item 11 onto the Vault, in alignment with Items 7.

		UNLESS OTHERWISE SPECIFIED:		NAME	DATE	 <b>FIRST ROBOTICS COMPETITION</b>	<b>TITLE:</b>  <b>Vault Assembly</b>
		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 $\pm .01$	QA.				
		THREE PLACE DECIMAL $\pm .001$	COMMENTS:				
		INTERPRET GEOMETRIC TOLERANCING PER:					
		MATERIAL					
		FINISH					
NEXT ASSY	USED ON						
APPLICATION		DO NOT SCALE DRAWING					
SCALE: 1:12   WEIGHT:						SHEET 3 OF 3	



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-18033	Vault polycarbonate Top Front Face	1
2	GE-18034	Vault HDPE Top Side	2
3	GE-18044	Vault HDPE Top	1
4	GE-18041	Vault Polycarbonate Top Backside	1
5	GE-18046	Vault Polycarbonate Top Base	1
6	GE-18030	80-20 Extrusion	7
7	GE-18048	Vault Bracket	8
8	flat_hex_.25_20_1	Steel Hex Flat Head Screw, 1/4"-20 x 1" long, fully threaded	11
9	nylock_.25_20	Steel Nylon-Insert Locknut, 1/4"-20	16
10	hex_.25_20_.75	Steel Hex Head Screw, 1/4"-20 x 3/4" long, fully threaded	19

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

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**Vault Top Assembly**

**B** **GE-18129**

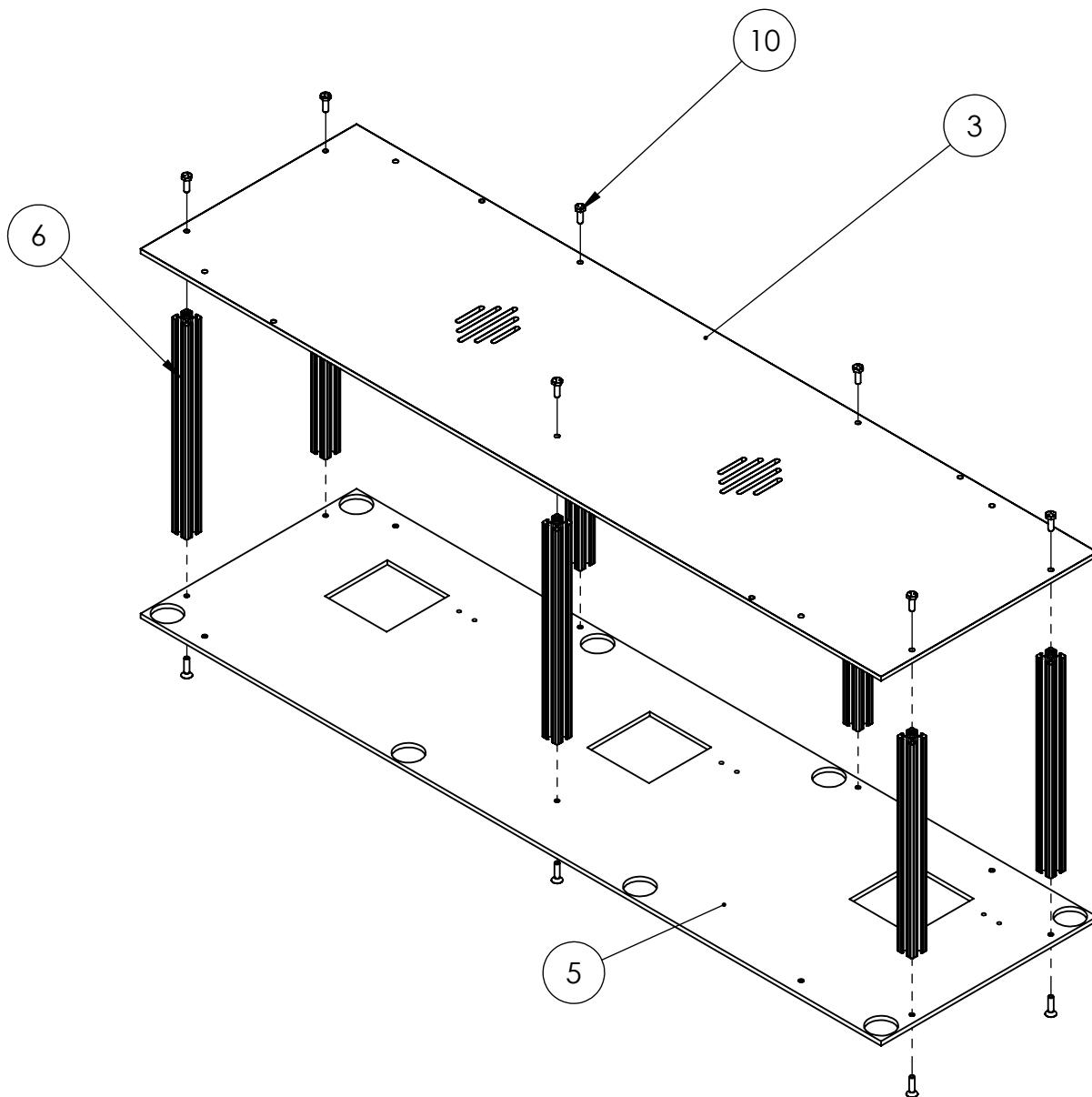
SIZE DWG. NO. REV  
SCALE: 1:8 WEIGHT: SHEET 1 OF 3

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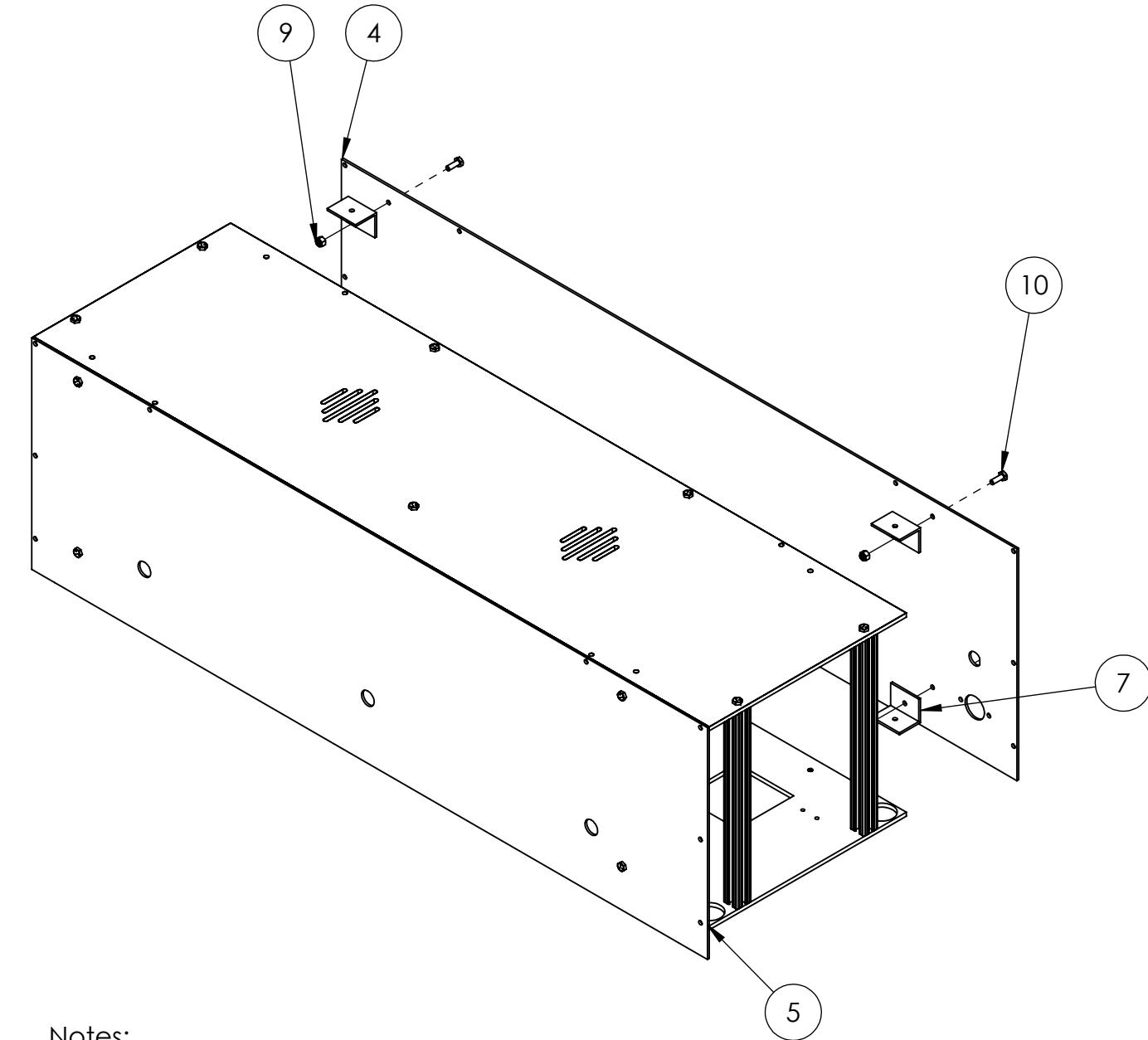
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Notes:  
1. Use Item 10 to fasten Item 3 and Item 5 to Item 6 (qty. 7)

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Notes:  
1. Use Item 10 and 9 to fasten item 7 bracket with 4  
2. Repeat with item 5 face

		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:
NEXT ASSY		MATERIAL	REV	
USED ON		FINISH		
		APPLICATION		DO NOT SCALE DRAWING
		SCALE: 1:8		WEIGHT:
		SHEET 2 OF 3		

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# Vault Top Assembly

SIZE DWG. NO. **B GE-18129** REV

SCALE: 1:8 WEIGHT: SHEET 2 OF 3

4

3

2

1

4

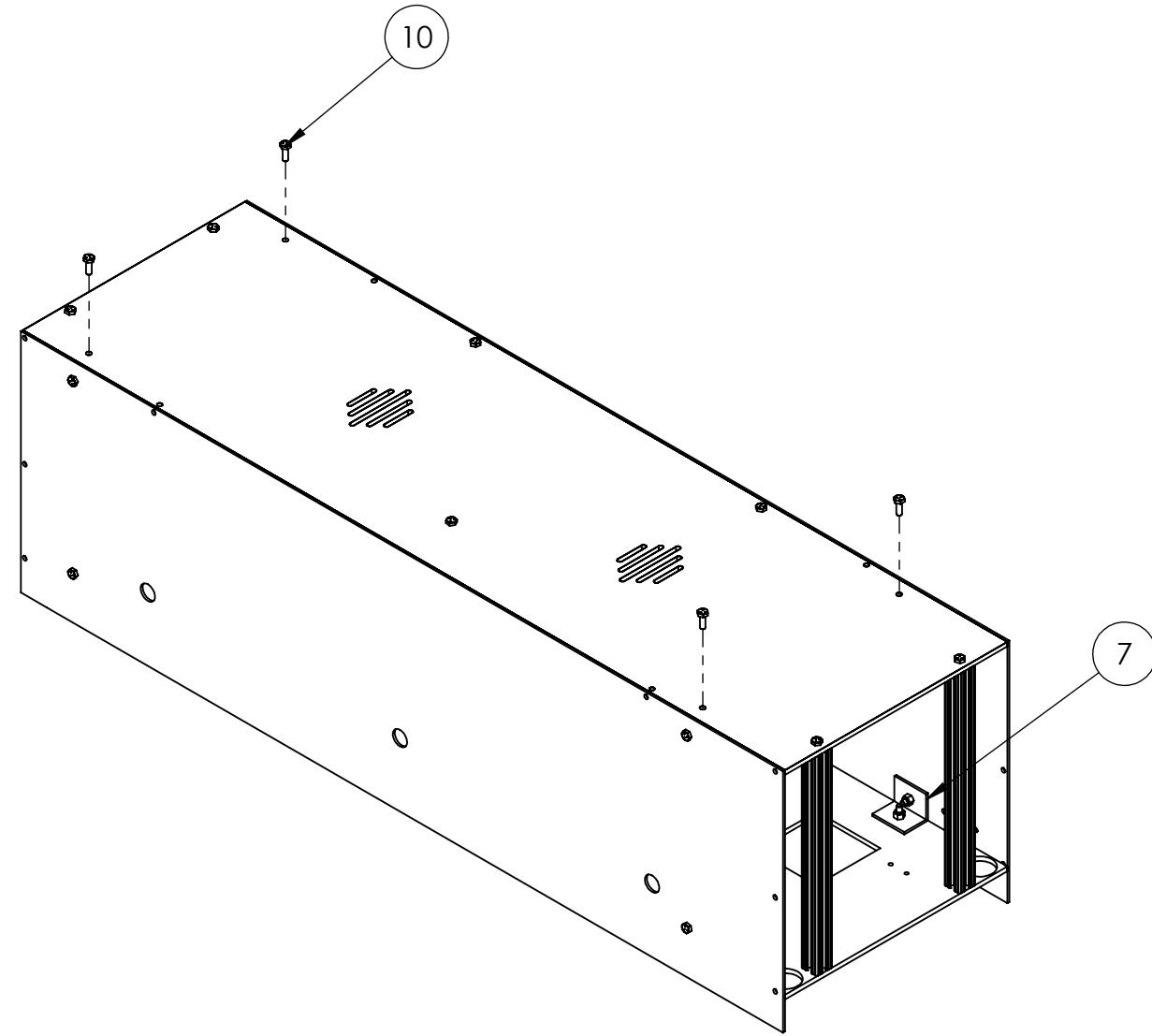
3

2

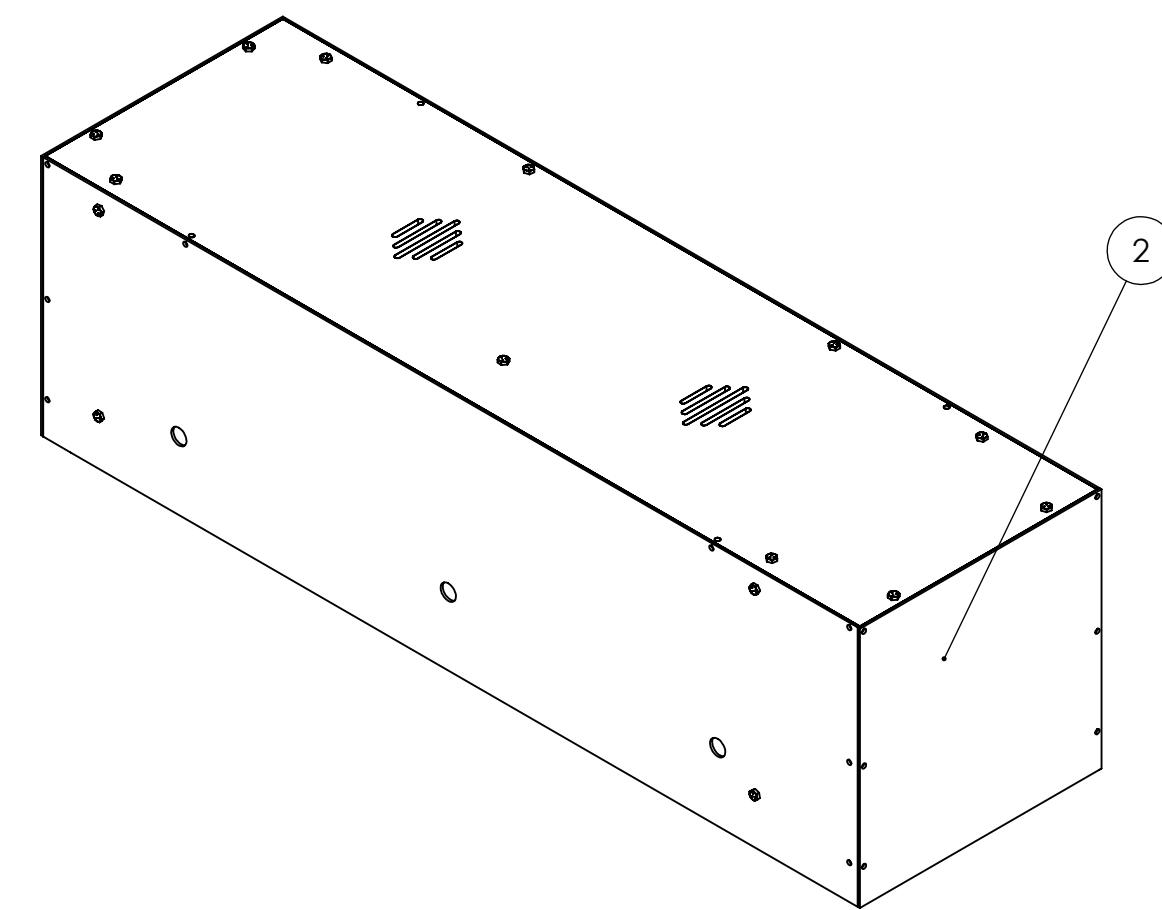
1

B

B



Notes:  
1. Finish attaching top and faces using Items 10 and 7



- Notes:  
1. Attach Item 2 using cable ties  
2. Repeat on opposite side

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

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**Vault Top  
Assembly**

**B** **GE-18129**

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

4

3

2

1