

4

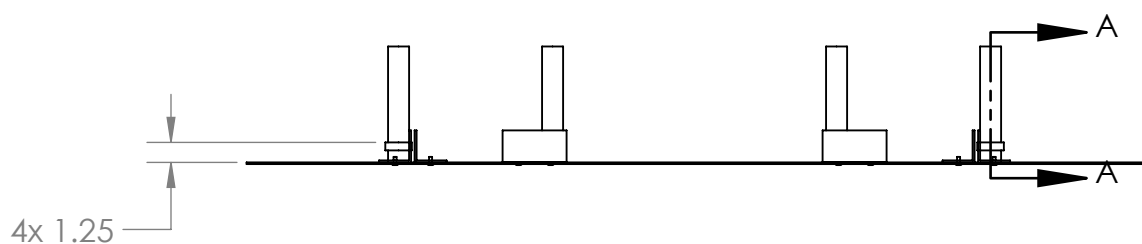
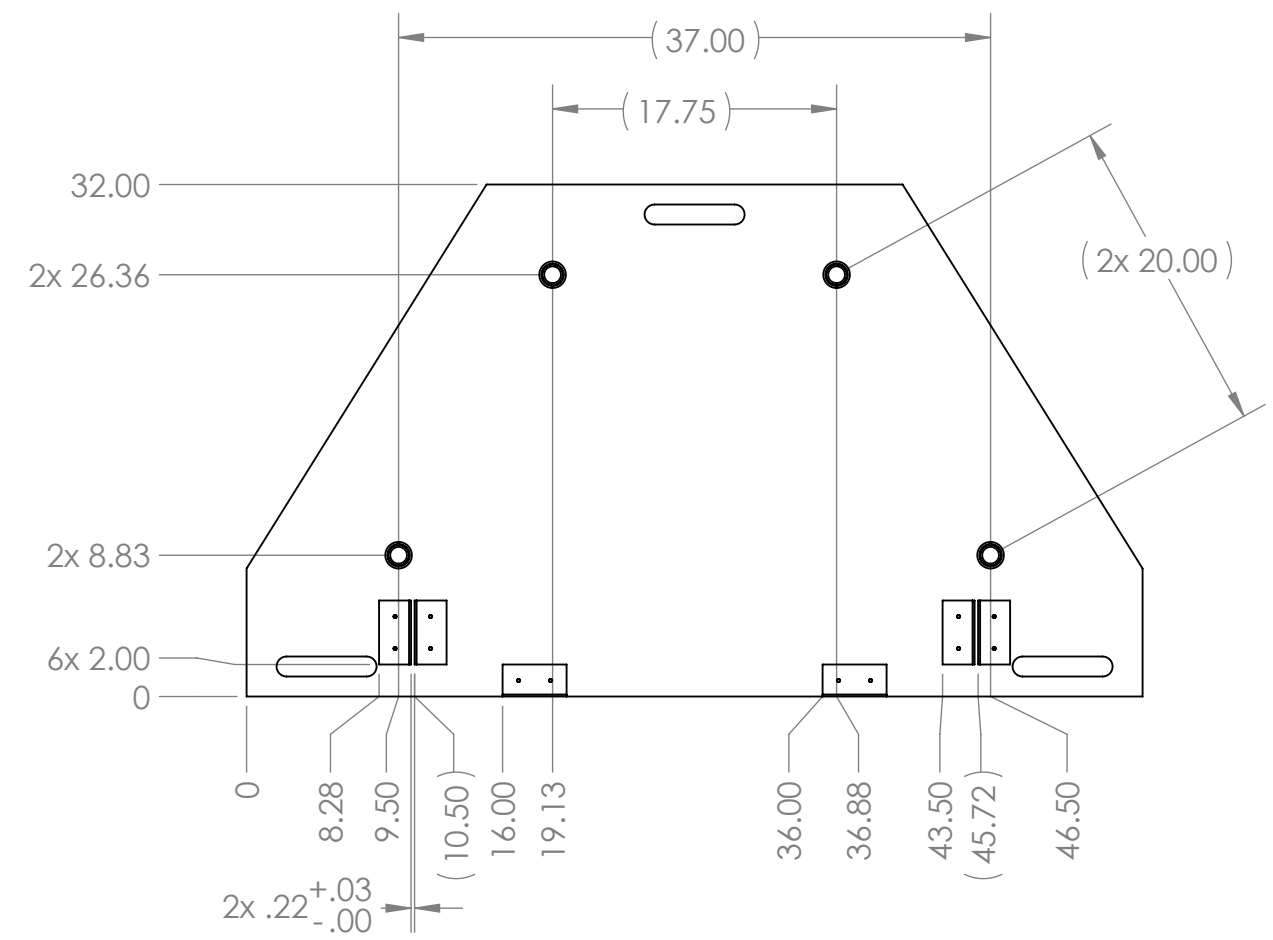
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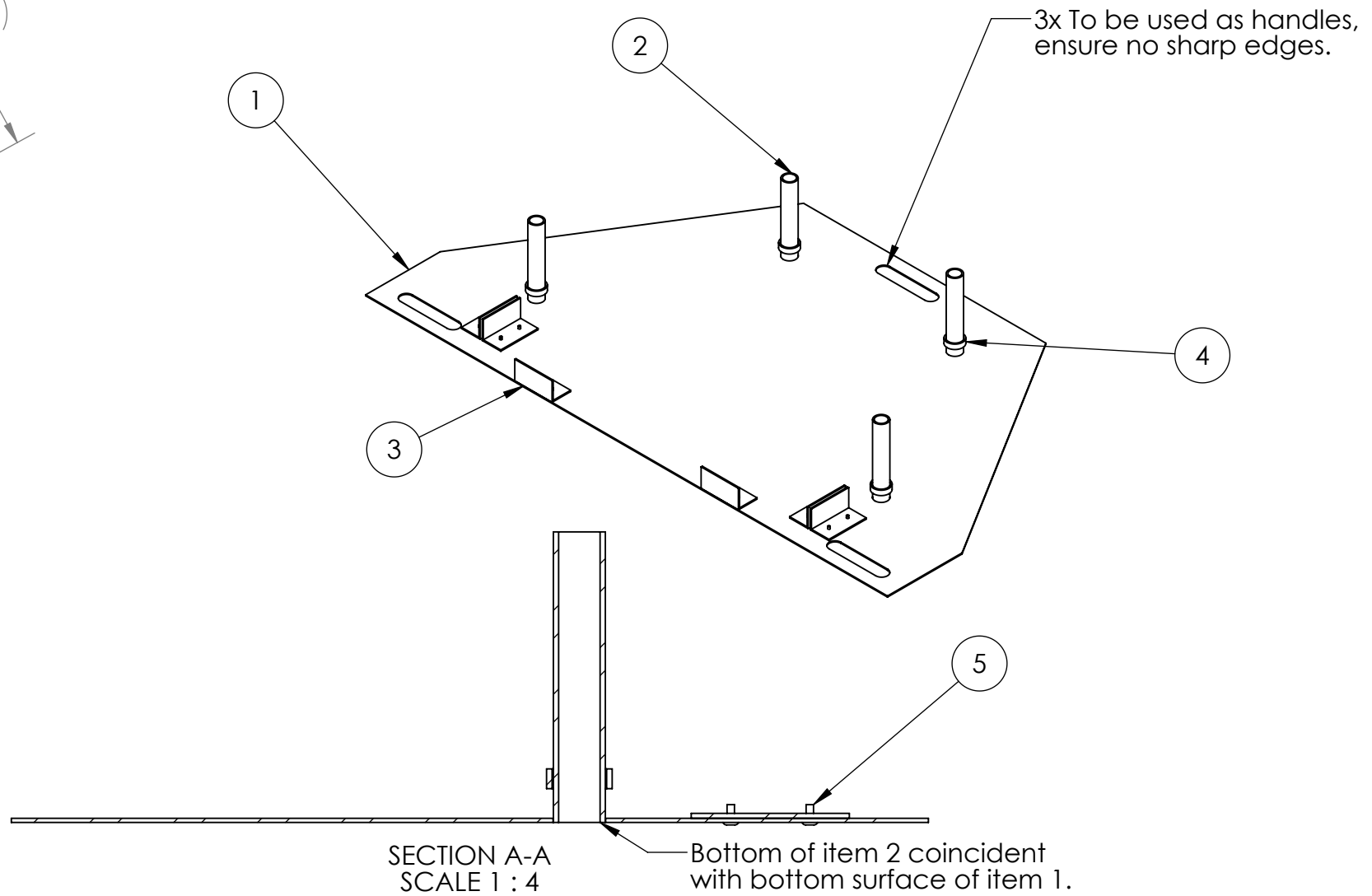
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REVISIONS

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



- Notes:
1. Remove all burrs and sharp edges.
  2. Powder coated black.
  3. Tag or label with part number.



SECTION A-A SCALE 1 : 4

Bottom of item 2 coincident with bottom surface of item 1.

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

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

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

TITLE: **Rocket Base**

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

SCALE: 1:12 WEIGHT: SHEET 1 OF 3

4

3

2

1

4

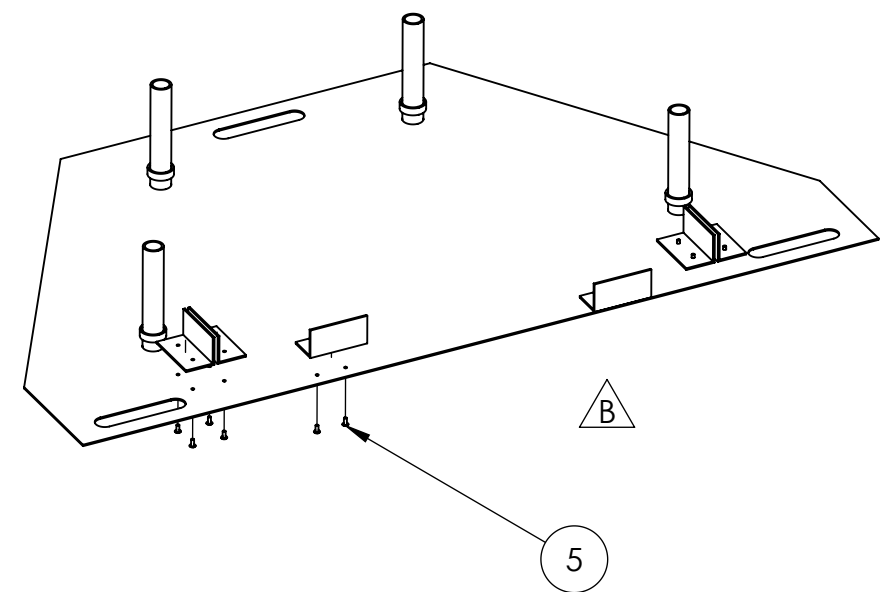
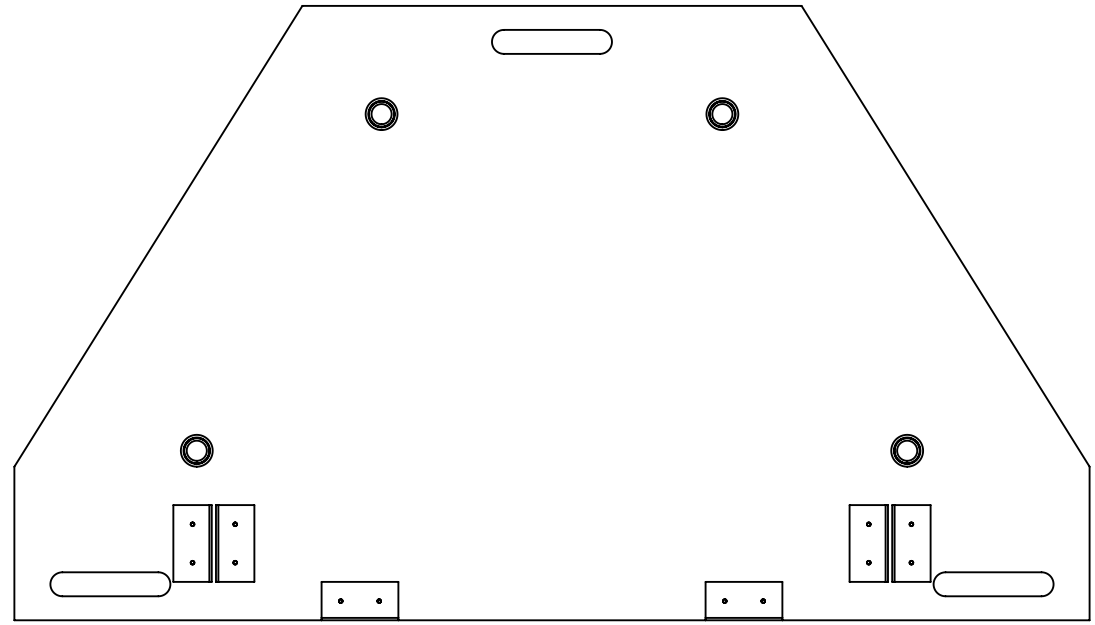
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2

1

B

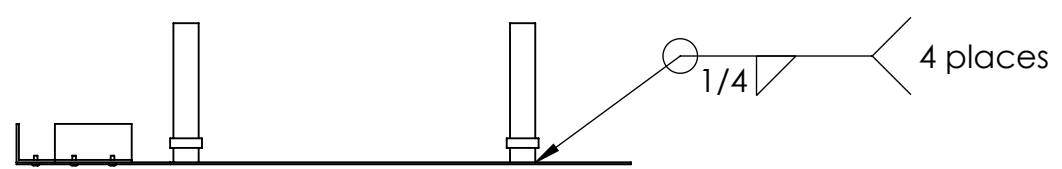
B



4 places  
 1/4 .25-1  
 B



No weld on top of item 4 permissible



A

A

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



TITLE: <b>Rocket Base</b>		
SIZE <b>B</b>	DWG. NO. <b>GE-19015</b>	REV <b>B</b>
SCALE: 1:10 WEIGHT:		SHEET 2 OF 3

4

3

2

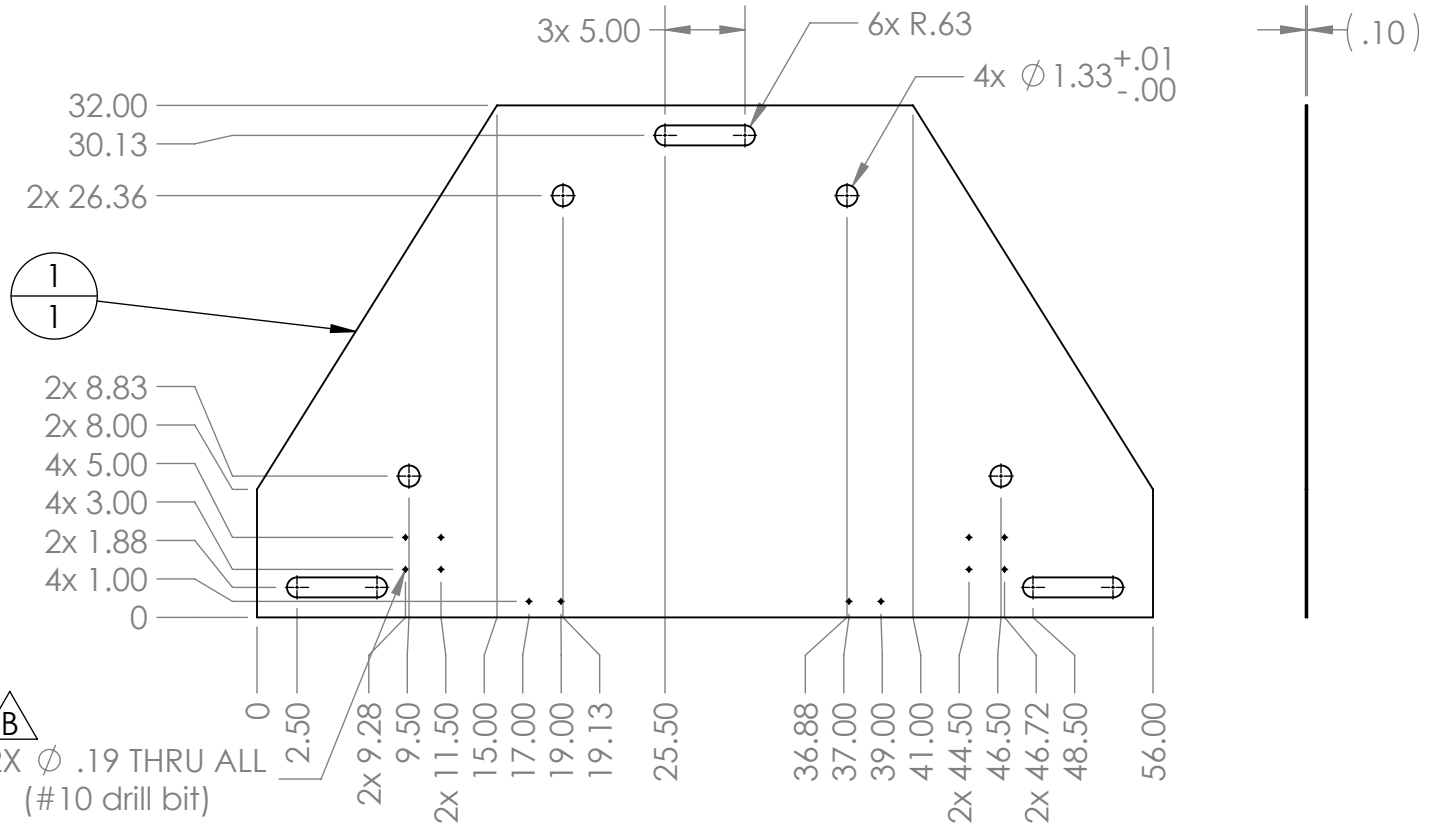
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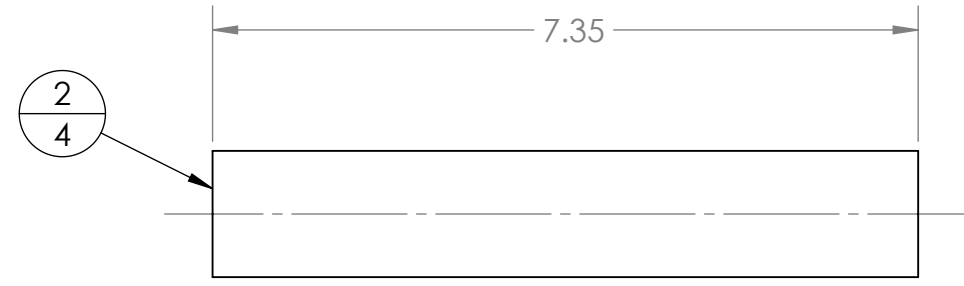
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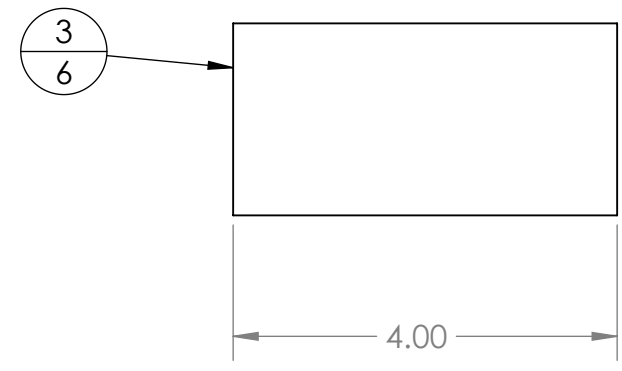
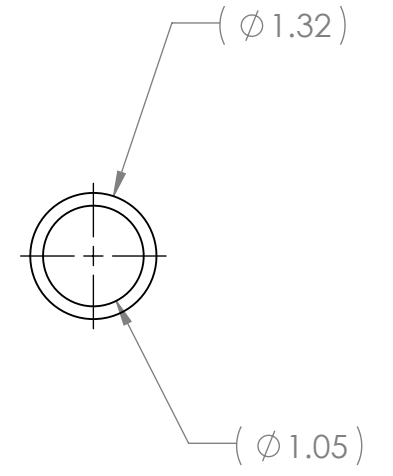
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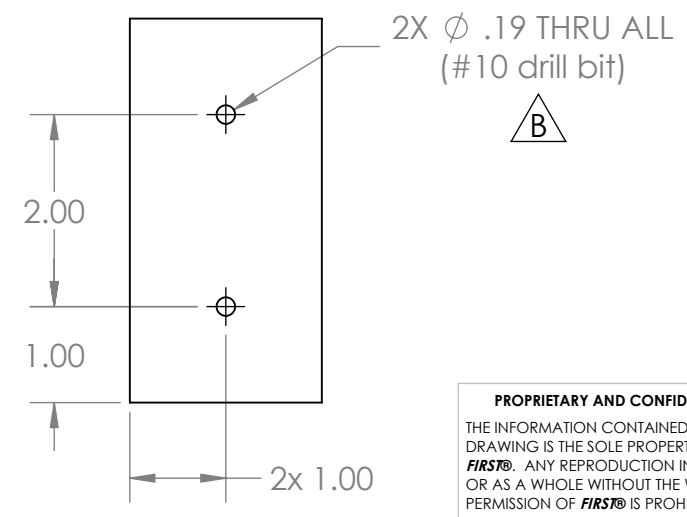
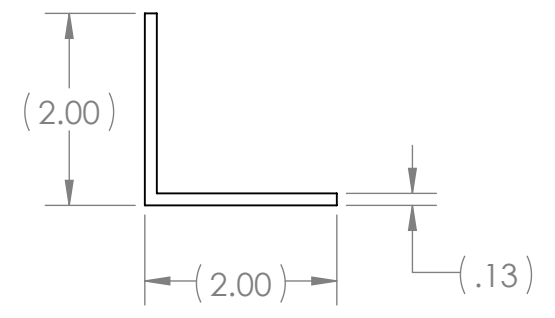
Material: 12 gauge A-366/1008 Cold Roll Steel  
Scale: 1:12



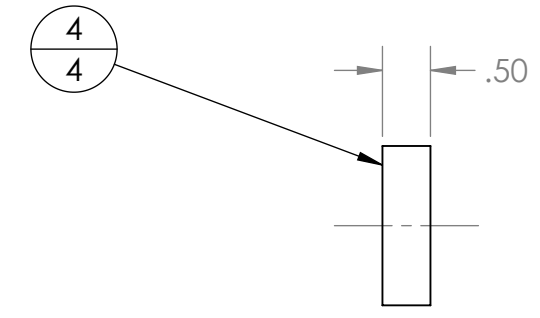
Material: 1" Schedule 40 A500 Steel  
Scale: 1:2



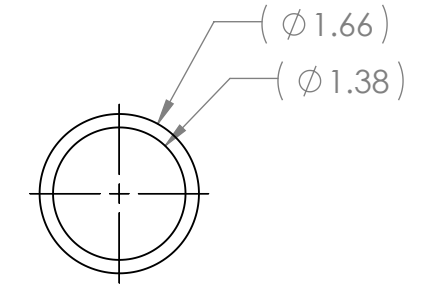
Material: 2" x .125" thk. A-36 Steel Angle  
Scale: 1:2



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



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

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

TITLE: **Rocket Base**

SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19015</b>	<b>B</b>
WEIGHT:		SHEET 3 OF 3

4

3

2

1

B

B

A

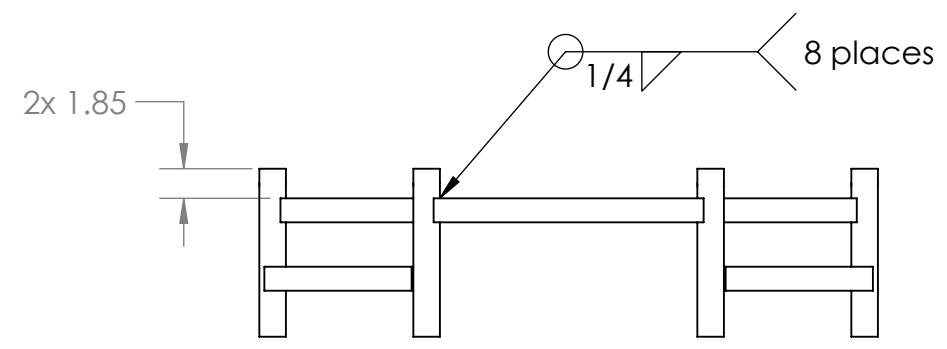
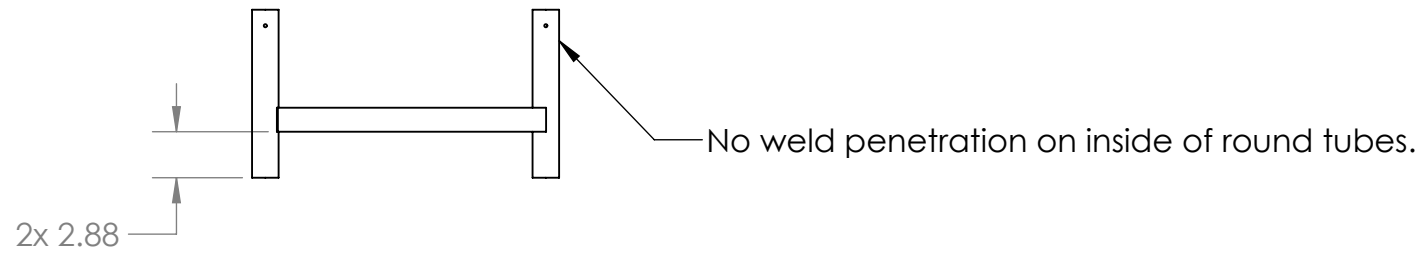
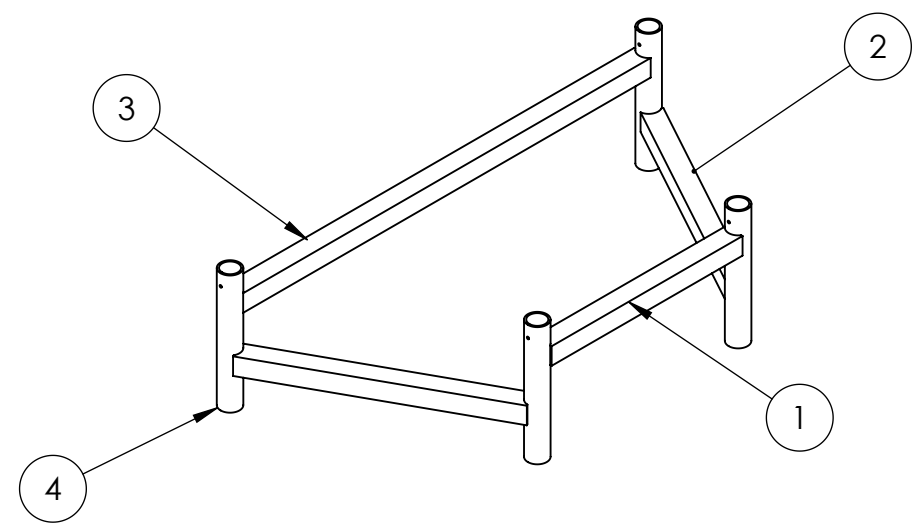
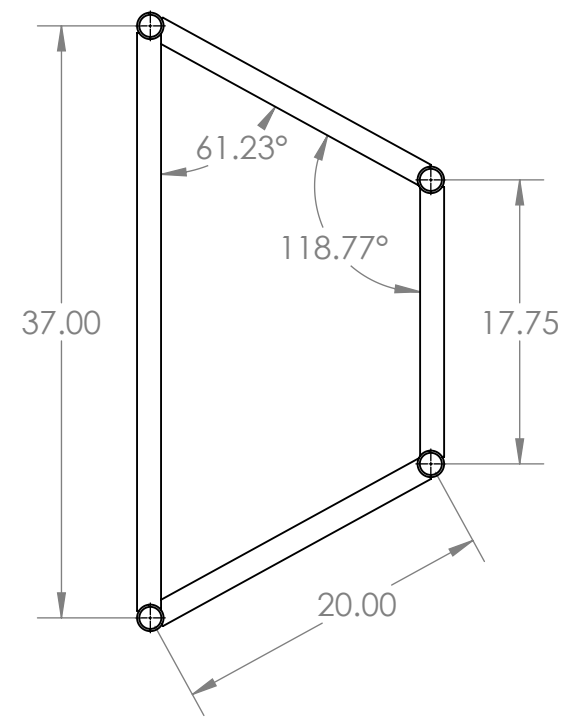
A

4

3

2

1



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

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

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UNLESS OTHERWISE SPECIFIED:		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			

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

TITLE:  
**Rocket Frame Slice**

SIZE DWG. NO. REV  
**B GE-19016**

SCALE: 1:12 WEIGHT: SHEET 1 OF 2

4

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2

1



4

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2

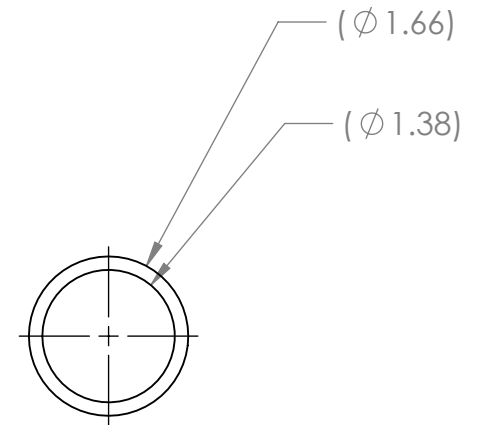
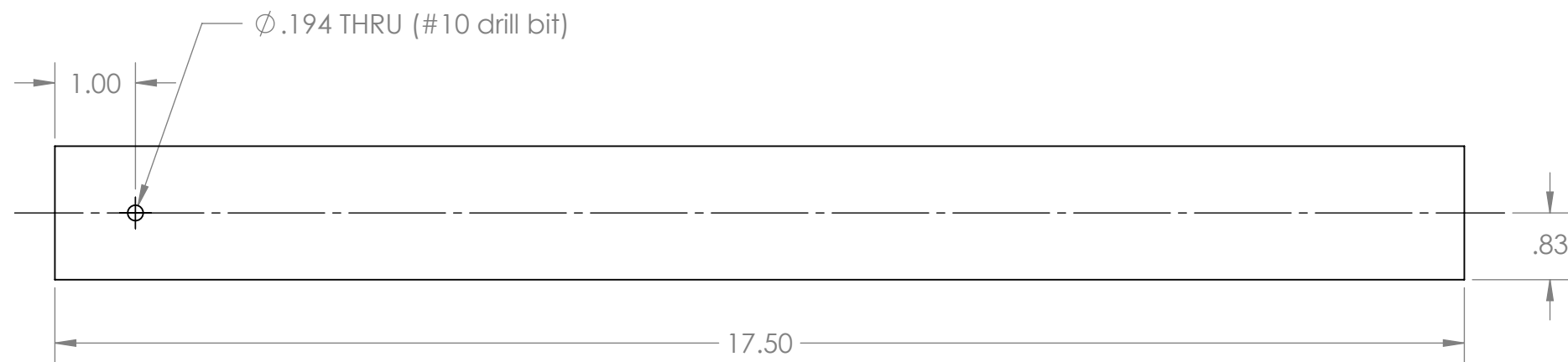
1

B

B

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A



Notes:

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

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		UNLESS OTHERWISE SPECIFIED:	NAME	DATE	 
		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$	DRAWN		
		INTERPRET GEOMETRIC TOLERANCING PER:	CHECKED		SIZE DWG. NO. REV <b>B</b> <b>GE-19017</b>
		MATERIAL	ENG APPR.		
NEXT ASSY	USED ON	FINISH	MFG APPR.		SCALE: 1:2 WEIGHT: SHEET 1 OF 1
APPLICATION		DO NOT SCALE DRAWING	Q.A.	COMMENTS:	

4

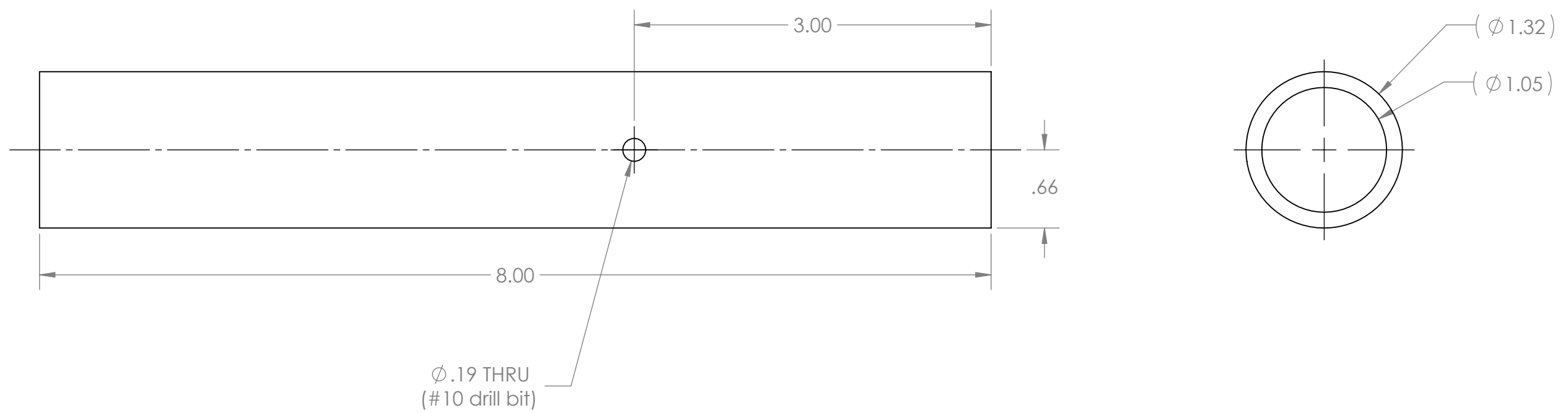
3

2

1

B

B



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

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



TITLE:		
Rocket Insert Tube		
SIZE	DWG. NO.	REV
<b>B</b>	GE-19018	
SCALE: 1:1	WEIGHT:	SHEET 1 OF 1

4

3

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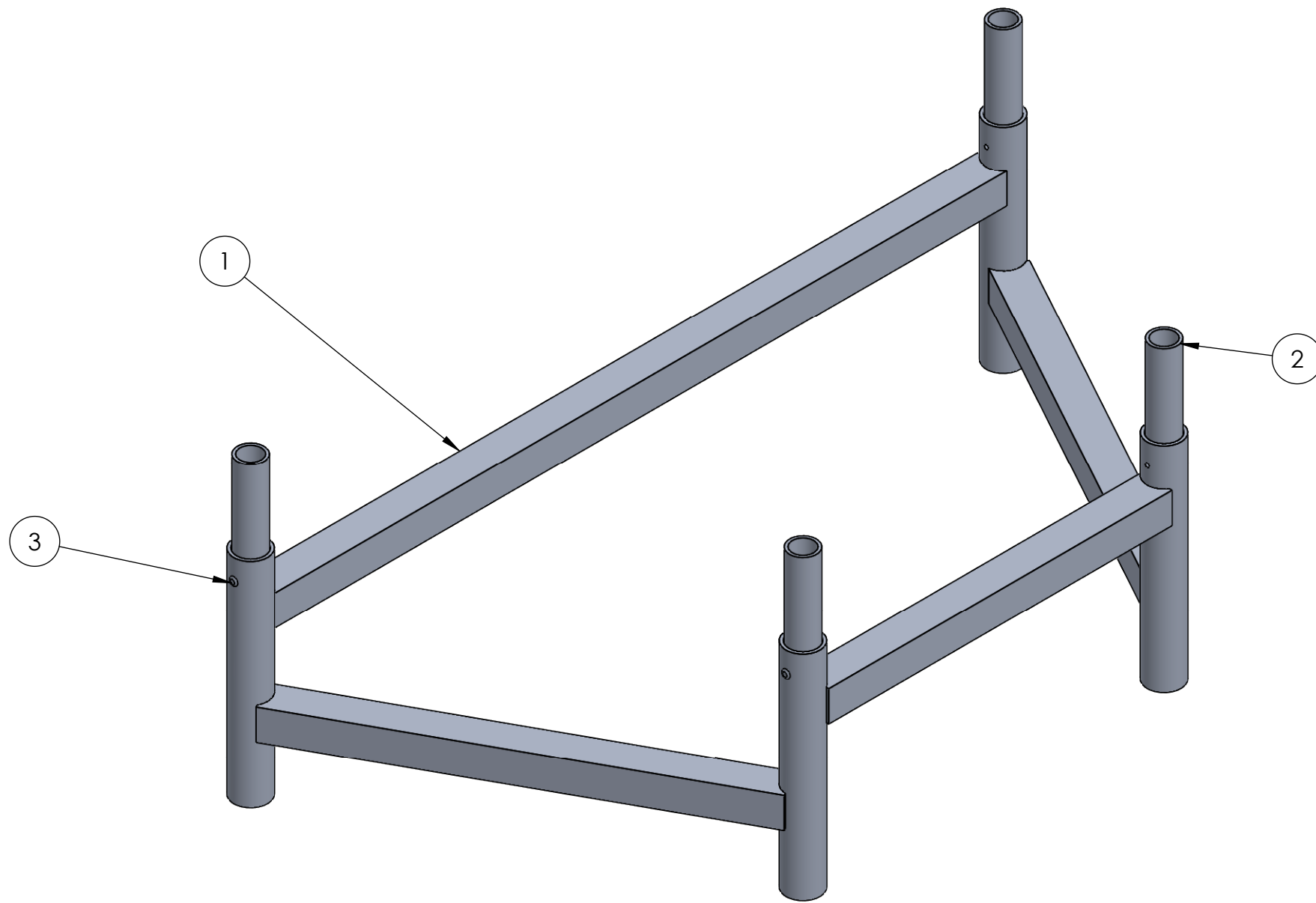
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ITEM NO.	PART NUMBER	DESCRIPTION	Default/ QTY.
1	GE-19016	Rocket Frame Slice	1
2	GE-19018	Rocket Insert Tube	4
3	rivet_.1875_.251-.375	3/16" Aluminum Rivet, .251-.375 Grip Range	4

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



TITLE:		
Rocket Frame Slice Assembly		
SIZE	DWG. NO.	REV
<b>B</b>	GE-19019	
SCALE: 1:5	WEIGHT:	SHEET 1 OF 2

4

3

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1



4

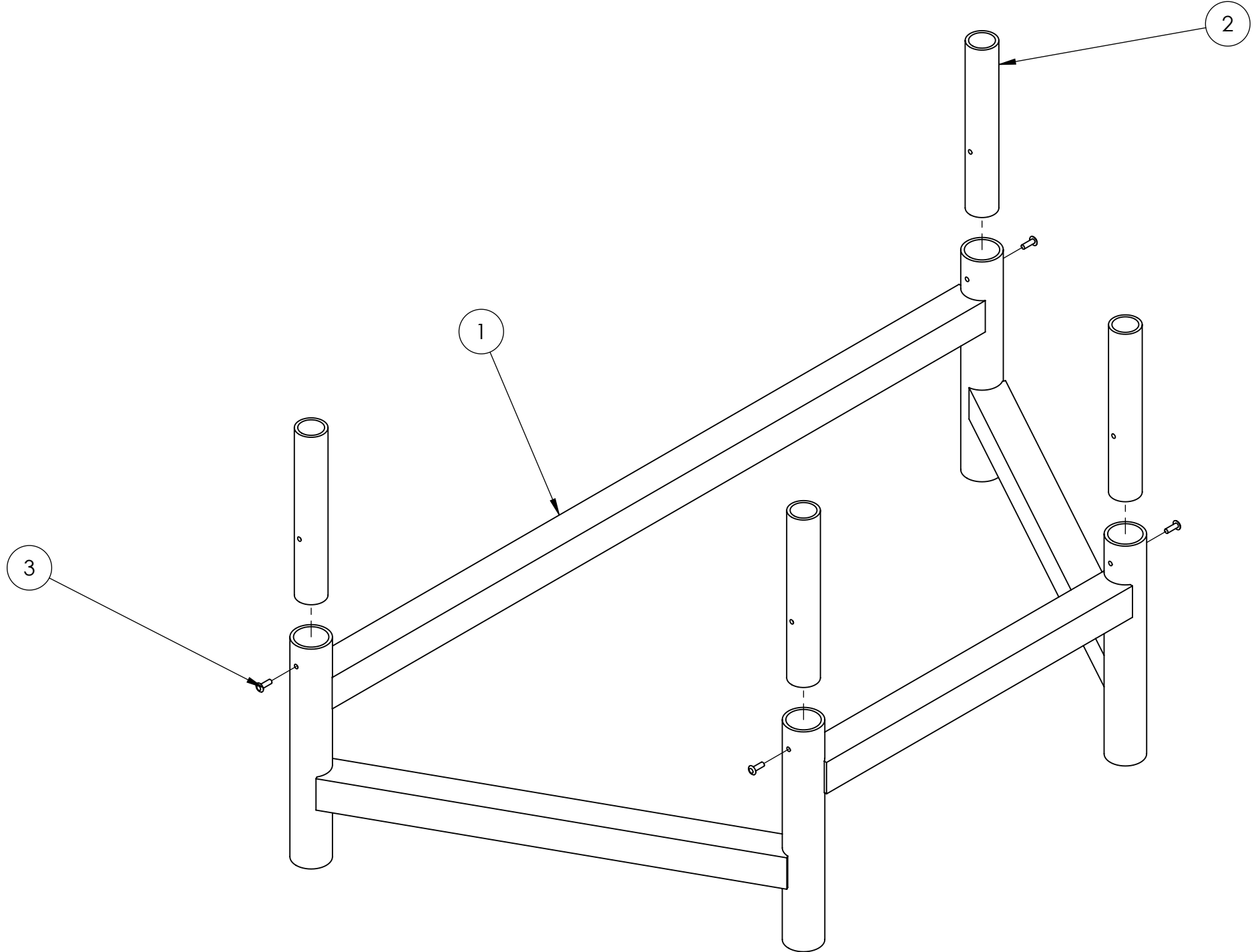
3

2

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B

B



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

A

A

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



TITLE:		
Rocket Frame Slice Assembly		
SIZE	DWG. NO.	REV
<b>B</b>	GE-19019	
SCALE: 1:5	WEIGHT:	SHEET 2 OF 2

4

3

2

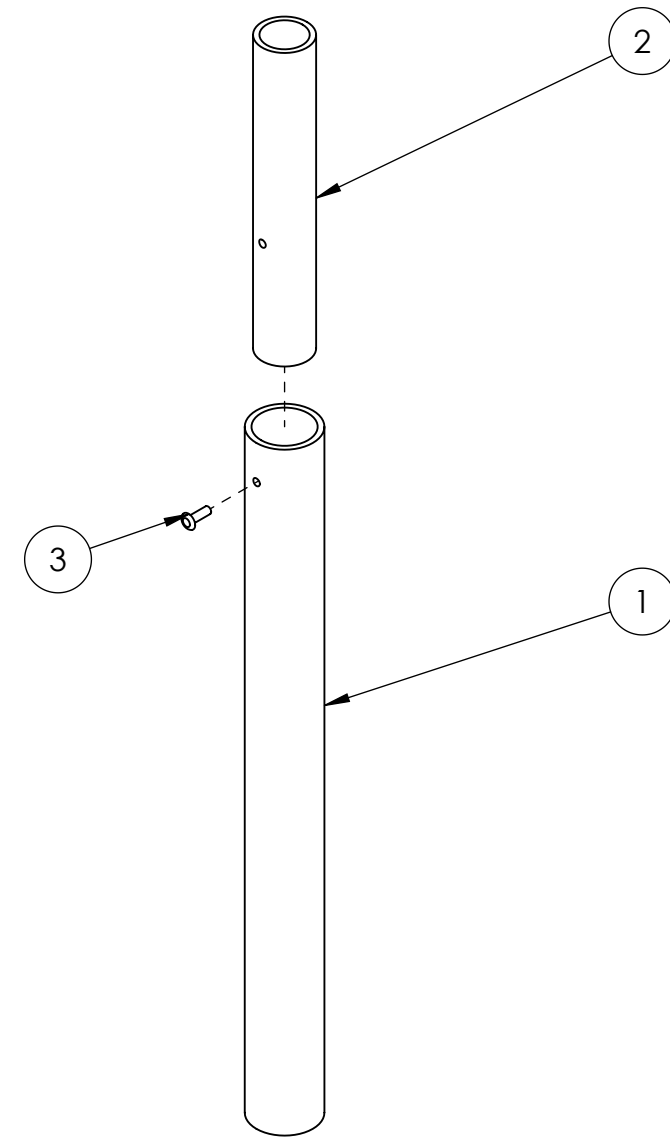
1

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1



Notes:  
1. Fasten Item 2 to Item 1, using Item 3.

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

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		UNLESS OTHERWISE SPECIFIED:	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		
		INTERPRET GEOMETRIC TOLERANCING PER:	CHECKED		SIZE DWG. NO. REV
		MATERIAL	ENG APPR.		<b>B</b> <b>GE-19024</b>
NEXT ASSY	USED ON	FINISH	MFG APPR.		SCALE: 1:4 WEIGHT: SHEET 1 OF 1
APPLICATION		DO NOT SCALE DRAWING	Q.A.		
			COMMENTS:		

4

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1

B

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A

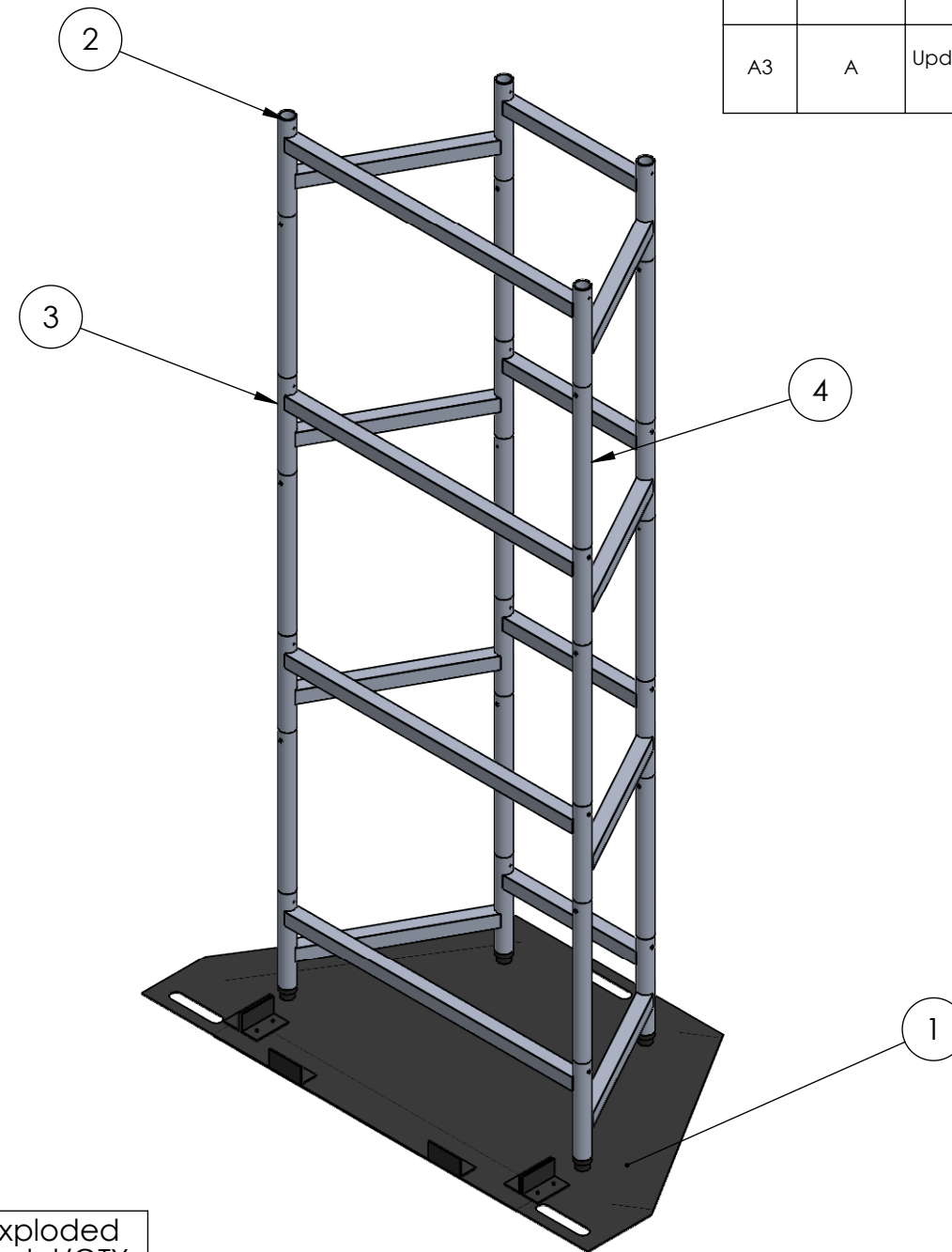
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REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
A3	A	Updated assembly to use GE-19016 at otp of assembly instead of GE-19019.	12/26/2018	CPO



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

A

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		UNLESS OTHERWISE SPECIFIED:	NAME	DATE	 
		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL: ±1/16 ANGULAR: MACH ±1° BEND ±1° TWO PLACE DECIMAL ±.01 THREE PLACE DECIMAL ±.001	DRAWN		
		INTERPRET GEOMETRIC TOLERANCING PER:	CHECKED		TITLE:
		MATERIAL	ENG APPR.		<b>Rocket Frame Assembly</b>
		FINISH	MFG APPR.		SIZE DWG. NO. REV
NEXT ASSY	USED ON		Q.A.		<b>B GE-19025 A</b>
APPLICATION		DO NOT SCALE DRAWING	COMMENTS:		SCALE: 1:16 WEIGHT: SHEET 1 OF 2

4

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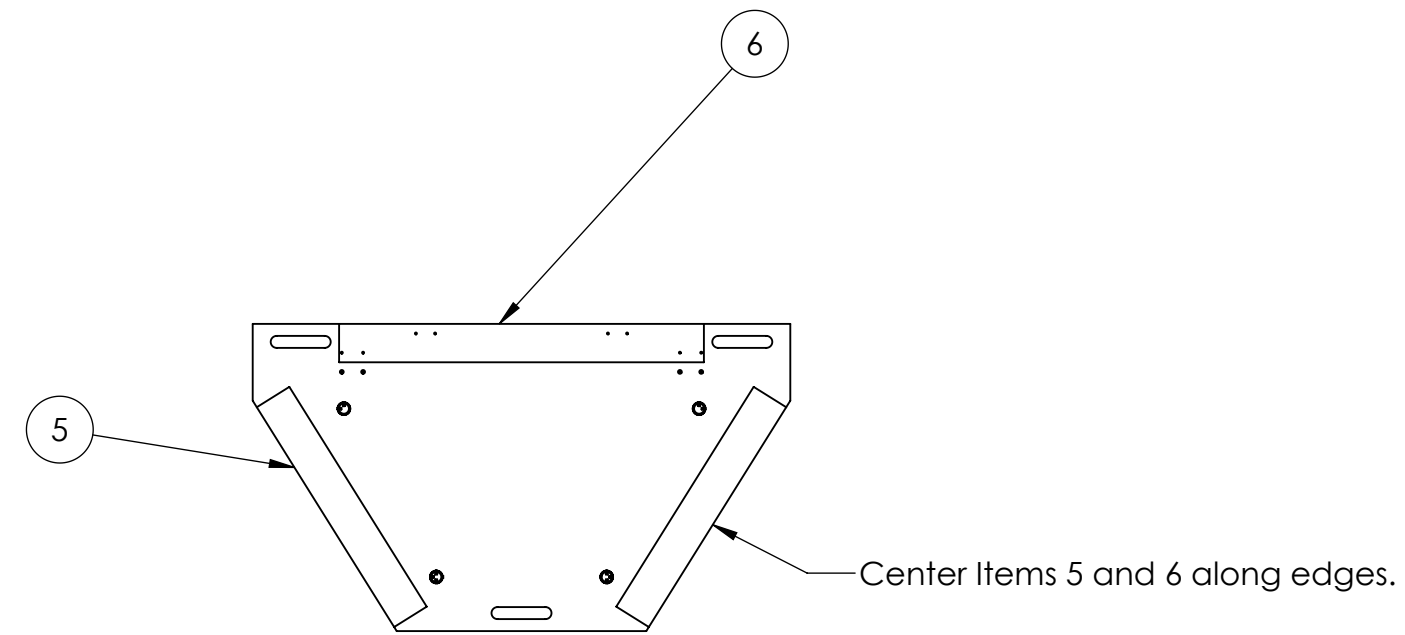
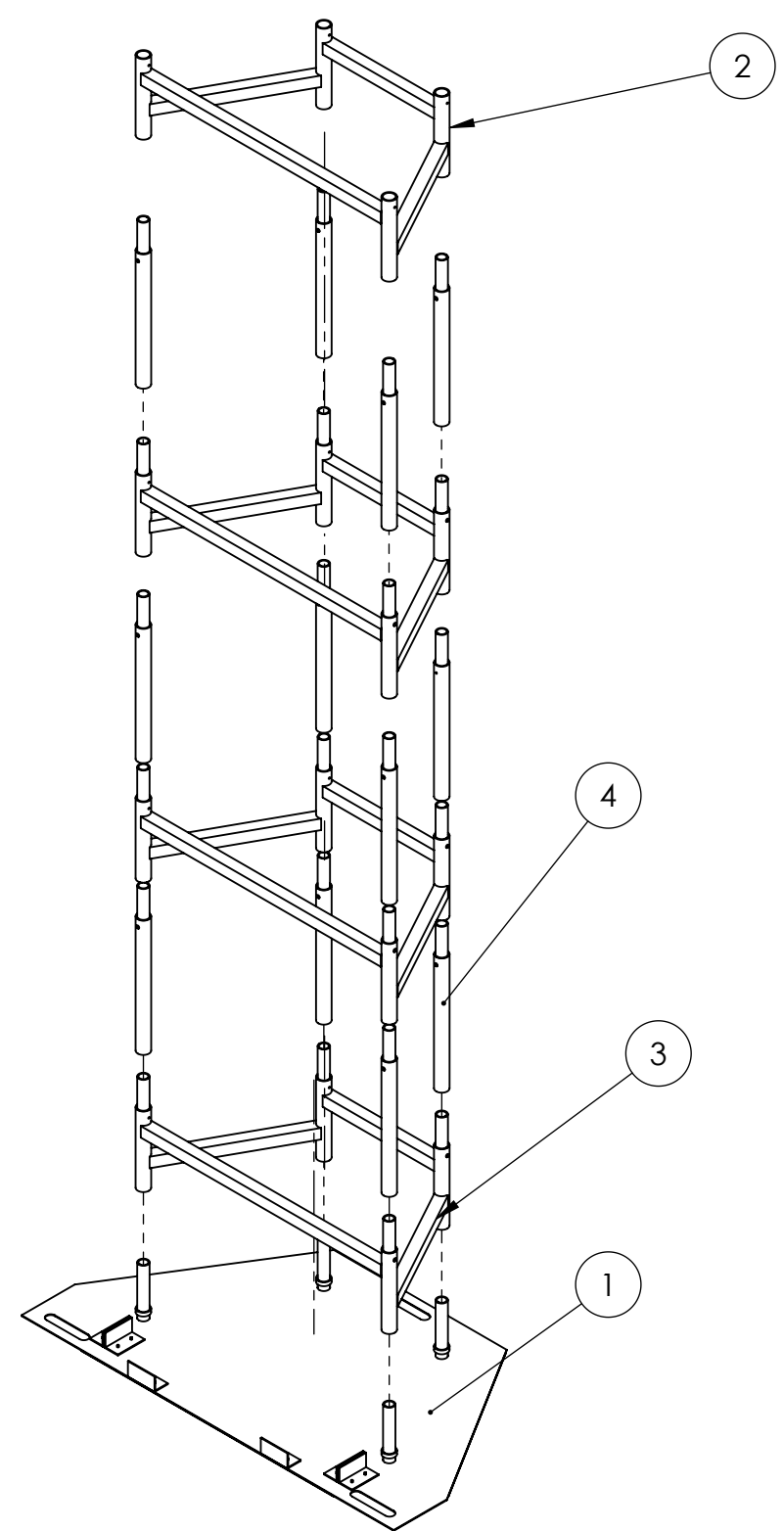
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		DIMENSIONS ARE IN INCHES	DRAWN	
		TOLERANCES:	CHECKED	
		FRACTIONAL ±1/16	ENG APPR.	
		ANGULAR: MACH ±1° BEND ±1°	MFG APPR.	
		TWO PLACE DECIMAL ±.01	Q.A.	
		THREE PLACE DECIMAL ±.001	COMMENTS:	
		INTERPRET GEOMETRIC TOLERANCING PER:		
		MATERIAL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

 		
TITLE: Rocket Frame Assembly		
SIZE <b>B</b>	DWG. NO. <b>GE-19025</b>	REV <b>A</b>
SCALE: 1:20 WEIGHT:		SHEET 2 OF 2

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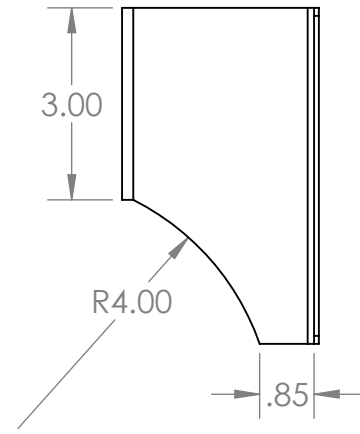
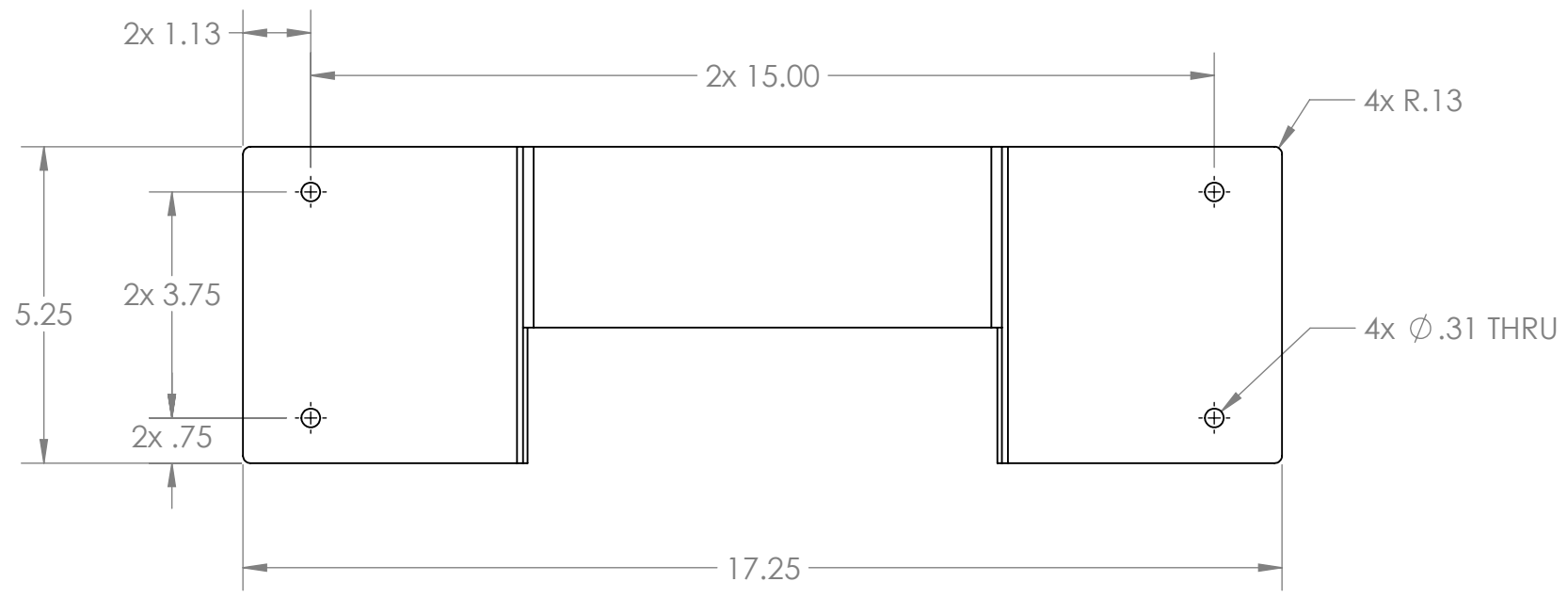
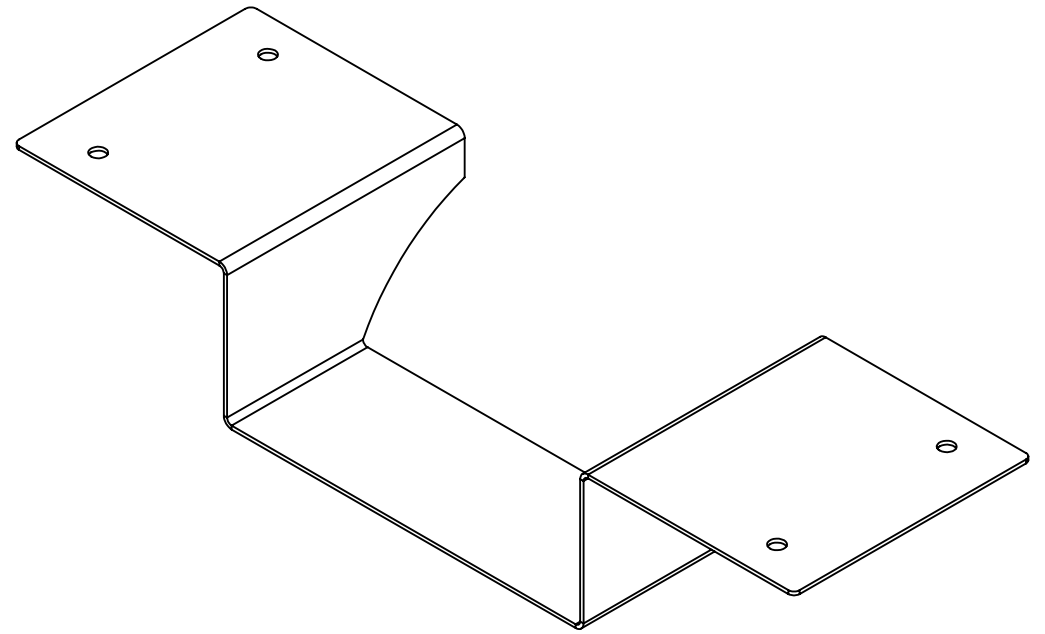
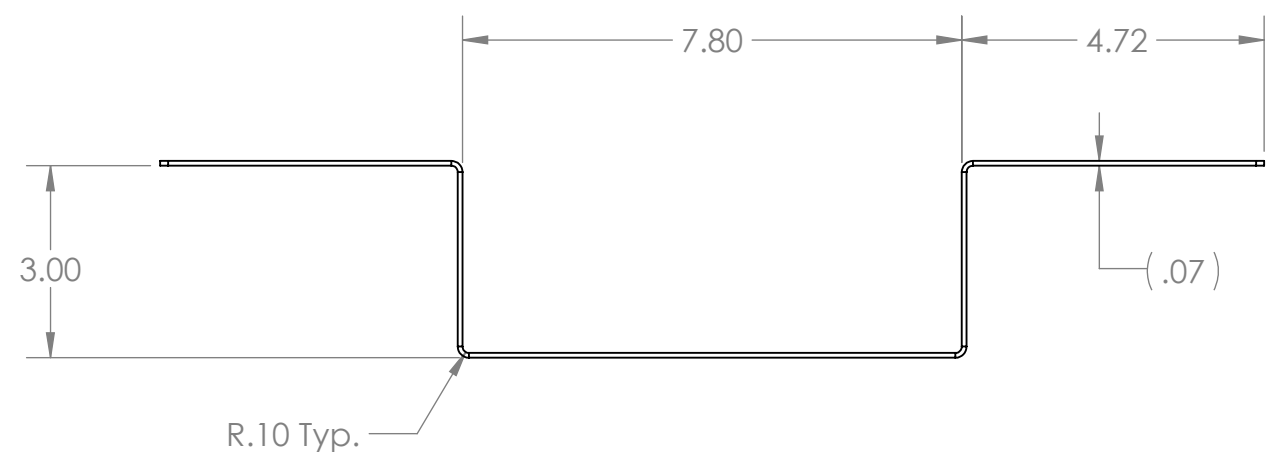
1

B

B

A

A



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

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		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		



TITLE:		
Keyhole Insert		
SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19026</b>	<b>A</b>
SCALE: 1:3	WEIGHT:	SHEET 1 OF 1

4

3

2

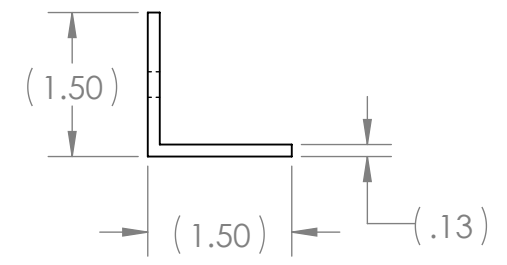
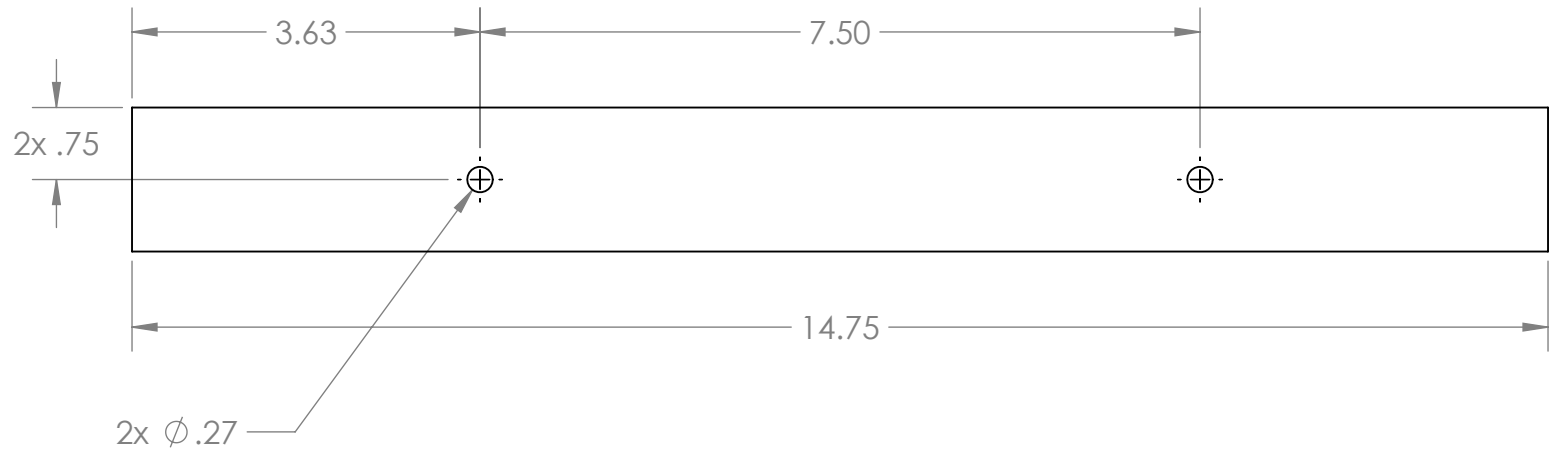
1

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2

1



Notes:

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

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		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		



TITLE:		
<b>Rocket Ramp Support Back</b>		
SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19028</b>	
SCALE: 1:2	WEIGHT:	SHEET 1 OF 1

4

3

2

1

B

B

A

A

4

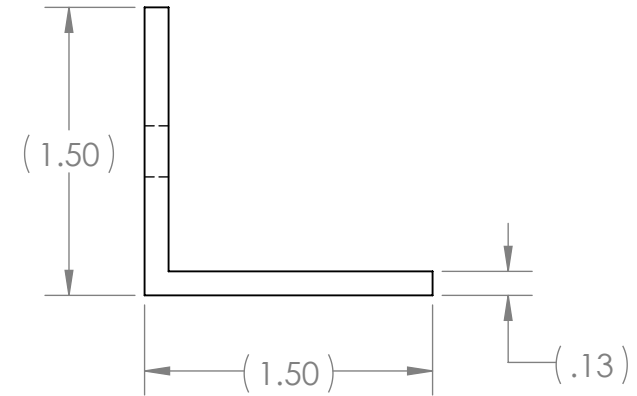
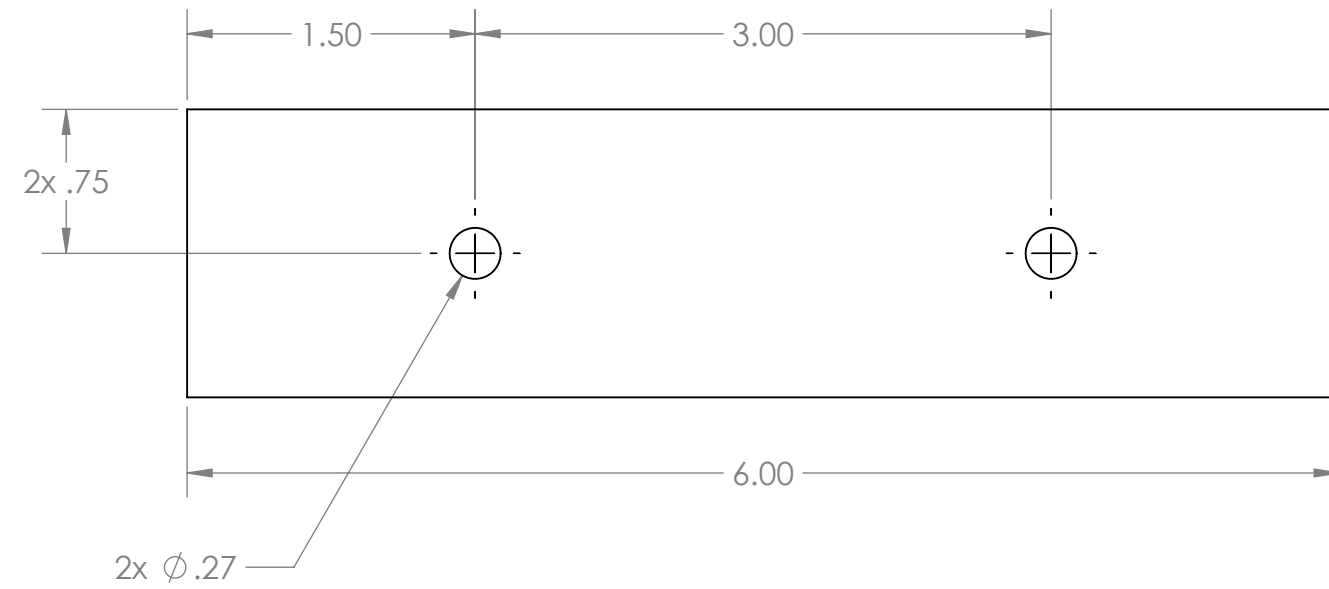
3

2

1

B

B





Notes:

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

A

A

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		UNLESS OTHERWISE SPECIFIED:	NAME	DATE	 
		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL ±1/16 ANGULAR: MACH ±1° BEND ±1° TWO PLACE DECIMAL ±.01 THREE PLACE DECIMAL ±.001	DRAWN		
		INTERPRET GEOMETRIC TOLERANCING PER:	CHECKED		TITLE:
		MATERIAL	ENG APPR.		<b>Rocket Ramp Support Front</b>
NEXT ASSY	USED ON	FINISH	MFG APPR.		SIZE DWG. NO. REV
APPLICATION		DO NOT SCALE DRAWING	Q.A.		<b>B GE-19029</b>
			COMMENTS:		SCALE: 1:1 WEIGHT: SHEET 1 OF 1

4

3

2

1

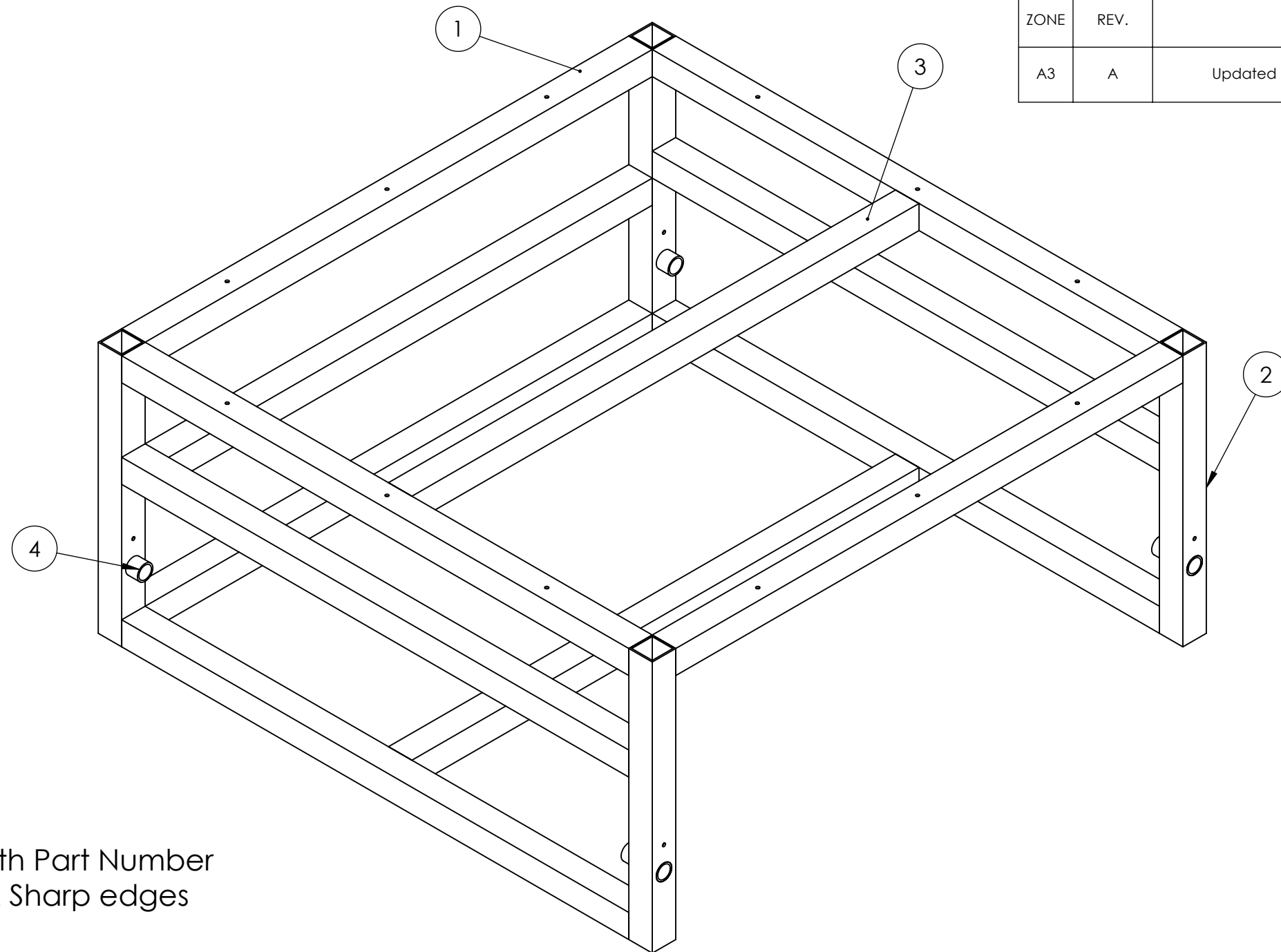
4

3

2

1

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
A3	A	Updated Material on BOM and Page 6	10/22/2018	MXS




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


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

A

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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	





TITLE: **HAB Level 3 Frame**

SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19030</b>	<b>A</b>

SCALE: 1:8 WEIGHT: SHEET 1 OF 6

4

3

2

1

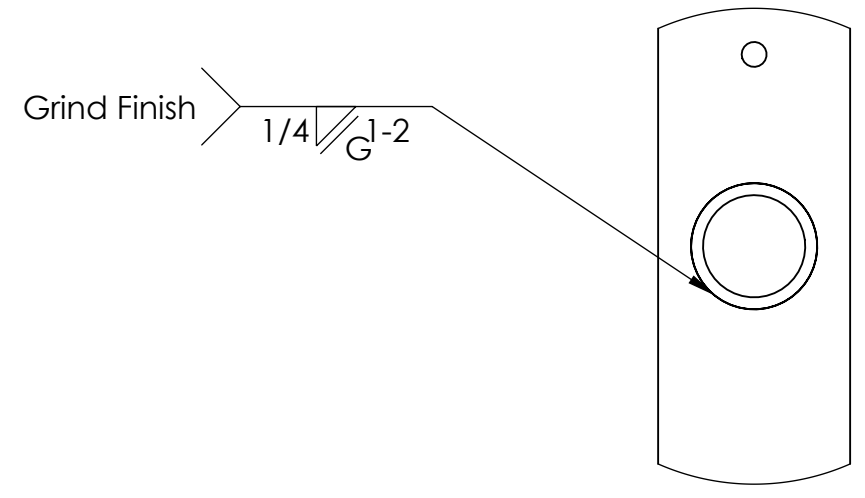
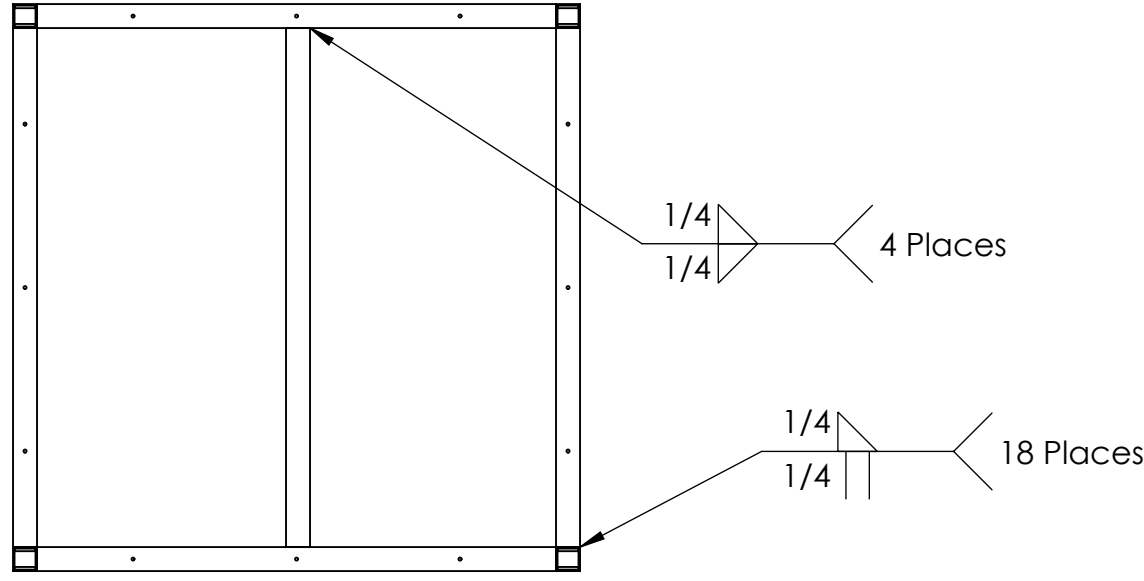


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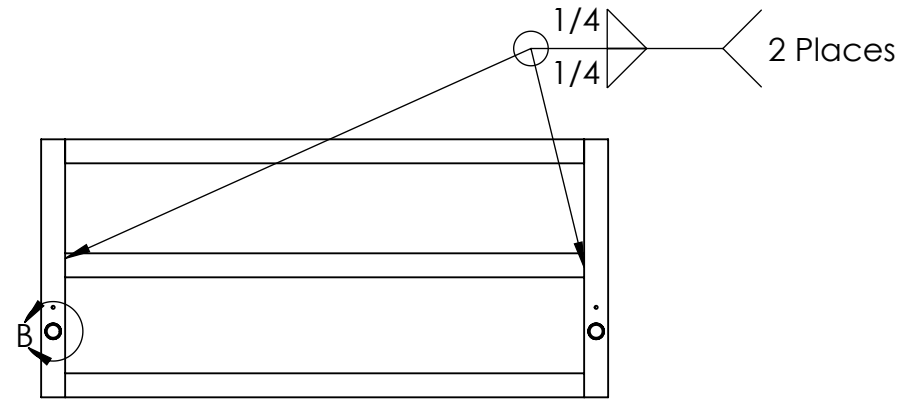
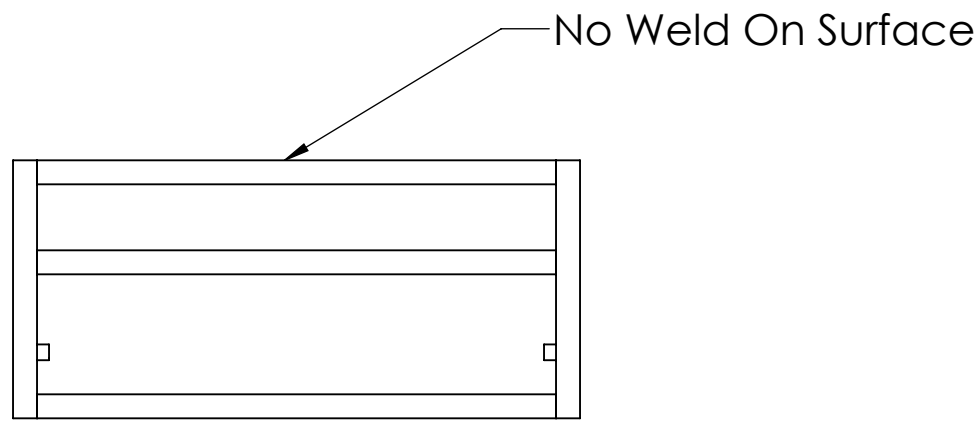
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2

1



DETAIL B  
SCALE 1 : 2



Notes:  
Remove Burrs & Sharp edges

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

TITLE: <b>HAB Level 3 Frame</b>		
SIZE <b>B</b>	DWG. NO. <b>GE-19030</b>	REV <b>A</b>
SCALE: 1:16 WEIGHT:		SHEET 2 OF 6

4

3

2

1

B

B

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A

4

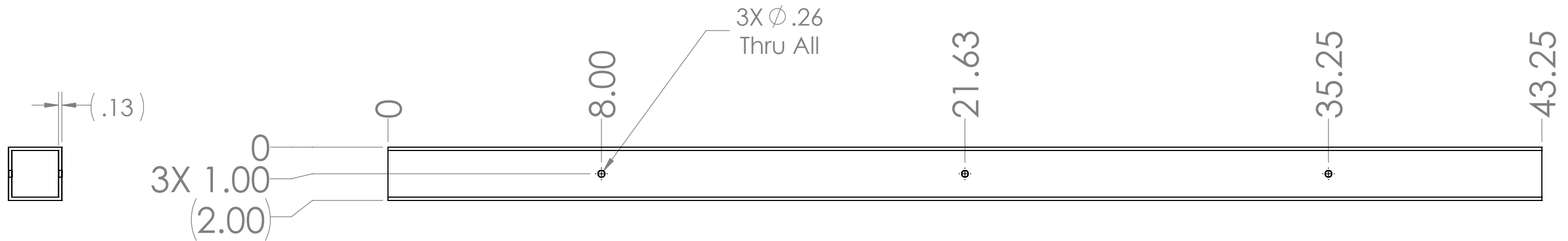
3

2

1

B

B





Notes:  
 Part: GE-19030-01  
 Material: 2"x .125" 6061 Thick Aluminum Square Tube  
 Remove Burrs & Sharp Edges

A

A

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		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL ±1/16 ANGULAR: MACH ±1° BEND ±1° TWO PLACE DECIMAL ±.01 THREE PLACE DECIMAL ±.001		DRAWN	
		INTERPRET GEOMETRIC TOLERANCING PER:		CHECKED	
		MATERIAL		ENG APPR.	
NEXT ASSY	USED ON	FINISH		MFG APPR.	
APPLICATION		DO NOT SCALE DRAWING		Q.A.	
				COMMENTS:	
				 	
TITLE: HAB Level 3 Frame					
SIZE	DWG. NO.	REV			
<b>B</b>	GE-19030	<b>A</b>			
SCALE: 1:8		WEIGHT:		SHEET 3 OF 6	

4

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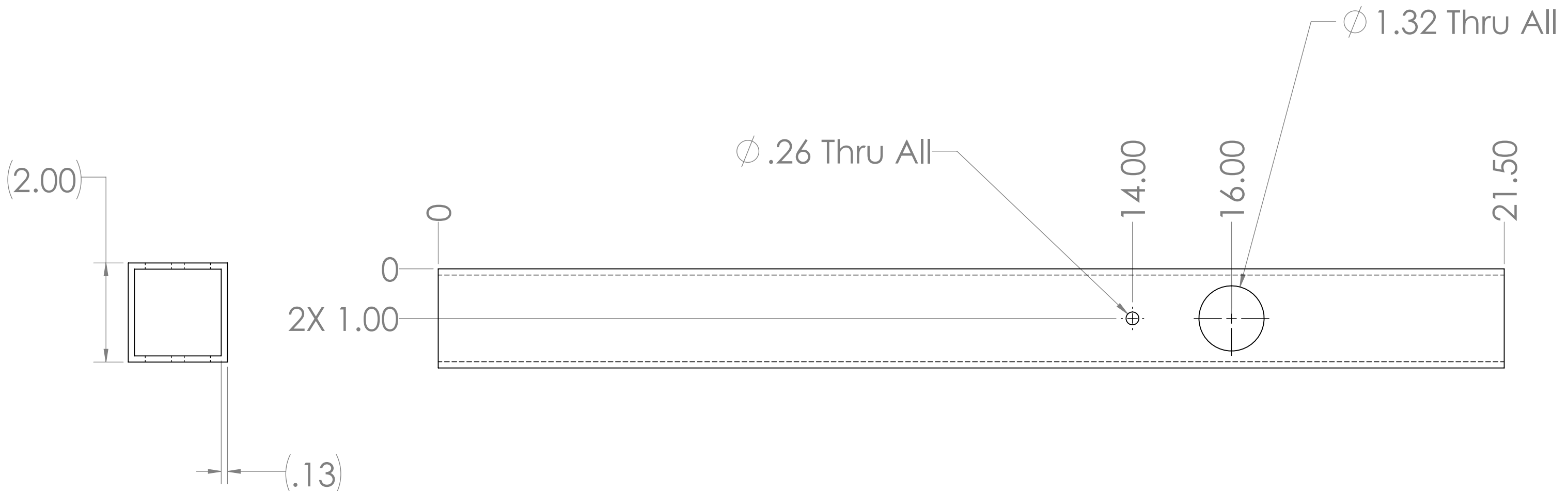
3

2

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Note:  
 Part: GE-19030-02  
 Material: 2"x .125" Thick 6061 Aluminum Square Tube  
 Remove Burrs & Sharp Edges

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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	
		INTERPRET GEOMETRIC TOLERANCING PER:		CHECKED	
		MATERIAL		ENG APPR.	
		FINISH		MFG APPR.	
NEXT ASSY	USED ON			Q.A.	
APPLICATION		DO NOT SCALE DRAWING		COMMENTS:	
				 	
				TITLE: HAB Level 3 Frame	
SIZE	DWG. NO.			REV	
<b>B</b>	GE-19030			<b>A</b>	
SCALE: 1:2		WEIGHT:		SHEET 4 OF 6	

4

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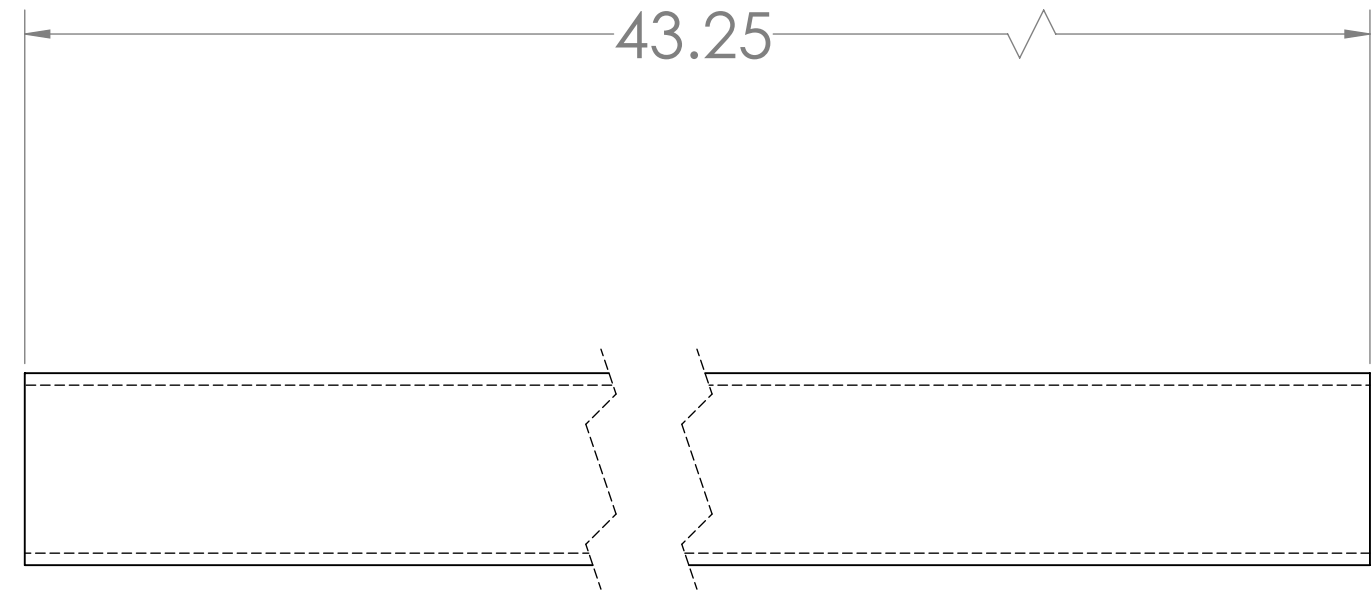
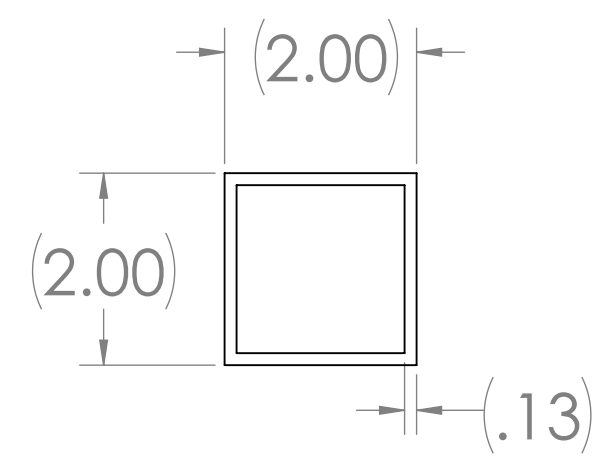
3

2

1



B

B



Notes:  
 Part Number: GE-19030-03  
 Material: 2"x .125" Thick 6061 Aluminum Square Tube  
 Remove Burrs & Sharp Edges

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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		
		INTERPRET GEOMETRIC TOLERANCING PER:	CHECKED		SIZE <b>B</b> DWG. NO. <b>GE-19030</b> REV <b>A</b> SCALE: 1:2 WEIGHT: SHEET 5 OF 6
		MATERIAL	ENG APPR.		
NEXT ASSY	USED ON	FINISH	MFG APPR.		
APPLICATION		DO NOT SCALE DRAWING	Q.A.		
			COMMENTS:		

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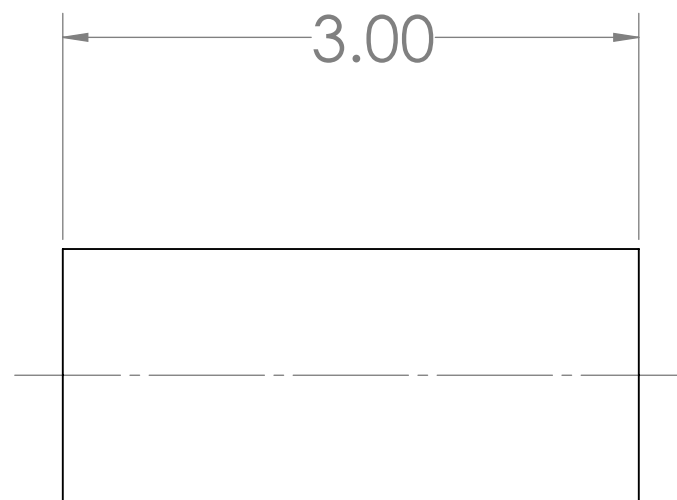
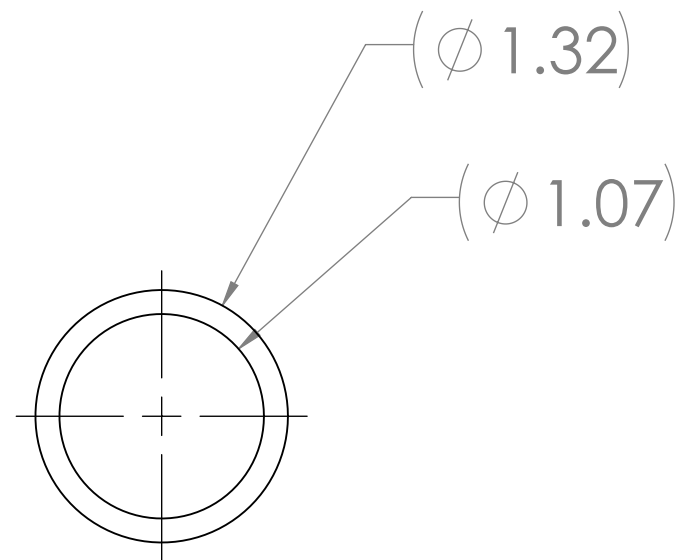
A

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Notes:  
 Part Number: GE-19030-04  
 Material: 1" Schedule 40 Pipe 6061 Aluminum  
 Remove Burrs & Sharp Edges

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

4

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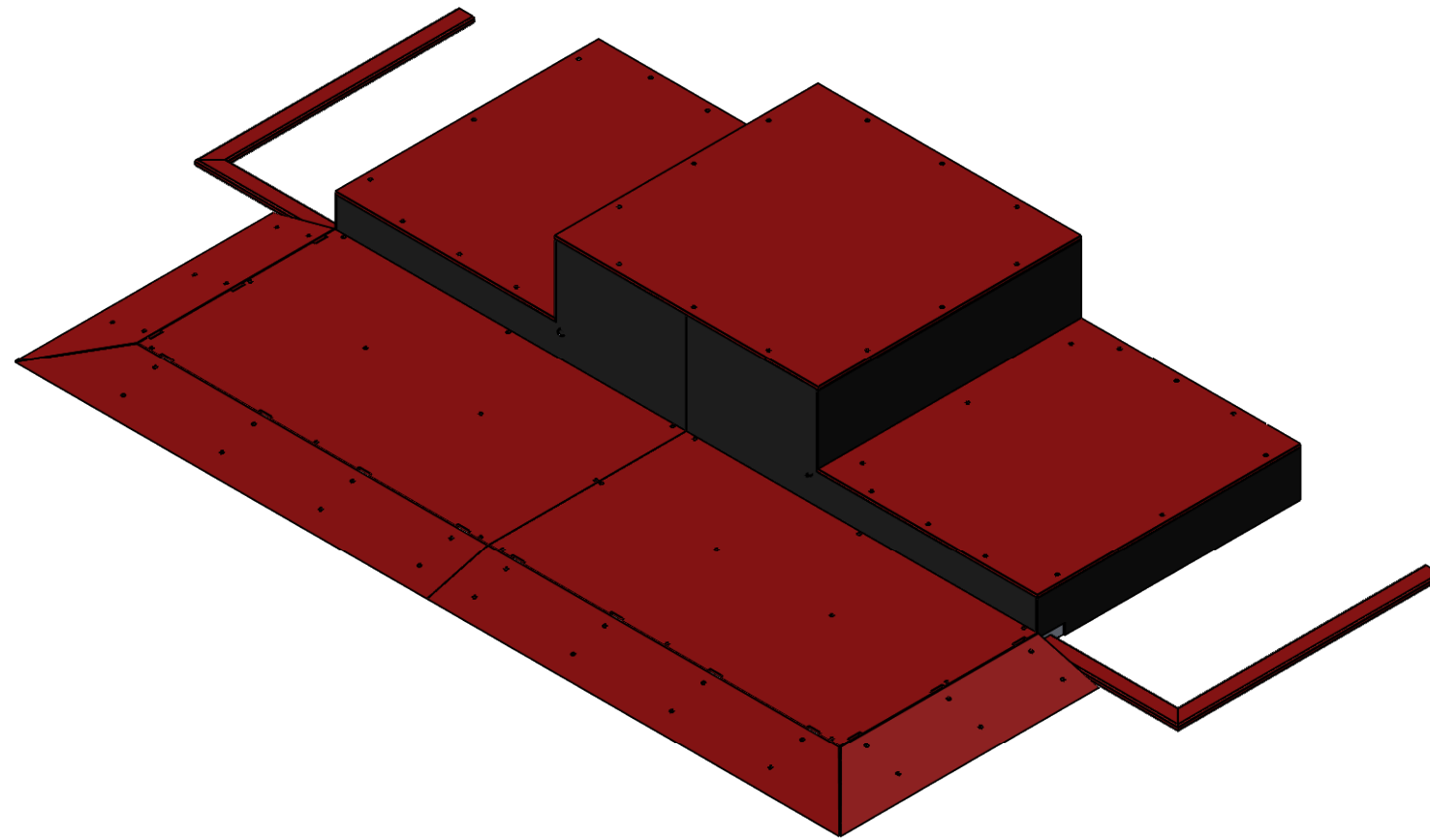
3

2

1

B

B





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

A

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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		
INTERPRET GEOMETRIC TOLERANCING PER:		CHECKED		TITLE: <h2 style="text-align: center;">Full Hab Assembly</h2>
MATERIAL		ENG APPR.		
FINISH		MFG APPR.		
NEXT ASSY	USED ON	Q.A.		SIZE DWG. NO. REV <b>B</b> GE-19031
APPLICATION		COMMENTS:		SCALE: 1:24 WEIGHT: SHEET 1 OF 4
DO NOT SCALE DRAWING				

4

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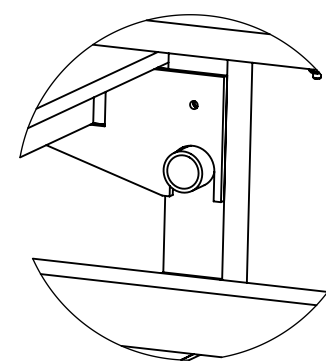
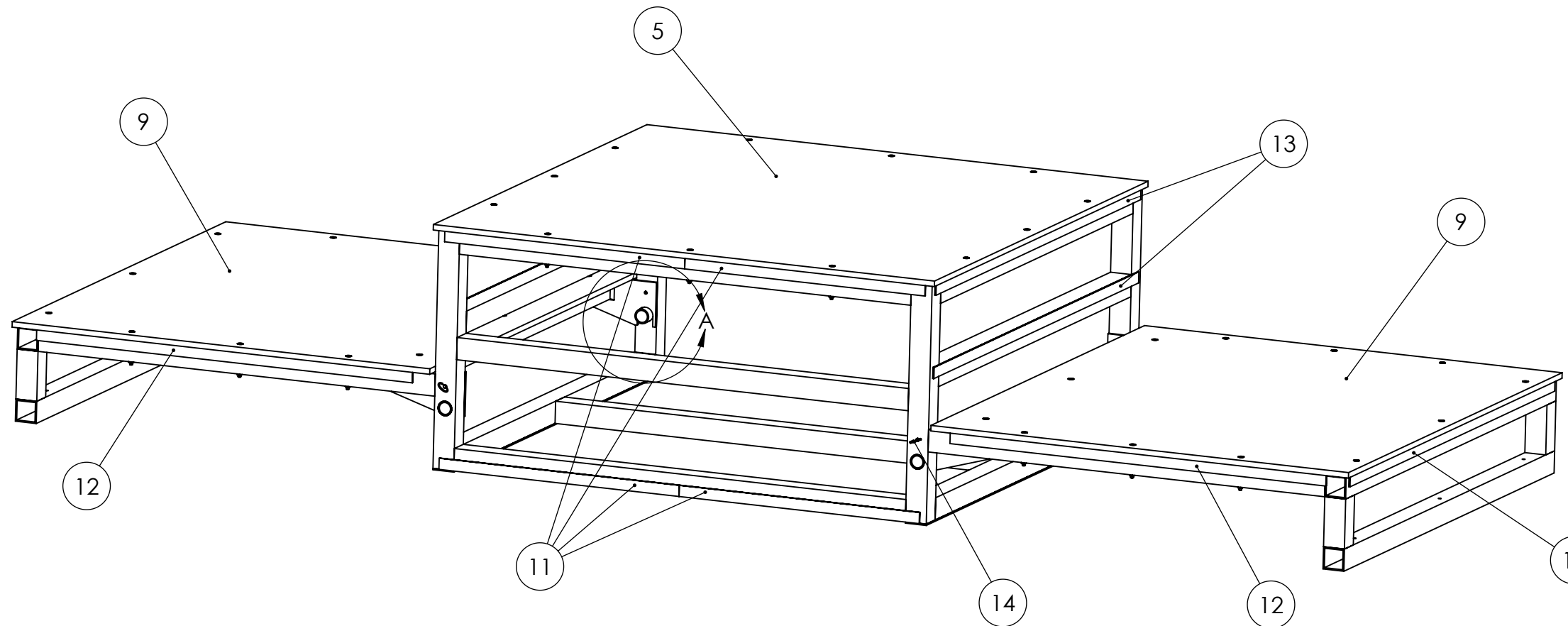
1

B

B

A

A





DETAIL A  
SCALE 1 : 6

13 Repeat on opposite end

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

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		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL ±1/16 ANGULAR: MACH ±1° BEND ±1° TWO PLACE DECIMAL ±.01 THREE PLACE DECIMAL ±.001		DRAWN	
		INTERPRET GEOMETRIC TOLERANCING PER:		CHECKED	
		MATERIAL		ENG APPR.	
		FINISH		MFG APPR.	
NEXT ASSY	USED ON			Q.A.	
APPLICATION		DO NOT SCALE DRAWING		COMMENTS:	
				 	
TITLE: Full Hab Assembly					
SIZE	DWG. NO.			REV	
<b>B</b>	GE-19031				
SCALE: 1:48				WEIGHT:	SHEET 2 OF 4

4

3

2

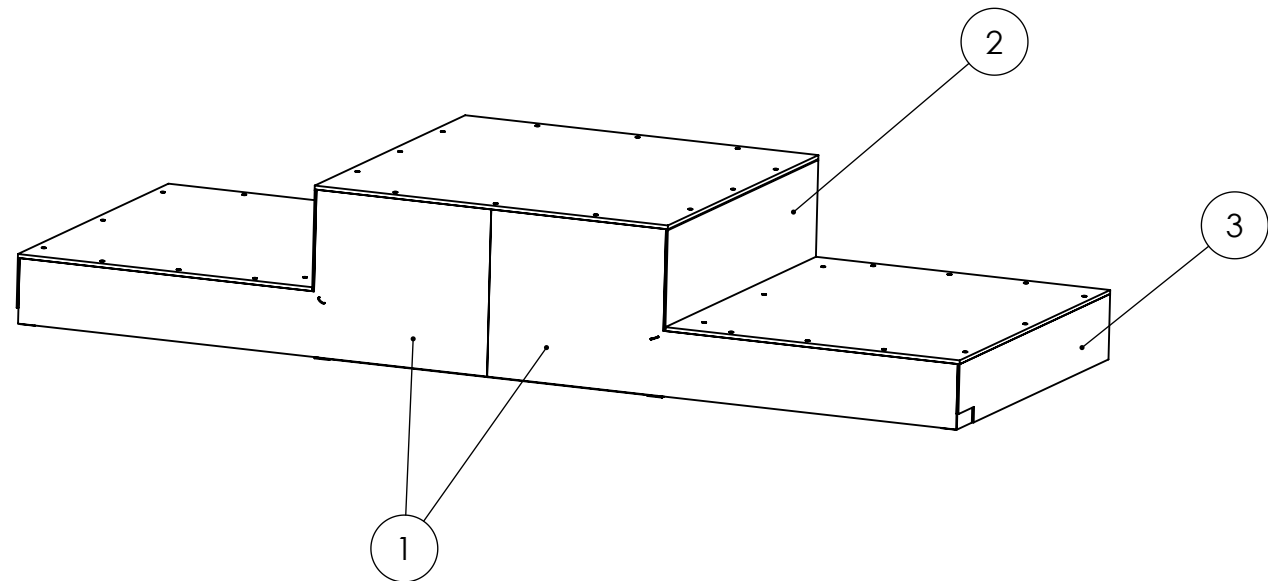
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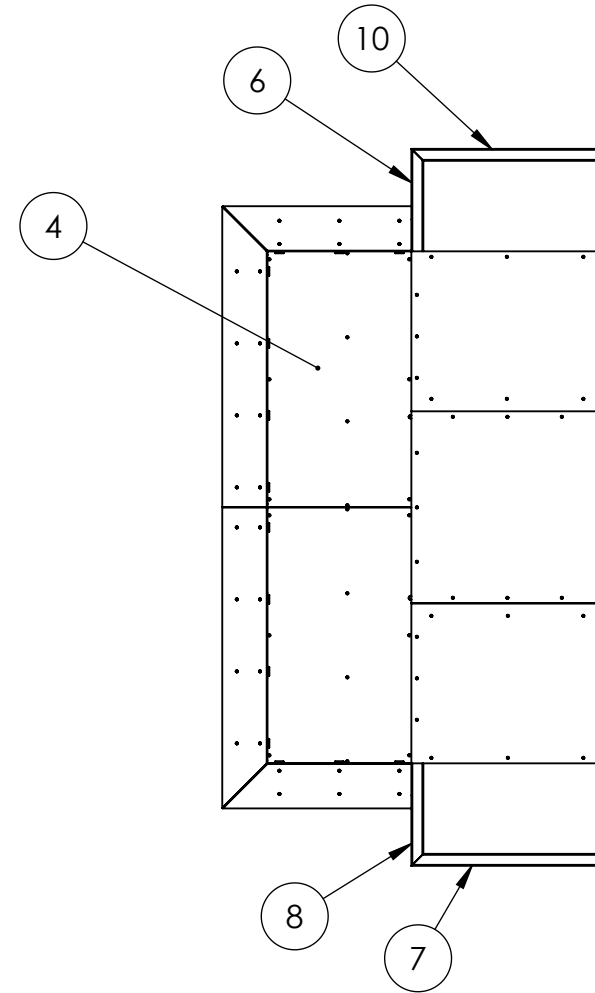
3

2

1





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



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

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		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL ±1/16 ANGULAR: MACH ±1° BEND ±1° TWO PLACE DECIMAL ±.01 THREE PLACE DECIMAL ±.001		DRAWN	
		INTERPRET GEOMETRIC TOLERANCING PER:		CHECKED	
		MATERIAL		ENG APPR.	
NEXT ASSY	USED ON	FINISH		MFG APPR.	
APPLICATION		DO NOT SCALE DRAWING		Q.A.	
				COMMENTS:	
				 	
				TITLE:	
				<h1>Full Hab Assembly</h1>	
SIZE	DWG. NO.	REV			
<b>B</b>	<b>GE-19031</b>				
SCALE: 1:48		WEIGHT:		SHEET 3 OF 4	

4

3

2

1

B

B

A

A

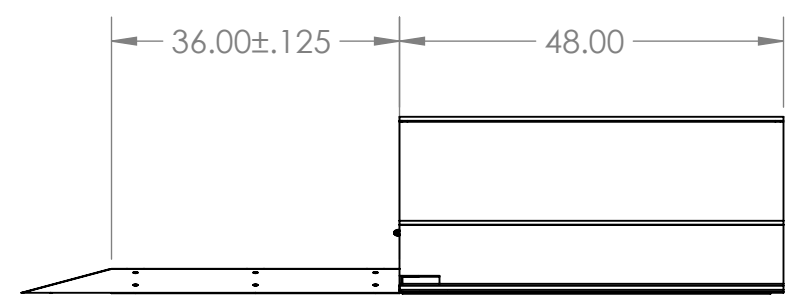
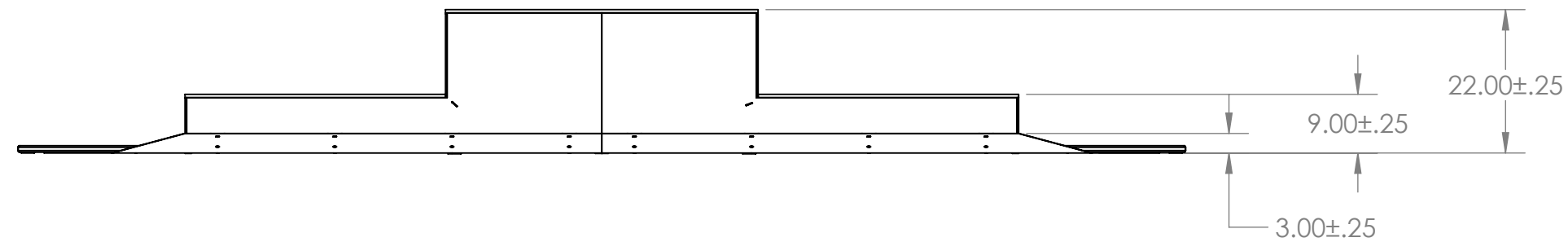
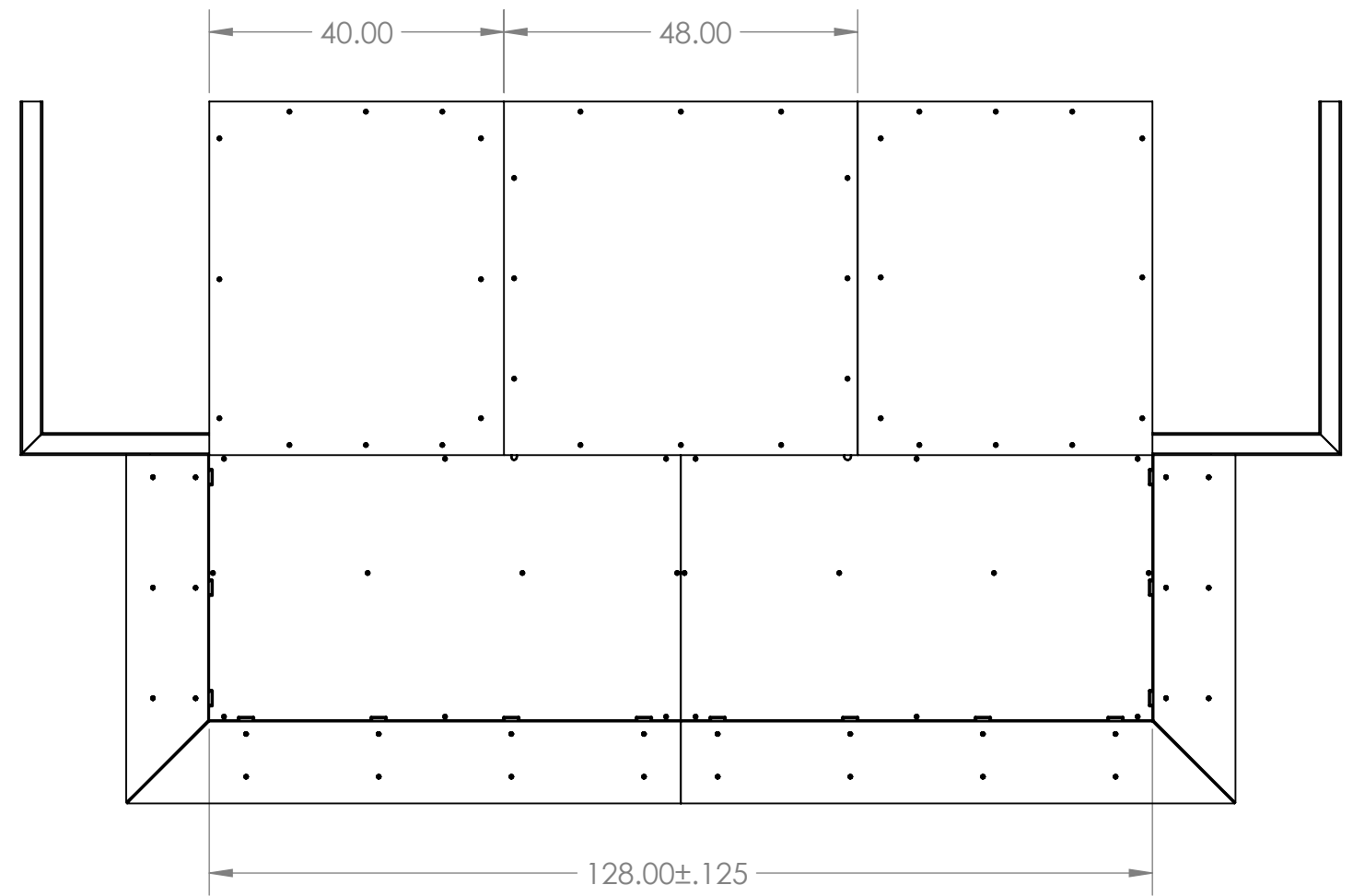


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B

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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		



TITLE:		
<b>Full Hab Assembly</b>		
SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19031</b>	
SCALE: 1:48 WEIGHT:		SHEET 4 OF 4

4

3

2

1

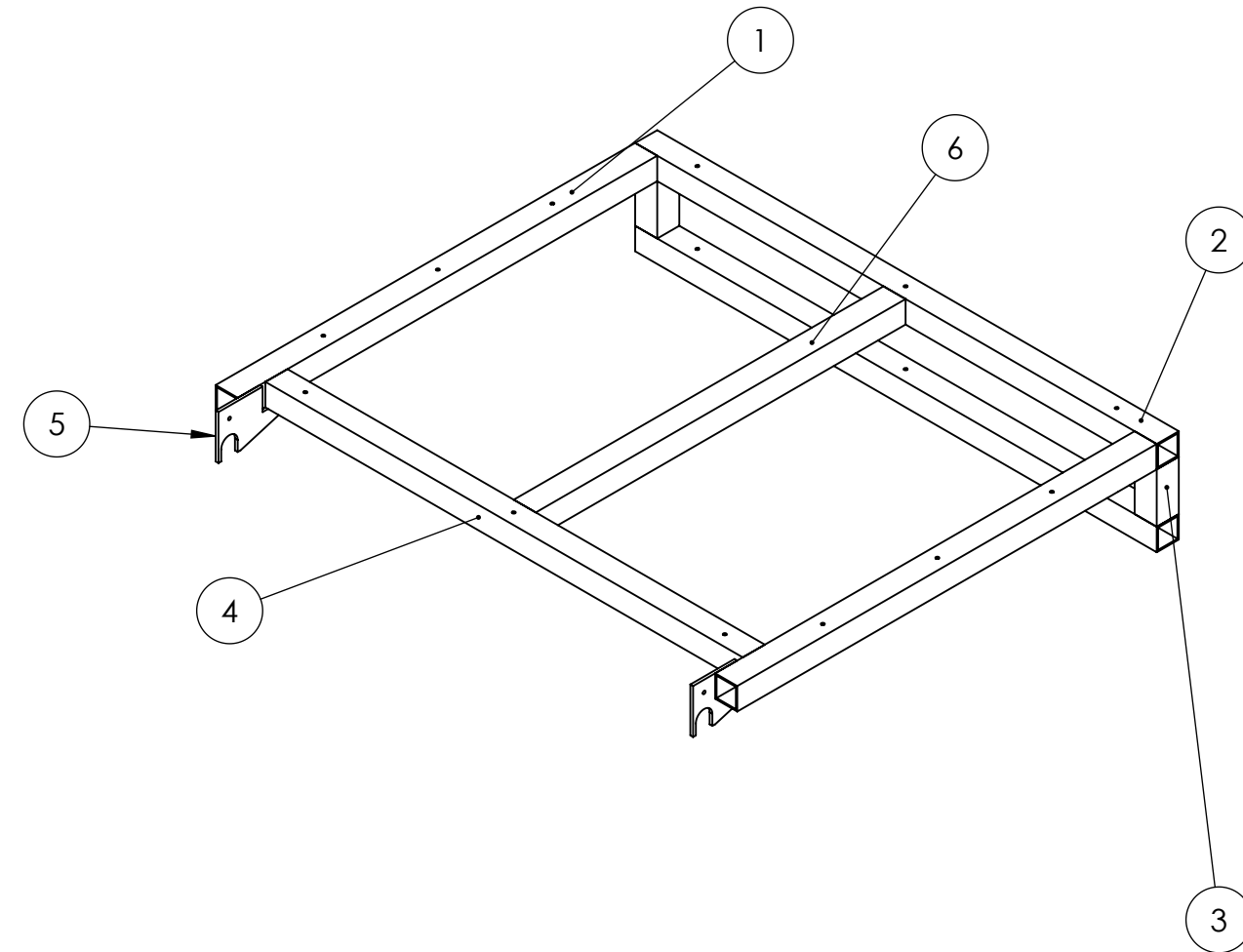
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3

2



1

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



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

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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		
INTERPRET GEOMETRIC TOLERANCING PER:		CHECKED		TITLE: <h2>HAB Level 2 Frame</h2>
MATERIAL		ENG APPR.		
FINISH		MFG APPR.		SIZE DWG. NO. REV <b>B</b> <b>GE-19032</b> <b>E</b>
NEXT ASSY	USED ON	Q.A.		
APPLICATION		COMMENTS:		SCALE: 1:12 WEIGHT: SHEET 1 OF 5
DO NOT SCALE DRAWING				

4

3

2

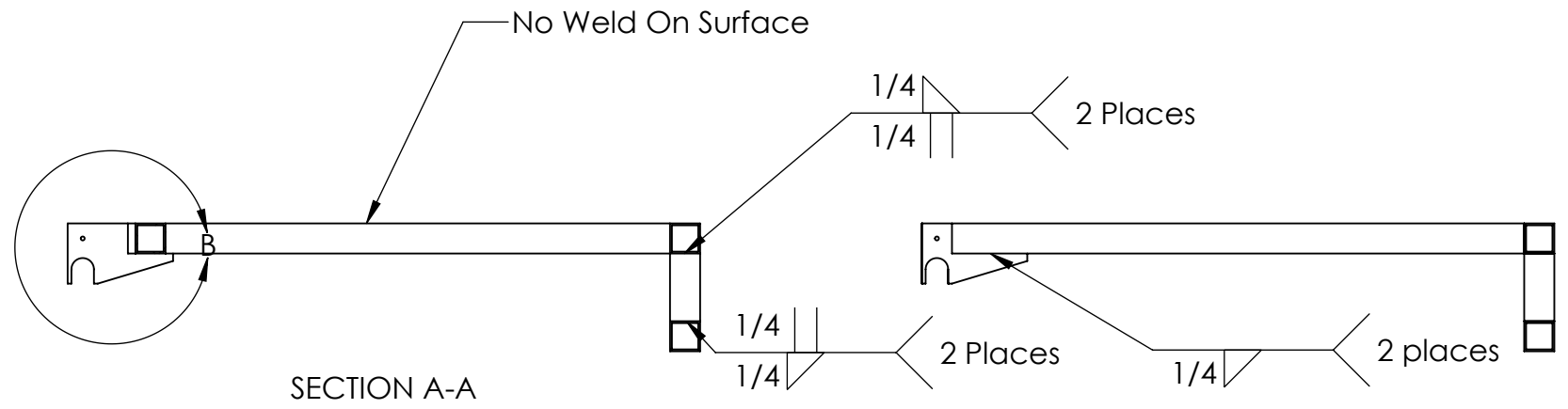
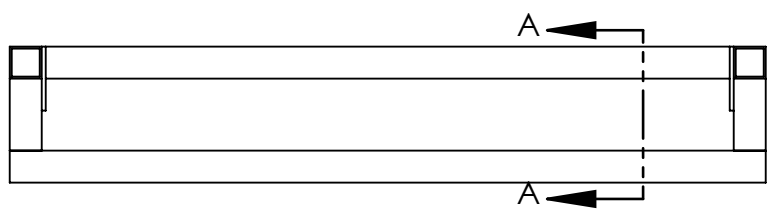
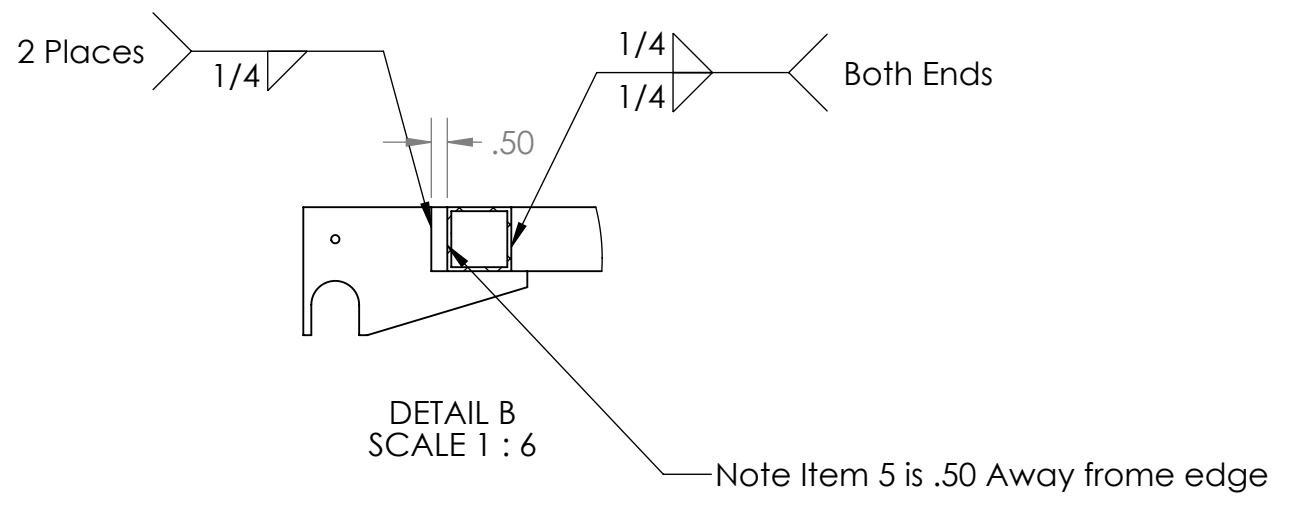
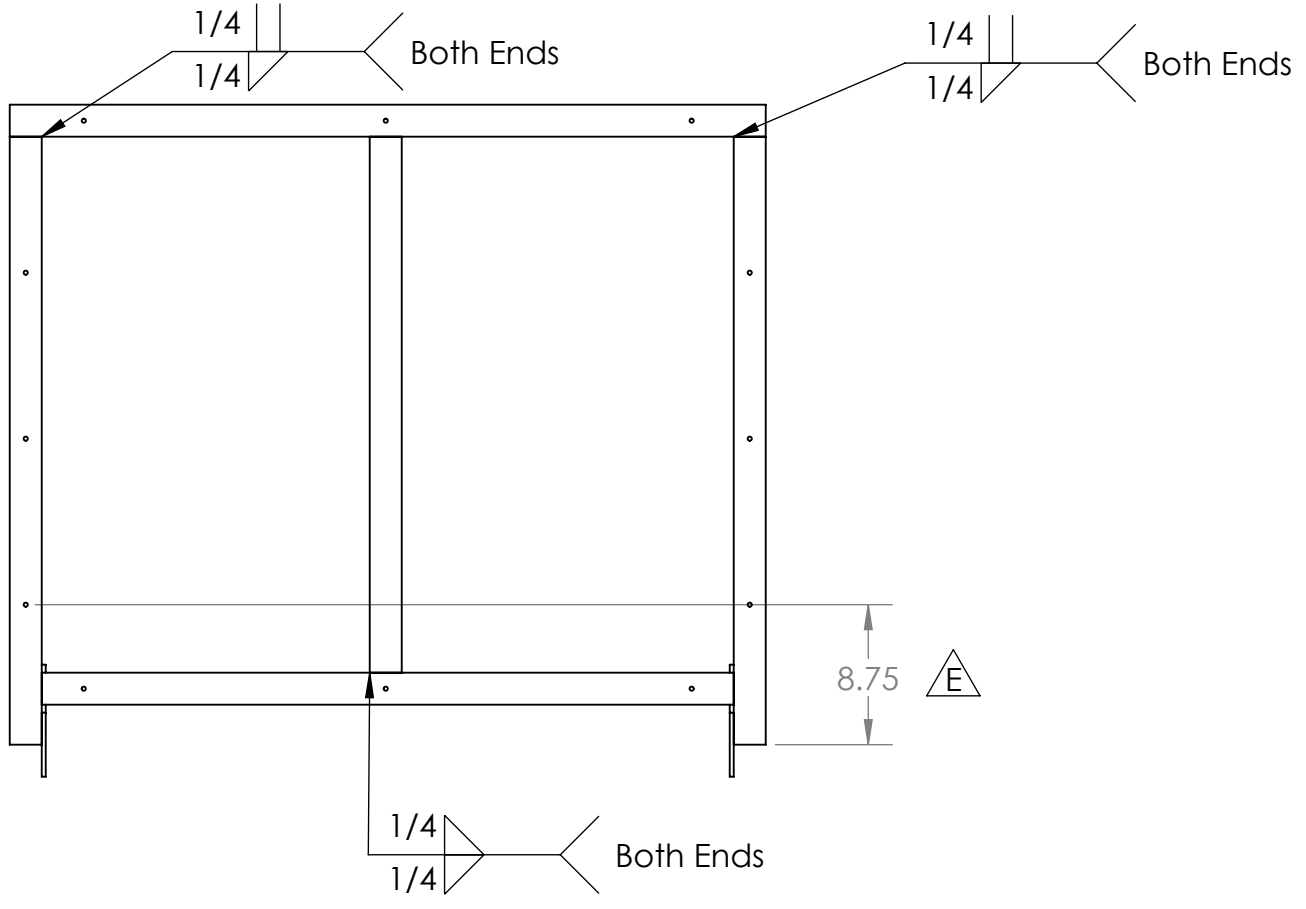
1

B

B

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A



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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			
		FINISH			
NEXT ASSY	USED ON				
APPLICATION		DO NOT SCALE DRAWING			

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

TITLE: **HAB Level 2 Frame**

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

SCALE: 1:12 WEIGHT: SHEET 2 OF 5

4

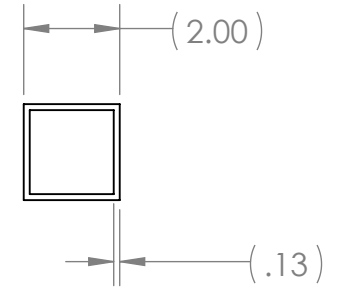
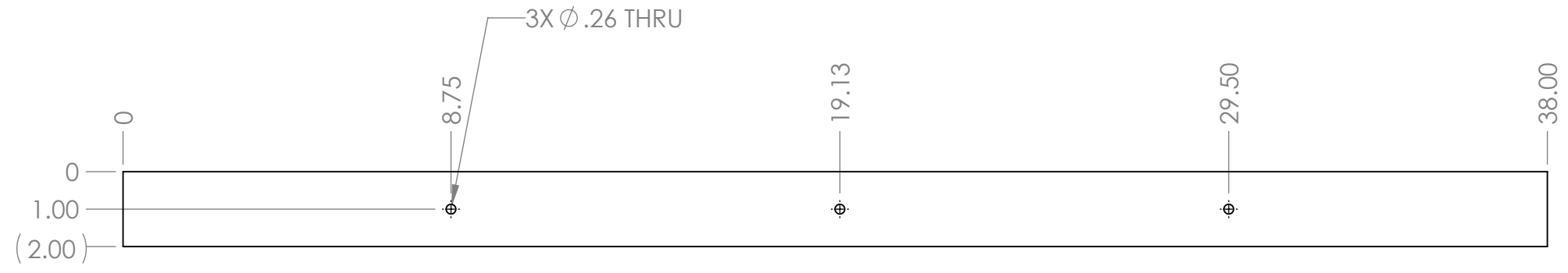
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2

1

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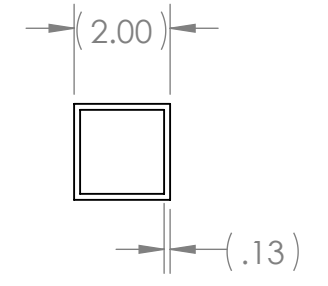
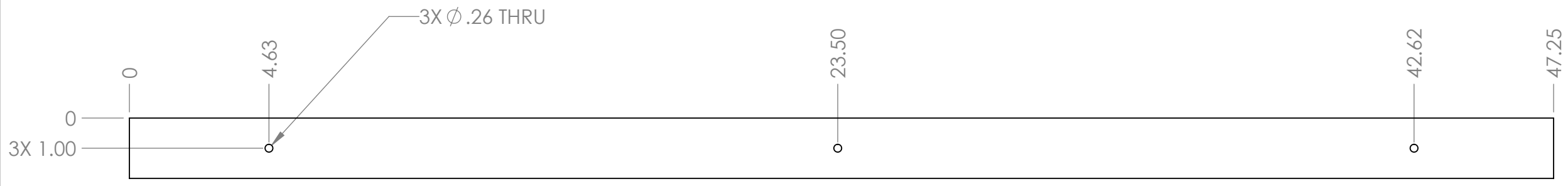
B



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

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

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		UNLESS OTHERWISE SPECIFIED:	NAME	DATE
		DIMENSIONS ARE IN INCHES	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		



TITLE: <b>HAB Level 2 Frame</b>		
SIZE <b>B</b>	DWG. NO. <b>GE-19032</b>	REV <b>E</b>
SCALE: 1:8	WEIGHT:	SHEET 3 OF 5

4

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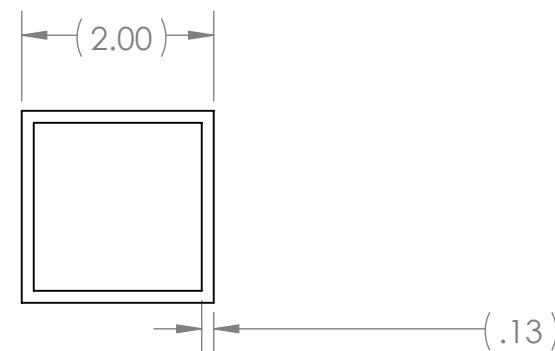
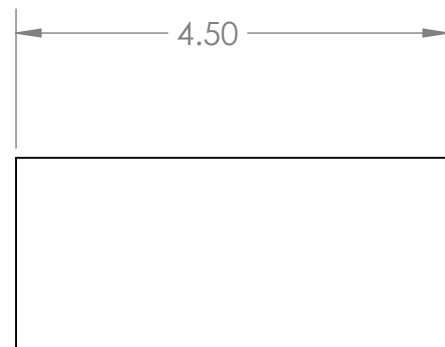
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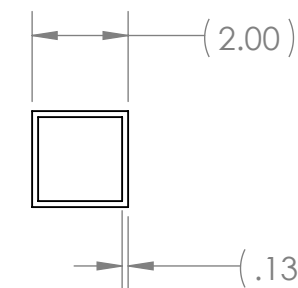
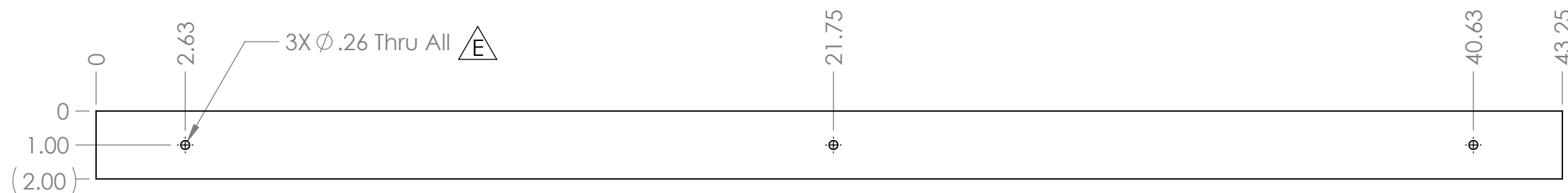
3

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Notes:  
 Part Material: GE-19032-03  
 Material: 2"x .125" Thick 6061 Aluminum Square Tube



Notes:  
 Part Material: GE-19032-04  
 Material: 2"x .125" Thick 6061 Aluminum Square Tube

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



TITLE: <b>HAB Level 2 Frame</b>		
SIZE <b>B</b>	DWG. NO. <b>GE-19032</b>	REV <b>E</b>
SCALE: 1:4	WEIGHT:	SHEET 4 OF 5

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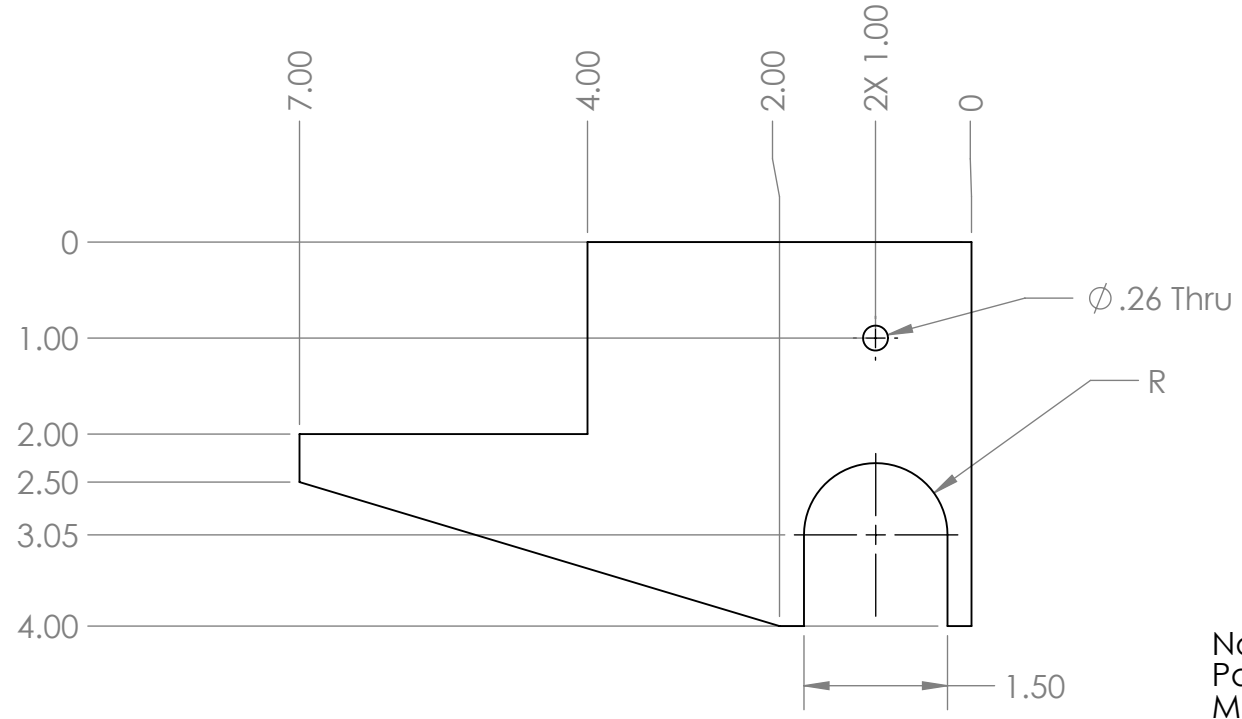
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2

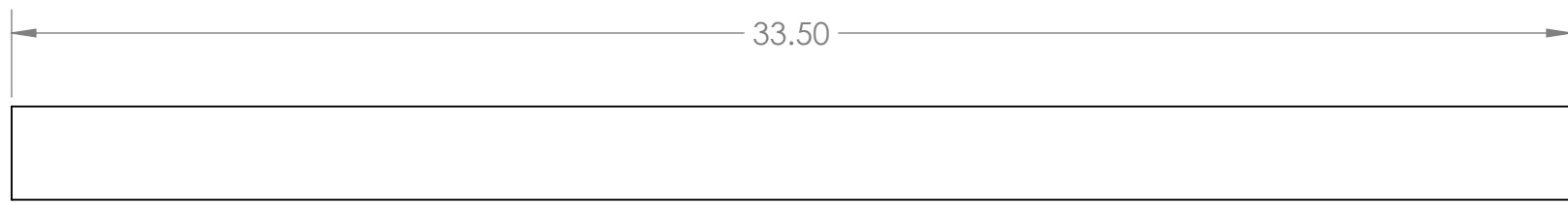
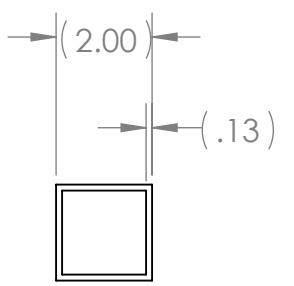
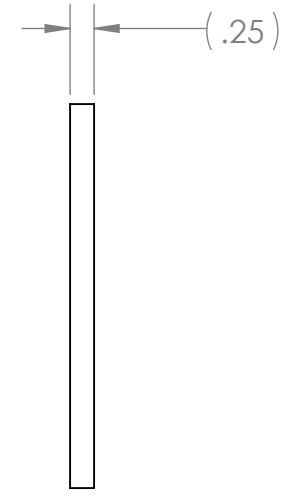
1

B

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Notes:  
 Part Material: GE-19032-05  
 Material: .25" Thick 6061 Aluminum Sheet



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

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



TITLE: <b>HAB Level 2 Frame</b>		
SIZE <b>B</b>	DWG. NO. <b>GE-19032</b>	REV <b>E</b>
SCALE: 1:4	WEIGHT:	SHEET 5 OF 5

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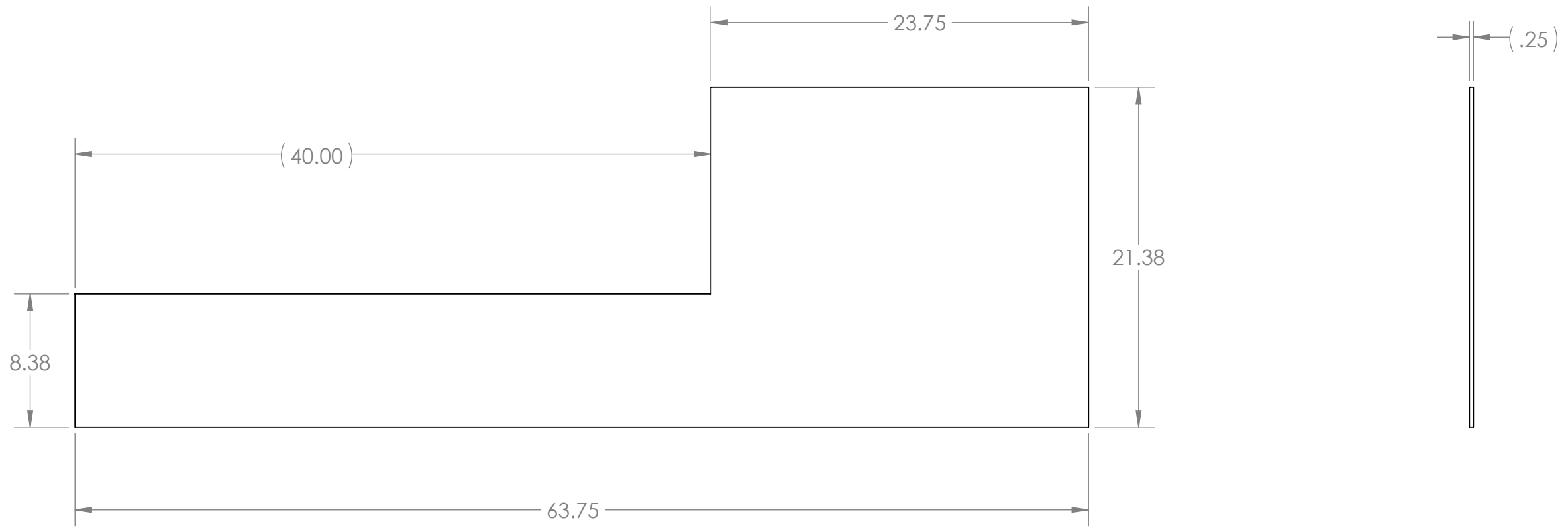
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Note:  
 Material: 1/4" Thick HDPE Sheet, Black  
 Finish: Orange Peel  
 Remove Sharp Edges and Burrs  
 Tag Or Label With Part Number

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		UNLESS OTHERWISE SPECIFIED:	NAME	DATE
		DIMENSIONS ARE IN INCHES	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		

TITLE:  
**HAB Front Plastic**

SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19033</b>	<b>A</b>

SCALE: 1:8 WEIGHT: SHEET 1 OF 1

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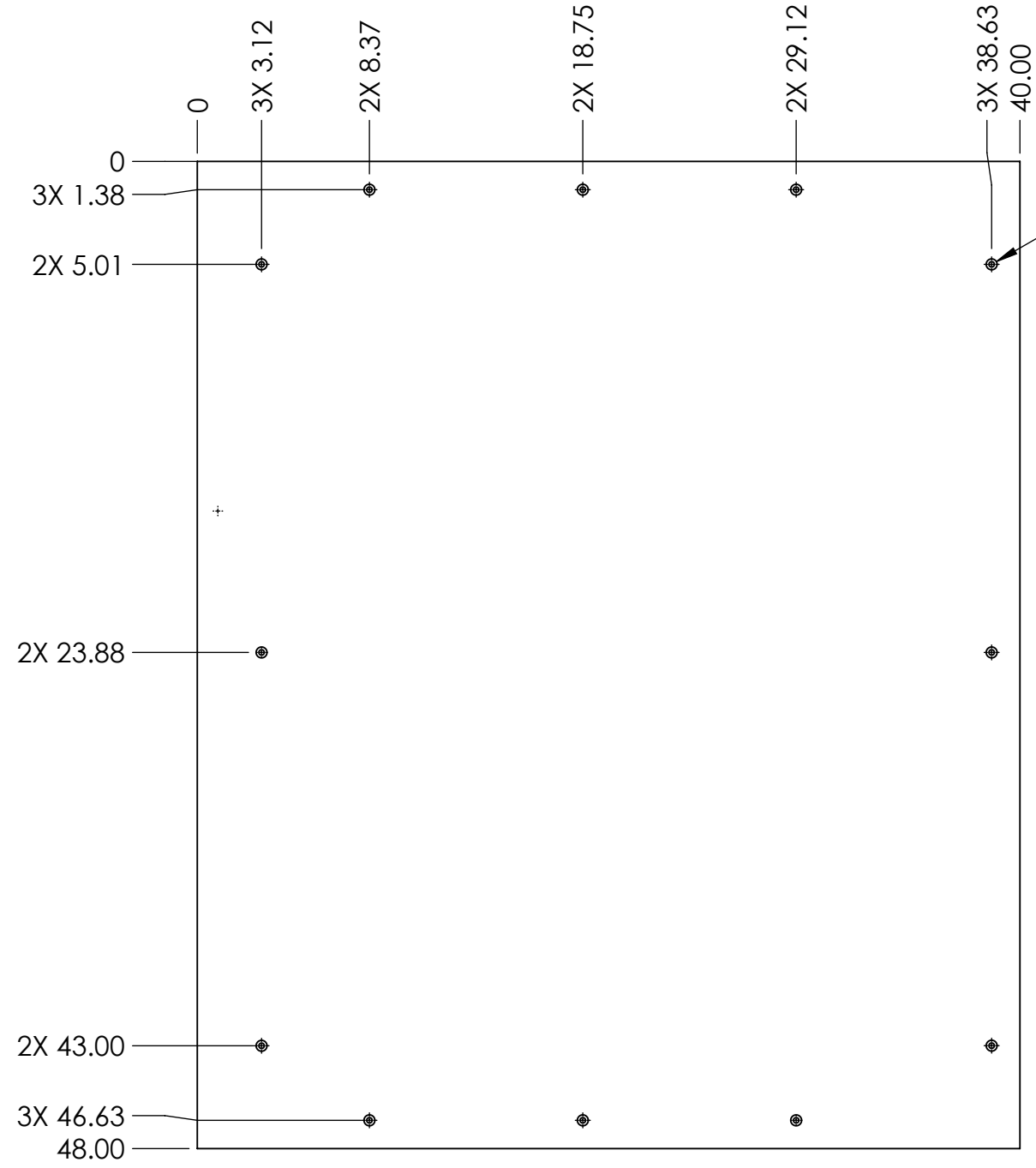
1

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12X  $\phi$  .27 THRU ALL  
 $\surd$   $\phi$  .53 X 82°

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

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

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		UNLESS OTHERWISE SPECIFIED:		NAME	DATE
		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm$ 1/16 ANGULAR: MACH $\pm$ 1° BEND $\pm$ 1° TWO PLACE DECIMAL $\pm$ .01 THREE PLACE DECIMAL $\pm$ .001		DRAWN	
		INTERPRET GEOMETRIC TOLERANCING PER:		CHECKED	
		MATERIAL		ENG APPR.	
NEXT ASSY	USED ON	FINISH		MFG APPR.	
APPLICATION		DO NOT SCALE DRAWING		Q.A.	
				COMMENTS:	
				TITLE:	
				 	
				<h1>Level 2 Top HDPE</h1>	
SIZE	DWG. NO.	REV			
<b>B</b>	<b>GE-19035</b>				
SCALE: 1:8	WEIGHT:	SHEET 1 OF 1			

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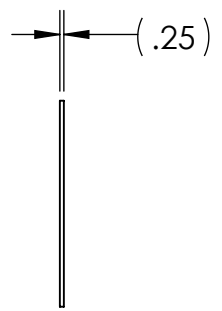
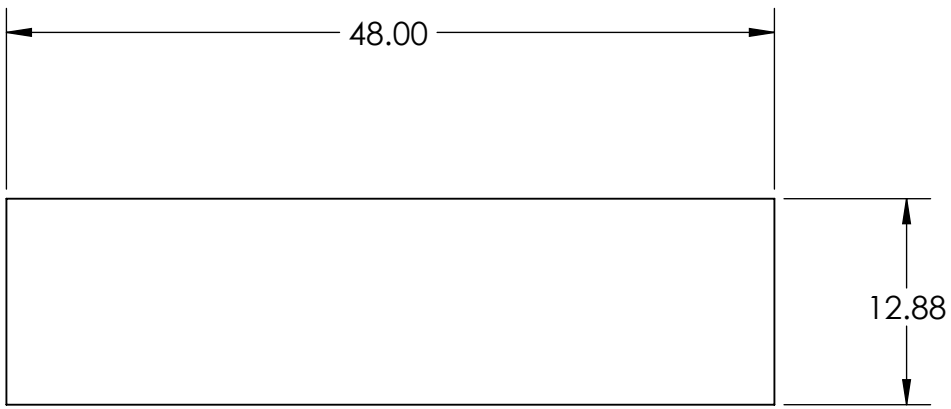


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Note:  
 Material: 1/4" Thick HDPE Black  
 Finish: Orange Peel  
 Tag Or Label With Part Number  
 Remove Sharp Edges and Burrs

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			DIMENSIONS ARE IN INCHES	DRAWN				TITLE: <h2 style="text-align: center;">Level 3 Side</h2>
			TOLERANCES:	CHECKED				
			FRACTIONAL ± 1/16	ENG APPR.				
			ANGULAR: MACH ± 1° BEND ± 1°	MFG APPR.				
			TWO PLACE DECIMAL ± .01	Q.A.				SIZE DWG. NO. REV <h1 style="text-align: center;">A GE-19037</h1>
		THREE PLACE DECIMAL ± .001	COMMENTS:					
		INTERPRET GEOMETRIC TOLERANCING PER:						
		MATERIAL				SCALE: 1:12 WEIGHT: SHEET 1 OF 1		
	NEXT ASSY	USED ON	FINISH					
	APPLICATION		DO NOT SCALE DRAWING					

2

1

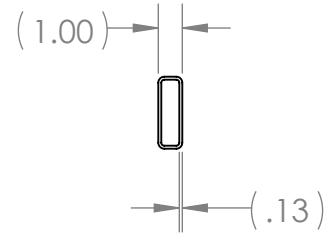
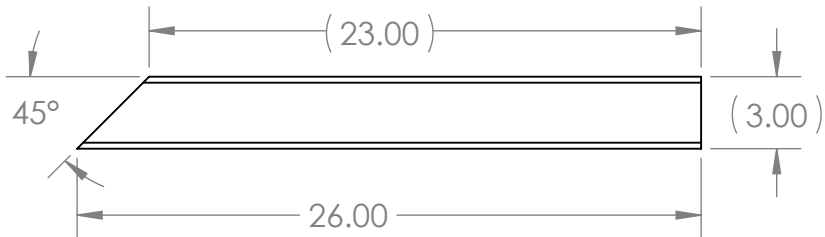
2

1

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

B

B





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

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

A

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			DIMENSIONS ARE IN INCHES	DRAWN				<b>TITLE:</b> Corral Tube Small
			TOLERANCES:	CHECKED				
			FRACTIONAL 1/16	ENG APPR.				
			ANGULAR: MACH 1° BEND 1°	MFG APPR.				
		TWO PLACE DECIMAL .01	Q.A.			SIZE	DWG. NO.	REV
		THREE PLACE DECIMAL .001	COMMENTS:			<b>A</b>	<b>GE-19038</b>	<b>A</b>
		INTERPRET GEOMETRIC TOLERANCING PER:				SCALE: 1:8	WEIGHT:	SHEET 1 OF 1
		MATERIAL						
		FINISH						
	NEXT ASSY	USED ON	DO NOT SCALE DRAWING					
	APPLICATION							

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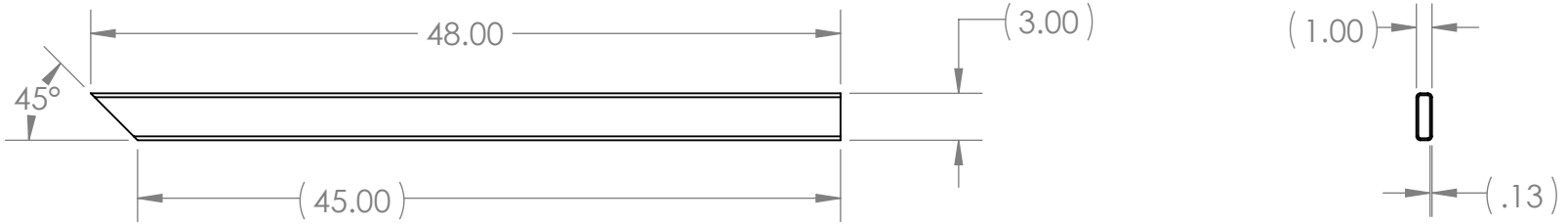
2

1

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

B

B



Notes:  
 GE-19039 A  
 Material: 1"x 3" x .125" A513 Rectangular Tube  
 Finish: Tiger Drylac Powder Coating, Or Equivalent  
 Remove Burrs and Shapr Edges

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

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			DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL 1/16 ANGULAR: MACH 1° BEND 1° TWO PLACE DECIMAL .01 THREE PLACE DECIMAL .001	DRAWN			
			INTERPRET GEOMETRIC TOLERANCING PER:	CHECKED			
			MATERIAL	ENG APPR.			
			FINISH	MFG APPR.			
NEXT ASSY	USED ON		Q.A.			<p>SIZE DWG. NO. REV</p> <p><b>A</b> <b>GE-19039</b> <b>A</b></p>	
APPLICATION		DO NOT SCALE DRAWING	COMMENTS:			<p>SCALE: 1:12 WEIGHT: SHEET 1 OF 1</p>	

2

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4

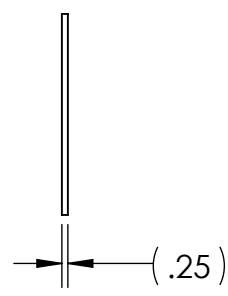
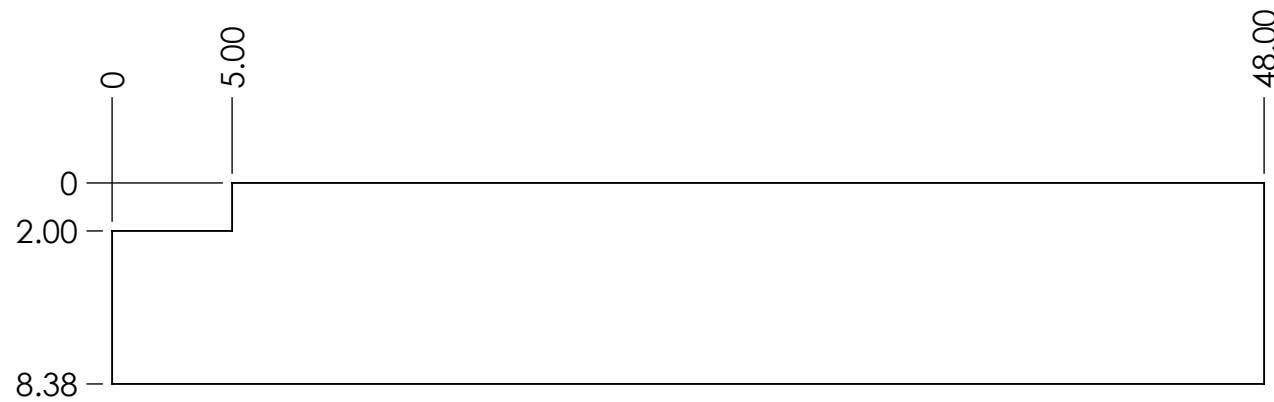
3

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

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		UNLESS OTHERWISE SPECIFIED:		NAME	DATE
		DIMENSIONS ARE IN INCHES	DRAWN		
		TOLERANCES:	CHECKED		
		FRACTIONAL ±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			



TITLE:  
**Level 2 Side**

SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19044</b>	

SCALE: 1:8 WEIGHT: SHEET 1 OF 1

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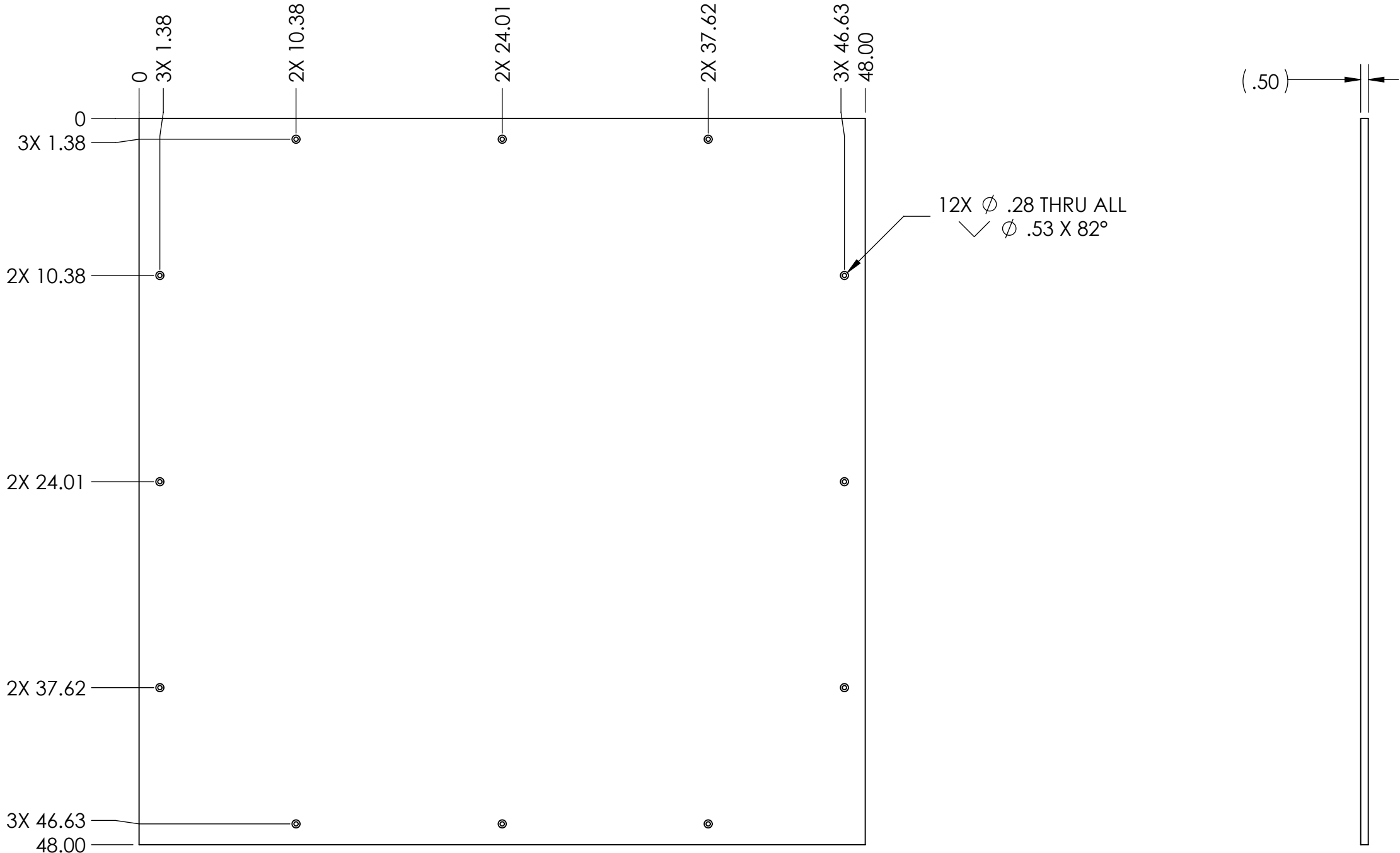
3

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

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

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



TITLE:		
HDPE Top Level 3		
SIZE	DWG. NO.	REV
<b>B</b>	GE-19045	
SCALE: 1:8	WEIGHT:	SHEET 1 OF 1

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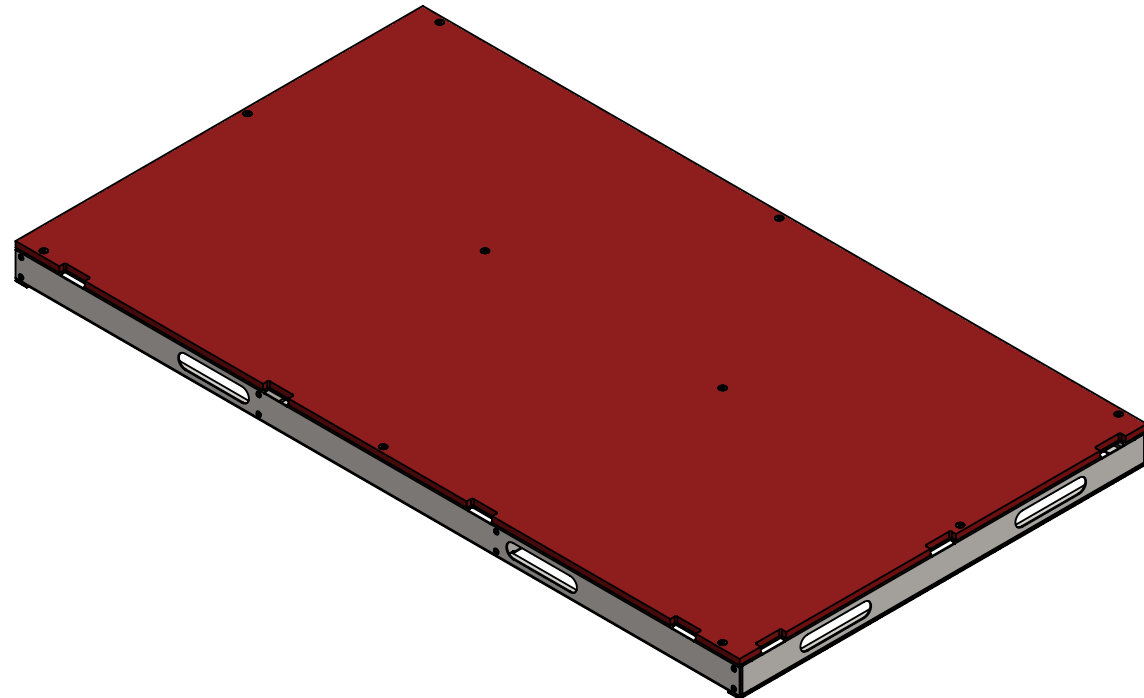
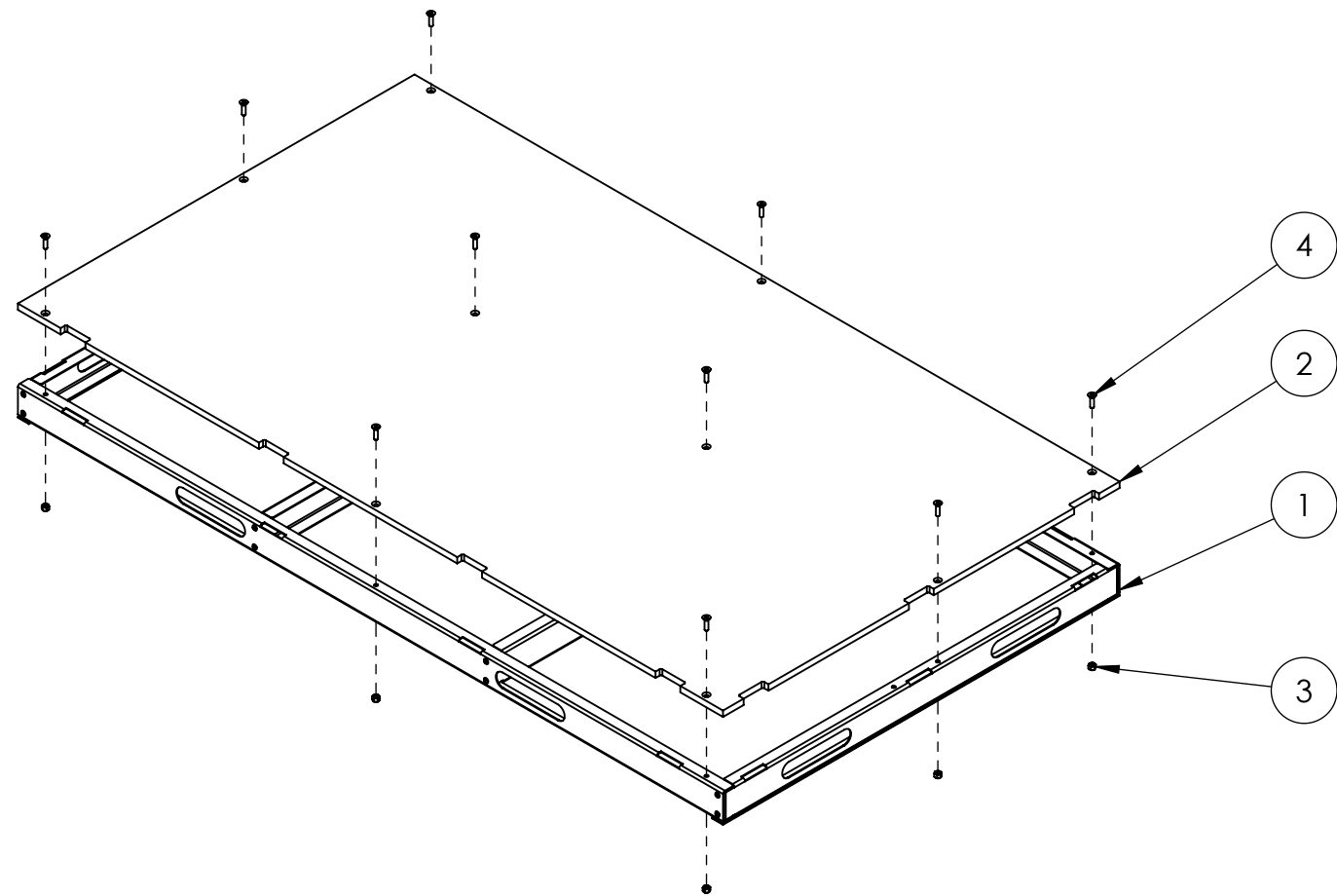
3

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

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

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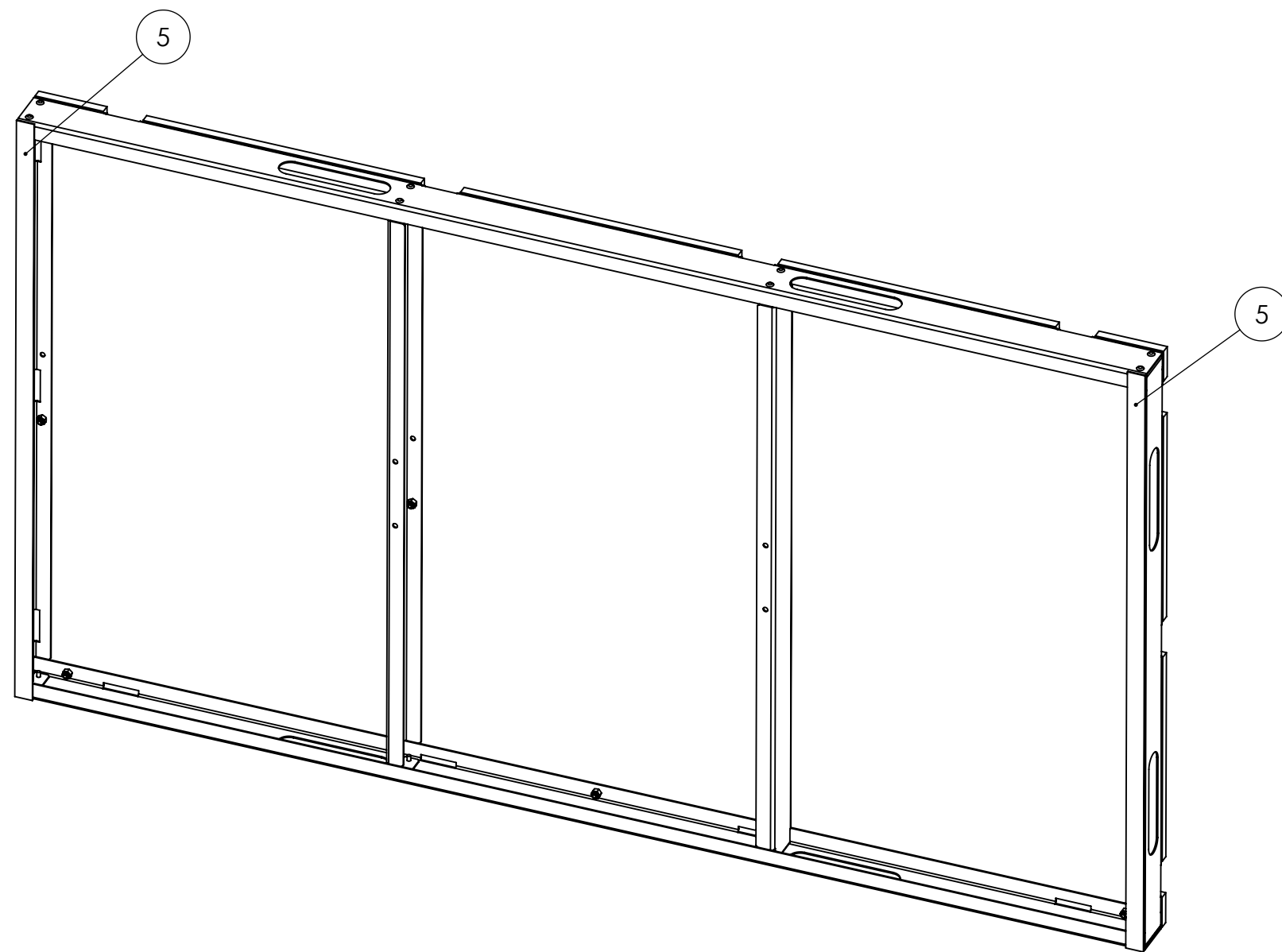
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Notes:  
 1. Clean steel surface prior to application of hook.

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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	DAF	
		INTERPRET GEOMETRIC TOLERANCING PER:	CHECKED		
		MATERIAL	ENG APPR.		
		FINISH	MFG APPR.		
NEXT ASSY	USED ON		Q.A.		
APPLICATION		DO NOT SCALE DRAWING	COMMENTS:		
			TITLE:		<b>Level 1 -          Platform Right</b>
			SIZE	DWG. NO.	
			<b>B</b>		<b>GE-19051</b>
			SCALE: 1:12 WEIGHT:		SHEET 2 OF 2

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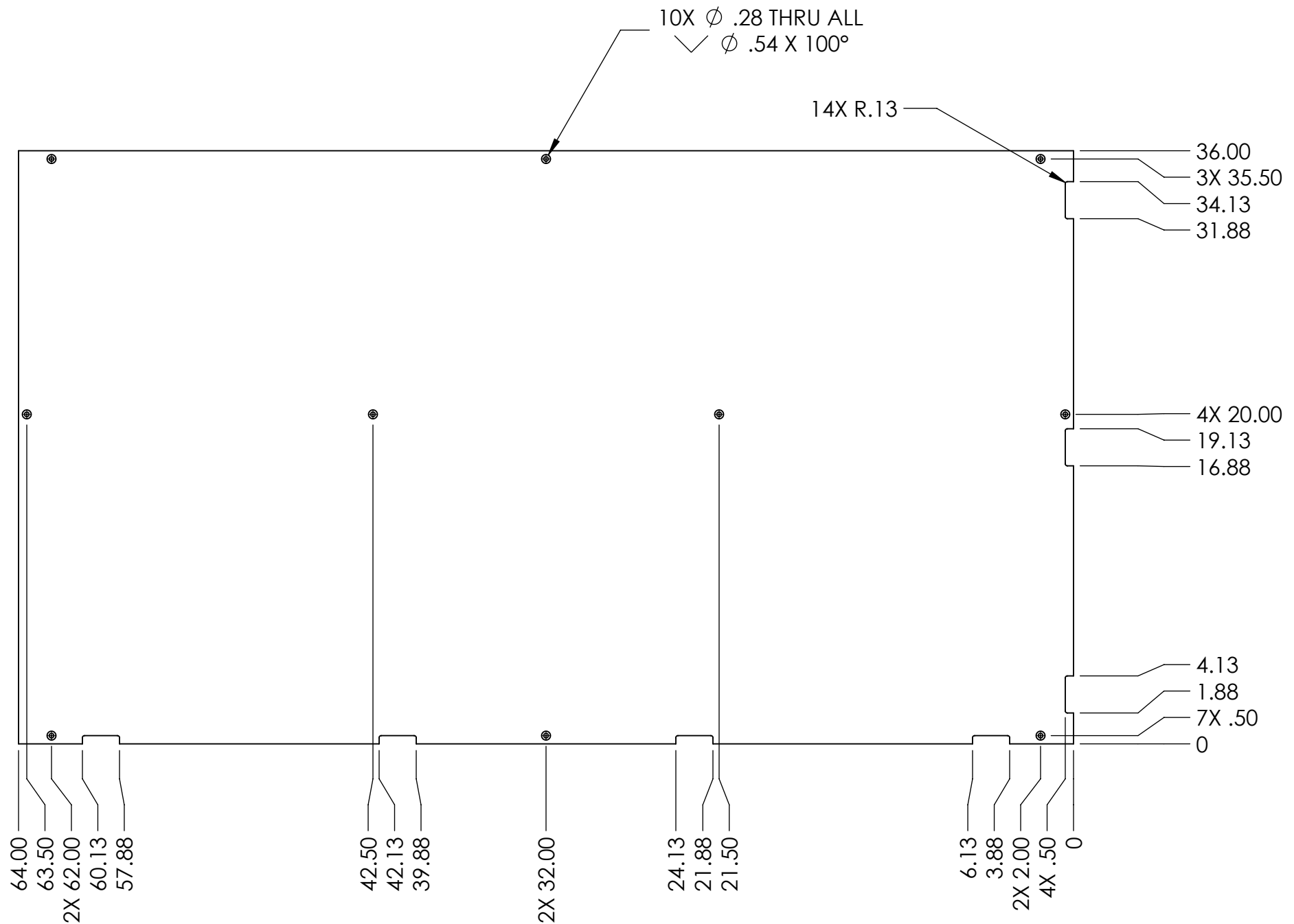
1

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Color Variations	
Part Number	Material
GE-19052-red	1/2" HDPE, Red
GE-19052-blu	1/2" HDPE, Blue
GE-19052-blk	1/2" HDPE, Black

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

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		UNLESS OTHERWISE SPECIFIED:		NAME	DATE	 
		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		
		INTERPRET GEOMETRIC TOLERANCING PER:		CHECKED		<b>Level 1 - Top Right</b>
		MATERIAL		ENG APPR.		
		FINISH		MFG APPR.		SIZE
NEXT ASSY	USED ON			COMMENTS:		DWG. NO.
APPLICATION		DO NOT SCALE DRAWING				<b>B</b> <b>GE-19052</b>
						REV
						SCALE: 1:8
						WEIGHT:
						SHEET 1 OF 1

4

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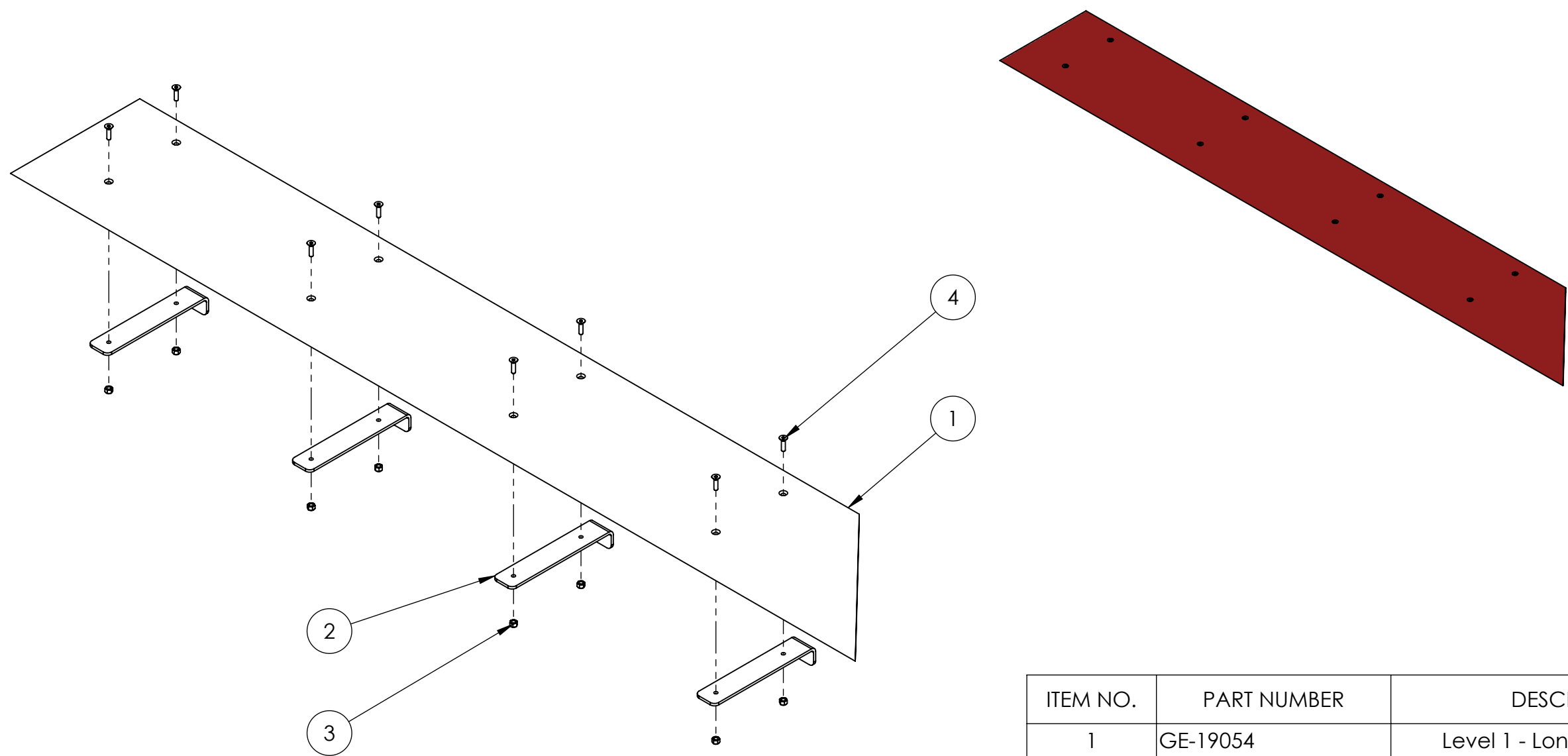
4 3 2 1

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

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UNLESS OTHERWISE SPECIFIED:		NAME	DATE	 
DIMENSIONS ARE IN INCHES		DRAWN	DAF	
TOLERANCES:		CHECKED		
FRACTIONAL 1/16		ENG APPR.		
ANGULAR: MACH 1° BEND 1°		MFG APPR.		
TWO PLACE DECIMAL .01		Q.A.		
THREE PLACE DECIMAL .001		COMMENTS:		
INTERPRET GEOMETRIC TOLERANCING PER:		<b>TITLE:</b> Level 1 - Long Ramp Assembly, Right		
MATERIAL				
NEXT ASSY	USED ON	<b>SIZE</b> <b>DWG. NO.</b> <b>REV</b> <b>B</b> <b>GE-19053</b>		
APPLICATION		<b>SCALE:</b> 1:8 <b>WEIGHT:</b> <b>SHEET 1 OF 1</b>		
DO NOT SCALE DRAWING				

4 3 2 1

4

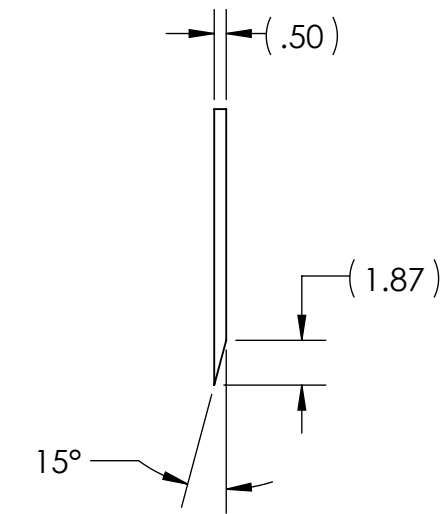
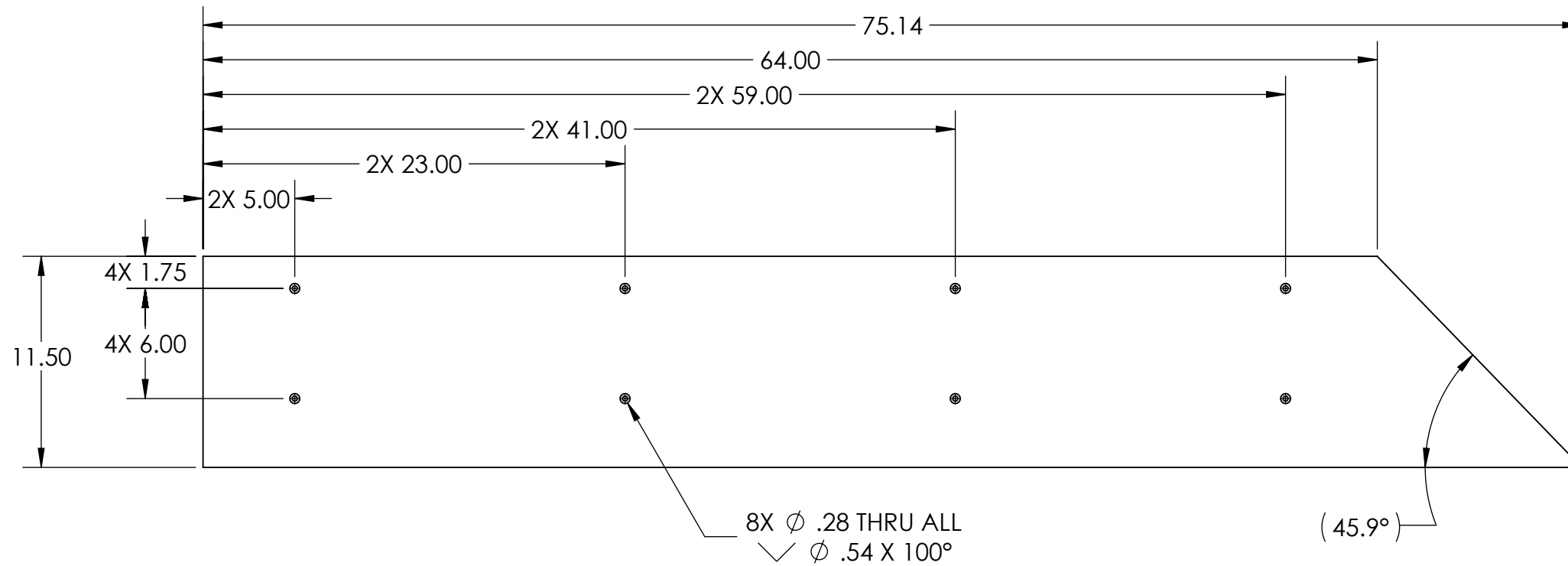
3

2

1

B

B



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

Notes:

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

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		UNLESS OTHERWISE SPECIFIED:	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	DAF	
		INTERPRET GEOMETRIC TOLERANCING PER:	CHECKED		
		MATERIAL	ENG APPR.		
		FINISH	MFG APPR.		
NEXT ASSY	USED ON		Q.A.		
APPLICATION		DO NOT SCALE DRAWING	COMMENTS:		
TITLE:					
<b>Level 1 - Long Ramp, Right</b>					
SIZE	DWG. NO.	REV			
<b>B</b>	<b>GE-19054</b>				
SCALE: 1:8	WEIGHT:	SHEET 1 OF 1			

4

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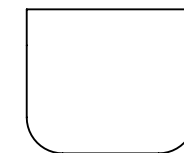
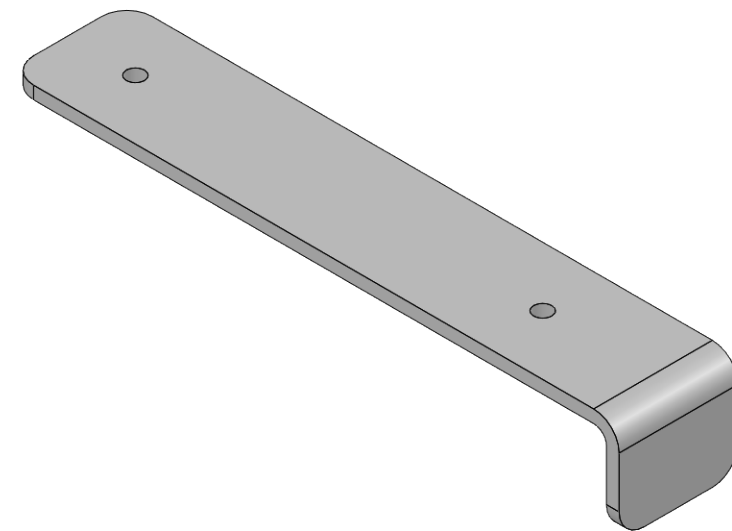
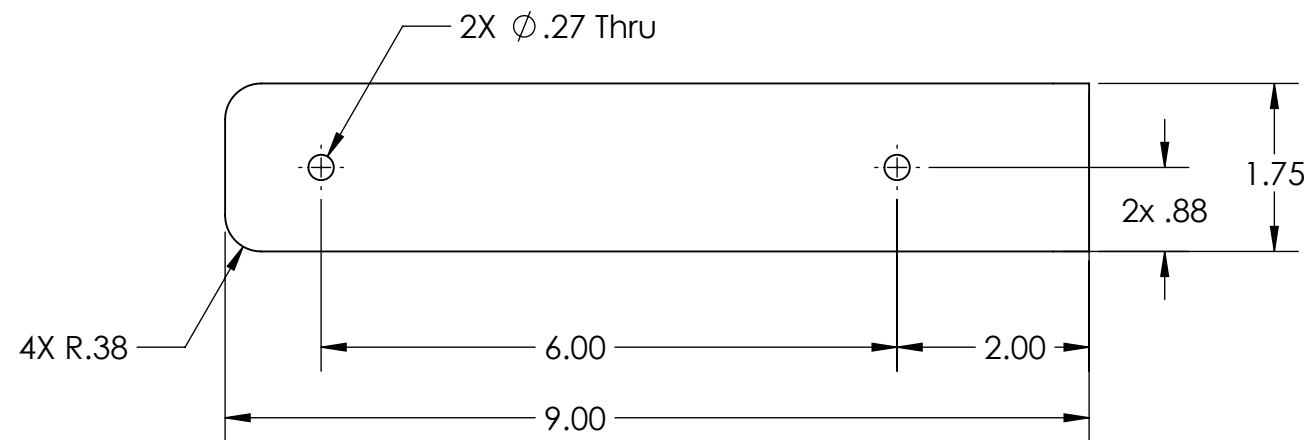
3

2

1

B

B



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NOTES:

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

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		UNLESS OTHERWISE SPECIFIED:	NAME	DATE	 
		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$	DRAWN	DAF	
		INTERPRET GEOMETRIC TOLERANCING PER:	CHECKED		
		MATERIAL	ENG APPR.		
		FINISH	MFG APPR.		
NEXT ASSY	USED ON		Q.A.		
APPLICATION		DO NOT SCALE DRAWING	COMMENTS:		
			TITLE:		<b>Level 1 - Ramp Support</b>
SIZE	DWG. NO.	REV			
<b>B</b>	<b>GE-19055</b>				
SCALE: 1:2		WEIGHT:			SHEET 1 OF 1

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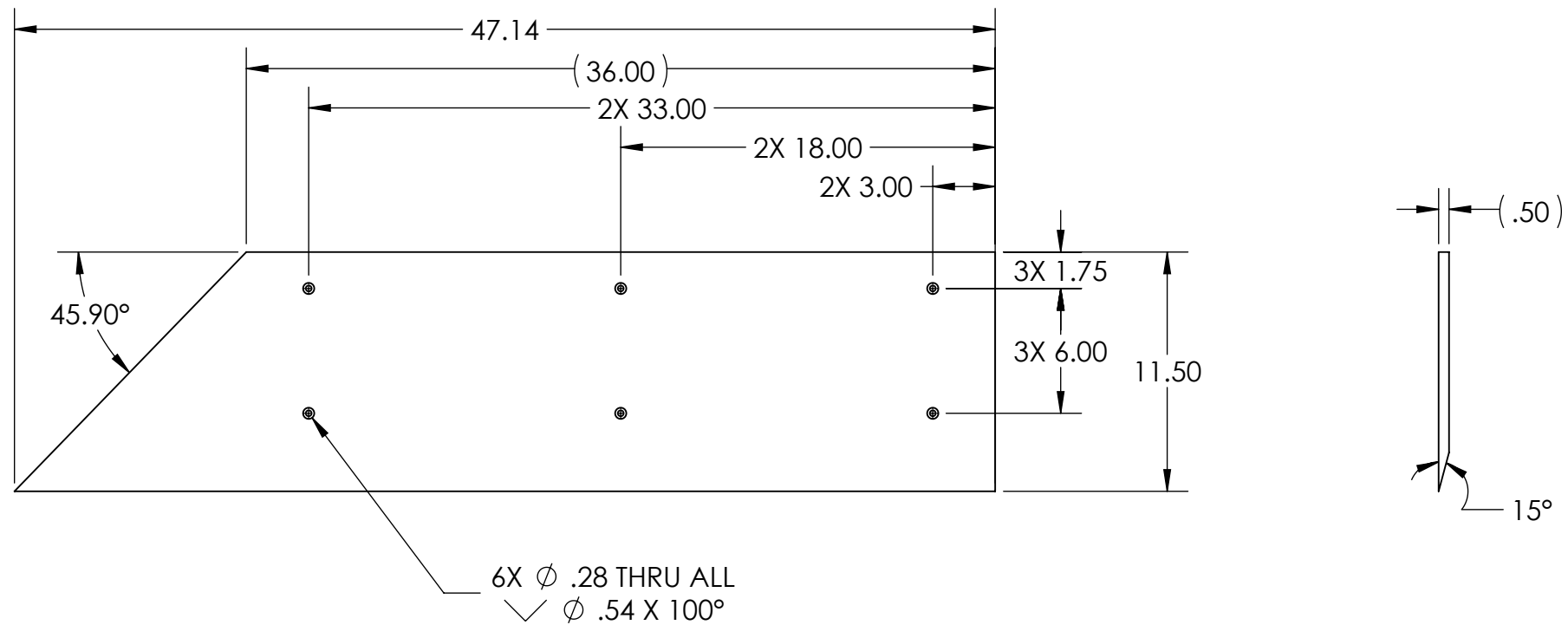
1

4

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1



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

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

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		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			
		INTERPRET GEOMETRIC TOLERANCING PER:	CHECKED			<b>Level 1 - Short Ramp, Right</b>
		MATERIAL	ENG APPR.			
NEXT ASSY	USED ON	FINISH	MFG APPR.			<b>B</b> <b>GE-19056</b>
APPLICATION		DO NOT SCALE DRAWING	Q.A.			SCALE: 1:8 WEIGHT: SHEET 1 OF 1
			COMMENTS:			

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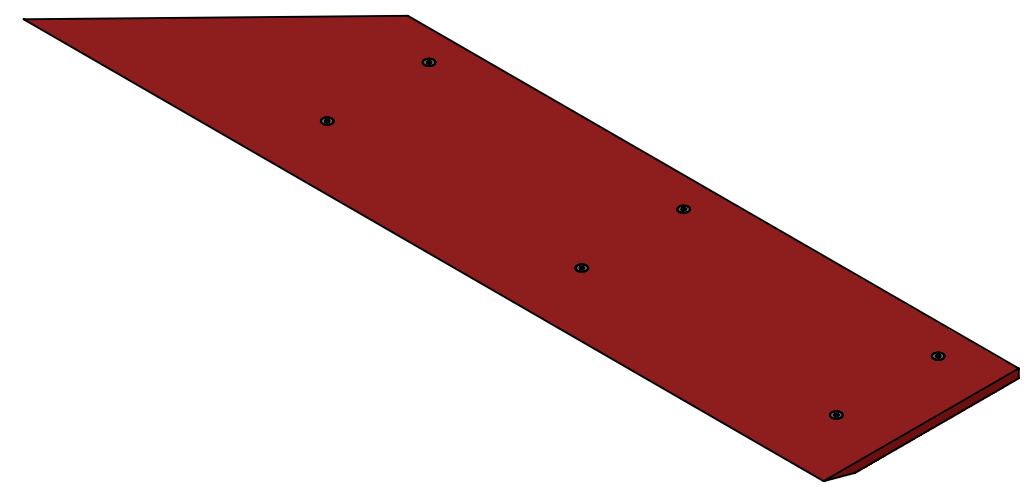
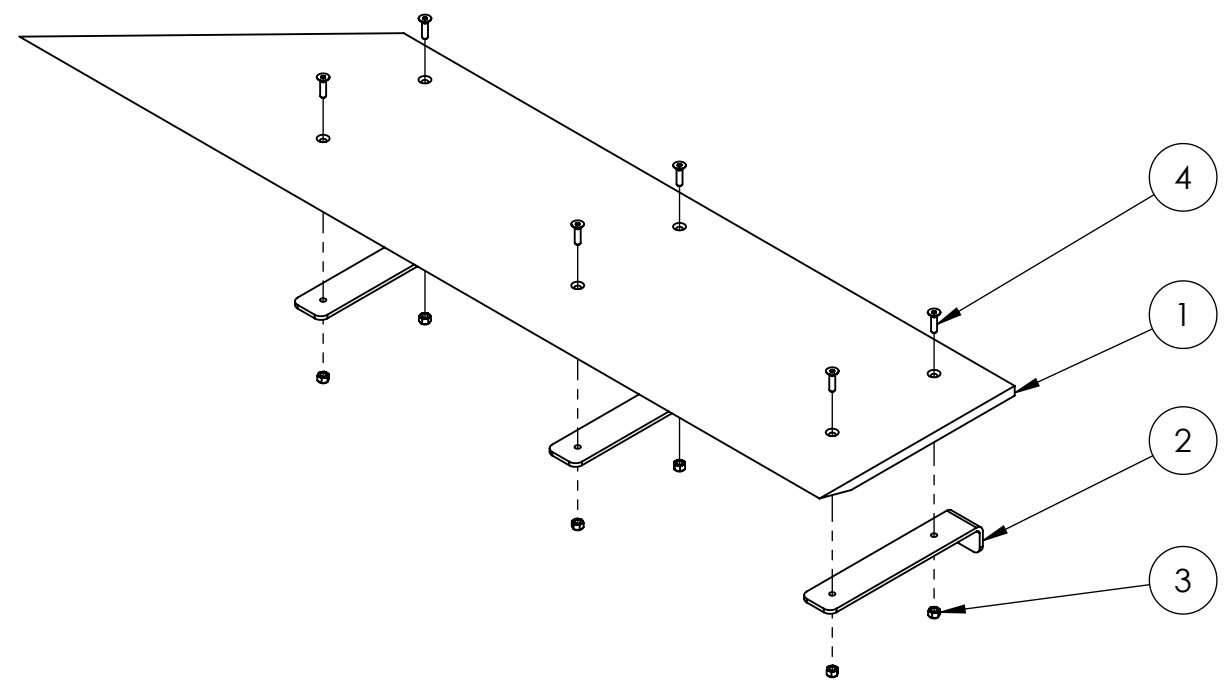
3

2

1

B

B





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

A

A

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UNLESS OTHERWISE SPECIFIED:		NAME	DATE	 
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL 1/16 ANGULAR: MACH 1° BEND 1° TWO PLACE DECIMAL .01 THREE PLACE DECIMAL .001		DRAWN	DAF	
INTERPRET GEOMETRIC TOLERANCING PER:		CHECKED		TITLE: <b>Level 1 - Short Ramp Assembly, Right</b>
MATERIAL		ENG APPR.		
FINISH		MFG APPR.		
NEXT ASSY	USED ON	Q.A.		SIZE <b>B</b> DWG. NO. <b>GE-19057</b> REV
APPLICATION		COMMENTS:		SCALE: 1:8 WEIGHT: SHEET 1 OF 1
DO NOT SCALE DRAWING				

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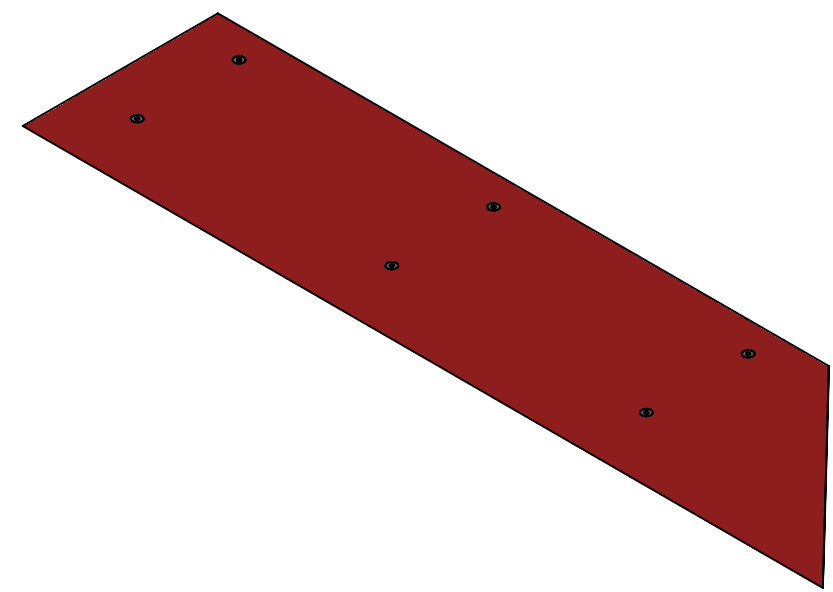
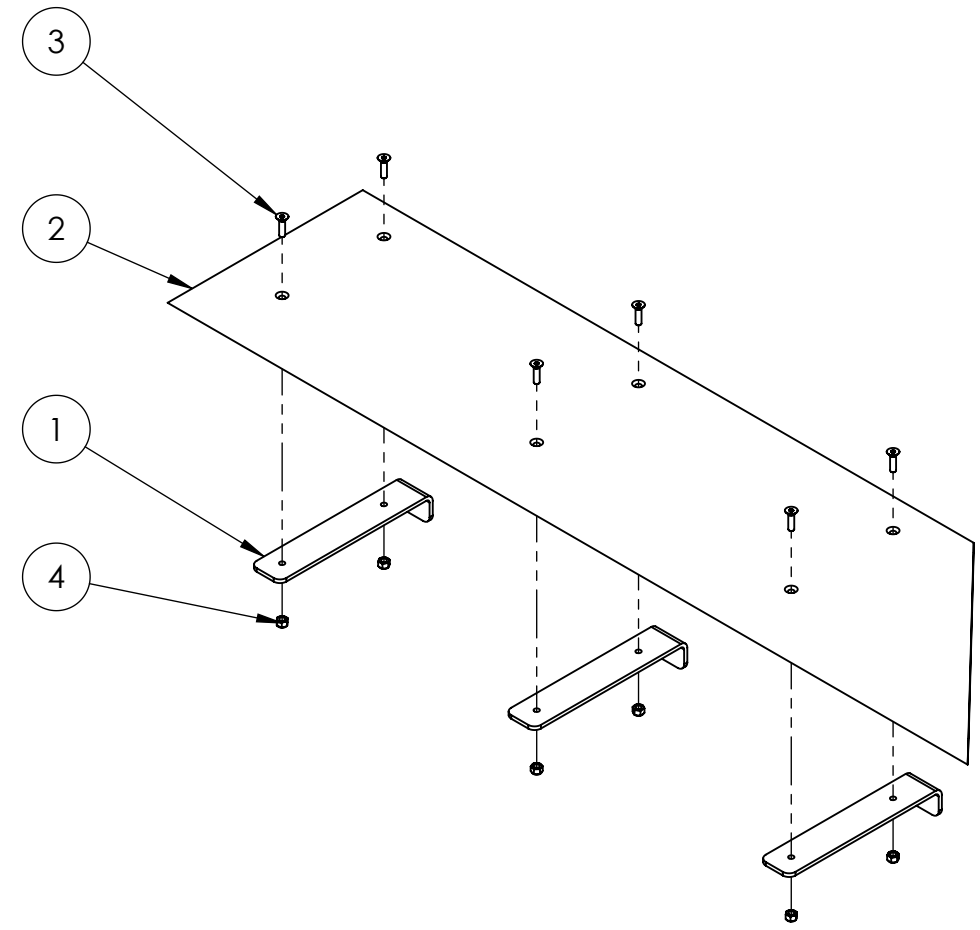
1

4

3



2

1



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

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UNLESS OTHERWISE SPECIFIED:		NAME	DATE	 
DIMENSIONS ARE IN INCHES		DRAWN	DAF	
TOLERANCES:		CHECKED		TITLE: <b>Level 1 - Short Ramp Assembly, Left</b>
FRACTIONAL 1/16		ENG APPR.		
ANGULAR: MACH 1° BEND 1°		MFG APPR.		
TWO PLACE DECIMAL .01		Q.A.		SIZE DWG. NO. REV <b>B GE-19058</b>
THREE PLACE DECIMAL .001		COMMENTS:		
INTERPRET GEOMETRIC TOLERANCING PER:				SCALE: 1:8 WEIGHT: SHEET 1 OF 1
MATERIAL				
NEXT ASSY	USED ON			
FINISH				
APPLICATION		DO NOT SCALE DRAWING		

4

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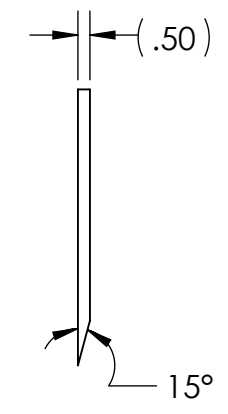
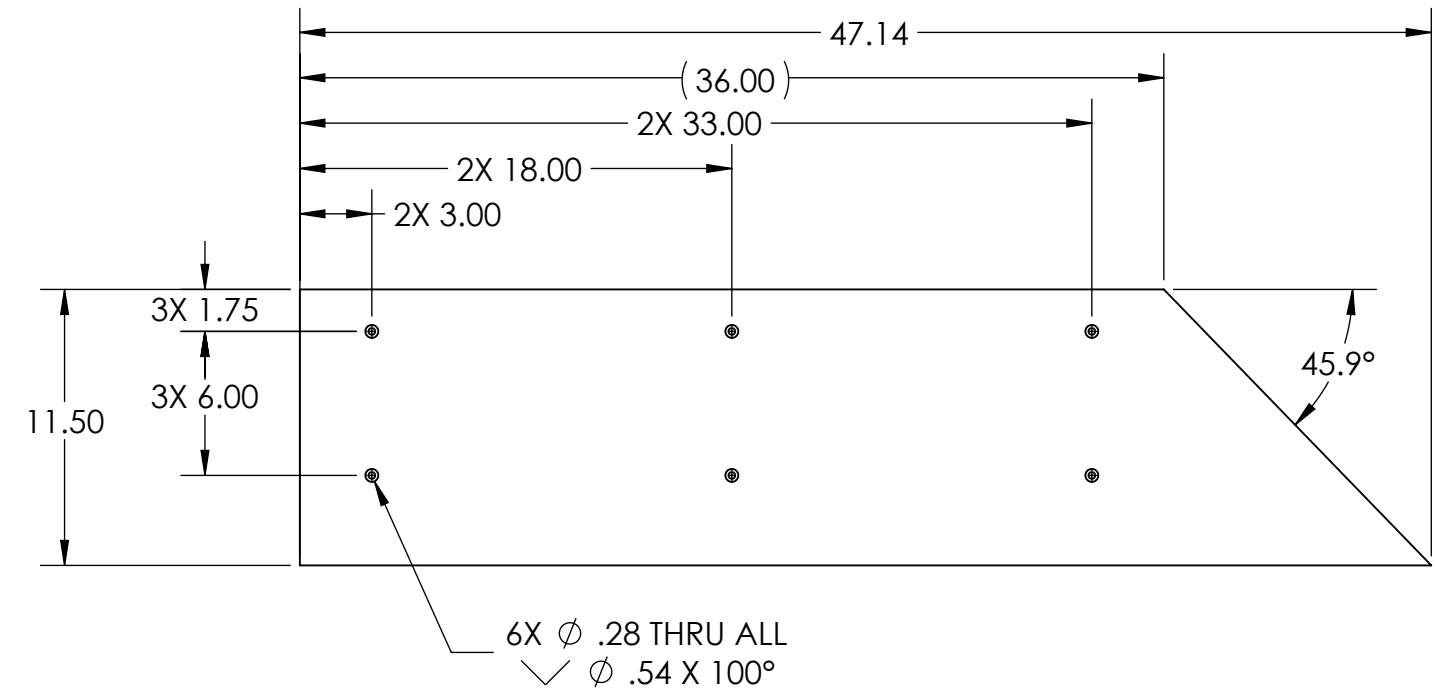
3

2

1

B

B



6X  $\phi$  .28 THRU ALL  
 $\surd$   $\phi$  .54 X 100°

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

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

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		UNLESS OTHERWISE SPECIFIED:	NAME	DATE
		DIMENSIONS ARE IN INCHES	DRAWN	DAF
		TOLERANCES:	CHECKED	9/10/18
		FRACTIONAL $\pm 1/16$	ENG APPR.	
		ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$	MFG APPR.	
		TWO PLACE DECIMAL $\pm .01$	Q.A.	
		THREE PLACE DECIMAL $\pm .001$	COMMENTS:	
		INTERPRET GEOMETRIC TOLERANCING PER:		
		MATERIAL		
NEXT ASSY	USED ON	FINISH		
APPLICATION		DO NOT SCALE DRAWING		

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

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

SIZE **B** DWG. NO. **GE-19059** REV

SCALE: 1:8 WEIGHT: SHEET 1 OF 1

4

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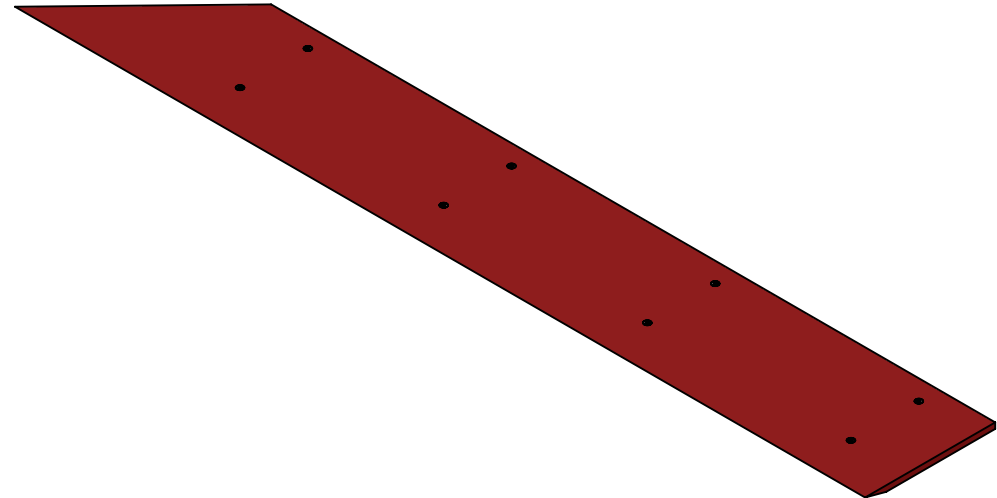
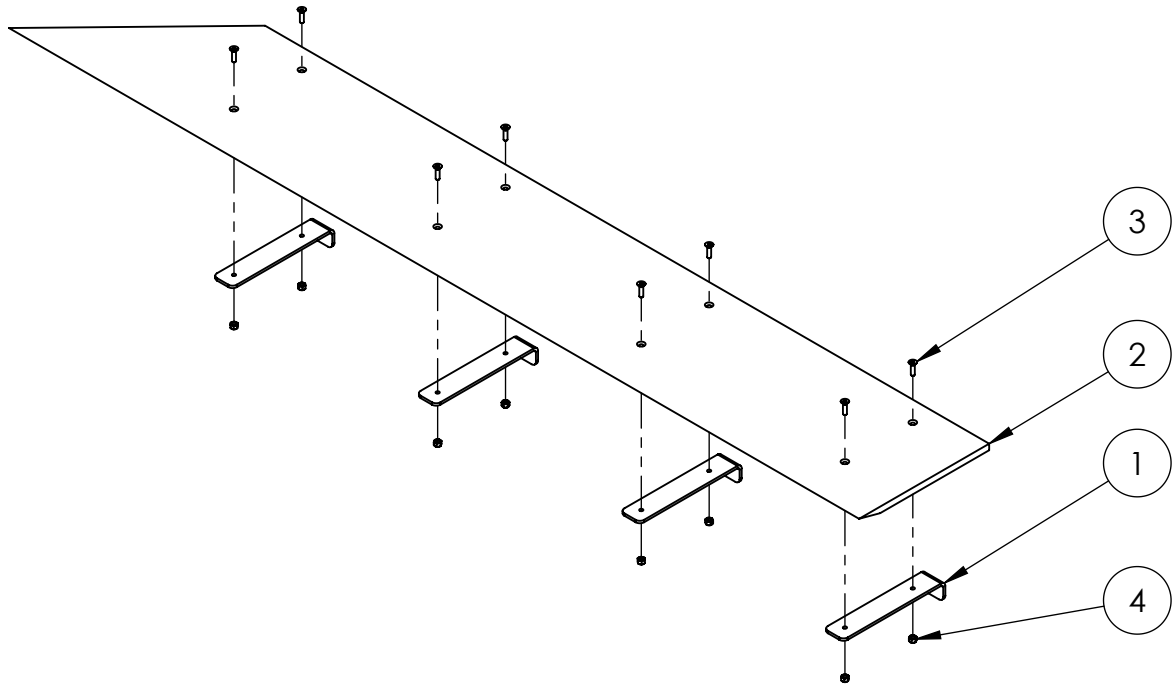
A

4

3

2

1



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



B

B

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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		
INTERPRET GEOMETRIC TOLERANCING PER:		CHECKED		TITLE: <b>Level 1 - Long Ramp Assembly, Left</b>
MATERIAL		ENG APPR.		
NEXT ASSY	USED ON	MFG APPR.		SIZE <b>B</b> DWG. NO. <b>GE-19060</b> REV
APPLICATION		FINISH		SCALE: 1:12 WEIGHT: SHEET 1 OF 1
DO NOT SCALE DRAWING		COMMENTS:		

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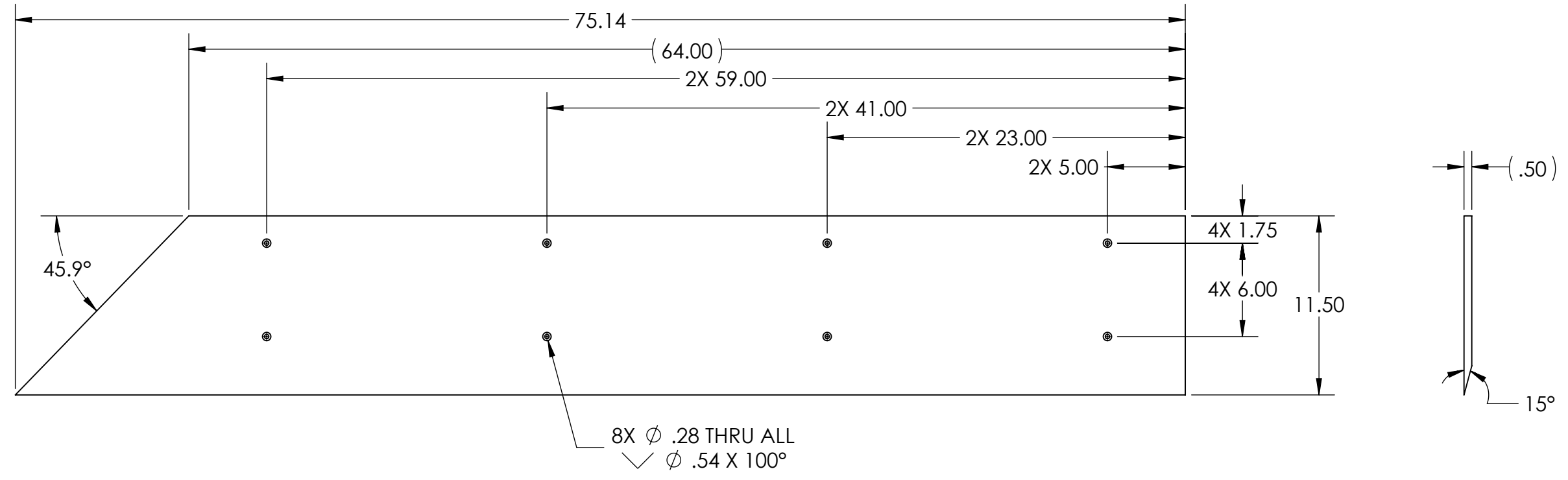
3

2

1

B



B



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

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

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		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	DAF		9/10/18
		INTERPRET GEOMETRIC TOLERANCING PER:	CHECKED			TITLE: <h3>Level 1 - Long Ramp, Left</h3>
		MATERIAL	ENG APPR.			
		FINISH	MFG APPR.			SIZE <b>B</b> DWG. NO. <b>GE-19061</b> REV
NEXT ASSY	USED ON	DO NOT SCALE DRAWING	Q.A.			SCALE: 1:8 WEIGHT: SHEET 1 OF 1
APPLICATION			COMMENTS:			

4

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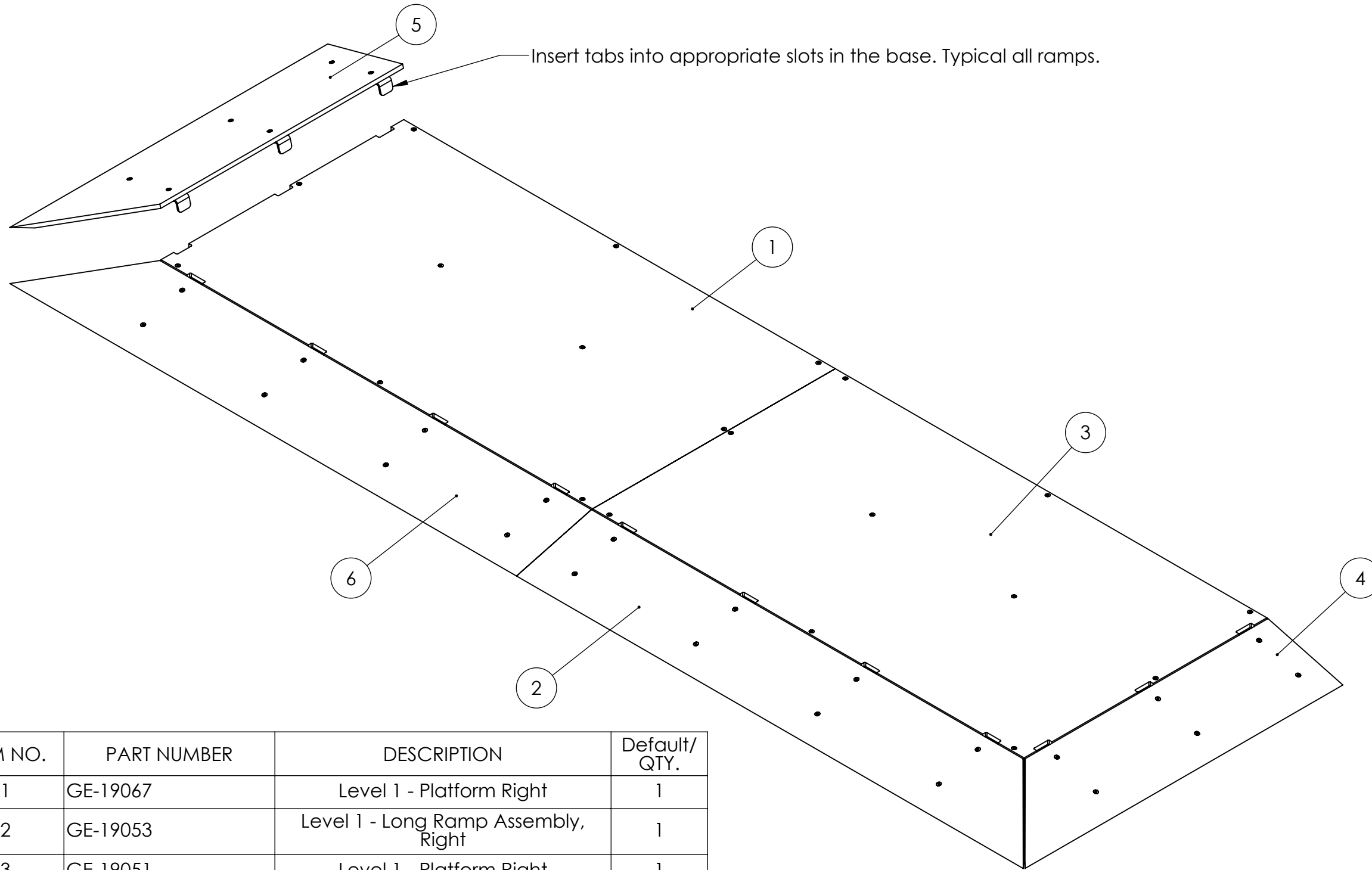
1

B

B

A



A



Insert tabs into appropriate slots in the base. Typical all ramps.

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

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		UNLESS OTHERWISE SPECIFIED:	NAME	DATE	 	
		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL 1/16 ANGULAR: MACH 1° BEND 1° TWO PLACE DECIMAL .01 THREE PLACE DECIMAL .001	DRAWN	DAF		9/10/18
		INTERPRET GEOMETRIC TOLERANCING PER:	CHECKED			TITLE:
		MATERIAL	ENG APPR.			<h1>Level 1 - Assembly</h1>
		FINISH	MFG APPR.			
NEXT ASSY	USED ON		Q.A.			<b>B</b> GE-19062
APPLICATION		DO NOT SCALE DRAWING	COMMENTS:			SCALE: 1:12 WEIGHT: SHEET 1 OF 1

4

3

2

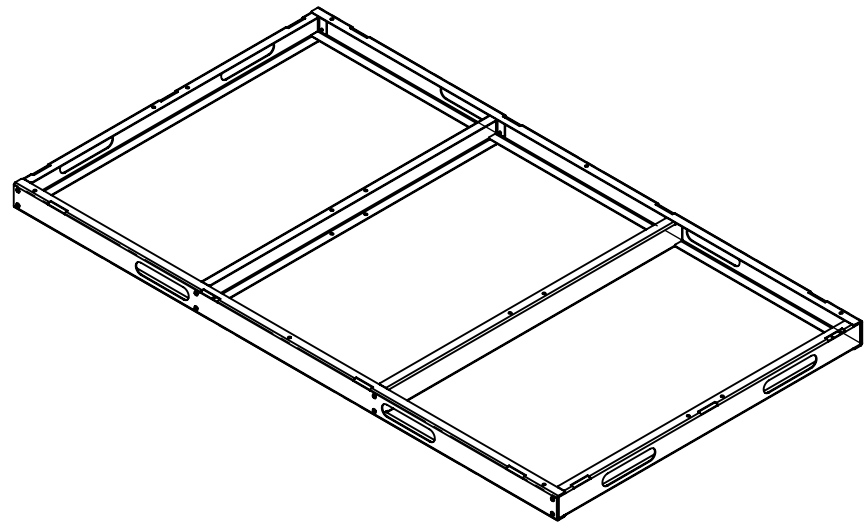
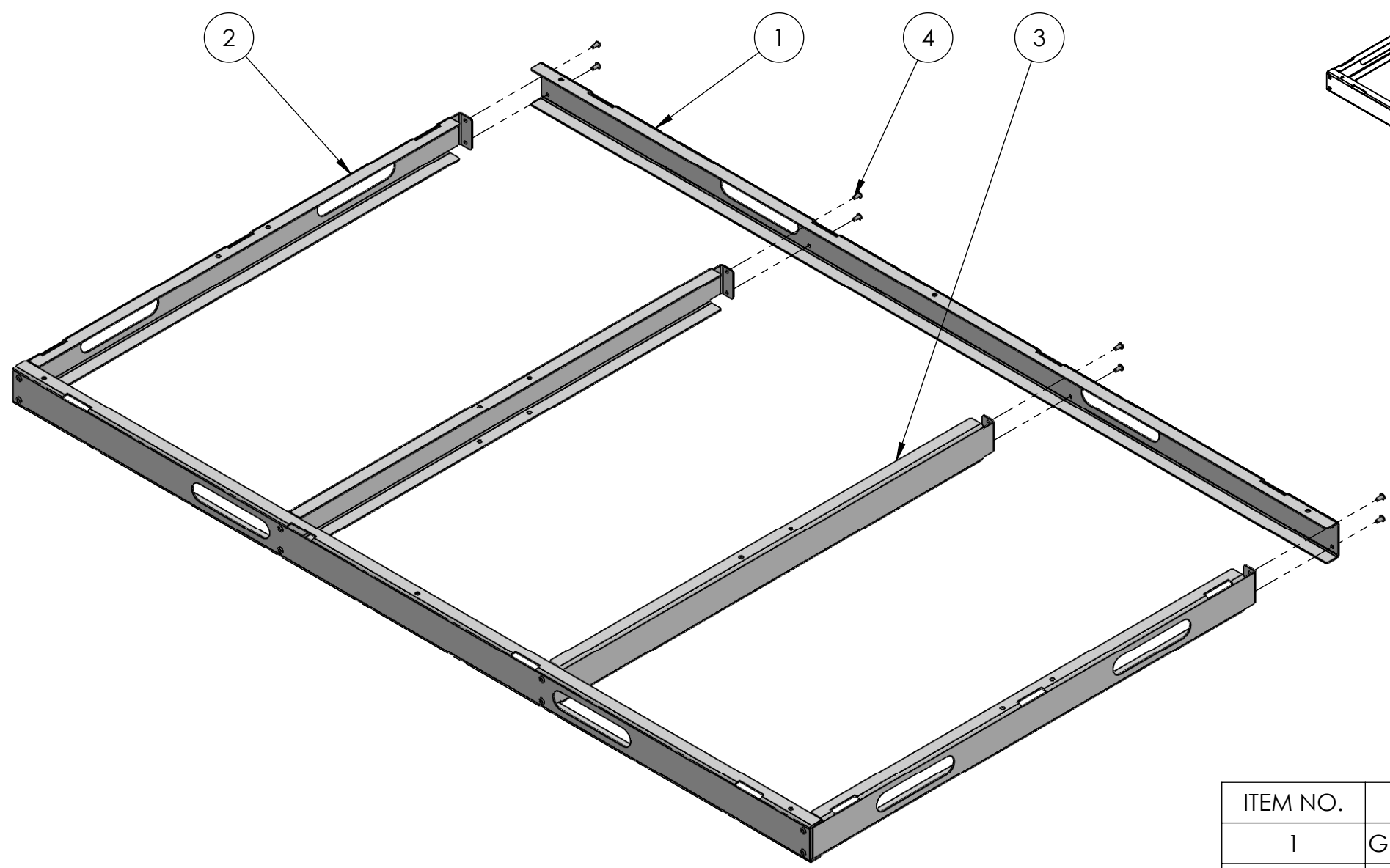
1

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2

1





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

Notes:

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

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UNLESS OTHERWISE SPECIFIED:		NAME	DATE	 
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL ±1/16 ANGULAR: MACH ±1° BEND ±1° TWO PLACE DECIMAL ±.01 THREE PLACE DECIMAL ±.001		DRAWN		
INTERPRET GEOMETRIC TOLERANCING PER:		CHECKED		TITLE: <h2>Level 1 - Frame</h2>
MATERIAL		ENG APPR.		
FINISH		MFG APPR.		
NEXT ASSY	USED ON	Q.A.		SIZE <b>B</b> DWG. NO. <b>GE-19063</b> REV
APPLICATION		COMMENTS:		SCALE: 1:8 WEIGHT: SHEET 1 OF 1
DO NOT SCALE DRAWING				

4

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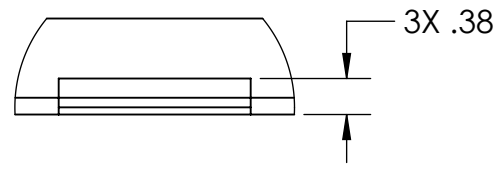
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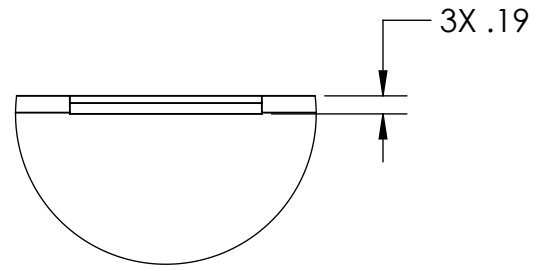
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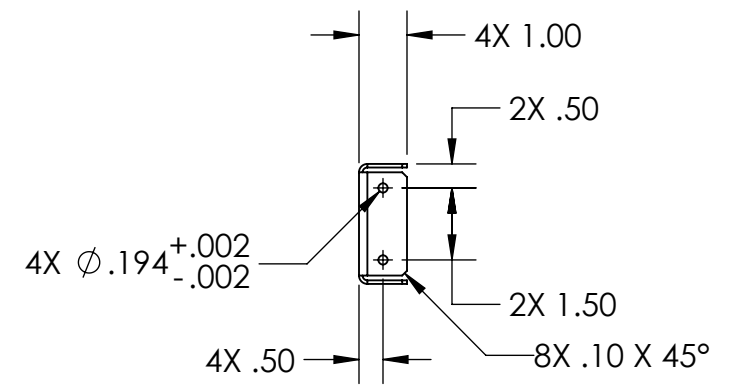
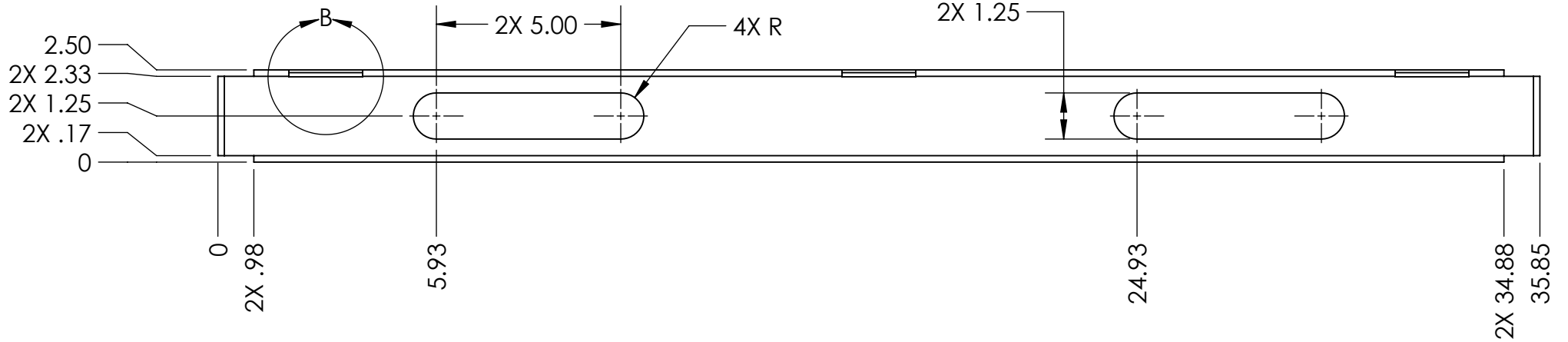
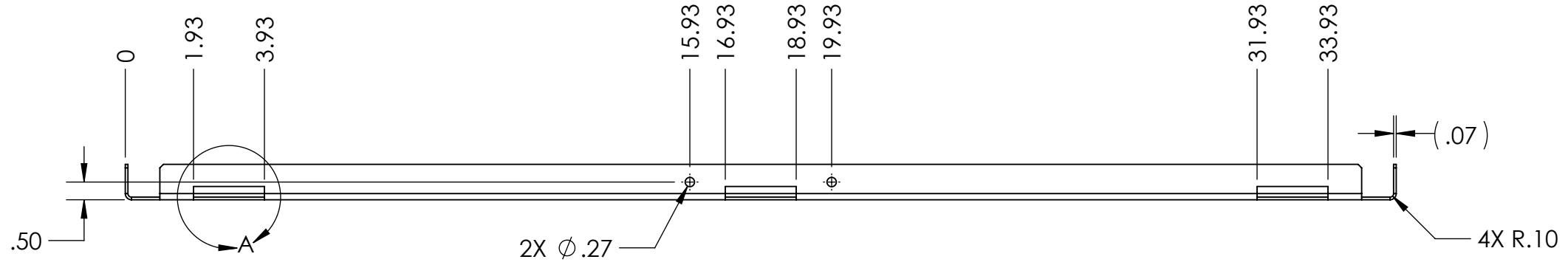
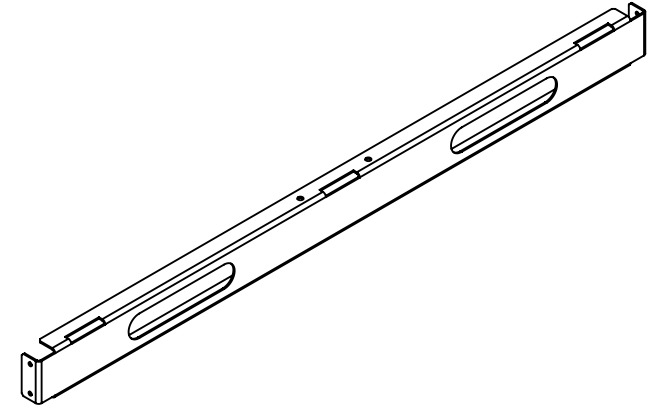
1



DETAIL A  
SCALE 1 : 2



DETAIL B  
SCALE 1 : 2



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

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		UNLESS OTHERWISE SPECIFIED:	NAME	DATE
		DIMENSIONS ARE IN INCHES	DRAWN	DAF
		TOLERANCES:	CHECKED	9/3/18
		FRACTIONAL: ±1/16	ENG APPR.	
		ANGULAR: MACH ±1° BEND ±1°	MFG APPR.	
		TWO PLACE DECIMAL ±.01	Q.A.	
		THREE PLACE DECIMAL ±.001	COMMENTS:	
		INTERPRET GEOMETRIC TOLERANCING PER:		
		MATERIAL		
NEXT ASSY	USED ON	FINISH		
APPLICATION		DO NOT SCALE DRAWING		

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

TITLE:  
**Level 1 - Side Brace**

SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19064</b>	

SCALE: 1:4 WEIGHT: SHEET 1 OF 1

4

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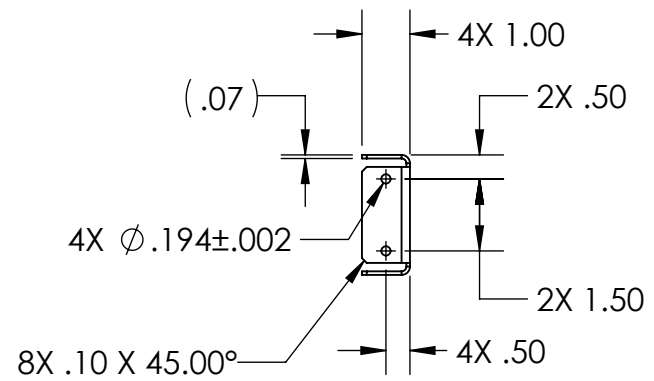
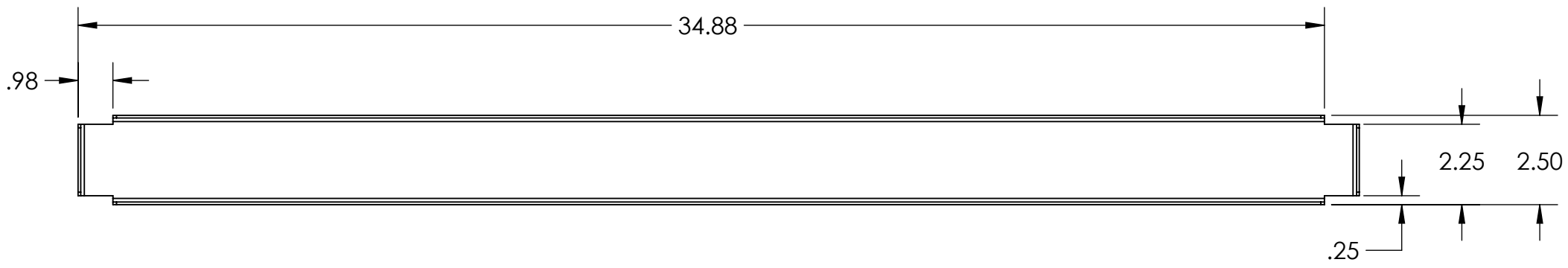
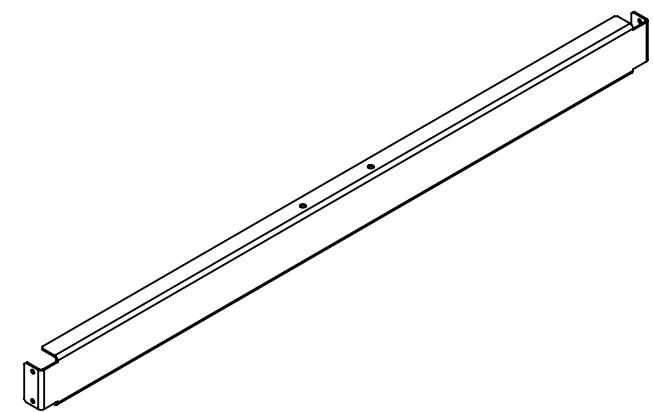
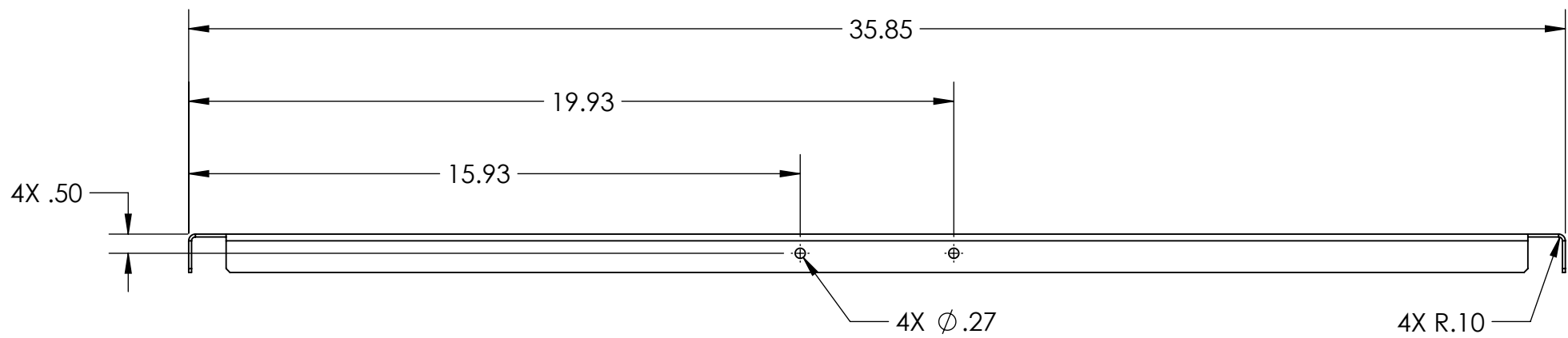
3

2

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

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		UNLESS OTHERWISE SPECIFIED:		NAME	DATE
		DIMENSIONS ARE IN INCHES	DRAWN	DAF	9/6/18
		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			



TITLE:  
**Level 1 - Middle Brace**

SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19065</b>	
SCALE: 1:4	WEIGHT:	SHEET 1 OF 1

4

3

2

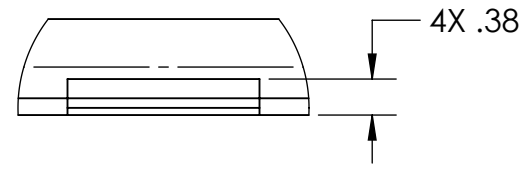
1

4

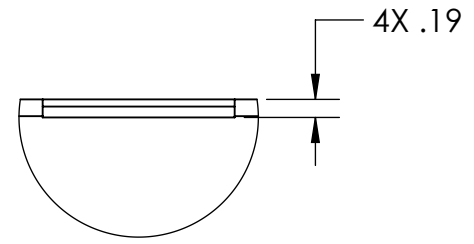
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2

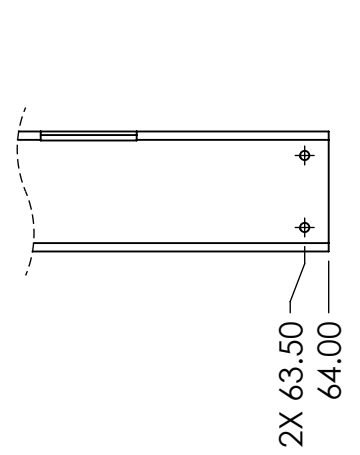
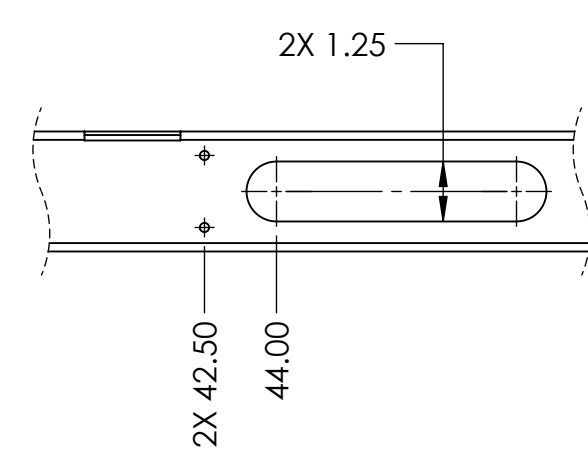
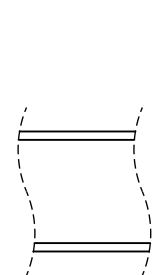
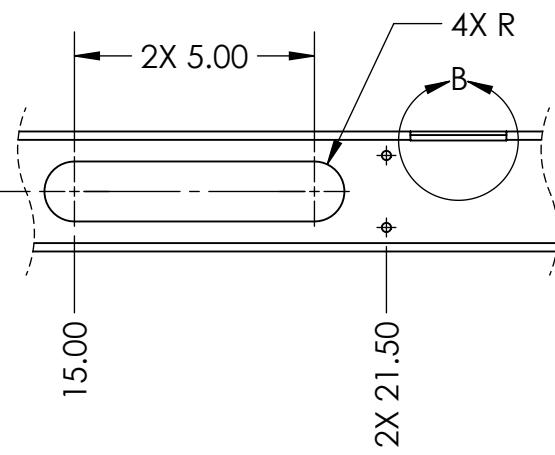
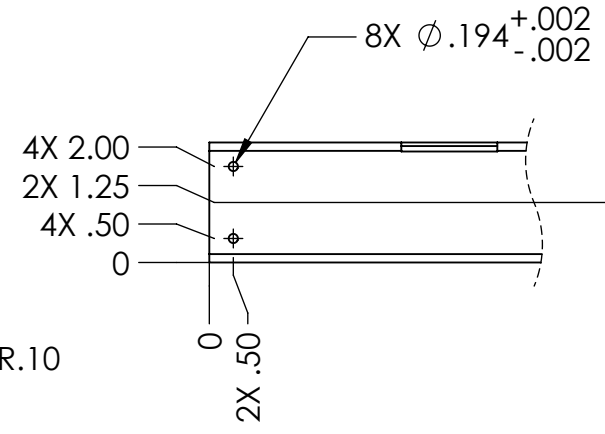
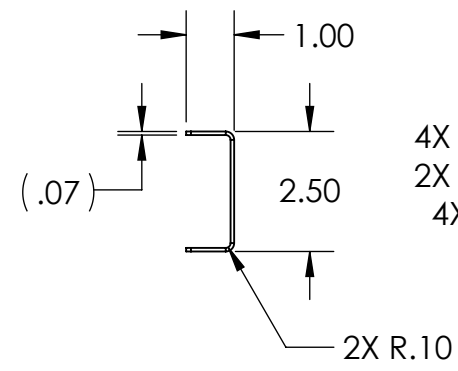
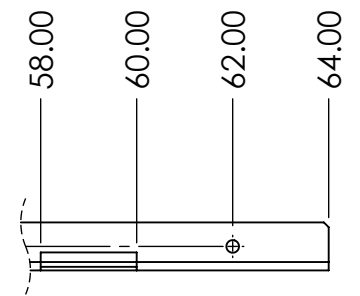
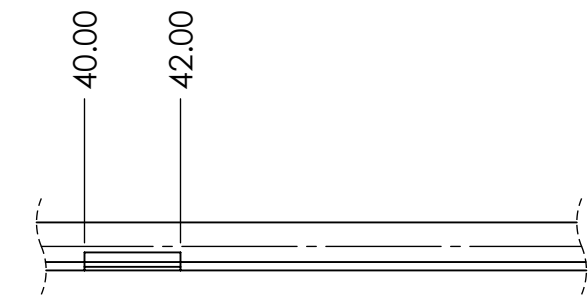
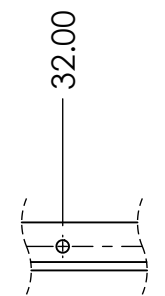
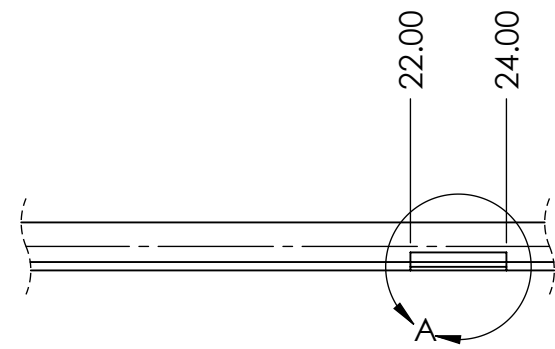
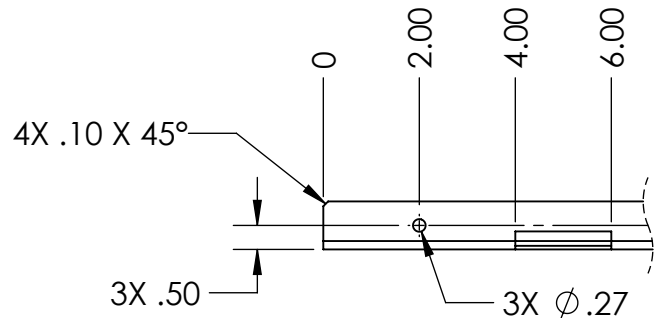
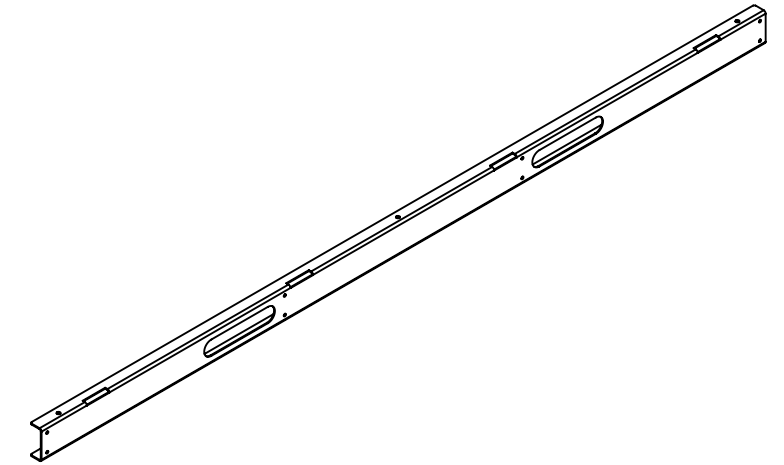
1



DETAIL A  
SCALE 1 : 2





DETAIL B  
SCALE 1 : 2



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

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		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	DAF	
		INTERPRET GEOMETRIC TOLERANCING PER:		CHECKED		TITLE:
		MATERIAL		ENG APPR.		<b>Level 1 - Front Brace</b>
		FINISH		MFG APPR.		
NEXT ASSY	USED ON			Q.A.		SIZE
APPLICATION		DO NOT SCALE DRAWING		COMMENTS:		DWG. NO.
						<b>B</b>
						<b>GE-19066</b>
						REV
						SCALE: 1:4
						WEIGHT:
						SHEET 1 OF 1

4

3

2

1

B

B

A

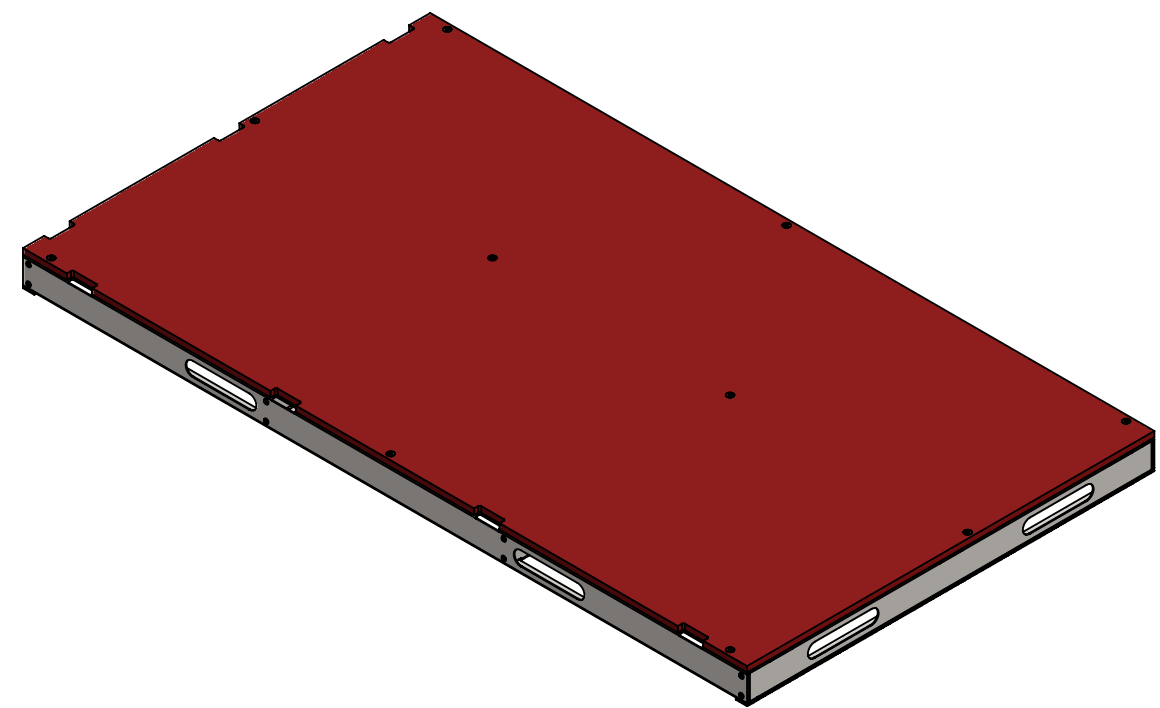
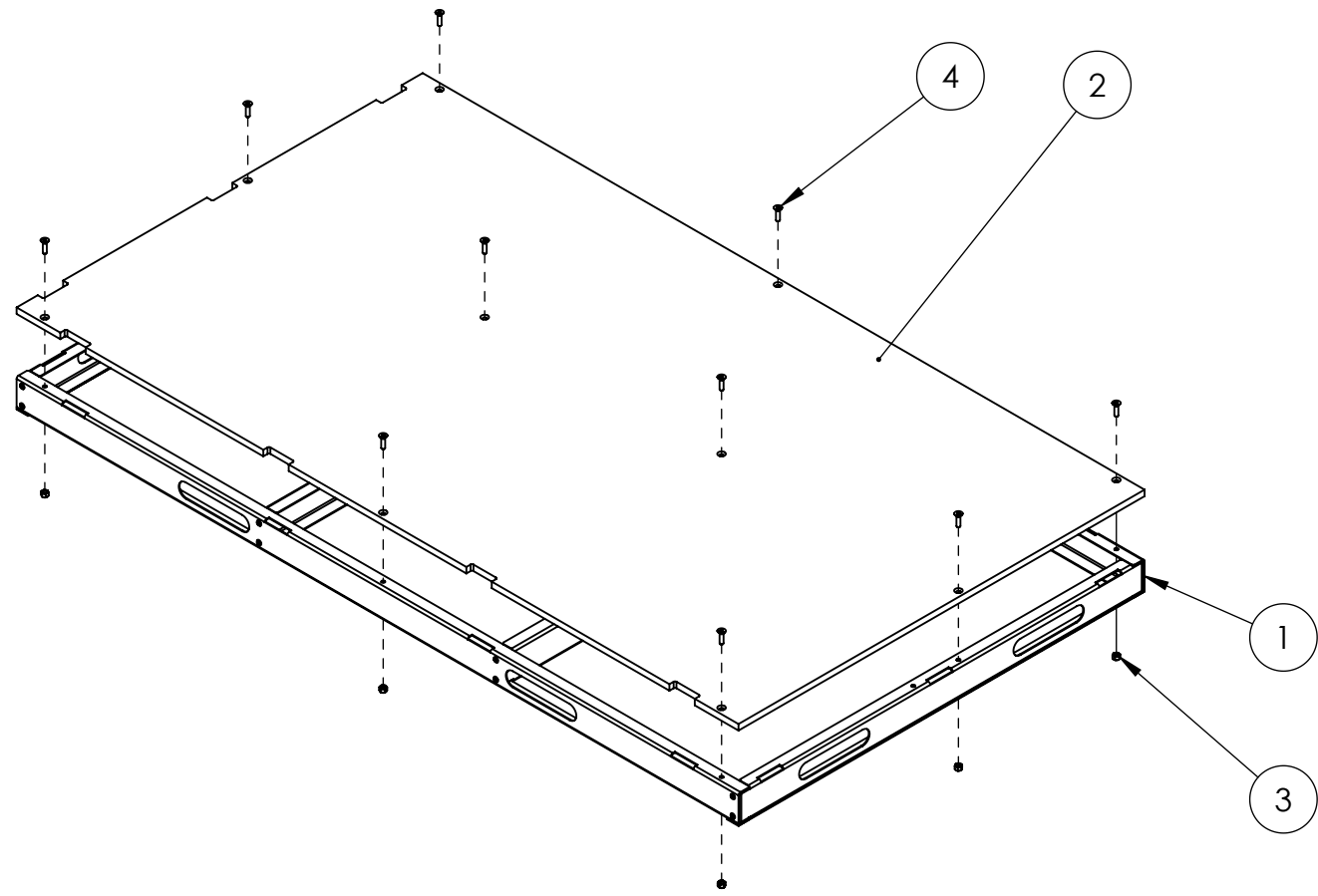
A

4

3



2

1



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

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UNLESS OTHERWISE SPECIFIED:		NAME	DATE	 
DIMENSIONS ARE IN INCHES		DRAWN		
TOLERANCES:		CHECKED		TITLE: <h2 style="text-align: center;">Level 1 - Platform Left</h2>
FRACTIONAL 1/16		ENG APPR.		
ANGULAR: MACH 1° BEND 1°		MFG APPR.		
TWO PLACE DECIMAL .01		Q.A.		SIZE DWG. NO. REV <b>B</b> <b>GE-19067</b>
THREE PLACE DECIMAL .001		COMMENTS:		
INTERPRET GEOMETRIC TOLERANCING PER:				SCALE: 1:12 WEIGHT:
MATERIAL				SHEET 1 OF 2
FINISH				
NEXT ASSY	USED ON			
APPLICATION		DO NOT SCALE DRAWING		

4

3

2

1

B

B

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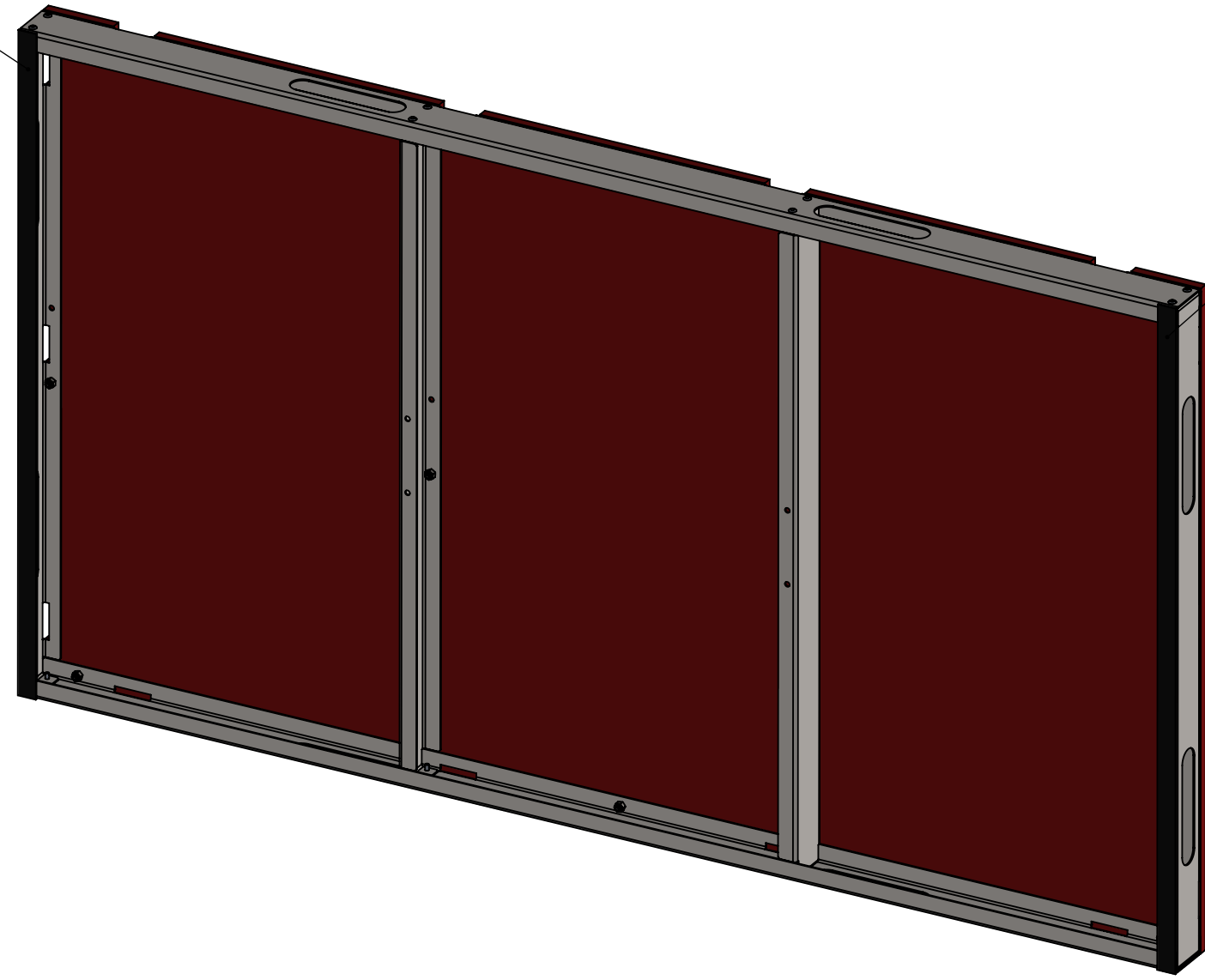
3

2

1

5

5



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

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



TITLE:		
<b>Level 1 - Platform Left</b>		
SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19067</b>	
SCALE: 1:12 WEIGHT:		SHEET 2 OF 2

4

3

2

1

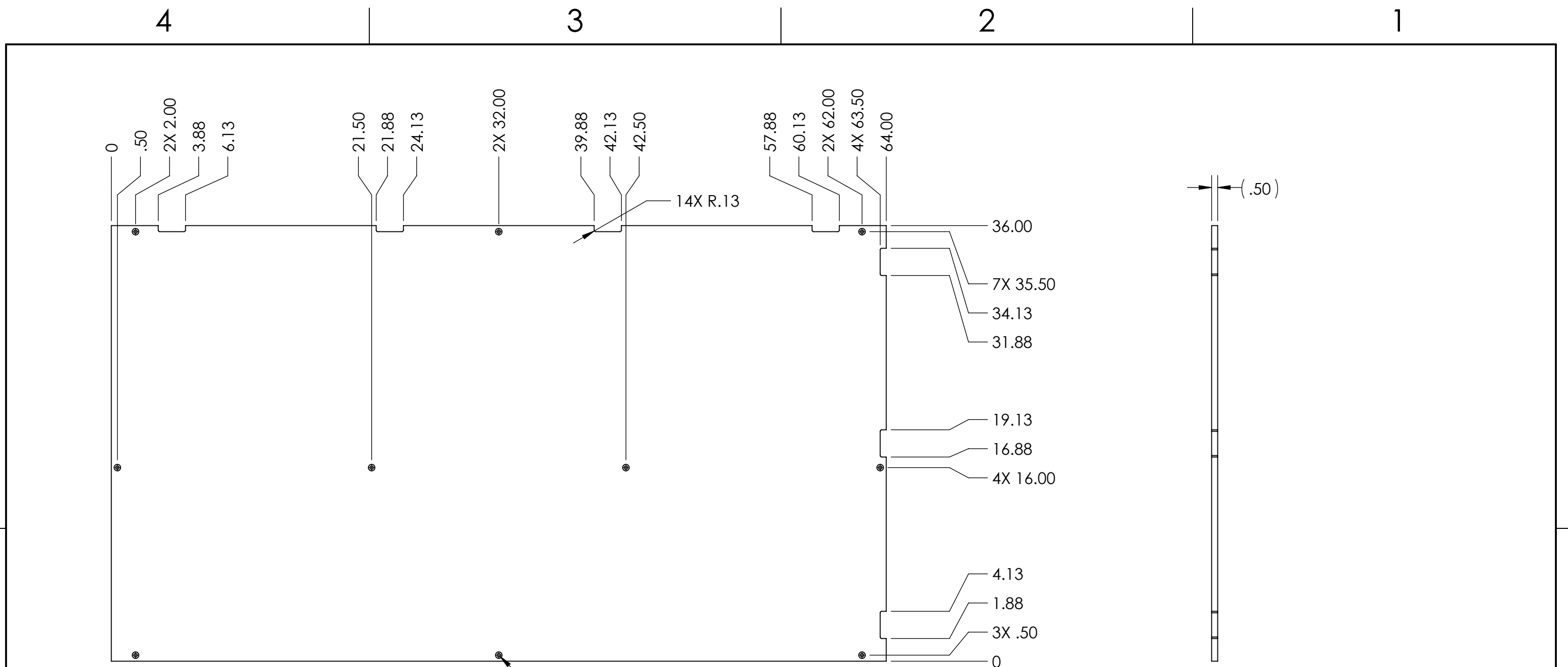
B

B

A

A







10X Ø .28 THRU ALL  
 ✓ Ø .54 X 100°

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

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

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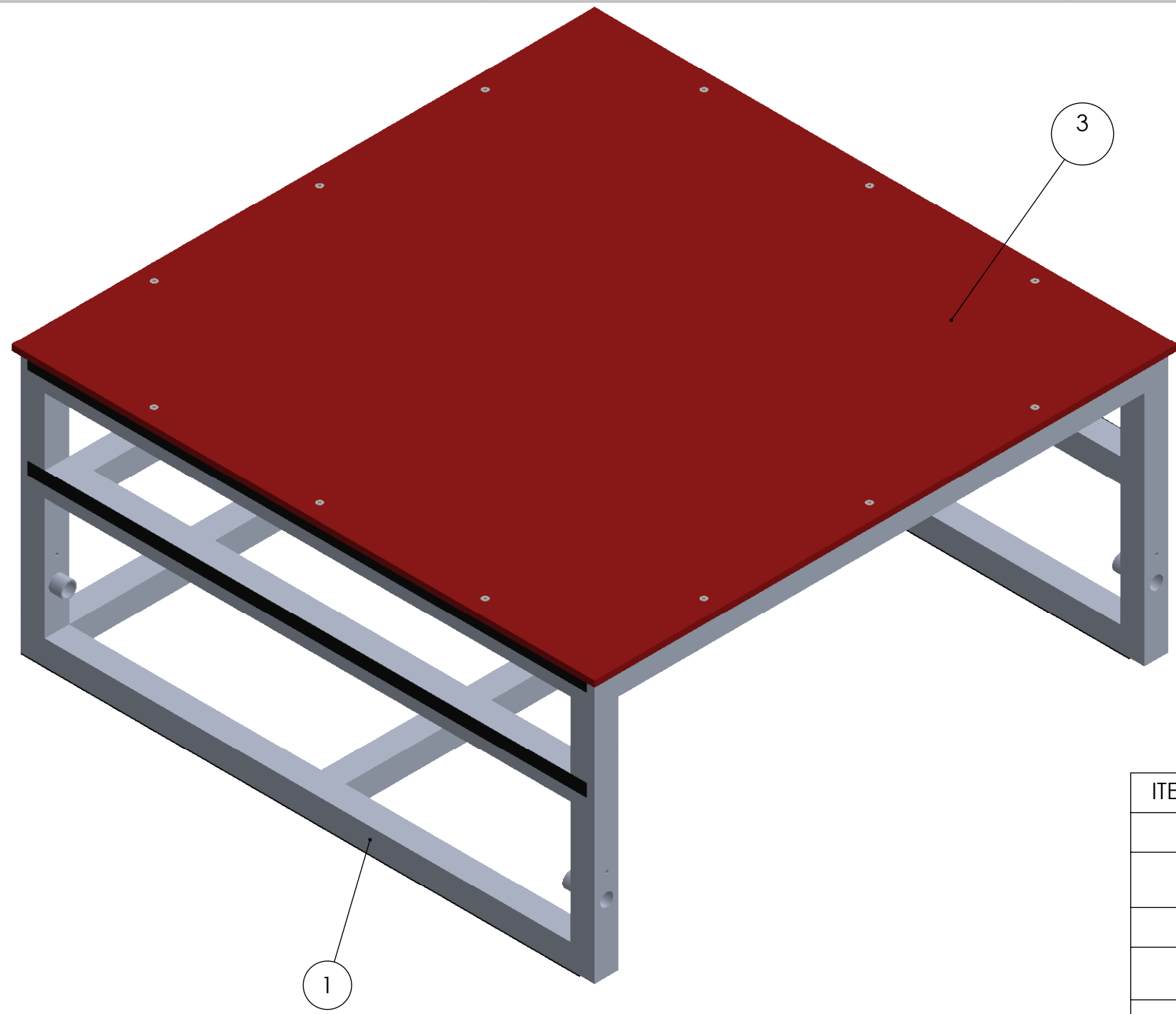
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		INTERPRET GEOMETRIC TOLERANCING PER:	CHECKED			TITLE: <b>Level 1 - Top Left</b>
		MATERIAL	ENG APPR.			
		FINISH	MFG APPR.			
NEXT ASSY	USED ON		Q.A.			SIZE DWG. NO. REV <b>B GE-19068</b>
APPLICATION		DO NOT SCALE DRAWING	COMMENTS:			
						SCALE: 1:8 WEIGHT: SHEET 1 OF 1

4

3

2

1



ITEM NO.	PART NUMBER	DESCRIPTION	Step /QTY.
1	GE-19030	HAB Level 3 Frame	1
2	Flat_Hex_.25-20_3.00	Steel Hex Drive Flat Head Screw 1/4"-20 Thread Size, 3" Long	12
3	GE-19045	HDPE Top Level 3	1
4	Hook_1_46	1" X 46" Hook Fastener, Adhesive Backed	6
5	Hook_2_46	2" X 46" Hook Fastner, Adhesion Backed	2
6	nylock_.25_20	Steel Nylon-Insert Locknut, 1/4"-20	12

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

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

TITLE:  
**Hab 3 Fastener Assembly**

SIZE **B** DWG. NO. **GE-19069** REV

SCALE: 1:8 WEIGHT: SHEET 1 OF 3

4

3

2

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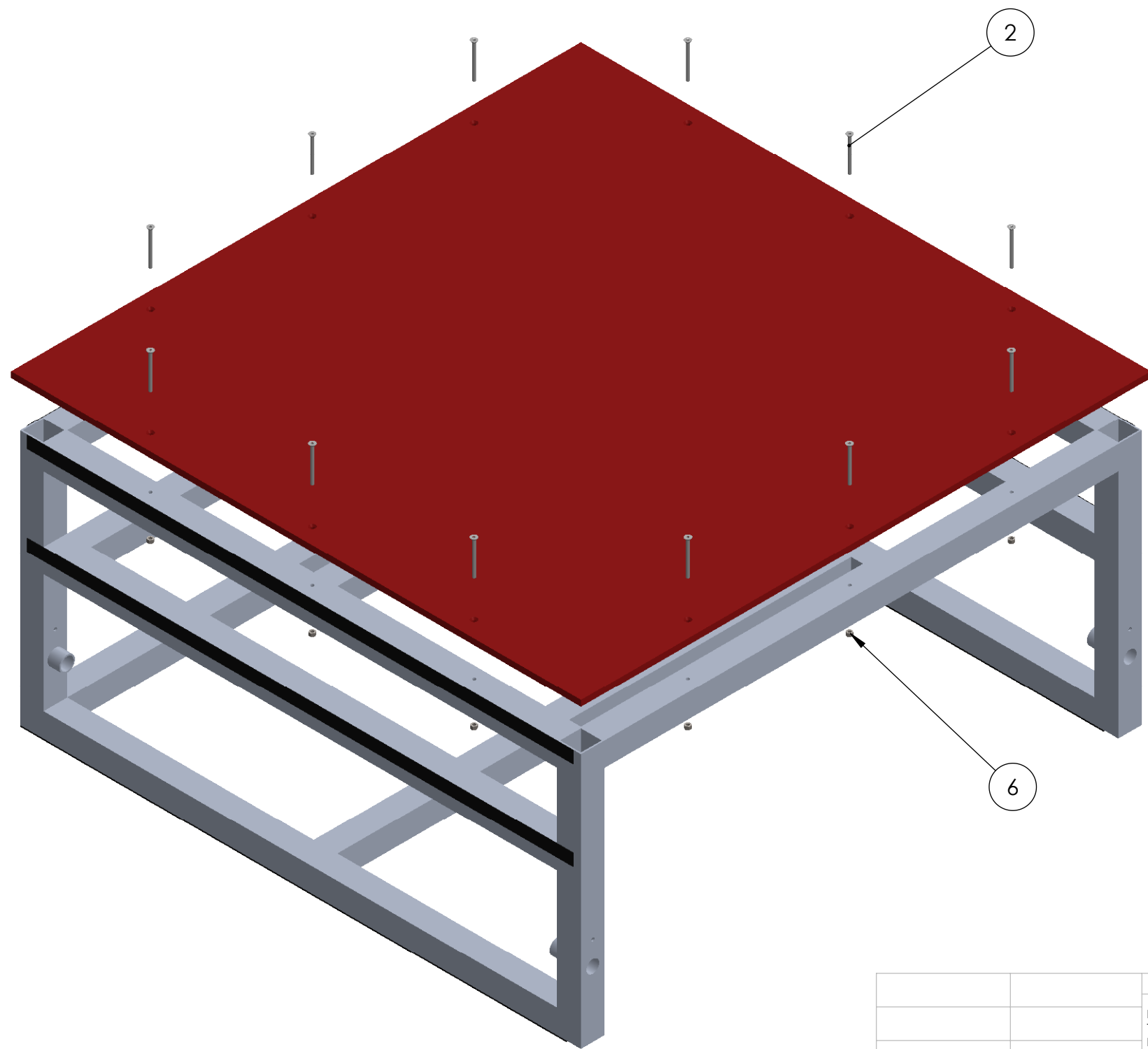
1

B

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		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		



TITLE:		
<b>Hab 3 Fastener Assembly</b>		
SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19069</b>	
SCALE: 1:8	WEIGHT:	SHEET 2 OF 3

4

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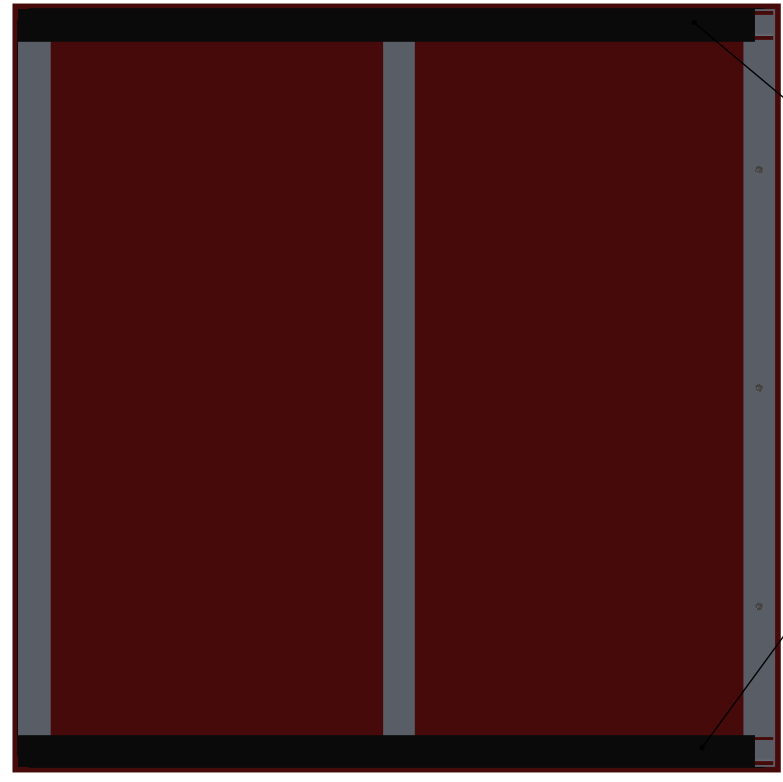
1



4  
Mirror on opposite side



4



5

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



TITLE:  
**Hab 3 Fastener Assembly**

SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19069</b>	

SCALE: 1:16 WEIGHT: SHEET 3 OF 3

4

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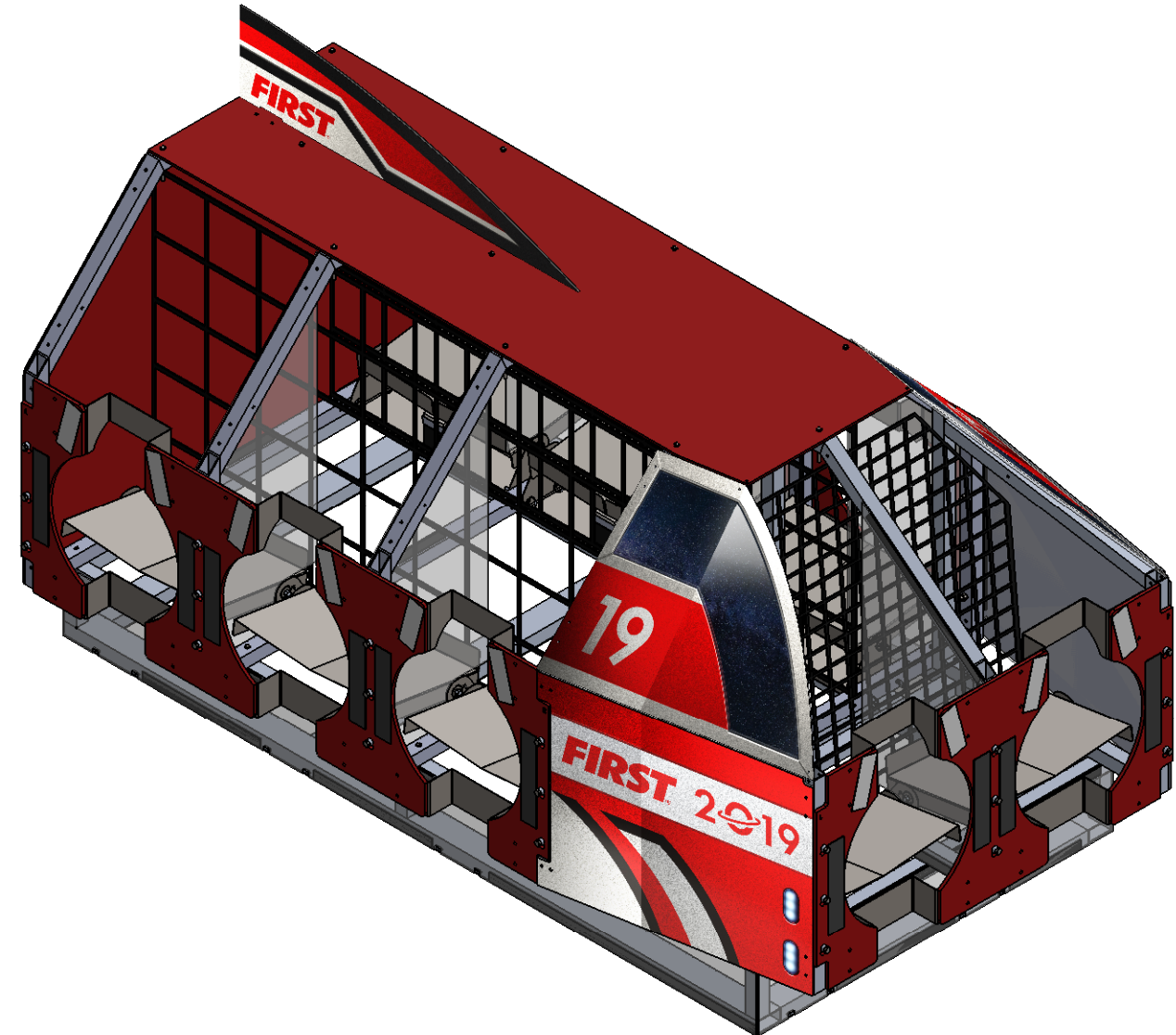
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-19026	Keyhole Insert	8
2	GE-19071-Assembly	Cargo Ship Base, with Hook	1
3	GE-19072-Assembly	Cargo Ship Main Frame	4
4	GE-19074-Assembly	Cargo Ship Frame Front	1
5	GE-19075	Cargo Ship Nose Side	2
6	GE-19078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



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

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REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
6-A2	A	Updated note on mounting cargo nets to address additional needs for diamond configuration of Cargo Net Side	2/14/2019	CPO



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

TITLE:  
**Cargo Ship Full Assembly**

SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19070</b>	<b>A</b>
SCALE: 1:16 WEIGHT:		SHEET 1 OF 8

4

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4

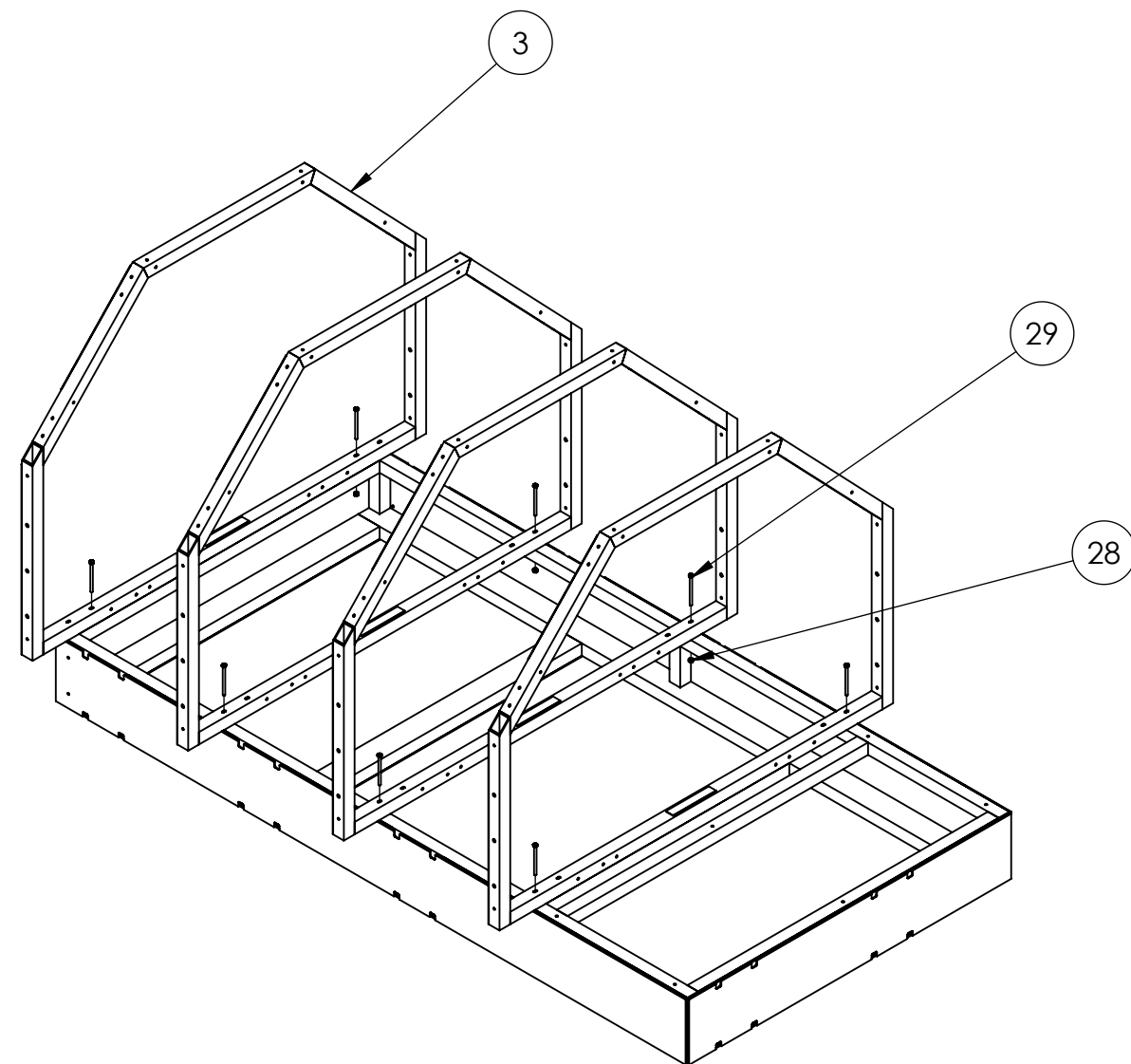
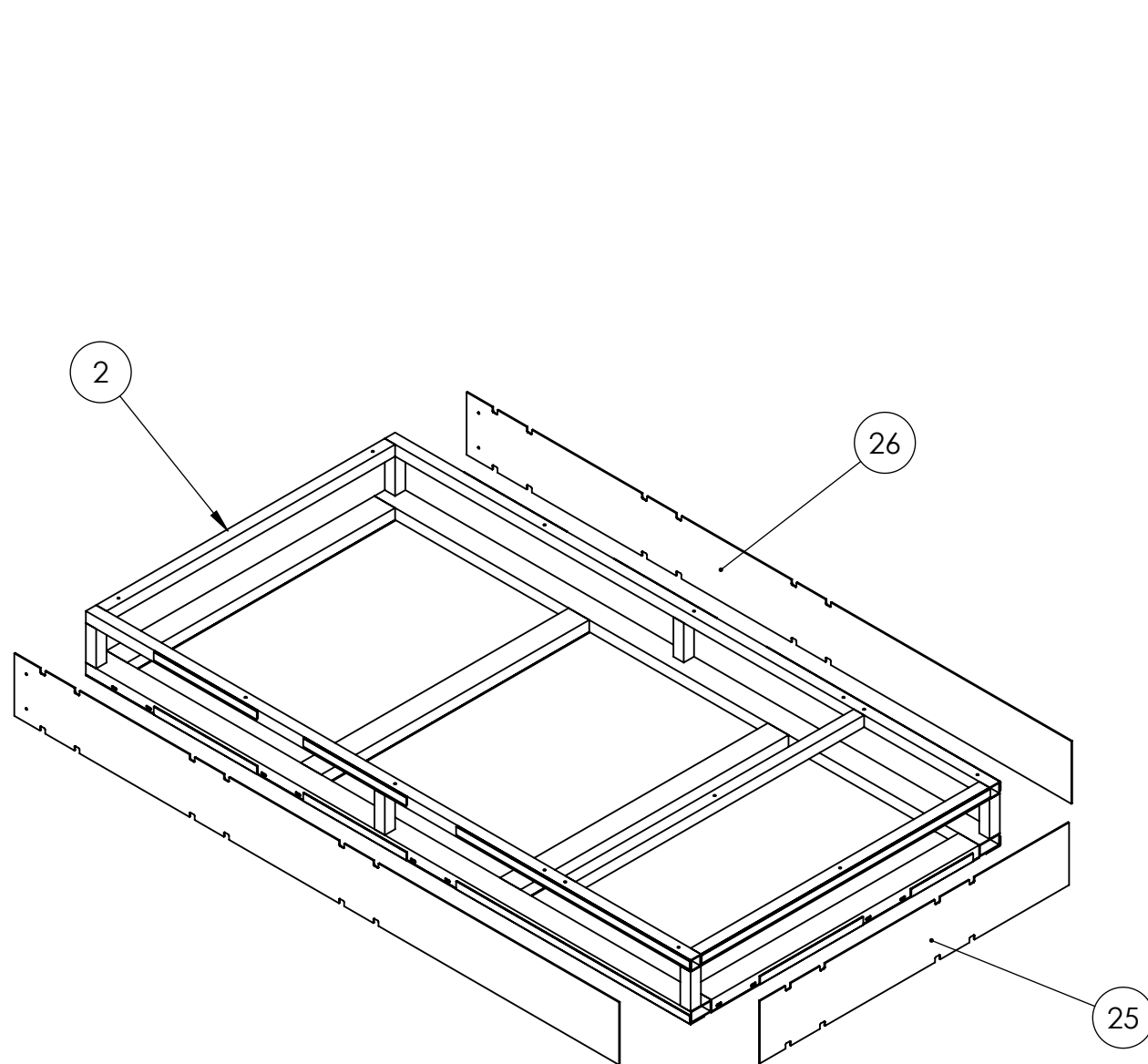
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2

1

B



B



A

A

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		INTERPRET GEOMETRIC TOLERANCING PER:	CHECKED		TITLE: <h3>Cargo Ship Full Assembly</h3>
		MATERIAL	ENG APPR.		
NEXT ASSY	USED ON	FINISH	MFG APPR.		SIZE <b>B</b> DWG. NO. <b>GE-19070</b> REV <b>A</b>
APPLICATION		DO NOT SCALE DRAWING	Q.A.		SCALE: 1:18 WEIGHT:
			COMMENTS:		SHEET 2 OF 8

4

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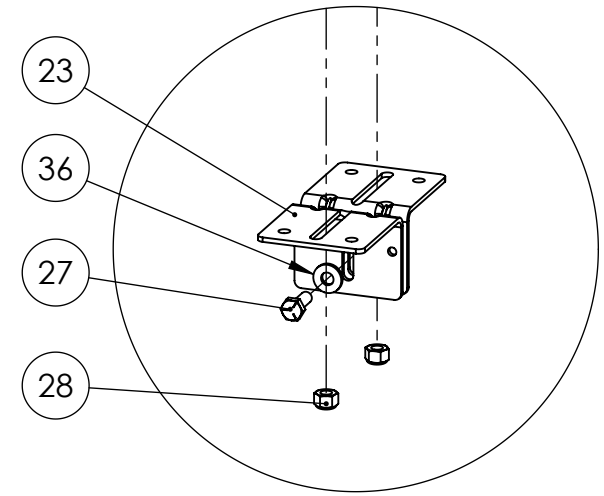
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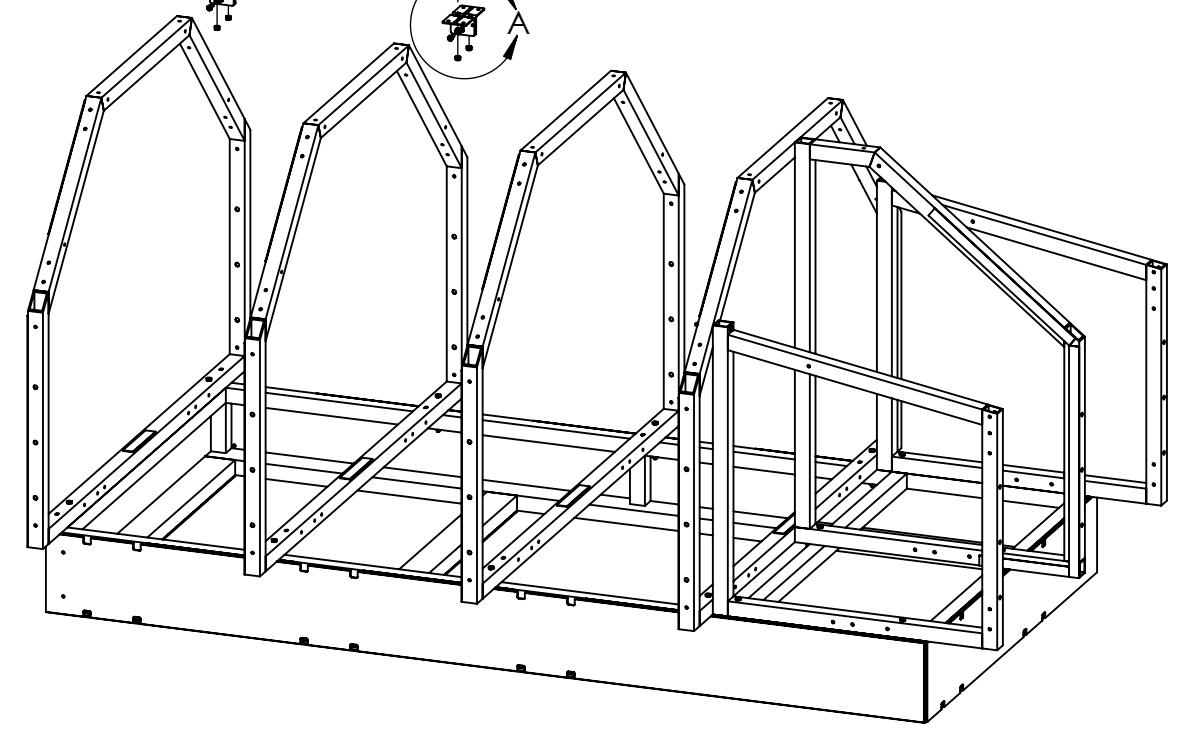
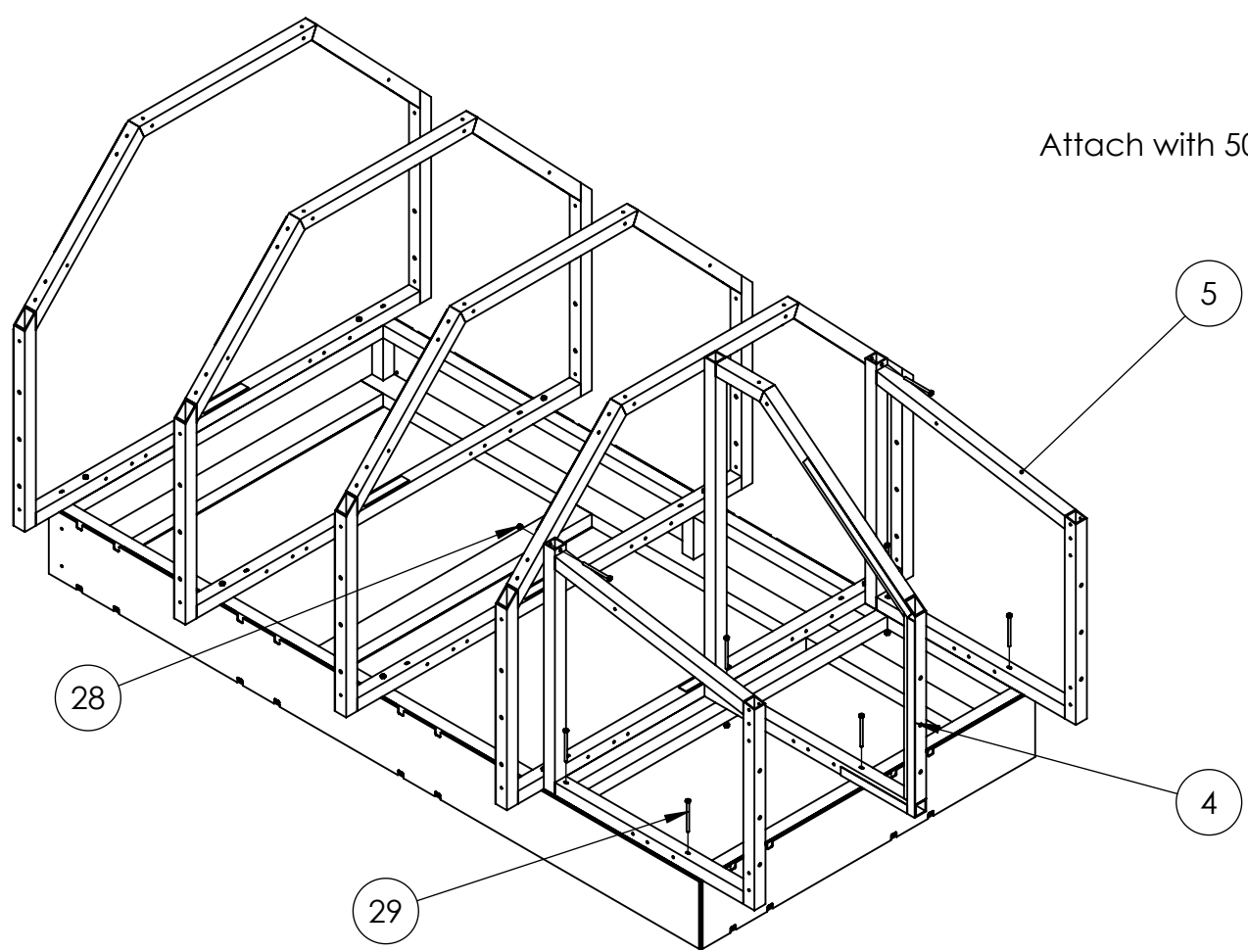
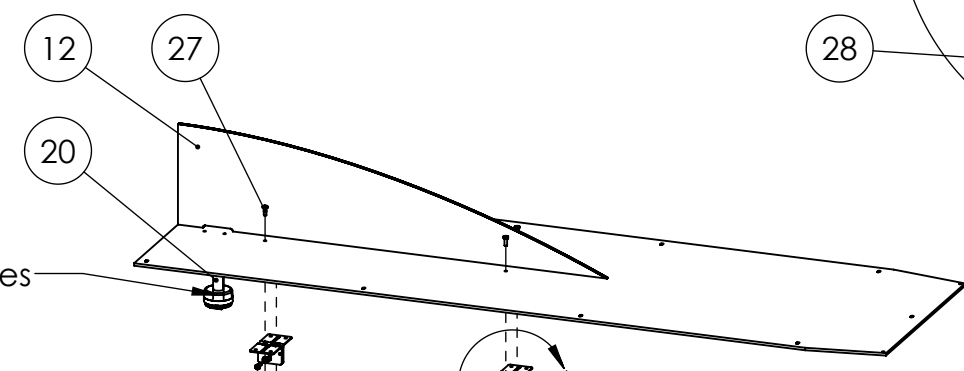
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2

1



DETAIL A  
SCALE 1 : 4



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

TITLE: <b>Cargo Ship Full Assembly</b>		
SIZE <b>B</b>	DWG. NO. <b>GE-19070</b>	REV <b>A</b>
SCALE: 1:18 WEIGHT:		SHEET 3 OF 8

4

3

2

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B

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A

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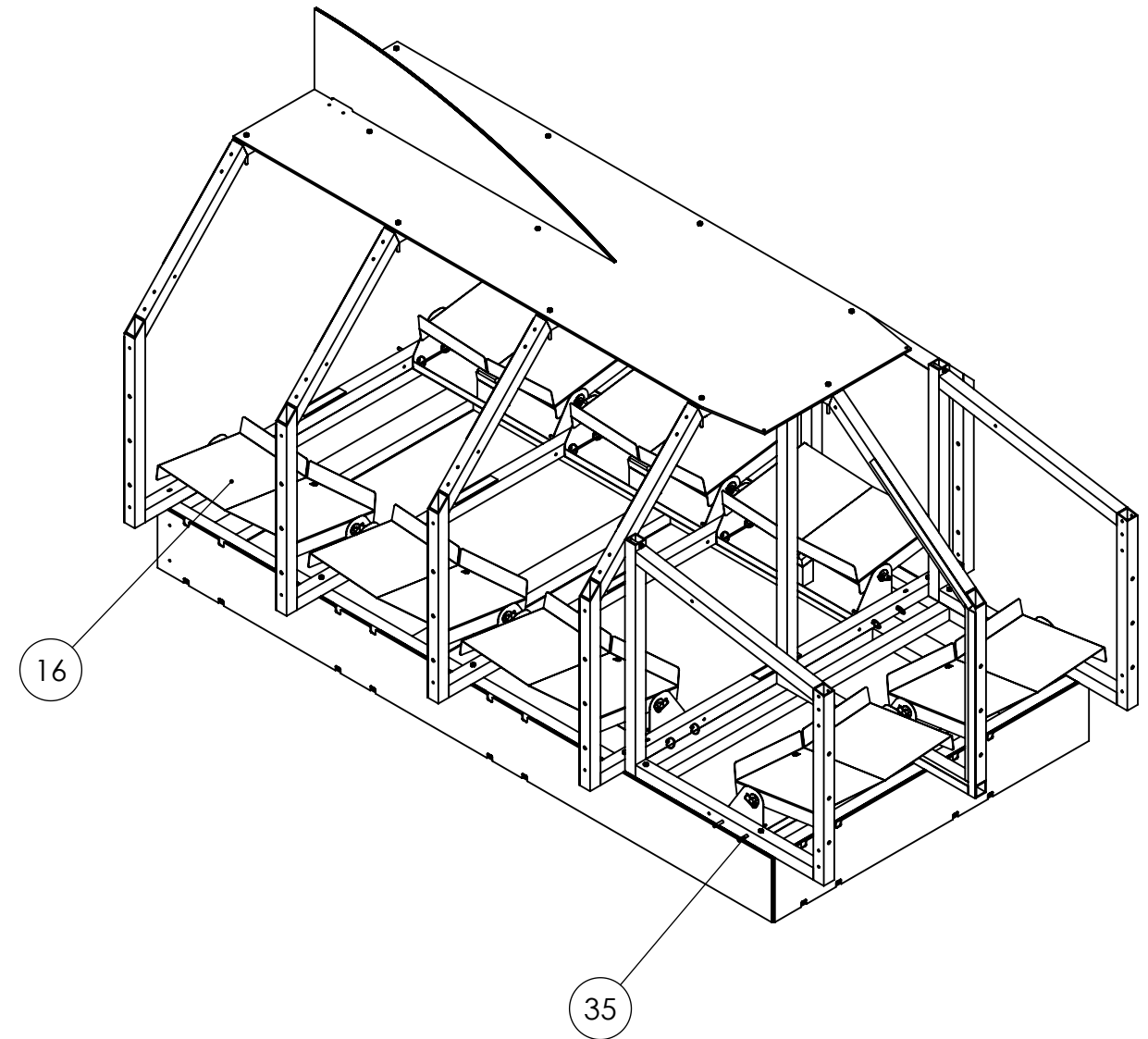
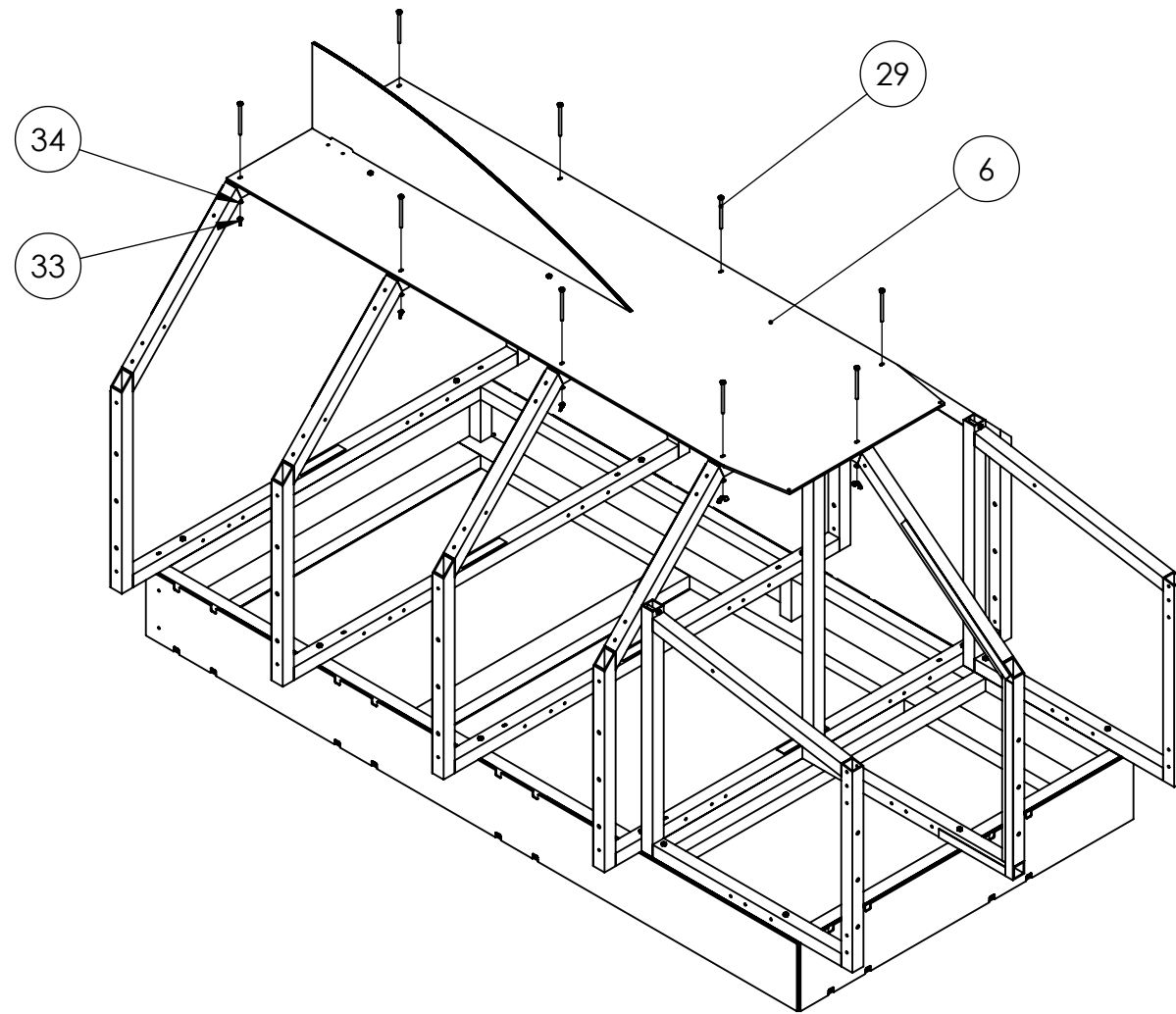
3

2

1

B

B





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

A

A

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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	
		INTERPRET GEOMETRIC TOLERANCING PER:		CHECKED	
		MATERIAL		ENG APPR.	
		FINISH		MFG APPR.	
NEXT ASSY	USED ON			Q.A.	
APPLICATION		DO NOT SCALE DRAWING		COMMENTS:	
 					
TITLE: <b>Cargo Ship Full Assembly</b>					
SIZE	DWG. NO.			REV	
<b>B</b>	<b>GE-19070</b>			<b>A</b>	
SCALE: 1:18 WEIGHT:				SHEET 4 OF 8	

4

3

2

1



4

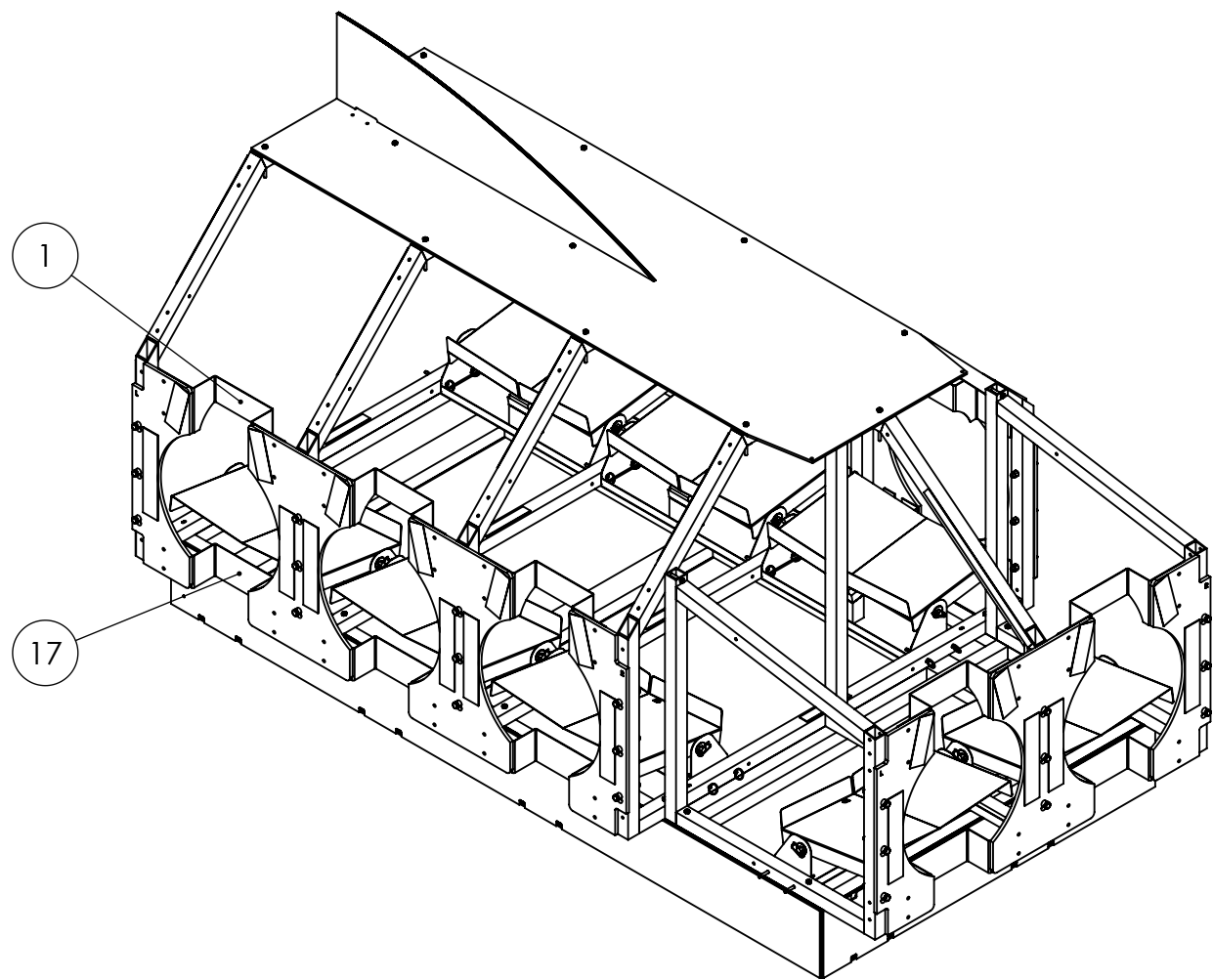
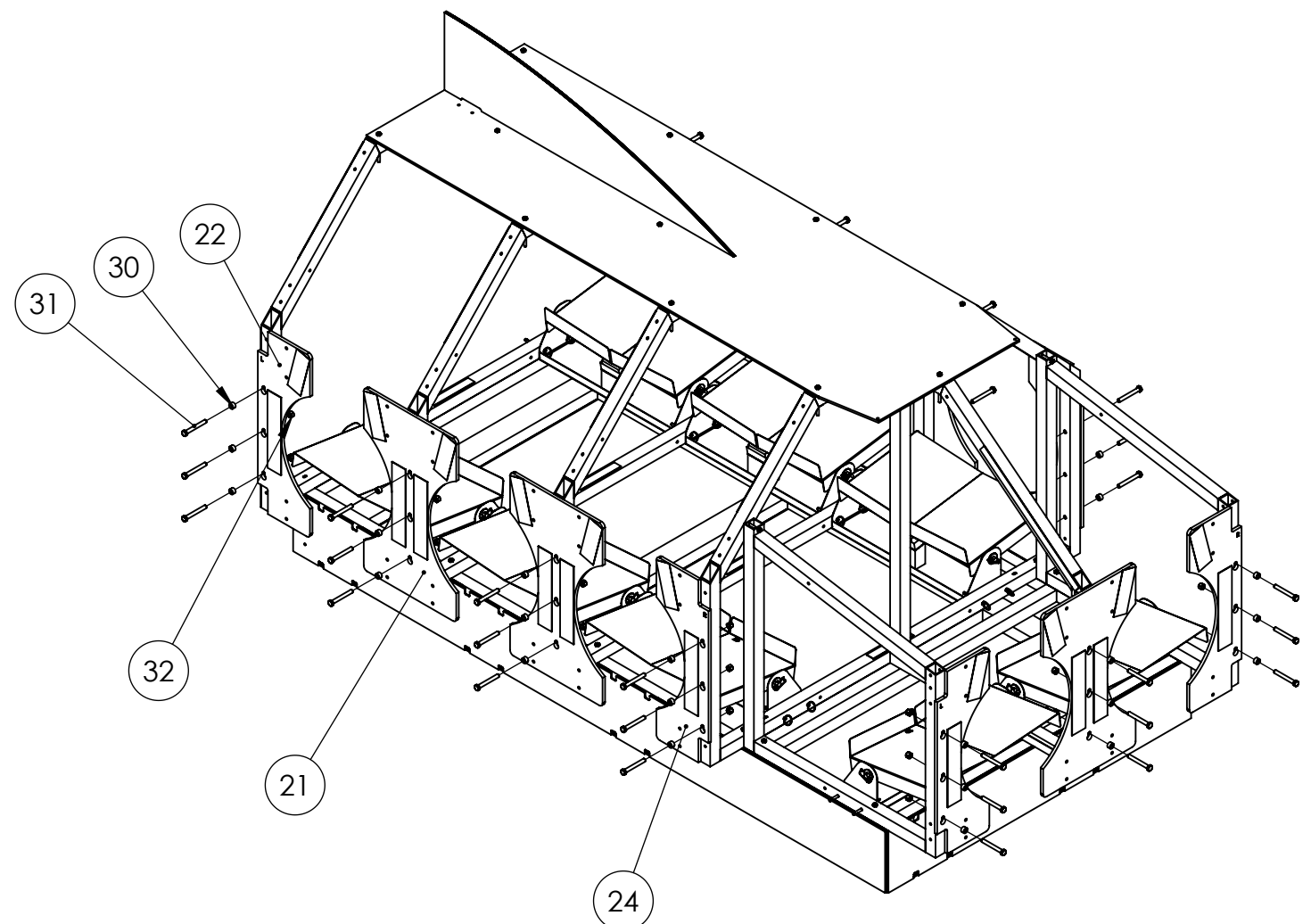
3

2

1

B

B





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

A

A

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		UNLESS OTHERWISE SPECIFIED:	NAME	DATE	 
		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$	DRAWN		
		INTERPRET GEOMETRIC TOLERANCING PER:	CHECKED		TITLE:
		MATERIAL	ENG APPR.		<b>Cargo Ship Full Assembly</b>
		FINISH	MFG APPR.		SIZE DWG. NO. REV
NEXT ASSY	USED ON		Q.A.		<b>B GE-19070 A</b>
APPLICATION		DO NOT SCALE DRAWING	COMMENTS:		SCALE: 1:18 WEIGHT: SHEET 5 OF 8

4

3

2

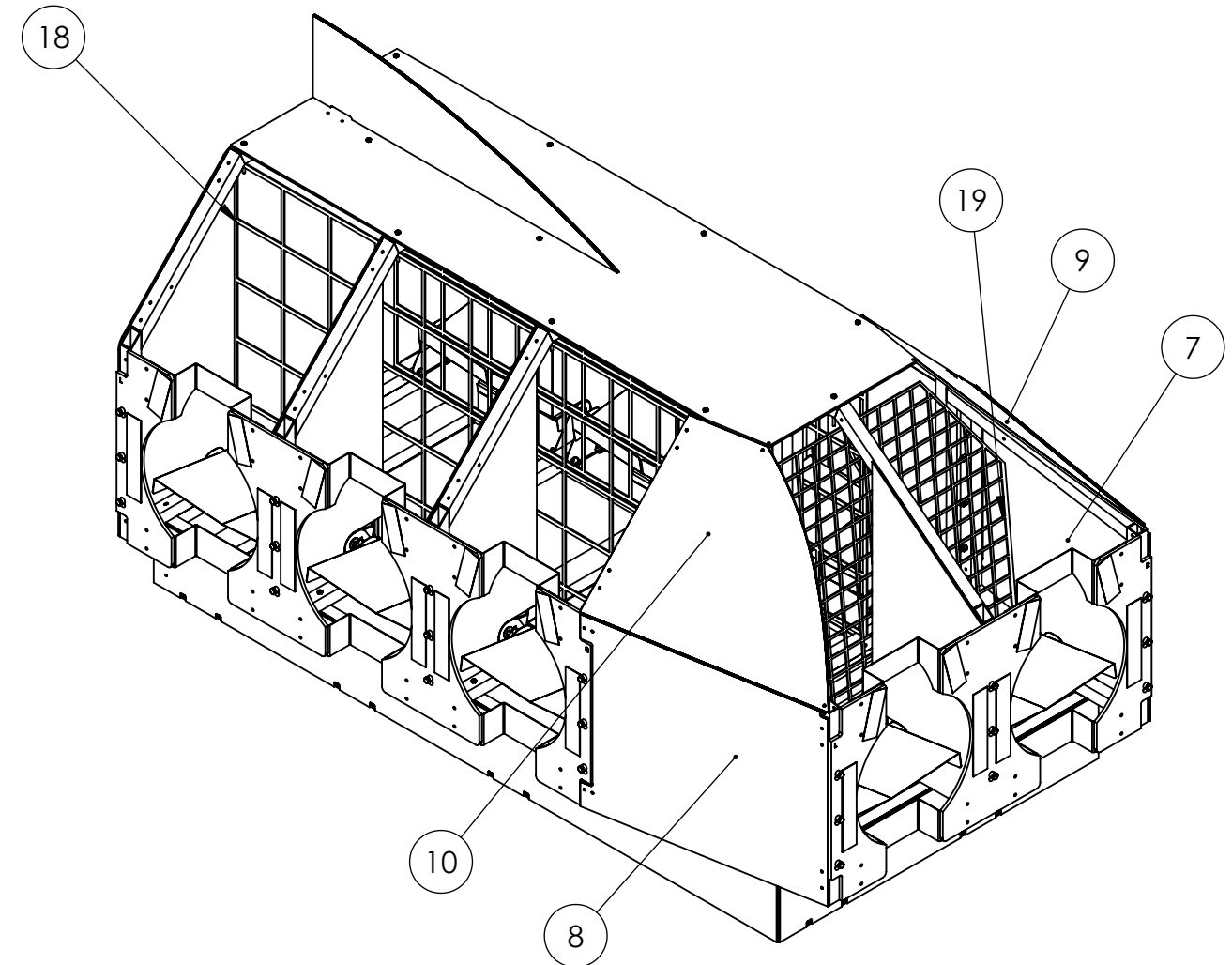
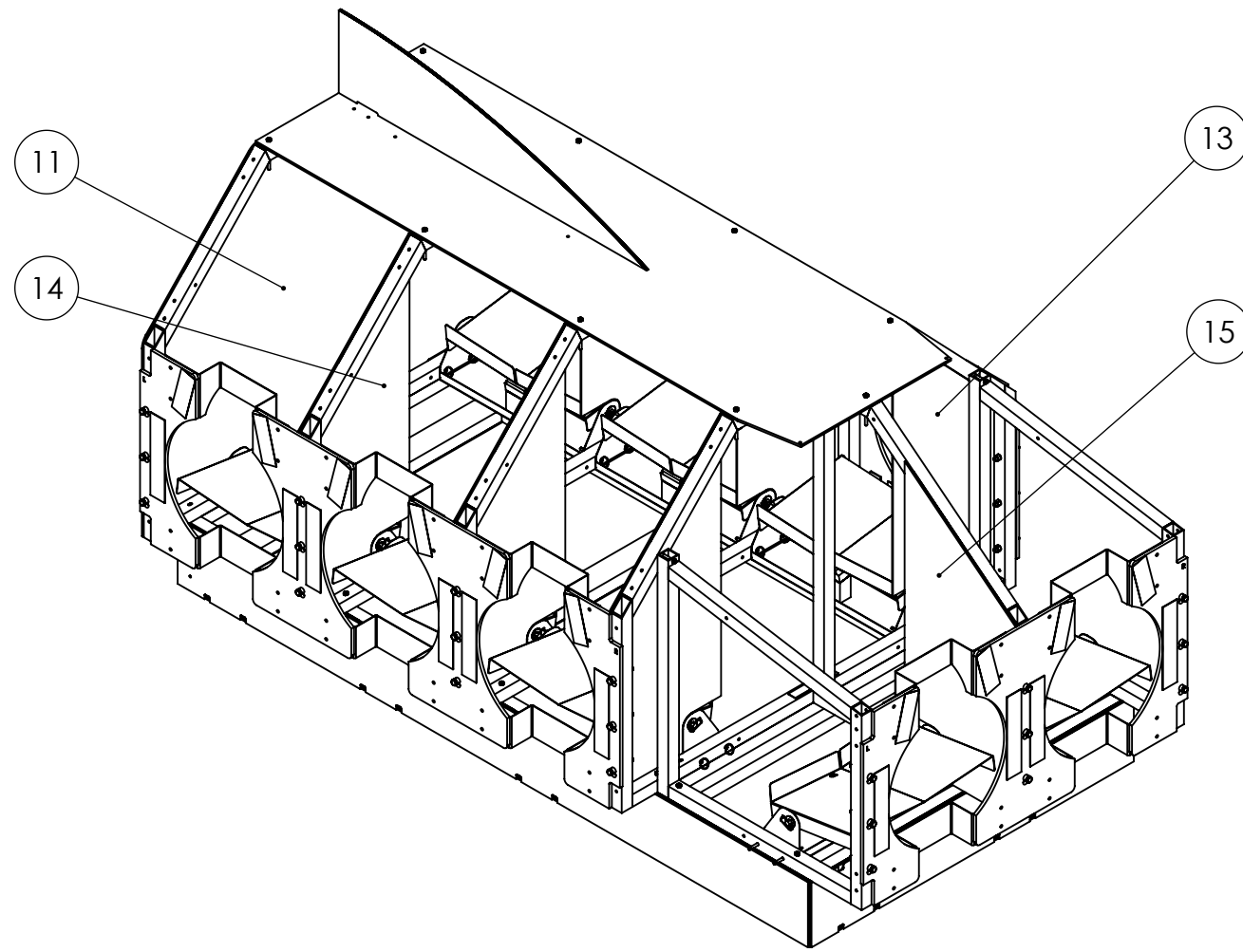
1

4

3

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1





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

Notes:  
 Attach Items 7, 8, 9 and 10 using 50-lb cable ties. Attach nets using 50-lb cable ties. If using side nets with diamond pattern, also use 18" bungee cords to secure edges.

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

TITLE:

# Cargo Ship Full Assembly

SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19070</b>	<b>A</b>
SCALE: 1:18 WEIGHT:		SHEET 6 OF 8

4

3

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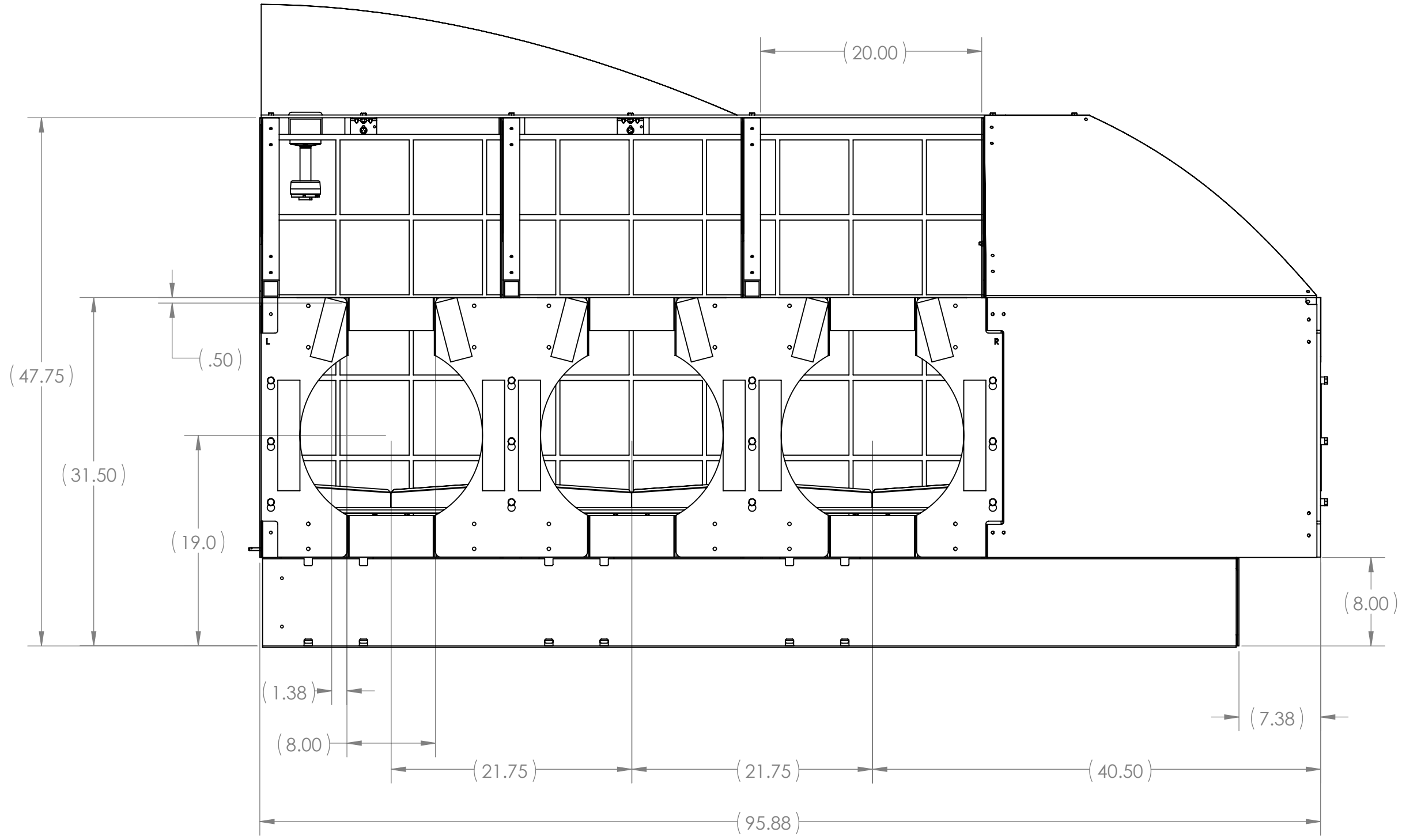
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DIMENSIONS ARE IN INCHES		DRAWN	
TOLERANCES:		CHECKED	
FRACTIONAL ±1/16		ENG APPR.	
ANGULAR: MACH ±1° BEND ±1°		MFG APPR.	
TWO PLACE DECIMAL ±.01		Q.A.	
THREE PLACE DECIMAL ±.001		COMMENTS:	
INTERPRET GEOMETRIC TOLERANCING PER:			
MATERIAL			
FINISH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

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

TITLE:  
**Cargo Ship Full Assembly**

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

SCALE: 1:10 WEIGHT: SHEET 7 OF 8

4

3

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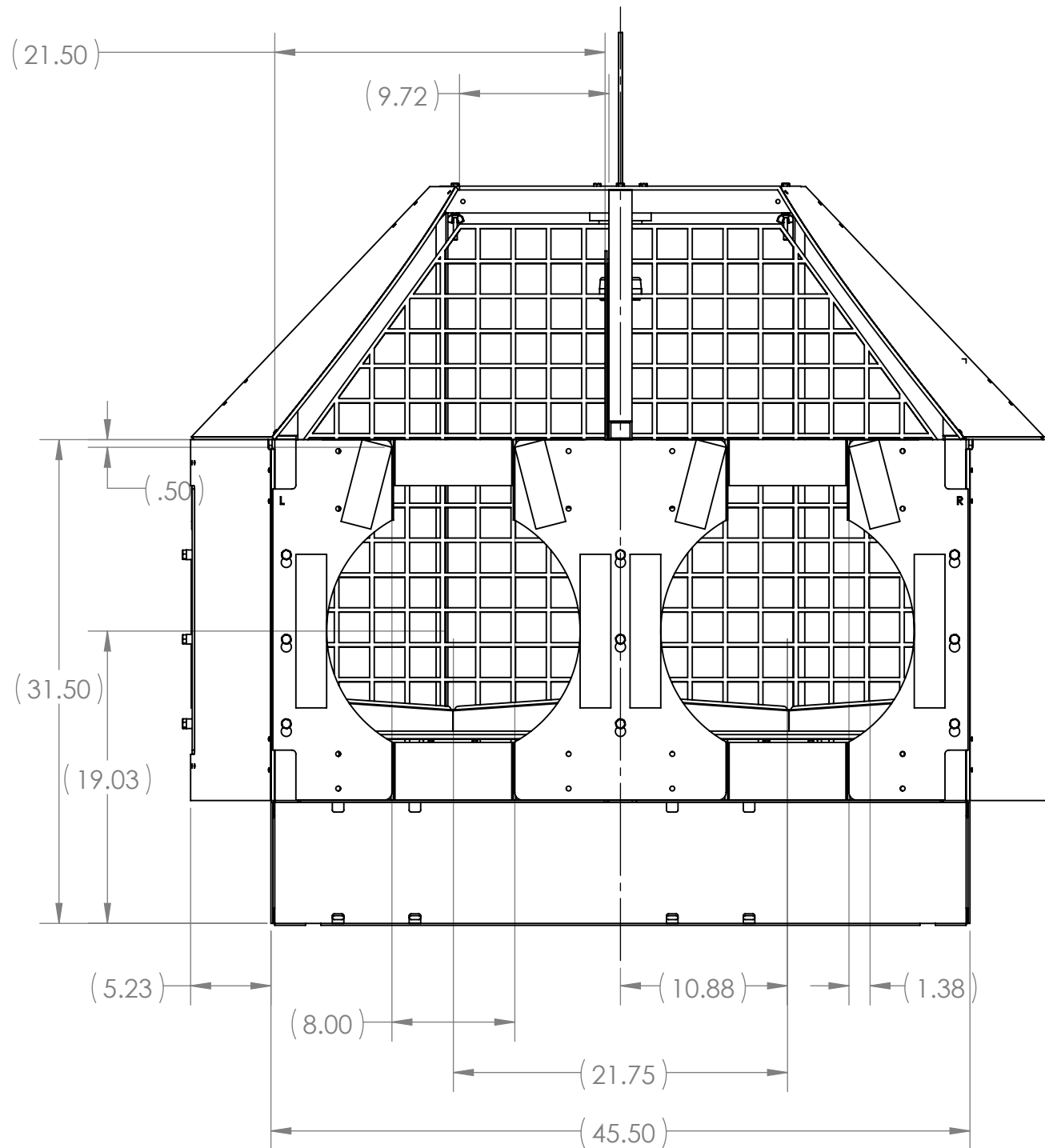
1

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B

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1

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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		



TITLE:		
<b>Cargo Ship Full Assembly</b>		
SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19070</b>	<b>A</b>
SCALE: 1:10 WEIGHT:		SHEET 8 OF 8

4

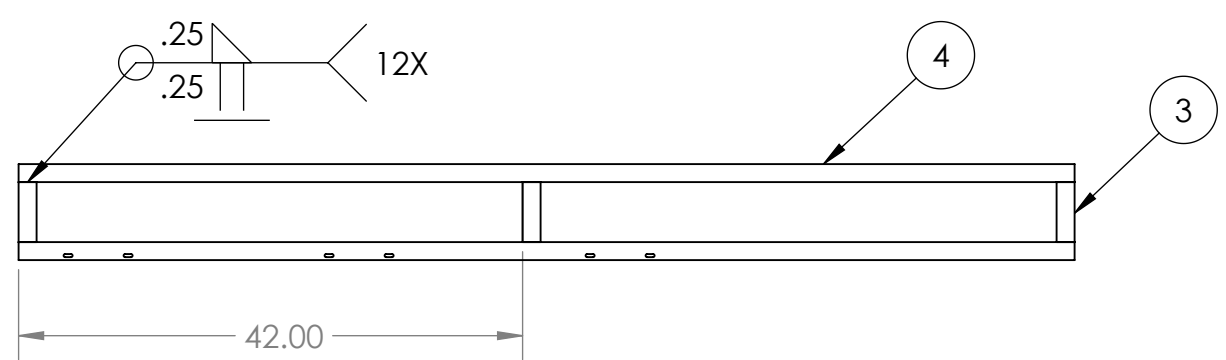
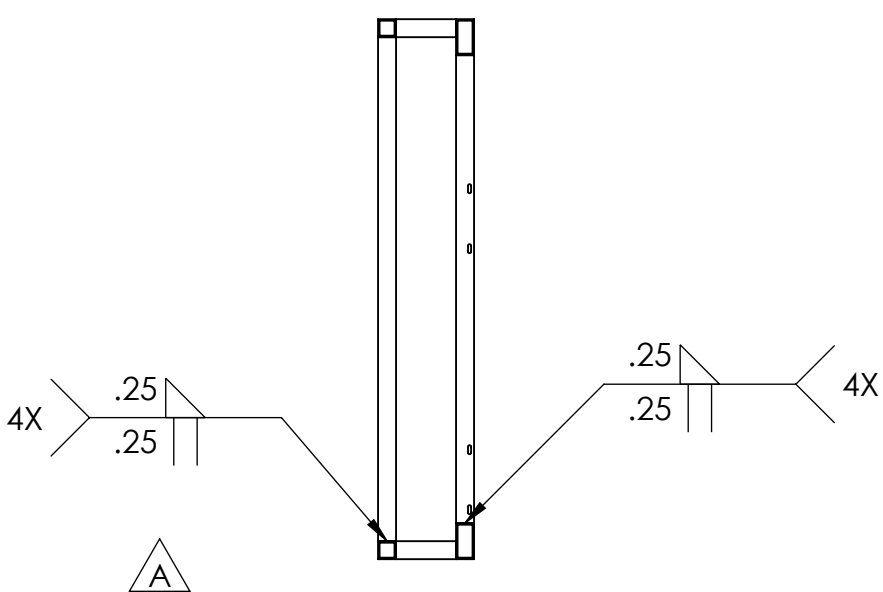
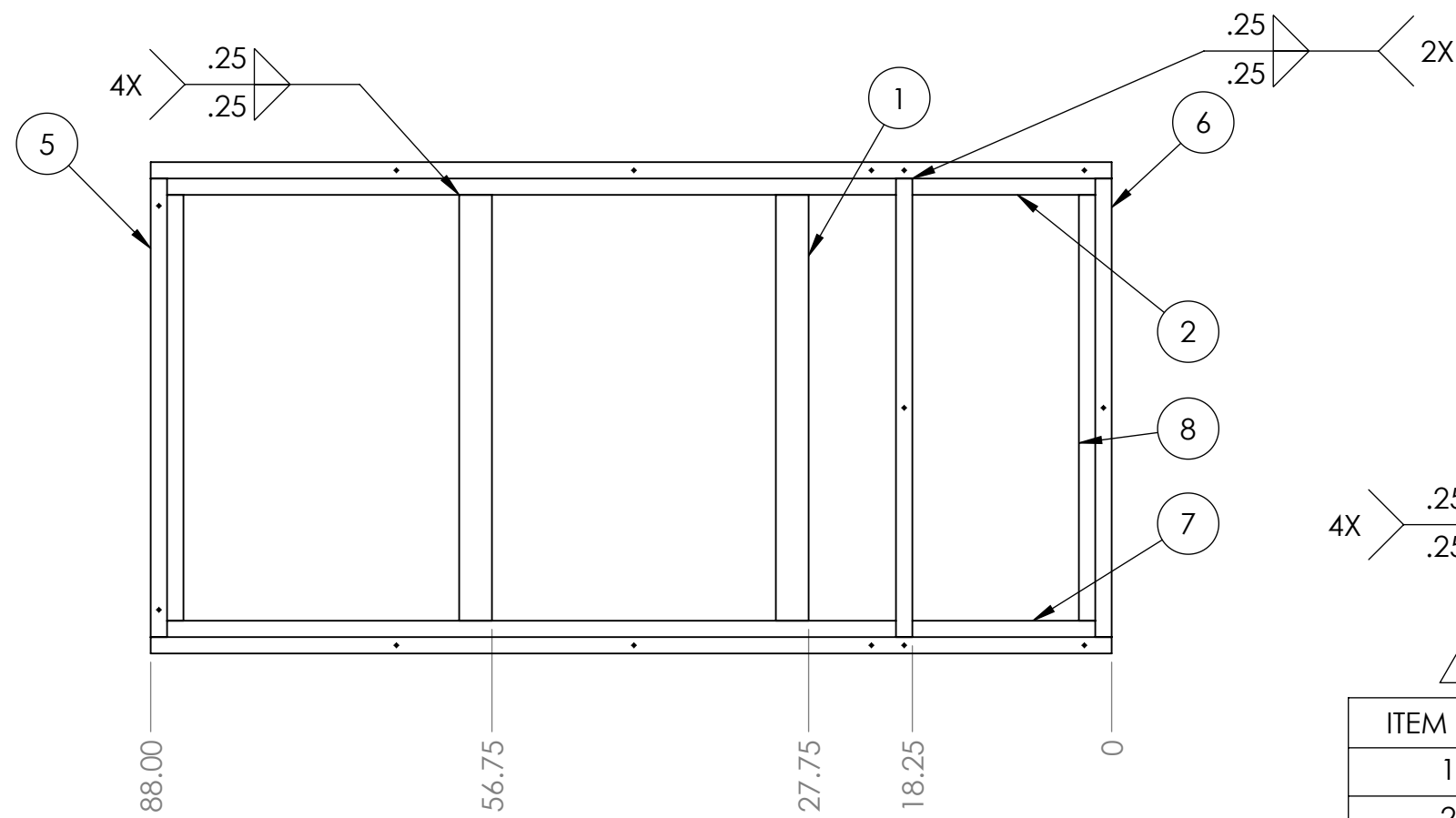
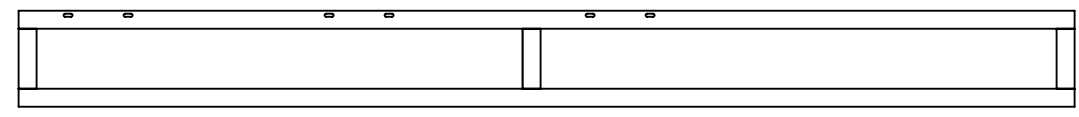
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2

1

REVISIONS

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



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

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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		



TITLE:  
**Cargo Ship Base**

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

SCALE: 1:16 WEIGHT: SHEET 1 OF 3

4

3

2

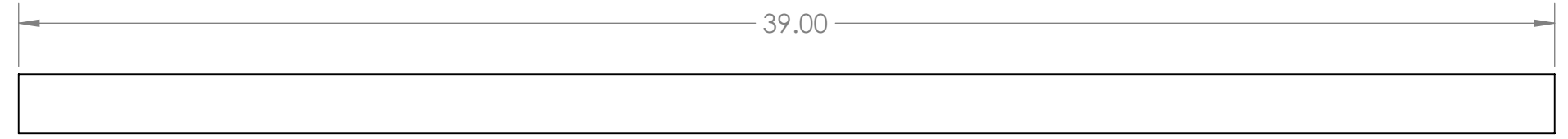
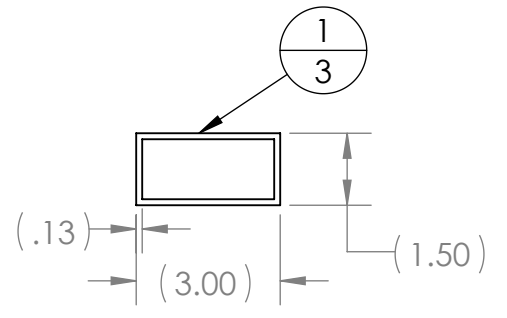
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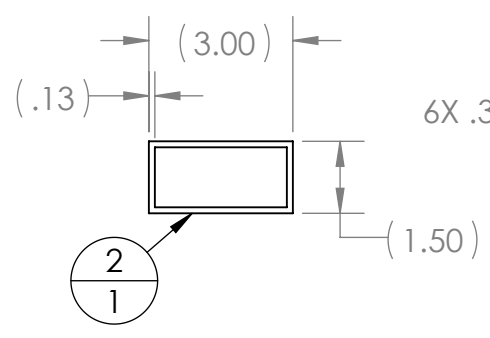
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2

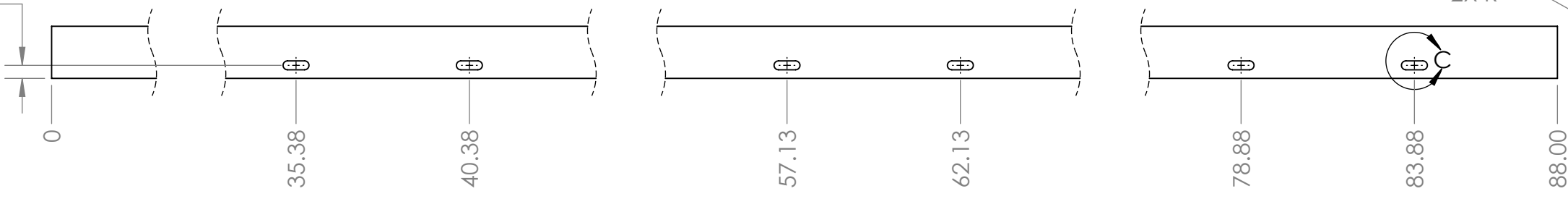
1



B



6X .38



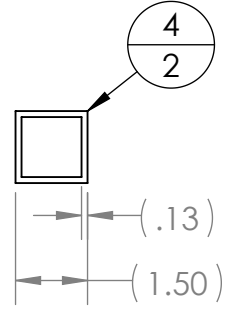
6X .26 X .75 THRU ONE WALL

2X R

DETAIL C  
SCALE 1 : 2

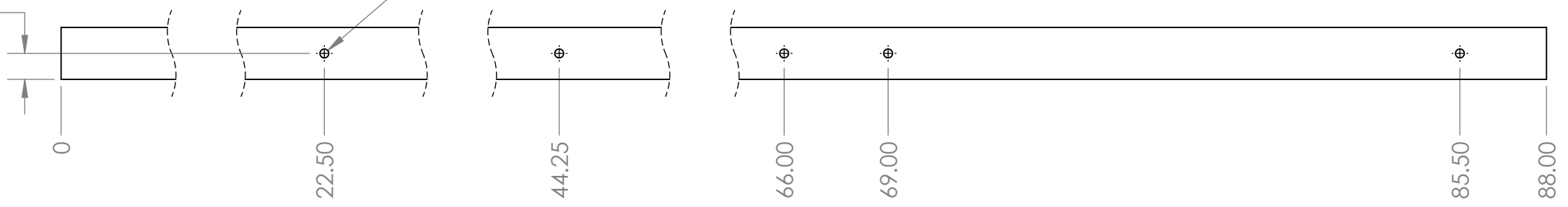
B

4/2

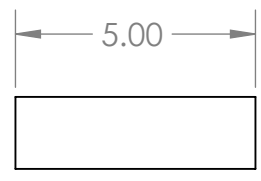
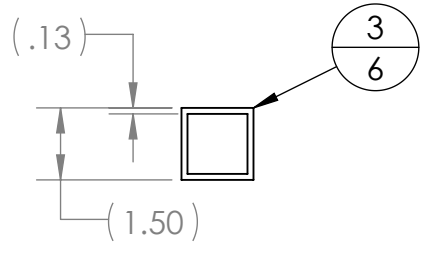


5X .75

5X Ø .26 THRU



A



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



TITLE:  
**Cargo Ship Base**

SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19071</b>	<b>B</b>

SCALE: 1:16 WEIGHT: SHEET 2 OF 3

4

3

2

1

A

4

3

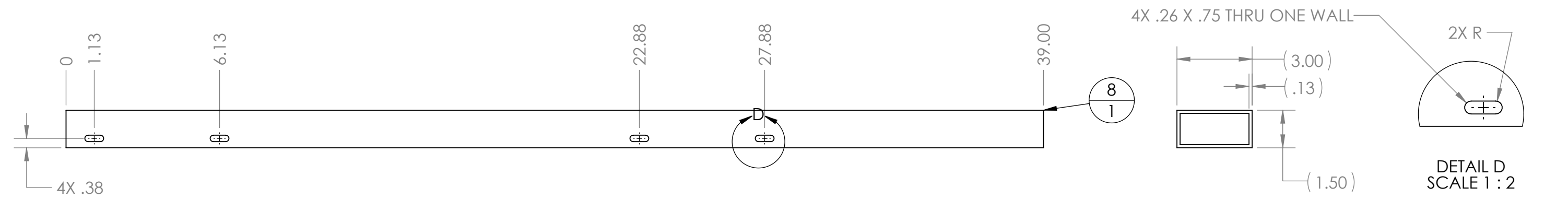
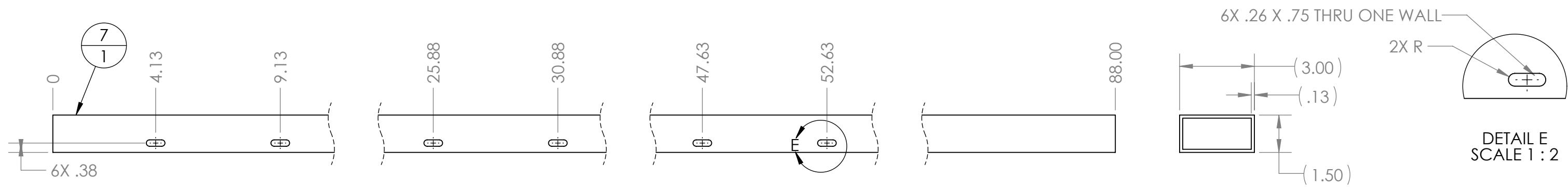
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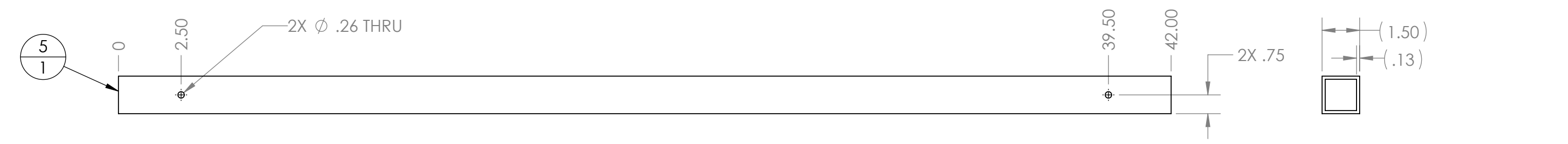
B

B



A

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		
		FINISH		
NEXT ASSY	USED ON			
APPLICATION		DO NOT SCALE DRAWING		

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

TITLE:  
**Cargo Ship Base**

SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19071</b>	<b>B</b>

SCALE: 1:16 WEIGHT: SHEET 3 OF 3

4

3

2

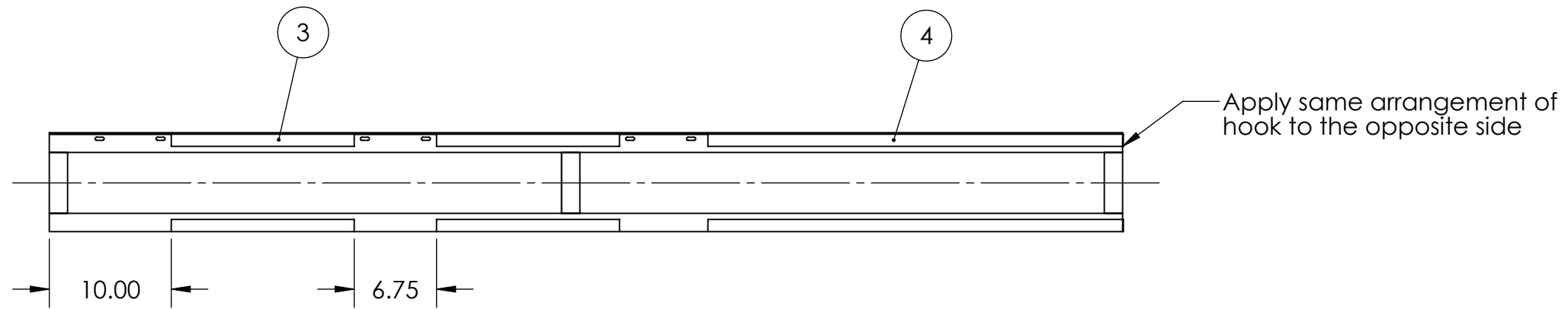
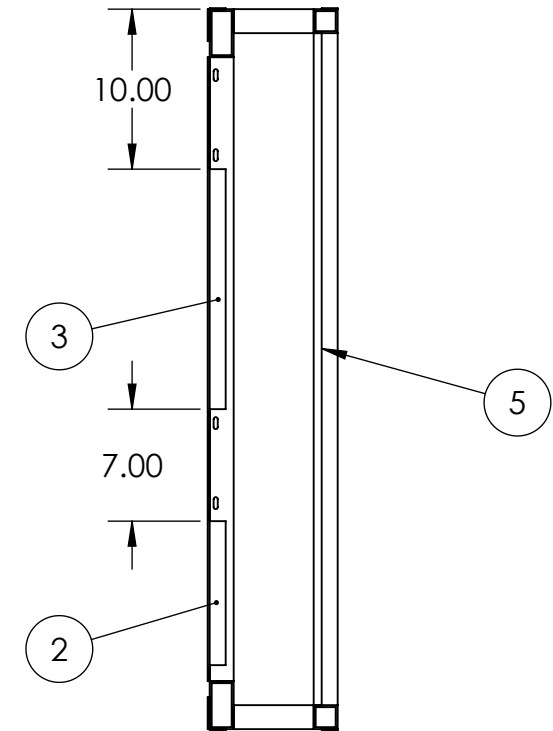
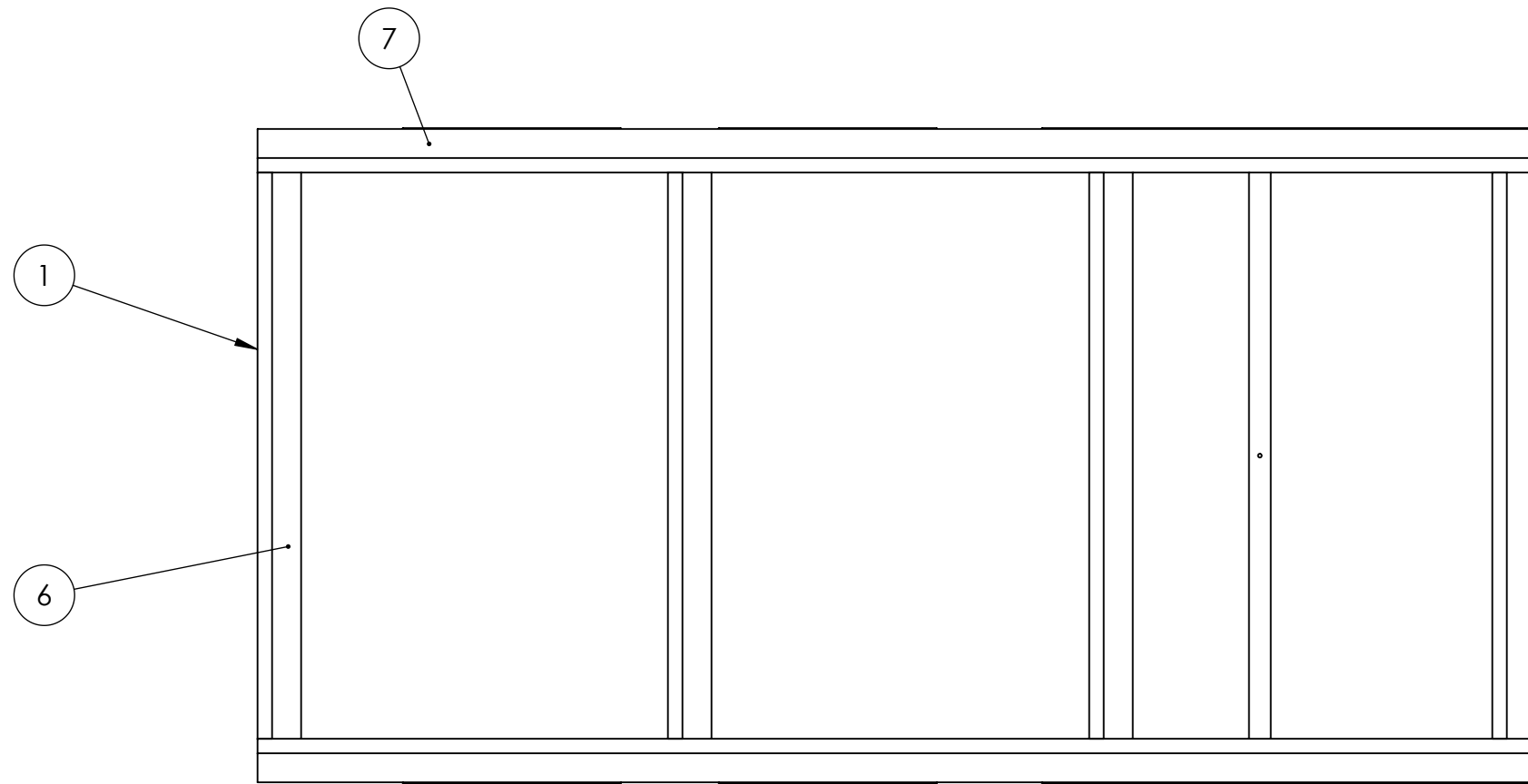
1

4

3

2

1



A

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

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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			



TITLE:		
<b>GE-19071, with Hook</b>		
SIZE	DWG. NO.	REV
<b>B</b>	GE-19071-Assembly	
SCALE: 1:12 WEIGHT:		SHEET 1 OF 1

4

3

2

1

B

A

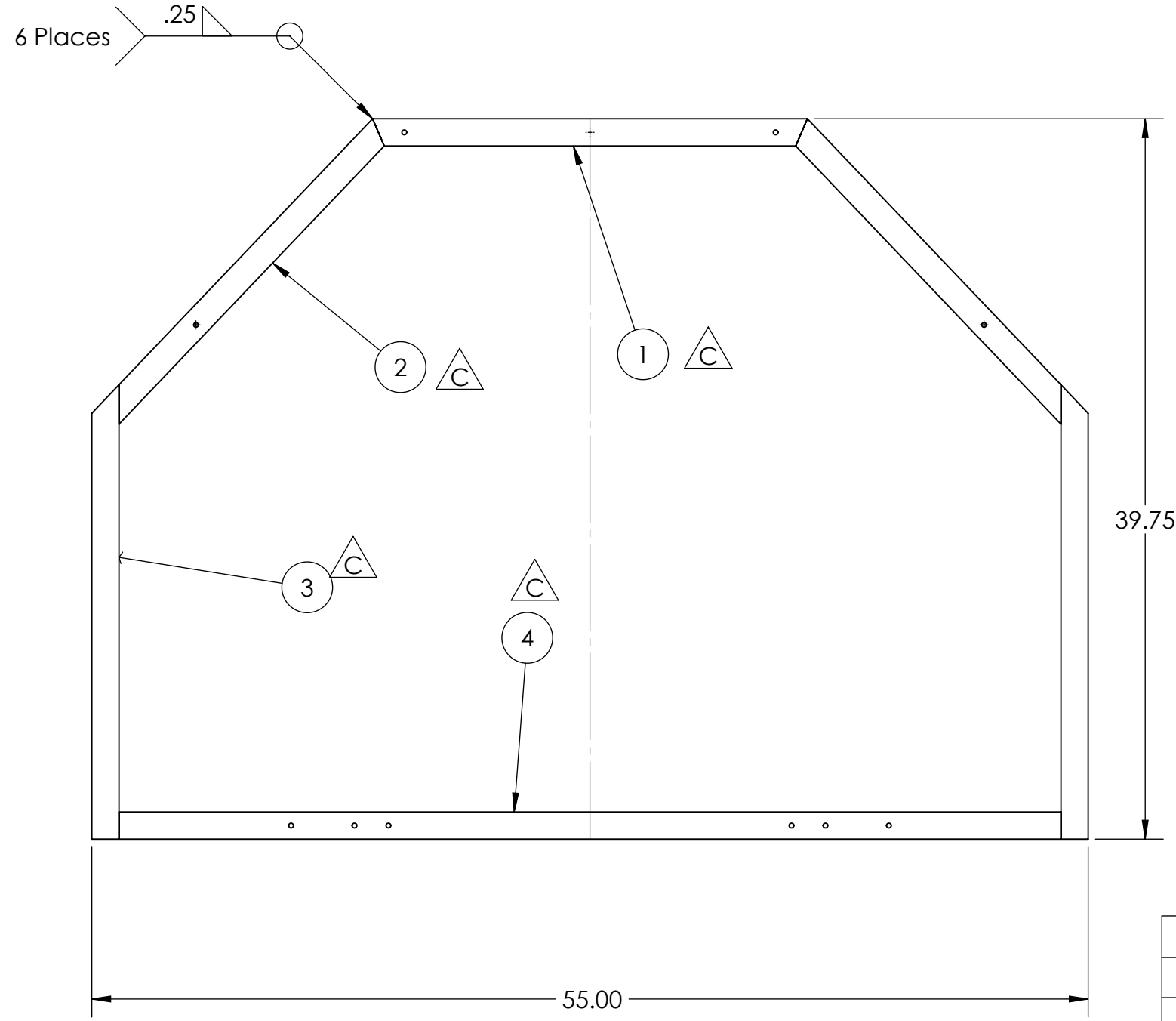


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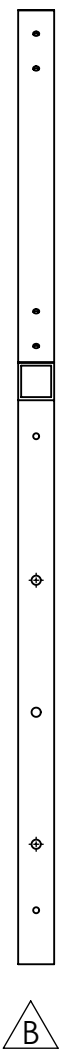
3

2

1





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



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

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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		
INTERPRET GEOMETRIC TOLERANCING PER:		CHECKED		TITLE: <h2>Cargo Ship Body Frame</h2>
MATERIAL		ENG APPR.		
FINISH		MFG APPR.		SIZE <b>B</b> DWG. NO. <b>GE-19072</b> REV <b>C</b>
NEXT ASSY	USED ON	Q.A.		SCALE: 1:8 WEIGHT:
APPLICATION		COMMENTS:		SHEET 1 OF 3
DO NOT SCALE DRAWING				

4

3

2

1

B

B

A

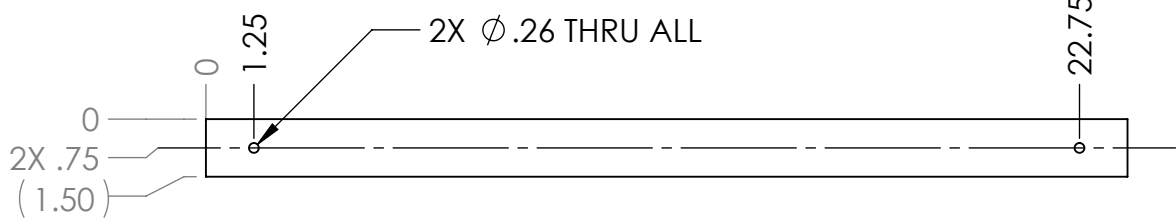
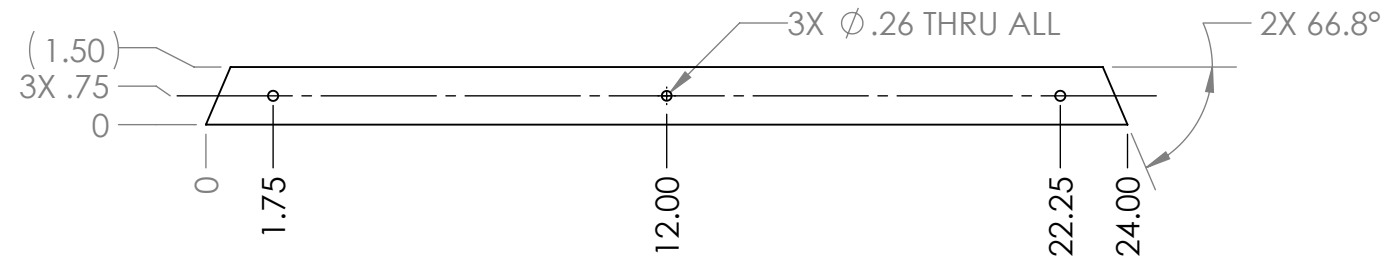
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4

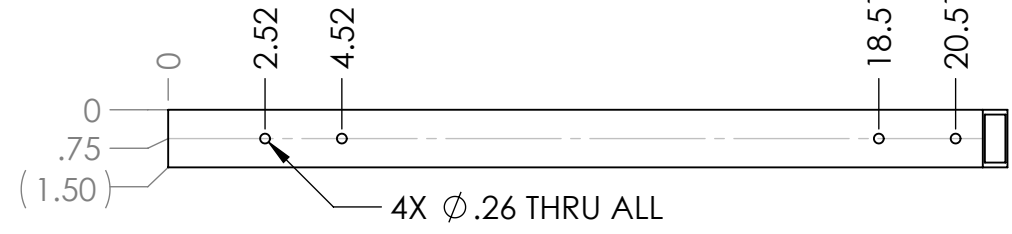
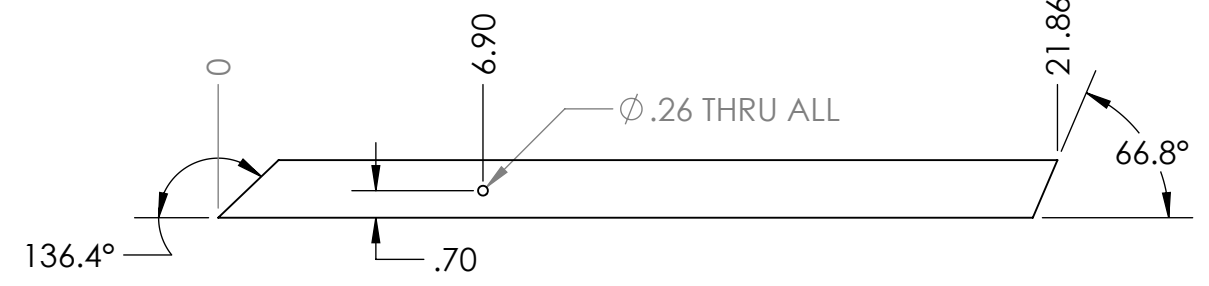
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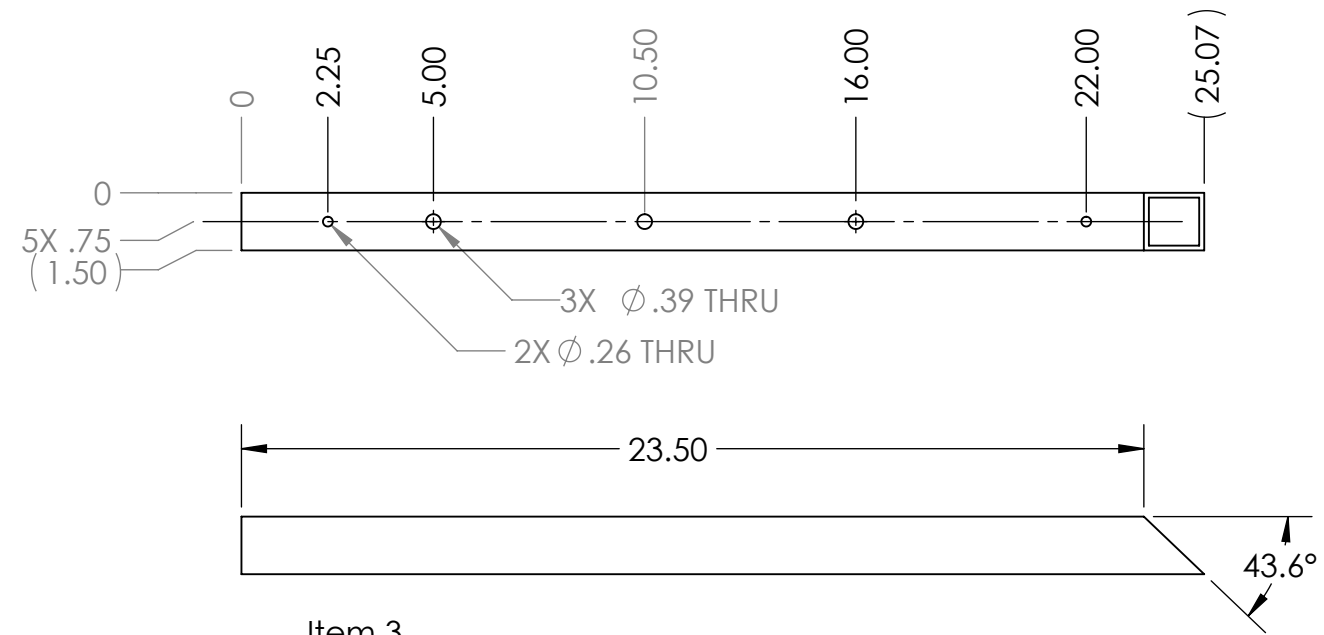
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Item 1  
Material: 1.5" x .125" thk Square Tubing, 6061 aluminum  
QTY: 1



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



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

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		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		



TITLE:  
**Cargo Ship Body Frame**

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

SCALE: 1:5 WEIGHT: SHEET 2 OF 3

4

3

2

1

B

B

A

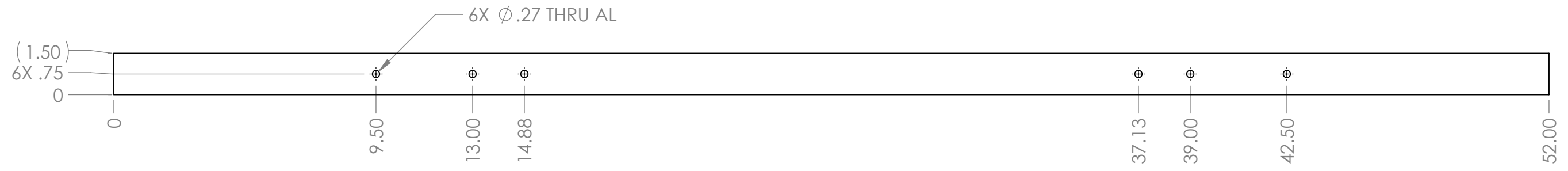
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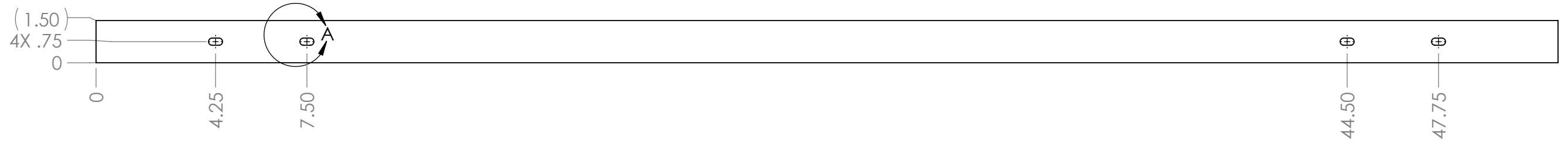
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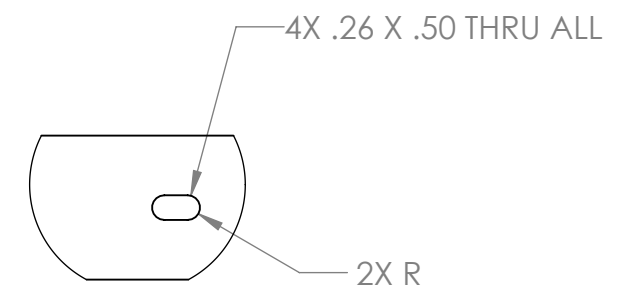
B

B



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

DETAIL A  
 SCALE 1 : 2



A

A

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



TITLE:  
**Cargo Ship Body Frame**

SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19072</b>	<b>C</b>

SCALE: 1:5 WEIGHT: SHEET 3 OF 3

4

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4

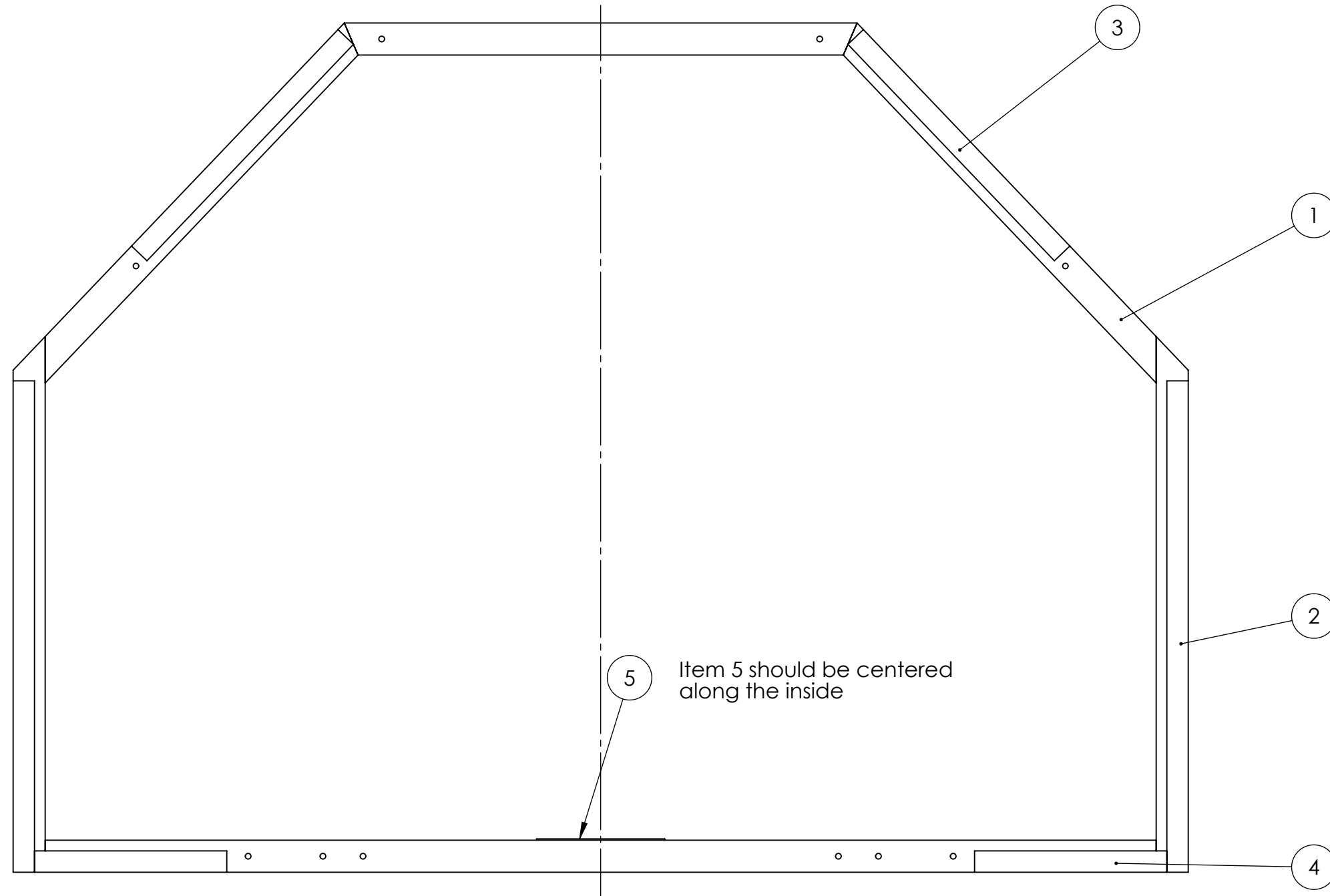
3

2

1

B

B



Item 5 should be centered along the inside



A

A

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

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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			

TITLE:  
**GE-19072, With Hook**

SIZE	DWG. NO.	REV
<b>B</b>	GE-19072-Assembly	

SCALE: 1:8 WEIGHT: SHEET 1 OF 1

4

3

2

1

4

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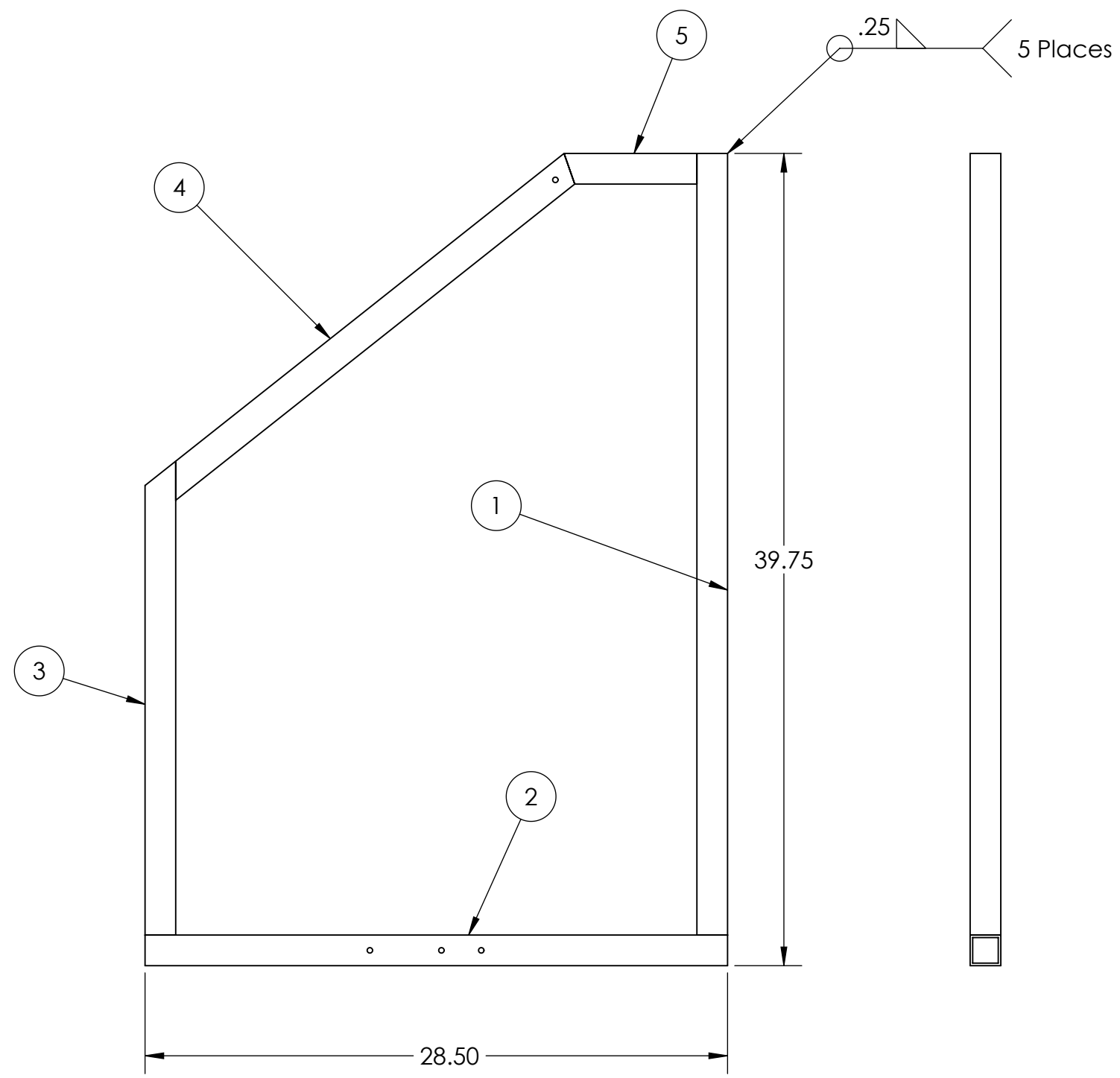
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1

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

B

B





A

A

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

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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		
INTERPRET GEOMETRIC TOLERANCING PER:		CHECKED		TITLE: <b>Cargo Ship Front Frame</b>
MATERIAL		ENG APPR.		
FINISH		MFG APPR.		SIZE DWG. NO. REV <b>B GE-19074 C</b>
NEXT ASSY	USED ON	Q.A.		
APPLICATION		COMMENTS:		SCALE: 1:7 WEIGHT: SHEET 1 OF 3
DO NOT SCALE DRAWING				

4

3

2

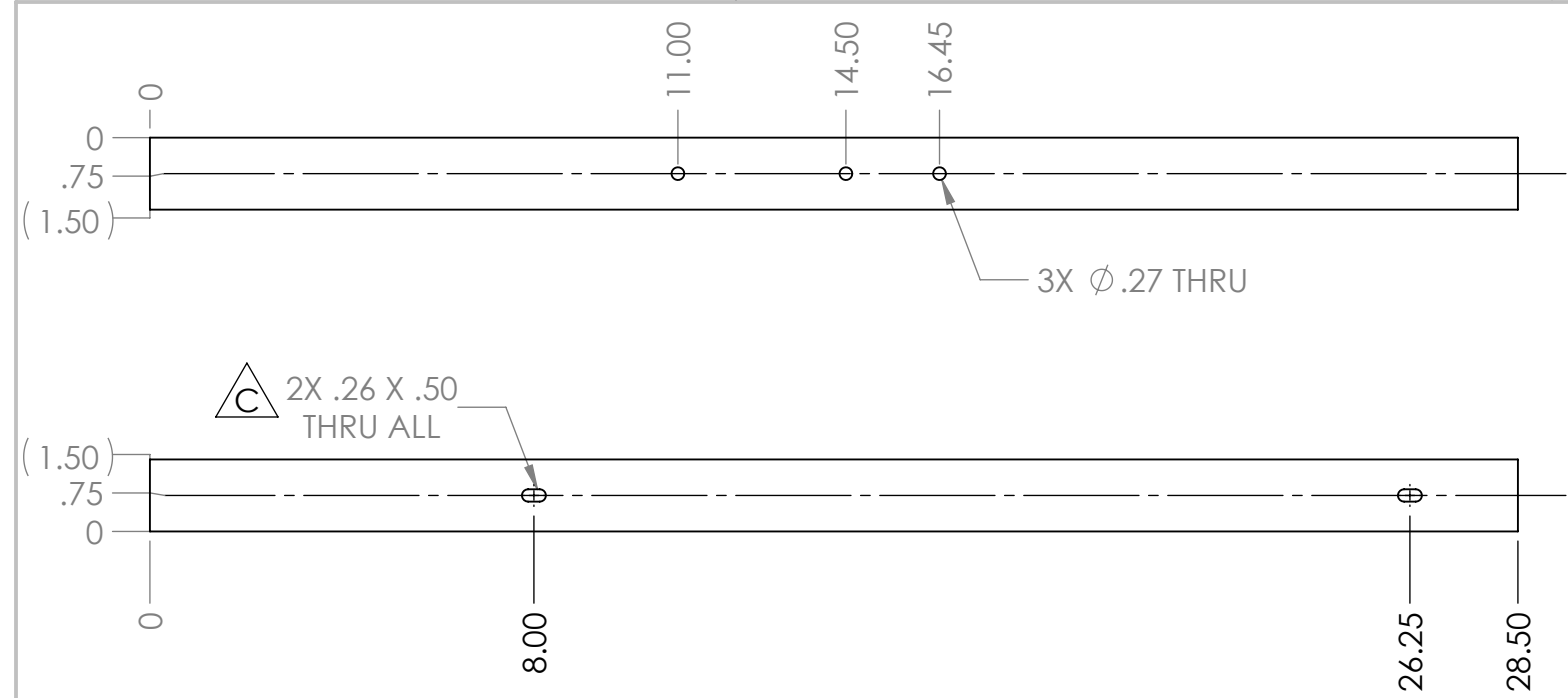
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4

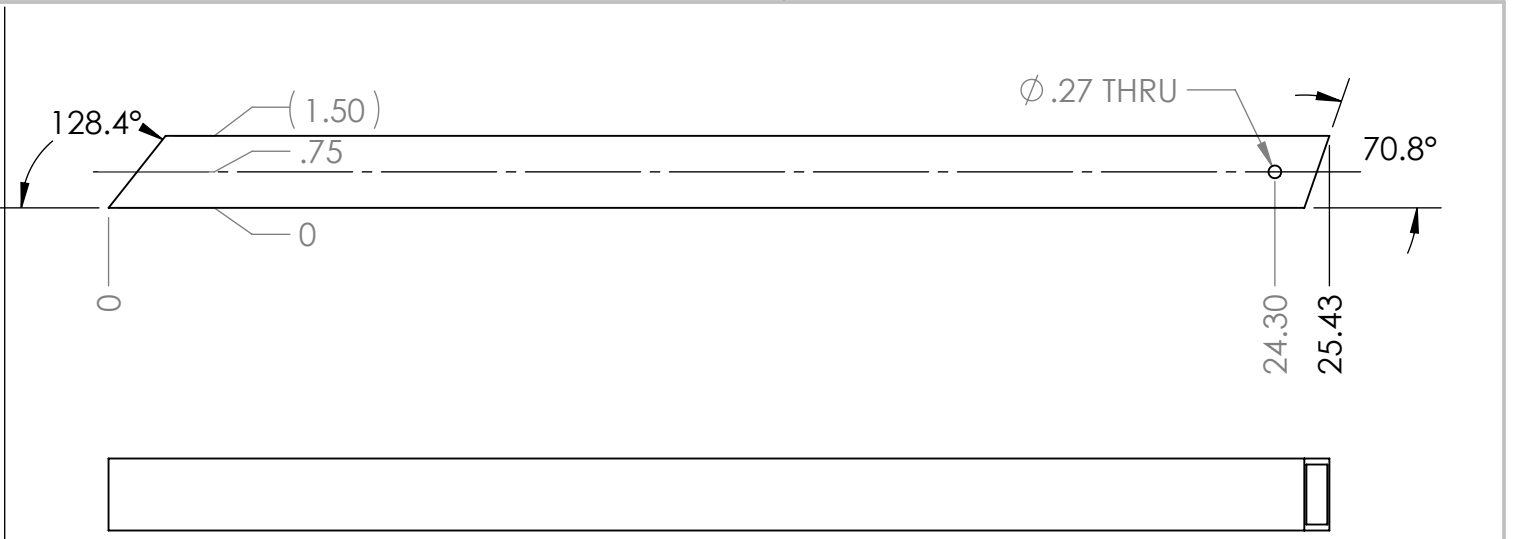
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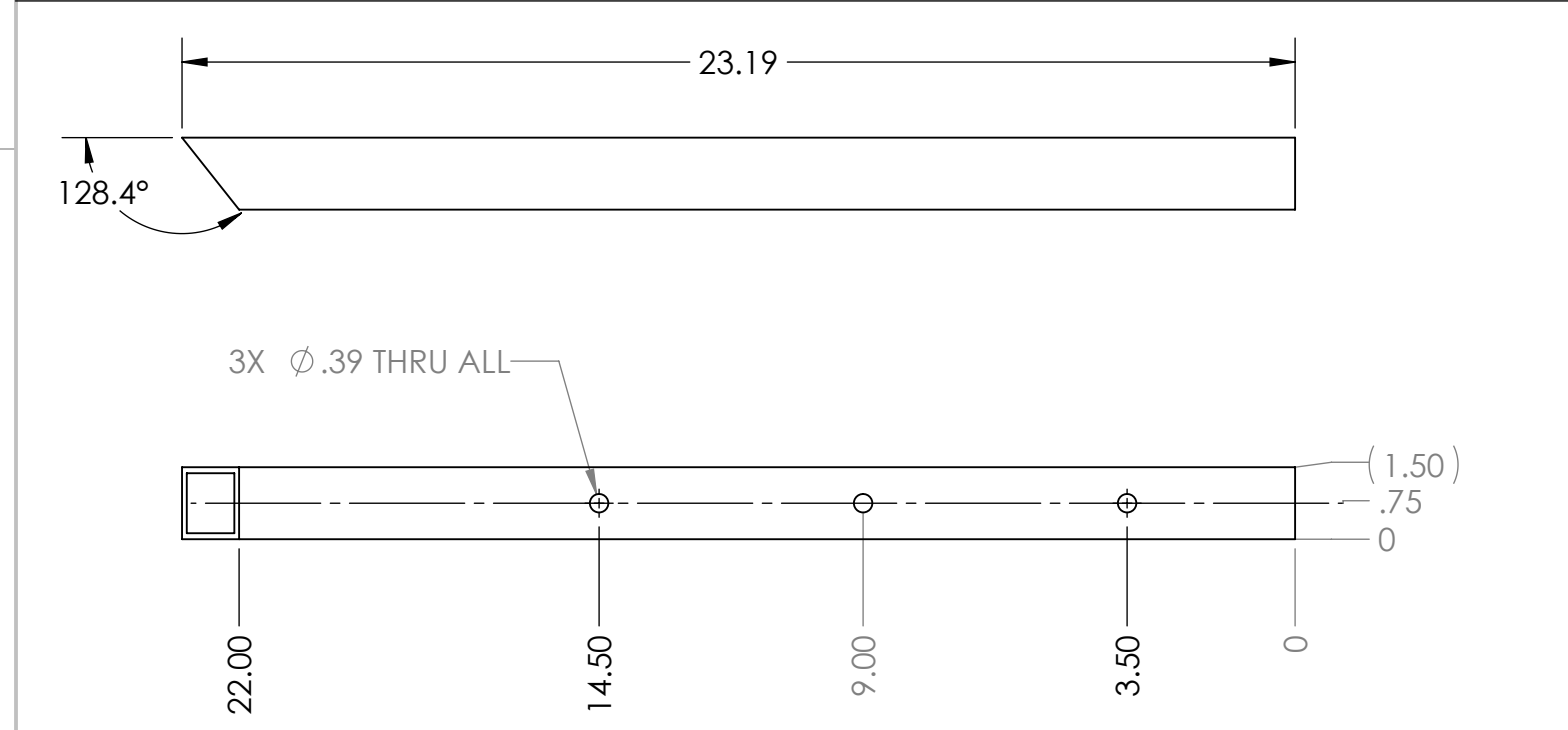
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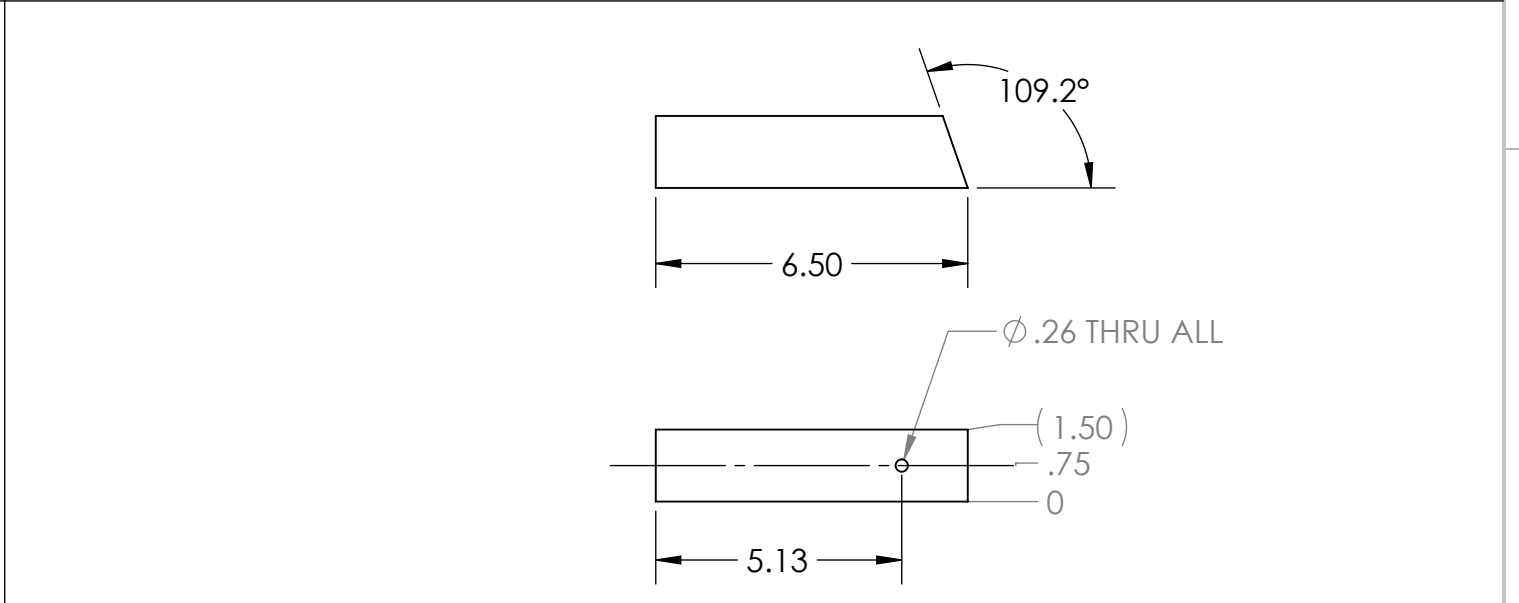
Item 2  
Material: 1.5" x .125" thk. Square Tubing, 6061 Aluminum  
QTY: 1



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



Item 3  
Material: 1.5" x .125" thk. Square Tubing, 6061 Aluminum  
QTY: 1



Item 5  
Material: 1.5" x .125" thk. Square Tubing, 6061 Aluminum  
QTY: 1

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

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

TITLE:  
**Cargo Ship Front Frame**

SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19074</b>	<b>C</b>

SCALE: 1:4 WEIGHT: SHEET 2 OF 3

4

3

2

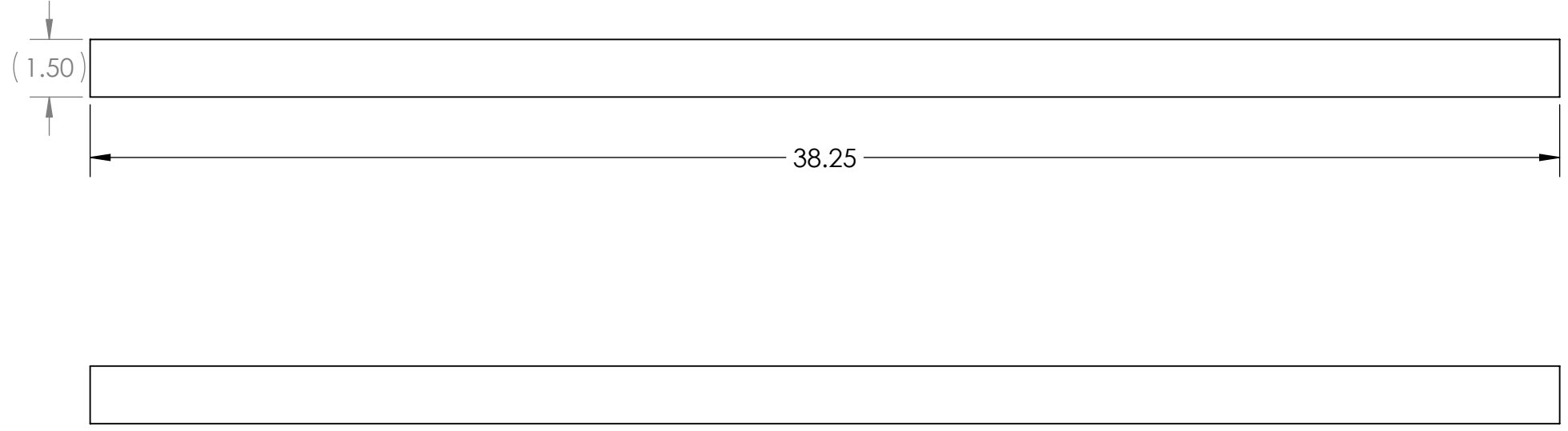
1

4

3

2

1



B

B

A



A

Item 1  
 Material: 1.5" x .125" thk. Square Tubing, 6061 Aluminum  
 QTY: 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	
		INTERPRET GEOMETRIC TOLERANCING PER:		CHECKED	
		MATERIAL		ENG APPR.	
		FINISH		MFG APPR.	
NEXT ASSY	USED ON			Q.A.	
APPLICATION		DO NOT SCALE DRAWING		COMMENTS:	

 		
TITLE: <b>Cargo Ship Front Frame</b>		
SIZE <b>B</b>	DWG. NO. <b>GE-19074</b>	REV <b>C</b>
SCALE: 1:4	WEIGHT:	SHEET 3 OF 3

4

3

2

1

4

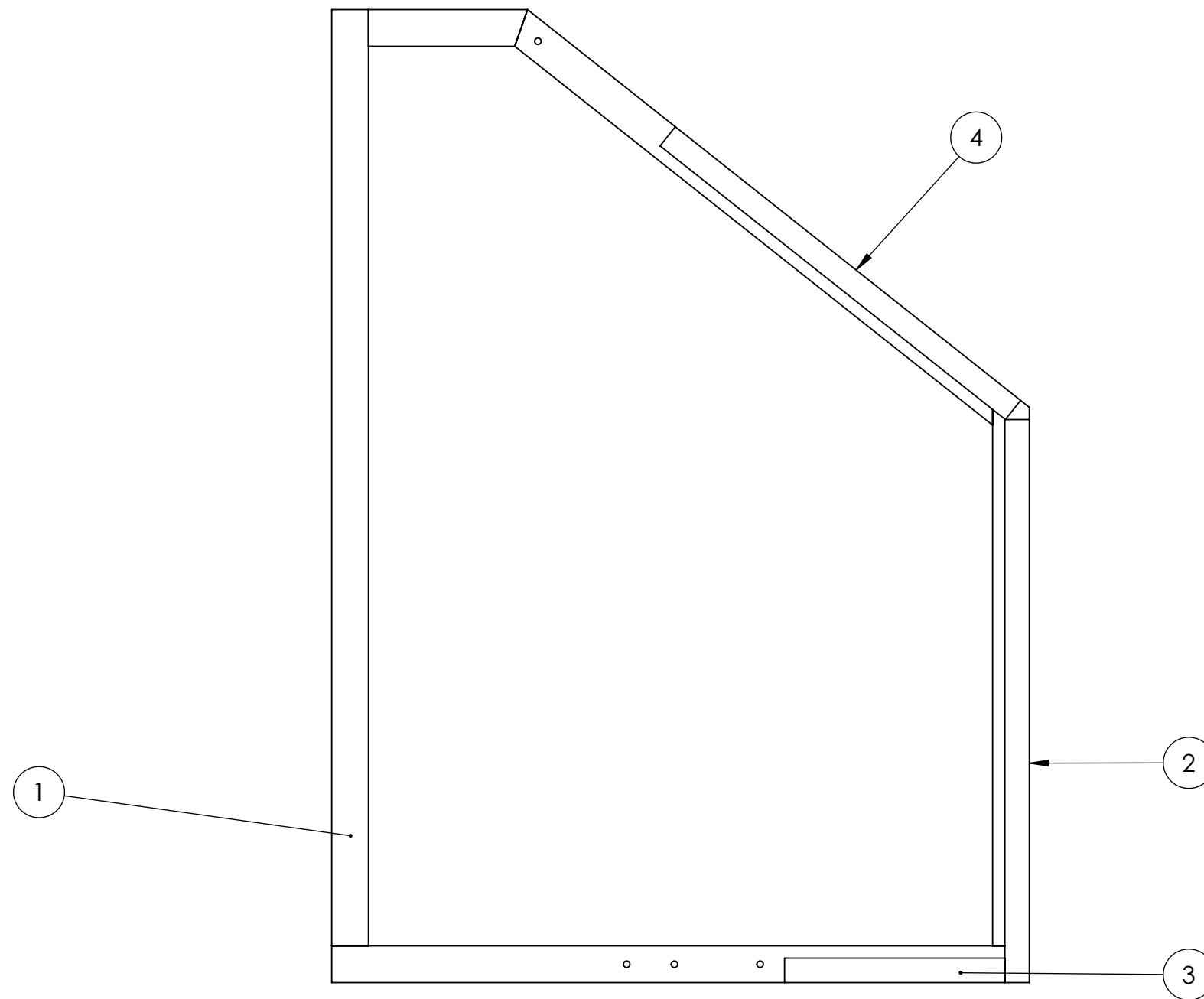
3

2

1

B

B



A

A

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

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



TITLE:		
<b>GE-19074, with Hook</b>		
SIZE	DWG. NO.	REV
<b>B</b>	GE-19074-Assembly	
SCALE: 1:8	WEIGHT:	SHEET 1 OF 1

4

3

2

1



4

3

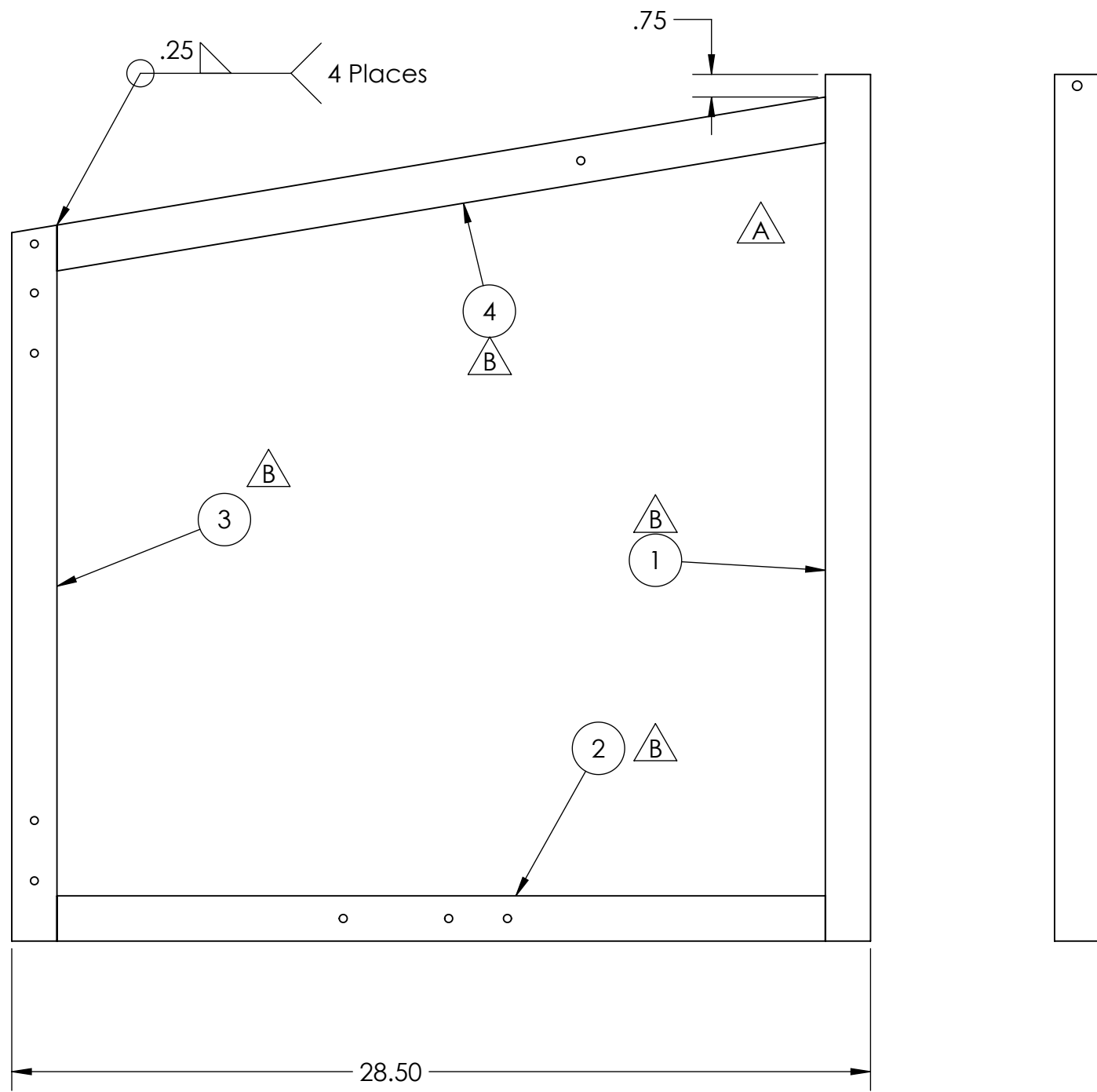
2

1

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

B

B





A

A

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

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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		
INTERPRET GEOMETRIC TOLERANCING PER:		CHECKED		TITLE: <b>Cargo Ship Nose Side</b>
MATERIAL		ENG APPR.		
FINISH		MFG APPR.		
NEXT ASSY	USED ON	Q.A.		SIZE <b>B</b> DWG. NO. <b>GE-19075</b> REV <b>D</b>
APPLICATION		COMMENTS:		SCALE: 1:5 WEIGHT: SHEET 1 OF 2
DO NOT SCALE DRAWING				

4

3

2

1

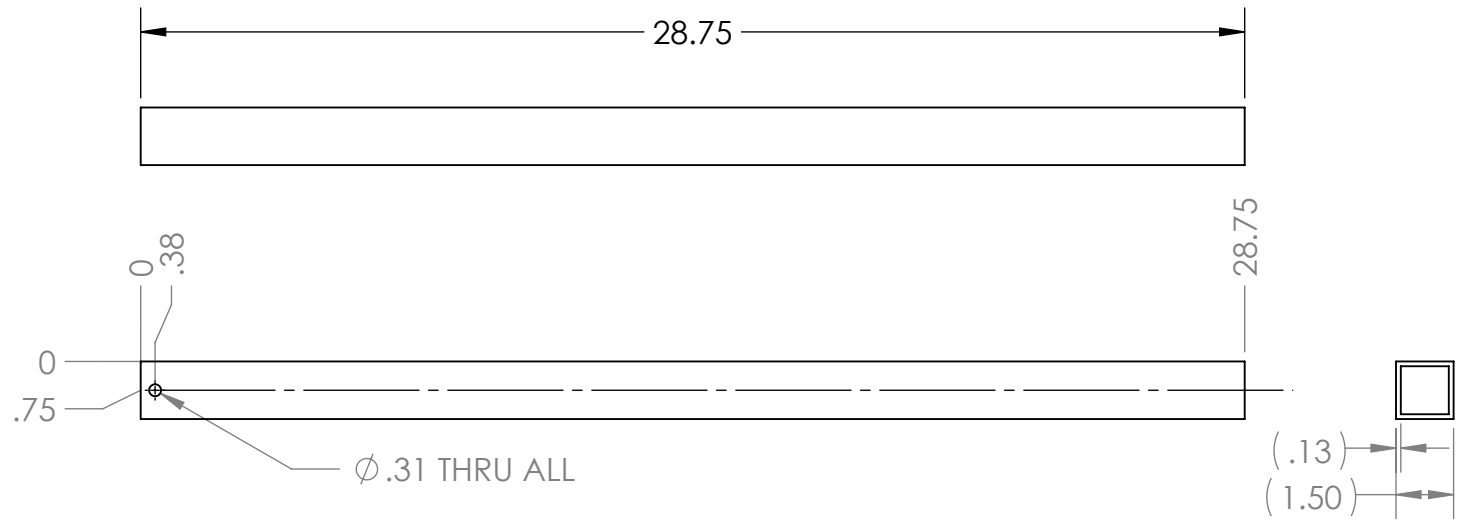
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3

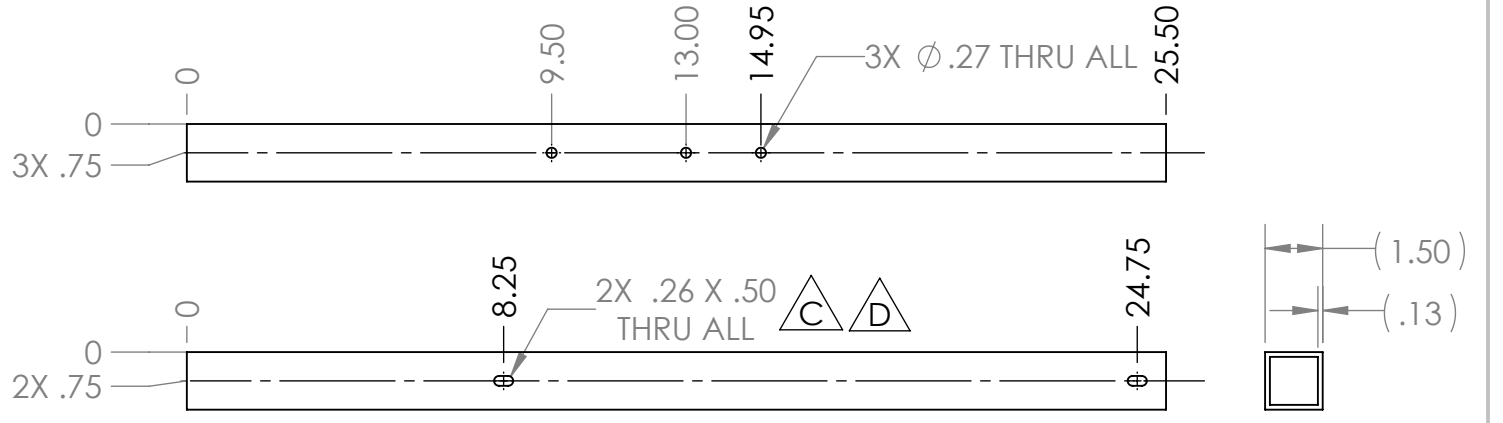
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1

B

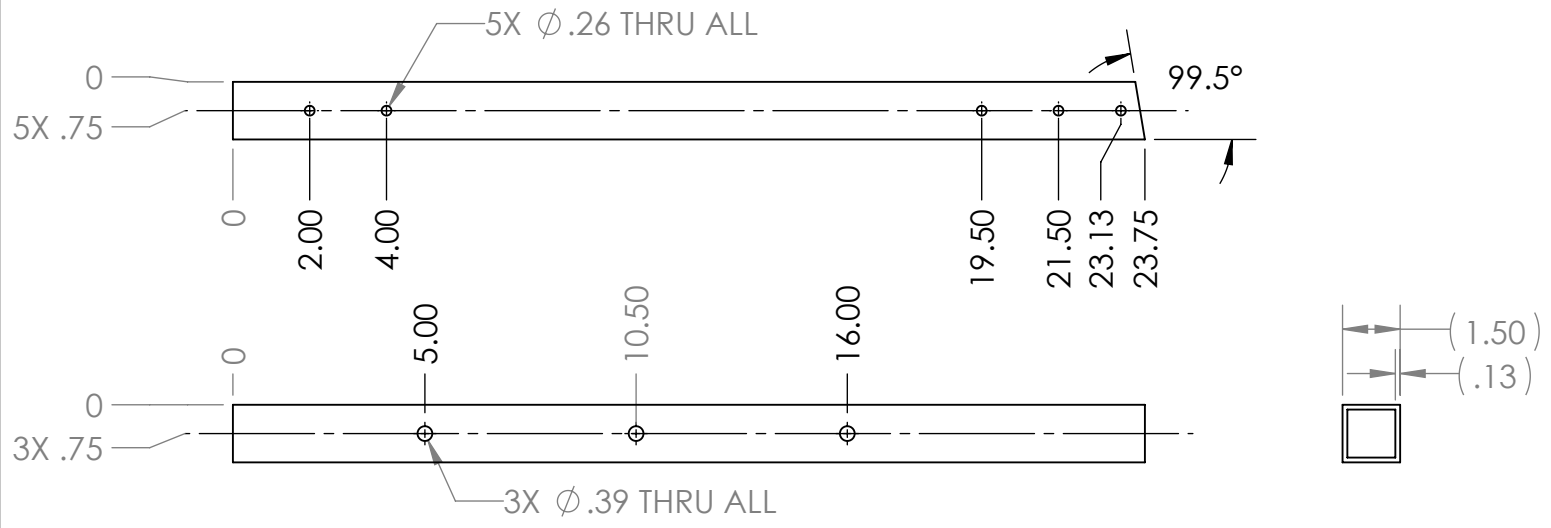


Item 1  
 Material: 1.5" x .125" thk Square Tubing, 6061 Aluminum  
 QTY: 1

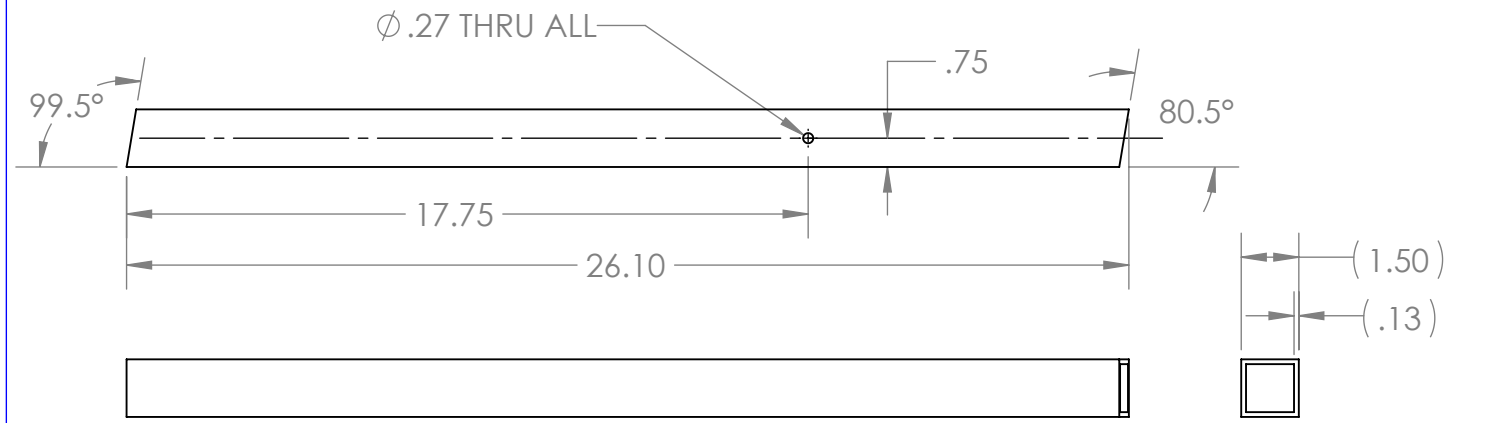


Item 2  
 Material: 1.5" x .125" thk Square Tubing, 6061 Aluminum  
 QTY: 1

A



Item 3  
 Material: 1.5" x .125" thk Square Tubing, 6061 Aluminum  
 QTY: 1



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

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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			
FINISH			
NEXT ASSY	USED ON		
APPLICATION			
DO NOT SCALE DRAWING			



TITLE:  
**Cargo Ship Nose Side**

SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19075</b>	<b>D</b>
SCALE: 1:5	WEIGHT:	SHEET 2 OF 2

4

3

2

1

B

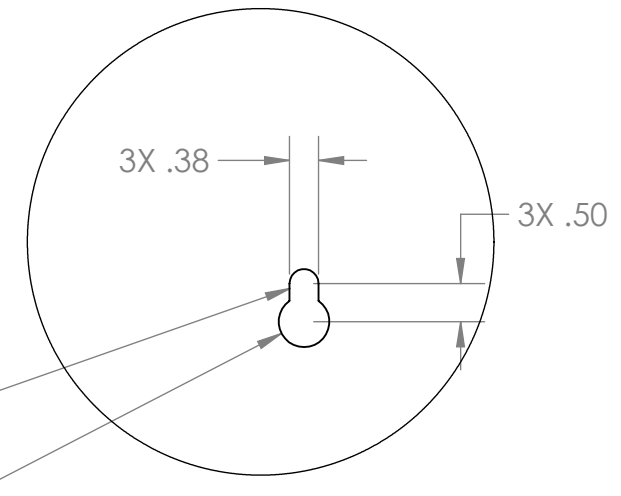
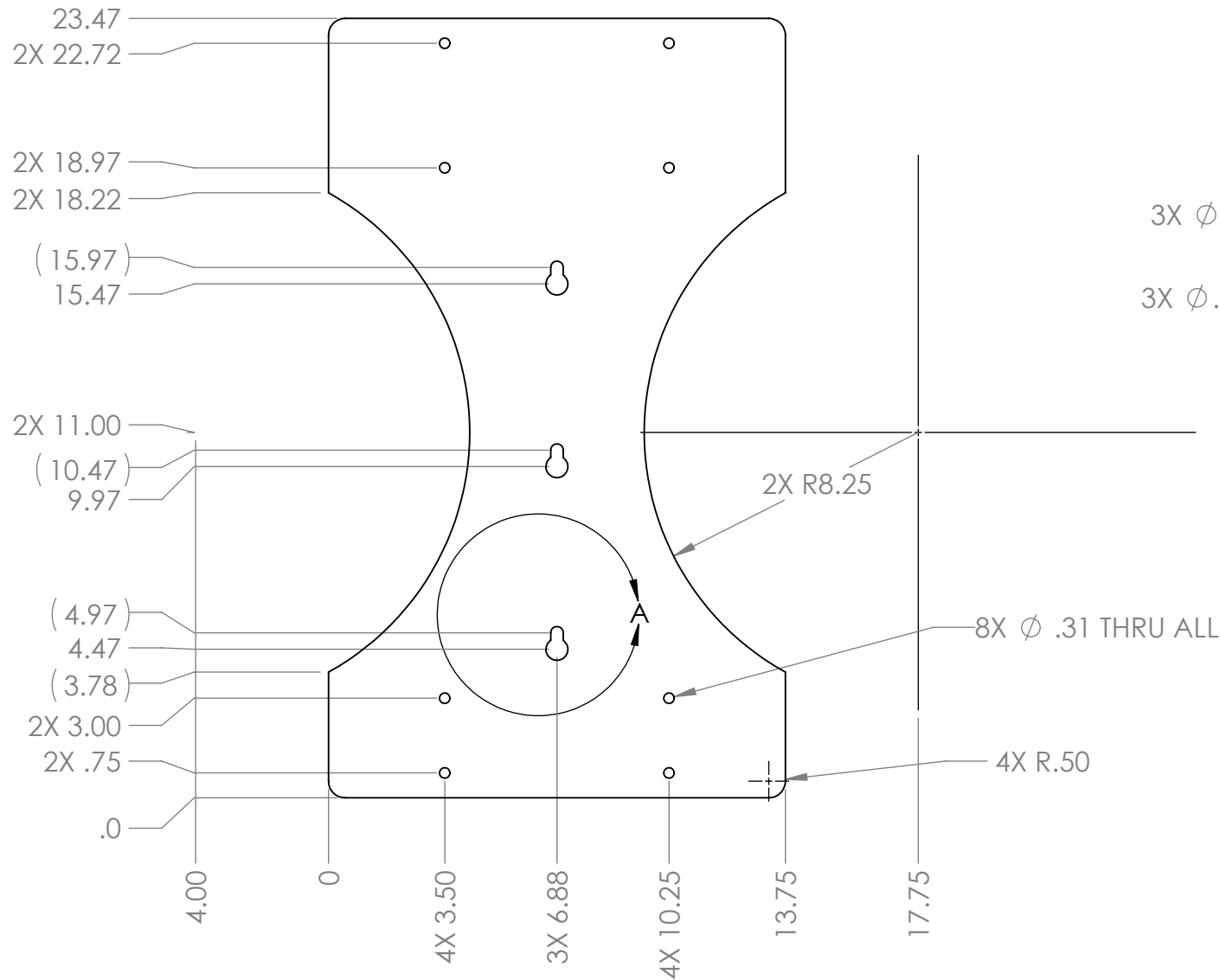
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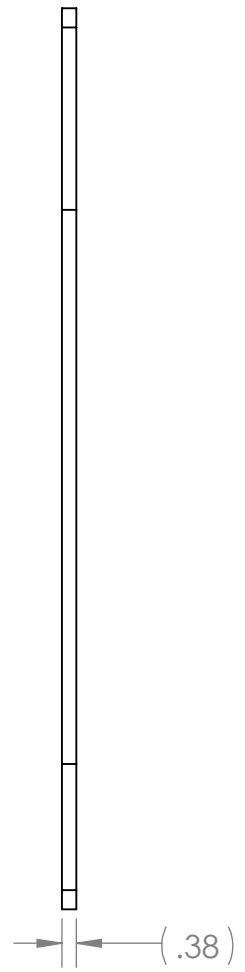
3

2

1



DETAIL A  
SCALE 2 : 5



B

B

A

A

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

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

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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			
USED ON			
APPLICATION			

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

TITLE:  
**Cargo Ship Panel Plastic Full**

SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19076</b>	<b>B</b>

SCALE: 1:5 WEIGHT: SHEET 1 OF 1

4

3

2

1

4

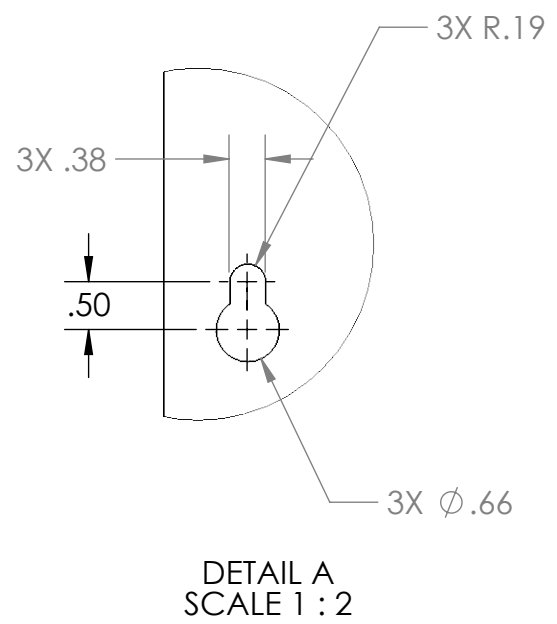
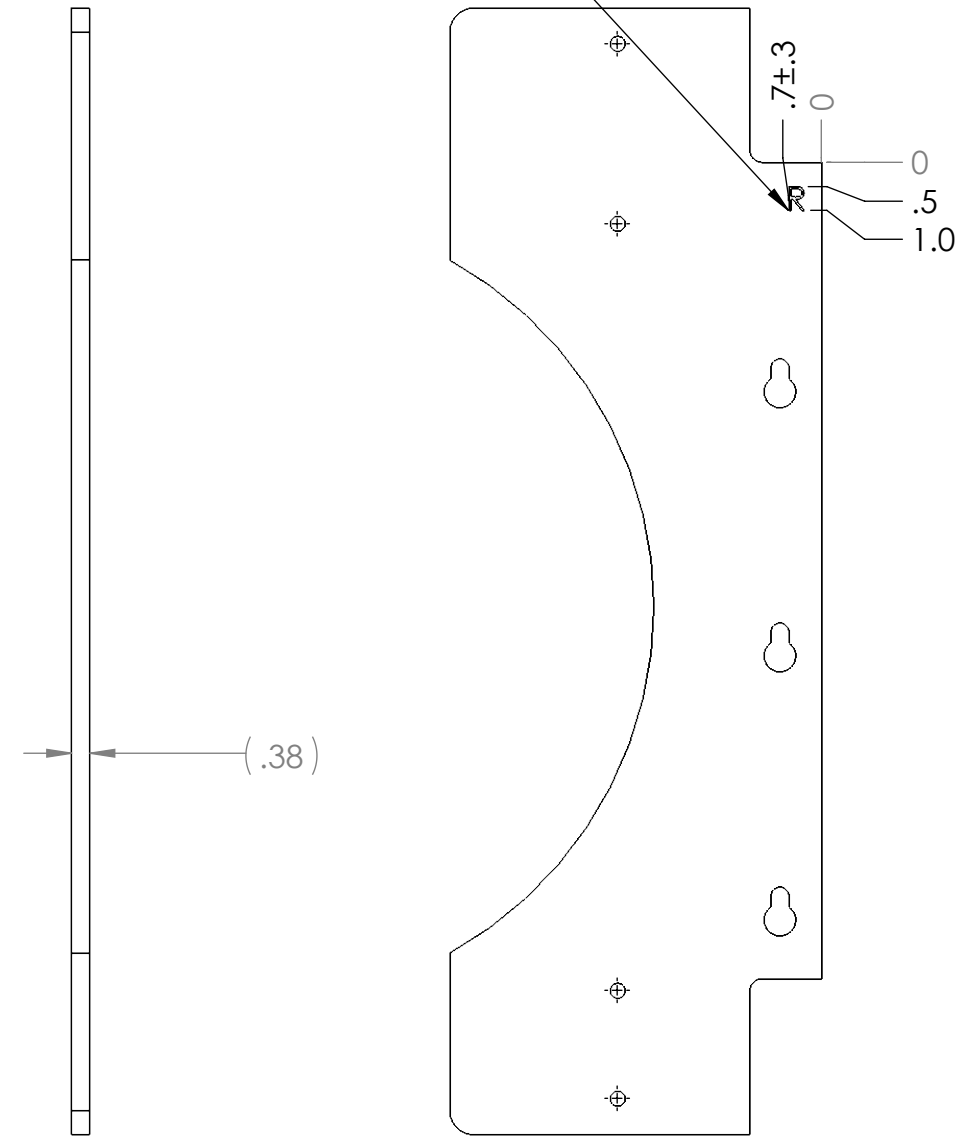
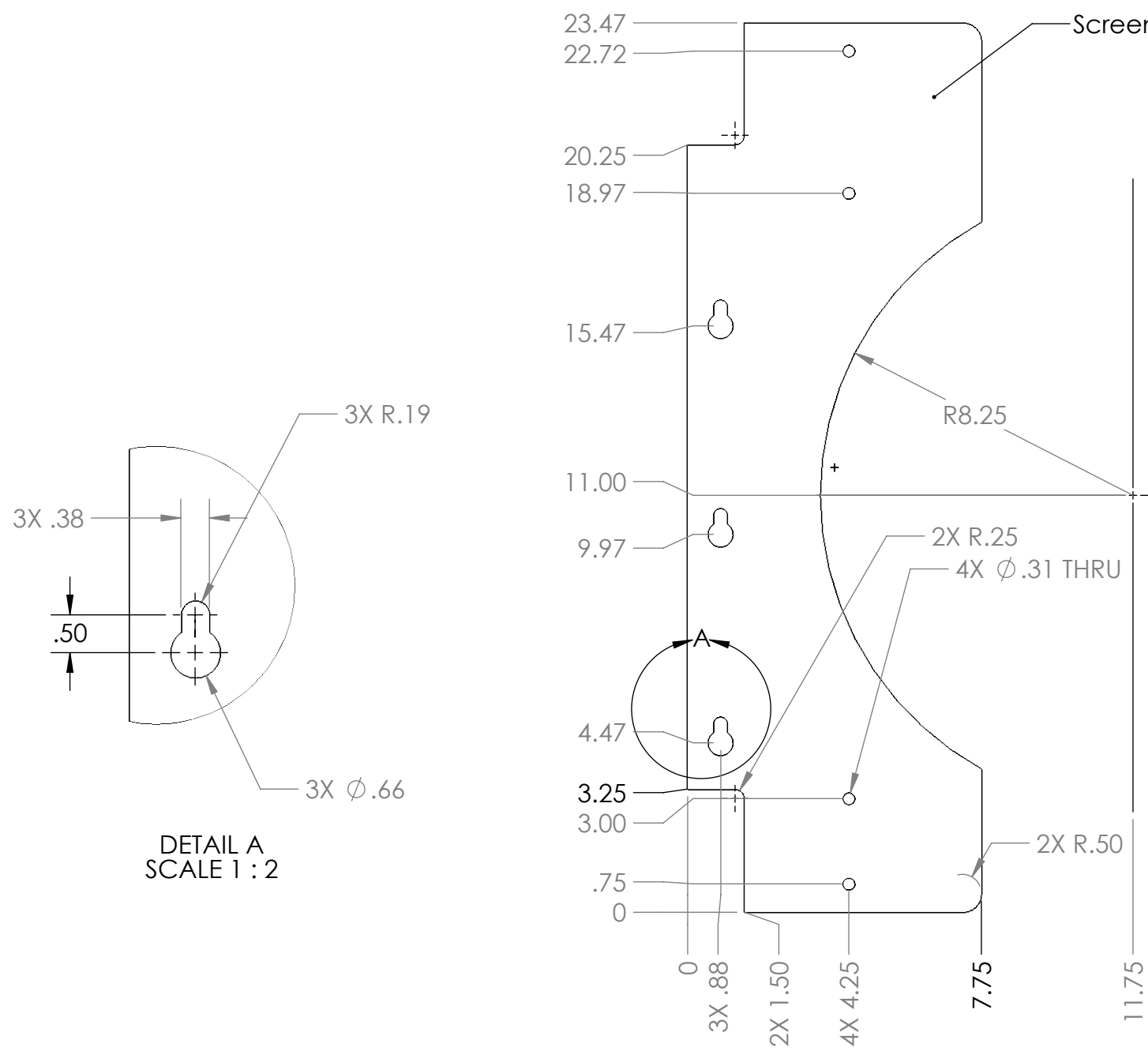
3

2

1

Engrave "R" in specified location

Screen print this side



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

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

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		UNLESS OTHERWISE SPECIFIED:	NAME	DATE
		DIMENSIONS ARE IN INCHES	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		

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

TITLE:  
**Cargo Ship Panel Plastic Right**

SIZE **B** DWG. NO. **GE-19077** REV **A**

SCALE: 1:4 WEIGHT: SHEET 1 OF 1

4

3

2

1

B

B

A

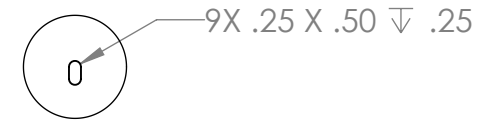
A

4

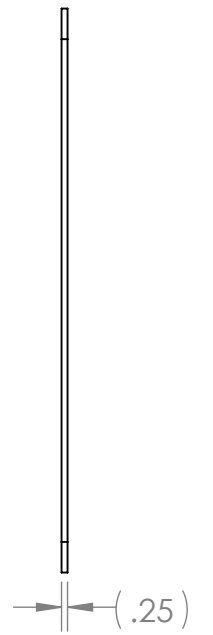
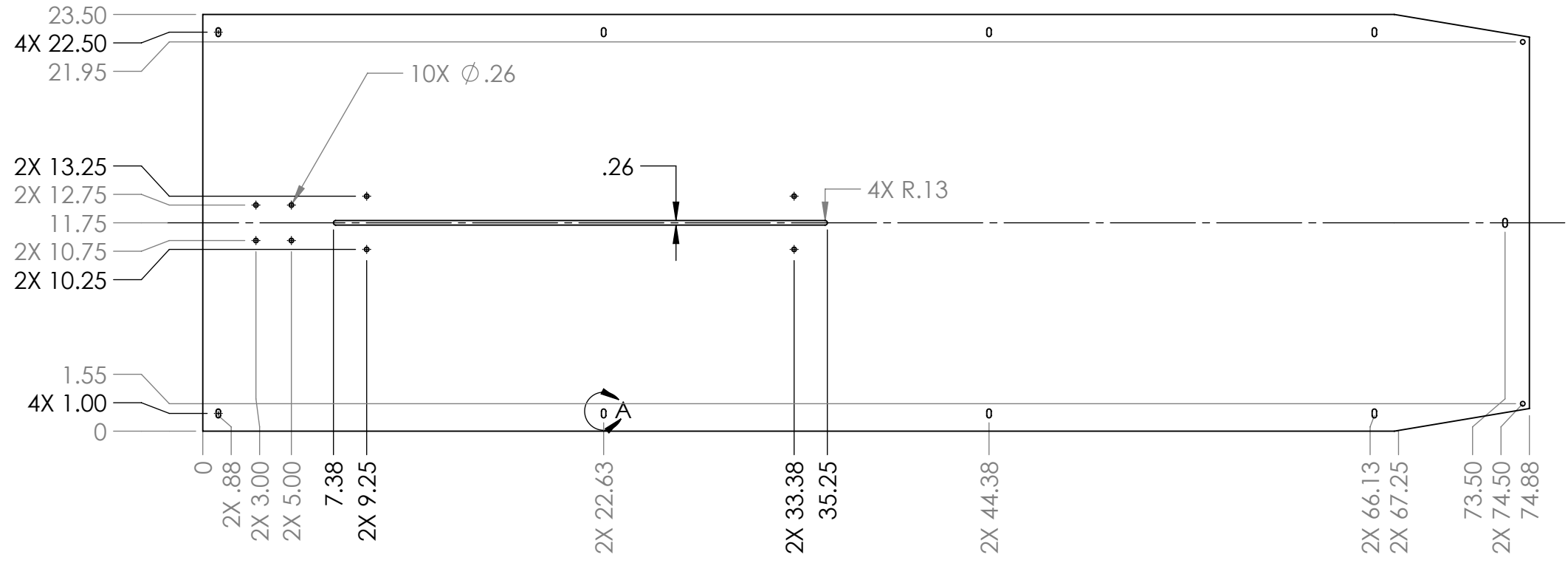
3

2

1



DETAIL A  
SCALE 1 : 4



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

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

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		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		

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

TITLE:  
**Cargo Ship Top Plastic**

SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19078</b>	<b>B</b>

SCALE: 1:8 WEIGHT: SHEET 1 OF 1

4

3

2

1

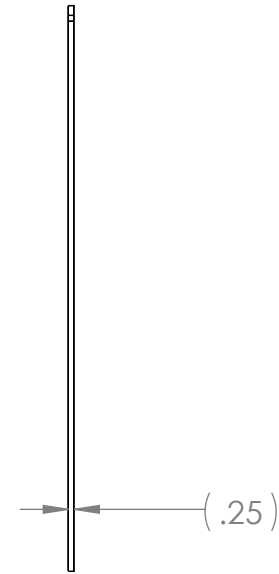
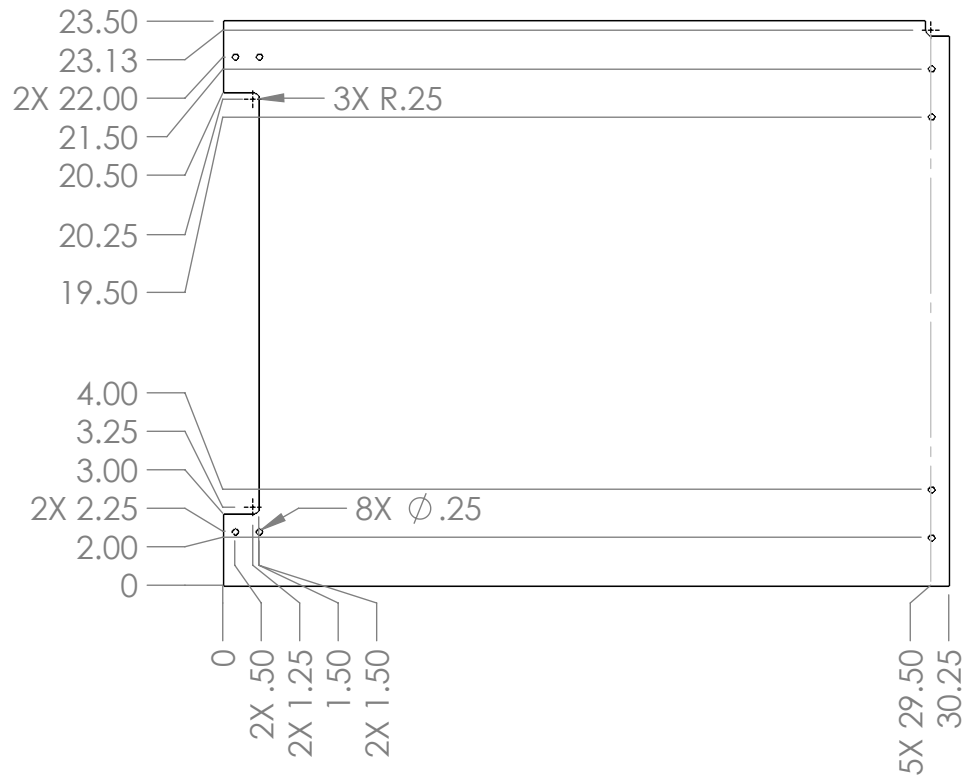
B

B

A

A

B





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

B

A

A

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		UNLESS OTHERWISE SPECIFIED:	NAME	DATE	 
		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$	DRAWN		
		INTERPRET GEOMETRIC TOLERANCING PER:	CHECKED		
		MATERIAL	ENG APPR.		SIZE DWG. NO. REV <b>A GE-19079 A</b>
		FINISH	MFG APPR.		
NEXT ASSY	USED ON		Q.A.		SCALE: 1:8 WEIGHT: SHEET 1 OF 1
APPLICATION		DO NOT SCALE DRAWING	COMMENTS:		

2

1

4

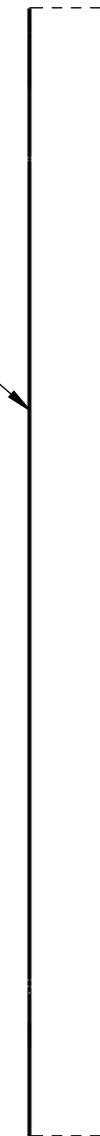
3

2

1



Vinyl applied to this side



B

B

A

A

Notes:  
Quantity per field: 1

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

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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			
FINISH			
NEXT ASSY	USED ON		
APPLICATION			
DO NOT SCALE DRAWING			




TITLE: **Cargo Ship Front Side Plastic, Left Blue**

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

SCALE: 1:4 WEIGHT: SHEET 1 OF 1

4

3

2

1

4

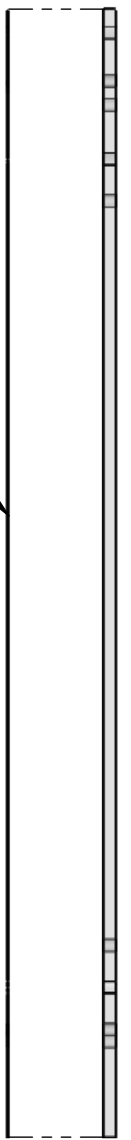
3

2

1



Vinyl applied to this side



B

B

A



A

Notes:  
Quantity per field: 1

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

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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			
FINISH			
NEXT ASSY	USED ON		
APPLICATION			
DO NOT SCALE DRAWING			

TITLE: **Cargo Ship Front Side Plastic, Left Red**

SIZE **B** DWG. NO. **GE-19079-Left-Red** REV

SCALE: 1:4 WEIGHT: SHEET 1 OF 1

4

3

2

1



4

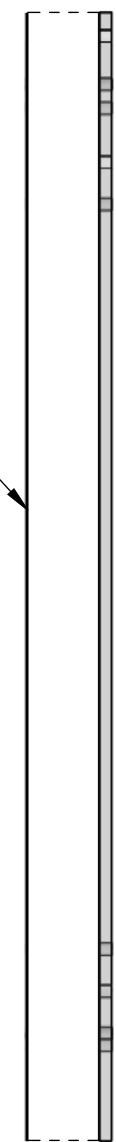
3

2

1



Vinyl applied to this side



B

B

A



A

Notes:  
Quantity per field: 1

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

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

TITLE: **Cargo Ship Front Side Plastic Right Blue**

SIZE	DWG. NO.	REV
<b>B</b>	GE-19079-Right-Blue	

SCALE: 1:4 WEIGHT: SHEET 1 OF 1

4

3

2

1

4

3

2

1



Vinyl applied to this side




Notes:  
Quantity per field: 1


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

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



**FIRST ROBOTICS COMPETITION**



**SOLIDWORKS**  
Modeling Solutions Partner

TITLE: <b>Cargo Ship Front Side Plastic, Right Red</b>		
SIZE <b>B</b>	DWG. NO. <b>GE-19079-Right-Red</b>	REV
SCALE: 1:4	WEIGHT:	SHEET 1 OF 1

4

3

2

1

B

B

A

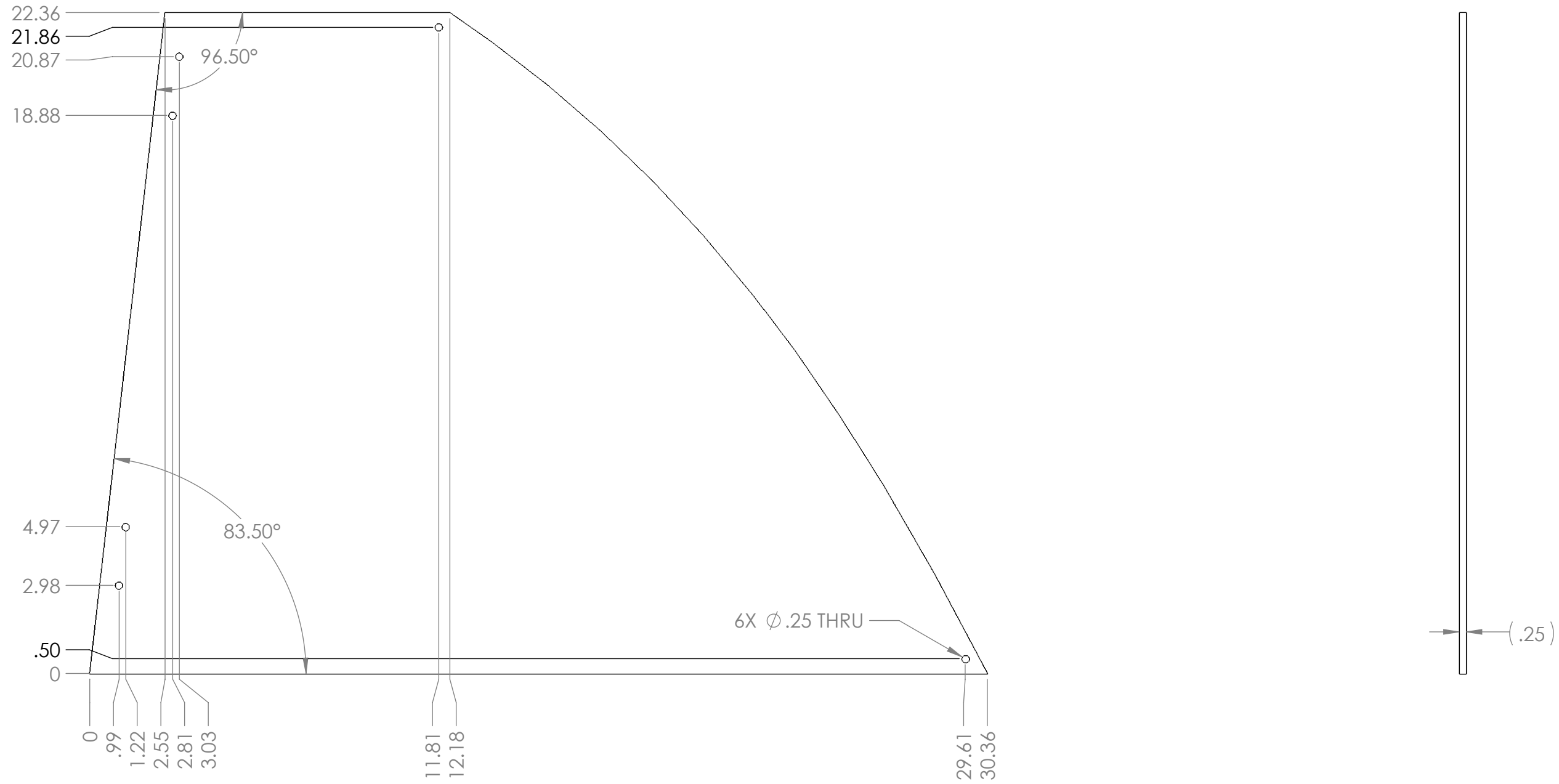
A

4

3

2

1



B

B

A

A

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

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UNLESS OTHERWISE SPECIFIED:		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			



TITLE:  
**Cargo Ship Front Top Plastic**

SIZE DWG. NO. REV  
**B GE-19080**

SCALE: 1:4 WEIGHT: SHEET 1 OF 1

4

3

2

1

4

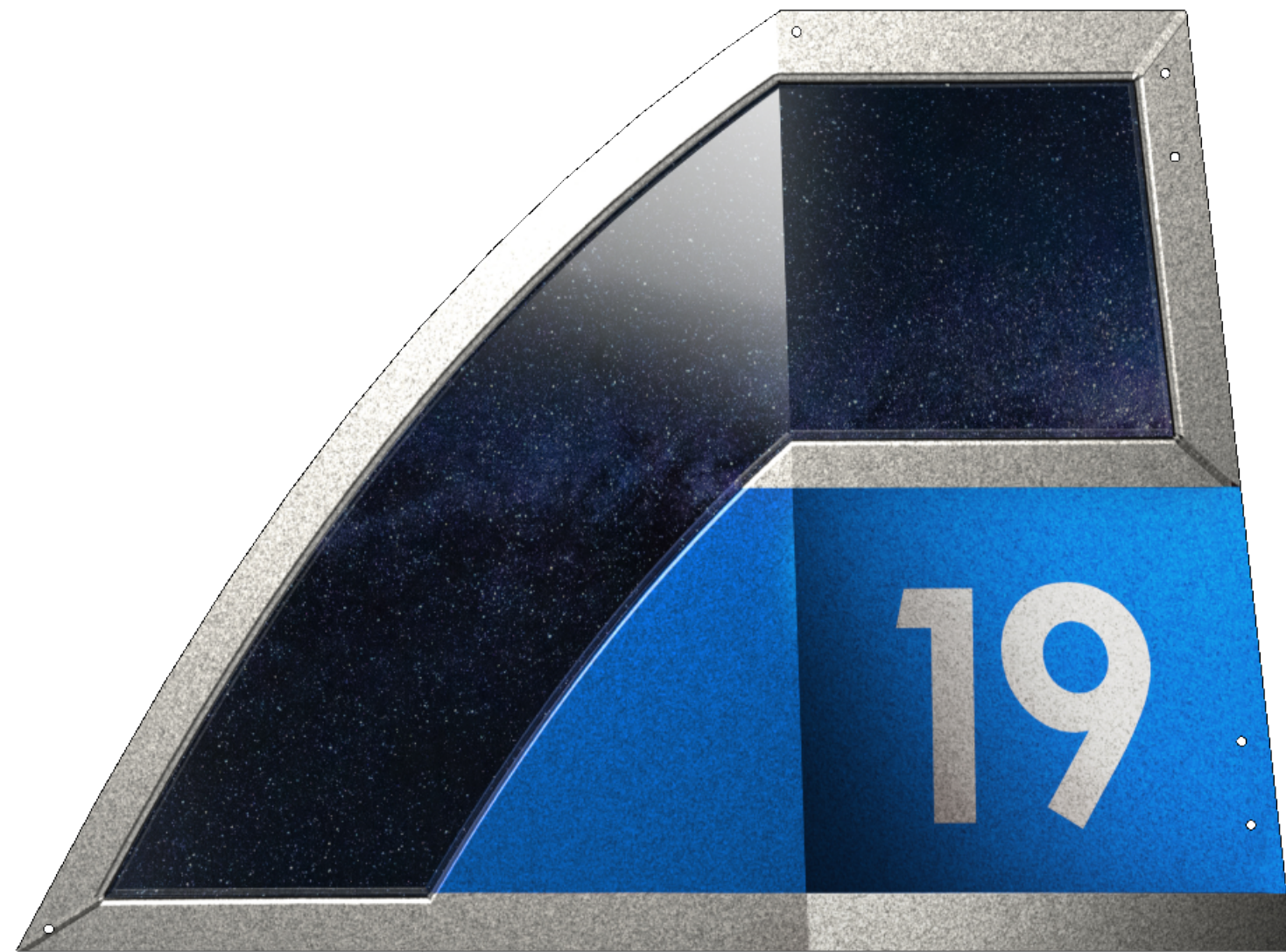
3

2

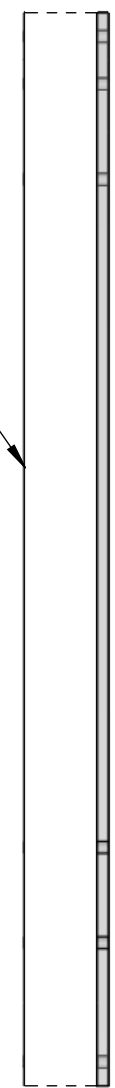
1

B

B



Vinyl applied to this side





A

A

Notes:  
Quantity per field: 1

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

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		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		
		INTERPRET GEOMETRIC TOLERANCING PER:	CHECKED		TITLE:
		MATERIAL	ENG APPR.		Cargo Ship Front Top Plastic Left Blue
		FINISH	MFG APPR.		SIZE DWG. NO. REV
NEXT ASSY	USED ON		Q.A.		<b>B</b> GE-19080-Left-Blue
APPLICATION		DO NOT SCALE DRAWING	COMMENTS:		SCALE: 1:4 WEIGHT: SHEET 1 OF 1

4

3

2

1

4

3

2

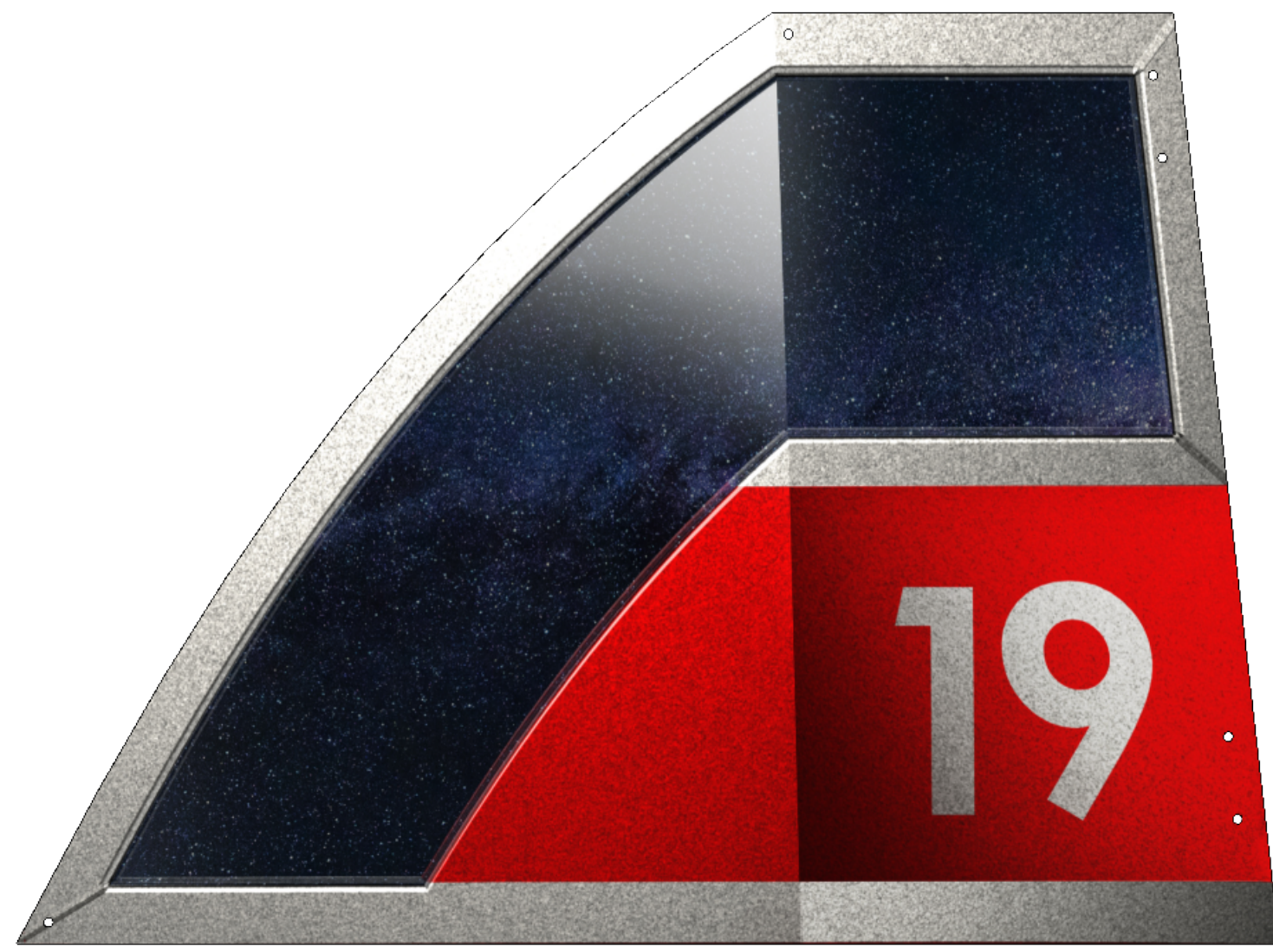
1

B

B

A

A



Vinyl applied to this side



Notes:  
Quantity per field: 1

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

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		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		




TITLE:  
**Cargo Ship Front Top Plastic Left Red**

SIZE **B** DWG. NO. **GE-19080-Left-Red** REV  
 SCALE: 1:4 WEIGHT: SHEET 1 OF 1

4

3

2

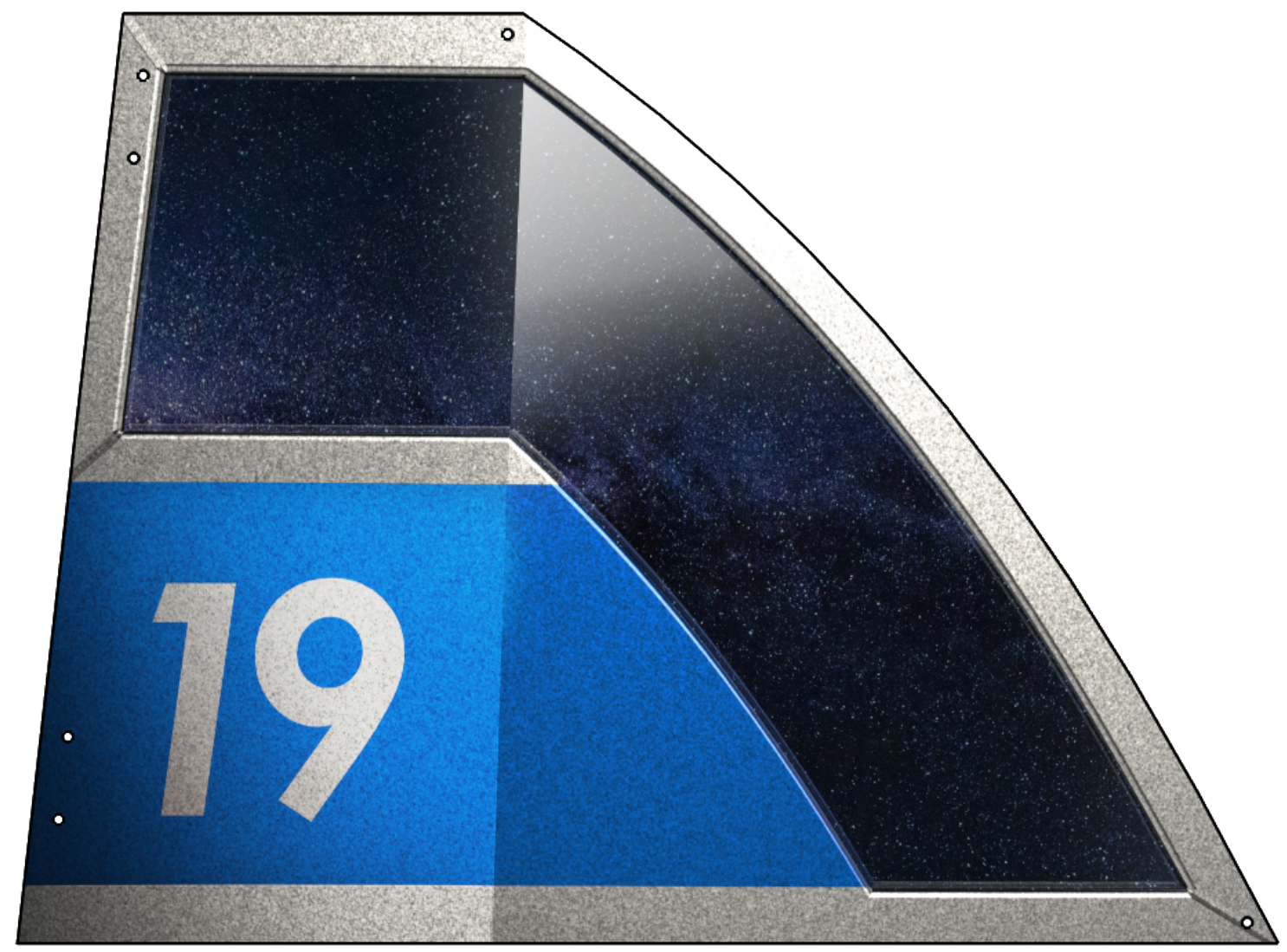
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4

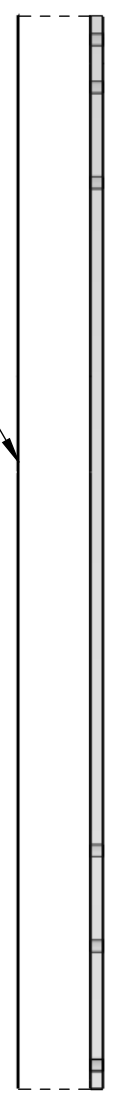
3

2

1



Vinyl applied to this side



B

B

A



A

Notes:  
Quantity per field: 1

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

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

TITLE: **Cargo Ship Front Top Plastic, Right Blue**

SIZE	DWG. NO.	REV
<b>B</b>	GE-19080-Right-Blue	

SCALE: 1:4 WEIGHT: SHEET 1 OF 1

4

3

2

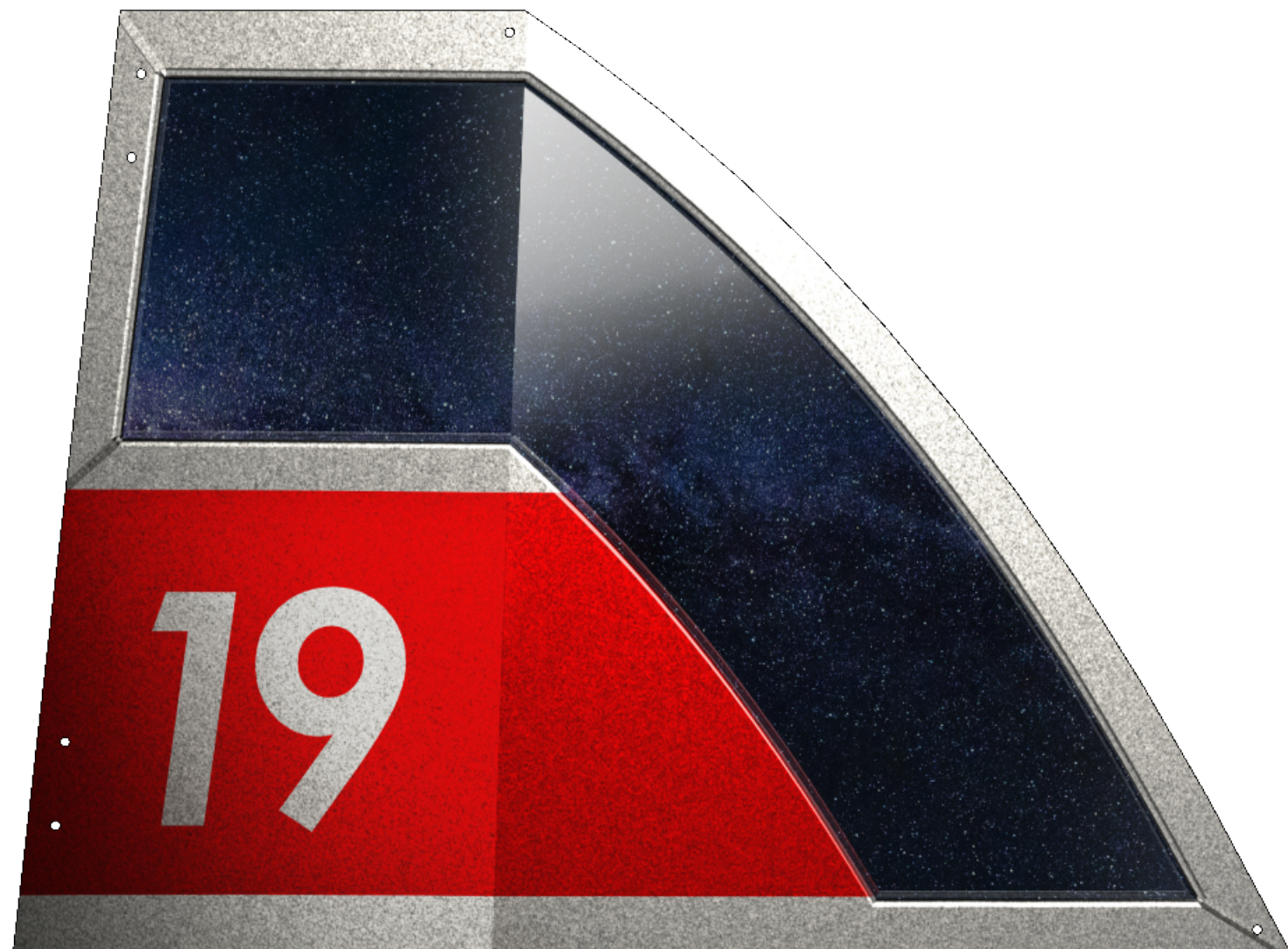
1

4

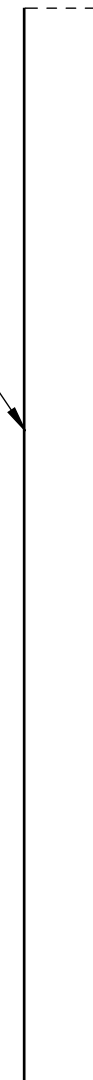
3

2

1



Vinyl applied to this side




Notes:  
Quantity per field: 1


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

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		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		



**TITLE:** Cargo Ship Front Top Plastic Right Red



SIZE	DWG. NO.	REV
<b>B</b>	GE-19080-Right-Red	
SCALE: 1:4	WEIGHT:	SHEET 1 OF 1

4

3

2

1

B

B

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A

4

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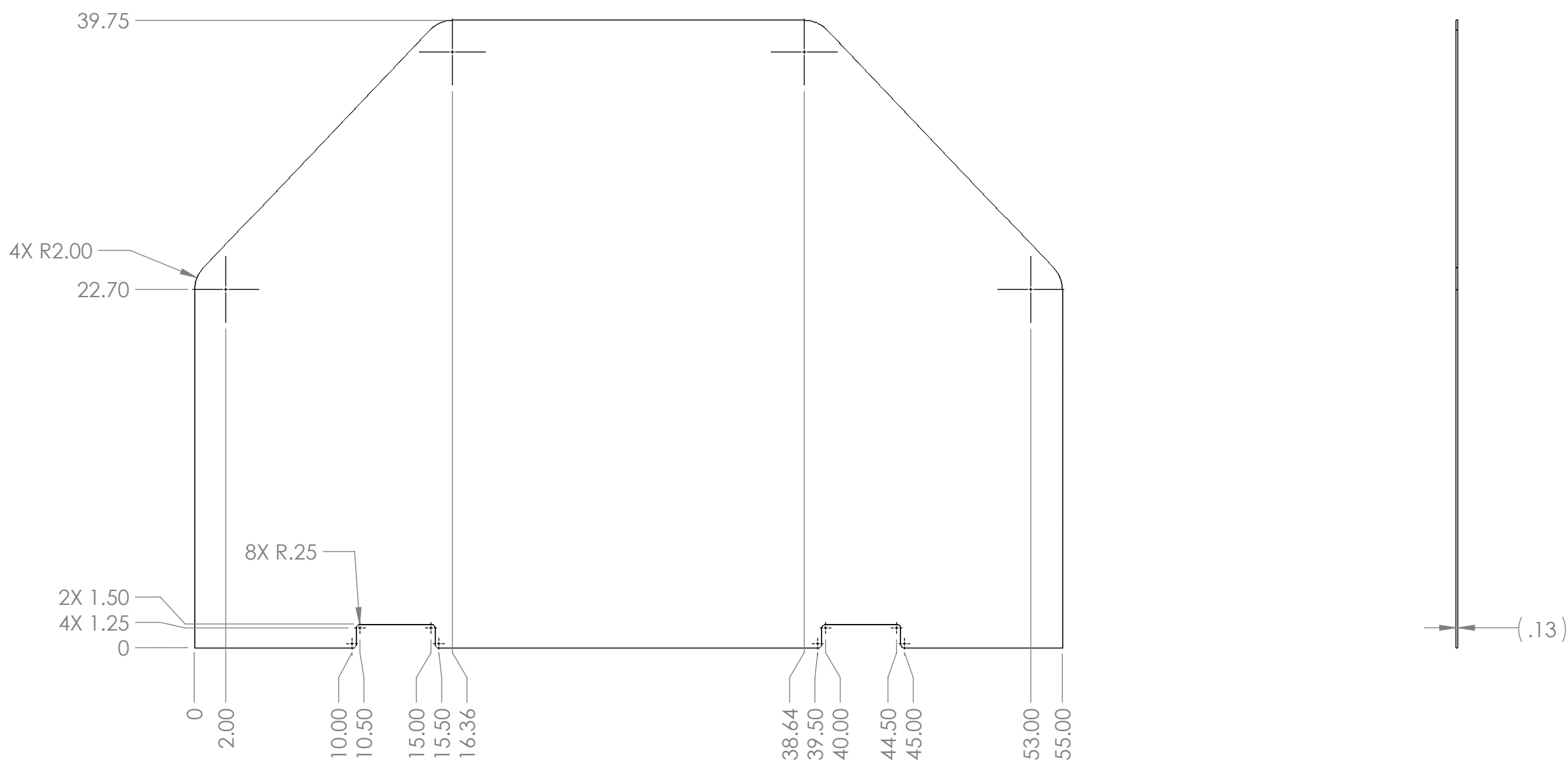
1

B

B

A

A





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

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

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		DIMENSIONS ARE IN INCHES		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			

 		
TITLE:		
<h1>Back Plastic, Cargo</h1>		
SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19081</b>	<b>A</b>
SCALE: 1:8	WEIGHT:	SHEET 1 OF 1

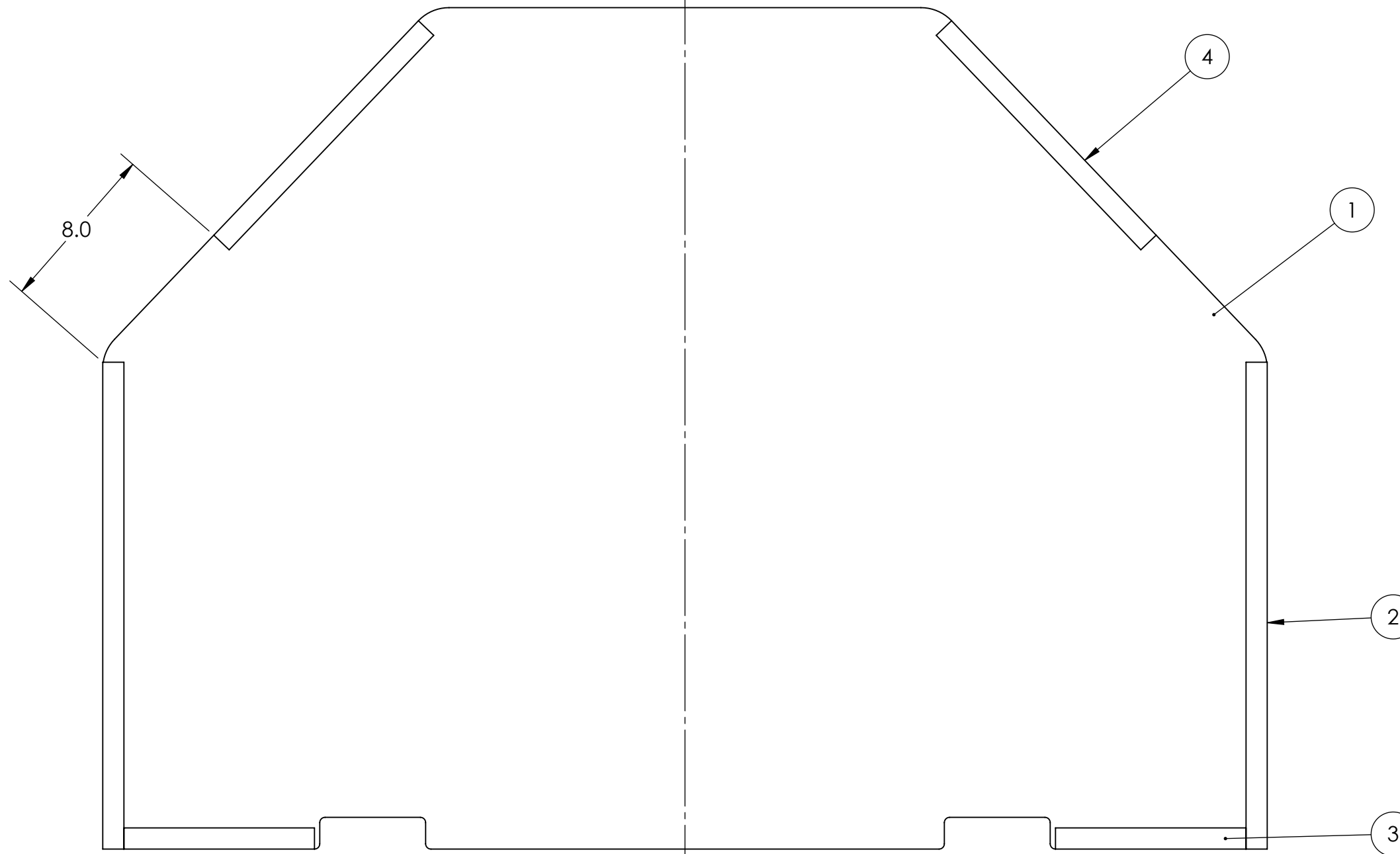


4

3

2



1



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

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

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		UNLESS OTHERWISE SPECIFIED:	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		
		INTERPRET GEOMETRIC TOLERANCING PER:	CHECKED		<b>GE-19081, with Loop</b>
		MATERIAL	ENG APPR.		
NEXT ASSY	USED ON	FINISH	MFG APPR.		<b>B</b> GE-19081-Assembly
APPLICATION		DO NOT SCALE DRAWING	Q.A.		SCALE: 1:8 WEIGHT: SHEET 1 OF 1
			COMMENTS:		

4

3

2

1

B

B

A

A

4

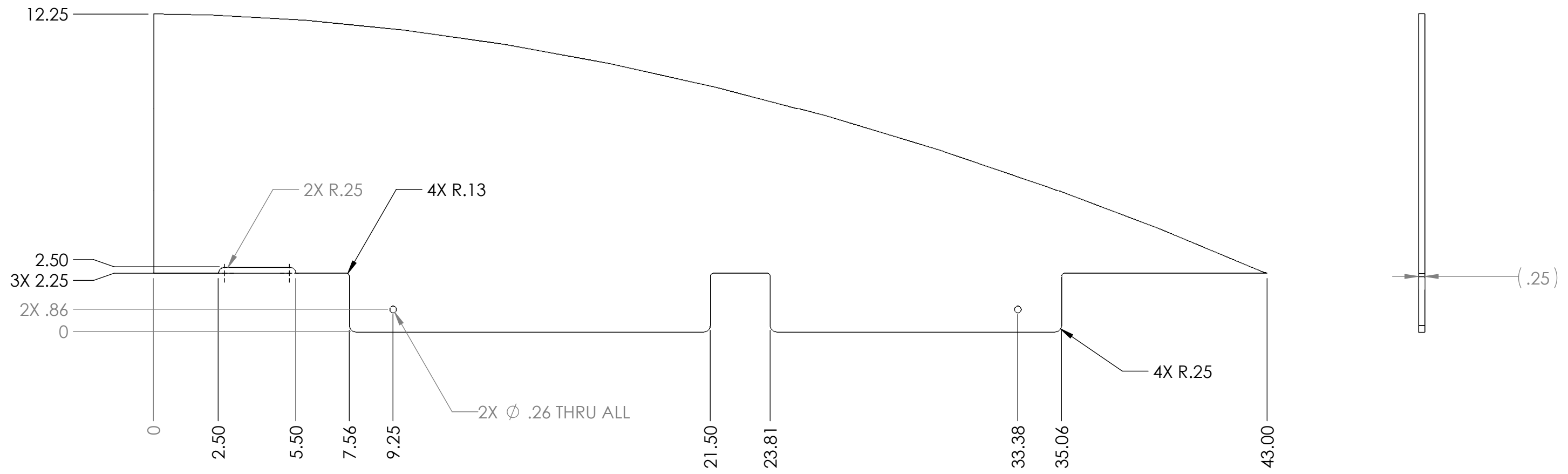
3

2

1

B

B



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

A

A

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



TITLE:		
<b>Cargo Ship Fin</b>		
SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19082</b>	
SCALE: 1:8	WEIGHT:	SHEET 1 OF 1

4

3

2

1

4

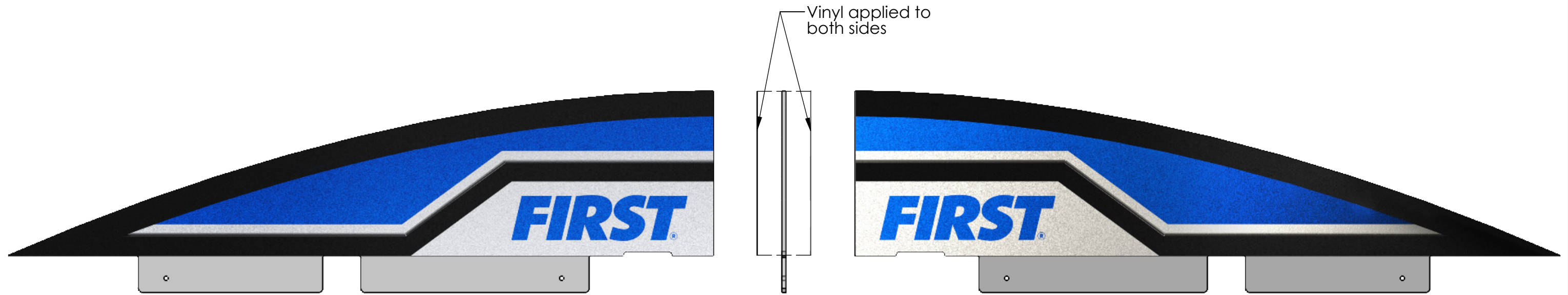
3

2

1

B

B





A

A

Notes:  
Quantity per field: 1

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

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		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		
		INTERPRET GEOMETRIC TOLERANCING PER:	CHECKED		SIZE DWG. NO. REV
		MATERIAL	ENG APPR.		<b>B</b> GE-19082-Blue
NEXT ASSY	USED ON	FINISH	MFG APPR.		SCALE: 1:6 WEIGHT: SHEET 1 OF 1
APPLICATION		DO NOT SCALE DRAWING	Q.A.		
			COMMENTS:		

4

3

2

1

4

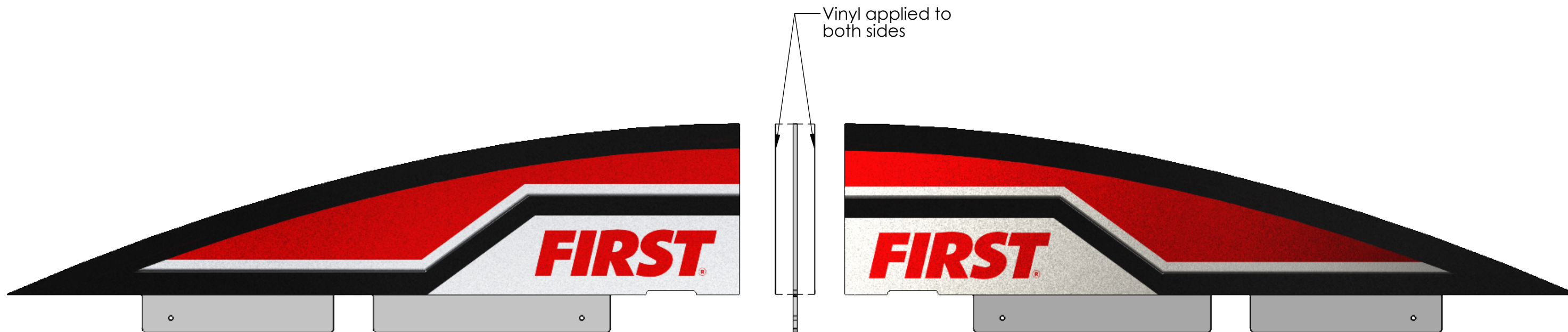
3

2

1

B

B



A



A

Notes:  
Quantity per field: 1

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

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DIMENSIONS ARE IN INCHES		DRAWN	
TOLERANCES:		CHECKED	
FRACTIONAL ±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			

TITLE:

## Cargo Ship Fin, Red

SIZE DWG. NO. REV

**B** GE-19082-Red

SCALE: 1:6

WEIGHT:

SHEET 1 OF 1

4

3

2

1

4

3

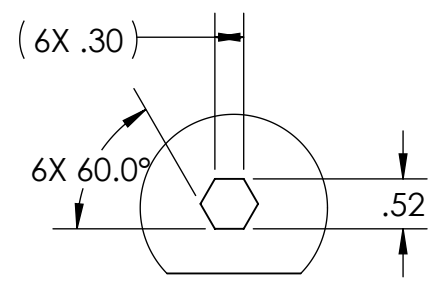
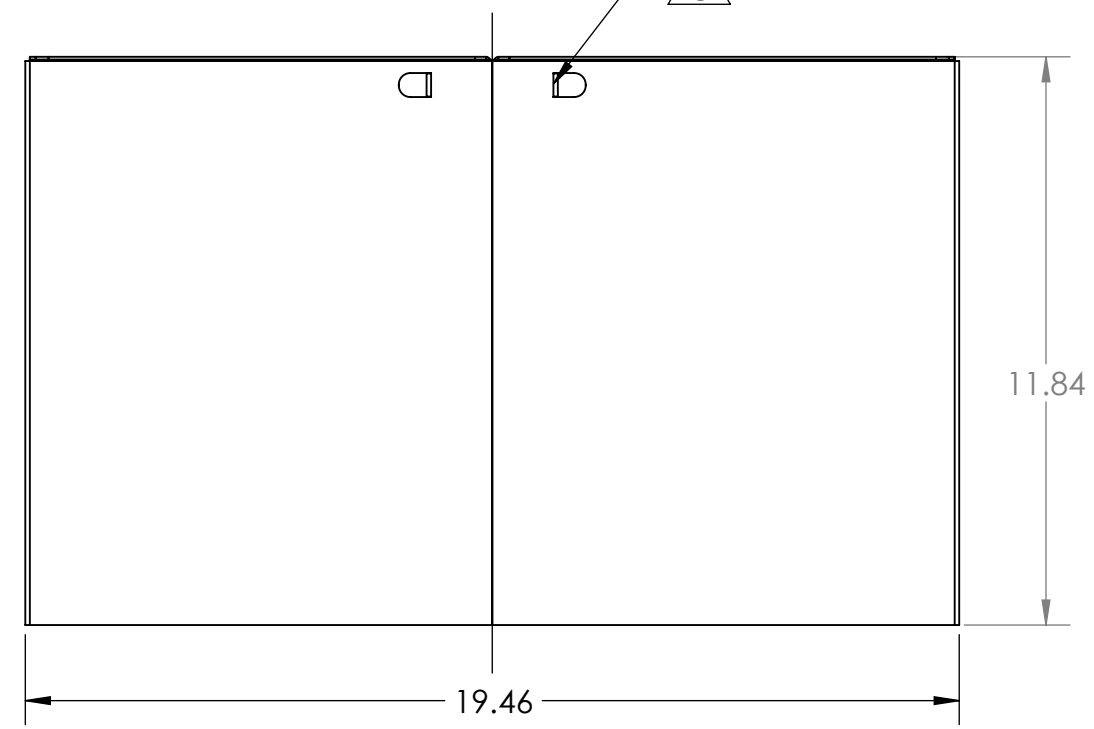
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1

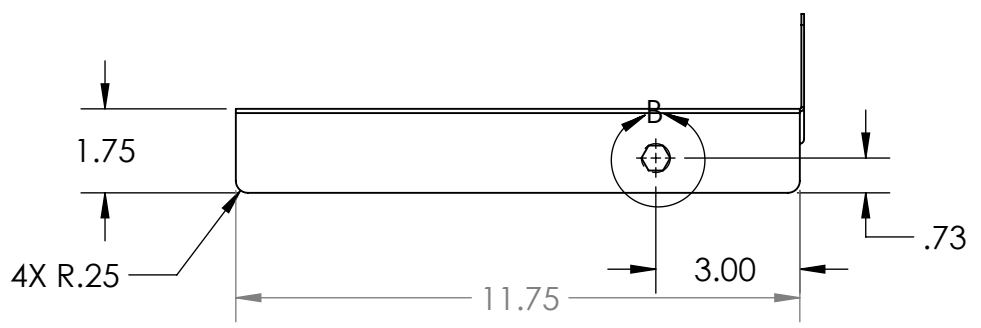
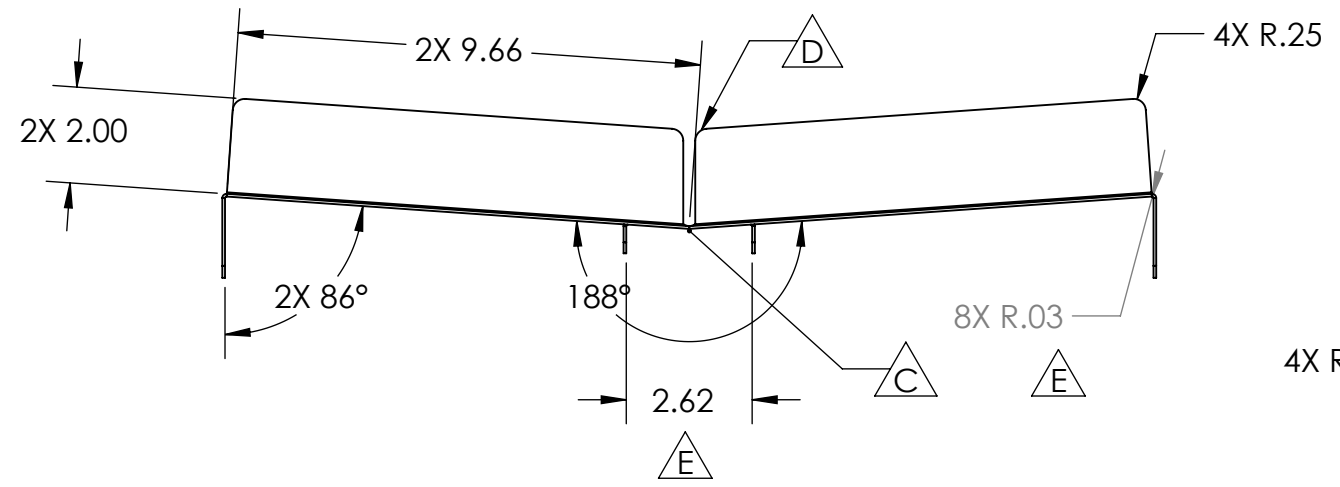
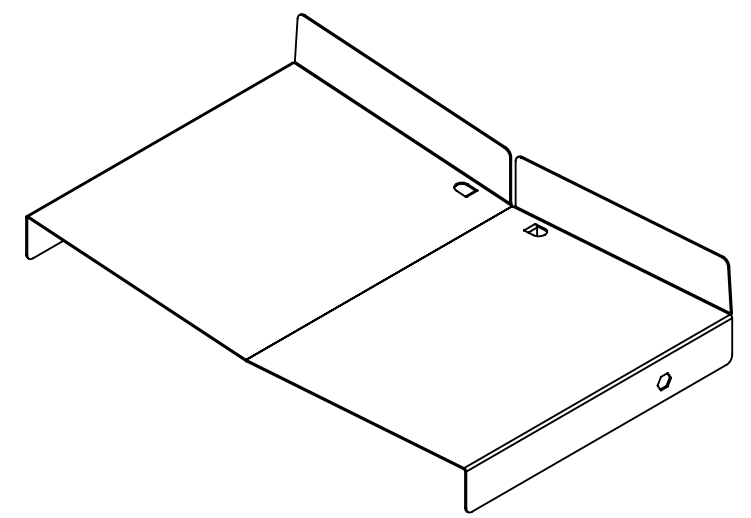
REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
B4	A	General redesign of part	7/13/2018	JRF
B4	B	General redesign of part	8/13/2018	JRF
A3, B3	C	Added tabs, change bend profile	09/27/2018	JRF
A3, 2-A1	D	Tab geometry modified; added fillets	10/16/2018	JRF
A3, 2-B3	E	Modified bend radius, added missing dimension	11/2/2018	JRF
2-A1	F	Tab geometry modified; slot size increased	11/7/2018	JRF

A B



DETAIL B  
SCALE 1 : 2



B

B

A

A

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

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



TITLE:  
**Tray Flip Plate**

SIZE **B** DWG. NO. **GE-19085** REV **F**

SCALE: 1:4 WEIGHT: SHEET 1 OF 2

4

3

2

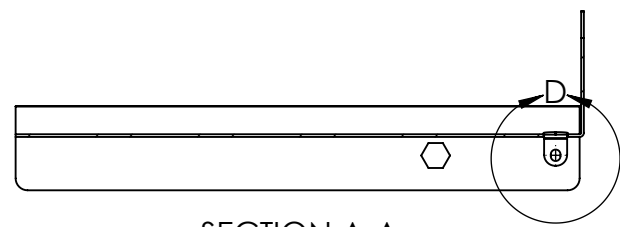
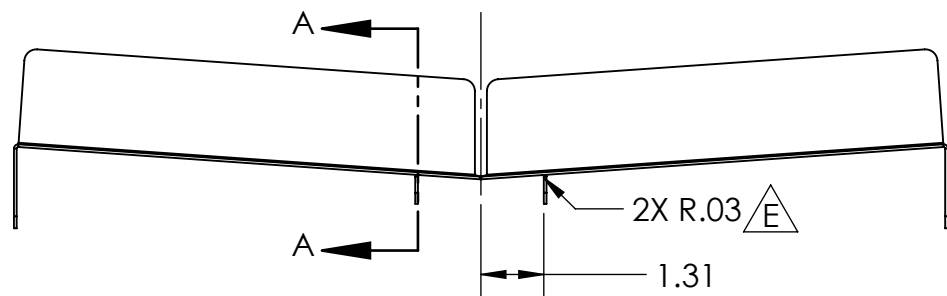
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4

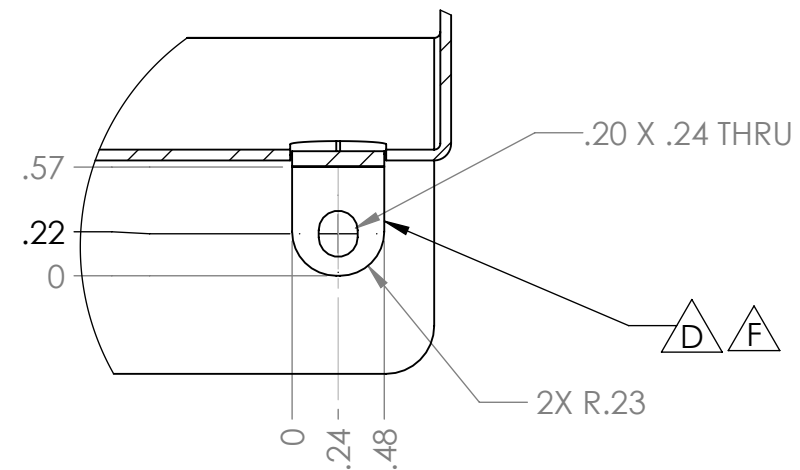
3

2

1



SECTION A-A



DETAIL D  
SCALE 1 : 1

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



TITLE:  
**Tray Flip Plate**

SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19085</b>	<b>F</b>
SCALE: 1:4	WEIGHT:	SHEET 2 OF 2

4

3

2

1

B

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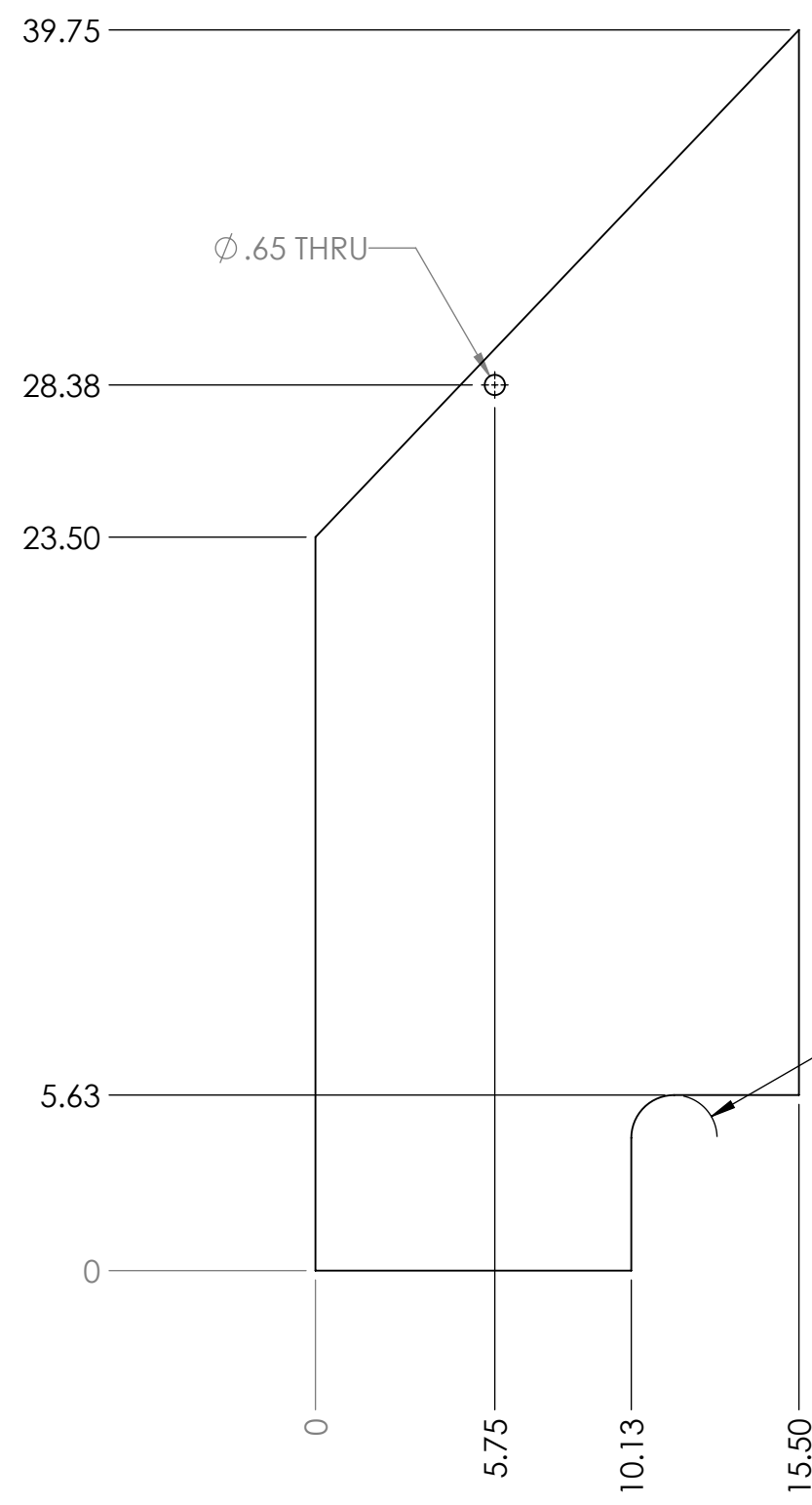
A

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

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

 		
TITLE:		
<h1>Cargo Ship Divider Side</h1>		
SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19088</b>	<b>A</b>
SCALE: 1:8	WEIGHT:	SHEET 1 OF 1

4

3

2

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B

B

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A

4

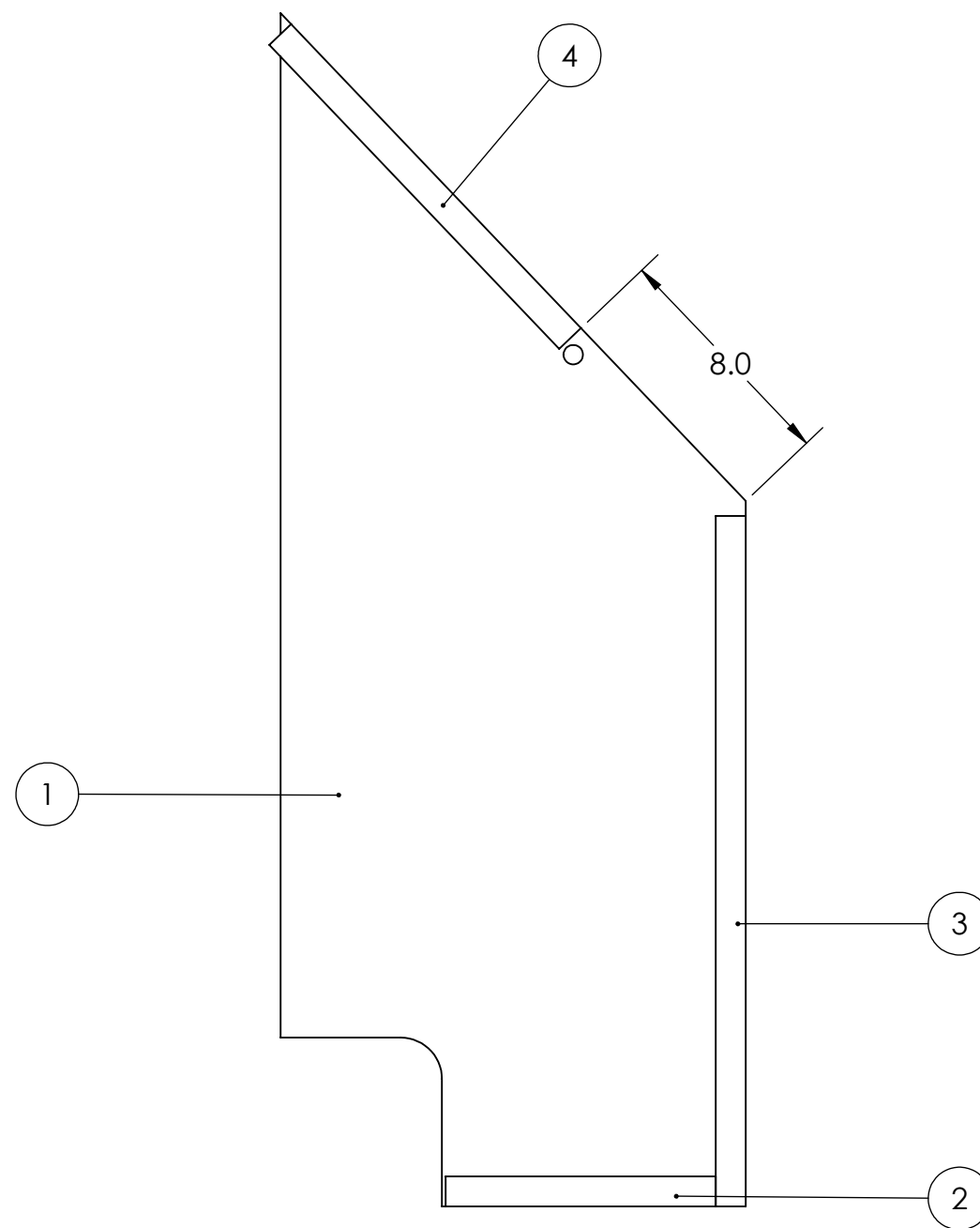
3

2

1

B

B



A

A

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

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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			



TITLE:  
**Cargo Ship Divider Side, Left**

SIZE	DWG. NO.	REV
<b>B</b>	GE-19088-Left-Assembly	
SCALE: 1:8	WEIGHT:	SHEET 1 OF 1

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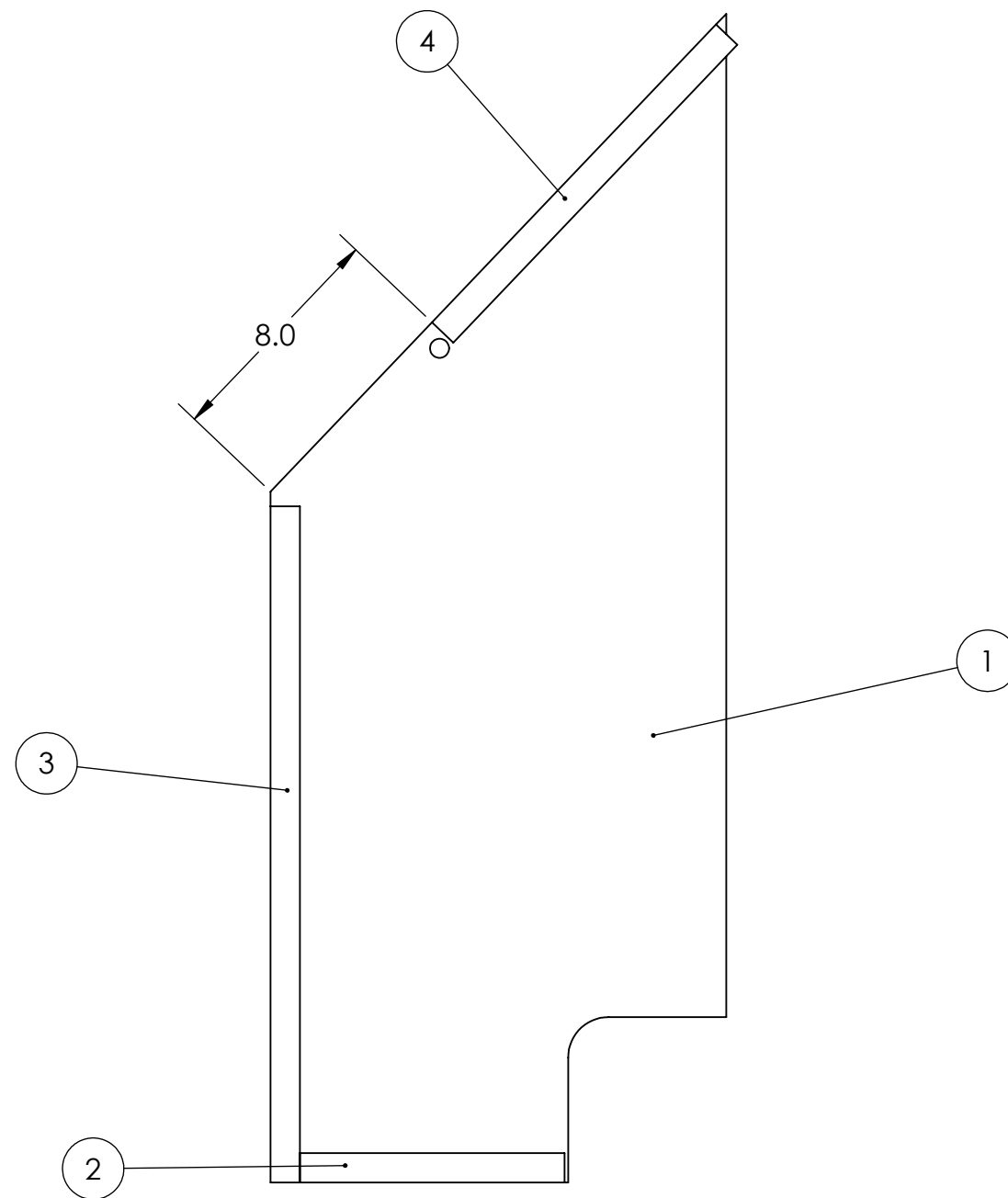
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	GE-19088	Cargo Ship Divider Side	1
2	Loop_1_9	1" x 9" Loop, Adhesive Backed	1
3	Loop_1_23	1" Loop, 23" Long	1
4	Loop_1_14	1" x 14" Loop, Adhesive Backed	1

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		UNLESS OTHERWISE SPECIFIED:	NAME	DATE	 
		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL: ±1/16 ANGULAR: MACH ±1° BEND ±1° TWO PLACE DECIMAL ±.01 THREE PLACE DECIMAL ±.001	DRAWN		
		INTERPRET GEOMETRIC TOLERANCING PER:	CHECKED		TITLE: <h3>Cargo Ship Divider Side, Right</h3>
		MATERIAL	ENG APPR.		
NEXT ASSY	USED ON	FINISH	MFG APPR.		SIZE <b>B</b> DWG. NO. GE-19088-Right-Assembly REV SCALE: 1:8 WEIGHT: SHEET 1 OF 1
APPLICATION		DO NOT SCALE DRAWING	Q.A.		
			COMMENTS:		

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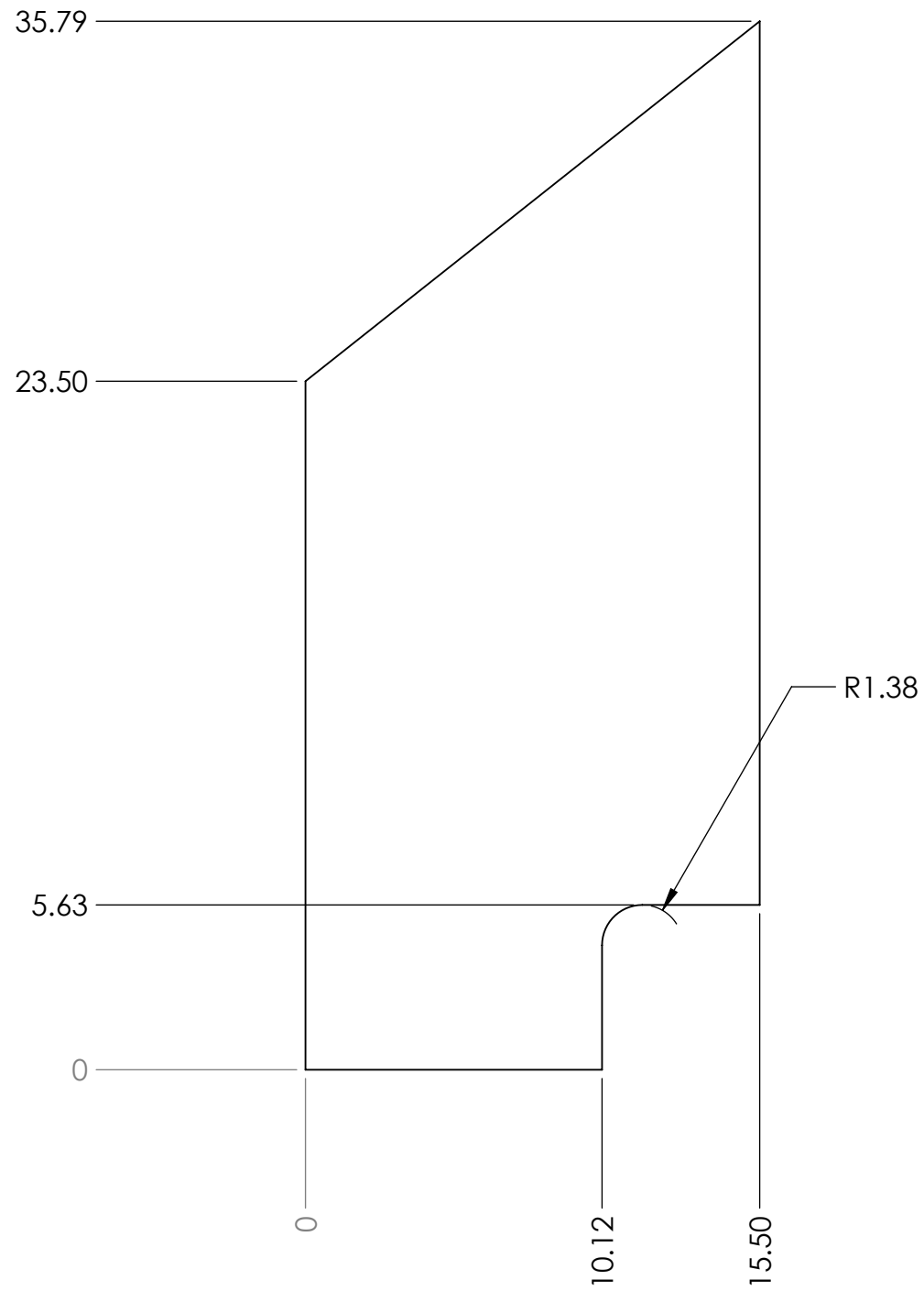
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- Notes:
1. Material: 1/8" Thick Clear Polycarbonate Sheet
  2. Remove all sharp edges and burrs
  3. Tag Or Label With Part Number

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		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		
		INTERPRET GEOMETRIC TOLERANCING PER:	CHECKED		TITLE:
		MATERIAL	ENG APPR.		<h1>Cargo Ship Divider Front</h1>
		FINISH	MFG APPR.		
NEXT ASSY	USED ON		Q.A.		SIZE DWG. NO. REV
APPLICATION		DO NOT SCALE DRAWING	COMMENTS:		<b>B</b> <b>GE-19089</b> <b>A</b>
					SCALE: 1:8 WEIGHT: SHEET 1 OF 1

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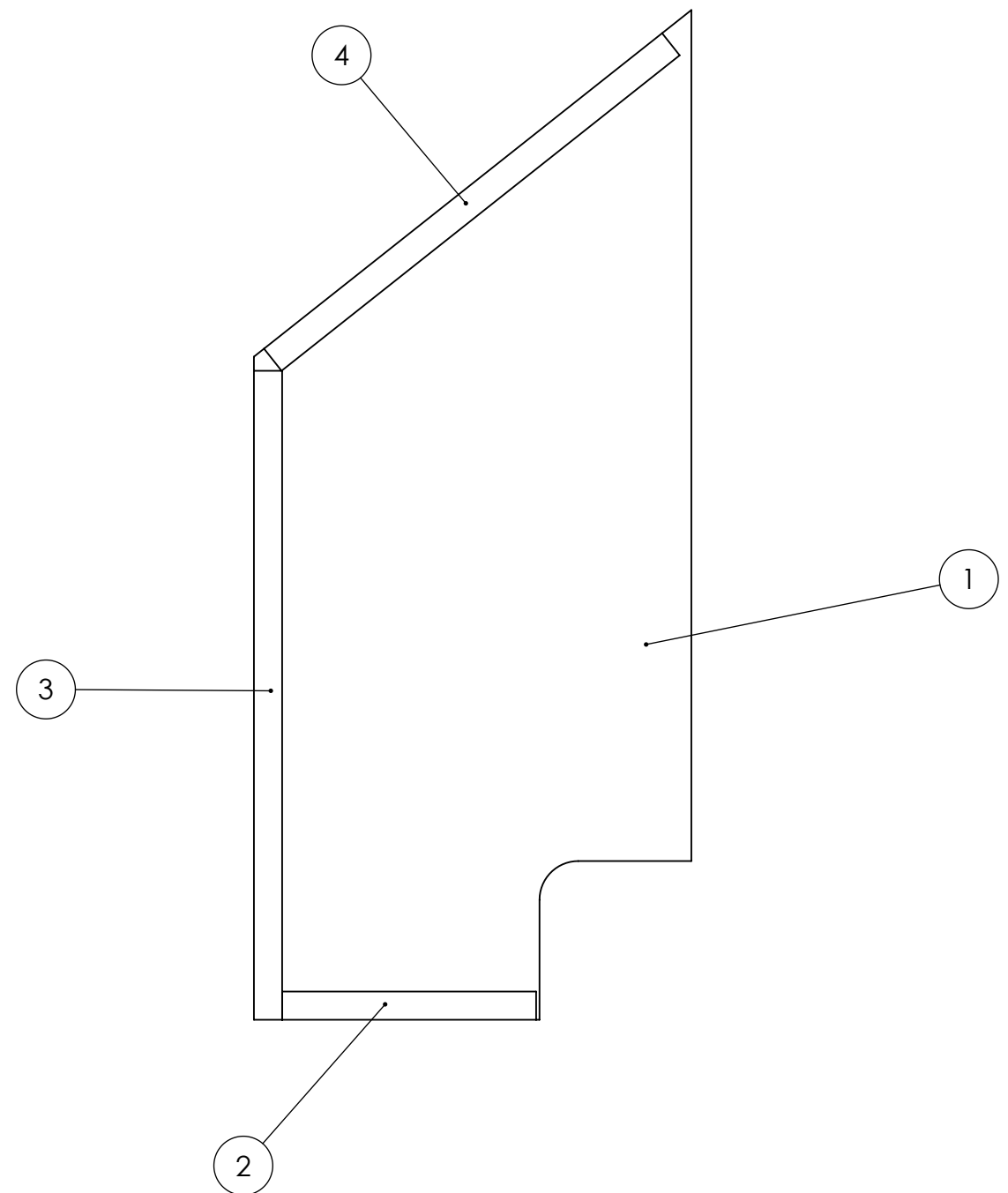
1

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

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

TITLE:  
**GE-19089, with Loop**

SIZE	DWG. NO.	REV
<b>B</b>	GE-19089-Assembly	

SCALE: 1:8 WEIGHT: SHEET 1 OF 1

4

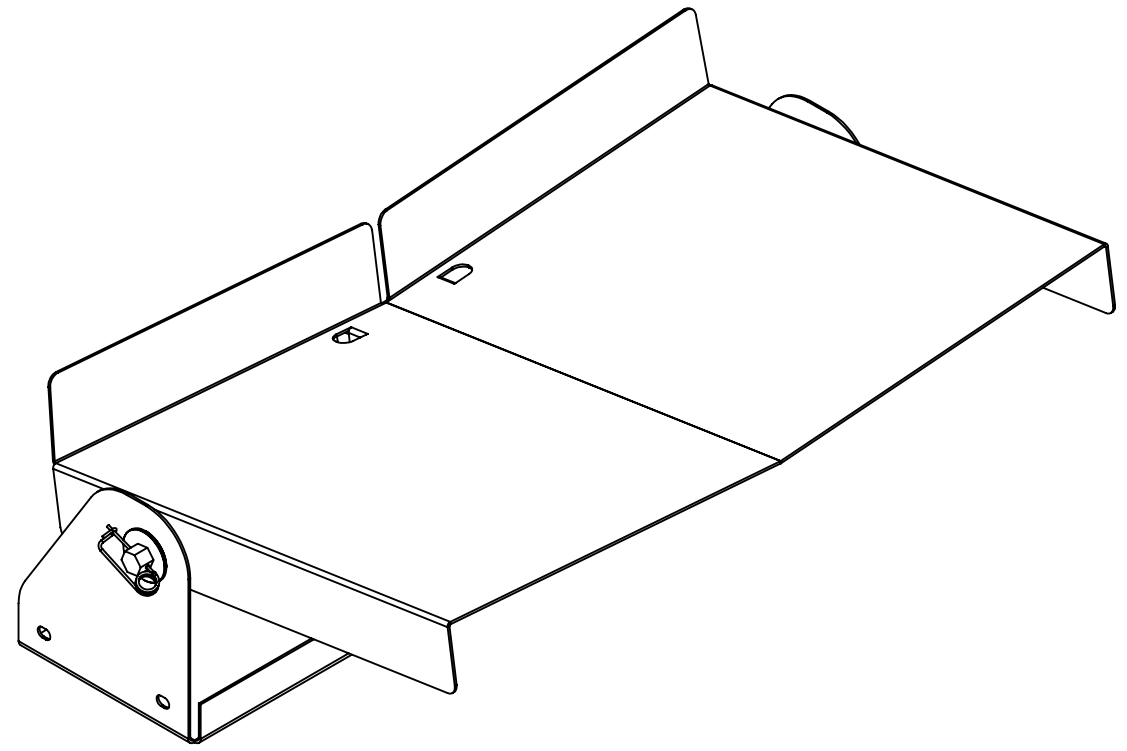
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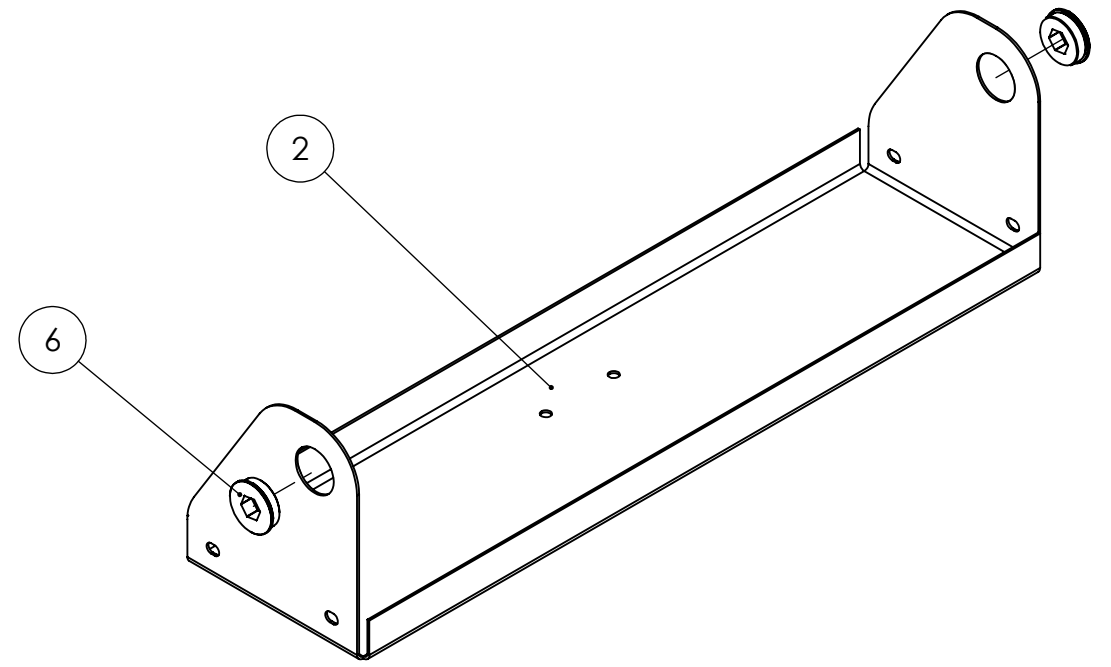
1

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

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

 		
TITLE:		
<h1>Cargo Ship Tray Assembly</h1>		
SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19092</b>	
SCALE: 1:12 WEIGHT:		SHEET 1 OF 3

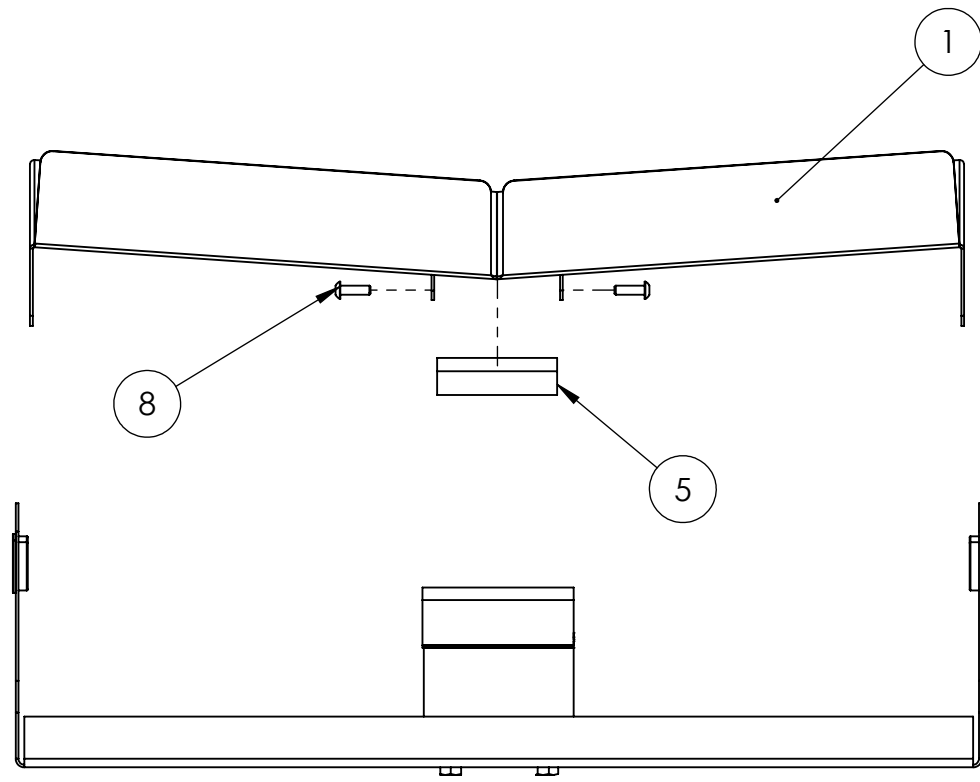
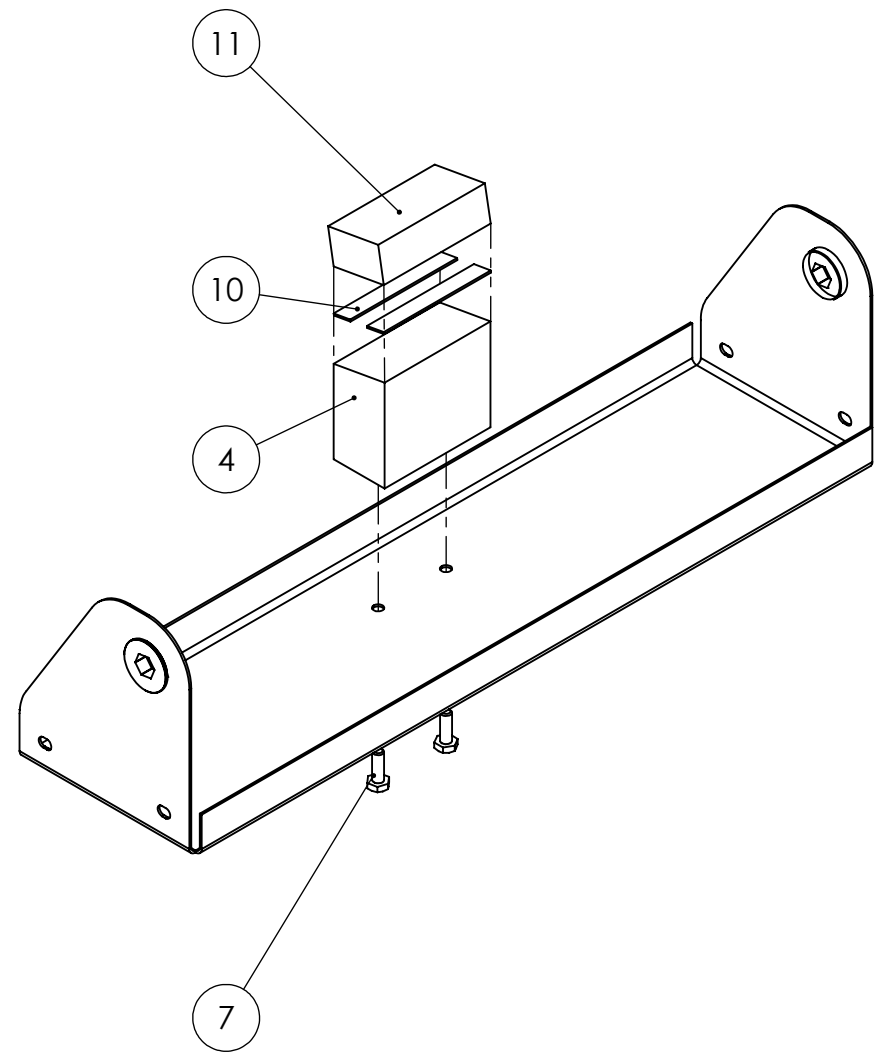
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Notes:  
Do not fully tighten bolts. Item 5 should be able to spin freely.

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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	
		INTERPRET GEOMETRIC TOLERANCING PER:		CHECKED	
		MATERIAL		ENG APPR.	
		FINISH		MFG APPR.	
NEXT ASSY	USED ON			Q.A.	
APPLICATION		DO NOT SCALE DRAWING		COMMENTS:	
 					
TITLE: <b>Cargo Ship Tray Assembly</b>					
SIZE	DWG. NO.			REV	
<b>B</b>	<b>GE-19092</b>				
SCALE: 1:4		WEIGHT:		SHEET 2 OF 3	

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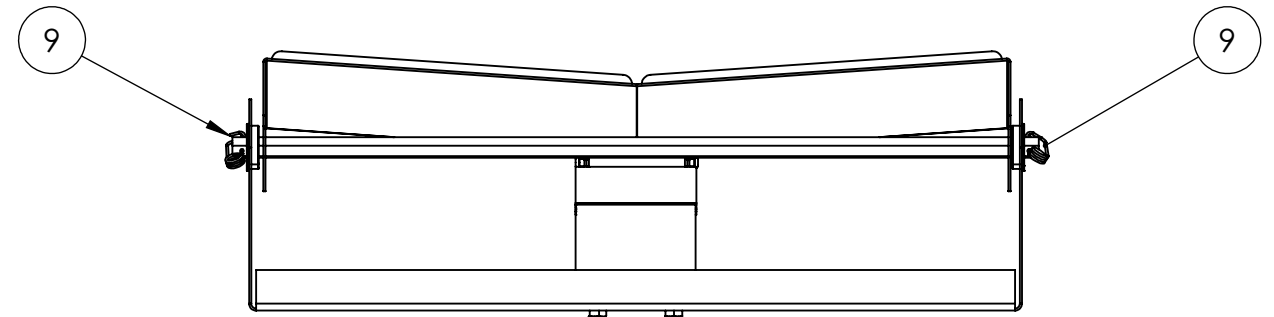
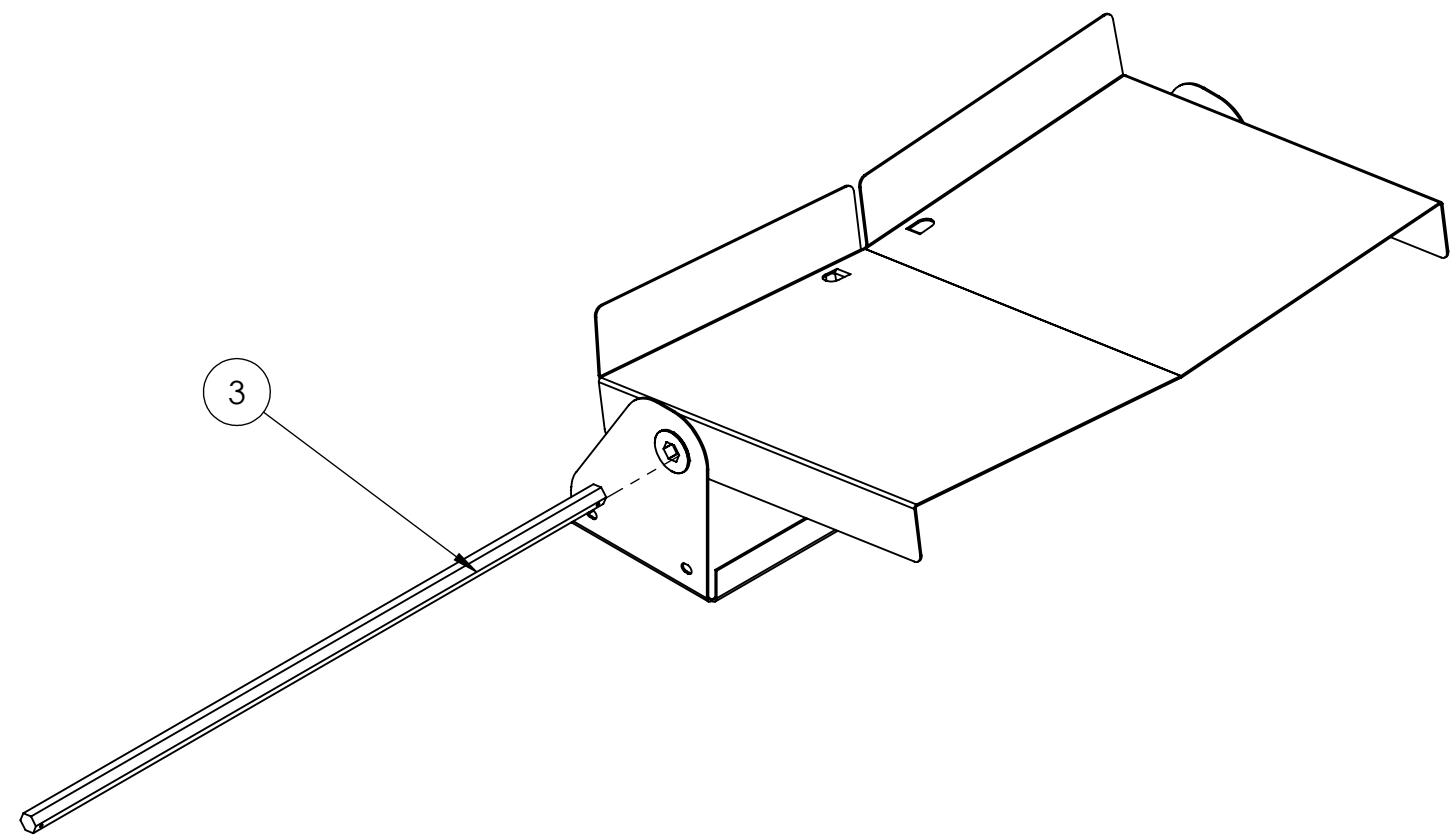
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		UNLESS OTHERWISE SPECIFIED:		NAME	DATE
		DIMENSIONS ARE IN INCHES	DRAWN		
		TOLERANCES:	CHECKED		
		FRACTIONAL ±1/16	ENG APPR.		
		ANGULAR: MACH ±1° BEND ±1°	MFG APPR.		
		TWO PLACE DECIMAL ±.01	Q.A.		
		THREE PLACE DECIMAL ±.001	COMMENTS:		
		INTERPRET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



TITLE:  
**Cargo Ship Tray Assembly**

SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19092</b>	

SCALE: 1:5 WEIGHT: SHEET 3 OF 3

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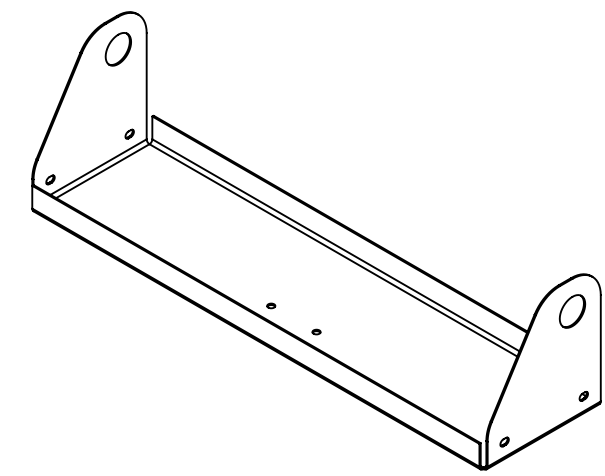
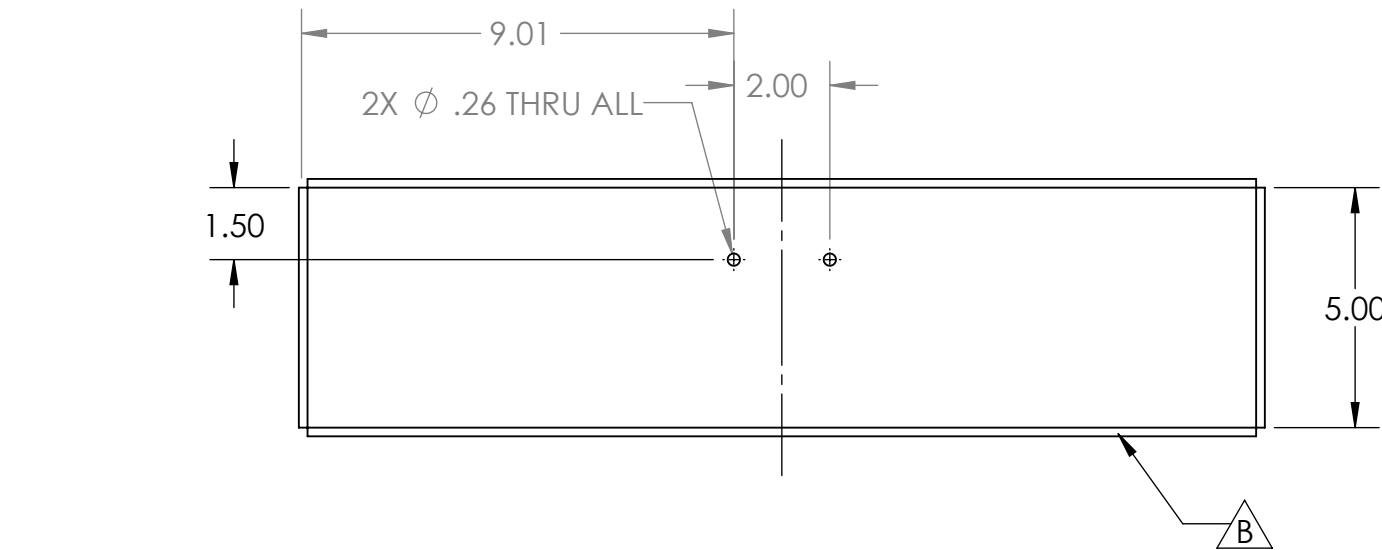
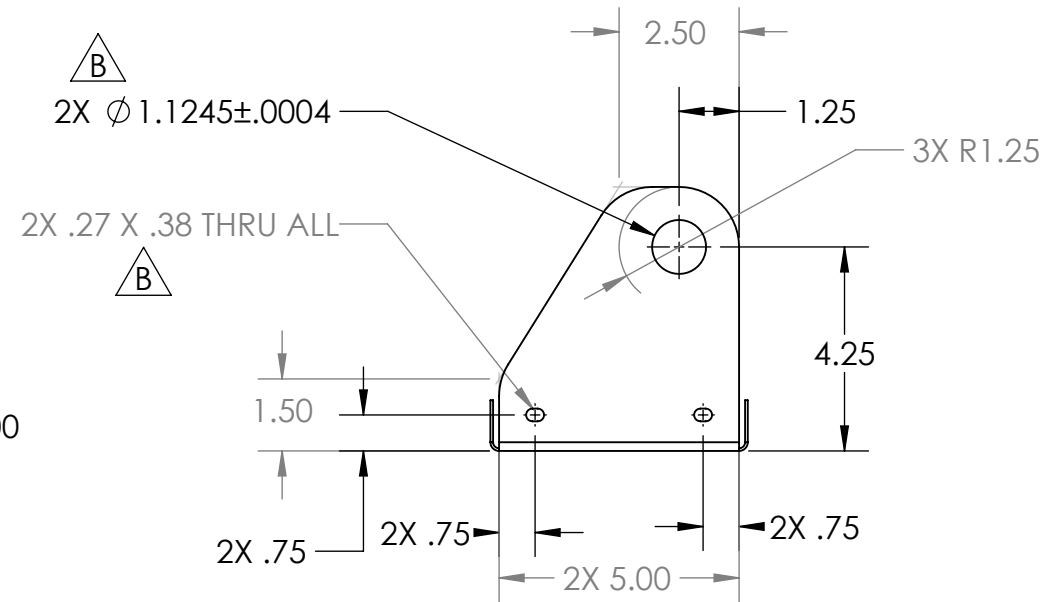
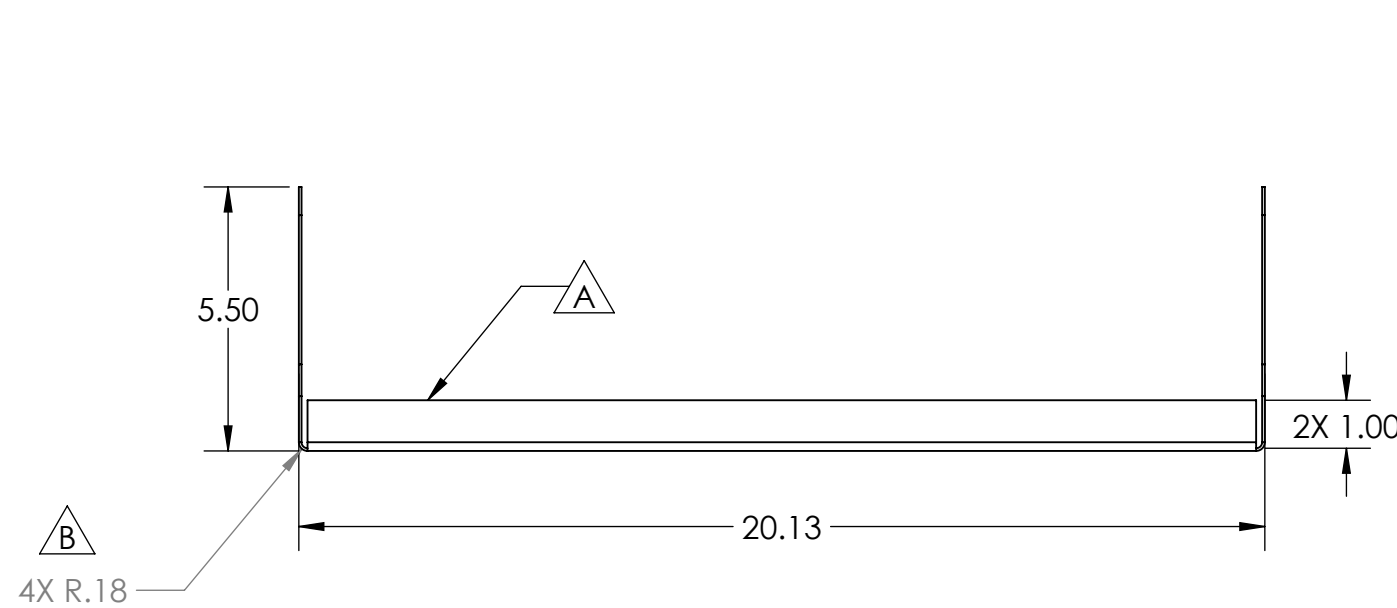
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REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
B4	A	Added flange	10/4/2018	JRF
A3, B2, B4	B	Holes changed to slots; changed tolerance on 1.12" hole; added second flange, decreased bend radius	10/30/2018	JRF

B

B





A

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

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		UNLESS OTHERWISE SPECIFIED:	NAME	DATE	 
		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL: ±1/16 ANGULAR: MACH ±1° BEND ±1° TWO PLACE DECIMAL ±.01 THREE PLACE DECIMAL ±.001	DRAWN		
		INTERPRET GEOMETRIC TOLERANCING PER:	CHECKED		TITLE: <h1>Tray Bracket</h1>
		MATERIAL	ENG APPR.		
		FINISH	MFG APPR.		SIZE DWG. NO. REV <b>B</b> GE-19095 <b>B</b>
NEXT ASSY	USED ON		Q.A.		
APPLICATION		DO NOT SCALE DRAWING	COMMENTS:		SCALE: 1:4 WEIGHT: SHEET 1 OF 1

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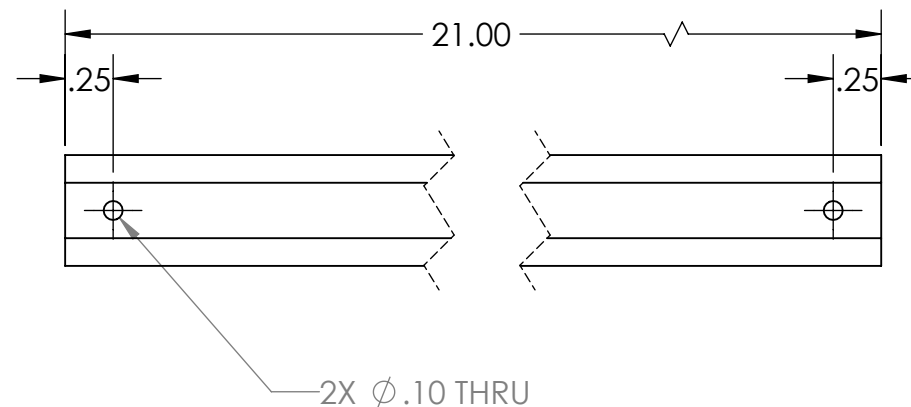
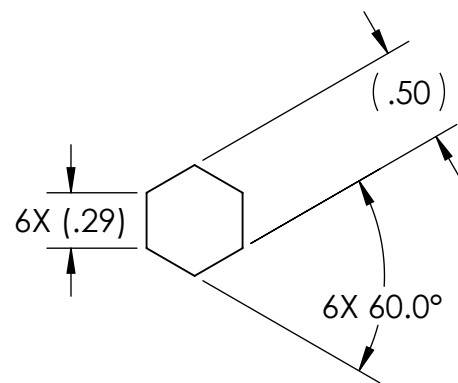
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Notes:

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

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		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	
		INTERPRET GEOMETRIC TOLERANCING PER:		CHECKED	
		MATERIAL		ENG APPR.	
		FINISH		MFG APPR.	
NEXT ASSY	USED ON			Q.A.	
APPLICATION		DO NOT SCALE DRAWING		COMMENTS:	
				 	
TITLE: Tray Hex Shaft					
SIZE	DWG. NO.			REV	
<b>B</b>	<b>GE-19096</b>			<b>A</b>	
SCALE: 1:4		WEIGHT:		SHEET 1 OF 1	

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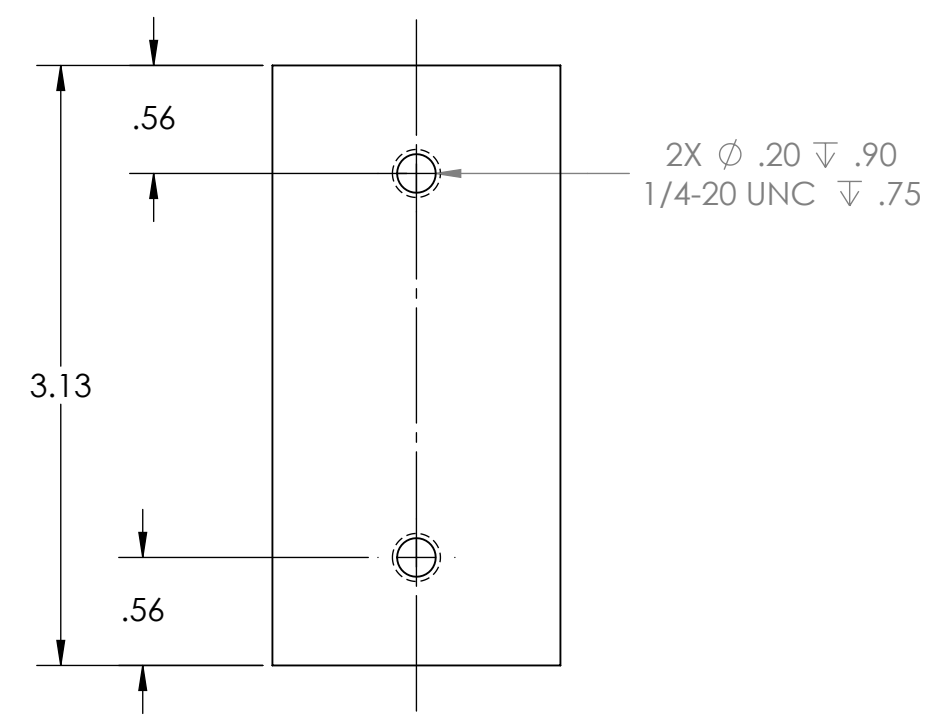
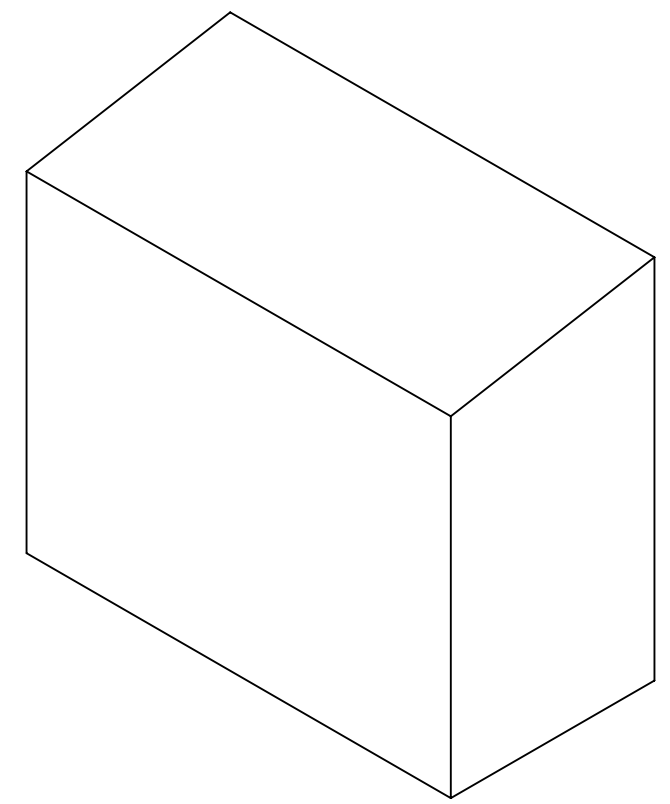
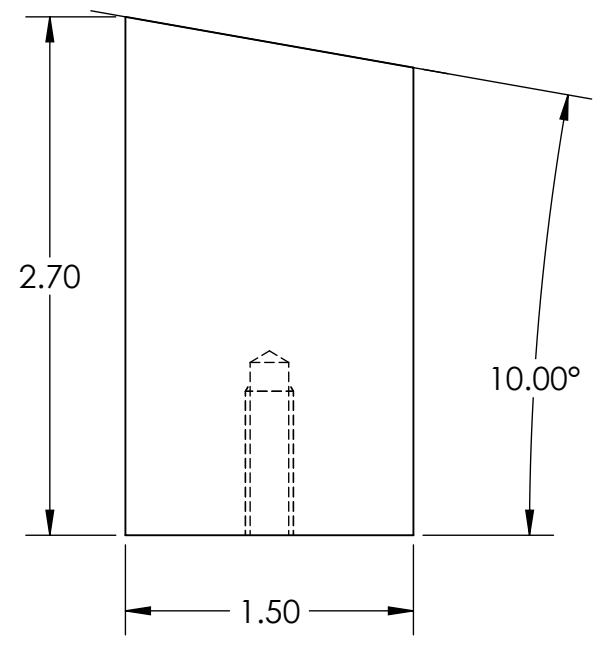


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- Notes:
1. Remove all sharp edges and burrs
  2. Material: ABS Plastic, smooth, any color
  3. Tag or label with part number

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		UNLESS OTHERWISE SPECIFIED:		NAME	DATE
		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL ±1/16 ANGULAR: MACH ±1° BEND ±1° TWO PLACE DECIMAL ±.01 THREE PLACE DECIMAL ±.001		DRAWN	
		INTERPRET GEOMETRIC TOLERANCING PER:		CHECKED	
		MATERIAL		ENG APPR.	
		FINISH		MFG APPR.	
NEXT ASSY	USED ON			Q.A.	
APPLICATION		DO NOT SCALE DRAWING		COMMENTS:	
				 	
				TITLE:	
				<h1>Tray Magnet Block</h1>	
SIZE	DWG. NO.			REV	
<b>B</b>	<b>GE-19097</b>				
SCALE: 1:1		WEIGHT:		SHEET 1 OF 1	

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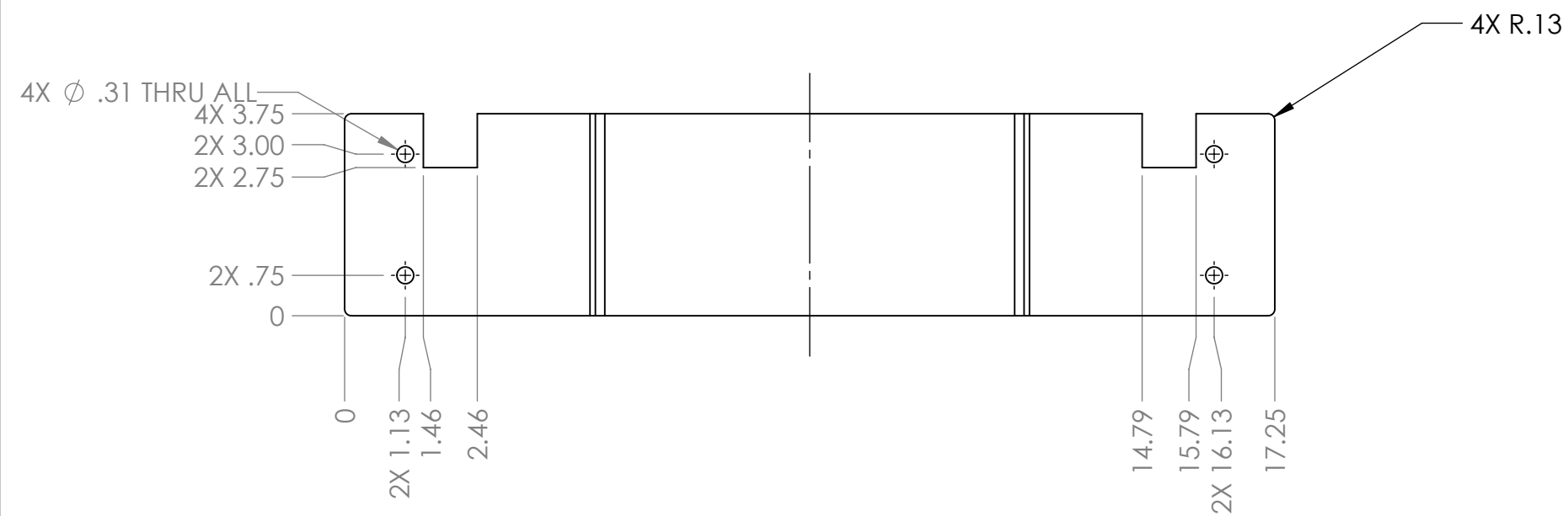
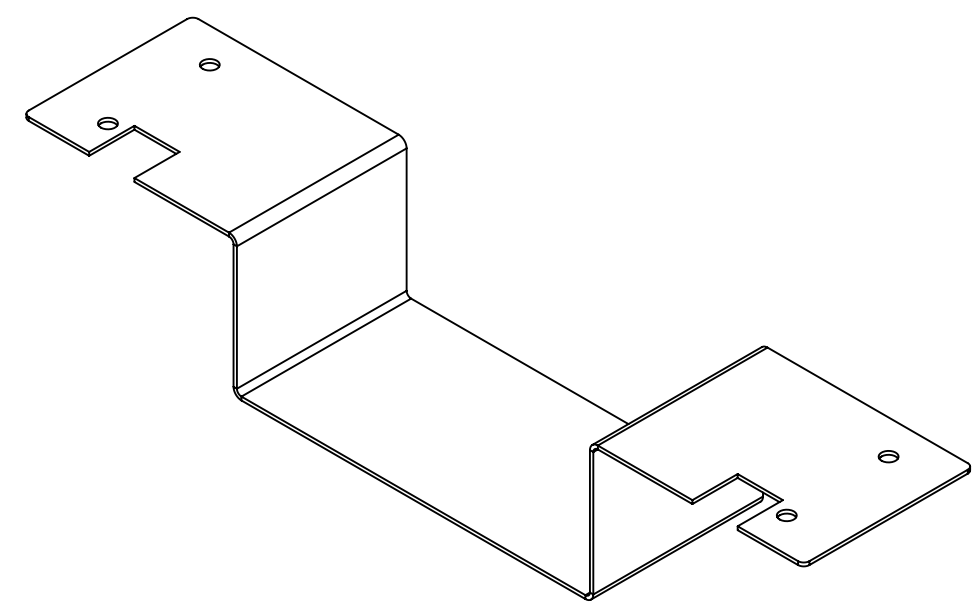
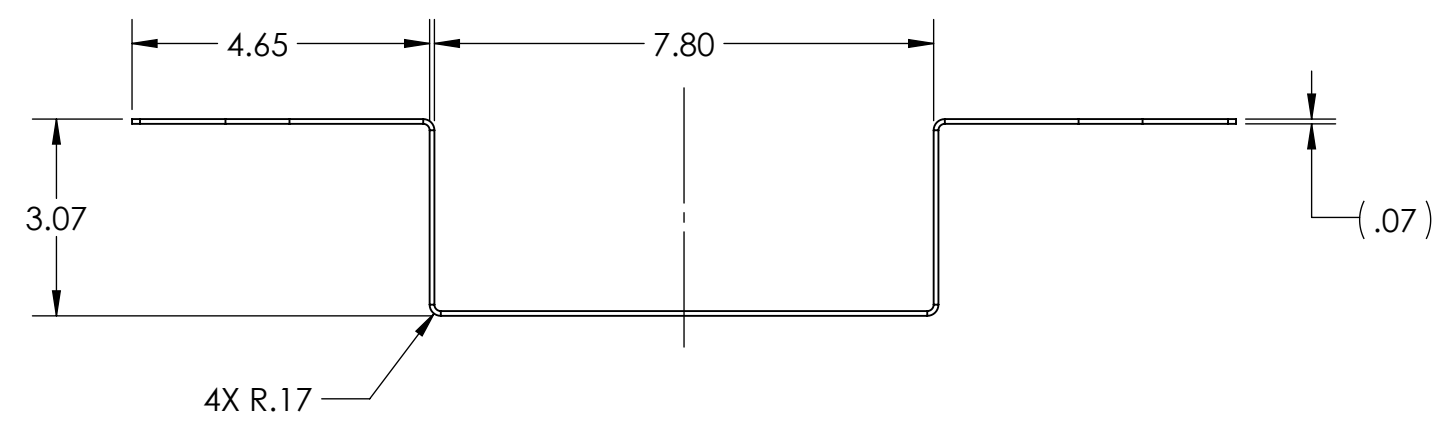
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- Notes:
1. Material: 14 gauge A-366/1008 Pre-Plated Steel.
  2. Remove all burrs and sharp edges.
  3. Tag or label with part number.

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

 		
TITLE:		
<h1>Keyhole Insert Bottom</h1>		
SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19098</b>	<b>A</b>
SCALE: 1:4 WEIGHT:		SHEET 1 OF 1

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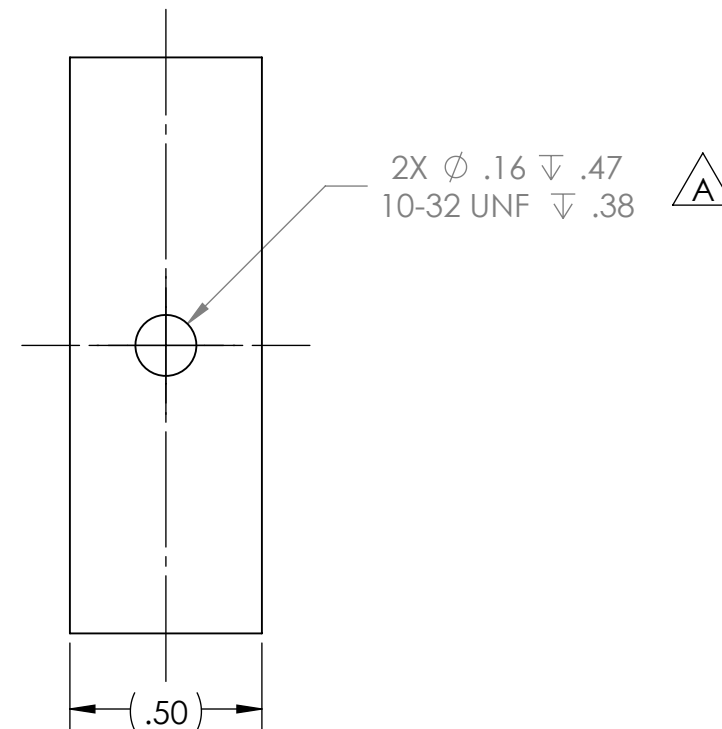
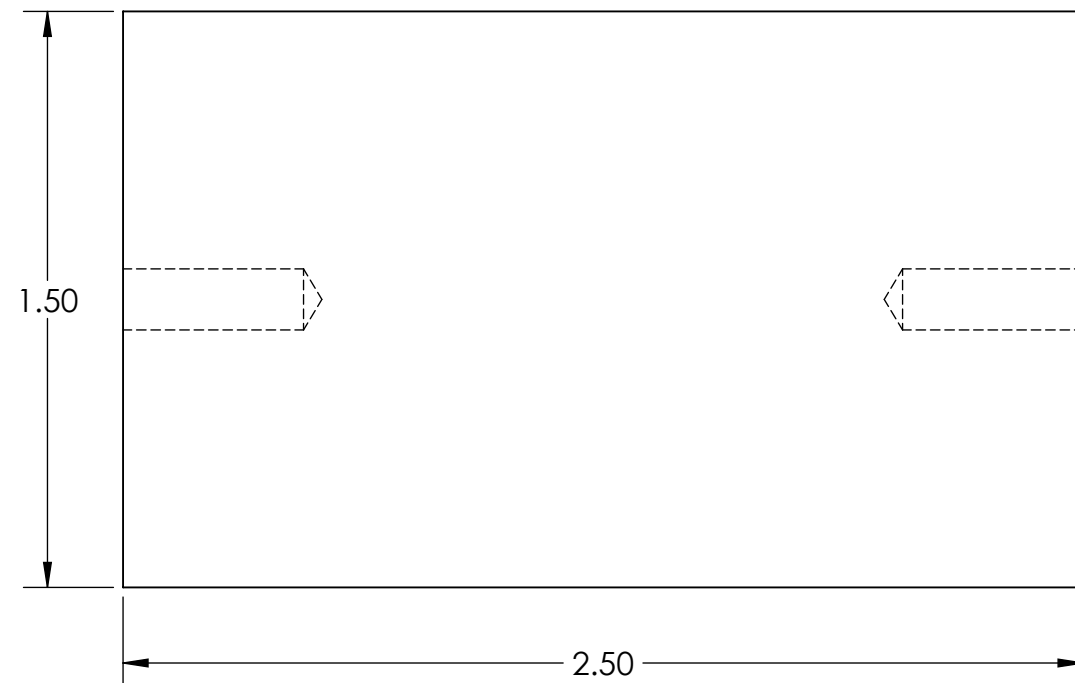
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REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
A4, B1	A	Changed thru hole to two tapped #10-32 holes	11/7/2018	JRF



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

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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		
INTERPRET GEOMETRIC TOLERANCING PER:		CHECKED		TITLE:
MATERIAL		ENG APPR.		Tray Steel Block
FINISH		MFG APPR.		SIZE DWG. NO. REV
NEXT ASSY	USED ON	Q.A.		<b>B</b> <b>GE-19099</b> <b>A</b>
APPLICATION		COMMENTS:		SCALE: 2:1 WEIGHT: SHEET 1 OF 1
DO NOT SCALE DRAWING				

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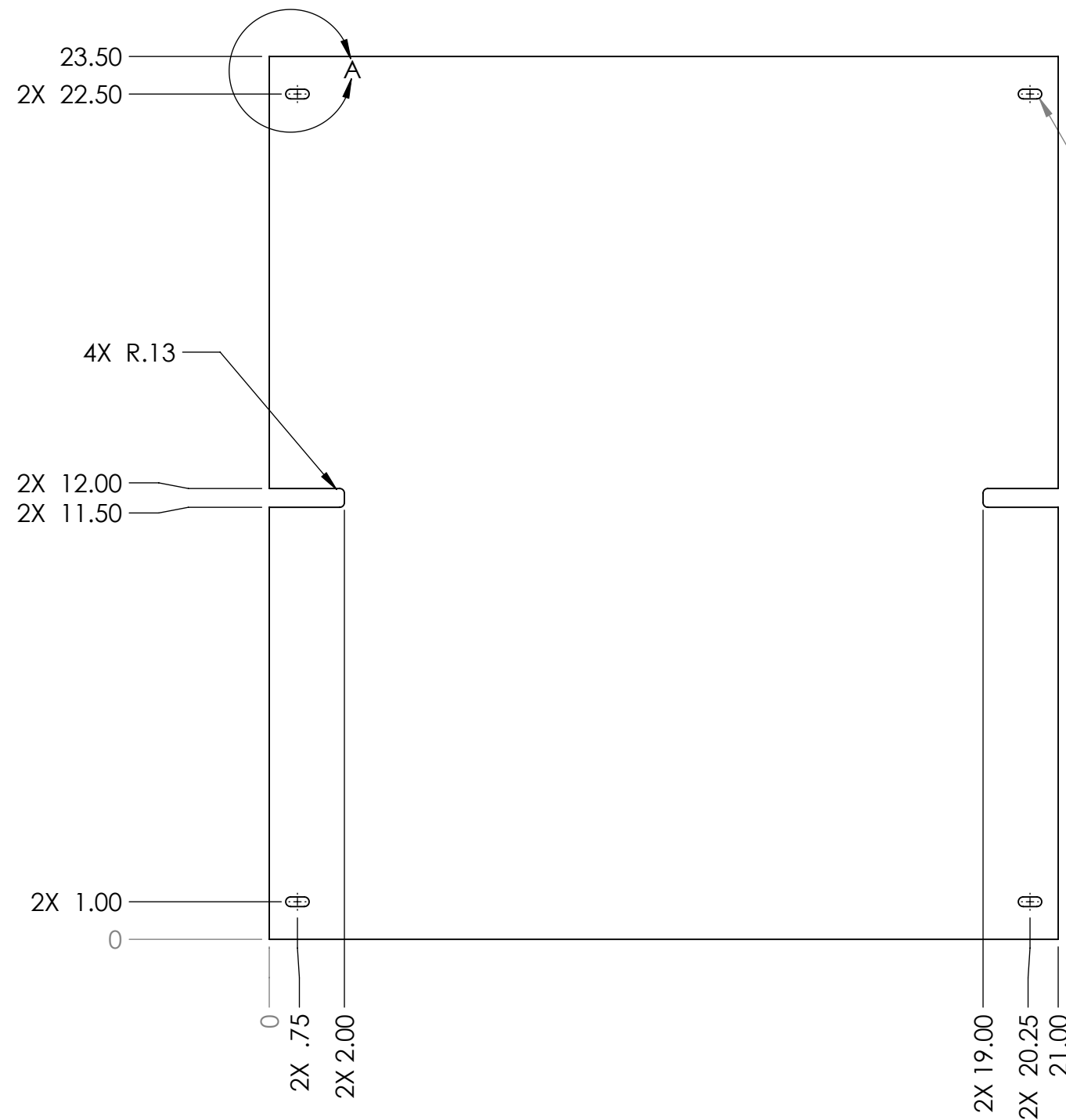
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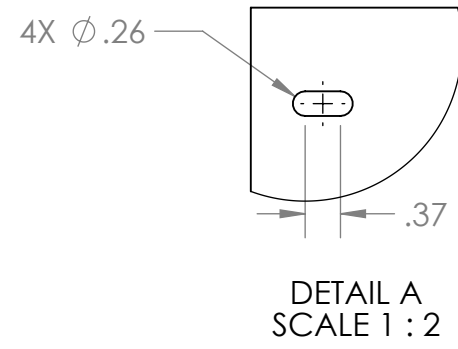
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- Notes:  
 1. Material: 1/8" Thick Clear Polycarbonate Sheet  
 2. Remove all sharp edges and burrs  
 3. Tag Or Label With Part Number

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

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

TITLE:  
**Bridge Plastic Top**

SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19100</b>	

SCALE: 1:8 WEIGHT: SHEET 1 OF 1

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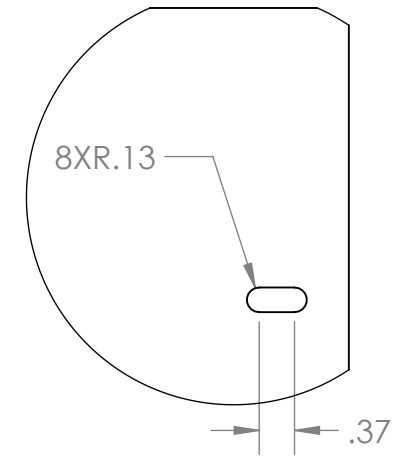
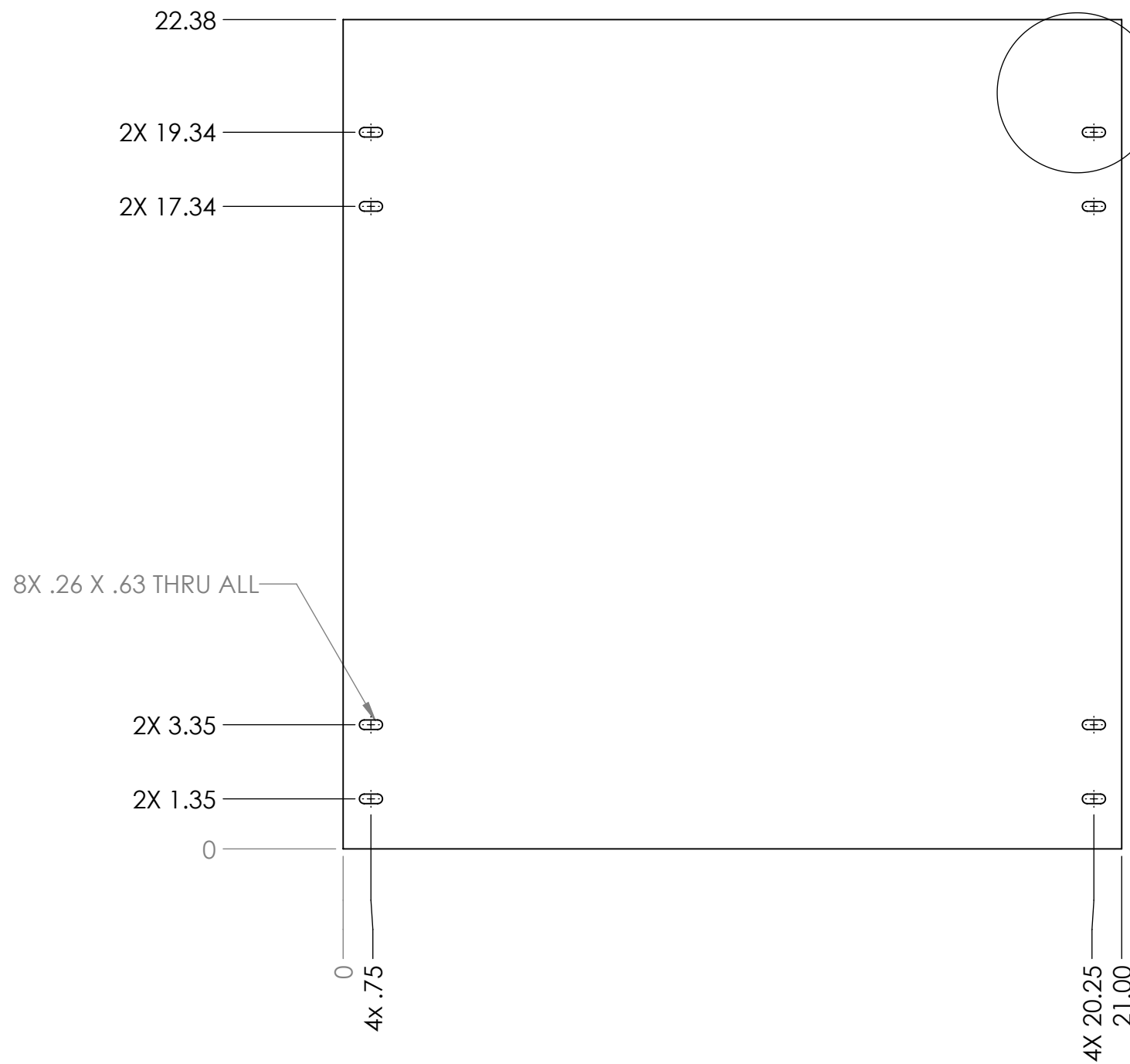
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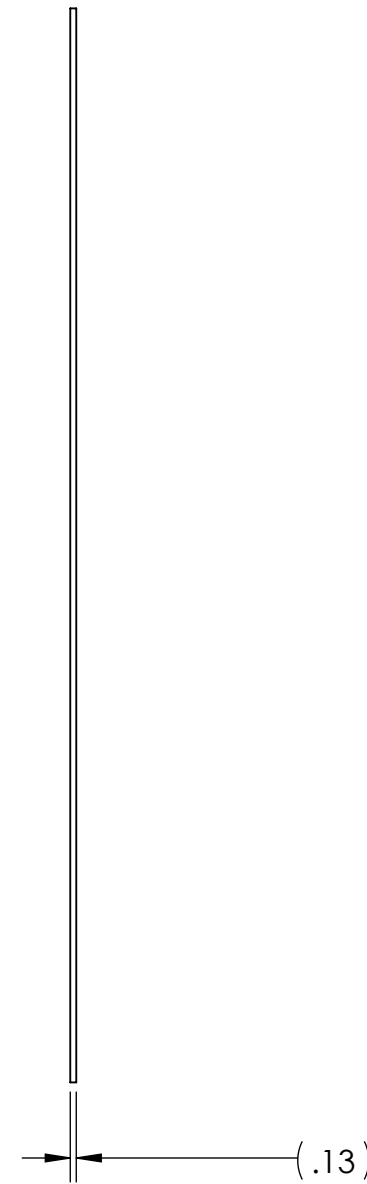
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DETAIL B  
SCALE 1 : 2





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Notes:

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

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		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	
		INTERPRET GEOMETRIC TOLERANCING PER:		CHECKED	
		MATERIAL		ENG APPR.	
		FINISH		MFG APPR.	
NEXT ASSY	USED ON			Q.A.	
APPLICATION		DO NOT SCALE DRAWING		COMMENTS:	
 					
TITLE: Bridge Plastic Top Side					
SIZE	DWG. NO.	REV			
<b>B</b>	GE-19101				
SCALE: 1:8		WEIGHT:		SHEET 1 OF 1	

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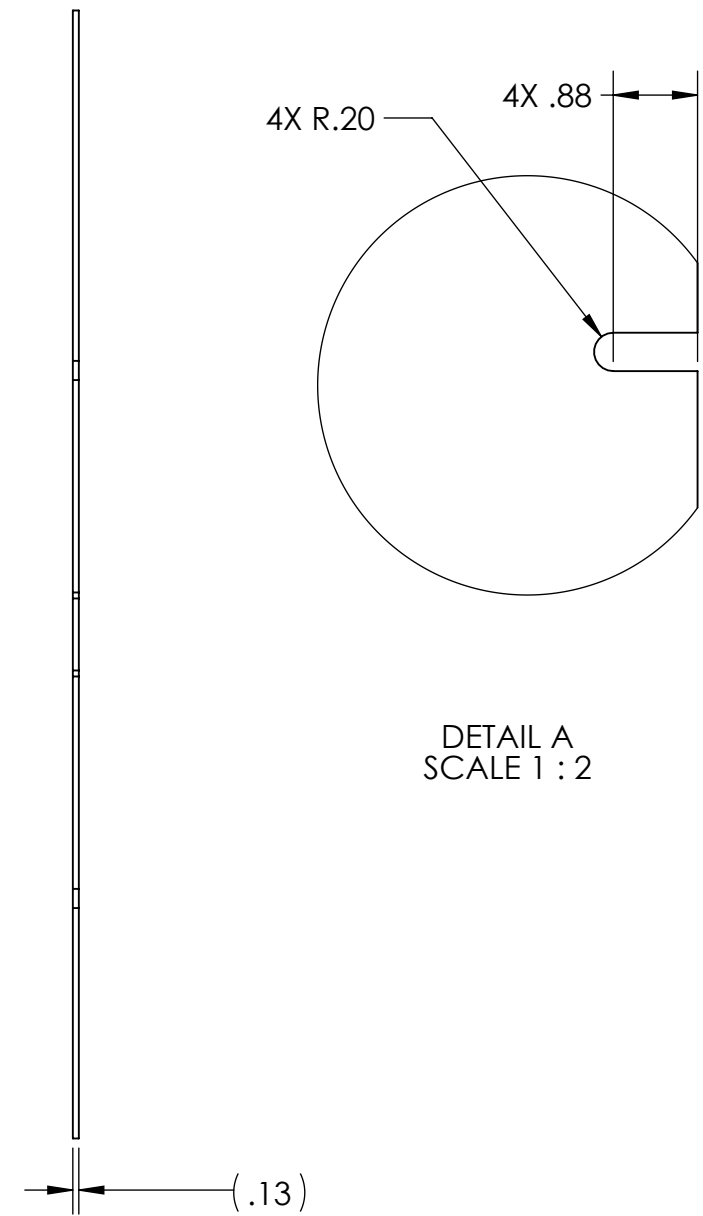
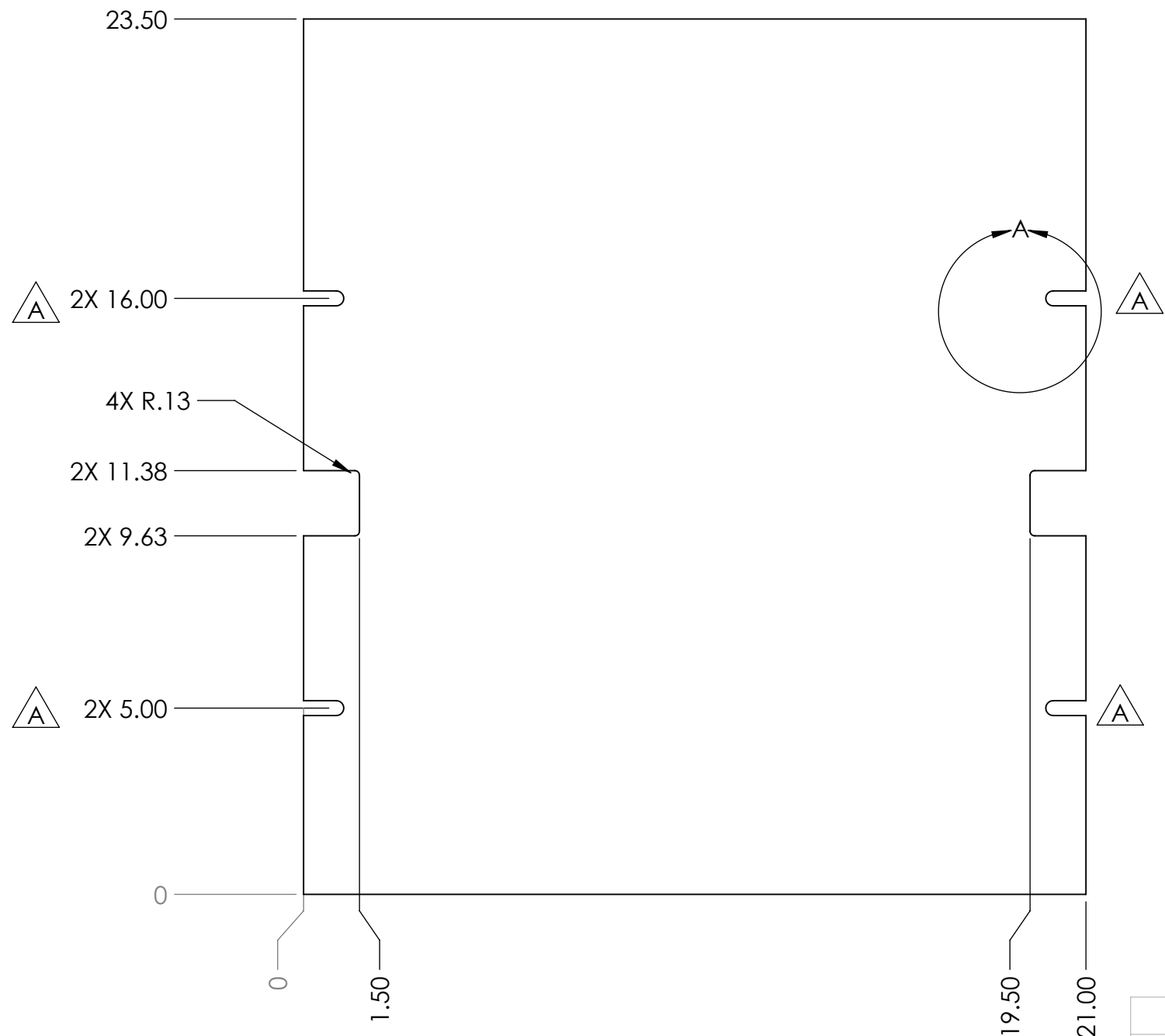
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1

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




DETAIL A  
SCALE 1 : 2


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

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		UNLESS OTHERWISE SPECIFIED:	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		



**FIRST ROBOTICS COMPETITION**



**SOLIDWORKS**  
Modeling Solutions Partner

TITLE:

# Bridge Plastic Side

SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19102</b>	<b>A</b>

SCALE: 1:8    WEIGHT:    SHEET 1 OF 1

4

3

2

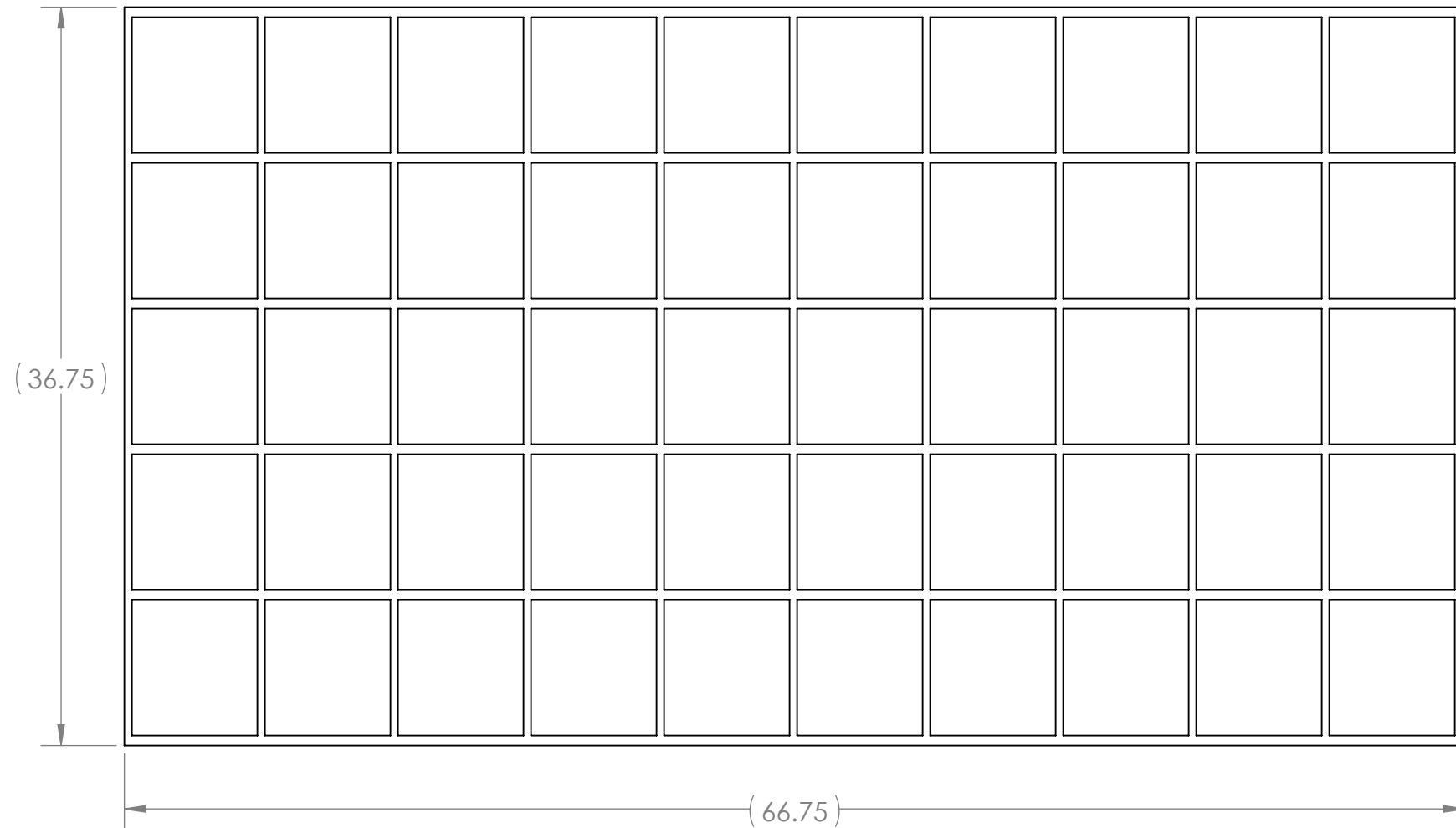
1

4

3

2

1



Notes:

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

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		DIMENSIONS ARE IN INCHES	DRAWN	
		TOLERANCES:	CHECKED	
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		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		



TITLE:  
**Cargo Net Side**

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

4

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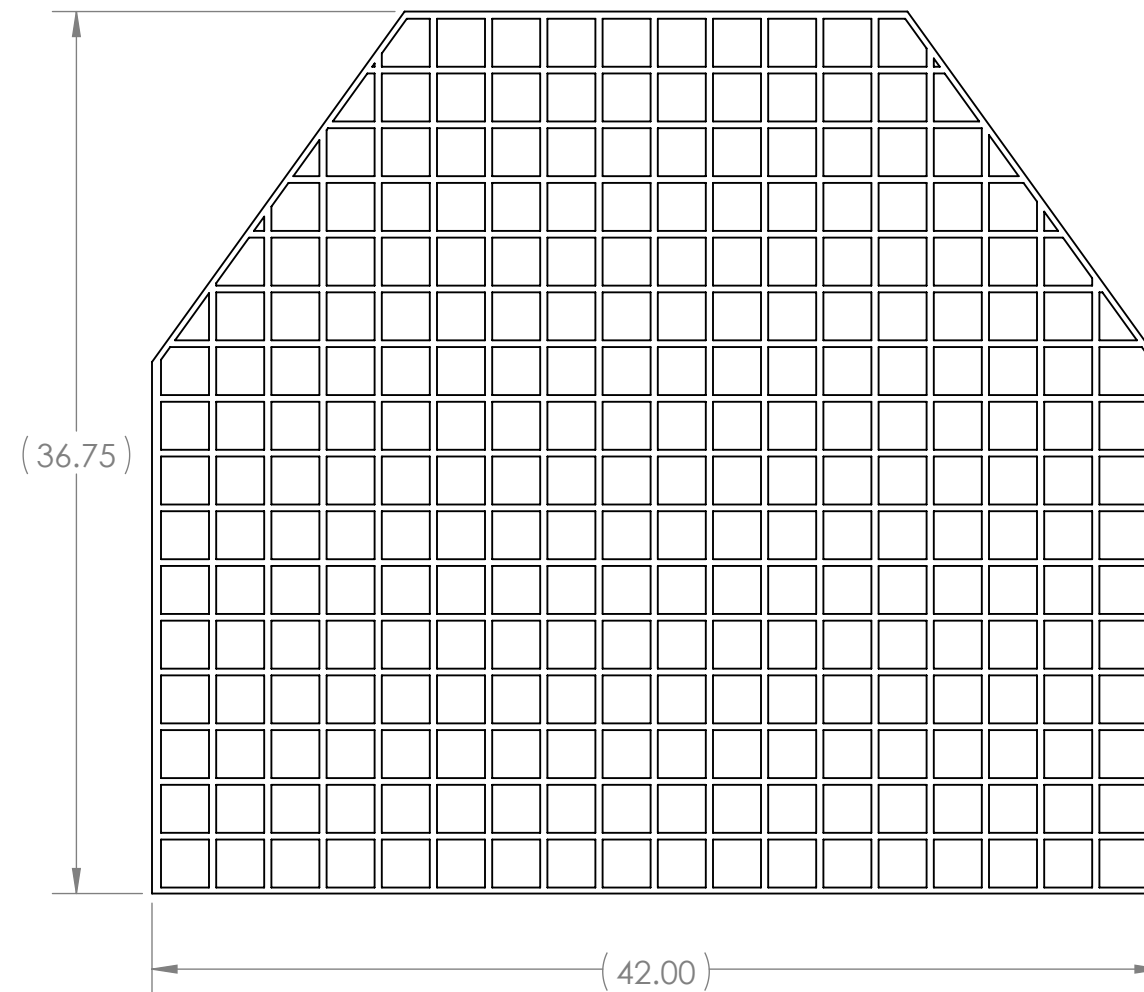
3

2

1

B

B



Notes:

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

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		UNLESS OTHERWISE SPECIFIED:		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			



TITLE:  
**Cargo Net Front**

SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19104</b>	
SCALE: 1:8	WEIGHT:	SHEET 1 OF 1

4

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A

A



4

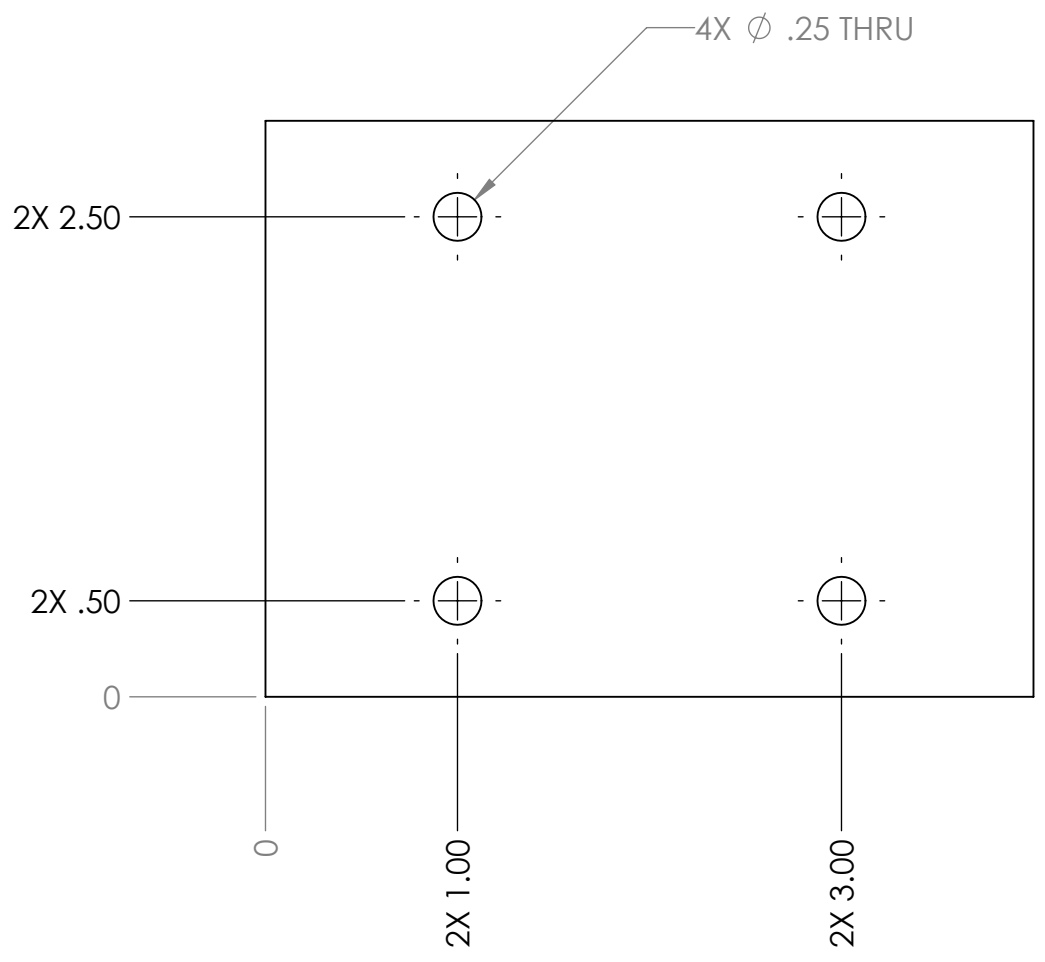
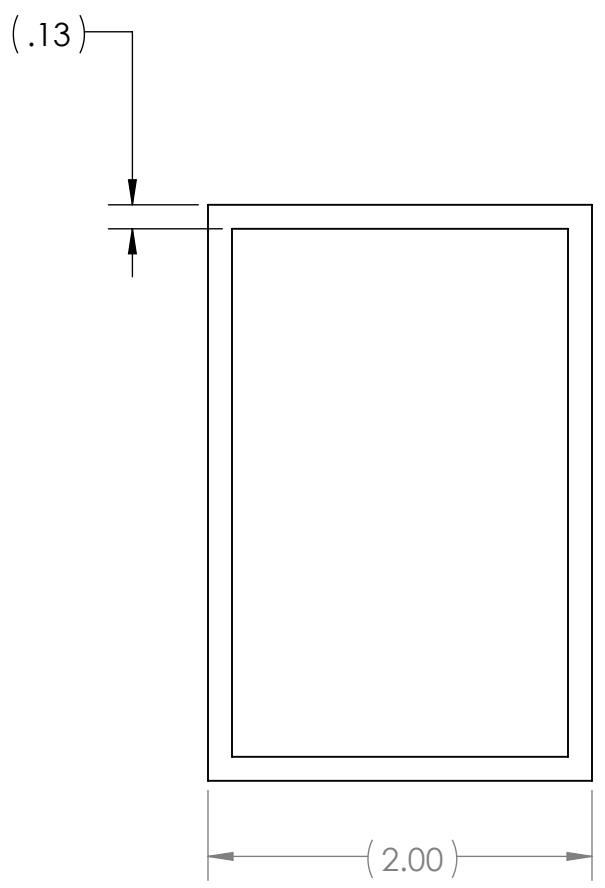
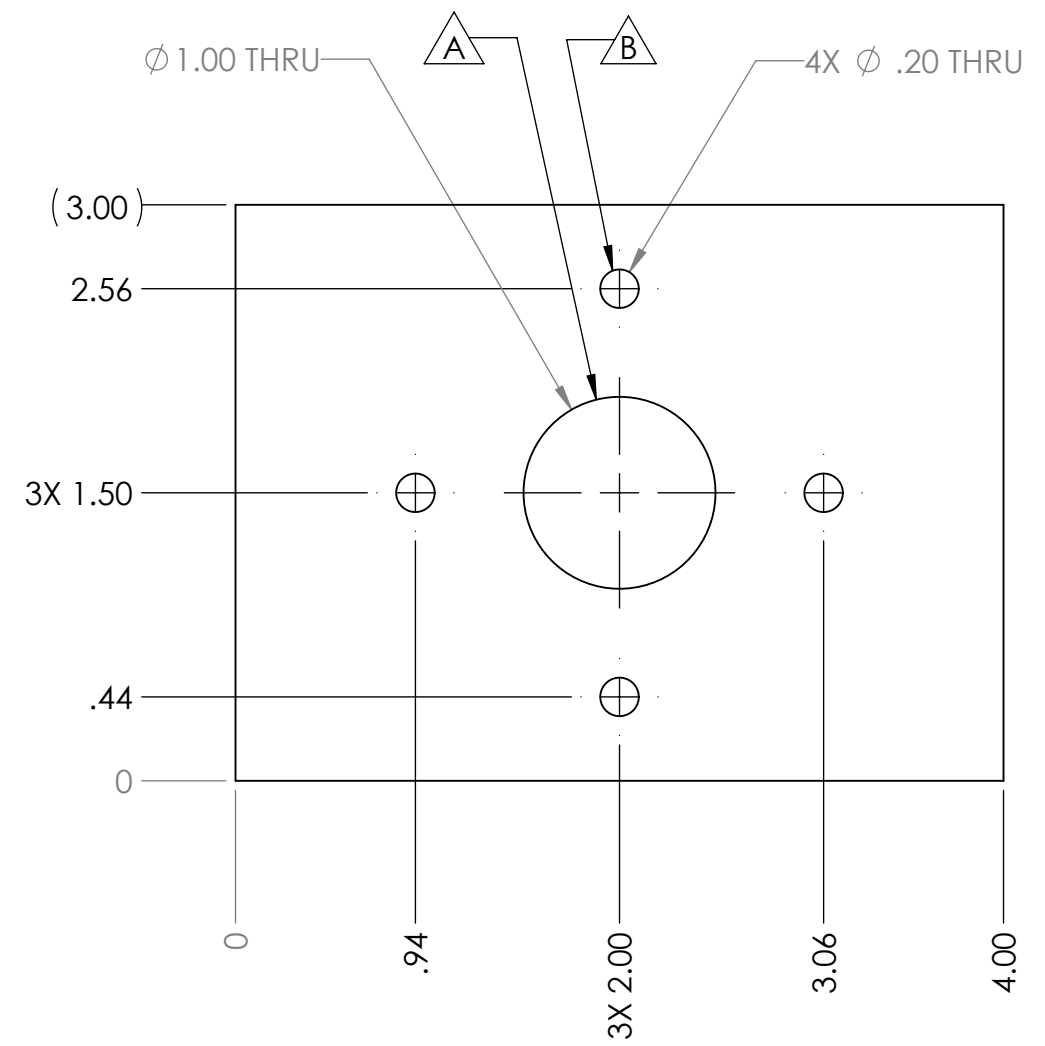
3

2

1

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

B



B

A

- Notes:
1. Material: 3" x 2" x .125" thk. Rectangular Tubing, 6063 Aluminum
  2. Remove all sharp edges and burrs
  3. Tag Or Label With Part Number

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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		
		FINISH		
NEXT ASSY	USED ON			
APPLICATION		DO NOT SCALE DRAWING		



TITLE:		
Light Mount		
SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19105</b>	<b>B</b>
SCALE: 1:1	WEIGHT:	SHEET 1 OF 1

A

4

3

2

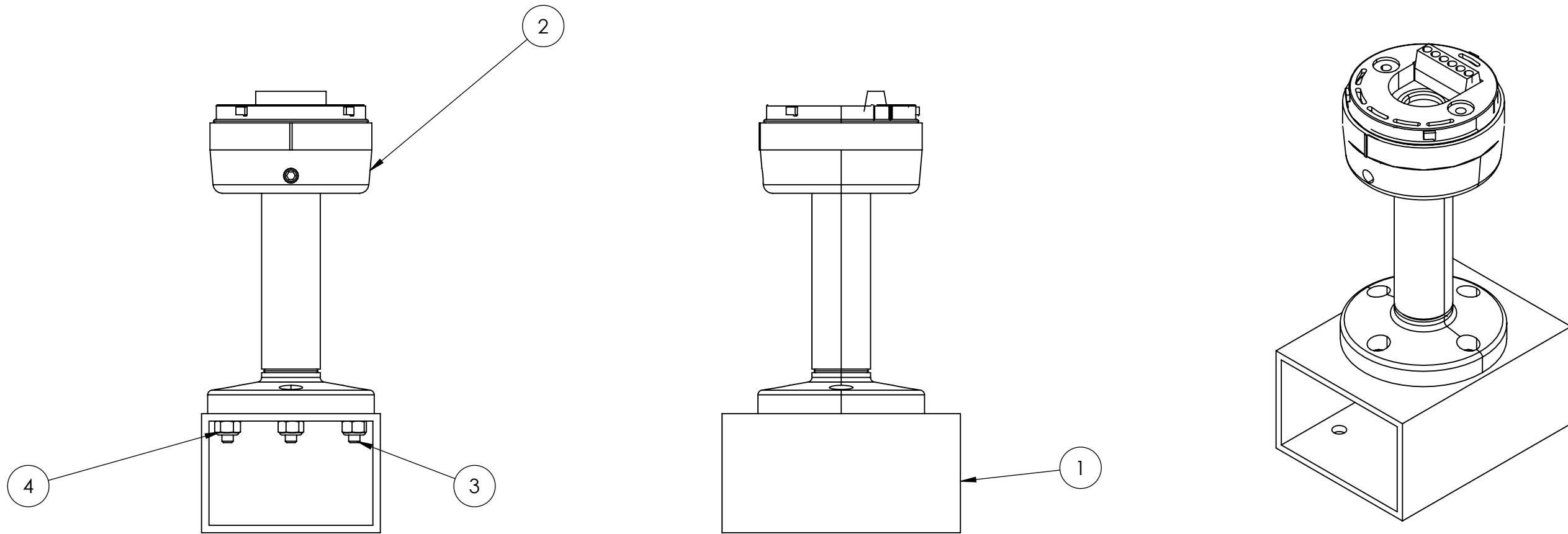
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Notes:  
1. Stack light not shown, but is part of the assembly.

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

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		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		

 		
TITLE:		
<h1>Light Sub Assembly</h1>		
SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19106</b>	
SCALE: 1:2	WEIGHT:	SHEET 1 OF 1

4

3

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4

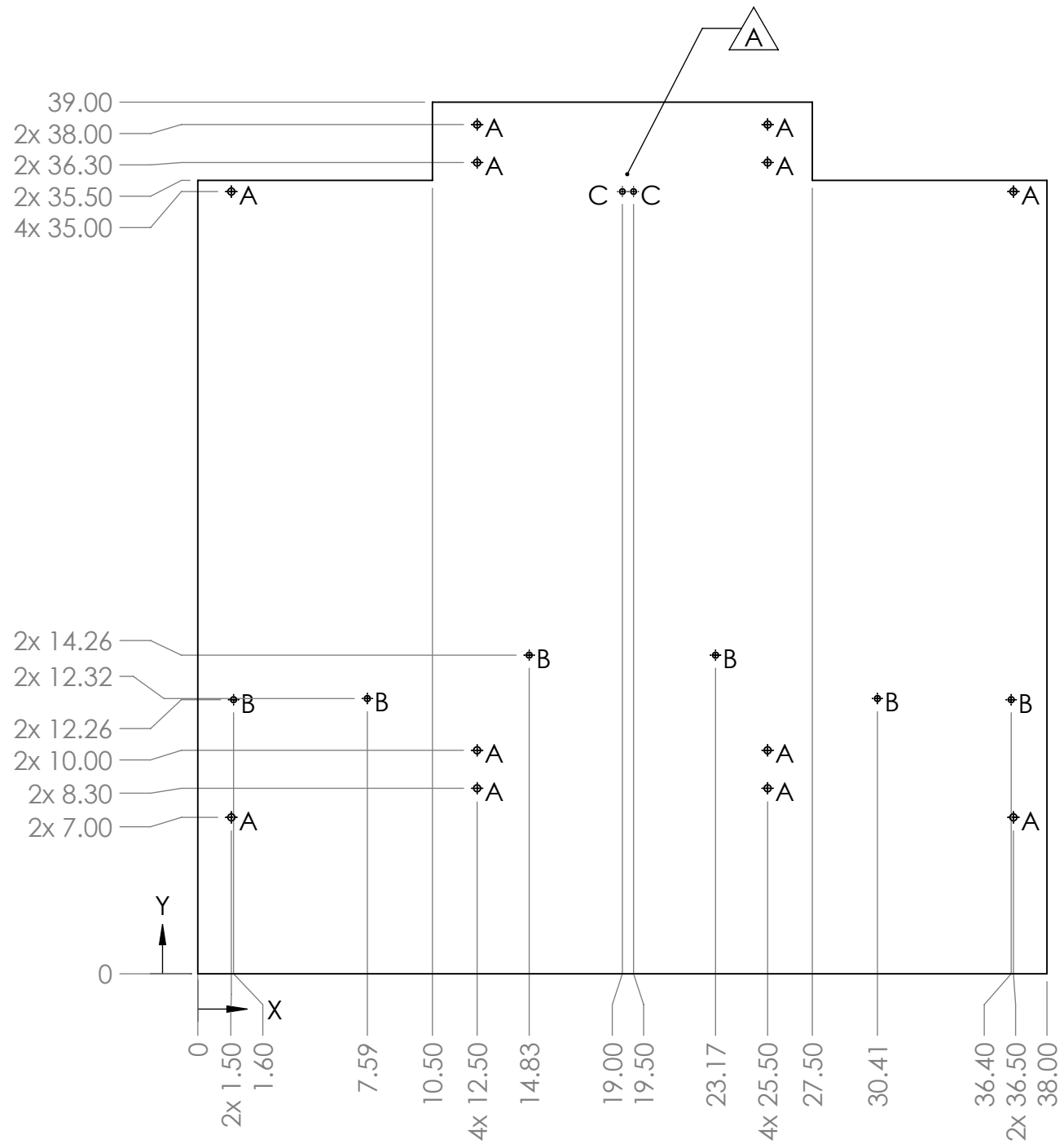
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2

1

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

TAG	SIZE	QUANTITY
A	Ø .31 THRU ALL	12
B	Ø .27 THRU ALL	6
C	Ø .25 THRU ALL	2





Notes:

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

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UNLESS OTHERWISE SPECIFIED:		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	

TITLE:

# Rocket Back Plastic Bottom

SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19109</b>	<b>A</b>
SCALE: 1:7	WEIGHT:	SHEET 1 OF 1

4

3

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B

B

A

A

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2

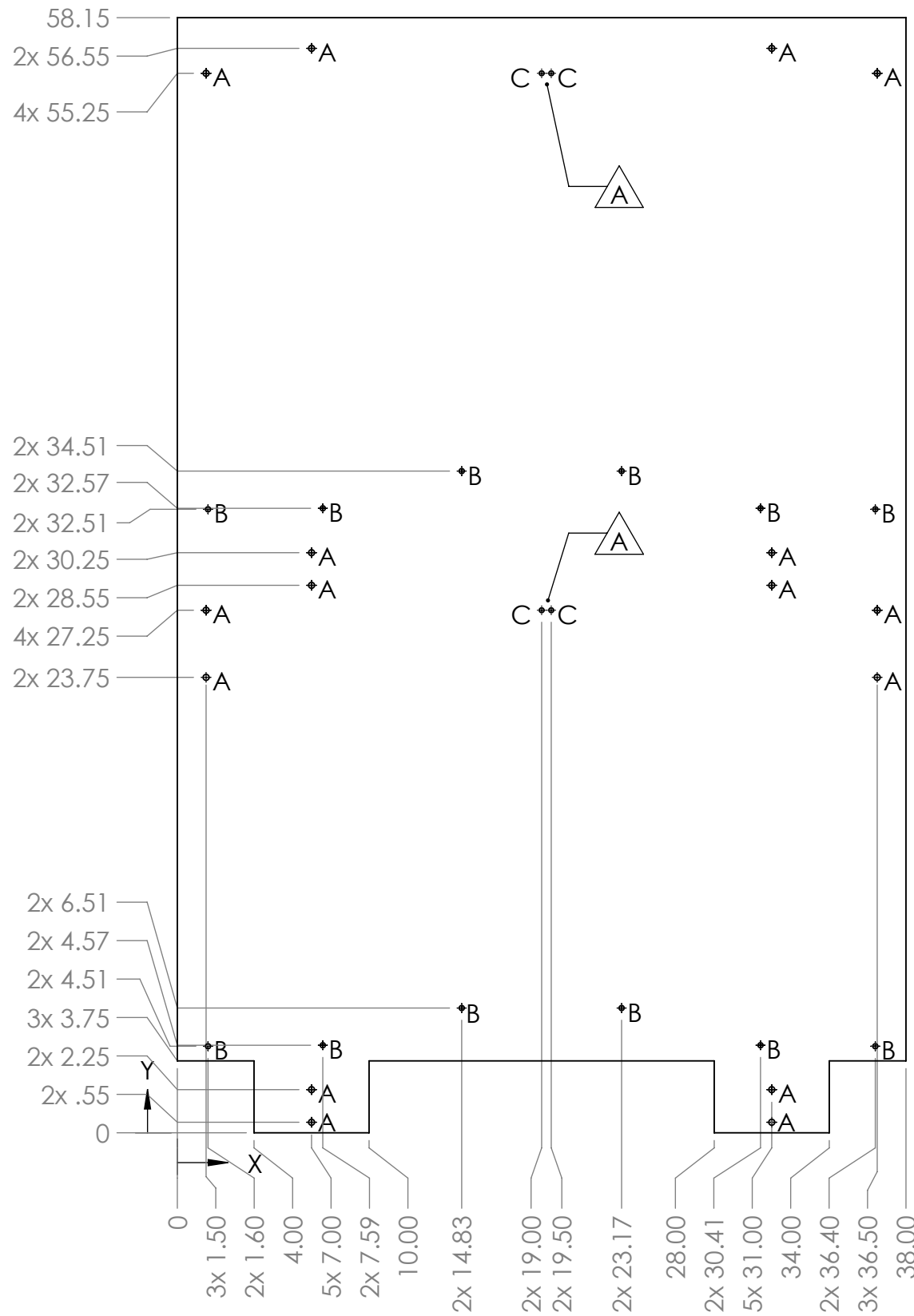
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REVISIONS

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



(.13)

TAG	SIZE	QUANTITY
A	Ø .31 THRU ALL	16
B	Ø .27 THRU ALL	12
C	Ø .25 THRU ALL	4



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

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UNLESS OTHERWISE SPECIFIED:		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	  <p>TITLE: <b>Rocket Panel Plastic Top</b></p>		
FINISH				
APPLICATION	DO NOT SCALE DRAWING			
NEXT ASSY	USED ON	SIZE <b>B</b>	DWG. NO. <b>GE-19110</b>	REV <b>A</b>
		SCALE: 1:10 WEIGHT:		SHEET 1 OF 1

4

3

2

1

B

B

A

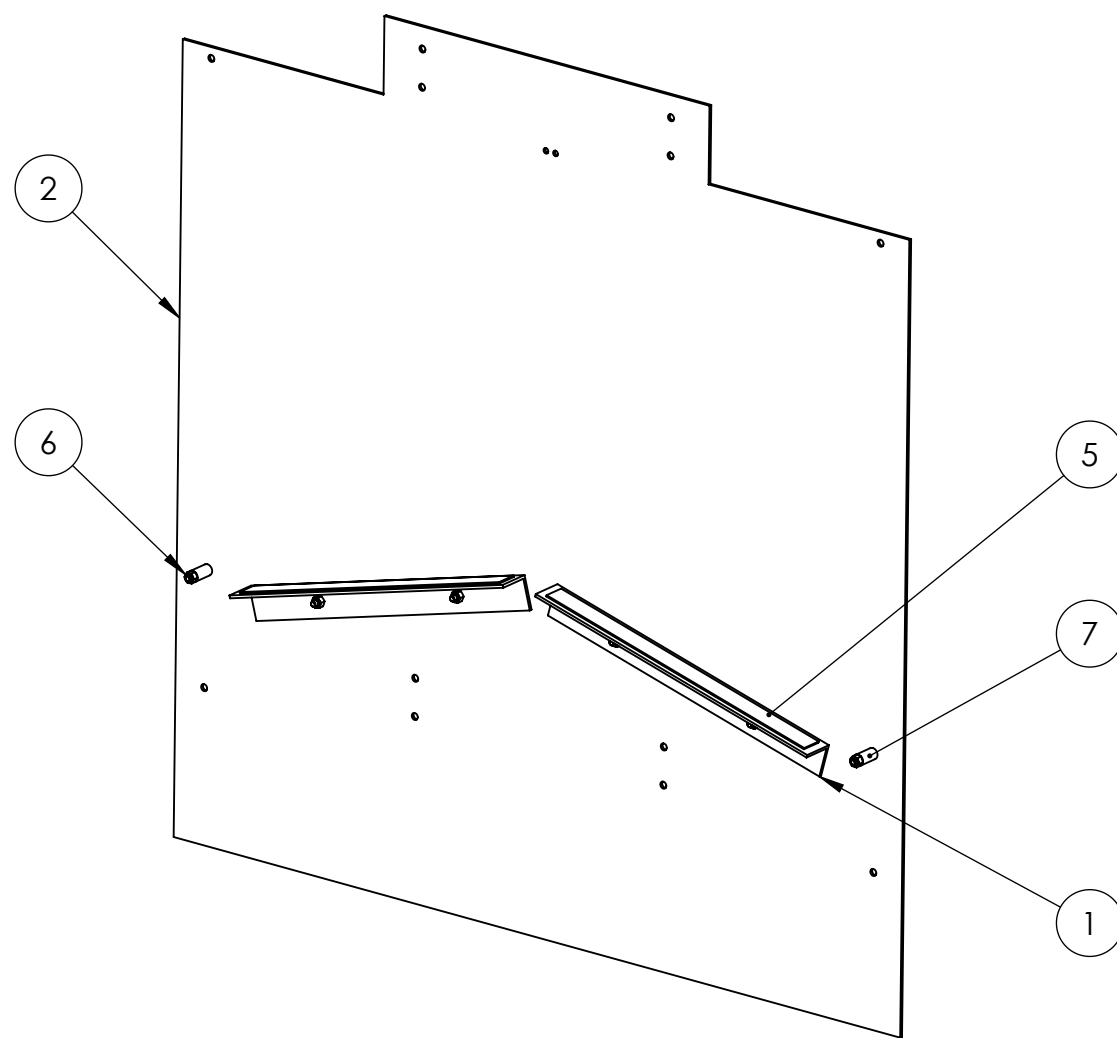
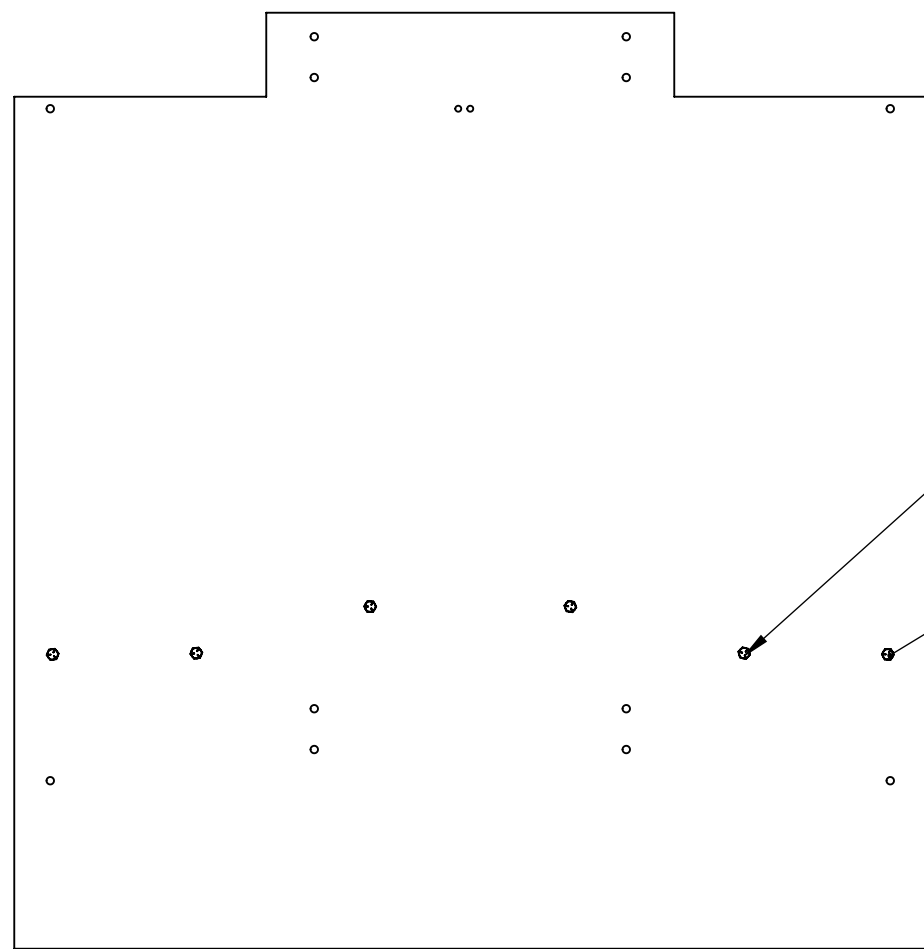
A

4

3

2

1



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

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

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

TITLE: **Rocket Back Bottom Assembly**

SIZE **B** DWG. NO. **GE-19113** REV

SCALE: 1:8 WEIGHT: SHEET 1 OF 1

4

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B

B

A

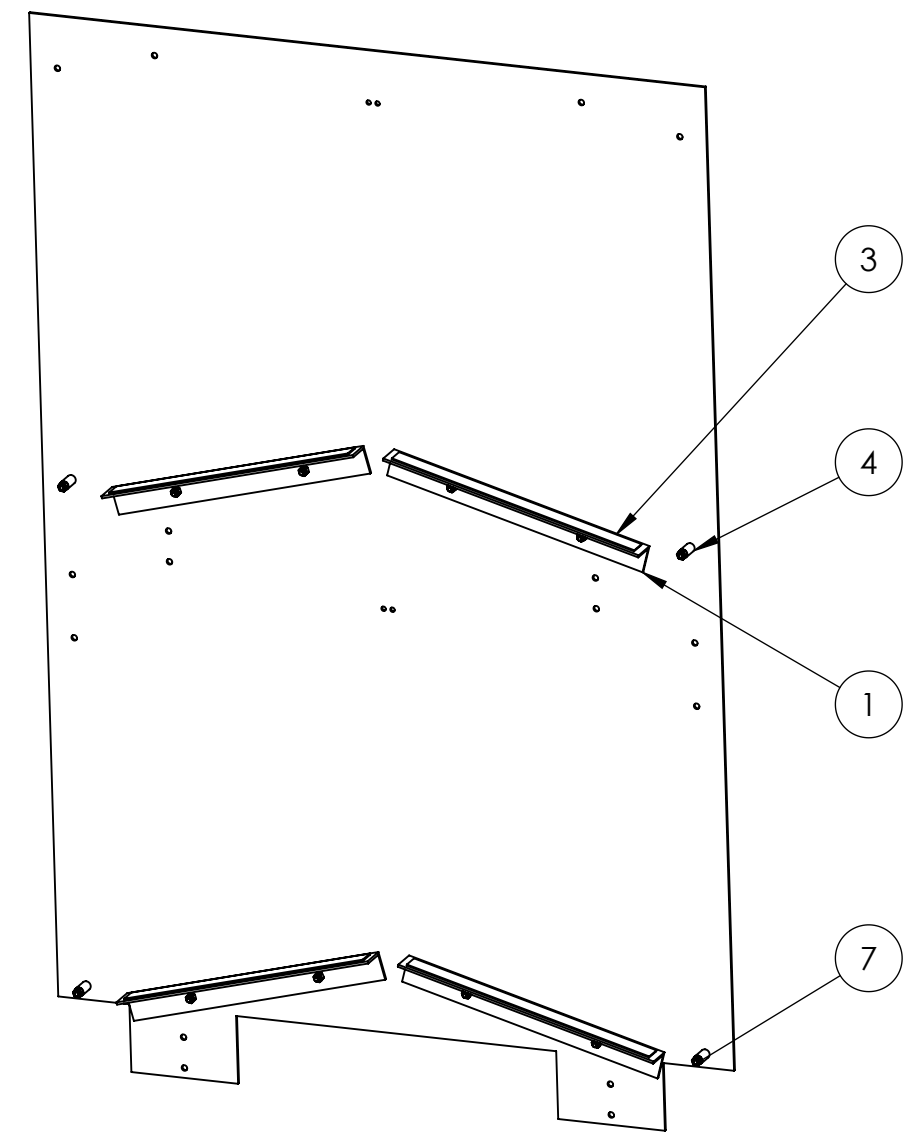
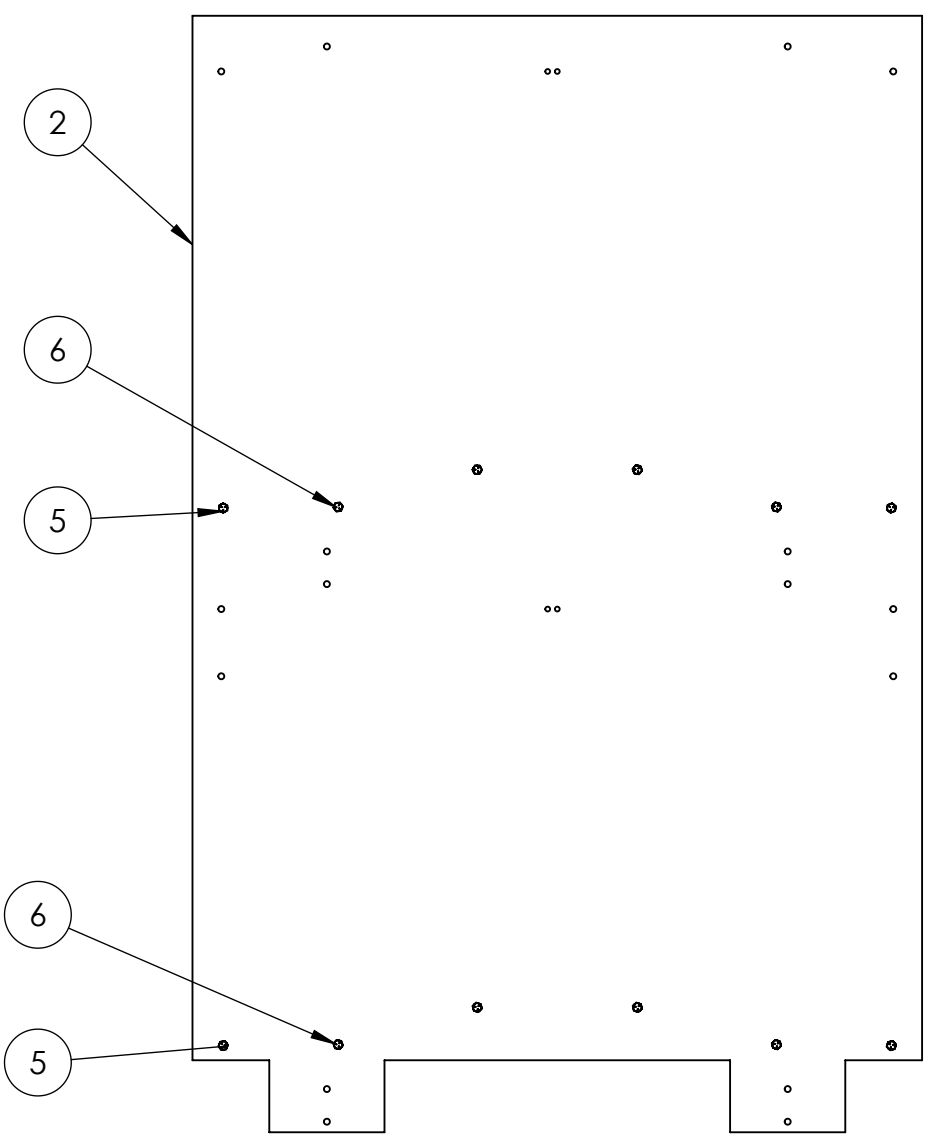
A

4

3

2

1





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

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

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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		

TITLE:  
**Rocket Back Top Assembly**

SIZE **B** DWG. NO. **GE-19114** REV  
 SCALE: 1:10 WEIGHT: SHEET 1 OF 1

4

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B

B

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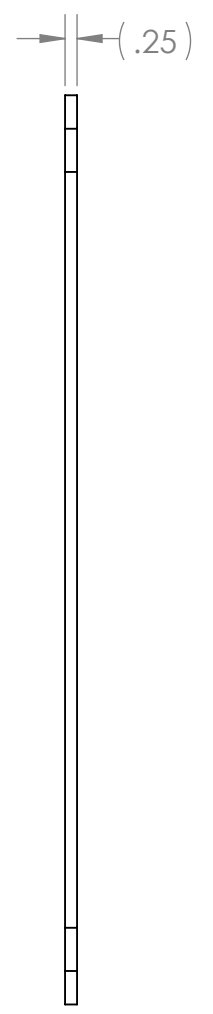
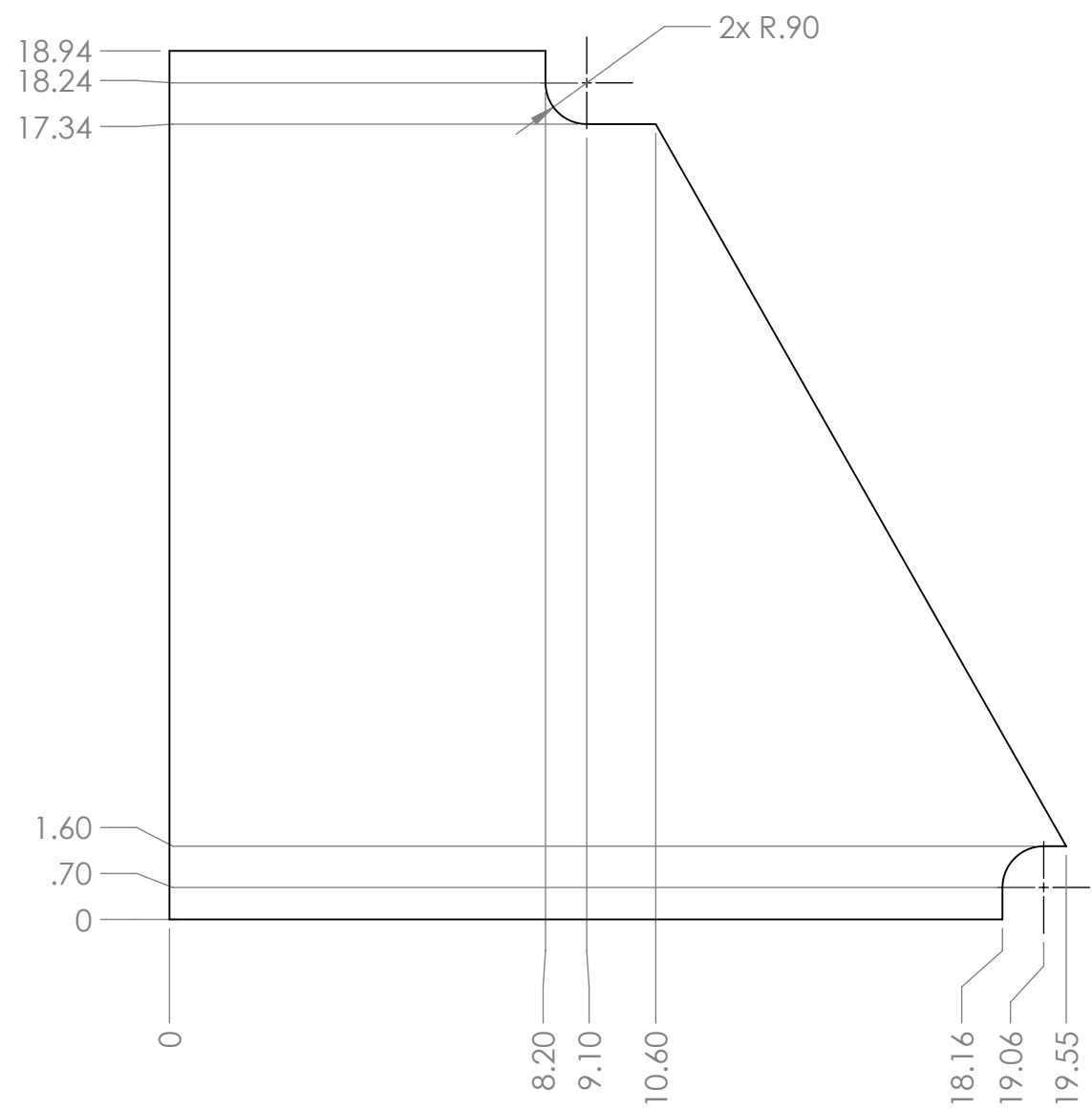
A

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Notes:

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

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		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		



TITLE:		
<h1>Rocket Ramp</h1>		
SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19115</b>	
SCALE: 1:4	WEIGHT:	SHEET 1 OF 1

4

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B

B

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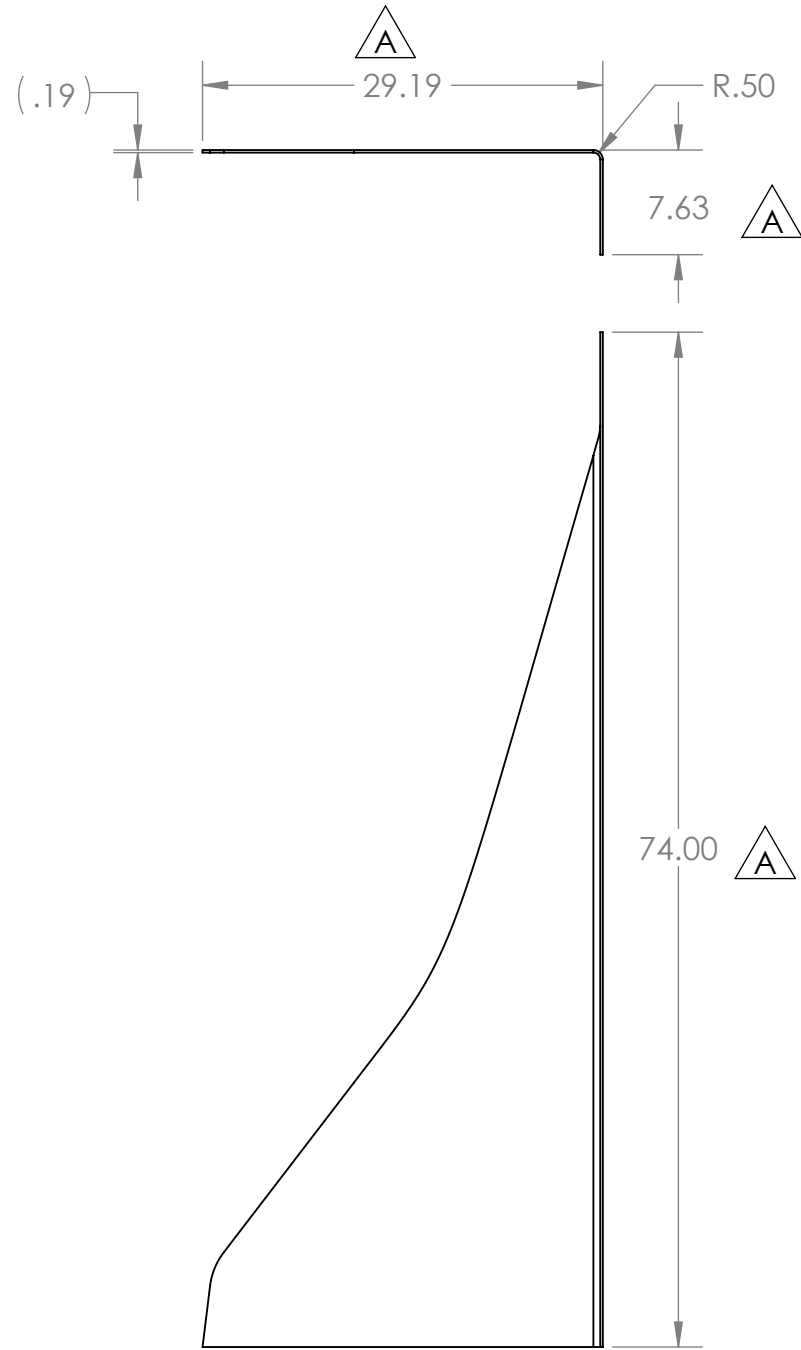
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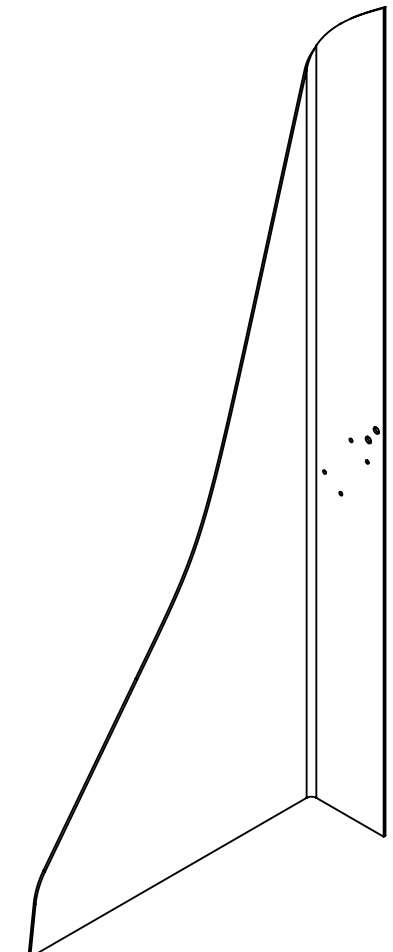
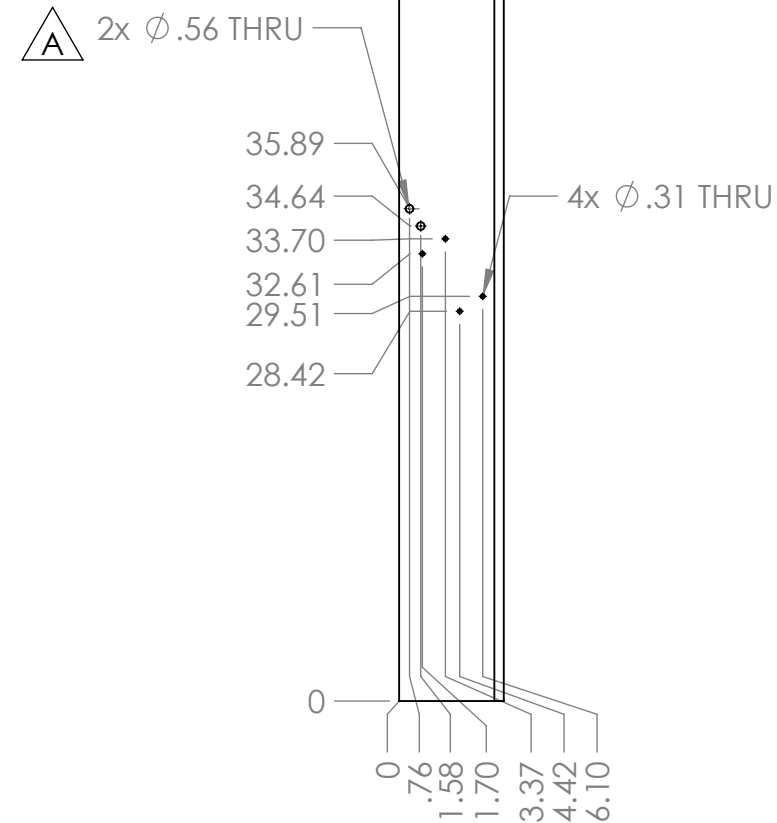
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2

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



Notes:

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

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		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL ±1/16 ANGULAR: MACH ±1° BEND ±1° TWO PLACE DECIMAL ±.01 THREE PLACE DECIMAL ±.001	DRAWN		
		INTERPRET GEOMETRIC TOLERANCING PER:	CHECKED		TITLE:
		MATERIAL	ENG APPR.		Fin, Left
		FINISH	MFG APPR.		SIZE DWG. NO. REV
NEXT ASSY	USED ON		Q.A.		<b>B</b> <b>GE-19116</b> <b>A</b>
APPLICATION		DO NOT SCALE DRAWING	COMMENTS:		SCALE: 1:14 WEIGHT: SHEET 1 OF 1

4

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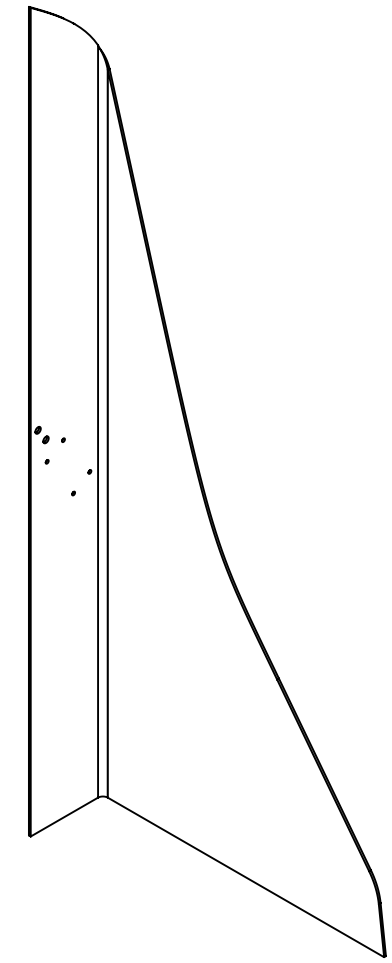
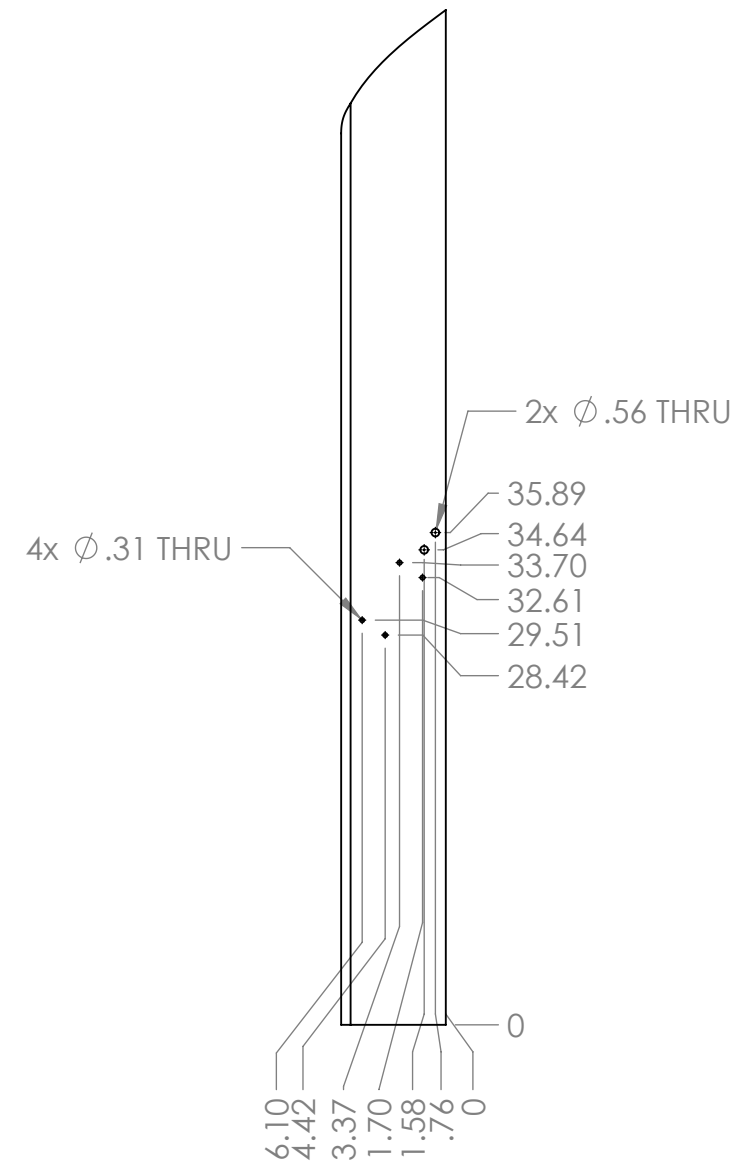
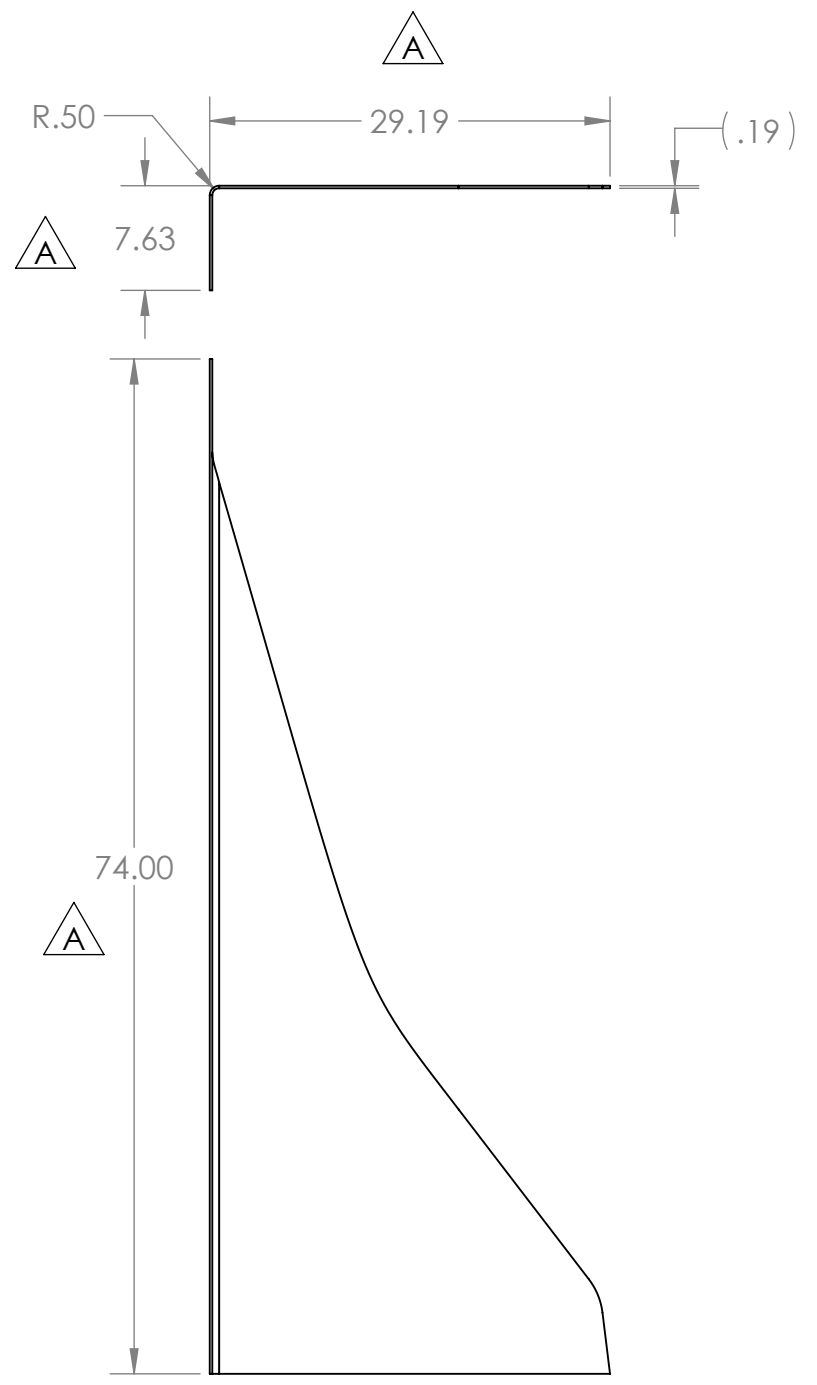
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3

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1



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



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



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DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL ±1/16 ANGULAR: MACH ±1° BEND ±1° TWO PLACE DECIMAL ±.01 THREE PLACE DECIMAL ±.001		DRAWN		
INTERPRET GEOMETRIC TOLERANCING PER:		CHECKED		TITLE: <b>Fin, Right</b>
MATERIAL		ENG APPR.		
NEXT ASSY	USED ON	MFG APPR.		SIZE <b>B</b> DWG. NO. <b>GE-19117</b> REV <b>A</b>
APPLICATION		FINISH		SCALE: 1:14 WEIGHT: SHEET 1 OF 1
		DO NOT SCALE DRAWING		

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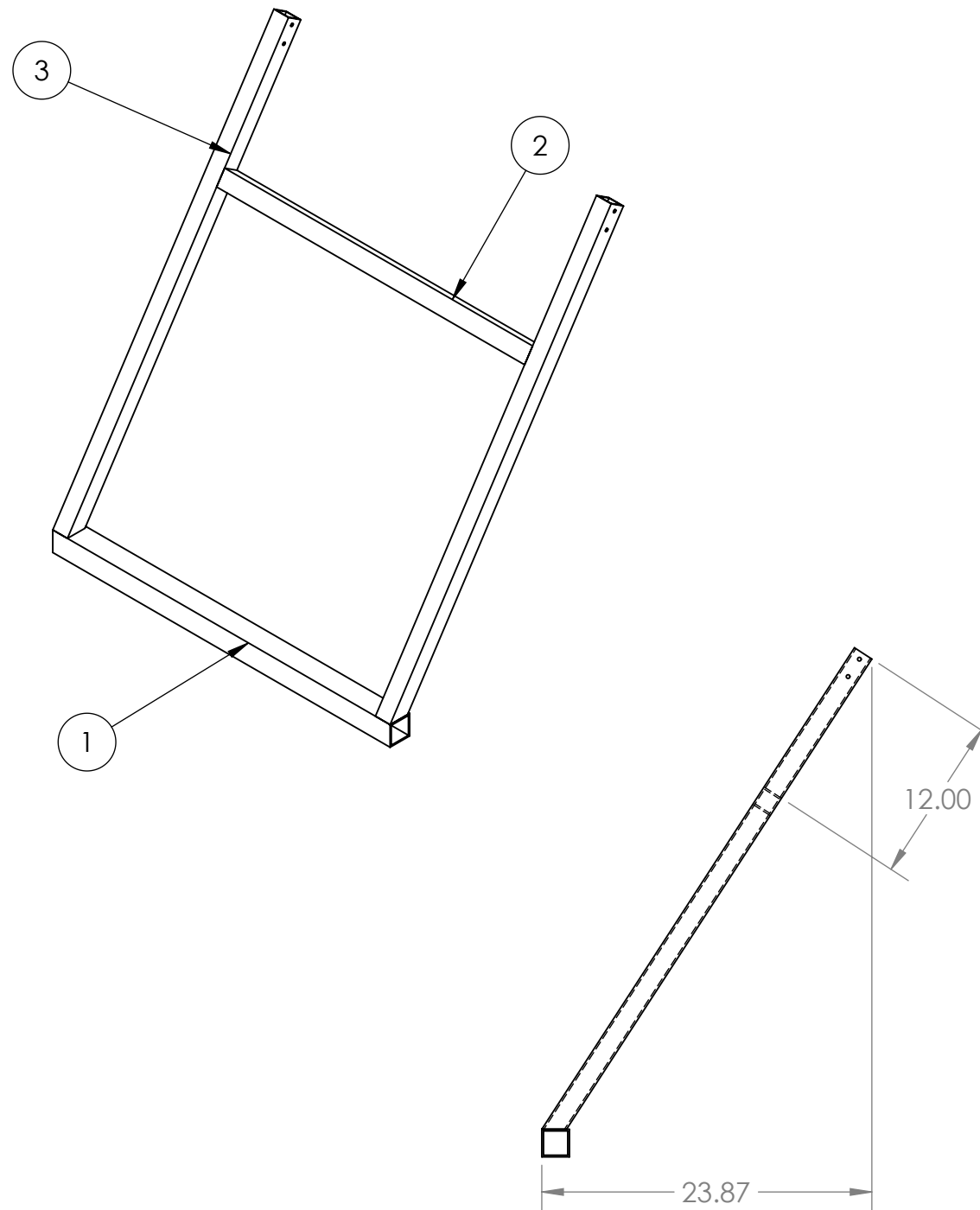
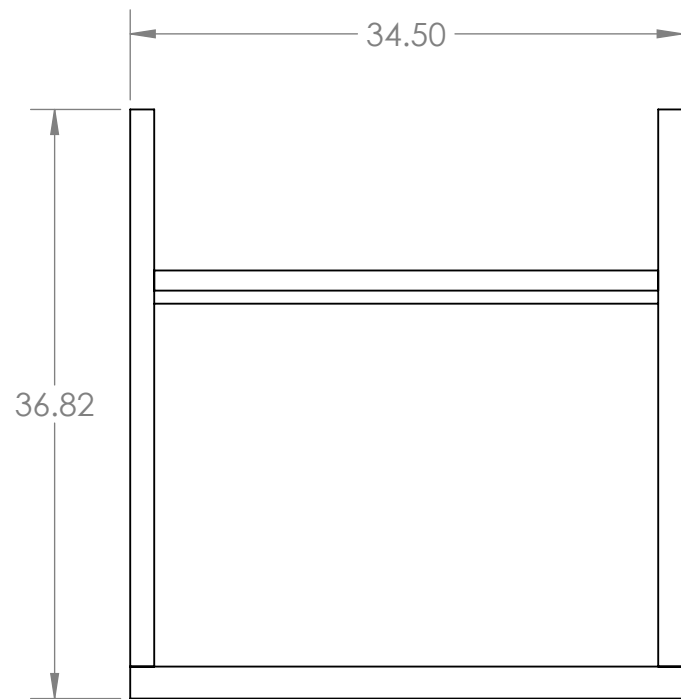
A

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Notes:  
 1. Tag or label with part number.

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

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		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		

 		
TITLE:		
<h1>Rocket Outrigger</h1>		
SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19118</b>	
SCALE: 1:12 WEIGHT:		SHEET 1 OF 3

4

3

2

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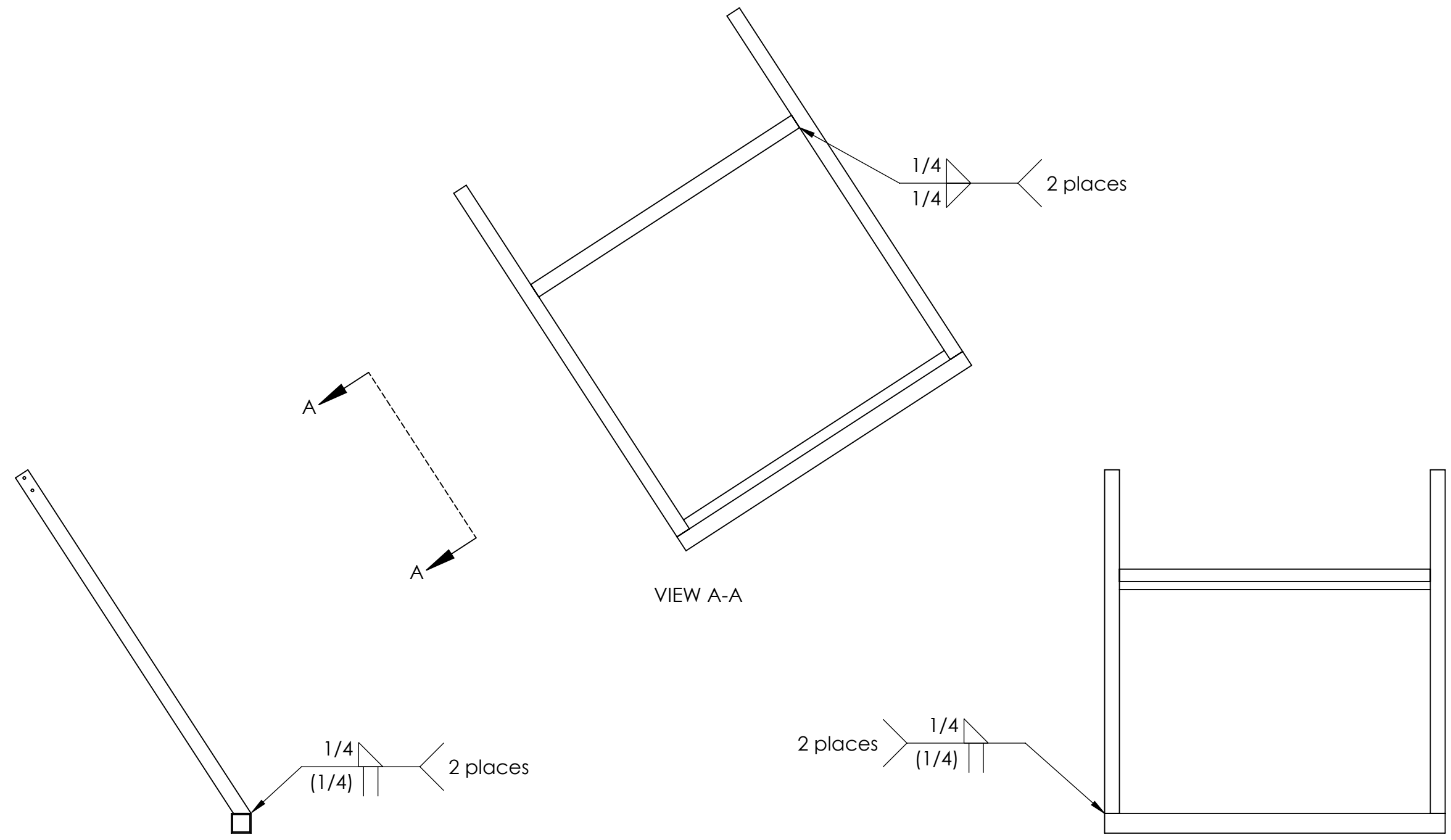
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2

1

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VIEW A-A

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		UNLESS OTHERWISE SPECIFIED:		NAME	DATE
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		TOLERANCES:		CHECKED	
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		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			



TITLE:		
<h1>Rocket Outrigger</h1>		
SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19118</b>	
SCALE: 1:12 WEIGHT:		SHEET 2 OF 3

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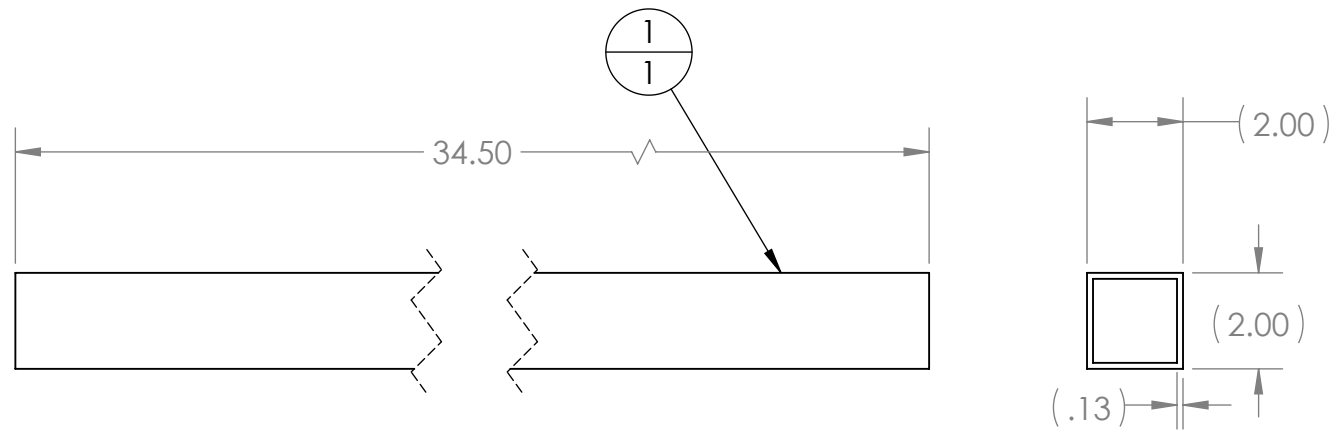
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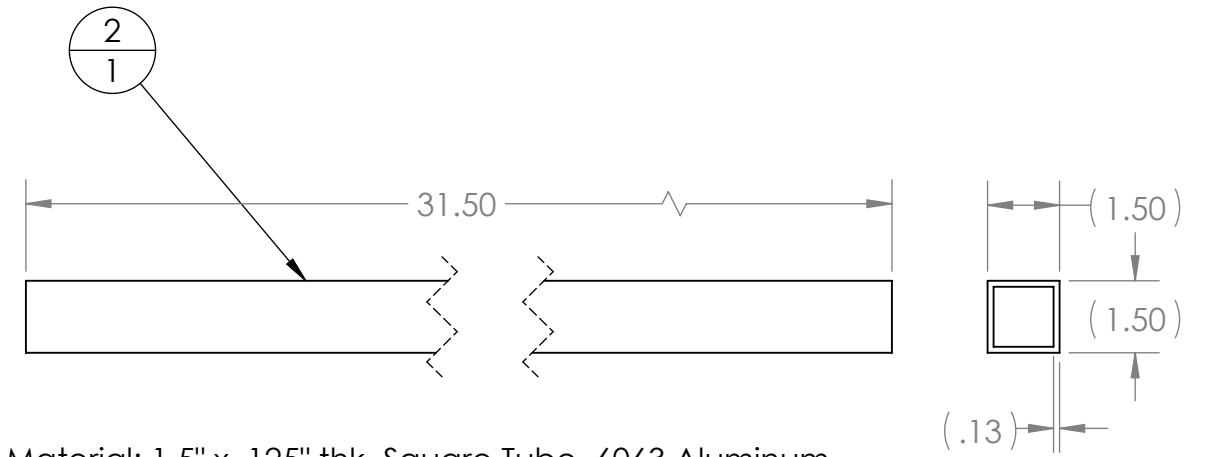
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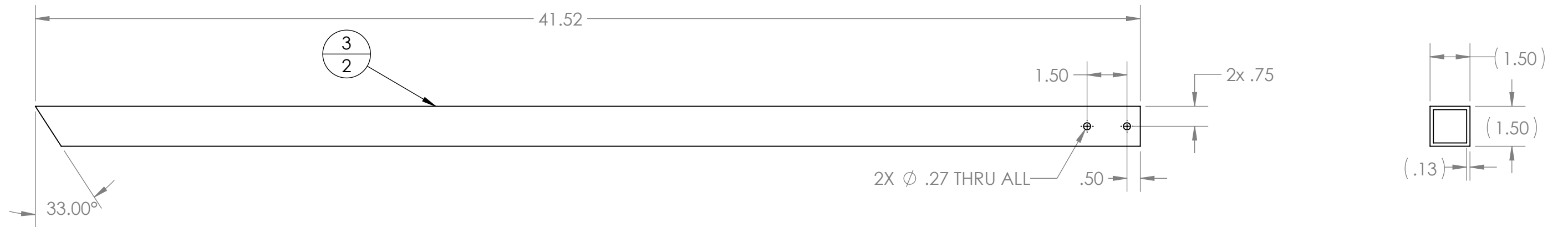
1



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





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



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

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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			
		FINISH			
NEXT ASSY	USED ON				
APPLICATION		DO NOT SCALE DRAWING			

TITLE:

# Rocket Outrigger

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

4

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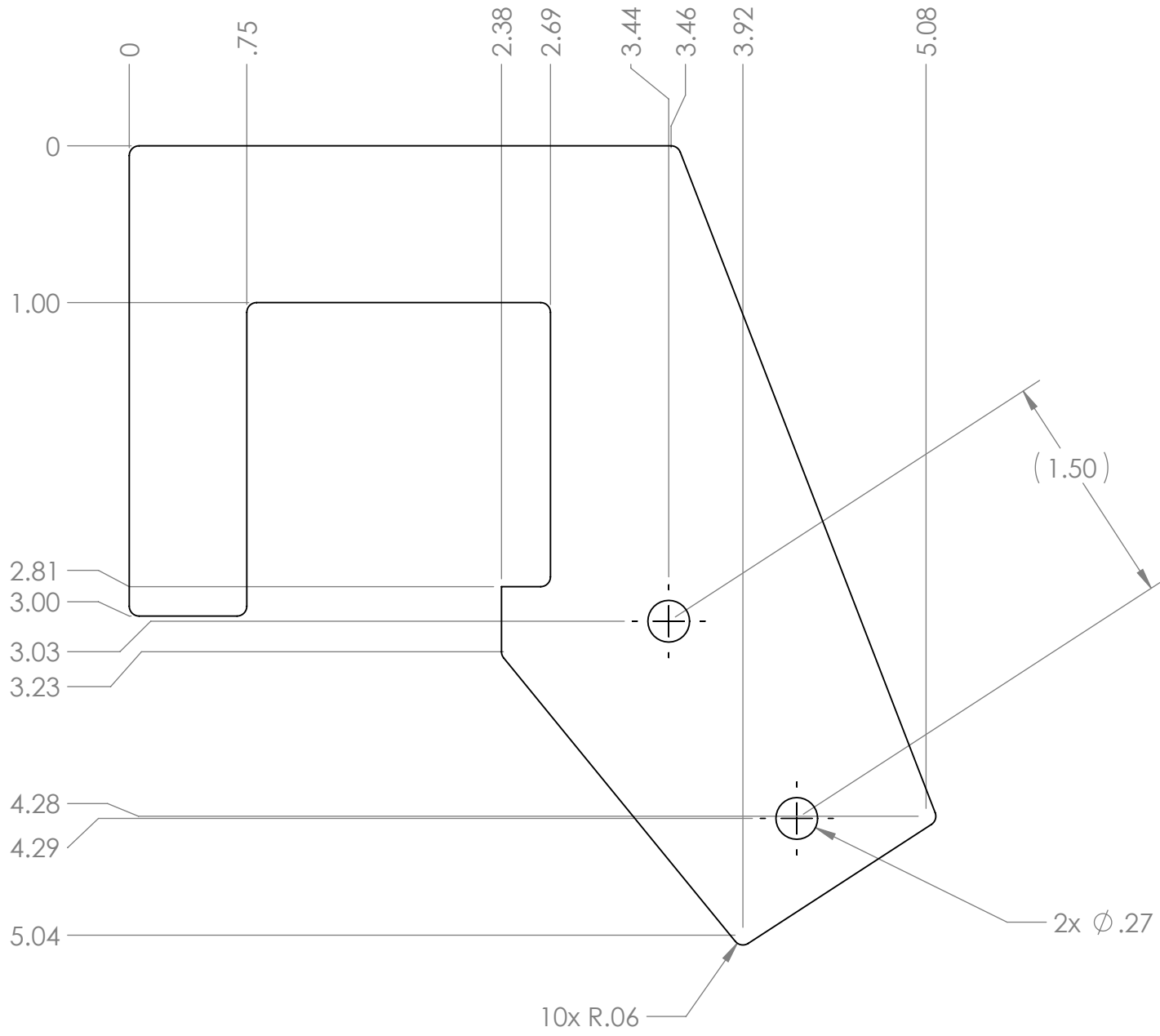
1

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Notes:

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

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		UNLESS OTHERWISE SPECIFIED:		NAME	DATE
		DIMENSIONS ARE IN INCHES		DRAWN	
		TOLERANCES:		CHECKED	
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		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			

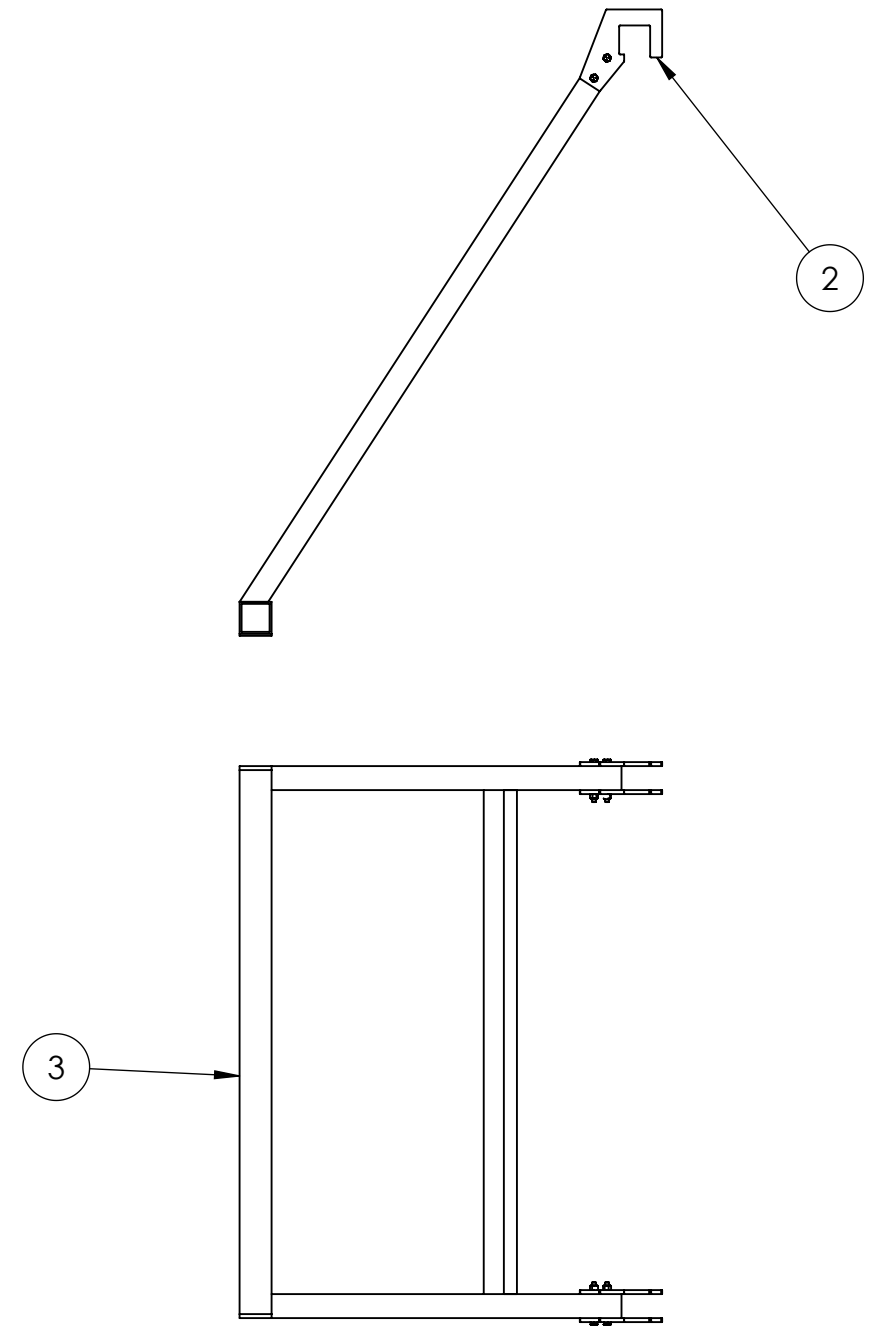
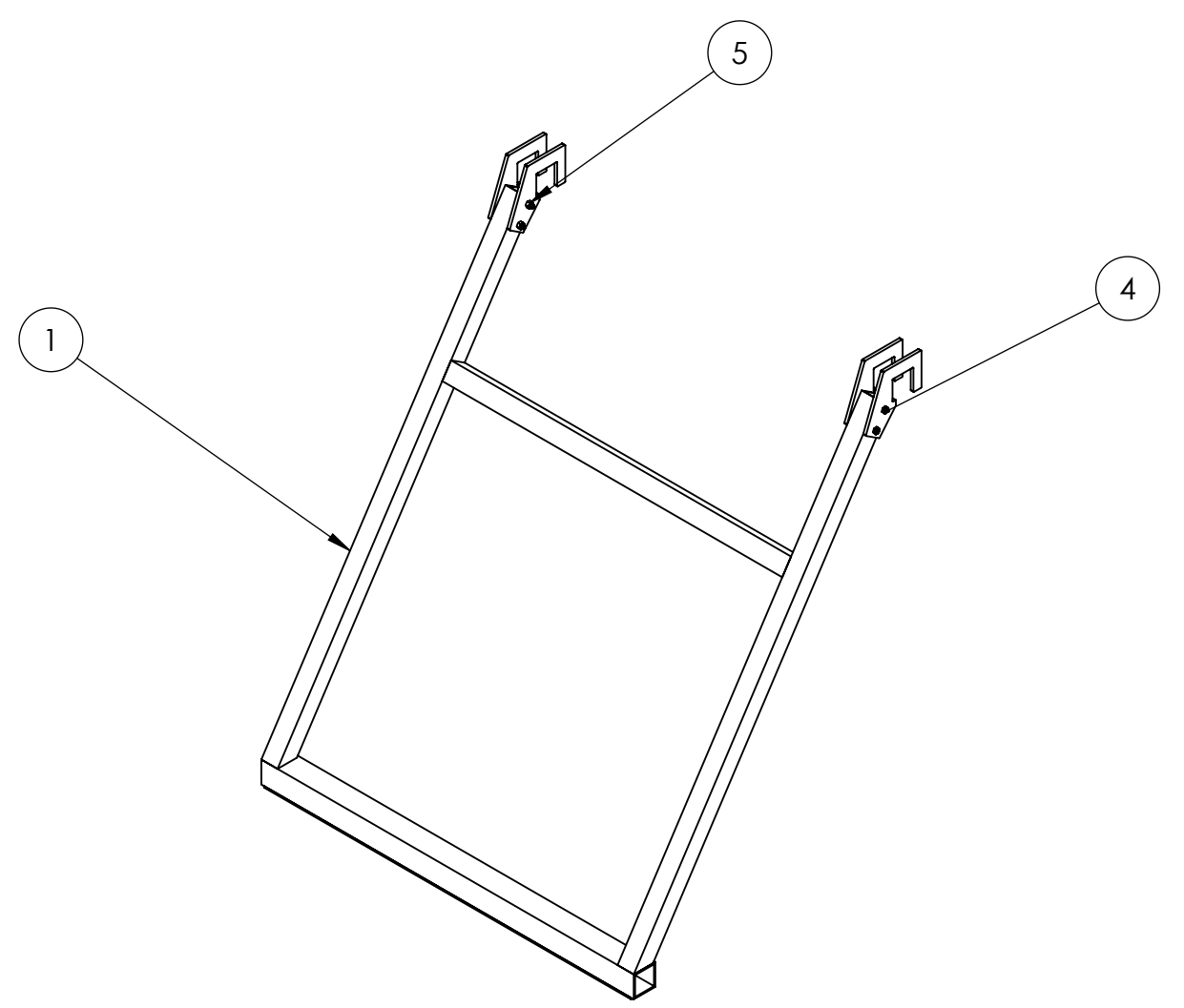
TITLE:

# Rocket Outrigger Gusset

SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19119</b>	
SCALE: 1:1	WEIGHT:	SHEET 1 OF 1

4 3 2 1

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

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

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

TITLE:  
**Rocket Outrigger Assembly**

SIZE **B** DWG. NO. **GE-19120** REV

SCALE: 1:12 WEIGHT: SHEET 1 OF 1

4 3 2 1

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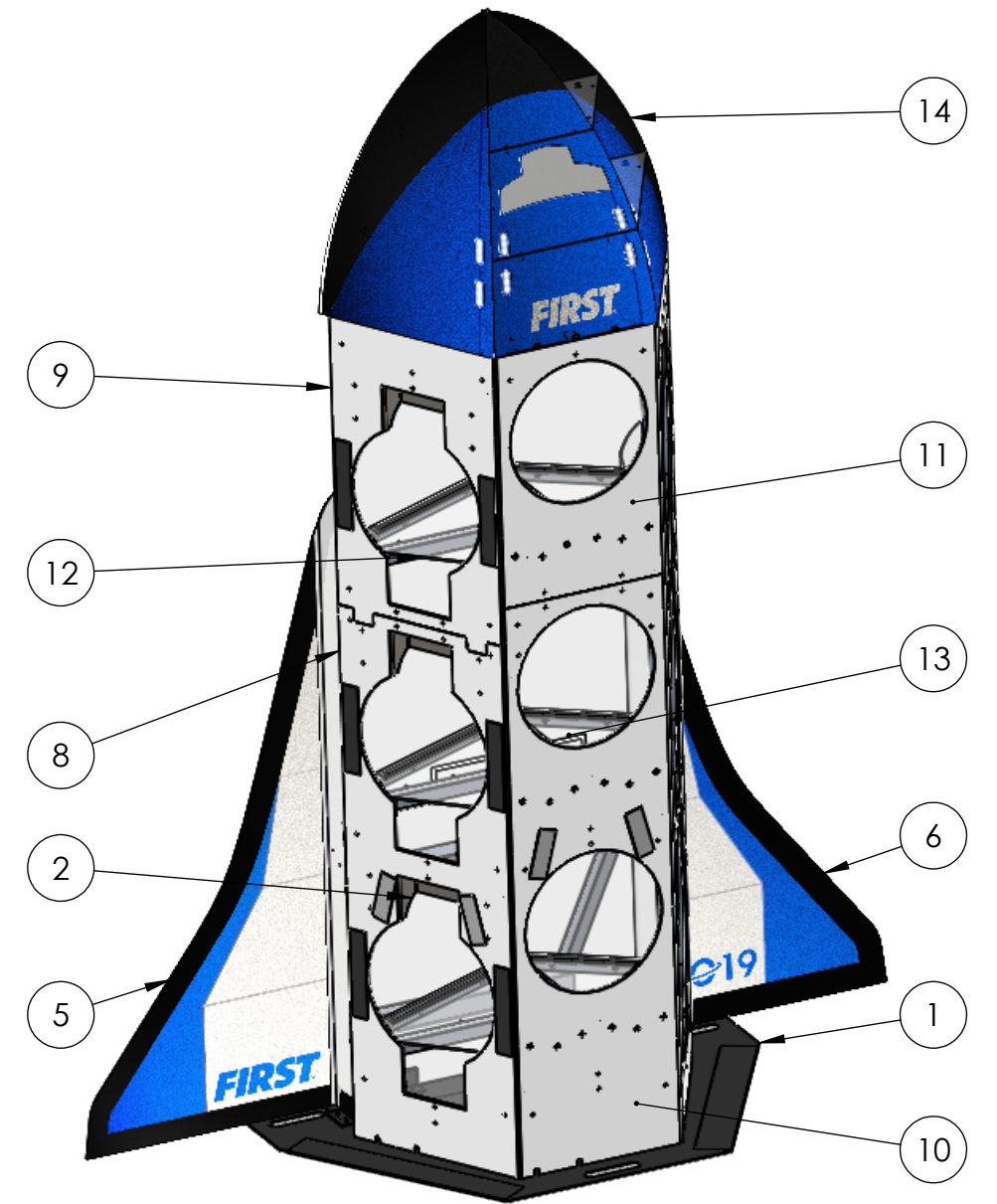
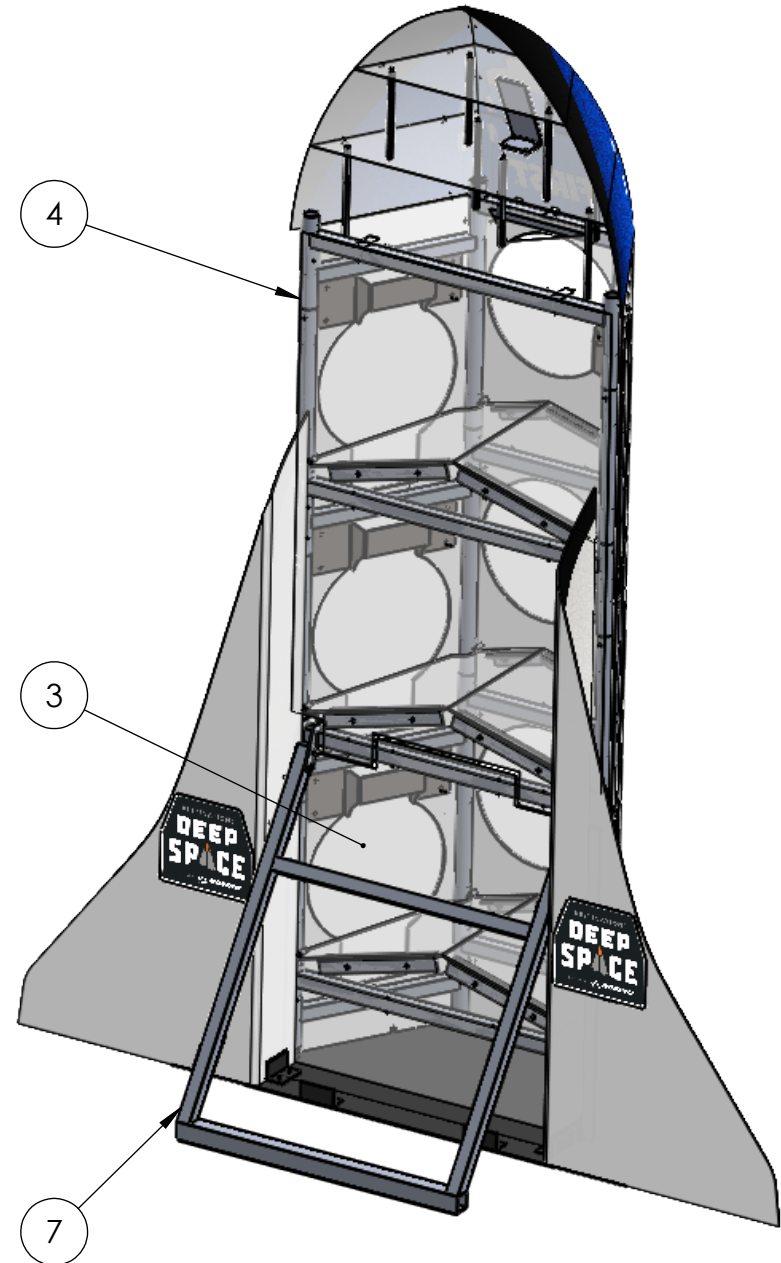
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Notes:  
 1. This assembly exists in Red and Blue configurations, only blue is shown here.

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



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		UNLESS OTHERWISE SPECIFIED:	NAME	DATE	 
		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL ±1/16 ANGULAR: MACH ±1° BEND ±1° TWO PLACE DECIMAL ±.01 THREE PLACE DECIMAL ±.001	DRAWN		
		INTERPRET GEOMETRIC TOLERANCING PER:	CHECKED		SIZE DWG. NO. REV
		MATERIAL	ENG APPR.		<b>B</b> <b>GE-19121</b>
		FINISH	MFG APPR.		SCALE: 1:20 WEIGHT: SHEET 1 OF 4
NEXT ASSY	USED ON		Q.A.		
APPLICATION		DO NOT SCALE DRAWING	COMMENTS:		

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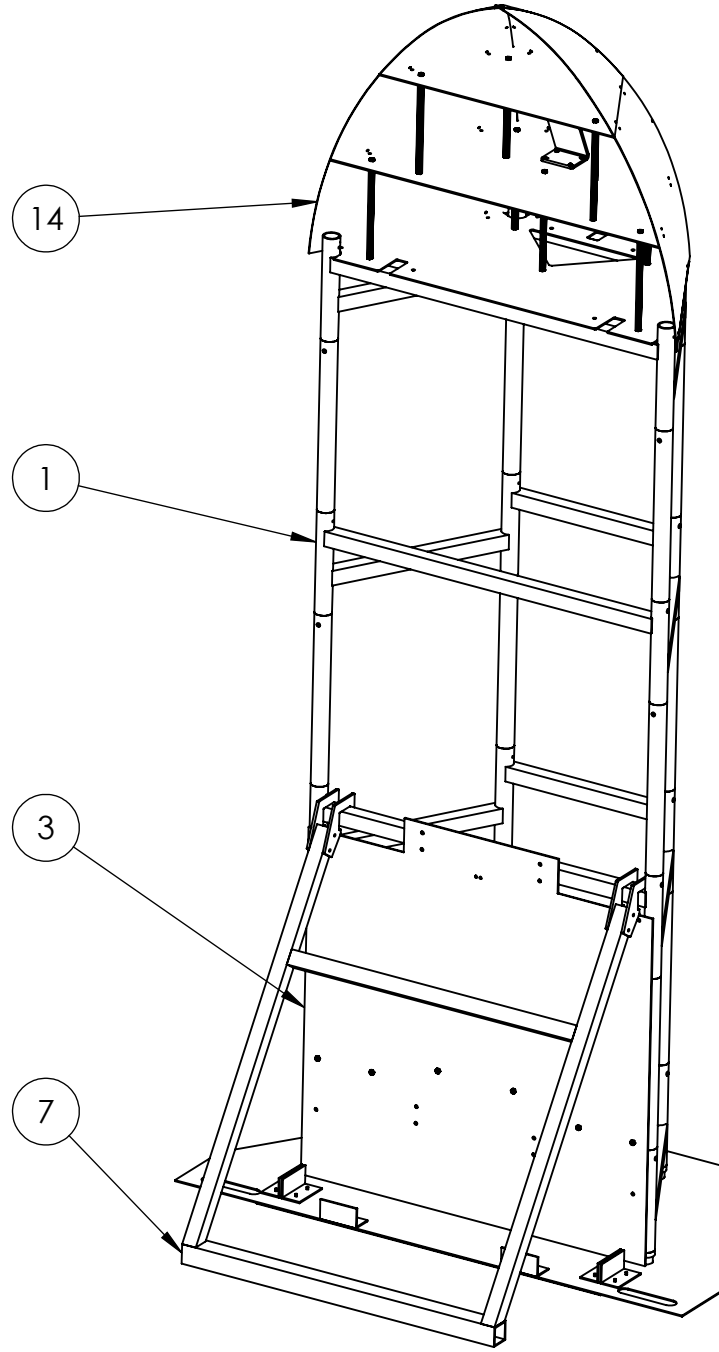
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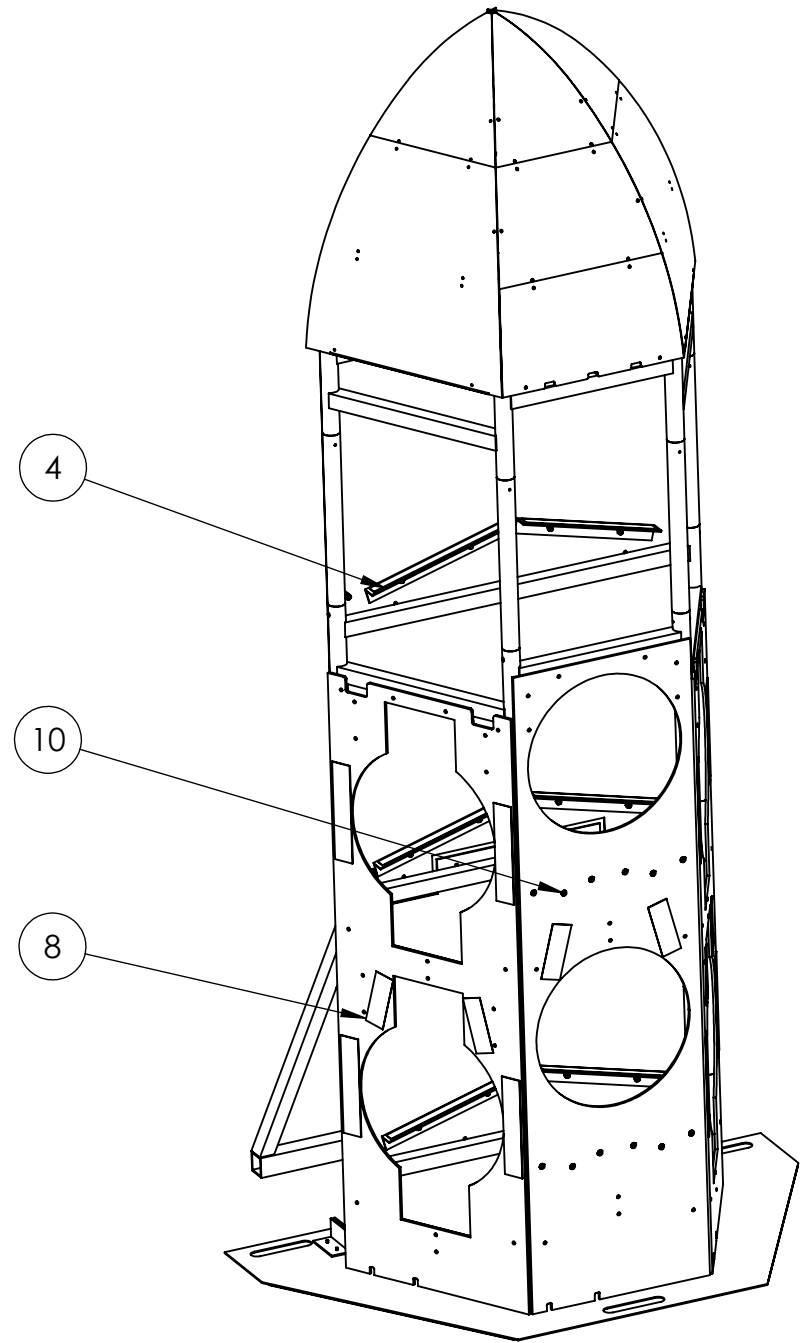
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Notes:



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



Notes:

1. Attach item 4 to the assembly using 120-lb cable ties, making sure not to use the holes along the side edges.
2. Attach item 8 (qty 2) and item 10 to the assembly. Do not use the cable tie holes at the top of the parts at this step.

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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		
		INTERPRET GEOMETRIC TOLERANCING PER:		CHECKED		<b>Rocket Assembly</b>
		MATERIAL		ENG APPR.		
		FINISH		MFG APPR.		<b>B</b> <b>GE-19121</b>
NEXT ASSY	USED ON			Q.A.		SCALE: 1:18 WEIGHT: SHEET 2 OF 4
APPLICATION		DO NOT SCALE DRAWING		COMMENTS:		

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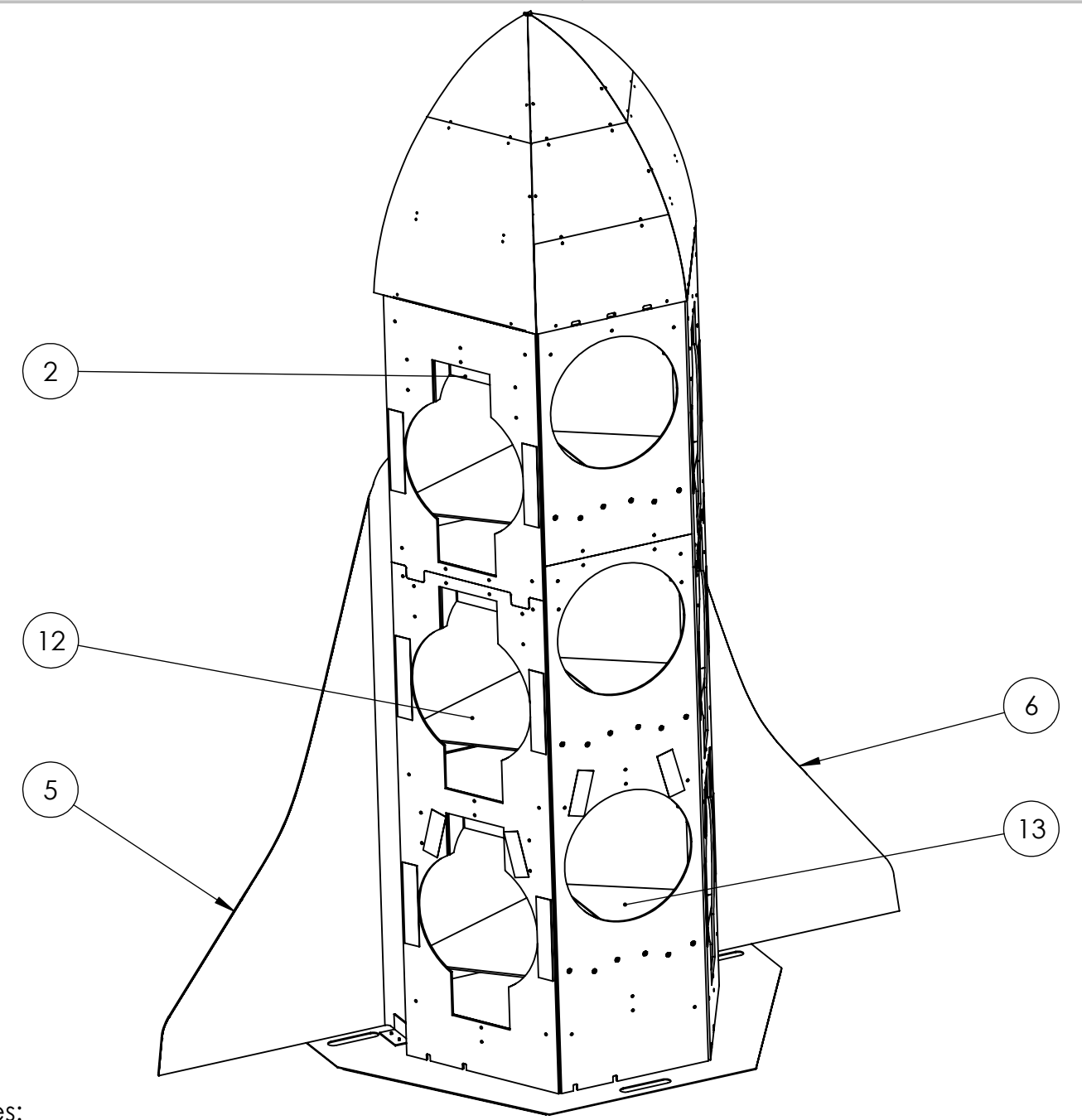
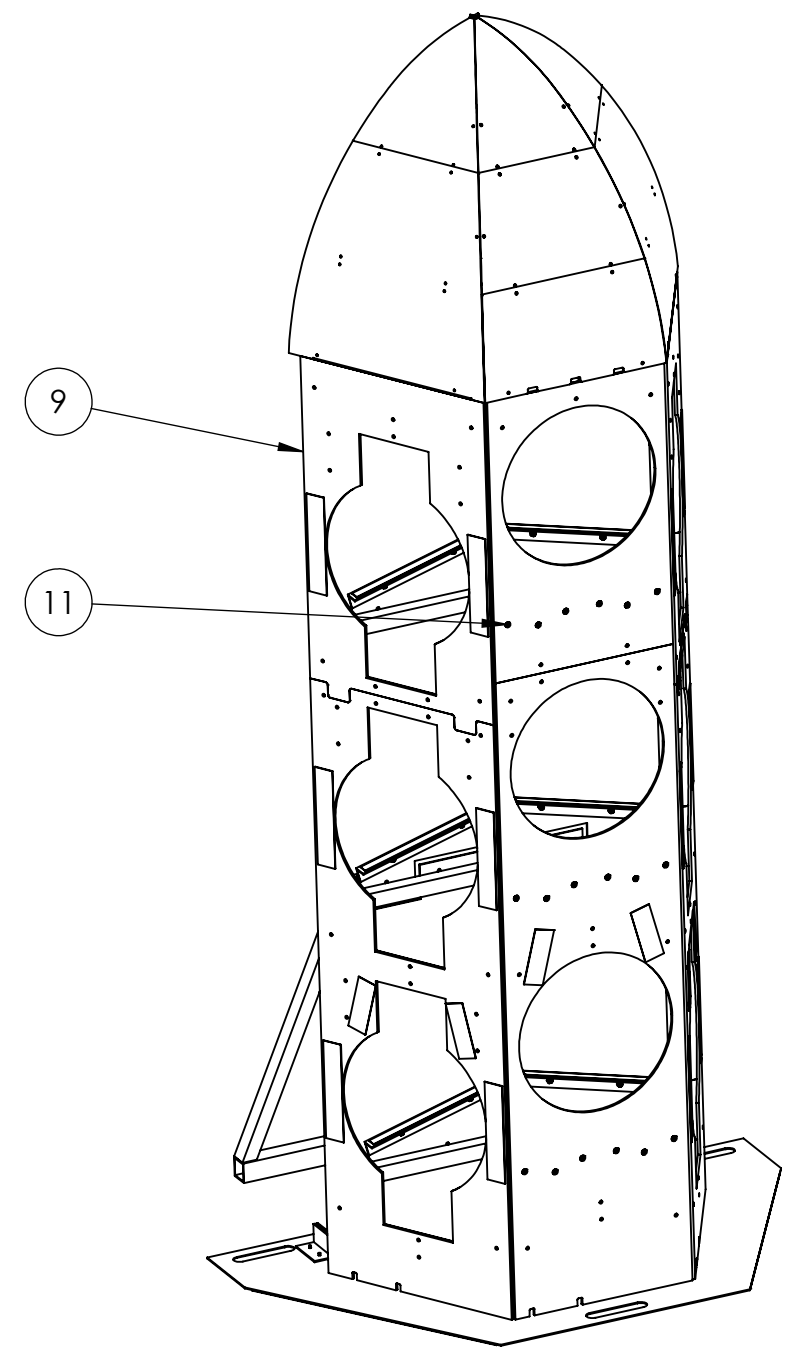


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- Notes:
1. Attach item 9 and 11 to the assembly using 120-lb cable ties.
  2. Ensure all cable tie holes have been used to connect plastic side faces to frame and each other.

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

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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		
INTERPRET GEOMETRIC TOLERANCING PER:		CHECKED		TITLE:
MATERIAL		ENG APPR.		<b>Rocket Assembly</b>
FINISH		MFG APPR.		SIZE DWG. NO. REV
NEXT ASSY	USED ON	Q.A.		<b>B GE-19121</b>
APPLICATION		COMMENTS:		SCALE: 1:18 WEIGHT: SHEET 3 OF 4
DO NOT SCALE DRAWING				

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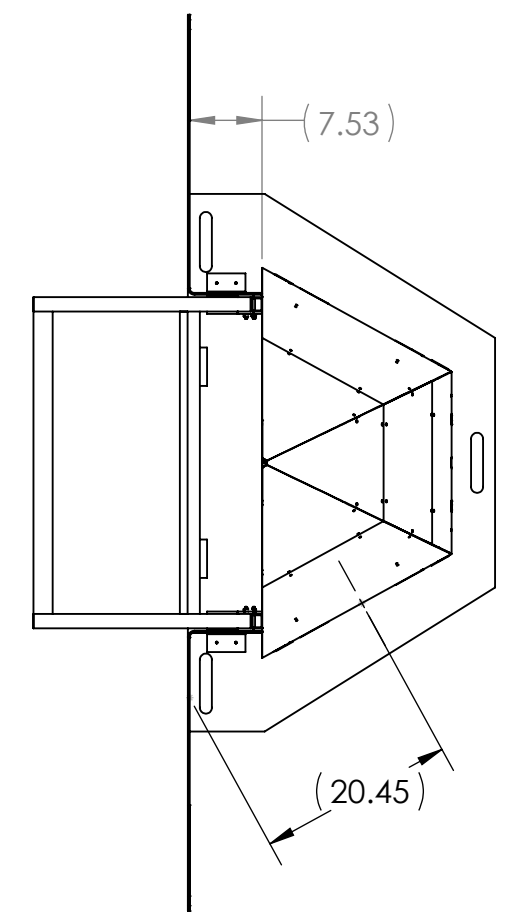
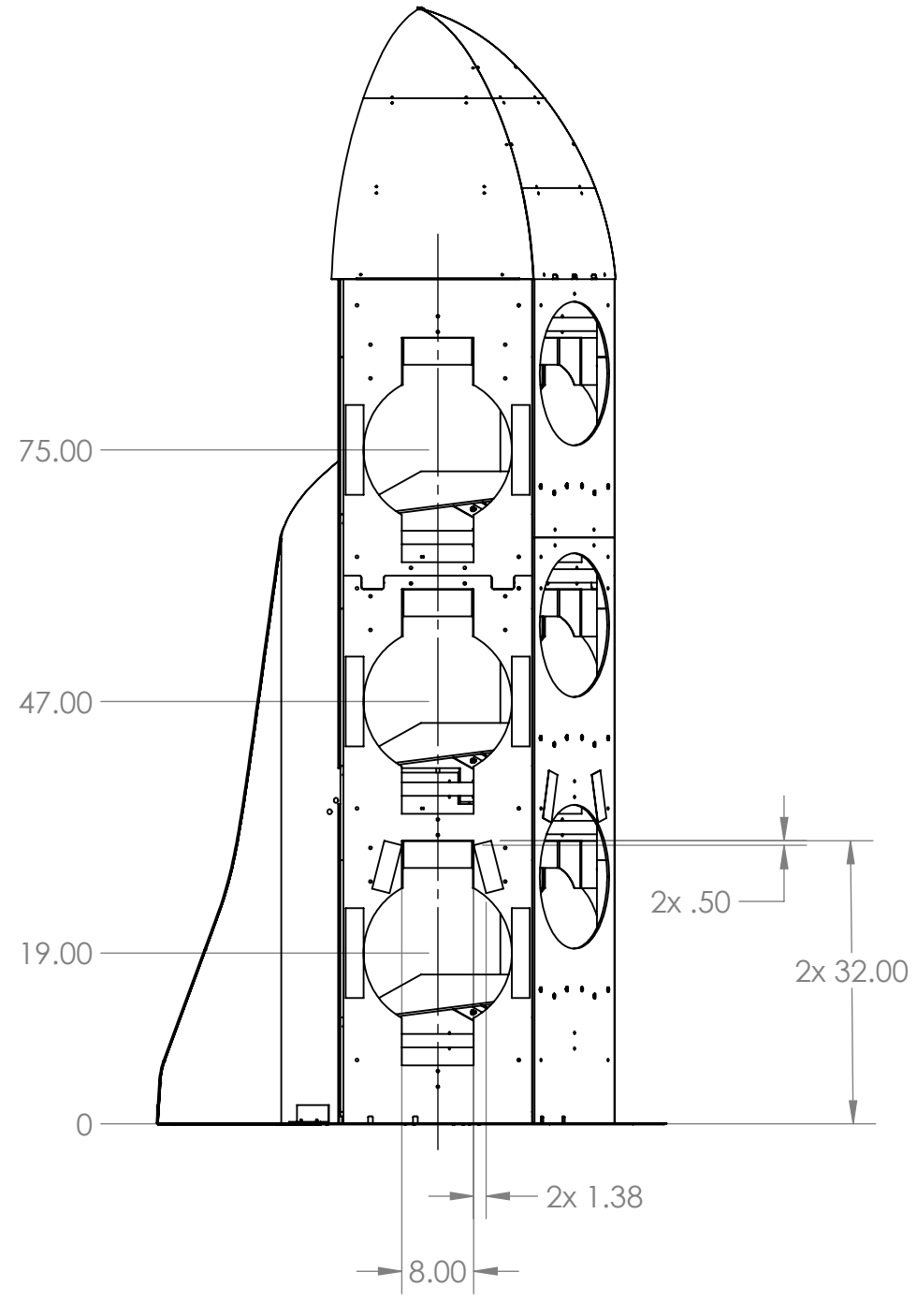
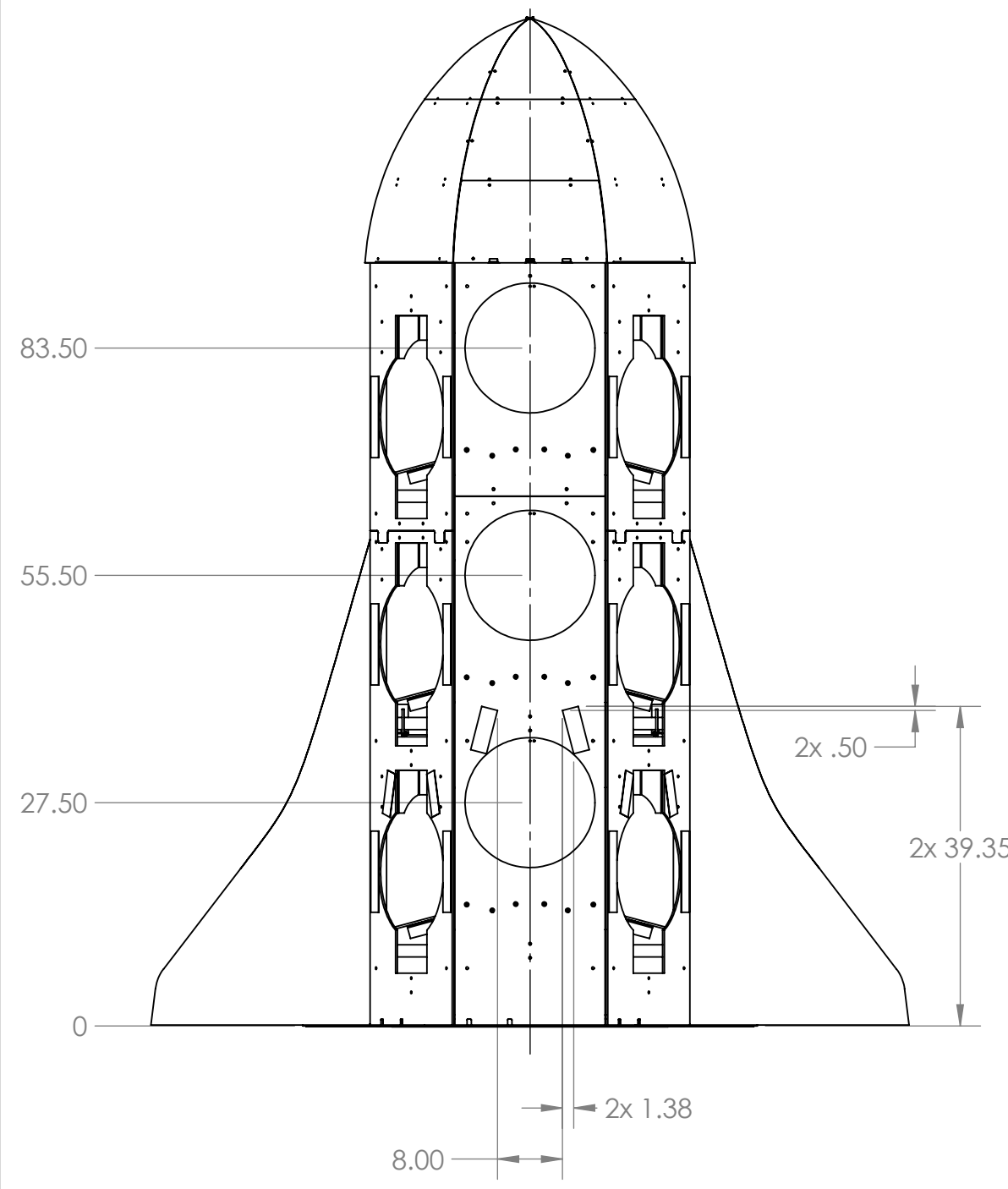
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		ANGULAR: MACH ± 1° BEND ± 1°	MFG APPR.	
		TWO PLACE DECIMAL ± .01	Q.A.	
		THREE PLACE DECIMAL ± .001	COMMENTS:	
		INTERPRET GEOMETRIC TOLERANCING PER:		
		MATERIAL		
NEXT ASSY	USED ON	FINISH		
APPLICATION		DO NOT SCALE DRAWING		



TITLE:		
<h1>Rocket Assembly</h1>		
SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19121</b>	
SCALE: 1:20 WEIGHT:		SHEET 4 OF 4

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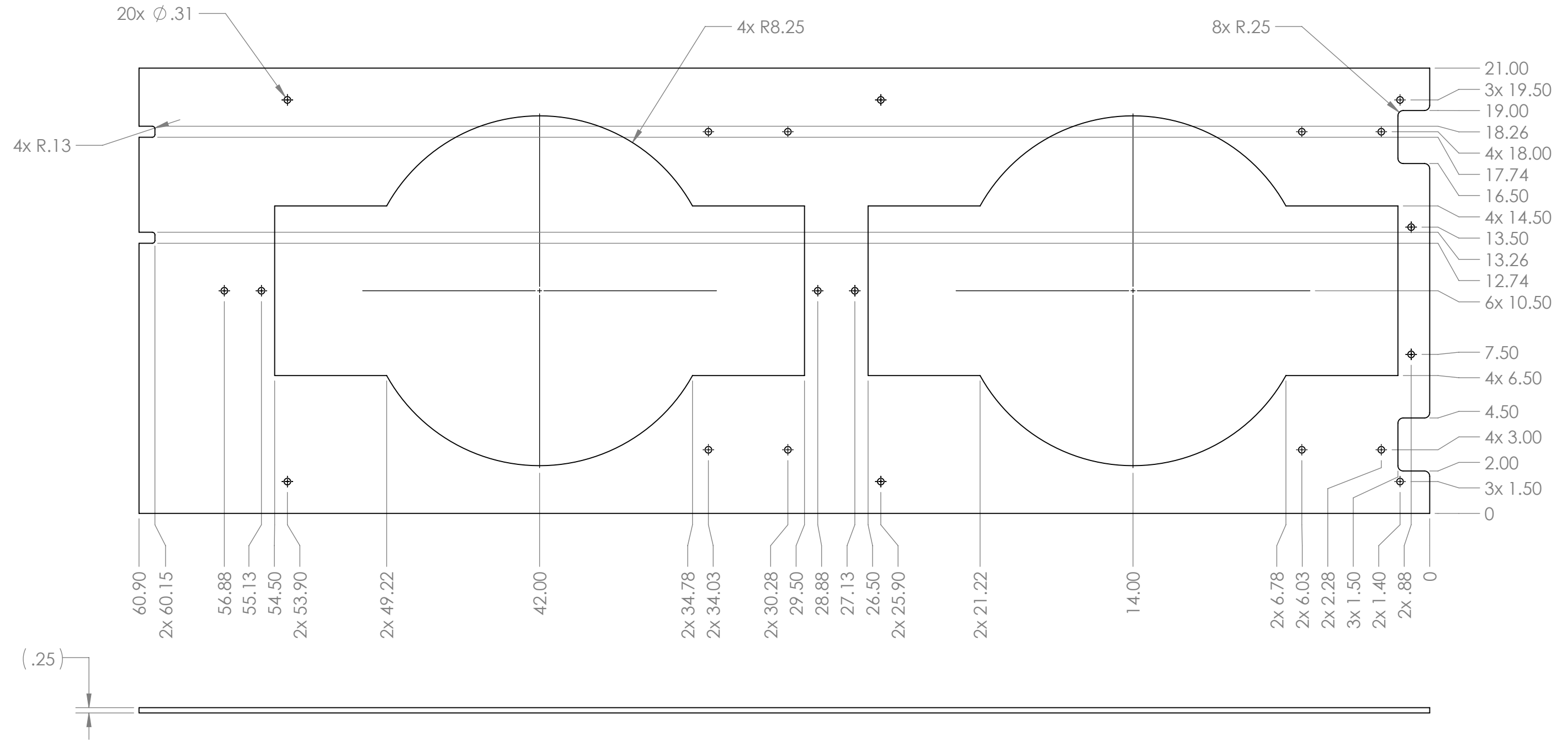
1

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

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		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

TITLE: **Rocket Panel Plastic Bottom**

SIZE **B** DWG. NO. **GE-19122** REV

SCALE: 1:5 WEIGHT: SHEET 1 OF 1

4

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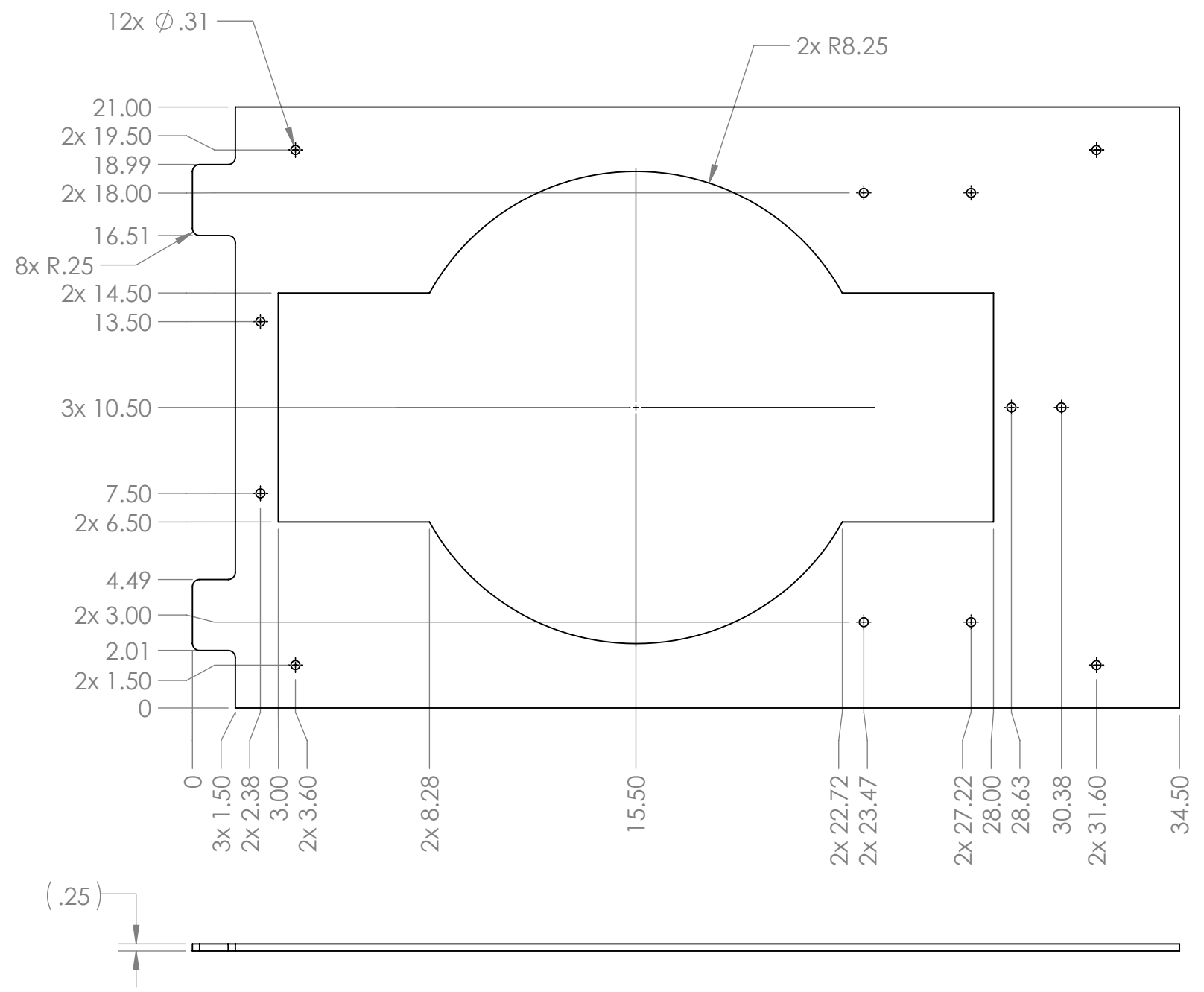
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Notes:

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

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		TOLERANCES:	CHECKED	
		FRACTIONAL $\pm$ 1/16	ENG APPR.	
		ANGULAR: MACH $\pm$ 1° BEND $\pm$ 1°	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:		
Rocket Panel Plastic Top		
SIZE	DWG. NO.	REV
<b>B</b>	GE-19123	
SCALE: 1:5	WEIGHT:	SHEET 1 OF 1

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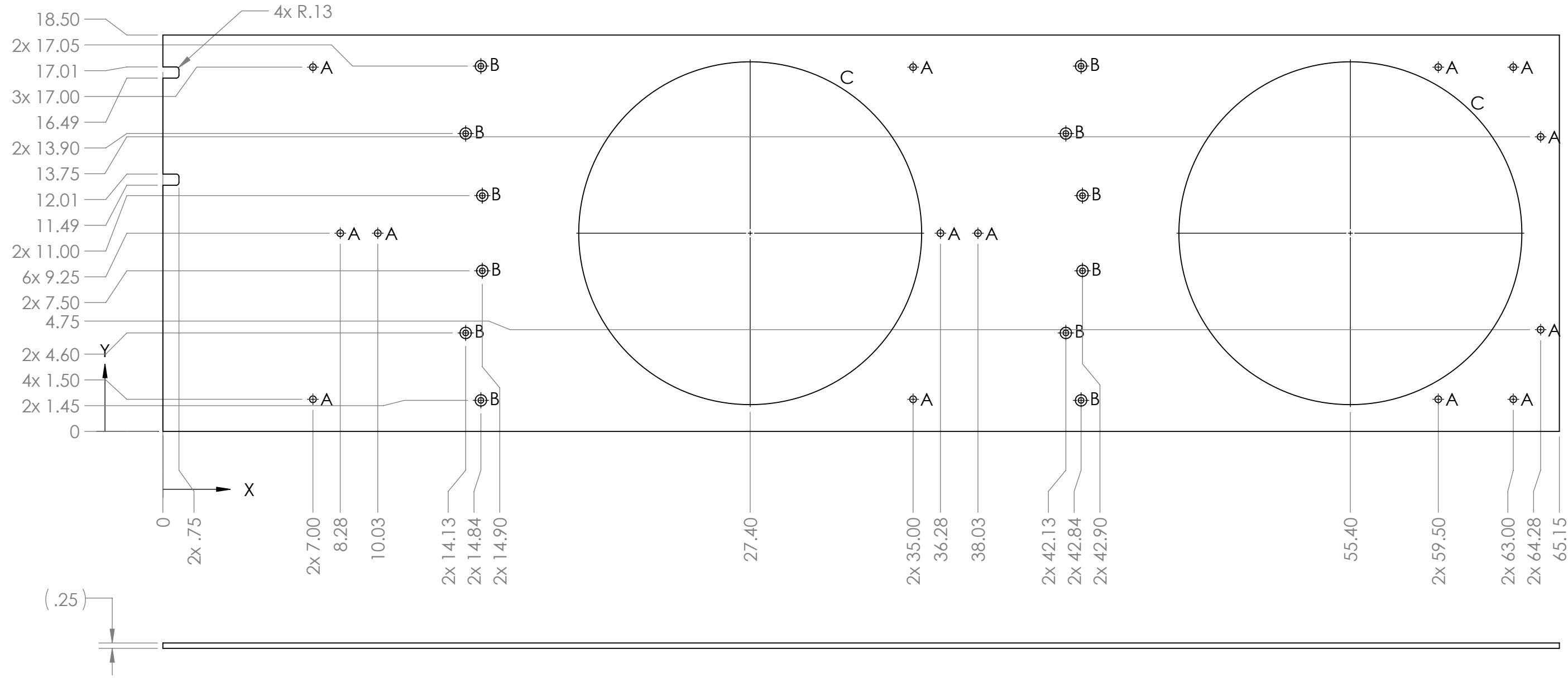
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2

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TAG	SIZE	QUANTITY
A	∅ .31 THRU ALL	14
B	∅ .27 THRU ALL ✓ ∅ .53 X 82°	12
C	∅ 16.00 THRU	2

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



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



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

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

TITLE:  
**Rocket Cargo Plastic Bottom**

SIZE **B** DWG. NO. **GE-19124** REV **A**

SCALE: 1:5 WEIGHT: SHEET 1 OF 1

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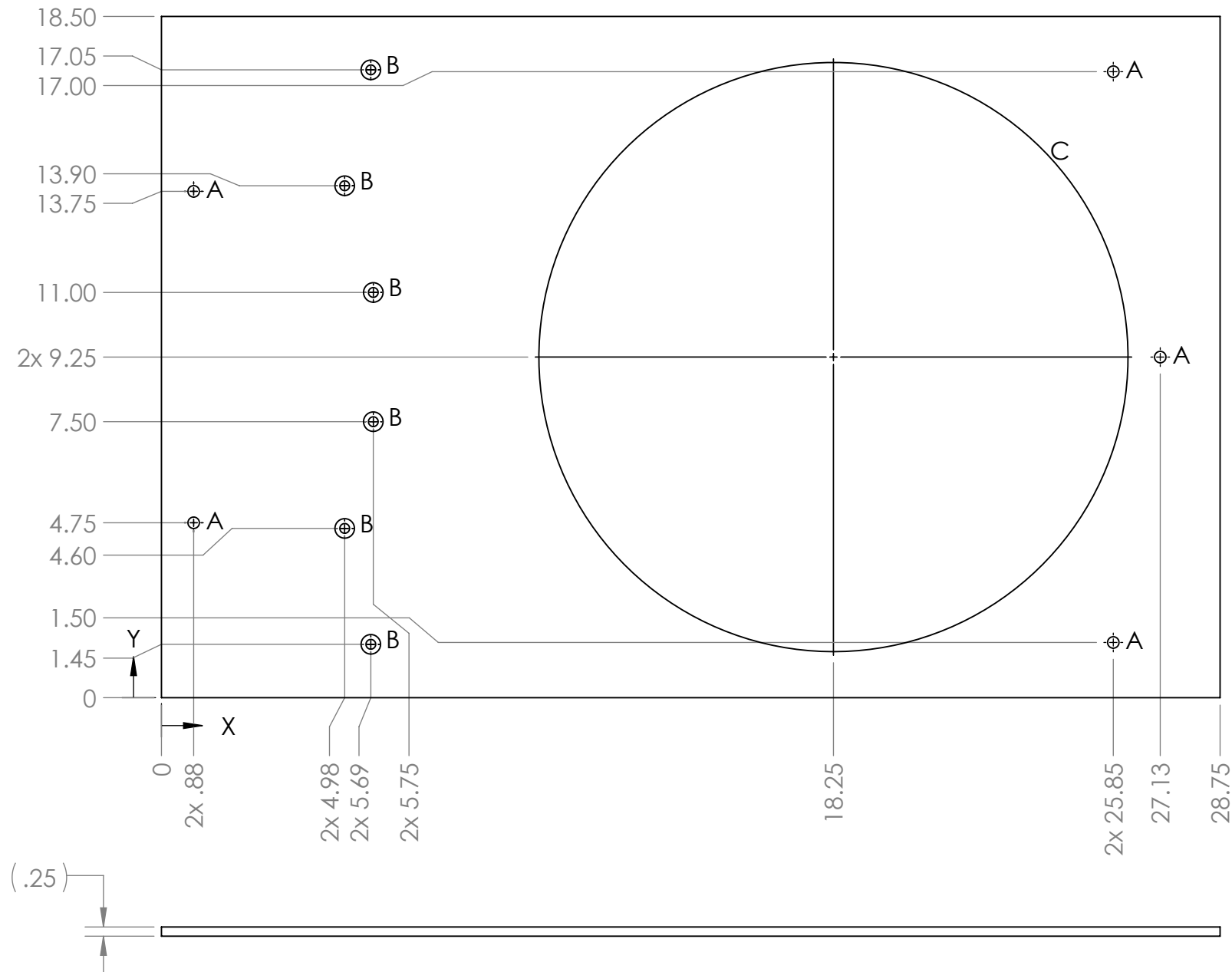
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TAG	SIZE	QUANTITY
A	$\phi$ .31 THRU ALL	5
B	$\phi$ .27 THRU ALL ✓ $\phi$ .53 X 82°	6
C	$\phi$ 16.00 THRU	1

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



## Notes:

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



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		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		



TITLE:		
Rocket Cargo Plastic Top		
SIZE	DWG. NO.	REV
<b>B</b>	GE-19125	<b>A</b>
SCALE: 1:4	WEIGHT:	SHEET 1 OF 1

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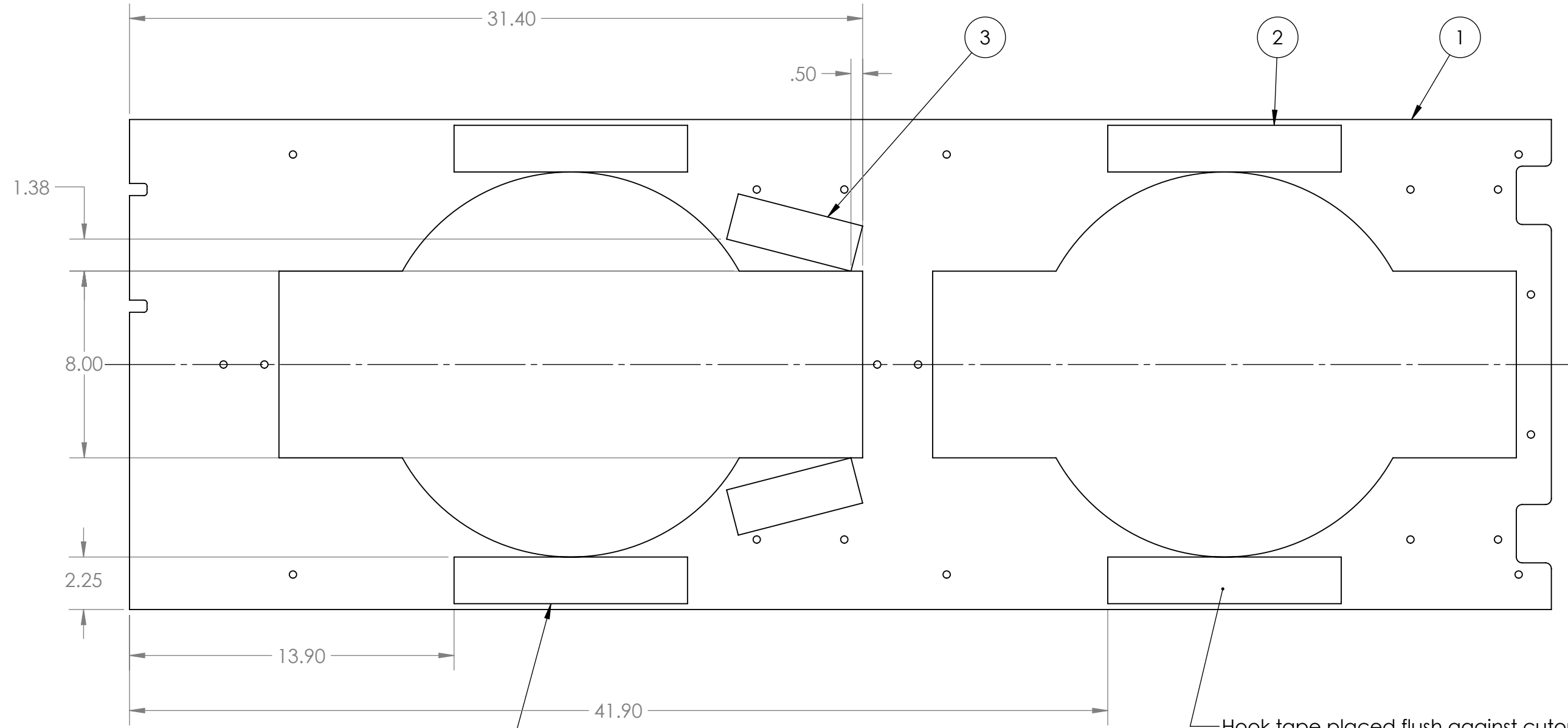
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REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
A4	A	Added note specifying hook fastener type.	1/10/2019	CPO



**A** Hook used is 3M Hook Fastener SJ3572

Hook tape placed flush against cutout, centered.

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

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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			

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

TITLE: **Rocket Panel Bottom Assembly**

SIZE **B** DWG. NO. **GE-19126** REV **A**

SCALE: 1:5 WEIGHT: SHEET 1 OF 1

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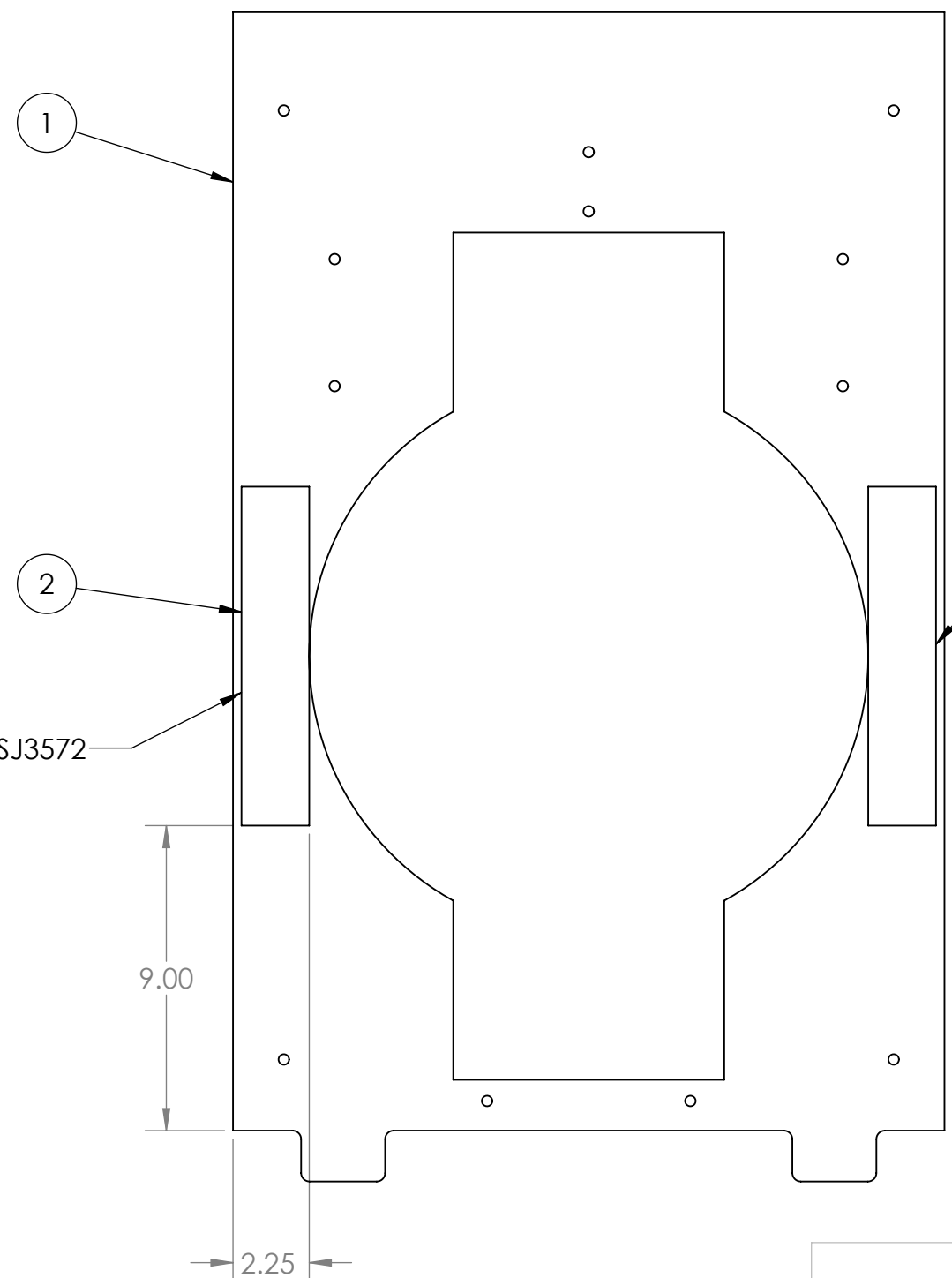
REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
A4	A	Added note specifying hook fastener type.	1/10/2019	CPO

B

B

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**A** Hook used is 3M Hook Fastener SJ3572

Hook tape placed flush against cutout, centered.

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

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



TITLE:		
Rocket Panel Top Assembly		
SIZE	DWG. NO.	REV
<b>B</b>	GE-19127	<b>A</b>
SCALE: 1:5	WEIGHT:	SHEET 1 OF 1

4

3

2

1

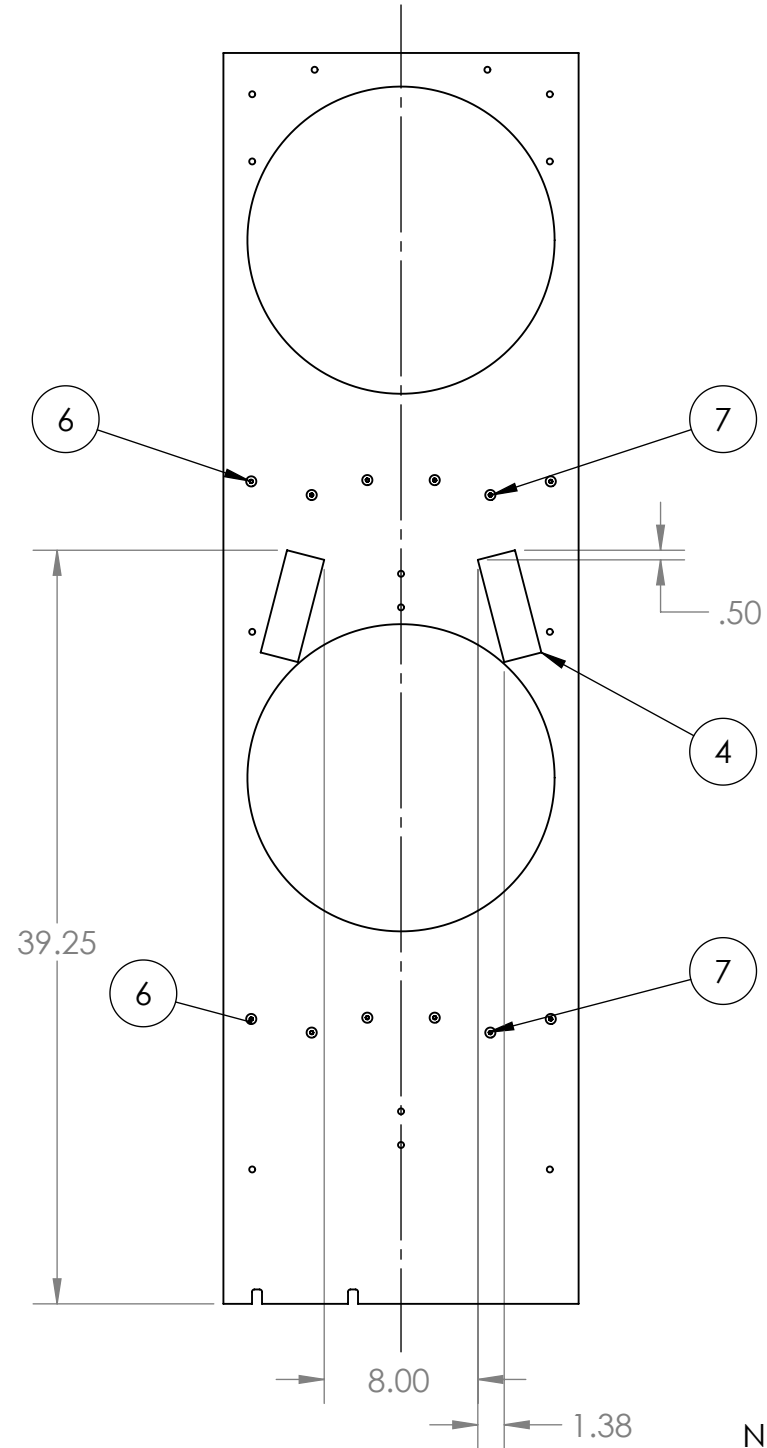
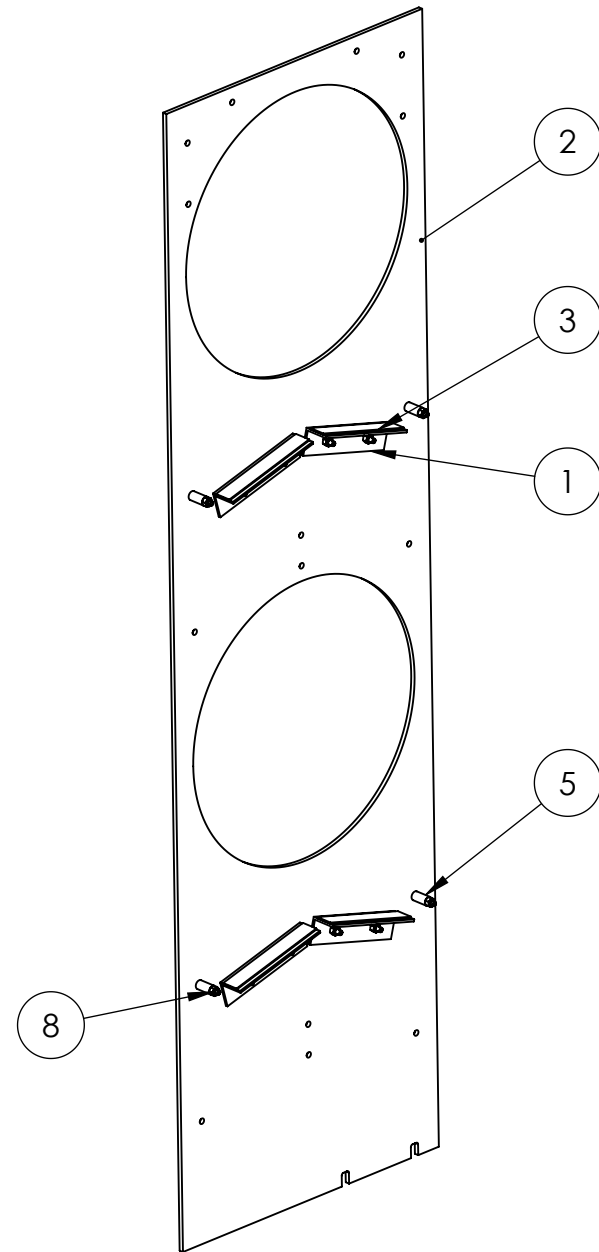


4

3

2

1



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

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-19029	Rocket Ramp Support Front	4
2	GE-19124	Rocket Cargo Plastic Bottom	1
3	Hook_1_6	1" x 6" Hook, Adhesive Backed	4
4	VisionTape	2" x 5.5" Retroreflective tape	2
5	spacer_.257_1_.5	Spacer, .257" ID, 1/2" OD, 1" thk	4
6	flat_hex_.25_20_1.75	Steel Hex Flat Head Screw, 1/4"-20 x 1.75" long, partially threaded	4
7	flat_hex_.25_20_1	Steel Hex Flat Head Screw, 1/4"-20 x 1" long, fully threaded	8
8	nylock_.25_20	Steel Nylon-Insert Locknut, 1/4"-20	12

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

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

TITLE:  
**Rocket Cargo Bottom Assembly**

SIZE **B** DWG. NO. **GE-19128** REV

SCALE: 1:10 WEIGHT: SHEET 1 OF 1

4

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2

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B

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4

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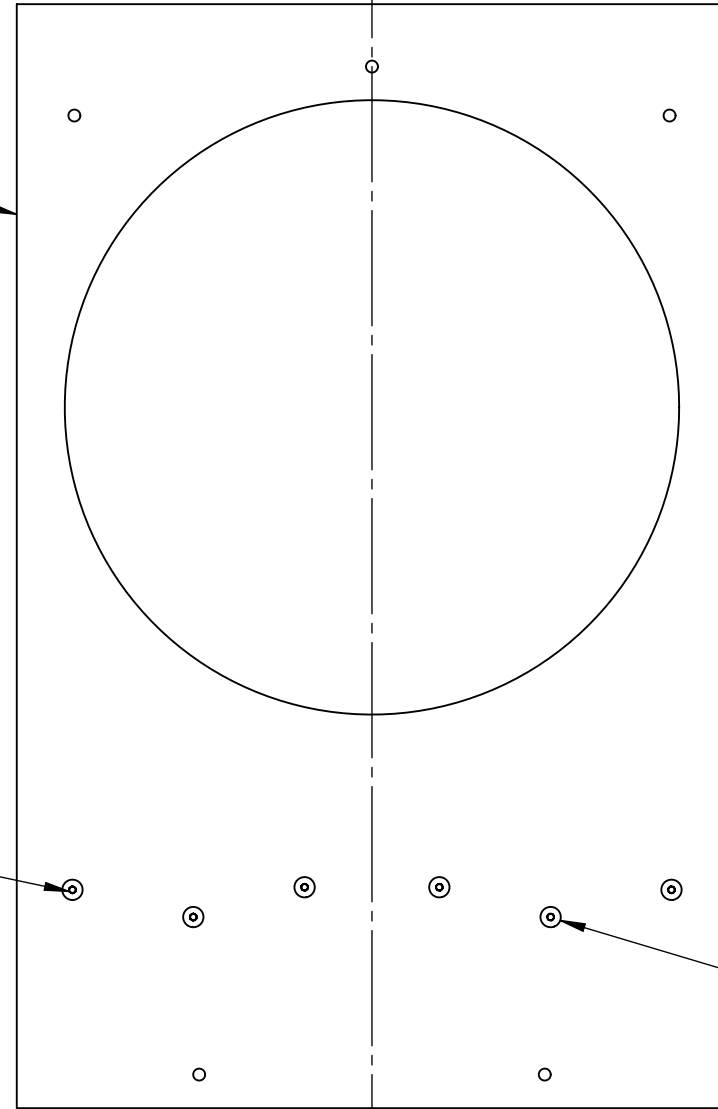
B

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6

5

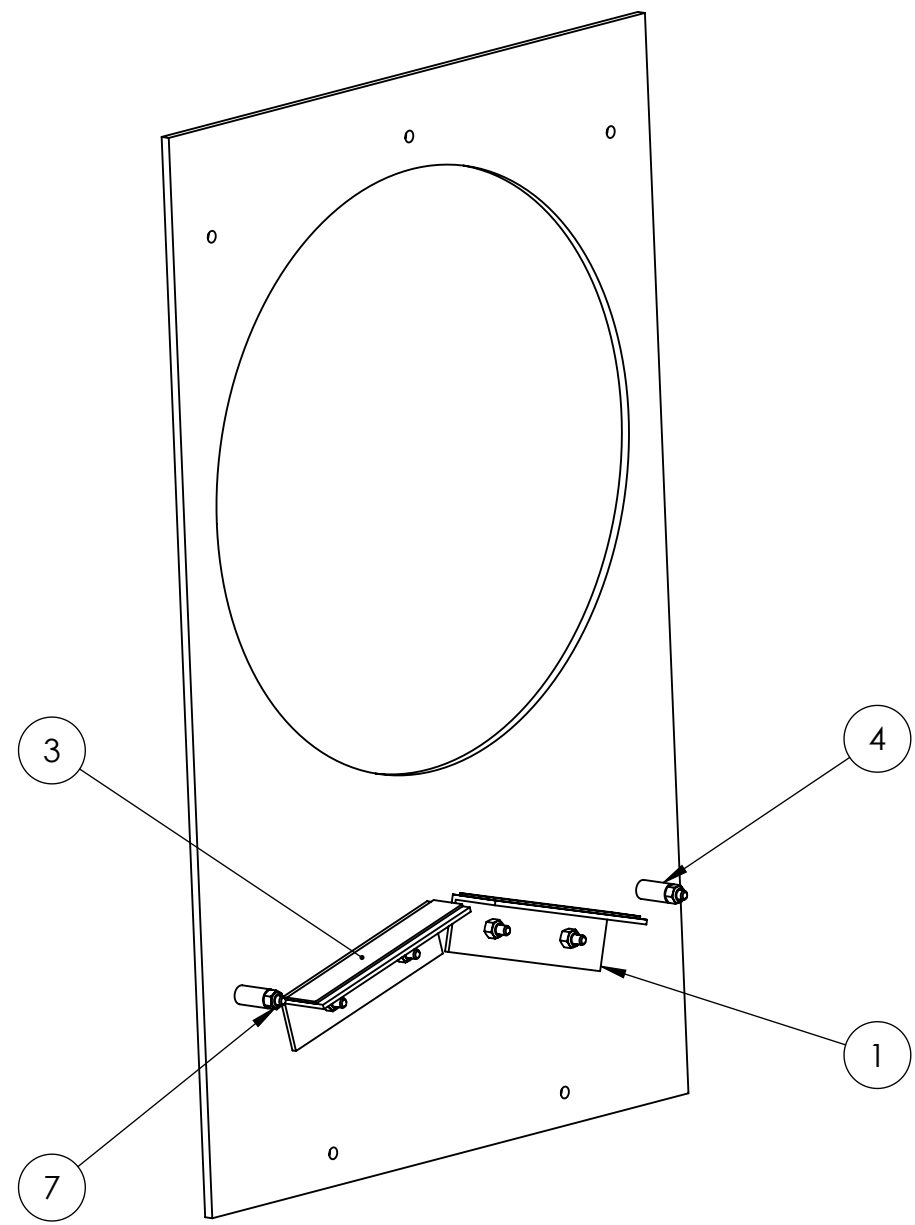


3

4

1

7



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

A

A

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

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

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

TITLE:  
**Rocket Cargo Top Assembly**

SIZE DWG. NO. REV  
**B GE-19129**

SCALE: 1:5 WEIGHT: SHEET 1 OF 1

4

3

2

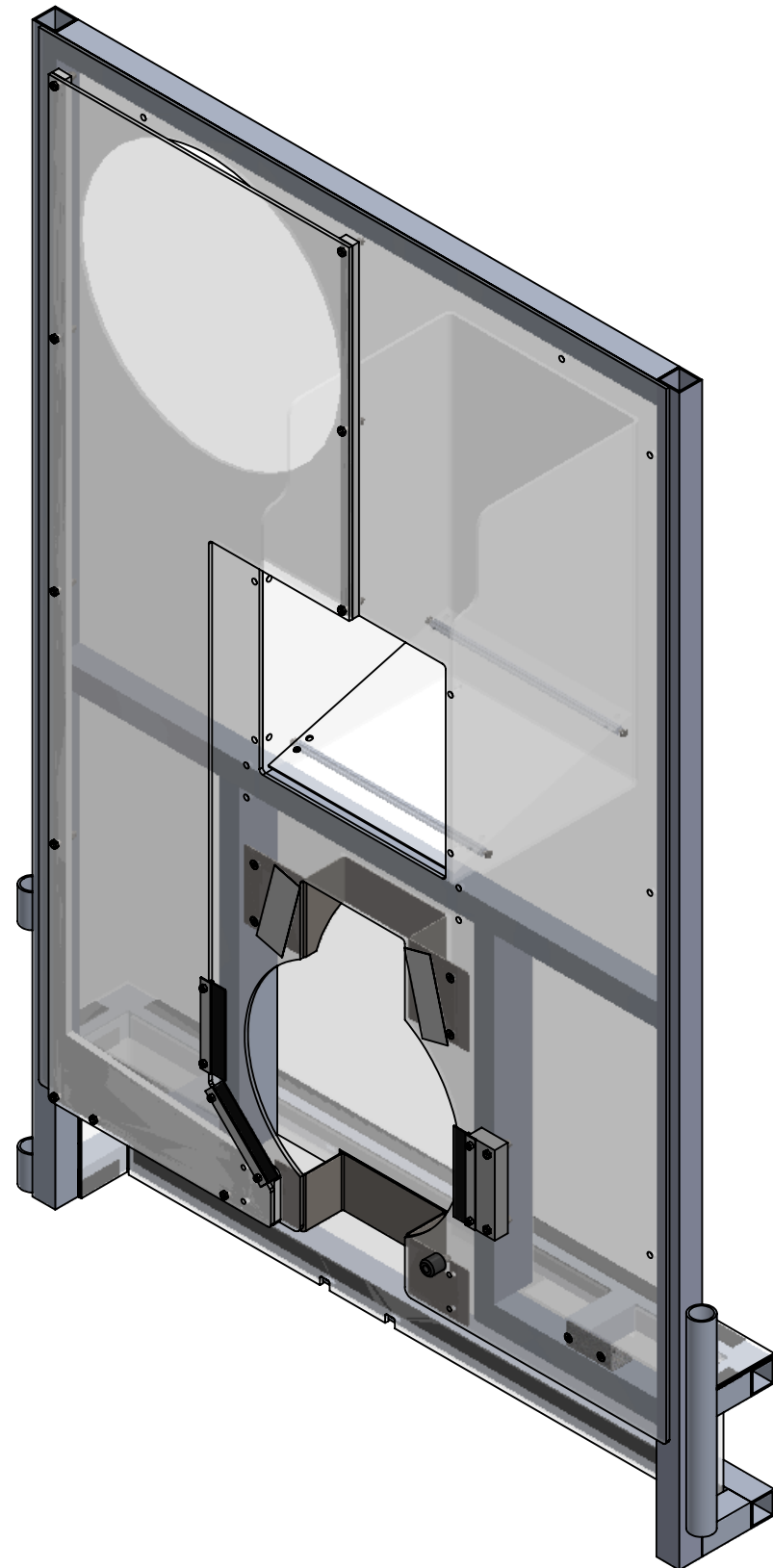
1

4

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2



1



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

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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			

TITLE:  
**Feeder Station Assembly**

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

SCALE: 1:10 WEIGHT: SHEET 1 OF 4

4

3

2

1

B

B

A

A

4

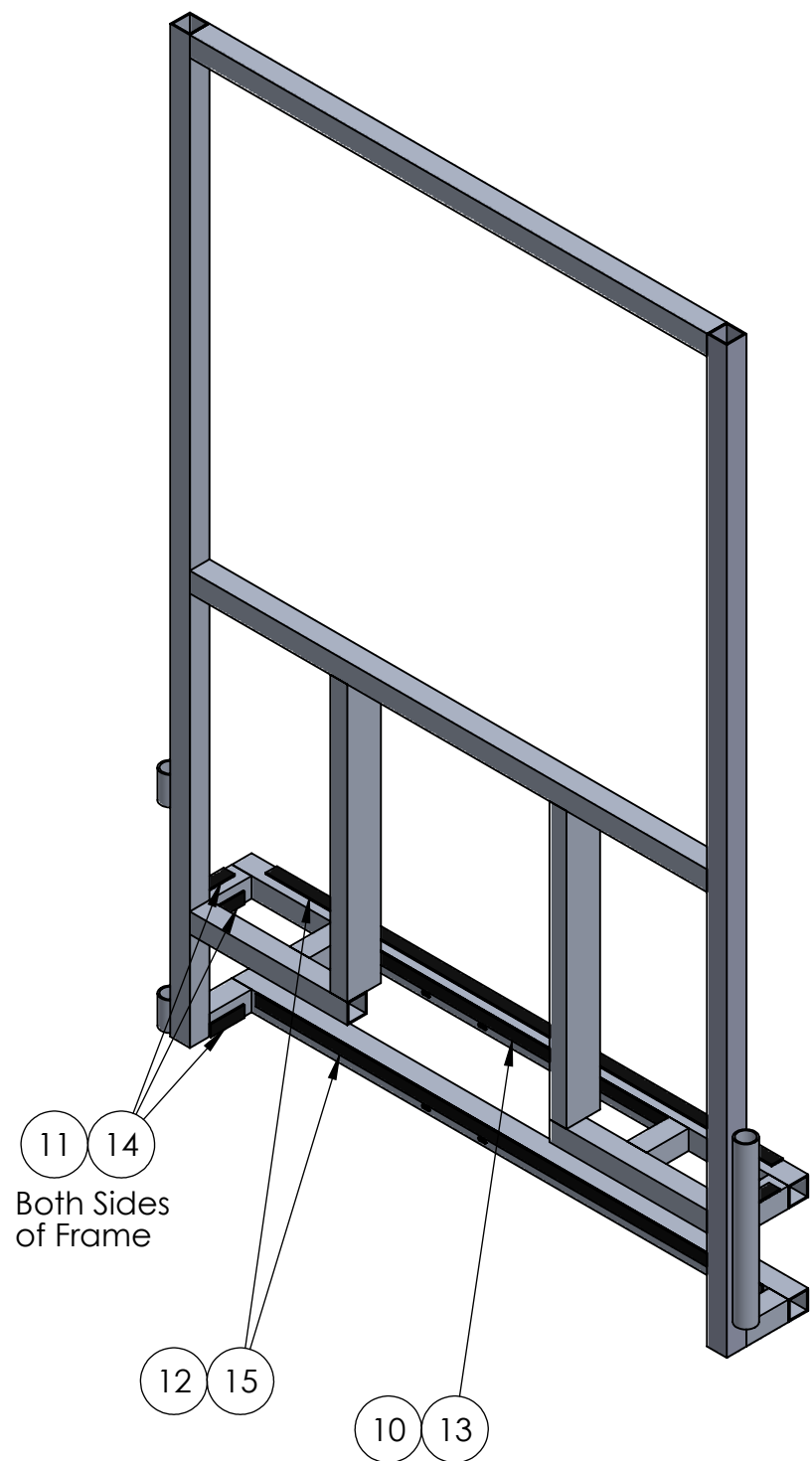
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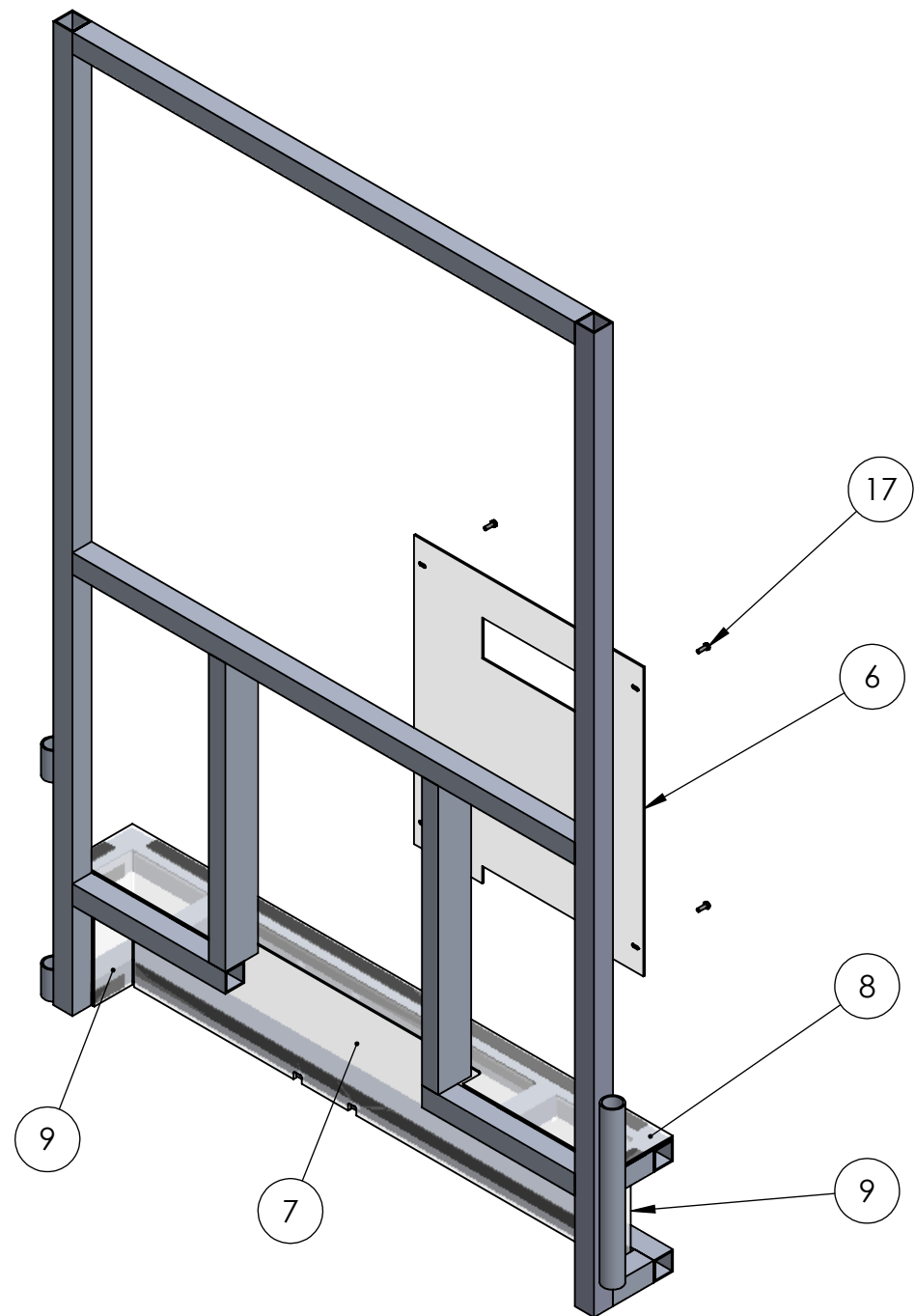
1

B

B



Both Sides of Frame





A

A

Notes:

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

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		UNLESS OTHERWISE SPECIFIED:	NAME	DATE	 
		DIMENSIONS ARE IN INCHES 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		
		INTERPRET GEOMETRIC TOLERANCING PER:	CHECKED		SIZE DWG. NO. REV
		MATERIAL	ENG APPR.		<b>B</b> <b>GE-19130</b>
NEXT ASSY	USED ON	FINISH	MFG APPR.		SCALE: 1:12 WEIGHT: SHEET 2 OF 4
APPLICATION		DO NOT SCALE DRAWING	Q.A.		
			COMMENTS:		

4

3

2

1

3

4

Cable tie Item 3 to Item 4 at all available locations.

5

Cable tie Item 5 to Item 3 in four locations.

16 1 18

Attach Item 1 to Item 3 using hardware

2

Cable tie Item 2 to Item 3 at two locations

4

3

2

1

B

B

A

A

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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			
		FINISH			
NEXT ASSY	USED ON				
		APPLICATION			
		DO NOT SCALE DRAWING			



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

4

3

2

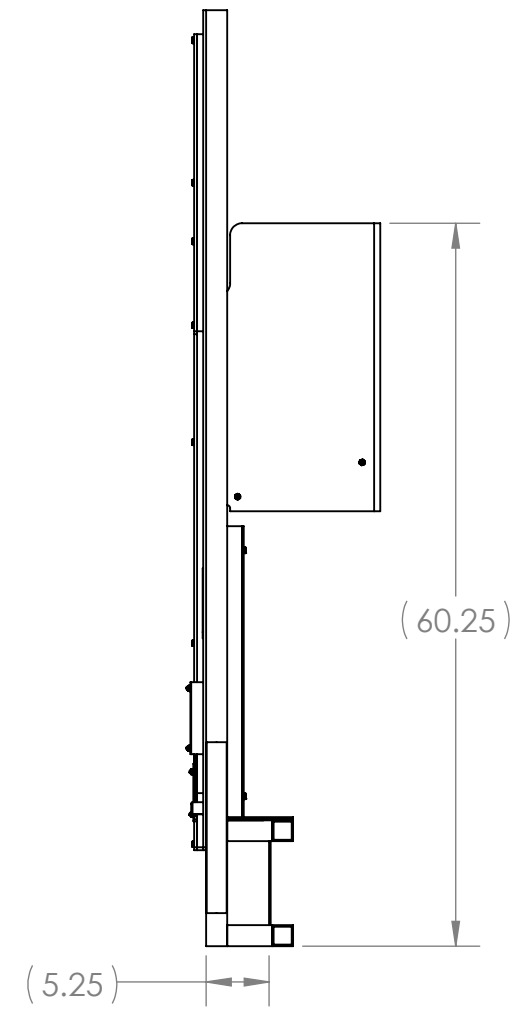
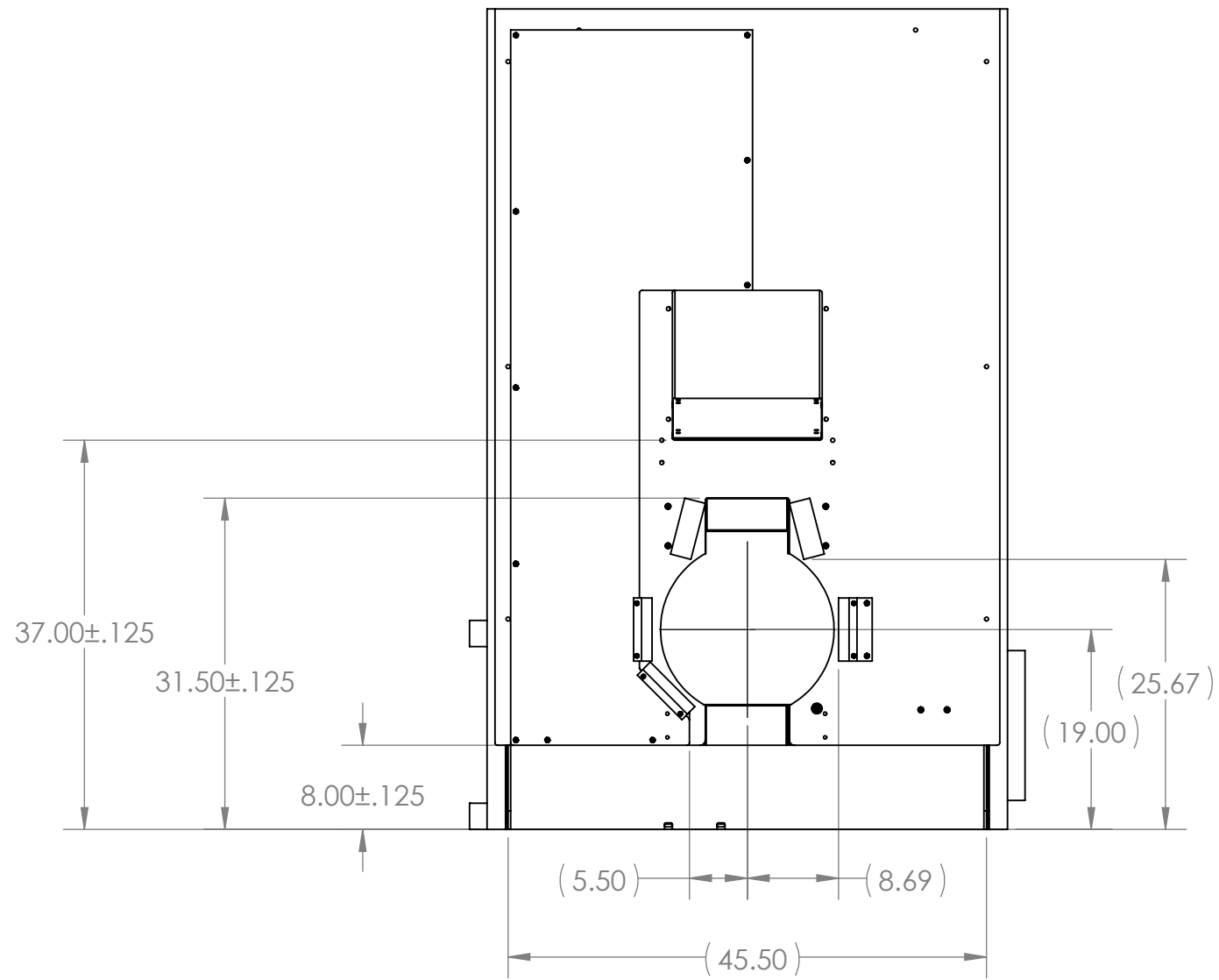
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B



B

A

A



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

4

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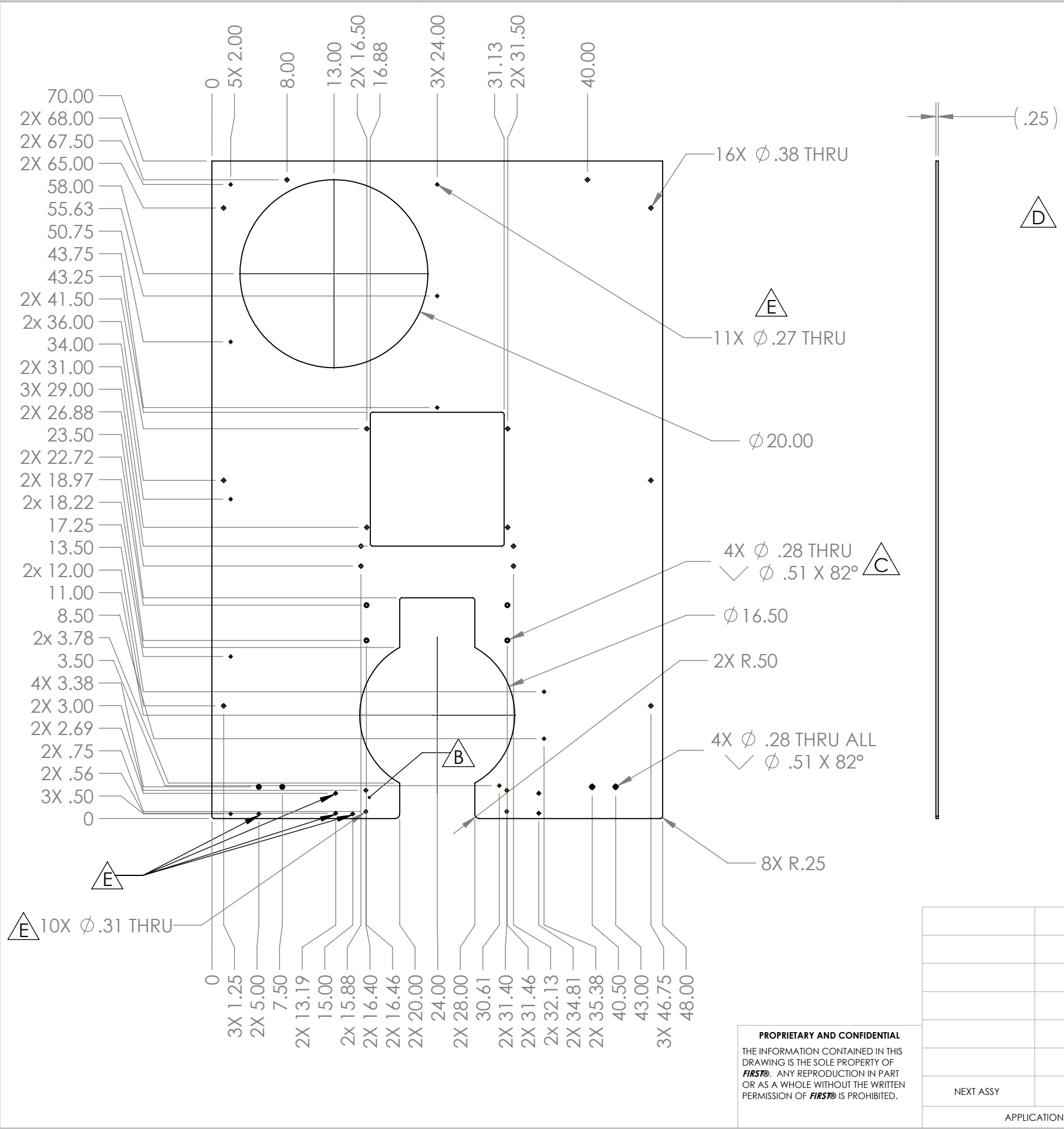
2

1

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
A1	A	Corrected part name.	10/10/2018	CPO
A3	B	Added 8X .31 Holes	10/17/2018	MXS
B3	C	Ø.31 Holes changed to C'Sink (4 places)	11/15/2018	DAF
B2	D	Corrected Table Error	11/15/2018	DAF
A4, B3	E	Changed Ø.27 holes to Ø.31, 2 places. Added four Ø.31 holes.	2/19/2019	DAF

B

B



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

A

A

4



3

2

1

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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			
FINISH			
NEXT ASSY	USED ON		
APPLICATION	DO NOT SCALE DRAWING		

TITLE:  
**Loading Station Panel, Right**

SIZE DWG. NO. REV  
**B GE-19131 E**

SCALE: 1:12 WEIGHT: SHEET 1 OF 1

4

3

2

1

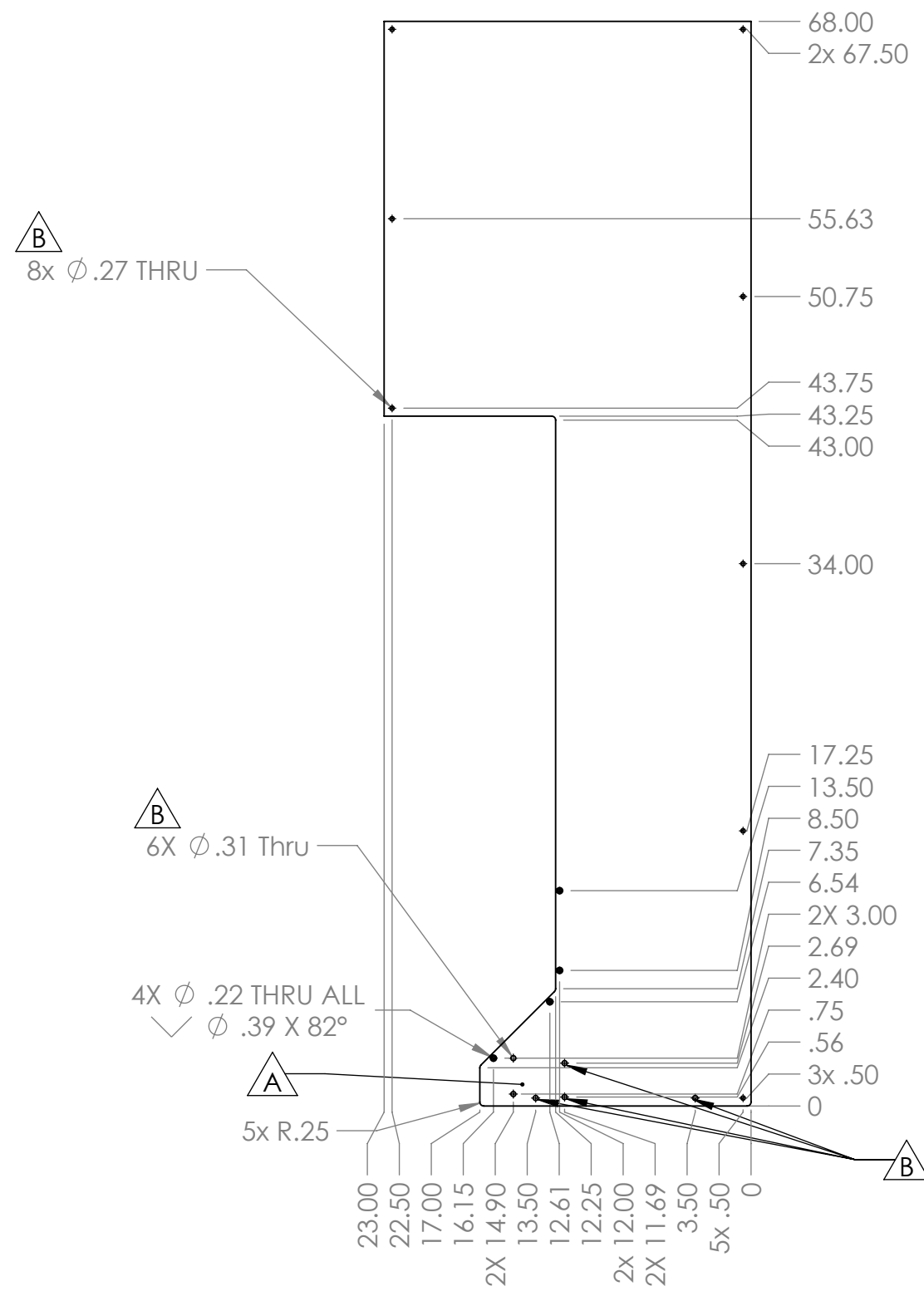
B

B

A

A



REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
A4	A	2X .31 Holes Added	10/16/2018	MXS
A3, A4, B4	B	Changed hole from $\phi$ .27 to $\phi$ .31, 2 places. Added 2X $\phi$ .31 diameter holes	2/19/2019	DAF



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

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

TITLE:  
**Slot Cover, Right**

SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19133</b>	<b>B</b>

SCALE: 1:10 WEIGHT: SHEET 1 OF 1

4

3

2

1

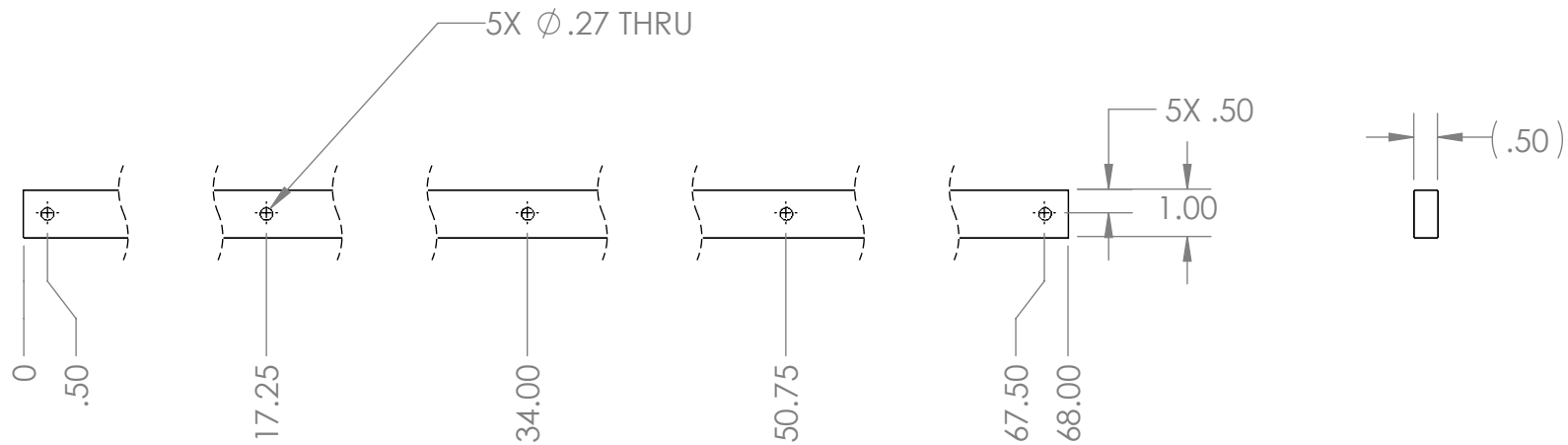


2

1

B

B





Notes:

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

A

A

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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				<b>TITLE:</b>  <h1 style="margin: 0;">Slot Guide, Large</h1>					
			INTERPRET GEOMETRIC TOLERANCING PER:	CHECKED									
			MATERIAL	ENG APPR.									
			FINISH	MFG APPR.									
	NEXT ASSY	USED ON	COMMENTS:	Q.A.			<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%;">SIZE</td> <td style="width: 55%;">DWG. NO.</td> <td style="width: 30%;">REV</td> </tr> <tr> <td style="text-align: center; font-size: 24pt;"><b>A</b></td> <td style="text-align: center; font-size: 24pt;"><b>GE-19134</b></td> <td></td> </tr> </table>	SIZE	DWG. NO.	REV	<b>A</b>	<b>GE-19134</b>	
SIZE	DWG. NO.	REV											
<b>A</b>	<b>GE-19134</b>												
	APPLICATION		DO NOT SCALE DRAWING				<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">SCALE: 1:4</td> <td style="width: 33%;">WEIGHT:</td> <td style="width: 34%;">SHEET 1 OF 1</td> </tr> </table>	SCALE: 1:4	WEIGHT:	SHEET 1 OF 1			
SCALE: 1:4	WEIGHT:	SHEET 1 OF 1											

2

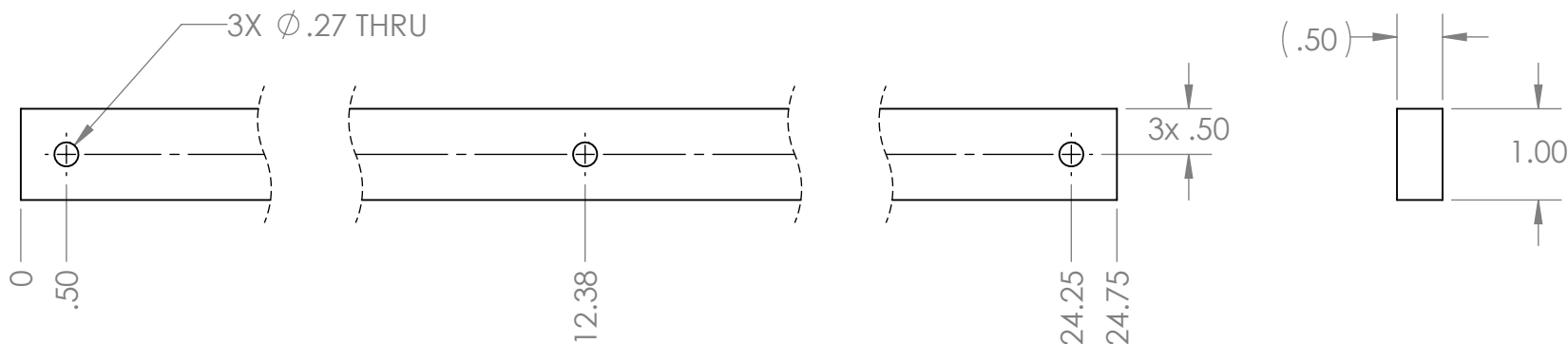
1

2

1

B

B



Notes:

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

A

A

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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			
		FINISH			
NEXT ASSY	USED ON				
APPLICATION		DO NOT SCALE DRAWING			



TITLE:  
**Slot Guide, Small**

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

2

1

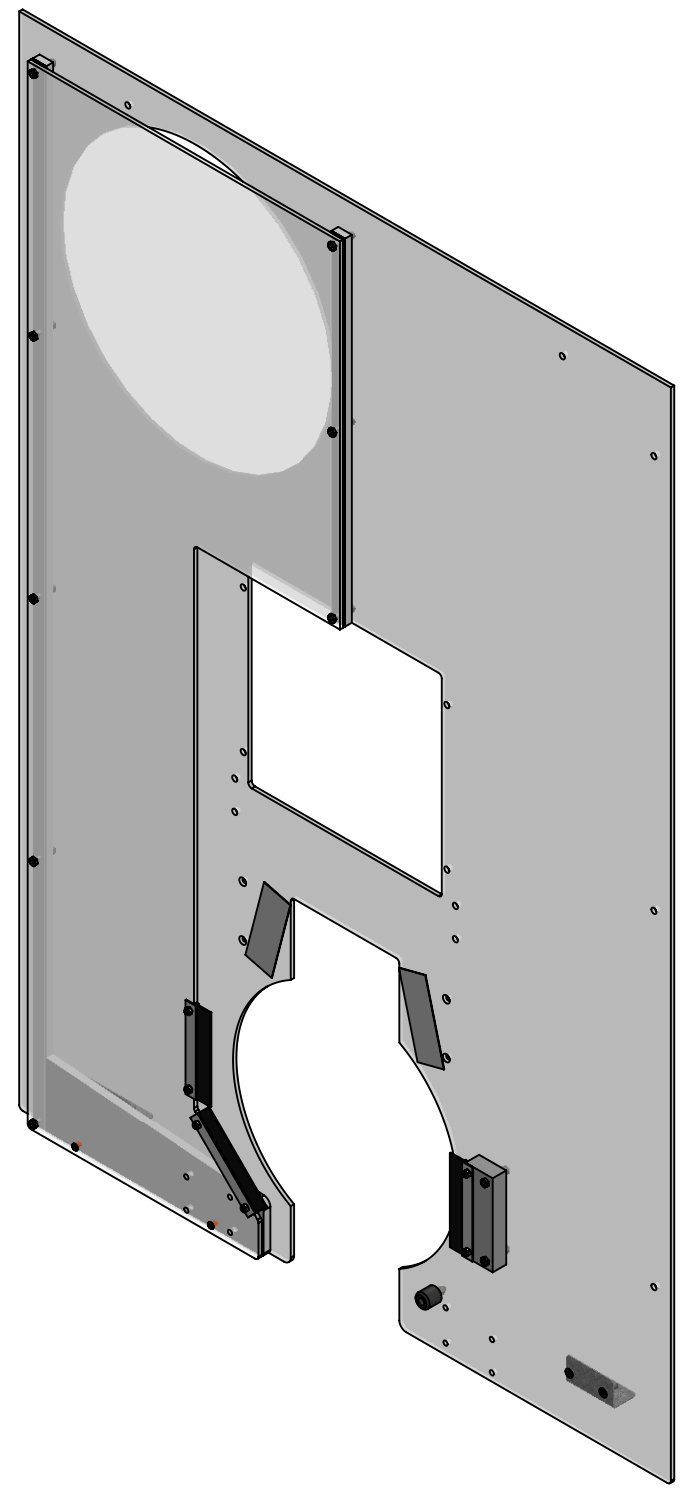
4

3

2

1

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
A3, B3, 2-A3, 2-A4, 2-B3	A	GE-19251, GE-19252, GE-19253 added to assembly. Hardware used to mount GE-19138 changed. Updated models of GE-19131, GE-19133, GE-19138 included.	2/19/2019	CPO



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-19131	Loading Station Panel, Right	1
2	GE-19133	Slot Cover, Right	1
3	GE-19134	Slot Guide, Large	1
4	GE-19135	Slot Guide, Small	1
5	GE-19138	Slot Guide, Angled	1
6	GE-19139	Slot Stop	1
7	GE-19140	Bumper, Rubber	1
8	GE-19142	Angle, Support	2
9	GE-19190	6" brush	3
10	GE-19251	Slot Guide Spacer, Large	1
11	GE-19252	Slot Guide Spacer, Small	1
12	GE-19253	Silicone Bolt Cap	2
13	VisionTape	2" x 5.5" Retroreflective tape	2
14	button_hex_.25_20_1.25	Button Head, Hex, 1/4-20 x 1.25	1
15	flat_hex_.25_20_1	Steel Hex Flat Head Screw, 1/4"-20 x 1" long, fully threaded	4
16	flat_hex_10_32_1.375	Flat Head, Hex, 10-32 x 1.375"	2
17	flat_hex_10_32_.625	Flat Head, Hex, 10-32 x .625"	4
18	hex_.25_20_1.5	Steel Hex Head Screw, 1/4"-20 x 1-1/2" long, fully threaded	10
19	nylock_.25_20	Steel Nylon-Insert Locknut, 1/4"-20	15
20	nylock_10_32	Low-Strength Steel Nylon-Insert Locknut, Zinc-Plated, 10-32 Thread Size	8
21	round_hex_flange_10_32_1.5_partial	Flanged, Round Hex Head, #10-32 x 1-1/2" long, fully threaded	2

A

A

B

B

A

A

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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		
APPLICATION			
DO NOT SCALE DRAWING			



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

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

SCALE: 1:10 WEIGHT: SHEET 1 OF 2

4

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2

1

4

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2

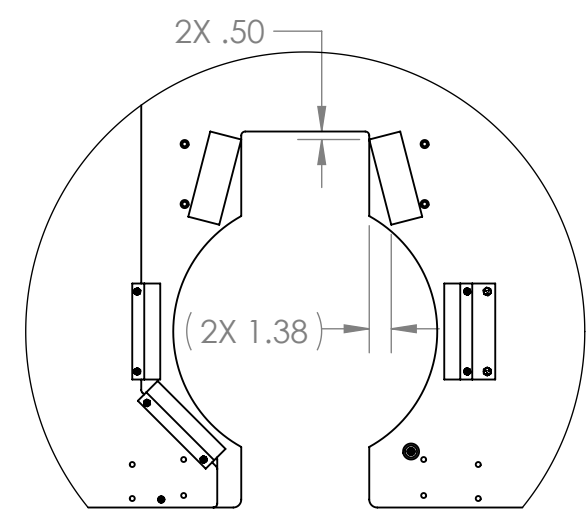
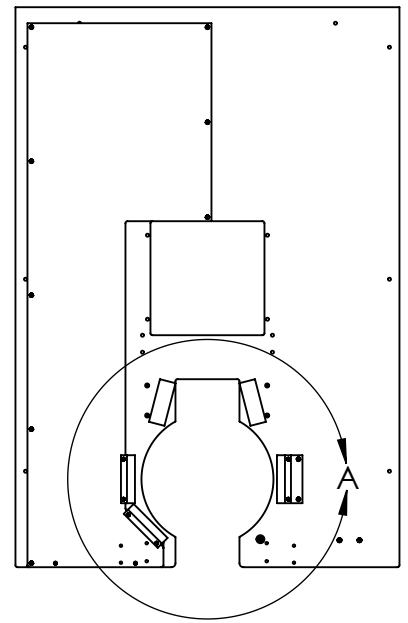
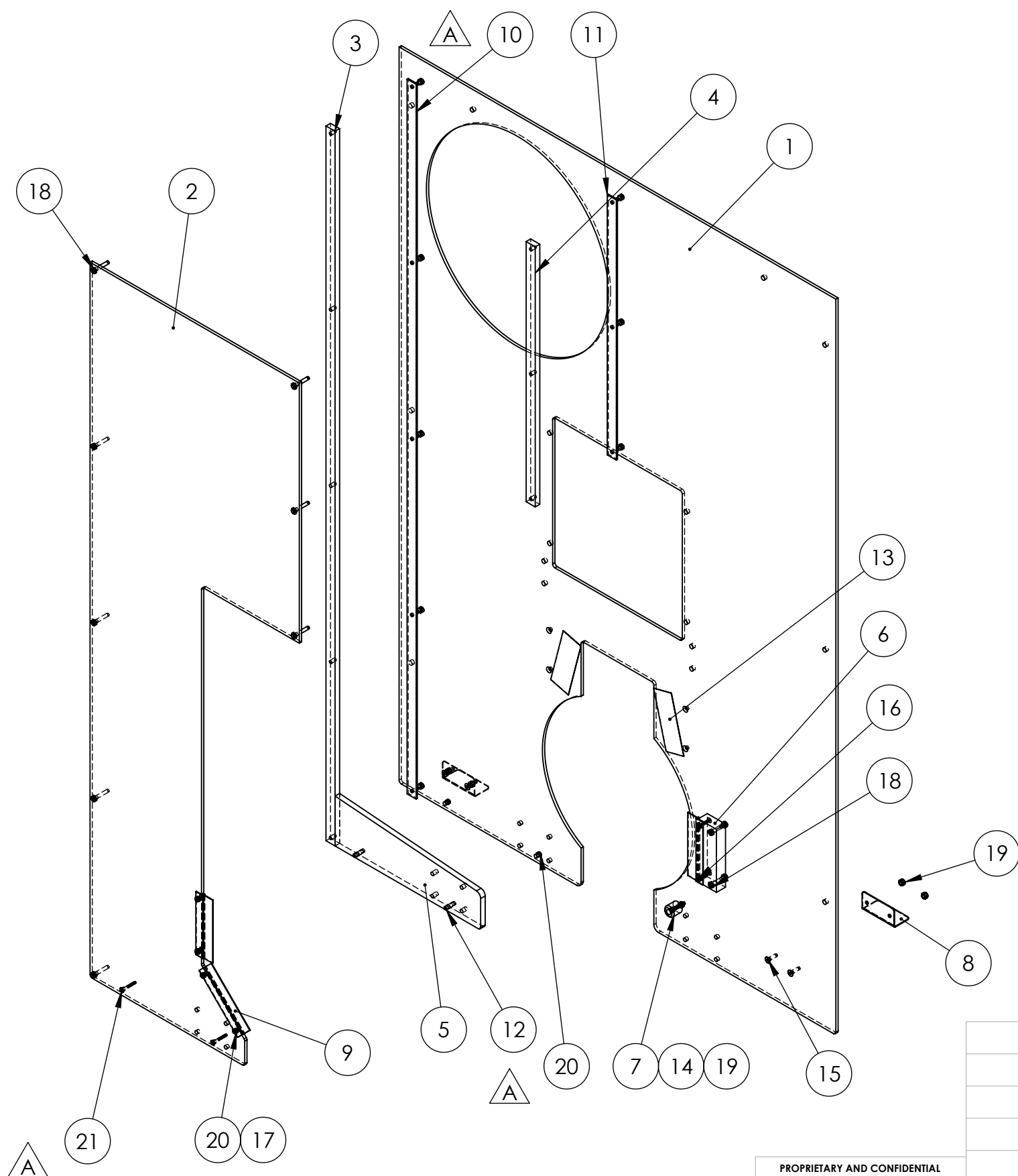
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		ANGULAR: MACH ±1° BEND ±1°	MFG APPR.	
		TWO PLACE DECIMAL ±.01	Q.A.	
		THREE PLACE DECIMAL ±.001	COMMENTS:	
		INTERPRET GEOMETRIC TOLERANCING PER:		
		MATERIAL		
		FINISH		
NEXT ASSY	USED ON			
APPLICATION	DO NOT SCALE DRAWING			

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

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

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

SCALE: 1:10 WEIGHT: SHEET 2 OF 2

4

3

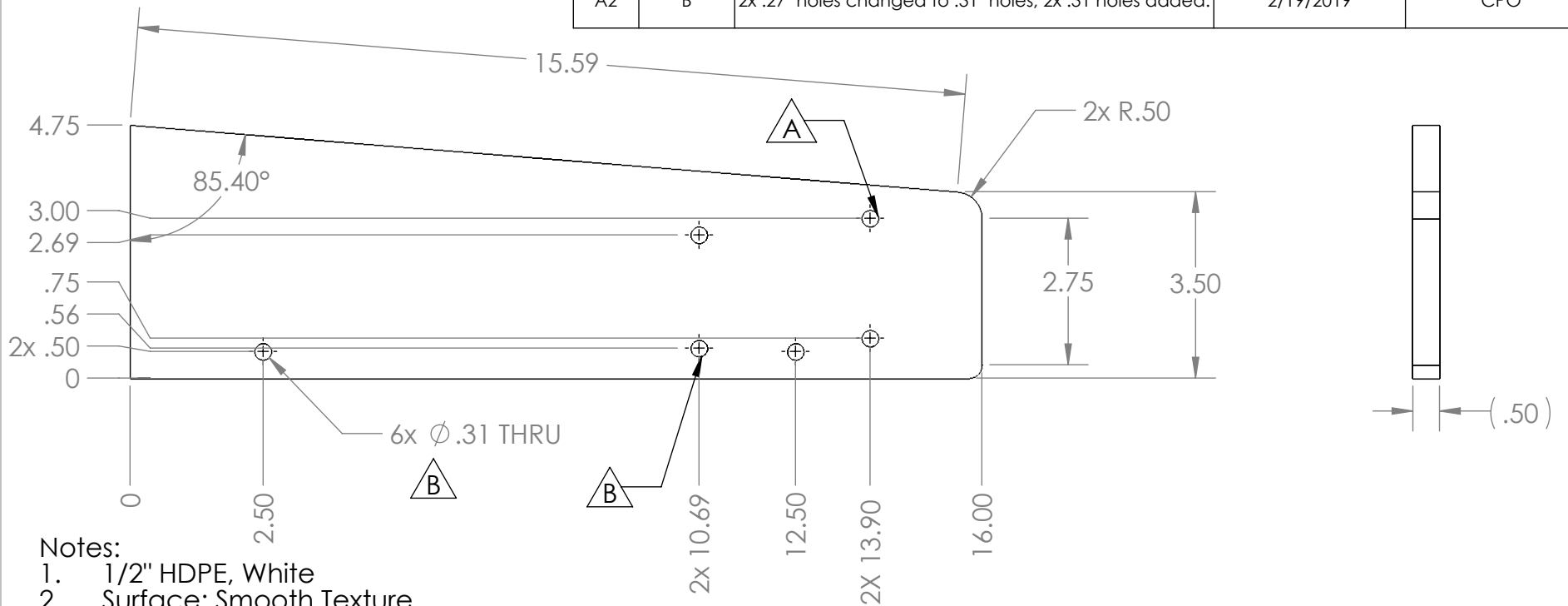
2

1

2

1

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
B2	A	2X .31 Holes Added	10/16/2018	MXS
A2	B	2x .27" holes changed to .31" holes, 2x .31 holes added.	2/19/2019	CPO



Notes:

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

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



TITLE: <b>Slot Guide, Angled</b>		
SIZE <b>A</b>	DWG. NO. <b>GE-19138</b>	REV <b>B</b>
SCALE: 1:3	WEIGHT:	SHEET 1 OF 1

2

1

4

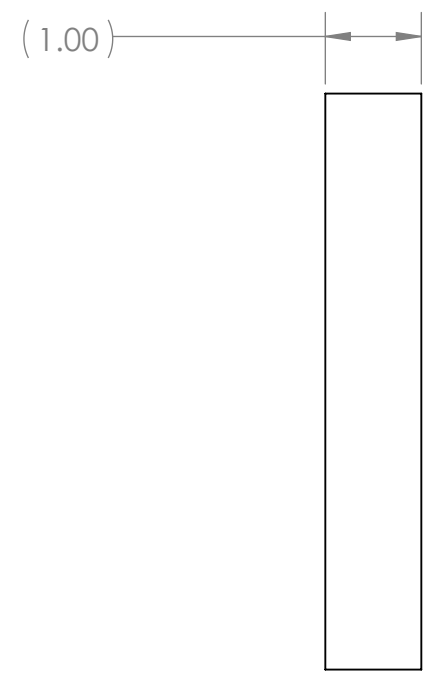
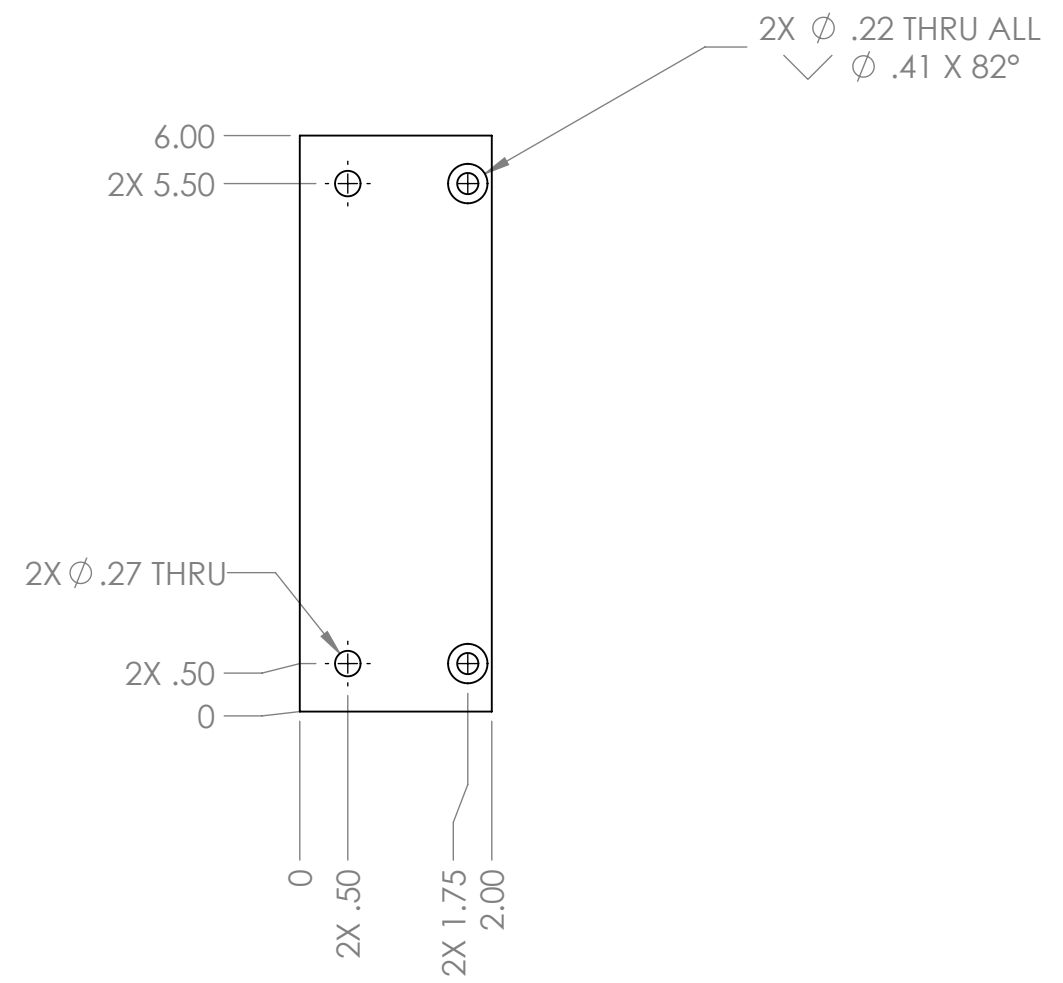
3

2

1



B

B



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

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		UNLESS OTHERWISE SPECIFIED:	NAME	DATE	 
		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$	DRAWN		
		INTERPRET GEOMETRIC TOLERANCING PER:	CHECKED		SIZE DWG. NO. REV <b>B</b> <b>GE-19139</b>
		MATERIAL	ENG APPR.		
NEXT ASSY	USED ON	FINISH	MFG APPR.		
APPLICATION		DO NOT SCALE DRAWING	Q.A.		
			COMMENTS:		

4

3

2

1

A

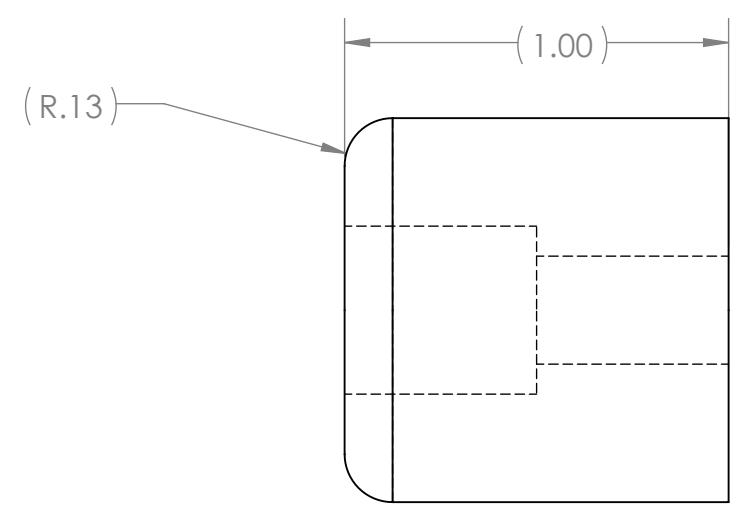
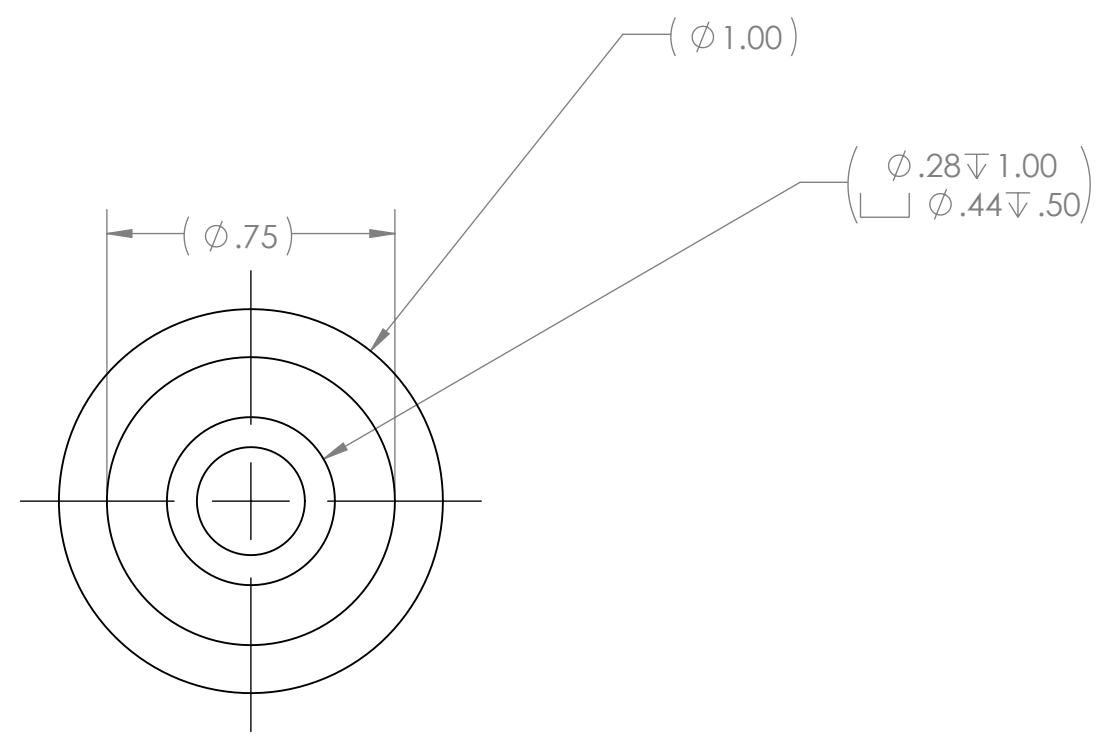
A

4

3



2

1



Note:  
 1" Rubber Bumper with Unthreaded Hole  
 Source: McMaster-Carr  
 Item #: 9540K953  
 Equivalent substitutions allowed

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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		
		INTERPRET GEOMETRIC TOLERANCING PER:	CHECKED		SIZE DWG. NO. REV <b>B GE-19140</b>
		MATERIAL	ENG APPR.		
NEXT ASSY	USED ON	FINISH	MFG APPR.		SCALE: 2:1 WEIGHT: SHEET 1 OF 1
APPLICATION		DO NOT SCALE DRAWING	Q.A.	COMMENTS:	

4

3

2

1

B

B

A

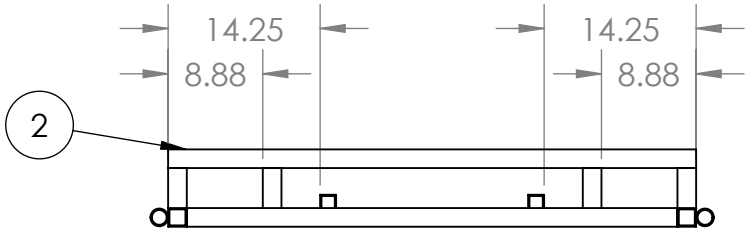
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4

3

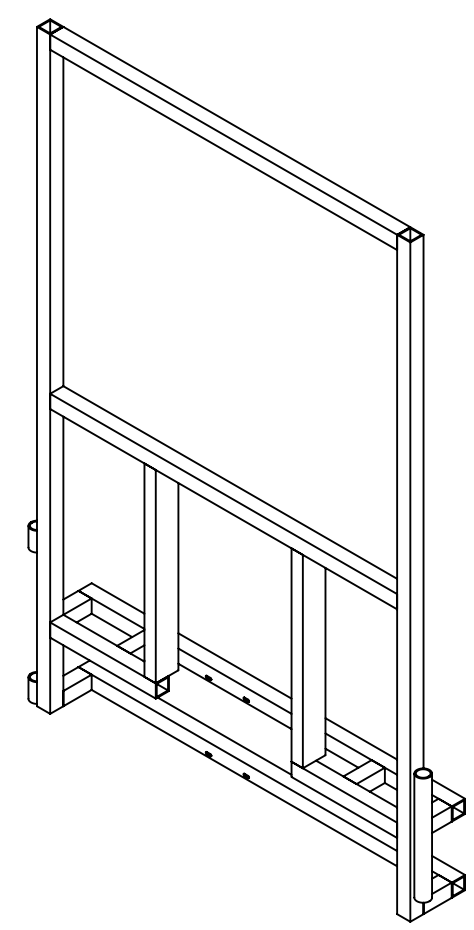
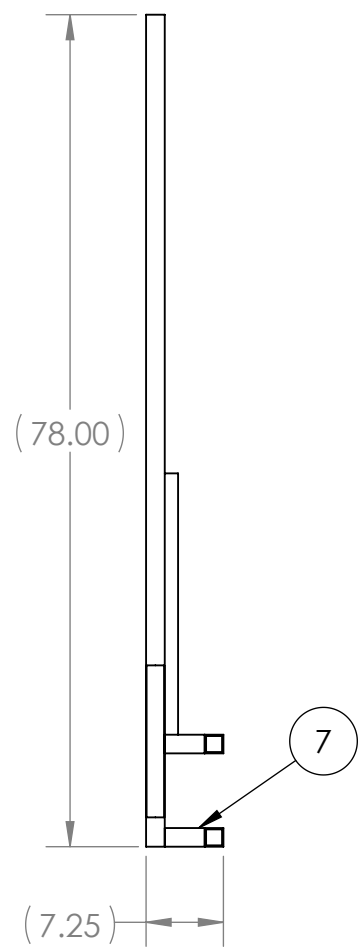
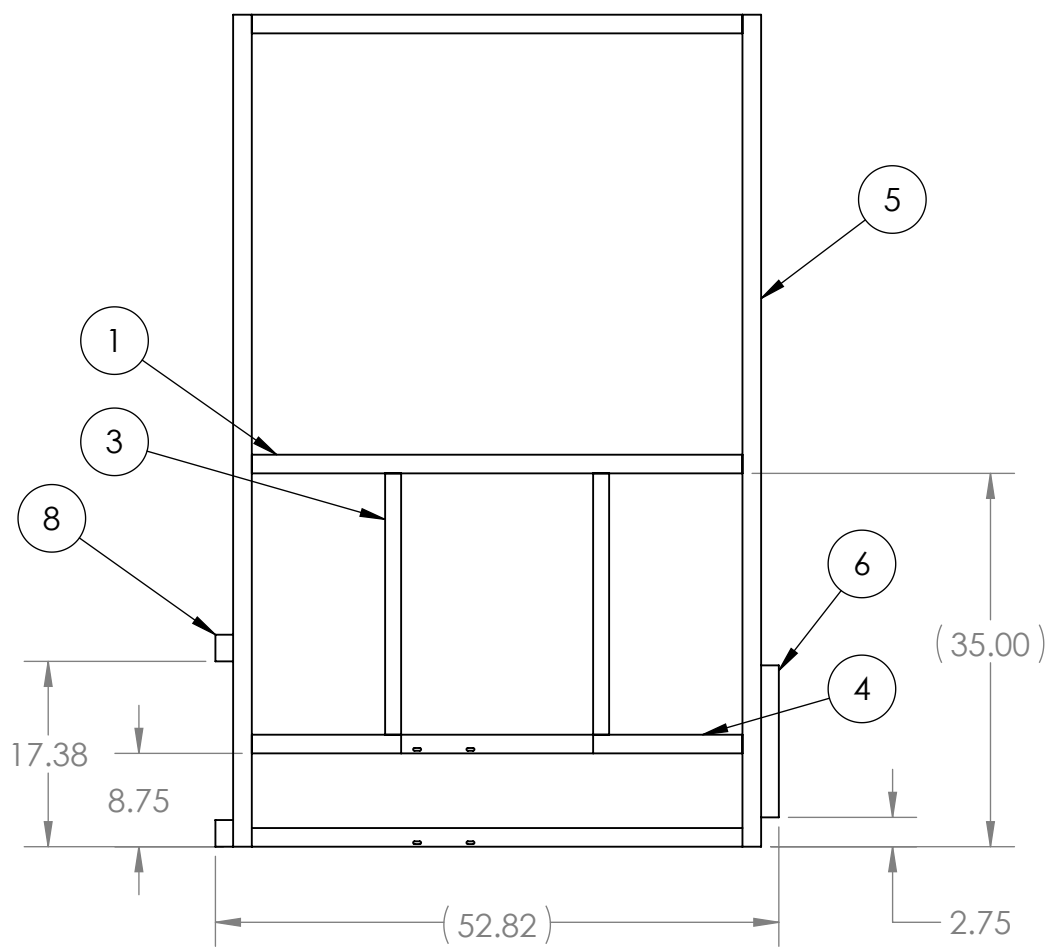
2

1



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

B



B

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

- Notes:
- Remove all burrs and sharp edges.
  - Tag or label with part number.

B

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



TITLE:  
**Loading Station Frame, Right**

SIZE **B** DWG. NO. **GE-19141** REV **B**

SCALE: 1:18 WEIGHT: SHEET 1 OF 4

4

3

2

1

A

A

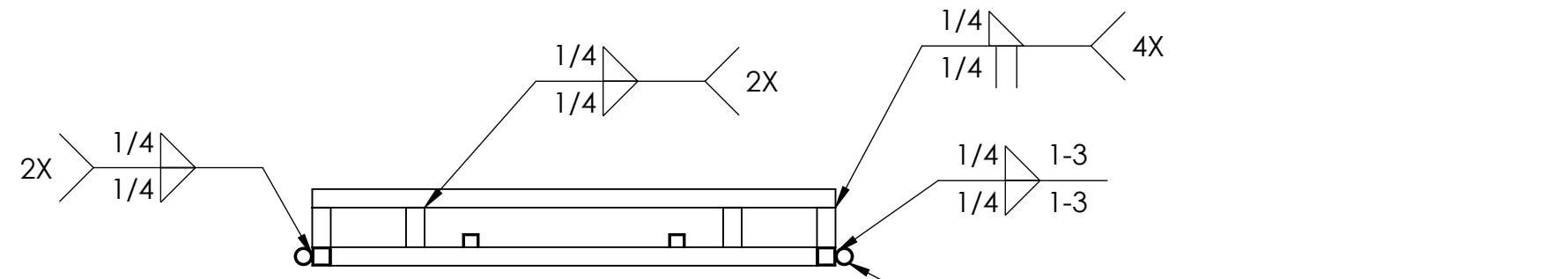


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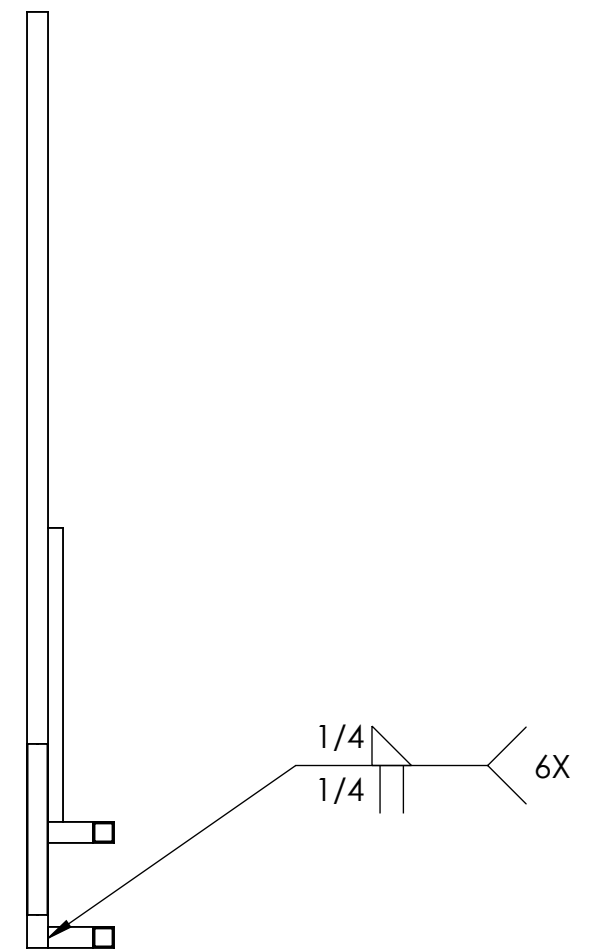
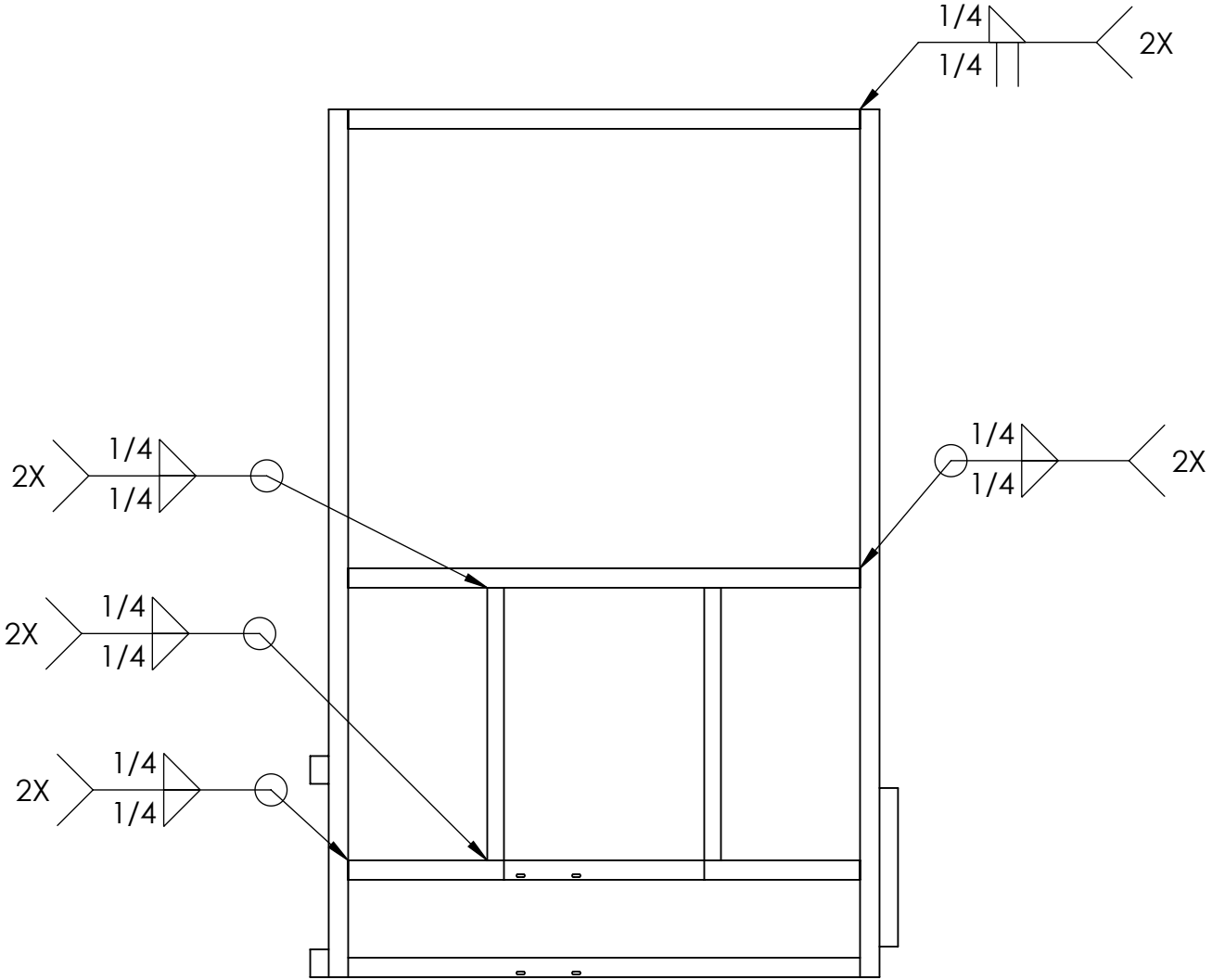
3

2

1



No weld permissible on inside of tubes. 3X



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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			
FINISH			
NEXT ASSY	USED ON		
APPLICATION			
DO NOT SCALE DRAWING			



TITLE:  
**Loading Station Frame, Right**

SIZE **B** DWG. NO. **GE-19141** REV **B**

SCALE: 1:16 WEIGHT: SHEET 2 OF 4

4

3

2

1

B

B

A

A

4

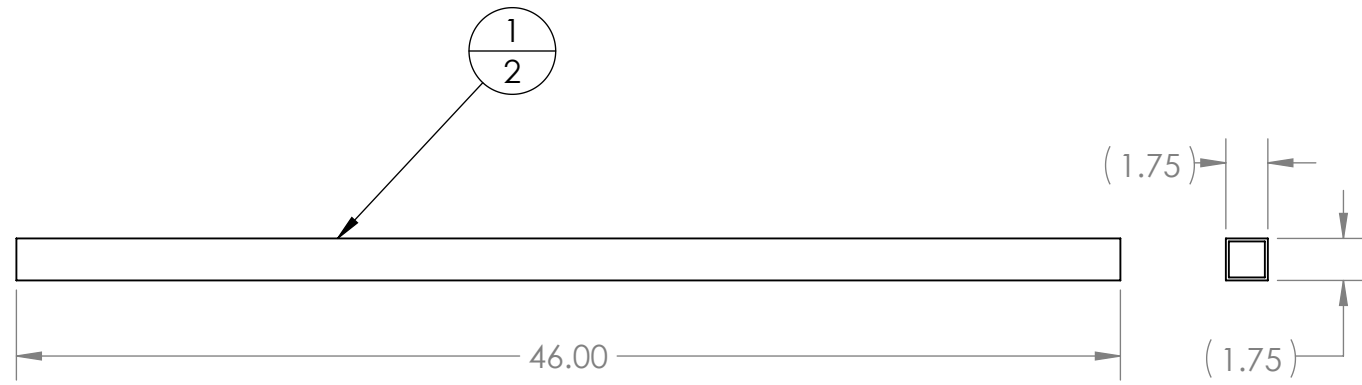
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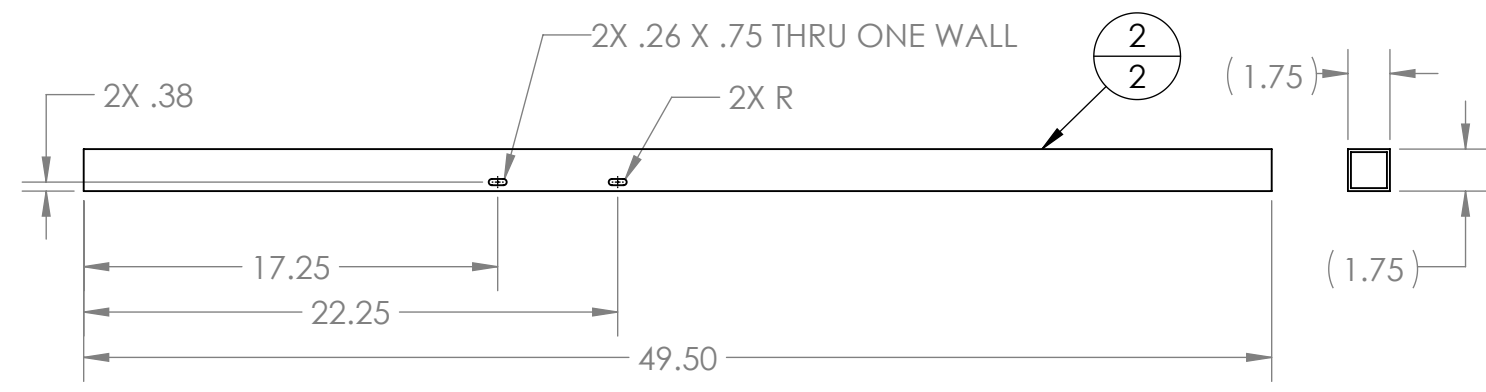
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B

B



Scale: 1:8



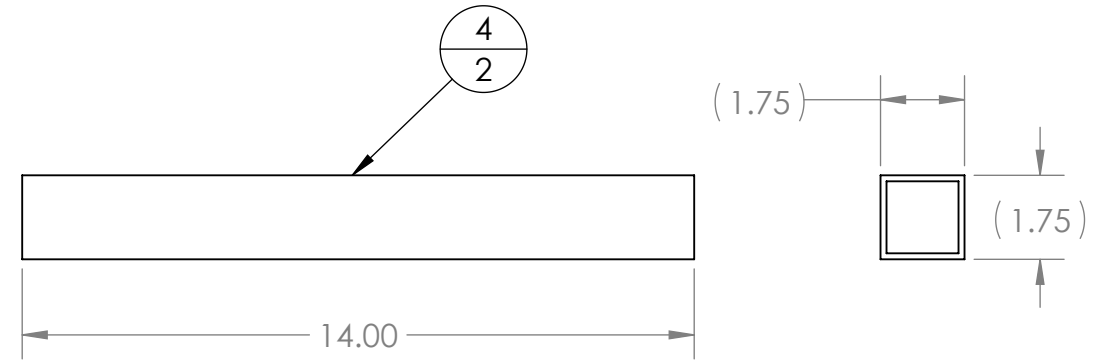
Scale: 1:8

A

A





Scale: 1:4



Scale: 1:4

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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			
		FINISH			
NEXT ASSY	USED ON				
APPLICATION		DO NOT SCALE DRAWING			

TITLE:

## Loading Station Frame, Right

SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19141</b>	<b>B</b>
WEIGHT:		SHEET 3 OF 4

4

3

2

1

4

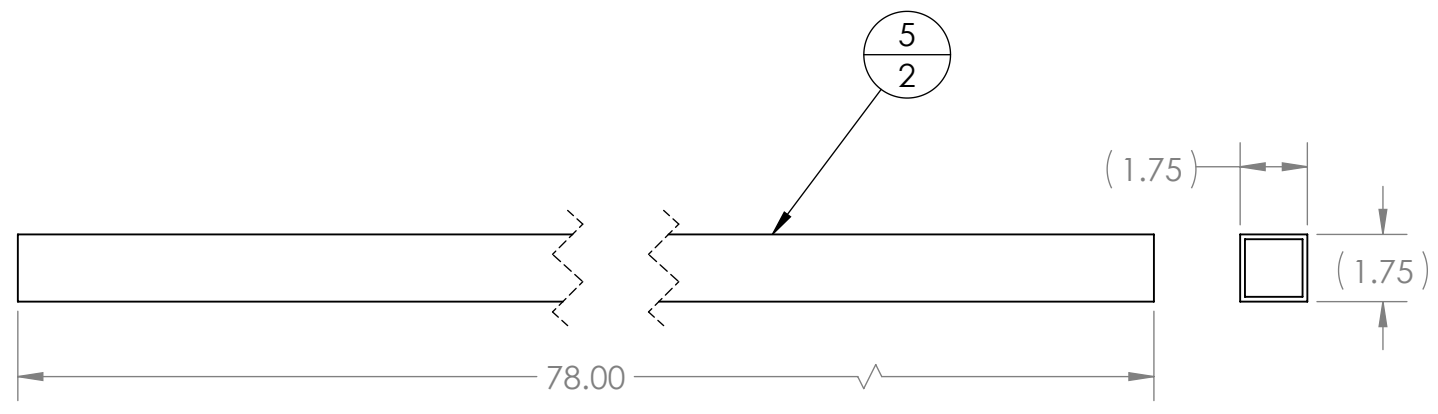
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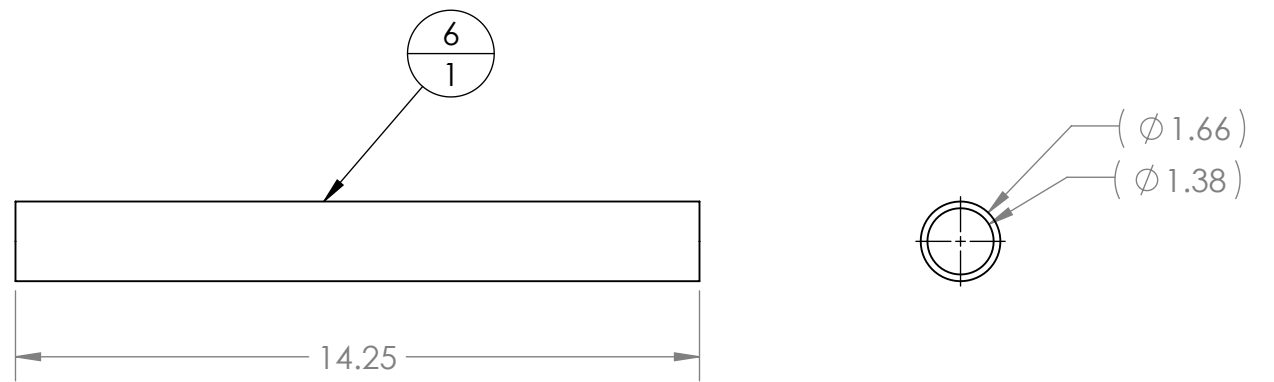
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B

B



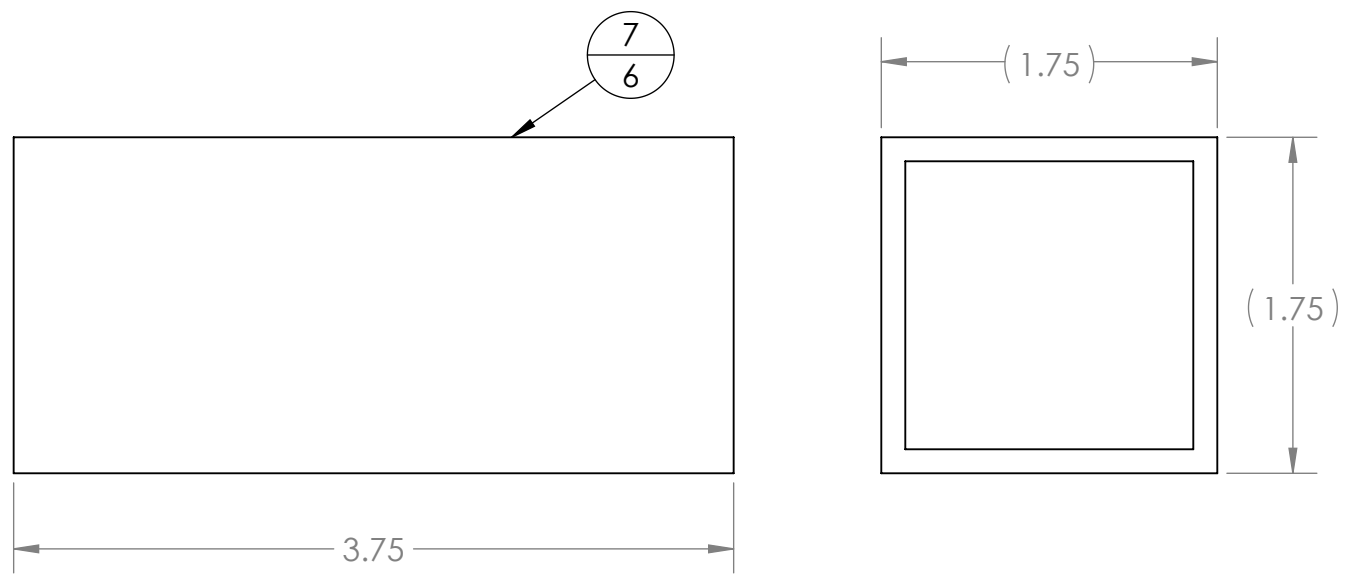
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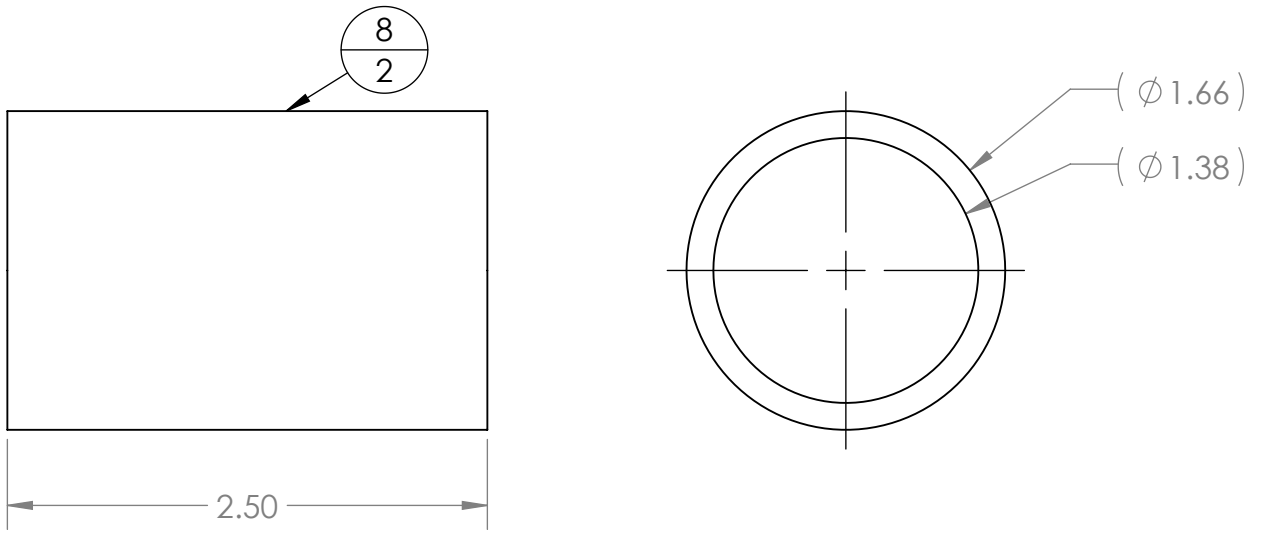
Scale: 1:4

A

A





Scale: 1:1



Scale: 1:1

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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			
		FINISH			
NEXT ASSY	USED ON				
APPLICATION		DO NOT SCALE DRAWING			

TITLE:

## Loading Station Frame, Right

SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19141</b>	<b>B</b>
SCALE: 1:5	WEIGHT:	SHEET 4 OF 4

4

3

2

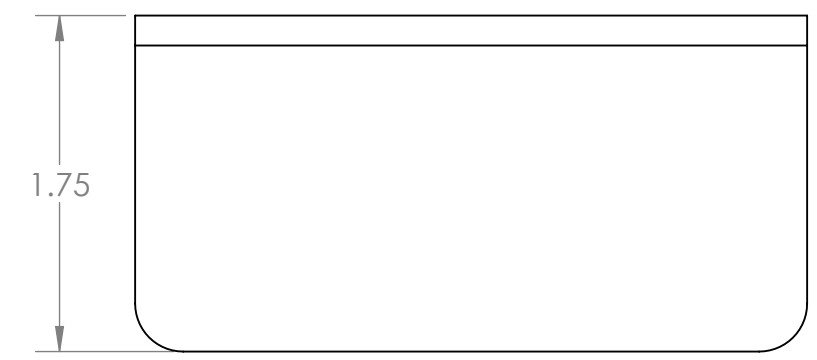
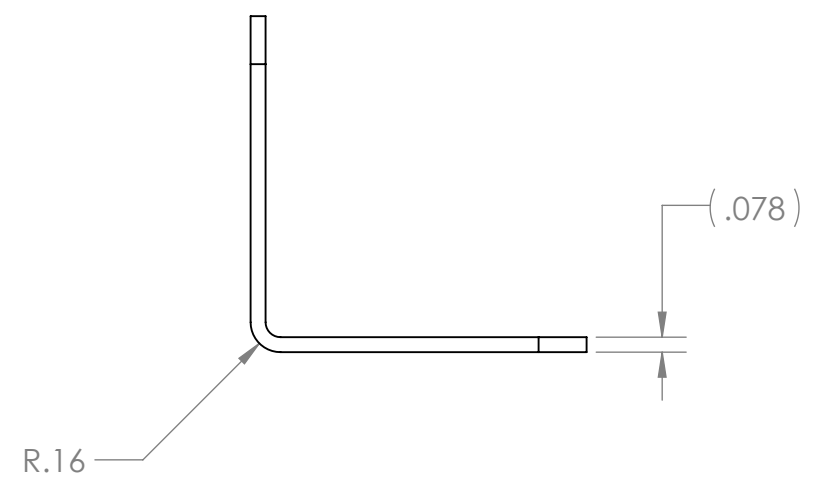
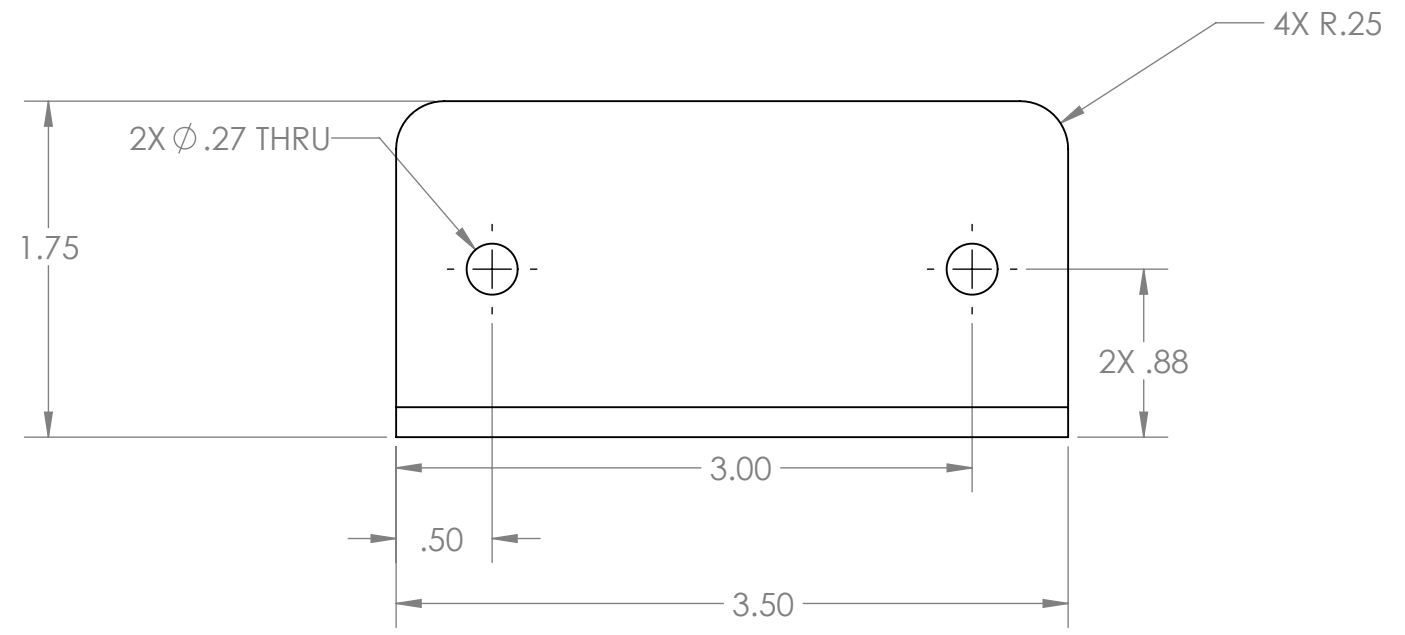
1

4

3



2

1



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

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		UNLESS OTHERWISE SPECIFIED:	NAME	DATE	 
		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$	DRAWN		
		INTERPRET GEOMETRIC TOLERANCING PER:	CHECKED		SIZE DWG. NO. REV <b>B</b> <b>GE-19142</b>
		MATERIAL	ENG APPR.		
NEXT ASSY	USED ON	FINISH	MFG APPR.		
APPLICATION		DO NOT SCALE DRAWING	Q.A.		
			COMMENTS:		

4

3

2

1

B

B

A

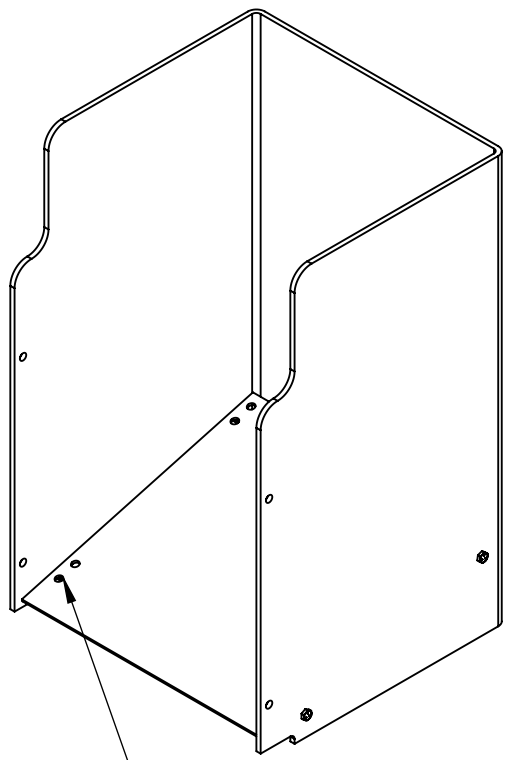
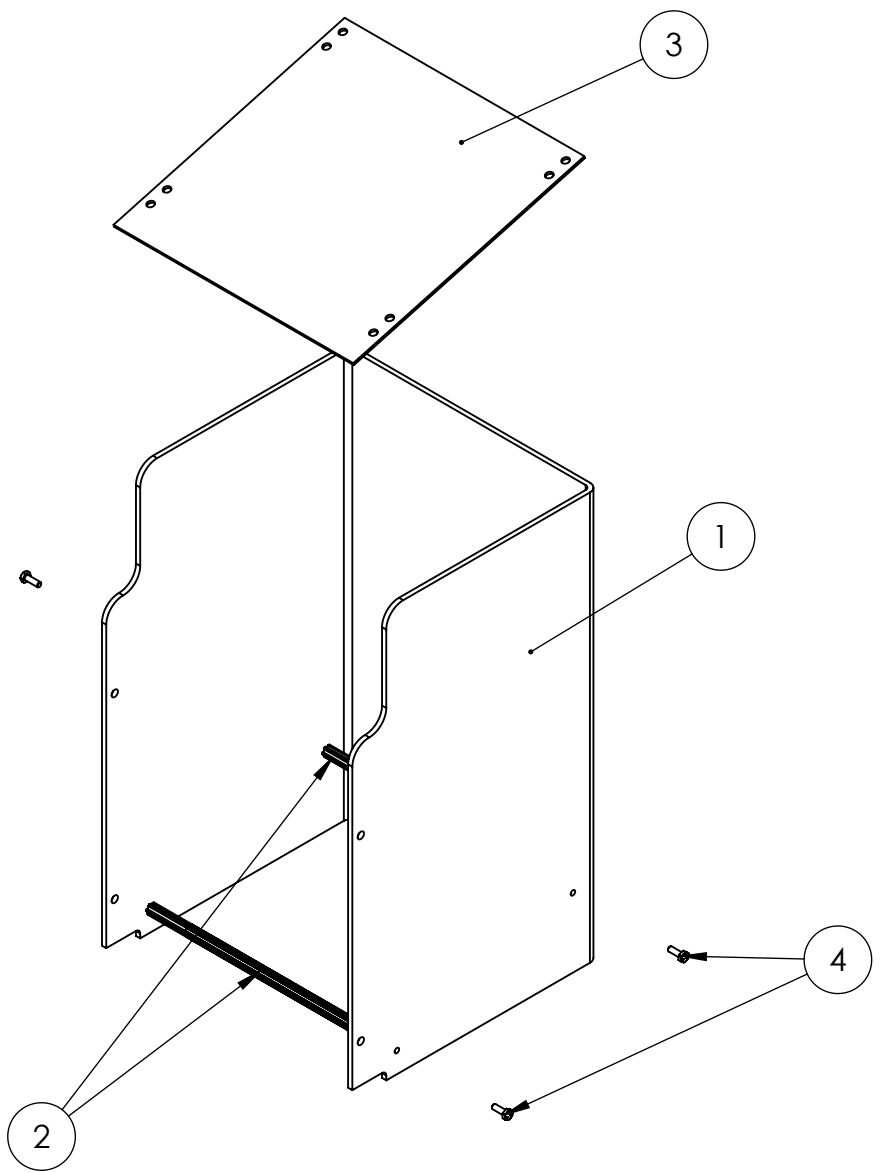
A

4

3

2



1



Cable tie Item (3) into place at four locations.

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

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DIMENSIONS ARE IN INCHES		DRAWN		
TOLERANCES:		CHECKED		
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	  <b>TITLE:</b> Chute Assembly		
FINISH				
APPLICATION	DO NOT SCALE DRAWING			
NEXT ASSY	USED ON	SIZE	DWG. NO.	REV
		<b>B</b>	<b>GE-19143</b>	
		SCALE: 1:8	WEIGHT:	SHEET 1 OF 1

4

3

2

1

B

B

A

A

4

3

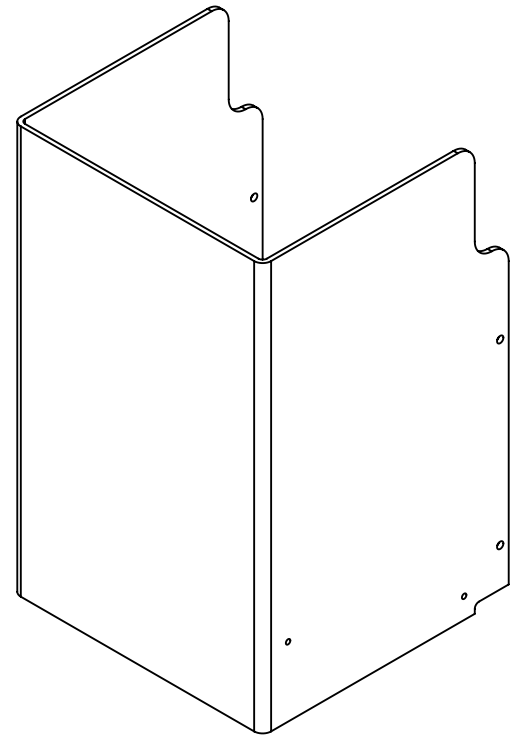
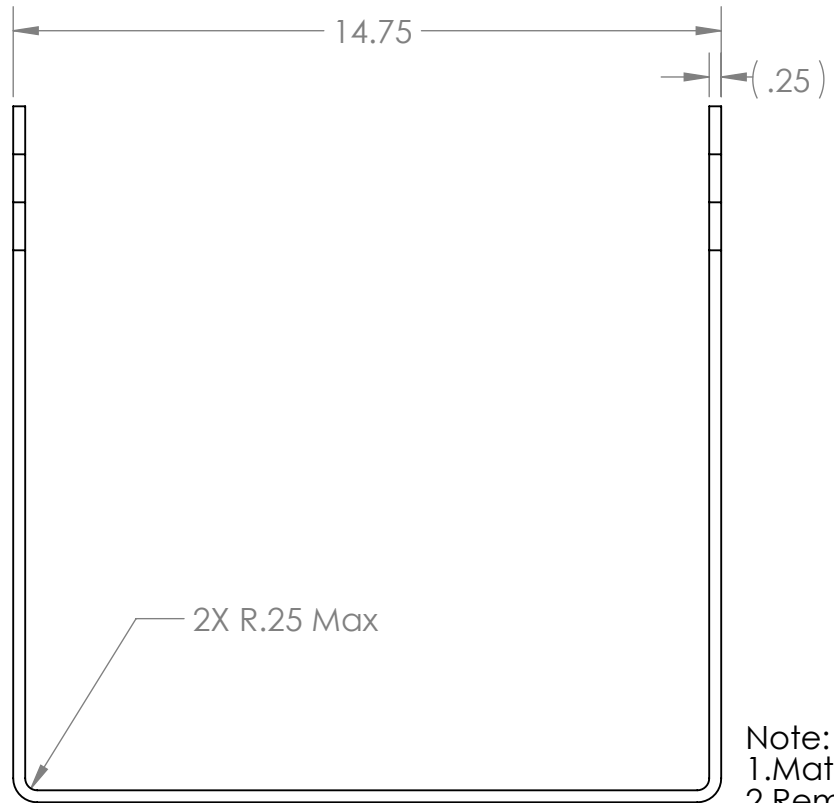
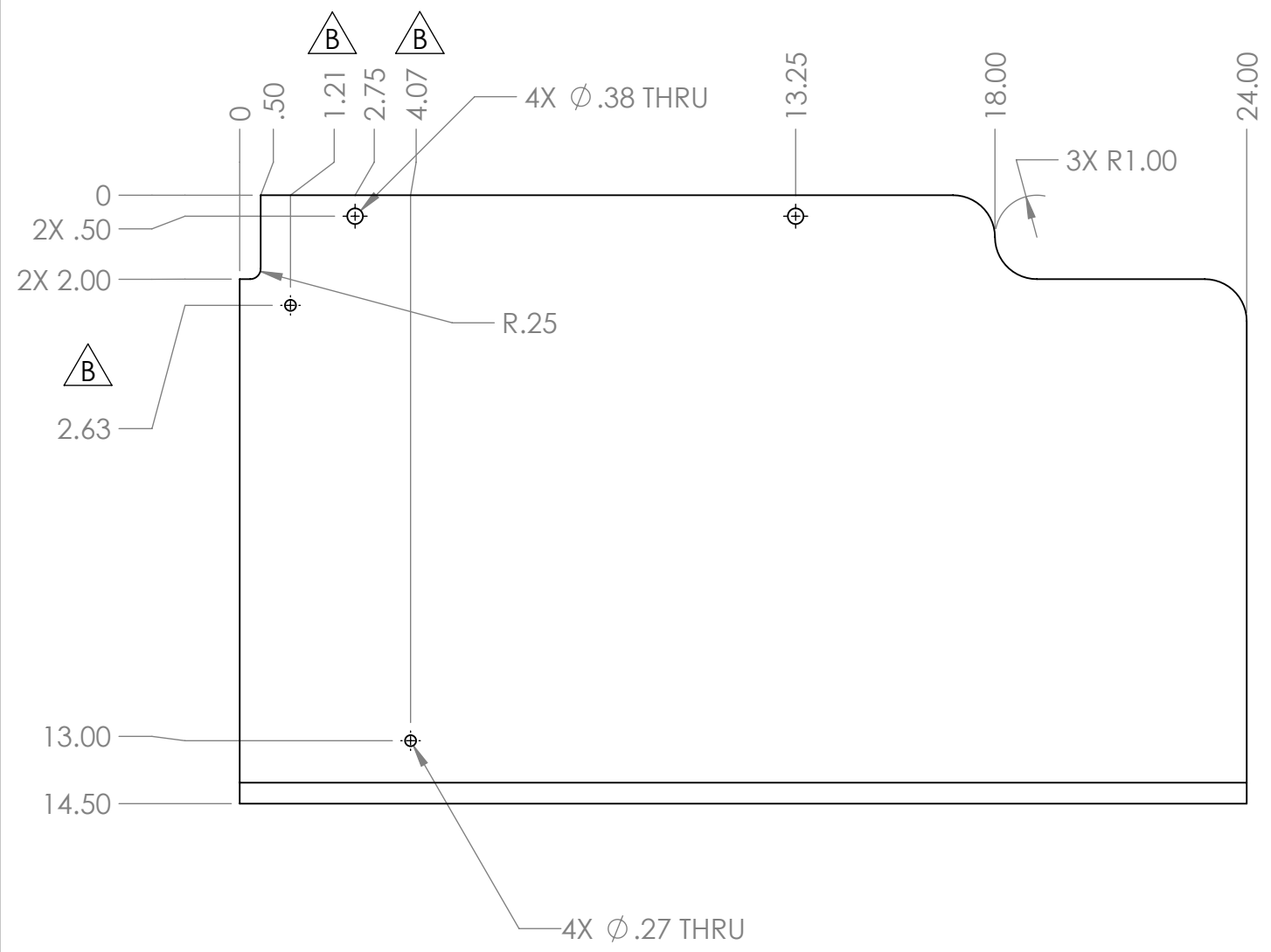
2

1

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

B

B



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

A

A

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

TITLE: Chute		
SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19144</b>	<b>B</b>
SCALE: 1:4		WEIGHT:
		SHEET 1 OF 1

4

3

2

1

4

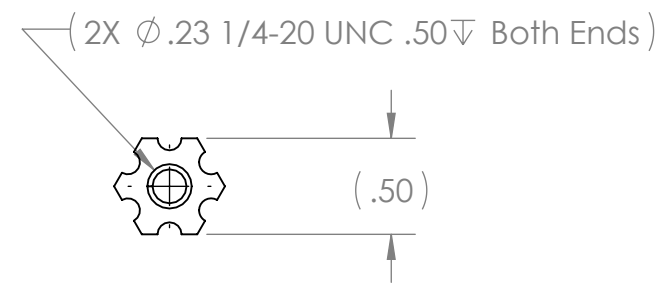
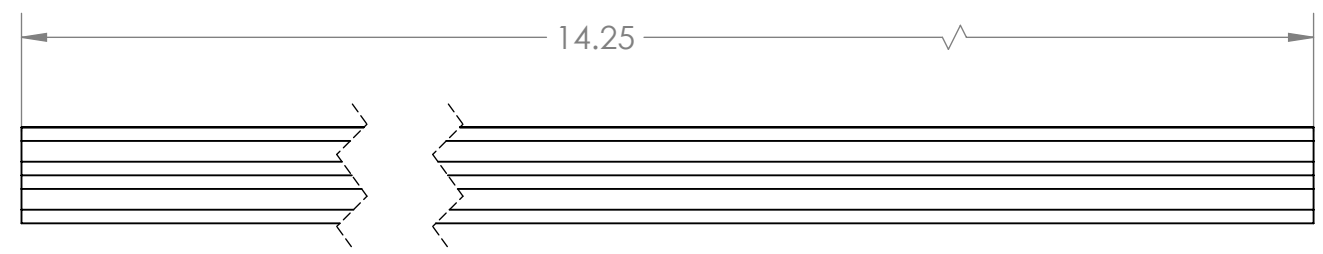
3

2

1

B

B





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

A

A

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		UNLESS OTHERWISE SPECIFIED:		NAME	DATE	 	
		DIMENSIONS ARE IN INCHES	DRAWN			TITLE:	
		TOLERANCES:	CHECKED			Churro	
		FRACTIONAL ±1/16	ENG APPR.			SIZE	DWG. NO.
		ANGULAR: MACH ±1° BEND ±1°	MFG APPR.			<b>B</b>	GE-19145
		TWO PLACE DECIMAL ±.01	Q.A.			SCALE: 1:1	WEIGHT:
		THREE PLACE DECIMAL ±.001	COMMENTS:				SHEET 1 OF 1
		INTERPRET GEOMETRIC TOLERANCING PER:					
		MATERIAL					
		FINISH					
NEXT ASSY	USED ON						
APPLICATION		DO NOT SCALE DRAWING					

4

3

2

1

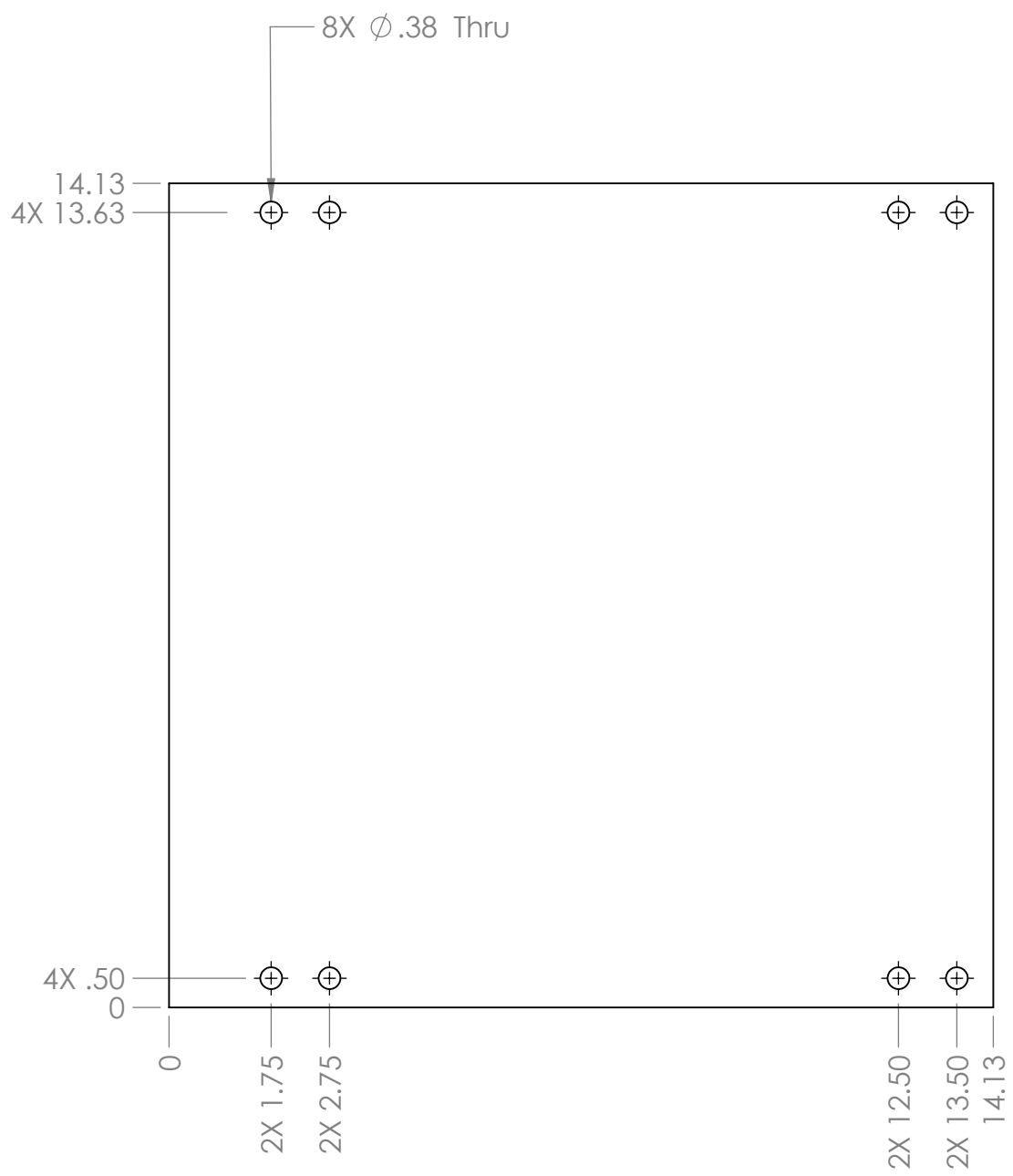
4 3 2 1

B

B



A

A



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

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		UNLESS OTHERWISE SPECIFIED:	NAME	DATE	 
		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$	DRAWN		
		INTERPRET GEOMETRIC TOLERANCING PER:	CHECKED		SIZE <b>B</b> DWG. NO. <b>GE-19146</b> REV SCALE: 1:3 WEIGHT: SHEET 1 OF 1
		MATERIAL	ENG APPR.		
NEXT ASSY	USED ON	FINISH	MFG APPR.		
APPLICATION		DO NOT SCALE DRAWING	Q.A.		
			COMMENTS:		



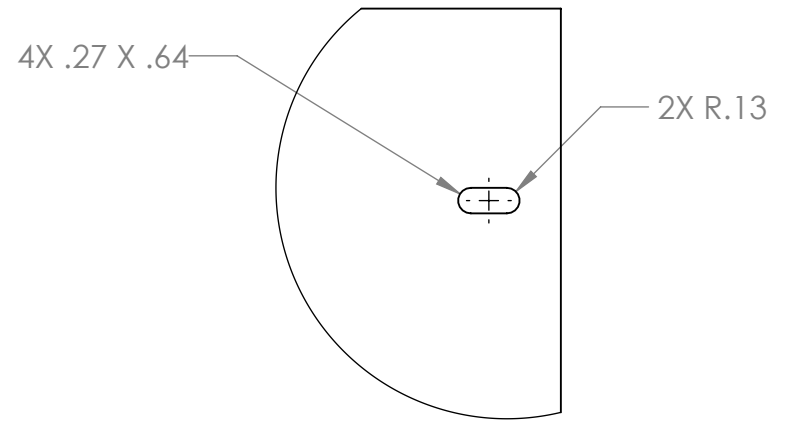
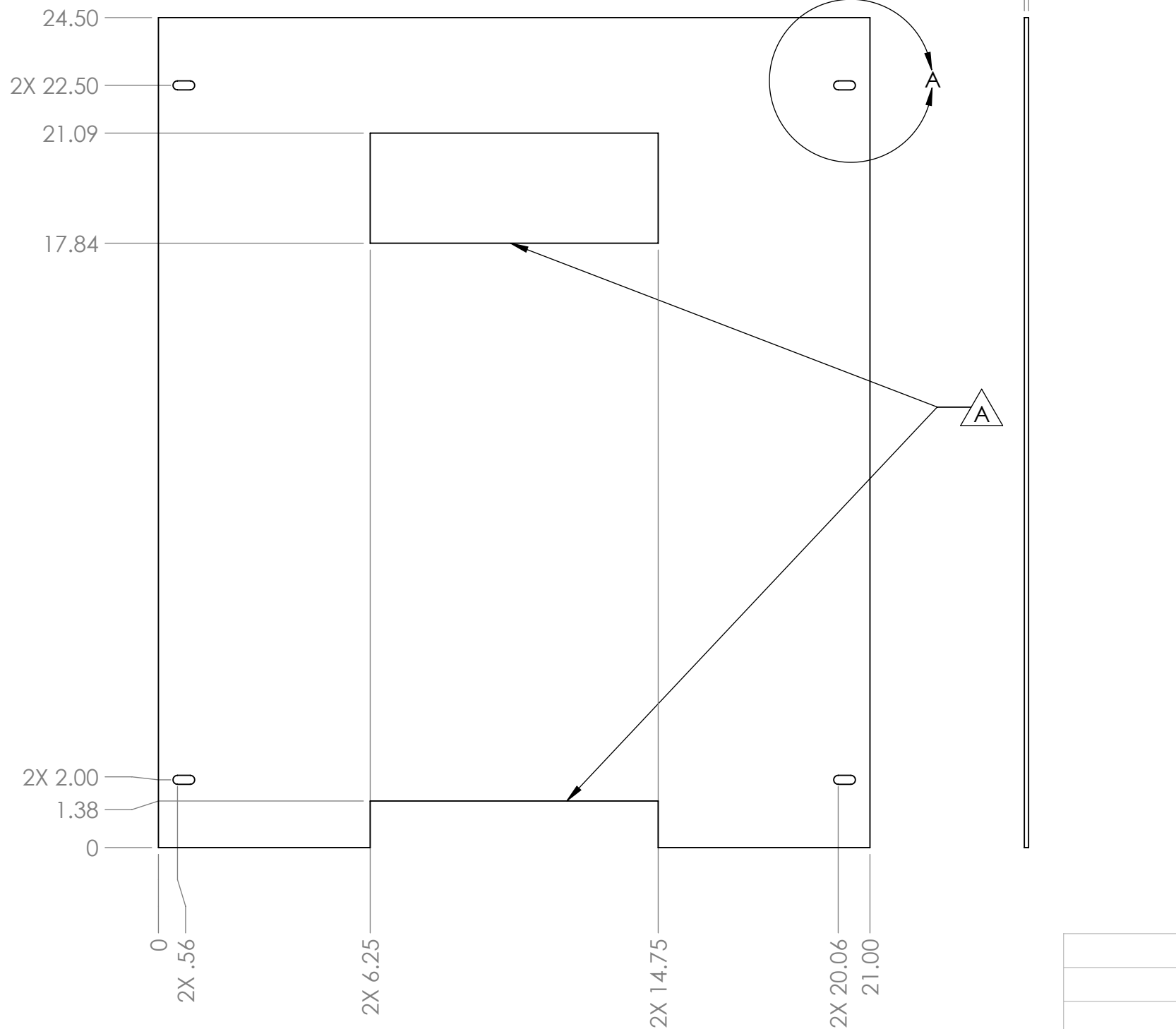
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3

2

1

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



DETAIL A  
SCALE 1 : 2

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

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



TITLE:  
**Keyhole Backing**

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

4

3

2

1

B

B

A

A

4

3

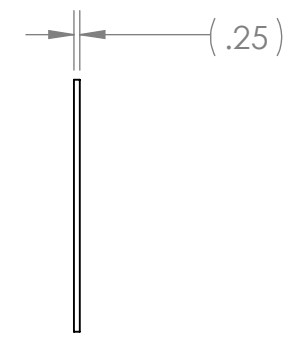
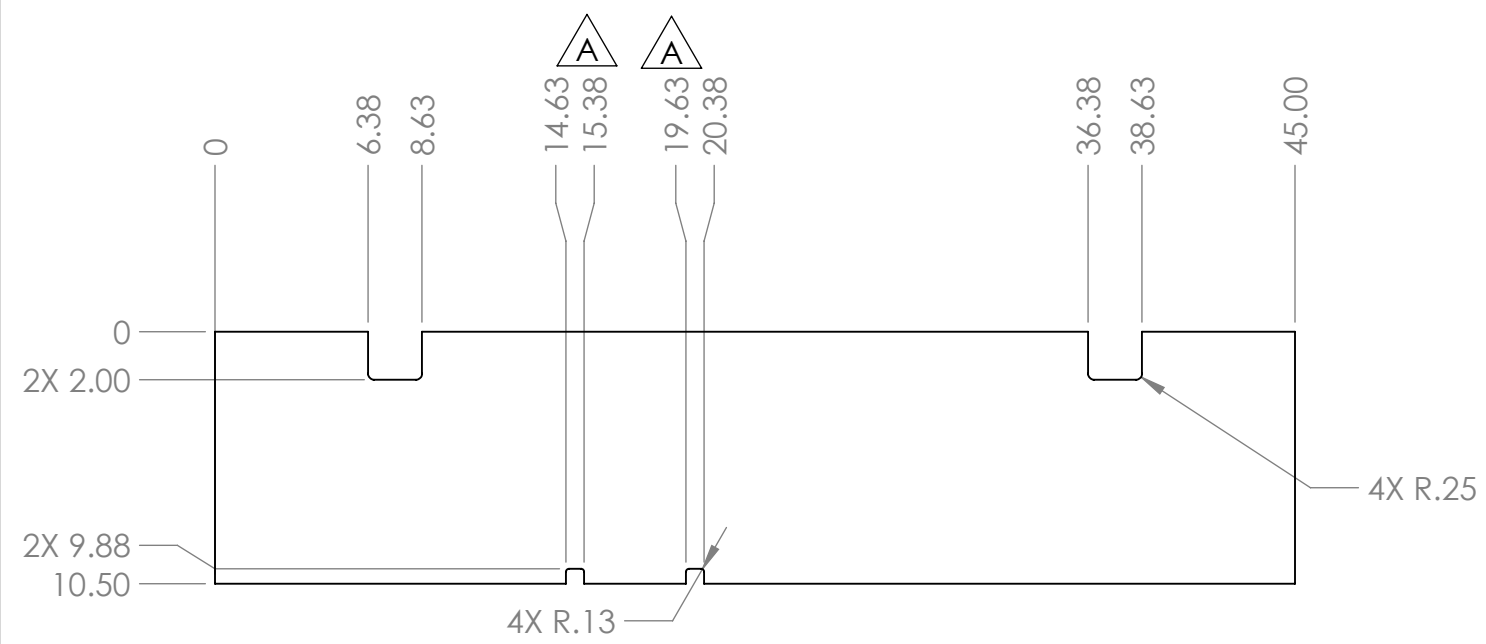
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1

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

B

B



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

A

A

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



TITLE: <b>Bumper Back</b>		
SIZE <b>B</b>	DWG. NO. <b>GE-19148</b>	REV <b>A</b>
SCALE: 1:8	WEIGHT:	SHEET 1 OF 1

4

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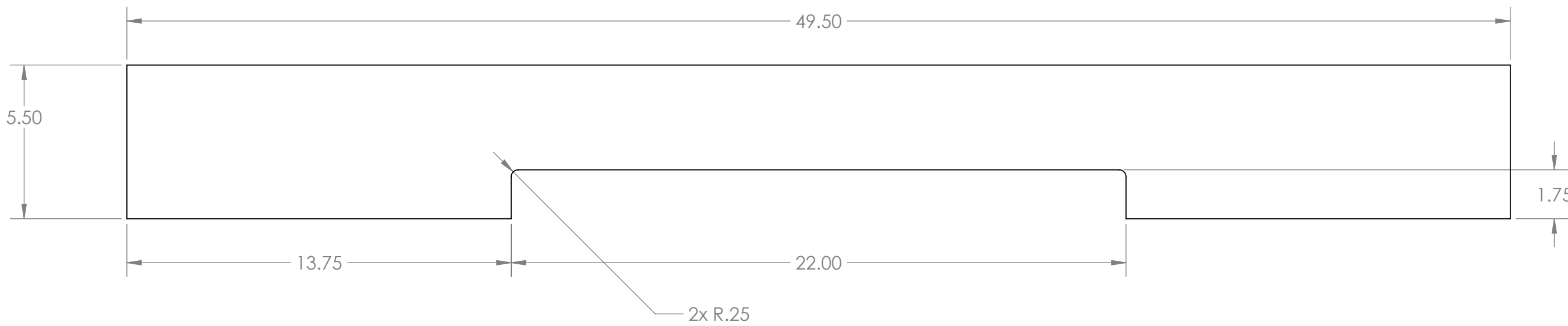
1

4

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1



Notes:

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

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		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	
		INTERPRET GEOMETRIC TOLERANCING PER:		CHECKED	
		MATERIAL		ENG APPR.	
		FINISH		MFG APPR.	
NEXT ASSY	USED ON			Q.A.	
APPLICATION		DO NOT SCALE DRAWING		COMMENTS:	
				TITLE: <b>Bumper Top</b>	
SIZE	DWG. NO.			REV	
<b>B</b>	<b>GE-19149</b>				
SCALE: 1:4		WEIGHT:		SHEET 1 OF 1	



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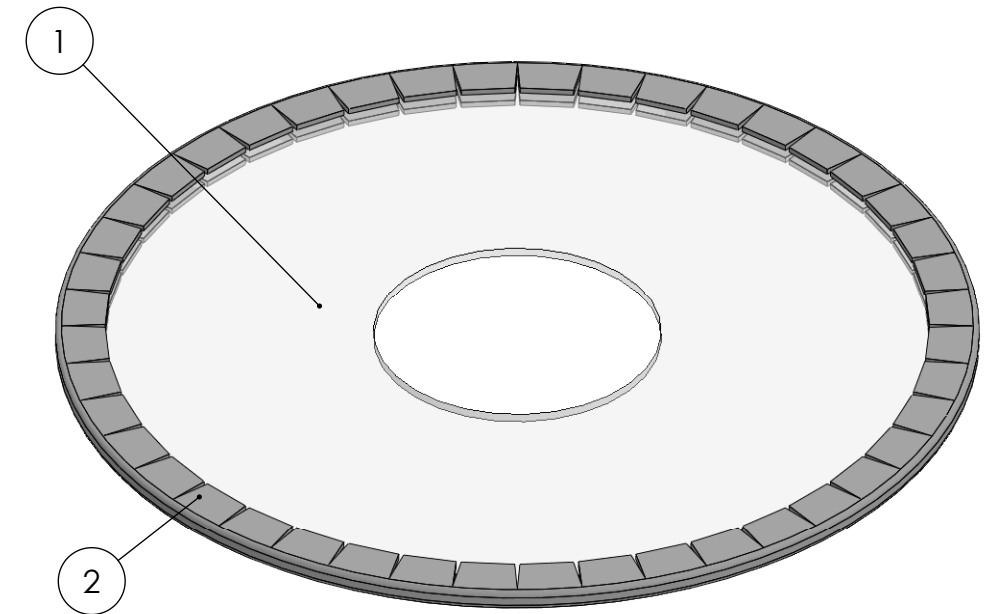
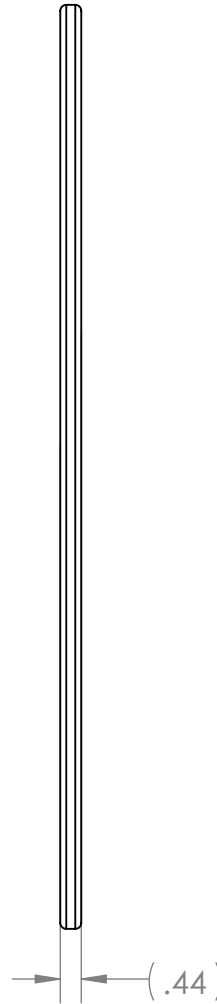
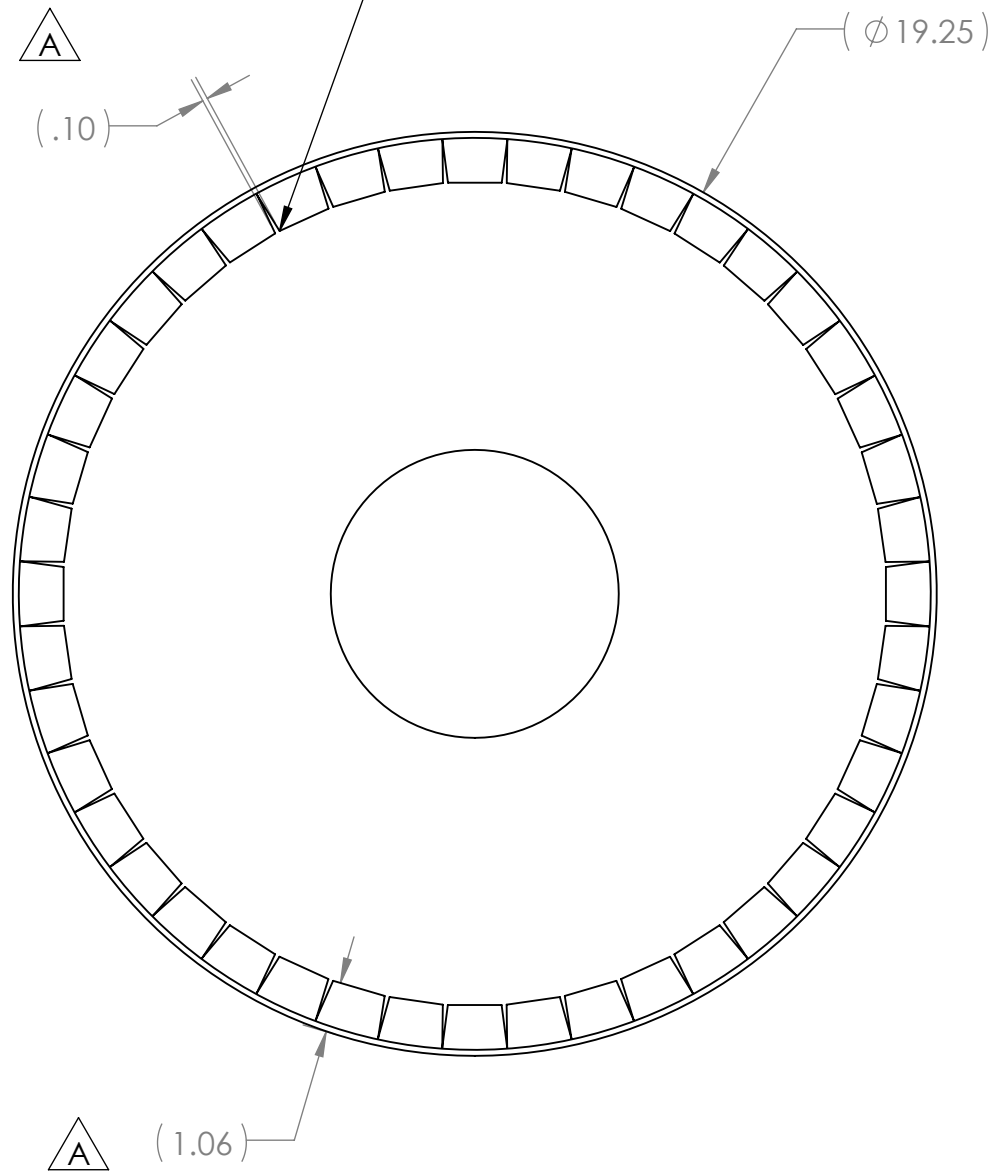
2

1

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
A4, B4	A	Updated per updates made to GE-19153.	1/23/2019	CPO



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



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

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

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UNLESS OTHERWISE SPECIFIED:		NAME	DATE	 
DIMENSIONS ARE IN INCHES		DRAWN	DAF	
TOLERANCES:		CHECKED		TITLE: <h1>Panel Assembly</h1>
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			SIZE <b>B</b> DWG. NO. <b>GE-19150</b> REV <b>A</b>
APPLICATION	DO NOT SCALE DRAWING			SCALE: 1:4 WEIGHT: SHEET 1 OF 1

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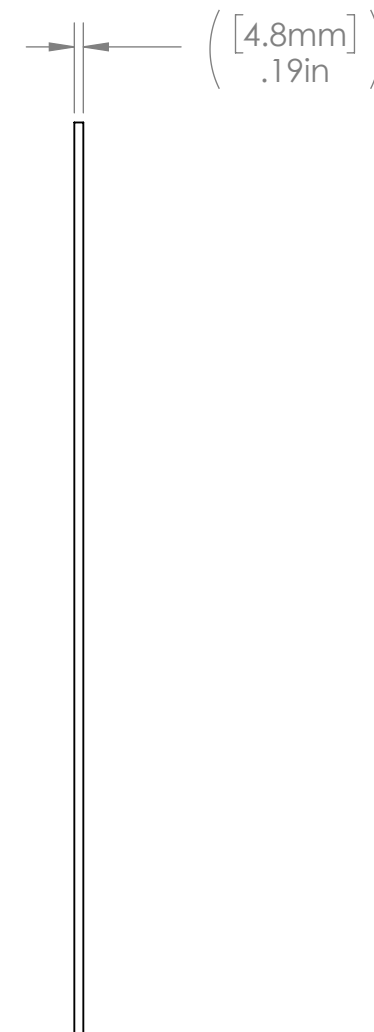
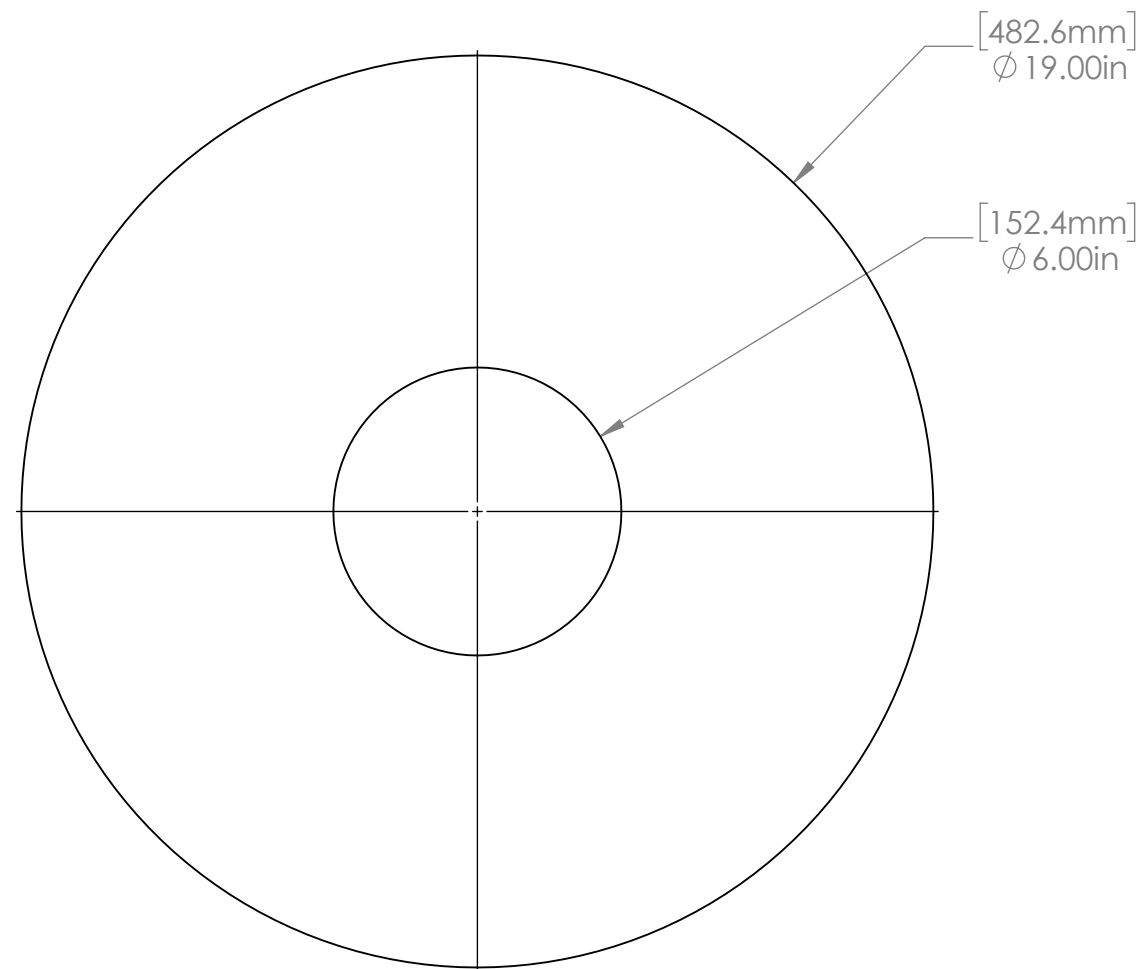
4

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



Note:

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



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		UNLESS OTHERWISE SPECIFIED:	NAME	DATE
		DIMENSIONS ARE IN INCHES	DRAWN	DAF
		TOLERANCES:	CHECKED	8/20/18
		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		



TITLE:		
Panel, Polycarbonate		
SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19151</b>	<b>A</b>
SCALE: 1:4	WEIGHT:	SHEET 1 OF 1

4

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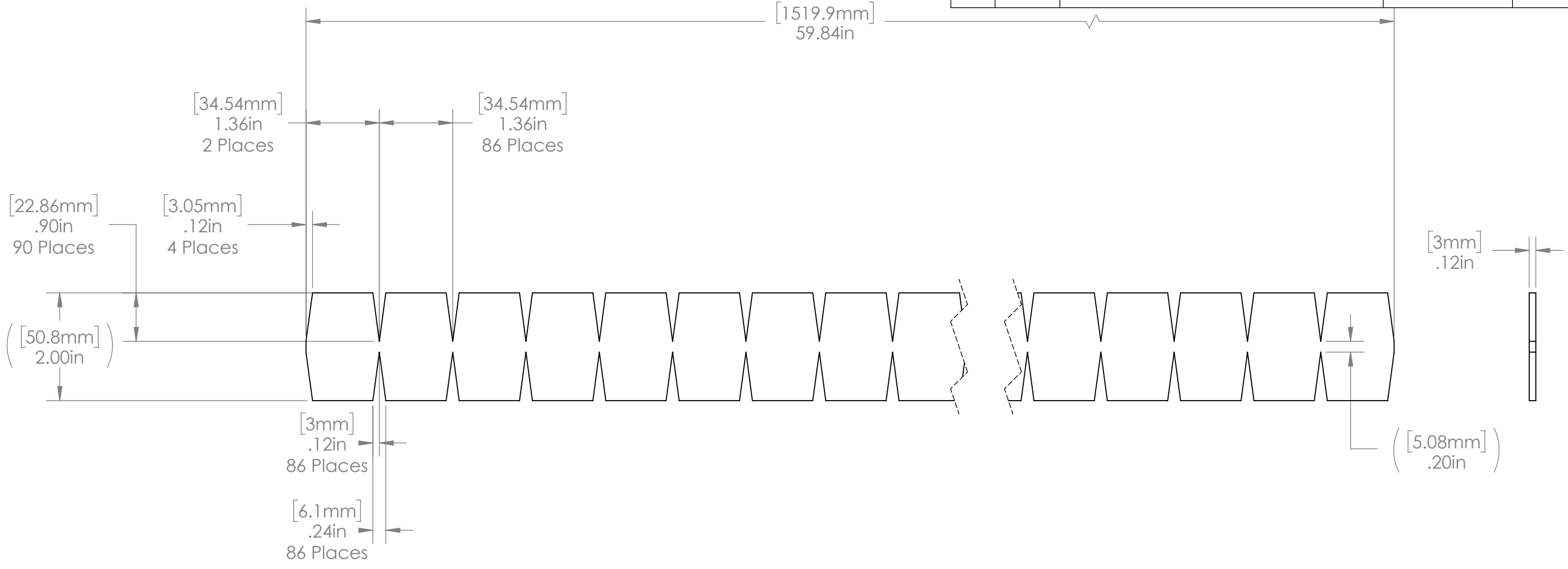
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REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A		8/22/2018	
	B	Updated drawing to match manufactured parts.	1/24/2019	



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

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



TITLE:		
Loop, Panel		
SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19153</b>	<b>B</b>
SCALE: 1:2	WEIGHT:	SHEET 1 OF 1

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B

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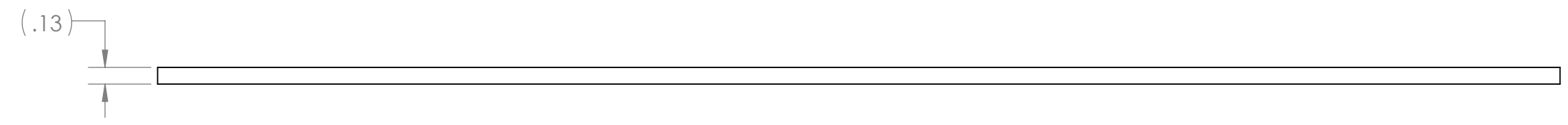
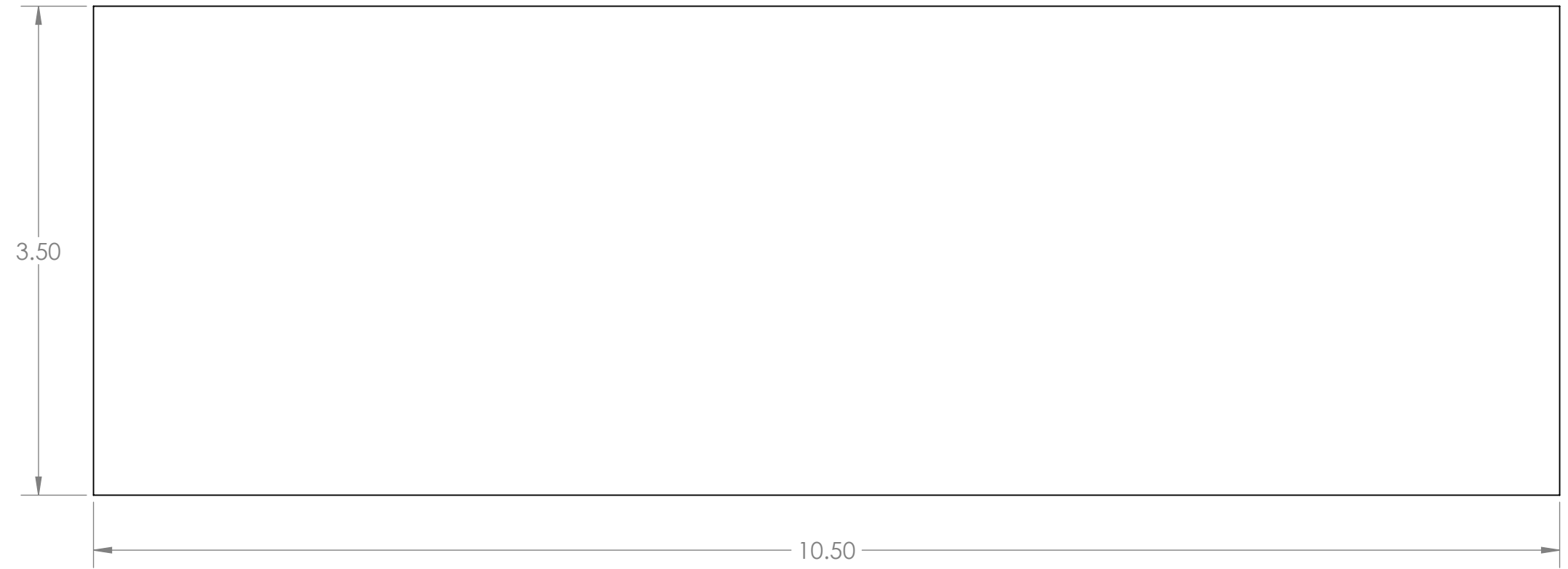
3

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

A

A

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



TITLE:		
Bumper Side		
SIZE	DWG. NO.	REV
<b>B</b>	GE-19154	
SCALE: 1:1	WEIGHT:	SHEET 1 OF 1

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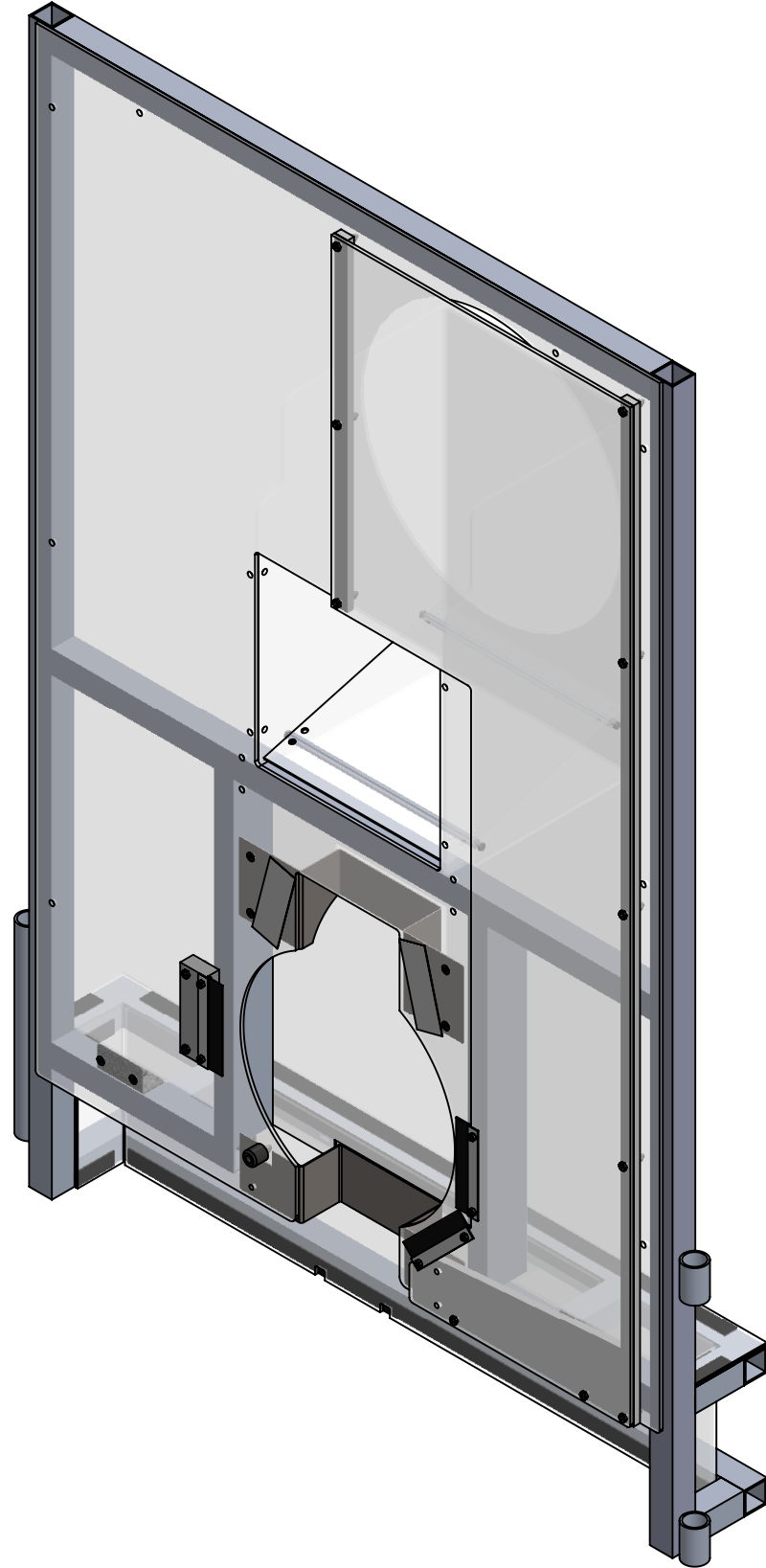
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-19026	Keyhole Insert	1
2	GE-19098	Keyhole Insert Bottom	1
3	GE-19143	Chute Assembly	1
4	GE-19147	Keyhole Backing	1
5	GE-19148	Bumper Back	1
6	GE-19149	Bumper Top	1
7	GE-19154	Bumper Side	2
8	GE-19156	Plastic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



B

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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		
INTERPRET GEOMETRIC TOLERANCING PER:		CHECKED		TITLE: <h2 style="text-align: center;">Loading Station Assembly, Left</h2>
MATERIAL		ENG APPR.		
FINISH		MFG APPR.		
NEXT ASSY	USED ON	Q.A.		SIZE DWG. NO. REV <b>B</b> <b>GE-19155</b>
APPLICATION		COMMENTS:		SCALE: 1:10 WEIGHT: SHEET 1 OF 4
DO NOT SCALE DRAWING				

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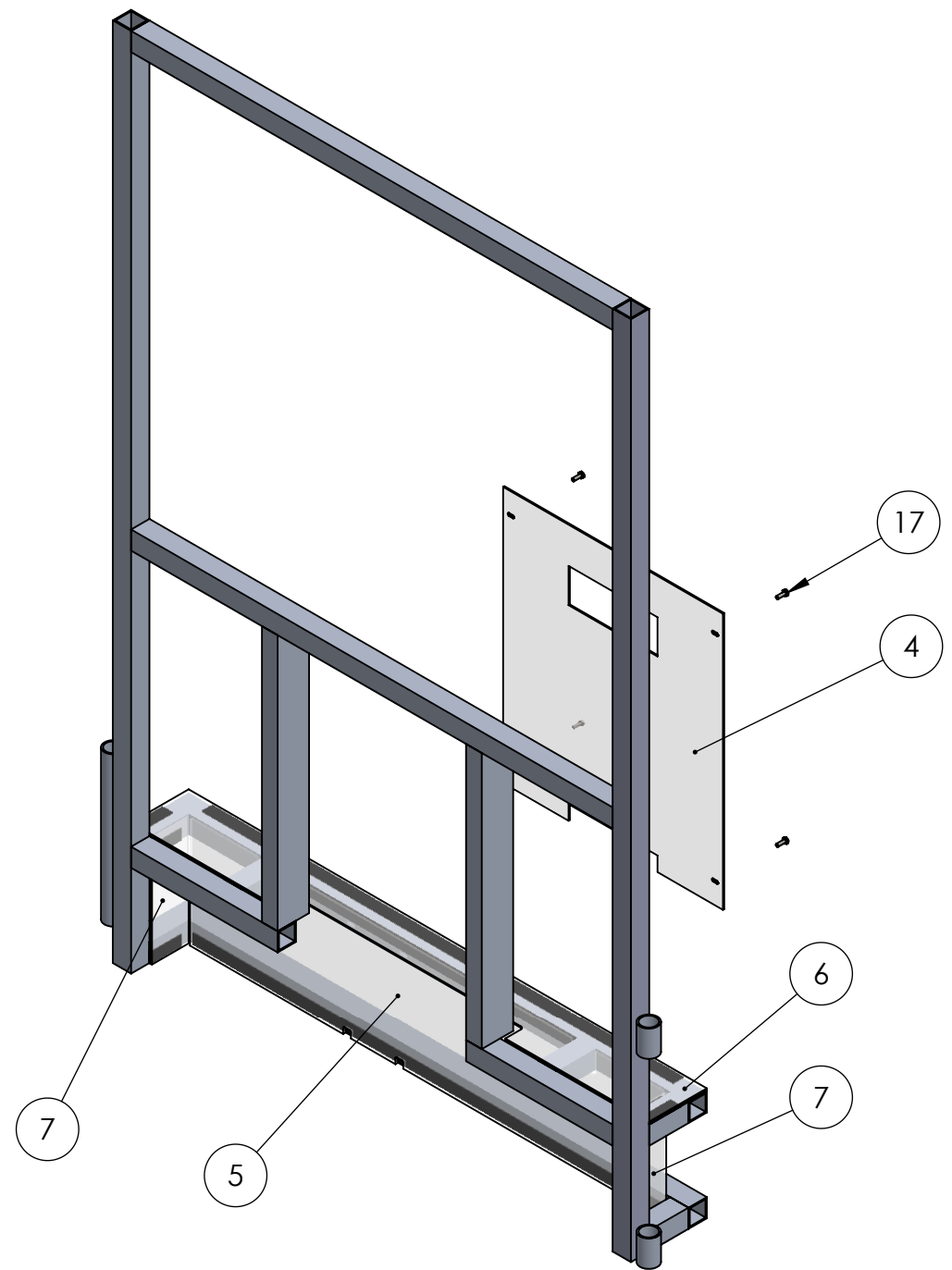
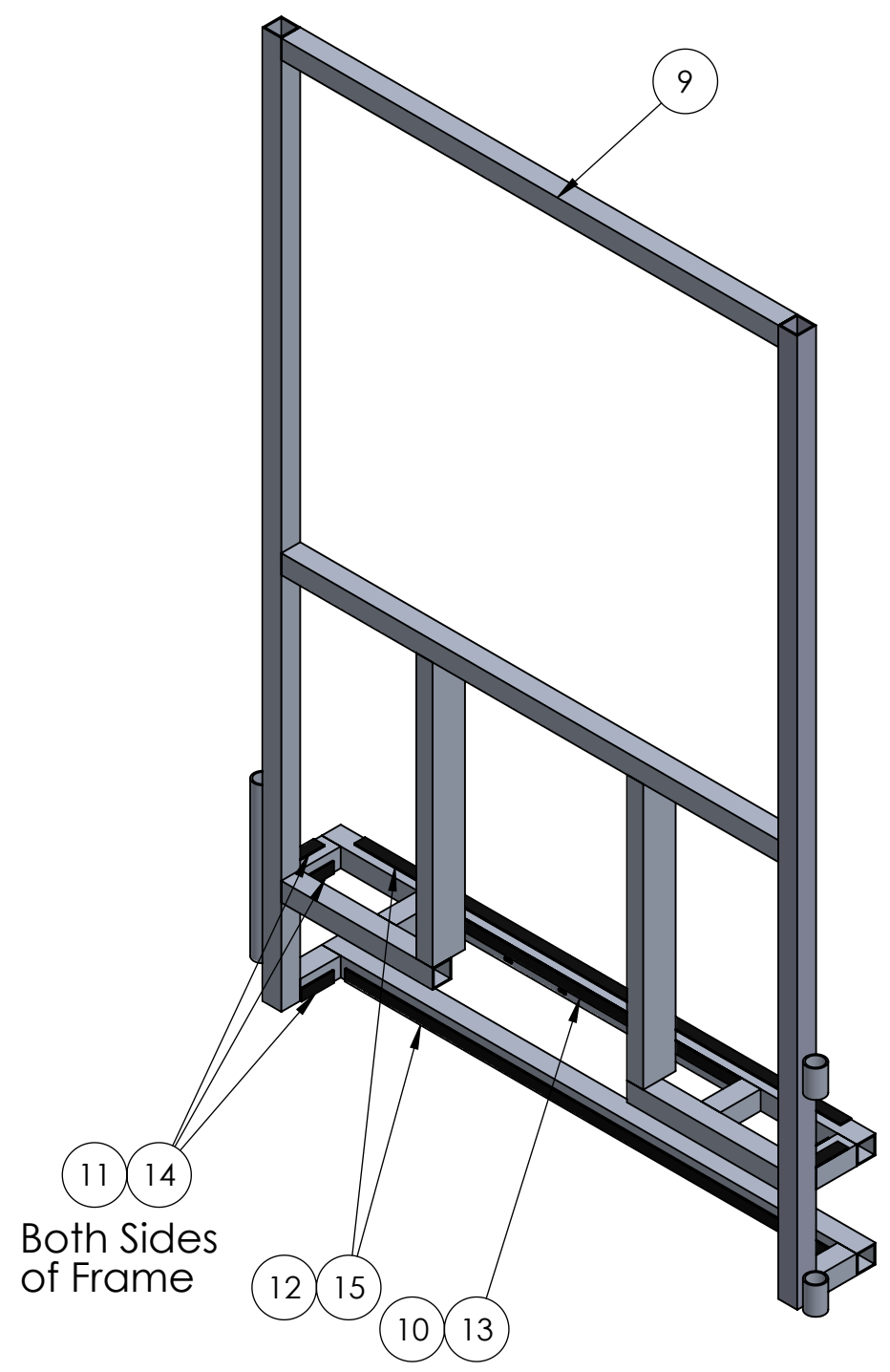
1

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Notes:

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

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		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		



TITLE:  
**Loading Station Assembly, Left**

SIZE DWG. NO. REV  
**B** **GE-19155**

SCALE: 1:12 WEIGHT: SHEET 2 OF 4

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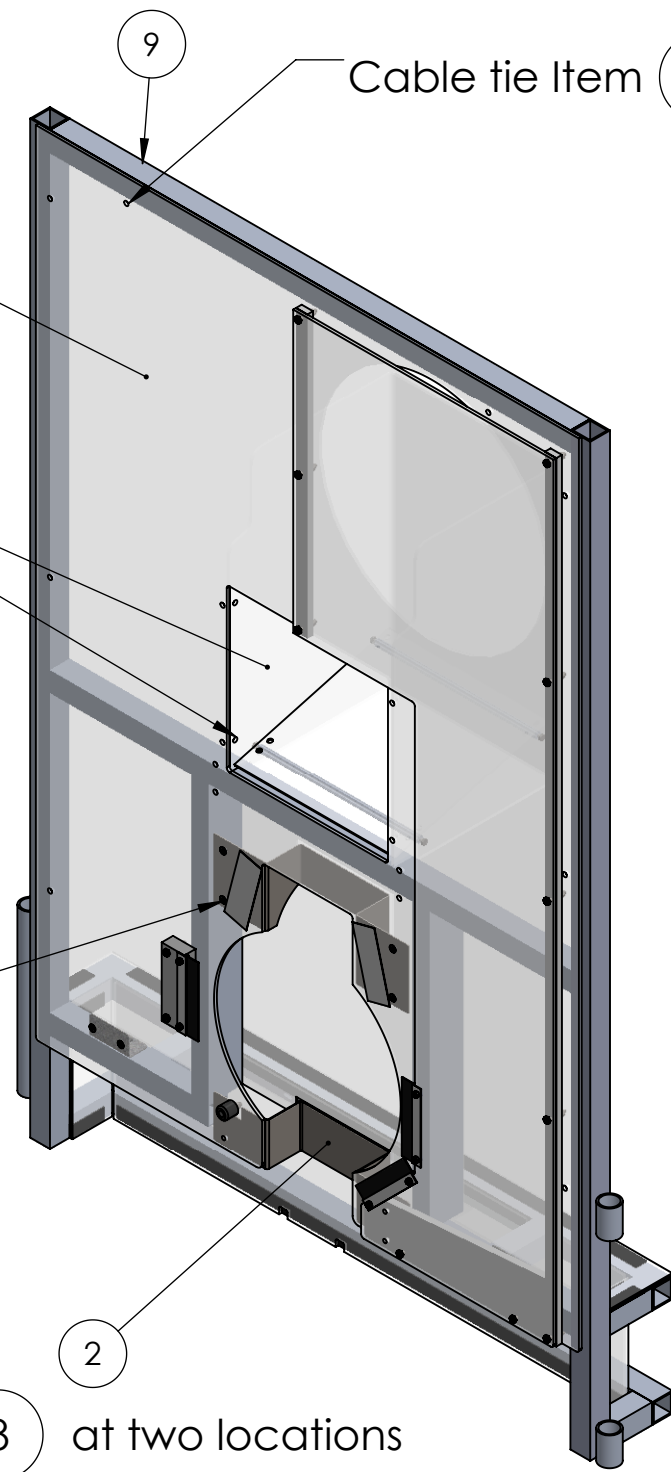
1

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

Cable tie Item 3 to Item 8 at four places.

Attach 1 to Item 8 with hardware. 4 places

Cable tie Item 2 to Item 8 at two locations



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

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

TITLE:  
**Loading Station Assembly, Left**

SIZE DWG. NO. REV  
**B GE-19155**

SCALE: 1:12 WEIGHT: SHEET 3 OF 4

4

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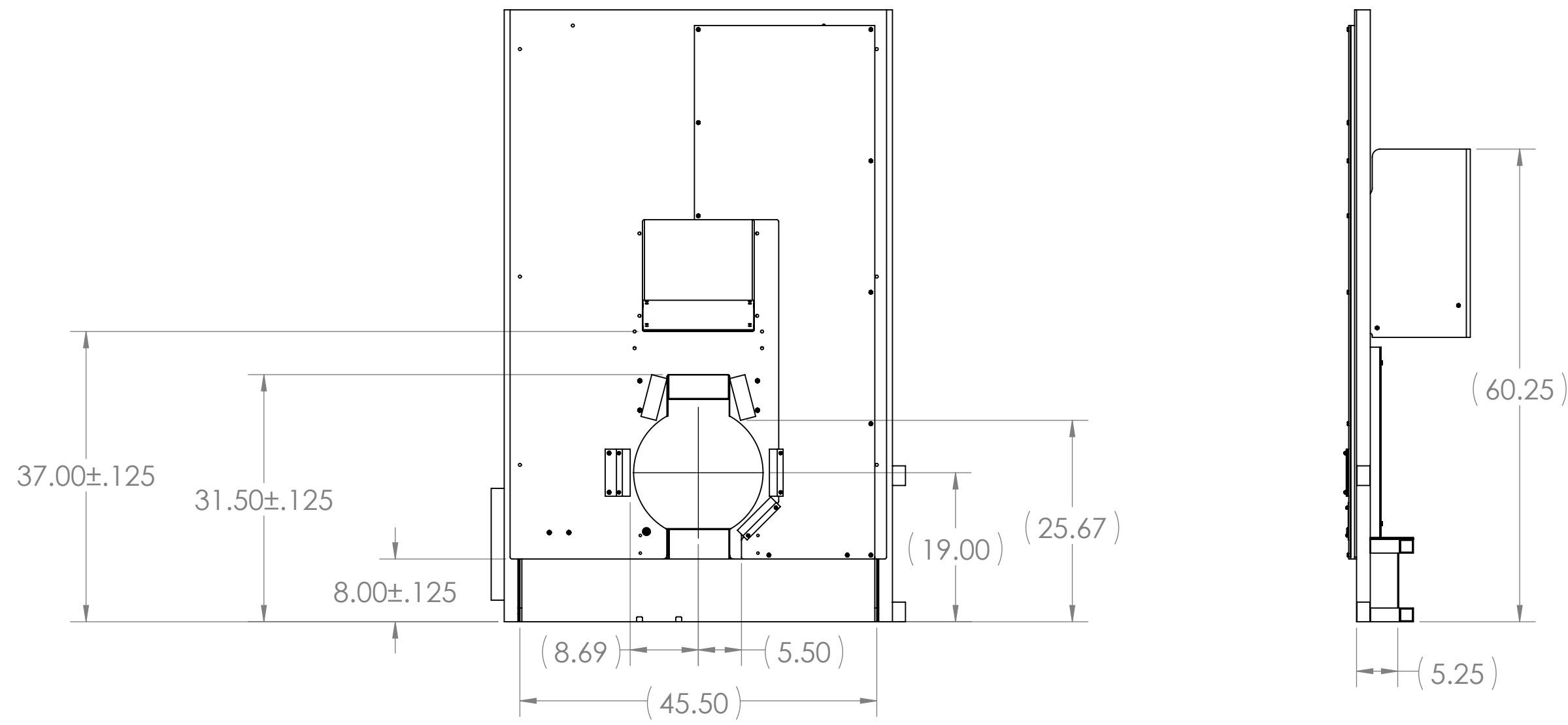
3

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



TITLE:		
<b>Loading Station Assembly, Left</b>		
SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19155</b>	
SCALE: 1:16 WEIGHT:		SHEET 4 OF 4

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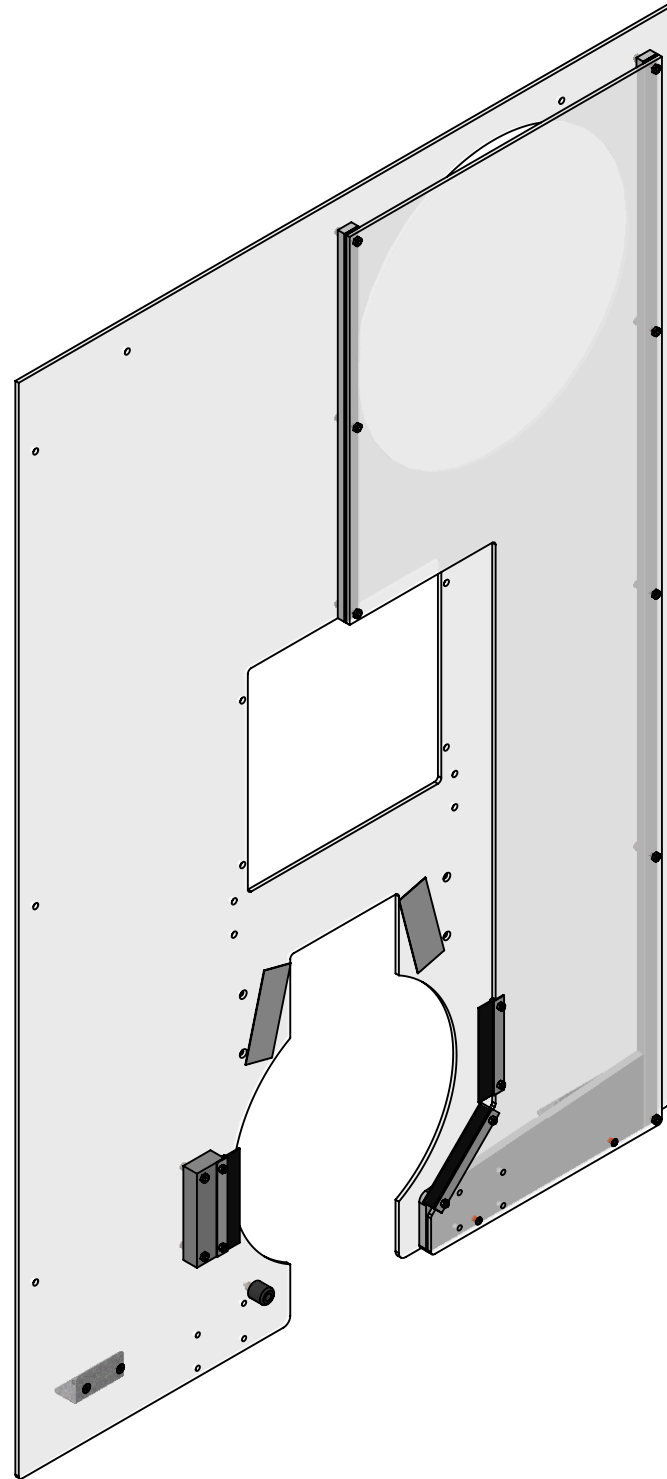
3

2

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REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
A3, B3, 2-A3, 2-B4	A	GE-19251, GE-19252, GE-19253 added to assembly. Hardware used to mount GE-19138 changed. Updated models of GE-19138, GE-19157, GE-19158 included.	2/19/2019	CPO

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-19134	Slot Guide, Large	1
2	GE-19135	Slot Guide, Small	1
3	GE-19138	Slot Guide, Angled	1
4	GE-19139	Slot Stop	1
5	GE-19140	Bumper, Rubber	1
6	GE-19142	Angle, Support	2
7	GE-19157	Loading Station Panel, Left	1
8	GE-19158	Slot Cover	1
9	GE-19190	6" brush	3
10	GE-19251	Slot Guide Spacer, Large	1
11	GE-19252	Slot Guide Spacer, Small	1
12	GE-19253	Silicone Bolt Cap	2
13	VisionTape	2" x 5.5" Retroreflective tape	2
14	button_hex_.25_20_1.25	Button Head, Hex, 1/4-20 x 1.25	1
15	flat_hex_.25_20_1	Steel Hex Flat Head Screw, 1/4"-20 x 1" long, fully threaded	4
16	flat_hex_10_32_1.375	Flat Head, Hex, 10-32 x 1.375"	2
17	flat_hex_10_32_.625	Flat Head, Hex, 10-32 x .625"	4
18	hex_.25_20_1.5	Steel Hex Head Screw, 1/4"-20 x 1-1/2" long, fully threaded	10
19	nylock_.25_20	Steel Nylon-Insert Locknut, 1/4"-20	15
20	nylock_10_32	Low-Strength Steel Nylon-Insert Locknut, Zinc-Plated, 10-32 Thread Size	8
21	round_hex_flange_10_32_1.5_partial	Flanged, Round Hex Head, #10-32 x 1-1/2" long, fully threaded	2



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

**FIRST**  
ROBOTICS  
COMPETITION

**SOLIDWORKS**  
Modeling Solutions Partner

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

SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19156</b>	<b>A</b>

SCALE: 1:16 WEIGHT: SHEET 1 OF 2

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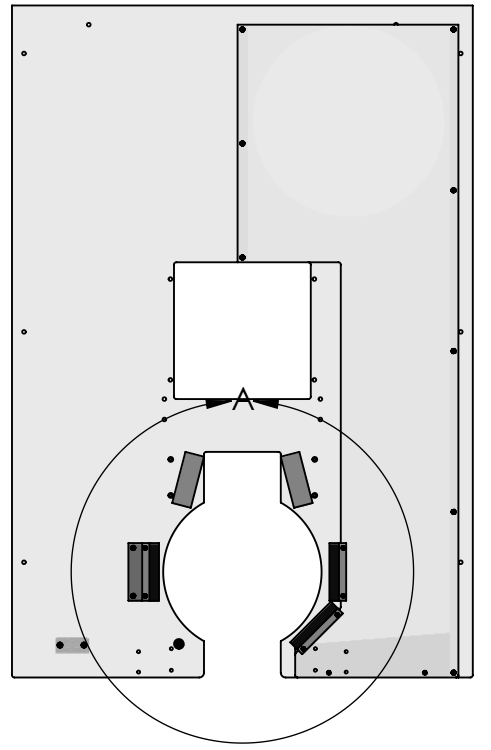
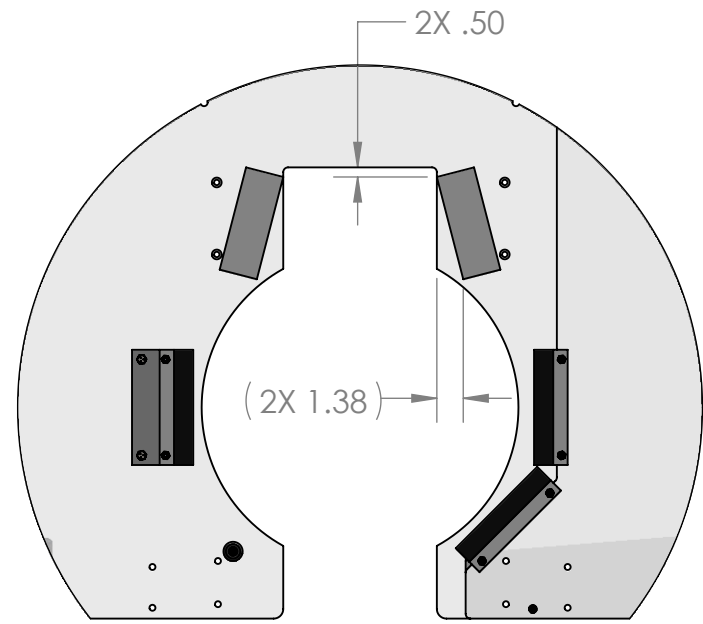
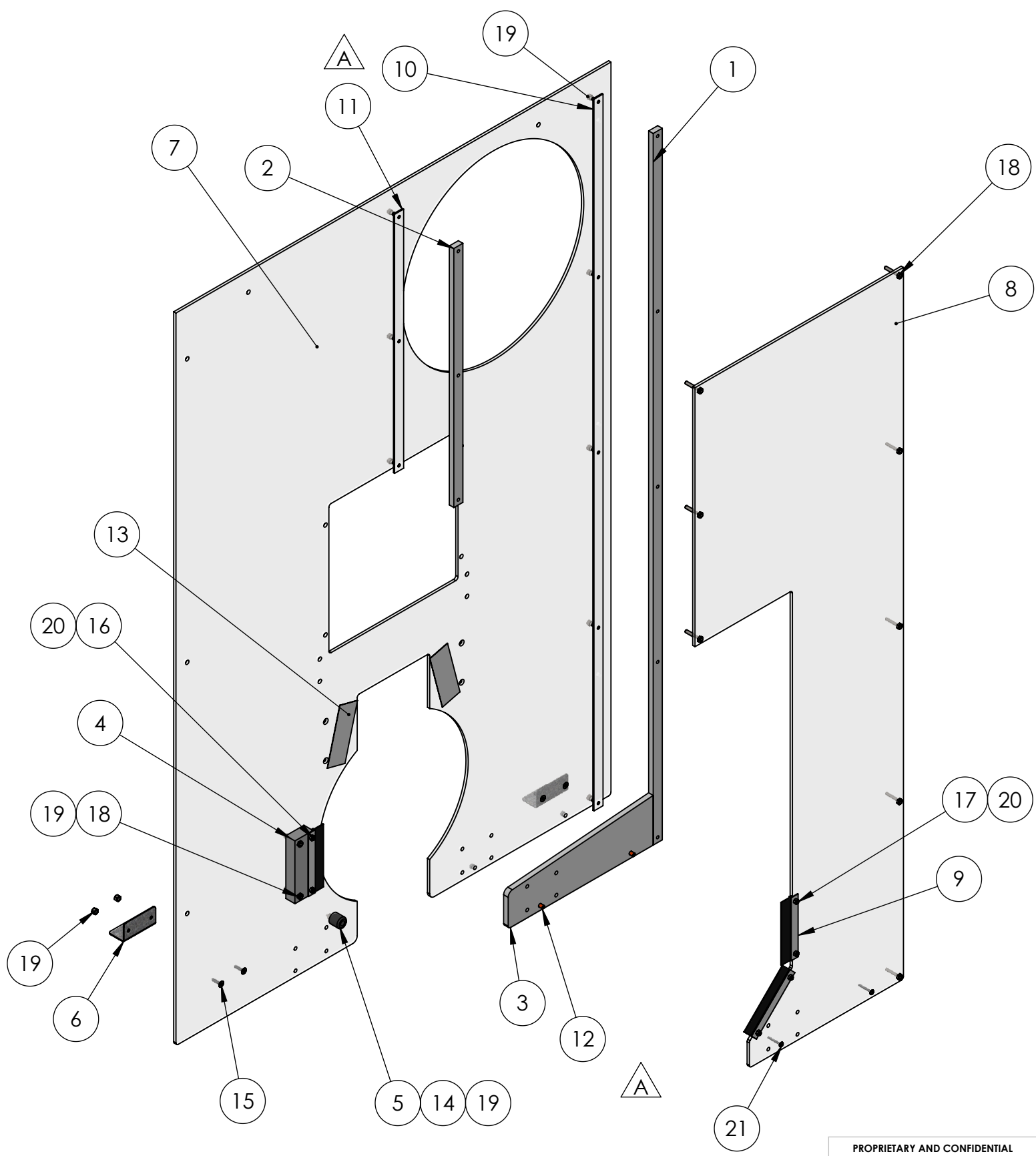
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		UNLESS OTHERWISE SPECIFIED:		DETAIL A		NAME	DATE	 
		DIMENSIONS ARE IN INCHES		DRAWN				
		TOLERANCES:		CHECKED				
		FRACTIONAL: ±1/16		ENG APPR.				
		ANGULAR: MACH ±1° BEND ±1°		MFG APPR.				
		TWO PLACE DECIMAL ±.01		Q.A.				
		THREE PLACE DECIMAL ±.001		COMMENTS:				
		INTERPRET GEOMETRIC TOLERANCING PER:						
		MATERIAL						
		FINISH						
NEXT ASSY	USED ON							
APPLICATION		DO NOT SCALE DRAWING						
		TITLE:		Plastic Assembly, Loading Station, Left				
SIZE	DWG. NO.	REV						
<b>B</b>	<b>GE-19156</b>	<b>A</b>						
SCALE: 1:10		WEIGHT:		SHEET 2 OF 2				

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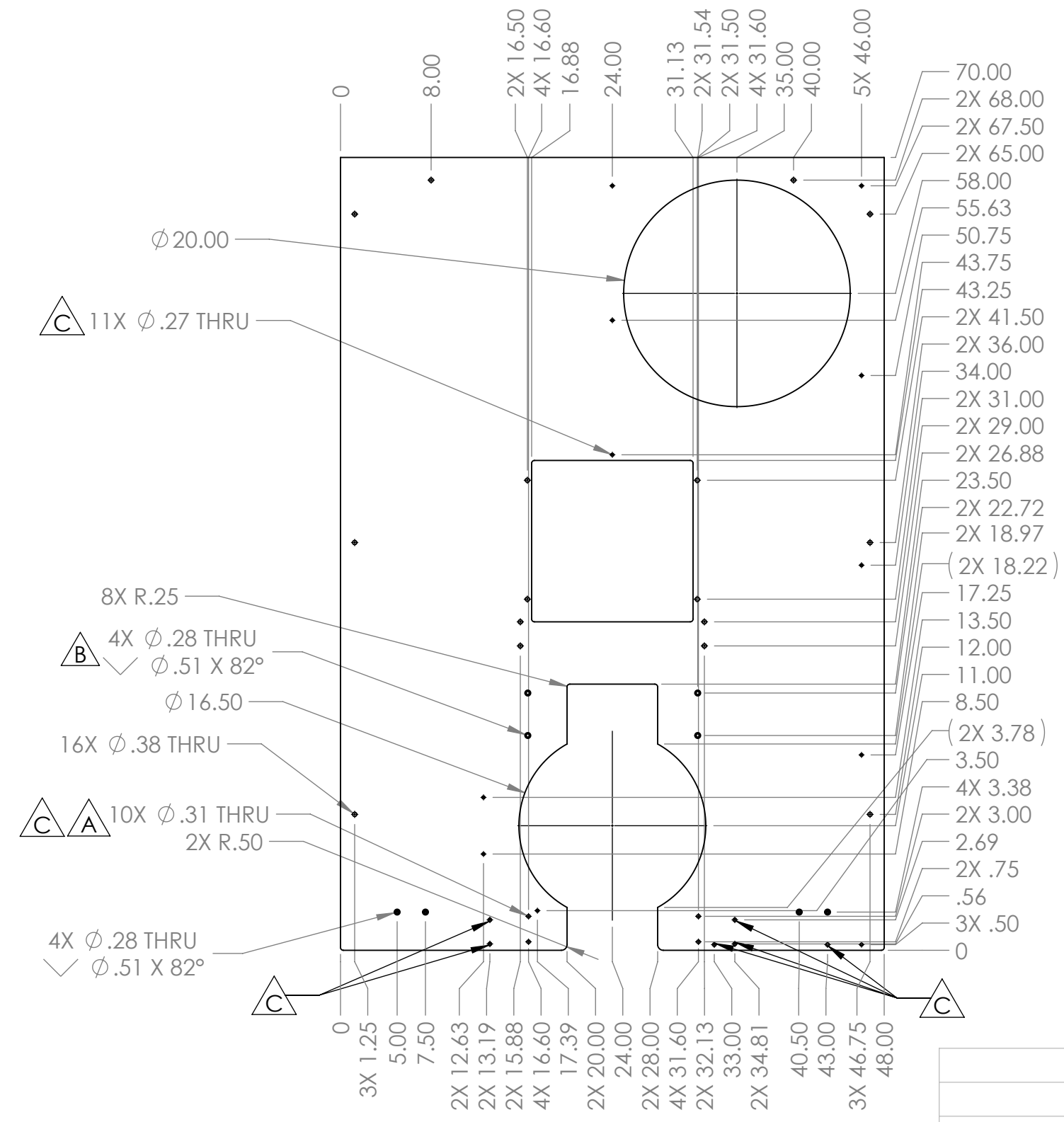
REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
A4	A	Added 8 .31 Holes	10/17/2018	MXS
A4	B	4X $\phi$ .31 changed to C'sink	11/15/2018	DAF
A2, A4, B4	C	Changed two holes from $\phi$ .27 to $\phi$ .31. Added four additional $\phi$ .31 holes.	2/19/2019	DAF

B

B

A

A



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

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UNLESS OTHERWISE SPECIFIED:		NAME	DATE
DIMENSIONS ARE IN INCHES		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

TITLE:  
**Loading Station Panel, Left**

SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19157</b>	<b>C</b>

SCALE: 1:12 WEIGHT: SHEET 1 OF 1

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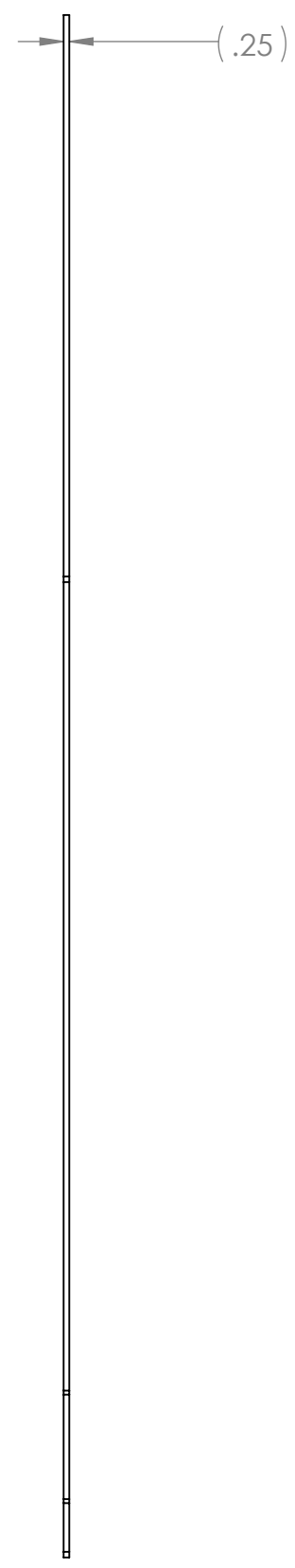
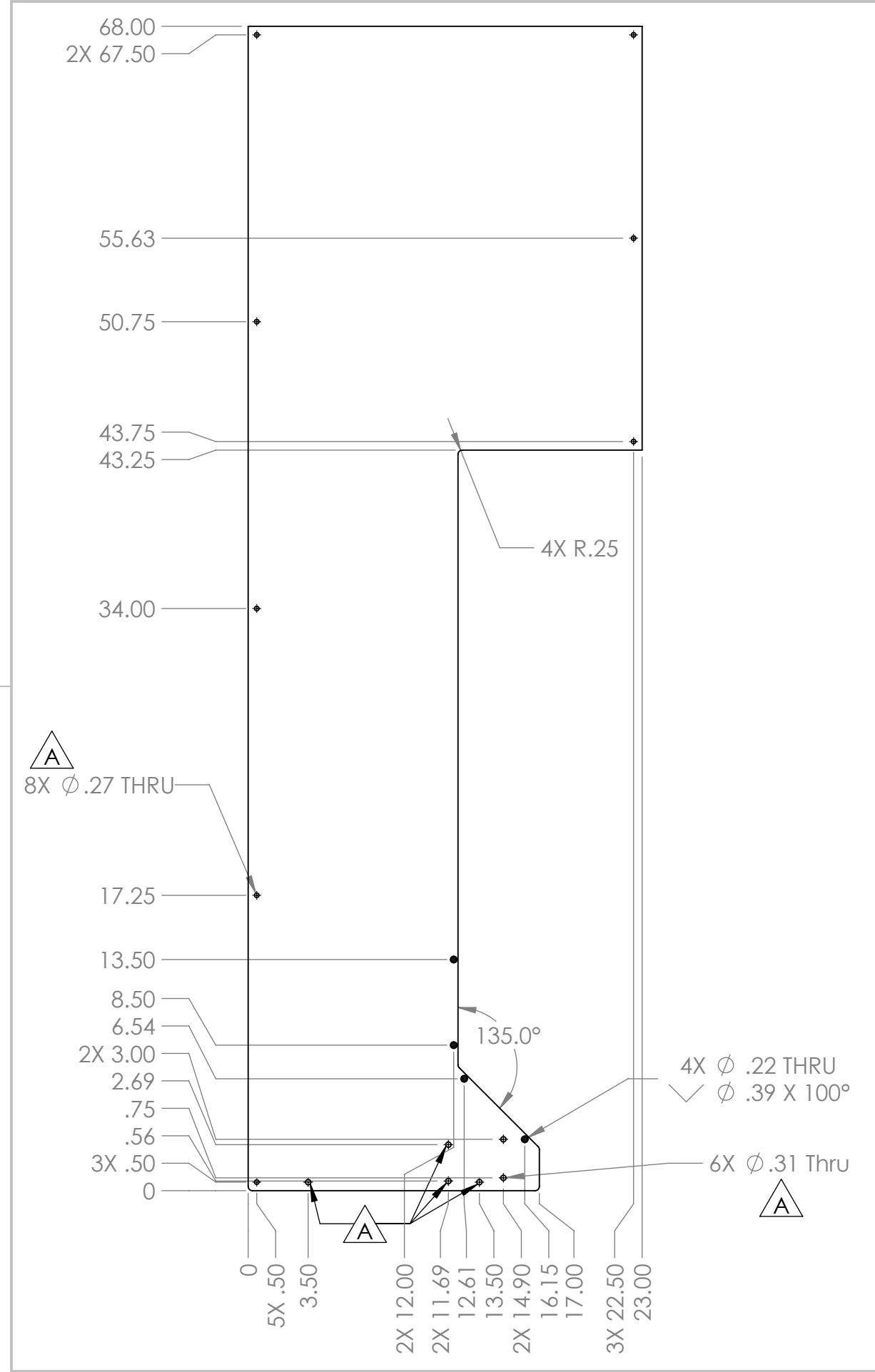
REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
A3, A4	A	Increased hole diameter from $\phi .27$ to $\phi .31$ , 2 places. Added two additional $\phi .31$ holes.	2/19/2019	DAF

B

B

A

A



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

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

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

TITLE: **Slot Cover**

SIZE **B** DWG. NO. **GE-19158** REV **A**

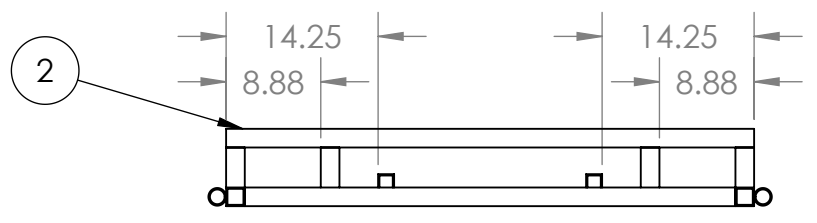
SCALE: 1:8 WEIGHT: SHEET 1 OF 1

4

3

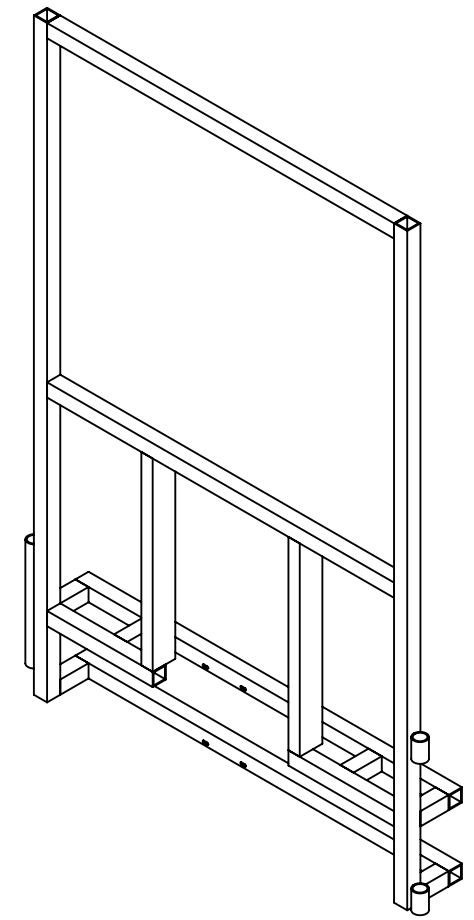
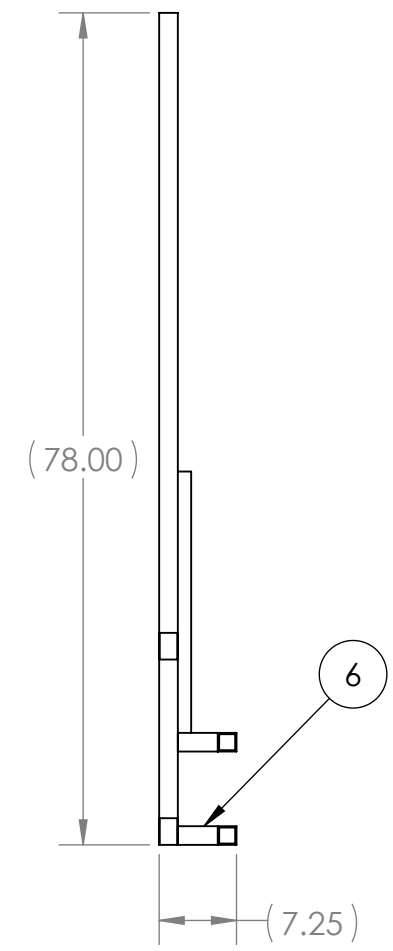
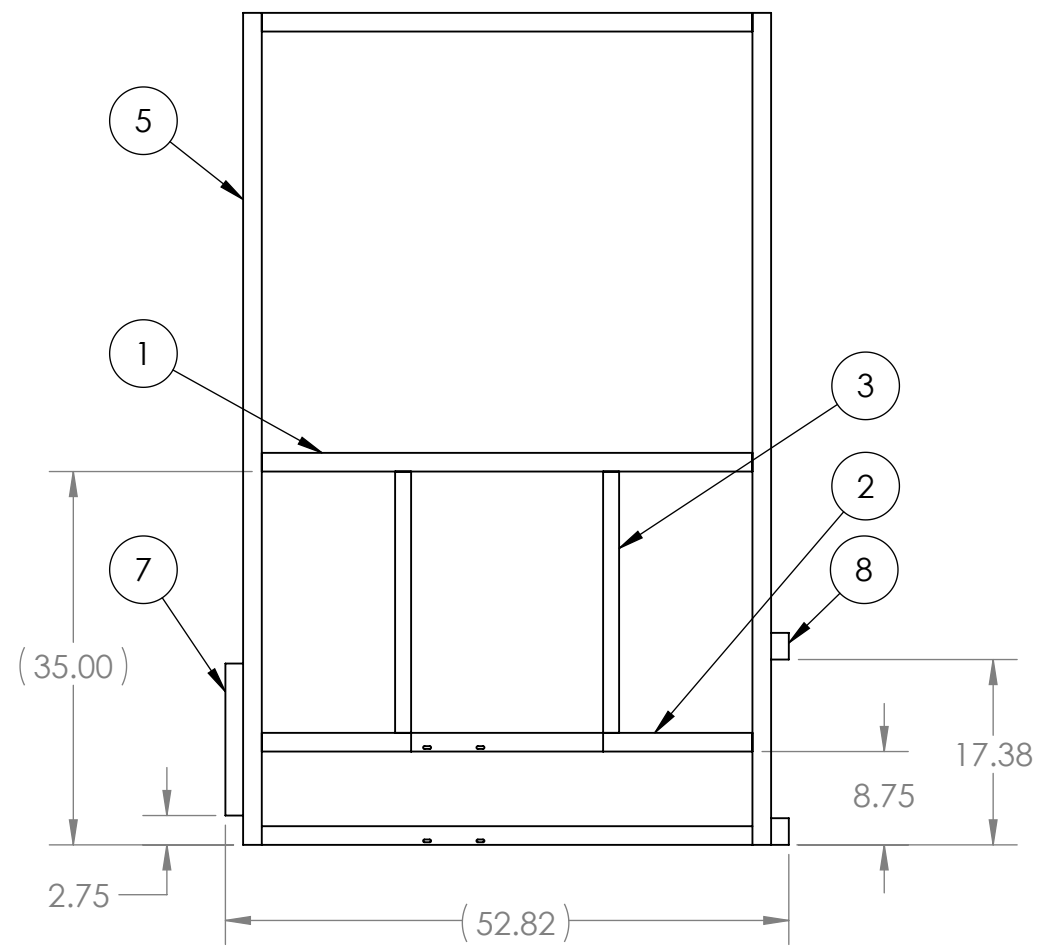
2

1



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

B



B

A

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

A

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UNLESS OTHERWISE SPECIFIED:		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			

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

TITLE:  
**Loading Station Frame, Left**

SIZE **B** DWG. NO. **GE-19159** REV **A**

SCALE: 1:18 WEIGHT: SHEET 1 OF 4

4

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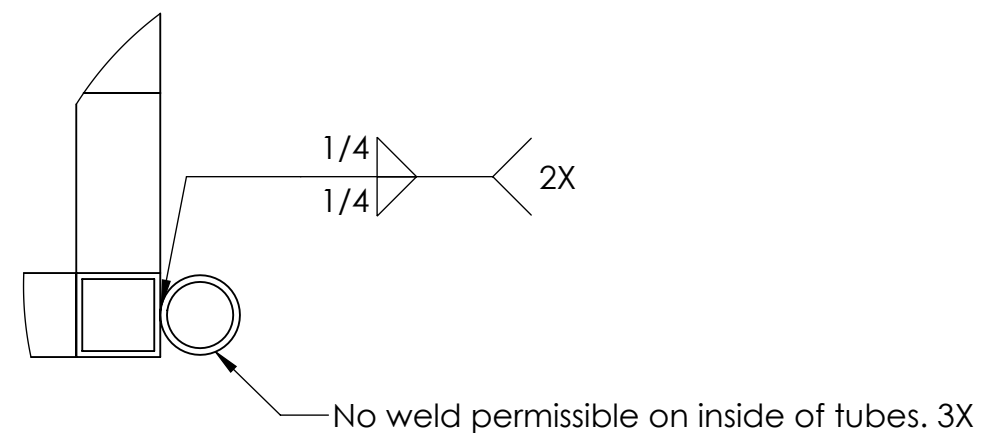
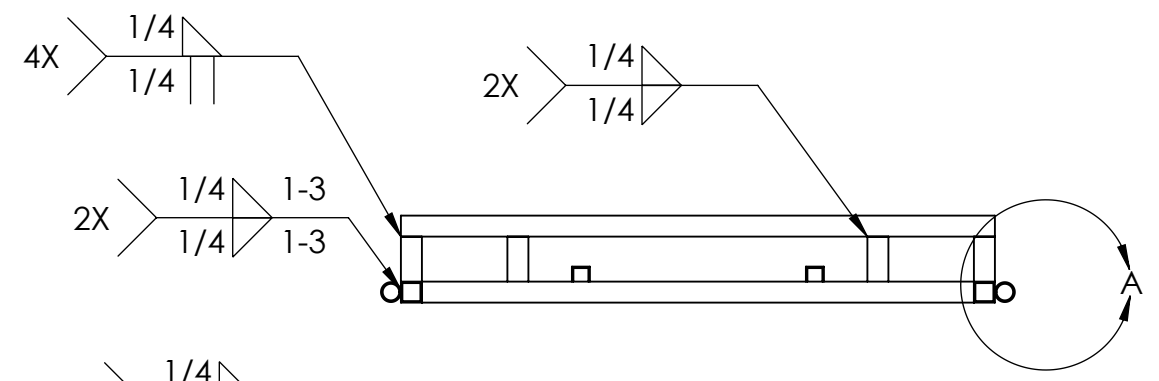


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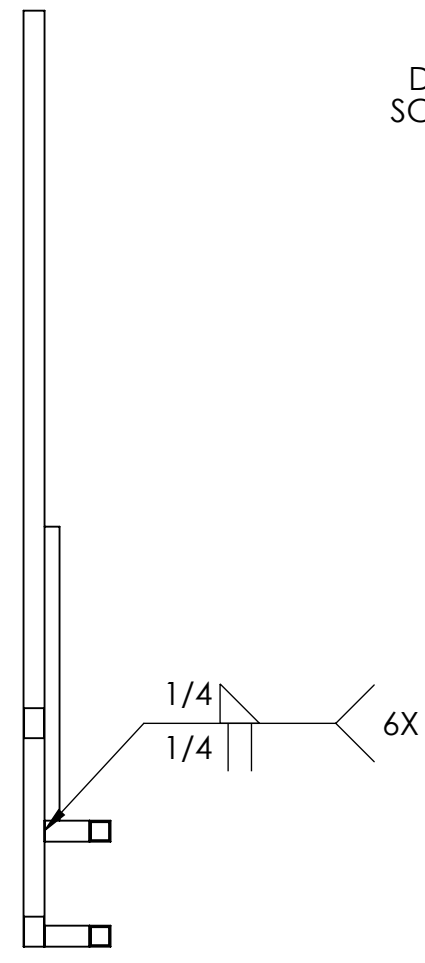
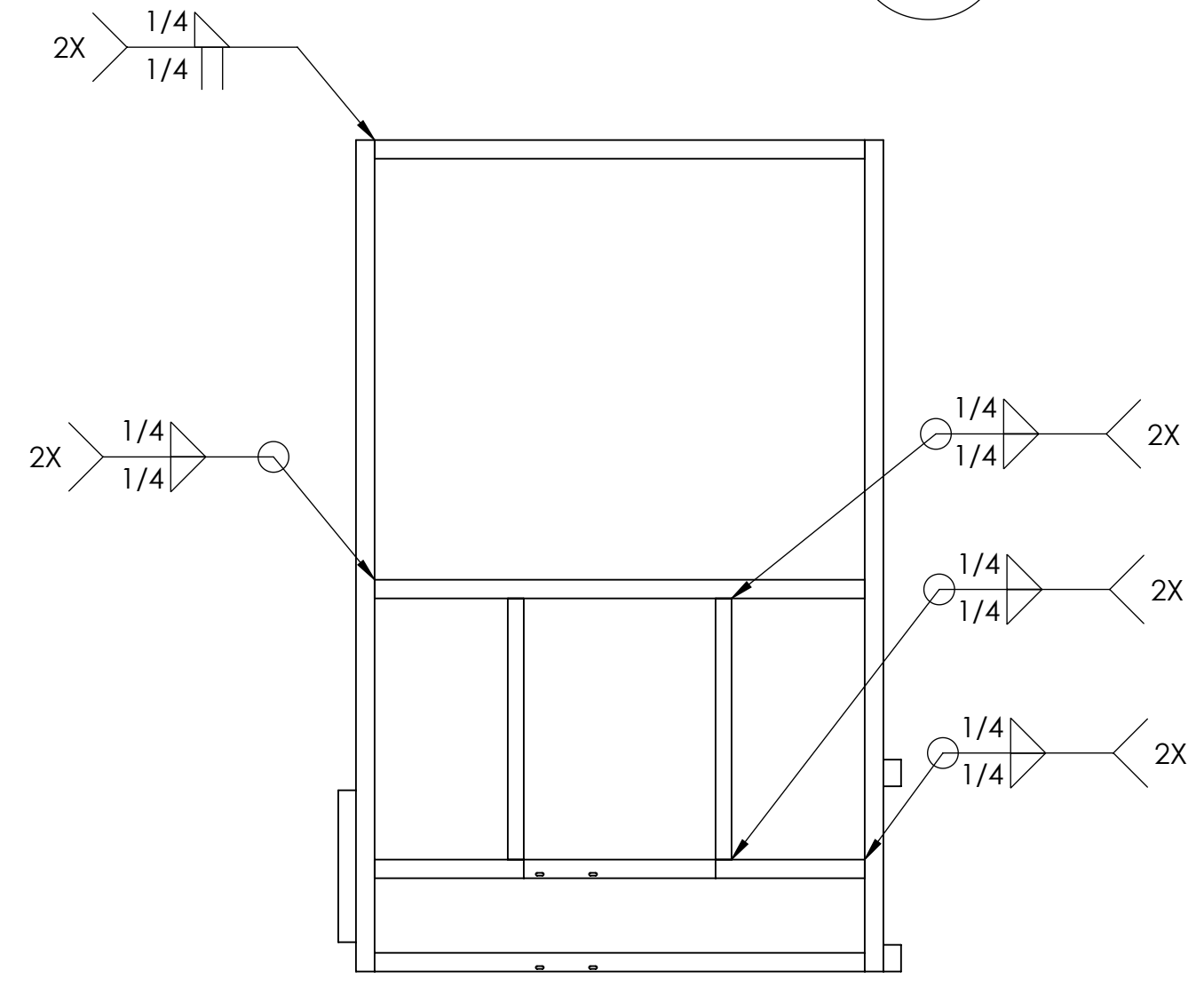
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DETAIL A  
SCALE 1 : 4



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

 		
TITLE:		
Loading Station Frame, Left		
SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19159</b>	<b>A</b>
SCALE: 1:16 WEIGHT:		SHEET 2 OF 4

4

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B

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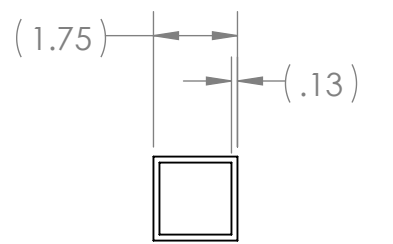
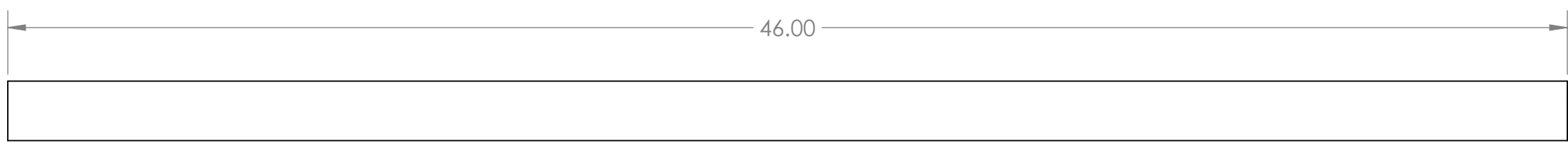
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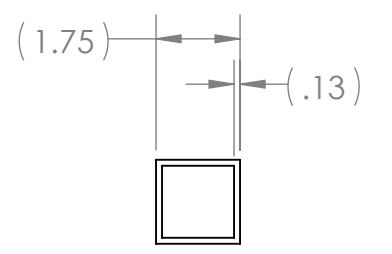
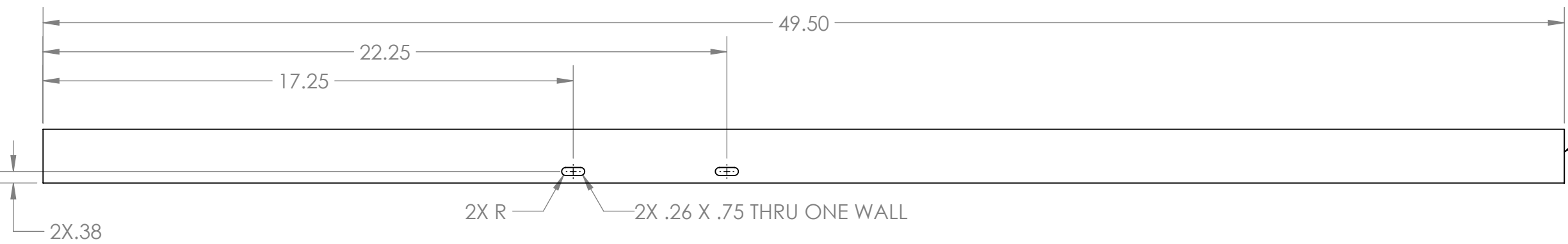
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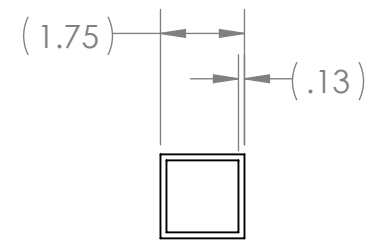
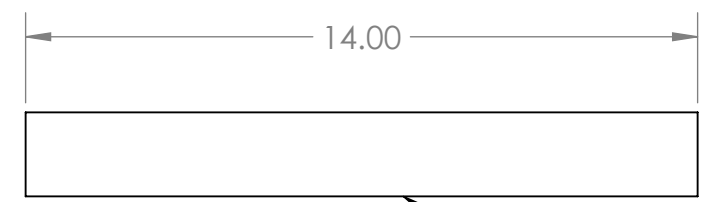
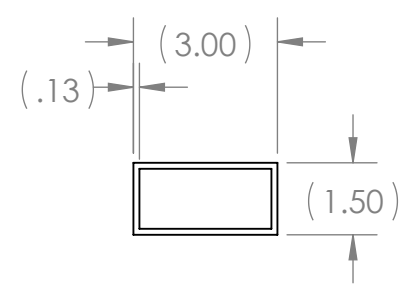
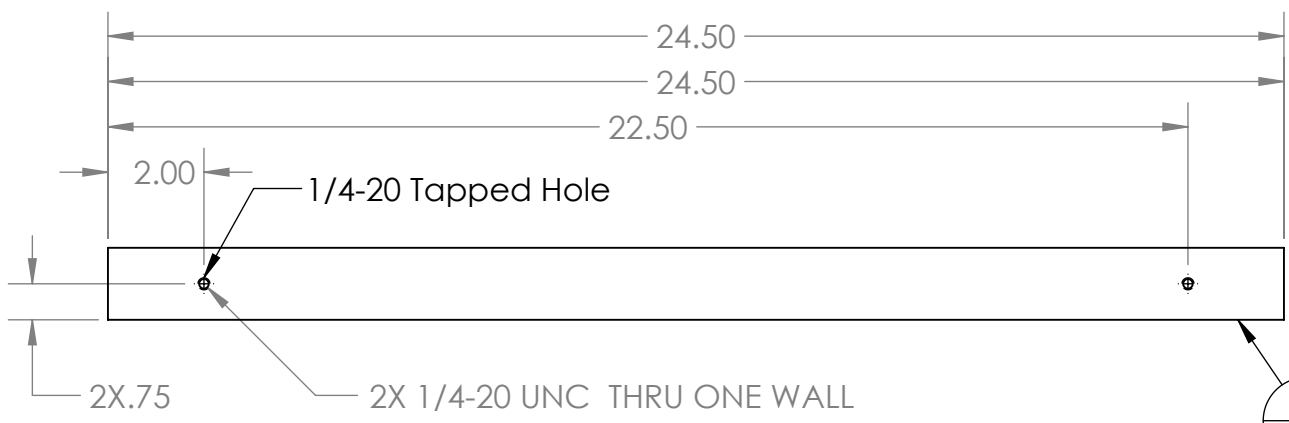
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B



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		



TITLE:  
**Loading Station Frame, Left**

SIZE **B** DWG. NO. **GE-19159** REV **A**

SCALE: 1:8 WEIGHT: SHEET 3 OF 4

4

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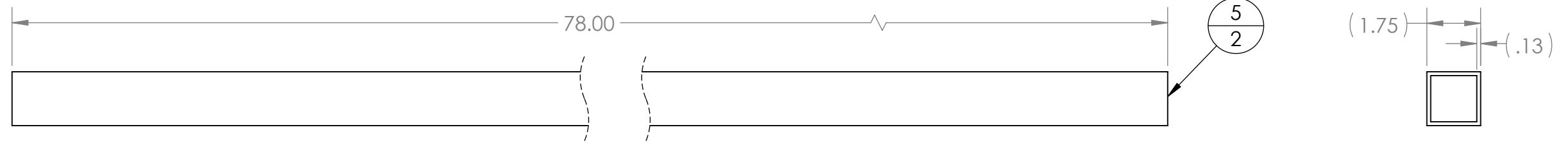
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4

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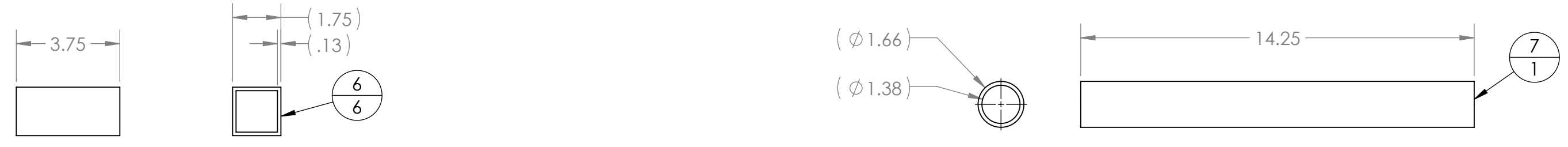
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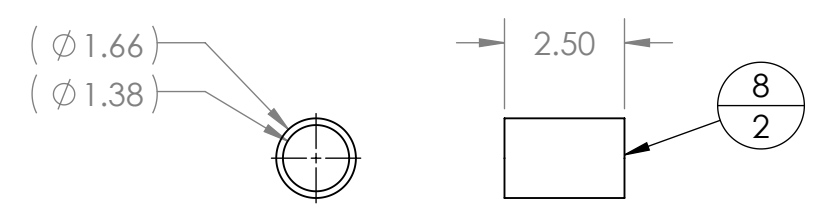
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		UNLESS OTHERWISE SPECIFIED:		NAME	DATE
		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL ±1/16 ANGULAR: MACH ±1° BEND ±1° TWO PLACE DECIMAL ±.01 THREE PLACE DECIMAL ±.001		DRAWN	
		INTERPRET GEOMETRIC TOLERANCING PER:		CHECKED	
		MATERIAL		ENG APPR.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

 		
TITLE: <b>Loading Station Frame, Left</b>		
SIZE <b>B</b>	DWG. NO. <b>GE-19159</b>	REV <b>A</b>
SCALE: 1:12 WEIGHT:		SHEET 4 OF 4

4

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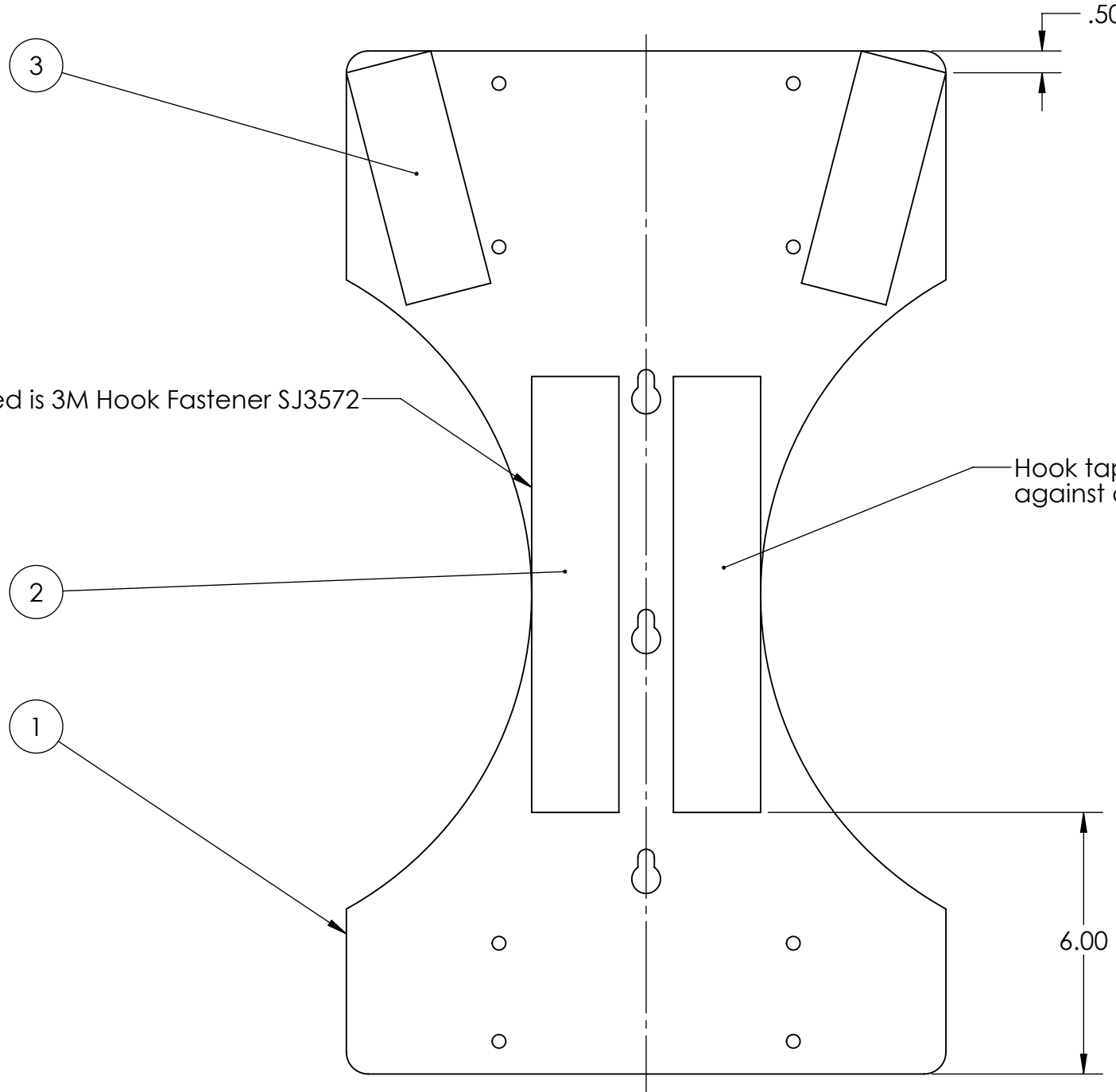
REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
B4	A	Added note specifying hook fastener type.	1/10/2019	CPO

B

B

**A** Hook used is 3M Hook Fastener SJ3572

Hook tape placed flush against cut out, centered



A

A

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

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

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



TITLE:		
Panel Plastic Full Assembly		
SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19165</b>	<b>A</b>
SCALE: 1:8	WEIGHT:	SHEET 1 OF 1

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REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
B4	A	Added note specifying hook fastener type.	1/10/2019	CPO

**A** Hook used is 3M Hook Fastener SJ3572

2

Hook tape placed flush against cut out, centered

1

6.00

.50

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3

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

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

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



TITLE:  
**Panel Plastic Half Assembly, Left**

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

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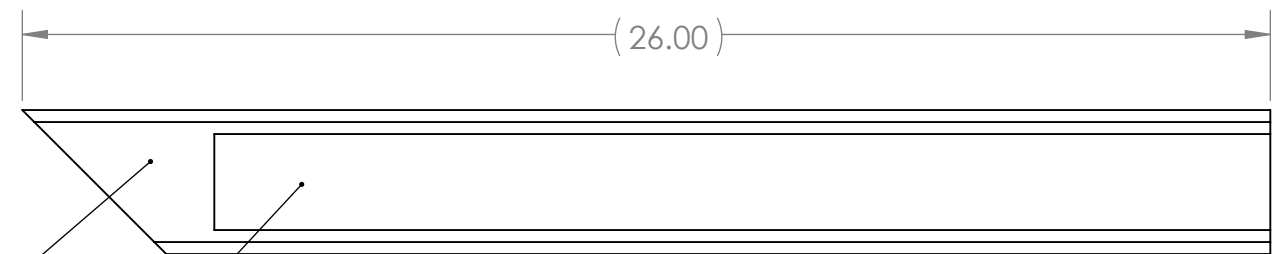
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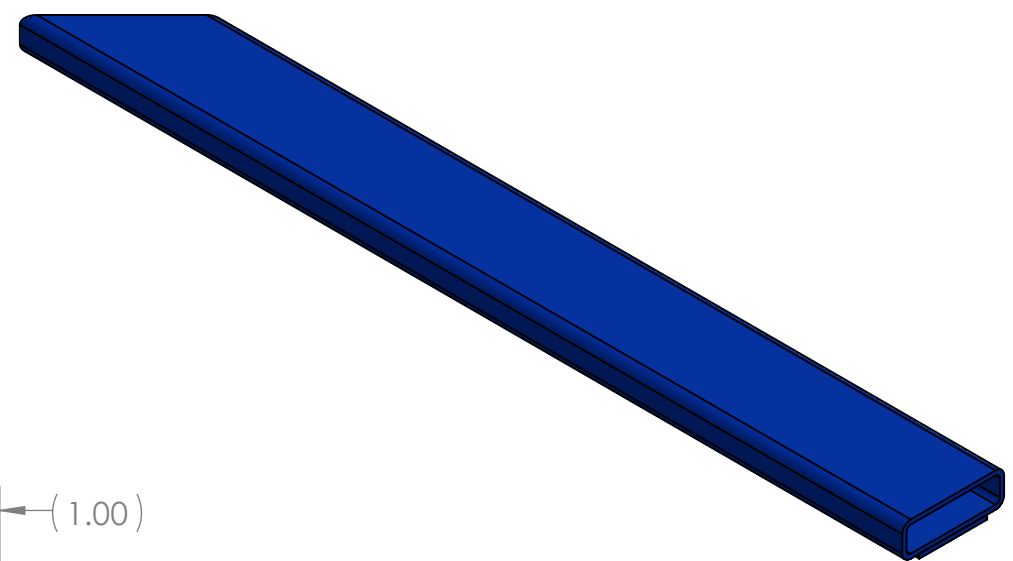
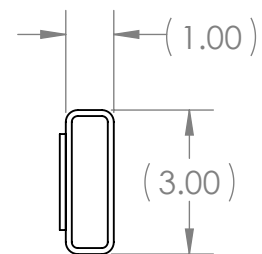
1

B

B





2 Hook should be aligned so that it is centered on the tube and flush with the end.



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

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

UNLESS OTHERWISE SPECIFIED:		NAME	DATE	 
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL 1/16 ANGULAR: MACH 1° BEND 1° TWO PLACE DECIMAL .01 THREE PLACE DECIMAL .001		DRAWN		
INTERPRET GEOMETRIC TOLERANCING PER:		CHECKED		TITLE: <b>Corral Tube Left Small Fastener Assembly</b>
MATERIAL		ENG APPR.		
FINISH		MFG APPR.		SIZE DWG. NO. REV <b>B GE-19167</b>
NEXT ASSY	USED ON	Q.A.		
APPLICATION		COMMENTS:		SCALE: 1:4 WEIGHT: SHEET 1 OF 1
DO NOT SCALE DRAWING				

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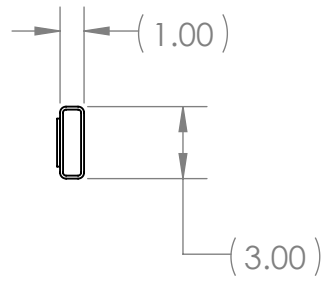
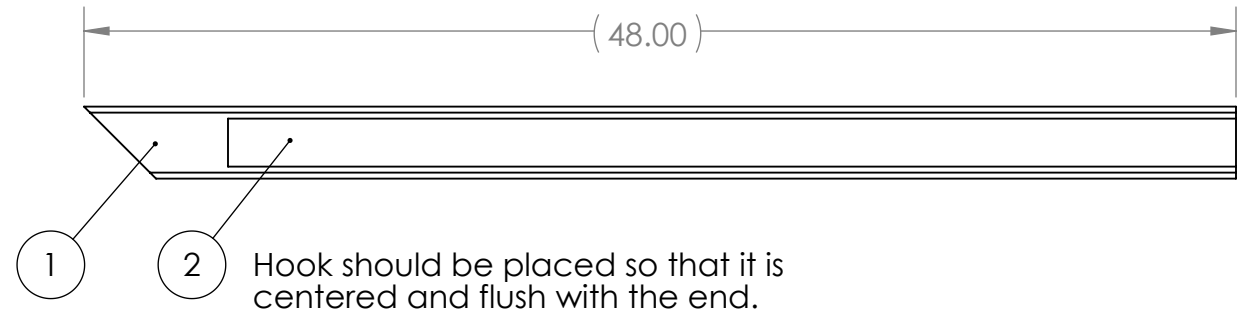
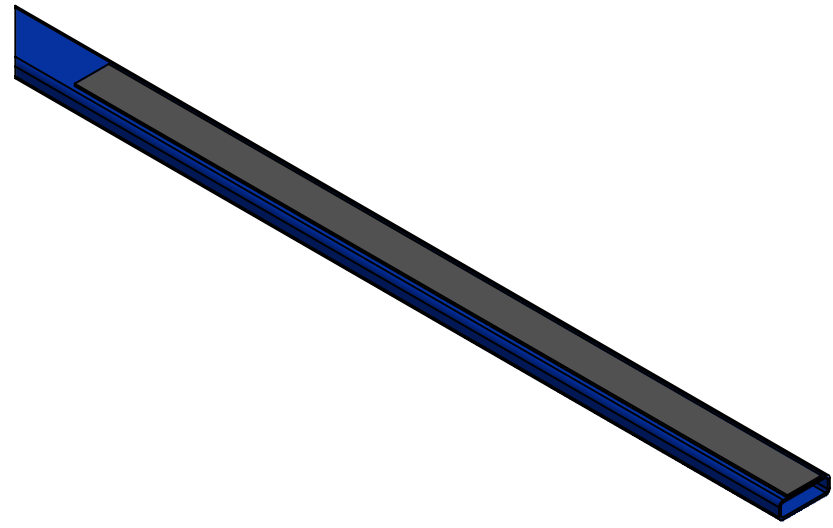
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B



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

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

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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		
INTERPRET GEOMETRIC TOLERANCING PER:		CHECKED		TITLE: <h3>Corral Tube Right Fastener Assembly</h3>
MATERIAL		ENG APPR.		
FINISH		MFG APPR.		
NEXT ASSY	USED ON	Q.A.		SIZE <b>B</b> DWG. NO. <b>GE-19168</b> REV
APPLICATION		COMMENTS:		SCALE: 1:8 WEIGHT: SHEET 1 OF 1
DO NOT SCALE DRAWING				

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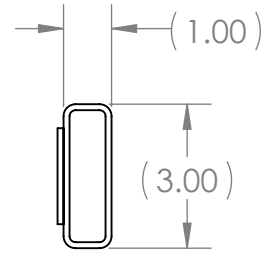
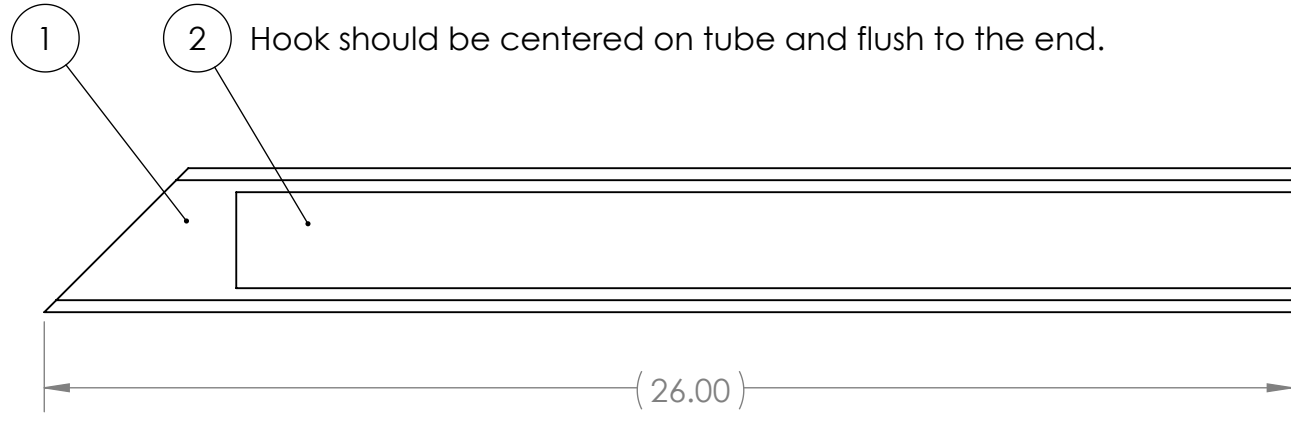
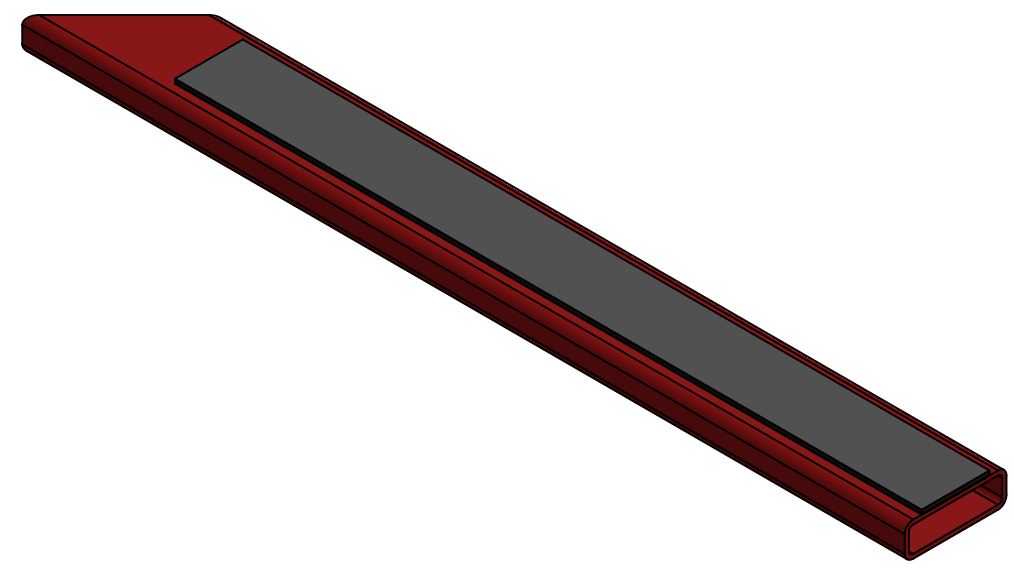
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Notes: Item ① can be either blue or red. Refer to part drawing for more details.

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

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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		
INTERPRET GEOMETRIC TOLERANCING PER:		CHECKED		TITLE: <b>Corral Tube Right Small Fastener Assembly</b>
MATERIAL		ENG APPR.		
FINISH		MFG APPR.		
NEXT ASSY	USED ON	Q.A.		SIZE <b>B</b> DWG. NO. <b>GE-19169</b> REV
APPLICATION		COMMENTS:		SCALE: 1:4 WEIGHT: SHEET 1 OF 1
DO NOT SCALE DRAWING				

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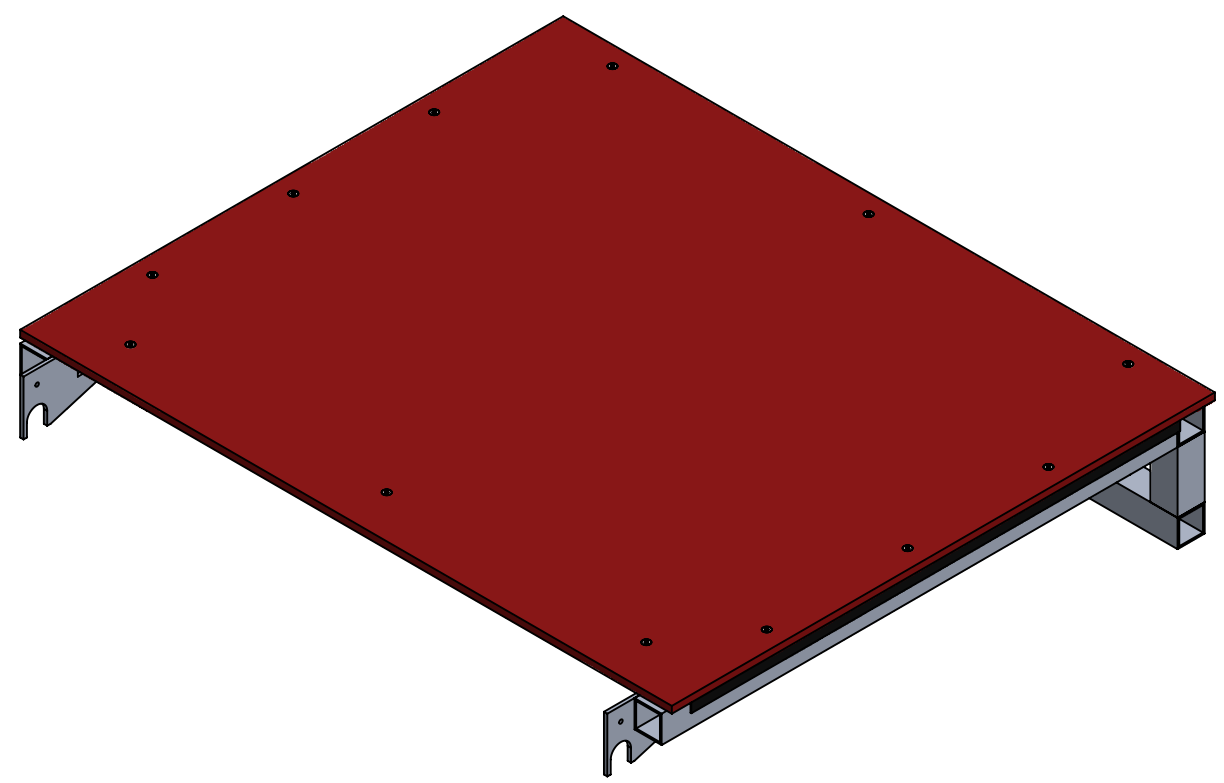
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ITEM NO.	PART NUMBER	DESCRIPTION	Default/ QTY.
1	GE-19032	HAB Level 2 Frame	1
2	GE-19035	Level 2 Top HDPE	1
3	Hook_1_46	1" X 46" Hook Fastener, Adhesive Backed	1
4	nylock_.25_20	Steel Nylon-Insert Locknut, 1/4"-20	12
5	Hook_1_36	1" x 36" Hook, Adhesive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

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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		
INTERPRET GEOMETRIC TOLERANCING PER:		CHECKED		TITLE: <h2>Hab 2 Fastener Assembly</h2>
MATERIAL		ENG APPR.		
FINISH		MFG APPR.		SIZE DWG. NO. REV <b>B</b> <b>GE-19176</b>
NEXT ASSY	USED ON	Q.A.		SCALE: 1:12 WEIGHT: SHEET 1 OF 3
APPLICATION		COMMENTS:		
DO NOT SCALE DRAWING				

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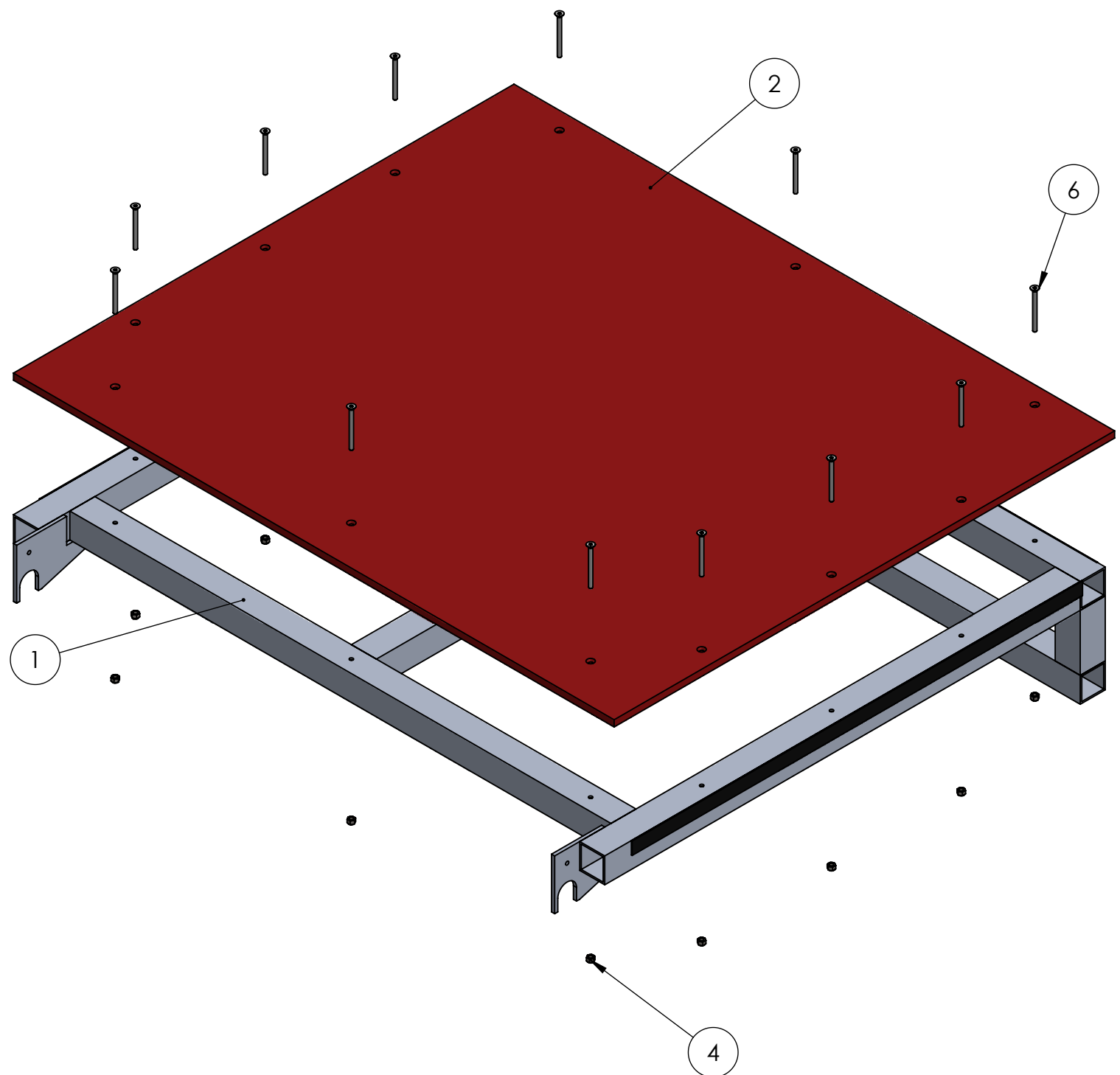
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		UNLESS OTHERWISE SPECIFIED:		NAME	DATE
		DIMENSIONS ARE IN INCHES		DRAWN	
		TOLERANCES:		CHECKED	
		FRACTIONAL 1/16		ENG APPR.	
		ANGULAR: MACH 1° BEND 1°		MFG APPR.	
		TWO PLACE DECIMAL .01		Q.A.	
		THREE PLACE DECIMAL .001		COMMENTS:	
		INTERPRET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



TITLE:		
Hab 2 Fastener Assembly		
SIZE	DWG. NO.	REV
<b>B</b>	GE-19176	
SCALE: 1:12 WEIGHT:		SHEET 2 OF 3

4

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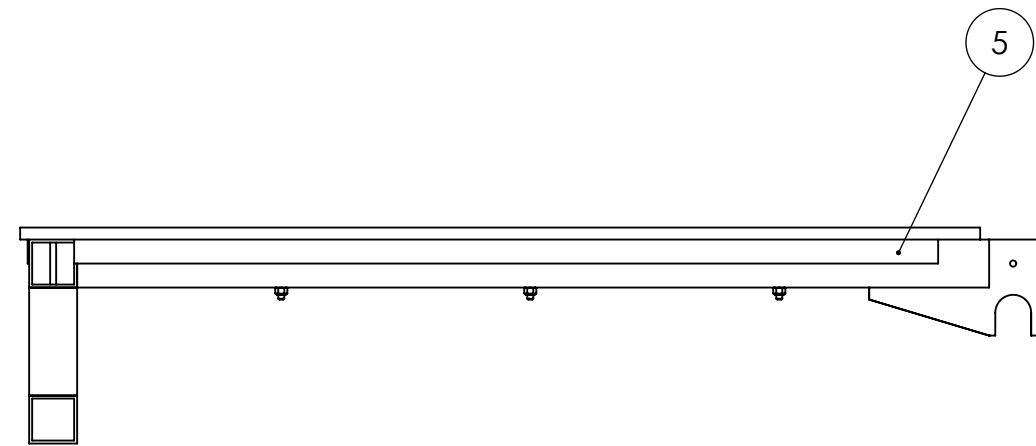
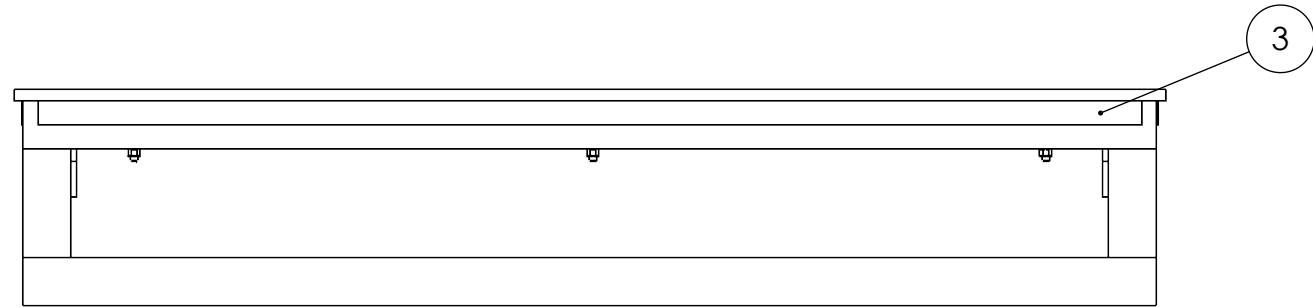
3

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Note:  
Repeat on opposite side

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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		
		INTERPRET GEOMETRIC TOLERANCING PER:		CHECKED		<b>Hab 2 Fastener Assembly</b>
		MATERIAL		ENG APPR.		
NEXT ASSY	USED ON	FINISH		MFG APPR.		<b>B</b> <b>GE-19176</b>
APPLICATION		DO NOT SCALE DRAWING		Q.A.		SCALE: 1:12 WEIGHT: SHEET 3 OF 3
				COMMENTS:		

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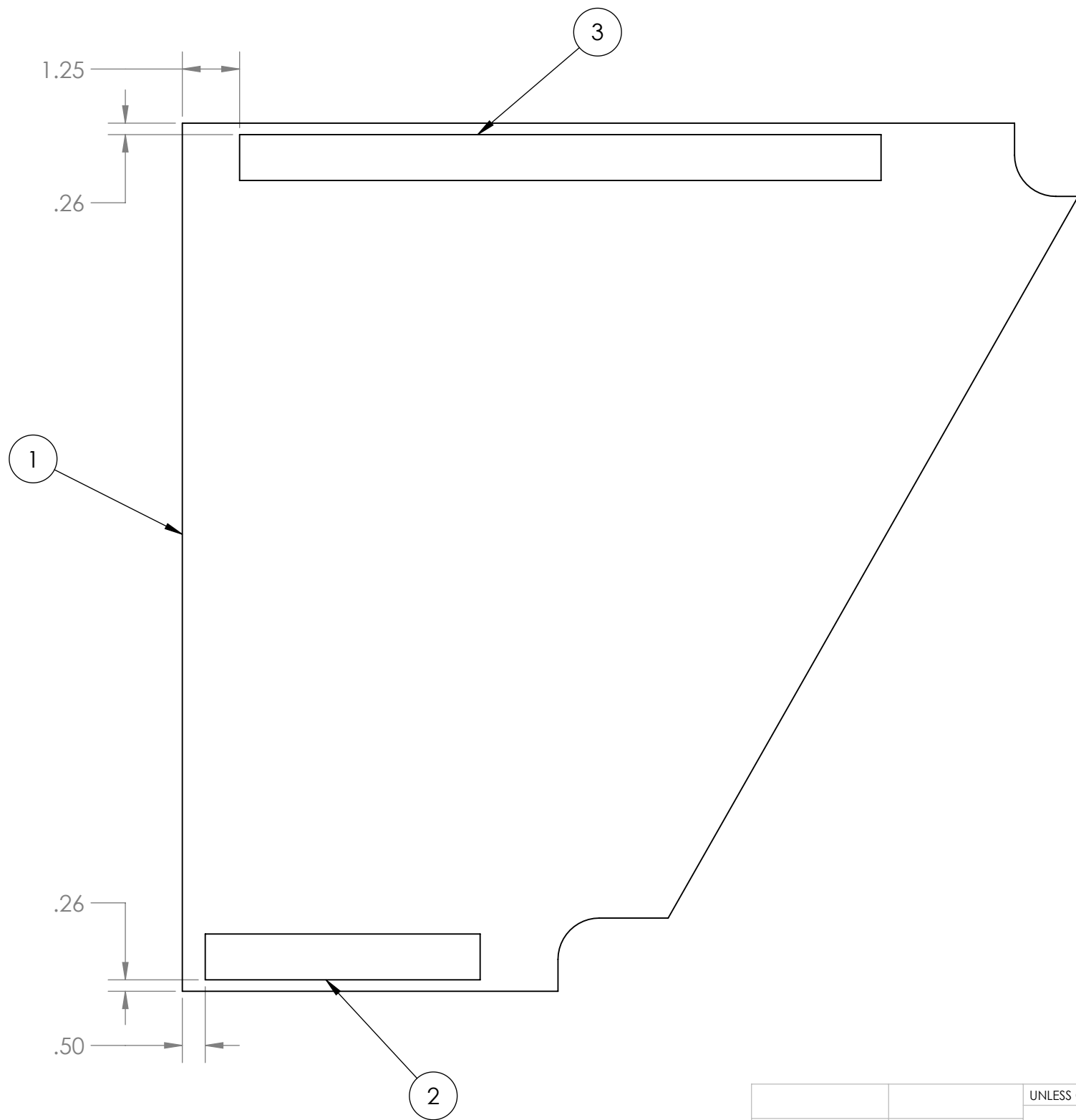
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-19115	Rocket Ramp	1
2	Loop_1_6	1" x 6" Loop, Adhesive Backed	1
3	Loop_1_14	1" x 14" Loop, Adhesive Backed	1

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UNLESS OTHERWISE SPECIFIED:		NAME	DATE
DIMENSIONS ARE IN INCHES		DRAWN	
TOLERANCES:		CHECKED	
FRACTIONAL ±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			

TITLE:  
**Rocket Ramp Left**

SIZE **B** DWG. NO. **GE-19180** REV  
 SCALE: 1:3 WEIGHT: SHEET 1 OF 1

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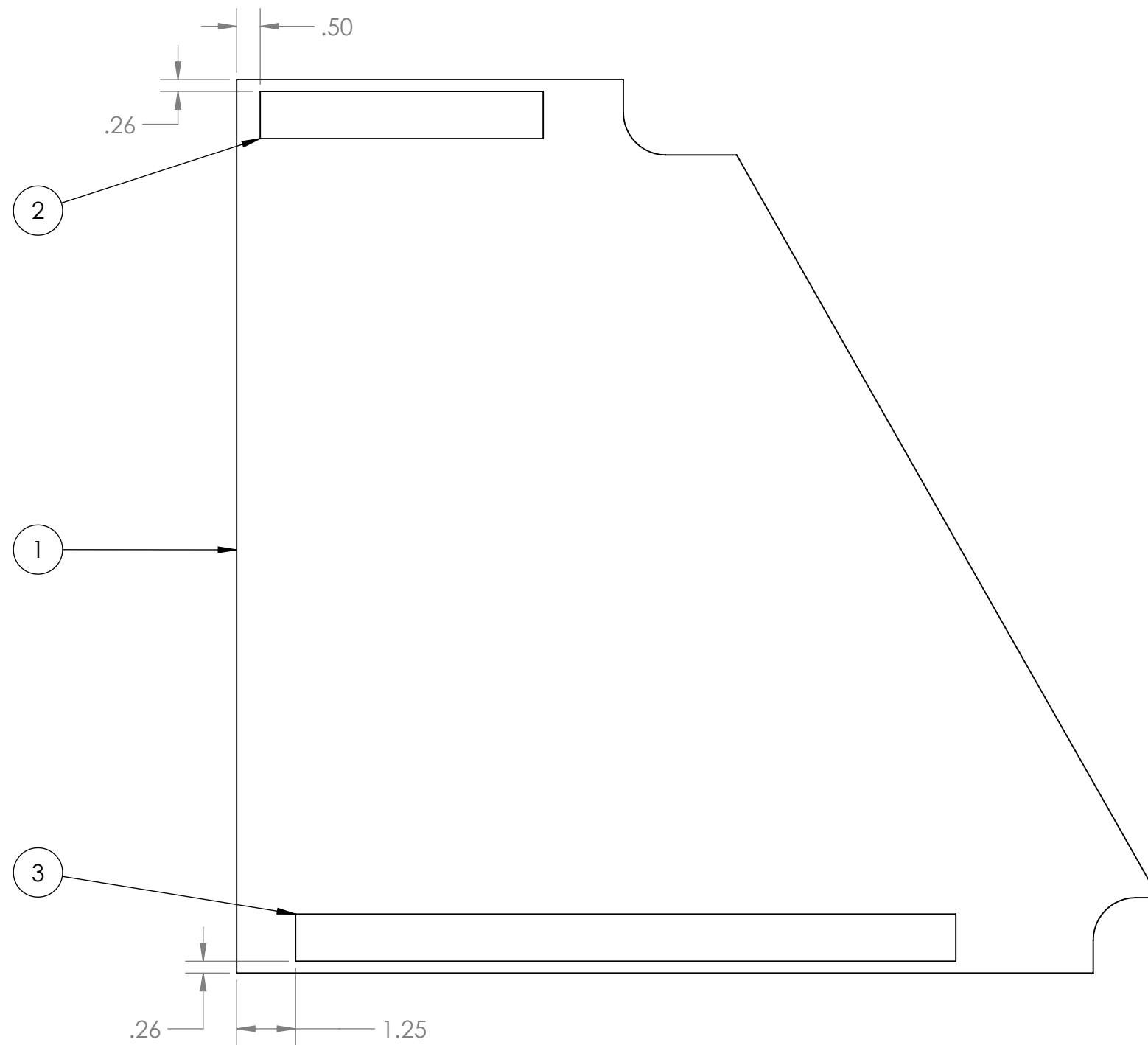
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-19115	Rocket Ramp	1
2	Loop_1_6	1" x 6" Loop, Adhesive Backed	1
3	Loop_1_14	1" x 14" Loop, Adhesive Backed	1

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UNLESS OTHERWISE SPECIFIED:		NAME	DATE
DIMENSIONS ARE IN INCHES		DRAWN	
TOLERANCES:		CHECKED	
FRACTIONAL ±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			



TITLE:		
<b>Rocket Ramp Right</b>		
SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19181</b>	
SCALE: 1:3	WEIGHT:	SHEET 1 OF 1

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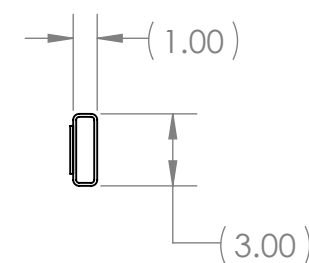
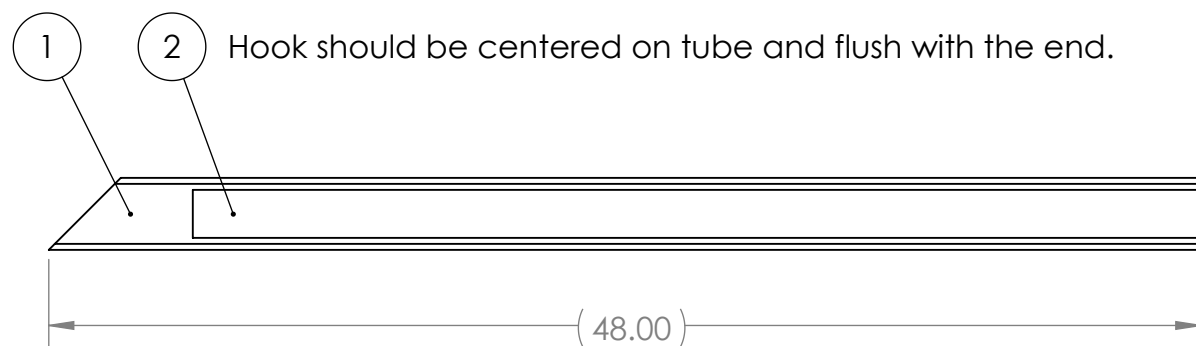
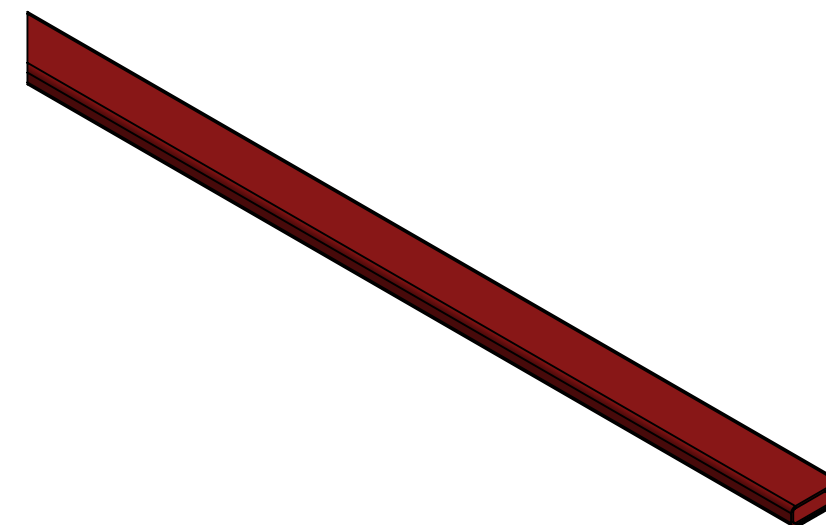
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Notes: Item (1) can be either blue or red. Refer to part drawing for more details.

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

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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		
INTERPRET GEOMETRIC TOLERANCING PER:		CHECKED		TITLE: <h3>Corral Tube Left Fastener Assembly</h3>
MATERIAL		ENG APPR.		
NEXT ASSY	USED ON	MFG APPR.		SIZE <b>B</b> DWG. NO. <b>GE-19182</b> REV
APPLICATION		FINISH		SCALE: 1:8 WEIGHT: SHEET 1 OF 1
DO NOT SCALE DRAWING		Q.A.		
		COMMENTS:		

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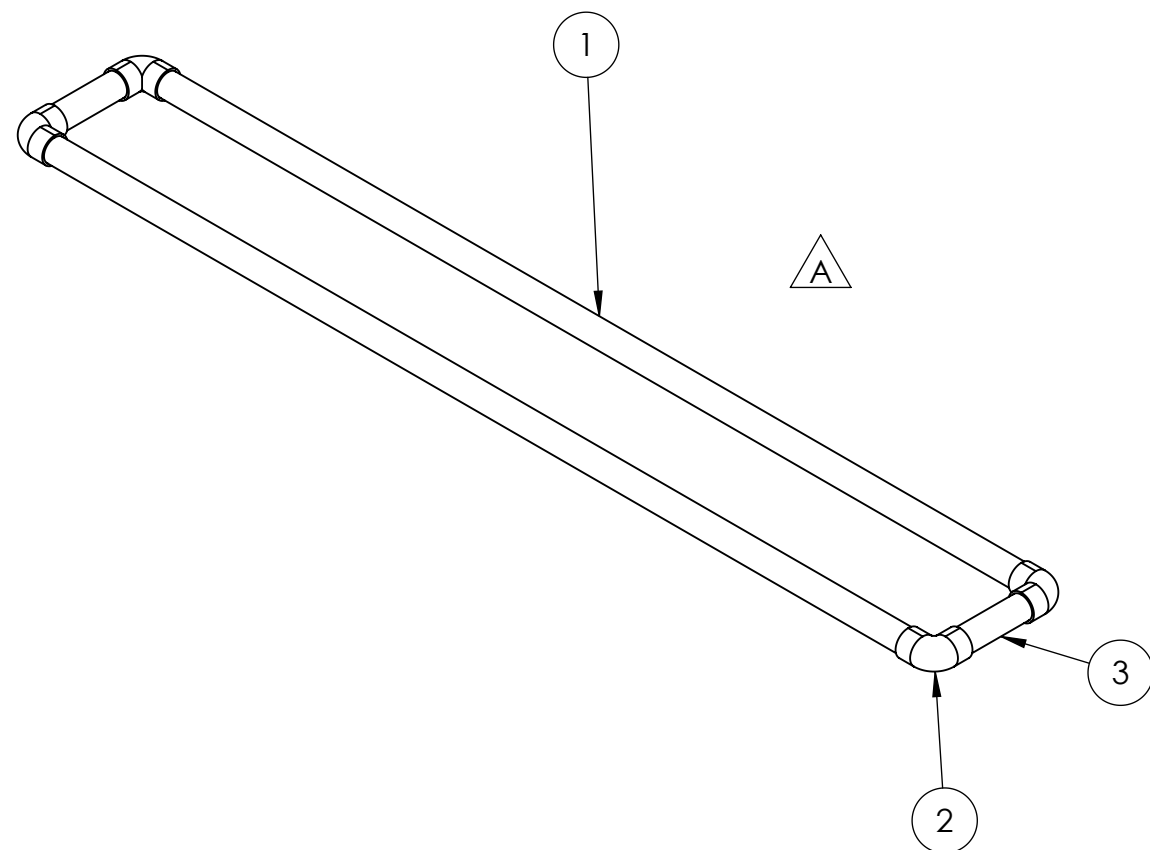
4

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



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-19183-01	1-1/2" Schedule 40 PVC Pipe	2
2	GE-19184	90 Degree Elbow	4
3	GE-19183-02	1-1/2" Schedule 40 PVC Pipe	2

Note:  
All Lettering to face down

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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		
INTERPRET GEOMETRIC TOLERANCING PER:		CHECKED		TITLE: <h2 style="text-align: center;">Cargo Hold Assembly</h2>
MATERIAL		ENG APPR.		
FINISH		MFG APPR.		SIZE <b>B</b> DWG. NO. <b>GE-19183</b> REV <b>B</b>
NEXT ASSY	USED ON	Q.A.		SCALE: 1:12 WEIGHT:
APPLICATION		COMMENTS:		SHEET 1 OF 5
DO NOT SCALE DRAWING				

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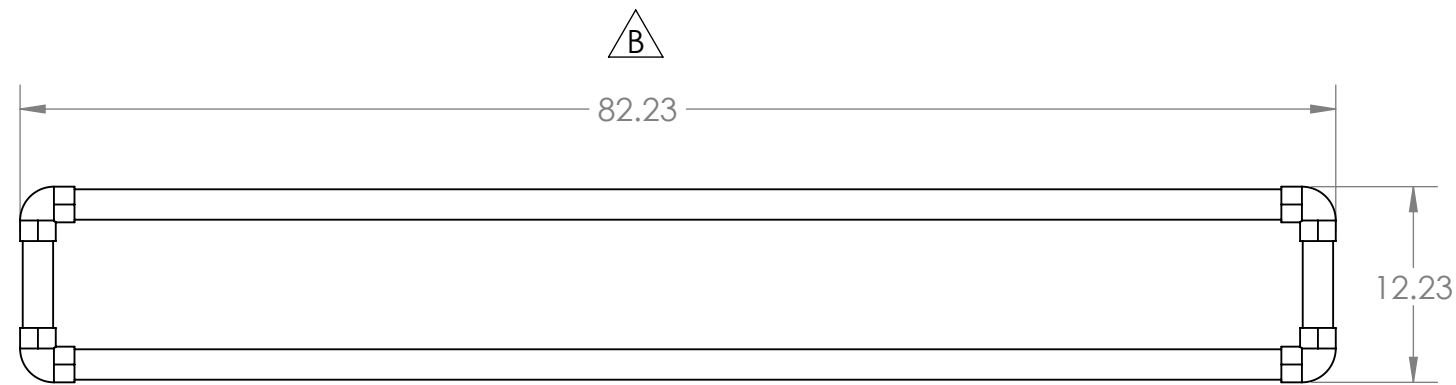
2

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

B

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



TITLE:		
Cargo Hold Assembly		
SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19183</b>	<b>B</b>
SCALE: 1:12 WEIGHT:		SHEET 2 OF 5

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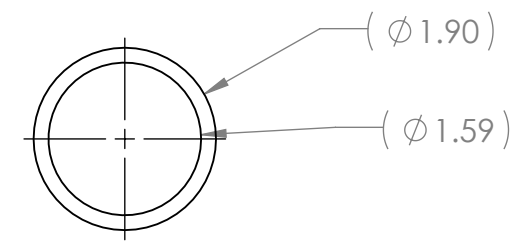
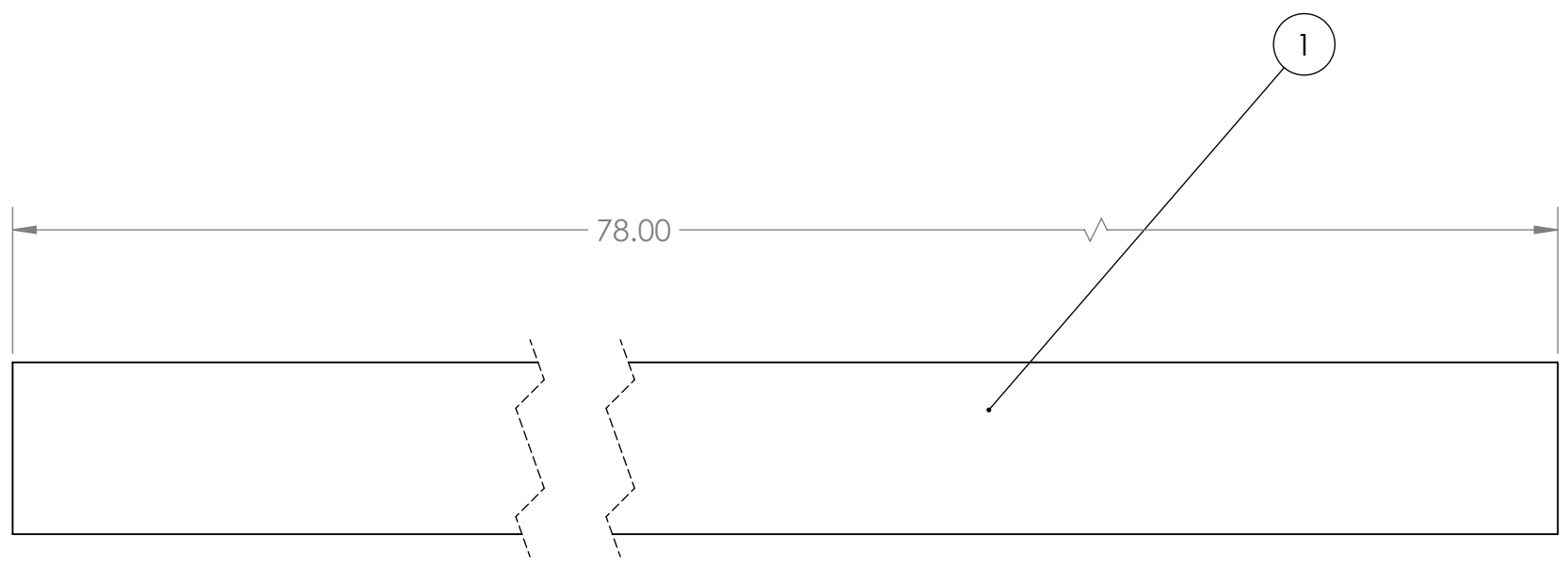
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Note  
 1. Material: 1 1/2" Thick Schedule 40 PVC Pipe  
 2. Remove Sharp Edges and Burrs  
 3. Tag or Label With Part Number



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

 		
TITLE: <b>Cargo Hold Assembly</b>		
SIZE <b>B</b>	DWG. NO. <b>GE-19183</b>	REV <b>B</b>
SCALE: 1:2	WEIGHT:	SHEET 3 OF 5

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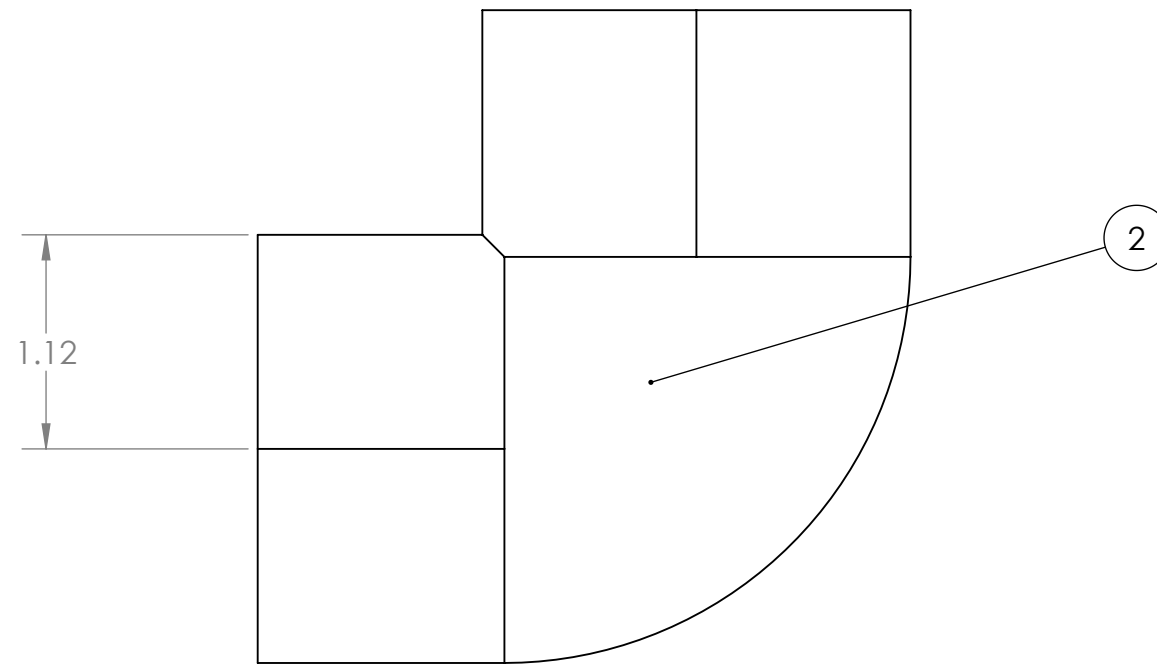
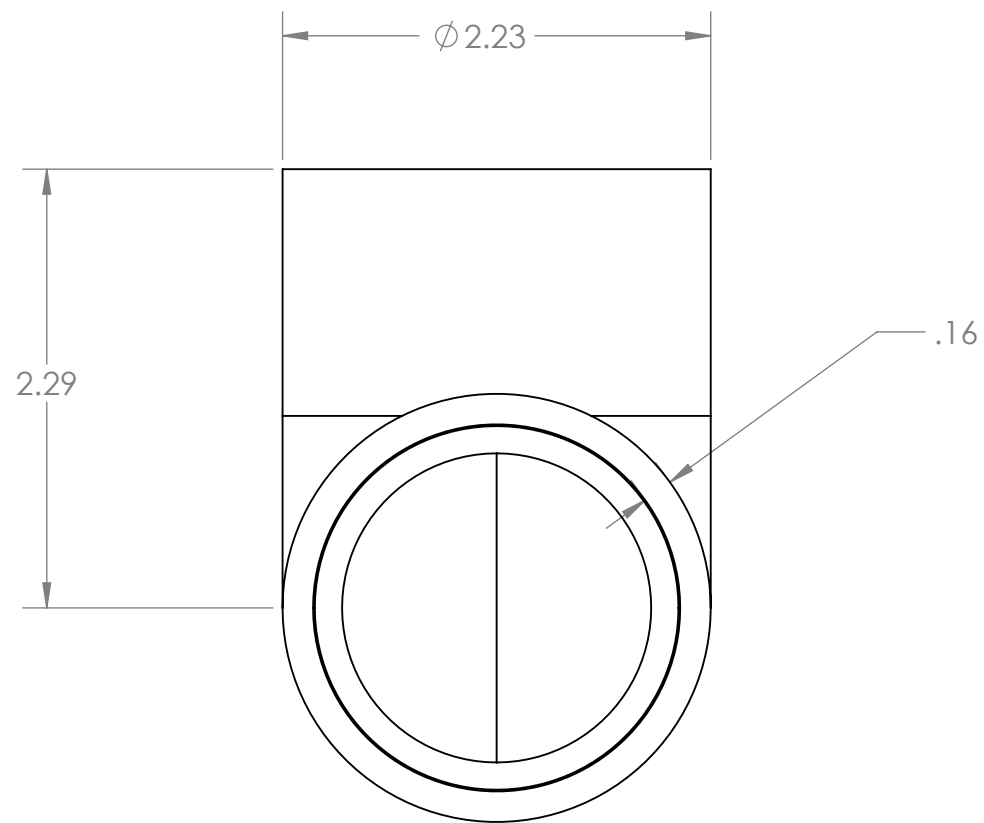
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Note:  
 1. Standard-Wall PVC Pipe Fitting for Water  
 90 Degree Elbow Connector, White, 1-1/2 Socket Female  
 2. McMaster-Carr 4880K25  
 3. Tag or Label With Part Number

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		UNLESS OTHERWISE SPECIFIED:	NAME	DATE	 
		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$	DRAWN		
		INTERPRET GEOMETRIC TOLERANCING PER:	CHECKED		<b>Cargo Hold Assembly</b>
		MATERIAL	ENG APPR.		
NEXT ASSY	USED ON	FINISH	MFG APPR.		SIZE <b>B</b>
APPLICATION		DO NOT SCALE DRAWING	Q.A.		DWG. NO. <b>GE-19183</b>
			COMMENTS:		REV <b>B</b>
					SCALE: 1:2 WEIGHT: SHEET 4 OF 5

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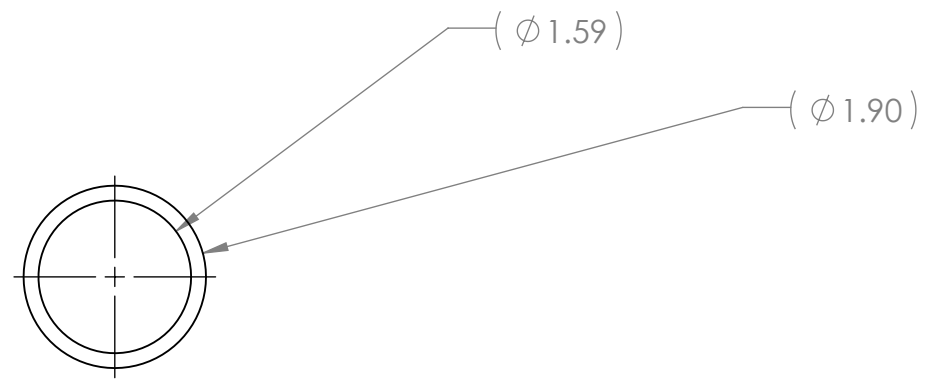
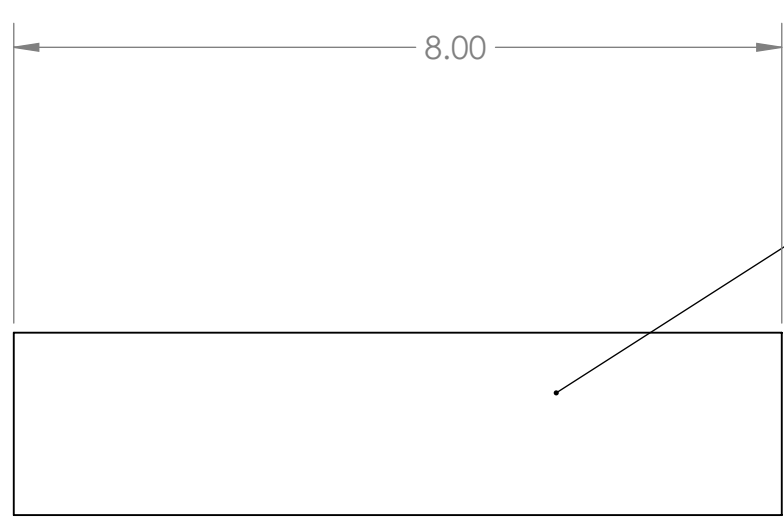
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Note  
 1. Material: 1 1/2" Thick Schedule 40 PVC Pipe  
 2. Remove Sharp Edges and Burrs  
 3. Tag or Label With Part Number

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		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			



TITLE: <b>Cargo Hold Assembly</b>		
SIZE <b>B</b>	DWG. NO. <b>GE-19183</b>	REV <b>B</b>
SCALE: 1:2	WEIGHT:	SHEET 5 OF 5

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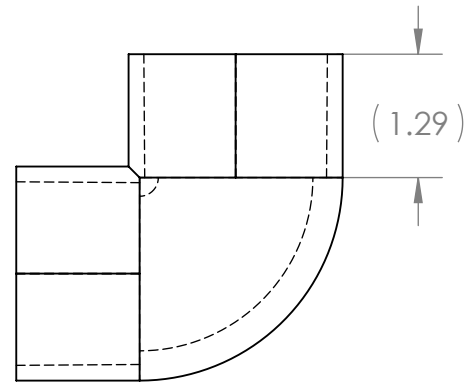
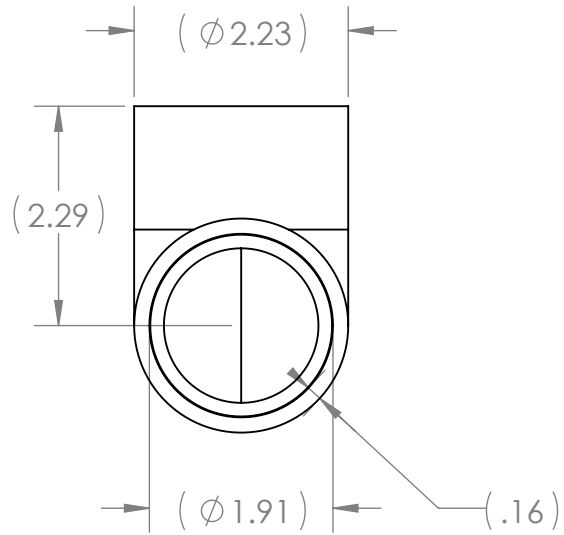
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Note:  
 1. Vendor: McMaster-Carr  
 2. 4880K25

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



TITLE:  
**90 Degree Elbow**

SIZE **A** DWG. NO. **GE-19184** REV **B**

SCALE: 1:2 WEIGHT: SHEET 1 OF 1

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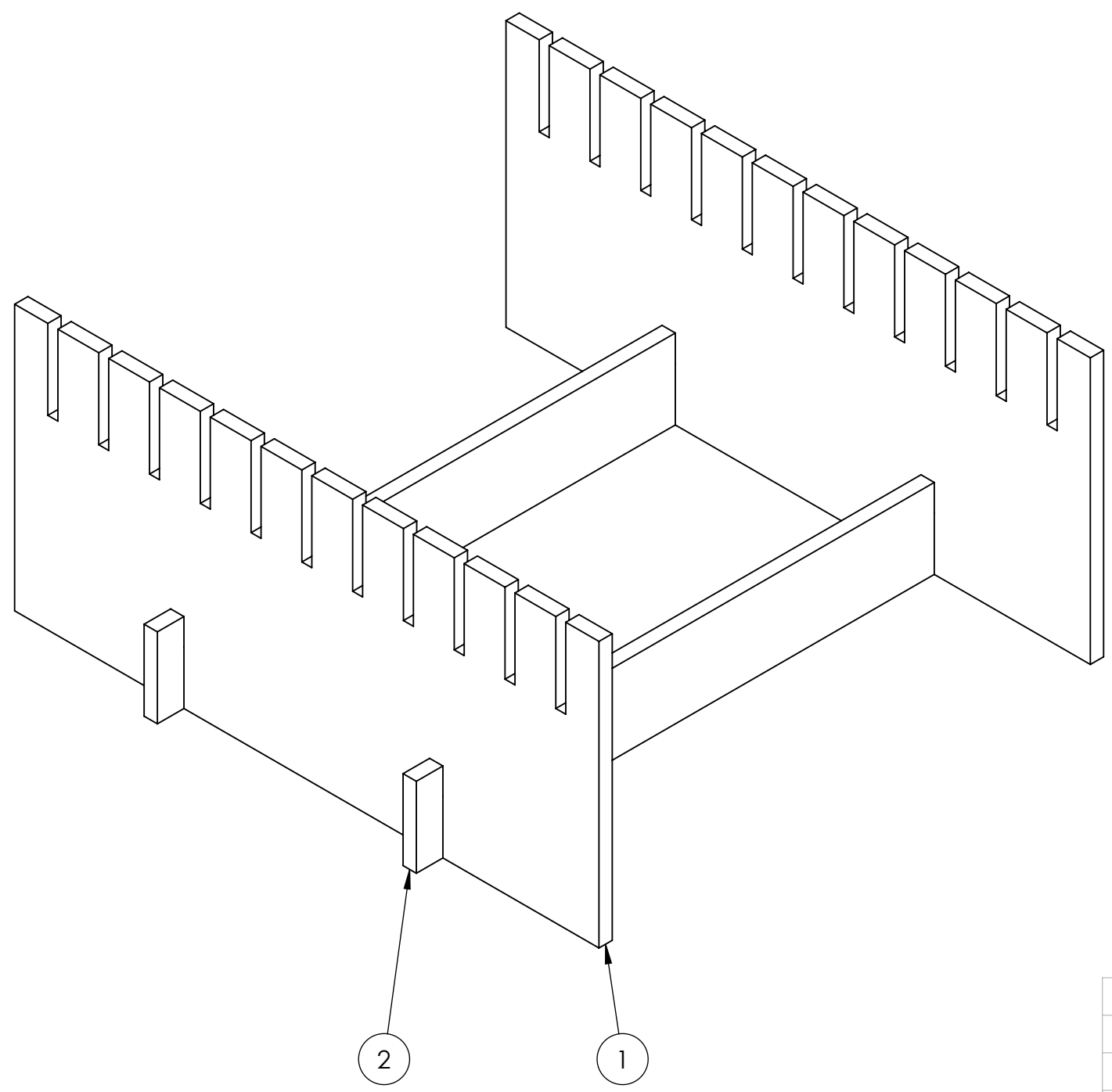
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GE-19186-02	1/2" Thick HDPE Sheet White	2
2	GE-19186-01	1/2" Thick HDPE Sheet White	2

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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		
INTERPRET GEOMETRIC TOLERANCING PER:		CHECKED		TITLE:
MATERIAL		ENG APPR.		<b>Panel Hold Assembly</b>
FINISH		MFG APPR.		SIZE DWG. NO. REV
NEXT ASSY	USED ON	Q.A.		<b>B GE-19186</b>
APPLICATION		COMMENTS:		SCALE: 1:4 WEIGHT: SHEET 1 OF 3
DO NOT SCALE DRAWING				

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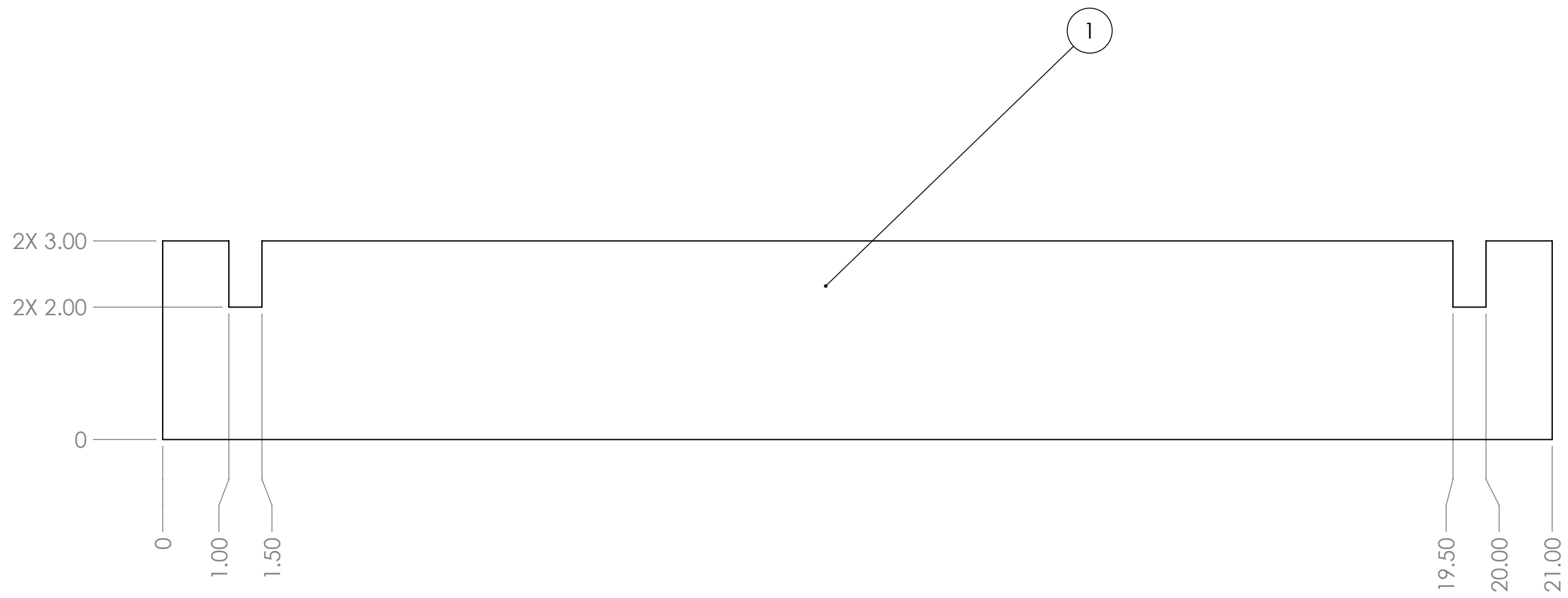
1

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Note:

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

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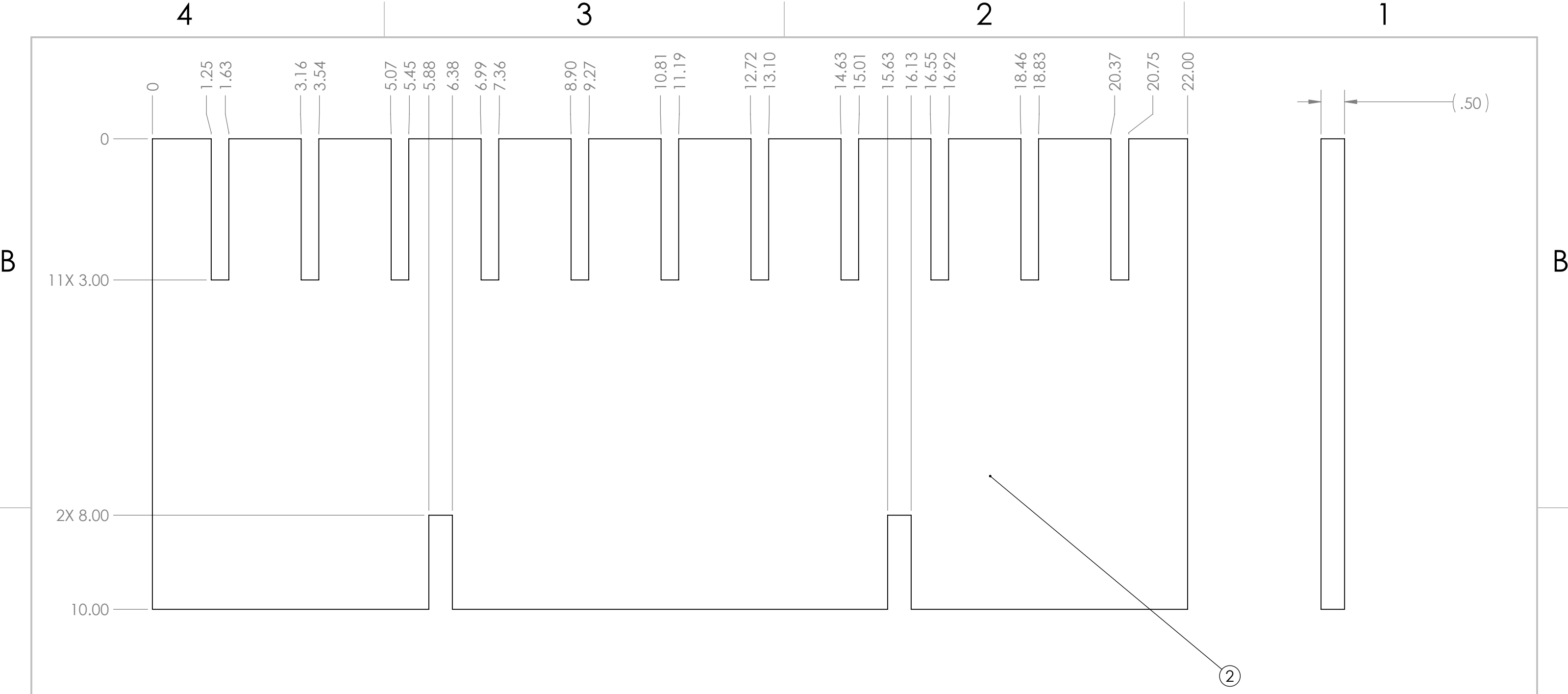
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		INTERPRET GEOMETRIC TOLERANCING PER:		CHECKED	
		MATERIAL		ENG APPR.	
		FINISH		MFG APPR.	
NEXT ASSY	USED ON			Q.A.	
APPLICATION		DO NOT SCALE DRAWING		COMMENTS:	
 					
TITLE: <b>Panel Hold Assembly</b>					
SIZE	DWG. NO.			REV	
<b>B</b>	<b>GE-19186</b>				
SCALE: 1:2		WEIGHT:		SHEET 2 OF 3	

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Note:

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

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

TITLE: **Panel Hold Assembly**

SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19186</b>	

SCALE: 1:2 WEIGHT: SHEET 3 OF 3

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FIRST logo applied on face.

Ø 13.00

Notes:

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

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		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		
		INTERPRET GEOMETRIC TOLERANCING PER:	CHECKED		SIZE DWG. NO. REV <b>B</b> <b>GE-19187</b>
		MATERIAL	ENG APPR.		
NEXT ASSY	USED ON	FINISH	MFG APPR.		SCALE: 1:2 WEIGHT: SHEET 1 OF 1
APPLICATION		DO NOT SCALE DRAWING	Q.A.	COMMENTS:	

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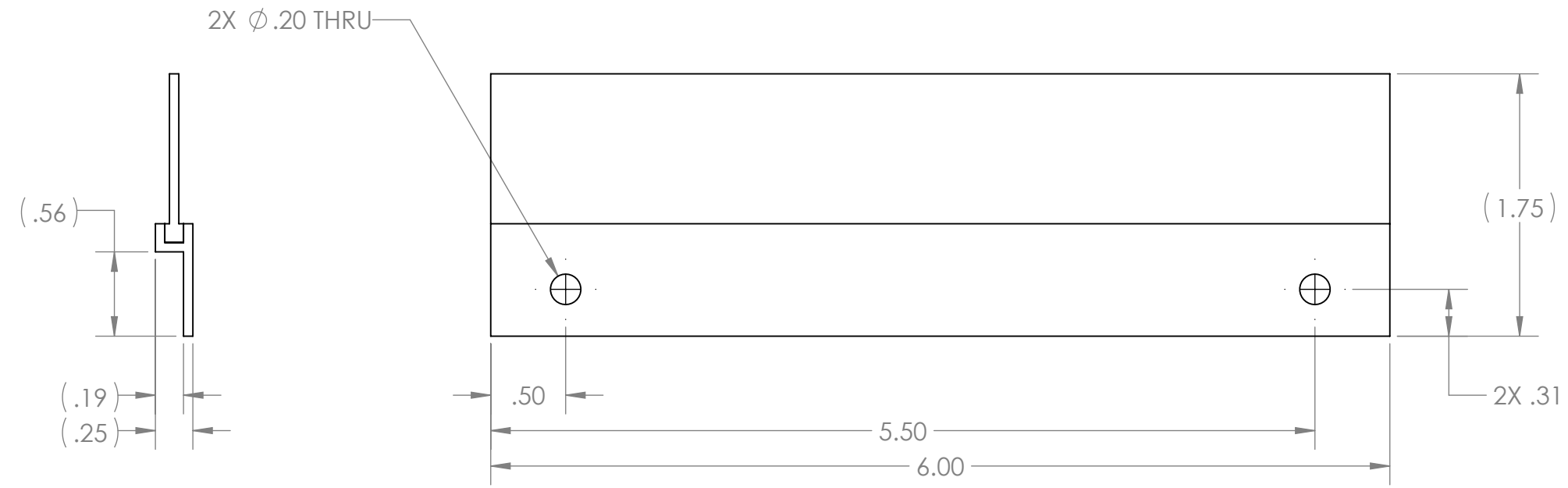
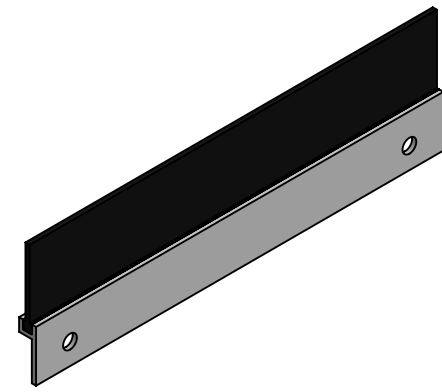
1

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

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



TITLE:		
Brush Assembly 6", Loading Station		
SIZE	DWG. NO.	REV
<b>B</b>	GE-19190	
SCALE: 1:1	WEIGHT:	SHEET 1 OF 1

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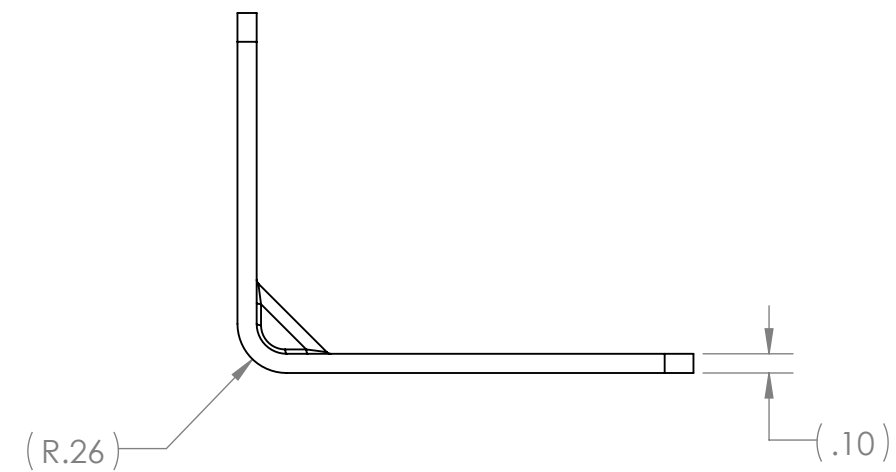
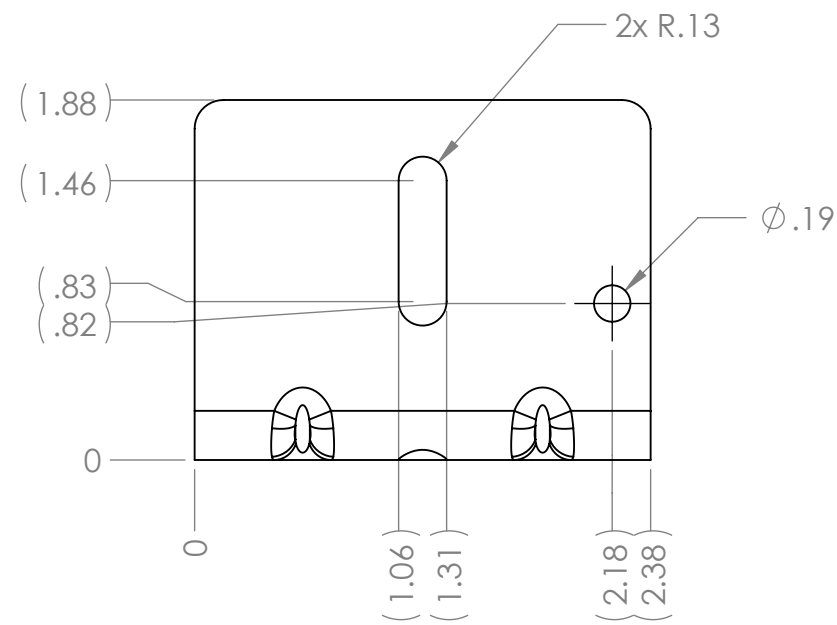
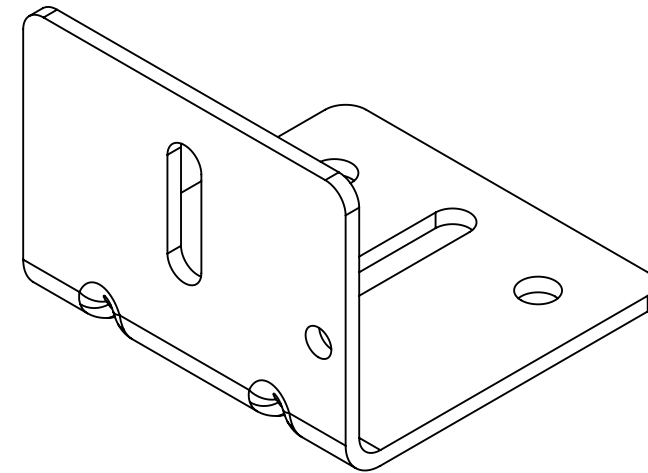
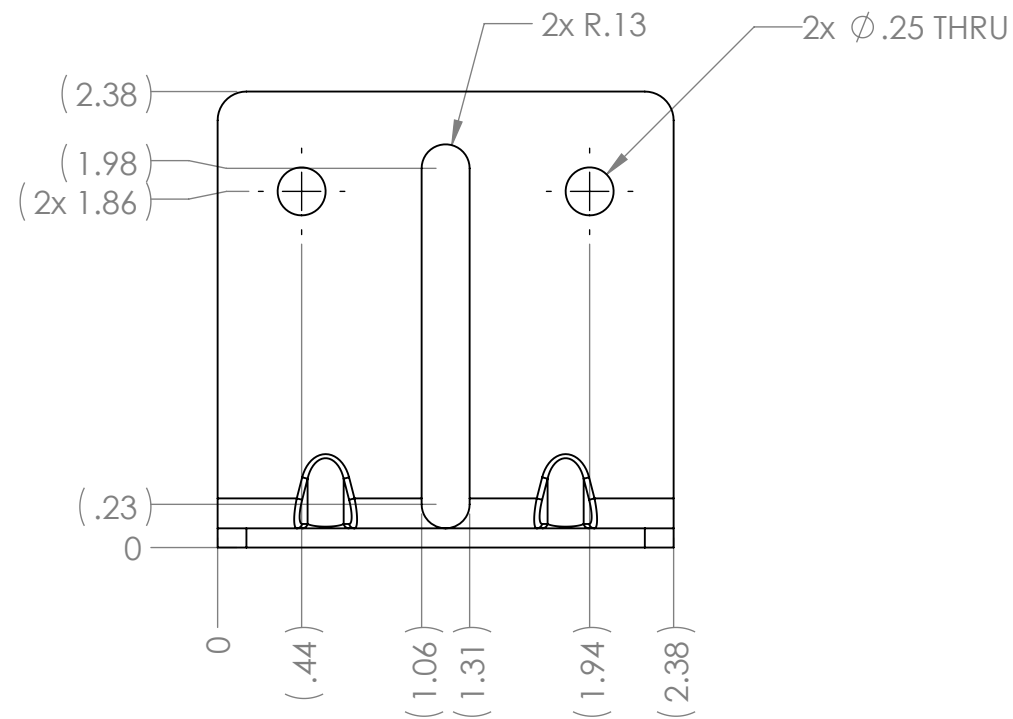
1

4

3

2

1





Notes:

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

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

TITLE:

# Cargo Ship Corner Bracket

SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19195</b>	
SCALE: 1:1	WEIGHT:	SHEET 1 OF 1

4

3

2

1

B

B

A

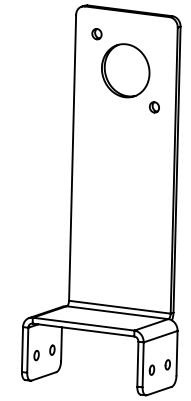
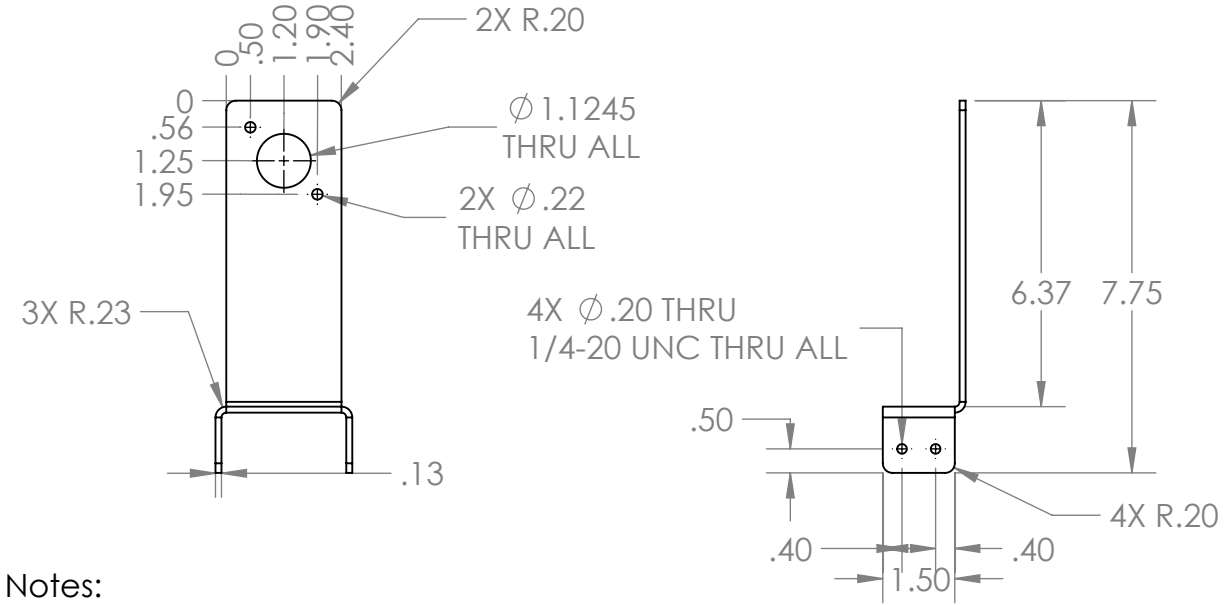
A

2

1

B

B



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

A

A

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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

TITLE:  
**Shutter Motor Bracket**

SIZE **A** DWG. NO. **GE-19196** REV

SCALE: 1:4 WEIGHT: SHEET 1 OF 1

2

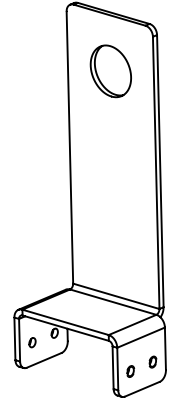
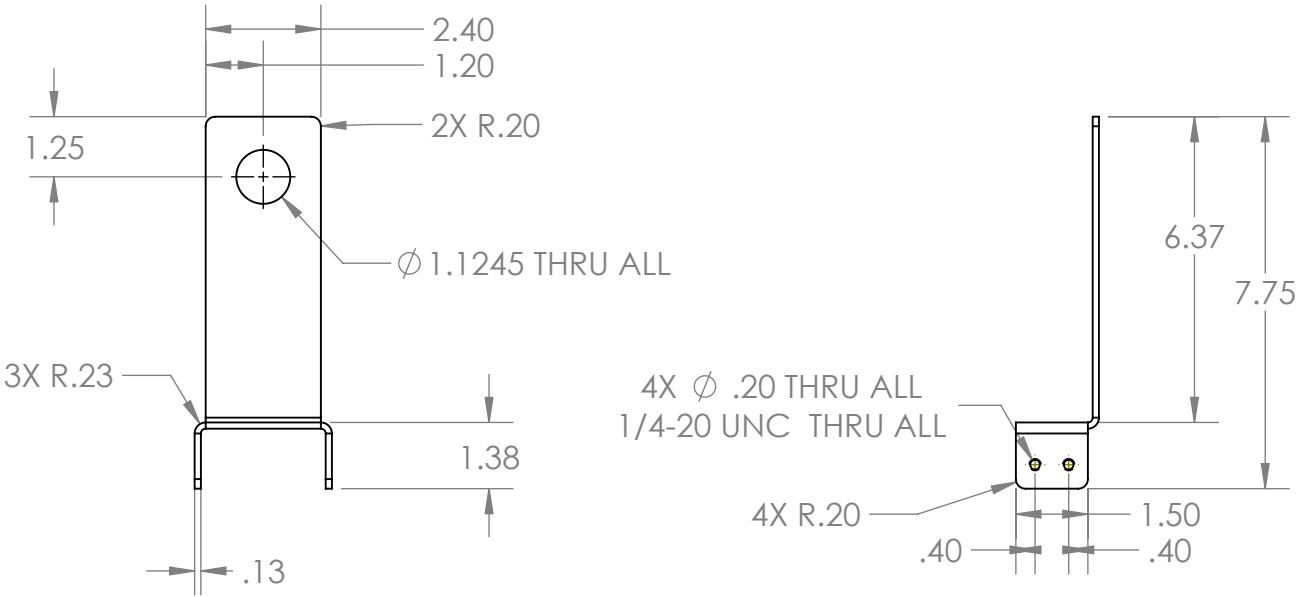
1

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B

B



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

A

A

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



TITLE:  
**Shutter Bracket**

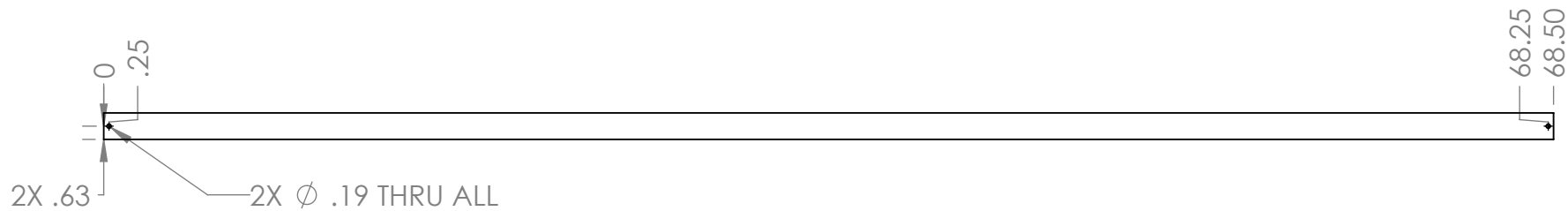
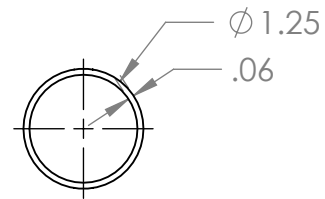
SIZE	DWG. NO.	REV
<b>A</b>	<b>GE-19197</b>	
SCALE: 1:4		WEIGHT:
		SHEET 1 OF 1

2

1

B

1





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

A

A

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		UNLESS OTHERWISE SPECIFIED:		NAME	DATE	 		
		DIMENSIONS ARE IN INCHES		DRAWN		TITLE: <b>Shutter Pipe</b>		
		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:		SIZE	DWG. NO.	REV
		INTERPRET GEOMETRIC TOLERANCING PER:				<b>A</b>	<b>GE-19198</b>	
		MATERIAL				SCALE: 1:16		WEIGHT:
		FINISH				SHEET 1 OF 1		
	NEXT ASSY	USED ON	APPLICATION	DO NOT SCALE DRAWING				

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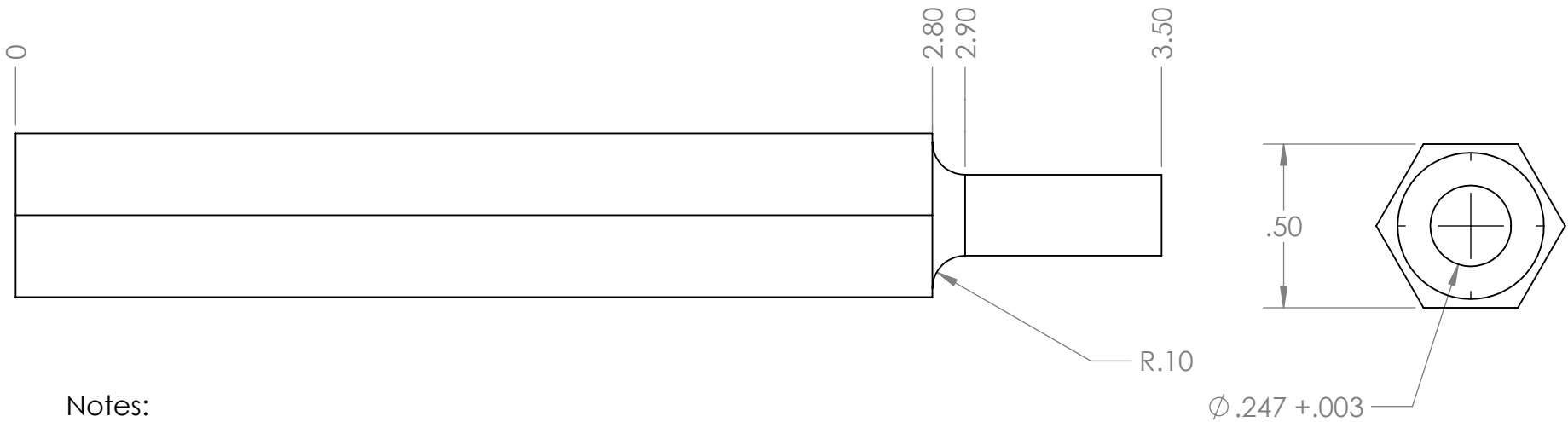
1

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B

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

A

A

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



TITLE:  
**Shutter Middle Axle**

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

2

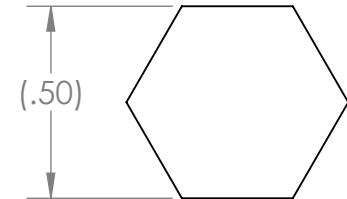
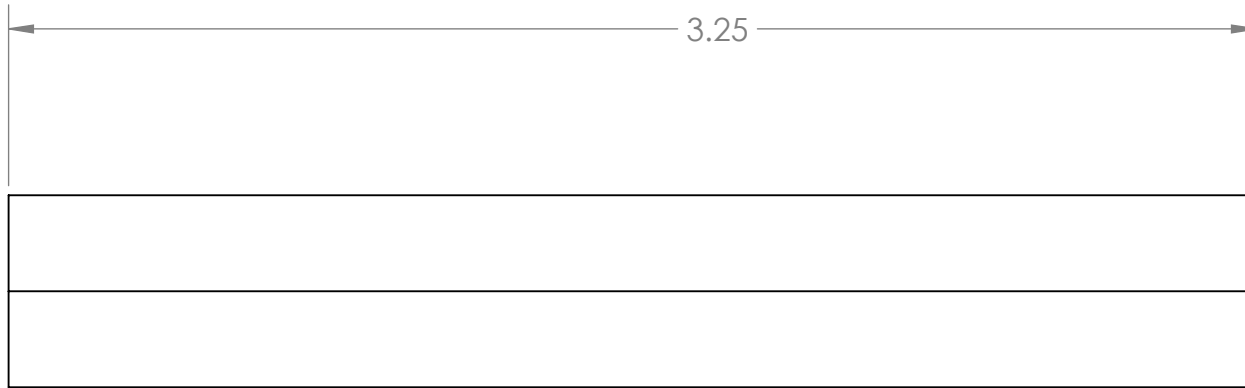
1

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B

B



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

A

A

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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			
		FINISH			
NEXT ASSY	USED ON				
APPLICATION		DO NOT SCALE DRAWING			

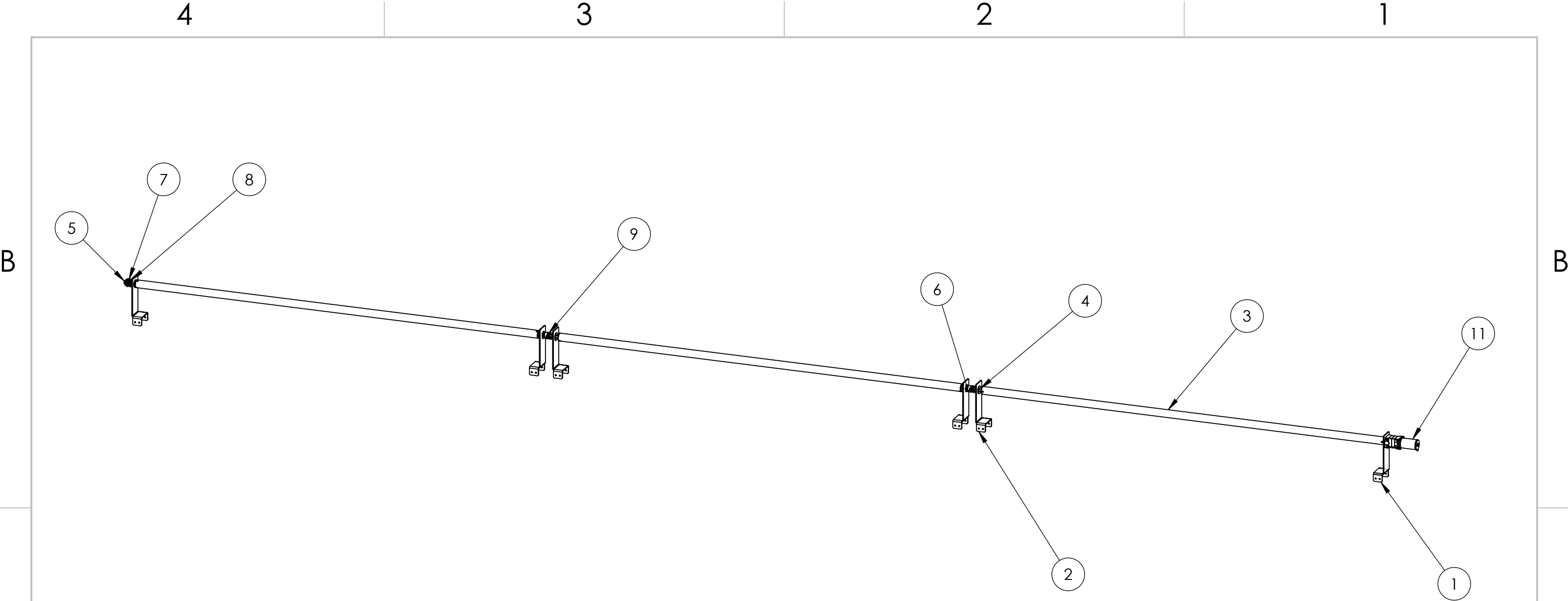


TITLE:  
**Shutter End Axle**

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



2

1



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

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



4

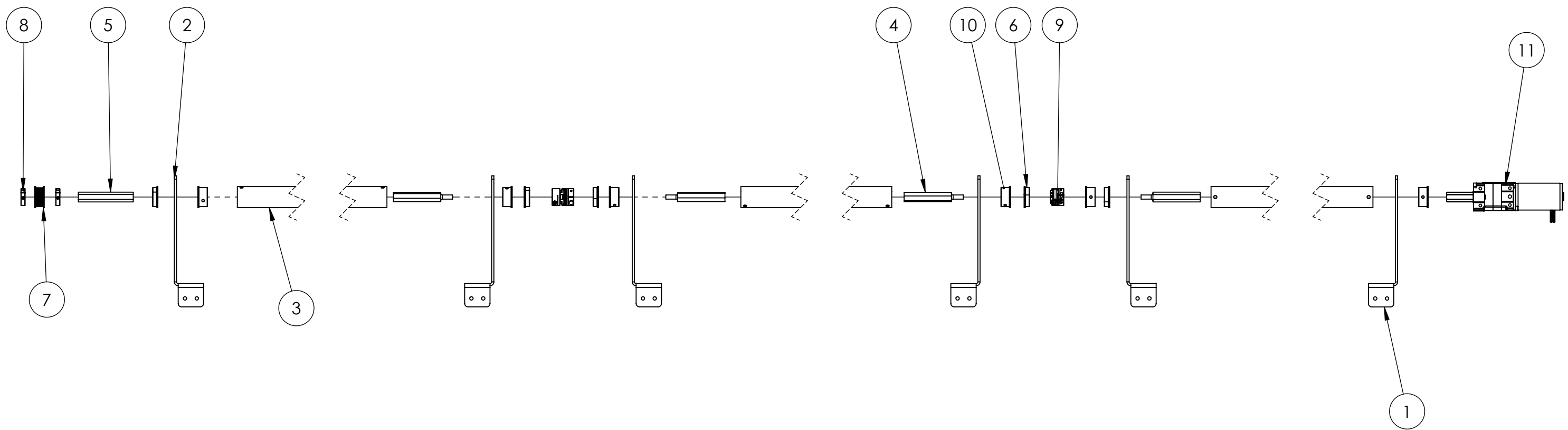
3

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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		
		INTERPRET GEOMETRIC TOLERANCING PER:	CHECKED		SIZE DWG. NO. REV
		MATERIAL	ENG APPR.		<b>B</b> <b>GE-19201</b>
NEXT ASSY	USED ON	FINISH	MFG APPR.		SCALE: 1:32 WEIGHT: SHEET 2 OF 2
APPLICATION		DO NOT SCALE DRAWING	Q.A.		
			COMMENTS:		

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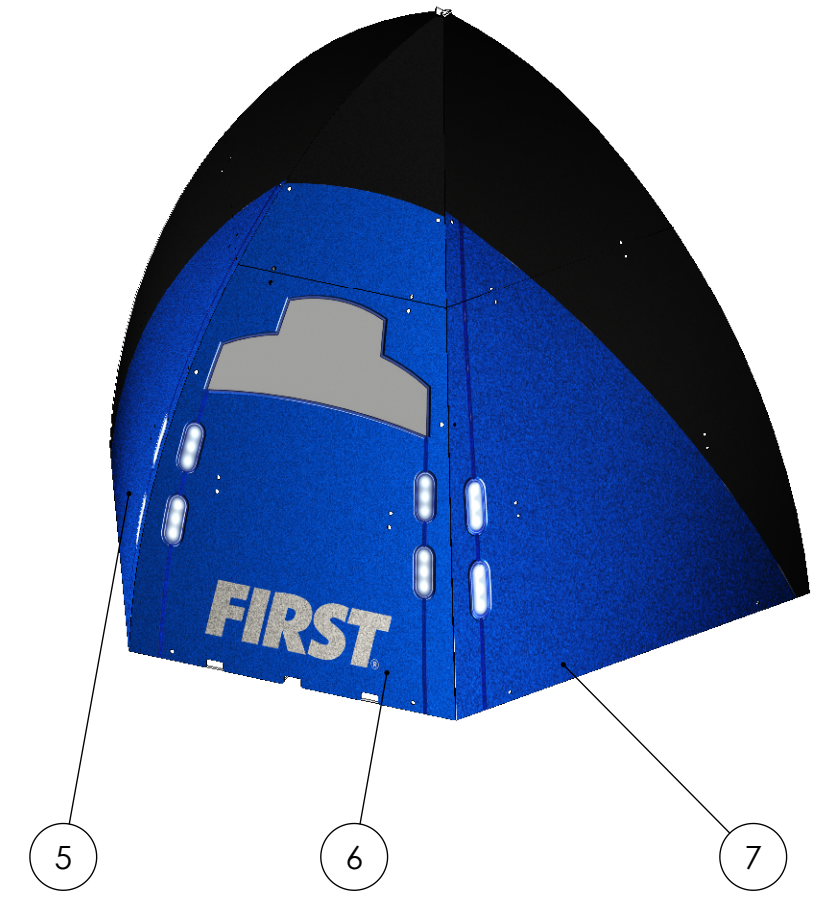
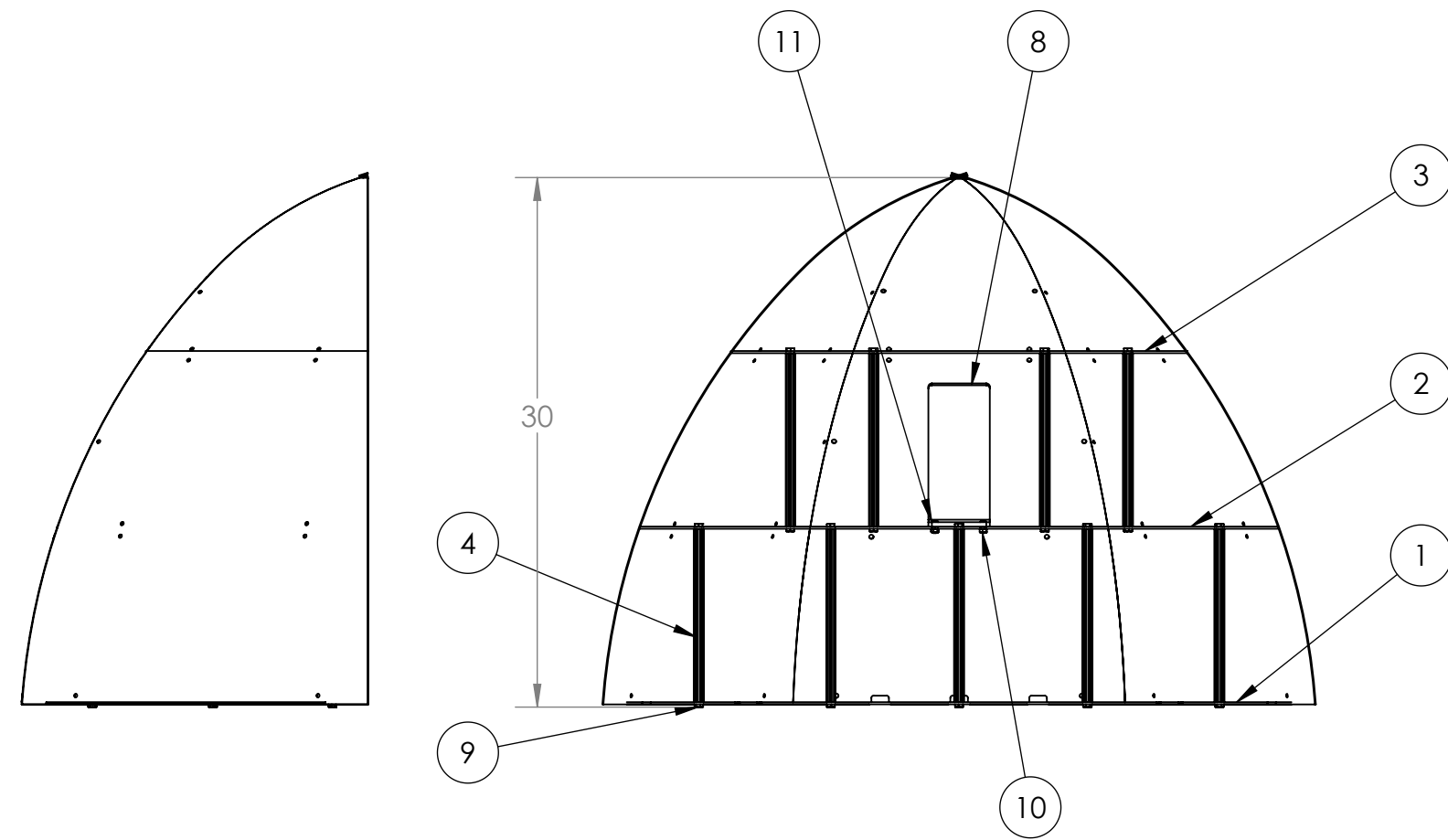
3

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B

B



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

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

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




TITLE: **Nose Cone Assembly**

SIZE **B** DWG. NO. **GE-19202** REV  
 SCALE: 1:10 WEIGHT: SHEET 1 OF 2

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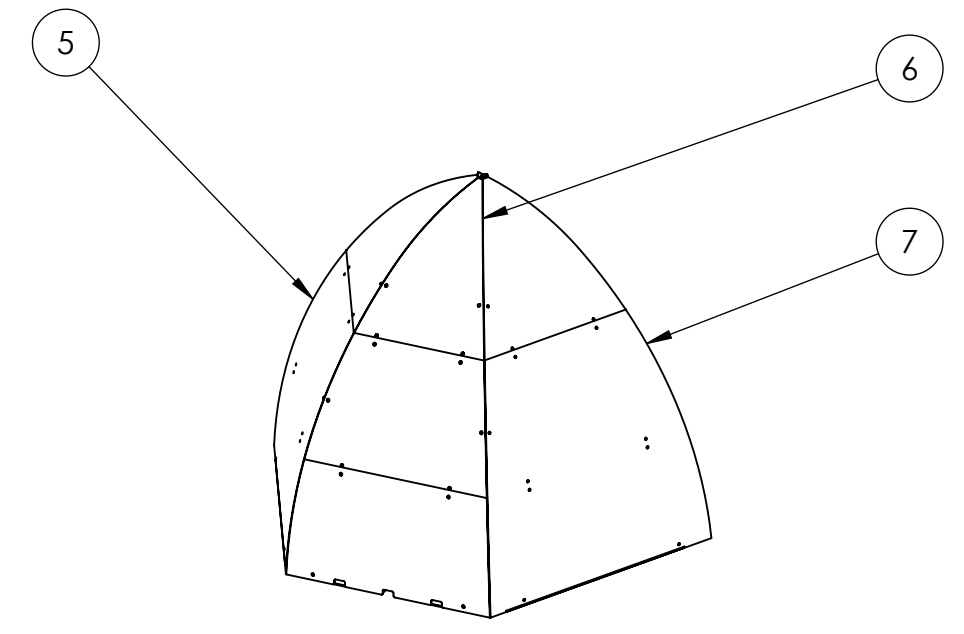
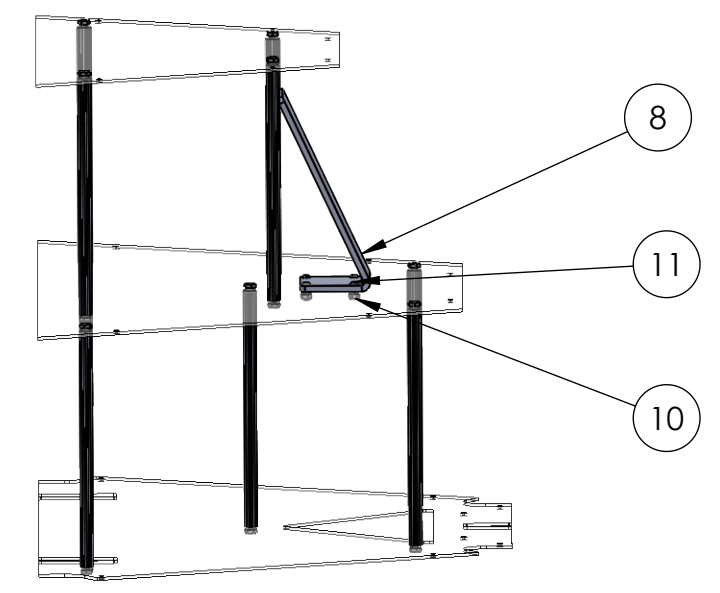
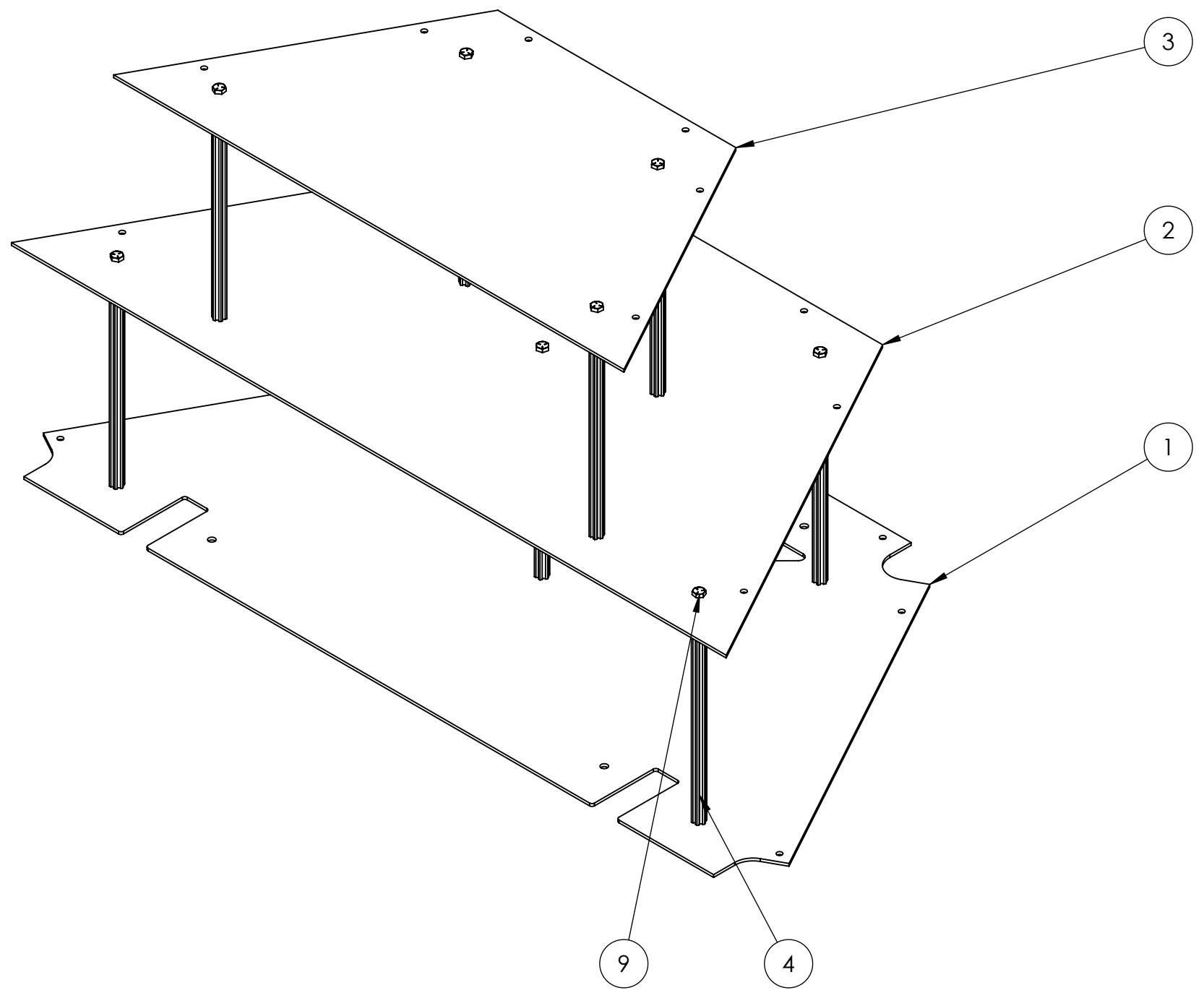
1

B

B

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A





Notes:

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

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		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			

 		
TITLE: <b>Nose Cone Assembly</b>		
SIZE <b>B</b>	DWG. NO. <b>GE-19202</b>	REV
SCALE: 1:5	WEIGHT:	SHEET 2 OF 2

4

3

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1

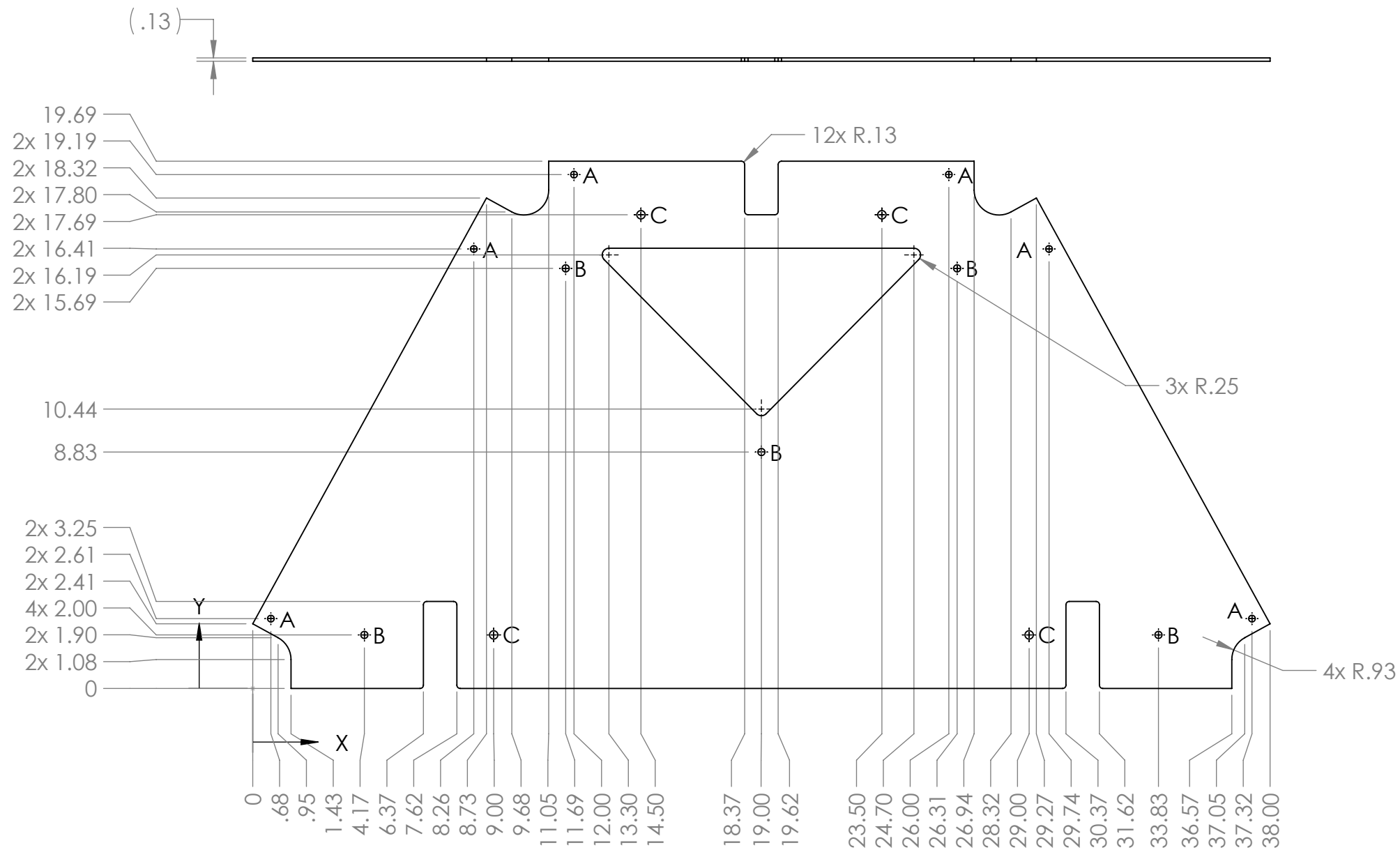
4

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1

TAG	SIZE	QUANTITY
A	∅ .25 THRU ALL	6
B	∅ .27 THRU ALL	5
C	∅ .31 THRU ALL	4





Notes:

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

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UNLESS OTHERWISE SPECIFIED:		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			

 		
TITLE: <b>Nose Cone Bottom Shelf</b>		
SIZE <b>B</b>	DWG. NO. <b>GE-19203</b>	REV
SCALE: 1:5	WEIGHT:	SHEET 1 OF 1

4

3

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1

B

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A

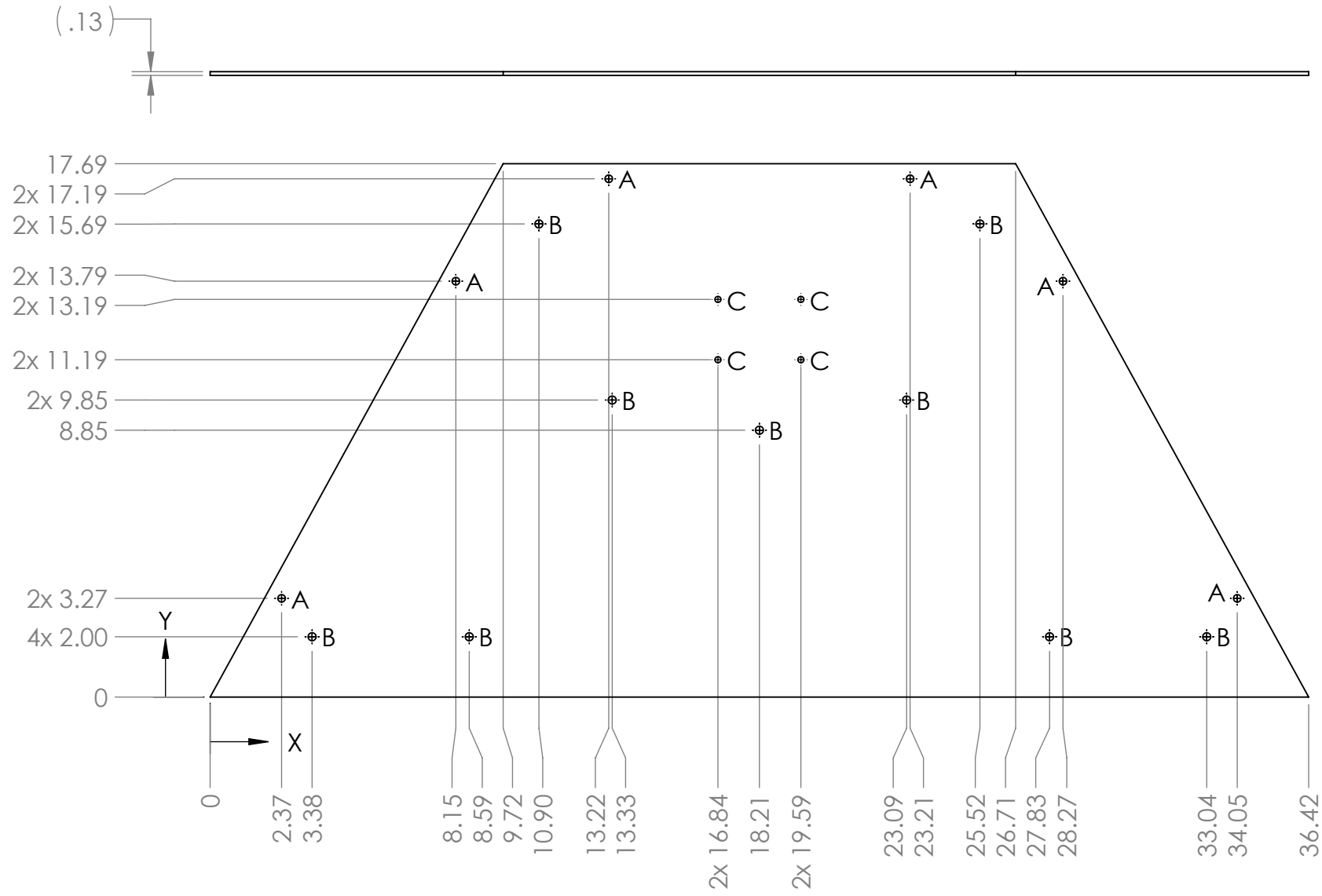
4

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1



TAG	SIZE	QUANTITY
A	∅ .25 THRU ALL	6
B	∅ .27 THRU ALL	9
C	∅ .20 THRU ALL	4



Notes:

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

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		UNLESS OTHERWISE SPECIFIED:		NAME	DATE
		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL ±1/16 ANGULAR: MACH ±1° BEND ±1° TWO PLACE DECIMAL ±.01 THREE PLACE DECIMAL ±.001		DRAWN	
		INTERPRET GEOMETRIC TOLERANCING PER:		CHECKED	
		MATERIAL		ENG APPR.	
		FINISH		MFG APPR.	
NEXT ASSY	USED ON			Q.A.	
APPLICATION		DO NOT SCALE DRAWING		COMMENTS:	
 					
TITLE: <b>Nose Cone Middle Shelf</b>					
SIZE	DWG. NO.			REV	
<b>B</b>	<b>GE-19204</b>				
SCALE: 1:5		WEIGHT:		SHEET 1 OF 1	

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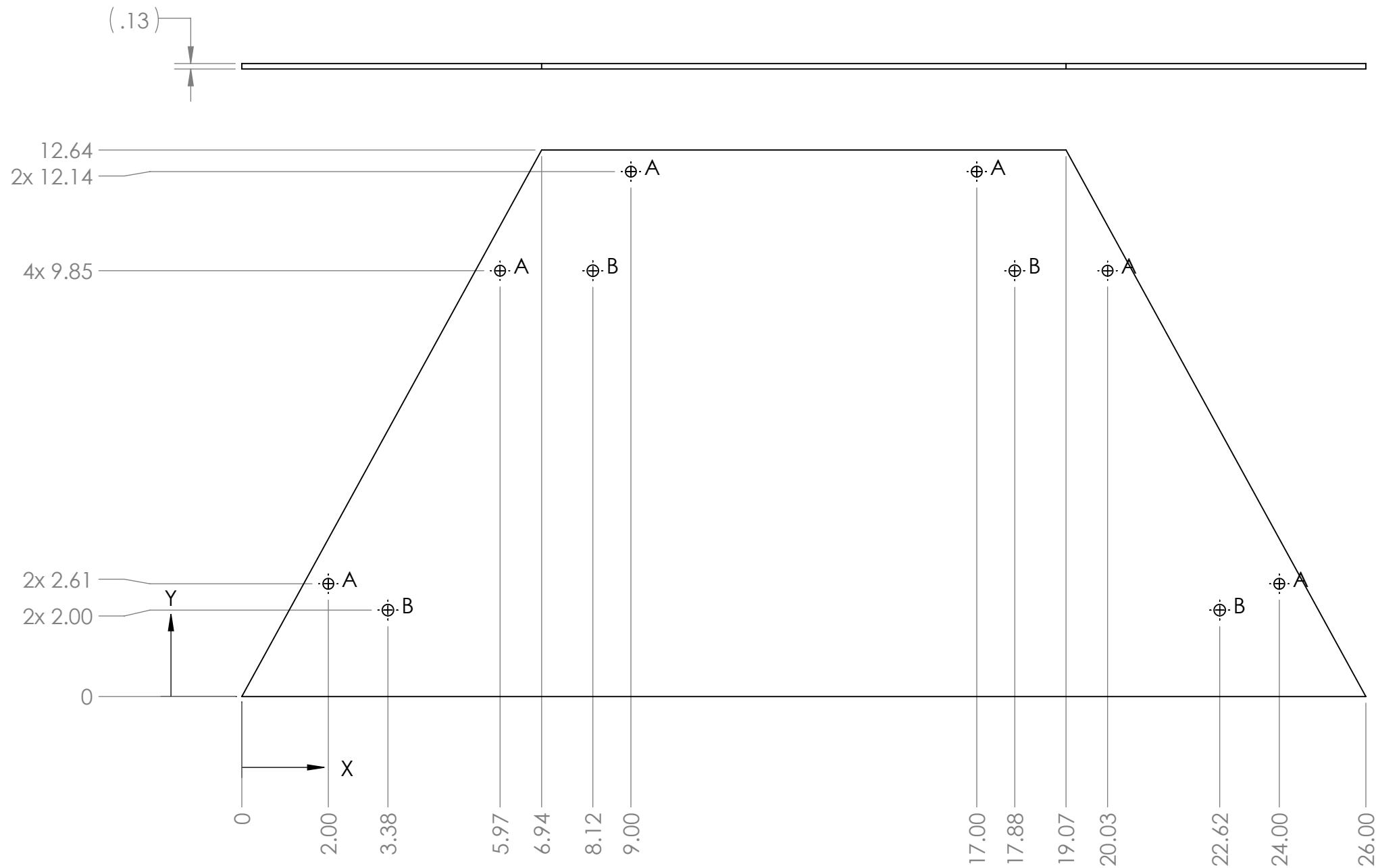
B

B

A

A

TAG	SIZE	QUANTITY
A	∅ .25 THRU ALL	6
B	∅ .27 THRU ALL	4





Notes:

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

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		UNLESS OTHERWISE SPECIFIED:	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		

 		
TITLE:		
<h1>Nose Cone Top Shelf</h1>		
SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19205</b>	
SCALE: 1:3	WEIGHT:	SHEET 1 OF 1

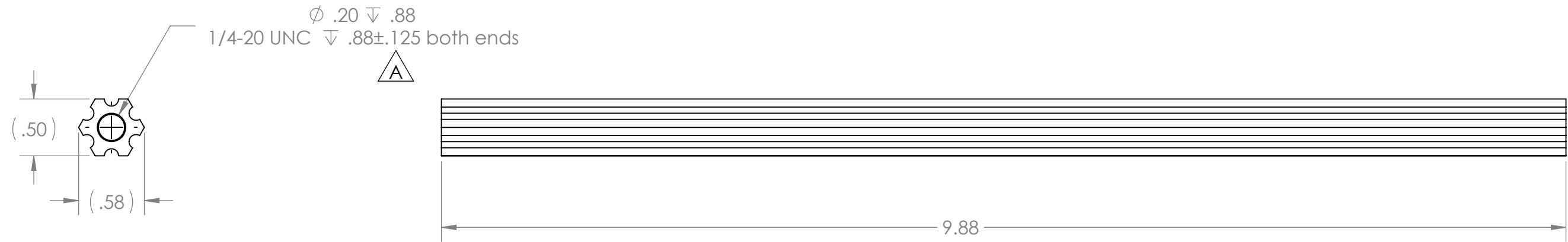
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1



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



Note:

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

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		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		
		INTERPRET GEOMETRIC TOLERANCING PER:	CHECKED		SIZE <b>B</b> DWG. NO. <b>GE-19206</b> REV <b>A</b>
		MATERIAL	ENG APPR.		SCALE: 1:1 WEIGHT: SHEET 1 OF 1
NEXT ASSY	USED ON	FINISH	MFG APPR.		
APPLICATION		DO NOT SCALE DRAWING	Q.A.		
			COMMENTS:		

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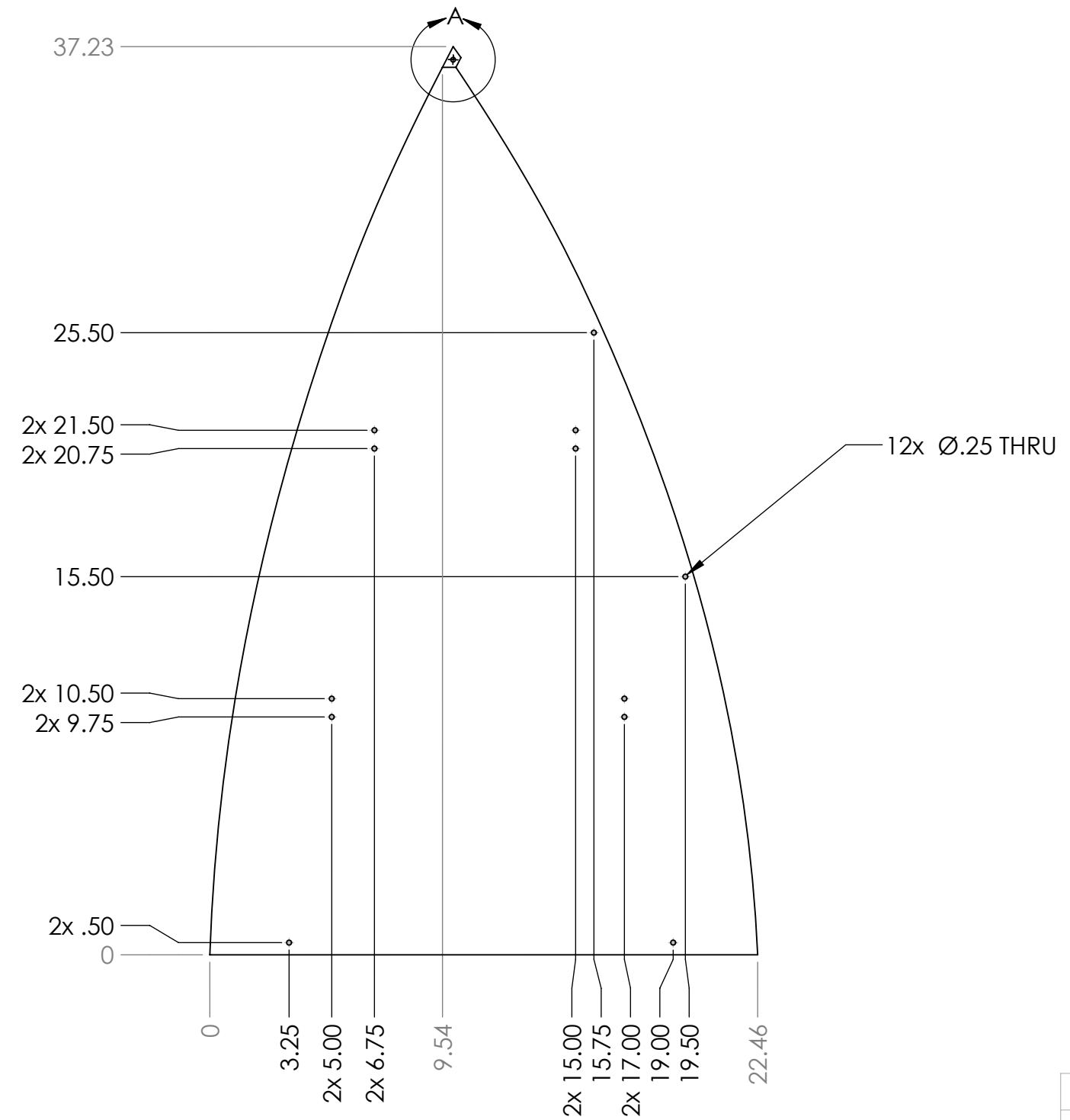
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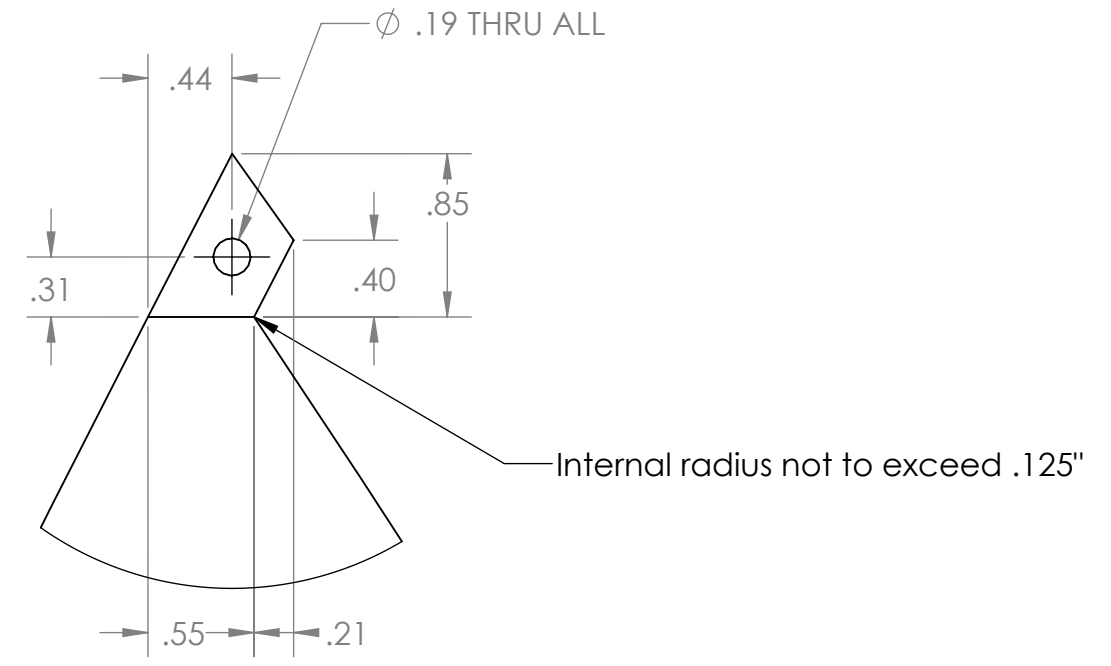
B

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(.06)





DETAIL A  
SCALE 1 : 1

Notes:

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

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		UNLESS OTHERWISE SPECIFIED:		NAME	DATE
		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL ±1/16 ANGULAR: MACH ±1° BEND ±1° TWO PLACE DECIMAL ±.01 THREE PLACE DECIMAL ±.001		DRAWN	
		INTERPRET GEOMETRIC TOLERANCING PER:		CHECKED	
		MATERIAL		ENG APPR.	
NEXT ASSY	USED ON	FINISH		MFG APPR.	
APPLICATION		DO NOT SCALE DRAWING		Q.A.	
				COMMENTS:	
 					
TITLE: <b>Nose Cone Left Face</b>					
SIZE	DWG. NO.			REV	
<b>B</b>	<b>GE-19207</b>				
SCALE: 1:6		WEIGHT:		SHEET 1 OF 1	

4

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1

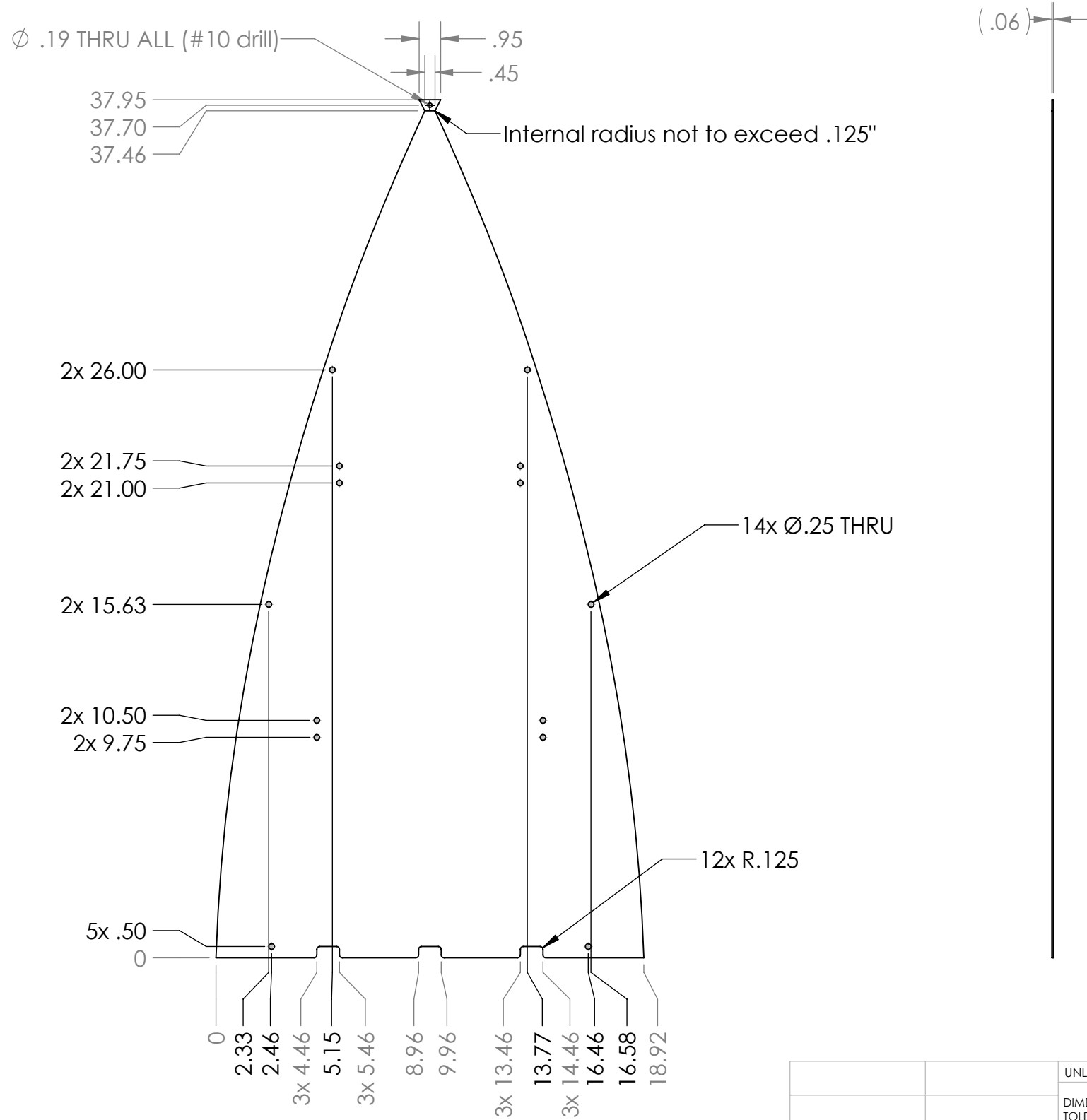


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- Notes:
1. Material: 1/16" thick polycarbonate, clear.
  2. Remove all burrs and sharp edges.
  3. Vinyl to be applied to face.
  4. Tag or label with part number.

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		UNLESS OTHERWISE SPECIFIED:		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	
		INTERPRET GEOMETRIC TOLERANCING PER:		CHECKED	
		MATERIAL		ENG APPR.	
		FINISH		MFG APPR.	
NEXT ASSY	USED ON			Q.A.	
APPLICATION		DO NOT SCALE DRAWING		COMMENTS:	
 					
TITLE: <b>Nose Cone Center Face</b>					
SIZE	DWG. NO.			REV	
<b>B</b>	<b>GE-19208</b>				
SCALE: 1:6		WEIGHT:		SHEET 1 OF 1	

4

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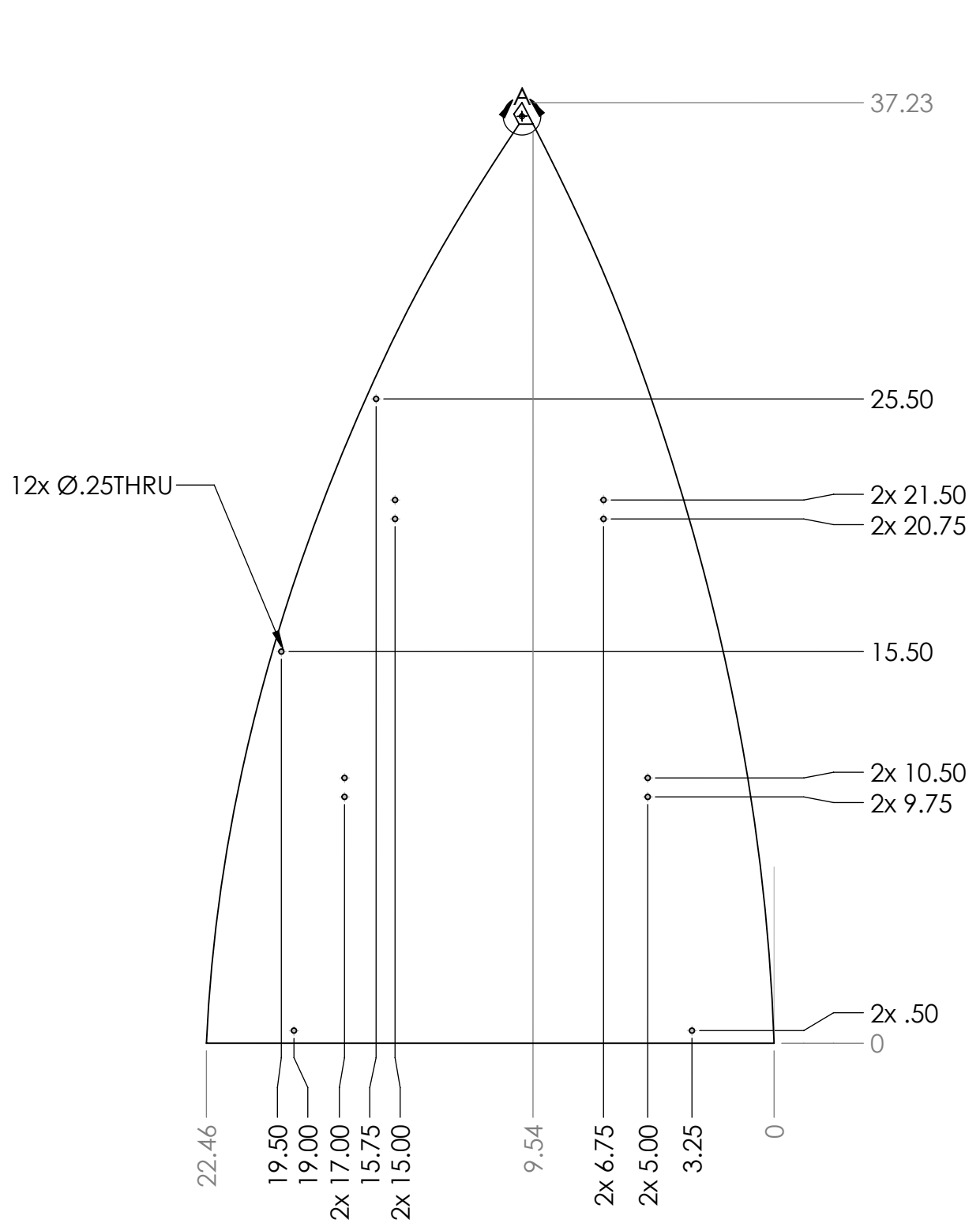
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B

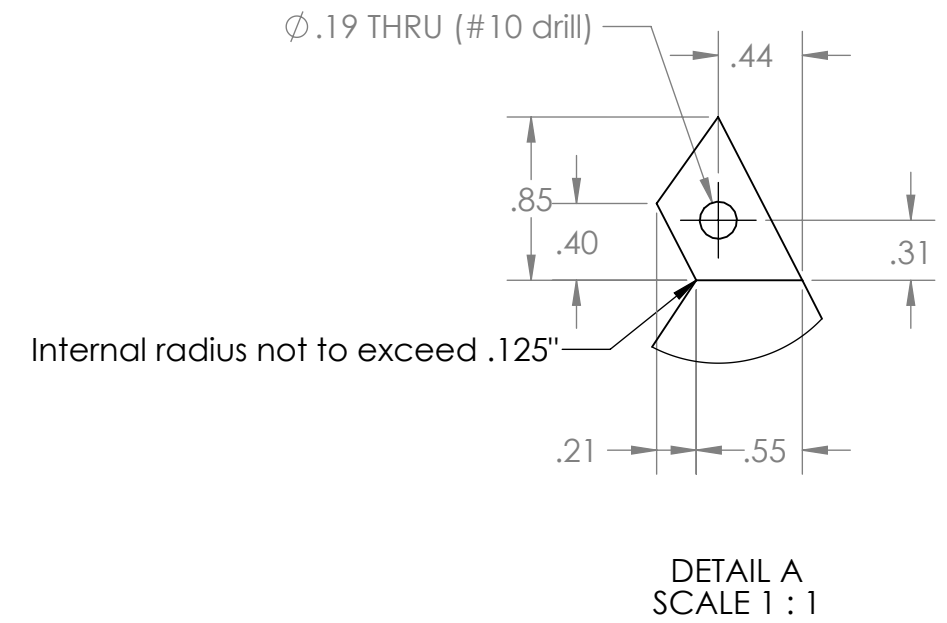
B

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(.06)





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

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		UNLESS OTHERWISE SPECIFIED:		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			

 		
TITLE:		
Nose Cone Right Face		
SIZE	DWG. NO.	REV
<b>B</b>	GE-19209	
SCALE: 1:6	WEIGHT:	SHEET 1 OF 1

4

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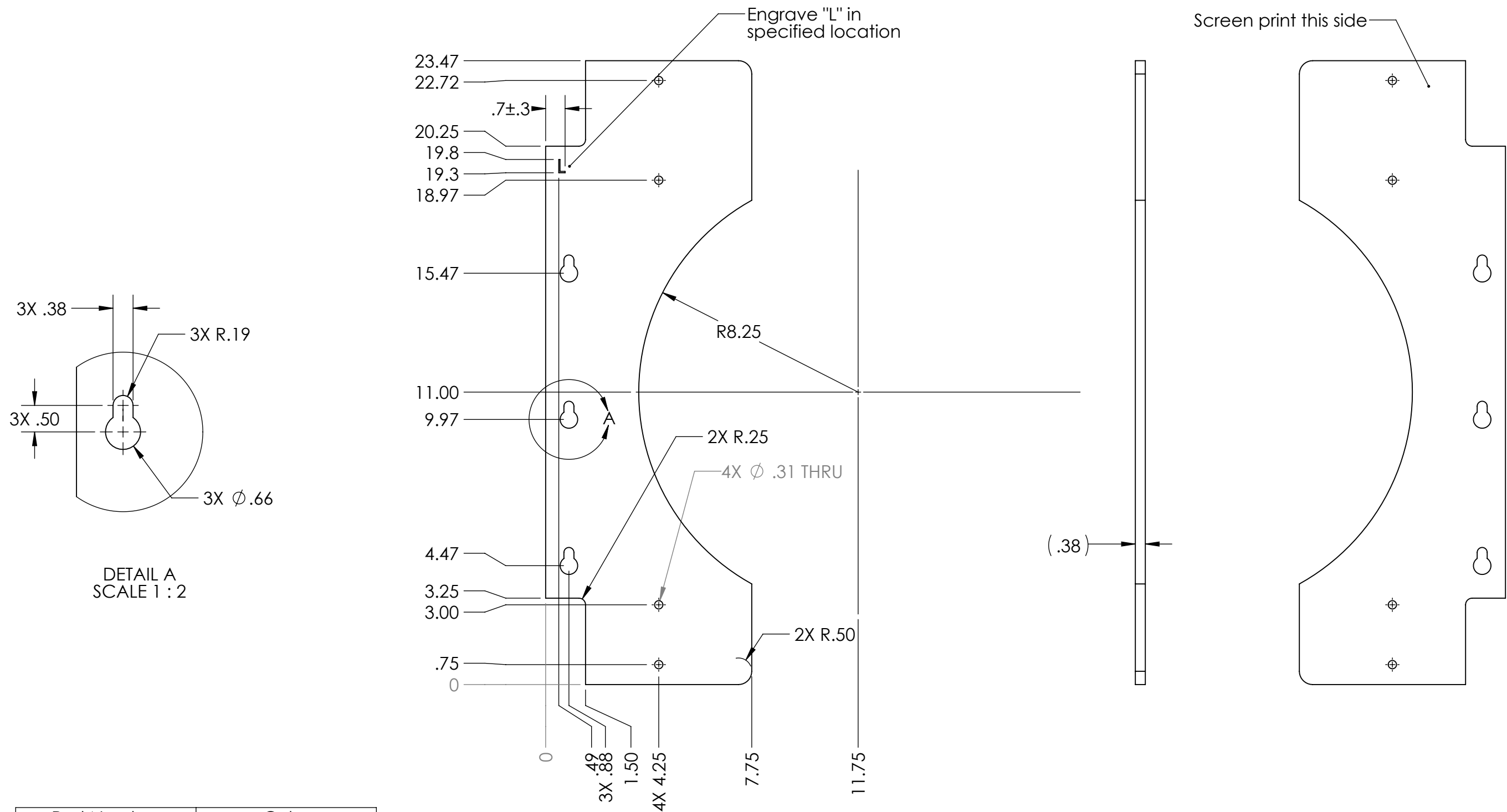
1

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1



DETAIL A  
SCALE 1 : 2



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

Note:  
 Dimensions are identical to GE-19077  
 Material: 3/8" Thick Polycarbonate Sheet Clear  
 Finish: Apply red or blue screen print to indicated side  
 Tag or Label With Part Number  
 Remove sharp edges and burrs

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		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			

 		
TITLE:		
Cargo Ship Panel Plastic Left		
SIZE	DWG. NO.	REV
B	GE-19210	
SCALE: 1:4	WEIGHT:	SHEET 1 OF 1

4

3

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1

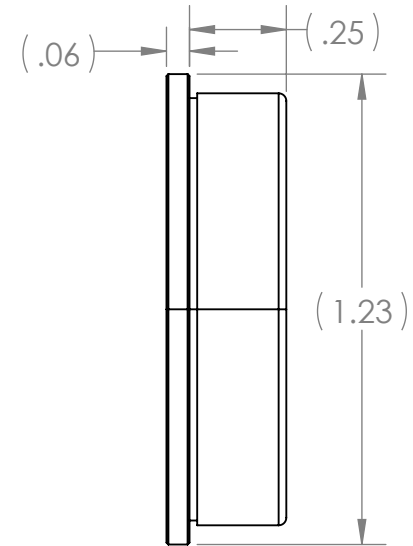
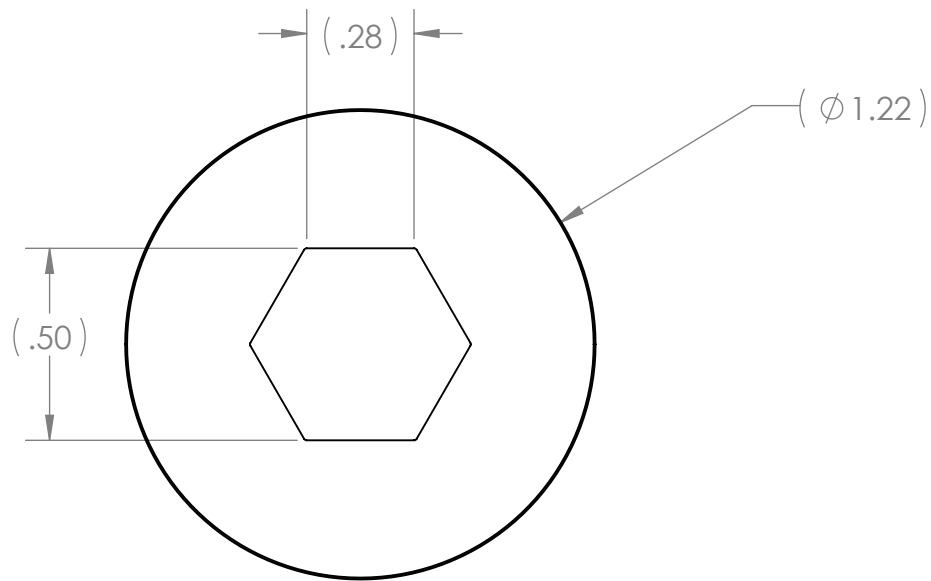
B

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

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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		
		INTERPRET GEOMETRIC TOLERANCING PER: MATERIAL	CHECKED		
			ENG APPR.		<b>SIZE</b> DWG. NO. <b>REV</b> <b>A</b> <b>GE-19215</b>
			MFG APPR.		
			Q.A.		SCALE: 2:1 WEIGHT: SHEET 1 OF 1
			COMMENTS:		
NEXT ASSY	USED ON	FINISH			
APPLICATION		DO NOT SCALE DRAWING			

2

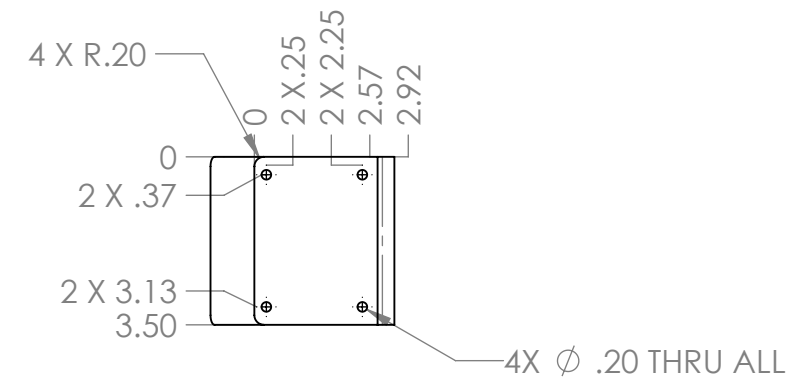
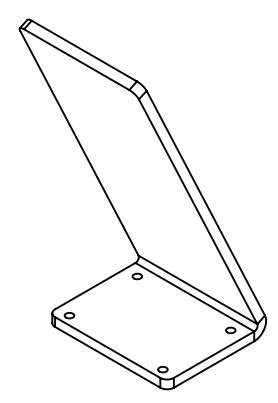
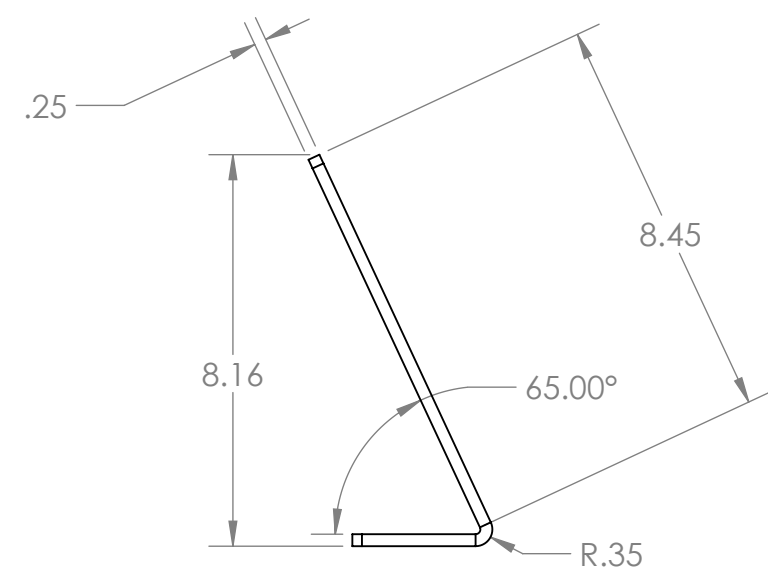
1

4

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

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		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL ±1/16 ANGULAR: MACH ±1° BEND ±1° TWO PLACE DECIMAL ±.01 THREE PLACE DECIMAL ±.001		DRAWN	
		INTERPRET GEOMETRIC TOLERANCING PER:		CHECKED	
		MATERIAL		ENG APPR.	
		FINISH		MFG APPR.	
NEXT ASSY	USED ON			Q.A.	
APPLICATION		DO NOT SCALE DRAWING		COMMENTS:	
 					
TITLE: Light Mounting Bracket					
SIZE	DWG. NO.			REV	
<b>B</b>	GE-19216				
SCALE: 1:4		WEIGHT:		SHEET 1 OF 1	

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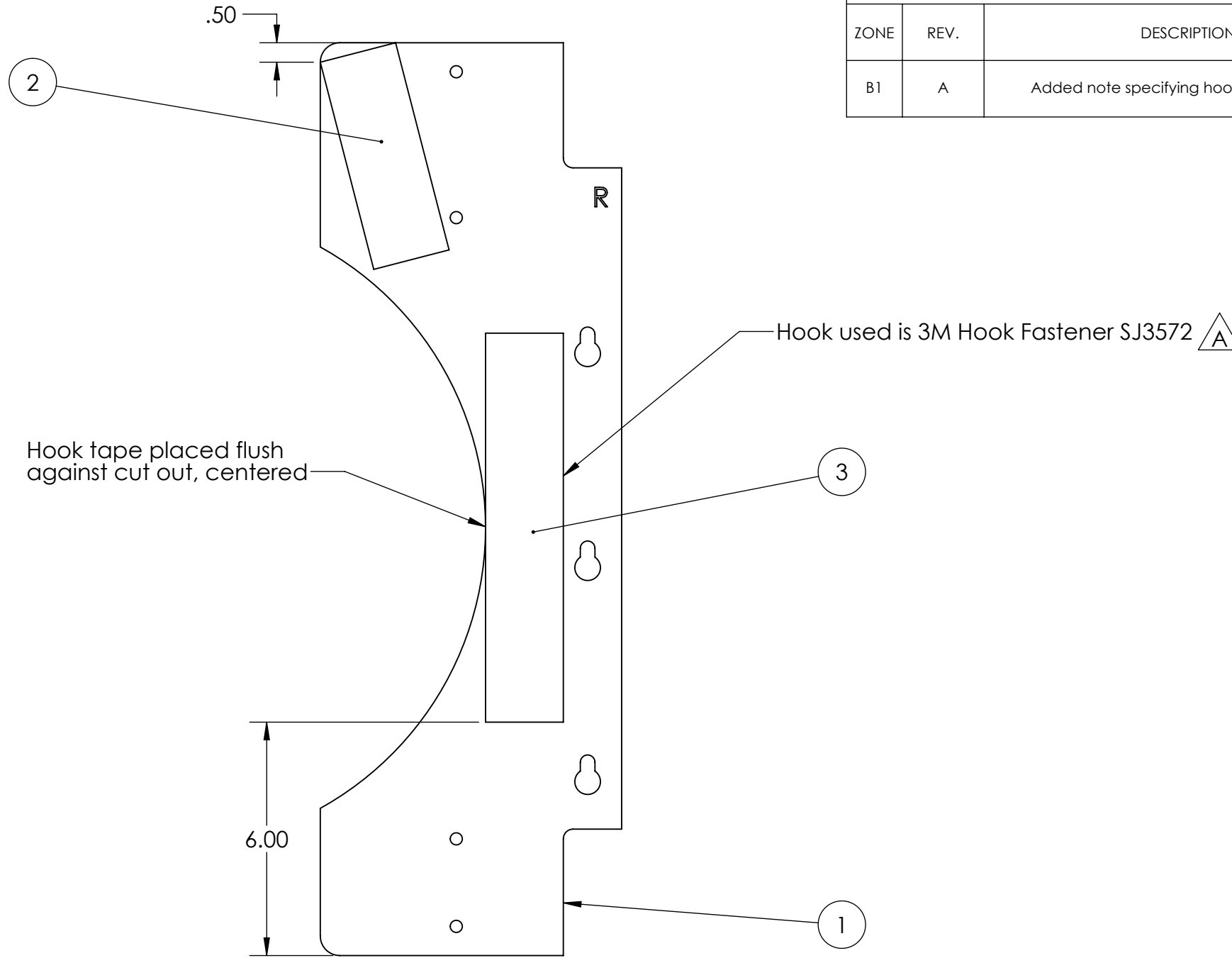
4

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REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
B1	A	Added note specifying hook fastener type.	1/10/2019	CPO



Hook tape placed flush against cut out, centered



Hook used is 3M Hook Fastener SJ3572  $\triangle A$

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

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

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

TITLE:

# Panel Plastic Half Assembly, Right

SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19217</b>	<b>A</b>

SCALE: 1:8 WEIGHT: SHEET 1 OF 1

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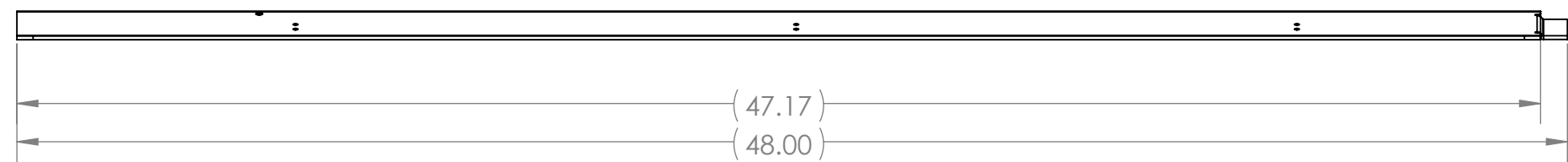
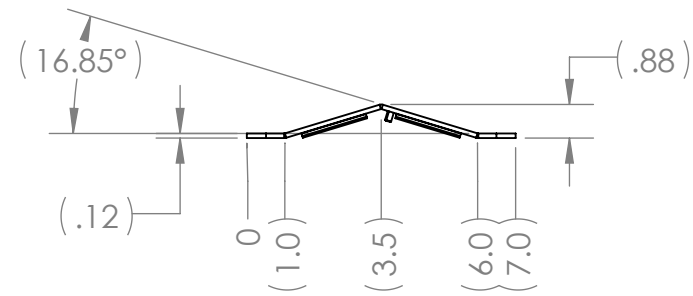
A

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Notes:

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

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		DIMENSIONS ARE IN INCHES	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		



TITLE:  
**Cable Protector Long Segment**

SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19223</b>	
SCALE: 1:5	WEIGHT:	SHEET 1 OF 1

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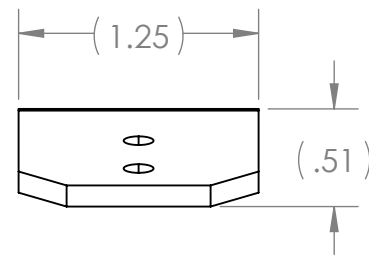
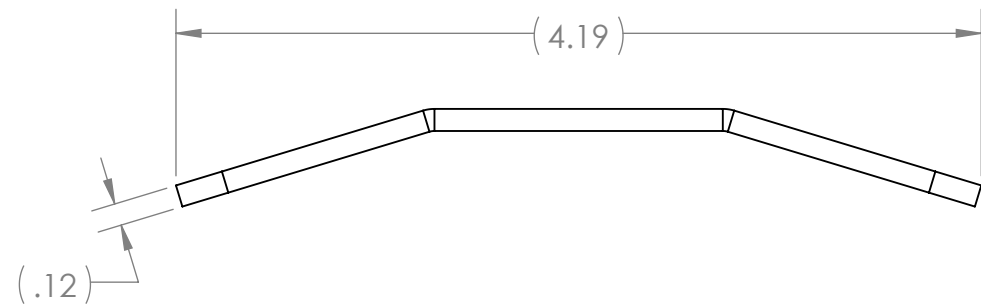
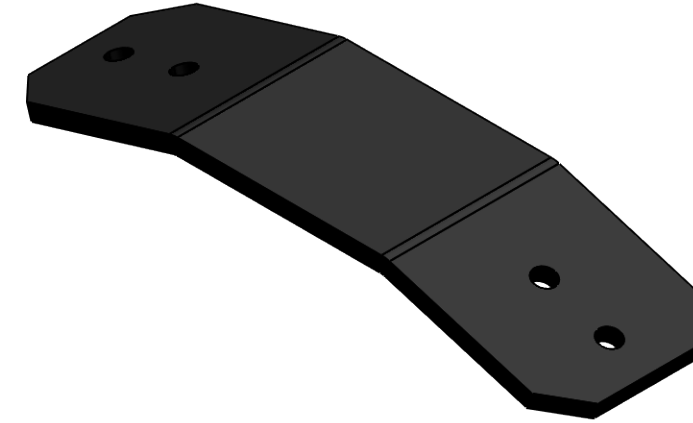
3

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Notes:

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

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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		
		INTERPRET GEOMETRIC TOLERANCING PER:	CHECKED		<b>Cable Protector Strap</b>
		MATERIAL	ENG APPR.		
		FINISH	MFG APPR.		SIZE <b>B</b> DWG. NO. <b>GE-19224</b> REV
NEXT ASSY	USED ON	APPLICATION	COMMENTS:		SCALE: 1:1 WEIGHT: SHEET 1 OF 1
		DO NOT SCALE DRAWING			

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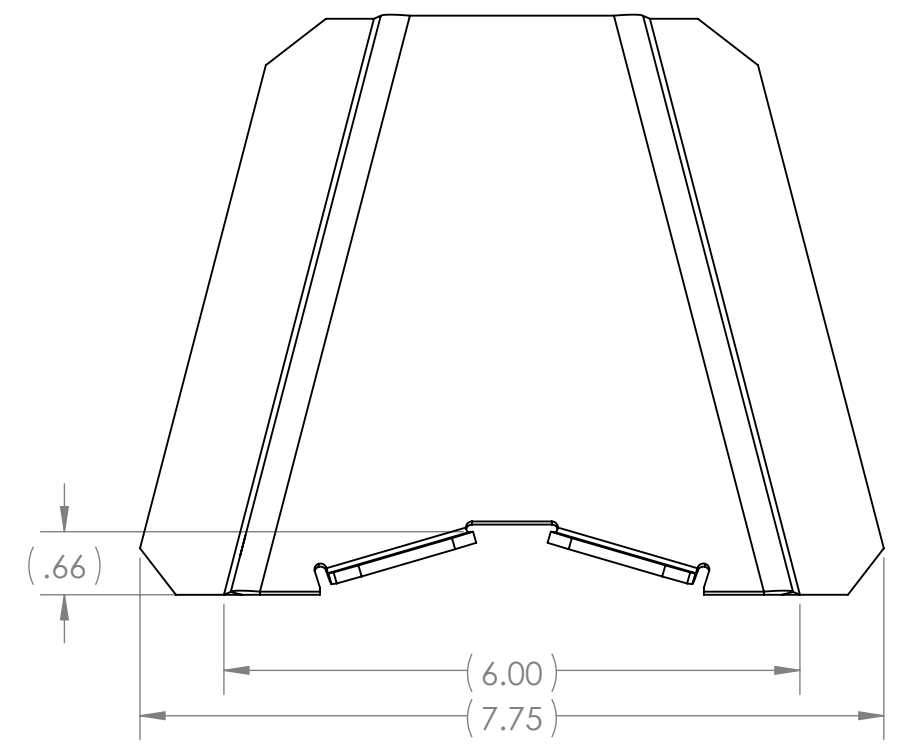
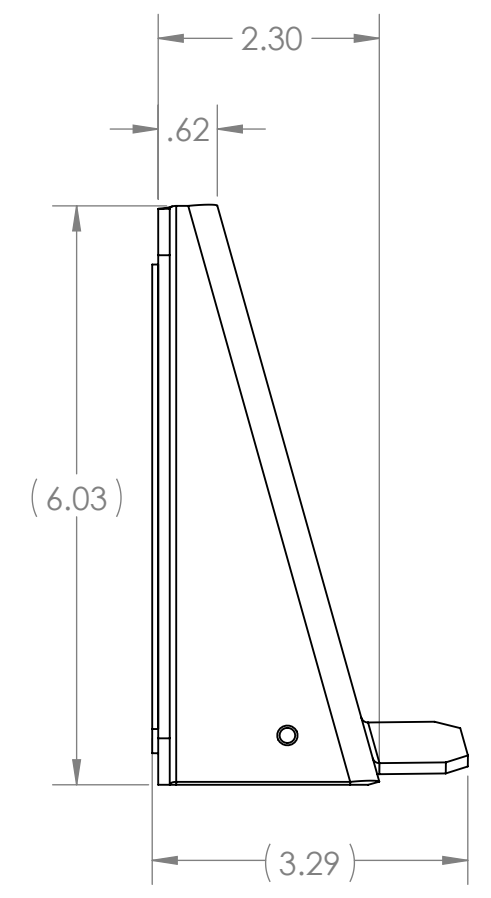
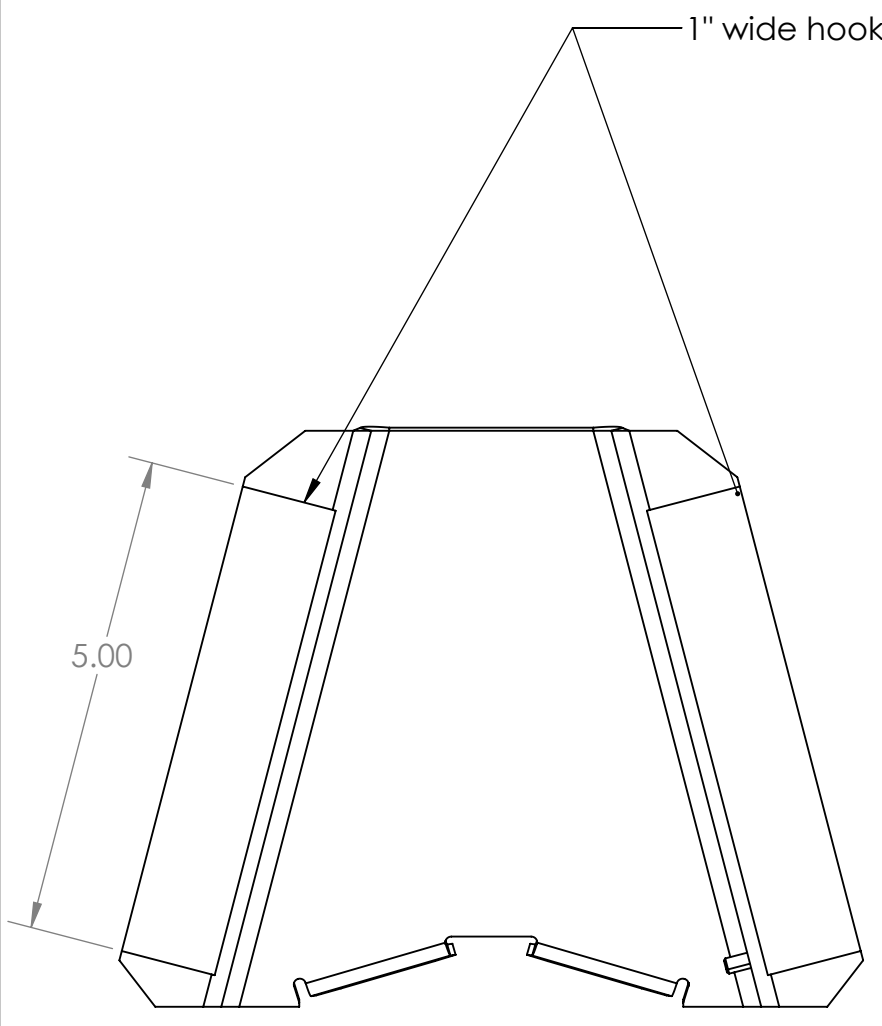
1

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Notes:

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

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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		



TITLE:		
<b>Cable Protector Exit Segment</b>		
SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19225</b>	
SCALE: 1:2	WEIGHT:	SHEET 1 OF 1

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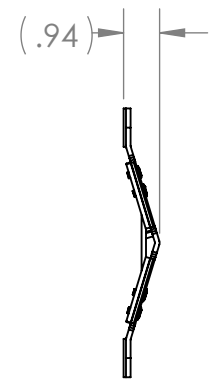
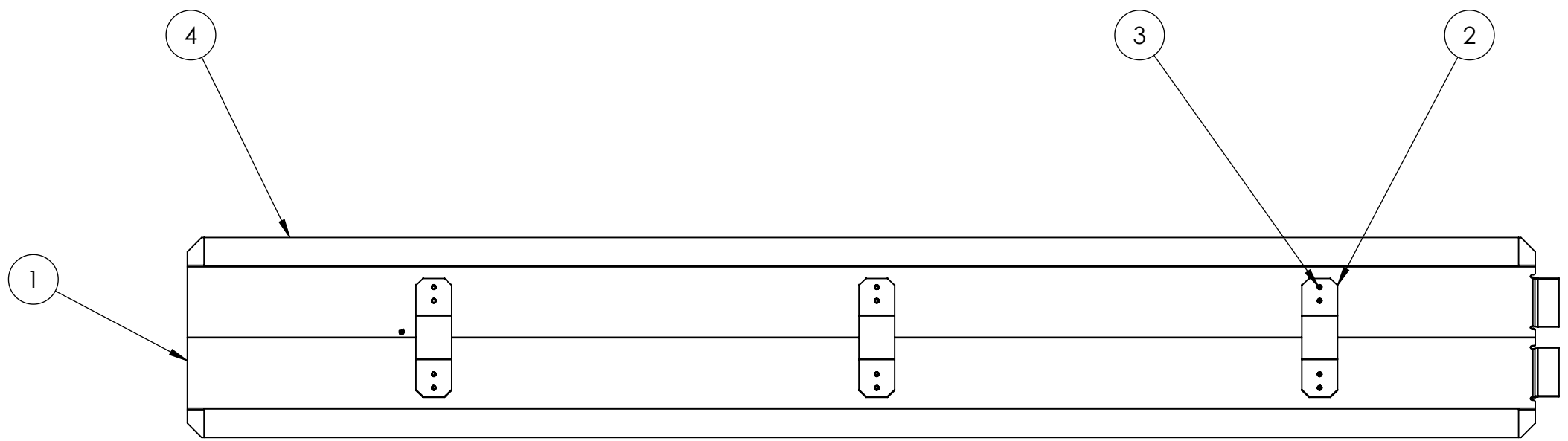
3

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B



Notes:

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



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

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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			

TITLE:  
**Cable Protector Long Assembly**

SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19226</b>	

SCALE: 1:5 WEIGHT: SHEET 1 OF 1

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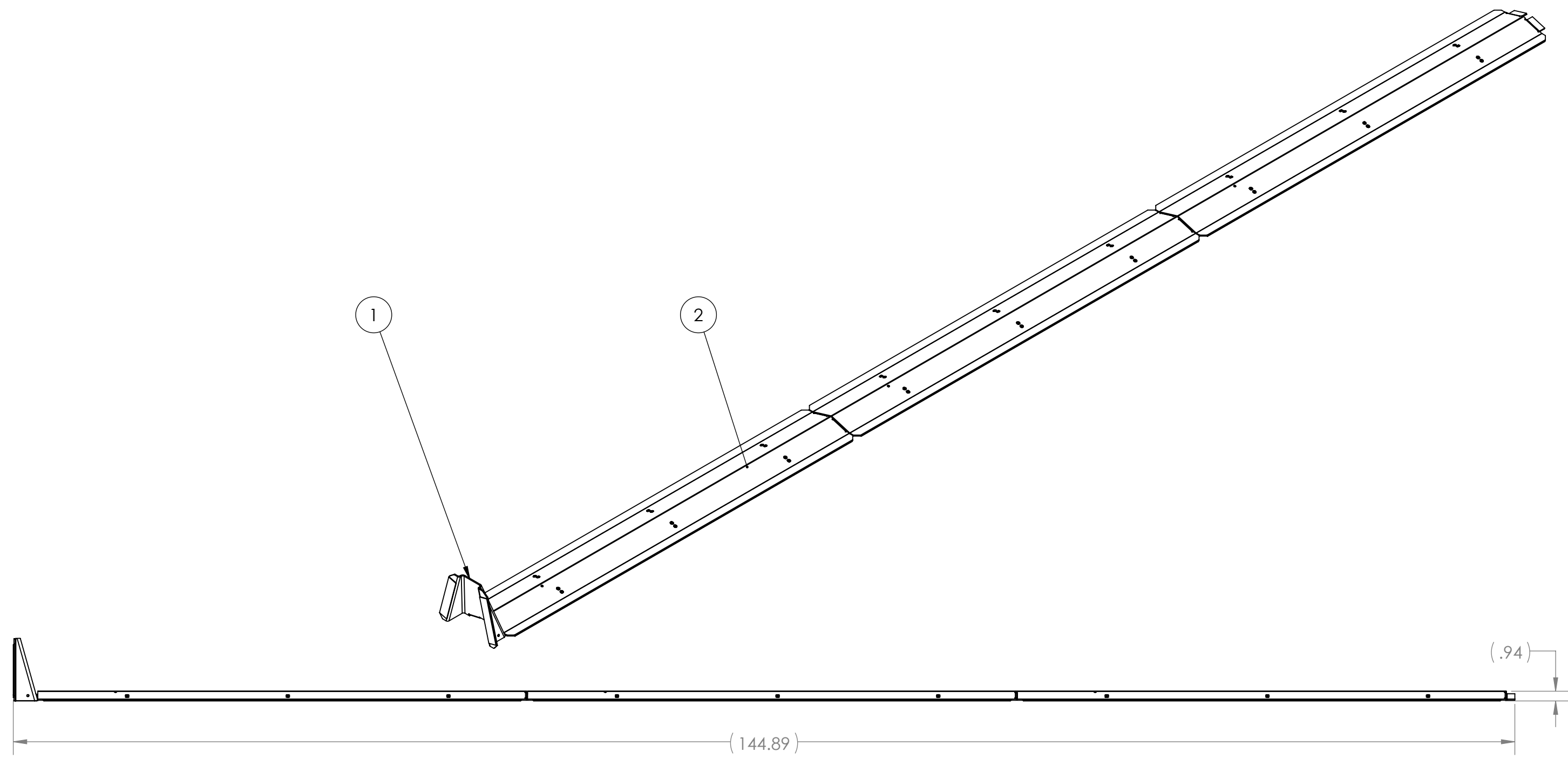
3

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

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

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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:  
**Cable Protector Assembly**

SIZE **B** DWG. NO. **GE-19227** REV

SCALE: 1:10 WEIGHT: SHEET 1 OF 1

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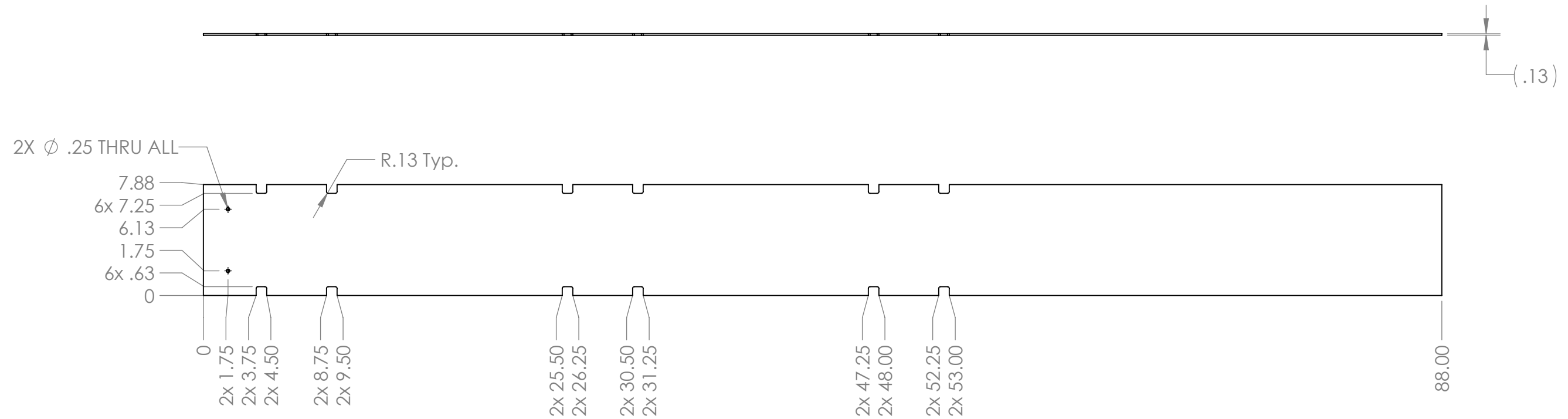
3

2

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B



B



Notes:

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

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		INTERPRET GEOMETRIC TOLERANCING PER:		CHECKED	
		MATERIAL		ENG APPR.	
		FINISH		MFG APPR.	
NEXT ASSY	USED ON			Q.A.	
APPLICATION		DO NOT SCALE DRAWING		COMMENTS:	
 					
TITLE: Cargo Ship Bumper Plastic Side					
SIZE	DWG. NO.	REV			
<b>B</b>	<b>GE-19228</b>	<b>A</b>			
SCALE: 1:8		WEIGHT:		SHEET 1 OF 1	

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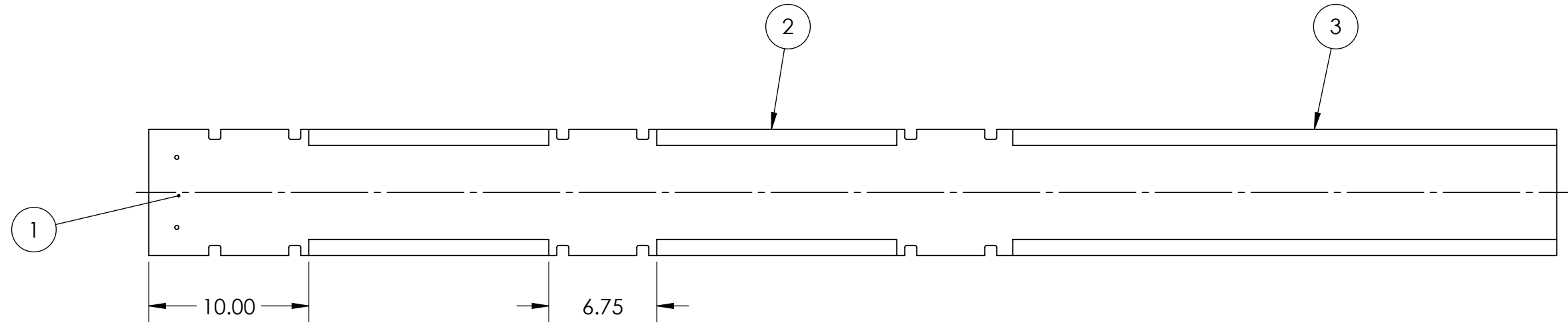
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	GE-19228	Cargo Ship Bumper Plastic Side	1
2	Loop_1_15	1" Adhesive-Backed Loop, 15" Long	4
3	Loop_1_34	1" x 34" Loop, Adhesive Backed	2

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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			

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

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

SIZE	DWG. NO.	REV
<b>B</b>	GE-19228-Assembly	

SCALE: 1:12 WEIGHT: SHEET 1 OF 1

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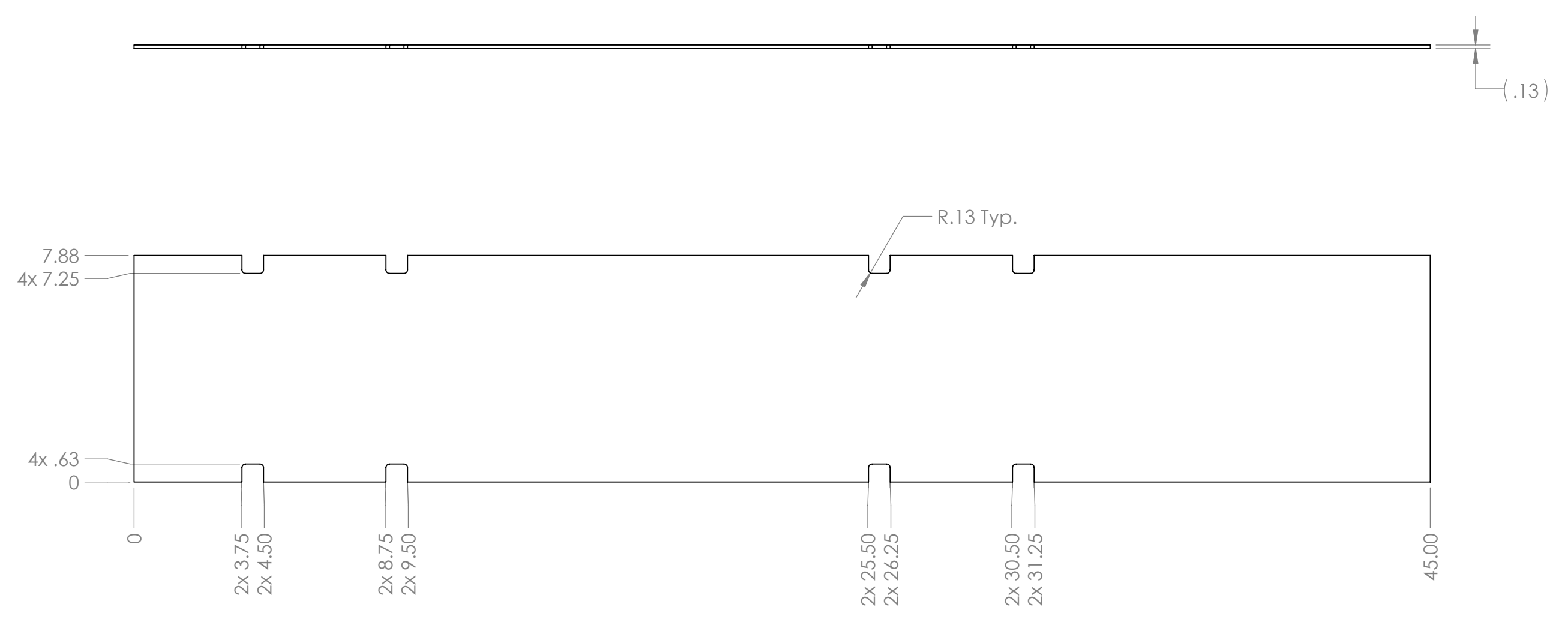
1

B

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Notes:

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

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		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			

				TITLE:	
				Cargo Ship Bumper Plastic Front	
SIZE	DWG. NO.	REV			
<b>B</b>	<b>GE-19229</b>	<b>A</b>			
SCALE: 1:4	WEIGHT:	SHEET 1 OF 1			

4

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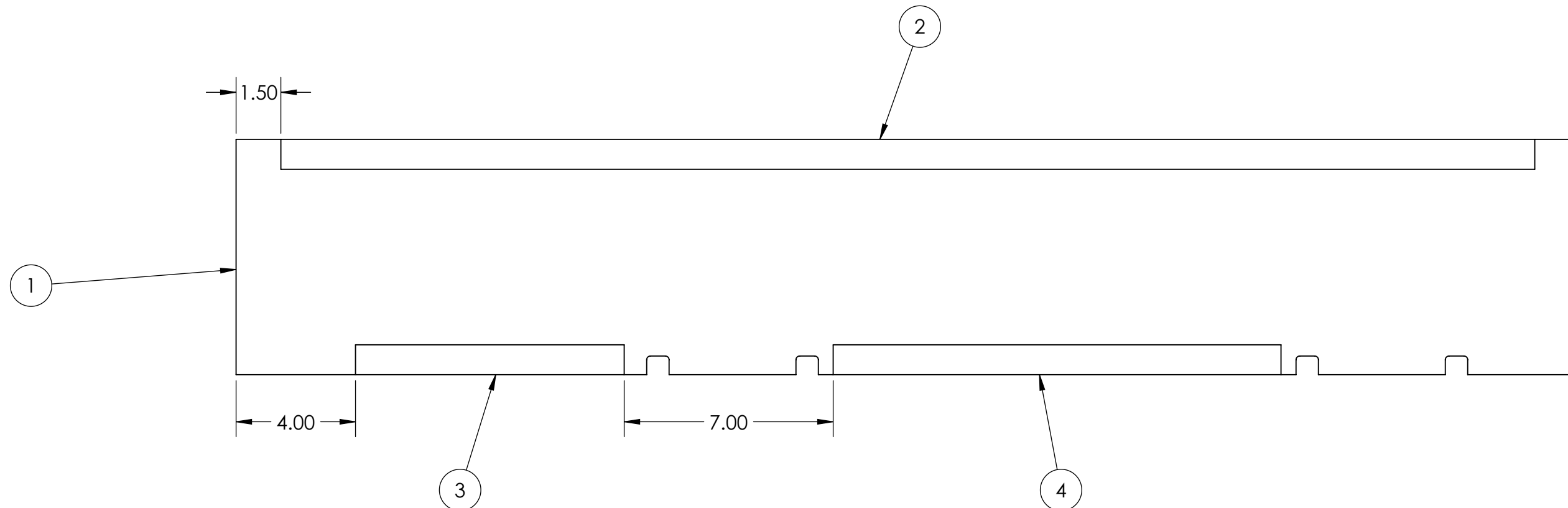
3

2

1

B

B



A

A

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

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



TITLE:		
<b>GE-19229, with loop</b>		
SIZE	DWG. NO.	REV
<b>B</b>	GE-19229-Assembly	
SCALE: 1:8	WEIGHT:	SHEET 1 OF 1

4

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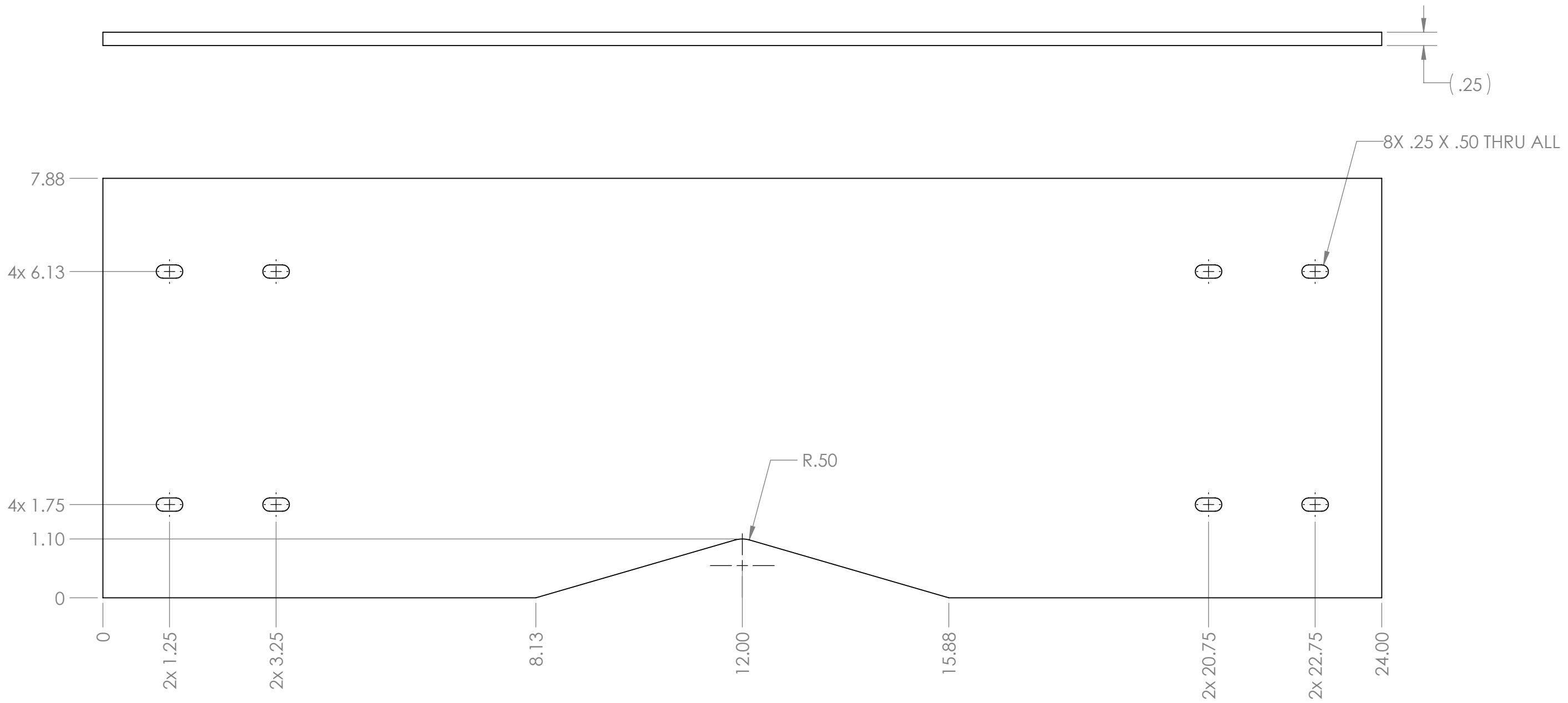
1

B

B

A

A



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

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

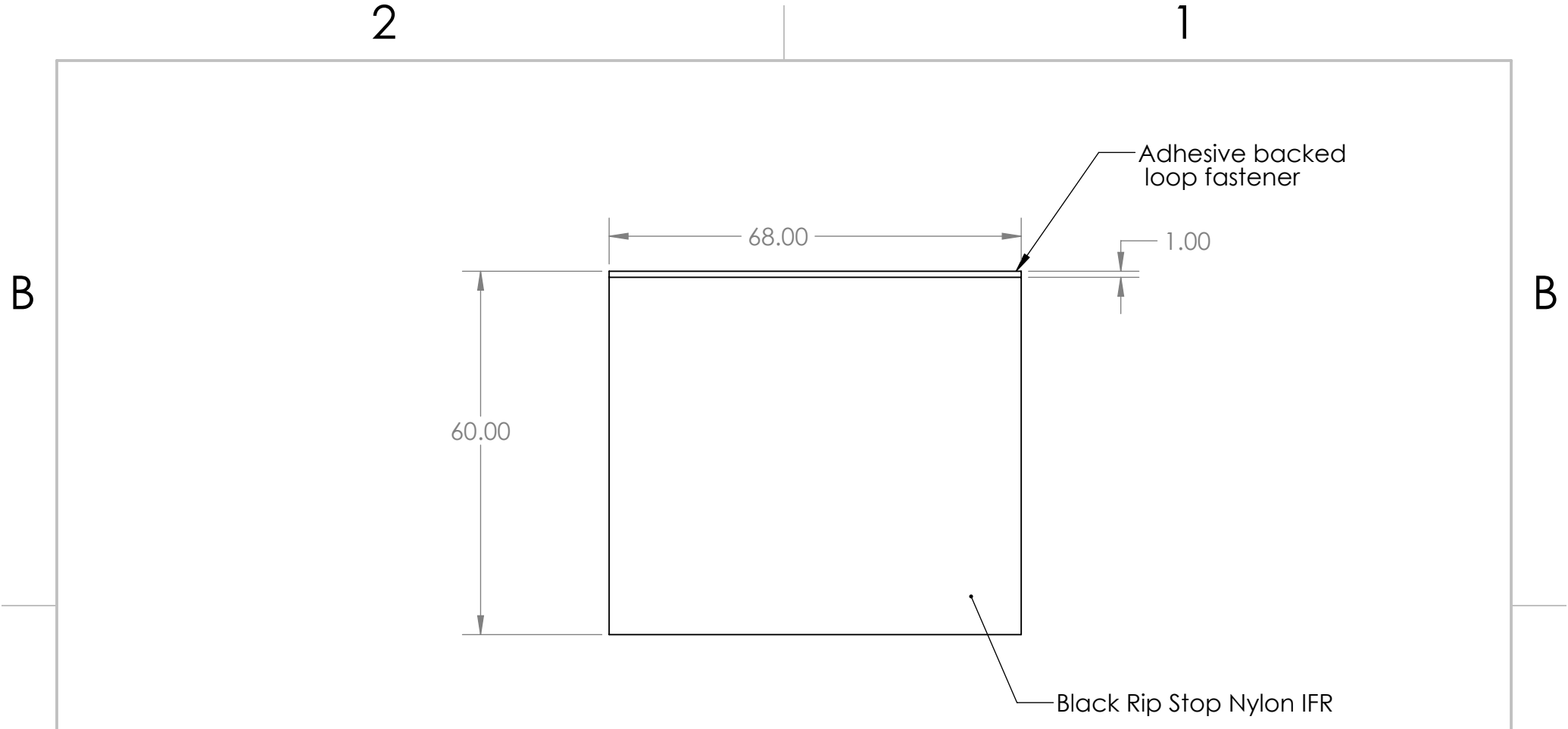
**FIRST ROBOTICS COMPETITION** **SOLIDWORKS** Modeling Solutions Partner

TITLE: **Cargo Ship Bumper Bridge**



SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19230</b>	

SCALE: 1:2 WEIGHT: SHEET 1 OF 1





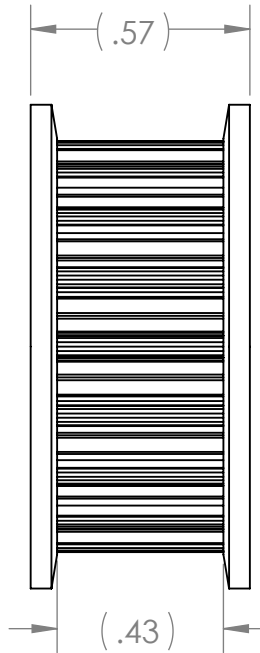
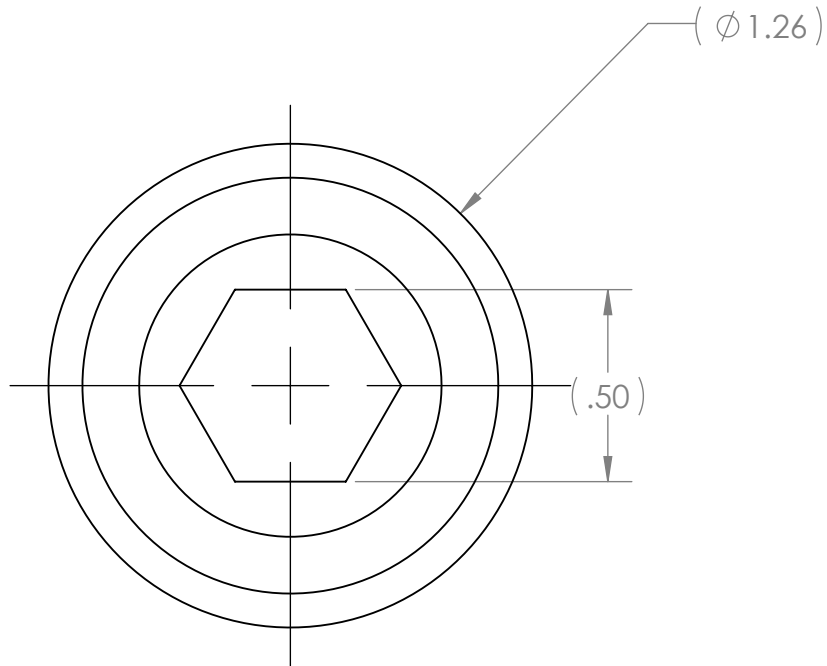
Note: Cut Edges need to be hemmed

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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				
			INTERPRET GEOMETRIC TOLERANCING PER:	CHECKED				
			MATERIAL	ENG APPR.				
			FINISH	MFG APPR.				
	NEXT ASSY	USED ON		Q.A.				SIZE DWG. NO. REV
		APPLICATION	DO NOT SCALE DRAWING	COMMENTS:				<b>A</b> <b>GE-19231</b>
								SCALE: 1:24 WEIGHT: SHEET 1 OF 1

2 1

A A

B



B



## Note:

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

A

A

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		UNLESS OTHERWISE SPECIFIED:		NAME	DATE	 
		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$		DRAWN		
		INTERPRET GEOMETRIC TOLERANCING PER:		CHECKED		
		MATERIAL		ENG APPR.		
		FINISH		MFG APPR.		
		DO NOT SCALE DRAWING		Q.A.		
NEXT ASSY	USED ON			COMMENTS:		<b>SIZE</b> DWG. NO. REV <b>A</b> <b>GE-19235</b>
APPLICATION				SCALE: 2:1 WEIGHT:		SHEET 1 OF 1

2

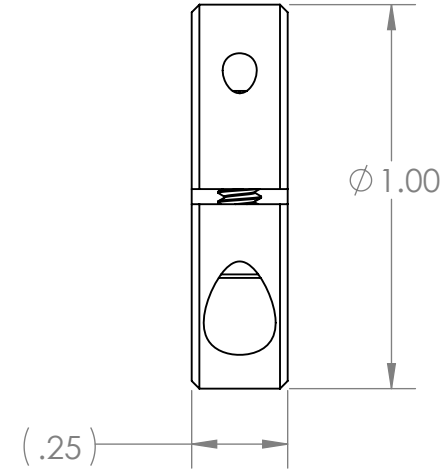
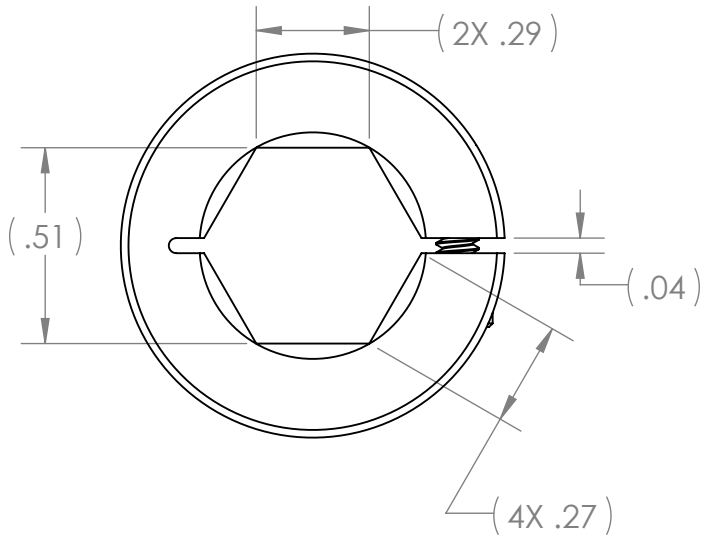
1

2

1

B

B





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

A

A

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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			
		FINISH			
NEXT ASSY	USED ON				
APPLICATION		DO NOT SCALE DRAWING			

TITLE:  
**Hex Shaft Collar**

SIZE	DWG. NO.	REV
<b>A</b>	<b>GE-19237</b>	

SCALE: 2:1    WEIGHT:    SHEET 1 OF 1

2

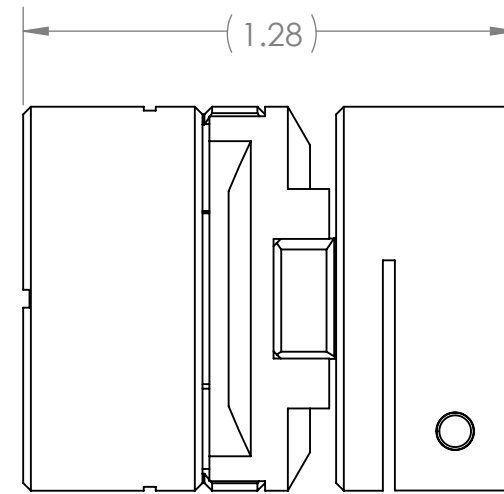
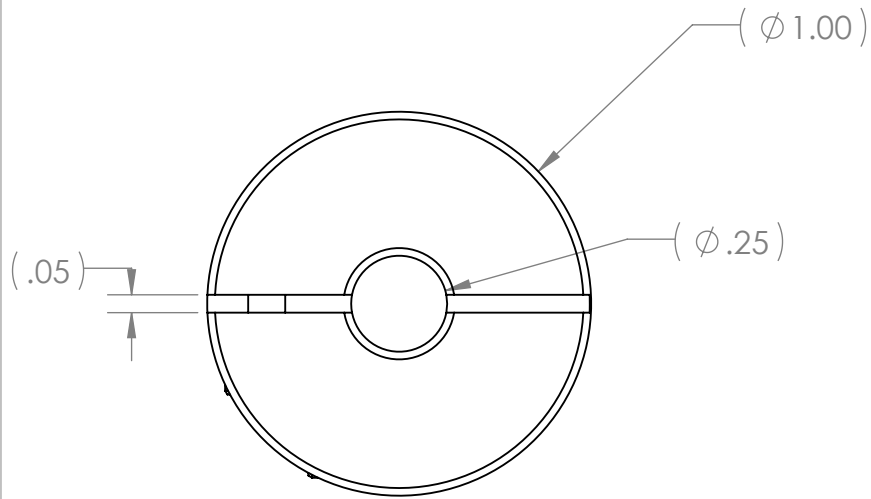
1

2

1

B

B





Notes:

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

A

A

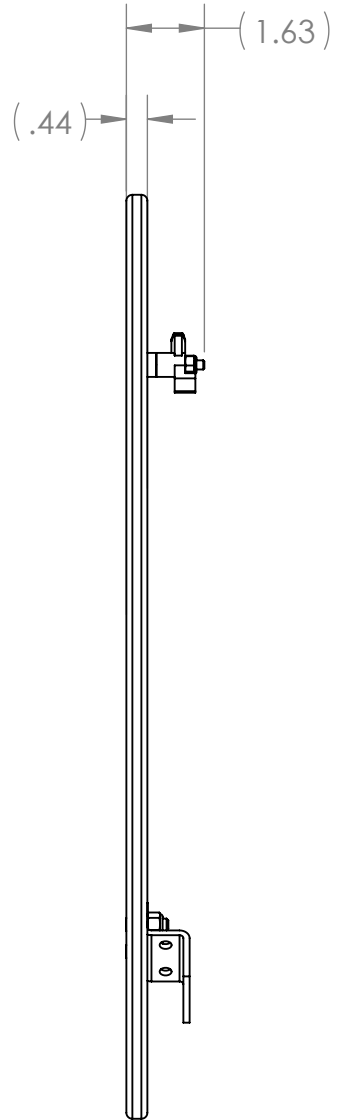
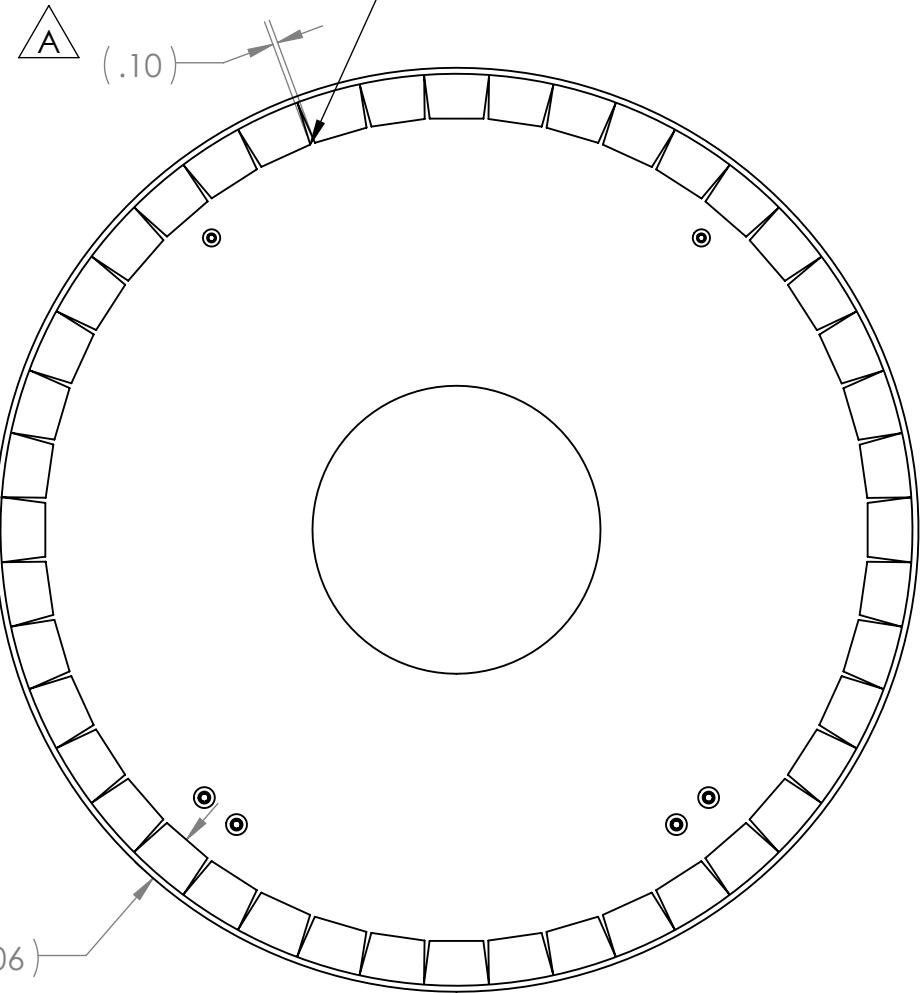
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		UNLESS OTHERWISE SPECIFIED:		NAME	DATE	 
		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$	DRAWN			
		INTERPRET GEOMETRIC TOLERANCING PER:	CHECKED			<h1>Coupler Assembly</h1>
		MATERIAL	ENG APPR.			
		FINISH	MFG APPR.			DWG. NO.
NEXT ASSY	USED ON		Q.A.			REV
		APPLICATION	COMMENTS:			<b>A</b> <b>GE-19243</b>
		DO NOT SCALE DRAWING				SCALE: 2:1
						WEIGHT:
						SHEET 1 OF 1

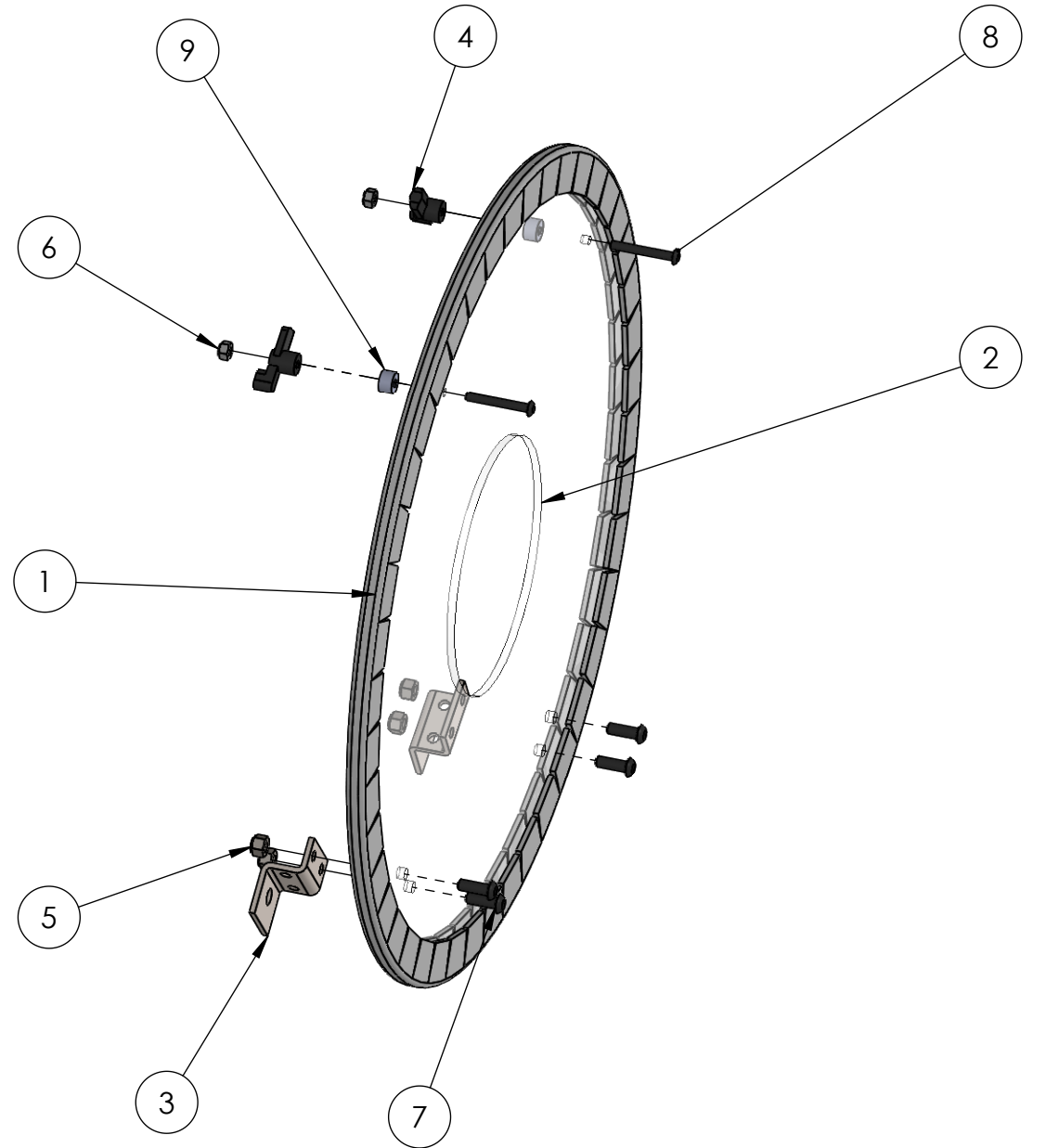
2

1

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



REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
B4	A	Updated per updates made to GE-19153	1/23/2019	CPO





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

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

 		
TITLE: Null Panel Assembly		
SIZE: B	DWG. NO.: GE-19244	REV: A
SCALE: 1:4	WEIGHT:	SHEET 1 OF 1

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2X  $\phi$  .20 THRU ALL

2x 5.10

$\phi$  19.00

(.19)

$\phi$  6.00

2x 6.08

2x 5.58

2x 6.14

4X  $\phi$  .27 THRU ALL

2x 5.25

2x 4.58

Note:

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

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UNLESS OTHERWISE SPECIFIED:

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

INTERPRET GEOMETRIC TOLERANCING PER:

MATERIAL

FINISH

NAME DATE

DRAWN

CHECKED

ENG APPR.

MFG APPR.

Q.A.

COMMENTS:

NEXT ASSY

USED ON

APPLICATION

DO NOT SCALE DRAWING



TITLE:

Null Panel,  
Polycarbonate

SIZE DWG. NO. REV

**B** GE-19245

SCALE: 1:3 WEIGHT:

SHEET 1 OF 1

4

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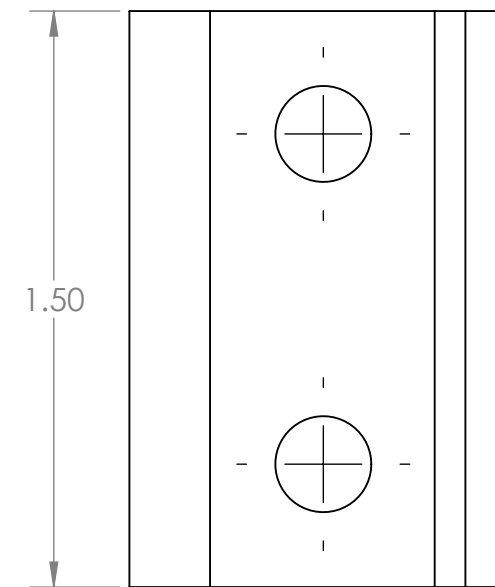
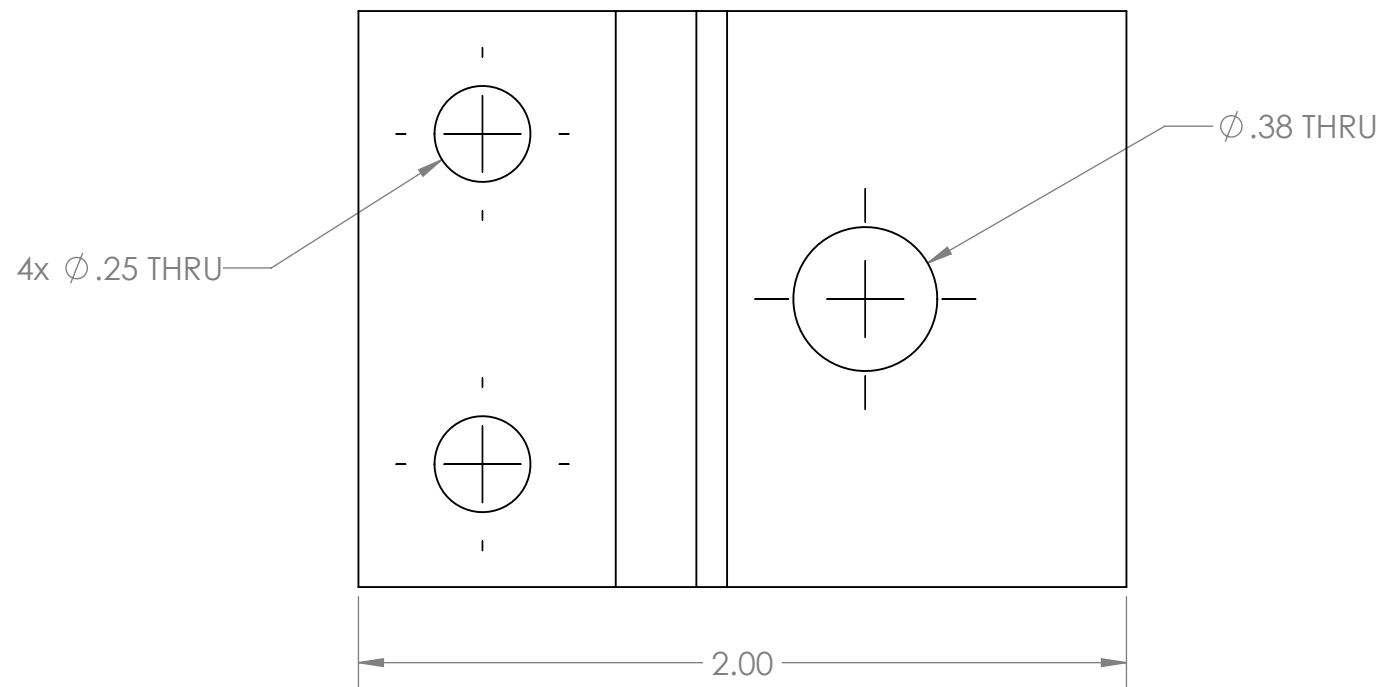
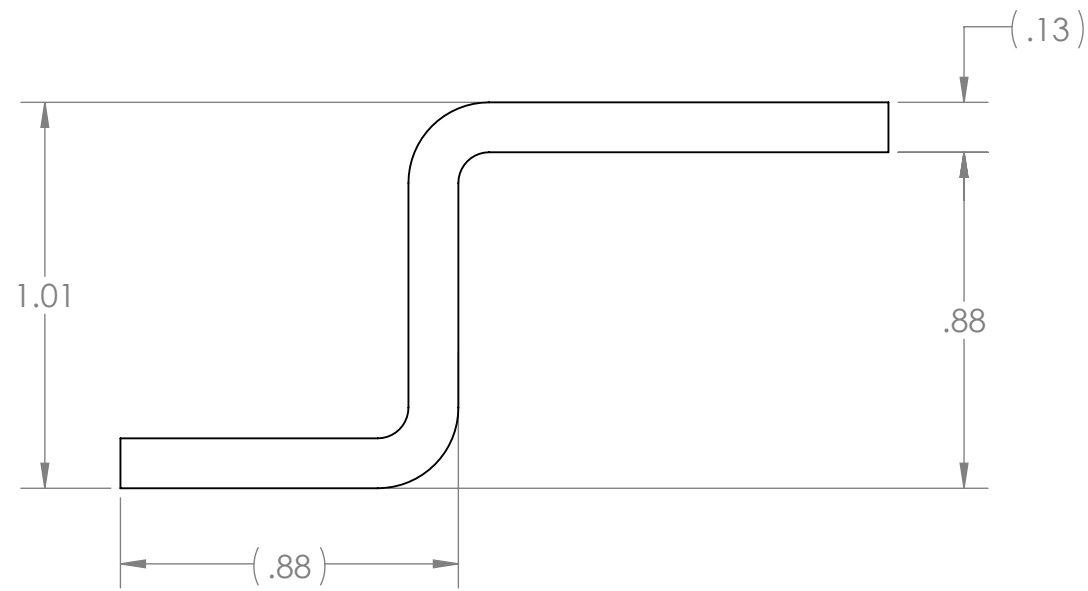
1

4

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1





Notes:

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

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

TITLE:

# Null Offset Bracket

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

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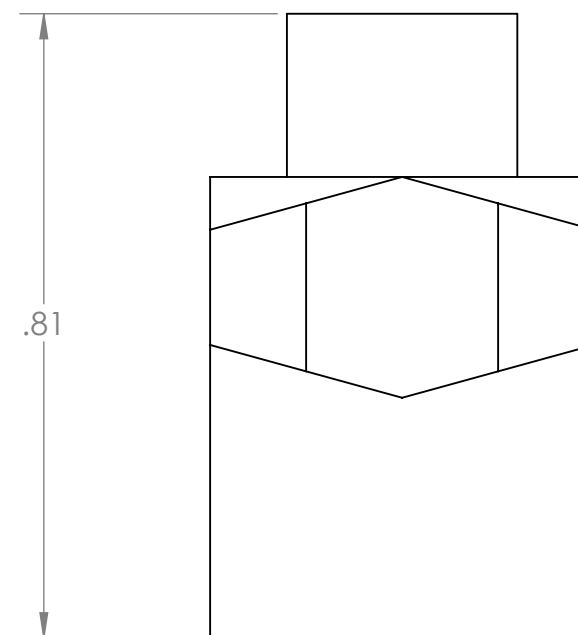
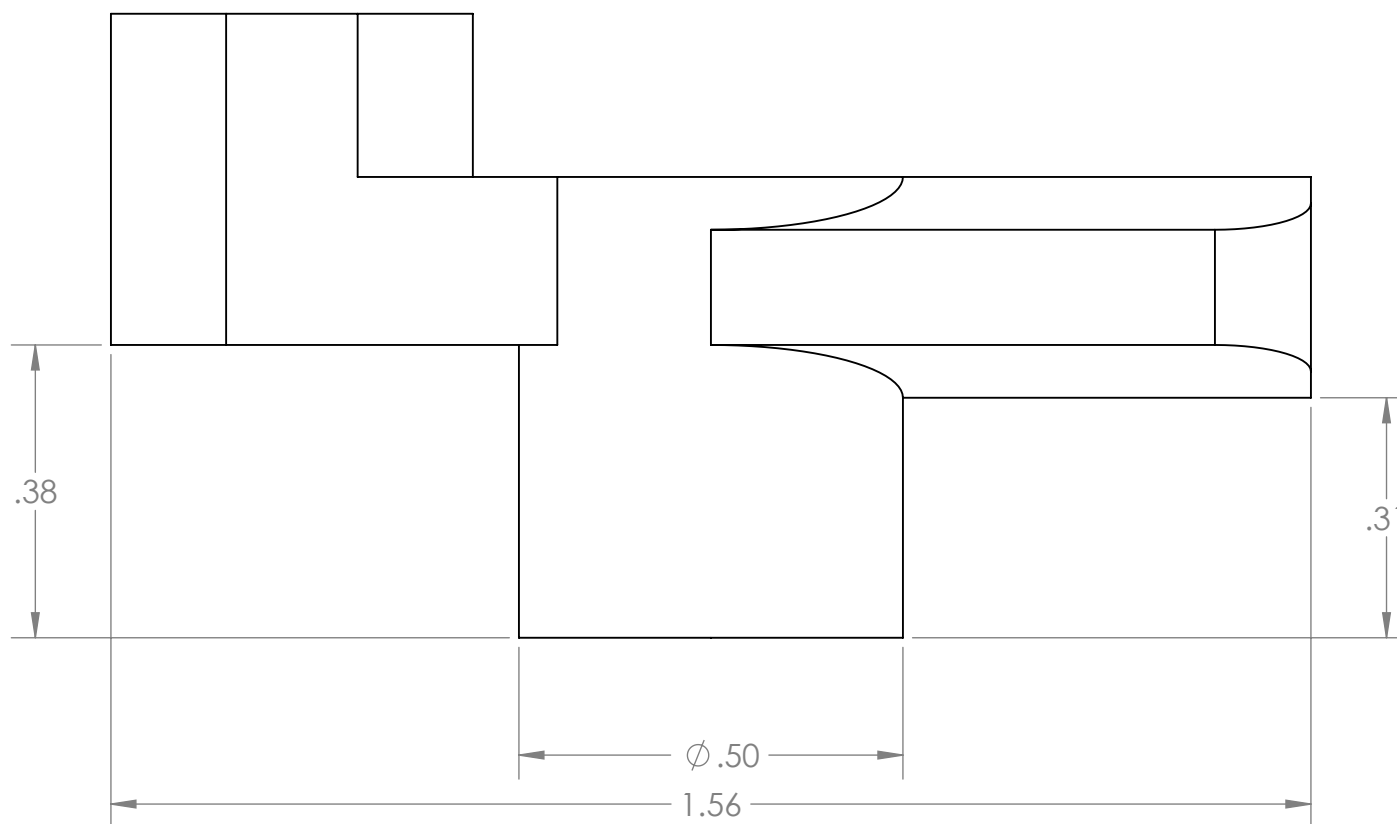
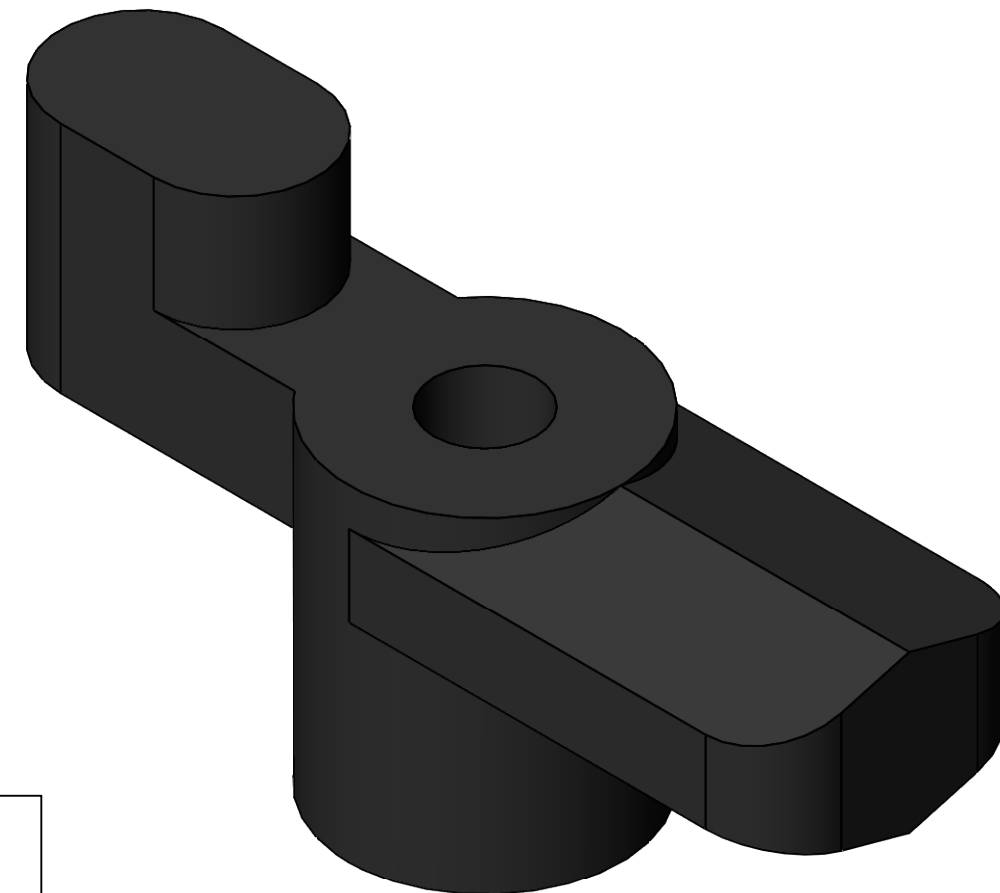
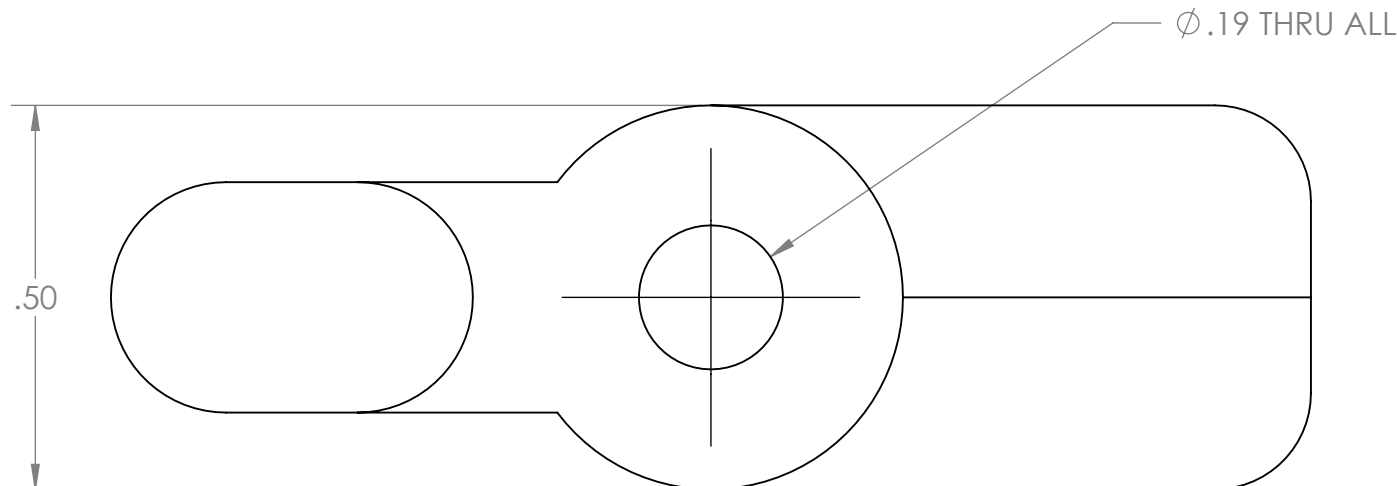
A

4

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1



Notes:

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

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		UNLESS OTHERWISE SPECIFIED:	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		
		INTERPRET GEOMETRIC TOLERANCING PER:	CHECKED		SIZE DWG. NO. REV
		MATERIAL	ENG APPR.		<b>B</b> <b>GE-19247</b>
		FINISH	MFG APPR.		SCALE: 4:1 WEIGHT: SHEET 1 OF 1
NEXT ASSY	USED ON		Q.A.		
APPLICATION		DO NOT SCALE DRAWING	COMMENTS:		

4

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B

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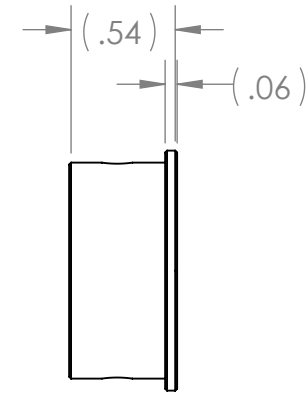
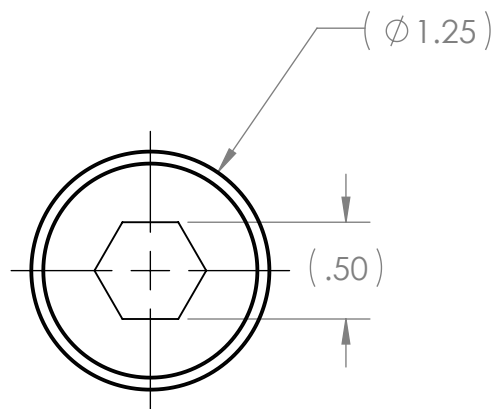


2

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Note:


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

A

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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:

# Versa Hub

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

2

1

4

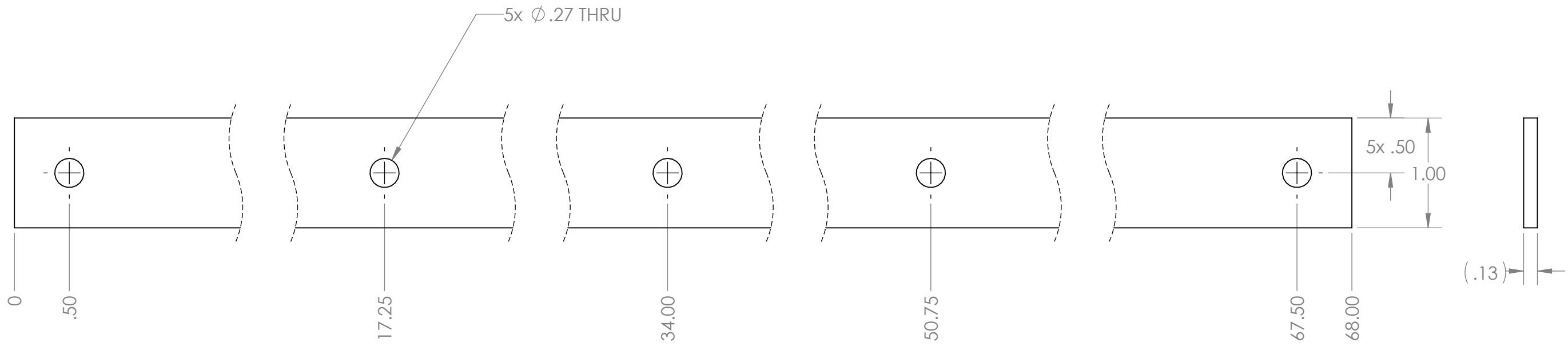
3

2

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B

B



Notes:

- 1. Material: 1/8" Polycarbonate, Clear
- 2. Remove all burrs and sharp edges.
- 3. Tag or label with part number.

A

A

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



TITLE: <b>Slot Guide Spacer, Large</b>		
SIZE <b>B</b>	DWG. NO. <b>GE-19251</b>	REV
SCALE: 1:1	WEIGHT:	SHEET 1 OF 1

4

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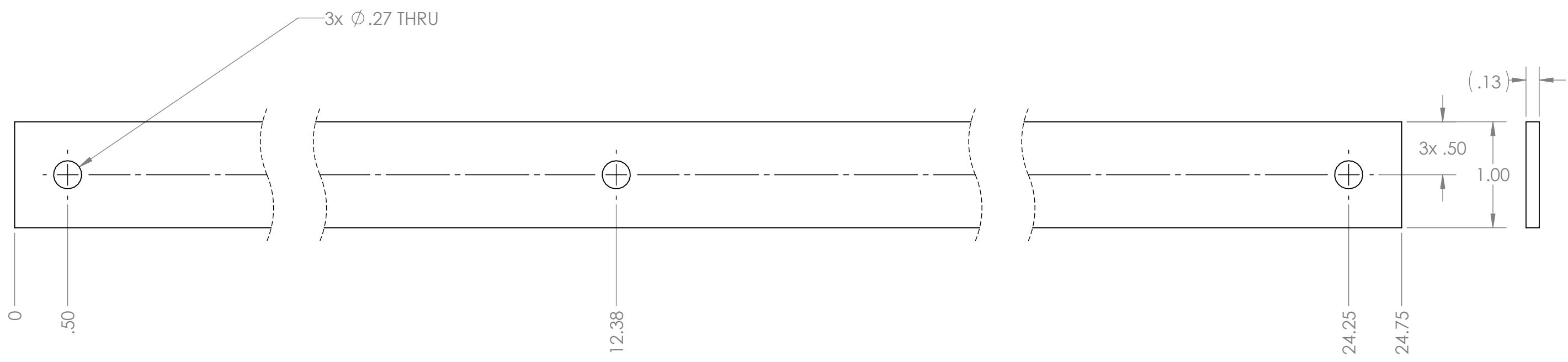
3

2

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B

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- Notes:
- 1/8" Polycarbonate, Clear.
  - Remove all burrs and sharp edges.
  - Tag or label with part number.



A

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

 		
TITLE: Slot Guide Spacer, Small		
SIZE	DWG. NO.	REV
<b>B</b>	<b>GE-19252</b>	
SCALE: 1:1	WEIGHT:	SHEET 1 OF 1

4

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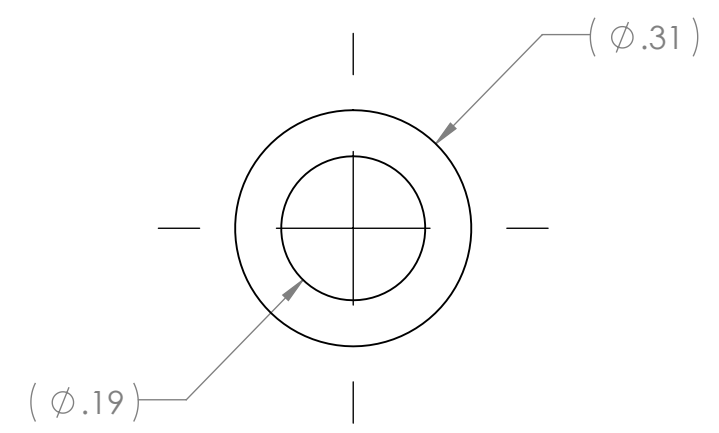
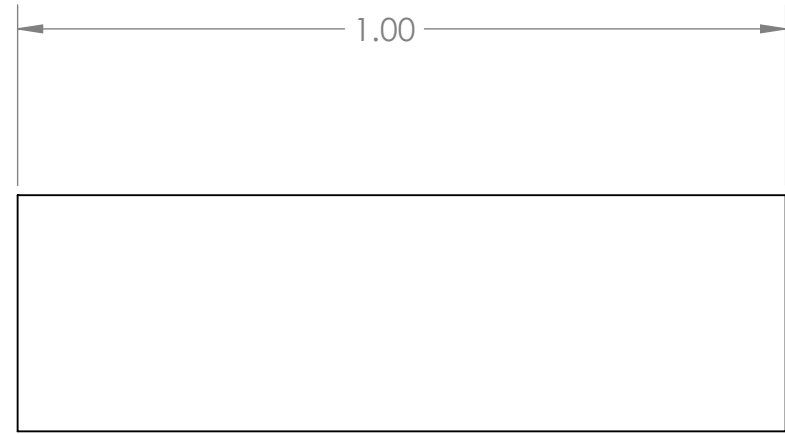
3

2

1

B

B





Notes:

- 1. Silicone Rubber Push-on Cap for 3/16" OD.
- 2. Source: McMaster
- 3. Item #: 92805K33
- 4. Equivalent substitutions allowed.

A

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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			
		INTERPRET GEOMETRIC TOLERANCING PER:	CHECKED			SIZE DWG. NO. REV <b>B</b> <b>GE-19253</b>
		MATERIAL	ENG APPR.			
NEXT ASSY	USED ON	FINISH	MFG APPR.			
APPLICATION		DO NOT SCALE DRAWING	Q.A.			
			COMMENTS:			

4

3

2

1