

4

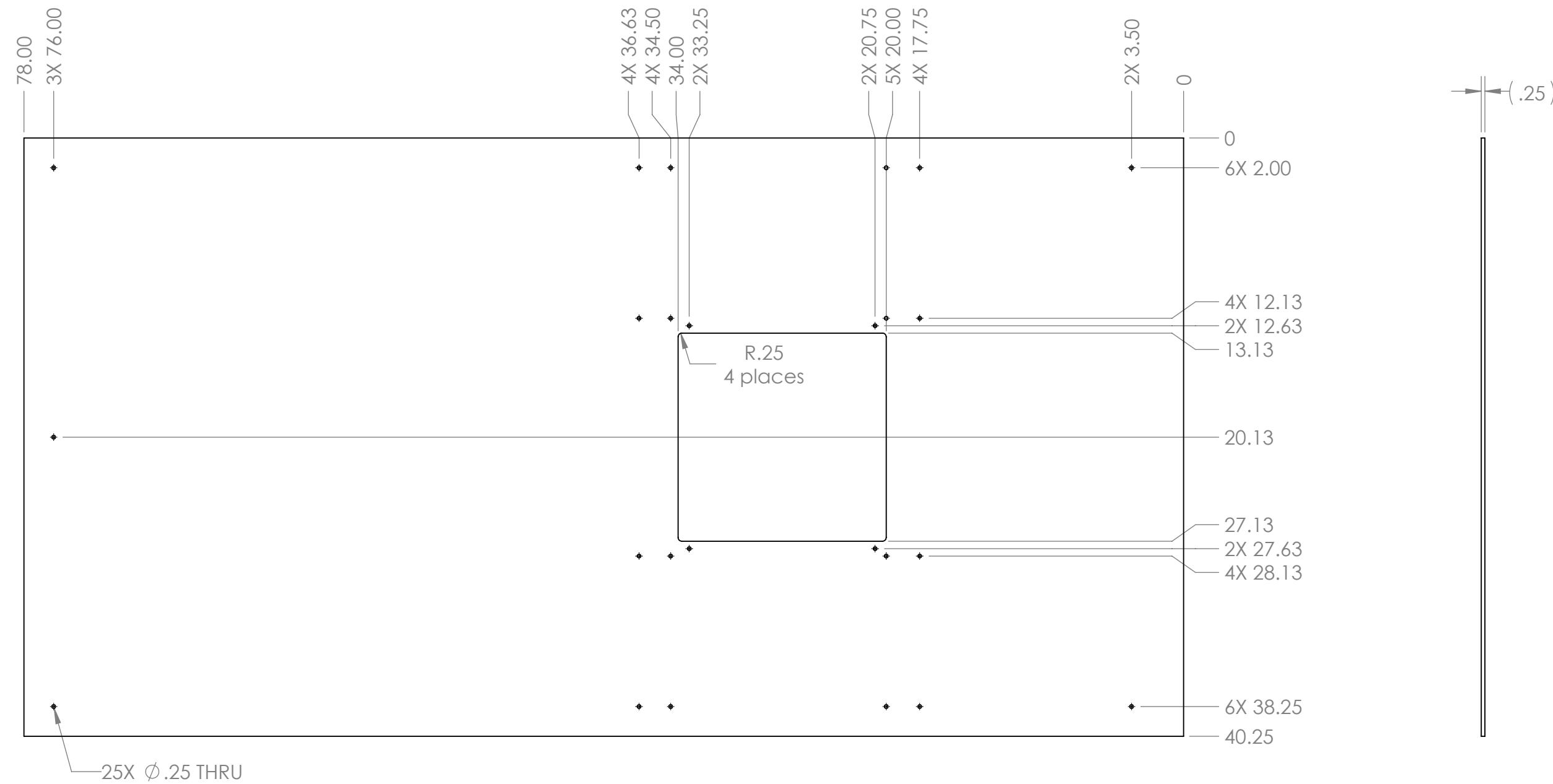
3

2

1

B

B



A

A

Notes:

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

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

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE: Panel, Portal

| | | |
|------------|-----------------|--------------|
| SIZE | DWG. NO. | REV |
| B | GE-18004 | |
| SCALE: 1:8 | WEIGHT: | SHEET 1 OF 1 |

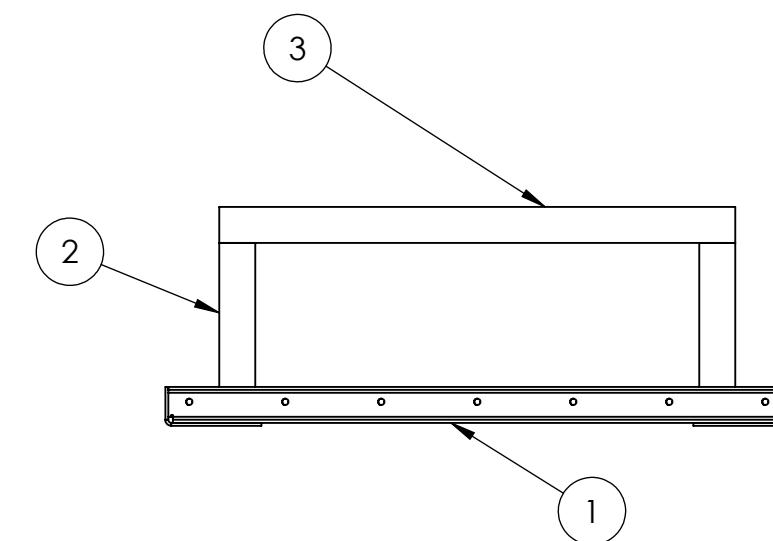
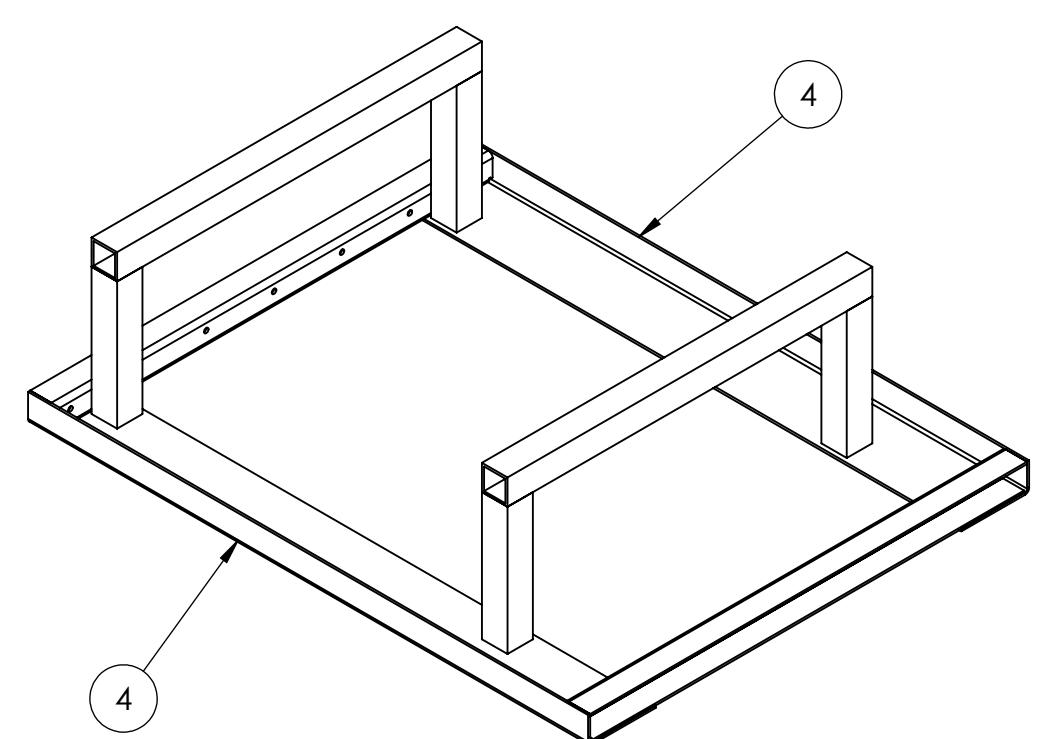
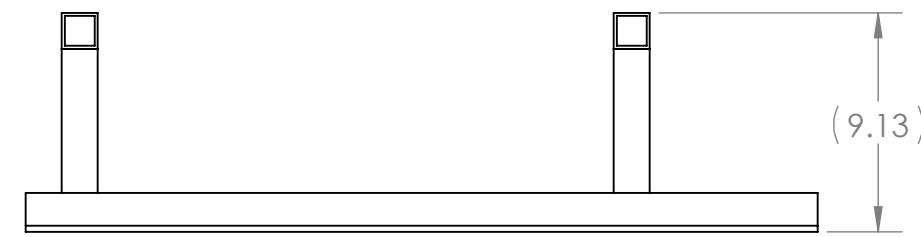
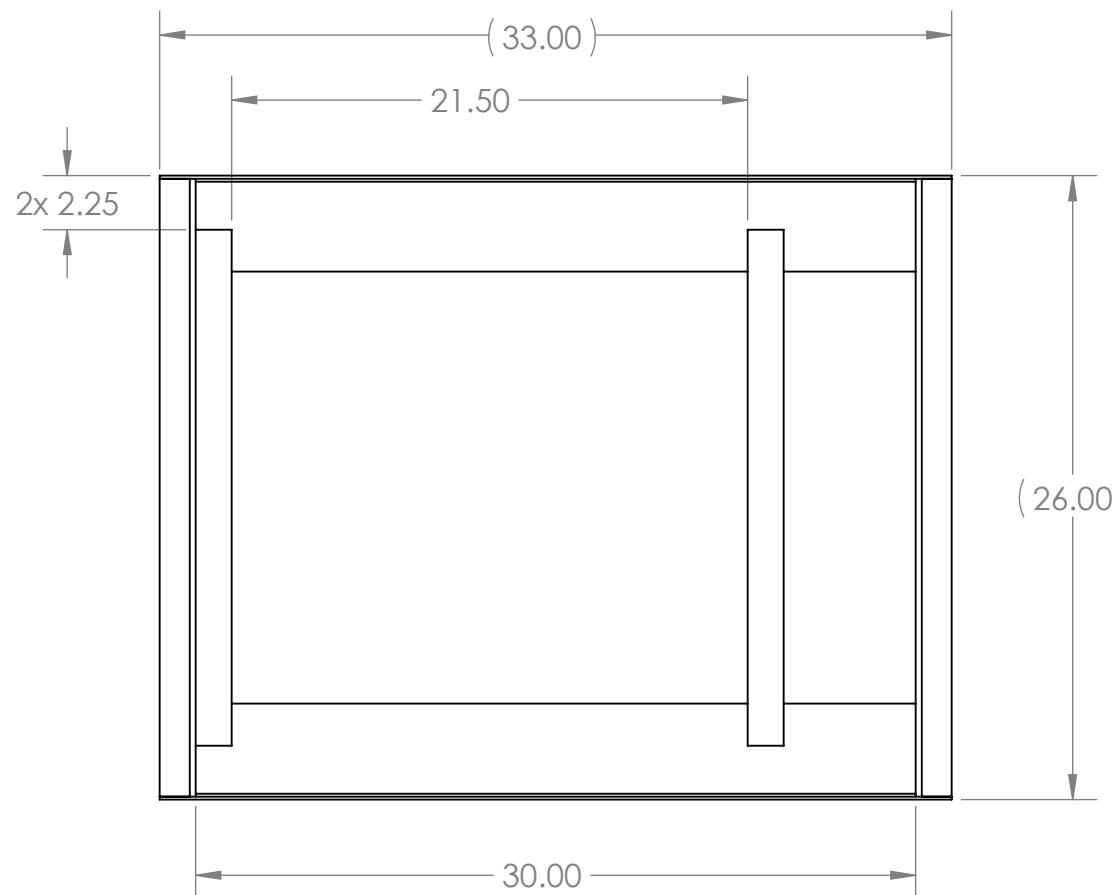
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4 3 2 1



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

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| | | | | |
|------------|-----------------|--|----------------------|------|
| | | UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL: ±1/16 ANGULAR: MACH ±1° BEND ±1° TWO PLACE DECIMAL: ±.01 THREE PLACE DECIMAL: ±.001 | NAME | DATE |
| | | DRAWN | | |
| | | CHECKED | | |
| | | ENG APPR. | | |
| | | MFG APPR. | | |
| | | Q.A. | | |
| | | COMMENTS: | | |
| | | MATERIAL | | |
| | | FINISH | | |
| | | APPLICATION | DO NOT SCALE DRAWING | |
| SIZE | DWG. NO. | REV | | |
| B | GE-18006 | | | |
| SCALE: 1:8 | WEIGHT: | SHEET 1 OF 3 | | |

FIRST
ROBOTICS
COMPETITION
SOLIDWORKS
Modeling Solutions Partner

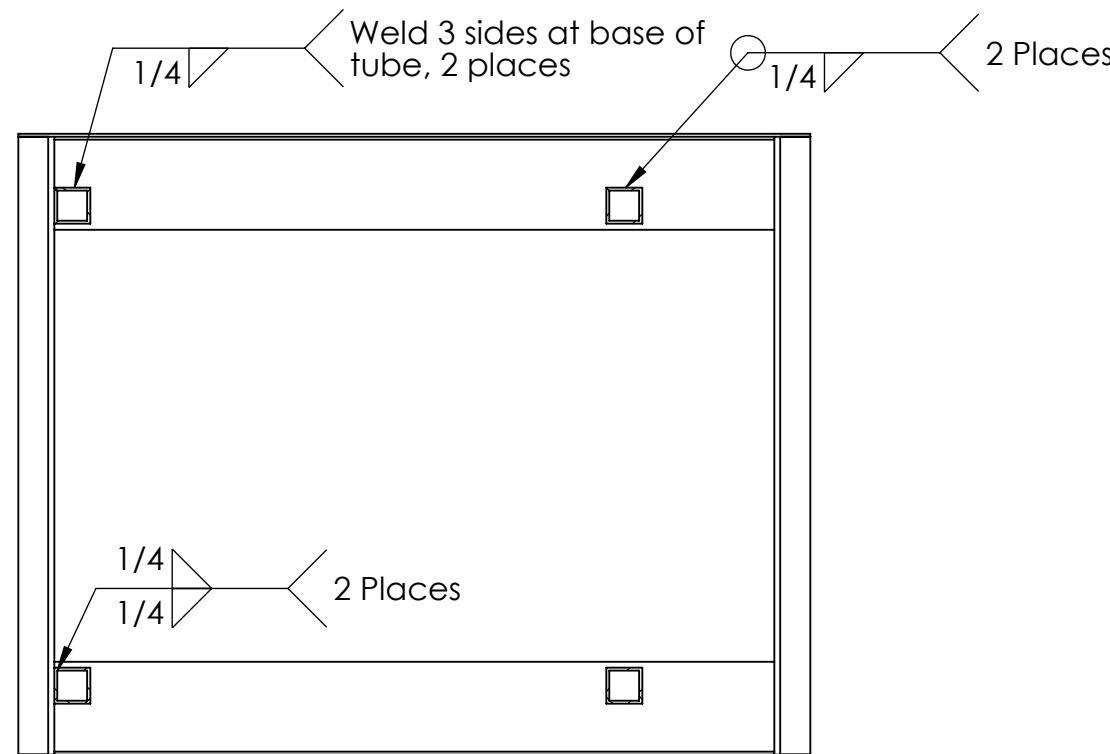
TITLE:
Roller Base

4

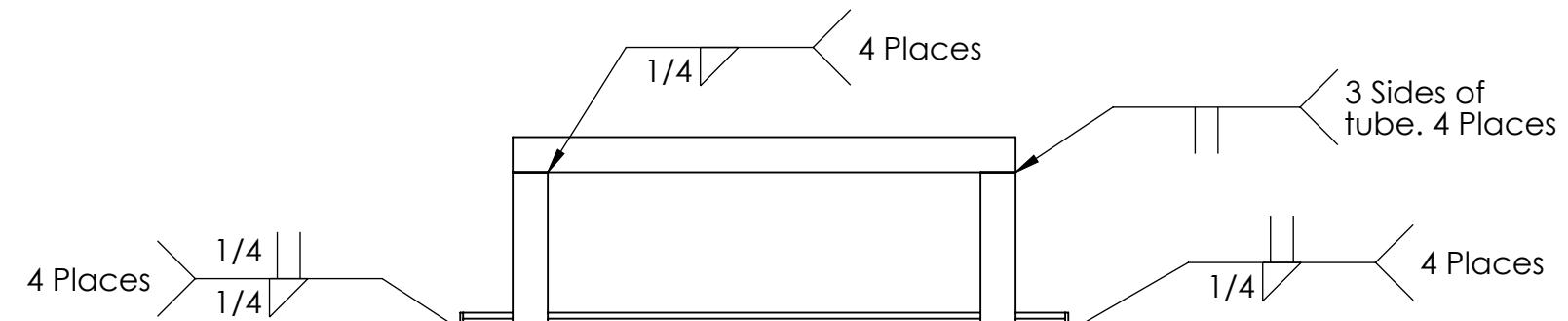
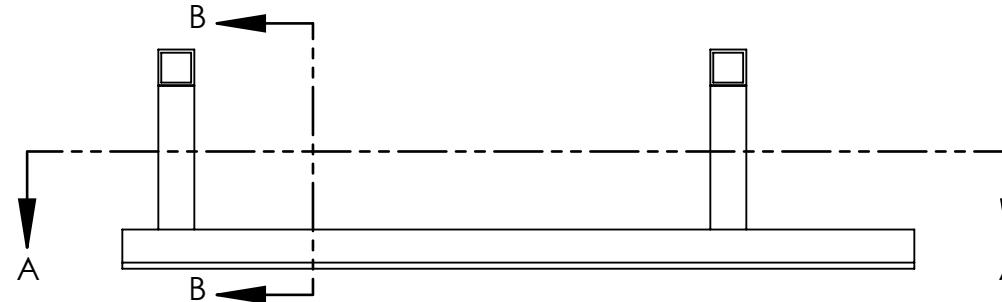
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SECTION A-A



SECTION B-B

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

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FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

ROLLER BASE

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

SCALE: 1:8 WEIGHT: SHEET 2 OF 3

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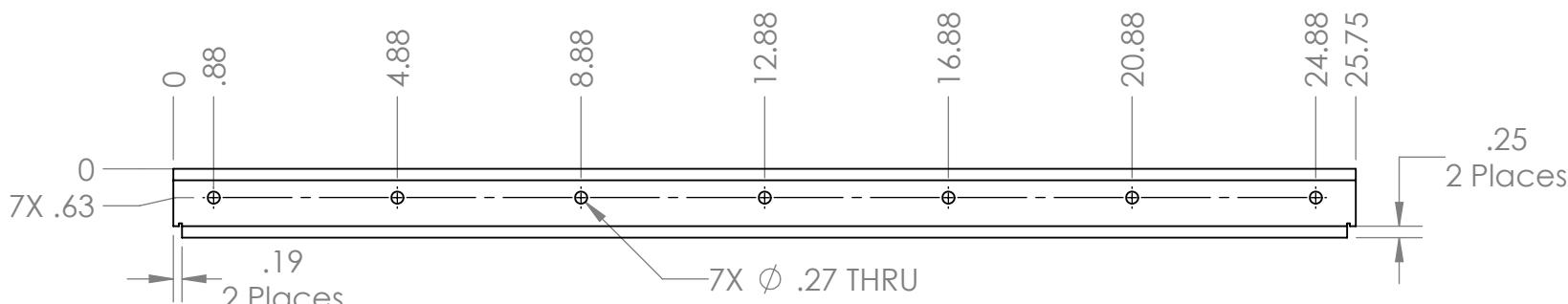
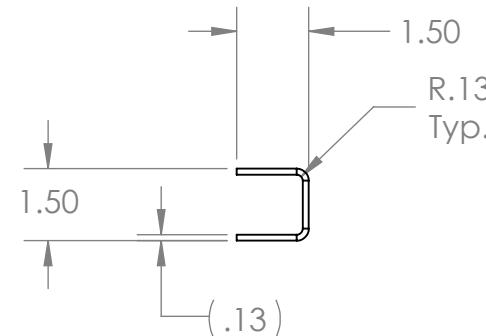
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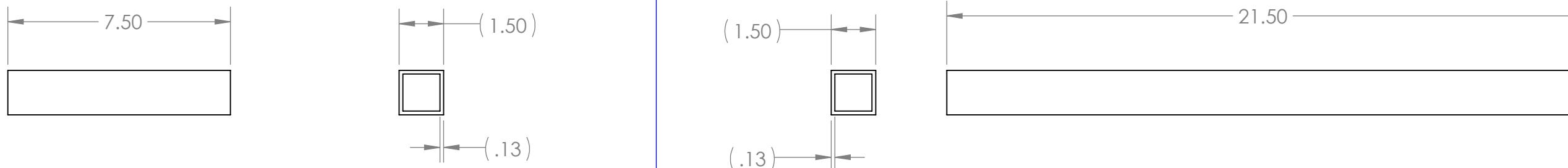
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B

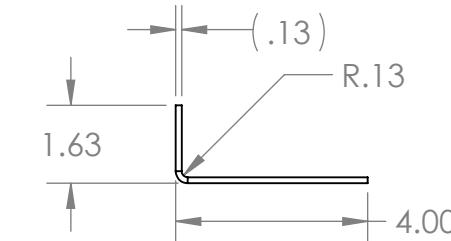
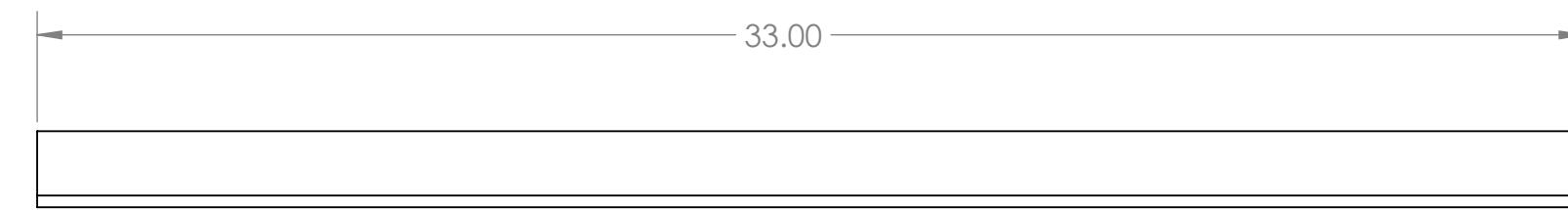
B

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



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

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



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

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| | | UNLESS OTHERWISE SPECIFIED: | | NAME | DATE |
|--------------------------|-----------------|--|--------------|------|------|
| DIMENSIONS ARE IN INCHES | | TOLERANCES: | | | |
| FRACTIONAL $\pm 1/16$ | | ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ | | | |
| INTERPRET GEOMETRIC | | TWO PLACE DECIMAL $\pm .01$ | | | |
| TOLERANCING PER: | | THREE PLACE DECIMAL $\pm .001$ | | | |
| MATERIAL | | | | | |
| NEXT ASSY | USED ON | FINISH | | | |
| APPLICATION | | DO NOT SCALE DRAWING | | | |
| ROLLER BASE | | | | | |
| SIZE | DWG. NO. | | REV | | |
| B | GE-18006 | | | | |
| SCALE: 1:8 | WEIGHT: | | SHEET 3 OF 3 | | |

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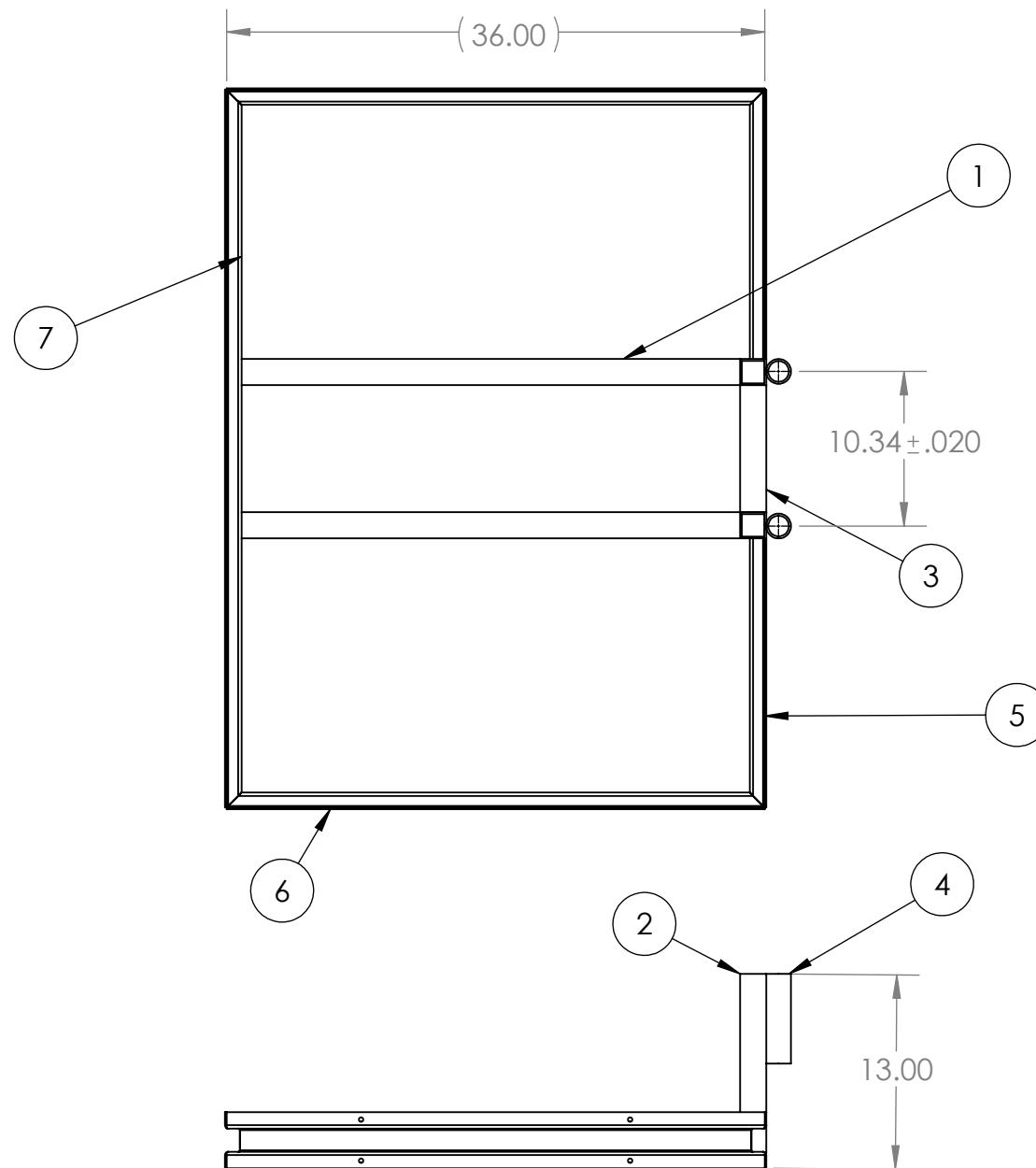
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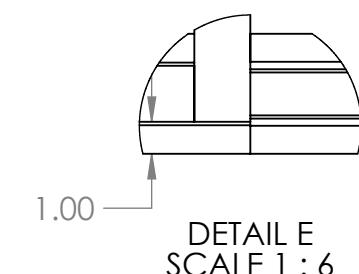
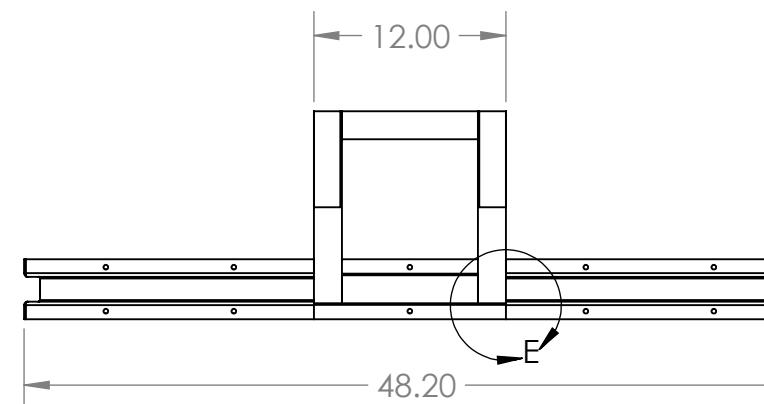
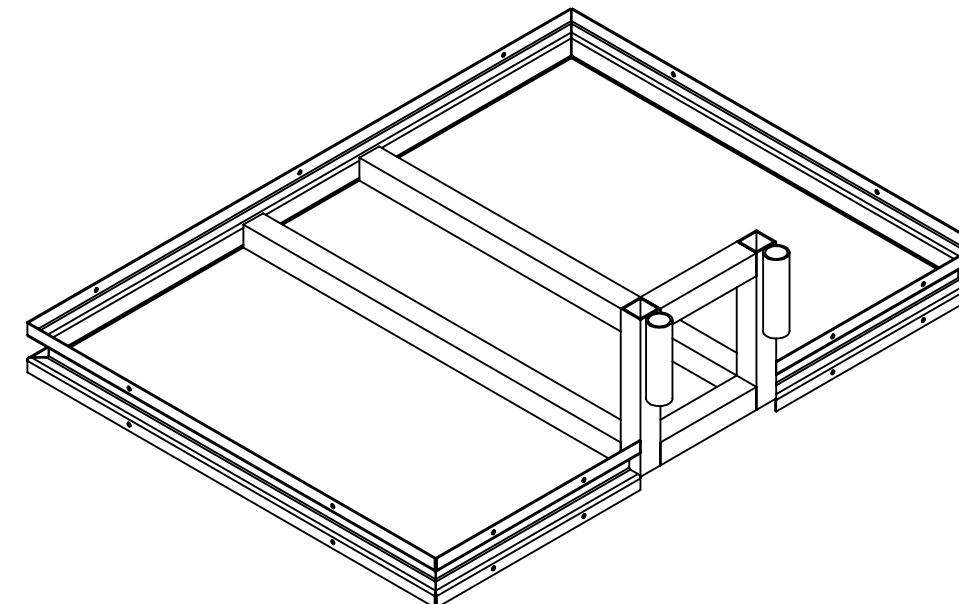
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| REVISIONS | | | | |
|-----------|------|-----------------|-----------|----------|
| ZONE | REV. | DESCRIPTION | DATE | APPROVED |
| 2-B1 | A | Weld note added | 12/7/2017 | CPO |



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

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Scale Plate

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

SCALE: 1:12 WEIGHT: SHEET 1 OF 7

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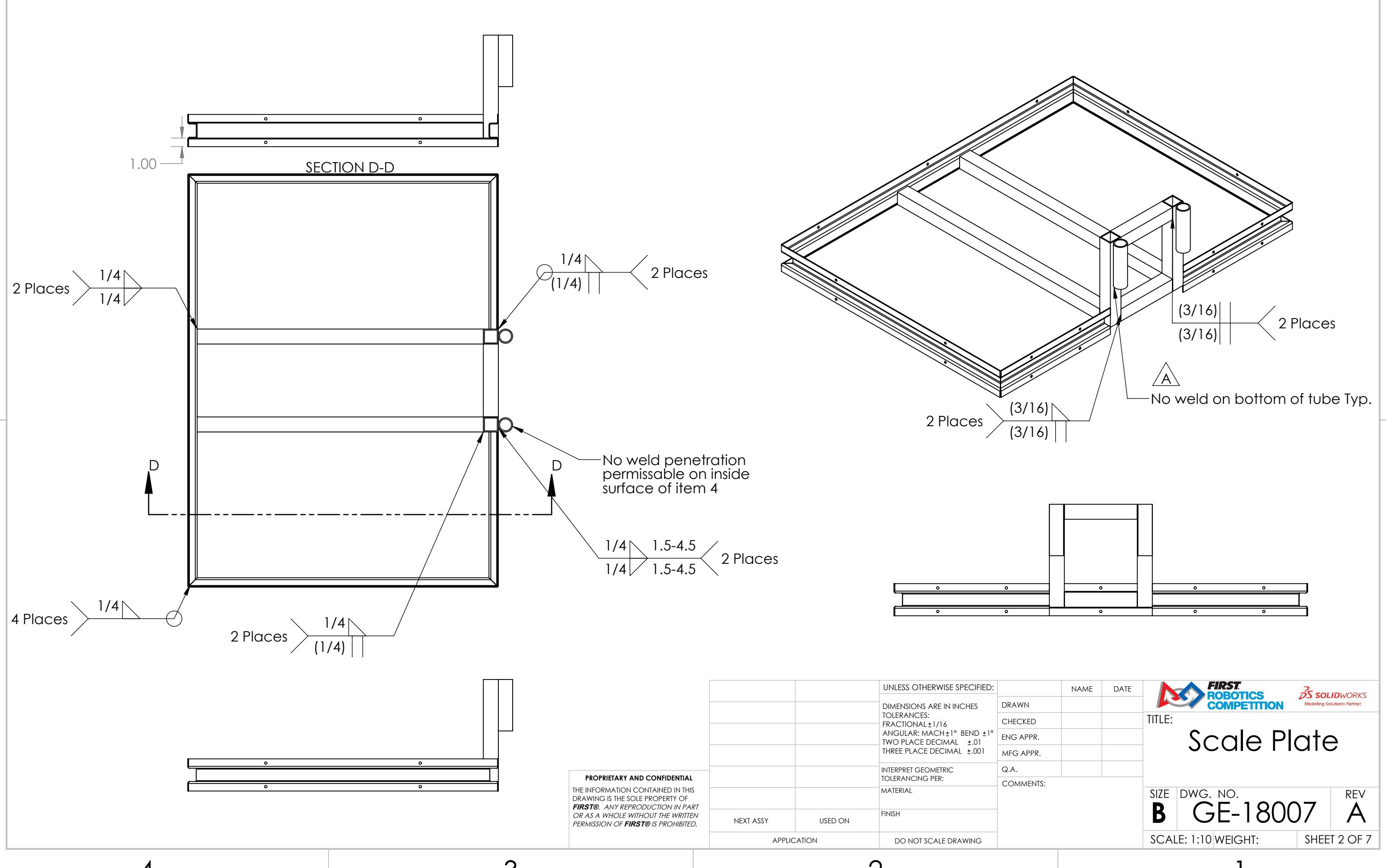
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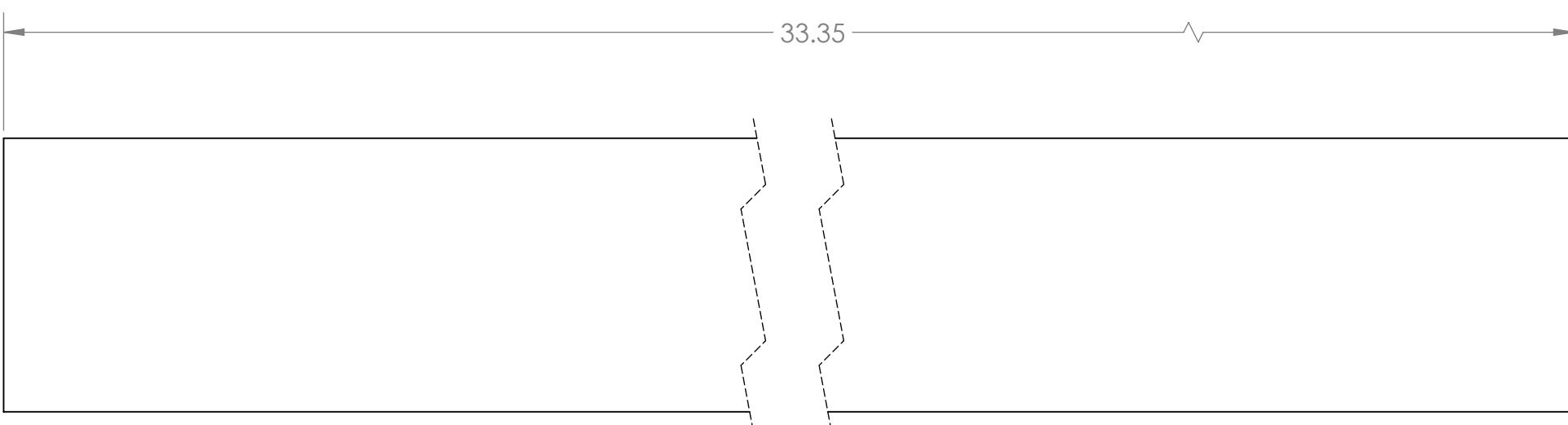
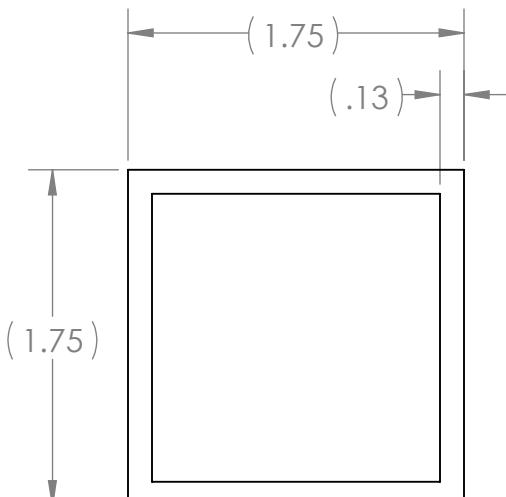


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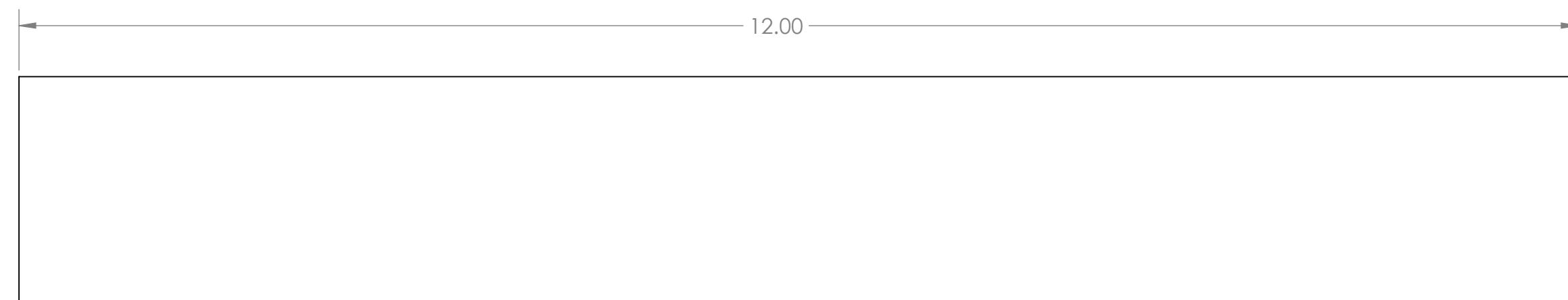
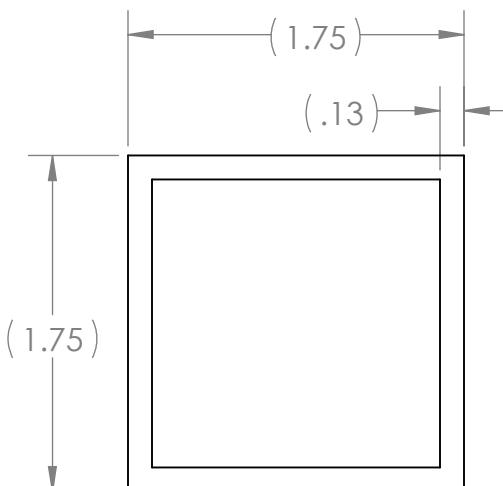


Item: GE-18007-01

Material: 1.75" x .125" thk. Square Tube, 6063 Aluminum

Scale 1:1

QTY: 2



Item: GE-18007-02

Material: 1.75" x .125" thk. Square Tube, 6063 Aluminum

Scale 1:1

QTY: 2

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|-------------|----------------------|--|--|--------------|------|
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| | | DRAWN | | | |
| | | CHECKED | | | |
| | | ENG APPR. | | | |
| | | MFG APPR. | | | |
| | | Q.A. | | | |
| | | COMMENTS: | | | |
| | | MATERIAL | | | |
| | | FINISH | | | |
| NEXT ASSY | USED ON | | | | |
| APPLICATION | DO NOT SCALE DRAWING | | | | |
| SIZE | DWG. NO. | | | REV | |
| B | GE-18007 | | | A | |
| SCALE: 1:1 | WEIGHT: | | | SHEET 3 OF 7 | |

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

Title:
Scale Plate

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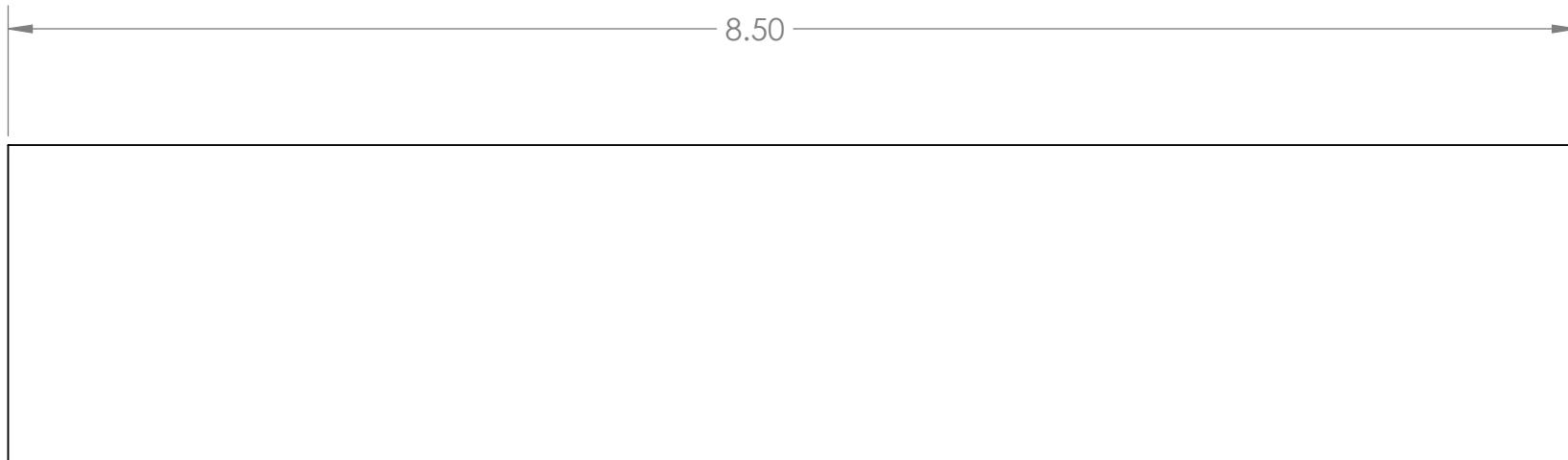
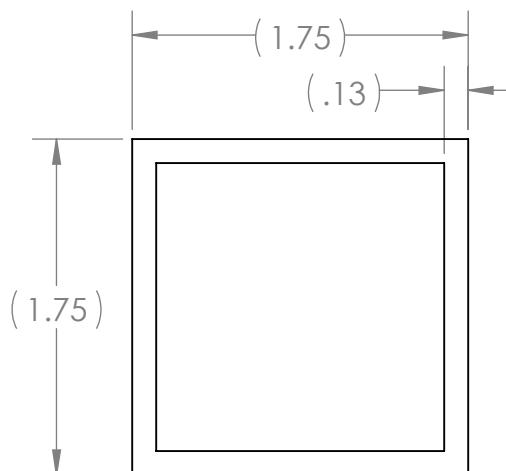
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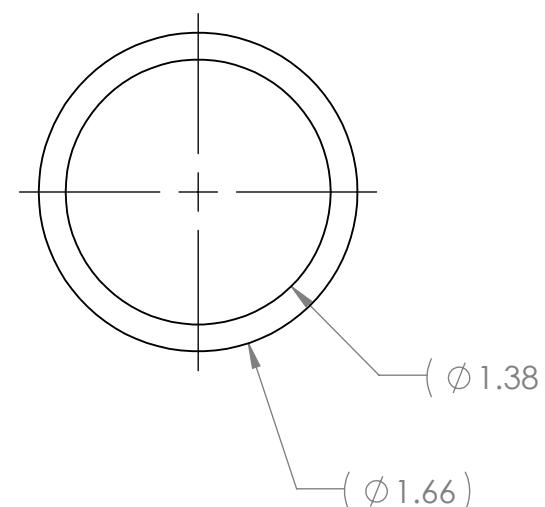
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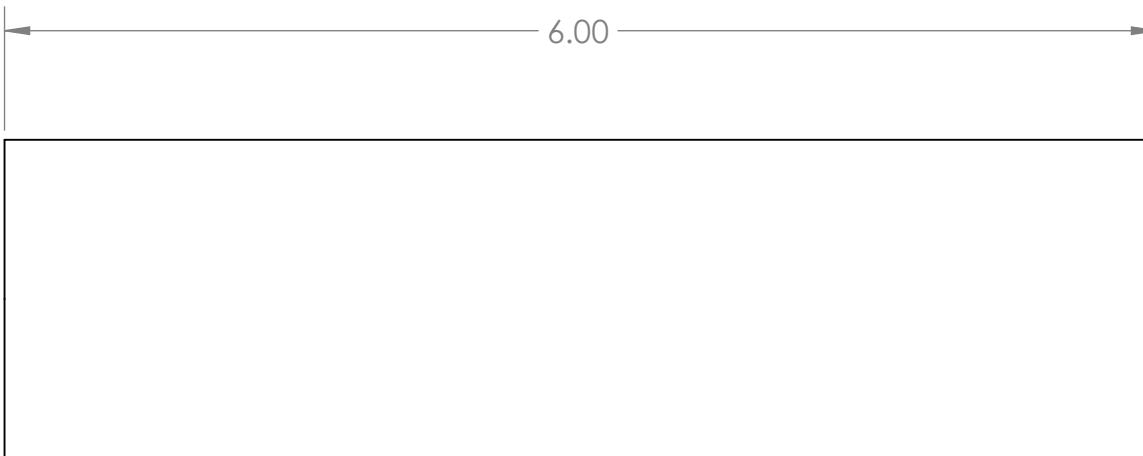
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Item: GE-18007-03
 Material 1.75" x .125" thk. Square Tube, 6063 Aluminum
 Scale 1:1
 QTY: 2



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



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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
 Modeling Solutions Partner

Title: Scale Plate

| | | |
|-------------|-----------------|--------------|
| SIZE | DWG. NO. | REV |
| B | GE-18007 | A |
| SCALE: 1:1 | WEIGHT: | SHEET 4 OF 7 |

4

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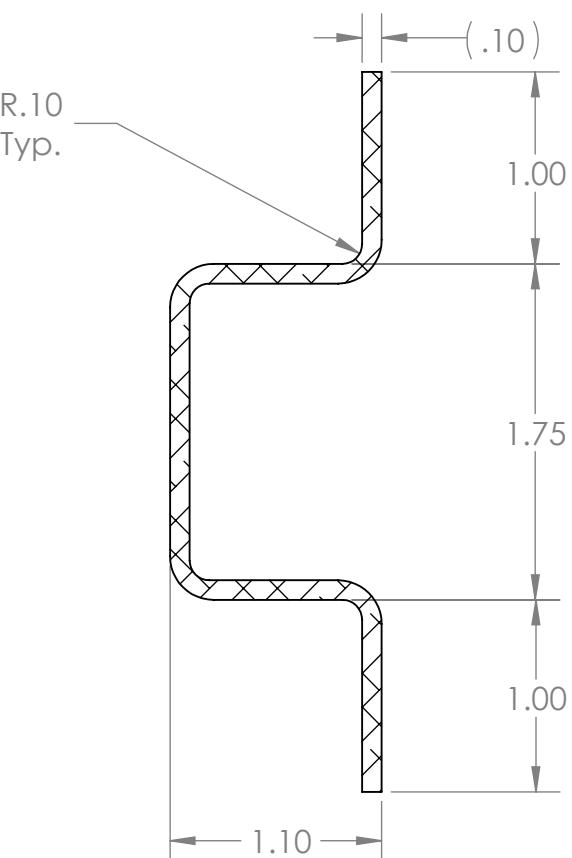
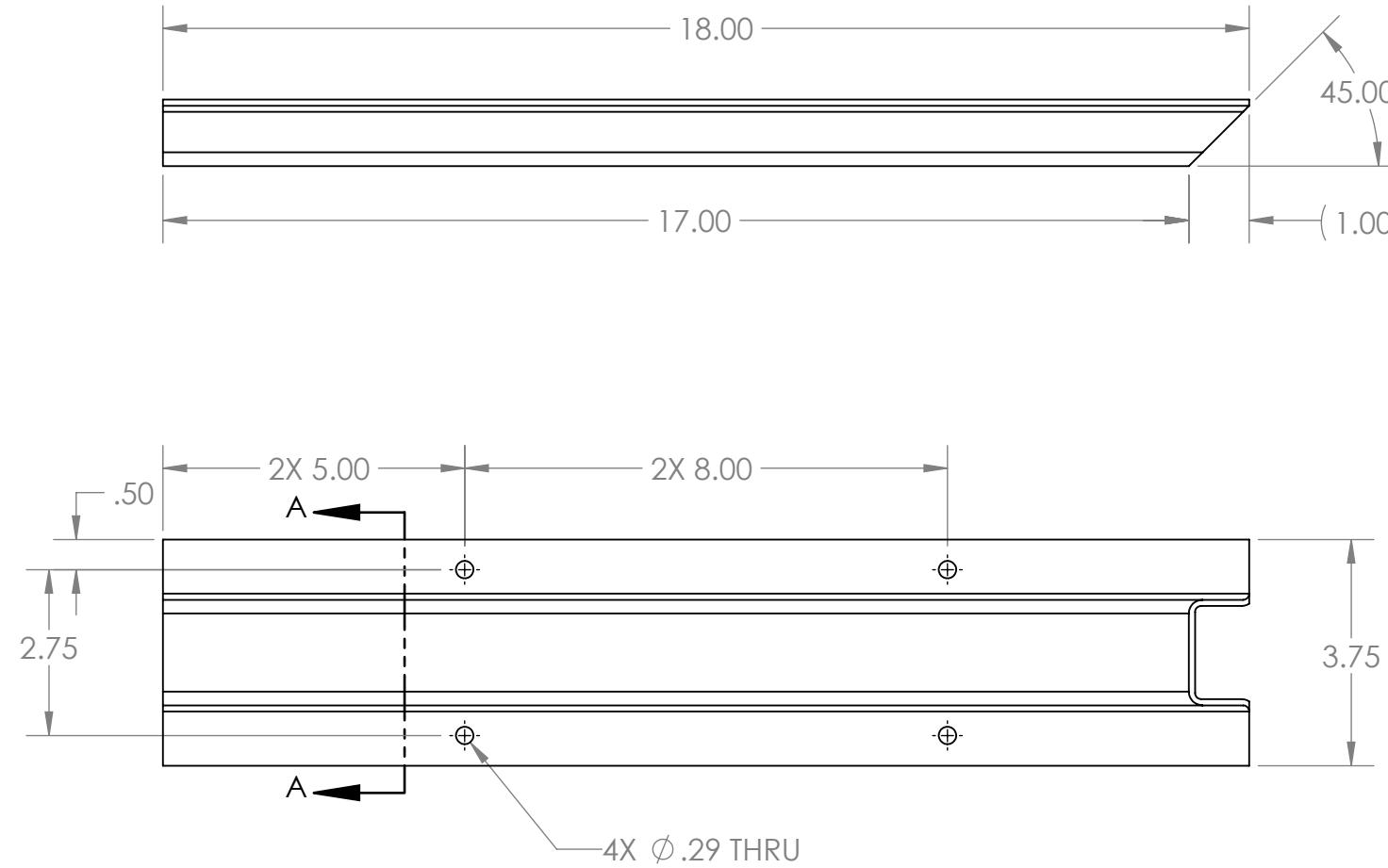
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B



SECTION A-A
SCALE 1 : 1

A

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

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|-------------|----------------------|--|--------------|------|
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| | | DRAWN | | |
| | | CHECKED | | |
| | | ENG APPR. | | |
| | | MFG APPR. | | |
| | | Q.A. | | |
| | | COMMENTS: | | |
| | | MATERIAL | | |
| | | FINISH | | |
| NEXT ASSY | USED ON | | | |
| APPLICATION | DO NOT SCALE DRAWING | | | |
| SIZE | DWG. NO. | | REV | |
| B | GE-18007 | | A | |
| SCALE: 1:3 | WEIGHT: | | SHEET 5 OF 7 | |

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

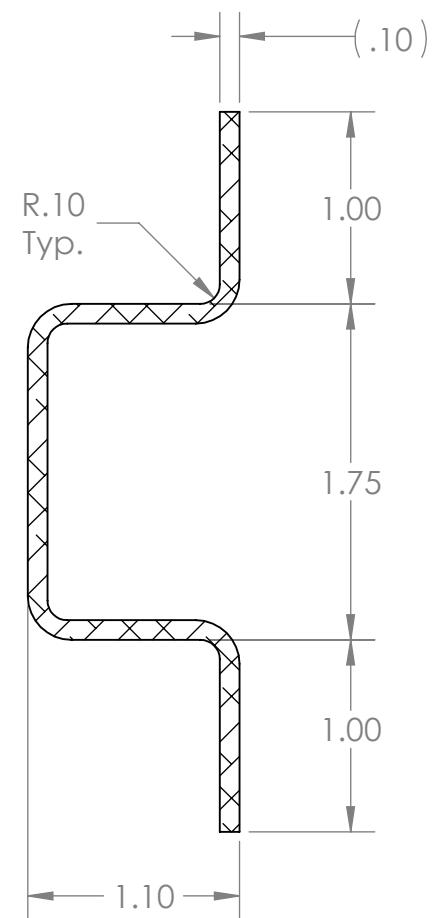
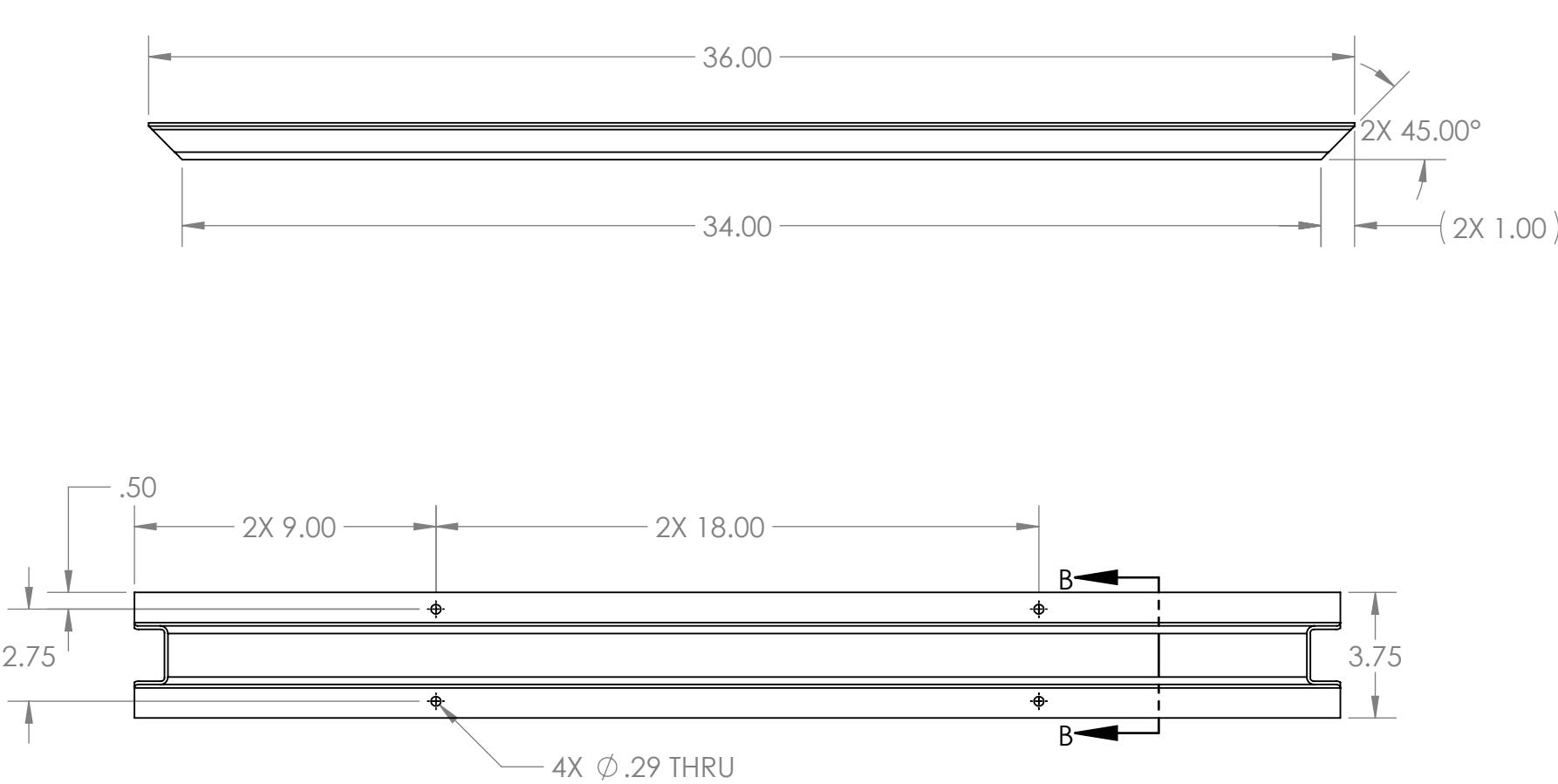
Title:
Scale Plate

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SECTION B-B
SCALE 1 : 1

Item: GE-18007-06

Material: 10 Gauge 5052 Aluminum Sheet

Scale 1:5

Qty: 2

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|-------------|----------------------|--|--|--------------|------|
| | | UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL: ±1/16 ANGULAR: MACH ±1° BEND ±1° TWO PLACE DECIMAL: ±.01 THREE PLACE DECIMAL: ±.001 | | NAME | DATE |
| | | DRAWN | | | |
| | | CHECKED | | | |
| | | ENG APPR. | | | |
| | | MFG APPR. | | | |
| | | Q.A. | | | |
| | | COMMENTS: | | | |
| | | MATERIAL | | | |
| | | FINISH | | | |
| NEXT ASSY | USED ON | | | | |
| APPLICATION | DO NOT SCALE DRAWING | | | | |
| SIZE | DWG. NO. | | | REV | |
| B | GE-18007 | | | A | |
| SCALE: 1:5 | WEIGHT: | | | SHEET 6 OF 7 | |

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

Title: Scale Plate

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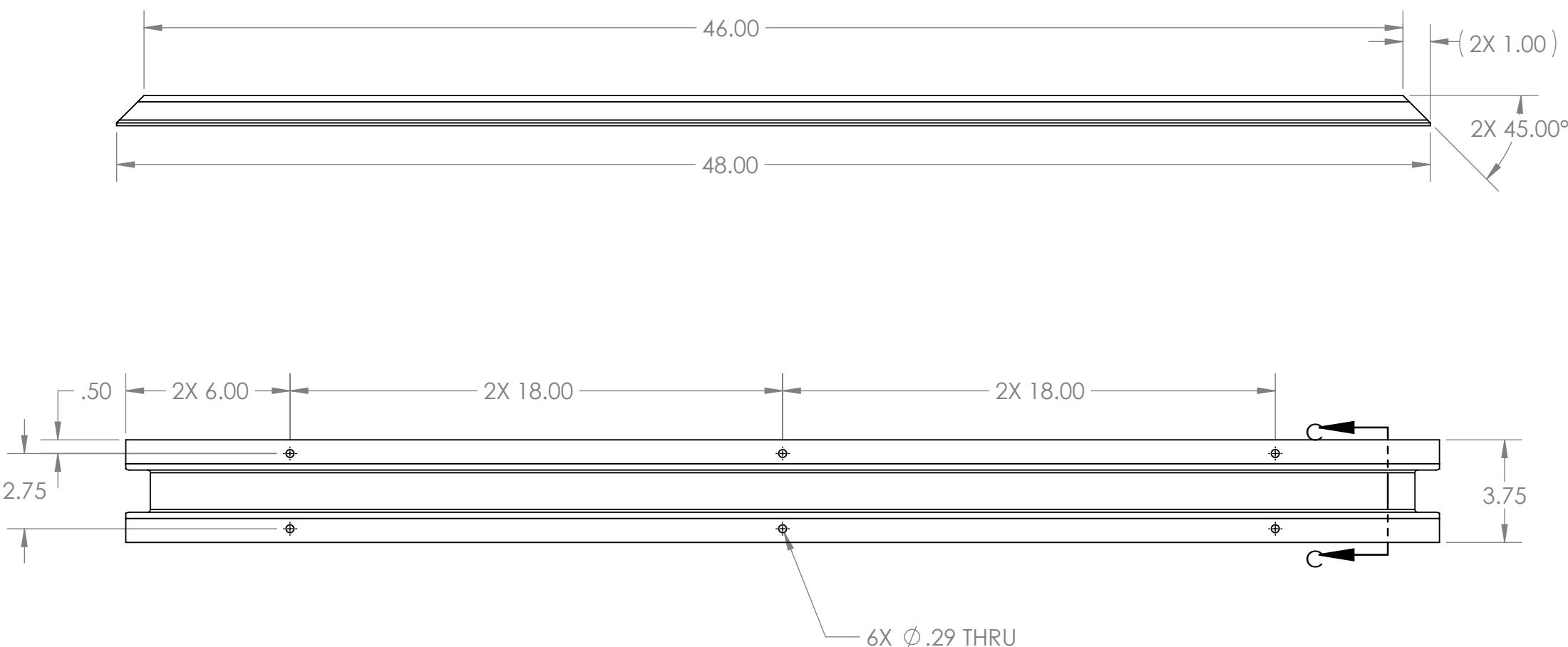
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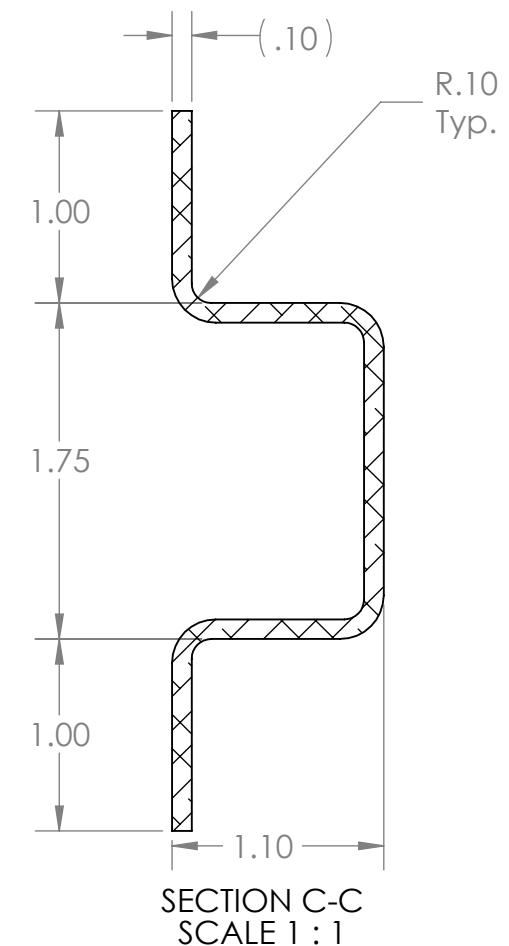
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Item: GE-18007-07
 Material: 10 Gauge 5052 Aluminum Sheet
 Scale 1:5
 Qty: 1



| | | UNLESS OTHERWISE SPECIFIED: | | NAME _____ DATE _____ DRAWN _____ CHECKED _____ ENG APPR. _____ MFG APPR. _____ Q.A. _____ COMMENTS: _____ | |
|----------------------------|---|---|----------------------|--|--|
| | | DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL: ±1/16 ANGULAR: MACH ±1° BEND ±1° TWO PLACE DECIMAL: ±.01 THREE PLACE DECIMAL: ±.001 | | | |
| | | INTERPRET GEOMETRIC TOLERANCING PER: | | | |
| | | NEXT ASSY | USED ON | | |
| | | FINISH | | | |
| | | APPLICATION | DO NOT SCALE DRAWING | | |
| A | A | FIRST ROBOTICS COMPETITION | | SOLIDWORKS Modeling Solutions Partner | |
| TITLE: Scale Plate | | SIZE DWG. NO. REV | | | |
| B GE-18007 A | | SCALE: 1:5 WEIGHT: SHEET 7 OF 7 | | | |

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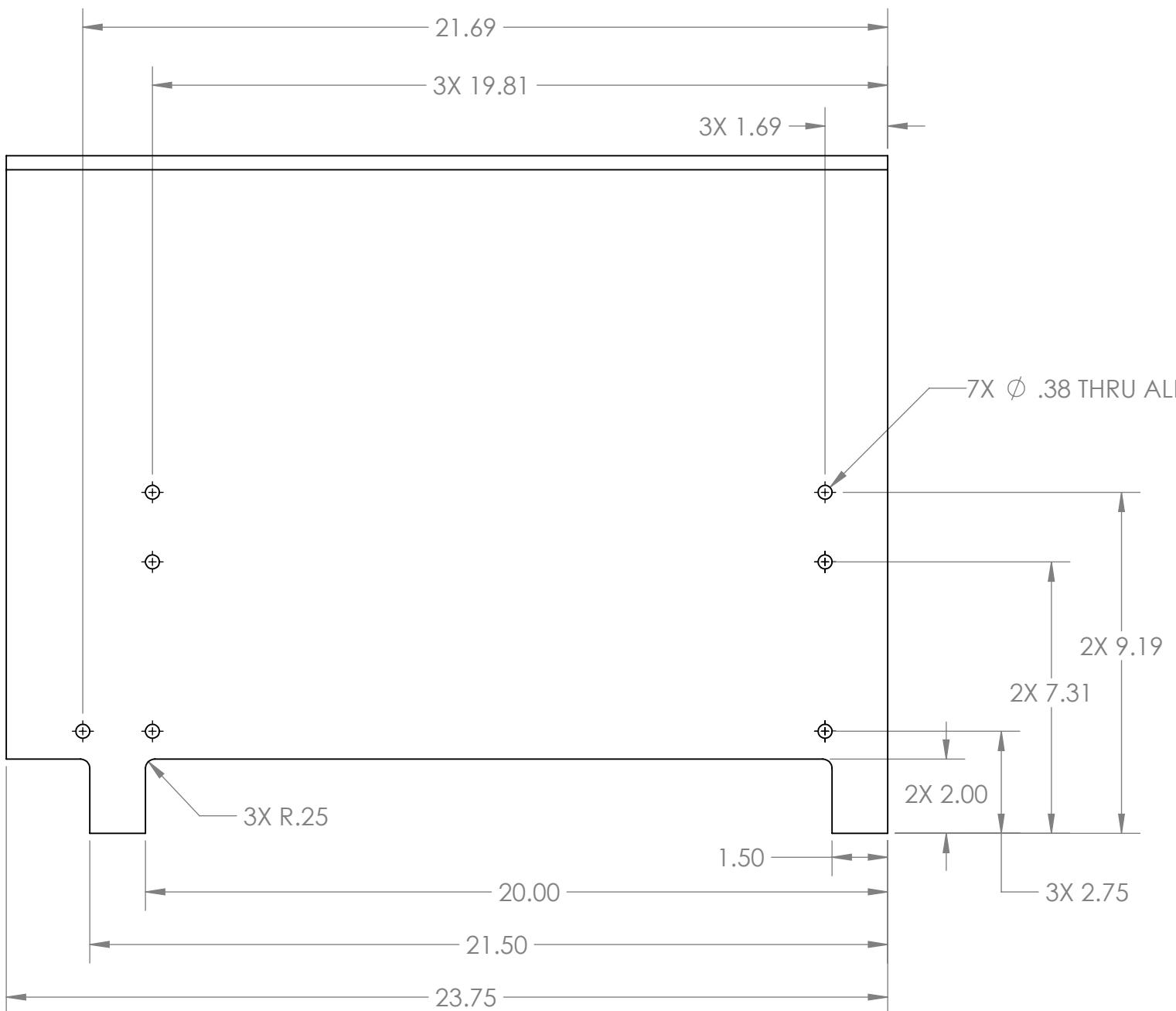
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|-------------|----------------------|--|------|------|
| | | UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL: ±1/16 ANGULAR: MACH ±1° BEND ±1° TWO PLACE DECIMAL ±.01 THREE PLACE DECIMAL ±.001 | NAME | DATE |
| | | DRAWN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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Roller Tunnel

| | | |
|------------|-----------------|--------------|
| SIZE | DWG. NO. | REV |
| B | GE-18008 | |
| SCALE: 1:8 | WEIGHT: | SHEET 1 OF 1 |

4

3

2

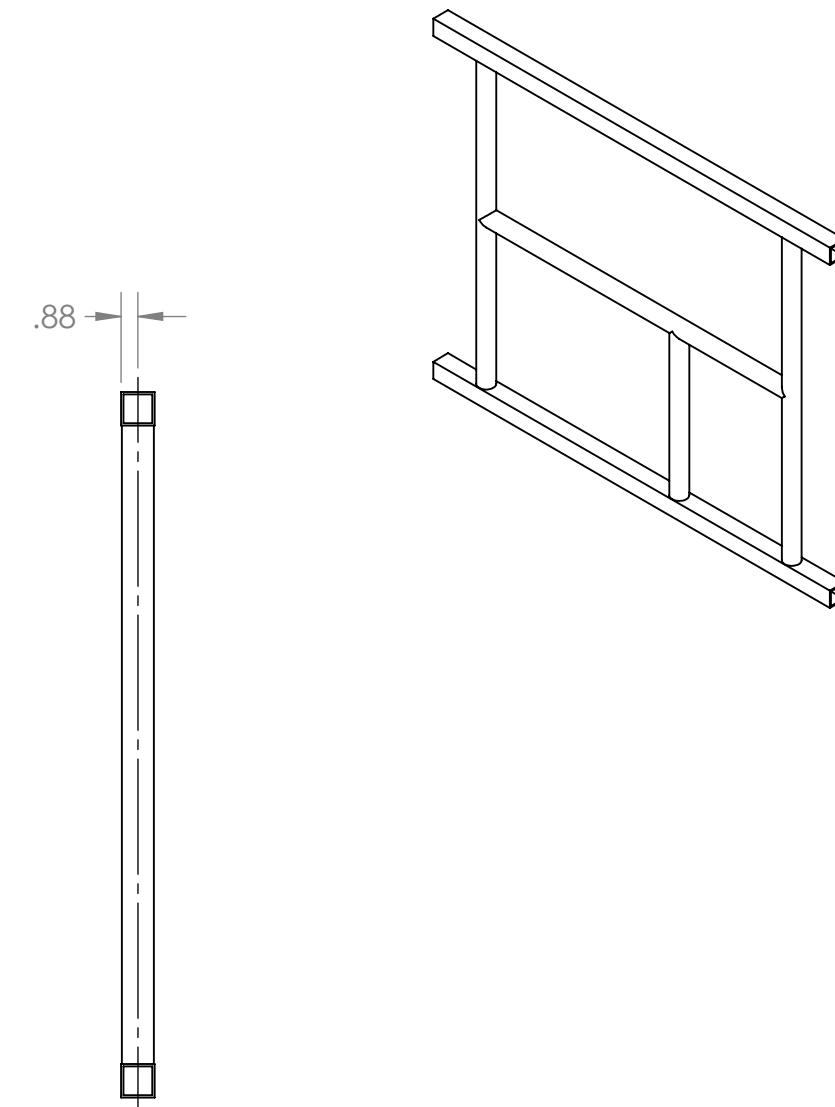
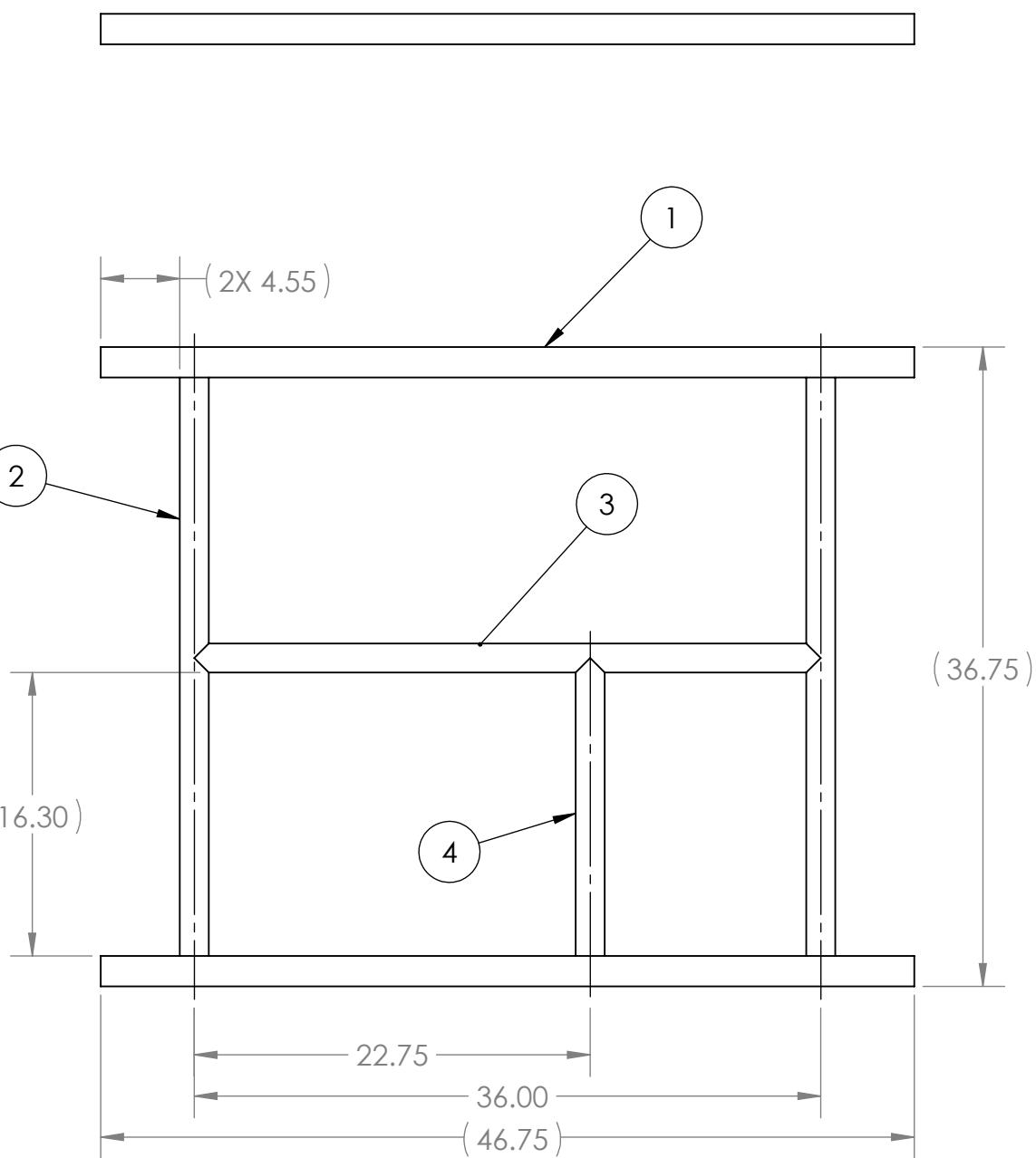
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2

1



B

B

A

A

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

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| | | | | | |
|-------------|-----------------|--|-----------|----------------------|------|
| | | UNLESS OTHERWISE SPECIFIED: | | NAME | DATE |
| | | DIMENSIONS ARE IN INCHES | DRAWN | | |
| | | TOLERANCES: | CHECKED | | |
| | | FRACTIONAL $\pm 1/16$ | ENG APPR. | | |
| | | ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ | MFG APPR. | | |
| | | TWO PLACE DECIMAL $\pm .01$ | Q.A. | | |
| | | THREE PLACE DECIMAL $\pm .001$ | COMMENTS: | | |
| | | | | | |
| | | INTERPRET GEOMETRIC TOLERANCING PER: | | | |
| | | MATERIAL | | | |
| | | NEXT ASSY | USED ON | FINISH | |
| | | | | | |
| | | APPLICATION | | DO NOT SCALE DRAWING | |
| | | | | | |
| SIZE | DWG. NO. | | | REV | |
| B | GE-18009 | | | | |
| SCALE: 1:10 | WEIGHT: | | | SHEET 1 OF 3 | |

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

Exchange Frame

4

3

2

1

4

3

2

1

B

B

The diagram illustrates a complex network of lines and connections. A central horizontal line is connected to a vertical line on the left and a vertical line on the right. The left vertical line is connected to a top horizontal line at its top and to a bottom horizontal line at its bottom. The right vertical line is also connected to a top horizontal line at its top and to a bottom horizontal line at its bottom. There are several diagonal lines connecting these vertical and horizontal segments to form a more intricate structure. Each connection point is marked with a small circle containing the text '1/4' followed by a diagonal line, indicating a specific type of joint or component placement.

A

A

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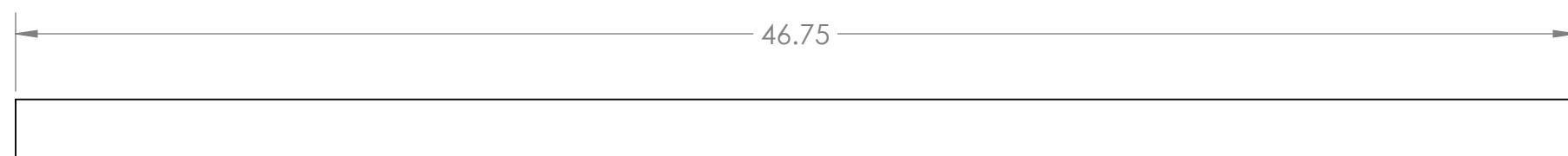
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|-------------|---------|--|-----------|--------------|------|--|--|
| | | UNLESS OTHERWISE SPECIFIED: | | NAME | DATE |  FIRST ROBOTICS COMPETITION | TITLE: <h1>Exchange Frame</h1> |
| | | DIMENSIONS ARE IN INCHES | DRAWN | | | | |
| | | TOLERANCES: | CHECKED | | | | |
| | | FRACTIONAL $\pm 1/16$ | ENG APPR. | | | | |
| | | ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ | MFG APPR. | | | | |
| | | TWO PLACE DECIMAL $\pm .01$ | Q.A. | | | | |
| | | THREE PLACE DECIMAL $\pm .001$ | COMMENTS: | | | | |
| | | INTERPRET GEOMETRIC TOLERANCING PER: | | | | | |
| | | MATERIAL | | | | | |
| NEXT ASSY | USED ON | FINISH | | | | | |
| APPLICATION | | DO NOT SCALE DRAWING | | | | | |
| SCALE: 1:10 | | WEIGHT: | | SHEET 2 OF 3 | | | |

4

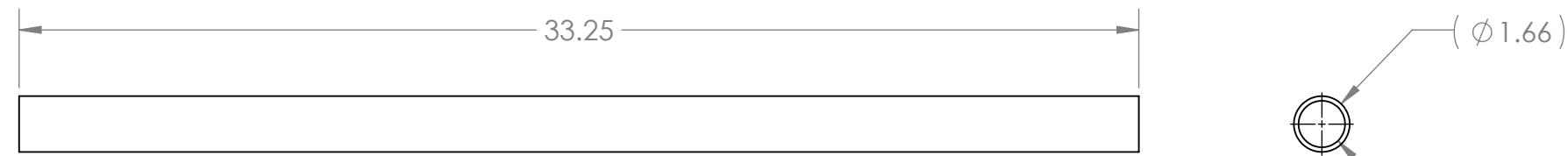
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2

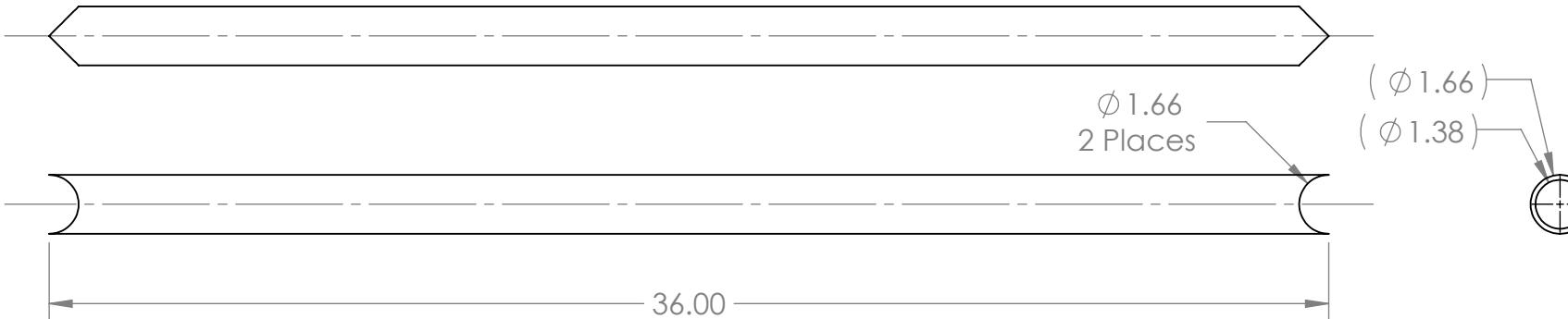
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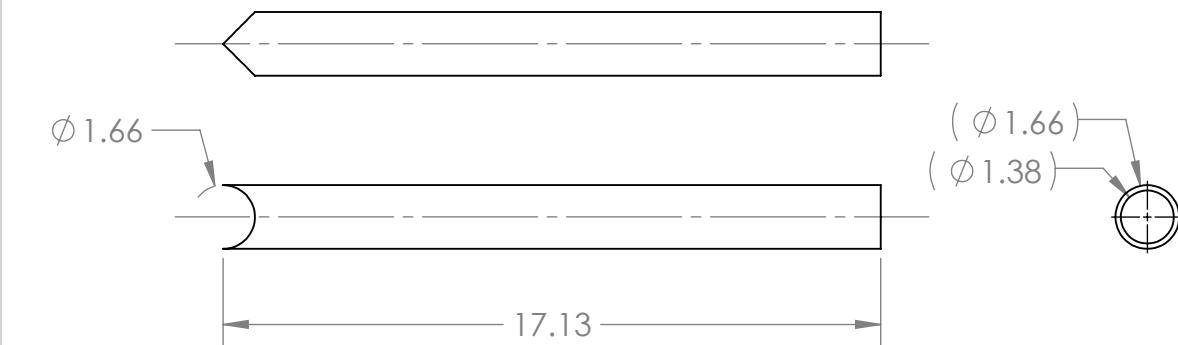
Item: GE-18009-01
Quantity: 2
Material: 1.75" x .125" thk. Square Tube, 6063 Aluminum



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



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



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

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Exchange Frame

| | | |
|------------|-----------------|--------------|
| SIZE | DWG. NO. | REV |
| B | GE-18009 | |
| SCALE: 1:5 | WEIGHT: | SHEET 3 OF 3 |

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1

REVISIONS

| ZONE | REV. | DESCRIPTION | DATE | APPROVED |
|--------|------|----------------------------------|----------|----------|
| D2, D3 | 1 | 33.25 was 33.75, 20.75 was 20.25 | 10/30/17 | DAF |

D

15

This technical drawing shows a mechanical part with various dimensions and features. The part is labeled '1' at the top center. It features a large rectangular cutout on the left side. On the right side, there is a vertical column of holes and a stepped profile. The bottom edge has a series of holes and a note indicating '18X Ø.25 THRU'. The top edge has several horizontal lines with callouts. The right edge has a series of horizontal lines with callouts. The bottom edge has a series of horizontal lines with callouts. The left edge has a series of horizontal lines with callouts.

Dimensions and features:

- Top edge: 4X 34.50, 34.00, 2X 33.25
- Right edge: 2X 20.75, 4X 20.00, 18.00, 2X 17.00, 4X 2.25, .00, 3X 4.88, 6.88, 7.13, 8.00, 2X 9.88, 10.38
- Bottom edge: 24.38, 2X 24.88, 26.75, 27.88, 2X 29.88, 2X 40.00, 2X 40.88, 2X 43.13, 48.00, .00
- Left edge: 18X Ø.25 THRU, 17.75

D

C

B

A

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

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4

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2

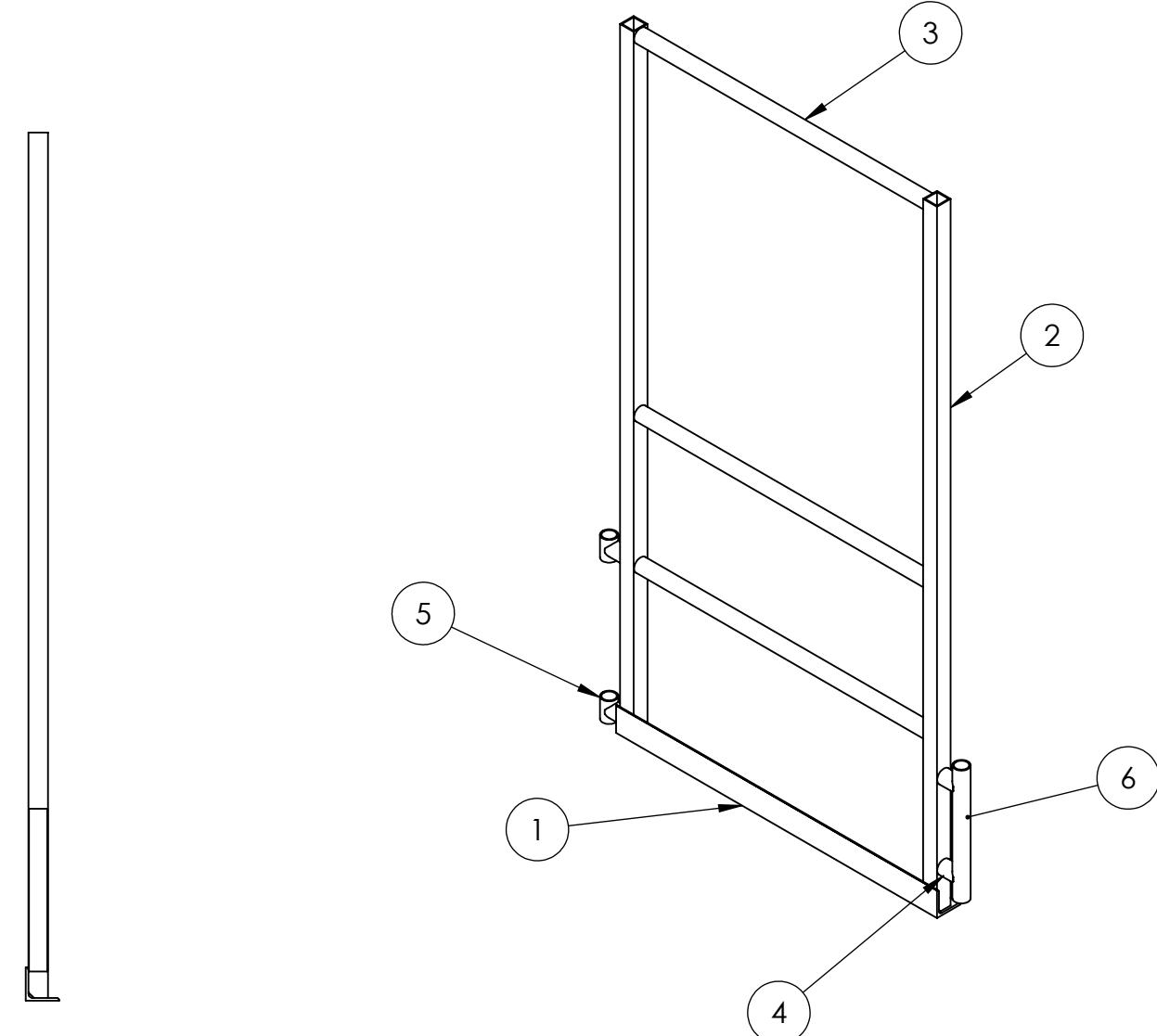
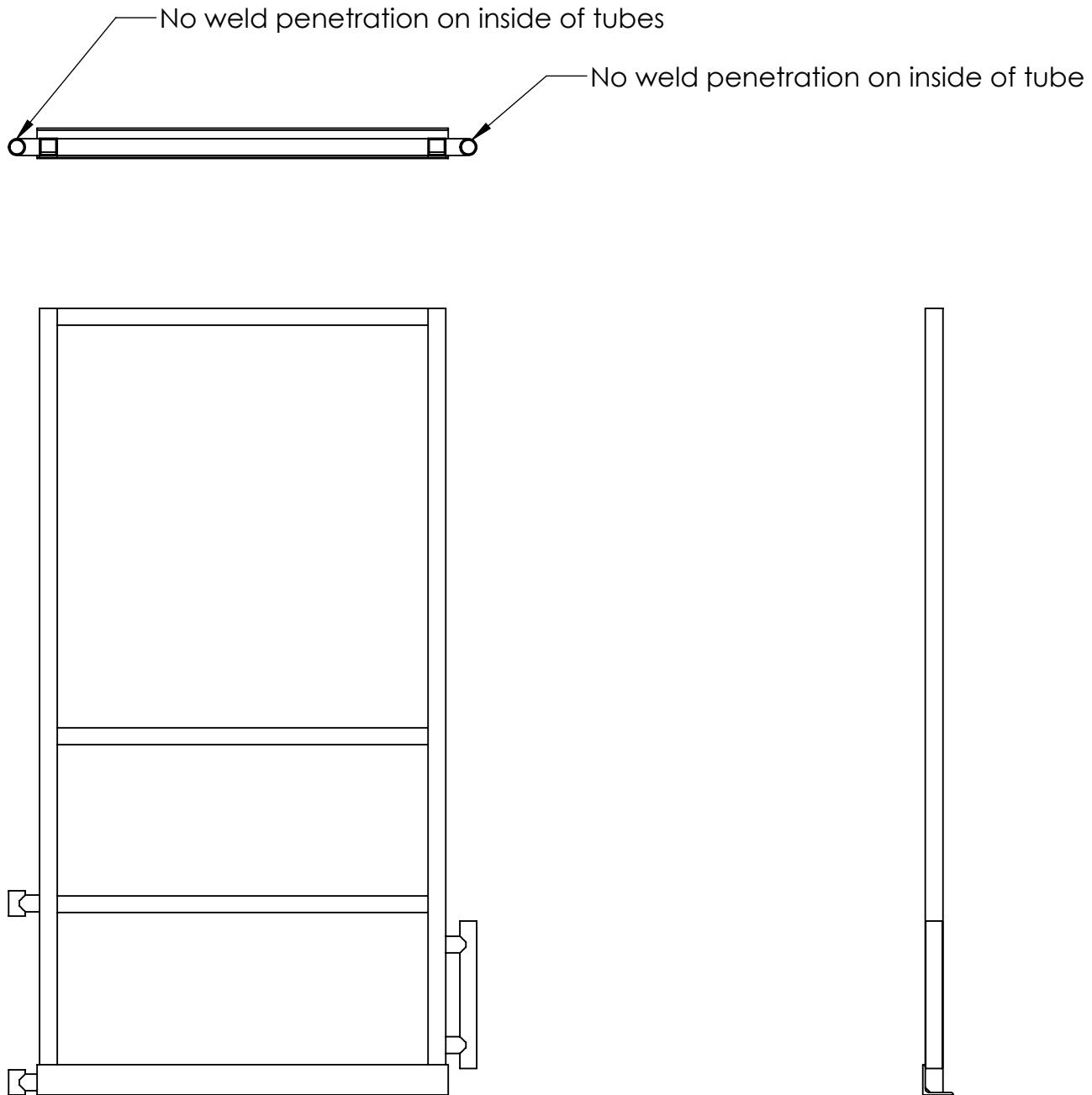
1

4

3

2

1



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

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|-------------|-----------------|---|----------------------|--------------|------|
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| | | DRAWN | | | |
| | | CHECKED | | | |
| | | ENG APPR. | | | |
| | | MFG APPR. | | | |
| | | Q.A. | | | |
| | | COMMENTS: | | | |
| | | MATERIAL | | | |
| | | FINISH | | | |
| | NEXT ASSY | USED ON | | | |
| | | APPLICATION | DO NOT SCALE DRAWING | | |
| SIZE | DWG. NO. | | | REV | |
| B | GE-18011 | | | | |
| SCALE: 1:16 | WEIGHT: | | | SHEET 1 OF 3 | |

 FIRST
ROBOTICS
COMPETITION  SOLIDWORKS
Modeling Solutions Partner

Portal Frame - Left

4

3

2

1

4

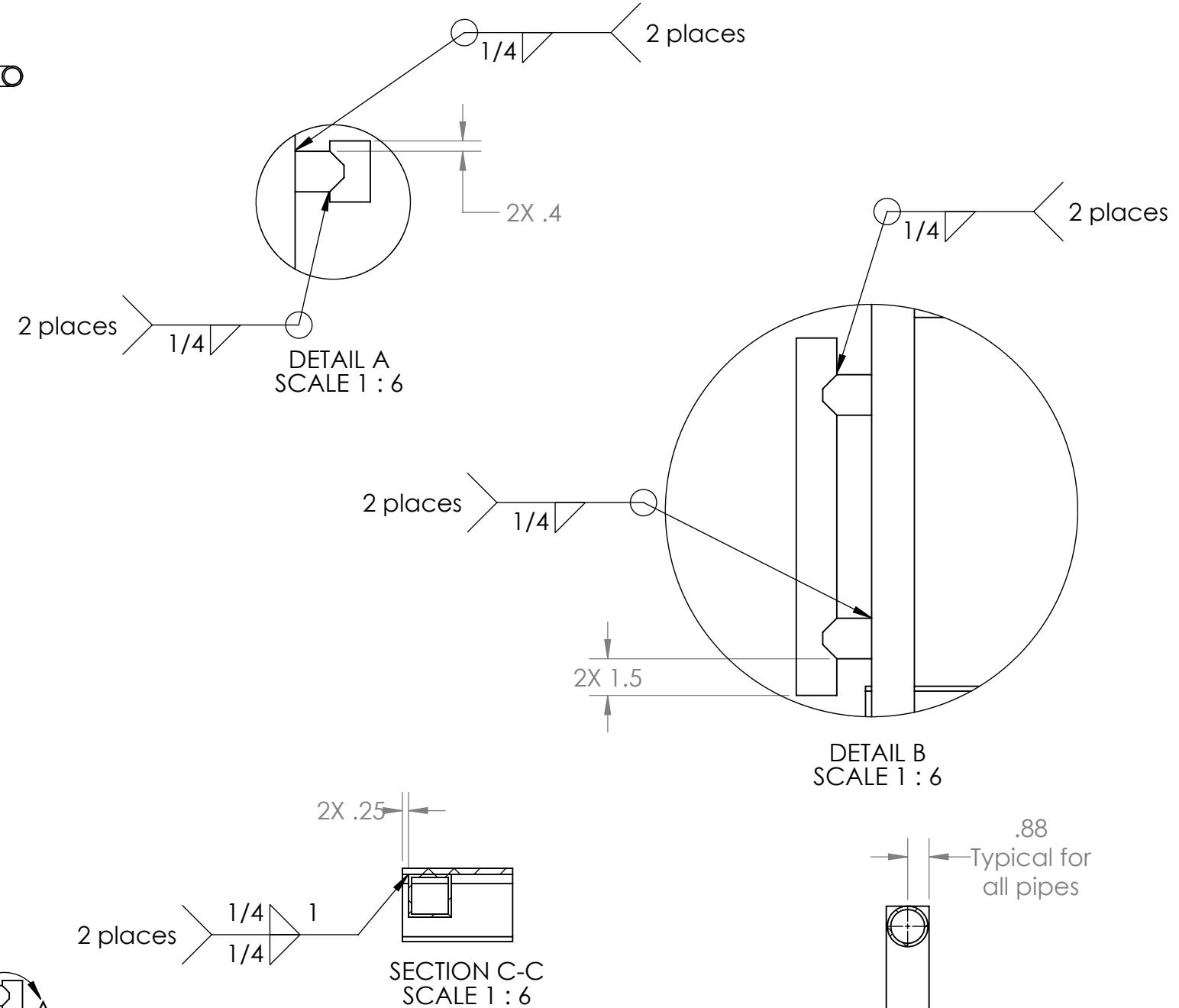
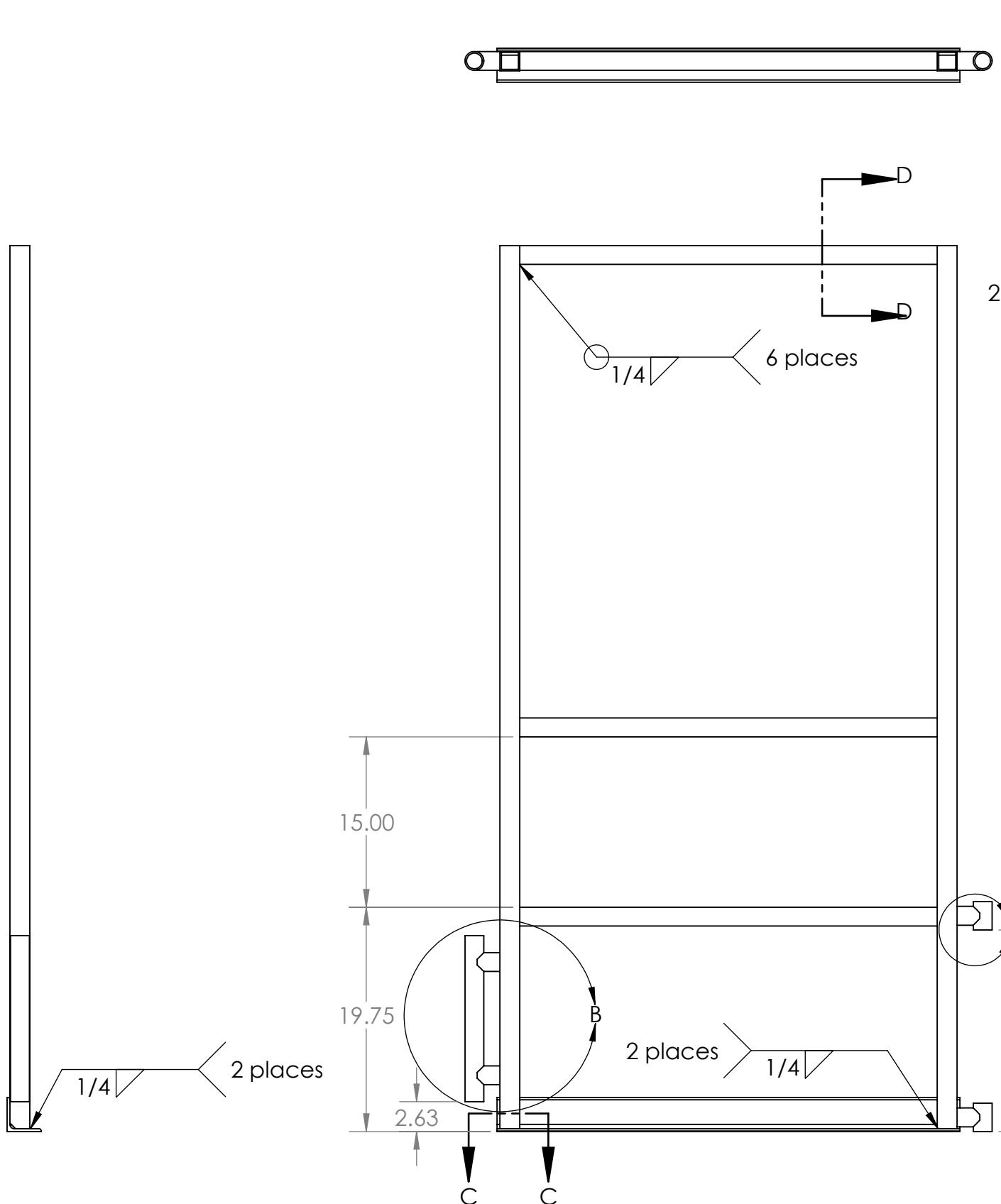
3

2

1

B

B



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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Portal Frame - Left

SIZE DWG. NO. REV
B GE-18011

SCALE: 1:12 WEIGHT: SHEET 2 OF 3

4

3

2

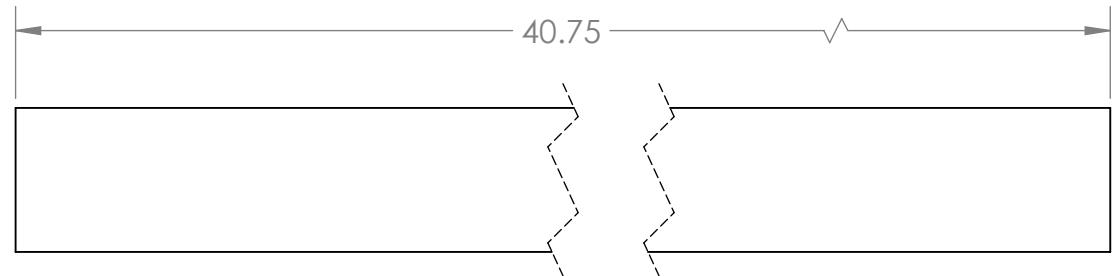
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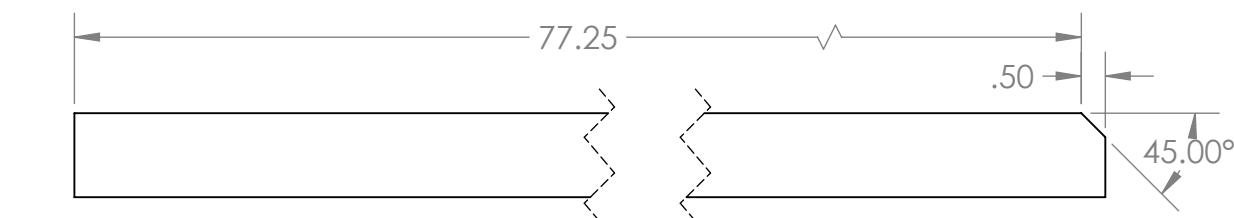
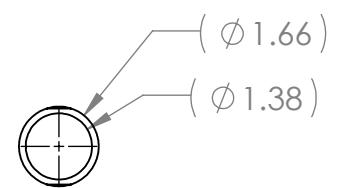
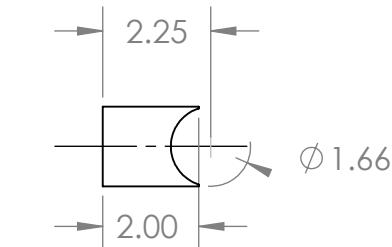
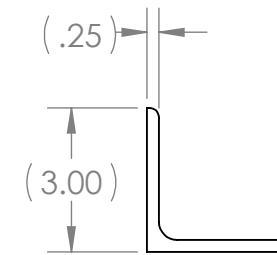
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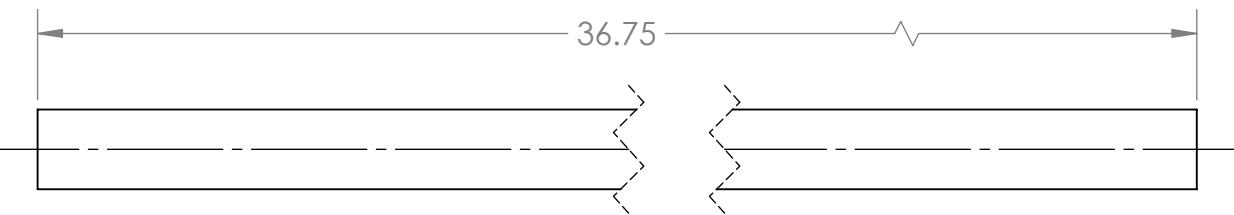
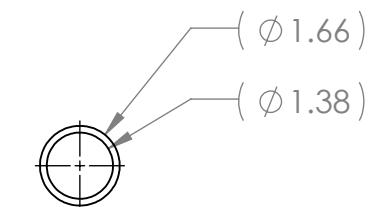
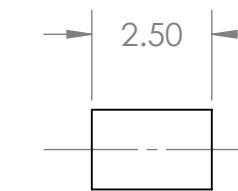
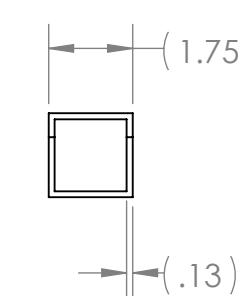
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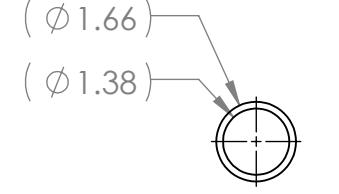
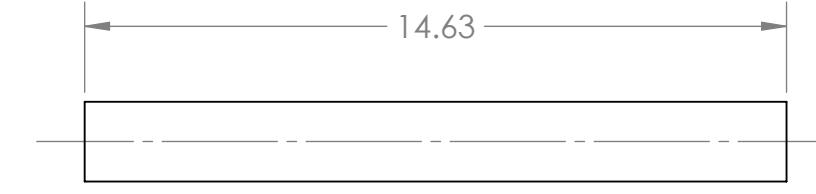
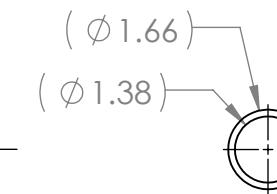
Item 1: GE-18011-01
Qty: 1
Material: 3" x .25" thk. Angle, 6061 Aluminum



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



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



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

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Portal Frame - Left

| | | |
|------------|-----------------|--------------|
| SIZE | DWG. NO. | REV |
| B | GE-18011 | |
| SCALE: 1:4 | WEIGHT: | SHEET 3 OF 3 |

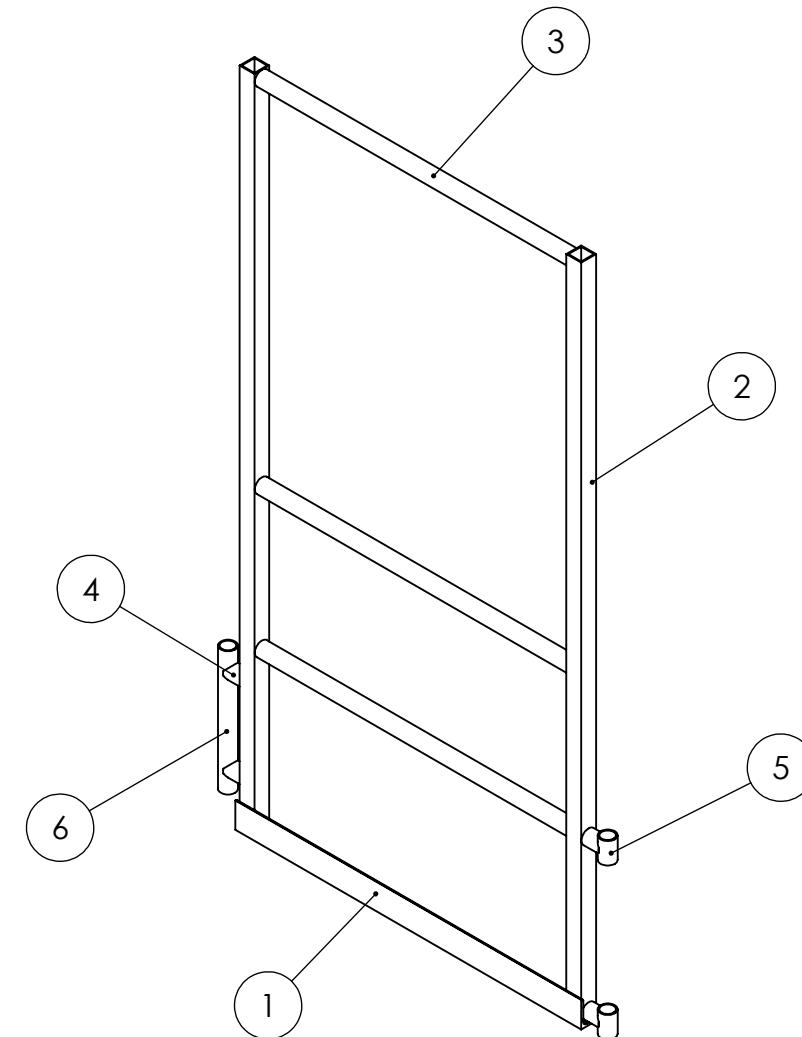
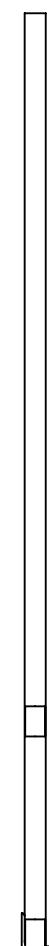
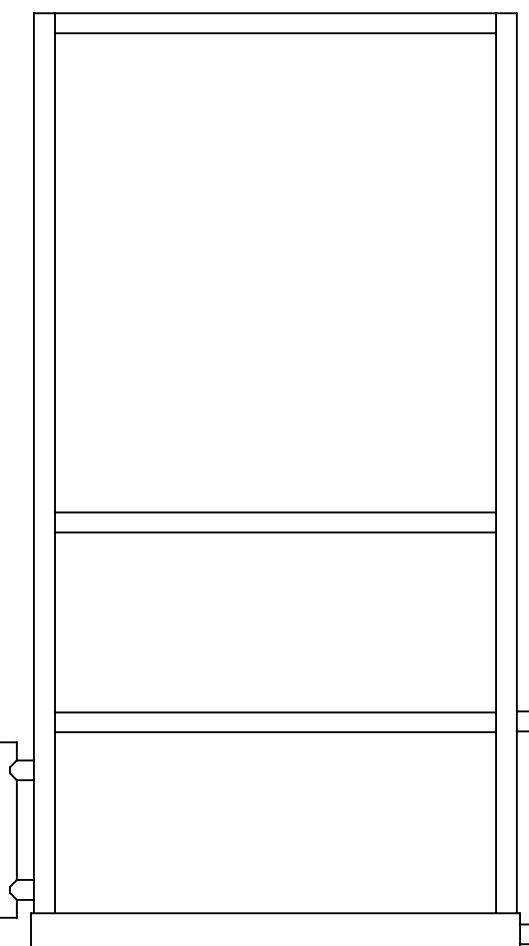
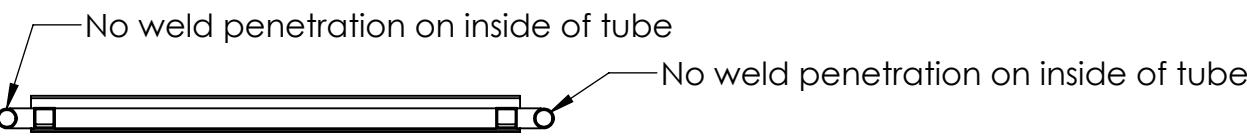
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4

3

2

1



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

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
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TITLE: Portal Frame - Right

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

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

4

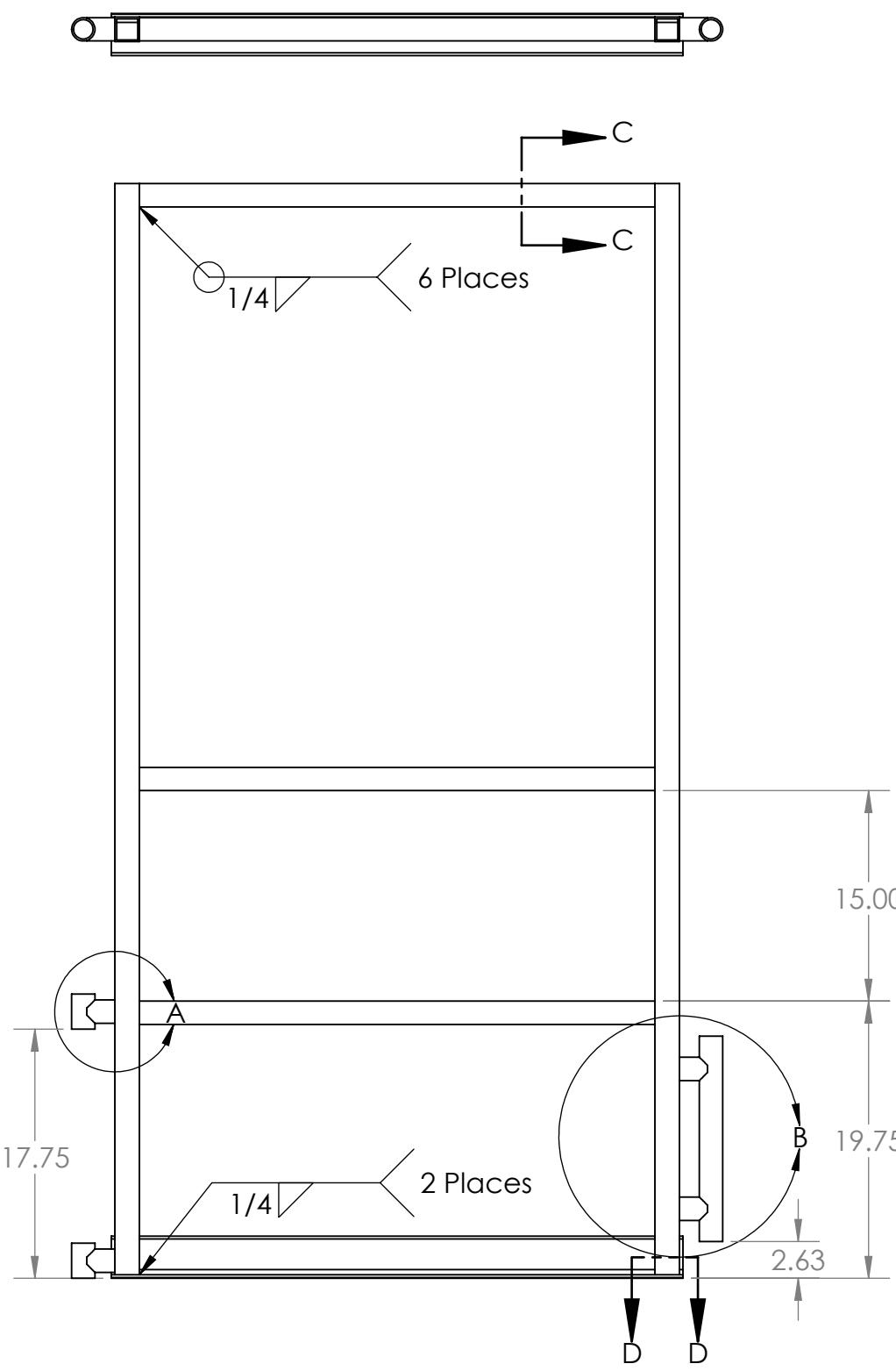
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2

1

B

B



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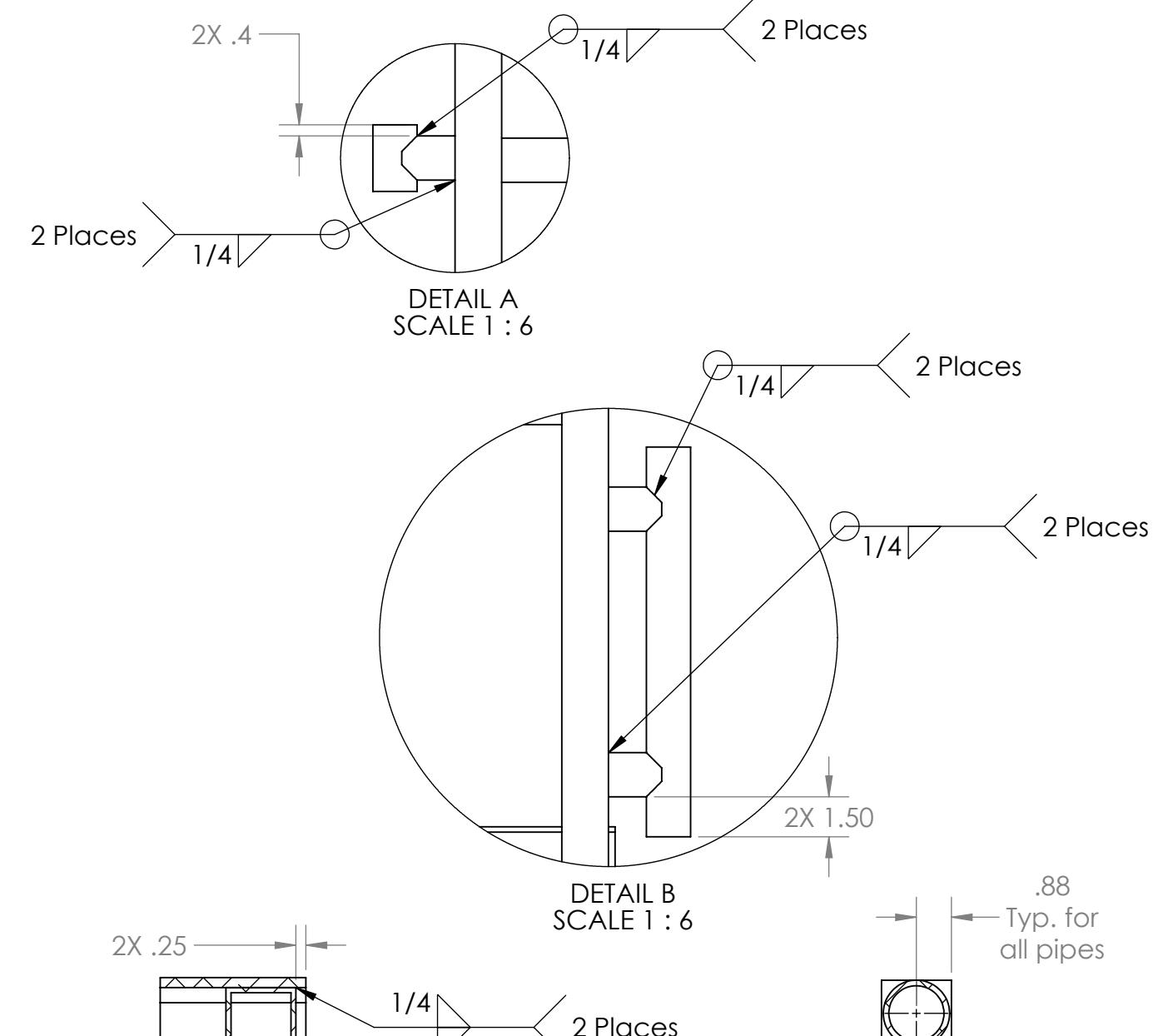
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|----------------------|---------|--|------|------|
| | | DRAWN | | |
| | | CHECKED | | |
| | | ENG APPR. | | |
| | | MFG APPR. | | |
| | | Q.A. | | |
| | | COMMENTS: | | |
| NEXT ASSY | USED ON | MATERIAL | | |
| APPLICATION | FINISH | | | |
| DO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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Portal Frame - Right

B **GE-18012**

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



4

3

2

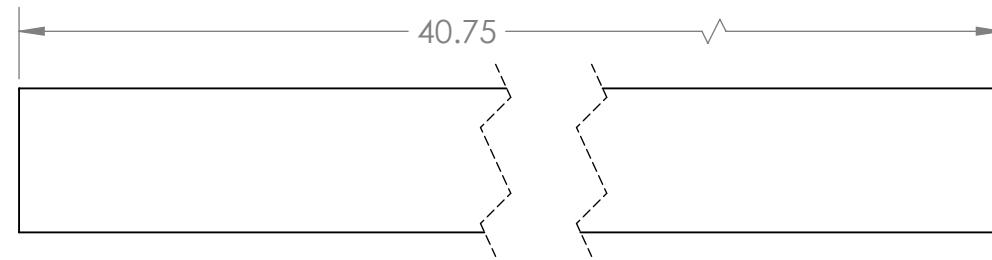
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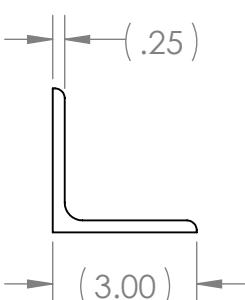
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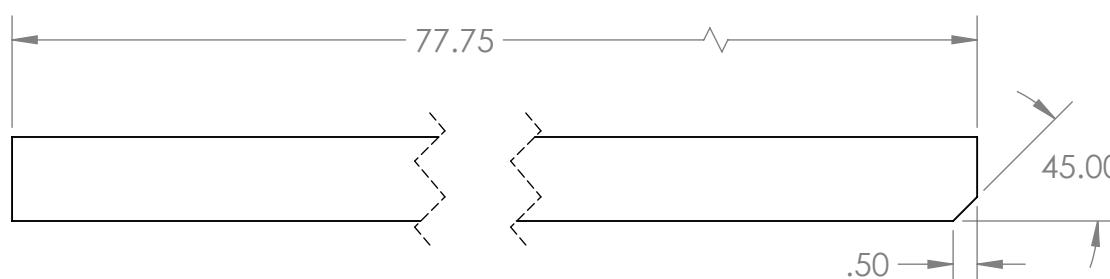
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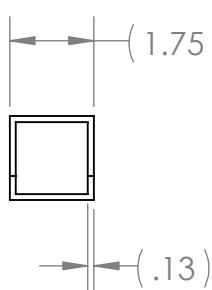
Item: GE18012-01
Qty: 1
Material 3" x .25" thick Angle, 6061 Aluminum



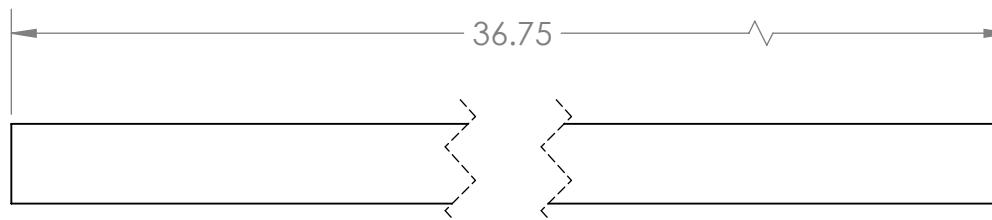
Item: GE18012-04
Qty: 4
Material 1-1/4" Schedule 40 Pipe, 6061 Aluminum



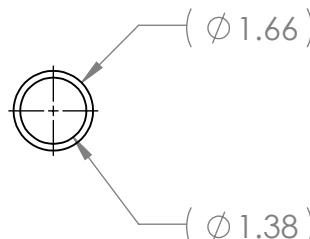
Item: GE18012-02
Qty: 2
Material 1.75" x .125" thick Square Tubing, 6061 Aluminum



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



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



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

2

3

4

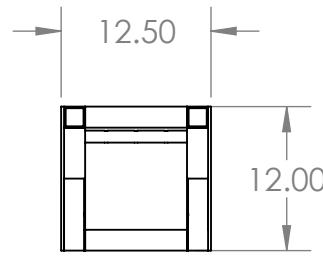
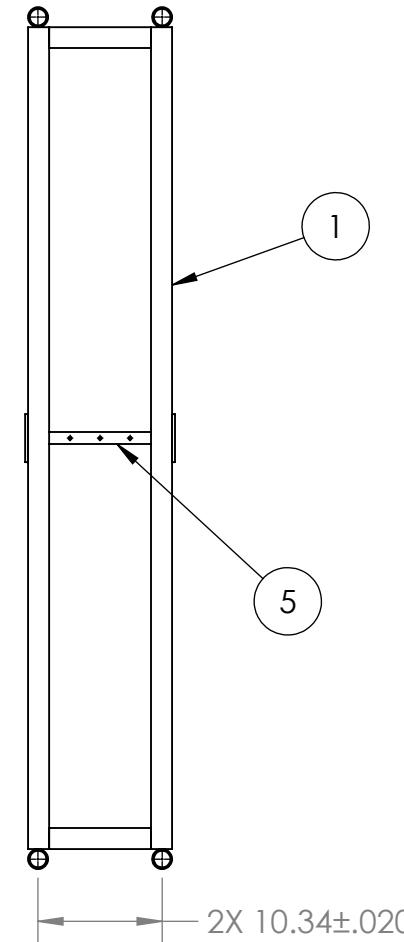
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| FRACTIONAL $\pm 1/16$ | | ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ | | | |
| TWO PLACE DECIMAL $\pm .01$ | | THREE PLACE DECIMAL $\pm .001$ | | | |
| | | | | | |
| | | INTERPRET GEOMETRIC TOLERANCING PER: | | | |
| | | MATERIAL | | | |
| NEXT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

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

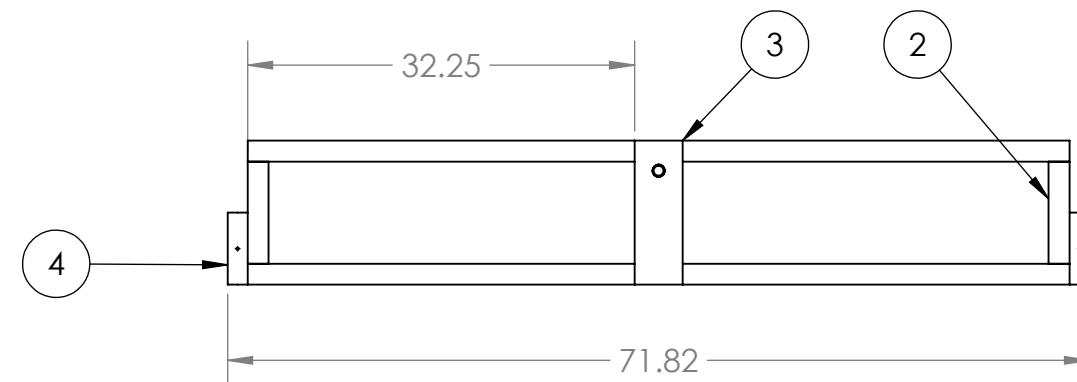
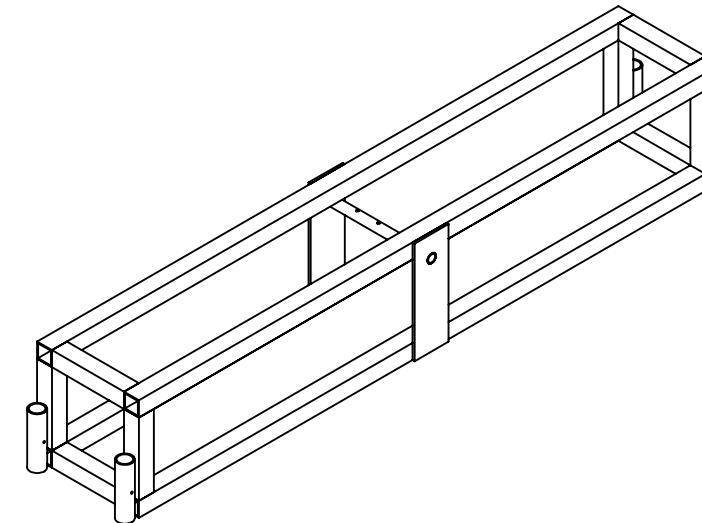
Portal Frame - Right

| | | |
|------------|-----------------|--------------|
| SIZE | DWG. NO. | REV |
| B | GE-18012 | |
| SCALE: 1:4 | WEIGHT: | SHEET 3 OF 3 |



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

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

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Switch Arm

B **GE-18013** **2**

SIZE DWG. NO. REV
SCALE: 1:16 WEIGHT: SHEET 1 OF 5

4

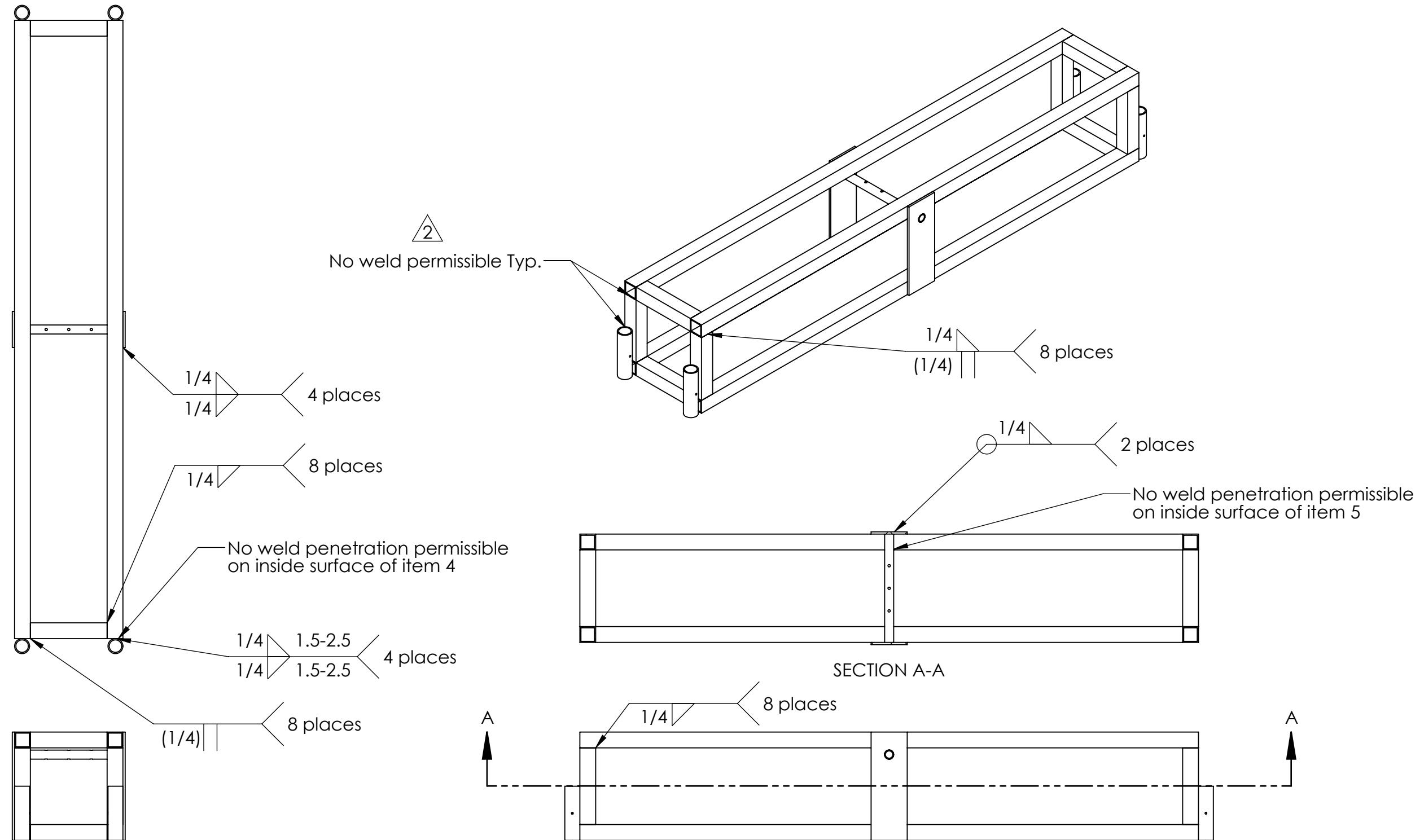
3

2

1

B

B



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PERMISSION OF **FIRST®** IS PROHIBITED.

| | | | |
|-------------|--|--------------|------|
| | UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$ | NAME | DATE |
| | DRAWN | | |
| | CHECKED | | |
| | ENG APPR. | | |
| | MFG APPR. | | |
| | Q.A. | | |
| | COMMENTS: | | |
| NEXT ASSY | USED ON | FINISH | |
| APPLICATION | DO NOT SCALE DRAWING | | |
| SIZE | DWG. NO. | REV | |
| B | GE-18013 | 2 | |
| SCALE: 1:12 | WEIGHT: | SHEET 2 OF 5 | |

4

3

2

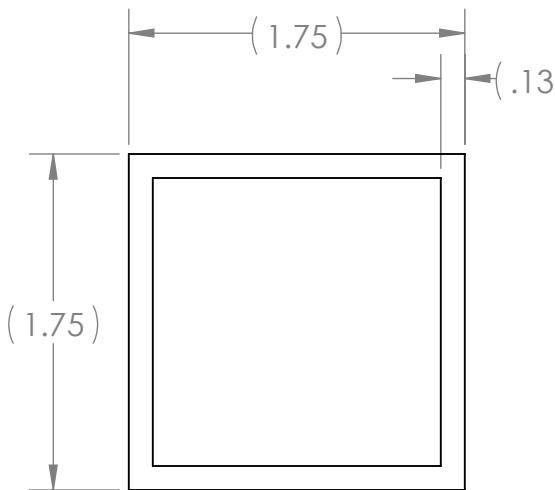
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4

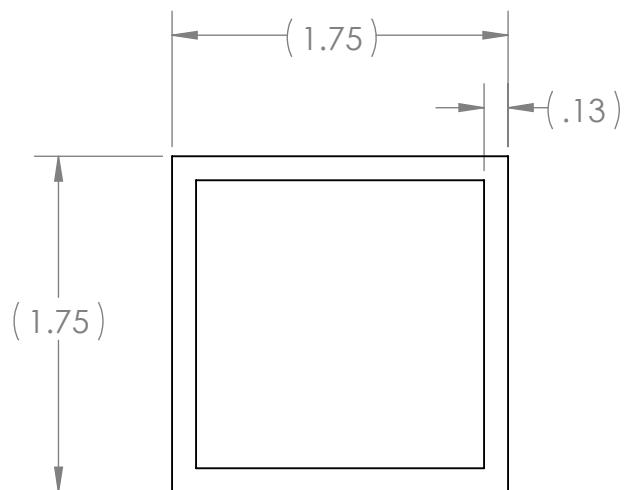
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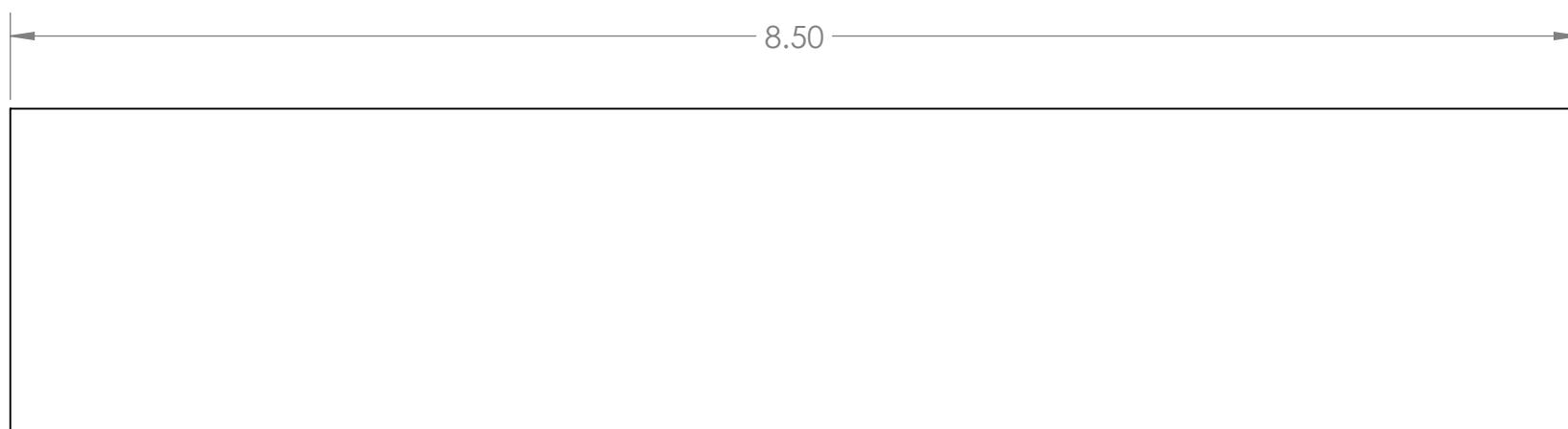
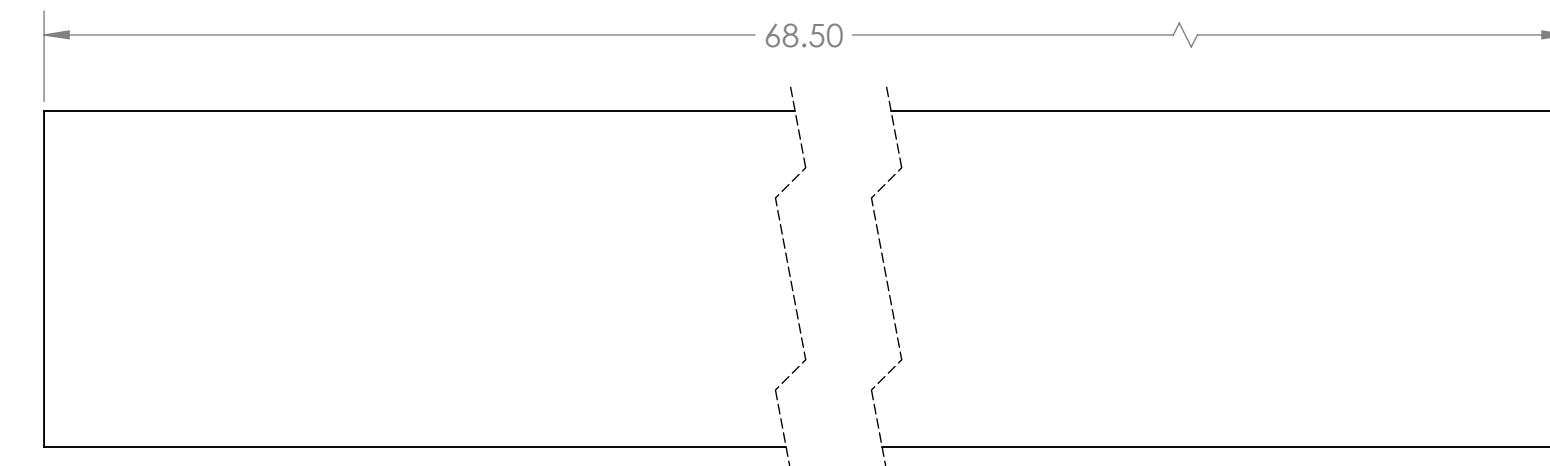
1



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



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



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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Switch Arm

| | | |
|------------|-----------------|--------------|
| SIZE | DWG. NO. | REV |
| B | GE-18013 | 2 |
| SCALE: 1:1 | WEIGHT: | SHEET 3 OF 5 |

4

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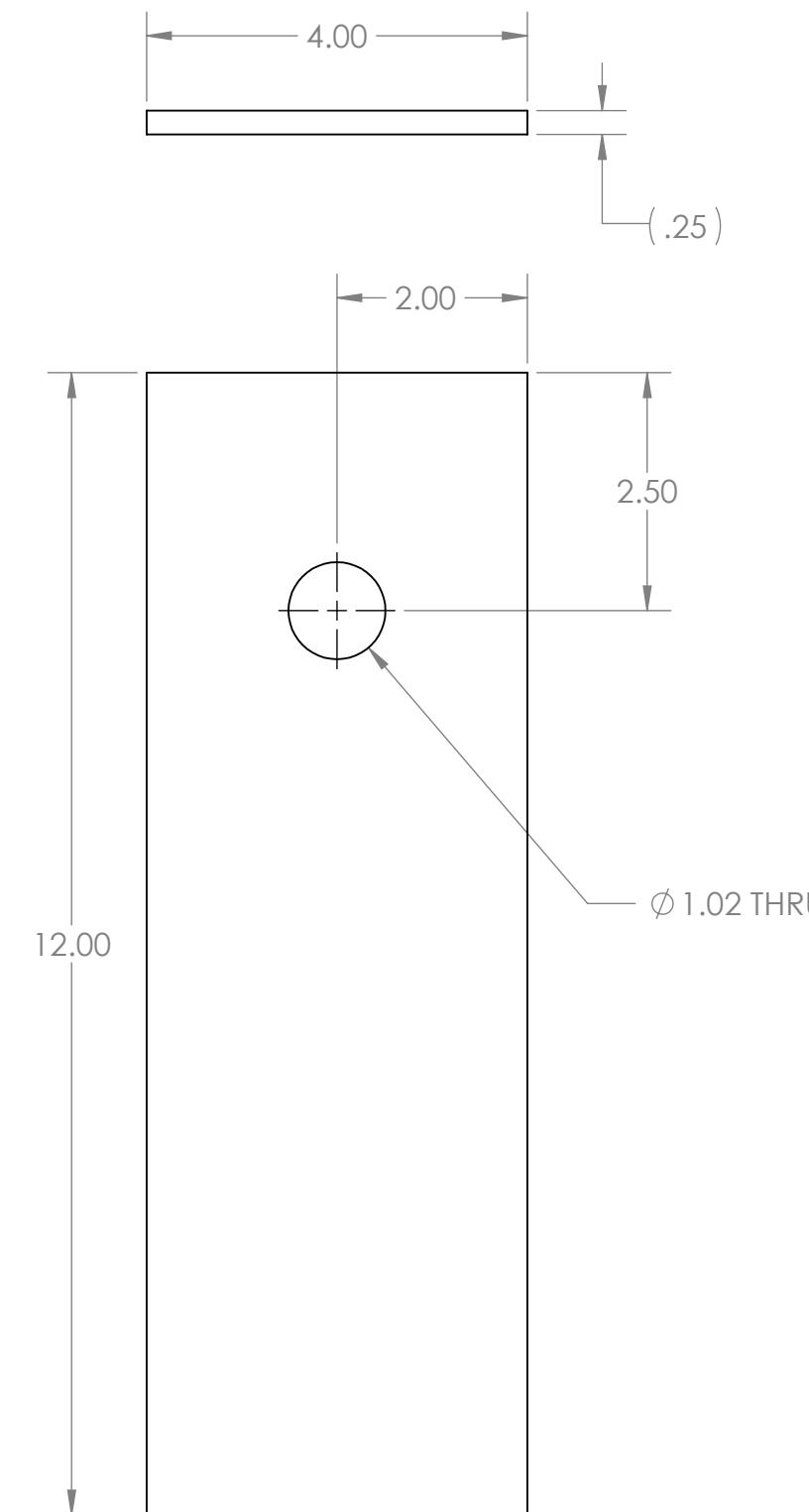
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1

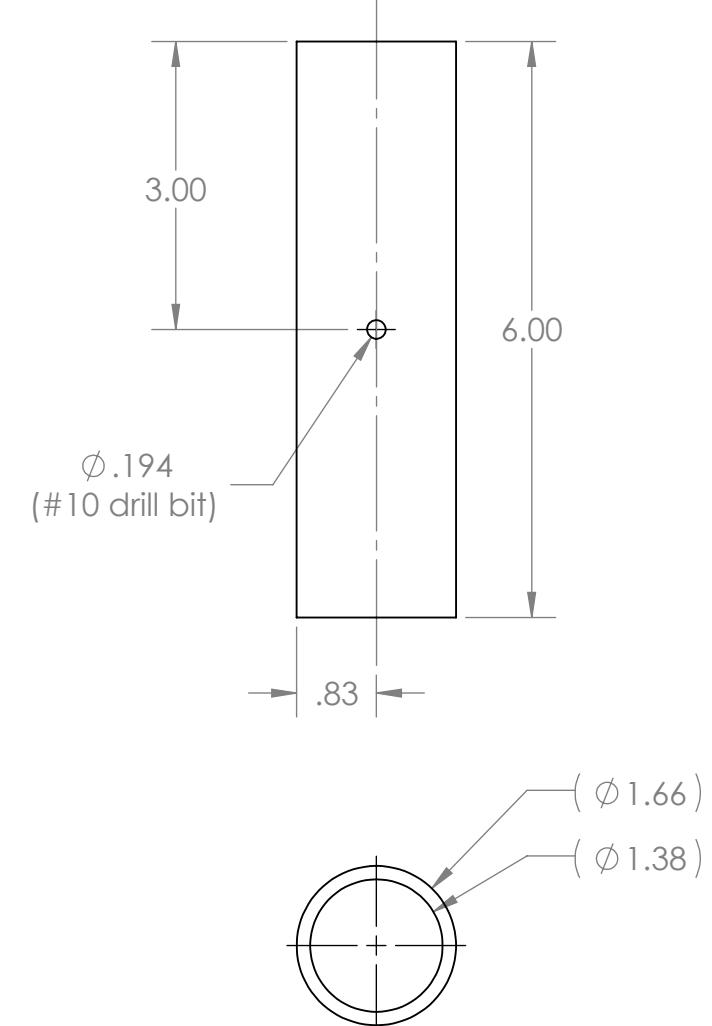
B

B



Item: GE-18013-3
Material: 0.25" thk. Plate, 6061 Aluminum
QTY: 2

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

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Switch Arm

SIZE DWG. NO. REV
B GE-18013 2

SCALE: 1:2 WEIGHT: SHEET 4 OF 5

4

3

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4

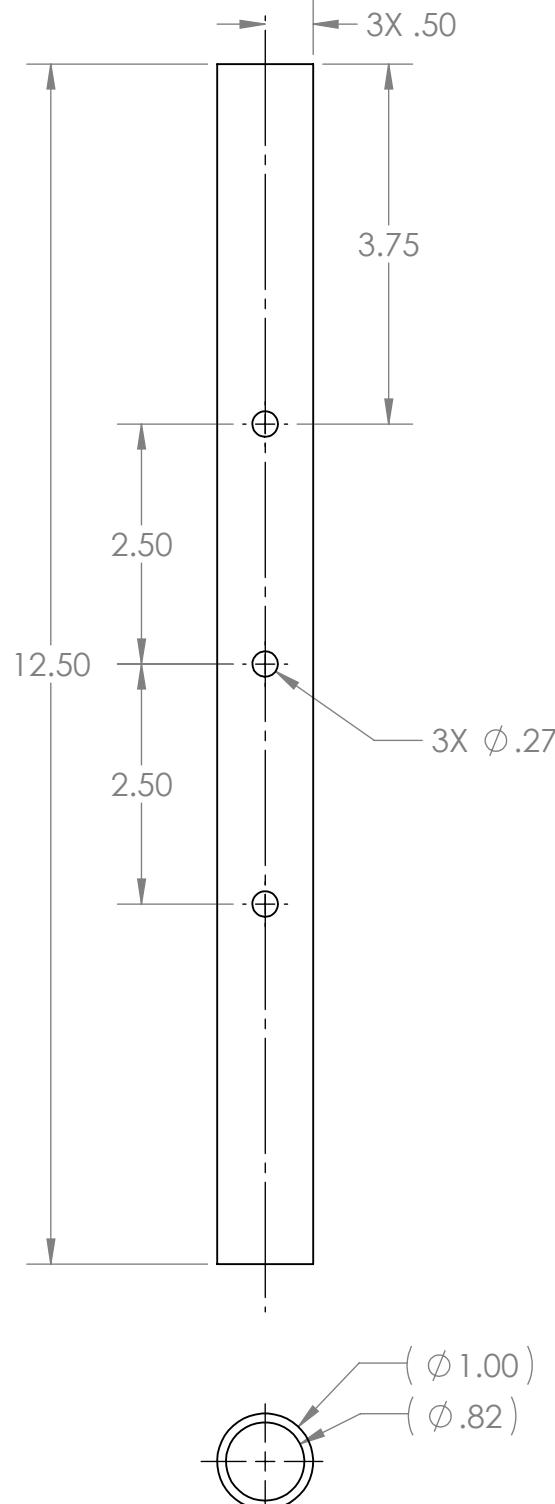
3

2

1

B

B



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

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| | | UNLESS OTHERWISE SPECIFIED: | | | |
|-------------|----------------------|--|--------------|-----|--|
| | | DIMENSIONS ARE IN INCHES | | | |
| | | TOLERANCES: | | | |
| | | FRACTIONAL $\pm 1/16$ | | | |
| | | ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ | | | |
| | | TWO PLACE DECIMAL $\pm .01$ | | | |
| | | THREE PLACE DECIMAL $\pm .001$ | | | |
| | | INTERPRET GEOMETRIC | | | |
| | | TOLERANCING PER: | | | |
| | | MATERIAL | | | |
| | | FINISH | | | |
| NEXT ASSY | USED ON | | | | |
| APPLICATION | DO NOT SCALE DRAWING | | | | |
| SCALE: 1:2 | | SIZE | DWG. NO. | REV | |
| B | | GE-18013 | 2 | | |
| SCALE: 1:2 | | WEIGHT: | SHEET 5 OF 5 | | |

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

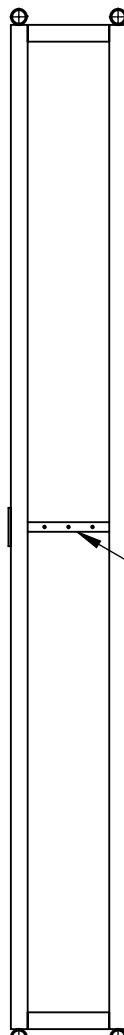
Switch Arm

4

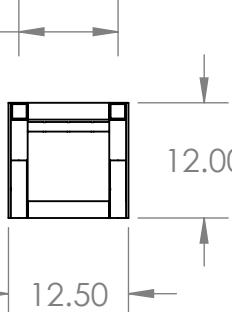
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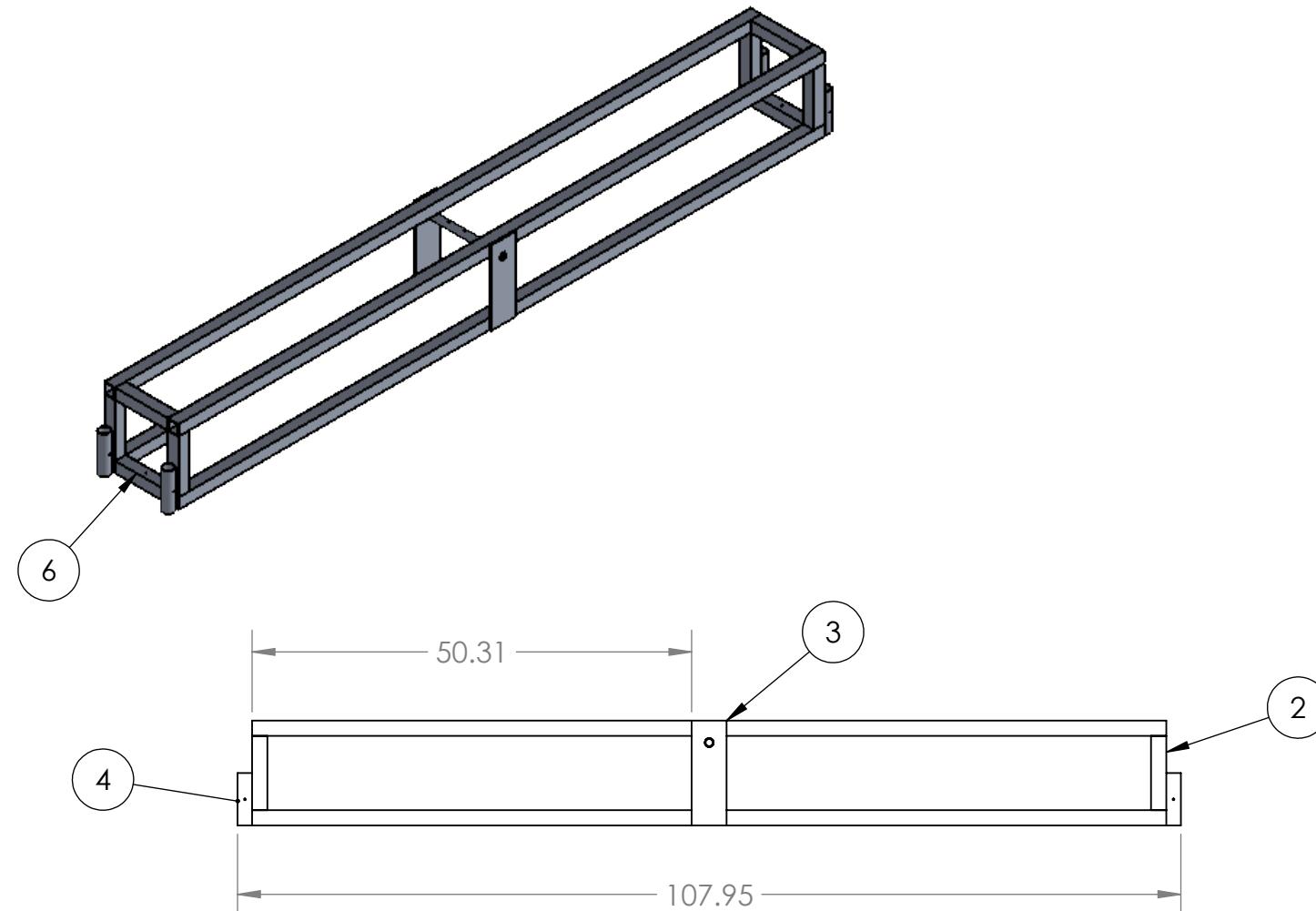
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1



5



3

2

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

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

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Scale Arm

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

SCALE: 1:20 WEIGHT: SHEET 1 OF 5

4

3

2

1

4

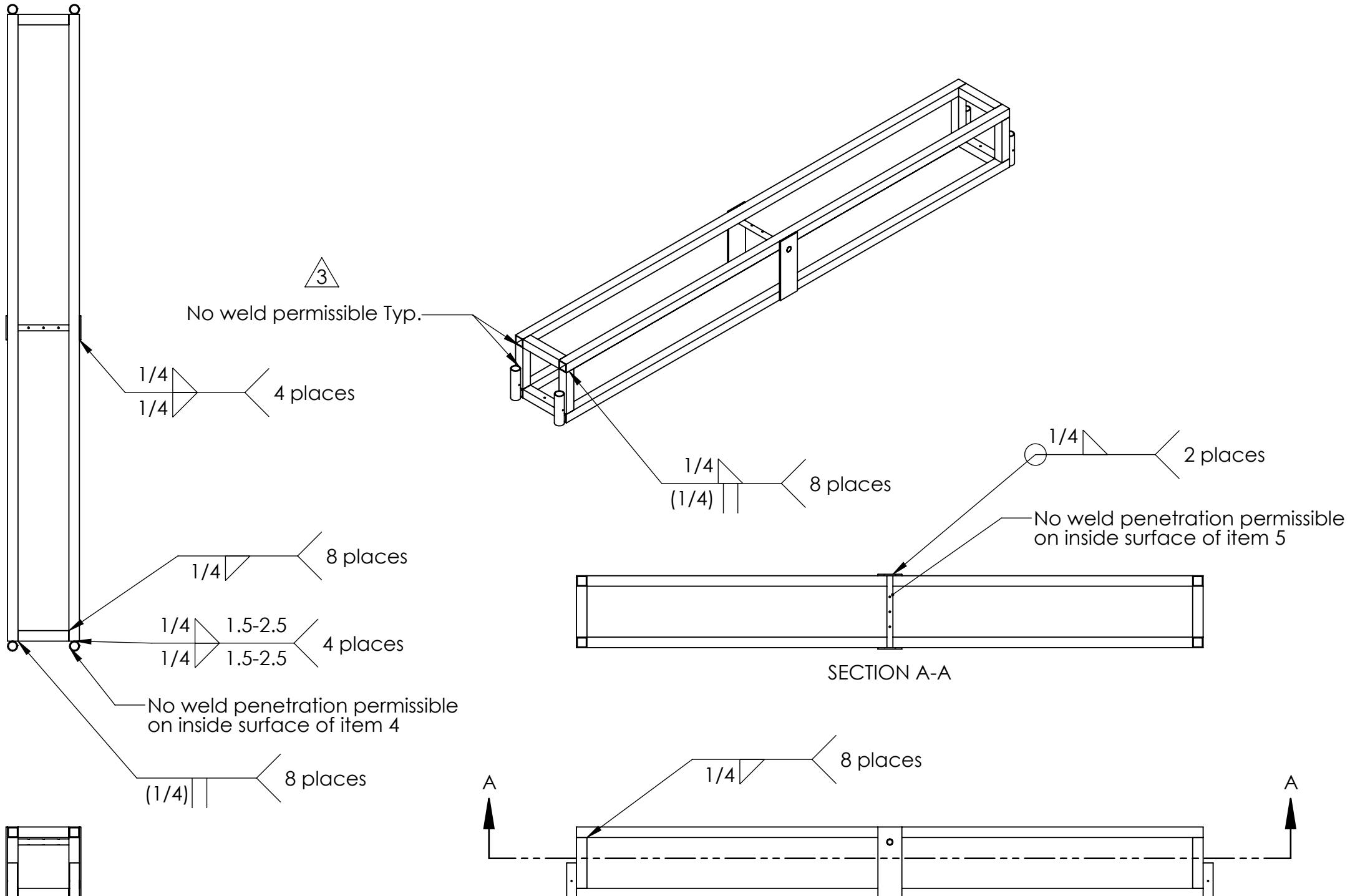
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2

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B

B



A

A

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Title: Scale Arm

Size: B **Dwg. No.:** GE-18014 **Rev.:** 3

Scale: 1:20 **Weight:** **Sheet 2 of 5**

4

3

2

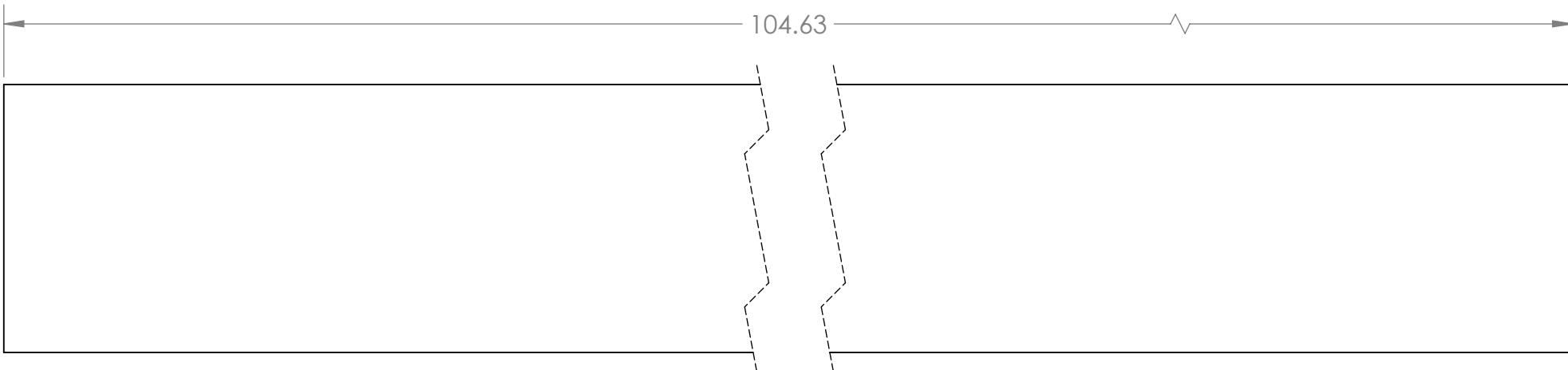
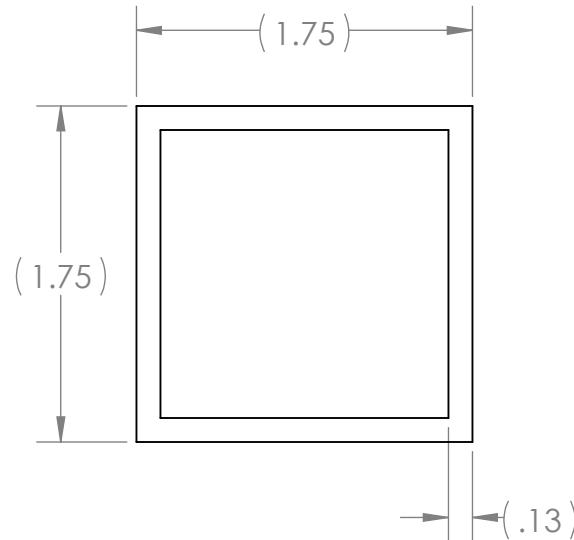
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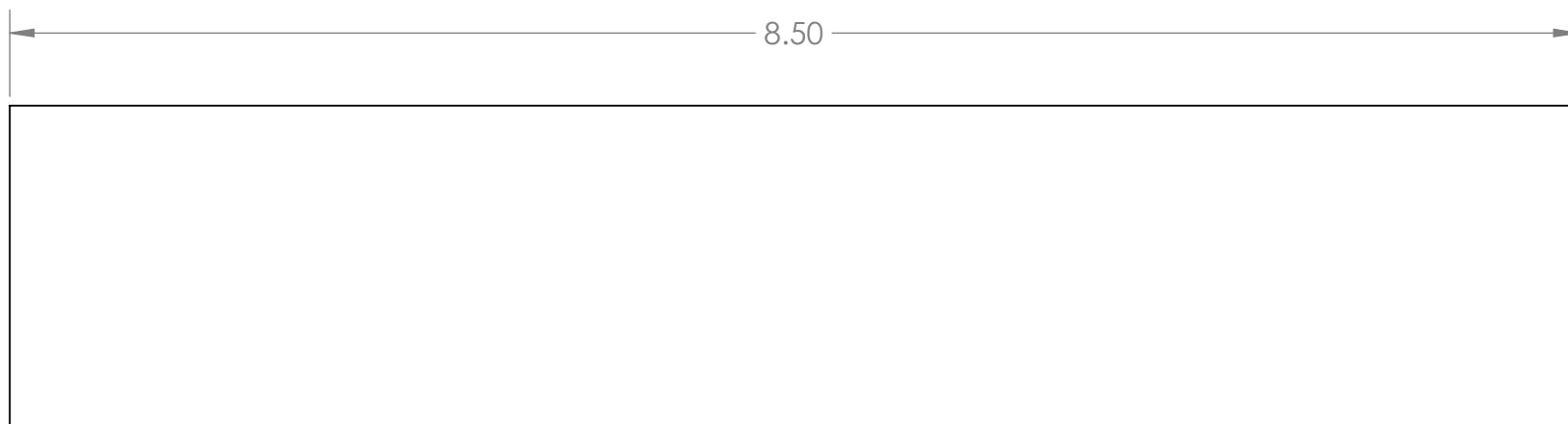
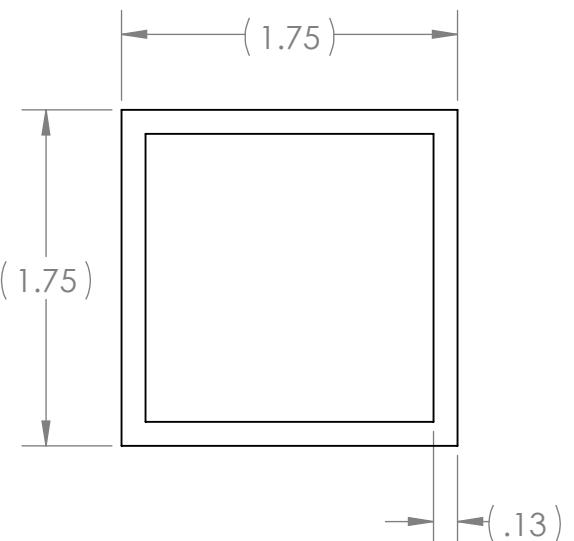
3

2

1



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



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

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

 FIRST
ROBOTICS
COMPETITION

 SOLIDWORKS
Modeling Solutions Partner

Scale Arm

SIZE DWG. NO. REV
B GE-18014 3

4

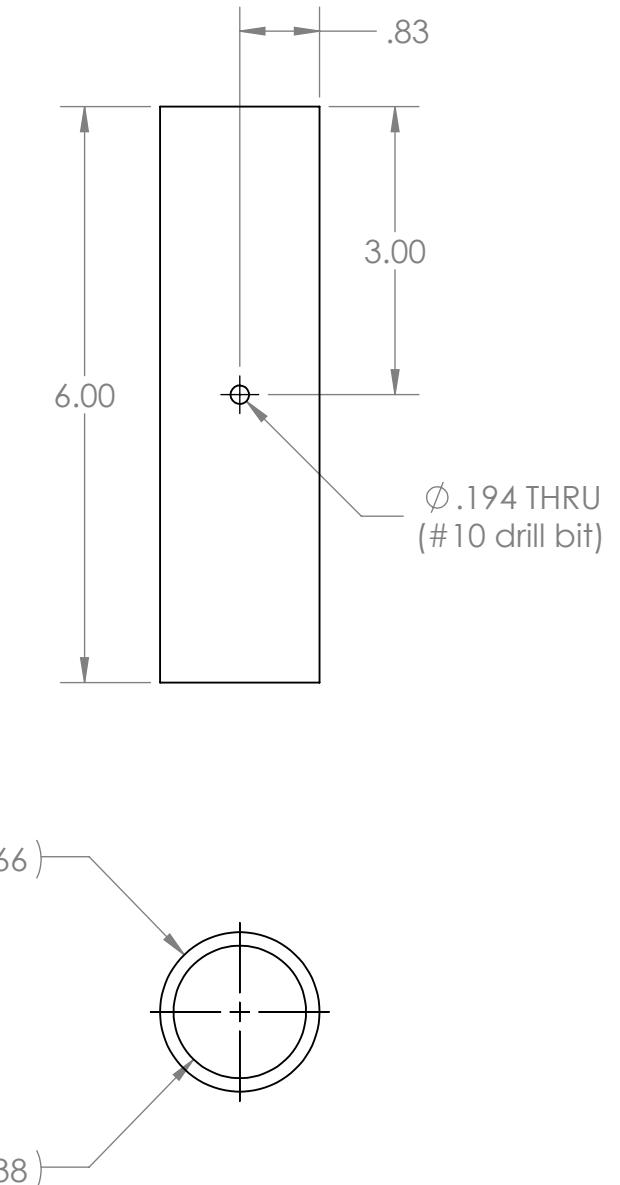
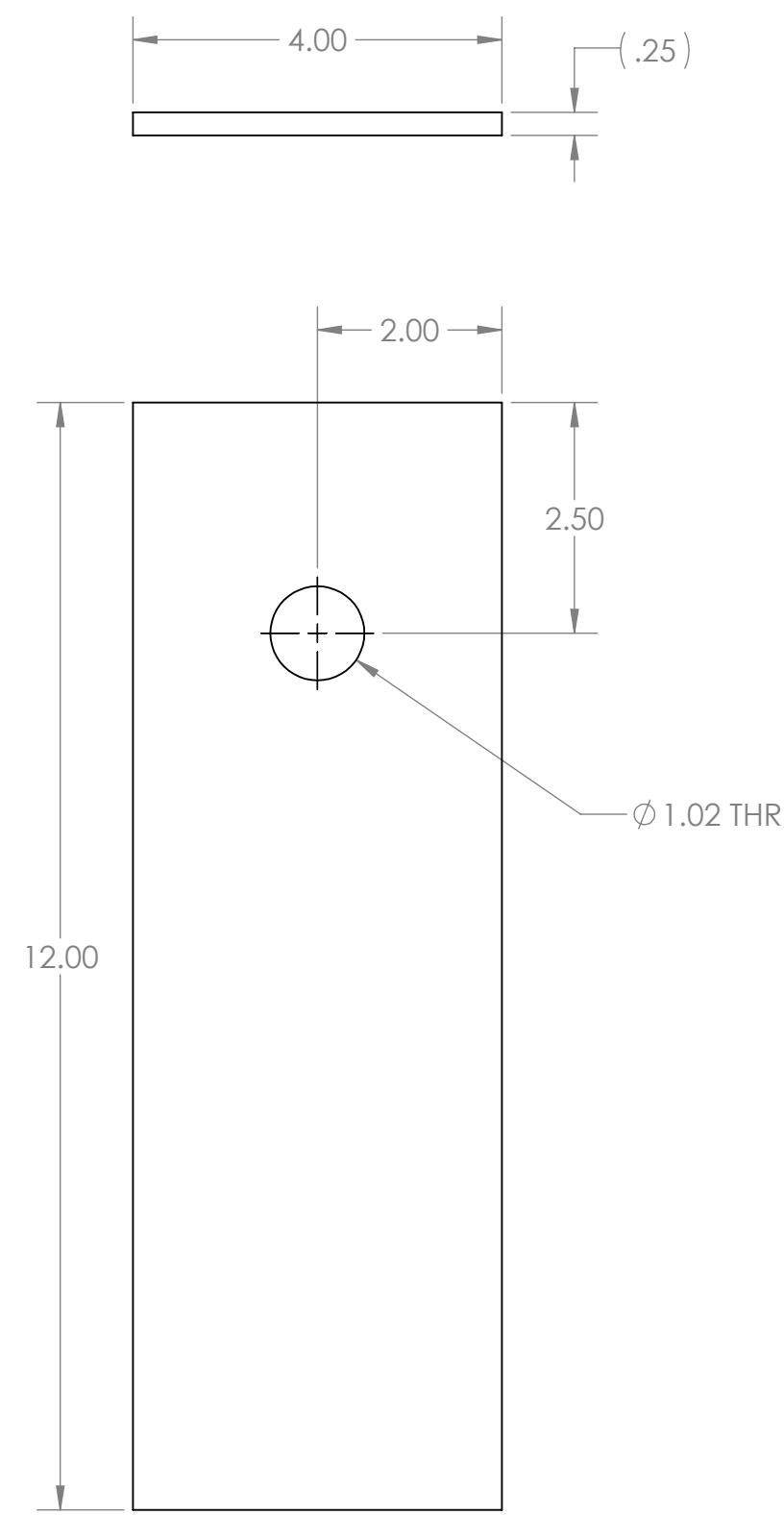
3

2

1

B

B



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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Scale Arm

SIZE DWG. NO. REV
B GE-18014 3

SCALE: 1:2 WEIGHT: SHEET 4 OF 5

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4

3

2

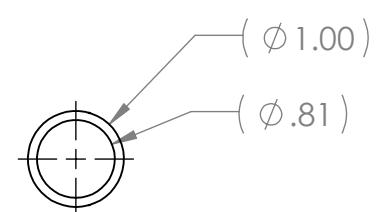
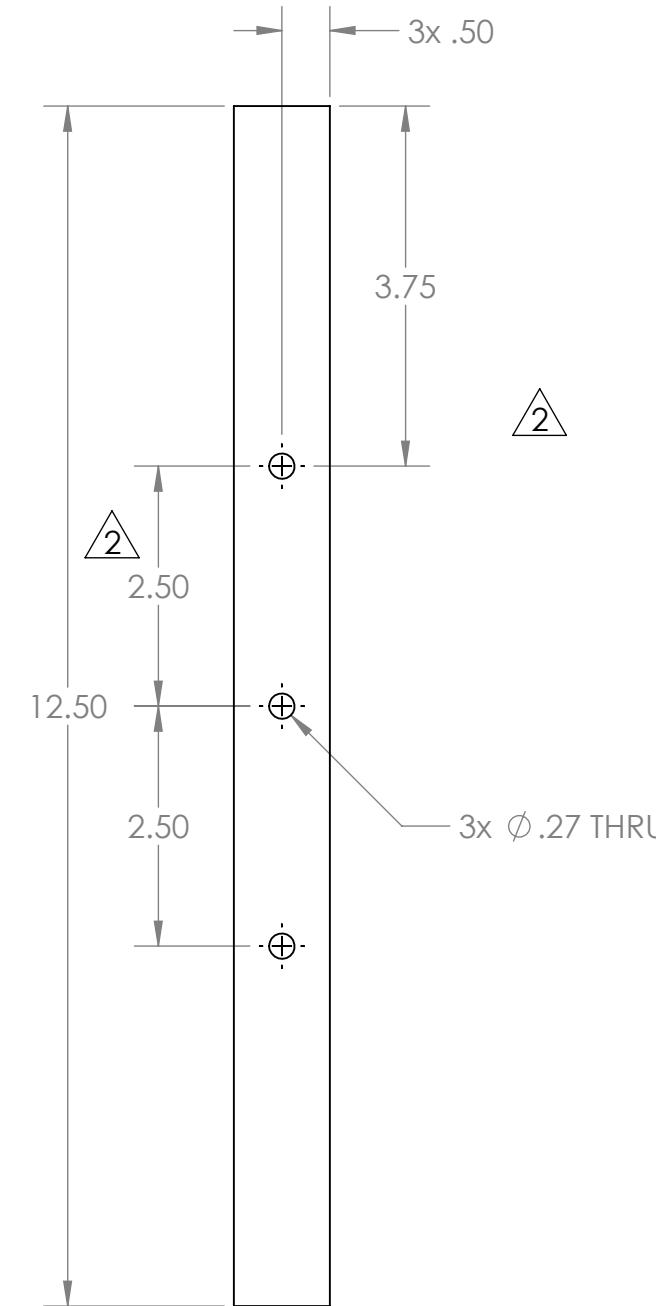
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4

3

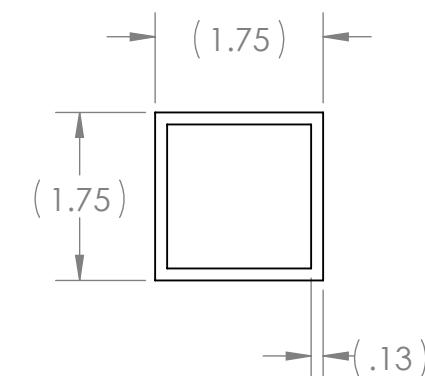
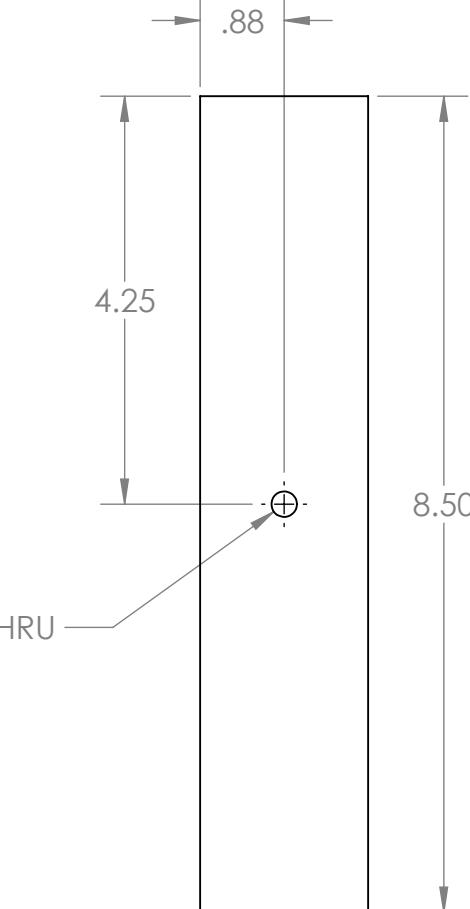
2

1



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

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

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Scale Arm

| | | |
|-------------|-----------------|--------------|
| SIZE | DWG. NO. | REV |
| B | GE-18014 | 3 |
| SCALE: 1:2 | WEIGHT: | SHEET 5 OF 5 |

4

3

2

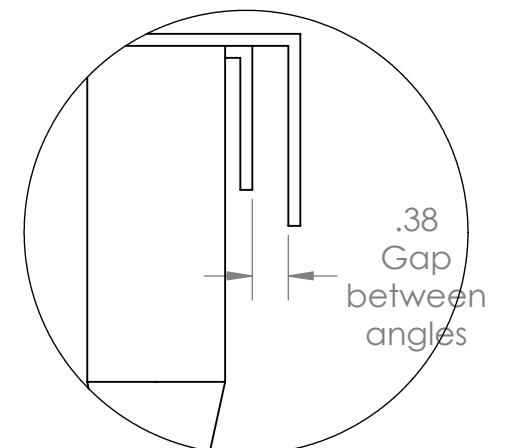
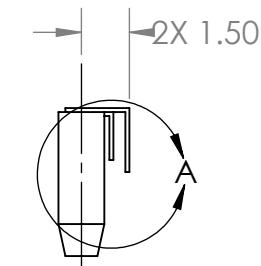
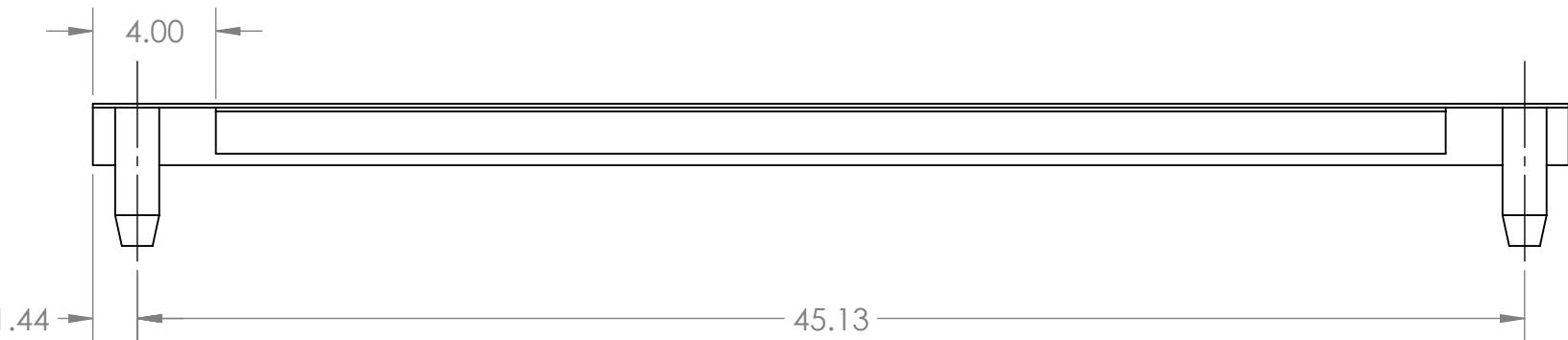
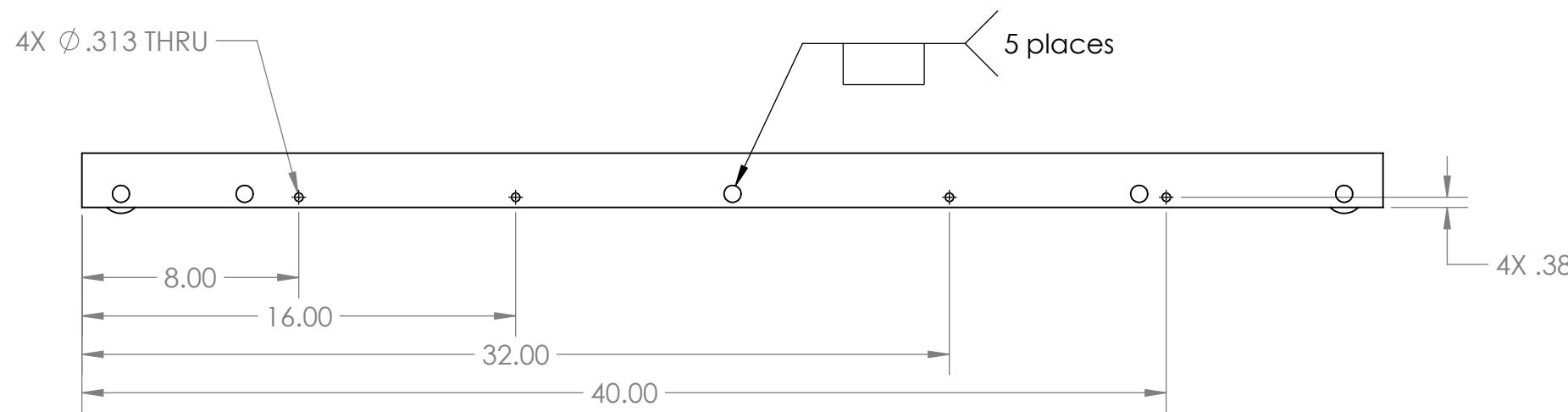
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2

1



DETAIL A
SCALE 1 : 2

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

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: **Top Rail, Exchange**

SIZE **B** DWG. NO. **GE-18015** REV **1**

SCALE: 1:6 WEIGHT: SHEET 1 OF 2

4

3

2

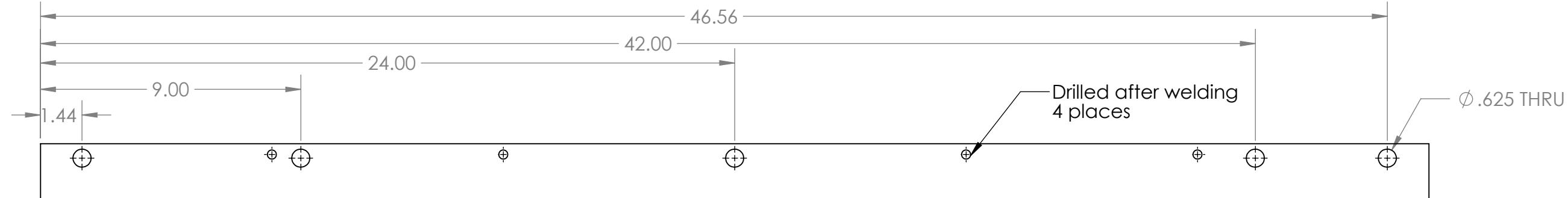
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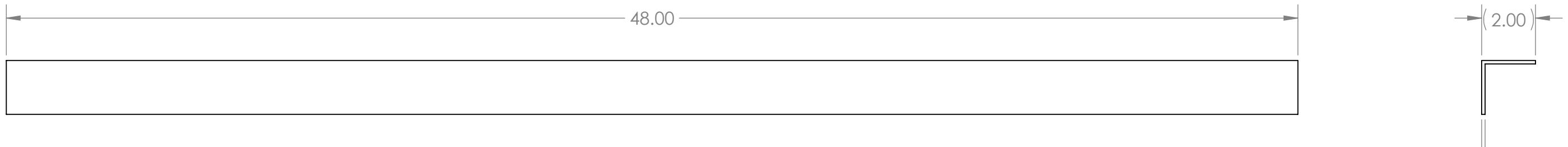
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1

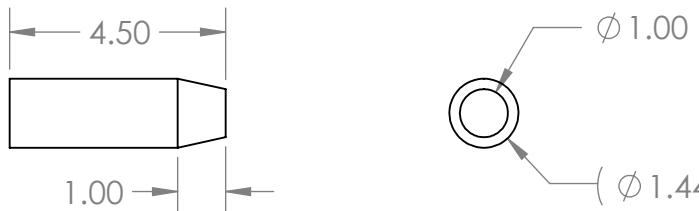


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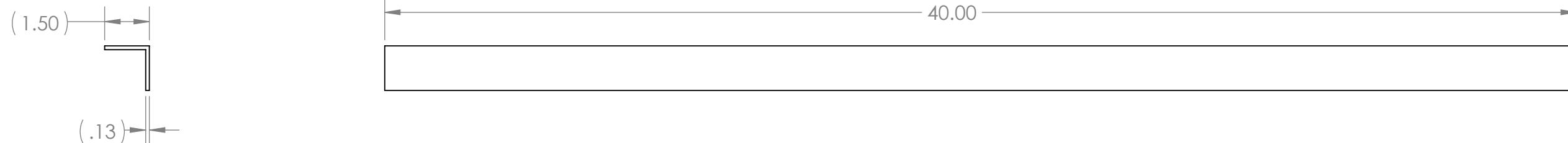
B



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



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



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

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Top Rail, Exchange

| | | |
|------------|-----------------|--------------|
| SIZE | DWG. NO. | REV |
| B | GE-18015 | |
| SCALE: 1:4 | WEIGHT: | SHEET 2 OF 2 |

4

3

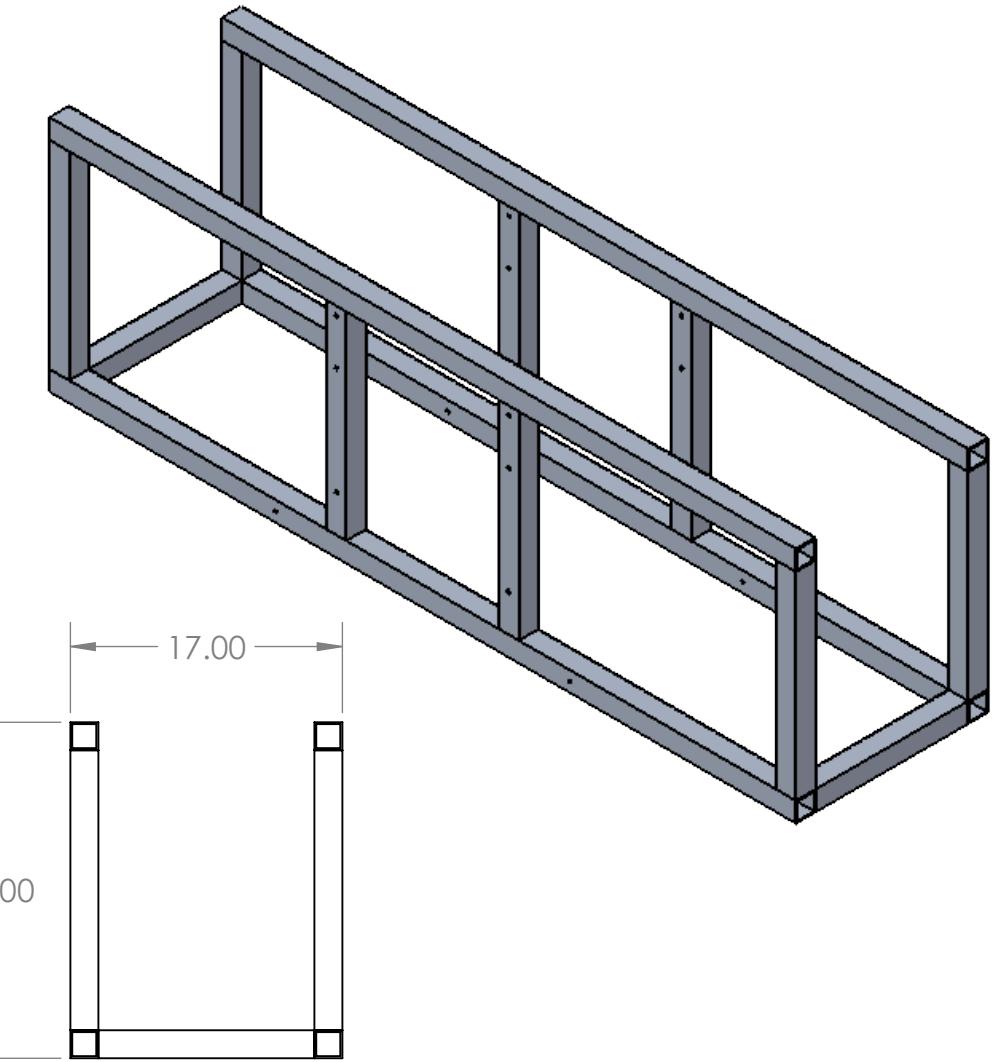
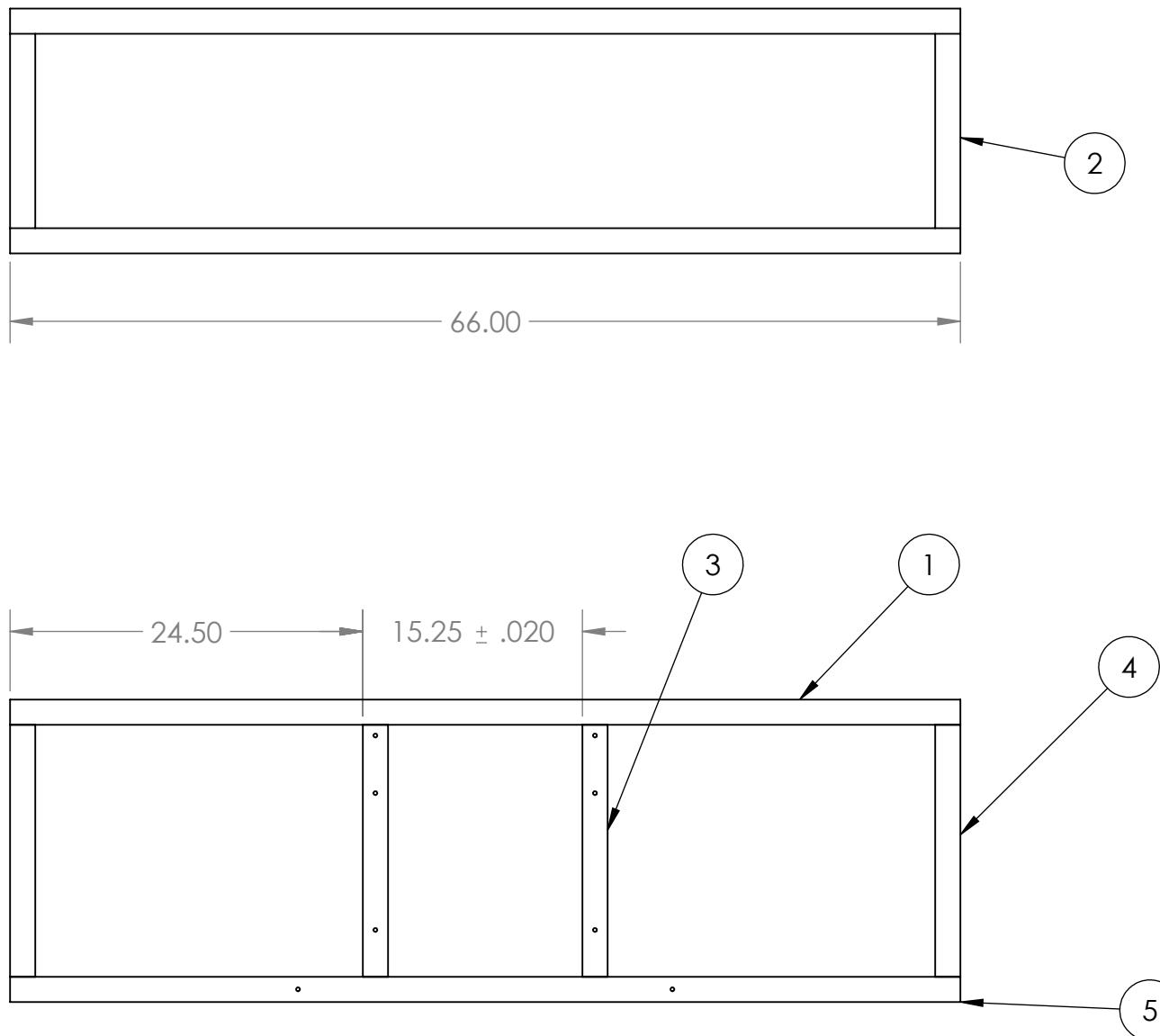
2

1

REVISIONS

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

B



A

| ITEM NO. | PART NUMBER | DESCRIPTION | QTY. |
|----------|-------------|---|------|
| 1 | GE-18016-1 | 1.75" x .125" thk. Square Tube, 6063 Aluminum | 2 |
| 2 | GE-18016-2 | 1.75" x .125" thk. Square Tube, 6063 Aluminum | 2 |
| 3 | GE-18016-3 | 1.75" x .125" thk. Square Tube, 6063 Aluminum | 4 |
| 4 | GE-18016-4 | 1.75" x .125" thk. Square Tube, 6063 Aluminum | 4 |
| 5 | GE-18016-5 | 1.75" x .125" thk. Square Tube, 6063 Aluminum | 2 |

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| | | | | | |
|-------------|-----------------|--|----------------------|------|------|
| | | UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL: ±1/16 ANGULAR: MACH ±1° BEND ±1° TWO PLACE DECIMAL ±.01 THREE PLACE DECIMAL ±.001 | | NAME | DATE |
| | | DRAWN | | | |
| | | CHECKED | | | |
| | | ENG APPR. | | | |
| | | MFG APPR. | | | |
| | | Q.A. | | | |
| | | COMMENTS: | | | |
| | | MATERIAL | | | |
| | | FINISH | | | |
| | | APPLICATION | DO NOT SCALE DRAWING | | |
| SIZE | DWG. NO. | REV | | | |
| B | GE-18016 | 3 | | | |
| SCALE: 1:12 | WEIGHT: | SHEET 1 OF 5 | | | |

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

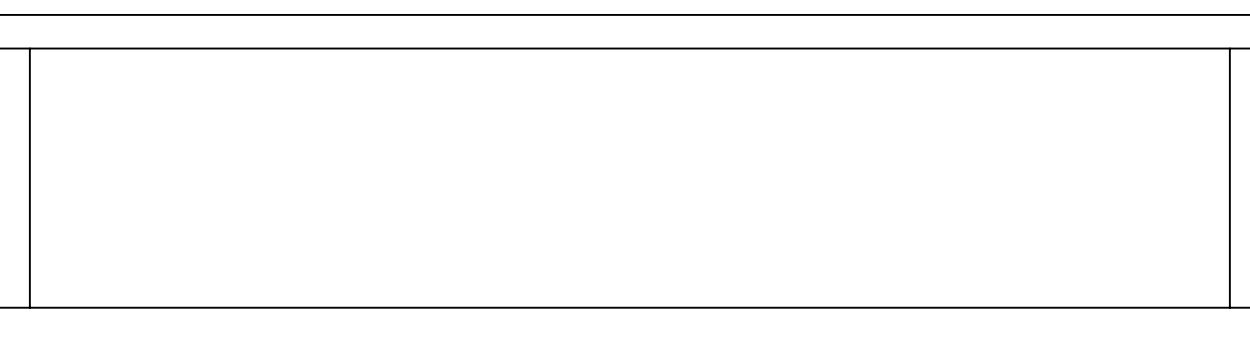
TITLE:
Switch Frame

4

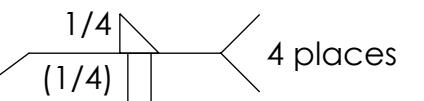
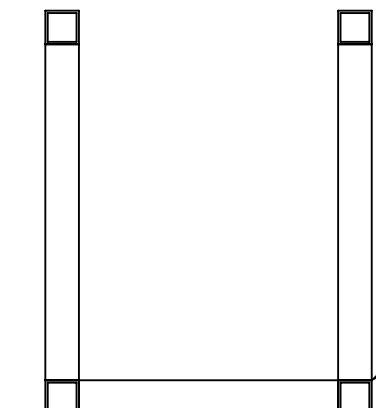
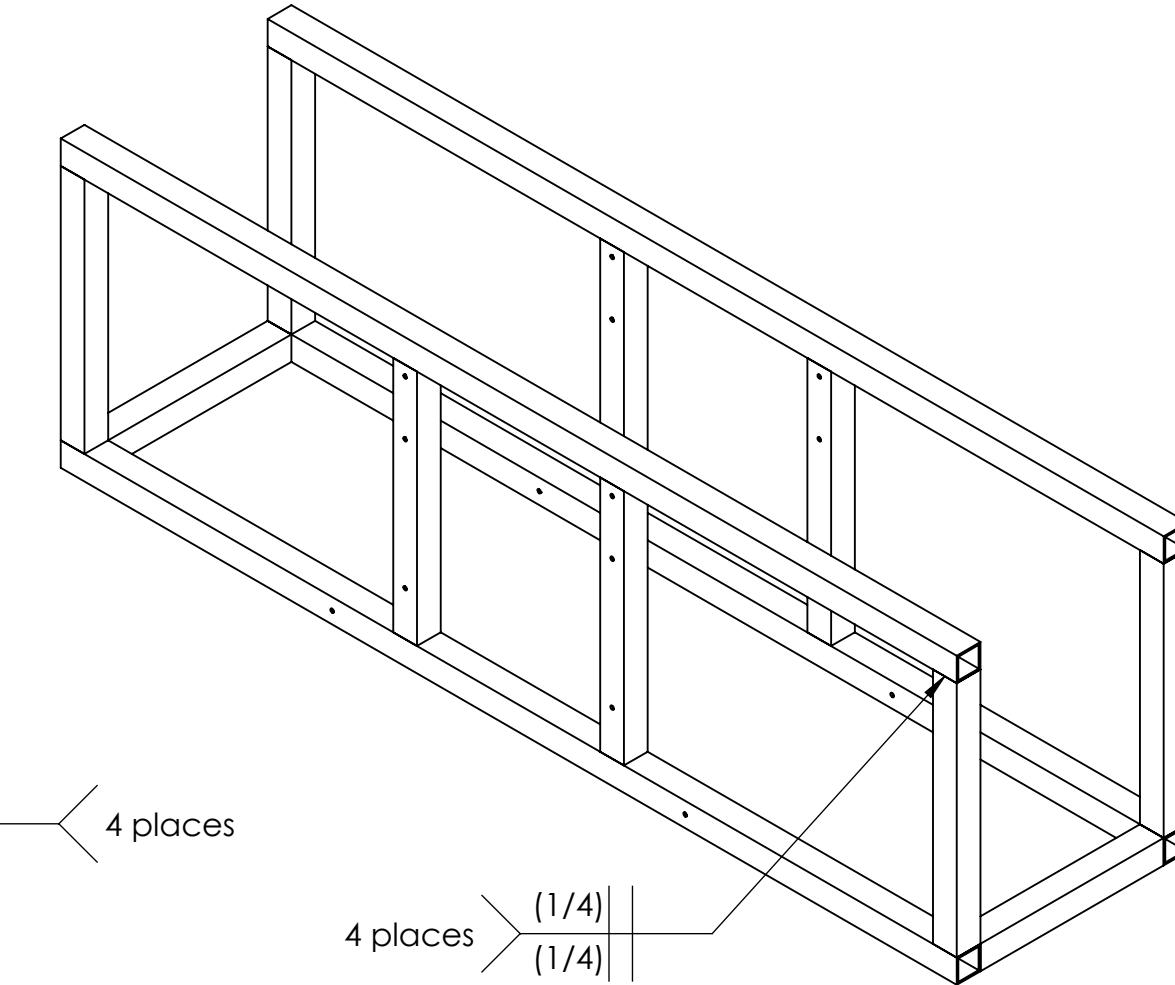
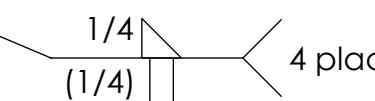
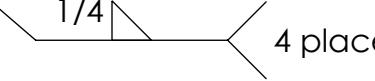
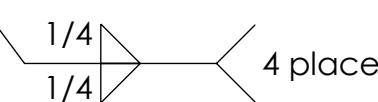
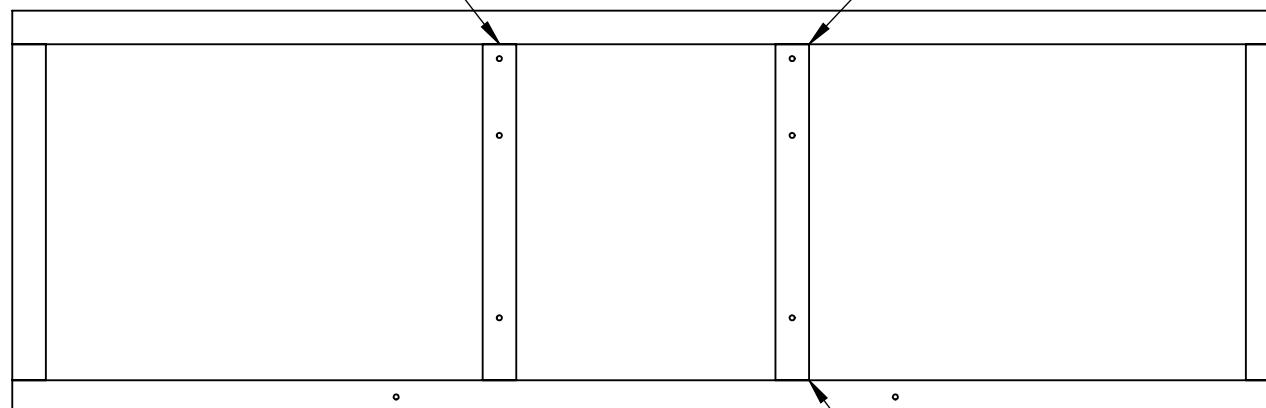
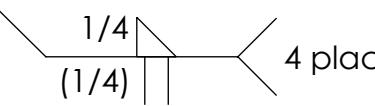
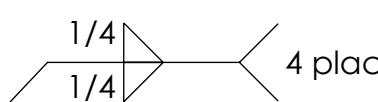
3

2

1



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



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| | | UNLESS OTHERWISE SPECIFIED: | NAME | DATE |
|--|-----------------|-----------------------------|-------|----------|
| DIMENSIONS ARE IN INCHES | | | | |
| TOLERANCES: | | | | |
| FRACTIONAL: $\pm 1/16$ | | | | |
| ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ | | | | |
| TWO PLACE DECIMAL $\pm .01$ | | | | |
| THREE PLACE DECIMAL $\pm .001$ | | | | |
| INTERPRET GEOMETRIC TOLERANCING PER: | | | | |
| MATERIAL | | | | |
| NEXT ASSY | USED ON | FINISH | | |
| APPLICATION | | DO NOT SCALE DRAWING | | |
| Switch Frame | | | | |
| SIZE | DWG. NO. | | REV | |
| B | GE-18016 | | | 3 |
| SCALE: 1:10 | WEIGHT: | | SHEET | 2 OF 5 |

4

3

2

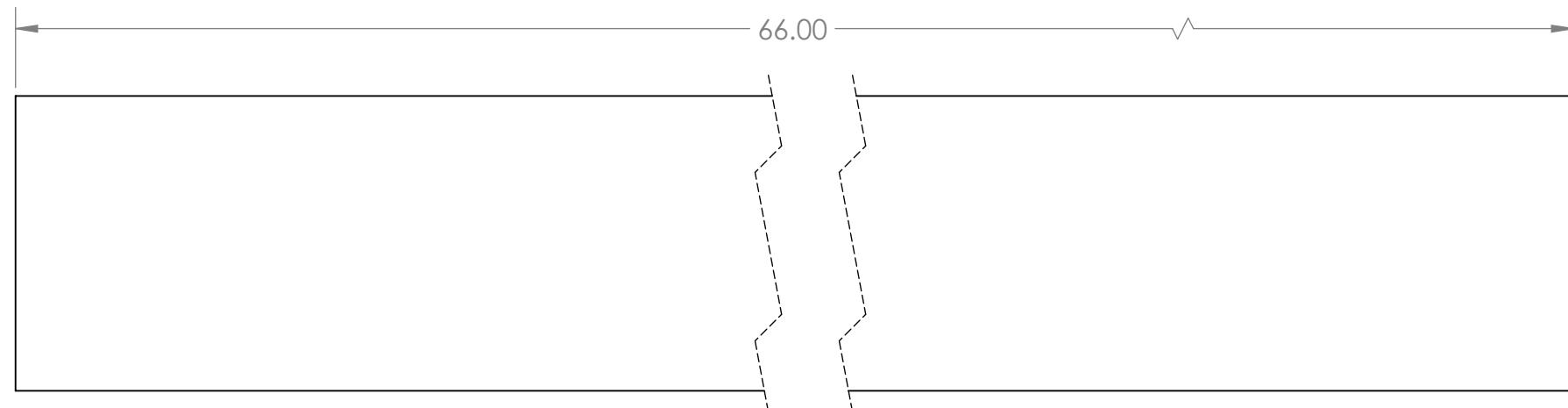
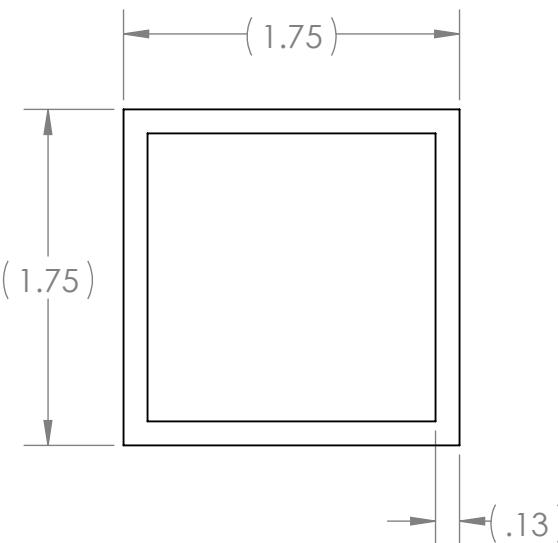
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4

3

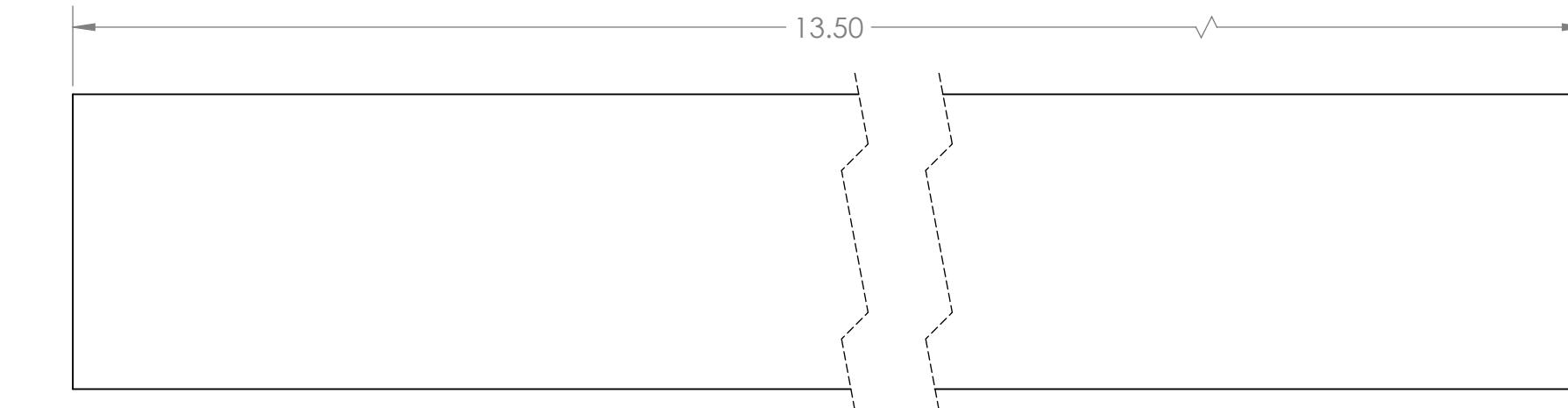
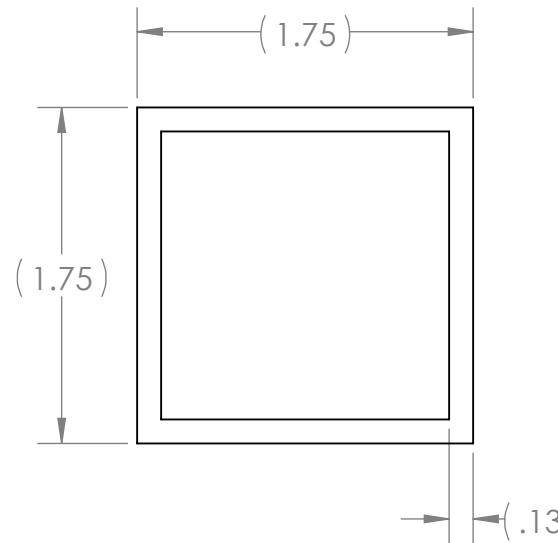
2

1



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

△
3



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

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|-----------------------------|--------------------------|--|--|------|------|
| DIMENSIONS ARE IN INCHES | | TOLERANCES: | | | |
| FRACTIONAL $\pm 1/16$ | | ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ | | | |
| TWO PLACE DECIMAL $\pm .01$ | | THREE PLACE DECIMAL $\pm .001$ | | | |
| | | | | | |
| | | INTERPRET GEOMETRIC TOLERANCING PER: | | | |
| | | MATERIAL | | | |
| | | FINISH | | | |
| NEXT ASSY | USED ON | | | | |
| APPLICATION | DO NOT SCALE DRAWING | | | | |
| TITLE: Switch Frame | | | | | |
| SIZE B | DWG. NO. GE-18016 | REV 3 | | | |
| SCALE: 1:1 | WEIGHT: | SHEET 3 OF 5 | | | |

4

3

2

1

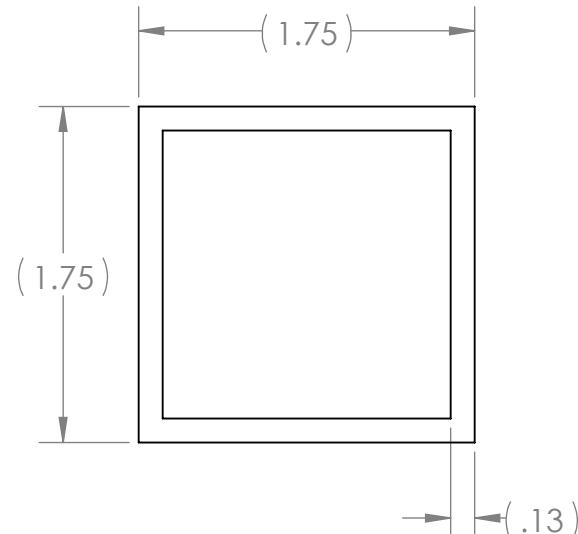
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3

2

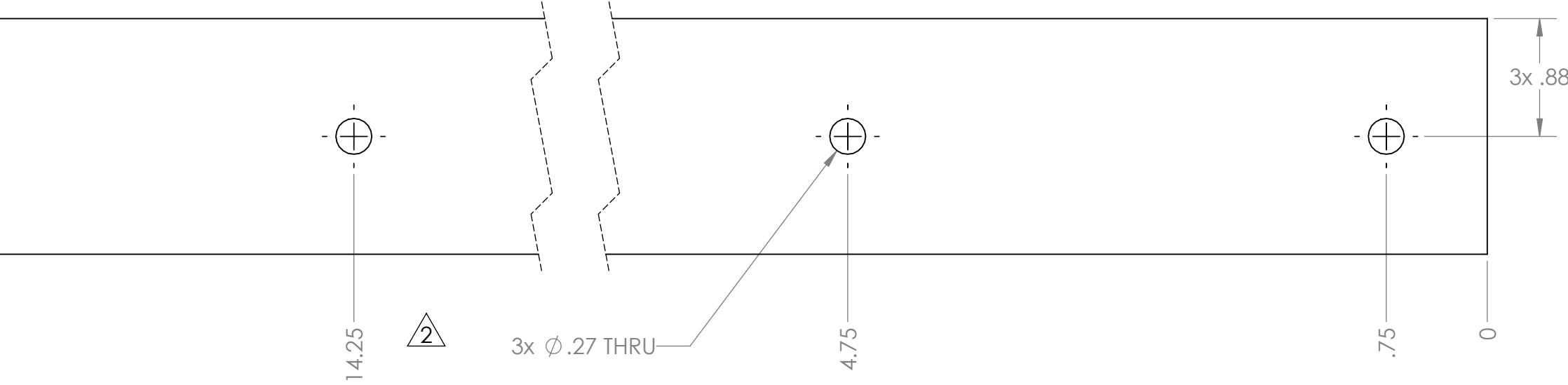
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B



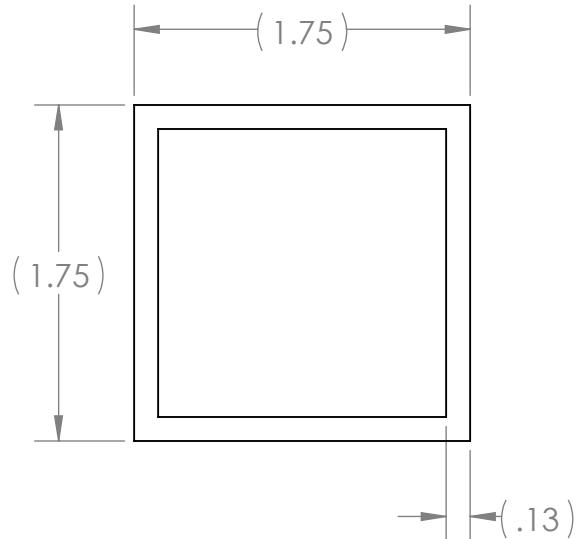
Item: GE-18016-3
 Material: 1.75" x .125" thk. Square Tube, 6063 Aluminum
 Scale: 1:1
 QTY: 4

17.50

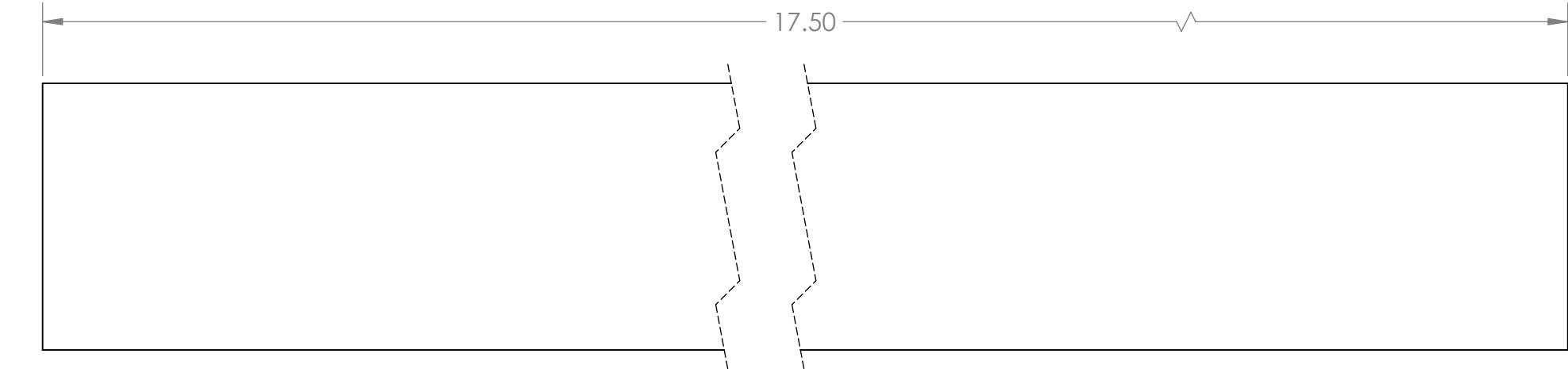


3x .88

B



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



A

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

FIRST
 ROBOTICS
 COMPETITION

SOLIDWORKS
 Modeling Solutions Partner

TITLE:
Switch Frame

SIZE DWG. NO. REV
B GE-18016 3

SCALE: 1:1 WEIGHT: SHEET 4 OF 5

4

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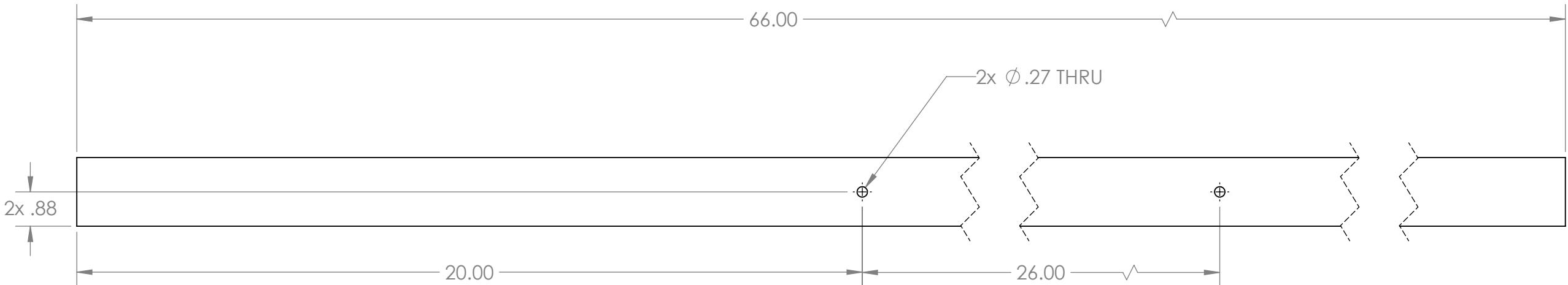
3

2

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B



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

3

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| | | | | | |
|------------|-----------------|--|--------------|----------------------|------|
| | | UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$ | | NAME | DATE |
| | | DRAWN | | | |
| | | CHECKED | | | |
| | | ENG APPR. | | | |
| | | MFG APPR. | | | |
| | | Q.A. | | | |
| | | COMMENTS: | | | |
| | | MATERIAL | | | |
| | | NEXT ASSY | USED ON | FINISH | |
| | | APPLICATION | | DO NOT SCALE DRAWING | |
| SIZE | DWG. NO. | | REV | | |
| B | GE-18016 | | 3 | | |
| SCALE: 1:3 | WEIGHT: | | SHEET 5 OF 5 | | |

 **FIRST
ROBOTICS
COMPETITION** 
SolidWorks
Modeling Solutions Partner

Switch Frame

4

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B

8x ϕ .27 THRU

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2x 5.00

2x 13.00

16.88

2x R.25

31.13

2x 35.00

2x 43.00

48.00

48.00

4x .50

0

4x 3.25

18.00

13.13

(.25)

A

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Notes:

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

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



SOLIDWORKS
Modeling Solutions Partner

TITLE:
Plate Back Wall

4

3

2

1

4

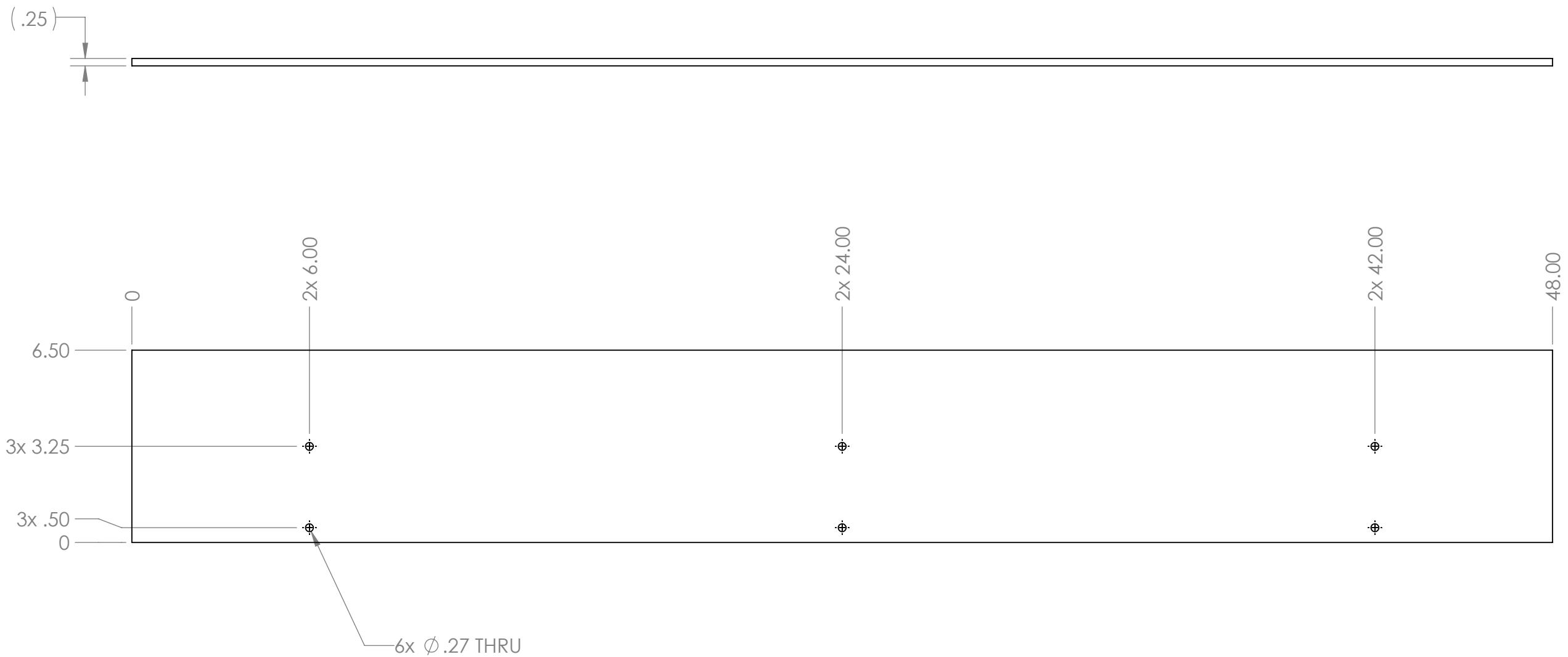
3

2

1

B

B



A

A

Notes:

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

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| | | | | | |
|------------|-----------------|--|---------|----------------------|------|
| | | UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$ | | NAME | DATE |
| | | DRAWN | | | |
| | | CHECKED | | | |
| | | ENG APPR. | | | |
| | | MFG APPR. | | | |
| | | Q.A. | | | |
| | | COMMENTS: | | | |
| | | MATERIAL | | | |
| | | NEXT ASSY | USED ON | FINISH | |
| | | APPLICATION | | DO NOT SCALE DRAWING | |
| B | GE-18018 | | | | |
| SCALE: 1:4 | WEIGHT: | SHEET 1 OF 1 | | | |



 SOLIDWORKS
Modeling Solutions Partner

TITLE:
Plate Front Wall

4

3

2

1

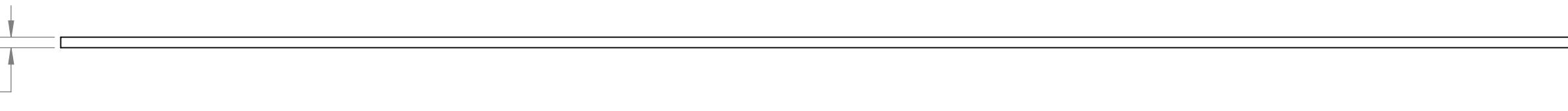
4

3

2

1

B



Notes:

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

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| | | UNLESS OTHERWISE SPECIFIED: | | TITLE: Plate Side Wall | COMMENTS: | | |
|-------------|--|--|--|------------------------------------|-----------|--|--|
| | | DIMENSIONS ARE IN INCHES | | | | | |
| | | TOLERANCES: | | | | | |
| | | FRACTIONAL $\pm 1/16$ | | | | | |
| | | ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ | | | | | |
| | | TWO PLACE DECIMAL $\pm .01$ | | | | | |
| | | THREE PLACE DECIMAL $\pm .001$ | | | | | |
| | | INTERPRET GEOMETRIC TOLERANCING PER: | | ENG APPR. MFG APPR. | Q.A. | | |
| | | MATERIAL | | | | | |
| NEXT ASSY | | USED ON | | | | | |
| | | FINISH | | | | | |
| APPLICATION | | DO NOT SCALE DRAWING | | SIZE DWG. NO. B GE-18019 | REV | | |
| | | | | | | | |
| | | | | | | | |
| SCALE: 1:3 | | WEIGHT: | | SHEET 1 OF 1 | | | |





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| REVISIONS | | | | |
|-----------|------|---|------------|----------|
| ZONE | REV. | DESCRIPTION | DATE | APPROVED |
| A1, B1 | 2 | Moved location of 4 countersunk holes. Removed 8 holes. | 11/17/2017 | CPO |
| A1 | 3 | Added missing dimension. | 1/12/2018 | CPO |

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Title: Scale Side Cover Polycarbonate

Size: DWG. NO. **B** **GE-18020** **Rev:** **3**

Scale: 1:6 **Weight:** **Sheet 1 of 1**

4

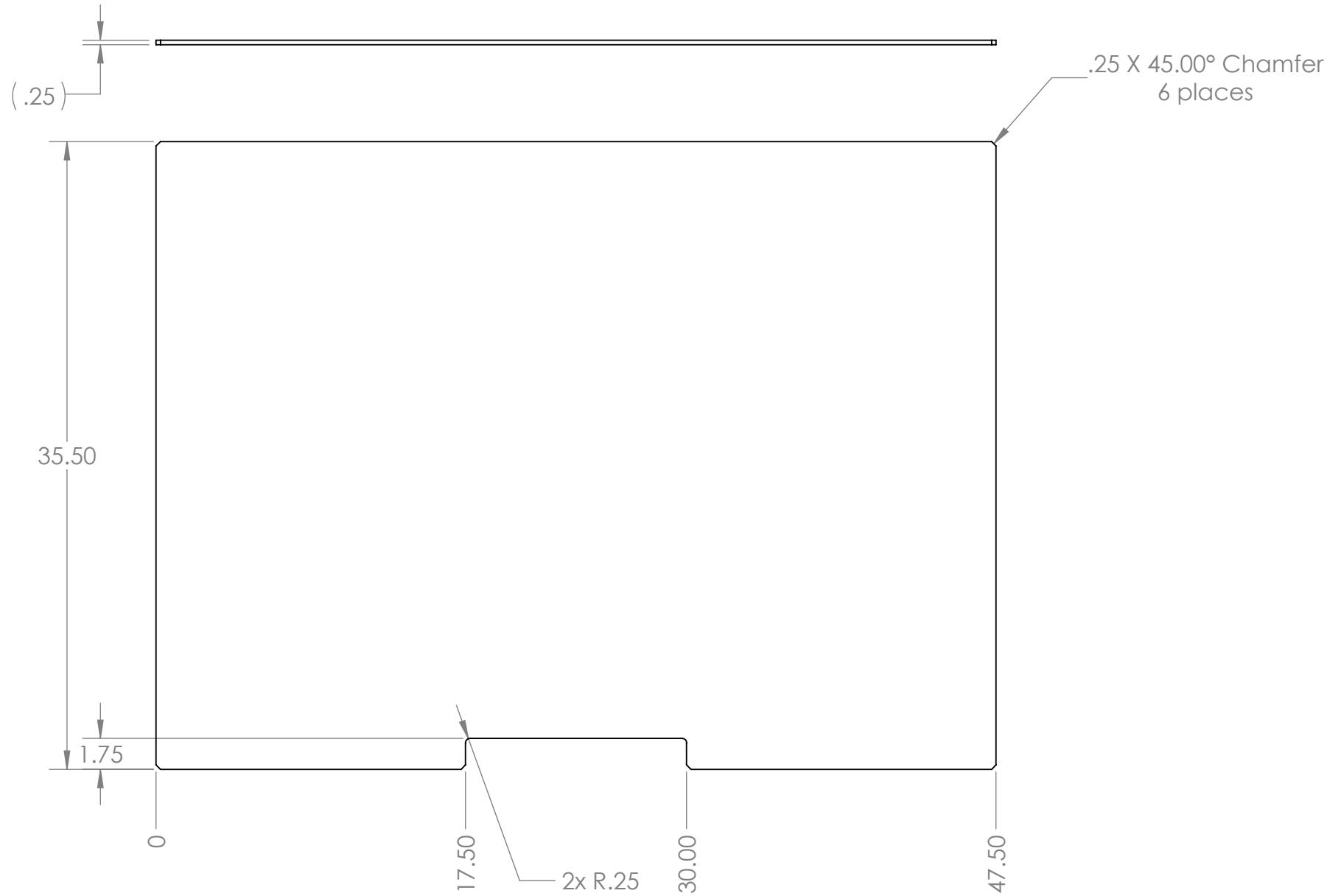
3

2

1

REVISIONS

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



Notes:

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

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| | | | | |
|---------------------------------|----------------------|--|--------------|------|
| | | UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL: ±1/16 ANGULAR: MACH ±1° BEND ±1° TWO PLACE DECIMAL: ±.01 THREE PLACE DECIMAL: ±.001 | NAME | DATE |
| | | DRAWN | | |
| | | CHECKED | | |
| | | ENG APPR. | | |
| | | MFG APPR. | | |
| | | Q.A. | | |
| | | COMMENTS: | | |
| | | MATERIAL | | |
| | | FINISH | | |
| NEXT ASSY | USED ON | | | |
| APPLICATION | DO NOT SCALE DRAWING | | | |
| SIZE DWG. NO. B GE-18021 | | REV. 2 | | |
| SCALE: 1:8 | | WEIGHT: | SHEET 1 OF 1 | |

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Scale and Switch Basket, Plate

4

3

2

1

4

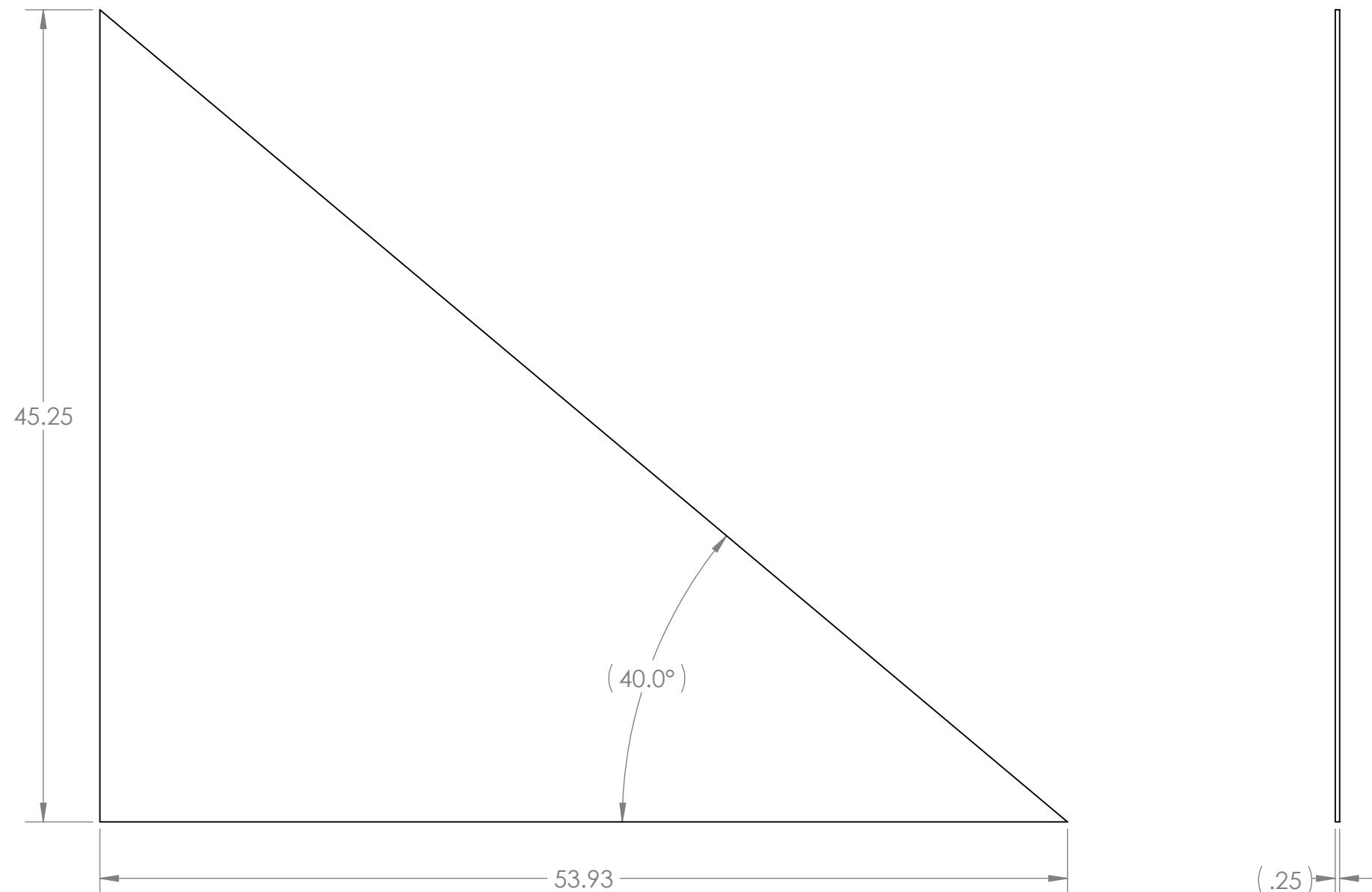
3

2

1

B

B



A

A

Notes:

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

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
 Modeling Solutions Partner

TITLE: Scale Outrigger Side Cover Polycarbonate

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

4

3

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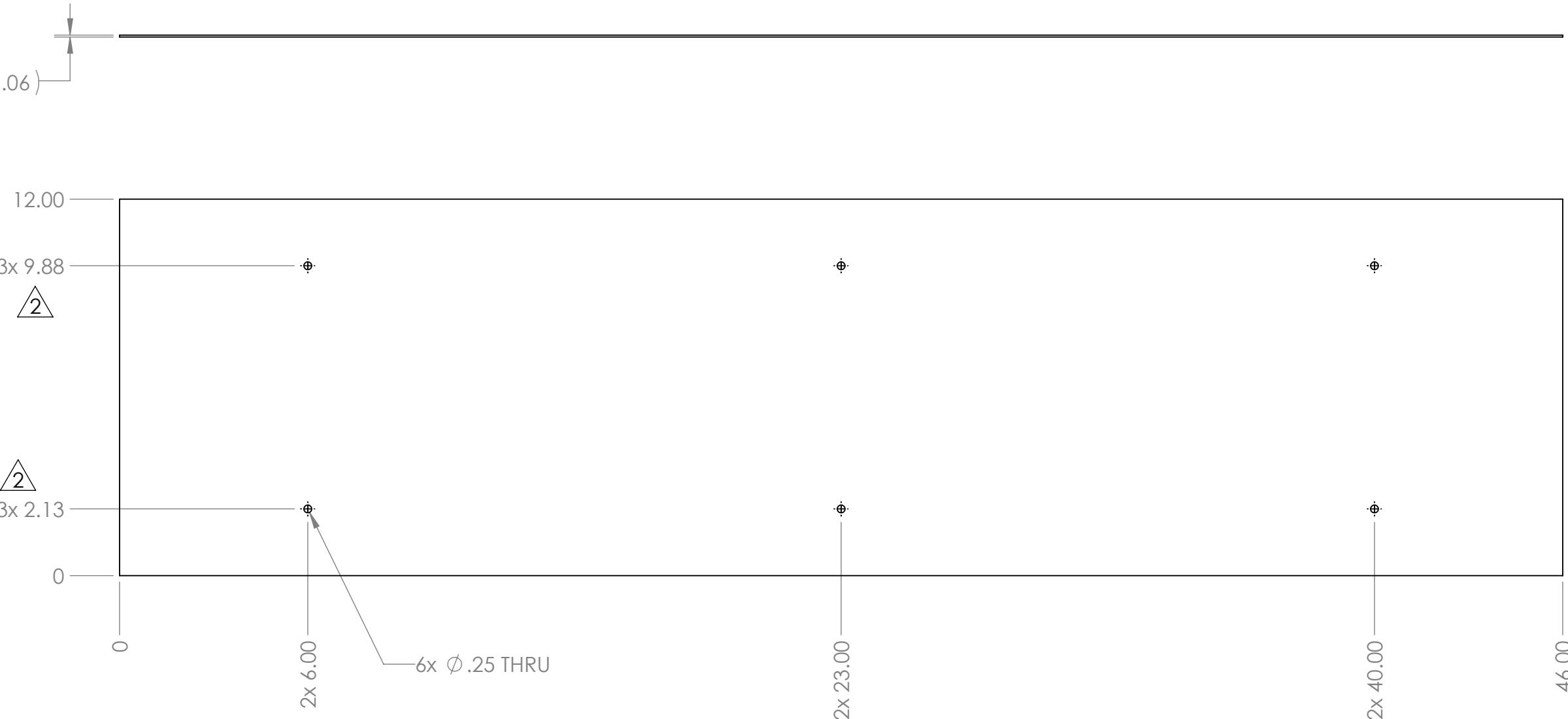
2

1

REVISIONS

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

B



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| | | | | |
|--|----------------------|--|--------------|------|
| | | UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL: ±1/16 ANGULAR: MACH ±1° BEND ±1° TWO PLACE DECIMAL: ±.01 THREE PLACE DECIMAL: ±.001 | NAME | DATE |
| | | DRAWN | | |
| | | CHECKED | | |
| | | ENG APPR. | | |
| | | MFG APPR. | | |
| | | Q.A. | | |
| | | COMMENTS: | | |
| | | MATERIAL | | |
| | | FINISH | | |
| NEXT ASSY | USED ON | | | |
| APPLICATION | DO NOT SCALE DRAWING | | | |
| SCALE: 1:4 | | WEIGHT: | SHEET 1 OF 1 | |
| SIZE B | | DWG. NO. GE-18023 | REV. 2 | |
| TITLE: Scale Arm Cover Polycarbonate | | | | |
| FIRST ROBOTICS COMPETITION SOLIDWORKS Modeling Solutions Partner | | | | |

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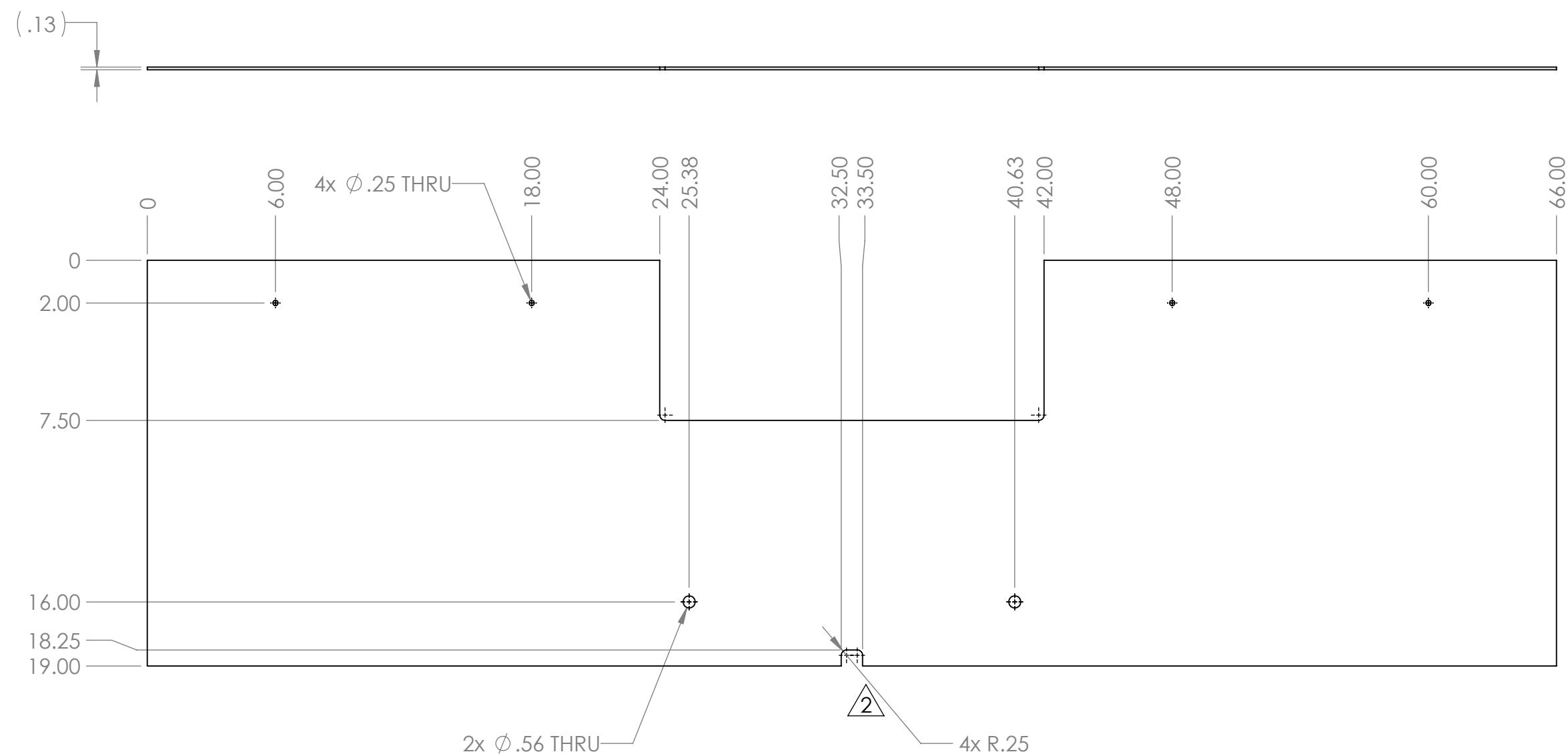
4

3

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1

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



Notes

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

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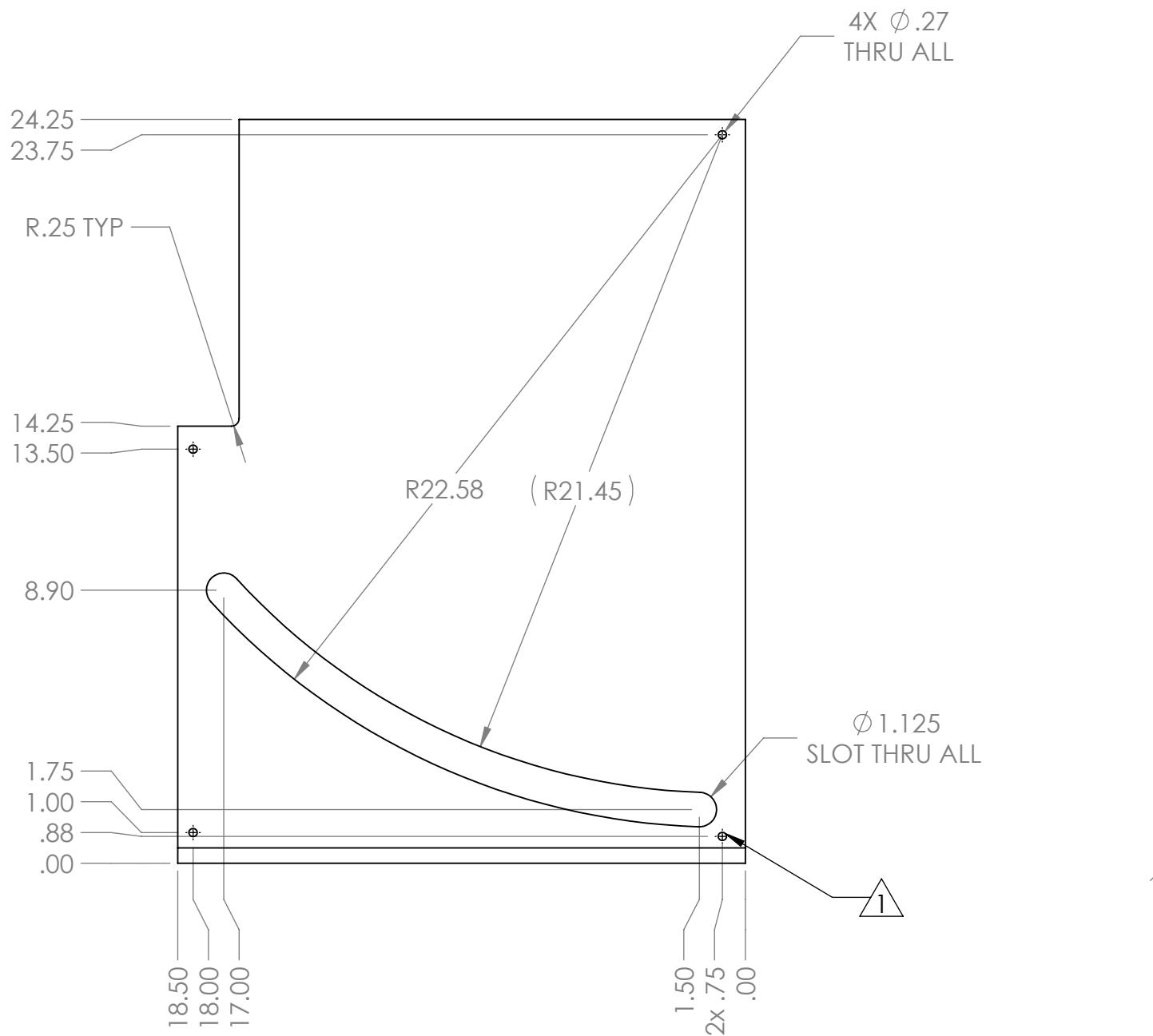
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|-------------|---------|---|------------------|-----------------------------|--------------|---|
| | | UNLESS OTHERWISE SPECIFIED: | | NAME | DATE |  FIRST ROBOTICS COMPETITION  SOLIDWORKS <small>Modeling Solutions Partner</small> |
| | | DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$ | DRAWN | | | |
| | | | CHECKED | | | |
| | | | ENG APPR. | | | |
| | | | MFG APPR. | | | |
| | | INTERPRET GEOMETRIC TOLERANCING PER: | Q.A. | | | TITLE: Switch Base Cover Polycarbonate |
| | | MATERIAL | COMMENTS: | | | |
| NEXT ASSY | USED ON | FINISH | | | | |
| APPLICATION | | DO NOT SCALE DRAWING | SIZE B | DWG. NO. GE-18024 | | REV 2 |
| | | | SCALE: 1:6 | WEIGHT: | SHEET 1 OF 1 | |

REVISIONS

| ZONE | REV. | DESCRIPTION | DATE | APPROVED |
|------|------|---------------------------------------|----------|----------|
| A3 | 1 | Added additional 0.27" diameter hole. | 1/8/2018 | CPO |

B

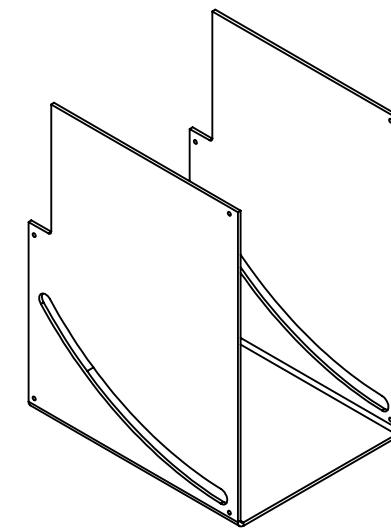
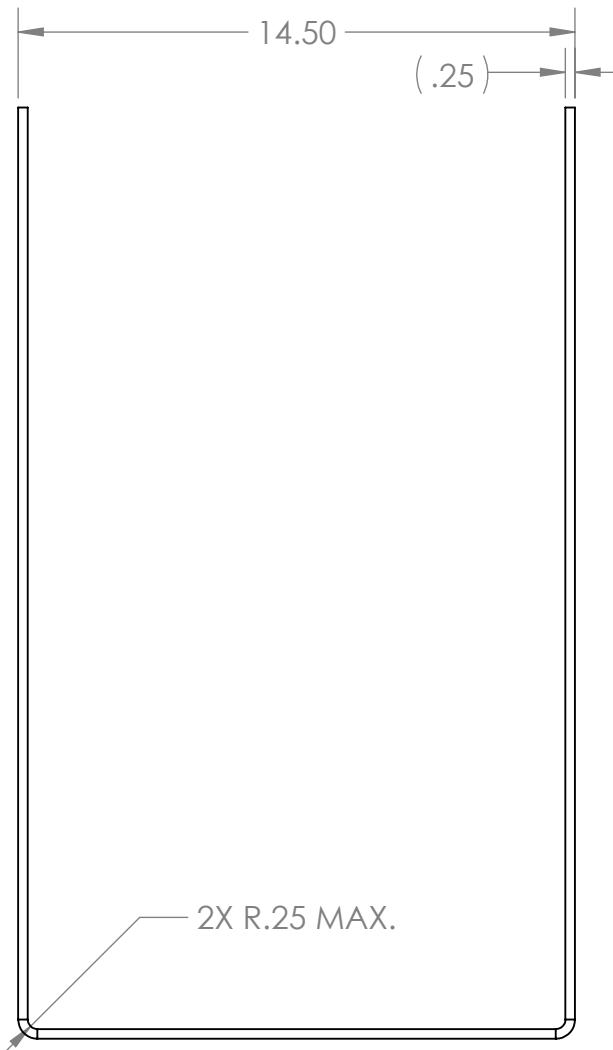
B



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

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| | | | | |
|-------------|----------------------|--|------|------|
| | | UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL: ±1/16 ANGULAR: MACH ±1° BEND ±1° TWO PLACE DECIMAL: ±.01 THREE PLACE DECIMAL: ±.001 | NAME | DATE |
| | | DRAWN | | |
| | | CHECKED | | |
| | | ENG APPR. | | |
| | | MFG APPR. | | |
| | | Q.A. | | |
| | | COMMENTS: | | |
| | | MATERIAL | | |
| | | FINISH | | |
| NEXT ASSY | USED ON | | | |
| APPLICATION | DO NOT SCALE DRAWING | | | |
| SIZE | DWG. NO. | REV | | |
| B | GE-18025 | 1 | | |
| SCALE: 1:5 | WEIGHT: | SHEET 1 OF 1 | | |



FIRST ROBOTICS COMPETITION
SolidWorks
Modeling Solutions Partner

Title: Chute Body

4

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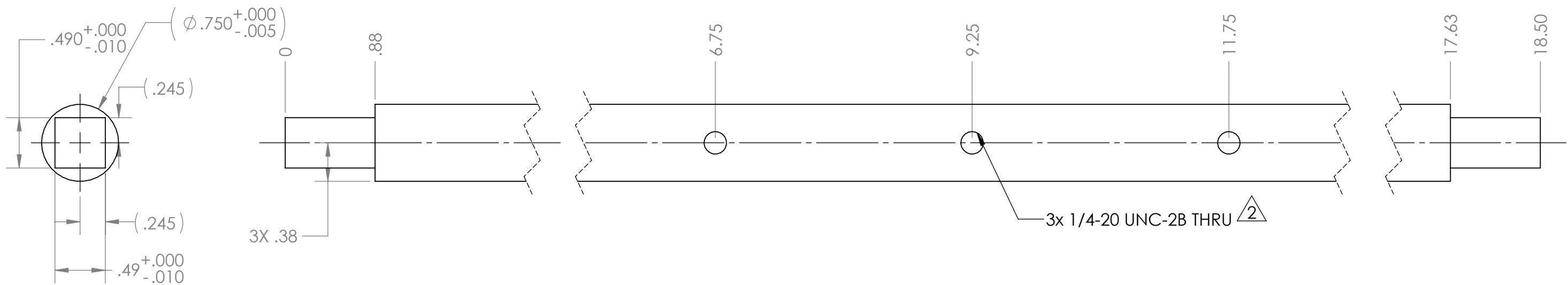
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REVISIONS

| ZONE | REV. | DESCRIPTION | DATE | APPROVED |
|--------|------|--|------------|----------|
| A1, A4 | 2 | Material Changed. 3 Clearance holes changed to 1/4-20 tapped holes | 11/17/2017 | CPO |

B

B



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

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
 Modeling Solutions Partner
 TITLE: **Switch/Scale Arm Shaft**
 SIZE **B** DWG. NO. **GE-18026** REV. **2**
 SCALE: 1:1 WEIGHT: **1** SHEET 1 OF 1

4

3

2

1

4

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Notes

- NOTES:

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

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|-------------------------------------|----------|---|-----------|------|--------------|--|
| | | UNLESS OTHERWISE SPECIFIED: | | NAME | DATE |  FIRST ROBOTICS COMPETITION SOLIDWORKS Modeling Solutions Partner |
| | | DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$ | DRAWN | | | |
| | | | CHECKED | | | |
| | | | ENG APPR. | | | |
| | | | MFG APPR. | | | |
| | | | Q.A. | | | |
| | | INTERPRET GEOMETRIC TOLERANCING PER: | COMMENTS: | | | |
| | | MATERIAL | | | | |
| NEXT ASSY | USED ON | FINISH | | | | |
| APPLICATION | | DO NOT SCALE DRAWING | | | | |
| TITLE: <h1>Pusher Panel</h1> | | | | | | |
| SIZE | DWG. NO. | | | REV | | |
| | B | GE-18027 | | | | |
| SCALE: 1:5 | | | WEIGHT: | | SHEET 1 OF 1 | |

4

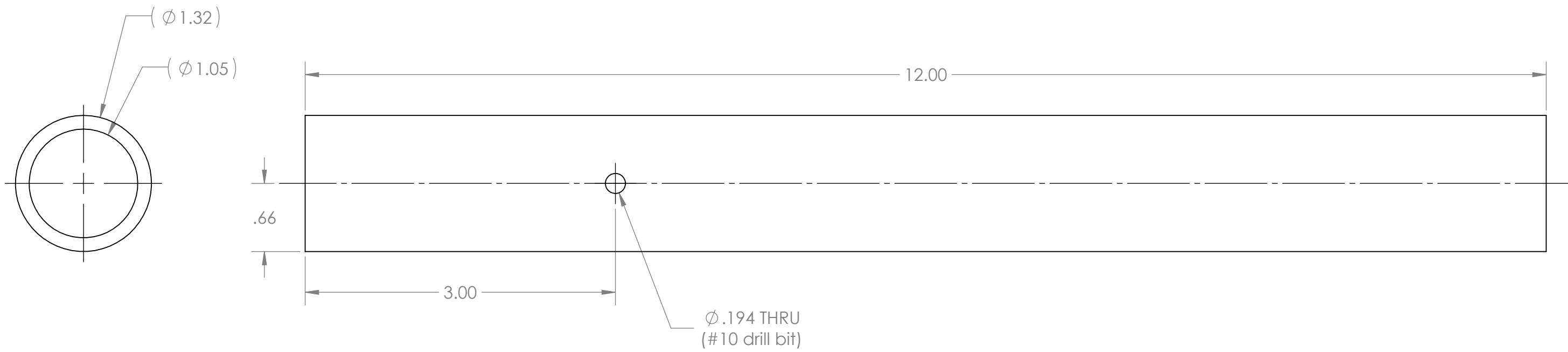
3

2

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B

B



Notes:

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

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|--|---------|---|-----------|----------------------|------|
| DIMENSIONS ARE IN INCHES | | | DRAWN | | |
| TOLERANCES: | | | CHECKED | | |
| FRACTIONAL $\pm 1/16$ | | | ENG APPR. | | |
| ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ | | | MFG APPR. | | |
| TWO PLACE DECIMAL $\pm .01$ | | | Q.A. | | |
| THREE PLACE DECIMAL $\pm .001$ | | | COMMENTS: | | |
| | | INTERPRET GEOMETRIC TOLERANCING PER: | | | |
| | | MATERIAL | | | |
| | | NEXT ASSY | USED ON | FINISH | |
| | | APPLICATION | | DO NOT SCALE DRAWING | |
| SIZE | | DWG. NO. | REV | | |
| B | | GE-18028 | | | |
| SCALE: 1:1 | WEIGHT: | SHEET 1 OF 1 | | | |

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

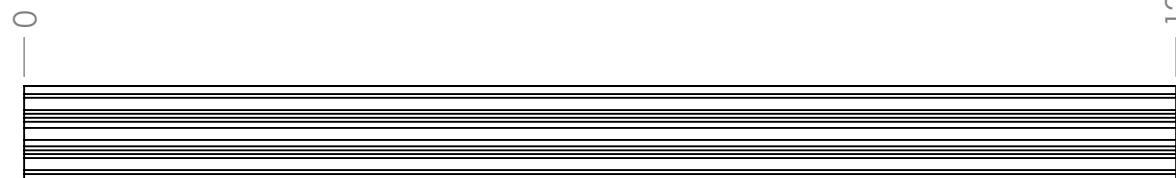
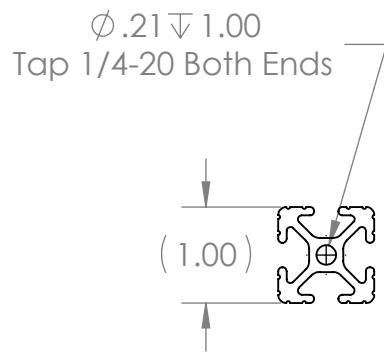
Plate Mount Pin

2

1

B

B



Note:

1. 80-20 aluminum extrusion
2. Remove all burrs and sharp edges

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

 **FIRST
ROBOTICS
COMPETITION** 
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TITLE:
80-20 Extrusion

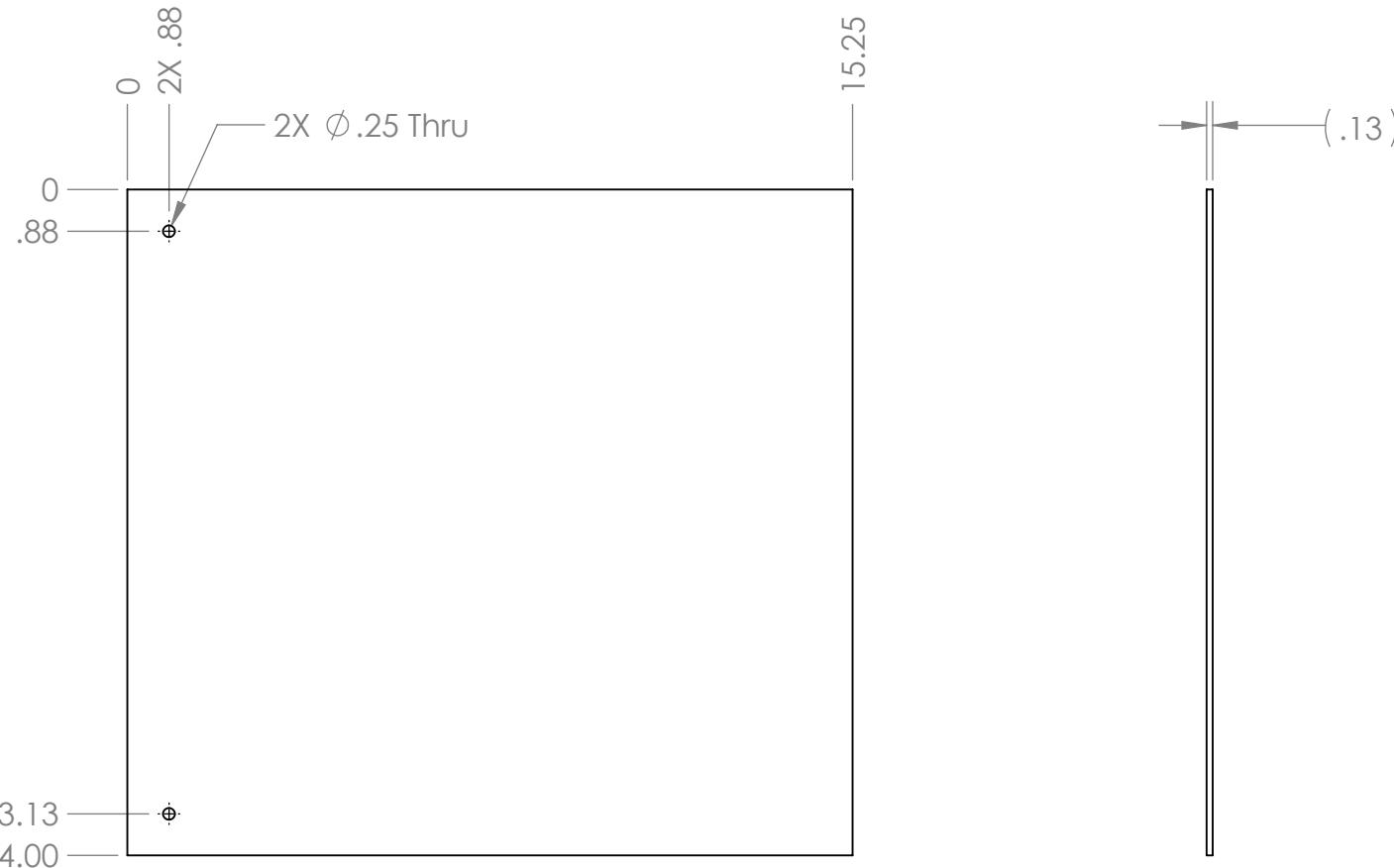
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|---------------------|-----------------|----------------|
| SIZE | DWG. NO. | REV |
| A | GE-18030 | |
| SCALE: 1:4 | | WEIGHT: |
| SHEET 1 OF 1 | | |

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Notes:

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

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



TITLE:

Vault HDPE Bottom Side

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

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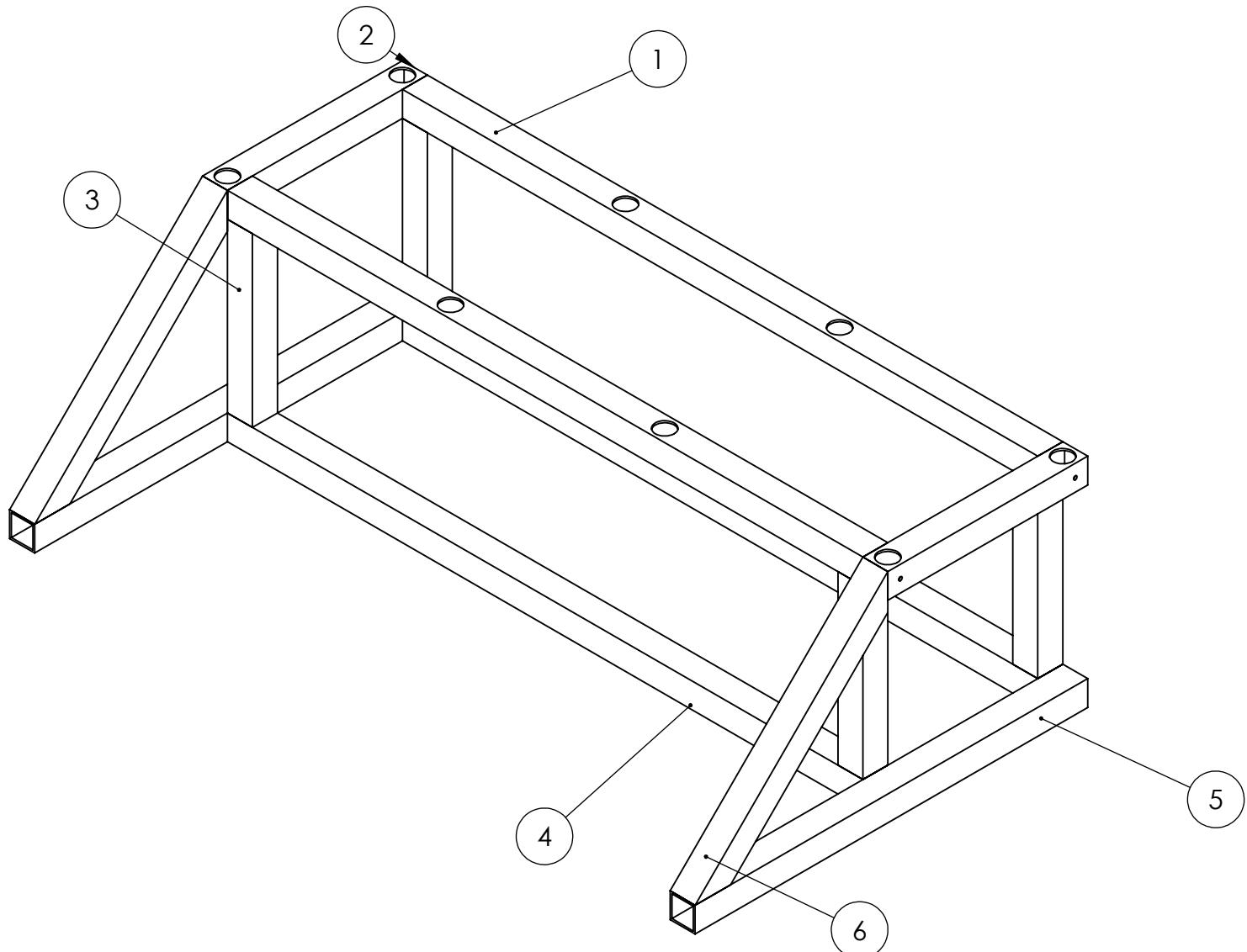
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B

B



Bill of Material

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

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| | | UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL: ±1/16 ANGULAR: MACH ±1° BEND ±1° TWO PLACE DECIMAL: ±.01 THREE PLACE DECIMAL: ±.001 | | NAME | DATE |
| | | DRAWN | | | |
| | | CHECKED | | | |
| | | ENG APPR. | | | |
| | | MFG APPR. | | | |
| | | Q.A. | | | |
| | | COMMENTS: | | | |
| | | MATERIAL | | | |
| | | FINISH | | | |
| NEXT ASSY | USED ON | APPLICATION | DWG. NO. B GE-18032 REV | | |
| | | DO NOT SCALE DRAWING | SCALE: 1:8 | WEIGHT: | SHEET 1 OF 7 |

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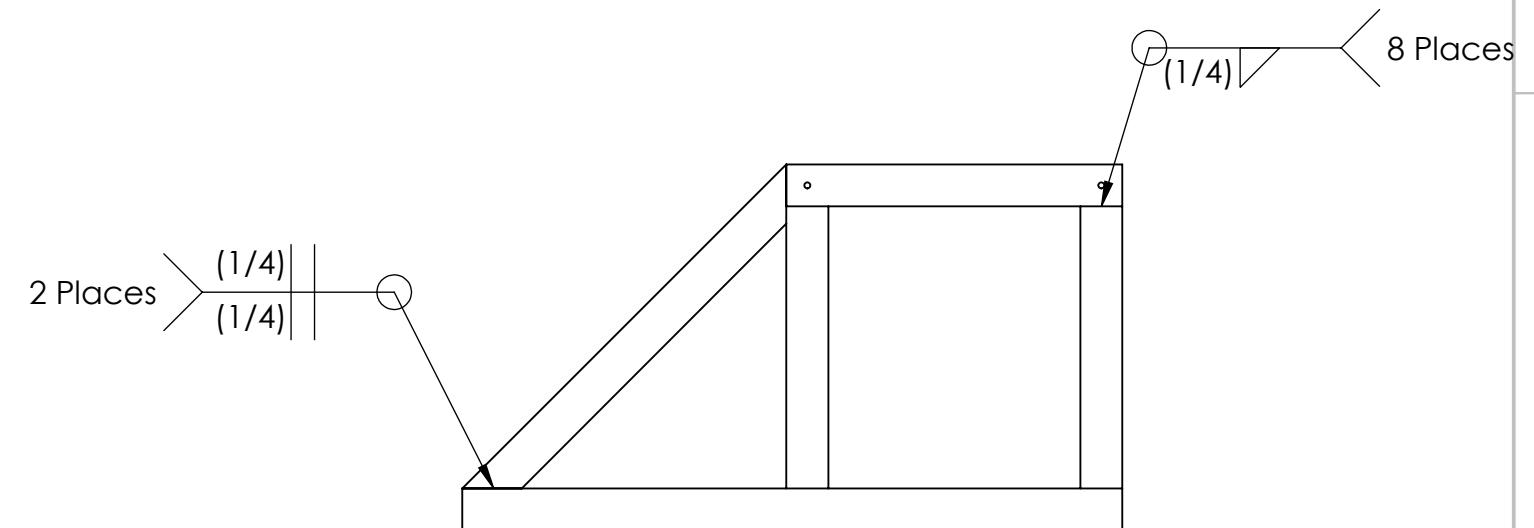
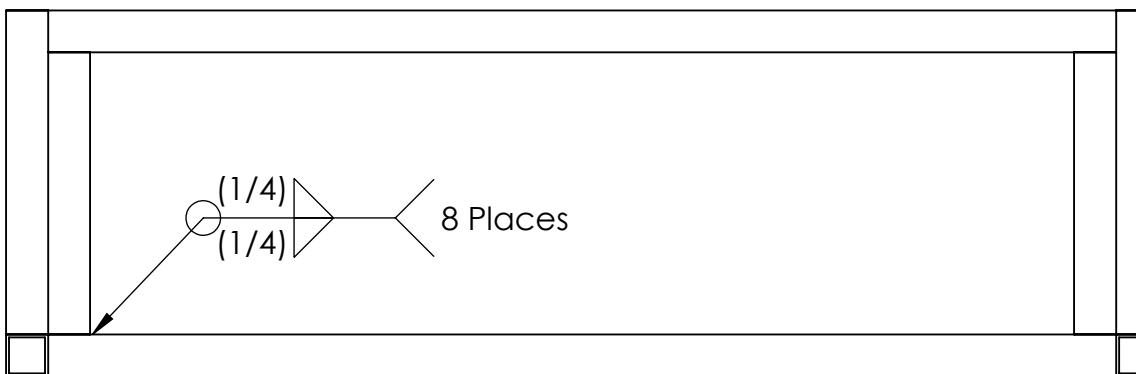
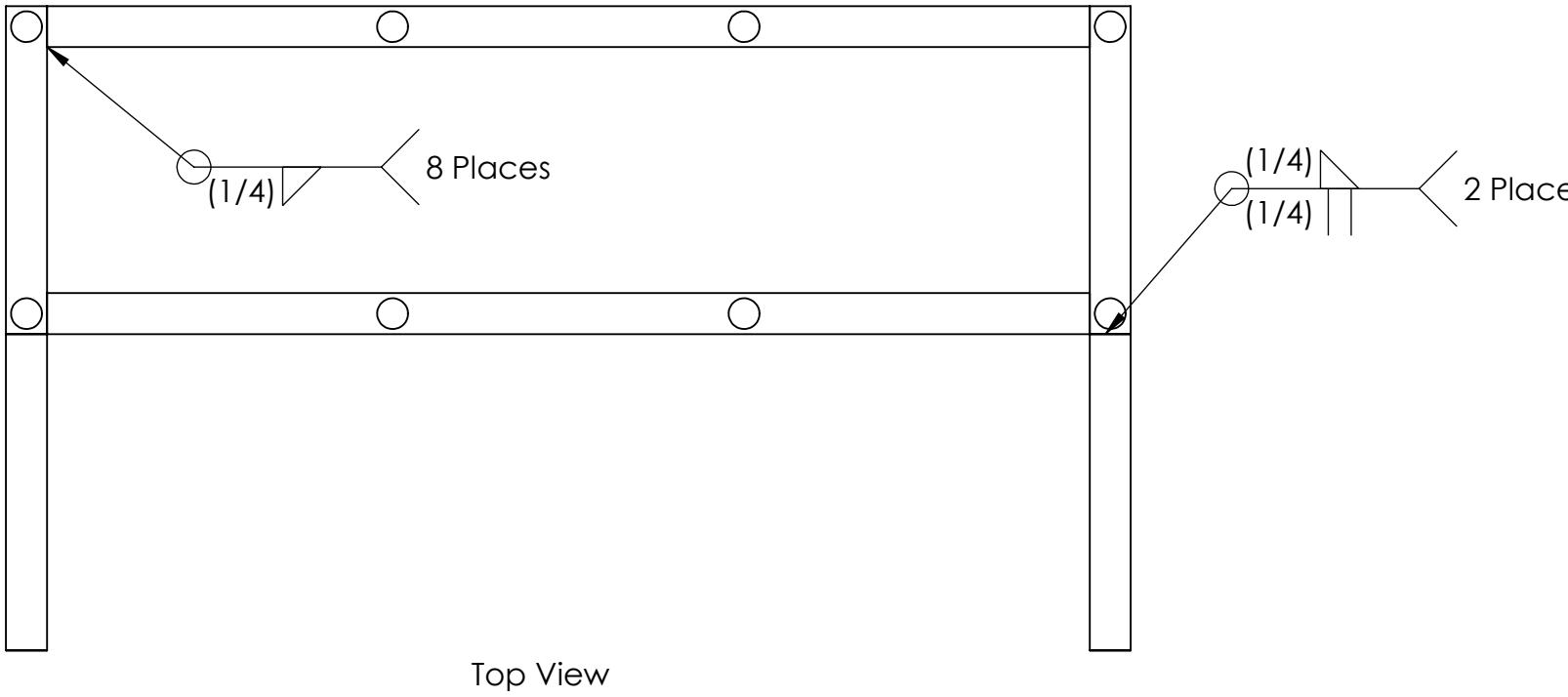
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| | | DRAWN | | | |
| | | CHECKED | | | |
| | | ENG APPR. | | | |
| | | MFG APPR. | | | |
| | | Q.A. | | | |
| | | COMMENTS: | | | |
| | | MATERIAL | | | |
| | | FINISH | | | |
| NEXT ASSY | USED ON | | | | |
| APPLICATION | DO NOT SCALE DRAWING |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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Vault Base

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

SCALE: 1:8 WEIGHT: SHEET 2 OF 7

4

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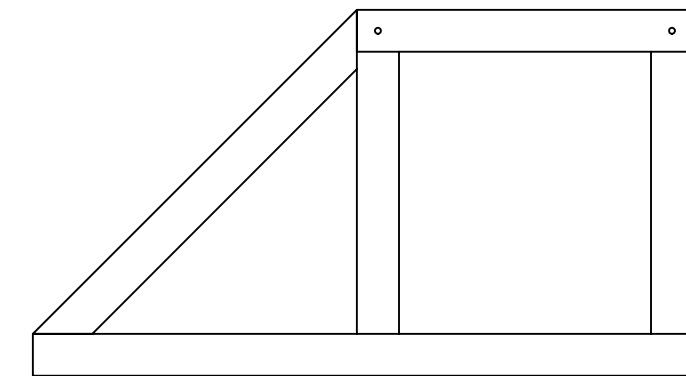
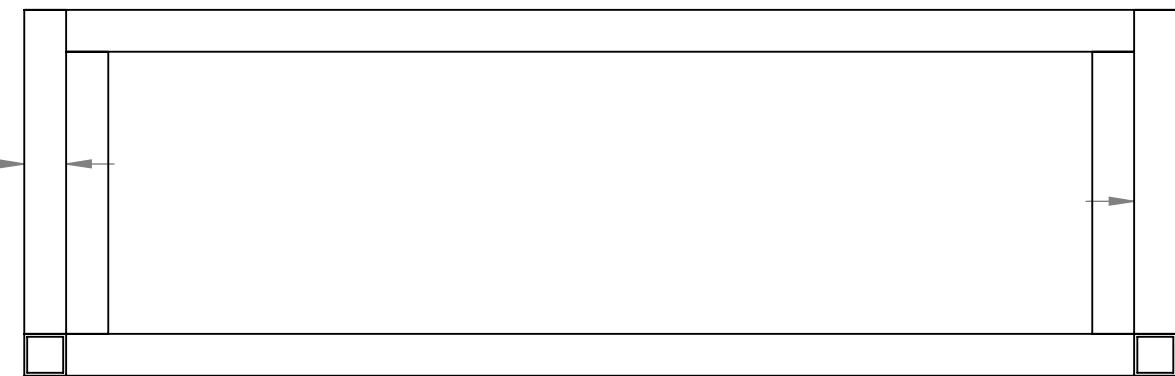
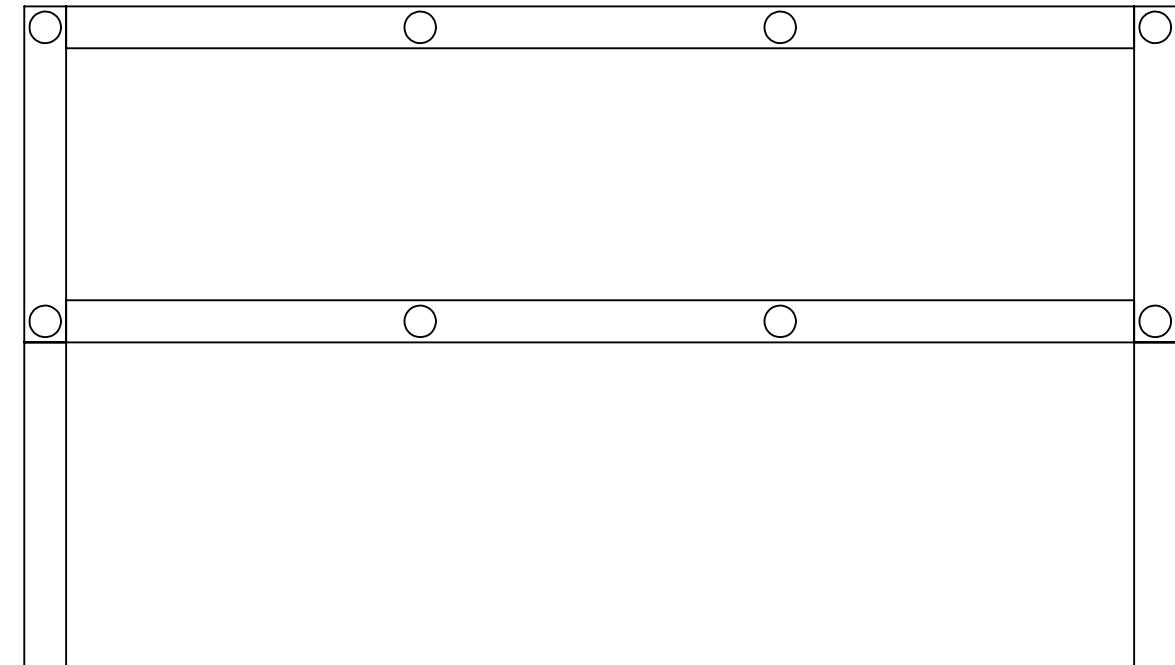
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|-----------|-------------|--|--|------|------|
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| | | DRAWN | | | |
| | | CHECKED | | | |
| | | ENG APPR. | | | |
| | | MFG APPR. | | | |
| | | Q.A. | | | |
| | | COMMENTS: | | | |
| | | MATERIAL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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Vault Base

SIZE DWG. NO. REV
B GE-18032

SCALE: 1:8 WEIGHT: SHEET 3 OF 7

4

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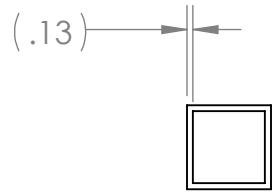
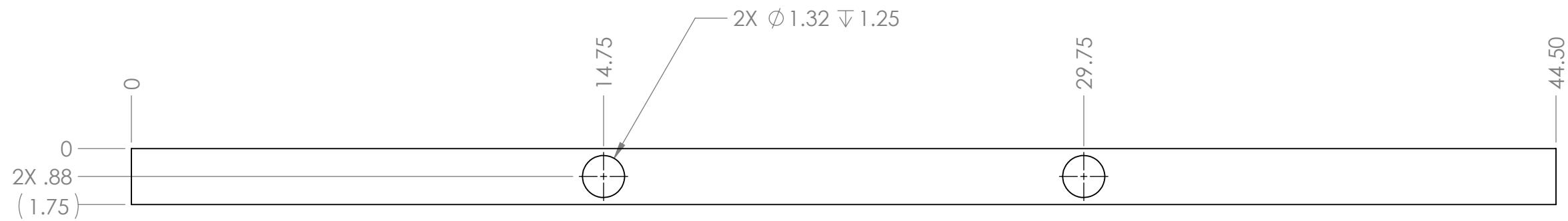
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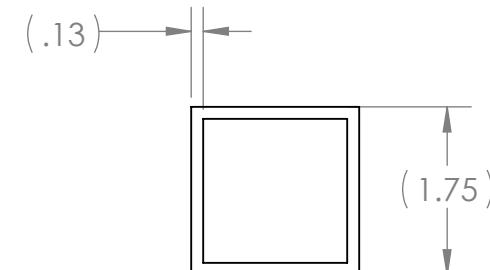
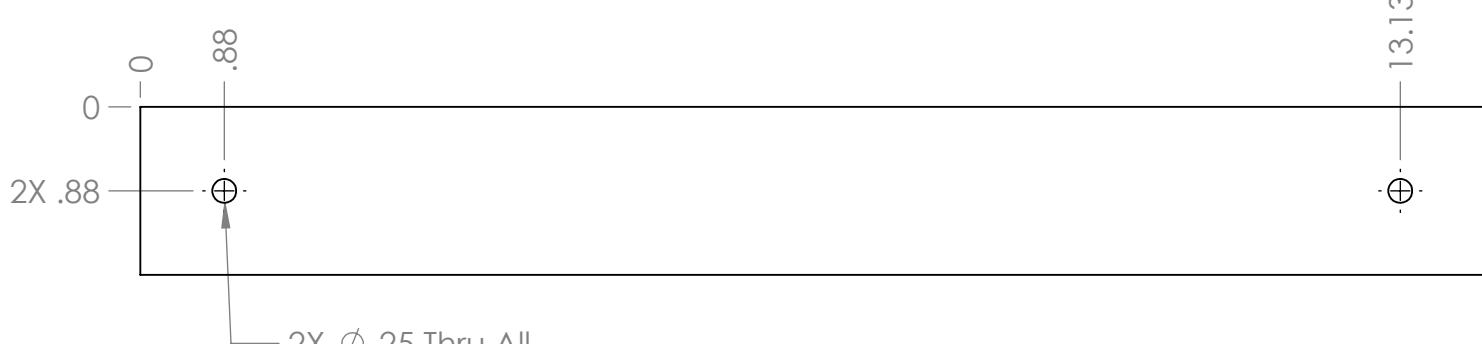
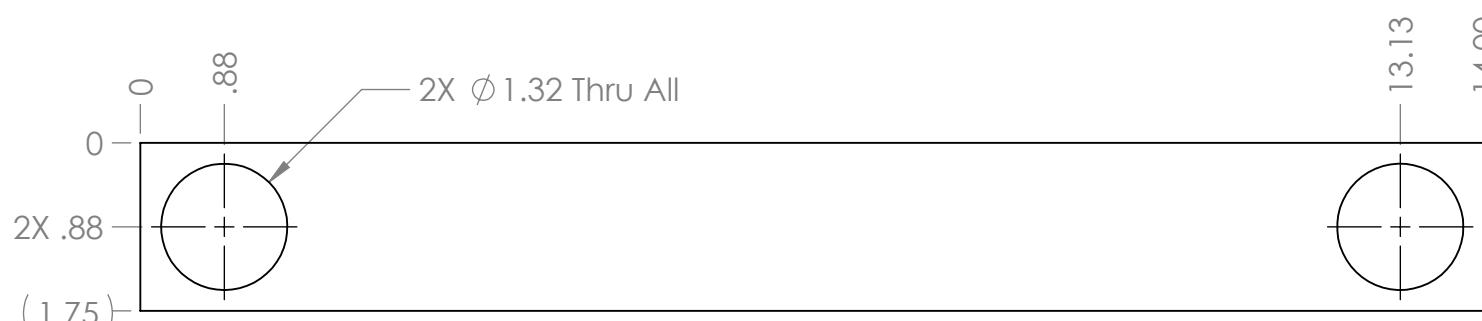
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B



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



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

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Vault Base

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

SCALE: 1:2 WEIGHT: SHEET 4 OF 7

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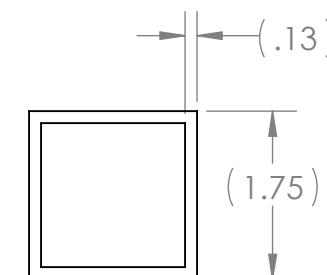
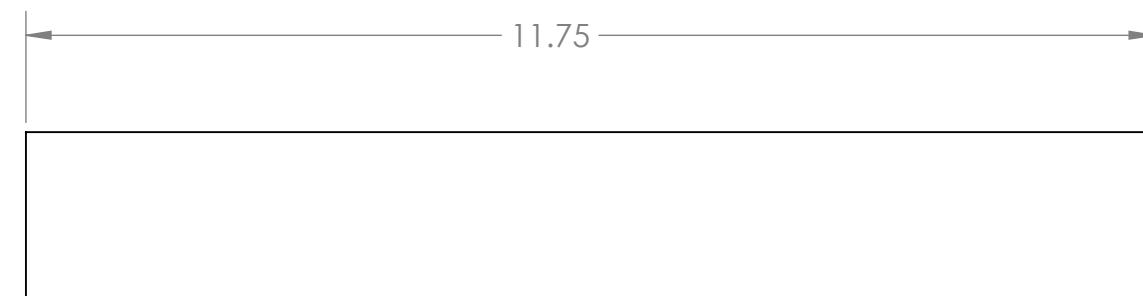
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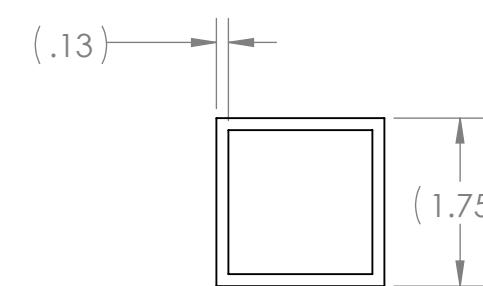
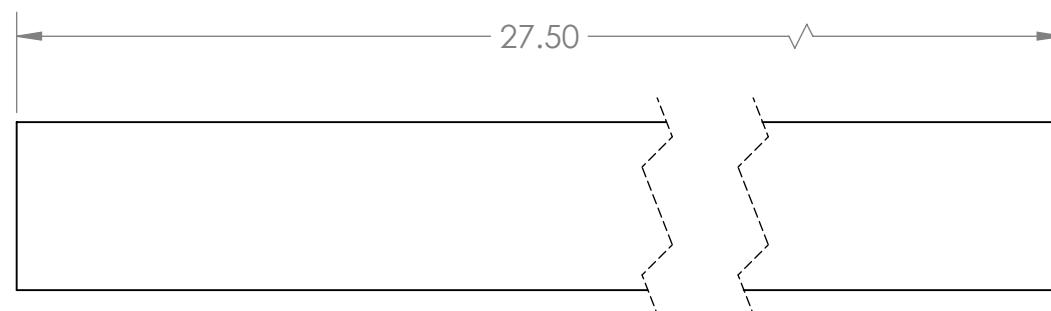
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Item Number: GE-18032-03
Material: 1 3/4" 6063 Aluminum Square Tube
Remove Sharp Edges and Burrs
QTY:4



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

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Vault Base

| | | |
|------------|-----------------|--------------|
| SIZE | DWG. NO. | REV |
| B | GE-18032 | |
| SCALE: 1:2 | WEIGHT: | SHEET 5 OF 7 |

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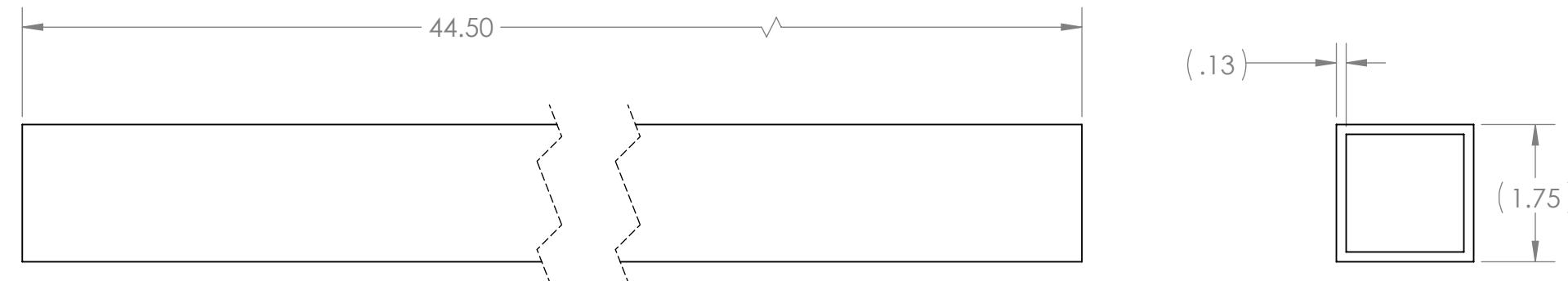
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2

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B

B



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

A

A

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| | | UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$ | | NAME | DATE |
| | | DRAWN | | | |
| | | CHECKED | | | |
| | | ENG APPR. | | | |
| | | MFG APPR. | | | |
| | | Q.A. | | | |
| | | COMMENTS: | | | |
| | | MATERIAL | | | |
| | | FINISH | | | |
| NEXT ASSY | USED ON | | | | |
| APPLICATION | DO NOT SCALE DRAWING | | | | |
| SIZE | | DWG. NO. | | REV | |
| B | | GE-18032 | | | |
| SCALE: 1:2 | WEIGHT: | | SHEET 6 OF 7 | | |

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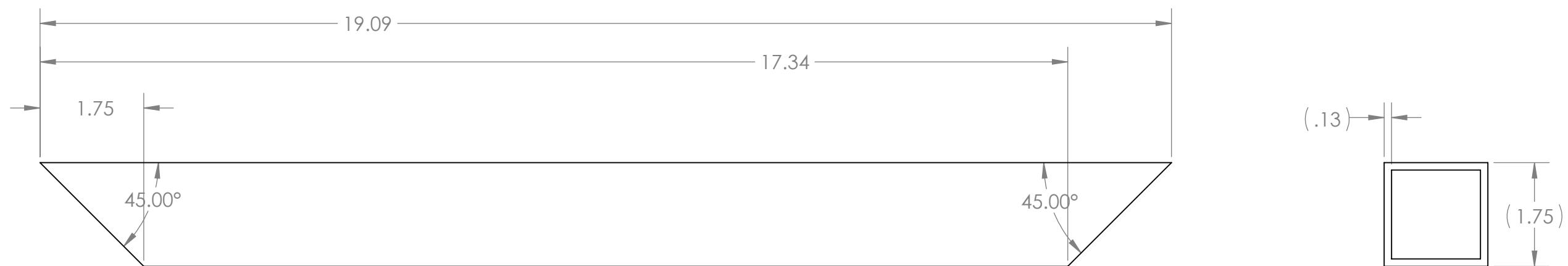
3

2

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B

B



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

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| | | | | | |
|------------|-----------------|--|--------------|------|------|
| | | UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$ | | NAME | DATE |
| | | DRAWN | | | |
| | | CHECKED | | | |
| | | ENG APPR. | | | |
| | | MFG APPR. | | | |
| | | Q.A. | | | |
| | | COMMENTS: | | | |
| | | MATERIAL | | | |
| | | FINISH | | | |
| NEXT ASSY | USED ON | | | | |
| | APPLICATION | DO NOT SCALE DRAWING | | | |
| SIZE | DWG. NO. | | REV | | |
| B | GE-18032 | | | | |
| SCALE: 1:2 | WEIGHT: | | SHEET 7 OF 7 | | |

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FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
 Modeling Solutions Partner

TITLE:
Vault Base

4

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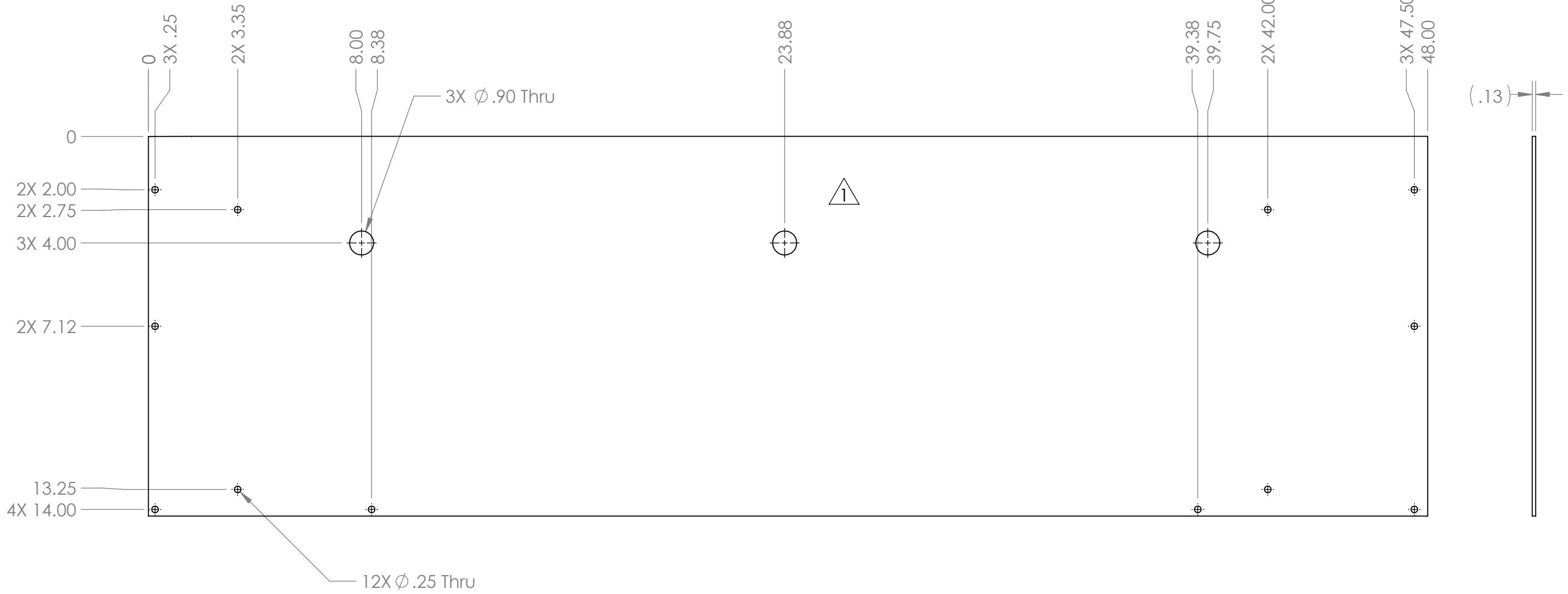
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REVISIONS

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

B

B



Note

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

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| | | | | |
|-------------------|----------------------|--|--------------|------|
| | | UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$ | NAME | DATE |
| | | DRAWN | | |
| | | CHECKED | | |
| | | ENG APPR. | | |
| | | MFG APPR. | | |
| | | Q.A. | | |
| | | COMMENTS: | | |
| | | MATERIAL | | |
| | | FINISH | | |
| NEXT ASSY | USED ON | | | |
| APPLICATION | DO NOT SCALE DRAWING | | | |
| SIZE DWG. NO. | | REV | | |
| B GE-18033 | | 1 | | |
| SCALE: 1:8 | | WEIGHT: | SHEET 1 OF 1 | |

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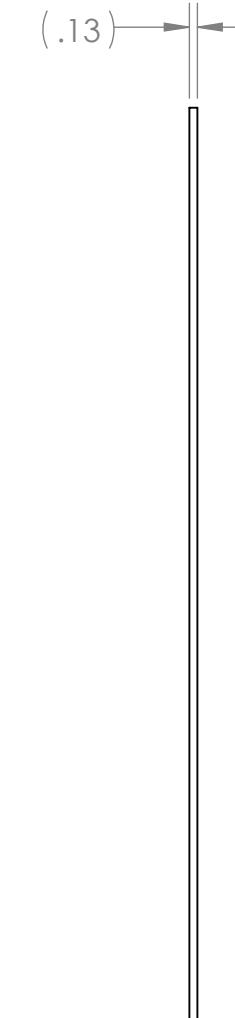
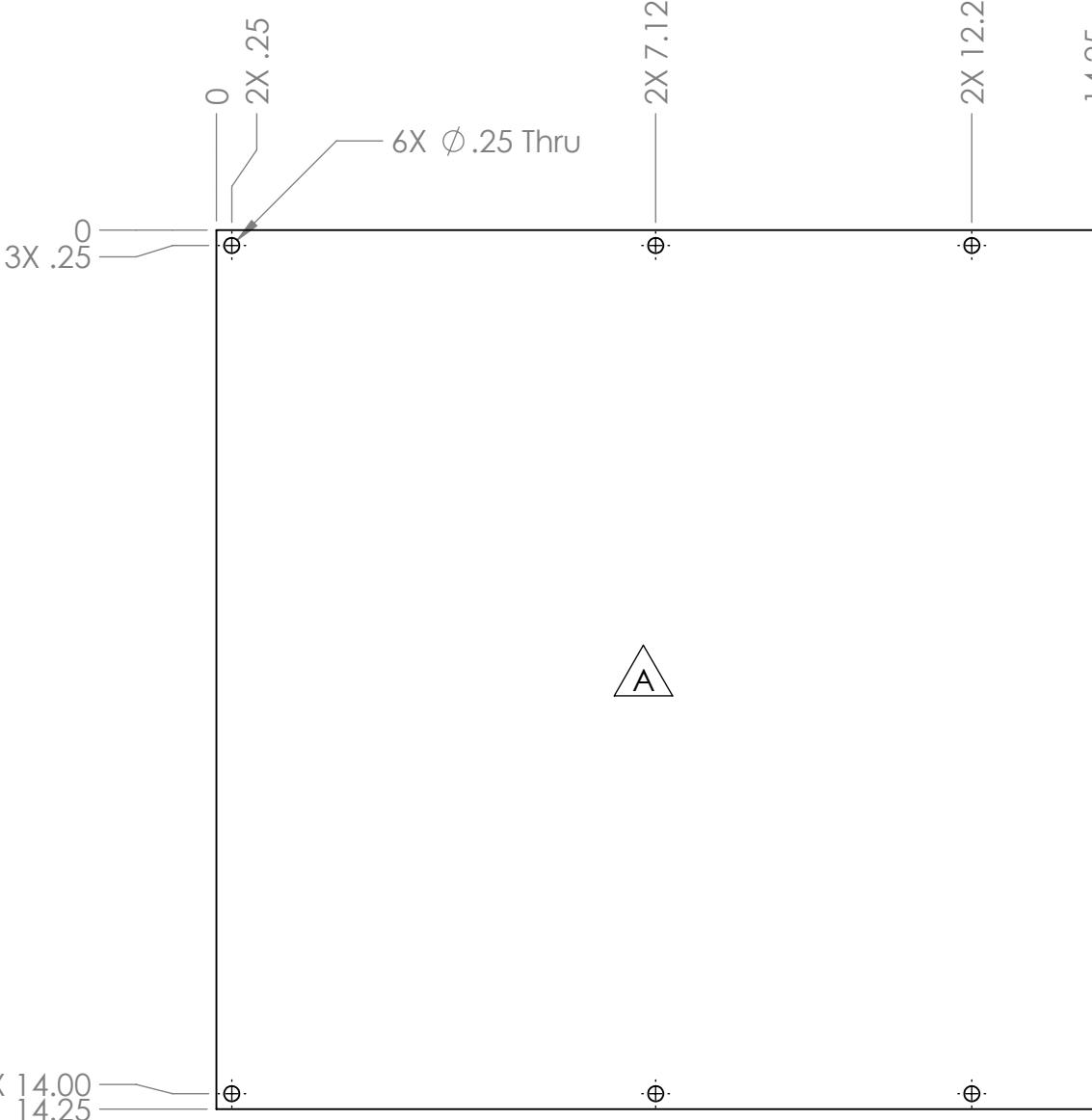
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Note
 1. 1 1/8" thk. smooth HDPE, blue or red
 2. Remove sharp edges and burrs

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
 Modeling Solutions Partner

Vault HDPE Top Side

| | | |
|------------|-----------------|--------------|
| SIZE | DWG. NO. | REV |
| B | GE-18034 | A |
| SCALE: 1:3 | WEIGHT: | SHEET 1 OF 1 |

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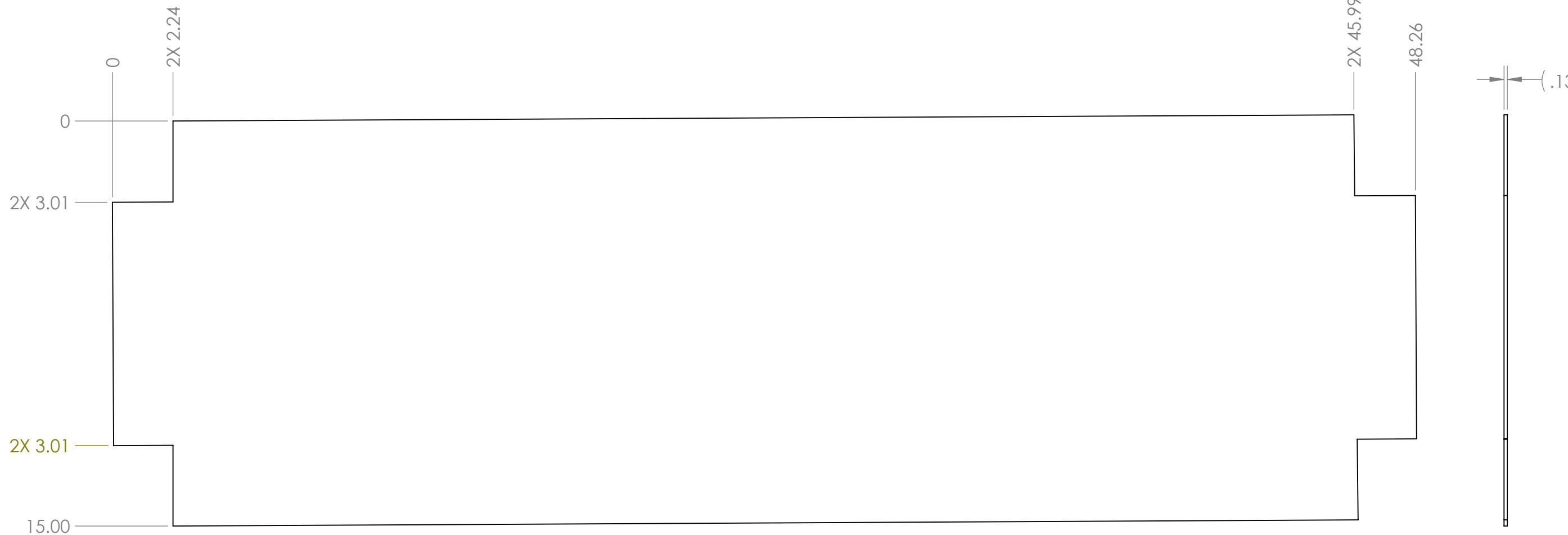
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- Notes:
1. 1/8" thk. smooth HDPE, red or blue
 2. Remove sharp edges and burrs

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| | | | | | |
|---|-----------------------------------|--|--------------|------|------|
| | | UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$ | | NAME | DATE |
| | | DRAWN | | | |
| | | CHECKED | | | |
| | | ENG APPR. | | | |
| | | MFG APPR. | | | |
| | | Q.A. | | | |
| | | COMMENTS: | | | |
| | | MATERIAL | | | |
| | | FINISH | | | |
| NEXT ASSY | USED ON | | | | |
| APPLICATION | DO NOT SCALE DRAWING | | | | |
| SOLIDWORKS Modeling Solutions Partner | | | | | |
| FIRST ROBOTICS COMPETITION | | | | | |
| TITLE: | Vault HDPE Bottom Back | | | | |
| SIZE | DWG. NO. | | REV | | |
| B | GE-18035 | | | | |
| SCALE: 1:4 | WEIGHT: | | SHEET 1 OF 1 | | |

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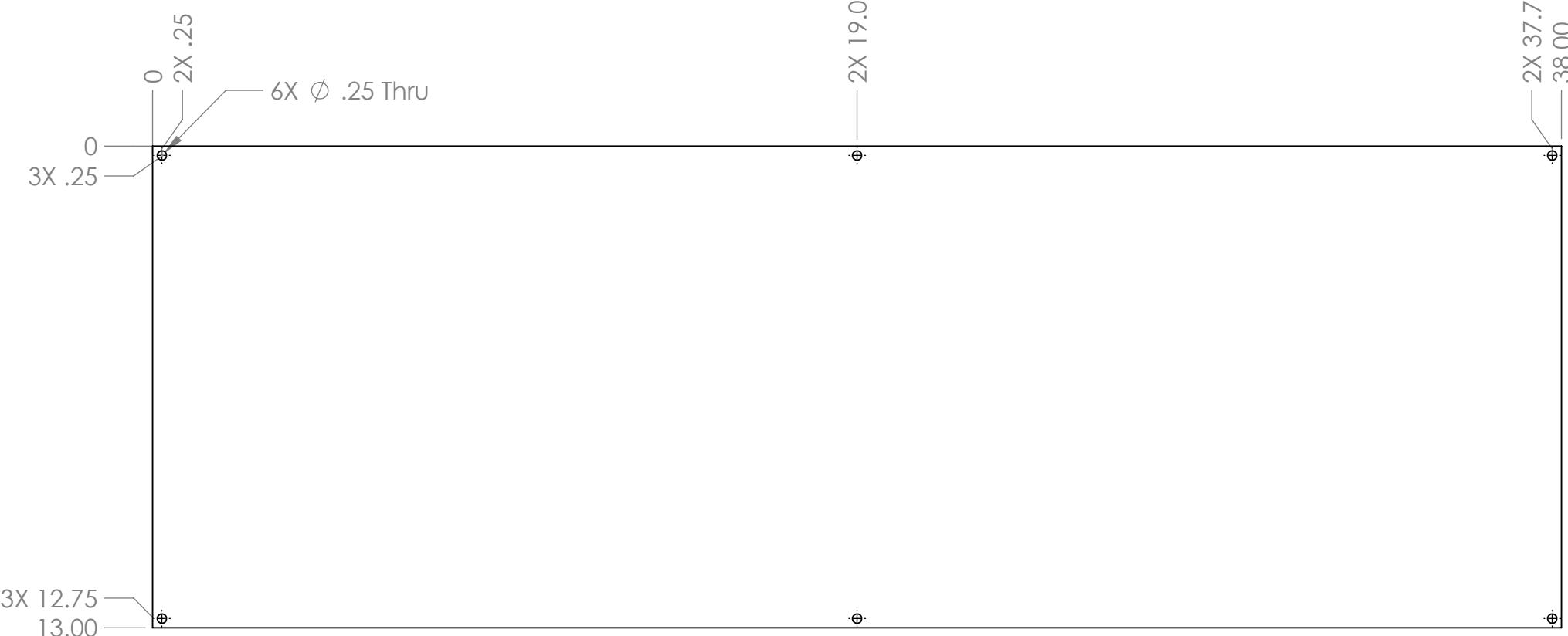
3

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Notes:

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

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| | | UNLESS OTHERWISE SPECIFIED: | | NAME | DATE |
|--|--------------------------|--------------------------------------|--|------|------|
| DIMENSIONS ARE IN INCHES | | TOLERANCES: | | | |
| FRACTIONAL ±1/16 | | ANGULAR: MACH ±1° BEND ±1° | | | |
| TWO PLACE DECIMAL ±.01 | | THREE PLACE DECIMAL ±.001 | | | |
| | | | | | |
| | | INTERPRET GEOMETRIC TOLERANCING PER: | | | |
| | | MATERIAL | | | |
| NEXT ASSY | USED ON | FINISH | | | |
| APPLICATION | | DO NOT SCALE DRAWING | | | |
| TITLE: Vault Polycarbonate Middle Insert | | | | | |
| SIZE B | DWG. NO. GE-18036 | REV | | | |
| SCALE: 1:4 | WEIGHT: | SHEET 1 OF 1 | | | |

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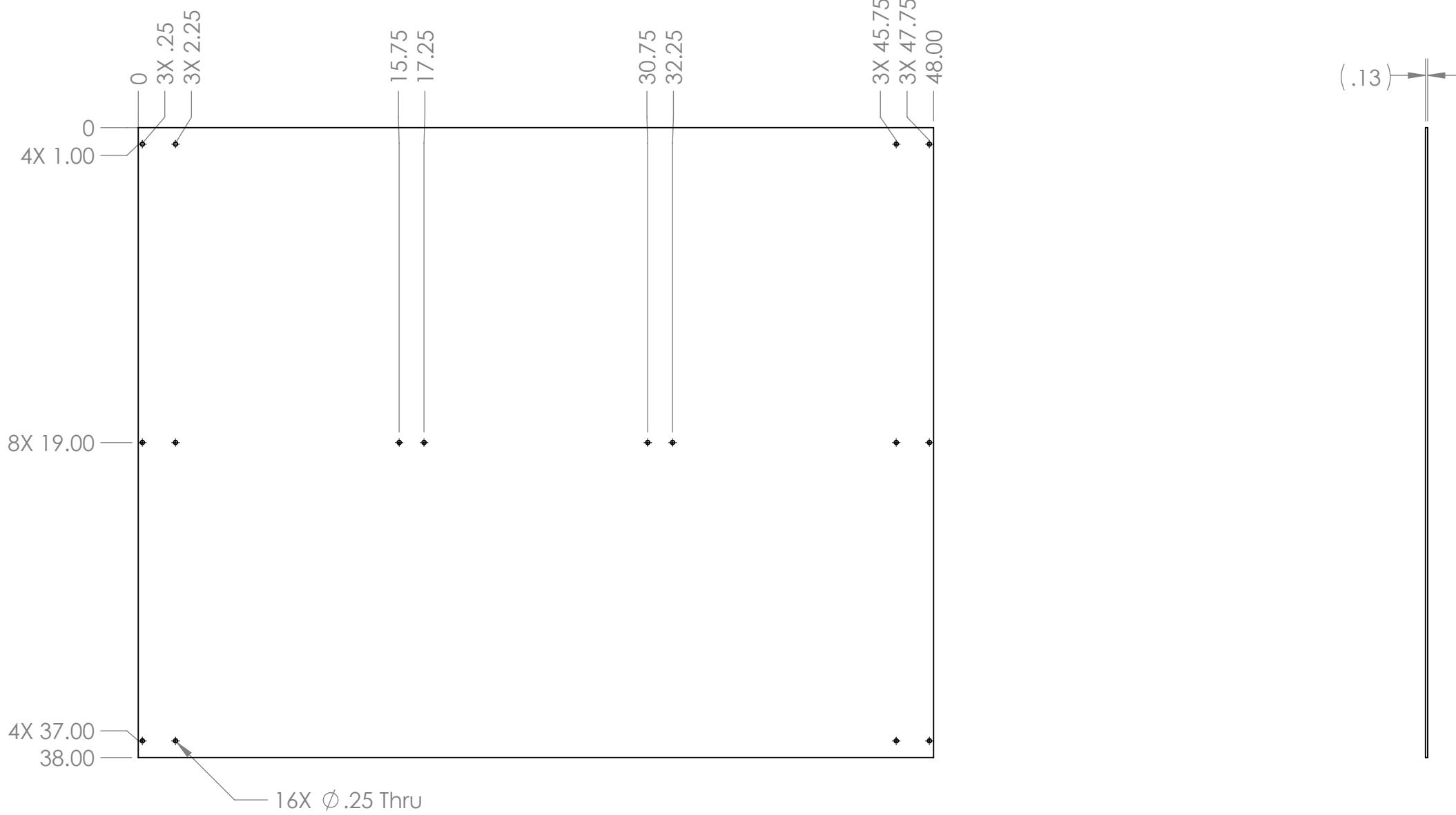
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Notes

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

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| | | UNLESS OTHERWISE SPECIFIED: | | NAME | DATE |
|-------------|-----------------|--|--|------|-----------|
| | | DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL ±1/16 ANGULAR: MACH ±1° BEND ±1° TWO PLACE DECIMAL ±.01 THREE PLACE DECIMAL ±.001 | | | |
| | | INTERPRET GEOMETRIC TOLERANCING PER: | | Q.A. | COMMENTS: |
| | | | | | |
| NEXT ASSY | USED ON | MATERIAL | | | |
| | | FINISH | | | |
| APPLICATION | | DO NOT SCALE DRAWING | | | |
| B | GE-18037 | | | | |
| SCALE: 1:8 | WEIGHT: | SHEET 1 OF 1 | | | |

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Vault Polycarbonate Backstop

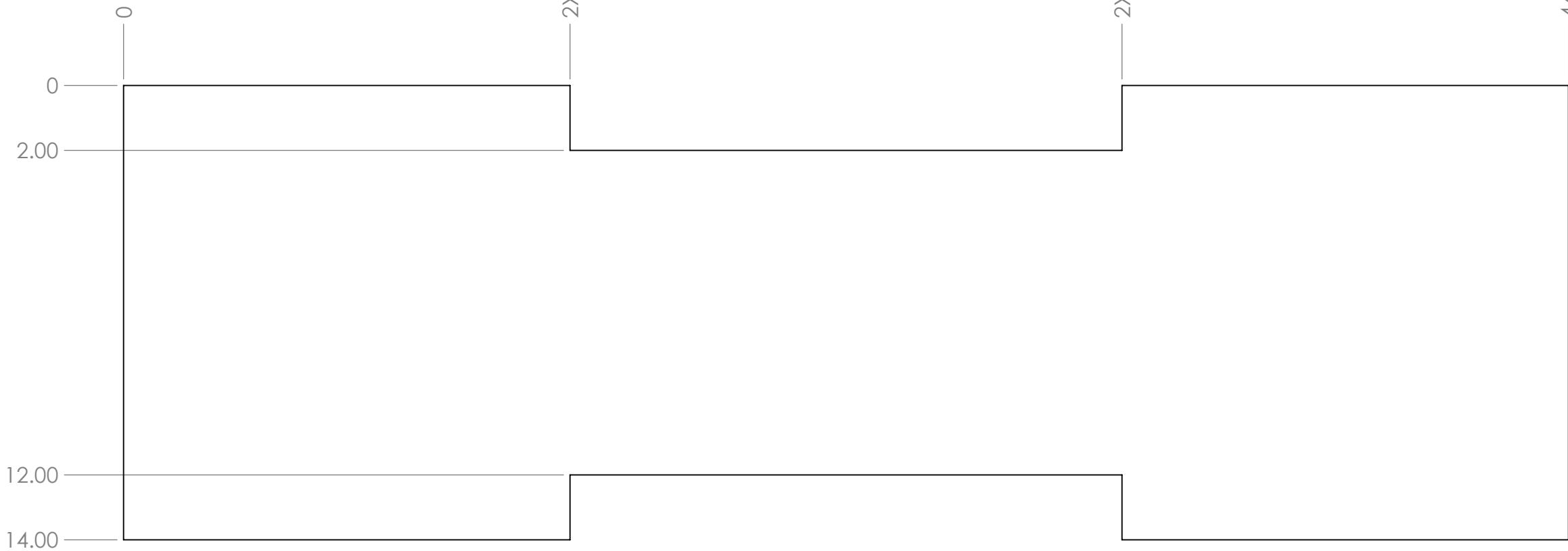
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Notes:

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

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| | | UNLESS OTHERWISE SPECIFIED: | | COMMENTS: | TITLE: Vault Polycarbonate Bottom Floor | | |
|-------------|-----------------|--|--|-----------|---|--|--|
| | | DIMENSIONS ARE IN INCHES | | | | | |
| | | TOLERANCES: FRACTIONAL ±1/16 ANGULAR: MACH ±1° BEND ±1° TWO PLACE DECIMAL ±.01 THREE PLACE DECIMAL ±.001 | | | | | |
| | | INTERPRET GEOMETRIC TOLERANCING PER: | | | | | |
| | | MATERIAL | | | | | |
| NEXT ASSY | | FINISH | | | | | |
| APPLICATION | | DO NOT SCALE DRAWING | | | | | |
| SIZE | DWG. NO. | REV | | | | | |
| B | GE-18038 | | | | | | |
| SCALE: 1:4 | WEIGHT: | SHEET 1 OF 1 | | | | | |

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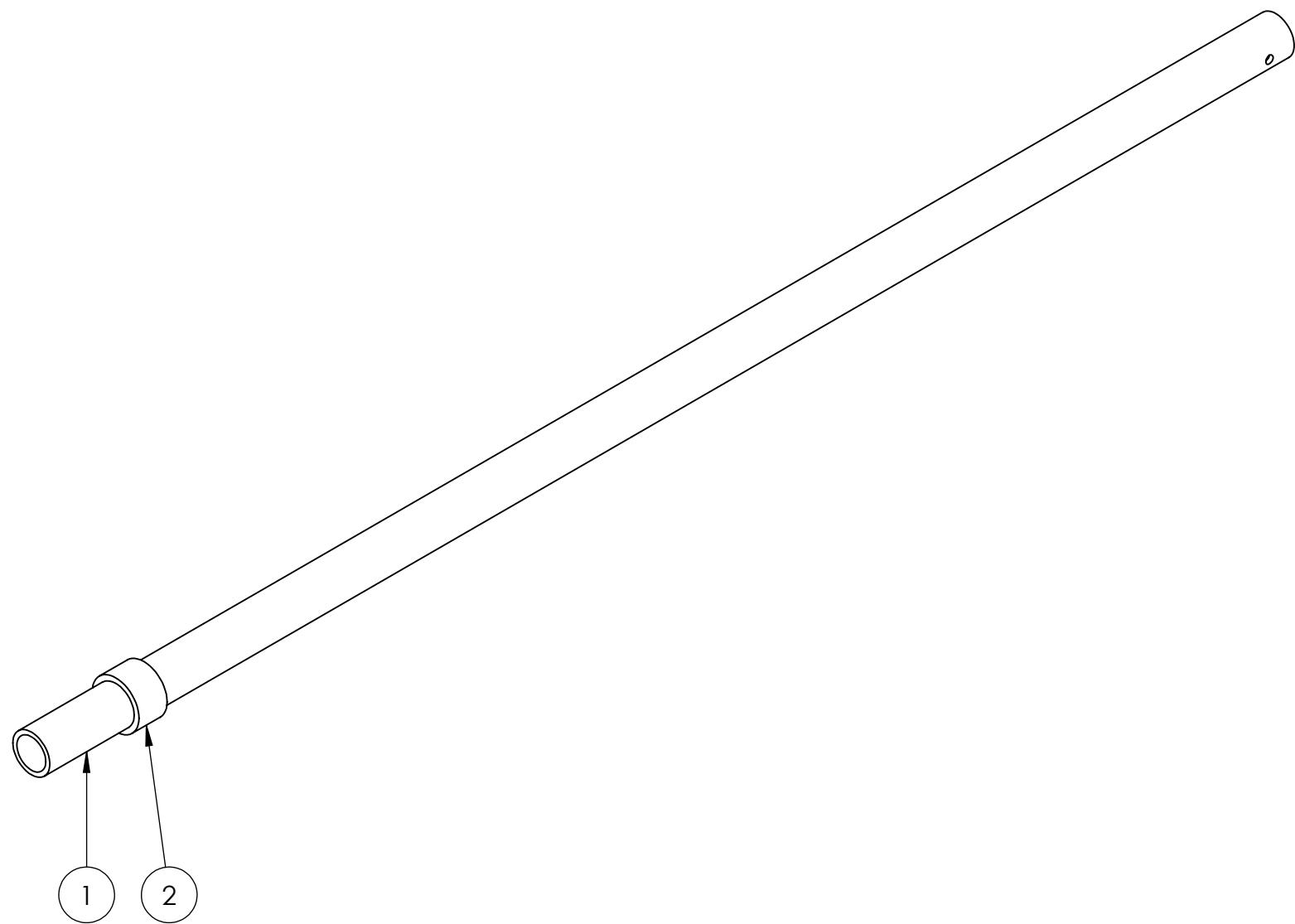
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| ITEM NO. | PART NUMBER | DESCRIPTION | QTY. |
|----------|-------------|----------------------------------|------|
| 1 | GE-18039-01 | 1" Schedule 40 Aluminum Pipe | 1 |
| 2 | GE-18039-02 | 1 1/4" Schedule 40 Aluminum Pipe | 1 |

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| | | | | | |
|------------|-----------------|--|----------------------|-----------|------|
| | | UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$ | | NAME | DATE |
| | | DRAWN | | | |
| | | CHECKED | | | |
| | | ENG APPR. | | | |
| | | MFG APPR. | | | |
| | | Q.A. | | | |
| | | INTERPRET GEOMETRIC TOLERANCING PER: | | COMMENTS: | |
| | | MATERIAL | | | |
| | NEXT ASSY | USED ON | FINISH | | |
| | | APPLICATION | DO NOT SCALE DRAWING | | |
| B | GE-18039 | | | | |
| SCALE: 1:4 | WEIGHT: | SHEET 1 OF 5 | | | |

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner
TITLE: Vault Support Pipes
SIZE **DWG. NO.** **REV**
B **GE-18039**

4

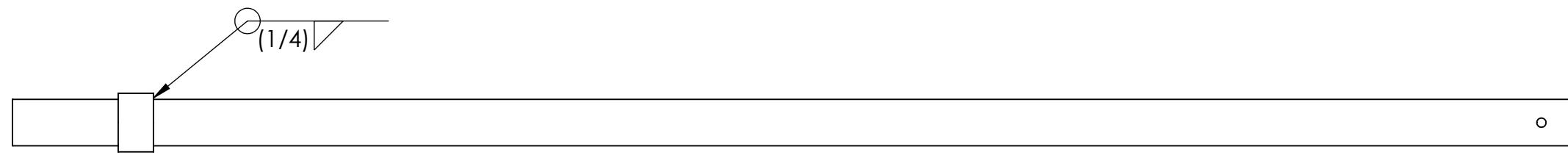
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|-------------|----------------------|---|--|------|------|
| | | UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL: $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Vault Support Pipes

| | | |
|------------|-----------------|--------------|
| B | GE-18039 | REV |
| SCALE: 1:8 | WEIGHT: | SHEET 2 OF 5 |

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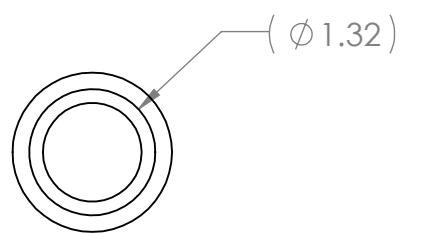
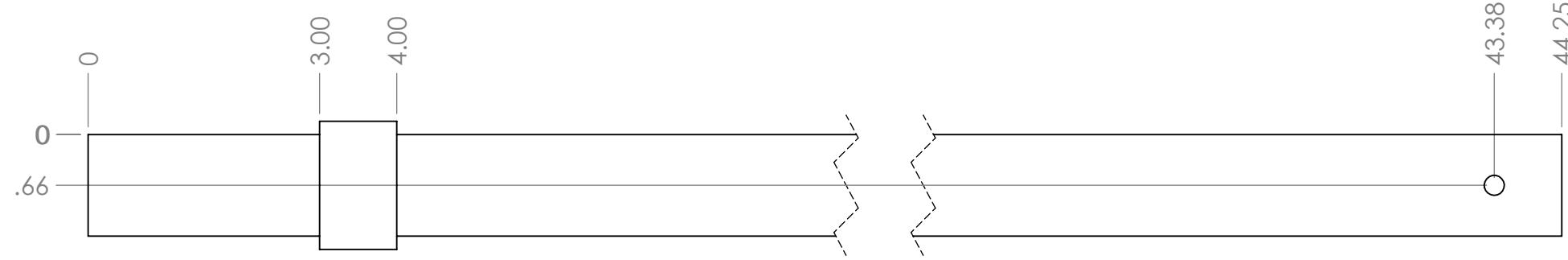
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| | | UNLESS OTHERWISE SPECIFIED: | | NAME | DATE |
|--|--|---|-----------|----------------------|------|
| DIMENSIONS ARE IN INCHES | | | DRAWN | | |
| TOLERANCES: | | | CHECKED | | |
| FRACTIONAL $\pm 1/16$ | | | ENG APPR. | | |
| ANGULAR: MACH $\pm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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Vault Support Pipes

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

SCALE: 1:8 WEIGHT: SHEET 3 OF 5

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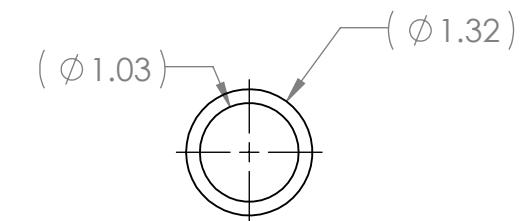
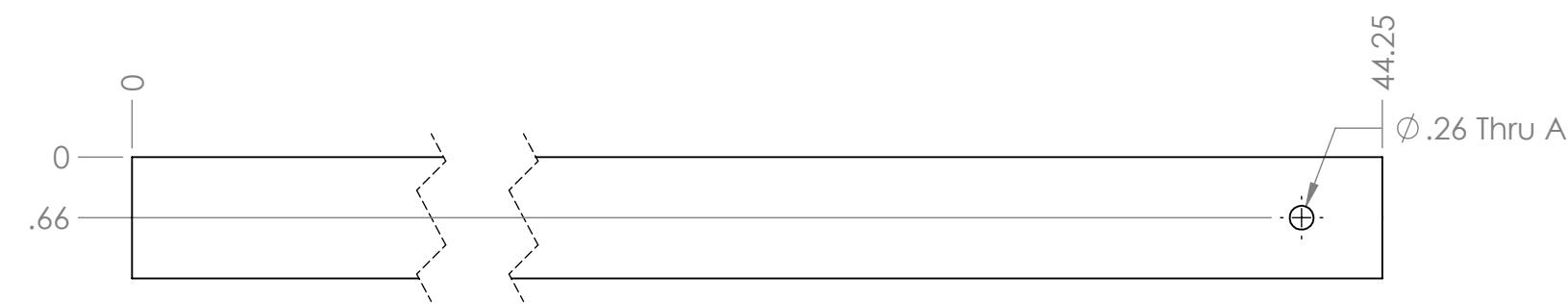
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Notes:

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

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Vault Support Pipes

| | | |
|-------------|-----------------|--------------|
| SIZE | DWG. NO. | REV |
| B | GE-18039 | |
| SCALE: 1:8 | WEIGHT: | SHEET 4 OF 5 |

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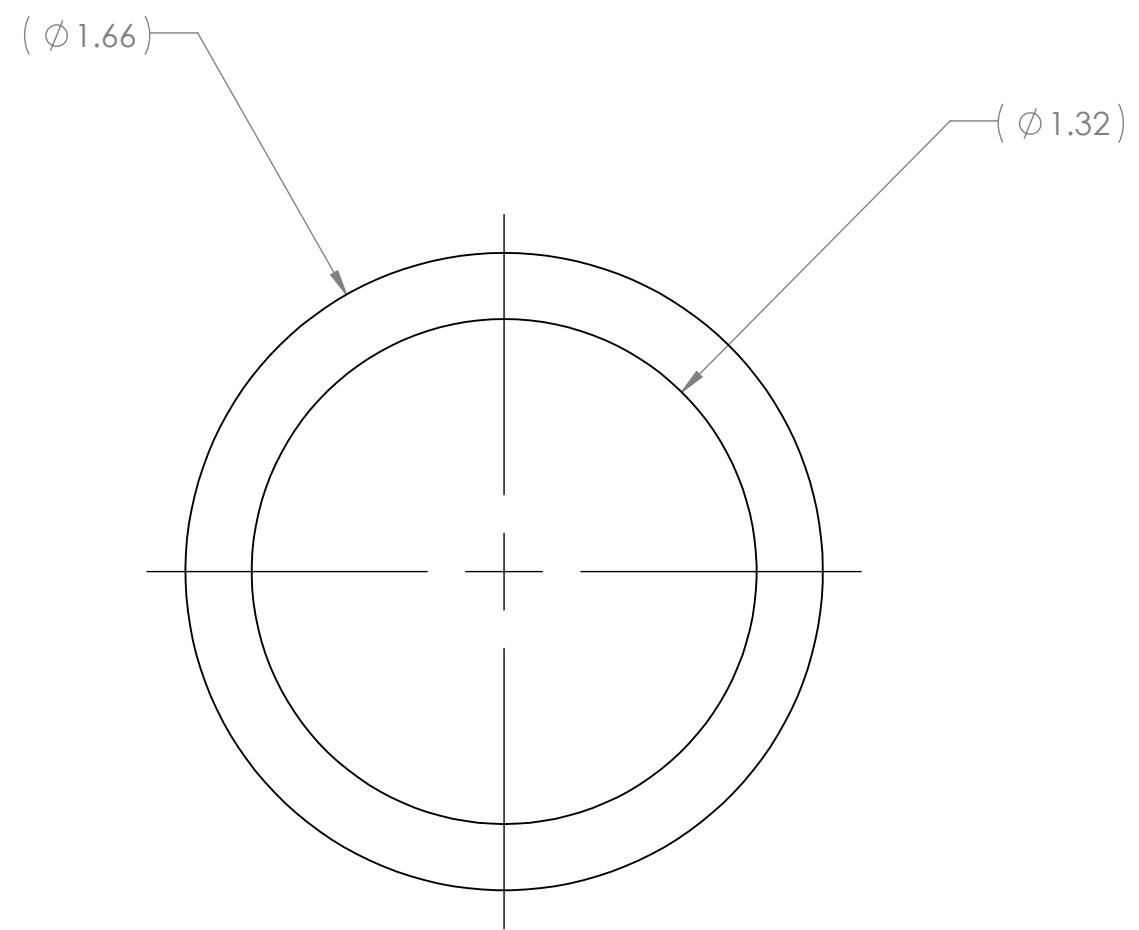
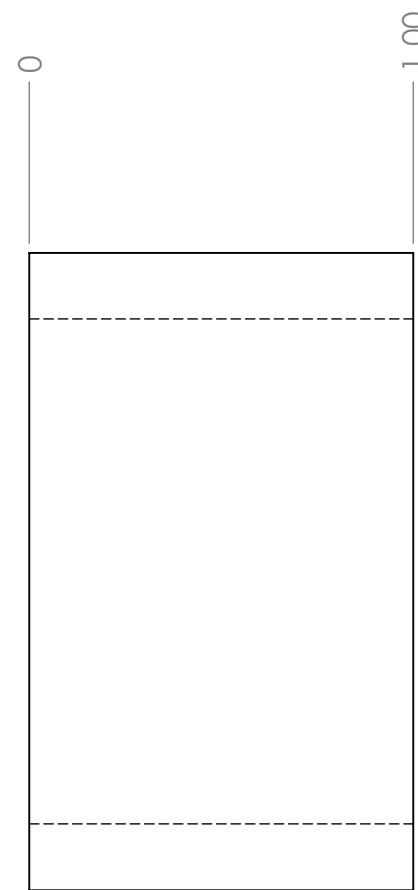
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Notes:

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

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

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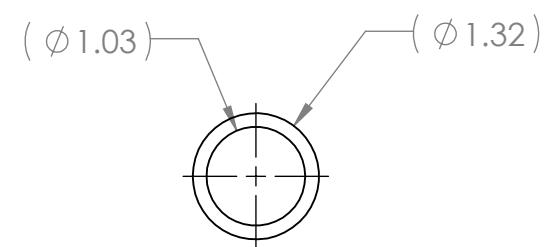
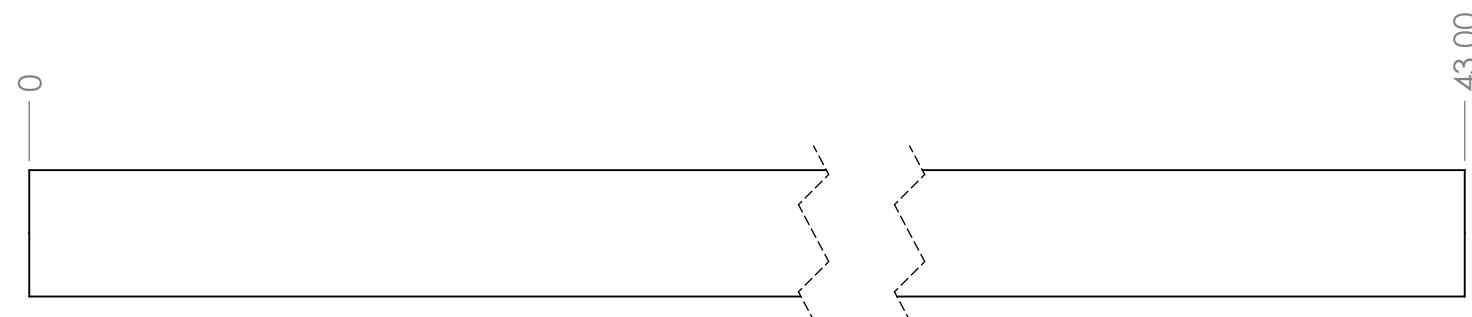
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Notes:
 1. 1.1" Schedule 40 Aluminum Pipe
 2. Remove all sharp edges and burrs

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

FIRST
ROBOTICS
COMPETITION

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

4

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1

REVISIONS

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

B

B



Notes:

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

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| | | | | |
|-------------|----------------------|--|------|------|
| | | UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL: ±1/16 ANGULAR: MACH ±1° BEND ±1° TWO PLACE DECIMAL: ±.01 THREE PLACE DECIMAL: ±.001 | NAME | DATE |
| | | DRAWN | | |
| | | CHECKED | | |
| | | ENG APPR. | | |
| | | MFG APPR. | | |
| | | Q.A. | | |
| | | COMMENTS: | | |
| | | MATERIAL | | |
| | | FINISH | | |
| NEXT ASSY | USED ON | | | |
| APPLICATION | DO NOT SCALE DRAWING | | | |
| SIZE | DWG. NO. | REV | | |
| B | GE-18041 | 1 | | |
| SCALE: 1:4 | WEIGHT: | SHEET 1 OF 1 | | |

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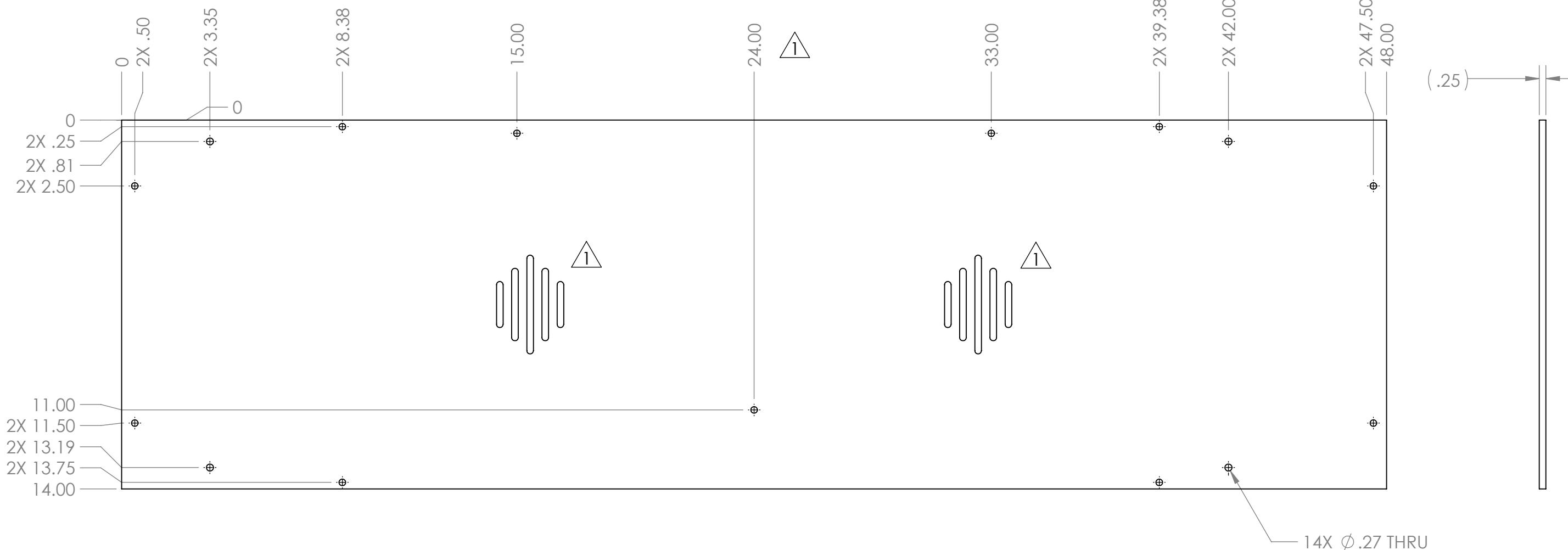
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REVISIONS

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



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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Vault HDPE Top

| | | |
|------------|-----------------|--------------|
| SIZE | DWG. NO. | REV |
| B | GE-18044 | 1 |
| SCALE: 1:4 | WEIGHT: | SHEET 1 OF 2 |

4

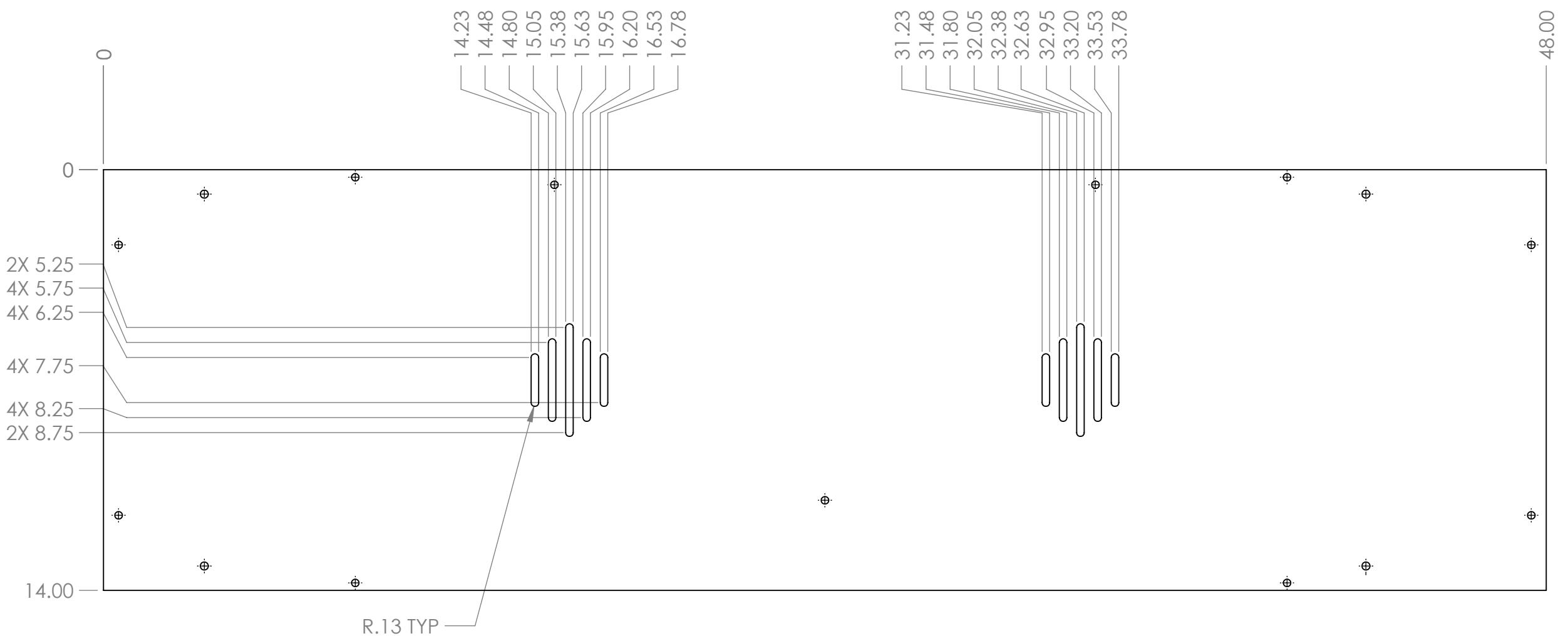
3

2

1

B

B



A

A

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| | | | | | |
|------------|-----------------|--|---------|----------------------|------|
| | | UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$ | | NAME | DATE |
| | | DRAWN | | | |
| | | CHECKED | | | |
| | | ENG APPR. | | | |
| | | MFG APPR. | | | |
| | | Q.A. | | | |
| | | COMMENTS: | | | |
| | | MATERIAL | | | |
| | | NEXT ASSY | USED ON | FINISH | |
| | | APPLICATION | | DO NOT SCALE DRAWING | |
| B | GE-18044 | 1 | | | |
| SCALE: 1:4 | WEIGHT: | SHEET 2 OF 2 | | | |

 **FIRST**
ROBOTICS
COMPETITION

 **SOLIDWORKS**
Modeling Solutions Partner

TITLE:
Vault HDPE Top

4

3

2

1

4

3

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1

B

0-

15.25

Notes:

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

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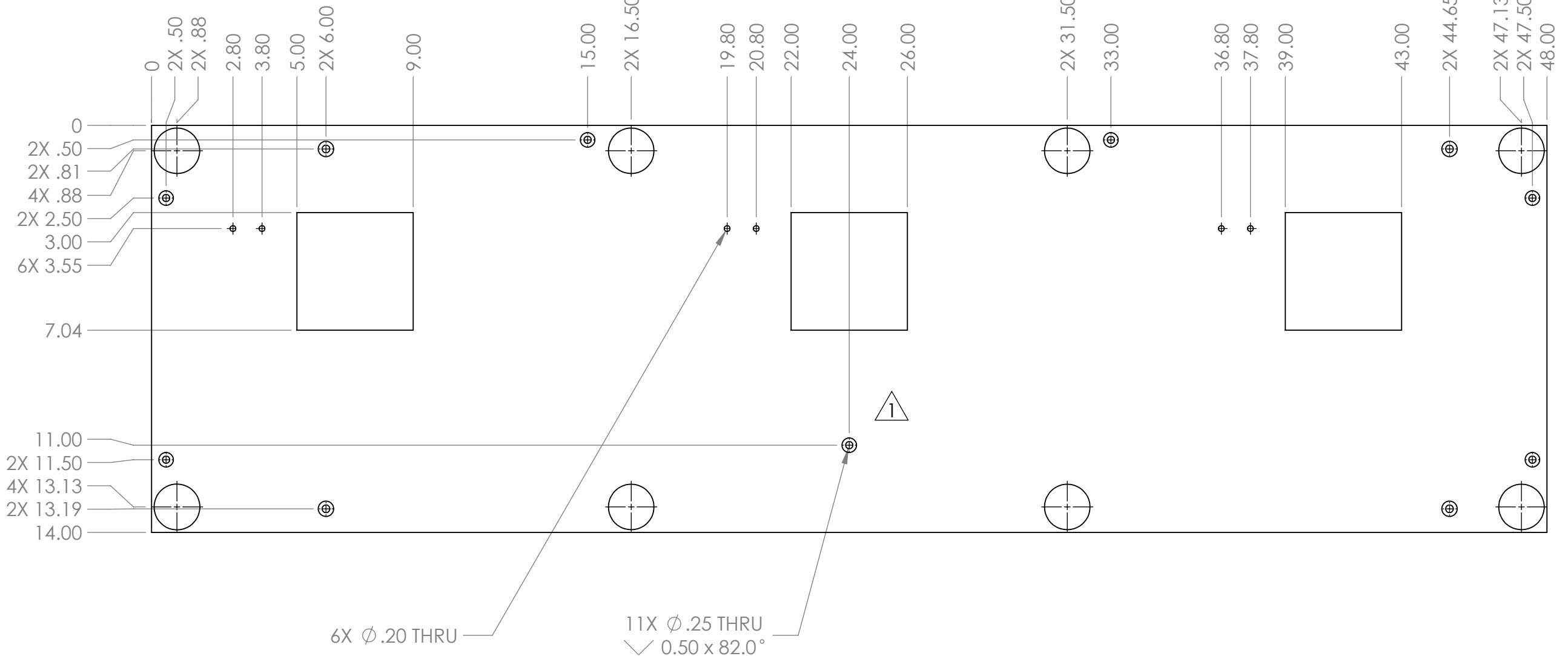
3

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B

B



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

SCALE: 1:4 WEIGHT: SHEET 1 OF 2

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Vault Polycarbonate Top Base

SIZE DWG. NO. REV
B GE-18046 1

4

3

2

1

4

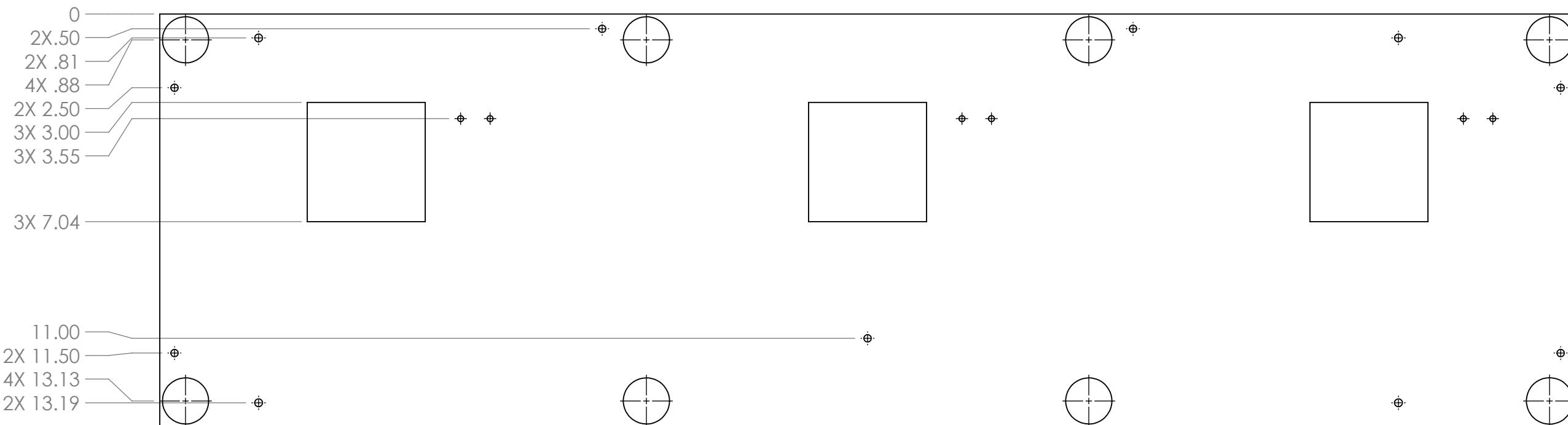
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1

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

**FIRST
ROBOTICS
COMPETITION** **SOLIDWORKS**
Modeling Solutions Partner
TITLE: **Vault
Polycarbonate Top
Base**
SIZE **B** DWG. NO. **GE-18046** REV **1**
SCALE: 1:4 WEIGHT: **1** SHEET 2 OF 2

4

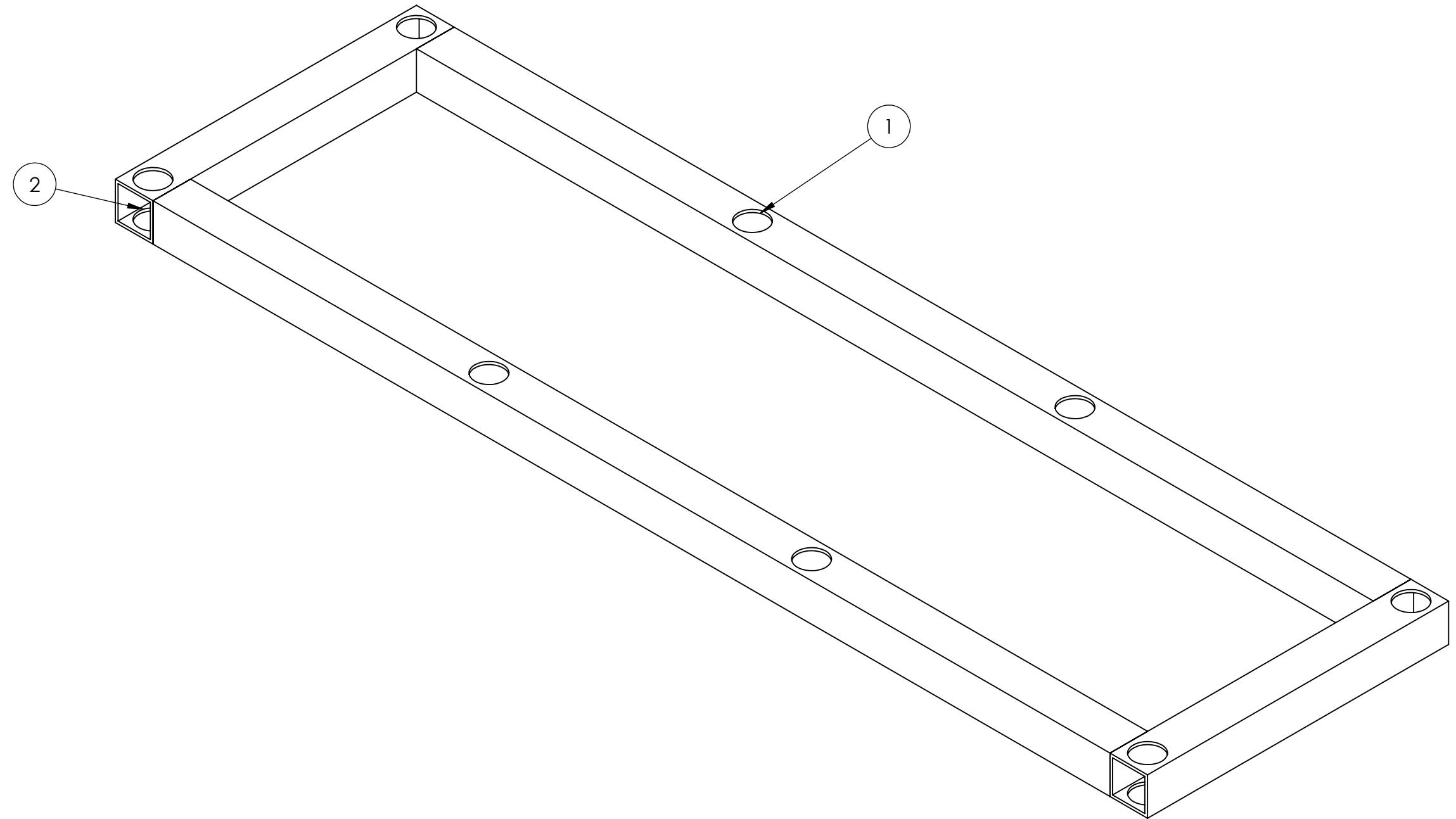
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2

1

B

B



A

A

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

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| | | | | | |
|------------|-----------------|--|----------------------|--------------|------|
| | | UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL: ±1/16 ANGULAR: MACH ±1° BEND ±1° TWO PLACE DECIMAL ±.01 THREE PLACE DECIMAL ±.001 | | NAME | DATE |
| | | DRAWN | | | |
| | | CHECKED | | | |
| | | ENG APPR. | | | |
| | | MFG APPR. | | | |
| | | Q.A. | | | |
| | | COMMENTS: | | | |
| | | MATERIAL | | | |
| | | FINISH | | | |
| | NEXT ASSY | USED ON | | | |
| | | APPLICATION | DO NOT SCALE DRAWING | | |
| SIZE | DWG. NO. | | | REV | |
| B | GE-18047 | | | | |
| SCALE: 1:4 | WEIGHT: | | | SHEET 1 OF 3 | |

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
Vault Top Frame

4

3

2

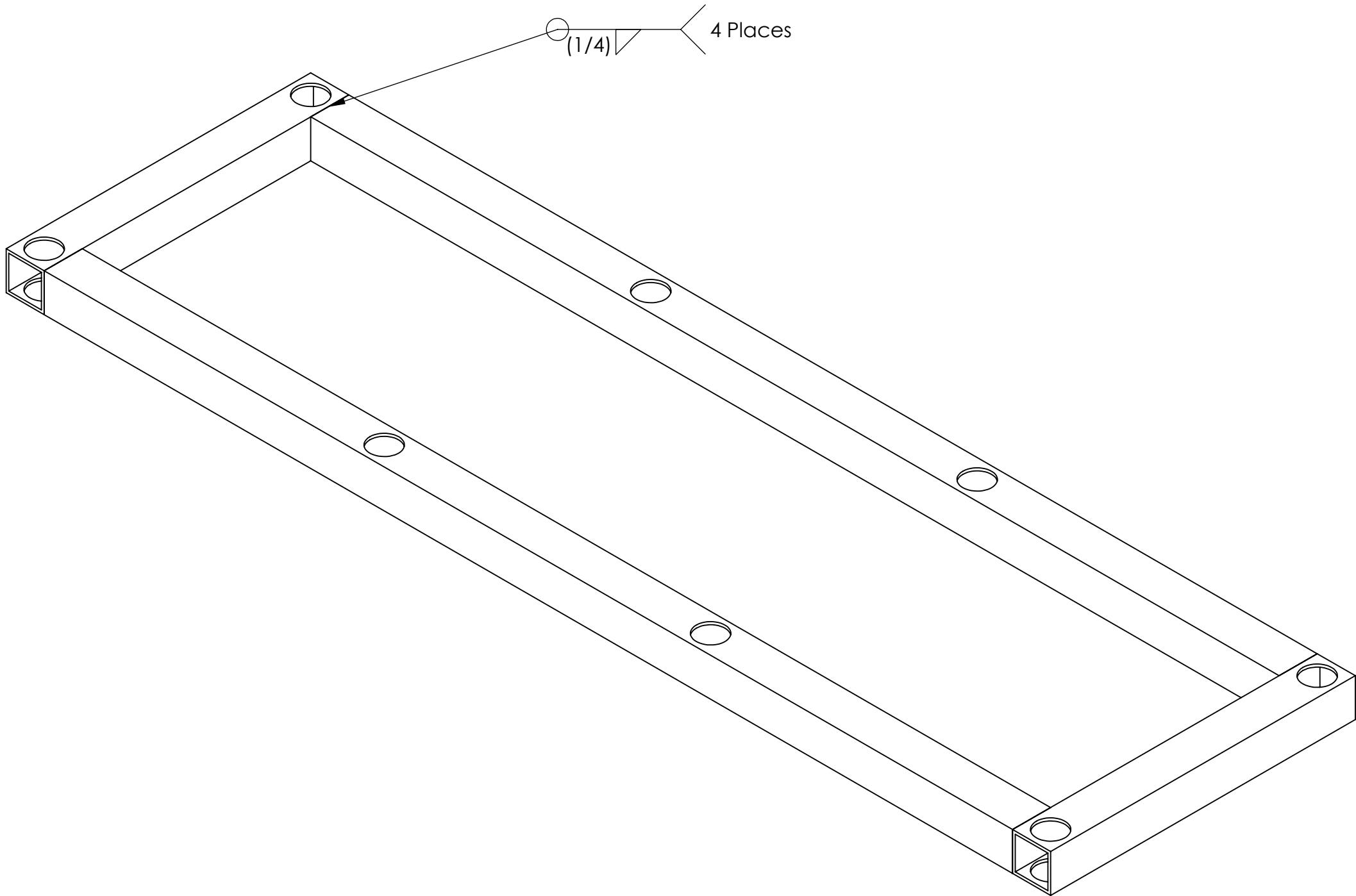
1

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1



B

B

A

A

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

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Vault Top Frame
SIZE: B **DWG. NO.:** GE-18047 **REV:**
SCALE: 1:8 **WEIGHT:** **Sheet 2 of 3**

4

3

2

1

4

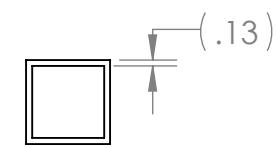
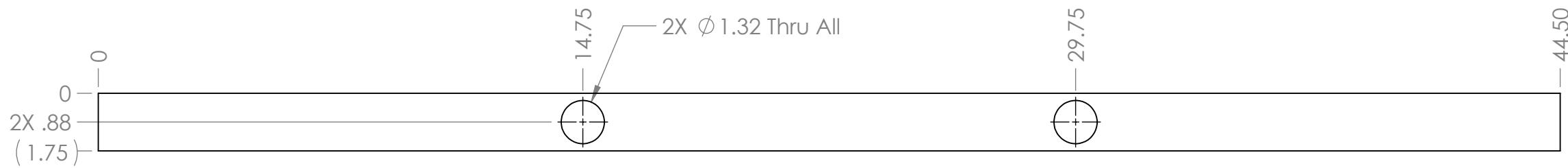
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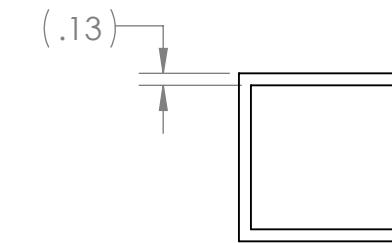
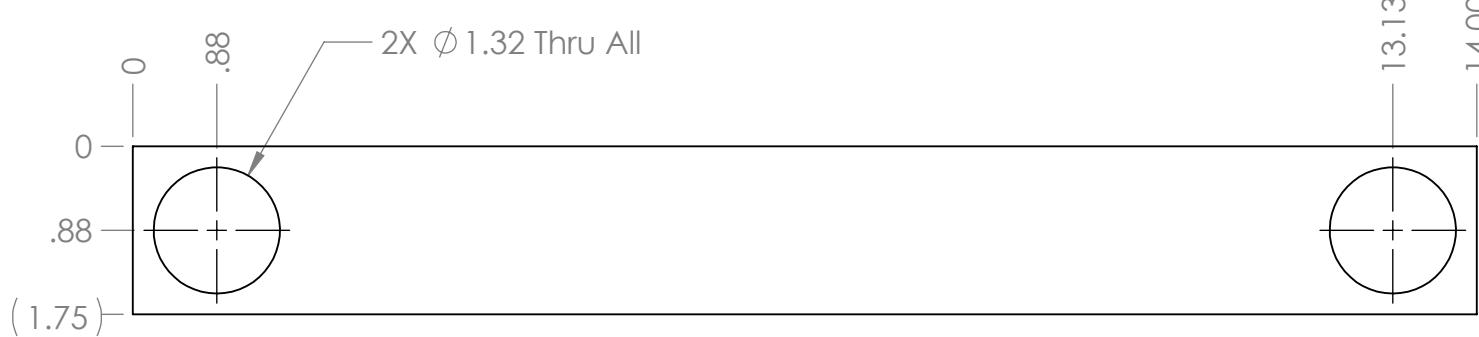
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B

B



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



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

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| | | | | |
|-------------|----------------------|--|------|------|
| | | UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$ | NAME | DATE |
| | | DRAWN | | |
| | | CHECKED | | |
| | | ENG APPR. | | |
| | | MFG APPR. | | |
| | | Q.A. | | |
| | | COMMENTS: | | |
| | | MATERIAL | | |
| | | FINISH | | |
| NEXT ASSY | USED ON | | | |
| APPLICATION | DO NOT SCALE DRAWING | | | |
| SIZE | DWG. NO. | REV | | |
| B | GE-18047 | | | |
| SCALE: 1:8 | WEIGHT: | SHEET 3 OF 3 | | |

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
 Modeling Solutions Partner

TITLE:
Vault Top Frame

4

3

2

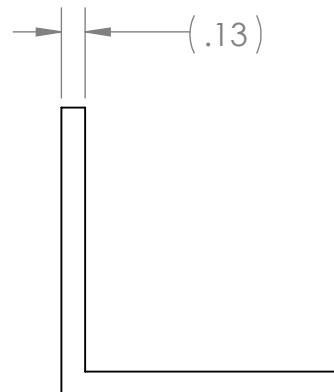
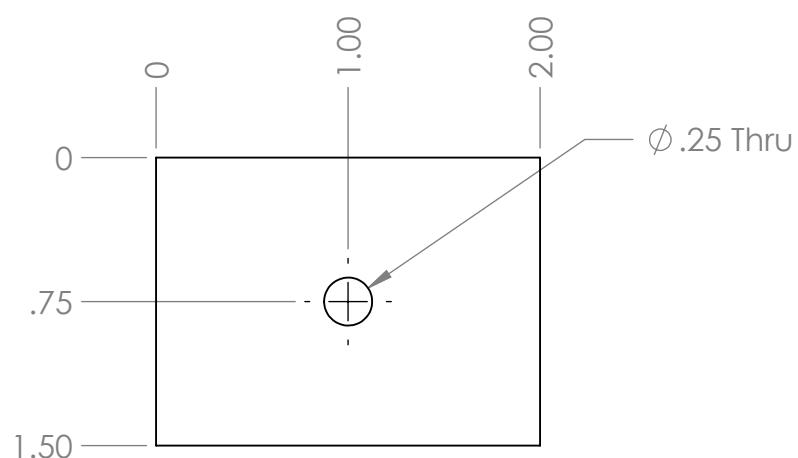
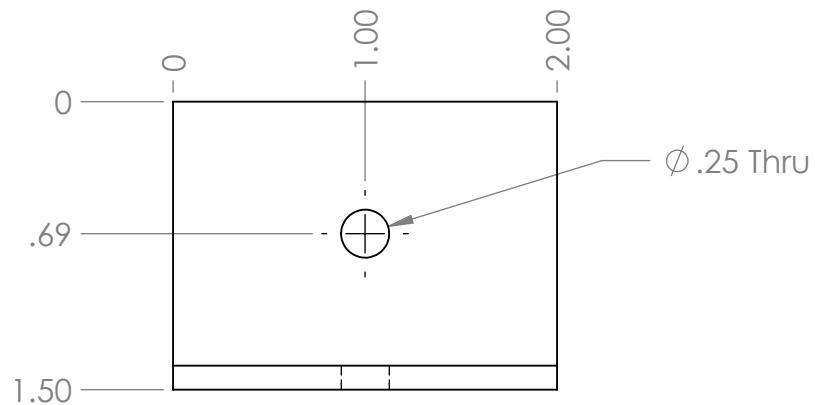
1

2

1

B

B



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

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



TITLE:

Vault Bracket

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

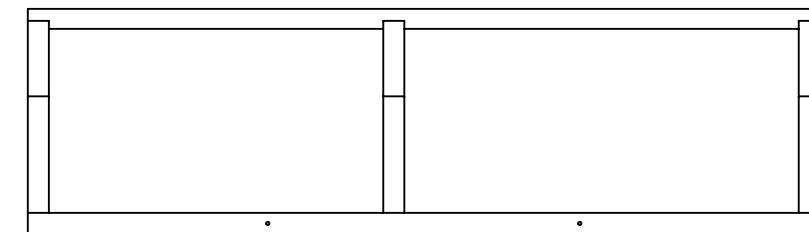
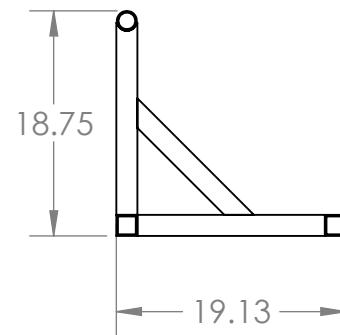
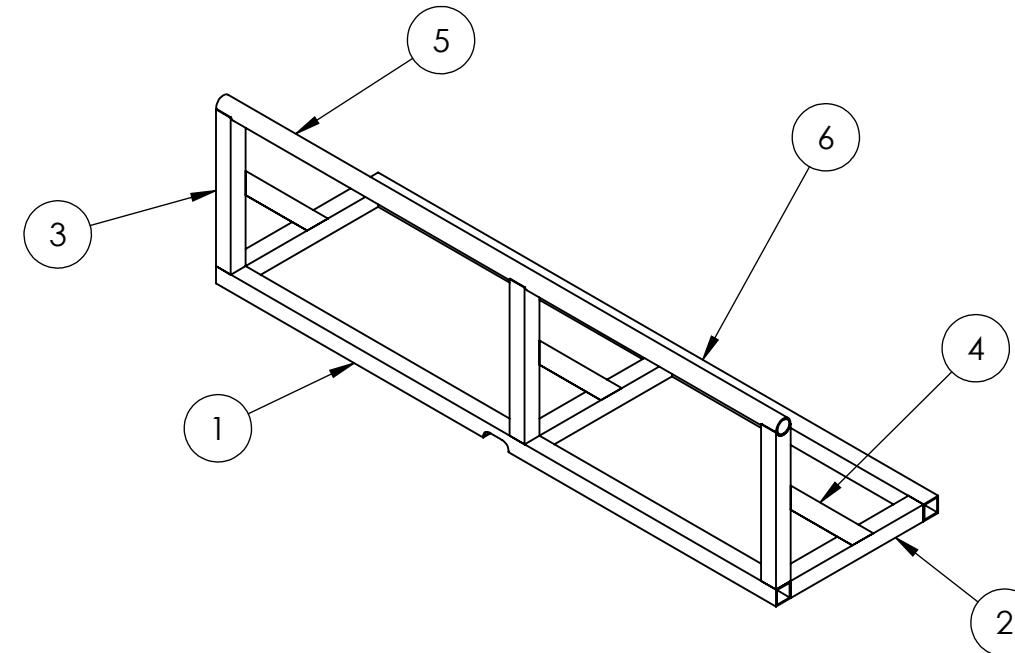
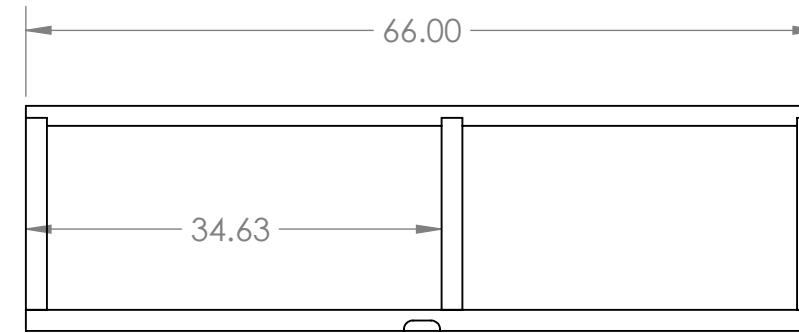
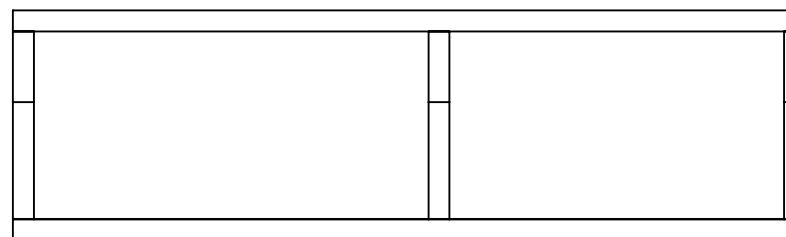
2

1

REVISIONS

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

B



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

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

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

Side Frame,
Fence

4

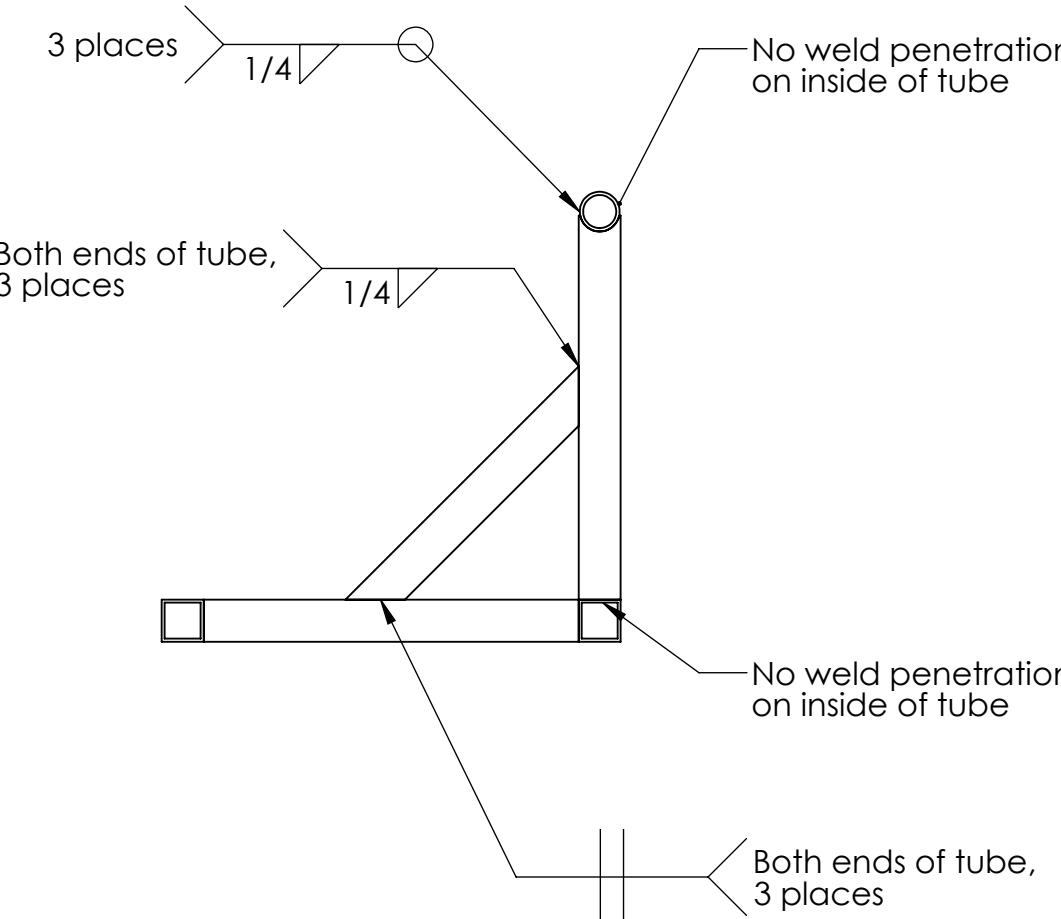
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| | | | | | |
|--|-------------|--|----------------------|-----------|------|
| | | UNLESS OTHERWISE SPECIFIED: | | NAME | DATE |
| | | DIMENSIONS ARE IN INCHES | | DRAWN | |
| | | TOLERANCES: | | CHECKED | |
| | | FRACTIONAL: $\pm 1/16$ | | ENG APPR.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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Title: Side Frame, Fence

Size: B **Dwg. No.:** GE-18051 **Rev.:** 1

Scale: 1:8 **Weight:** **Sheet 2 of 3**

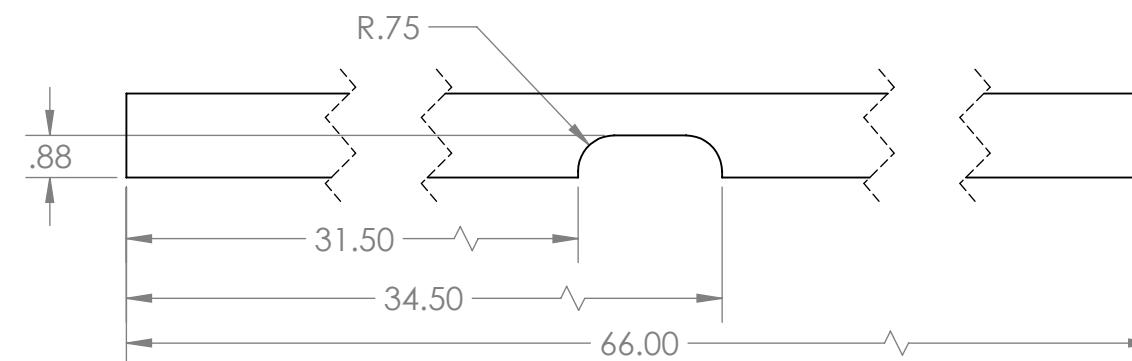
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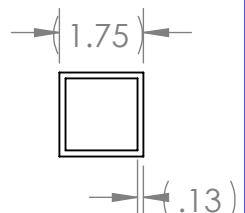
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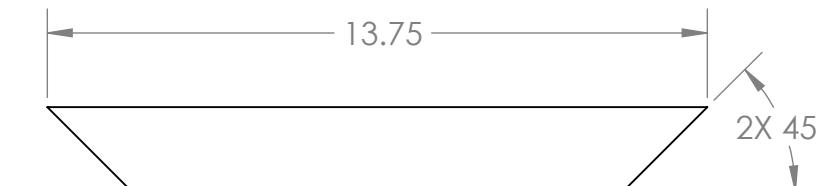


Item: GE-18051-01
Qty: 1
Material: 1.75" x .125" thk. Square Tube, 6061 Aluminum

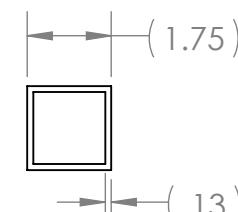
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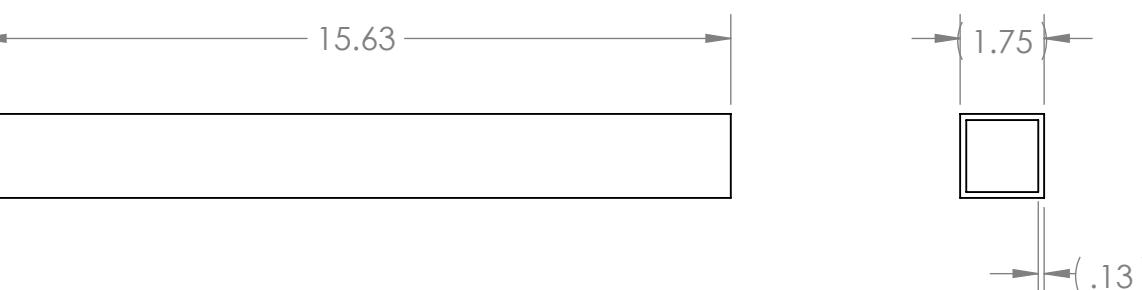
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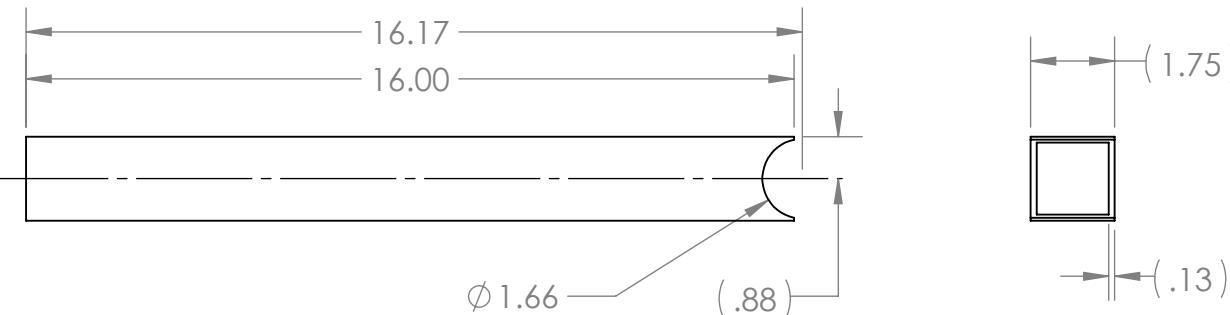
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B



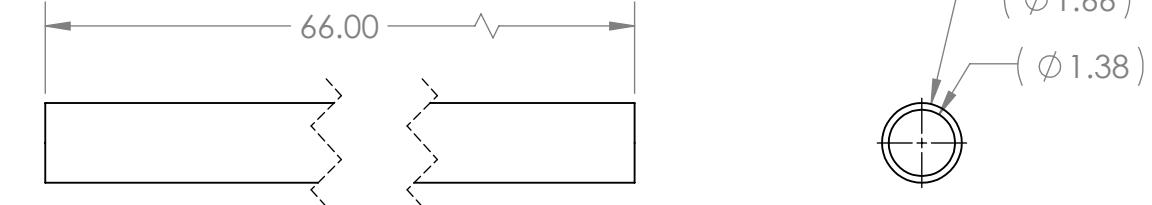
Item: GE-18051-02
Qty: 3
Material: 1.75" x .125" thk. Square Tube, 6061 Aluminum



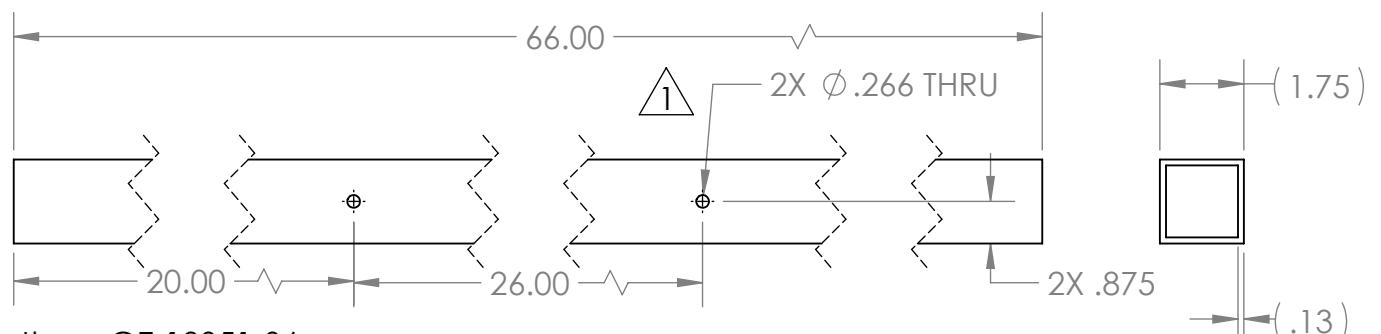
Item: GE-18051-03
Qty: 3
Material: 1.75" x .125" thk. Square Tube, 6061 Aluminum

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



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



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

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Side Frame, Fence

| | | |
|------------|-----------------|--------------|
| SIZE | DWG. NO. | REV |
| B | GE-18051 | 1 |
| SCALE: 1:4 | WEIGHT: | SHEET 3 OF 3 |

4

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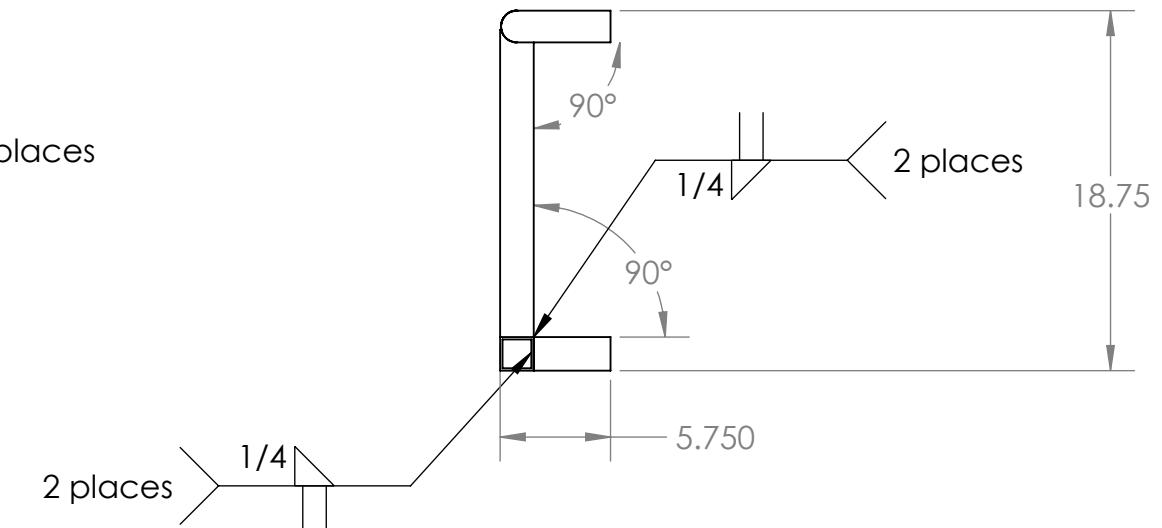
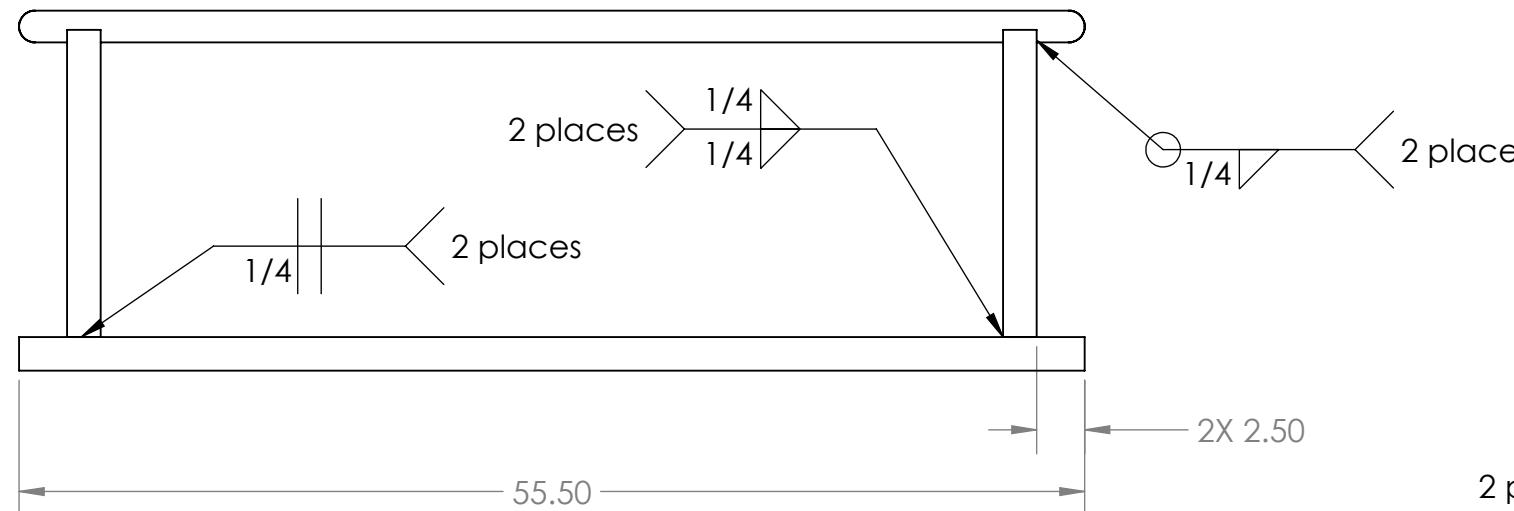
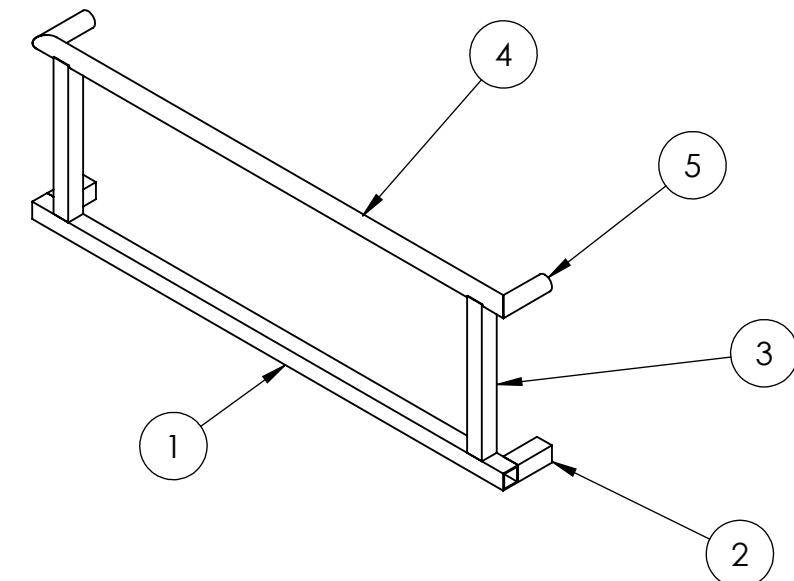
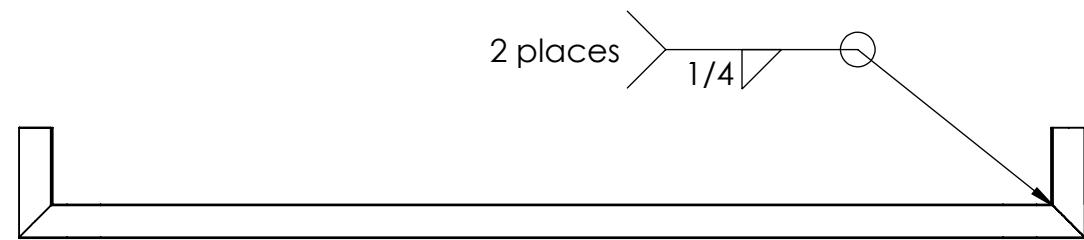
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1



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

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

End Frame, Fence

B **GE-18052** **REV**

SCALE: 1:10 WEIGHT: **SHEET 1 OF 2**

4

3

2

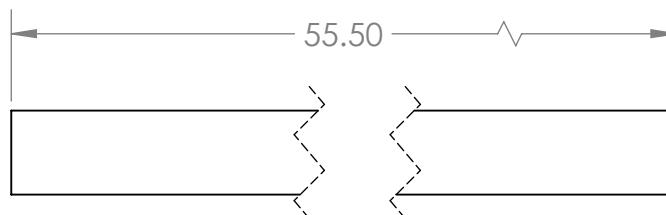
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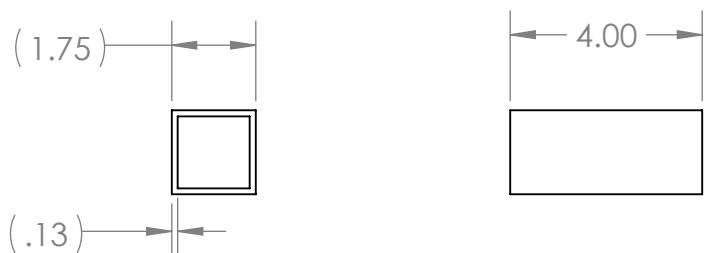
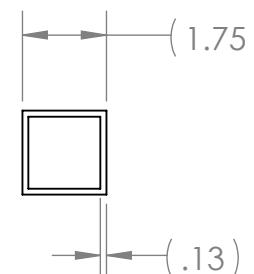
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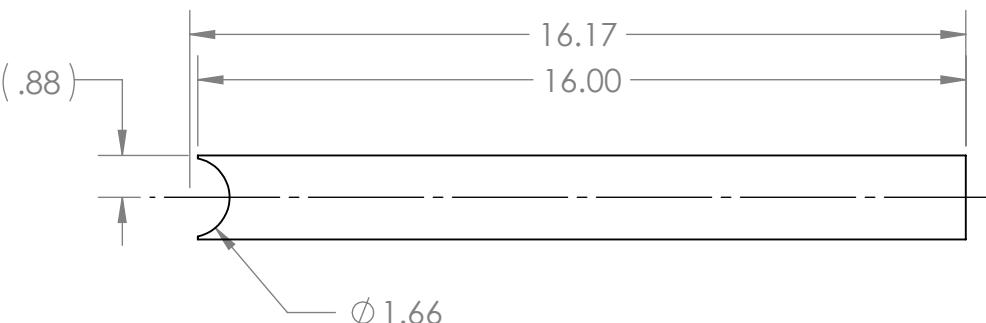
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Item: GE-18052-01
Qty: 1
Material: 1.75" x .125" thk. Square Tube, 6061 Aluminum

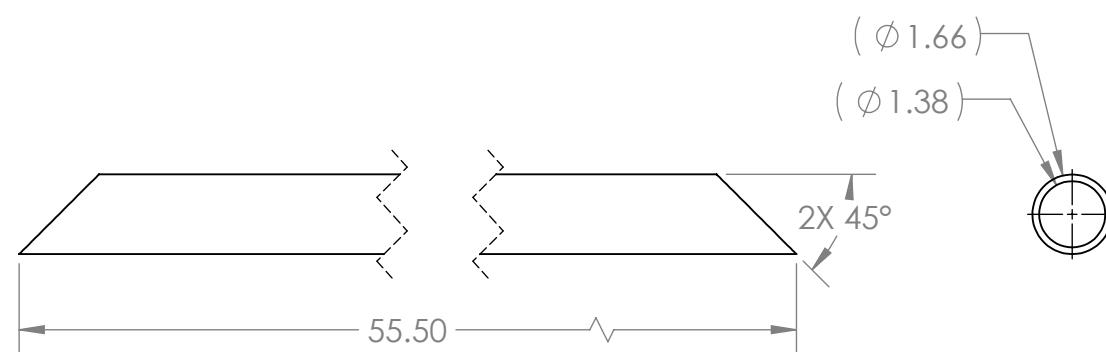


Item: GE-18052-02
Qty: 2
Material: 1.75" x .125" thk. Square Tube, 6061 Aluminum

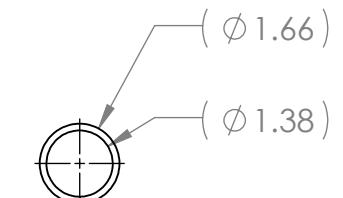
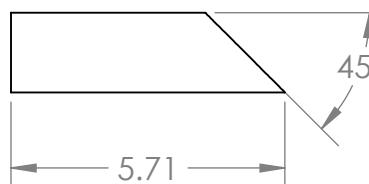


Item: GE-18052-03
Qty: 2
Material: 1.75" x .125" thk. Square Tube, 6061 Aluminum

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



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

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

End Frame, Fence

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

4

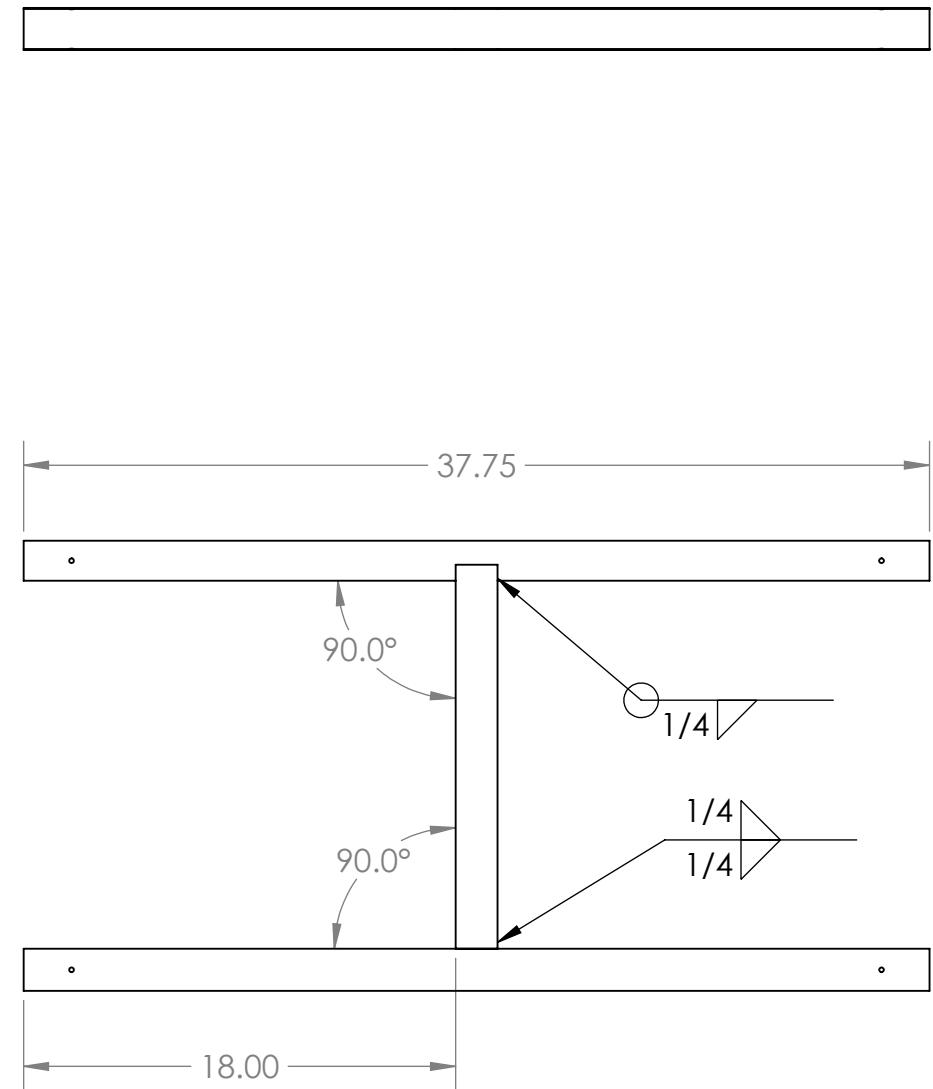
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| ITEM NO. | PART NUMBER | DESCRIPTION | QTY. |
|----------|-------------|---|------|
| 1 | GE-18053-01 | 1.75" x .125" thk. Square Tube, 6061 Aluminum | 1 |
| 2 | GE-18053-02 | 1.75" x .125" thk. Square Tube, 6061 Aluminum | 1 |
| 3 | GE-18053-03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

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Connecting Frame, Fence

SIZE DWG. NO. REV
B GE-18053

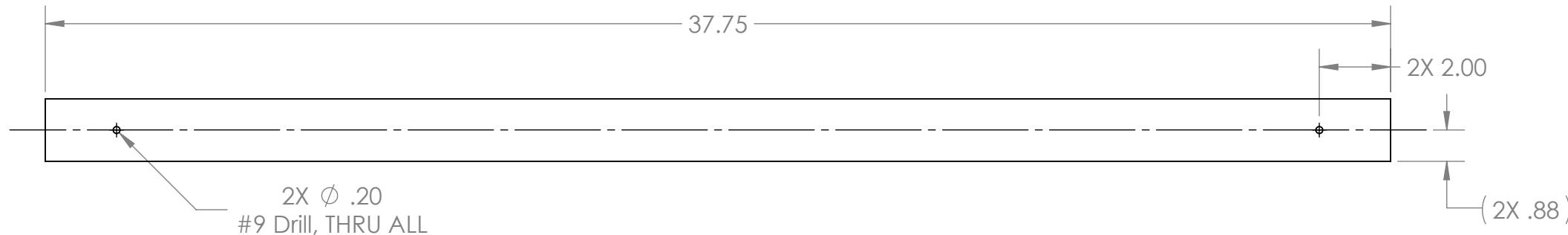
SCALE: 1:8 WEIGHT: SHEET 1 OF 2

4

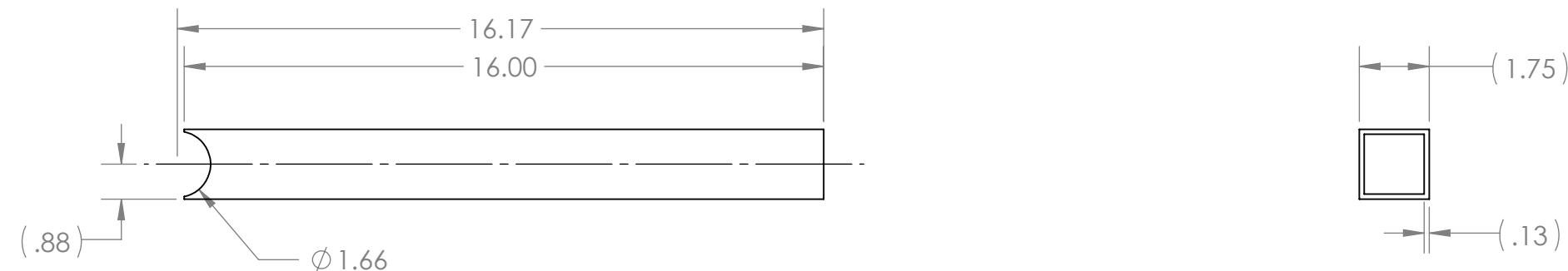
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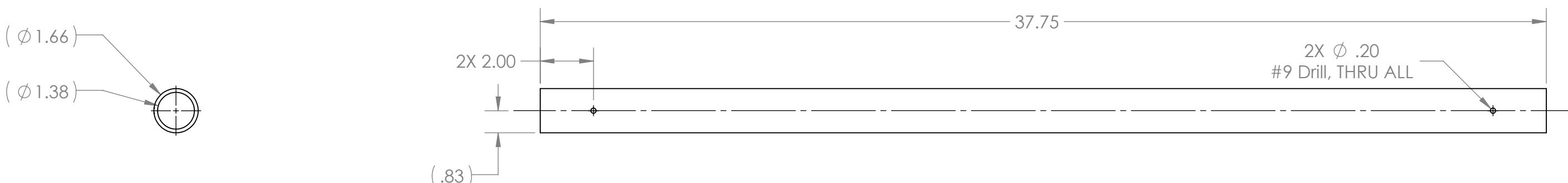
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B
Item: GE-18053-01
Qty: 1
Material: 1.75" x .125" thk. Square Tube, 6061 Aluminum



Item: GE-18053-02
Qty: 1
Material: 1.75" x .125" thk. Square Tube, 6061 Aluminum



A
Item: GE-18053-03
Qty: 1
Material: 1-1/4" Schedule 40 Pipe, 6061 Aluminum

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Connecting Frame, Fence

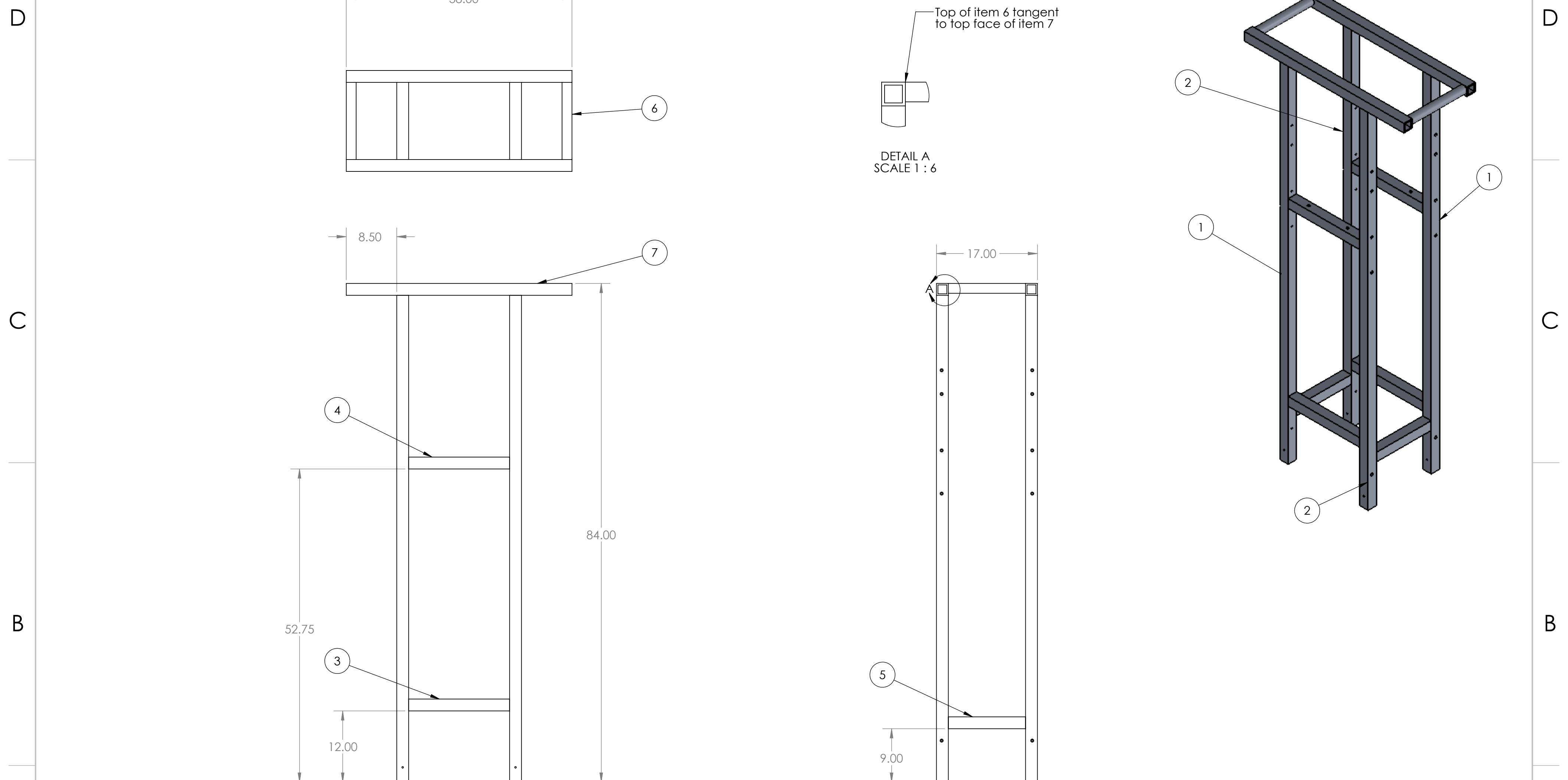
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|------------|-----------------|--------------|
| SIZE | DWG. NO. | REV |
| B | GE-18053 | |
| SCALE: 1:4 | WEIGHT: | SHEET 2 OF 2 |

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|---------------------|-----------------|-----------------------------|------|--------------|
| | | DRAWN | | |
| | | CHECKED | | |
| | | ENG APPR. | | |
| | | MFG APPR. | | |
| | | Q.A. | | |
| | | COMMENTS: | | |
| SIZE | DWG. NO. | | REV | |
| C | GE-18054 | | | |
| SCALE: 1:12 WEIGHT: | | | | SHEET 1 OF 6 |

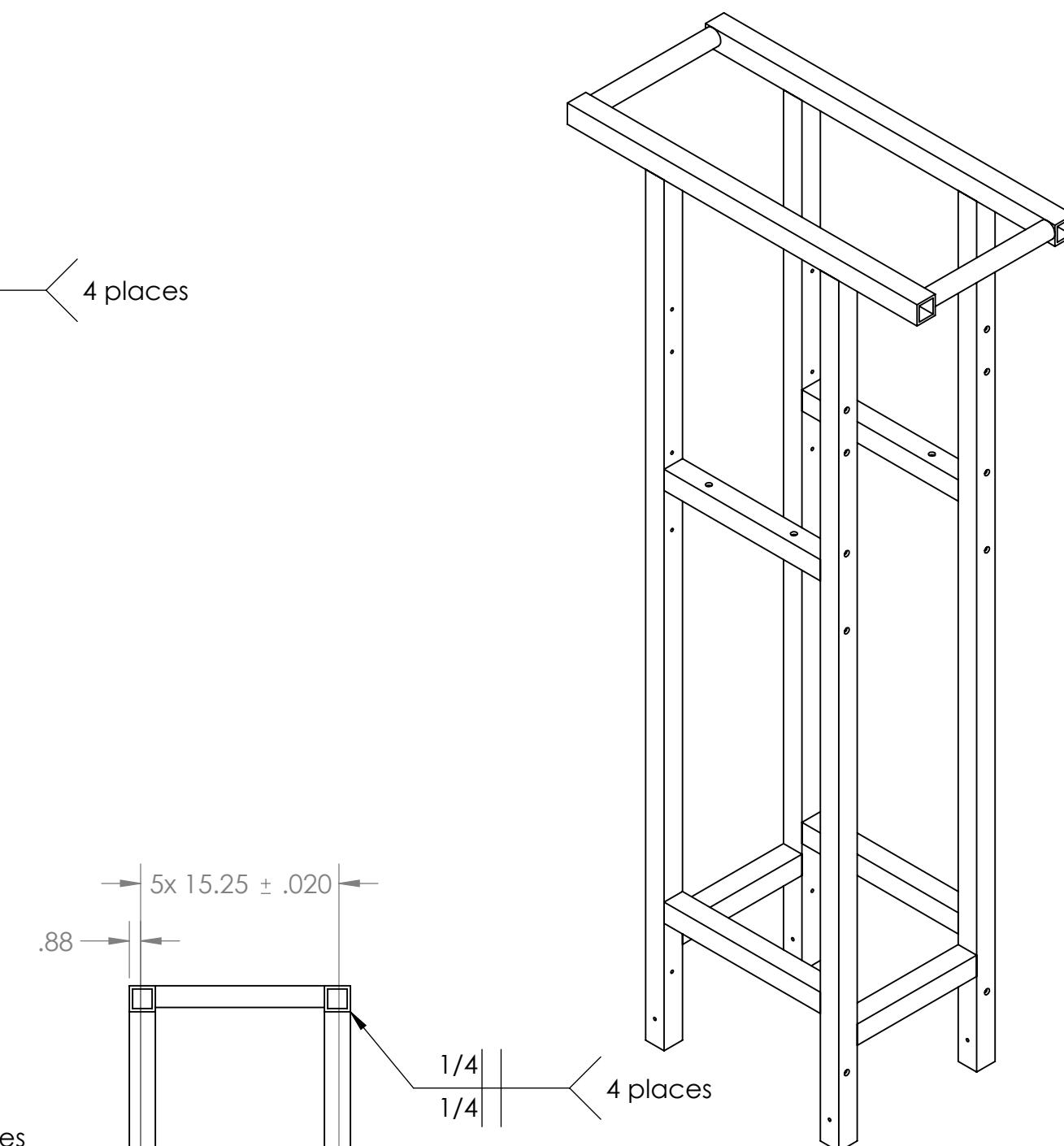
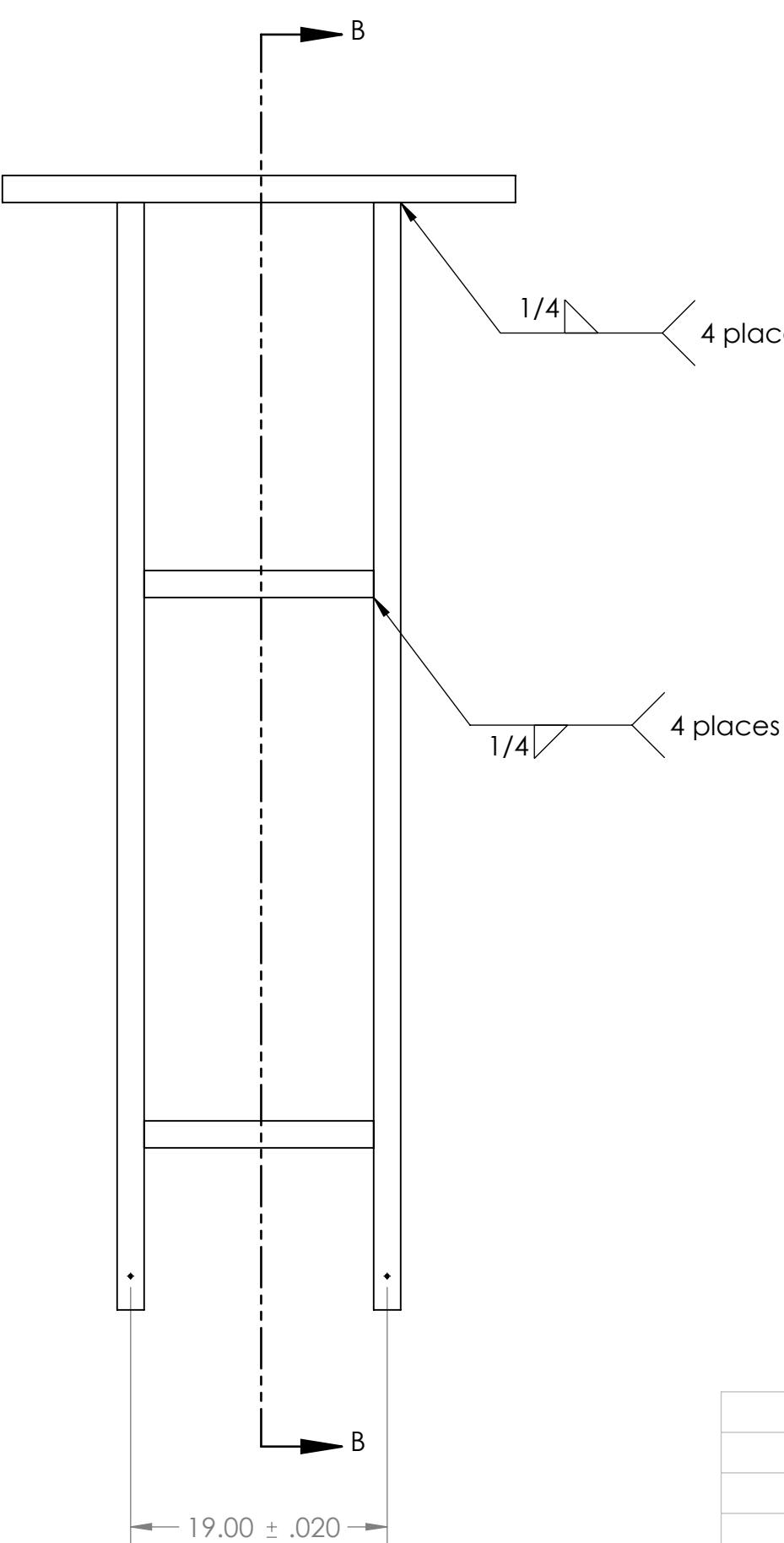
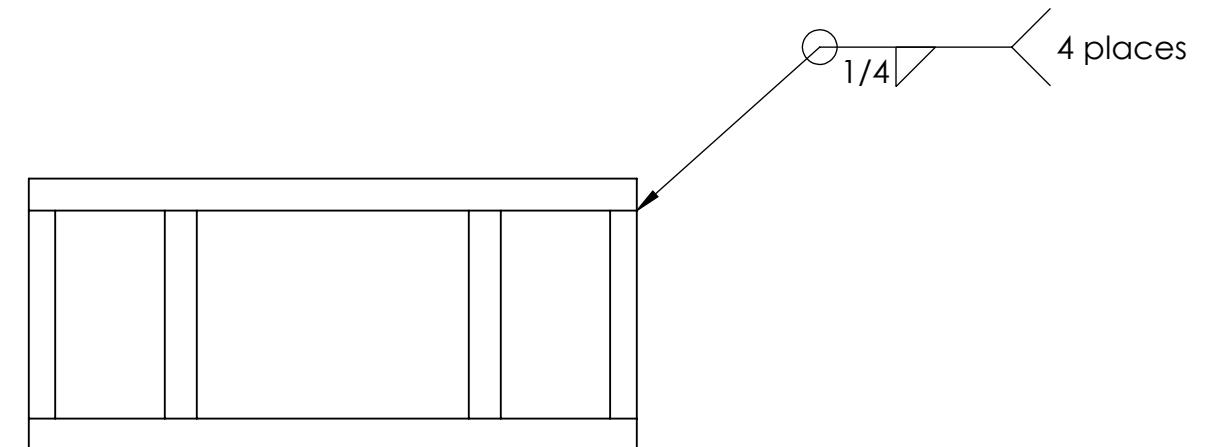
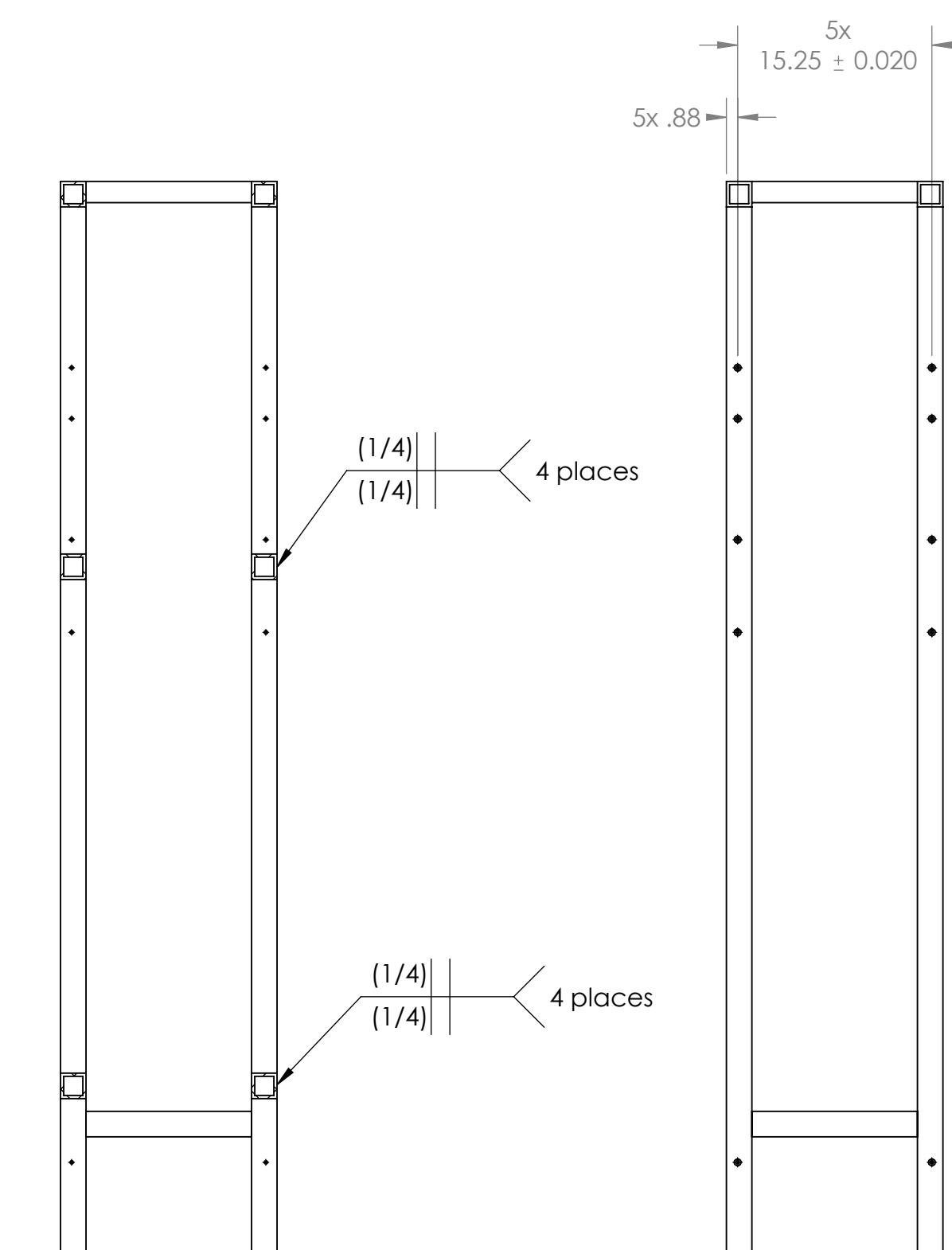
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| | | UNLESS OTHERWISE SPECIFIED: | | DRAWN | NAME | DATE | | | |
|---|--|--|--|----------------------|------|------|--|--|--|
| | | DIMENSIONS ARE IN INCHES | | | | | | | |
| | | TOLERANCES | | | | | | | |
| | | FRACTIONAL: $\pm 1/16$ | | | | | | | |
| | | ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ | | | | | | | |
| | | TWO PLACE DECIMAL $\pm .01$ | | | | | | | |
| | | THREE PLACE DECIMAL $\pm .001$ | | | | | | | |
| PROPRIETARY AND CONFIDENTIAL | | INTERPRET GEOMETRIC | | | | | | | |
| THE INFORMATION CONTAINED IN THIS | | TOLERANCING PER: | | | | | | | |
| DRAWING IS THE SOLE PROPERTY OF | | MATERIAL | | | | | | | |
| FIRST [®] . | | NEXT ASSY | | | | | | | |
| ANY REPRODUCTION IN PART | | USED ON | | | | | | | |
| OR AS A WHOLE WITHOUT THE WRITTEN | | FINISH | | | | | | | |
| PERMISSION OF FIRST [®] IS PROHIBITED. | | APPLICATION | | DO NOT SCALE DRAWING | | | | | |
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FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
Scale Frame

SIZE DWG. NO. REV
C GE-18054

SCALE: 1:12 WEIGHT: SHEET 2 OF 6

4

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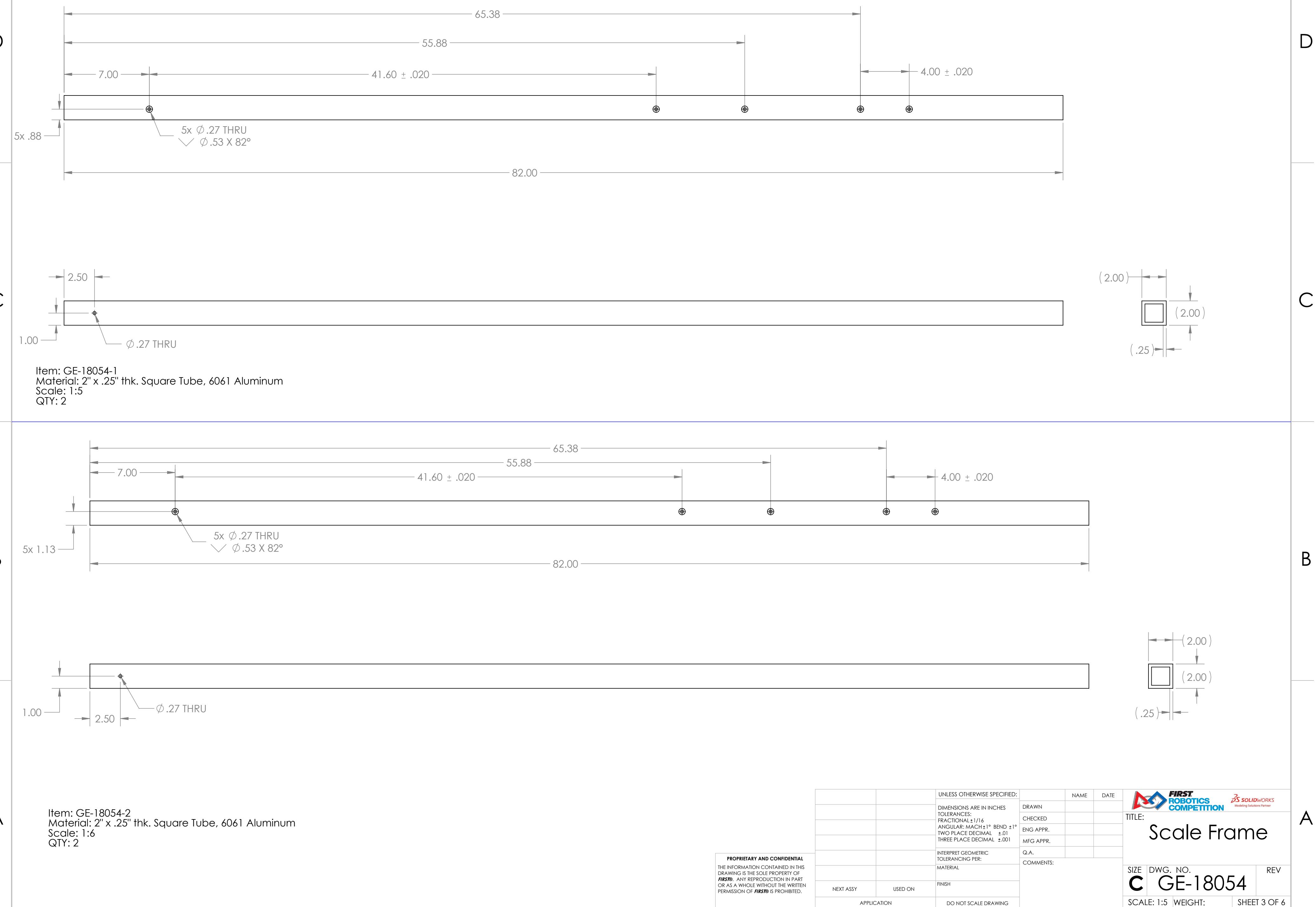
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Item: GE-18054-2
Material: 2" x .25" thk. Square Tube, 6061 Aluminum
Scale: 1:6
QTY: 2

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|-------------|----------|---|------------|---------|--------------|--|
| | | UNLESS OTHERWISE SPECIFIED: | | NAME | DATE |  FIRST ROBOTICS COMPETITION  SOLIDWORKS Modeling Solutions Partner |
| | | DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$ | DRAWN | | | |
| | | | CHECKED | | | |
| | | | ENG APPR. | | | |
| | | | MFG APPR. | | | |
| | | INTERPRET GEOMETRIC TOLERANCING PER: | Q.A. | | | |
| | | MATERIAL | COMMENTS: | | | |
| NEXT ASSY | USED ON | FINISH | | | | |
| APPLICATION | | DO NOT SCALE DRAWING | SCALE: 1:5 | WEIGHT: | SHEET 3 OF 6 | |
| SIZE | DWG. NO. | | | REV | GE-18054 | |

4

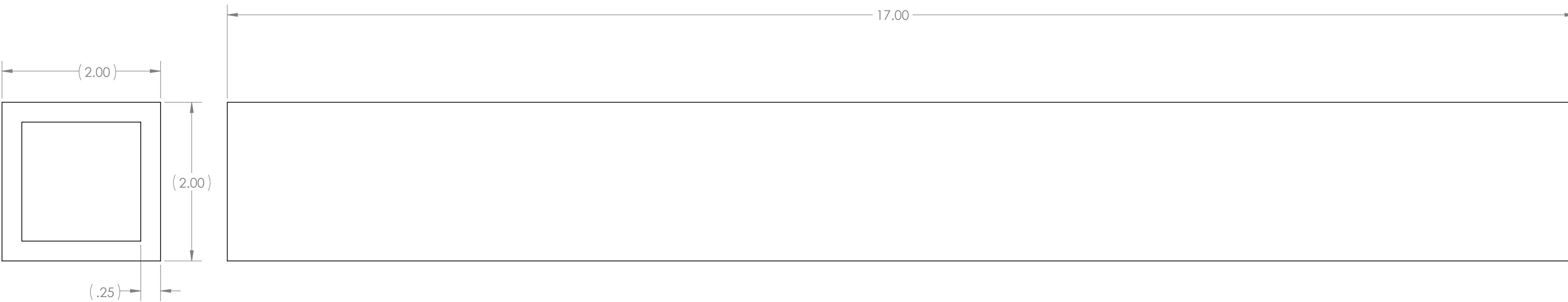
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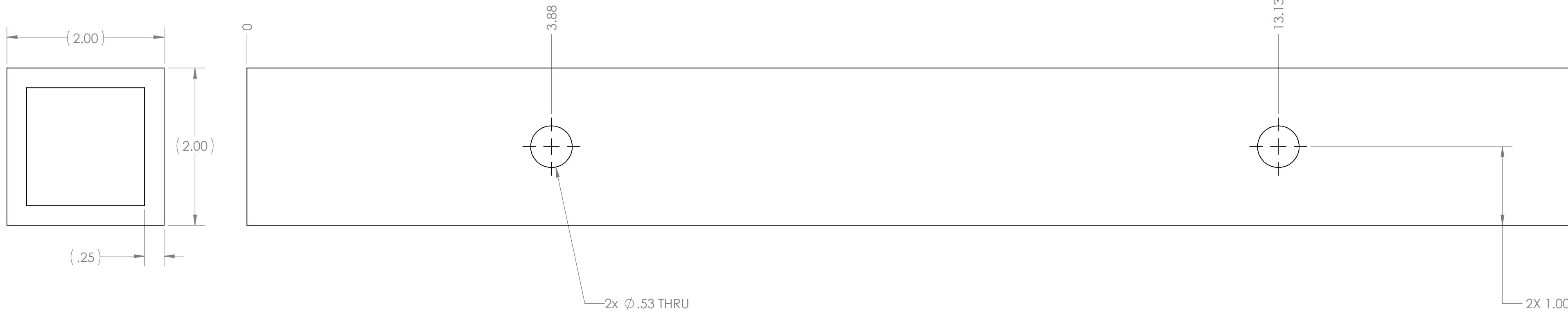
D



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

C

C



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

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

FIRST[®] ROBOTICS COMPETITION SOLIDWORKS Modeling Solutions Partner

Scale Frame

| | | |
|-----------------|-----------------|--------------|
| C | DWG. NO. | REV |
| GE-18054 | | |
| SCALE: 1:1 | WEIGHT: | SHEET 4 OF 6 |

4

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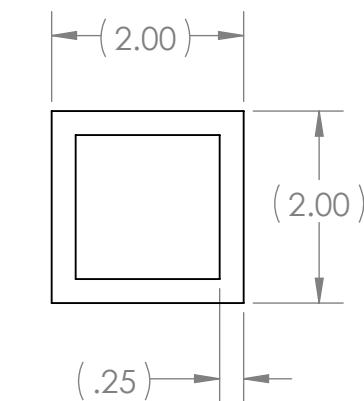
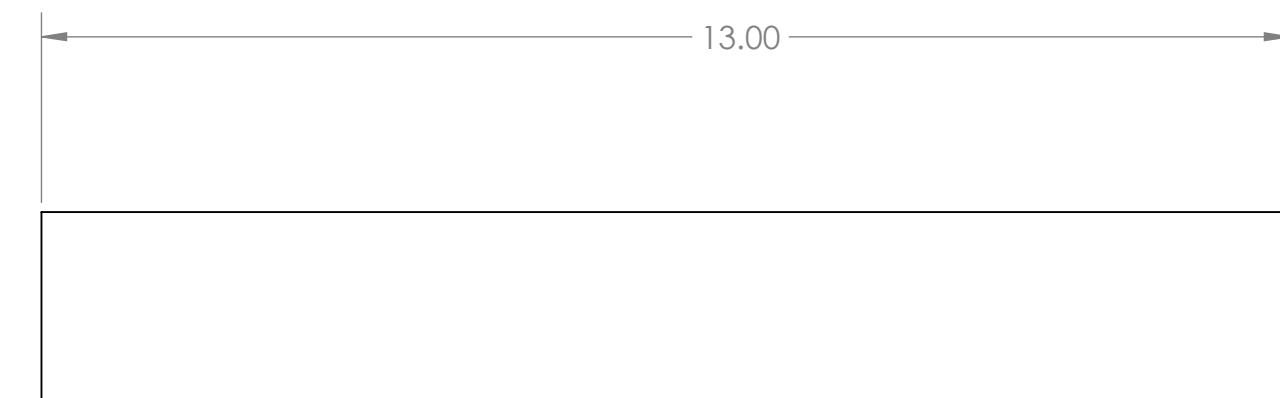
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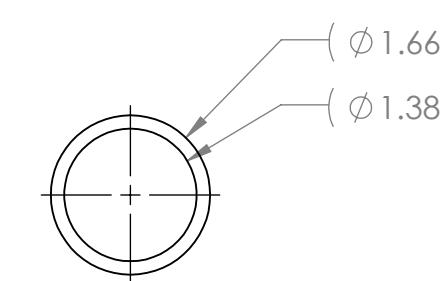
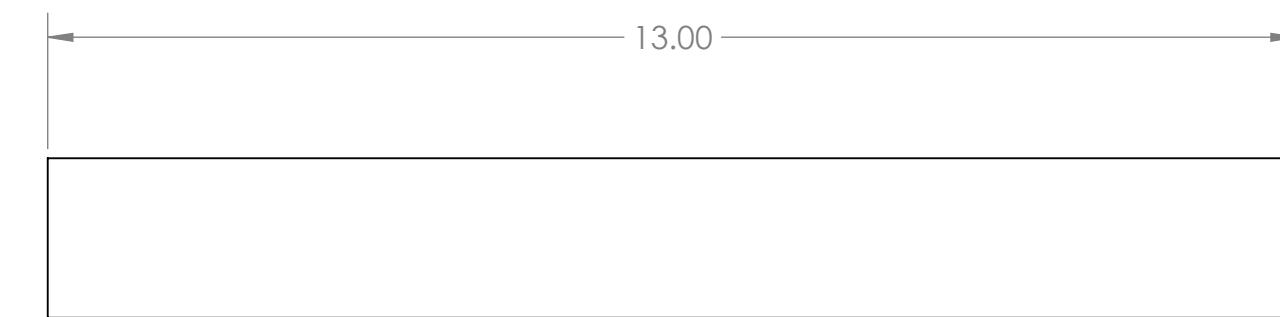
C

C

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

B

B



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

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

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

Title: Scale Frame

Size: DWG. NO. **C** **GE-18054** **Rev:**

SCALE: 1:2 WEIGHT: SHEET 5 OF 6

4

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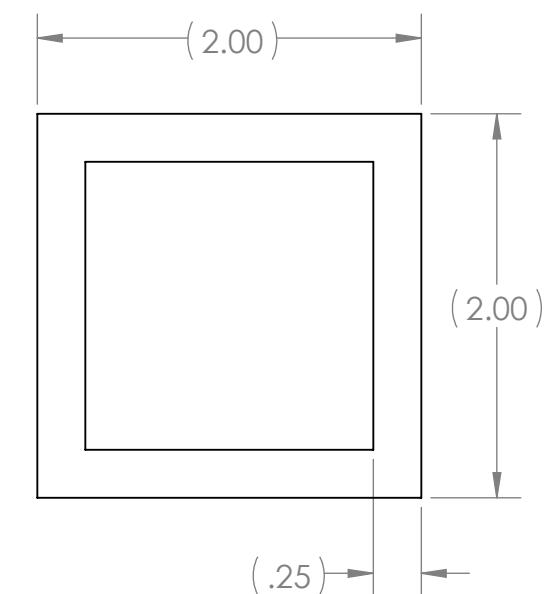
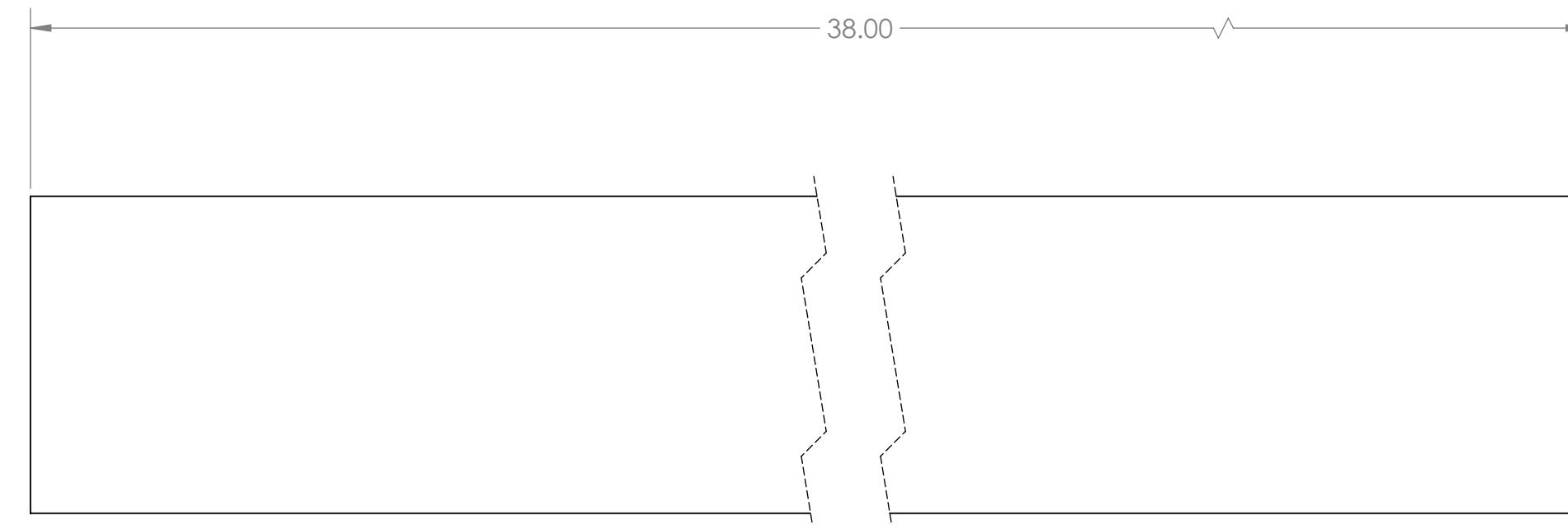
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D

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

C

C

B

B

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

FIRST[®] ROBOTICS COMPETITION SOLIDWORKS Modeling Solutions Partner
Scale Frame
 SIZE DWG. NO. REV
C GE-18054
 SCALE: 1:1 WEIGHT: SHEET 6 OF 6

4

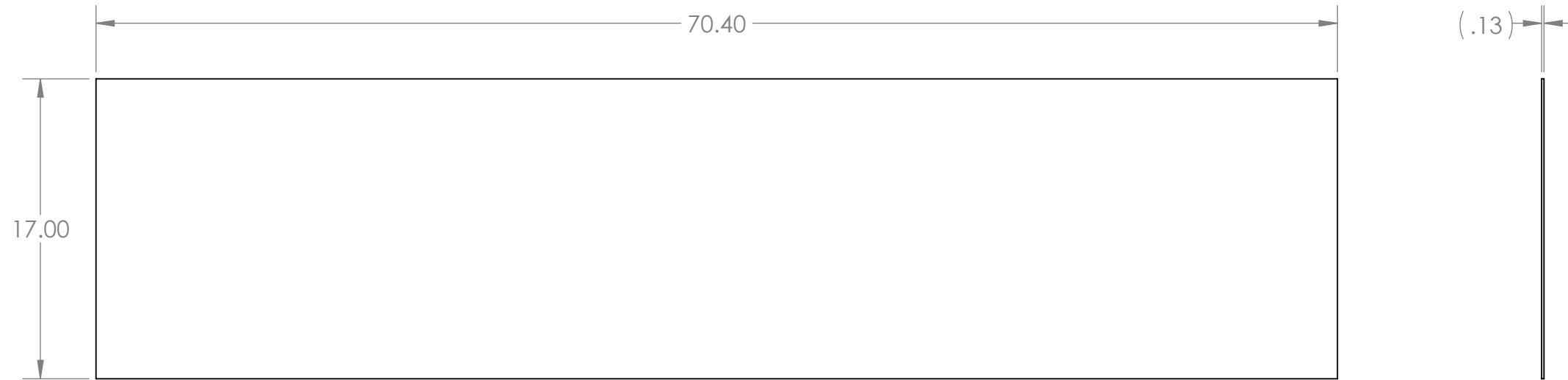
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B

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**Notes:**

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

A

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| | | DRAWN | | | |
| | | CHECKED | | | |
| | | ENG APPR. | | | |
| | | MFG APPR. | | | |
| | | Q.A. | | | |
| | | COMMENTS: | | | |
| | | MATERIAL | | | |
| | | INTERPRET GEOMETRIC TOLERANCING PER: | | | |
| | | NEXT ASSY | USED ON | FINISH | |
| | | APPLICATION | | DO NOT SCALE DRAWING | |
| B | GE-18055 | | | | |
| SCALE: 1:8 | WEIGHT: | SHEET 1 OF 1 | | | |

4

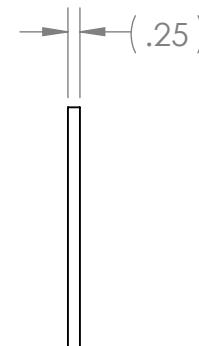
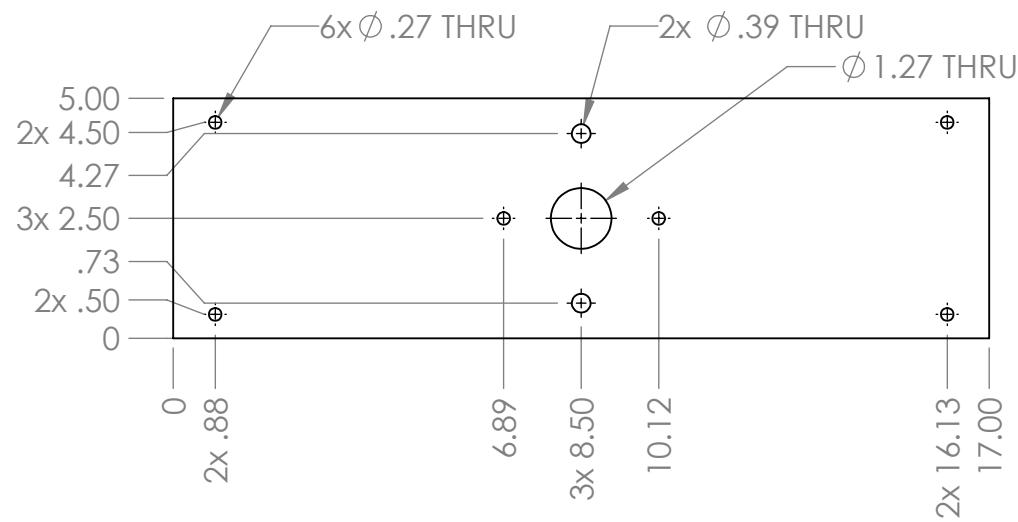
3

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Notes:

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

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

| | |
|------|-----------|
| Q.A. | COMMENTS: |
|------|-----------|

| SIZE | DWG. NO. | REV |
|------------|----------|--------------|
| A | GE-18056 | |
| SCALE: 1:4 | WEIGHT: | SHEET 1 OF 1 |

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

TITLE:
**Bearing Damper
Polycarbonate**

4

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1

**Notes:**

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

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Title: Scale Side HDPE

| | | |
|-------------|-----------------|--------------|
| SIZE | DWG. NO. | REV |
| B | GE-18057 | |
| SCALE: 1:3 | WEIGHT: | SHEET 1 OF 1 |

4

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2

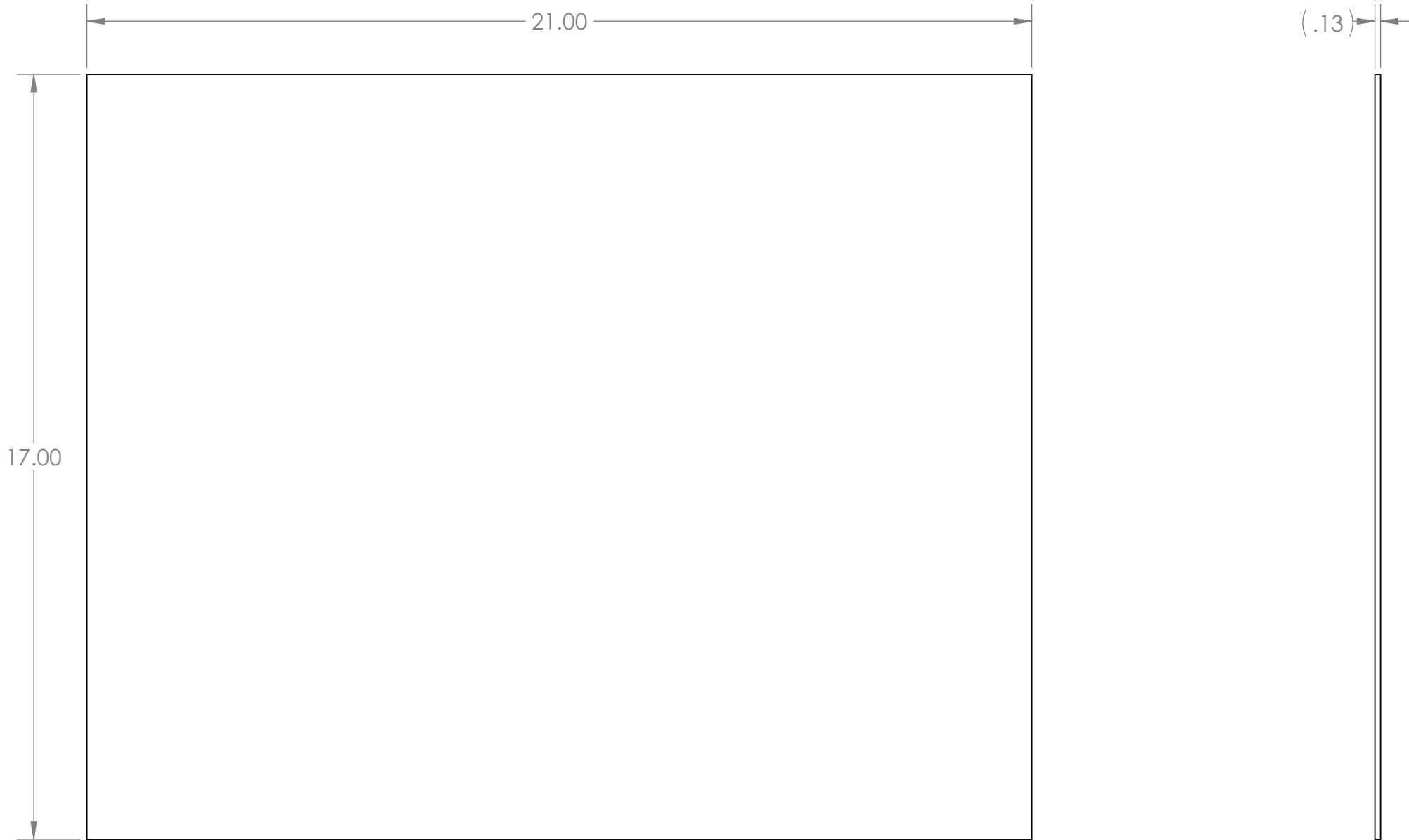
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B

B

A

A

Notes:

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

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OR AS A WHOLE WITHOUT THE WRITTEN
PERMISSION OF **FIRST®** IS PROHIBITED.

| | | | | | |
|-------------|----------------------|--|--|------|--------------|
| | | UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$ | | NAME | DATE |
| | | DRAWN | | | |
| | | CHECKED | | | |
| | | ENG APPR. | | | |
| | | MFG APPR. | | | |
| | | Q.A. | | | |
| | | COMMENTS: | | | |
| | | MATERIAL | | | |
| | | FINISH | | | |
| NEXT ASSY | USED ON | | | | |
| APPLICATION | DO NOT SCALE DRAWING | | | | |
| B | GE-18058 | | | | |
| SCALE: 1:3 | WEIGHT: | | | | |
| | | | | | SHEET 1 OF 1 |

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B

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Notes:

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

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
 Modeling Solutions Partner

TITLE: Sensor Curtain

| | | |
|-------------|-----------------|--------------|
| SIZE | DWG. NO. | REV |
| B | GE-18059 | |
| SCALE: 1:2 | WEIGHT: | SHEET 1 OF 1 |

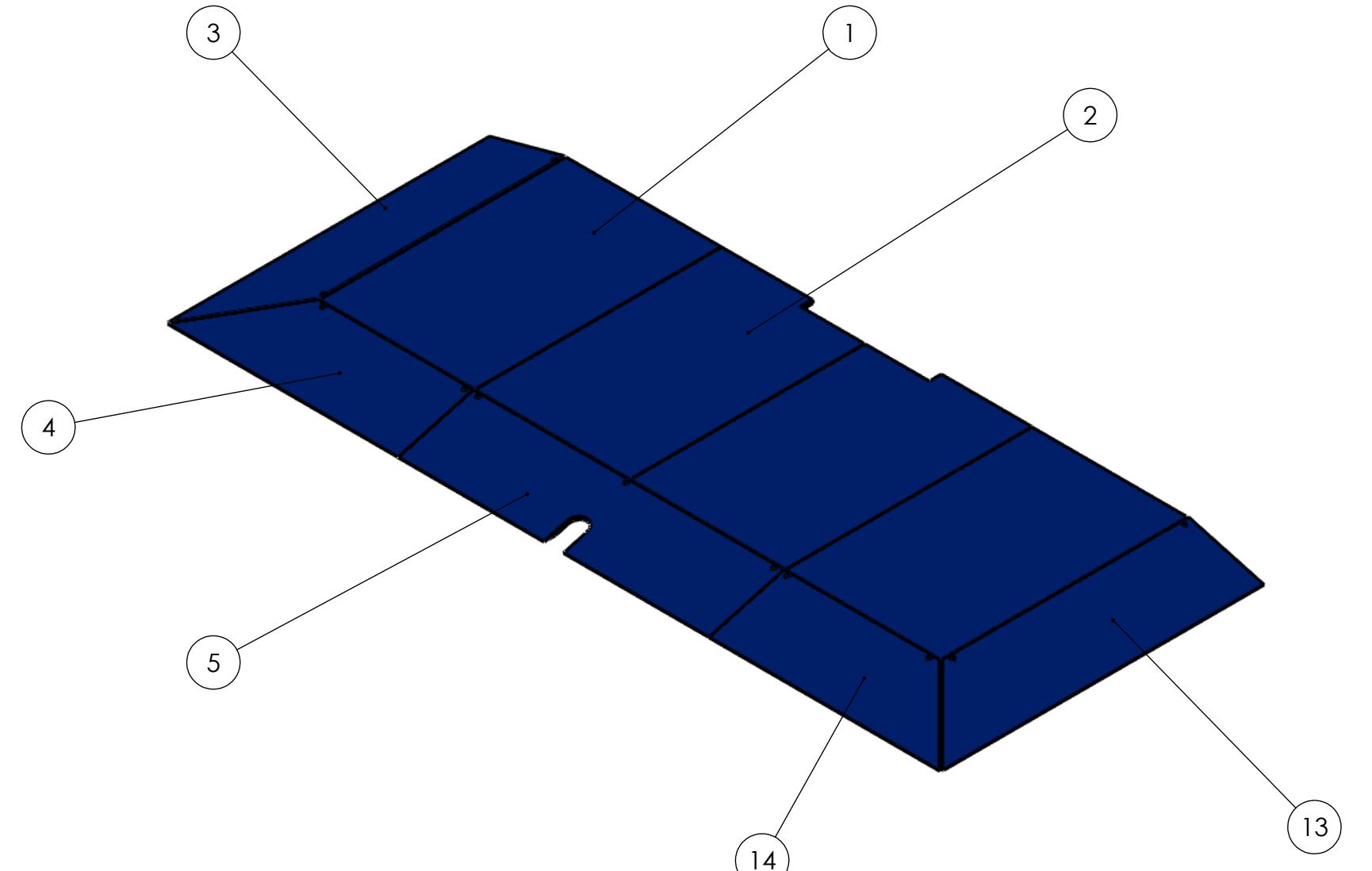
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3

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| REVISIONS | | | | |
|-----------|------|---|-----------|----------|
| ZONE | REV. | DESCRIPTION | DATE | APPROVED |
| 2-A4 | 1 | Changed part number called out in note to match displayed part. | 1/12/2018 | CPO |

B

B

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

A

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| | | | |
|--------------------------------------|-----------|------|---|
| UNLESS OTHERWISE SPECIFIED: | NAME | DATE | FIRST ROBOTICS COMPETITION <small>SOLIDWORKS</small> <small>Modeling Solutions Partner</small> |
| 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 | | | |

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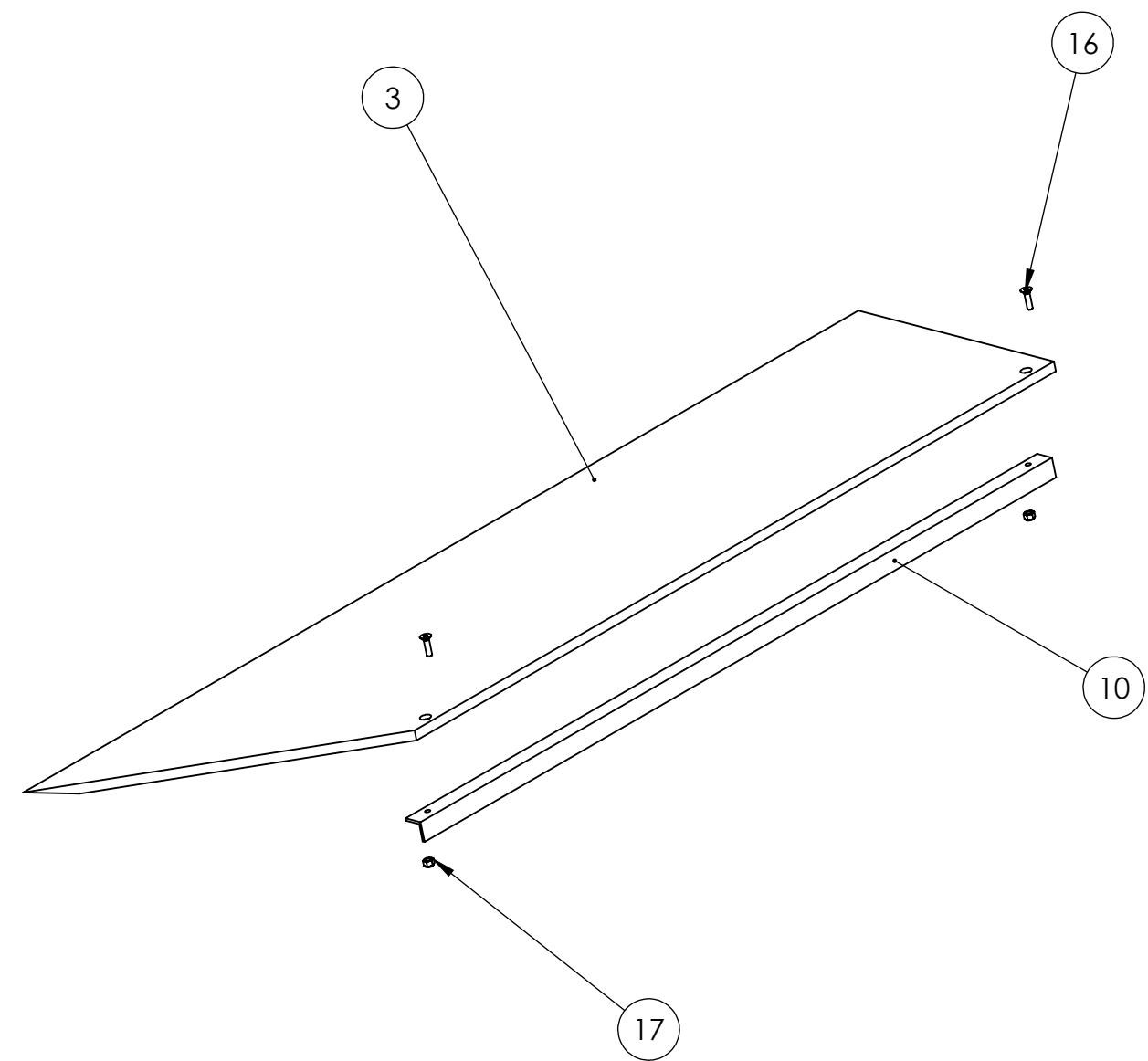
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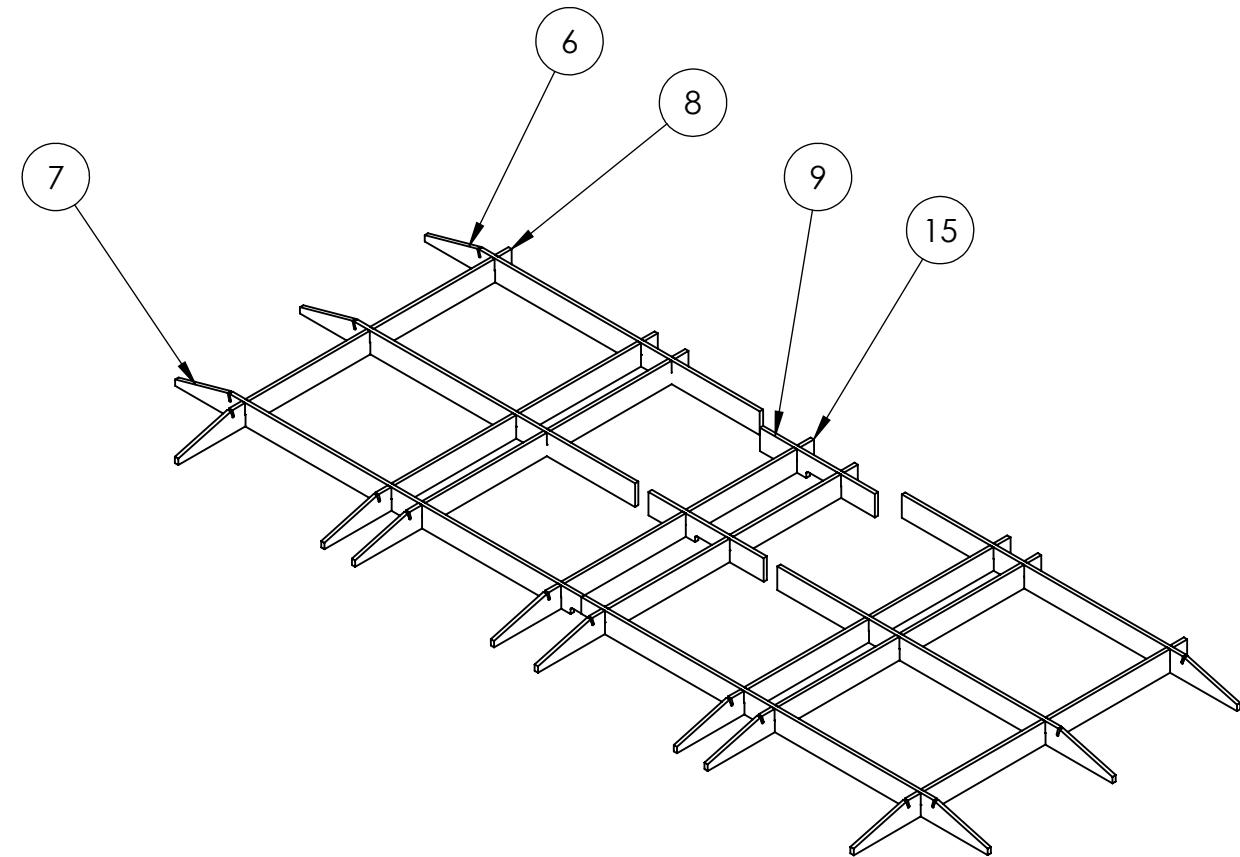


Notes:

1
Bolt Item 10 to Item 3 using Items 16 and 17. Repeat steps for the following Items, using Items 16 and 17 to fasten:

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

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Notes:

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

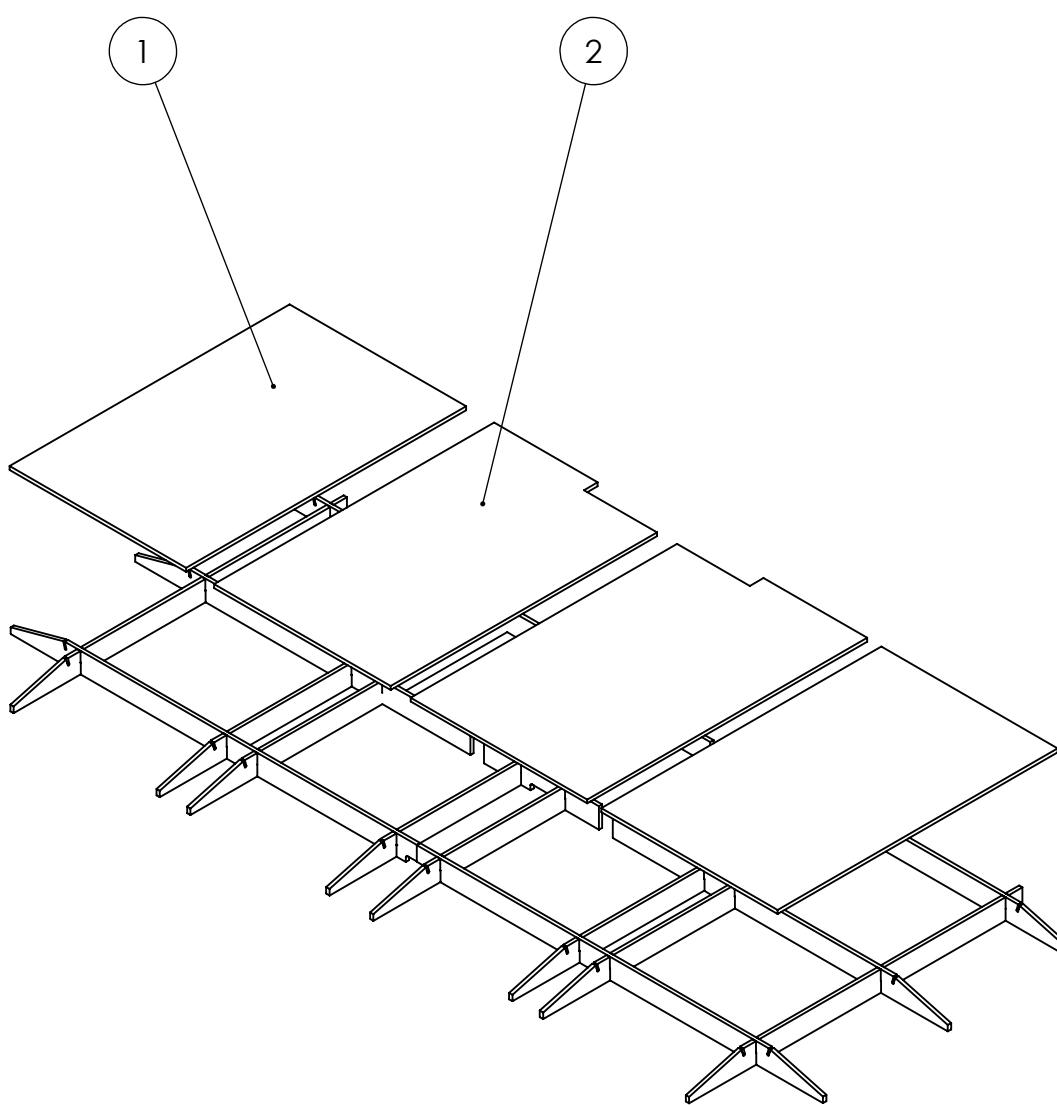
| | | UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL: ±1/16 ANGULAR: MACH ±1° BEND ±1° TWO PLACE DECIMAL ±.01 THREE PLACE DECIMAL ±.001 | NAME | DATE |
|-------------|---------|--|--------------|------|
| | | DRAWN | | |
| | | CHECKED | | |
| | | ENG APPR. | | |
| | | MFG APPR. | | |
| | | Q.A. | | |
| | | COMMENTS: | | |
| NEXT ASSY | USED ON | INTERPRET GEOMETRIC TOLERANCING PER: | | |
| | | MATERIAL | | |
| | | FINISH | | |
| APPLICATION | | DO NOT SCALE DRAWING | | |
| | | SIZE DWG. NO. REV | | |
| B | | GE-18060 1 | | |
| SCALE: 1:32 | | WEIGHT: | SHEET 2 OF 3 | |

4

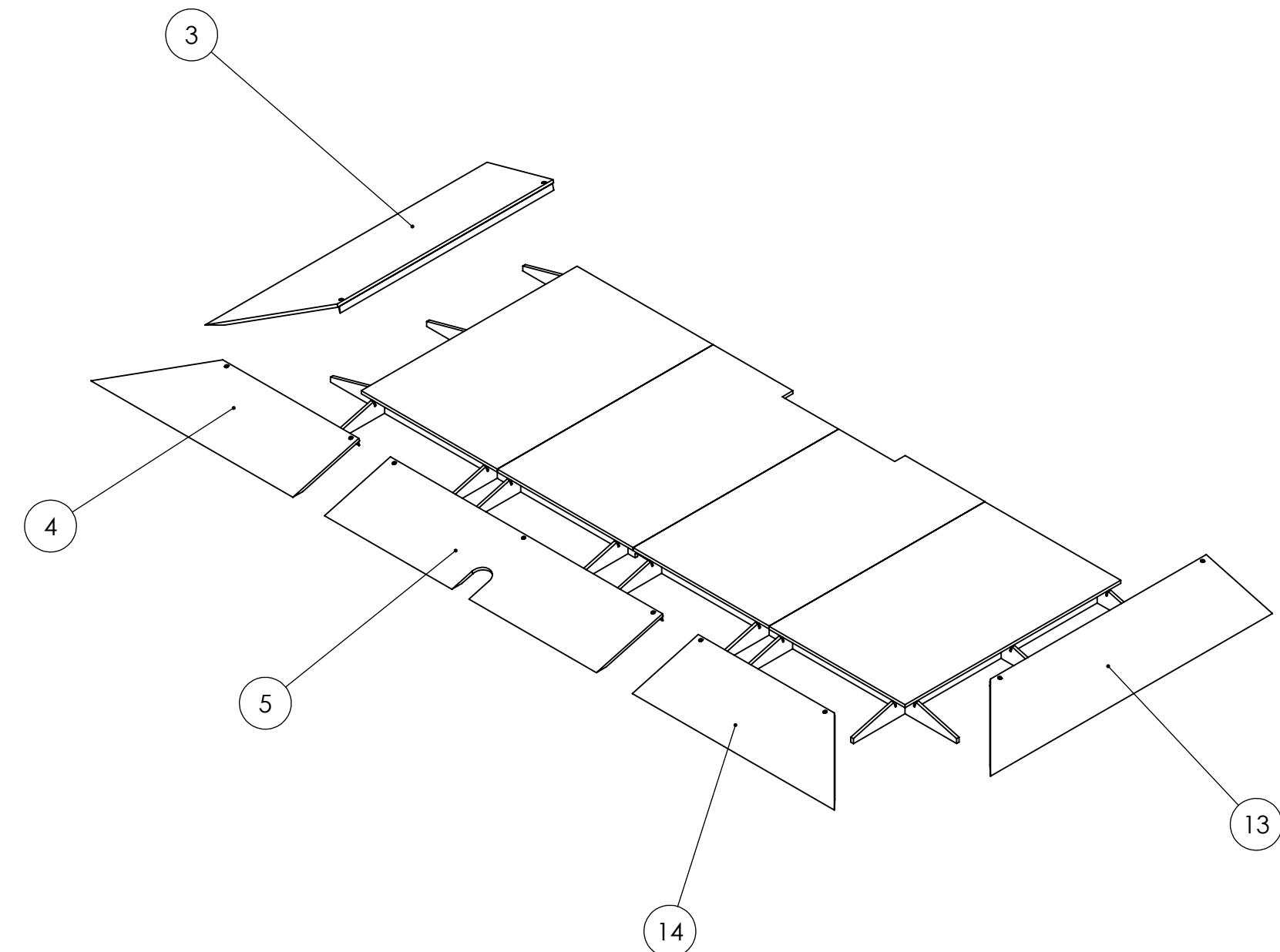
3

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



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

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Platform

SIZE DWG. NO. **B** **GE-18060** **REV** **1**

SCALE: 1:32 WEIGHT: SHEET 3 OF 3

4

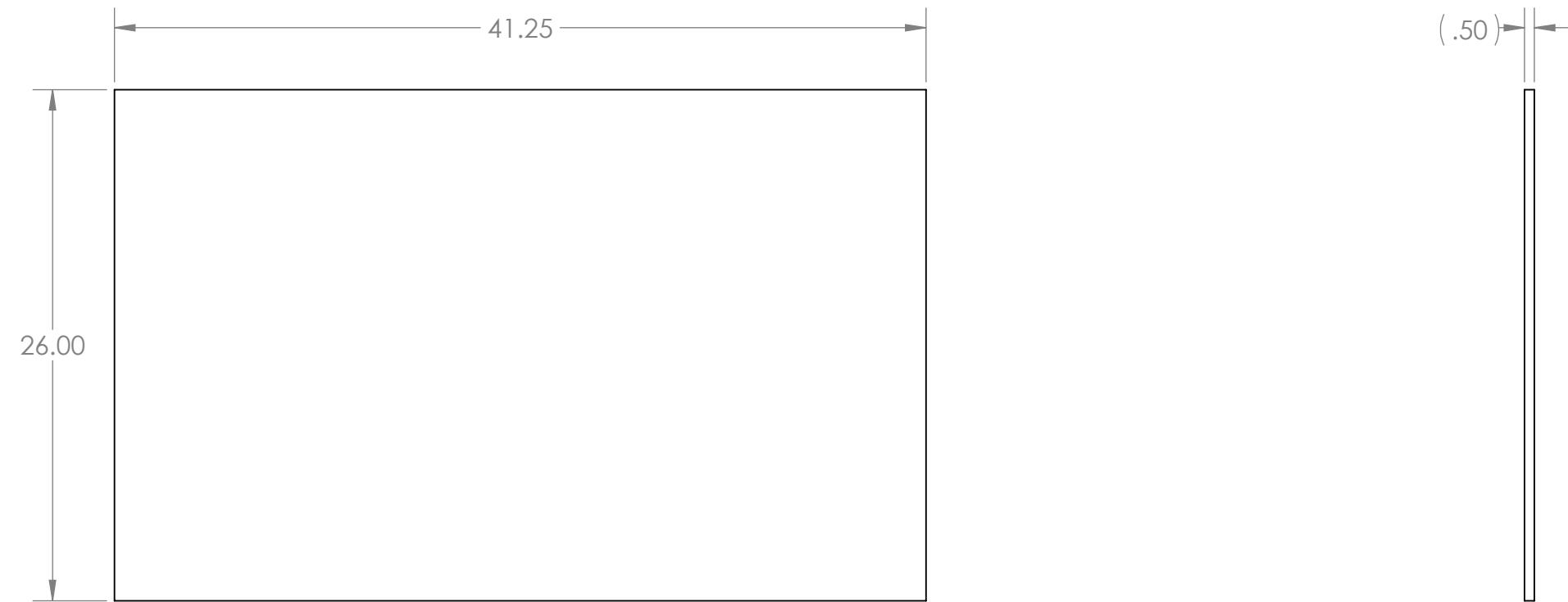
3

2

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B

B



A

A

Notes:

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

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| | | | | | |
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| | | UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$ | | NAME | DATE |
| | | DRAWN | | | |
| | | CHECKED | | | |
| | | ENG APPR. | | | |
| | | MFG APPR. | | | |
| | | Q.A. | | | |
| | | COMMENTS: | | | |
| | | MATERIAL | | | |
| | | FINISH | | | |
| NEXT ASSY | USED ON | | | | |
| APPLICATION | DO NOT SCALE DRAWING | | | | |
| B | GE-18061 | | | | |
| SCALE: 1:8 | WEIGHT: | | | | |
| | | | | | SHEET 1 OF 1 |

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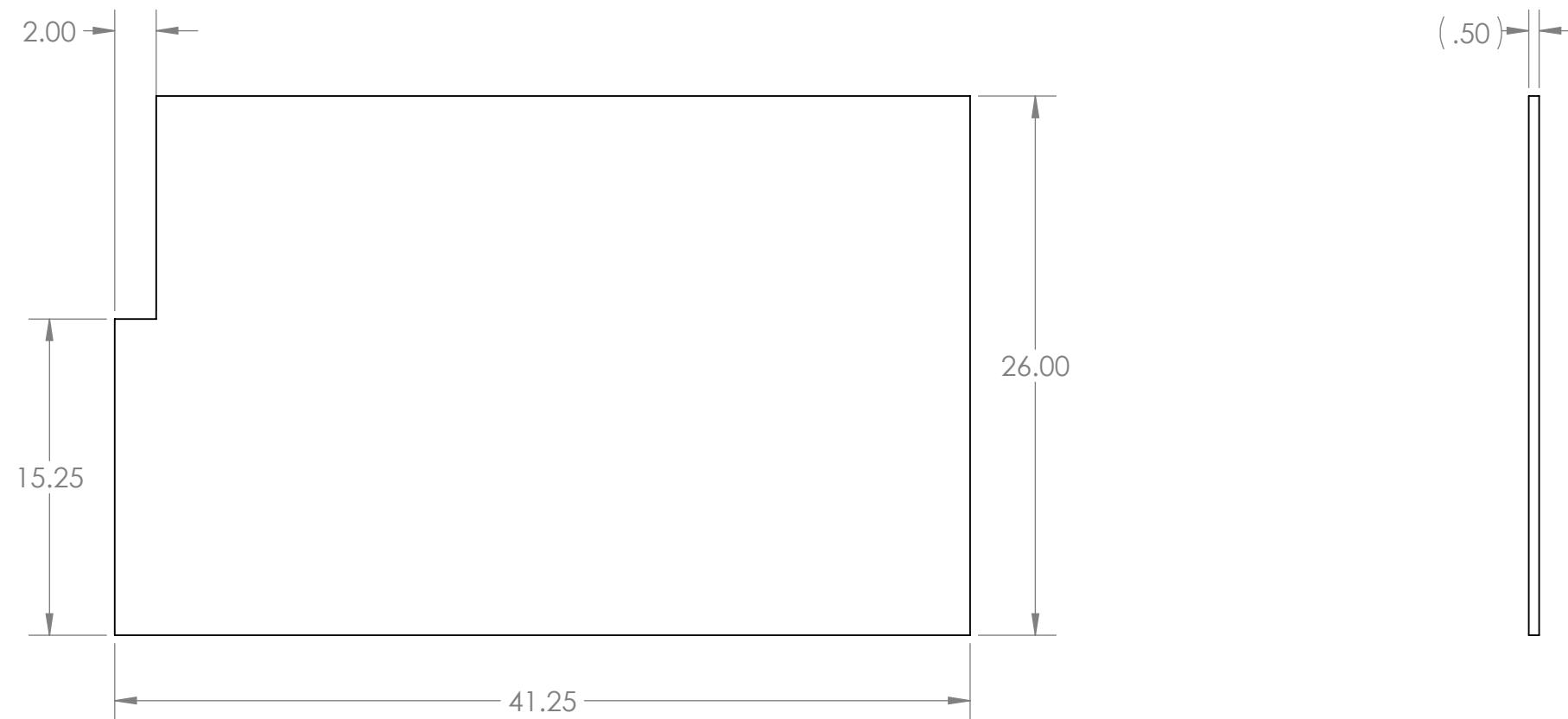
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Notes:

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

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|-------------|----------------------|--|--|--------------|------|
| | | UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL: ±1/16 ANGULAR: MACH ±1° BEND ±1° TWO PLACE DECIMAL: ±.01 THREE PLACE DECIMAL: ±.001 | | NAME | DATE |
| | | DRAWN | | | |
| | | CHECKED | | | |
| | | ENG APPR. | | | |
| | | MFG APPR. | | | |
| | | Q.A. | | | |
| | | COMMENTS: | | | |
| | | MATERIAL | | | |
| | | FINISH | | | |
| NEXT ASSY | USED ON | | | | |
| APPLICATION | DO NOT SCALE DRAWING | | | | |
| SIZE | DWG. NO. | | | REV | |
| B | GE-18062 | | | | |
| SCALE: 1:8 | WEIGHT: | | | SHEET 1 OF 1 | |

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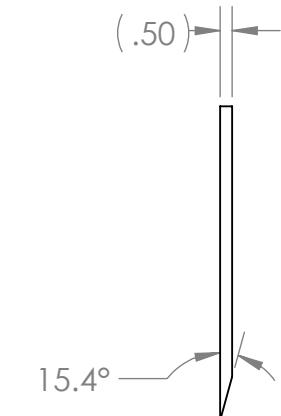
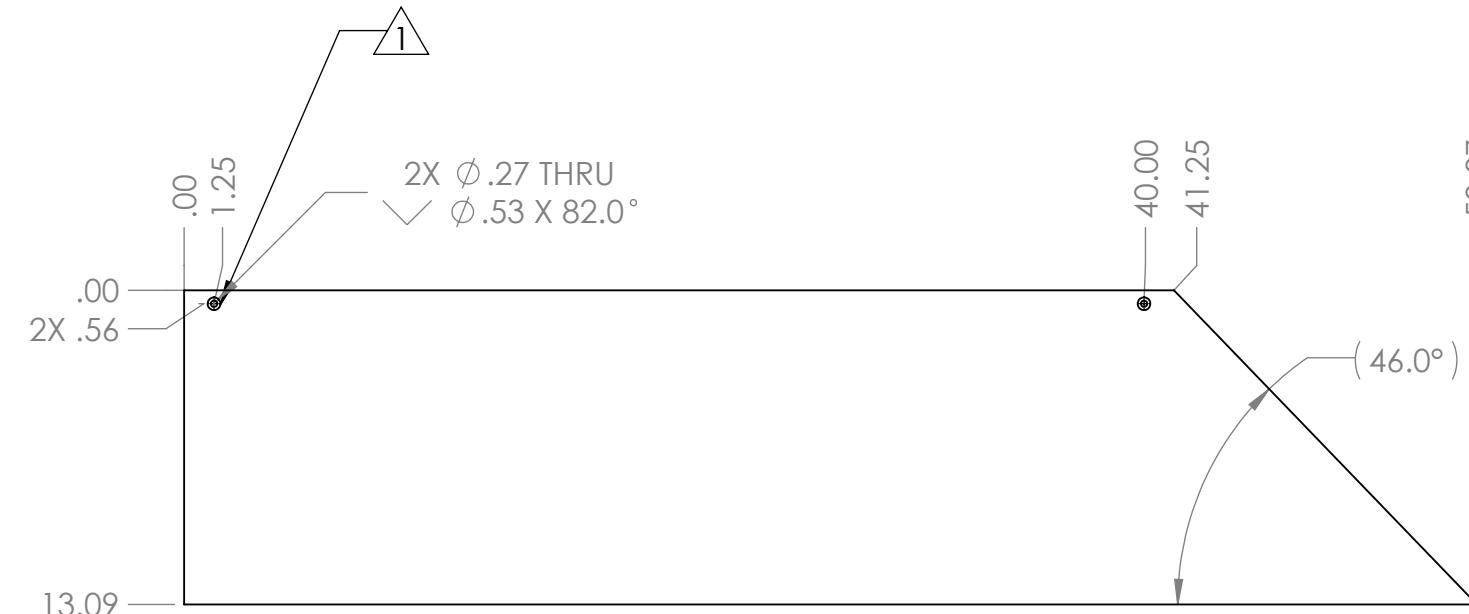
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2

1

REVISIONS

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



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

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|-------------|----------------------|--|------|------|
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| | | DRAWN | | |
| | | CHECKED | | |
| | | ENG APPR. | | |
| | | MFG APPR. | | |
| | | Q.A. | | |
| | | COMMENTS: | | |
| | | MATERIAL | | |
| | | FINISH | | |
| NEXT ASSY | USED ON | | | |
| APPLICATION | DO NOT SCALE DRAWING | | | |
| SIZE | DWG. NO. | REV | | |
| B | GE-18063 | 1 | | |
| SCALE: 1:8 | WEIGHT: | SHEET 1 OF 1 | | |

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
**Platform Short
Side**

4

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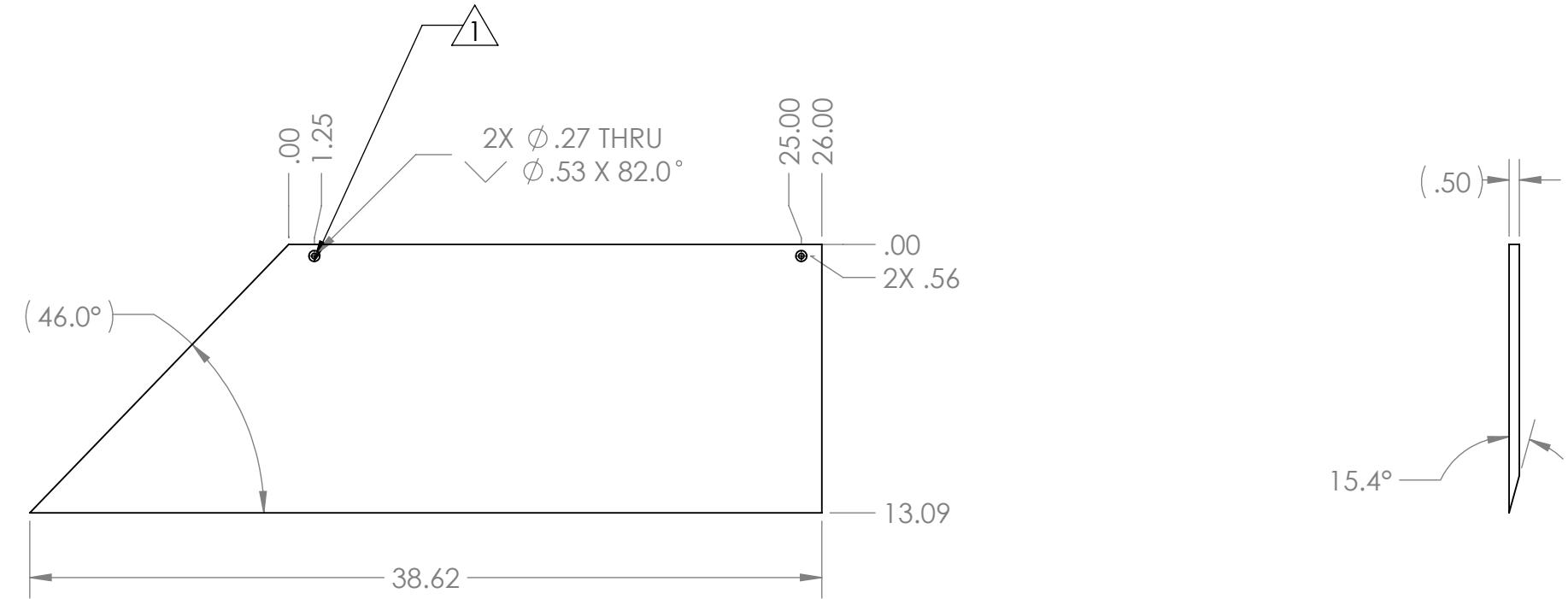
1

REVISIONS

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

B

B



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

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|-------------------|----------------------|--|--------------|------|
| | | UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$ | NAME | DATE |
| | | DRAWN | | |
| | | CHECKED | | |
| | | ENG APPR. | | |
| | | MFG APPR. | | |
| | | Q.A. | | |
| | | COMMENTS: | | |
| | | MATERIAL | | |
| | | FINISH | | |
| NEXT ASSY | USED ON | | | |
| APPLICATION | DO NOT SCALE DRAWING | | | |
| SIZE DWG. NO. | | REV | | |
| B GE-18064 | | 1 | | |
| SCALE: 1:8 | | WEIGHT: | SHEET 1 OF 1 | |

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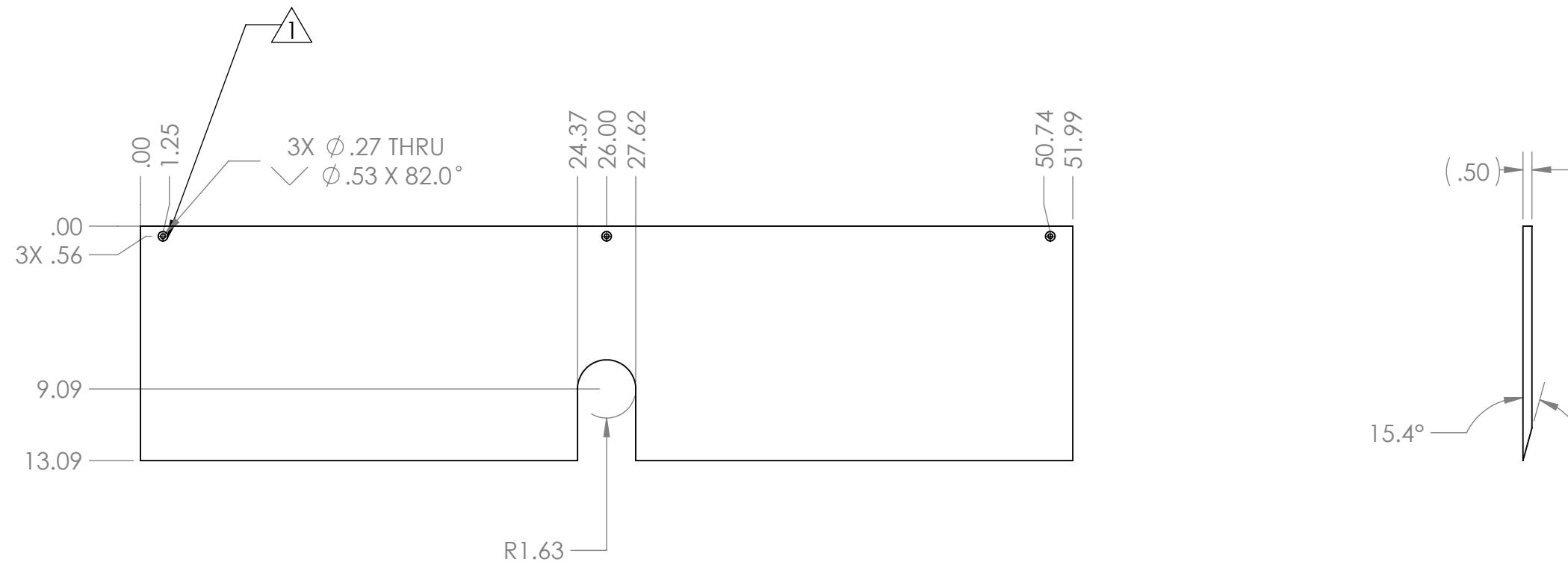
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| REVISIONS | | | | |
|-----------|------|--|----------|----------|
| ZONE | REV. | DESCRIPTION | DATE | APPROVED |
| B3 | 1 | Changed number and location of holes; increased length of part | 11/30/17 | JRF |



Notes

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

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

4

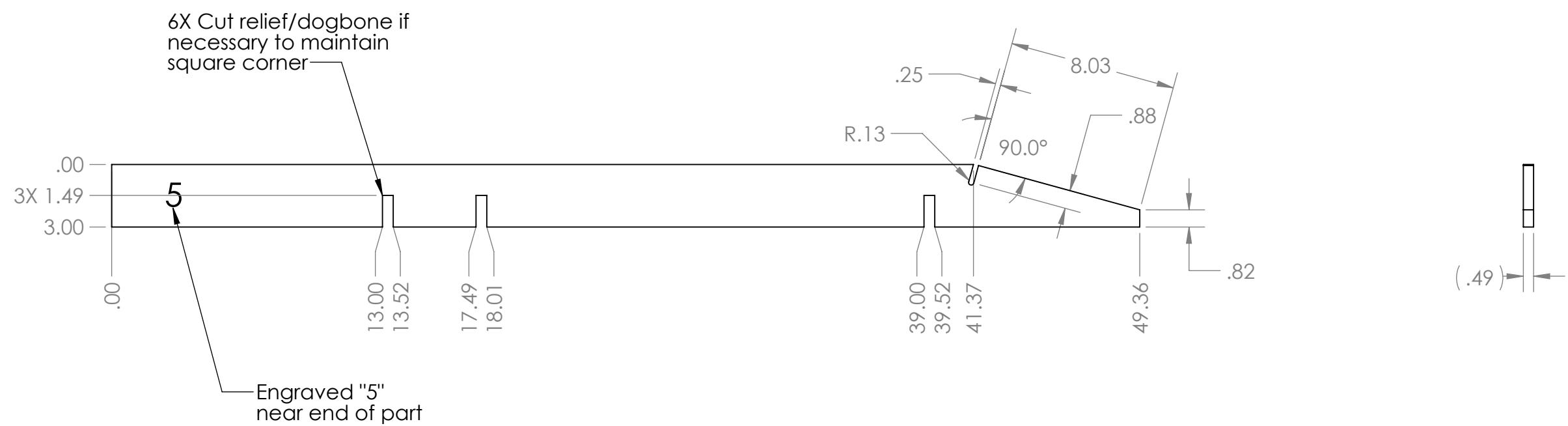
3

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B

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Notes:

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

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

**Platform Brace,
Long Side 1**

SIZE DWG. NO. REV
B GE-18066

SCALE: 1:6 WEIGHT: SHEET 1 OF 1

4

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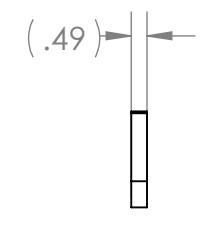
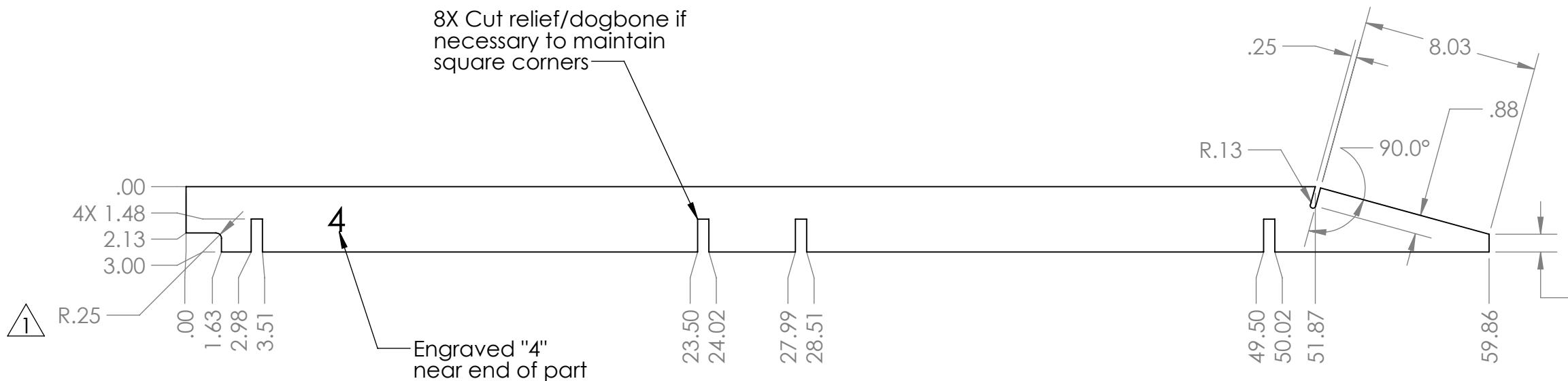
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REVISIONS

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

B

B



A

A

Notes:

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

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| | | | | |
|-------------|----------------------|--|------|------|
| | | UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$ | NAME | DATE |
| | | DRAWN | | |
| | | CHECKED | | |
| | | ENG APPR. | | |
| | | MFG APPR. | | |
| | | Q.A. | | |
| | | COMMENTS: | | |
| | | MATERIAL | | |
| | | FINISH | | |
| NEXT ASSY | USED ON | | | |
| APPLICATION | DO NOT SCALE DRAWING | | | |
| SIZE | DWG. NO. | REV | | |
| B | GE-18067 | 1 | | |
| SCALE: 1:6 | WEIGHT: | SHEET 1 OF 1 | | |

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

Platform Brace,
Long Side 2

4

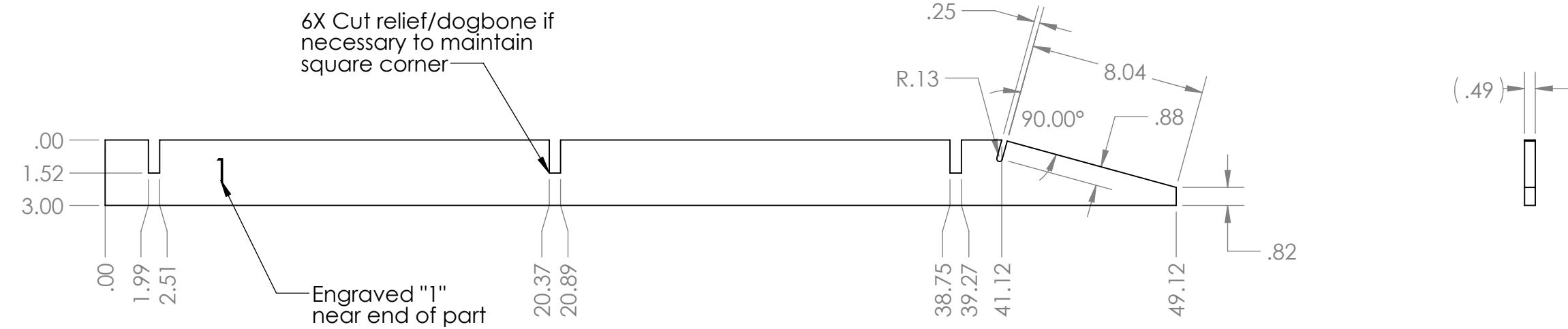
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Notes:

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

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

**Platform Brace,
Short Side 1**

| | | |
|------------|-----------------|--------------|
| B | GE-18068 | REV |
| SCALE: 1:6 | WEIGHT: | SHEET 1 OF 1 |

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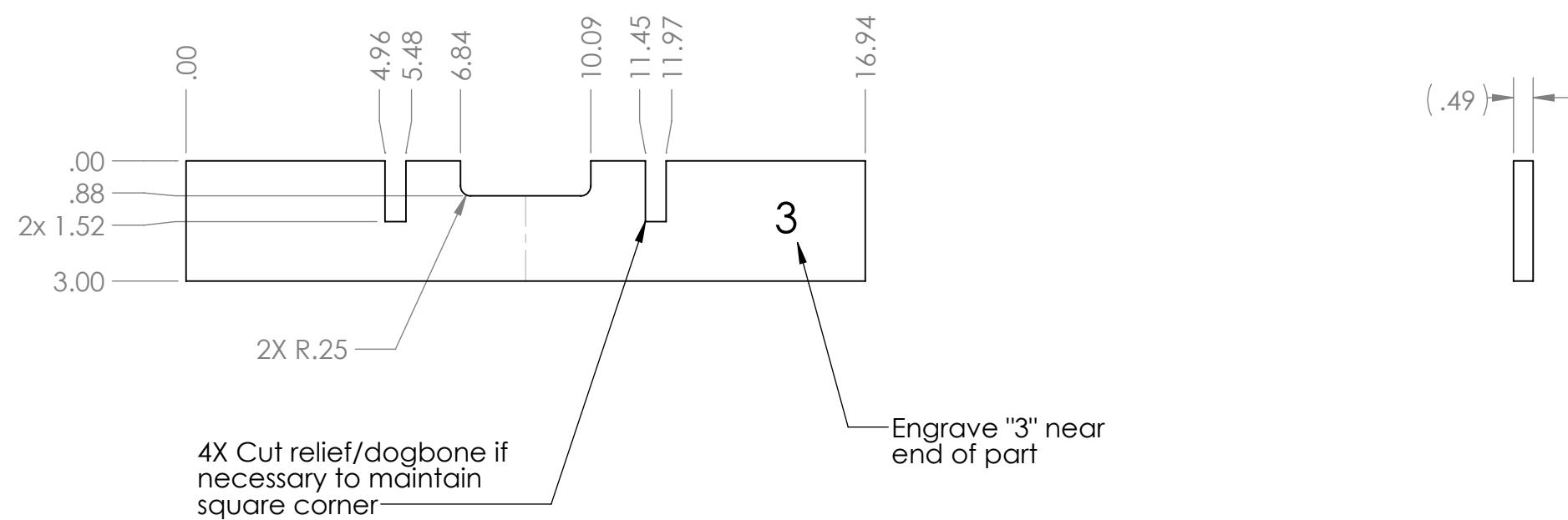
3

2

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Notes:

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

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|------------|-----------------|--|---------|----------------------|
| | | UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$ | NAME | DATE |
| | | DRAWN | | |
| | | CHECKED | | |
| | | ENG APPR. | | |
| | | MFG APPR. | | |
| | | Q.A. | | |
| | | COMMENTS: | | |
| | | MATERIAL | | |
| | | NEXT ASSY | USED ON | FINISH |
| | | APPLICATION | | DO NOT SCALE DRAWING |
| B | GE-18069 | | | |
| SCALE: 1:4 | WEIGHT: | SHEET 1 OF 1 | | |

4

3

2

1

4

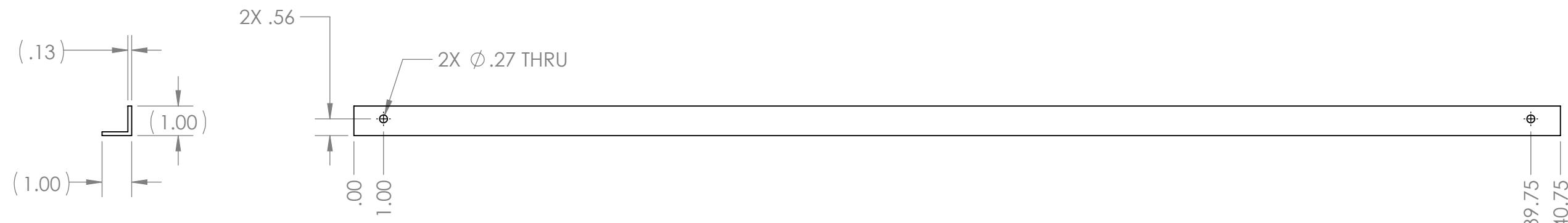
3

2

1

B

B



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

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| | | UNLESS OTHERWISE SPECIFIED: | | NAME | DATE |
|-------------|-----------------|-----------------------------|---|------|------|
| DRAWN | CHECKED | 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 $\pm .001$ | | |
| ENG APPR. | MFG APPR. | | | | |
| Q.A. | COMMENTS: | | | | |
| MATERIAL | | | | | |
| NEXT ASSY | USED ON | FINISH | | | |
| APPLICATION | | DO NOT SCALE DRAWING | | | |
| SIZE | DWG. NO. | REV | | | |
| B | GE-18070 | | | | |
| SCALE: 1:4 | WEIGHT: | SHEET 1 OF 1 | | | |

4

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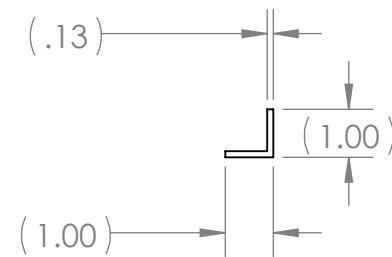
3

2

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B

B



Notes:

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

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|------------|-----------------|--|---------|----------------------|------|
| | | UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$ | | NAME | DATE |
| | | DRAWN | | | |
| | | CHECKED | | | |
| | | ENG APPR. | | | |
| | | MFG APPR. | | | |
| | | Q.A. | | | |
| | | COMMENTS: | | | |
| | | MATERIAL | | | |
| | | NEXT ASSY | USED ON | FINISH | |
| | | APPLICATION | | DO NOT SCALE DRAWING | |
| B | GE-18071 | | | | |
| SCALE: 1:4 | WEIGHT: | SHEET 1 OF 1 | | | |

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

**Platform Angle,
Long Side**

4

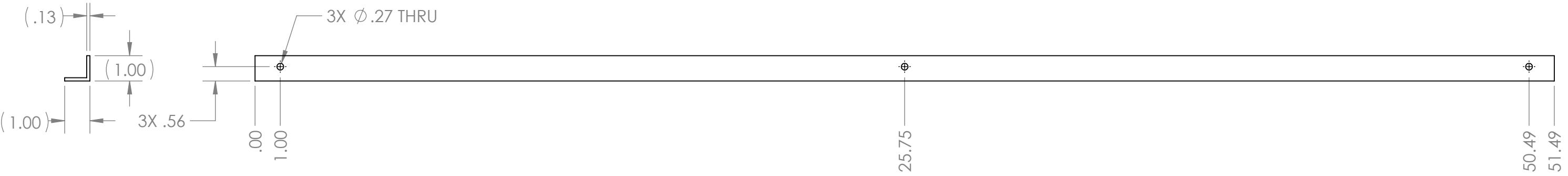
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2

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B

B



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

4

3

2

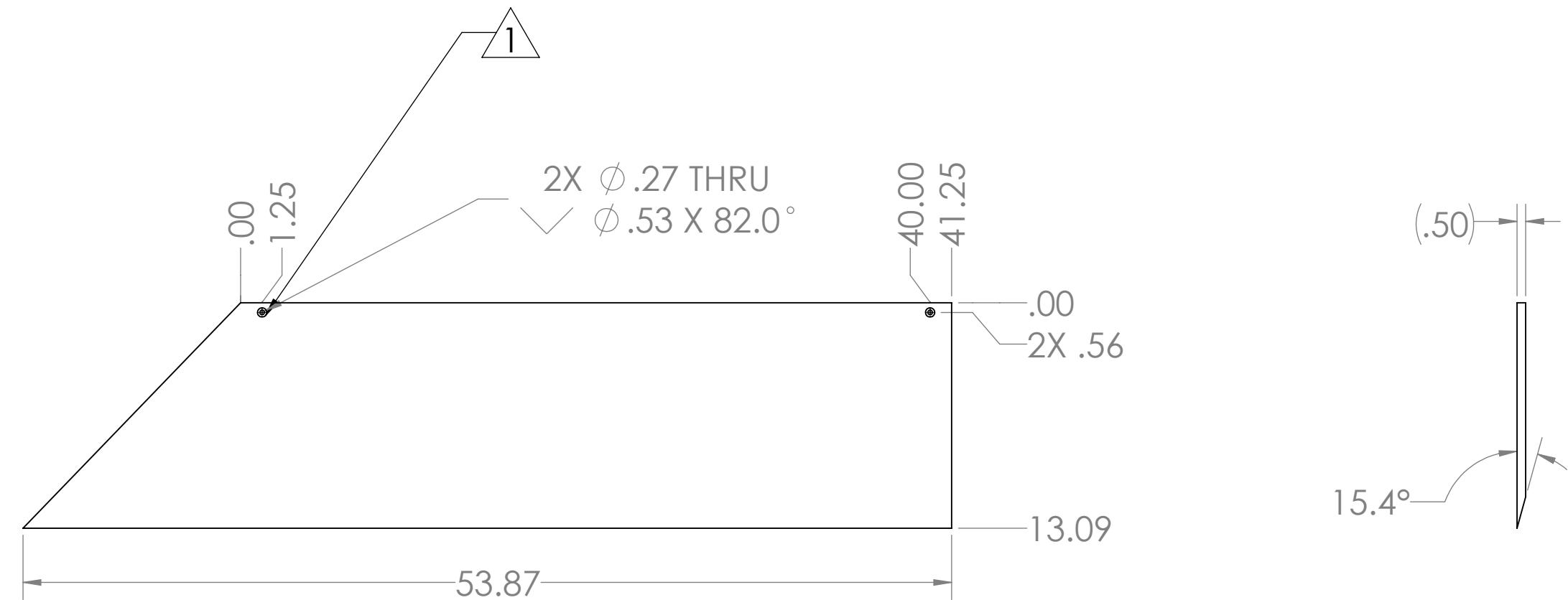
1

REVISIONS

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

B

B



Notes:

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

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| | | | | | | | |
|-------------|---------|---|------------|---------|--------------|--|--|
| | | UNLESS OTHERWISE SPECIFIED: | | NAME | DATE |  FIRST ROBOTICS COMPETITION | TITLE: <h1>Platform Short Side Mirrored</h1> |
| | | DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$ | DRAWN | | | | |
| | | | CHECKED | | | | |
| | | | ENG APPR. | | | | |
| | | | MFG APPR. | | | | |
| | | INTERPRET GEOMETRIC TOLERANCING PER: | Q.A. | | | | |
| | | MATERIAL | COMMENTS: | | | | |
| NEXT ASSY | USED ON | FINISH | | | | SIZE DWG. NO. B GE-18073 | REV 1 |
| APPLICATION | | DO NOT SCALE DRAWING | | | | | |
| | | | SCALE: 1:8 | WEIGHT: | SHEET 1 OF 1 | | |

4

3

2

1

4

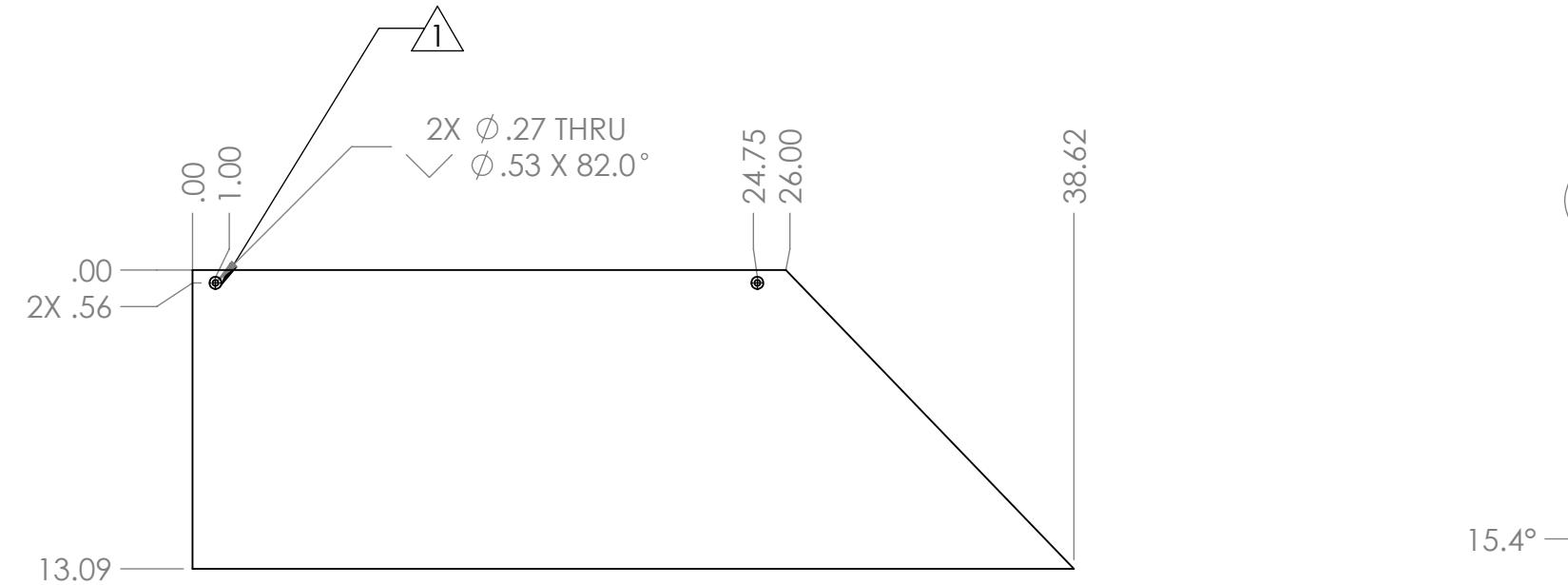
3

2

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B

B



A

A

Notes:

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

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| | | | | | |
|------------|-----------------|--|----------------------|------|------|
| | | UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$ | | NAME | DATE |
| | | DRAWN | | | |
| | | CHECKED | | | |
| | | ENG APPR. | | | |
| | | MFG APPR. | | | |
| | | Q.A. | | | |
| | | COMMENTS: | | | |
| | | MATERIAL | | | |
| | NEXT ASSY | USED ON | FINISH | | |
| | | APPLICATION | DO NOT SCALE DRAWING | | |
| SIZE | DWG. NO. | REV | | | |
| B | GE-18074 | 1 | | | |
| SCALE: 1:8 | WEIGHT: | SHEET 1 OF 1 | | | |

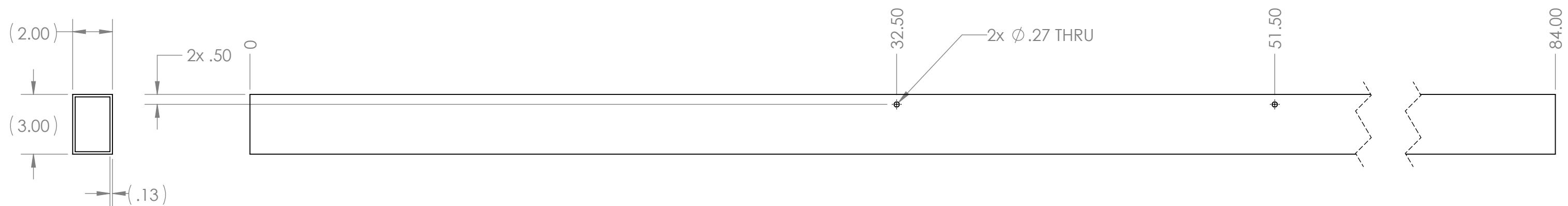
4

3

2

1

B



B

Notes:

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

A

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner
TITLE: **Scale Base Outrigger**
SIZE **B** DWG. NO. **GE-18075** REV **1**
SCALE: 1:5 WEIGHT: SHEET 1 OF 1

4

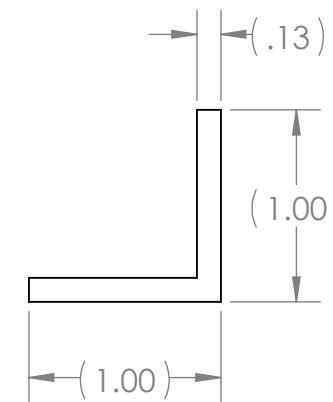
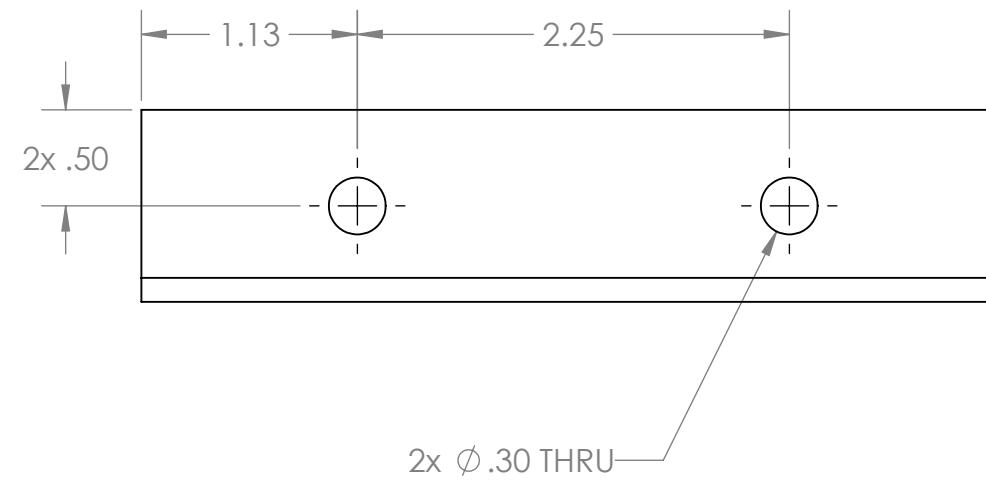
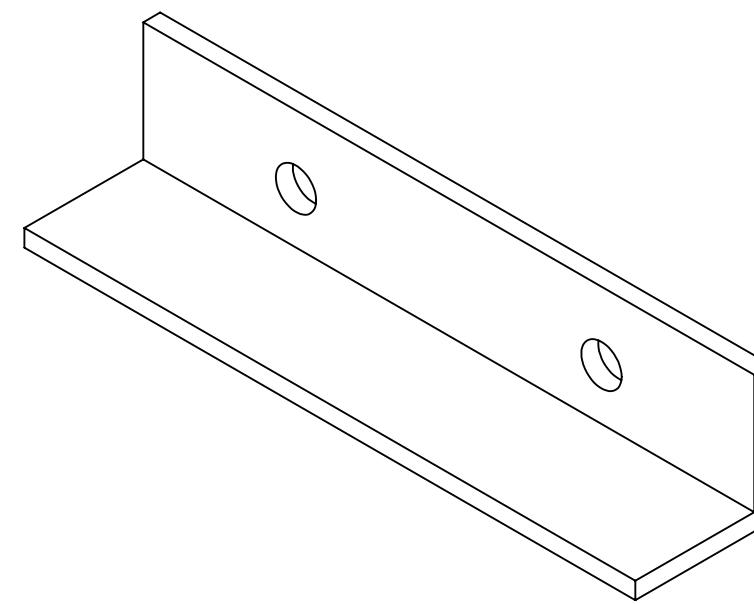
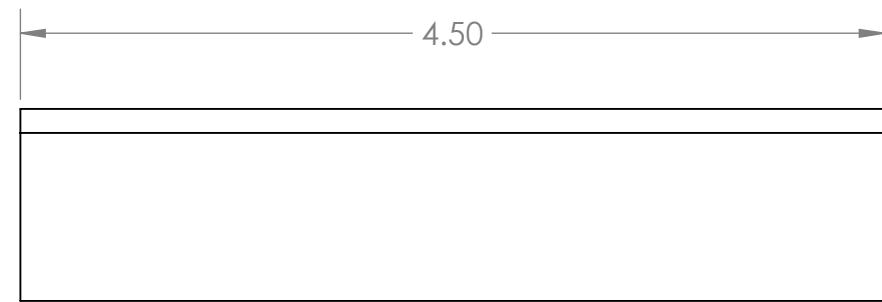
3

2

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B

B



A

A

Notes:

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

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| | | 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: Scale Angle Brace

| | | |
|------------|-----------------|--------------|
| SIZE | DWG. NO. | REV |
| B | GE-18076 | |
| SCALE: 1:1 | WEIGHT: | SHEET 1 OF 1 |

4

3

2

1

4

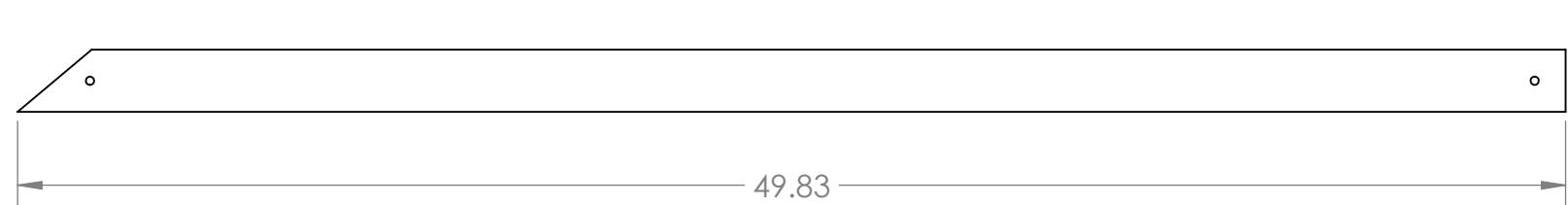
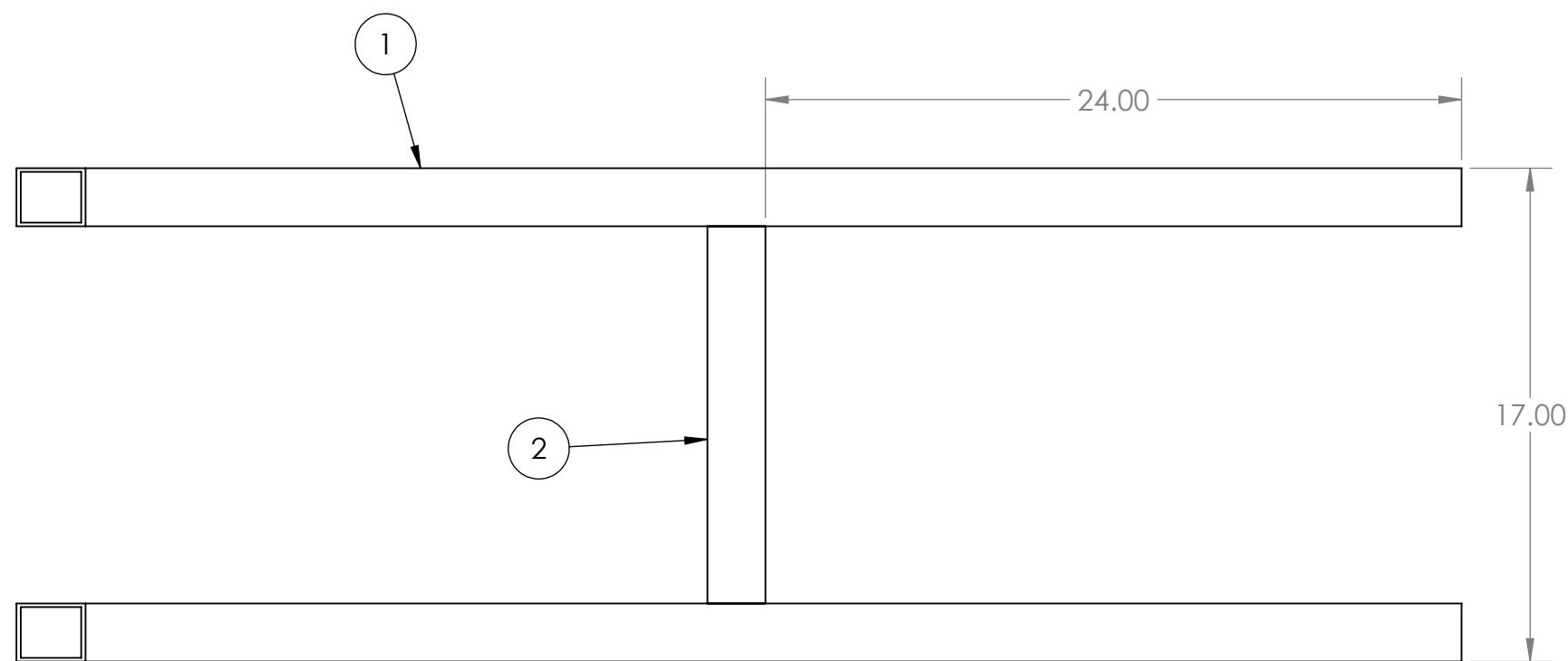
3

2

1

B

B



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

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| | | | | | |
|------------|-----------------|--|----------------------|------|------|
| | | UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$ | | NAME | DATE |
| | | DRAWN | | | |
| | | CHECKED | | | |
| | | ENG APPR. | | | |
| | | MFG APPR. | | | |
| | | Q.A. | | | |
| | | COMMENTS: | | | |
| | | MATERIAL | | | |
| | | FINISH | | | |
| | | APPLICATION | DO NOT SCALE DRAWING | | |
| SIZE | DWG. NO. | REV | | | |
| B | GE-18077 | | | | |
| SCALE: 1:6 | WEIGHT: | SHEET 1 OF 3 | | | |

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:

Outrigger Wing
Horizontal

SIZE DWG. NO. REV

B GE-18077

SCALE: 1:6 WEIGHT: SHEET 1 OF 3

4

3

2

1

4

3

2

1



1/4
1/4
2 places



2 places
(1/4)



B

B

A

A

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|-------------|----------------------|--|--|------|------|
| | | UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$ | | NAME | DATE |
| | | DRAWN | | | |
| | | CHECKED | | | |
| | | ENG APPR. | | | |
| | | MFG APPR. | | | |
| | | Q.A. | | | |
| | | COMMENTS: | | | |
| | | MATERIAL | | | |
| | | FINISH | | | |
| NEXT ASSY | USED ON | | | | |
| APPLICATION | DO NOT SCALE DRAWING | | | | |
| B | GE-18077 | | | | |
| SCALE: 1:6 | WEIGHT: | SHEET 2 OF 3 | | | |

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:

**Outrigger Wing
Horizontal**

SIZE DWG. NO. REV
B GE-18077

4

3

2

1

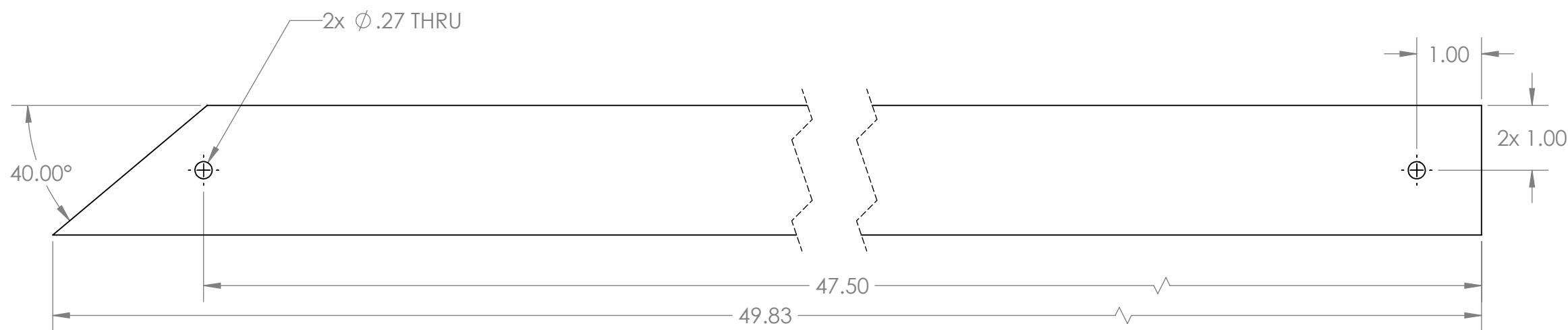
4

3

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1

B



ITEM: GE-18077-1
 Material: 2" x .125" thk. Square Tube, 6061 Aluminum
 Scale: 1:2
 QTY: 2



ITEM: GE-18077-2
 Material: 2" x .125" thk. Square Tube, 6061 Aluminum
 Scale: 1:2
 QTY: 1

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| | | UNLESS OTHERWISE SPECIFIED: | | NAME | DATE |
|-----------------------------|---------|--|--------------|------|------|
| DIMENSIONS ARE IN INCHES | | TOLERANCES: | | | |
| FRACTIONAL $\pm 1/16$ | | ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ | | | |
| TWO PLACE DECIMAL $\pm .01$ | | THREE PLACE DECIMAL $\pm .001$ | | | |
| | | INTERPRET GEOMETRIC TOLERANCING PER: | | | |
| | | MATERIAL | | | |
| NEXT ASSY | USED ON | FINISH | | | |
| APPLICATION | | DO NOT SCALE DRAWING | COMMENTS: | | |
| SCALE: 1:2 | | WEIGHT: | SHEET 3 OF 3 | | |
| B | | GE-18077 | REV | | |

 FIRST ROBOTICS COMPETITION  SOLIDWORKS
Modeling Solutions Partner

TITLE:
Outrigger Wing Horizontal

4

3

2

1

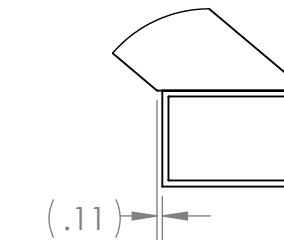
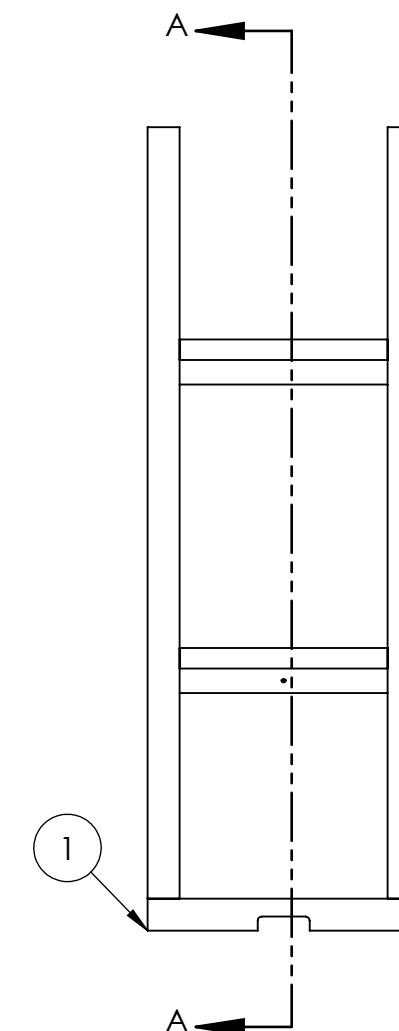
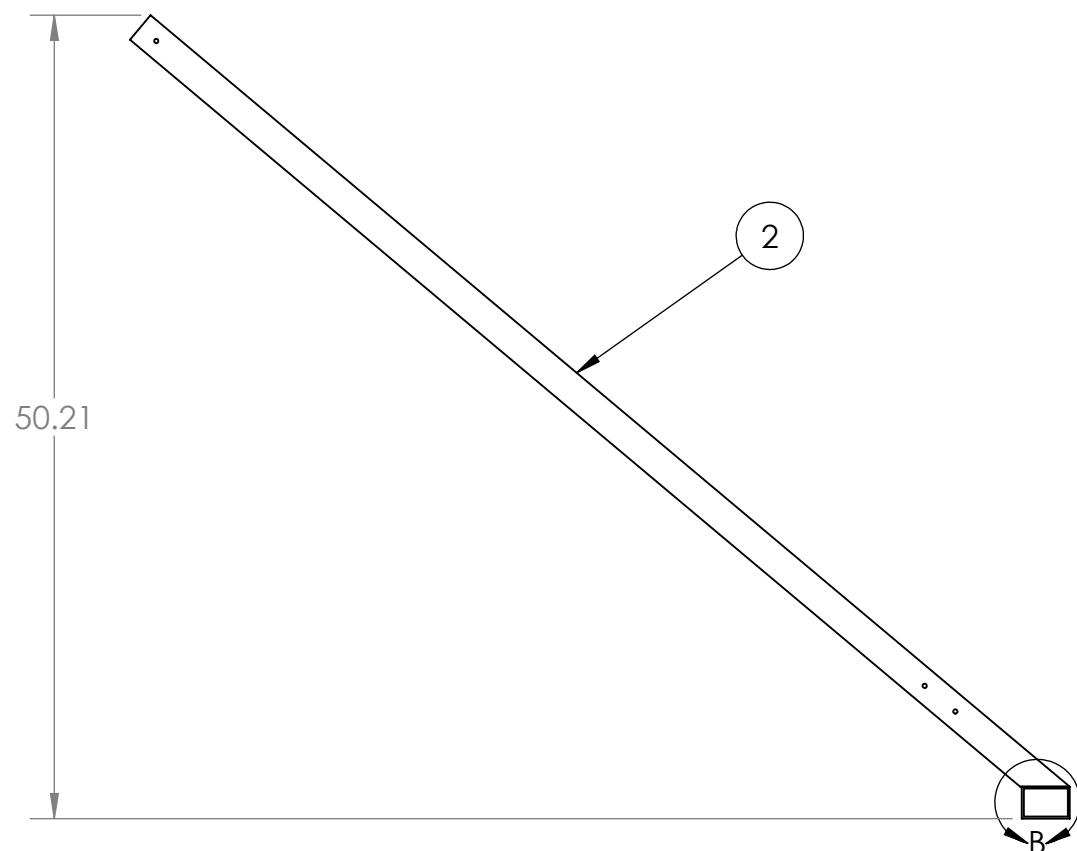
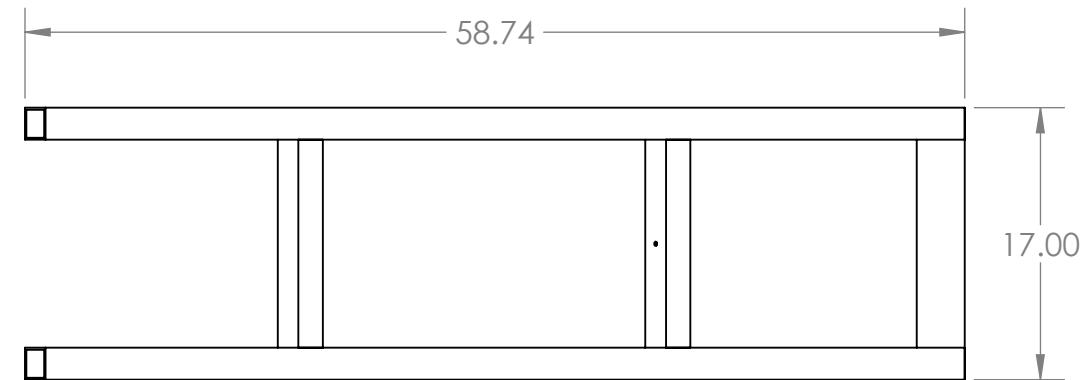
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4

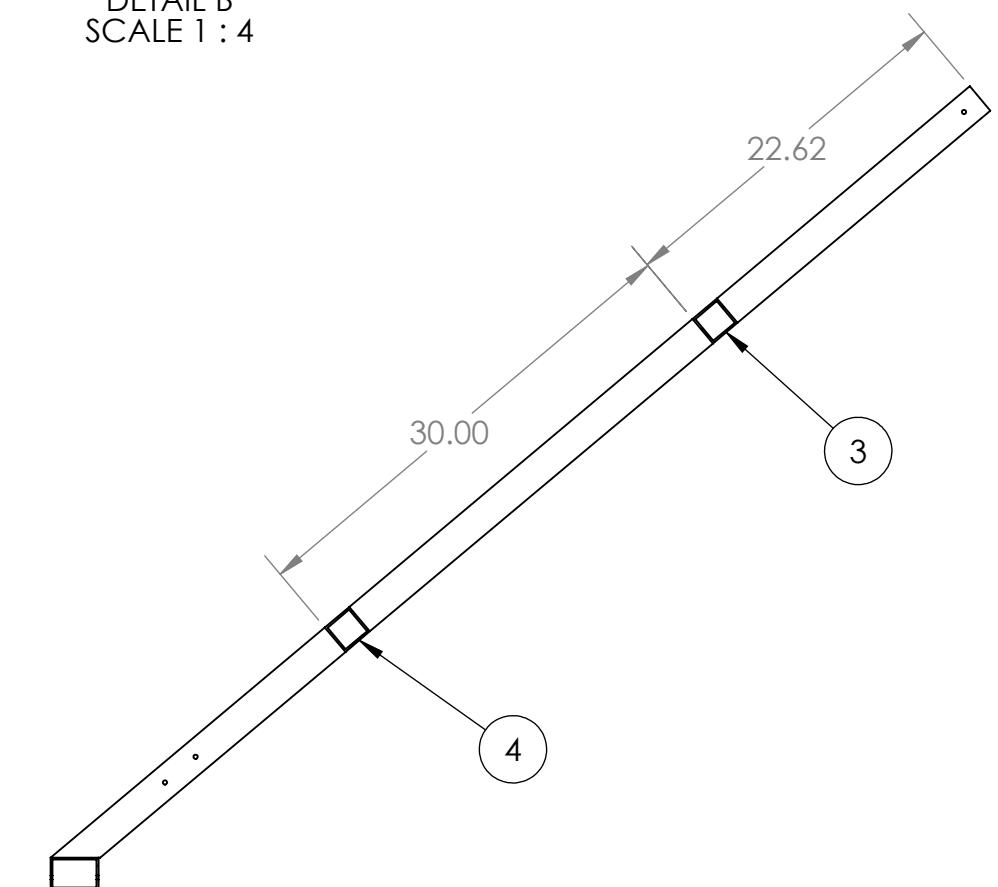
3

2

1



DETAIL B
SCALE 1 : 4



SECTION A-A

| ITEM NO. | PART NUMBER | DESCRIPTION | QTY. |
|----------|-------------|--|------|
| 1 | GE-18078-1 | 3" x 2" x .125" thk. Rectangular Tube, 6061 Aluminum | 1 |
| 2 | GE-18078-2 | 2" x .125" thk. Square Tube, 6061 Aluminum | 2 |
| 3 | GE-18078-3 | 2" x .125" thk. Square Tube, 6061 Aluminum | 1 |
| 4 | GE-18078-4 | 2" x .125" thk. Square Tube, 6061 Aluminum | 1 |

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|-------------|-----------------|--|----------------------|------|
| | | UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL: ±1/16 ANGULAR: MACH ±1° BEND ±1° TWO PLACE DECIMAL: ±.01 THREE PLACE DECIMAL: ±.001 | NAME | DATE |
| | | DRAWN | | |
| | | CHECKED | | |
| | | ENG APPR. | | |
| | | MFG APPR. | | |
| | | Q.A. | | |
| | | COMMENTS: | | |
| | | MATERIAL | | |
| | | FINISH | | |
| | | APPLICATION | DO NOT SCALE DRAWING | |
| SIZE | DWG. NO. | | REV | |
| B | GE-18078 | | | |
| SCALE: 1:12 | WEIGHT: | | SHEET 1 OF 4 | |

FIRST ROBOTICS COMPETITION
SOLIDWORKS
Modeling Solutions Partner

TITLE:
**Outrigger Wing
Diagonal**

4

3

2

1

4

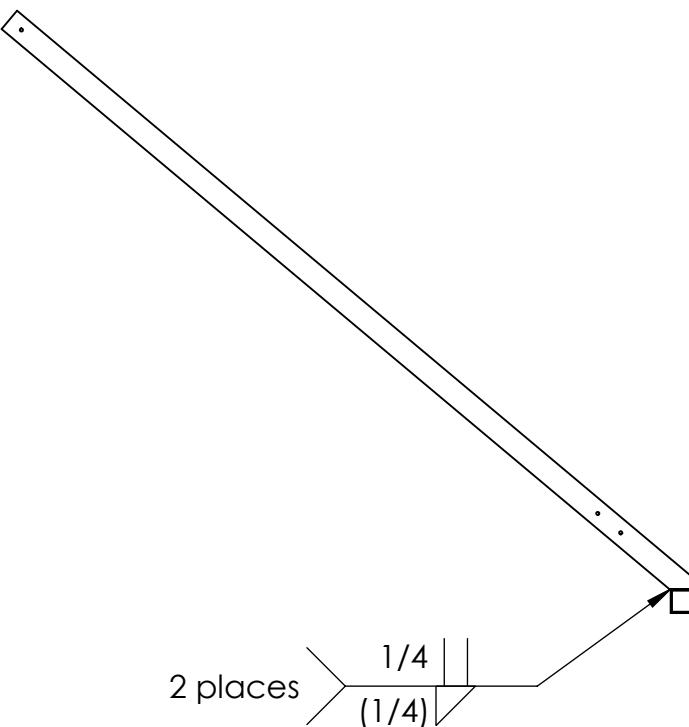
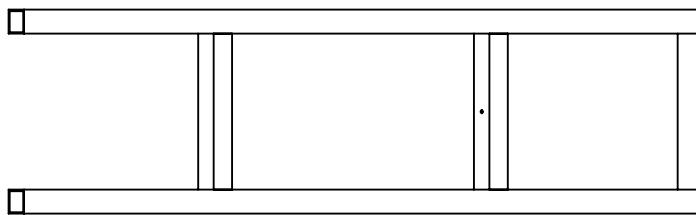
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2

1

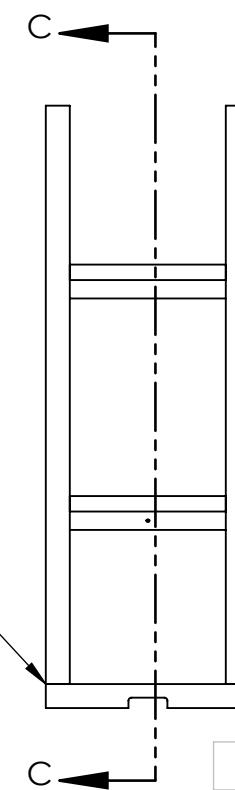
B

B



2 places $\frac{1}{4}$ (1/4)

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C

C

| | | UNLESS OTHERWISE SPECIFIED: | | | | | |
|---------------------------------|---------|---|--|--|-------------|----------------------|------|
| DIMENSIONS ARE IN INCHES | | | | | DRAWN | NAME | DATE |
| TOLERANCES: | | | | | CHECKED | | |
| FRACTIONAL: $\pm\frac{1}{16}$ | | | | | ENG APPR. | | |
| ANGULAR: MACH $\pm 1^\circ$ | | | | | 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:

Outrigger Wing Diagonal

SIZE DWG. NO. REV
B GE-18078

SCALE: 1:16 WEIGHT: SHEET 2 OF 4

4

3

2

1

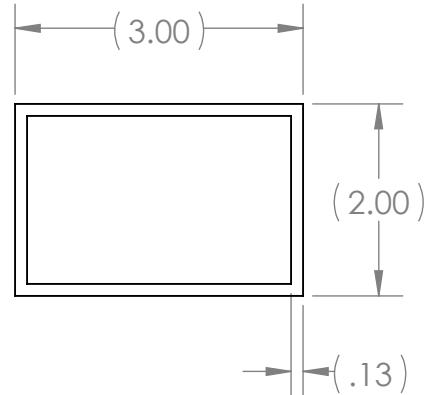
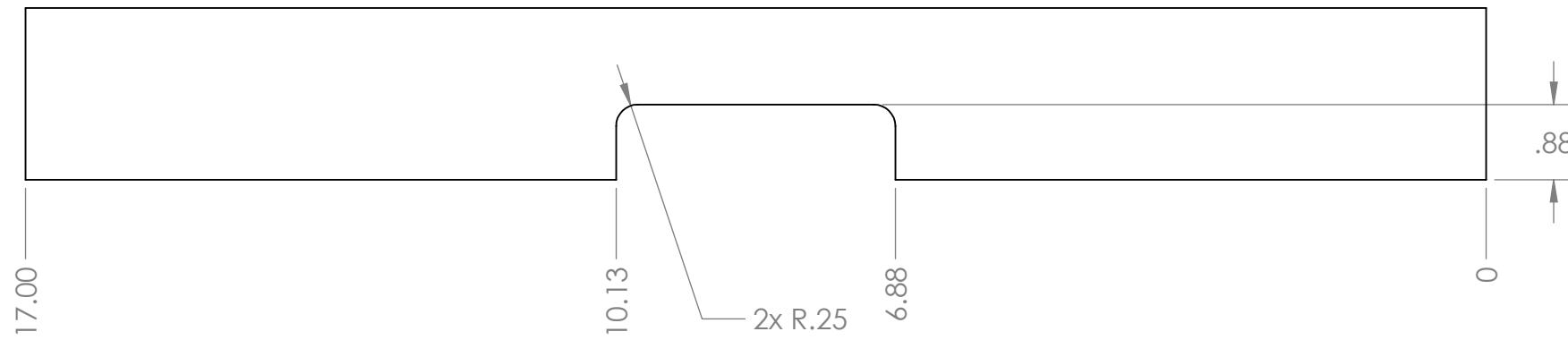
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3

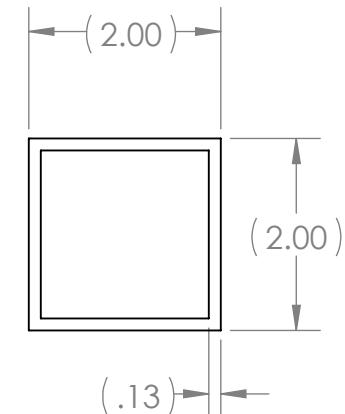
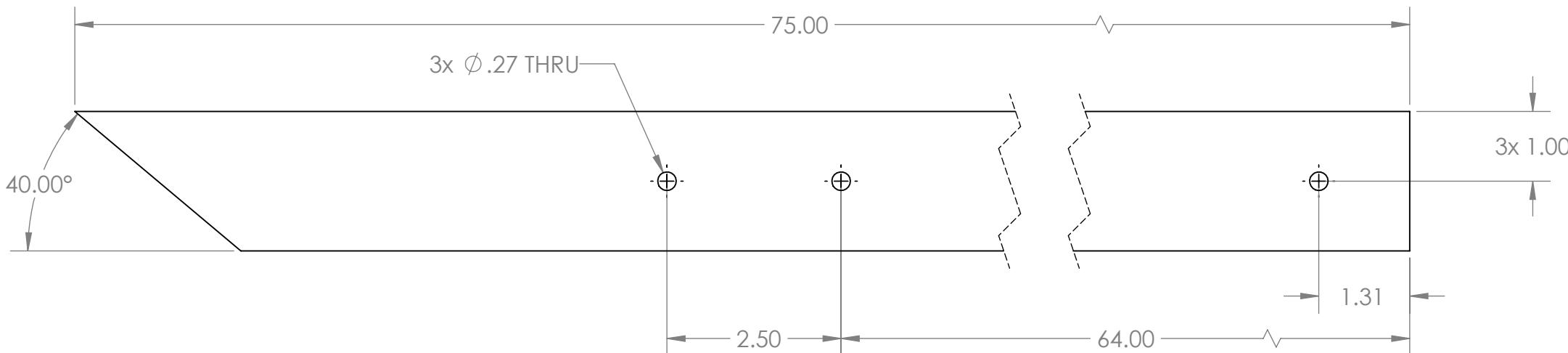
2

1

B



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



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

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
 Modeling Solutions Partner

Outrigger Wing Diagonal

| | | |
|------------|-----------------|--------------|
| B | GE-18078 | REV |
| SCALE: 1:2 | WEIGHT: | SHEET 3 OF 4 |

4

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1

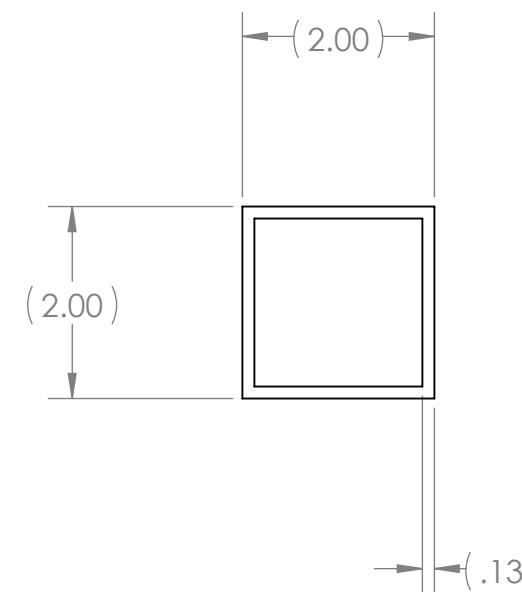
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4

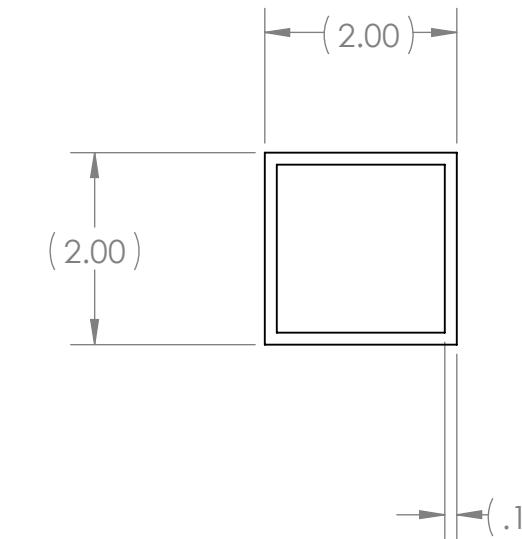
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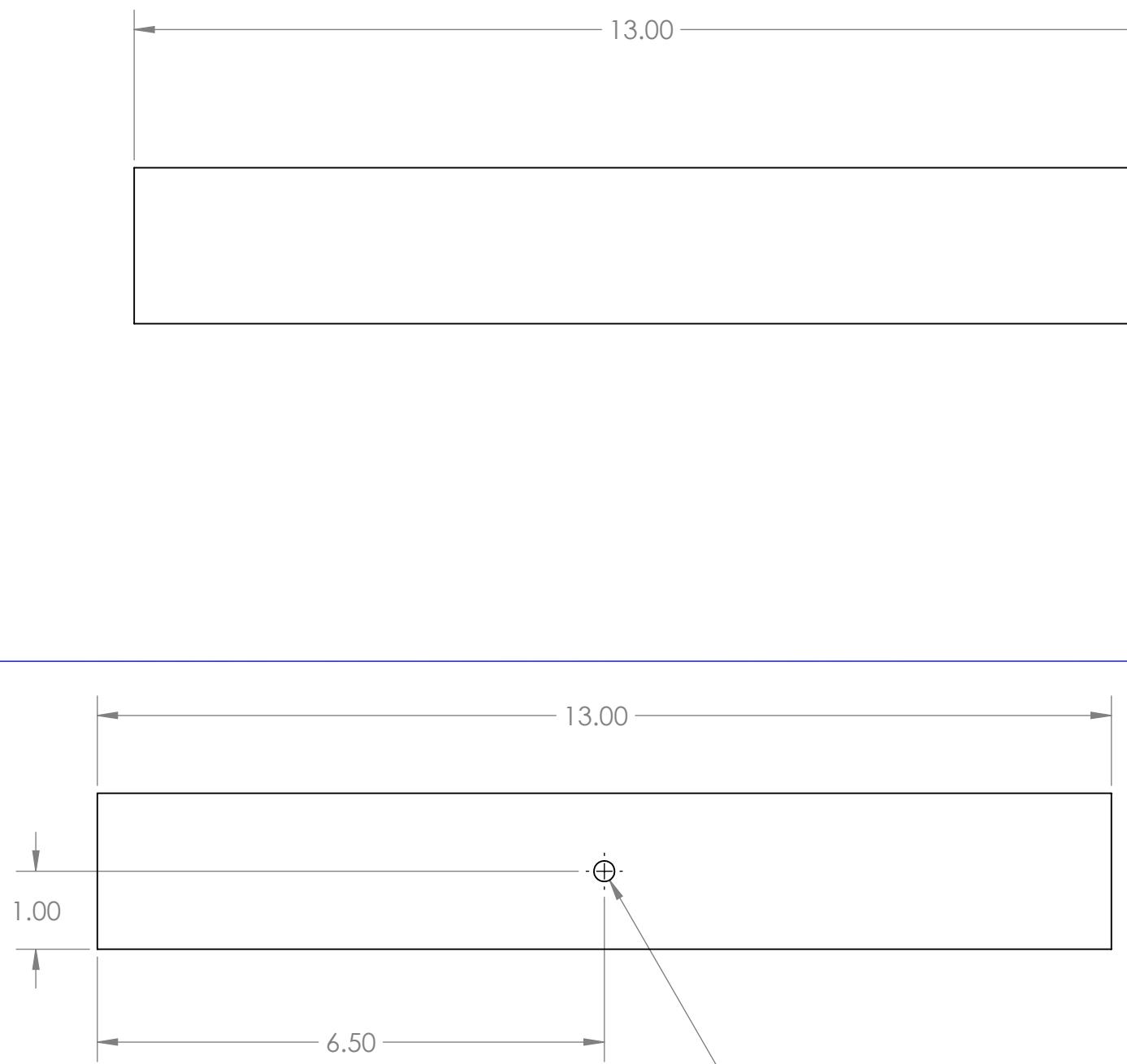
1



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



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



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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Outrigger Wing Diagonal

| | | |
|------------|-----------------|--------------|
| SIZE | DWG. NO. | REV |
| B | GE-18078 | |
| SCALE: 1:2 | WEIGHT: | SHEET 4 OF 4 |

4

3

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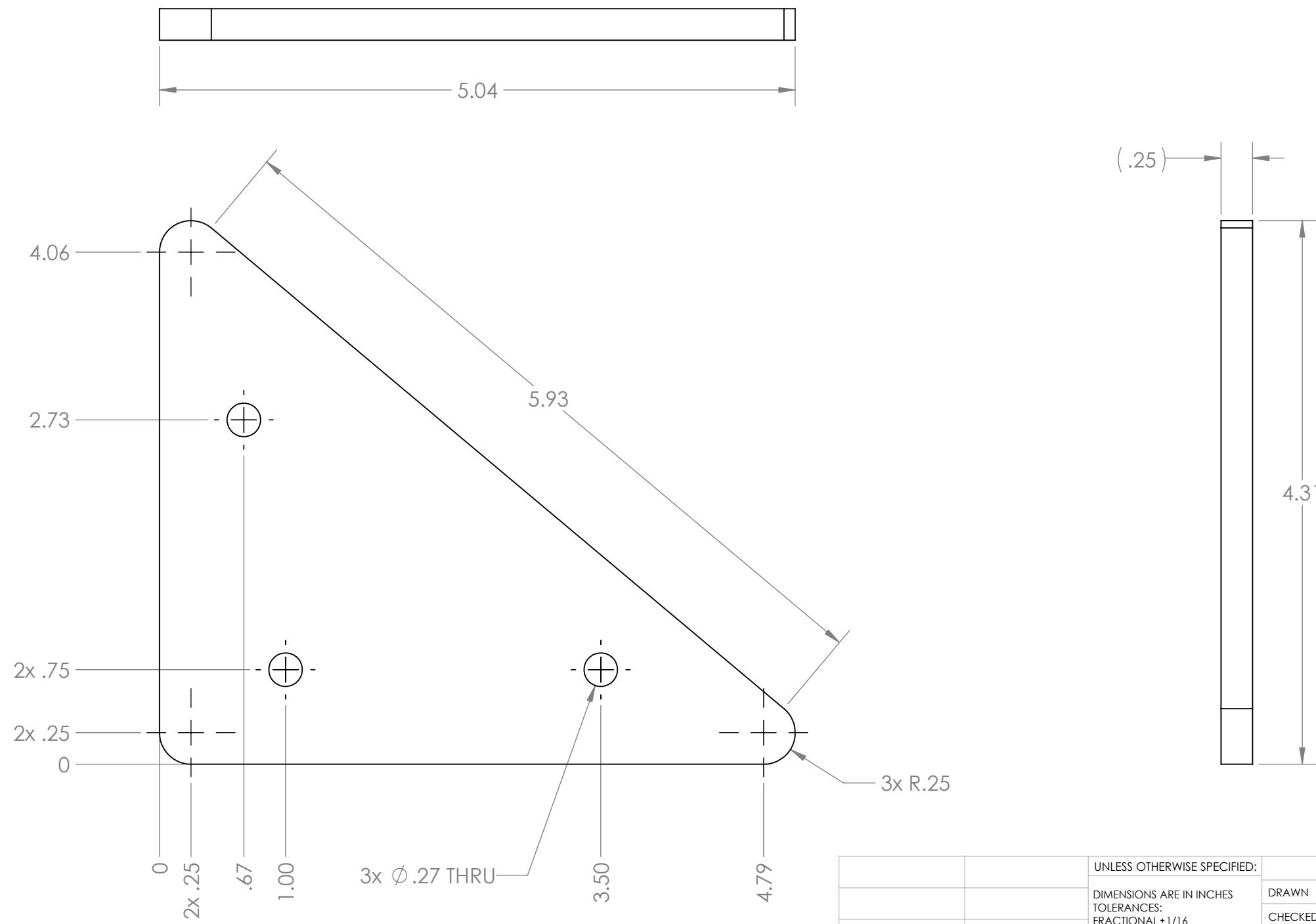
1

B

B

A

A



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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
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Title: Outrigger Wing Plate

| | | |
|------------|-----------------|--------------|
| SIZE | DWG. NO. | REV |
| B | GE-18079 | |
| SCALE: 1:1 | WEIGHT: | SHEET 1 OF 1 |

4

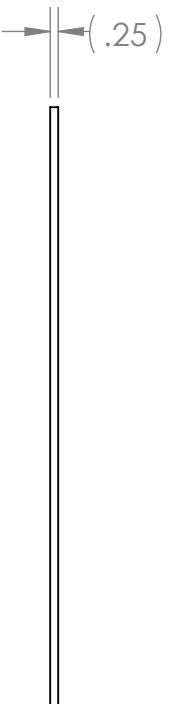
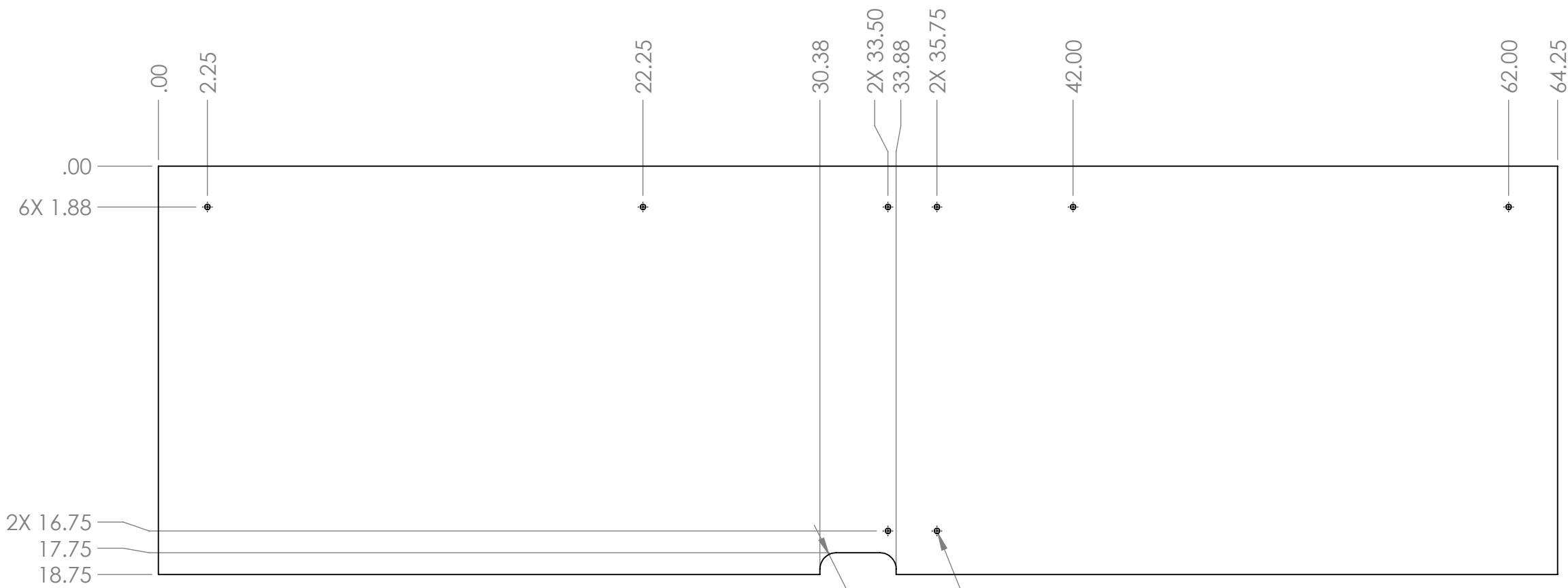
3

2

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B

B



Notes:

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

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|---|---|--|-----------------|------------|-----------|
| | | DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL ±1/16 ANGULAR: MACH ±1° BEND ±1° TWO PLACE DECIMAL ±.01 THREE PLACE DECIMAL ±.001 | | | |
| | | INTERPRET GEOMETRIC TOLERANCING PER: | | Q.A. | COMMENTS: |
| | | | | | |
| | | MATERIAL | | | |
| NEXT ASSY | USED ON | FINISH | | | |
| APPLICATION | | DO NOT SCALE DRAWING | | | |
| FIRST ROBOTICS COMPETITION | SOLIDWORKS Modeling Solutions Partner | TITLE: Fence Polycarb, Middle | | | |
| B | GE-18080 | SIZE | DWG. NO. | REV | |
| SCALE: 1:6 | WEIGHT: | SHEET 1 OF 1 | | | |

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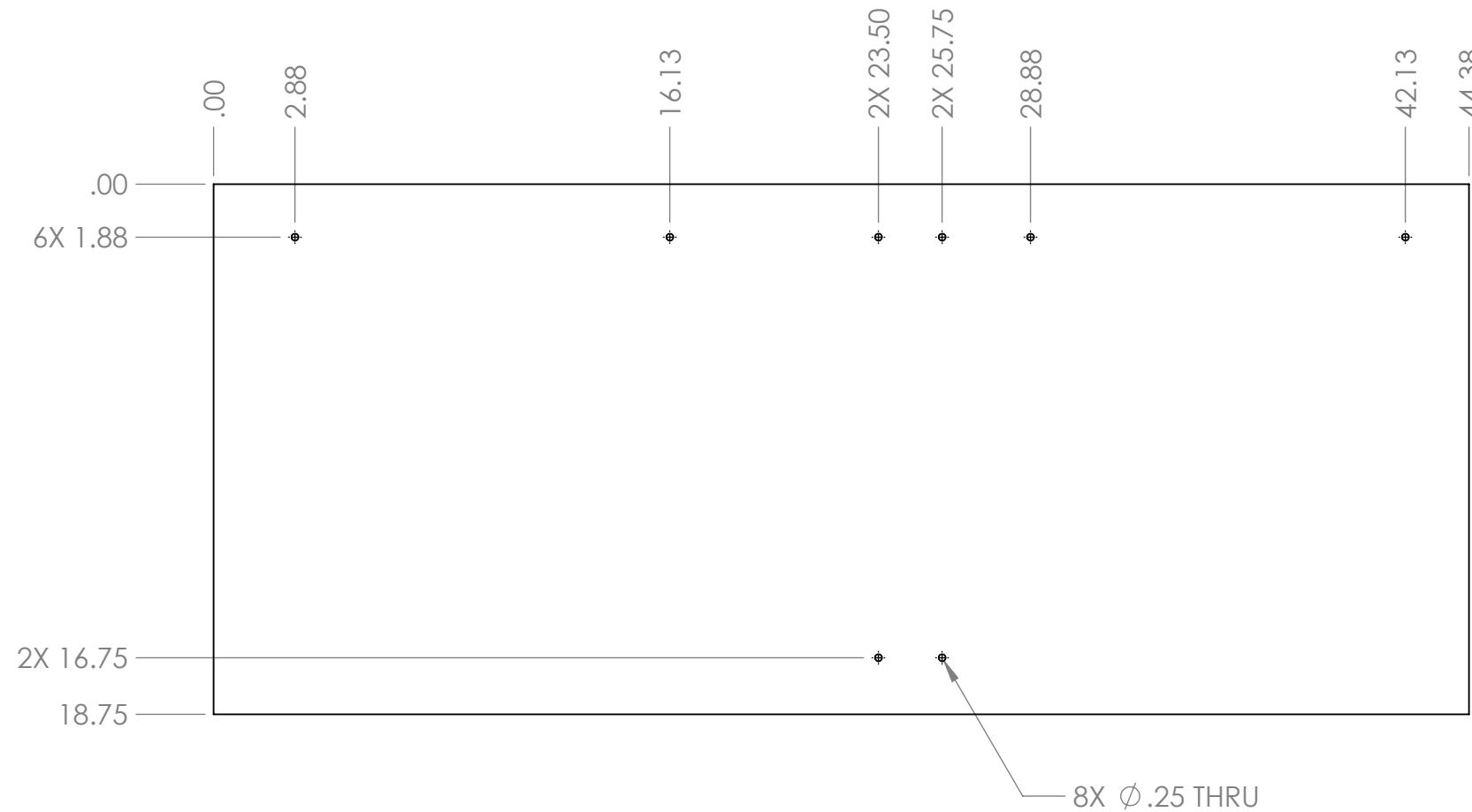
3

2

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B

B



Notes:

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

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Fence Polycarb, Outer Side

SIZE **DWG. NO.** **REV**
B **GE-18081**

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

4

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4

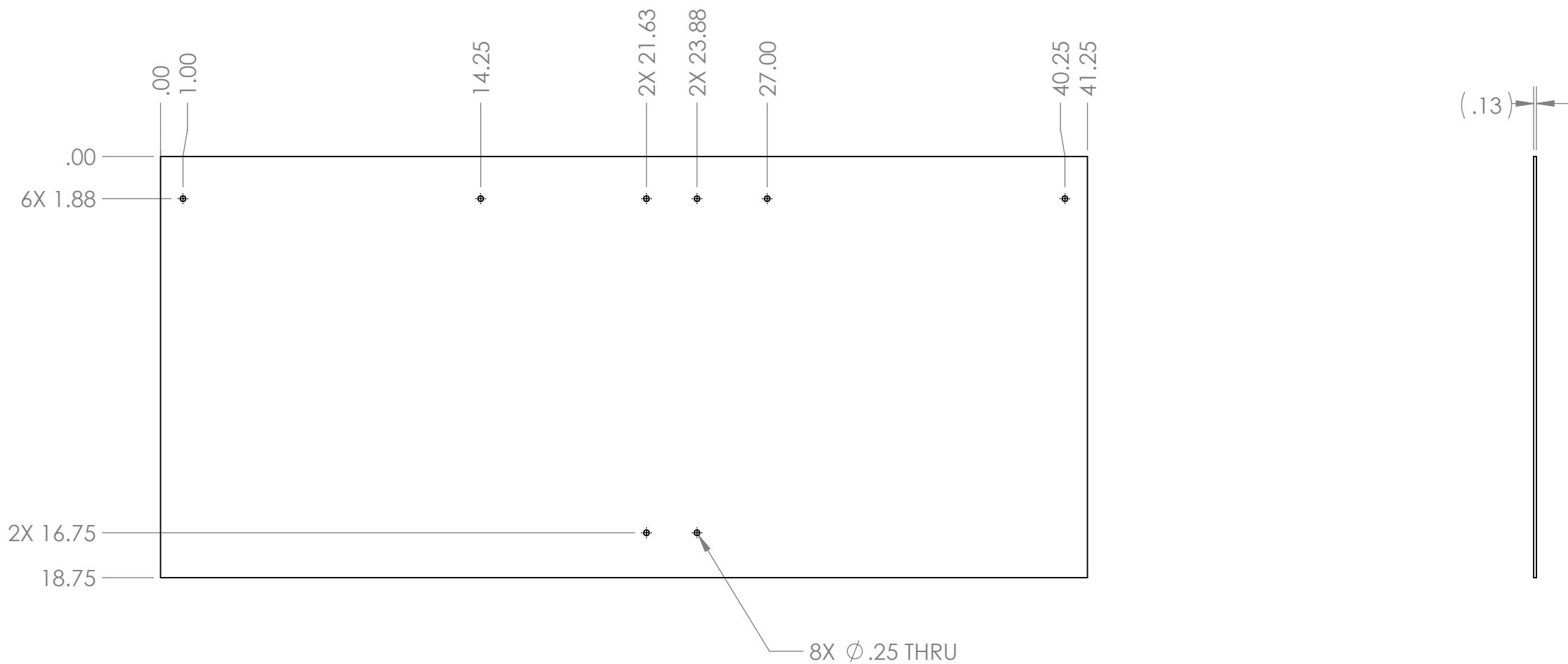
3

2

1

B

B



A

A

Notes:

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

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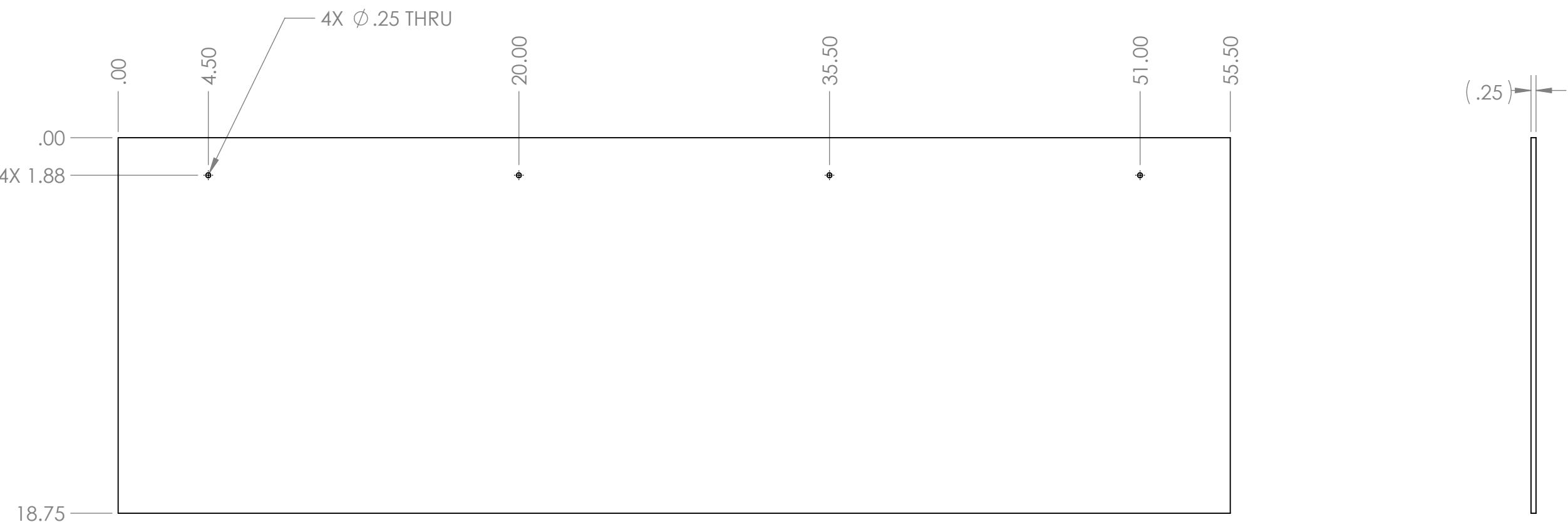
| | | UNLESS OTHERWISE SPECIFIED: | | DRAWN | NAME | DATE | |
|-------------|-----------------|--|-----------------|------------|-----------|-----------|--|
| | | DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL ±1/16 ANGULAR: MACH ±1° BEND ±1° TWO PLACE DECIMAL ±.01 THREE PLACE DECIMAL ±.001 | | | | | |
| | | INTERPRET GEOMETRIC TOLERANCING PER: | | CHECKED | ENG APPR. | MFG APPR. | |
| | | MATERIAL | | | | | |
| NEXT ASSY | USED ON | FINISH | | Q.A. | COMMENTS: | | |
| APPLICATION | | DO NOT SCALE DRAWING | | | | | |
| B | GE-18082 | SIZE | DWG. NO. | REV | | | |
| SCALE: 1:6 | WEIGHT: | SHEET 1 OF 1 | | | | | |

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

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| NEXT ASSY | USED ON | INTERPRET GEOMETRIC TOLERANCING PER: | | ENG APPR. | MFG APPR. |
| | | MATERIAL | | | |
| | | FINISH | | | |
| APPLICATION | | DO NOT SCALE DRAWING | | | |
| B | GE-18083 | | | | |
| SCALE: 1:6 | WEIGHT: | SHEET 1 OF 1 | | | |



**Fence Polycarb,
Outer End**

SIZE DWG. NO. REV
B GE-18083

SCALE: 1:6 WEIGHT: SHEET 1 OF 1

4

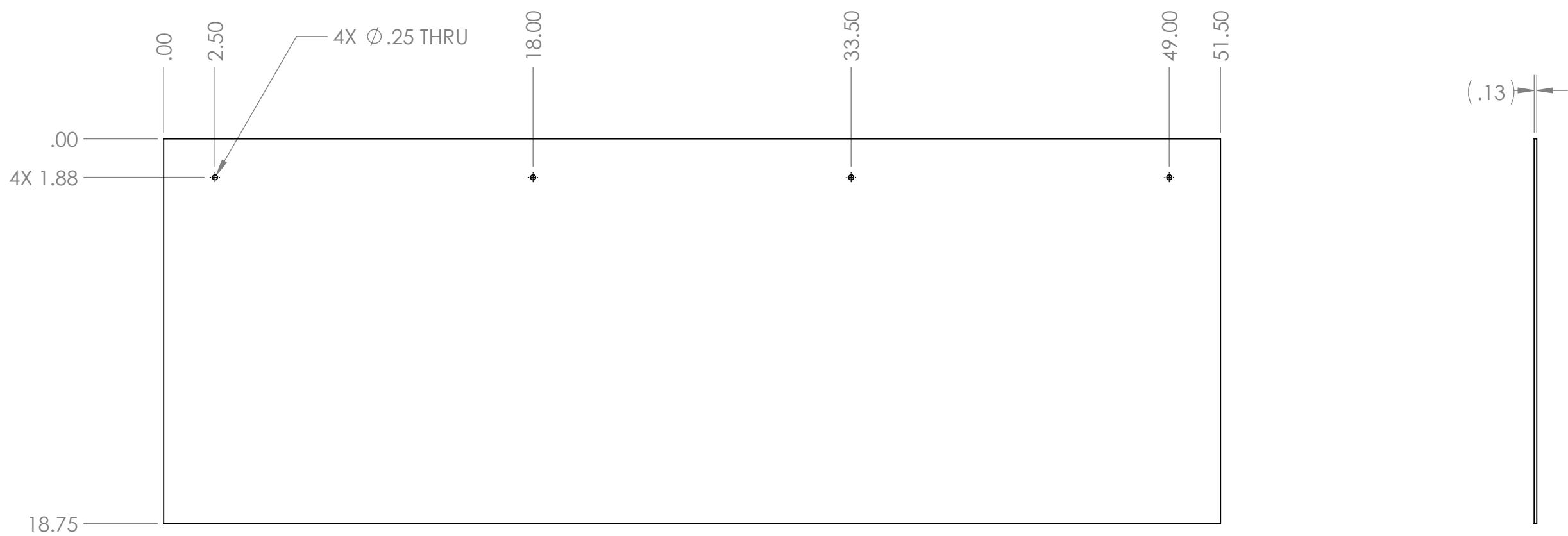
3

2

1

B

B



A

A

Notes:

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

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|-------------|----------------------|--|--|------|------|
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| | | DRAWN | | | |
| | | CHECKED | | | |
| | | ENG APPR. | | | |
| | | MFG APPR. | | | |
| | | Q.A. | | | |
| | | COMMENTS: | | | |
| | | MATERIAL | | | |
| | | FINISH | | | |
| NEXT ASSY | USED ON | | | | |
| APPLICATION | DO NOT SCALE DRAWING | | | | |
| B | GE-18084 | | | | |
| SCALE: 1:6 | WEIGHT: | | | | |
| | | SHEET 1 OF 1 | | | |

4

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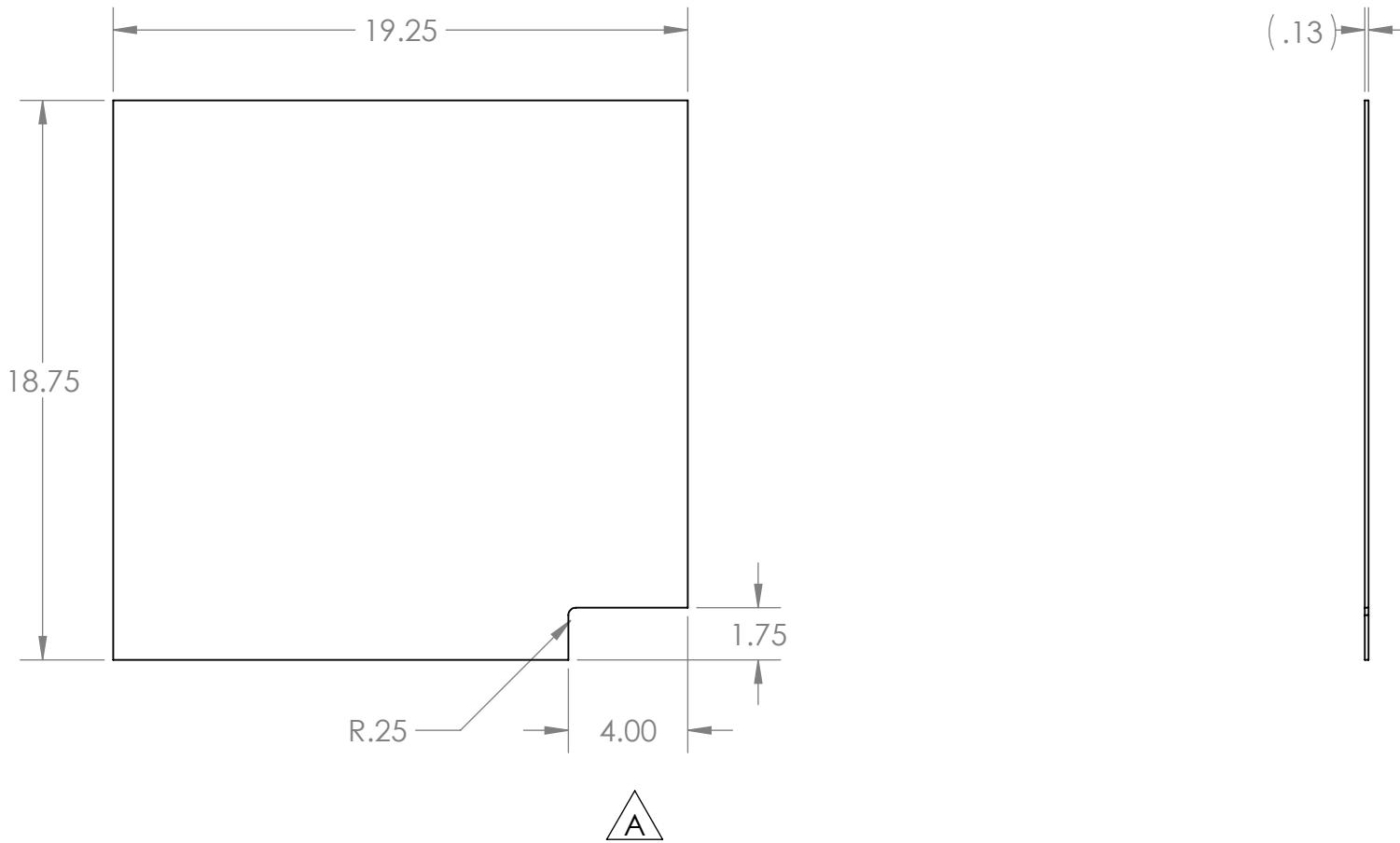
1

REVISIONS

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

B

B



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

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

4

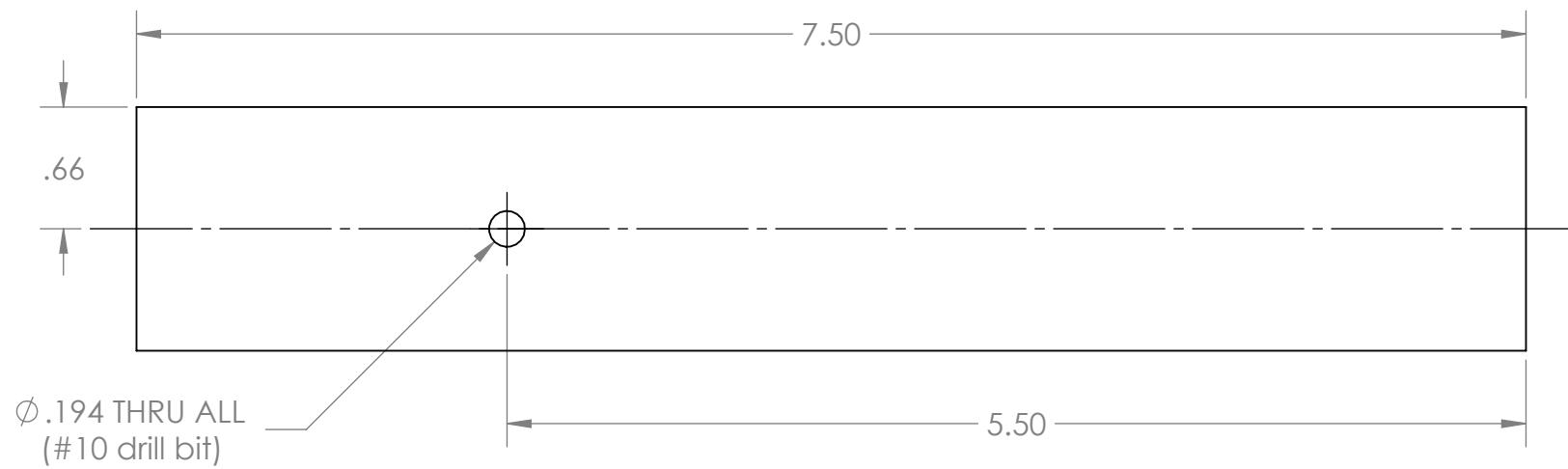
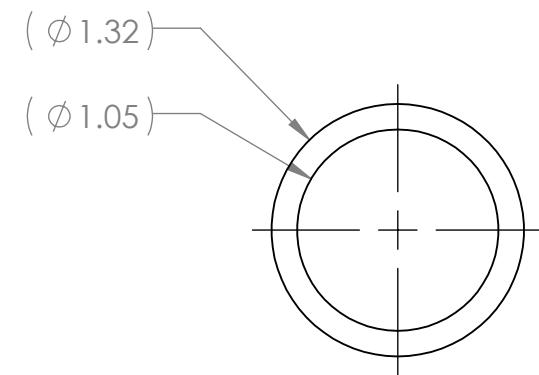
3

2

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B

B



Notes:

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

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|-------------|-----------------|--|--|---|--|
| | | DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL ±1/16 ANGULAR: MACH ±1° BEND ±1° TWO PLACE DECIMAL ±.01 THREE PLACE DECIMAL ±.001 | | | |
| | | INTERPRET GEOMETRIC TOLERANCING PER: | | | |
| | | MATERIAL | | | |
| NEXT ASSY | USED ON | FINISH | | | |
| APPLICATION | | DO NOT SCALE DRAWING | | | |
| B | GE-18086 | A | | SIZE DWG. NO. REV | |
| SCALE: 1:1 | | WEIGHT: | | SHEET 1 OF 1 | |

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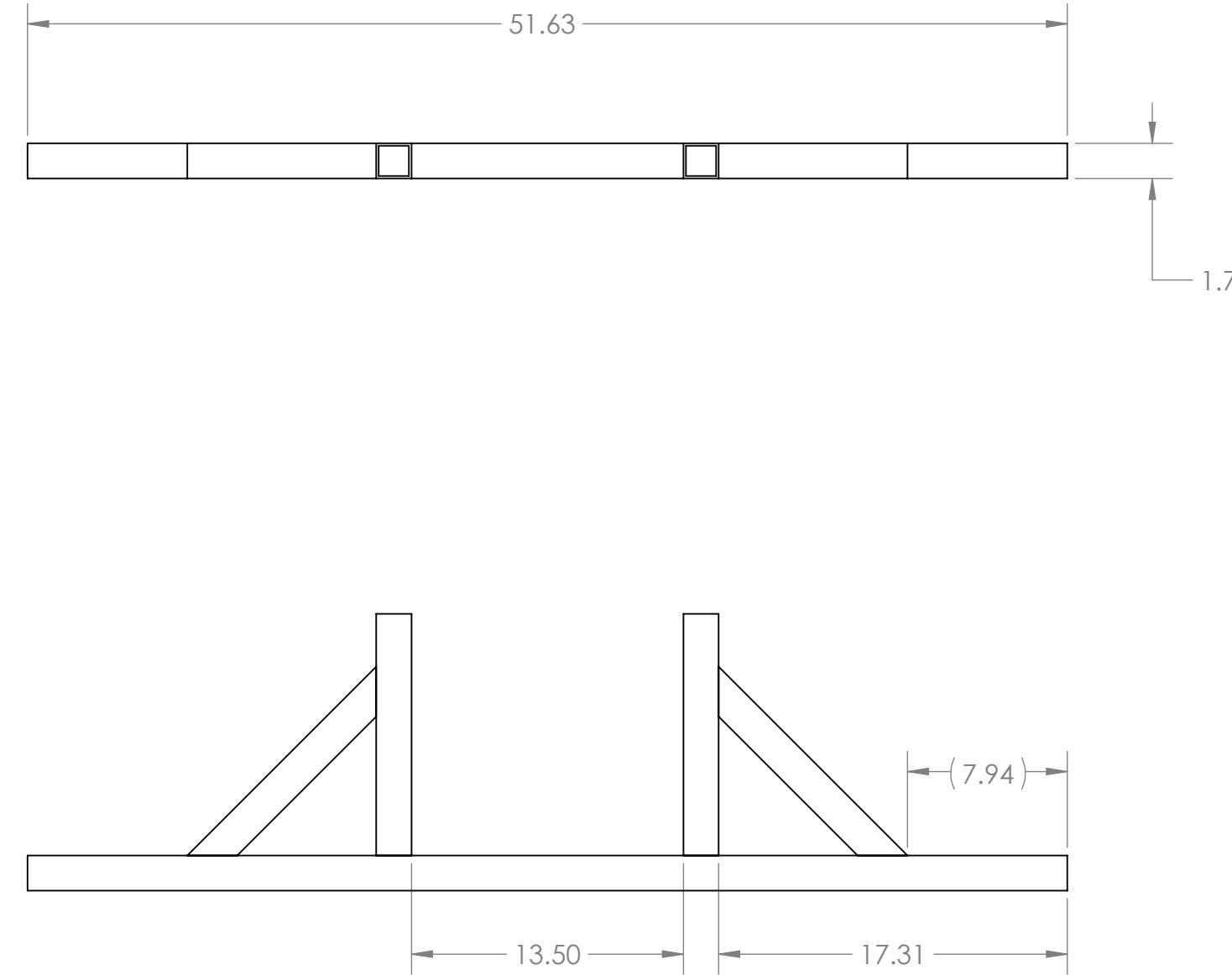
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B

B



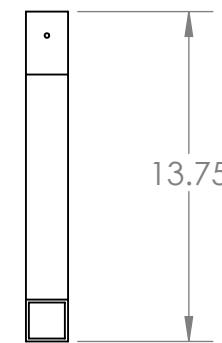
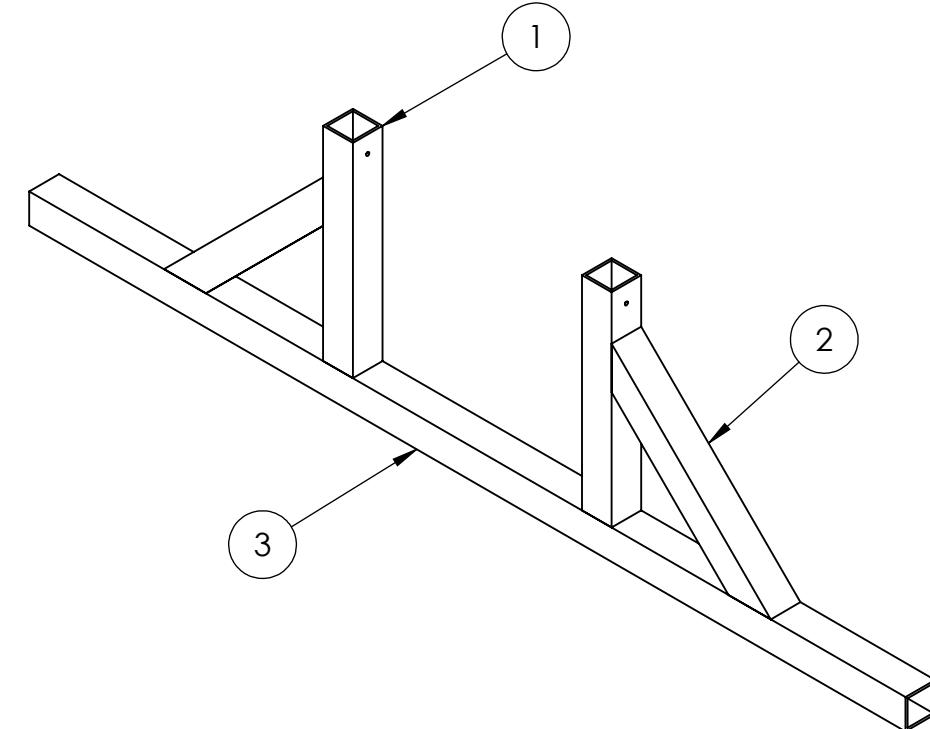
A

A

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

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| | | DRAWN | | |
| | | CHECKED | | |
| | | ENG APPR. | | |
| | | MFG APPR. | | |
| | | Q.A. | | |
| | | COMMENTS: | | |
| | | MATERIAL | | |
| | | FINISH | | |
| | NEXT ASSY | USED ON | | |
| | | APPLICATION | DO NOT SCALE DRAWING | |
| SIZE | DWG. NO. | | REV | |
| B | GE-18087 | | | |
| SCALE: 1:8 | WEIGHT: | | SHEET 1 OF 3 | |



FIRST ROBOTICS COMPETITION
SOLIDWORKS
Modeling Solutions Partner

Switch Fence Brace

SIZE DWG. NO. REV
B GE-18087

SCALE: 1:8 WEIGHT: SHEET 1 OF 3

4

3

2

1

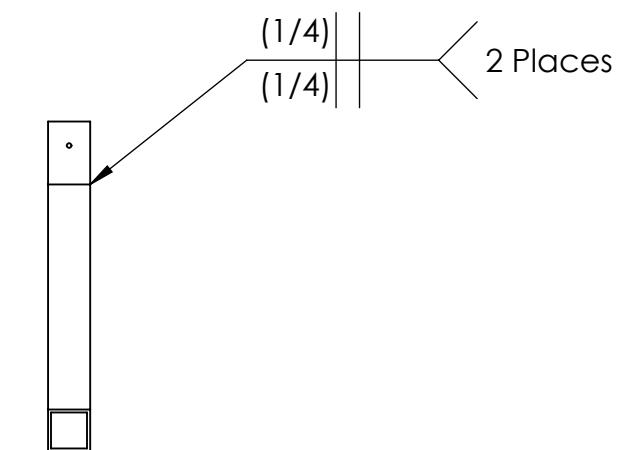
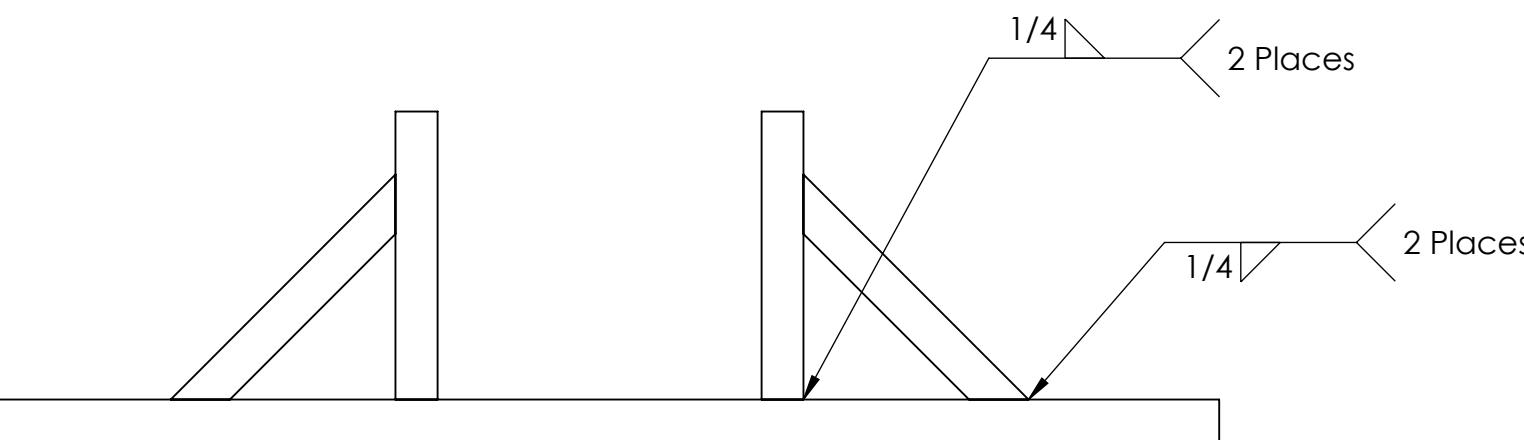
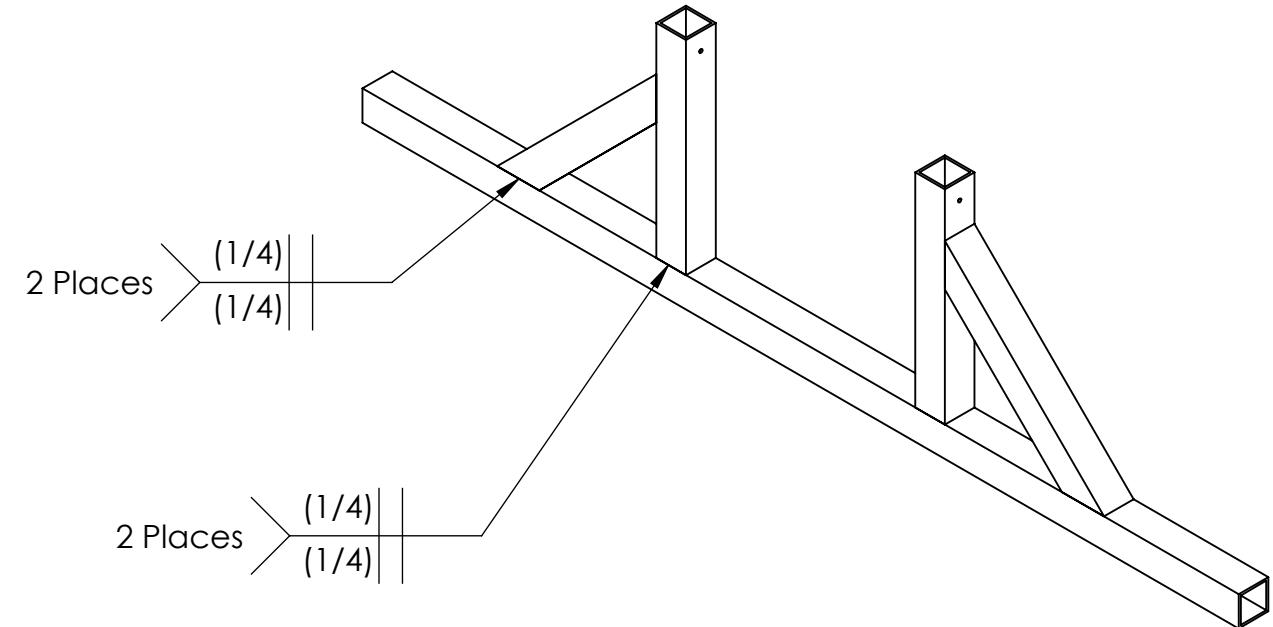
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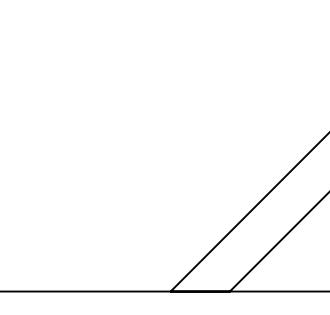
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| TOLERANCES: | | | | |
| FRACTIONAL: $\pm 1/16$ | | | | |
| ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ | | | | |
| TWO PLACE DECIMAL $\pm .01$ | | | | |
| THREE PLACE DECIMAL $\pm .001$ | | | | |
| INTERPRET GEOMETRIC TOLERANCING PER: | | | | |
| MATERIAL | | | | |
| NEXT ASSY | USED ON | FINISH | | |
| APPLICATION | | DO NOT SCALE DRAWING | | |
| TITLE: Switch Fence Brace | | | | |
| SIZE B | DWG. NO. GE-18087 | REV | | |
| SCALE: 1:8 | WEIGHT: | SHEET 2 OF 3 | | |

4

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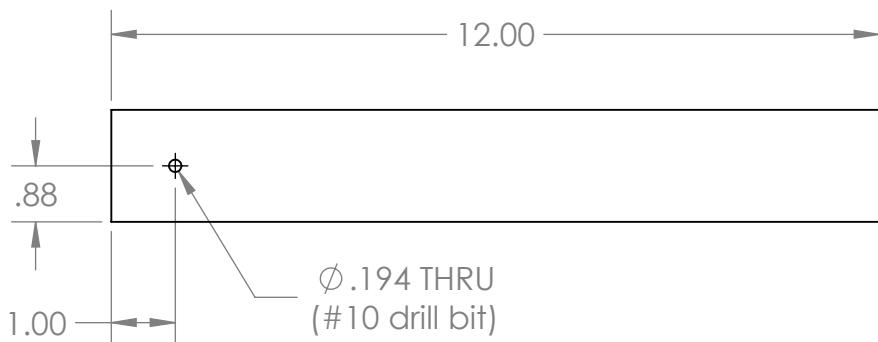
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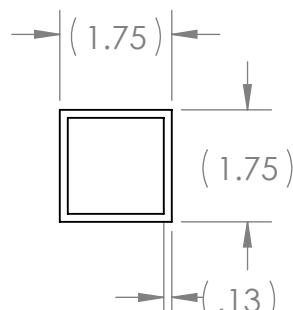
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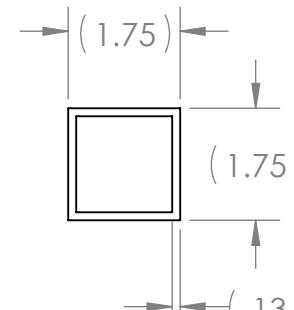
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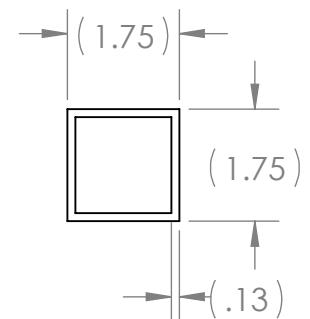
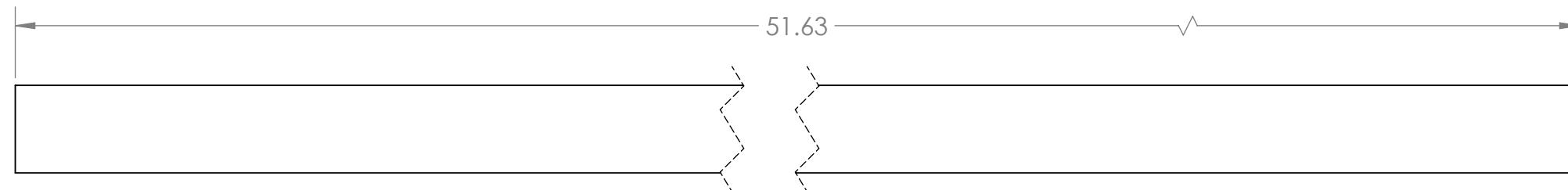
Item: GE-18087-1
Material: 1.75" x .125" thk. Square Tube, 6063 Aluminum
QTY: 2



A technical drawing of a trapezoidal structure. The top horizontal side is labeled "13.26". The left vertical side has an angle of "45.0°" indicated by a dashed line and arrow. The right vertical side is labeled "45.00". The bottom horizontal side is straight.



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



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

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| | | DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$ | DRAWN | | | |
| | | | CHECKED | | | |
| | | | ENG APPR. | | | |
| | | | MFG APPR. | | | |
| | | INTERPRET GEOMETRIC TOLERANCING PER: | Q.A. | | | |
| | | MATERIAL | COMMENTS: | | | |
| NEXT ASSY | USED ON | FINISH | | | | |
| APPLICATION | | DO NOT SCALE DRAWING | SCALE: 1:3 | | WEIGHT: | SHEET 3 OF 3 |
| SIZE | | DWG. NO. | | REV | | |
| B | | GE-18087 | | | | |

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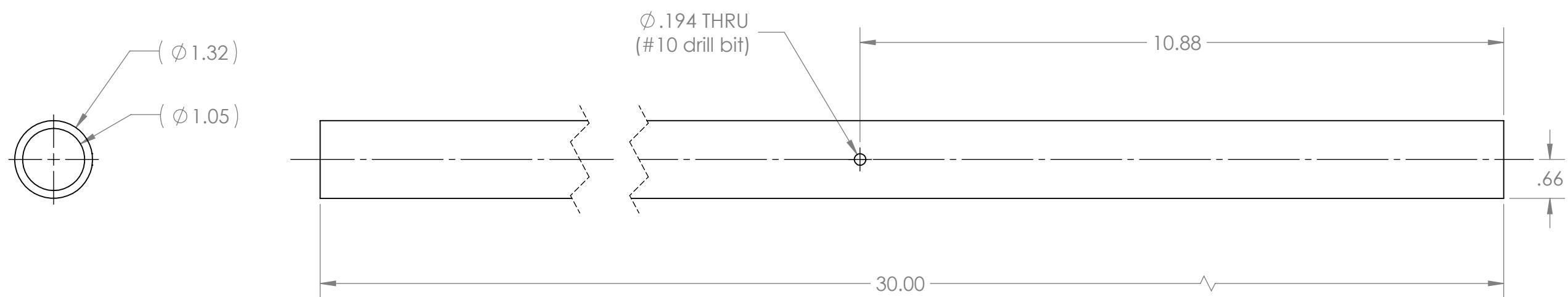
3

2

1

B

B



Notes:

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

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

**Switch Fence
Brace Pin**

| | | |
|------------|-----------------|--------------|
| SIZE | DWG. NO. | REV |
| B | GE-18088 | |
| SCALE: 1:2 | WEIGHT: | SHEET 1 OF 1 |

4

3

2

1

4

3

2

1

B

B



A

A

Notes:

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

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| | | UNLESS OTHERWISE SPECIFIED: | | NAME daf | DATE 11/26/17 | |
|-------------|---------|---|--|------------------------|------------------|--|
| | | DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$ | | | | |
| | | INTERPRET GEOMETRIC TOLERANCING PER: | | ENG APPR. MFG APPR. | Q.A. | |
| | | MATERIAL | | | | |
| NEXT ASSY | USED ON | FINISH | | COMMENTS: | | |
| APPLICATION | | DO NOT SCALE DRAWING | | | | |
| B | | GE-18090 | | SIZE DWG. NO. REV | | |
| SCALE: 1:4 | | WEIGHT: | | SHEET 1 OF 1 | | |

 **FIRST**
ROBOTICS
COMPETITION

 **SOLIDWORKS**
Modeling Solutions Partner

TITLE:
Roller, Conveyor

4

3

2

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4

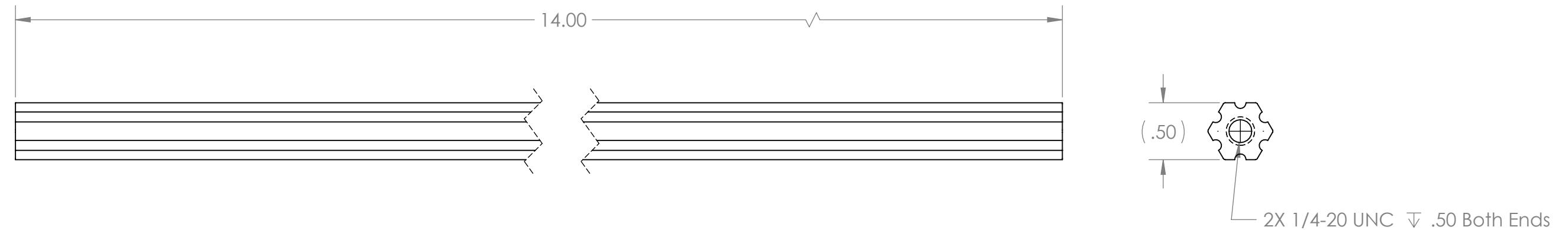
3

2

1

B

B



A

A

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

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| | | | | | |
|-------------|----------------------|--|-----|----------|--------------|
| | | UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$ | | NAME | DATE |
| | | DRAWN | DAF | 11/26/17 | |
| | | CHECKED | | | |
| | | ENG APPR. | | | |
| | | MFG APPR. | | | |
| | | Q.A. | | | |
| | | COMMENTS: | | | |
| | | MATERIAL | | | |
| | | FINISH | | | |
| NEXT ASSY | USED ON | | | | |
| APPLICATION | DO NOT SCALE DRAWING | | | | |
| SIZE | DWG. NO. | | | | REV |
| B | GE-18091 | | | | |
| SCALE: 1:1 | WEIGHT: | | | | SHEET 1 OF 1 |

4

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4

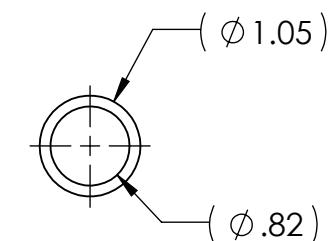
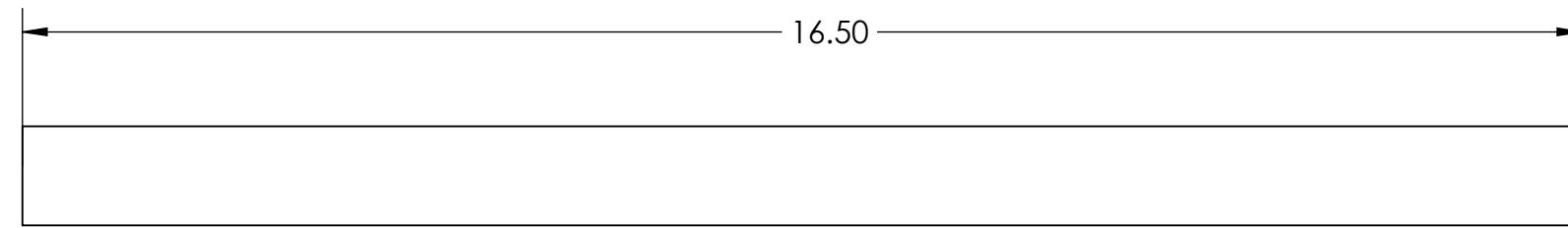
3

2

1

B

B



Notes:

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

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

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

Handle, Chute

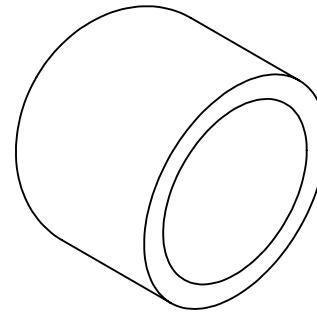
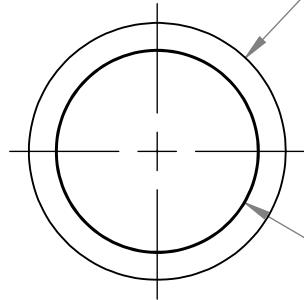
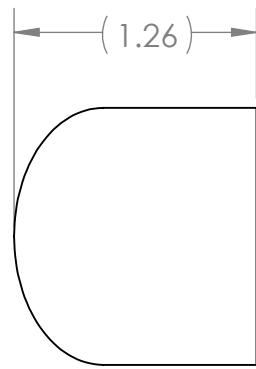
4

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B



B

Notes:

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

A

| | | UNLESS OTHERWISE SPECIFIED: | | | NAME | DATE |
|-------------|---------|--------------------------------------|--|-----------|------|------|
| | | 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 | | | | |

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TITLE:

End Cap, PVC

| | | |
|------------|-----------------|--------------|
| SIZE | DWG. NO. | REV |
| A | GE-18093 | |
| SCALE: 1:1 | WEIGHT: | SHEET 1 OF 1 |

4

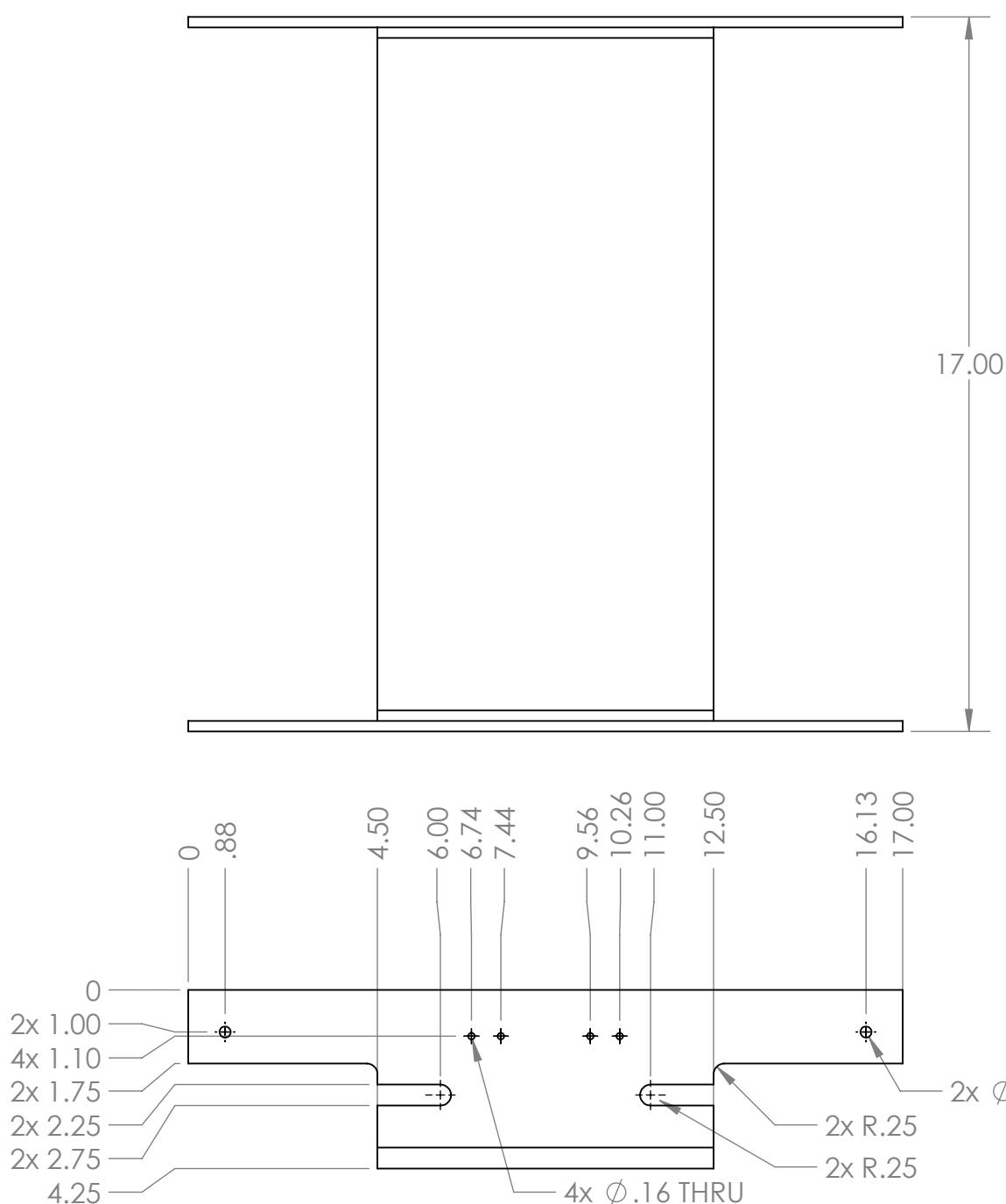
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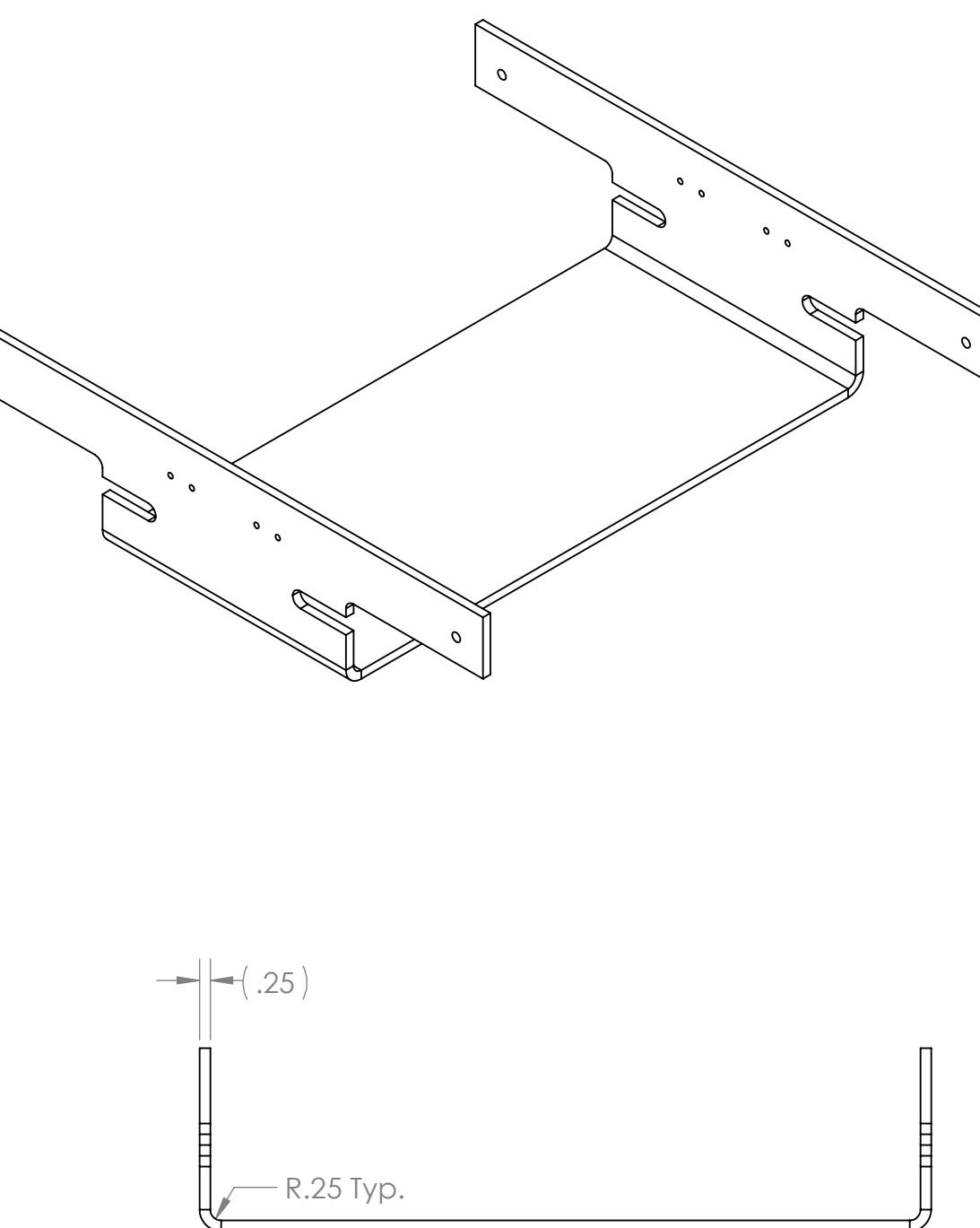
B



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

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| | | | | |
|--|-------------|--|--|---|
| | | UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL: ±1/16 ANGULAR: MACH ±1° BEND ±1° TWO PLACE DECIMAL: ±.01 THREE PLACE DECIMAL: ±.001 | NAME DRAWN CHECKED ENG APPR. MFG APPR. | DATE Casey O'Connor 11/28/2017 |
| | | INTERPRET GEOMETRIC TOLERANCING PER: MATERIAL | Q.A. COMMENTS: | TITLE: Scale Sensor Mount |
| | NEXT ASSY | USED ON | FINISH | SIZE DWG. NO. B GE-18094 REV |
| | APPLICATION | DO NOT SCALE DRAWING | | SCALE: 1:4 WEIGHT: SHEET 1 OF 1 |



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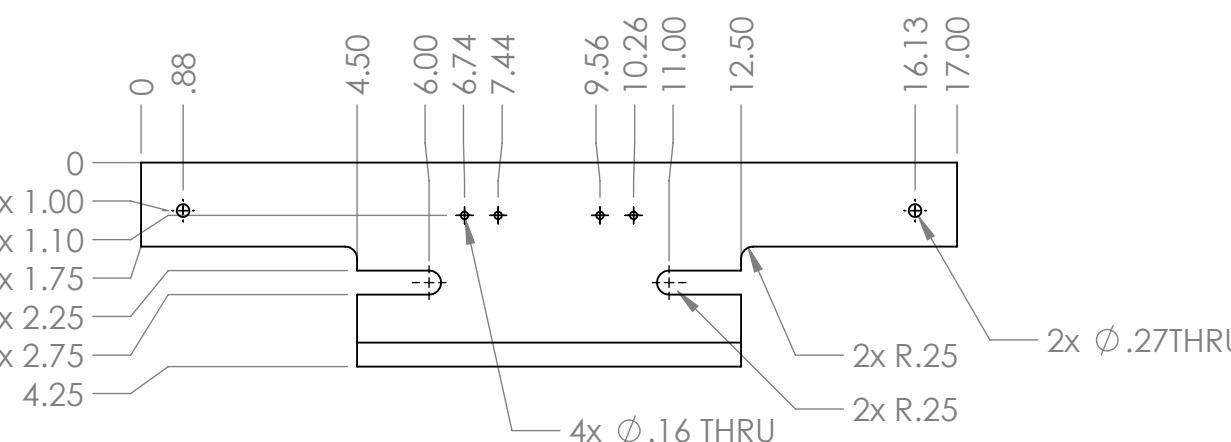
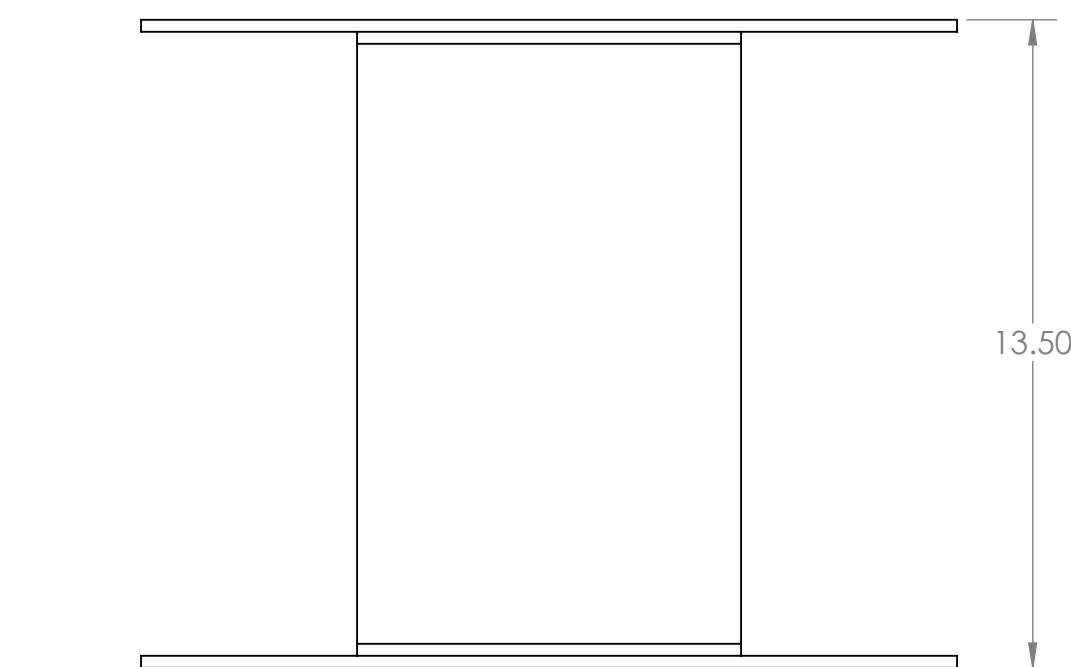
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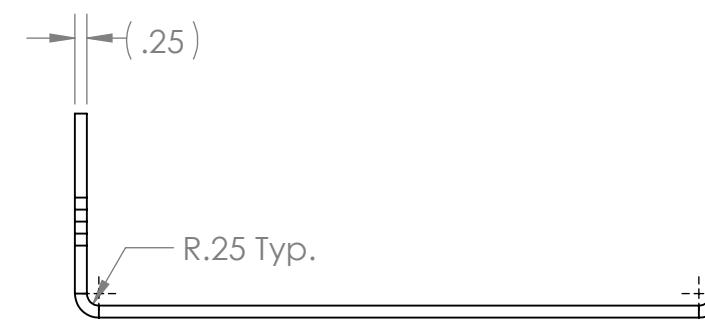
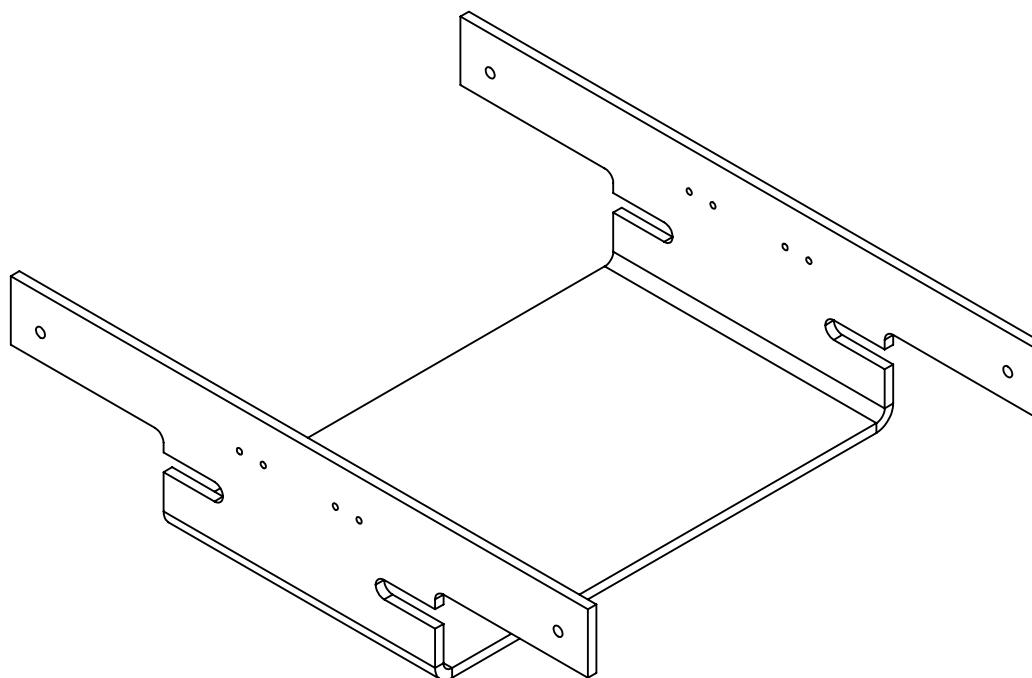
1

B



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

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|--|--|--|----------------------|------------|
| | | DRAWN | Casey O'Connor | 11/28/2017 |
| | | CHECKED | | |
| | | ENG APPR. | | |
| | | MFG APPR. | | |
| | | Q.A. | | |
| | | COMMENTS: | | |
| | | MATERIAL | | |
| | | NEXT ASSY | USED ON | FINISH |
| | | APPLICATION | DO NOT SCALE DRAWING | |

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Switch Sensor Mount

| | | |
|------------|-----------------|--------------|
| SIZE | DWG. NO. | REV |
| B | GE-18095 | |
| SCALE: 1:4 | WEIGHT: | SHEET 1 OF 1 |

4

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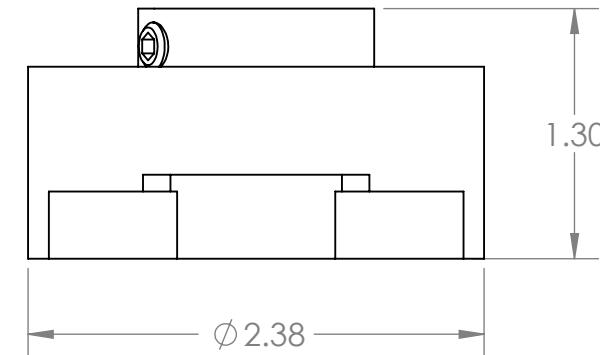
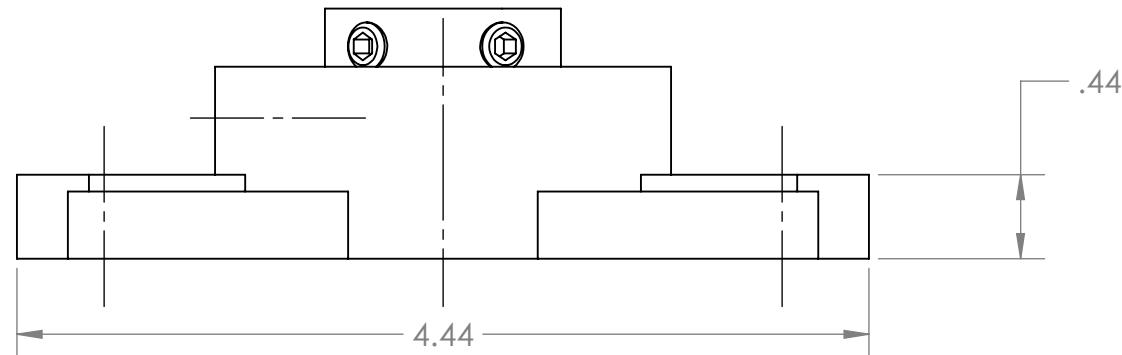
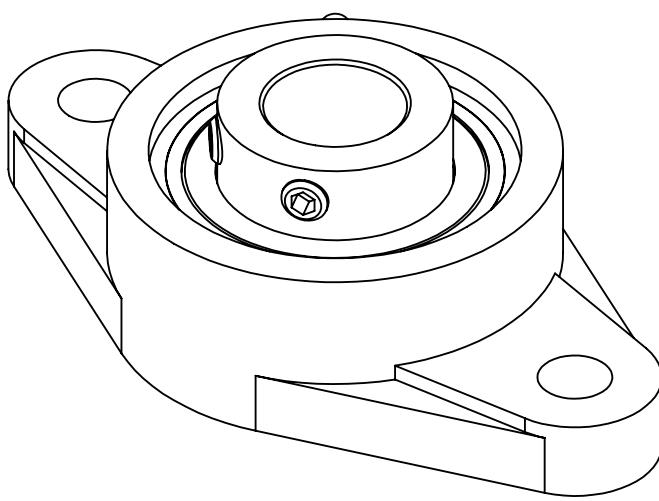
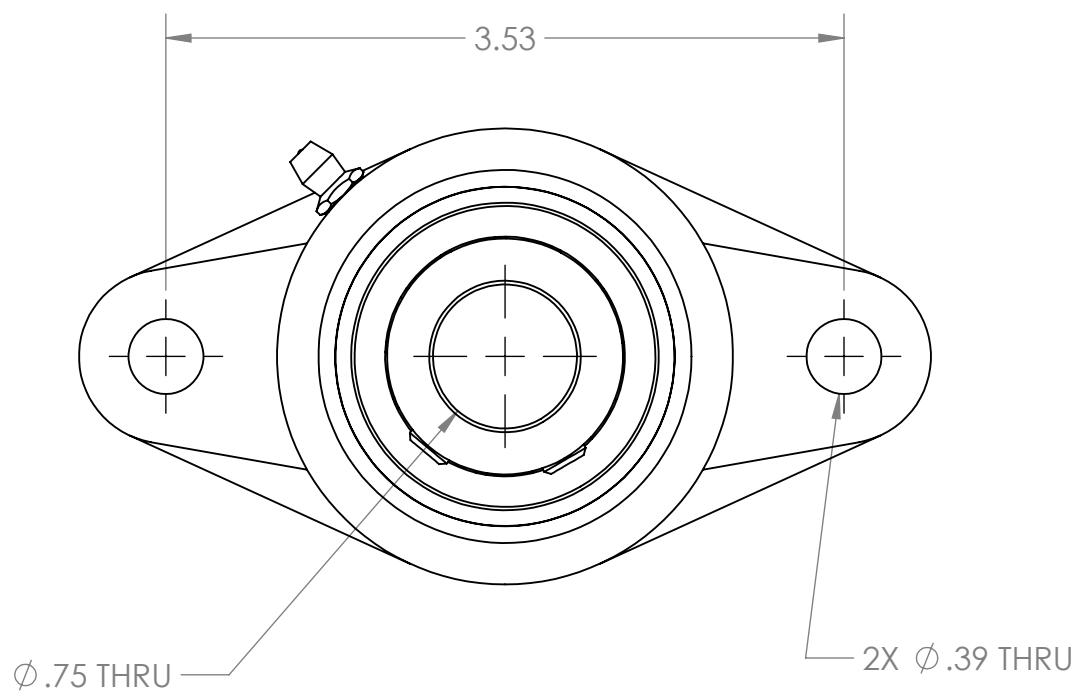
1

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B

B

A

A

Notes:

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

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Title: Scale/Switch Bearing
Size: B **Dwg. No.:** GE-18096 **Rev.:**

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

4

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2

1

A technical drawing of a circular component. The outermost boundary is a thick circle. Inside it is a thinner circle, and further in is a square cutout. Two small circles with cross-hairs, labeled "2X Ø.27 THRU", are located on the left and right sides of the component. Dimension lines indicate a height of ".50" from the bottom of the inner circle to the top of the outer circle, and a width of "3.23" across the entire outer circle. A vertical dimension line on the right indicates a height of ".50" from the bottom of the inner circle to the top of the outer circle.

A technical drawing of a rectangular component. The width of the main body is labeled as 3.74. The total height of the component is labeled as .45. There are small rectangular features at the top left and bottom right corners.

A diagram showing a circular coil with a central diamond-shaped core. The diamond shape is formed by two intersecting lines that meet at the center. The entire assembly is enclosed within concentric circles representing the coil's turns.

A diagram showing a long, thin, horizontal rectangle representing a component. A horizontal dimension line with arrows at both ends spans the width of the rectangle, labeled "2.76".

Notes

- Notes:

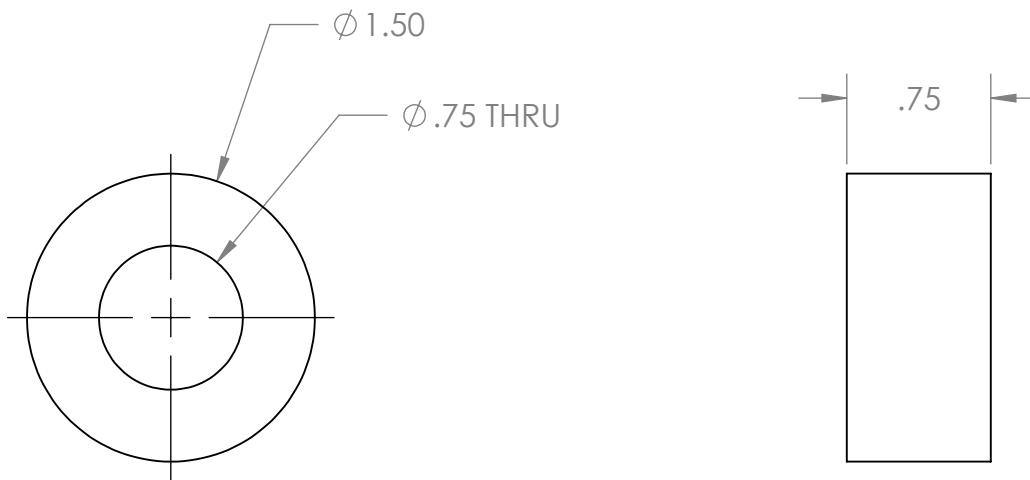
 1. Description: Rotary Speed Limiter, Opening for Square shaft, 1437 in.-oz Maximum Torque
 2. Source: McMaster-Carr
 3. Item #: 6597K24
 4. Equivalent substitutions allowed

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| | | | | | | | | |
|-------------|---------|--|------------|----------|--------------|--|---|--|
| | | UNLESS OTHERWISE SPECIFIED: | | NAME | DATE |  FIRST ROBOTICS COMPETITION | TITLE: <h1>Scale/Switch Damper</h1> | |
| | | DIMENSIONS ARE IN INCHES | DRAWN | | | | | |
| | | TOLERANCES: | CHECKED | | | | | |
| | | FRACTIONAL $\pm 1/16$ | ENG APPR. | | | | | |
| | | ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ | MFG APPR. | | | | | |
| | | TWO PLACE DECIMAL $\pm .01$ | Q.A. | | | | | |
| | | THREE PLACE DECIMAL $\pm .001$ | COMMENTS: | | | | | |
| | | INTERPRET GEOMETRIC TOLERANCING PER: | | | | | | |
| | | MATERIAL | | | | | | |
| NEXT ASSY | USED ON | FINISH | | | | | | |
| APPLICATION | | DO NOT SCALE DRAWING | | | | | | |
| | | | SCALE: 1:1 | WEIGHT: | SHEET 1 OF 1 | REV | | |
| | | | B | GE-18097 | | | | |

B

B



Notes:

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

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

 **FIRST**
ROBOTICS
COMPETITION 
SOLIDWORKS
Modeling Solutions Partner

TITLE:

Switch Shaft Spacer

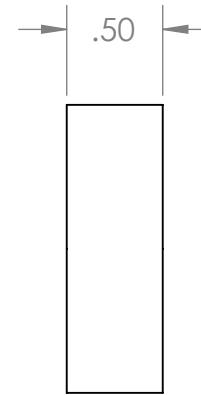
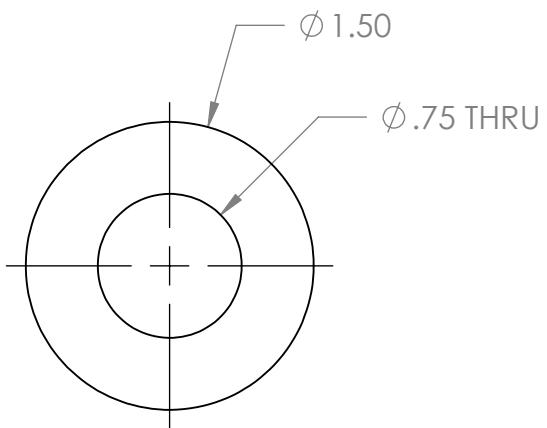
| SIZE | DWG. NO. | REV |
|------------|-----------------|--------------|
| A | GE-18098 | |
| SCALE: 1:1 | WEIGHT: | SHEET 1 OF 1 |

2

1

B

B



Notes:

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

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

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 **FIRST**
ROBOTICS
COMPETITION

 **SOLIDWORKS**
Modeling Solutions Partner

TITLE:

Scale Shaft Spacer

| SIZE | DWG. NO. | REV |
|------------|-----------------|--------------|
| A | GE-18099 | |
| SCALE: 1:1 | WEIGHT: | SHEET 1 OF 1 |

4

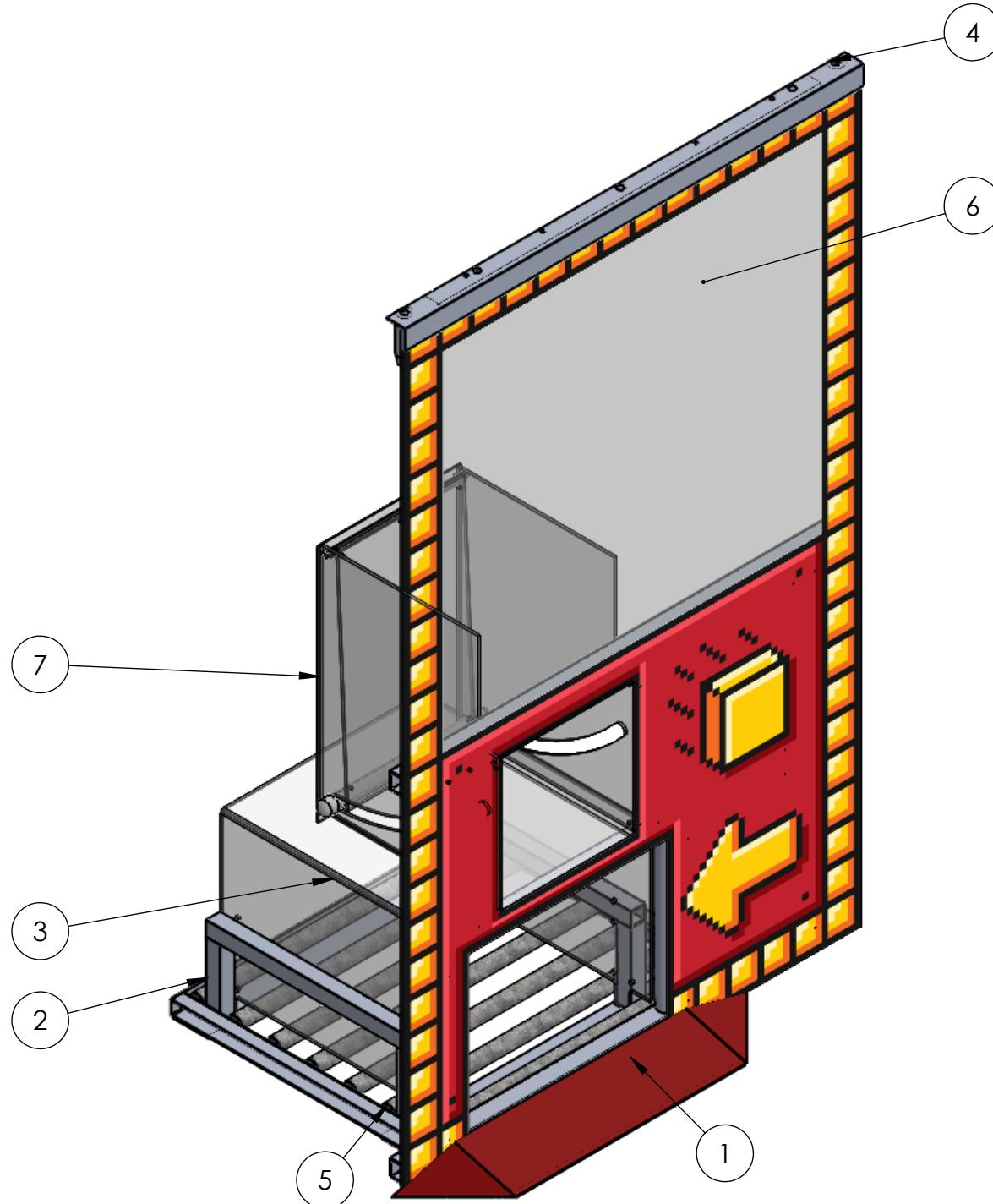
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B

B



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

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

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE: Assembly, Exchange

SIZE B DWG. NO. GE-18100 REV

SCALE: 1:12 WEIGHT: SHEET 1 OF 2

4

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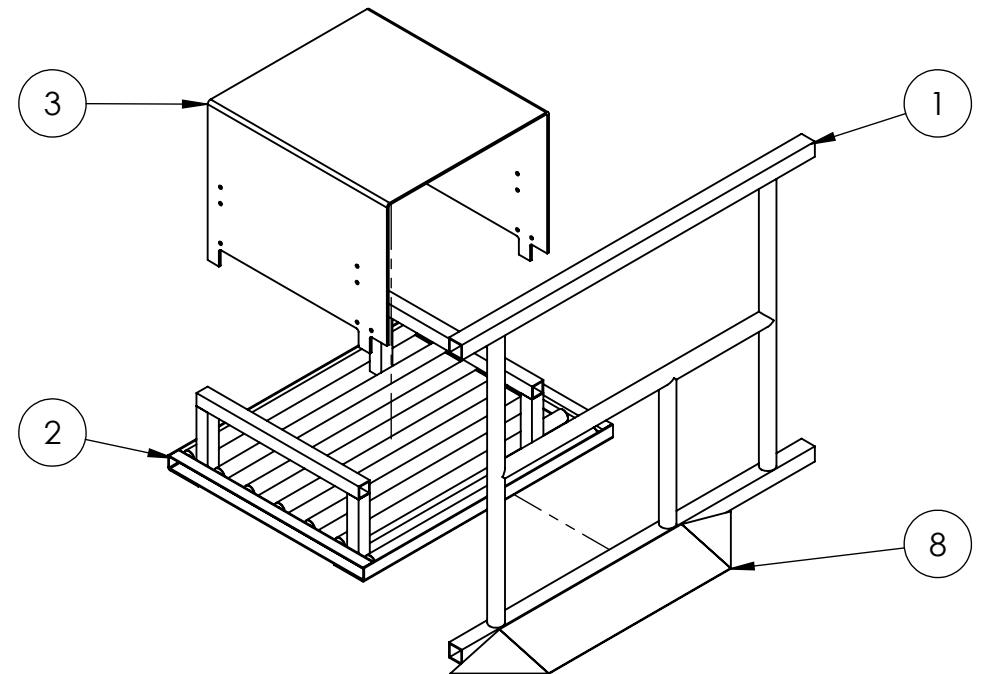
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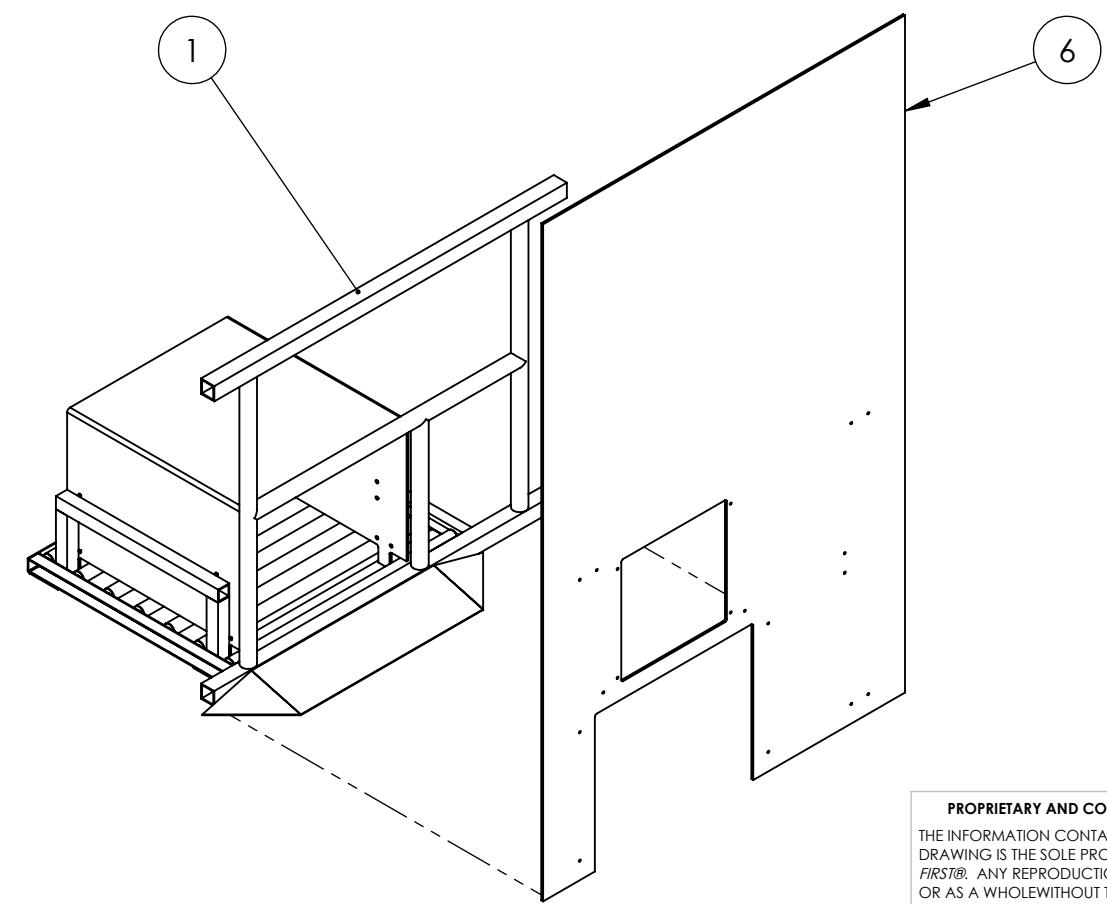
1

B

B



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



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

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

FIRST ROBOTICS COMPETITION

SOLIDWORKS

Modeling Solutions Partner

TITLE: Assembly, Exchange

SIZE B DWG. NO. GE-18100 REV

SCALE: 1:18 WEIGHT: SHEET 2 OF 2

4

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2

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4

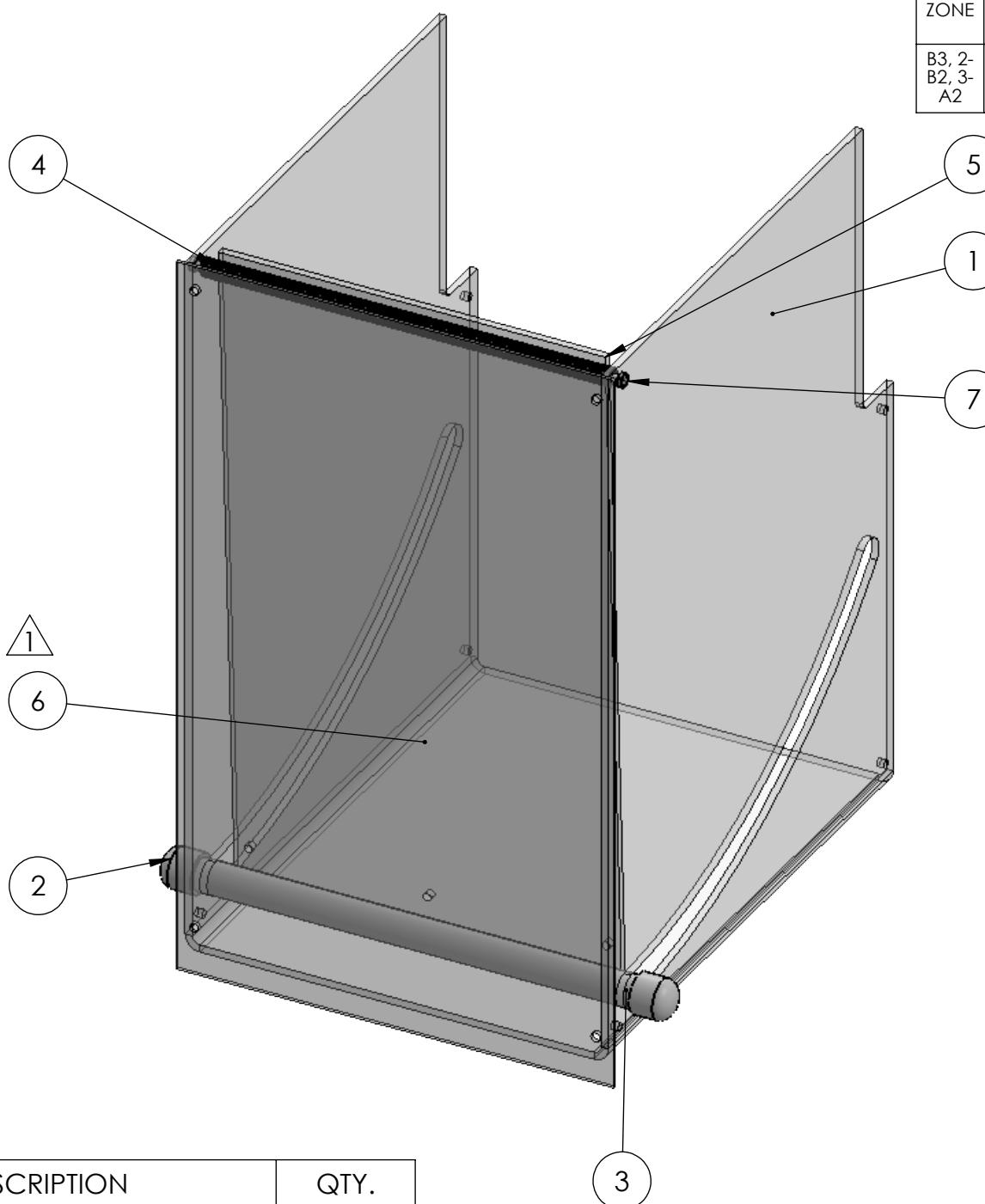
3

2

1

REVISIONS

| ZONE | REV. | DESCRIPTION | DATE | APPROVED |
|------------------------|------|--|----------|----------|
| B3, 2- B2, 3- A2 | 1 | Added ite GE-18130 Chute Back Wall. Updated fastener used. | 1/8/2018 | CPO |



| ITEM NO. | PART NUMBER | DESCRIPTION | QTY. |
|----------|----------------|---|------|
| 1 | GE-18025 | Chute Body | 1 |
| 2 | GE-18093 | End Cap, PVC | 2 |
| 3 | GE-18092 | Handle, Chute | 1 |
| 4 | GE-18091 | Churro, 14" | 1 |
| 5 | GE-18027 | Pusher Panel | 1 |
| 6 | GE-18130 | Chute Back Wall | 1 |
| 7 | hex_.25_20_.75 | Steel Hex Head Screw, 1/4"-20 x 3/4" long, fully threaded | 2 |

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

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
Assembly, Chute

SIZE DWG. NO. REV
B GE-18101 1
SCALE: 1:5 WEIGHT: SHEET 1 OF 3

4

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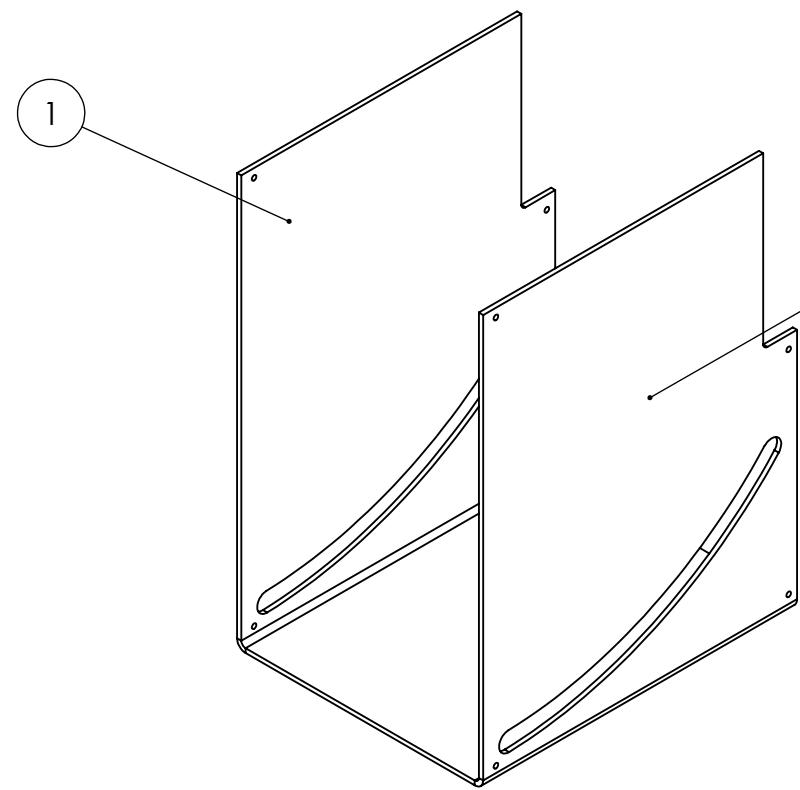
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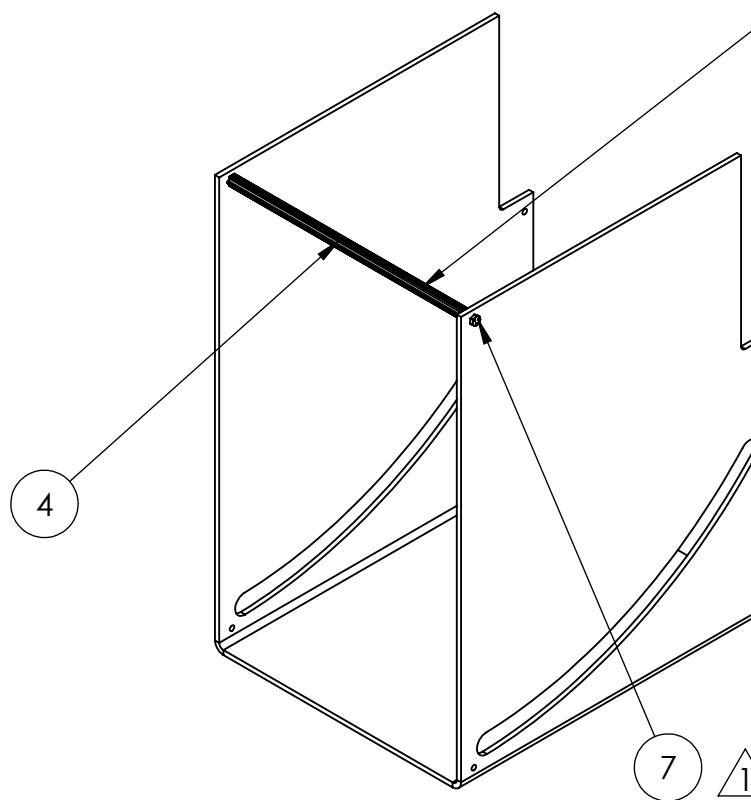
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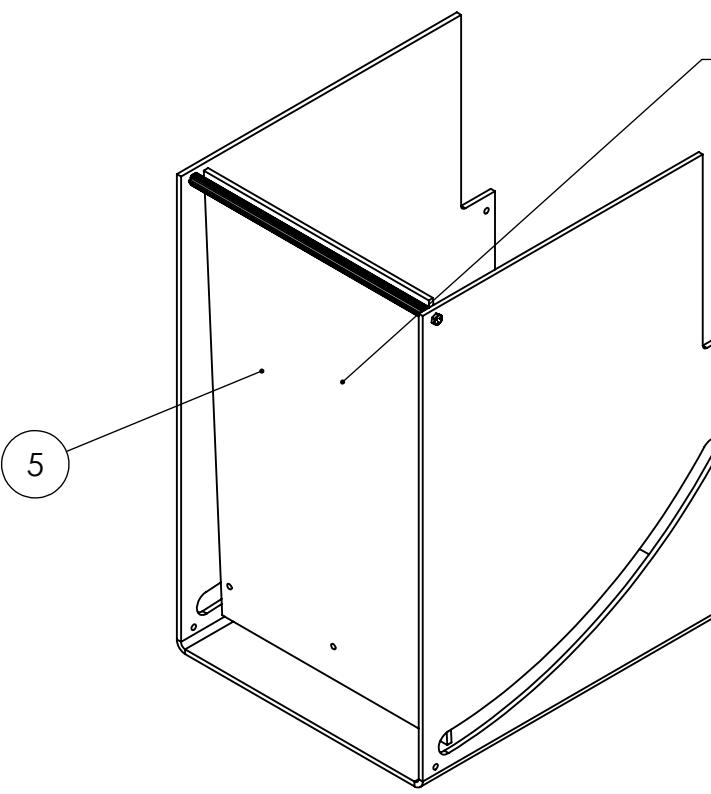
1



Step 1:
Fix Item 1 to station.



Step 2:
Add Item 4 and attach using Item 7 (qty: 2).



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

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

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

Assembly, Chute

SIZE DWG. NO. REV
B GE-18101 1

SCALE: 1:8 WEIGHT: SHEET 2 OF 3

4

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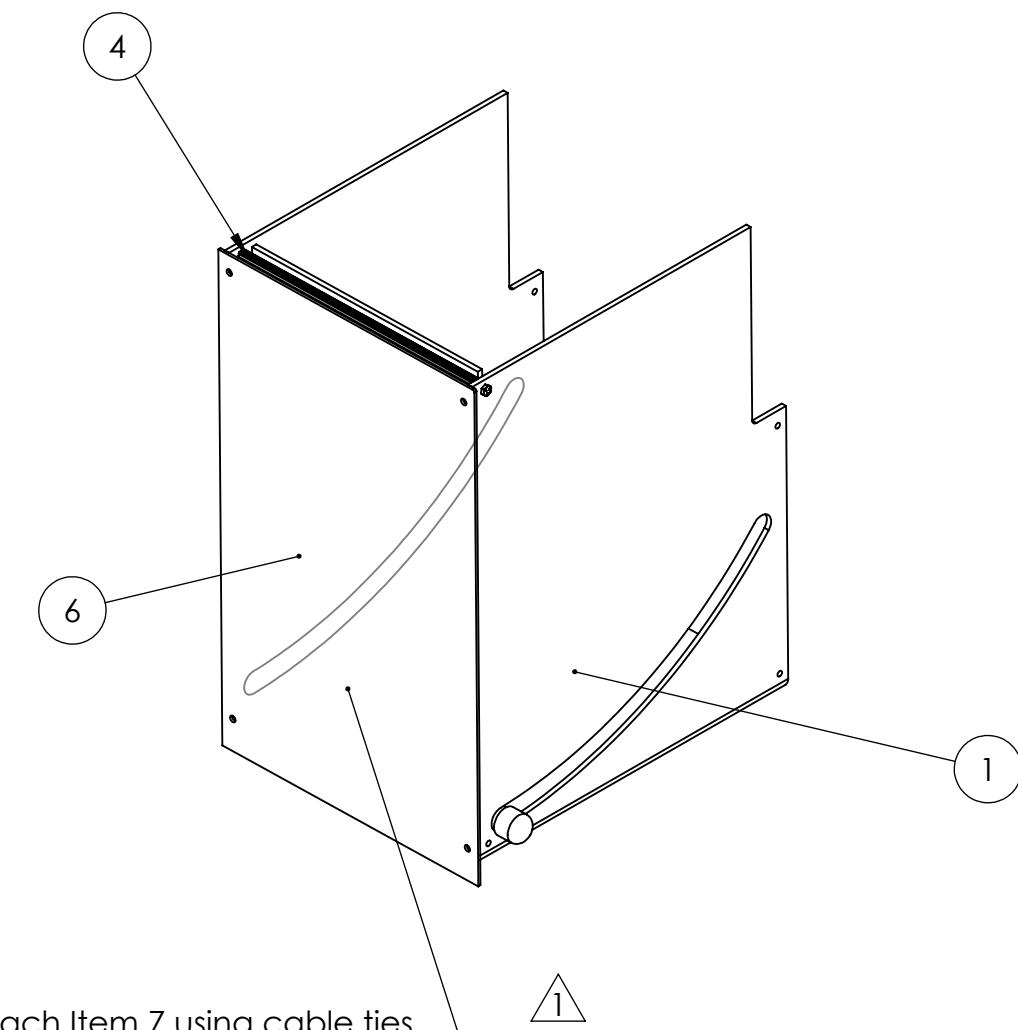
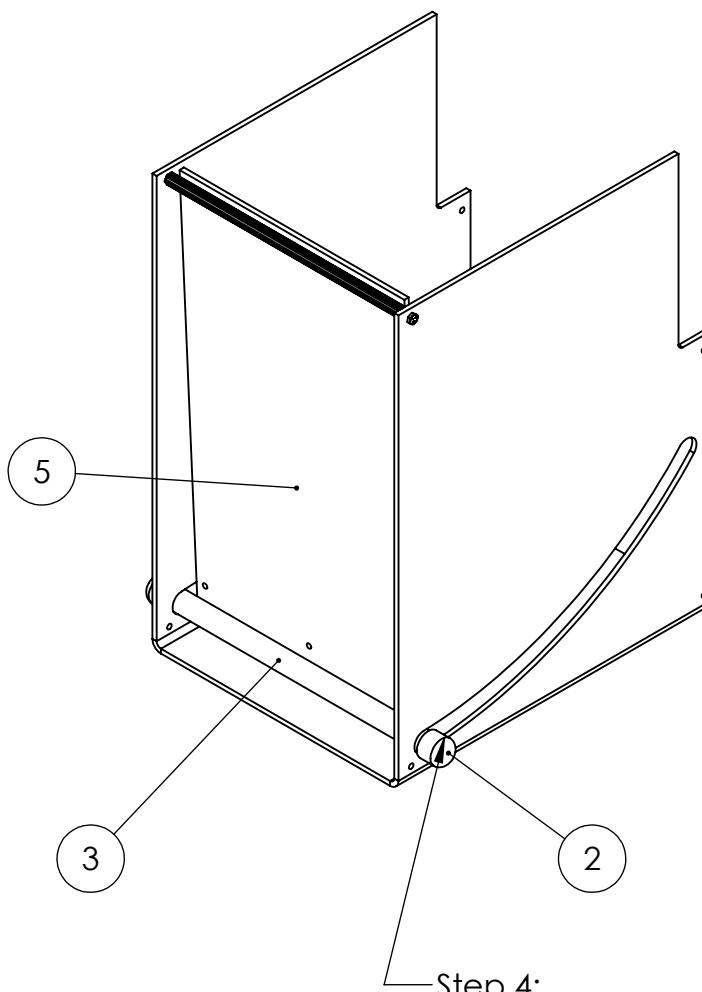
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| | | DIMENSIONS ARE IN INCHES | | | |
| | | TOLERANCES: | | | |
| | | FRACTIONAL: ±1/16 | | | |
| | | ANGULAR: MACH ±1° BEND ±1° | | | |
| | | TWO PLACE DECIMAL ±.01 | | | |
| | | THREE PLACE DECIMAL ±.001 | | | |
| | | INTERPRET GEOMETRIC TOLERANCING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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Assembly, Chute

SIZE DWG. NO. REV
B **GE-18101** **1**

SCALE: 1:8 WEIGHT: SHEET 3 OF 3

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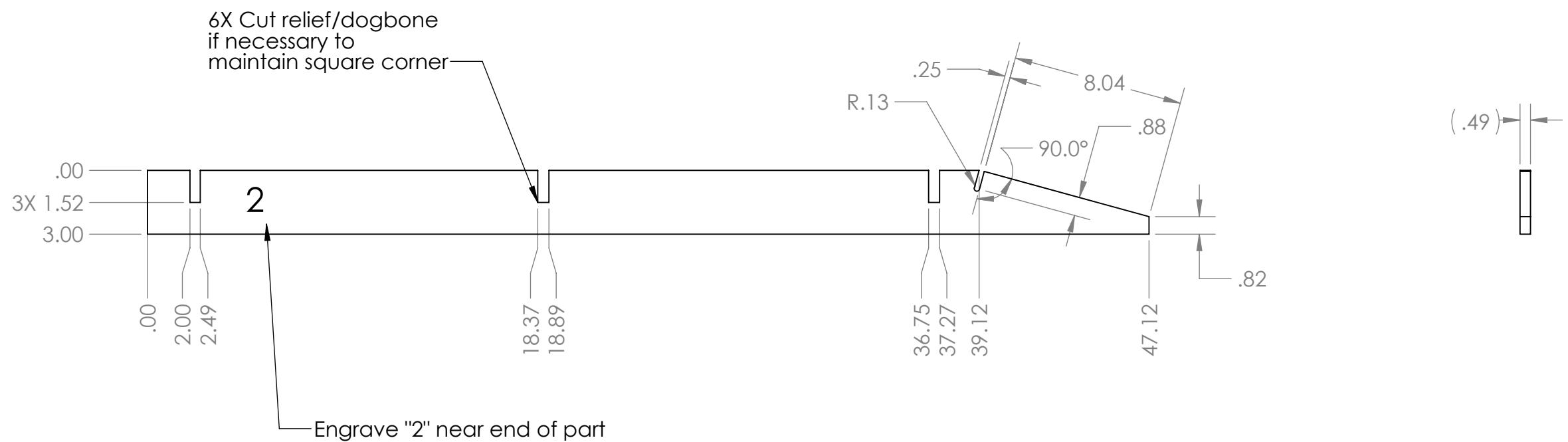
3

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Notes:

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

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

**Platform Brace,
Short Side 2**

SIZE DWG. NO. REV
B GE-18105

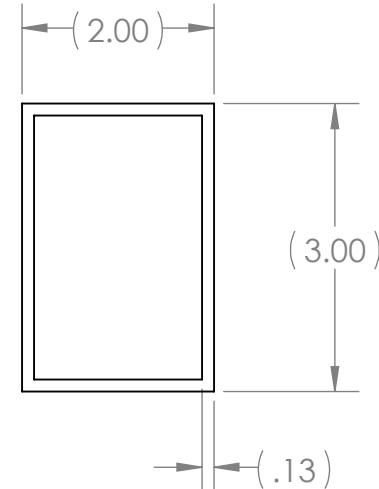
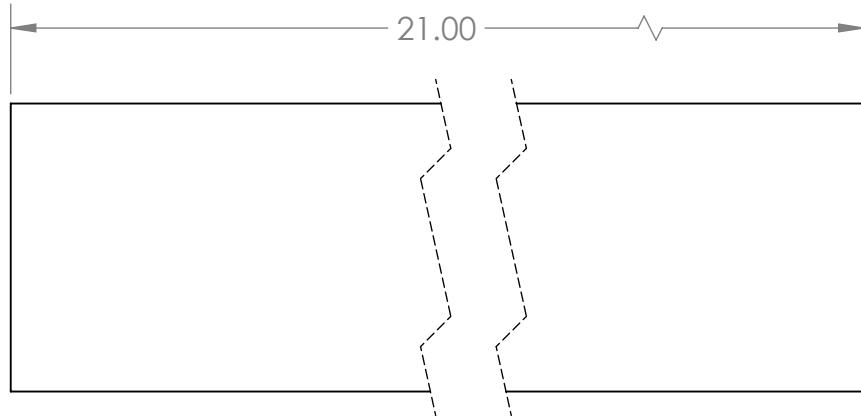
SCALE: 1:6 WEIGHT: SHEET 1 OF 1

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**Notes:**

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

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

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

TITLE:

Scale Lockout Bar

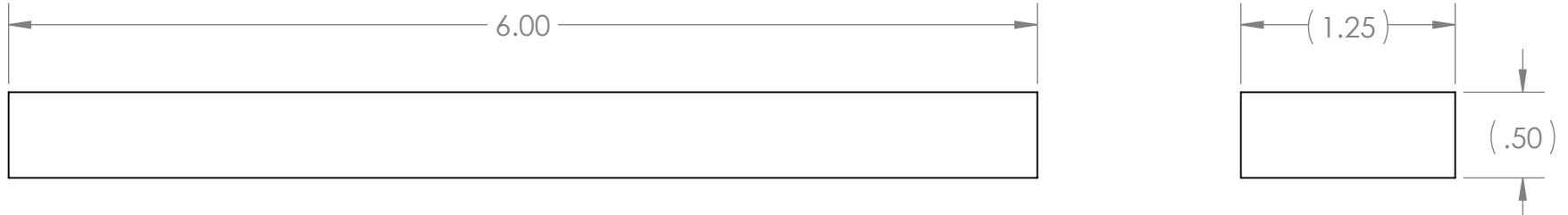
| | | |
|------------|-----------------|--------------|
| SIZE | DWG. NO. | REV |
| A | GE-18106 | |
| SCALE: 1:2 | WEIGHT: | SHEET 1 OF 1 |

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Notes:

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

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

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|--|---|---------|---|
| | FIRST ROBOTICS COMPETITION | | SOLIDWORKS Modeling Solutions Partner |
| TITLE: Scale/Switch Counterweight | | | |
| SIZE | DWG. NO. | REV | |
| A | GE-18107 | | |
| SCALE: 1:1 | | WEIGHT: | SHEET 1 OF 1 |

4

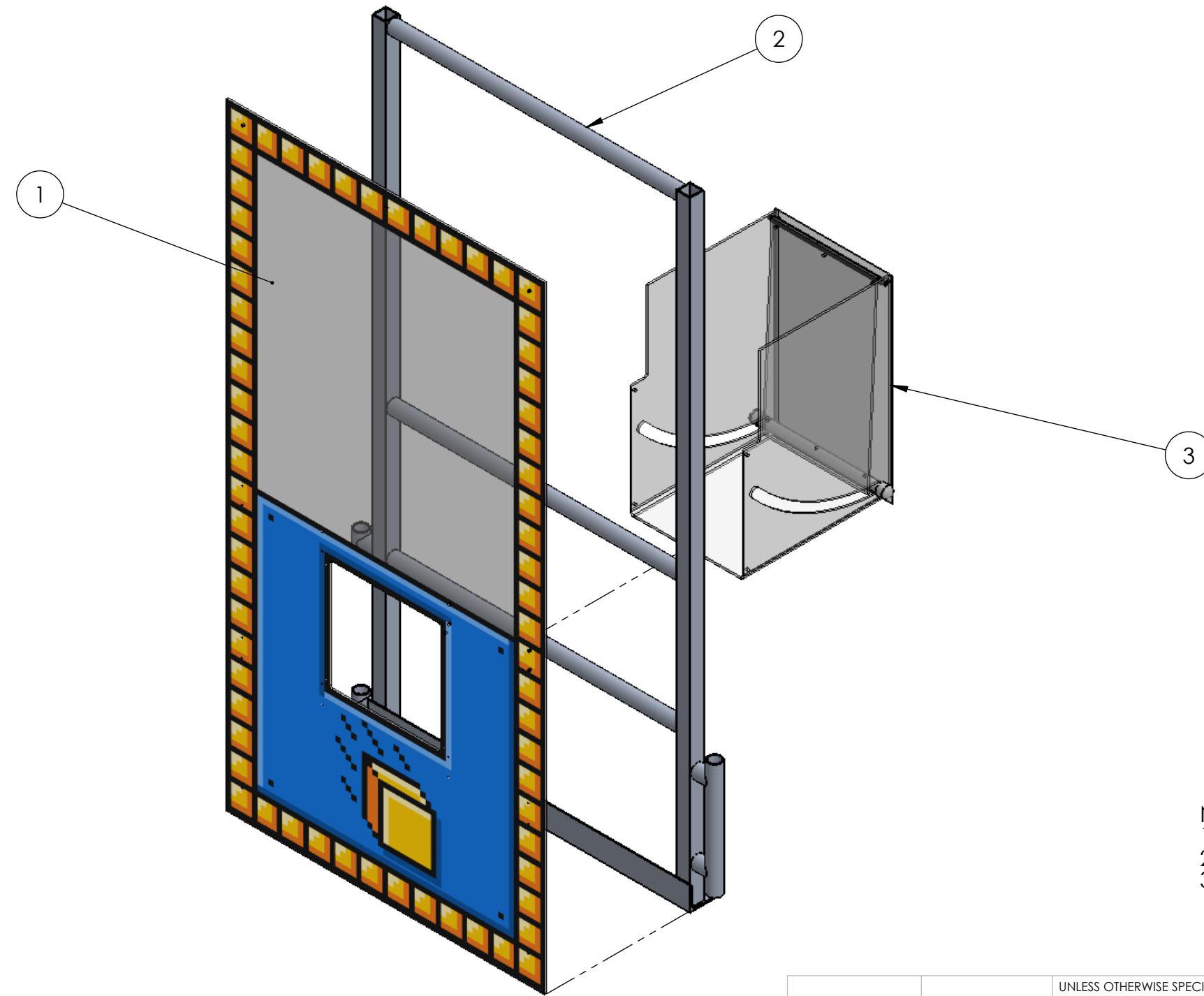
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Notes:

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

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

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| | | DRAWN | | | |
| | | CHECKED | | | |
| | | ENG APPR. | | | |
| | | MFG APPR. | | | |
| | | Q.A. | | | |
| | | INTERPRET GEOMETRIC TOLERANCING PER: | | COMMENTS: | |
| | | MATERIAL | | | |
| | | NEXT ASSY | USED ON | FINISH | |
| | | APPLICATION | | DO NOT SCALE DRAWING | |
| SIZE | DWG. NO. | REV | | | |
| B | GE-18108 | | | | |
| SCALE: 1:12 | WEIGHT: | SHEET 1 OF 1 | | | |

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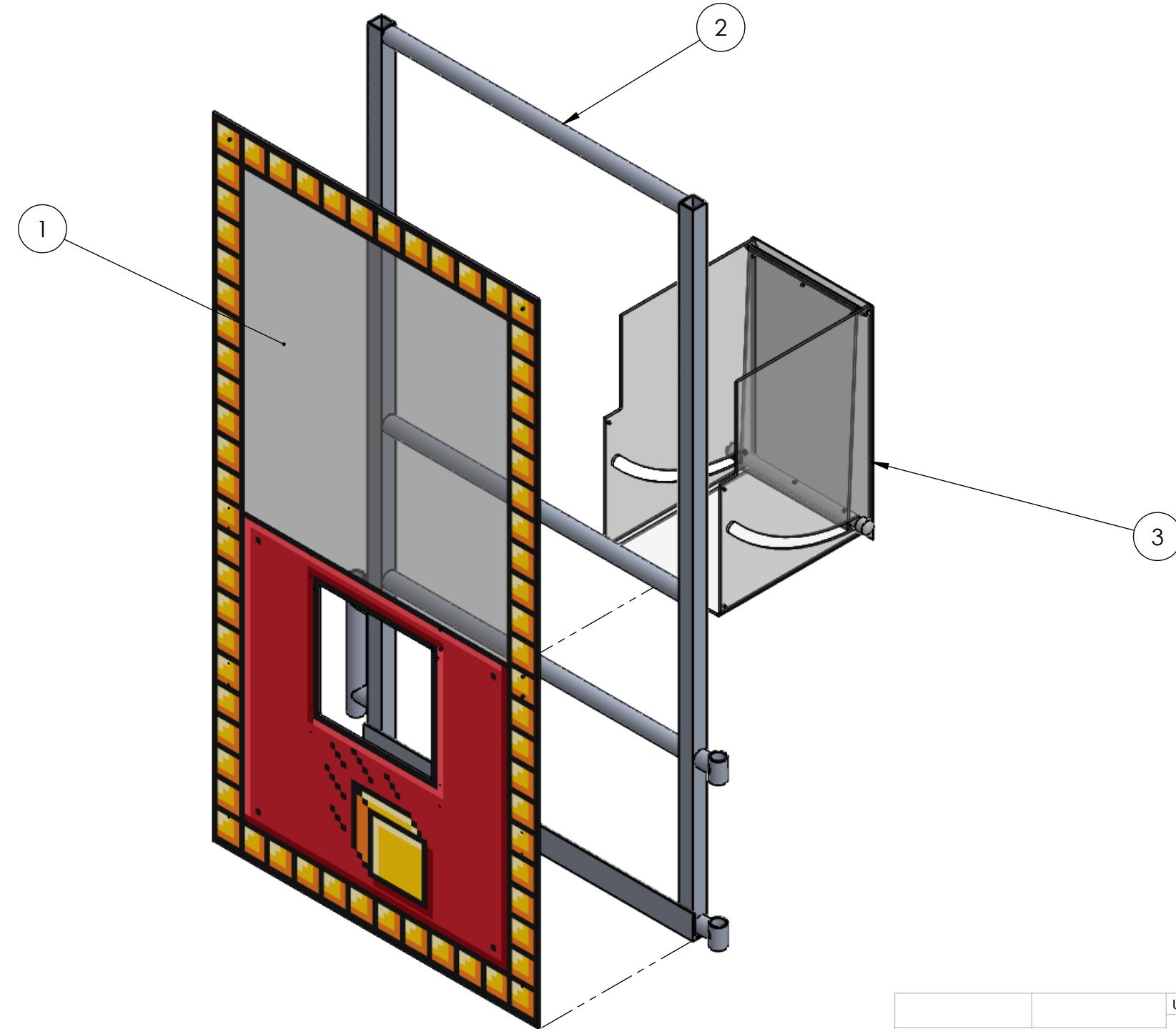
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- Notes:**
1. Attach Item 2 to field perimeter.
 2. Attach Item 1 to Item 2 using cable ties.
 3. Attach Item 3 to Item 1 using cable ties.

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

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Portal - Right

SIZE **DWG. NO.** **REV**
B **GE-18109**

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

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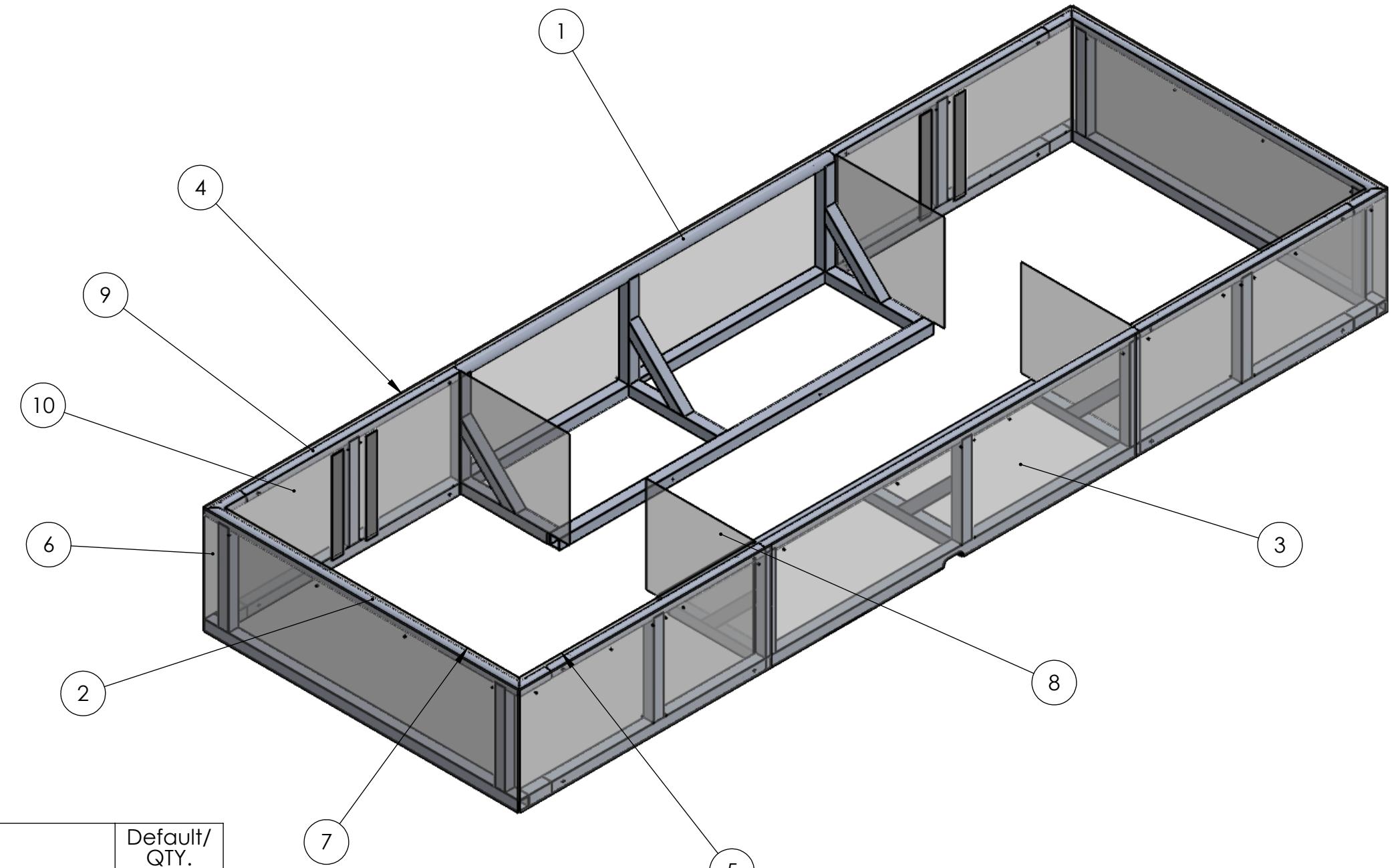
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| ITEM NO. | PART NUMBER | DESCRIPTION | Default/ QTY. |
|----------|-------------|----------------------------|------------------|
| 1 | GE-18051 | Side Frame, Fence | 2 |
| 2 | GE-18052 | End Frame, Fence | 2 |
| 3 | GE-18080 | Fence Polycarb, Middle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

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| | | DRAWN | | |
| | | CHECKED | | |
| | | ENG APPR. | | |
| | | MFG APPR. | | |
| | | Q.A. | | |
| | | COMMENTS: | | |
| | | MATERIAL | | |
| | | FINISH | | |
| NEXT ASSY | USED ON | APPLICATION | DO NOT SCALE DRAWING | |
| SCALE: 1:32 WEIGHT: SHEET 1 OF 3 | | | | |

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Fence Assembly

B GE-18110

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This technical drawing illustrates the exploded view of a fence assembly. The diagram shows several rectangular frames arranged in a staggered pattern. Three specific components are labeled: Item 1, which is a long horizontal bar; Item 9, which is a vertical support post; and Item 2, which is a horizontal brace. Arrows point from each label to its corresponding part in the assembly. The frames are constructed from a combination of horizontal and vertical bars, with diagonal braces for stability.

Notes:

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

| | | | | | |
|--|--|--|-----------|------|------|
| | | UNLESS OTHERWISE SPECIFIED: | | NAME | DATE |
| | | DIMENSIONS ARE IN INCHES | DRAWN | | |
| | | TOLERANCES: | CHECKED | | |
| | | FRACTIONAL $\pm 1/16$ | | | |
| | | ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ | | | |
| | | TWO PLACE DECIMAL $\pm .01$ | ENG APPR. | | |

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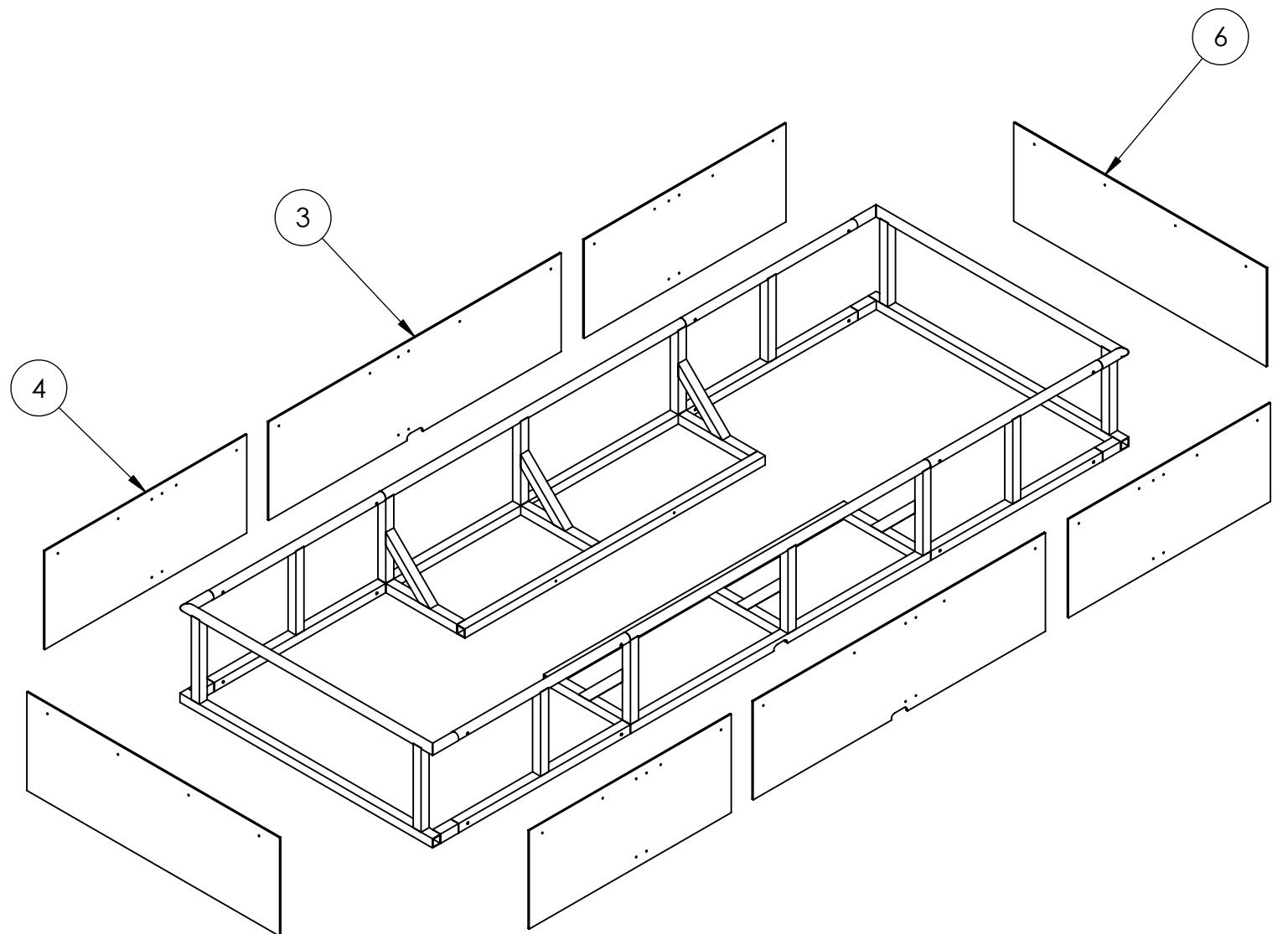
TITLE: Fence

Notes:

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

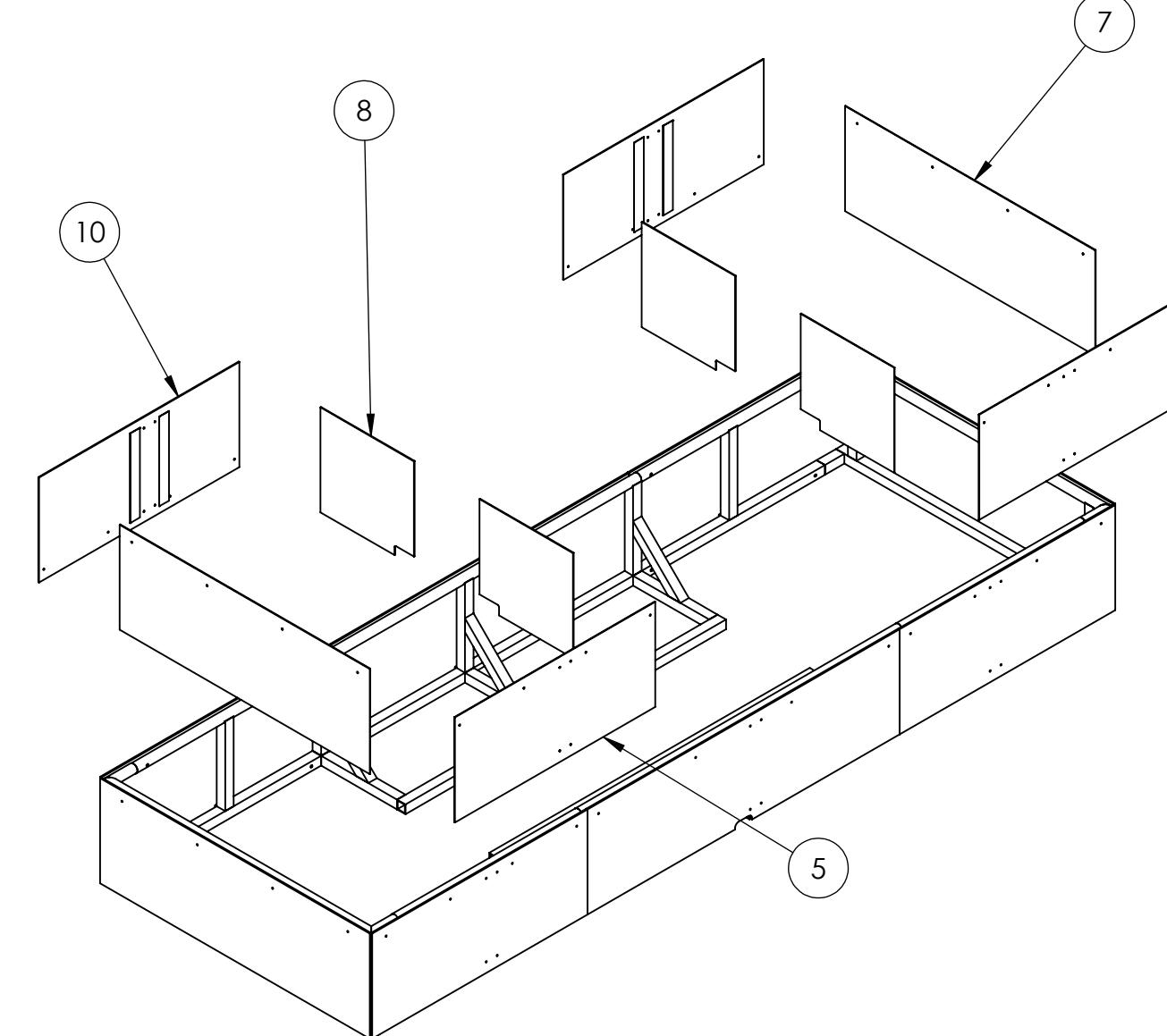
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|-------------|---------|---|-------------|---------|--------------|--|--|
| | | UNLESS OTHERWISE SPECIFIED: | | NAME | DATE |  FIRST ROBOTICS COMPETITION | TITLE: <h1>Fence Assembly</h1> |
| | | DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$ | DRAWN | | | | |
| | | | CHECKED | | | | |
| | | | ENG APPR. | | | | |
| | | | MFG APPR. | | | | |
| | | | Q.A. | | | | |
| | | INTERPRET GEOMETRIC TOLERANCING PER: | COMMENTS: | | | | |
| | | MATERIAL | | | | SIZE DWG. NO. B GE-18110 REV | |
| NEXT ASSY | USED ON | FINISH | | | | | |
| APPLICATION | | DO NOT SCALE DRAWING | | | | | |
| | | | SCALE: 1:32 | WEIGHT: | SHEET 2 OF 3 | | |



Notes:

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



Notes:

- NOTES:**

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

| | | | | | | | |
|-------------|---------|---|-------------|---------|--------------|--|--|
| | | UNLESS OTHERWISE SPECIFIED: | | NAME | DATE |  FIRST ROBOTICS COMPETITION | TITLE: <h1>Fence Assembly</h1> |
| | | DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .01$ THREE PLACE DECIMAL $\pm .001$ | DRAWN | | | | |
| | | | CHECKED | | | | |
| | | | ENG APPR. | | | | |
| | | | MFG APPR. | | | | |
| | | INTERPRET GEOMETRIC TOLERANCING PER: | Q.A. | | | | |
| | | MATERIAL | COMMENTS: | | | | |
| NEXT ASSY | USED ON | FINISH | | | | | |
| APPLICATION | | DO NOT SCALE DRAWING | | | | | |
| | | | SCALE: 1:32 | WEIGHT: | SHEET 3 OF 3 | | |

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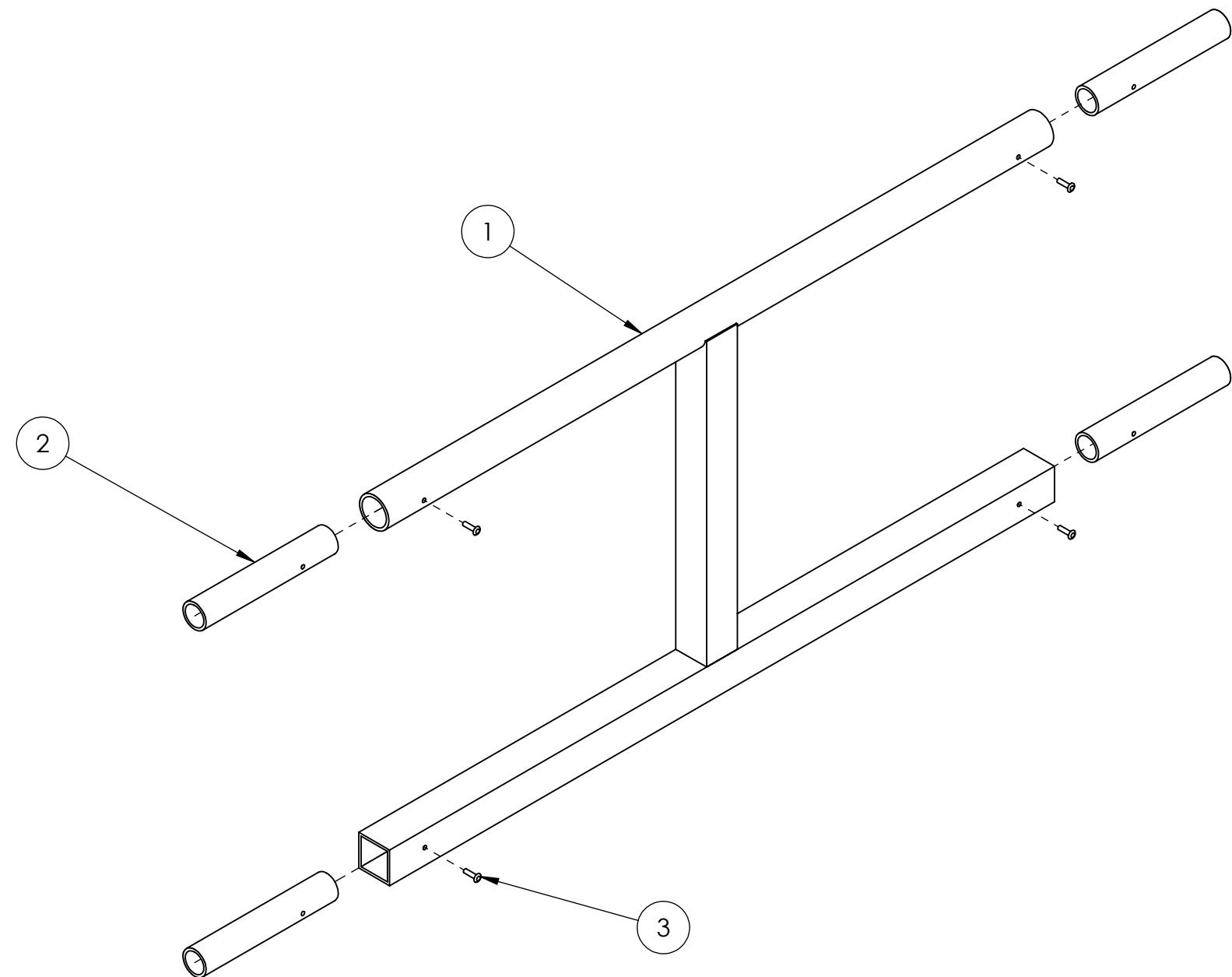
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B

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A

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

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| | | DRAWN | | |
| | | CHECKED | | |
| | | ENG APPR. | | |
| | | MFG APPR. | | |
| | | Q.A. | | |
| | | COMMENTS: | | |
| | | INTERPRET GEOMETRIC TOLERANCING PER: | | |
| | | MATERIAL | | |
| | | NEXT ASSY | USED ON | FINISH |
| | | APPLICATION | | DO NOT SCALE DRAWING |
| SIZE | DWG. NO. | REV | | |
| B | GE-18111 | | | |
| SCALE: 1:16 | WEIGHT: | SHEET 1 OF 1 | | |

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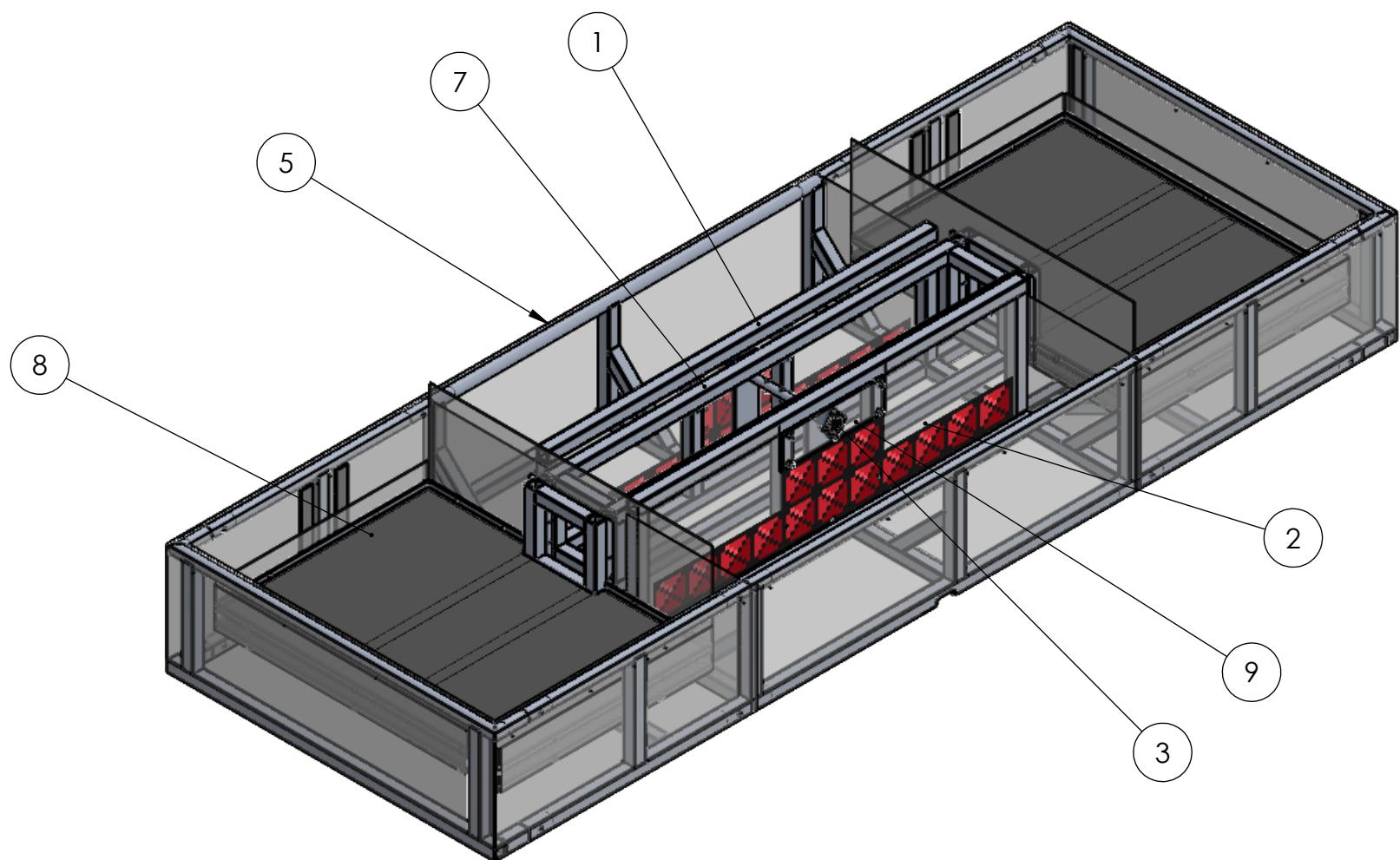
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| ITEM NO. | PART NUMBER | DESCRIPTION | Default/QTY. |
|----------|-------------------------|---|--------------|
| 1 | GE-18016 | Switch Frame | 1 |
| 2 | GE-18024 | Switch Base Cover Polycarbonate | 2 |
| 3 | GE-18026 | Switch/Scale Arm Shaft | 1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

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| | | DRAWN | | |
| | | CHECKED | | |
| | | ENG APPR. | | |
| | | MFG APPR. | | |
| | | Q.A. | | |
| | | COMMENTS: | | |
| | | MATERIAL | | |
| | | FINISH | | |
| NEXT ASSY | USED ON | APPLICATION | DO NOT SCALE DRAWING | |
| SCALE: 1:32 WEIGHT: | | | | SHEET 1 OF 3 |

 FIRST ROBOTICS COMPETITION  SOLIDWORKS
Modeling Solutions Partner

Switch Assembly

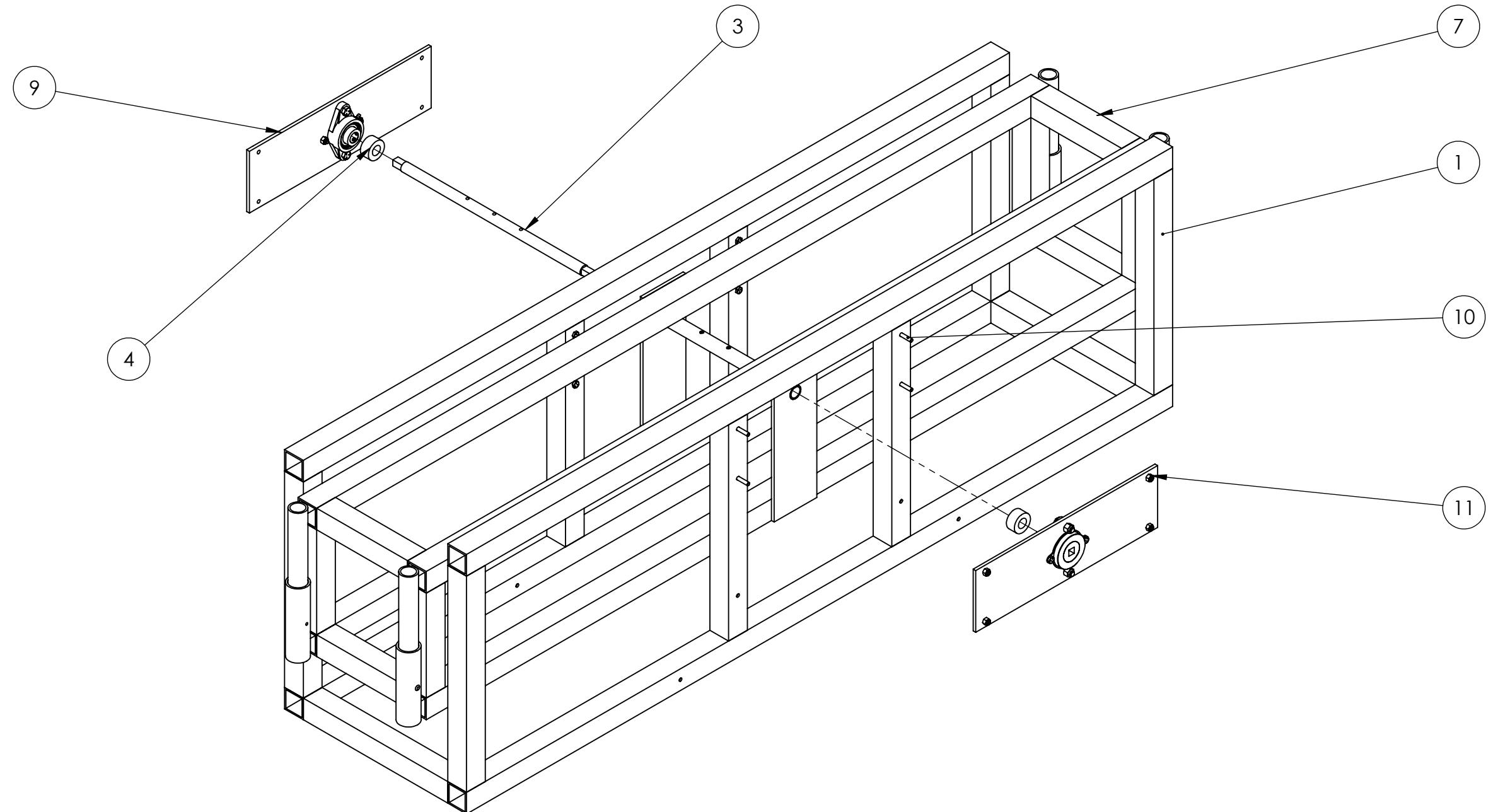
SIZE DWG. NO. REV
B GE-18112

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

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|-------------|-----------------|--|--------------|----------------------|------|
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| | | DRAWN | | | |
| | | CHECKED | | | |
| | | ENG APPR. | | | |
| | | MFG APPR. | | | |
| | | Q.A. | | | |
| | | COMMENTS: | | | |
| | | MATERIAL | | | |
| | | INTERPRET GEOMETRIC TOLERANCING PER: | | | |
| | | NEXT ASSY | USED ON | FINISH | |
| | | APPLICATION | | DO NOT SCALE DRAWING | |
| SIZE | DWG. NO. | | REV | | |
| B | GE-18112 | | | | |
| SCALE: 1:32 | WEIGHT: | | SHEET 2 OF 3 | | |

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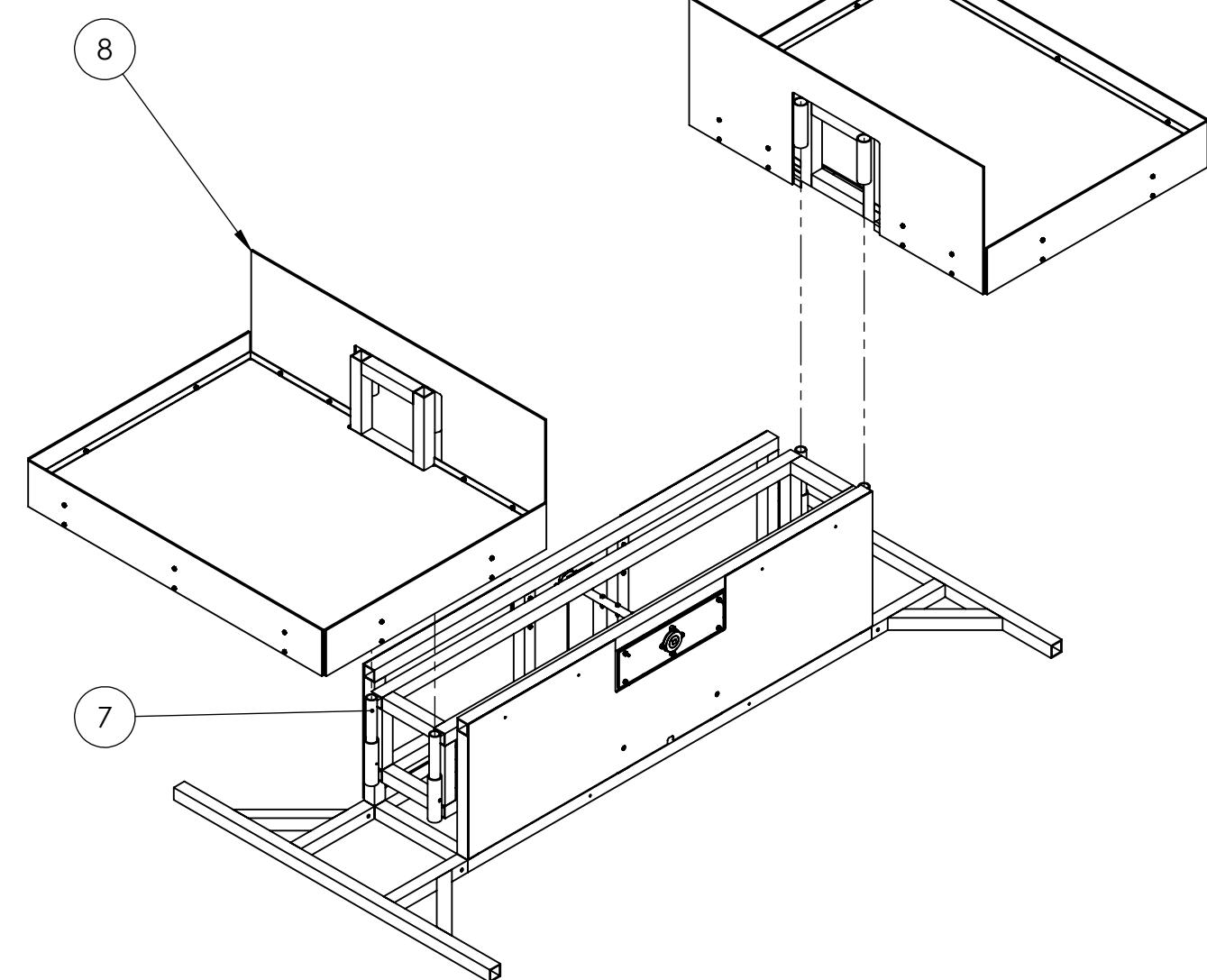
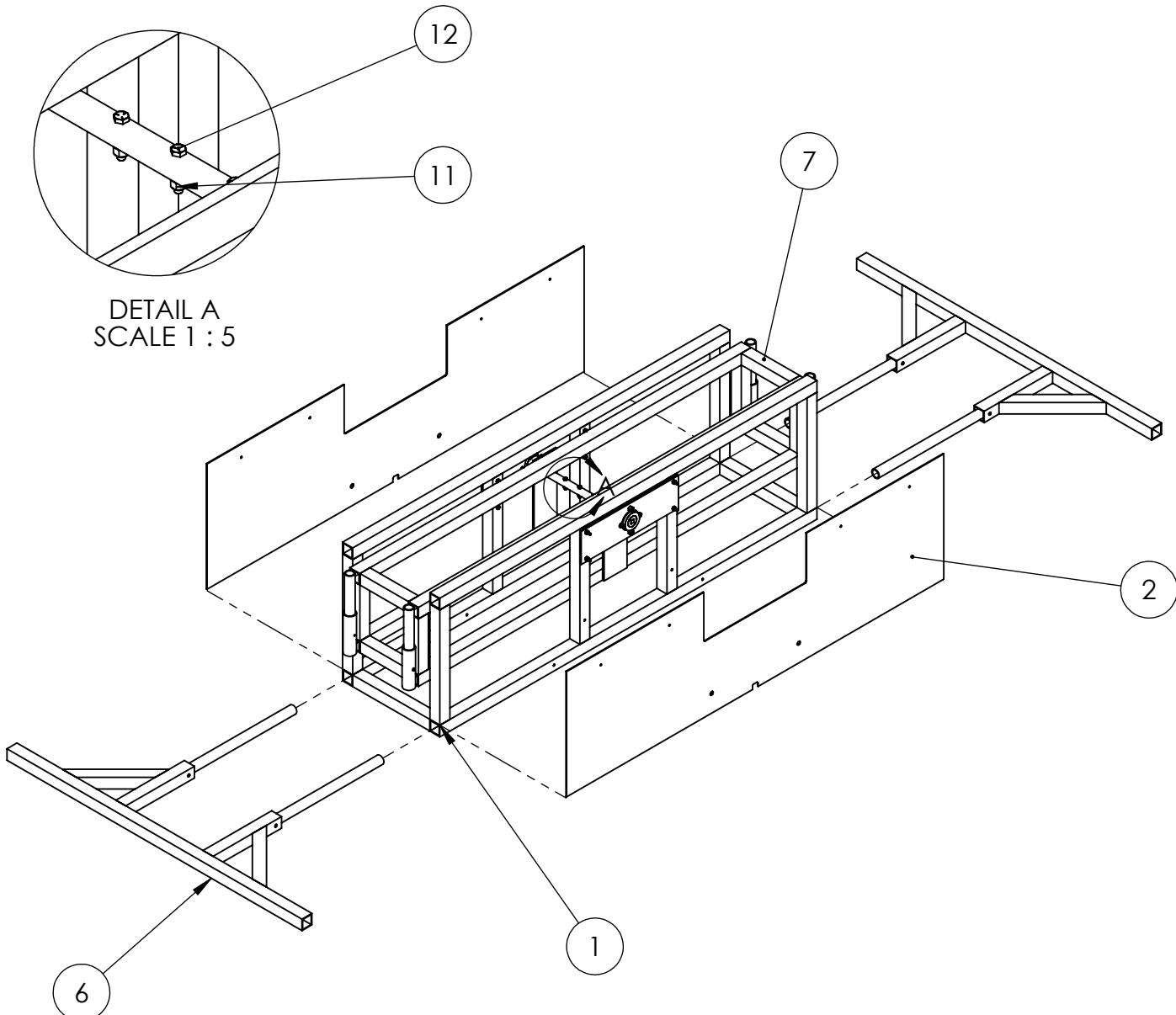
A

4

3

2

1



Notes:

1. Align Item 3 (the shaft) through the tube of Item 7 and secure alignment using Items 11 (qty: 3) and 12 (qty: 3).
2. (Not pictured) Build Item 5 around the assembly, following assembly drawings for GE-18110.

Notes:

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

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|-----------|---------|--|----------------------|------|------|
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| | | DRAWN | | | |
| | | CHECKED | | | |
| | | ENG APPR. | | | |
| | | MFG APPR. | | | |
| | | Q.A. | | | |
| | | COMMENTS: | | | |
| | | MATERIAL | | | |
| | | FINISH | | | |
| NEXT ASSY | USED ON | APPLICATION | DO NOT SCALE DRAWING | | |
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FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Switch Assembly

| | | |
|-------------|-----------------|--------------|
| SIZE | DWG. NO. | REV |
| B | GE-18112 | |
| SCALE: 1:32 | WEIGHT: | SHEET 3 OF 3 |

4

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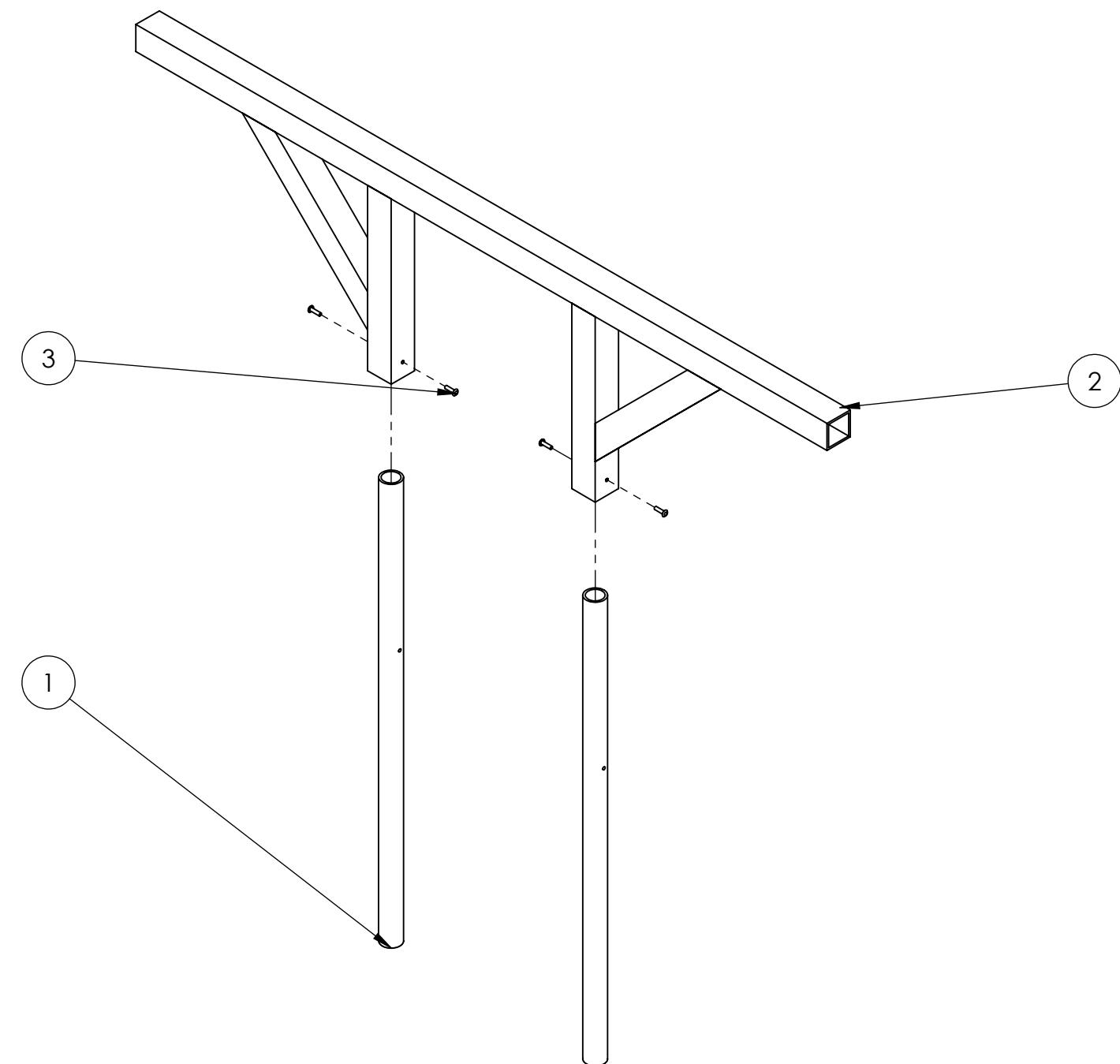
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B

B



A

A

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

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

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE: Switch Fence
Brace Assembly

SIZE DWG. NO. REV
B GE-18113

SCALE: 1:8 WEIGHT: SHEET 1 OF 1

4

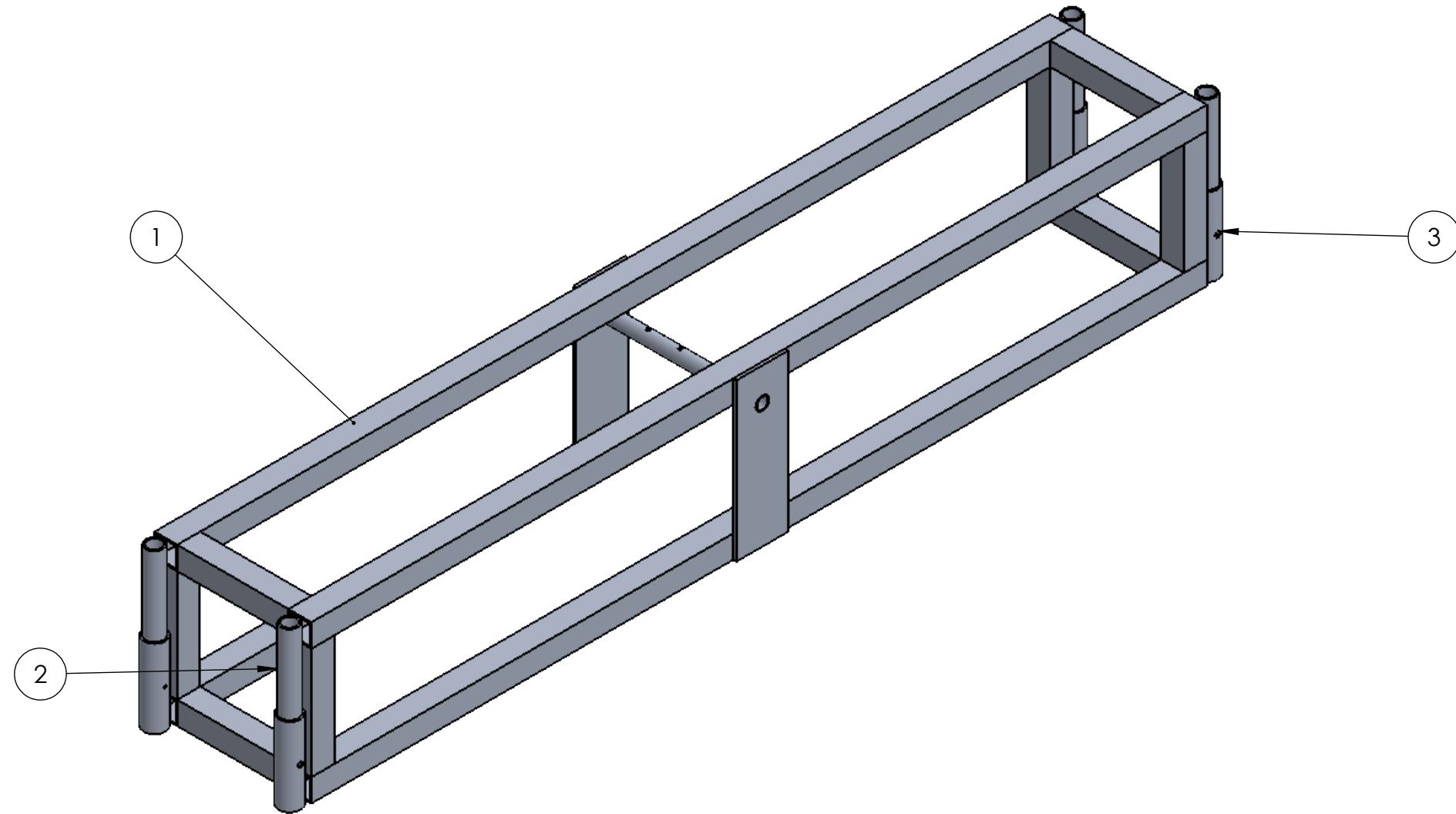
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B

B



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

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| | | | | | |
|--|--|--|-----------|---------------------------------|------|
| | | UNLESS OTHERWISE SPECIFIED: | | NAME | DATE |
| | | DIMENSIONS ARE IN INCHES | DRAWN | | |
| | | TOLERANCES: | CHECKED | | |
| | | FRACTIONAL $\pm 1/16$ | ENG APPR. | | |
| | | ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ | MFG APPR. | | |
| | | TWO PLACE DECIMAL $\pm .01$ | Q.A. | | |
| | | THREE PLACE DECIMAL $\pm .001$ | COMMENTS: | | |
| | | INTERPRET GEOMETRIC TOLERANCING PER: | | | |
| | | MATERIAL | | | |
| | | NEXT ASSY | USED ON | FINISH | |
| | | APPLICATION | | DO NOT SCALE DRAWING | |
| | | | | SCALE: 1:8 WEIGHT: SHEET 1 OF 2 | |

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Switch Arm Assembly

B **GE-18114**

4

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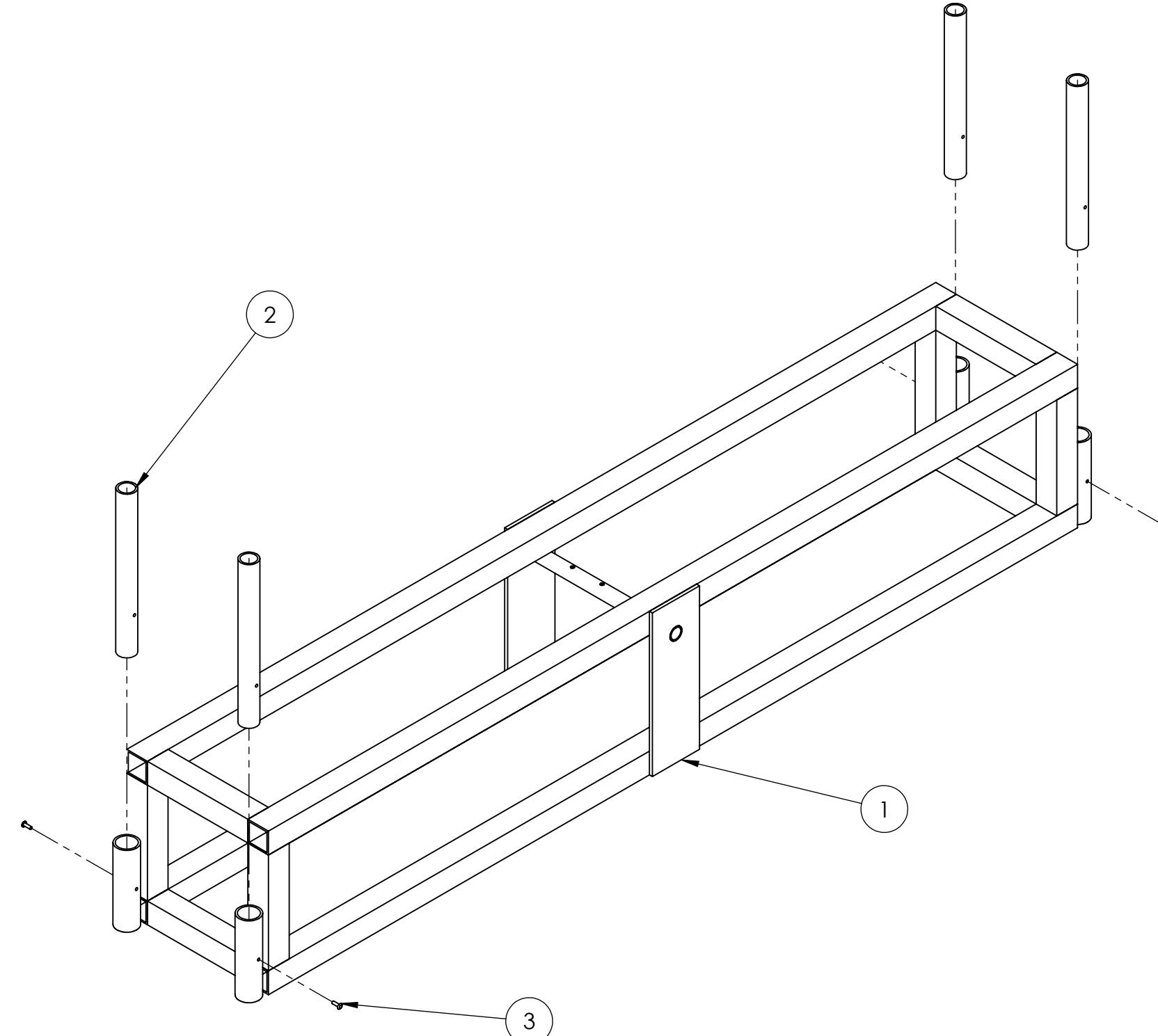
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B

B



Notes:

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

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Switch Arm Assembly

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

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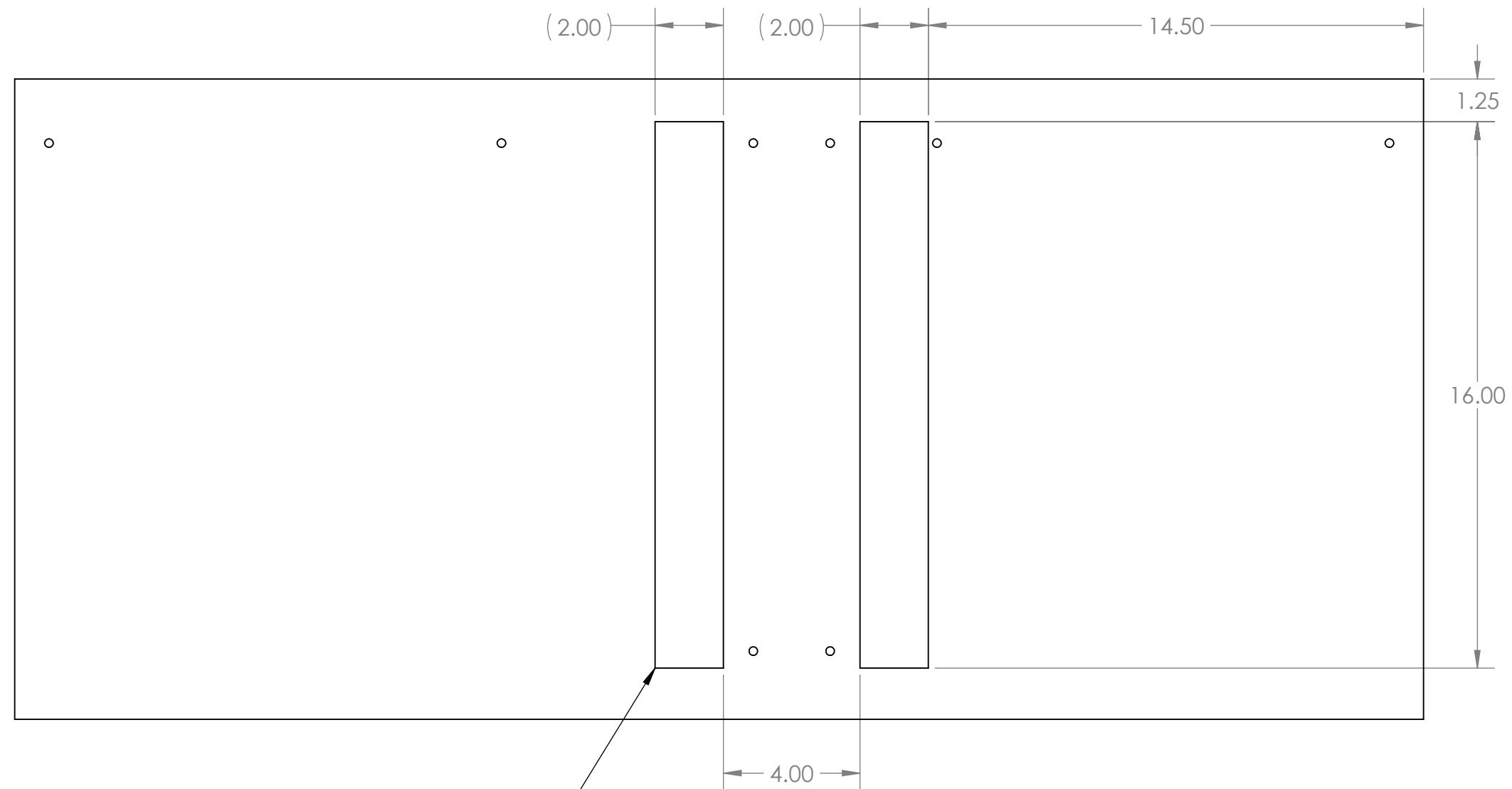
1

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Notes:

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

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

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Vision Fence Polycarbonate

| | | |
|------------|-----------------|--------------|
| SIZE | DWG. NO. | REV |
| B | GE-18115 | |
| SCALE: 1:4 | WEIGHT: | SHEET 1 OF 1 |

4

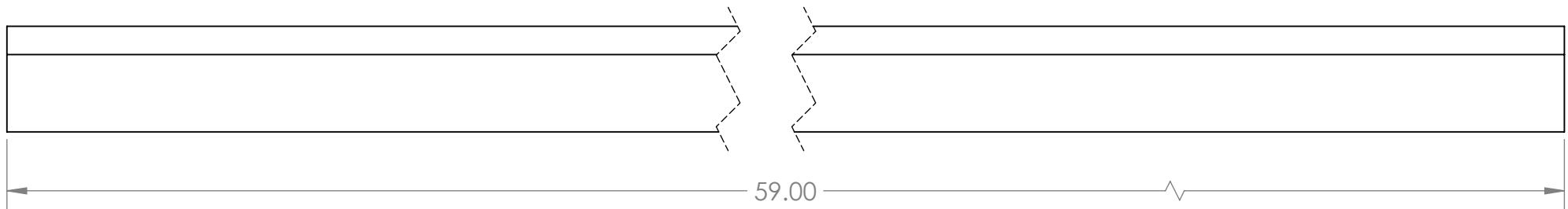
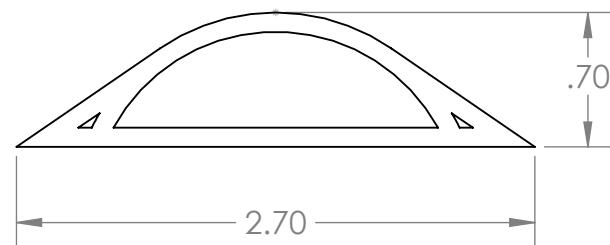
3

2

1

B

B



Notes:

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

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Long Wire Protector

| | | |
|------------|-----------------|--------------|
| SIZE | DWG. NO. | REV |
| B | GE-18116 | |
| SCALE: 1:1 | WEIGHT: | SHEET 1 OF 1 |

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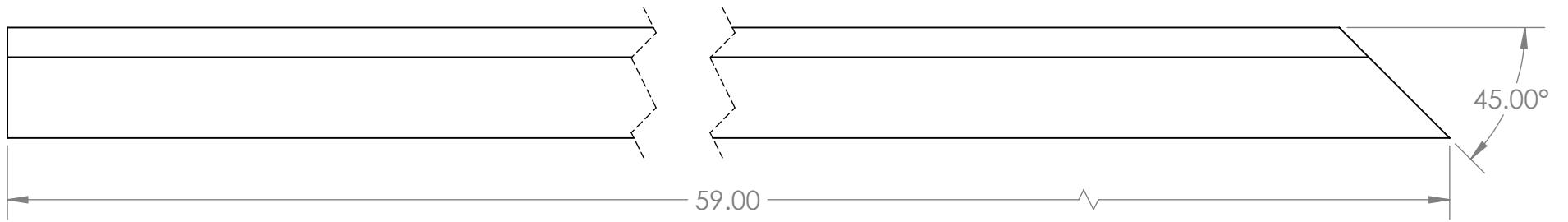
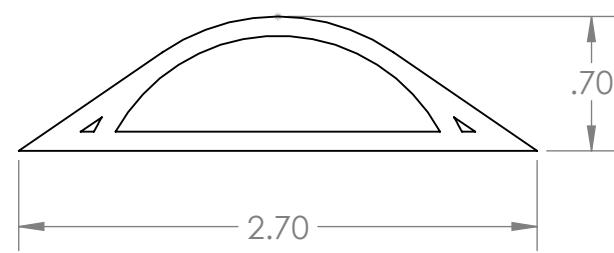
3

2

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B

B



Notes:

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

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1

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| | | DRAWN | | | |
| | | CHECKED | | | |
| | | ENG APPR. | | | |
| | | MFG APPR. | | | |
| | | Q.A. | | | |
| | | COMMENTS: | | | |
| | | MATERIAL | | | |
| | | NEXT ASSY | USED ON | FINISH | |
| | | APPLICATION | | DO NOT SCALE DRAWING | |
| B | GE-18117 | | | | |
| SCALE: 1:1 | WEIGHT: | SHEET 1 OF 1 | | | |

 **FIRST**
ROBOTICS
COMPETITION

 **SOLIDWORKS**
Modeling Solutions Partner

TITLE: **Long Mitered Wire Protector**

SIZE DWG. NO. **B** REV

GE-18117

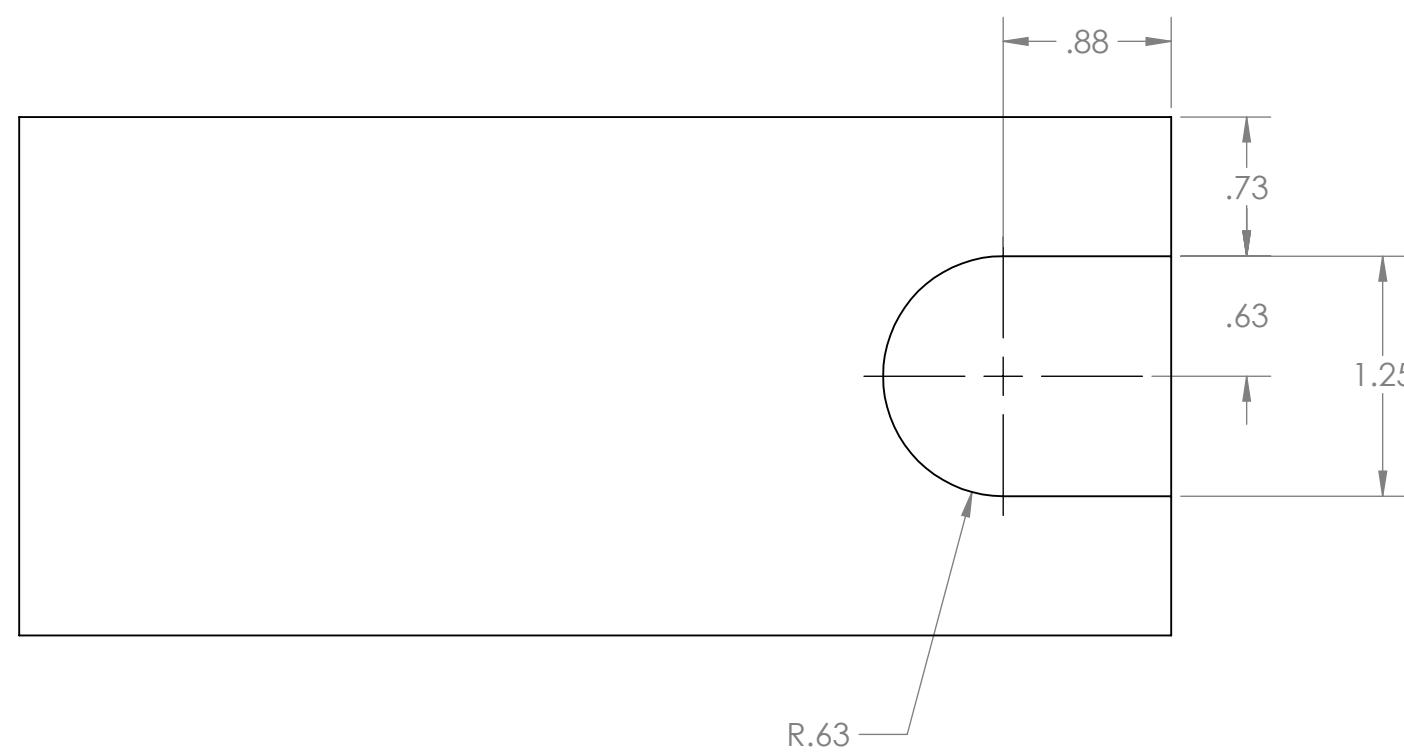
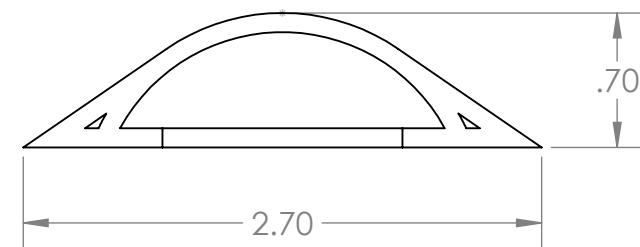
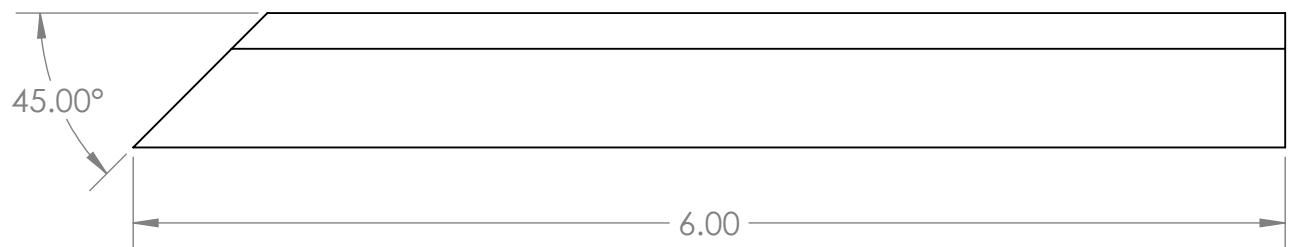
4

3

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B



Notes:

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

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| | | DRAWN | | | |
| | | CHECKED | | | |
| | | ENG APPR. | | | |
| | | MFG APPR. | | | |
| | | Q.A. | | | |
| | | COMMENTS: | | | |
| | | MATERIAL | | | |
| | | FINISH | | | |
| NEXT ASSY | USED ON | | | | |
| APPLICATION | DO NOT SCALE DRAWING | | | | |
| SIZE | DWG. NO. | | | | REV |
| B | GE-18118 | | | | |
| SCALE: 1:1 | WEIGHT: | | | | SHEET 1 OF 1 |

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

TITLE:
**Short Mitered
Wire Protector**

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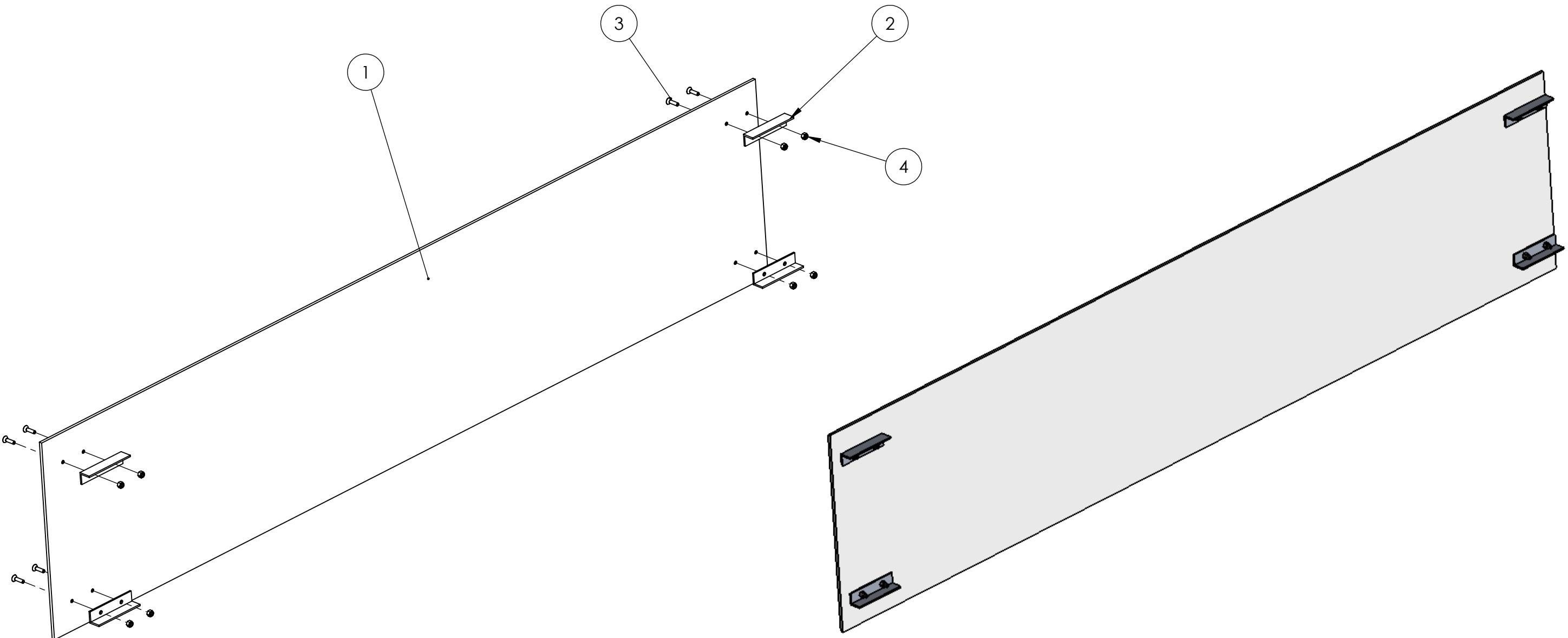
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B

B



A

A

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

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| | | DIMENSIONS ARE IN INCHES | 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: Scale Side Cover Polycarbonate Sub Assembly

SIZE DWG. NO. REV
B **GE-18119**

SCALE: 1:8 WEIGHT: SHEET 1 OF 1

4

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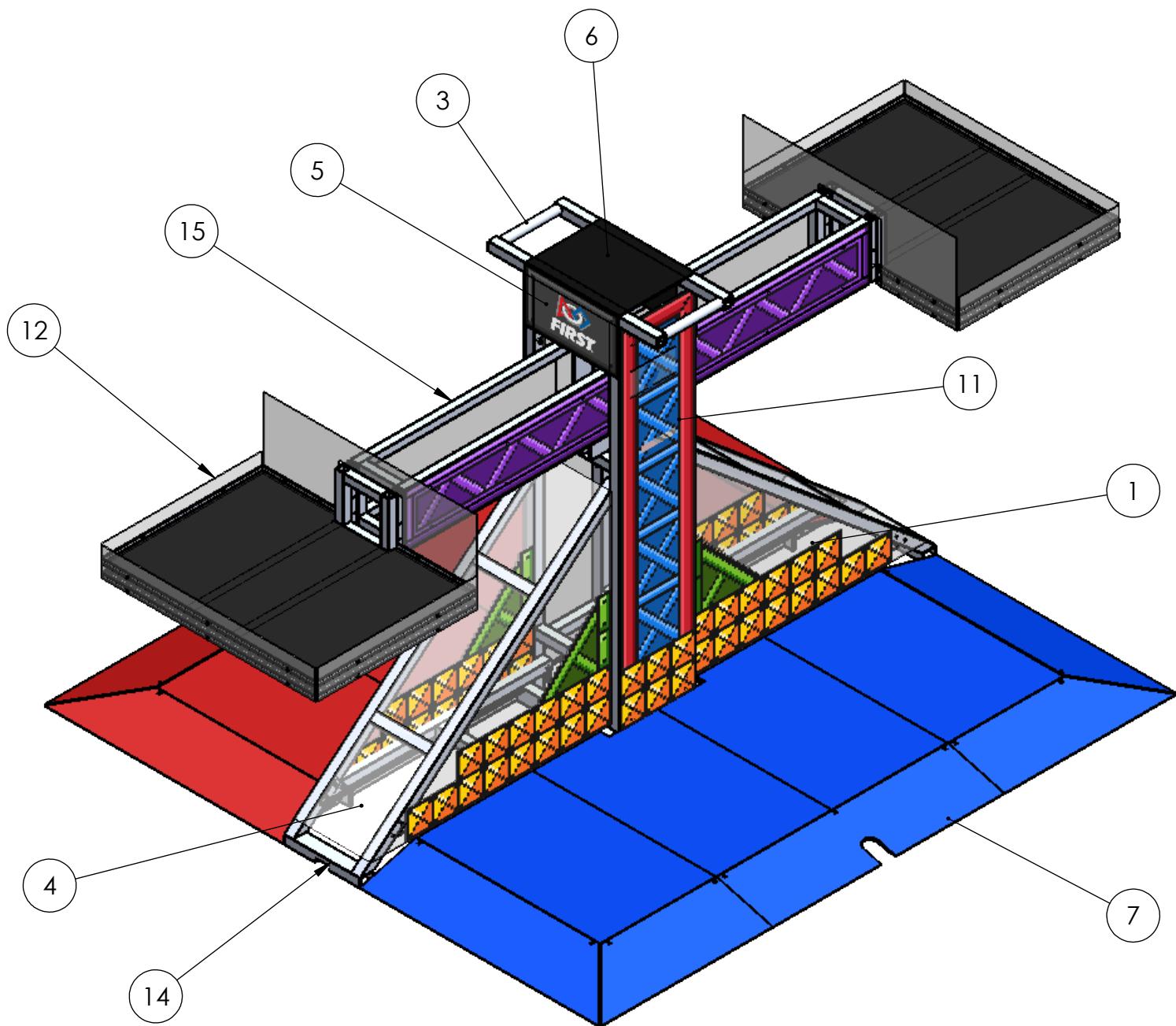
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| ITEM NO. | PART NUMBER | DESCRIPTION | Default/ QTY. |
|----------|------------------------|---|---------------|
| 1 | GE-18022 | Scale Outrigger Side Cover Polycarbonate | 4 |
| 2 | GE-18026 | Switch/Scale Arm Shaft | 1 |
| 3 | GE-18054 | Scale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

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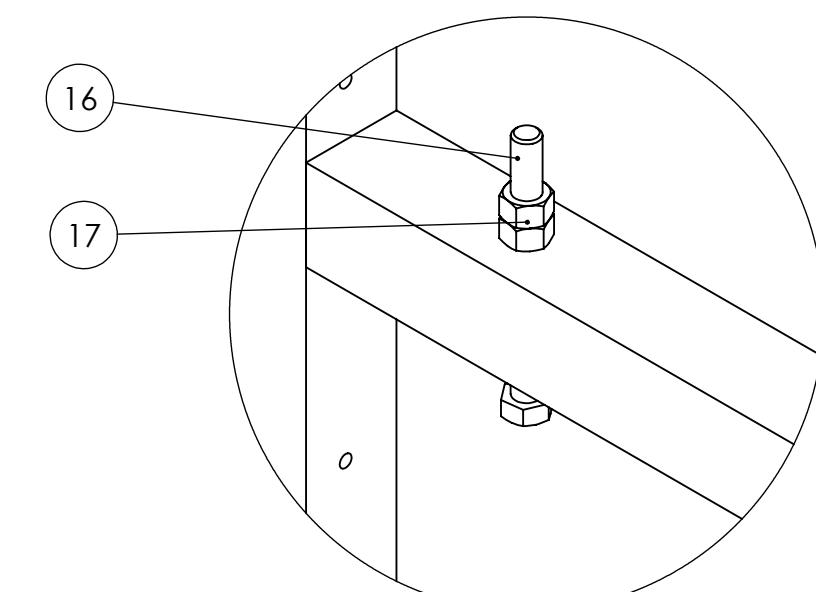
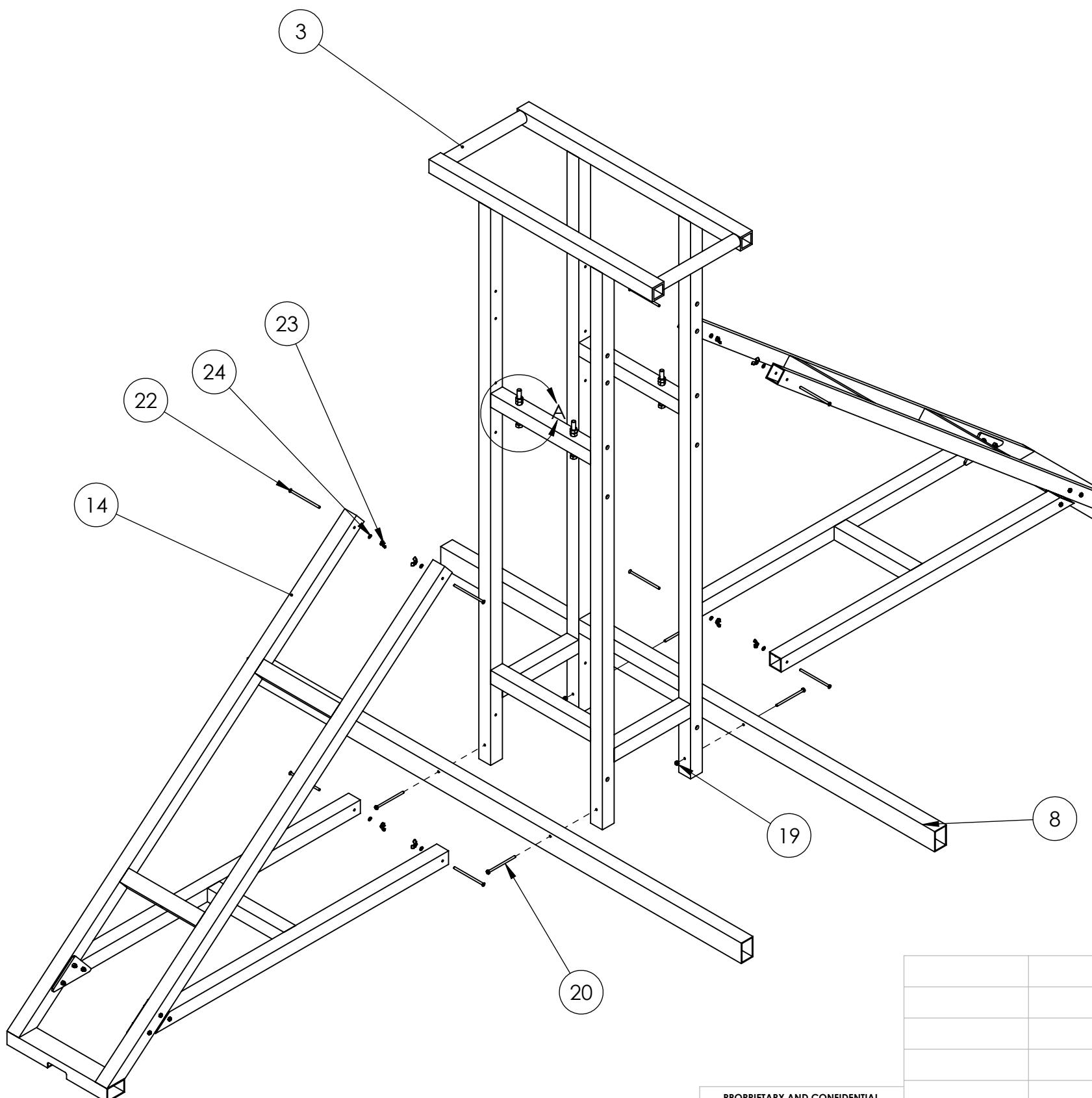
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|-------------|---------|--|------|------|
| | | UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL: ±1/16 ANGULAR: MACH ±1° BEND ±1° TWO PLACE DECIMAL ±.01 THREE PLACE DECIMAL ±.001 | NAME | DATE |
| | | DRAWN | | |
| | | CHECKED | | |
| | | ENG APPR. | | |
| | | MFG APPR. | | |
| | | Q.A. | | |
| | | COMMENTS: | | |
| | | MATERIAL | | |
| | | FINISH | | |
| NEXT ASSY | USED ON | | | |
| APPLICATION | | DO NOT SCALE DRAWING | | |
| SCALE: 1:48 | WEIGHT: | SHEET 1 OF 5 | | |

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Title: Scale Assembly

Size: DWG. NO. **B** GE-18120 **Rev:**

4 3 2 1



DETAIL A
SCALE 1 : 3

Notes:

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

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Title: Scale Assembly

Size: B **Dwg. No.:** GE-18120 **Rev:**

Scale: 1:48 **Weight:**

Sheet 2 of 5

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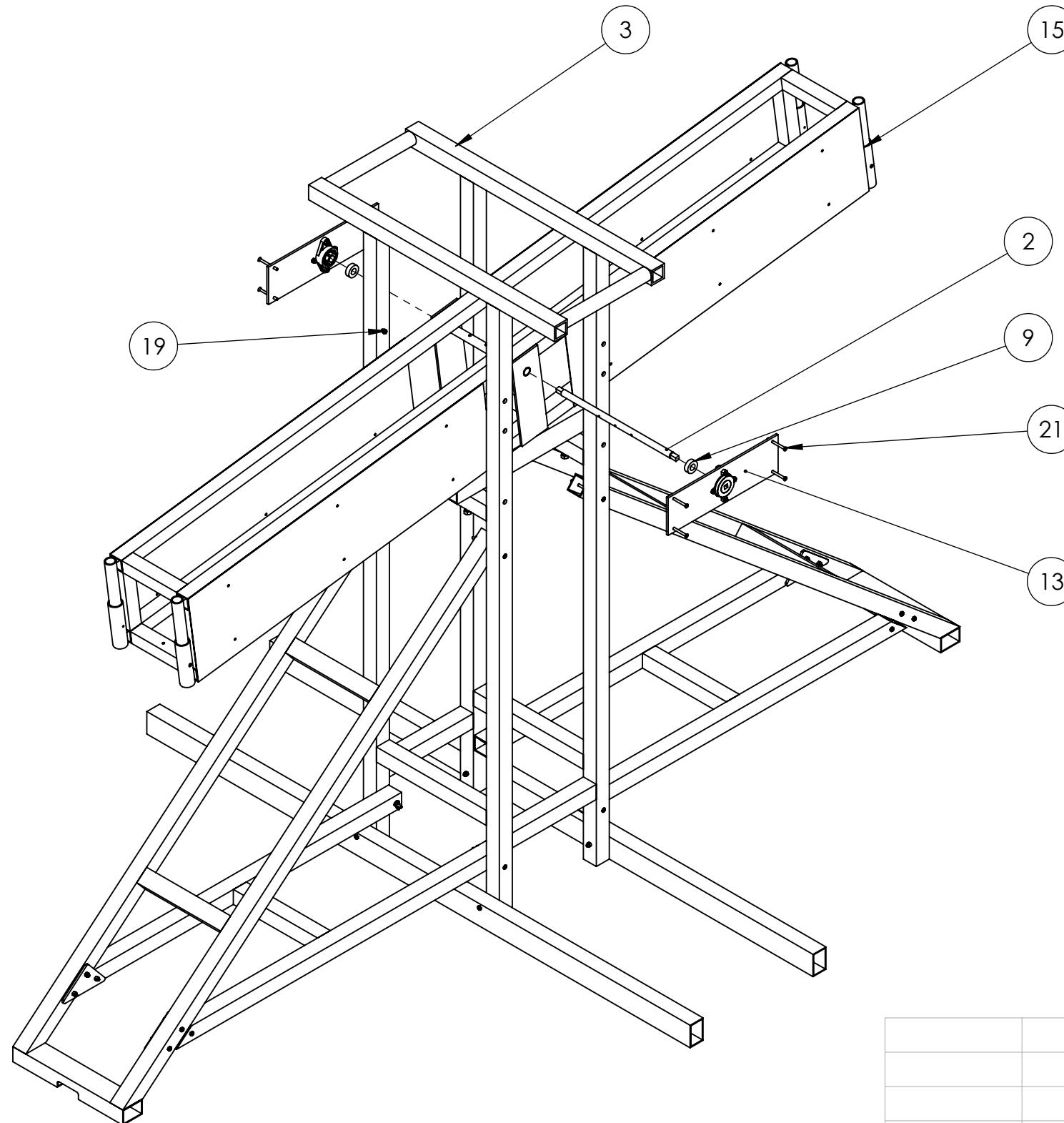
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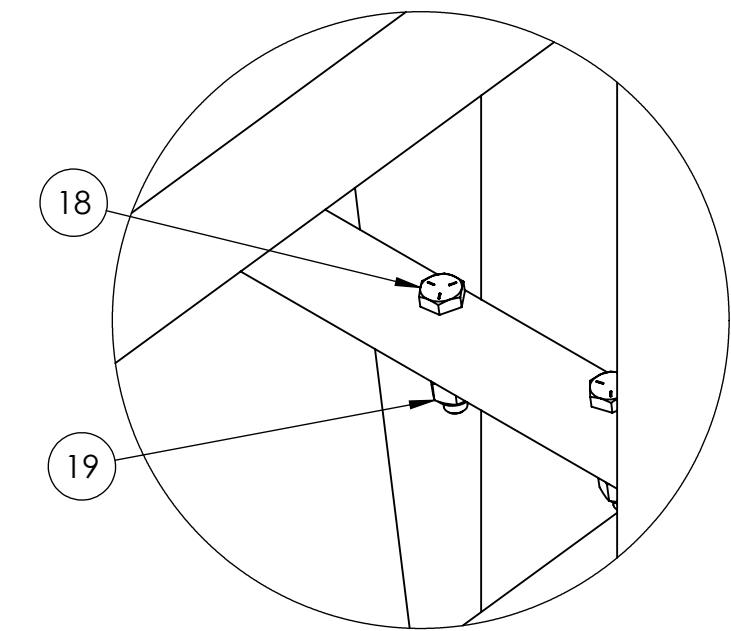
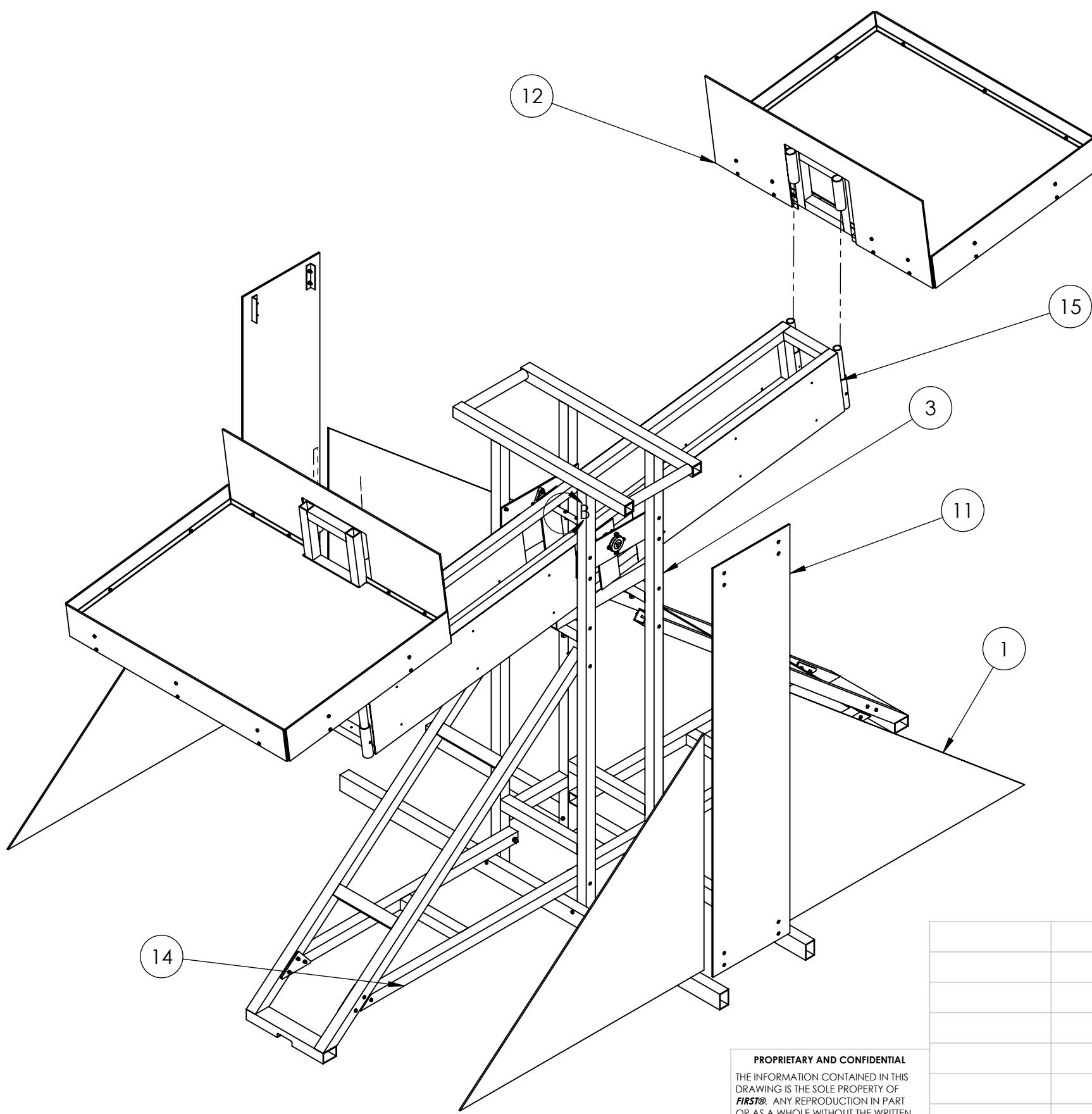
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|-------------|----------------------|---|--|--------------|------|
| | | UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL: $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$, BEND $\pm 1^\circ$ TWO PLACE DECIMAL: $\pm .01$ THREE PLACE DECIMAL: $\pm .001$ | | NAME | DATE |
| | | DRAWN | | | |
| | | CHECKED | | | |
| | | ENG APPR. | | | |
| | | MFG APPR. | | | |
| | | Q.A. | | | |
| | | COMMENTS: | | | |
| | | MATERIAL | | | |
| | | FINISH | | | |
| NEXT ASSY | USED ON | | | | |
| APPLICATION | DO NOT SCALE DRAWING | | | | |
| SIZE | DWG. NO. | | | REV | |
| B | GE-18120 | | | | |
| SCALE: 1:48 | WEIGHT: | | | SHEET 3 OF 5 | |

4

3

2

1



DETAIL B
SCALE 1 : 2

Notes:

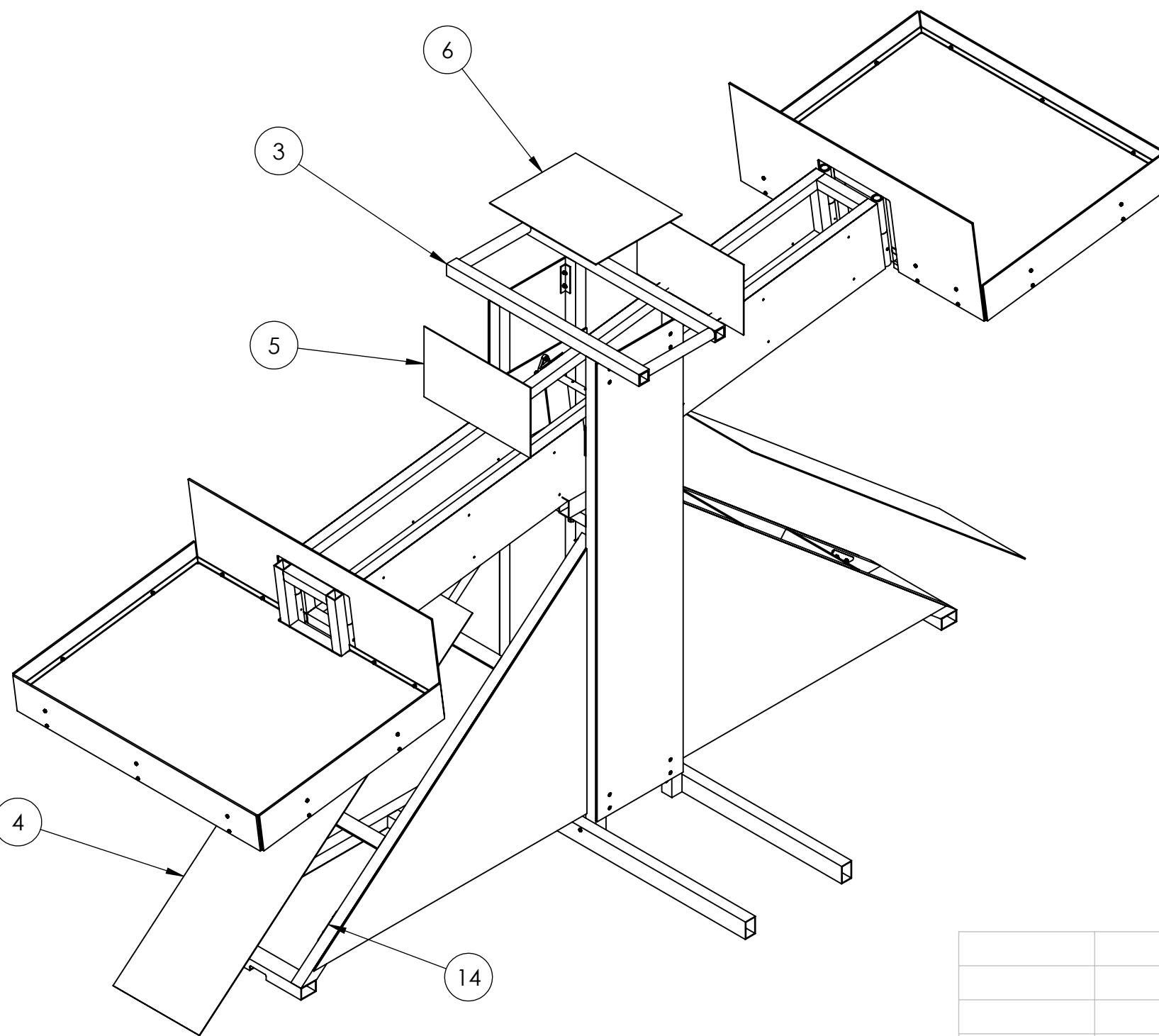
1. Align Item 2 (the shaft) through the tube of Item 17 and secure alignment using Items 18 (qty: 3) and 19 (qty: 3).
2. Slide Items 12 (qty: 2) onto the pins of Item 15.
3. Attach Items 11 to Item 3 using hook and loop.
4. Attach Items 1 to Items 14 using hook and loop.

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Scale Assembly

| | | |
|-------------|-----------------|--------------|
| SIZE | DWG. NO. | REV |
| B | GE-18120 | |
| SCALE: 1:48 | WEIGHT: | SHEET 4 OF 5 |



Notes:

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

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Scale Assembly

| | | |
|-------------|-----------------|--------------|
| SIZE | DWG. NO. | REV |
| B | GE-18120 | |
| SCALE: 1:48 | WEIGHT: | SHEET 5 OF 5 |

4

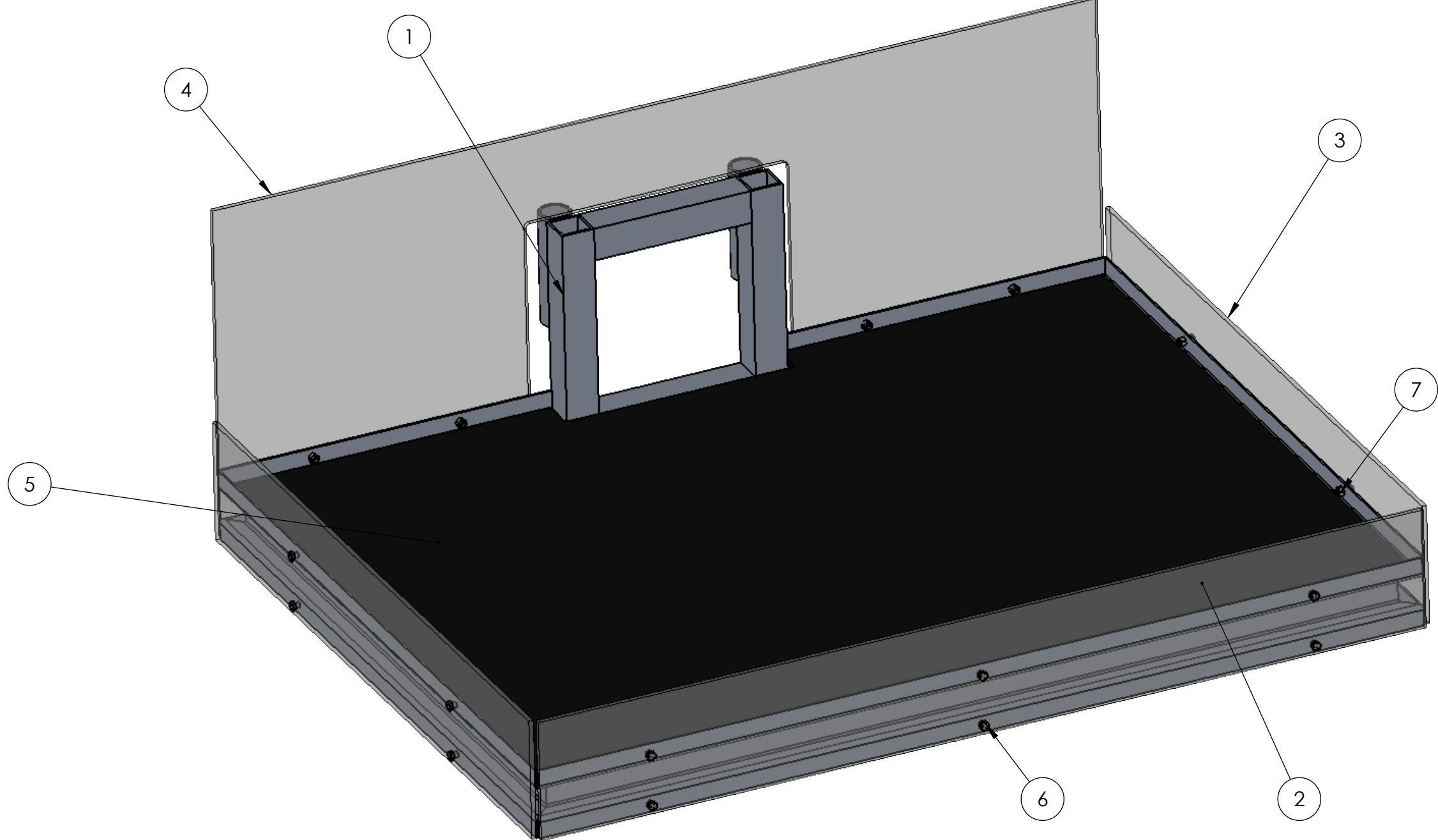
3

2

1

B

B



A

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

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| | | | | | |
|------------|-----------------|--|-----------|----------------------|--------------|
| | | UNLESS OTHERWISE SPECIFIED: | | NAME | DATE |
| | | DIMENSIONS ARE IN INCHES | DRAWN | | |
| | | TOLERANCES: | CHECKED | | |
| | | FRACTIONAL $\pm 1/16$ | ENG APPR. | | |
| | | ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ | MFG APPR. | | |
| | | TWO PLACE DECIMAL $\pm .01$ | Q.A. | | |
| | | THREE PLACE DECIMAL $\pm .001$ | COMMENTS: | | |
| | | | | | |
| | | INTERPRET GEOMETRIC TOLERANCING PER: | | | |
| | | MATERIAL | | | |
| | | NEXT ASSY | USED ON | FINISH | |
| | | | | | |
| | | APPLICATION | | DO NOT SCALE DRAWING | |
| | | | | | |
| SIZE | DWG. NO. | | | | REV |
| B | GE-18121 | | | | |
| SCALE: 1:6 | WEIGHT: | | | | SHEET 1 OF 2 |

4

3

2

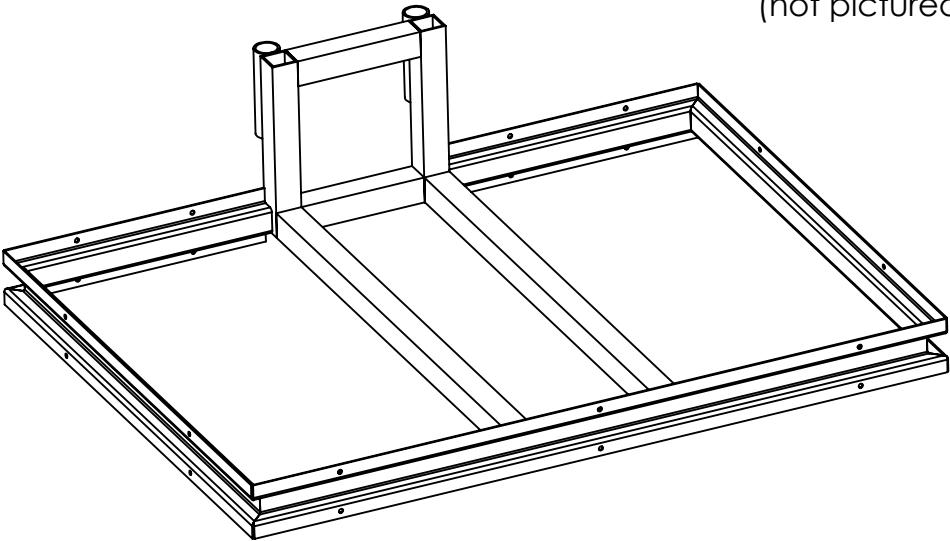
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4

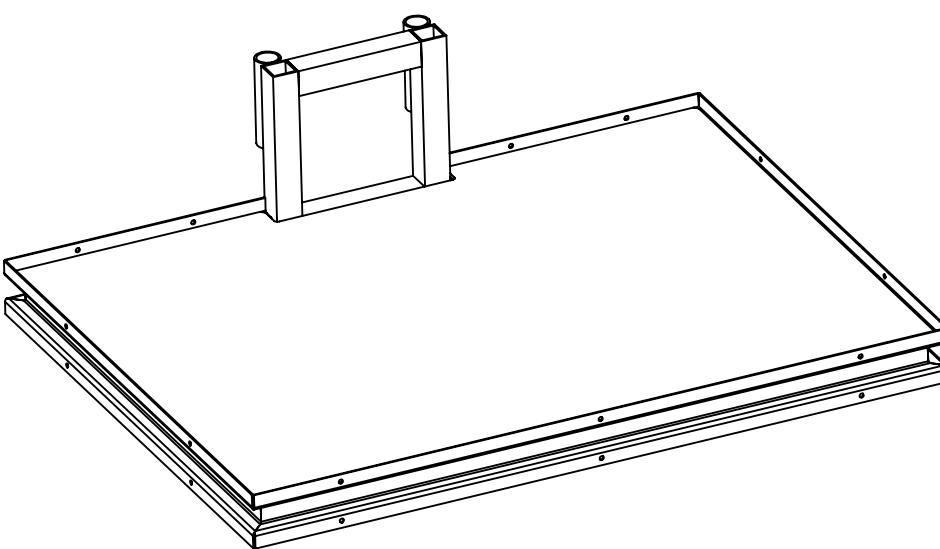
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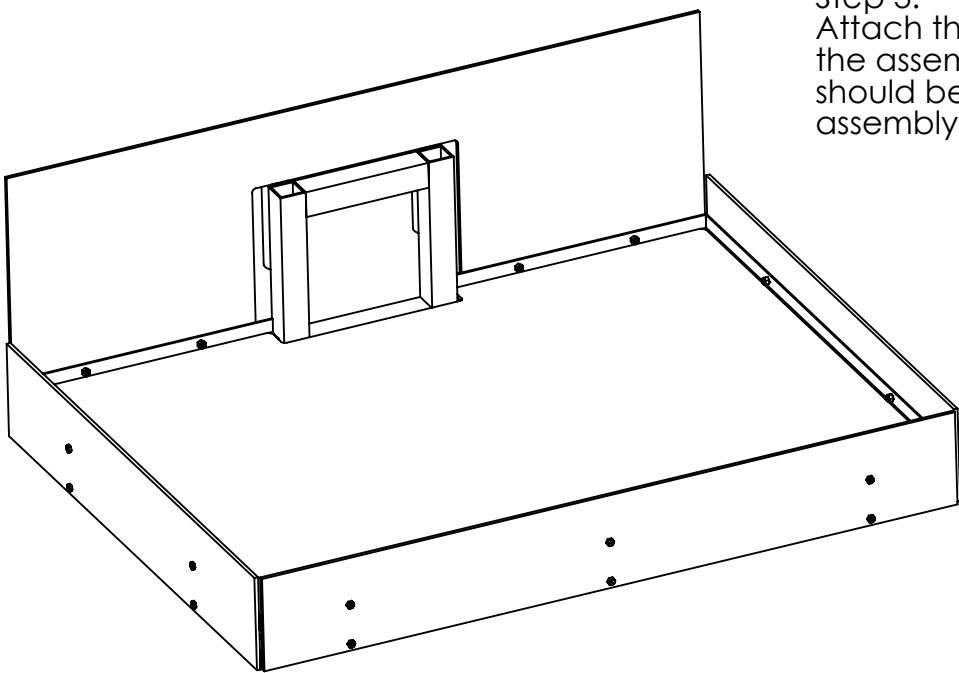
1



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



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



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

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Basket Assembly

| | | |
|-------------|-----------------|--------------|
| SIZE | DWG. NO. | REV |
| B | GE-18121 | |
| SCALE: 1:12 | WEIGHT: | SHEET 2 OF 2 |

4

3

2

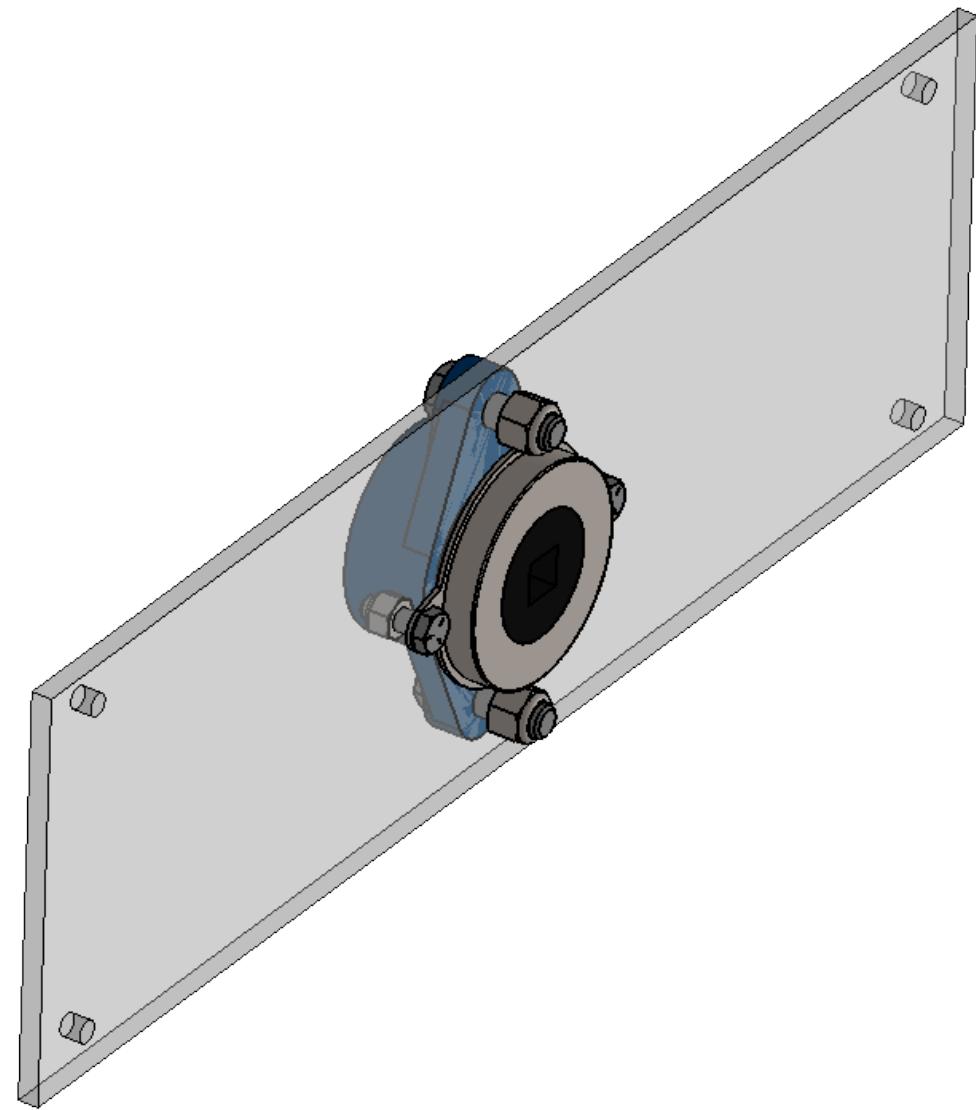
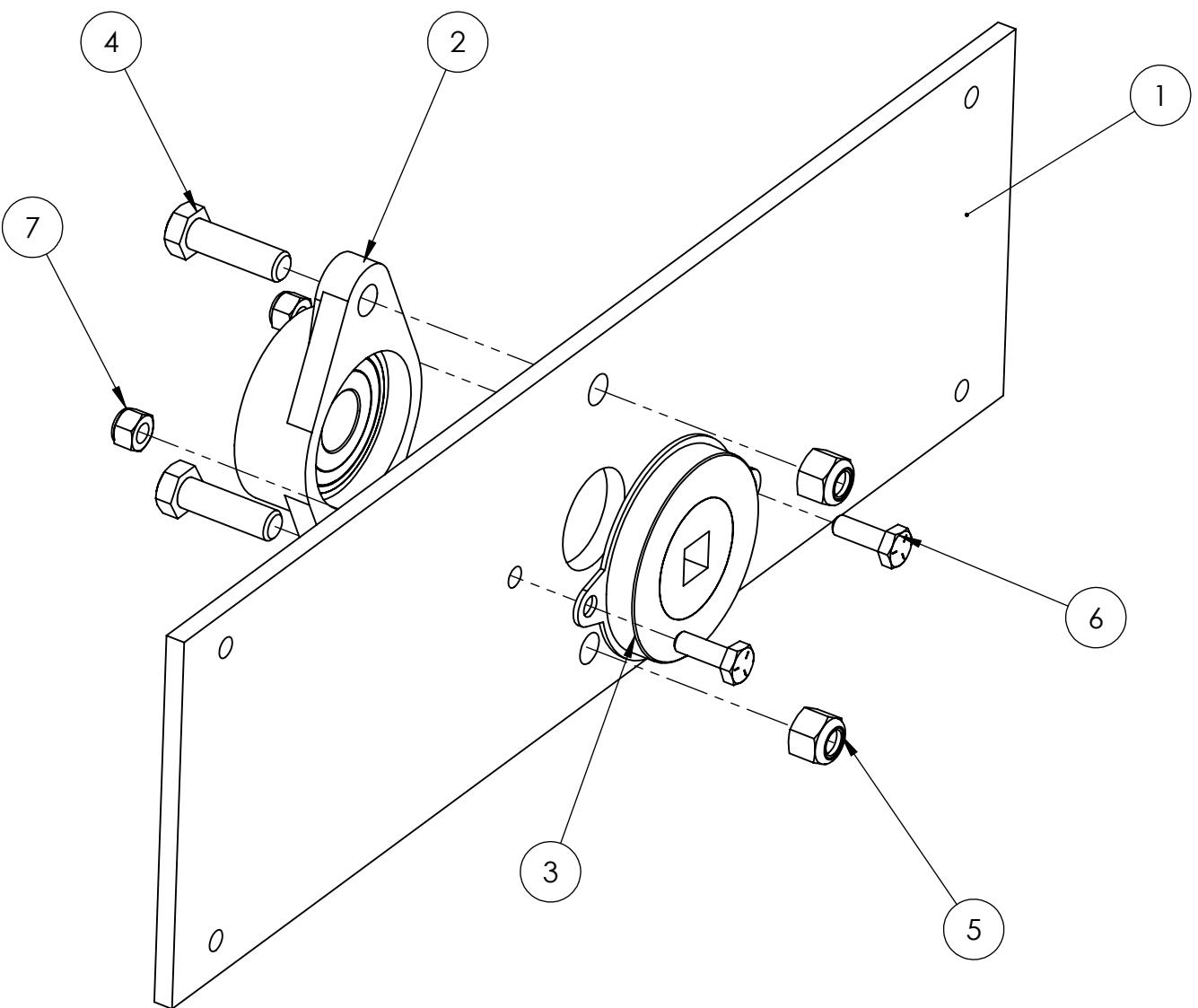
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Notes:

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

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

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| | | | | |
|------------|-----------------|--|----------------------|------|
| | | UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL: ±1/16 ANGULAR: MACH ±1° BEND ±1° TWO PLACE DECIMAL: ±.01 THREE PLACE DECIMAL: ±.001 | NAME | DATE |
| | | DRAWN | | |
| | | CHECKED | | |
| | | ENG APPR. | | |
| | | MFG APPR. | | |
| | | Q.A. | | |
| | | COMMENTS: | | |
| | | MATERIAL | | |
| | | FINISH | | |
| | NEXT ASSY | USED ON | | |
| | | APPLICATION | DO NOT SCALE DRAWING | |
| SIZE | DWG. NO. | | REV | |
| B | GE-18122 | | | |
| SCALE: 1:2 | WEIGHT: | | SHEET 1 OF 1 | |

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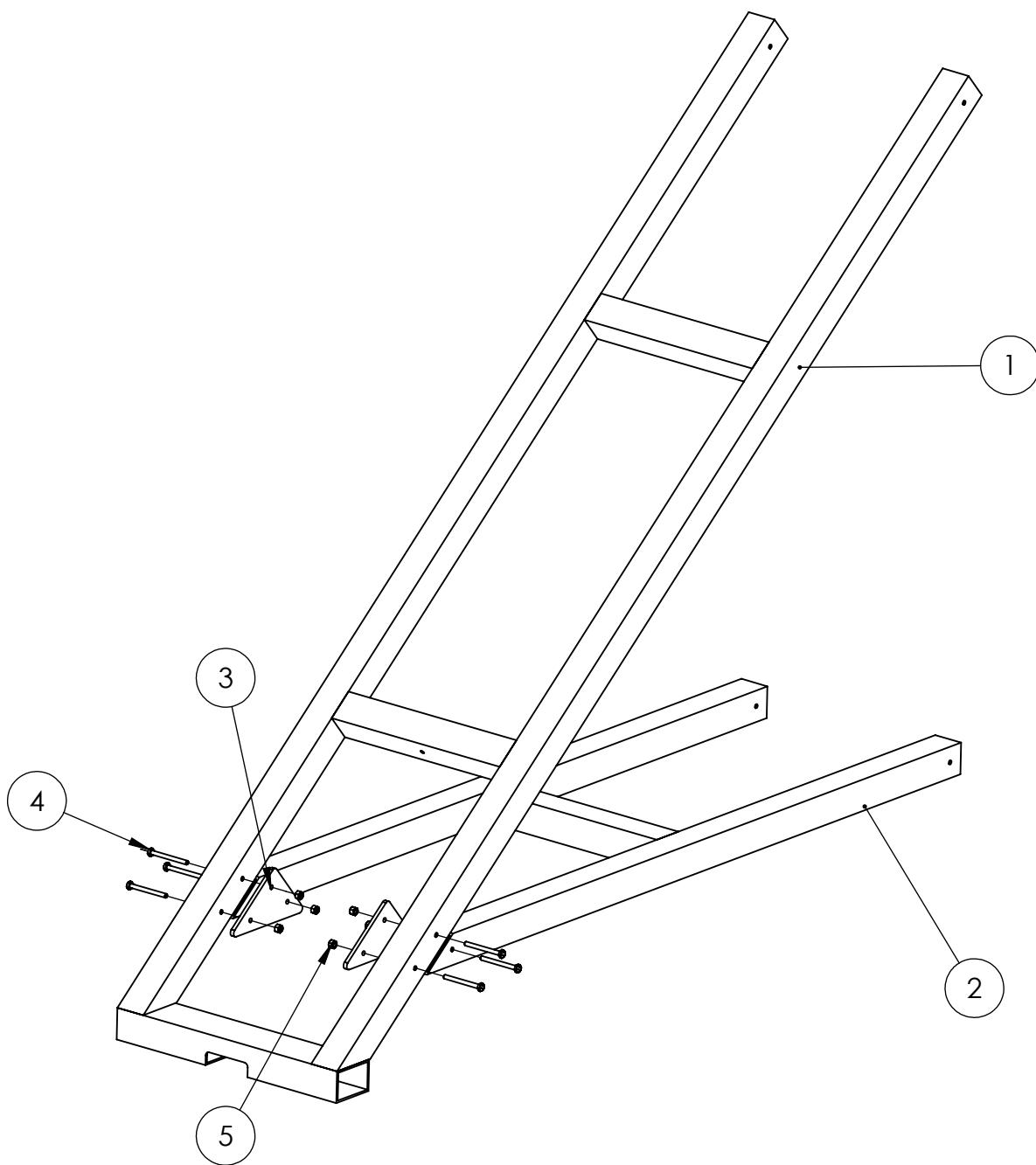
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| ITEM NO. | PART NUMBER | DESCRIPTION | QTY. |
|----------|-----------------------------|---|------|
| 1 | GE-18078 | Outrigger Wing Diagonal | 1 |
| 2 | GE-18077 | Outrigger Wing Horizontal | 1 |
| 3 | GE-18079 | Outrigger Wing Plate | 2 |
| 4 | hex_.25_20_2.75_part ial | Steel Hex Head Screw, 1/4"-20 x 2-3/4" long, partially threaded | 6 |
| 5 | nylock_.25_20 | Steel Nylon-Insert Locknut, 1/4"-20 | 6 |

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| | | DRAWN | | | |
| | | CHECKED | | | |
| | | ENG APPR. | | | |
| | | MFG APPR. | | | |
| | | Q.A. | | | |
| | | COMMENTS: | | | |
| | | MATERIAL | | | |
| | | FINISH | | | |
| | NEXT ASSY | USED ON | | | |
| | | APPLICATION | DO NOT SCALE DRAWING | | |
| SIZE | DWG. NO. | | | REV | |
| B | GE-18123 | | | | |
| SCALE: 1:10 | WEIGHT: | | | SHEET 1 OF 1 | |

FIRST
ROBOTICS
COMPETITION

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TITLE: **Outrigger Assembly**

SIZE **B** DWG. NO. **GE-18123** REV

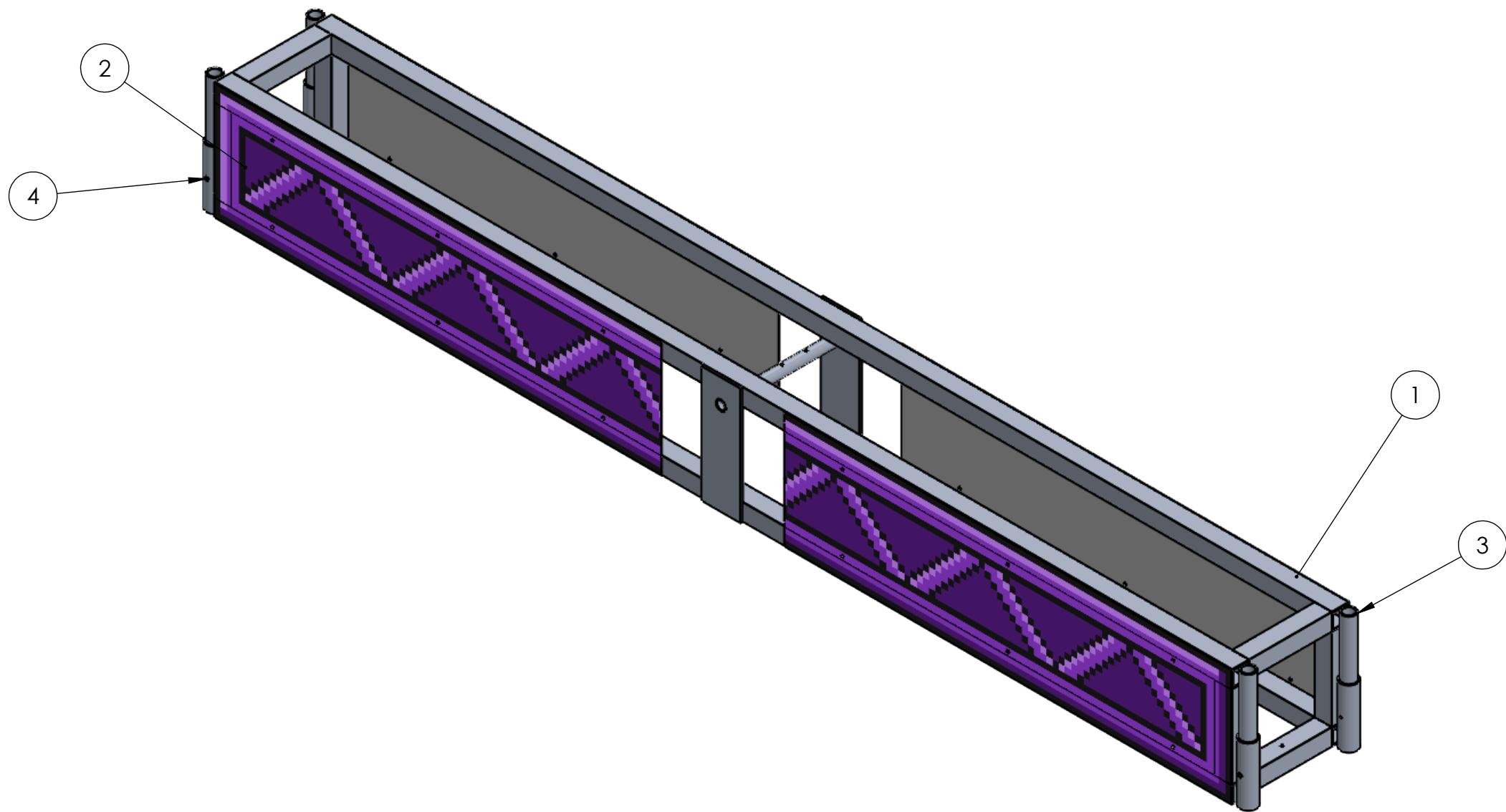
SCALE: 1:10 WEIGHT: SHEET 1 OF 1

4

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B

B

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

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|-------------|---------|---|--|--------------|------|
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| | | DRAWN | | | |
| | | CHECKED | | | |
| | | ENG APPR. | | | |
| | | MFG APPR. | | | |
| | | Q.A. | | | |
| | | COMMENTS: | | | |
| | | MATERIAL | | | |
| | | FINISH | | | |
| NEXT ASSY | USED ON | | | | |
| APPLICATION | | DO NOT SCALE DRAWING | | | |
| SCALE: 1:24 | | WEIGHT: | | SHEET 1 OF 2 | |

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

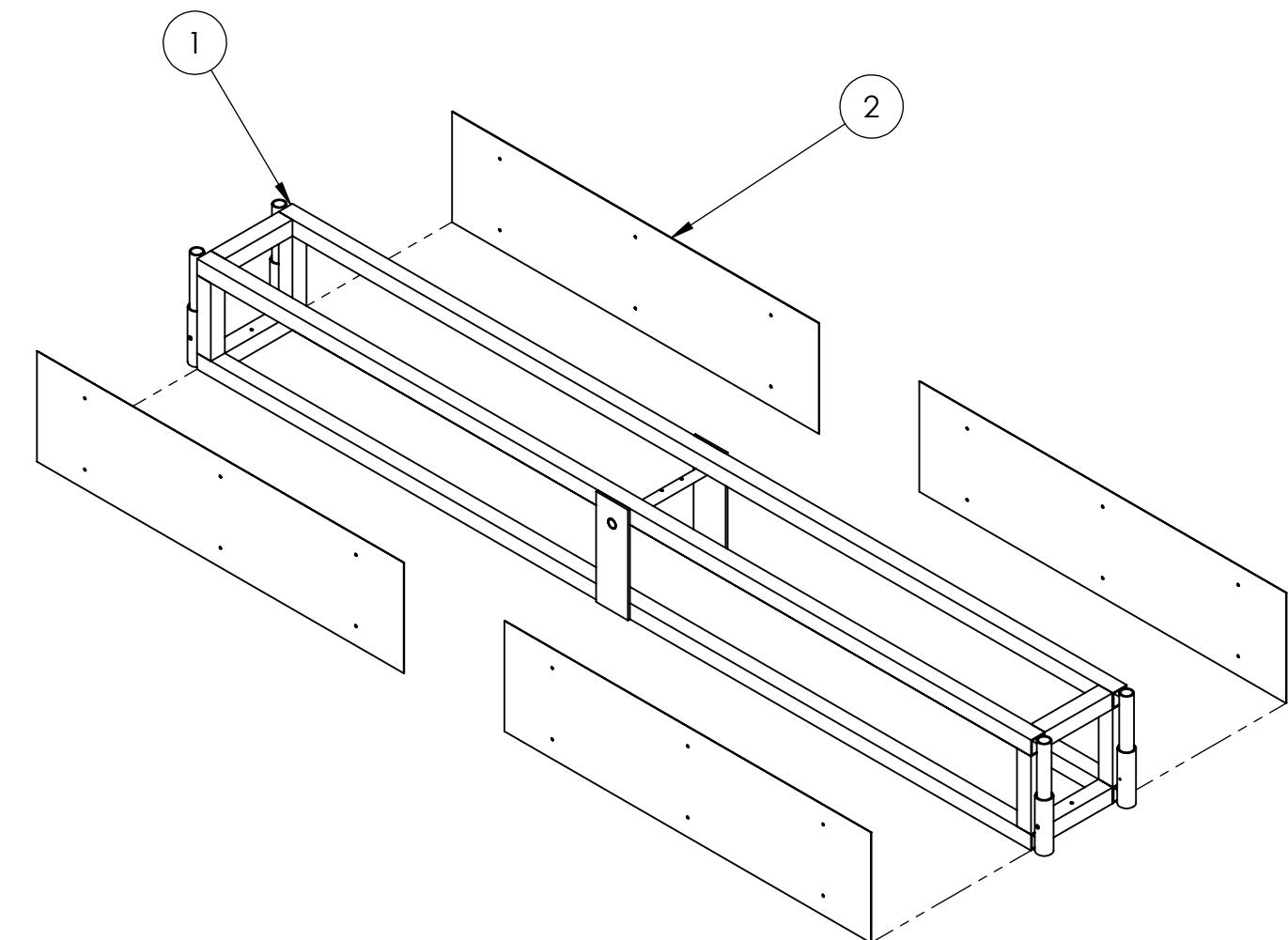
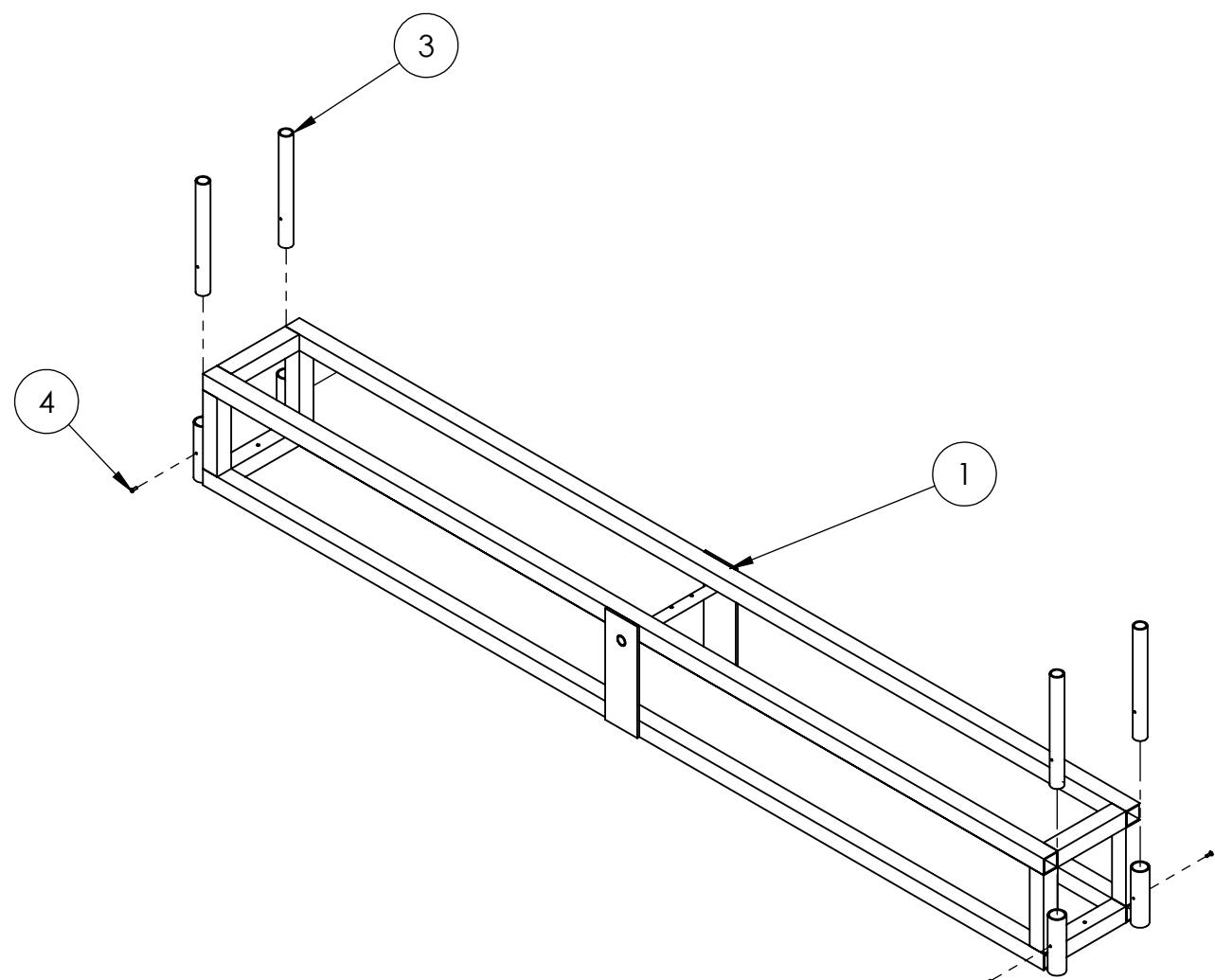
Title: Scale Arm Assembly
Size: DWG. NO. **B** **GE-18125** **Rev:**

4

3

2

1



Note:

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

Note:

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

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|-------------|-----------------|--|----------------------|------|------|
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| | | DRAWN | | | |
| | | CHECKED | | | |
| | | ENG APPR. | | | |
| | | MFG APPR. | | | |
| | | Q.A. | | | |
| | | COMMENTS: | | | |
| | | MATERIAL | | | |
| | NEXT ASSY | USED ON | FINISH | | |
| | APPLICATION | | DO NOT SCALE DRAWING | | |
| SIZE | DWG. NO. | REV | | | |
| B | GE-18125 | | | | |
| SCALE: 1:24 | WEIGHT: | SHEET 2 OF 2 | | | |

4

3

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1

B

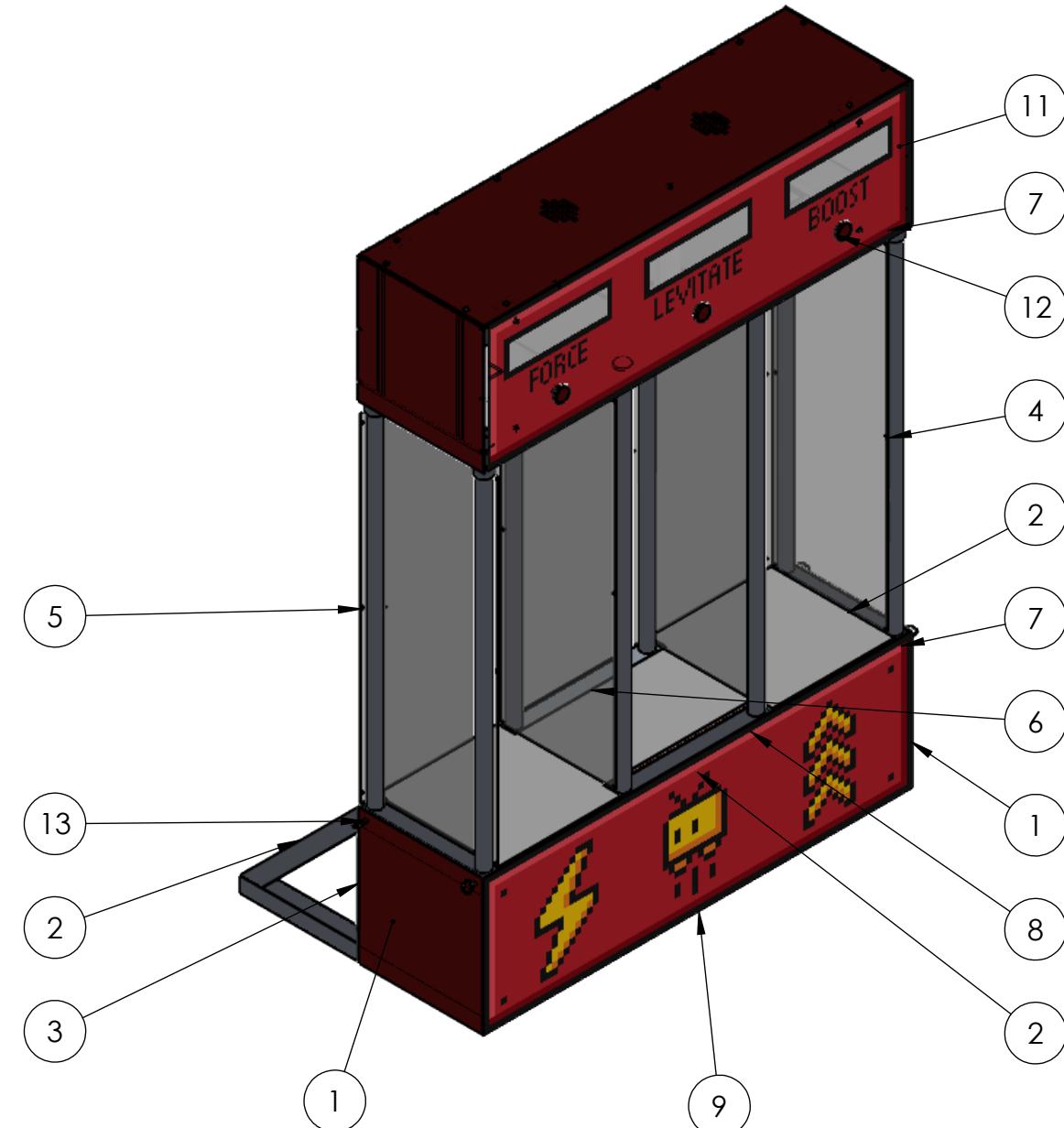
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REVISIONS

| ZONE | REV. | DESCRIPTION | DATE | APPROVED |
|------|------|---|-----------|----------|
| 2-A3 | 1 | Revised note to refer to correct ITEM NO. | 1/12/2018 | CPO |

B

B



A

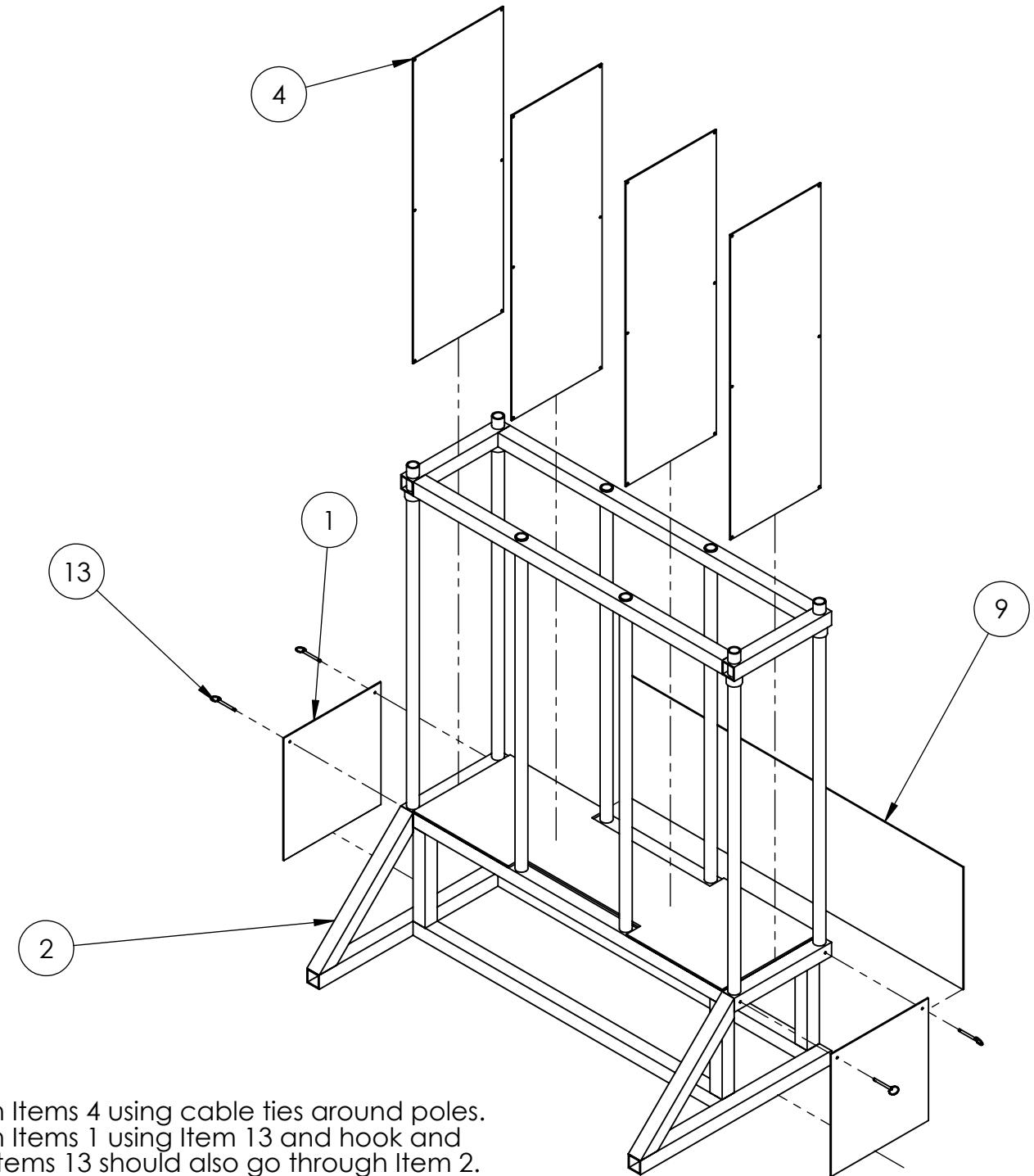
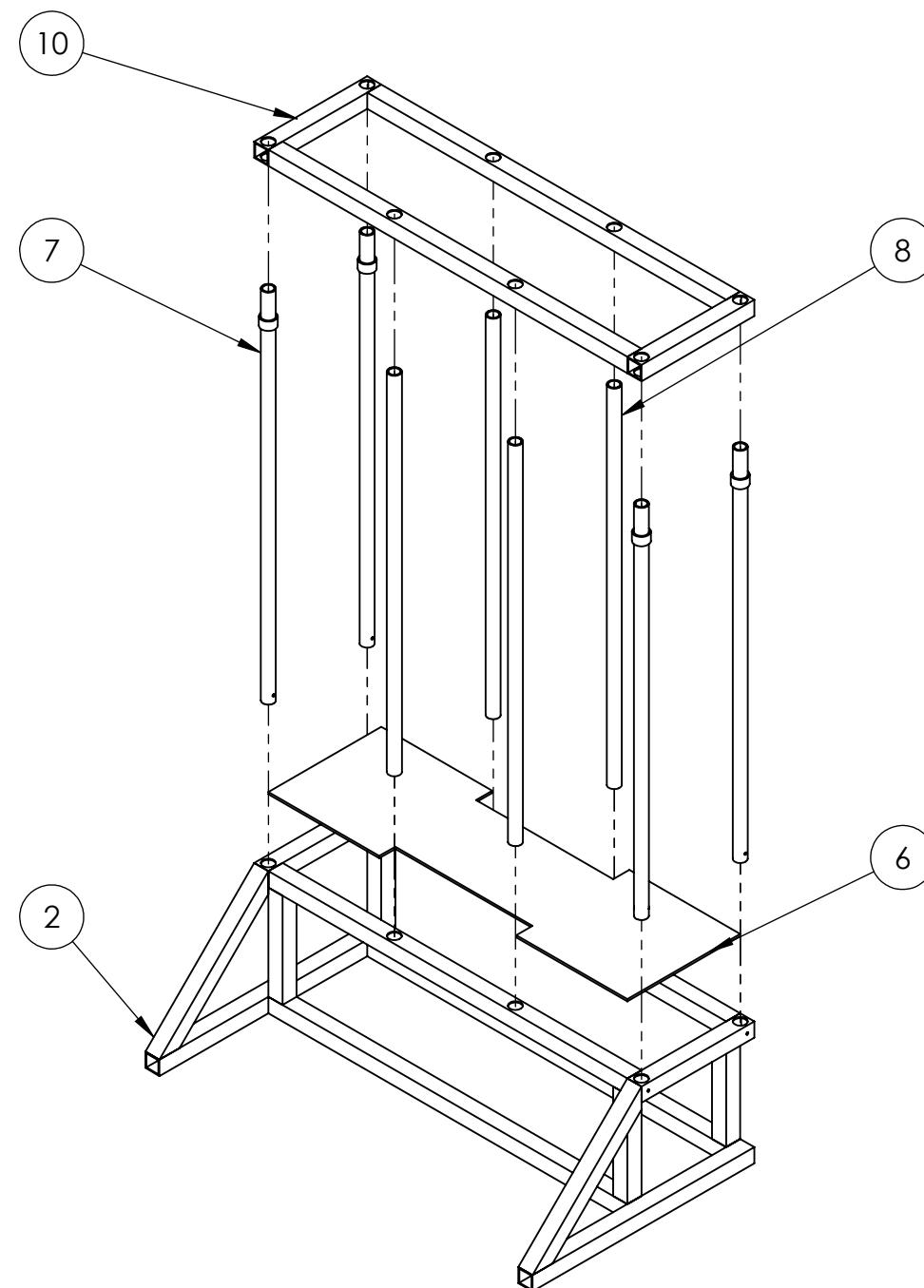
A

| ITEM NO. | PART NUMBER | DESCRIPTION | Default/QTY. |
|----------|----------------------|---|--------------|
| 1 | GE-18031 | Vault HDPE Bottom Side | 2 |
| 2 | GE-18032 | Vault Base | 1 |
| 3 | GE-18035 | Vault HDPE Bottom Back | 1 |
| 4 | GE-18036 | Vault Polycarbonate Middle Insert | 4 |
| 5 | GE-18037 | Vault Polycarbonate Backstop | 1 |
| 6 | GE-18038 | Vault Polycarbonate Bottom Floor | 1 |
| 7 | GE-18039 | Vault Support Pipes | 4 |
| 8 | GE-18040 | Vault Middle Support Pipes | 4 |
| 9 | GE-18045 | Vault Polycarbonate Bottom Front | 1 |
| 10 | GE-18047 | Vault Top Frame | 1 |
| 11 | GE-18129 | Vault Top Assembly | 1 |
| 12 | Vault_Button | | 3 |
| 13 | pin_quick_ring_.25_2 | SS Ring-Grip Quick-Release Pin, 1/4" diameter, 2" long | 4 |
| 14 | hex_.25_20_.75 | Steel Hex Head Screw, 1/4"-20 x 3/4" long, fully threaded | 12 |
| 15 | nylock_.25_20 | Steel Nylon-Insert Locknut, 1/4"-20 | 12 |

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|-------------|----------|--|----------------------|------|
| | | UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL: ±1/16 ANGULAR: MACH ±1° BEND ±1° TWO PLACE DECIMAL: ±.01 THREE PLACE DECIMAL: ±.001 | NAME | DATE |
| | | DRAWN | | |
| | | CHECKED | | |
| | | ENG APPR. | | |
| | | MFG APPR. | | |
| | | Q.A. | | |
| | | COMMENTS: | | |
| | | MATERIAL | | |
| | | FINISH | | |
| | | APPLICATION | DO NOT SCALE DRAWING | |
| SIZE | DWG. NO. | REV | | |
| B | GE-18126 | 1 | | |
| SCALE: 1:14 | WEIGHT: | SHEET 1 OF 3 | | |

4 3 2 1



Notes:

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

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

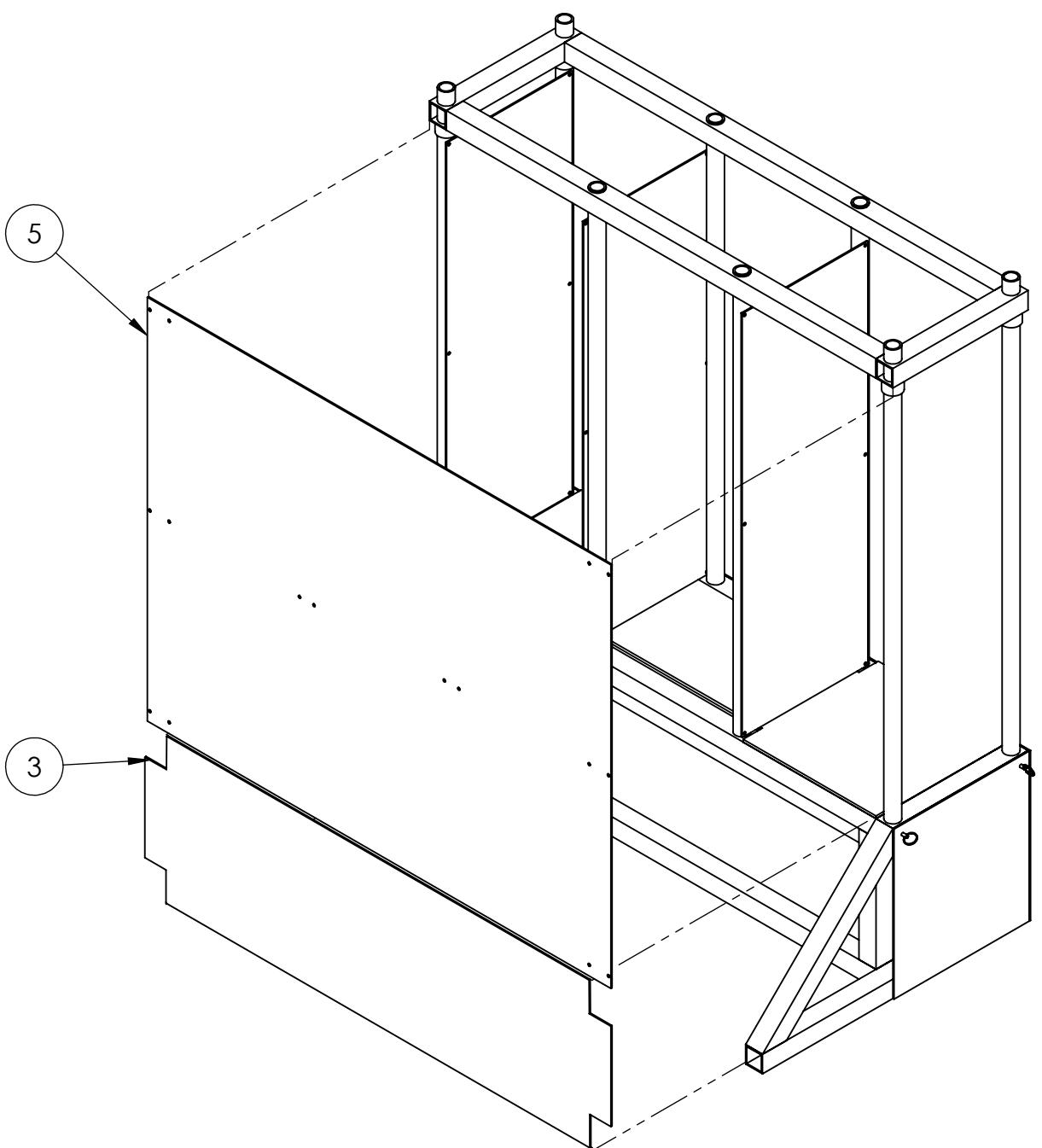
TITLE: Vault Assembly

SIZE DWG. NO. **B** GE-18126 **REV** **1**

SCALE: 1:12 WEIGHT: SHEET 2 OF 3

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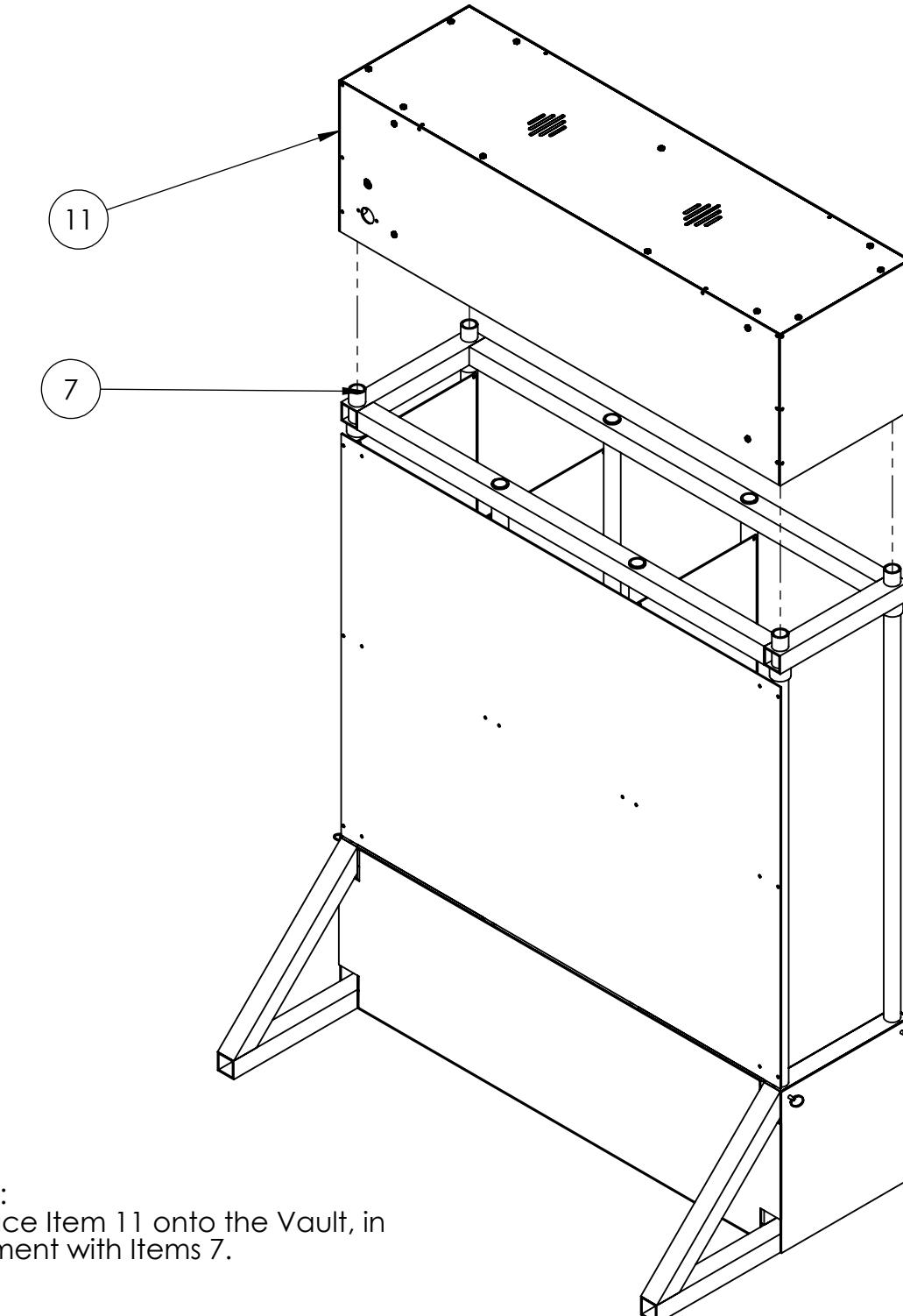
4 3 2 1



Notes:

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

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

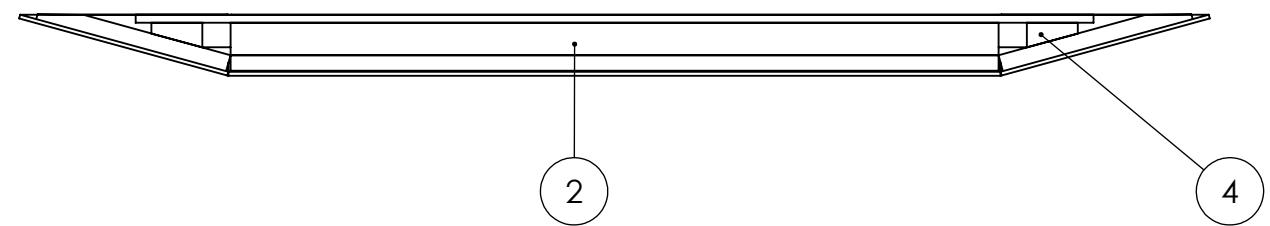
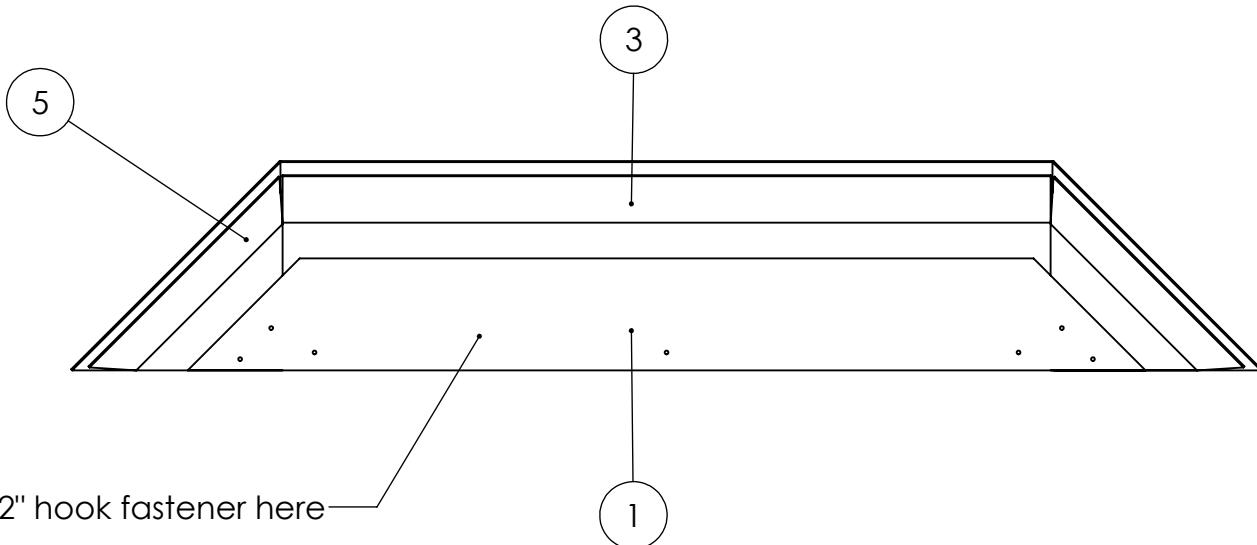
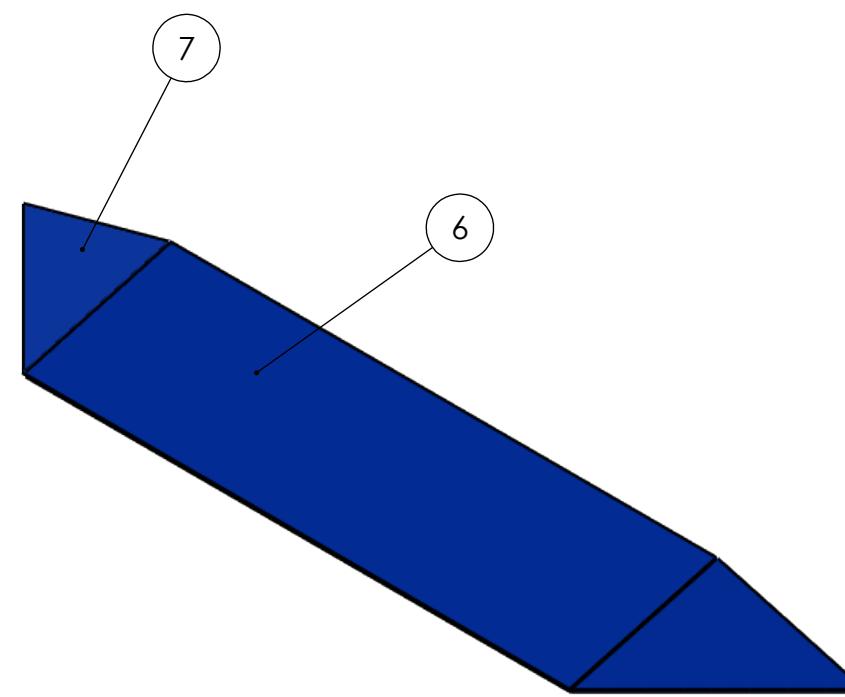
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|-----------------------|---------|--|-----------|------|------|--|--|
| | | UNLESS OTHERWISE SPECIFIED: | | NAME | DATE |  FIRST ROBOTICS COMPETITION | TITLE: <h1>Vault Assembly</h1> |
| | | DIMENSIONS ARE IN INCHES | DRAWN | | | | |
| | | TOLERANCES: | CHECKED | | | | |
| | | FRACTIONAL $\pm 1/16$ | ENG APPR. | | | | |
| | | ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ | MFG APPR. | | | | |
| | | TWO PLACE DECIMAL $\pm .01$ | QA. | | | | |
| | | THREE PLACE DECIMAL $\pm .001$ | COMMENTS: | | | | |
| | | INTERPRET GEOMETRIC TOLERANCING PER: | | | | | |
| | | MATERIAL | | | | | |
| NEXT ASSY | USED ON | FINISH | | | | | |
| APPLICATION | | DO NOT SCALE DRAWING | | | | | |
| SCALE: 1:12 WEIGHT: | | | | | | SHEET 3 OF 3 | |

4

3

2

1



B

B

A

A

| ITEM NO. | PART NUMBER | DESCRIPTION | Default/ QTY. |
|----------|-------------|-----------------------------|------------------|
| 1 | GE-18127-01 | 1/4" thk. Polycarb, clear | 1 |
| 2 | GE-18127-02 | 2"x4" Pine | 1 |
| 3 | GE-18127-03 | 1/2" AC Plywood | 1 |
| 4 | GE-18127-04 | 2"x4" Pine | 2 |
| 5 | GE-18127-05 | 1/2" AC Plywood | 2 |
| 6 | GE-18127-06 | 1/8" thk. HDPE, red or blue | 1 |
| 7 | GE-18127-07 | 1/8" thk. HDPE, red or blue | 2 |

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

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

Ramp, Exchange

B **GE-18127**

REV

4

3

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4

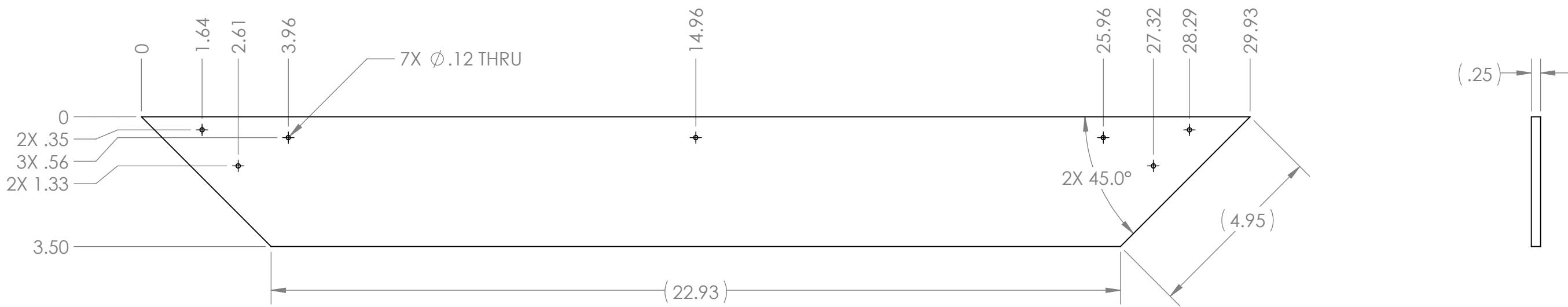
3

2

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B

B



Item: GE-18127-01

Material: 1/4" thk. clear polycarbonate

QTY: 1

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
 Modeling Solutions Partner

Ramp, Exchange

| | | |
|------------|-----------------|--------------|
| B | GE-18127 | REV |
| SCALE: 1:4 | WEIGHT: | SHEET 2 OF 6 |

4

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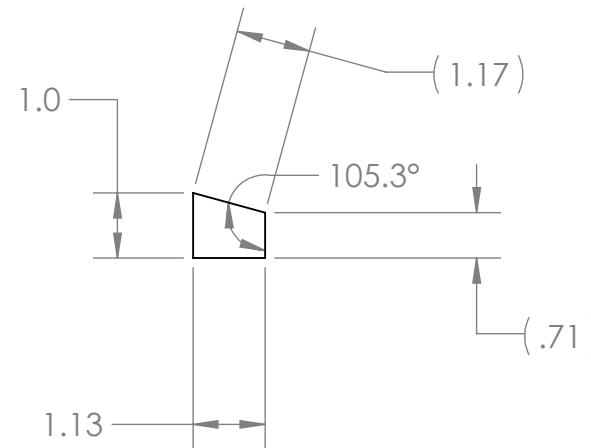
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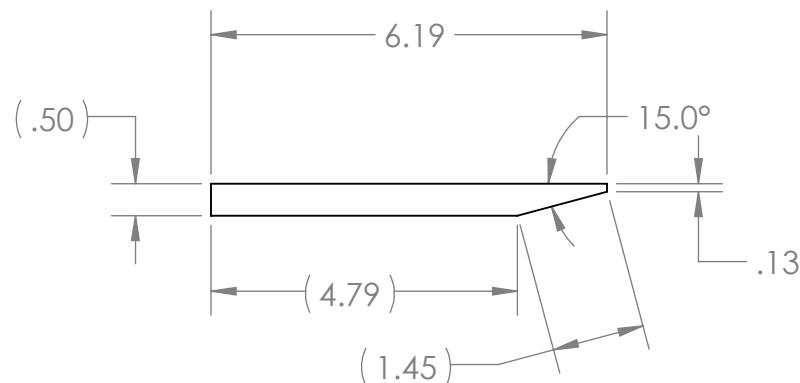
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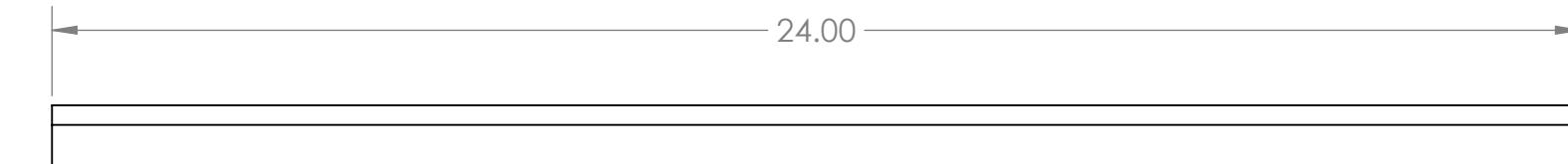


Item: GE-18127-02
Material: 2"x4" Pine
QTY: 1



Item: GE-18127-03
Material: 1/2" AC Plywood
QTY: 1

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|-----------------------------------|---------|--------------------------------------|-----------|------|------|
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| TOLERANCES: | | | | | |
| FRACTIONAL: ±1/16 | | | | | |
| ANGULAR: MACH ±1° BEND ±1° | | | | | |
| TWO PLACE DECIMAL: ±.01 | | | | | |
| THREE PLACE DECIMAL: ±.001 | | | | | |
| | | INTERPRET GEOMETRIC TOLERANCING PER: | | | |
| | | MATERIAL | | | |
| NEXT ASSY | USED ON | FINISH | | | |
| APPLICATION | | DO NOT SCALE DRAWING | COMMENTS: | | |
| | | | | | |
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| FIRST ROBOTICS COMPETITION | | | | | |
| Ramp, Exchange | | | | | |
| GE-18127 | | | | | |
| SCALE: 1:3 | WEIGHT: | SHEET 3 OF 6 | | | |

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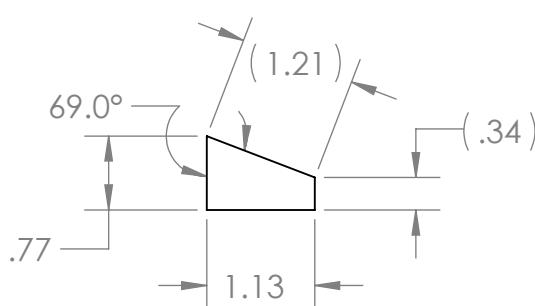
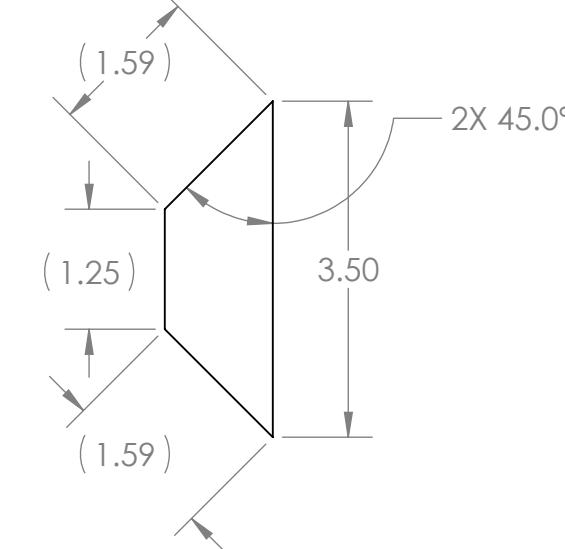
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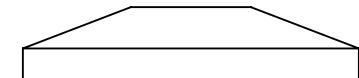
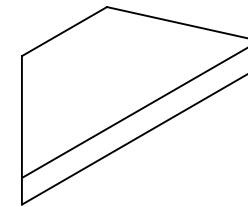
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B



Item: GE-18127-04
Material: 2"x4" Pine
QTY: 2



Item: GE-18127-05
Material: 1/2" AC Plywood
QTY: 2

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

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Modeling Solutions Partner

Ramp, Exchange

SIZE DWG. NO. REV
B GE-18127

SCALE: 1:2 WEIGHT: SHEET 4 OF 6

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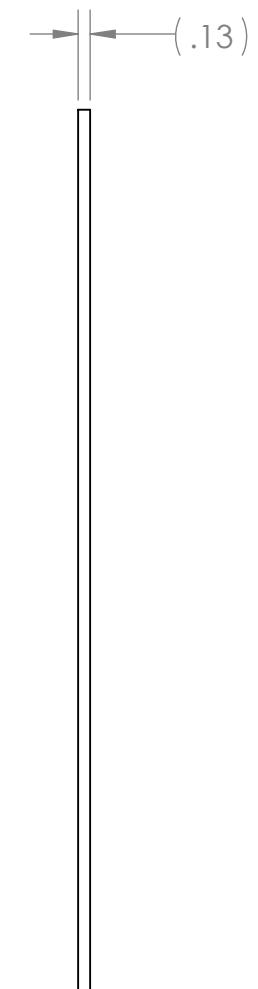
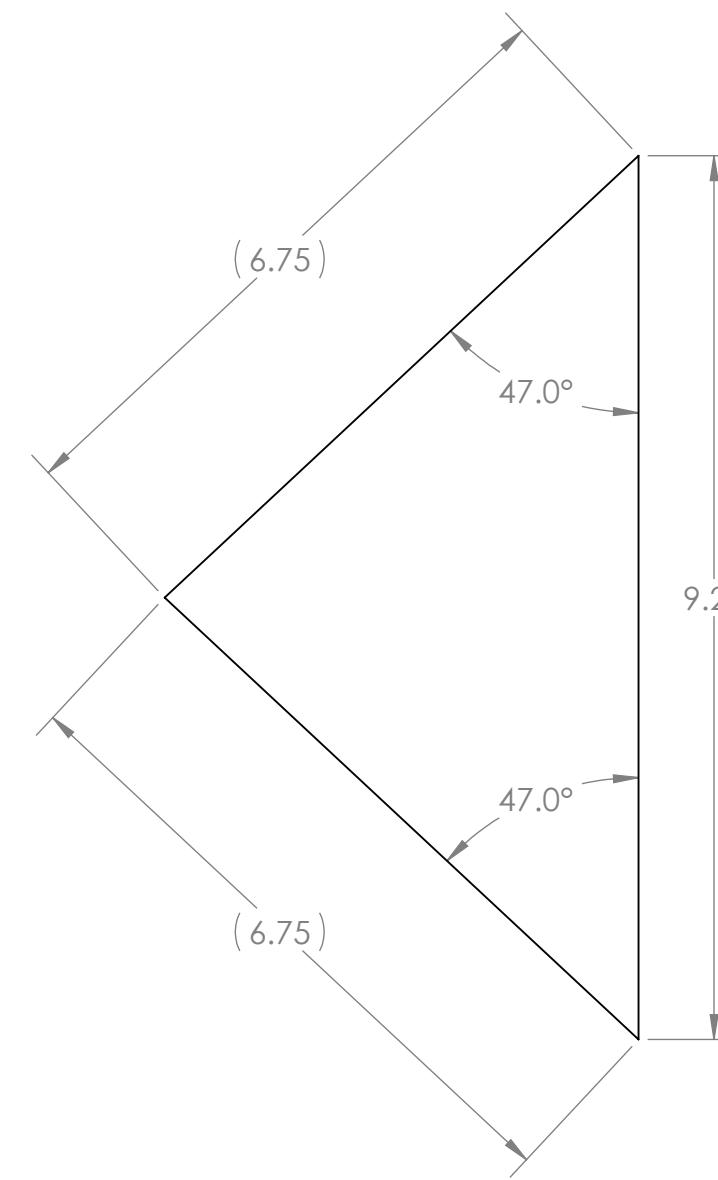
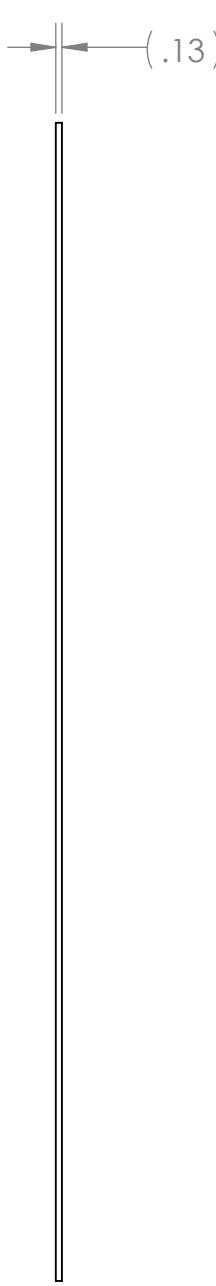
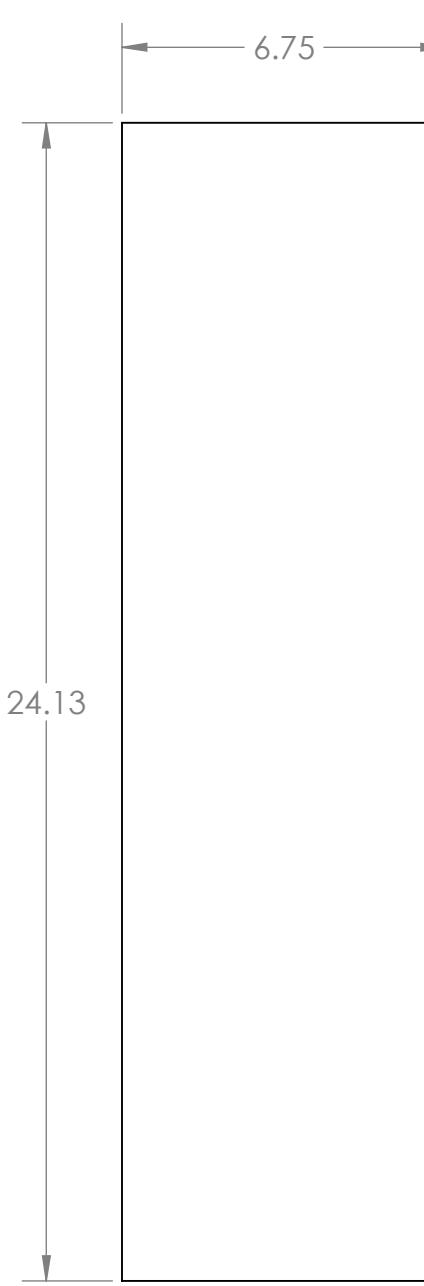
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|-------------|---------|--|------|------|
| | | DRAWN | | |
| | | CHECKED | | |
| | | ENG APPR. | | |
| | | MFG APPR. | | |
| | | Q.A. | | |
| | | COMMENTS: | | |
| | | MATERIAL | | |
| NEXT ASSY | USED ON | FINISH | | |
| APPLICATION | | DO NOT SCALE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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: **Ramp, Exchange**

| | | |
|---------------|--------------------------|--------------|
| SIZE B | DWG. NO. GE-18127 | REV |
| SCALE: 1:2 | WEIGHT: | SHEET 5 OF 6 |

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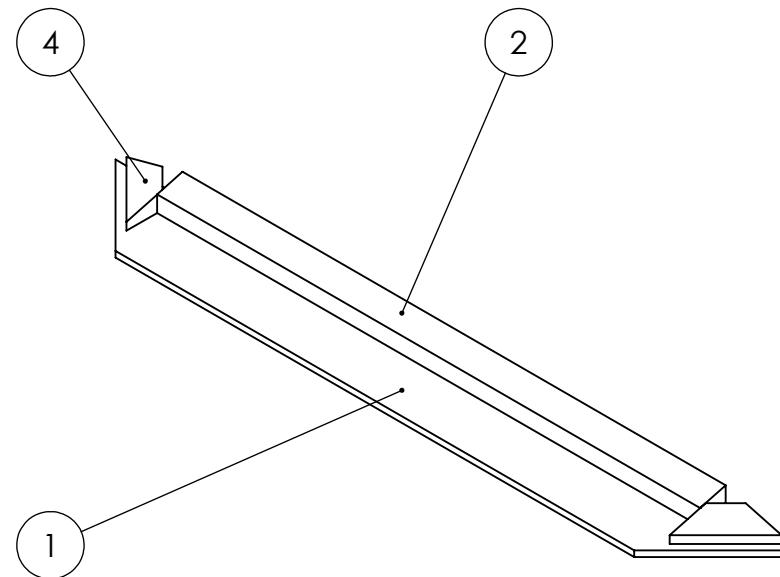
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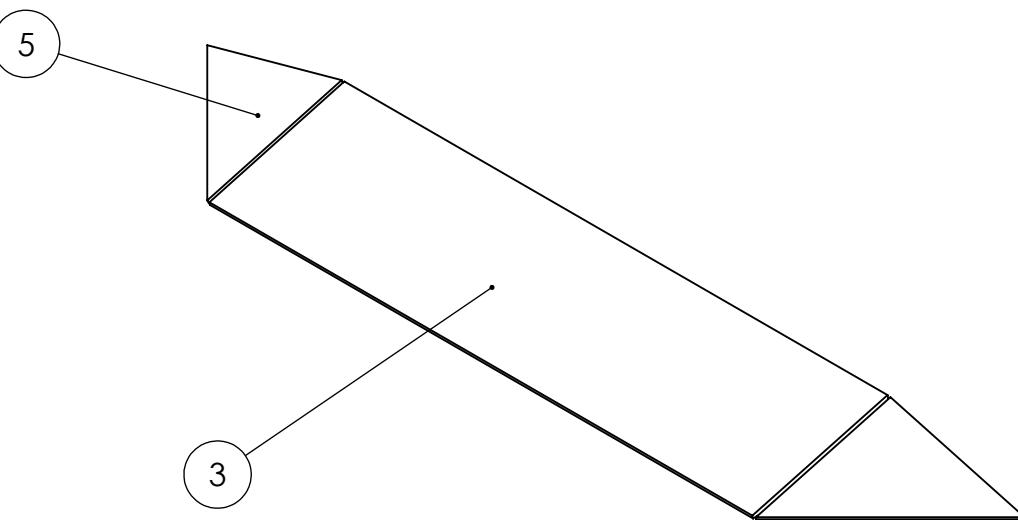
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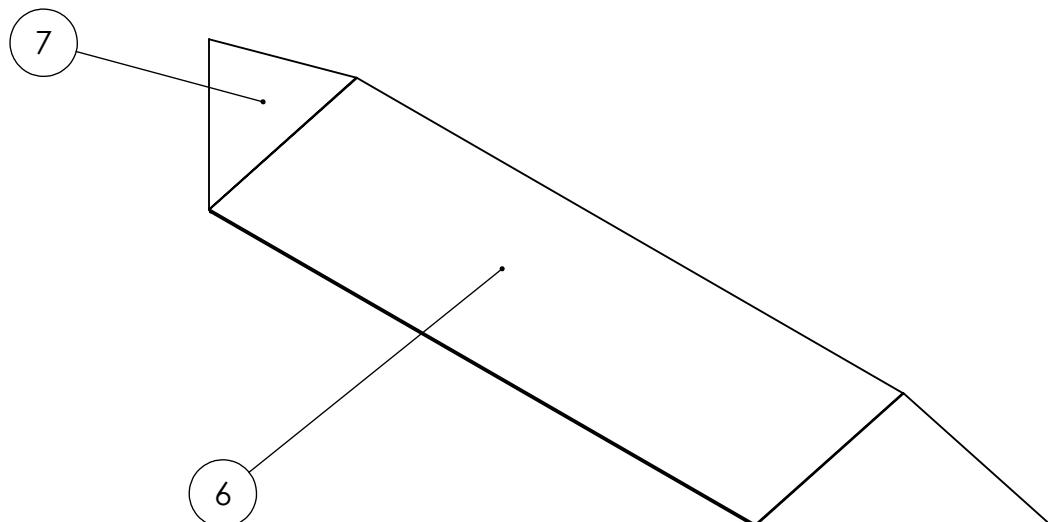
B



Step 1: Attach Item 2 and Item 4 (qty: 2) to Item 1 using wood screws through the holes in Item 1.



Step 2: Attach Item 3 and Item 5 (qty: 2) to Item 4 and Item 2 using wood screws.



Step 3: Attach Item 6 and Item 7 (qty: 2) to Item 5 and Item 6 using double stick tape.

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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Ramp, Exchange

SIZE DWG. NO. REV
B **GE-18127**

SCALE: 1:6 WEIGHT: SHEET 6 OF 6

4

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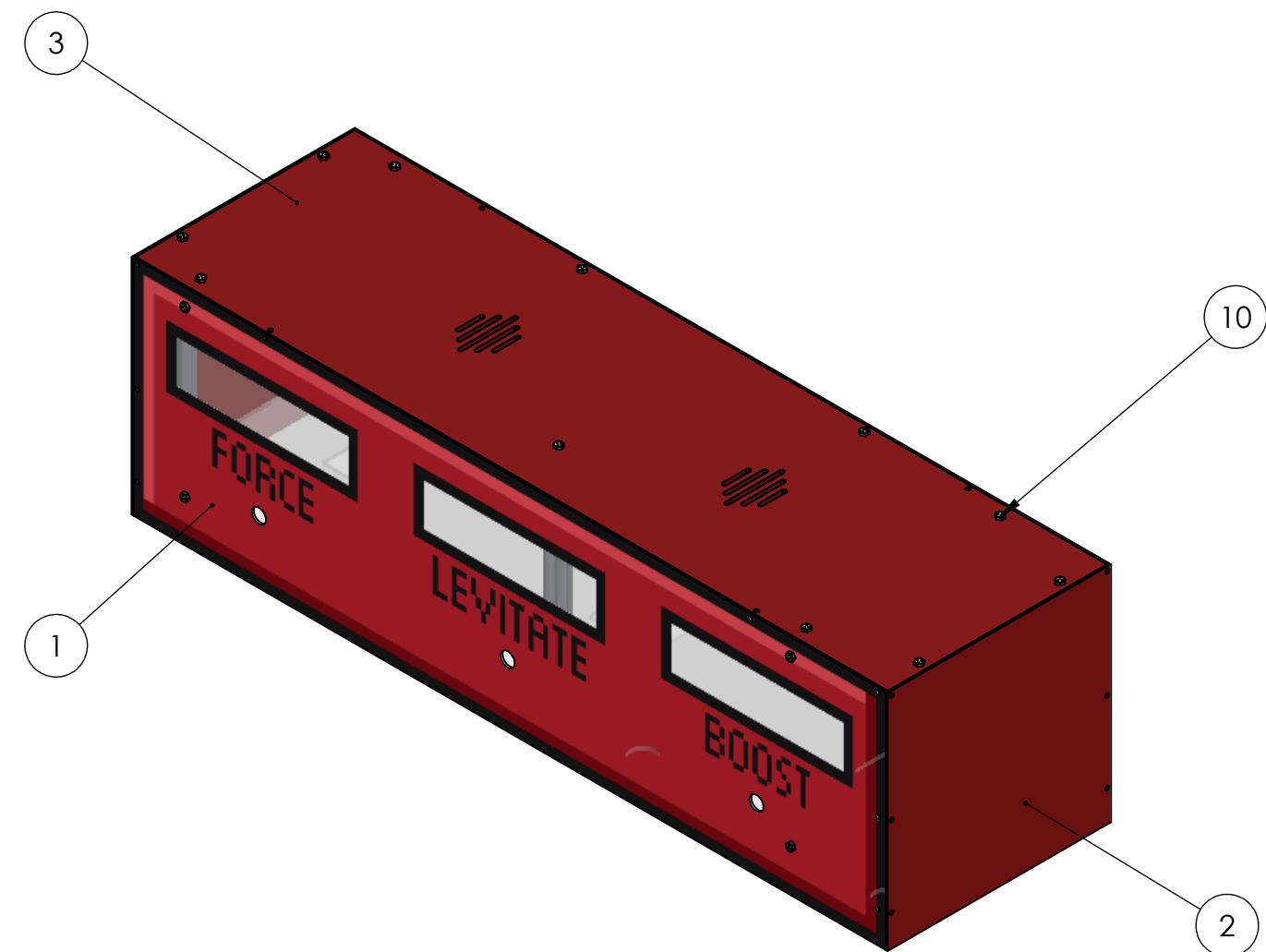
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B

B



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

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| | | DRAWN | | |
| | | CHECKED | | |
| | | ENG APPR. | | |
| | | MFG APPR. | | |
| | | Q.A. | | |
| | | COMMENTS: | | |
| | | MATERIAL | | |
| | | FINISH | | |
| NEXT ASSY | USED ON | APPLICATION | DO NOT SCALE DRAWING | |
| SCALE: 1:8 WEIGHT: SHEET 1 OF 3 | | | | |

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: **Vault Top Assembly**

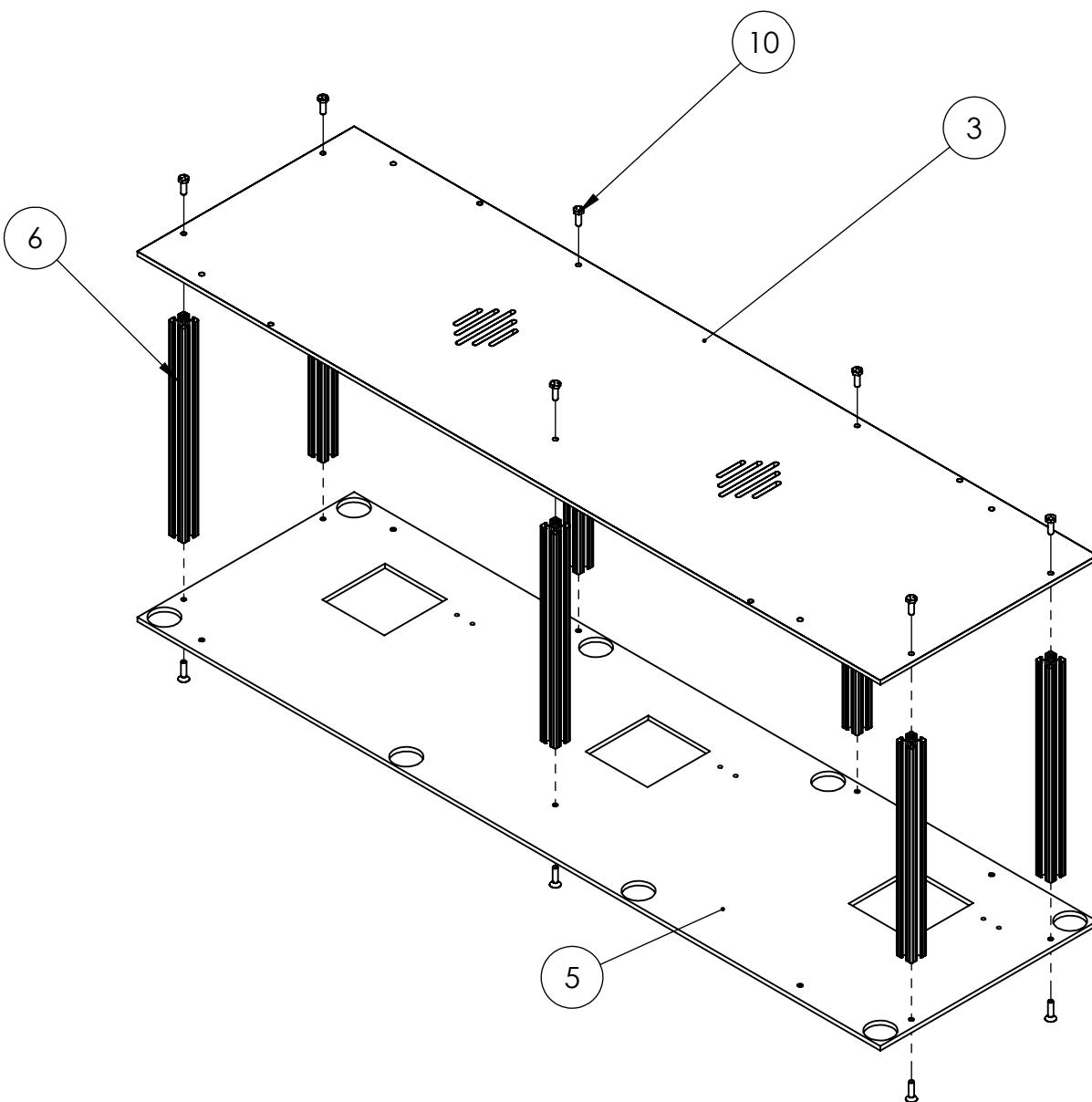
SIZE **DWG. NO.** **REV**
B **GE-18129**

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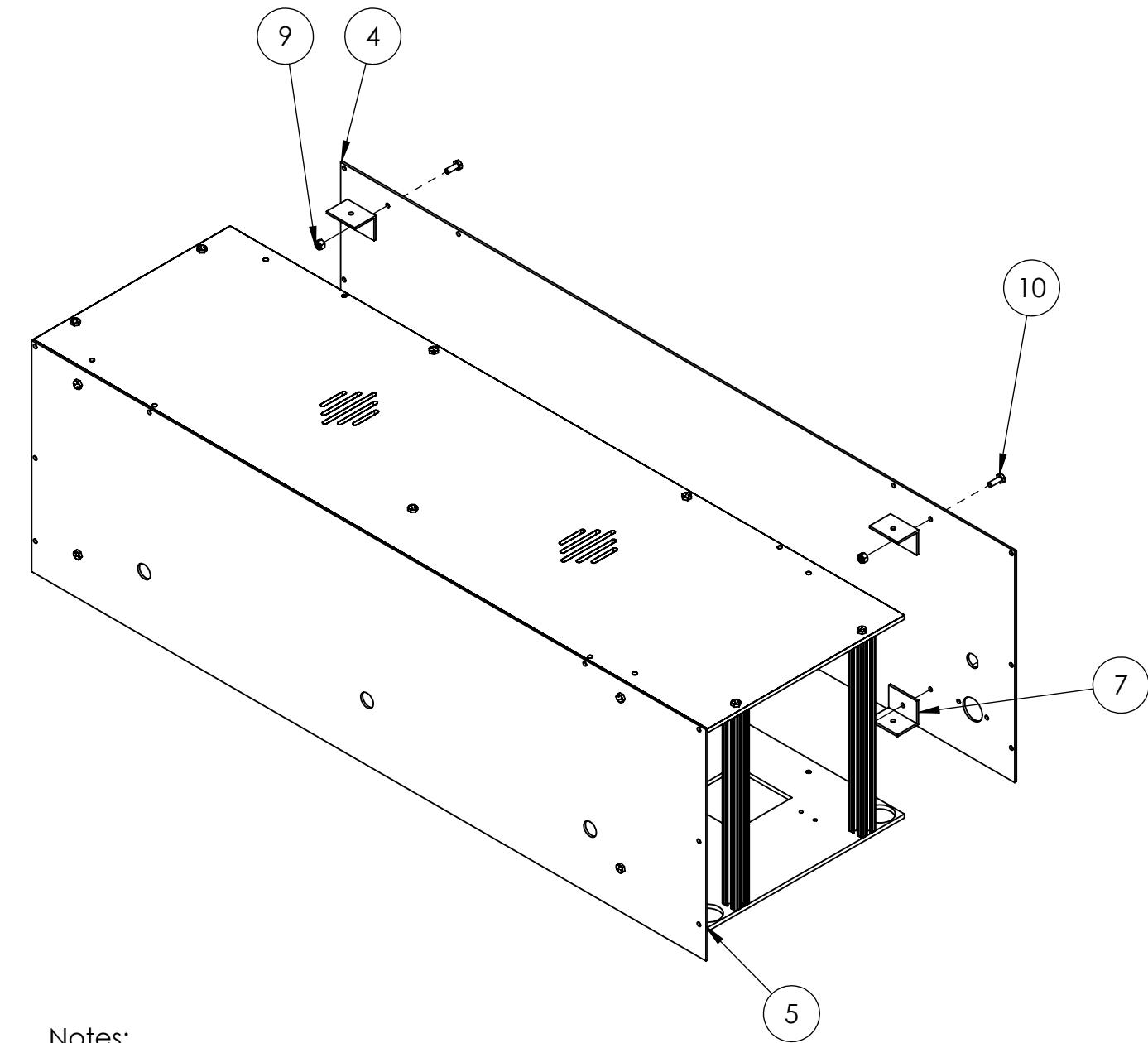
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Notes:
1. Use Item 10 to fasten Item 3 and Item 5 to Item 6 (qty. 7)

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



| | | UNLESS OTHERWISE SPECIFIED: | NAME | DATE |
|-------------|---------|--|------|------|
| | | DIMENSIONS ARE IN INCHES | | |
| | | TOLERANCES: | | |
| | | FRACTIONAL: $\pm 1/16$ | | |
| | | ANGULAR: MACH $\pm 1^\circ$, BEND $\pm 1^\circ$ | | |
| | | TWO PLACE DECIMAL $\pm .01$ | | |
| | | THREE PLACE DECIMAL $\pm .001$ | | |
| | | INTERPRET GEOMETRIC TOLERANCING PER: | | |
| | | MATERIAL | | |
| NEXT ASSY | USED ON | FINISH | | |
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FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

Vault Top Assembly

B **GE-18129**

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

4

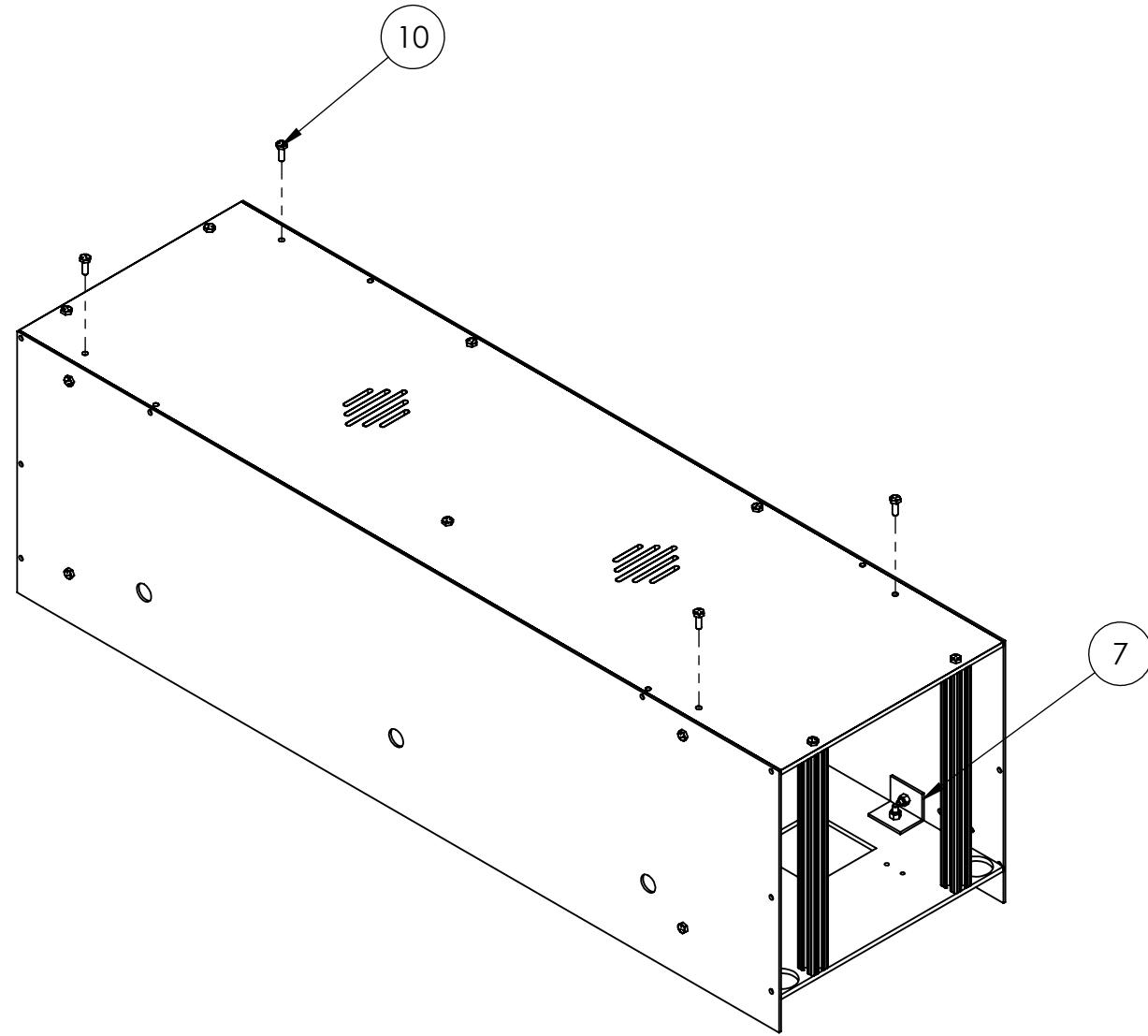
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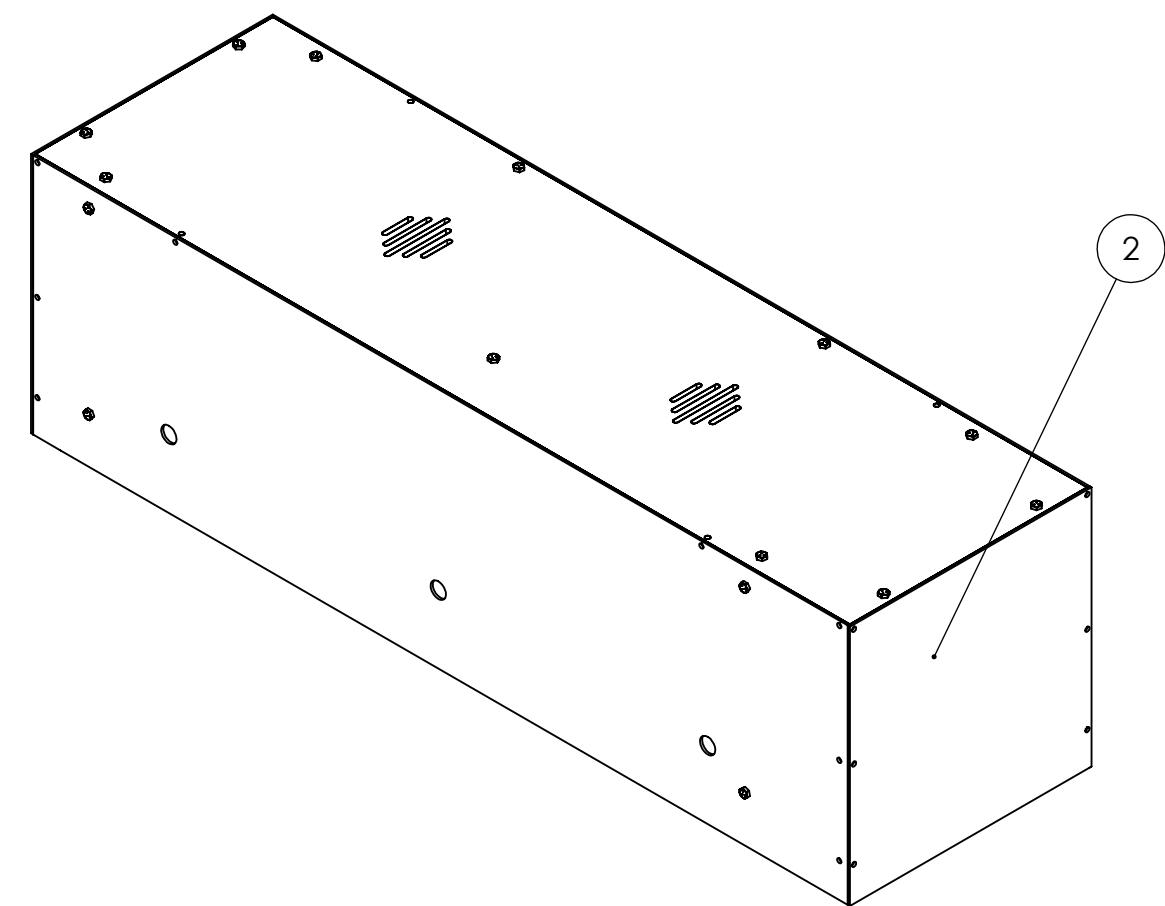
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B

B



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



Notes:

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

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

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

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

SCALE: 1:8 **WEIGHT:** **SHEET 3 OF 3**

4

3

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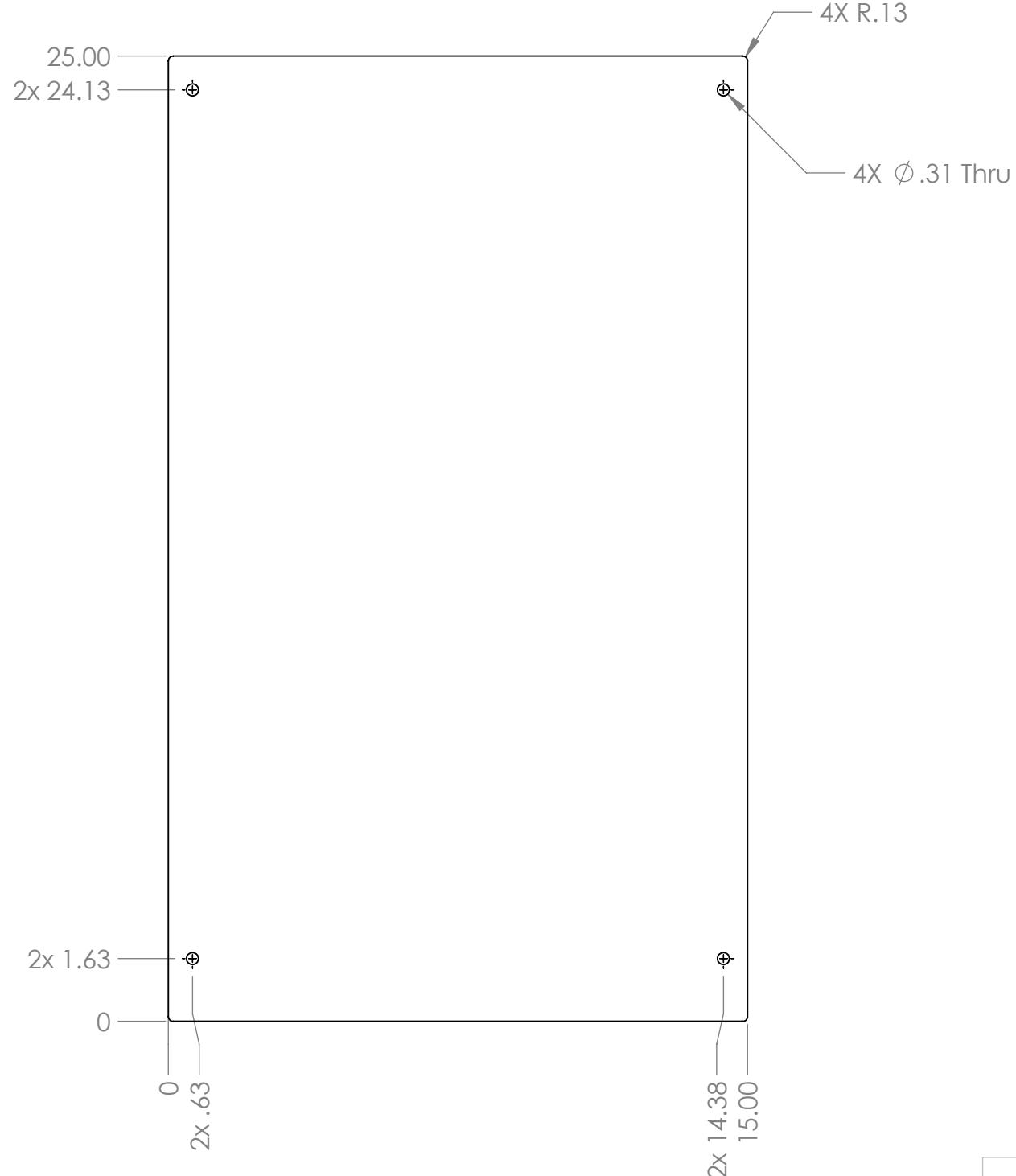
B

B

A

A

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



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

FIRST ROBOTICS COMPETITION **SOLIDWORKS**
Modeling Solutions Partner

TITLE: Chute Back Wall

| | | |
|------------|-----------------|--------------|
| SIZE | DWG. NO. | REV |
| B | GE-18130 | |
| SCALE: 1:4 | WEIGHT: | SHEET 1 OF 1 |

4

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1