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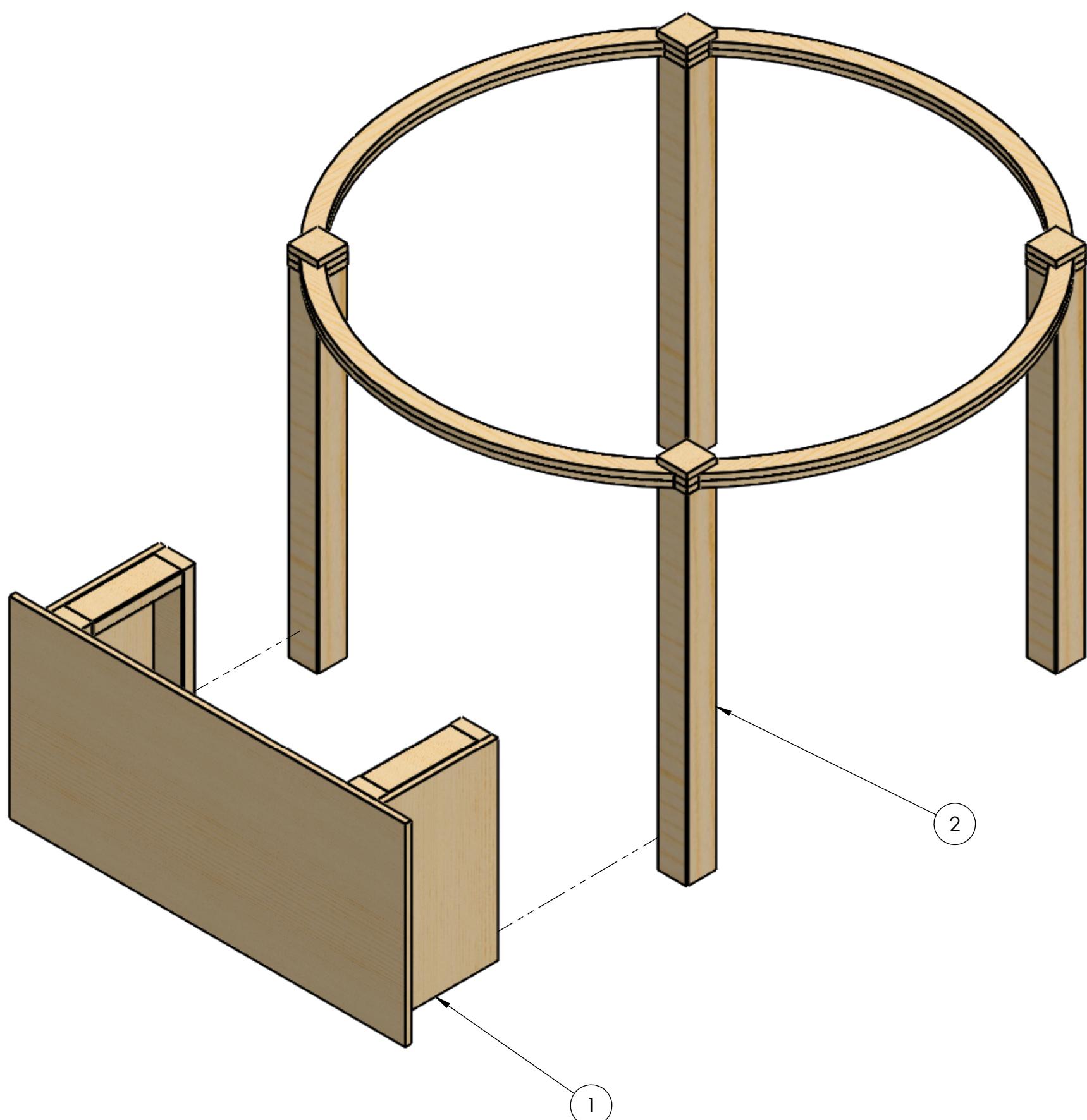
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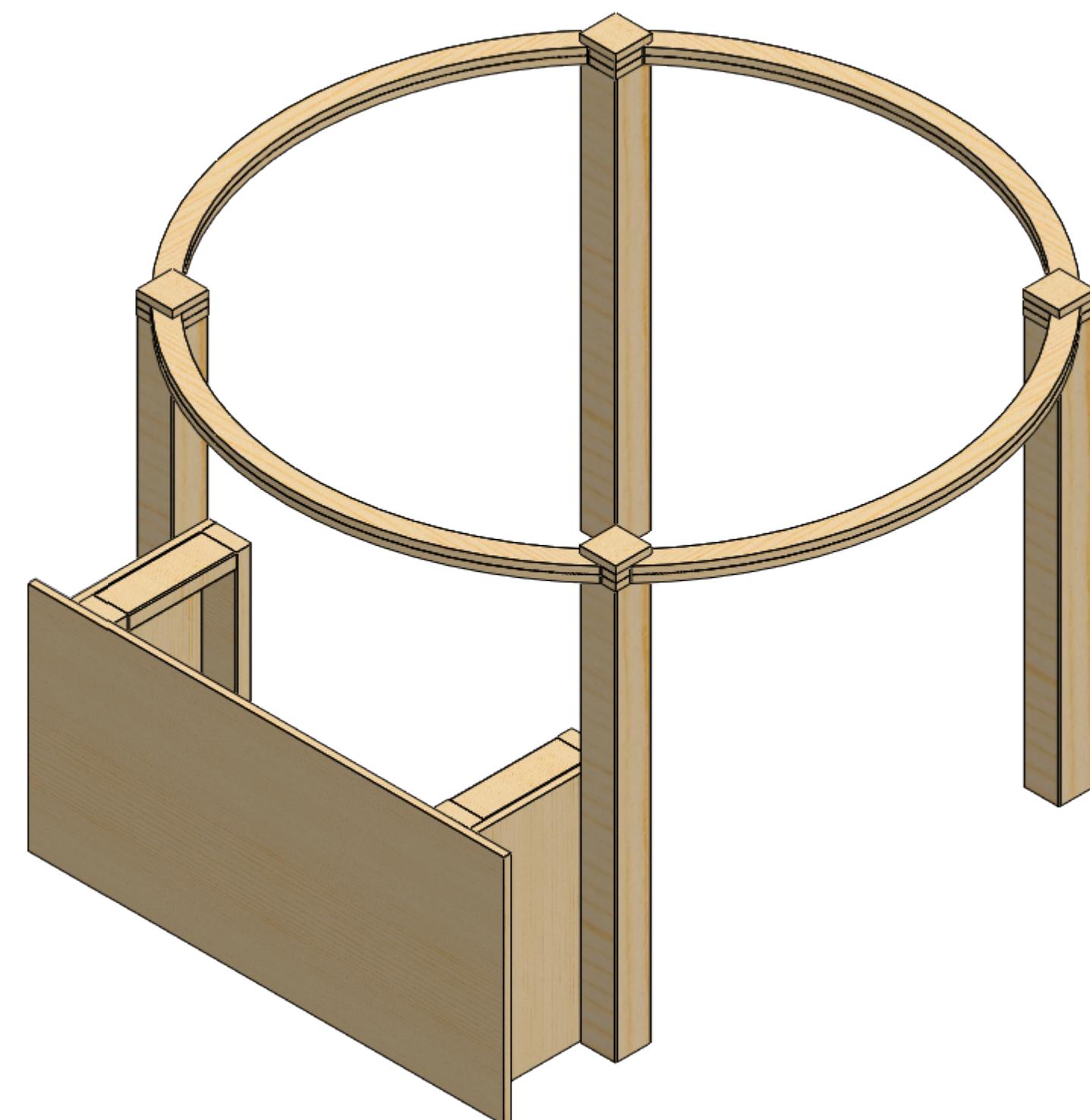
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Note: If you are planning to disassemble frequently, you may want to consider using bolted connections instead of screws. It is helpful to consider ability to move assembly through doors before fastening sub-assemblies together.



Hardware Needed:
#8 x 2" Long Screw - Qty 10

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	TE-22010	Hub - Simple Build - Fender Assembly	1
2	TE-22020-Multiple	Hub - Simple Build - Lower Hub Assembly - Multiple	1

UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES

TOLERANCES:

FRACTIONAL $\pm 1/16$

ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$

TWO PLACE DECIMAL $\pm .13$

THREE PLACE DECIMAL $\pm .125$

MATERIAL/FINISH:

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COMMENTS:

REMOVE ALL BURRS AND SHARP EDGES.

DO NOT SCALE DRAWING

TEAM NAME DATE
DRAWN KAMC 1/3/2022

PROPRIETARY AND CONFIDENTIAL

FIRST ROBOTICS COMPETITION

SOLIDWORKS Modeling Solutions Partner

TITLE: Hub - Simple Build - Full Lower Hub + 1/4 Fender Assembly

SIZE DWG. NO. REV
C TE-22001-Multiple

SCALE: 1:10 SHEET 1 OF 3

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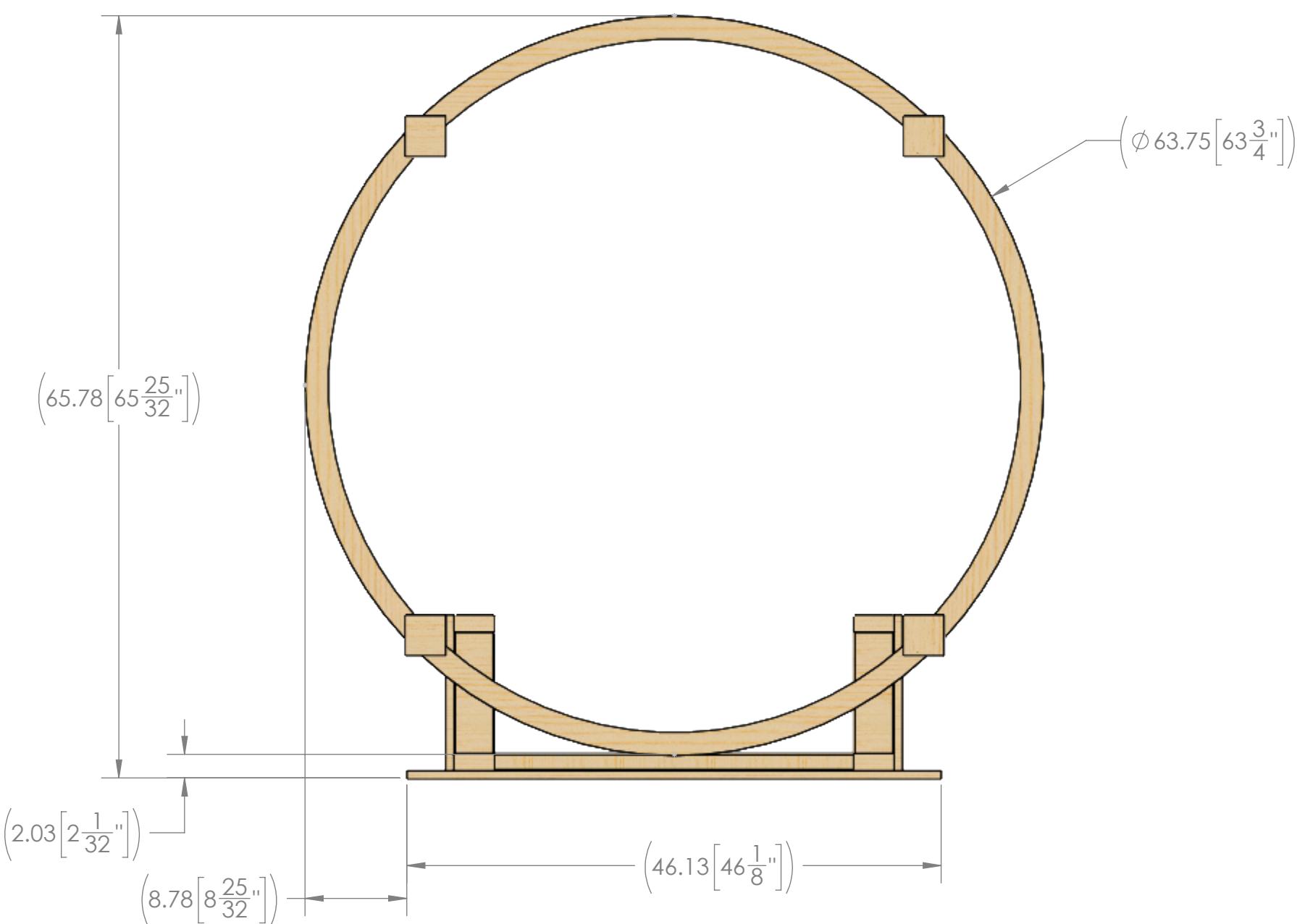
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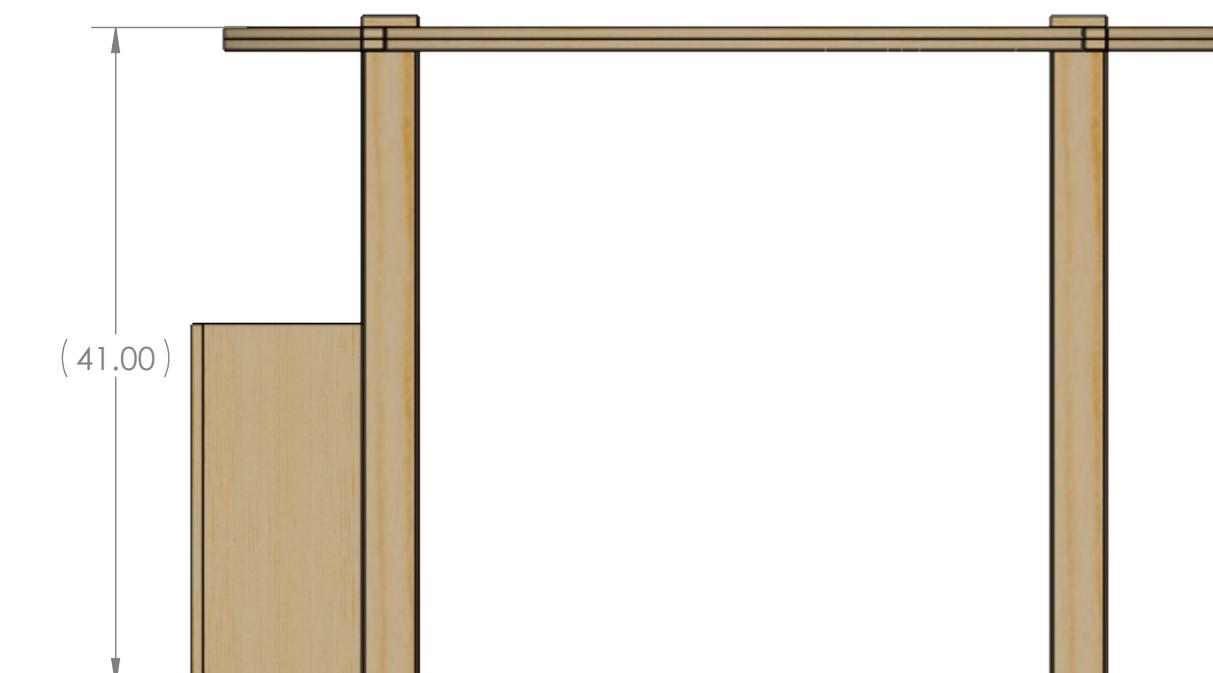
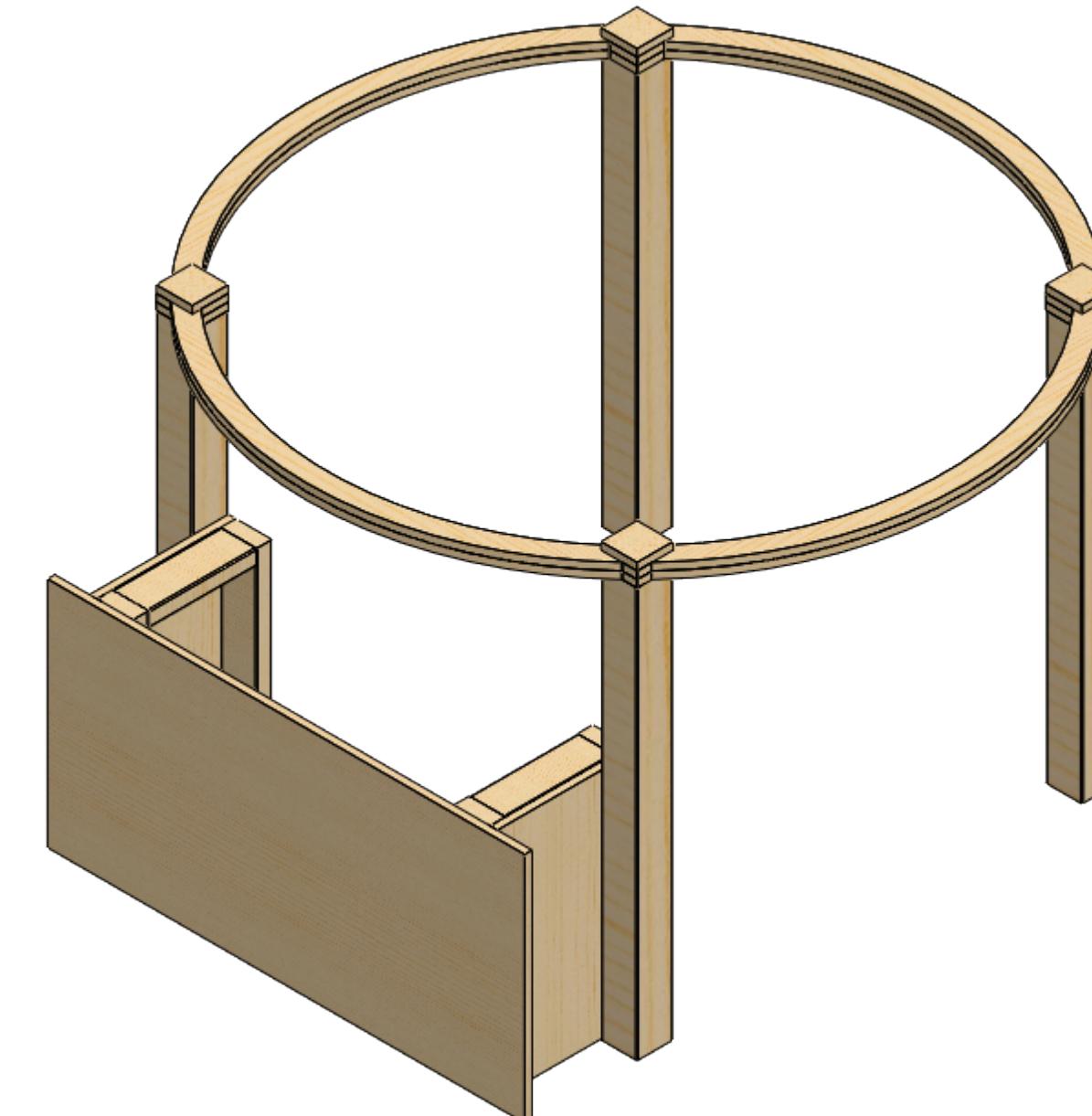
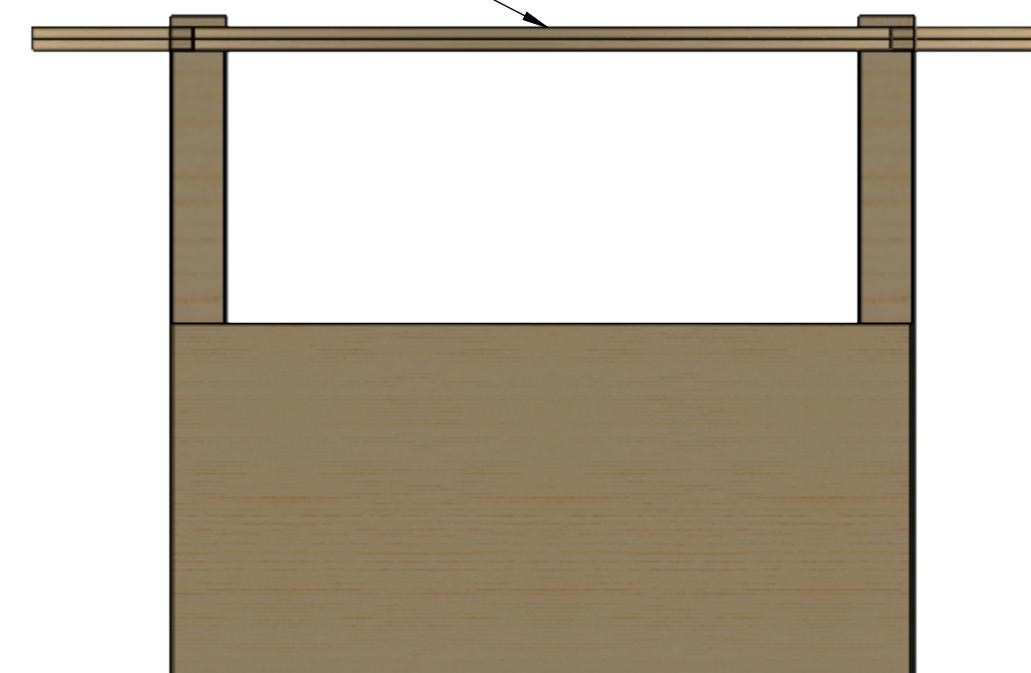
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Note: On Field, there is a protrusion in approximately this location. See GE-22300 for details



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MATERIAL/FINISH:	SIZE	DWG. NO.	REV
	C	TE-22001-Multiple	
COMMENTS:	REMOVE ALL BURRS AND SHARP EDGES.		
DO NOT SCALE DRAWING	SCALE: 1:12	SHEET 2 OF 3	

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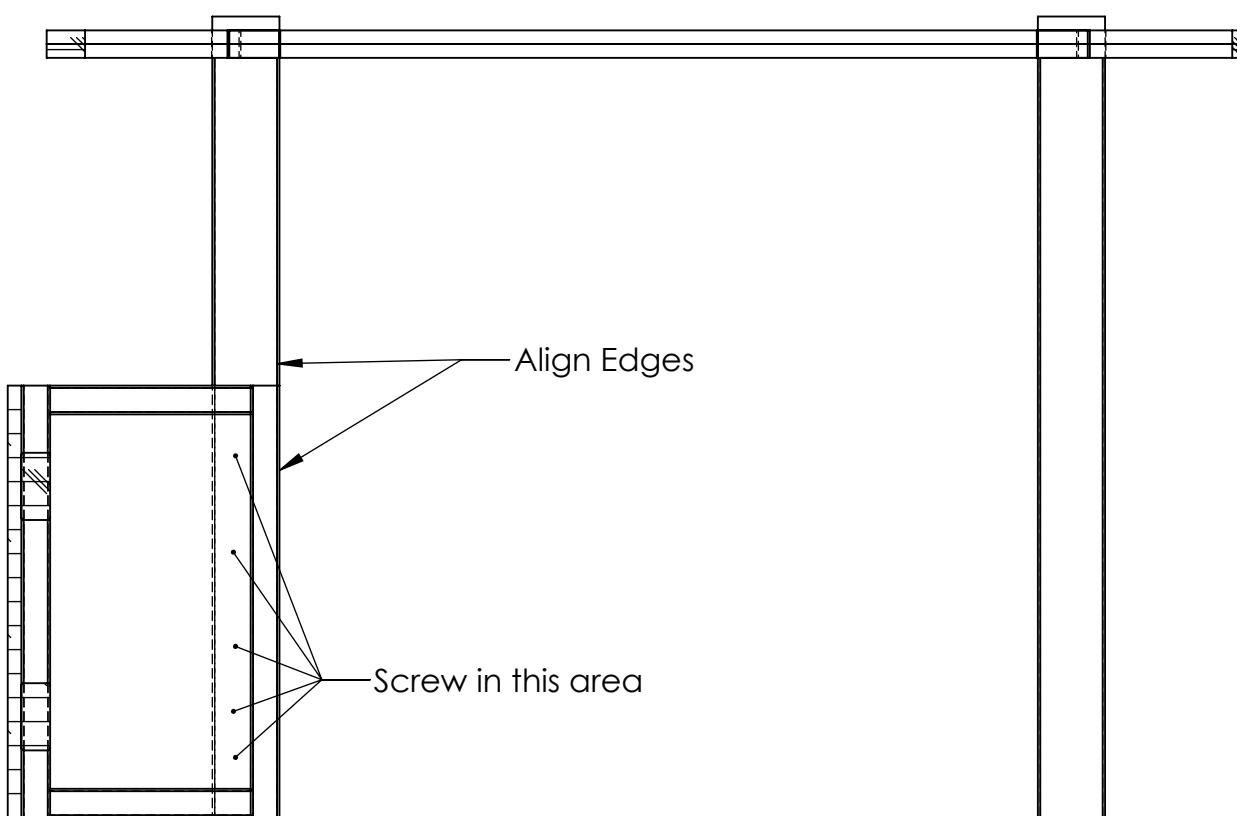
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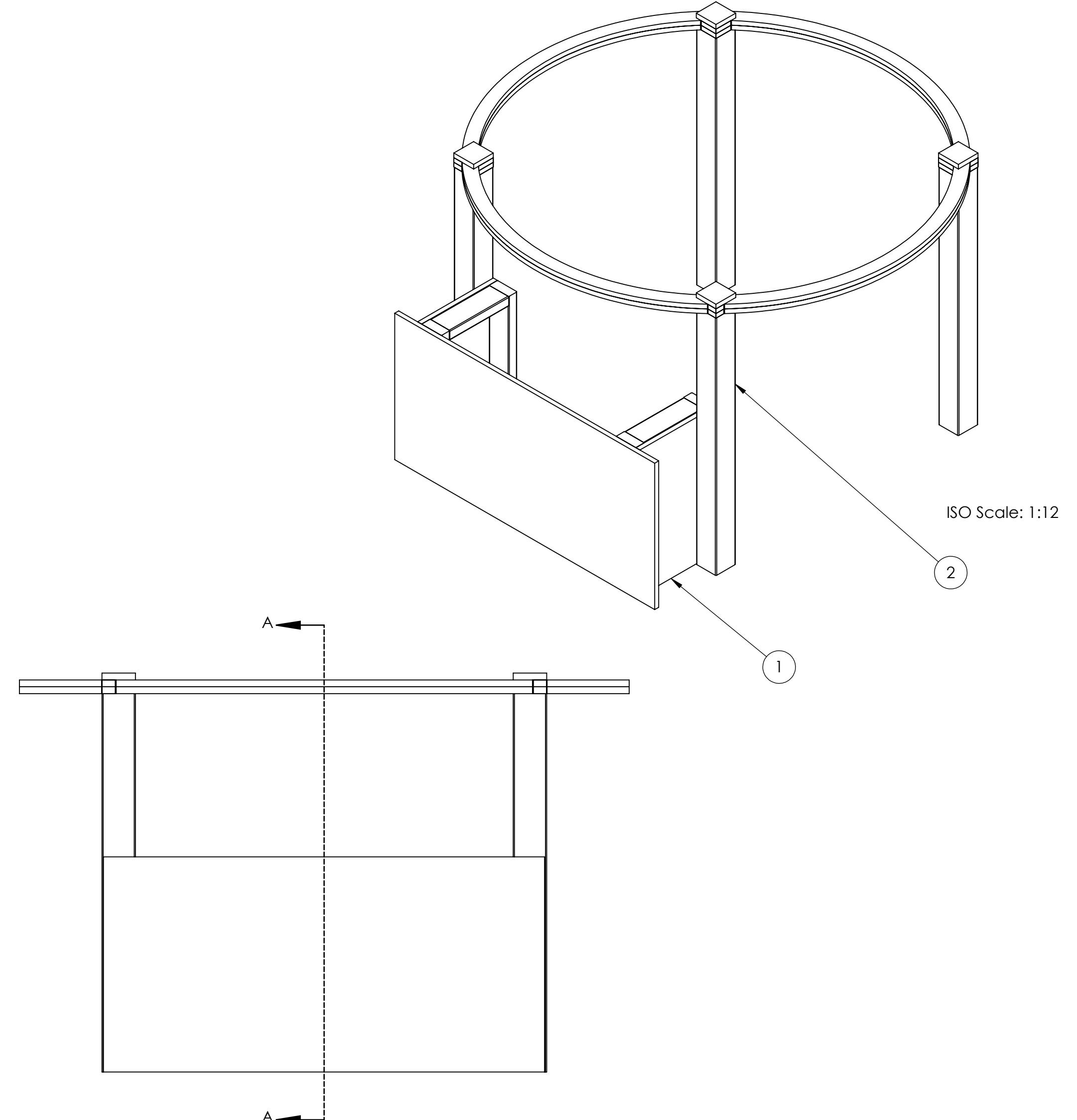
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Step 1:



SECTION A-A
Hidden Lines SHown

1. Align (2) to (1), as shown.
2. Connect using 2" Long Screws. It is recommended to 10x screws, 5x screws into each 4" x 4" Lumber on (2), as shown in Section A-A.



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DIMENSIONS ARE IN INCHES	DRAWN	KAMC	1/3/2022
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MATERIAL/FINISH:	SIZE	DWG. NO.	REV
	C	TE-22001-Multiple	
COMMENTS:	SCALE: 1:10	SHEET 3 OF 3	
REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

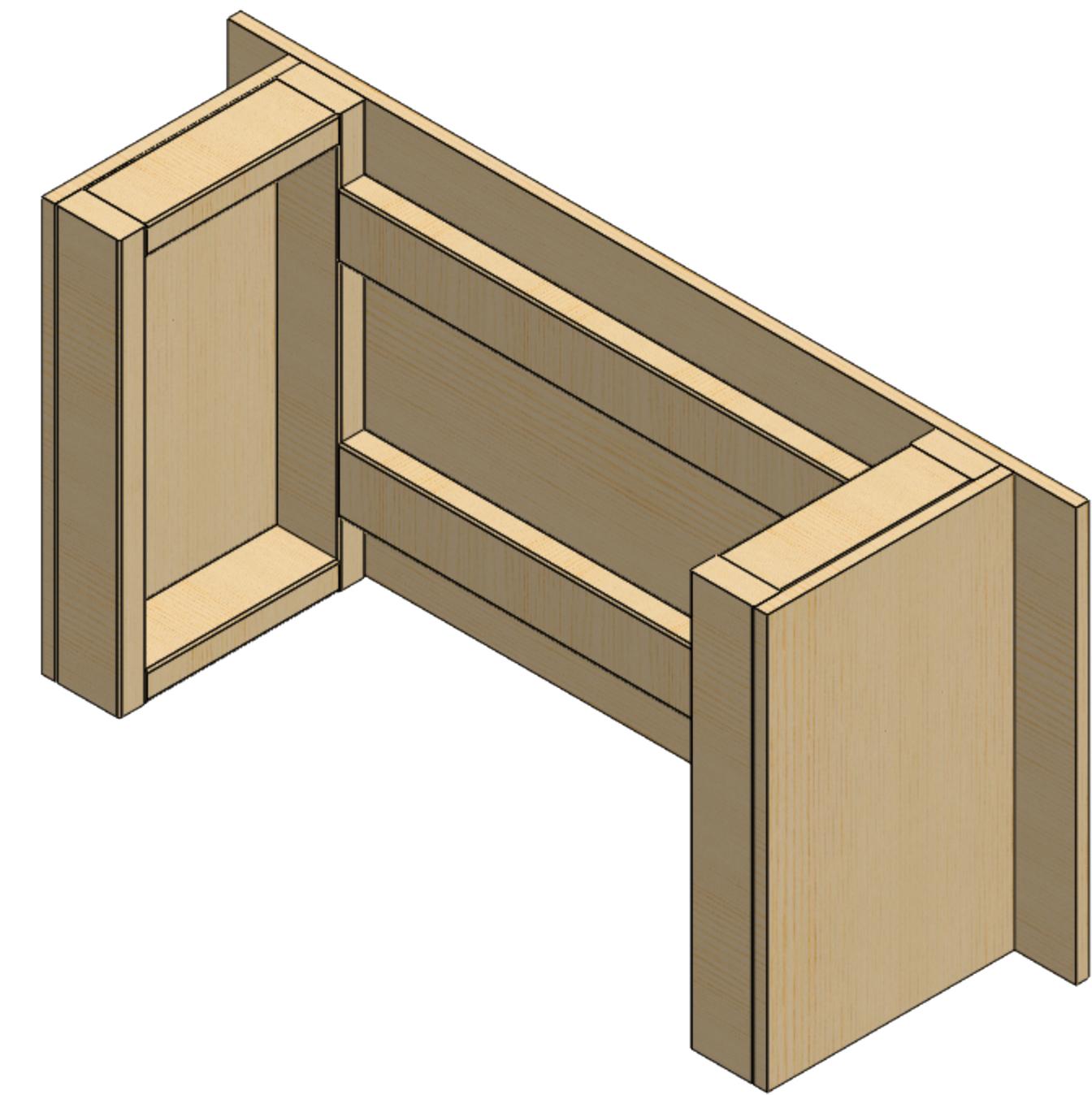
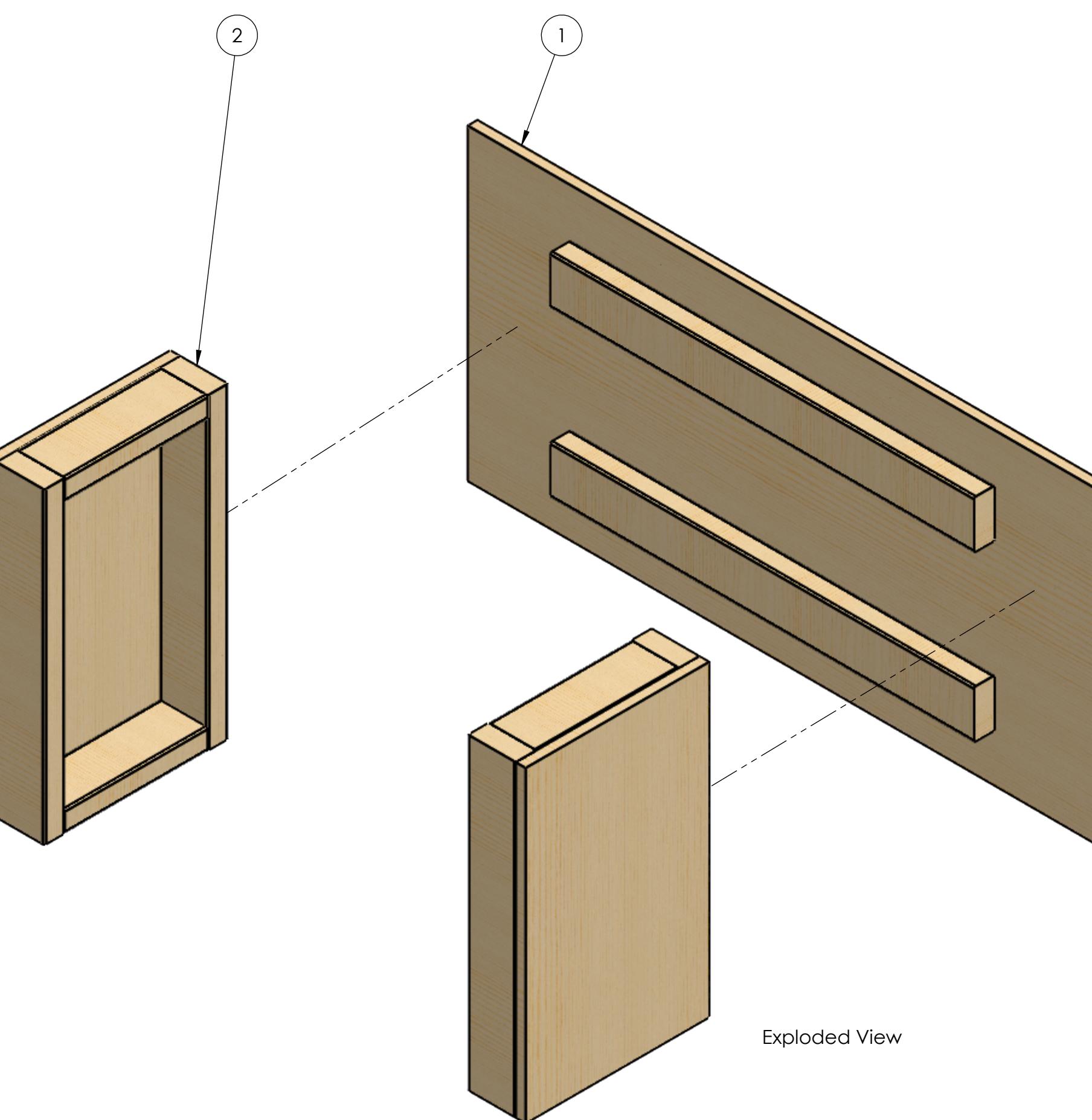
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Hardware Needed:
#8 x 2" Long Screw - Qty 10

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	TE-22013	HUB - Basic Build - Fender Front Assembly	1
2	TE-22017	HUB - Basic Build - Fender Side Assembly	2

UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL $\pm 1/16$
ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$
TWO PLACE DECIMAL $\pm .13$
THREE PLACE DECIMAL $\pm .125$

MATERIAL/FINISH:

COMMENTS:
REMOVE ALL BURRS AND SHARP EDGES.

DO NOT SCALE DRAWING

TEAM NAME DATE
DRAWN KAMC 12/30/2021

FIRST ROBOTICS COMPETITION DS SOLIDWORKS Modeling Solutions Partner

TITLE: Hub - Simple Build - Fender Assembly

SIZE DWG. NO. REV

C TE-22010

SCALE: 1:6 SHEET 1 OF 3

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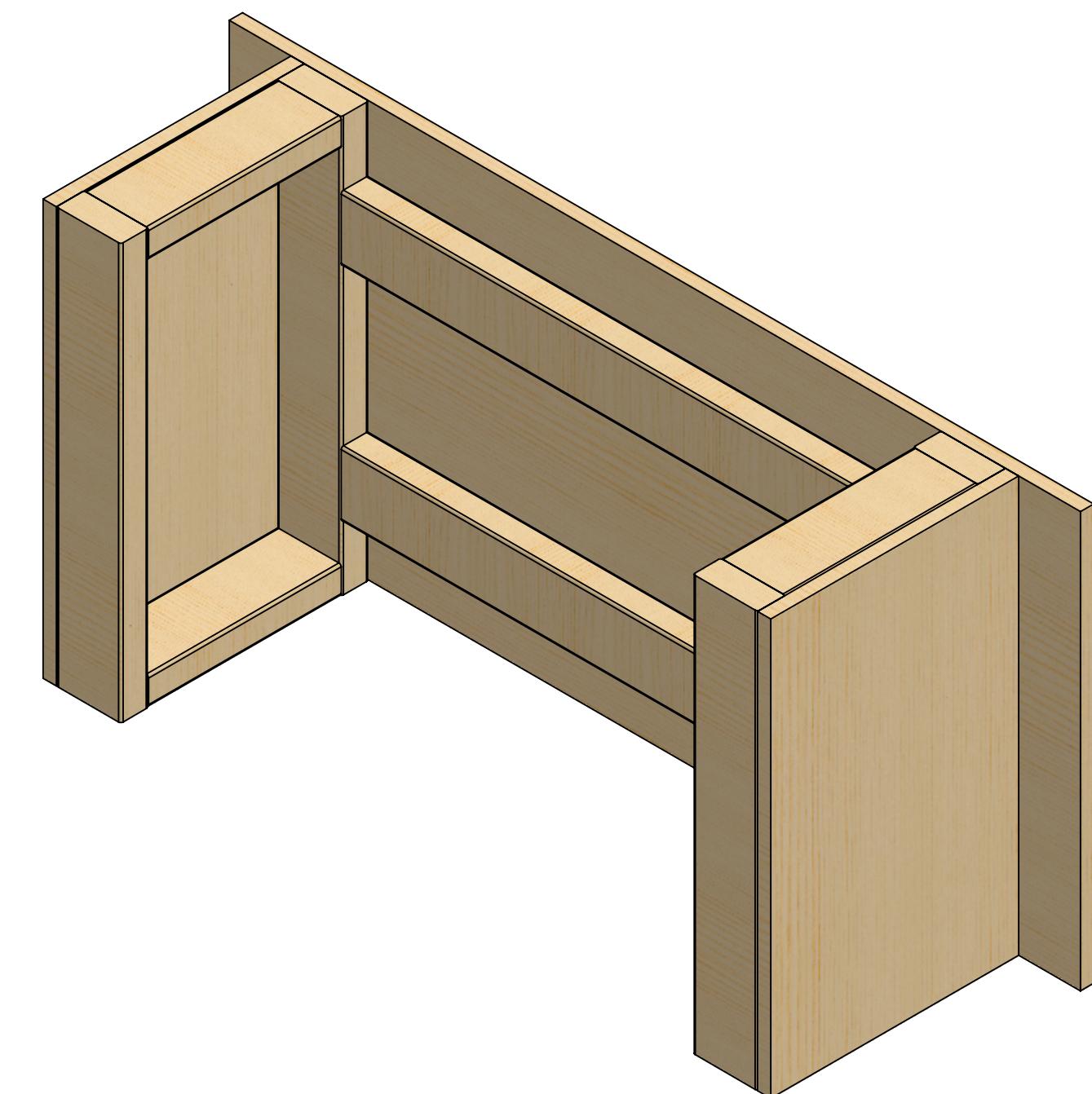
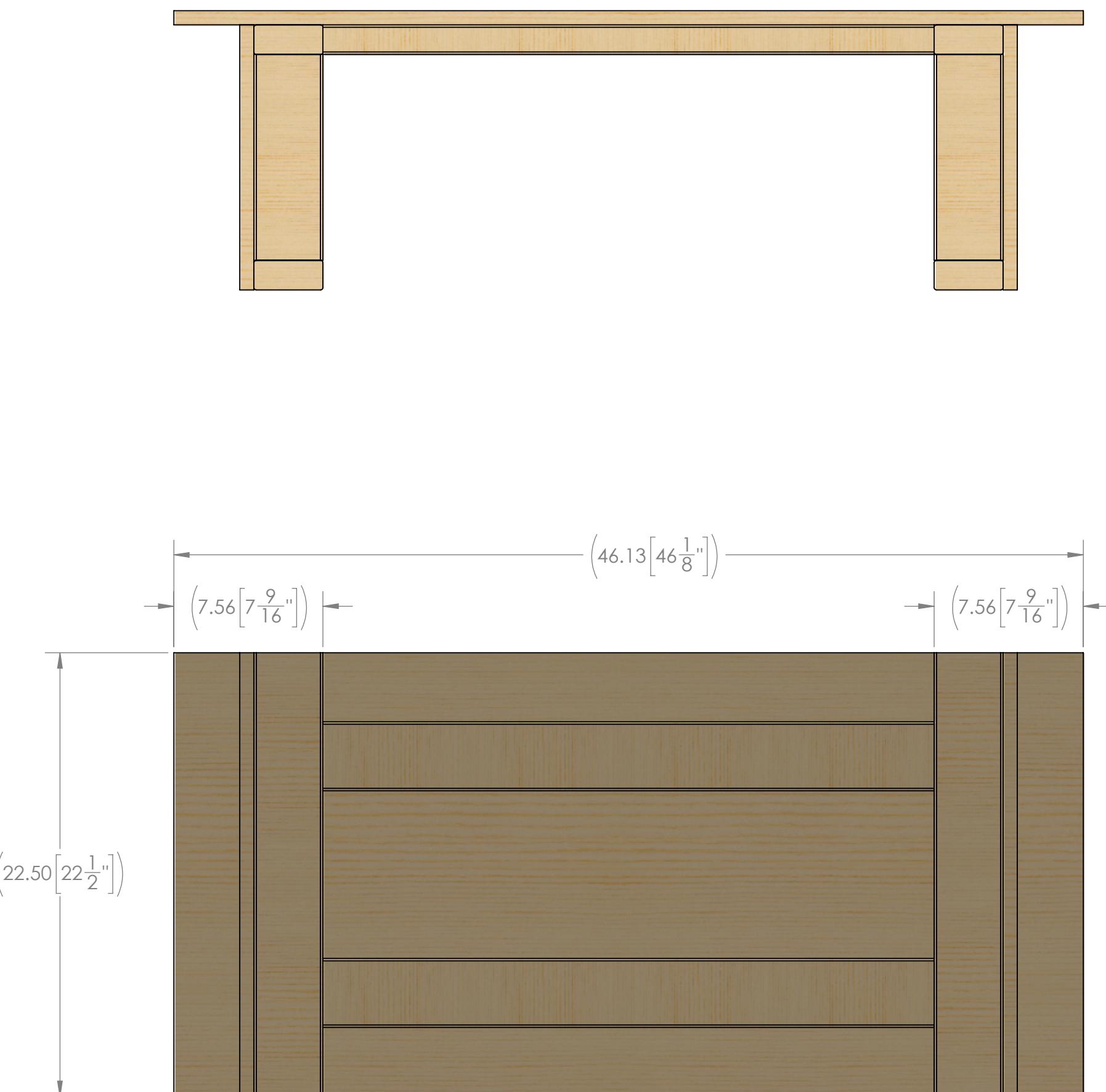
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UNLESS OTHERWISE SPECIFIED:	TEAM	NAME	DATE
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .13$ THREE PLACE DECIMAL $\pm .125$	DRAWN	KAMC	12/30/2021
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:	SIZE	DWG. NO.	REV
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.	C	TE-22010	
DO NOT SCALE DRAWING	SCALE: 1:6	SHEET 2 OF 3	

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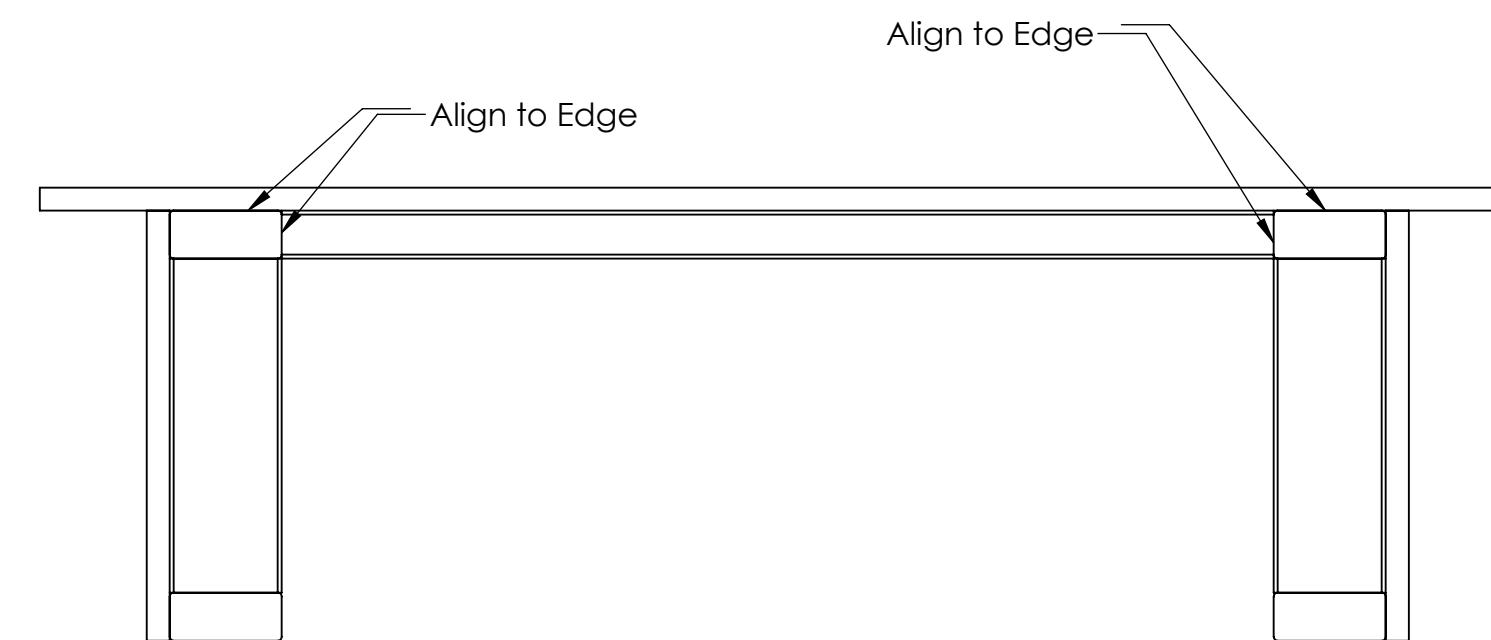
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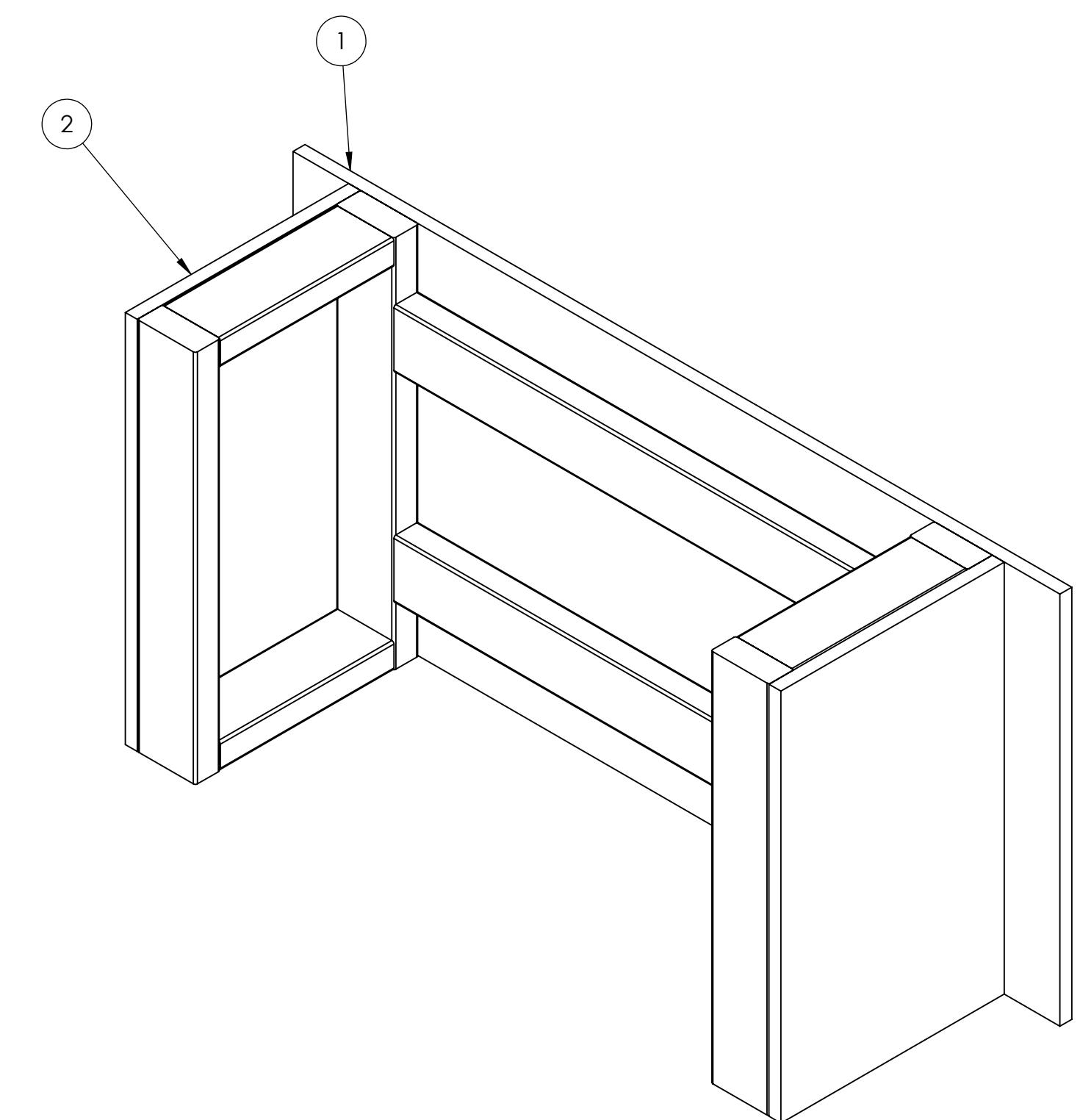
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Step 1



Step 1:

1. Align 2x (2) to (1) as shown.
2. Connect using 2" long screws. It is recommended to use 5x screws into each (2).



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MATERIAL/FINISH:	SIZE	DWG. NO.	REV
	C	TE-22010	
COMMENTS:		SCALE: 1:6	
REMOVE ALL BURRS AND SHARP EDGES.		SHEET 3 OF 3	
DO NOT SCALE DRAWING			

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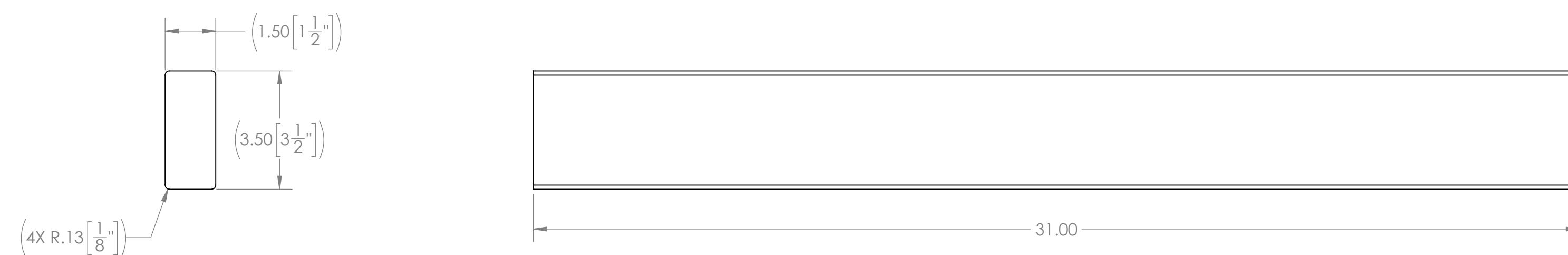
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UNLESS OTHERWISE SPECIFIED:	TEAM	NAME	DATE
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .13$ THREE PLACE DECIMAL $\pm .125$	DRAWN	KAMC	12/29/2021
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH: 2"x4" Lumber	SIZE	DWG. NO.	REV
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.	C	TE-22011	
DO NOT SCALE DRAWING	SCALE: 1:3	SHEET 1 OF 1	

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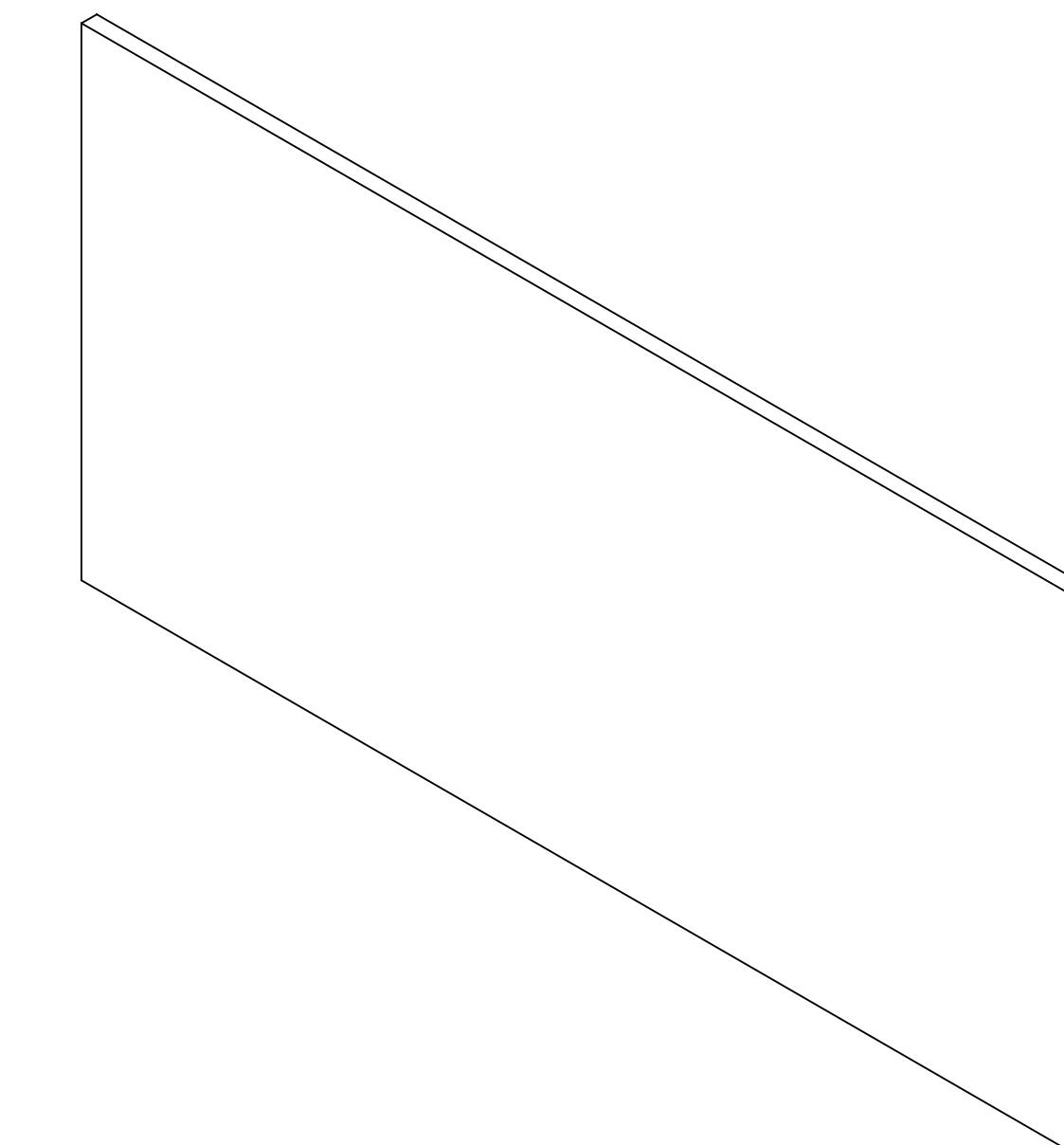
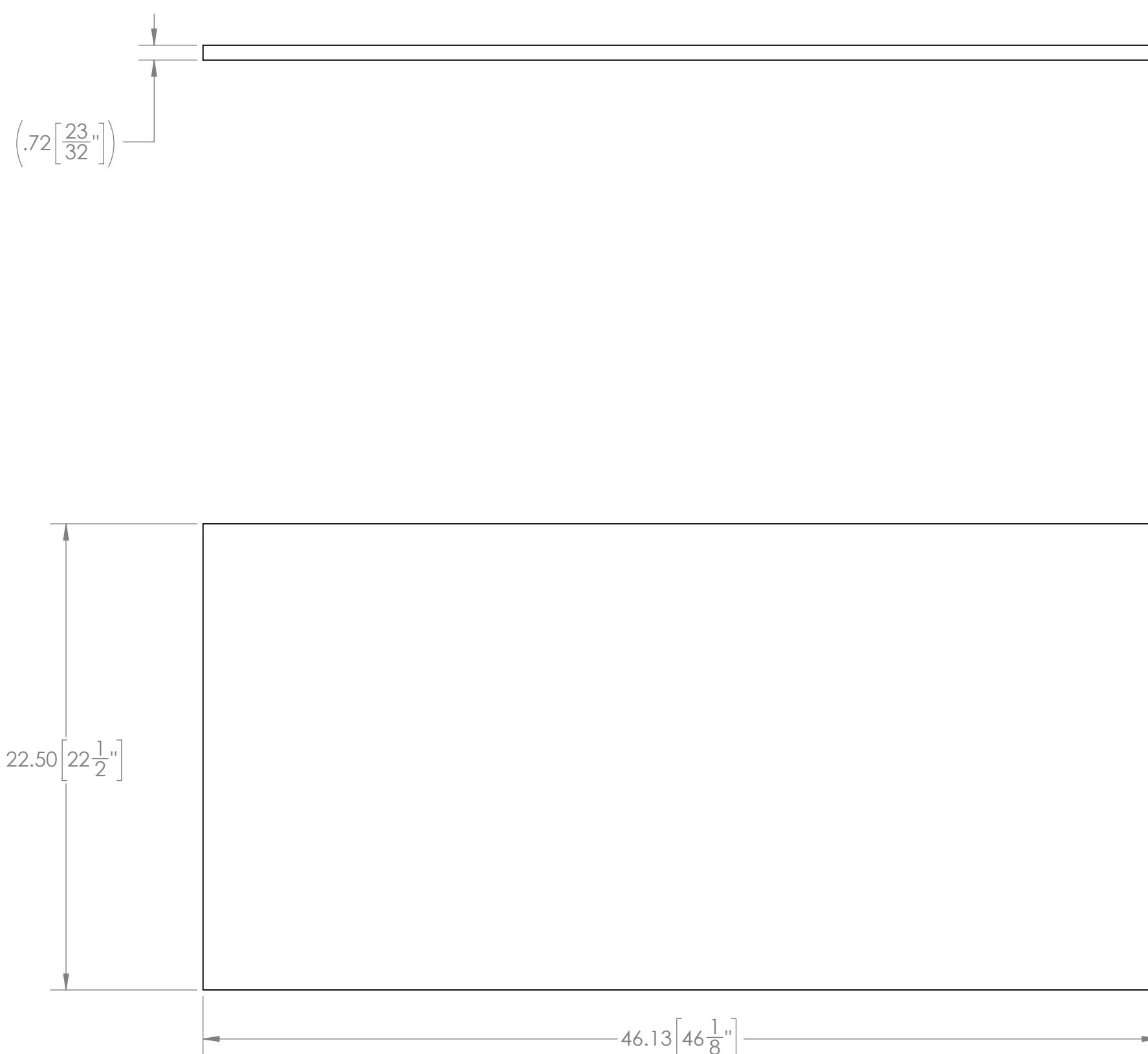
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UNLESS OTHERWISE SPECIFIED:	TEAM	NAME	DATE
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .13$ THREE PLACE DECIMAL $\pm .125$	DRAWN	KAMC	12/29/2021
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH: 3/4" Plywood	SIZE	DWG. NO.	REV
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.	C	TE-22012	
DO NOT SCALE DRAWING	SCALE: 1:6	SHEET 1 OF 1	

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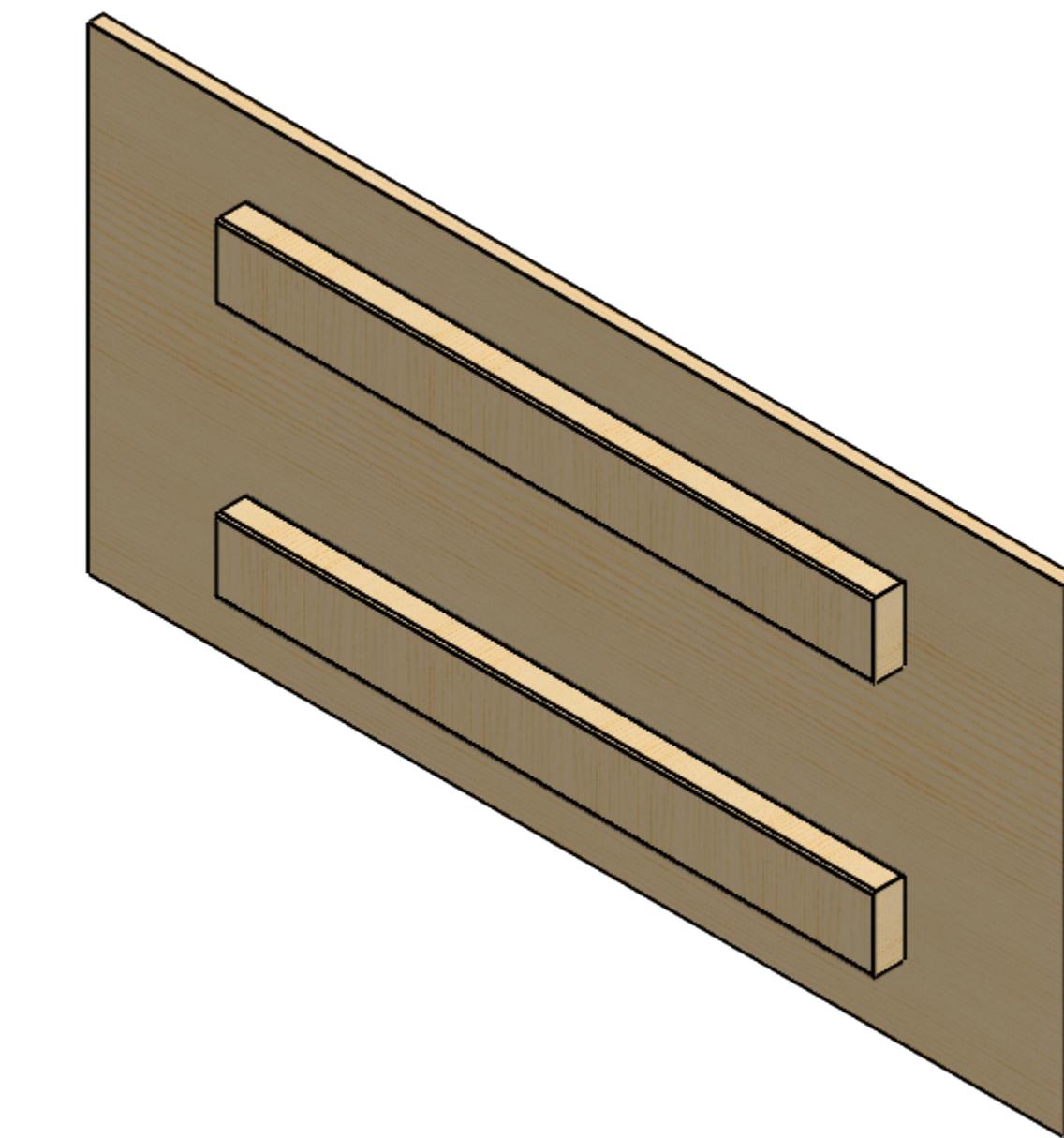
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A technical diagram illustrating a wooden board assembly. The main board (2) is shown in perspective, featuring a light-colored wood grain and a thin, dark-colored strip running along its top edge. A callout circle labeled '2' points to this strip. A dashed line extends from the top edge of the main board down to a smaller, horizontal board (1) positioned below it. This smaller board also has a similar dark strip along its top edge. Another callout circle labeled '1' points to the top edge of this smaller board. The boards are set against a white background.

Exploded View

Step 1:

1. Align 2x (1) to (2) as shown, using dimensions provided on Sheet 2.
 2. Connect using 2" long screws. It is recommended to use 7x screws into each (1)



Hardware Needed:
#8 x 2" Long Screws - Qty 14

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	TE-22011	HUB - Simple Build - Fender Front Horizontal 2x4	2
2	TE-22012	HUB - Simple Build - Fender Front	1

UNLESS OTHERWISE SPECIFIED

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

MATERIAL/FINIS

DO NOT SCALE DRAWING



COMPETITION

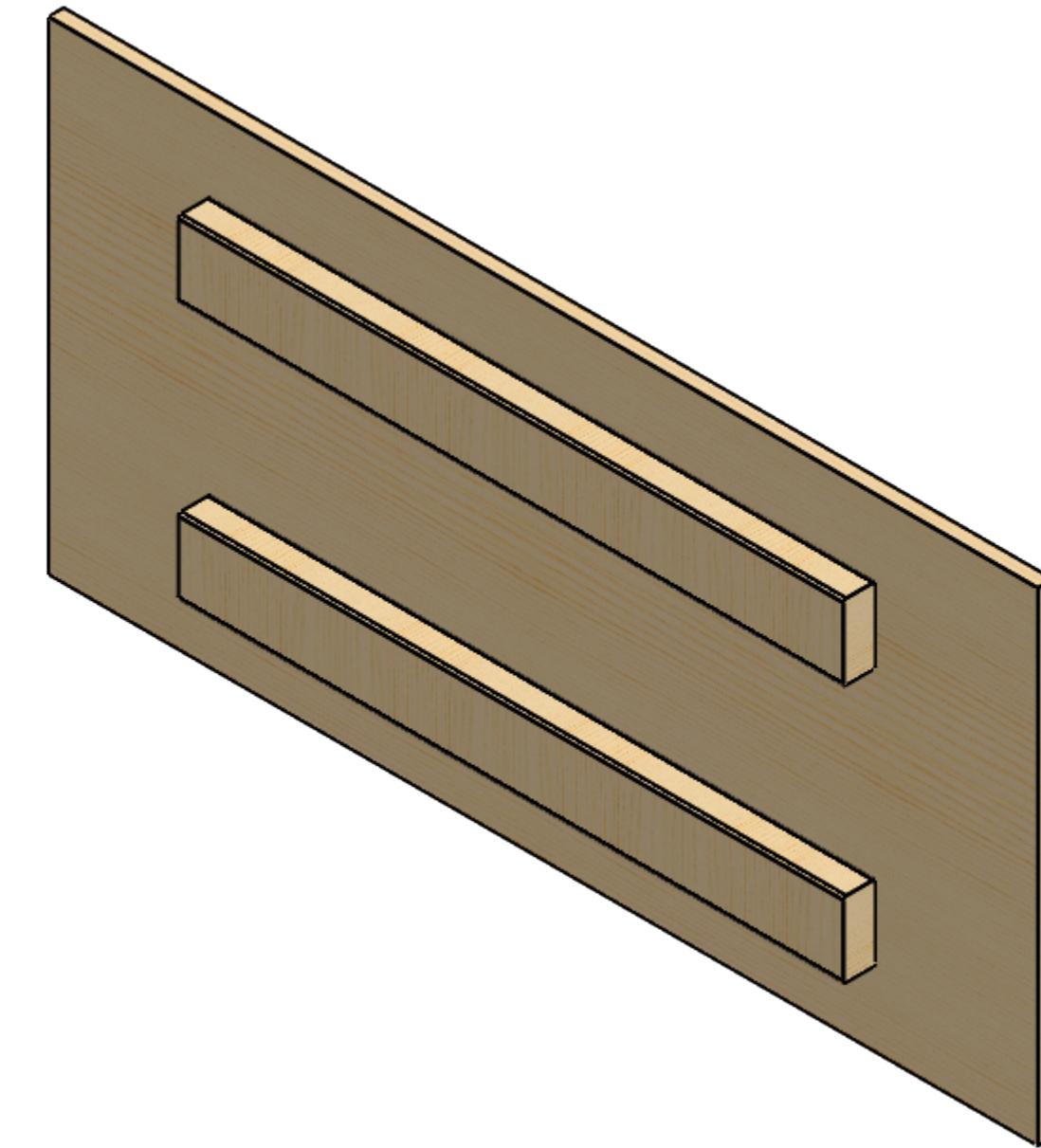
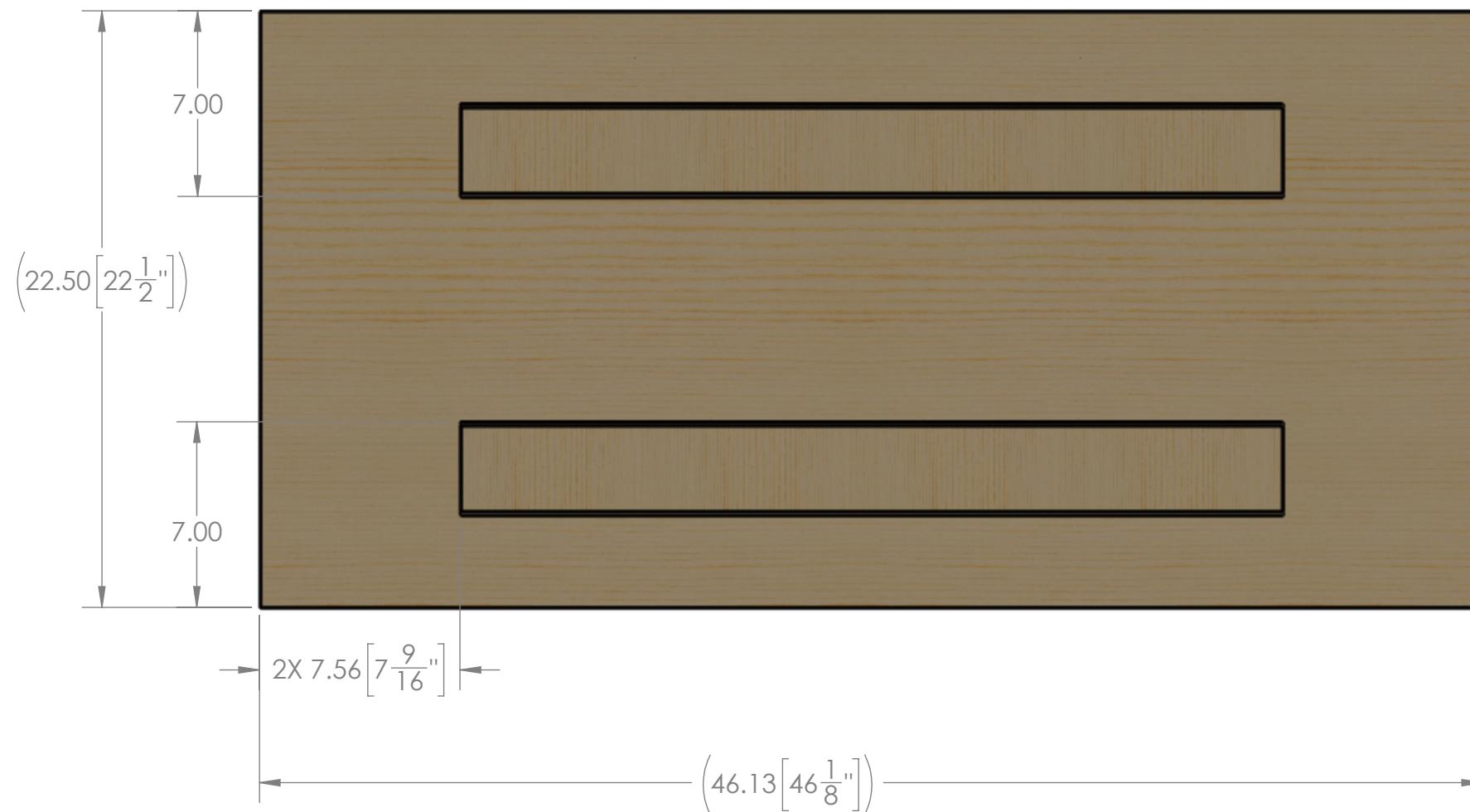
TITLE: HUB - Basic Build - Fender Front Assembly

SIZE	DWG NO	REV
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C	TE-22013
SCALE: 1:6	SHEET 1 OF 2

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 $(2.22[2\frac{7}{32}"])$

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MATERIAL/FINISH:	SIZE	DWG. NO.	REV
	C	TE-22013	
COMMENTS:	REMOVE ALL BURRS AND SHARP EDGES.		
DO NOT SCALE DRAWING	SCALE: 1:6	SHEET 2 OF 2	

**FIRST
ROBOTICS
COMPETITION**
SOLIDWORKS
Modeling Solutions Partner

TITLE: HUB - Basic Build -
Fender Front Assembly

SIZE DWG. NO. REV
C TE-22013

SCALE: 1:6 SHEET 2 OF 2

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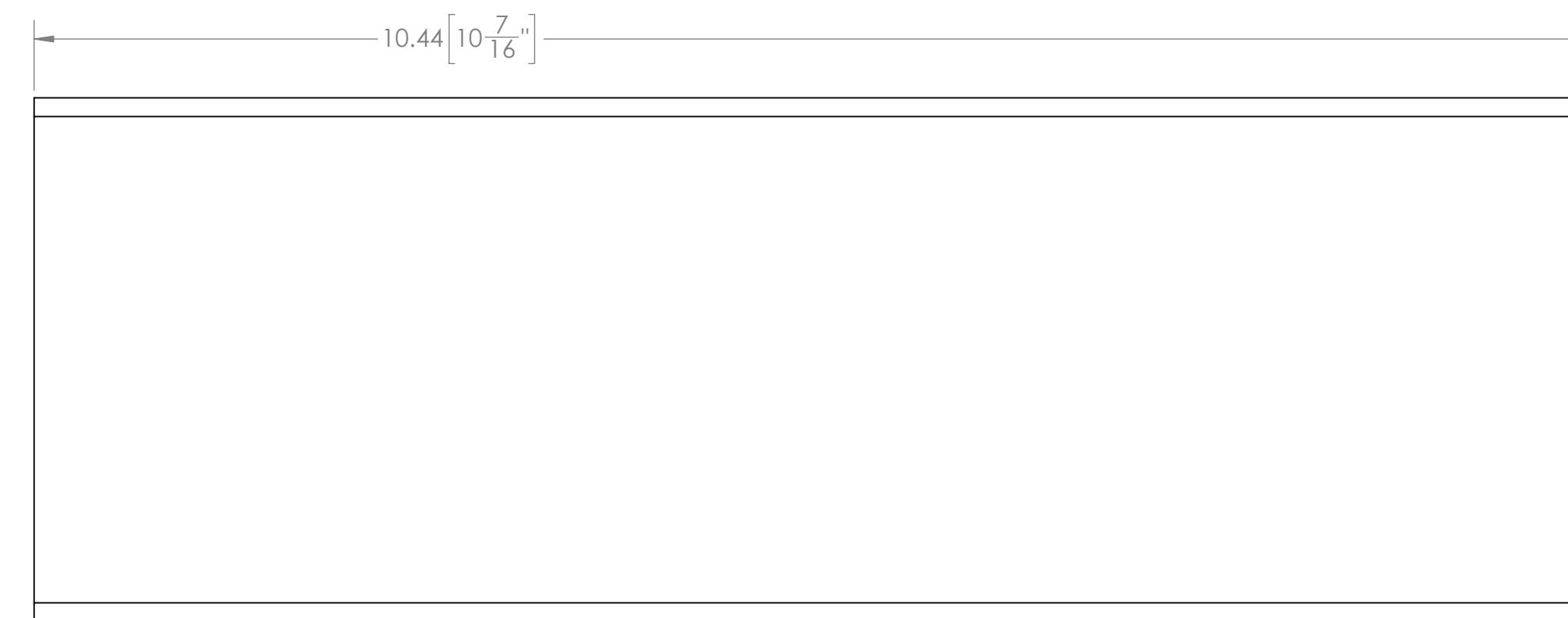
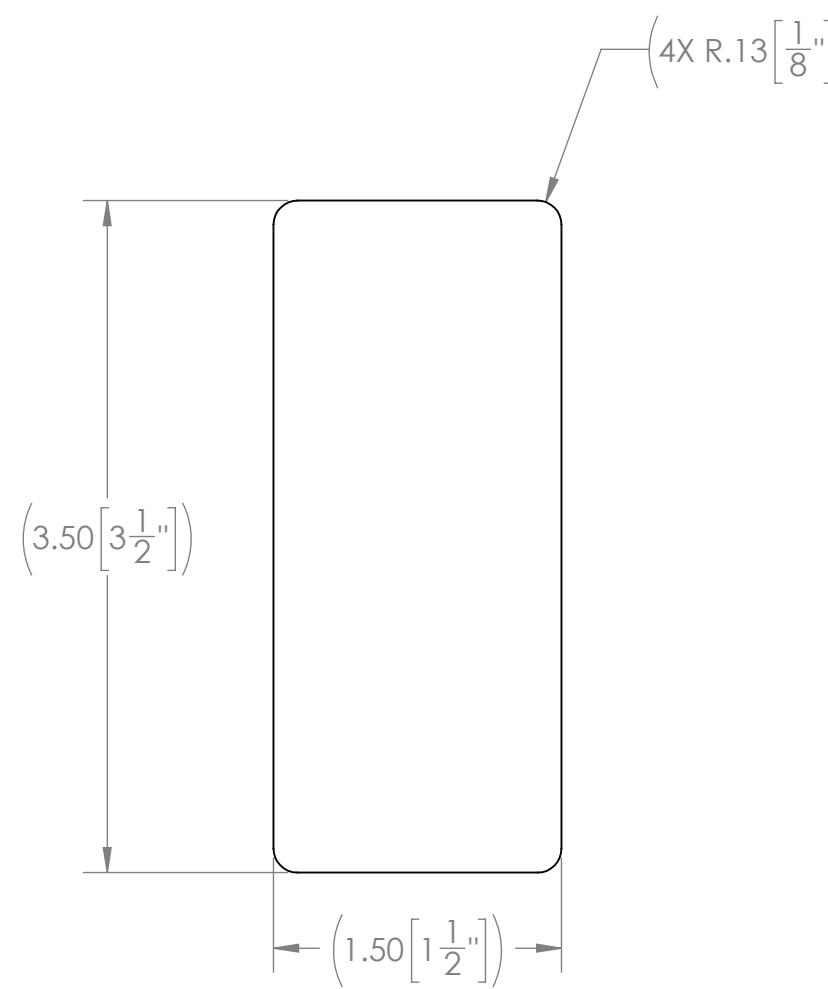
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MATERIAL/FINISH:	SIZE	DWG. NO.	REV
2"x4" Lumber	C	TE-22014	
COMMENTS:		SCALE: 1:1	
REMOVE ALL BURRS AND SHARP EDGES.		SHEET 1 OF 1	
DO NOT SCALE DRAWING			

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FIRST
ROBOTICS
COMPETITION

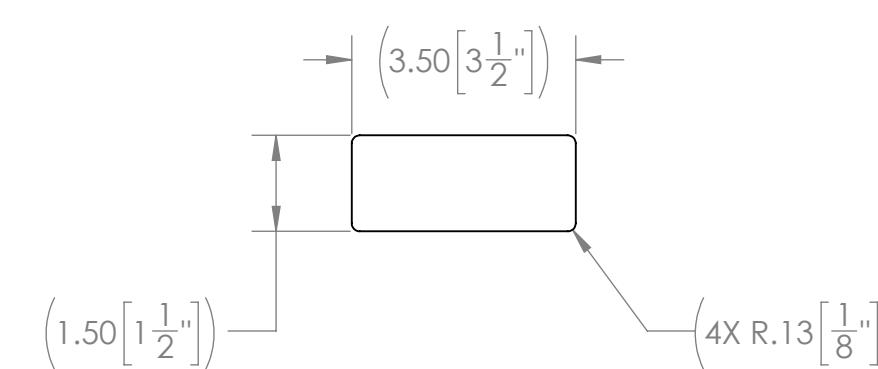
SOLIDWORKS
Modeling Solutions Partner

TITLE: HUB - Simple Build -
Fender Side Horizontal
2x4

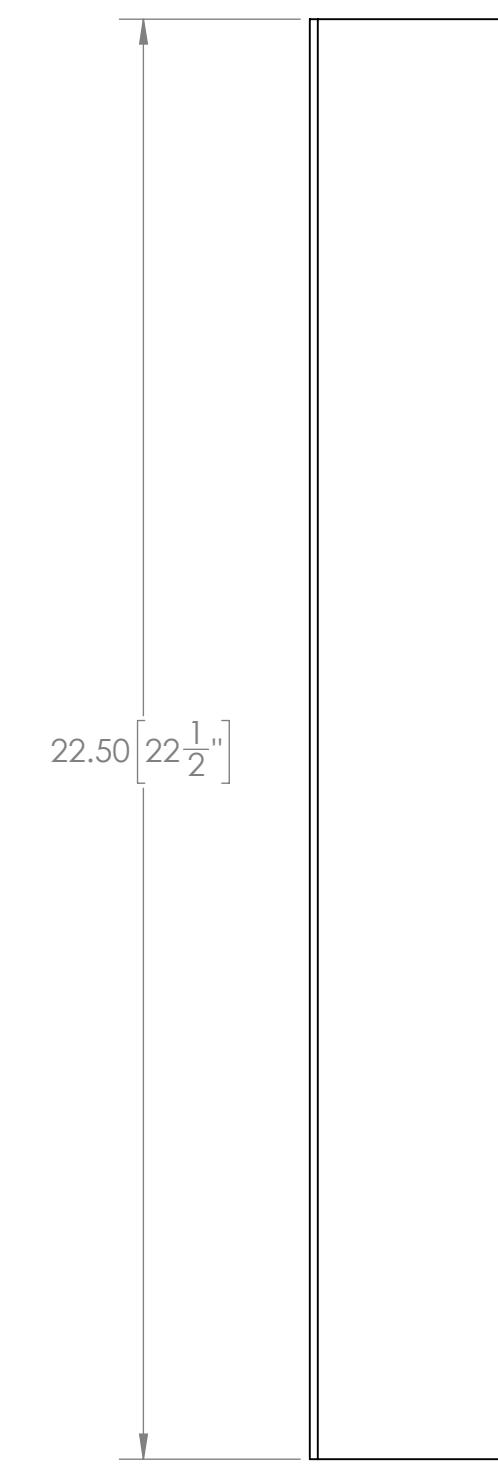
SIZE DWG. NO. REV
C TE-22014

SCALE: 1:1 SHEET 1 OF 1

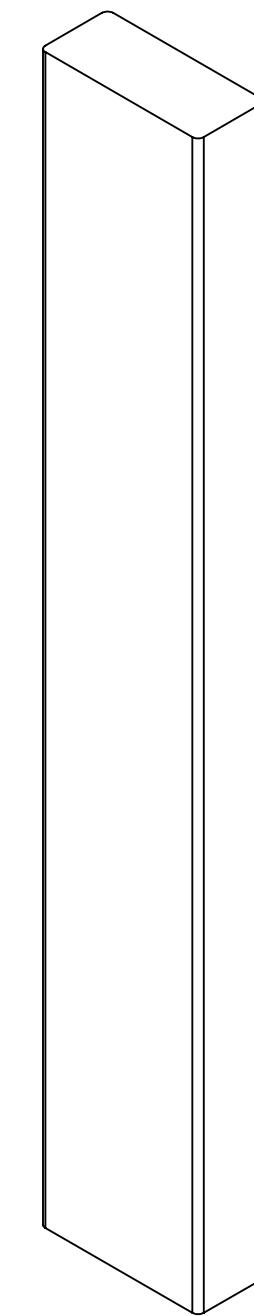
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UNLESS OTHERWISE SPECIFIED:	TEAM	NAME	DATE
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .13$ THREE PLACE DECIMAL $\pm .125$	DRAWN	KAMC	12/29/2021
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH: 2"x4" Lumber	SIZE	DWG. NO.	REV
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.	C	TE-22015	
DO NOT SCALE DRAWING	SCALE: 1:3	SHEET 1 OF 1	

 **FIRST
ROBOTICS
COMPETITION**  **SOLIDWORKS**
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 $(.72\left[\frac{23}{32}\right])$ $13.44\left[13\frac{7}{16}\right]$

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22.50 $\left[22\frac{1}{2}\right]$

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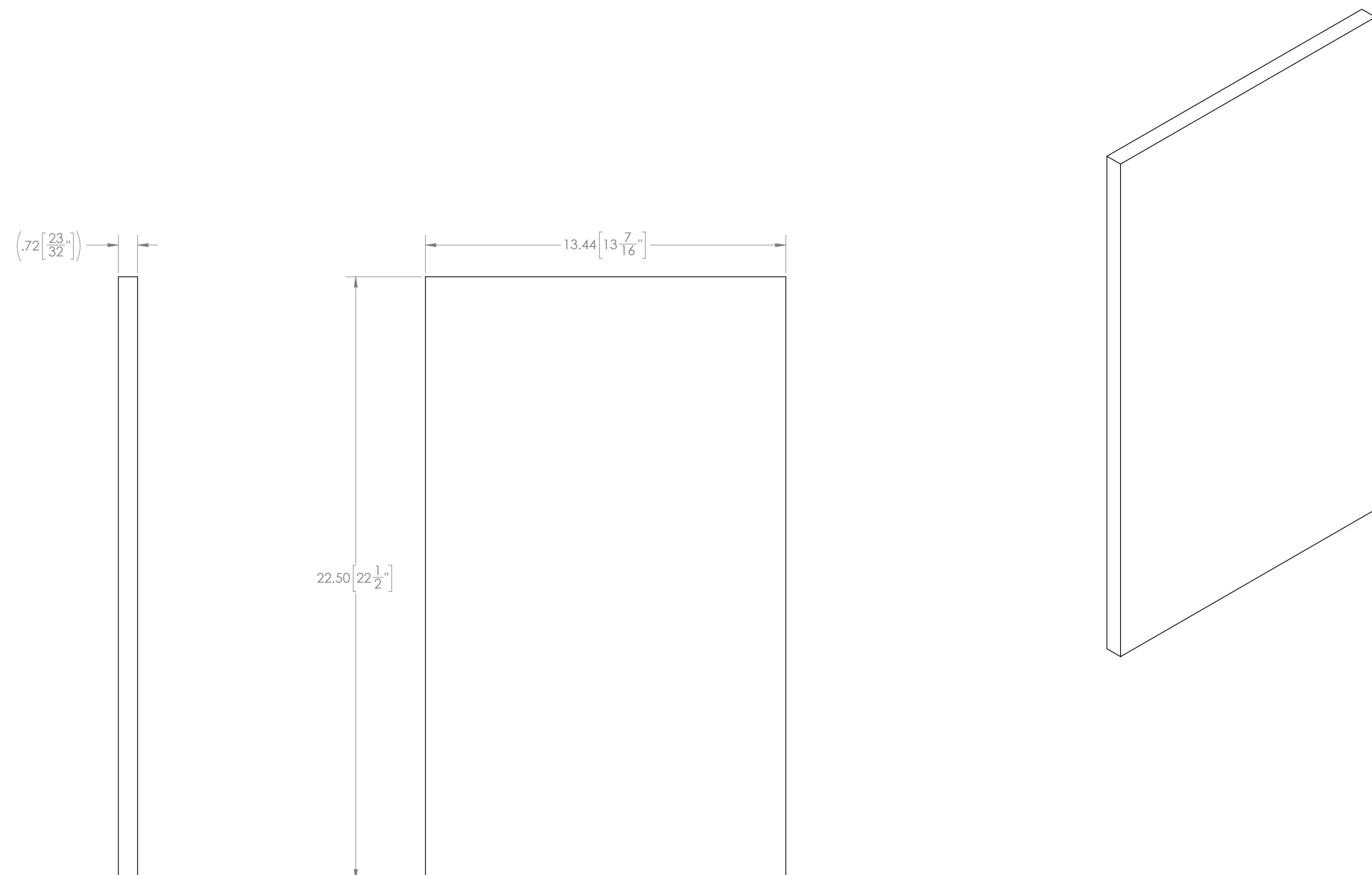
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UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL $\pm 1/16$
ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$
TWO PLACE DECIMAL $\pm .13$
THREE PLACE DECIMAL $\pm .125$

MATERIAL/FINISH:

3/4" Plywood

DO NOT SCALE DRAWING

TEAM NAME DATE

DRAWN KAMC 12/29/2021

SOLIDWORKS
Modeling Solutions Partner

TITLE: HUB - Simple Build -
Fender Side

SIZE DWG. NO. REV

C TE-22016

SCALE: 1:3 SHEET 1 OF 1

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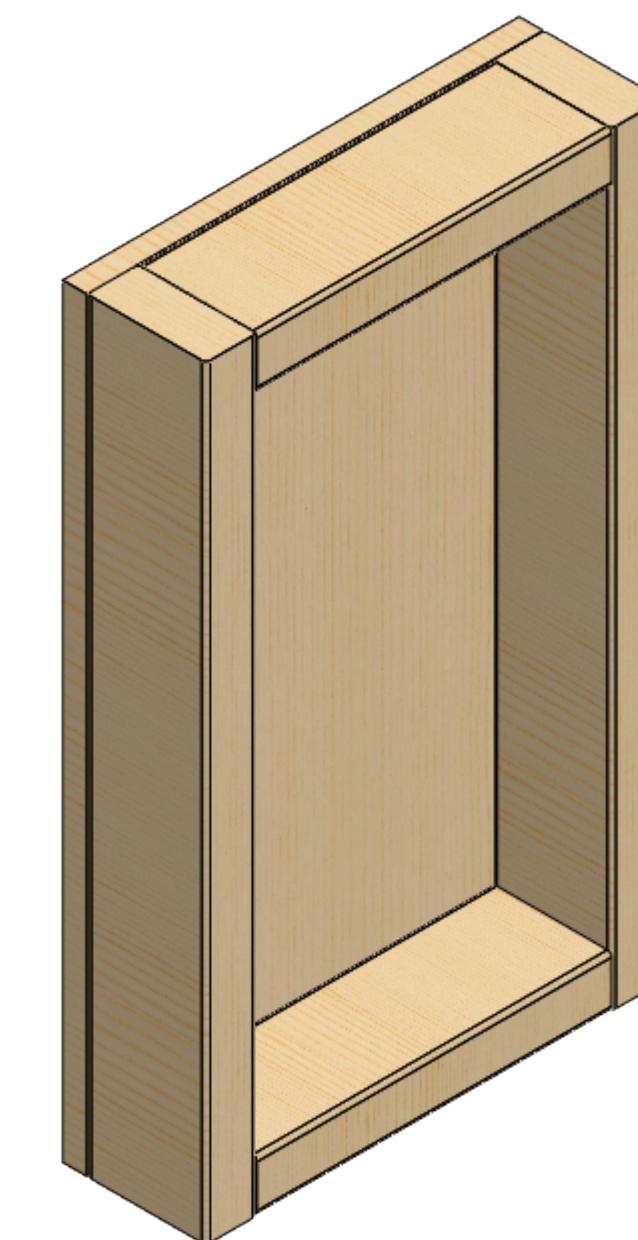
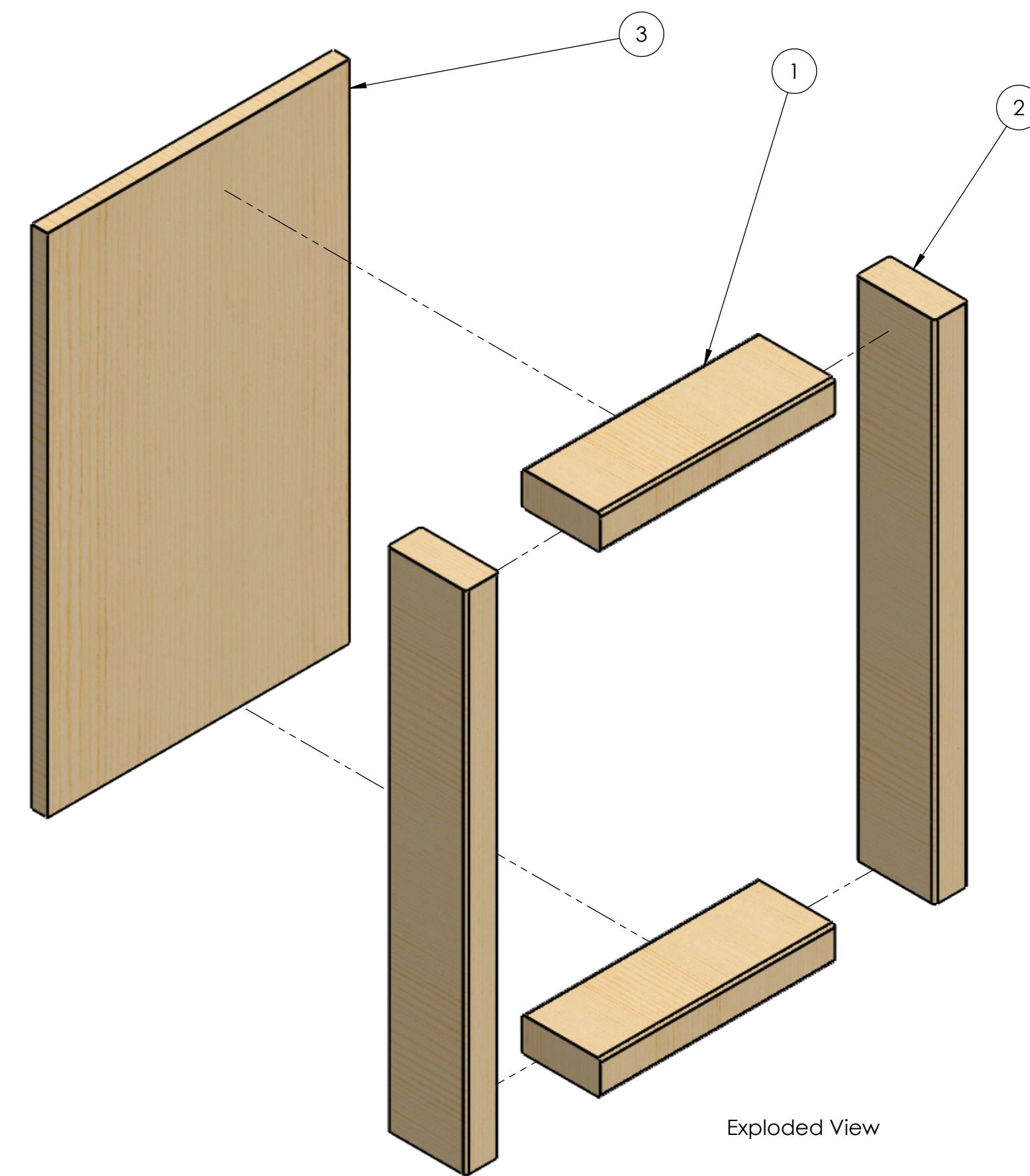
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Hardware:
#8 x 2" Long Screw - Qty 16
#8 x 2.5" Long Screw - Qty 8

ITEM NO.	PART NUMBER	DESCRIPTION	
1	TE-22014	HUB - Simple Build - Fender Side Horizontal 2x4	2
2	TE-22015	HUB - Simple Build - Fender Vertical 2x4	2
3	TE-22016	HUB - Simple Build - Fender Side	1

UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES

TOLERANCES:

FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .13$ THREE PLACE DECIMAL $\pm .125$

MATERIAL/FINISH:

DO NOT SCALE DRAWING

TEAM _____ NAME _____ DATE _____

DRAWN KAMC 12/30/2021



SOLIDWORKS

Modeling Solutions Partner

COMPETITION

Modeling Solutions Partner

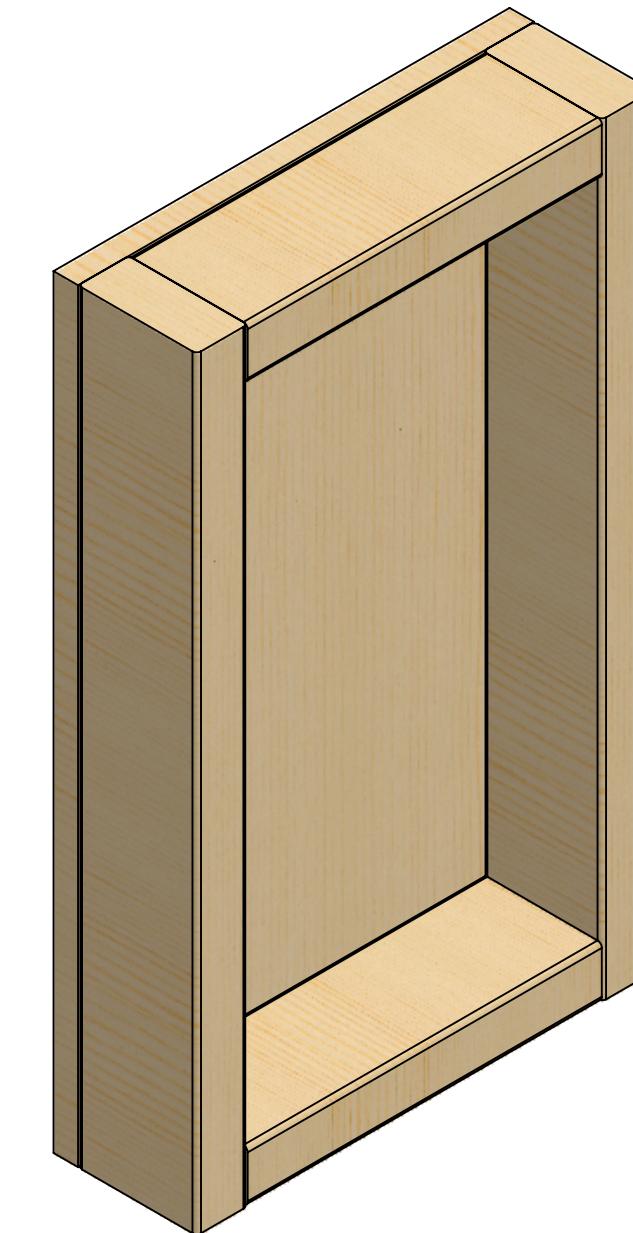
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COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

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COMPETITION**  SOLIDWORKS
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TITLE: **HUB - Basic Build -
Fender Side Assembly**

SIZE DWG. NO. REV
C TE-22017

SCALE: 1:4 SHEET 2 OF 3

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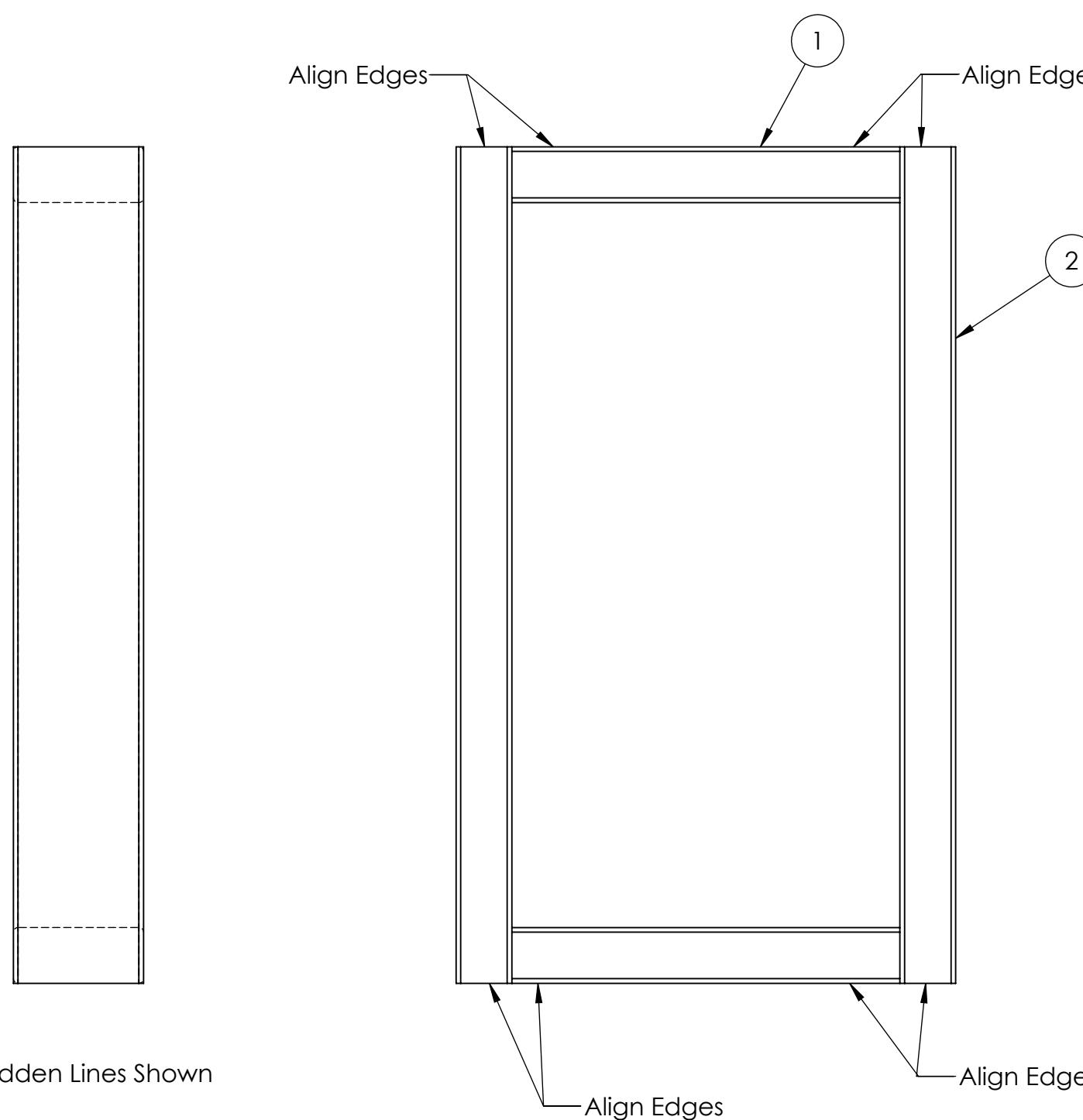
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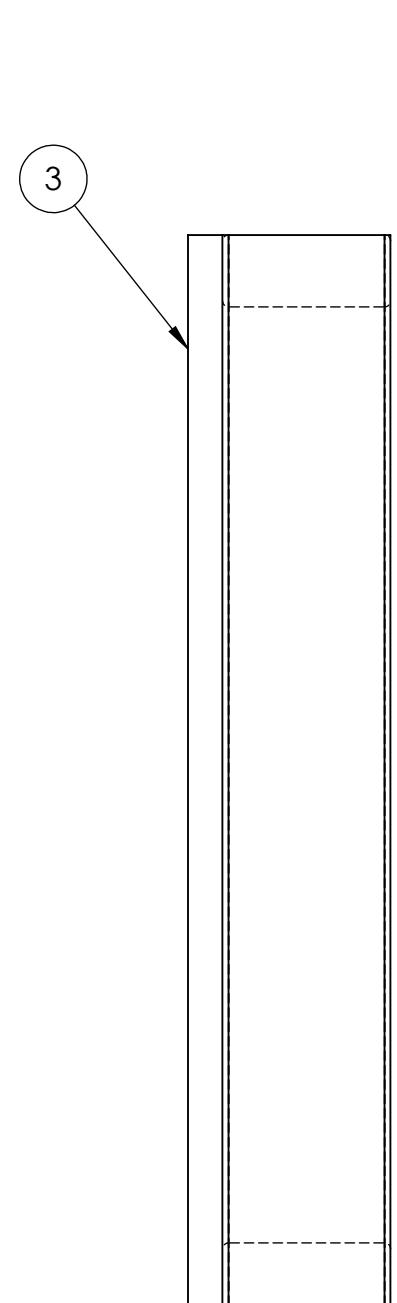
Step 1



Hidden Lines Shown

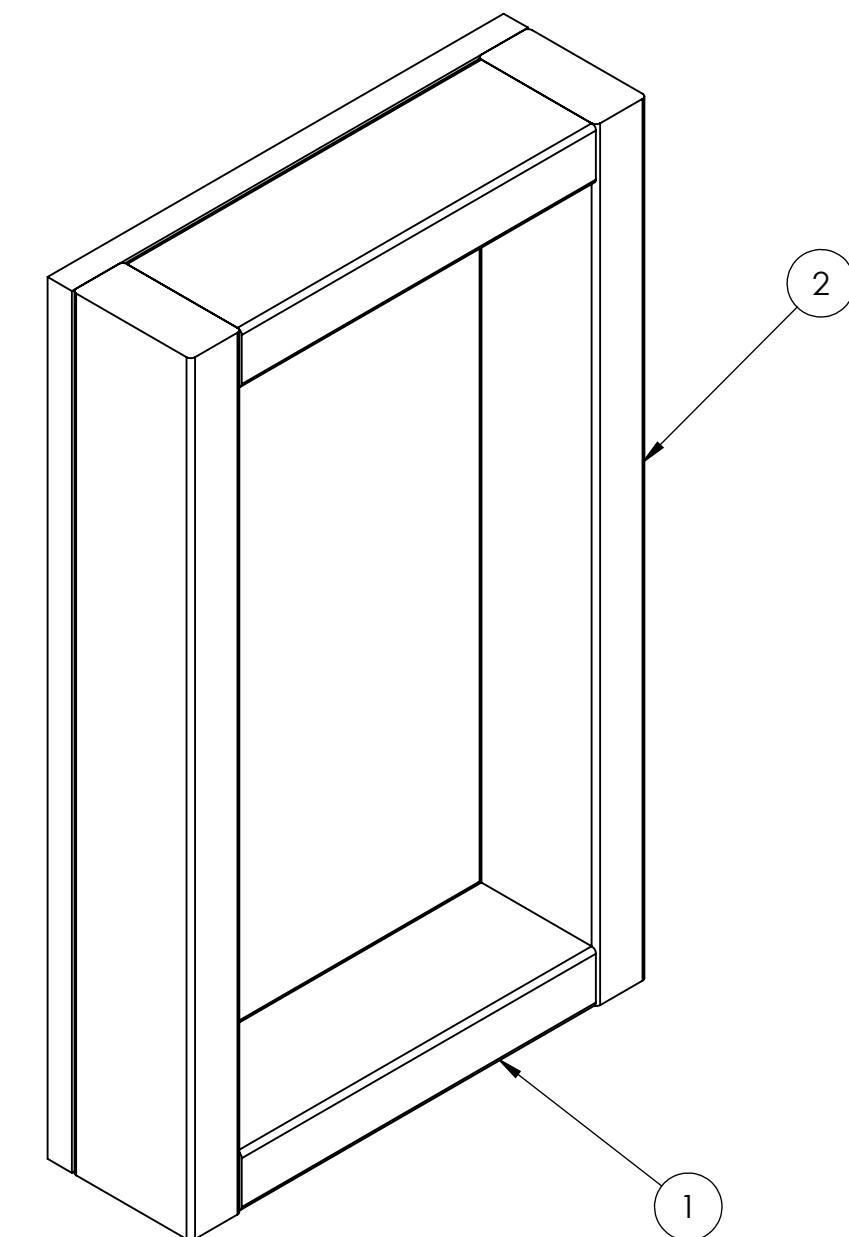
1. Align 2x 1 and 2x 2, as shown.
2. Attach using 2.5" long screws. It is recommended to use 2x screws into each interface between a 2 and 1.

Step 2



Hidden Lines Shown

1. Align 3 to the assembly made in Step 1, as shown.
2. Attach using 2" Long Screws. It is recommended to use 5x screws into each 2 and 3x screws into each 1.



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DRAWN	KAMC	12/30/2021	
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MATERIAL/FINISH:			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING	SIZE	DWG. NO.	REV
	C	TE-22017	
SCALE: 1:4		SHEET 3 OF 3	

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

TITLE: **HUB - Basic Build -
Fender Side Assembly**

SIZE DWG. NO. REV

C TE-22017

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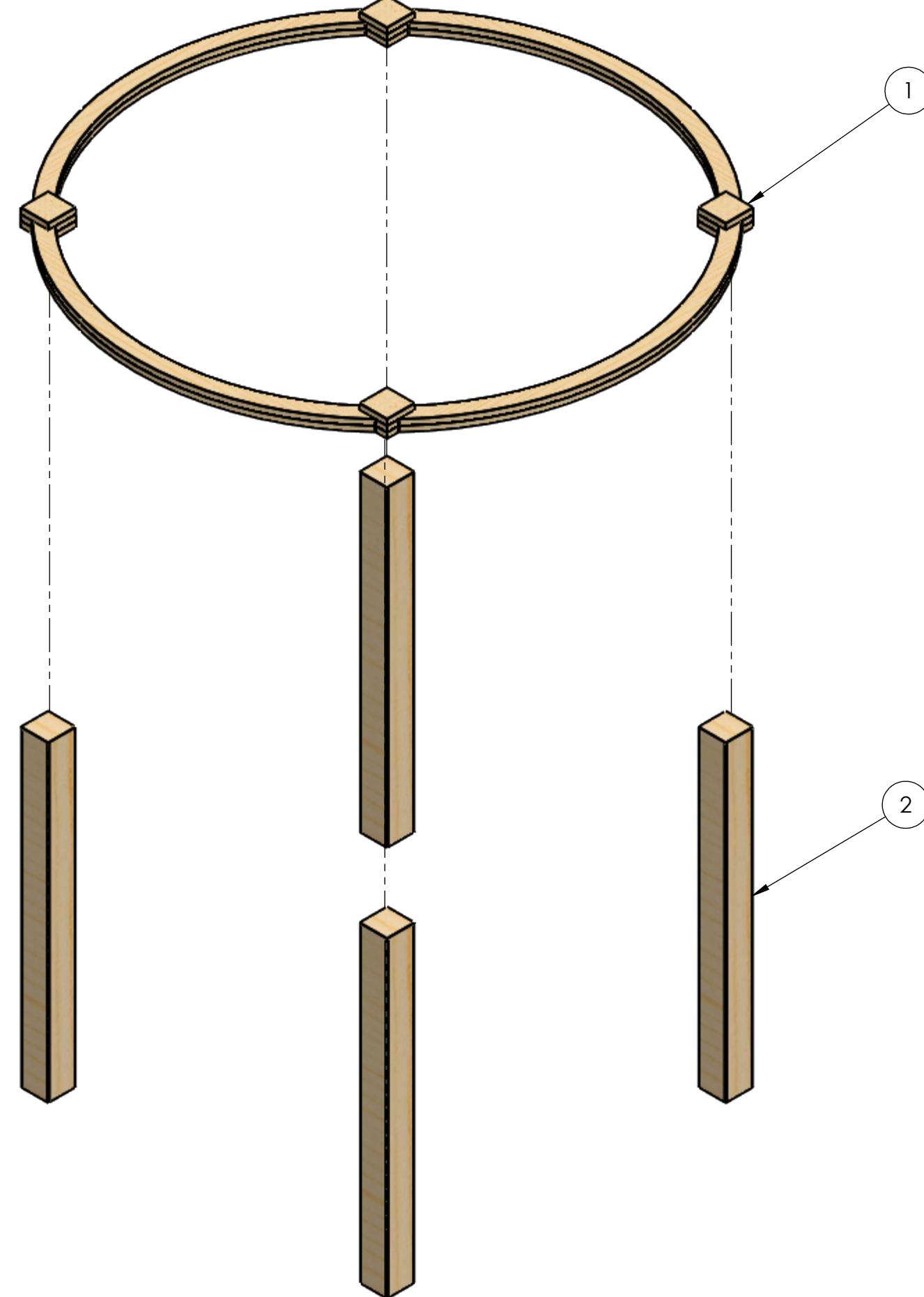
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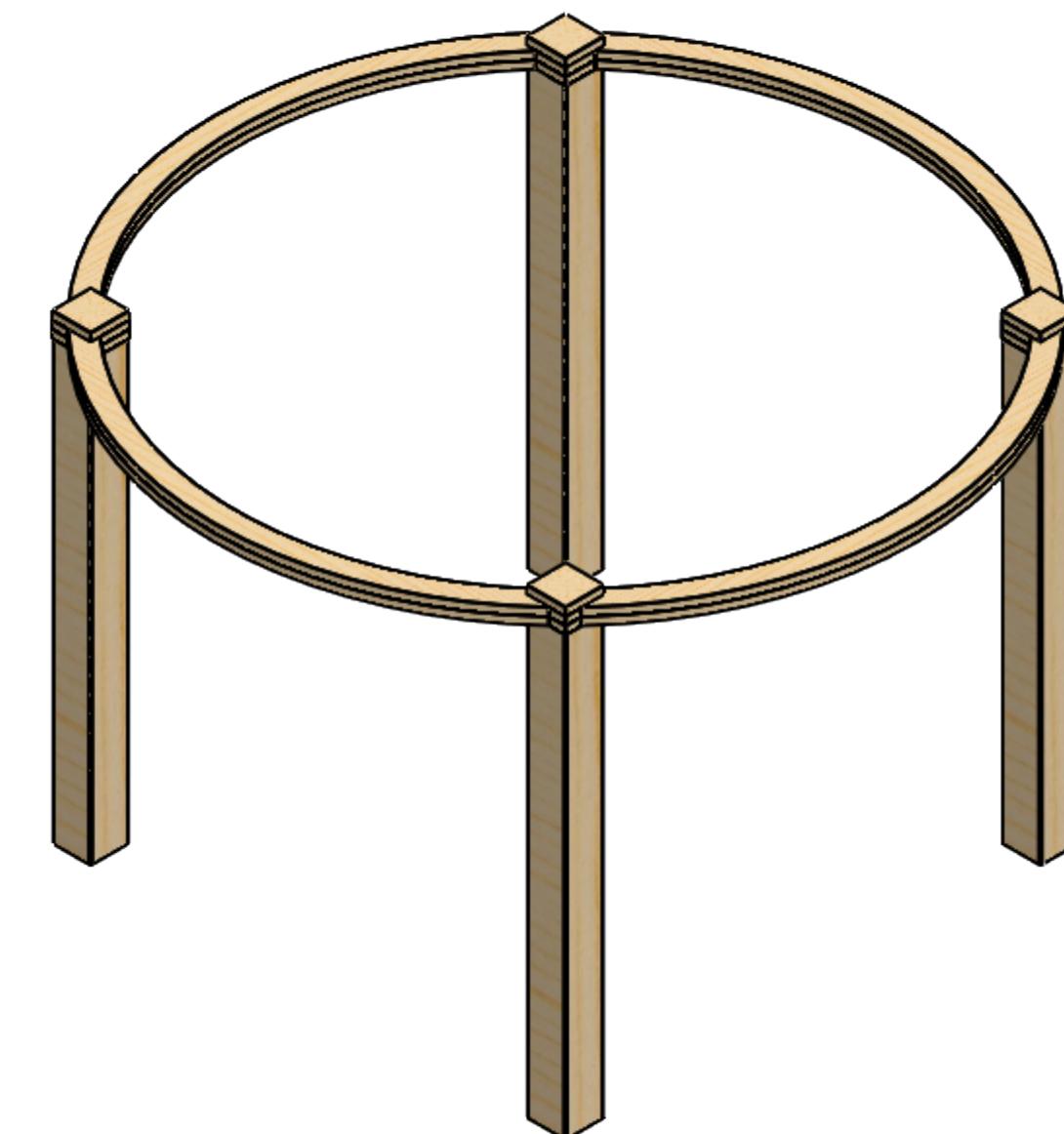
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Step 1:

1. Align 4x (2) to (1), as shown on Sheet 2.
 2. Connect using 3.5" long screws. It is recommended to use 4x screws into each .
- Note: Be careful not to place screws too close to the edges of (2).



Note: Use TE-22020-Single if you are only forming 1/4 ring.

Hardware Needed:
#10 x 3.5" Long Screws - Qty 16

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	TE-22024	Hub - Simple Build - Lower Hub Ring Full Assembly - Multiple	1
2	TE-22025	HUB - Simple Build - Vertical for Lower Hub Ring 4x4	4

UNLESS OTHERWISE SPECIFIED:			TEAM	NAME	DATE
			DRAWN	KAMC	12/30/2021
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COMMENTS:					
REMOVE ALL BURRS AND SHARP EDGES.					
DO NOT SCALE DRAWING					
SIZE	DWG. NO.	REV			
C	TE-22020-Multiple				
SCALE: 1:12			SHEET 1 OF 2		

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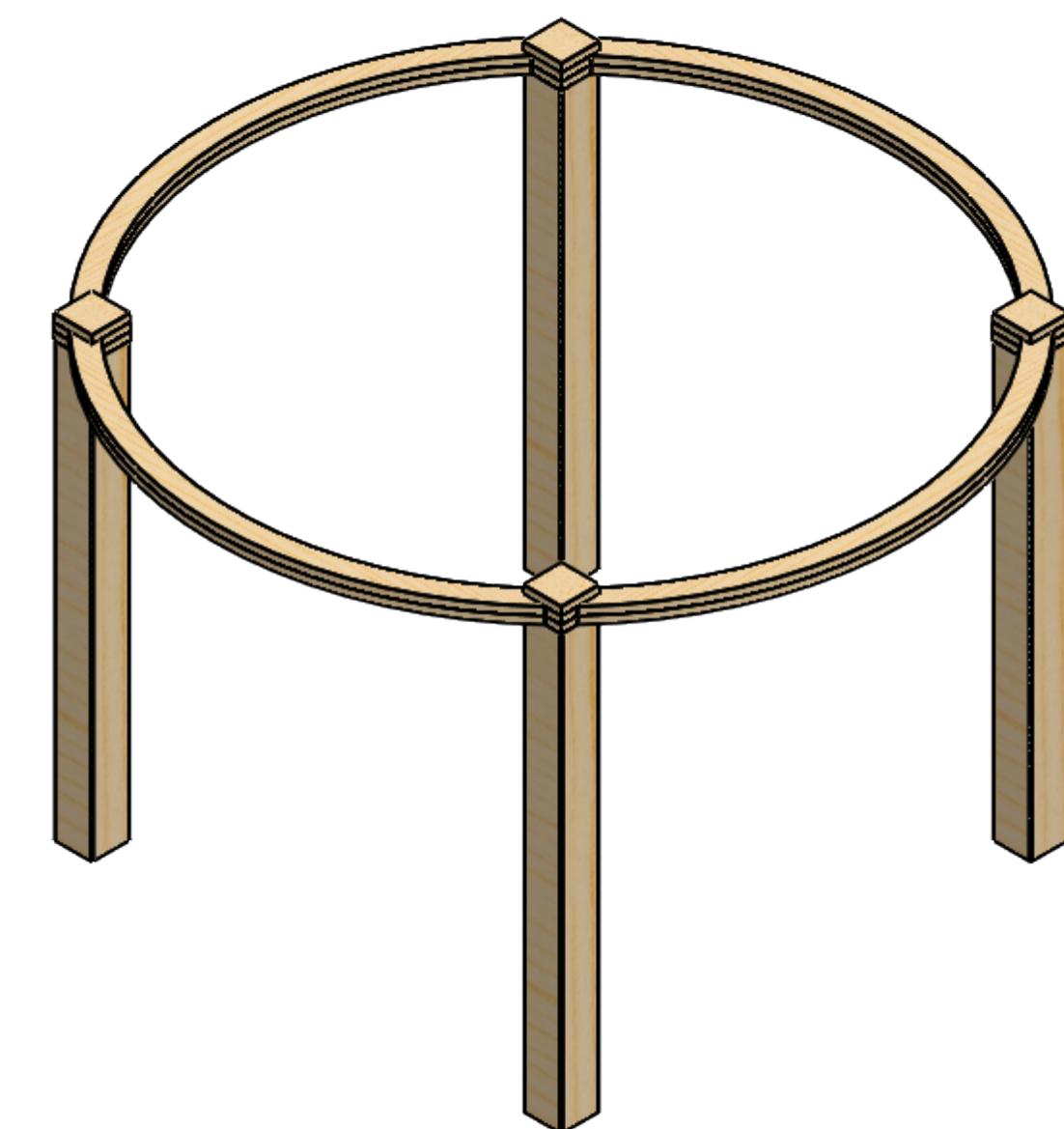
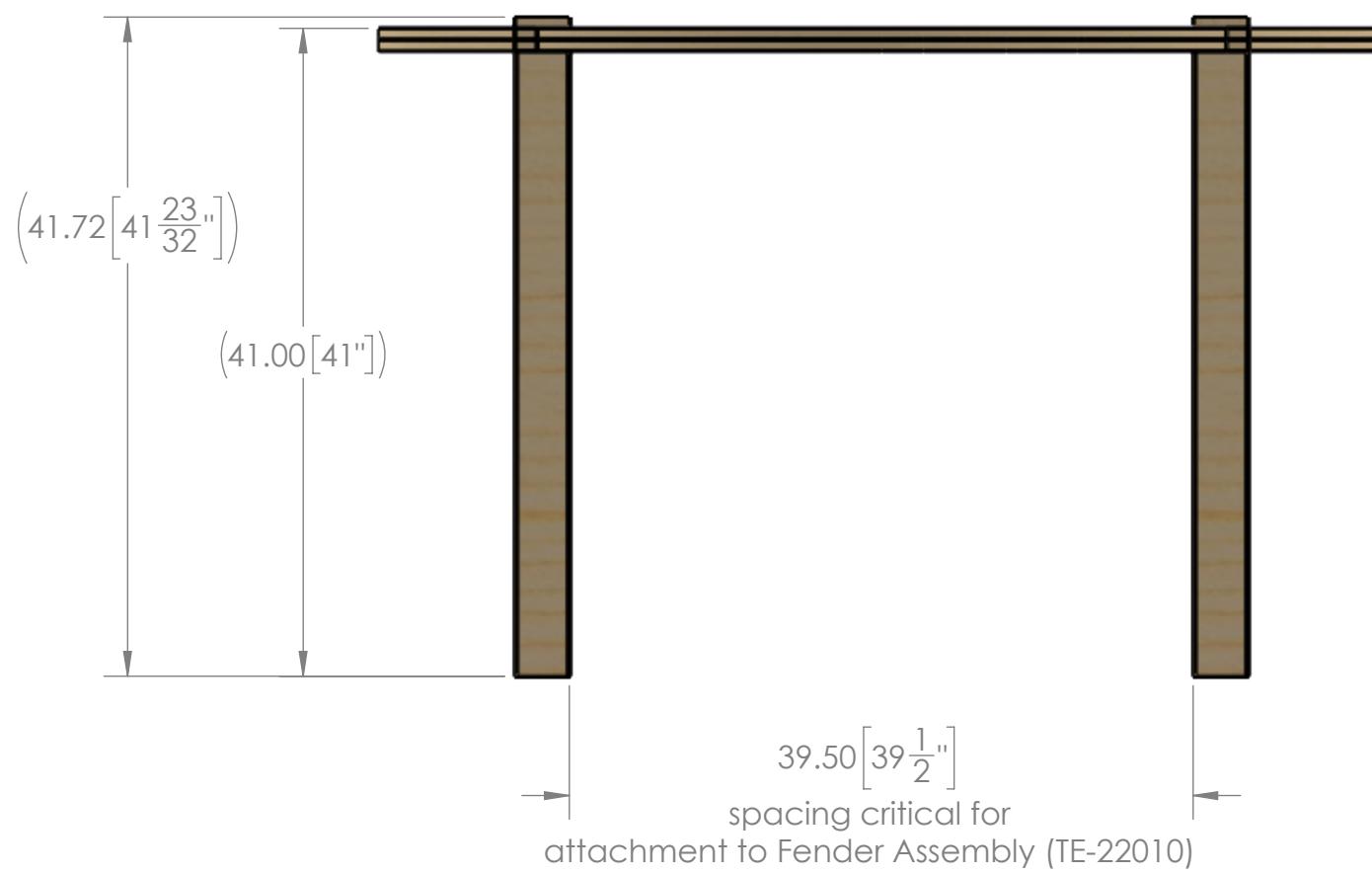
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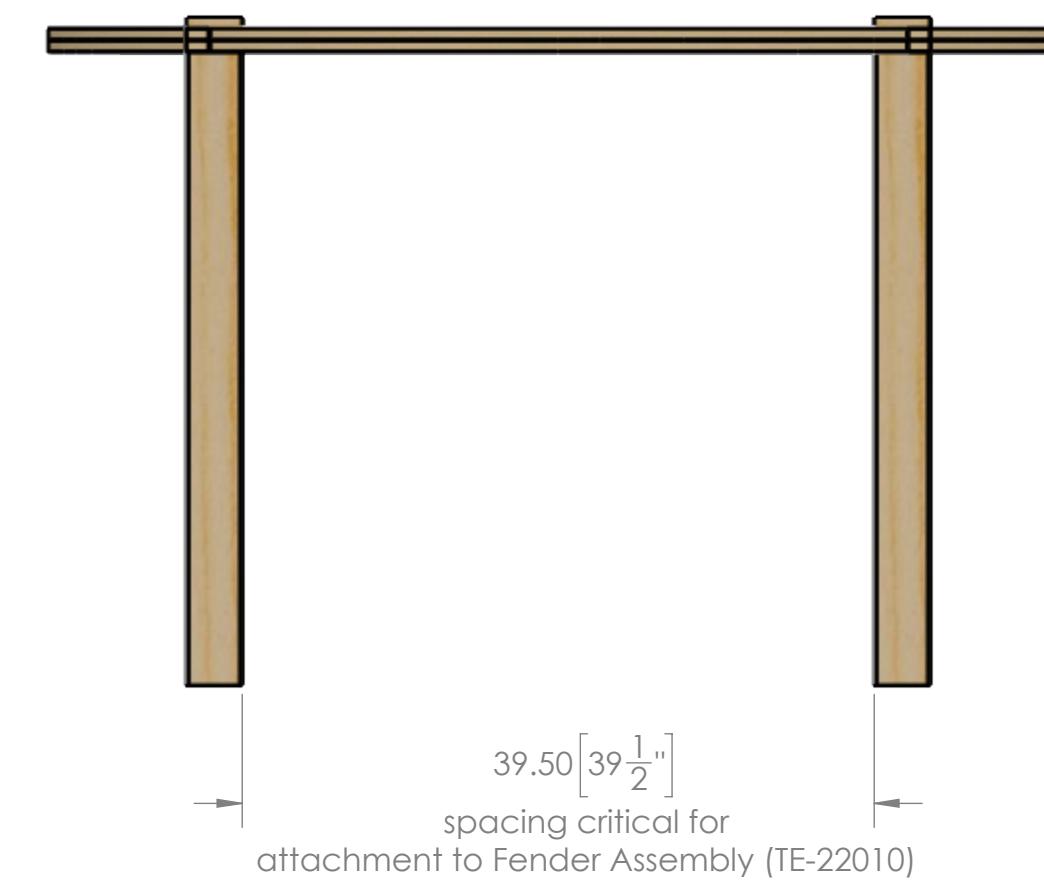
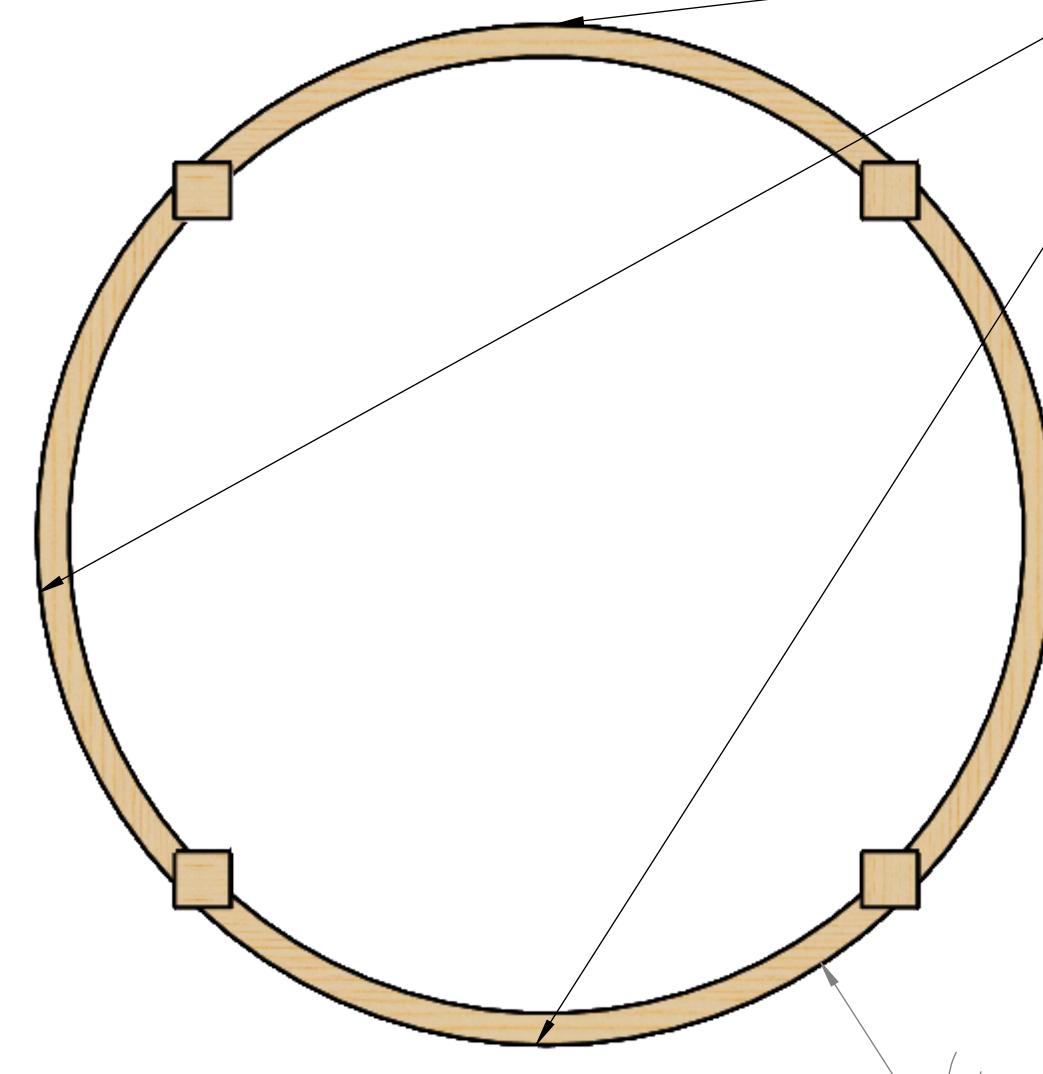
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Note: On Field, there is a protrusion in approximately this location. See GE-22300 for details.



spacing critical for attachment to Fender Assembly (TE-22010)

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

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

TITLE: **Hub - Simple Build - Lower Hub Assembly - Multiple**
SIZE DWG. NO. REV
C TE-22020-Multiple

SCALE: 1:12 SHEET 2 OF 2

4

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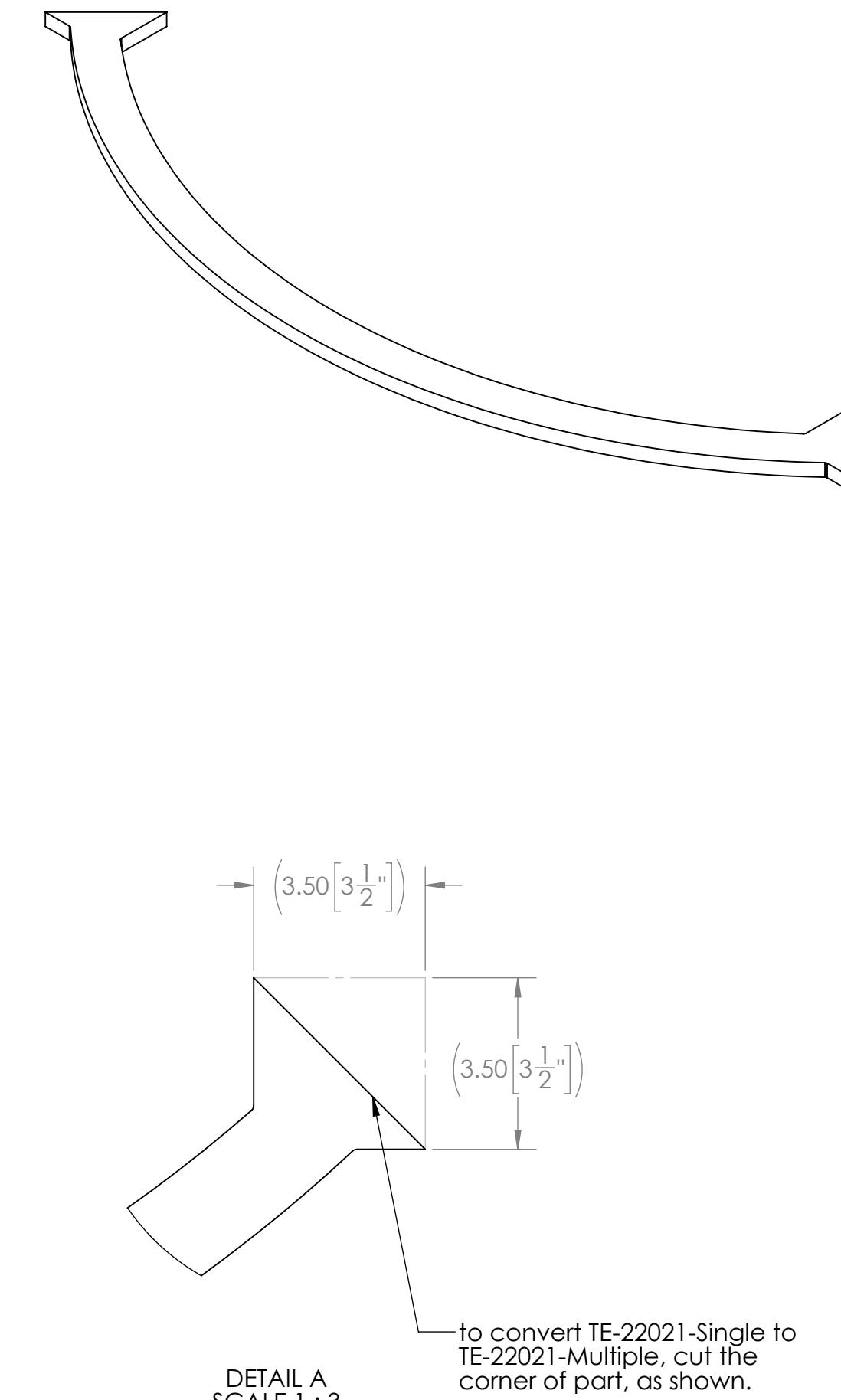
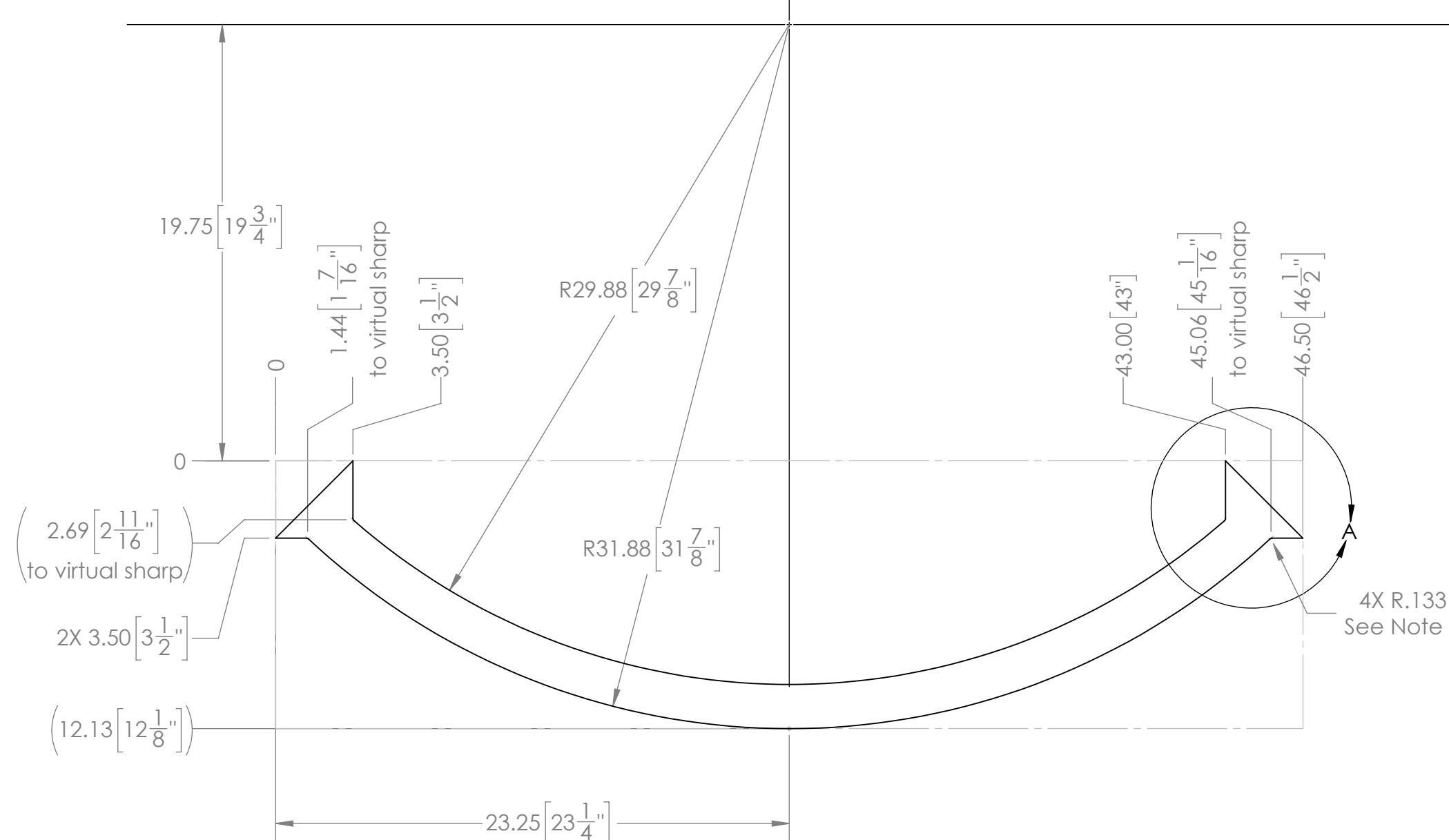
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**Note:**

1. Radii located at internal corners are provided predominately for teams making parts with a router. A 90 degree angle is sufficient clearance.
2. Use TE-22021-Single if you are forming only 1/4 ring.

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DIMENSIONS ARE IN INCHES	DRAWN	KAMC	12/29/2021
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MATERIAL/FINISH:	3/4" Plywood	REV	
COMMENTS:	REMOVE ALL BURRS AND SHARP EDGES.		
DO NOT SCALE DRAWING	SCALE: 1:6	SHEET 1 OF 1	

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

TITLE:
Hub - Simple Build - Lower Hub Ring - Multiple

SIZE DWG. NO. REV
C TE-22021-Multiple

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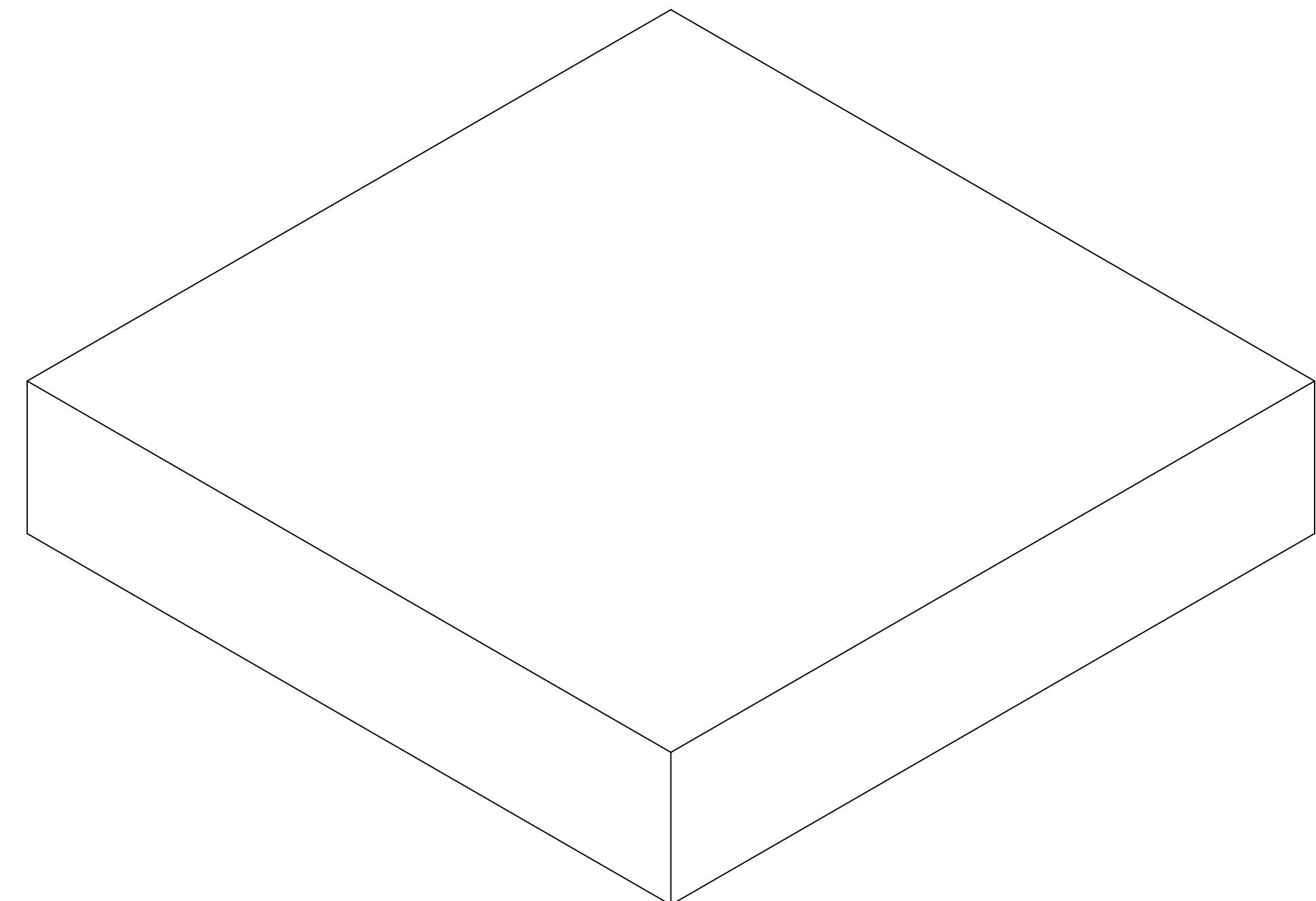
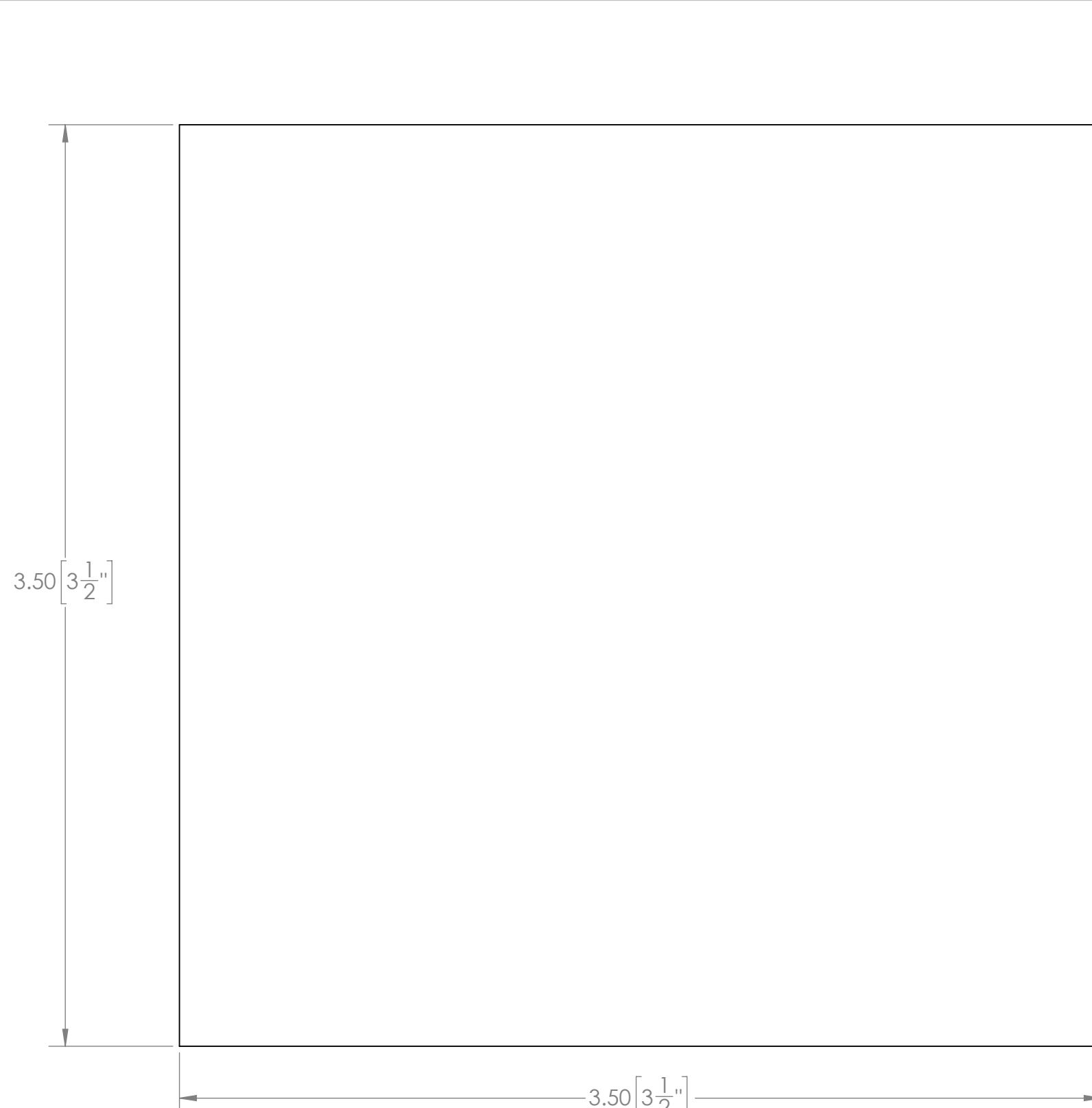
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UNLESS OTHERWISE SPECIFIED:	TEAM	NAME	DATE
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .13$ THREE PLACE DECIMAL $\pm .125$	DRAWN	KAMC	12/29/2021
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MATERIAL/FINISH: 3/4" Plywood	SIZE	DWG. NO.	REV
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.	C	TE-22022	
DO NOT SCALE DRAWING	SCALE: 2:1	SHEET 1 OF 1	

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FIRST ROBOTICS COMPETITION
SOLIDWORKS
Modeling Solutions Partner

TITLE:
Hub - Simple Build -
Lower Hub Ring
Connection Plate

SIZE DWG. NO. REV
C TE-22022
SCALE: 2:1 SHEET 1 OF 1

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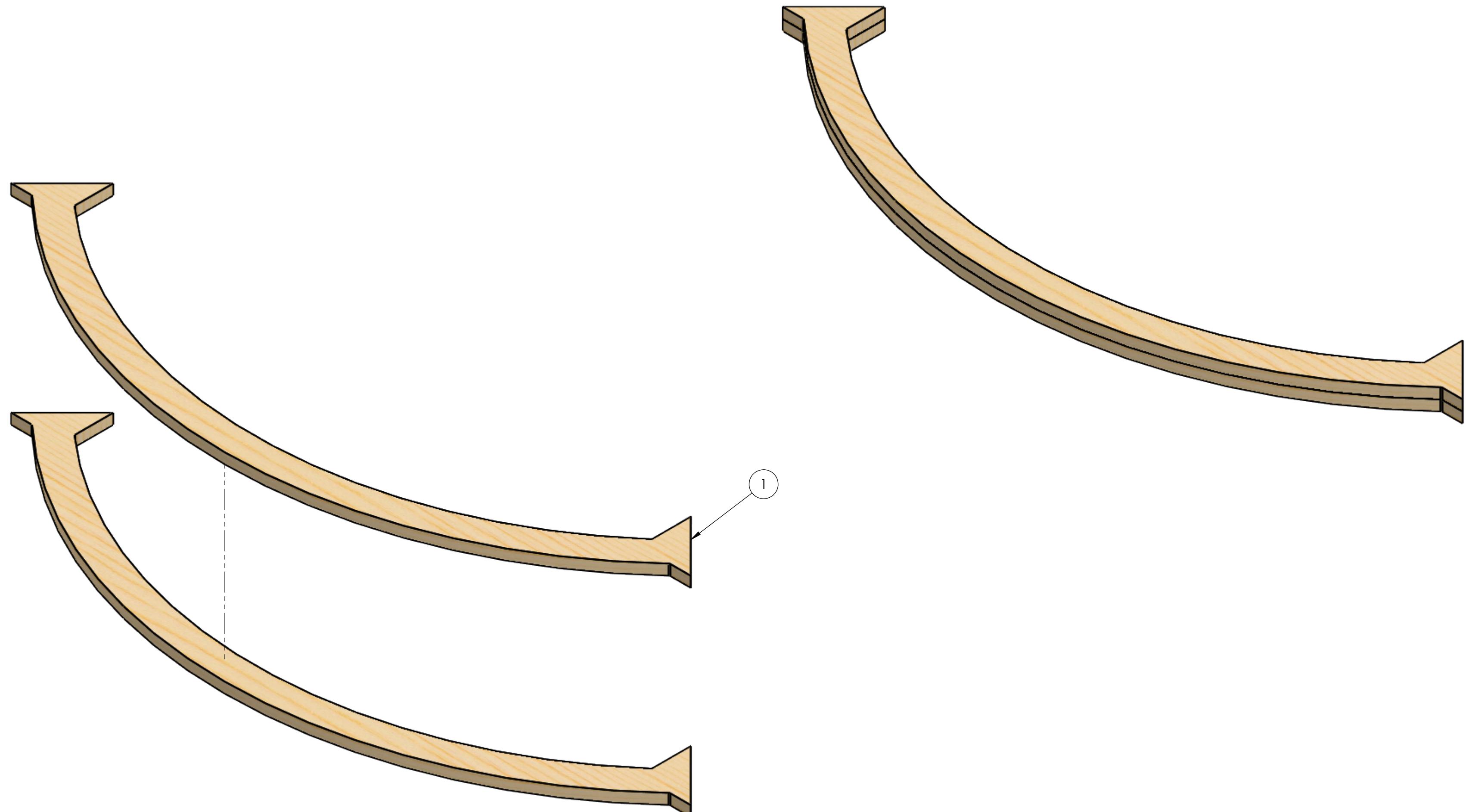
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Note: Use TE-22023-Single if you are only forming a 1/4 ring.

Hardware:
#8 x 1.25" Long Screw - Qty 8

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	TE-22021-Multiple	Hub - Simple Build - Lower Hub Ring - Multiple	2

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DRAWN	KAMC	12/30/2021				
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COMMENTS:						
REMOVE ALL BURRS AND SHARP EDGES.						
DO NOT SCALE DRAWING			SIZE	DWG. NO.	REV	C
			TE-22023-Multiple			
			SCALE: 1:4	SHEET 1 OF 2		

Step 1:

1. Align 2x (1) as shown.
2. Connect using 1.25" long screws. It is recommended to use 8x screws. Screws should ONLY be placed around the arc. Avoid placing screws on the triangular ends.

DIMENSIONS ARE IN INCHES
TOLERANCES:

FRACTIONAL $\pm 1/16$
ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$
TWO PLACE DECIMAL $\pm .13$
THREE PLACE DECIMAL $\pm .125$

MATERIAL/FINISH:

DO NOT SCALE DRAWING

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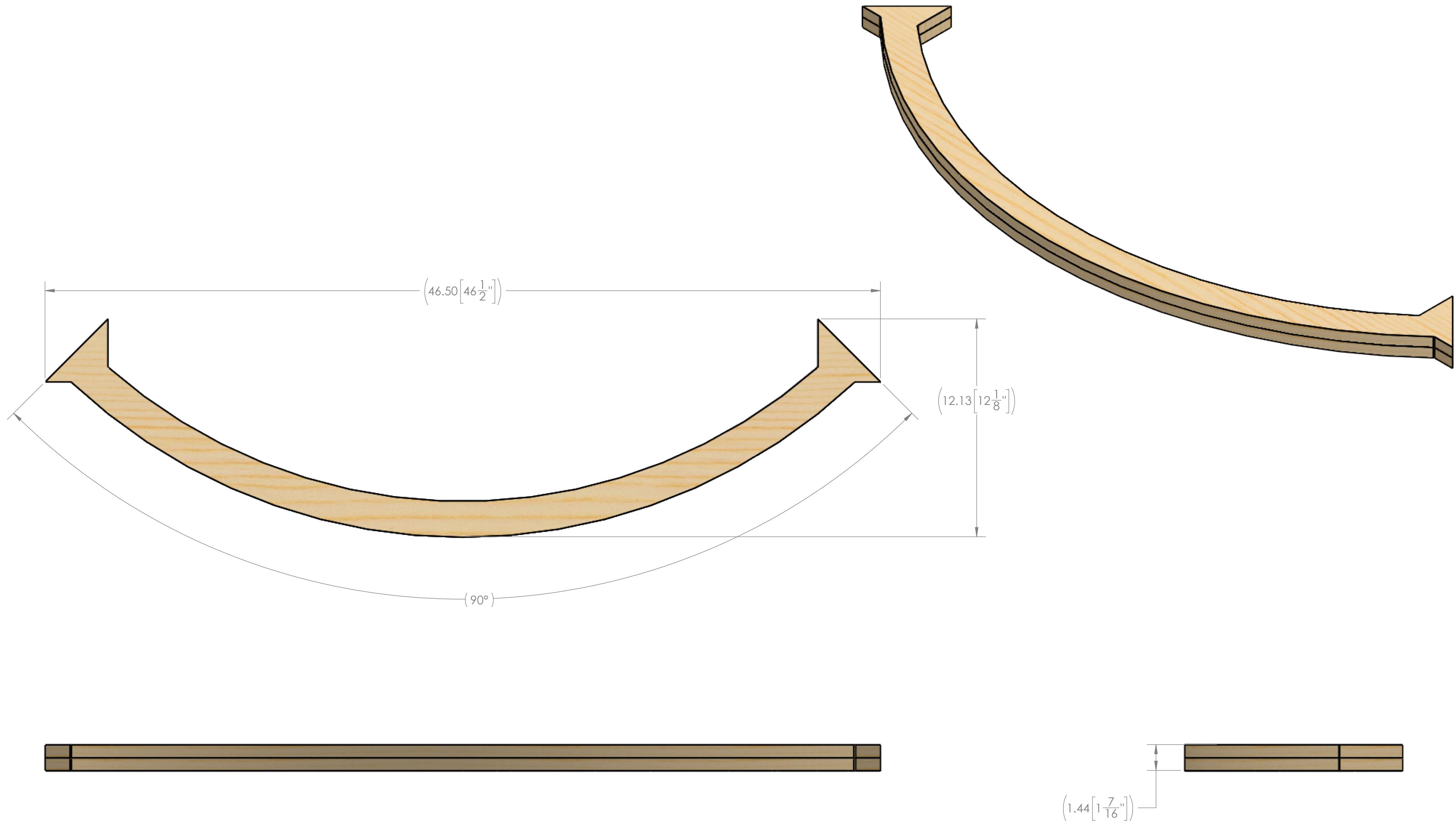
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DRAWN	KAMC	12/30/2021	
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MATERIAL/FINISH:			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
Hub - Simple Build -
Lower Hub Ring
Assembly - Multiple

SIZE DWG. NO. REV
C TE-22023-Multiple

SCALE: 1:4 SHEET 2 OF 2

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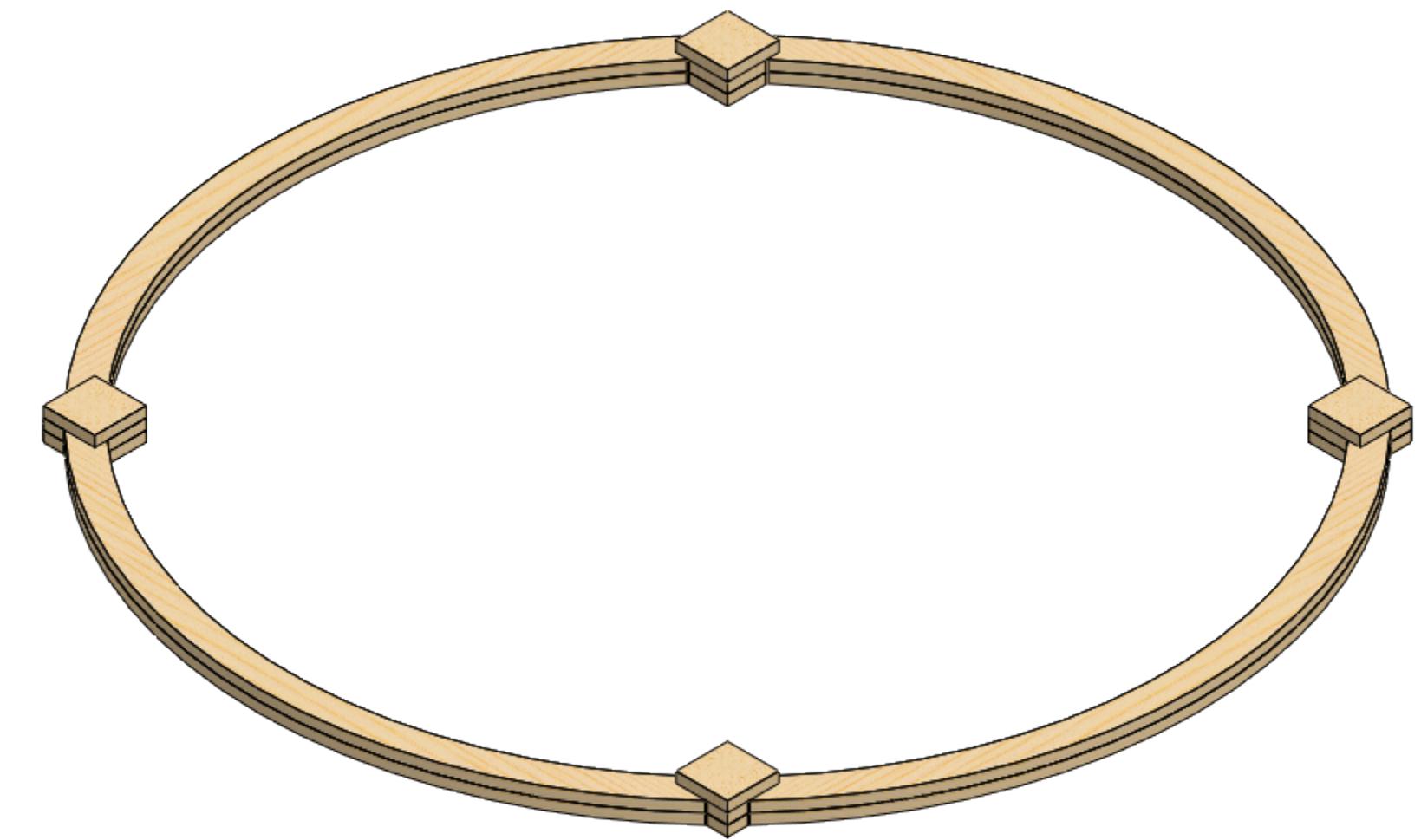
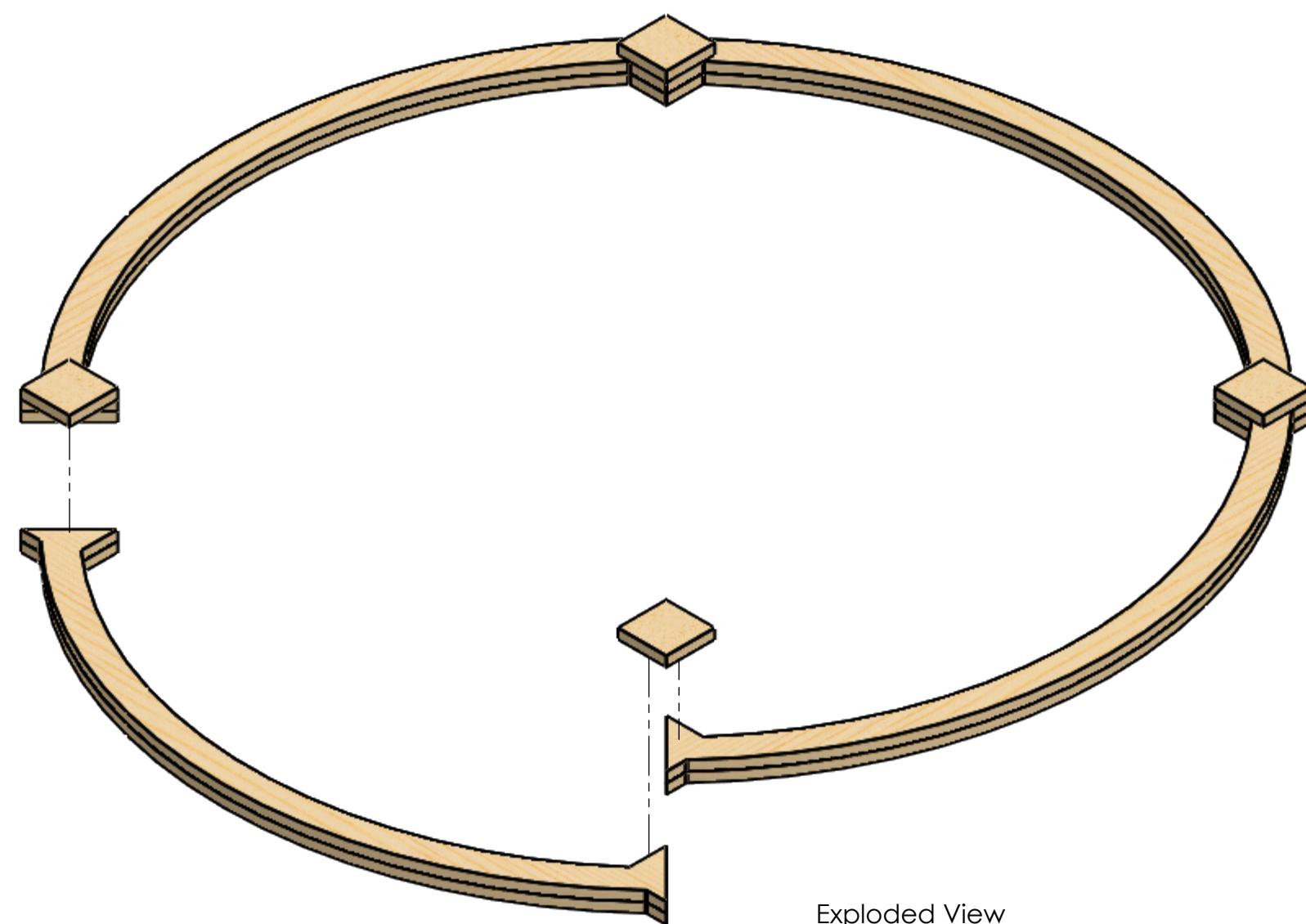
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Note: Use TE-22023-Single if you are only forming a 1/4 ring.

Hardware Needed:
#8 x 2" Long Screw - Qty 8

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	TE-22022	Hub - Simple Build - Lower Hub Ring Connection Plate	4
2	TE-22023-Multiple	Hub - Simple Build - Lower Hub Ring Assembly - Multiple	4

UNLESS OTHERWISE SPECIFIED:			TEAM	NAME	DATE	 FIRST ROBOTICS COMPETITION		
			DRAWN	KAMC	12/30/2021			
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .13$ THREE PLACE DECIMAL $\pm .125$						PROPRIETARY AND CONFIDENTIAL		
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						Hub - Simple Build - Lower Hub Ring Full Assembly - Multiple		
						SIZE	DWG. NO.	REV
						C	TE-22024	
						SCALE: 1:8	SHEET 1 OF 3	
DO NOT SCALE DRAWING								

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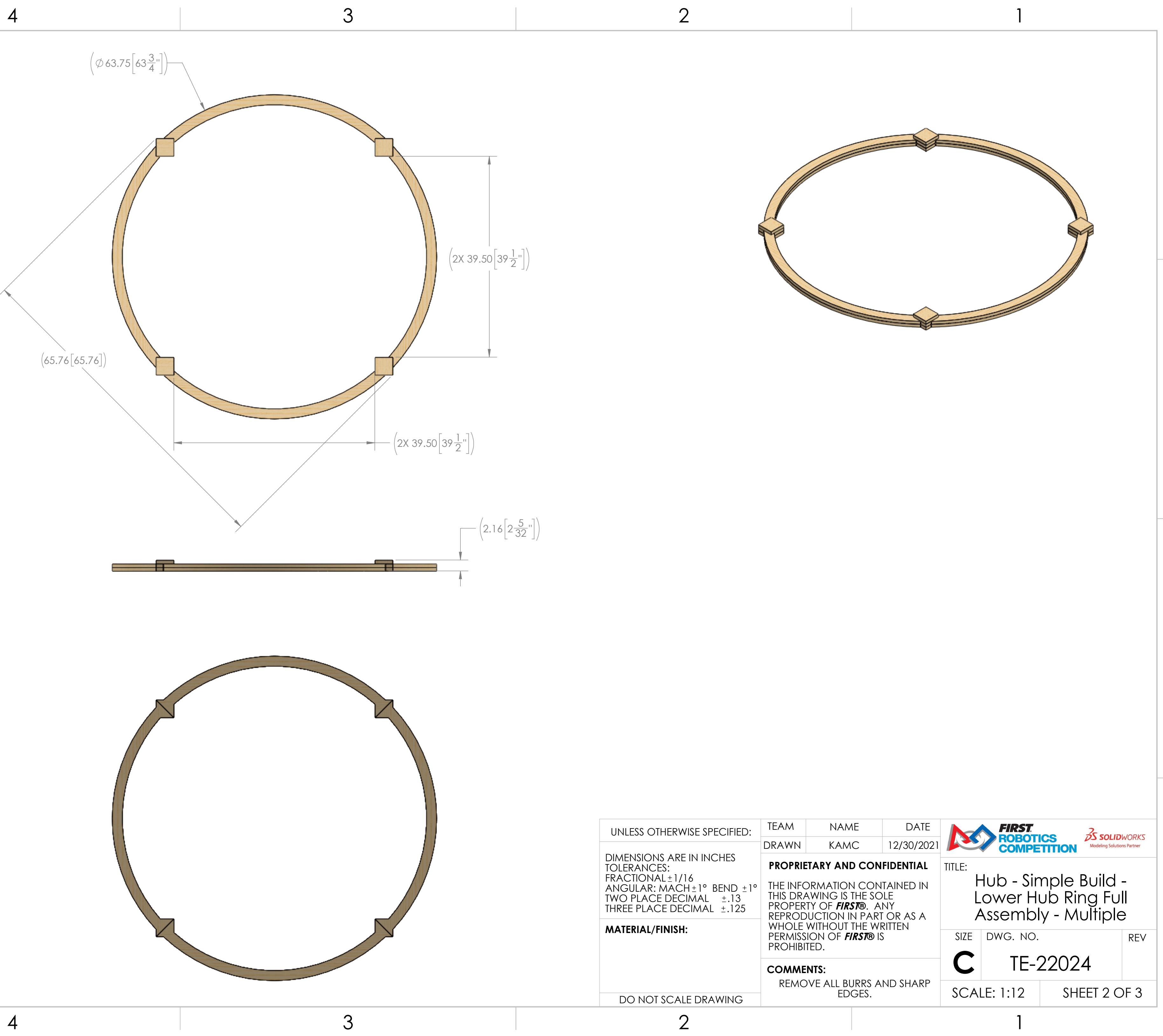
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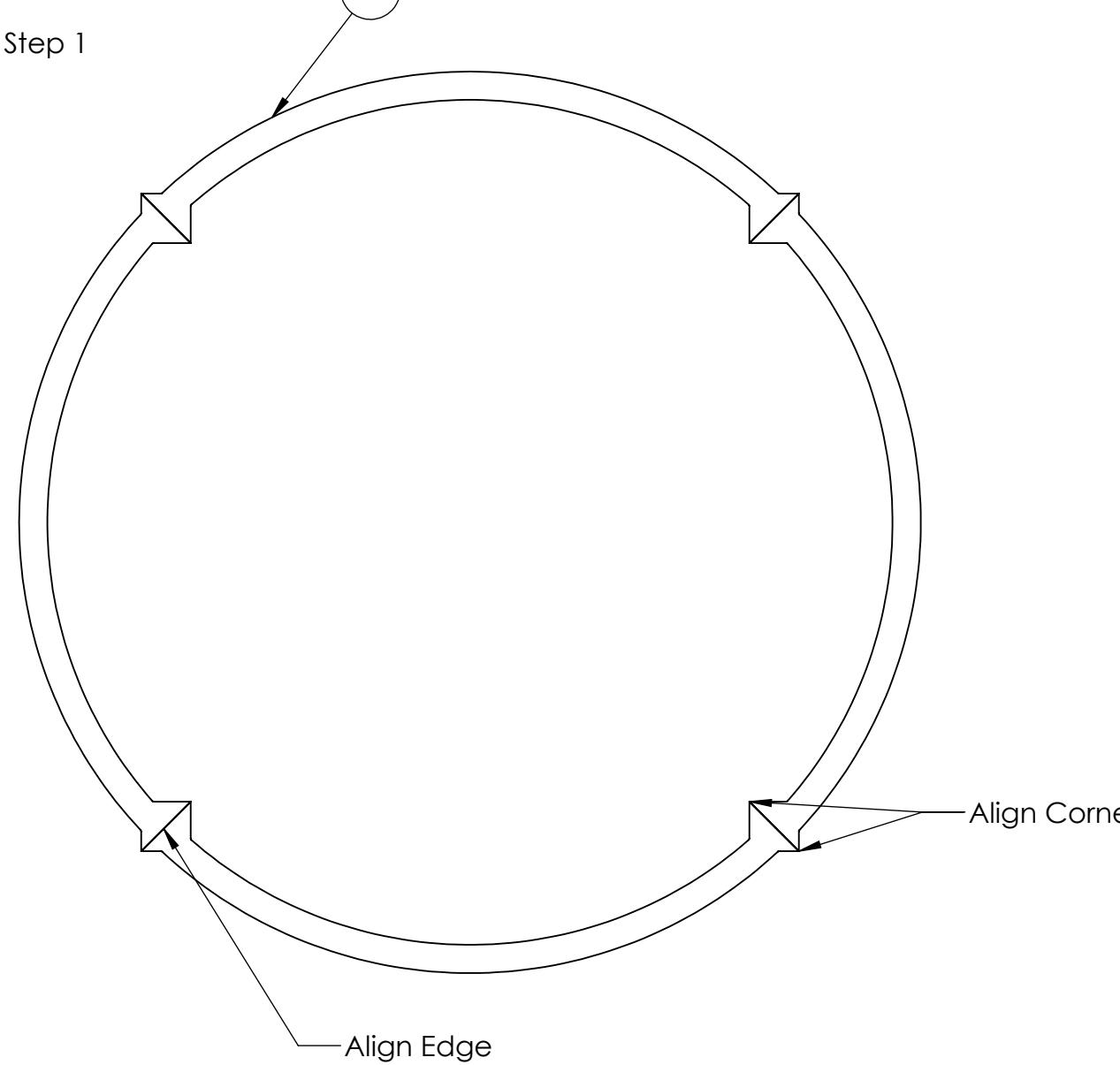


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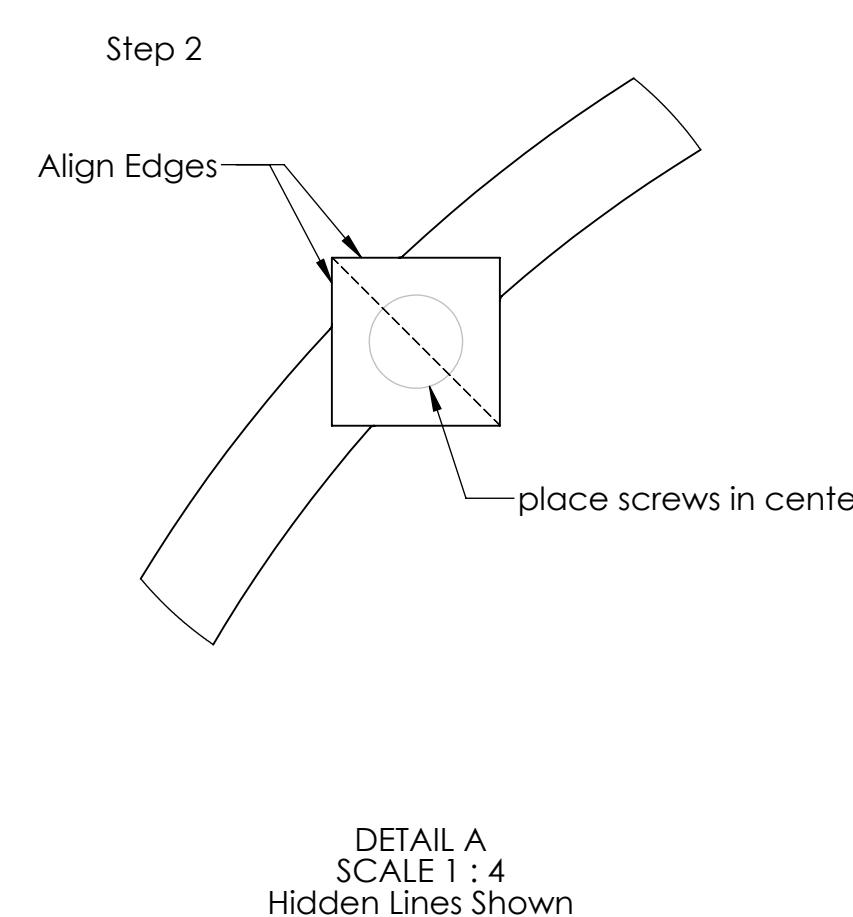
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1. Align 4x (2), as shown. Attachment will happen in next step



1. Align 4x (1) onto the ring formed in Step 1, as shown.
2. Connect using 2" long screws. It is recommended to use only 2x screws towards the center of (1), 1x into each (1). This will ensure there is room for connection when added to TE-22020-Multiple.

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MATERIAL/FINISH:	SIZE	DWG. NO.	REV
C TE-22024			
DO NOT SCALE DRAWING	SCALE: 1:12	SHEET 3 OF 3	

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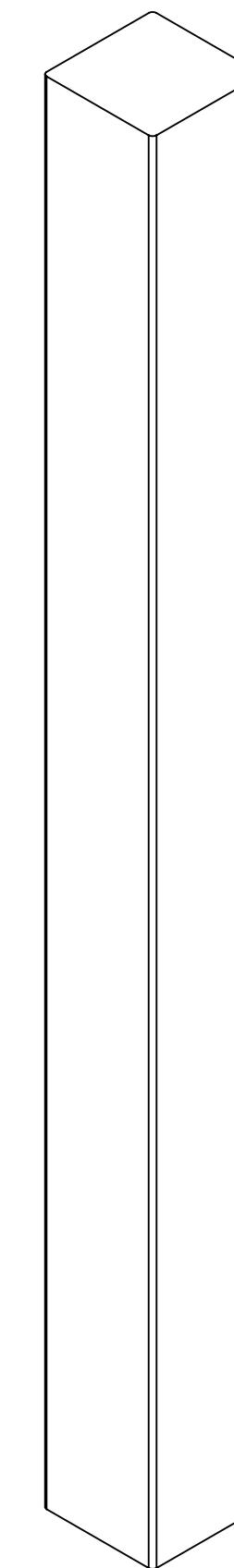
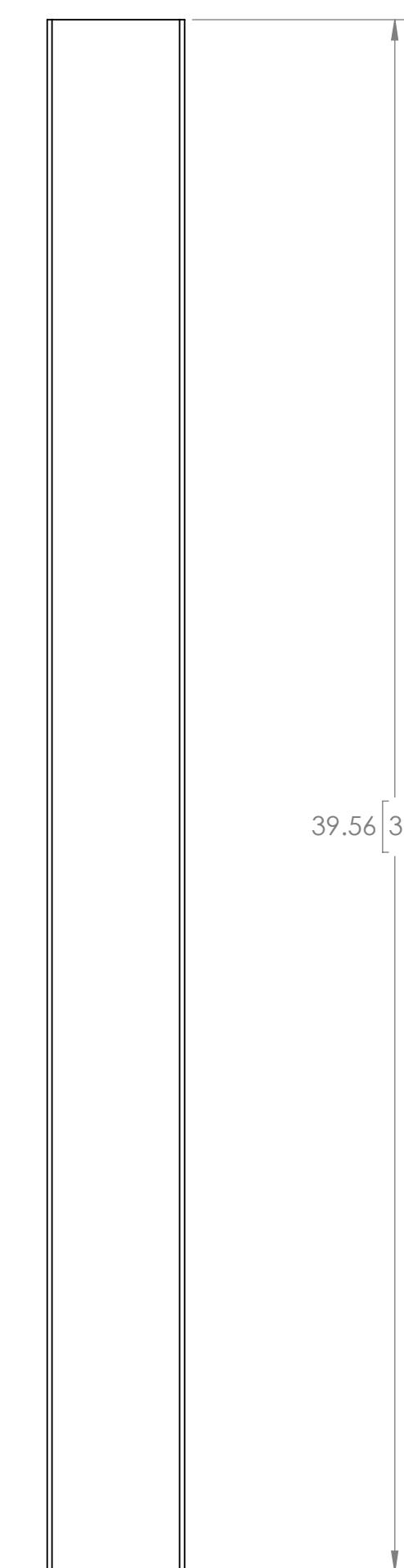
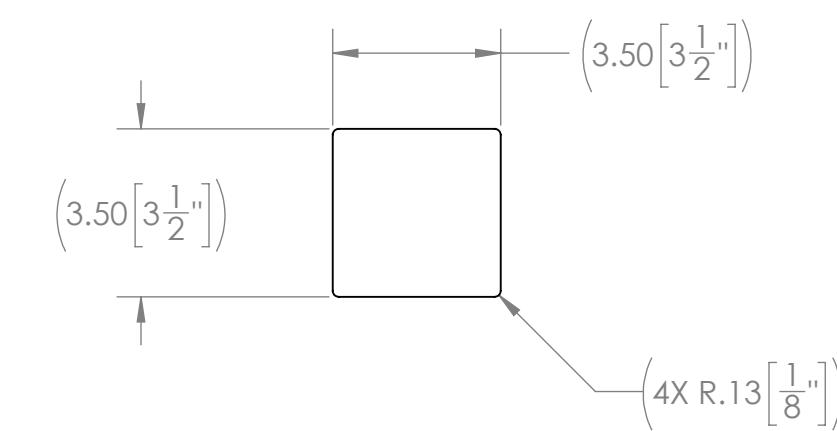
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MATERIAL/FINISH:	SIZE	DWG. NO.	REV
4"x4" Lumber	C	TE-22025	
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING	SCALE: 1:4	SHEET 1 OF 1	

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