

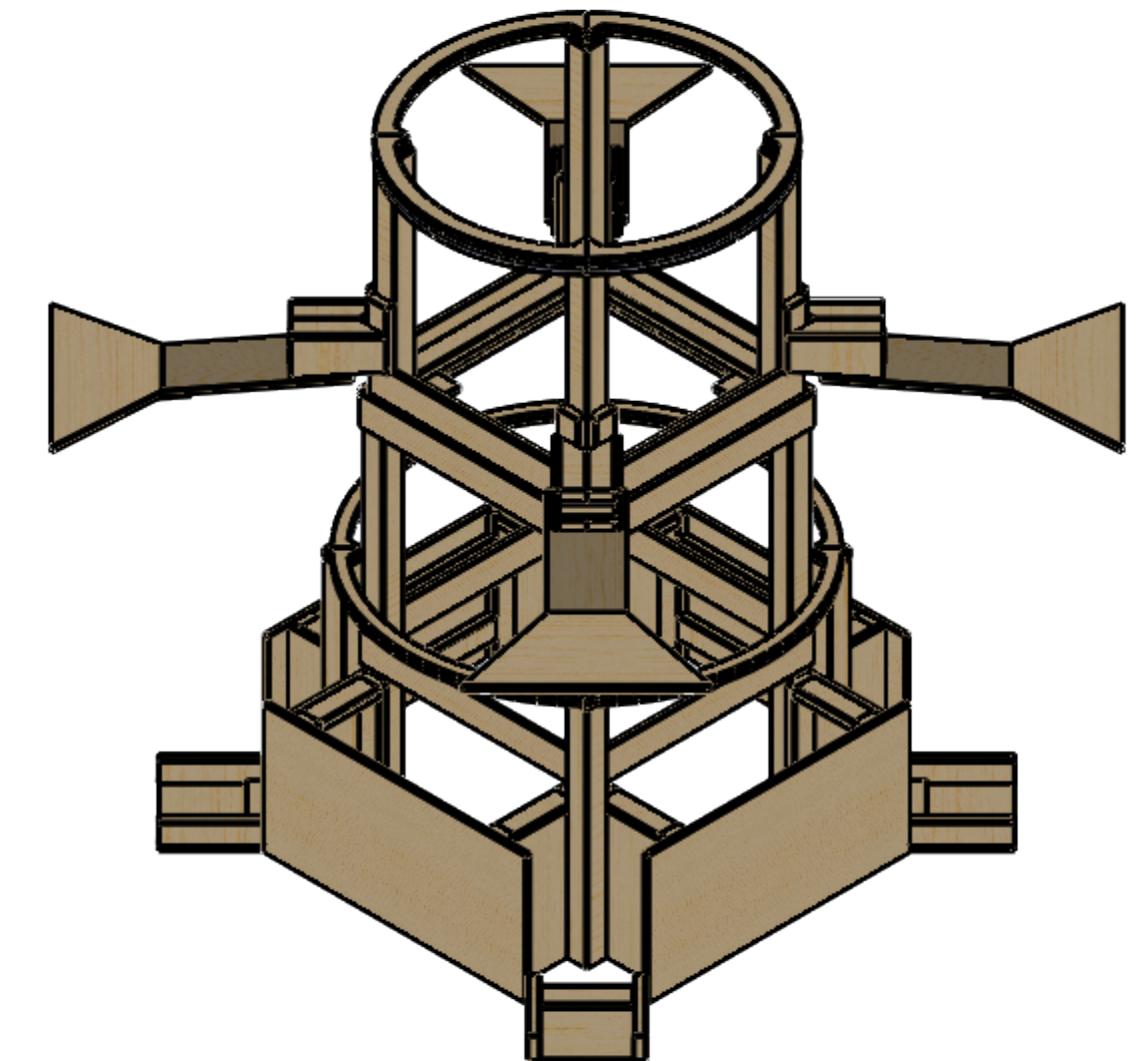
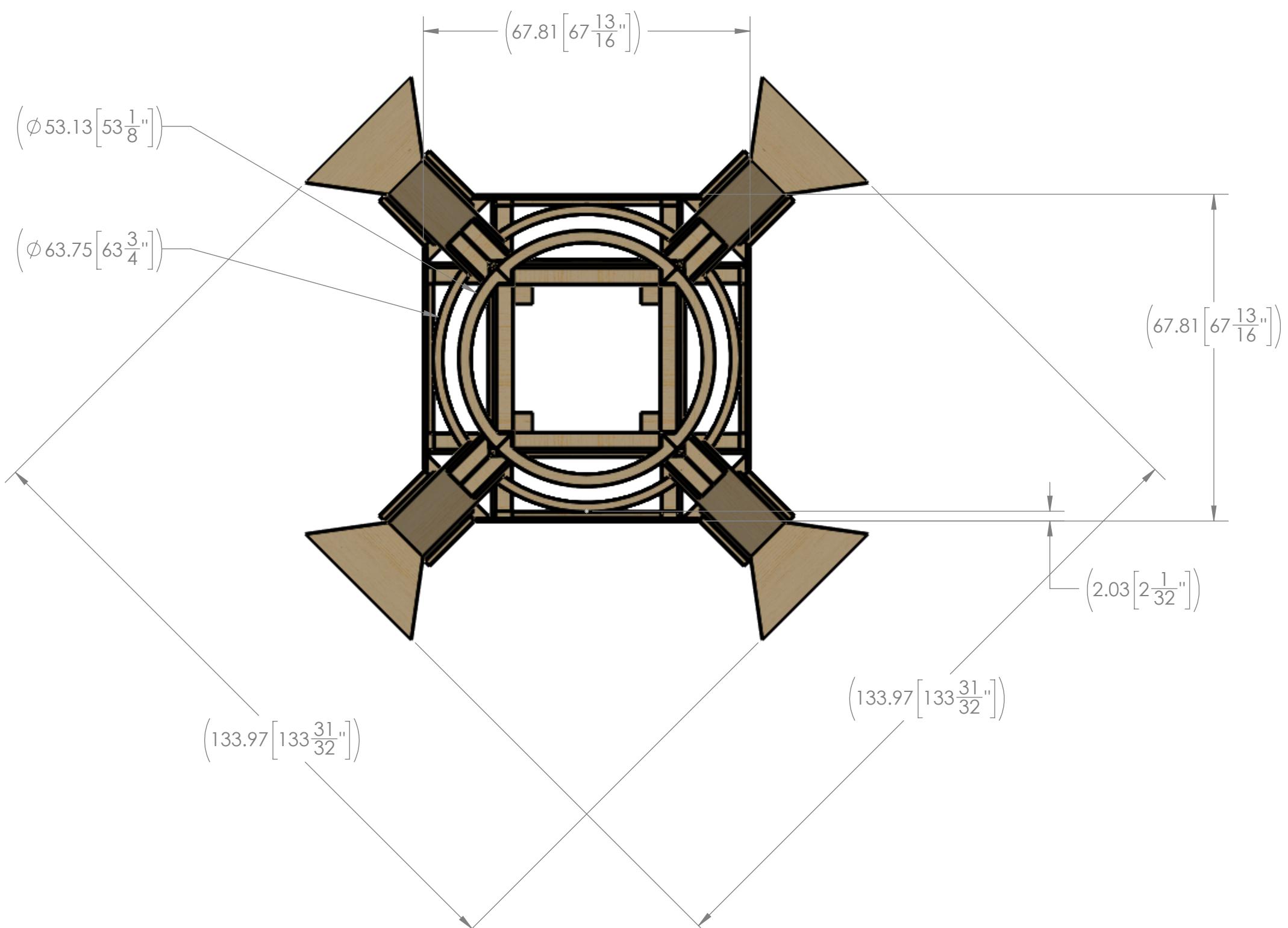
- Note:
1. Use TE-22000-AM if pairing with AndyMark Ring AM-4672.
 2. If you are planning to disassemble frequently, you may want to consider using bolted connections instead of screws. It is helpful to consider ceiling height and ability to move assembly through doors before fastening sub-assemblies together.

Hardware Needed:
 #8 x 1.25" Long Screw - Qty 16
 #8 x 2" Long Screw - Qty 32
 #8 x 2.5" Long Screw - Qty 20
 #8 x 3" Long Screw - Qty 16
 #10 x 3.5" Long Screw - Qty 64
 Wood Staples, Thumb Tacks, Tape, etc. for TE-22070 attachment
 Optional, but encouraged: Safety Edging

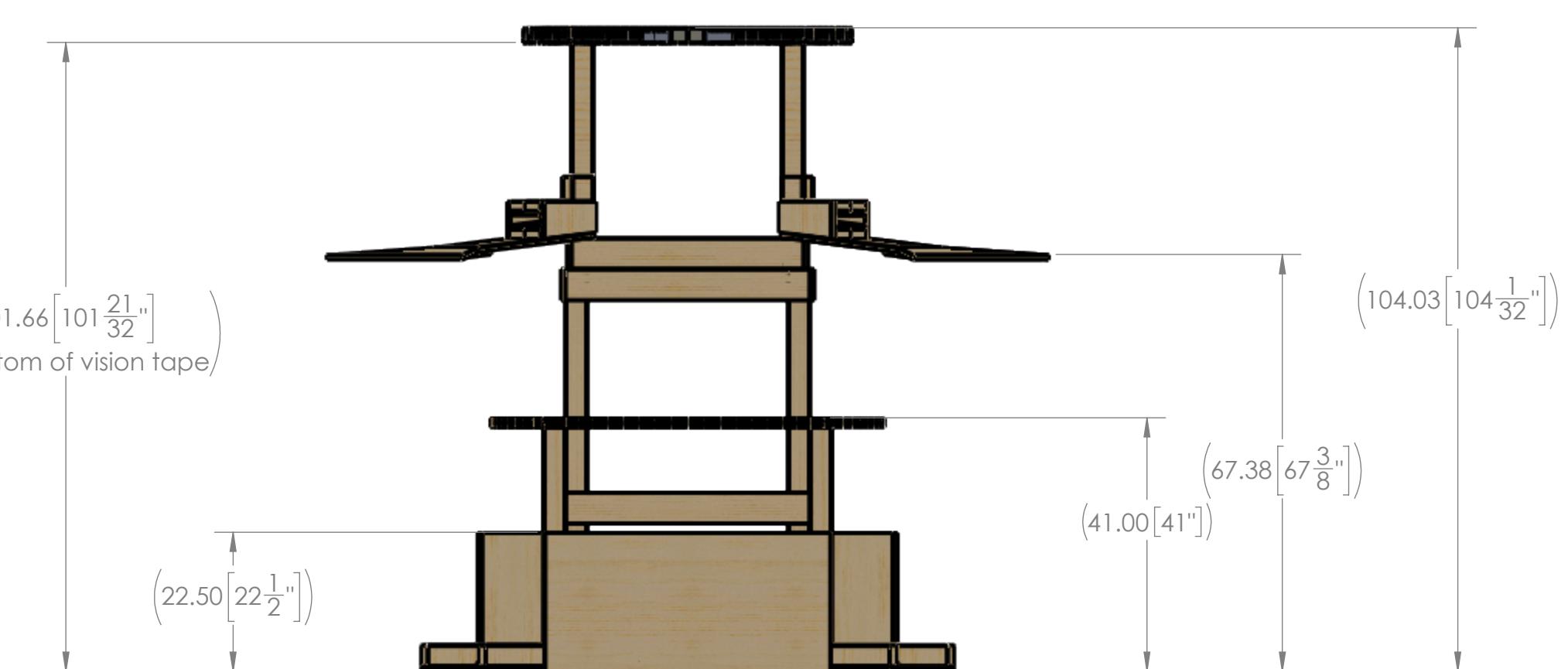
ITEM NO.	PART NUMBER	DESCRIPTION	
1	TE-22010	Hub - Simple Build - Fender Assembly	4
2	TE-22023-Multiple	Hub - Simple Build - Lower Hub Ring Assembly - Multiple	4
3	TE-22025	HUB - Simple Build - Vertical for Lower Hub Ring 4x4	4
4	TE-22030	Hub - Simple Build - Upper Hub Goal Assembly	1
5	TE-22040	Hub - Simple Build - Upper Hub Base Assembly	1
6	TE-22050	Hub - Simple Build - Lower Exit Assembly	4
7	TE-22060	Hub - Simple Build - Upper Exit Assembly	4
8	TE-22070	Hub - Simple Build - Vision Assembly	8

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			DRAWN	KAMC	1/4/2022
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COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.					
SIZE	DWG. NO.	REV			
C	TE-22000				
SCALE: 1:18			SHEET 1 OF 6		

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TEAM _____ NAME _____ DATE _____

DRAWN KAMC 1/4/2022

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 $\pm .125$

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FIRST
ROBOTICS
COMPETITION
SOLIDWORKS
Modeling Solutions PartnerTITLE: Hub - Simple Build - Full
Hub Assembly

SIZE DWG. NO. REV

C TE-22000

SCALE: 1:24 SHEET 2 OF 6

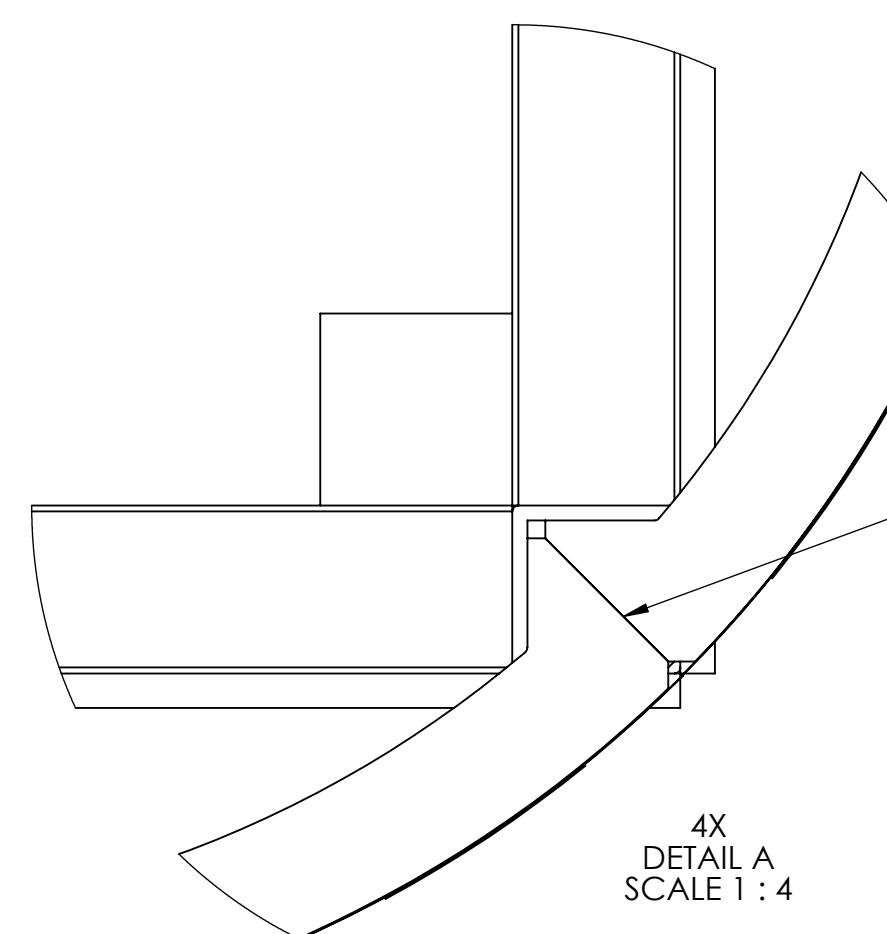
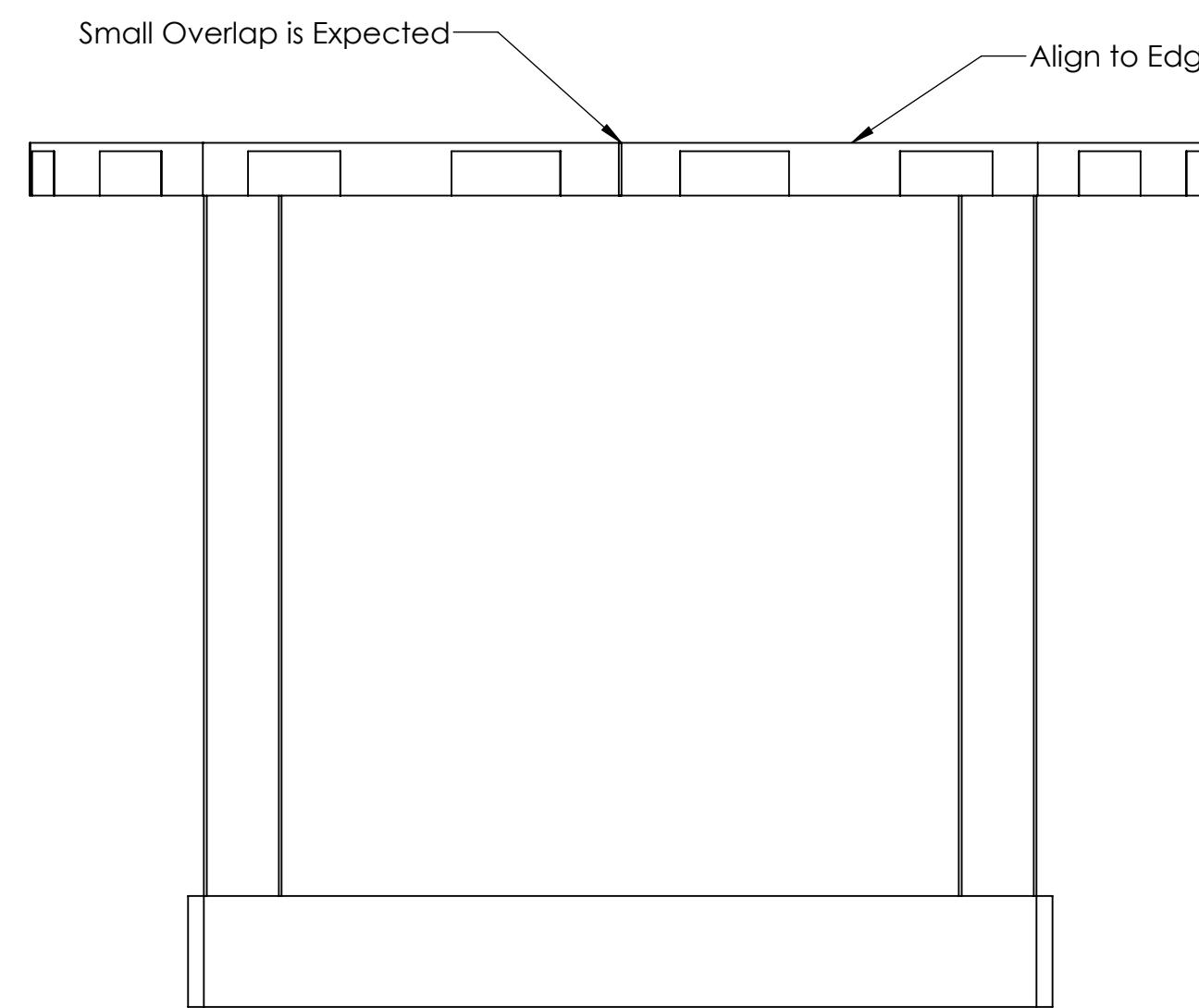
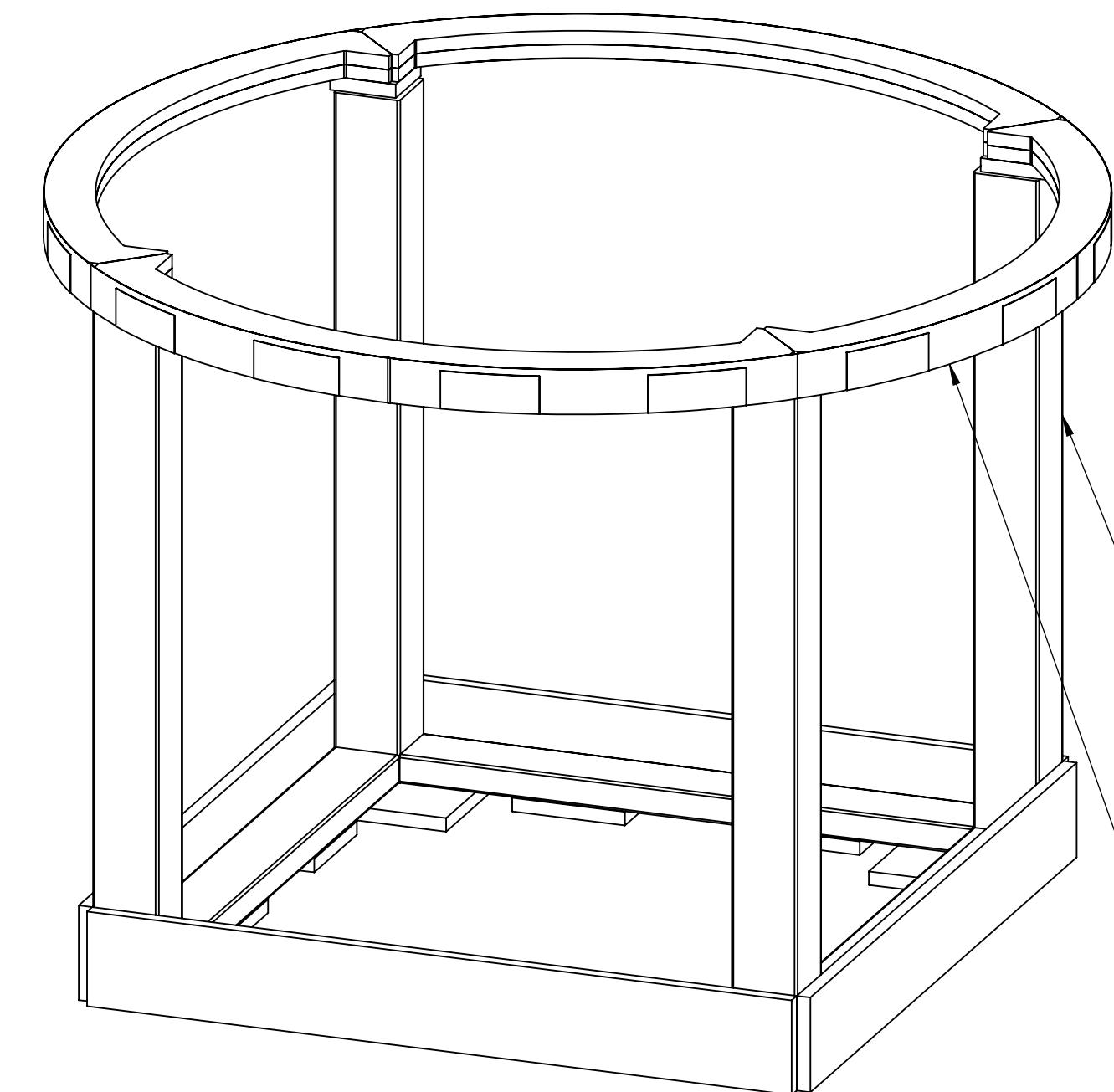
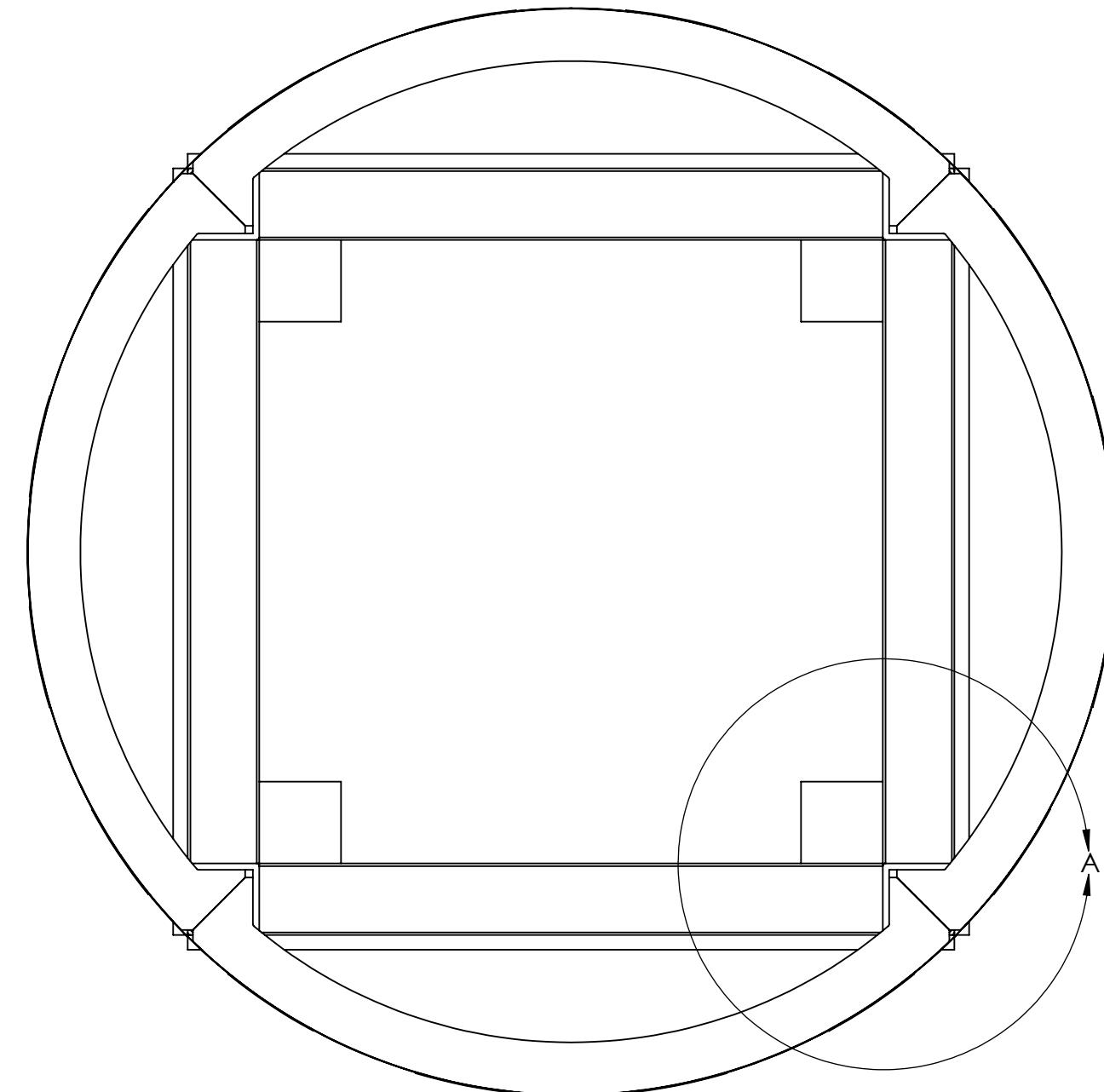
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Step 1



Align (8) to (4) as shown. Note alignment information called out in Detail A.

Connect (8) to (4) using a fastener. Some recommendations would be Wood Staples, Thumb Tacks, or Tape,

Repeat 7x time, until there is a total of 8x (8) attached to (4).

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

TITLE:
**Hub - Simple Build - Full
Hub Assembly**

SIZE DWG. NO. REV

C TE-22000

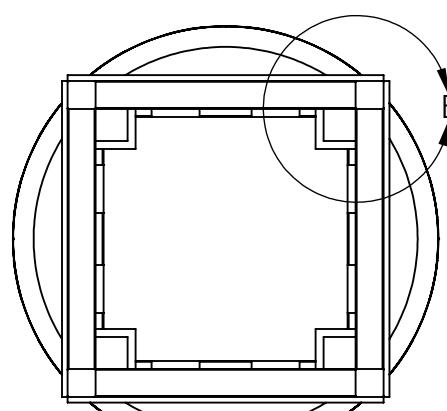
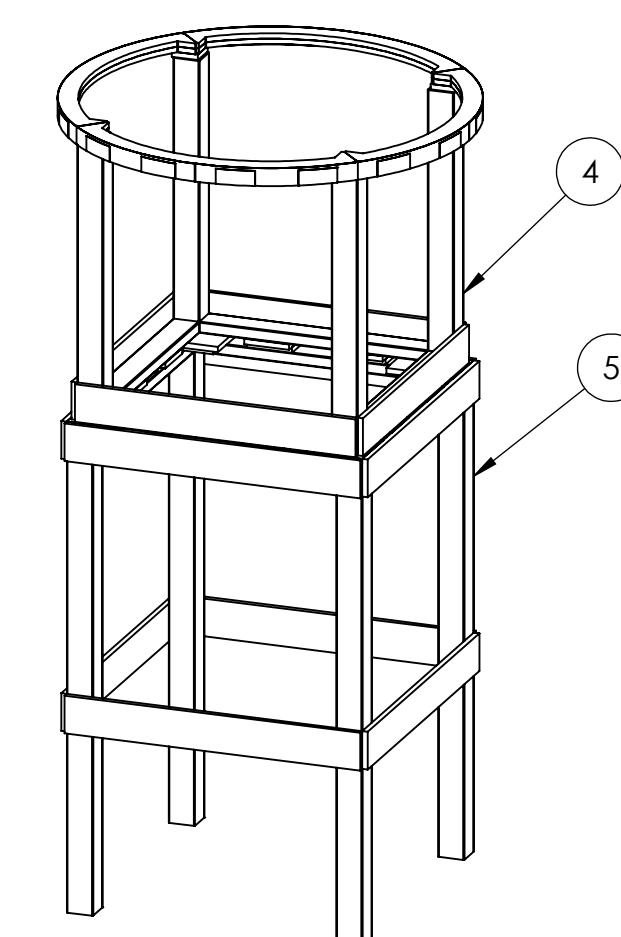
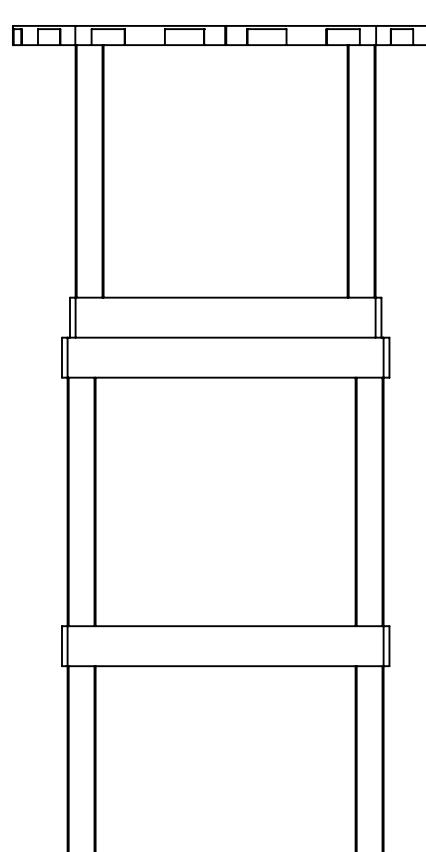
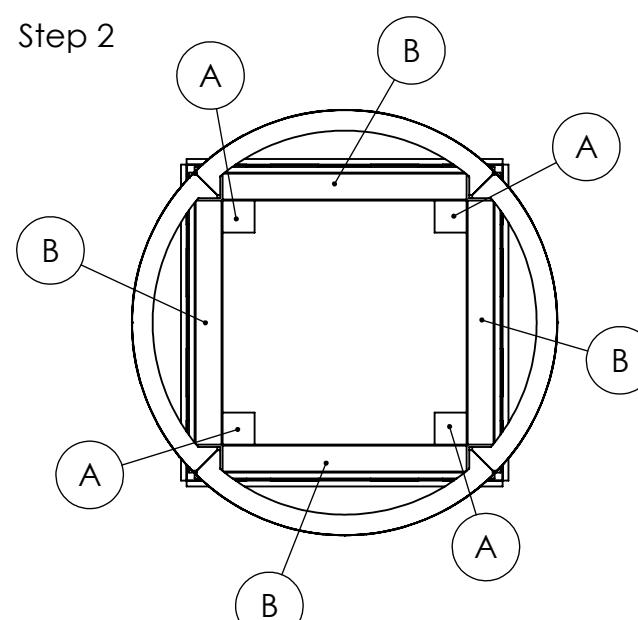
SCALE: 1:8 SHEET 3 OF 6

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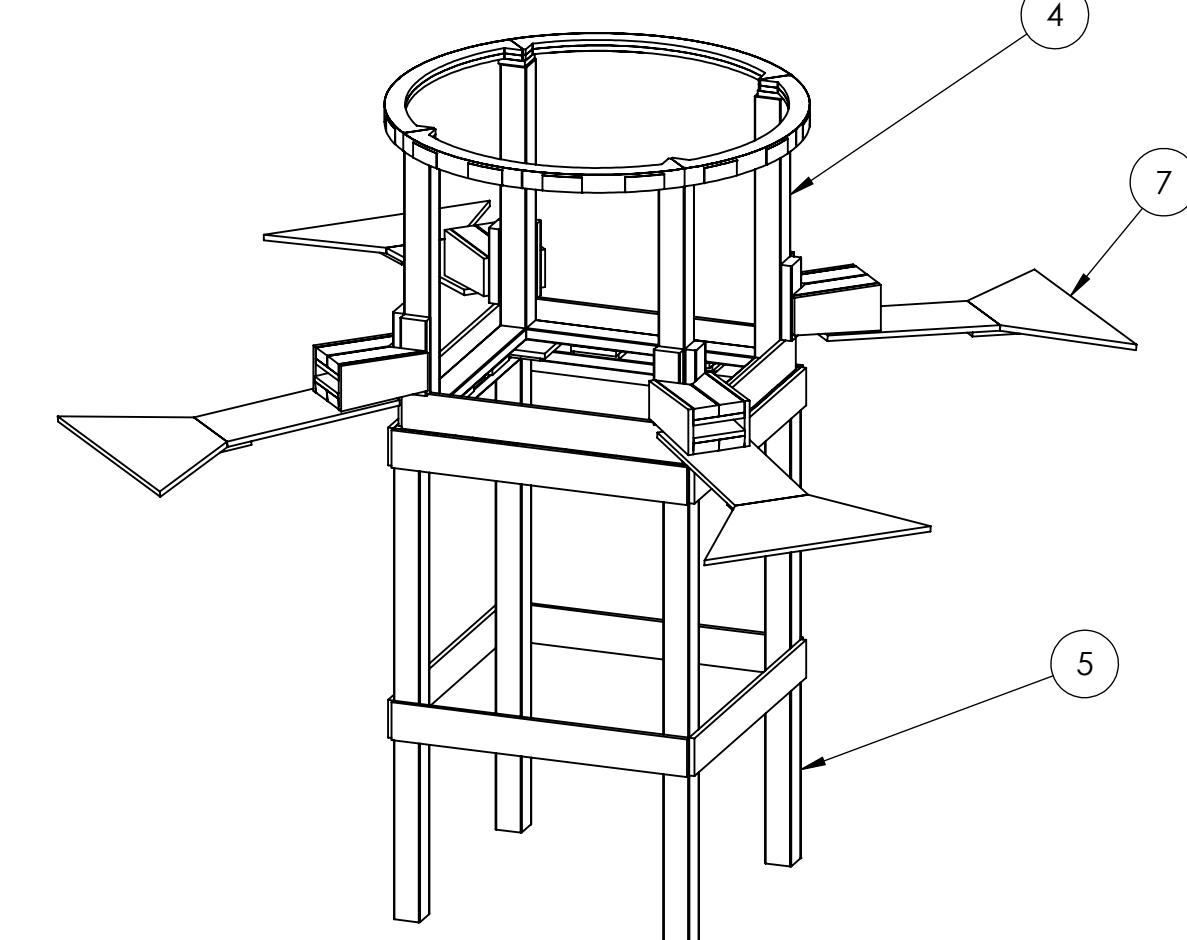
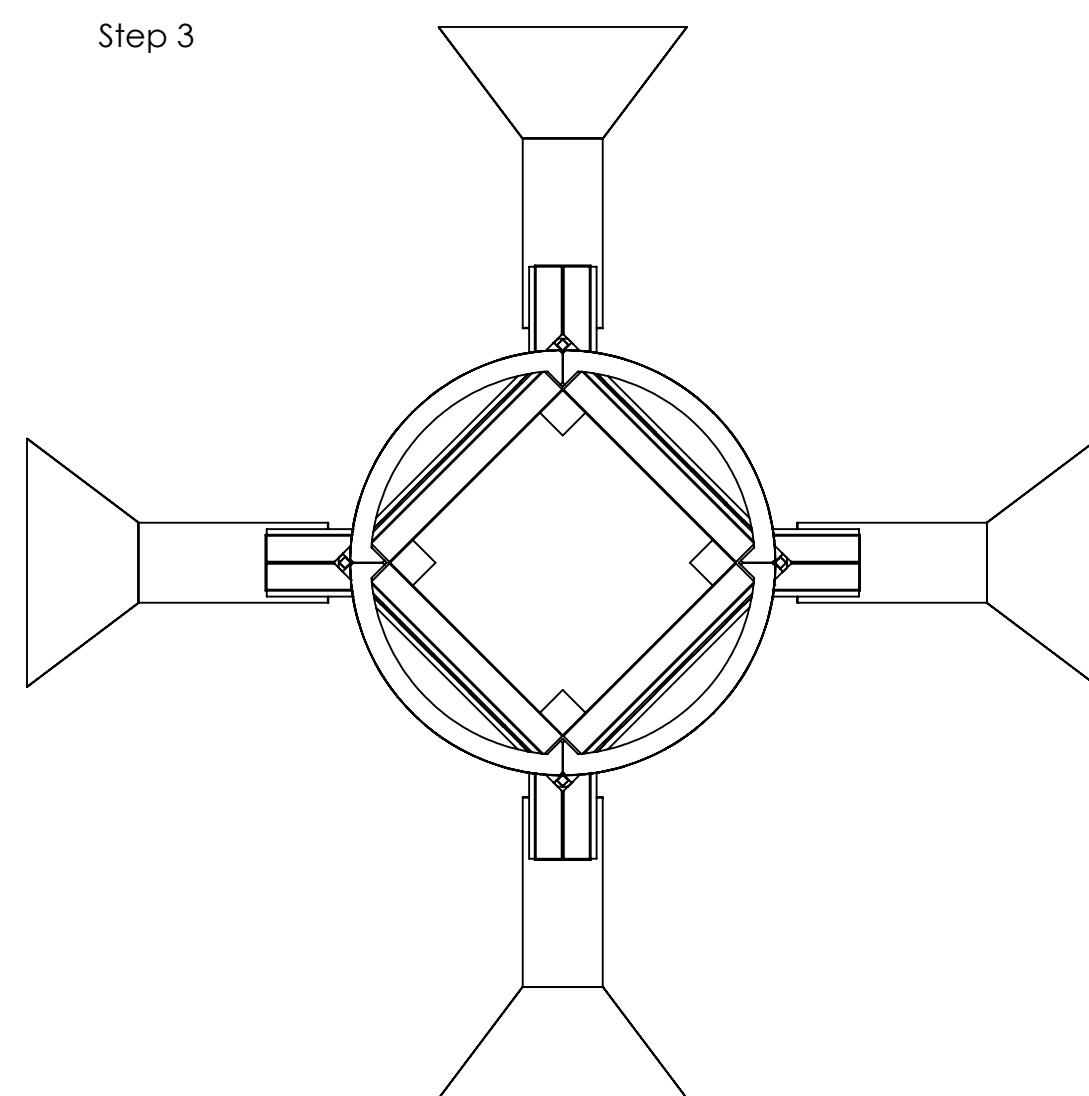
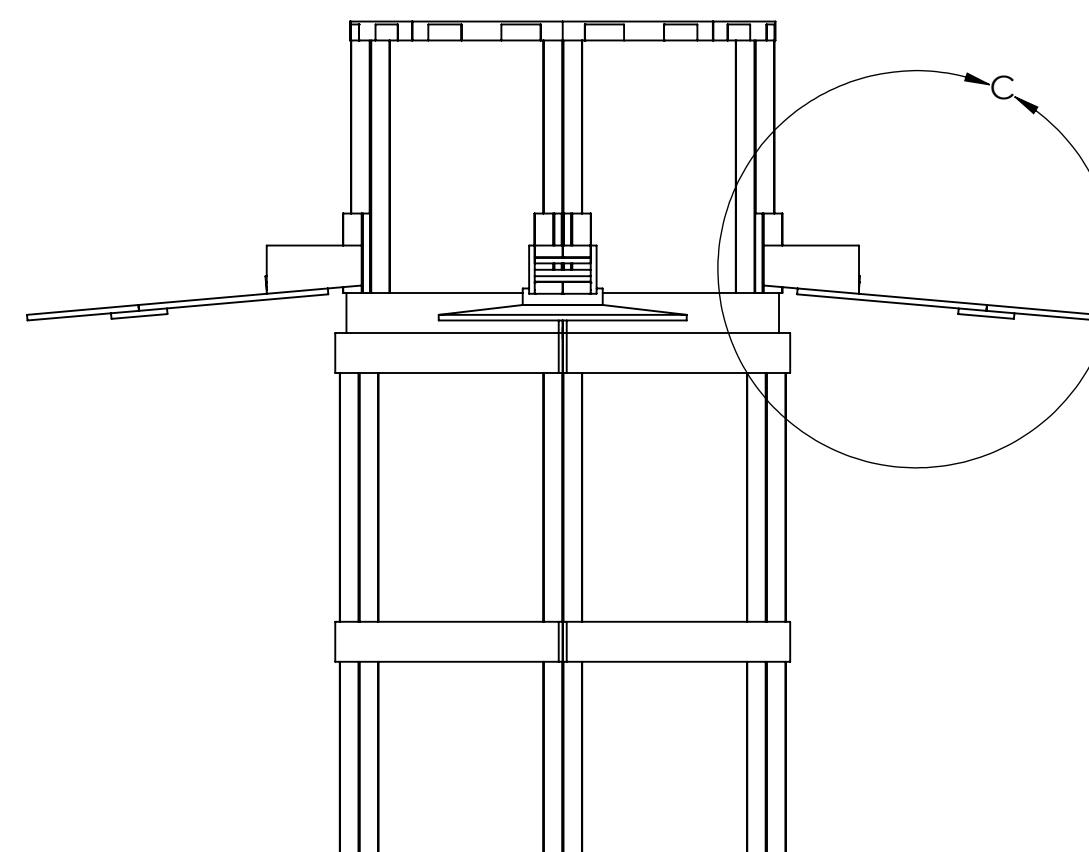
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Bottom View

1. Align (4) to (5) as shown. Note the dimensions in Detail B.
2. Connect using 1.25" and 2.5" Long Screws. It is recommended to use 4x 1.25" long screws into each area indicated by (A). It is recommended to use 5x 2.5" long screws into each area indicated by (B).

4X
DETAIL B
SCALE 1 : 12

1. Align 4x (7) to (4) on the assembly from Step 2 , as shown.
2. Connect using 3.5" long screws. It is recommended to use 8x screws per (7) , 4x screws per 2"x4" lumber on (7) . Note: Be mindful of screw placement into the 4"x4" lumber to ensure two screws do not collide.
3. Optional: It is recommended to install safety edging on (7) at this time. Safety edging could be pool noodles, baby proofing material, etc.

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DIMENSIONS ARE IN INCHES			DRAWN	KAMC	1/4/2022
TOLERANCES: FRACTIONAL $\pm\frac{1}{2}$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .50$					
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COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.					
DO NOT SCALE DRAWING					

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COMPETITION**  **SOLIDWORKS**
Modeling Solutions Partner

TITLE:
Hub - Simple Build - Full Hub Assembly

SIZE DWG. NO. REV

C TE-22000

SCALE: 1:24 SHEET 4 OF 6

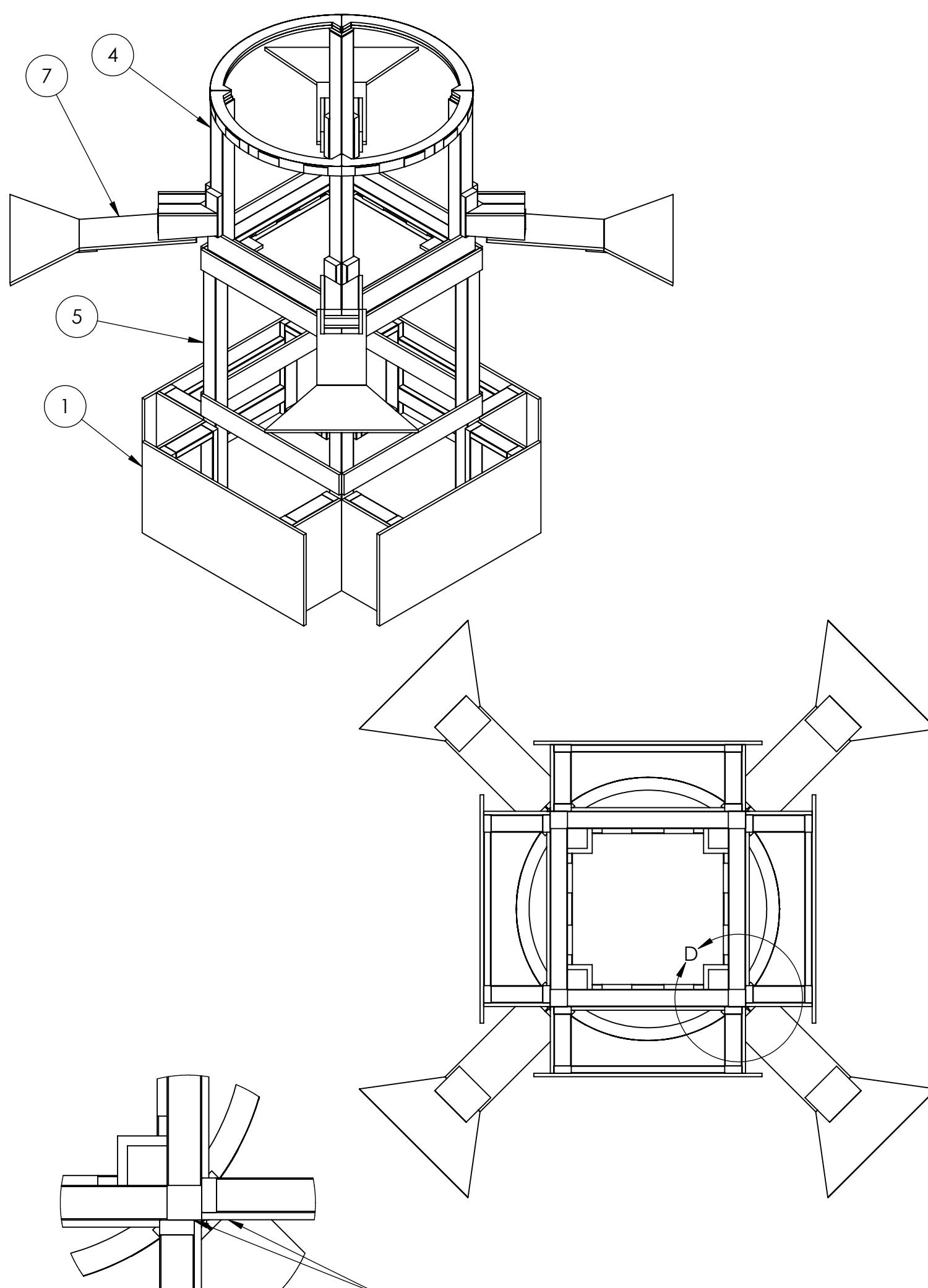
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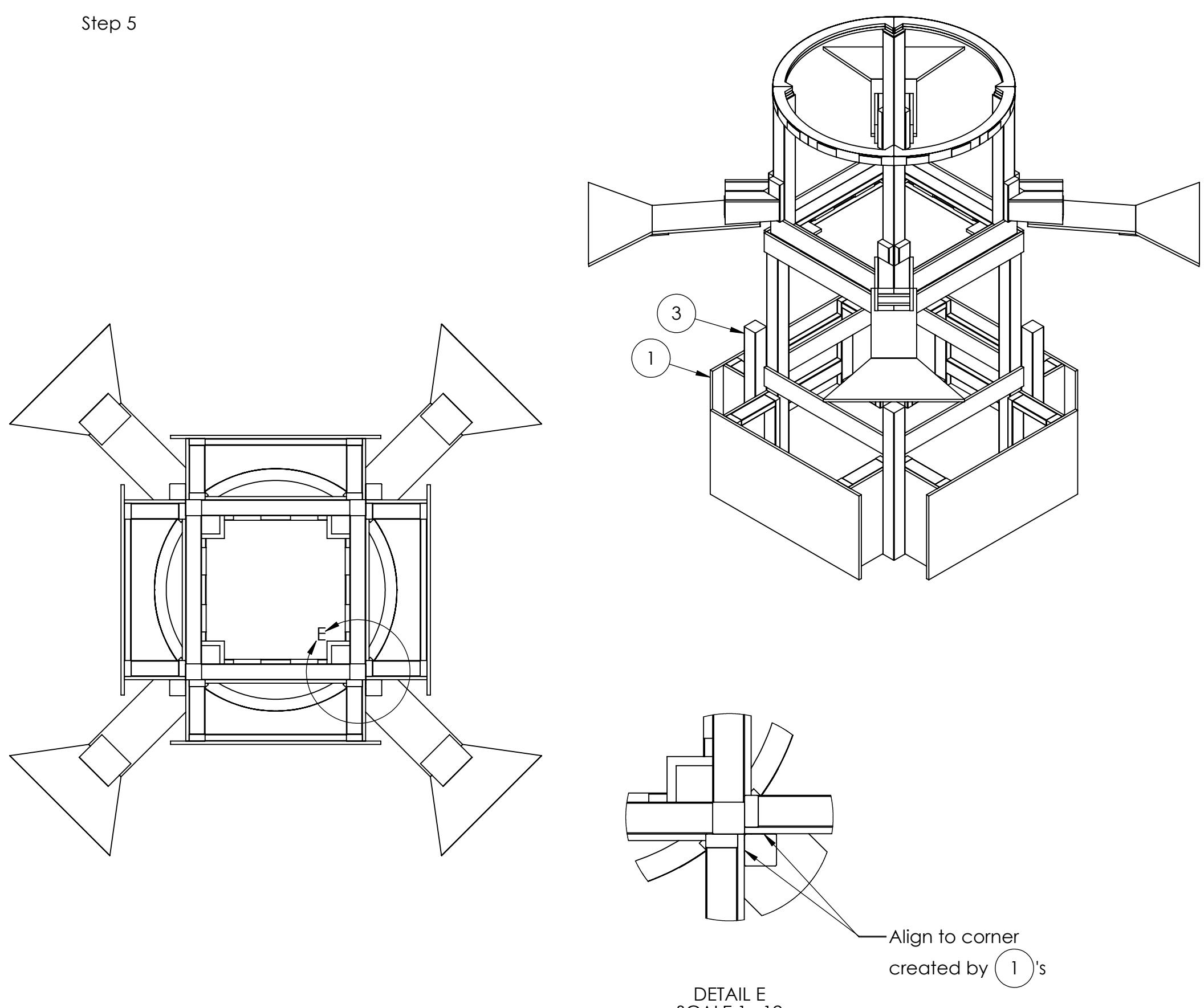
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Step 4



Step 5



1. Align 4x (1) to (5) from Step 3, as shown.
2. Connect using 3.5" long screws. It is recommended to use 8x screws per (1), 4x into each 2"x4" lumber of (1).

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COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
Hub - Simple Build - Full Hub Assembly

SIZE DWG. NO. REV

C TE-22000

SCALE: 1:24 SHEET 5 OF 6

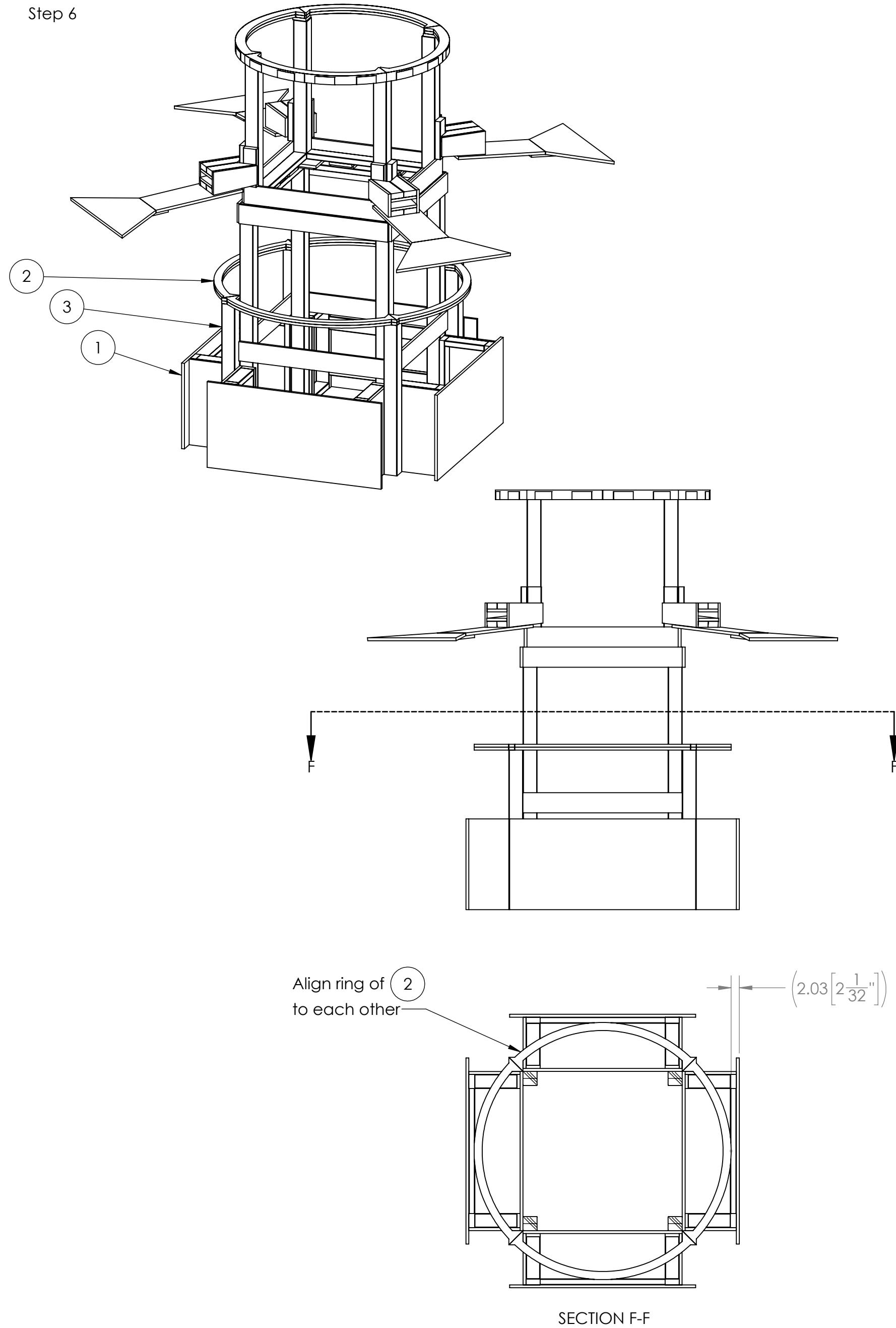
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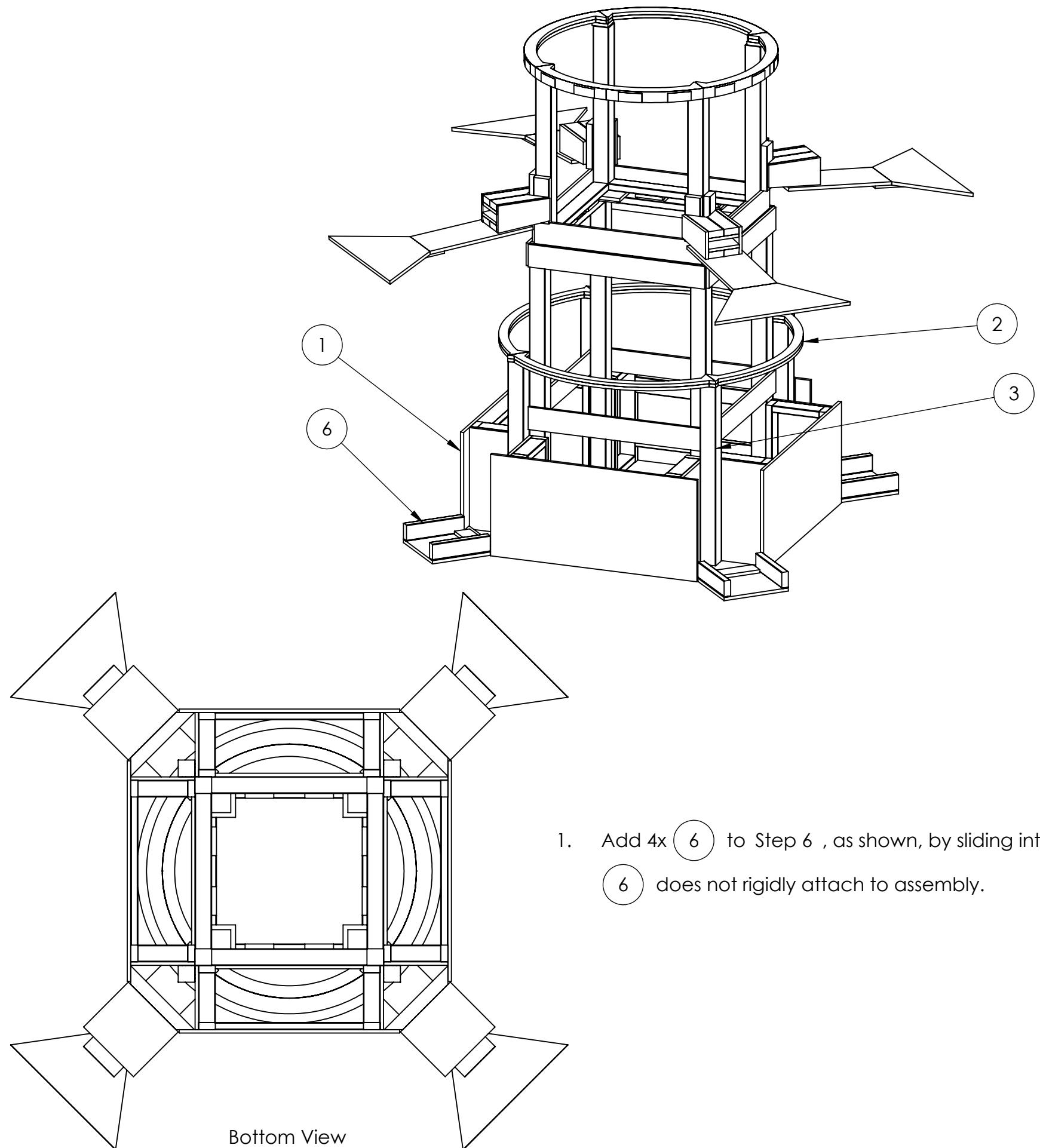
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Step 6



1. Align 4x (2) to each other, on top of 4x (3). Ideally, the triangular edges of (2) align with adjacent (2). If this does not occur, split the difference evenly amongst all (3)'s.
 2. Connect (2) to (3) using 3" long screws. It is recommended to use 4x screws per (2), 2x per (3).
- Note: Be careful not to screw too close to the edge of (3).

Step 7



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SOLIDWORKS
 Modeling Solutions Partner

TITLE:
Hub - Simple Build - Full Hub Assembly

SIZE DWG. NO. REV

C TE-22000

SCALE: 1:24 SHEET 6 OF 6

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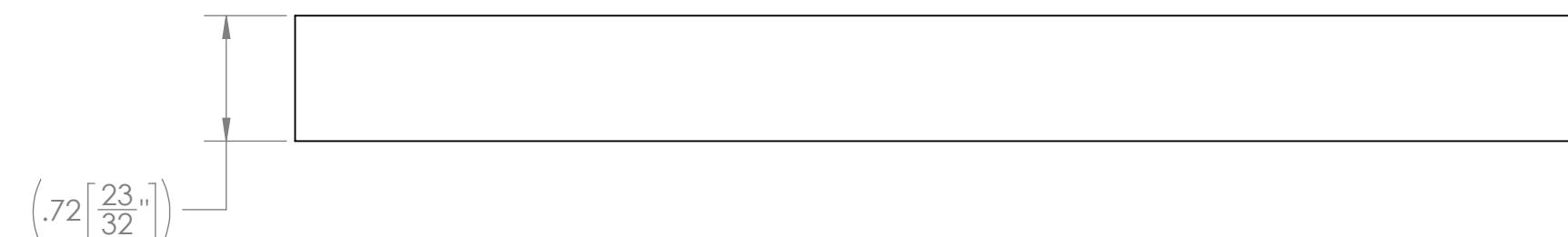
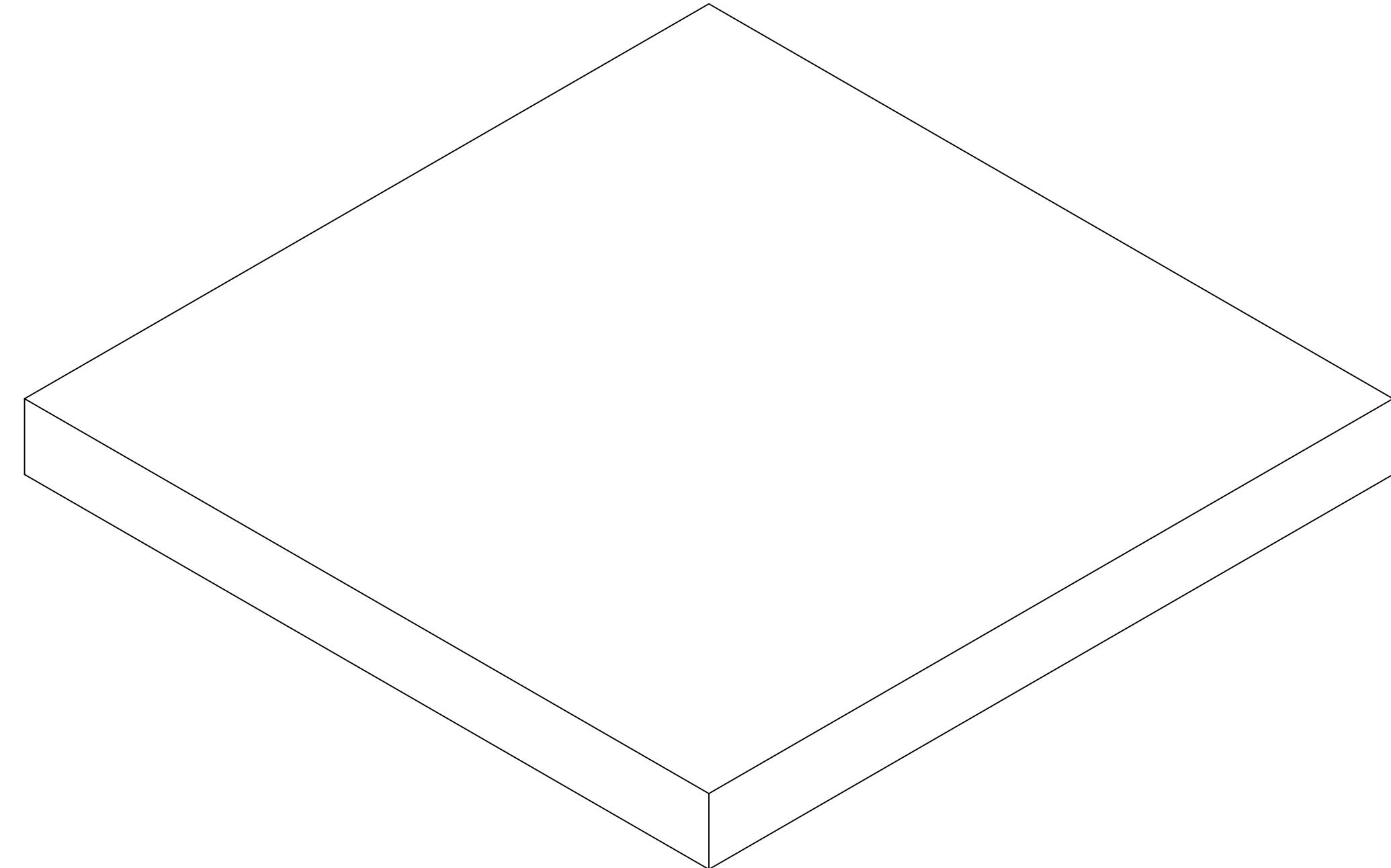
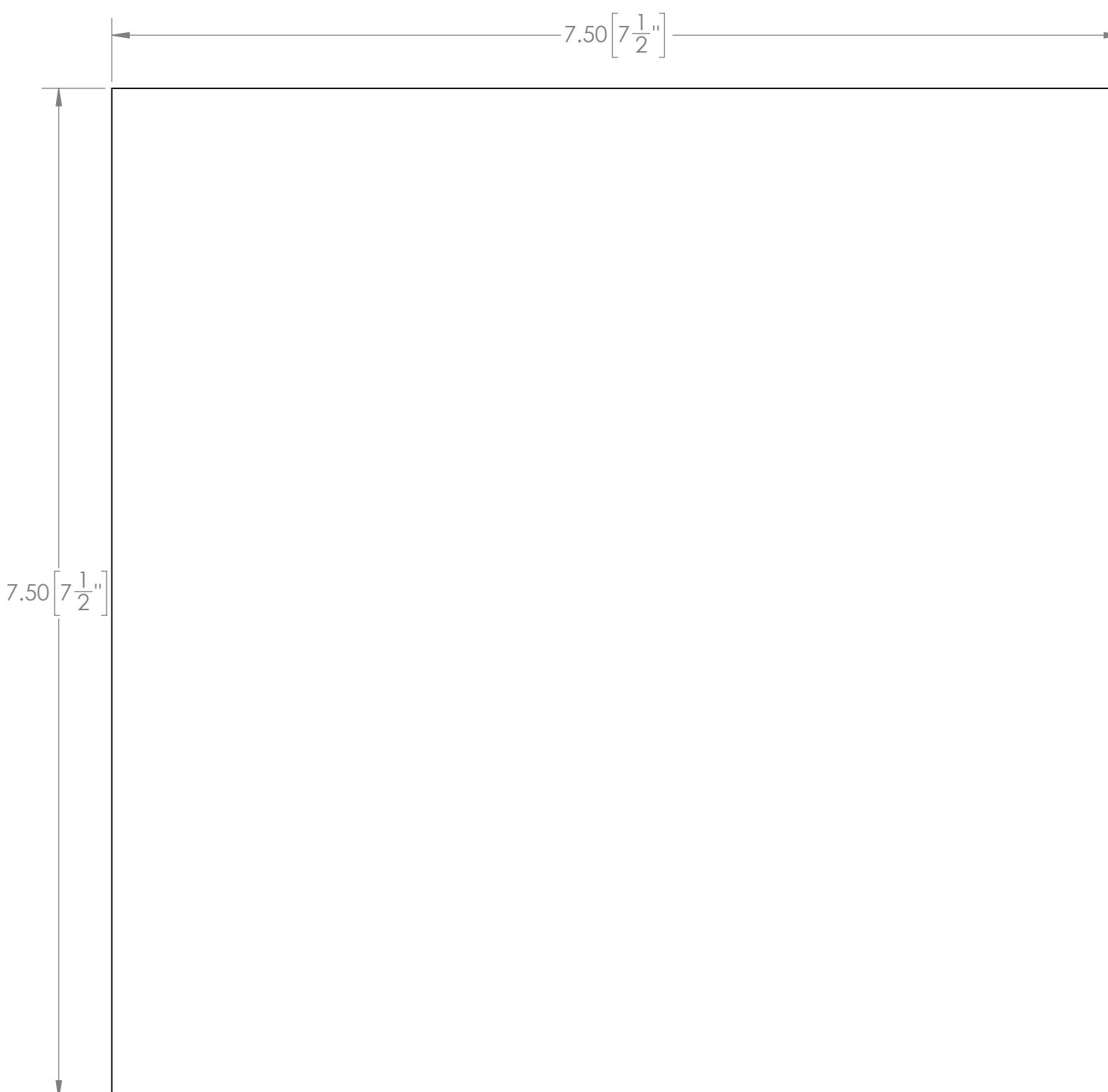
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MATERIAL/FINISH:	SIZE	DWG. NO.	REV
3/4" Plywood	C	TE-22005	
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING	SCALE: 1:1	SHEET 1 OF 1	

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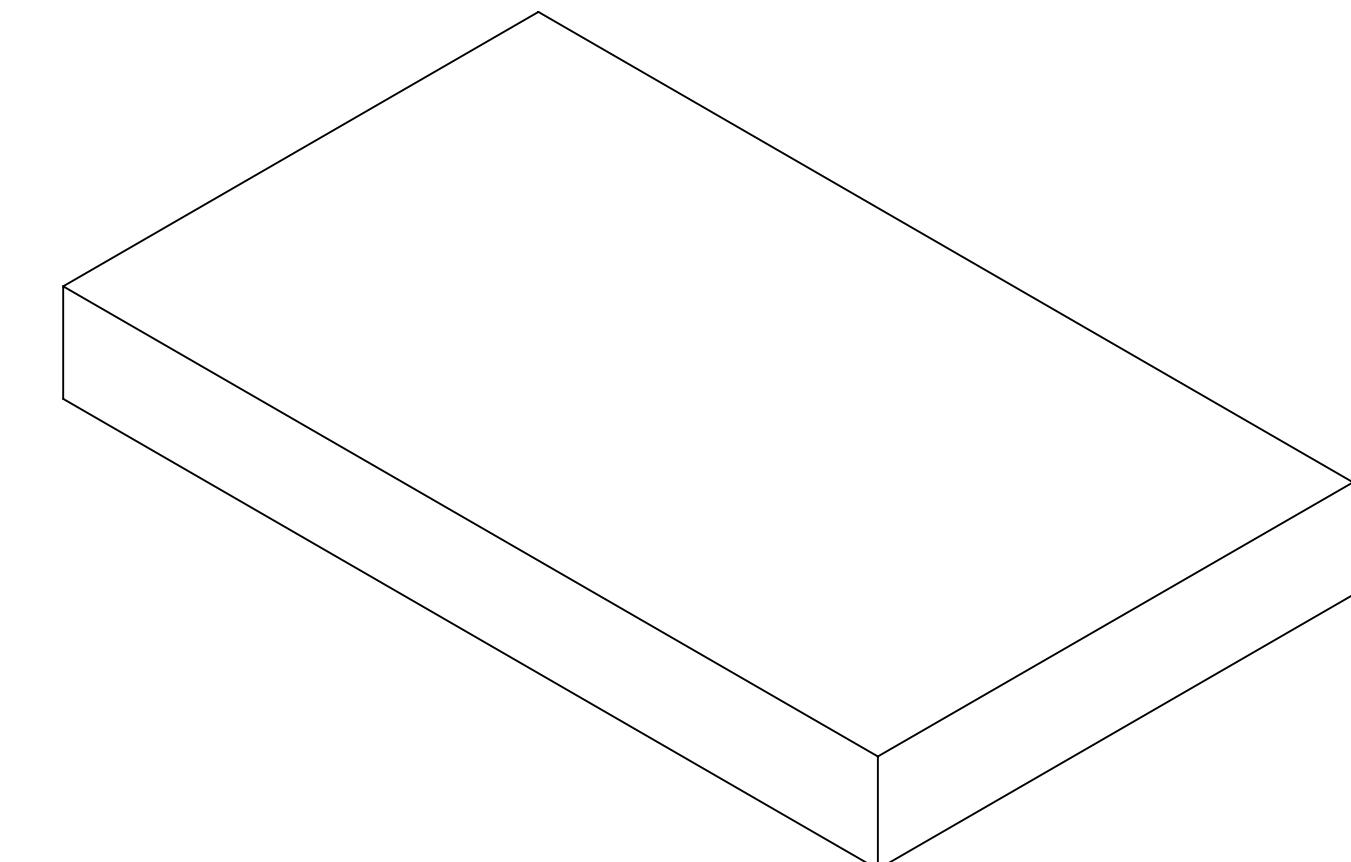
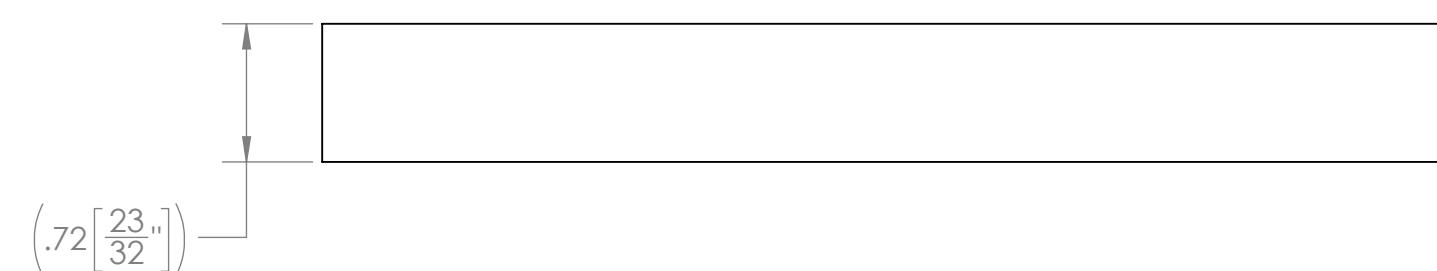
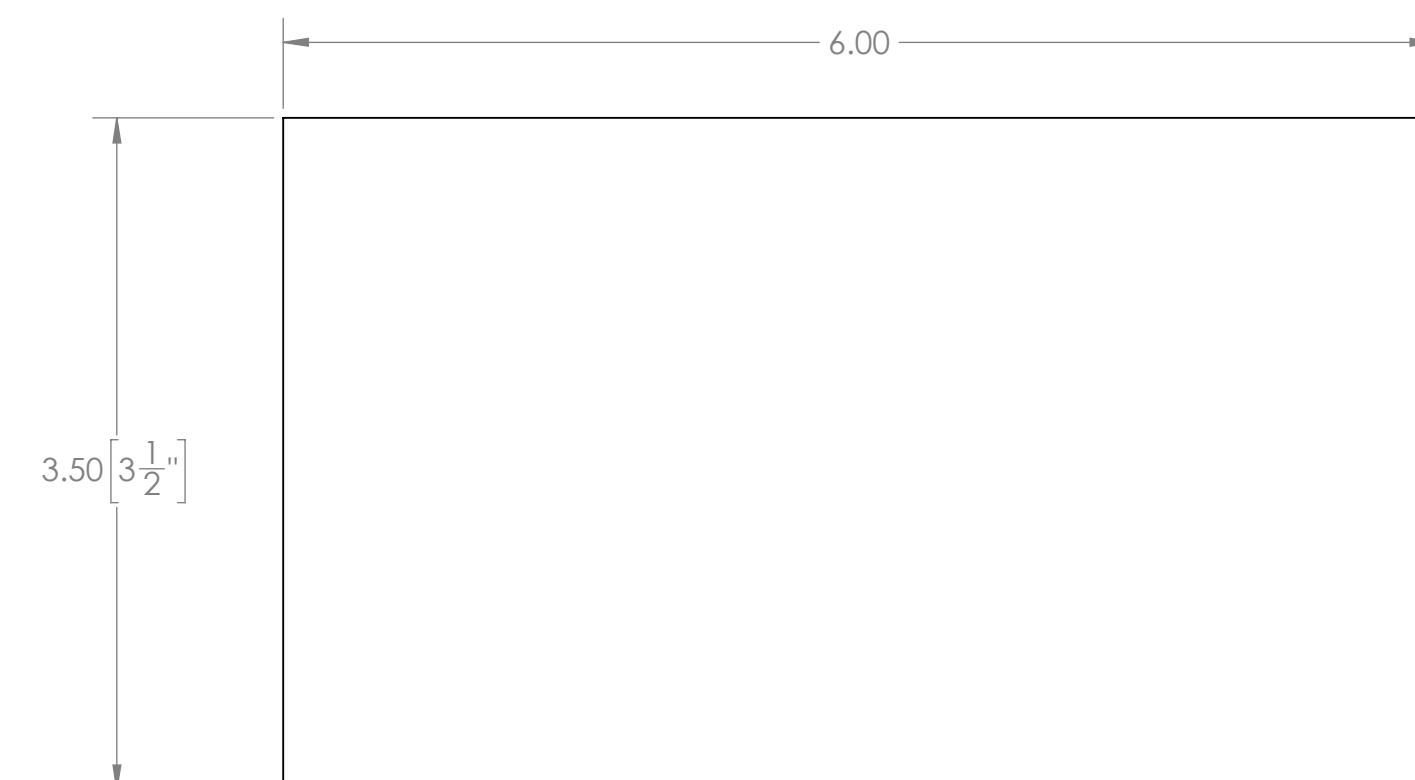
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MATERIAL/FINISH:	SIZE	DWG. NO.	REV
3/4" Plywood	C	TE-22006	
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING	SCALE: 1:1	SHEET 1 OF 1	

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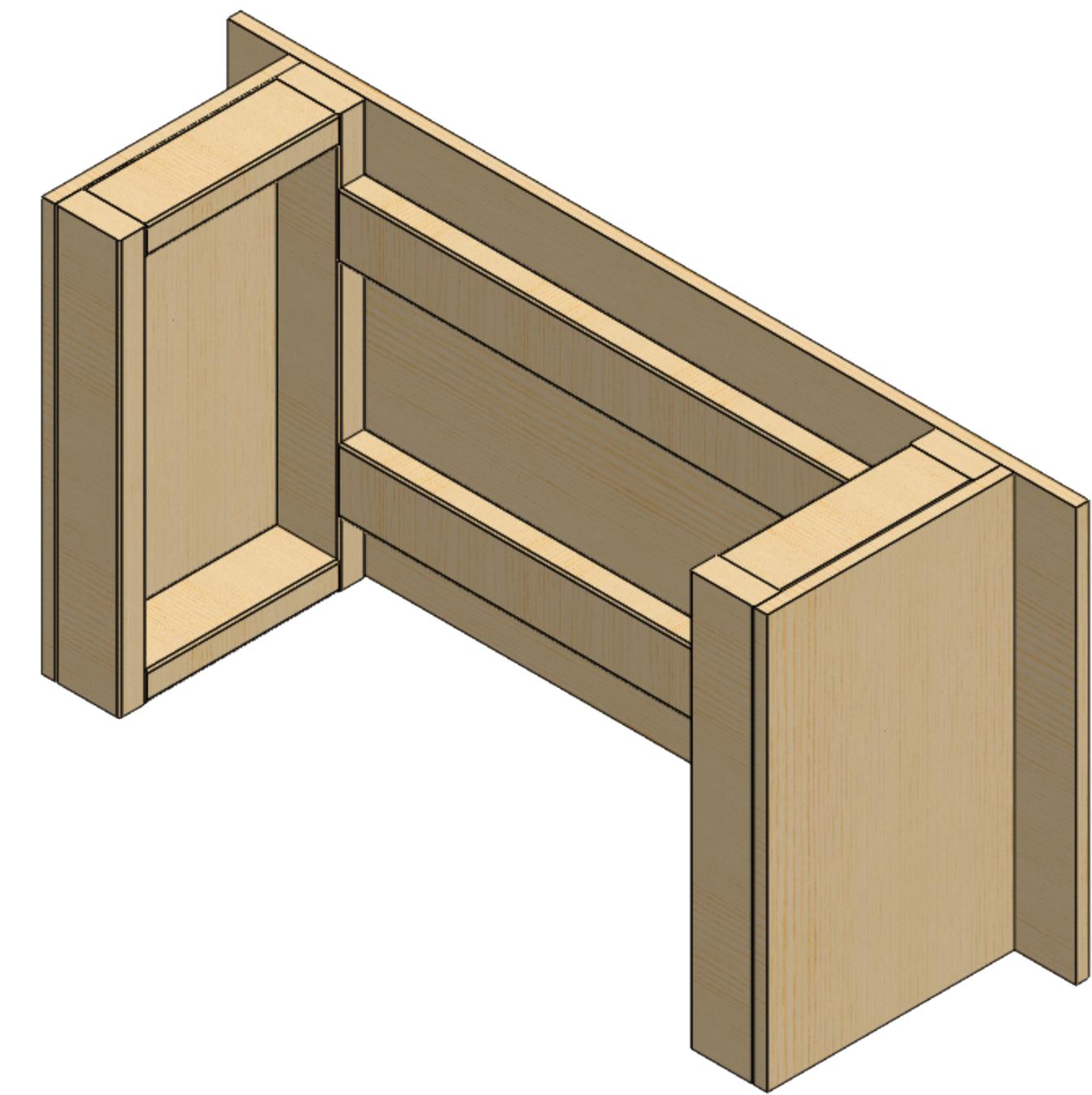
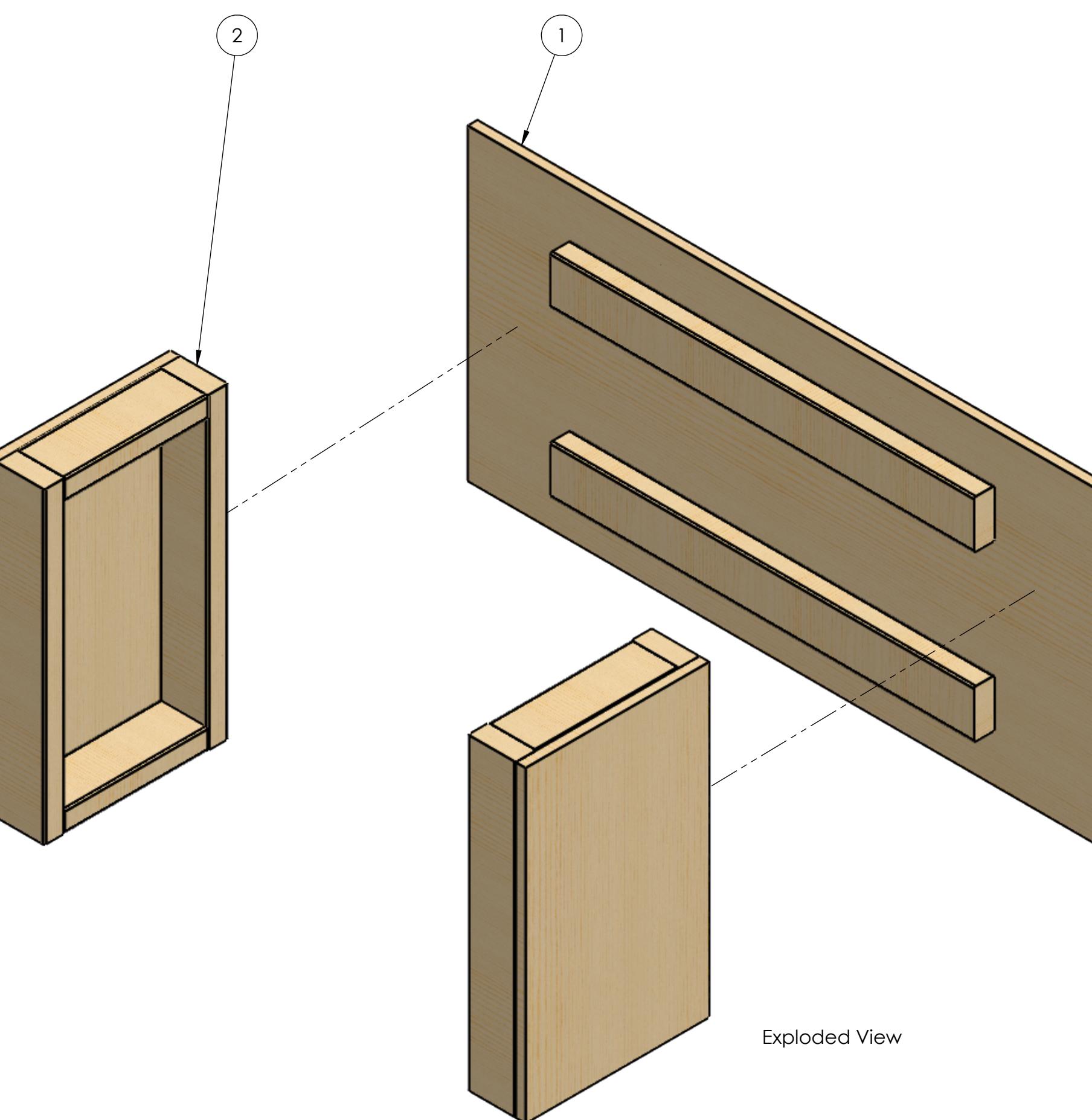
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Hardware Needed:
#8 x 2" Long Screw - Qty 10

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

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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 $\pm .13$
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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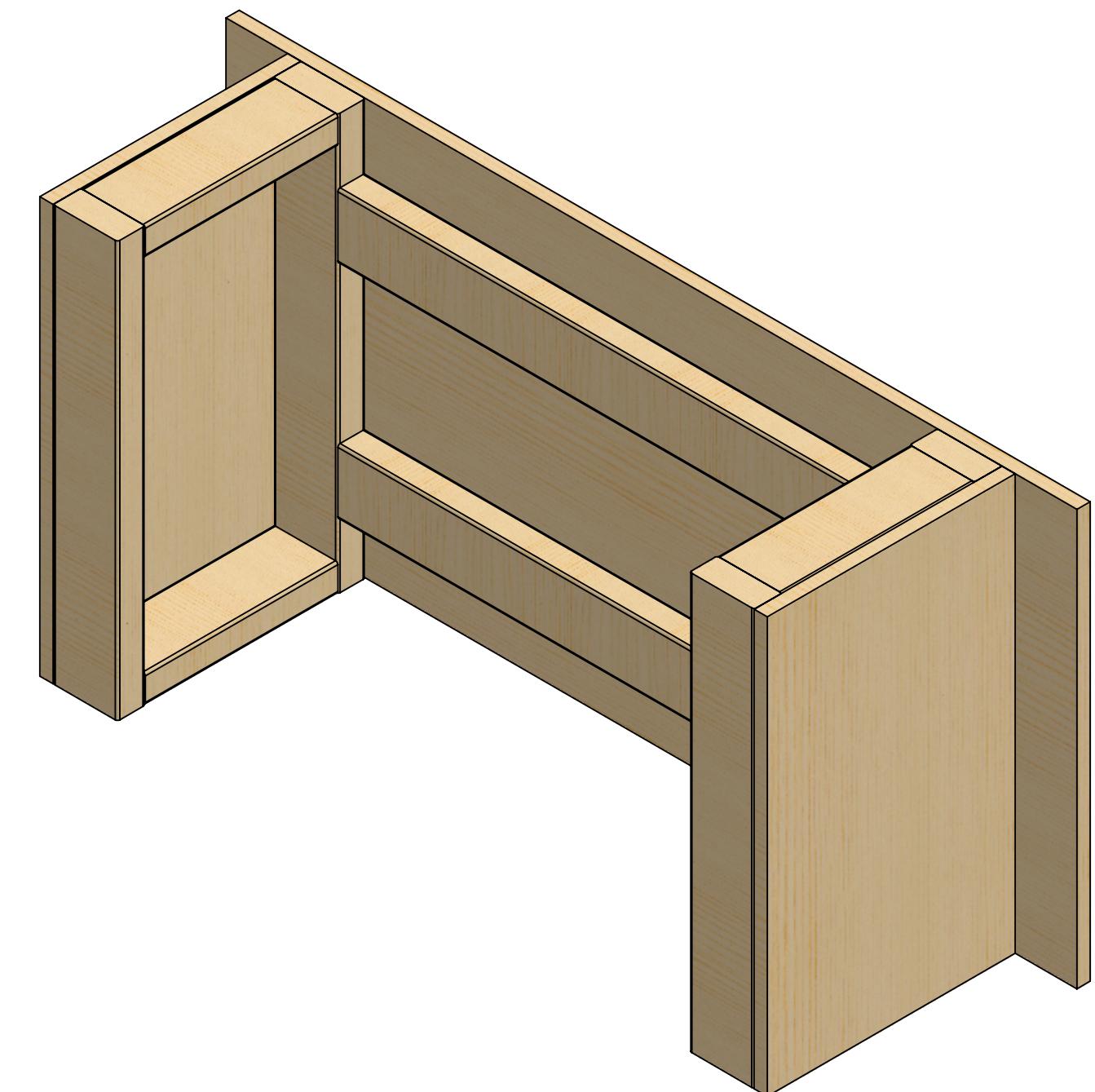
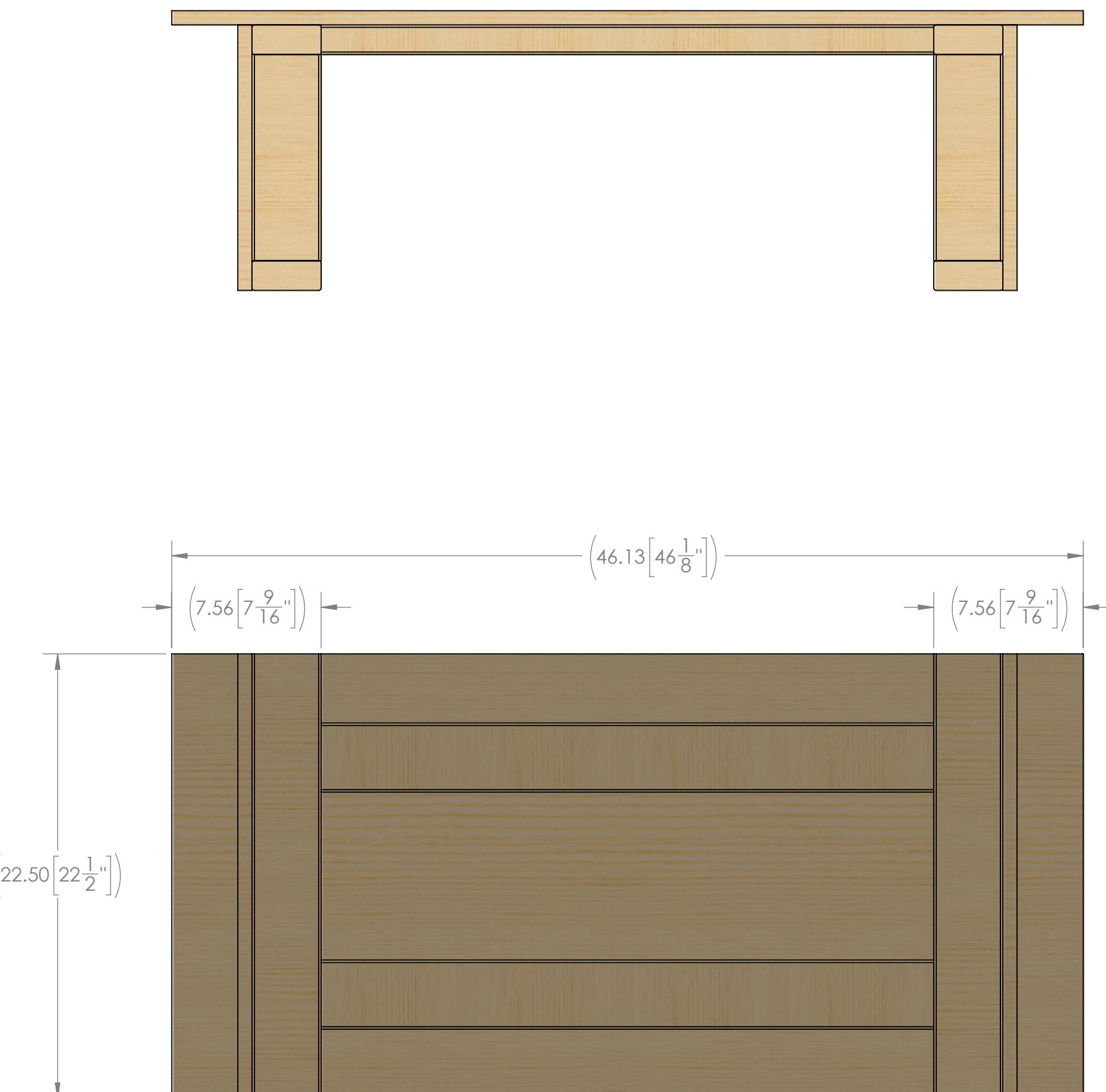
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 FIRST ROBOTICS COMPETITION  SOLIDWORKS Modeling Solutions Partner			
TITLE: Hub - Simple Build - Fender Assembly			
SIZE DWG. NO. REV			
C TE-22010			
SCALE: 1:6 SHEET 2 OF 3			

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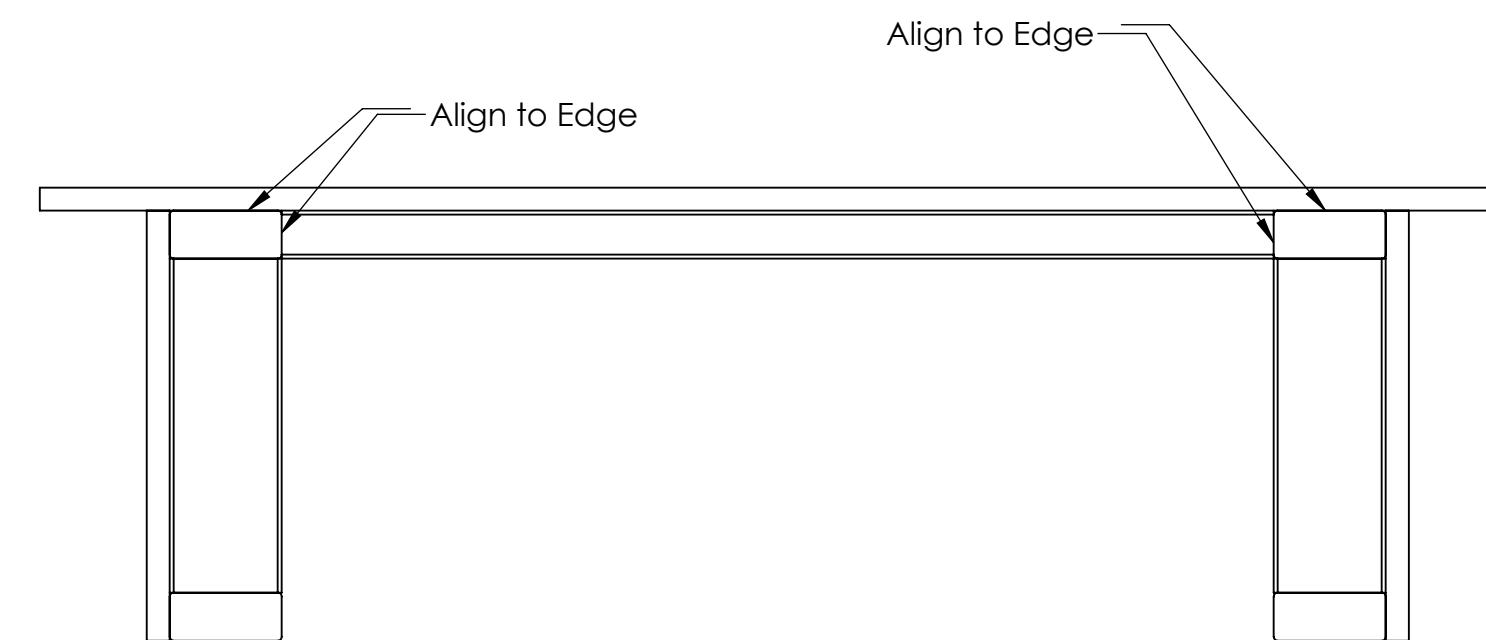
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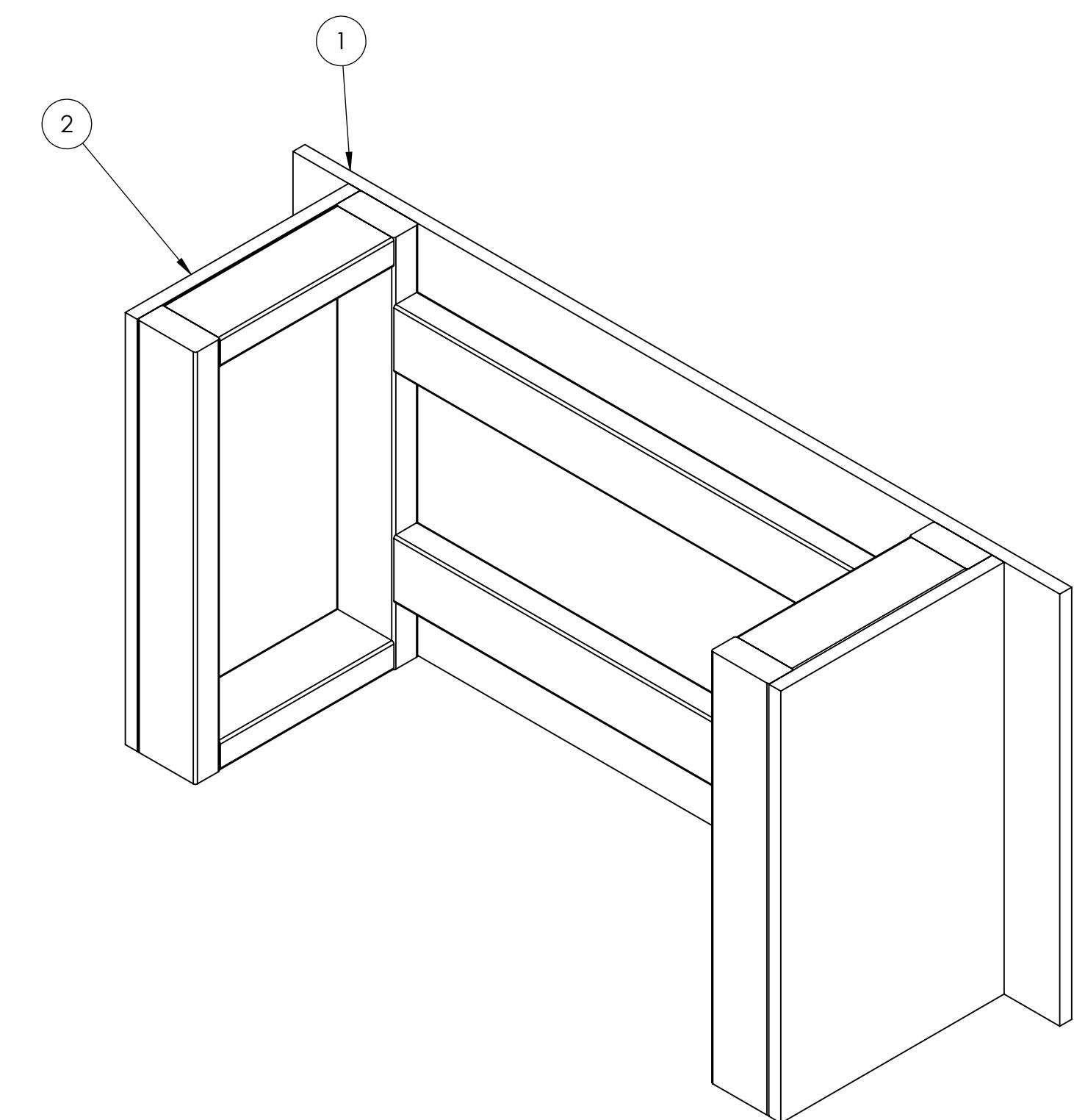
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Step 1



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).



B

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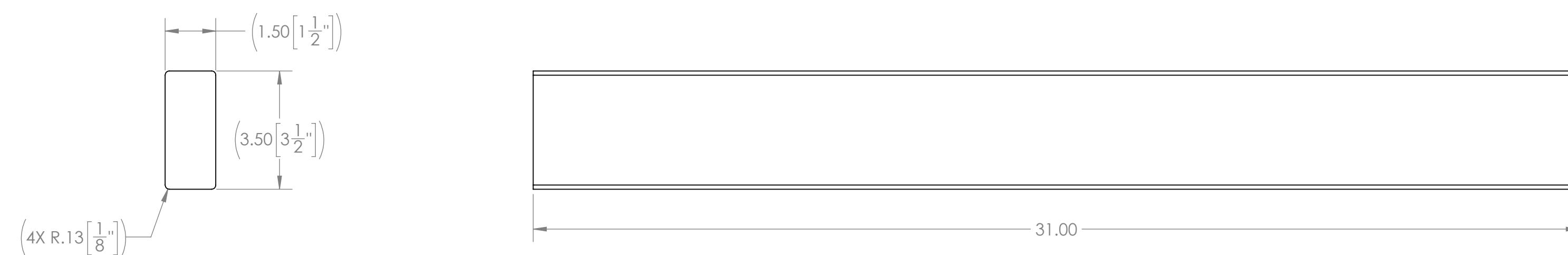
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DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .13$ THREE PLACE DECIMAL $\pm .125$	DRAWN	KAMC	12/29/2021
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MATERIAL/FINISH: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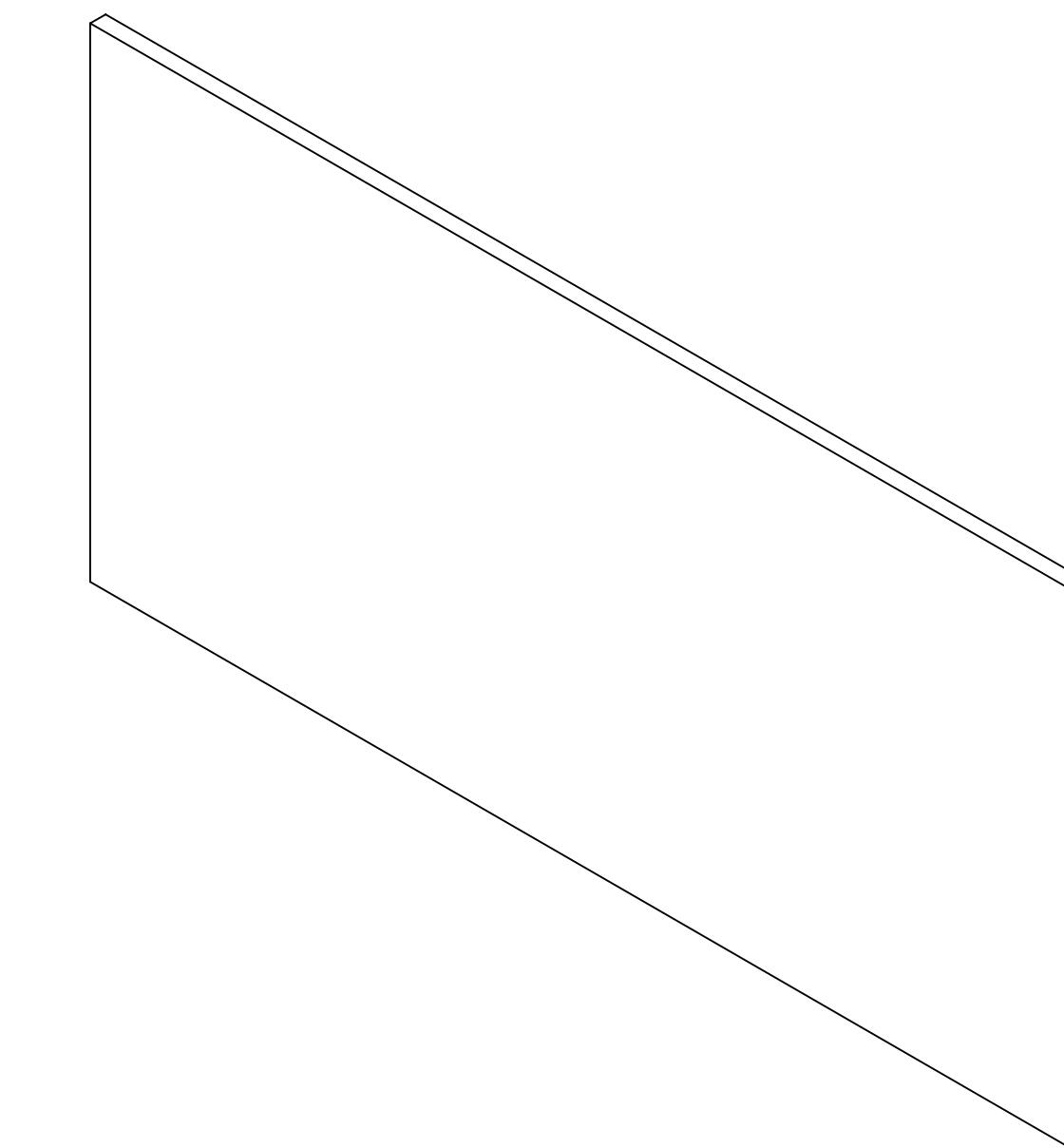
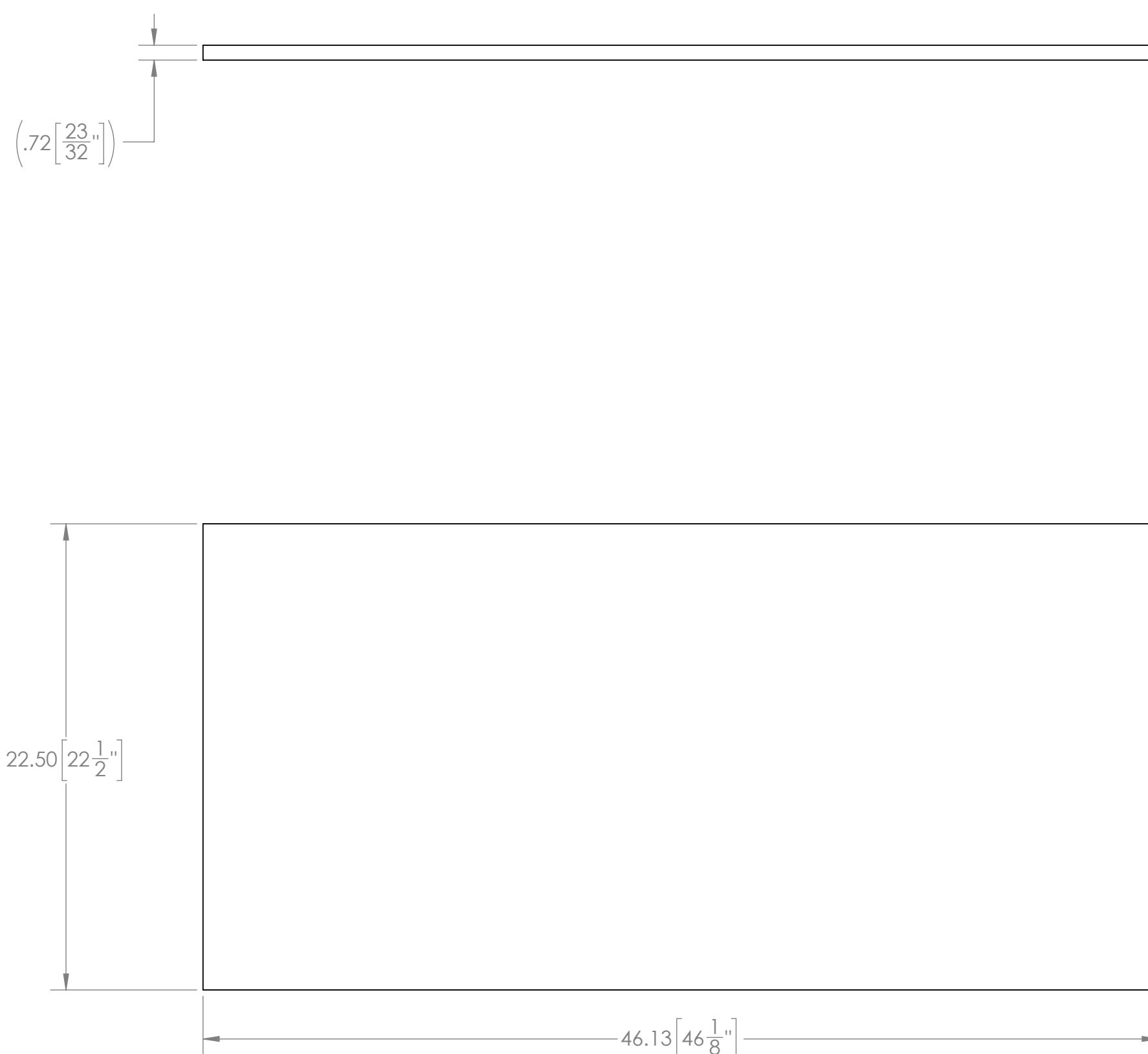
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DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .13$ THREE PLACE DECIMAL $\pm .125$	DRAWN	KAMC	12/29/2021
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MATERIAL/FINISH: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

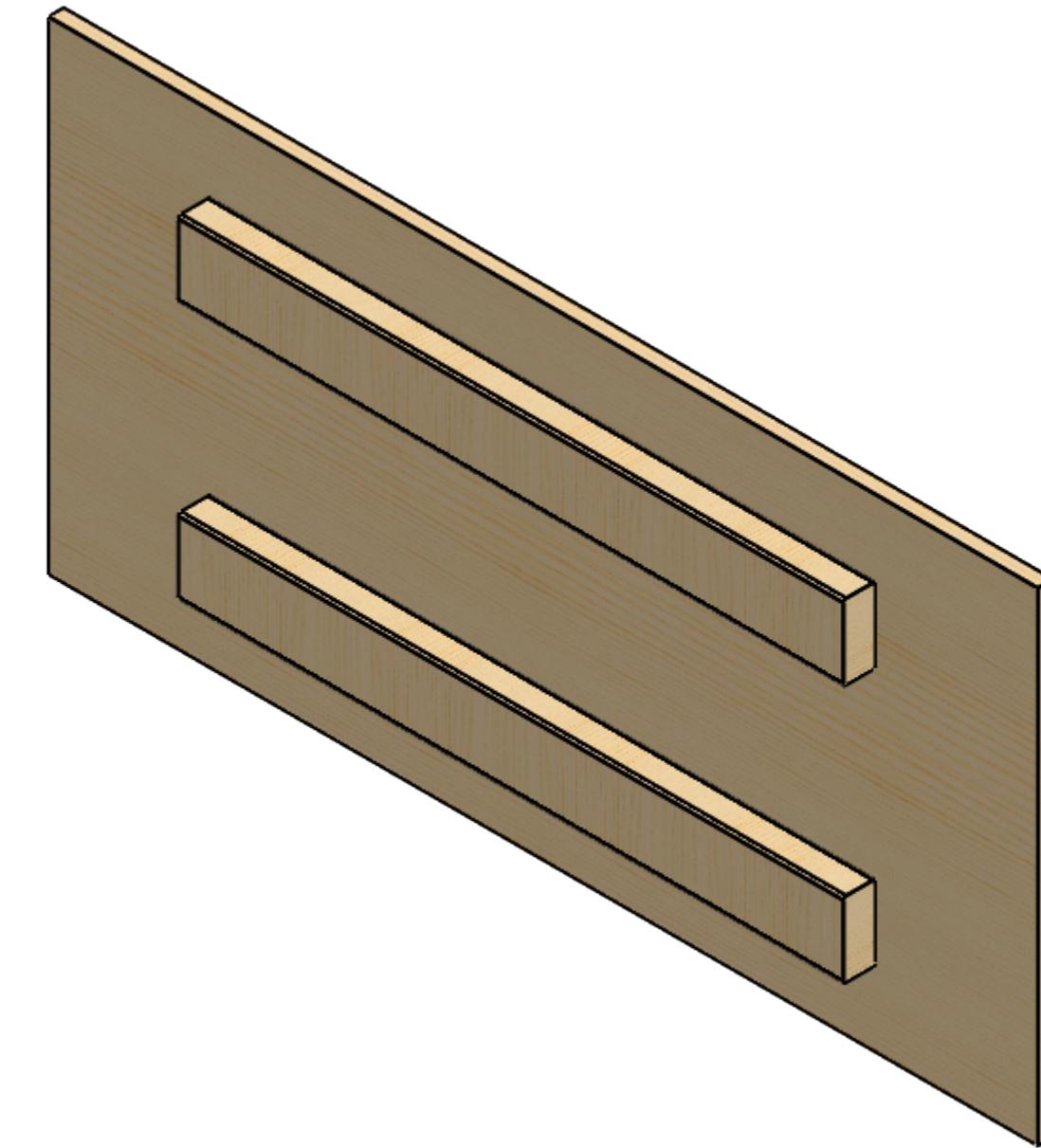
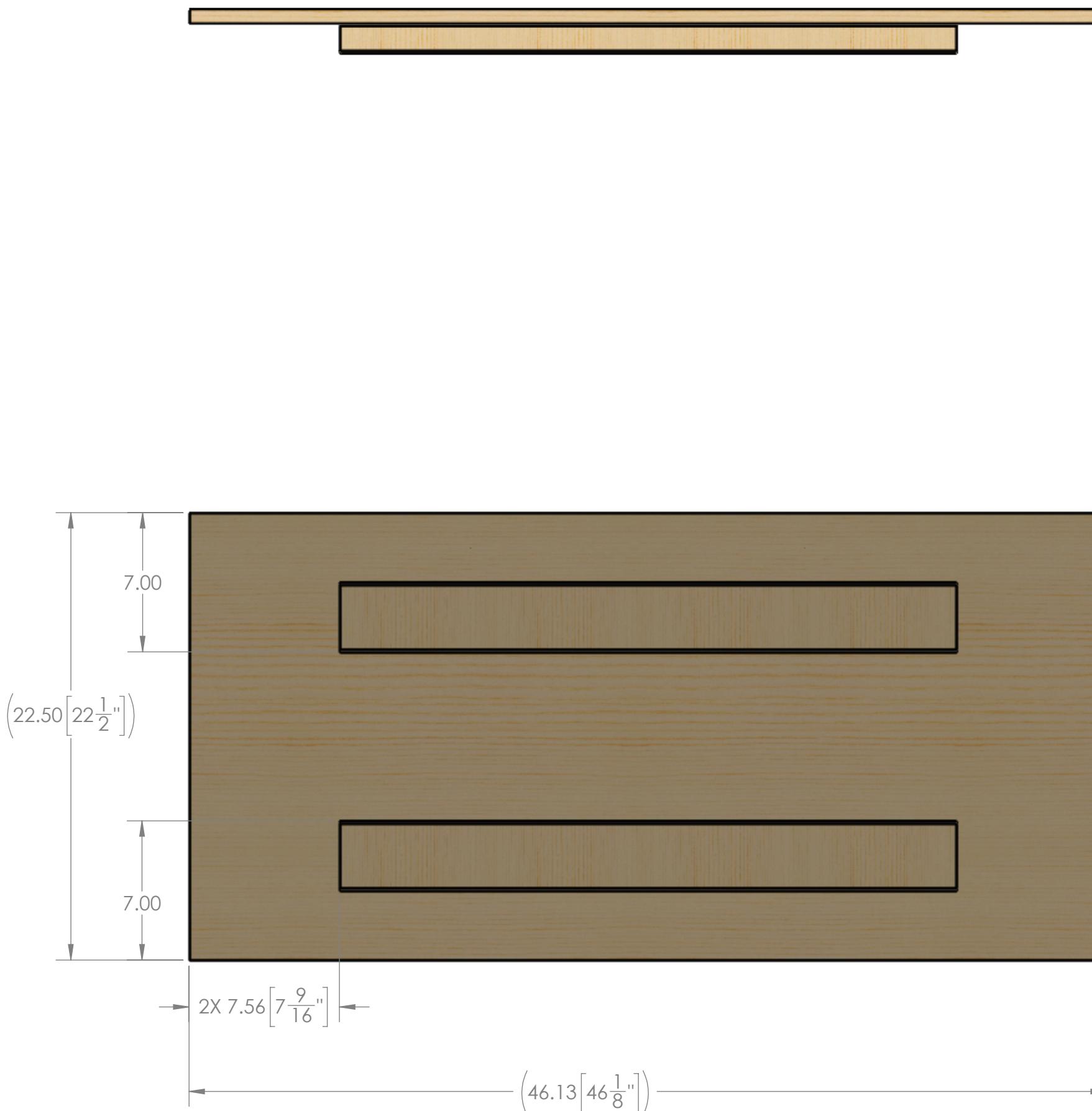
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COMMENTS:	REMOVE ALL BURRS AND SHARP EDGES.		
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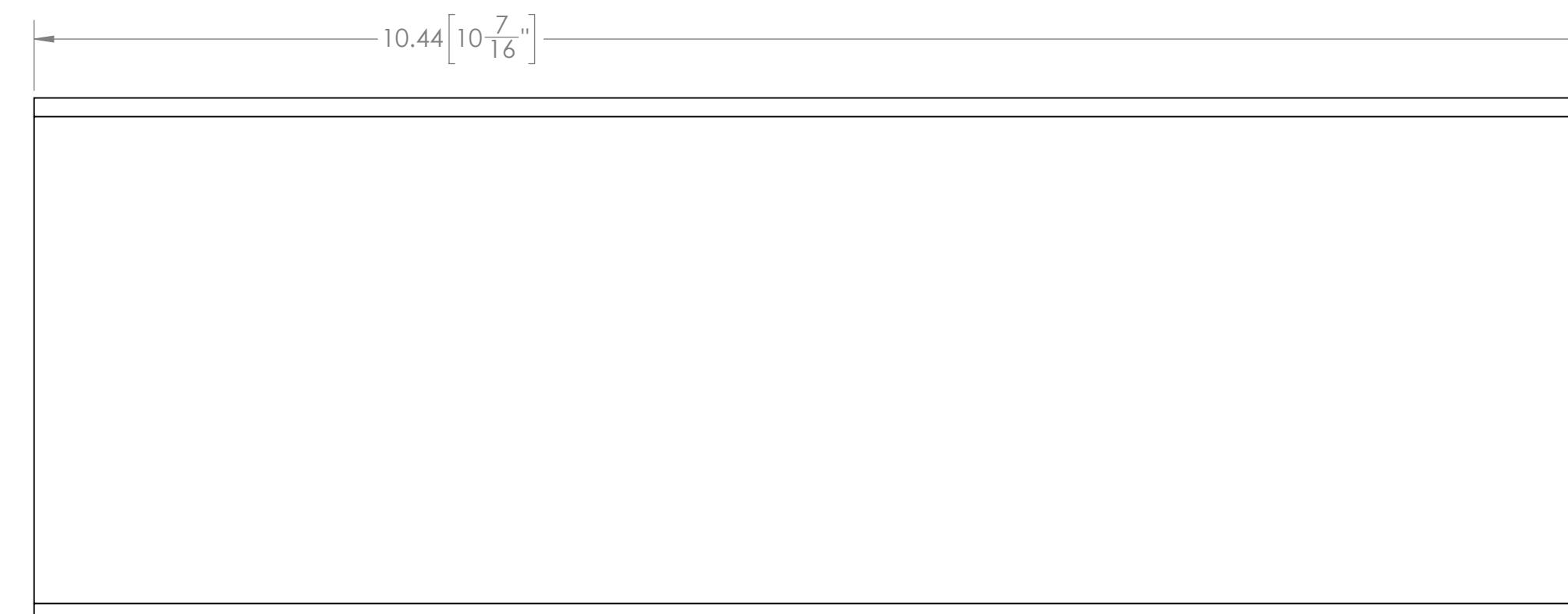
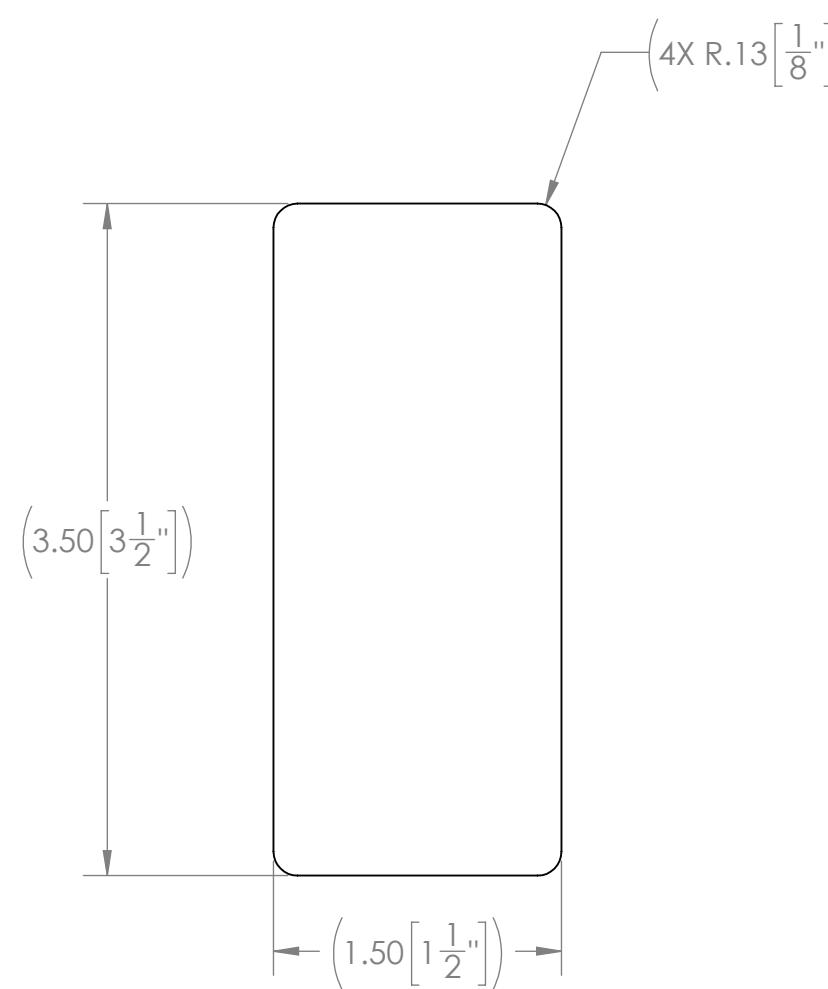
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MATERIAL/FINISH:	SIZE	DWG. NO.	REV
2"x4" Lumber	C	TE-22014	
COMMENTS:		SCALE: 1:1	
REMOVE ALL BURRS AND SHARP EDGES.		SHEET 1 OF 1	
DO NOT SCALE DRAWING			

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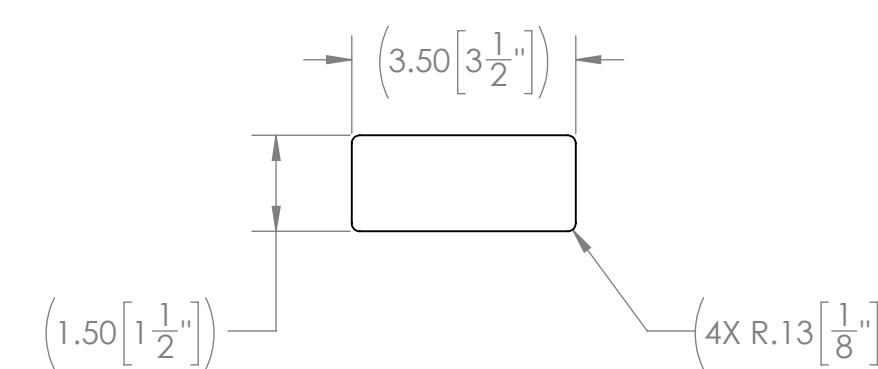
TITLE:
HUB - Simple Build -
Fender Side Horizontal
2x4

SIZE DWG. NO. REV

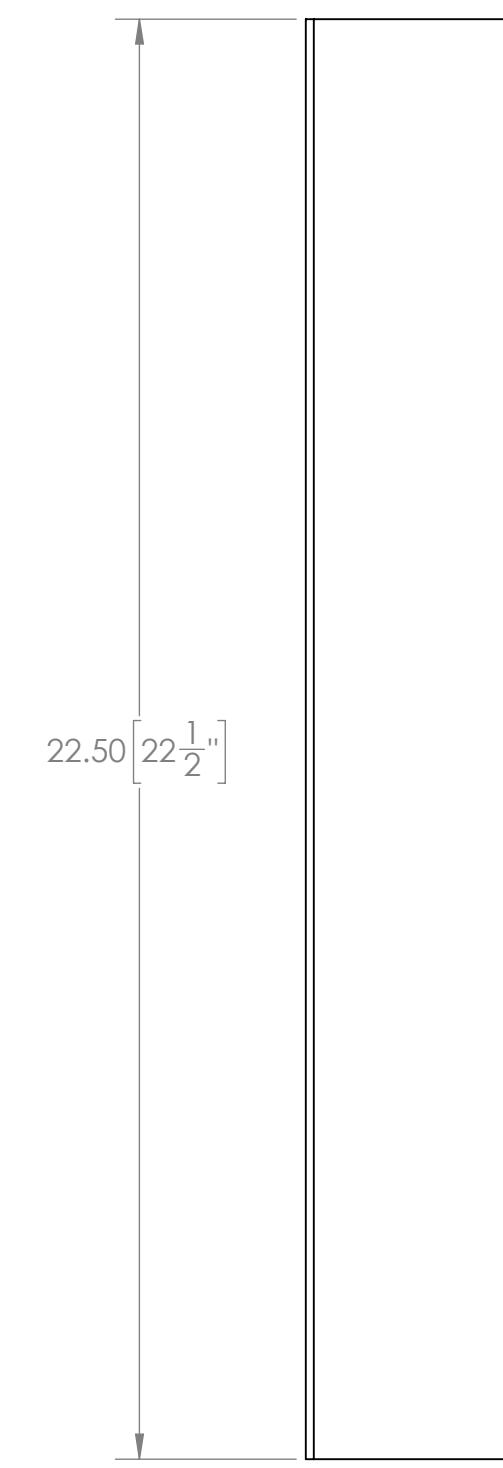
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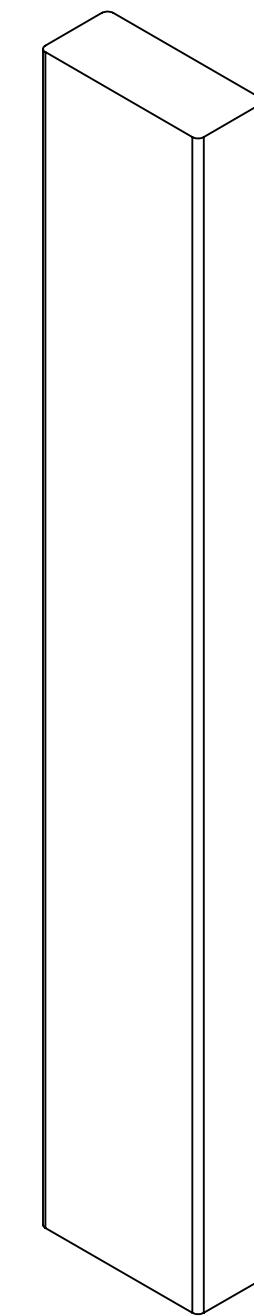
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UNLESS OTHERWISE SPECIFIED:	TEAM	NAME	DATE
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .13$ THREE PLACE DECIMAL $\pm .125$	DRAWN	KAMC	12/29/2021
PROPRIETARY AND CONFIDENTIAL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

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

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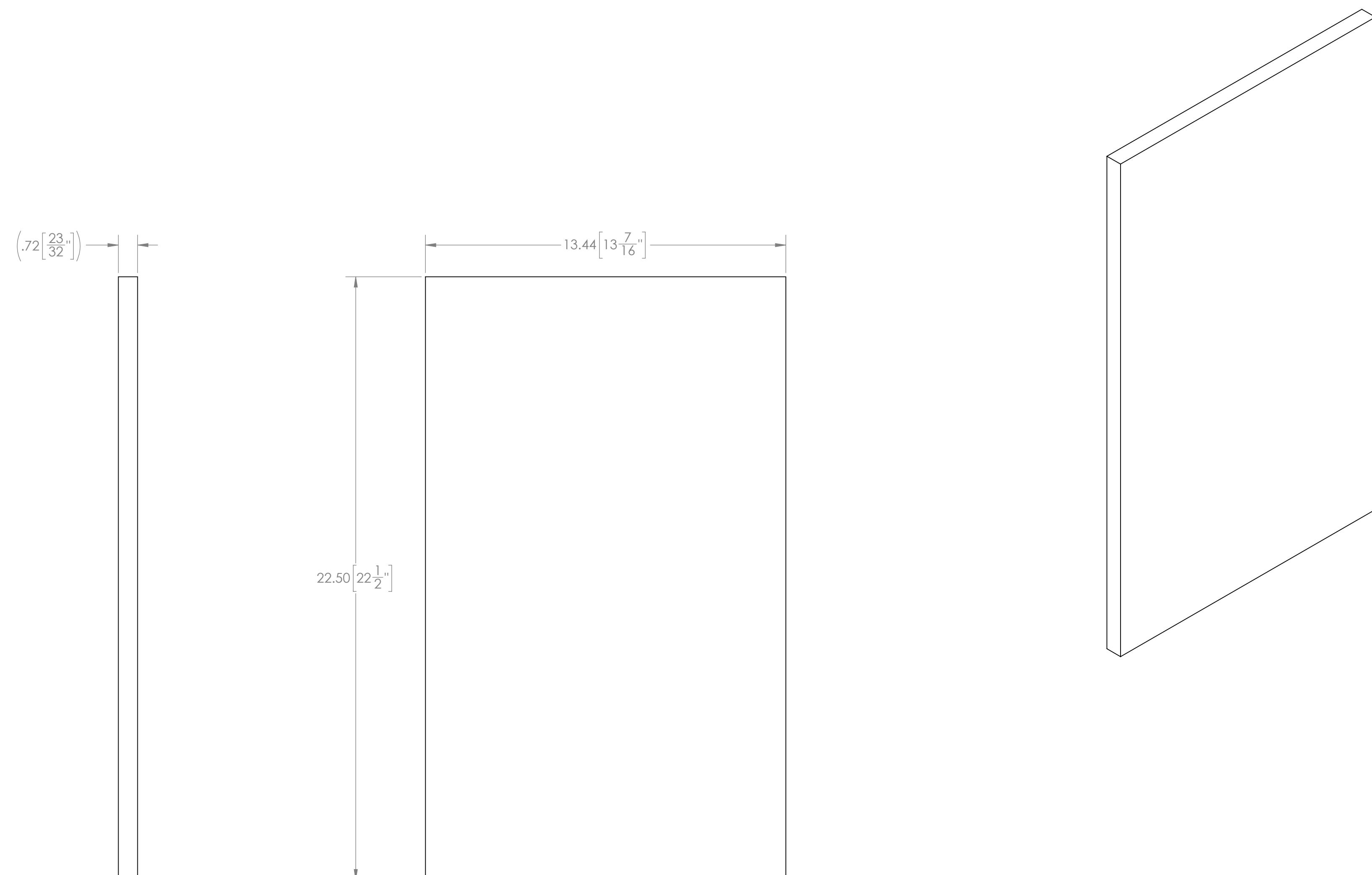
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UNLESS OTHERWISE SPECIFIED:

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

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COMMENTS:

REMOVE ALL BURRS AND SHARP EDGES.



TITLE: HUB - Simple Build -
Fender Side

SIZE DWG. NO. REV

C TE-22016

SCALE: 1:3 SHEET 1 OF 1

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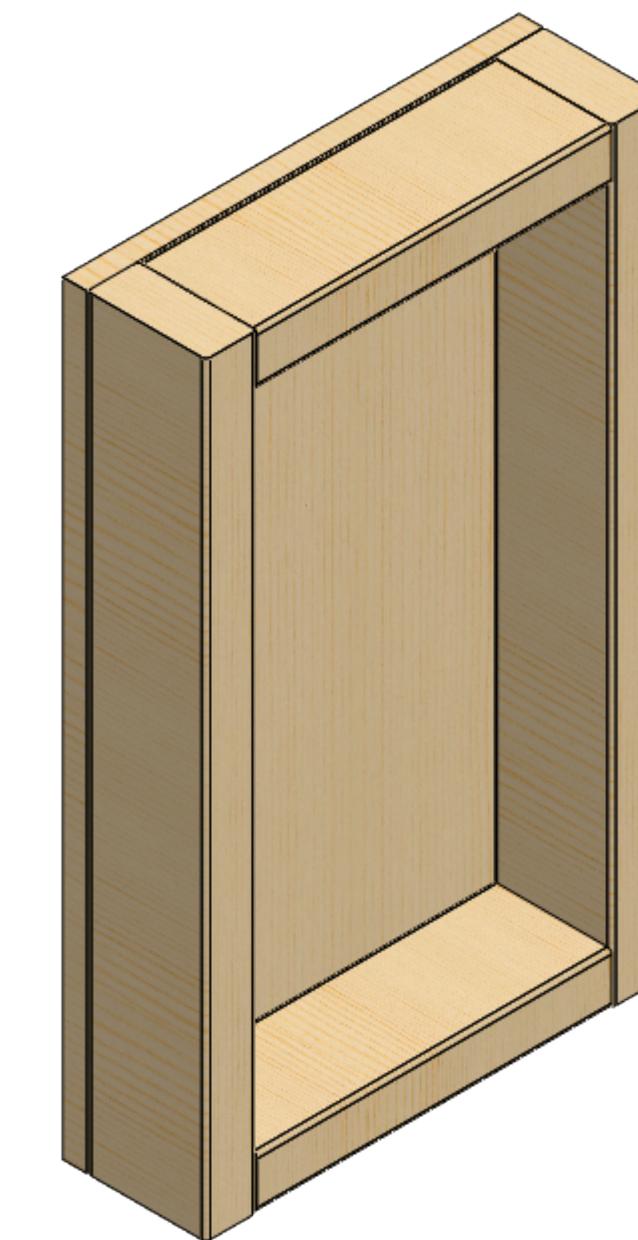
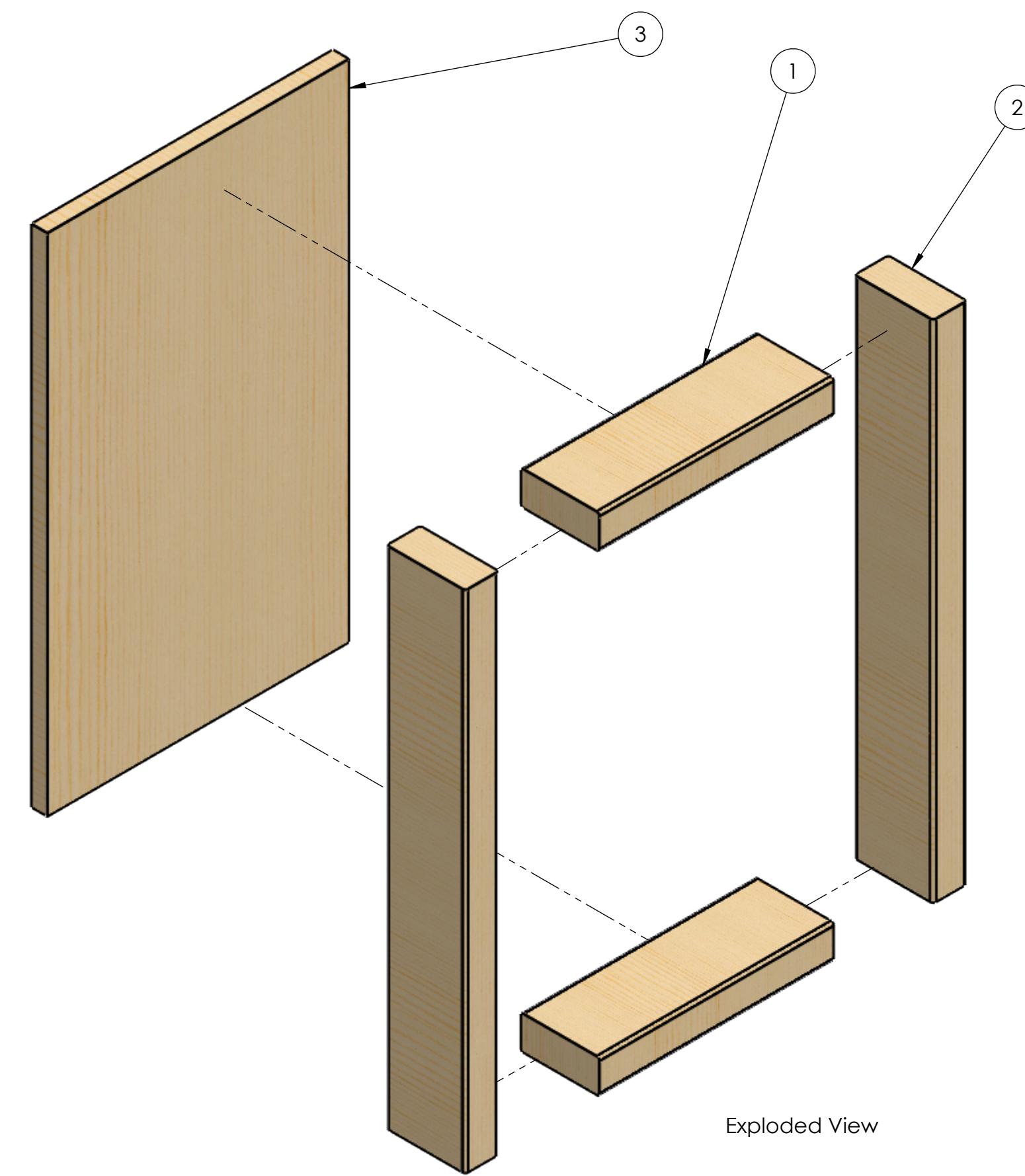
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Hardware:
#8 x 2" Long Screw - Qty 16
#8 x 2.5" Long Screw - Qty 8

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



TITLE: HUB - Basic Build -

Fender Side Assembly

SIZE DWG. NO. REV

C TE-22017

SCALE: 1:4 SHEET 1 OF 3

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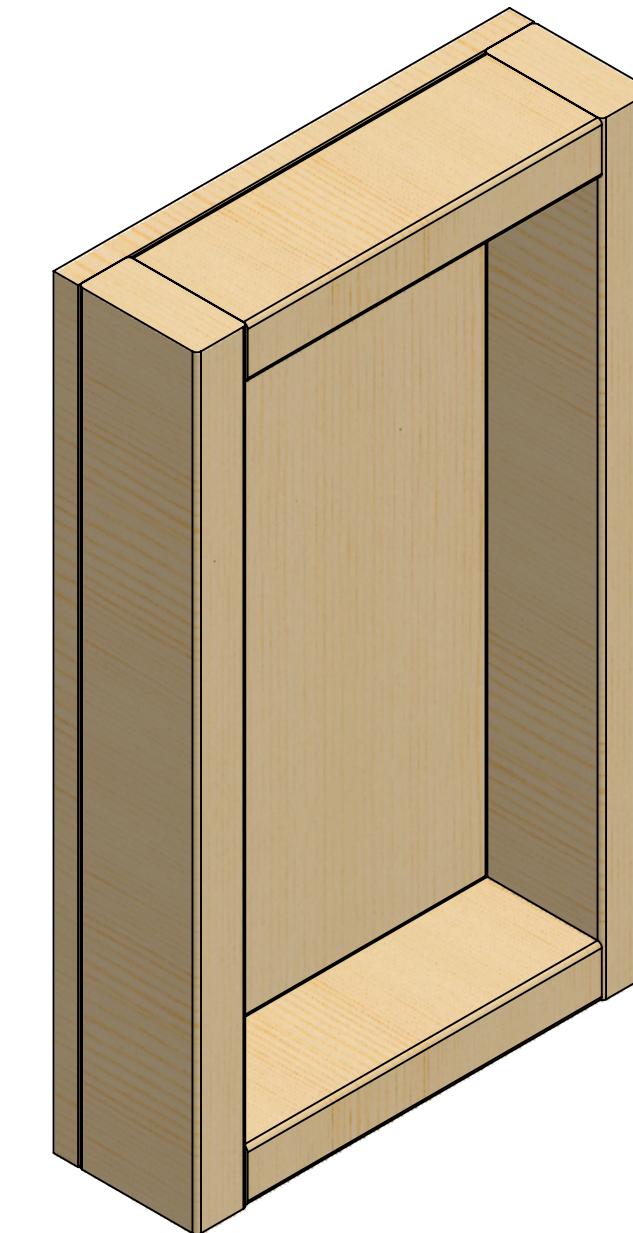
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DRAWN	KAMC	12/30/2021	
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MATERIAL/FINISH:			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

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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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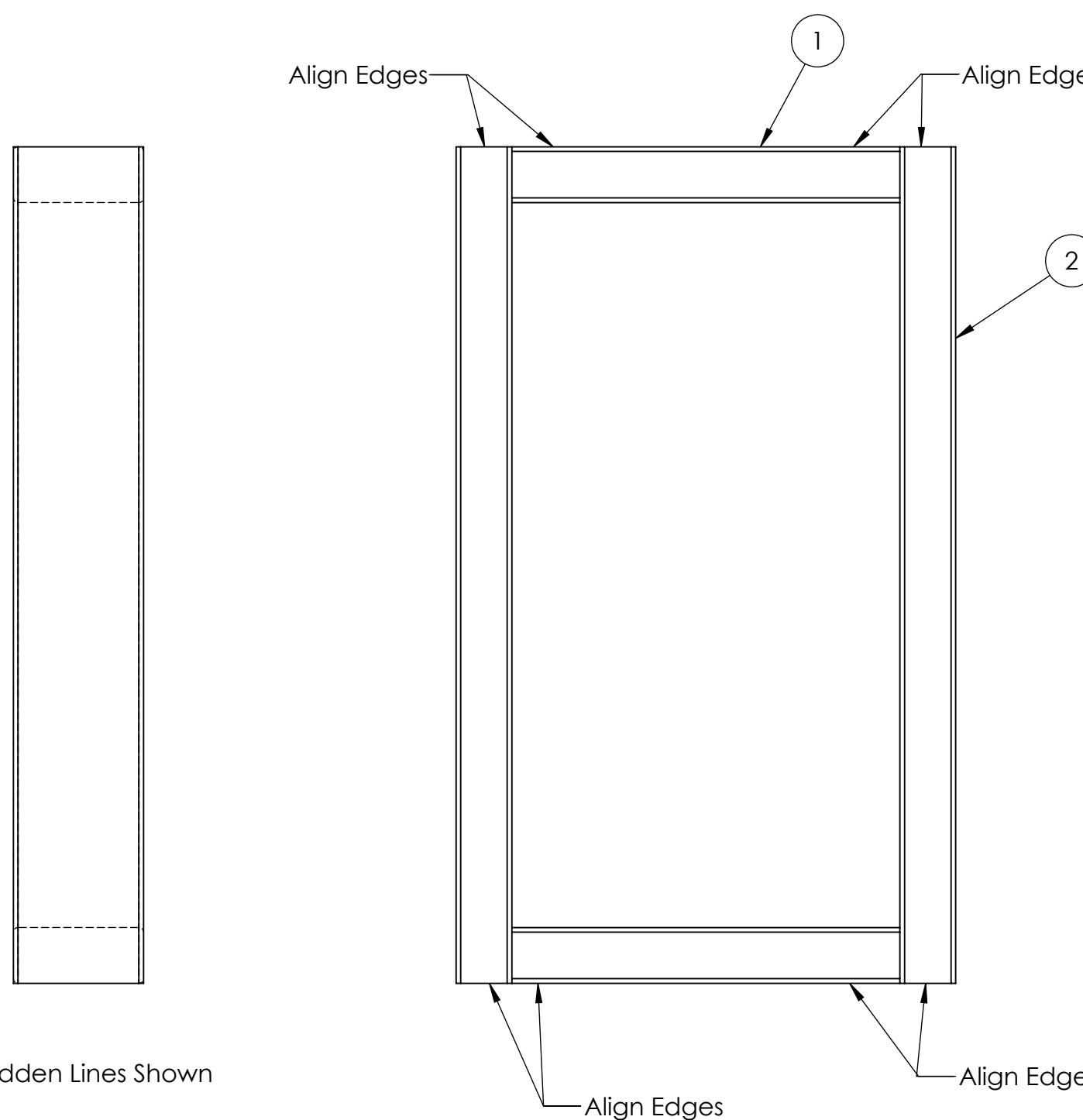
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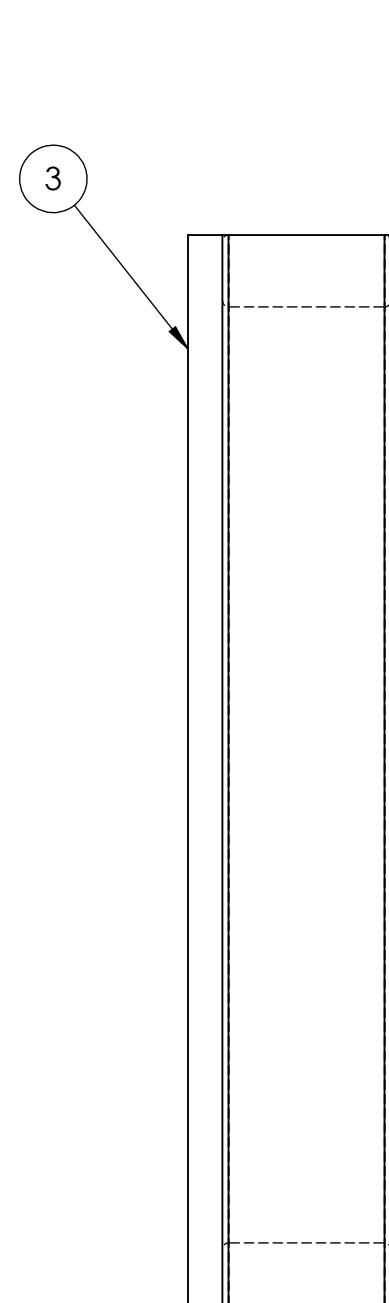
Step 1



Hidden Lines Shown

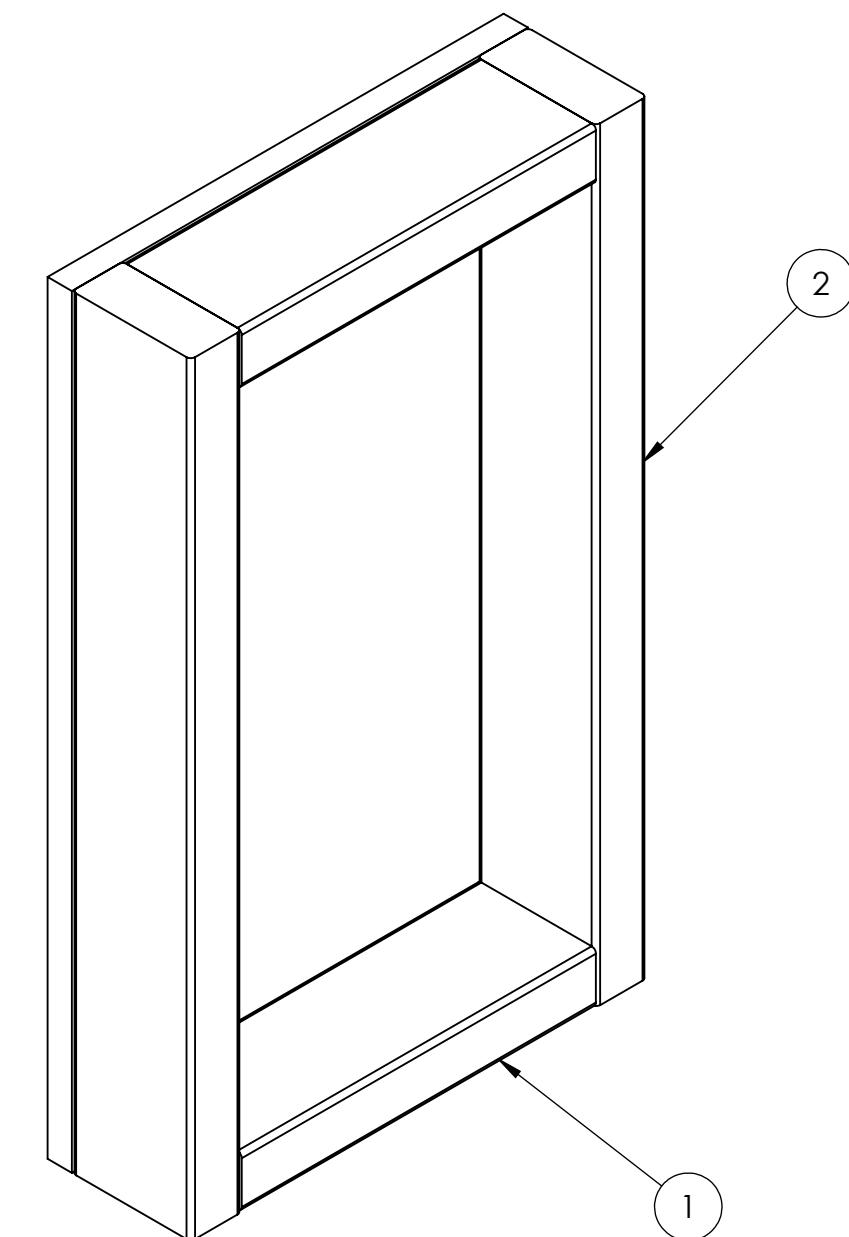
1. Align 2x 1 and 2x 2, as shown.
2. Attach using 2.5" long screws. It is recommended to use 2x screws into each interface between a 2 and 1.

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.



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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MATERIAL/FINISH:			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			
TITLE: HUB - Basic Build - Fender Side Assembly			
SIZE	DWG. NO.	REV	
C	TE-22017		
SCALE: 1:4		SHEET 3 OF 3	



SOLIDWORKS
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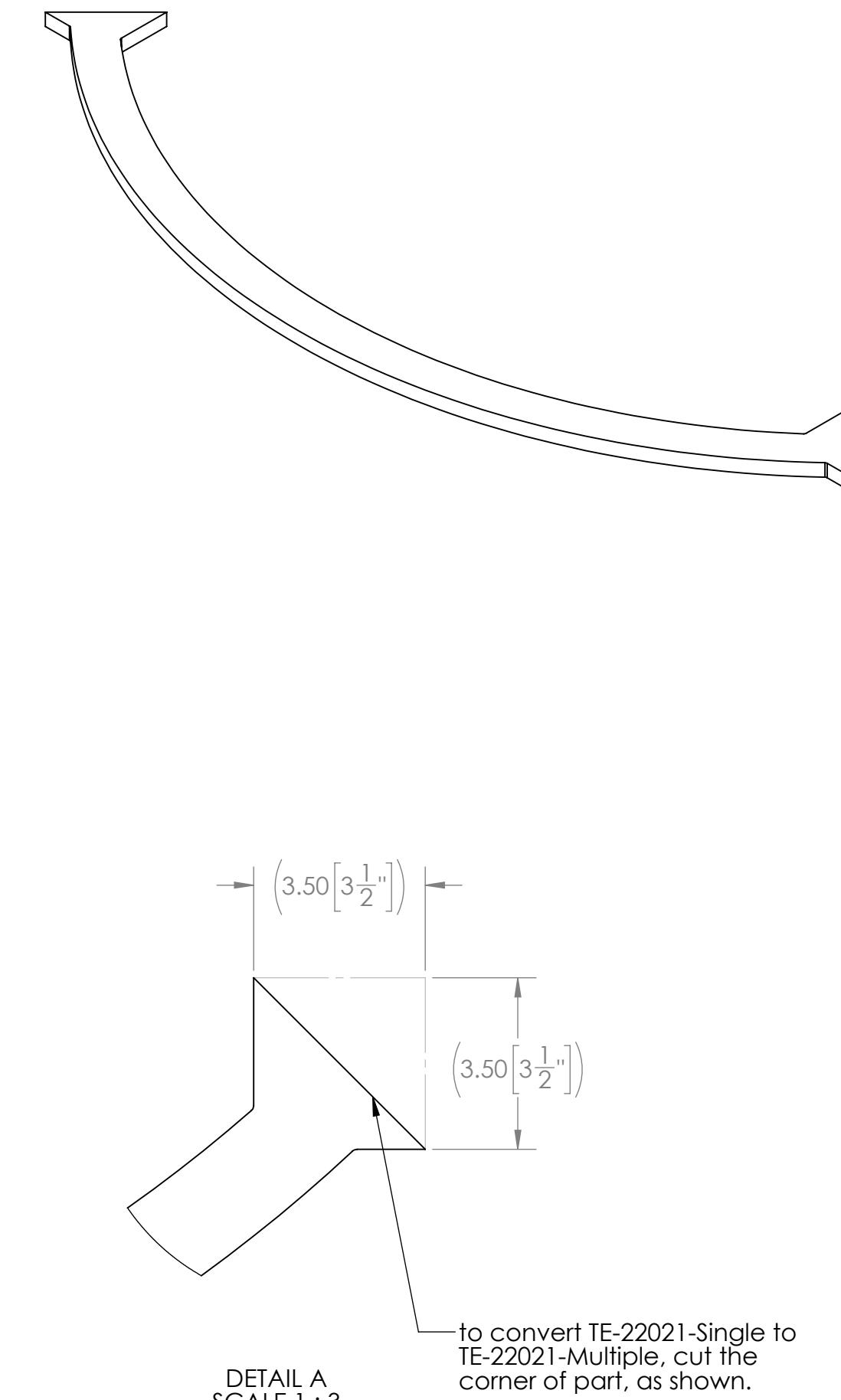
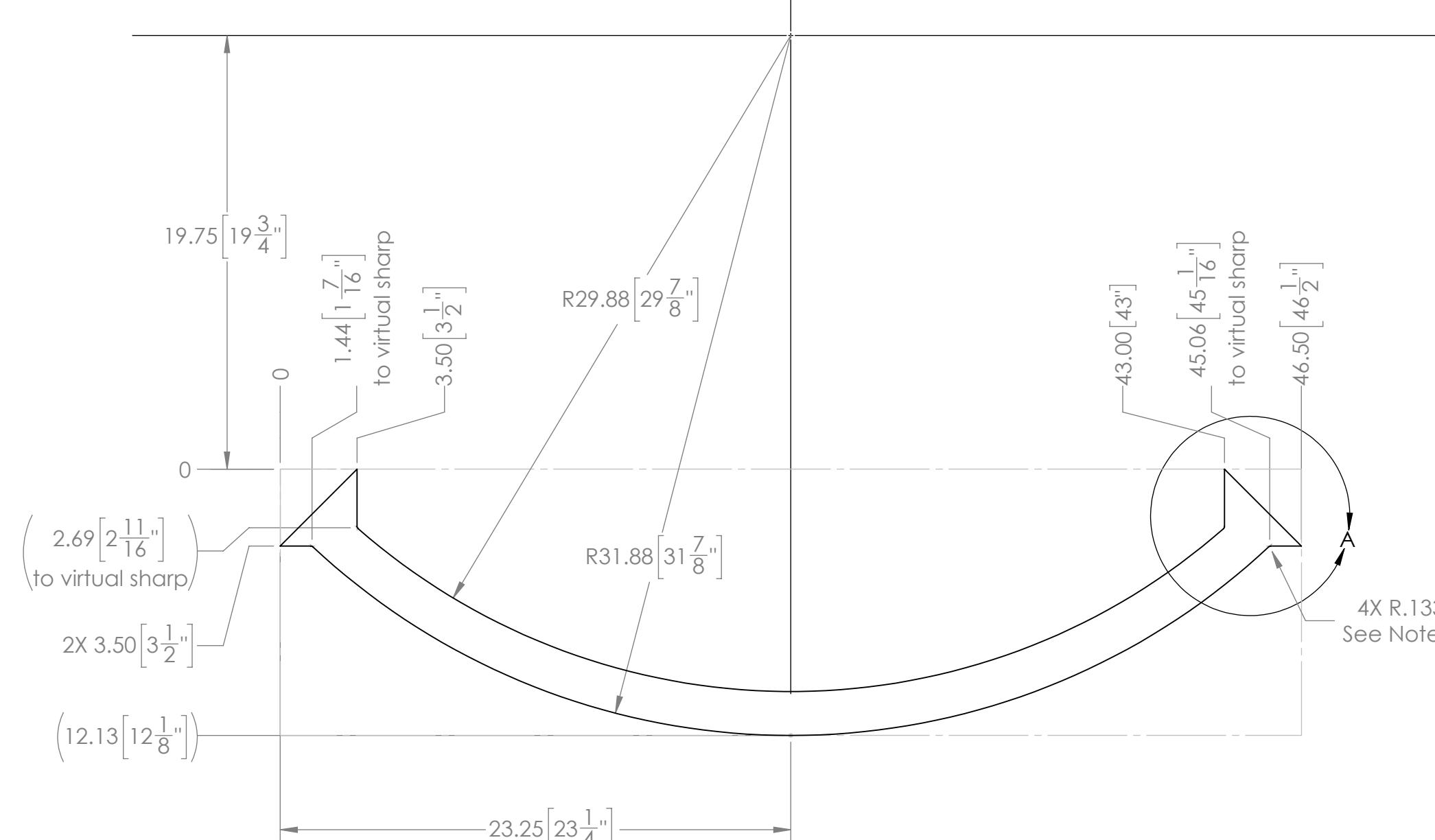
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**Note:**

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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MATERIAL/FINISH:	3/4" Plywood		
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING	SIZE	DWG. NO.	REV
	C	TE-22021-Multiple	
	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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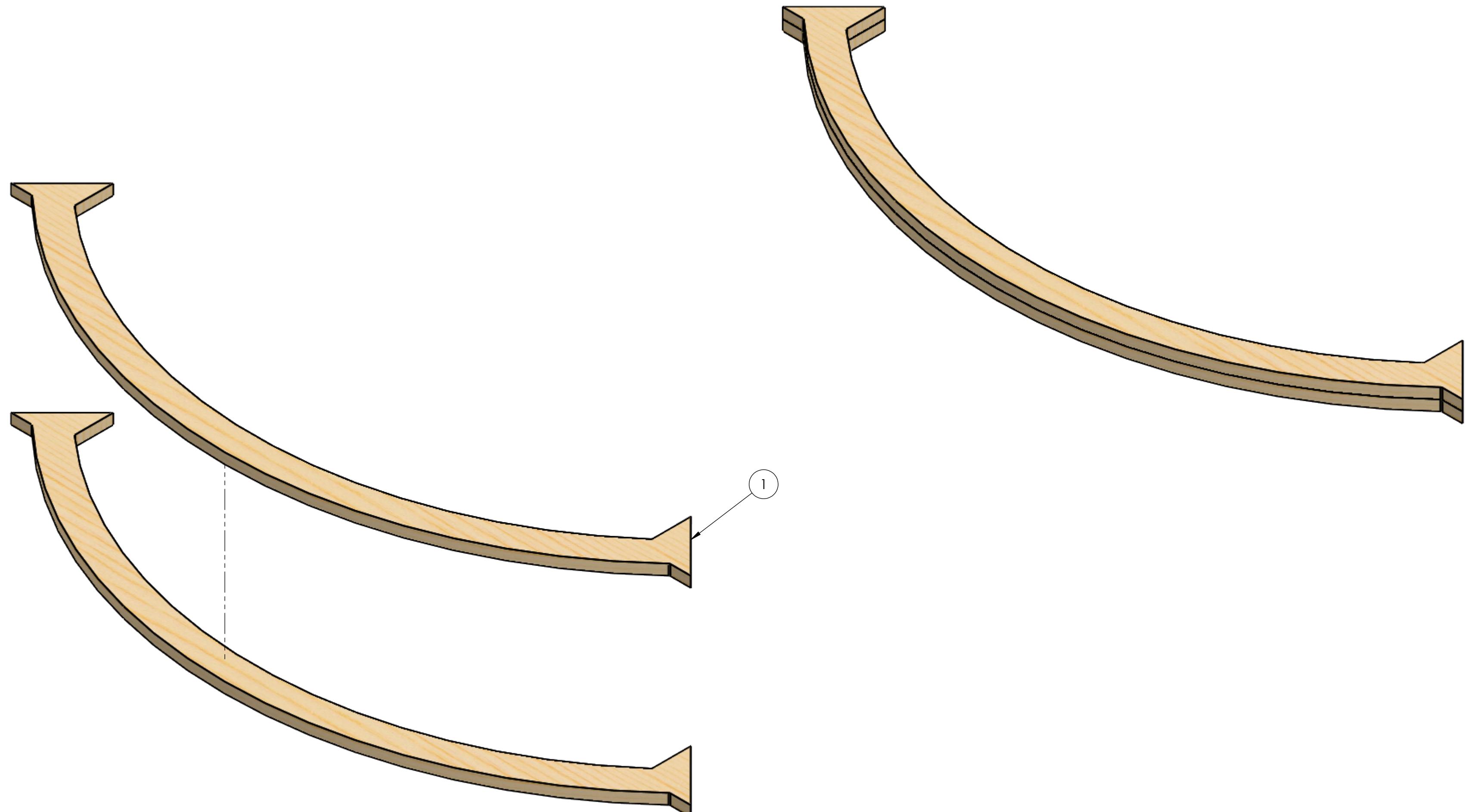
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Note: Use TE-22023-Single if you are only forming a 1/4 ring.

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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TITLE: Hub - Simple Build - Lower Hub Ring Assembly - Multiple					
SIZE	DWG. NO.	REV			
C	TE-22023-Multiple				
COMMENTS:			REMOVE ALL BURRS AND SHARP EDGES.		
DO NOT SCALE DRAWING			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

FIRST ROBOTICS COMPETITION DS SOLIDWORKS Modeling Solutions Partner

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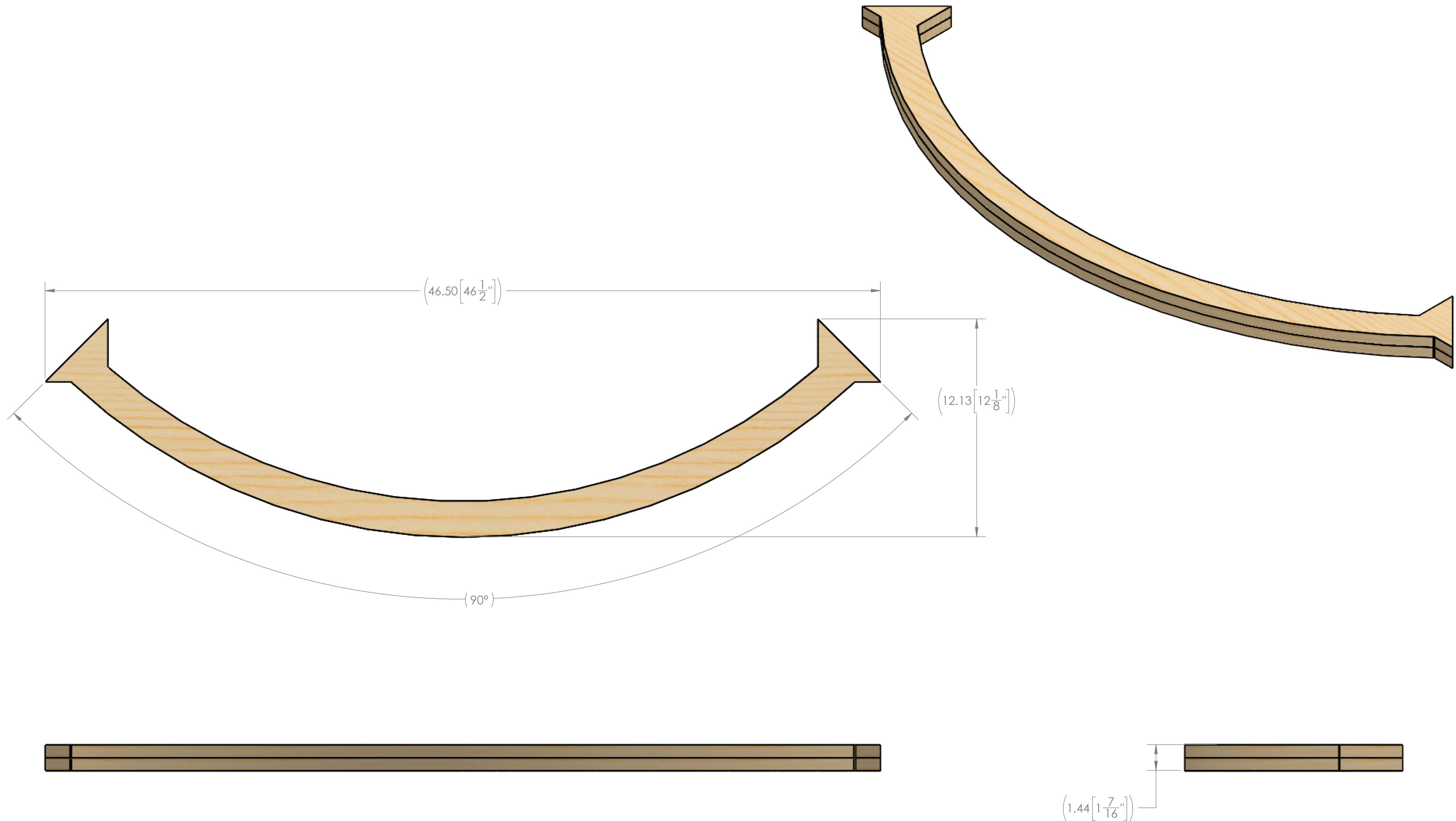
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DRAWN	KAMC	12/30/2021	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST
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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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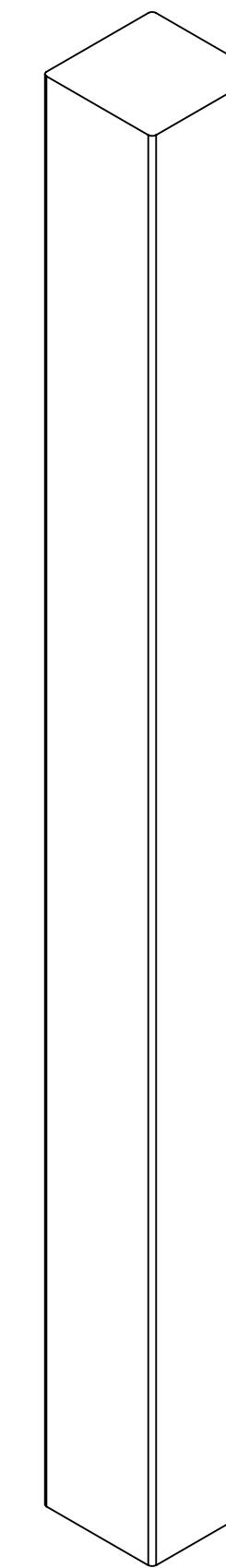
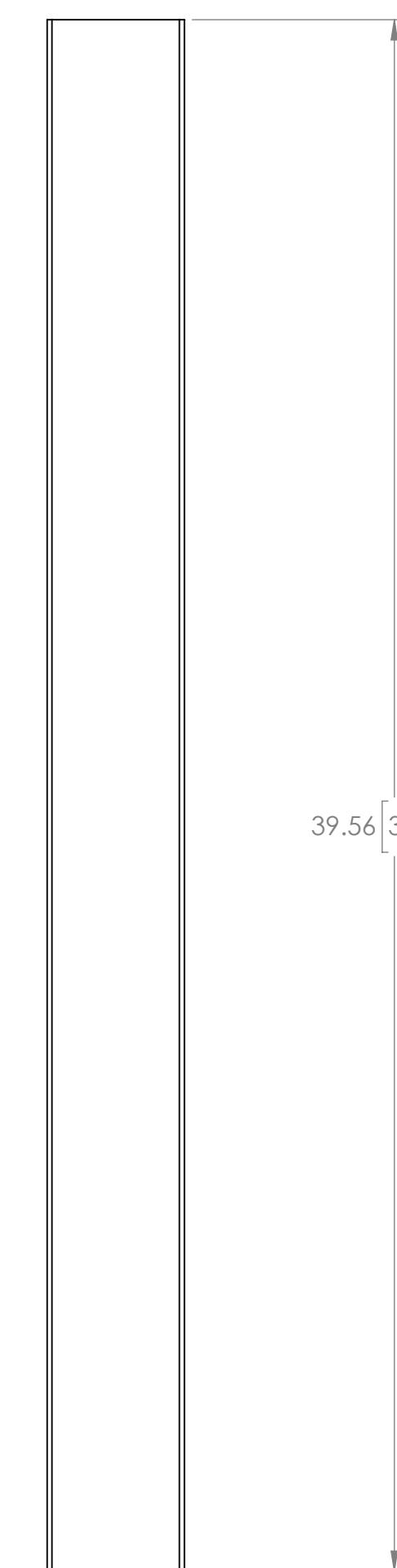
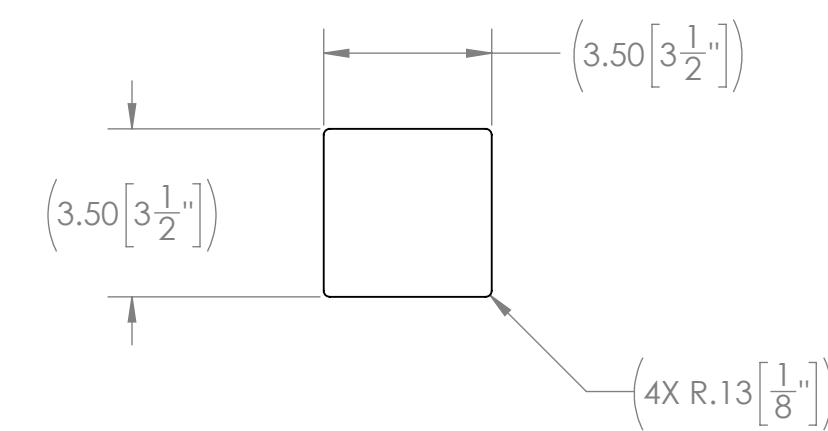
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DRAWN	KAMC	12/29/2021	
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MATERIAL/FINISH:	SIZE	DWG. NO.	REV
4"x4" Lumber	C	TE-22025	
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING	SCALE: 1:4	SHEET 1 OF 1	

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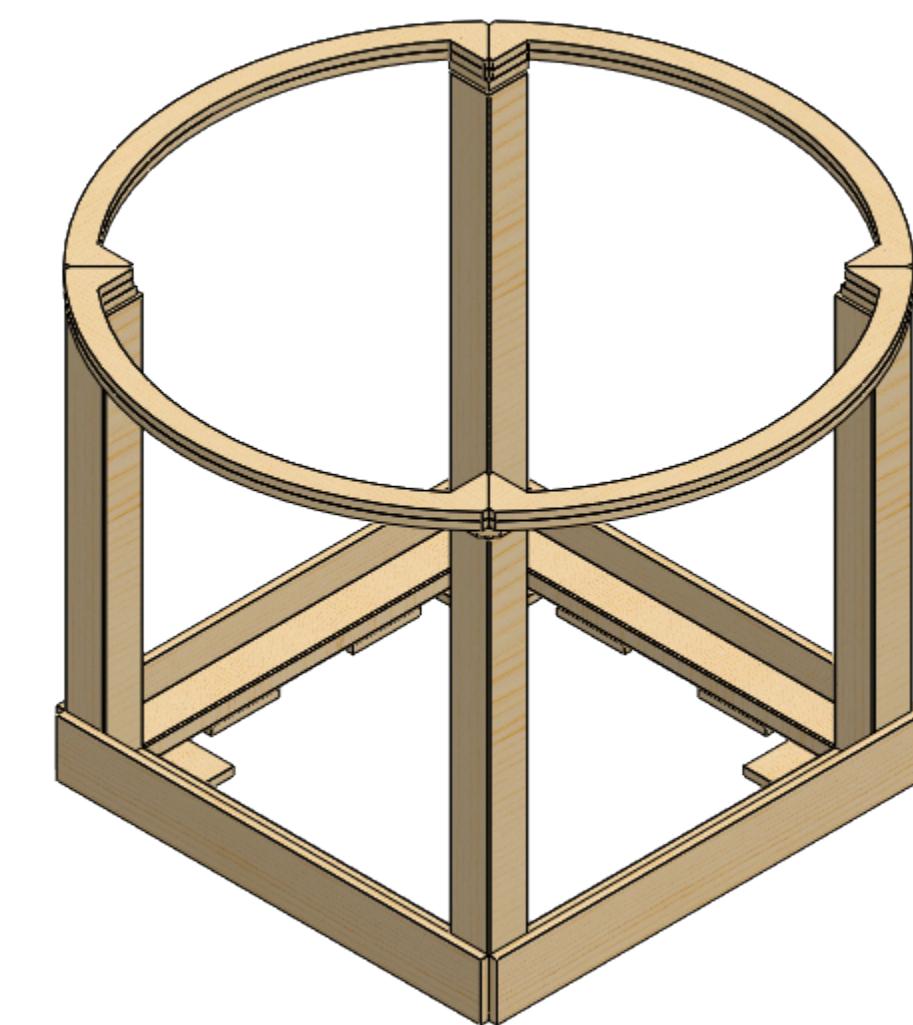
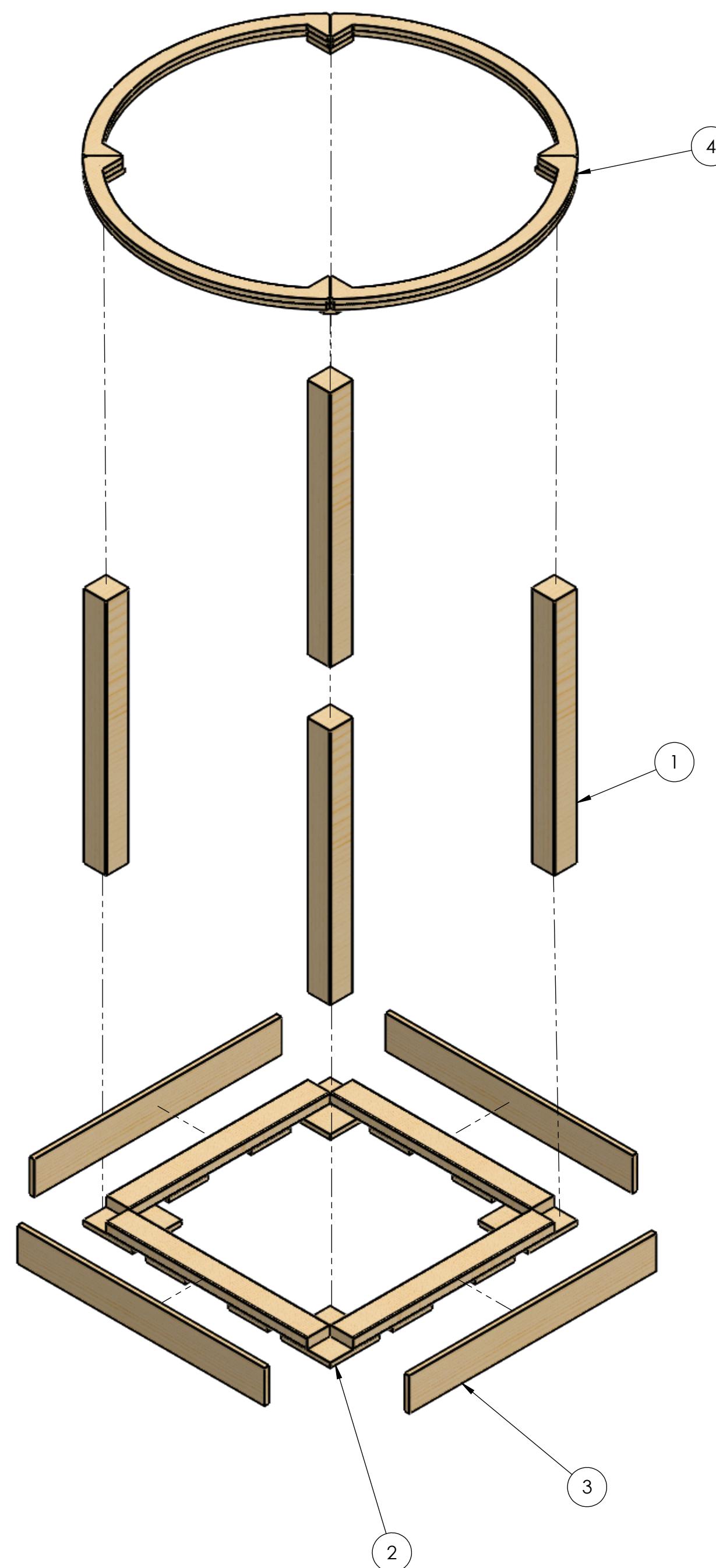
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Note:
Use Assembly TE-22030-AM if pairing with AndyMark's
Upper Hub Vision Ring Assembly (AM-4672)

Hardware Needed:
#8 x 1.25" Long Screw - Qty 12
#8 x 2" Long Screw - Qty 48
#10 x 3.5" Long Screw - Qty 16

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	TE-22036	Hub - Simple Build - Upper Hub Goal 4x4	4
2	TE-22038	Hub - Simple Build - Upper Hub Goal Bottom Assembly	1
3	TE-22037	Hub - Simple Build - Upper Hub Goal Rectangle Connection Plate	4
4	TE-22034	Hub - Simple Build - Upper Hub Full Ring Assembly	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

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

TITLE:
**Hub - Simple Build -
Upper Hub Goal
Assembly**

SIZE DWG. NO. REV
C TE-22030

SCALE: 1:12 SHEET 1 OF 4

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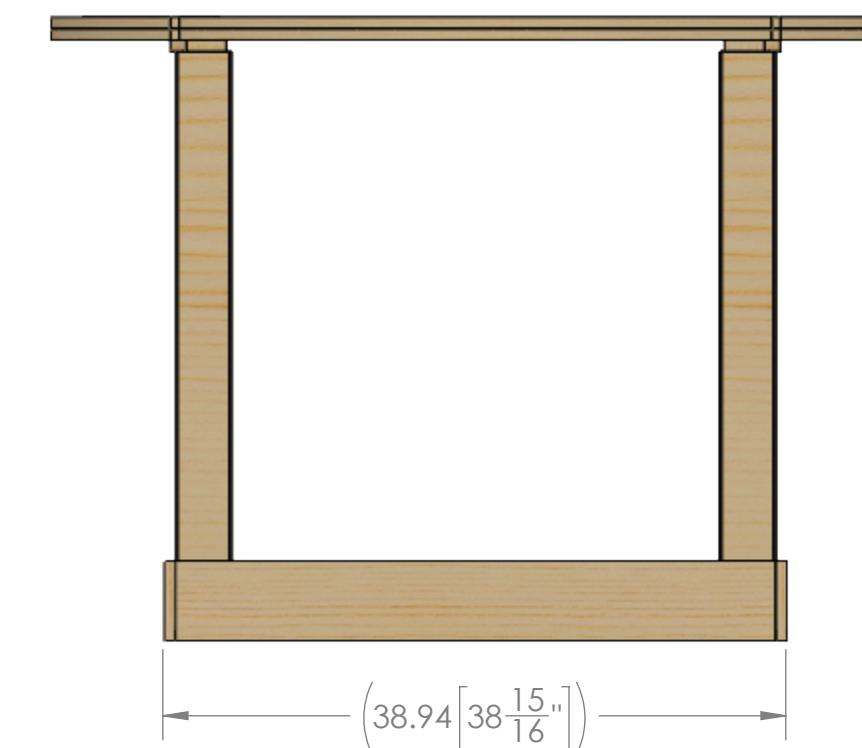
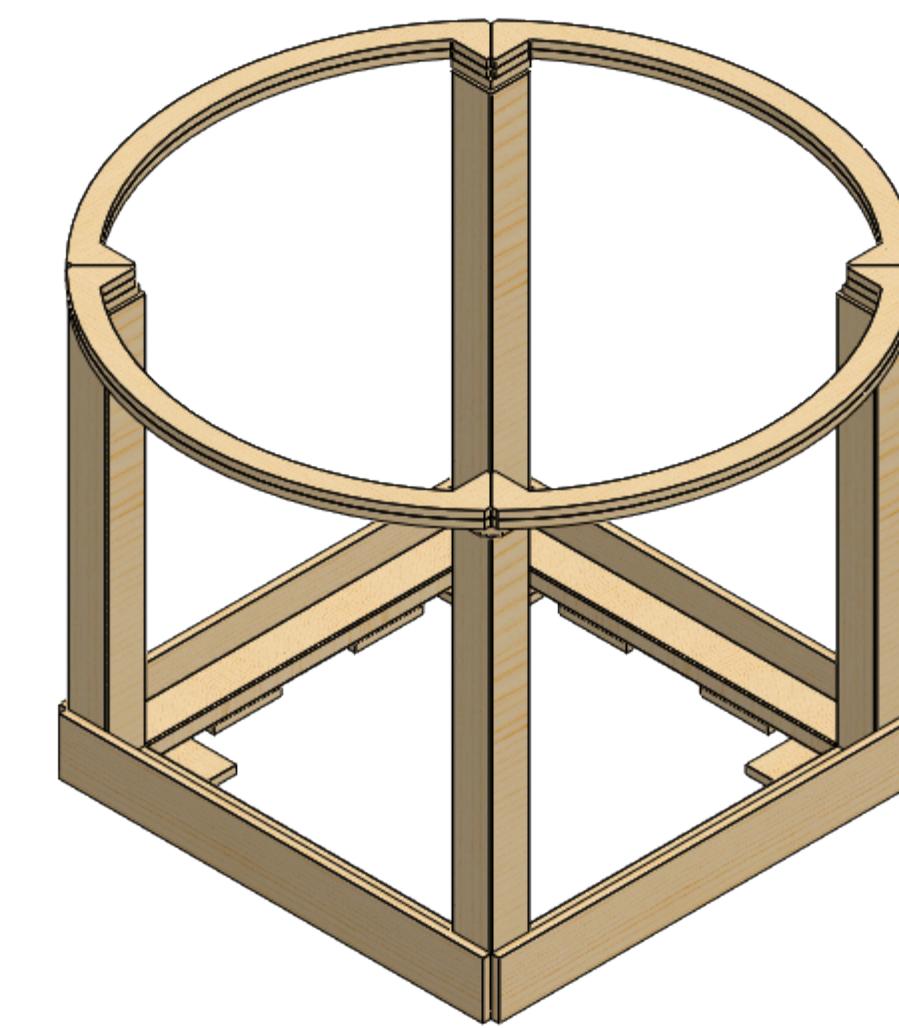
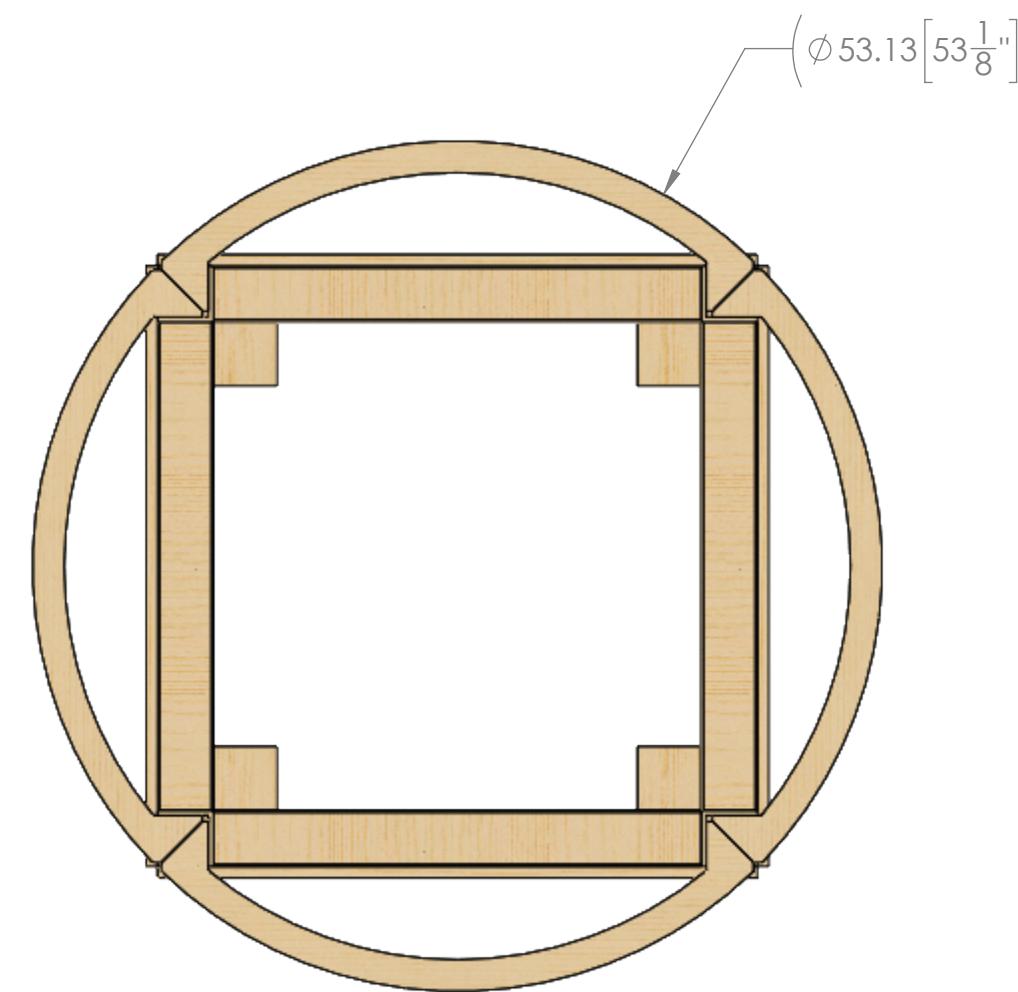
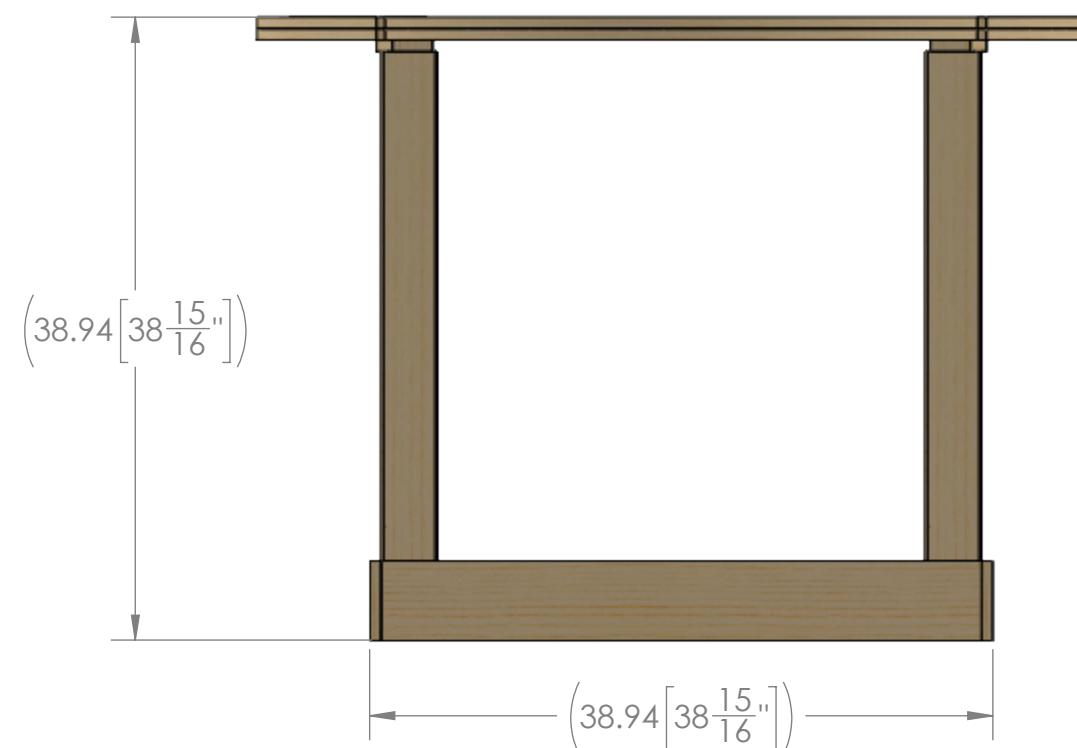
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UNLESS OTHERWISE SPECIFIED:	TEAM	NAME	DATE
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .13$ THREE PLACE DECIMAL $\pm .125$	DRAWN	KAMC	12/30/2021
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MATERIAL/FINISH:			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
Hub - Simple Build -
Upper Hub Goal
Assembly

SIZE DWG. NO. REV

C TE-22030

SCALE: 1:12 SHEET 2 OF 4

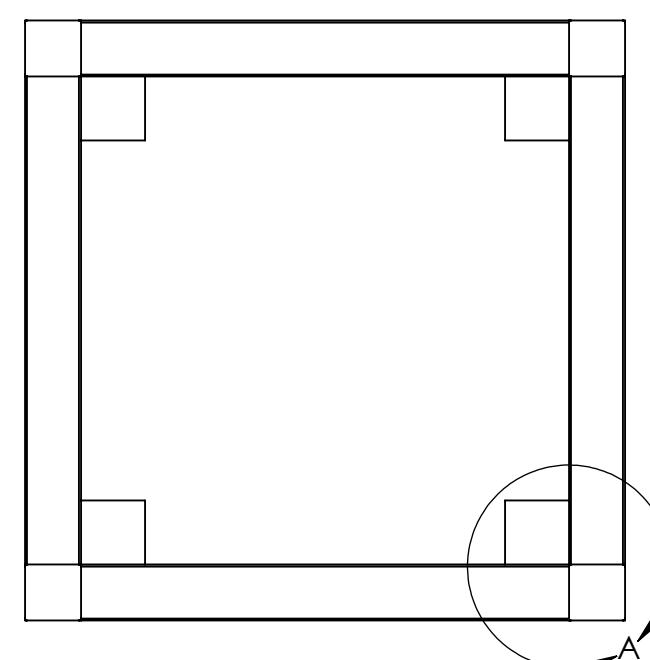
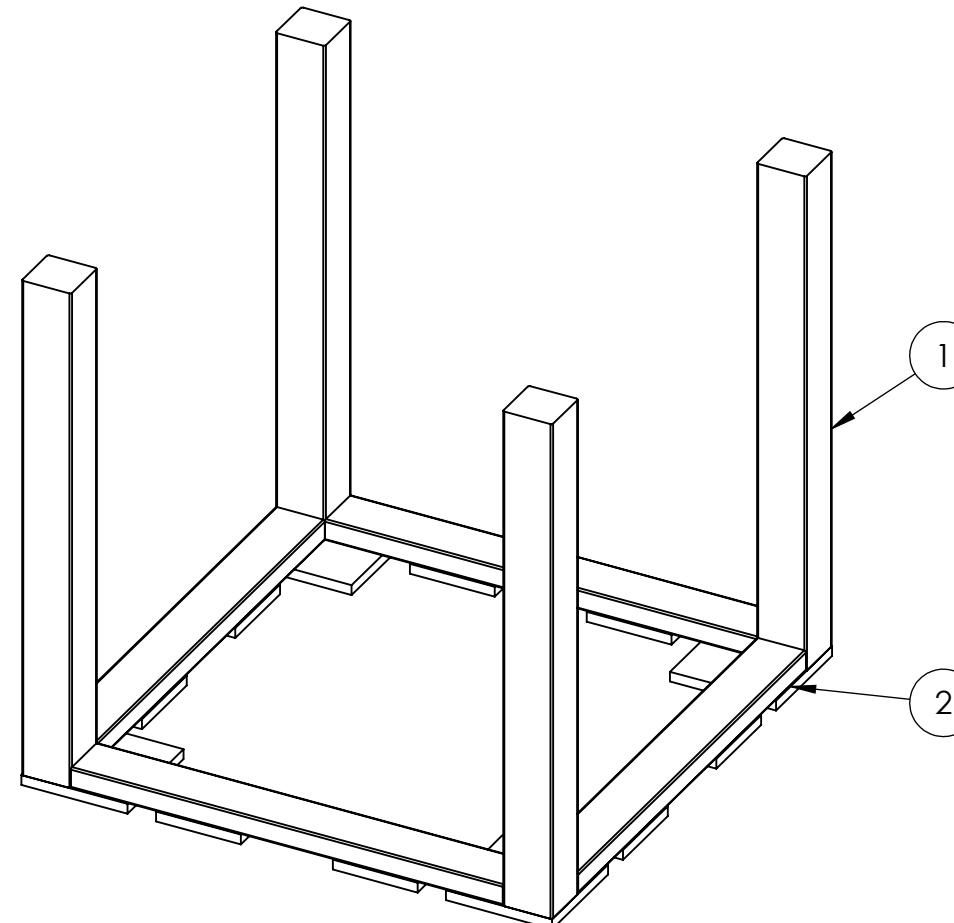
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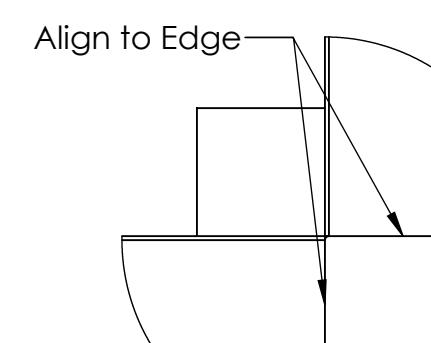
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Step 1

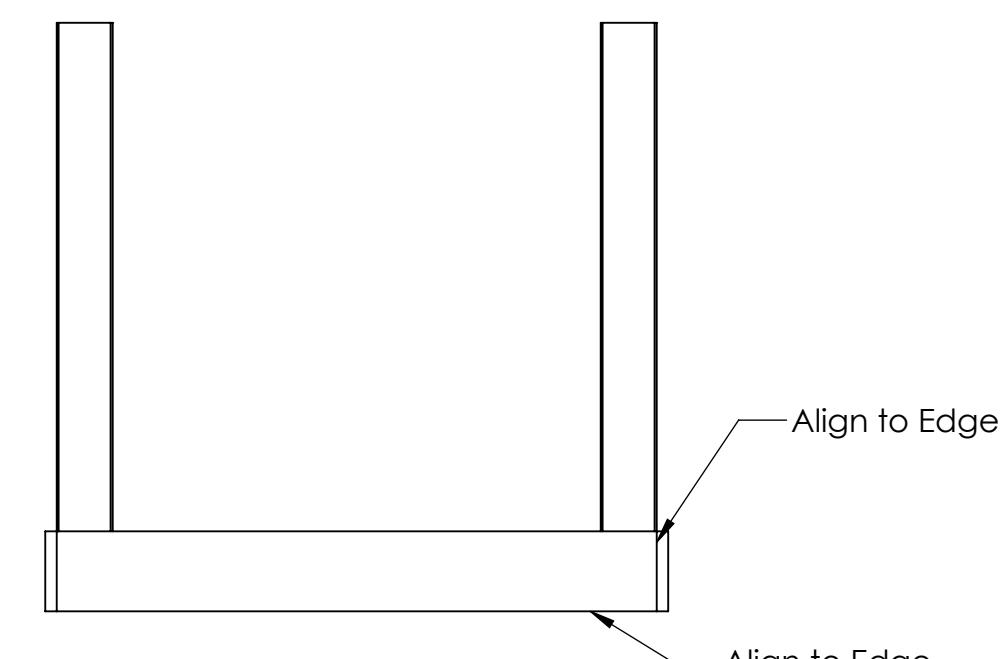
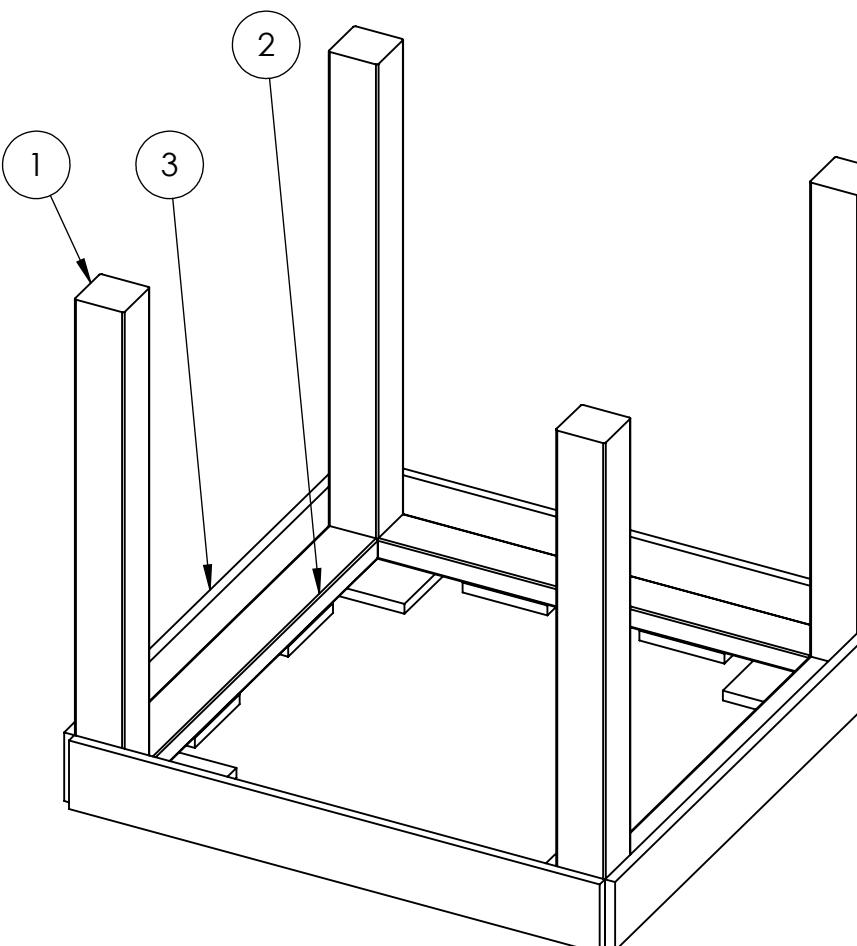


1. Align 4x (1) to (2), as shown.
2. Connect using 2" Long Screws. It is recommended to use 4x screws per (1).



4X
DETAIL A
SCALE 1 : 6

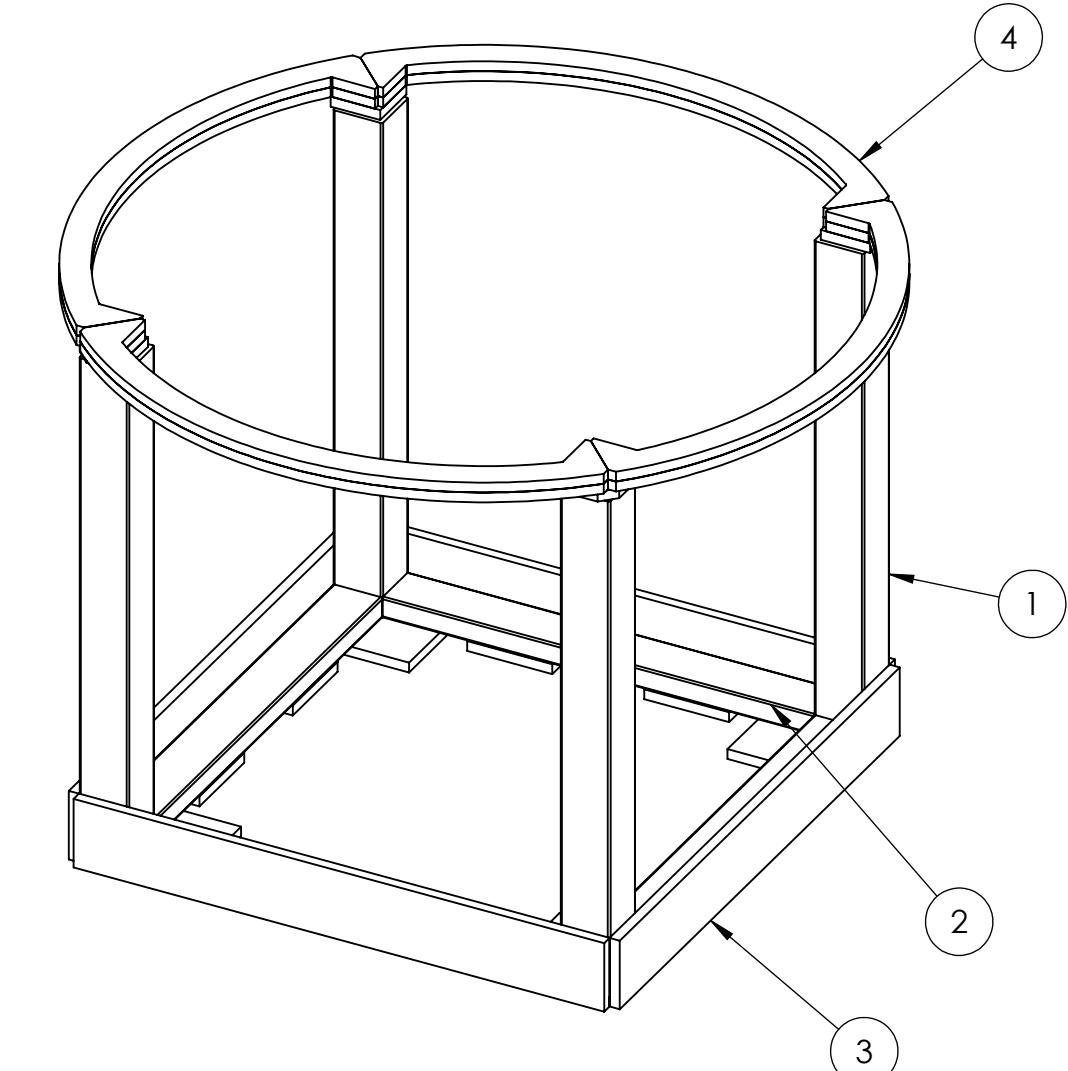
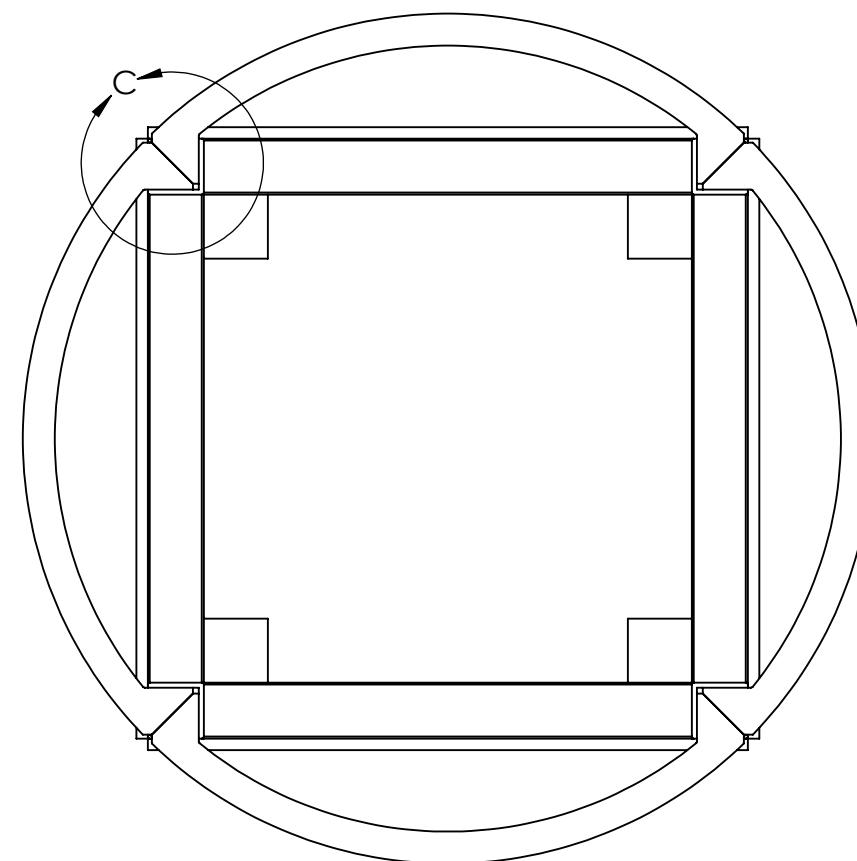
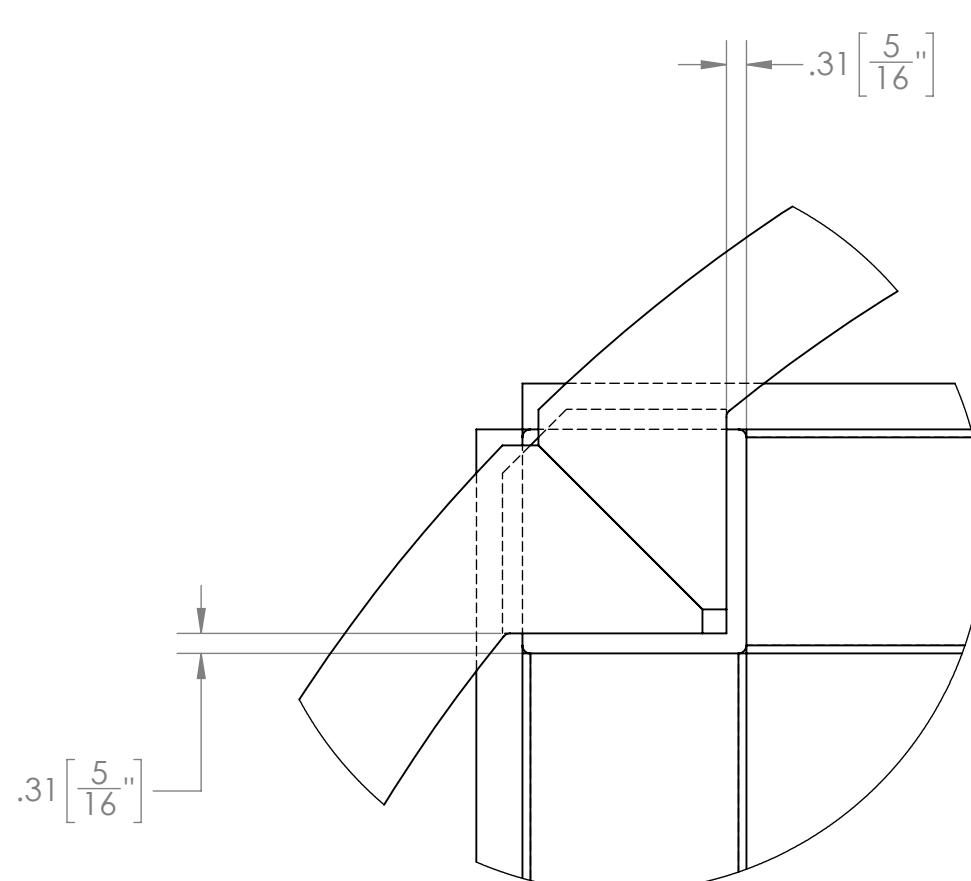
Step 2



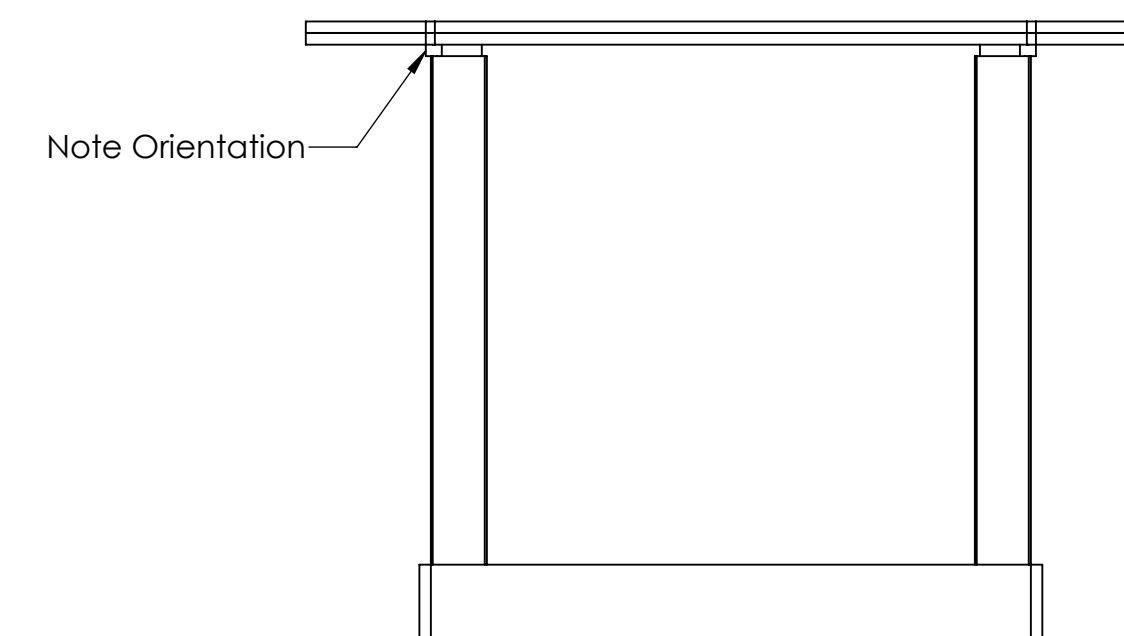
1. Align 4x (3) to Step 1, as shown.
2. Attach (3) to (1) using 2" Long Screws. It is recommended to use 8x screws per (3), 4x into each (1).
3. Attach (3) to the 2"x4" Lumber of (2) using 1.25" Long Screws. It is recommended to use 3x screws per (3). Be careful to center the screw into the 2"x4" Lumber to avoid splitting the wood.

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MATERIAL/FINISH:			
COMMENTS:	REMOVE ALL BURRS AND SHARP EDGES.		
DO NOT SCALE DRAWING			
		TITLE: Hub - Simple Build - Upper Hub Goal Assembly	
SIZE	DWG. NO.	REV	
C	TE-22030		
SCALE: 1:12		SHEET 3 OF 4	

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4X
DETAIL C
SCALE 1 : 3
Hidden Lines Shown



1. Align ④ to Step 2, as shown. Note the orientation of ④.

Note: Warping may be present on ①. If this is the case, evenly split the difference from the dimensions provided in Detail C to center ④ on assembly.

2. Connect using 3.5" Long Screws. It is recommended to use 4x screws into each ①.

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MATERIAL/FINISH:	SIZE	DWG. NO.	REV
	C	TE-22030	
COMMENTS:	REMOVE ALL BURRS AND SHARP EDGES.		
DO NOT SCALE DRAWING	SCALE: 1:12	SHEET 4 OF 4	

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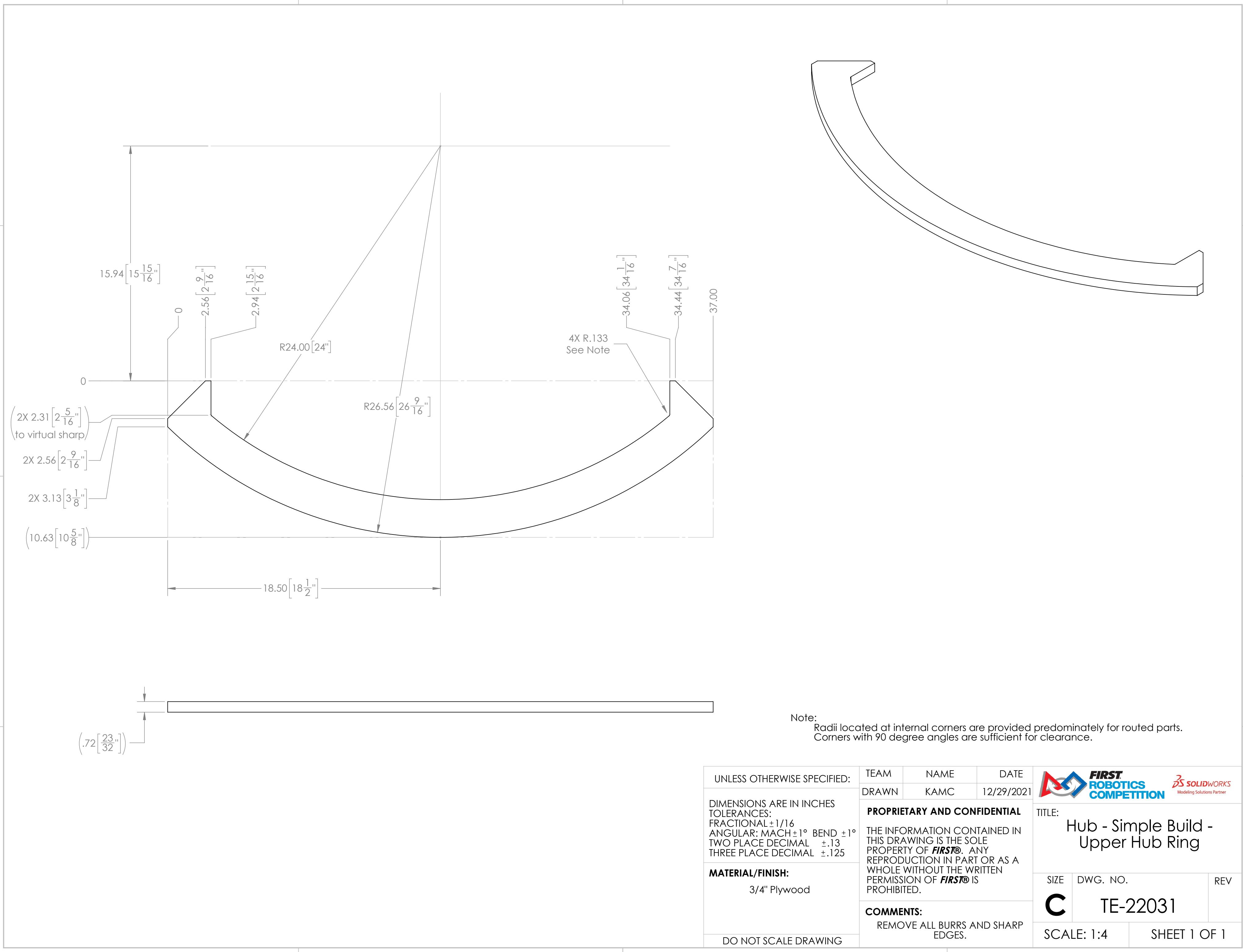
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SIZE	DWG. NO.	REV
C	TE-22031	
SCALE: 1:4	SHEET 1 OF 1	



SOLIDWORKS
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TITLE: Hub - Simple Build -
Upper Hub Ring

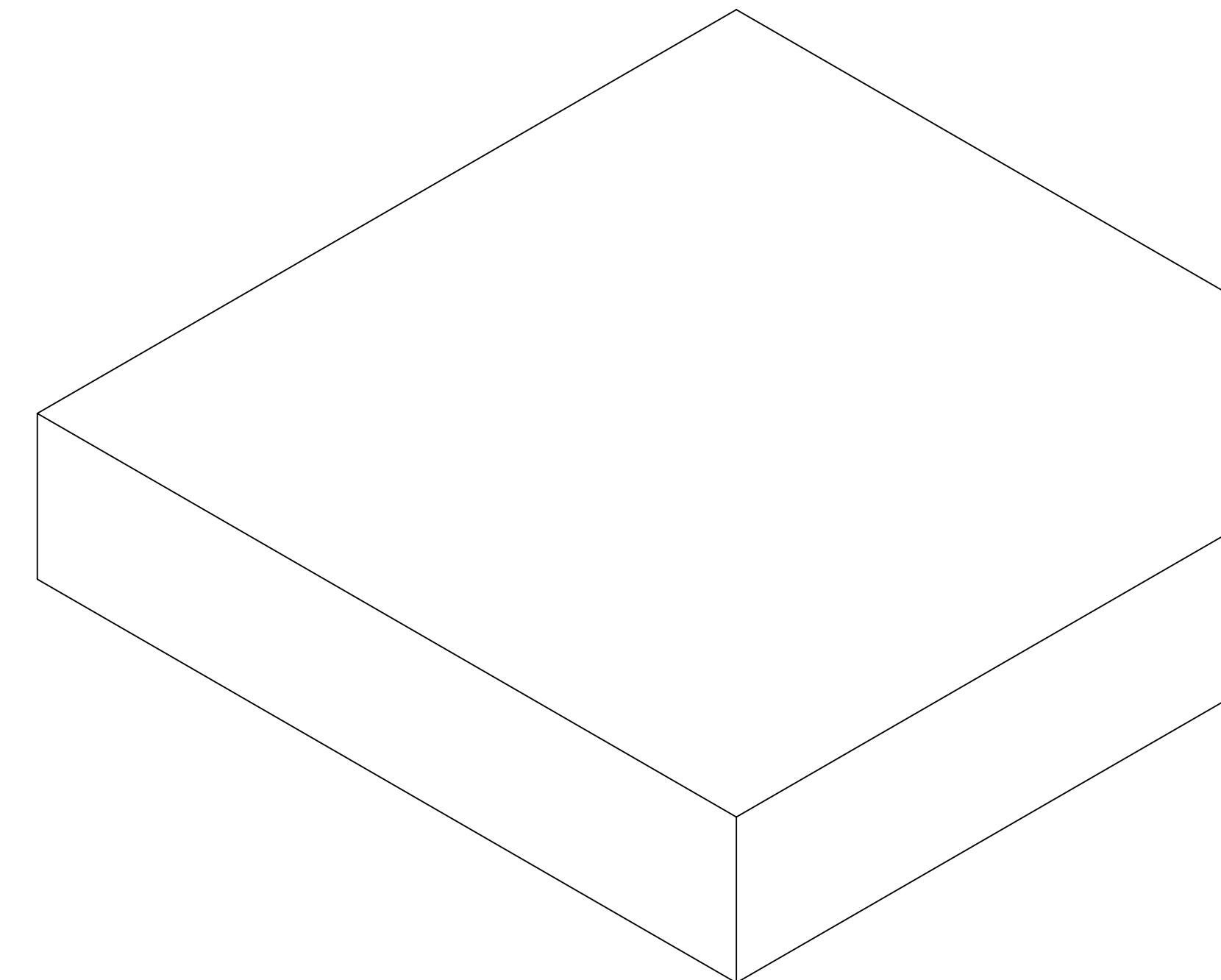
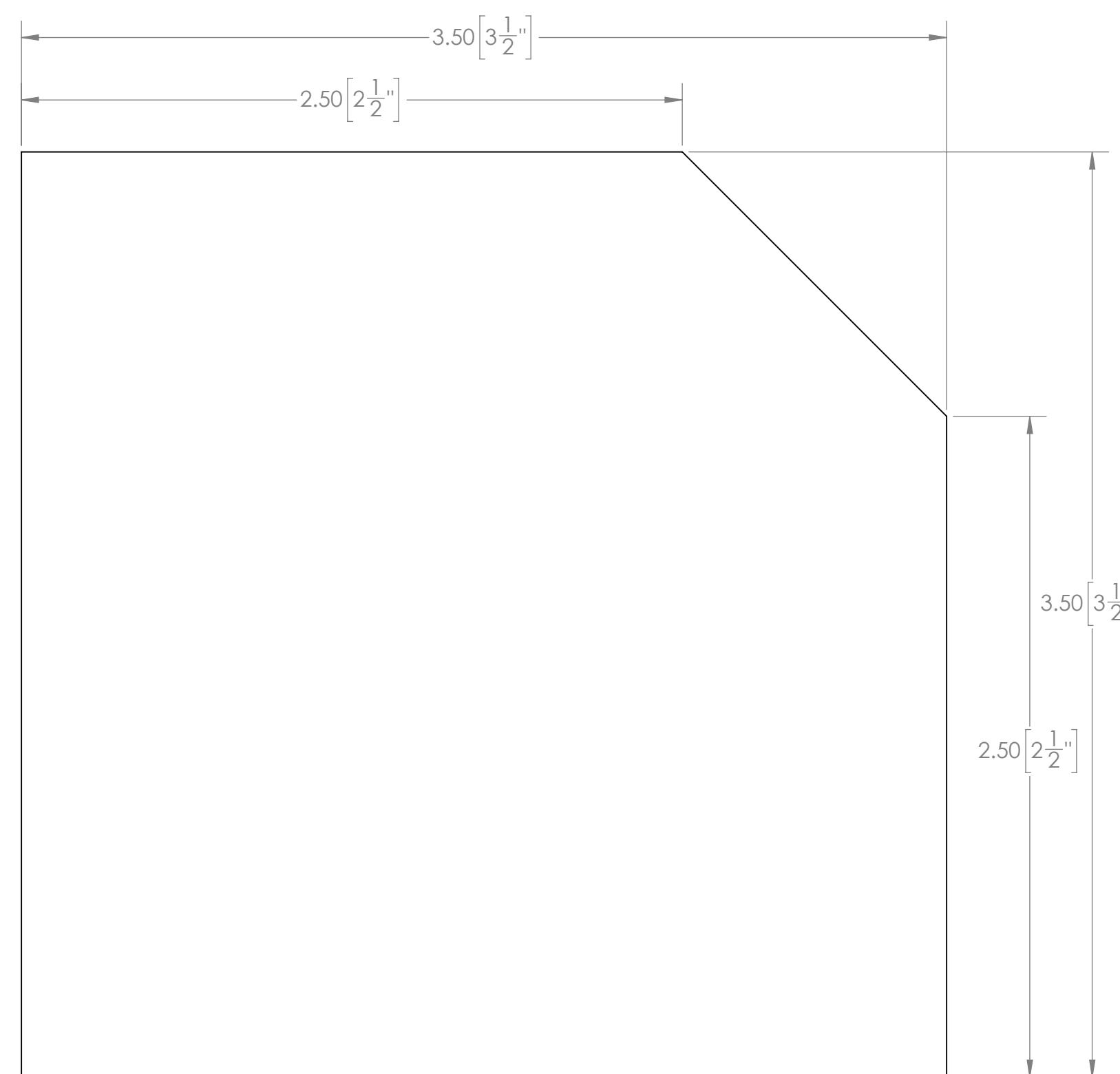
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DIMENSIONS ARE IN INCHES	DRAWN	KAMC	12/29/2021
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MATERIAL/FINISH:	SIZE	DWG. NO.	REV
3/4" Plywood	C	TE-22032	
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING		SCALE: 2:1	SHEET 1 OF 1

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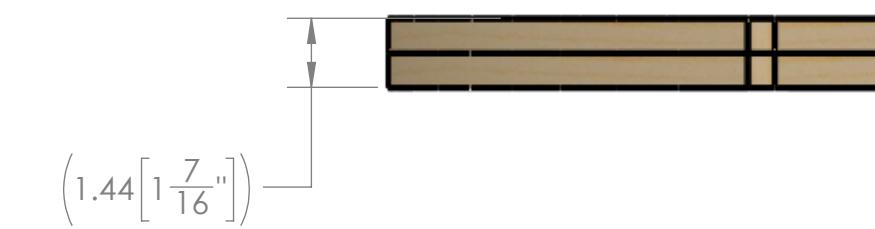
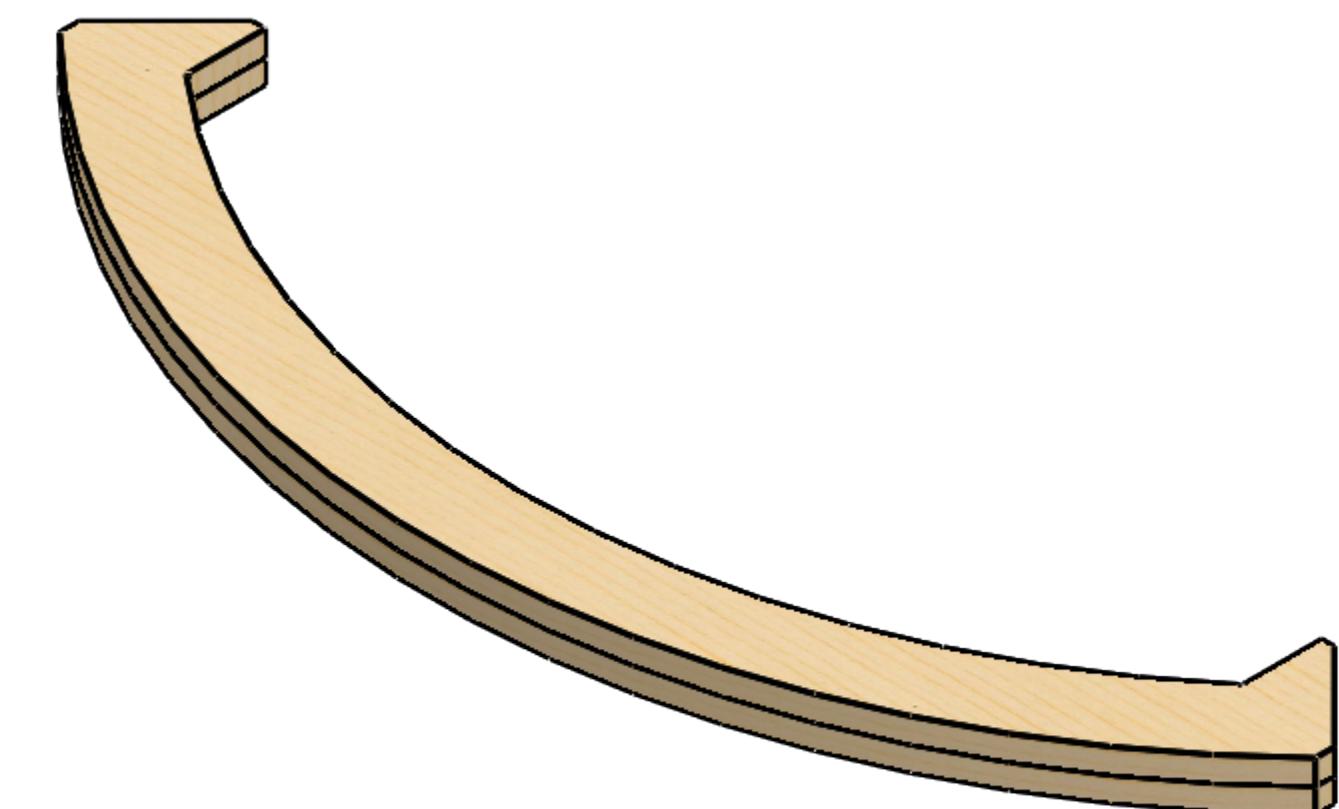
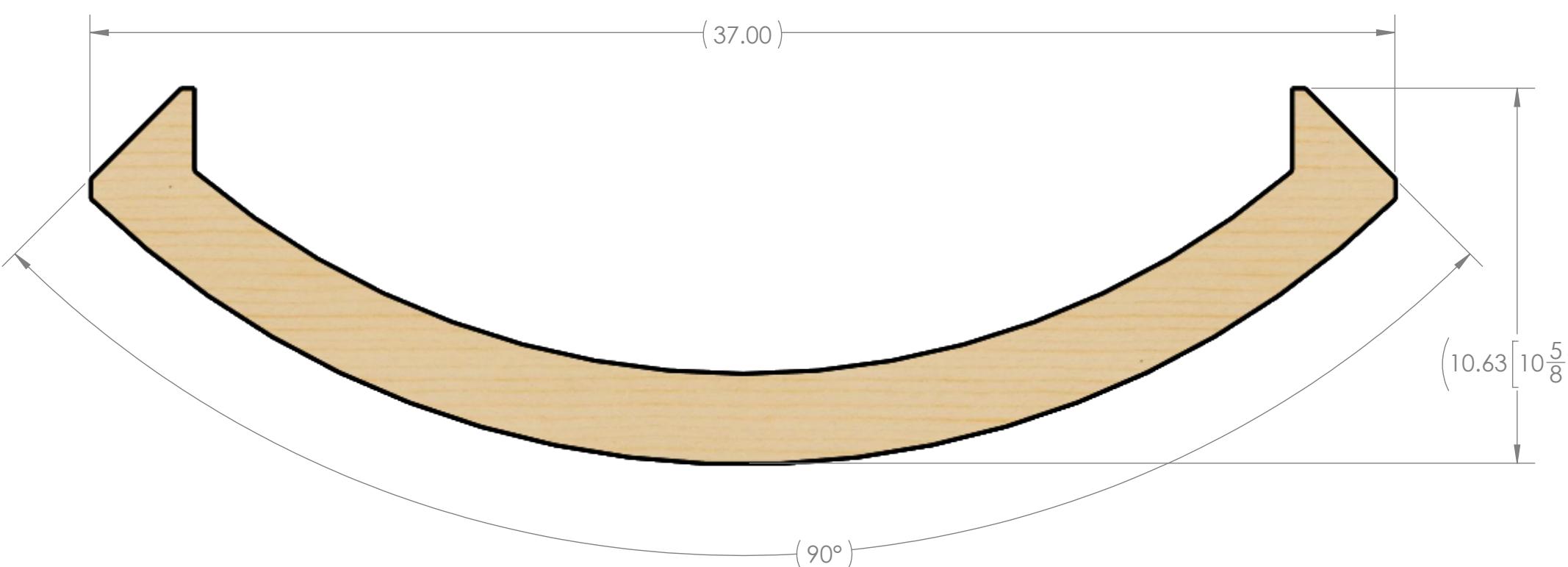
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UNLESS OTHERWISE SPECIFIED:	TEAM	NAME	DATE
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .13$ THREE PLACE DECIMAL $\pm .125$	DRAWN	KAMC	12/30/2021
PROPRIETARY AND CONFIDENTIAL			
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COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			
 FIRST ROBOTICS COMPETITION  TITLE: Hub - Simple Build - Upper Hub Ring Assembly SIZE DWG. NO. REV C TE-22033			
SCALE: 1:4 SHEET 2 OF 2			

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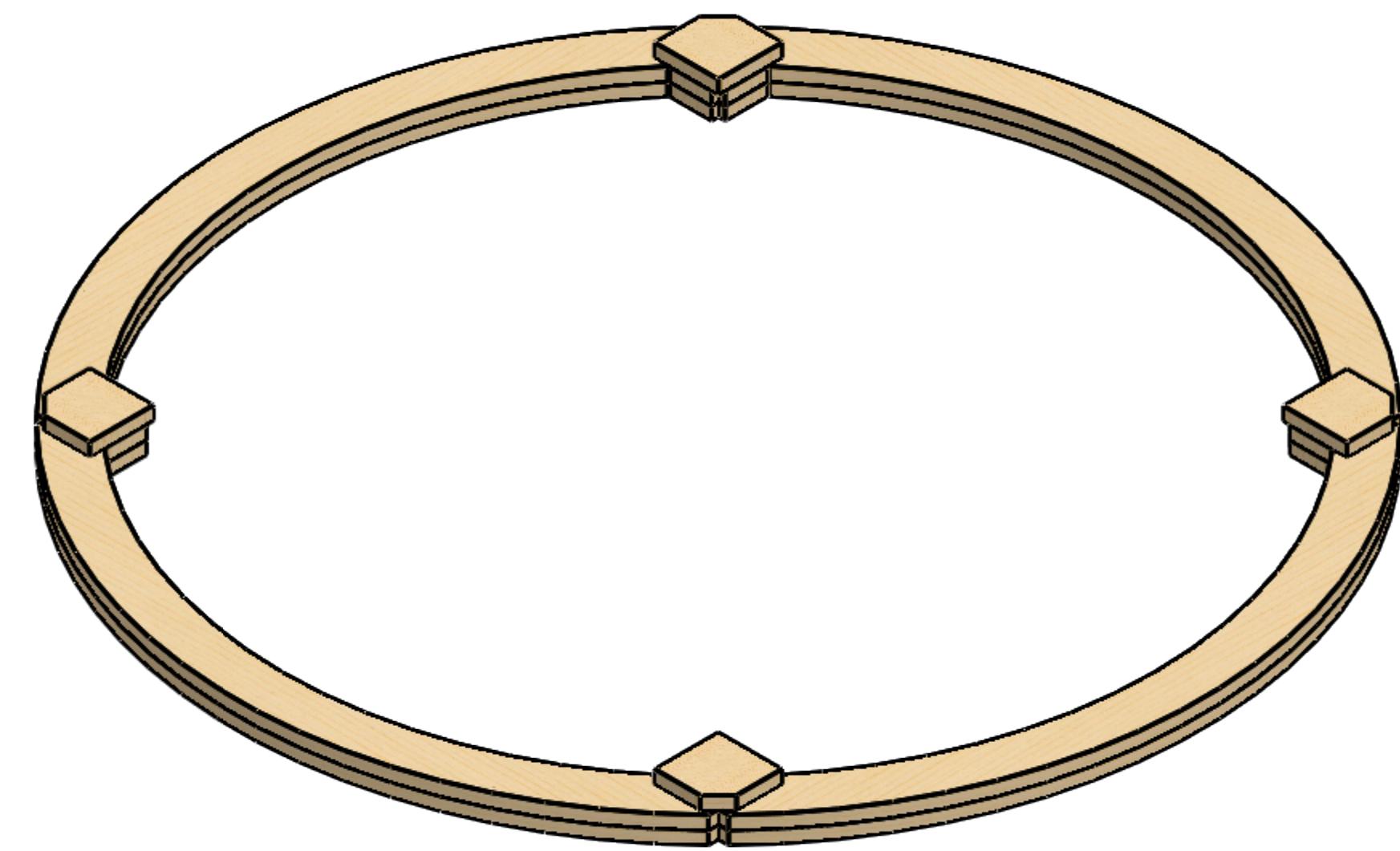
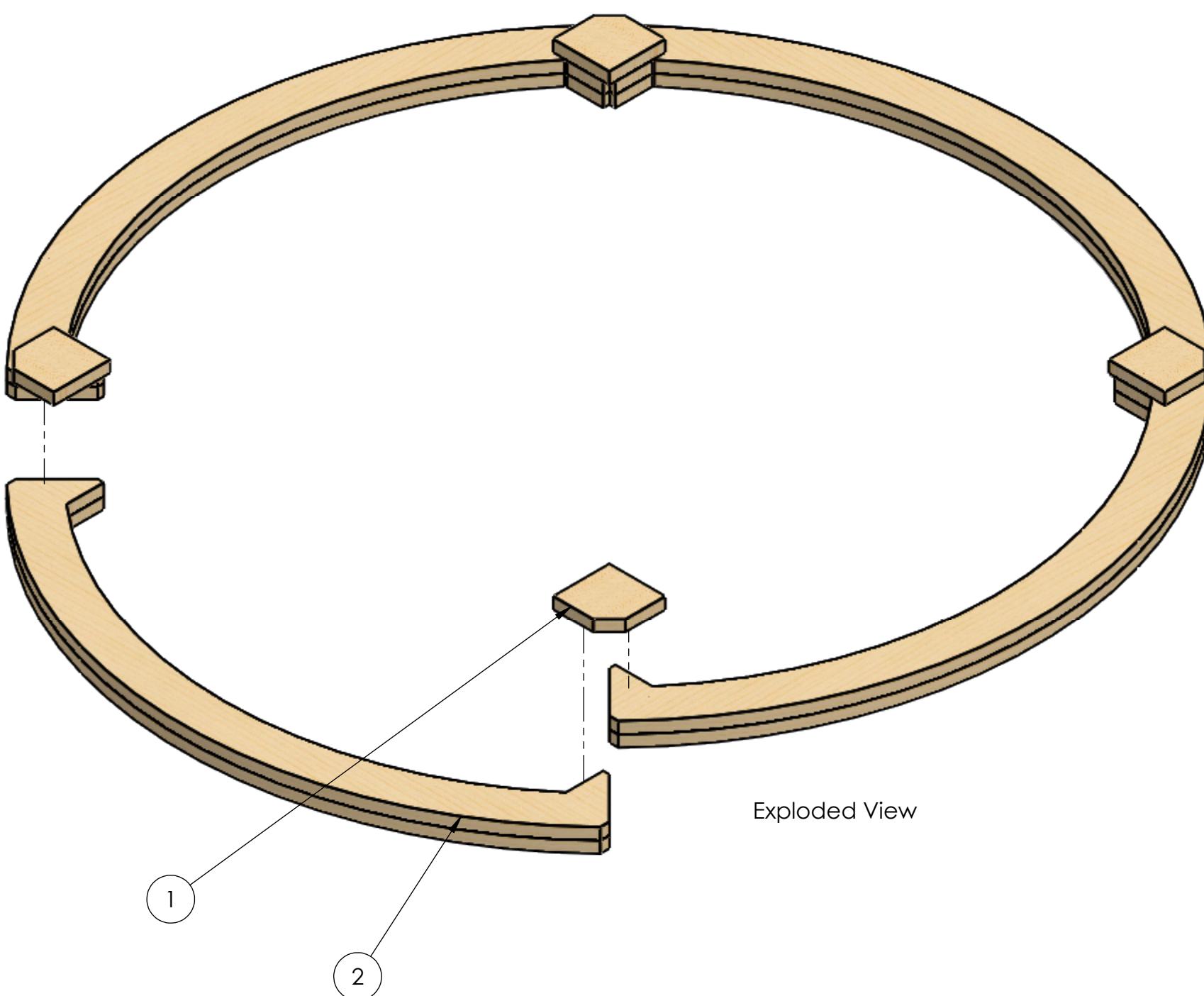
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Hardware Needed:
#8 x 2" Long Screw - Qty 8

ITEM NO.	PART NUMBER	DESCRIPTION	
1	TE-22032	Hub - Simple Build - Upper Hub Ring Connection Plate	4
2	TE-22033	Hub - Simple Build - Upper Hub Ring Assembly	4

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			DRAWN	KAMC	12/30/2021	
PROPRIETARY AND CONFIDENTIAL						
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST IS PROHIBITED.						
MATERIAL/FINISH:						TITLE: Hub - Simple Build - Upper Hub Full Ring Assembly
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.						
DO NOT SCALE DRAWING			SIZE	DWG. NO.	REV	
			C	TE-22034		
			SCALE: 1:6	SHEET 1 OF 3		

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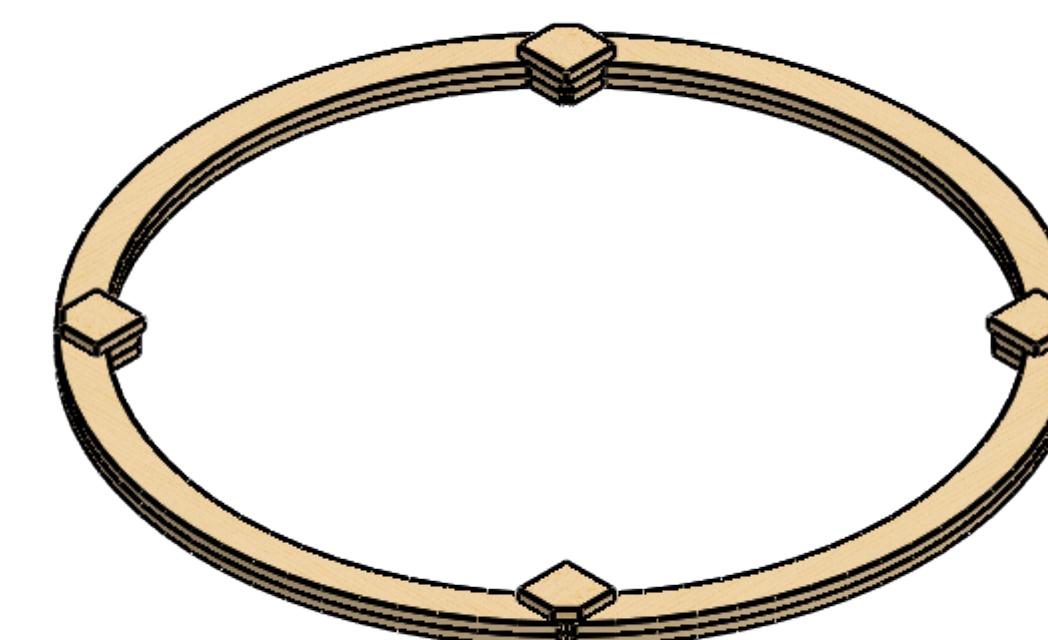
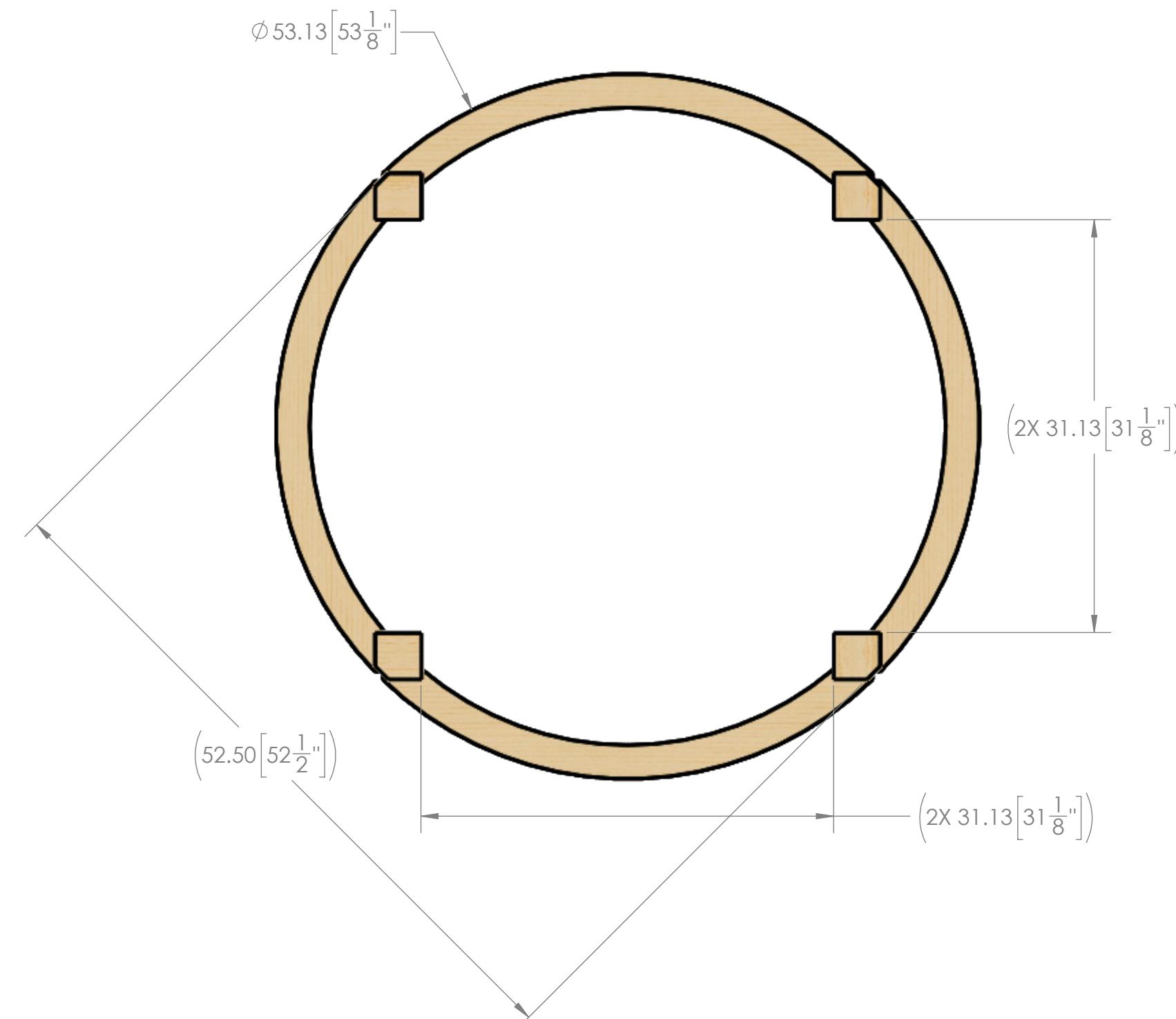
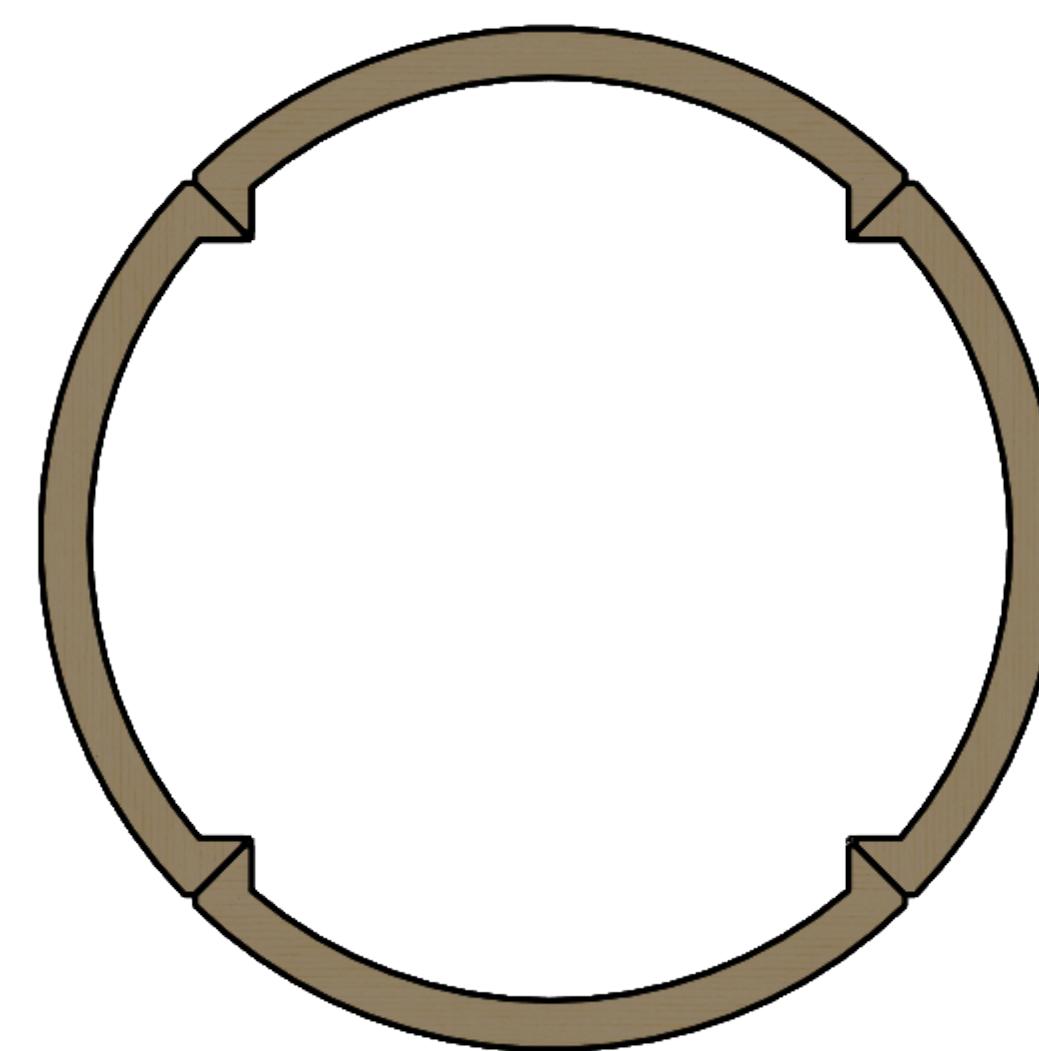
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DIMENSIONS ARE IN INCHES	DRAWN	KAMC	12/30/2021
TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$			
TWO PLACE DECIMAL $\pm .13$ THREE PLACE DECIMAL $\pm .125$			
MATERIAL/FINISH:			
PROPRIETARY AND CONFIDENTIAL THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
Hub - Simple Build -
Upper Hub Full Ring
Assembly

SIZE DWG. NO. REV
C TE-22034

SCALE: 1:10 SHEET 2 OF 3

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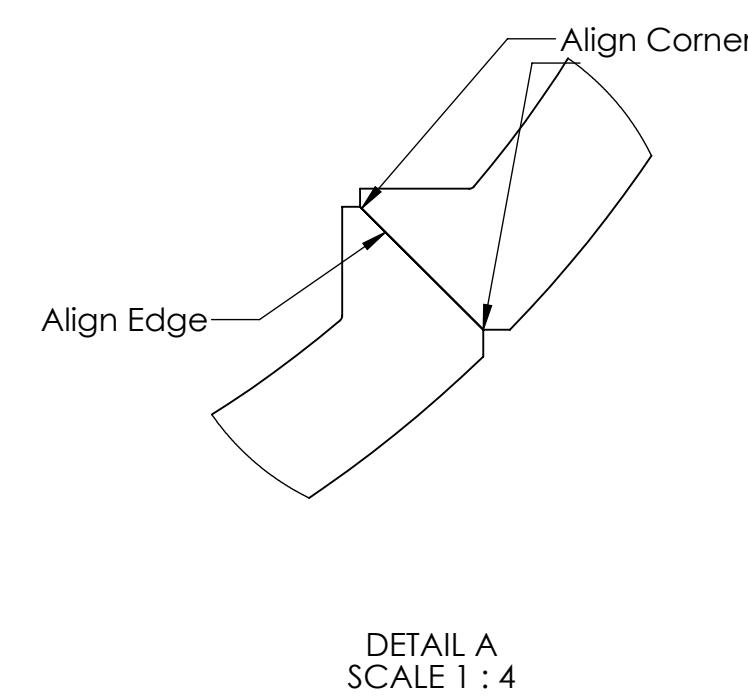
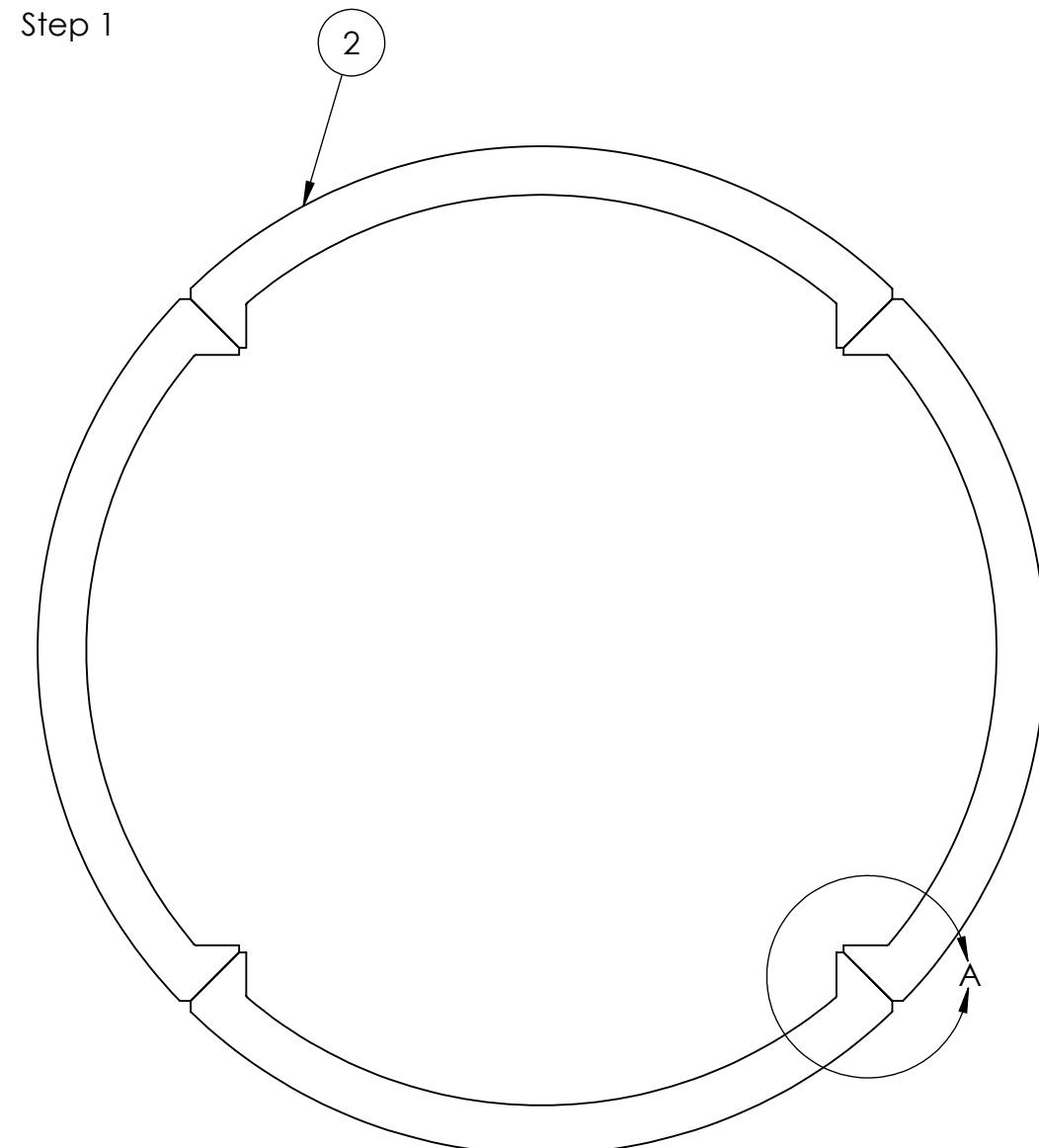
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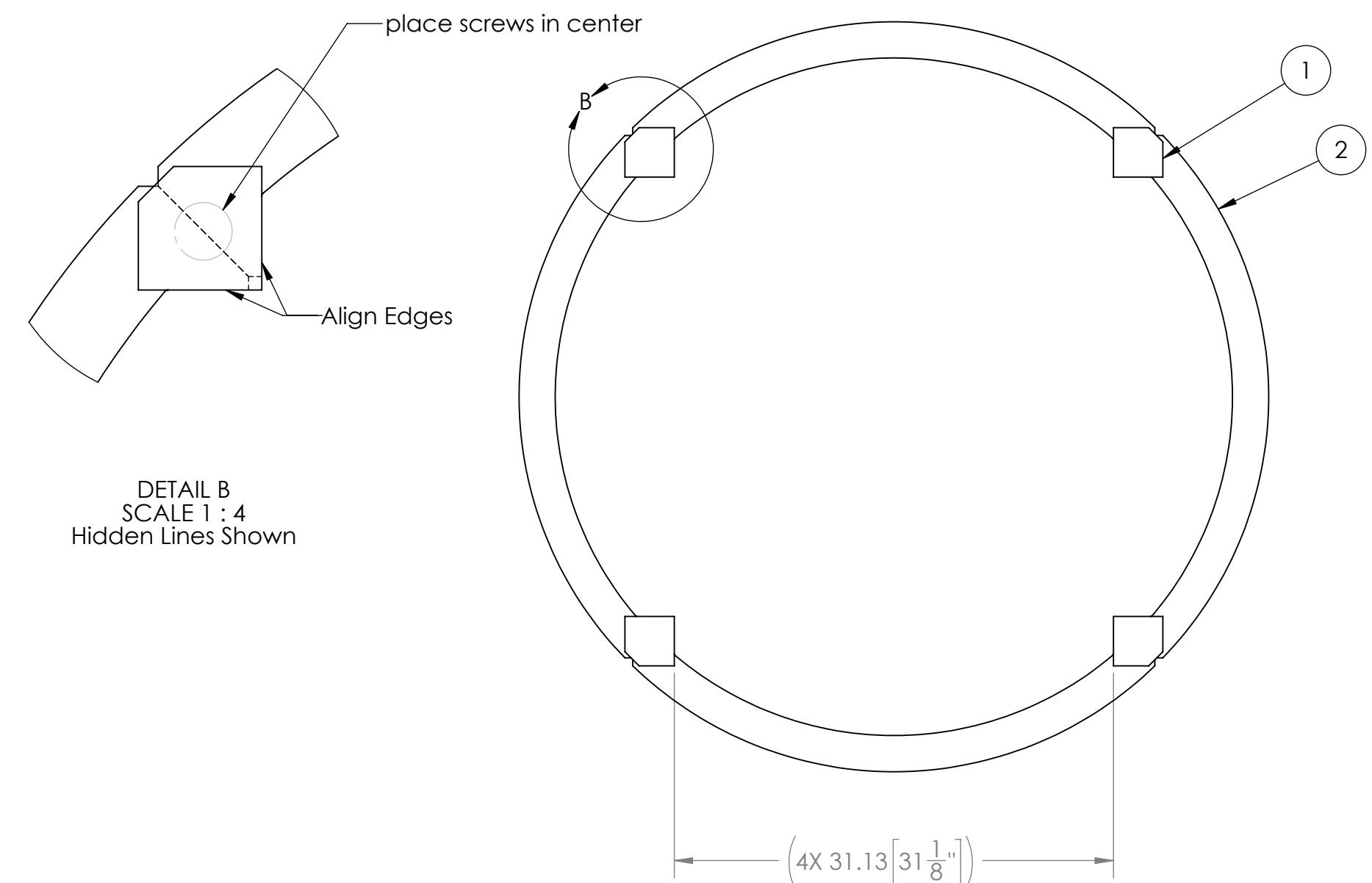
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Step 2



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), one into each (2). This will ensure there is room for connection when added to TE-22030.

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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 - Upper Hub Full Ring Assembly

SIZE DWG. NO. REV

C TE-22034

SCALE: 1:10 SHEET 3 OF 3

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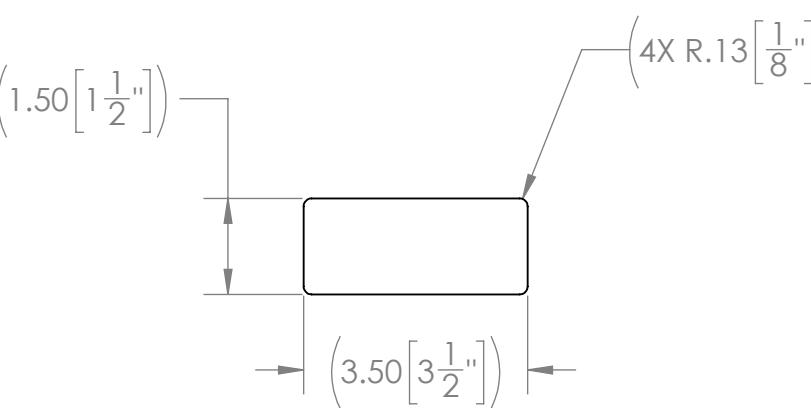
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30.50 [$30\frac{1}{2}''$]

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MATERIAL/FINISH:	SIZE	DWG. NO.	REV
2"x4" Lumber	C	TE-22035	
COMMENTS:		SCALE: 1:3	
REMOVE ALL BURRS AND SHARP EDGES.		SHEET 1 OF 1	
DO NOT SCALE DRAWING			

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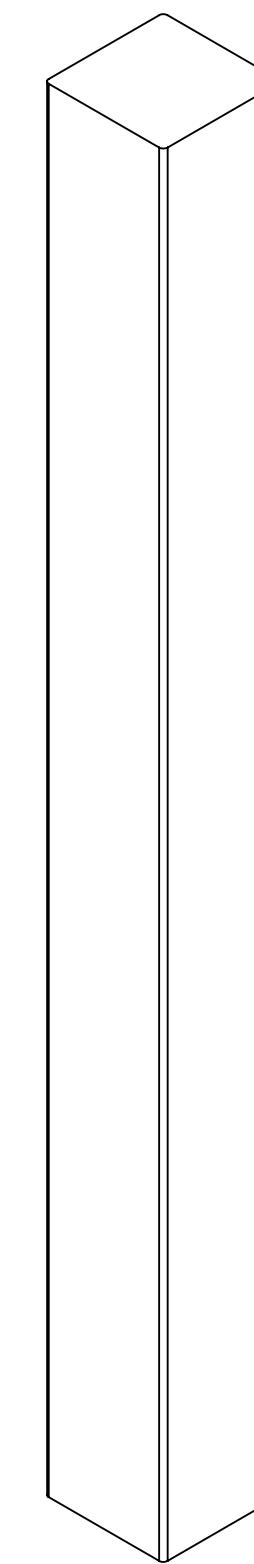
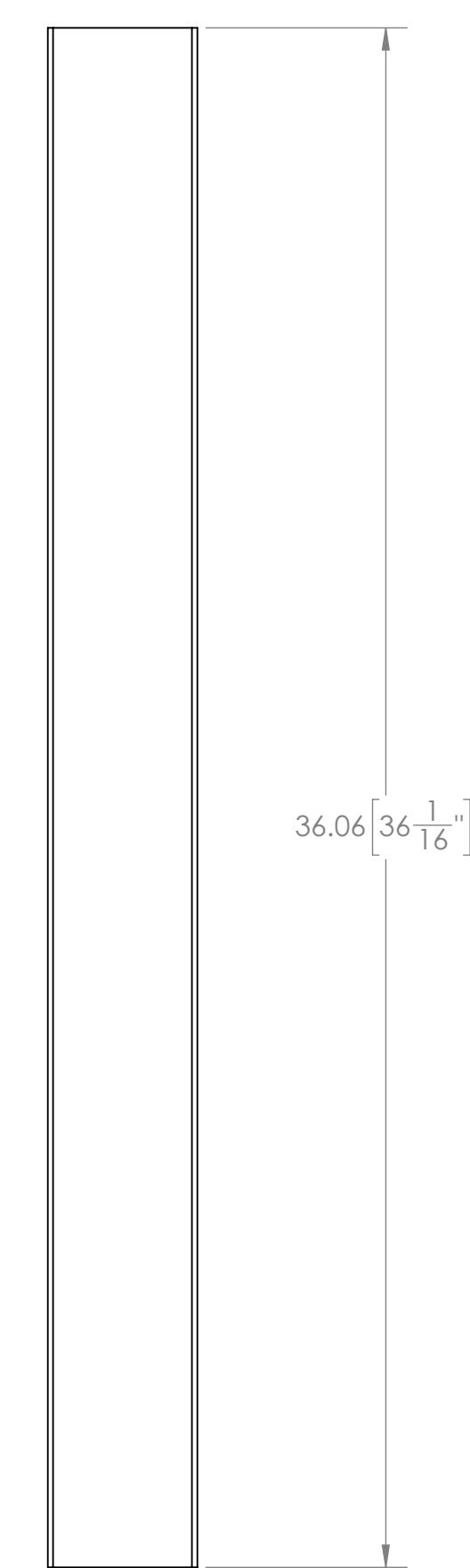
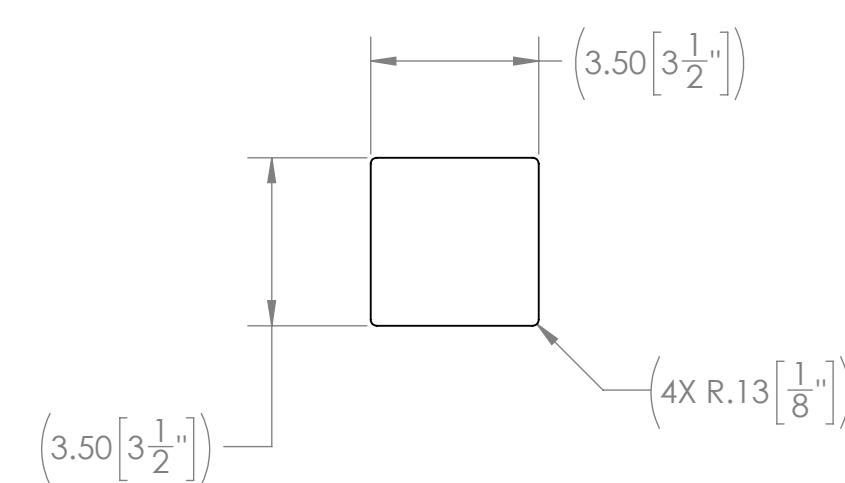
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PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH: 4"x4" Lumber			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
Hub - Simple Build -
Upper Hub Goal 4x4

SIZE DWG. NO. REV

C TE-22036

SCALE: 1:4 SHEET 1 OF 1

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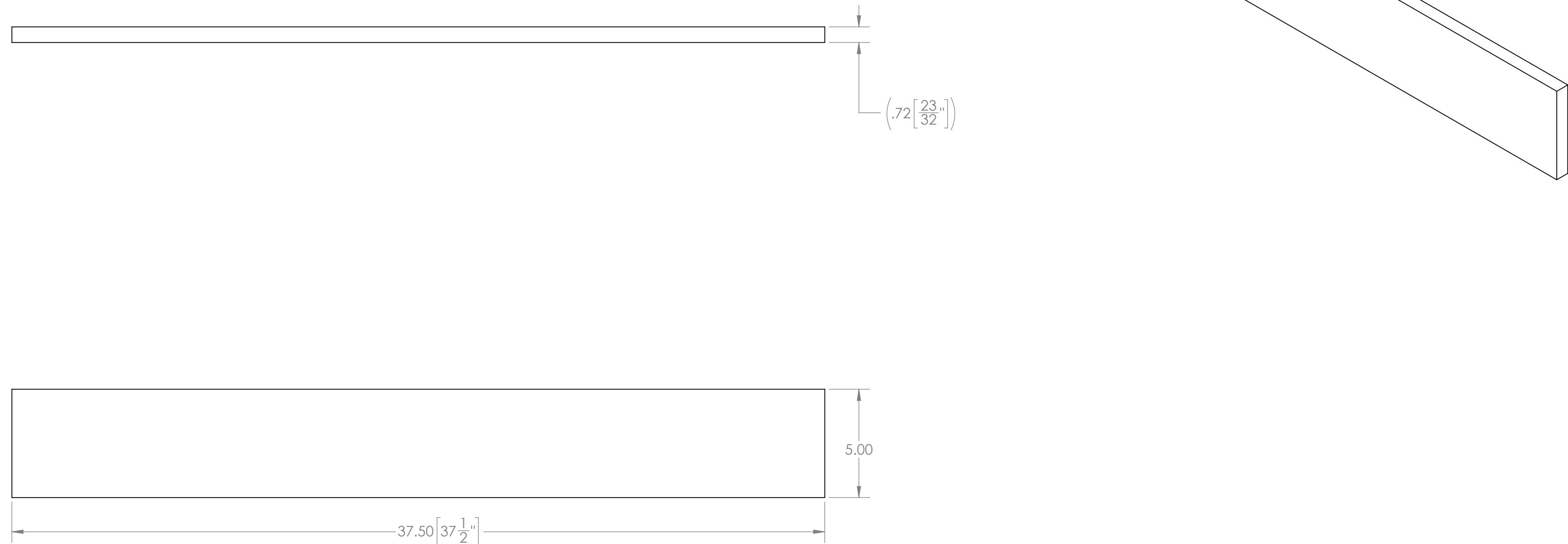
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DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .13$ THREE PLACE DECIMAL $\pm .125$	DRAWN	KAMC	12/29/2021
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH: 3/4" Plywood	SIZE	DWG. NO.	REV
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.	C	TE-22037	
DO NOT SCALE DRAWING	SCALE: 1:4	SHEET 1 OF 1	

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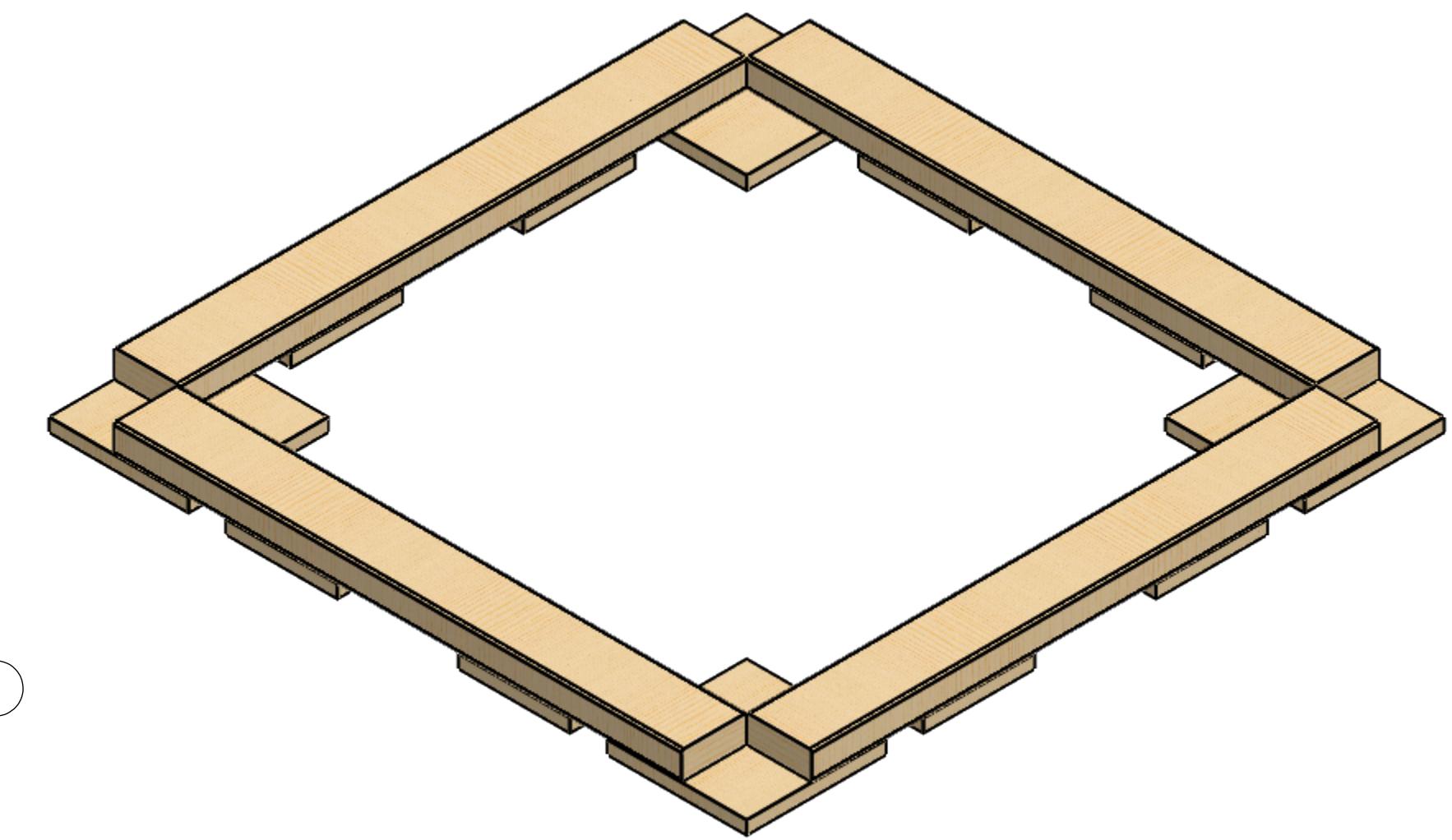
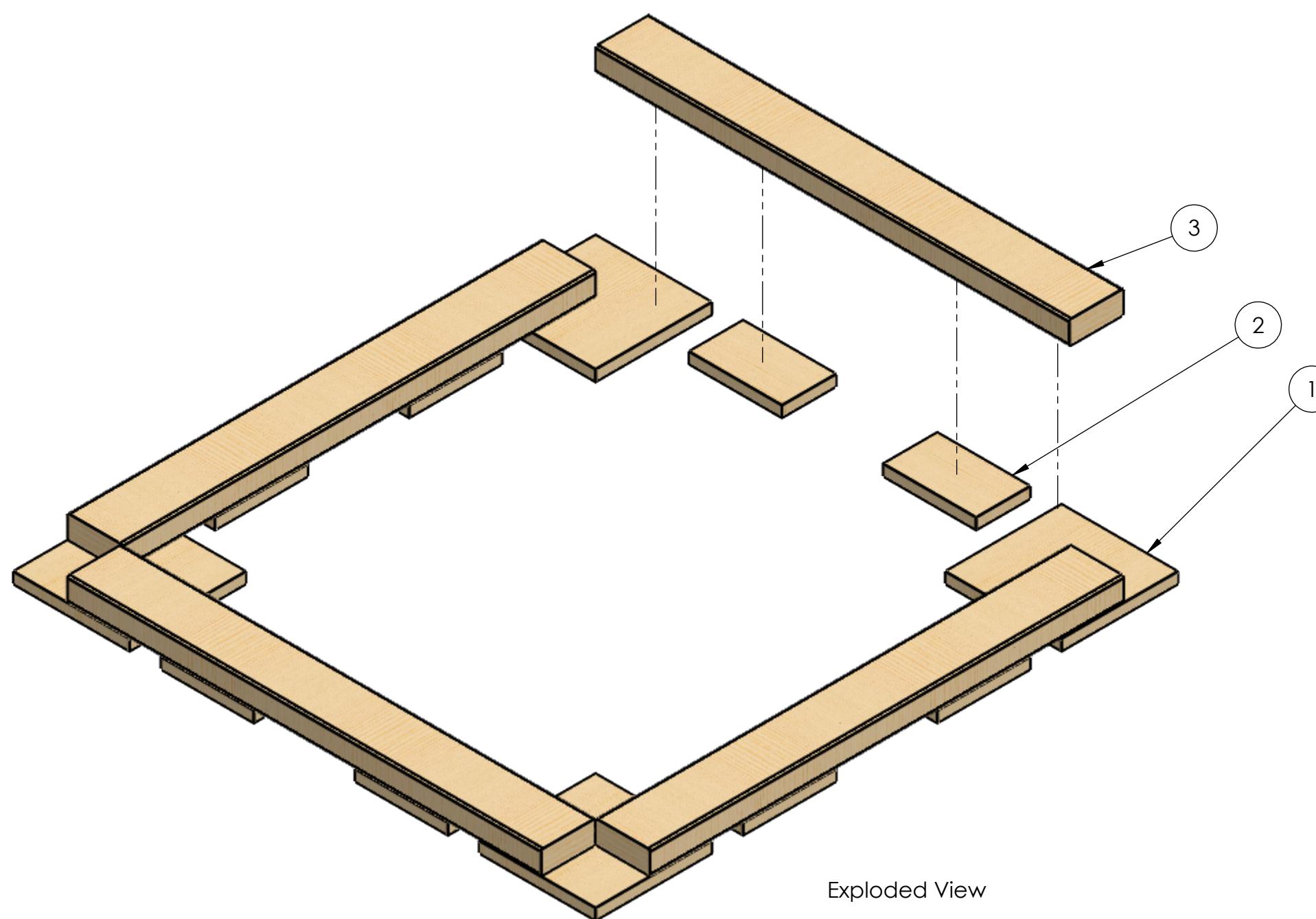
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Hardware Needed:
#8 x 2" Long Screw - Qty 58

ITEM NO.	PART NUMBER	DESCRIPTION	
1	TE-22005	Hub - Simple Build - Upper Hub Square Connection Plate	4
2	TE-22006	Hub - Simple Build - Upper Hub 2x4 Connection Plate	8
3	TE-22035	Hub - Simple Build - Upper Hub Goal 2x4	4

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COMMENTS:								
REMOVE ALL BURRS AND SHARP EDGES.								
DO NOT SCALE DRAWING			SIZE	DWG. NO.	REV			
			C	TE-22038				
			SCALE: 1:6	SHEET 1 OF 3				

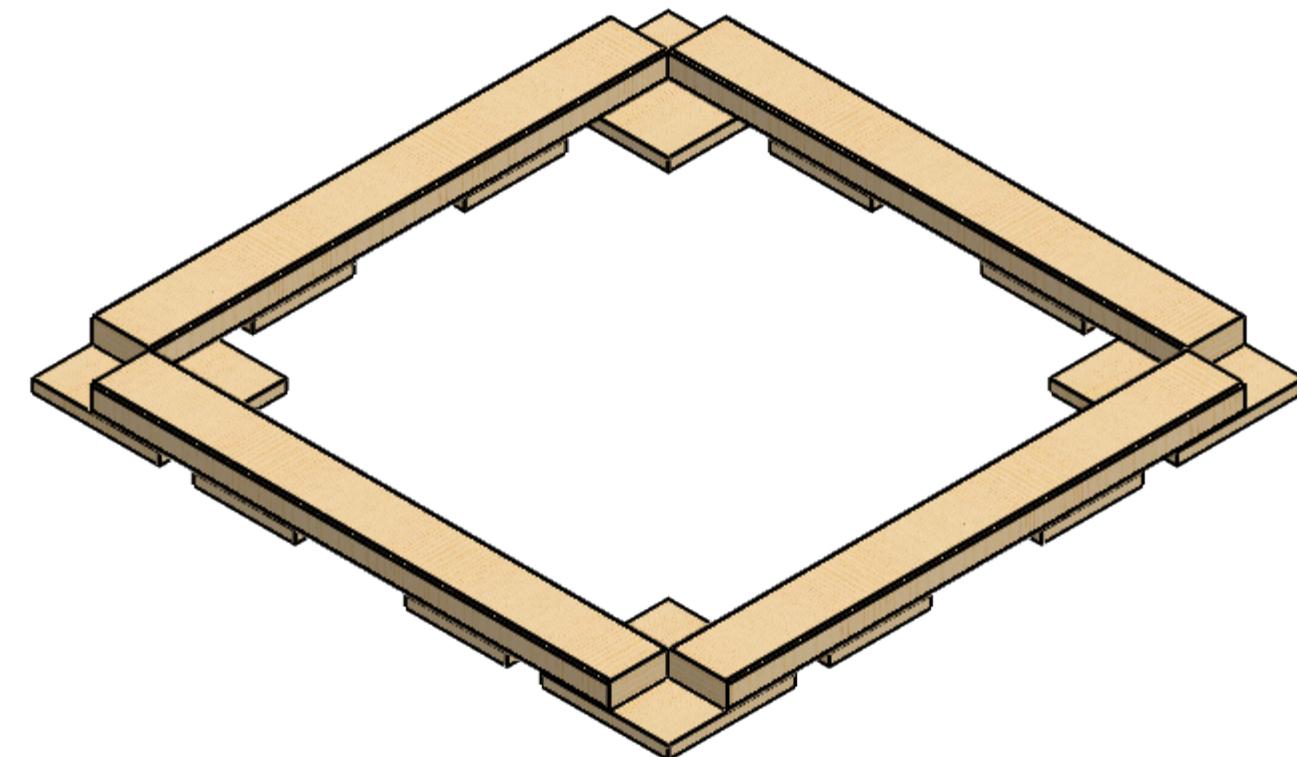
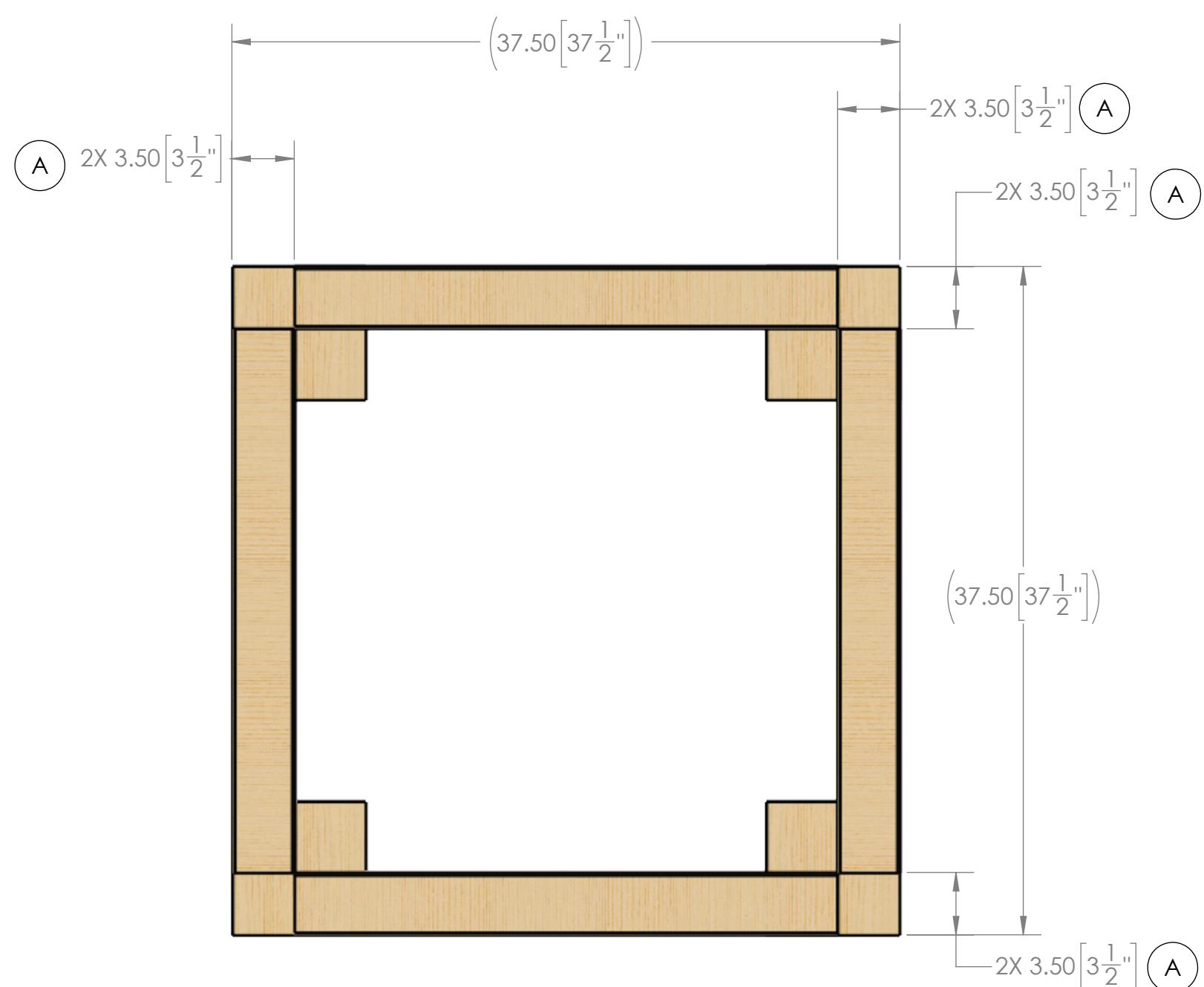
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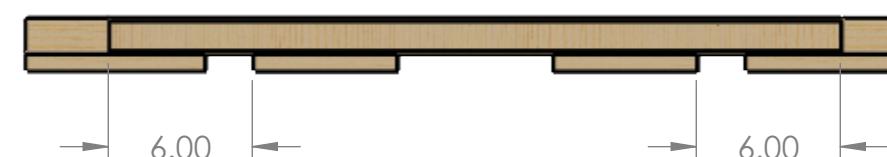
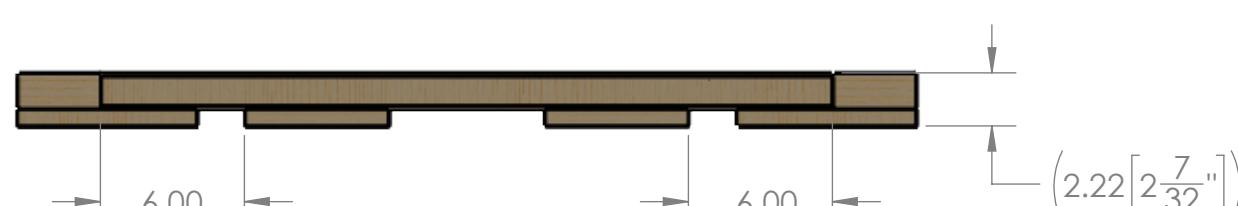
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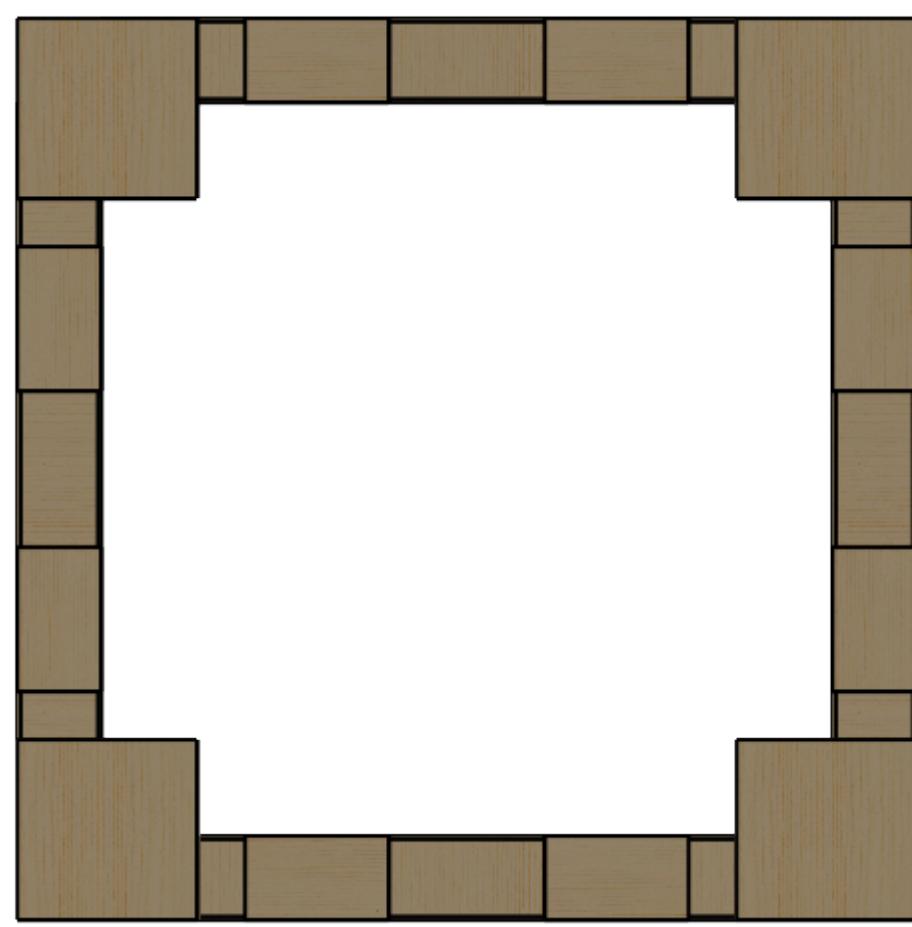
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MATERIAL/FINISH:			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

Note:

Dimensions with (A) indicate spacing for 4"x4" lumber from TE-22036 (or TE-22036-AM if you are connecting to AndyMark's Upper Hub Vision Ring AM-4672). It is recommended to measure the cross section of TE-22036 (or TE-22036-AM) and modify these dimensions as needed.

FIRST
ROBOTICS
COMPETITION

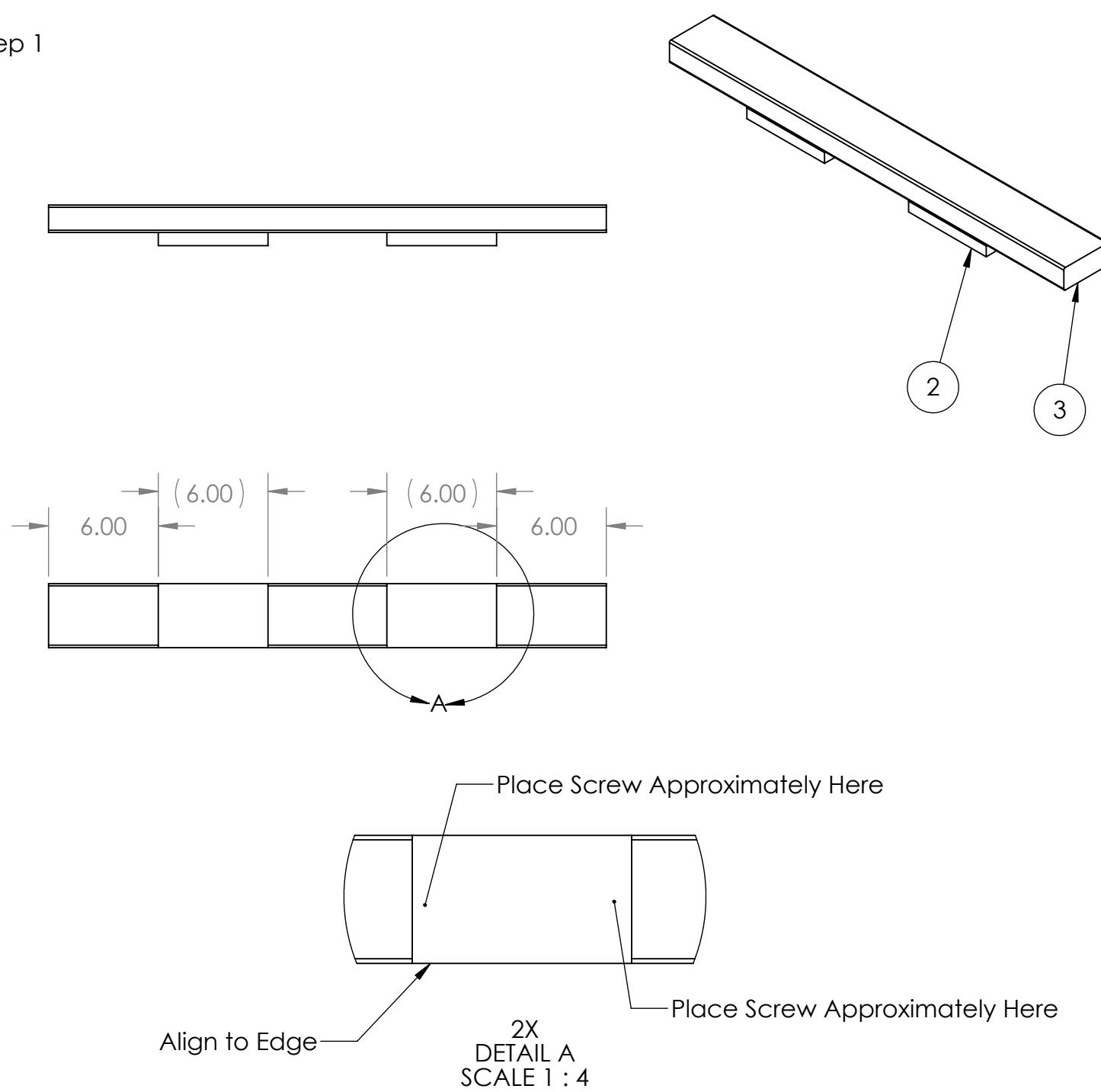
SOLIDWORKS
Modeling Solutions Partner

TITLE:
Hub - Simple Build -
Upper Hub Goal
Bottom Assembly

SIZE DWG. NO. REV
C TE-22038

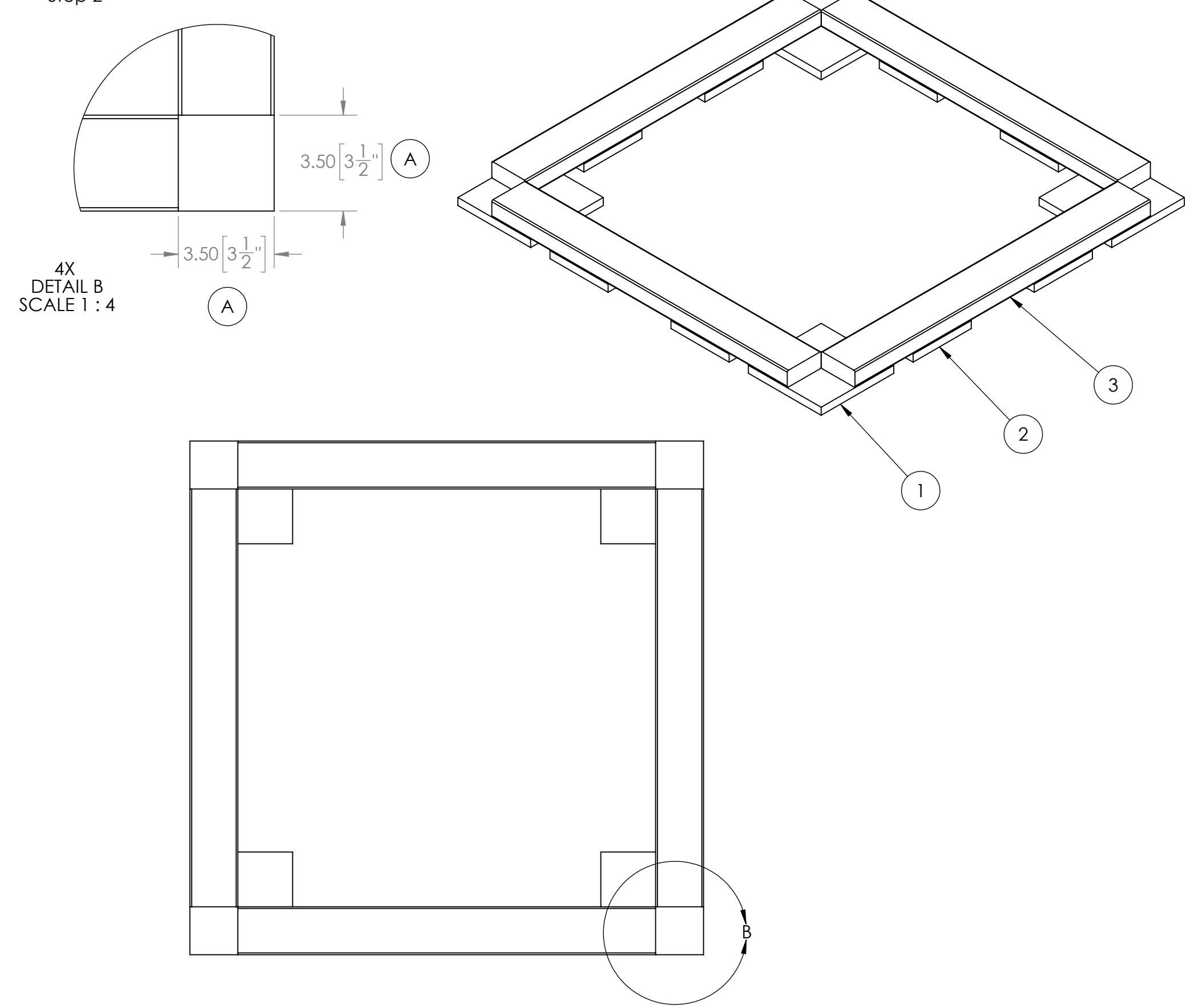
SCALE: 1:8 SHEET 2 OF 3

Step 1



1. Align 2x (2) on (3), as shown.
2. Connect using 2" long screws. It is recommended to use 2x screws per (2) and locate them as shown above. Keep center of (2) clear of screws.
3. Repeat until you have a total of 4x sub-assemblies.

Step 2



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MATERIAL/FINISH:			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING	SIZE	DWG. NO.	REV
	C	TE-22038	
	SCALE: 1:8	SHEET 3 OF 3	

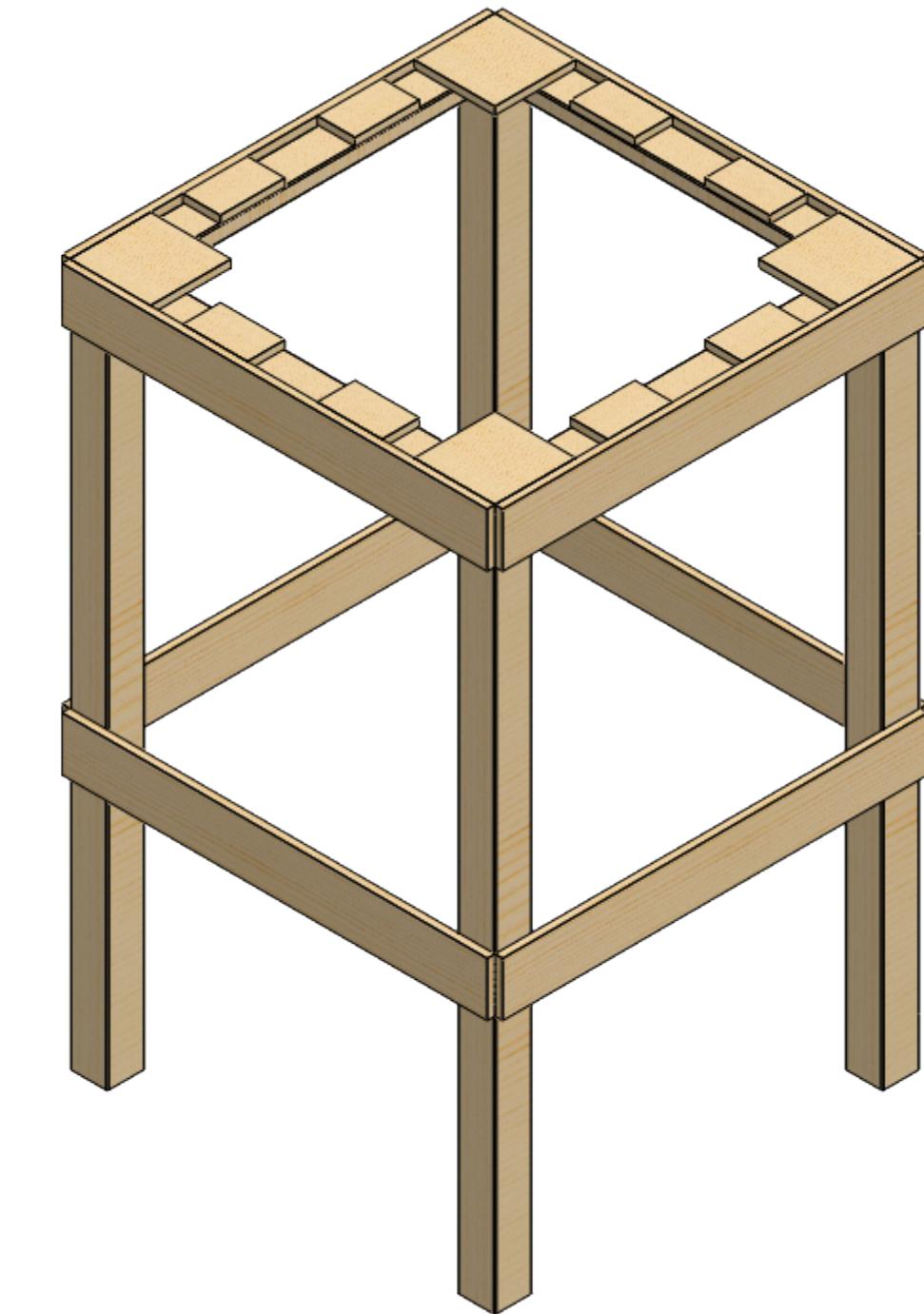
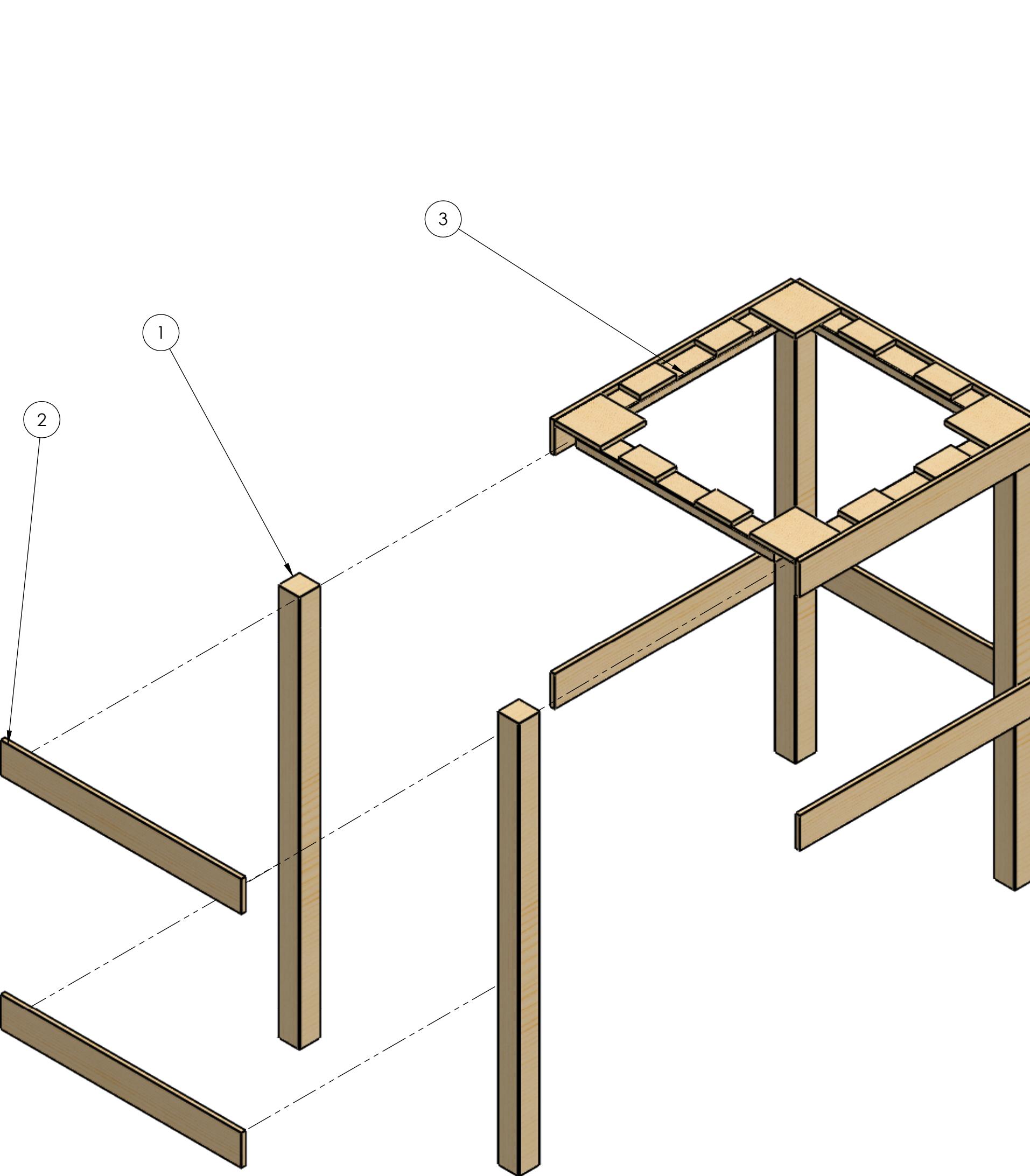
FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
Hub - Simple Build -
Upper Hub Goal
Bottom Assembly

SIZE DWG. NO. REV

C TE-22038



Hardware Needed:
 #8 x 1.25" Long Screw - Qty 12
 #8 x 2" Long Screw - Qty 80

ITEM NO.	PART NUMBER	DESCRIPTION	
1	TE-22042	Hub - Simple Build - Upper Hub Base 4x4	4
2	TE-22043	Hub - Simple Build - Upper Hub Base Rectangle Connection Plate	8
3	TE-22044	Hub - Simple Build - Upper Hub Base Top Assembly	1

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			DRAWN	KAMC	12/30/2021	 SOLIDWORKS Modeling Solutions Partner		
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MATERIAL/FINISH:								
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.								
DO NOT SCALE DRAWING								
SIZE	DWG. NO.	REV	TITLE: Hub - Simple Build - Upper Hub Base Assembly					
C	TE-22040							
SCALE: 1:12				SHEET 1 OF 4				

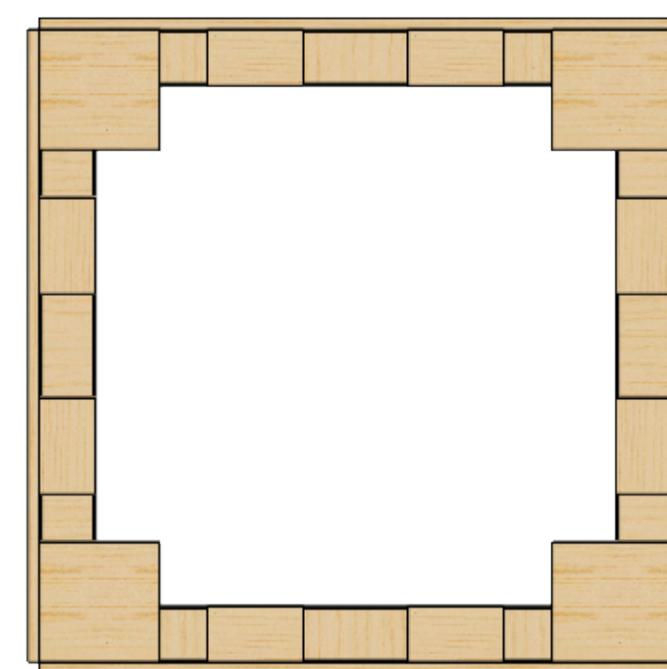
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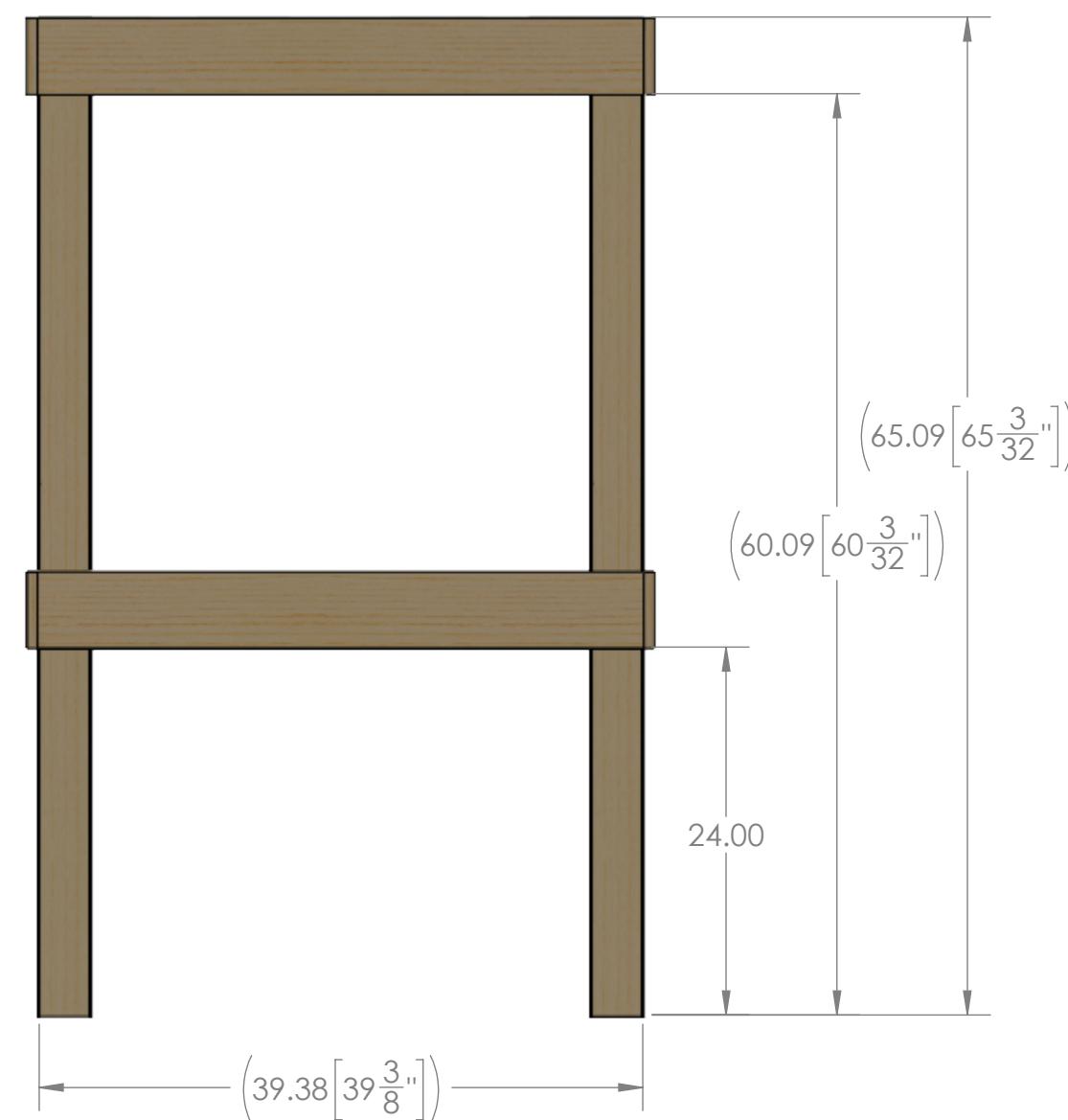
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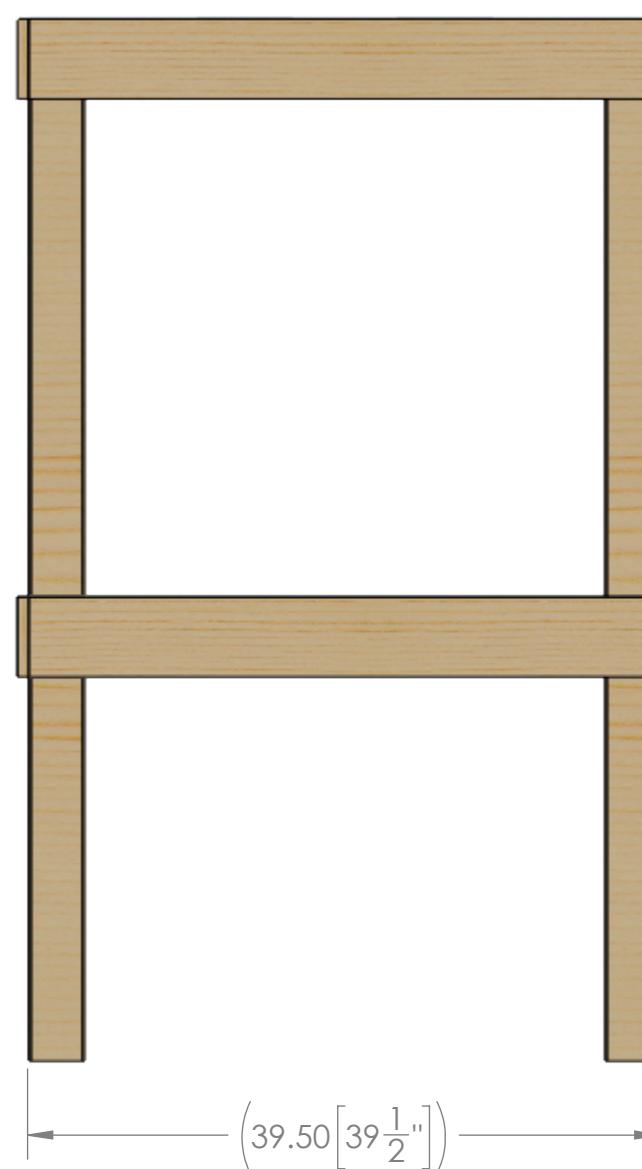
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MATERIAL/FINISH:			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
Hub - Simple Build -
Upper Hub Base
Assembly

SIZE DWG. NO. REV

C TE-22040

SCALE: 1:12 SHEET 2 OF 4

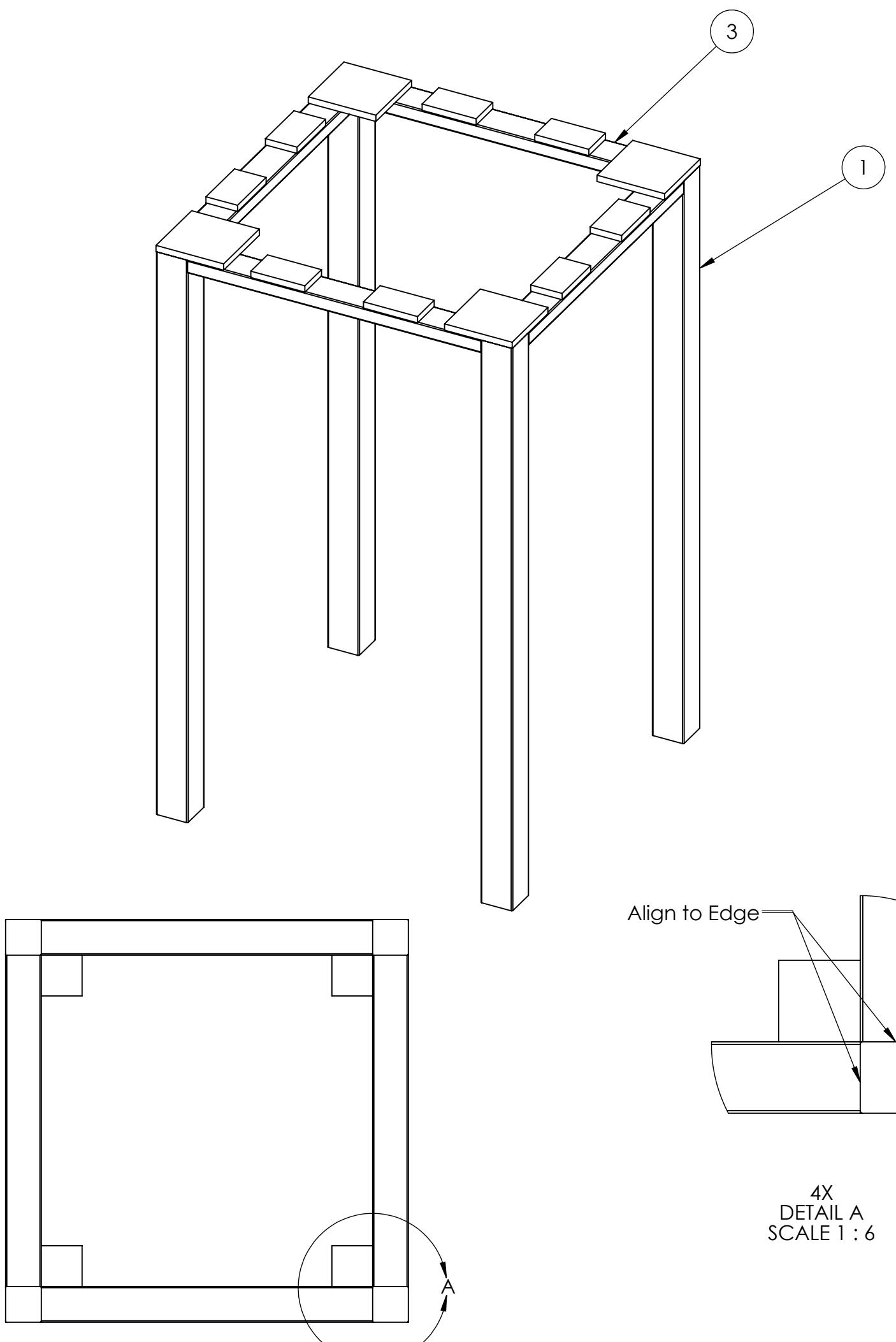
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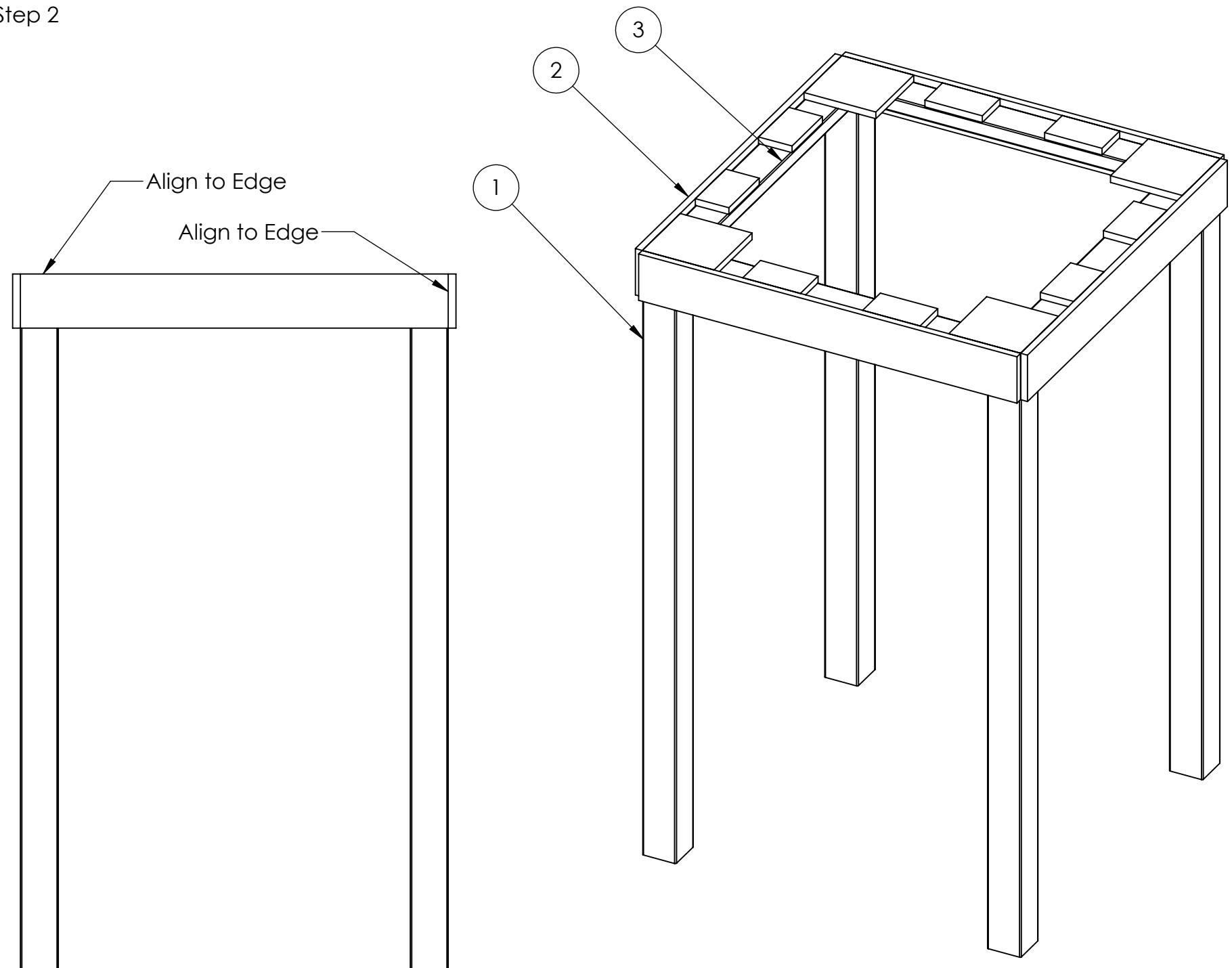
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Step 1



1. Align 4x (1) to (3), as shown.
2. Connect using 2" Long Screws. It is recommended to use 4x screws per (1).

Step 2



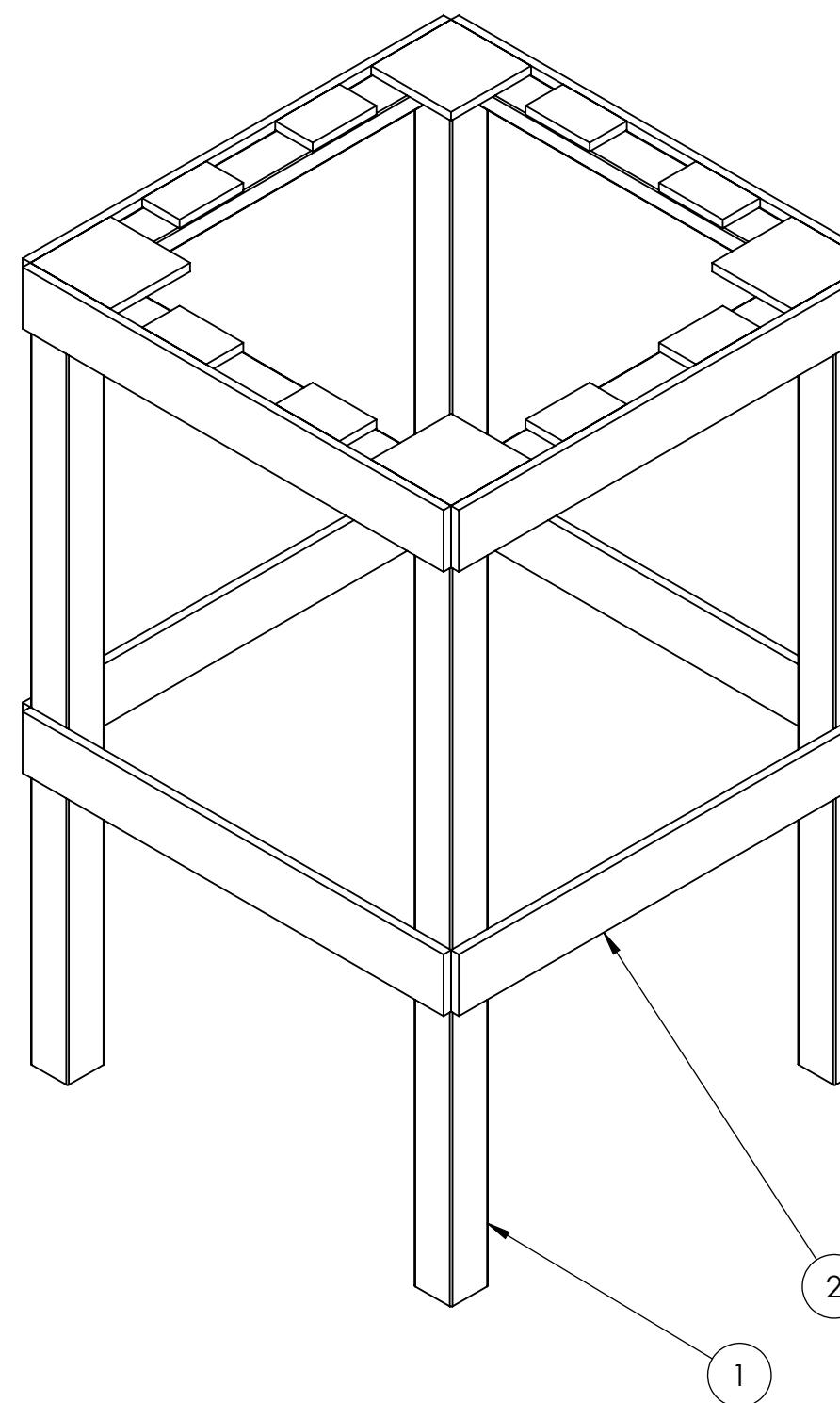
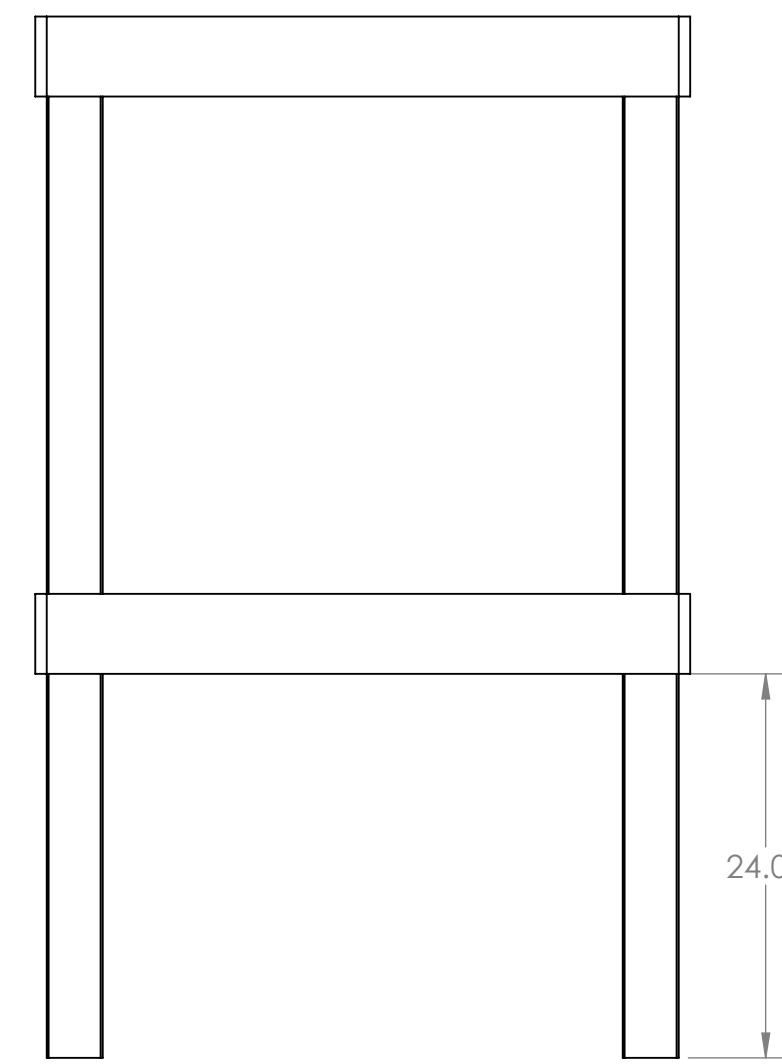
1. Align 4x (2) to Step 1, as shown.
2. Attach (2) to (1) using 2" Long Screws. It is recommended to use 8x screws per (2), 4x into each (1).
3. Attach (2) to the 2"x4" Lumber of (3) using 1.25" long screws. It is recommended to use 3x screws per (2). Be careful to center the screw into the 2"x4" Lumber to avoid splitting the wood.

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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 - Upper Hub Base Assembly	
SIZE	DWG. NO.
C	TE-22040
REV	
SCALE: 1:12	SHEET 3 OF 4

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Step 3



1. Align 4x (2) to Step 2, as shown.
2. Attach (2) to (1) using 2" Long Screws. It is recommended to use 8x screws per (2), 4x into each (1).

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MATERIAL/FINISH:	SIZE	DWG. NO.	REV
	C	TE-22040	
COMMENTS:		SCALE: 1:12	
REMOVE ALL BURRS AND SHARP EDGES.		SHEET 4 OF 4	
DO NOT SCALE DRAWING			

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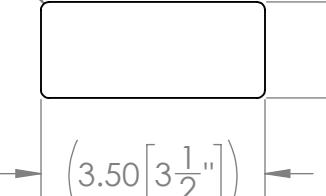
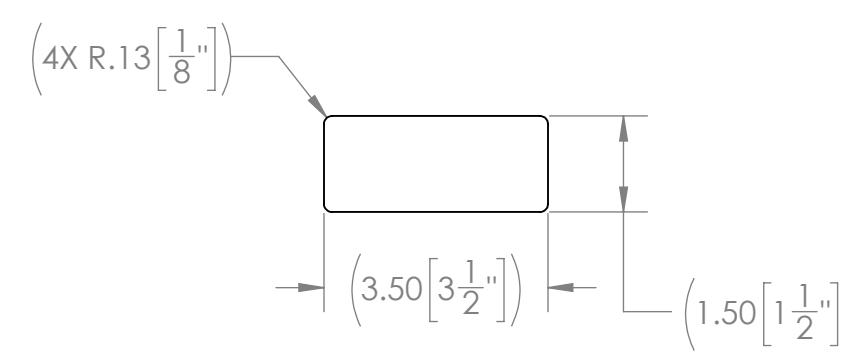
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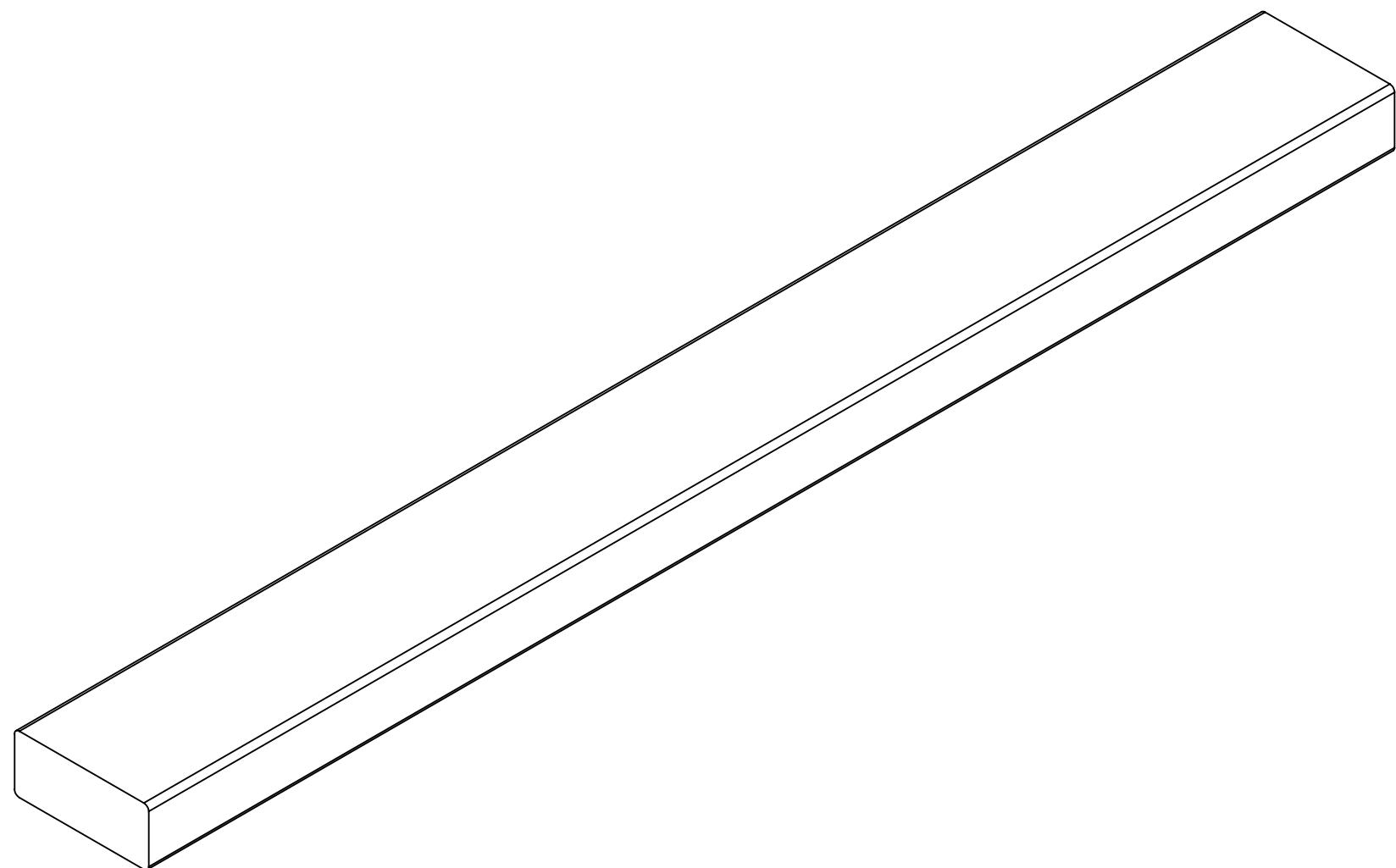
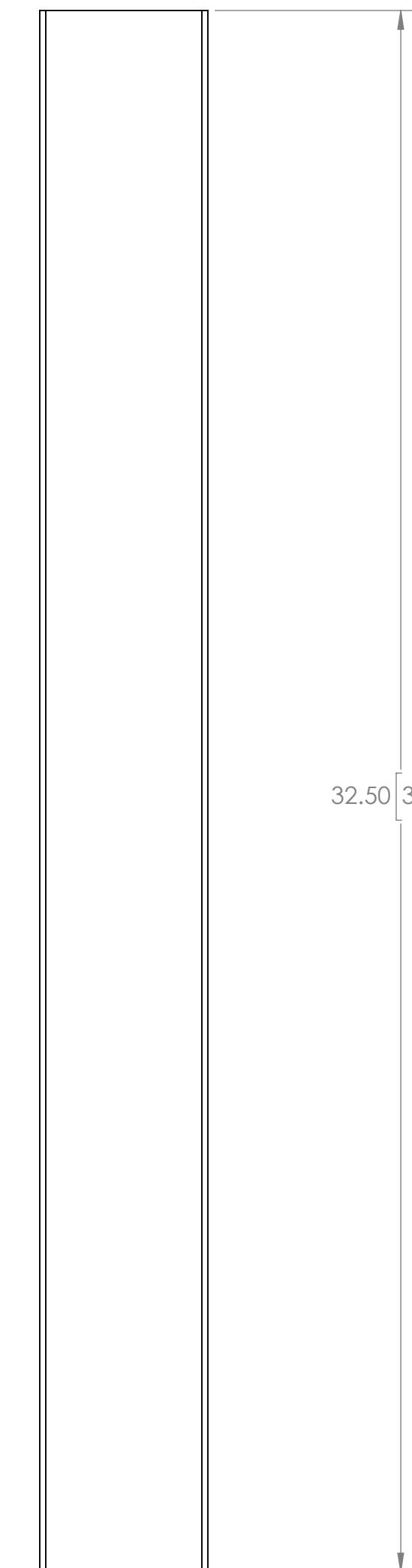
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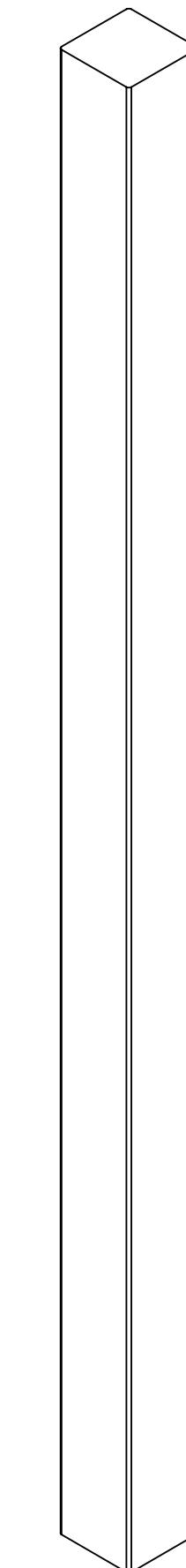
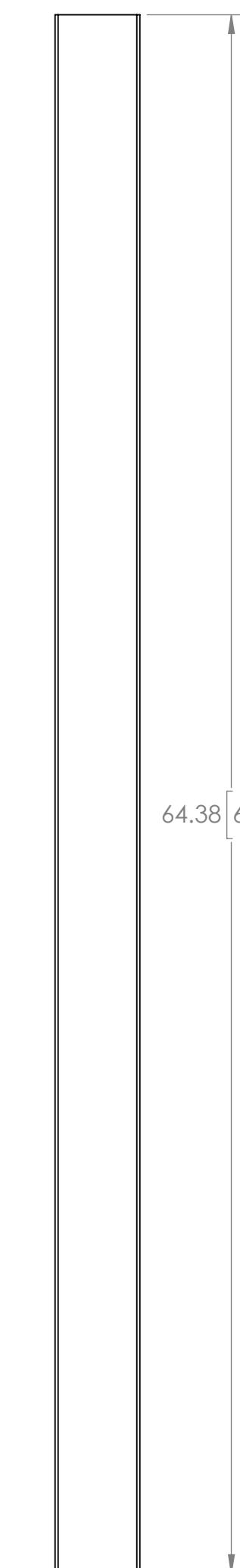
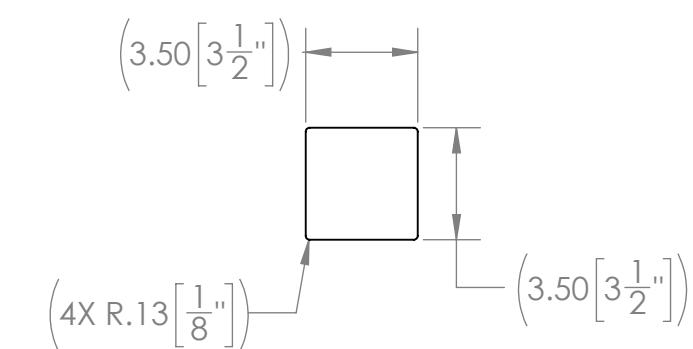


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MATERIAL/FINISH: 2"x4" Lumber		COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.		
DO NOT SCALE DRAWING		TITLE: Hub - Simple Build - Upper Hub Base 2x4		
		SIZE	DWG. NO.	REV
		C	TE-22041	
		SCALE: 1:3		SHEET 1 OF 1

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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: 4"x4" Lumber	SIZE	DWG. NO.	REV
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.	C	TE-22042	
DO NOT SCALE DRAWING	SCALE: 1:6	SHEET 1 OF 1	

 **FIRST ROBOTICS COMPETITION**  Modeling Solutions Partner

TITLE: Hub - Simple Build -
Upper Hub Base 4x4

SIZE DWG. NO. REV
C TE-22042

SCALE: 1:6 SHEET 1 OF 1

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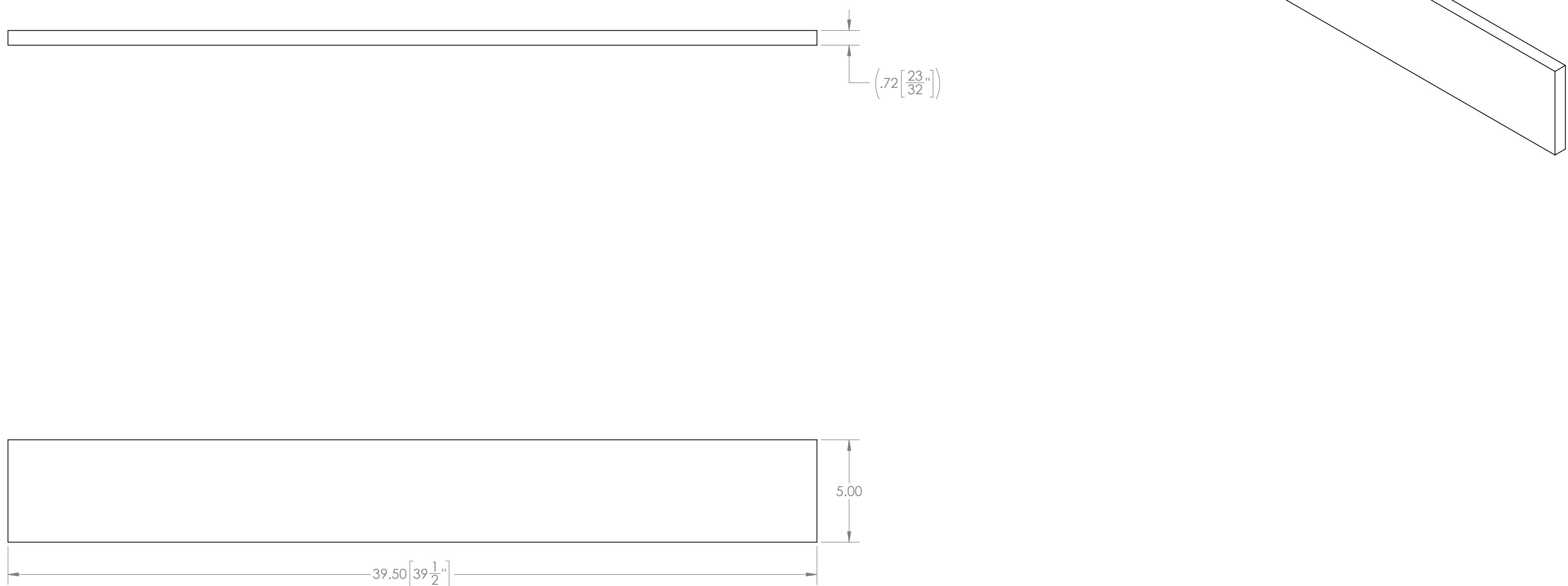
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MATERIAL/FINISH:	SIZE	DWG. NO.	REV
3/4" Plywood	C	TE-22043	
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING	SCALE: 1:4	SHEET 1 OF 1	

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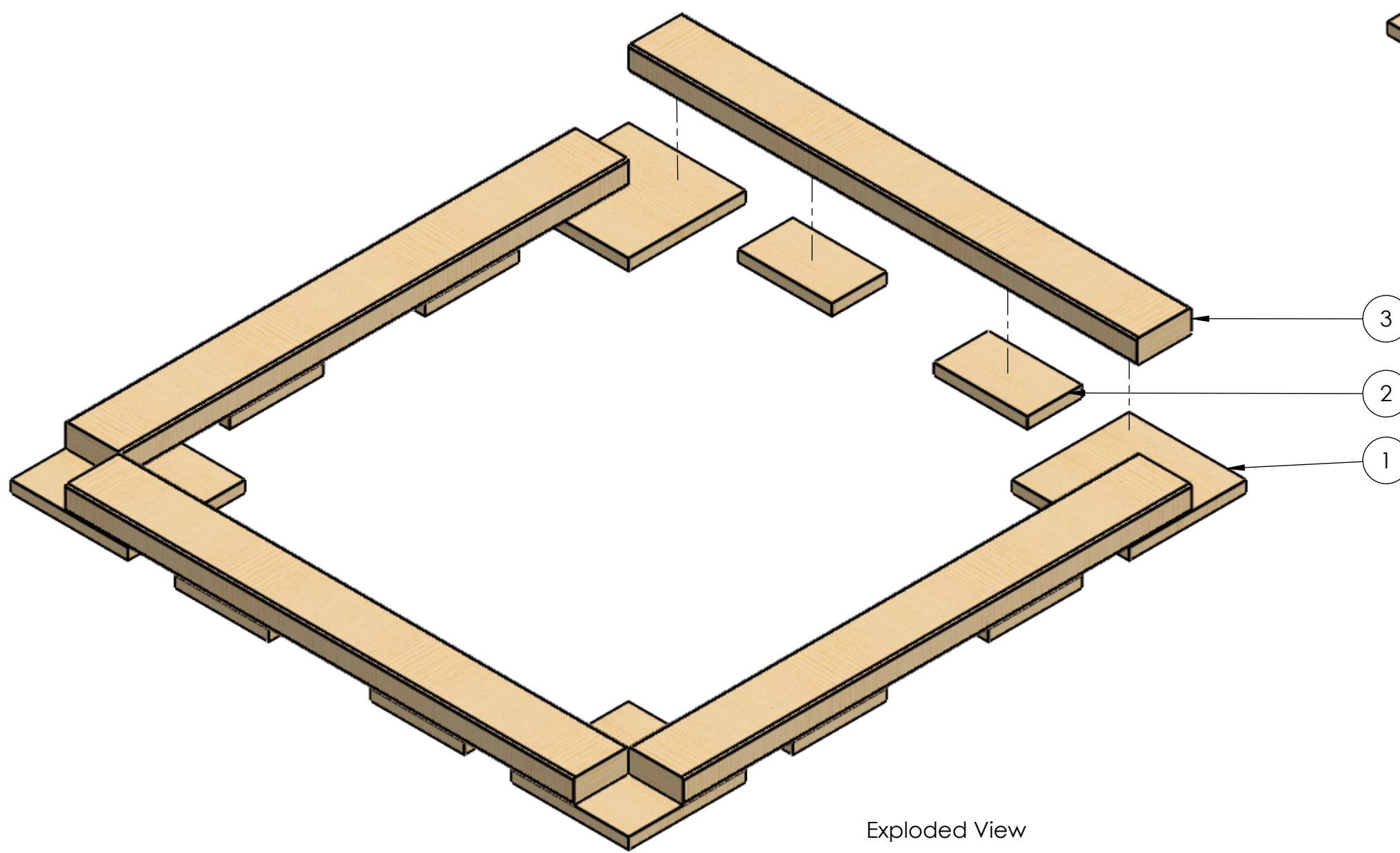
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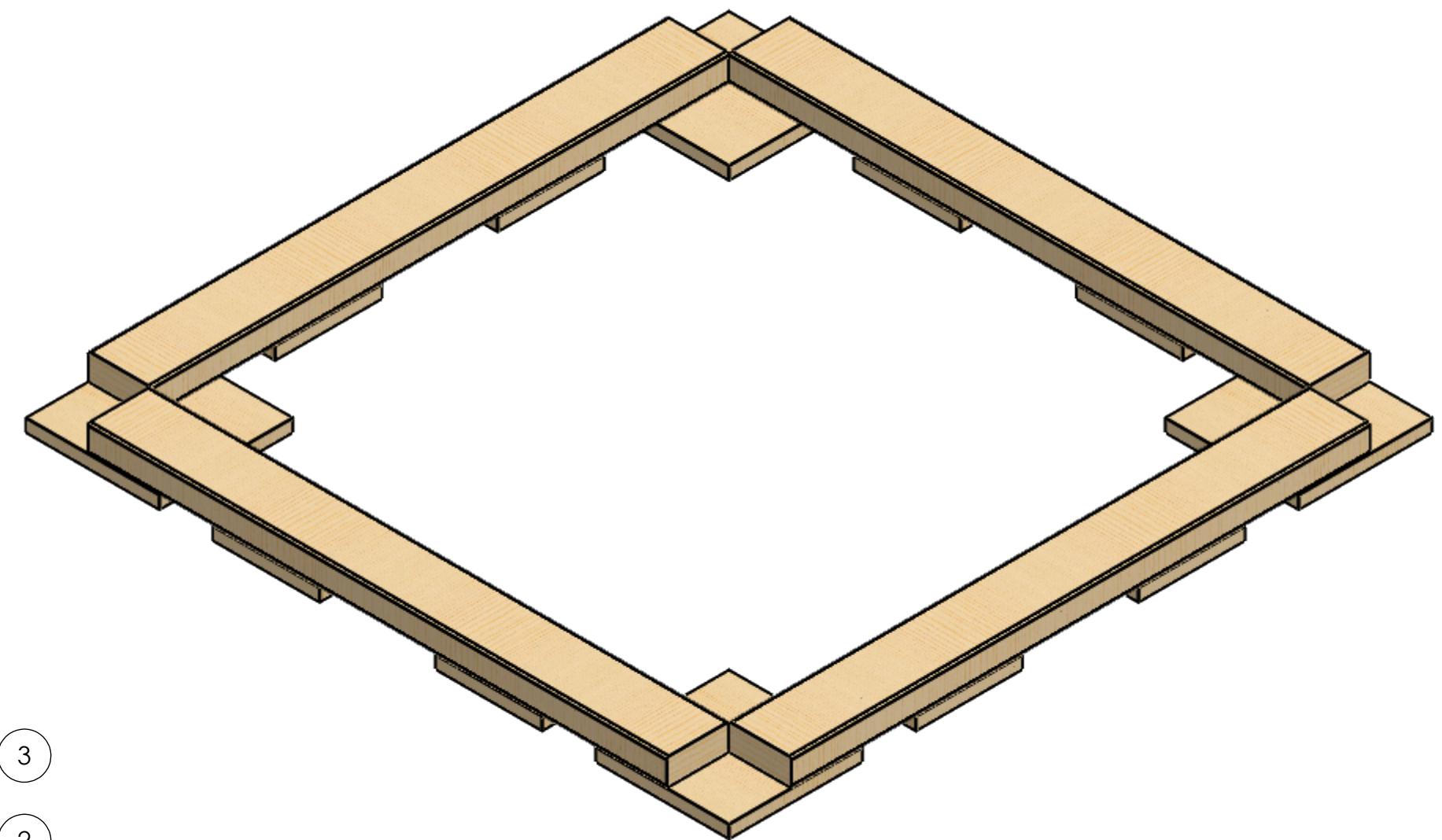
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Exploded View



Hardware Needed:
#8 x 2" Long Screw - Qty 58

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	TE-22005	Hub - Simple Build - Upper Hub Square Connection Plate	4
2	TE-22006	Hub - Simple Build - Upper Hub 2x4 Connection Plate	8
3	TE-22041	Hub - Simple Build - Upper Hub Base 2x4	4

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DO NOT SCALE DRAWING		SIZE	DWG. NO.	REV	
		C	TE-22044		
		SCALE: 1:6	SHEET 1 OF 3		

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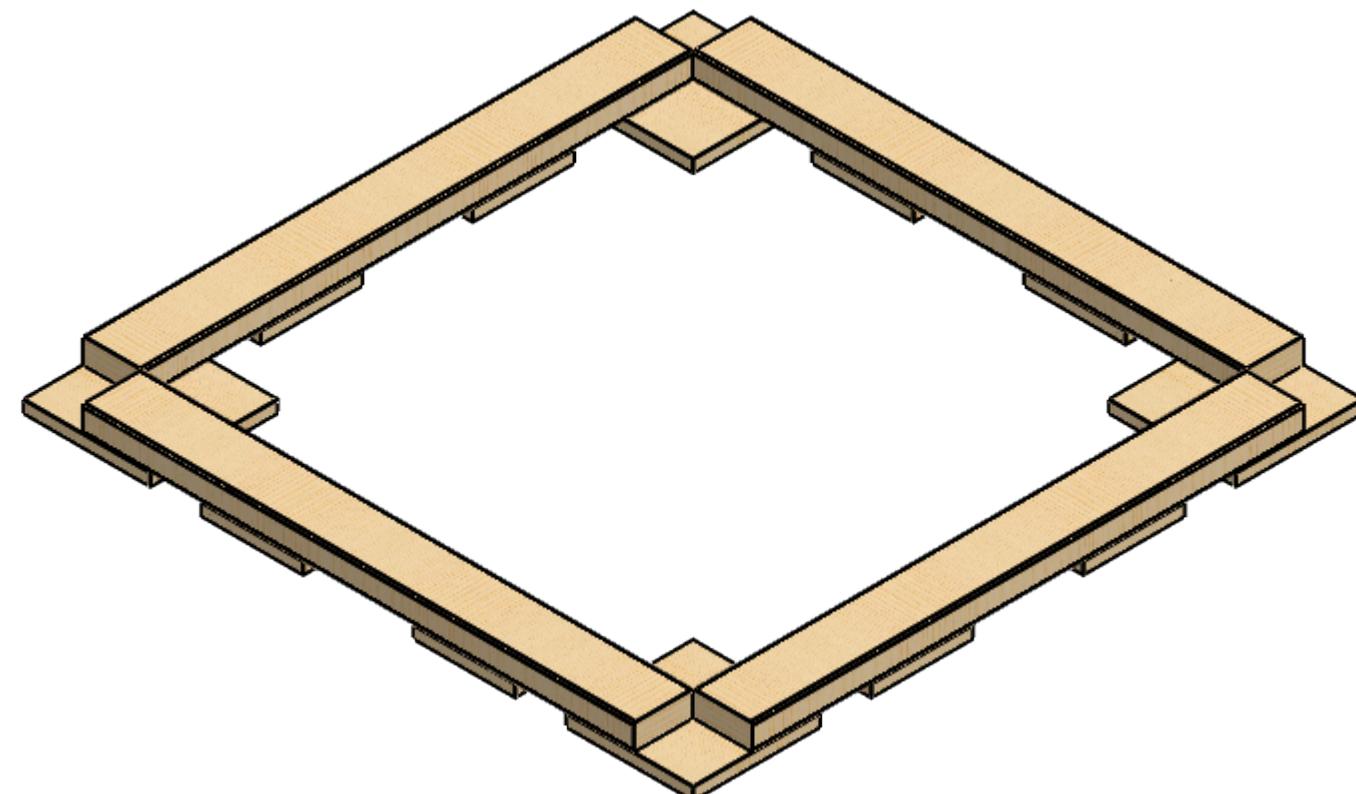
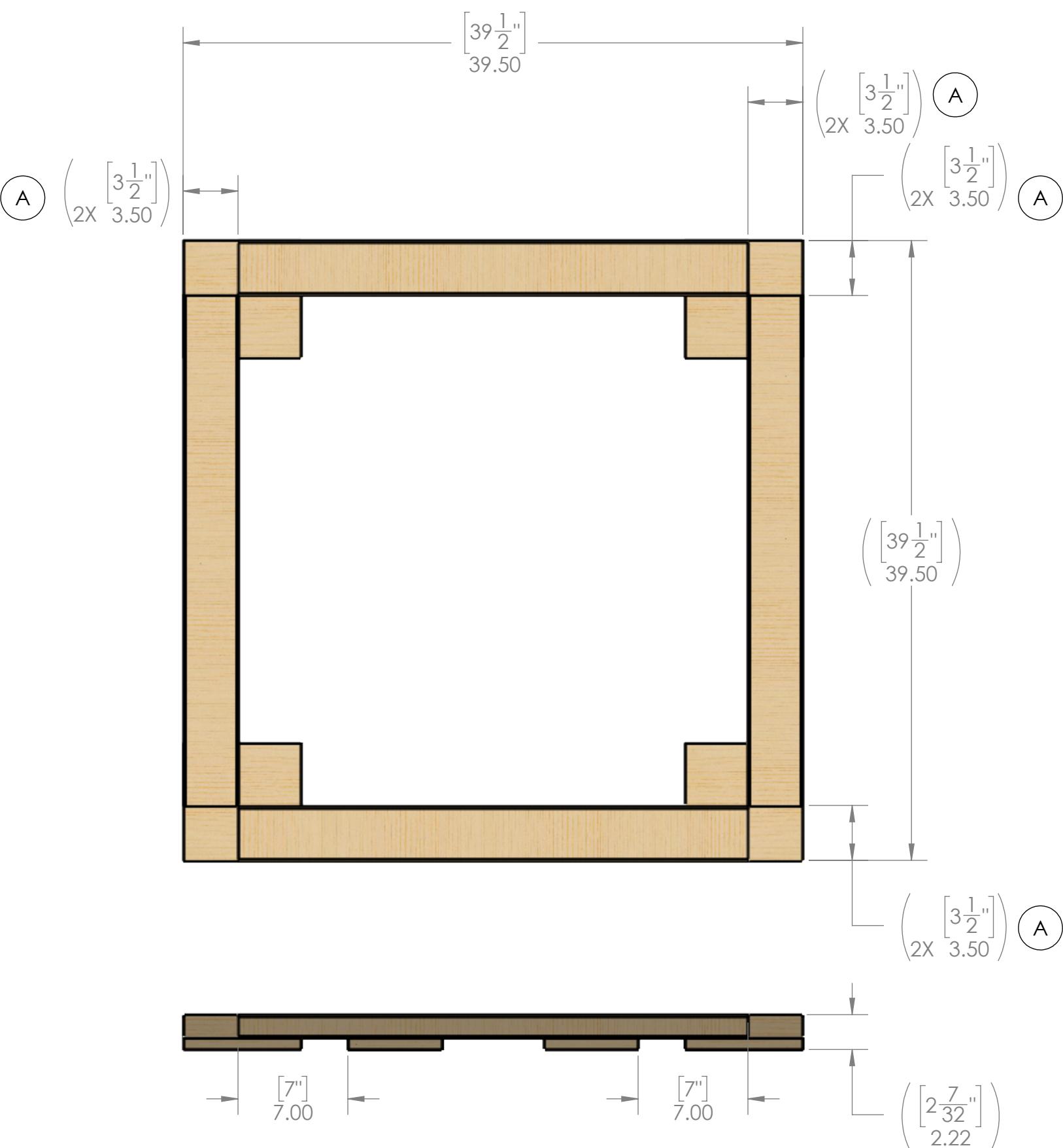
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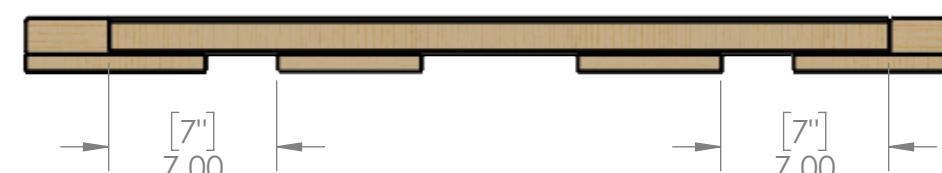
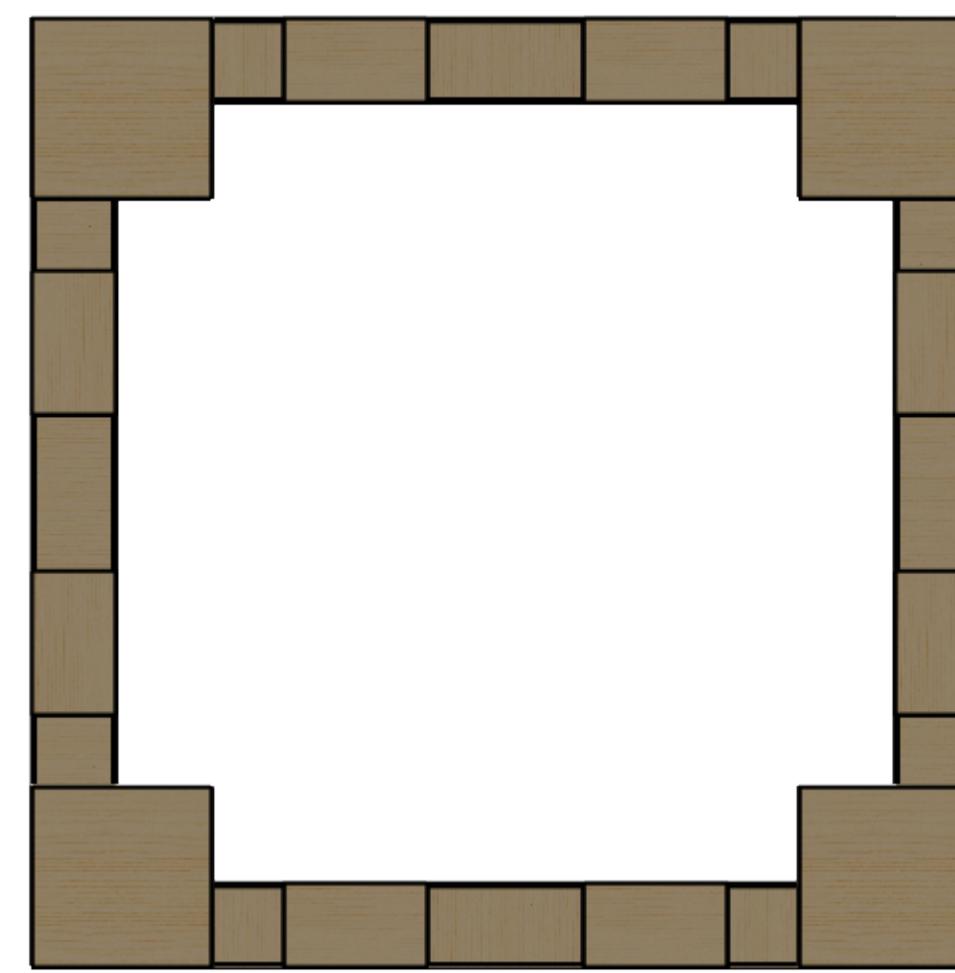
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**Note:**

Dimensions with (A) indicate spacing for 4"x4" lumber from TE-22042. It is recommended to measure the cross section of TE-22042 and modify these dimensions as needed.

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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 - Upper Hub Base Top Assembly			
SIZE DWG. NO. REV			
C TE-22044			
SCALE: 1:8 SHEET 2 OF 3			

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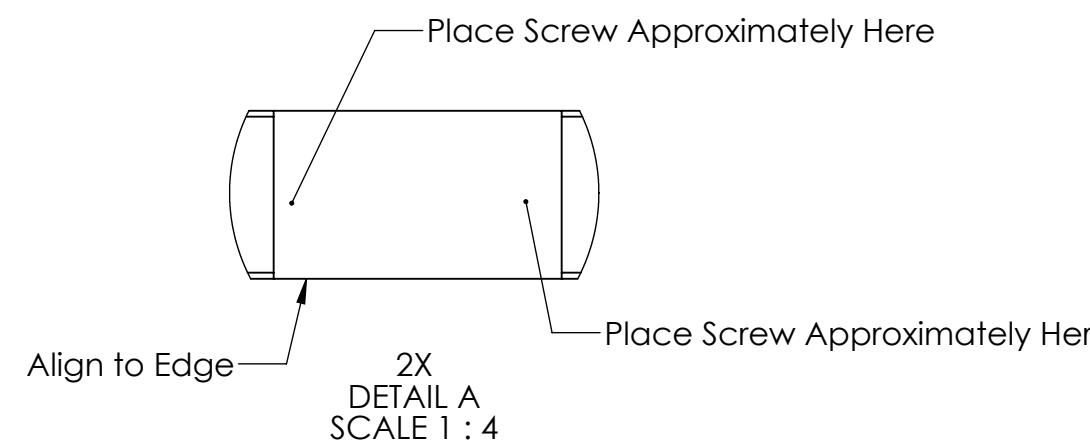
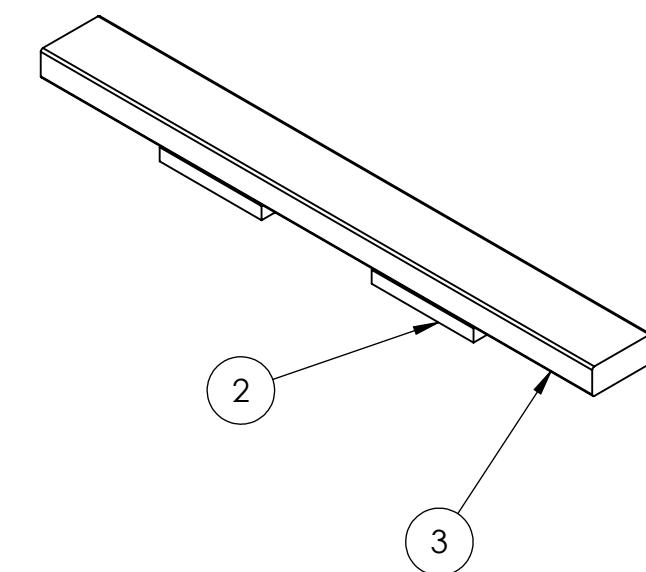
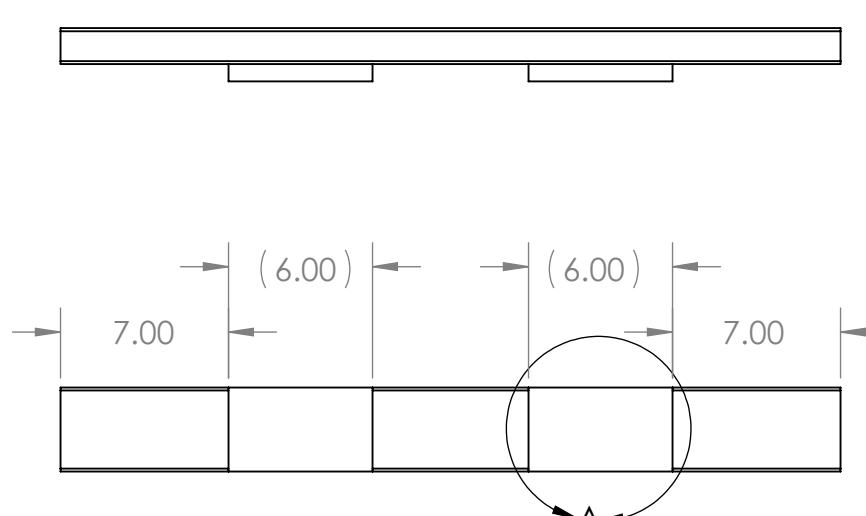
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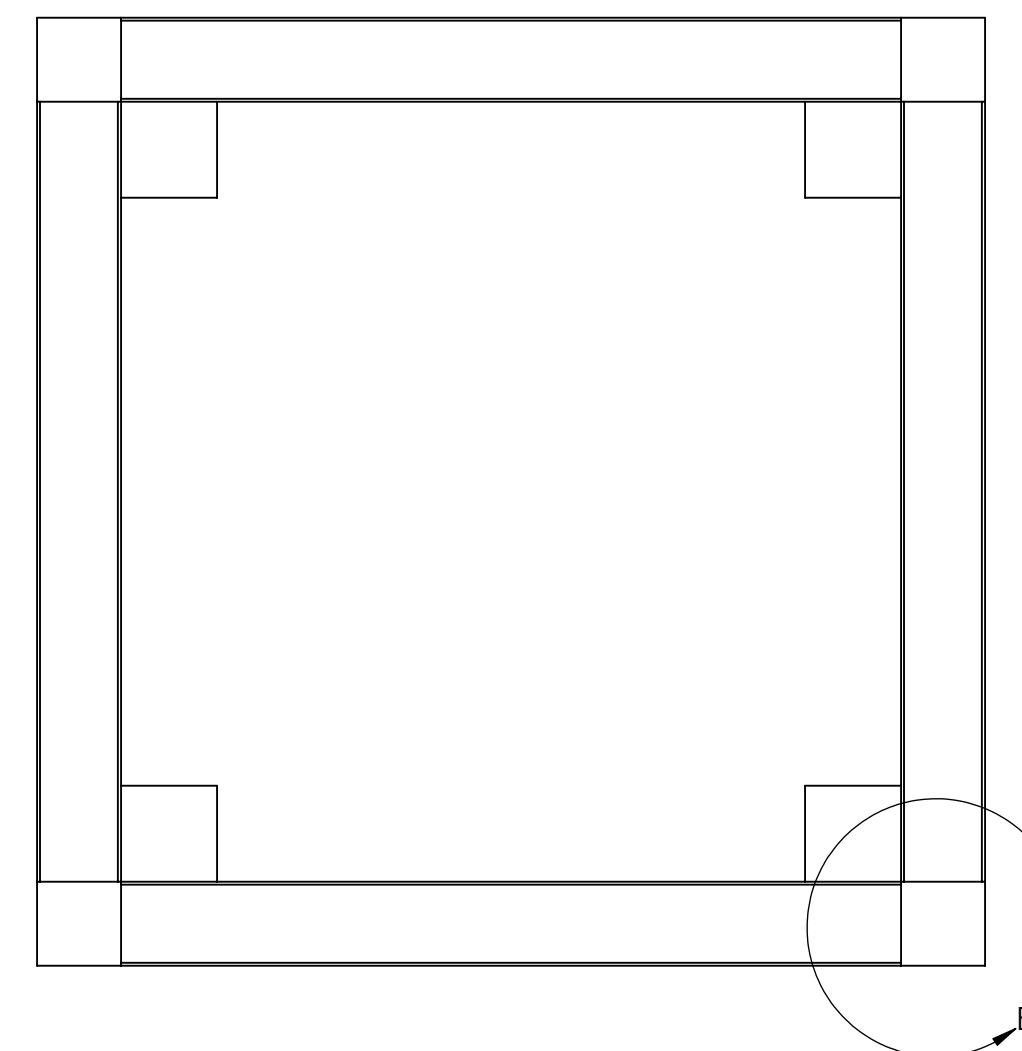
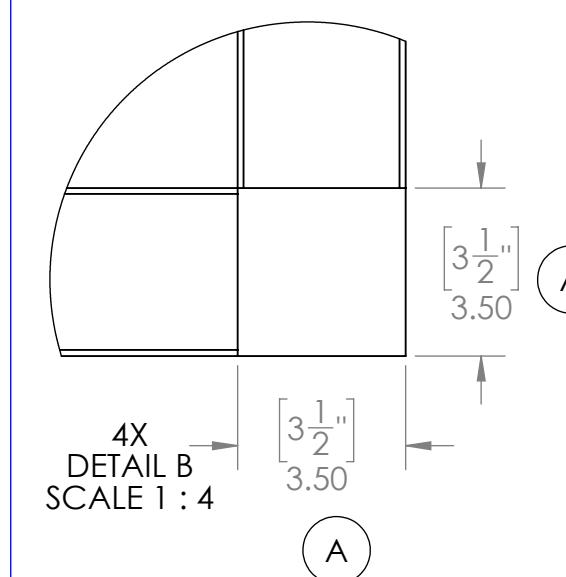
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Step 1



1. Align 2x (2) on (3), as shown.
2. Connect using 2" long screws. It is recommended to use x2 screws per (2) and locate them as shown above. Keep center of (2) clear of screws.
3. Repeat until you have a total of 4 assemblies.

Step 2



1. Align 4x (1) to the x4 Step 1 assemblies, as shown.

Dimensions with (A) indicate spacing for 4"x4" lumber from TE-22042. It is recommended to measure the cross section of TE-22042 and modify these dimensions as needed.

2. Connect using 2" long screws. It is recommended to use x8 screws per (2), x4 into each end.

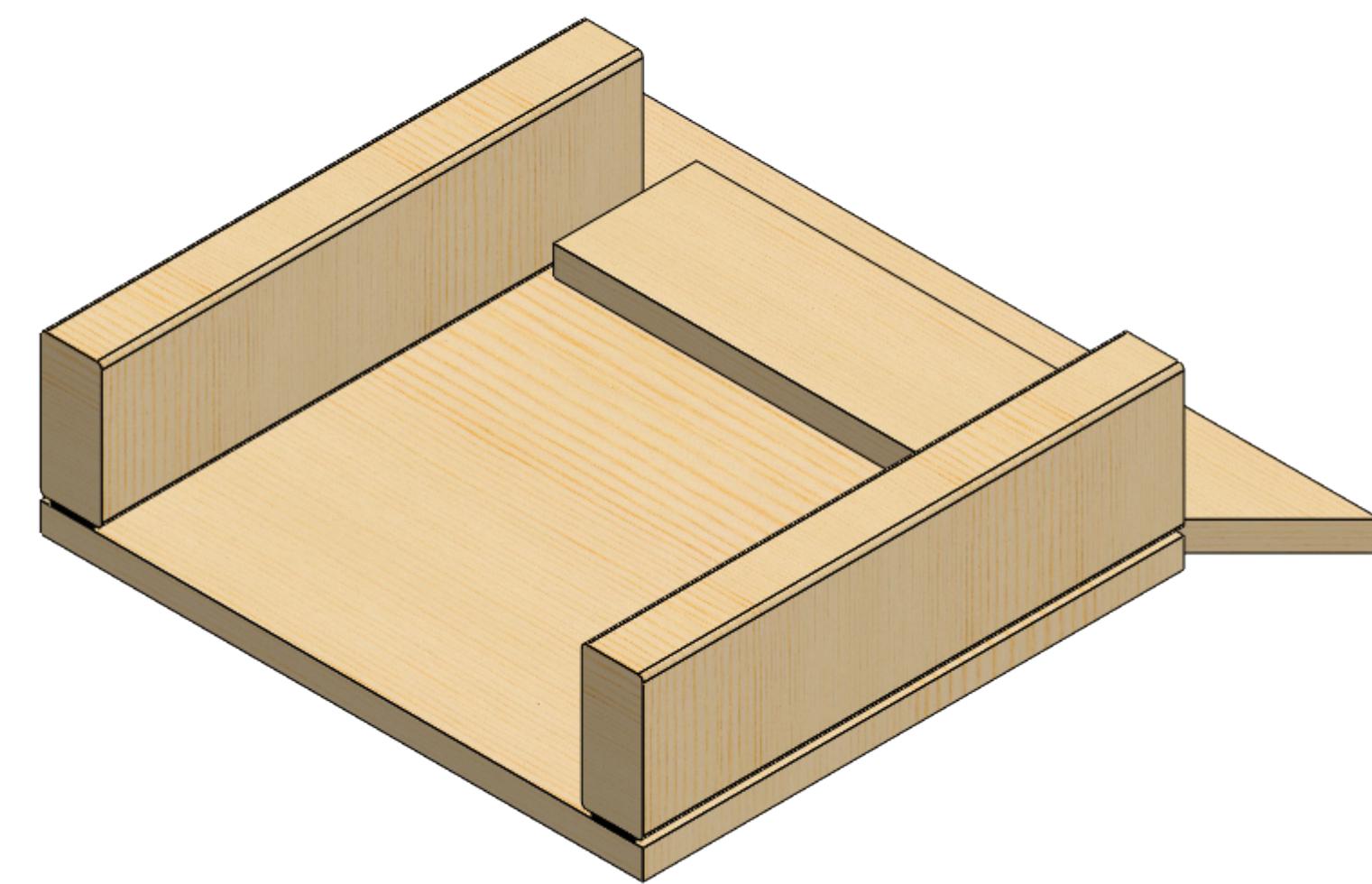
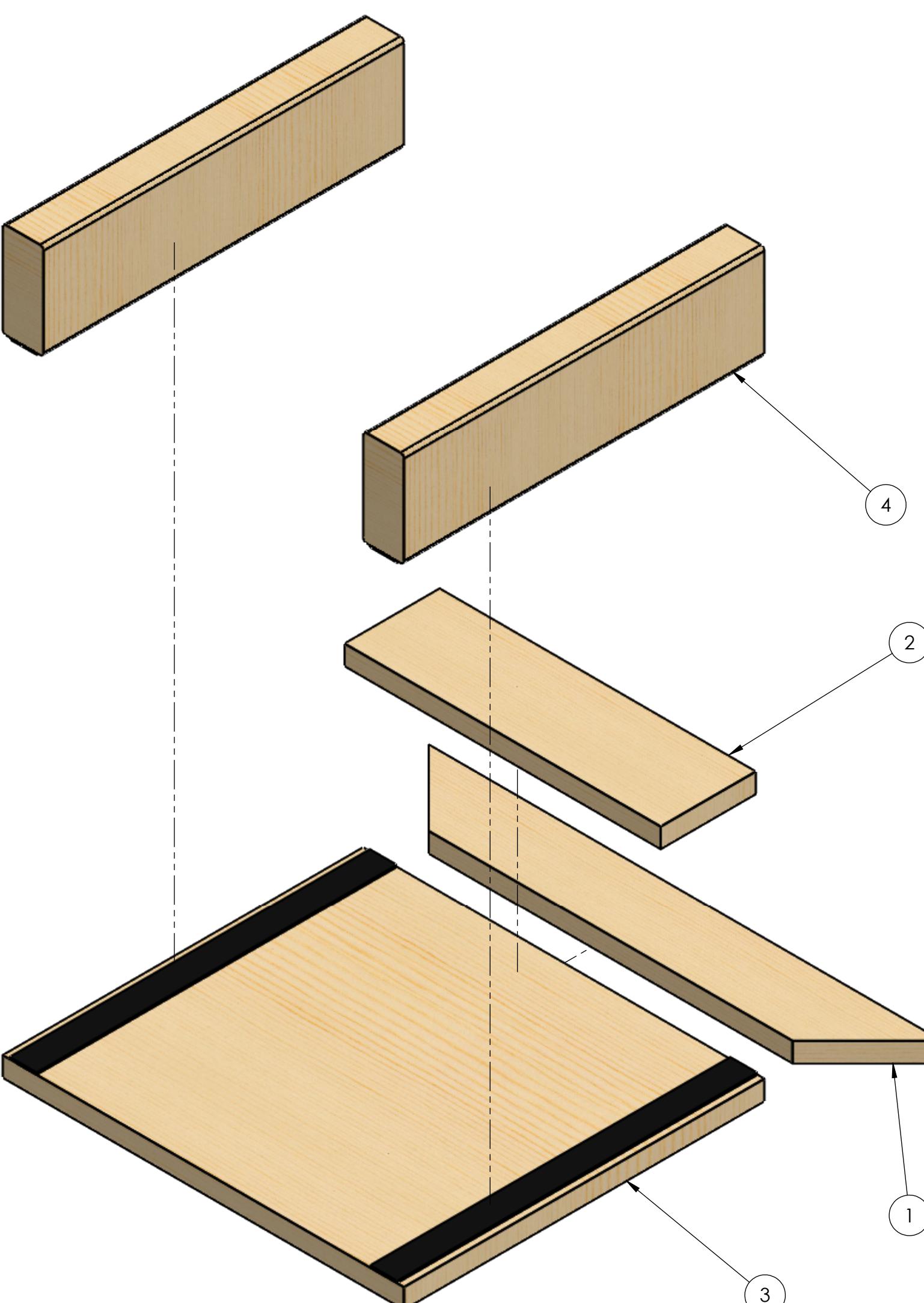
UNLESS OTHERWISE SPECIFIED:	TEAM	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	KAMC	12/30/2021
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:			
COMMENTS:	REMOVE ALL BURRS AND SHARP EDGES.		
DO NOT SCALE DRAWING			
 FIRST ROBOTICS COMPETITION	 SOLIDWORKS Modeling Solutions Partner		
TITLE:	Hub - Simple Build - Upper Hub Base Top Assembly		
SIZE	DWG. NO.	REV	
C	TE-22044		
SCALE:	1:8	SHEET 3 OF 3	

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

ITEM NO.	PART NUMBER	DESCRIPTION	
1	TE-22052	HUB - Simple Build - Lower Exit Base Back	1
2	TE-22053	HUB - Simple Build - Lower Exit Base Connection	1
3	TE-22055	HUB - Simple Build - Lower Exit Base Front with Loop Assembly	1
4	TE-22056	HUB - Simple Build - Lower Exit 2x4 with Hook Assembly	2

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			DRAWN	KAMC	12/30/2021	 FIRST ROBOTICS COMPETITION		
			SOLIDWORKS Modeling Solutions Partner					
			PROPRIETARY AND CONFIDENTIAL					
			THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST IS PROHIBITED.					
			TITLE: Hub - Simple Build - Lower Exit Assembly					
			SIZE	DWG. NO.		REV		
			C	TE-22050				
			SCALE: 1:3		SHEET 1 OF 3			
			DO NOT SCALE DRAWING					

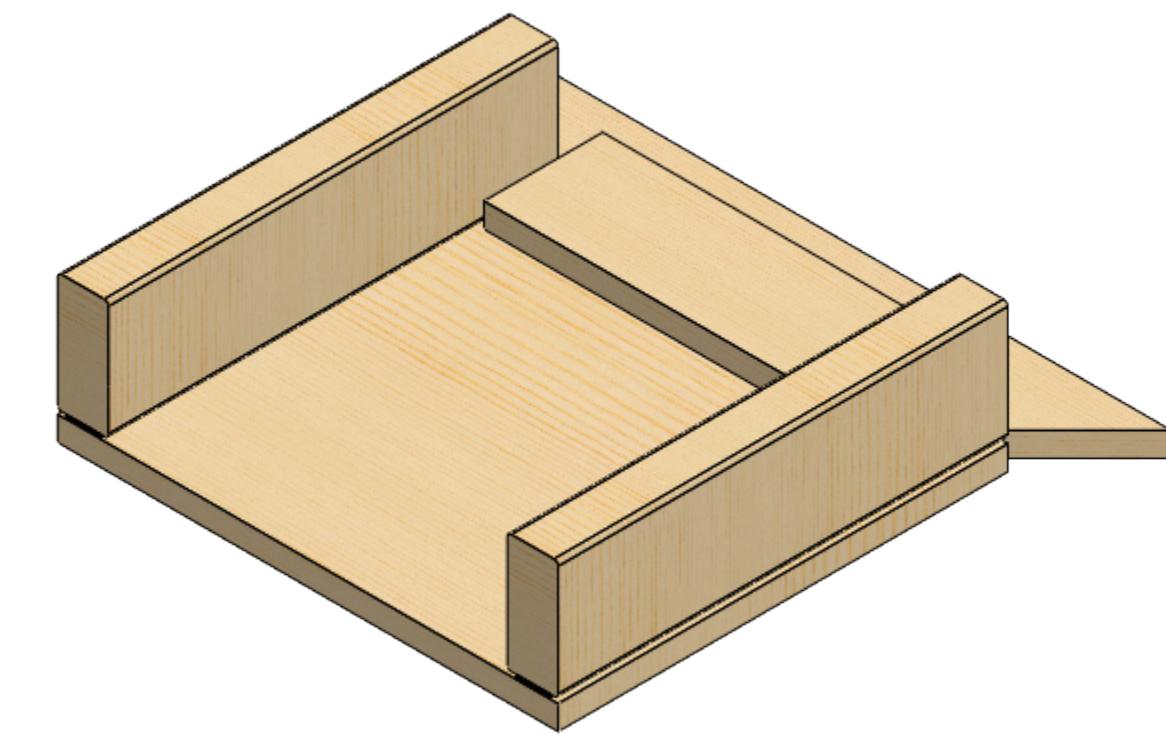
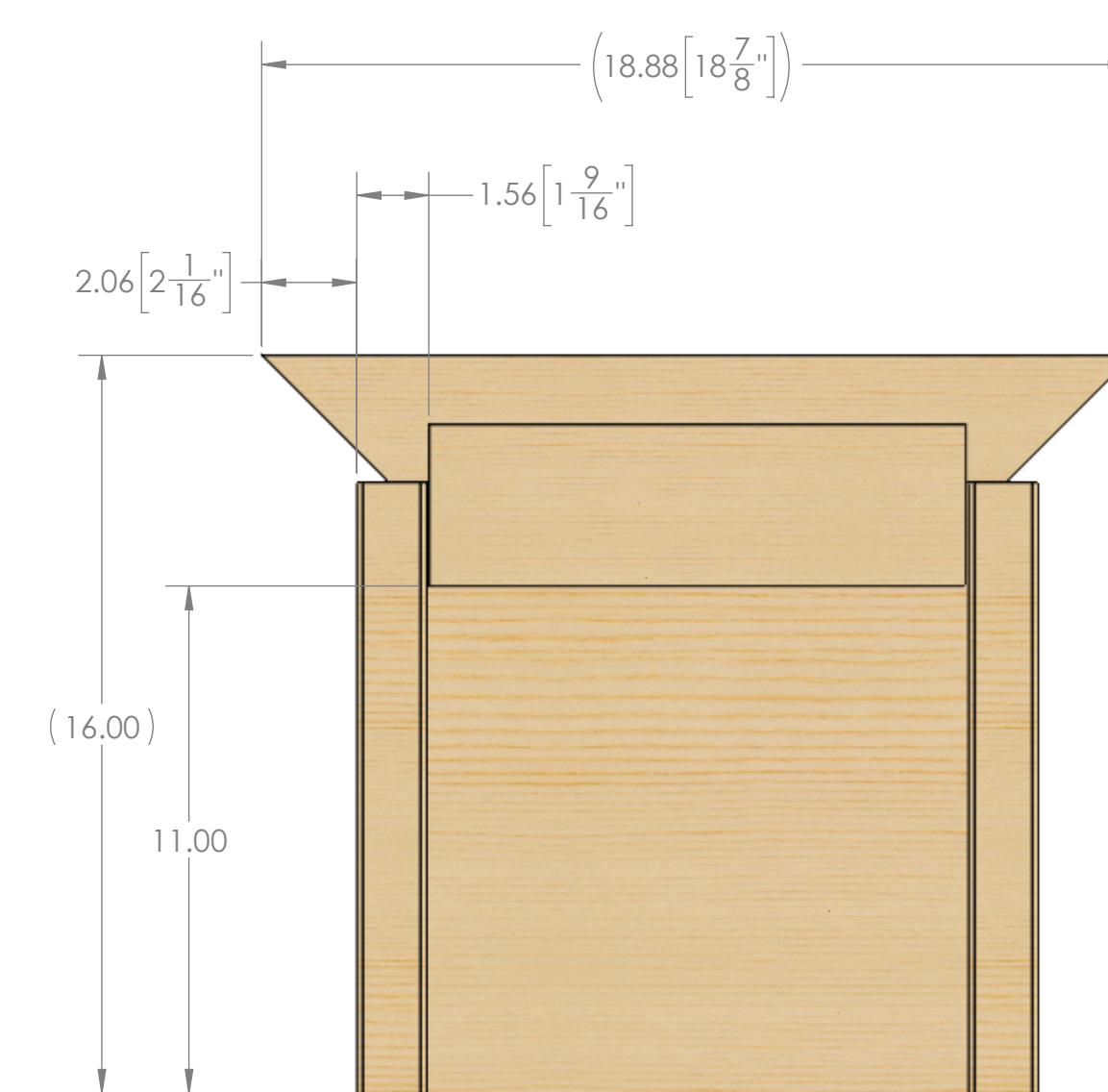
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UNLESS OTHERWISE SPECIFIED:	TEAM	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	KAMC	12/30/2021
TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$			
TWO PLACE DECIMAL $\pm .13$ THREE PLACE DECIMAL $\pm .125$			
MATERIAL/FINISH:	PROPRIETARY AND CONFIDENTIAL	THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.	
COMMENTS:	REMOVE ALL BURRS AND SHARP EDGES.		
DO NOT SCALE DRAWING	SIZE	DWG. NO.	REV
	C	TE-22050	
	SCALE: 1:4	SHEET 2 OF 3	

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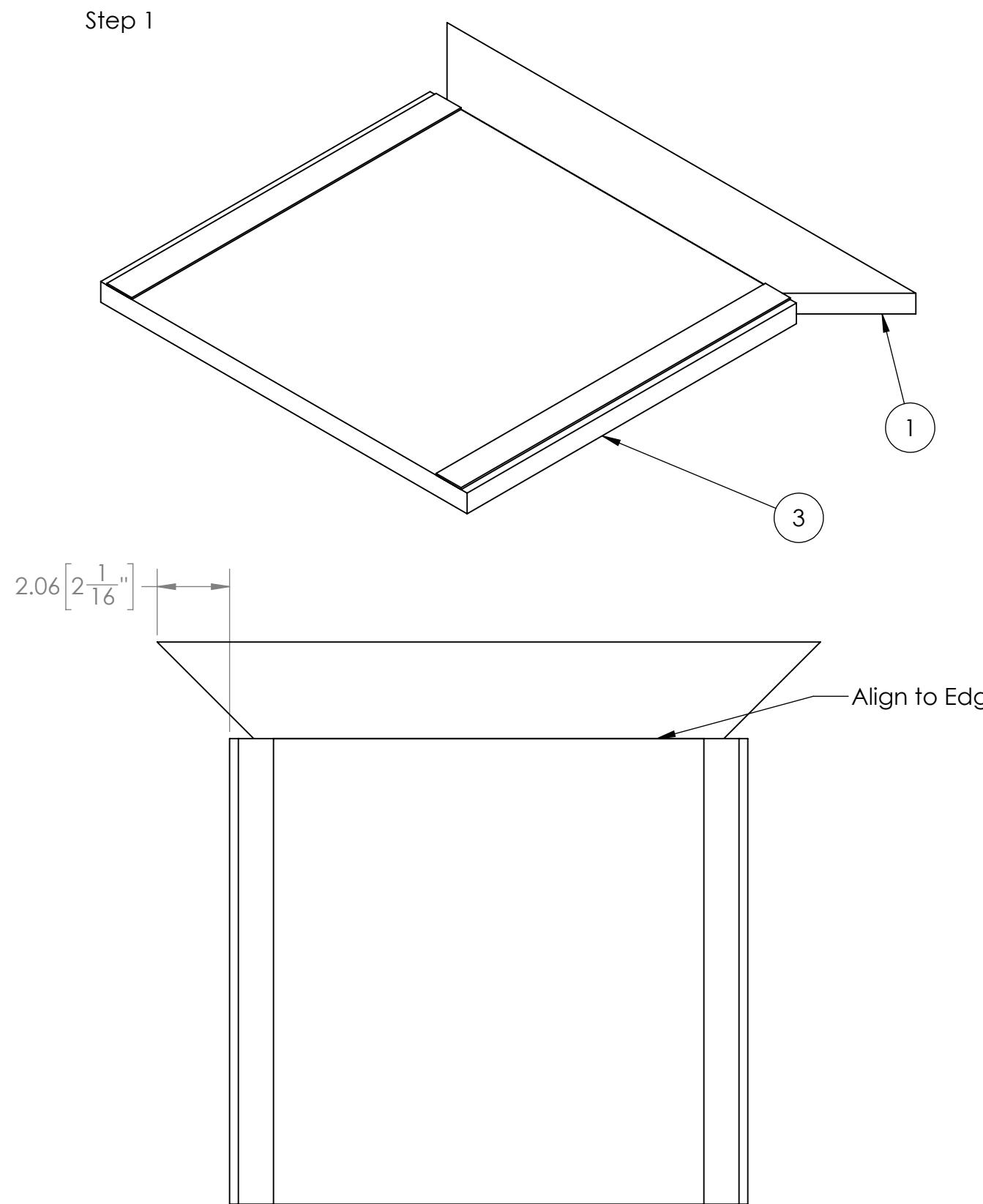
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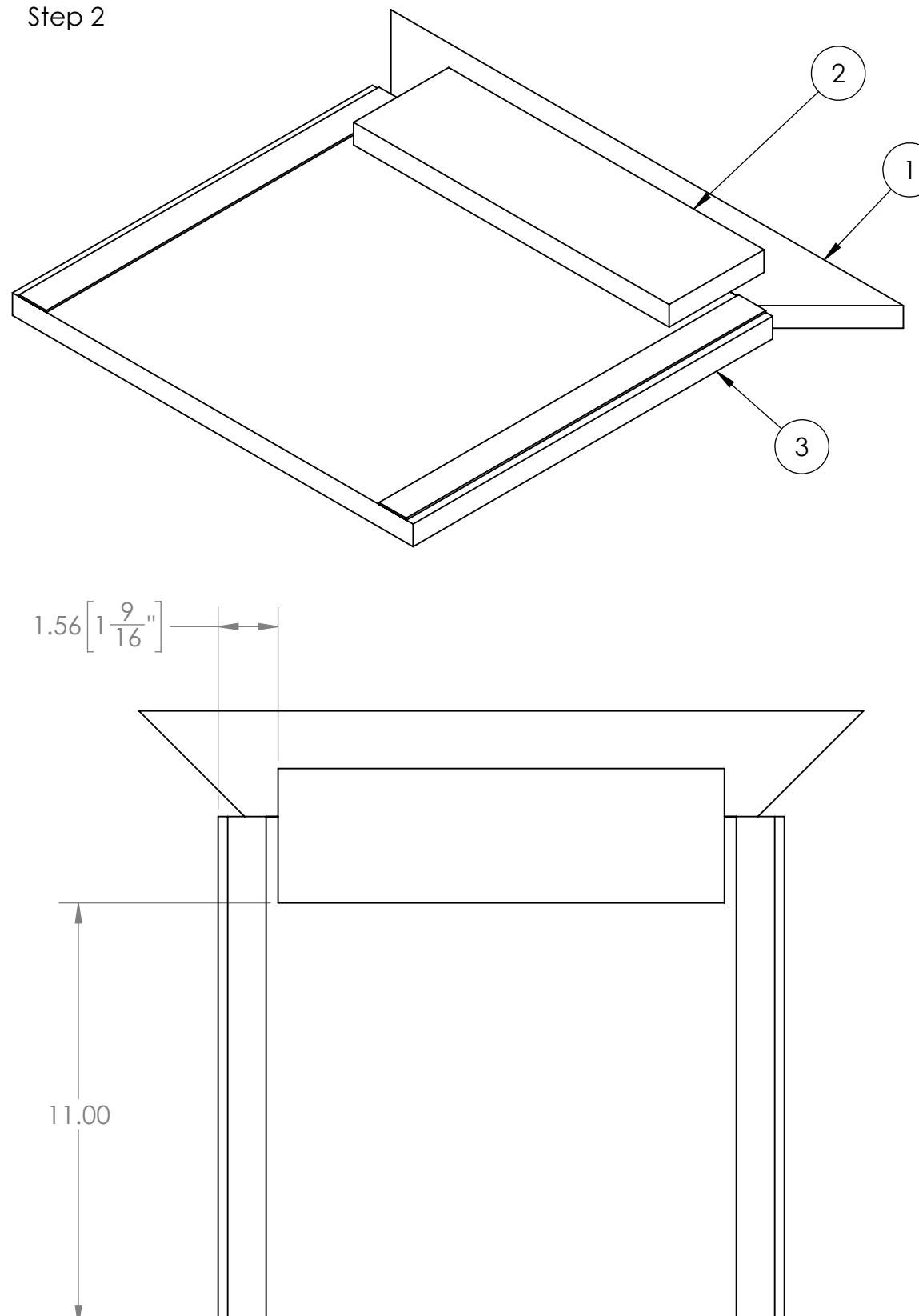
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Step 1



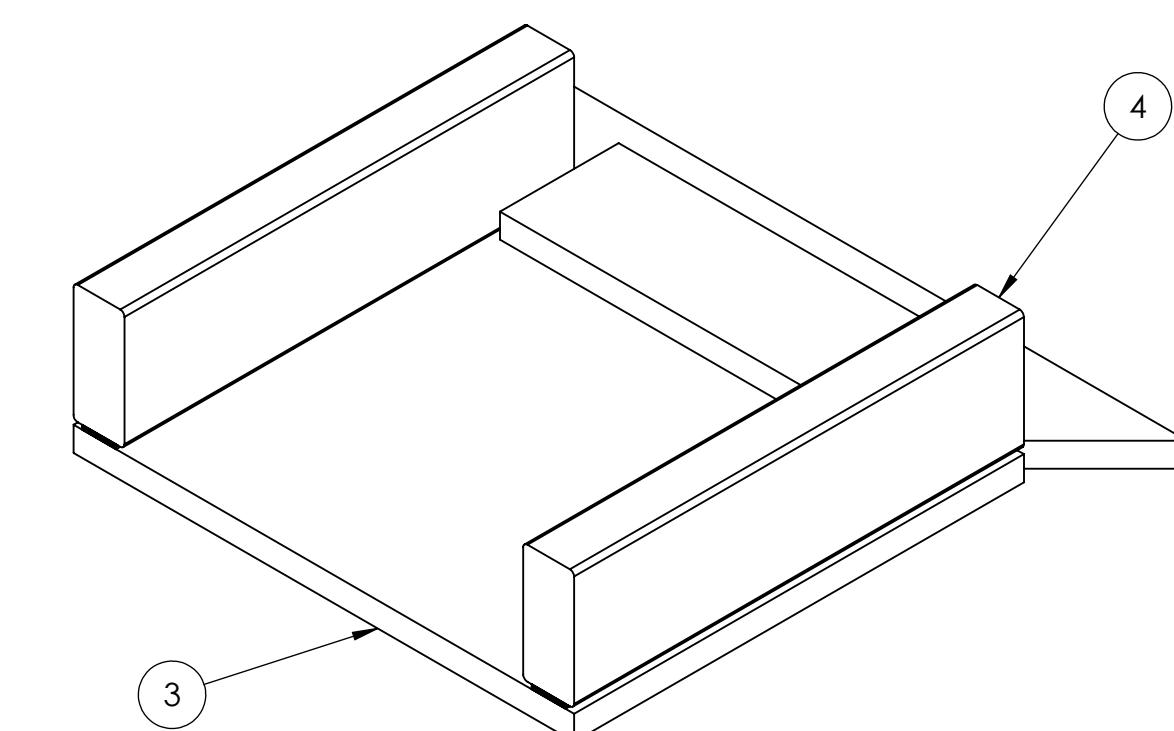
1. Align (3) to (1), as shown. Connection will happen in the next step.

Step 2



1. Align (2) to Step 1, as shown.
2. Connect using 1.25" Long Screws. It is recommended to use 8x screws, 4x into (3) and 4x into (1).

Step 3



1. Add 2x (4) to hook on (3), as shown.

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

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COMMENTS:

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FIRST[®] ROBOTICS COMPETITION

SOLIDWORKS

Modeling Solutions Partner

TITLE: Hub - Simple Build - Lower Exit Assembly

SIZE DWG. NO. REV

C TE-22050

SCALE: 1:4 SHEET 3 OF 3

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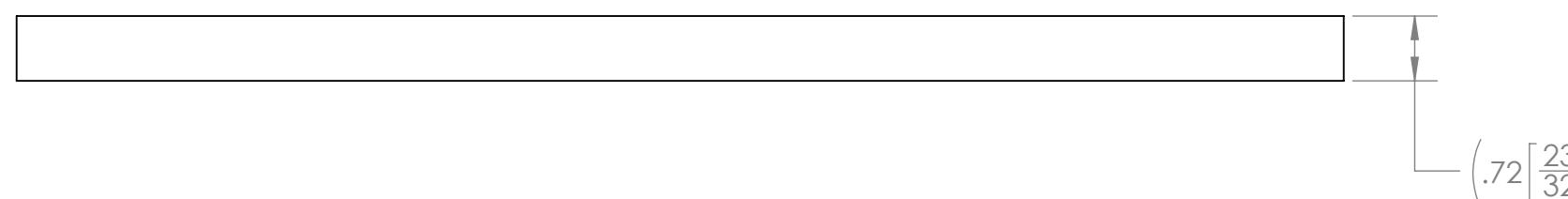
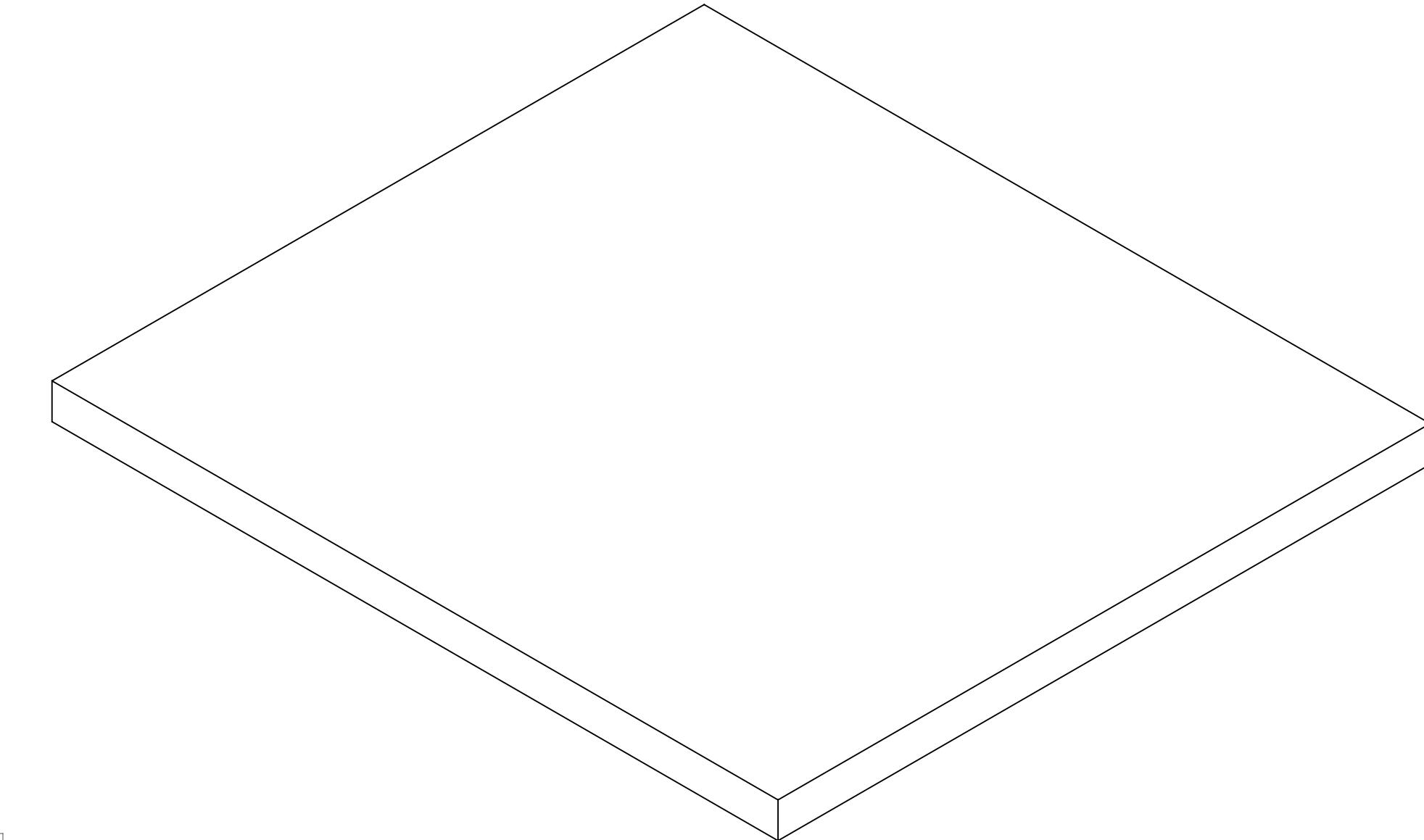
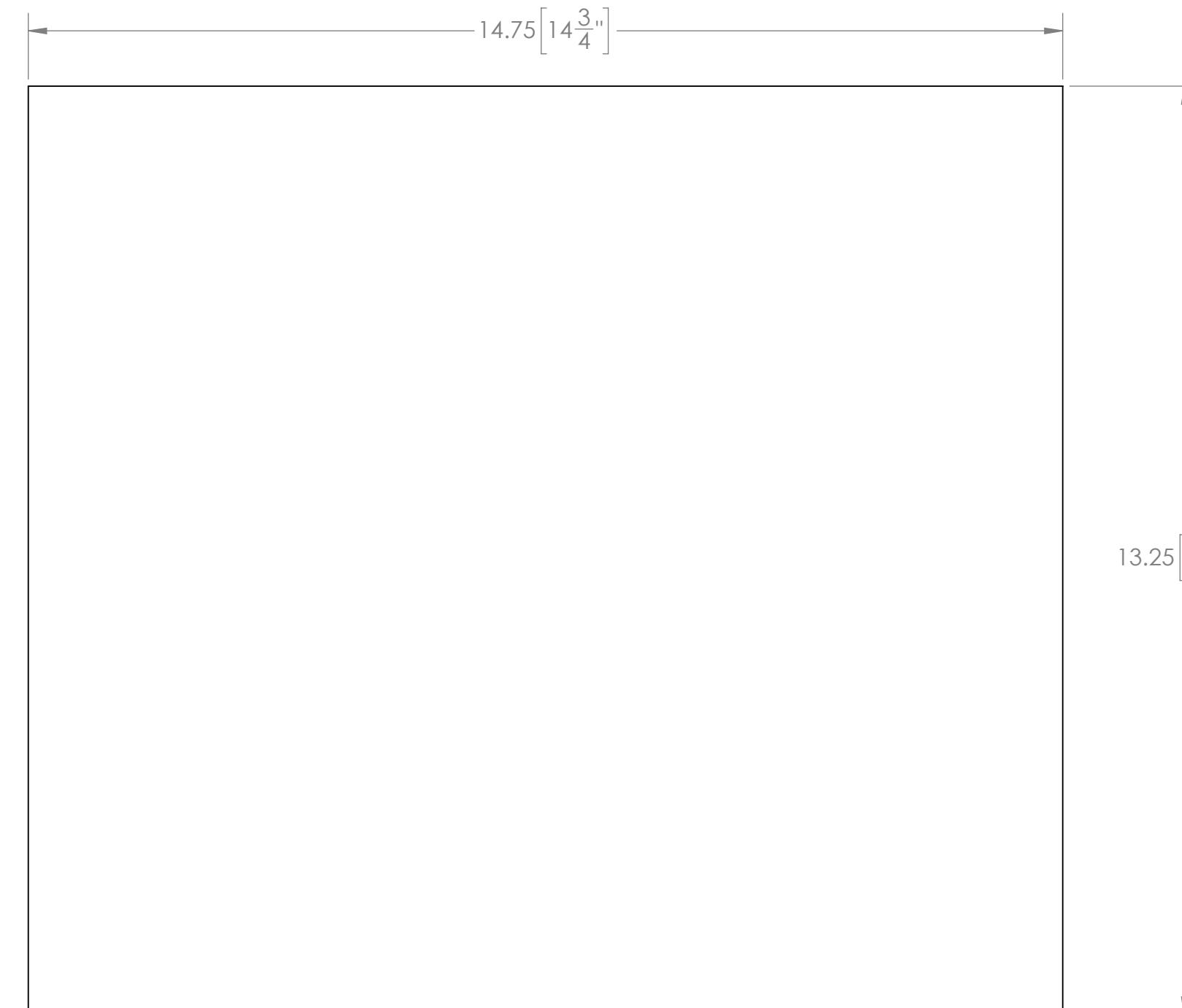
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MATERIAL/FINISH:	SIZE	DWG. NO.	REV
3/4" Plywood	C	TE-22051	
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING	SCALE: 1:2	SHEET 1 OF 1	

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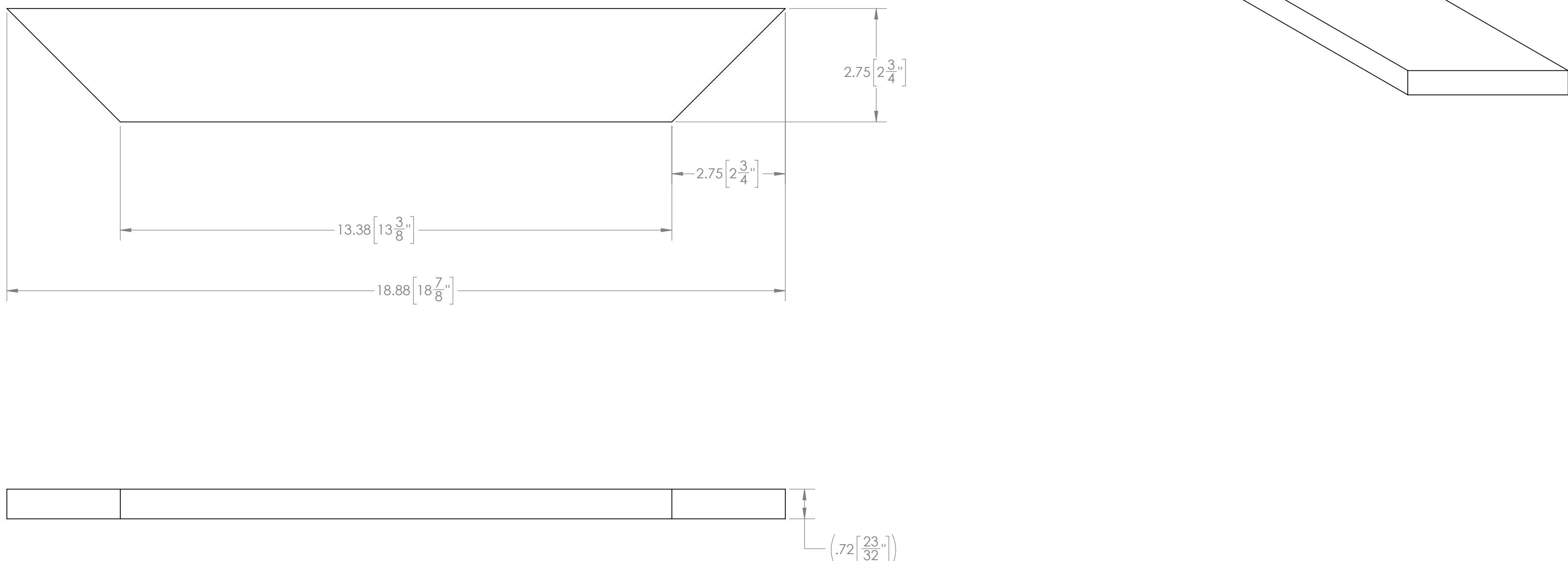
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MATERIAL/FINISH: 3/4" Plywood			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
HUB - Simple Build -
Lower Exit Base Back

SIZE DWG. NO. REV

C TE-22052

SCALE: 1:2 SHEET 1 OF 1

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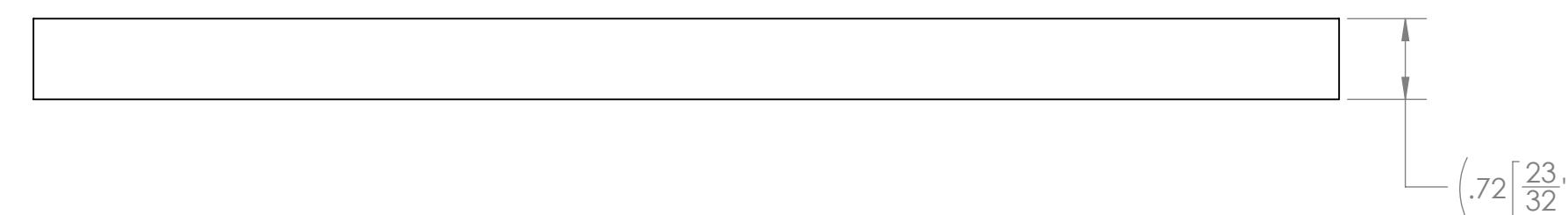
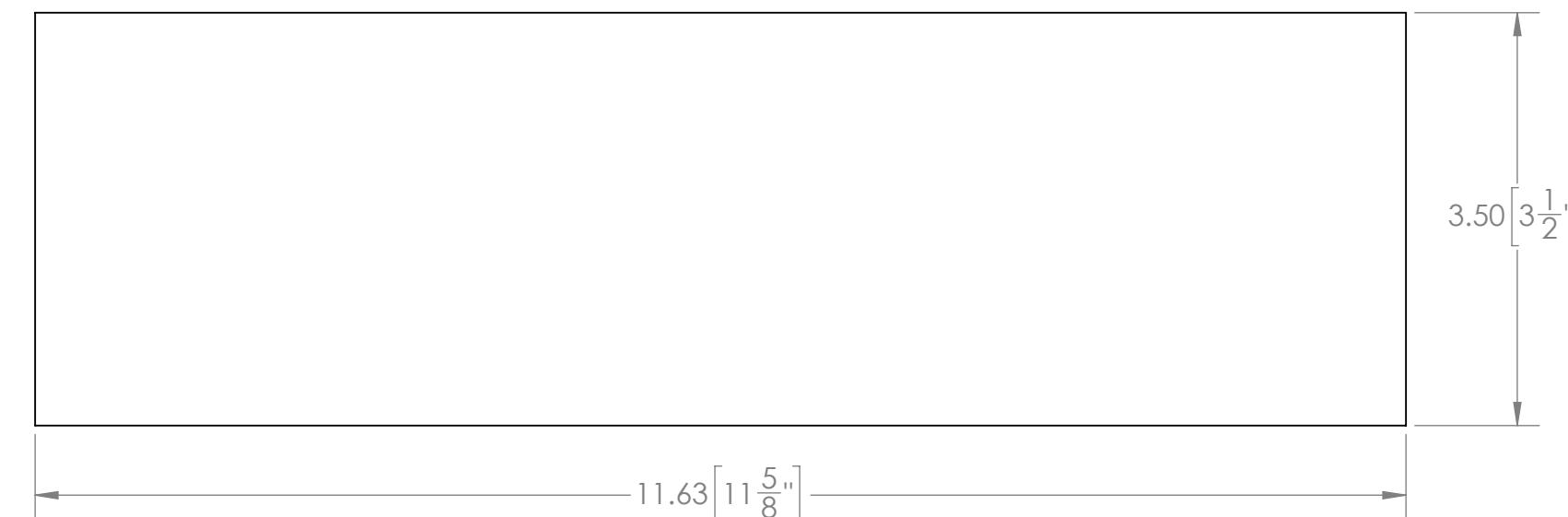
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DRAWN	KAMC	12/29/2021	
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MATERIAL/FINISH:	SIZE	DWG. NO.	REV
3/4" Plywood	C	TE-22053	
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING		SCALE: 2:3	SHEET 1 OF 1

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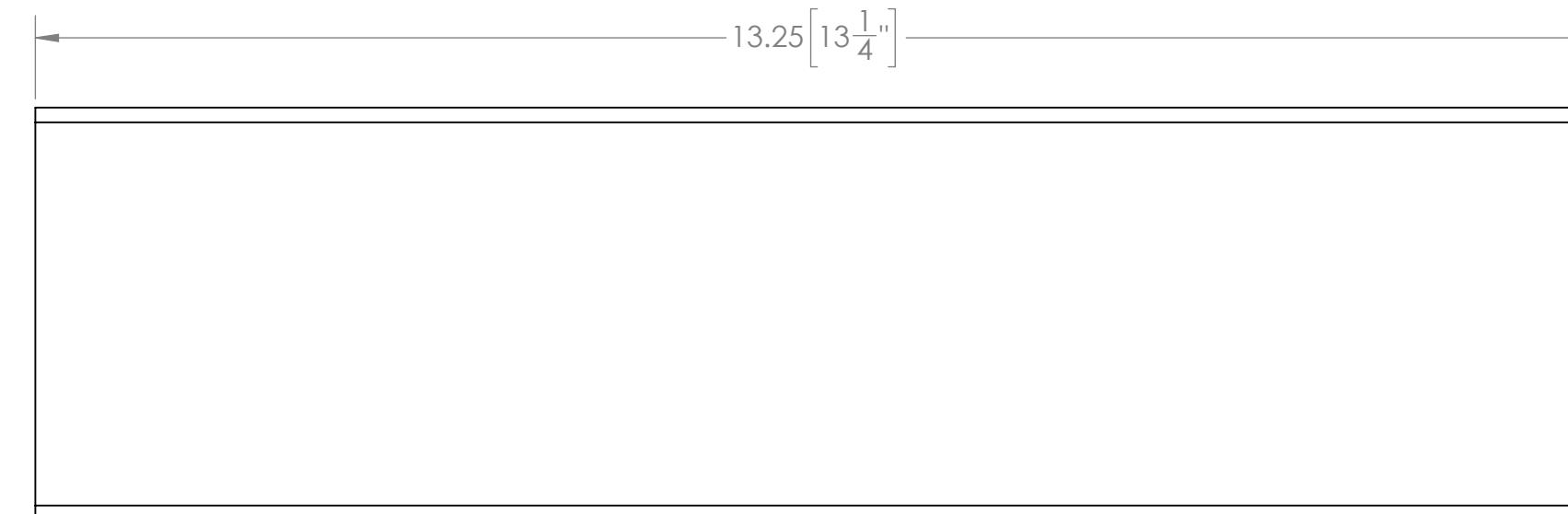
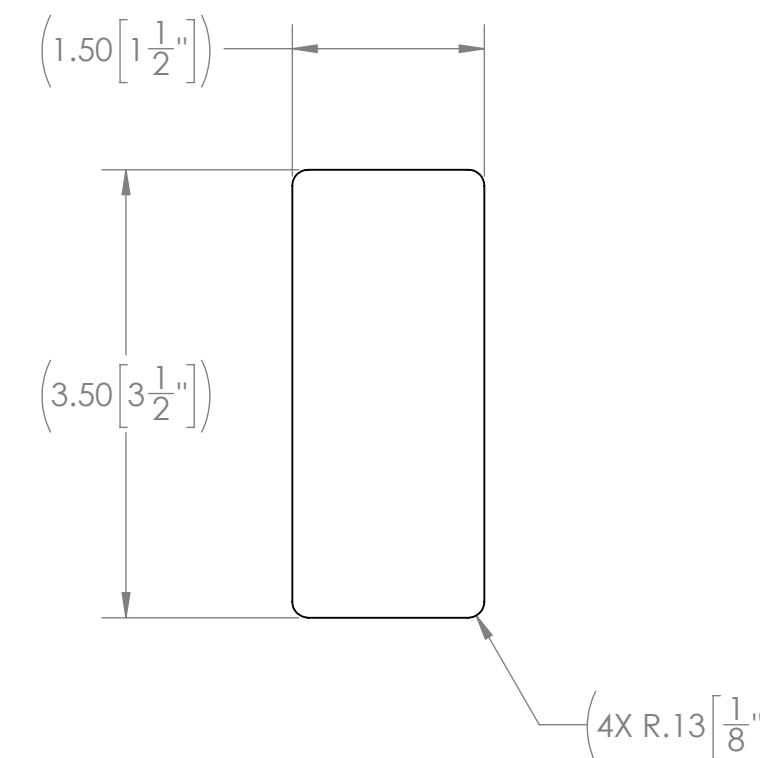
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DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .13$ THREE PLACE DECIMAL $\pm .125$	DRAWN	KAMC	12/29/2021
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH: 2"x4" Lumber	SIZE	DWG. NO.	REV
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.	C	TE-22054	
DO NOT SCALE DRAWING	SCALE: 2:3	SHEET 1 OF 1	

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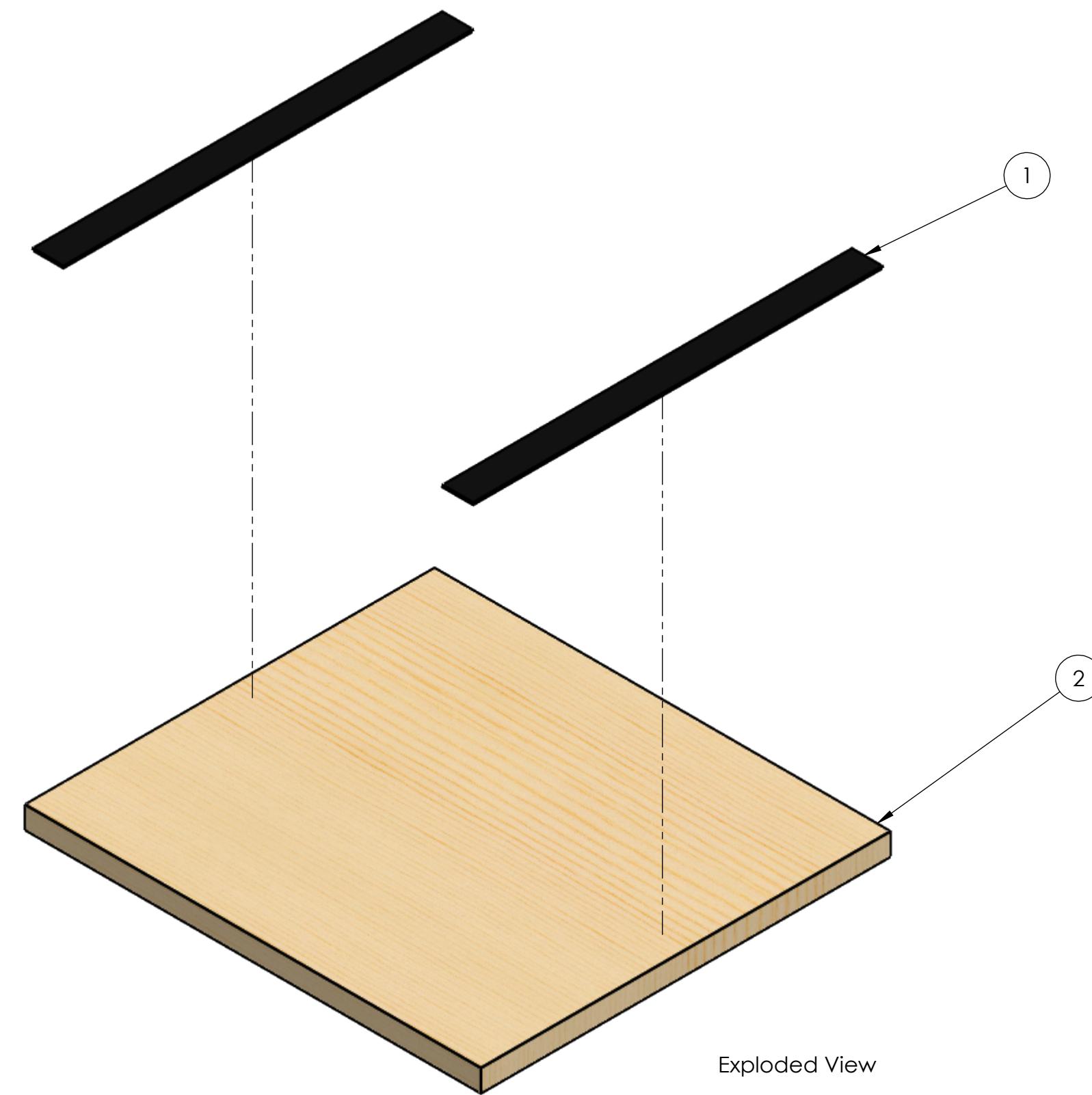
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Exploded View



Hardware Needed:
Optional: Wood Staples

- Step 1**
1. Attach 2x (1) to (2) as shown using adhesive backing.
 2. Optional: Use wood staples to connect (1) to (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 $\pm .125$

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EDGES.

DO NOT SCALE DRAWING

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	Loop_1_13.25	1" x 13.25" Loop, Adhesive Backed	2
2	TE-22051	HUB - Basic Build - Lower Exit Base Front	1

TEAM	NAME	DATE
DRAWN	KAMC	12/30/2021

FIRST ROBOTICS COMPETITION DS SOLIDWORKS Modeling Solutions Partner

TITLE: HUB - Simple Build - Lower Exit Base Front with Loop Assembly

SIZE DWG. NO. REV

C TE-22055

SCALE: 1:3 SHEET 1 OF 2

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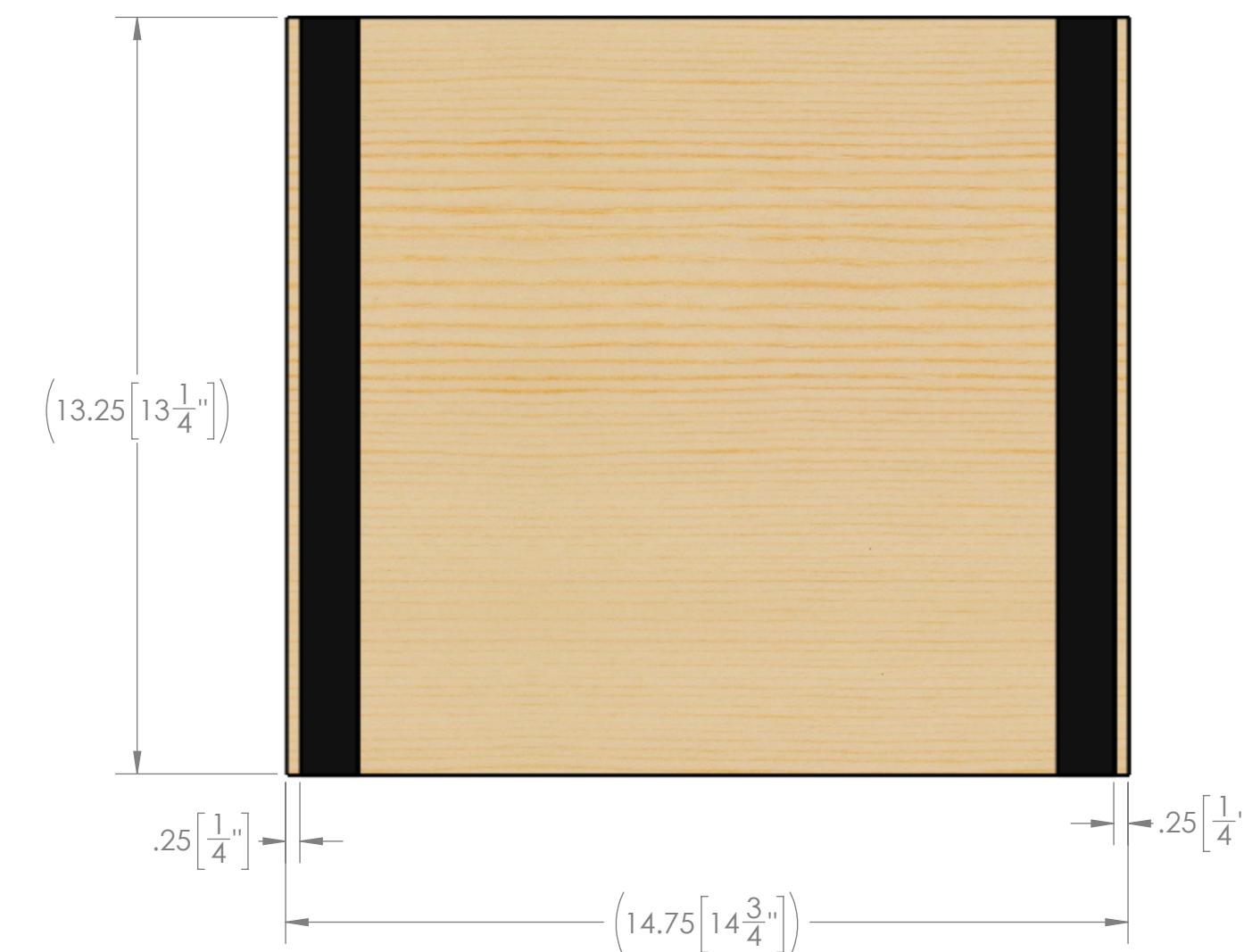
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MATERIAL/FINISH:	SIZE	DWG. NO.	REV
	C	TE-22055	
COMMENTS:	REMOVE ALL BURRS AND SHARP EDGES.		
DO NOT SCALE DRAWING	SCALE: 1:3	SHEET 2 OF 2	

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

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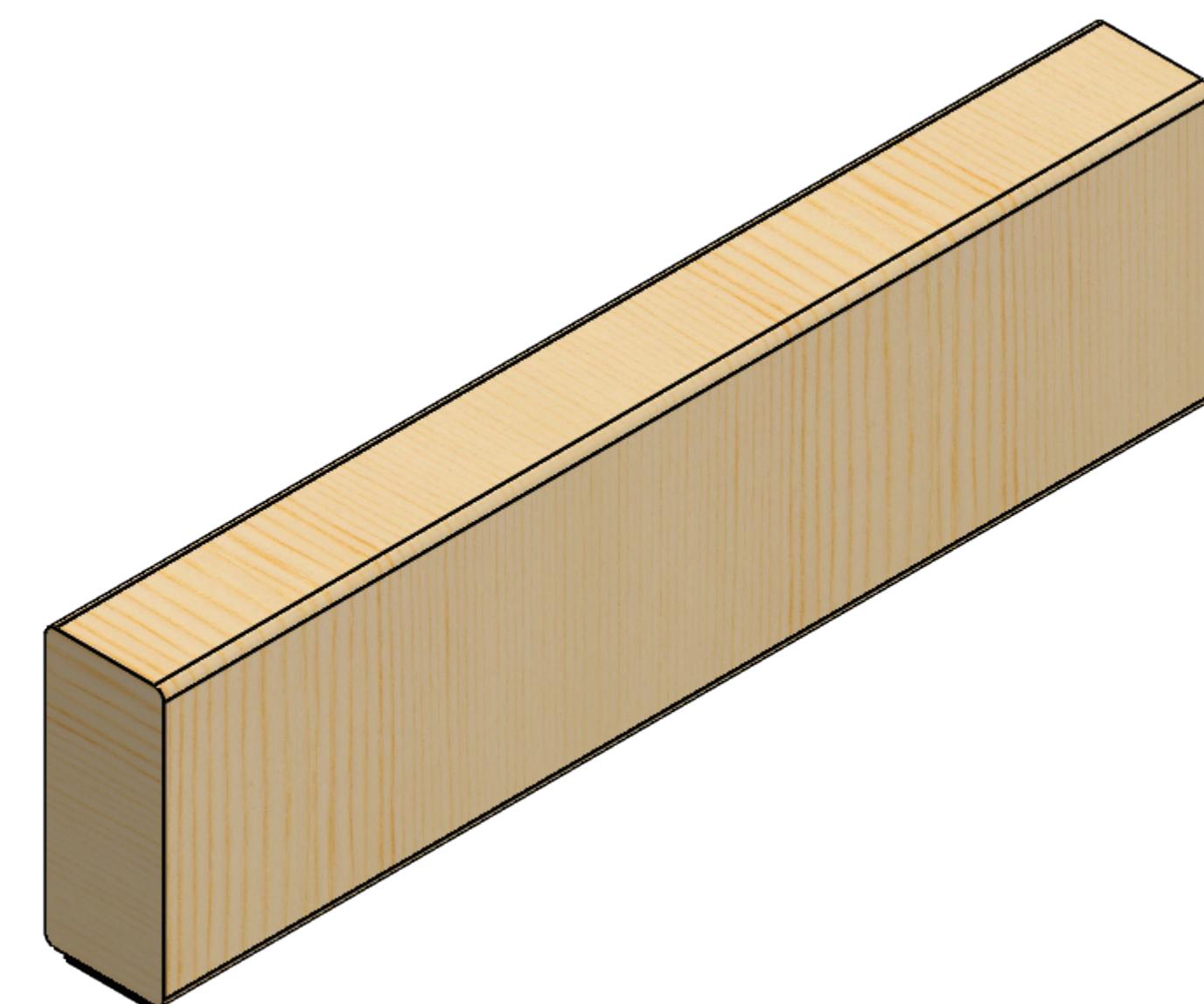
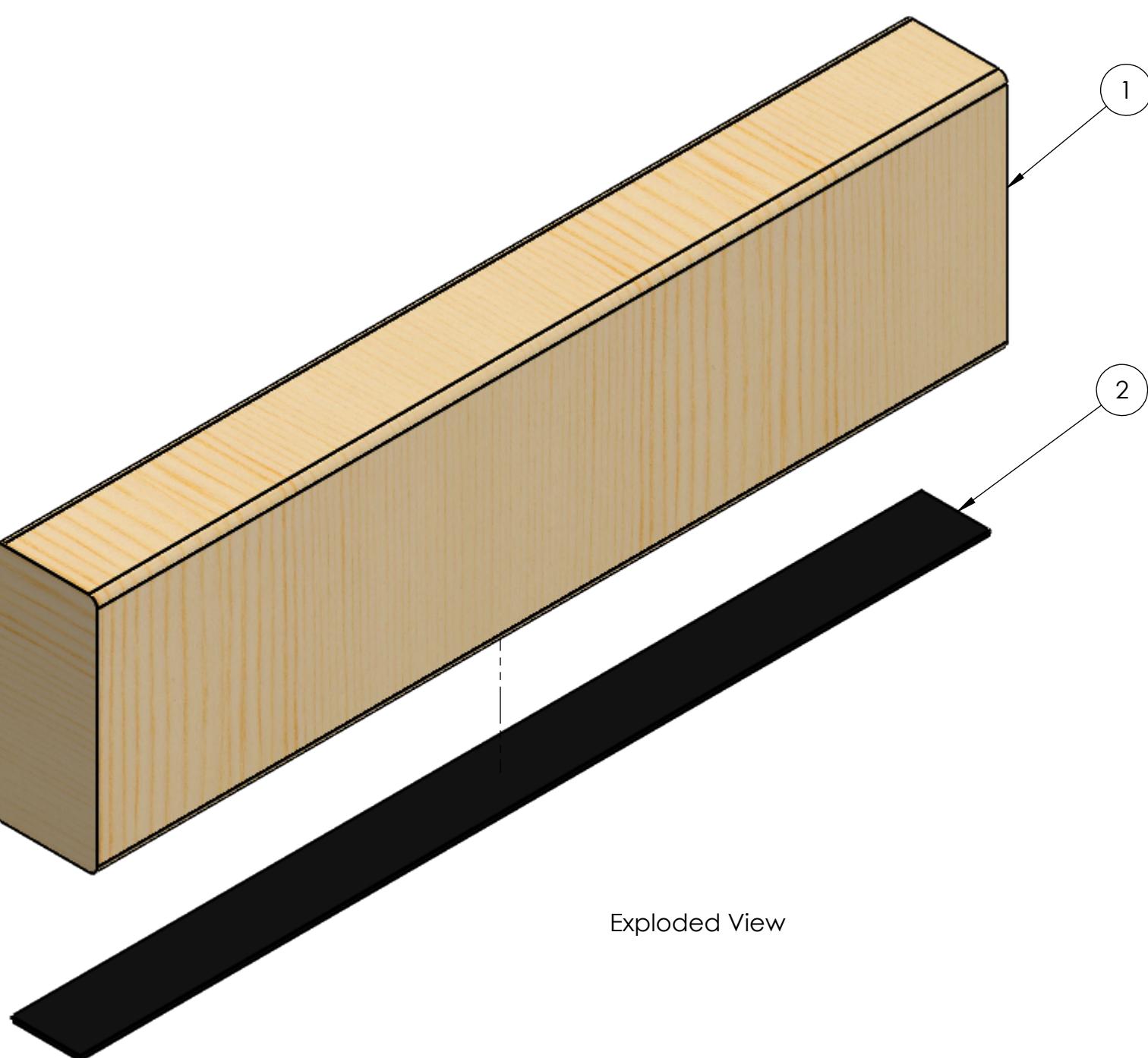
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Attach (2) to (1) as shown using adhesive backing.

Optional: Use wood staples to connect (2) to (1).

Hardware Needed:
Optional: Wood Staples

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	TE-22054	HUB - Simple Build - Lower Exit 2x4	1
2	Hook_1_13.25	1" x 13" Hook, Adhesive Backed	1

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

MATERIAL/FINISH:

COMMENTS:
REMOVE ALL BURRS AND SHARP EDGES.

DO NOT SCALE DRAWING



TITLE: HUB - Simple Build - Lower Exit 2x4 with Hook Assembly

SIZE DWG. NO. REV

C TE-22056

SCALE: 2:3 SHEET 1 OF 2

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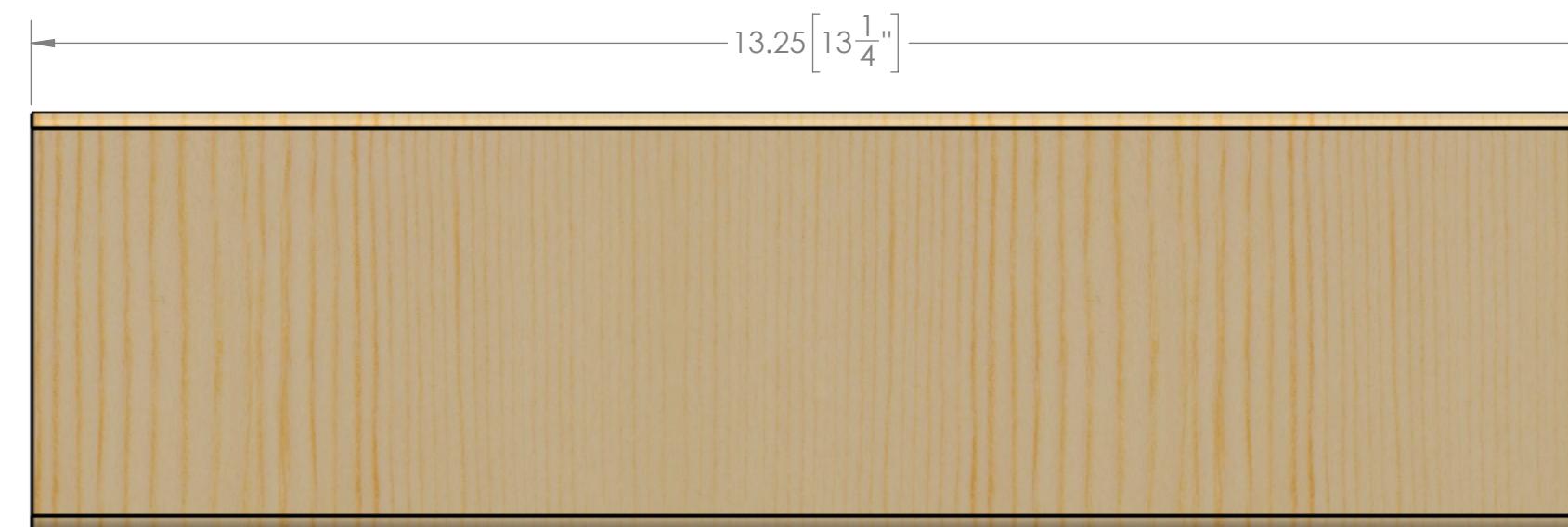
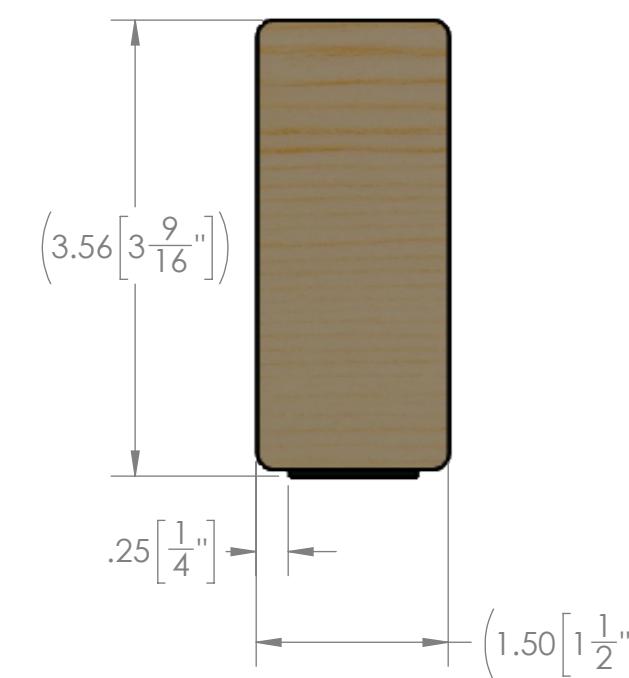
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	C	TE-22056	
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.		SCALE: 2:3	SHEET 2 OF 2
DO NOT SCALE DRAWING			

 **FIRST
ROBOTICS
COMPETITION**  SOLIDWORKS
Modeling Solutions Partner

TITLE: HUB - Simple Build - Lower Exit 2x4 with Hook Assembly

SIZE DWG. NO. REV
C TE-22056

SCALE: 2:3 SHEET 2 OF 2

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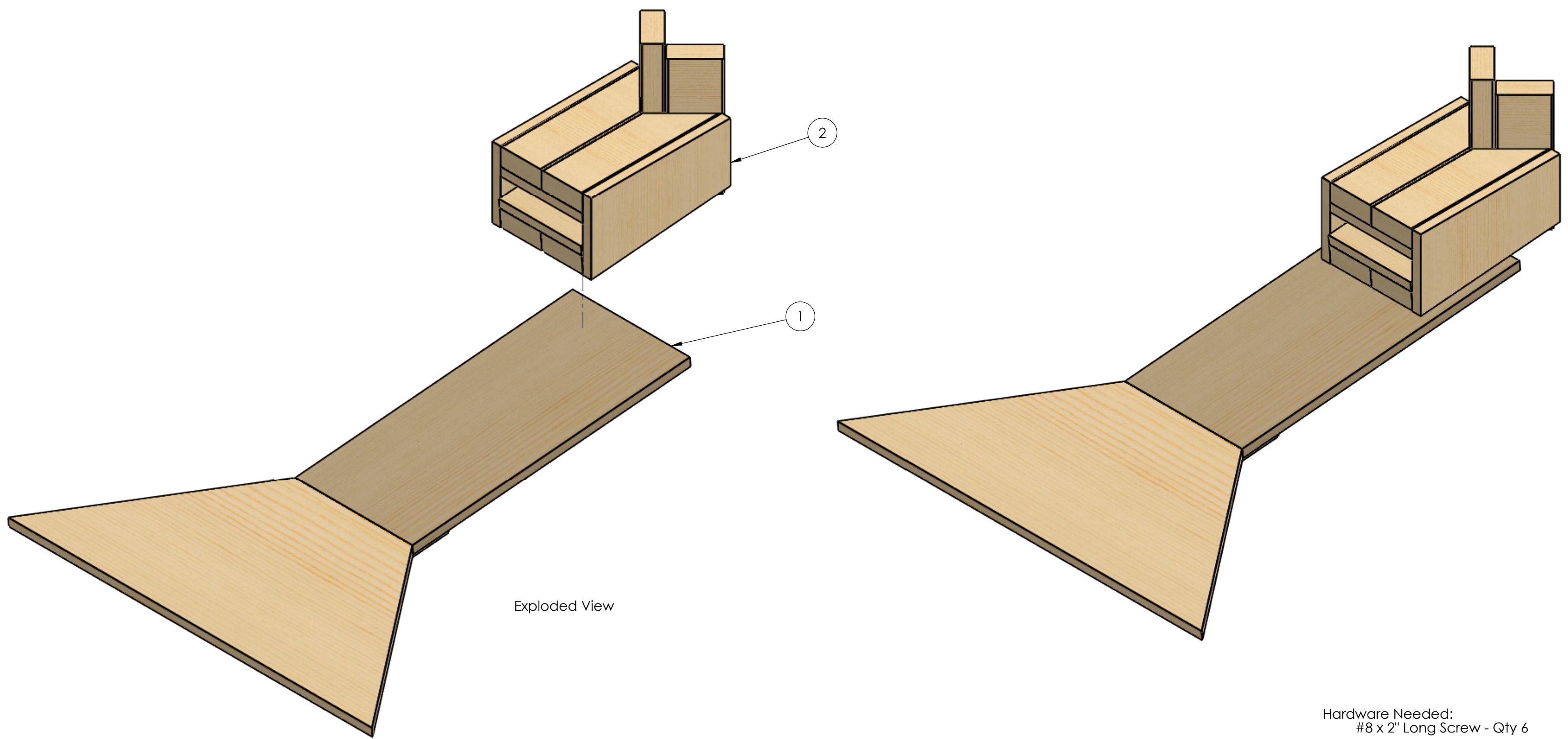
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Step 1:

1. Align (1) and (2), as shown on Sheet 2.
2. Connect using 2" Long Screws. It is recommended to use 6x screws.

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

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	TE-22064	Hub - Simple Build - Upper Exit Chute Assembly	1
2	TE-22068	Hub - Simple Build - Upper Exit Connection Assembly	1

TEAM	NAME	DATE
DRAWN	KAMC	12/30/2021

FIRST ROBOTICS COMPETITION

SOLIDWORKS Modeling Solutions Partner

PROPRIETARY AND CONFIDENTIAL

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COMMENTS:

REMOVE ALL BURRS AND SHARP EDGES.

SIZE DWG. NO. REV

C TE-22060

SCALE: 1:5 SHEET 1 OF 2

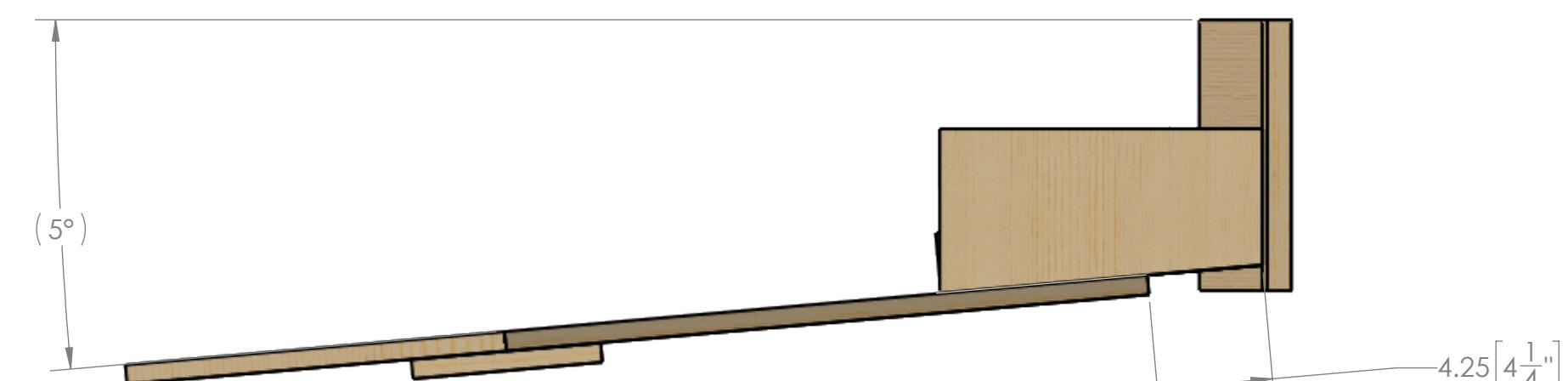
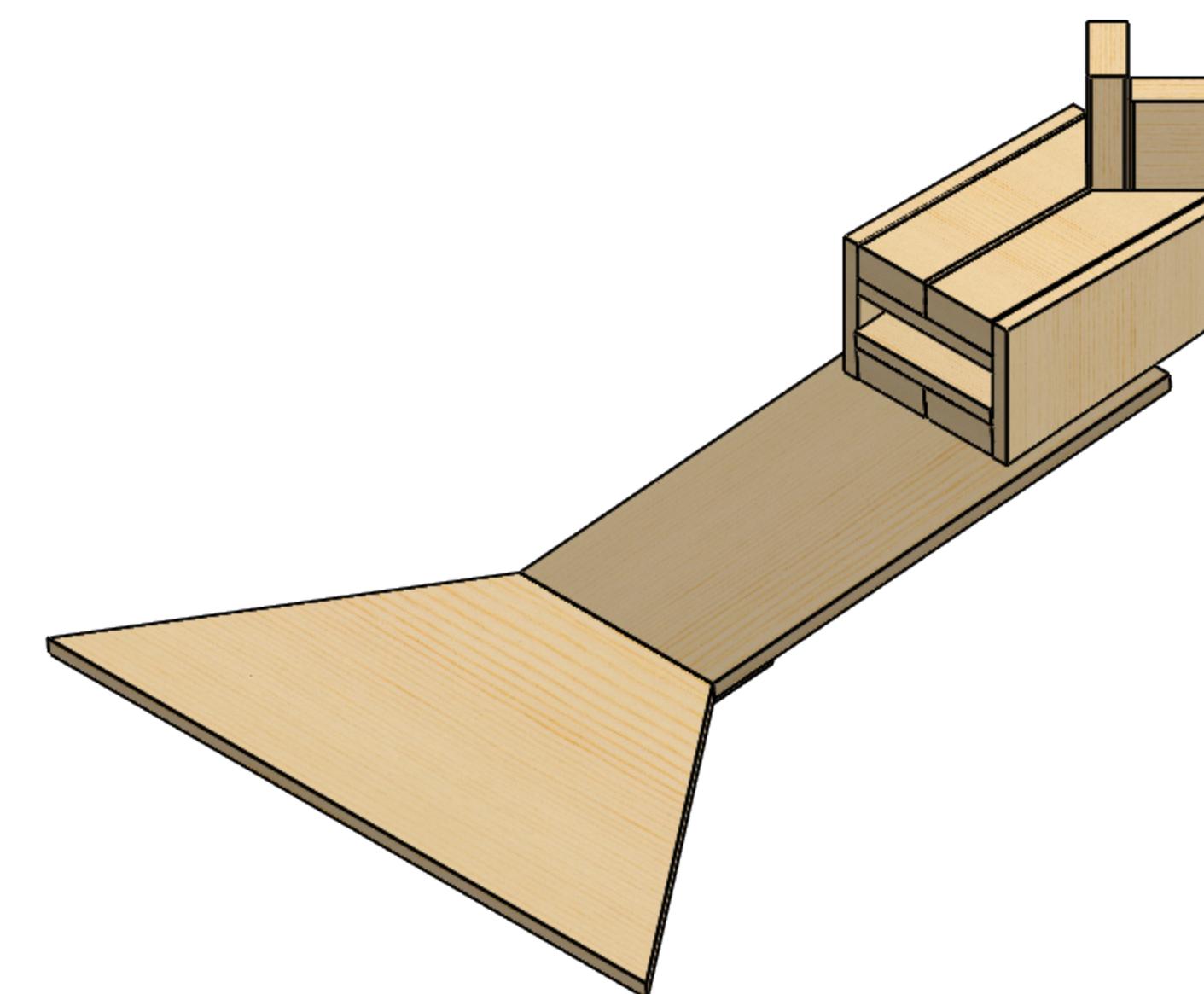
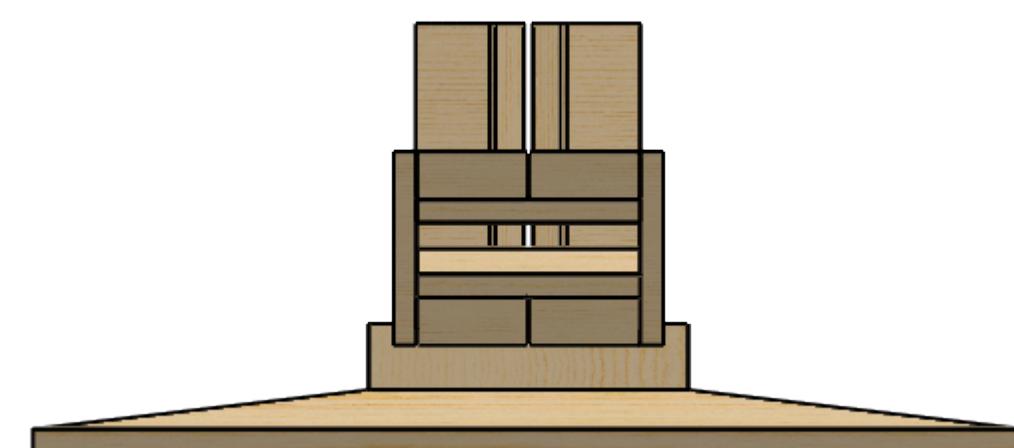
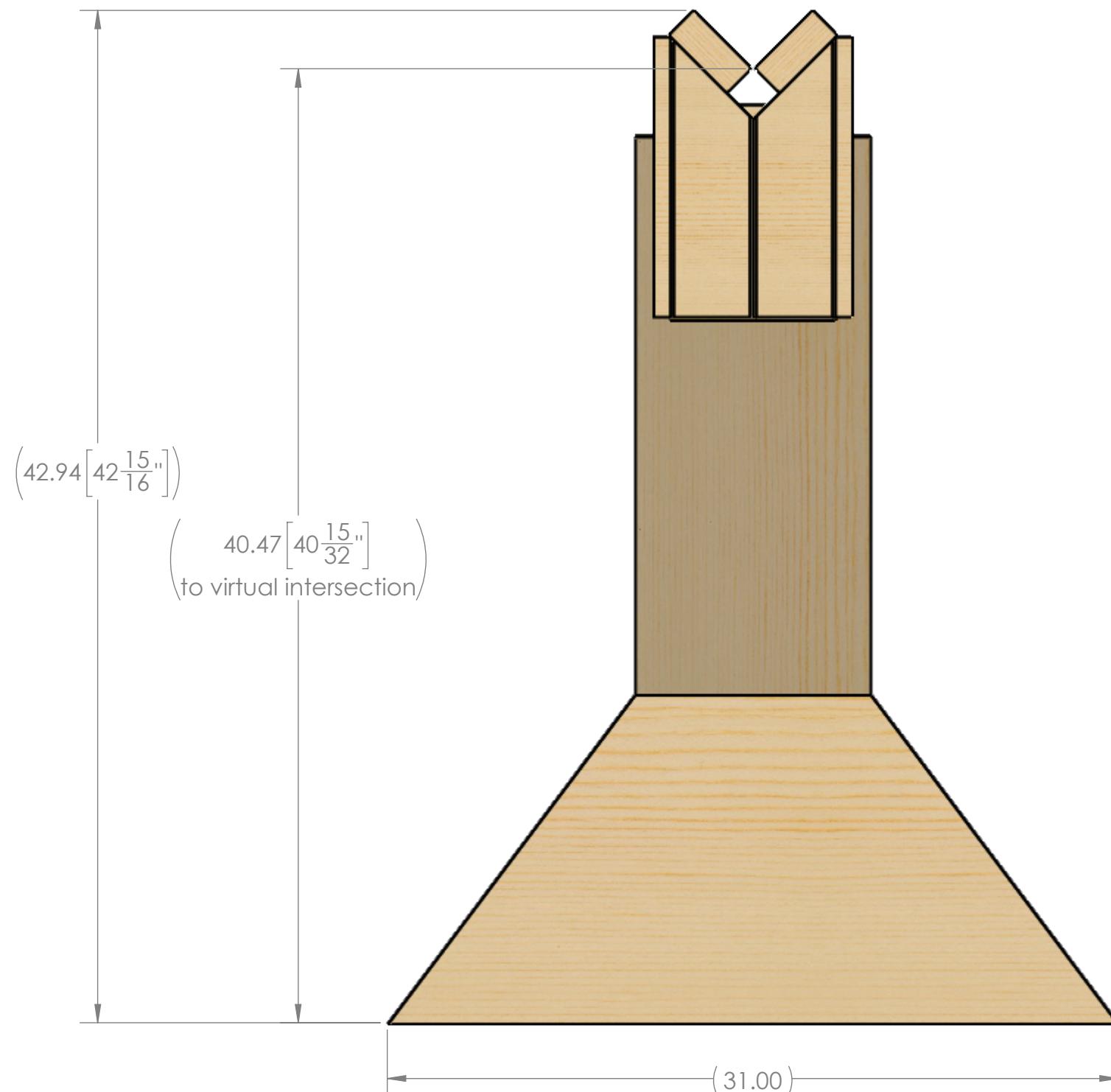
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UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES

TOLERANCES:

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

MATERIAL/FINISH:

DO NOT SCALE DRAWING

TEAM NAME DATE

DRAWN KAMC 12/30/2021



TITLE:
**Hub - Simple Build -
 Upper Exit Assembly**

SIZE DWG. NO. REV

C TE-22060

SCALE: 1:6 SHEET 2 OF 2

4

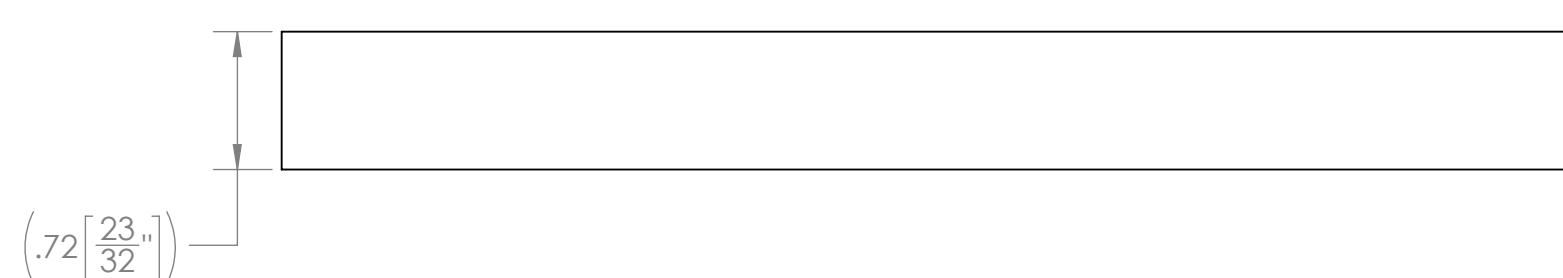
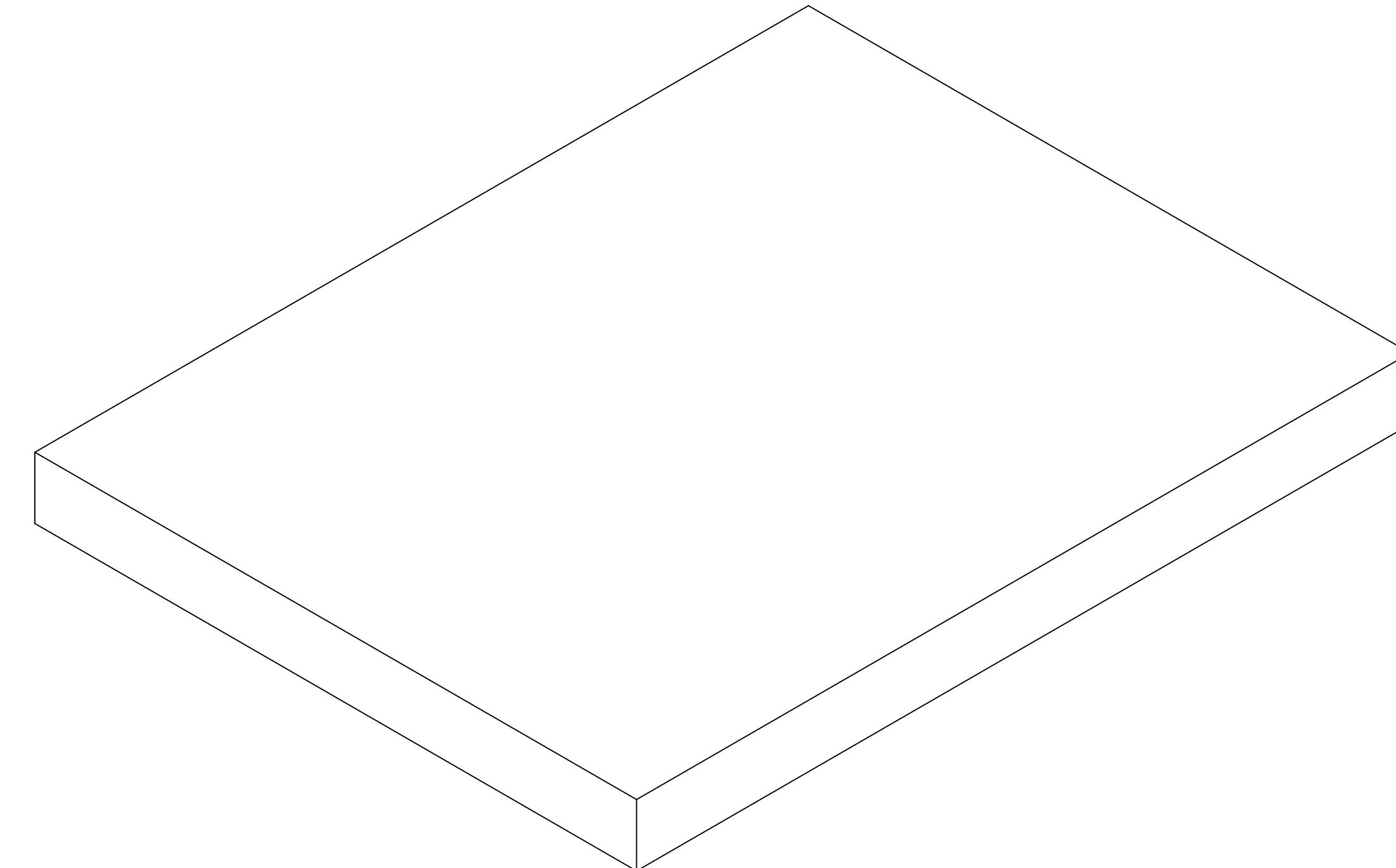
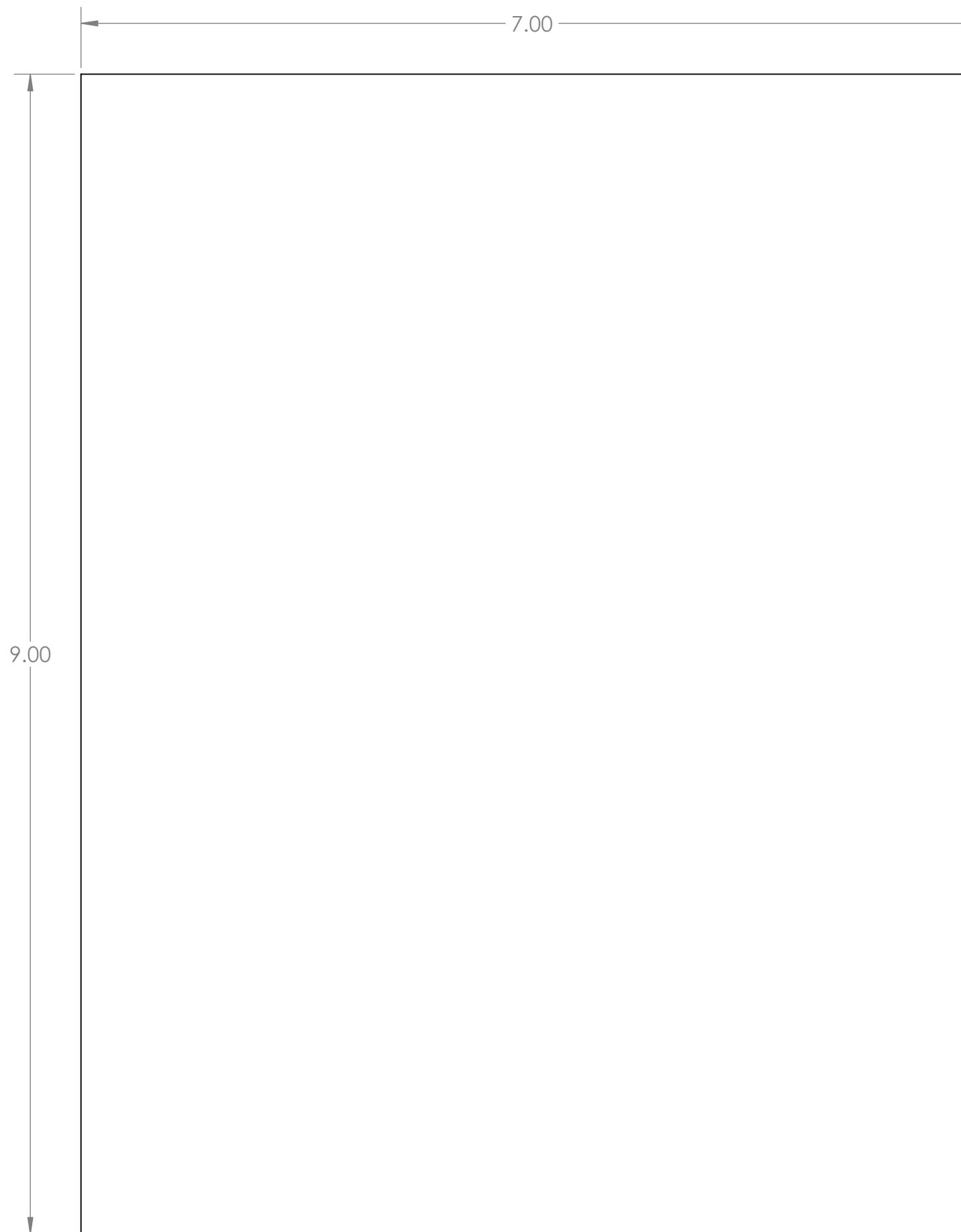
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UNLESS OTHERWISE SPECIFIED:	TEAM	NAME	DATE
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .13$ THREE PLACE DECIMAL $\pm .125$	DRAWN	KAMC	12/29/2021
PROPRIETARY AND CONFIDENTIAL			
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FIRST®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FIRST® IS PROHIBITED.			
MATERIAL/FINISH: 3/4" Plywood			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE: Hub - Simple Build -
Upper Exit Connection
Plate

SIZE DWG. NO. REV
C TE-22061

SCALE: 1:1 SHEET 1 OF 1

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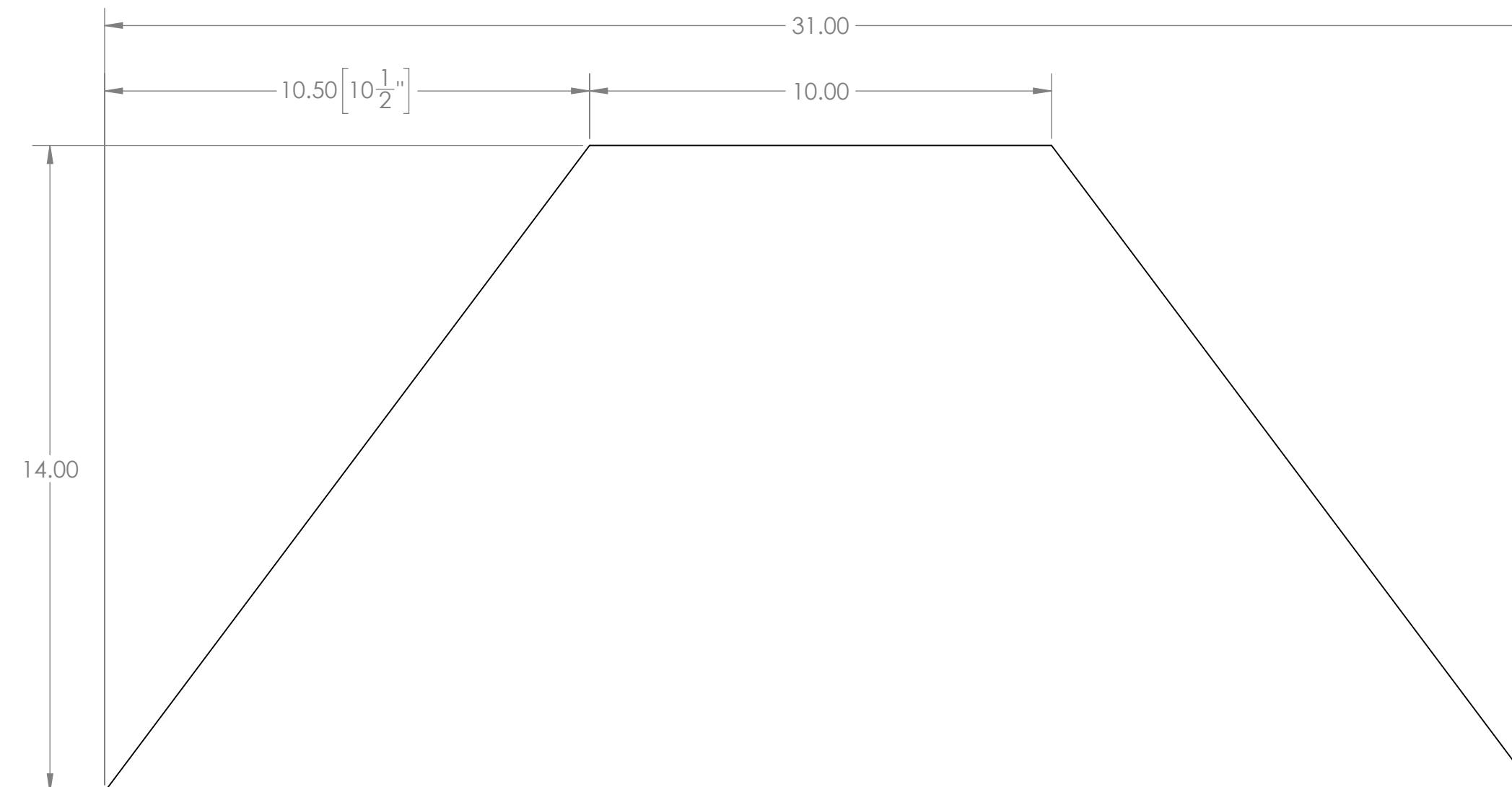
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UNLESS OTHERWISE SPECIFIED:

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 -

Upper Exit Chute End

SIZE DWG. NO. REV

C TE-22062

SCALE: 1:3 SHEET 1 OF 1

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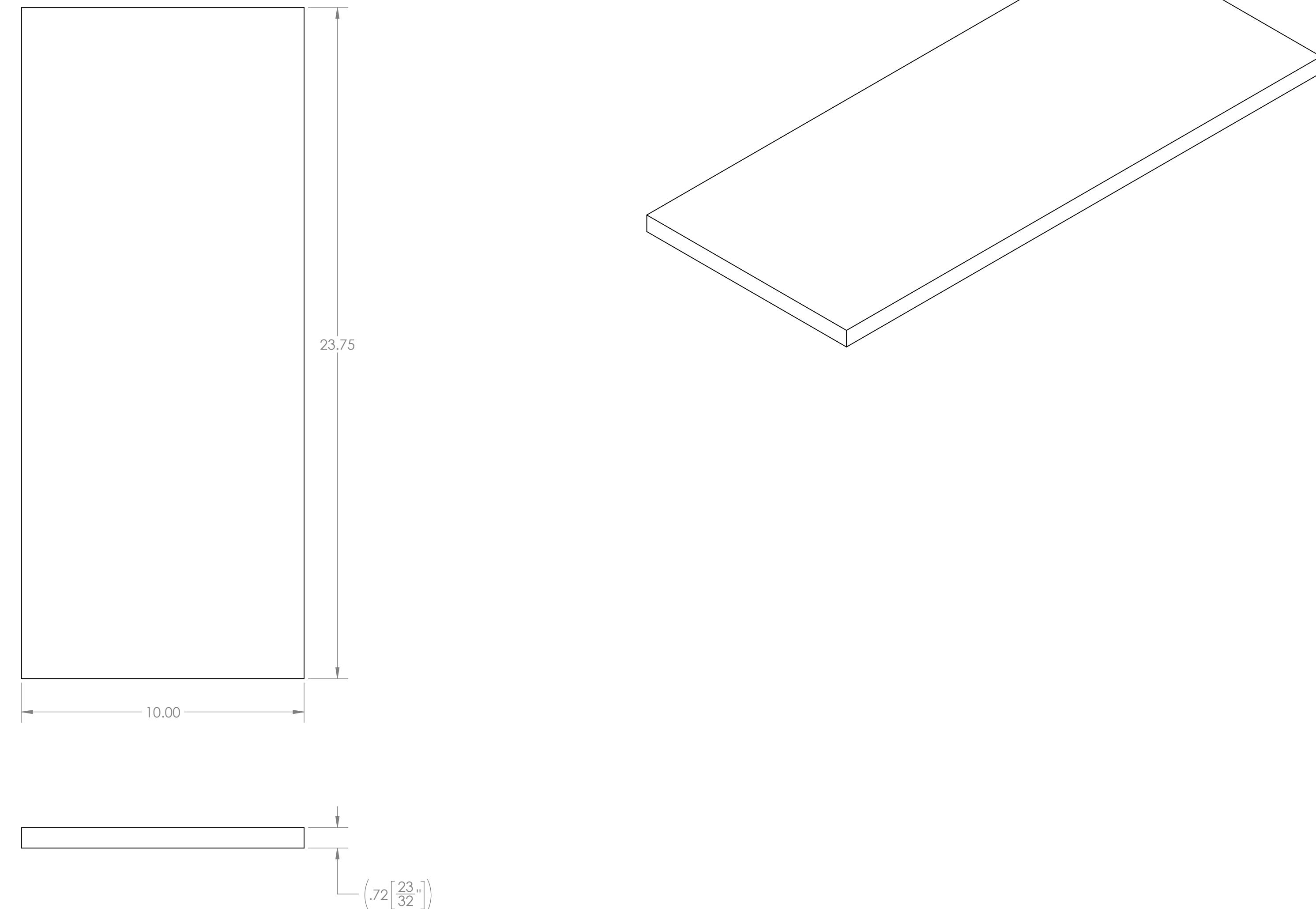
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DRAWN	KAMC	12/29/2021	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:	SIZE	DWG. NO.	REV
3/4" Plywood	C	TE-22063	
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING	SCALE: 1:3	SHEET 1 OF 1	

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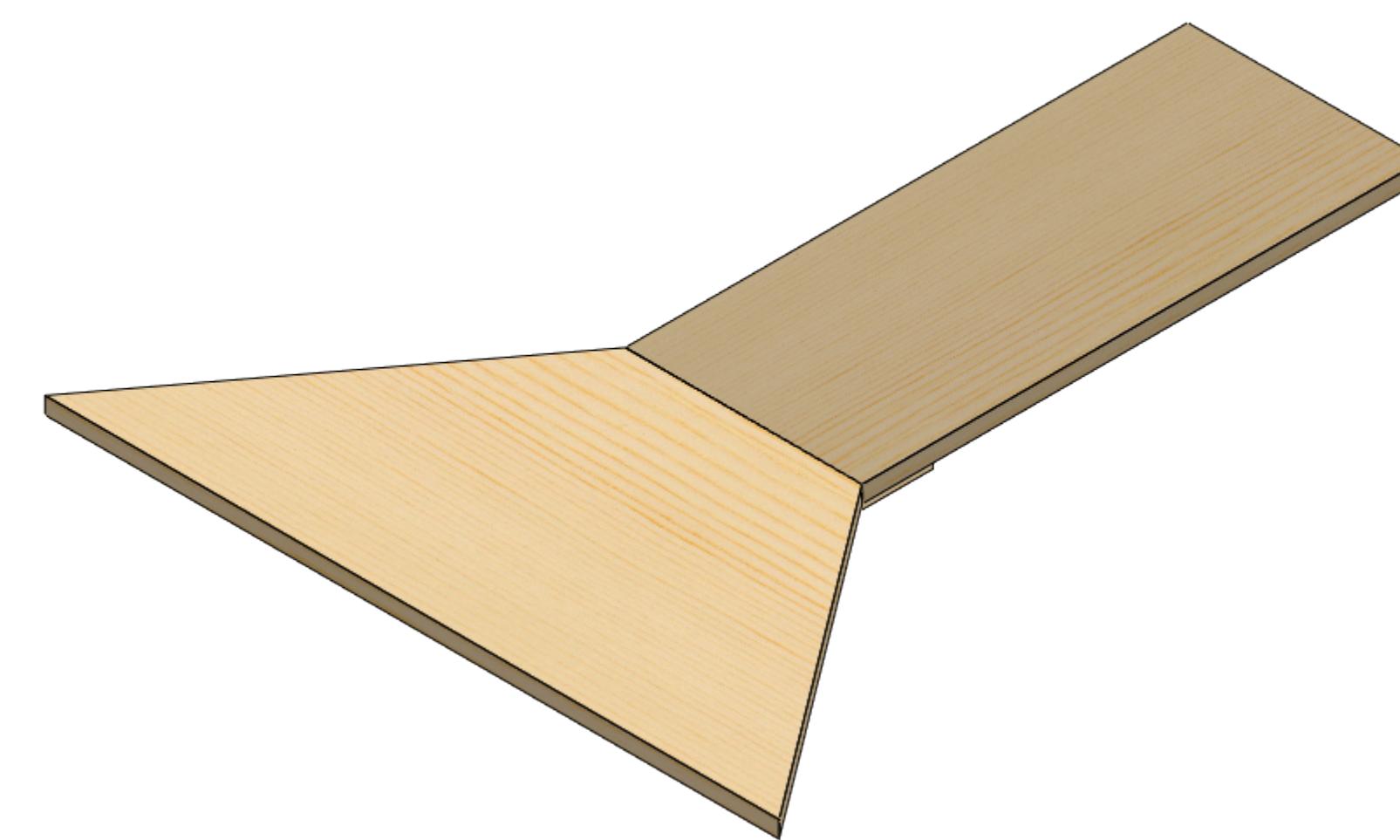
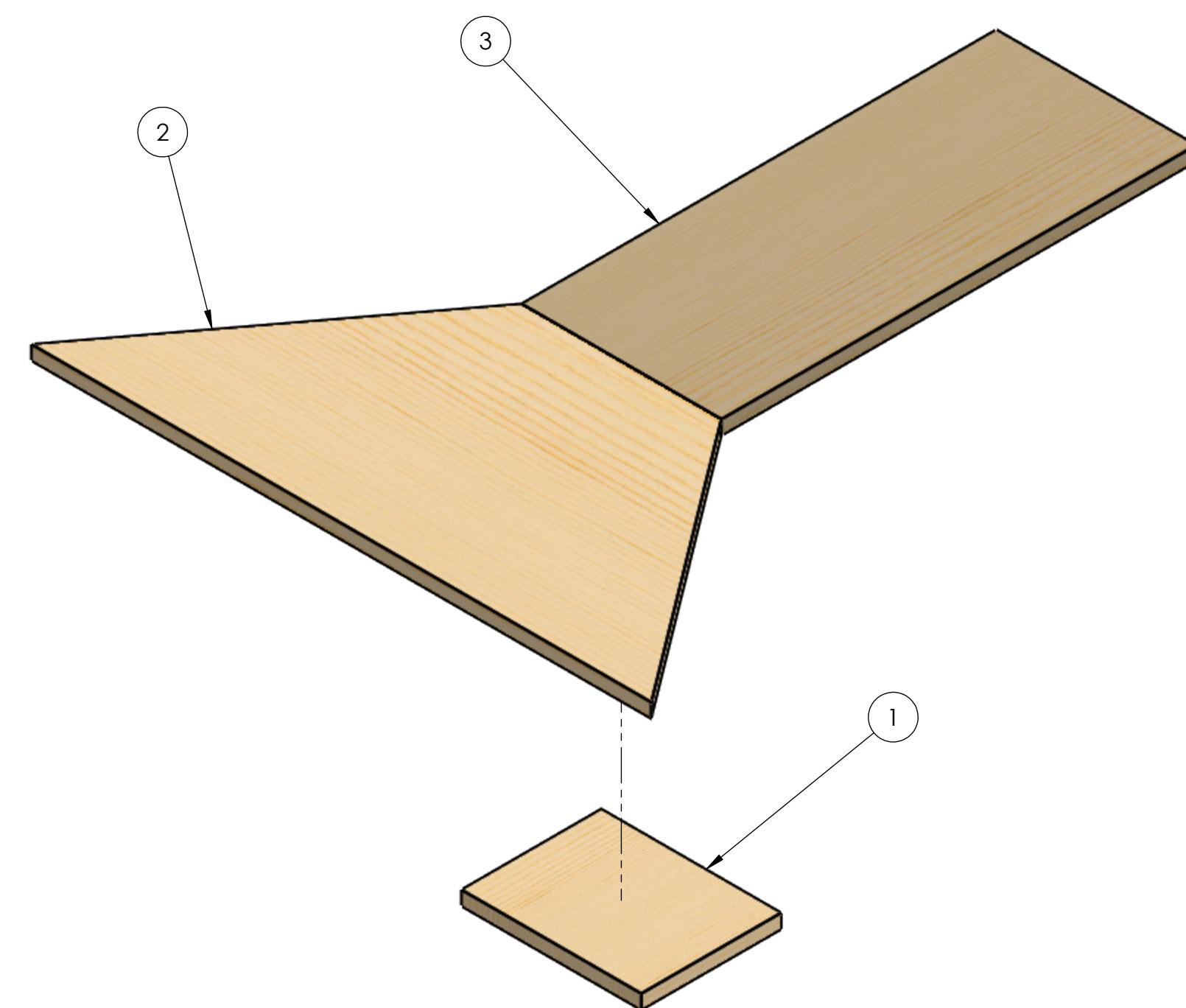
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ITEM NO.	PART NUMBER	DESCRIPTION	
1	TE-22061	Hub - Simple Build - Upper Exit Connection Plate	1
2	TE-22062	Hub - Simple Build - Upper Exit Chute End	1
3	TE-22063	Hub - Simple Build - Upper Exit Chute Base	1

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DRAWN	KAMC	12/30/2021	 FIRST ROBOTICS COMPETITION					
 SOLIDWORKS Modeling Solutions Partner								
PROPRIETARY AND CONFIDENTIAL								
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COMMENTS:								
REMOVE ALL BURRS AND SHARP EDGES.								

SIZE	DWG. NO.	REV
C	TE-22064	
SCALE: 1:5	SHEET 1 OF 3	

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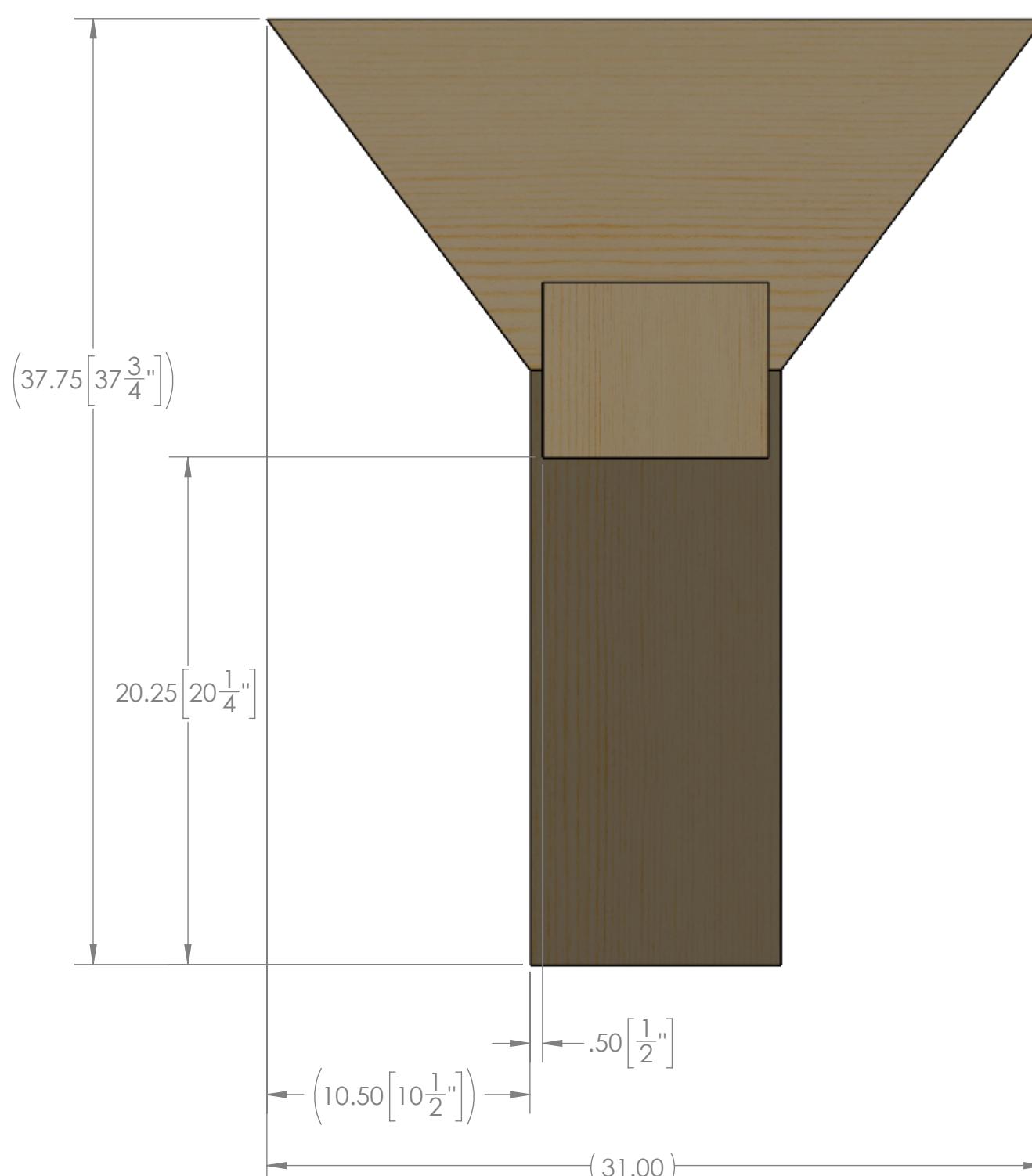
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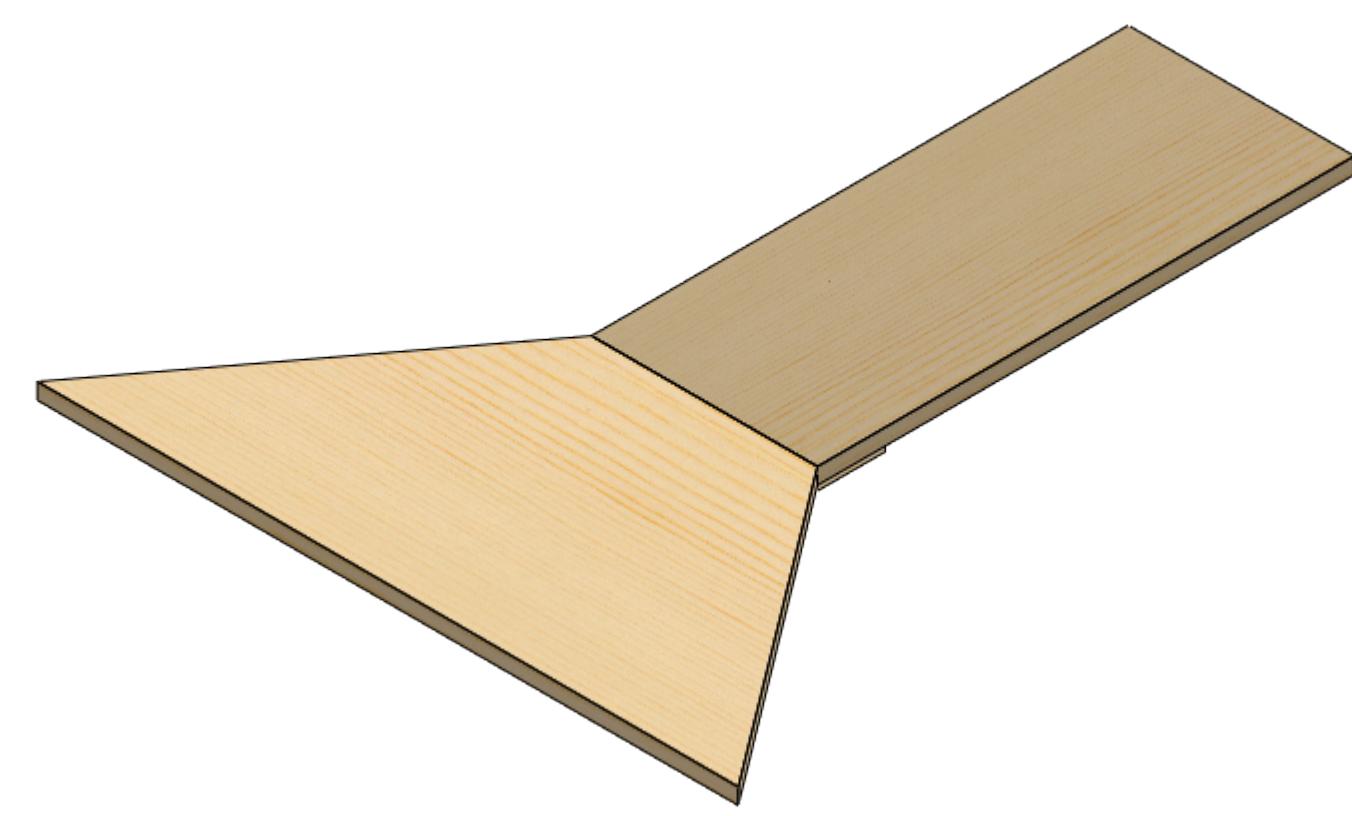
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$(1.44 [1 \frac{7}{16}"])$



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DRAWN	KAMC	12/30/2021	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:	SIZE	DWG. NO.	REV
	C	TE-22064	
COMMENTS:	REMOVE ALL BURRS AND SHARP EDGES.		
DO NOT SCALE DRAWING	SCALE: 1:6	SHEET 2 OF 3	

FIRST
ROBOTICS
COMPETITION

SOLIDWORKS
Modeling Solutions Partner

TITLE:
Hub - Simple Build -
Upper Exit Chute
Assembly

SIZE DWG. NO. REV

C TE-22064

SCALE: 1:6 SHEET 2 OF 3

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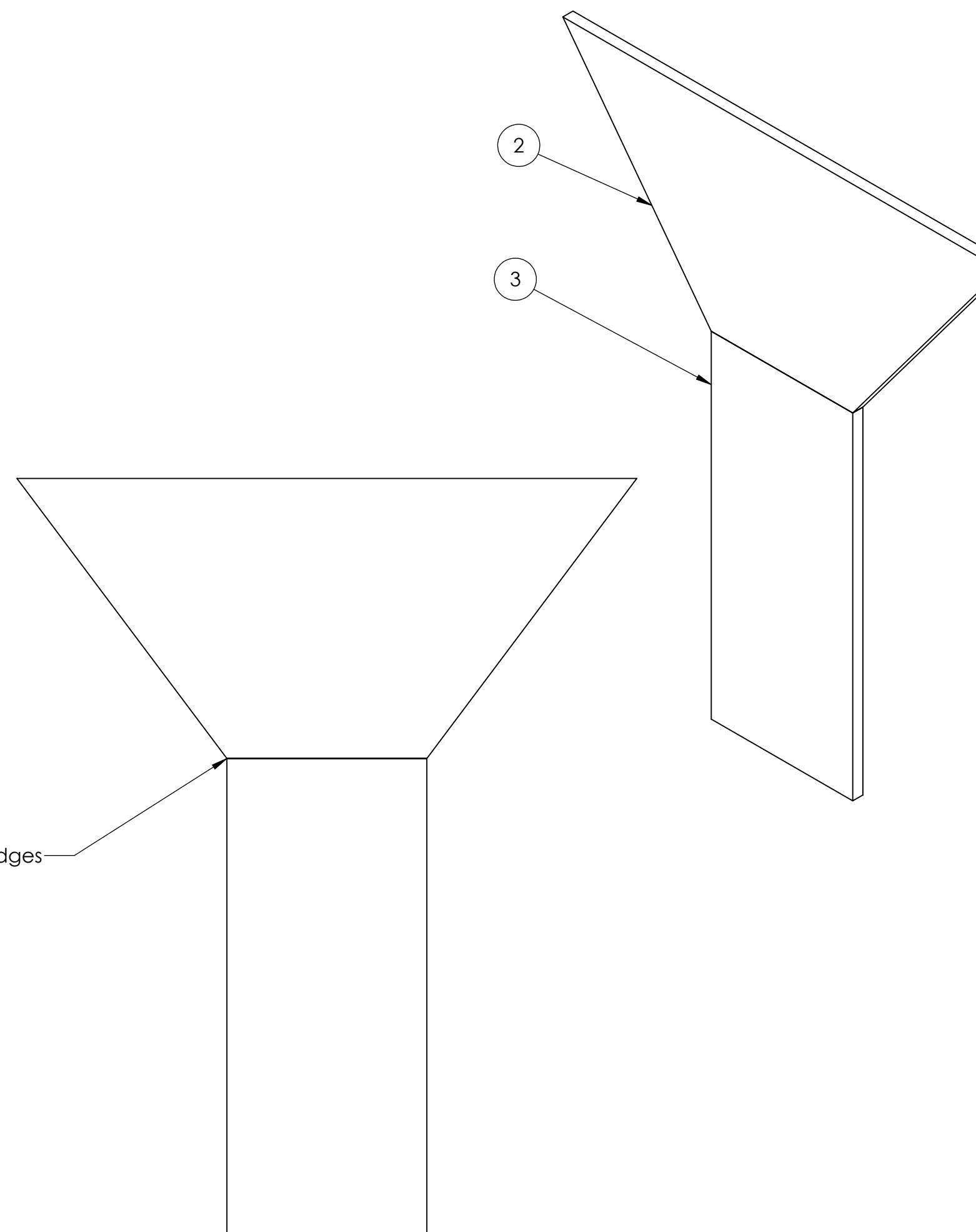
1

Step 1

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Align Edges



1. Align (3) to (2), as shown. Connection will happen in the next step.

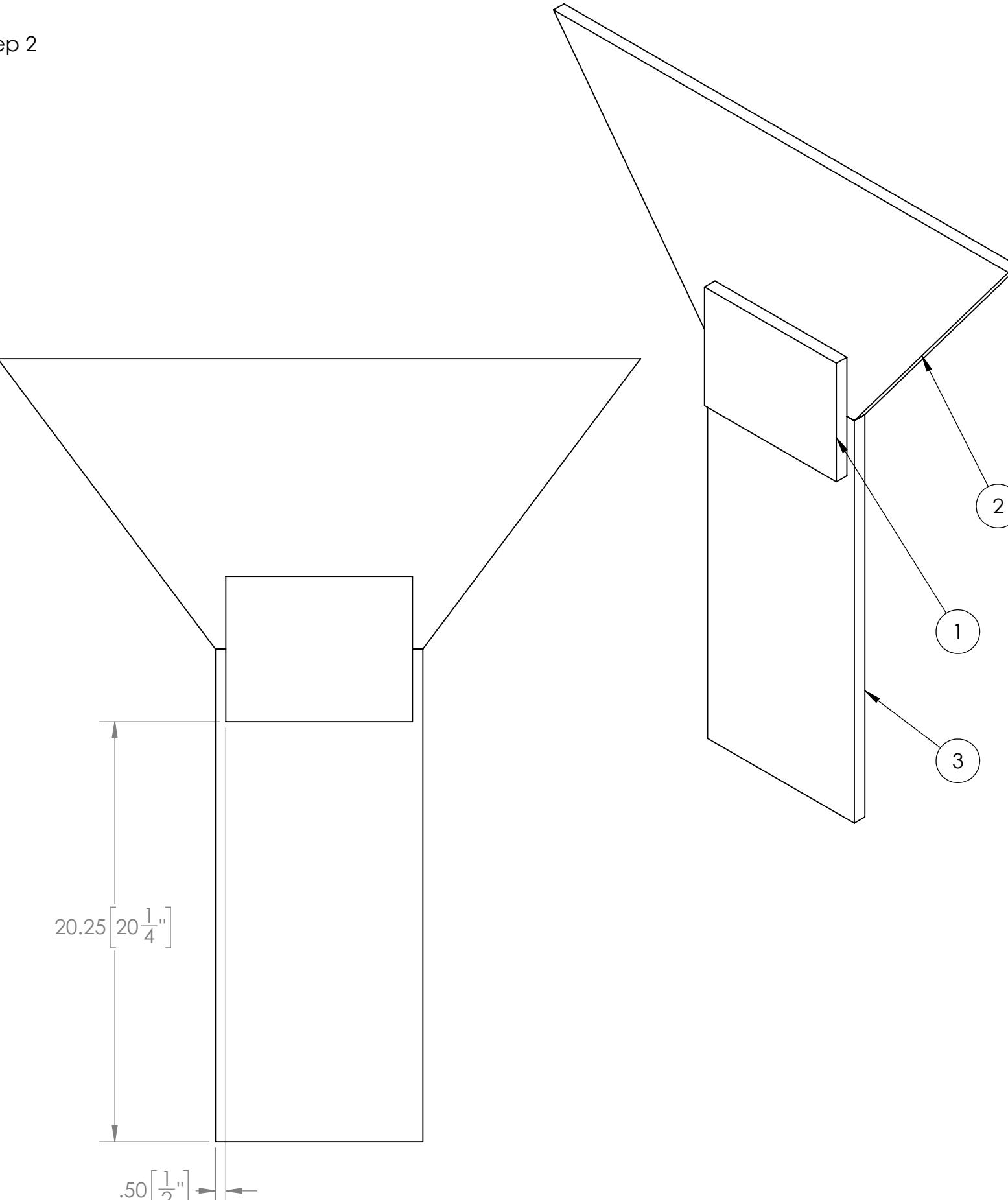
Step 2

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1. Align (1) to Step 1, as shown.
2. Connect using 1.25" Long Screws. It is recommended to use 8x screws, 4x screws into (3) and 4x screws into (2).

UNLESS OTHERWISE SPECIFIED:			TEAM	NAME	DATE
DIMENSIONS ARE IN INCHES			DRAWN	KAMC	12/30/2021
PROPRIETARY AND CONFIDENTIAL					
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MATERIAL/FINISH:	COMMENTS:	SIZE	DWG. NO.	REV	
	REMOVE ALL BURRS AND SHARP EDGES.	C	TE-22064		
		SCALE: 1:6	SHEET 3 OF 3		
DO NOT SCALE DRAWING					

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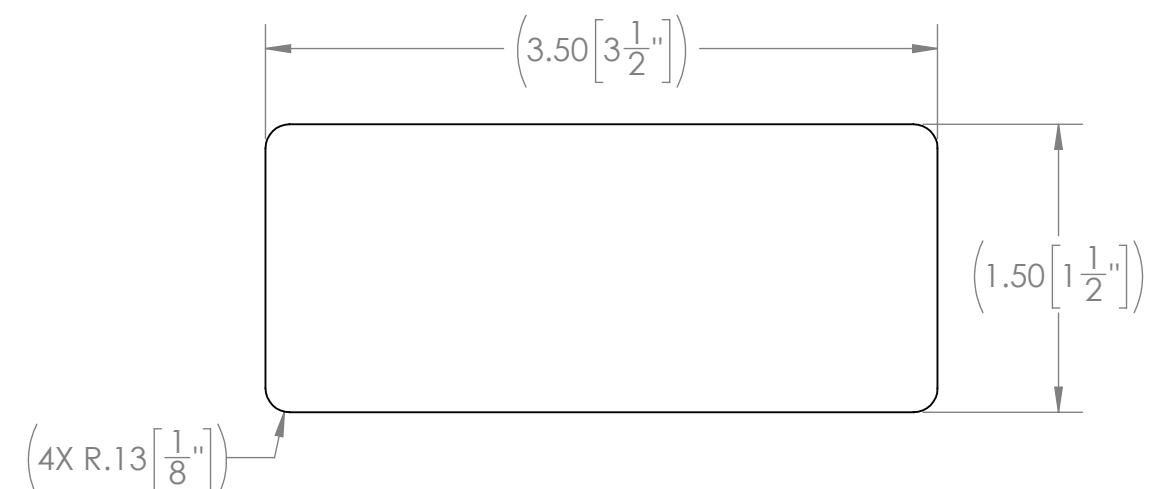
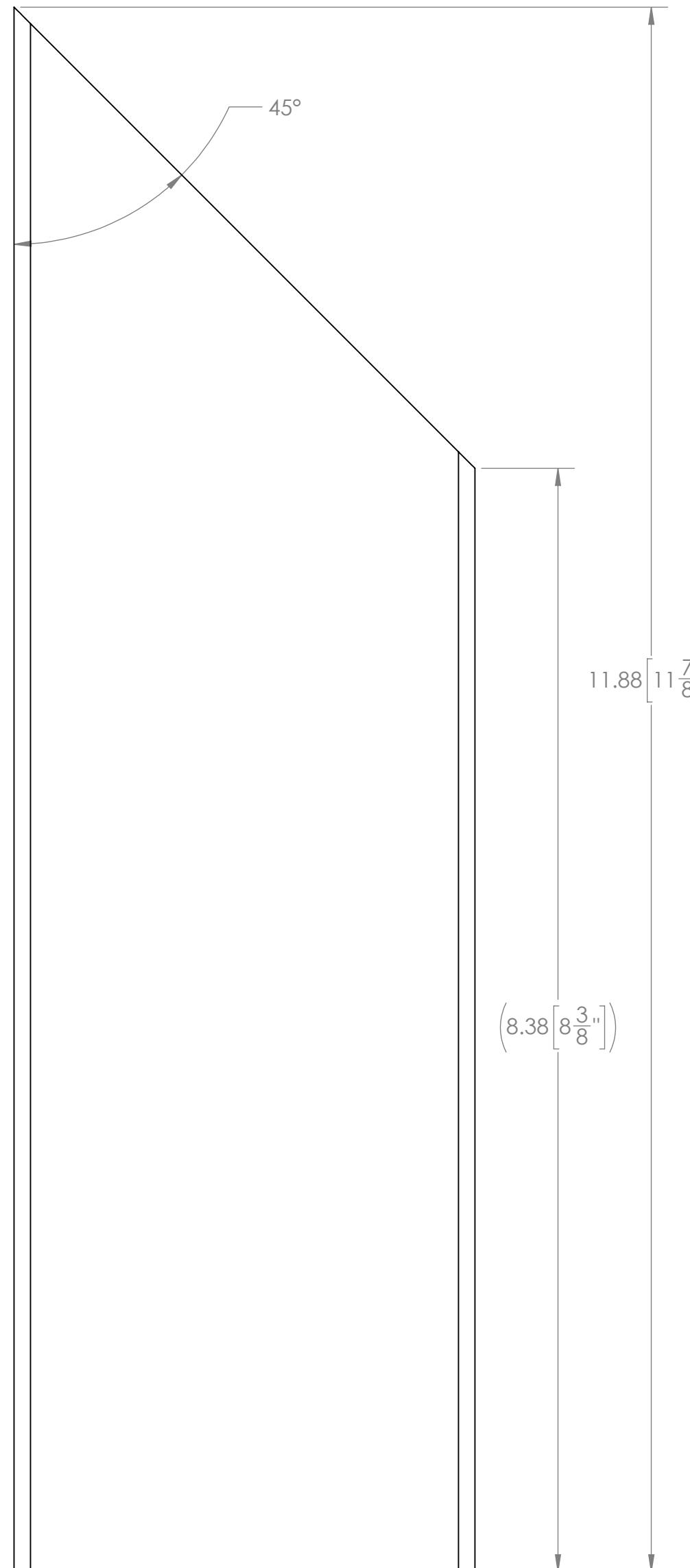
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DIMENSIONS ARE IN INCHES	DRAWN	KAMC	12/29/2021
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH: 2"x4" Lumber			
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

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

TITLE: Hub - Simple Build -
Upper Exit Connection
Box 2x4

SIZE DWG. NO. REV

C TE-22065

SCALE: 1:1 SHEET 1 OF 1

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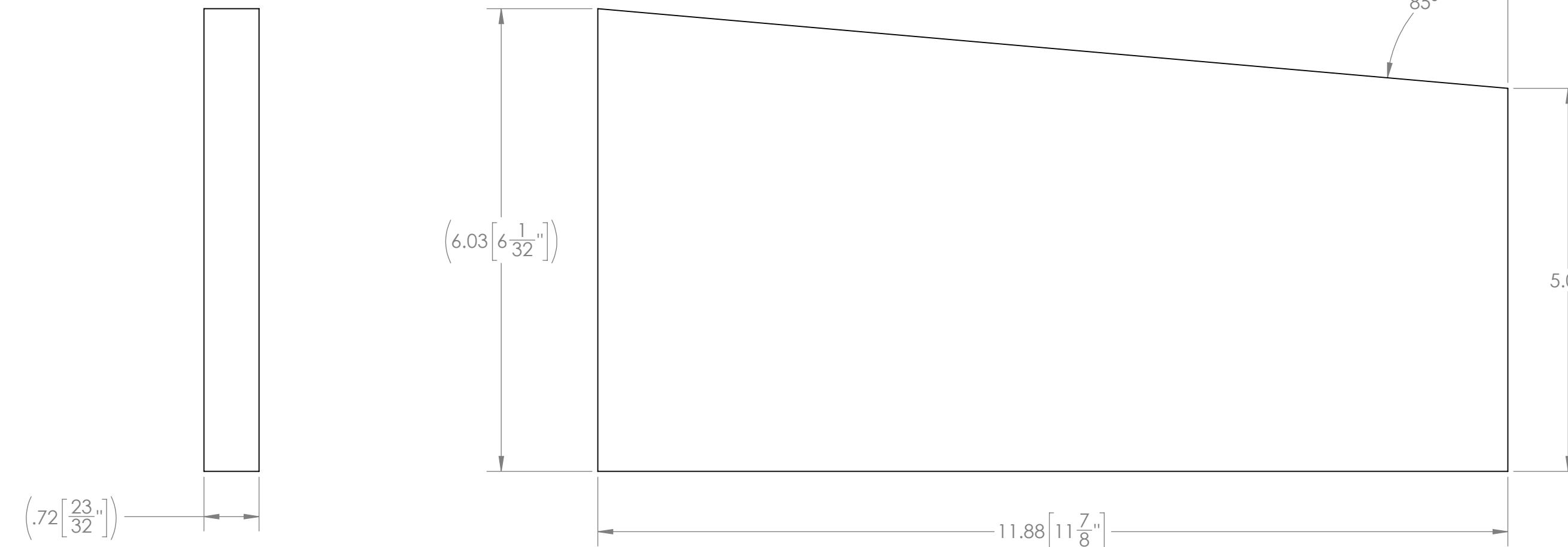
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UNLESS OTHERWISE SPECIFIED:	TEAM	NAME	DATE
DRAWN	KAMC	1/3/2022	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:	SIZE	DWG. NO.	REV
3/4" Plywood	C	TE-22066	
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING	SCALE: 2:3	SHEET 1 OF 1	

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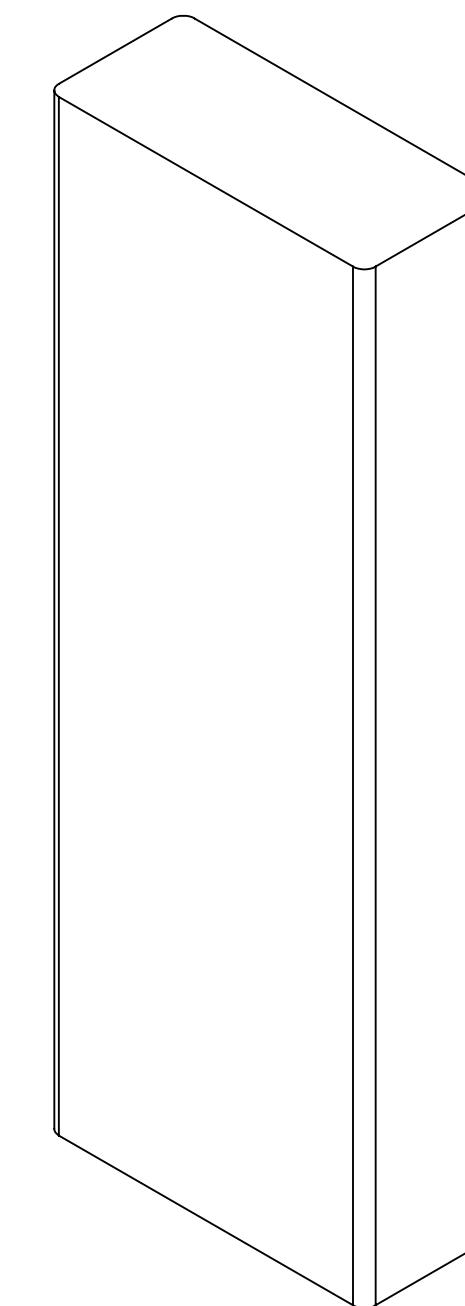
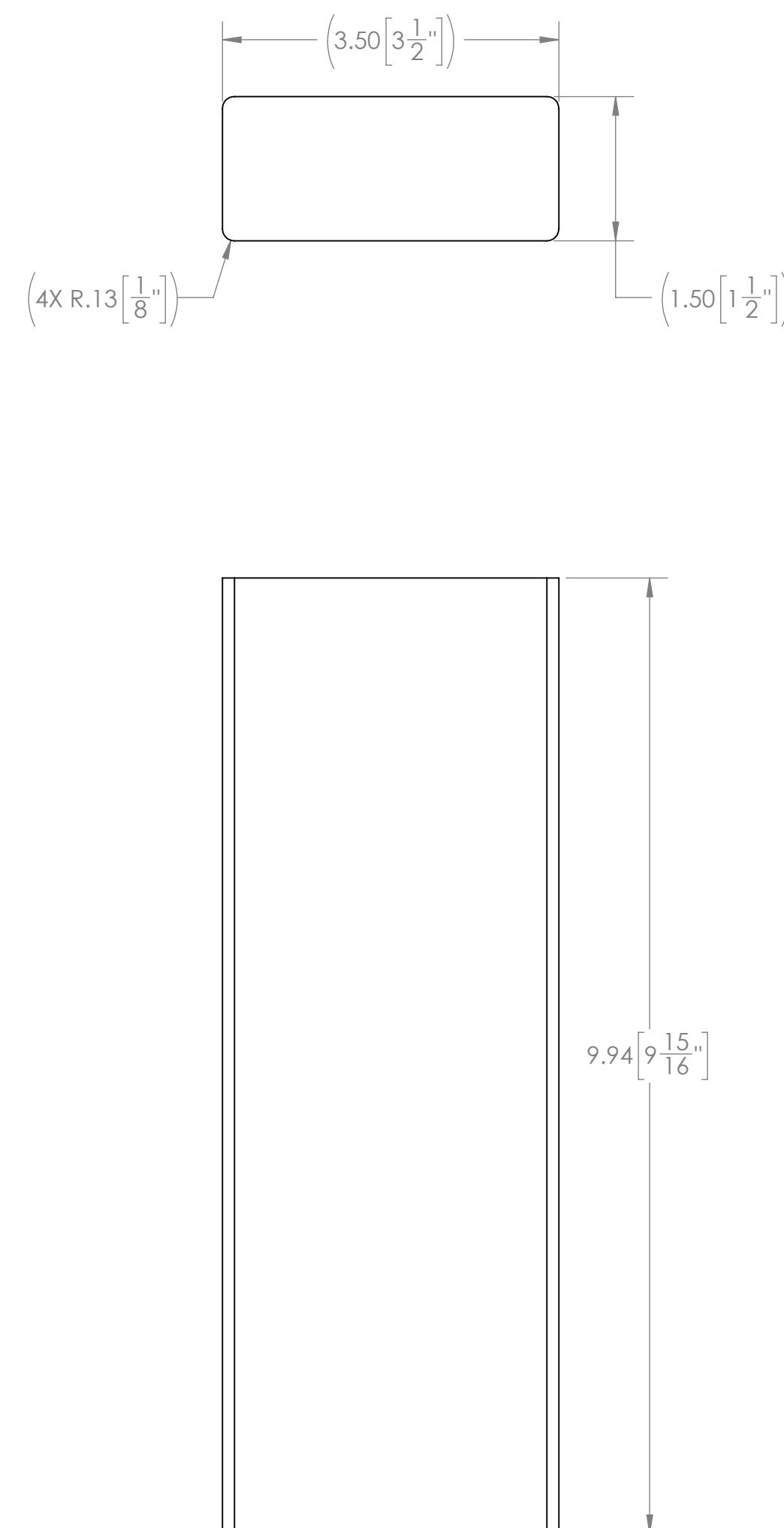
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DIMENSIONS ARE IN INCHES	DRAWN	KAMC	12/29/2021
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:	SIZE	DWG. NO.	REV
2"x4" Lumber	C	TE-22067	
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING	SCALE: 2:3	SHEET 1 OF 1	

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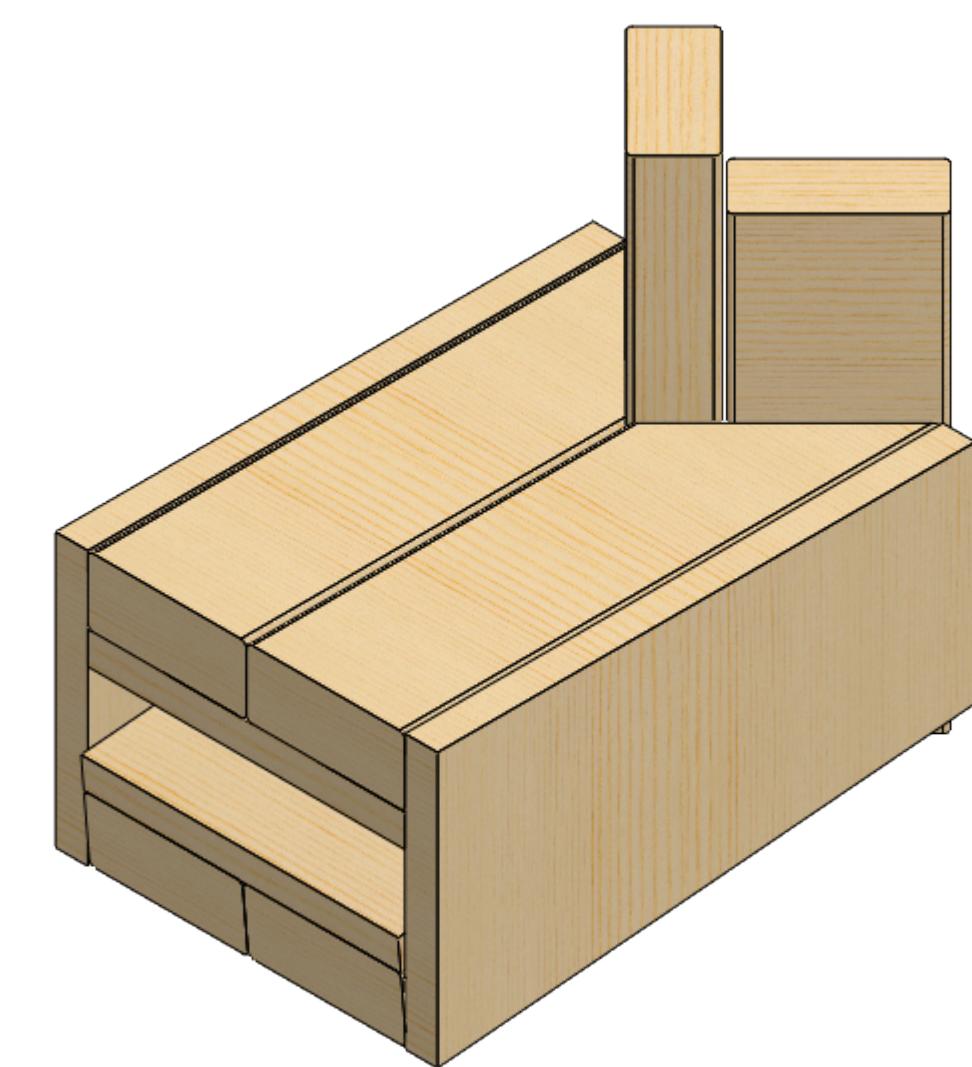
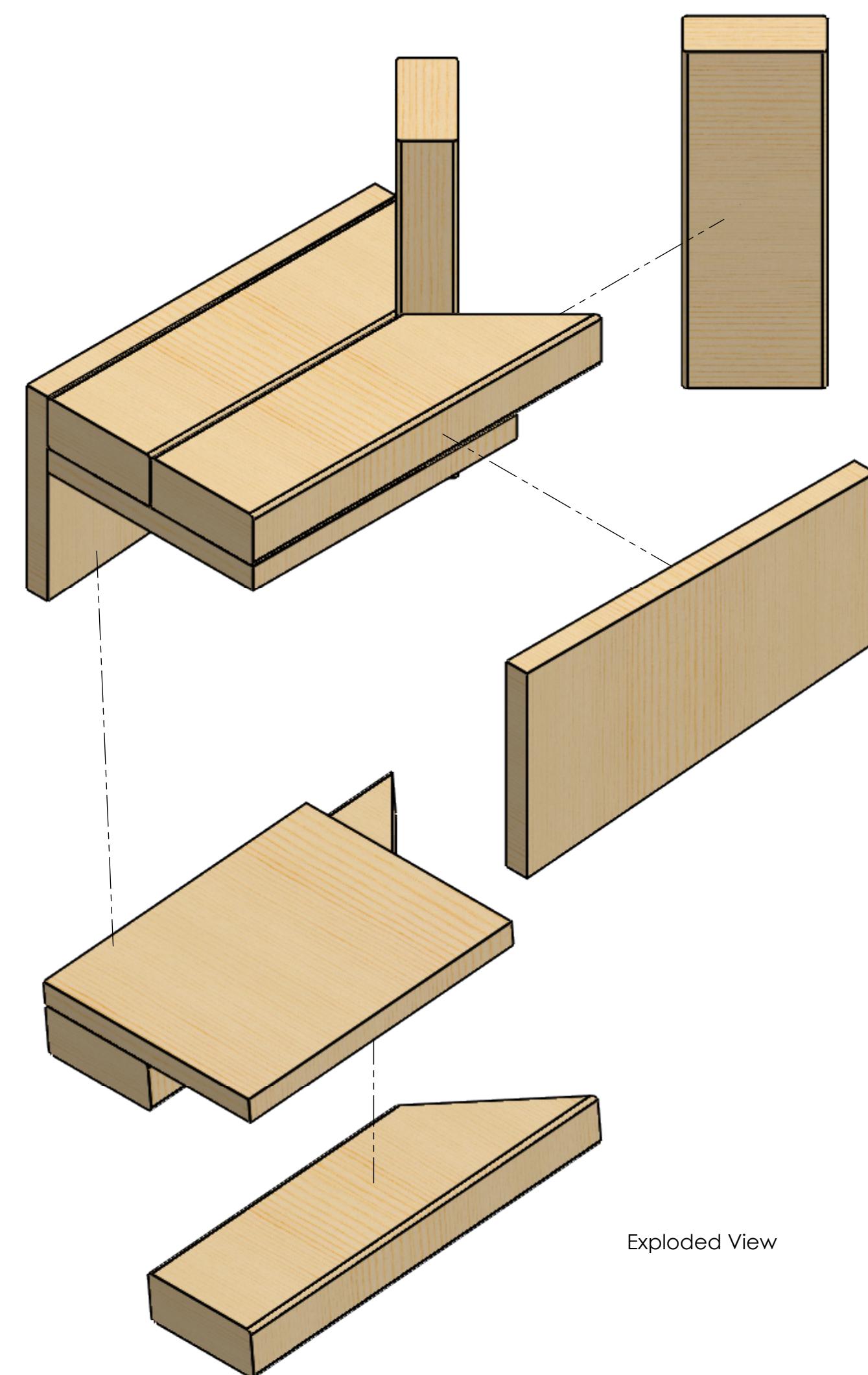
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Hardware Needed:
 #8 x 2" Long Screw - Qty 24
 #8 x 2.5" Long Screw - Qty 8

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	TE-22065	Hub - Simple Build - Upper Exit Connection Box 2x4	4
2	TE-22061	Hub - Simple Build - Upper Exit Connection Plate	2
3	TE-22066	Hub - Simple Build - Upper Exit Connection Box Side	2
4	TE-22067	Hub - Simple Build - Upper Exit Connection 2x4	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-22068		
		SCALE: 1:3	SHEET 1 OF 3		

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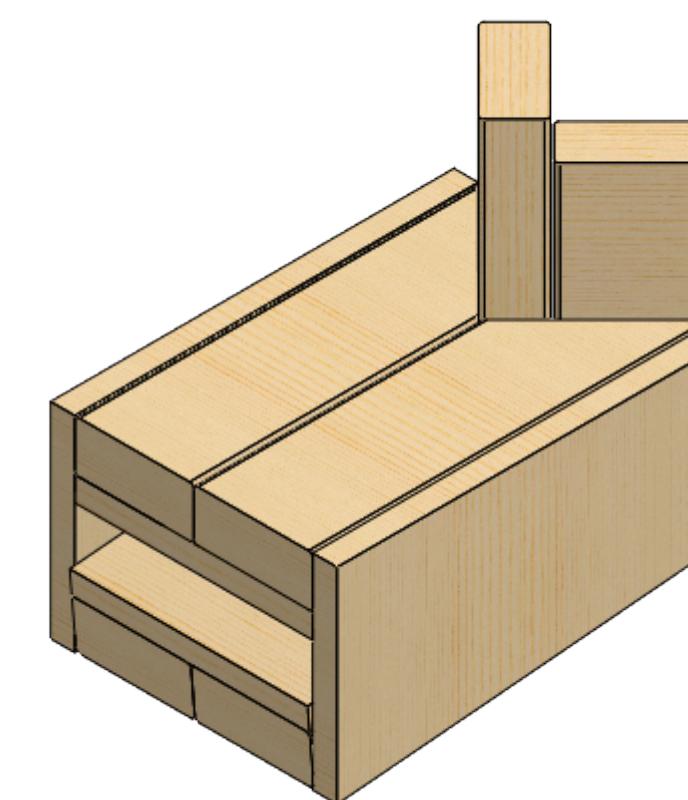
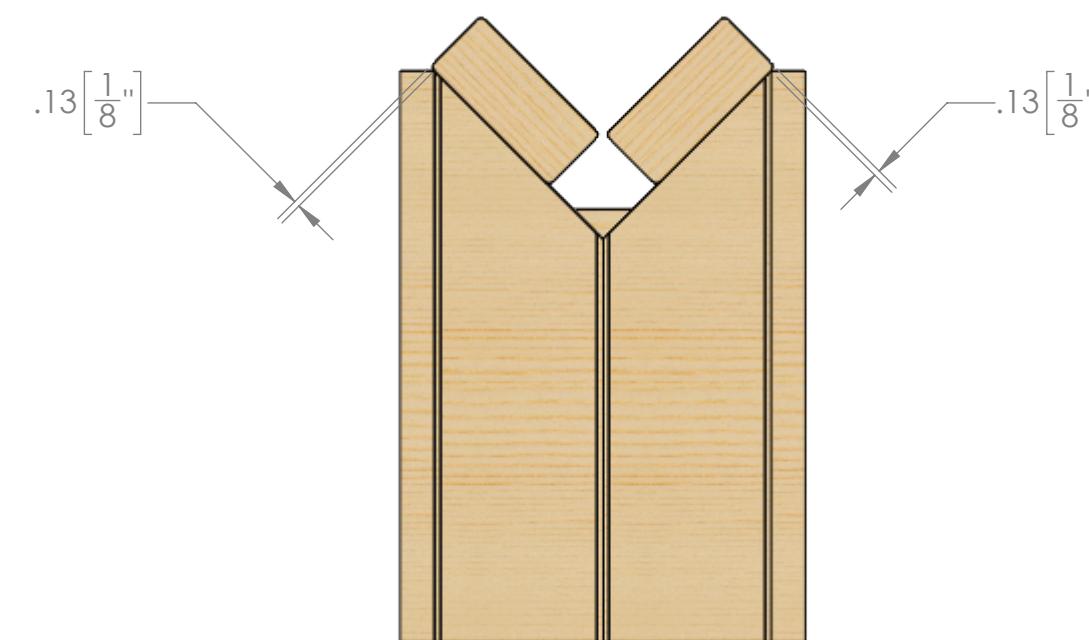
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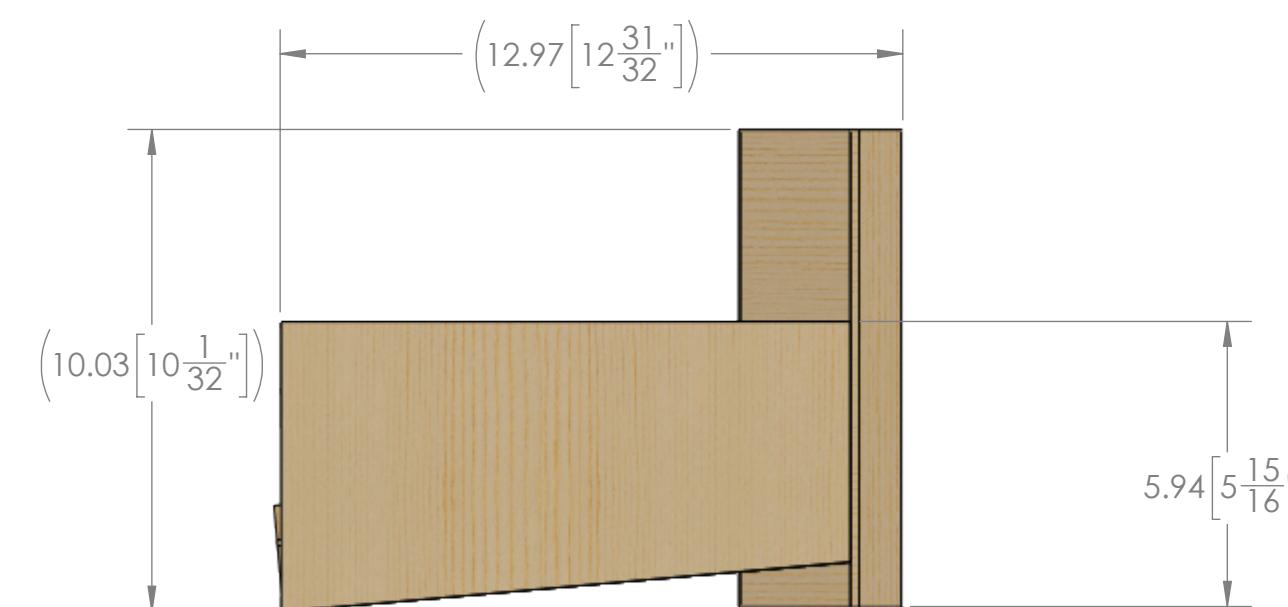
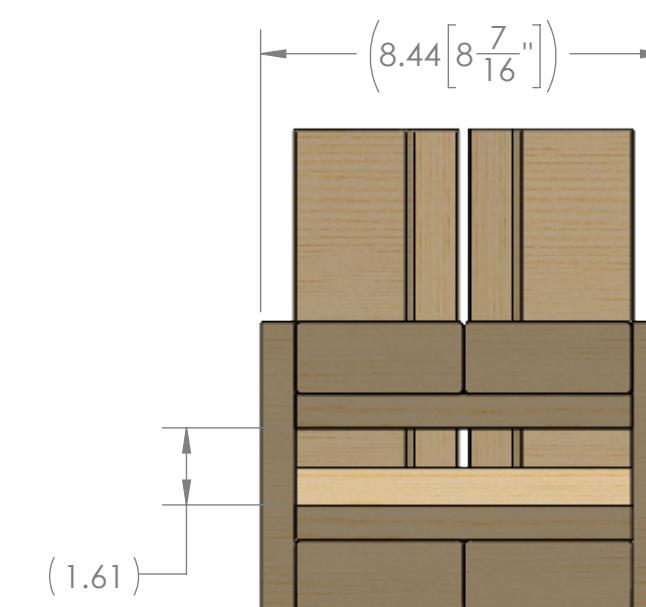
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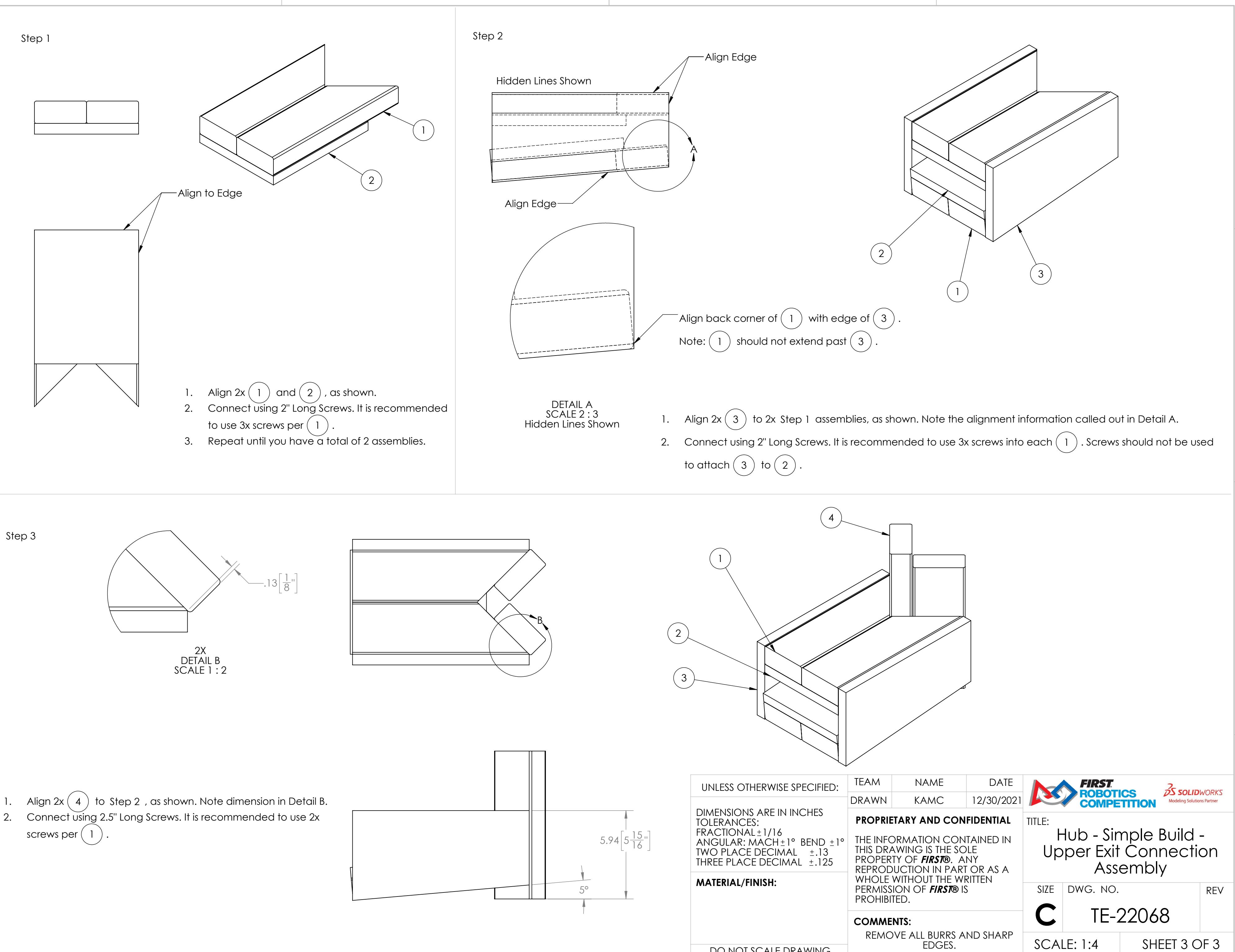
UNLESS OTHERWISE SPECIFIED:	TEAM	NAME	DATE
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL $\pm 1/16$ ANGULAR: MACH $\pm 1^\circ$ BEND $\pm 1^\circ$ TWO PLACE DECIMAL $\pm .13$ THREE PLACE DECIMAL $\pm .125$	DRAWN	KAMC	12/30/2021
PROPRIETARY AND CONFIDENTIAL			
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COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING			

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

TITLE: **Hub - Simple Build -
Upper Exit Connection
Assembly**

SIZE DWG. NO. REV
C TE-22068

SCALE: 1:4 SHEET 2 OF 3



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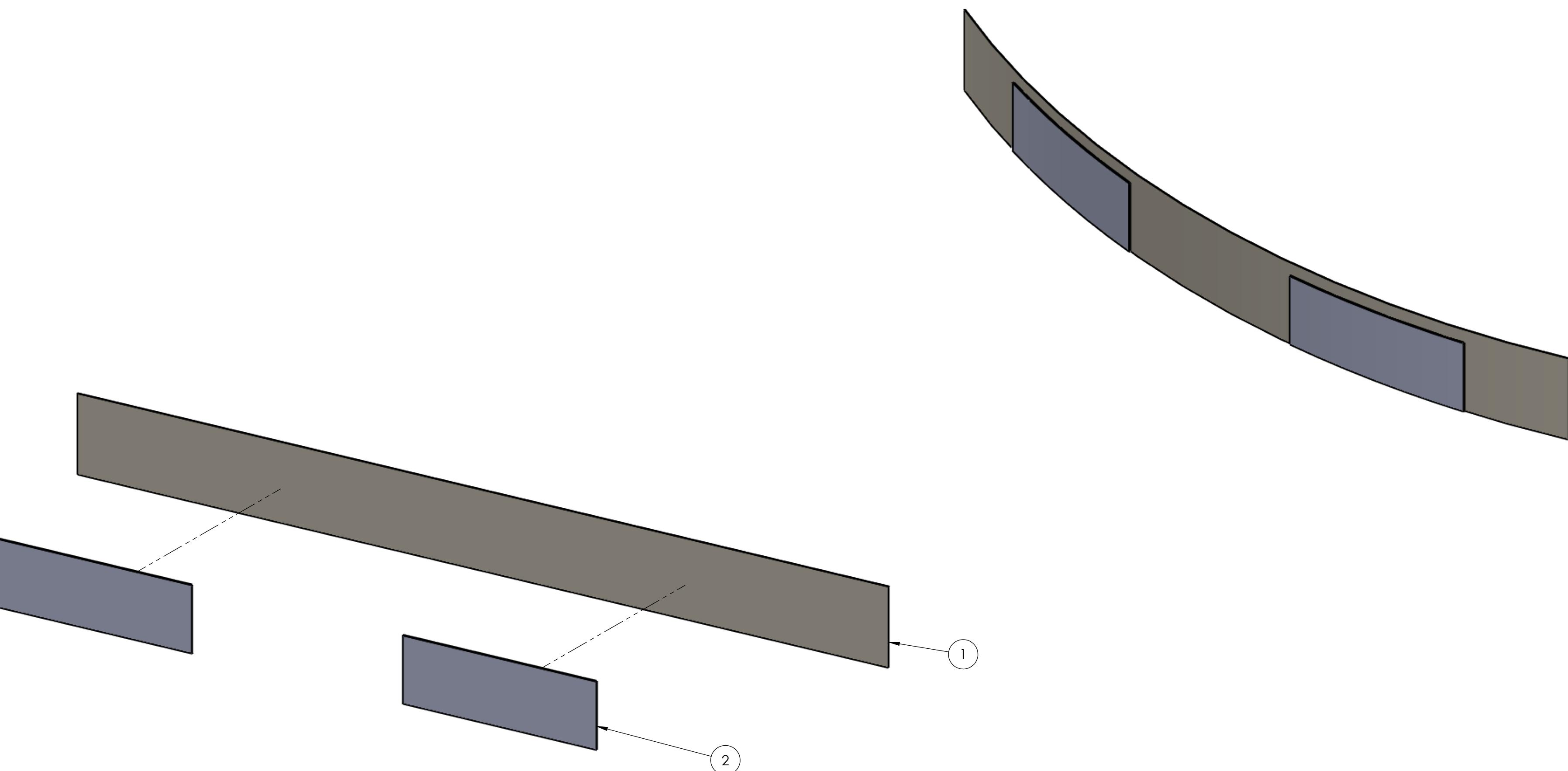
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**Notes:**

1. Assembly will be bent to shape when attaching to Upper Hub.
2. Poster board can be replaced with other similar thin, flexible materials.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	TE-22071	Hub - Simple Build - Vision Backing	1
2	Reflective Tape_VISIONTARGET	2" Wide, 5" Long Vision Target Tape	2

UNLESS OTHERWISE SPECIFIED:		TEAM	NAME	DATE
		DRAWN	CO	12/30/2021
PROPRIETARY AND CONFIDENTIAL				
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 $\pm .125$				
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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 - Vision Assembly
SIZE DWG. NO. REV
C TE-22070

SCALE: 1:2 **SHEET 1 OF 2**

Step 1:

1. Align 2x (2) to (1), as shown on Sheet 2.
2. Connect (2) to (1) using the adhesive backing on (2).

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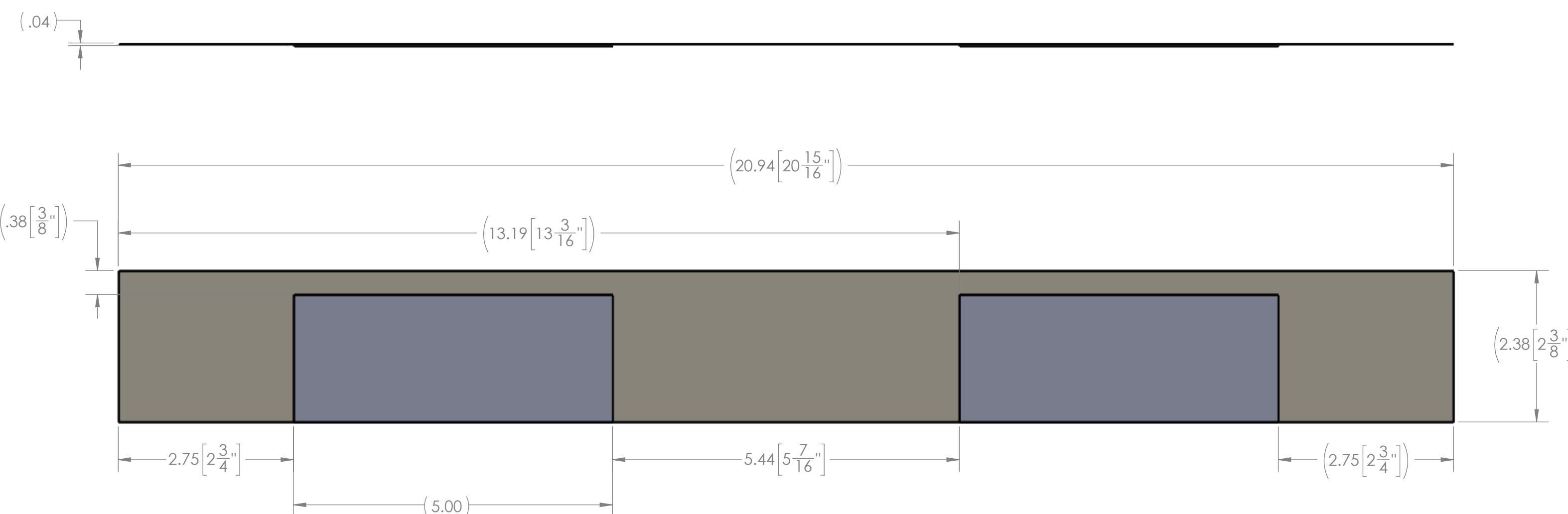
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DRAWN	CO	12/30/2021	
PROPRIETARY AND CONFIDENTIAL			
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MATERIAL/FINISH:	SIZE	DWG. NO.	REV
	C	TE-22070	
COMMENTS:	REMOVE ALL BURRS AND SHARP EDGES.		
DO NOT SCALE DRAWING	SCALE: 2:3	SHEET 2 OF 2	

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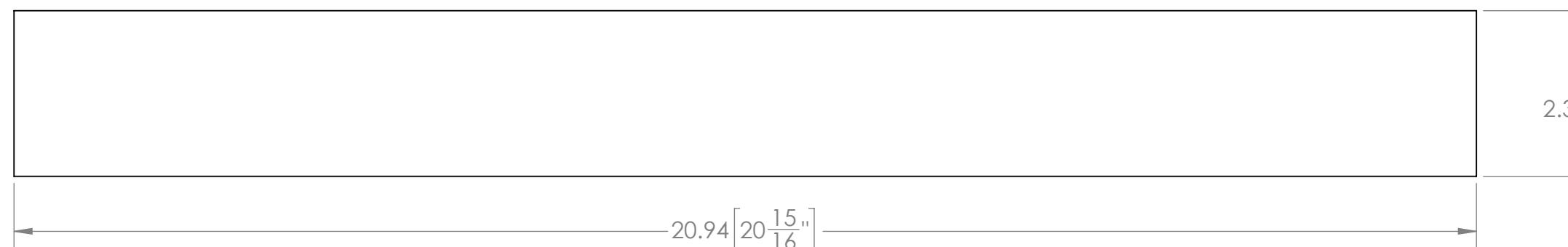
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- Notes:
1. Part will be bent to shape when attaching to Upper Hub.
 2. Poster board can be replaced with other similar thin, flexible materials.

UNLESS OTHERWISE SPECIFIED:	TEAM	NAME	DATE
DRAWN	CO	12/30/2021	
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MATERIAL/FINISH:	SIZE	DWG. NO.	REV
Poster Board	C	TE-22071	
COMMENTS: REMOVE ALL BURRS AND SHARP EDGES.			
DO NOT SCALE DRAWING	SCALE: 1:2	SHEET 1 OF 1	

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