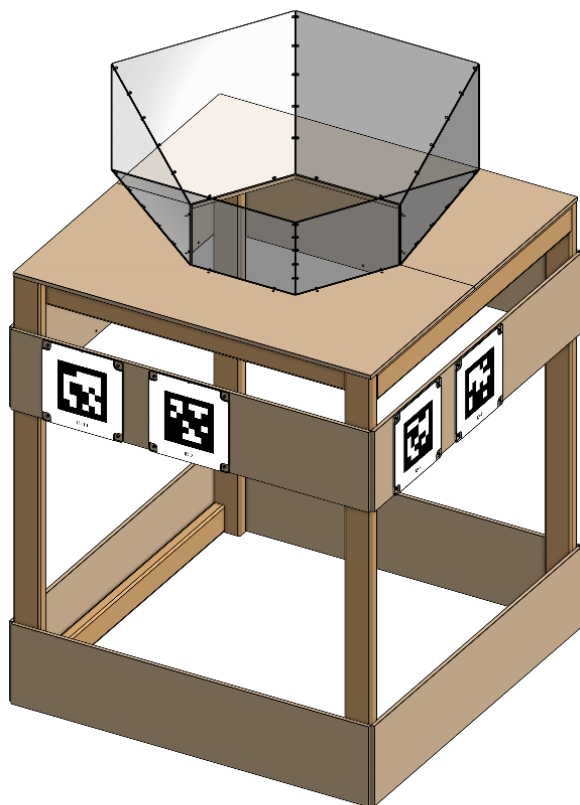


TE-26300 HUB



Description

This is a Hub, designed for teams to use to practice scoring Fuel. Each field element has multiple versions designed for teams. Before constructing this assembly, be sure to check [the Playing FIELD webpage](#) to confirm the design is the best fit for your team.

This element includes the usage of the same polycarbonate funnel panels as used on the real field, GE-26329. Details are included in this document for teams to manufacture this part, but there are also options to purchase versions of these parts instead. See the [Unofficial FIELD Elements for Sale section of the Playing FIELD webpage](#) for details.

In this document, you will find assembly instructions and drawings for this design.

CAD Files

CAD files are available in two formats. Links to both versions can be found on [the Playing FIELD webpage](#).

The Onshape version of the CAD files can be accessed. This design was created in Onshape, a **FIRST®** Modeling Solutions Sponsor.



STEP files of this assembly are included for the convenience of non-Onshape users.

Drawings

All drawing files have been exported to PDF Format. Drawings show the dimensions and details required to cut out individual parts. Assembly instructions can be found below in this document.

Shopping List (if building multiple team element designs, plywood and lumber can be consolidated):

Plywood and Lumber (Example Cut List is at end of Readme):

- 2" x 4" x 8' Lumber – 7 Pieces
- 4' x 8' x 1/2" Thick Plywood – 2 Sheet

Hardware/Other:

- 4' x 8' x 1/8" Thick Polycarbonate – 1 Sheet
 - o Only necessary if manufacturing GE-26329 instead of purchasing, see "Description" section above
- #8 Wood Screws x 2.5" long – Approximately 48 Pieces
- #8 Wood Screws x 1.5" long – Approximately 76 Pieces
- 50lb Cable-Ties – 42 Pieces

Notes about Hardware

All wood screws can be replaced with nuts and bolts of your choosing to make the design easier to disassemble and store. If this is not a concern for your team, wood screws will make for a sturdier assembly.

Notes about Materials

- Plywood and Hardboard Sheets – quality of plywood is up to the user. Plywood of lower qualities may contain voids and may warp more than high quality plywood. All dimensions listed are "nominal". For example, 1/2in plywood is typically 15/32".
- Lumber – quality of lumber is up to the user. Please keep in mind that lumber of lower qualities may warp more than high quality lumber. All dimensions below are the "mill cut" dimensions. For example, 2in x 4in lumber is really 1-1/2in x 3-1/2in.

Example Cut List (All units are Inches)

2x4 Lumber (can be combined with all other Team Elements to reduce number of purchased pieces. Be sure to note required repetitions – how many times each Layout ID needs to be cut):

Layout ID	Repetition	Stock length	Part length / Label	Qty	Cuts in layout
A	3x	96			
			43.063 / TE-26303	2	The number of cuts 2
					Waste
					Material remnant 9.624
					Cut 0.25
			43.063 TE-26303	43.063 TE-26303	
B	4x	96			
			55.972 / TE-26301	1	The number of cuts 1
					Waste
					Material remnant 39.903
					Cut 0.125
			55.972 TE-26301		

1/2" Plywood (can be combined with all other Team Elements to reduce number of purchased panels):

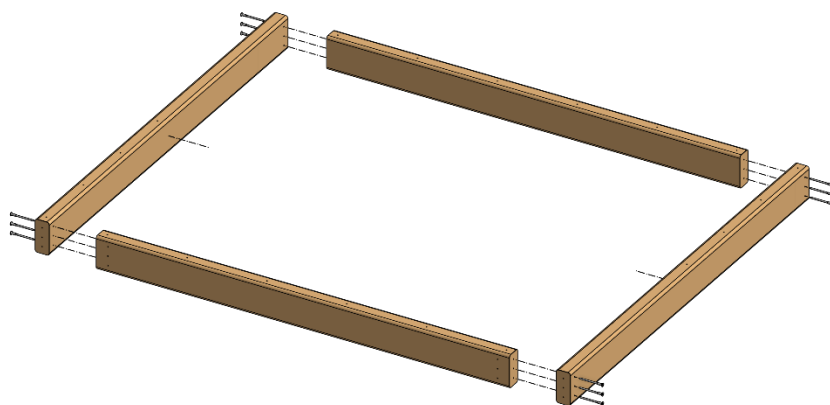
Layout ID	Repetition	Stock dimensions	Panel	Qty
A	1x	96 x 48	23.031 x 46.063 / TE-26304	2
			10.5 x 46.063 / TE-26305	4
			Cuts in layout	
			The length of cuts	372.378
			The number of cuts	7
B	1x	96 x 48	10.5 x 46.063 / TE-26306	4
			Cuts in layout	
			The length of cuts	228.564
			The number of cuts	5

1/8" Polycarbonate (Only necessary if manufacturing GE-26329 instead of purchasing, see "Description" section above)

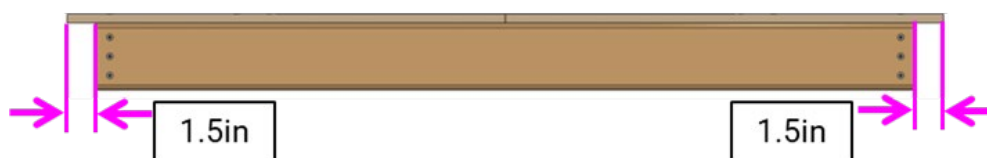
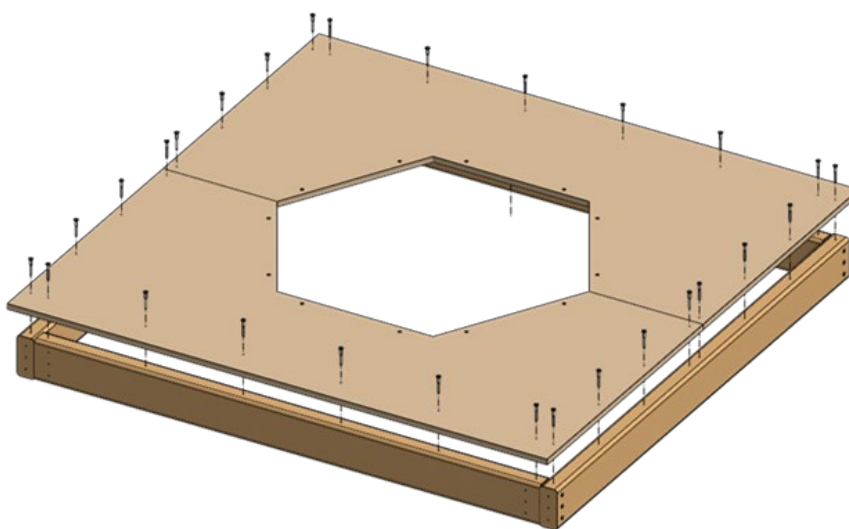
Layout ID	Repetition	Stock dimensions	Panel	Qty
A	1x	96 x 48	17.9 x 24 / GE-26329	6
			Cuts in layout	
			The length of cuts	263.875
			The number of cuts	8

Assembly Instructions

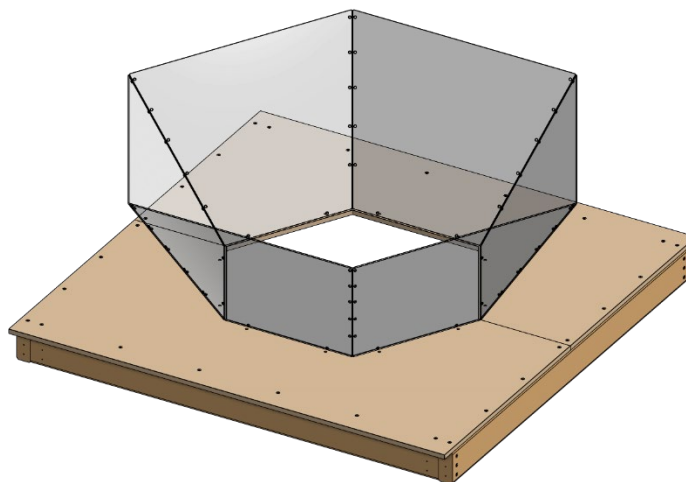
1. Fasten the base of the TE-26302 (Hub Top Assembly) together with four TE-26303 (Hub Main Horizontal Beam) using 2-1/2in screws as shown below.



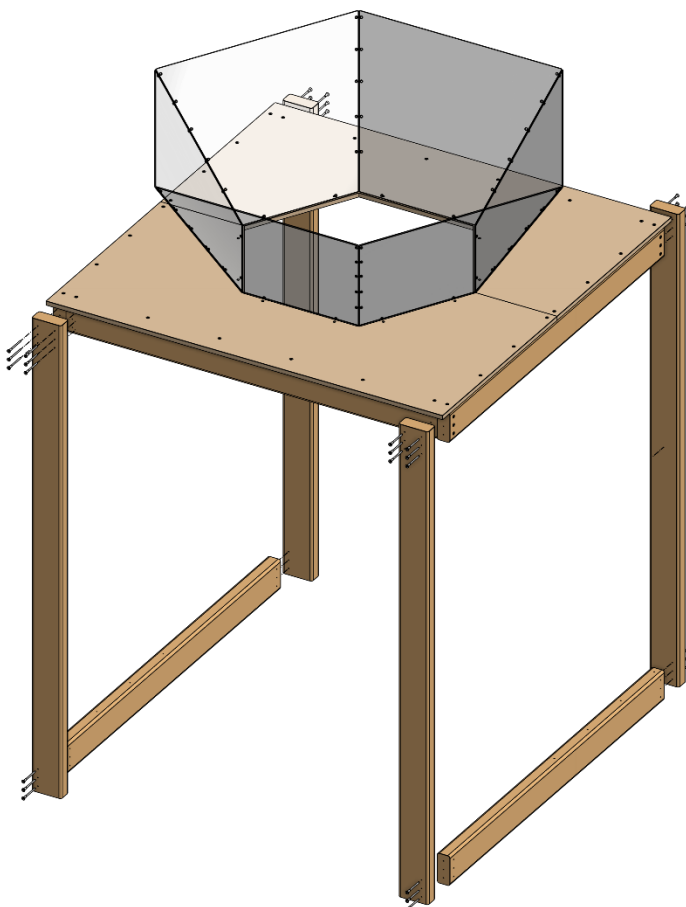
2. Attach both TE-26304 (Hub Top Funnel Plate) on top of the base and fasten using 1-1/2in screws.



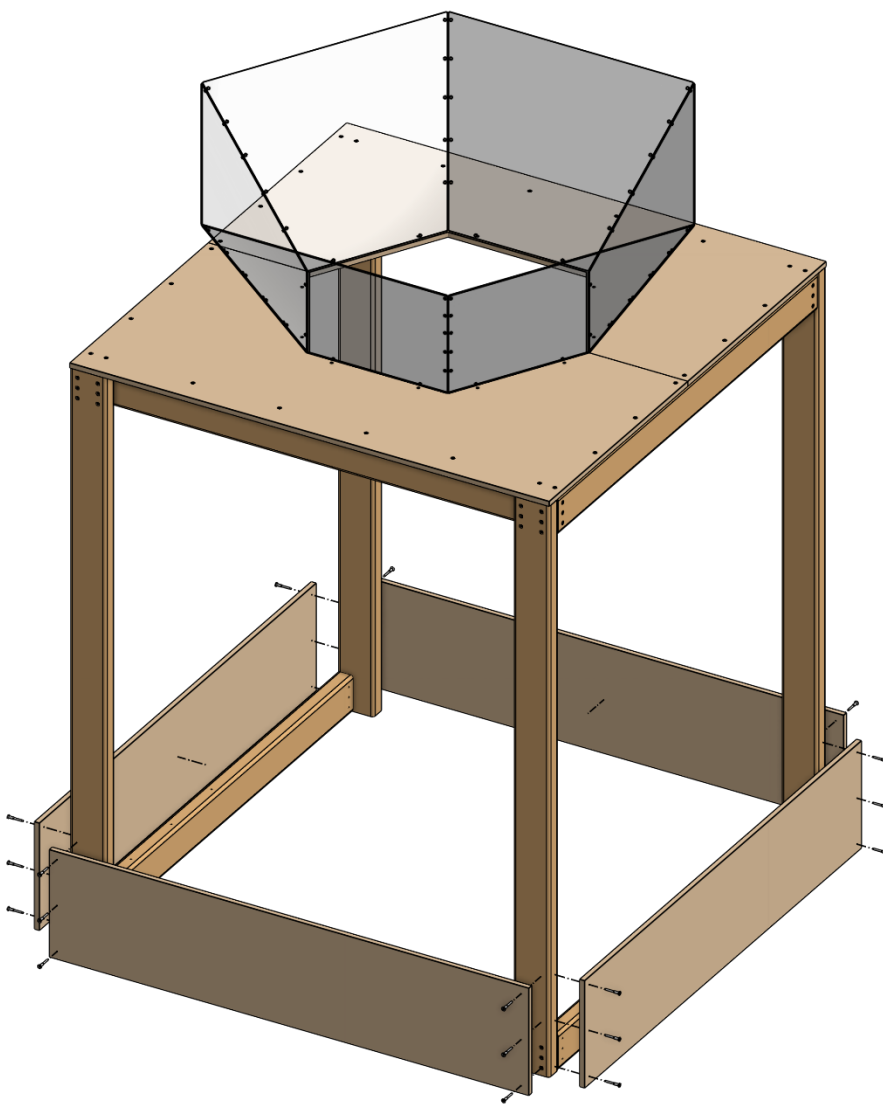
3. Attach all 6 GE-26329 (Hub Funnel Side) pieces together separately using 50lbs Cable-Ties. Then attach that Hub Funnel assembly to the top of the base, using 50lbs Cable-Ties.



4. Attach two TE-26301 (Hub Main Vertical Beam) to each side of the Top Assembly (4 total), along with attaching two more TE-26303 (Hub Main Horizontal Beam) between them on the bottom. Attach all using 2-1/2in screws.

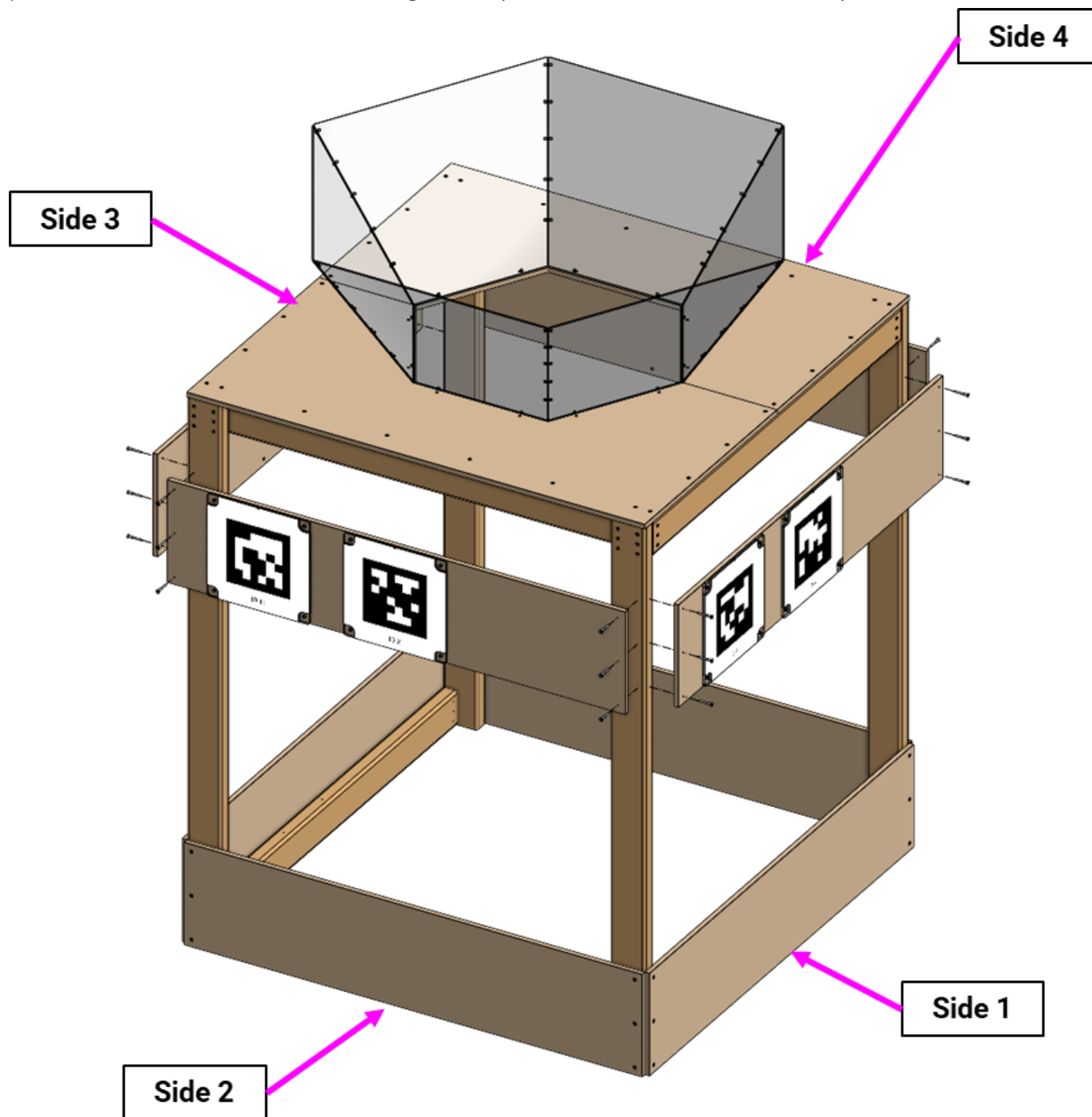


5. Attach a TE-26305 (Hub Bottom Support Plate) on all 4 sides along the bottom of each TE-26301 using 1-1/2in screws.



6. Attach a TE-26306 (Hub April Tag Plate) on all four sides at a height of 49-1/2in above the ground to the top of TE-26306 using 1-1/2in screws.

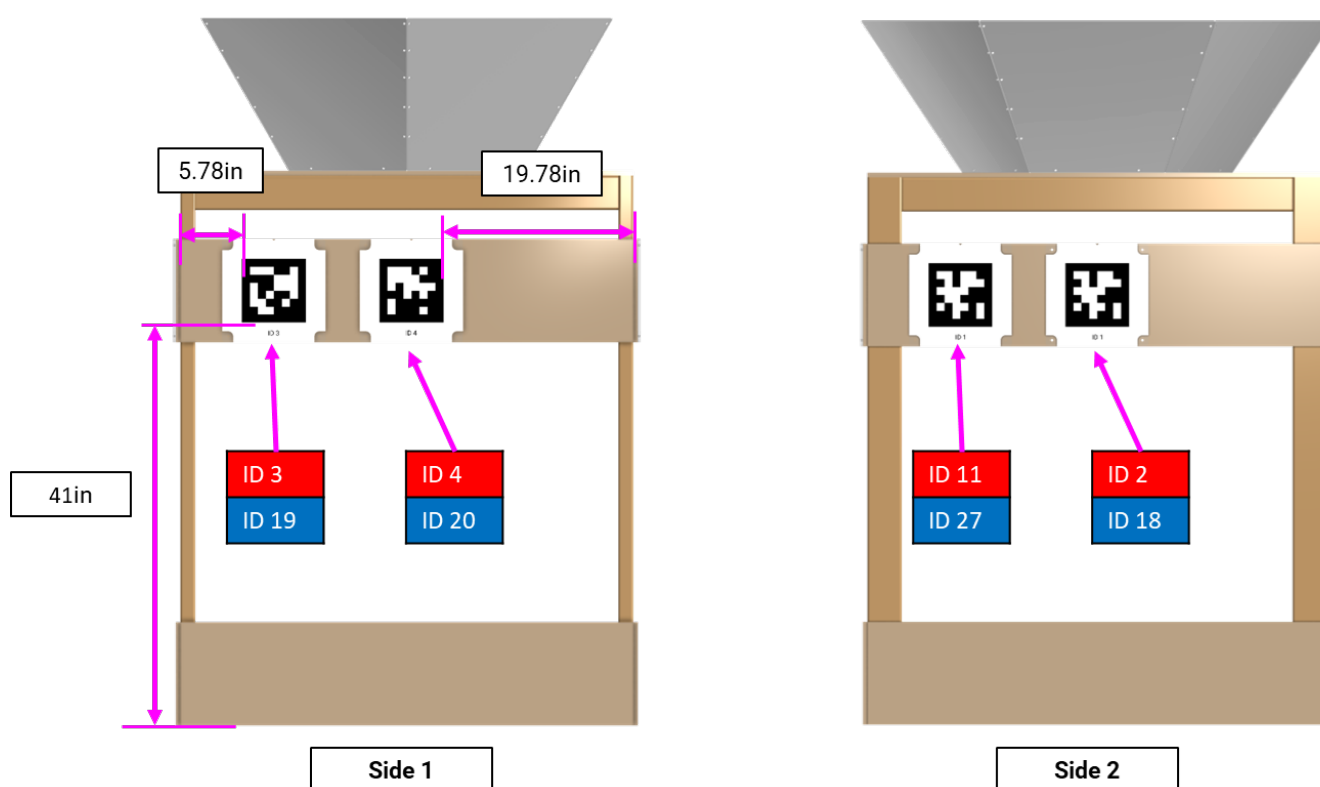
Note: All April Tags are positioned in the center and the left side except on Side 4 where it is positioned towards the center and right side (one of the funnel flat hex sides).

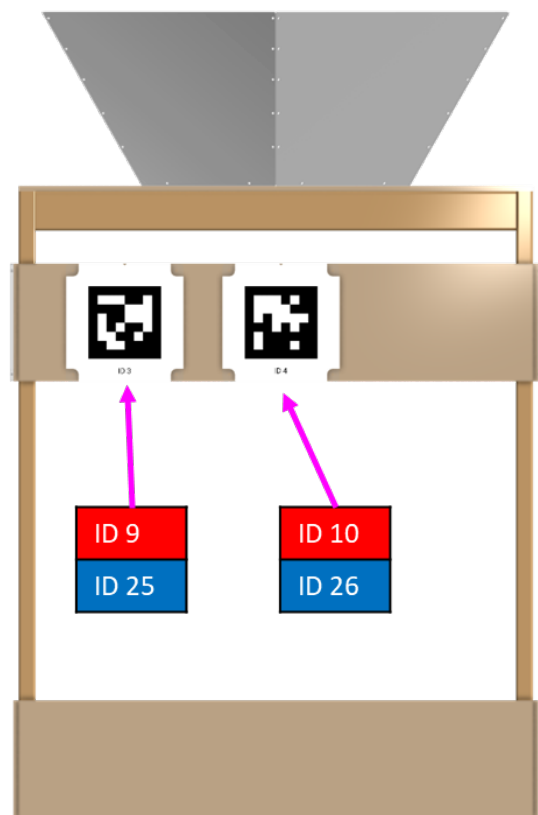


AprilTag Placement

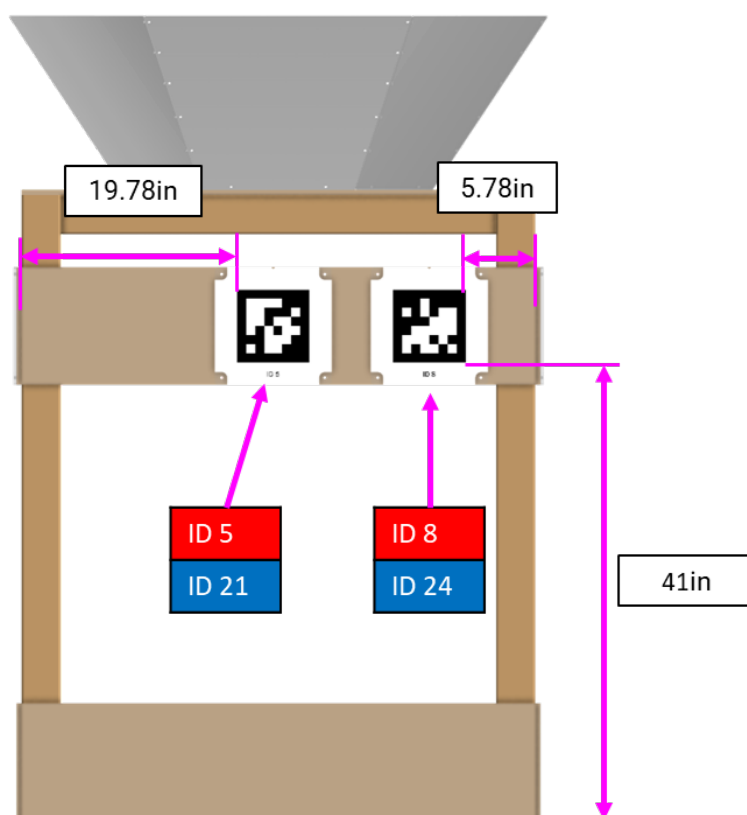
The images below illustrate where the tags should be located on the team version of the Hub. The dimensions provided are the height from the carpet to the bottom edge of the black square on the tag, and the left and right edge of the Hub Verticals to the edges of the black square on the tag.

For further details on AprilTag field layout and printing AprilTags, see the AprilTag Images and User Guide document on the Playing FIELD webpage.





Side 3



Side 4

Version History

Version	Description of Changes	Date
1	<ul style="list-style-type: none">Initial Draft	01/10/2026
2	<ul style="list-style-type: none">Updated dimensions for AprilTag placement in build instructions.Hole locations changed on TE-26306 part drawing to correct AprilTag location.	01/12/2026

4

3

2

1

D

D

C

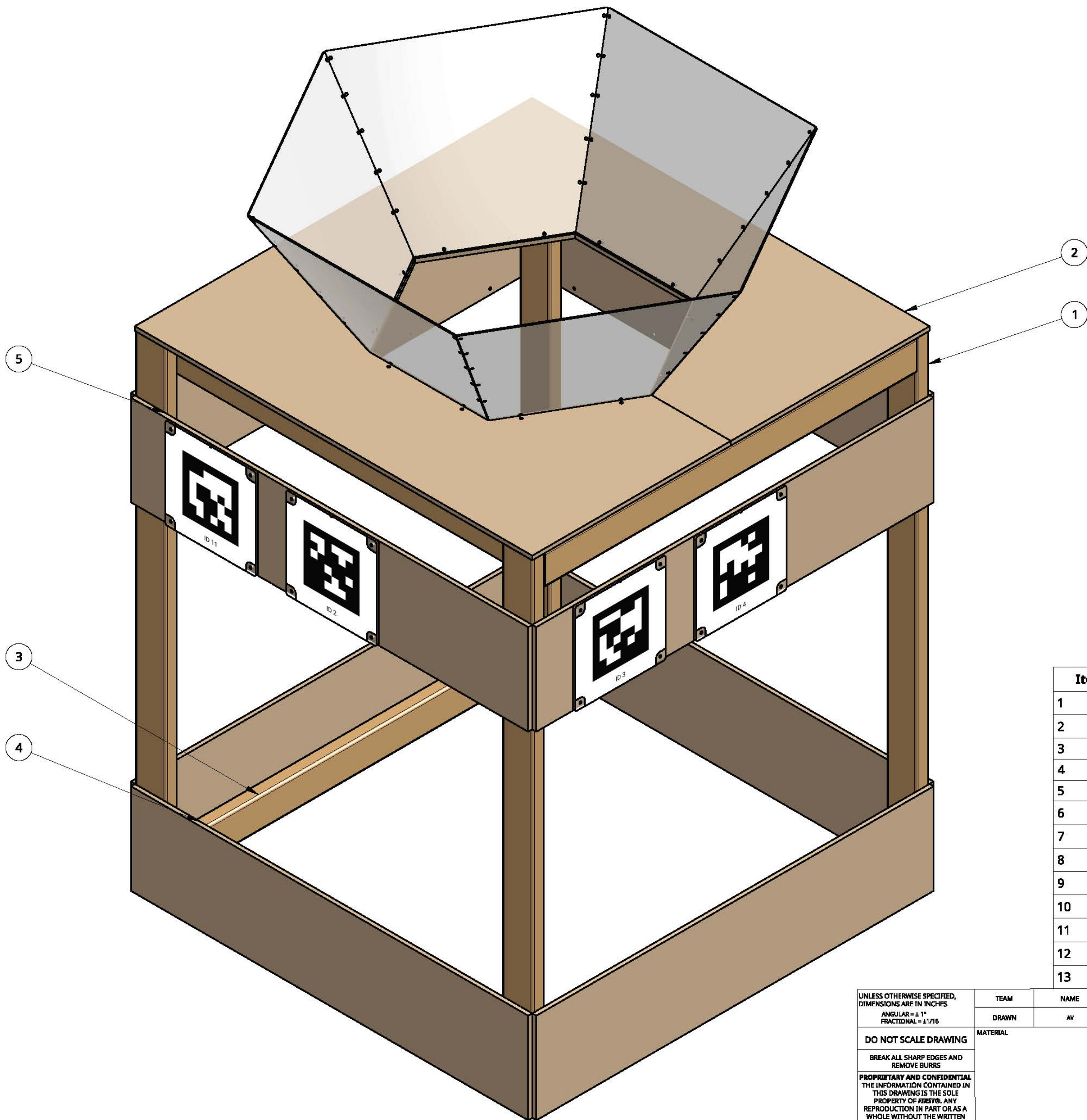
C

B

B

A

A



Item	Quantity	Part number	Description
1	4	TE-26301	Hub Main Vertical Beam
2	1	TE-26302	Hub Top Assembly
3	2	TE-26303	Hub Main Horizontal Beam
4	4	TE-26305	Hub Bottom Support Plate
5	4	TE-26306	Hub April Tag Plate
6	1	FE-00083-ID2	AprilTag, ID 2
7	1	FE-00083-ID3	AprilTag, ID 3
8	1	FE-00083-ID4	AprilTag, ID 4
9	1	FE-00083-ID5	AprilTag, ID 5
10	1	FE-00083-ID8	AprilTag, ID 8
11	1	FE-00083-ID9	AprilTag, ID 9
12	1	FE-00083-ID10	AprilTag, ID 10
13	1	FE-00083-ID11	AprilTag, ID 11

UNLESS OTHERWISE SPECIFIED,
DIMENSIONS ARE IN INCHES
ANGULAR = ± 1°
FRACTIONAL = ± 1/16

DO NOT SCALE DRAWING

BREAK ALL SHARP EDGES AND
REMOVE BURRS

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.

TEAM	NAME	DATE
DRAWN	AV	10/19/2025

MATERIAL



TITLE		
TE HUB		
SIZE	DWG NO.	REV.
C	TE-26300	
SCALE	1:6	SHEET 1 of 1

D

C

B

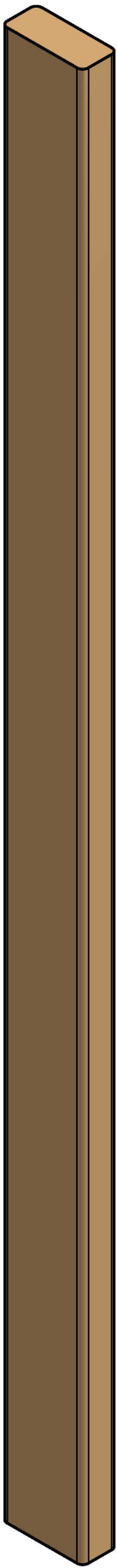
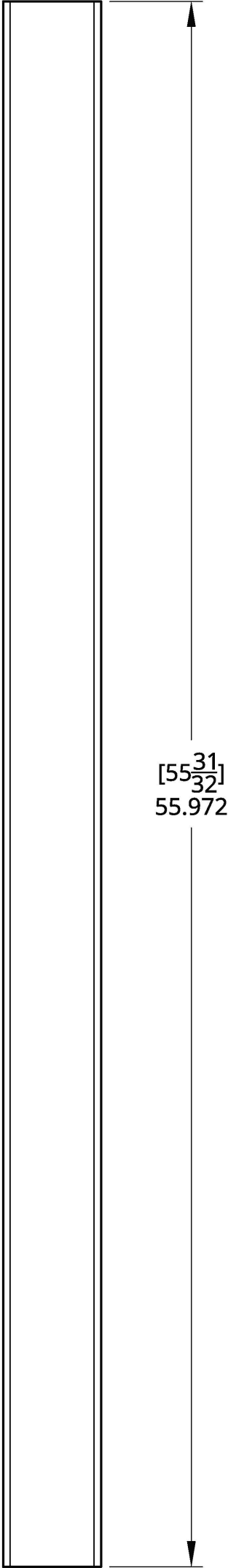
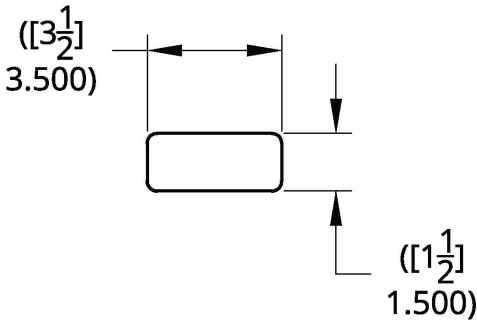
A


D

C

B

A



UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES ANGULAR = ± 1° FRACTIONAL = ± 1/16	TEAM	NAME	DATE		
	DRAWN	AV	10/21/2025		
	MATERIAL			TITLE	
DO NOT SCALE DRAWING	2X4 LUMBER			HUB MAIN VERTICAL BEAM	
BREAK ALL SHARP EDGES AND REMOVE BURRS				SIZE	REV.
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.				C	
SCALE		1:5		SHEET	1 of 1

D

C

B

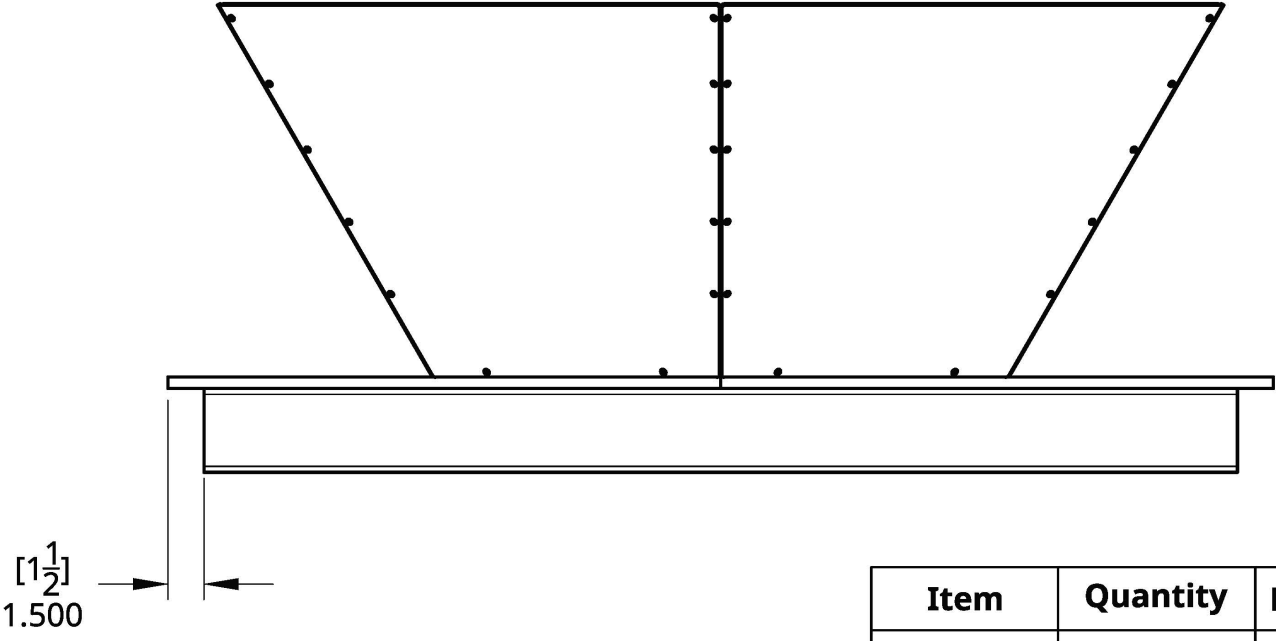
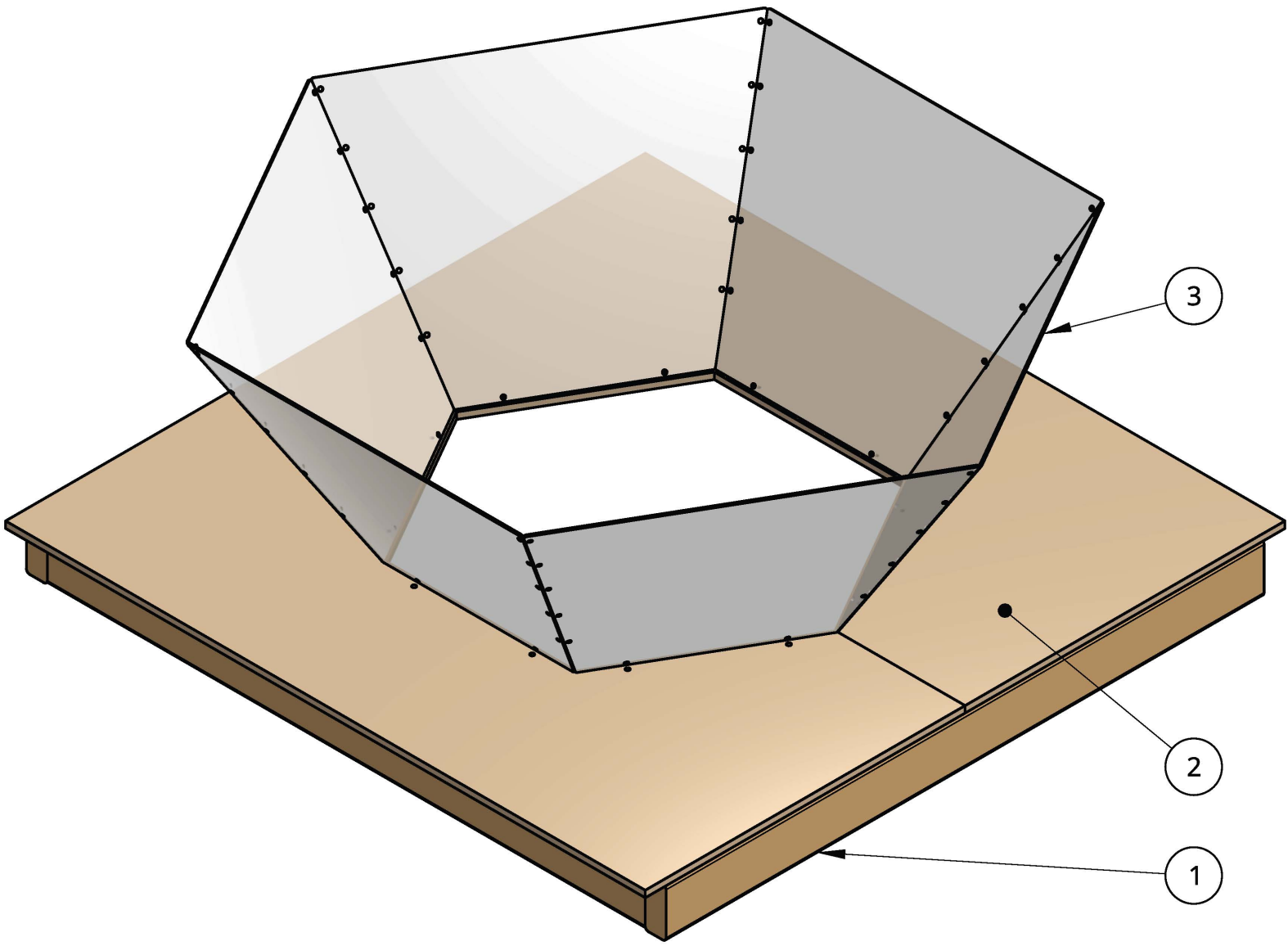
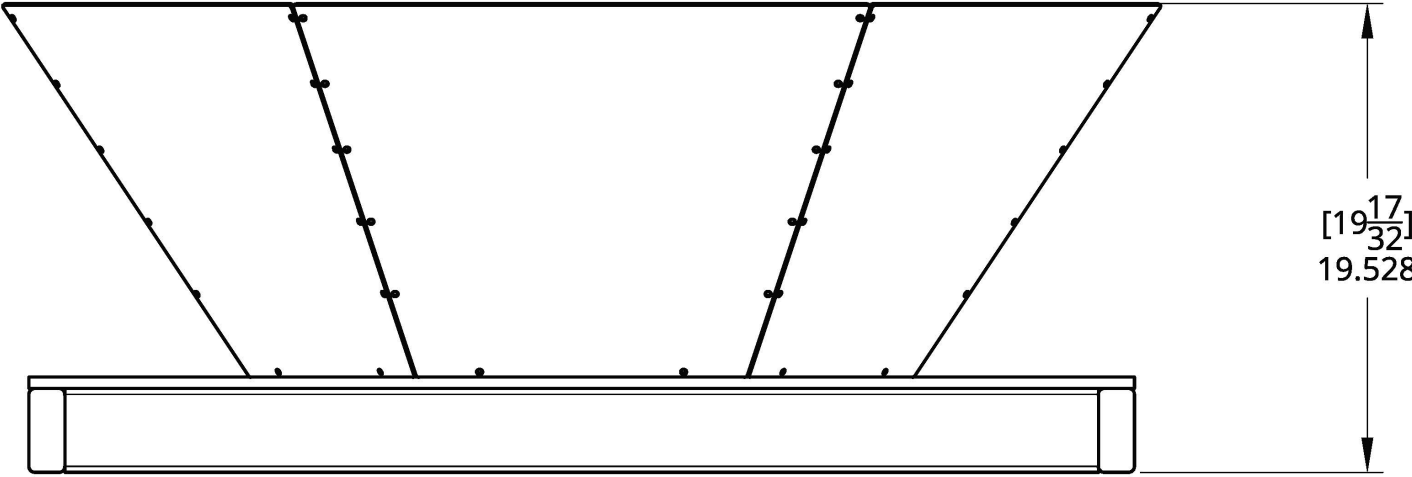
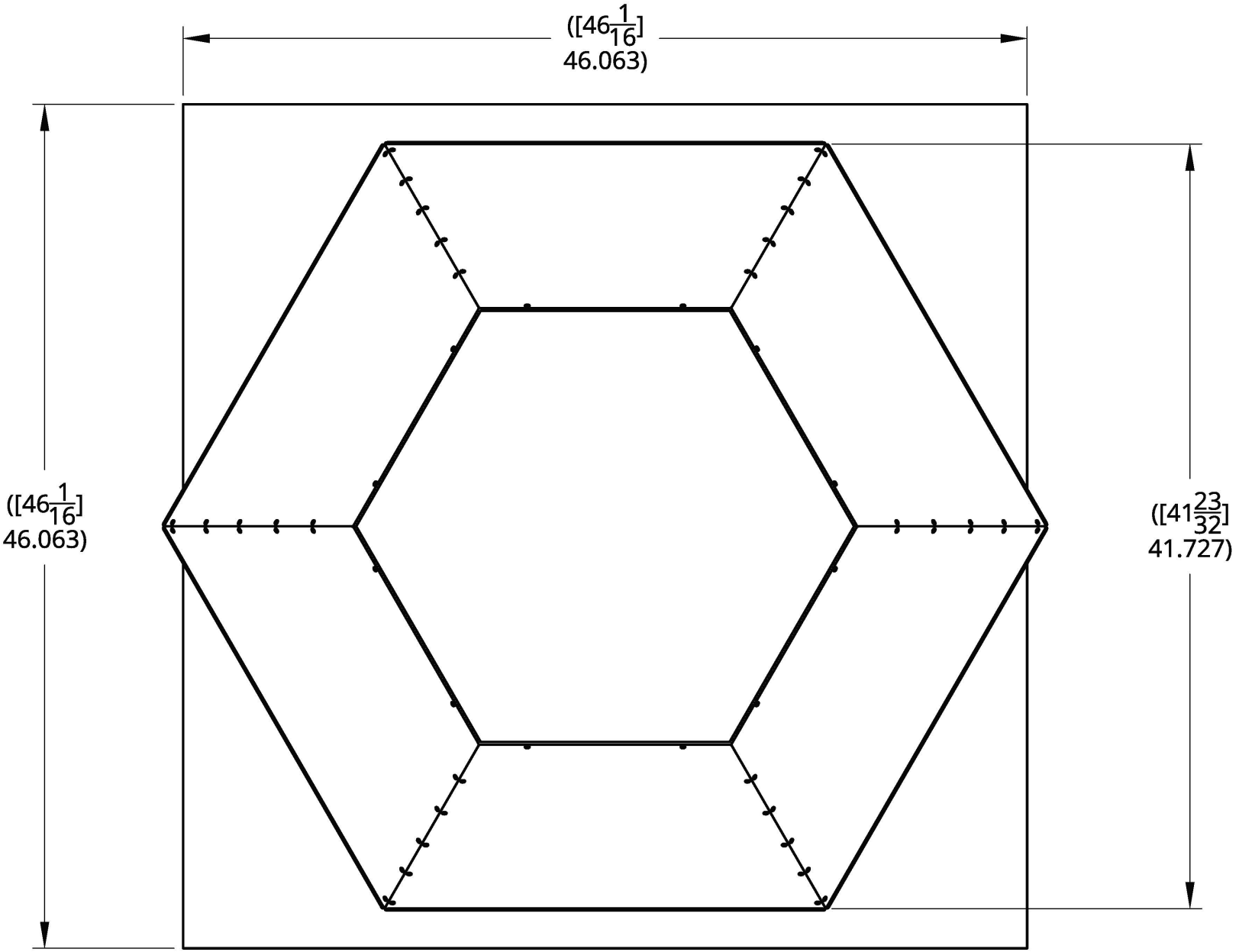
A

D


C

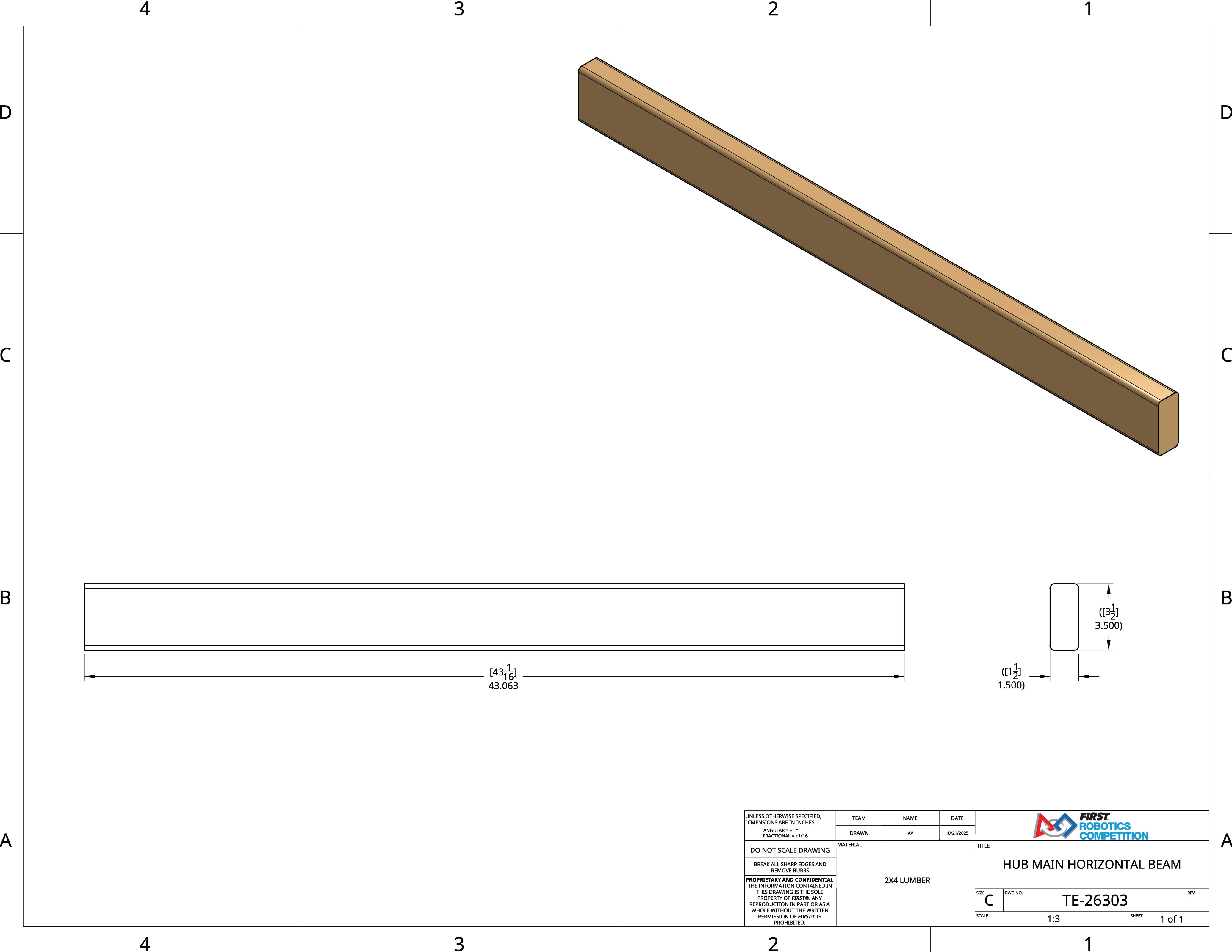
B


A



Item	Quantity	Part number	Description
1	4	TE-26303	Hub Main Horizontal Beam
2	2	TE-26304	Hub Top Funnel Plate
3	6	GE-26329	Hub Funnel Side

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES ANGULAR = ± 1° FRACTIONAL = ± 1/16	TEAM	NAME	DATE		
	DRAWN	AV	10/19/2025		
DO NOT SCALE DRAWING	MATERIAL			TITLE	
BREAK ALL SHARP EDGES AND REMOVE BURRS				HUB TOP ASSEMBLY	
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.					
	SIZE	DWG NO.		REV.	
	C	TE-26302			
	SCALE	1:8		SHEET	1 of 1



UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES ANGULAR = ± 1° FRACTIONAL = ± 1/16	TEAM	NAME	DATE		
	DRAWN	AV	10/21/2025		
DO NOT SCALE DRAWING	MATERIAL <				

D

C

B

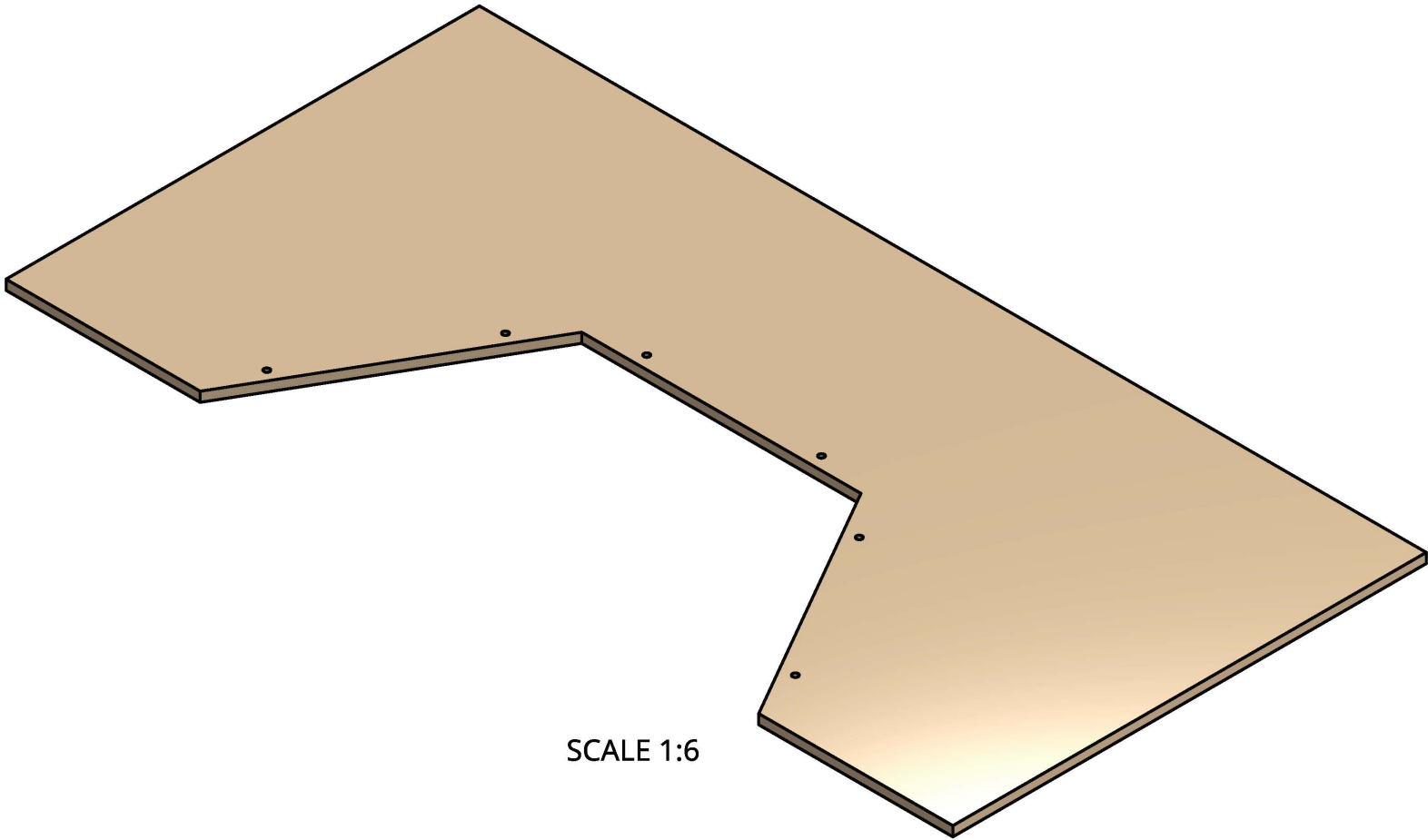
A

D

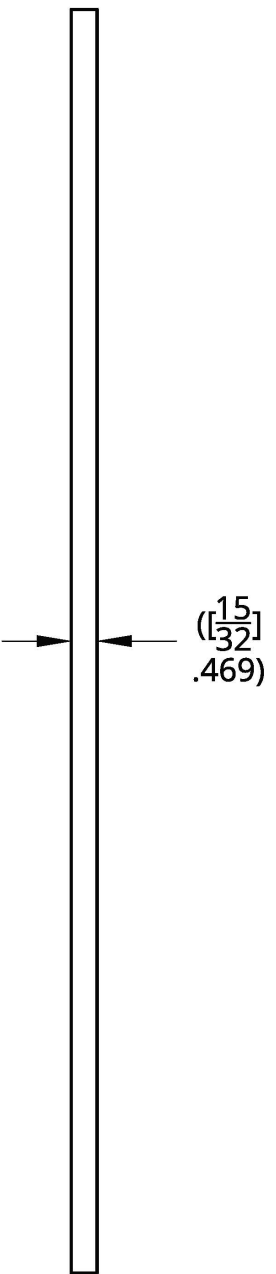
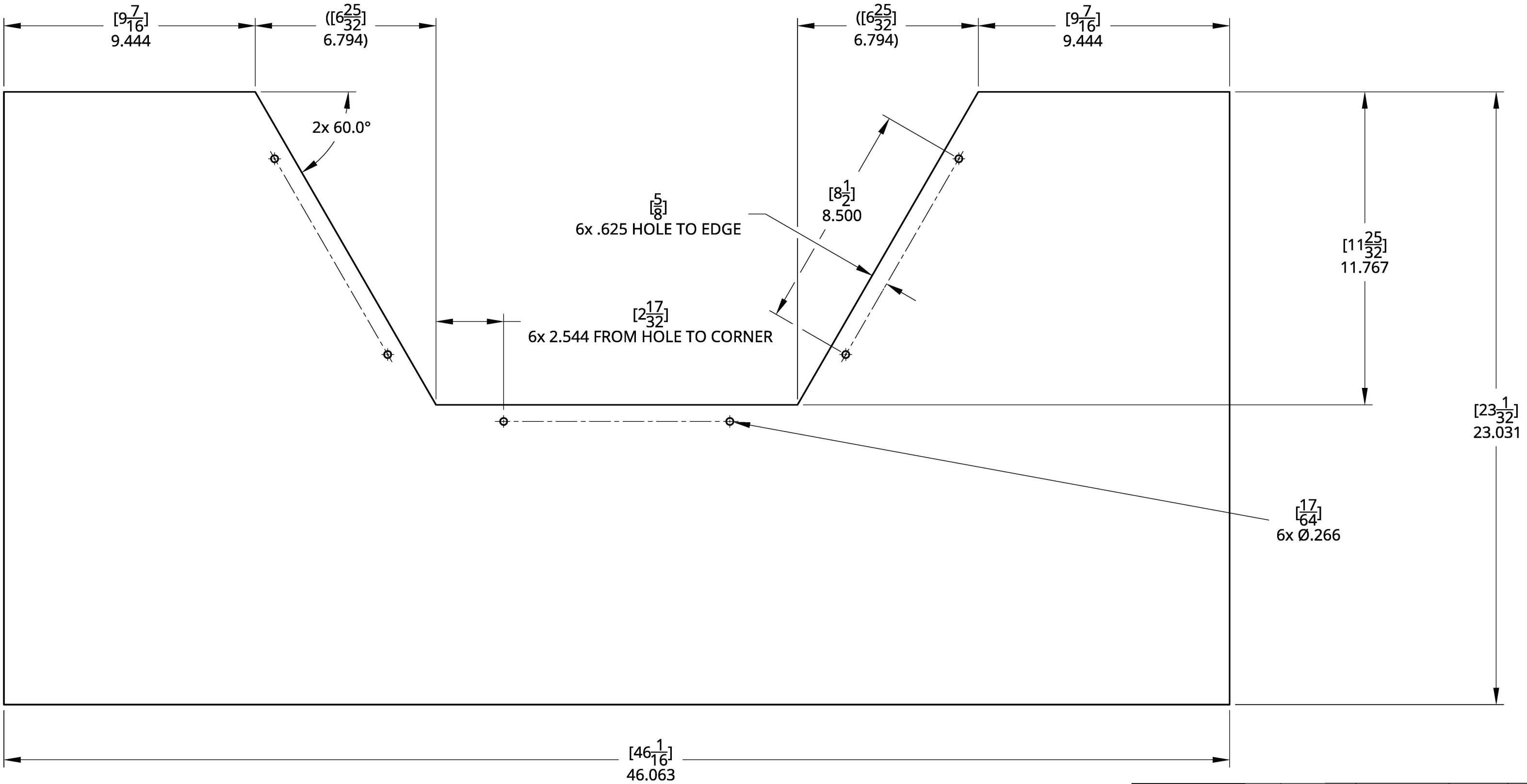
C


B

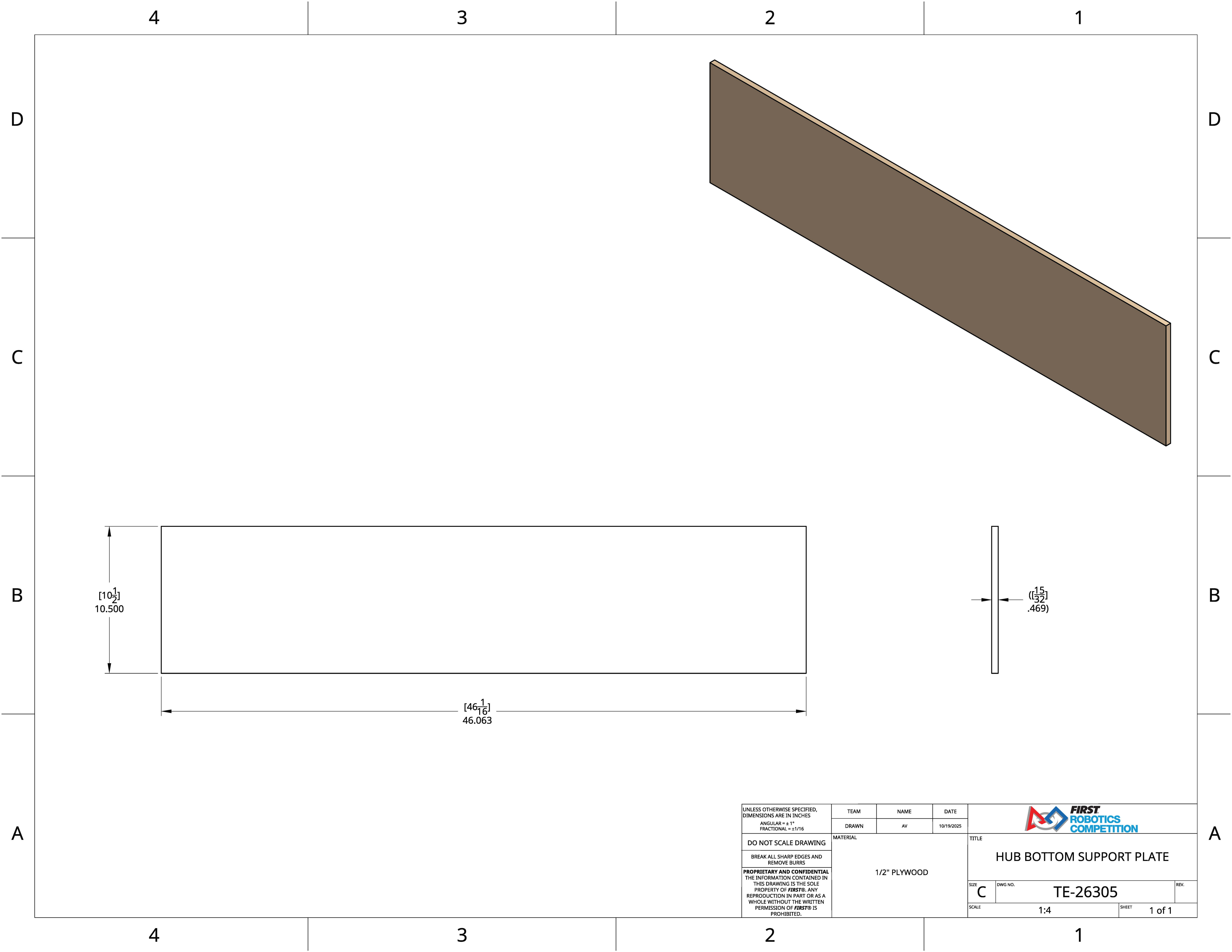
A




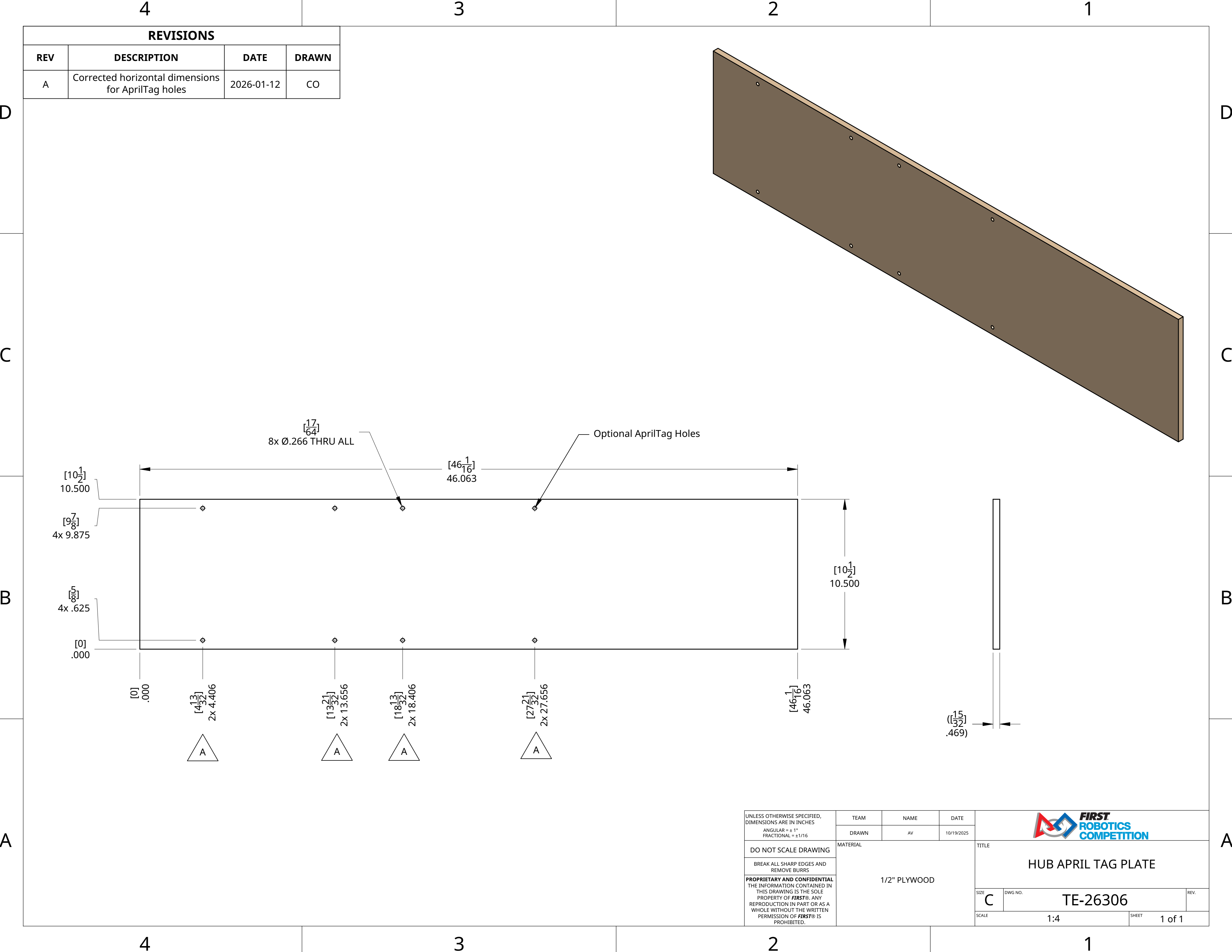
SCALE 1:6




UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES ANGULAR = ± 1° FRACTIONAL = ± 1/16	TEAM	NAME	DATE		
	DRAWN	AV	10/21/2025		
	MATERIAL			TITLE	
DO NOT SCALE DRAWING	1/2" PLYWOOD			HUB TOP FUNNEL PLATE	
BREAK ALL SHARP EDGES AND REMOVE BURRS				SIZE C DWG NO. TE-26304 REV.	
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.				SCALE 1:3.5 SHEET 1 of 1	



UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES ANGULAR = ± 1° FRACTIONAL = ± 1/16	TEAM	NAME	DATE		
	DRAWN	AV	10/19/2025		
DO NOT SCALE DRAWING	MATERIAL <				



REVISIONS			
REV	DESCRIPTION	DATE	DRAWN
A	Corrected horizontal dimensions for AprilTag holes	2026-01-12	CO

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES ANGULAR = ± 1° FRACTIONAL = ±1/16	TEAM	NAME	DATE					
	DRAWN	AV	10/19/2025					
DO NOT SCALE DRAWING	MATERIAL 1/2" PLYWOOD			TITLE				
BREAK ALL SHARP EDGES AND REMOVE BURRS				HUB APRIL TAG PLATE				
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.				SIZE	DWG NO.	TE-26306		REV.
				C				
				SCALE	1:4		SHEET	1 of 1

D

C

B

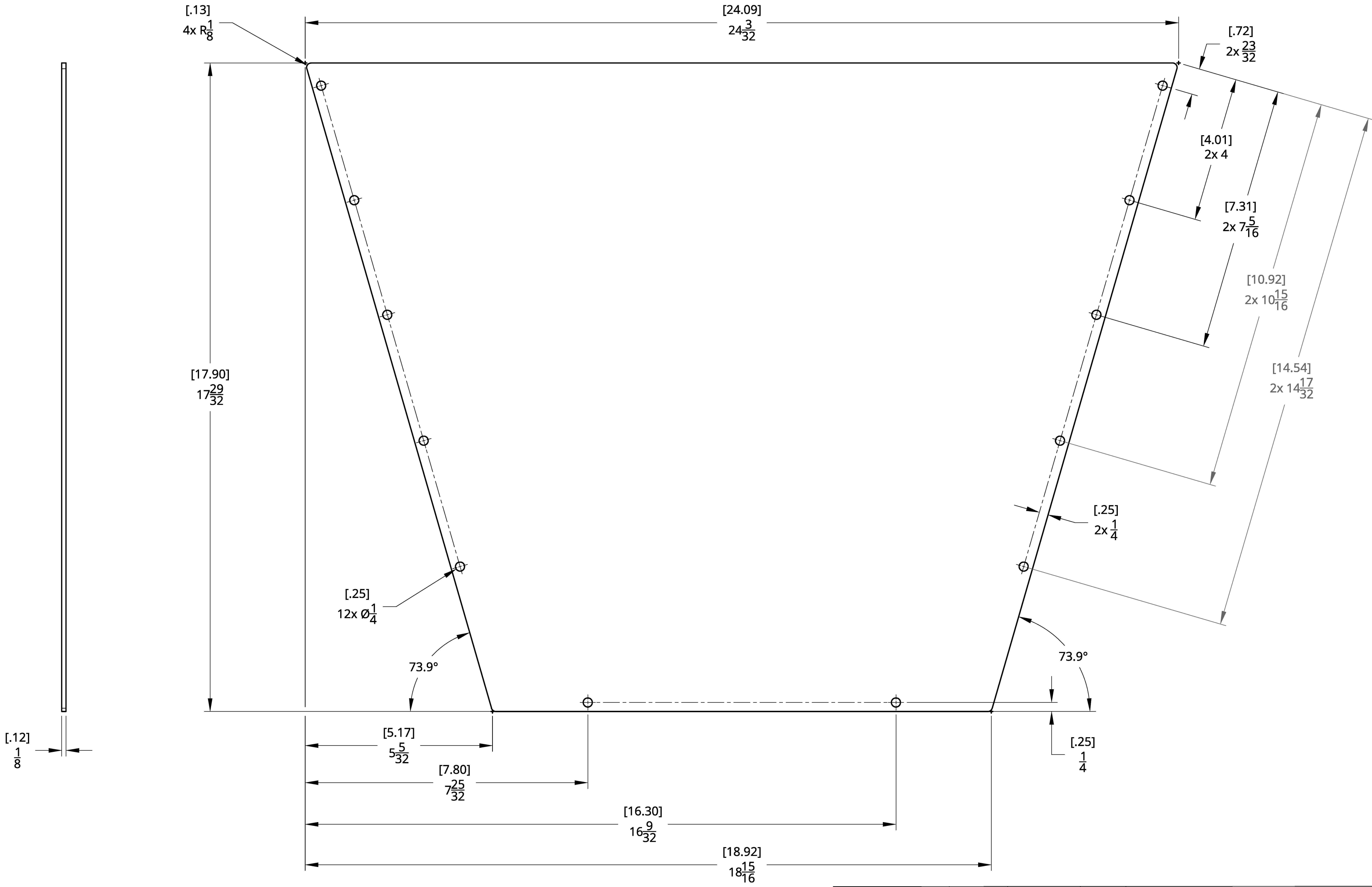
A


D

C

B

A



UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES ANGULAR = ± 1° FRACTIONAL = ±1/16	TEAM	NAME	DATE				
	DRAWN	AV	01/05/2026				
DO NOT SCALE DRAWING	MATERIAL 1/8" POLYCARBONATE, CLEAR			TITLE			
BREAK ALL SHARP EDGES AND REMOVE BURRS				HUB FUNNEL SIDE			
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.				SIZE	DWG NO.	REV.	
				C	GE-26329		
				SCALE	1:2		SHEET