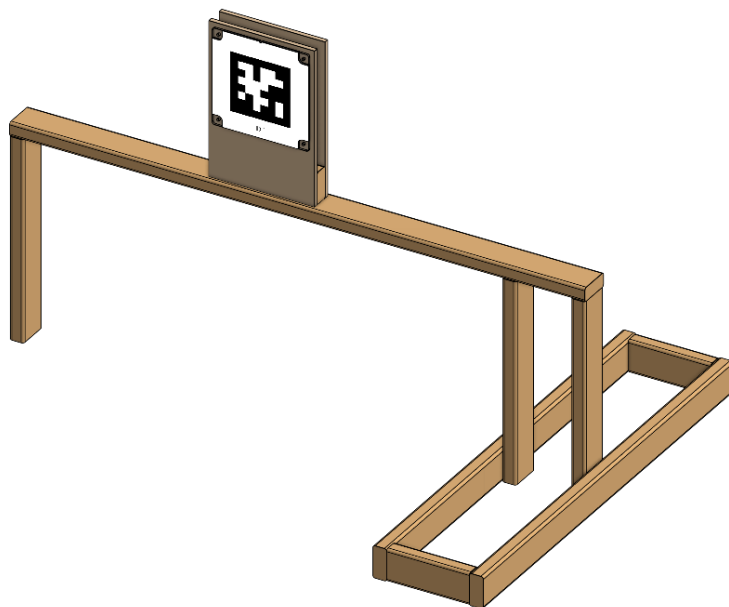


TE-26200 TRENCH



Description

This is a Trench, designed so that teams can practice driving and auto routines. 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. 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 – 3 Pieces
- 4' x 4' x 1/2" Thick Plywood – 1 Sheet

Hardware/Other:

- #8 Wood Screws x 2.5" long – Approximately 30 Pieces
- #8 Wood Screws x 1.5" long – Approximately 8 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, ½” 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, 2” x 4” lumber is really 1½” x 3½”.

Example Cut List (All units are Inches):

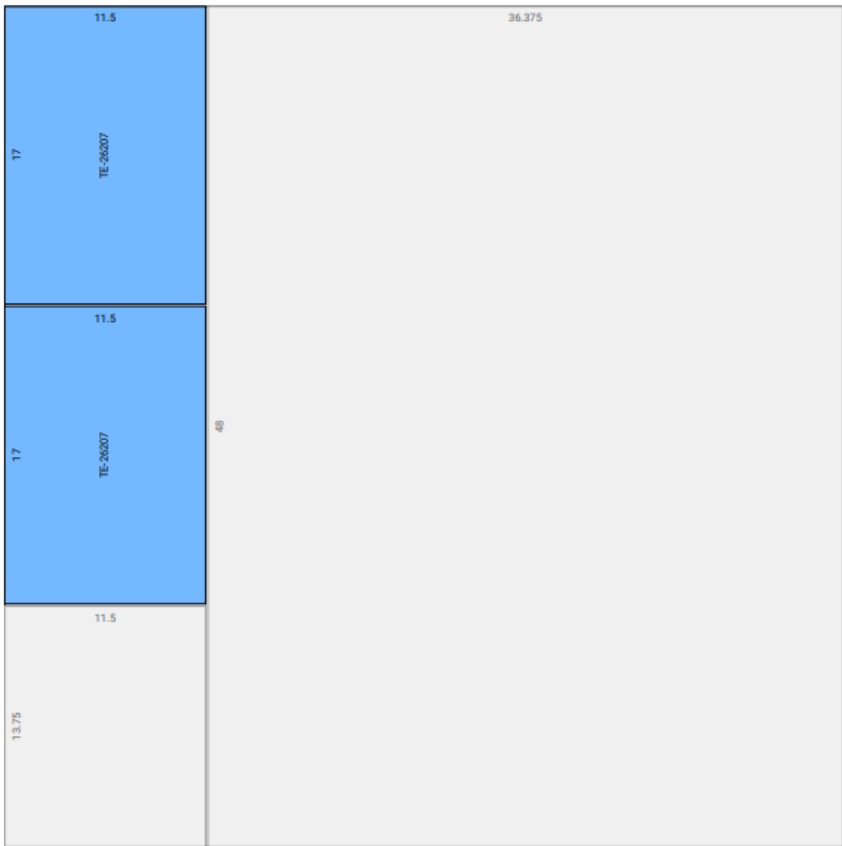
2x4 Lumber (can be combined with all other Team Elements to reduce number of purchased pieces):

Layout ID A	Repetition 1x	Stock length 96	Part length / Label Qty	Cuts in layout
			47 / TE-26202 2	The number of cuts 2
				Waste
				Material remnant 1.75
				Cut 0.25
<div> <div>47 TE-26202</div> <div>47 TE-26202</div> </div>				

Layout ID B	Repetition 1x	Stock length 96	Part length / Label Qty	Cuts in layout
			62.594 / TE-26205 1	The number of cuts 3
			22.125 / TE-26204 1	
			9 / TE-26203 1	Waste
				Material remnant 1.906
				Cut 0.375
<div> <div>62.594 TE-26205</div> <div>22.125 TE-26204</div> <div>9 TE-26203</div> </div>				

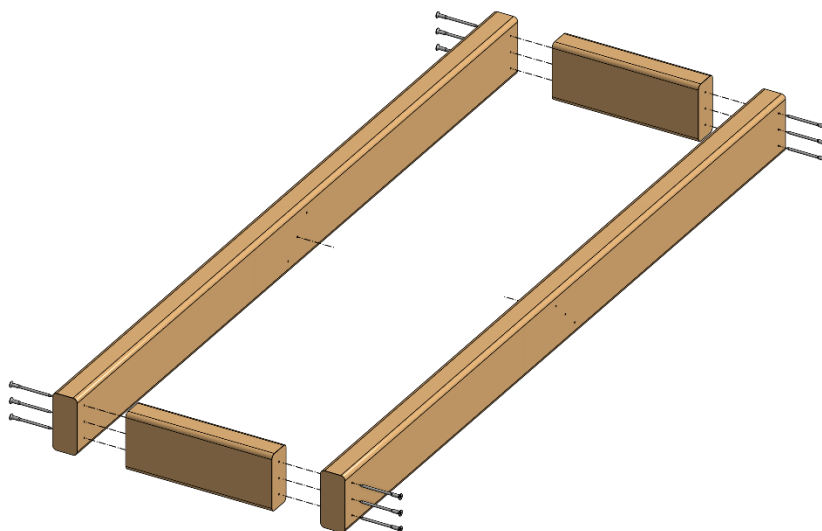
Layout ID C	Repetition 1x	Stock length 96	Part length / Label Qty	Cuts in layout
			22.125 / TE-26204 2	The number of cuts 4
			11.5 / TE-26206 1	
			9 / TE-26203 1	Waste
				Material remnant 30.75
				Cut 0.5
<div> <div>22.125 TE-26204</div> <div>22.125 TE-26204</div> <div>11.5 TE-26206</div> <div>9 TE-26203</div> </div>				

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

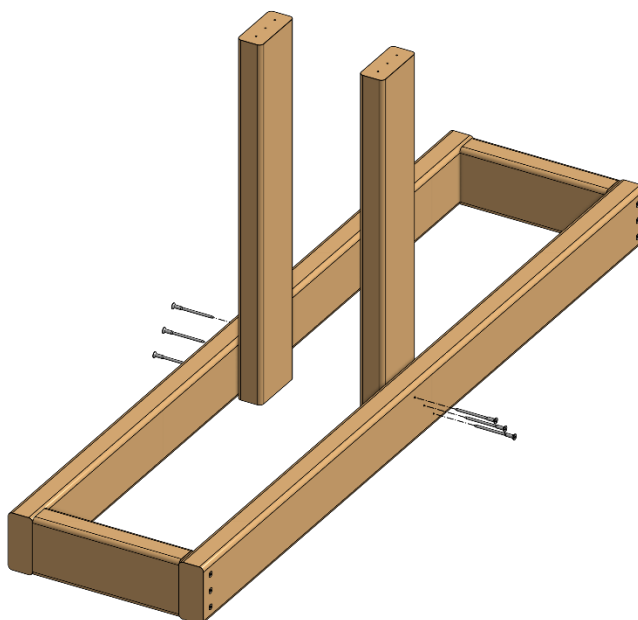
Layout ID	Repetition	Stock dimensions	Panel	Qty
A	1x	48 x 48	11.5 x 17 / TE-26207	2
				
Cuts in layout				
The length of cuts				71
The number of cuts				3

Assembly Instructions

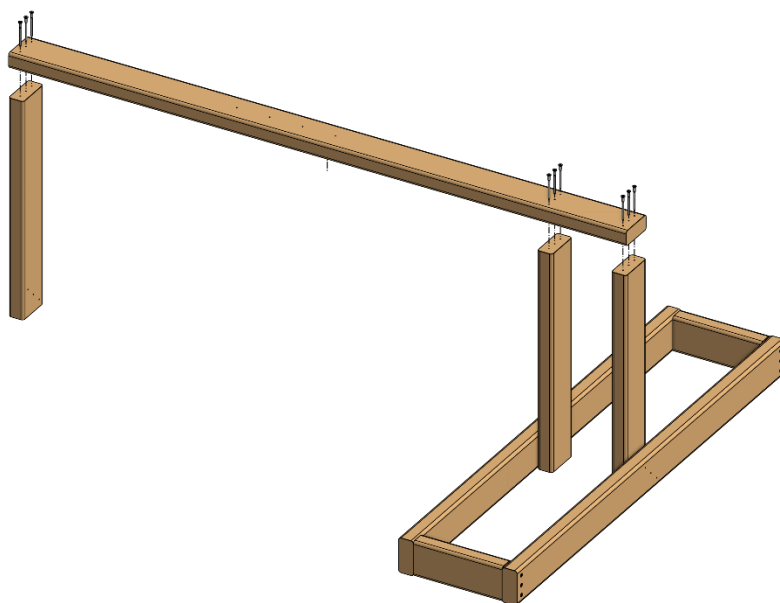
1. Fasten the base together with two TE-26202 (Trench Base Depth Beam) and two TE-26203 (Trench Base Width Beam). Attach all together using 2-1/2in screws.



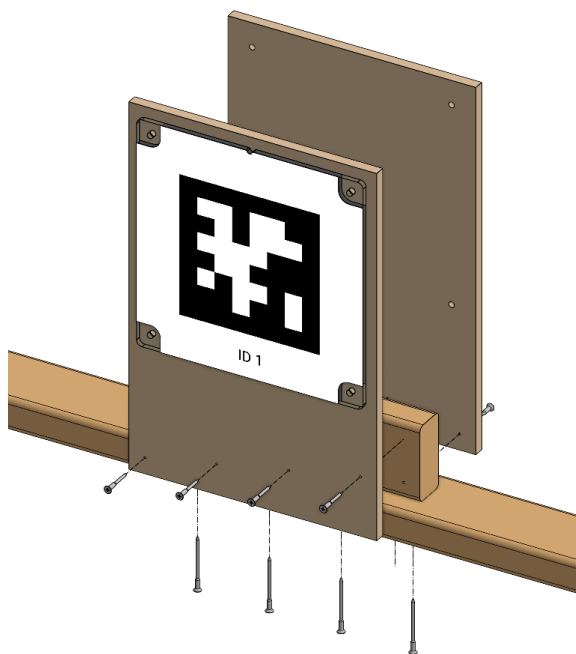
2. Attached two TE-26204 (Trench Height Beam) centered along the inside face of the beams using 2-1/2in screws.

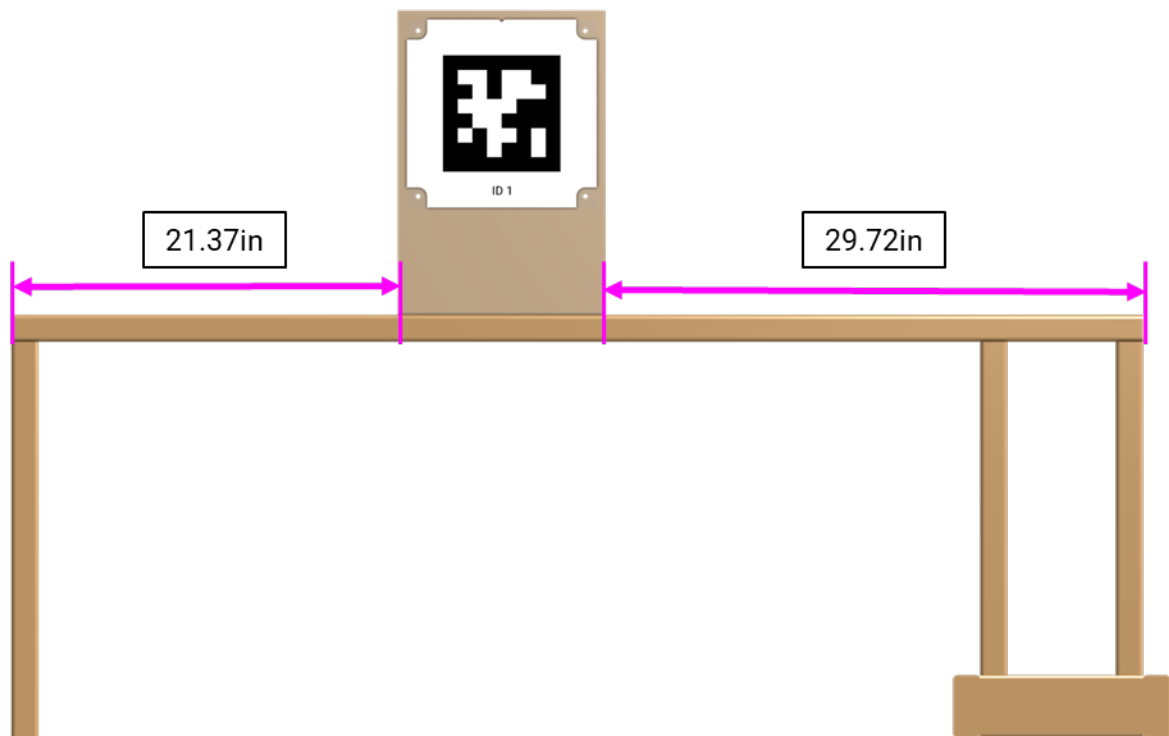


3. Attach TE-26205 (Trench Arm Beam) on top of the height beams along with the 3rd TE-26204 (Trench Height Beam) at the end of the arm using 2-1/2in screws



4. Attach the TE-26206 (Trench April Tag Mount Beam) onto TE-26205 (Trench Arm Beam) as dimensioned below and attach both TE-26207 (Trench April Tag Panel) to each of TE-26206 using 1-1/2in screws.

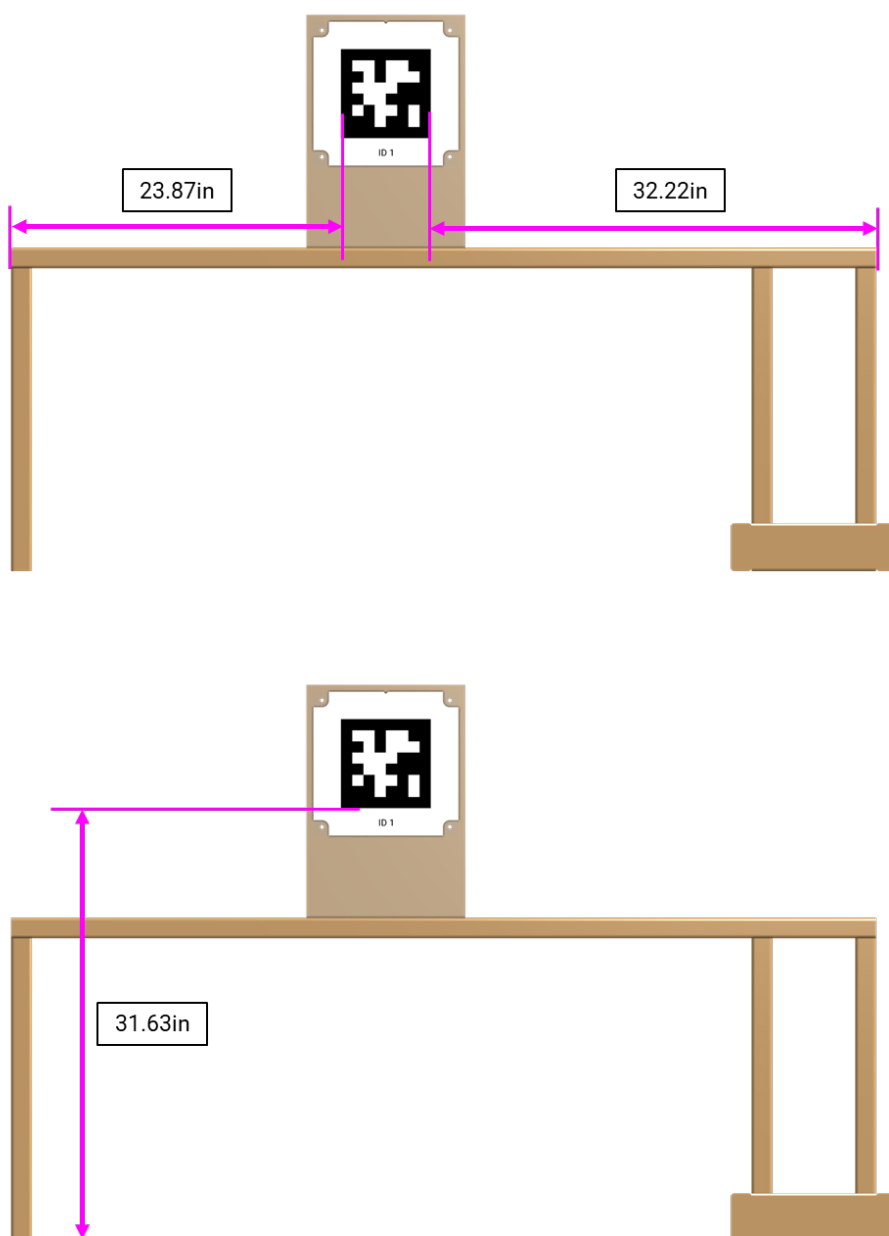




AprilTag Placement

The image below illustrates where the tag should be located on the team version of the Trench. The dimension provided is the height from the carpet to the bottom edge of the black square on the tag, and ends of the arm to the left and right edges of the black square on the tag.

The tag shown may not match the tag required for this field element. The tags needed may be IDs 1, 6, 7, 12, 17, 22, 23 or 28 depending on the desired position on the field. For further details on AprilTag field layout and printing AprilTags, see the AprilTag Images and User Guide document on [the Playing FIELD webpage](#).



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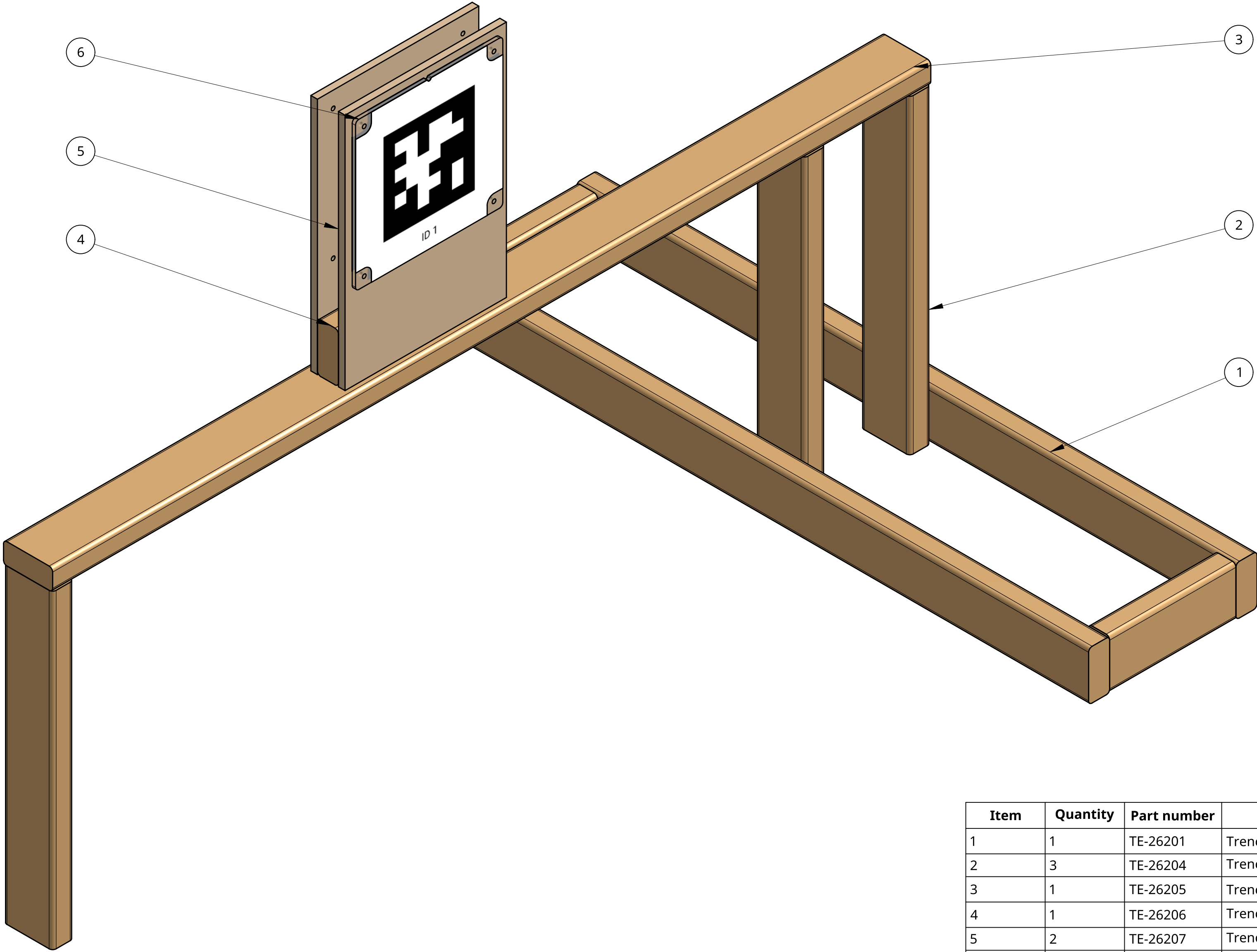
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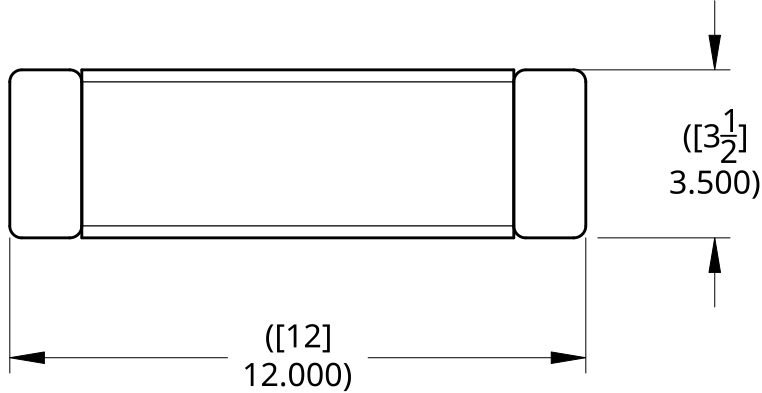
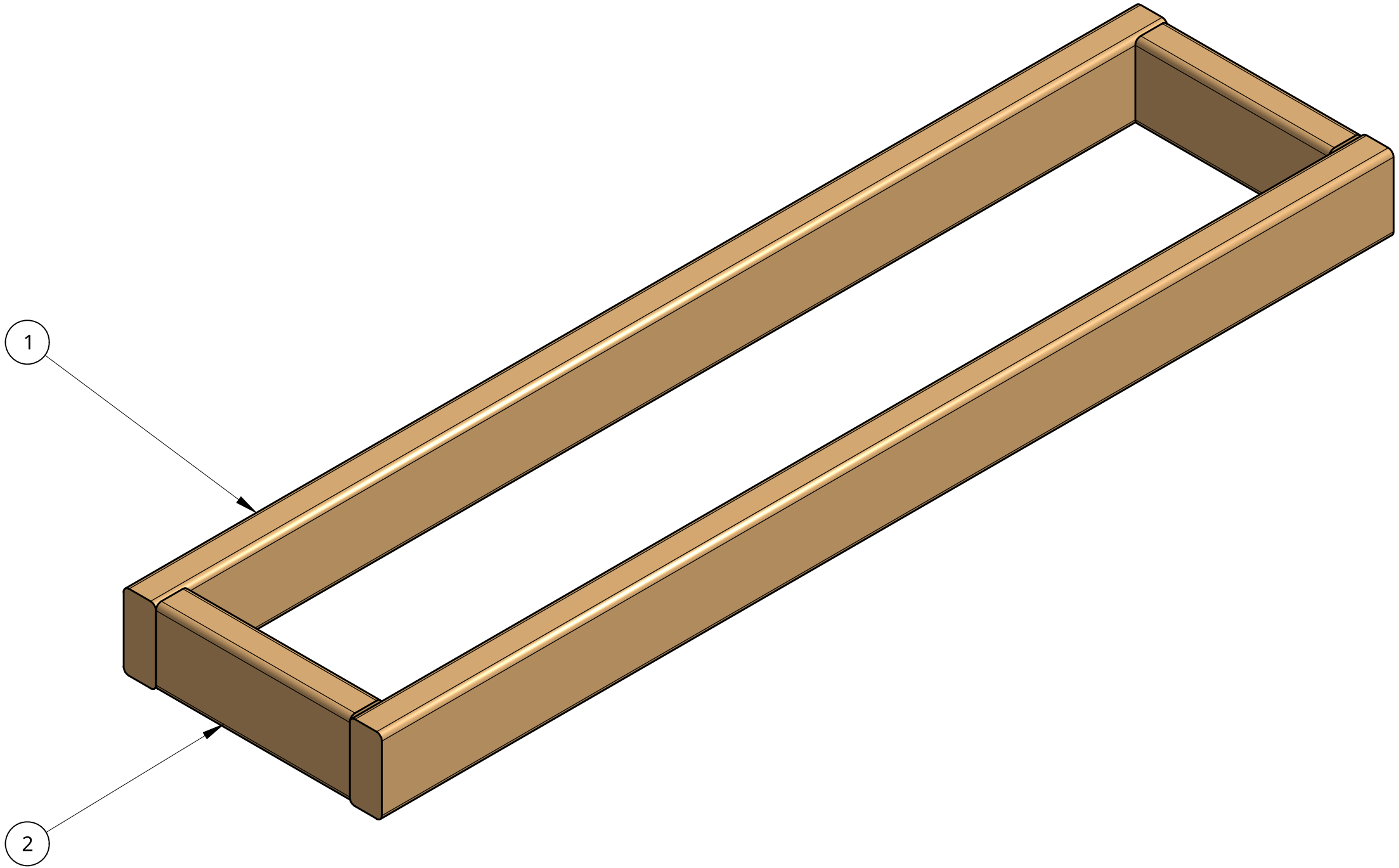
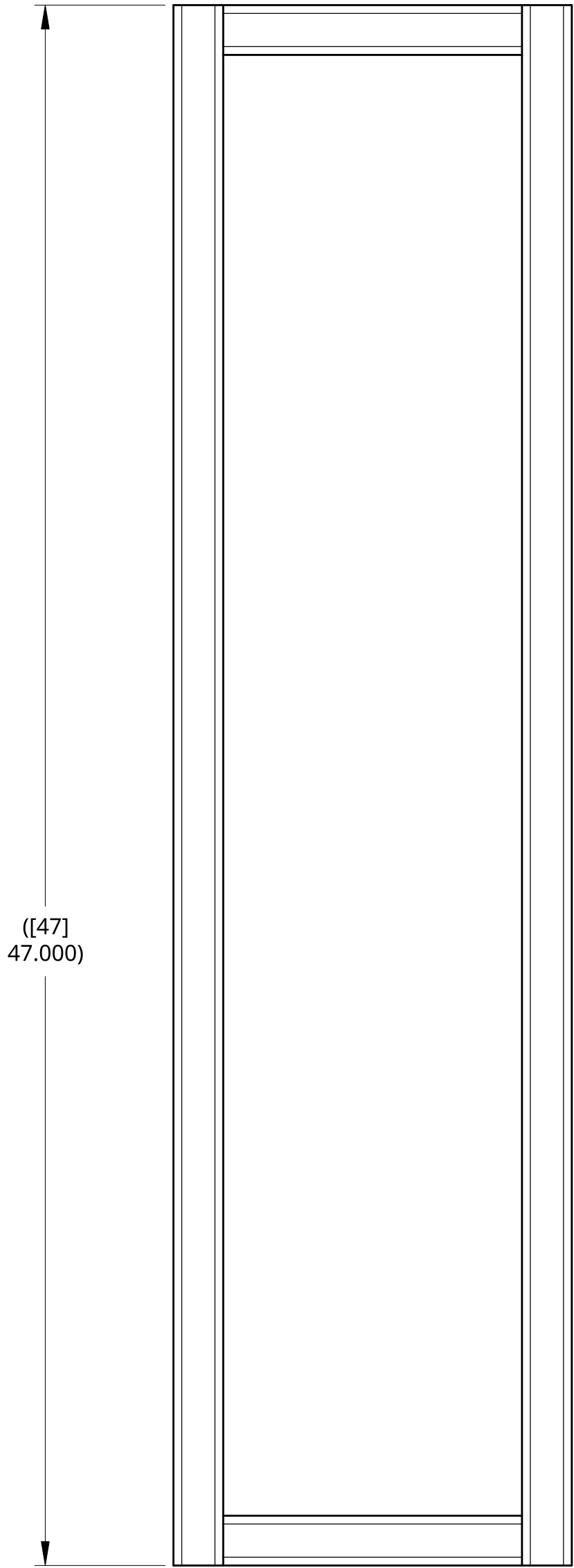
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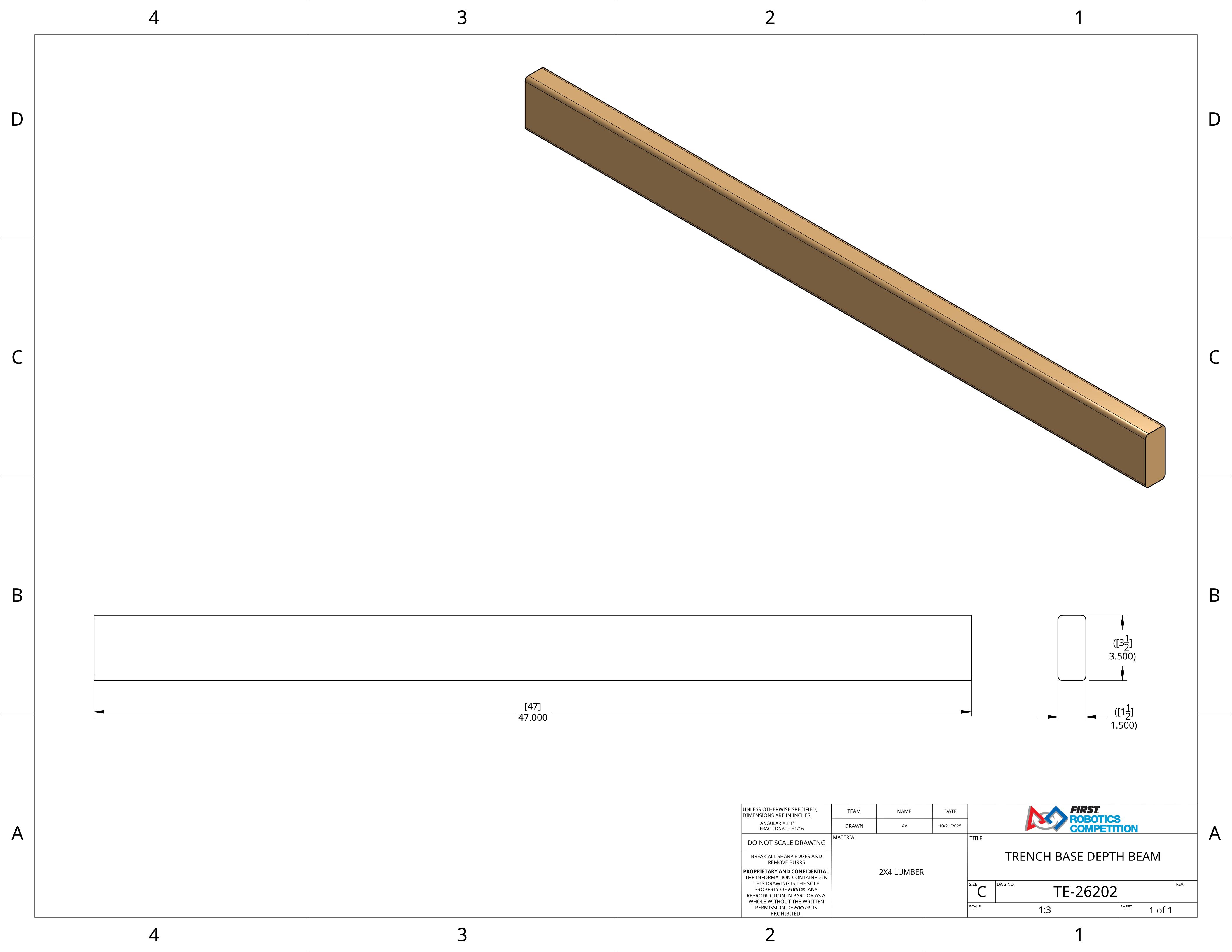
Item	Quantity	Part number	Description
1	1	TE-26201	Trench Base
2	3	TE-26204	Trench Height Beam
3	1	TE-26205	Trench Arm Beam
4	1	TE-26206	Trench April Tag Mount Beam
5	2	TE-26207	Trench April Tag Panel
6	1	FE-00083-ID1	AprilTag, ID 1
7	1	FE-00083-ID12	AprilTag, ID 12


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	DRAWN	AV	10/20/2025		
	MATERIAL			TITLE	
				TE TRENCH	
SIZE		DWG NO.		REV.	
C		TE-26200			
SCALE		1:4		SHEET	1 of 1



Item	Quantity	Part number	Description
1	2	TE-26202	Trench Base Depth Beam
2	2	TE-26203	Trench Base Width Beam

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MATERIAL				TITLE		
				TRENCH BASE		
				SIZE	DWG NO.	REV.
				C	TE-26201	
				SCALE 1:4		SHEET 1 of 1



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

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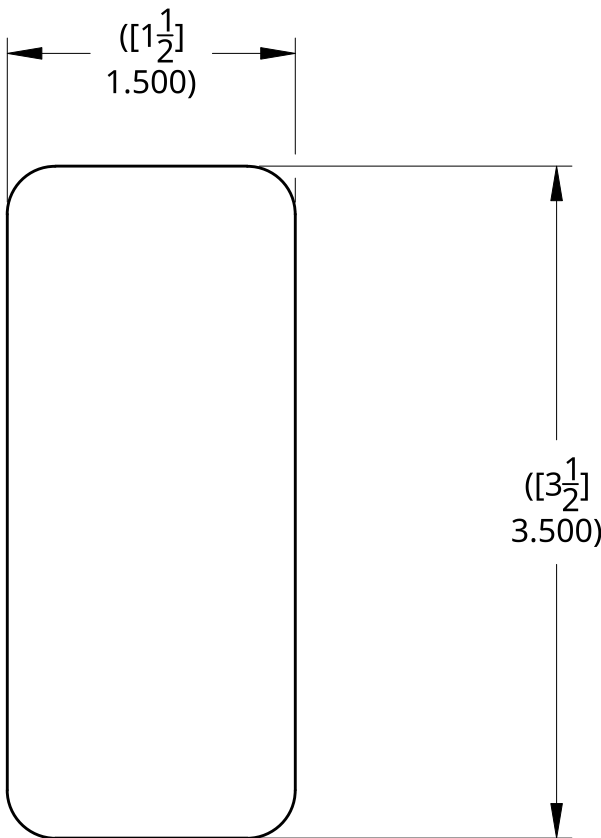
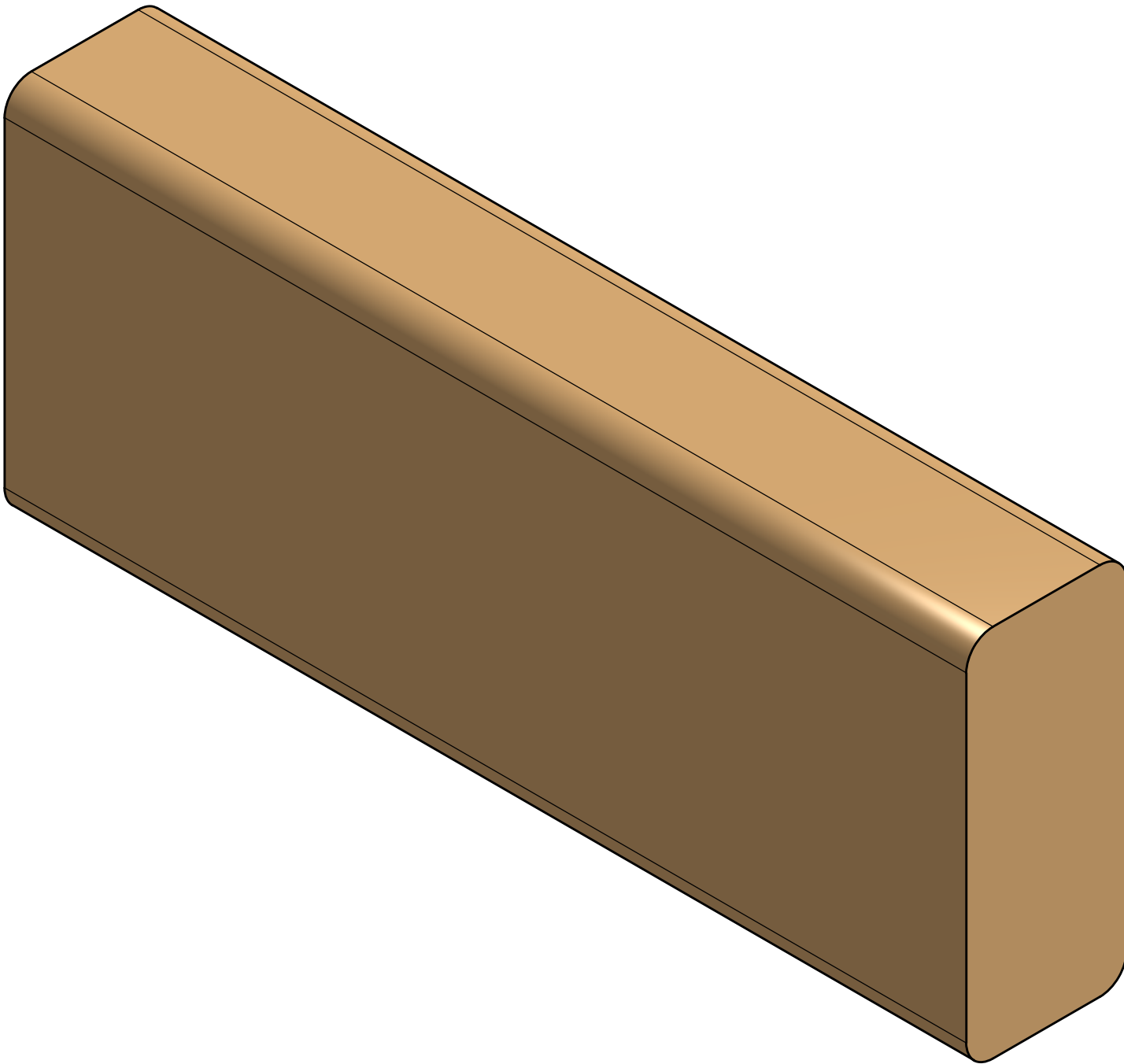
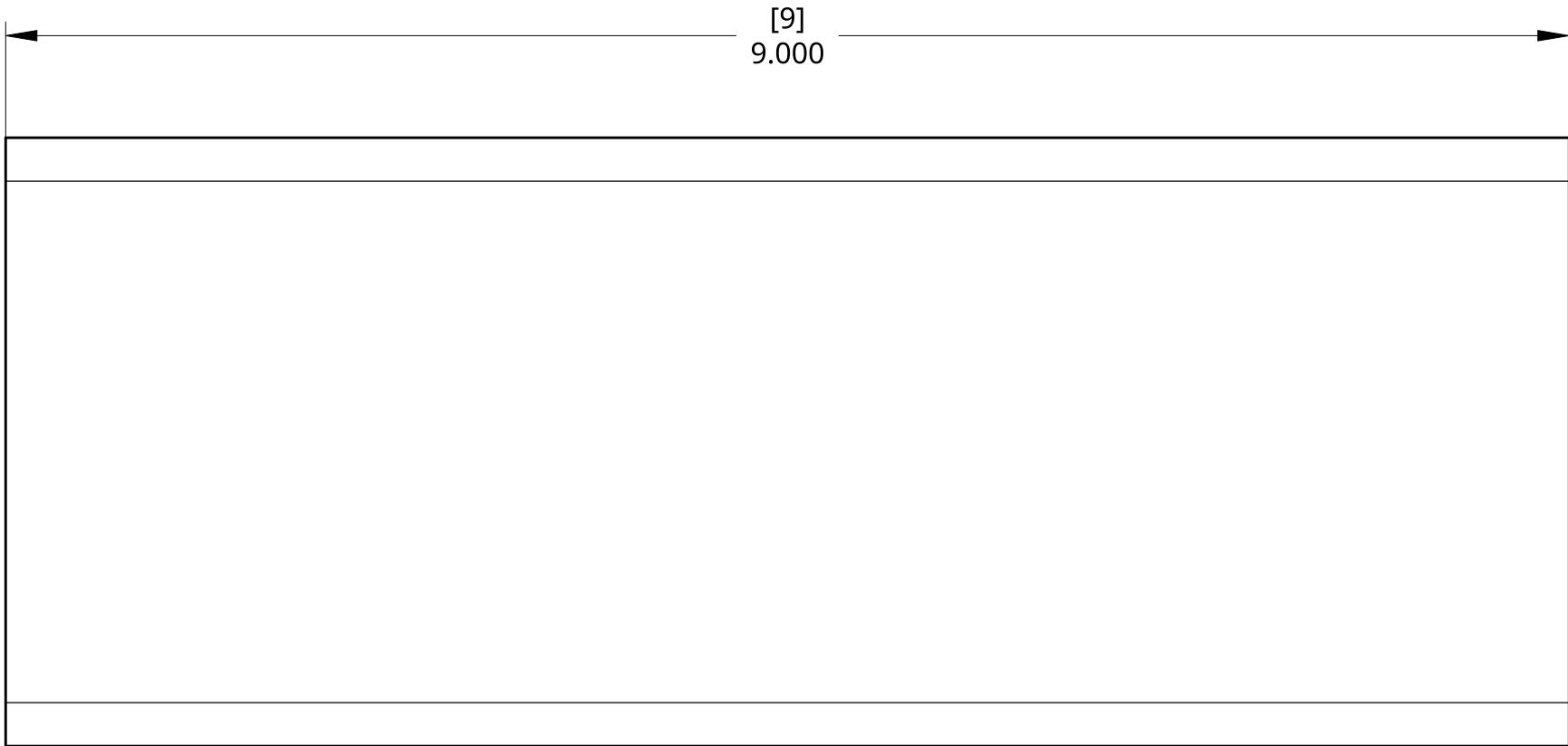
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UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES ANGULAR = ± 1° FRACTIONAL = ±1/16	TEAM	NAME	DATE			
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DO NOT SCALE DRAWING	MATERIAL 					

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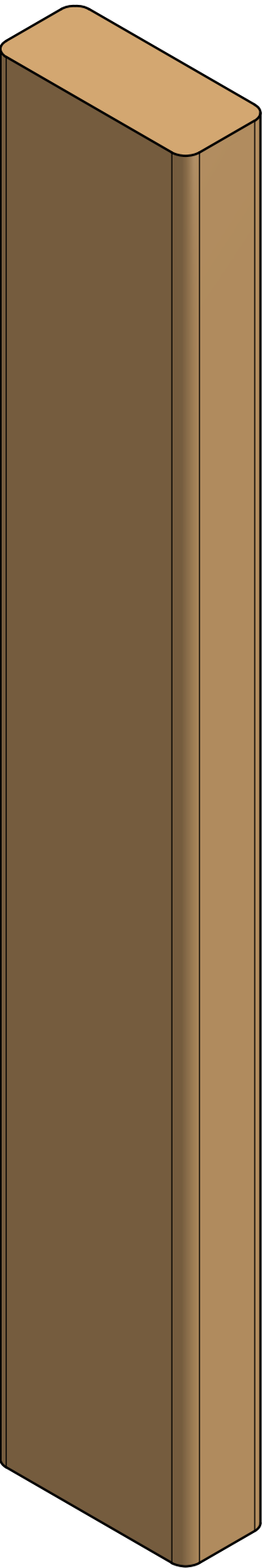
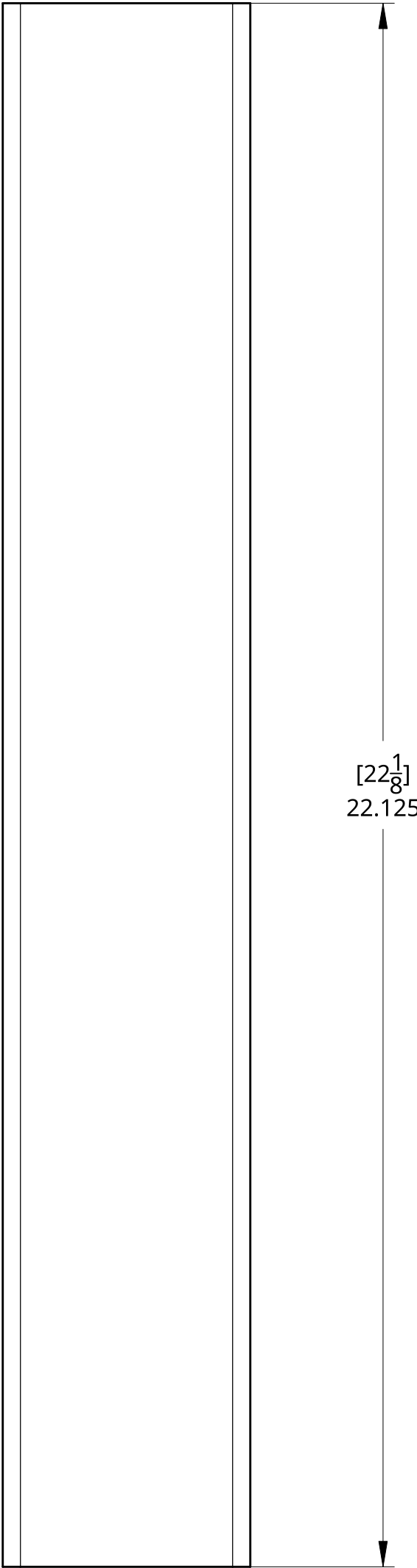
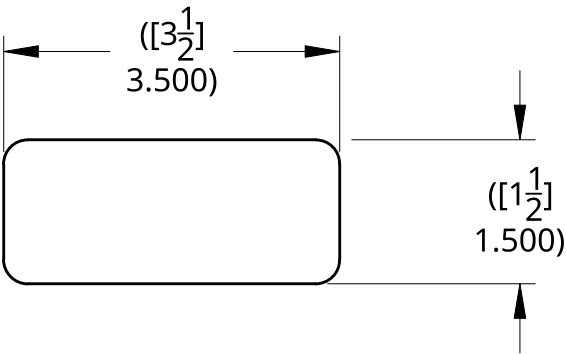
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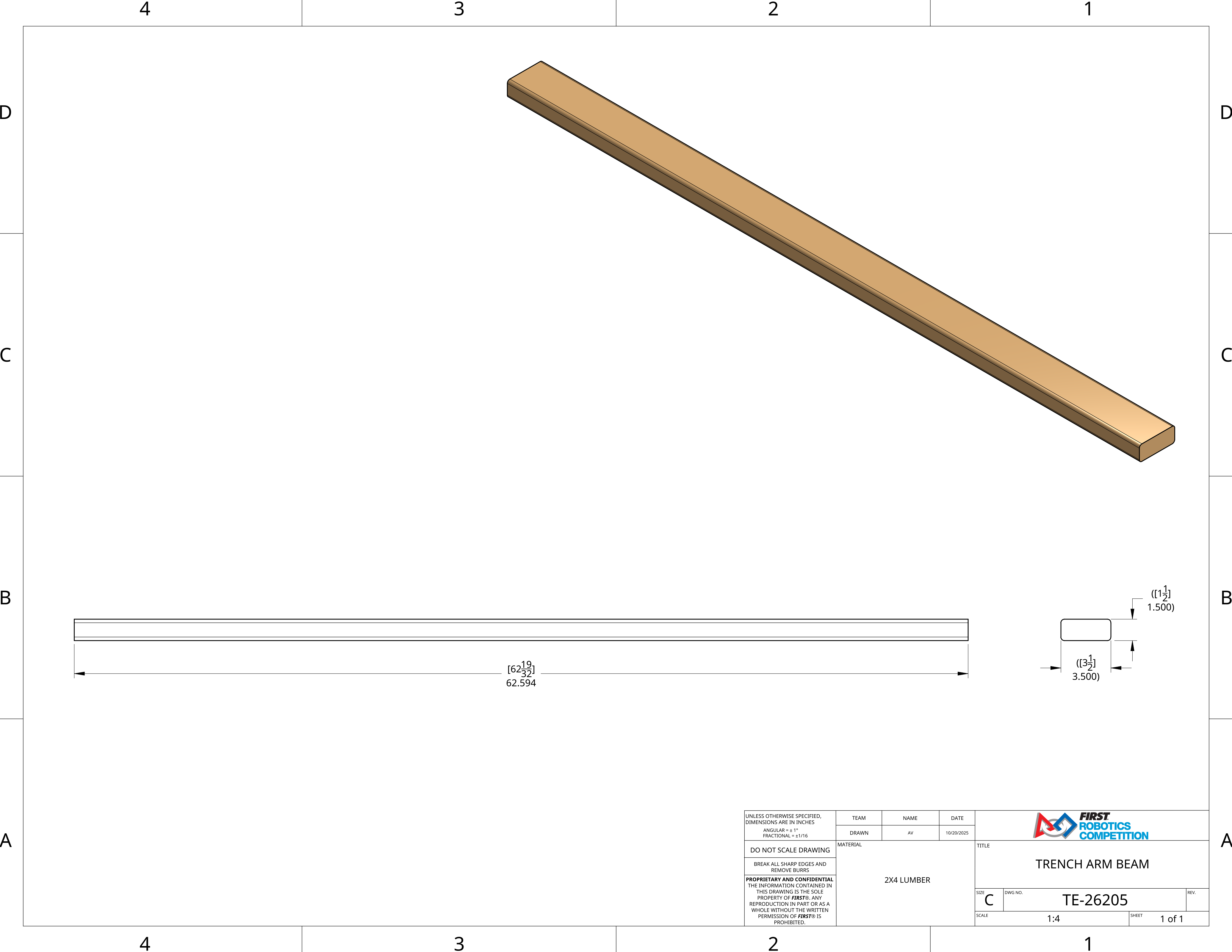
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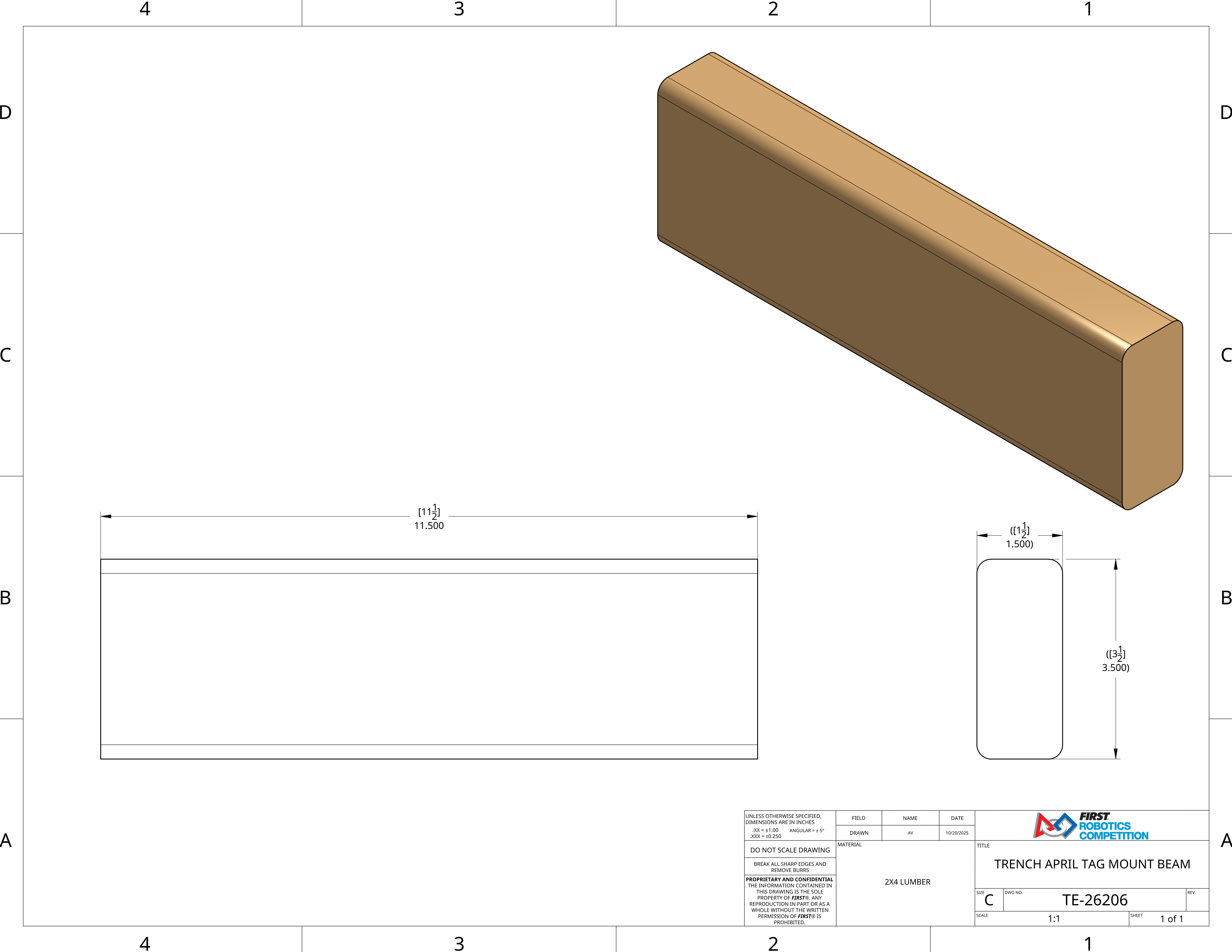
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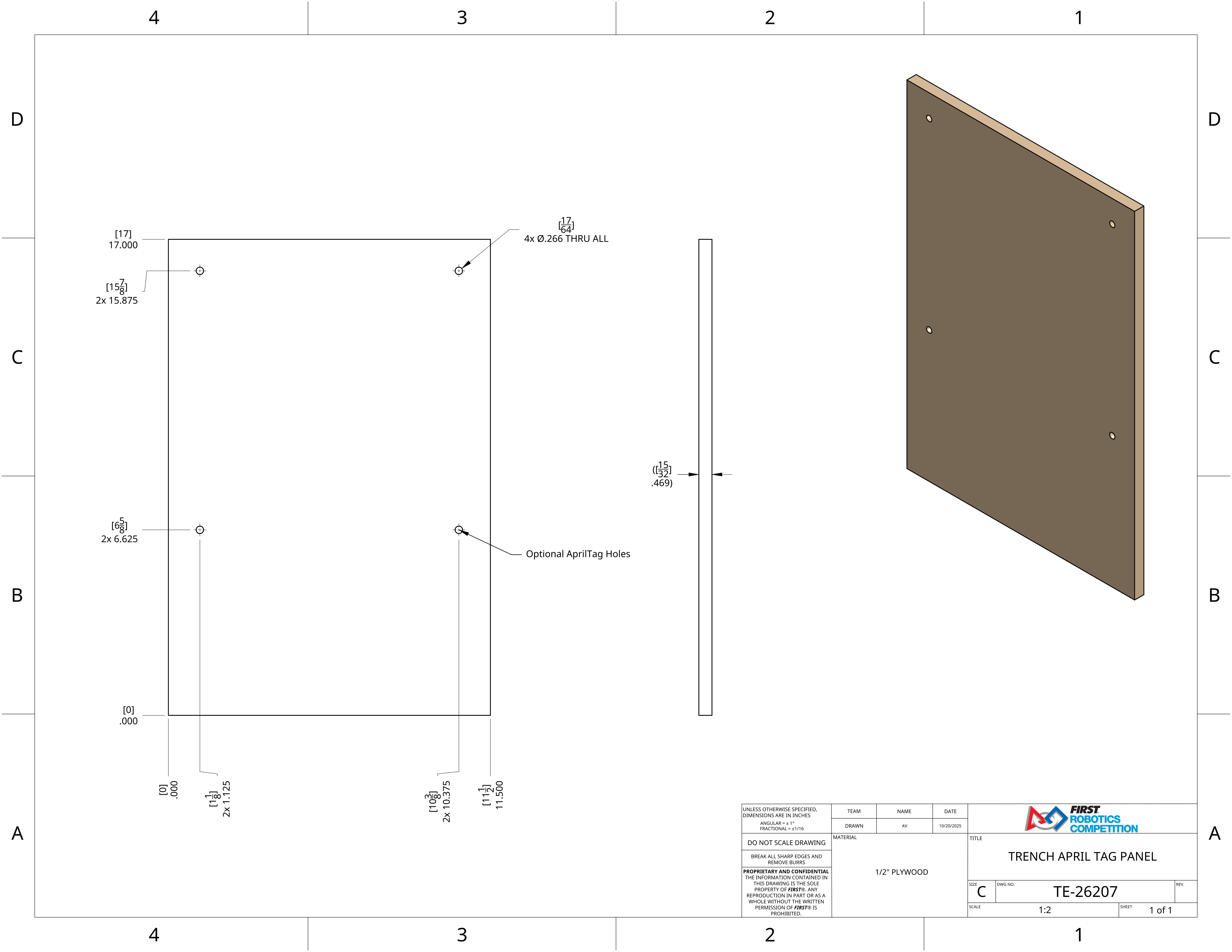
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES ANGULAR = ± 1° FRACTIONAL = ± 1/16	TEAM	NAME	DATE			
	DRAWN	AV	10/20/2025			
DO NOT SCALE DRAWING	MATERIAL 2X4 LUMBER			TITLE TRENCH HEIGHT BEAM		
BREAK ALL SHARP EDGES AND REMOVE BURRS						
PROPRIETARY AND CONFIDENTIAL THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF <i>FIRST</i> ®. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF <i>FIRST</i> ® IS PROHIBITED.				SIZE C	DWG NO. TE-26204	REV.
SCALE 1:2				SHEET 1 of 1		




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DO NOT SCALE DRAWING	MATERIAL 				



UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES .XX = ±1.00 ANGULAR = ± 5° .XXX = ±0.250	FIELD	NAME	DATE			
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DO NOT SCALE DRAWING	MATERIAL 					



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DO NOT SCALE DRAWING	MATERIAL 					