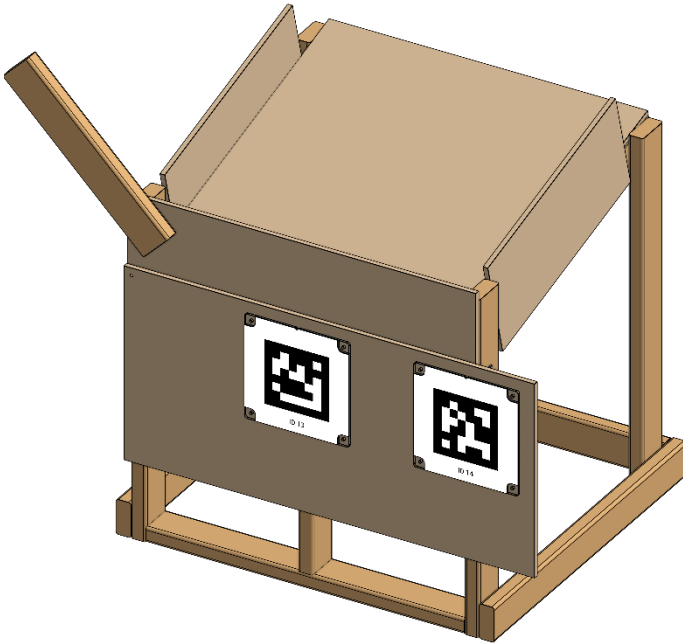


TE-26000 OUTPOST



Description

This is an Outpost, designed so teams can practice acquiring Fuel. Each field element has multiple versions designed for teams. Before constructing this assembly, be sure to check [the Playing FIELD webpage](https://www.firstinspires.org/robotics/frc/the-playing-field) 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](https://www.firstinspires.org/robotics/frc/the-playing-field).

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

Hardware/Other:

- #8 Wood Screws x 2.5" long – Approximately 54 Pieces
- #8 Wood Screws x 1.5" long – Approximately 16 Pieces
- #8 Wood Screws x 1" long – Approximately 4 Pieces
- 1/4-20 x 3.5in long bolt – 2 Pieces

- 1/4-20 Wing Nut – 2 Pieces
- Optional – the TE-26016 (Outpost Chute Door) may be done via a wood screw, or with a nut and bolt. If opting for a nut and bolt:
 - o 1/4-20 x 5in long bolt – 1 Piece
 - o 1/4-20 Wing Nut – 1 Piece (3 total after including the 2 above)

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, 1/2” 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 1-1/2” x 3-1/2”.

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 A	Repetition 1x	Stock length 96	Part length / Label		Qty	Cuts in layout				
			34 / TE-26002		2	The number of cuts		4		
			20 / TE-26017		1	Waste				
			7 / TE-26004		1	Material remnant		0.5		
						Cut		0.5		
			34 TE-26002		34 TE-26002		20 TE-26017		7 TE-26004	
Layout ID B	Repetition 2x	Stock length 96	Part length / Label		Qty	Cuts in layout				
			36 / TE-26015		1	The number of cuts		2		
			33.5 / TE-26009		1	Waste				
						Material remnant		26.25		
						Cut		0.25		
			36 TE-26015		33.5 TE-26009					
Layout ID C	Repetition 1x	Stock length 96	Part length / Label		Qty	Cuts in layout				
			34.838 / TE-26010		1	The number of cuts		2		
			33 / TE-26012		1	Waste				
						Material remnant		27.912		
						Cut		0.25		
			34.838 TE-26010		33 TE-26012					
Layout ID D	Repetition 1x	Stock length 96	Part length / Label		Qty	Cuts in layout				
			33 / TE-26012		1	The number of cuts		2		
			31.838 / TE-26003		1	Waste				
						Material remnant		30.912		
						Cut		0.25		
			33 TE-26012		31.838 TE-26003					
Layout ID E	Repetition 1x	Stock length 96	Part length / Label		Qty	Cuts in layout				
			31.838 / TE-26003		1	The number of cuts		1		
						Waste				
						Material remnant		64.037		
						Cut		0.125		
			31.838 TE-26003							

1x2 Lumber:

Layout ID	Repetition	Stock length	Part length / Label	Qty	Cuts in layout
A	1x	96	31.838 / TE-26007	2	The number of cuts 4
			15 / TE-26006	2	Waste
					Material remnant 2.324

31.838 TE-26007	31.838 TE-26007	15 TE-26006	15 TE-26006	
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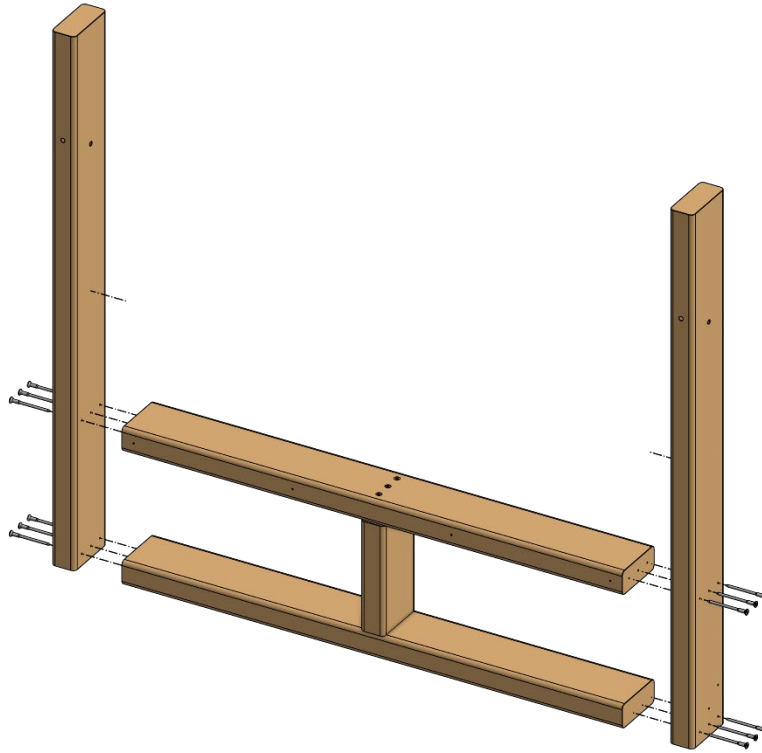
1/2" Plywood (can be combined with all other Team Elements to reduce number of purchased panels):

Layout ID	Repetition	Stock dimensions	Panel	Qty
A	1x	96 x 48	34.838 x 8.5 / TE-26016	1
			33 x 31.838 / TE-26013	1
			41.169 x 19.5 / TE-26005	1
			10 x 23 / TE-26014	2

Cuts in layout	
The length of cuts	315.477
The number of cuts	9

Assembly Instructions

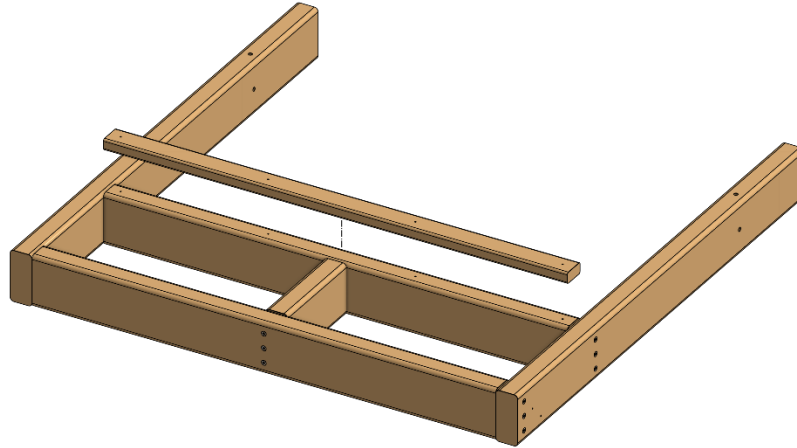
1. Fasten the TE-26001 (Outpost Front Frame) assembly together by attaching the TE-26004 (Outpost Front Middle Beam) centered between two TE-26003 (Outpost Front Horizontal Beam) and then attach two TE-26002 (Outpost Front Vertical Beam) vertical on both sides while being in line with the ground. Attach all together using 2-1/2in screws. The holes on TE-26002 should be biased up.



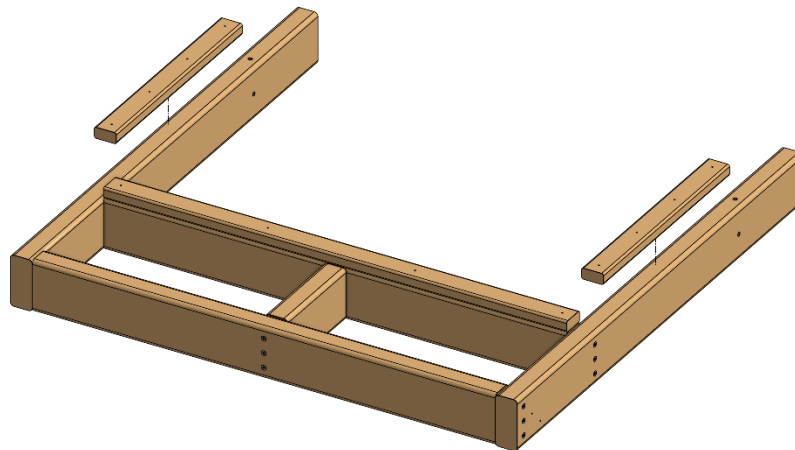
2. After assembly of the frame, lay the current frame on the ground face up.

Steps 3-6: DO NOT FASTEN anything until step 6 when everything is aligned.

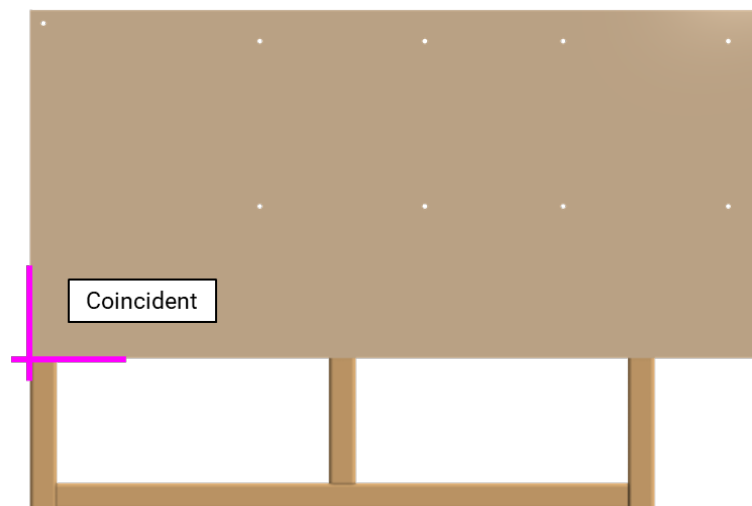
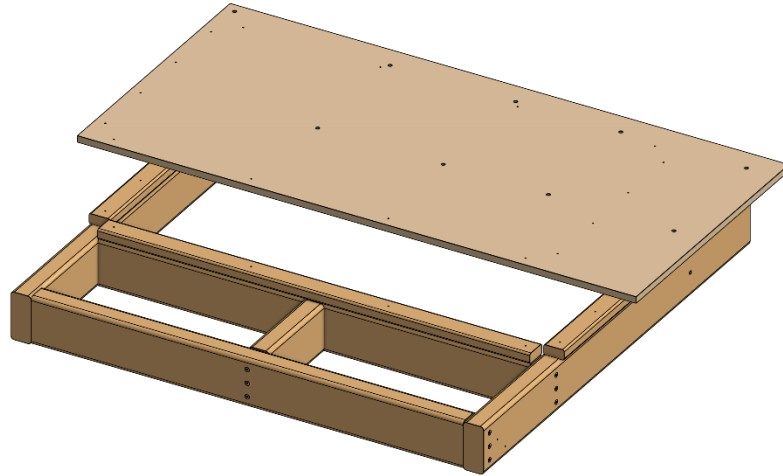
3. Align and set one TE-26007 (Outpost Front Horizontal Spacer) on the front face of the top TE-26003 (Outpost Front Horizontal Beam). Do not fasten anything until the very end when the front plate has been aligned.



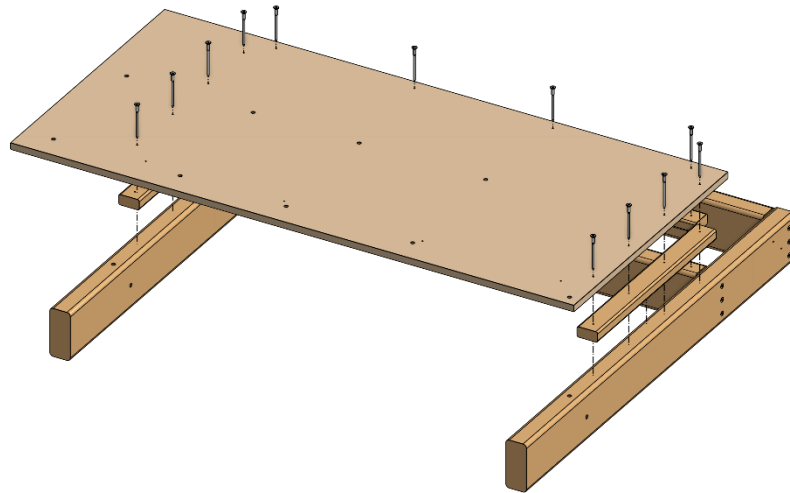
4. Align two of the TE-26006 (Outpost Front Vertical Spacer) on the front face of the TE-26002s (Outpost Front Vertical Beam), while keeping the corners coincident with the TE-26007.



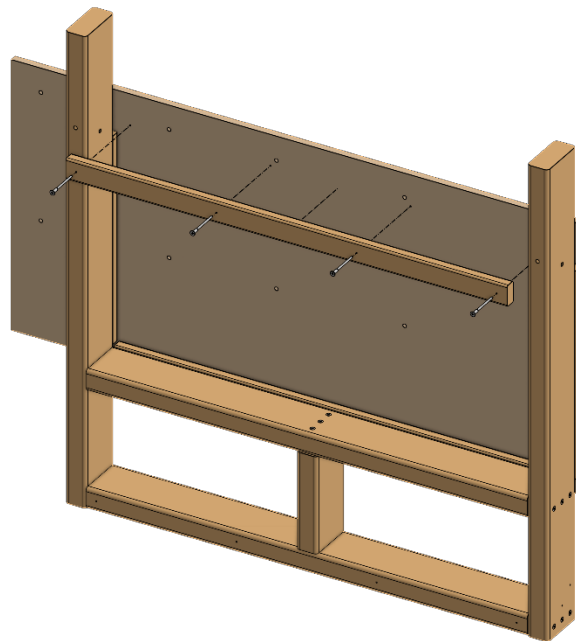
5. Attach the TE-26005 (Outpost Front Plate) on top of all the spacers while making it coincident with the left most face of the left TE-26006 and the bottom most face of TE-26007.



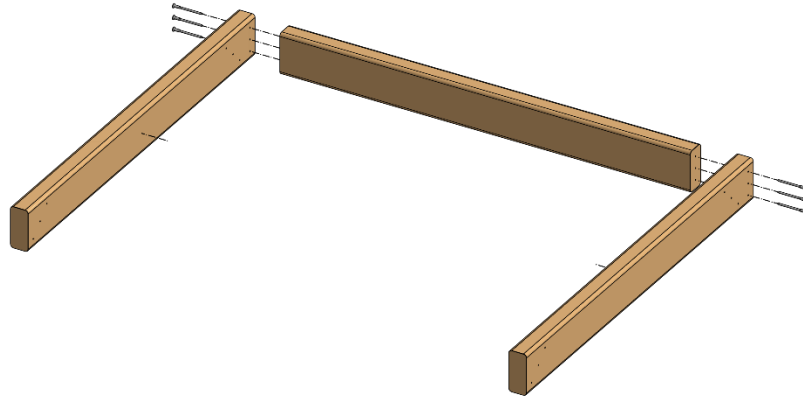
6. Fasten all together using 2-1/2in screws.



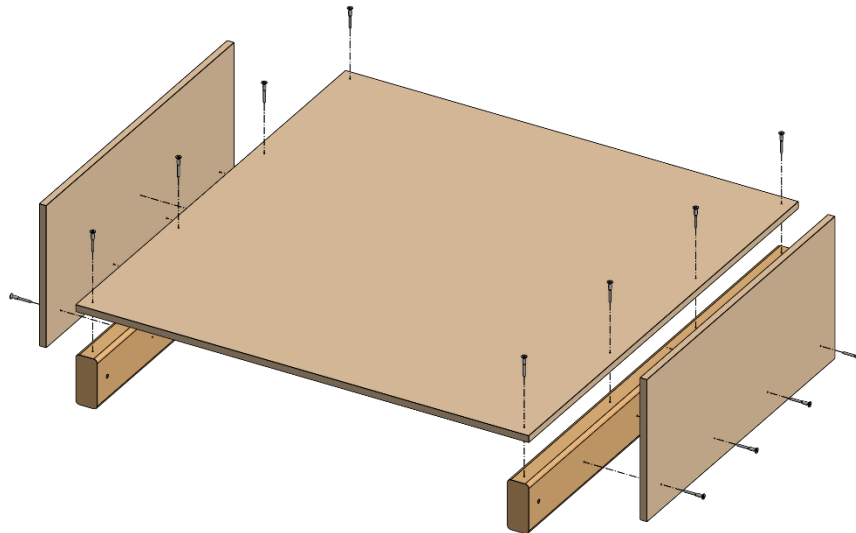
7. Attach the final TE-26007 (Outpost Front Horizontal Spacer) to the back of the TE-26005 (Outpost Front Plate) keeping in the rectangular pattern with all the other spacers using 1in screws. Note: attaching screws in the opposite direction than shown will be harder to align but will result in a better connection.



8. Fasten the TE-26008 (Outpost Floor Frame) together with two TE-26009 (Outpost Floor Depth Beam) and one TE-26010 (Outpost Floor Width Beam). Attach all together using 2-1/2in screws.

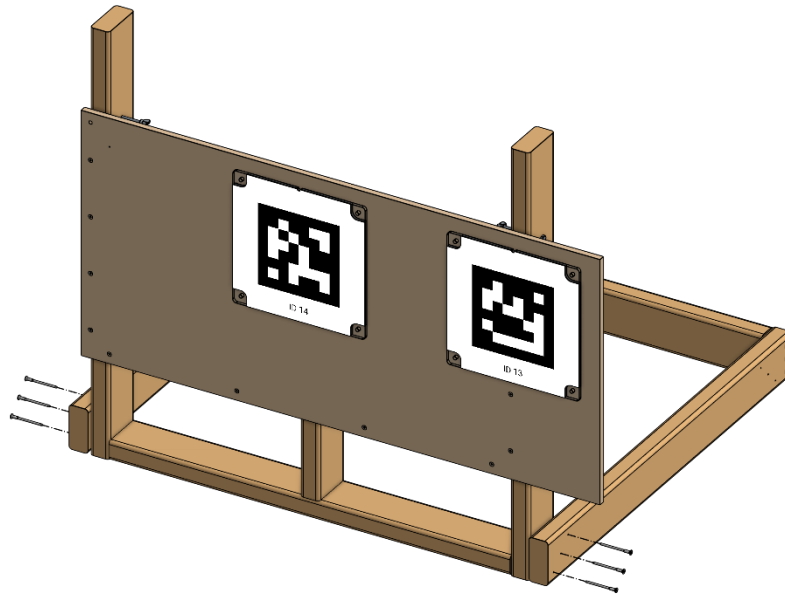


9. Fasten together the TE-26011 (Outpost Chute Frame) by attaching two TE-26012 (Outpost Chute Beam) to the bottom side edge of the TE-26013 (Outpost Chute Panel) on both sides. Then attach two TE-26014 (Outpost Chute Side Plate) 5 inches from each side on the outside of both TE-26011s. Ensure the two TE-26012 are aligned the same way - the holes should be on the same side of the assembly. Attach all together using 1-1/2in screws.

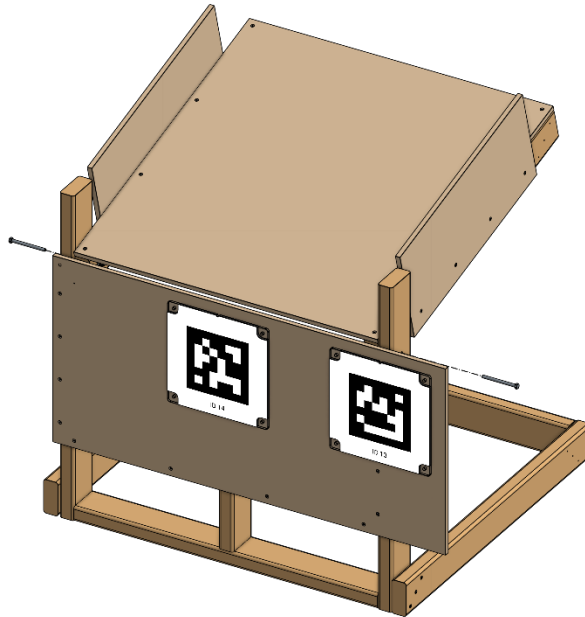




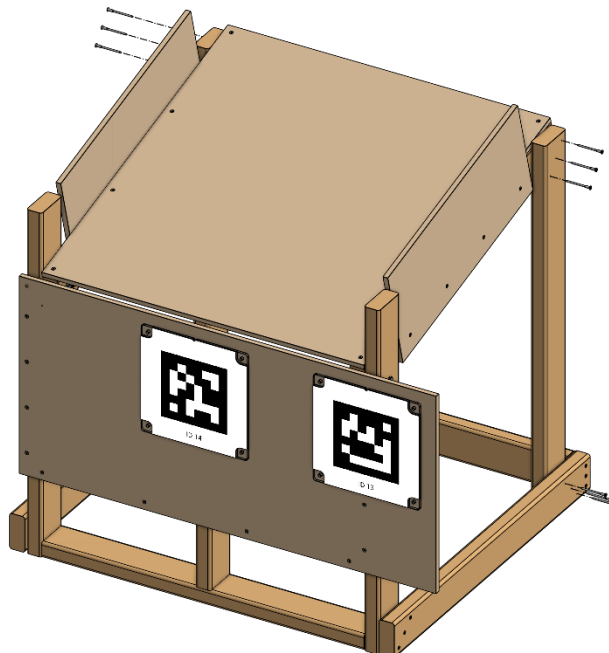
10. Attach the TE-26008 (Outpost Floor Frame) to the bottom of the TE-26001 (Outpost Front Frame) using 2-1/2in screws as shown below.



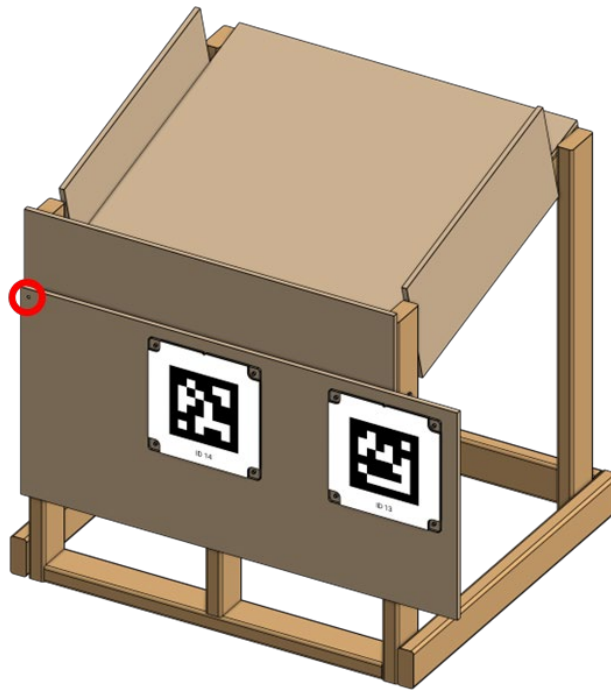
11. Attach the TE-26011 (Outpost Chute Frame) to the top of both TE-26002 (Outpost Front Vertical Beam) inserting the 1/4-20 x 3.5in bolts through the drilled holes in each part. Leave this loose enough so that TE-26011 can rotate freely.



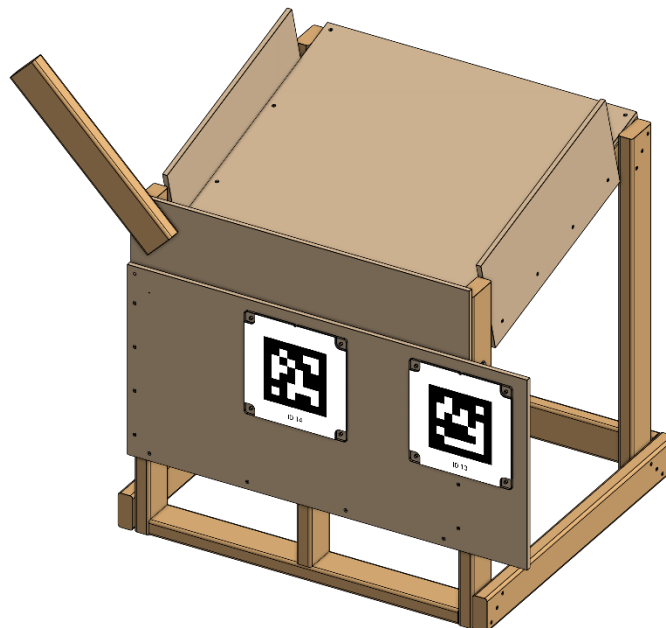
12. Using a Leveling App on your phone, rotate TE-26011 until it is at a 15-degree angle with the ground. Then use two TE-26015s (Outpost Back Height Beam) to lock the TE-26011 into place by attaching wood screws into both TE-26011 and TE-26008.



13. Attach the TE-26016 (Outpost Chute Door) to the top of the TE-26001 (Outpost Front Frame) with either a wood screw or a 1/4-20 x 5in long bolt. If using the bolt – insert through the drilled holes in each part. If using a wood screw – align markings on the TE-26005 (Outpost Front Plate) and TE-26016 and screw in place and into the TE-26002 behind. Do not overtighten hardware - the door should rotate freely up and down.



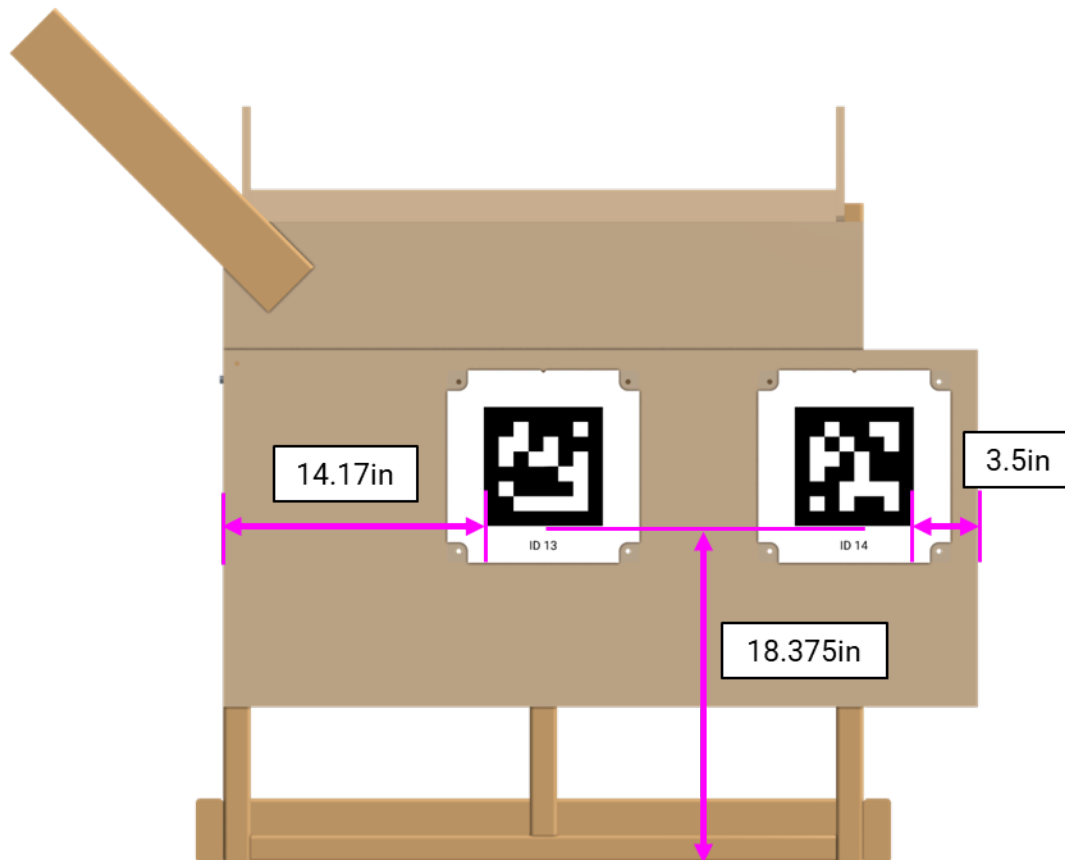
14. Attach TE-26017 (Outpost Chute Handle) in front of the TE-26016 (Outpost Chute Door) at an approximately ~45-degree angle to mock the actual Chute Door Handle and action

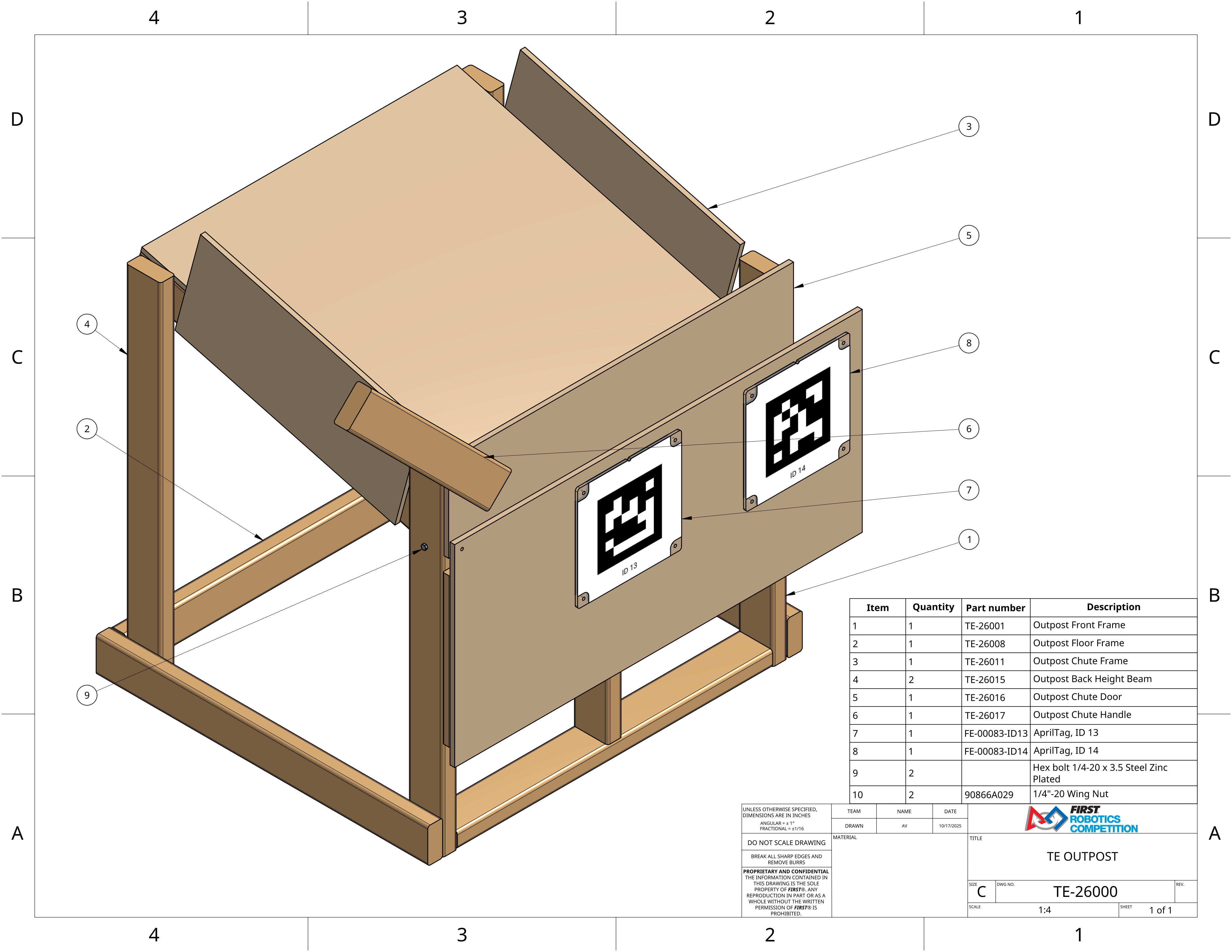


AprilTag Placement

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

The tag shown may not match the tag required for this field element. This tag may be IDs 13, 14, 29, or 30 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](#).





Item	Quantity	Part number	Description
1	1	TE-26001	Outpost Front Frame
2	1	TE-26008	Outpost Floor Frame
3	1	TE-26011	Outpost Chute Frame
4	2	TE-26015	Outpost Back Height Beam
5	1	TE-26016	Outpost Chute Door
6	1	TE-26017	Outpost Chute Handle
7	1	FE-00083-ID13	AprilTag, ID 13
8	1	FE-00083-ID14	AprilTag, ID 14
9	2		Hex bolt 1/4"-20 x 3.5 Steel Zinc Plated
10	2	90866A029	1/4"-20 Wing Nut

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

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TEAMNAME


DRAWN

MATERIAL

DATE

AV

10/17/2025



TITLE

TE OUTPOST

SIZE

C

DWG NO.

TE-26000

REV.

SCALE

1:4

SHEET

1 of 1

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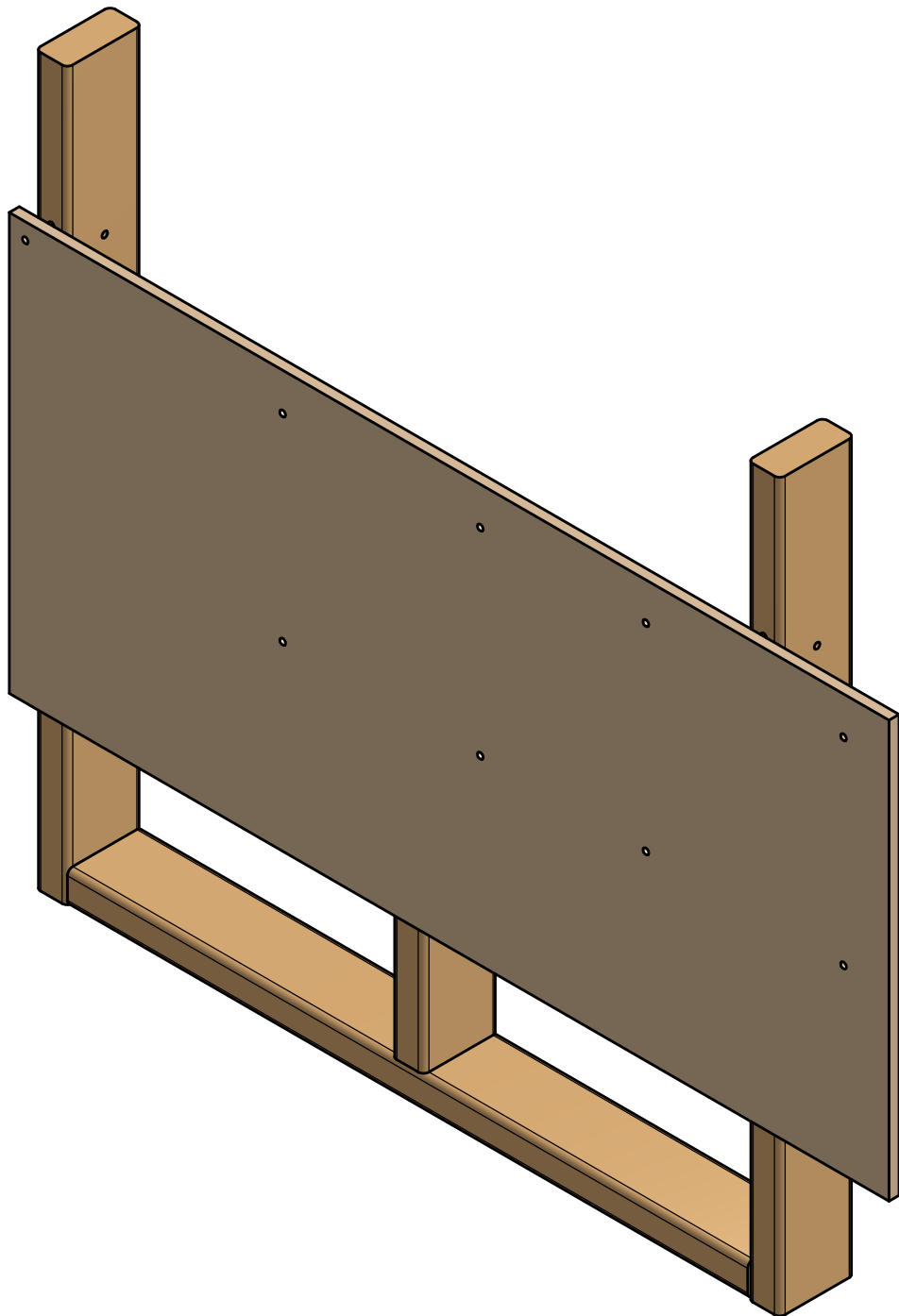
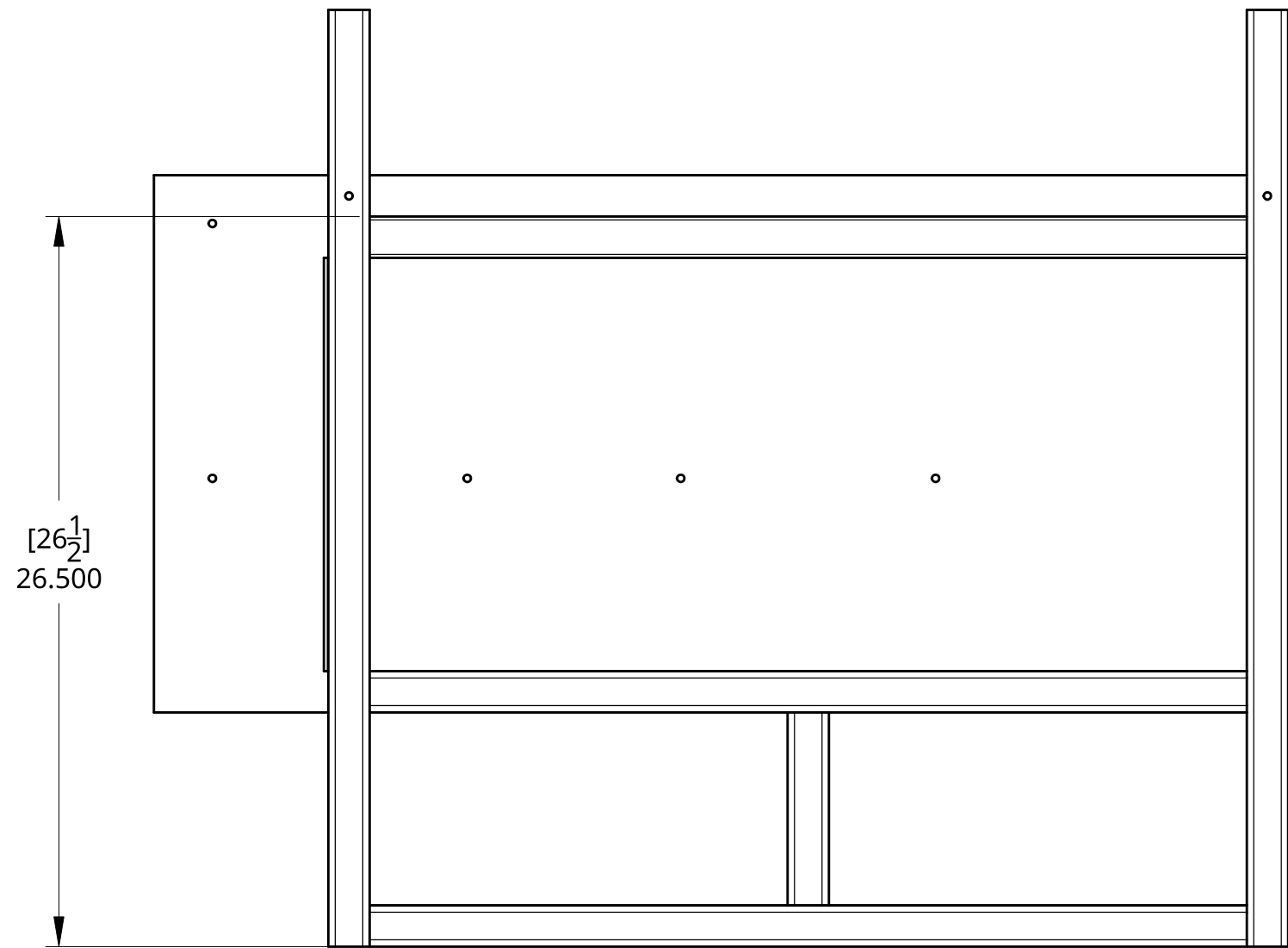
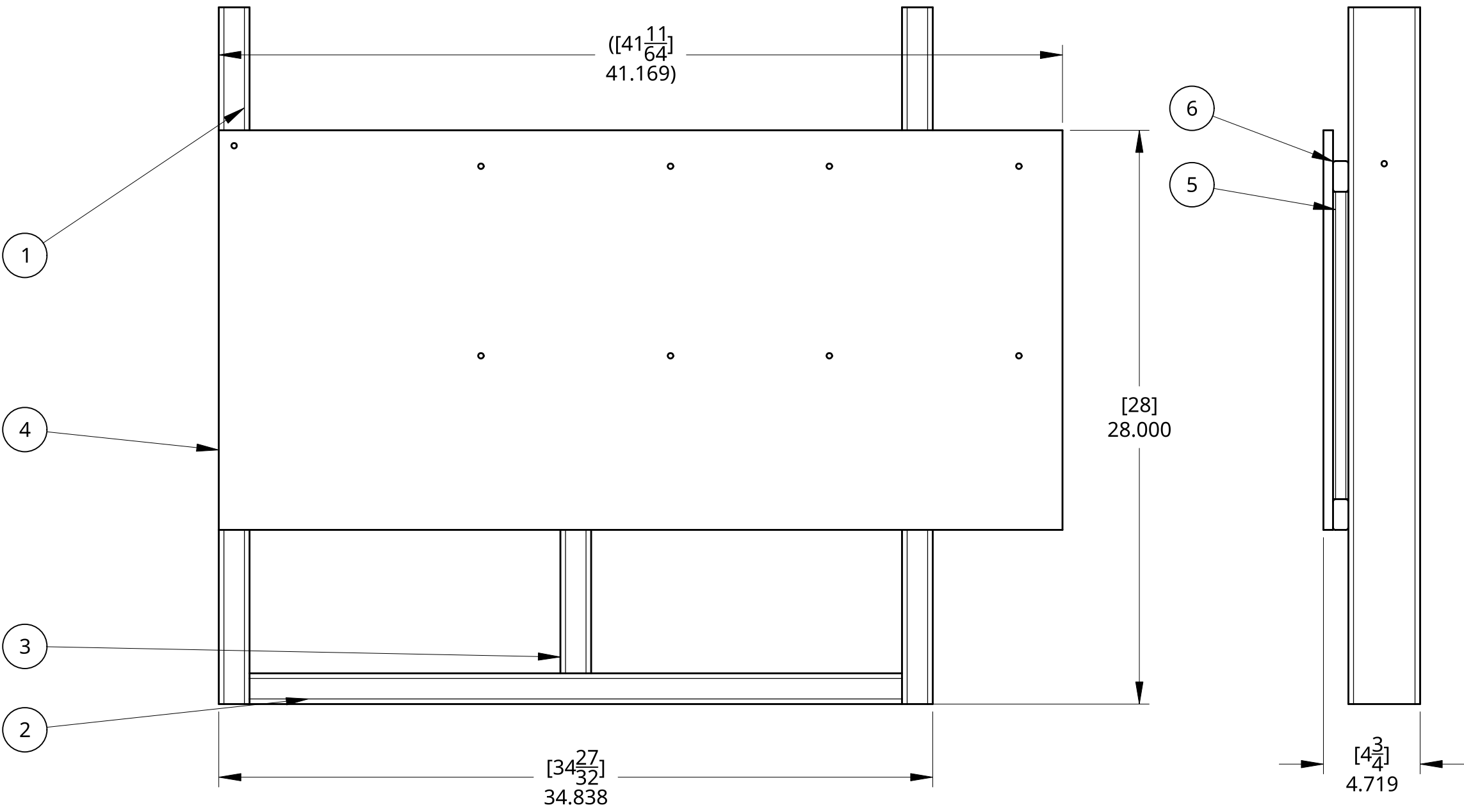
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Item	Quantity	Part number	Description
1	2	TE-26002	Outpost Front Vertical Beam
2	2	TE-26003	Outpost Front Horizontal Beam
3	1	TE-26004	Outpost Front Middle Beam
4	1	TE-26005	Outpost Front Plate
5	2	TE-26006	Outpost Front Vertical Spacer
6	2	TE-26007	Outpost Front Horizontal Spacer

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	DRAWN	AV	10/17/2025		
	MATERIAL			TITLE	
				OUTPOST FRONT FRAME	
SIZE		DWG NO.		REV.	
C		TE-26001			
SCALE			1:6		SHEET 1 of 1

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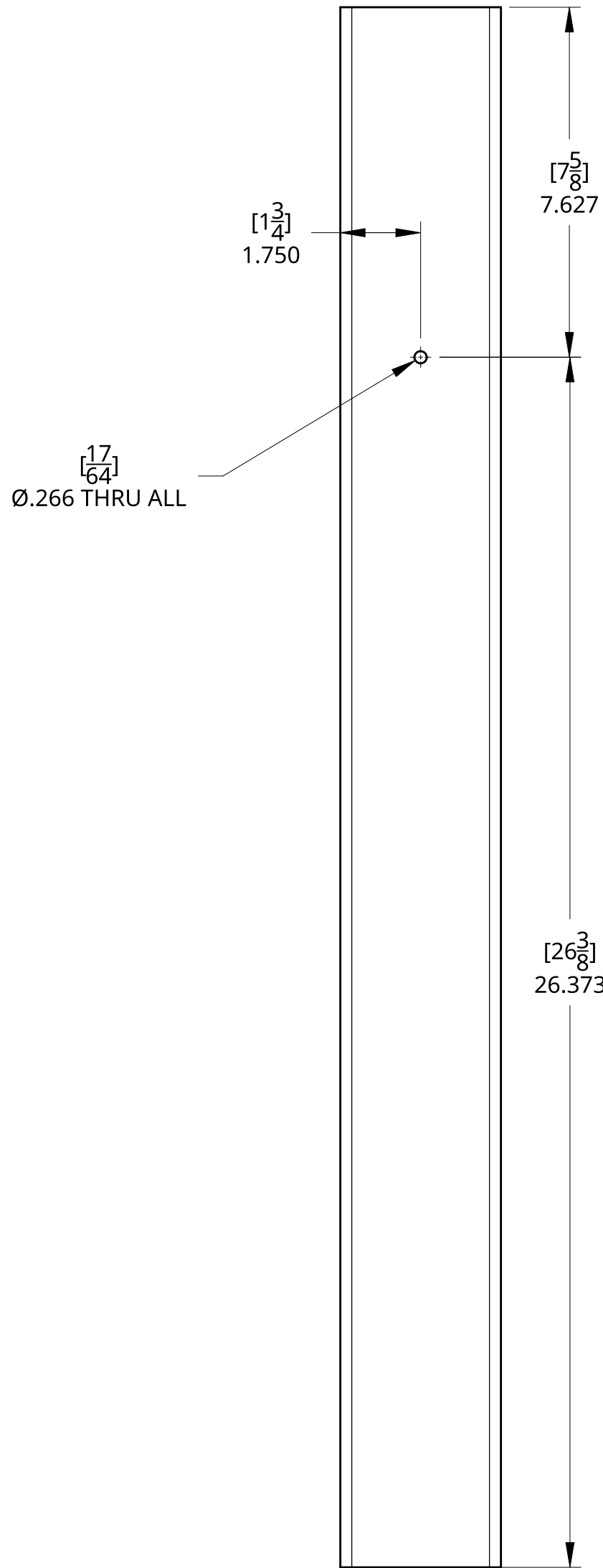
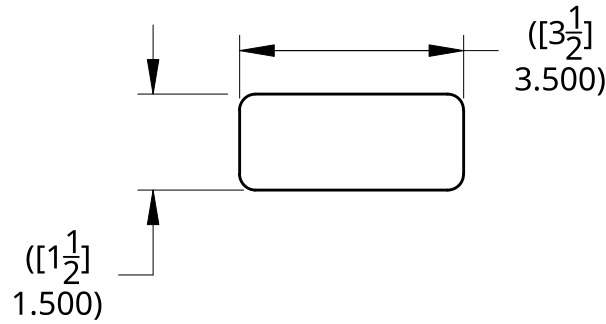
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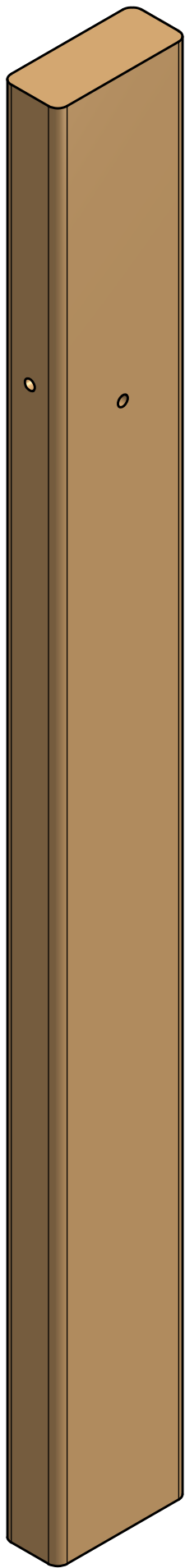
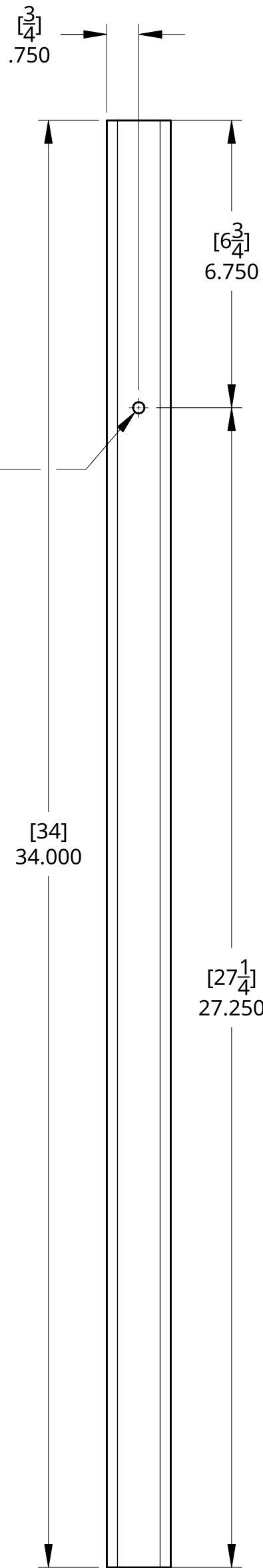
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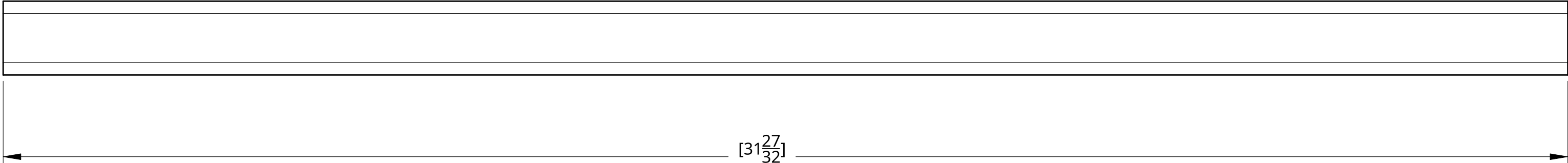
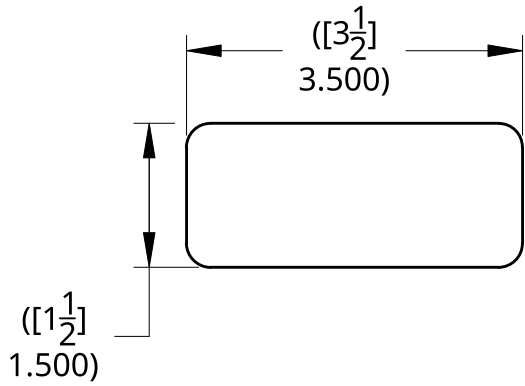
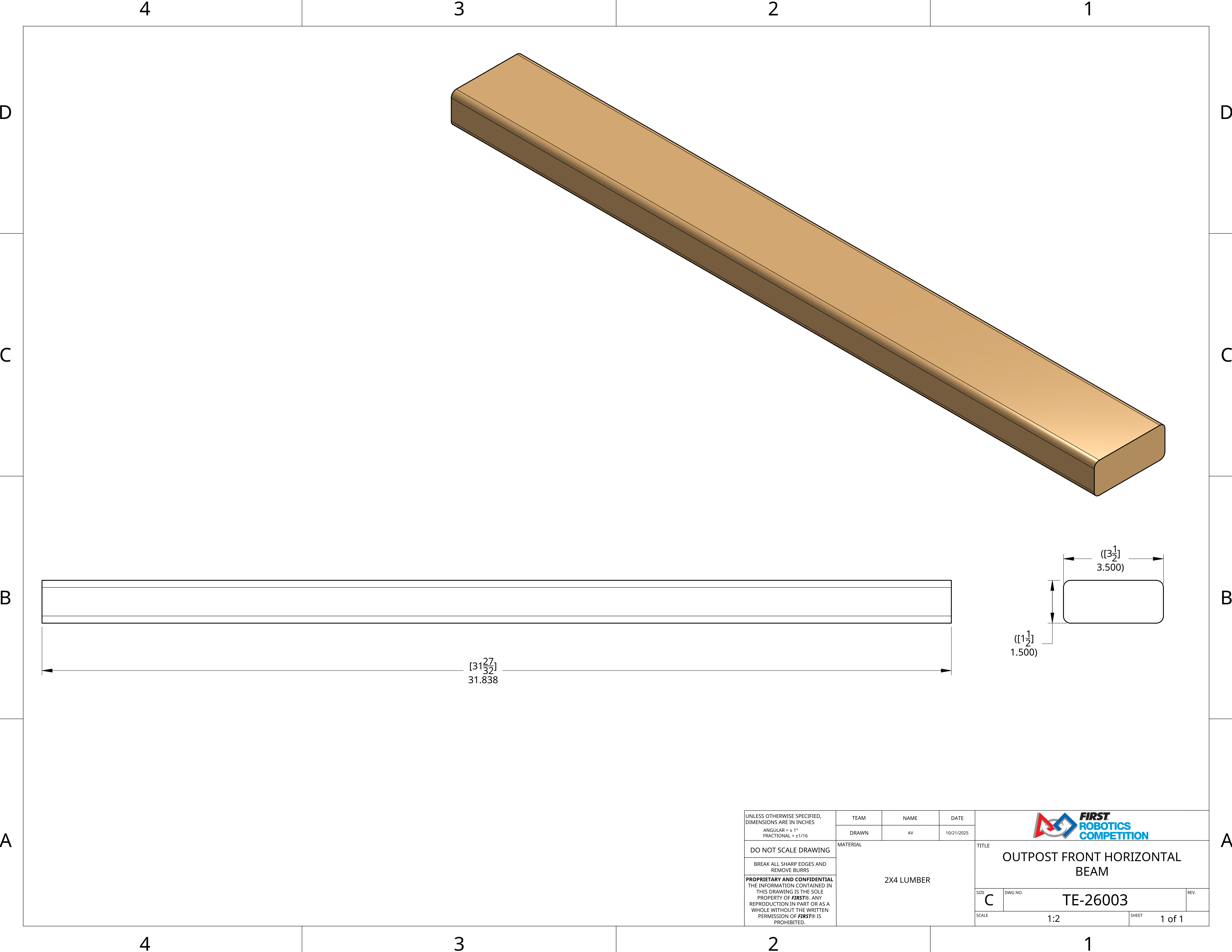
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Ø.266 THRU ALL
Optional hole - only drill if
attaching TE-26016 via bolt



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	DRAWN	AV	10/21/2025			
DO NOT SCALE DRAWING	MATERIAL 2X4 LUMBER			TITLE OUTPOST FRONT VERTICAL BEAM		
BREAK ALL SHARP EDGES AND REMOVE BURRS						
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				SCALE 1:3		SHEET 1 of 1



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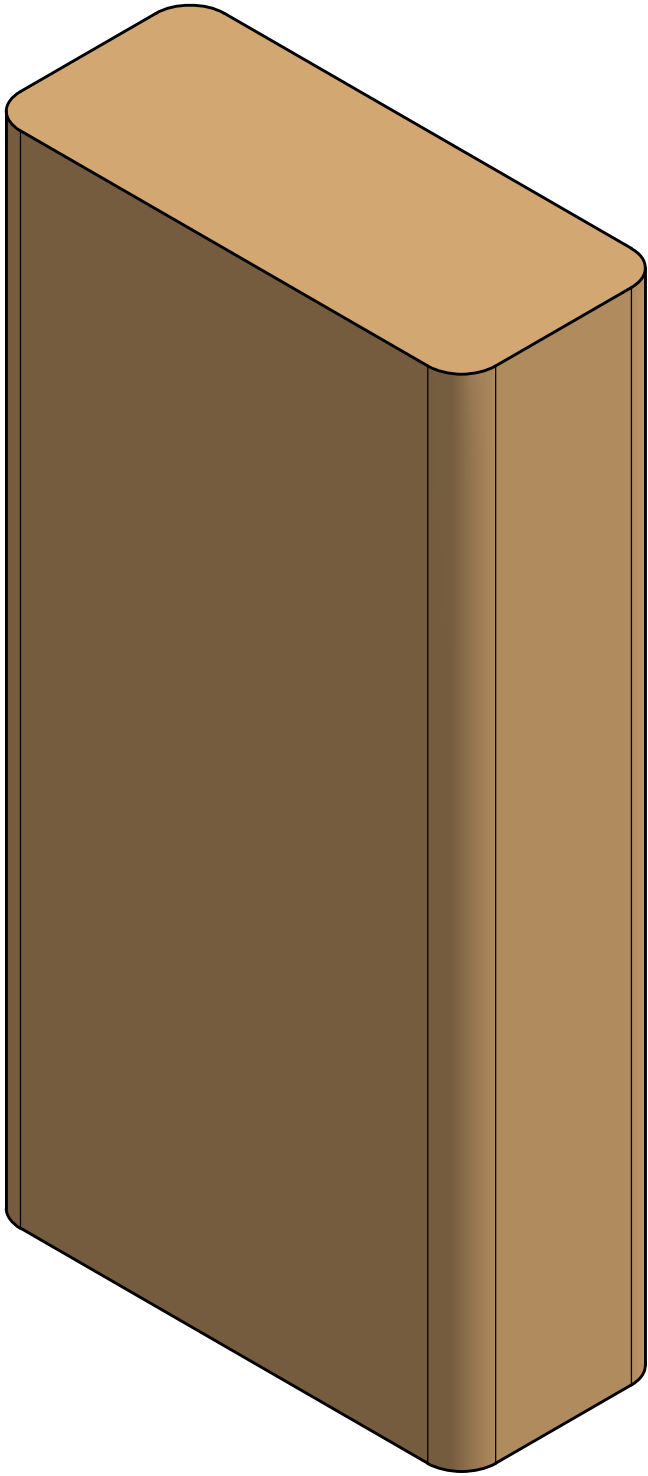
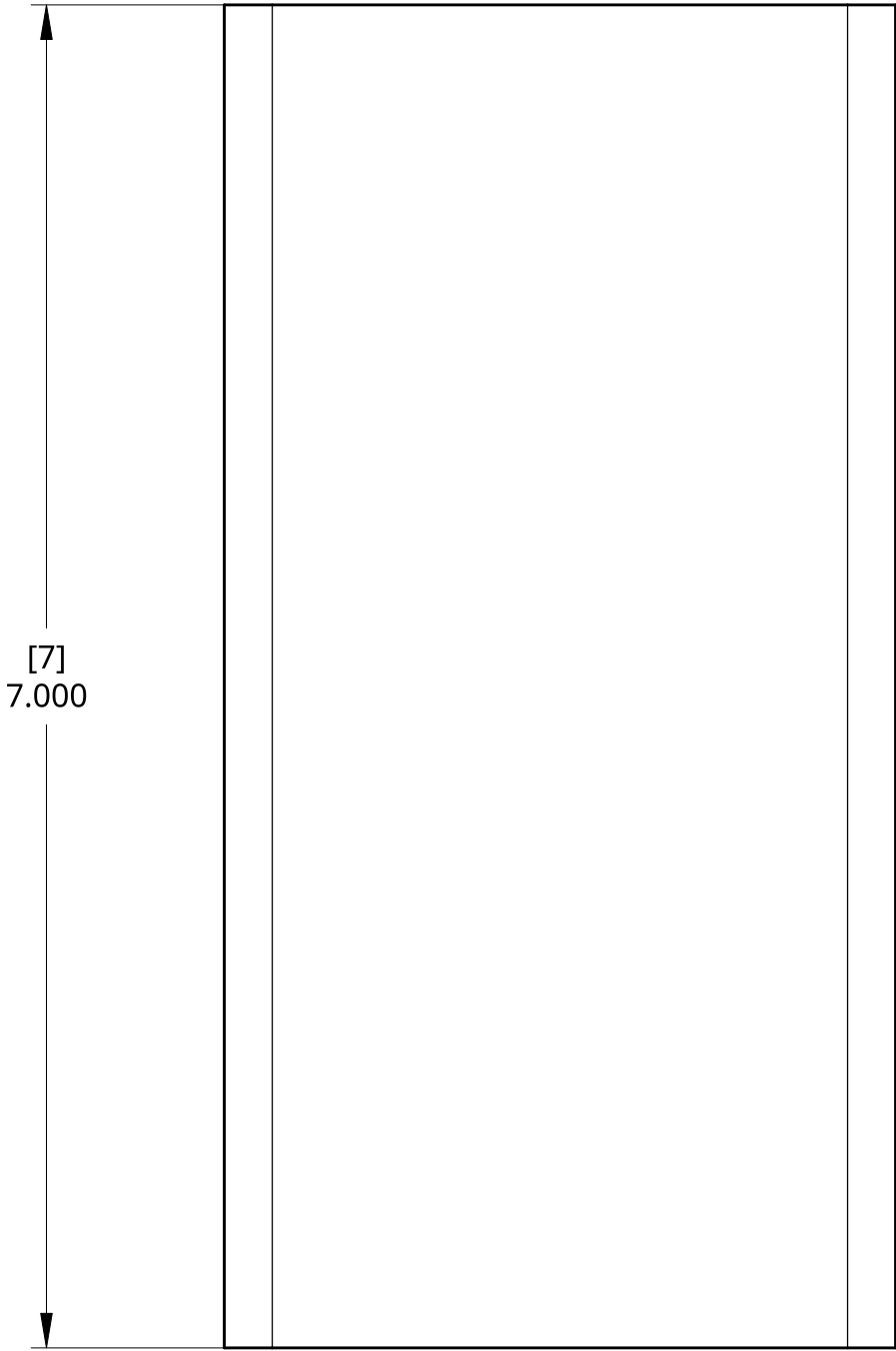
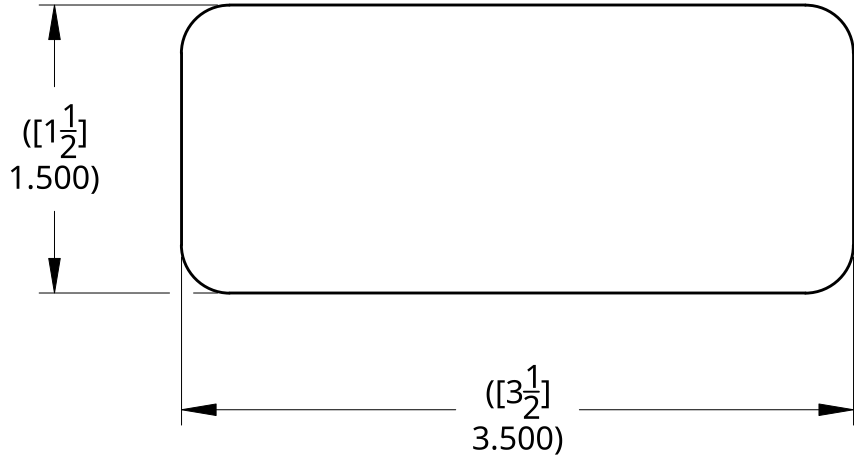
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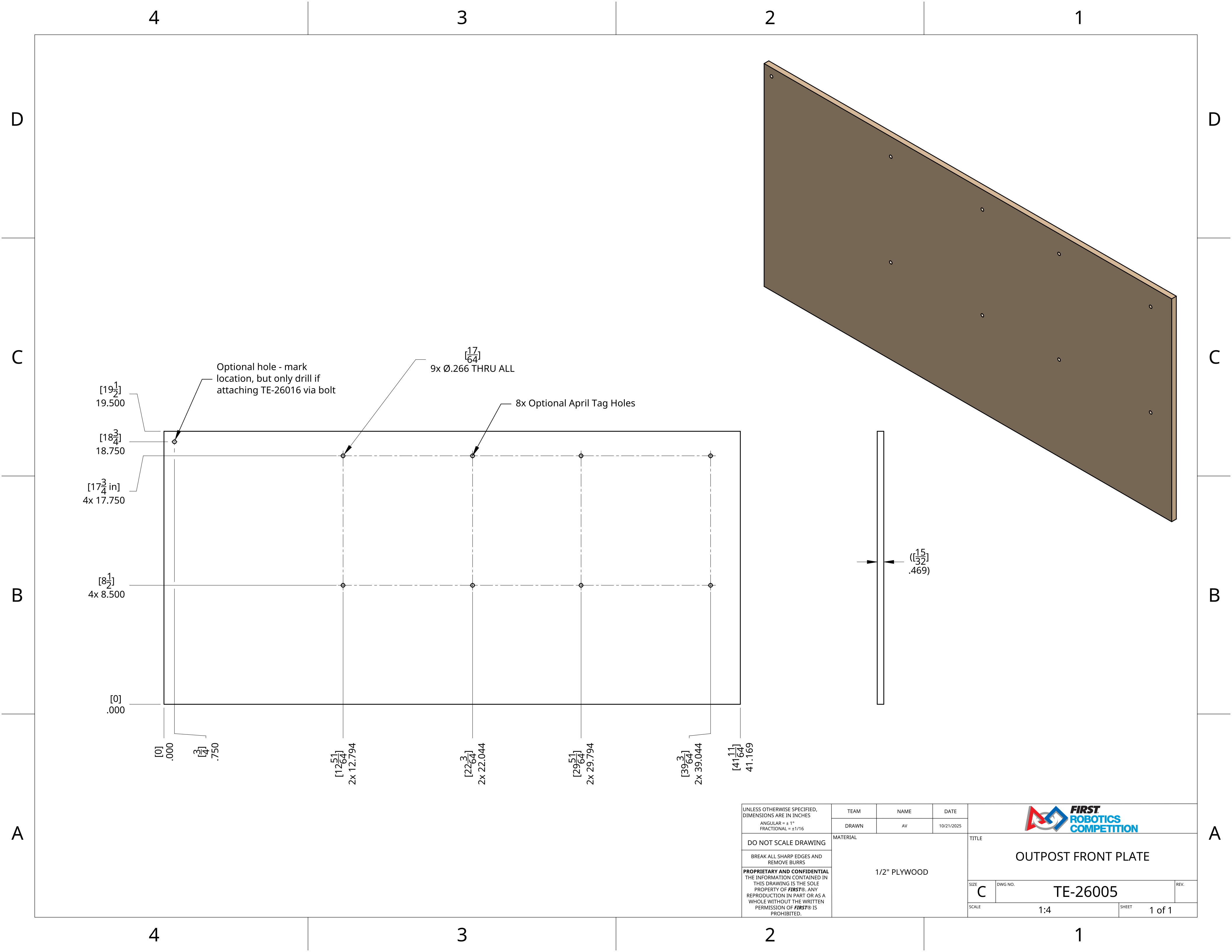
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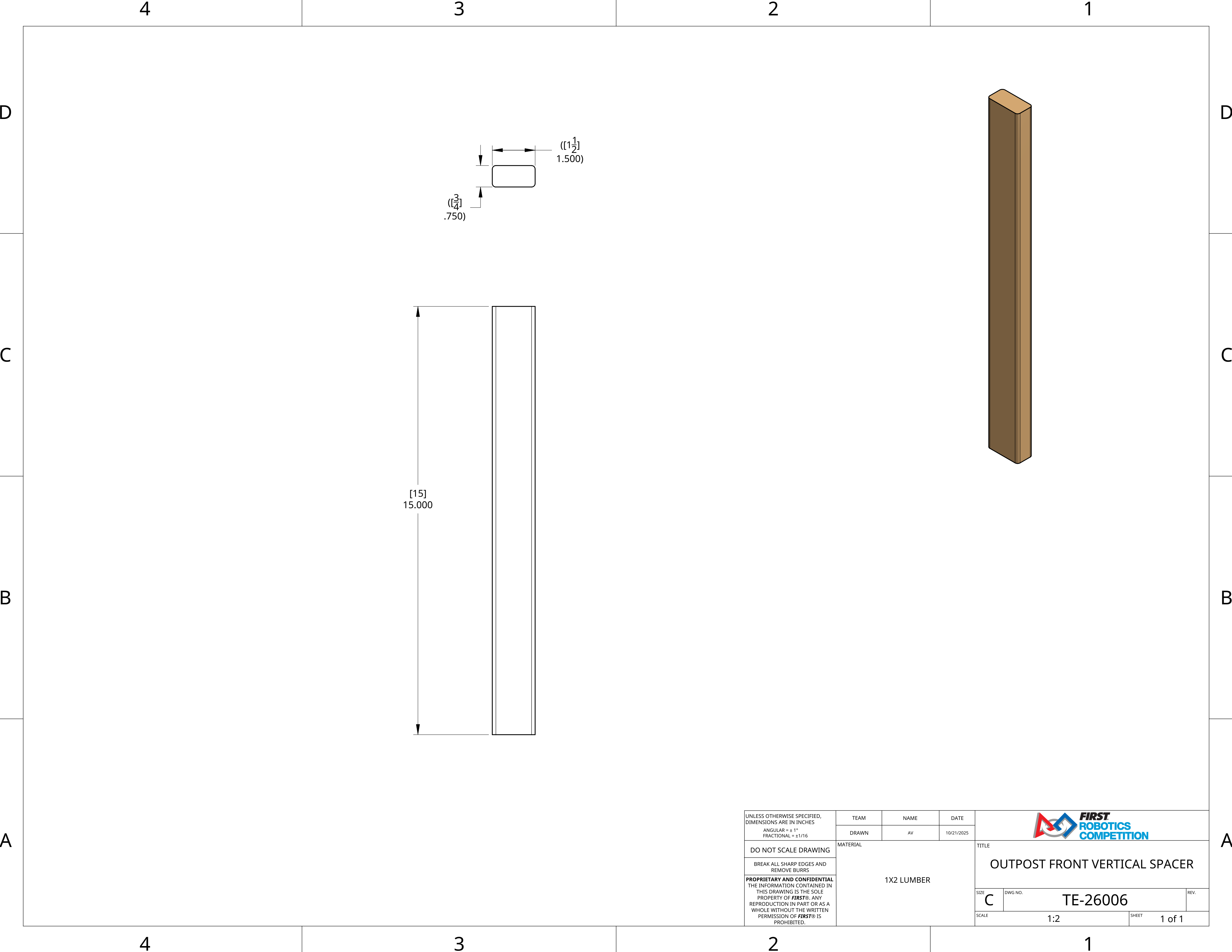
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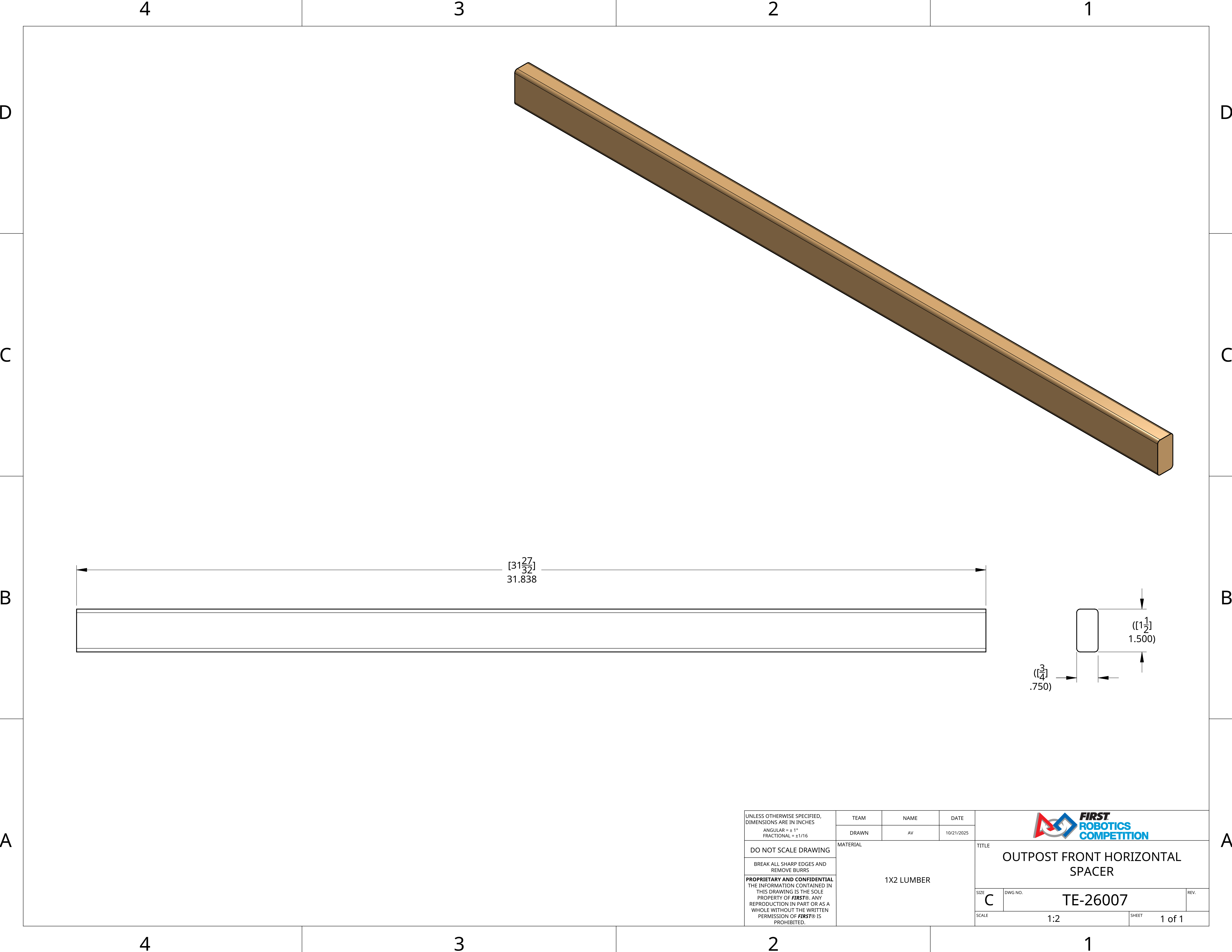
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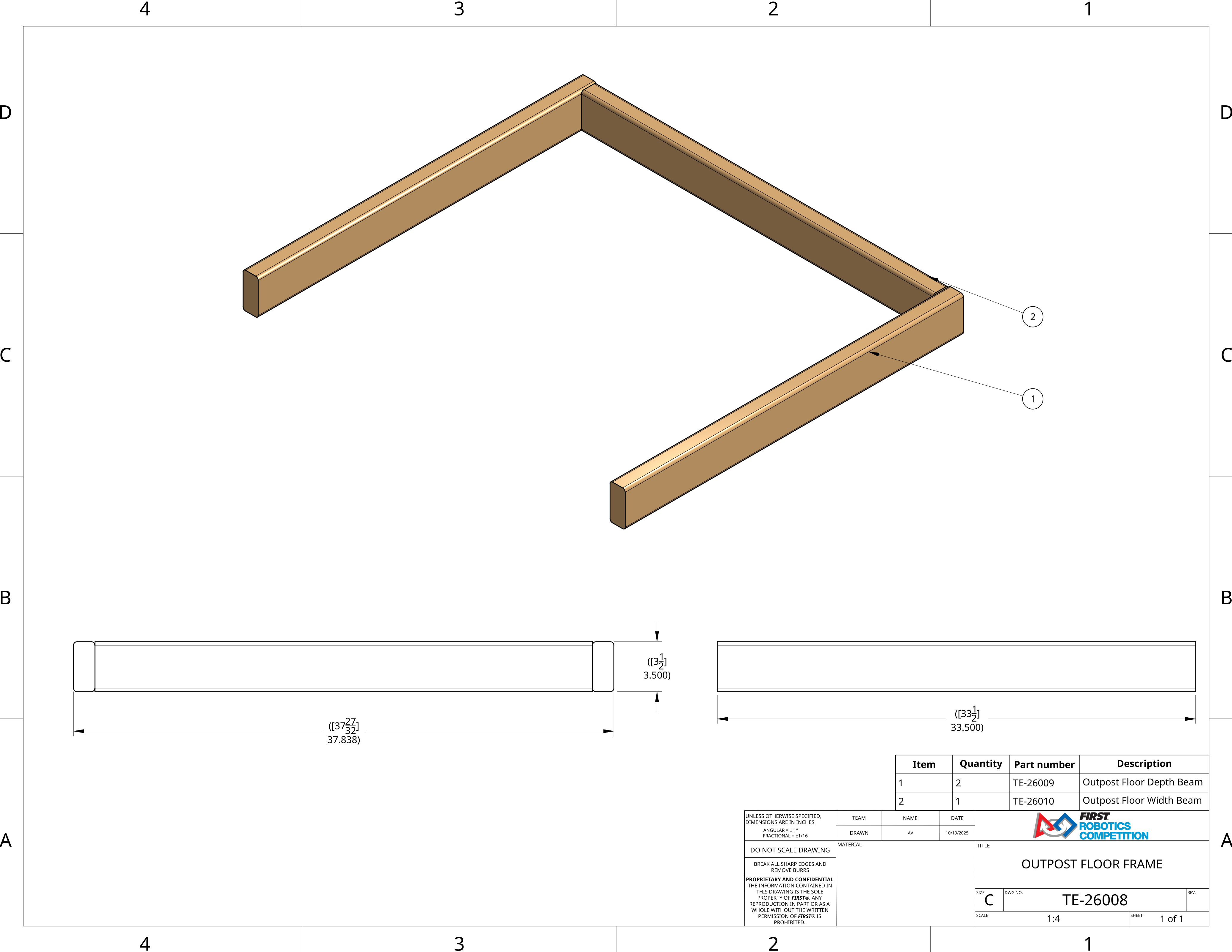
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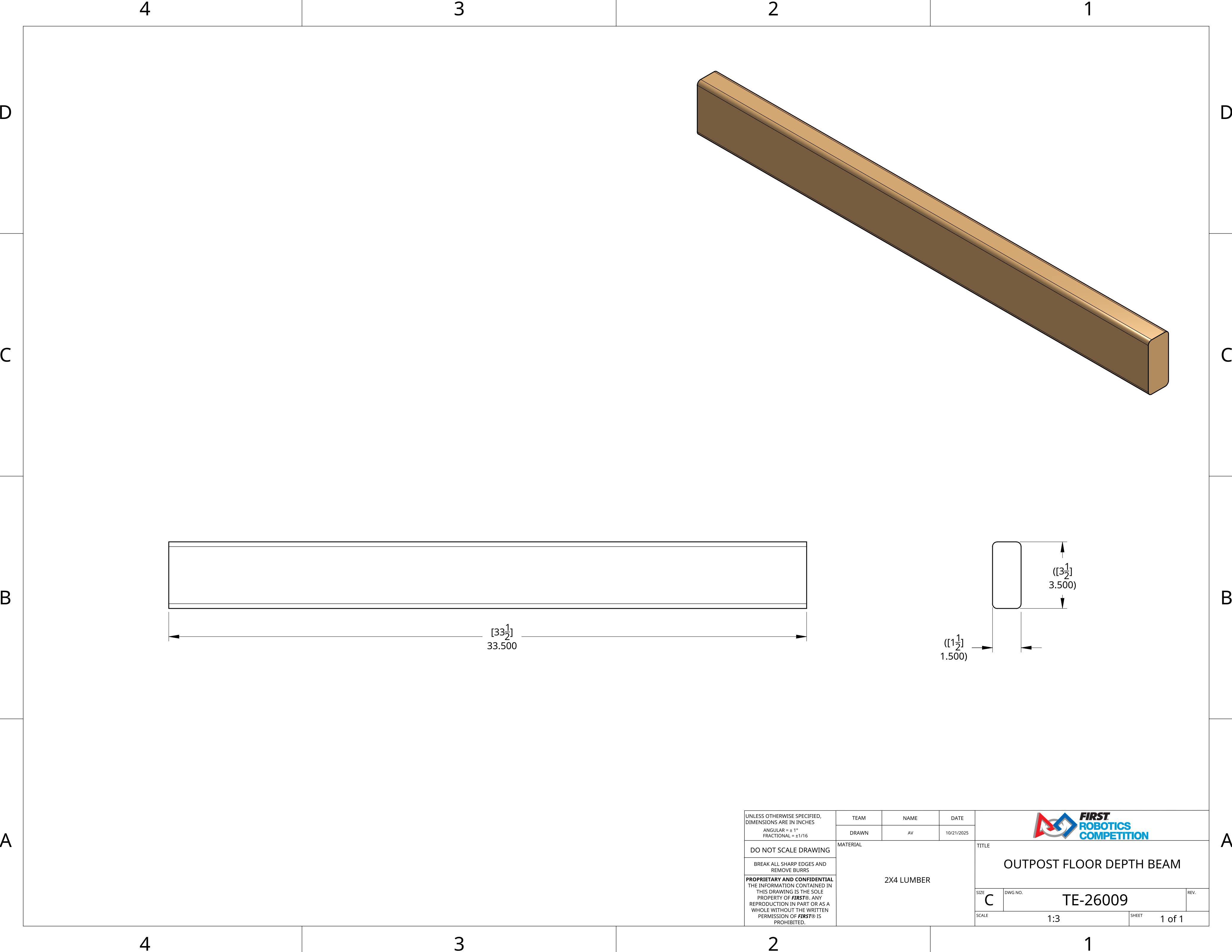



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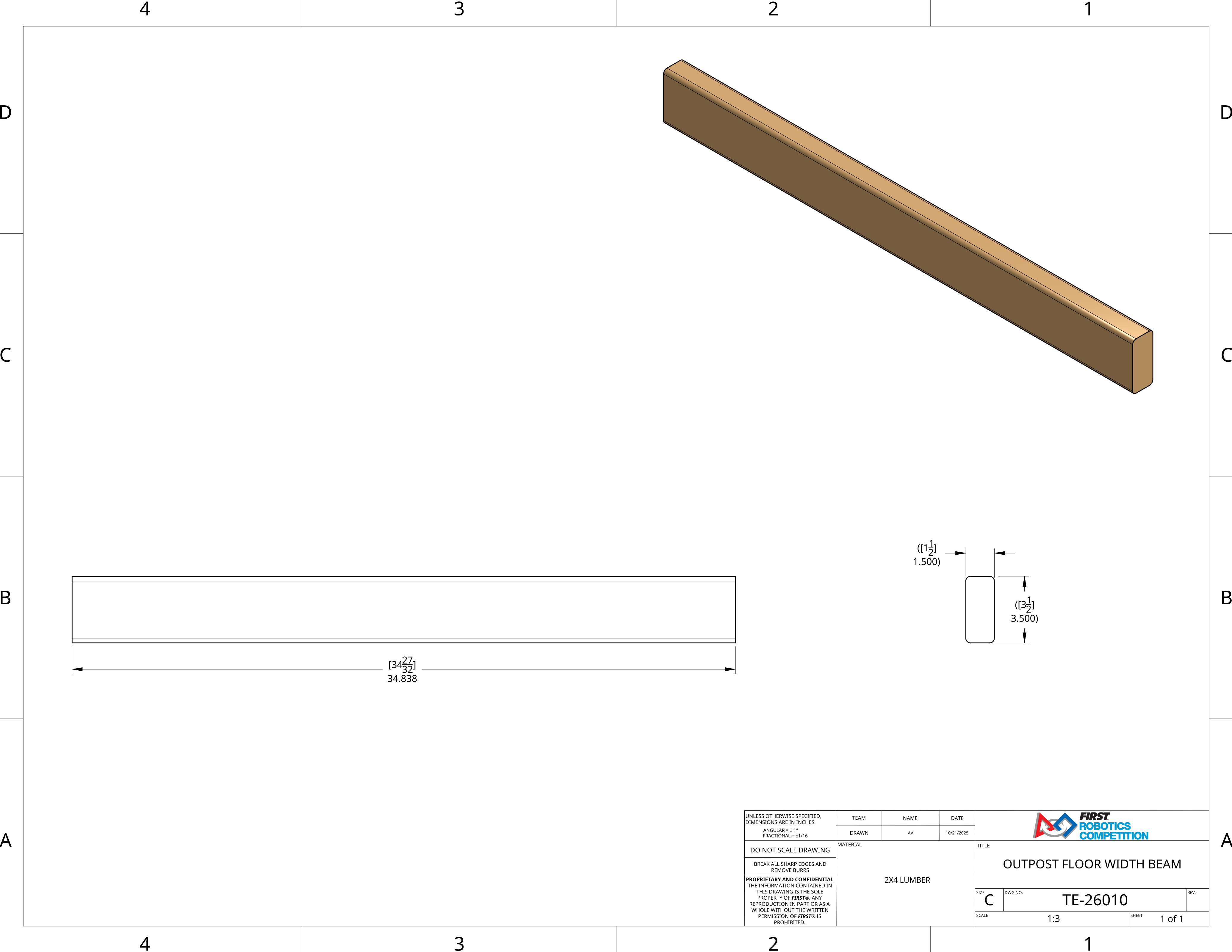



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UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES ANGULAR = ± 1° FRACTIONAL = ± 1/16	TEAM	NAME	DATE		
	DRAWN	AV	10/21/2025		
DO NOT SCALE DRAWING	MATERIAL 				



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 2X4 LUMBER			TITLE		
BREAK ALL SHARP EDGES AND REMOVE BURRS				OUTPOST FLOOR WIDTH BEAM		
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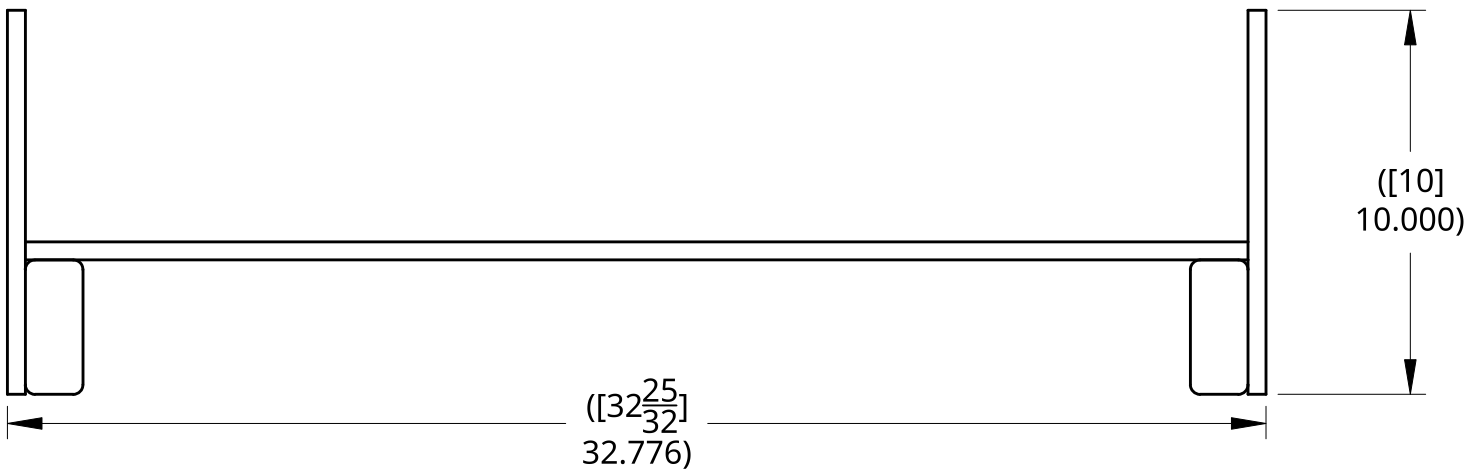
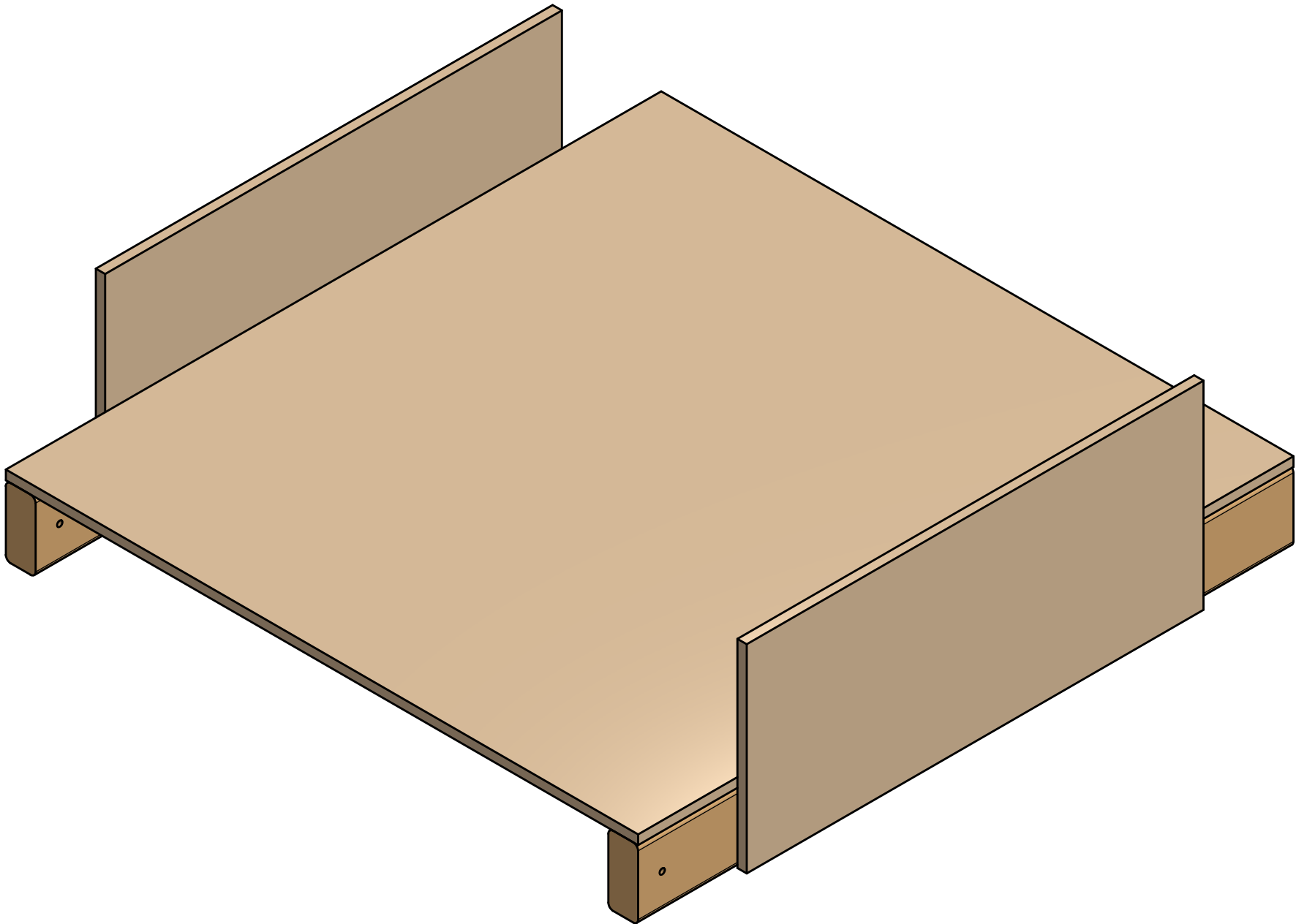
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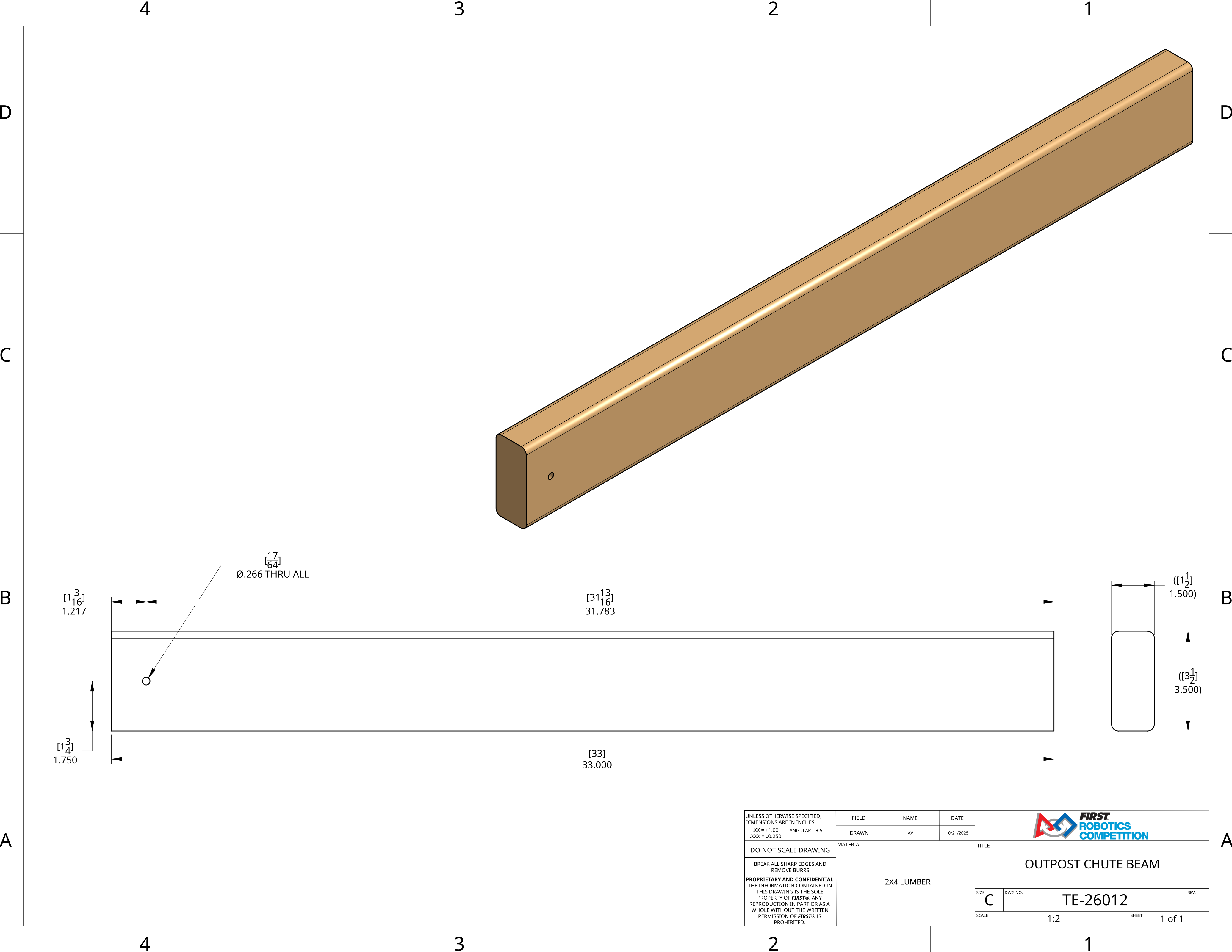
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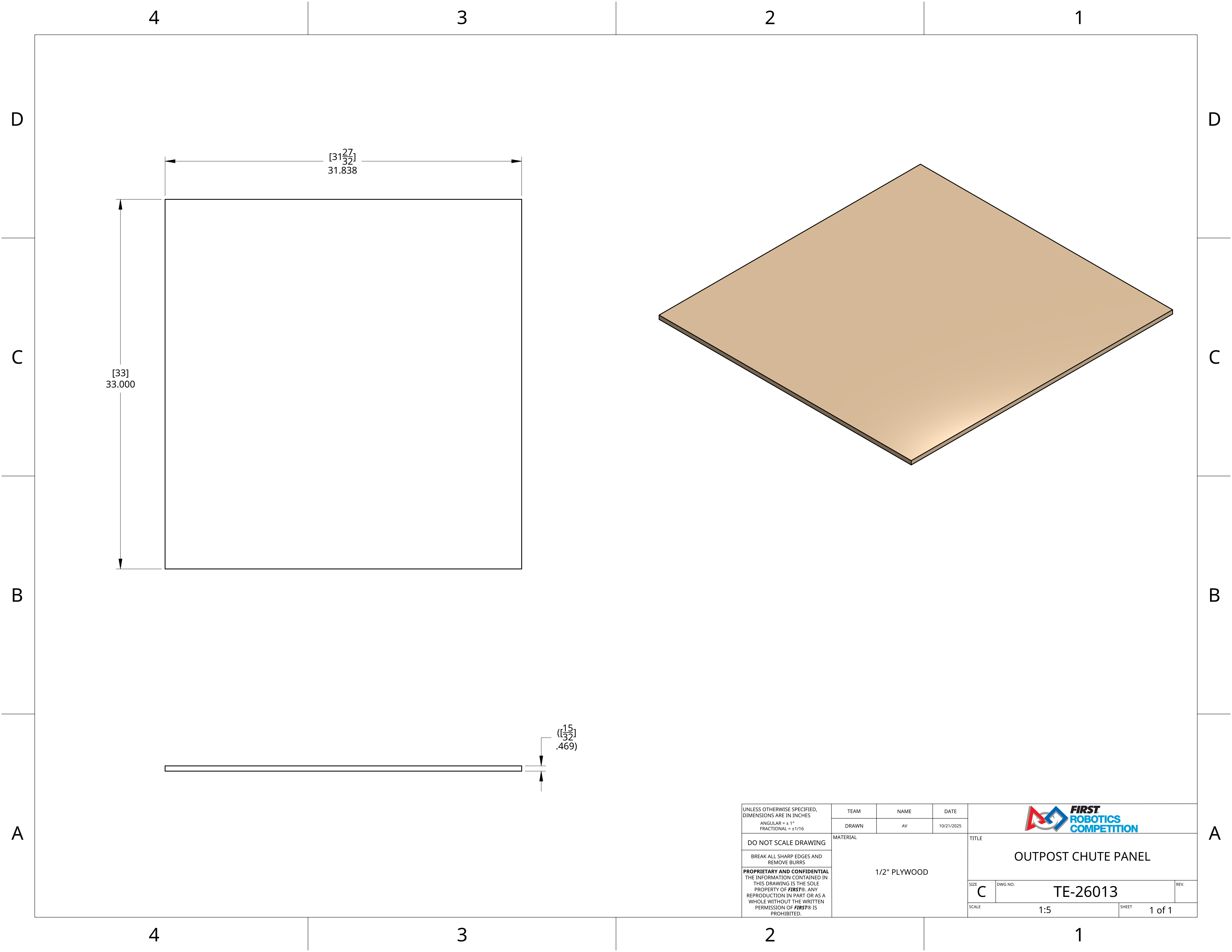
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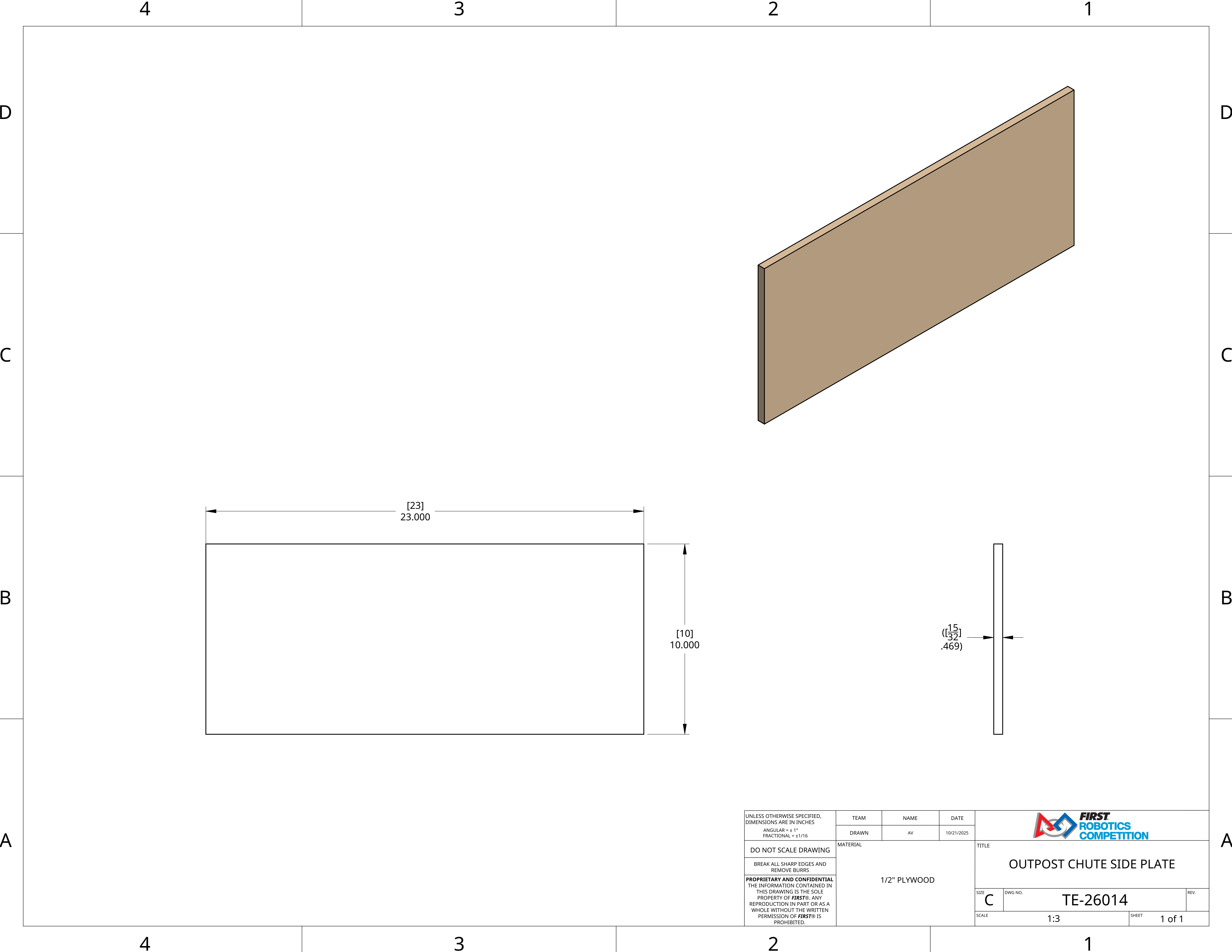



Item	Quantity	Part number	Description
1	2	TE-26012	Outpost Chute Beam
2	1	TE-26013	Outpost Chute Panel
3	2	TE-26014	Outpost Chute Side Plate

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES ..XX = ±1.00 ANGULAR = ± 5° ..XXX = ±0.250	FIELD	NAME	DATE		
	DRAWN	AV	10/19/2025		
DO NOT SCALE DRAWING	MATERIAL			TITLE	
BREAK ALL SHARP EDGES AND REMOVE BURRS				OUTPOST CHUTE FRAME	
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	C		TE-26011		
	SCALE		1:5		SHEET 1 of 1







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	DRAWN	AV	10/21/2025		
DO NOT SCALE DRAWING	MATERIAL 				

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3

2

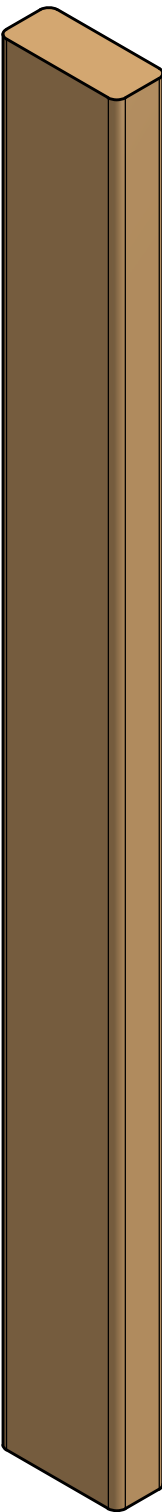
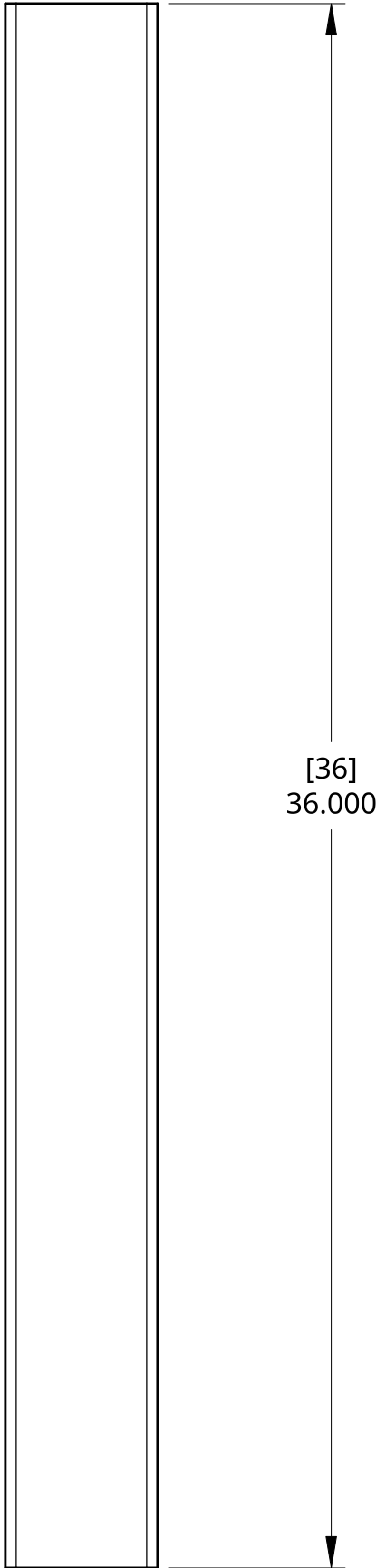
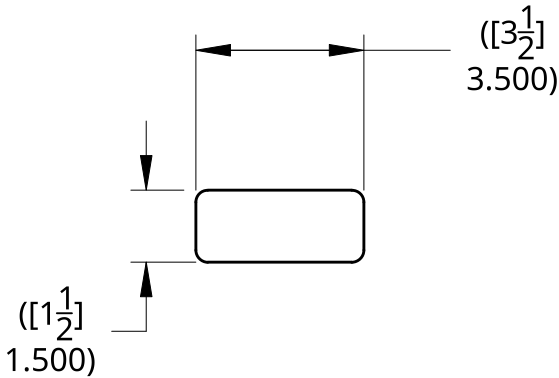
1


D

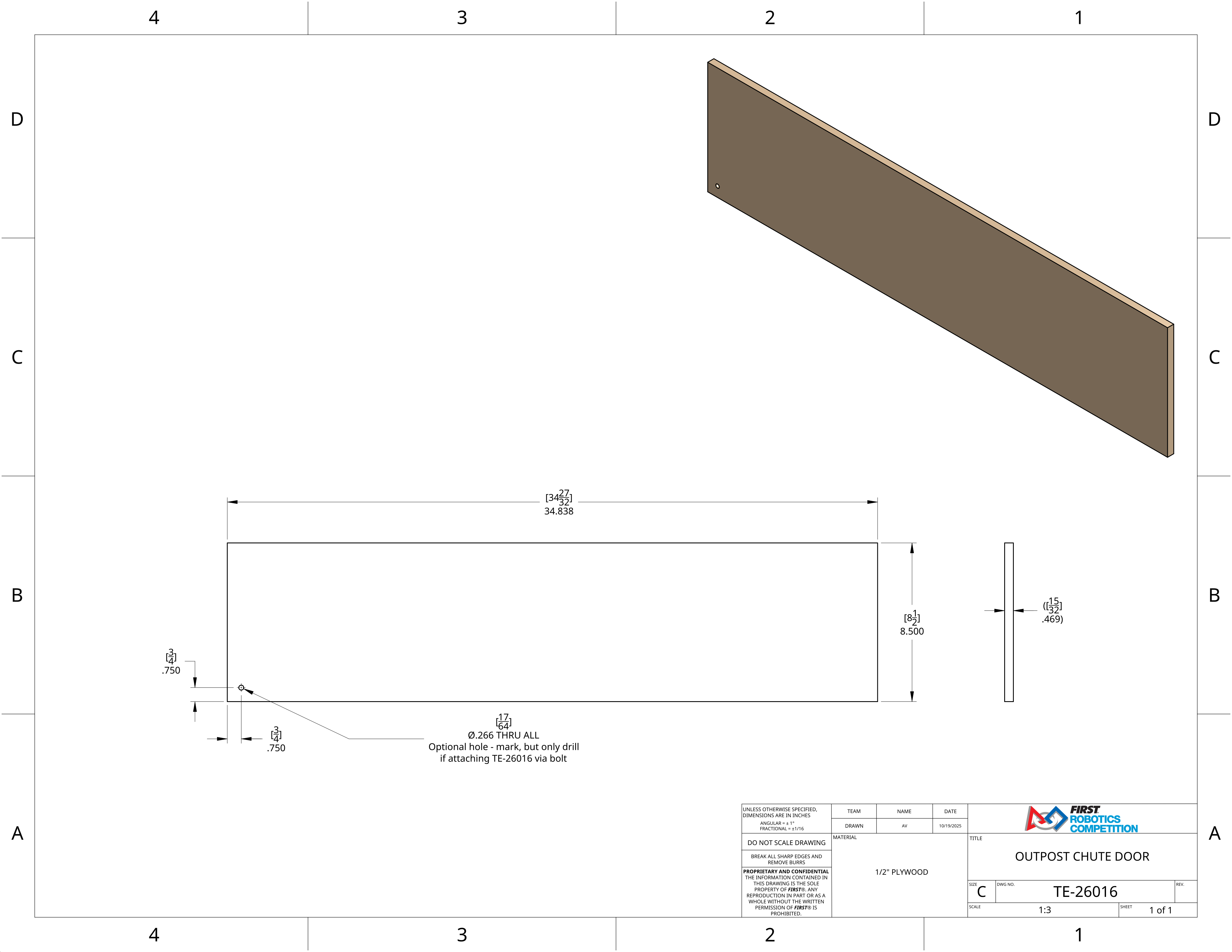
C

B

A



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 				



$\left[\frac{3}{4}\right]$
.750


$\left[\frac{3}{4}\right]$
.750

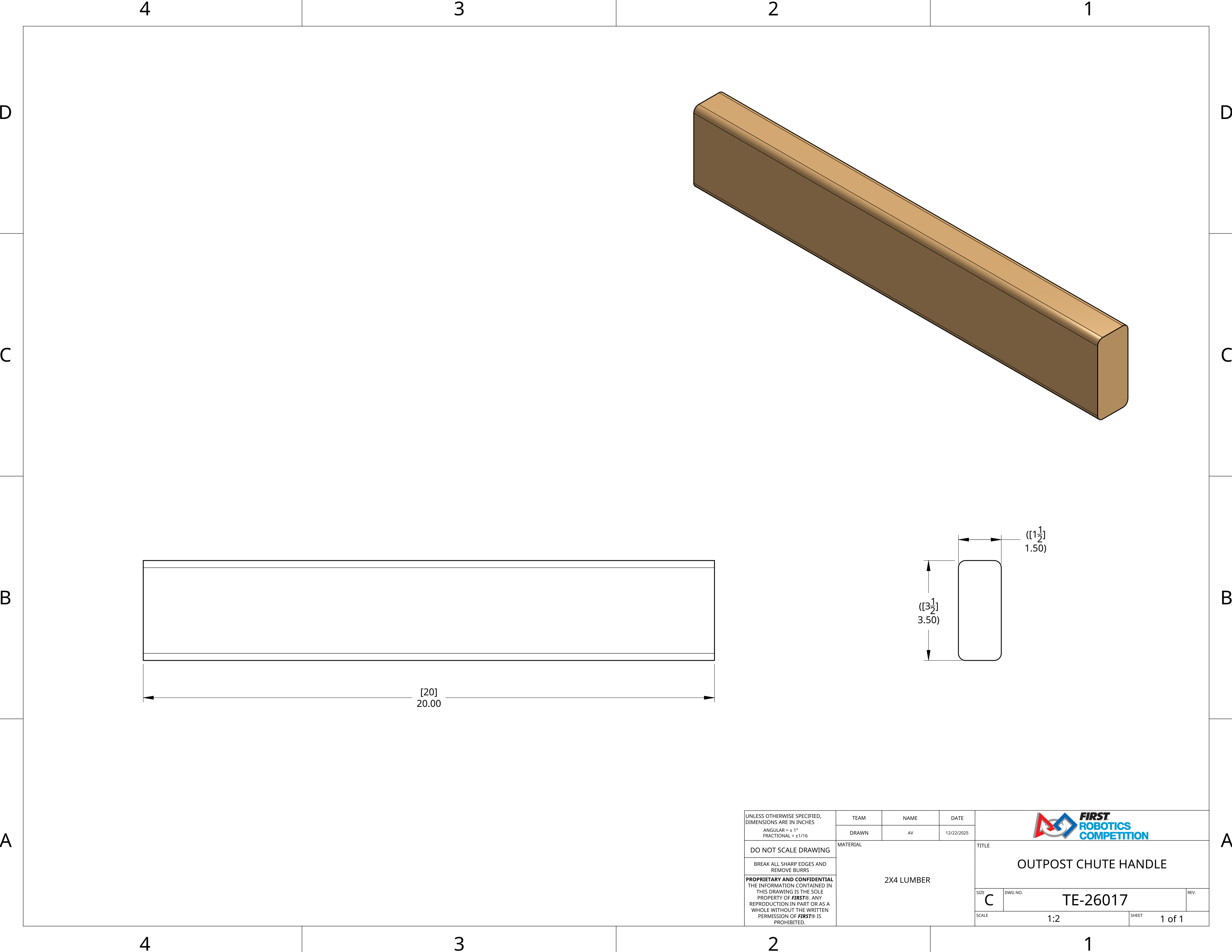
$\left[34\frac{27}{32}\right]$
34.838


$\left[8\frac{1}{2}\right]$
8.500

$\left(\left[\frac{15}{32}\right]\right)$
.469

$\left[\frac{17}{64}\right]$
Ø.266 THRU ALL
Optional hole - mark, but only drill
if attaching TE-26016 via bolt

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 <					



UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES ANGULAR = ± 1° FRACTIONAL = ±1/16	TEAM	NAME	DATE			
	DRAWN	AV	12/22/2025			
DO NOT SCALE DRAWING	MATERIAL 2X4 LUMBER			TITLE		
BREAK ALL SHARP EDGES AND REMOVE BURRS				OUTPOST CHUTE HANDLE		
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-26017	
				SCALE	1:2	SHEET