

Team 2A - WF Words

July 13, 2018

ME 486C

Hardware Review 2

Introduction:

Attached to and in this document, will be the figures with the 90-100% of the project being done from both the building and having it done with SolidWorks. Also, attached photos of our current manufactured design and images of CAD along with a list of Action Items that each person will complete between now and the end of the semester. In the appendices, you will find all the parts needed with dimensions in the drawing. The building and the material that were used to build the parts that were not in the first Hardware review. Which are, the table of the catapult and the catapult itself was done by following the steps that will be shown below:

Catapult manufacturing is shown below:

Parts List:

- The structural pieces of wood are 1 1/2-inch redwood boards cut into the following lengths
- 2 pieces 16 inches long
- 1 piece 13 inches long
- 6 pieces 8 3/4 inches long
- 1 thin dowels 7/16-inch diameter. These are what you twist the rope on.
- 8 3/4-inch-long dowel, this will act as the release mechanism.
- 14 2 1/2-inch flat head interior construction screws
- 1 1 inch flathead screw
- Three small hook screw for the releasing mechanism
- 30 feet of string

Tools List:

- Power drill
- Drill Bits: 7/16, 31/64, 15/64, 7/64
- Electric Mitre Saw for cuts
- Scissors to cut string
- Safety Glasses

The Build:

Start by laying the two 16 inch pieces' side by side. place 3 8 inch prices of wood under the two 16 inch pieces, line them up so that all ends are square and flush. Predrill holes for the screws with 7/64th drill bit

screw down constructions screws to tighten all boards together. should form the base of the catapult. add the two vertical legs by spacing them 4 inches from the end of the catapult the opposite direction of where it launches things from. predrill holes and screw down. Add top support, predrill holes, screw down.

drill holes in side of catapult 3 inches from the end in the center to create holes for the string.

add string. wrap around dowels, sew the string through the whole catapult four times, then sew around the firing block in a pattern 8 around the wood wrapped around the dowels
tighten three hook screws onto catapult, one on each support and the end where the firing would take place, and one on the launching board.
spin dowels to tighten catapult. pull firing mechanism to release catapult.

Table manufacturing is shown below:

Parts:

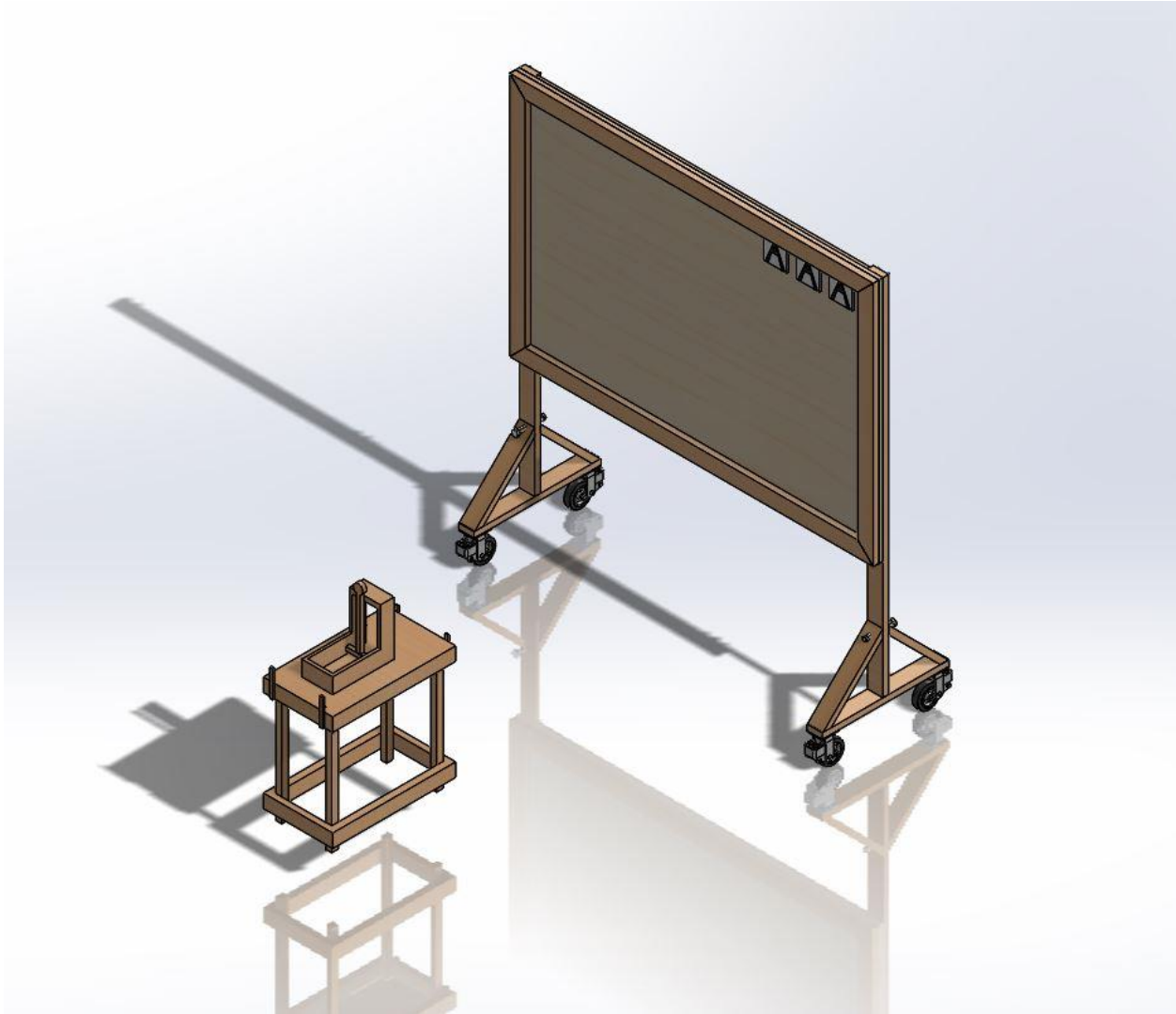
1. 4 1.5in by 3.5inch by 8 feet redwood (2 by 4s)
2. 28 2.5-inch impact flat head construction screws
3. 1 1.5 by 1.5 by 4-foot redwood blaster for catapult level
3. construction adhesive
4. 4 1.5 inch casters

Tool list:

1. 10 inch electric mitre saw
2. 10-inch power table saw
3. power drill
4. impact drill
5. measuring tape
6. pencil for marking
7. safety glasses
8. drill bits: 9/64, 7/64th
9. impact head screw bit

The build:

start by measuring and cutting 4 boards that measure 1.5 by 1.75 by 32 inches,
measure and cut 4 boards that measure 1.5 by 3.5 by 18 inches
measure and cut 4 boards that measure 1.5 by 3.5 by 11.75 inches
cut a 45-degree angle on all boards that are measured less than 18 inches
make two frames out of the 8 boards.
pre-drill 2 holes on the side about .5 inches from each side in the center of the boards
use impact drill to secure frame with screws
run down 4 boards on the table saw with the blade measured at .75 inches cut grooves down the 4 boards to create on table top cut for a frame the table.
cut some 2 by 4s in half to create measured table planks that are .75 inches by 3.5 by 17 inches
glue them into frame
set legs that are measured to 1.5 by 1.75 by 32 onto each inside corner of table screw into place
set table top upwards and side legs into the other frame.
height for leg supports is 3.5 from them ground without wheels.
screw into place
pre-drill holes for wheels with 9/64th wood bit drill
screw legs into place



(Figure 1)

This figure shows the isometric view of the Scoreboard with the new parts that have been built (the table and the catapult).



(Figure 2)

In this figure, you can see how we have adjusted the place of the wheels to be on the very last end of the board. It was done without influencing any other part

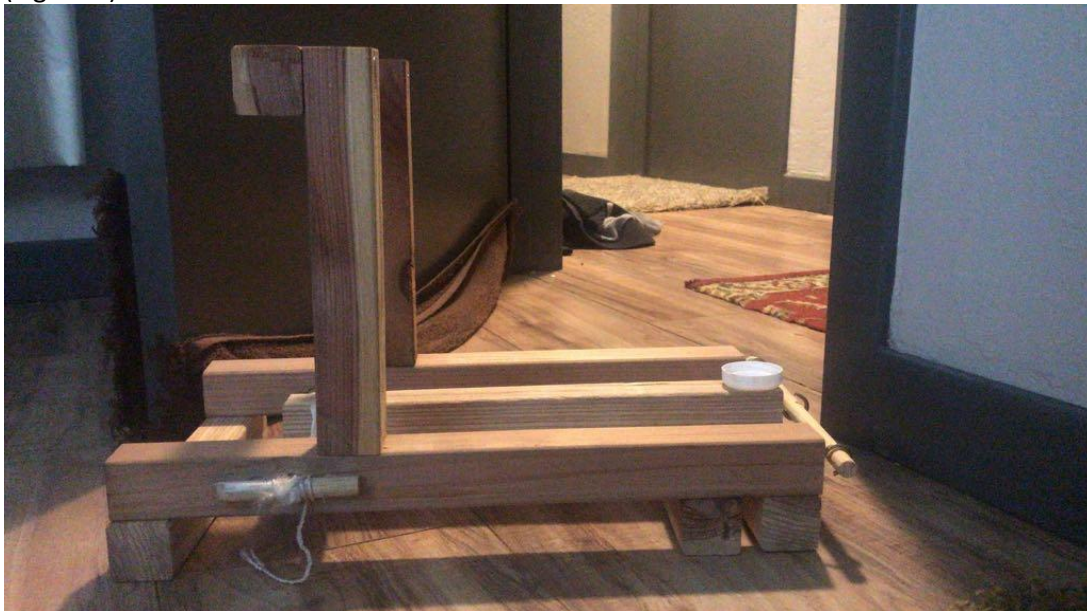


(Figure 3)

In this figure, you can see the table that have been manufactured with different places on the top to change the position of the target that they want to hit.



(Figure 3)



(Figure 4)

For the 2 figures above, this is the catapult that we manufactured to be the system of delivery to hit the target on the Scoreboard.

Summary:

This progress was done and finalized during the past week to produce the best version of our design. We have built it in SolidWorks and manufactured it in real life. We have finished the 90% of our project in terms of designing the project in SolidWorks and manufacturing. We started working on the manufacturing the past couple of days after finishing our presentation. The SolidWorks was updated the day of our presentation. Also, we will update our website with all the document needed with the new manufactured parts that have been built with the updated CAD design. On this note, we are waiting on the feedback that will be provided from you to us to better enhance our project.

List of Action:

After finishing the required parts from the HR1, we are looking now to enhance our project for the better. We still have the Velcro material missing from our project. We have ordered it and waiting for its arrival so we can finalize our project and test it from there. There are some individual parts that would need to be accomplished individually.

The Individual Parts Are:

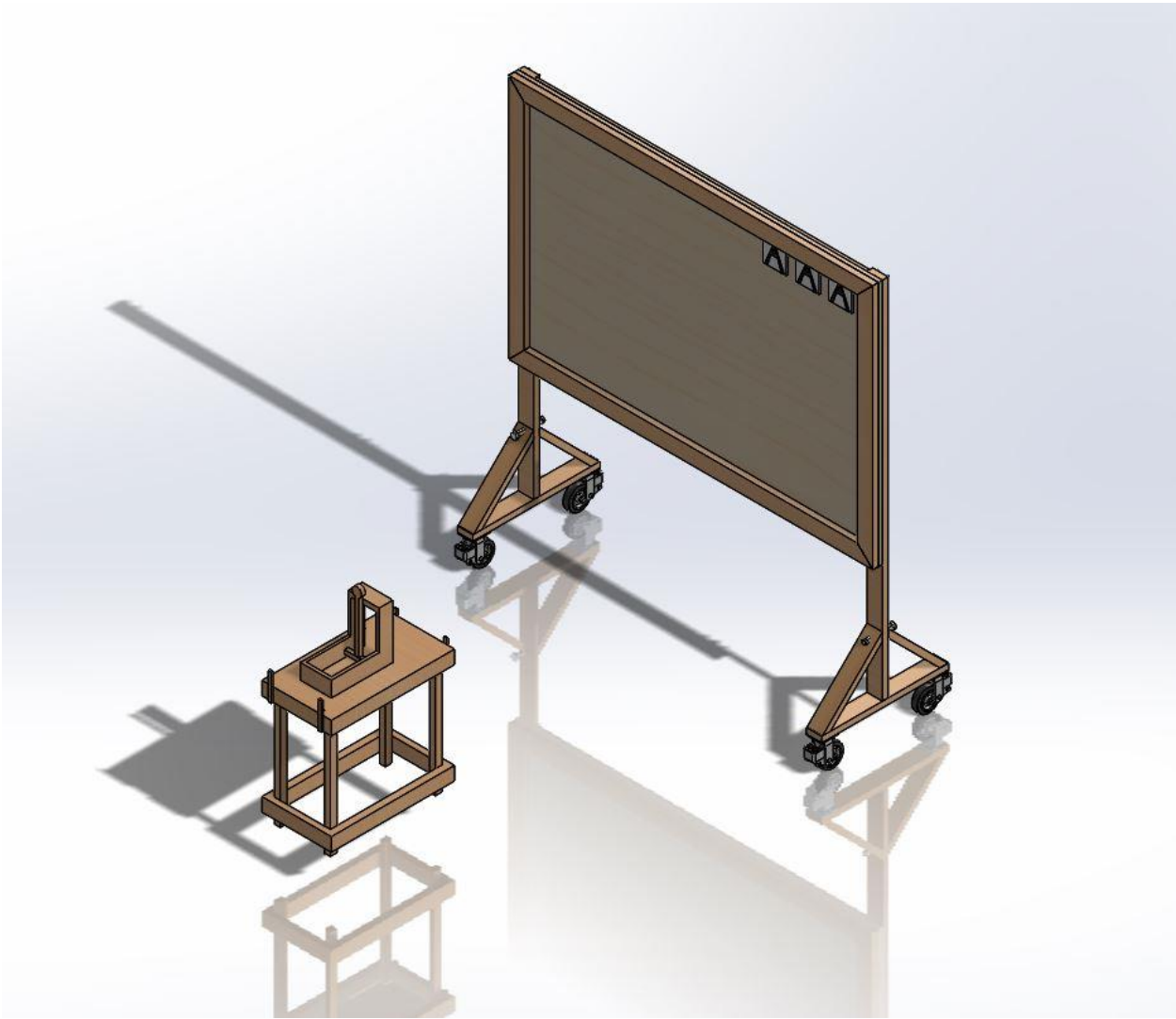
Mohammad Alotaibi will build wheels on the table that is holding the catapult. Also, he will add the two sides that prevent the ball from going anywhere outside of the Scoreboard that's in front of it.

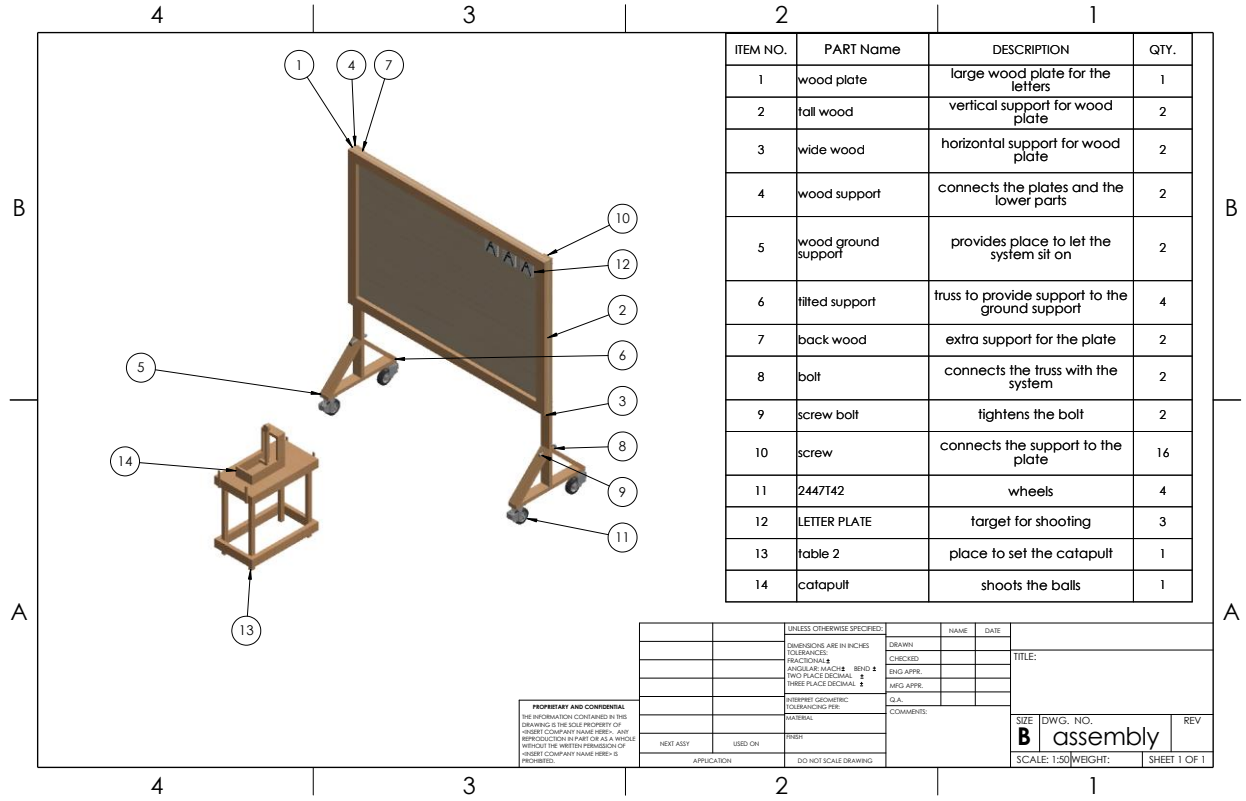
Mohammad Alsaïdi will continue developing the Website for our team where he will add the new design that was built by SolidWorks and adding pictures of the manufactured design from it first started to its status right now.

Shamlan Alshammari will manufacture the Velcro material to the Scoreboard and place them on the position of the alphabets that are placed on the Scoreboard.

Bader Alshammari will continue his CAD to deliver the best version of the design until the due date of the CAD package at the end of the semester.

Appendices:

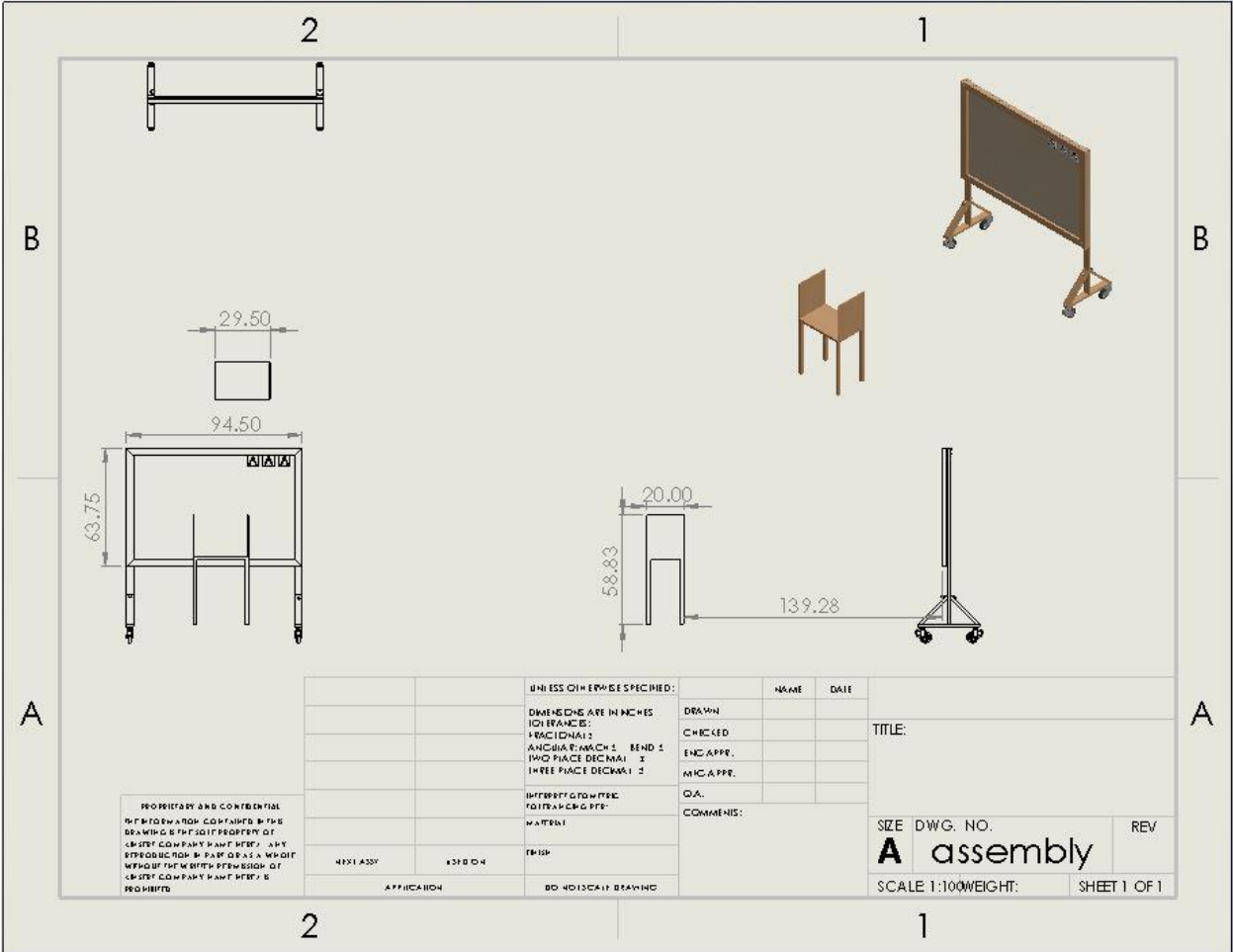




ITEM NO.	PART Name	DESCRIPTION	QTY.
1	wood plate	large wood plate for the letters	1
2	tall wood	vertical support for wood plate	2
3	wide wood	horizontal support for wood plate	2
4	wood support	connects the plates and the lower parts	2
5	wood ground support	provides place to let the system sit on	2
6	tilted support	truss to provide support to the ground support	4
7	back wood	extra support for the plate	2
8	bolt	connects the truss with the system	2
9	screw bolt	tightens the bolt	2
10	screw	connects the support to the plate	16
11	2447T42	wheels	4
12	LETTER PLATE	target for shooting	3
13	table 2	place to set the catapult	1
14	catapult	shoots the balls	1

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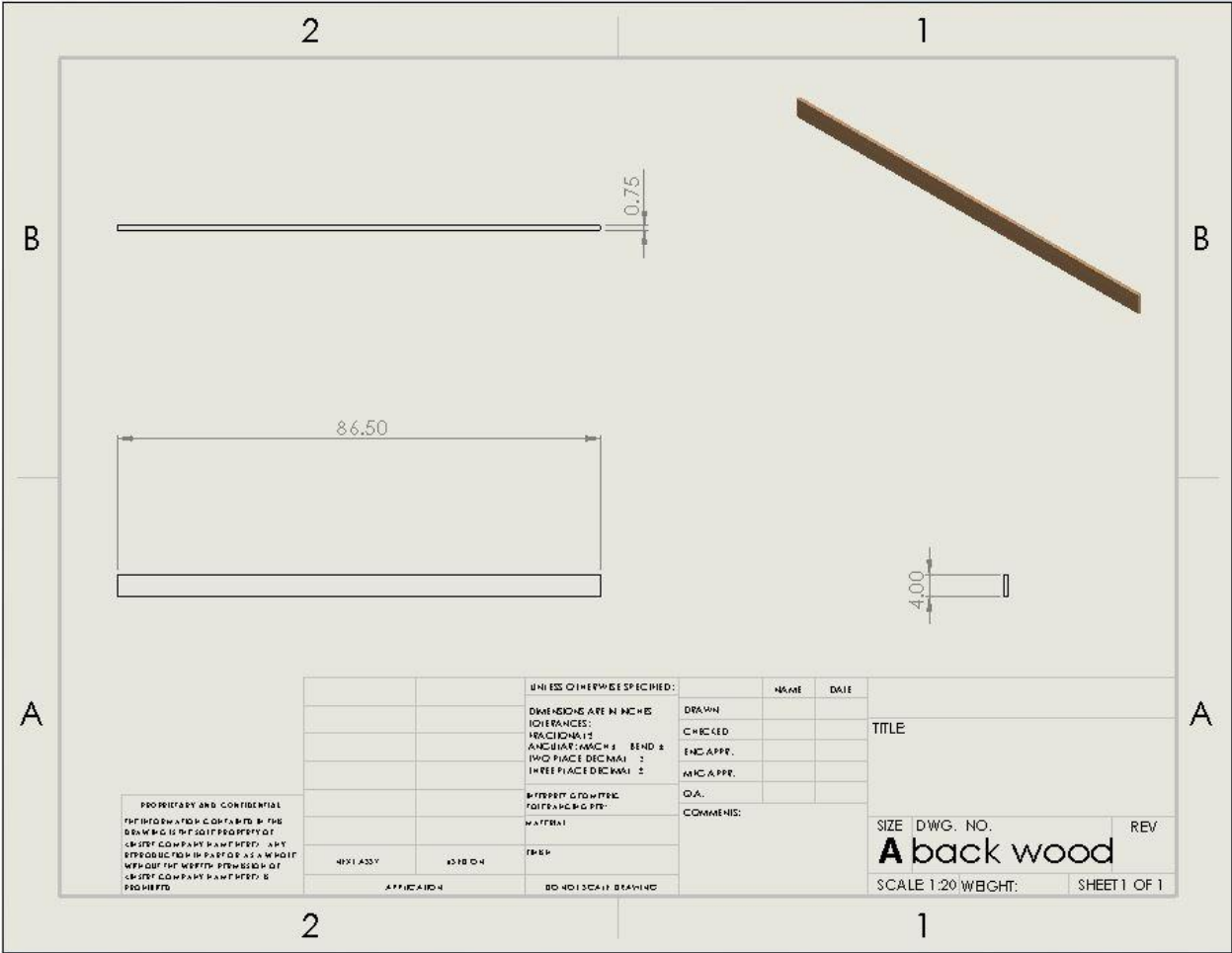
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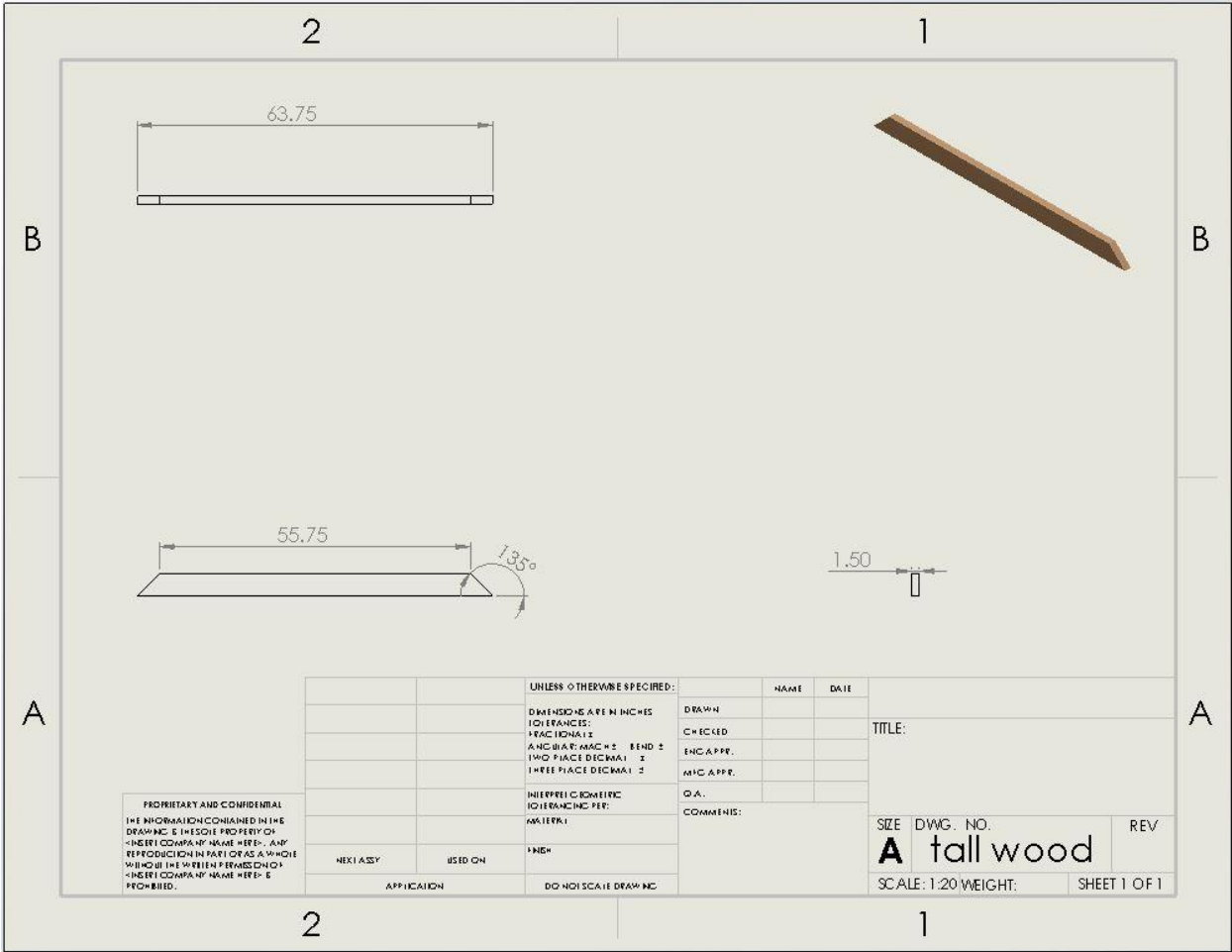
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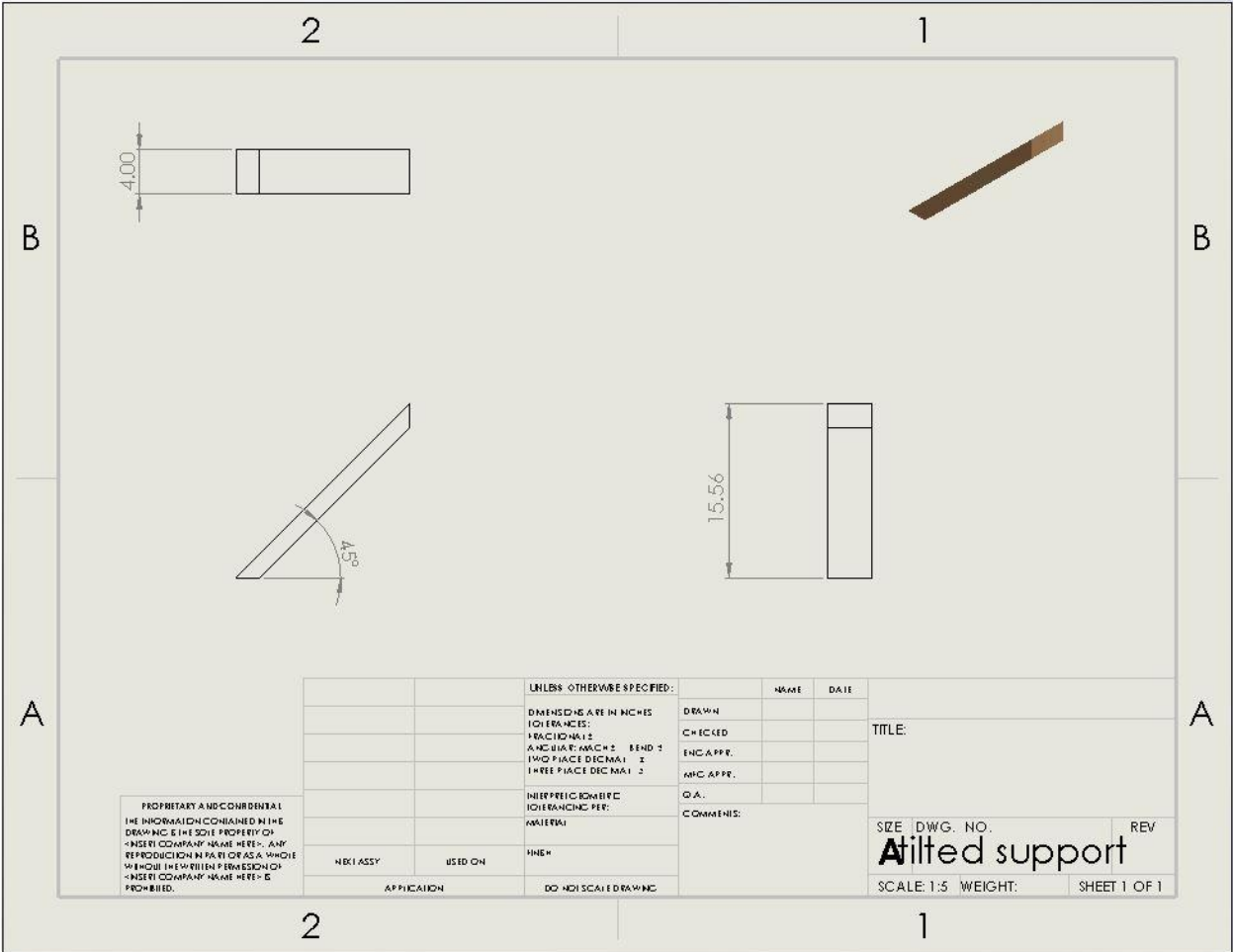
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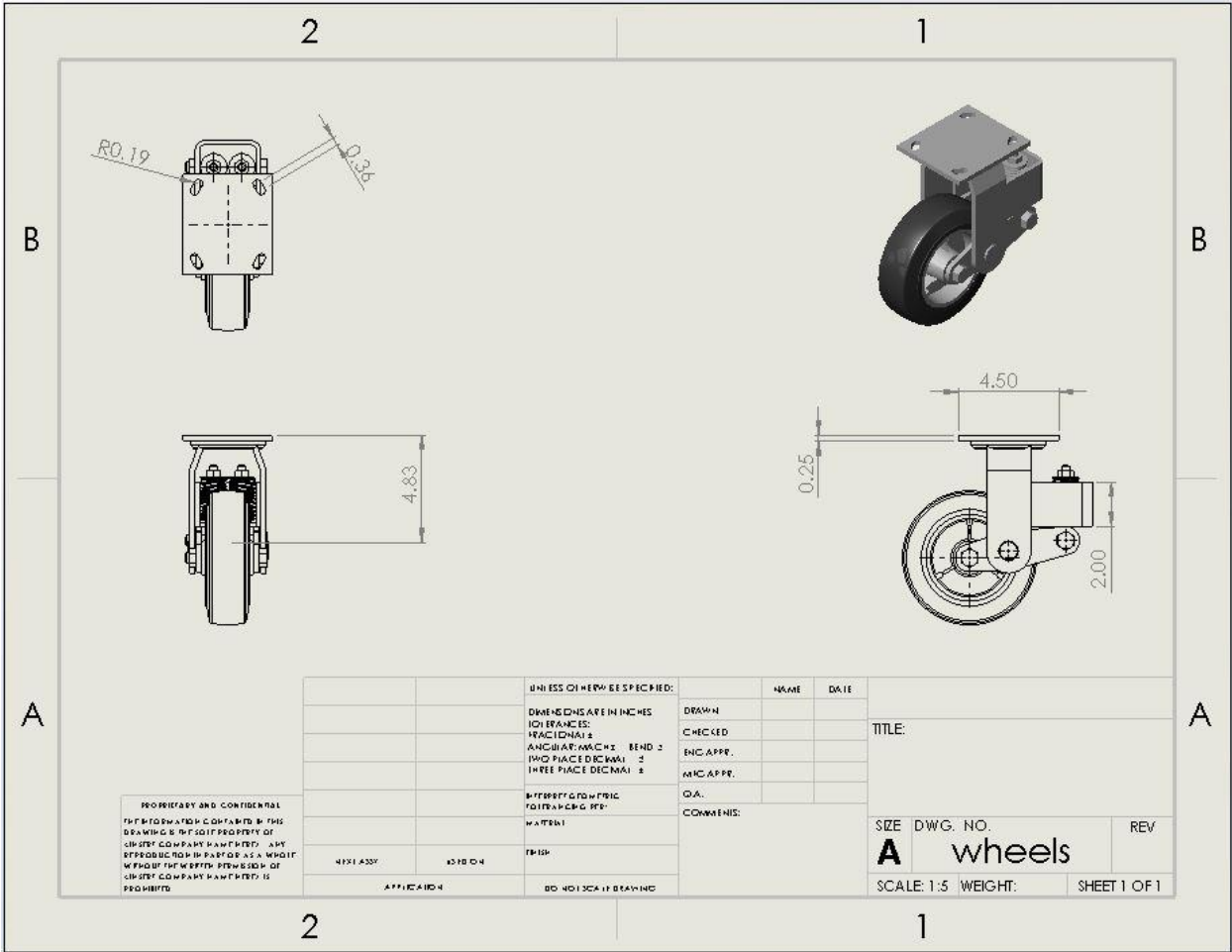
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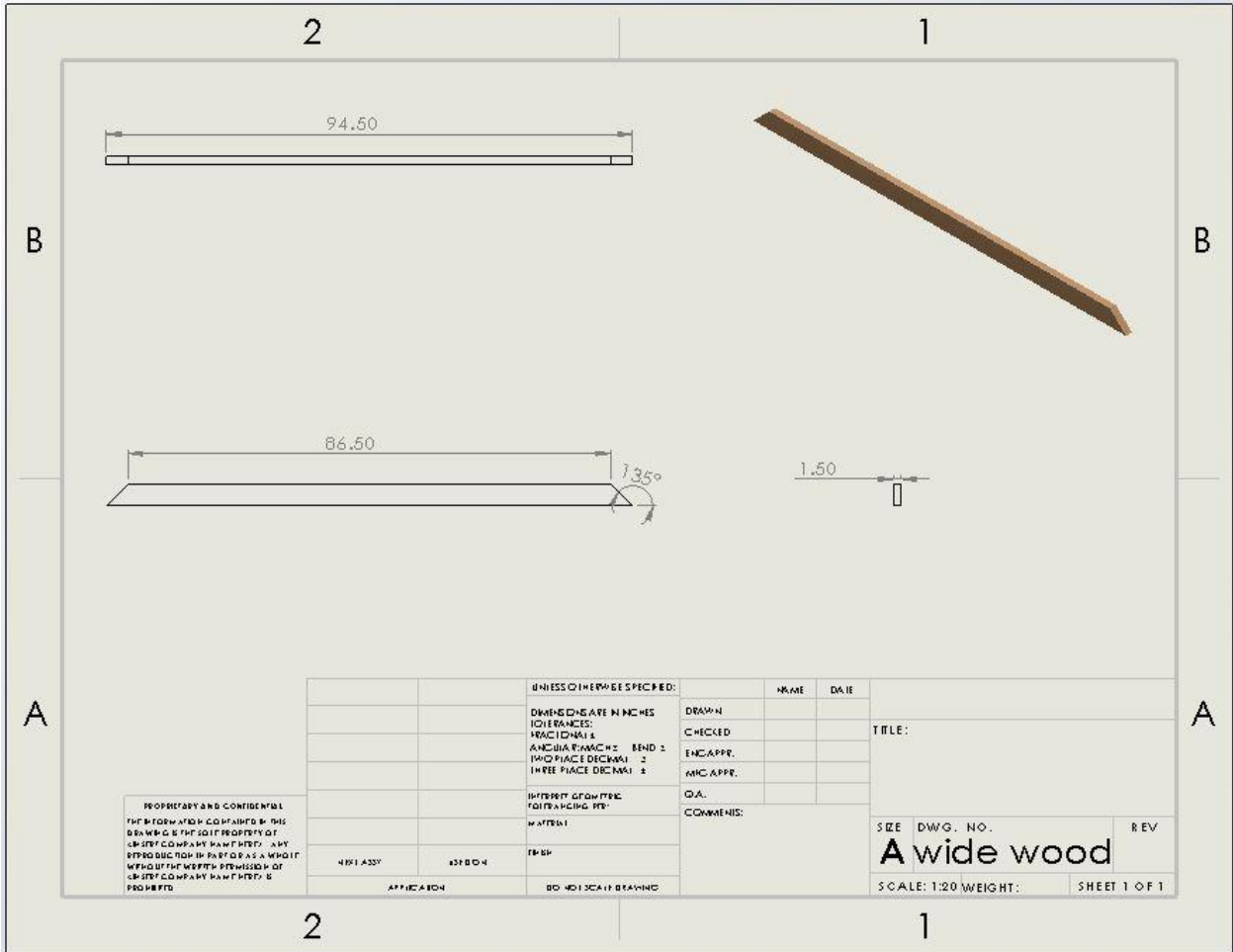
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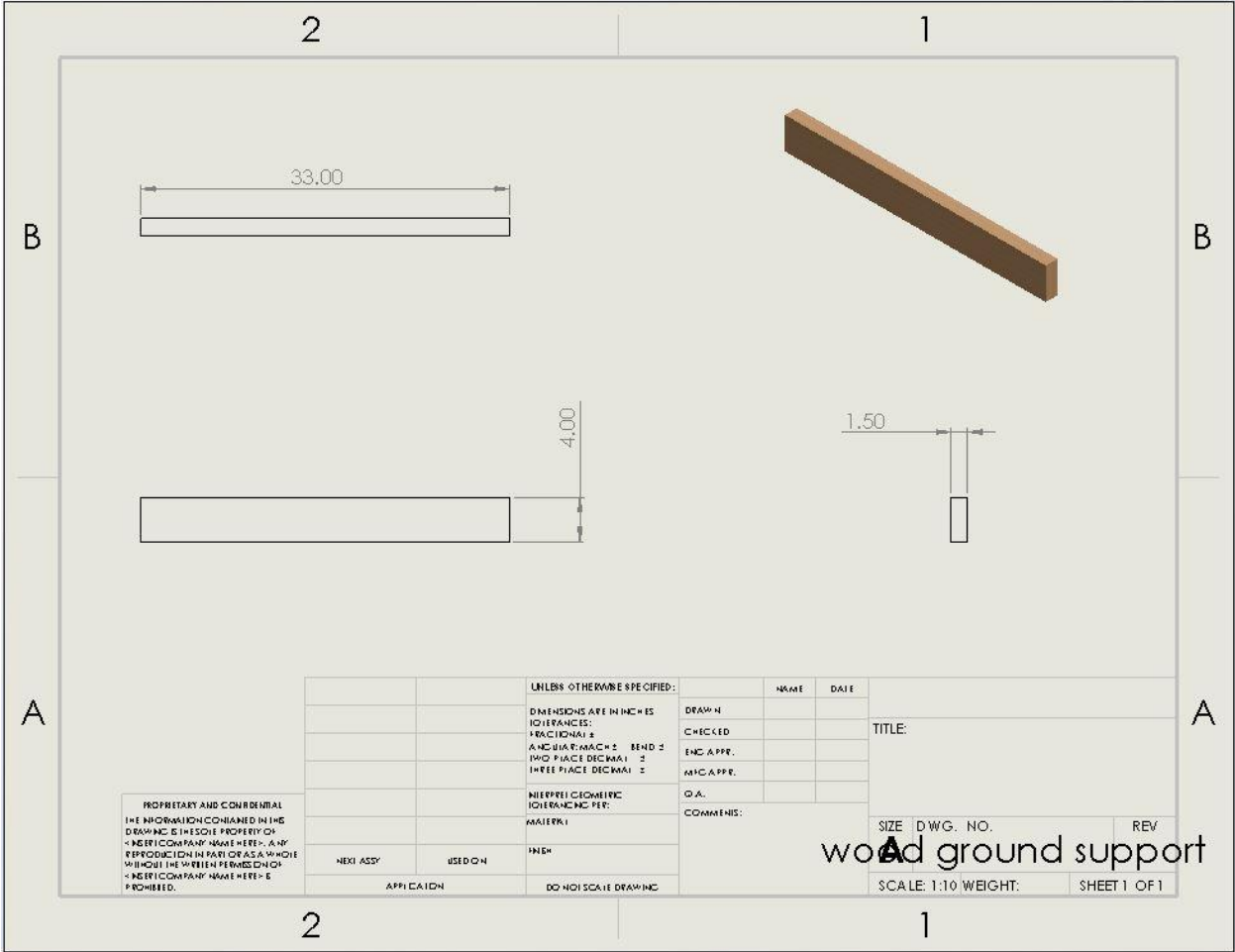
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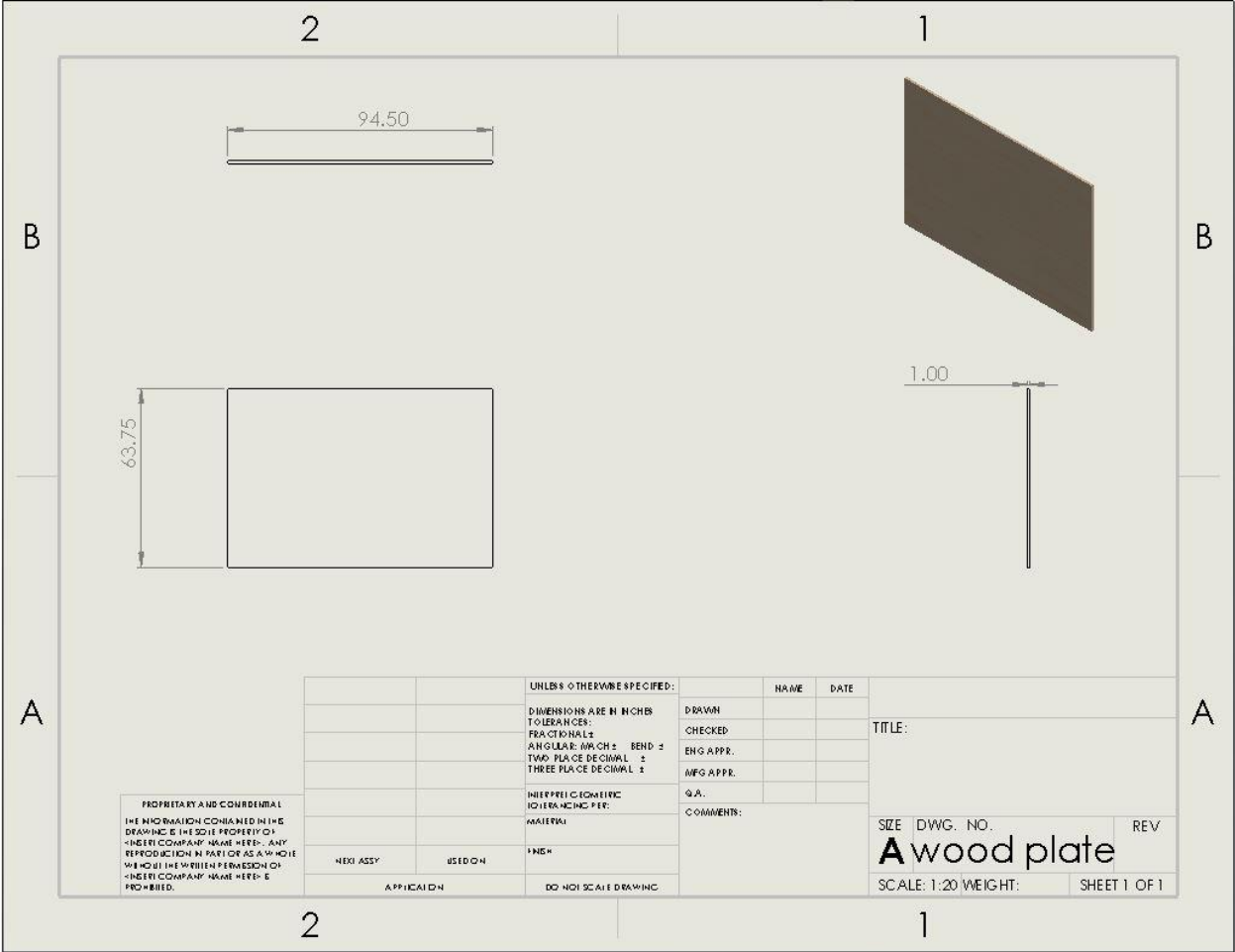


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wood ground support



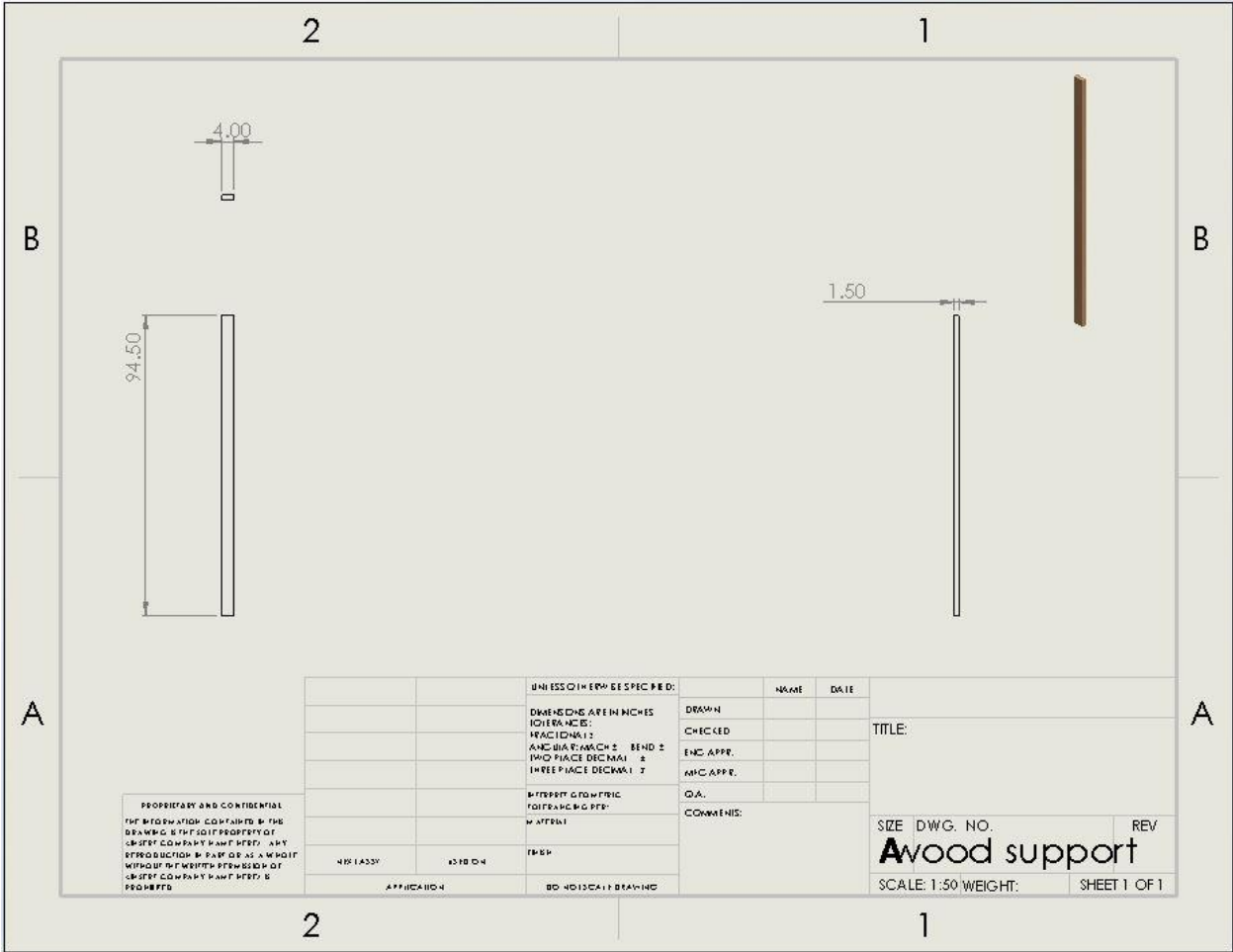
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