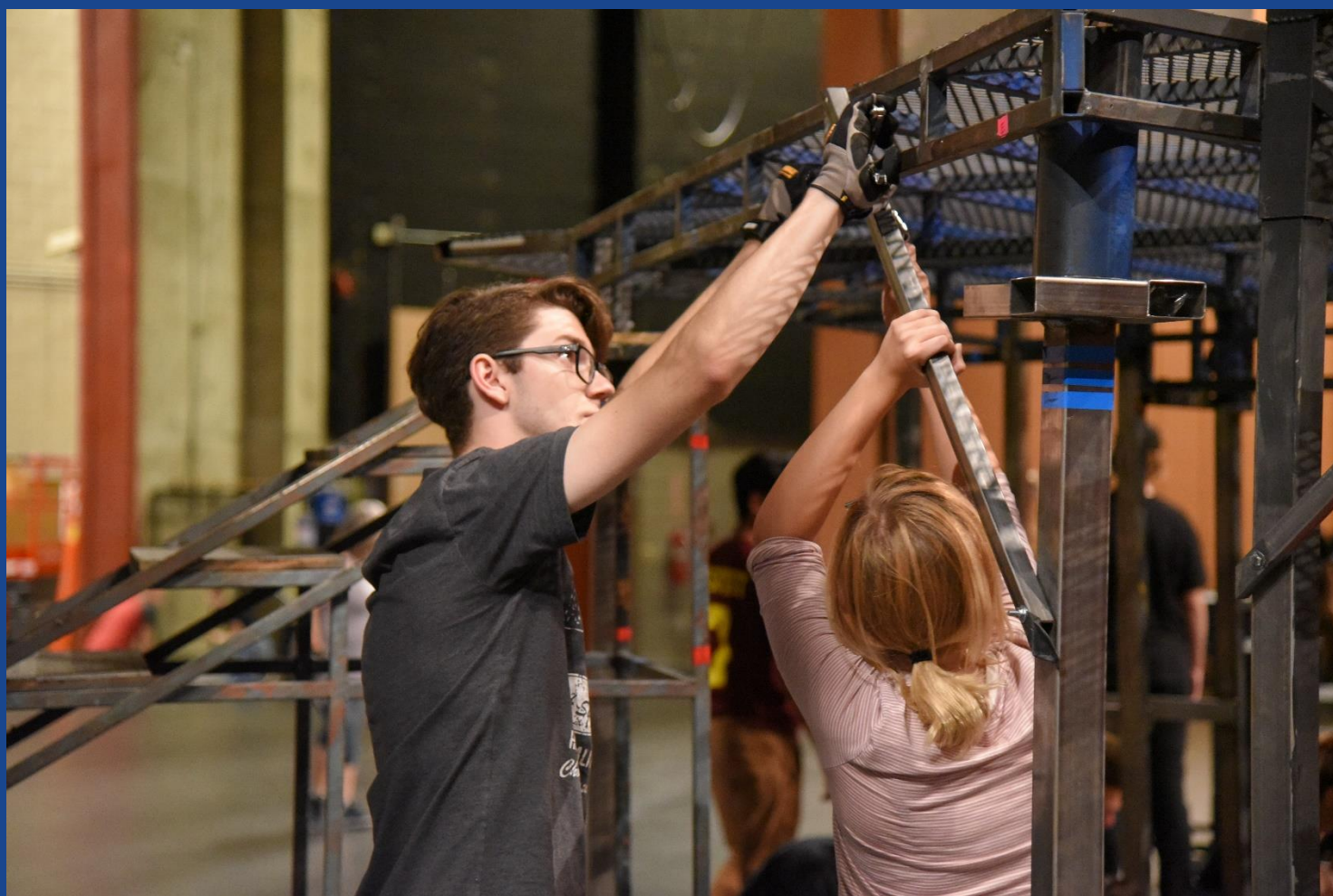


Building Hollywood Flats



Introduction

Flats- a scenic staple.

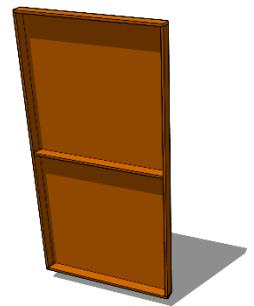
The term “flat” refers to those pieces of theatrical scenery which are positioned on stage to create the scenic background for your production. Flats are also used as “masking” in order to hide the backstage areas from audience view. *Hollywood* flats are created from wood and covered with a thin plywood such as luan. Flats covered in fabric or canvas are referred to as *Broadway* flats. Often in school theatre programs, the preferred flat style is a Hollywood flat for its strength and durability.

Why Hollywood flats?

Hollywood style flats are a staple of many modern theatre productions as they provide rigid flats that can quickly be assembled with minimal tools and effort, can remain vertical with minimal bracing, and are durable enough to withstand repeated usage and handling, especially by student technicians. They are not prone to puncture and warpage like fabric covered flats, and the slight increase in cost of material is offset by their ability to be repainted multiple times without needing removal and recovering of their facing.

The following guide is the best possible method for constructing this type of flat in a way that maximizes structural integrity and resilience.

PRO TIP: Flats can be built in any shape or size, but many theatres create and stock sizes in two-foot increments such as 4 x 8, 2 x 10, 2 x 8 etc. Note that when referring to a flat, you should always give the width first, followed by the height.



Constructing a Hollywood Flat

Materials

Lumber

- 1 - 4' x 8' sheet of 1/8" plywood (Generally referred to as underlayment or “Luan”)
-You may also use 3/4" plywood (3/16" actual thickness) if you find 1/8" plywood to be too flexible
- 5 - 8' long boards of 1"x4" (actual dimension 3/4" x 3 1/2" hardwood)
(Alternatively, you can also use strips of 3/4" plywood that have been cut to the same dimensions)



Tools & Fasteners

- A 16 gauge pneumatic narrow crown staple gun
- Box of 16 gauge 2" staples
- Box of 16 gauge 3/4" narrow crown staples
- Air compressor
- Wood glue
- Tape measure
- Miter saw

Alternatively

- Power drill
- 3/16" drill bit
- 20 - 2" wood or drywall screws
- 24 - 1" wood or drywall screws

Instructions for Construction using a Drill

Follow the same basic assembly instructions used for assembling platforms. Whenever the instructions call for stapling, instead pre-drill two pilot holes using the 3/16" drill bit, and secure the joints using 2" screws. The face can be secured using 3/4" screws with no need to pre-drill, and they can be placed every 12" along the frame.

Cut List

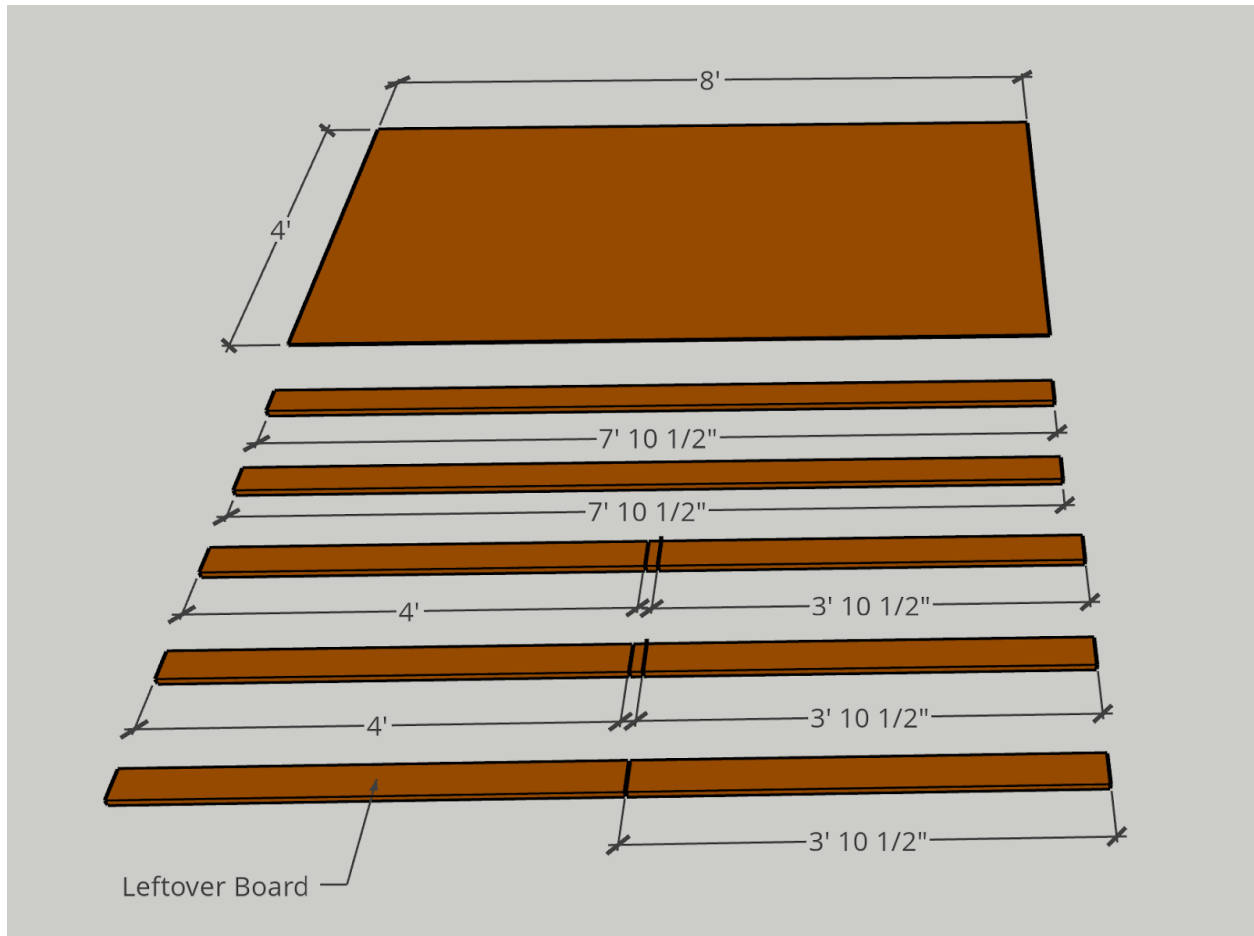
Cut the boards to the follow lengths:

- 2 @ 4' long
- 3 @ 3' 10 1/2"
- 2 @ 7' 10 1/2"

PRO TIP: When cutting you must account for the Kerf (width) of the saw blade you are using. For example, this means you cannot cut two 4' lengths from an 8' board, because one of the boards will wind up slightly shorter than 4' long. Instead, plan your cuts so that you have a little extra in each board after your cuts.

- Board 1: 4' piece and a 3' 10 1/2" piece (with about 1 1/4" piece as scrap)
- Board 2: 4' piece and a 3' 10 1/2" piece (with about 1 1/4" piece as scrap)
- Board 3: 1 piece at 3' 10 1/2" (With just under 4' 1 1/2" left over, which can be used to cut either a 4' board or a 3' 10 1/2" board for another flat if you're building multiple at once)
- Boards 4 and 5: Cut to 7' 10 1/2"

Cutting



Clearly mark your 3' 10 1/2" pieces and 4' pieces so that you don't accidentally get them mixed up. Writing the dimensions on the side of the boards as you cut them is a great way to manage this.

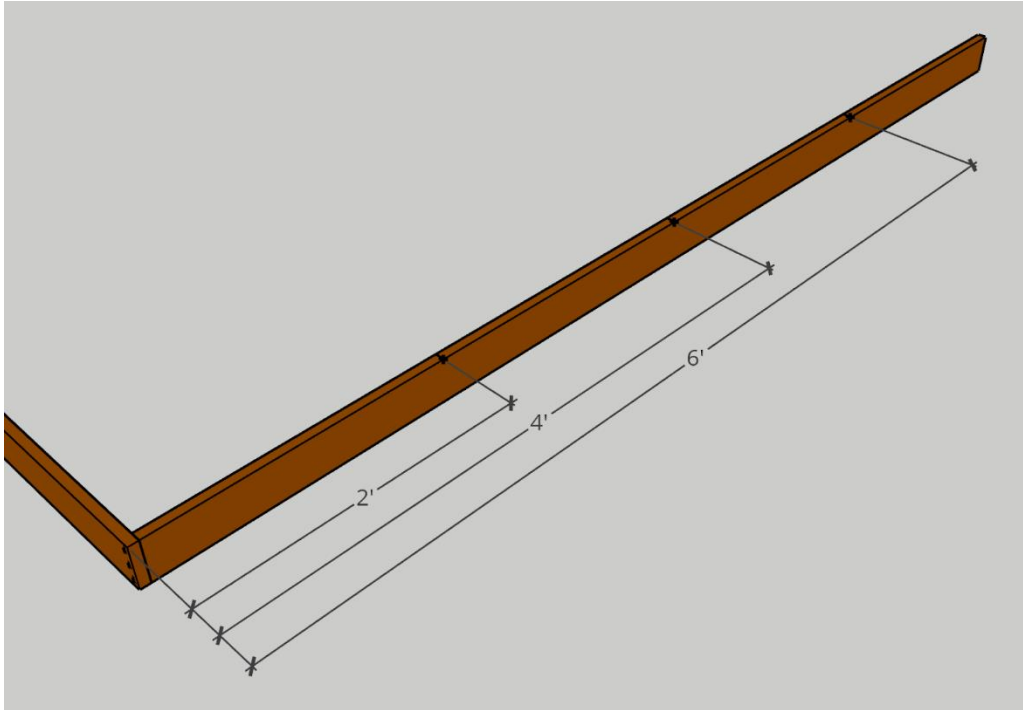
Part names:

- Rail - The 4' pieces, these will serve as the top and bottom "caps" for the frame.
- Stile - The two 7' 10 1/2" pieces that will serve as the vertical sides of the frame
- Toggle - The three 3' 10 1/2" pieces that will sit horizontally between the stiles

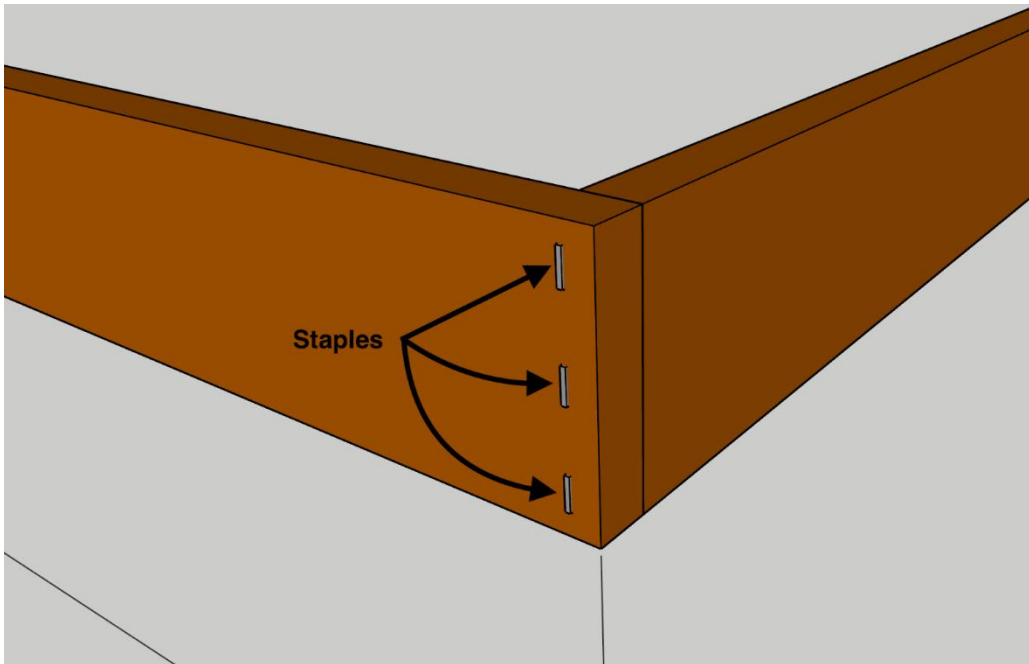
Assembly

Step-by-Step Instructions using a Pneumatic Stapler

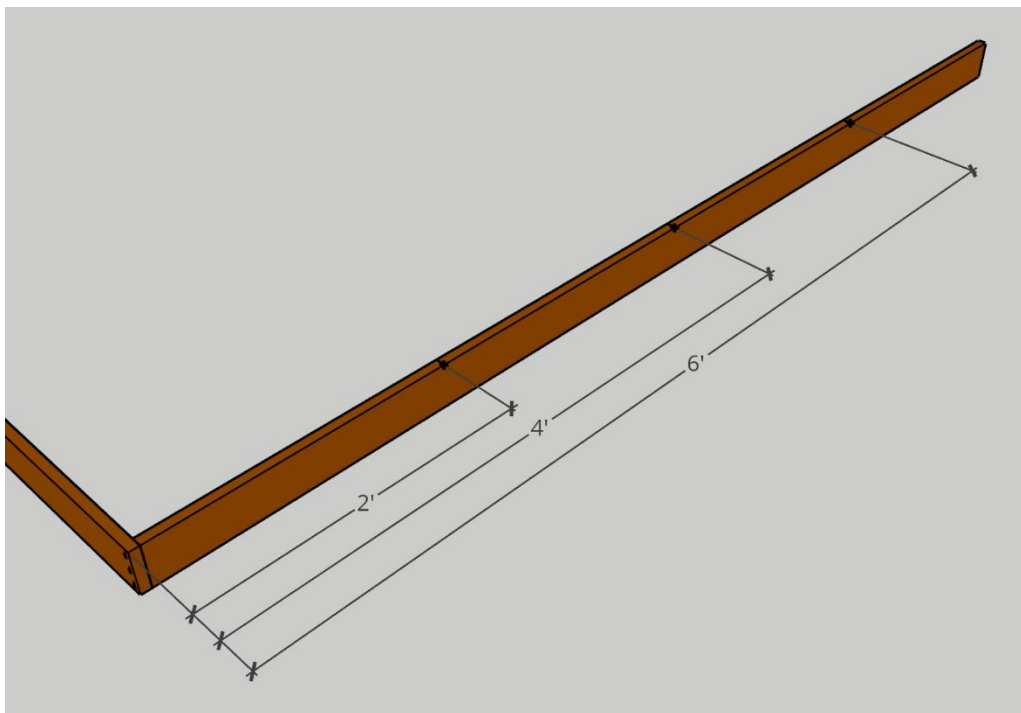
1. Lay out one Rail (4') and one Stile (7' 10 1/2") "on edge" (narrow edge against the work surface) so that they form an L shape, with the end of the Stile sitting flush with the face of the Rail.



2. Apply glue to the end of the stile and press it into place against the rail. Ensure that the edges of the two boards are parallel and flush with each other. Staple the joint three times through the face of the Rail into the end of the Stile using 2" staples.

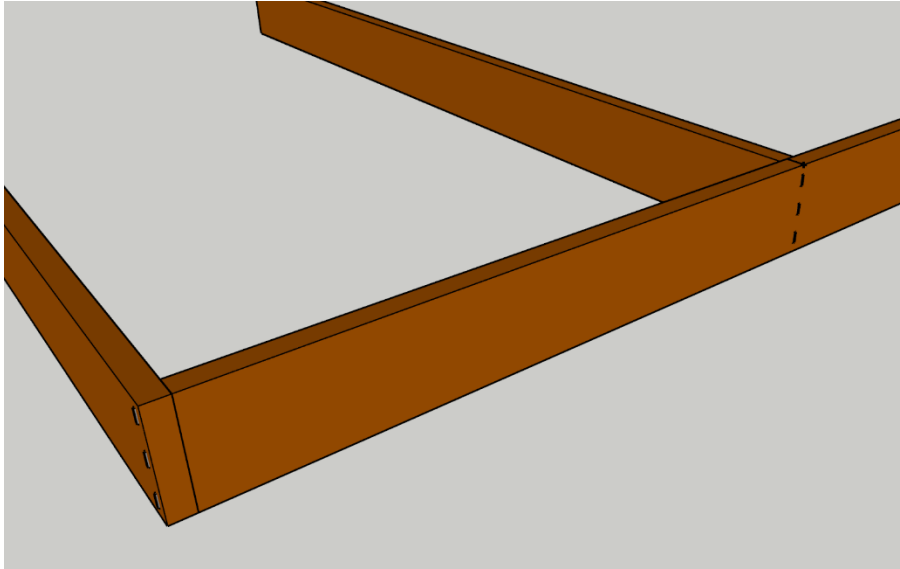


3. Measure from the outside corner along the rail and make a mark at 24", 48" and 72" on the top edge of the Stile. These will be your "center" marks for the Toggles.



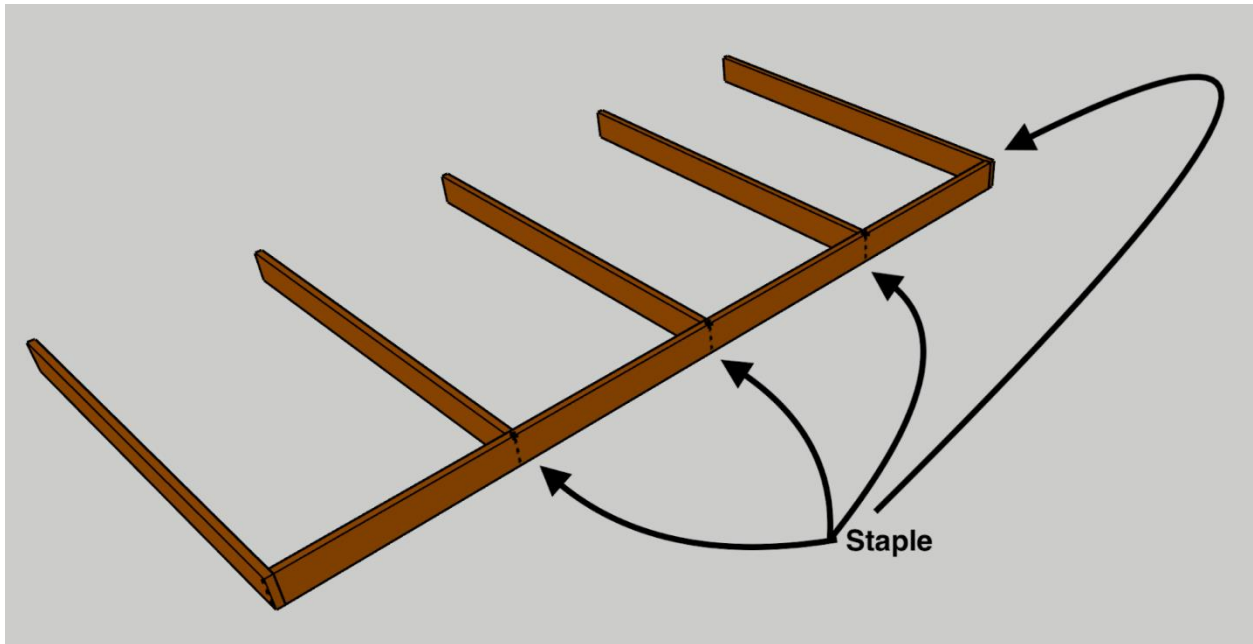
4. Starting at the 24" mark, place a Toggle (3' 10 1/2") on the "inside" of the Stile, so that it is centered on the mark you made.

5. Apply glue to the end of the Toggle and staple it into place using the same 3-staple method used in step 2.



6. Repeat step 5 on the 48" mark and the 72" mark.

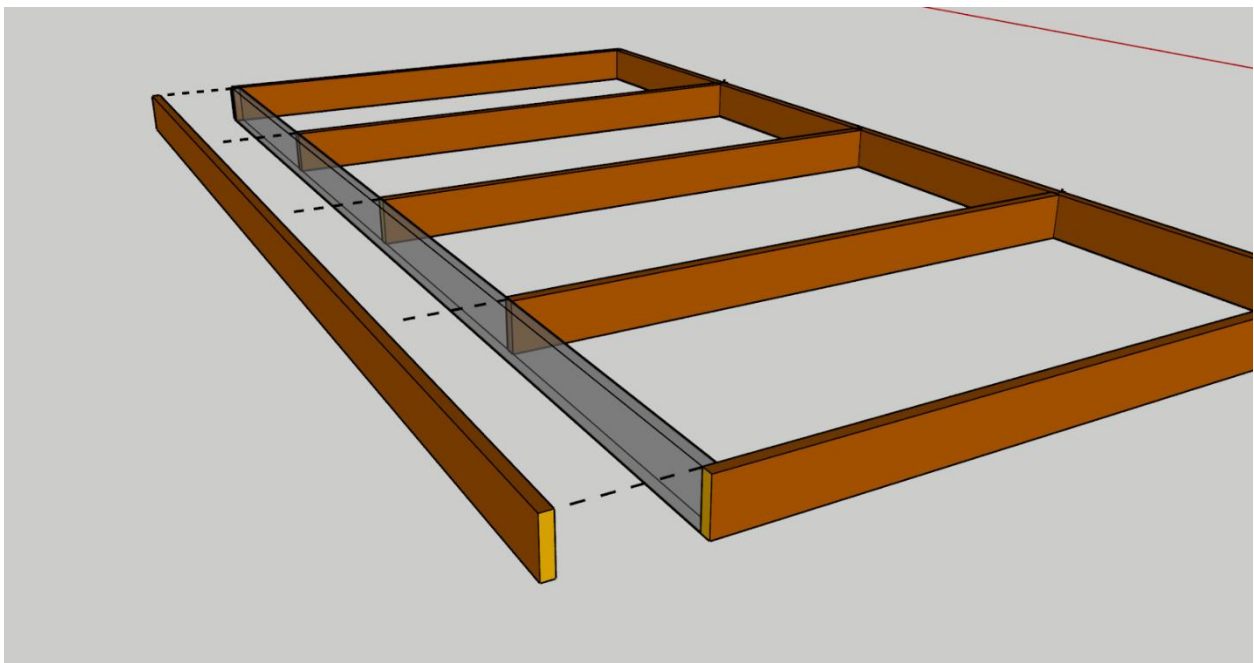
7. Place the second Rail at the exposed end of the Stile piece, and glue and staple it into place as you did with the first Rail in Step 1.



8. Place the other Stile on the open side of the frame and make the same centering marks on the Stile as in Step 3.

9. Remove the Stile and apply glue to the exposed ends of the toggles and to the ends of the Stile.

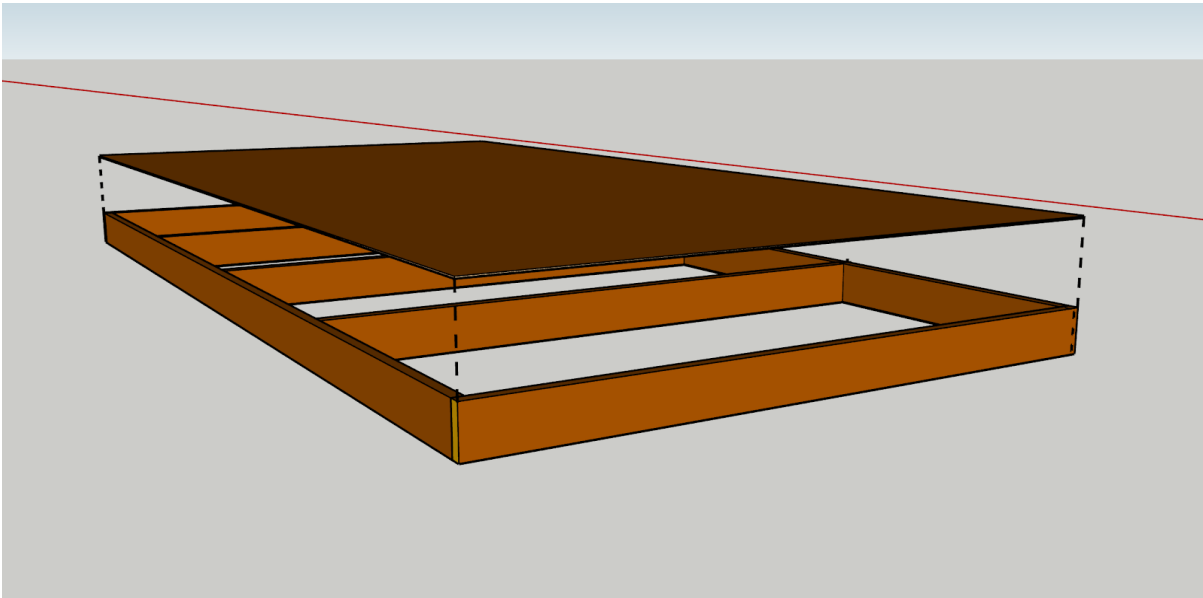
10. Fit the Stile into place, being careful not to smear glue, and center the Toggles on their marks as close as possible.



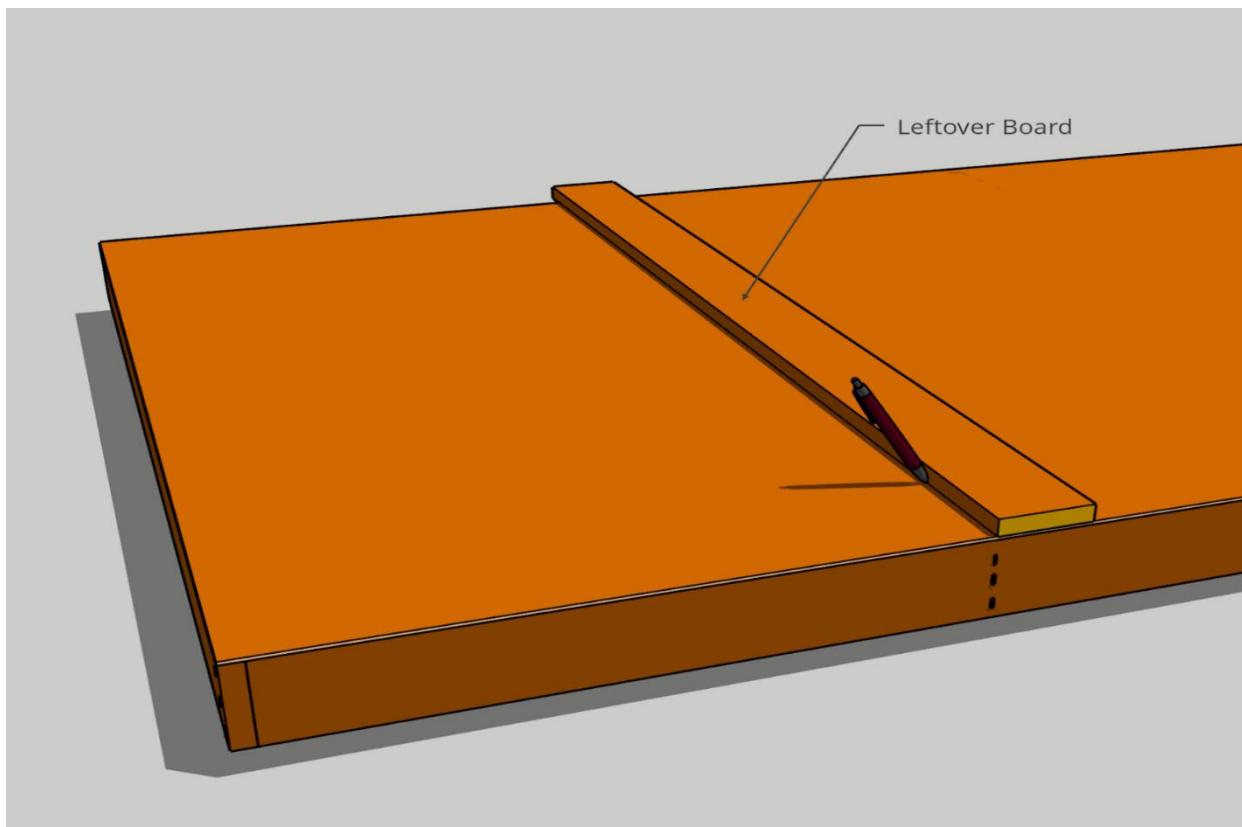
11. Starting at one end where the Stile meets a Rail, staple it into place, then work your way down the board, securing each Toggle in turn, ensuring that the Toggles are centered appropriately on their marks.

12. Staple the last corner where the Stile meets the other Rail.

13. Place the sheet of $\frac{1}{8}$ " plywood over the frame and pull the frame underneath as close to square as possible.

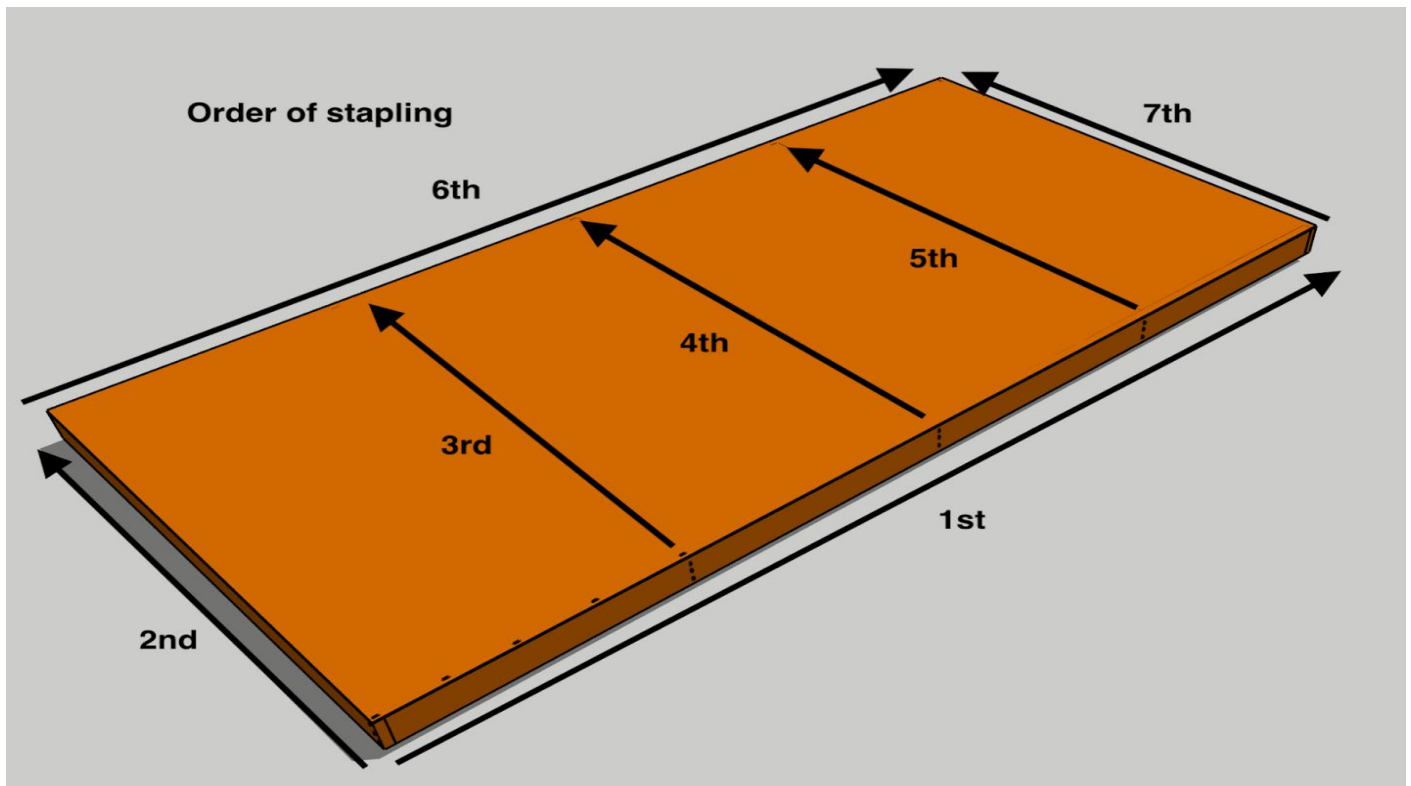


14. Using a long straight edge and a pencil (you could use the extra piece of left over 1x4 board if need be) and using the exposed staple points along the stiles as your guides, draw lines across the face of the plywood to mark the center lines of the Toggles underneath. This will make it much easier to staple down through the face of the plywood into the Toggles later.



Decision point: If you don't plan on disassembling this flat at any time, follow the next steps. If you would like to be able to remove the facing for any reason in the future, skip to Step 17.

15. Remove the sheet of plywood and apply a thin bead of glue to all the top edges of the frame that it was just sitting on. Smooth the glue using your finger or a small brush. It is important that you do this step to ensure maximum adhesion between the glue and the wood.
16. Carefully place the plywood sheet back on the frame, choosing one corner of the frame and plywood to line up first. (Do not worry about getting the entire frame squared up right away).
17. Replace the 2" staples in your staple gun with $\frac{3}{4}$ " staples.
18. Beginning at the flush corner, staple through the plywood into the frame using the $\frac{3}{4}$ " staples.
19. Working your way along the stile, place staples every 6". Pay close attention to the plywood and the stile as you do this, they should be flush at the point where you're stapling each time. You can shift the frame or the plywood back and forth slightly as you go to make sure that the edge where they meet is as flush as possible.
20. Once you complete the Stile side, go back to the point where you started, and staple along the Rail, using the same method.
21. By now, the frame should be fairly rigid under the plywood. Work your way up the Flat, stapling along the Toggles one at a time, from the stapled Stile side toward the unstapled Stile.
22. Repeat step 19, stapling the other Stile.
23. Staple along the final Rail.



Optional but Highly Recommended

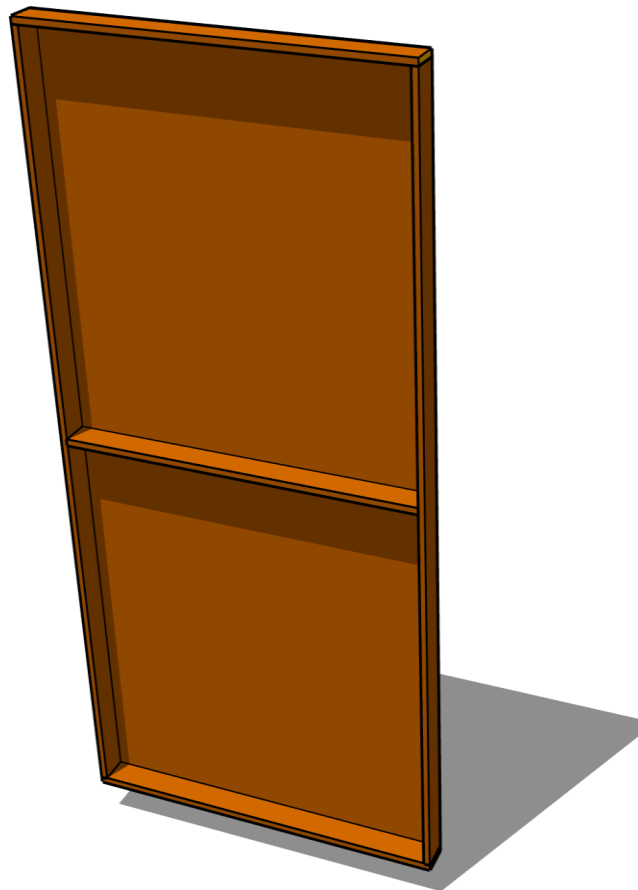
24. You might have a slight overhang of material on one side of the flat due to slight oversizing of the plywood sheets. This can easily be removed with a sander or router fit with a flush trim bit. This step is highly recommended because it will make it significantly easier to fit multiple flats edge to edge without buckling or gaps, especially if you're planning on using them to build a masking wall or continuous section of set.

Alternate Construction with Less Materials

If you're trying to save on materials or make the flats as lightweight as possible you can use a single Toggle centered at 48" in the middle of the flat. This method won't be as rigid overall, but it will create a perfectly good masking wall as long as you aren't planning on attaching anything to the flat as part of the scenic design.

Usage

Hollywood style flats can easily be joined to each other by clamping or screwing the frames together on the back side. They can easily remain vertical on their own with minimal bracing or if a corner is built by joining flats at a right angle.



Relevant Code

While there are not specific industry standards or codes that exist for the construction of Hollywood style flats like the one detailed here, this design has emerged as the most common and most reliable version of a “hard” flat that is in use in theatres of all levels.

Refer to manufacturer manuals for instructions on specific tool use.

OSHA Standard Number 1926/ Subparts D, E, I, J, K, L, M, N, and X

Links and Resources

Inverted Periaktoi by Jason Robert LeClair

This simple design solution maximizes your use of flats and offers three designs in one.

<https://dramatics.org/the-inverted-periaktoi/>

Safety in the School Scene Shop by Dana Taylor

Important safety considerations for school scene shops.

<https://www.nfhs.org/articles/safety-in-the-scene-shop-for-school-theatre-programs/>

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