

BUILD YOUR OWN SHADE CANOPY

Shade, specifically this Build Your Own (BYO) Shade Canopy, can quickly turn an underutilized outdoor (hot) space into a place that is heavily used and loved. Shade canopies are one of the most requested public space amenities, which is why a shade structure was a must to include it in Tiny WPA's comprehensive Build Your Own (BYO) Toolkit.

With no ground disturbance; no demonstrable wind, snow or rain load; and a pop of color, this BYO Shade Canopy supercharges a traditional pergola design, but uses deep hanging panels of coroplast to create beautiful, affordable and easy-to-build shade. The canopy design emerged from an iterative process and honors the structures of many porches in West Philadelphia, where Tiny WPA is based.

We are proud of this shade solution and are excited to see one in your neighborhood!

8 HOURS

COST \$450-950



And then there was shade! Mantua Civic Association's Youth Ambassadors wanted a pop of color and some shade for their pocket park at the corner of 38th and Melon in Philadelphia. In less than four hours, together the teens, Mantua Civic and Tiny WPA built this eye-catching shade canopy.



WHAT DO YOU NEED?



MATERIALS

- 22 2 x 3 x 8ft common pine, douglas fir or cedar boards
- 17 2 x 2 x 8ft pressure treated pine boards
- 14 sheets of coroplast or fabric 16" x 7' 6"
- 3 sheets 150 grit sandpaper
- 2 qt semi-gloss exterior paint with primer
- 1 wood glue
- 2 boxes of 2 1/2" exterior wood screws (minimum 125 screws)
- 90 1" exterior cabinet screws
- 2-4 extra 2" full length boards for bracing
- 4 concrete deck blocks

TOOLS

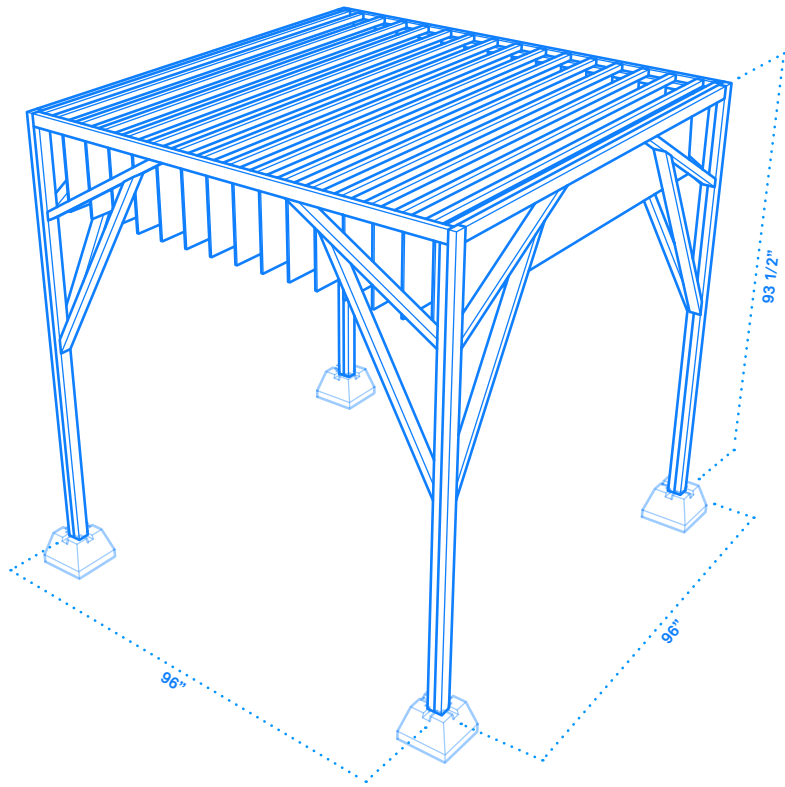
- 1 table saw
- 1 chop saw (also called a miter saw)
- 1 drill with a driver bit and 1/8" drill bit
- 1 orbital sander or 150 grit sandpaper and sanding block
- 1 tape measure
- 1 framing square
- 1 speed square
- 1 nailset and hammer
- 1 drop cloth
- 1 paint brush or roller
- 1 paint tray
- 1 safety glasses
- 4 speed clamps (the more the better!)

Optional:

- 1 18-gauge finish nailer (see more in the Tips! section)

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TIPS!

Here are a couple of tips and things you should consider before you head to the hardware store to purchase materials.

Wood Selection

The stock that's available at your local hardware store can vary, but it's worth the time to pick the straightest pieces with the fewest imperfections and knots. Selecting pieces that aren't warped, bowed, or twisted will save time once you start to assemble and increase the longevity of your completed shade structure.

Secrets to a Great Paint Job

When it comes to painting, several thin coats are better than one heavy coat. It's also important to make sure all exposed surfaces are painted when using pine or douglas fir boards - especially the end grain! Painting all surfaces will protect the wood from water and potential rot.

Use a Table Saw

The table saw plays an essential role in keeping your boards perfect and square. Cut $\frac{1}{8}$ " from all edges before finalizing the widths listed here in the cutlist. If the table saw is not used, you will have to recalculate the width of your shade structure.

Gaps Between Boards are Bad!

A gap of any size between any two pieces of wood means that connection is 50% weaker than if they were touching. If a gap exists, you will need to remove ALL of the screws and then screw it back together. A clamp or extra set of hands will help hold pieces of wood together when fastening.

Make Sure It's Square!

Before attaching the legs to the top frame, use a framing square to ensure they are perpendicular, aka 'square.' Using clamps, temporarily fasten long pieces of scrap wood as braces to the leg and frame to hold the structure square as you fasten the diagonal supports. Once the diagonals are secure, you can remove these temporary braces.

Diagonals Savvy

Because the diagonal supports are cut at 30 and 60 degree angles, when fastening them to the structure they will want to 'move.' Pre-drilling and having an extra set of hands to hold everything together will help minimize this challenge. Also marking where the diagonals should hit on the leg and frame to keep the structure square will help you line up when you're fastening.

Toenailing and Screw Angles

Be aware of the angle you hold the drill when attaching the diagonal supports so that your screws don't poke through the wood. Try to drill perpendicular to the face of the wood as much as possible, but with some angles you may have to 'toenail' the screws. There are videos on YouTube that will teach you how to do this 'pro-technique.'

Prevent Racking!

Racking is when a structure tilts or collapses as it's structural components are forced out of square. To prevent this problem while rotating the shade structure, attach two temporary cross braces at the base of the legs (one cross brace per two legs).

Spacing the Shade Panels

Use your spacer blocks to quickly line up where the shade panels need to be installed without having to measure the exact distance every time. This will help the work go faster and eliminate user error in measuring. Start in the middle and move out.

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CUTLIST: LEGS AND MAIN STRUCTURE

Start with the 22 2x3s and a table saw. Please note that the dimensions of most 2x3s are actually 1 ½" x 2 ½". This knowledge is helpful when measuring and cutting down your boards. 2x3 boards come with rounded edges to prevent splinters, among other reasons.

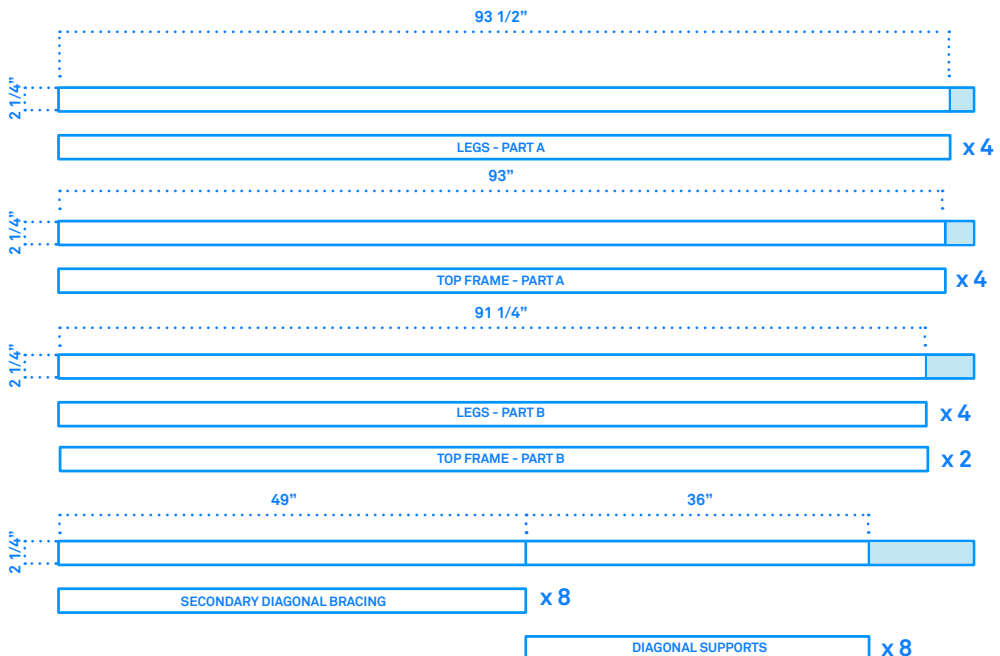
First Cuts

Using a table saw, trim off the rounded edges by cutting a very narrow width (approximately ⅛" or less) along the entire length of the board. (This is called "milling off the radius"). After doing so, set your table saw fence to 2 ¼". Place the fresh cut edge of the 2x3 board against the fence, and cut the board along the entire length. Repeat this process. All 2x3 boards should be 2 ¼" wide.



Second Cuts

Remove a blade's width from the factory end of your 2x3s, and then cut them down to the measurements and amounts listed above. There should be four 93 ½" boards, four 93" boards, six 91 ¼" boards, eight 49" boards, and eight 36" boards.



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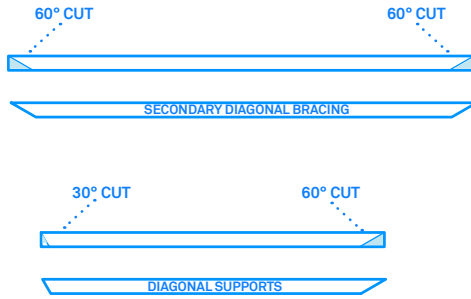


CUTLIST: DIAGONAL BRACING

After cutting the bracing to length, angles should be cut on each end of the boards.

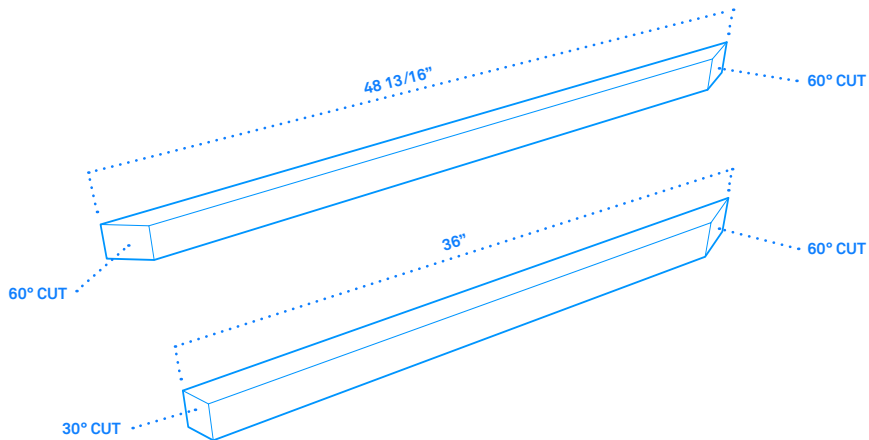
Angle Cuts

After cutting all the shorter pieces to length, turn them on edge and cut the additional angles of 60° and 30°.



Final Dimensions for Diagonal Bracing

After cutting all bracing pieces, you should have eight diagonal supports and eight secondary diagonal bracing pieces.



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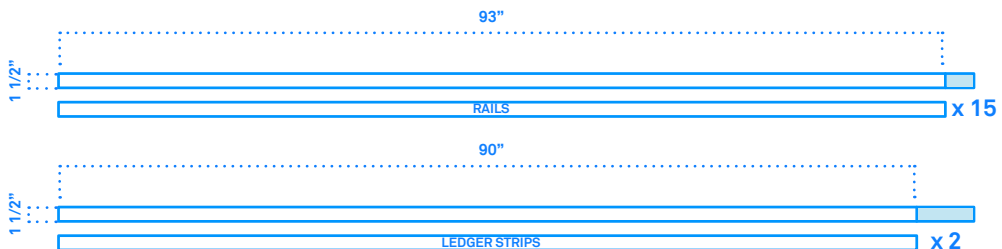


CUTLIST: RAILS AND LEDGER STRIPS

Next up are the pressure treated rails and ledger strips. We'll want these to be as uniform as possible, so setting up the stop on the chop saw will make this part of the job flow much easier. The pressure treated will remain unpainted.

First Cuts

Remove a blade's width from the factory end of your pressure treated 2x2s, and then cut them down to the measurements listed below. After cutting, you should have fifteen rails and 2 ledger strips.



CUTLIST: COROPLAST

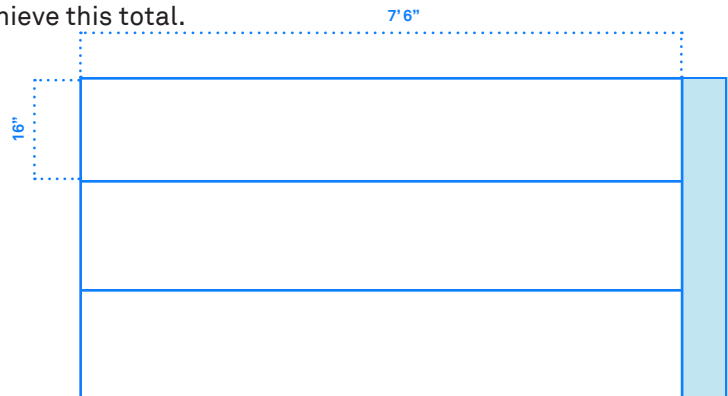
For the final cuts, we'll need to cut down the coroplast into 16" strips on the table saw. If you are using full sheets of 4'x8' material, it can be useful to have a second person to help with this part.

First Cuts

Assuming you are using a 4'x8' sheet of coroplast, cut down the full sheet of material to be 7' 6".

Second Cuts

Then, cut the 4' x 7' 6" material into 16" strips. You can get three strips per 4'x8' sheet. In total, you need fourteenth 16" strips. You will need five 4'x8' sheets to achieve this total.



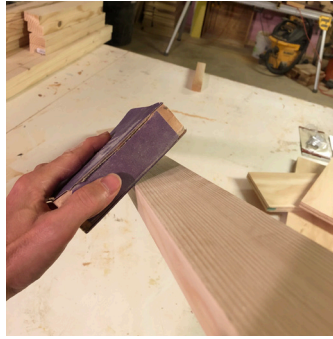
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HERE'S HOW YOU DO IT!



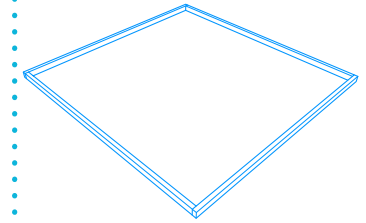
Sand your boards to prevent splintering and injury as you build.



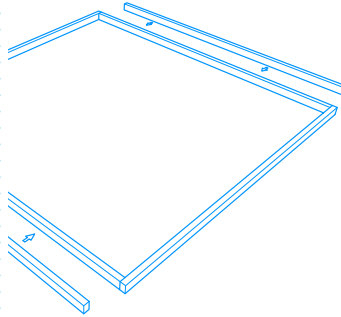
Chamfer all corners of the bracing and legs with a sanding block.



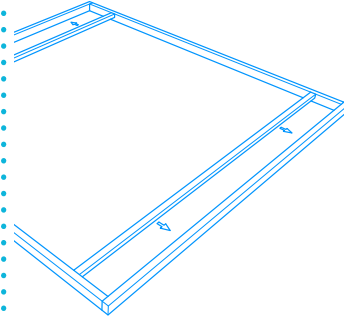
Paint your boards (see the Tips! section for painting suggestions).



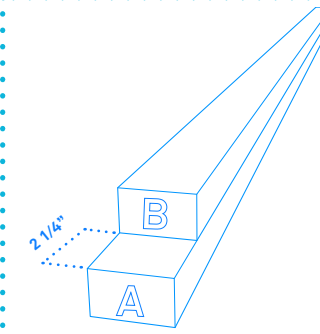
Assemble 93" 2x3 boards (top frame - part a) with 2 1/2" screws. Align and square all corners.



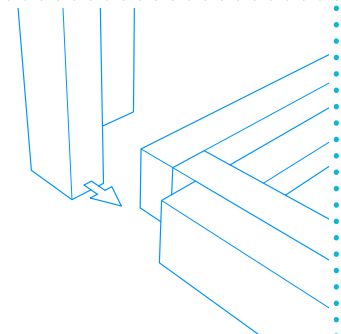
Install exterior 91 1/4" 2x3 boards (top frame - part b) with 2 1/2" screws.



Install 90" 2x2 pressure treated ledger strips. Align top so it's flush with top of structure.



Sister 93 1/2" (legs - part a) and 91 1/4" (legs - part b) boards into legs with 2 1/2" screws. Align flush on the far end.



Slide shoulder of leg onto notch of main structure. Attach with 2 1/2" screws in a triangle pattern.



Use clamps to attach temporary bracing to support the legs.



Attach 36" diagonal supports with 2 1/2" screws. Remove temporary bracing.

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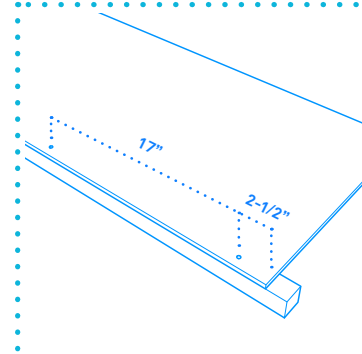
HERE'S HOW YOU DO IT!



Attach the secondary diagonal bracing with 2 ½" screws.



Assemble shades with coroplast sheets and 90° pressure treated rails.



Use six cabinet screws per rail to attach coroplast. Space 2 ½" from each end, and 17" apart through the middle.



Use clamps or screws to attach temporary bracing to support the legs.



Flip structure onto its side (here's why we need the leg bracing.)



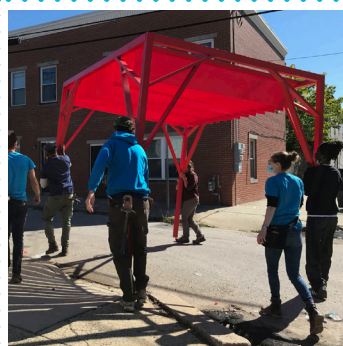
Create at least two 4 ½" blocks. These will help us space our shades.



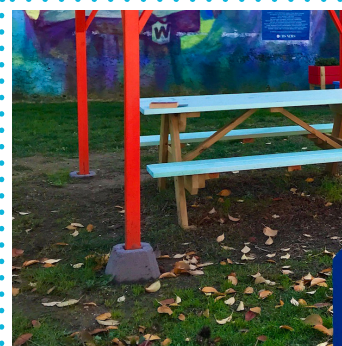
Begin installing shades from middle of structure. Screw from bottom.



Attach with 2 ½" screws. Use 4 ½" blocks and work your way out to ends.



Flip structure onto feet, remove temporary bracing.



Move your structure to its final location. Use concrete deck blocks to secure the legs in place.

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MORE NOTES ON BUILDING YOUR SHADE CANOPY!

Here are a few more tips for finishing up the beautiful shade canopy you are making!

Focus Sanding High Touch Areas

We've said it before but we will say it again, focus your sanding and chamfering on high touch and use areas.

Don't Have the Capacity to Paint?

Painting improves the durability of the design and these canopies are designed to last. However, if you do not have the space or capacity to paint, an unpainted shade canopy is better than nothing at all. If you do paint, it's recommended to do touch-ups every two years or so to keep everything looking sharp.

All the Dimensions Matter!

While there is some flexibility in how the shade canopy gets finished, 'nailing' the dimensions as we've designed them is absolutely important.

Did We Mention Gaps are Bad?

A gap means there is a TINY amount of room for the joint to move. If the joint starts to move it WILL get weaker over time. Again, you will need remove ALL of the screws and then screw it back together. And wood glue is magical, by the way.

Maintain the Canopy Properly

If you do paint, we recommend repainting every two years to keep your structure looking sharp. When

you are ready to repaint, lightly sand your structure to allow new paint to adhere better. It's also important to look for any nicks, scrapes or cracks and do touch-ups as needed. Remember: any exposed wood will absorb water, causing the wood to rot. Paint "seals" the wood, protecting it from rain and mold.

Run into Problems? We can Help!

Have questions or need help working through a fabrication problem? We are happy to help. Email Tiny WPA at info@tinywpa.org.

Post Pictures of Your Building Process on Instagram and Tiny WPA!

We want to cheerlead for you and give you some visibility for your efforts! Tag us (@tinywpa) and we will happily repost any photos or stories that you share.

Don't have an Instagram account?

Send photos to info@tinywpa.org, and we will post them!



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