


DOUBLE SHADE STRUCTURE

DIFFICULTY:
VERY COMPLEX

 12 VOLUNTEERS

 6 HOURS

MATERIALS

PREP

- (2) 4x4x12ft boards
- (6) 4x4x10ft boards
- (16) 2x6x8ft boards
- (48) 2x2x8ft boards
- (4) pieces of 4x8 lattice

BUILD

- (9) 80lb bags of concrete
- (6) 4x4x10ft boards
- (8) 4x4x36" trapezoids
- (16) 2x6x8ft boards
- (48) 2x2x8ft boards
- (4) 4x8 lattice sheets
- (16) .5x8" galvanized carriage bolts
- (16) .5" galvanized nuts
- (16) .5" galvanized washers
- 5lbs 2.5" deck screws
- (16) H2.5A rafter ties
- (8) LS30-R skewable angle braces
- 2lbs 1.5" Simpson N8 nails
- 2lbs 2.5" 8d galvanized nails

Tools listed on page 2

PREP LIST

1. Sort materials into piles by like items to ensure you have materials needed to complete project.
2. Take (2) 4x4x12ft boards. Cut each into (4) 4x4x36" pieces, for total of (8) 4x4x36" pieces.
3. Set aside the rest of lumber - it will NOT be cut.
4. Angled Cuts: Take the 4x4x36" pieces cut in step 2. Cut off 45° on both sides to create a 4x4x36" trapezoid. Repeat for the rest of the 4x4x36" pieces.


BUILD LIST

1. Sort materials into piles by like items to ensure you have materials needed to complete project.
2. First, 4x4x10s must be set in ground as posts. Each post will be buried 2ft in the ground with concrete. The footprint of the shade structure is 14ft long by 6.5ft wide. Holes need to be 24" deep with about an 8" diameter.
3. Posts need to be level both side to side and front to back. They also need to be in straight line with proper alinement. A string-line can be helpful for this.
4. Let the concrete set for several hours before completing the shade structure.
5. Once the concrete has set, take eight 2x6x8ft boards and lay them on the ground. The 2x6x8 boards will meet in middle of center post and run parallel with long side of structure stretching roughly 10" past the outside posts. The 2x6x8 boards will run on BOTH sides of the 4x4 posts.
6. Using two ladders, raise the headers to the tops of the 4x4 posts and level them (keep in mind the tops of the posts might not be exactly the same height, it is not necessary). Attach the headers to the posts temporarily with 2.5" screws.

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TOOLS

BUILD

Tape measure

Safety goggles

Pencil

Hammer

Ladder

.5 long drill bit

Screwdriver bit

Sandpaper

.75" socket with ratchet or .75"
open-ended wrench

Drill

7. Using the long .5" drill bit, drill 1 hole through both 2x6x8 headers and the 4x4 post in order to fit the 8" carriage bolt through this hole. On the center posts, each set of headers will get a bolt (2 bolts per center post).



8. Now place carriage bolt through each hole you've drilled (total of 8 holes - 1 through each corner post and 2 through both center posts). Put the carriage both through the hole so the head of the bolt is facing outward and the washer and nut are on the inside of the structure.



9. Next you'll attach the 4x4x36" trapezoid braces. Make sure the 45 degree angle sits flush with the 4x4 post but also passes through the 2x6x8 headers. You'll attach the lower end of the 4x4 trapezoid brace to the 4x4 post using the angled brackets and the 1.5" Simpson nails.



10. On higher end of trapezoid brace, use .5" long drill bit to drill hole through both 2x6x8 headers and the 4x4x36" trapezoid brace. Place 8" carriage bolt through hole and attach using washer and nut, again make sure head is on outside of the structure and washer and nut are on the inside.



11. Next you'll layout the remaining eight 2x6x8 rafters above the headers. The rafters should overhang the outside headers by about 5 3/4" on each side. The rafters should be roughly 2'6" apart. The end rafters should be approximately flush with the end of the headers. There are 2 rafters, side by side, in the center (to cover the seams where the 2x2s will meet).



12. Use rafter ties to attach rafters to the headers. Make sure 2 rafter ties are used per rafter (one on each end). You'll use the 1.5" Simpson nails to fasten the rafters to the headers.



13. Attach 2x2x8s on top of rafters using 8d nails, evenly spaced about 2 5/8" apart. The 2x2x8s should meet in middle of shade structure where the two 2x6x8 rafters were placed side by side.



14. Finally, use 8d nails to attach 4 sheets of 4'x8' lattice onto 2x2x8s. Orient the sheets of lattice.

