

# SUKKAH CONSTRUCTION

## PART 1: FABRICATION OF COMPONENTS

As you prepare each wood component, mark it with its letter code.

References to "left" and "right" assumes you are facing the front of the sukkah.

Depending on the tools you have available and your skill level, fabrication time will vary from a few hours to most of a day. But this investment in time will result in a sukkah that will last indefinitely! Once fabricated, the assembly and disassembly can be done in an hour.

Refer to the accompanying figures frequently to guide your work. "Measure twice, cut once!" Take special note of how things are oriented. It will aid assembly to mark the components where they connect (for example, mark the Front and Back Top Rails with an "L" on the left end and an "R" on the right end.)

**Please note corrections on pages 3, 5, 6, 8, and 10!**

### Cut Wooden Components

#### *Top Rails and Extension Blocks (Figure #1)*

Cut 3" off two of the 2" x 4" x 8' studs making them 7'9" in length. These will become the Front Top Rail (A) and Back Top Rail (B).

Cut 7" off two of the 2" x 4" x 8' studs making them 7'5" in length. These will become the Left Top Rail (C) and Right Top Rail (D).

From a 2" x 4" x 8' stud, cut two lengths of 8" each. These will become Extension Block (J) and Extension Block (K).

#### *Corner Posts*

The remaining four 2" x 4" x 8' studs will remain uncut. These will become the four Corner Posts: Back Left Corner Post (E), Back Right Corner Post (F), Front Left Corner Post (G), and Front Right Corner Post (H).

### ***Back and Side Panels (Figure #2)***

For the Back Panel (L), Side Panel (M), and Side Panel (N), cut a 4' x 8' x ½" sheet of plywood lengthwise into 4 parts. You will have four pieces of plywood each 12" wide and 8' in length. You will need three of the four pieces to construct a Single Sukkah: one for the Back Panel and two for the Side Panels.

### ***Diagonal Stabilizers (figure #3)***

Cut one of the 1" x 3" x 8' furring strips in half. These will be the Diagonal Stabilizers (Z).

### ***Attach the Simpson Strong Corner Ties to the Corner Posts (Figure #4)***

**The corner posts will all be oriented with the narrow (2") side facing front. Be sure the Corner Ties are oriented correctly on the Corner Posts before attaching.**

Back Left Corner Post (E) - Mark a line on the post 6½" from the top. Slide the Corner Tie down from the top of the stud until the bottom of the Tie is on the mark. One arm of the Corner Tie should be extended to the right and the other arm extended forward. Fasten Corner tie to Post with Simpson Screws.

Back Right Corner Post (F) - Mark a line on the post 6½" from the top. Slide the Corner Tie down from the top of the stud until the bottom of the Tie is on the mark. One arm of the Corner Tie should be extended to the left and the other arm extended forward. Fasten Corner tie to Post with Simpson Screws.

Front Left Corner Post (G) - Mark a line on the post 6½" from the top. Slide the Corner Tie down from the top of the stud until the bottom of the Tie is on the mark. One arm of the Corner Tie should be extended to the right and the other arm extended backward. Fasten Corner tie to Post with Simpson Screws.

Front Right Corner Post (H) - Mark a line on the post 6½" from the top. Slide the Corner Tie down from the top of the stud until the bottom of the Tie is on the mark. One arm of the Corner Tie should be extended to the left and the other arm extended backward. Fasten Corner tie to Post with Simpson Screws.

### ***Drill holes in the Corner Posts (Figure #5)***

Start with the Back Left Corner Post (E) - On the wide side of the Post, mark a horizontal line 11" from the bottom of the Post and another horizontal line 21" from the bottom of the Post. Then mark center point of each line... It will be 1¾" from the sides of the Post. At the center points, drill a ~~5/8"~~ 5/16" hole through the Post. **(Corrected!)**

Repeat this process for the Back Right Corner Post (F), Front Left Corner Post (G), and Front Right Corner Post (H).

### ***Drill holes in the Extension Blocks (Figure #6)***

On the wide side of Extension Block (J) and Extension Block (K), draw a horizontal line 1" from the bottom and another 1" from the top. Then mark center point of each line... It will be 1¾" from the sides of the Block. At the center points, drill ~~5/8"~~ 5/16" holes through the Blocks. **(Corrected!)**

### ***Attach Extension Blocks to Back Corner Posts (Figures #7 and #8)***

Select the Back Left Corner Post (E). On the inner (right-facing) wide side, mark a horizontal line 12" from the bottom of the Post (which will be 1" above the bottom hole you previously drilled). Align Extension Block (J) vertically with the narrow edge against the Post, with the bottom of the Block at the line and the side of the Block flush with the back edge of the Post (see figure #7). Fasten the Extension Block to the Post using 3" wood screws.

Select the Back Right Corner Post (F). On the inner (~~right~~ left-facing) wide side, mark a horizontal line 12" from the bottom of the Post (which will be 1" above the bottom hole you previously drilled). Align Extension Block (K) vertically with the narrow edge against the Post, with the bottom of the Block at the line and the side of the Block flush with the back edge of the Post (see figure #8). Fasten the Extension Block to the Post using 3" wood screws. **(Corrected!)**

### ***Drill holes in the Side Panels (Figures #9 and #10)***

Select the Front Left Corner Post (G) - On the outer (left-facing) wide side of the Post, mark a horizontal line 10" from the bottom of the Post (one inch below the hole you previously drilled). Using 4" C-clamps, clamp the Left Side Panel (M) to the Post so that the edge of the Panel is flush with the edge of the Post and the bottom edge of the panel is on the horizontal line (figure #9). Use the carpenter's square to ensure that the Panel is perfectly perpendicular to the Post. Using the holes in the Post as pilots, drill through the holes into and through the Panel.

Select the Back Left Corner Post (E) - On the outer (left-facing) wide side of the Post, mark a horizontal line 10" from the bottom of the Post (one inch below the hole you previously drilled). Using 4" C-clamps, clamp the Left Side Panel (M) to the Post so that the edge of the Panel is flush with the edge of the Post and the bottom edge of the panel is on the horizontal line (figure #9). Use the carpenter's square to ensure that the Panel is perfectly perpendicular to the Post. Using the holes in the Post as pilots, drill through the holes into and through the Panel.

Select the Front Right Corner Post (H) - On the outer (right-facing) wide side of the Post, mark a horizontal line 10" from the bottom of the Post (one inch below the hole you previously drilled). Using 4" C-clamps, clamp the Right Side Panel (N) to the Post so that the edge of the Panel is flush with the edge of the Post and the bottom edge of the panel is on the horizontal line (figure #10). Use the carpenter's square to ensure that the Panel is perfectly perpendicular to the Post. Using the holes in the Post as pilots, drill through the holes into and through the Panel.

Select the Back Right Corner Post (F) - On the outer ((right-facing) wide side of the Post, mark a horizontal line 10" from the bottom of the Post (one inch below the hole you previously drilled). Using 4" C-clamps, clamp the Left Side Panel (N) to the Post so that the edge of the Panel is flush with the edge of the Post and the bottom edge of the panel is on the horizontal line (figure #10). Use the carpenter's square to ensure that the Panel is perfectly perpendicular to the Post. Using the holes in the Post as pilots, drill through the holes into and through the Panel.

### ***Drill holes in the Back Panel (Figure #11)***

Select the Back Left Corner Post (E) - On the outer (rear-facing) narrow side of the Post, mark a horizontal line 10" from the bottom of the Post (same location as the line used to align the side panel). Using 4" C-clamps, clamp the Back Panel (L) to the Post so that the edge of the Panel is flush with the left rear edge of the Post and the bottom edge of the panel is on the horizontal line (figure #11). Use the carpenter's square to ensure that the Panel is perfectly perpendicular to the Post. Using the holes in the Extension Block (J) as pilots, drill through the holes into and through the Panel.

Select the Back Right Corner Post (F) - On the outer (rear-facing) narrow side of the Post, mark a horizontal line 10" from the bottom of the Post (same location as the line used to align the side panel). Using 4" C-clamps, clamp the Back Panel (L) to the Post so that the edge of the Panel is flush with the right rear edge of the Post and the bottom edge of the panel is on the horizontal line (figure #11). Use the carpenter's square to ensure

that the Panel is perfectly perpendicular to the Post. Using the holes in the Extension Block (K) as pilots, drill through the holes into and through the Panel.

### ***Drill holes for fastening the Roof Strut Stabilizers (Y) to the Corner Posts (Figure #12)***

Select one of the 1" x 3" x 8' furring strips. Draw a horizontal line  $\frac{3}{4}$ " from each the end of the board. Mark the center point of each line. It will be  $1\frac{1}{4}$ " from the sides of the board. At the center points, drill a ~~5/8"~~ **5/16"** hole through the board. **(Corrected!)**

Select one more of the 1" x 3" x 8' furring strips. and repeat the above step.

### ***Notch the ends of the Roof Struts (X) (Figure #13)***

Each Roof Strut (X) (1" x 3" x 8' furring strip) will be notched at each end as indicated in figure #13. Each strut can be cut individually, but the 7 struts can be partially precut to save effort and time.

Bundle the 7 struts together on sawhorses. Align them so that they are on edge (narrow side as the base). Align the ends of the struts carefully and then clamp the bundle tightly with wood clamps or tie tightly with inflexible cord.

Using the carpenter's square, carefully draw a horizontal line across the bundle exactly  $1\frac{1}{2}$ " from the ends of the boards at each end of the bundle.

Set your circular saw to a depth of exactly 1". Cut across the bundle on the horizontal lines.

Undo the bundle and complete the notch by cutting from the ends of each strut to the precut.

**[Alternatively, if you have a router, you can use a straight bit to make the slots.]**

### ***Slot the Front and Back Top Rails (Figure #14)***

Select the Front Top Rail (A) and the Back Top Rail (B). Bundle the 2 Rails together on sawhorses. Align them so that they are on edge (narrow side as the base). Align the ends of the Rails carefully and then clamp the bundle tightly with wood clamps or tie tightly with inflexible cord.

Using a measuring tape, starting at one end, mark the boards at 10.5" and then at 6 intervals of 12". Verify that the resulting marks are at 10.5", 22.5", 34.5", 46.5", 58.5", 70.5", and 82.5". These are the center points for the notches. (Note: it is not critical to be very precise in these measurements!)

Next, using the carpenter's square, draw horizontal lines across the bundle  $\frac{3}{8}$ " before and  $\frac{3}{8}$ " after the center marks. You should then have seven  $\frac{3}{4}$ " wide areas marked on the boards.

Set your circular saw to a depth of exactly  $\frac{3}{4}$ ". Cut across the bundle on the horizontal lines. Use a very sharp wood chisel to knock out the wood plugs and file the slots smooth and even.

**[Alternatively, if you have a router, you can use a  $\frac{3}{4}$ " straight bit to make the slots.]**

### ***Install hanger bolts in the Corner Posts (Figure #15)***

Select the Front Left Post (G) and Front Right Post (H).

On the top of each Post, locate and mark the center point of the Post. It will be  $\frac{3}{4}$ " from each wide side of the Post and  $1\frac{3}{4}$ " from each narrow side of the Post. In the center point, drill  $\frac{3}{16}$ " pilot hole about  $\frac{3}{4}$ " deep, making sure the hole is perfectly vertical.

**Repeat for the Back Left Post (E) and Back Right Post (F). (Added!)**

### ***How to insert the Hanger Bolts (Figure #16)***

If you don't have a hanger bolt tool bit, use the following method to insert the hanger bolts:

- (a) attach two nuts to the hanger bolt on the machine threaded end.
- (b) turn the nuts so that they are snug against each other, using two wrenches, tighten them together.
- (c) insert the wood screw threaded end into the pilot hole in the end of the Post. Grip the pair of nuts with an adjustable wrench and turn the bolt into the pilot hole, ensuring that the hanger bolt remains as vertical as possible. Continue to turn the hanger bolt until the wood screw threaded end is completely in the hole.
- (d) Using two wrenches, turn the two nuts in opposite directions to loosen them, and then they can be removed.

**THIS COMPLETES THE FABRICATION OF THE SUKKAH COMPONENTS.**

## CONSTRUCTING A DOUBLE SUKKAH

To build a double size (8' x 16') sukkah, purchase double quantities of all materials except you will only need the one Plywood Sheet and only need 4 additional C-Clamps, not 8. You will also need to purchase three 3" x ¼" Lag Screws and washers.

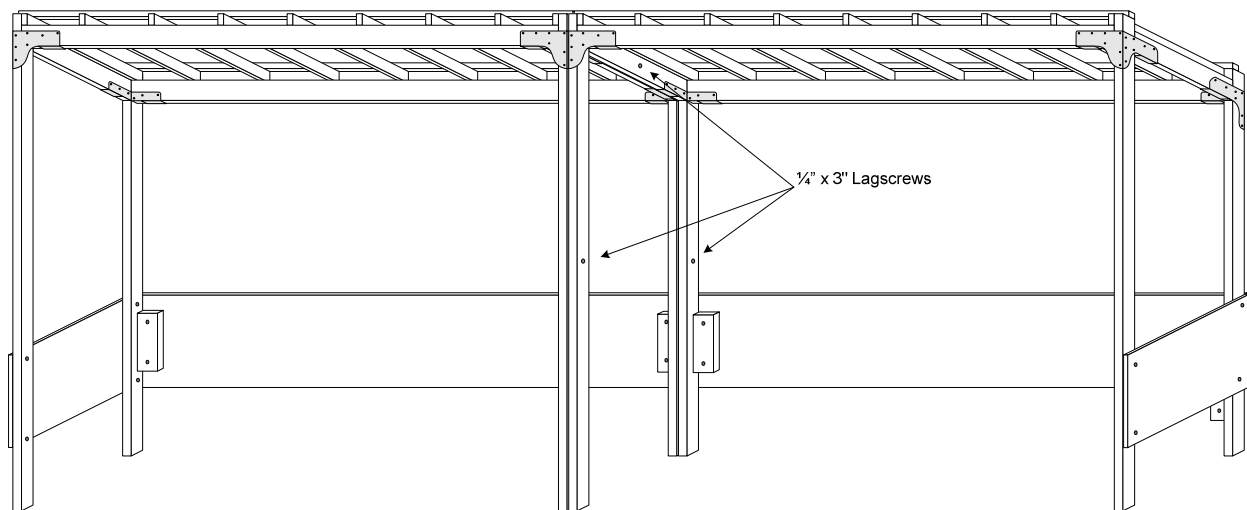
Fabricate the components the exact same way as for the single sukkah except that the fourth 12" x 8' sheet of plywood that was previously waste will now be used as another side panel.

You will construct two identical, but mirror image sukkahs that will be connected side-by-side. The construction will have the following changes:

The left-side sukkah will not have a Right Side Panel and the right-side sukkah will not have a Left Side Panel.

The Top Left Rail of the right-hand sukkah and the Top Right Rail of the left-hand sukkah will be fastened to their corner posts using screws instead of clamps

The center adjacent Top Rails and Corner Posts will be fastened together using 3" lag screws. Use one lag screw at the center points of the top rails and the corner posts.



## BILL OF MATERIALS

Component	Size / model	Quantity	Est. price each	Est. cost
Exterior Plywood Sheet	½" x 4" x 8'	1	\$35.00	\$35.00
Studs <sup>1</sup>	2" x 4" x 8'	9	\$3.00	27.00
Furring Strips <sup>2</sup>	1" x 3" x 8'	10	\$1.50	15.00
Simpson Strong Corner Tie	RTC24	4	\$5.75	5.75
Simpson Strong Tie Screws	SD8X1.25 1¼"	1 box (100)	\$9.00	9.00
Wood Screws	3" Phillips head	~6	\$0.05	.30
Wood Screws	2" Phillips head	~6	\$0.05	.30
Hanger Bolts	¼" x 3'	4	\$1.20	4.80
Machine Bolts*	¼" x 3½"	<del>8</del> -12	\$0.60	7.20
Nuts*	¼"	~12	\$0.10	1.20
Washers*	¼"	~24	\$0.05	1.20
C-Clamps*	2"	8	\$2.50	20.00
				\$126.75

<sup>1</sup>Actual dimensions are: 1½" x 3½"

<sup>2</sup>Actual dimensions are: ¾" x 2½"

\*Required for Assembly only.



**TOOLS REQUIRED FOR INITIAL FABRICATION OF COMPONENTS:**

Tools	Application
<b>Wood Saw - Circular Power Saw strongly recommended.</b>	Required for cutting plywood, studs, and furring strips.
<b>Drill and 3/16" and 5/16" bits - Power Drill highly recommended.</b>	Required for holes in Corner Posts, Back and Side Panels, and Extension Blocks.
<b>Screwdriver, medium Phillips head - Power Drill or Driver recommended.</b>	Required for attaching Corner Ties to Corner Posts and Extension Blocks to Rear Corner Posts.
<b>Wood Chisel, 1/2" and Hammer - Router recommended.</b>	Required for slotting Front and Back Top Rails for Roof Struts. Also could be used for notching Roof Struts.
<b>Wood Rasp and/or Sandpaper.</b>	Required to smooth the Rail slots and Strut notches.
<b>Small Adjustable or 7/16" Wrenches.</b>	Required for installing Hanger Bolts on top of Corner Posts.
<b>Carpenter's Square and Tape Measure.</b>	
<b>Pair of sawhorses.</b>	
<b>Clamps - 2 with Minimum 8" opening.</b>	

## COMPONENT LIST

Component ID	Component	Size / model	Quantity
	<b>Studs<sup>1</sup></b>	<b>2" x 4" x 8'</b>	<b>9</b>
<b>A &amp; B</b>	Front and Back Top Rails	Stud - 2" x 4" x 7'9"	2
<b>C &amp; D</b>	Left and Right Top Rails	Stud - 2" x 4" x 7'5"	2
<b>E, F, G, and H</b>	Corner posts	Stud - 2" x 4" x 8'	4
<b>J &amp; K</b>	Extension Blocks	Stud - 2" x 4" x 8"	2
	<b>Plywood Sheet</b>	<b>½" x 4" x 8'</b>	<b>1</b>
<b>L</b>	Rear Panel	Plywood - ½" x 12" x 8'	1
<b>M &amp; N</b>	Side Panel	Plywood - ½" x 12" x 8'	2
	<b>Furring Strips<sup>2</sup></b>	<b>1" x 3" x 8'</b>	<b>10</b>
<b>X</b>	Roof Struts	furring strip - 1" x 3" x 8'	7
<b>Y</b>	Roof Strut Stabilizers	furring strip - 1" x 3" x 8'	2
<b>Z</b>	Diagonal Stabilizers	furring strip - 1" x 3" x 4'	2
	<b>Simpson Strong Corner Tie</b>	<b>RTC24</b>	<b>4</b>
	<b>Simpson Strong Tie Screws</b>	<b>SD8X1.25 1¼"</b>	<b>~64</b>
	<b>Hanger Bolts</b>	<b>¼" x 3"</b>	<b>4</b>
	<b>Wood Screws</b>	<b>3" Phillips head</b>	<b>~6</b>
	<b>Machine Bolts*</b>	<b>¼" x 3½"</b>	<b><del>8</del>-12</b>
	<b>Nuts*</b>	<b>¼"</b>	<b>~12</b>
	<b>Washers*</b>	<b>¼"</b>	<b>~24</b>
	<b>C Clamps*</b>	<b>2"</b>	<b>8</b>

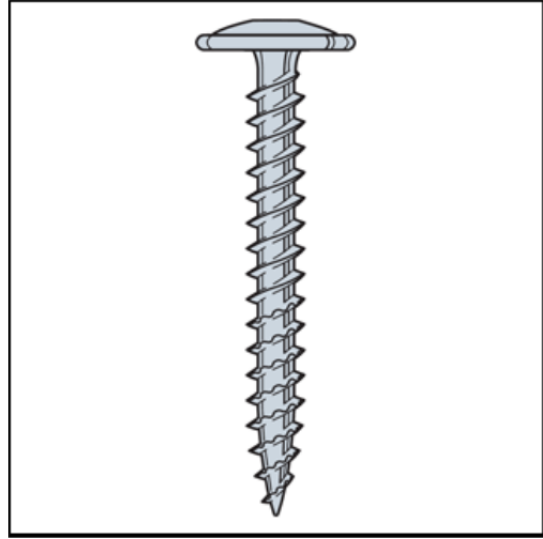
<sup>1</sup>Actual dimensions are: 1½" x 3½"

<sup>2</sup>Actual dimensions are: ¾" x 2½"

\*Required for Assembly only.



**Simpson Strong Corner Tie RTC24**



**Simpson Strong Tie Screws SD8X1.25 1 1/4"**



**Wood Screws - 3" Phillips head**



**Hanger Bolts - 1/4" x 3"**



**Clamps - 2 with Minimum 8" opening**



**C Clamps - 2" \***



**Stove Bolts - ¼" x 3½" \***