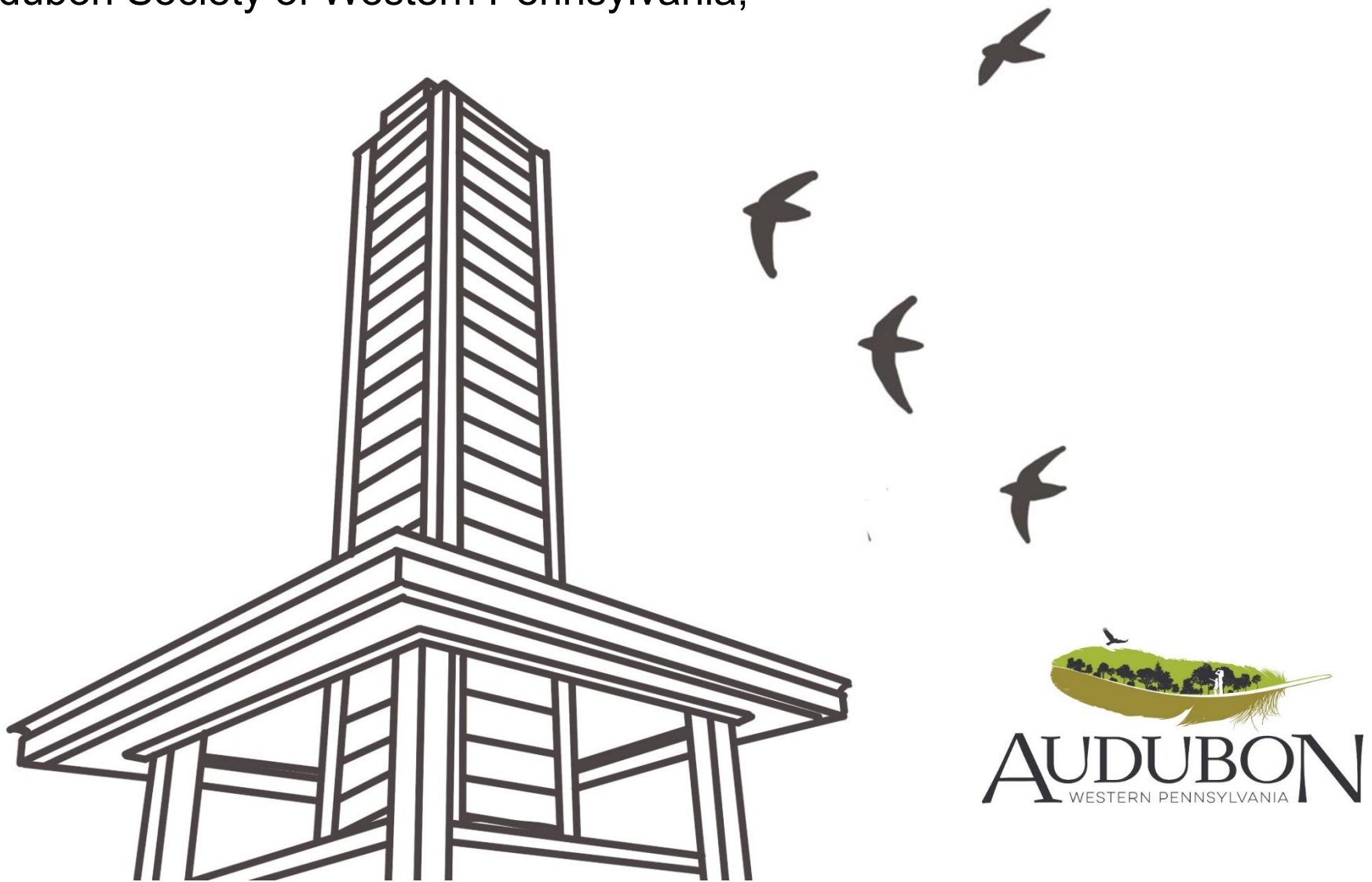


A Guide to Constructing Chimney Swift Towers

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Overview of a Chimney Swift Tower

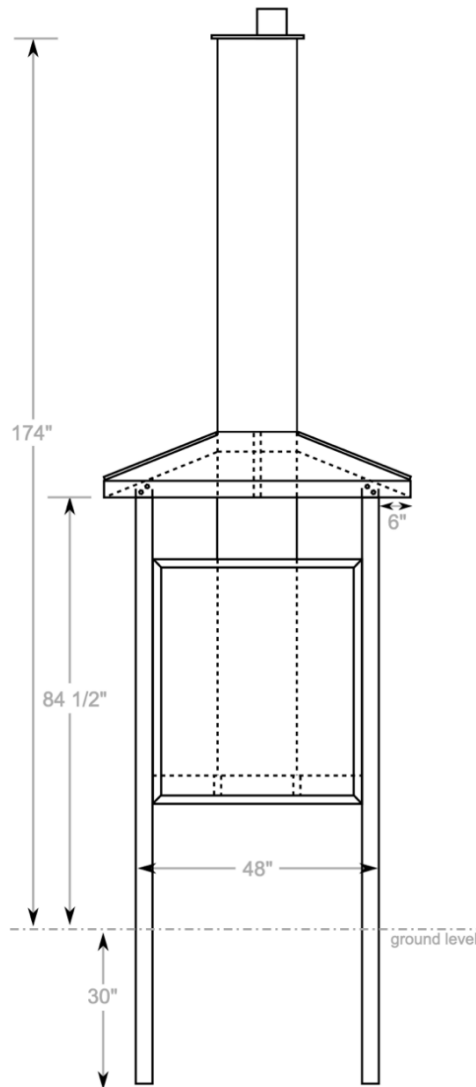


Figure 1. A completed Chimney Swift Tower is approximately 15 feet tall and 5 feet wide. It requires a minimum footing depth of 30 inches (as shown).

Required Tools:

Safety glasses, work gloves and other PPE as necessary
 Tape Measure, pencils/markers
 Hammer, caulking gun, paint brushes/rollers
 Circular saw (a miter saw is also strongly recommended)
 Framing & masonry saw blades (if using fiber cement siding)
 Drill/Impact driver with driver bits
 Framing square and rafter square
 $\frac{3}{8}$ " Drill bit and $\frac{1}{8}$ " masonry drill bit (if using fiber cement siding)
 Tin snips or side-cutters
 8 ft. or 10 ft. ladder
 Shovel, digging bar, and post-hole digger

Required Materials:

4 – 4"X4"X10' Pressure-treated, ground-contact
 4 – 48"X96" 19/32" T1-11 sheathing
 4 – 48"X96" Fiber cement (or engineered) panel siding
 4 – $\frac{3}{4}$ " X 2 $\frac{1}{2}$ " X 144" Fiber cement (or engineered) trim boards
 2 – 48"X96" $\frac{3}{4}$ " R-3.75 Foam board insulation
 2 – 48"X96" 23/32" Plywood sheathing
 2 – 2"X6"X8' Pressure-treated board
 8 – 2"X2"X8' Pressure-treated board
 4 – 2"X4"X10' Pressure-treated board
 3 – 2"X4"X8' Pressure-treated board
 16 – 1"X4"X8' Pressure-treated board
 1 – 30# Felt roof underlayment (218 sq. ft. roll)
 1 – Bundle roofing shingles (choice of type and color)
 2 – 10' Aluminum drip edge (choice of color)
 1 – 14 in. X 10' Aluminum roll flashing
 1 – 1lb. Box #8 X 1 $\frac{1}{2}$ in. Exterior wood screws
 1 – 1 lb. Box #8 X 2 in. Exterior wood screws
 1 – 1 lb. Box #10 X 3 in. Exterior wood screws
 1 – 1 lb. Box 1" Electro-galvanized roofing nails
 1 – 1 lb. Box 1 $\frac{1}{2}$ " 4D Hot-dipped galvanized common nails
 16 – $\frac{1}{4}$ " X 4" Structural wood screws (Spax/Fastenmaster)
 1 – Tube latex or elastomeric joint sealant
 1 – Gal. Multi-Surface Sealer Primer
 1 – Gal. 100% acrylic exterior paint (choice of type and color)

Getting Started

This guide has been developed to offer instructions for what we consider to be the most effective and efficient process for building a swift tower. The design is based on the original work done by Paul and Georgean Kyle. This tower design would not be possible with the groundwork that they laid.

It is worth noting that we work in Pennsylvania. We do not have pests such as ants that may require additional considerations to protect the nestlings. We are also fortunate to have soils that offer a stable footing for the tower. If you are unsure of the structure of your soils, we recommend consulting with a building code professional in your area to understand recommended footing procedures. This may impact the footing depth or type of footing. Building a swift tower requires a considerable amount of time and resources.

Considering your local environment and building codes will ensure long-term success for your project.

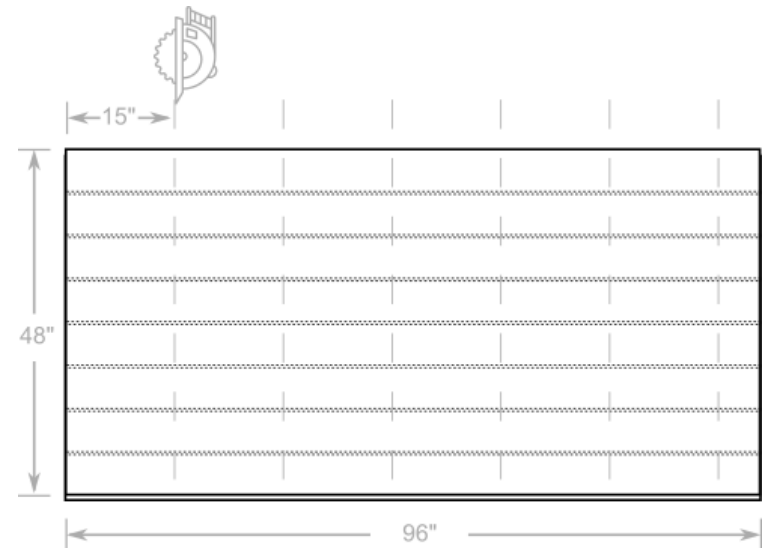
Because swift towers are typically placed in areas without the modern conveniences of a home or workplace, the first portion of the instructions is intended to be done prior to arriving at the installation location. Taking advantage of a dry, flat and level workspace, we will pre-fabricate several sections of the tower. These sections, along with pre-cut pieces and some remaining materials will then be transported to the installation site for final assembly. Many of the tools necessary to pre-fabricate the sections will also be needed in the field, so cordless tools, or a nearby power source will serve you well.

A how-to video is also available from our website at aswp.org. It may be valuable to view the video first, so that terminology and the overall construction sequence is understood before using this guide to constructing a swift tower.

Pre-Fabrication Constructing the Tower Column

Examine the sheets of T1-11 to familiarize yourself with its details. One side of the T1-11 is grooved, the other side is smooth. Please note the orientation of the grooves with relation to the 48" and 96" sides of the sheet. Are the grooves parallel or perpendicular to the 96" length of the sheet? This is important in the following steps. Finally, note that the long edges of the T1-11 are tongue-and-groove in nature. When stacking, one sheet of T1-11 would overlap the sheet below it. This too, becomes important in the following steps.

STEP 1. Using two sheets of T1-11 sheathing, cut a total of twelve (12) 15" X 48" as shown in [Figure 2](#). These pieces will be used to form the nesting column and will be referred to as column sides in the next steps.

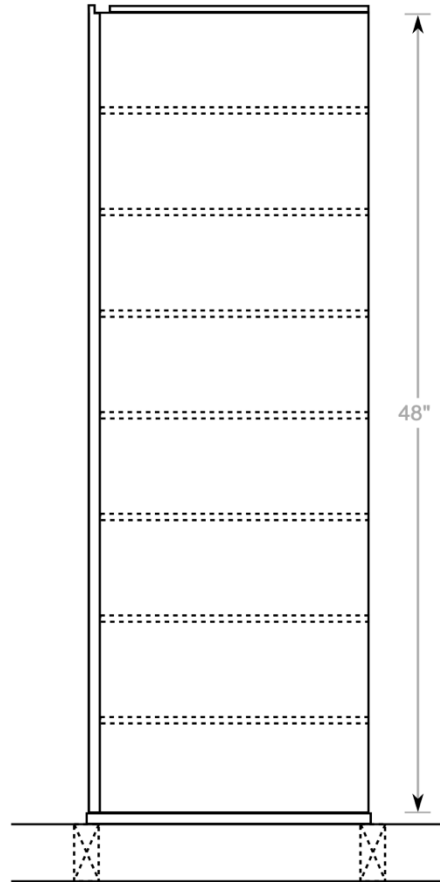
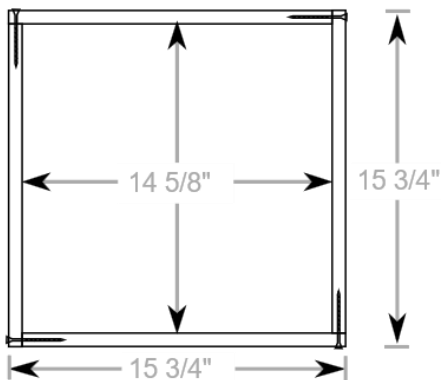


[Figure 2](#). T1-11 cutting pattern for column sides.

Note: The orientation of the grooves on the T1-11 is important. When constructed, we want the grooves to be horizontal to the ground so they offer the birds a place to affix their nest (like mortar joints in a traditional chimney). Therefore, when cutting the sheets of T1-11, ensure that the grooves run parallel to the 15” width of the column sides.

If your grooves run perpendicular to the short end of the sheet, you will need to rip the 96” length into two 48” sections, and then cross-cut those halves into the 15” X 48” column sides.

Step 2. Using four (4) of the column sides, place them with the 15” groove-side down, and the 15” tongue side facing upward. Arrange the column sides so that the corners alternate, as shown in Figure 3. This will ensure that you end up with a perfectly square 15 3/4” column.



Figures 3 and 4. Alternating corners, grooves facing inward and T1-11 tongue and groove orientation.

Step 3. Using #8 X 2 in. exterior screws, fasten the four column sides together as shown in Figures 3 and 4.

Step 4. Repeat steps 2 and 3 for the rest of the column sides.

The three completed column sections can be set aside for use later.

Step 5. Using two (2) 2”X 4” X 8’ and two (2) 2” X 4” X 10’ boards, cut the various components needed to frame the kiosk roof.

From the two (2) 8’ boards, cut two (2) 48” boards and two (2) 45” boards.

From the two (2) 10’ boards, cut two (2) 19” boards, two (2) 16” boards, and cut eight (8) 15 1/4” boards with 30-degree ends as shown in Figure 5.



Figure 5. 2” X 4” X 15 1/4” rafter detail.

Step 6. Using #10 X 3 in. exterior screws, attach the two 48” boards and the two 45” boards to form a 48” square frame.

Step 7. Using #10 X 3 in. exterior screws, attach the two 19” boards and the two 16” boards to form a 19” square frame.

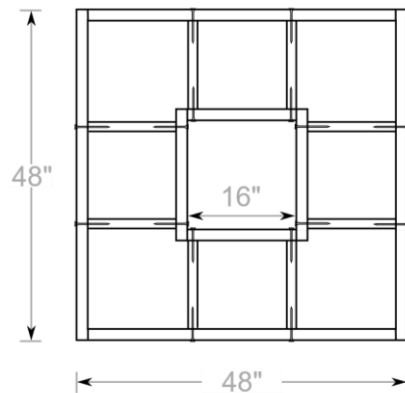
Note: It is important to be sure that the *inside* dimensions of this frame measures 16” on all sides. Make any minor adjustments necessary to be certain this is the case. A column section will need to slide through this frame in a later step, so the inside dimension is vital.

Step 8. Measure 16" in from each corner of the 48" frame and make a mark on the top of the board. Using a rafter square, extend these marks across the top and down the inside of each board. Likewise, measure 1 ½" in from the corner of the 19" frame, make a mark and extend that line across the top and down the outside of each board. These lines represent the outside edges of the eight roof rafter locations.

Step 9. Locate an object or build a box out of scrap lumber that measures 8 to 9" tall and approximately 18" square. Place this in the center of your 48" frame – it'll serve to prop-up the center of the roof frame to the correct height for the next step.

Step 10. Place the eight 15 ¼" boards between the 19" frame and 48" frame at the locations marked in Step 8. The outside edge of each rafter should be aligned with the lines you made. Your framing should match [Figure 6](#).

Step 11. Using #10 X 3 in. exterior screws, secure each rafter in place.

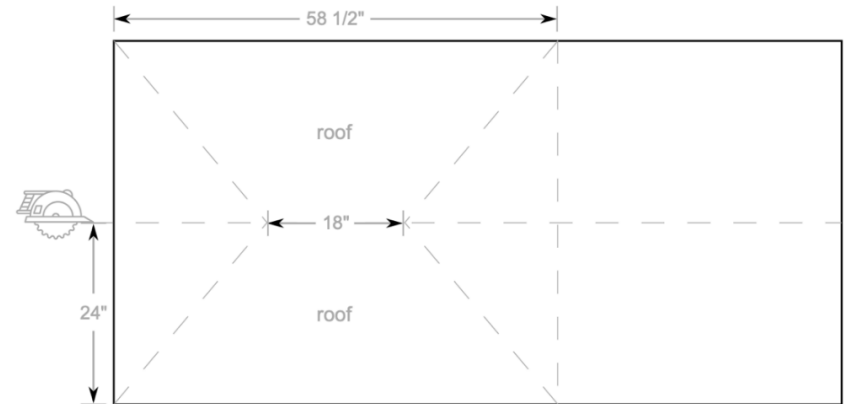


[Figure 6](#). Kiosk roof framing.

The roof framing can be set aside for use later. The object or box you built as a prop can be discarded

Step 12. Using the two (2) sheets of 23/32" plywood, cut four (4) sections of roof sheathing as shown in [Figure 7](#).

Note: The easiest way to make these cuts are as follows: Mark and rip the sheet at 58 ½". Set the remaining 37 ½" X 48" piece aside for now. Mark and cross-cut the 48" X 58 ½" piece to form two (2) 24" X 58 ½" pieces. On one of the 58 ½" edges of each sheet make marks at 20 ¼" and at 38 ¼". Using a straight-edge, connect these marks to the opposite corner of the 58 ½" sheet. The resulting trapezoid should measure 58 ½" along the bottom edge and 18" along the top edge.



[Figure 7](#). Roof sheathing cutting diagram.

The four (4) sections of roof sheathing can be set aside for use later.

Step 13. Using one of the left-over 37 ½" X 48" pieces of plywood from the previous step, mark and make cuts to create a 22" square piece of sheathing. This will serve as the column top.

Step 14. Using plunge cuts, cut a 6" X 11" square into the column top. The hole should be offset, with the first 11" cut along the center line of the 22" column top as shown in Figures 8 and 9.

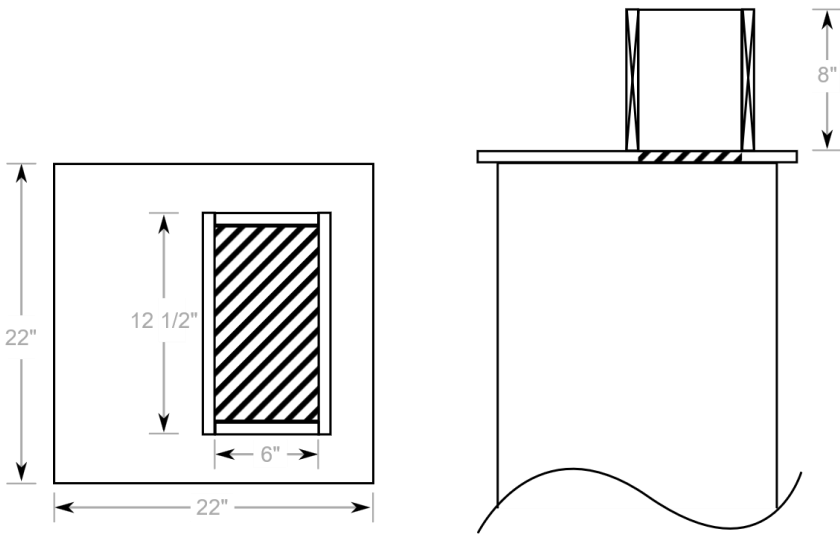
Step 15. Using that same scrap piece of sheathing, mark and make cuts to form two (2) 8" X 12 ½" pieces and two (2) 8" X 6" pieces.

Step 16. Using #8 X 2 in. exterior screws, attach these four pieces together to form a 12 ½" X 7 ½" box. This box becomes your sun collar as shown in Figures 8 and 9.

Step 17. Using #8 x 2 in exterior screws, attach the sun collar to the column top by screwing through the underside of the column top and into the sun collar edges.

Step 18. Using the other 37 ½" X 48" piece of plywood, cut a 16" square. This will become your column bottom as shown in Figure 10.

Step 19. A series of ventilation holes are required in this 16" square piece of sheathing. Following the pattern shown in Figure 10, drill the forty-nine (49) 3/8" holes.



Figures 8 and 9. Column top and sun collar detail.

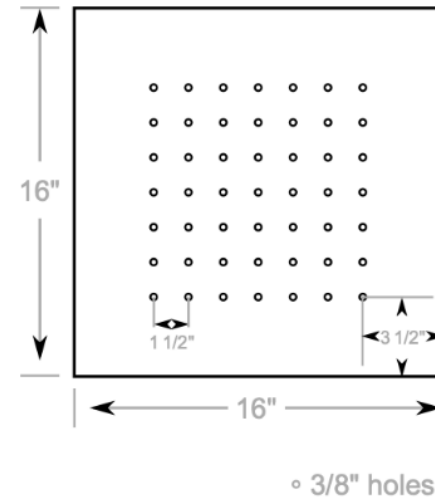


Figure 10. Column Bottom Detail

Step 20. Using #8 x 2 in. exterior screws, affix the column top to the top one of the column sections (top of column has the tongue on the outside edge of T1-11), and affix the column bottom to the bottom of one of the other column sections (bottom of column has groove on inside edge of T1-11). By default, the remaining tower column will become the center section.

Note: This is an excellent time to put a couple of coats of paint and primer on the column top, all sides of the sun collar, and the column bottom. It is much easier now, than when the swift tower is assembled.

Step 21. Using the remaining two (2) sheets of T1-11, mark and cut to form four (4) 37 1/2" X 48" pieces. These will become your kiosk panels (or sign panels).

Step 22. Using the eight (8) 2" X 2" X 8' boards, miter cut eight (8) 48" lengths and eight (8) 37 1/2" lengths. These boards will become a finished border on the kiosk panels. We use 45-degree miters on all ends, so the 2" X 2" create a picture frame effect when assembled.

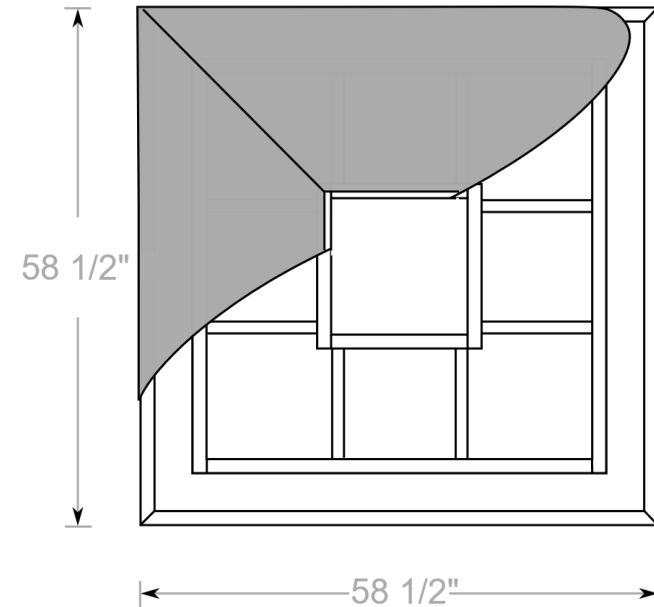
Step 23. Using #8 X 2 in. exterior screws, affix the boards to the T1-11 kiosk panels to create the aforementioned picture frame effect. Carefully positioning the boards along the edge of the panels and screwing through the back of the T1-11 and into the 2" X 2" boards is the cleanest look, however pre-drilling and counter-sinking the screws in the 2" X 2" picture frame looks nice too, especially if you space the screws evenly.

Step 24. Using the four (4) sheets of fiber cement, mark and cut eight (8) 17" X 96" sheets. These will be used as siding on the tower column. Each will be cut to the exact length at the tower location, so leave them all at 96" length for now.

Step 25. Using the two 2" X 6" X 8' boards, mark and cut four (4) 42" boards. These four boards will be assembled in the field and will form an "H" between the kiosk posts that supports the weight of the column.

On two (2) 42" boards, mark lines at 14 1/2" and 30 1/2". Transfer those lines across the top and down the sides of the boards. These lines represent the outside edges of the 2" X 6" boards that form the inside of the "H" as shown in [Figure 13](#) on Page 8.

Step 26. Using the remaining two (2) 2" X 4" X 10' boards, cut four (4) 58 1/2" boards. For aesthetics, these boards should have 45-degree mitered ends along the long (3 1/2") edge of the boards. These boards will become fascia boards along the outer edge of the roof and will need to form a 58 1/2" square box, as shown in [Figure 11](#).



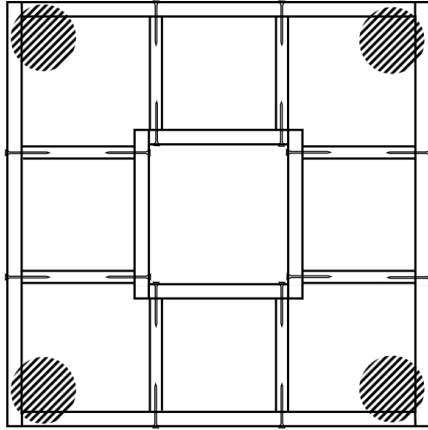
[Figure 11](#). Kiosk roof cut-away with 58 1/2" fascia boards.

Step 27. Assemble each prefabricated components and all remaining materials and transport to the installation location.

This concludes the pre-fabrication steps.

All steps beyond this point are done at swift tower location

Step 28. Using the roof framing structure, mark the four post hole locations as shown in [Figure 12](#). The posts will attach on the inside of the roof framing structure, with overall dimensions of 45" to all outside corners. The roof framing acts as a convenient template to mark those locations.



[Figure 12](#). Using the roof framing as a post hole template.

Step 29. Dig footing holes to a depth of 30" and tamp the base of the holes tight, leaving no loose soil or rocks.

Note: If you are working on uneven terrain, you may need to make adjustments to the depth of the footing holes as necessary, but we strongly recommend 30" depth at a minimum. Therefore, you may need to make uphill post hole locations a bit deeper than 30".

Step 30. Position the roof framing structure over the holes again and check for alignment. Leaving the roof framing in place, insert the 4" X 4" X 10' posts into the footing holes. Have a partner hold the posts as plumb as possible and begin loosely backfilling the holes with the soil that was removed in Step 27. Tamp the soil firmly as fill and continue checking your spacing and plumbness (38" between the inside sides of each 4X4, or 45" from outside edge to outside edge of each 4X4).

Step 31. Once all holes are filled and tamped firmly, you can slide the roofing structure up the posts, and using #10 X 3 in. screws, attach one corner of the roofing framing structure to the top of a 4" X 4".

Step 32. Using a level, ensure the roof framing is perfectly level and secure it to the three (3) other posts.

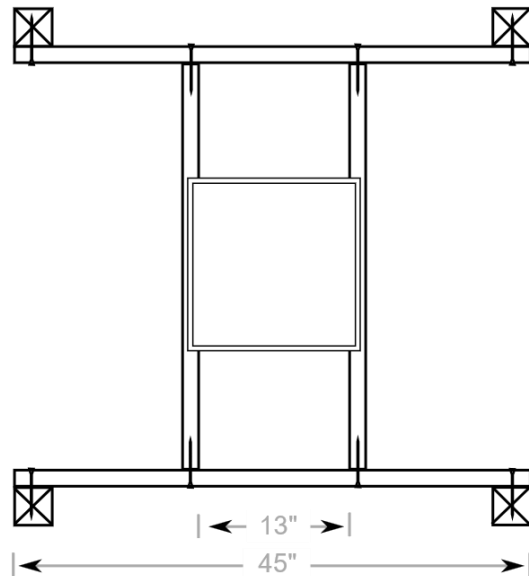
Note: If your post holes were 30" deep, you should have a measurement of ~86 1/2" from the ground to the bottom of the roof framing. If you are on uneven terrain, one of your four measurements should be 30" deep. Make note of that post and proceed with it for the next step.

Step 33. From the underside of the roof framing, measure down each post and make a mark at 60". Using a level, double check that these marks are level with one another. This will double check the level of your roof framing, and it'll ensure that the tower support is installed level. Using a rafter square, extend your marks across the inside faces of each 4" X 4" post.

Step 34. Using 1/4" X 4" structural screws, affix one of the 42" long 2" X 6" boards to the inside of two 4" X 4" posts (be sure the lines you made on this board earlier are facing inward). The bottom edge of the 2" X 6" should align with the marks you made at 60" on the posts, and should be centered on the posts.. Affix the other 42" board to the opposite pair of 4" X 4" posts, again making sure the marks you made earlier are facing inward and the 2" X 6" is centered on the posts (you will need the remaining 1 1/2" on the outside edges of the 4" X 4" posts to make room for kiosk panels later).

Step 35. Using $\frac{1}{4}$ " X 4" structural screws, affix the remaining two 42" boards to the inside of the two boards you just installed. Align the outside edge of each board with the line you made in an earlier step. When looking down from above, you will have formed an "H" with two center connectors as shown in [Figure 13](#).

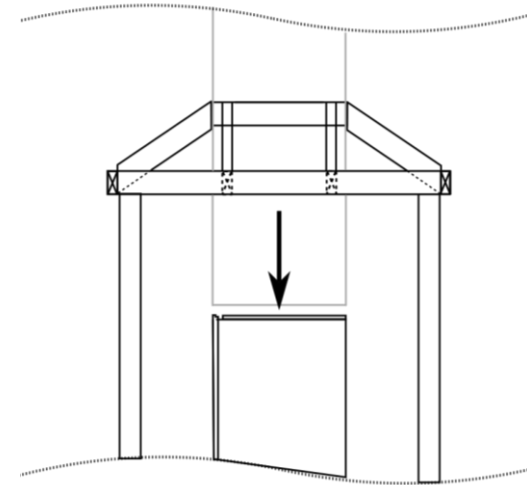
Note. The two center connectors must measure 13" apart, or 16" from outside edge to outside edge.



[Figure 13](#). Bird's-eye-View of "H" tower column support framing.

Step 36. Center the bottom tower column section (the one with the ventilated bottom on it) on the "H" framing you just created. Ensure it is centered on the 2" X 6" center supports from both directions, as shown in [Figure 13](#). Using #8 X 2 in. screws, toenail the bottom column in place. These screws are best placed through the bottom and into the 2" X 6".

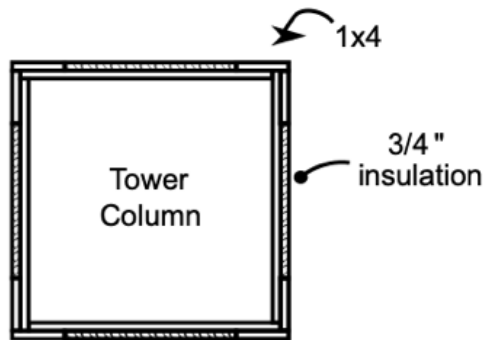
Step 37. With the help of a partner, carefully slide the center column section down through the roof framing. Align the tongue-and-groove sections of the T1-11 columns with one another until they are locked together evenly as shown in [Figure 14](#). Be sure that your column is plumb by using a level along two sides of the column. From your ladder, you can also use a level across the top of the column to check plumb.



[Figure 14](#). Slide center column down through roof framing.

Step 38. Using #8 x 2 in. exterior screws, secure the inner roof framing to the center tower column. Use two (2) screws per side, placed as near the corners of the column as possible. Drive the screws through the 2" X 4" framing and into the T1-11 column. This step locks the column to the roof framing and associated posts which ensures a stable column.

Step 39. Measure and cut eight (8) 1" X 4" boards to length to fit along the vertical edges of the tower column. Using #8 x 1 1/2 in. exterior screws, attach the boards to the outside edges of the tower column. These boards will extend from the underside of the inner roof framing to the bottom of the tower column. Begin by attaching four of the boards on two opposite sides of the tower column, and then the remaining four boards to the other two sides. When completing the final two sides, overlap the outer edge of the 1" X 4" that was previously installed to create a new outside corner as shown in [Figure 15](#).



[Figure 15](#). Tower column with overlapping 1X4 corners.

Step 40. Using #8 x 2 in. exterior screws, attach the four (4) pieces of roof sheathing. Ensure all edges and corners line up before securing in place.

Note: The upper edge of the roof sheathing will NOT reach the tower column. There will be a ~ 1" gap as shown in the roof cut-away back in [Figure 11](#) on Page 6.

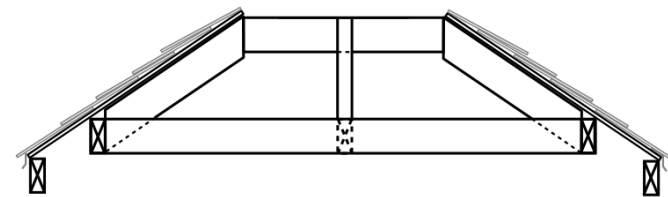
Step 41. With a partner, carefully hoist the upper tower column onto the kiosk roof. Using ladders, and placing your weight on the roof if needed, position the upper tower column on top of the center column, ensuring secure fitment at the tongue-and-groove connection.

Step 42. Using #8 X 1 1/2 in. exterior screws, attach the eight (8) remaining boards (cut to length) to the outside edges of the tower column. Follow the same procedures as you did previously, to tie the upper tower column sections together.

Step 43. Mark and cut the 3/4" foam insulation to fit between the 1" X 4" boards on all sides of the tower column (above and below the roof) as shown in [Figure 15](#). Attach the insulation to the tower column using a bead of construction adhesive.

Step 44. Using #10 X 2 in. exterior screws, attach the four mitered 58 1/2" boards to the underside of the outer edge of the roof sheathing, being careful to align the corners properly. To keep the corners aligned and square, use #8 X 3 in. exterior screws to attach the mitered ends to one another.

Step 45. Cut and install aluminum drip edge along the outer edge of the roof sheathing, as shown in [Figure 16](#). Cutting outside mitered ends on the angled drip skirt will produce a more finished look.



[Figure 16](#). Kiosk roof framing, drip edge, and shingled roof detail.

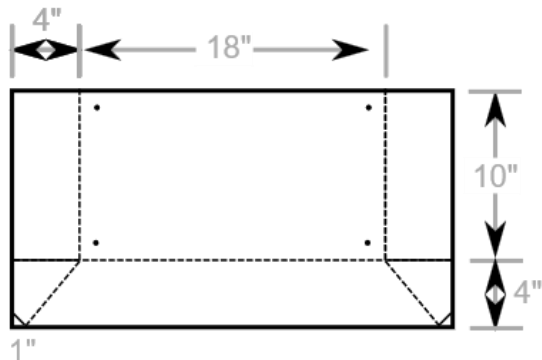
Step 46. Unroll the felt underlayment and cut four (4) 60" lengths. Affix the felt to the roof sheathing using staples, allowing it to overlap as needed. Trim excess along the outer edges of the drip edge.

Step 47. Using 1" electro-galvanized roofing nails, and beginning at the lower edge, install a starter strip of shingles, followed by a step pattern of shingles until you reach the top of the roof sheathing.

Step 48. Cut and bend corner shingles for the four corners of the roof and install using the same step pattern.

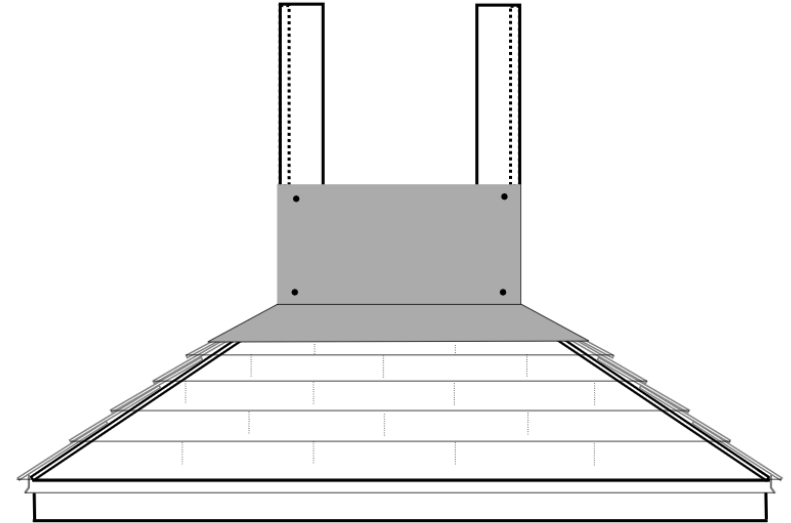
Note: If you are unsure of proper shingle installation refer to the package instructions on your shingle bundles.

Step 49. Unroll and cut the aluminum roll flashing into four (4) 26" lengths. Working with a length at a time, measure, mark, and cut the aluminum as shown in [Figure 17](#).



[Figure 17](#). Aluminum flashing cutting/folding detail. Folds are shown as dotted lines, cuts are shown as solid lines.

Step 50. Using four (4) 1" electro-galvanized roofing nails, attach each piece of aluminum flashing to the tower column as shown in [Figure 18](#), ensuring that the aluminum is folded appropriately and laying flat over the shingles in all areas.



[Figure 18](#). Aluminum flashing placement

Step 51. Using your ladder, measure from the underside of the column top to the bend in your aluminum flashing. Transfer this measurement to four (4) of the 17" X 96" fiber cement (or engineered) panels and four (4) lengths of the HZ5 Primed Fiber Cement (or engineered) Trim boards. Make the appropriate cuts.

Step 52. Mark pilot hole locations 1” in from the edge, and every 12” along the long edges of the siding panels and trim boards. Using a 1/8” drill bit, pre-drill these locations.

Note: If using engineered wood panels, pre-drilling may not be necessary.

Step 53. Using 1 ½” 4D hot dipped common nails, secure the fiber cement panels to the four (4) faces of the upper column, as shown in Figure 18.

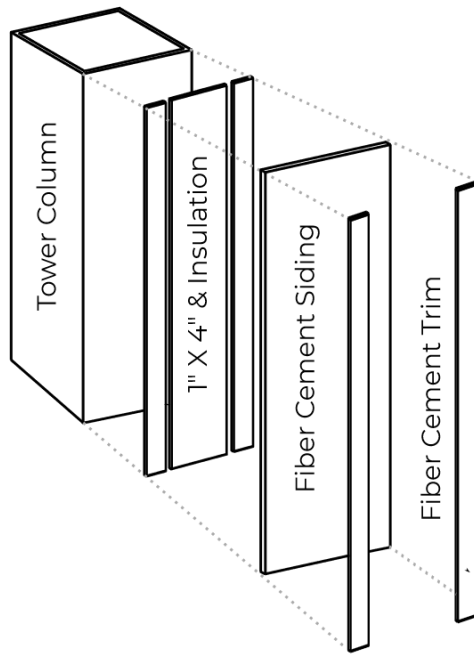


Figure 19. Exterior column layers.

Step 54. Using 1 ½” 4D hot dipped common nails, secure the fiber cement trim boards to the outer edges of the tower column. Install the trim on opposite faces of the tower column, and then finish the other two faces by overlapping the trim edges to create new outside corners.

Step 55. Repeat steps 48 through 51 for the lower column, under the kiosk roof.

Step 56. Using a latex joint sealant and caulking gun, seal all cracks formed on the edges of the fiber cement panels and fiber cement trim. We use QUAD #517 Exterior Window, Door and Siding Sealant, but any elastomeric or latex sealant will work well.

Step 57. Using the 100% acrylic paint of your choice, apply two coats to all exposed surfaces of the fiber cement or engineered siding products.

Note: You may paint the surfaces of the pressure-treated lumber as well, if you wish. We normally do not, and allow the exposed wood to naturally weather, which results in an earthy, gray-brown color over time.

Step 58. Using #10 X 3 in. exterior wood screws, attach the four (4) kiosk panels to the openings between the 4” X 4” posts. The exact height of the panels does not matter, but we find that panels mounted 28” above the ground offer a comfortable height for signage, maps, or other information that may be attached to the kiosk panels.

Congratulations, your swift tower is now complete!

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