



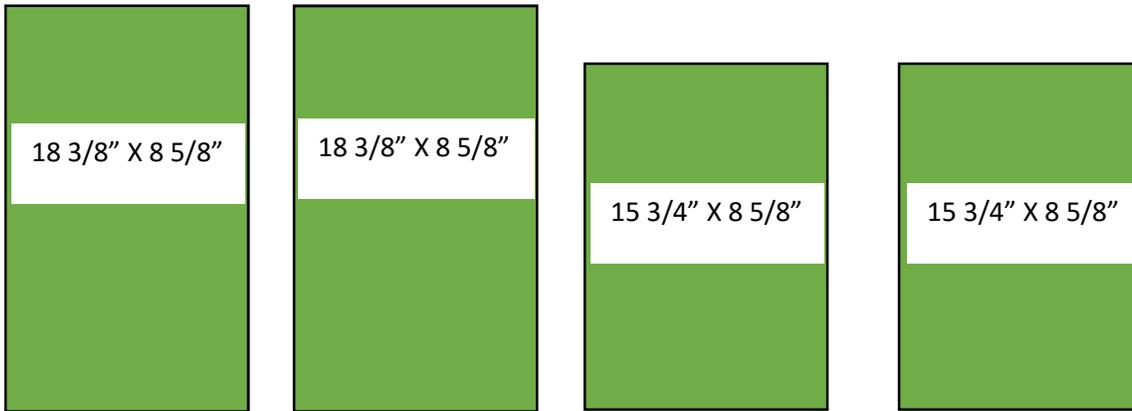
How to Build and Insulated Hive

Supplies for TWO insulated deep boxes:

- 1 – 4' X 8' .5" plywood
- 1 – 2' X 8' 1.5" Polystyrene Insulation
- 1 – 2' X 2' # 8 Hardware cloth or metal window Screen
- 2 – 2" X 4" X 8' boards
- 1 – 1 1/2" X 4' wood dowel
- Titebond III Wood Glue
- Loc-tite: PL Premium construction adhesive
- Nails/Screws/Staples
- (Optional 2' x 2' galvanized sheet metal for frame rests).
- Tools: Tape measure, Jigsaw/table-saw/miter saw, Drill, 1 1/2" hole saw, 7/8" spade bit, straight edge, retractable knife (for cutting insulation), Carpenters square, and Heavy duty stapler.

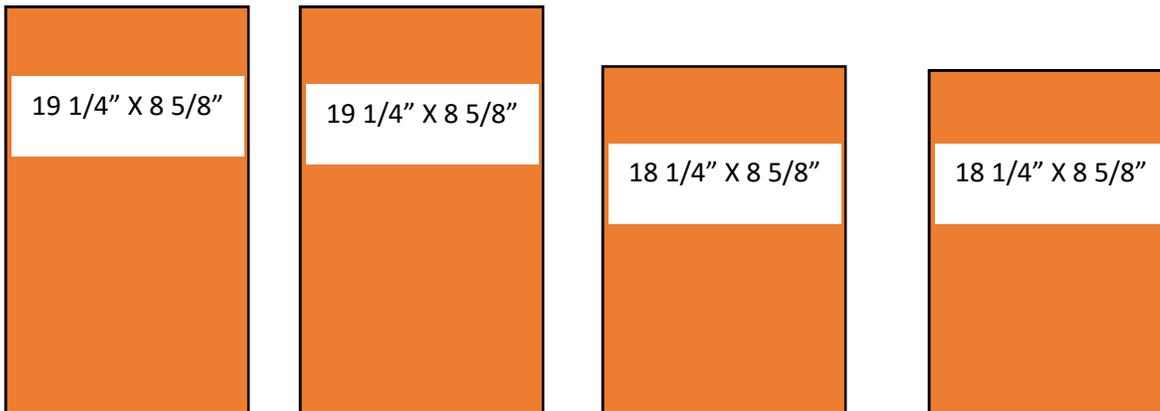
*when cutting remember to account for blade kerf and [reference tips on the last page](#) before starting the project.

Link to how to video: <https://www.youtube.com/watch?v=UFhYXxQizcA>



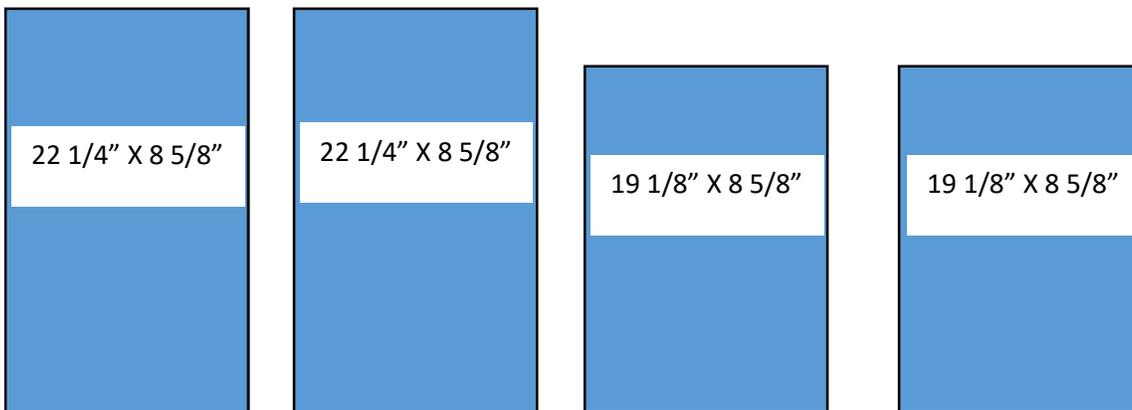
1> Make an 8 5/8" rip cut length way on a sheet of plywood.

2> *Cut two pieces at 18 3/8" and two pieces at 15 3/4" (this will form the inside of one box).



1> Make an 8 5/8" rip cut length way on the sheet of insulation.

2> *Cut two pieces at 19 1/4" and two pieces at 18 1/4" (this will go on the outside of the interior plywood box).

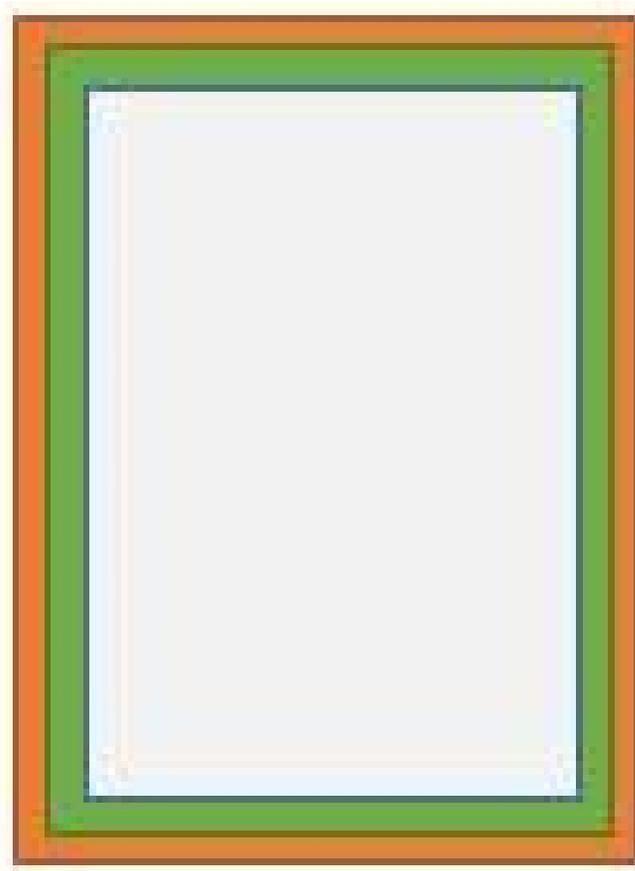


1> Using existing 8 5/8" rip plywood.

2> *Cut two pieces at 22 1/4" and two pieces at 19 1/8" (this will form the outside of one box).

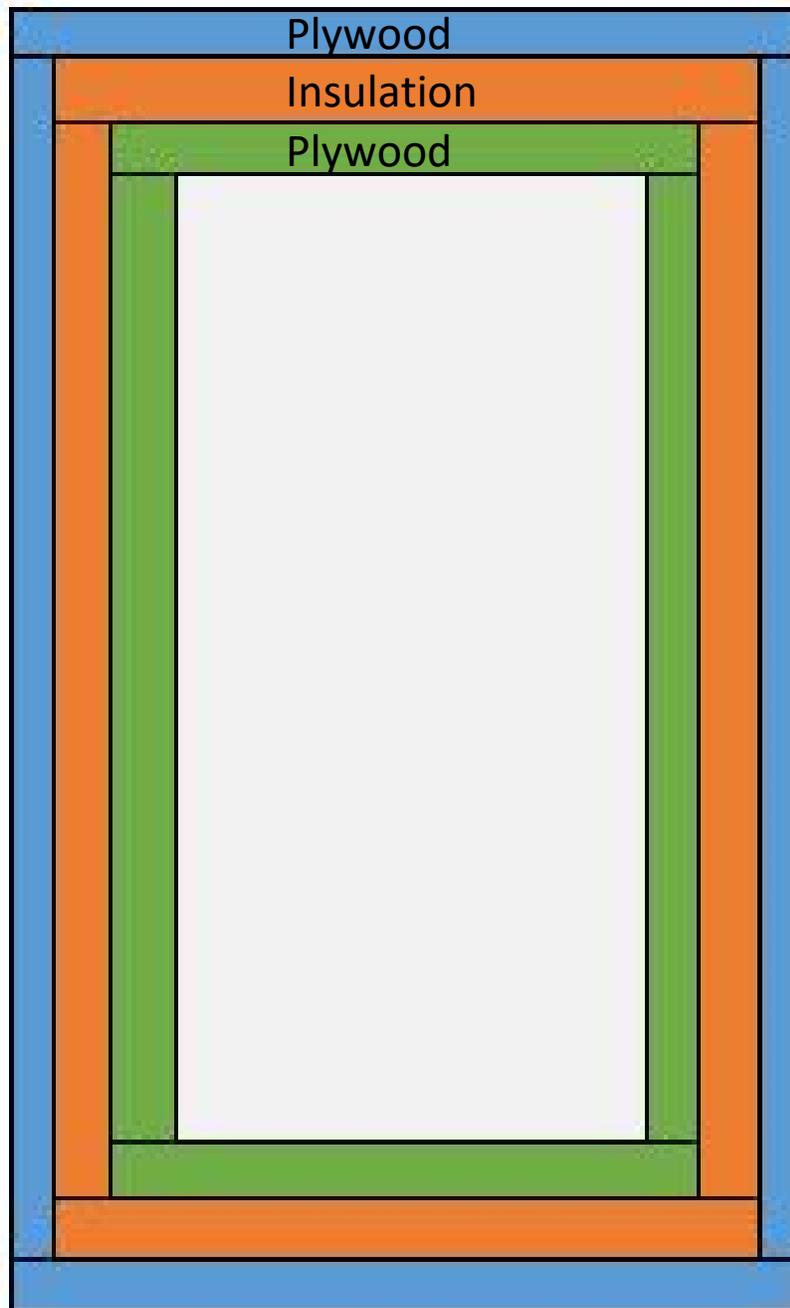
**Orange is the insulation wrapped around the plywood interior (green).

Premium XL is applied to the insulation when applied to the plywood.



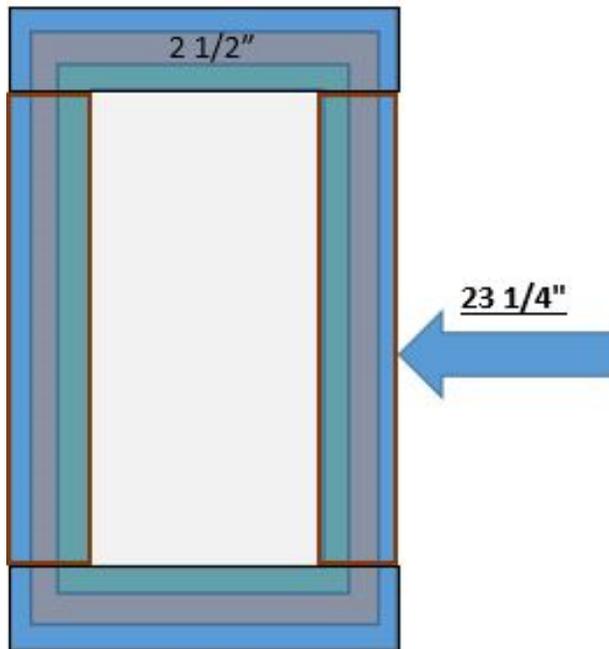
After All cuts are made, fasten the end pieces of inner-box to the side pieces of the inner-box using a line of glue and fasteners to cap both end of the side pieces to make a box. After the box has dried, install insulation as described above**. Following the same procedure as the inner-box assemble the outer box around the insulation/inner-box.

The instructions above should produce a result similar to the diagram below.

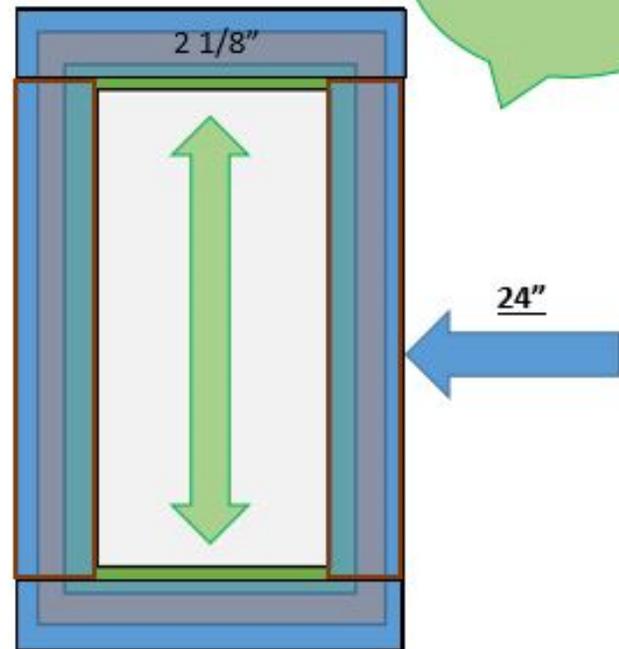


1. From the remaining plywood two pieces $2\frac{1}{2}$ " wide and $23\frac{1}{4}$ " long and two pieces $2\frac{1}{2}$ " and 24 " long. Also cut two pieces that are $2\frac{1}{2}$ " wide and $19\frac{3}{4}$ " long *(Optional: cut two strips of sheet metal $2\frac{3}{4}$ " and $19\frac{3}{4}$ "*).
2. Also from the plywood cut two pieces that are $2\frac{1}{8}$ " wide and $19\frac{3}{4}$ " long.

Bottom View

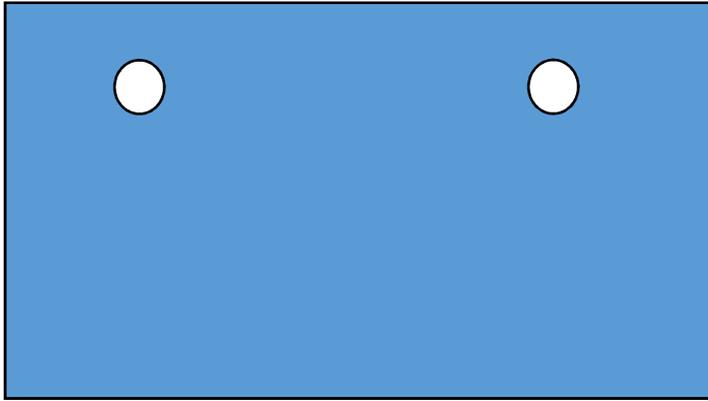


Top View



*(Use adhesive before sheet metal is installed under the $2\frac{1}{8}$ " X $19\frac{3}{4}$ ".)

After the box has dried, it is time to install vent holes. For this you will need a $1\frac{1}{2}$ " hole saw, a $\frac{7}{8}$ " spade drill bit, and a length of $1\frac{1}{2}$ " of wooden dowel.



- 1) Cut four 1 1/2" holes in the box that are 2 1/2" down and 5" over from the nearest end
- 2) Cut four 2 1/2" pieces of wooden dowel.
- 3) Cover the outside of the dowel in wood glue and slide it into the hole and allow to dry.
- 4) After dry, mark the center of each dowel and bore out with the 7/8" spade bit.
- 5) Cut 4 - 2" X 2" piece of #8 hardware cloth or metal window screen. Staple the screening over the inside of the vent holes.
- 6) Lastly, use some form of exterior coating on all surfaces of the box excluding the four interior walls.

The deep box is now complete. Use these boxes as the brood chambers for the hives. If smaller more manageable honey supers are desired either use traditional Langstroth medium boxes with a shim to accommodate the added area of the insulated boxes or follow the instructions above using the medium Langstroth dimensions.

For handles rip a 16" 2x4 board in half and cut into 8" lengths and fasten to the sides of the box.

Deep Box Complete

Tips:

- Measure every piece before moving to the next step. Dimensions may be slightly different depending on materials used.
- Use PL Premium on all outside components and TiteBond III wood glue on inner components. These are tested brands, but not required to complete the project.
- Exterior of the box needs a primer base coat and exterior rated 2nd and or 3rd coating

Notes:

Bottom Board with removable back:

How to video link: www.youtube.com/watch?v=xsTup1i2AcA

Materials to get started: (REMEMBER TO MEASURE AS YOU GO TO INSURE SURE CORRECT ASSEMBLY)

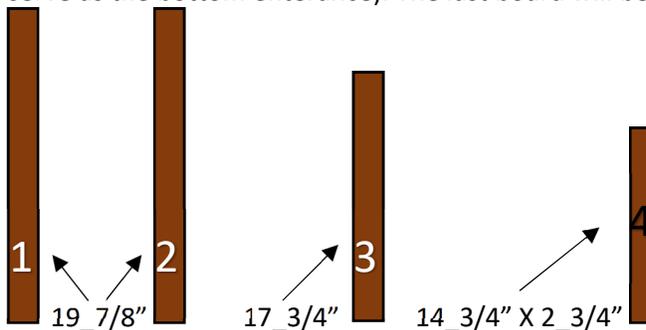
- (2) 8' - 2X4's
- (1) 72" – 1/2" X 3/4" Runner Strips
- (2) 5/16" X 3" Hanger Bolts
- (2) 5/16" flat washers
- (2) 5/16" X 18 Wingnuts
- (1) 48" X 1" X 4" Pine board
- (1) 1" X 18_3/8" X 14_3/4" Foam Insulation board
- (1) #8 X 18_1/4" X 14_5/8" Hardware cloth section
- Glue, Nails/Staples/Screws, ECT

Tools to get started:

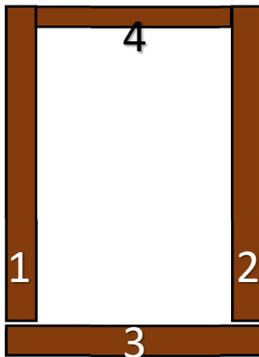
Tape Measure, Saw, drill, hammer (Staple/Nail gun), Clamps, and 1/4" and 3/8" drill bit, and a 1_1/8" plywood spacer block.

When Cutting be sure to account for the Kerf of the blade

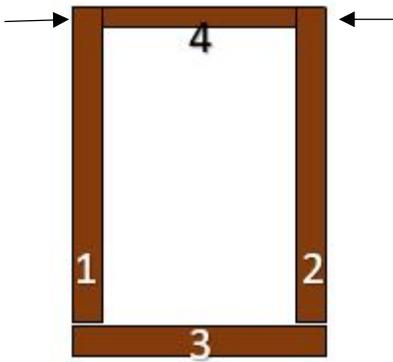
- 1) First cut * out all required pieces required to assemble the bottom board. You will need 2 – 2" X 4" boards measuring 19_7/8". Next cut one board measuring 14_3/4", then rip it down from 3_1/2" to 2_3/4"(this will serve as the bottom entrance). The last board will be cut to 17_3/4"



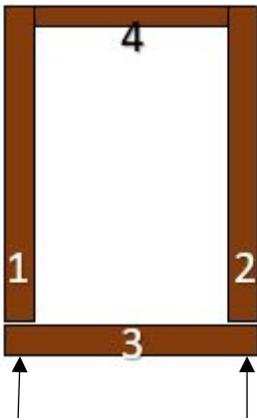
- 2) Assemble the boards with the longer side boards on the outside of the short ripped board making sure there is exterior wood glue on either end. Next, Flush up the face of the 2_3/4" board with the ends of the long side boards as shown below.



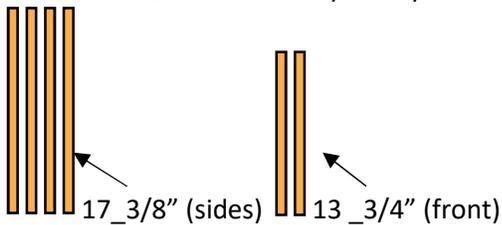
3) Fasten the side boards to the front board with glue and desired fastener.



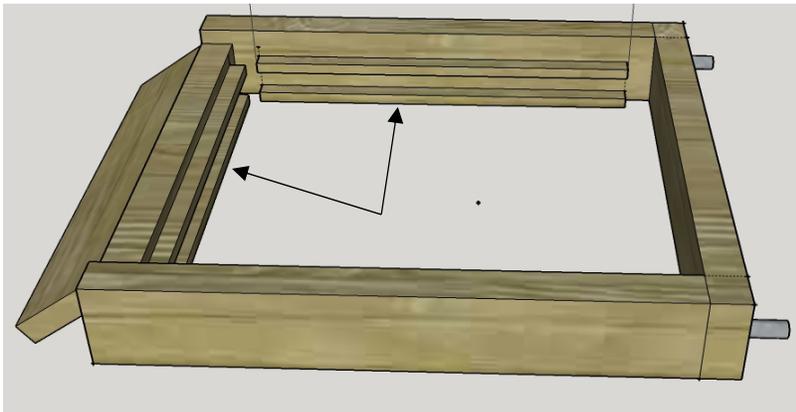
4) Lastly Line up the back 2" X 4" so it's ends are flush with the outside face of each of the longer side boards. Square up the frame and affix the rear board with a single screw $1\frac{3}{4}$ " down and $\frac{3}{4}$ " in on each side. This should center up the screws in the ends of the longer side boards.



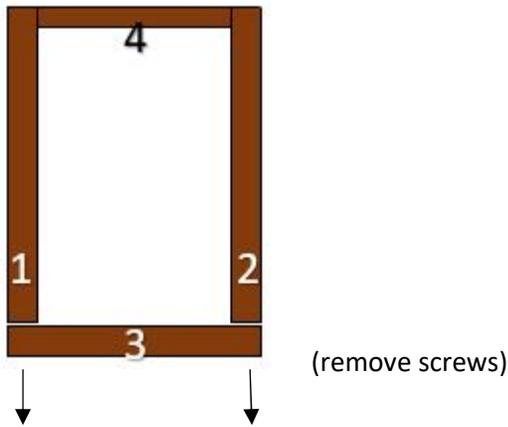
5) Cut * four sections of the $\frac{1}{2}$ " X $\frac{3}{4}$ " runner strips to $17\frac{3}{8}$ ", two sections to $13\frac{3}{4}$ "



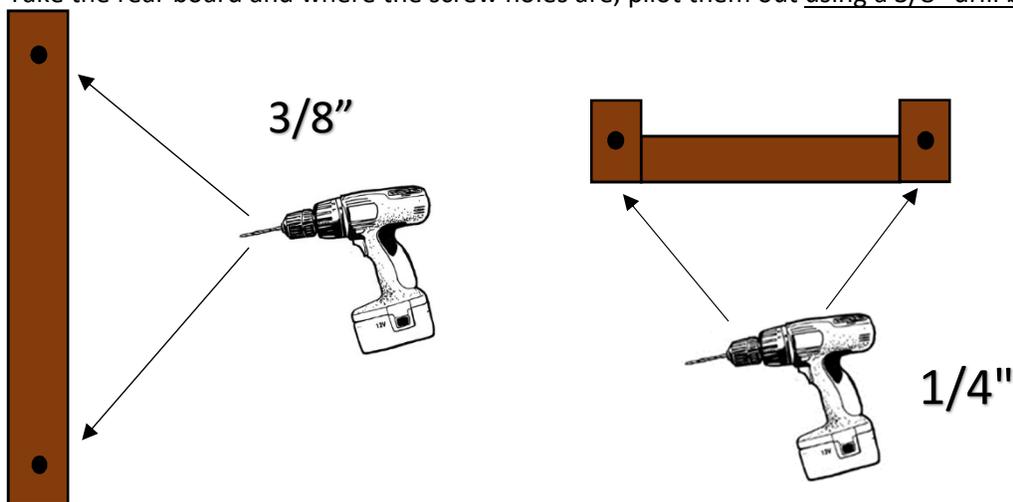
6) Staying flush with the bottom, attach a runner strip on each side and the front. Be sure to use glue and a fastener to attach the runners. Next, use the $1\frac{1}{8}$ " spacer block rested on top of the first set of runners and attach the second tier of runners in the same manner as the first.



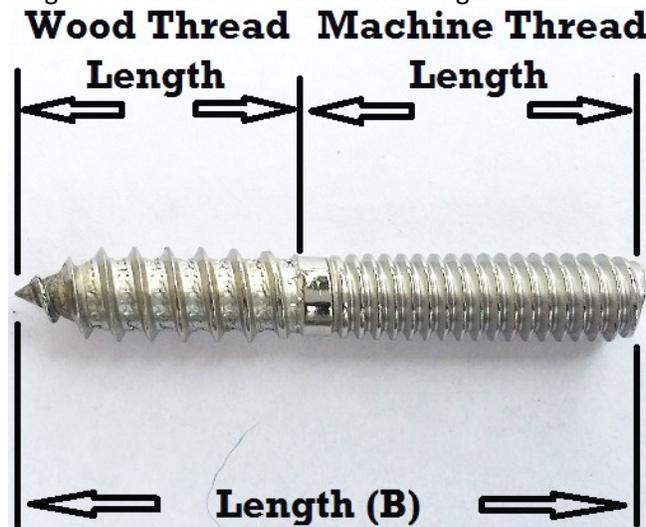
7) After an appropriate amount of time has pasted for glue to set, un-fasten the two screws from the rear board.



8) Take the rear board and where the screw holes are, pilot them out using a $3/8''$ drill bit (left Below).

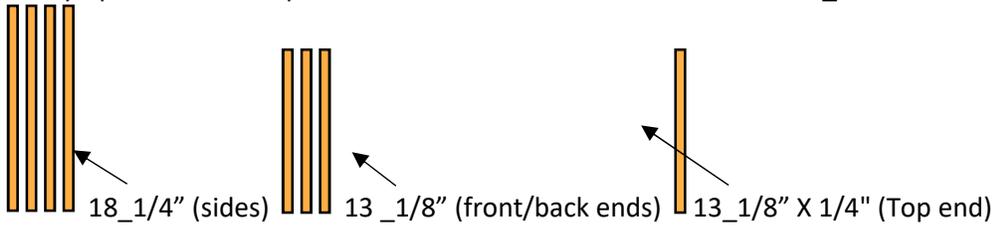


9) In the ends of the main frame (right above), use the $1/4''$ drill bit to pilot into the ends of the board the same length as the wood thread on the hanger bolts.

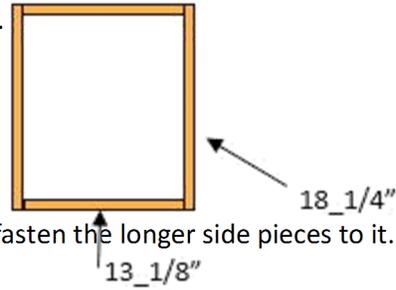


10) Using either a hanger bolt driving bit or inserting the machined thread portion of the hanger bolt into the drill chuck itself. apply exterior wood glue to the wood threaded portion of the hanger bolt, then drive the hanger bolts into the ends of the main frame into the previously piloted $1/4''$ holes.

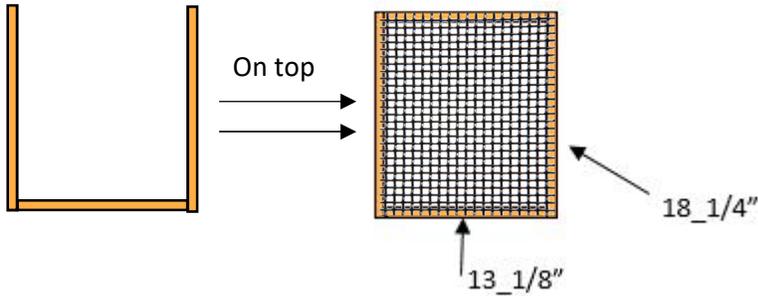
- 11) Clean access glue from the bolts after they are installed and let dry.
- 12) Using the Runner stripping to cut * four sections measuring $18\frac{1}{4}$ " and Three sections measuring $13\frac{1}{8}$ ". Lastly rip* a runner strip the is $\frac{1}{4}$ " X $\frac{3}{4}$ " and cut* it to measure $13\frac{1}{8}$ ".



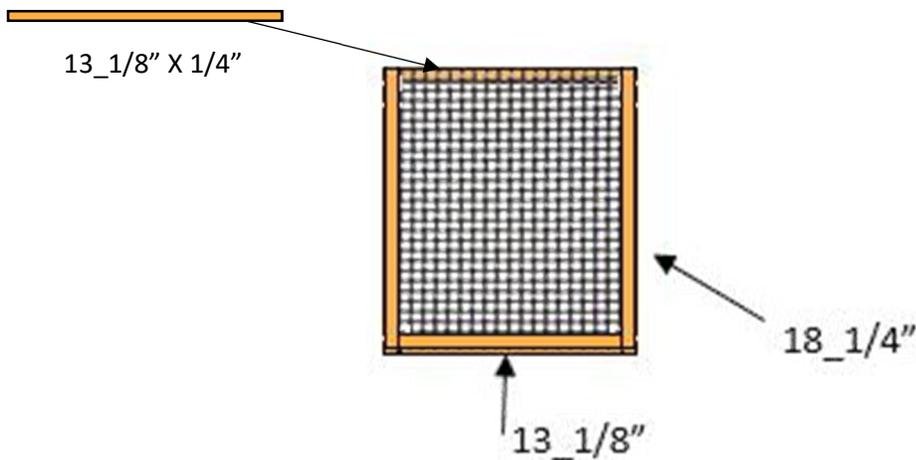
- 13) Using to longer side pieces and two shorter end pieces. Apply glue to the ends of the shorter pieces and fasten the longer sides making a square frame (allow to dry).



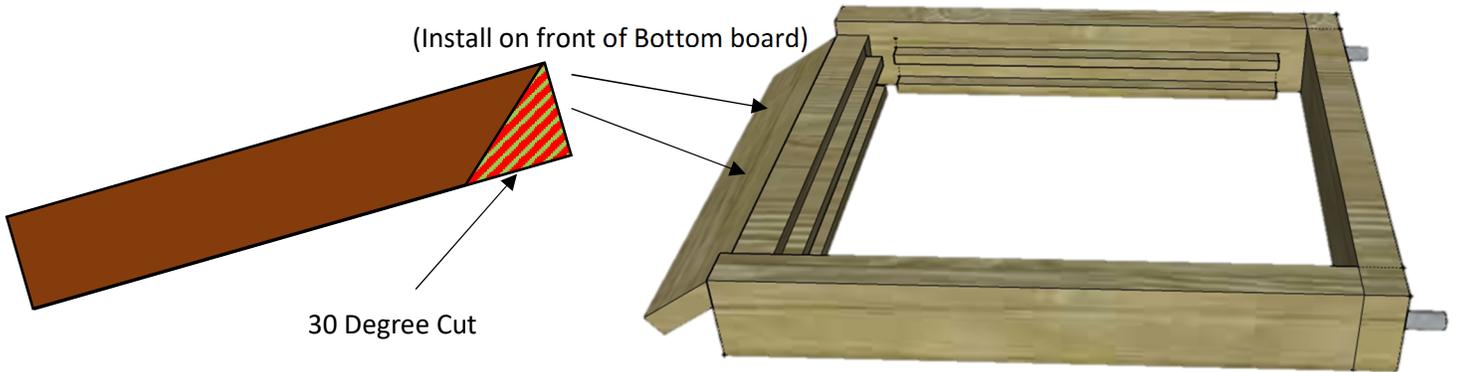
- 14) Again take one short side apply glue to the ends and fasten the longer side pieces to it.



- 15) Take the #8 Hardware cloth and sandwich it between the two runner strip frames. Fasten the frames to mesh with glue and 1" to $1\frac{1}{4}$ " nails or staples. Take the last (Narrow) frame piece and put it into place, nail/staple the piece into place. (making sure to clean up any of the fasteners that pushed through the bottom of the removable screen frame.)



16) Take the 1" X 4" and cut it to the same width as the bottom board. Next cut one corner off at a 30 Deg angle. On the freshly cut angle, apply glue and line up with the bottom of the entrance. When everything is flush fasten landing board to the Bottom board.



Bottom Board Finished

Inner Cover and Insulated Outer Cover

Materials for Inner Cover:

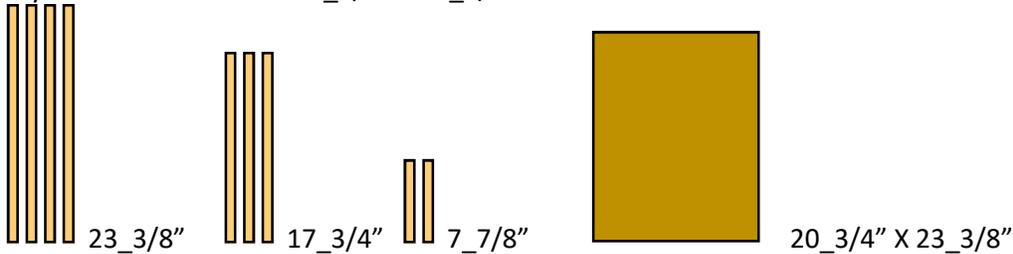
- 1 - 2' X 2' 1/4" Plywood sheet
- 1 - 4' 2 X 4 board
- Exterior Wood Glue
- Nails/Staples (1_1/4")

Tools for Inner Cover:

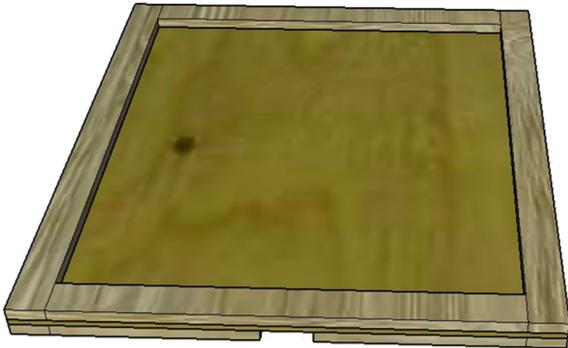
- Tape Measure
- Saw
- Tool for chosen fastener

Make sure to account for the kerf of the blade when cutting pieces

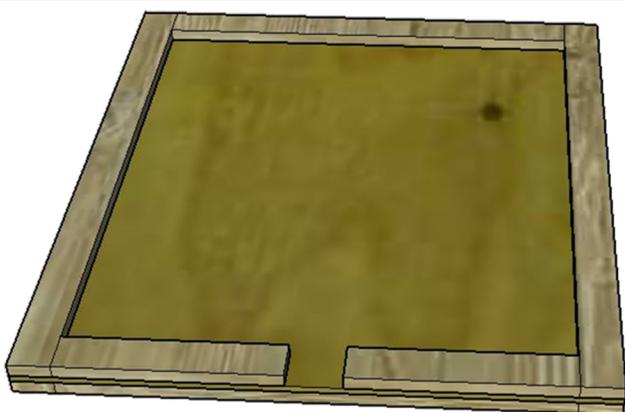
- 1) First, *Cut the pieces needed for assembly from the 2 X 4. Four pieces *cut to 23_3/8" X 1_1/2" X 1/2". Next, *cut Three pieces to 17_3/4" X 1_1/2" X 1/2". Then *cut Two pieces to 7_7/8" X 1_1/2" X 1/2". Finally, *cut the Plywood sheet down to 20_3/4" X 23_3/8".



- 2) Apply glue to one wide edge of the each of the four ripped pieces and install to one side of the plywood making sure all outside edges are flush.



- 3) With the one side installed flip the plywood over and start installing the remaining ripped boards in the same manner, leaving the two short ripped pieces for last.



- 4) When installing the two short pieces meet the ends against the inner edge of the previously installed ripped pieces. This should result in a 2" gap between the two short pieces.



Inner Cover Complete

Insulated Outer Cover:

Materials for outer cover:

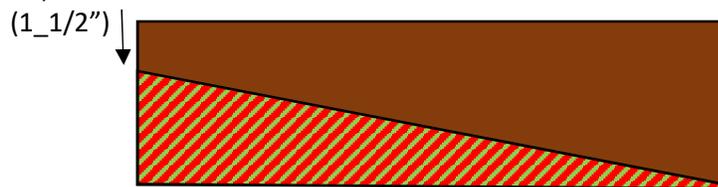
- 1 – 8' 2 X 4
- 1 – 48" X 24" 1/2" plywood
- 1 – 2' X 2' X 1" Insulation
- 1 – 2" X 2" Spacer
- 1 – 24" X 24" Weather resistant roofing material
- 1 – 36" 3/4" X 1/2" Support Runner (Ripped Pine 2 x 4)
- Construction adhesive, Nails/Screws/Staples, and Silicone Caulk.

Tools for outer cover:

- Tape measure
- Saw
- Tool for fastener
- Caulk gun

(Remember to account for the kerf of the blade when cutting pieces)

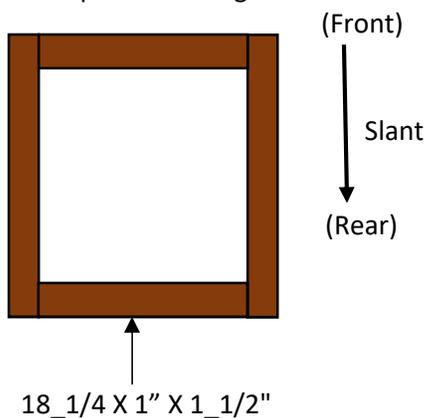
- 1) *Cut two pieces of 2 X 4 to 23_7/8". *Cut one piece of 2 x 4 to 18_1/4" and finally *cut one piece of 2 X 4 to 18_1/4" X 1" X 1_1/2".
- 2) Take the two pieces measuring 23_7/8" lay them on the table so they measure 3_1/2" high. On one end measure down 1_1/2" and make a mark, then run a straight diagonal line down to corner on the opposite end. Repeat on the other 2 X 4.



 Save this piece, it can be a template when using a tables saw.

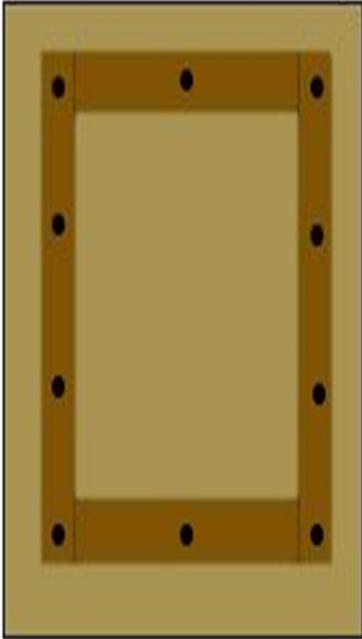
After the marks are made, *cut the angle(s) carefully. Keep the upper portion of the cut.

- 3) Assemble all pieces making a frame with the slant running to the back.



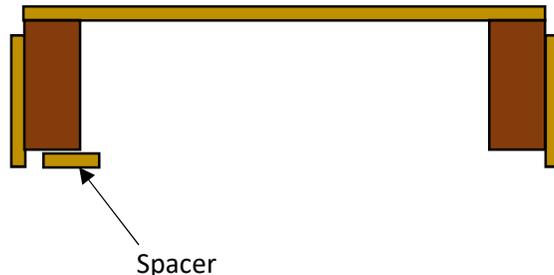
- 4) *Cut 1/2" plywood to 25_7/8" X 21_1/4". Apply construction adhesive on the entire top face of the roof frame. Install roof on frame, using a 2" X 2" spacer between the outside edge of the frame and the edge of the plywood to make sure the roof is square.

- 5) Measure in 2_3/4" from the edge of the plywood and secure plywood to roof frame with 2" screws.



- 6) *Cut remaining plywood into four strips. *Cut two pieces to 23_7/8" X 2" and *cut two pieces to 22_1/4" X 2". These will be the overhang that prevents the roof from sliding off.
- 7) Use a small piece of 1/2" plywood as a spacer to create the 1/2" overhang off the bottom of the roof frame. First attach the sides then attach the ends. This can be done with construction adhesive and small nails or staples.

(Cross-section of roof)



- 8) With all of the wooden components assembled, paint and or prime the entire insulated roof assembly. At least two coats are recommended.
- 9) After the adhesive and paint has set, *cut a piece of insulation to a snug fit inside of the roof frame. Then take two spare pieces of the 1/2" x 3/4" runner strips and fasten to the inside walls of the roof frame after the insulation is installed. (These pieces do not have to go end to end. These just prevent the insulation from falling out.)
- 10) With the roof assembled, painted and insulated *cut weather resistant material (Plaskolite corrugated plastic sheet) to the same dimensions as the plywood. Fasten the weather proof material to the plywood using 1" screws that have been dipped in exterior caulk before being driven into the plywood to prevent leaking.

Outer Cover Complete