



Disclaimer: Read this BEFORE beginning any construction!

These plans are intended for use as a guide only! Adjustments may be needed as circumstances require. Dimensions may be altered at the builder's requirements. Be sure if any alterations occur, that the measurements are adjusted accordingly! If you (the builder) are ever at doubt as to how to construct any structure in these plans, consult a professional. Always use safety equipment when needed and follow manufacturer recommendations for tools, mechanical parts and any components you are not familiar with.

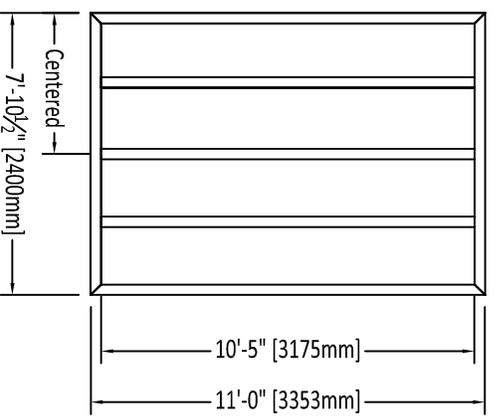
This structure is able to be wired for electricity. Please consult a professional and your local power company before installing any dedicated lines.

This structure is able to be fully completed inside. These plans do NOT include instructions on interior finishing and any such construction practices will be solely at the discretion of the builder. Materials such as insulation, gypsum board and interior furnishing such as counters, tables, etc are not included in these plans.

Builder assumes all risks associated with construction! Always use safe construction practices, i.e. sturdy scaffolding when working at heights, safety equipment such as gloves and safety glasses. Make sure all tools are in proper working condition and do NOT use any tools with damaged or frayed cords or broken components.

These plans are intended as a guide only! 3-Dimensional Concepts will not accept responsibility for any measurements misrepresented in these plans and field measurements should always be taken, never assumed. The rule-of-thumb, "measure twice, cut once", always applies. Accuracy of such measurements are determined by many factors, not limited to, builder competency and experience, tool repair, and tool type. However, should mistakes be found in these plans, we would very much appreciate hearing about them so they may be corrected. Please forward any questions, comments or concerns to jeff@3dimconcepts.com. Once you have read through this disclaimer, it is time to start building. Good luck, and work safe!

1.) To start you will need a solid foundation. This is a relatively small playhouse, so a wooden foundation will suffice perfectly well. We recommend 4x4 pressure-treated post.



A
1
Wooden Foundation Layout
Scale: $\frac{3}{16}$ " = 1'0"



B
1
Wooden Foundation
Scale: $\frac{3}{16}$ " = 1'0"

Note: If you would like a concrete foundation, omit the interior joists and fill the rim with concrete.

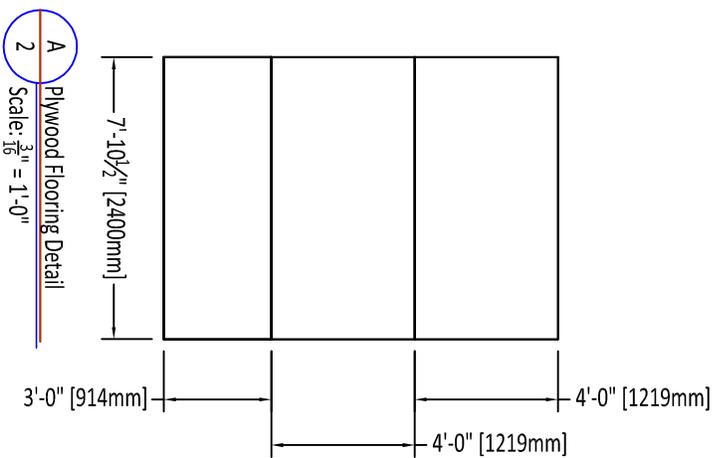


C
1
Concrete Foundation
Scale: NTS

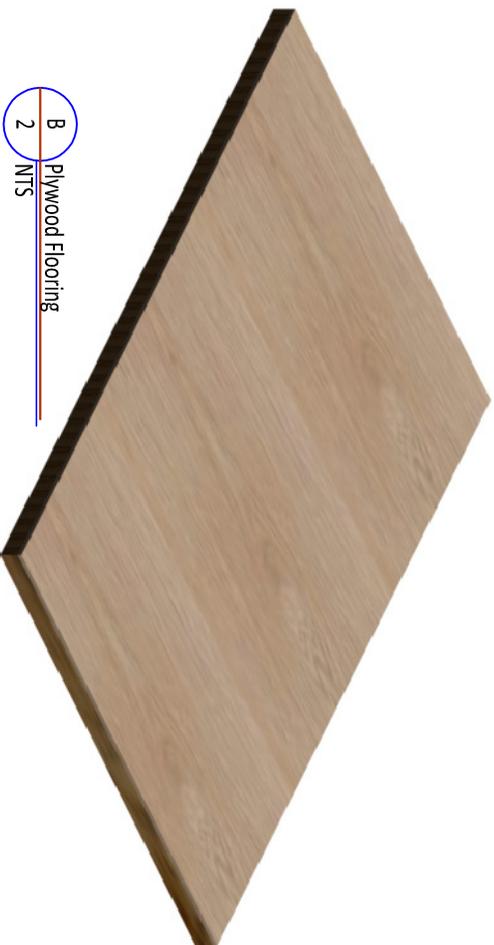
Materials:

Description:	Quantity:
4x4x12' Pressure Treated Post	5
4x4x8' Pressure Treated Post	2
Concrete (by builder)	Builder

2) For the flooring, simply lay down 3 sheets of cedar or oak plywood (we recommend $\frac{3}{4}$ " for rigidity). Cedar and oak plywood have very good moisture and insect resistance. Always a good combination when talking about flooring.



B Plywood Flooring
2 NTS



Note: if you chose to use a concrete slab, an industrial border such as "Liquid Nails™" will do very nicely to bond the sheets to the concrete. Screw or nail around the wooden rim. The result will look the same as above.

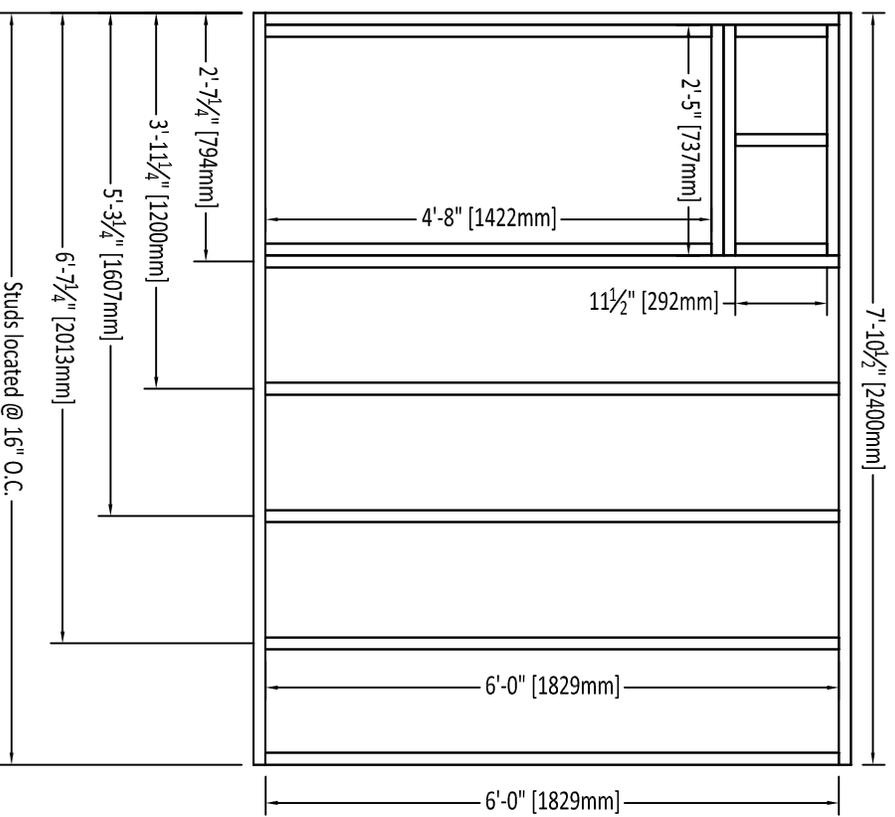
Materials:

Description: _____ Quantity: _____
4x8' Cedar or Oak Plywood Sheet 3

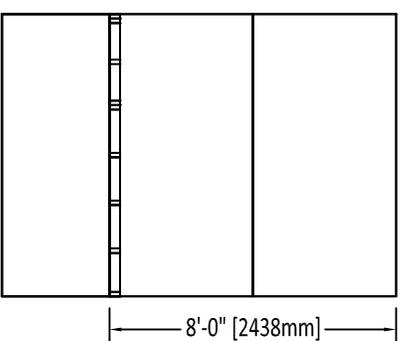
3) For the front wall, we recommend 2x4x6' pine planks. Follow the diagram below. Align the very front edge of the wall with the edge of the middle plywood flooring sheet. This should be located at precisely 8'-0".

Note: Whenever building a structure, it is important to always start by laying out the side pieces, find the center and layout the remaining pieces from the center. Basically start on the outside, go to the center and build outward.

4) For the front wall, construct the wall supports, build the header, and construct the door frame. After each piece is constructed, assemble to form 3A.



A Front Wall Elevation
3 Scale: 3/4" = 1'-0"



B Front Wall Location Detail
3 Scale: 3/16" = 1'-0"



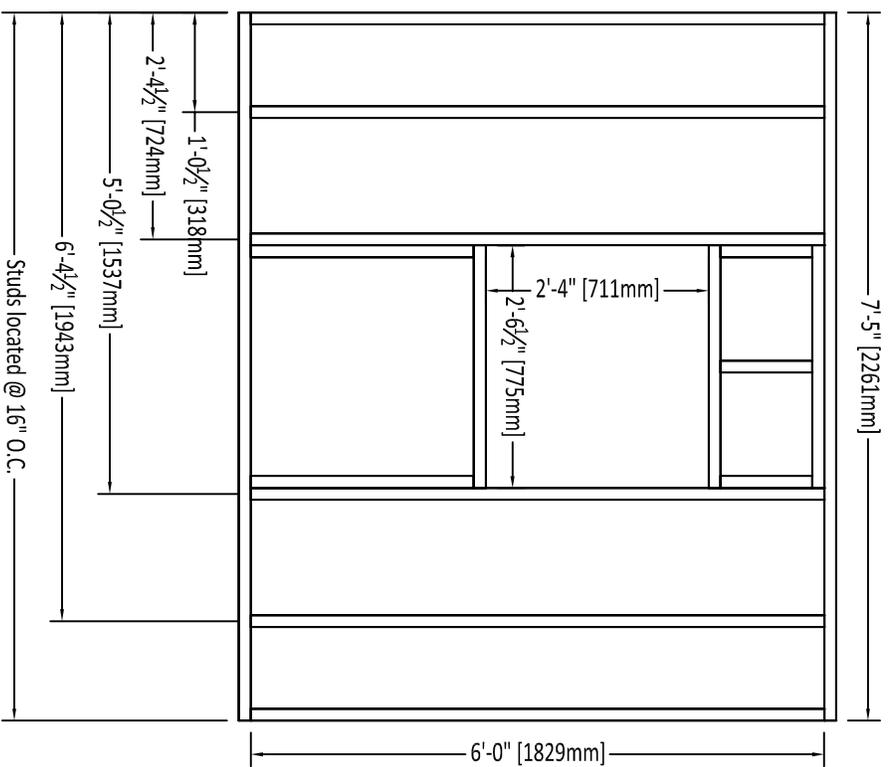
C Front Wall Diagram
3 Scale: NTS

Materials:

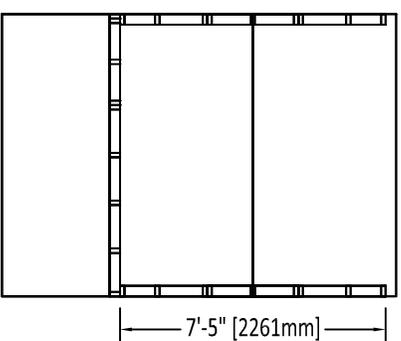
Description:	Quantity:
2x4x10' Plank	10
2x4x8' Plank	2

5) For the side wall, we recommend 2x4x6' pine planks. Follow the diagram below. You will need two of these walls.

Note: Whenever building a structure, it is important to always start by laying out the side pieces, find the center and layout the remaining pieces from the center. Basically start on the outside, go to the center and build outward.



A Side Wall Elevation
4 Scale: $\frac{1}{2}'' = 1'-0''$



B Side Wall Location Detail
4 Scale: $\frac{3}{16}'' = 1'-0''$



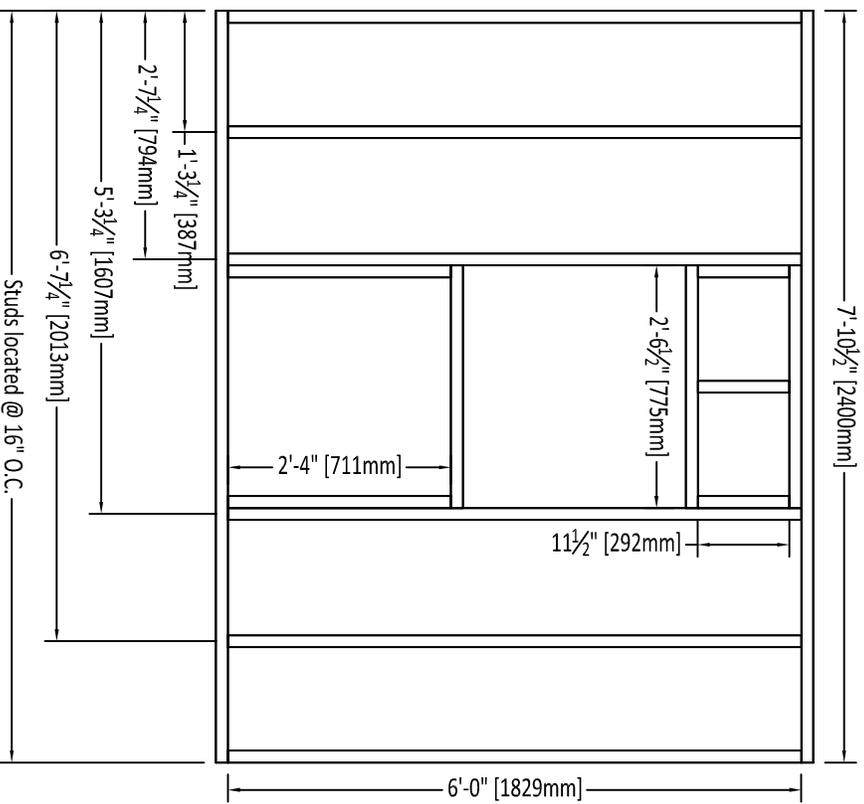
C Side Wall Diagram
4 Scale: NTS

Materials:

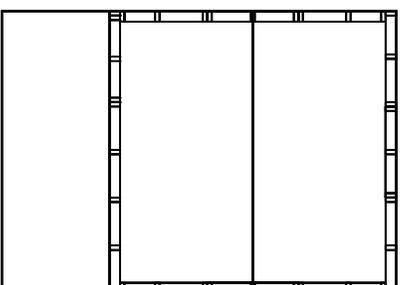
Description:	Quantity:
2x4x10' Plank	20
2x4x8' Plank	4

6) The rear wall is very similar to the side walls. Follow the diagram below.

Note: Whenever building a structure, it is important to always start by laying out the side pieces, find the center and layout the remaining pieces from the center. Basically start on the outside, go to the center and build outward.



A Rear Wall Elevation
 5 Scale: $\frac{1}{2}'' = 1'-0''$



B Rear Wall Location Detail
 5 Scale: $\frac{3}{16}'' = 1'-0''$

Materials:

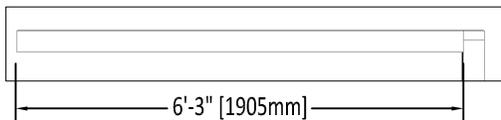
Description:	Quantity:
2x4x10' Plank	10
2x4x8' Plank	2

C Rear Wall Diagram
 5 Scale: NTS

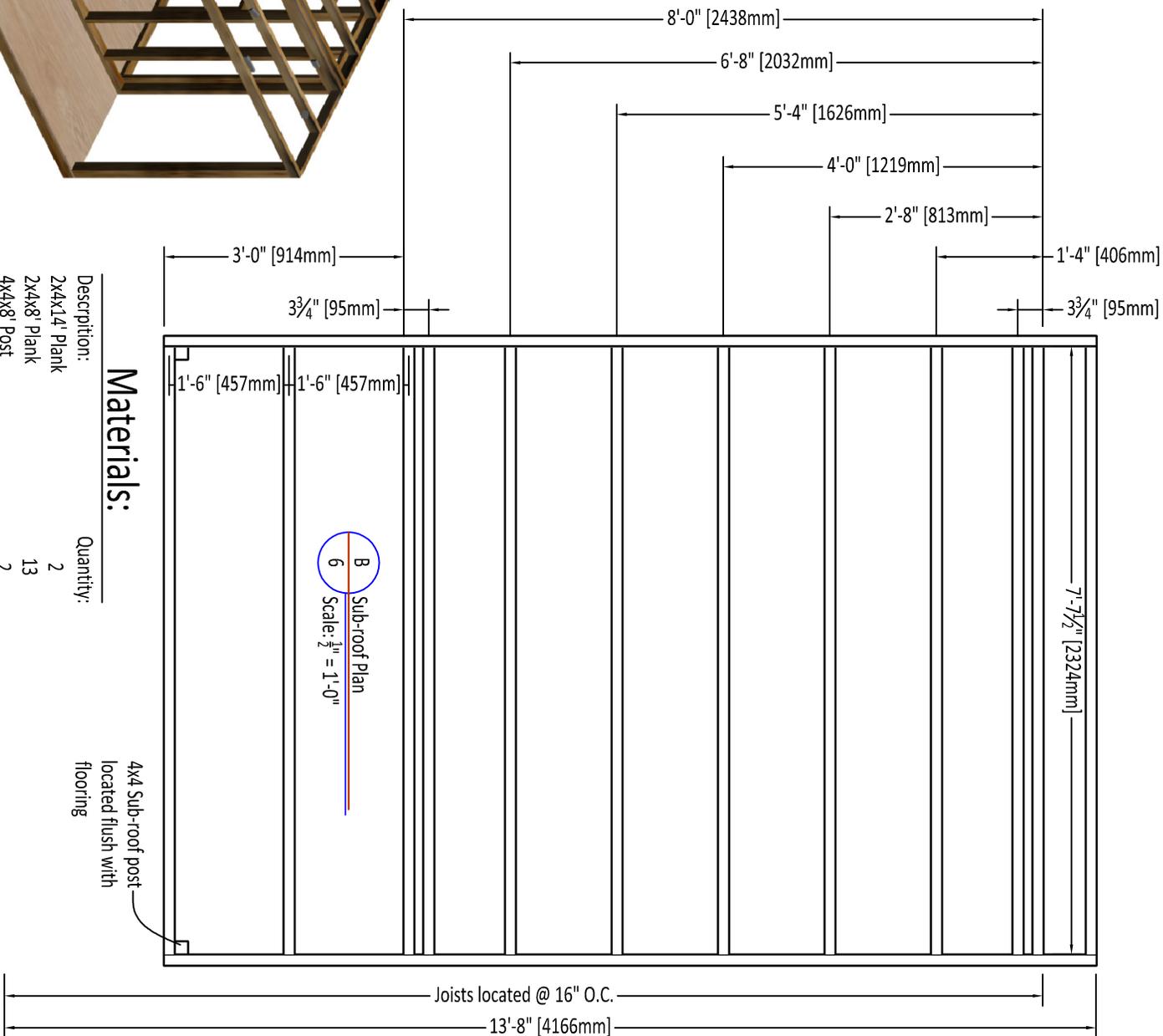


7) Before getting on the roof structure, you will need to tie the top of the roof together. Follow the diagram below for the sub-roof construction.

A Sub-roof Post
Scale: $\frac{3}{8}" = 1'-0"$



B Sub-roof Plan
Scale: $\frac{1}{2}" = 1'-0"$

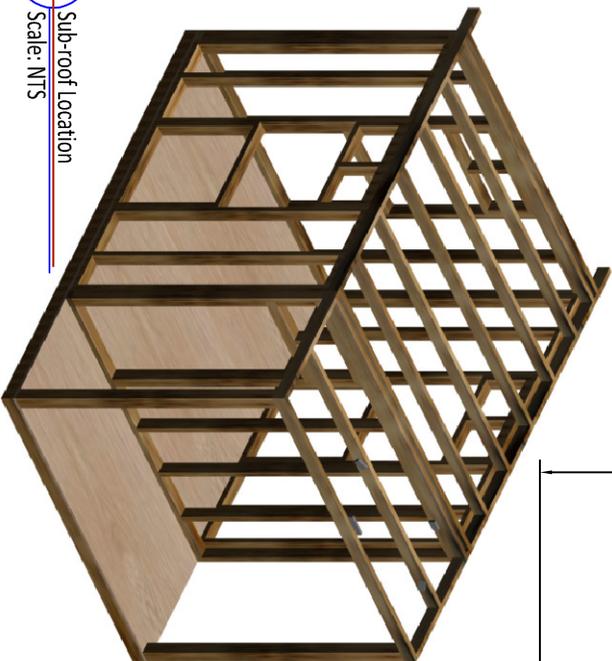


Materials:

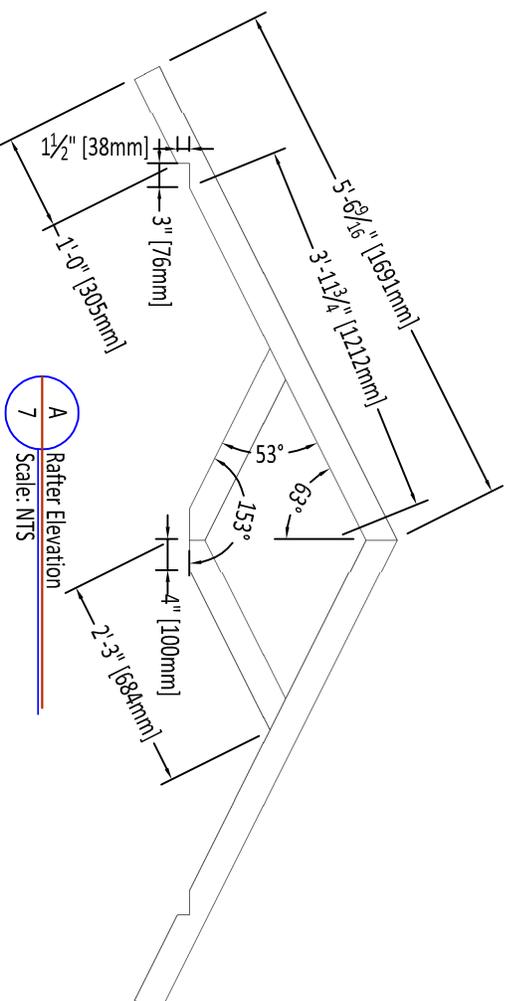
Description:	Quantity:
2x4x14' Plank	2
2x4x8' Plank	13
4x4x8' Post	2

4x4 Sub-roof post located flush with flooring

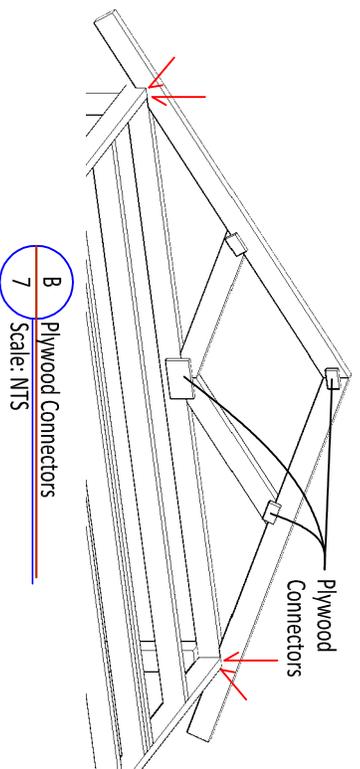
C Sub-roof Location
Scale: NTS



8) For more information on constructing rafters, refer to the appendix at the back of these plans. Rafter lengths and styles may vary according to builder preferences.



9) Use scraps of 3/4" plywood as connectors for the edges of the rafters. Screw the ends of the rafters directly to the sub-roof frame.

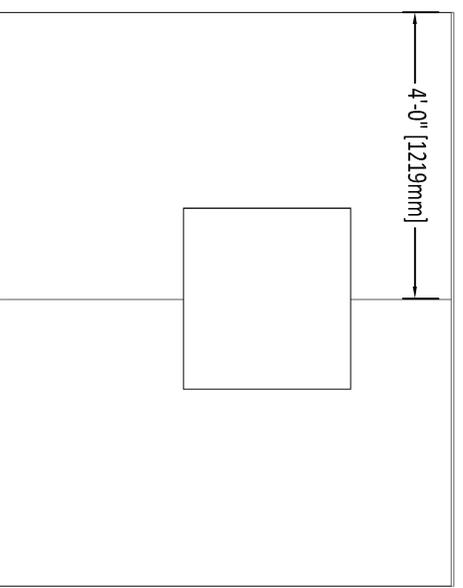


Materials:

Description: 2x4x6 Plank
Quantity: 30



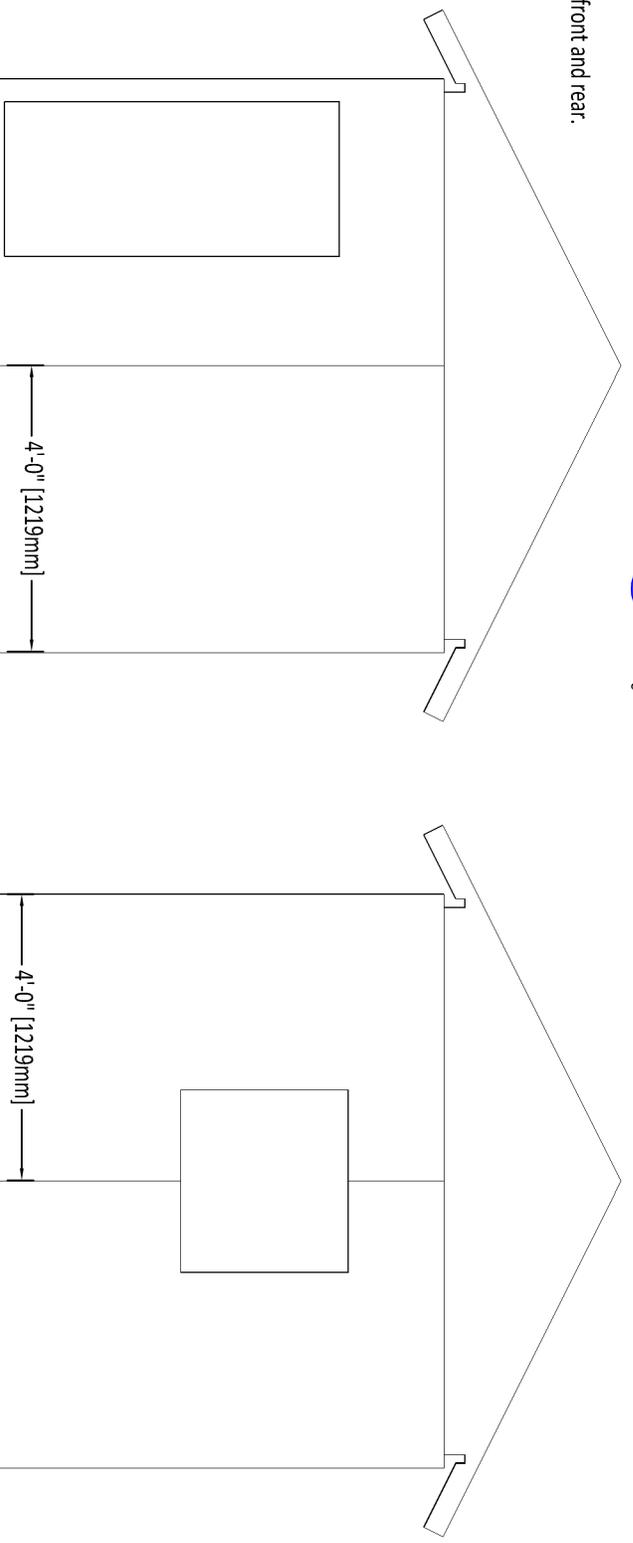
10) Sheathing is time consuming, but can be relatively simple. At the least you will need a circular or jig saw. Measure and layout your cuts. Start with the side sheathing and run the sheathing up right under the rafters. If you wish, miter the top edge so the sheathing is flush with the bottom surface of the rafters.



Materials:
Description: 4x8' Plywood Sheet
Quantity: 12

A Side Sheathing
8 Scale: $\frac{3}{8}'' = 1'0''$

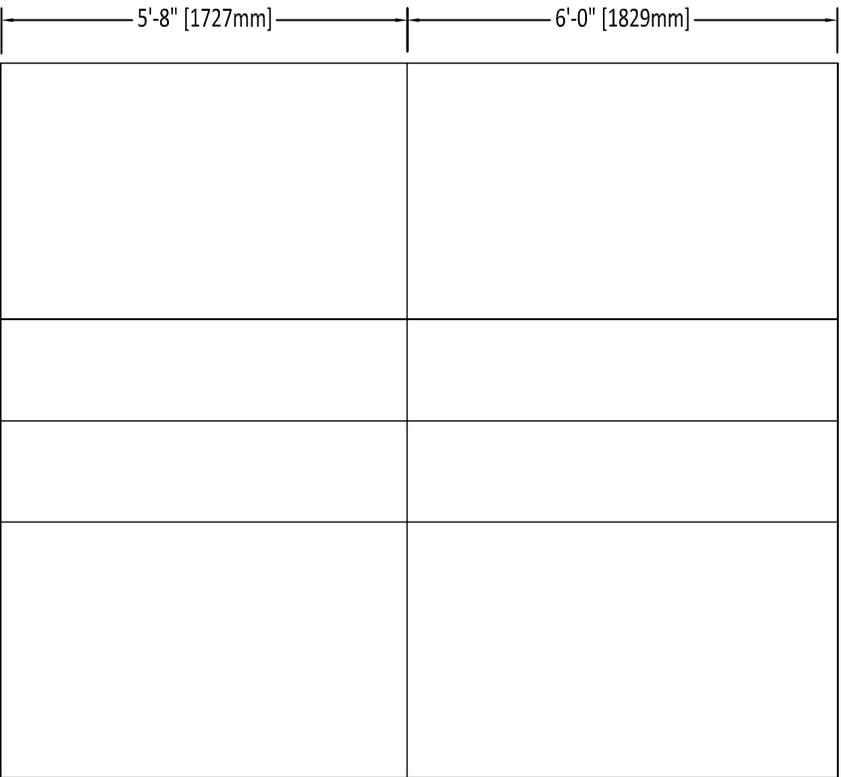
11) Now, front and rear.



B Front Sheathing
8 Scale: $\frac{3}{8}'' = 1'0''$

C Rear Sheathing
8 Scale: $\frac{3}{8}'' = 1'0''$

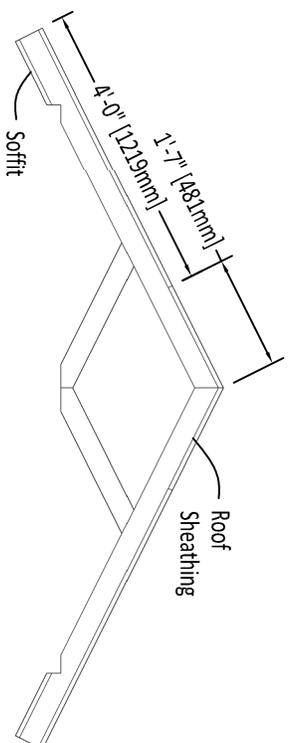
12) And the roof and soffit. The soffit is the piece that covers the bottom of the rafters, preventing insect intrusion.



A Roof Sheathing Plan
9 Scale: $\frac{3}{8}" = 1'0"$

Materials:

Description: 4x8 Plywood Sheet
Quantity: 6

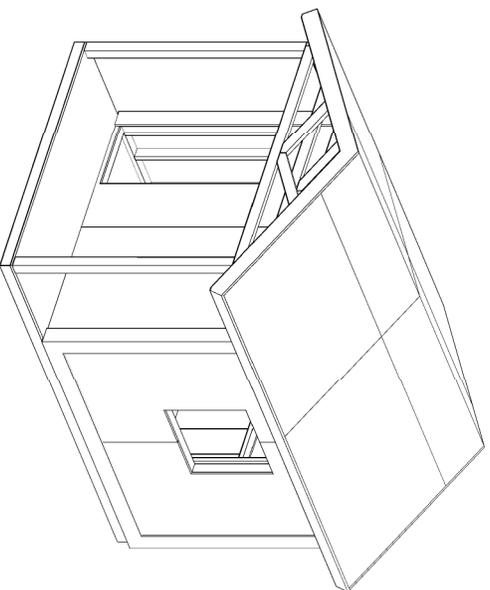


B Roof Sheathing & Soffit
9 Scale: NTS



C Exterior Sheathing
9 Scale: NTS

13) Install the trim. Finish up by installing the door, windows, adding veneers and roofing. (You wish, you may insulate and sheetrock (gypsum board) the interior. The rest is entirely up to you.



A Trim Diagram
9 Scale: NTS

Materials:

Description:	Quantity:
1x6 Trim Board	Builder
Paint or Veneer or Siding	Builder
Roofing Material	Builder

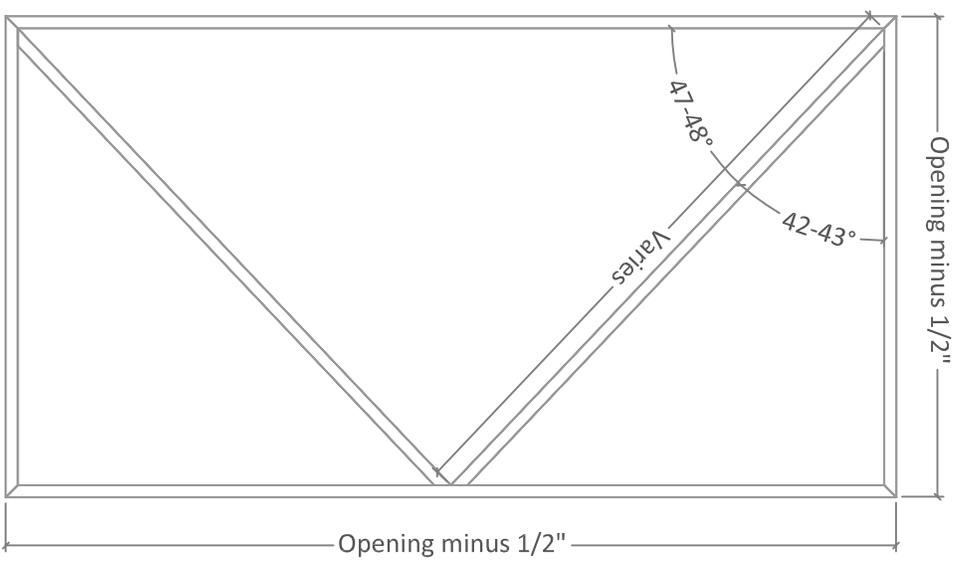


For the door, construction is relatively simple. If you want to install a latch, that is up to you. We do not show the details because there are special tools involved, most of which the normal person does not have. However, if you DO happen to come across such tools, you will be able to add a doorknob and catch should you desire.

As with the window, this is a very simple door and you do NOT have to construct the door in this way.

If you prefer to purchase a door, make sure the rough opening size is adequate. The frame rough opening in this instance is 2'-6 $\frac{1}{2}$ "x56", minus $\frac{1}{2}$ " for swing on both the sides and the top and bottom, that leaves a door size of 2'-6"x55 $\frac{1}{2}$ ".

1) To begin, we are using 1'4 planks and $\frac{1}{2}$ " plywood sheathing. Cut the frame pieces as shown below. You DO NOT have to miter the corners, we just recommend it for aesthetic purposes.



A Rear Sheathing Diagram
A1 Scale: NTS

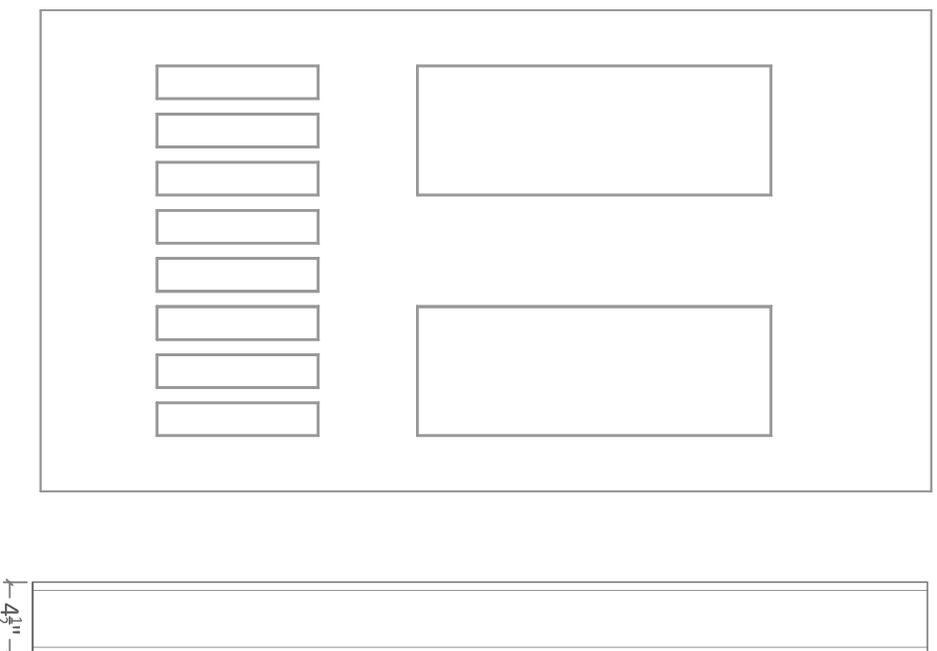
We will show the door in this example with a pattern cut out of the front and back sheathing, but this is not required. It is purely for looks and does not affect the integrity of the door at all.

Before you attach the panel to the door frame, you will want to check the swing in the doorway. We have allowed for $\frac{1}{2}$ " swing, but depending on construction methods and accuracy, swing may be affected by as much as 1".

Please ensure the frame will swing in the opening without getting stuck or caught. You should allow more swing once you add the door panels so check after each step to ensure swing is not impeded.

Materials

Description:	Qty:
1x4x6' Planks	5
4x8 $\frac{1}{2}$ " Plywood Sheet	2
Hinges	3



B Rear Sheathing Diagram
A1 Scale: NTS

2) Attach the front panel to the door frame, and **MAKE SURE THE CORNERS ARE SQUARE** and edges are flush. You may even want to sand the corners of the inside swing so they are rounded a little bit.

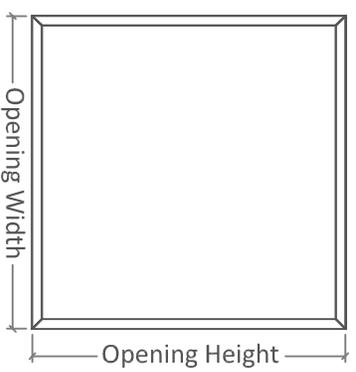
3) Insulate the door with either blow foam or regular R-13 roll insulation will work.

4) Enclose the door with the second panel. You may want to round the edges on this side also.

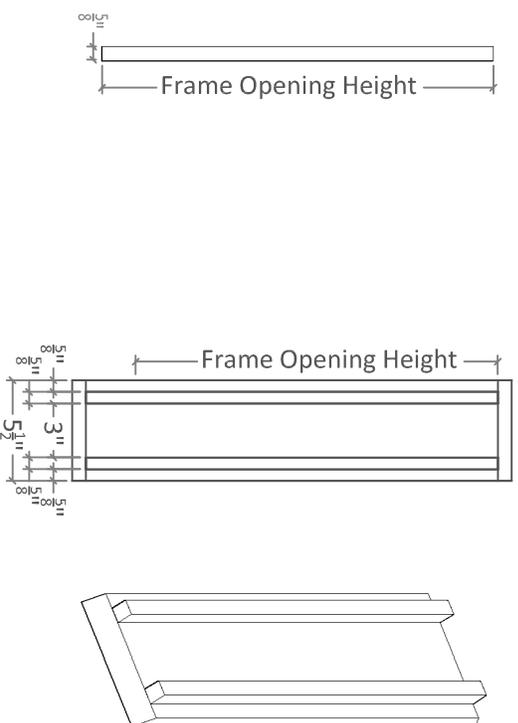
5) A single slide bolt works wonders on the outside and inside to lock the door shut. **If you don't want your kids to be able to lock the door, only install the slide bolt on the outside!** The slide bolt also offers a grip to pull the door open.

Windows are complicated to design and when at all possible, should be purchased. These details are for a very simple sliding window. You will need, and know how to use, a miter saw, a router (preferably with a guide) or table saw with an adjustable gouging blade (or blade kit), and a square (speed square, carpenter square, either works).

1) Cut and miter 1x6 planks as shown below. **DO NOT ASSEMBLE YET!**

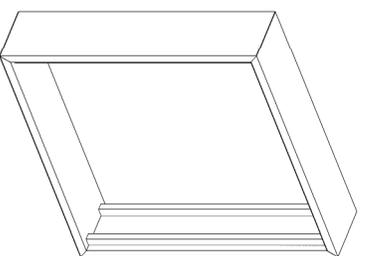


2) Rip a 1x4x8' into strips $\frac{5}{8}$ " thick. These will serve many purposes in the future but for now, we just want four of them to match the opening, so either rip and cut one piece or rip an entire board into $\frac{5}{8}$ " strips and place the pieces to the side for later.



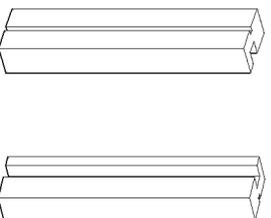
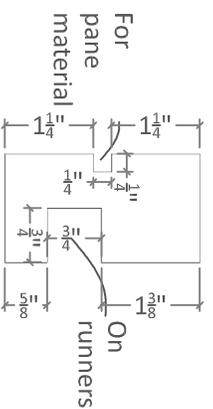
3) Using 1" screws and a level, screw two runners onto one of the exterior frame pieces. Repeat for the second side (see above).

4) Check to make sure the runners will fit inside the frame when assembled. Make any adjustments if necessary. **DO NOT ASSEMBLE!**

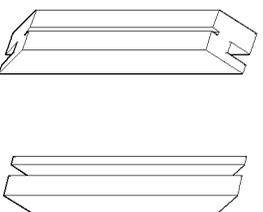
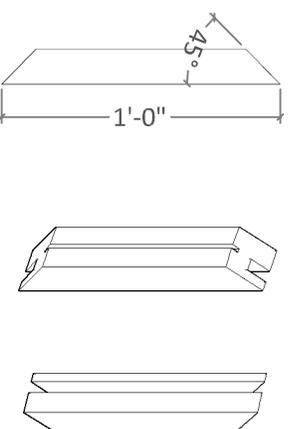


5) Rip a 8'-2x6 down the center lengthwise.

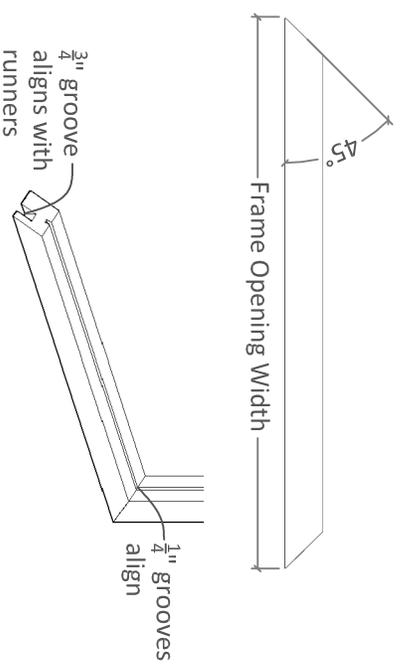
6) Use a router to gouge a $\frac{3}{4} \times \frac{3}{4}$ " groove down the center of one side. Flip the board over and gouge a $\frac{1}{4} \times \frac{1}{4}$ " groove down the center of the other side (see detail)



7) Miter the ends. Make sure the narrow ($\frac{1}{4} \times \frac{1}{4}$ ") groove is facing inwards! The wide ($\frac{3}{4} \times \frac{3}{4}$ ") grooves go out toward the runners, the inside grooves will hold a pane of window material.



8) Rip a 2x6 lengthwise down the middle and miter ends as shown below. Run a $\frac{1}{4}$ "x $\frac{1}{4}$ " groove down the middle, just as with the 2x6 above. Hold them together and MAKE SURE THE GROOVES ALIGN PROPERLY! You will need to gouge a $\frac{3}{4}$ x $\frac{3}{4}$ " groove out of the ends.



Materials

Description:	Qty:
2x6x6' Planks	24
1x6x8' Planks	6
1x4x8' Planks	6

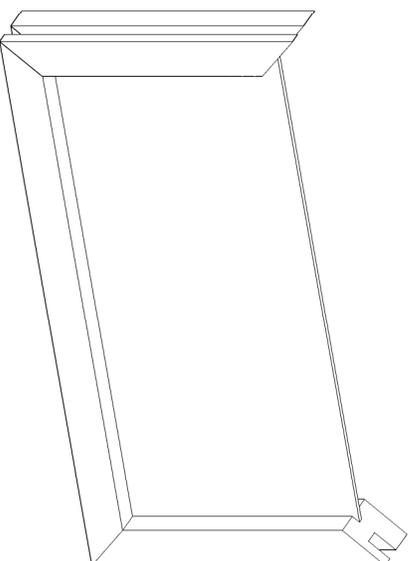
9) Lastly, before construction, you will need to determine what type of pane material you want to use. For a playhouse, we would recommend against using glass and go with clear acrylic or polyvinyl pane.

IF YOU DECIDE TO USE GLASS, WE HIGHLY RECOMMEND PURCHASING $\frac{1}{4}$ " THICK PROFESSIONALLY CUT PANES. YOU WILL NEED 2 PER WINDOW. ON THIS SET THAT EQUALS 12 PANES OF GLASS TOTAL.

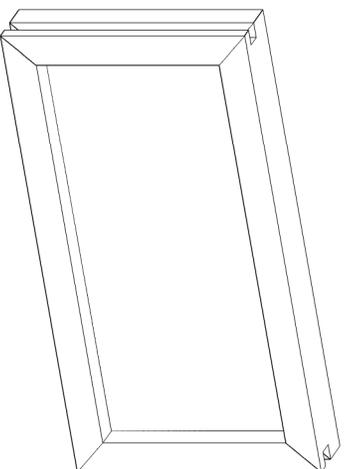
SHOULD YOU DECIDE TO CUT YOUR OWN GLASS, YOU DO SO AT YOUR RISK! USE ALL SAFETY PROCEDURES AND EQUIPMENT WHEN HANDLING GLASS!



10) Assemble the window frame around the pane. Run a bead of epoxy or polyethylene (or equivalent) seal down the frame pieces as you assemble the window to get a good, weather-tight, bond. You could increase rotting and mildew growth if you choose not to.

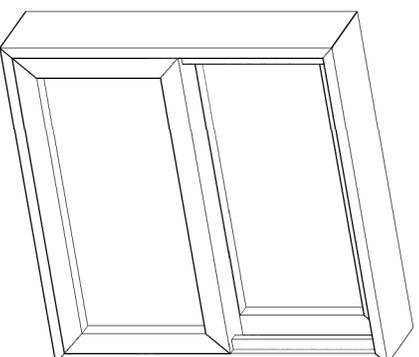
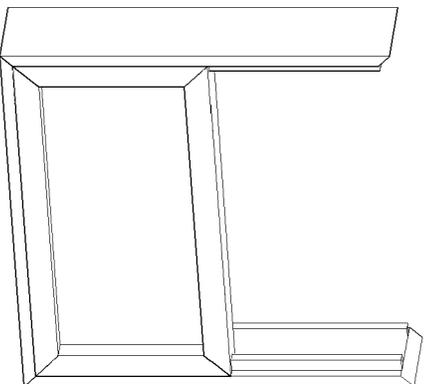


11) Cap off the window with the top piece and connect all pieces with 1" small radius ($\frac{1}{4}$ " or smaller) screws. Be sure you don't screw down into the window panel!



12) Repeat for second window.

13) Once you have two window assemblies, two exterior frame pieces with runners on them, and two exterior frame pieces for the top and bottom, carefully assemble the exterior window frames AROUND the window assemblies.



14) Cap off the window assembly, Ensure the windows slide easily and there is about $\frac{1}{16}$ - $\frac{1}{8}$ " gap between the window assemblies so they will not impede each other's movement.

15) Place the window in the window frame. Screw the exterior frame to the opening provided. You may have to use a soft mallet or a dead-blow hammer to get the window centered in the opening.

16) How the windows stay up or down is up to the user. We recommend getting a slide bolt and installing at least one on the movable assembly. Which assembly moves or stays stationary is up to the builder.

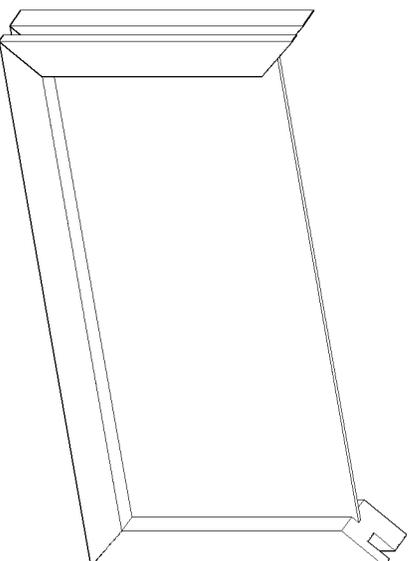
17) Lastly, before construction, you will need to determine what type of pane material you want to use. For a playhouse, we would recommend against using glass and go with clear acrylic or polyvinyl pane.

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SHOULD YOU DECIDE TO CUT YOUR OWN GLASS, YOU DO SO AT YOUR RISK! USE ALL SAFETY PROCEDURES AND EQUIPMENT WHEN HANDLING GLASS!

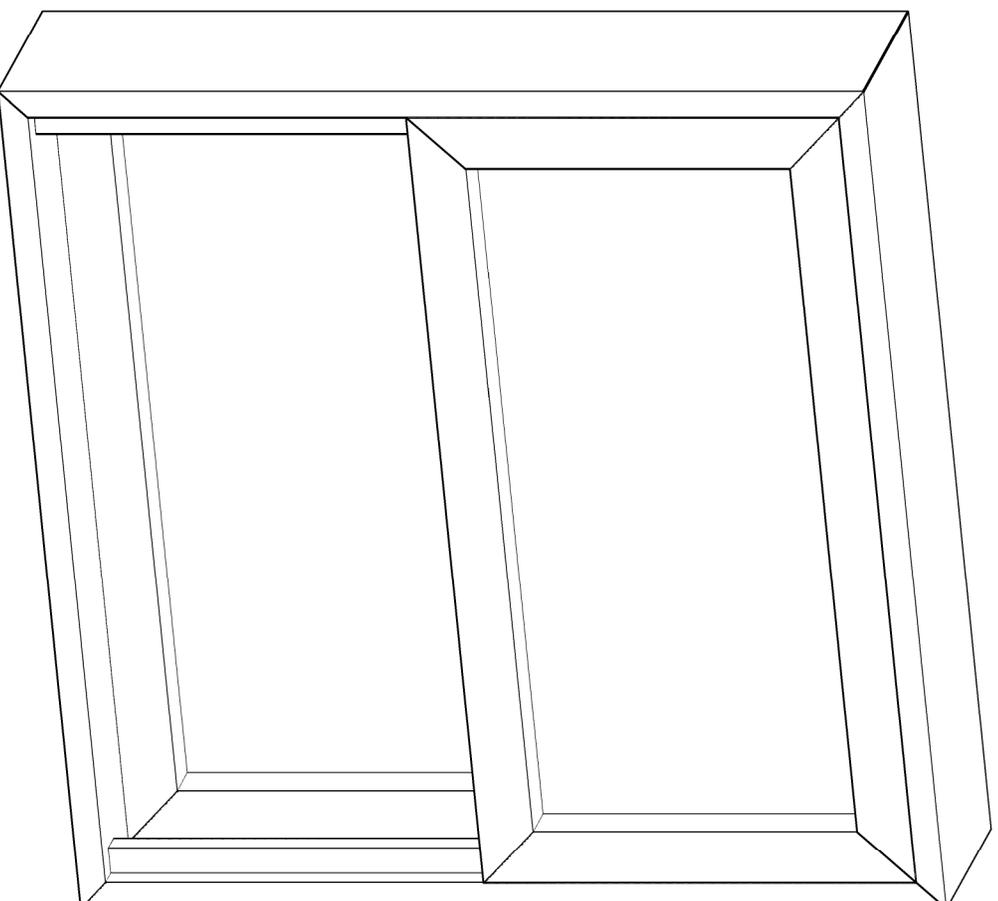


18) Assemble the window frame around the pane. Run a bead of epoxy or polyethylene (or equivalent) seal down the frame pieces as you assemble the window to get a good, weather-tight, bond. You could increase rotting and mildew growth if you choose not to.



Additional Stuff for the Window Assemblies:

- 1) Use weather striping along the seam between the window assemblies to keep wind, and weather out as much as possible.
- 2) We recommend having one stationary, and one movable window. Most often, anchor the exterior window to the top of the assembly and let the interior window slide up and down.
 - 1) Drill a $\frac{1}{4}$ " pin hole in the interior, left or right, side of the movable window assembly.
 - 2) While the window is closed, drill into the runner about $\frac{1}{4}$ ".
 - 3) Keeping the drill bit inside the pin hole, pull the drill bit back out a little, raise the window and drill back in about $\frac{1}{4}$ " into the runner. We recommend about 3" increments.
 - 4) Repeat as necessary for how much you wish the window to open. Cut a length of $\frac{1}{4}$ " dowel (may need sanding to slide freely) to use as a pin.
 - 5) Add a slide pin to both the top and bottom of the movable window so the windows can be "locked" shut if you wish.

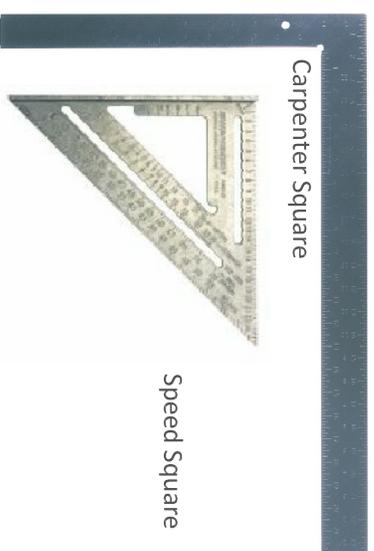


To determine the rafter lengths,

- 1) Divide the entire span by two (example: If the roof span is 20 feet, divided by 2 = 10 feet, 0 inches).
- 2) Now add the overhang (example: 18-inch overhang makes the length 11 feet 6 inches).
- 3) Now, convert the 6 inches of the 11 feet 6 inches into a fraction. It happens to be 0.5 (6 divided by 12). Thus 11 feet 6 inches is now 11.5
- 4) Suppose you desire an 5/12 roof pitch, or for every 12 inches horizontally, you get 5 inches up and 12 inches vertically. Convert that number by using the rafter conversion chart below or can be found on any framing square.
- 5) For the purpose of this article, the 5/12 roof pitch converts to 1.083 on the rafter conversion chart found on any framing square. Therefore, 11.5 x 1.083 = 12.4545 feet is what the rafter length will be.
- 6) Obviously, getting to the thousands of an inch is a feat in itself, so lets just round to the nearest $\frac{1}{8}$ " which is 12.5 feet or 12'-6".

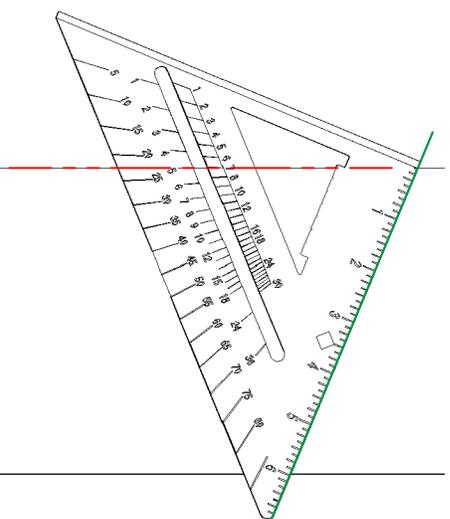
If you feel at all uncomfortable constructing roof elements, consult a professional. Also, you will need to be comfortable with heights and please use all safety precautions when placing the rafters. Not every rafter will be directly above a solid surface and there will be open spans beneath them. We recommend use of a ladder and assistant(s) to help you get the rafters into position.

1) If you need to be introduced to the tools most professionals work with when cutting rafters. There are basically two tools used commonly, the speed-square and the carpenter square. Both are shown below.



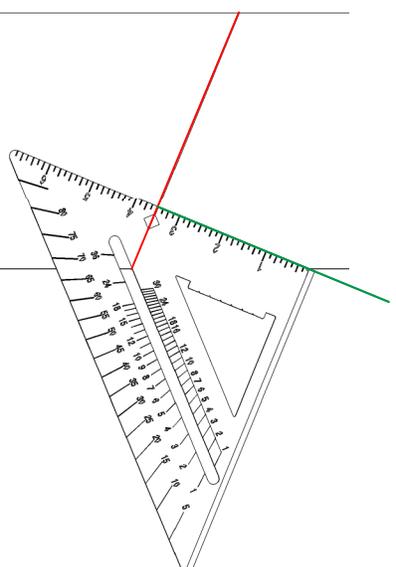
<u>Roof Slope</u>	<u>Factor</u>
Flat	1.0
1:12	1.003
2:12	1.014
3:12	1.031
4:12	1.054
5:12	1.083
6:12	1.118
7:12	1.158
8:12	1.202
9:12	1.250
10:12	1.302
11:12	1.357
12:12	1.414
13:12	1.474
14:12	1.537
15:12	1.601
16:12	1.667
17:12	1.734
18:12	1.803
19:12	1.873
20:12	1.943
21:12	2.015
22:12	2.088
23:12	2.162

For the speed square, start by lining up your plumb cut by aligning the pivot point on the speed square with the desired pitch. This example is going to use a 5-12 slope but the principle is the same with any slope. See the diagram below.



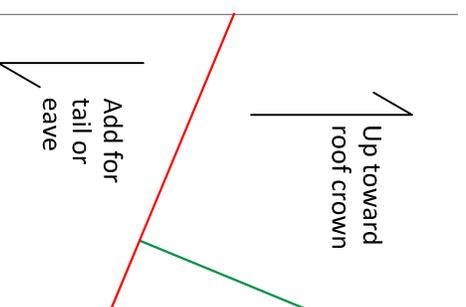
See how the red line lines up with the little notch in the back of the speed square and the number 5 in the "common". The common simply refers to a common rafter. Notice also, how the "HIP/VAL" lines up quite nicely with 7? For a $\frac{1}{2}$ slope, the corresponding hip/valley slope would be 7. Easy peasy.

2) Anyway, mark your line along the GREEN side with all the numbers. To make your seat cut, simply plumb the other side at the length you need and follow the diagram below for a nice $3\frac{1}{2}$ " seat cut.



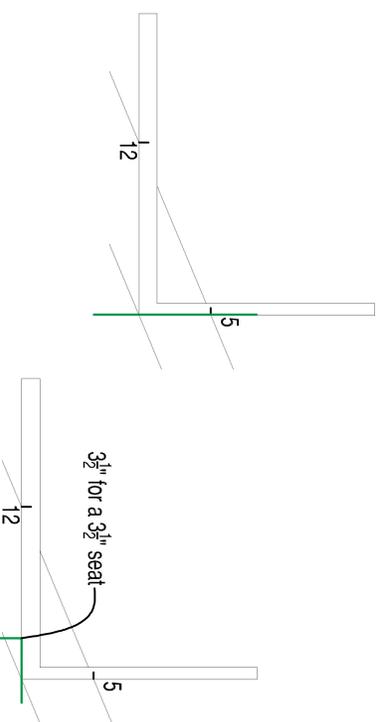
Align the diamond sight so the line cuts the center and your pivot point is flush against the outside edge of the rafter to be cut.

The RED line represents the mark you just made for plumb. Now again, mark along the green line for your seat cut. See the nice "L" shaped seat? Cut your seat out and it should look something like below.



The previous page contains instructions with a table which will help you measure the overall rafter length.

For a Framing (Rafter) Square it is basically the same principle. Align the 5 and the 12 as shown below. Mark the GREEN line shown in 1 for plumb.



To mark the seat measure the 3 1/2" on the square and mark the plumb at the end as shown above in 2.