DISCLAIMER:

READ BEFORE YOU BEGIN! THESE PLANS ARE INTENDED AS A GUIDE ONLY! READ THESE INSTRUCTIONS COMPLETELY THROUGH ONCE AND UNDERSTAND WHAT IS REQUIRED.

We will not be held responsible for any accidents or injuries anyone may sustain. Builder assumes all risks associated with construction work!

We assume some builder competency in the use of tools, safety and equipment.

If you are unsure of any procedures, please contact a professional. The methods in this plan assume a minimum amount of power tools. Also, if you know of alternate methods of construction, feel free to use them!

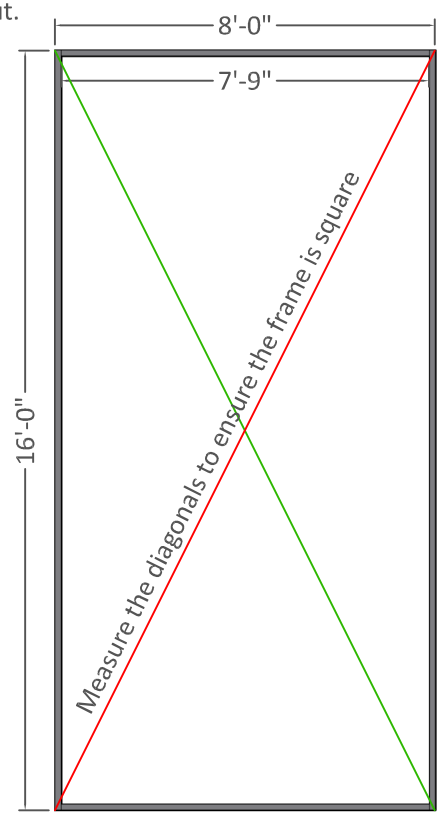
Using other tools to speed the work process is just fine.

Work safely and wear proper safety equipement such as gloves, ear protection and eye protection.

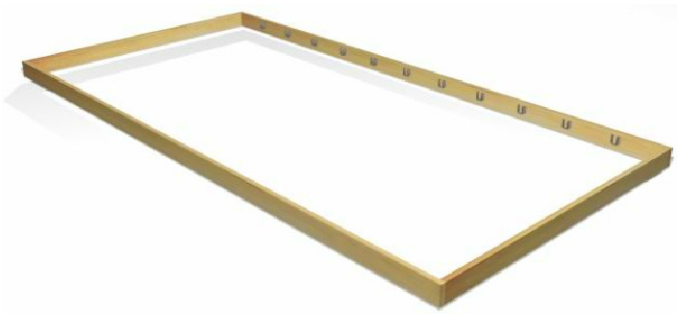
MATERIALS		
Description	Dimensions	Quantity
Foundation		
2x6 plank	2x6x16'	5
2x4 plank	2x4x8'	15
Plywood Sheet	4'x8'x$\frac{3}{8}$" min	8
Walls		
2x4 plank	2x4x8'	100
2x4 plank	2x4x16'	6
Sheathing	4x8'x$\frac{3}{8}$" min.	12
Window Hardware	By Builder	8
Roofing		
2x4 plank (struts)	2x4x8'	13
2x6 plank (rafters)	2x6x8'	21
2x8 plank (bottom chord)	2x8x8'	13
4x4 Post	4x4x16'	2
Truss Plates	By Builder	208
Sheathing	4x8'x$\frac{1}{2}$"" min.	10
Roofing	By Builder	By Builder
Nesting Boxes		
2x2 Post	2x2x8'	2
2x4 Plank	2x4x4'	1
Plywood or OSB Sheet	4x8'x$\frac{5}{8}$" min.	1
Roofing	By Builder	By Builder
Hinges	By Builder	By Builder
Roost		
2x4 plank	2x4x8'	6
1" Ø Dowels	1"Ø x 4'	9
Doors and Windows		
Door & Window Assembly	By Builder	By Builder

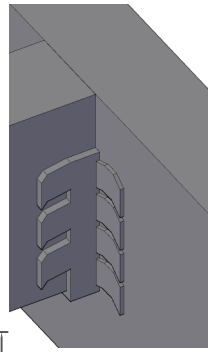
Disclaimer: This list is NOT all encompassing! It does NOT include components such as fasteners, paints, adhesives, glues and window and door materials! Please read through the ENTIRE direction set BEFORE purchasing materials and layout and plan your construction process!

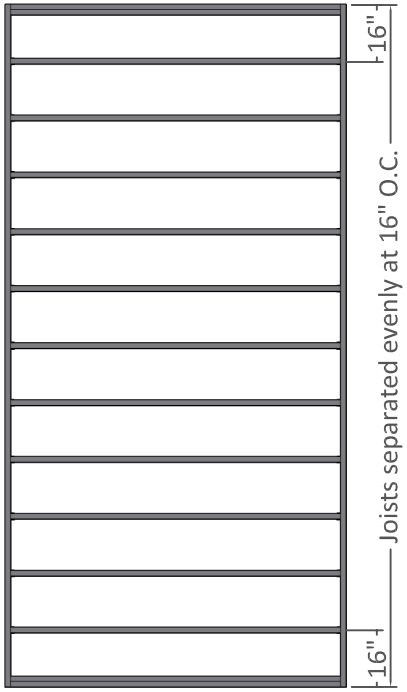
To begin, you will need to construct your frame and square it up. The most common way to ensure a square frame is to measure the diagonals. If the diagonals match, the frame is square. See the diagram below to see what we are talking about.



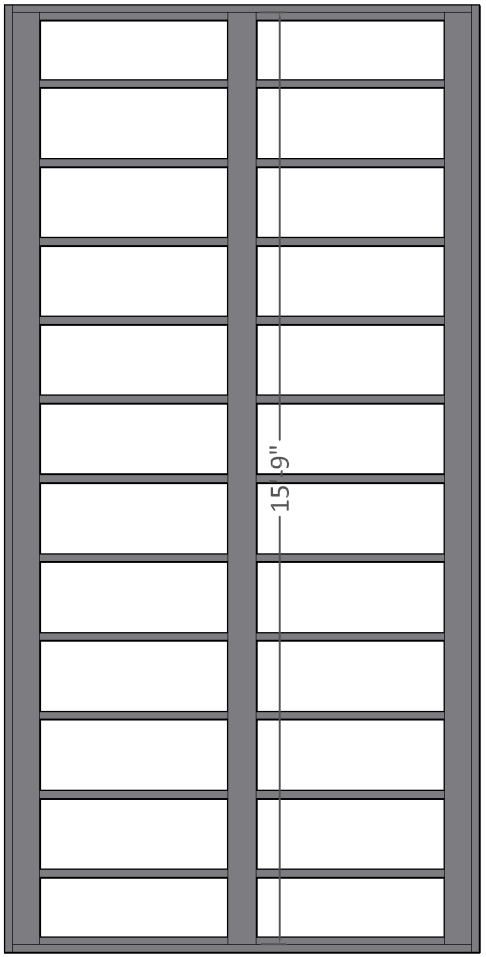
Now fill in the framework with 2x4 joists. If you need to move the structure, use joist hangers to make the connections even stronger.



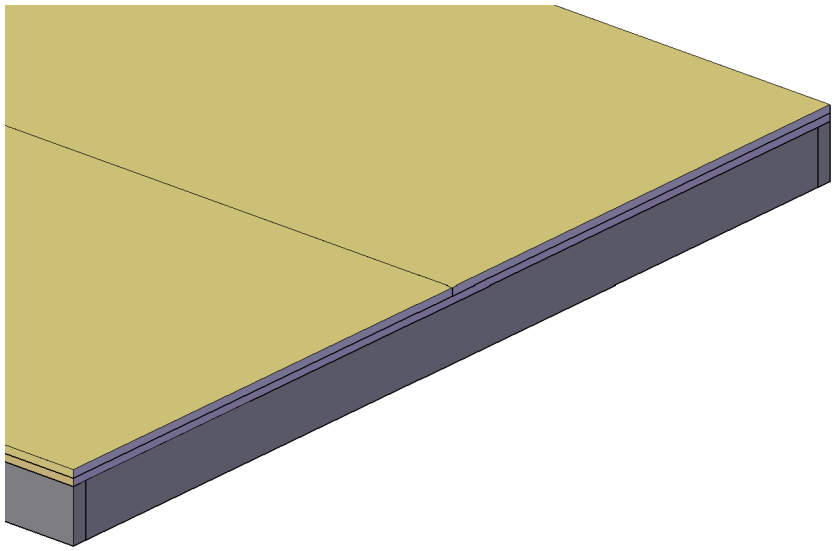




Cut three (3) reinforcing planks as shown below and attach them under the floor frame. These will give the flooring structural rigidity and allow the structure to be relocated more easily.

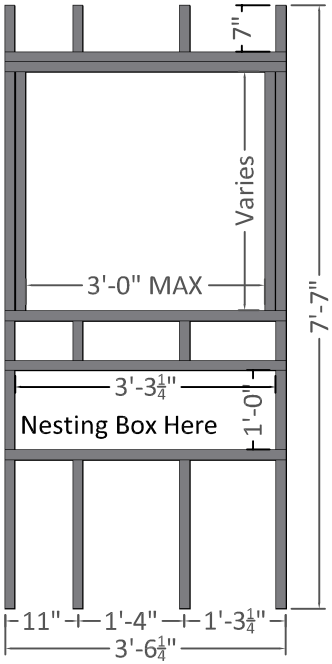


You should be able to just lay 4 plywood sheets across the joists. We recommend doubling up and alternating the direction of the plywood sheets.



Notes:

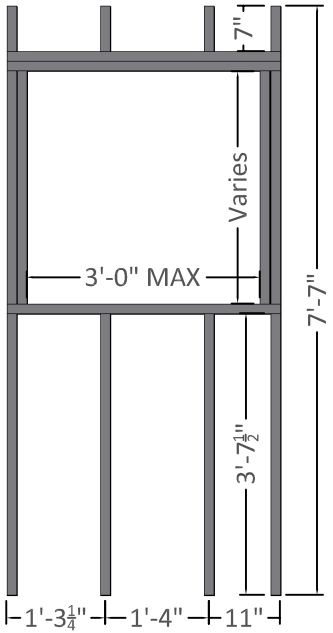
For the side wall, there are many windows. So start with the window frames as shown below.



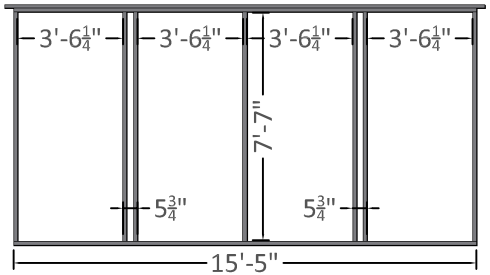
Window size may vary. These plans are drawn with the intent of fitting 4 windows in the space provided. This means, the widow height MAY vary, but the window width MUST be no larger than 36"!

Make sure the NESTING BOX area is precisely the same dimensions as shown because all nesting boxes are designed off of this opening size!

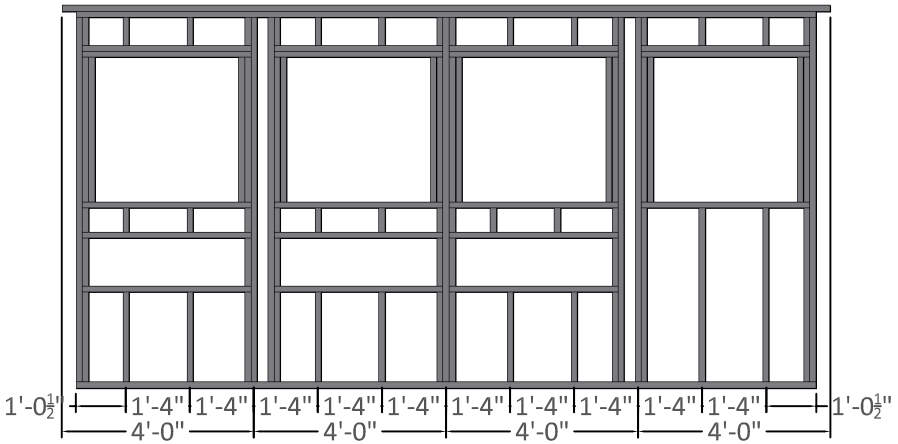
For the solid wall, should you desire, follow the diagram at right. It is very similar to a regular window wall. Shouldn't be too much trouble.



Once you have the window assemblies in place they should fit into the frame as shown.

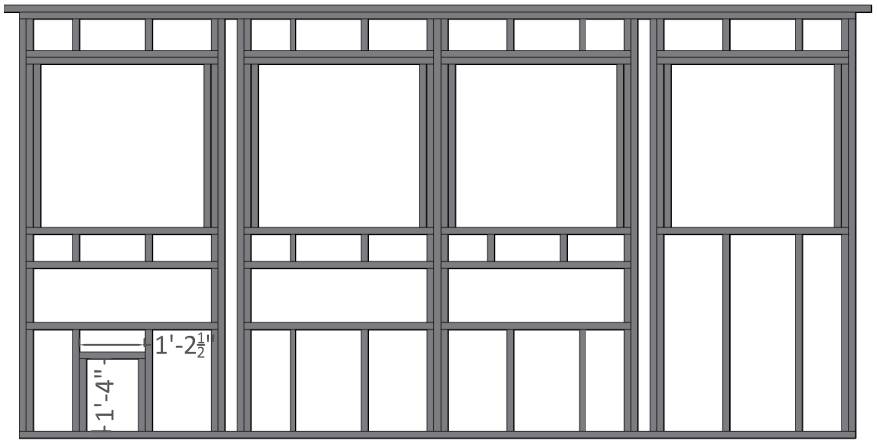


Note: Now the layout may seem funny, but once you insert the window framing into the openings, the sheathing should lay across the wall frames when in place.



Now, once you have the framing in place, you will want to make an opening for your chickens so they can access the coop without you having to open and close the door all the time.

Generally, a 12x12" opening is sufficient for most breeds but larger breeds may need bigger access openings.



No need for fancy opening holes or anything, just add the small framing shown. Just fit it between the window sill studs.

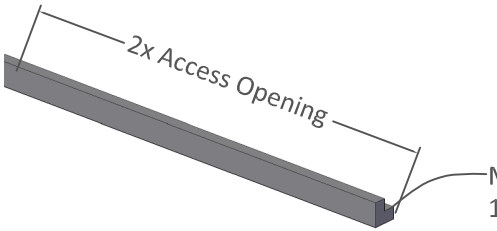
Sheath the walls. Make sure you cut out the paneling at the base of the two middle window frames for your run! You may save the sheathing until you are done with the wall frames. Also, don't forget to give yourself about ¾" lip below the top plate to attach the roof sheathing to!

Notes:

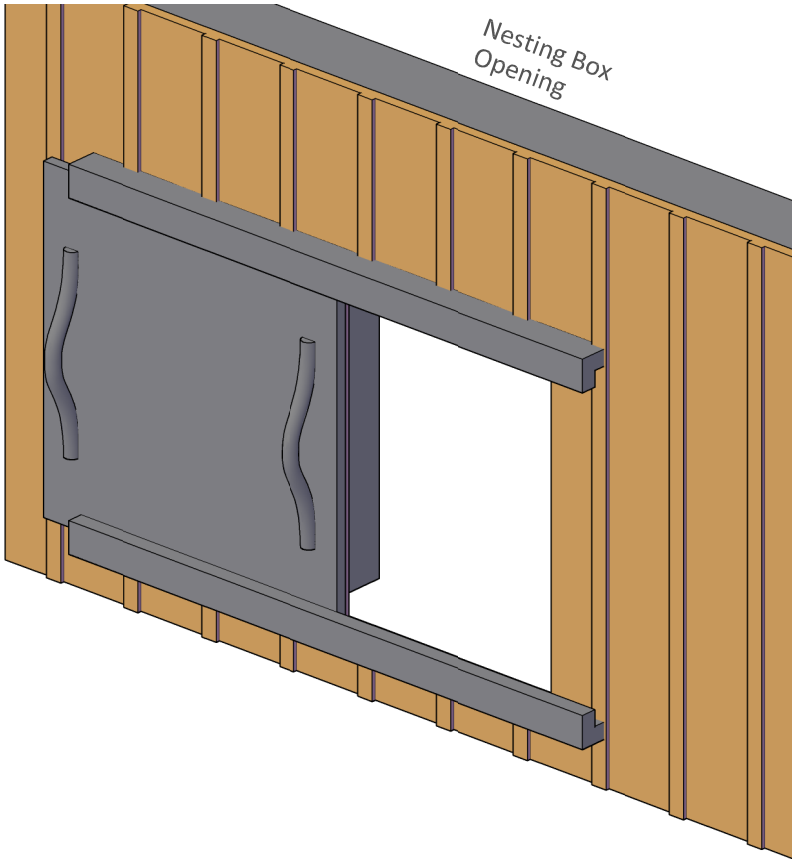
Now, just to install slides and a door. This is a very basic method and is used commonly. You will need either a router with a guide (or a router table) or a table saw with a dado blade.

Simply rip a dado in a 2x2 post roughtly $\frac{1}{16}$" - $\frac{1}{8}$" larger than the door panel material.

Cut the slides to length and attach in place as shown below. That's it!

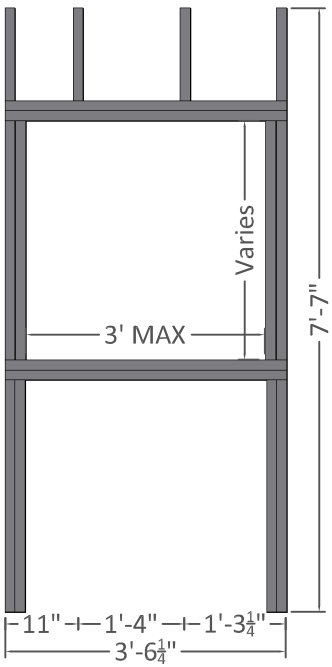


Make sure the dado is at least 1/16-1/8" larger than the paneling you intend to use



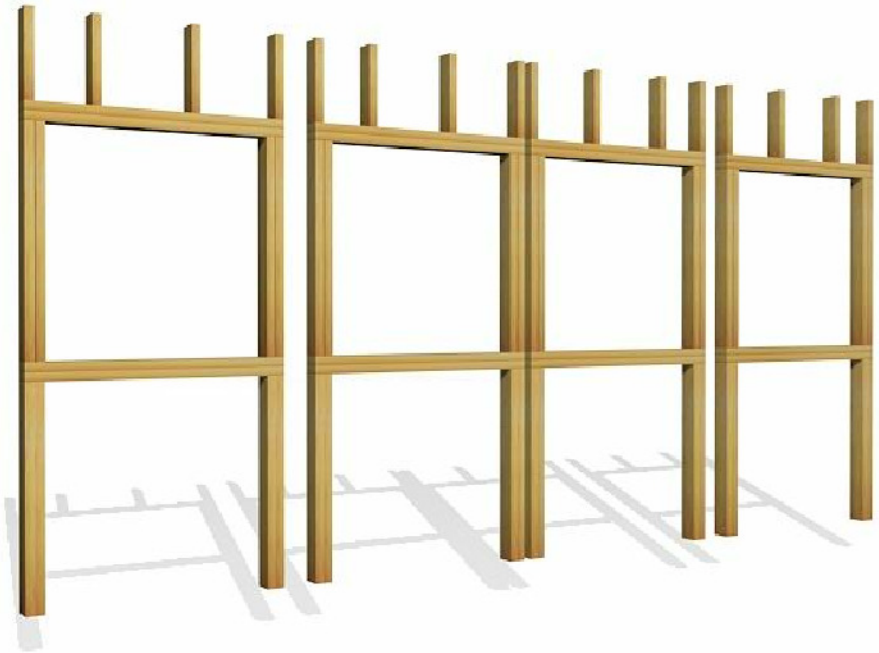
Notes:

For the side wall, there are many windows. So start with the window frames as shown below.

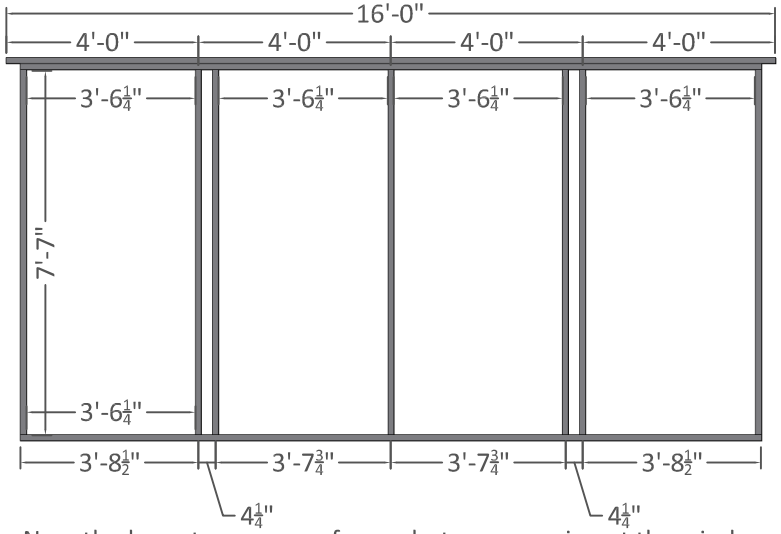


Window size may vary. These plans are drawn with the intent of fitting 4 windows in the space provided. This means, the widow height MAY vary, but the window width MUST be no larger than 36"!

Be careful! This configuration is meant to be put into the wall framing and is NOT structurally sound by itself! In fact, it will seem quite flimsy because there is no support on the sides for rigidity. Also, no sheathing over the openings for a rigid backing.



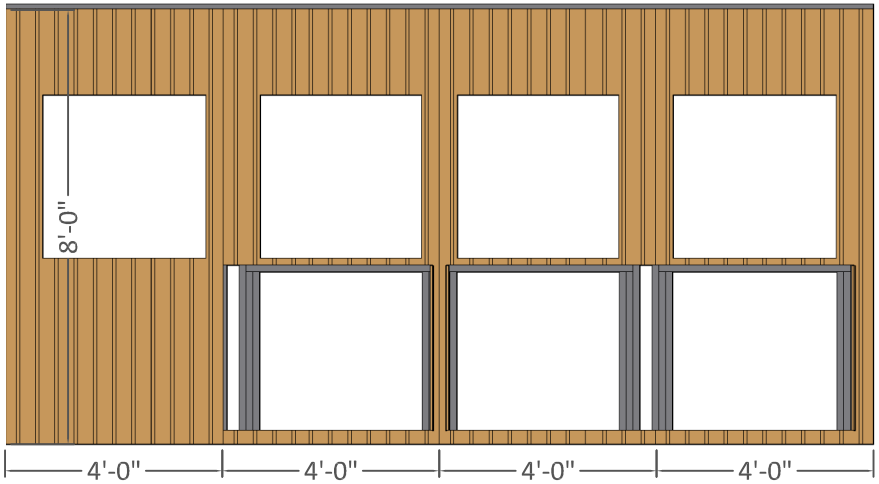
Once you have the window assemblies in place they should fit into the frame as shown.



Note: Now the layout may seem funny, but once you insert the window framing into the openings, the sheathing should lay across the wall frames when in place.

Make sure you attach each window frame to the wall framing with screws! Make sure the connections are nice and tight, and don't forget the header supports at the top above the window openings!

Once you have all of the window frames in place, you can go ahead and start sheathing the wall in. Be careful not to cover the base where you will put chicken wire.



Align the sheathing along the top plate, right down the middle ($\frac{3}{4}$" from the top). It's OK if the sheathing overlaps, it should connect with the rest of the walls later. And don't just cut the bottom off. The overlap should sit over any flooring you have on the ground. If the structure is to be built on grade, go ahead and trim the sheathing flush with the base board.

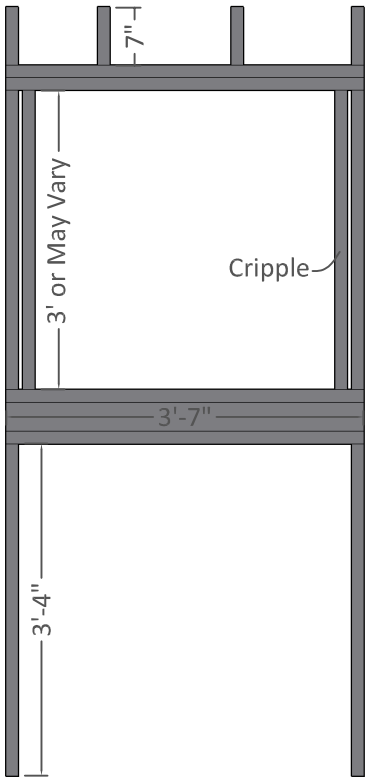
Run some chicken wire along the bottom of the open sections. This will act as a "run" portion of the coop, allowing for fresh air and ventilation.

Grab the pieces cut out for the "run". You will want to use the pieces as paneling that you can open and close. Attach them to the wall sheathing with hinges. Ensure they can lock closed with slide latches or hook and eye pins.

Now just to install the windows and you are done. You can wait to install the windows until ALL of the walls are connected.

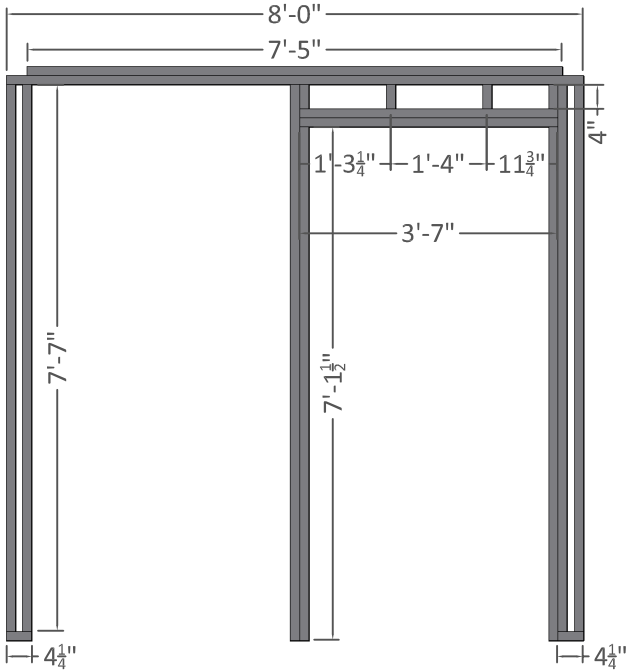
Notes:

For this wall, the key is to make sure all open ways are properly supported. Ensure the headers are not free-hanging with the use of cripples. Cripples are simply supports beneath any header that keep the structure from settling.

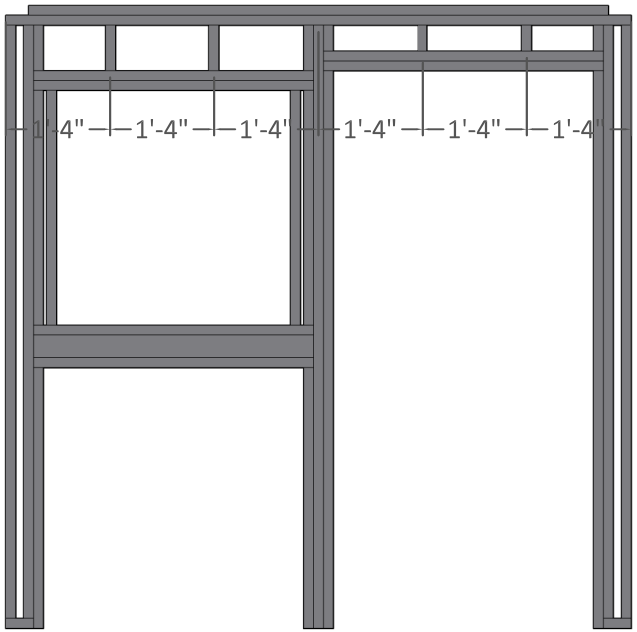


Notice the framework for the clean out. This structure will not be stable until combined with studs to provide vertical integrity.

Follow the diagram below and assemble the rest of the wall frame on the ground.



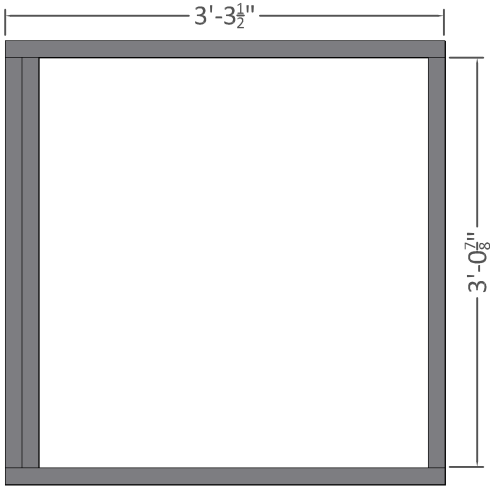
Combine the two frames. Make sure the window frame is squared up in the wall frame. If your frame is out of square then the window may not fit properly.



Sheathing is pretty easy. Make sure you don't sheath the frame until you have them attached to the rest of the walls. It is just a precaution to ensure the sheathing is properly aligned.

Notes:

Once you get the sheathing on the outside, you will want to construct a quick clean out frame. It should be roughly $\frac{1}{4}$" smaller than the opening for the panel. It is just a plain square frame as shown below.



Hint: Notice the double frame on the hinge side!
Before placing the frame in the clean out opening, you will want to attach the sheathing to the outside so it is nice and rigid. Also, use some shims or something thin (such as a carpenter square) to lift the frame in place so it will swing freely. (You DID remember to allow yourself about $\frac{1}{4}$", right?)

Once all of the sheathing is on your structure, nothing much left to do but fill in the amenities!

Notes:

The following diagrams show the order of construction for the wall frames.
You do NOT have to follow this order, it is just for reference.

Continuing wall construction... Here is the frame enclosed.

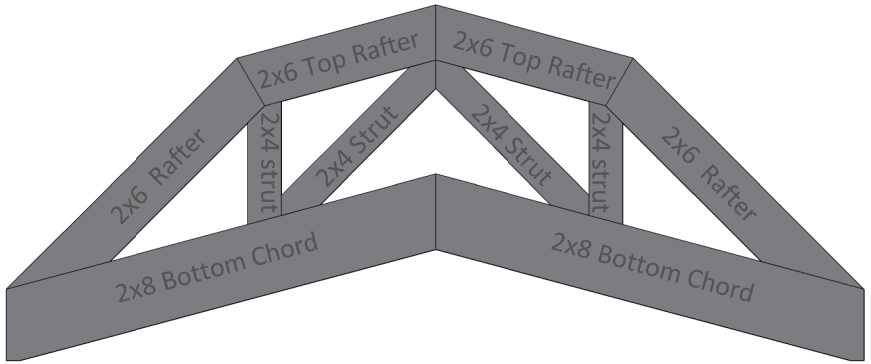
Now would be a great time to construct the divider wall inside. The structure is still slightly flexible and you don't have the constraints of the roof in tying in the frame to the walls.

Sheath in the frames in any order you wish. REMEMBER! Hang the sheathing halfway in the top tie plate, or lower, to give your roof sheathing something to tie to!

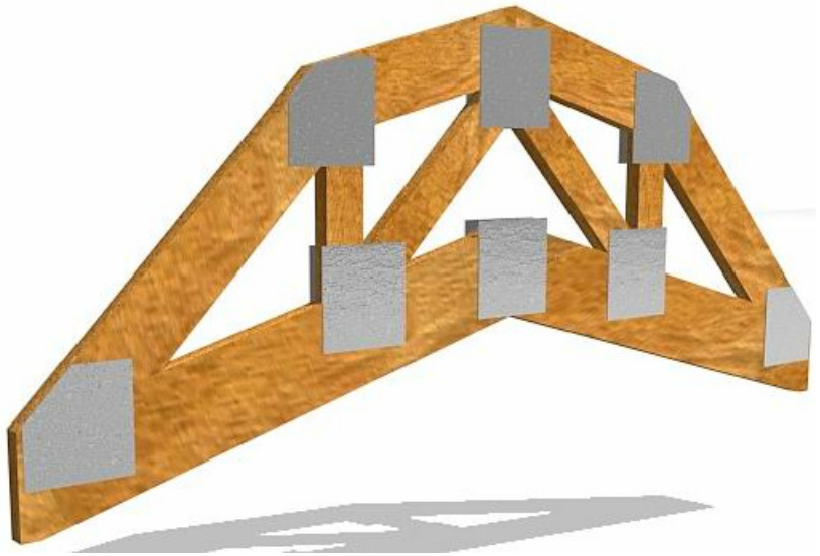
For the roof framing, PLEASE FOLLOW THESE INSTRUCTIONS CAREFULLY!!! IF YOU DO NOT FEEL COMFORTABLE CONSTRUCTING ROOFING ELEMENTS, DO NOT ATTEMPT! CONSULT A PROFESSIONAL!

Falling from even a small height can result in serious injury or death so take all necessary precautions and MAKE SURE YOU WEAR SAFETY EQUIPMENT and follow any safety guidelines!

Having said that, follow the diagram below to create your roof rafters. We really do recommend connecting the pieces with rafter plates. They are literally large, square plates with shard edges perforated out of them. They act as a binder. Be sure to connect BOTH sides of each rafter!

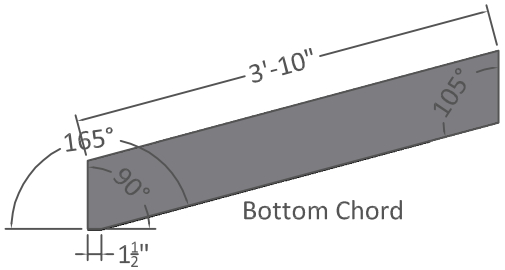


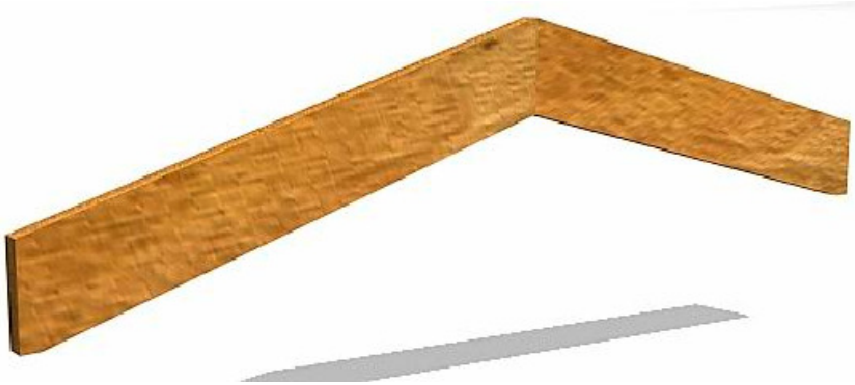
We will detail the trusses more in the coming pages. Please familiarize yourself with the terms WE are using. There are more terms for these components, but these plans are intended for the every-day builder. We are trying to describe the components using the simplest terms possible.



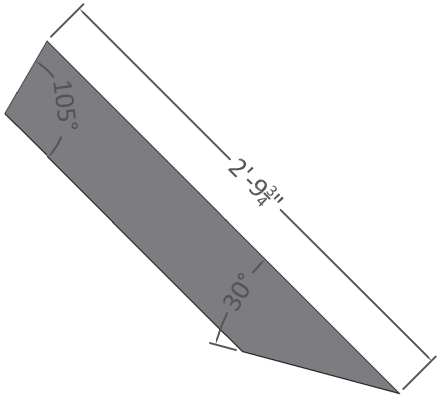
Notes:

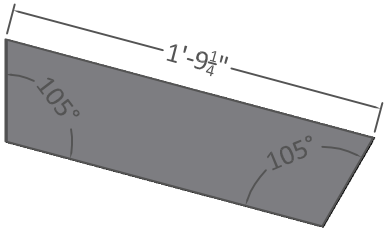
OK, we are going to detail the components individually so you, the builder, can take your time, measure and layout the truss before assembling.



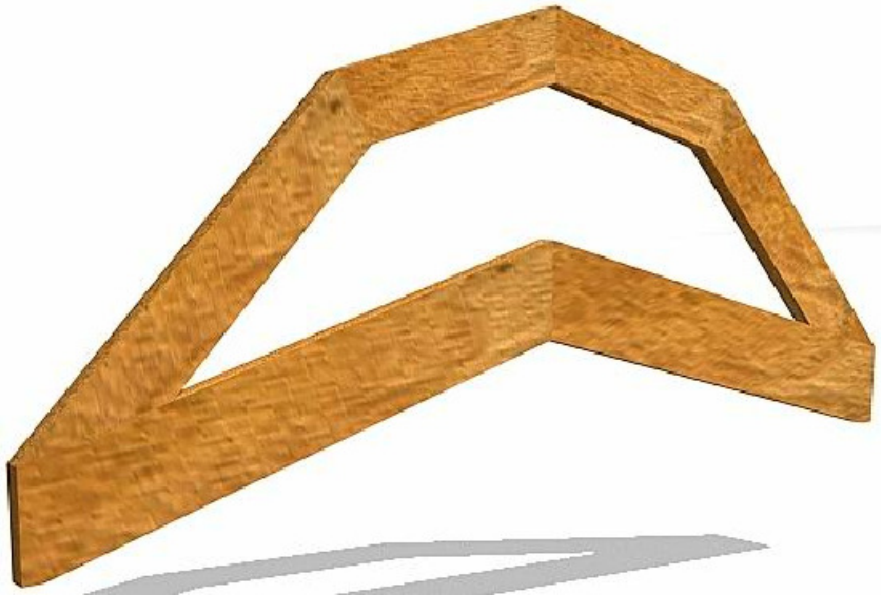


For the rafters:



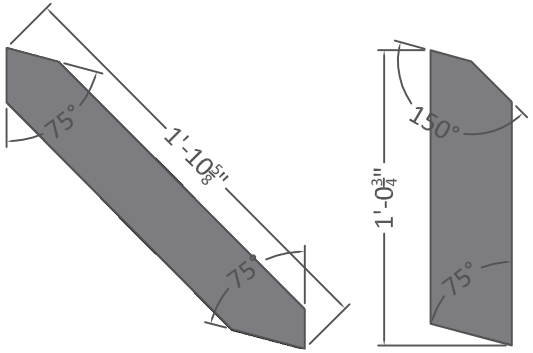


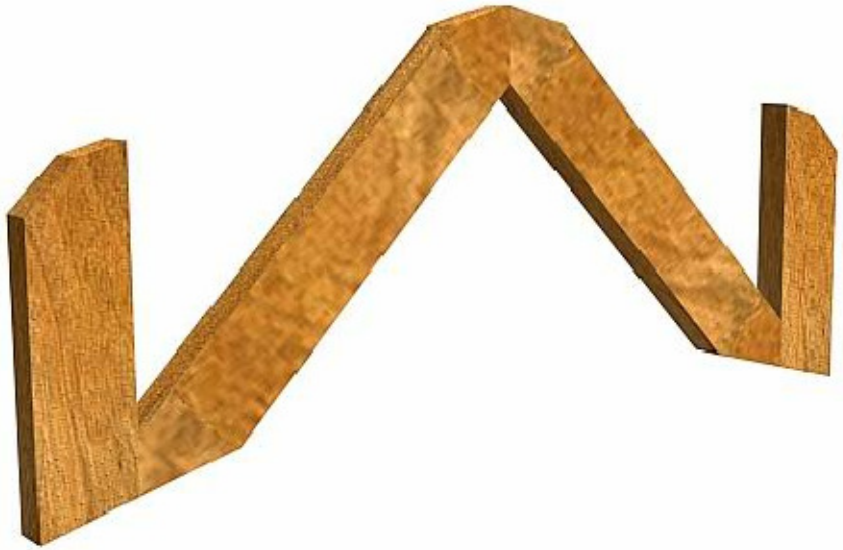
At this point you should be able to assemble the rafter ON THE GROUND. You can toe nail screws through then ends to just hold it together. Make sure each piece fits properly and there aren't any gaps in the seams between pieces.



Notes:

Now you need to add struts for structural support. We do have them dimensioned up, but by far the easiest way to dimension these in the real world would be to ensure your rafter frame is squared up and layout the 2x4 struts right on top of the rafter. Mark your cuts and put them in place.





Assemble the struts in place on the ground. **Make sure the vertical struts lay properly directly under the seam of the peak rafter and the general rafter!**

We recommend using brackets to anchor the struts together at the base. The point of constructing the rafters is to make them as rigid as is possible. Essentially you will need to ensure all seams are connected solid. Screw them into place initially, but some other means of connecting the seams MUST be employed!

One of the best fasteners for rafters are connector plates. Make sure the entire seam is covered as thoroughly as possible. You MAY have to cut or bend the connector plate. Use connector plates ON BOTH SIDES OF THE RAFTER!

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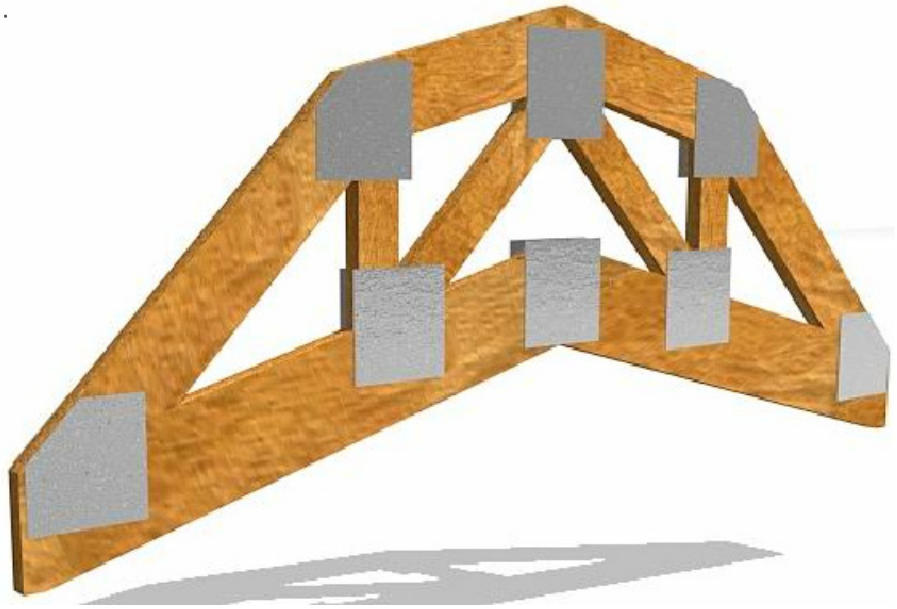

Notes:

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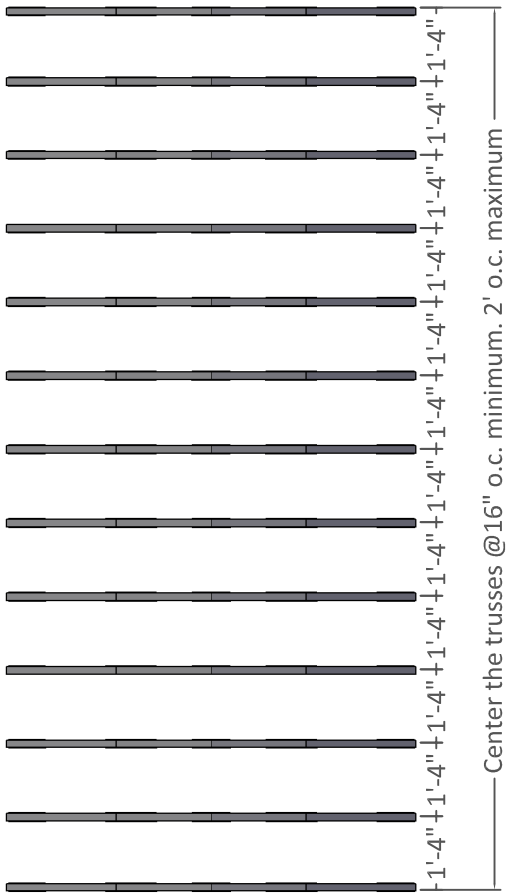
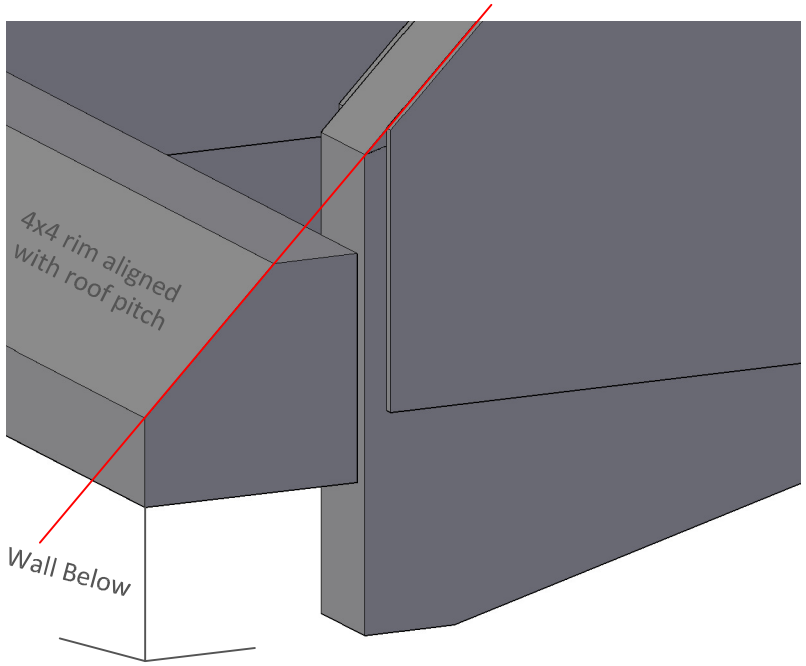
Falling from even a small height can result in serious injury or death so take all necessary precautions and MAKE SURE YOU WEAR SAFETY EQUIPMENT and follow any safety guidelines!

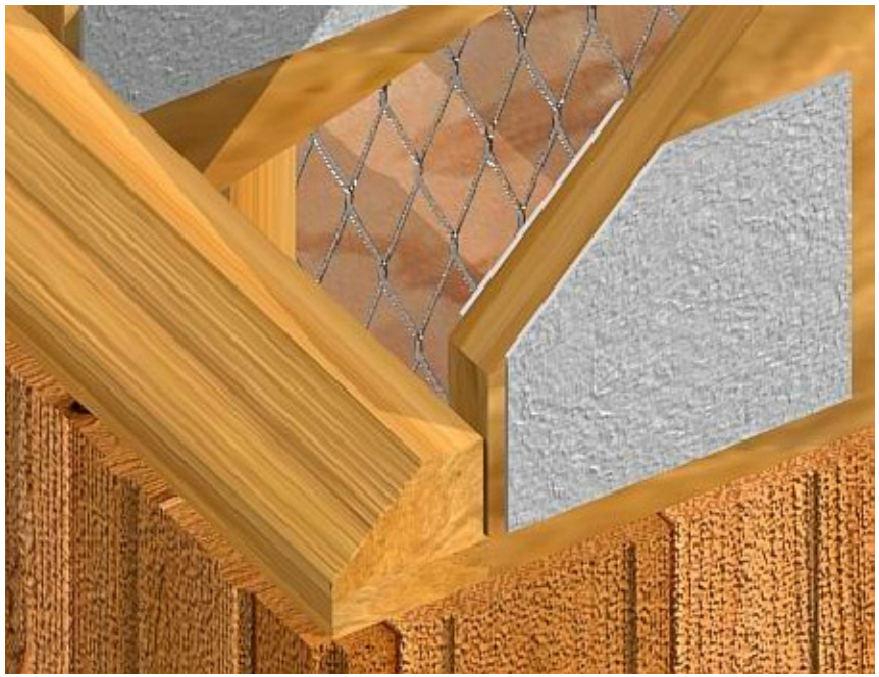
PLACE TRUSSES CAREFULLY. TAKE YOUR TIME AND GET THE ALIGNMENT CORRECT. WHERE POSSIBLE, USE RAFTER HANGERS TO SUPPORT THE LOADS! ALWAYS USE ASSISTANCE WHEN PLACING AND ANCHORING SHEATHING, WORKING AT HEIGHTS AND LEVELING THE TRUSSES!



Notes:

Before you begin sheathing, you will need to rip a couple of 4x4 posts at pitch to use as rims. Since the rafters SHOULD be supported in rafter hangers, it will be up to you, the builder, to make sure the rim is cut properly to align with the roof pitch.





Now, CAREFULLY attach the roof sheathing to the rafters! You will have to cut the sheathing to accommodate the gambrel roof style.

Notes:

All that is really left from this point is to seal up the roof with roofing. You WILL want to use tarpaper, roofing material and do a nice job making sure all the seams between plywood sheets are sealed up so you don't have any water leaking through.

Now, once your roof frame is up and all the seams are sealed up with epoxy or other weather-proof sealant, go ahead and finish up the roof with roofing. **You do NOT have to use tin as shown here.**

Some tips on roofing:

1) carefully read and understand all directions (if included with your particular roofing materials).

2) Coating the roof with a weather proof substance, such as tar, is always a good idea. It seals the wooden sub-roofing and makes it harder for water to penetrate. Also, it can seal up any cracks or burrs.

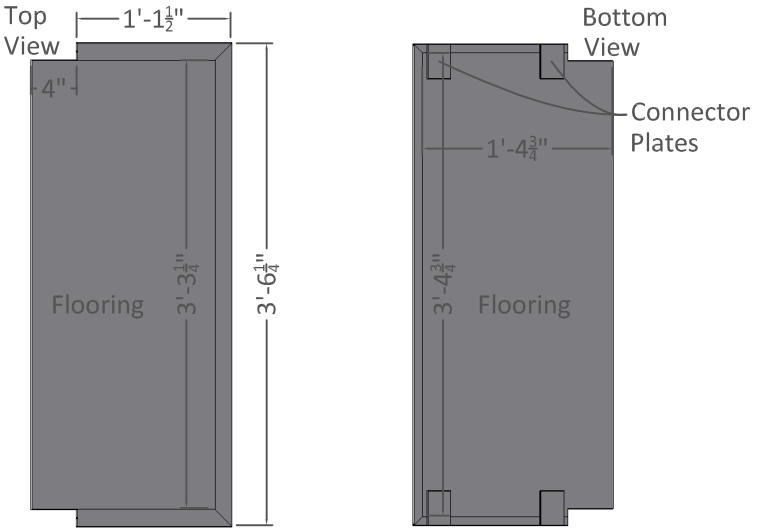
3) If you use cedar or other wooden shingles, make sure to use tar-paper and understand how the manufacturer wants you to lay the shingles. Also, you MAY want to weatherproof the shingles with a coat of polyurethane or other approved sealant. Also check for UL fireproofing rating.

Notes:

For the nesting box, you need to figure around 12-18" per chicken depending upon breed.

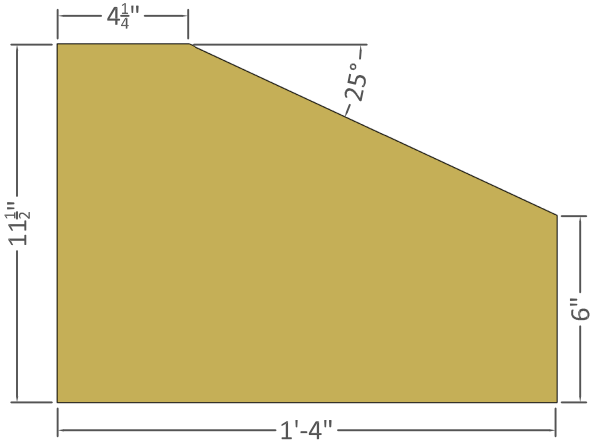
Now, the nesting box is not a complex structure to build, but it does need to have some better materials underneath. We recommend $\frac{3}{4}$" cedar or oak plywood. If you wish, you may use OSB to offset the cost of plywood, you are just going to have to clean the nesting boxes more often!

Now, having said that, start by constructing a "frame of sorts to fit in the opening of the coop wall.



If you have the skills and the tools, we actually recommend routering dados into the 2x2 frame and insetting the flooring. The plywood flooring will end up looking like a big, fat "T". Either that, or use metal connector plates to hold the flooring tight. A combination of the two works quite nicely...

Now, cut out he dividers as shown below. You can use down to $\frac{1}{4}$" OSB or Plywood sheet.



Separate them according to the expected size of the chickens you have. A good size is about every 10-12" apart. This will create a snug, enclosed, personal space for the chickens to lay and nest their eggs.

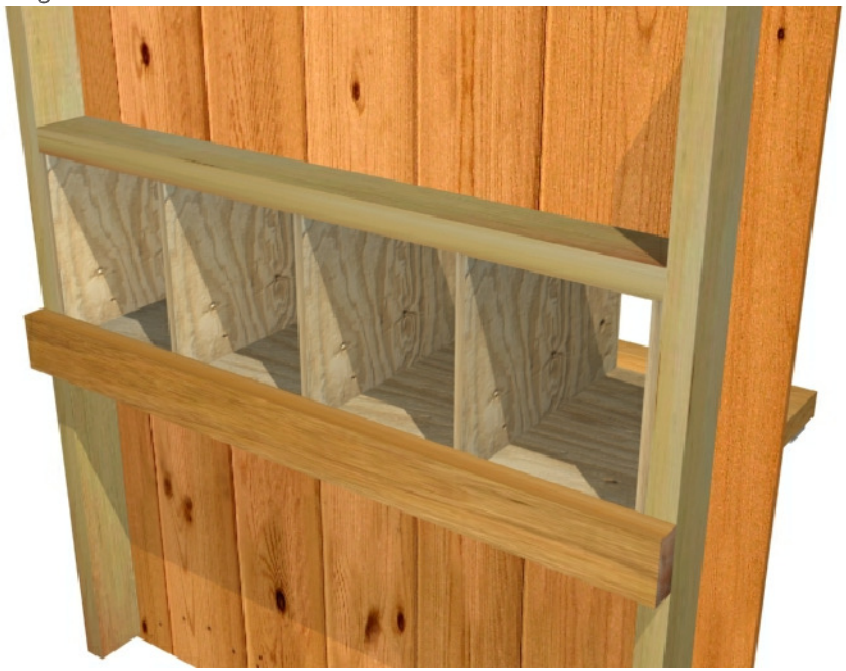
Notes:

OK, lay out the dividers. We recommend using brackets to hold them for a longer life and a sturdier wall. You MAY use screws through the bottom, but, really, hitting a $\frac{1}{4}$" target by "eyeballing" is tough and you may just end up shredding the base of the divider and putting unnecessary holes in the floor of the nesting box.

If you live in a colder climate, do NOT screw through the bottom! The holes can create "vents" and let cold air into a space that is supposed to be warm!

The nesting box assembly thus far should fit in the opening of the wall frame.

You need to attach a front brace across the front of the wall. Both as a main support and as a stoop and as a frame to help keep straw in the nesting box.



Notes:

You will want to anchor the nesting box to the sheathing with an angle bracket to make sure the frame stays in place.

Once the floor framing is in place, assemble the rear panel out of a piece of sheathing. You will want to attach some paneling before using a hinge to ensure the rear panel opens freely.

You will want to anchor the nesting box to the sheathing with an angle bracket to make sure the frame stays in place.

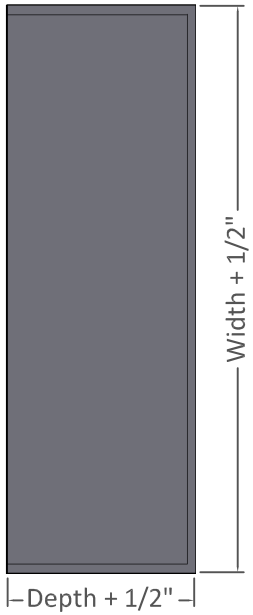
Once the floor framing is in place, assemble the rear panel out of a piece of sheathing. You will want to attach some paneling before using a hinge to ensure the rear panel opens freely.

Add siding to the outside walls of the nesting box (should you desire).

Notes:

The only thing left is to do is to complete the roof. Start off by framing the roofing slightly larger than the the largest dimensions of the nesting box.

Frame the roof panel similar to the flooring.



You will have to miter the hinge ends of the frame and mitering the sub roof panel is a good idea as to not impede with the swing of the hinges above.

You will have to attach any roofing material before attaching the hinge to the nesting box roof panel assembly and the wall.

Congratulations! The nesting box is completed! Repeat the process as necessary for as many nesting boxes you want.

Notes:

So far, your coop should look something like the diagram below.

Use the scrap leftover from your wall sheathing to create your panels to cover the chicken wire. You will NEED to complete this step to close up your chickens at night and to keep the coop warm during cold weather.

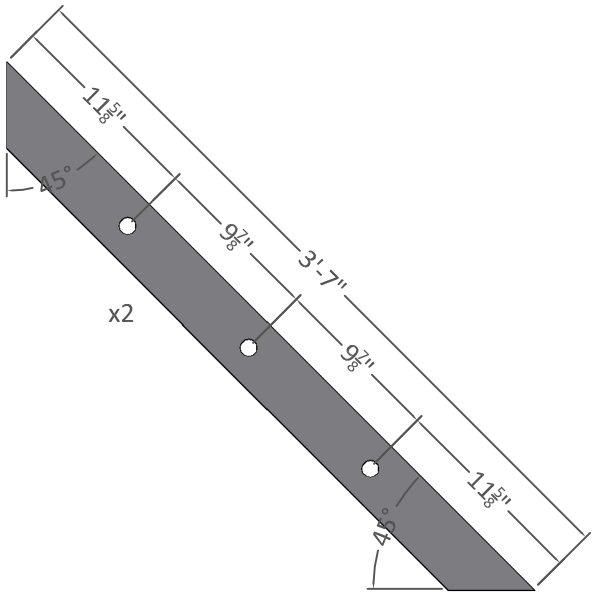
Notes:

So far, your coop should look something like the diagram below.

Use the scrap leftover from your wall sheathing to create your panels to cover the chicken wire. You will NEED to complete this step to close up your chickens at night and to keep the coop warm during cold weather.

Notes:

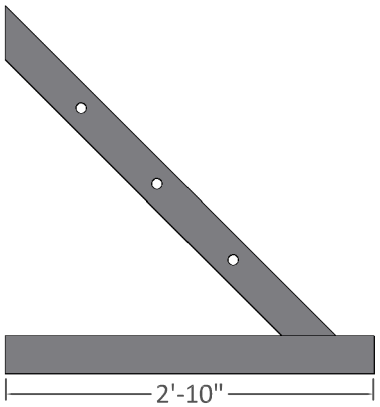
For the roost, the key is support. Use brackets to anchor the roost to the wall frame. Use angle brackets to connect the front and rear braces. Make sure the dowels are secured properly with screws and glue. If you do NOT secure the dowel, they will spin when the chickens try to roost.



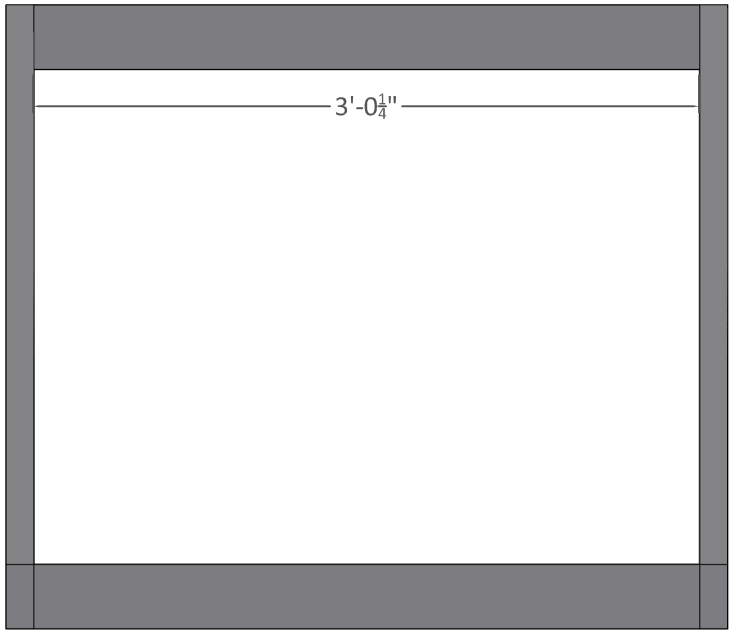
Attach the diagonals directly to the wall studs of the side wall. Use hangers to ensure a good hold and make sure the diagonals are level across the top.

Now, attach the base supports to the diagonals. Use brackets if possible. Screw directly through the top of the diagonal into the base support below. Use hangers to attach the base support to the wall stud, directly beneath the diagonal.

You will notice we have left a lip out the front of the roost. This is essentially going to serve two purposes. 1) It will give the chickens a "step" up to the main roosts and 2) it gives you a solid surface to attach the front brace.



Solidify the roost frame with the front and rear 2x4 braces. We recommend using angle brackets to connect the front and rear braces.



Bringing it all together, run the dowels through the holes in the diagonals and secure in place with screws to make sure the dowels do not rotate.

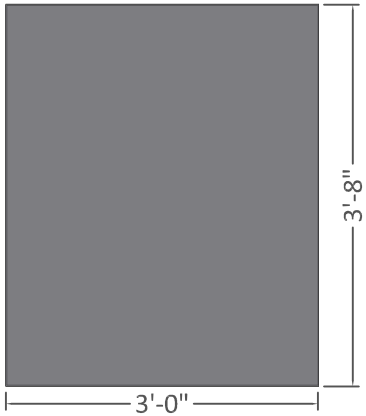
Let us diagram the completion of the roosts. First, use hangers or heavy duty screws to anchor the roost diagonals and base supports.

Then, attach your front and back braces and anchor the roost dowels in place.

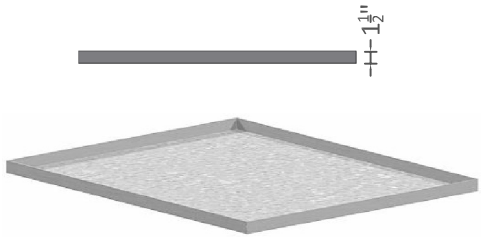
Repeat the process for the remaining two roosts.

Notes:

For the poo pan, you may have to go and purchase a 3x3 shallow metal pan. But, just in case you have some fabrication skills, we will dimension up the poo pan for catching chicken droppings.

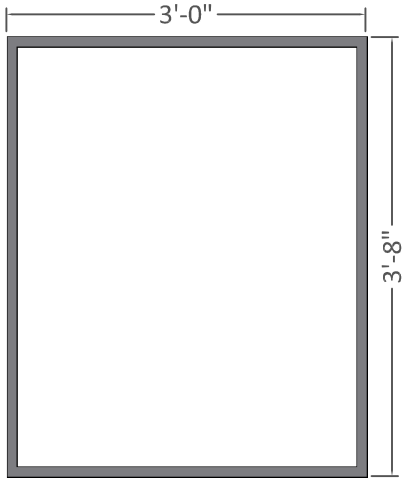


Use a min $\frac{1}{8}$" stainless steel plate and fold up the corners as shown below.



Attach the screen to the poo pan with a clasp. We do not recommend a hinge. You will want to completely remove the screen from the poo pan for cleaning.

For the screen, use the same $\frac{1}{8}$" stainless steel and fabricate yourself a frame as shown below.



Weld a screen to the top to keep the chickens from walking over their own poo.

Notes:

Now, just to finalize the structure. We recommend you purchase door and window assemblies, but we have added generic plans for constructing your basic door and a double hung type of window.

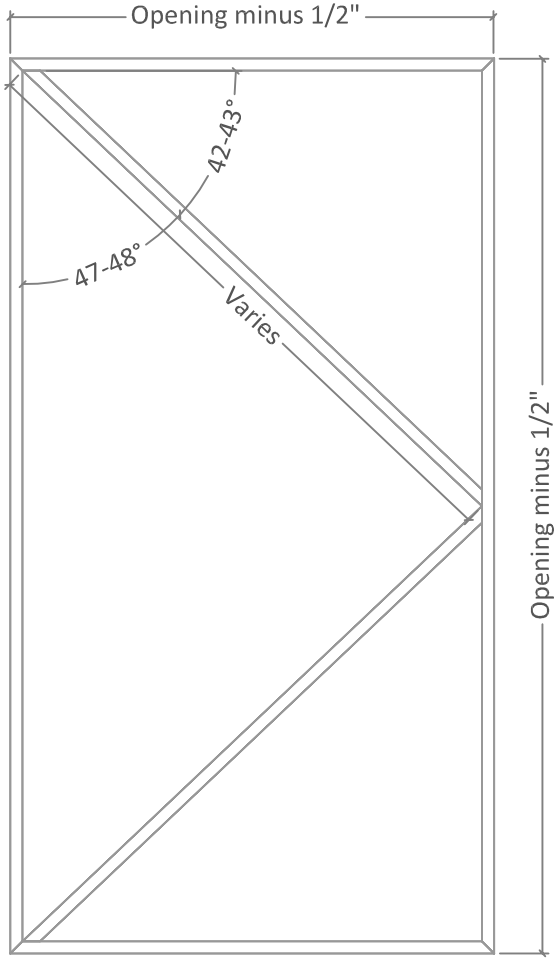
And for the doors.

And just to seal up cracks, seams and any other mistakes that need to be taken care of. And you are done! Congratulations!

Notes:

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 can be anything. Just tweak the dimensions to match your rough opening. **Be sure you subtract $\frac{1}{2}$" from the rough opening to allow for swing!**
1) To begin, we are using 1'4 planks and $\frac{1}{2}$" plywood sheeting. Cut the frame pieces as shown below. You DO NOT have to miter the corners, we just recommend it for aesthetic purposes.



We will show the door in this example with a pattern cut out of the front and back sheeting, 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'x$\frac{1}{2}$" Plywood Sheet	2
Hinges	3

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.

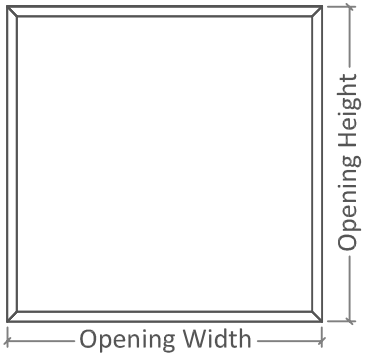
3) Insulate the door with either blow foam or regular R-13 roll insulation will work.

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

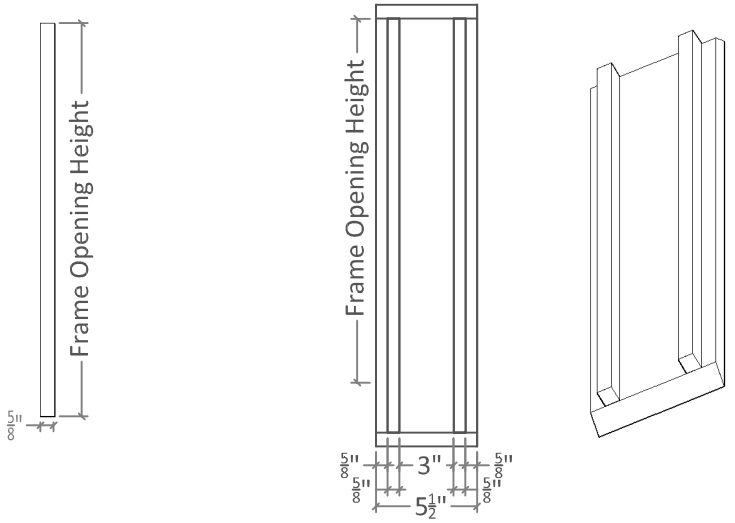
5) A single slide bolt works wonders on the outside and inside to lock the door shut. If you don't want your kids to be able to lock the door, only install the slide bolt on the outside! The slide bolt also offers a grip to pull the door open.

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!

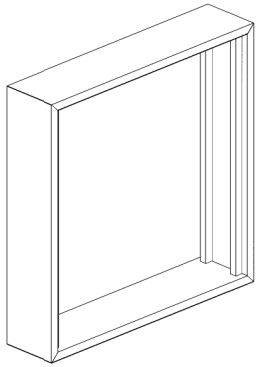


2) Rip a 1x4x8' into strips $\frac{5}{8}$" thick. These will serve many purposes in the future but for now, we just want four of them to match the opening, so either rip and cut one piece or rip an entire board into $\frac{5}{8}$" strips and place the pieces to the side for late.



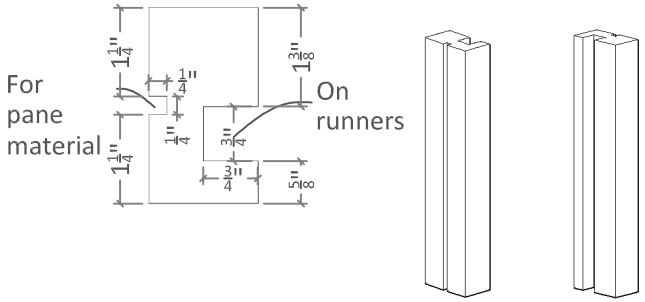
3) Using 1" screws and a level, screw two runners onto one of the exterior frame pieces. Repeat for the second side (see above).

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

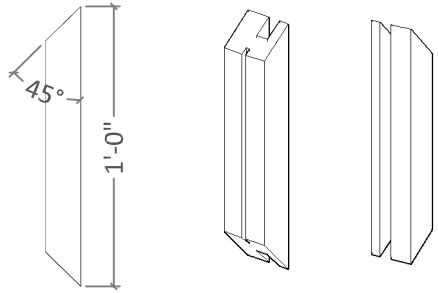


5) Rip a 8'-2x6 down the center lengthwise.

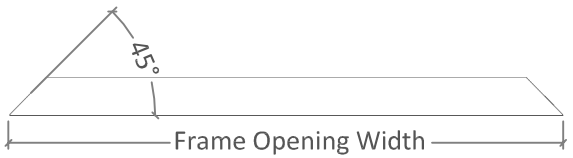
6) Use a router to gouge a $\frac{3}{4}$"x$\frac{3}{4}$" groove down the center of one side. Flip the board over and gouge a $\frac{1}{4}$x$\frac{1}{4}$" groove down the center of the other side (see detail)

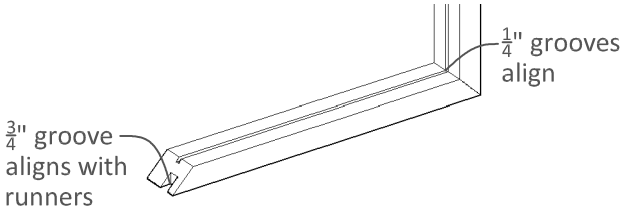


7) Miter the ends. Make sure the narrow ($\frac{1}{4}$x$\frac{1}{4}$") groove is facing inwards! The wide ($\frac{3}{4}$x$\frac{3}{4}$") grooves go out toward the runners, the inside grooves will hold a pane of window material.



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

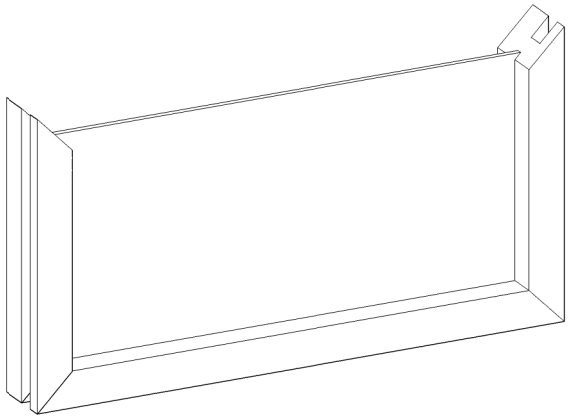
Description:	Qty:
2x6x6' Planks	24
1x6x8' Planks	6
1x4x8' Planks	6

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.

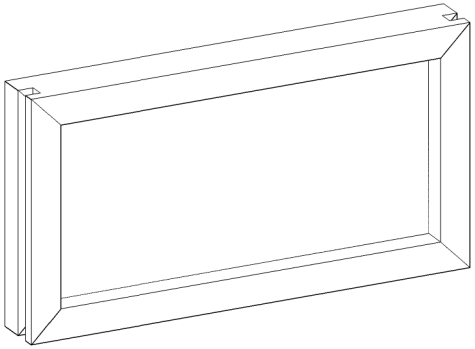
IF YOU DECIDE TO USE GLASS, WE HIGHLY RECOMMEND PURCHASING $\frac{1}{4}$" THICK PROFESSIONALLY CUT PANES. YOU WILL NEED 2 PER WINDOW. ON THIS SET THAT EQUALS 12 PANES OF GLASS TOTAL.

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.

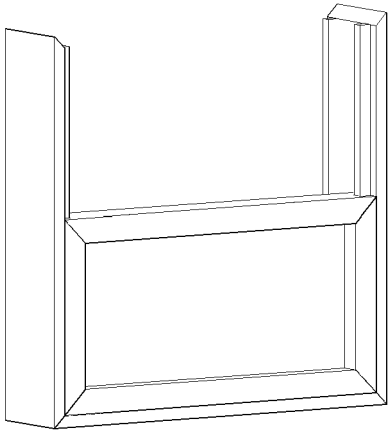


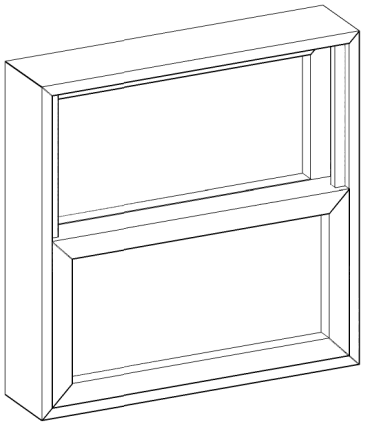
11) Cap off the window with the top piece and connect all pieces with 1" small radius ($\frac{1}{4}$" or smaller) screws. Be sure you don't screw down into the window pane!



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.

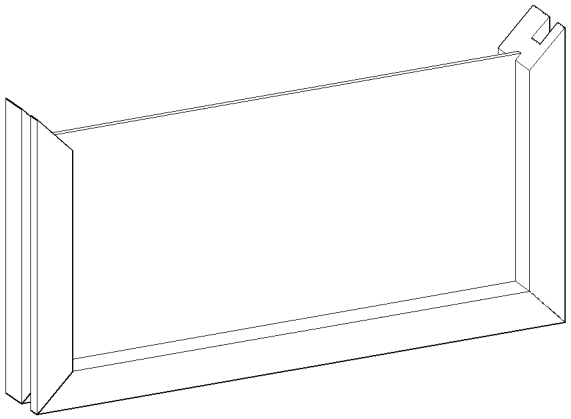
16) How the windows stay up or down is up to the user. We recommend getting a slide bolt and installing at least one on the movable assembly. Which assembly moves or stays stationary is up to the builder.

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.

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!

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.

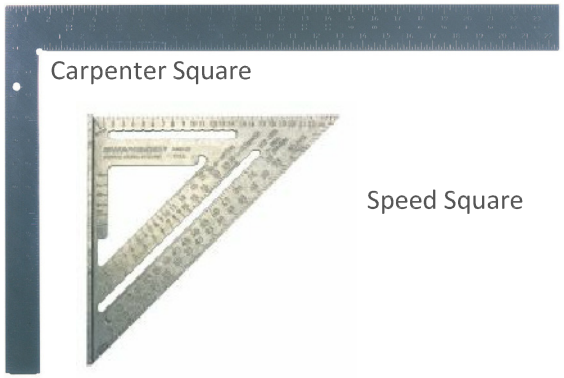
5) For the purpose of this article, the 5/12 roof pitch converts to 1.083 on the rafter conversion chart found on any framing square.Therefore, 11.5 x 1.083 = 12.4545 feet is what the rafter length will be.

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".

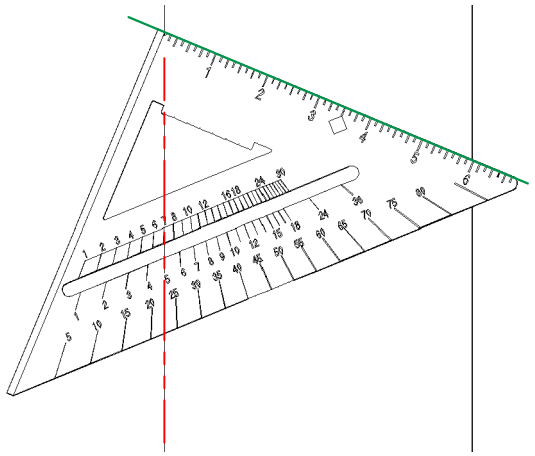
Roof Slope	Factor
Flat	1.0
1:12	1.003
2:12	1.014
3:12	1.031
4:12	1.054
5:12	1.083
6:12	1.118
7:12	1.158
8:12	1.202
9:12	1.250
10:12	1.302
11:12	1.357
12:12	1.414
13:12	1.474
14:12	1.537
15:12	1.601
16:12	1.667
17:12	1.734
18:12	1.803
19:12	1.873
20:12	1.943
21:12	2.015
22:12	2.088
23:12	2.162

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.

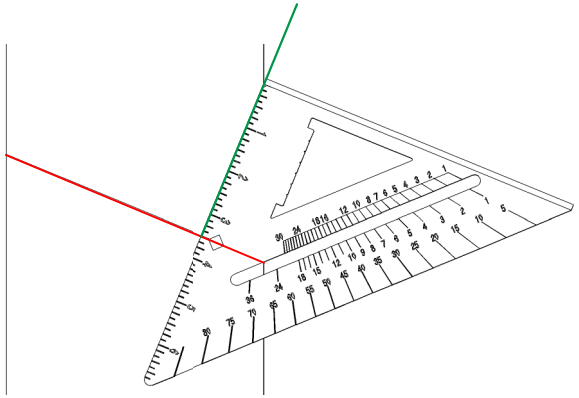


For the speed square, start by lining up your plumb cut by aligning the pivot point on the speed square with the desired pitch. This example is going to use a 5-12 slope but the principle is the same with any slope. See the diagram below.



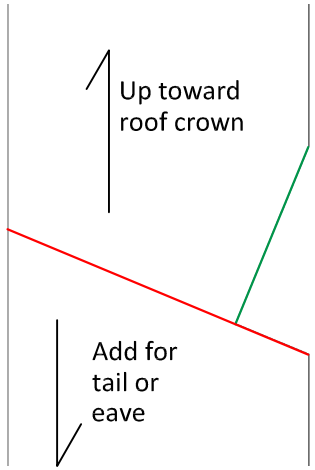
See how the red line lines up with the little notch in the back of the speed square and the number 5 in the "common". The common simply refers to a common rafter. Notice also, how the "HIP/VAL" lines up quite nicely with 7? For a $\frac{5}{12}$ slope, the corresponding hip/valley slope would be 7. Easy 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.



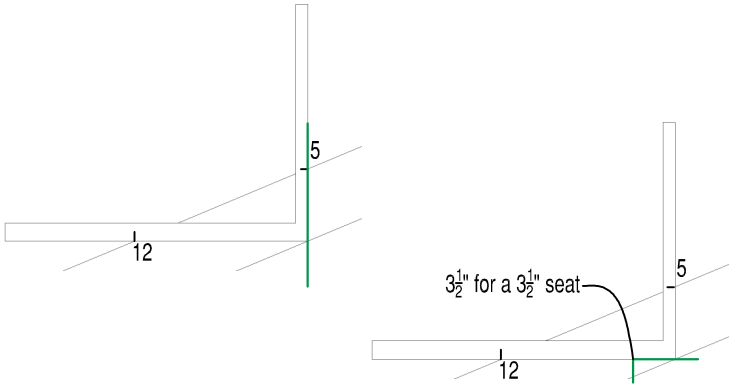
Align the diamond sight so the line cuts the sight down the center and your pivot point is flush against the outside edge of the rafter to be cut.

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 $3\frac{1}{2}$" on the square and mark the plumb at the end as shown above in 2.