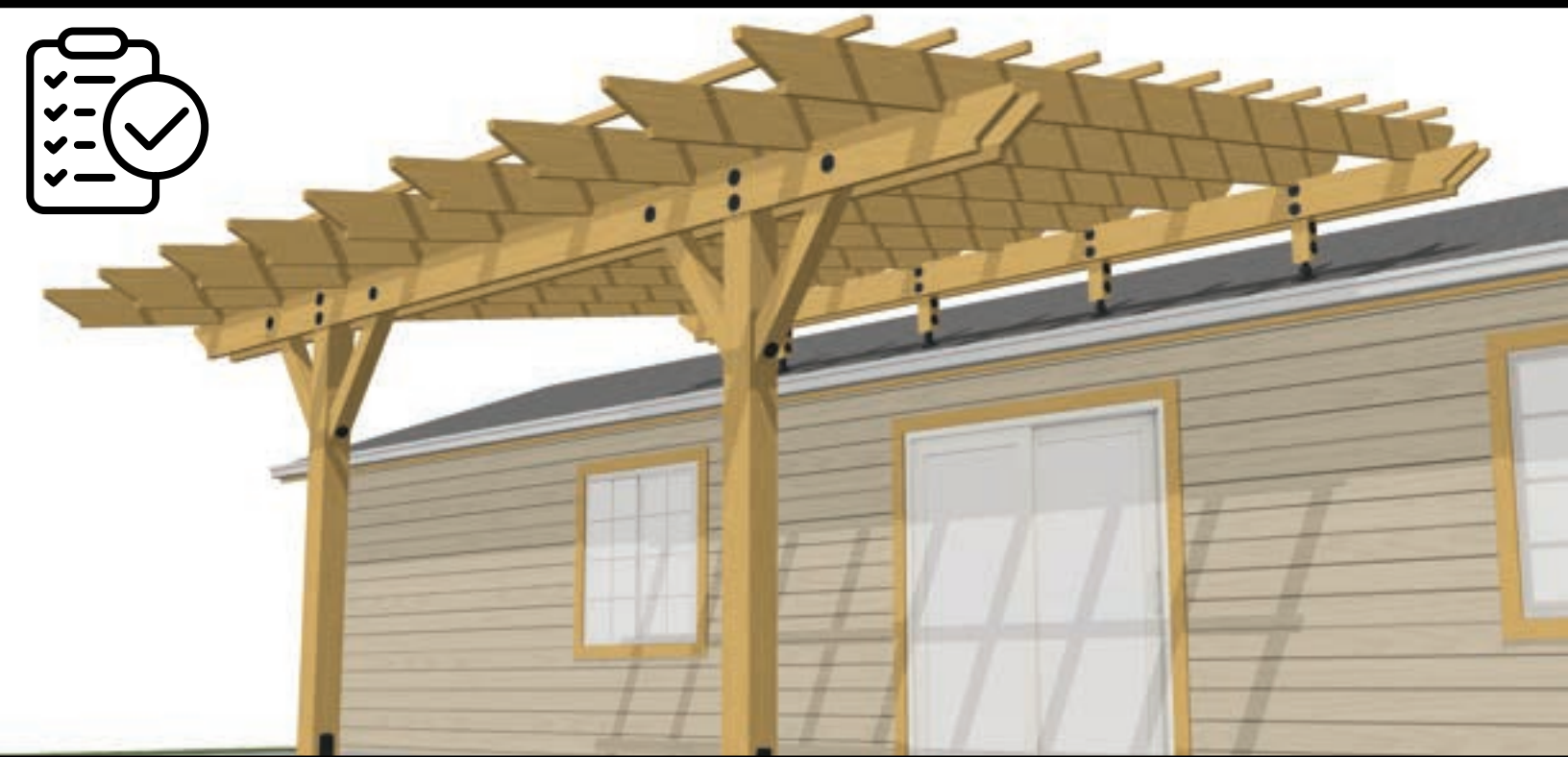




# PATIO ROOF RISER

## COMPLETE INSTALL GUIDE

(FOR LO-PRO AND POST MOUNT STYLE)



Exact hardware dimensions and engineering documents  
can be found at [patioroofriser.com/engineering](http://patioroofriser.com/engineering).

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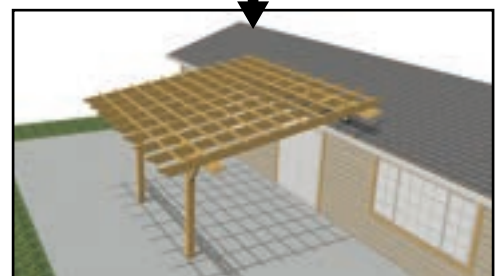
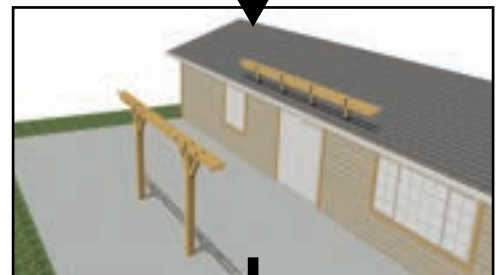
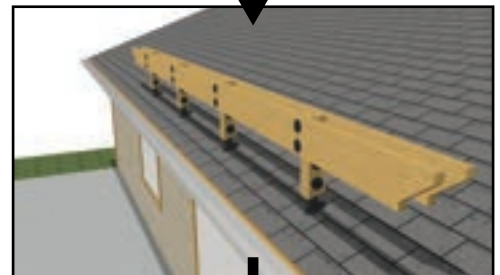
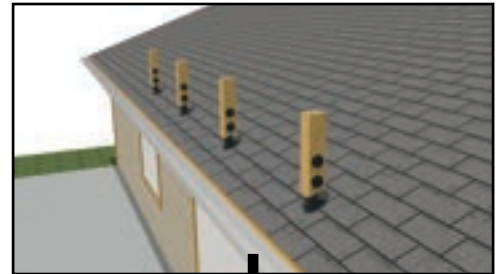
16 **Building Tips / Tricks**

⑯ *Cutting 'Bird's Mouth' Notches*

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★ **Completed Pergola with Patio Roof Risers**





# **BEFORE YOU START**



Our online pergola builder is a great place to start if you are still trying to decide on the sizing / hardware style of your pergola.

The utility also provides a complete hardware and material list for some standard pergola sizes.

**[prrbuilder.com](http://prrbuilder.com)** 

**\*\*\*All measurements in this guide are figured for nominal lumber\*\*\***

## **TOOLS NEEDED (for basic rooftop installation):**

- tape measure and pencil (just making sure you didn't forget)
- square • level • string line • table saw w/ 10" blade
- drill bits: 5/16" and 9/16"
- 9/16" socket (roof lags)
- 15/16" socket and wrench (grade 8 bolt on roof riser hardware)
- 3/4" socket and wrench (post and beam connections)

## **GENERAL TIPS / PREP:**

- It is best to build your pergola with 'S dry' or 'kiln dried' lumber.
- When selecting the post, beam and rafter lumber material, make sure it is free of heart wood or "bulls eyes".
- Before building your pergola, it is best practice to pre-finish the lumber with an exterior wood sealer or oil stain. Be sure to finish any cuts made in the field as well.
- When installing horizontal building members, make sure the crown of the lumber is facing up.

## **DISCLAIMER:**

*Your use of these plans must be reviewed and approved by qualified professionals familiar with all applicable building codes. The specific design and location of the structure, the building materials used, the quality of construction, the condition of the soils or substrates involved, and the site-specific loading due to the particular characteristics of potential impact events such as earthquakes and high velocity winds will affect the strength and safety of the structure or project. The plans are not a substitute for professional judgment. A qualified professional must confirm that the plans may be used at your site by referring to all applicable building codes, amendments and all other relevant information, including without limitation to the current Patio Roof Riser engineering and warranty information available at [patoroofriser.com](http://patoroofriser.com). Due to the large variety of potential applications for the plans, Patio Roof Riser shall not be liable in any manner whatsoever for the results obtained through the use of these plans.*

# POST MOUNT PREP

(Skip this step if you're using LO-PROs.)

1

First, cut the roof pitch angle off the bottom of each post. (Nominal 4x4)

The 'standard' height of the post is **16"**. You can make it taller, increasing the overall height of your cover, however, you may need to add diagonal bracing depending on the height.



2

Measure from the long side of the post and make a mark at **8"** (9" if your pitch is greater than 10/12).

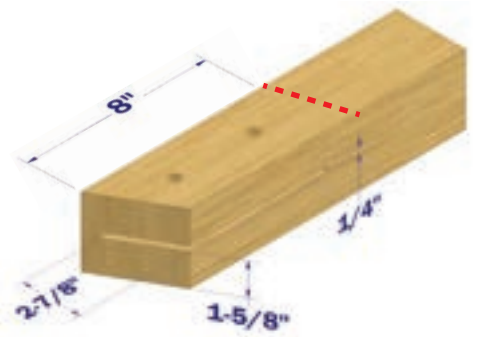
Now use your hardware as a guide to mark your two side holes and drill (2) **9/16"** holes through the post.



3

Next, use a table saw with a 10" blade to cut a **1/4"** wide groove in the center of your post.

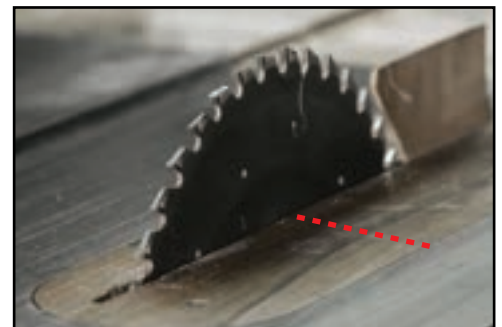
Set cutting depth at **2-7/8"** and guide at **1-5/8"**. Make your cut with the short side of the post facing down. Most blades are **1/8"** thick so you'll have to move your guide over **1/8"** and make another cut.



4

Mark your table saw table with a straight line coming out from the center of the blade. (image right)

Stop your cut when your 8" post mark and center blade mark meet or slightly pass each other (The two dashed lines in steps 3 & 4).



# BLOCKING INSTALLATION



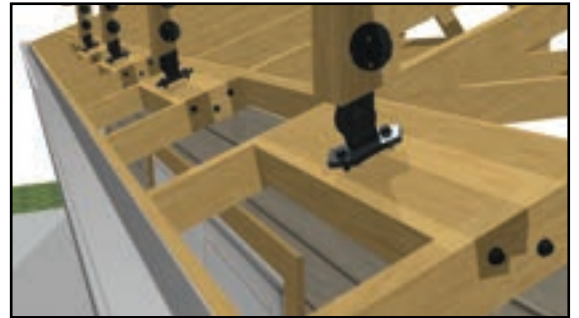
Patio Roof Risers are engineered and designed to be installed directly into your rafter tails.

(image right - shown without roofing)



However, if you have open soffits, we recommend installing optional 4x8 blocking between your truss members.

(image right - shown without roofing)



**1**

Installing the blocking is pretty straightforward. First, you'll want to cut your 4x8 to lengths that will fit between your rafter tails.

You will also need (3) **3/8" x 5"** lag screws for each side of the block.



**2**

Now secure the blocking with the lag screws spaced evenly on both sides.

You can install the block flush against your bird blocking, however, if your bird blocking is vented then you will want to back your 4x8 block off a few inches to allow for proper airflow.



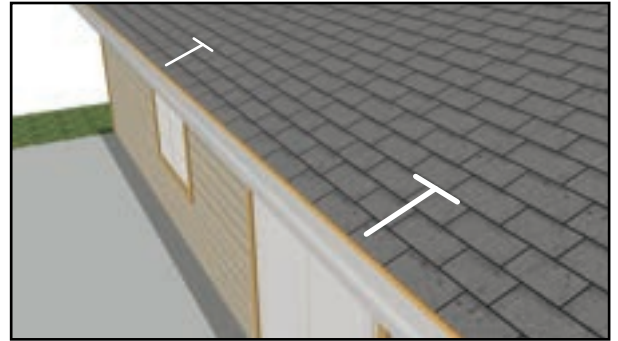
There are other ways to install the blocking as well, including using Simpson's A34 framing clips. You can find more information about alternate installation methods in our engineering documents ([patioroofriser.com/engineering](http://patioroofriser.com/engineering)).

# ROOFTOP INSTALLATION

1

First, locate your rafters (if you're not using blocking) and exterior wall and transfer these locations to your roof.

You will install the bases on each end first and then use them as a guide for the bases between them.

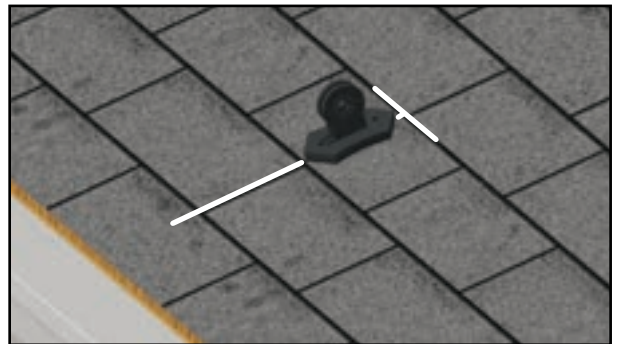


**Note: If you have closed soffits, the easiest way to locate your rafters is by lifting your roofing material and looking for a plywood joint. This should tell you exactly where your rafter is located.**

2

Do not remove the butyl seal paper quite yet. Position the base in line with the "T" and mark it's current position.

Typically, you will want to position the base such that it does not fall on a shingle lap, however, the butyl will still seal properly if it does.



3

You will now want to 'probe' for the exact center of your rafter with a small (1/16") drill bit. Don't worry, the butyl will also seal these micro-holes.

Now that you've found the exact center of the rafter, using the base as a guide, pre-drill (2) **5/16"** holes for mounting the base.



4

Next, properly clean the area with a damp rag, removing any moss, sawdust and dirt.

Now you will remove the butyl seal paper, reposition the base where you have marked and install with the **3/8" x 4"** flange roofing lags.



cont.

# ROOFTOP INSTALLATION

5

After installing both ends, snap a chalk line or run a tight string line between the two ends and set the remaining center base plates at **48"** on center.

You can probe again for dead center of your rafters, but at this point you should be perfectly accurate by just measuring.



6

## Post Mount Assembly

You will now attach the upper part of each roof riser and align them to the roof pitch. Install the adjustment pins and the grade 8 bolt and locknut.



## LO-PRO Assembly

The LO-PRO riser uses the same base as the Post Mount, however, it has a washer that is installed in the center and uses two shorter adjustment pins, one installed on each side.



7

## Post Installation (Skip this step if you're using LO-PROs)

Just like with the bases, start with the outer two posts. Slide the posts over the roof risers and use the included bridge washers and **4-1/2"** bolts and nuts to secure the post to the hardware.

Make sure the outer two posts are level before fully tightening bolts, then run a string line between them to level the remaining posts.



cont.

# ROOFTOP BEAM INSTALLATION

8

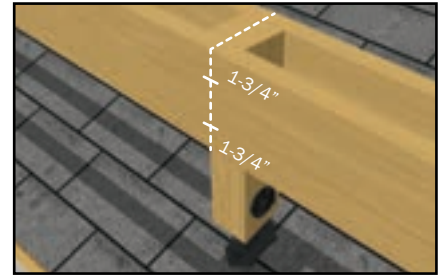
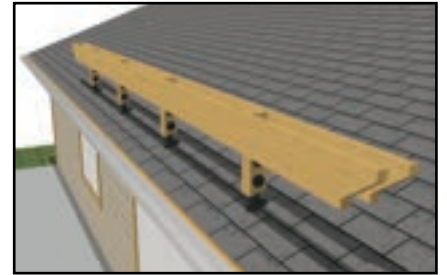
## Post Mount Beams

First, install both beams using 3" screws where they will end up hidden behind bridge washers. Check posts and beams for level again.

Now mark the center line of the posts on the outside of the beams. Along these lines you just made, measure down **1-3/4"** from the top of the beam and up **1-3/4"** from the bottom of the beam and make a mark at each spot. Drill (2) **9/16"** holes through both the beams and post at these marks. **Note: to ensure level holes, drill half of the hole from each side.**

Use bridge washers and **7-1/2"** bolts and nuts to secure the beams to the posts.

**Note: These bolts are not included in the basic Post Mount kit.**



## LO-PRO Beam

Start by fitting your 4x8 beam into your *LO-PRO*s. Due to variance in roof surface and lumber crowning it may take some adjustment to make the beam fit perfectly. Shimming with a piece of shingle can help get your beam in the correct position.

Once your beam is right where you want it, mark for your holes, using the hardware as a guide. Now, Remove the beam, and drill (2) **9/16"** holes through the beam for each bracket.

**Note: to ensure level holes, drill half of the hole from each side of beam.**



Each *LO-PRO* Patio Roof Riser will come with the bolts for securing the beam, however, you can also use (12) Simpson **1/4" x 1-1/2"** SDS screws per bracket instead.

cont.

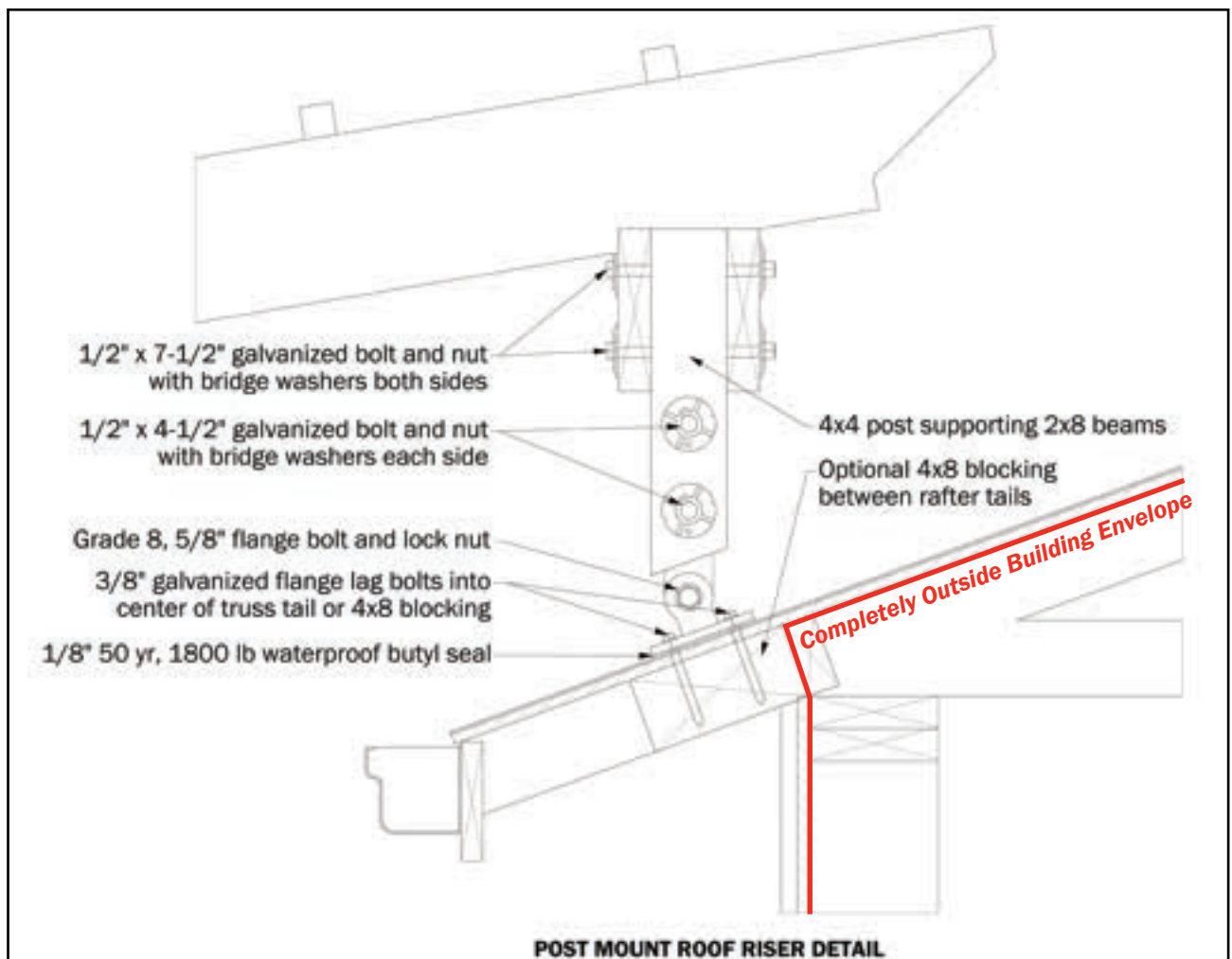


# ROOFTOP INSTALL INFO

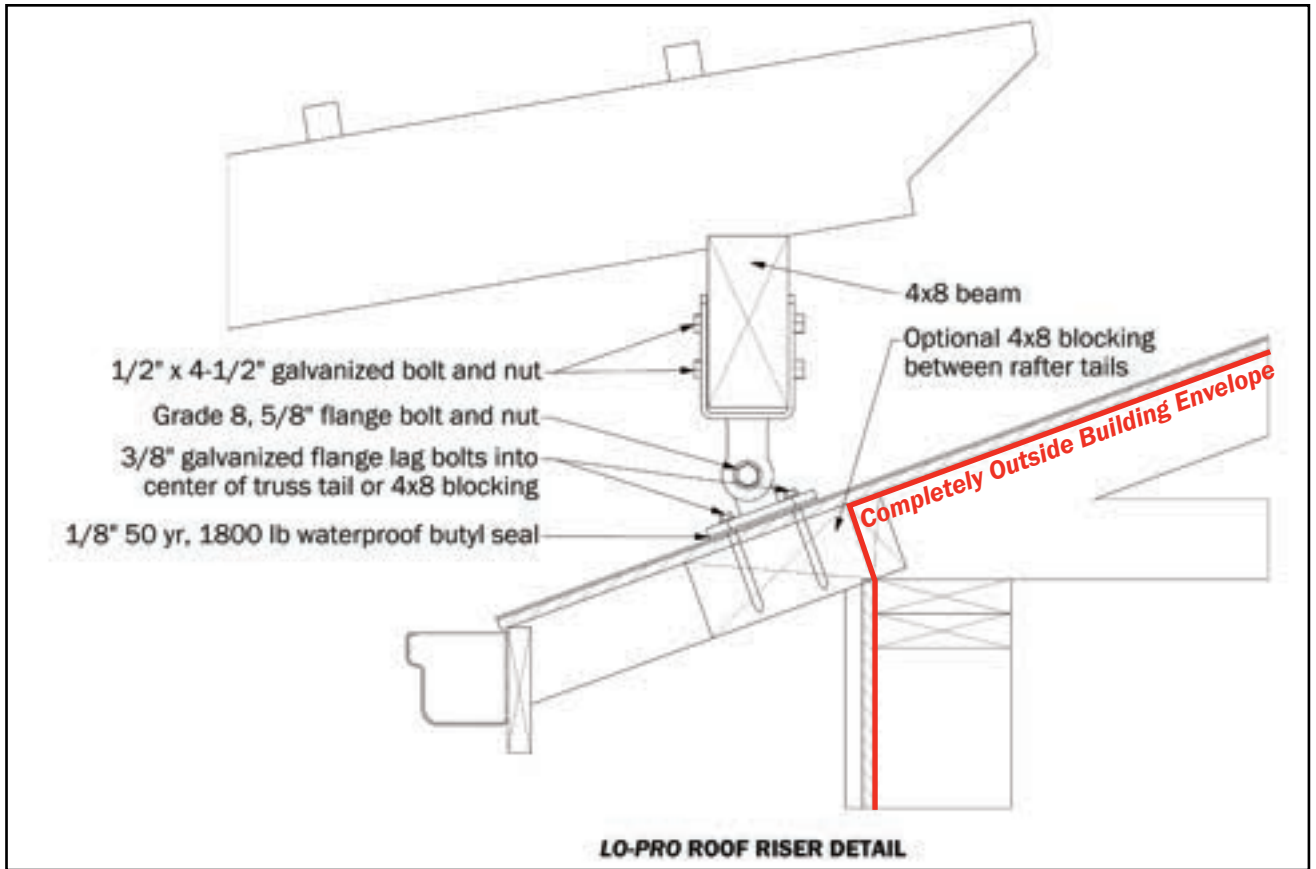


Crowning is common especially when beam members get longer. Make sure when installing any horizontal building members that the crown is facing up. If you're using LO-PROs, you can use the extra holes in the bracket to help hold your beam in place.

When installing Patio Roof Risers into rafter tails, take the extra time to make sure you have found the exact center of your rafter before pre-drilling and installing your bases. Another reason to use blocking is to avoid this exceptionally tedious process.



# ROOFTOP INSTALL INFO



**Now that your rooftop install is done, it's time for the rest of your pergola!**

**Keep following our guide, or take your own creative path!**



# GROUND POST AND BEAM INSTALLATION

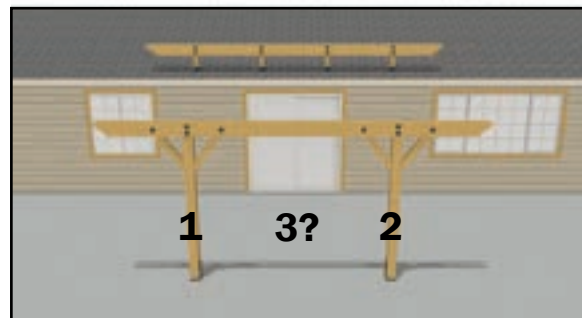
1

First, you will need to determine the height of your ground posts. If you are putting a roof on, this will be determined by the distance from the house and pitch of the cover (no shallower than a 2/12 is recommended). If your cover isn't going to be pitched, then just match the height of your roof beams.



i

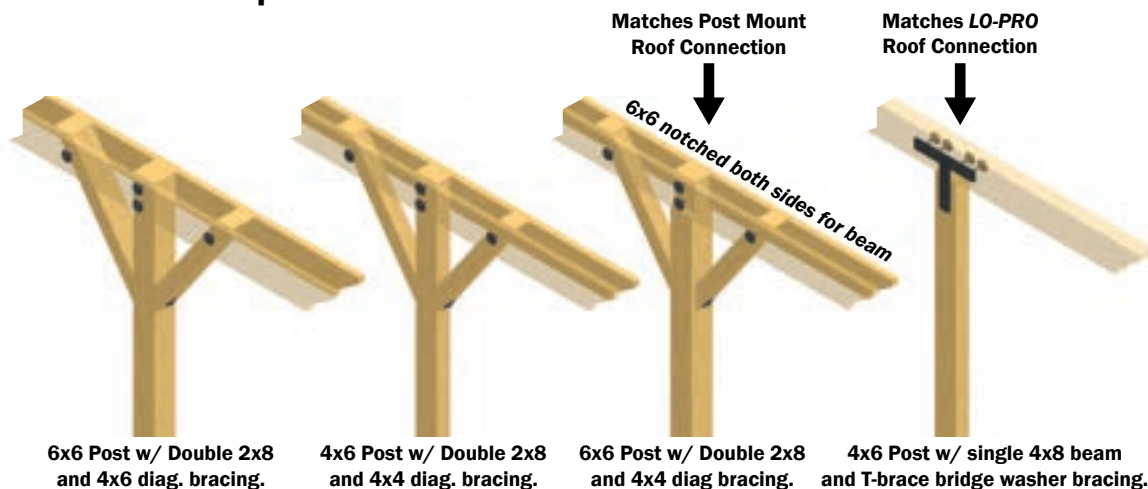
How many posts you need for the span depends on the species and grade of wood, spacing, local codes and snow loads. For this reason, we always recommend you check span charts for your specific area and/or have your plans approved by a local engineer.



2

Now it's time to prepare your posts and decide what style of post to beam connections you are going to use.

Using a double beam with diagonal braces is the most common pergola style and will match the Post Mount roof connection. Another option is to use a single beam with a T-brace on one or both sides (use bridge washers for shear if only one side) which will match the *LO-PRO* roof connection. **We highly recommend one of the last two options listed below.**



cont.

# GROUND POST AND BEAM INSTALLATION

3

**Notching** your posts may seem daunting, however, creating a ledge for your beam to sit on will make your structure stronger.

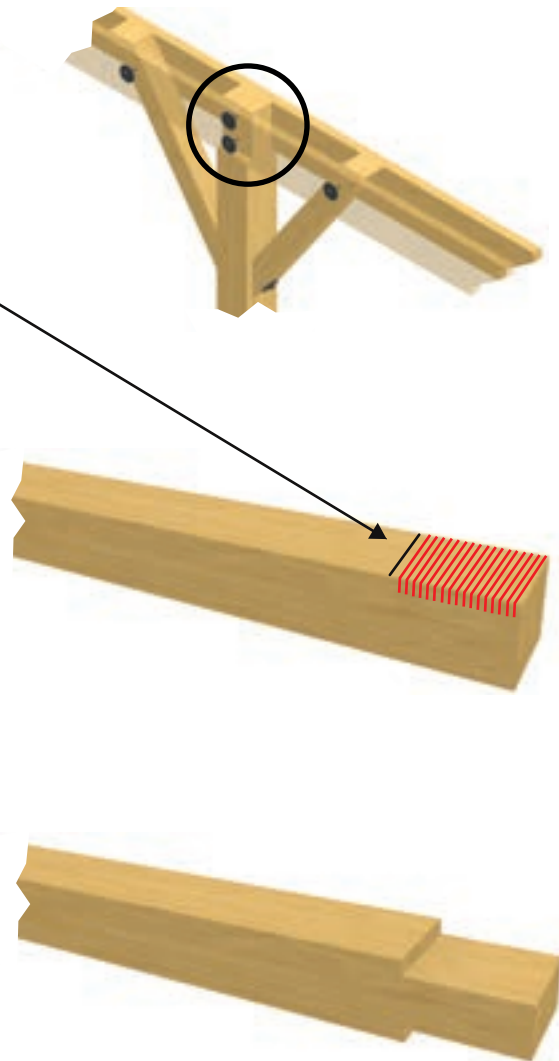
You will first make a mark horizontally across your post at the exact height of your beam.

Next, set the cutting depth of your skill-saw such that after you remove a notch from each side of the beam you are left with **3-1/2"** of material.

**e.g.** if your post is **5-5/8"** then you will remove **1-1/16"** from each side.

Now cut across the post just inside the mark you made. Make several cuts approximately **1/4"** apart for the entire width of the notch.

Finally, chisel away the remaining material and make the inside faces of the notches smooth. Remember that you can always widen your notches if necessary, but you can't make a notch narrower.



You can also create a notch for a single 4x8 beam on a 6x6 post instead of using a 4x6 post and a T-brace as depicted on the previous page.

This notch is larger however, and will require a table saw or beam saw for the notch cuts. Set the depth of cut to the exact width of your beam and make cuts same as described before. Finish and smooth with a chisel.



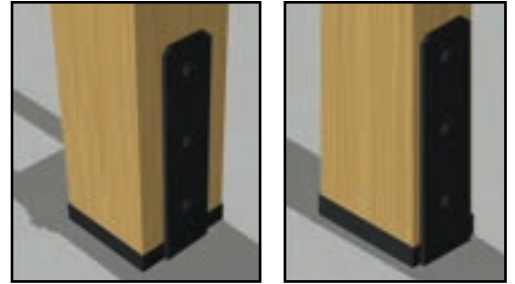
cont.

# GROUND POST AND BEAM INSTALLATION

4

Because there are so many variables when setting your post, it will not be covered in this guide. We will assume that your posts have been set and leveled properly, whether that be on a form, deck, patio, etc...

We do provide a post base that matches the style of our other hardware and will work on a 6x6, 4x6 or 6x8 post. Detailed engineering documents for this base are available ([patioroofriser.com/engineering](http://patioroofriser.com/engineering)).



5

Just like during our roof side installation, we will start by installing the beams with 3" screws. Place these screws such that they will be hidden behind a bridge washer after taken out.

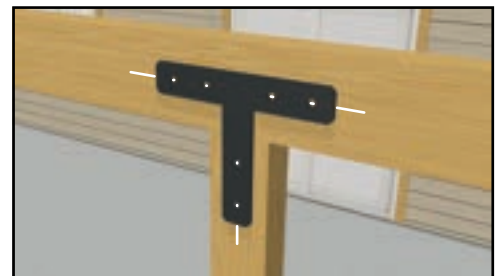
Repeat step 8 on page 6 to mark and drill holes for the double beam. Remember that you will need **9-1/2"** bolts if you aren't notching your 6x6.



For installing the T-brace on a single 4x8 beam, start by marking a center line on your beam and post. Center your T-brace with these lines, mark and drill **9/16"** holes.

**Note: to ensure level holes, drill half of the hole from each side of beam.**

You can use two T-braces or just one on whichever side you prefer with bridge washers on the other side. Install with **4-1/2"** bolts.



cont.

# GROUND POST AND BEAM INSTALLATION

6

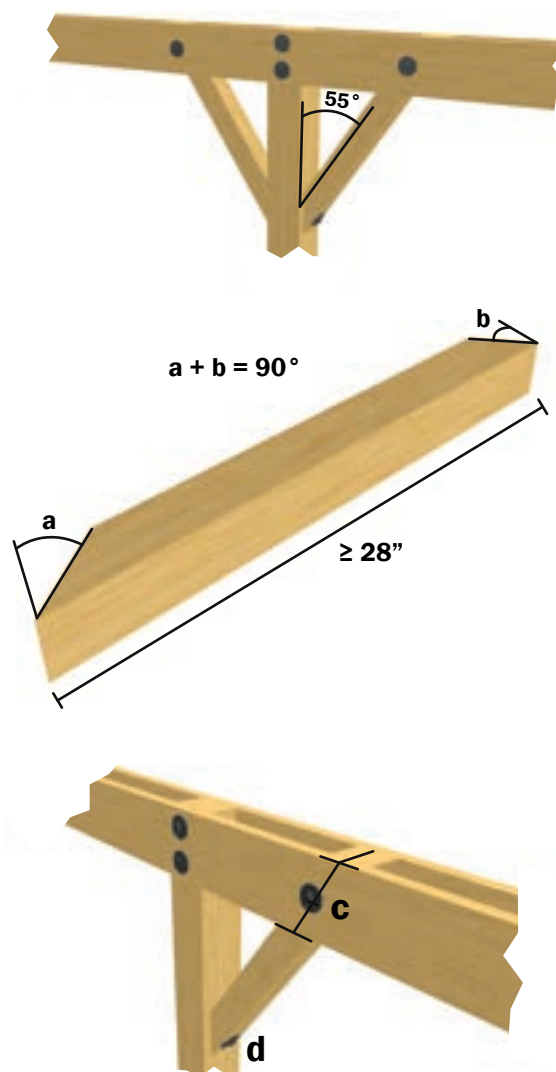
Diagonal braces add support and cut the functional span needed for beam members.

We prefer to set our braces at a **55°** angle for the looks, but **45°** is the most common.

Make sure to cut your angles such that they compliment each other (both add up to **90°**). If you do this right, your braces will end up perfectly flush with the top of your beams.

The outside length of your brace should be at least **28"**.

Slide the brace into place and clamp it between the two beams to temporarily hold it in place while you pre-drill your holes. **9/16"** hole through the beams and **3/8"** hole into the post. Secure with **(c) 7-1/2"** bolt, nut and bridge washers and **(d) 1/2" x 5"** lag screw with bridge washer into post.



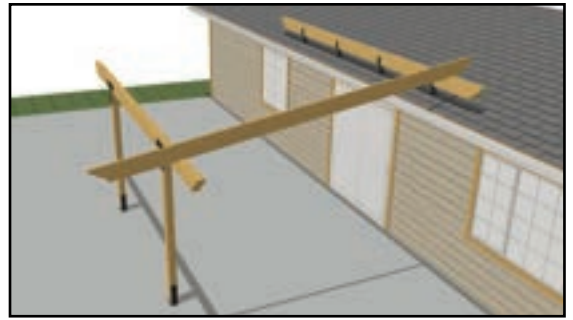
**Your ground side install is complete! Time for rafters!**



# RAFTER INSTALLATION

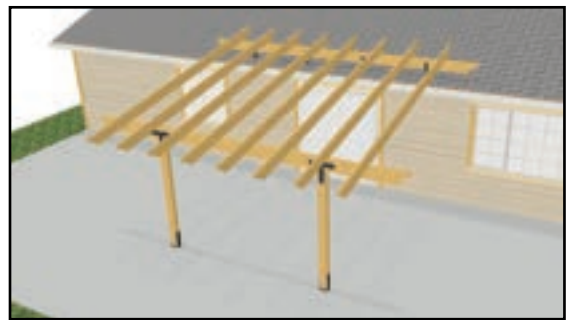
**1**

First, figure the length of your rafters. If your pergola is sloped for a roof then we recommend that your rafter extends **3'** past your ground side beam and **1'** past your rooftop beam.



**2**

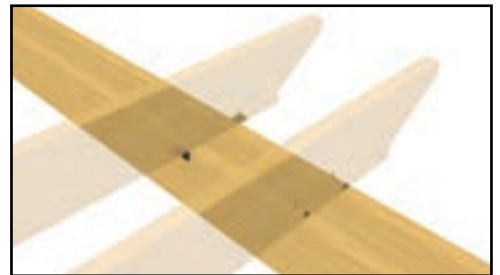
Next, decide what rafter spacing you are going to use. **24"** or **16"** on center is the most typical. The size and span of your rafters or snow load in your area might require **16"** on center, remember to check building codes and consult with a local engineer. (2x8 rafters are depicted)



**3**

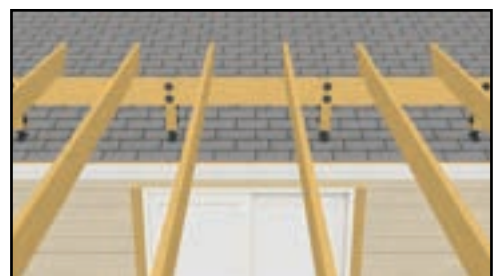
Connecting your rafters to your beams can be done in various ways. If you are building a decorative or shade pergola that won't have a slope, simply 'toenailing' or using rafter clips works well.

With a slope, you will want to use hurricane ties or cut a 'bird's mouth' into your rafters and then toenail them. On page 16 we go into detail on how to prep a bird's mouth cut in your rafters.



**4**

Space the rafters evenly along your beams. The Roof Risers can sometimes interfere with mounting your rafters, so we typically space them such that they don't land in line with any Roof Risers.

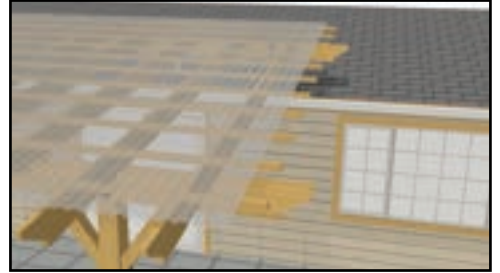
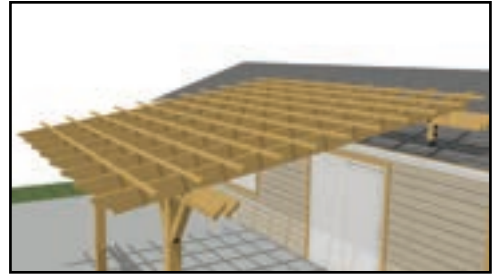


# PURLIN INSTALLATION

**1**

Purlins are an important part of your structure considering that they are what hold your roofing material. At this point you could also choose to add sheathing and roof with composite shingles, rolled roofing, etc... (purlins 2x2 typ.)

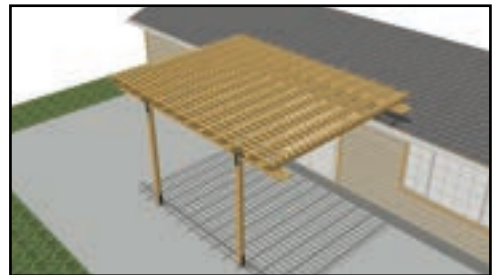
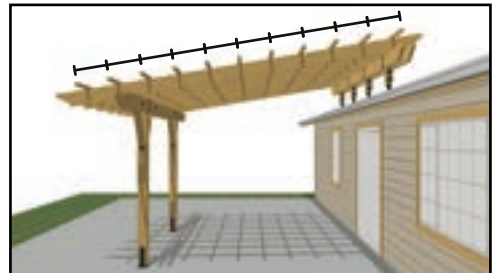
Once again, figure the length of your purlins first. Our beams are typically **2'** longer than our roofing material width. And our purlins are **1'** longer, making them stick out **6"** past the roofing and land **6"** short of the beam on each side.



**2**

Like the rafters, purlin spacing is also dependent on many site-specific factors. We typically space them **16"** or **12"** on center, but remember to check building codes and consult with a local engineer.

For a shade pergola, space your purlins and rafters much closer together. Depicted to the right is **16"** on center rafters with **6"** on center 2x2 purlins. You could also use 2x4 purlins to create even more shade.



**3**

To secure your purlins to your rafters, first, pre-drill a **3/16"** hole through the purlin to avoid splitting the wood.

Fasten with a 3" exterior wood screw.





# RE-ROOFING



Replacing the roofing under your patio roof risers is more simple than you might think!

Of course, any roof work is dangerous, especially when removing supports from your pergola. Make sure that all work done is reviewed and approved by qualified building professionals familiar with all applicable building codes.

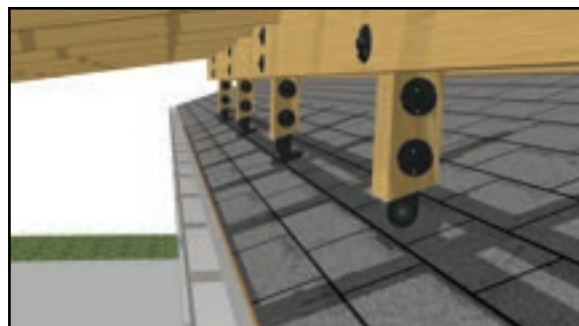
**1**

The safest way to remove Patio Roof Risers is to build a complete, temporary wall structure to support your pergola as you change your roofing. Image (right) is just to visualize the support and is not to be used as a building reference.



**2**

Remove the grade 8 bolt, adjustment pins and the two roofing lags from the riser. The base should now come right out from under the rest of the riser and give you just enough room to replace your roofing material.



**3**

After your roofing has been changed, remove and replace the butyl on the base. **We provide free butyl when it comes time to change your roofing.**

Reinstall the adjustment pins and grade 8 bolt **first** and then your roofing lags (if you install the lags first the holes for the pins might not line up).



# BUILDING TIPS / TRICKS



Our slogan is, “Make It Simple”. This is obviously a relative term, building a pergola is no small feat. Our goal is to simplify the process as much as possible and that starts with our hardware.

This section will cover some building tips / tricks that will hopefully make your pergola even more simple to build.

- 1 Cutting ‘Bird’s Mouth’ notches in your rafters.**
- 2 Decorative beam and rafter tail cuts.**
- 3 How to combine two beams for larger spans.**

## 1

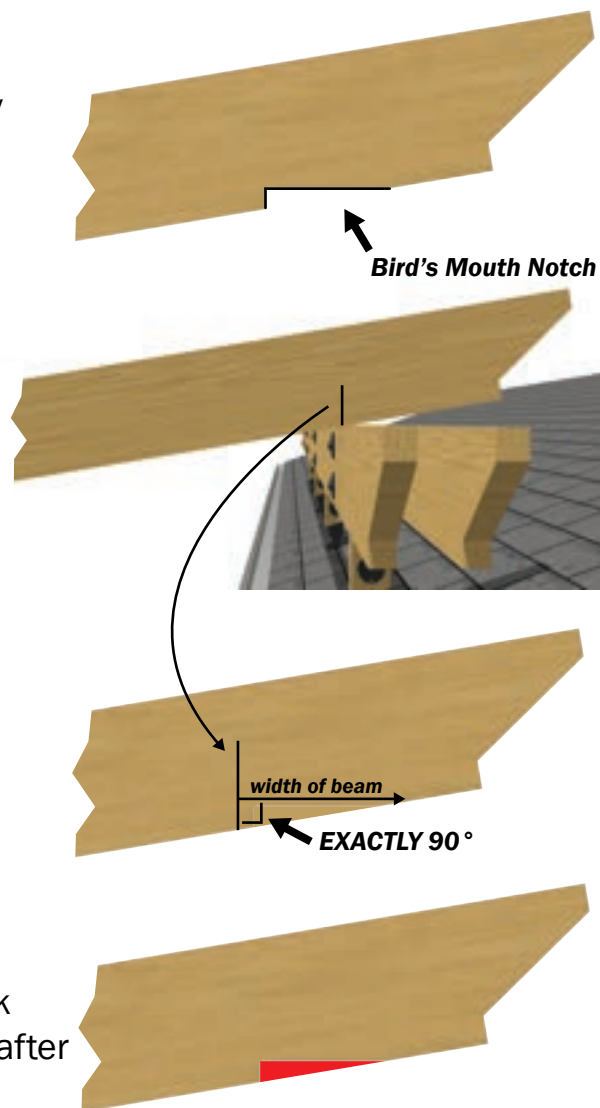
A **‘Bird’s Mouth’** notch allows sloped rafters to sit flat across your beams and allows them to be ‘toenailed’ directly into your beams, removing the necessity for hardware that might otherwise be an eyesore.

First, make sure that your posts are plumb (perfectly vertical) and set your straightest rafter member square to both beams. Use a square against your beam to transfer a line onto the rafter (on both ground and roof beams).

Now measure over the exact width of your beam(s) and make sure that this line intersects the line from the previous step at **EXACTLY 90°**.

Now make your cuts with a skill saw and finish them with a jig saw.

Put your beam back up and double check that your cuts line up and then use this rafter as a template for the remaining rafters.

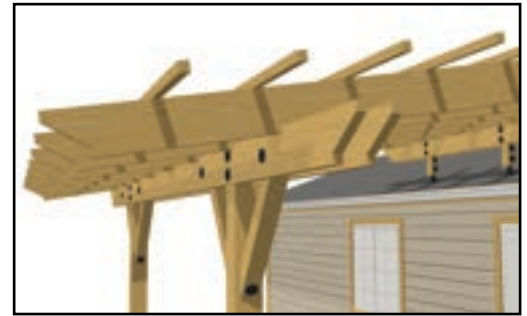


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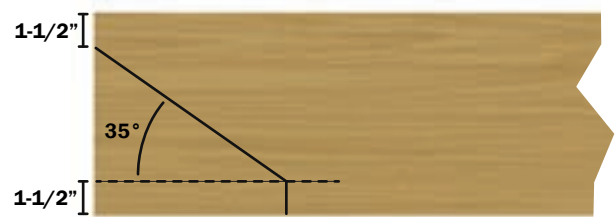
# BUILDING TIPS / TRICKS

2

Adding **decorative cuts** to the end of your rafters / beams is a simple way to spice up the look of your pergola! There are countless different styles you could choose, so we will just show you how to style them like we do and explain why we like this look specifically.



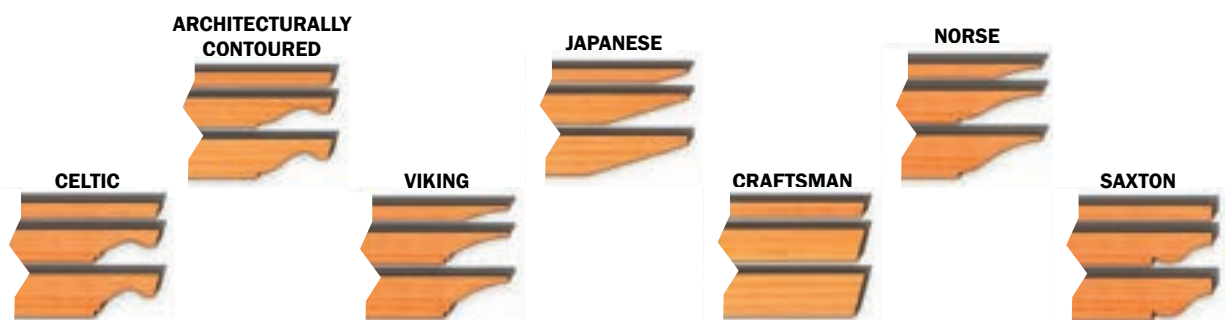
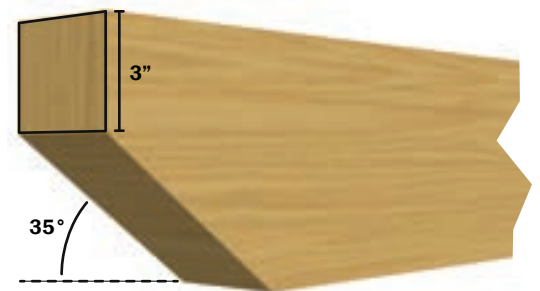
First, we measure down **1-1/2"** from the top of our beam/rafter and up **1-1/2"** from the bottom and make a line along the length of the board. The angle that you choose for the diagonal cut can be whatever you'd like. We typically make it **~35°**. Make your cuts with a skill saw and finish with a jig saw.



The reason we make the cuts like this is to give the appearance of 2x2s on the end of the beams which will match the look of your purlins.



Making the cut like this on a 4x8 beam can prove more tricky, so we will usually measure **3"** from the top instead and cut the angle all the way to the bottom of the board with a beam saw.



cont.

# BUILDING TIPS / TRICKS

3

When working on especially large pergolas it sometimes becomes necessary to join multiple beams. This is a technical process, so, again, make sure that all work done is reviewed and approved by qualified building professionals familiar with all applicable building codes.

On the ground side, this joint must always be sitting on top of a beam or a notch. Depicted to the right (A) is an example of double 2x8 beams, notched so they can be secured with two through bolts and bridge washers. The other image (B) shows two 4x8s butt together and secured with a T-brace.



A



B

On the rooftop beam, since your Patio Roof Risers are spaced 4' on center, you can simply make a diagonal cut in each beam and have them meet between two risers and pin them together with screws.



The diagonal cut is to prevent light from passing through the joint and typically cut at  $\sim 30^\circ$ . The screws are installed on the back side of beam for concealment.

