

### 1. Delivery Day

By now you should have the construction site for your new log home prepared for delivery. Your logs will be coming on a large flatbed semi trailer truck that will require you to plan ahead to assure a smooth delivery without problems. Access to your site will be an important factor. Many log homes are built in remote or mountainous areas that are sometimes a challenge to access with a trailer truck. The road will need to be wide enough (20 feet minimum) for a truck to travel. Any sharp turns or corners will need to be wide enough for a truck with a trailer to go around. There should be no tree limbs or low hanging wires within a 14 foot area above the road surface. If the truck will be utilizing a private drive to access the building site, the same requirements will need to be met. Once your logs and materials have been unloaded from the truck, the driver will need a suitable area to turn around or an alternate route to leave your construction site. Please coordinate with the driver if necessary to have this planned for the driver's arrival. If you are uncertain if your site will meet these requirements, please have someone that knows check and make sure access is available before the truck arrives. The driver of the truck will have the final decision in any questionable situations.



Another important part of delivery day is the unloading of the truck. Your logs and other material will be packaged in bundles that will require a large piece of equipment for unloading, such as an all terrain forklift or a Lull capable of lifting up to 5000 lbs. You will need to have dunnage/stickers available to place your material bundles on to keep them up off the ground once they have been unloaded. Also, all material packages should be covered with tarps or some type of waterproof covering to keep them dry at all times. You are allotted two hours for unloading time.

### 2. Taking Inventory of Material

Once you have unloaded all material and the truck has successfully left your site, it is time to check your inventory. You will receive two copies of a "shipping schedule" with your delivery that will outline what materials we have shipped on that particular load. It is important that you check your materials at this time for quantities and inspect for any damage that may have occurred during shipping. After you have confirmed your inventory and noted any shortages or damage, you will need to fill out the shipping schedule that is marked "return to office" and mail it to Maine Cedar Specialty Products. We will use the information

on this copy to correct any discrepancies or damaged materials.

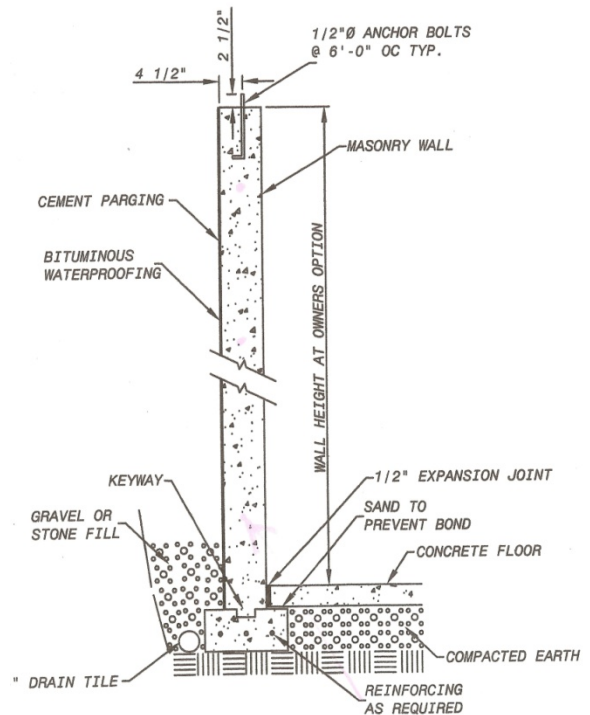


**3. Foundation**

The type of foundation that you build your log home upon will be determined by preference, cost, type of soil, what is typical to your area and available resources. Some types of foundations commonly used include:

- Insulated Concrete Forms
- Pre-cast walls
- Poured concrete walls
- Concrete slabs
- Block

In any case, the foundation that you build your house upon will need to be installed to the proper dimensions for your new log home, to include all pads for load bearing columns. Maine Cedar will provide drawings with the foundation size and footing locations. It will be up to the homeowner and the builder to make sure all foundation work is in compliance with local building codes.



## Illustration 1

### 4. Foundation Cap (Sub floor) - 1st Floor

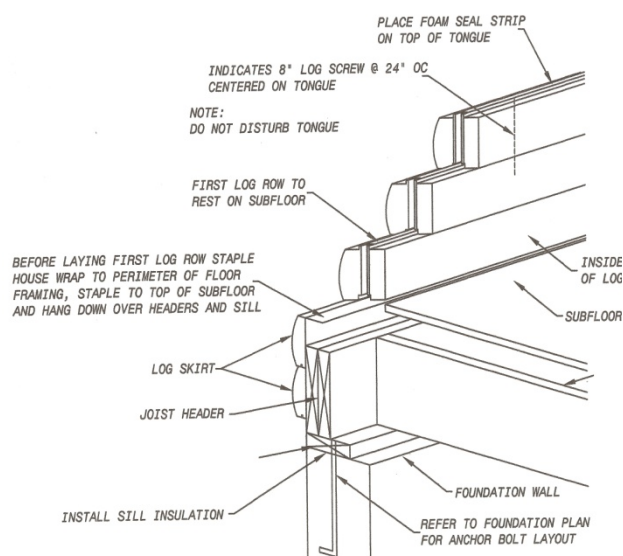
Once you have determined that the foundation is square, flat and level, you will want to start framing the first floor. The basic construction for our floor framing is the same as for a conventionally built home. The only difference is that we require a double rim joist around the perimeter to provide a more solid base for the log wall to be built on. The basic steps are outlined below:

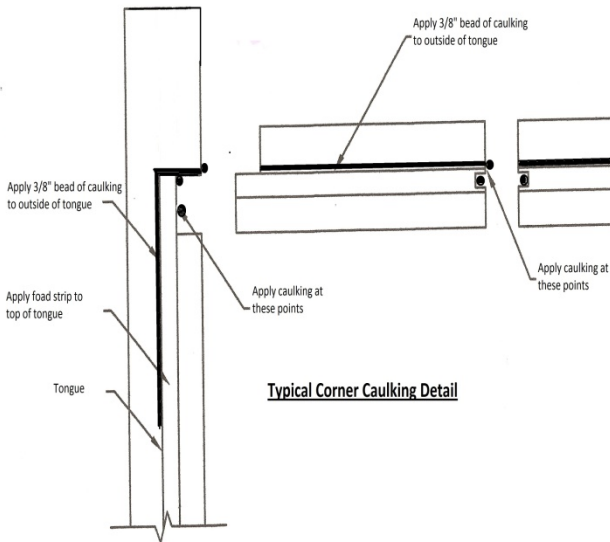
- Install 2x8 PT sill plate w/sill seal
- build girder according to "floor framing plan" with joints over lally columns
- Install required floor joists and headers
- cover with 23/32 sub-floor, we suggest you use construction adhesive and ring shank nails or screws for this

### 5. Installing First Log Row

This is a very important part of constructing your new log home. Take extra care to make sure this step is done correctly, as mistakes made here will carry on through the whole log stacking process. The first thing you need to do is establish a chalked line measured in 4" from the outside perimeter of the floor. This will be a guide to follow with the inside face of the logs. Next, measure the lines and check with the dimensions given on the "floor plan" supplied by Maine Cedar and verify the lengths are correct. Also, mark all door locations on the deck at this time. Now wrap the entire rim joist with house wrap and let it come onto the floor, but not cover the line previously chalked at 4". The next step is to apply two 3/8" beads of caulking to the floor, the first one about 1" out from the 4" line and the second one right near the outer edge of the floor. Do not apply caulking at the door locations. Now check the "log elevation" drawing and determine the orientation of the corner. Start with the female log, line up the inside face and the corner notch with the chalked line and secure the log to the floor using log screws every 24 to 30 inches screwed directly into the floor joist below. Continue on around the floor until the entire first row is complete. Most builders prefer to start with the corners and work towards the center of the wall. Be sure to apply caulking and splines as shown in illustrations 3 and 4. It is very important to use enough caulking and to not skip any splines. When you come to the middle of the log row, you will need to cut the final log to length and dado the end to complete the row. A large miter saw and a simple router with a 3/4" flute bit and fence guide are the best tools to do this with.

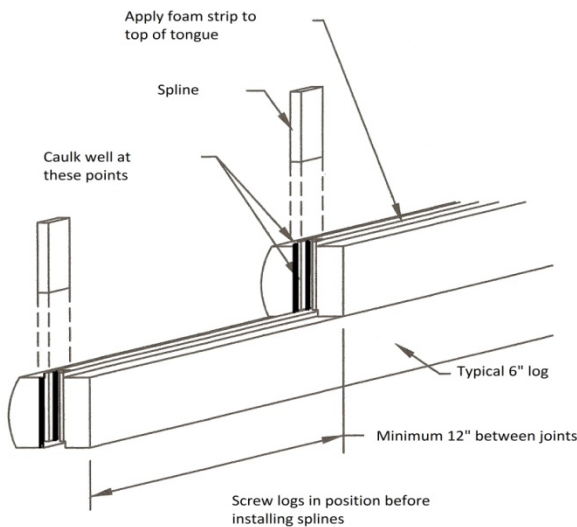
## Illustration 2





**Illustration 3**

Follow these guidelines closely to ensure a proper weather seal between logs and joints.



**Illustration 4**

**6. Prepare to Stack Logs**

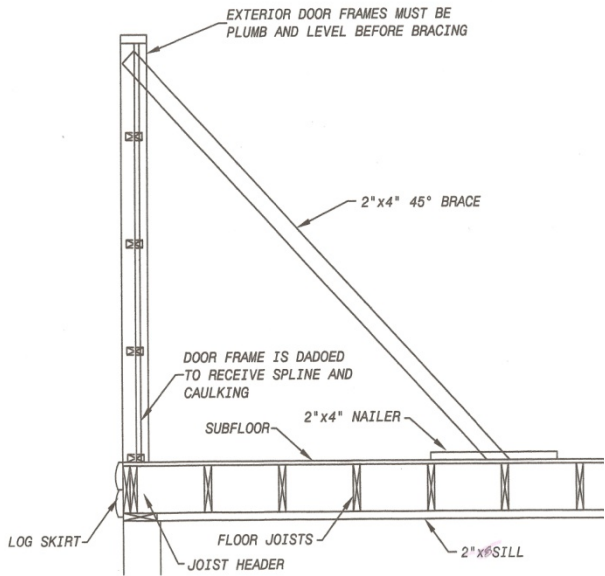
Some time should be taken now to prepare for stacking the first floor logs.

- Go around the perimeter log that is installed and mark on the floor the location of partitions and windows.
- Mark the location of all electrical wires on the floor. Mark which are switches, outlets and kitchen height outlets.
- Drill electrical holes through log and sub-floor, clear any debris and use 1 1/4" auger drill bit.

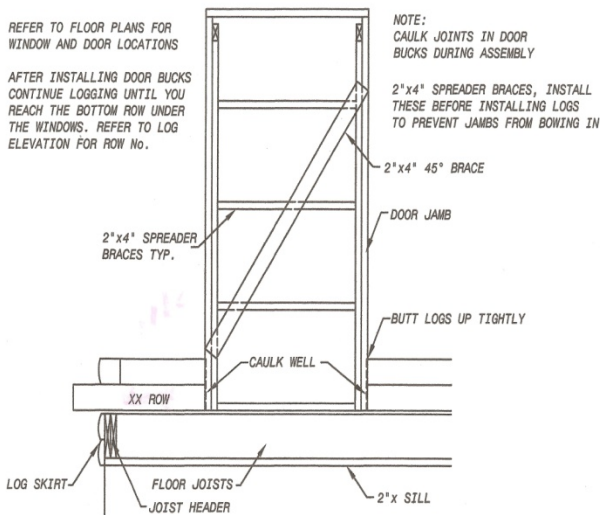
It is important to mark the location of your electrical holes well so that your electrician will be able to find them. Also, make sure the hole is clean of debris on each log course you drill. Any kitchen switches and outlets will be at a higher location than other normal height outlets. Check with your electrician to determine what height to locate them at.

- Now install 2x4 guides at the corners and brace them plumb to the floor.
- Install door bucks and brace them to the floor, plumb and square.

It is important to check all 2x4 guides and door bucks often to make sure they stay plumb. The straighter you stack your logs the easier construction will be. Taking the time to do these steps correctly will pay off in the end. Follow the illustrations to assure you brace correctly and apply caulking and splines correctly. Always refer to "floor plan" for door buck locations.



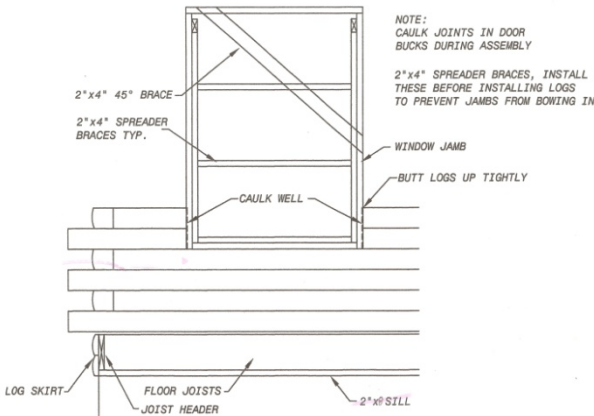
**Illustration 5**



**Illustration 6**

**7. Stacking Logs**

Stacking the logs will go along smoothly if you took the time to do things correctly on the previous steps. It is important to make absolutely sure all caulking, splines and foam get placed as directed. It is equally important to make sure all joints are being put together good and tight and that all logs are getting screwed together properly. Some homes will have 6"x6" inside corners. If this is the case, every other log course should have log screws "toe-nailed" into the 6"x6" to ensure they cannot pull apart. When putting butt and pass corners together, most builders prefer to put the female log in place first and then place the male log. Make sure to use the 2x4 guides to align the corner logs as you screw them in place. As the logs go up, you will need to be drilling the electrical holes and thinking about what log course the boxes need to be cut into. Some builders will cut the boxes in with a skill saw and chisel before the log is installed while others will wait until inside work is being done and cut in boxes with a router and a plywood template. You will have to decide which way will work best for you. It will be important to refer to the "log elevation" sheets to know what log row to install window bucks onto.



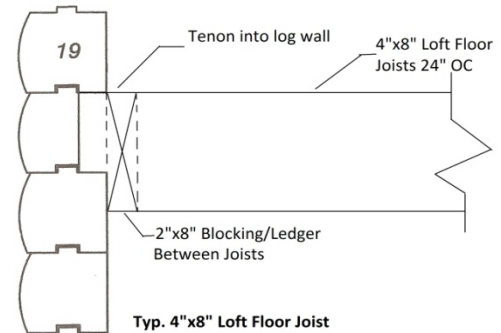
**Illustration 7**

When you are ready to install window bucks, you will need to refer to the "floor framing" plan to find the correct dimension for where to place the buck in the wall. Mark the location, apply foam and caulking as you normally would and screw the buck into place with log screws. Make sure to brace the window bucks plumb and square just as you did with the door bucks and continue stacking logs. When you get to the top of the window and door bucks, you will need to pay special attention to the logs that span the tops of the bucks. These logs act as headers and need to be installed as shown on the "log elevation" drawings. If you have been keeping everything braced plumb, these logs will go into place quite easily. Make sure to keep the inside face of the logs flush with each other as you screw them into place. Once you have stacked the logs up to row 17, you will need to take a look at your drawings to see if you have tie beams that need to go in. You will also need to start planning for the loft floor joists.

## 8. Tie Beams and Loft Floor Joists

If the home you are building utilizes a conventional truss roof system, then you will

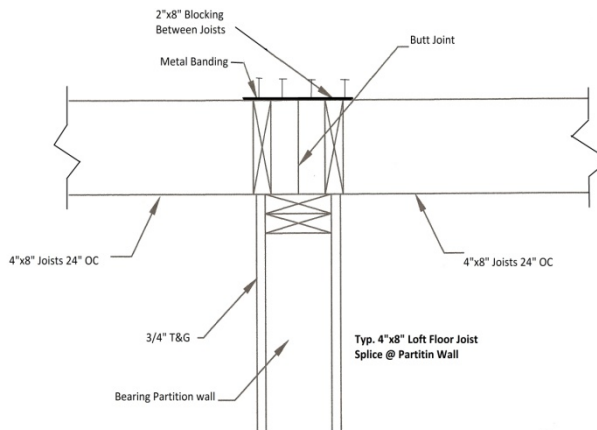
continue stacking logs until complete according to the "log elevation" plan for your home. If your home utilizes a log purlin roof system, then it most likely will have at least one tie beam or possibly a log truss and beams for loft floor joists. Refer to the construction drawings that were designed specifically for your home as methods do vary from home to home. Pay particular attention to both the row of logs the tie beam or log truss is installed upon and the row of logs the floor joists are installed upon. Tie beams and loft floor joists get notched into the log wall using a mortise and tenon that is cut in the field.



**Illustration 8**

Tie beams sometimes will rest on a bearing partition or be posted in one or several locations. Again, you will have to refer to the drawings for your home. Loft floor joist almost always will be spliced upon a bearing partition wall. It will need to be framed to the proper height before installation of the joists. Once the joists are in place, 2"x8" blocking should be installed between the joists, both at the log wall and at the ends that are spliced on a partition. Metal banding should also be installed at the joints to keep them from pulling apart. Care

should be taken when doing this, as it will remain visible when complete.



**Illustration 9**

Once the loft floor joists have been installed, it makes a good area to put down temporary decking to work from.

## 9. Gable Ends

Now that the loft floor joists are completed, you can finish stacking the logs. Refer to the "log elevation" plan to finish the courses, including the angled plate row up to the gable end logs. At this time, it is helpful to have a reference point at the location that the peak of the roof or gable end will end at. To do this, simply erect a pole, which can be a 2x or a long board. At the center of the gable wall, brace it plumb and attach a string at the height where the peak of the roof will be. Then run the string down to the plate row. You now have a guide line to build the gable end. Now start to stack the gable logs. It will be easier to start with an angled log at each end of a log course and fill in between until that course is complete. It is important to continue to make sure you are using enough caulking and applying the foam tape properly. While stacking the gable logs, keep in mind the location of the purlins. There will be pockets cut into the logs at these locations. It will be much easier to do if you know where the log screws are located. The gable walls should be braced well during construction. A good way to do this is to construct a strong back using long 2x4's attached to the log wall with screws and then braced back to the loft floor joists or to the 1st floor. On large gable walls, more bracing will be required. You may want to use 2 or 3 strong backs with bracing. Make sure to keep the angled ends of the gable logs flush with each other and follow the guide string to ensure a good straight angle up the top of the gable wall.

### 10. Log Purlin Roof

This will most likely be the most difficult part if constructing your log home. It is important to take your time and make sure you "measure twice, cut once". Purlins are a difficult and costly item to replace if you should happen to cut one to short.

If you have a log truss or carrying arm set in the home, it will be easiest to use the gable end as a large pattern to get measurements from to determine the length to cut the top chords. Go through the purlins and find the one with the smallest diameter at the top. Use this purlin as a guideline to determine the height of the top chord of the truss or carrying arm. If your smallest purlin top is 8", then that is what you will use to find the length of the top chord. To start, measure down square 8" off the top of the gable wall. Then measure at the top and bottom of the gable end and then snap a chalk line. Now measure from the point that the top chord of the log truss intersects with the bottom chord of the truss ("Point A on the Side view of log truss") up to the peak of the gable ("Point B"). This will be the length you will use as a starting point for your log truss. You will need to add on additional inches to allow for notching the top chord into the bottom chord. Also, a lap joint is usually what you will use for joining the top chords of the truss. Assemble the log truss with the split post and threaded rod in the center upright with additional bracing as shown on your drawings.

Next, you will need to layout the purlin pockets or notches in the gable ends and determine the length of any support posts where purlins splice or end. Refer to the illustration that shows the log purlin setting on the support post. To do this step, mark the center of the purlin notches

on the gable wall, referring to the drawings for the correct measurement. Then, mark the actual notch by measuring the notch on each purlin and then marking it on the gable wall. Do not cut the notches yet.

Now that the purlin notches are marked, move on to getting purlins ready. The first thing to do is snap a chalk line down the center of each purlin. Next, measure to length. Refer to the drawings for the correct lengths and then verify in the field. If the purlin is spliced on a post, carrying arm or truss, you will need to cut it at the exact length it needs to be. If the purlin is not spliced and just ends on a post, then you will need to use the measurement given to the center of the post. Add half the width of the post plus a couple of extra inches. It can be trimmed later if needed. Now the end of the purlin will need to be notched to accept the post that will be supporting it. To do this, refer to the illustration that shows the end of a purlin resting upon a support post. Line A will be at the chalked line on top of the purlin and also the centerline of the purlin notch at the gable end. Mark line A square down from the flat surface of the purlin. Now draw line B down so that it comes to about the center of the purlin. Line B will be a plumb line (the angle that corresponds to the angle of the roof pitch). Now draw line C across the bottom of the purlin or square with line B. This will mark the location of the top of the post. You will need to adjust this up or down to get the notch at the correct depth so that it rests on the post nicely. At this point, you will need to take the measurements from where line A intersects with line B and where line B intersects with line C and transfer the measurements and the lines onto the purlin notches on the gable end walls. Once the lines have been transferred, the



measurement from line C to the loft floor should be the length of the support post for that purlin. This process can be confusing at first, but will get easier after you have done a couple.

When you get ready to chisel the notches for the support posts into the end of the purlins, it will be best to match each support post top to a purlin. This way the notch can be fit to the post. To do this simply, cut a 1" thick wafer of the top of the support post and use that as a pattern to mark and chisel the notch into the purlin. It will be important to keep track of which post goes to each purlin. After all the notches have been cut, you should cut the support post to length and toe nail them in place as they may require adjustments later. Also, it is a good idea to leave the post a 1/2 or 3/4 inch long to be trimmed later.

If the ends of the purlins are being spliced on a log truss or carrying arm, you will need to cut a flat area on the bottom of the purlin to rest upon the beam that will support it. There are two illustrations included that will show this detail. One is the end view of a purlin on the top chord of a log truss and the other is purlin splice on a log truss or carrying arm. If you have already constructed the log truss, then you already will know how far to measure down to where you will cut the flat surface to rest on the truss. If your measurement was 8", then that is what you will use here also. In some homes, the purlins will splice on a round support post but be supported in the middle by a log truss. In this case, you will have to notch the purlin to fit over the top chord of the truss. To measure and mark the depth of the notch on a round purlin, refer to the illustration on how to measure the depth. If you have chalked a line up the center of the top chord, you can

measure from the inside of the log wall to the chalked line on the truss. Then on the purlin, measure the same distance from the square notch towards the center to determine the location of the notch. It is worth taking the extra time here to fit each purlin notch to the size of the truss log. In other words, the size of the truss log changes. It is larger at one end than the other so all of the notches will not be the same size.

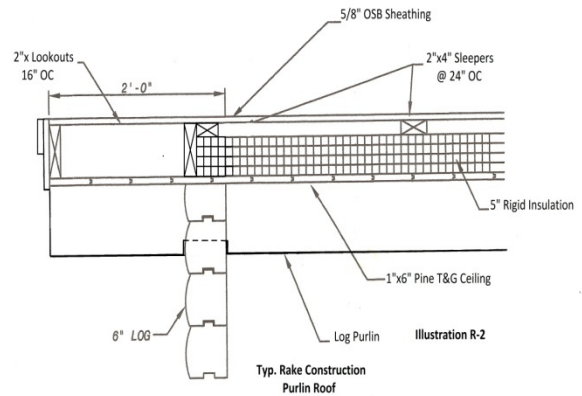
Now you should have the purlins all cut to length and all notches made. Any log truss or carrying arms should be cut and assembled and ready to go into place and all of the support posts should be cut and braced in place. At this time, cut the pockets in the gable end walls that the purlins will set in. This procedure is usually done with a chainsaw or sawzall. If care was taken when stacking the logs, there should be no screws in the location of the notches. Also, a couple of shallow grooves should be cut in the sides of the notches to allow a space to apply expanding foam to seal the purlin. Refer to the illustration on how to seal the purlin notch.

### 11. Setting the Purlins

Now that all of the preparation work is complete, it is time to set the purlins in place and get them straight and flat. The best way to set the purlins is with a crane. It is best to have two people on the roof and one on the ground connecting the purlins. Starting at the bottom and working your way towards the top is the best way. You should set the ridge purlins last. Once all of the purlins are set in place and braced, you will need to string each one from end to end to make sure they are straight and flat. You may be required to shorten the support posts at this time if they were intentionally left too long.

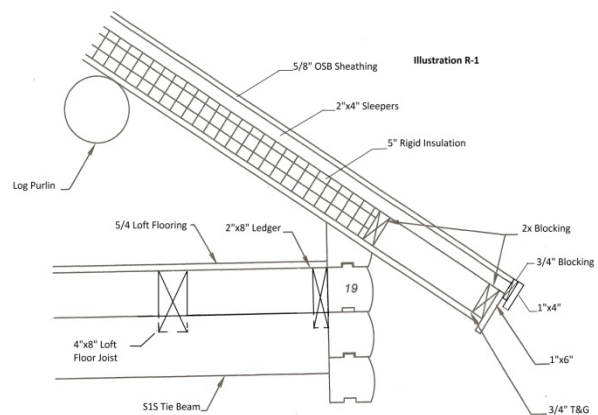
**12. Installing the Double Roof**

At the plate row log, check the measurement and make sure it is 24" from the inside face of the log to the end of the overhang on the plate row log. Now go to the ridge purlin and measure out 24" from the inside face of the log and snap a chalk line from ridge to plate row. Cut the ends off the purlins so you now have a nice straight line up the rakes. Organize the 1x6 v-groove pine so that you can pick lengths to use that will minimize waste. Rip the groove side off the first course of v-groove, line up the edge with the ends of the purlins groove side down and start installing the ceiling. Make sure to apply 2 rows of foam tape on top of the log wall as the pine comes over the top. Stagger the joints so they are not all lined up with each other. Before covering any splices in the purlins, be sure to nail a couple of bands of metal strapping across the joint. The banding metal from the log bundles works good for this. The next step is to install the 2x nailers that go around the outside perimeter of the roof and the 2x insulation stops. The insulation stops should allow the rigid insulation to go just about to the outer edge of log, refer to illustrations 10 and 11.



**Illustration 10**

The next step is to put down a layer of felt paper and then the sheets of rigid foam. Most houses will have 2 layers of 2" and 1 layer of 1", for a total of 5" of foam insulation. It is important to stagger all of the joints both horizontally and vertically. The last layer should be arranged so that the joints fall on a 2' OC layout so the 2x4 sleepers will lay directly on the joints.

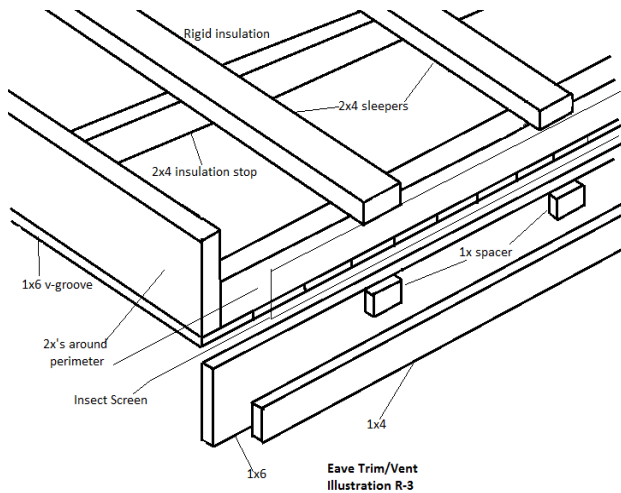


**Illustration 11**

After the insulation is in place, the 2x4 sleepers should be installed. The insulation sleepers should be installed 24"OC and be screwed through all the layers of insulation and into the

roof purlins below. Refer to illustrations 10 and 11 for more detail on how this should be done. Often times wiring for the ceiling lights and fans will now be installed on top of the insulation. This is about the only opportunity you will have to do this before the roof sheathing goes on. Now sheath, trim and apply roofing product using the same methods typically used in residential construction. A common way to get ventilation into this type of roof system is to create a vent that is built into the eaves utilizing the 1x6 and 1x4 trim boards. Refer to illustrations 10, 11 and 12 for more detail.

When venting the roof by utilizing the trim, you should install insect screen over the open ventilation area before installing any trim boards. This will ensure that you do not get insects or bats into your roof system.

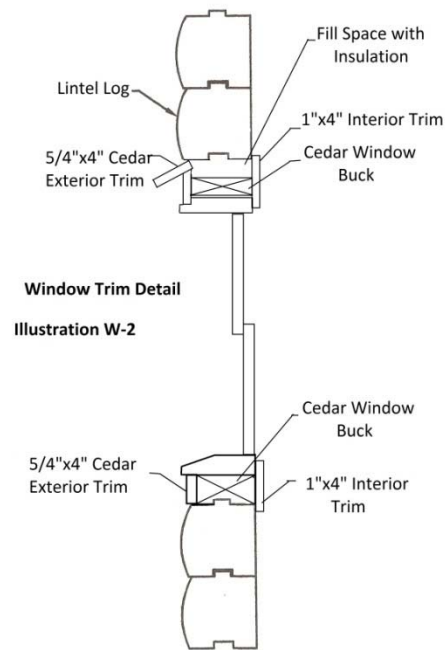


**Illustration 12**

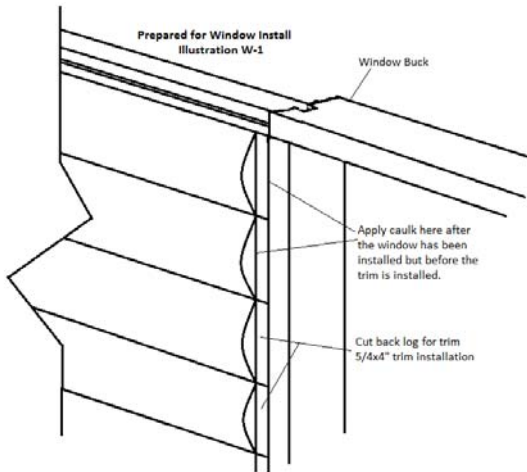
### 13. Installing Windows & Doors

Now that the roof is complete, the next step is usually to install the windows and doors. Install the windows according to the manufacture's

instructions and then prepare for trim. When trimming the windows, it is necessary to cut back part of the log to allow room for the 5/4 x 4" trim and also to add another area for caulking to seal your home from outside weather. Install the window and nail it in place. Now measure from the outside of the window over 3 5/8". Do this at the top and the bottom of the window and then snap a chalk line. Make a cut with a skill saw and chisel out the wood to make an area to accept the trim. Refer to illustration 14 to see what this should look like and where to apply caulking. The top window trim has a drip cap over the top that should be installed at about a 30 degree angle. Refer to illustration 13 for a detail on how that should be assembled. Doors are installed and trimmed the same way as the windows.



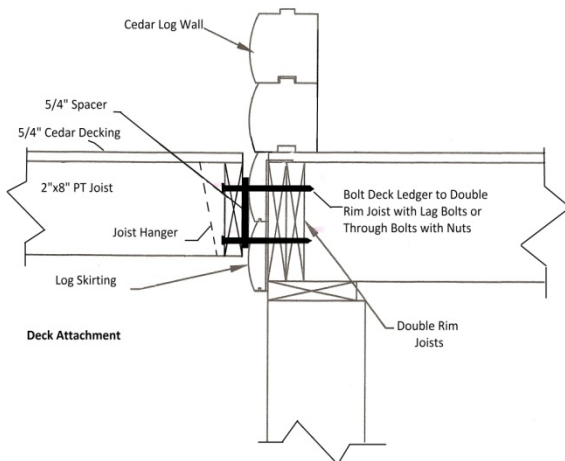
**Illustration 13**



**Illustration 14**

**14. Decks & Porches**

Our decks are framed with 2x8 pressure treated 16"OC and covered with 5/4x5 radius edge cedar decking. We recommend you install the log siding around the outside of the rim joists and then bolt the 2x8 PT ledger to the house with spacer blocks behind it. Using the method described allows for water and snow that gets on the deck or porch to be able to escape. Refer to the illustration below.

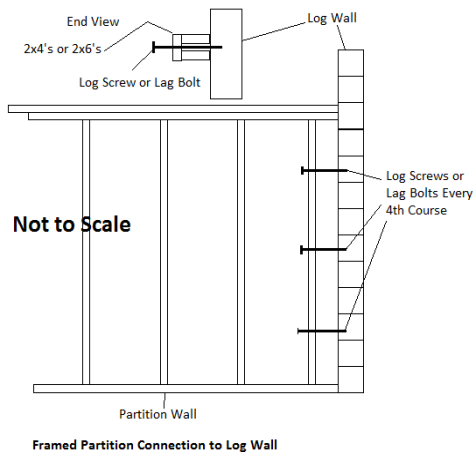


**Illustration 15**

The cedar decking can be nailed or screwed down, whichever way you prefer is fine. It should be installed tight together as it typically does shrink some. Most porch roofs are framed with dimensional lumber and collar ties with 1x5 tongue & groove cedar ceilings. You should refer to your construction drawings to verify the type of construction your porch will have. If it is a purlin roof system, you will have already constructed much of it when you did the house roof purlins. Most of our homes use a rustic cedar log railing system for use on the decks and porches. The most common way to assemble this type of rail is to cope the ends of the rails to fit the support posts or deck posts and then drill holes the length of them, top and bottom to accept the log balusters. It is important when you measure the layout for the holes to make sure you meet the spacing requirements for the balusters. Most codes require that a 4" sphere not be able to pass through the space. If you measure the layout holes at 7" or 7 1/2"OC, the spacing should come out correctly.

**15. Interior**

The interior construction is not much different than the methods used in any home construction so we will not include much instruction here. One thing that does require attention is the end of the framed partition walls. A strong back should be built into the end of the framed wall and nailed with 8" pole barn nails or screwed with 8" lag bolts into the log wall every fourth course of logs. It is important that this step is not overlooked.



**Illustration 16**

Before installing the loft flooring, you may want to install wiring for any ceiling fixtures below. To do this, simply router a groove in the top of the beam deep enough to insert a wire into. After the wire is installed, it should be covered with something to protect it from nails when installing the loft flooring.

Most of our homes are supplied with tongue and groove pine for use as interior wall coverings on partition walls. We suggest, when starting a new wall that, you measure from the ceiling down to the top of the board and make sure they are parallel with each other. If not, make adjustments now so that it comes out properly at the top of the wall. If you are installing drywall on your interior partitions, it should be done the same way it would be installed in any home.

**16. Sealer**

The wood on the interior of your home should be sealed with a finish to protect it from stains, moisture and discoloration. The most common product used is a water-based polyurethane.

Some products have UV inhibitors to help prevent discoloration due to ultraviolet light exposure from the sun. Three applications are usually needed to acquire a good finish. You may want to consider using an exterior grade sealer in the bathrooms because of the high moisture levels. Most water-based polyurethanes won't stand up to moisture and will peel off. The exterior should have a sealer applied to it also. We recommend using an oil type finish that penetrates the wood. There are many products to choose from. You will have to choose one that suits your needs, price and is available in the area that you live. Another thing to be aware of is water continuously coming in contact with the logs, such as water off the roof splashing onto the logs. You should try to avoid this whenever possible. If your home has an uncovered deck on the side the eaves are on, then you will have a place for water to continually splash onto the log wall. The best way to avoid this is to install good gutters that will take the water away without letting it drip onto the deck. Another area of concern is a valley on the roof. Valleys carry large quantities of water off the roof and sometimes can cause it to splash onto the house. This will cause the life of the finish to be shortened. Constant moisture in contact with wood is never a good thing. Many times a stone drip edge around the perimeter of your home will help to prevent any water from splashing onto the logs of your home. In any case, this is something to be aware of and watch for. After your building is 1 or 2 years old and has been through the changing of several seasons, it would be wise to give it a good visual inspection. Any checks in the logs that are between a 9 o'clock and 3 o'clock position should be caulked to prevent water from entering. The purlin ends that protrude

through the log wall should also be checked for cracks that could allow air infiltration. After these areas have been attended to, they should only require additional attention when re-applying stain or sealer to your home.

