

Building a Sundeck 1-2-3

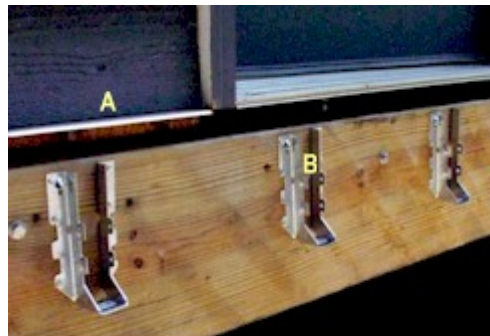


Adding a deck is one of the most useful projects a homeowner can do to improve their home. Each deck is different and presents its own set of challenges, so contact us with unique questions if they are not covered here. We are building a 12' x 24' deck with "clipped" corners and lattice installed below.

Check with your local building code enforcement office for specific material requirements in your area. For instance, the footer requirements vary greatly in different areas of the country, and you will need to know your local requirements.

Certain assumptions are made with deck building. 1. Use appropriate lumber such as pressure treated yellow pine, redwood, or others designated for such work. 2. Use galvanized nails, nuts, bolts, and screws.

Step 1 - Install ledger board on house as shown. Remove siding material if necessary to place your ledger board directly on the sheathing. If siding material is masonry you will bolt the ledger board directly on the surface of the brick or block. Ledger board will normally be the same size as the joists you are using. In our project a large ledger board was installed previously to cover the area below the door until the deck could be installed.



Determine length of deck, cut and nail ledger board directly to sheathing or brick veneer. Drill 1/2" holes every 16" through ledger board and house floor joists. Install with 1/2" x 8" galvanized nuts and bolts with washers and tighten securely.

Step 2 - Measure and install joist hangers every 16". See Figure "B" above. Fill every hole in each

joist hanger with nails or screws. Joist hanger nails are also available at your local home center.

Figure "A" is the flashing placed behind the siding to go on top of the decking boards to keep rain from washing behind the ledger board.

Step 3 - Locate and install footers to hold deck.
This is best planned with information provided by your local building code enforcement office.

They will provide the following:

- How many footers will be required for a deck your size.
- How deep to dig to stay below the frost line.
- Thickness of solid masonry footer (usually 8").
- Minimum length and width (footprint) of the footer.



Footer placement will be determined by the length and width of the deck. Part of determining footer location is to square up the area where the footers will be placed. Our project used footer blocks which can be purchased at your local home center. A string is used to assure all footers are in line.

If your deck is 24' long by 12' deep with cantilevered joists, your footer line will be 10' out from the house. Place two stakes in the ground 10' out from the house that are 24' apart. Diagonally measure across this 10'x24' rectangle to determine the squareness of this work area. Adjust the stakes left or right (staying 24' apart and 10' from the house) to make your work area a true rectangle with 90 degree angles. When you have both diagonal measurements equal, your work area is square. This is the line for your footers to be placed in. If you are cantilevering your main beam as well, measure in 24" from each end and then calculate the number of additional footers needed to cover the distance left. By cantilevering floor joists over main girder as we have done you can have a stronger deck and can use smaller lumber. Check below for some general guidelines as to lumber specs and deck construction.

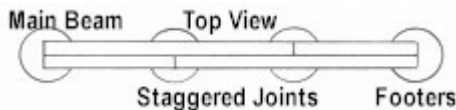
General Lumber Guidelines: (Check your local building code for requirements in your area)

- Pressure treated lumber (.40cca and above) can be placed on or below the ground. In other words your footer does not have to reach above the ground as ours did to keep the lumber above grade.
- Double 2x10 is the normal main girder (beam) on deck construction. Larger lumber can be used to span longer distances between footers.
- Double 2x10 pressure treated SYP (Southern Yellow Pine) can normally span approximately 8 feet between supports. (See "D" to "B" below)
- Deck joists can be cantilevered approximately 24" past main girder.
- Main Beam can be cantilevered approximately 24" past each end column support (See "E"

below) Cantilevering the main beam frequently allows for fewer footers and upright column supports, while making the deck just as strong.

- 2x8 SYP treated joists will span approximately 12 feet. With cantilevering you could build a 14 foot deck with 2x8 joists.
- 2x10 SYP treated joists will span approximately 14 feet, allowing a 16 foot deck with cantilevered joists.
- Vertical column supports can be 4x4 material up to a length of approximately 4 feet. For lengths longer than 4 feet between footer and bottom of girder beam (location "C" below) , use a 6x6.

Step 4 - Assemble main girder beam to cover the length of the deck (same length as the ledger board you fastened to the house). Stagger the seams in the two piece girder so they are over top of a column support (location "B"). Drawing below shows staggered girder joints.



Step 5 - Determine the height of the column supports ("C") by installing 2 joists. Install and nail one joist in each **end** joist hanger on the ledger board that is **in-line** with the two end footers. Place a level on top of first joist at point "A" and raise that joist until it is level. Nail a temporary column support at the end of that joist, holding it in place. Repeat this for the other end joist. Measure the distance from the **top** of your footer to the **bottom** of each joist. Subtract the thickness of your main beam (9 1/4" for a 2x10 beam). This will be the length of your vertical column support. Nail a guide (see location "D" on figure above) to side of vertical column to hold main girder in place and in-line during assembly.

Fasten main girder to vertical columns with guide (location "D") and lift into place. It should come up under the two joists used earlier for measurement. Square up, plumb columns and toe-nail these two joists to the girder to hold in place. Toe nail these two joists in their correct location by mirroring the joist locations on the ledger board. Measure and add any additional vertical columns. Temporarily brace this structure with diagonal 2x4 braces on the vertical columns. Now your ready to start installing deck joists.



Step 6 - Now that we have the main girder in place and supported by all it's vertical columns, its time to install the joists, followed by the decking boards.

If you haven't already measured the 16" joist spacing on the girder beam, do so now. The measurements should mirror the ledger board joist spacing. Place and nail remaining joists in place, filling all nail holes in joist hangers. If you have a 24" cantilever on both the girder beam and the joists, the clipped corner will be exactly 45 degrees. This makes cutting the angles easier. **Note** that at point "A" the diagonal rim joist ends at the girder beam allowing the end deck joist full support on the girder. Nail rim joist to end of all joists as shown at location "B".



Point "A & B" show the rim joist that closes up the end of the joists.

Step 7 - Installing deck boards. We install boards at an angle because you can build a 12 to 14 foot deck with no seams in the decking boards. Deck boards that are butted together end to end tend to splinter when dried out. You have less splinters and cracked boards if you can use full length boards. 16' decking boards will cover a 12' deep deck at a 45 degree angle. 16' decking boards will cover a 14' deep deck at less than a 45 degree angle, but still acceptable. Determine your angle and cut the end that butts up to the house.

Note in the pictures that after the boards are fastened down you snap a chalk line leaving a 1 inch overhang and cut off the boards in place. Also note that you simply install full length boards around the clipped corner and cut them off in place as well. See points "A, B & C" Points "B & C" are the 45 degree clipped corner.



Some tips about decking lumber you probably are not aware. This information will help you have a better deck. Many homeowners pick out their lumber at the store...if you do this you might as well follow this guidance concerning your decking boards. Use 5/4 x 6" decking in place of 2x6 lumber. Choose lumber that has an end grain that looks like this:



Next we'll work on the railing

This shows the board is from the outside of the tree. Boards that are closer to the center of the tree will warp upwards when the sun dries them out. Install your decking boards with a "Frown" (as shown)...not



with a "Smile". The natural desire of this board to cup downward will be counteracted by the drying effects of the sun on the opposite side of the board... thus a straighter deck.

Now on to railings...

Railings:

Our project deck uses a picket railing with unique and easy to build railing supports. We also have projects showing fancy railing patterns such as Sunburst and Chippendale .



Step 8 - Our railing system is easy to build, low cost and stronger than the 4x4 posts frequently used. The upright posts are made entirely of 2x4's that are fastened together to form a "T" as shown. The length of board "A" is 36". The length of board "B" is 42" (44" for 2x10 joists) Fasten together as shown...flush on one end. Cut bevel in end as shown in photo below at location "D". Install upright posts as needed by the deck design. Try not to exceed 7 feet between upright posts.

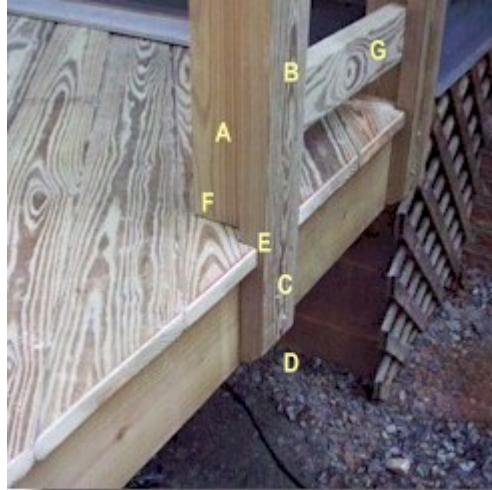
Determine each post location and cut out the 1" overhang on the edge of the deck. (location "E") Cutout will be 3 1/2" wide. Install each post by making it plumb and nailing it to the joist. Drill a 3/8" hole in the face of the upright in the middle of the joist at location "C". Install 3/8" x 4" bolt and tighten.

Angle posts are shown in photo below. The 3 boards are assembled in place unlike the T posts which are preassembled.

For added strength install 2 1/2" screw from under the deck, into the upright at location "F".



Angle corner posts



Step 9 - Measure and install horizontal 2x4 railing supports ("G") between each set of upright posts. Nail or screw into back of upright T post as shown. Top board is flush with top of post, bottom board is 4" up from deck surface.

Step 10 - Install top rail. This is 5/4x6" decking board. Make miter cuts at angles as shown.

Step 11 - Cut pickets 32" long and bevel one end as shown. (You will get 3 pickets out of each 2x2x8'). cut and install a 2x2 horizontally (location "J" in photo below) directly below the top rail on the outside of the railing.



Space the pickets 3 1/2" apart using a 2x4 as shown. Location "K" in photo above.



Angle rail assembly completed

Angle corner post with top rail installed

Example railing styles are shown below for you to consider. Carry on reading for instructions on how to build it.



Chippendale Rail



Picket railing



Sunburst Rail

Stairs:

Most deck require some stairs. They can be simple or complex as shown here. We cover how to make stairs in a previous article, but will show you here about the handrail. Making Stairs

Handrails are usually required when you reach more than 3 risers...the simple stairs to the right have 3 risers, and the ones below have 5.





Handrail construction is identical to rail construction except you cut the **T posts** at an angle on top to receive the top rail. Check your local building codes for handrail height requirements.

Want to get fancy ?



Chippendale Railing 1-2-3

A Chippendale style railing is one of the most beautiful designs for your sundeck. However, It is time consuming to build so contractors charge a premium. We'll show you how to "do it yourself"! Even with no knowledge of how to build this railing, you can accomplish this task in less than 1 hour per section. (post to post) This translates to 8-10 hours work on a railing that will be enjoyed for many years to come. Plus all your friends will wonder how you did it!



The Chippendale style works best with post to post distances of 3' to 7'. The post to post distance in our project is 3 feet. The angle of the boards changes as the post to post distance gets longer. You can use 2x2 or 2x4 lumber as the pickets for the interior of this railing design.

Construction:

Step 1. Install Top and bottom 2"x4" horizontal rail from post to post. Top rail measurement is normally 36" off the deck or floor. Bottom rail measurement varies depending on the project and your preferences. Typically 3-4 inches off the deck is an appropriate measurement for the bottom rail. Our project has an additional bottom board to attach screening as this rail is for a screened porch.



Step 2. To begin the railing pattern, install a diagonal board from a top corner to the opposite bottom corner as shown. The simplest way to measure this board and all boards for this railing is to pre-cut your board 4 inches longer than where the board is going to be used. Hold this board in place behind the railing, centering it in the corner angles. Mark both ends with a pencil, and cut. This piece should fit exactly in place. Secure with galvanized finish nails.



Step 3. Measure along this diagonal board and mark the center point. The next board will cross this existing board at the midpoint. Precut your board as before, hold in place and mark to determine the angle and length. Cut and install as shown. Repeat this procedure to complete the other side of the "X".



Step 4. The Chippendale style uses evenly spaced pickets to complete the railing. The distance between these pickets cannot exceed your local building code requirements for picket spacing. Check locally for the spacing code requirement. Measure each half of the newly formed "X". and divide to have even spacing between pickets without exceeding your local code requirements. You may need more pickets than our project required. To make these pickets you pre-cut the boards, and hold in place to measure and mark as before. The length of each of these boards is correct when they are exactly parallel to the main "X" board as shown in the pictures. Hint: to check parallel simply check the measurement at each end of the board, or cut a spacer. Attach with galvanized nails and continue until the section is complete. Repeat the same procedure for each section. Now you're a Chippendale Pro!



Sunburst Deck Railing

All of us admire fancy woodworking while wishing we had the skills to include it in our home projects. The sunburst deck railing is one such feature that attracts attention and you can build yourself!

The sunburst deck rail design is relatively easy to build, but requires a number of angle cuts. This is made easier with a power miter saw. Our [Tools](#) section discusses one such saw that is relatively low priced (at \$139) and useful for many projects around the home.

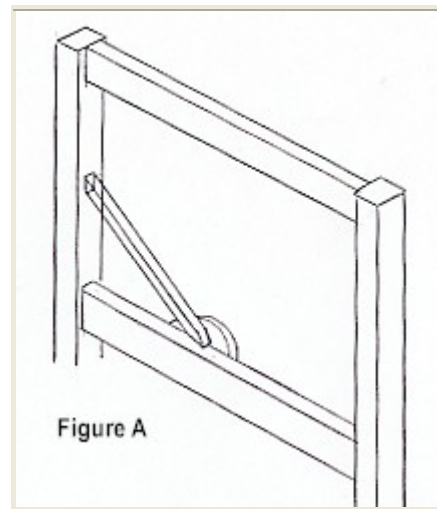
The sunburst deck railing design works best with upright post spacing of 4-5 feet between posts. The sunburst shown in the photo to the right is over 7 feet long, therefore requires more 2x2 spokes than a shorter span.



Step 1. Install upright 4x4 posts evenly spaced on each straight run of rail. To determine the spacing, divide the total distance to be covered by the railing (in a straight line) by 4 to see how many 4 foot spaces your distance requires. (See Example calculation below) Since you want each post-to-post space to be the same, you divide any remaining "partial" space by the total number of post-to-post spaces in that section of railing. (**Example:** 18 feet of straight line railing distance, divided by 4, equals 4.5 sections to cover 18 feet. Since we can't build 4 1/2 sections we need to divide the 1/2 section among the remaining 4 sections equally. 1/2 section equals 2 feet long. 2 feet divided by the 4 sections of railing is 6 inches added to each section. Each section of railing will be 4 feet 6 inches long, therefore space each post 4 feet 6 inches apart.)

Step 2. Once your upright posts are in place fasten a 2x4 horizontally from post to post at the top and 4" off the deck at the bottom. Mark the center point of these top and bottom boards.

Step 3. Use 2x2 PT lumber as the pickets for the railing. Reference Figure **B** below and secure one of the two semi-circular cover boards to the bottom horizontal board. Measure and fasten your first picket in place which is the center vertical one. The tops of all pickets are toe-nailed into the board they touch. The bottom of all pickets are face nailed into the semi-circular cover (cut from 2x10 board). See Figure **A** for an example of one picket installed.



Cut a taper in the bottom 3 inches of each picket as shown in figure **C** to allow them to be positioned closely together. Location "X" in figure **C** is where the largest space occurs between pickets. This distance cannot exceed the greatest picket spacing allowed by your local building code. The "X" distance will determine your picket spacing, and the number of pickets needed to complete the railing. To install the rest of the pickets, hold in position determined by spacing distance "X", and mark angle, cut and nail. After all pickets are installed, fasten other semi-circular cover in place. Remember you toe nail the top and face nail the bottom of each picket. Repeat for each remaining section of railing. Enjoy and let

your friends wonder how you did it!

