

STEP CONSTRUCTION specs

SPECIAL NOTE: *Every step building situation is different; the methods listed here simply cover the most basic applications. Confer with your Team Leader to determine the best options for your situation.*

Tools Needed:

Screw Gun
3 ½" Screws
Tape Measure
Post Hole Digger
Level Circular Saw
Reciprocating Saw
Chalk Line
Carpenter Pencil
Framing Square
Stair Gauges

- The “risers” (or stringers) are the vertical side pieces onto which the horizontal steps, or “treads”, are attached.
- Precut risers (2-step and 3-step) are available at most home improvement centers and lumber yards. These precut risers are a significant time saver, and cover most applications.

Note: *For stairs that require more than 2 or 3-step stringers, see next section.*

- Steps should be at least 36” wide and up to 48” wide. Wide steps (greater than 36”) may require an additional riser in the middle for added support.
- The tread, or step, is usually made with a single 2” x 12” plank or with two 2” x 6” planks laid side-by-side. Some applications may require the use of 5/4” x 6” deck board to match an existing structure.

STEPS WITH HAND RAILS

For steps with hand rails, you will need two stringers (maybe three if the stairs are wider), and four 4” x 4” posts (possible six if the stairs are wider) to anchor the steps to, but also to hold the handrails.

- first, find where the steps will go and use the stringers to determine where the four post holes need to be dug; these should be at least 18” deep.

CAUTION: *Always check for underground utilities before digging. If unsure don’t dig.*

- Once the post holes are dug, put the post in place.
 - starting on one side, make sure both posts are plum and attach the risers to the post using 3 ½” screws.
 - Repeat the process again on the other side of the stairs while ensuring that the treads are level with each other.
 - This can be accomplished by using a long carpenter’s level or by placing a board across the two stringers and putting a smaller level on top of the board.
- If there is a third riser in the middle, you will need to dig additional post holes to support the riser that is in the middle.

- The post that are holding up this stringer will need to be cut level with stringer to allow for the tread, or step to be placed flat on the surface of the stringer.
- once all the stringers are secured to the posts, install the tread, or step.
- once the treads are in place, pour the concrete into the holes to secure the posts in place.
- Now that all the treads are in place, it is time to cut the post to allow for the hand rails to be installed.
- The 4" x 4" posts will be cut on an angle to allow for the hand rail to also be on an angle.
- To measure the angle, measure up 36" from the tread on the front side of the 4" x 4" post (the side facing away from the house or porch).
- Using a board or a chalk line, match up the marks on the posts and mark the angle.
- Using a circular saw, reciprocating saw / saws-all, cut off the posts.
- A 2" x 4" attached on the side of the uprights, just below the top rail, provides added strength and firmness when the top rail is attached.
- For the top rail, consider using a 5/4" x 6" deck board. This product is sanded smooth and has rounded edges.

STEPS WITHOUT HAND RAILS

- First, attach risers to the house or porch (see below for proper length nails and screws). This can be done in several ways:
 - The most common way is to use metal joist hangers. A metal joist hanger is a piece of hardware that attaches to the house or porch and "cradles" the riser. Use 3" or 3 1/2" screws, and be sure you are attaching the joist hanger to solid wood on the house or porch.
 - The second way is to use a header board (a 2" x 6" board that is longer than the overall width of the stairs.) If you are using a header board, the risers are first attached to the header, and then the header is attached to the house or porch (use 3" or 3 1/2" nails or screws here). Be sure you are attaching the header to solid wood on the house or the porch.
 - Two other options include nailing from the back (if access is available, such as from the inside of a porch), and toe-nailing.

TIP: Be sure to leave enough room between the walking surface of the porch and the top of the stair stringer to allow for the tread that you will be putting on once the stringers are attached.

- You may want to consider having some spare 4" x 4" post blocks available to anchor the bottom of the steps into the ground.
- After the risers are secured, the treads, or steps, are put in place. The nose of the tread should be flush with the riser, or no more than a 1" overhang.

CUTTING STAIR STRINGERS

The steps outlined here are not the only way to cut stair stringers. If you have questions, ask your camp leadership for more clarification and guidance. We are so used to uniform, professionally built staircases that the slightest discrepancy between steps can create a tripping hazard. Tall steps make climbing hard while shallow steps are uncomfortable and dangerous.

- Stringers are cut from a single 2" x 12" board. You will first need to determine the rise of the stairs that you are building. The rise is the overall vertical height of the stairs.
- The standard rise of an individual step is 7" with the run, or depth, of each step being 10", or enough to accommodate two 2" x 6" boards laid next to each other for the tread.

- To measure out the rise and run of each step, use the framing square (stair gauges, or small brass fixtures that clamp onto the square, may be helpful in consistently marking the rise and run.)
 - Knowing that your rise will be 7" and the run will be 10", lay the framing square on the 2" x 12" at the appropriate markings.
 - Continue marking the steps until you have marked out all the treads you will need to come to the proper height, making sure that the stair gauge (A in the above image) lines up with the end of the tread marking (B in the above image).
 - Once all steps are marked, you are ready to cut.
 - To cut the steps, use a circular saw. **DO NOT** overcut, be sure to stop the circular saw where your lines meet, and finish the cuts with a hand saw.
 - Once you are finished cutting out the stringer, you can use it to mark out the other stringers, then proceed to constructing the steps
- Note:** If you are building stairs with more than 5 steps, you will need additional posts to provide additional support to the stringers, but also the handrails.

PROPER LENGTH NAILS OR SCREWS

SPECIAL NOTE: Screws and power drills are preferable to hammers and nails.

- General rule is the nail or screw should be at least 1" longer than the board into which you are nailing. Put another way, it should penetrate at least 1" into the board to which you are joining. Example: A 2 x 4 is 1 ½" thick. A proper nail or screw will be at least 2 ½" long. Longer nails or screws give added strength, but should not protrude out the back of the other side.
- Use 3" or 3 ½" length nails or screws when attaching the frame to the 4 x 4 support posts and to the house. This will give added strength to these weight bearing surfaces.