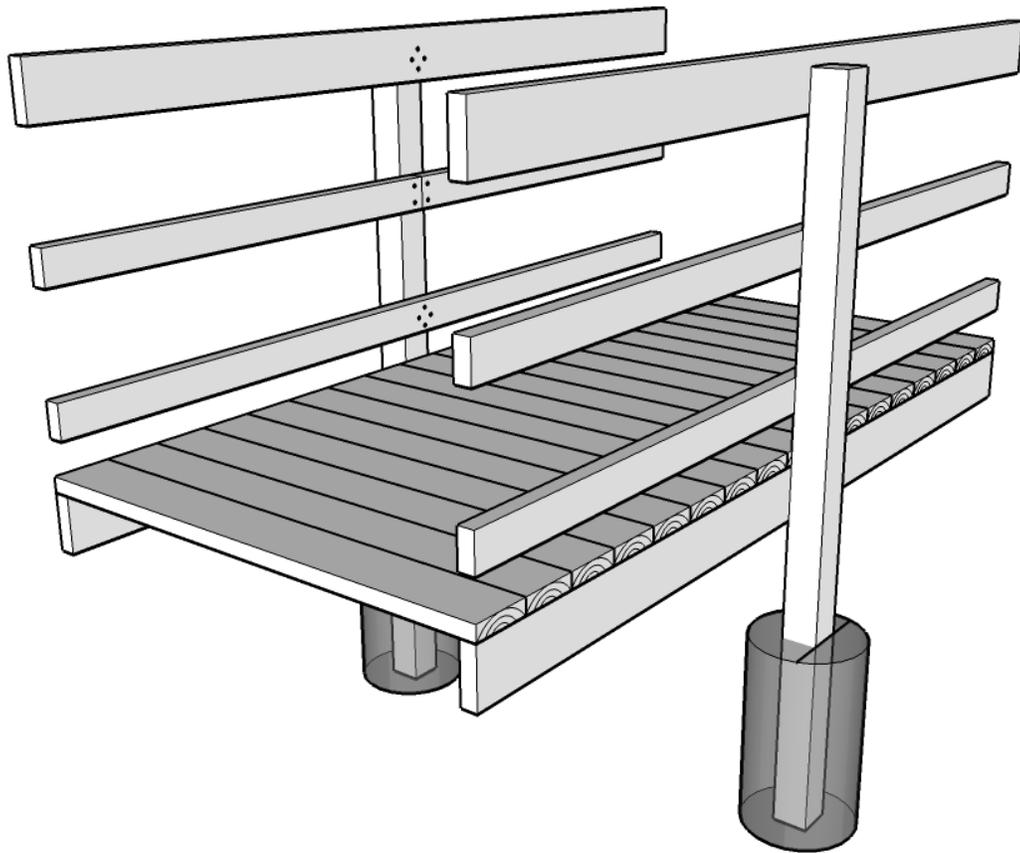


# CCC Project Manual

# HANDRAILS



## Project Components & How-To's

# Handrails

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## Common Materials

- 2x6 for Top Rail
- 2x4 for middle and bottom rails
- 16d nails
- Screws (optional)

## Handrail Tools

- 10" Spacer Block (optional)
- Sandpaper
- Miter Saw (optional)
- Circular Saw

## Common Measurements

- Finished rail height should be 36"
- 4x4 Posts should be cut 34 1/2" from finished decking height (35 1/2" from framing)
- The bottom of the Bottom rail is 3.5" from decking
- The bottom of the Middle rail is 10" from the top of the bottom rail (you can use 10" space block to set this spacing)
- Top rail overhangs the 4x4 posts that it attaches to by 1 1/2"
- If possible top rail should extend past the 4x4 at bottom of ramp/steps by 12" in order to give the user a rail until they are completely on flat ground.
- Post hole depth should be 20" ideally but 12" minimum

## General Handrail Info

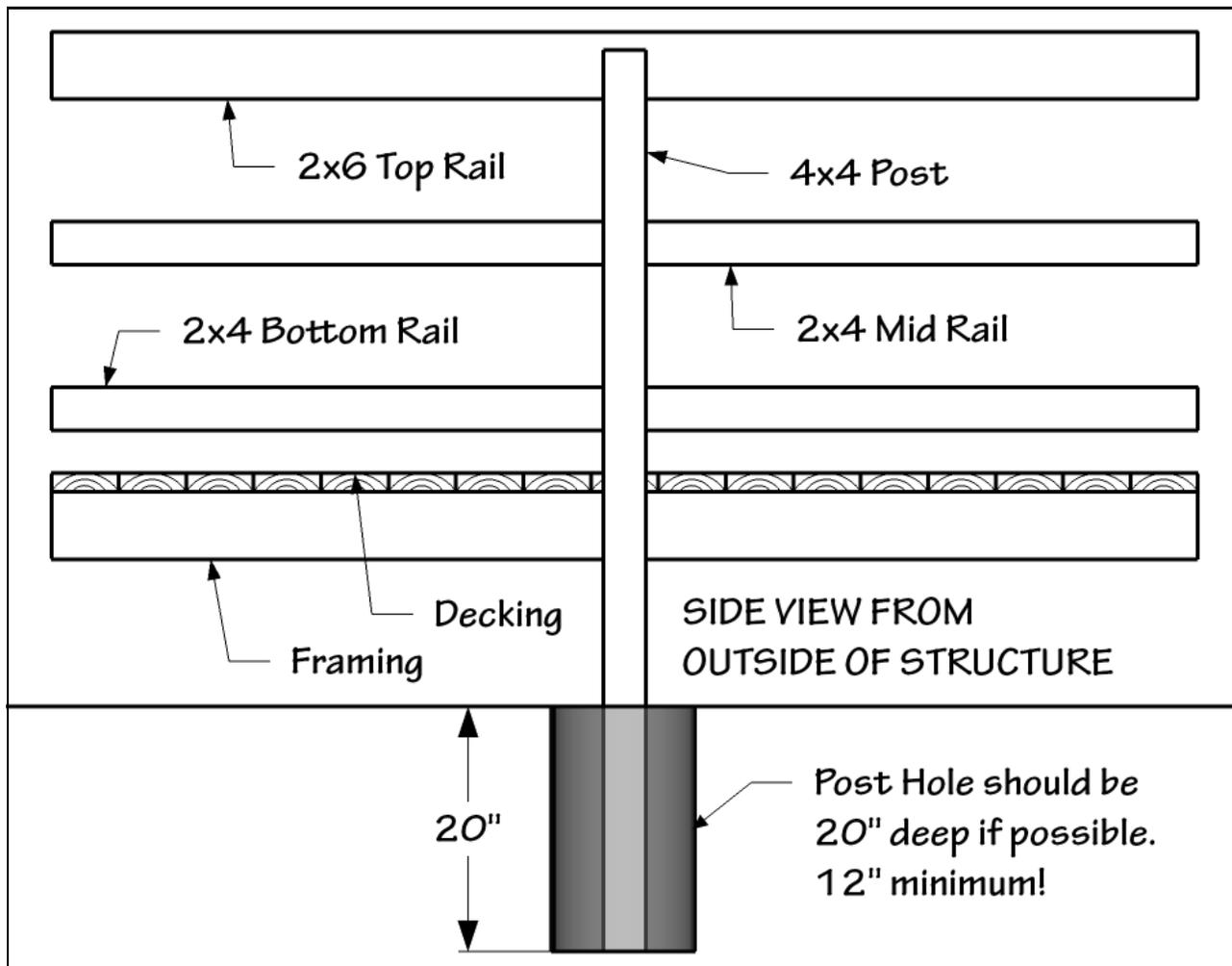
- To make structures sturdy and safe for the homeowner, CCC most often uses a three-rail system: a 2x6 top rail, 2x4 mid rail, and 2x4 bottom rail.
- Two-rail systems (2x6 top, 2x4 bottom) may suffice for steps that aren't too high off the ground, but keep in mind the safety of the homeowner and family members (i.e. small children). Don't build 1-rail systems; they offer little safety and are therefore pointless! Remember: the point of having handrails is for SAFETY.
- WE DON'T DO PICKETS!
- As a general rule, handrails should follow the same paths and patterns as the framing system of porches, ramps, and steps.

## Handrail Components

- Cap Blocks
  - ☞ Use 4"x8"x16" masonry cap blocks.
  - ☞ The ground should be leveled beneath each cap block.
  - ☞ Posts sit directly on cap blocks and do not necessarily need additional anchoring.
  - ☞ Cap blocks can only be used if the posts can be bolted to the structure (e.g. porch, ramp, steps).
- Postholes
  - ☞ If cap blocks are unavailable or the handrails cannot be connected to the structure (e.g. porch, ramp, steps), you must dig postholes to sink posts into the ground.
  - ☞ 20" deep if possible and resting on solid footing (e.g. brick, stone, gravel). 12" deep minimum!
  - ☞ Postholes should be backfilled with water & gravel concrete mix (no more than 1/2 bag per hole).

# Handrails

- Posts
  - ☞ Spaced at least every 8' (outside to outside) to support rails.
  - ☞ Posts should be cut at 34 ½" from top of the decking to top of the post (or at 36" from top of the framing to the top of post).
  - ☞ If possible, bolt posts to other structures (e.g. porches, ramps, steps) with ½" x 6" galvanized carriage bolts, washers, and nuts for added stability. Keep bolt heads on the outside of the structure.
- Top Rails
  - ☞ Use 2x6 boards only (top rails must bear loads, so 2x4s are not sufficient).
  - ☞ Top edge should be 1 ½" higher than top of post.
  - ☞ Whenever possible, top edges should be sanded well so they don't splinter in someone's hand.
  - ☞ If you are building steps or a ramp, the top rail should extend at least 12" out from the bottom post, to give the homeowner a section to grab onto when ascending the steps/ramp.
- Mid Rails
  - ☞ Use 2x4 boards.
  - ☞ There should be an 10" space between mid rail and bottom rail, and 10" between mid rail and top rail. Most importantly, the mid rails should look good aesthetically, so don't be afraid to deviate slightly from the 10" if you need to.



# Handrails

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- Bottom Rails
  - ☞ Use 2x4 boards.
  - ☞ Should be 3 ½” from the top of decking to the bottom of the bottom rail. For greatest ease, you can use two 2x4 scraps set on-edge, because these measure approximately 3 ½” on-edge. Set the blocks on the surface of the deck, then set the 2x4 bottom rail on the blocks. Fasten the rail, then remove the blocks.
- Fastening
  - ☞ All rails should be attached on their edges to the INSIDE of all posts.
  - ☞ Use 16d nails to fasten.
  - ☞ Use 2 nails at the ends of boards, and a 4-nail “diamond pattern” where a rail intersects a board.

## Building Sequence

1. Complete all framing and decking for the project first, THEN install rails. Let posts run wild while you frame and deck whatever structure you’re building (ramp, porch, etc.).
2. When framing and decking are complete, measure and cut posts to proper height. You can either measure 34 ½” from the top of the decking, or 36” from the top of the frame.
3. Install all LEVEL rails first: those rails that are for porches and landings. Install bottom rails first, then top rails, then mid rails.
4. Next, install all “slanted” rails, that is, rails for ramps and steps. Again, install bottom rails first, then top rails, then mid rails.
5. Cut any ends of rails so that they are flush with posts. On ramps or steps, always allow the top rail to extend about 12” past the bottom-most post. This ensures that people will have something to grasp when starting up the ramp or steps.
6. Sand top rails so that they are smooth and splinter-free. If you have time and enough sandpaper, you can sand the mid and bottom rails as well, but this is not always necessary.

# Handrails

