

Chapter 14 - Stairs & Finish Framing

Things to Consider

- Most of the houses now have a 2 piece stairway. There will be 2 sections for the 2nd floor and 2 sections for the basement. Ensure the correct sections are installed.

Components

Stair Cases	Basement Safety Rails
Setting Bathtub	Attic Access
Basement Shelving	

Timing & Prerequisites

- This phase of the project cannot begin until the framing is complete.
- It is preferred that this phase is not started until the roofing system is complete.
- The rough mechanicals cannot start until the stairs are installed.
- The House/Project Lead will work with the Habitat Superintendent to coordinate these volunteer activities.

Materials Needed	
Stairs	Basement Shelving
Pre-built Staircase 2" Wood Screws	2x4s 1/2" OSB 16d Common Nails 8d Common Nails
Stairway Landings	Blocking
2x10s 2x4s 3/4" OSB Joist Hangers Hanger Nails 16d Common Nails 10d Common Nails 8d Common Nails Construction Glue	2x4 2x8 16d Common Nails
Safety Railing	
2x4s Pressure Treated 2x4 10d Common Nails 16d Common Nails	

Phase Specific Tools Needed	
Description:	Quantity:
○	

Activities

Install Stairway Landings

The size and shape to the landings will change based on the house design. Build the landing to the design in the prints.

Landing will be built with 2x10 floor joist and ¾" OSB sub-floor. Ensure the joists and band boards are supported with joist hanger and jack studs.

Glue and nail the OSB sub-floor to the joists.

Install Stairs

1. Preparing the rough opening
 - Remove the temporary railings
 - Ensure the opening is big enough for the stairs
2. Position 2 volunteers at the top of the opening and 4 volunteers below the stairs.
3. Slide the stairs into the opening. If you are installing the basement steps, you will need to lower the stairs to the basement and then slide them into place.
4. Push the top of the staircase up into the hole and center in the opening.
5. When the top of the staircase is flush with the floor, nail through the stringers below the steps into the header using 16d nails; 2 nails per side. Once the stairs are secured, add 2 or 3 more 16d nails through the riser into the header.

Note: Raise the top tread up above the sub-floor by the thickness of the laminate flooring where laminate flooring will be installed. For carpeted areas, install the top tread flush with the sub-floor.

Install Framing for Stairway Ceiling

1. Install a 2x4 header to hold the top of the stairway ceiling.
 - Cut a 2x4 long enough to extend across the top of the stairway.
 - Position the 2x4 header on top of the double top plates of the walls on either side of the stairs. The 2x4 header should be placed even with the top of the stairs.
 - Nail the 2x4 header in with 16d common nails.

2. Install ceiling support rails.
 - Snap a chalk line on the studs along the side of the stairway, starting at the front edge of the header just installed; extend down to the bottom corner of the header at the bottom of the stairs.
 - Measure this line and cut three 2x4s to the length.
 - Cut one end of each 2x4 with an angle to fit under the 2x4 header just installed and the other end with an angle to fit at the bottom corner of the header at the bottom of the stairs. To determine the angles needed, hold one of the 2x4 flush to the bottom of the chalk line. Lay a scrap piece of 2x4 across the face of the 2x4 and flush to the top header. Draw a line on the cut 2x4 even with the bottom of the scrap 2x4. Repeat this procedure at the bottom header.
 - Nail 2 rails to the sides of the stair wall. Nail through the rails into the studs with 16d nails.
 - Nail the 3rd rail down the center of the stairway. Nail through the top into the 2x4 header and the bottom into the header.

Install Storage Area over Stairway

Note – This storage area is built very much like a stair way.

1. Frame in a 2-8 doorway in the wall above the stairway header.
2. Frame in 3 shelves (step) in the area above the stairway. The tops of the shelves are 24", 48" and 72".
3. Each shelf should extend back to within 6" of the stairway ceiling.
4. Cover the frame with $\frac{3}{4}$ " OSB. No drywall on the fronts (risers) or tops (treads) of the shelves.
5. The front edge of the bottom shelf (after the OSB) must be $\frac{1}{2}$ " behind the door frame to allow the door jamb to set into the opening.
6. Install enough blocking in the side walls to support the drywall.
7. Apply $\frac{3}{4}$ " OSB to the top stairway ceiling supports that extend above the top step.

Install Blocking

Blocking is needed in various places to provide an anchor point for hanging things like cabinets and handrails.

1. The blocking is installed before the drywall and flush to the studs with the wide side of the material facing into the room.
2. Blocking can be cut from 2x4s, 2x6s or 2x8, depending on how much an anchor is needed and how much room is available.
3. Blocks are cut from 2x material to go between the studs. Usually these will be 14 $\frac{1}{2}$ ".

4. Nail the blocks in place with 16d common nails. Nail 2 nails through the studs into each end of the blocking if possible. Otherwise, toe-nail with 8d common nails into each end.

Install Kitchen Cabinet Blocking

1. Locate the position of the kitchen cabinets on the prints and mark their location on the floor.
2. Measure up from the floor and make a mark at 84" on the studs in the wall where the cabinets will go.
3. Cut 2x4 blocks to fit between the studs.
4. Install a 2x4 block at each mark; positioned on edge (3 ½" side facing out); and with the center of the block aligned with the marks.

Install Range Hood Blocking

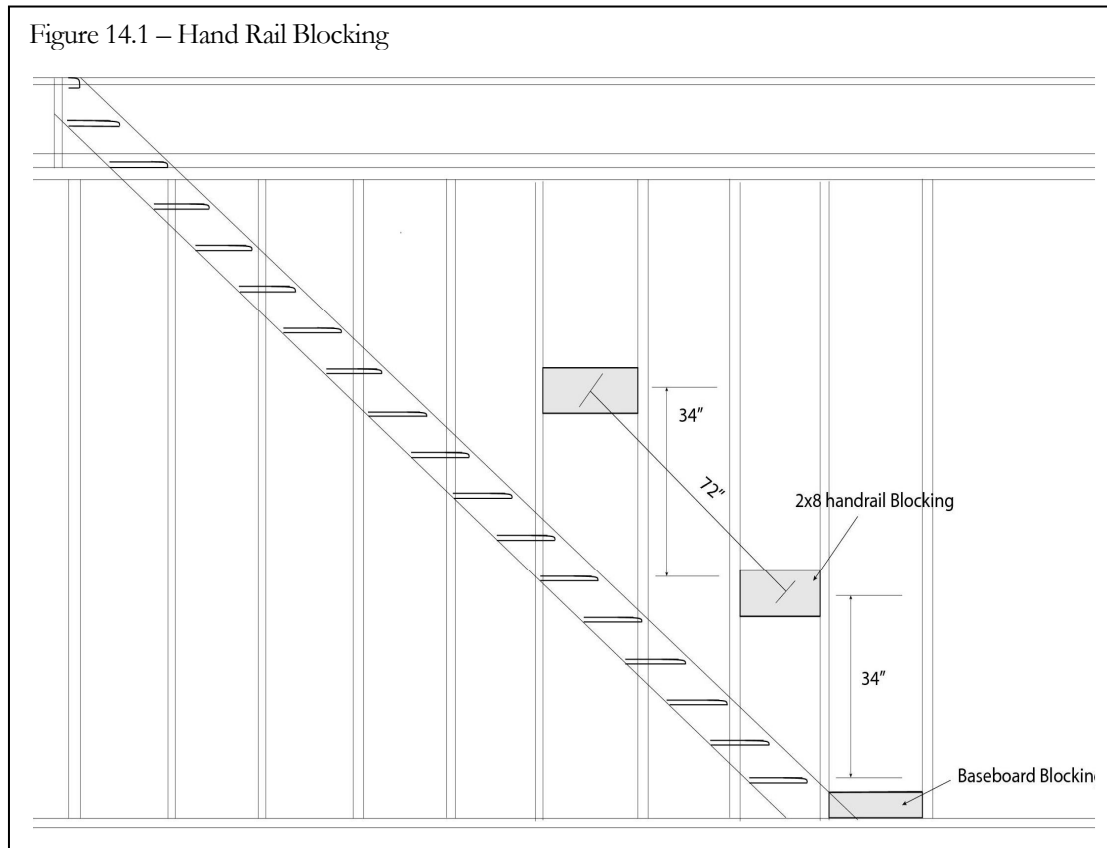
1. The bottom of the header should be at absolutely no less than 72" above subfloor and 8" or so of free space to sill to allow for vent.
2. Locate the position of the range on the prints then identify the stud cavity behind the center of the stove.
3. Measure up from the floor and make marks at 72" and 64" on the studs.
4. Cut two (2) 2x4 blocks to fit between the studs; one for a header and one for a sill.
5. Install the header above the 72" mark and the sill below the 64" mark; positioned with 1 ½" side facing out.

Install Bathroom Blocking

1. Install blocking for the grab bars.
 - a. Check the prints for location of the shower grab bars.
 - b. Cut 2x4 blocks needed.
 - c. Install 2x4 blocking per prints.

Install Handrail Blocking

1. Cut 2x8 blocks.
2. Install 2x8 blocks 34" to the center of the blocking above the tread nosing running parallel to the plane of the steps. (See figure 14.1)
3. Install blocks above the tread of the first, middle and last step.
4. Cut a 2x8 block.
5. Install the 2x8 block at the base of the staircase to provide an anchor point for the baseboard trim. Install this block flush to the bottom plate in the cavity where the staircase ends.



Install Door Handle Blocking

1. On each exterior and interior door, place blocking in the wall in the stud cavity where the door handle (when door is open) meets the wall. This will alleviate a hole being punched in the drywall from a door handle in the situation where a door stop is missing.
2. Install the blocking at a height of 36" from the finished floor to the center of the blocking.

Remove Bottom Plate in Doorways

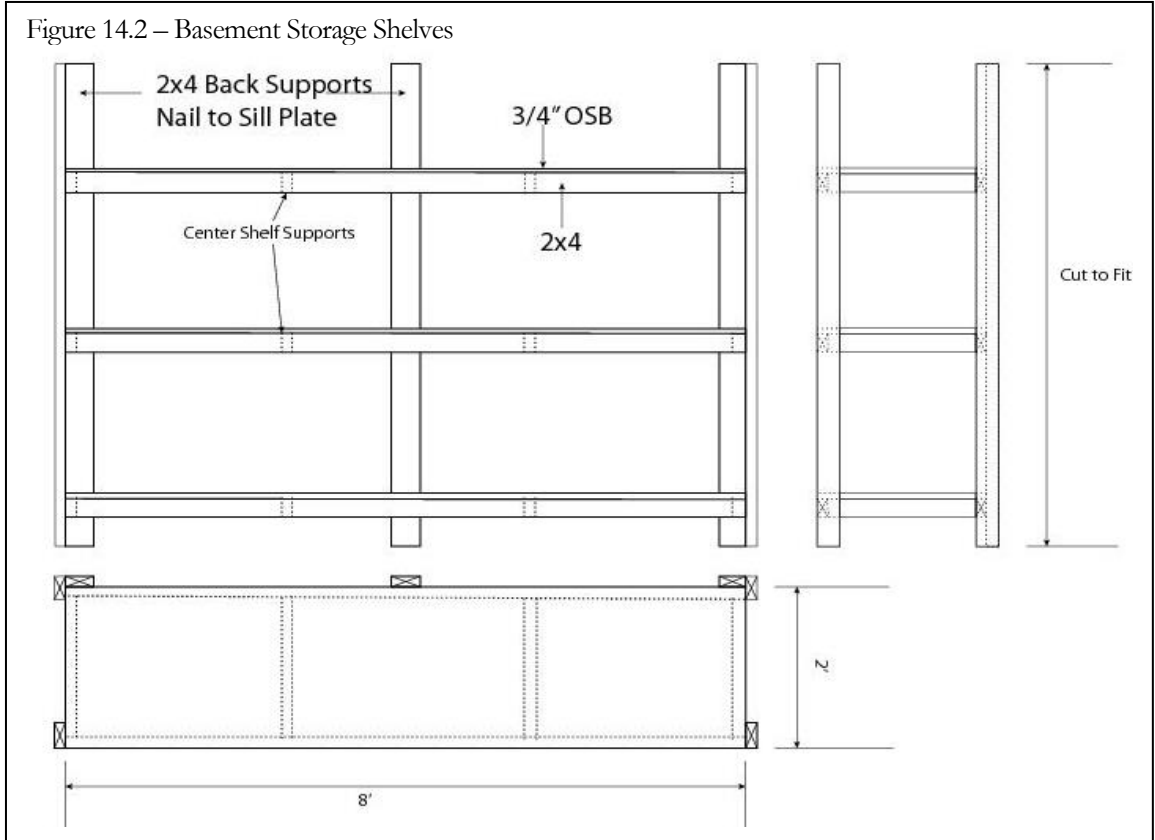
1. Toe-nail through the bottom plate between the king and jack studs on each side of the door into the flooring with a 16d common nail.
2. Use a reciprocating saw to cut the bottom plate which extends across the bottom of the doorways. Cut down through the plate on both sides of the doorway.
3. Use a hammer to tap the 2x4 out of the door.

Install Attic Access

1. Locate the position of the attic access on the prints and mark the location on the horizontal members of the truss. The opening should be 22 ½" by 36".
2. Cut 2x4 blocks to go between the horizontal members of the trusses. This will be 22 ½".
3. Nail the blocks in place with 16d common nails. Nail each corner in with 2 nails.
4. Cut pieces of 1/2" OSB to fit inside the access opening; 13" above the truss which means you will need 2 pieces 22 ½" by 16 ½" and 2 pieces 35" by 16 ½".
5. Nail these pieces into the opening flush with the bottom of the truss with 8d common nails.

Build Basement Shelves

1. Build shelving in the basement for storage. (See Figure 14.2).
Note - Build the shelving unit in the basement; it will not fit down the stairs.
2. Cut 2x4 supports for the 3 shelves:
 - a. Twelve (12) 2x4s – 21" (6 for end shelf supports and 6 for center shelf blocking)
 - b. Six (6) 2x4s – 96" (front and back shelf supports)
3. Cut 1/2" OSB shelving.
 - a. Three (3) ½" OSB – 24" x 96"
4. Assemble the 3 shelves.
5. Cut 2x4 legs.
 - a. Four (4) 2x4s – 72" (Side bracing)
 - b. Three (3) 2x4s – (Back bracing) Field verify sill height
6. Assemble the shelving unit.
7. Anchor the shelves to the wall sill with two (2) 16d nails through each of the three (3) 2x4 back supports.



Install Basement Safety Rails

If the basement stairs have open sides, safety rails will need to be installed. (See Figure 14.3). Safety rails must be installed on both sides, if both sides are open.

1. Install a pole to secure the bottom of the railing made from two (2) 2x4 attached in an "L". (See Figure 14.3)

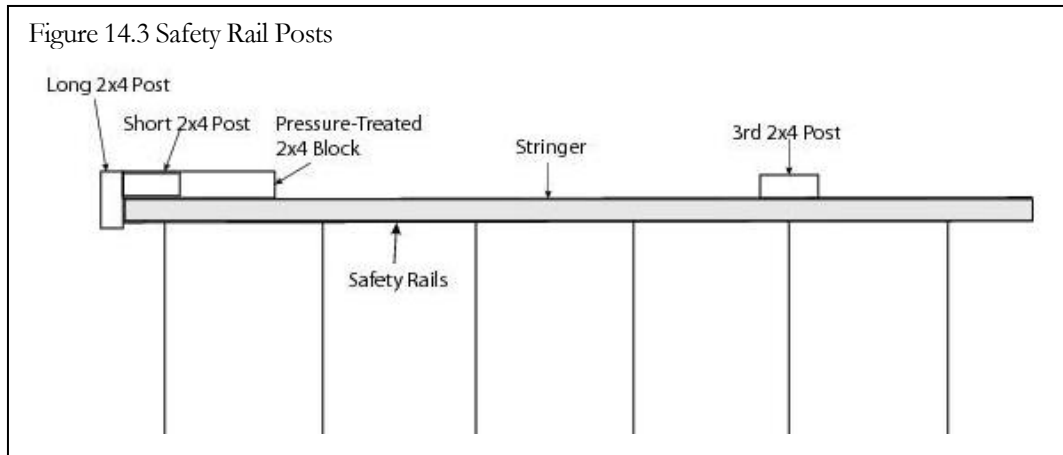
Cut a 2x4 post which extends from the bottom of the sub-floor to the floor. Cut a short piece of pressure-treated 2x4 for a block to hold the post. Cut a second 2x4 post which extends from the bottom of the header to the top of the block.

Attach the 2x4 block to the back of the long post even with the bottom of the long post. Attach the short post to the back of the long post to form an "L" with the bottom of the short post flush to the top of the 2x4 block. Attach using 16d common nails; 1 every 16".

Position the pole at the bottom of the stairs; 1 to 6 inches from the nose of the bottom step; with the 2x4 block on the outside of the stair stringer. Attach the 2x4 block to the side of the stair case with 16d galvanized nails. Plumb the post and attach to the header of joist with 16d common nails.

2. Attach additional support post.

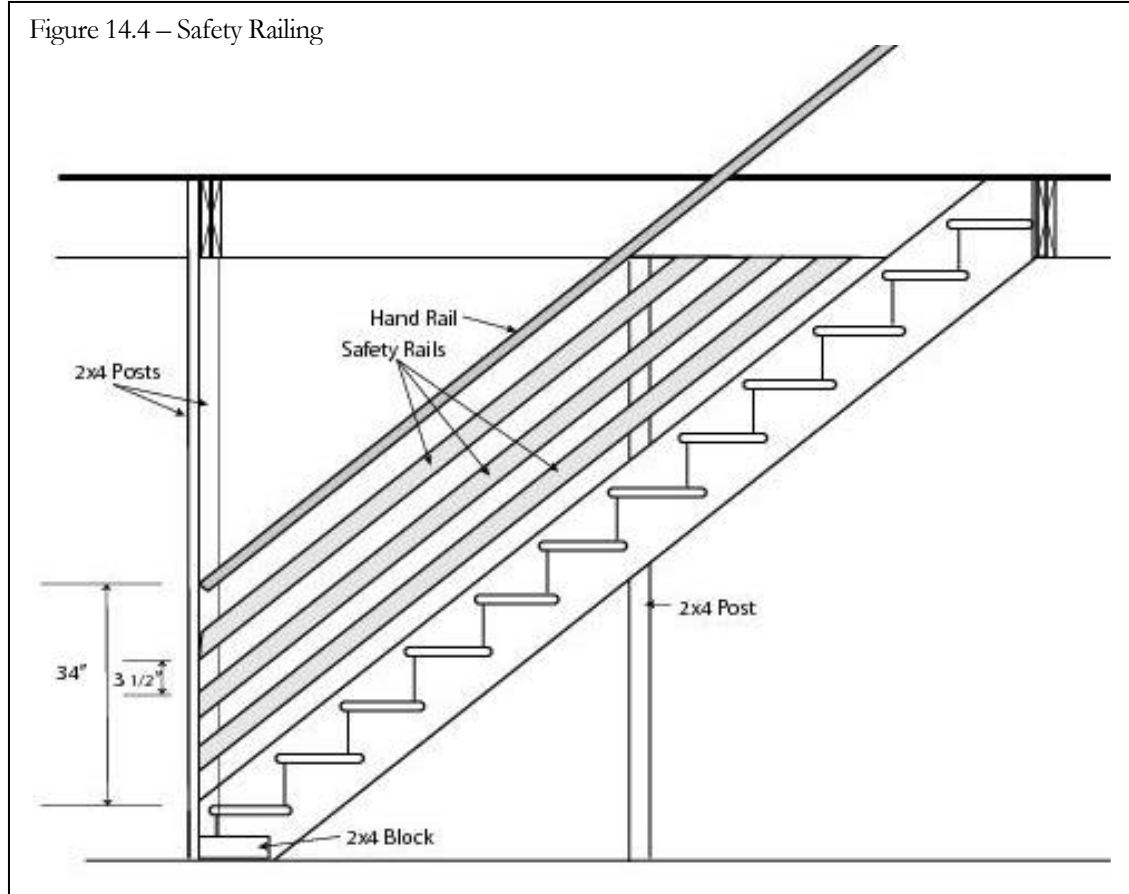
Cut the third 2x4 post which extends from the bottom of the header to the floor. Position post on the outside of the stairway stringer; 30" from the point where the stringer intersects the header. Plumb the post and attach to the stringer with 8d common nails.



3. Install safety rails. (See Figure 14.4).

Cut a 2x4 that will extend from the side of the bottom post to the header at the same angle as the staircase. Lay 2x4 spacers on top of the stringer. Lay the 2x4 to be cut on top of the spacers and against the bottom post. Using the back side of the post, mark a line at the bottom of the 2x4. Using the back side of the header, mark a line at the top of the 2x4. Cut the rail; set back on the spacers; and attach to the posts with 10d common nails. Toe-nail the 2x4 into the header with 16d common nails.

Move the 2x4 spacer on top the rail just installed. Cut and install 2 more 2x4 safety rails as before. Each rail will be 3 1/2" above the previous rail.



Install the Bath Tub Enclosure

1. Before setting the tub enclosure, ensure the grab bar blocking is in place and the outside wall is insulated.
2. Position the bath tub enclosure into place.
3. Make sure there are studs aligned with the flanges of the enclosure. If not additional blocking will be required to secure the tub.
4. Pre-drill holes in the flanges.
5. Screw the enclosure to the studs with drywall screws.

Tips & Techniques

Quality Assurance Checklist

- Use a tape measure to double check the height of blocking for cabinets and handrails.