Look for painter's tape on the hammer drill for where to set the depth.
8A. Front Handrail Posts

The white front porch posts

Tools Needed

- Tape Measure
- Post Level
- Hammer
- Ratchet Set (Long)
- Safety Glasses
- Driver & Bits
- Pencil
- Compressed Air Can
- Hammer Drill
- Dust Mask

Hardware Needed

- 1/8" & 3/8" Concrete Bits
- Wedge Anchors

Notes
Front Handrail Posts

1. Pencil in location for post holes on the concrete using [Image 1] to determine location (the middle of the post should align with the middle of the brick column).

*Note: For the posts in front of the steps, align them so that the distance between them equals the width of the steps.*

2. Use the hammer drill with a $\frac{1}{8}$” bit, set to 3.25” depth, to drill one hole.

3. Place the post over that hole to see if your holes have moved, and adjust if necessary.

4. Continue to drill one hole at a time, checking for adjustments after each hole.

5. Drill the same holes with the $\frac{3}{8}$” bit, spraying compressed air to remove dust as you drill.

6. Spray in the hole when finished drilling.

7. Stand the wedge anchors in the holes (the anchor goes in first).

8. Place the post over the anchors. Set the washers, and lightly tighten the nuts down below heads of bolts.

9. Rotate between the four anchors, hammering them down into place. Hit each anchor a few times before switching to another ([Image 3]). Do this until they cannot go down any further.
10. Use the post level to determine which anchor is at the highest point (Image 1).

11. Use a ratchet to bear down on the nut at the highest point, and tighten to a snug fit (Image 2).

**DO NOT overtighten - the hardware may break.**

12. Use the post level to determine if shims are needed. If so, insert shims.

13. Fasten remaining nuts to a snug fit.

14. Place plastic spacers over the post (Image 3).

15. Fasten a screw in the bottom spacer.

16. Hold the top spacer so that the screw will be 1½ – 2” down from the top of the post, and fasten a screw there.

17. Slide base cap, sleeve, and cap into place.
8B. Front Handrails

The white rails that are placed between the handrail posts

Tools Needed

- Tape Measure
- 4-FT Level
- Hammer Drill
- Safety Glasses
- Driver & Bits
- Pencil
- Miter (Chop) Saw

Hardware Needed

- Tapcon Screws
- 5/32” Concrete Bit

^ The hex heads are ideal

Let the drill do the work - the concrete bits are somewhat fragile.
Front Handrails

See the next page for all related images.

1. Measure the distance between brick and post both at the top \((X_1)\) and at the bottom \((X_2)\). Whichever is shorter, cut your rails to that length minus \(\frac{1}{4}''\) (Image 1).

2. Measure from the center of a rail, and mark half the cut length out on each side of the center (Image 2).

   Example: If your cut length is 96”, find the midpoint. Mark 48” to the left of the midpoint. Then, mark 48” to the right of the midpoint.

   **Condition #1** Distance from 1st picket to column must be less than 4” (Image 3)

   **Condition #2** Bracket must not impede picket installation (Image 4)

   *To meet these conditions, you may need to shift your cut marks from Step 2.

3. Install brace on the underside of the bottom rail (Image 1).

4. Hold bottom rail with brackets and brace in place. Level, and mark bracket locations (Image 1).

5. On the brick, hold a detached bracket in place to mark holes for pre-drilling.
   - Slide brackets onto bottom rail again, and set Tapcon screws in the brick (Image 1).

6. Set (self-tapping) screws through bracket into post (Image 1).

7. Attach pickets, top rail, and brackets on top rail (Image 1).

8. Level a picket to ensure they stand straight up, and mark top bracket locations (Image 1).

9. Lean assembly over to pre-drill in brick. Then, set brackets into brick with Tapcons (Images 1 & 5).

10. Set (self-tapping) screws through top bracket into post (Image 1).

11. Level a picket to ensure it’s not leaning either toward the brick or the post. Then, set screws through the side of all four brackets into the rails (Image 6).

12. Install white caps over screws.
Front Handrails, Cont.

This page speaks 5,000 words.

Image 1. Front Handrail Diagram

Image 2. Mark for Cuts
If cut length is 94", measure 42" out from center (on both sides).

Image 3. Condition 1 Met
Must be less than 4”

Image 4. Condition 2 Unmet
Bracket impedes picket hole

Image 5. Lean to Pre-Drill

Image 6. Level and Screw

Use a speed square to level, and screw.
8C. **Closet Shelving**

Provides organization for closet storage

**Tools Needed**
- Tape Measure
- Torpedo Level
- Driver & Bits
- Pencil
- Hammer
- Bolt Cutters
- Drill & Bits

**Hardware Needed**
- AWL
- Wood Screw

**Materials Needed**
- Wire Shelving
- C Clamp
- Support Brace
- End Bracket

**Safety Note**
Be careful with cut ends of the wire shelving - they can be sharp!
1. Measure the width of the closet’s back wall.

2. Subtract 1”. Cut the shelving at this width.

Note: Measure from the part of the shelf that sticks out the furthest (one of the thicker wires).

3. Mark the height at the back wall at three intervals spaced evenly across the wall (see p. 16 for blocking heights - it varies by closet type).

4. Hold the shelving in line with the marks, set C clamps every 18”, and screw in (Image 3).

5. Raise shelving to make level front to back at one end (Image 4).

Hold an end bracket template (Images 1 & 2) in place, and pencil in nail locations (Image 4).

6. Drill holes for the bracket with a ¼” drill bit, OR make holes with an awl.

7. Raise shelving up first, and then install end bracket using a hammer to tap in nails.

8. Repeat steps 5-7 on opposite end.

9. Hold the support brace roughly in the center of the wall, attaching the top component as shown in (Image 5) (in between a top rack wire).

10. Drill a hole where the brace will be attached to the drywall, and set the included drywall anchor.
8D. **Exterior Deck**

An elevated wooden platform connected to the house

### Tools Needed
- **Tape Measure**
- **6-Ft Level**
- **Driver & Bits**
- **Pencil**
- **Hammer**
- **Auger**

### Hardware Needed
- **2 1/2” & 3” Wood Screws**
- **TECO**
- **3”, 5”, & 8” Lag Screws**
- **Joist Hanger**

### Materials Needed
- **Concrete Mix**

### Notes
Exterior Deck

The most dangerous part of a house - build it right!

*Use only treated wood.

1. Measure 2x6 joists and 1x6 deck boards. Size box accordingly to minimize cuts (deck boards and joists should not have to be cut).

Reference [Images 4-6] for Steps 2-7:

2. Fasten a 2x10 ledger under the exterior door using 3” lag screws (Images 1-3).

3. Cut 6” off of a 4x4 post, and attach it to the ledger with a 5” lag screw, leaving 3” of the end of the ledger exposed. Repeat on other end of ledger.

4. Fasten a 2x6 flush to the top of a 2x10 using 3” wood screws. Line up perpendicular to the ledger flush against the outside of the 4x4 piece (with the 2x10 on the outside), and attach to the 4x4 with a 5” lag screw. Repeat on other end of ledger.

5. Level the 2x10/2x6’s (with a slight slope away from the house), and attach an upright 2x4 to each one to keep them at this level.

6. Attach final 2x10 parallel to the ledger to cap the box, using 3” wood screws.

7. Adjust box to make the distances from corner to corner equal, and nail two diagonal 2x4’s to brace.
8. Dig holes for 4x4 posts ≥12” deep using an auger.

9. Stand posts in holes, and pour in dry concrete mix.

Reference Image 1 for Steps 10-12 & 14:

10. Cut dropped beams to fit between the side 2x10’s.

11. Level posts. Attach dropped beams to outside of posts, one on each end, fitting the dropped beams flush against the bottom of the 2x6’s attached to the side 2x10’s. Use 5” lag screws.

12. Level posts, and attach dropped beams to side 2x10’s using 3” wood screws.

13. Wet concrete to set posts.

14. Trim posts flush with top of dropped beams using a sawzall, and cut beveled corners on dropped beams.

---

9. Install 2x6 joists 16” O.C., perpendicular to the back wall of the house, using joist hangers (Images 1 & 2).

10. Install 1x6 deck boards perpendicular to 2x6 joists, attaching two 2.5” wood screws into each joist.

Reference Image 3 for Steps 11-15:

11. Cut 4x4 handrail posts, and cut a beveled corner on each.

12. Fasten each handrail post to a 2x10 rim beam with two lag screws.

13. Install top rail with 2x4’s, attaching two 3” wood screws to each handrail post.

14. Install 1x6 cap on top of top rail using 3” wood screws.

15. Install spindles flush with the bottom of the 1x6 cap using 2.5” wood screws.

*Note: Start in the center, level the first spindle, and work out to the corners. Use a scrap 2x4 to give 3.5” spacing in between each spindle.*
8E. Deck Stairs

The stairs connecting the back porch to the backyard

Tools Needed

- Tape Measure
- 6-ft Level
- Driver & Bits
- Pencil
- Carpenter’s Square
- Circular Saw
- Jigsaw
- Sawzall
- Stair Nuts

Materials Needed

- Concrete Mix
- 3” Lag Screws
- Wood Screw
- Scrap 2x4

Hardware Needed

Safety Note

If you leave before finishing, put up a temporary guardrail.
Find Stair Dimensions

Take care to find your dimensions first

1. Measure the approximate height (X) (Image 1).

\[ \frac{X}{7} = \# \text{ of risers (round to nearest whole number)} \]

\[ \# \text{ of risers} - 1 = \# \text{ of steps} \]

\[ \# \text{ of steps} \times 11” = \text{length of staircase (Y)} \]

2. Place a 2x4 Y” out, level, and attach that 2x4 to the post where the stairs will begin (Image 2).

3. Re-measure from the top of the 2x4 to determine your exact height (X’) (Image 2).

4. \[ \frac{X’}{\# \text{ of risers}} = \text{Riser height (Z)} \]

Cut the Stringers

Sloped boards that support the other components

1. Use a carpenter’s square and stair nuts to trace the cut lines on a treated 2x12 (Image 3):
   - Stairs extend 11” out and Z” down.
   - Trace a 2x4 at the end to cut out a notch.

2. Use a circular saw to get most of the cut. Finish with a jigsaw or sawzall.

3. Trace the 1st stringer to cut the 2\textsuperscript{nd} and 3\textsuperscript{rd} stringers.
Install Stringers & Steps

Driver, start your engine!

1. Measure Z” down (see p. 132 for “Z”) from the top of the 2x10 rim board, and mark.

2. Set top step of stringers level to that mark, and fasten with 3” lag screws.

3. Cut treads (steps) the width of the stairway, and attach with two 3” wood screws into each stringer (Image 1).

Image 1. Attaching a Stair Tread

1 Photo courtesy of Habitat for Humanity How to Build a House by Larry Haun, published by The Taunton Press.
1. Set posts, ensuring that they are at least 36” above the corner of their respective treads.

2. Measure and mark posts 36” up from the corner of their treads.

3. Align the top of a 2x4 with these marks, and mark the cut lines on the 2x4 (see red lines in Image 1).

4. Cut and attach this 2x4 rail. Then, cut posts to align flush with this rail (blade runs parallel to 2x4).

5. Cut and install the 1x6 cap (and round the corners).

6. Install spindles (top end aligns flush with cap, while bottom end screws into stringer).
   - Use a 2x4 as a spacer, and level between spindles.
   - **Note:** Pre-drill the hole in the spindles.

---

**Grab Bar**

Reference Image 2 for the following steps.

1. Cut the A piece to (X-2)” with 45° cuts angled inward.

2. Cut both B pieces in accordance with the measurement of the hardware with 45° cuts.

3. Pre-drill holes. Install 3” and 1.5” screws at different heights so they do not intersect.

4. Install hardware every 4’ into the 2x4 rail.

5. Screw grab bar into hardware. Ensure it is 34-38” above the corner of a step.
There is a right way to paint. And a wrong way!
 Painting Guidelines

Keep the house clean and organized.

1. Ensure walls, doors, ceilings, and floors have been cleaned.

2. Make a paint station for mixing and pouring.

3. Cover finish flooring with Ram Board or drop cloths.

4. Tape door hardware and hinges.

5. Have a group of three paint one whole room.

6. Use a brush to paint the “cut-in”—3 inches along:
   - Ceiling edges
   - Wall edges
   - Window edges
   - Window sills
   - Doors
   - Door trim
   - Baseboard

   Note: Inspect frequently when using a brush - they are prone to drip easily.

   Note: Address any spills immediately!

7. Roll the ceiling, and then roll the walls.
   - Roll in one direction only, up and down (not side to side).
   A) Cover the entire height of the wall in one motion.
   B) Go back and fill in missed spots.
   C) Lightly roll over the seam.
   - Dip the roller in paint after each strip.

   Note: After every few strips that you roll, inspect for any drips, and reapply a light coat to smooth them out.

8. Have staff inspect before moving on.

   Attention: If you’re having to push hard on the roller, you need more paint! Use liberally!

9. When finished, use a hose to rinse out brushes and trays in the designated rinsing area.

10. Ensure caulking and spackling is done before putting on a 2nd coat of paint.