

# Chapter 17 - Exterior Trim

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This chapter will address the decorative trim work for the porch posts, beams, and handrails.

<b>Things to Consider</b>
<ul style="list-style-type: none"> <li>➤ <b>Porch beams will be wrapped with Smart Trim.</b></li> <li>➤ <b>Smart Trim must never be mitered or beveled.</b></li> <li>➤ <b>All six sides of the Smart Trim must be primed and painted before installation.</b></li> </ul>
<b>Components</b>
<ul style="list-style-type: none"> <li><b>Porch Post &amp; Beam Trim</b></li> <li><b>Porch Railings &amp; Balusters</b></li> </ul>

### Timing & Prerequisites

- The porch trim cannot be installed until the porch framing has been inspected.
- The porch ceiling should be installed prior to installing the Smart Trim on the beams. The Smart Trim will be installed below the F-channel.
- The porch siding and porch trim activities will require coordination.
  - The porch ceilings and J-channel around the beams should be installed before the beam Smart Trim.
  - The F-channel and soffits for the porch eaves should be installed before the beam Smart Trim.
  - The J-channel on the gable ends cannot be installed until the Smart Trim has been installed on the beams.
- The Porch Railing activities cannot begin until the siding is complete.
- The House/Project Lead will work with the Construction Superintendent to coordinate these activities and to schedule the inspections.

<b>Materials Needed</b>	
<b>Porch Beams, Posts &amp; Railings</b>	
<b>Beam &amp; Post Trim</b>	<b>Railings &amp; Balusters</b>
Smart Trim (4", 6", 8", 10", 12") White Painter's Caulk 2" Straight Pneumatic Finish Nails White Wood Filler	5/4 Composite trim (6" & 4") for Top Rails 4/4 Composite trim (4") for Railings 2X2 Balusters 3" Exterior Screws for Railings 2 1/2" Coated Decking Screws 2" Coated Screws 6x6 for Post Gravel Cement White Wood Filler Sand Paper 6"x3/8" Lag Screws and Washers 1/2" PVC spacer material Exterior Primer Drop Cloths

## Trim on Porch Beams (Volunteer)

The porch beams will be covered with  $\frac{3}{4}$ " thick Smart Trim.

Before installing the Smart Trim on the beams, complete installing the J-channel around the beams for the siding, soffit panels for the porch ceiling and the F-channel for the eaves.

Before installing the trim, cut the pieces of trim and dry fit the pieces, then prime and paint all six sides.

Install the Smart trim with 2  $\frac{1}{2}$ " finish nails. A pneumatic nailer works best.

### Smart Trim on the Bottom of the Beams

1. Cover the areas on the bottom of the beams between the posts and between the house and the posts with 6" Smart Trim. (See Figure 17.1a). Leave a  $\frac{1}{4}$ " gap between the trim and posts for expansion.
2. Attach the trim with two (2) rows of 2  $\frac{1}{2}$ " finishing nails through the Smart Trim into the beam; one into the 2x8 side and one into the 2x3 side. Place nails every 16".

### Smart Trim on the Inside Face of Porch Beams

The inside face of porch beams will be covered with 8" or 10" Smart Trim, depending on the beam size. In some cases, the trim must be ripped to fit. (See Figure 17.1a).

1. Cut pieces of Smart Trim long enough to cover the inside faces of the beams.
2. The beams for the front porches on the Anna and Rachel will not have a top plate; therefore, the Smart Trim will need to be ripped to fit. (See Figure 17.1b).
3. Cut the trim on the side beams first and then the front beam, leaving the boards  $\frac{1}{4}$ " short for expansion.
4. A router with a straight bit should be used to create a  $\frac{3}{8}$ " deep pocket on the back side of the trim to fit over the framing brackets.
5. Dry fit and then paint all six sides.
6. Hold the trim down to create a  $\frac{1}{8}$ " reveal along the bottom and nail in place. A clamp will help hold the inside Smart Trim tight to the edge of the bottom Smart Trim.

Figure 17.1a – Smart Trim Inside of Porch Beams

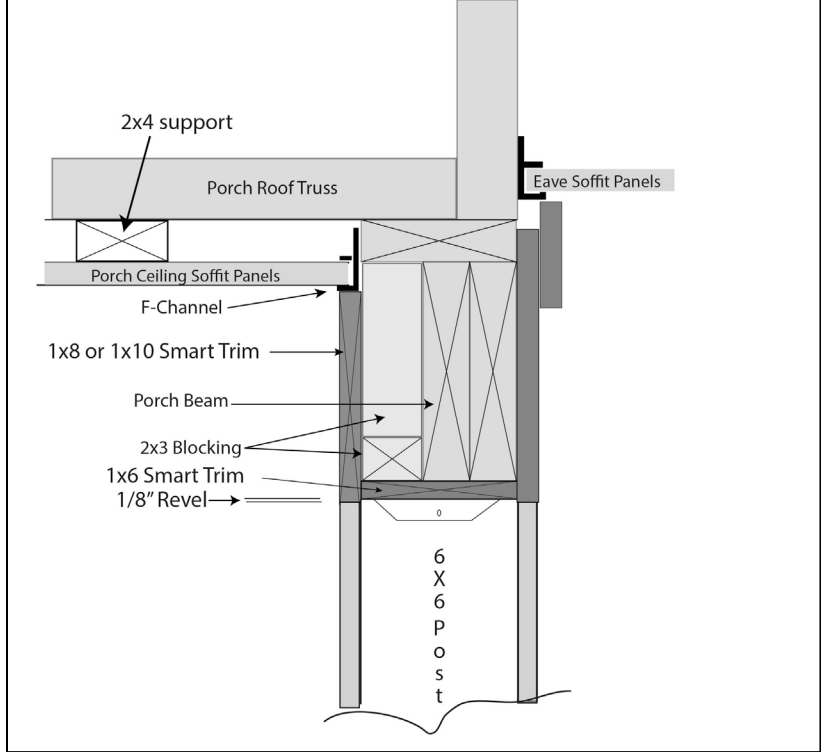
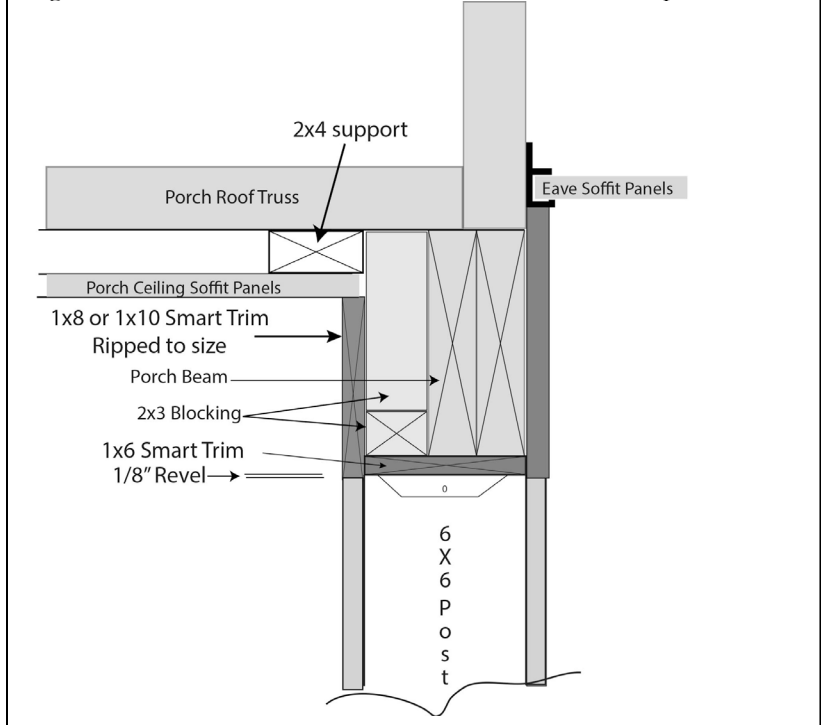


Figure 17.1b Smart Trim Inside of Porch Beam with no Top Plate



**Smart Trim on the Outside of the Beam**

The installation of the Smart Trim on the outside of the beams will vary depending on the type of porch roof, the pitch of the roof, and the trusses used. Some models may have roof trusses which are built with an energy heel, in which case, the trim will need to be wider.

- If the distance from the soffit panels on the eaves to the bottom of the beam is 11 3/8" or less, then a single layer of Smart Trim will cover the beam.
- If the distance from the soffit panels on the eaves to the bottom of the beam is 11 1/2" or more, two layers of Smart Trim will be needed. (See Figure 17.2a).

**Side Beams (Layer 1)**

- First, cover the sides with the first layer.
- Cut a piece of Smart Trim to fit between the J-Channel wrapped around the beam and the end of the front edge of the beam.
- If only one layer of Smart Trim will be needed, rip the piece to size. Allow for 1/8" reveal below the beam.
- If two layers of Smart Trim will be used, the first layer should be 10" or 12" wide piece.
- Use a router with a straight beam to make 3/8" pockets in the back side of the trim to fit over the framing brackets.
- Paint all six sides.
- Hold the piece in place, flush to the front edge of the beam and 1/8" below the beam, then nail in place.

**Front Beam (Layer 1)**

- The first layer of the front Smart Trim extends out over the ends of the beam to cover the ends of the first layer of Smart Trim on the sides. (See Figure 17.2b).
- Cut a piece of Smart Trim to cover the front beam extending out over the first layer of the sides.
- Rip, router, paint and install like the sides.

**Side Beams (Layer 2)**

- The second layer of Smart Trim covering the sides should be a smaller width covering the top 1/3 to 1/4 of the beam.
- Cut pieces of Smart Trim to cover the side beams extending out to the front edge of the first layer of Smart Trim on the front beam.
- No ripping or pockets will be needed.
- Paint and install across the top of the side beams.

**Front Beams (Layer 2)**

- The second layer of Smart Trim covering the front will match the second layer on the sides. (See Figure 17.2b).
- Cut pieces of Smart Trim to cover the front beam extending out to the outside edge of the second layer of Smart Trim on the side beams.
- No ripping or pockets will be needed.
- Paint and install across the top of the side beams.

Figure 17.2a - Smart Trim on outside of Porch beams

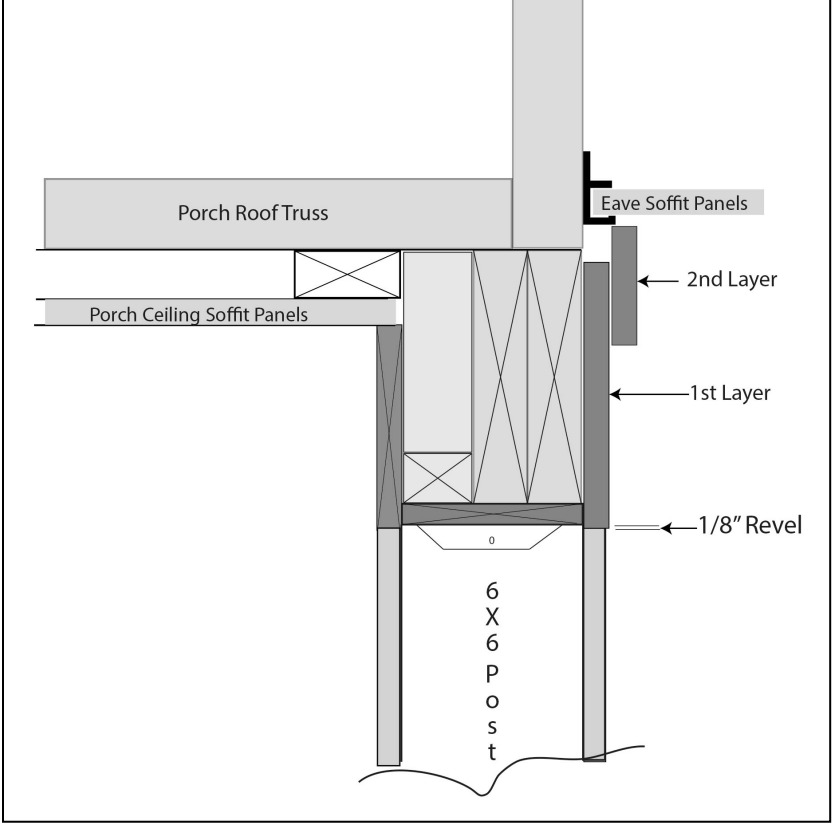
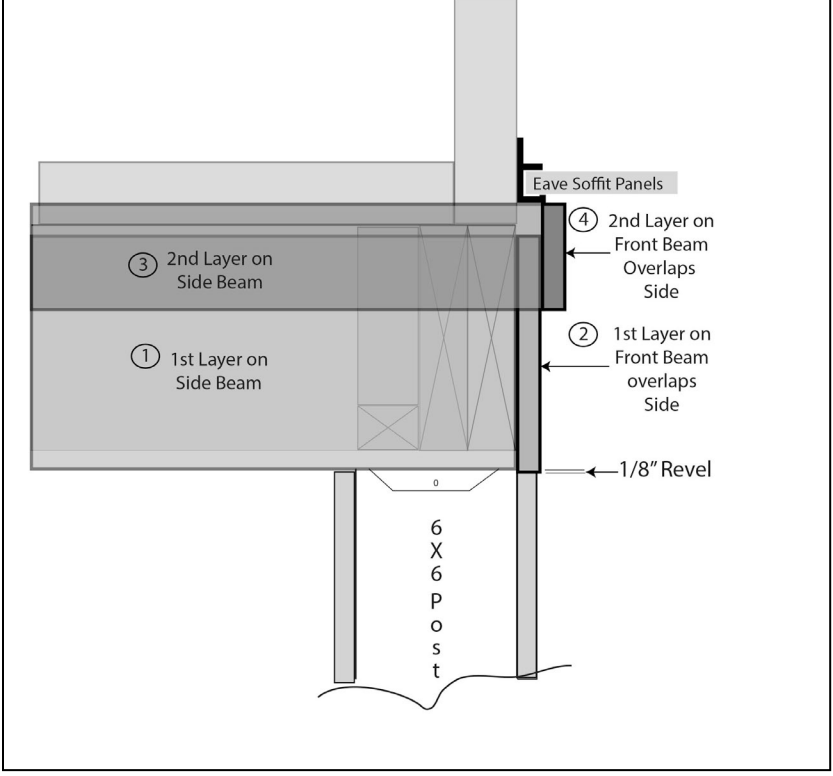


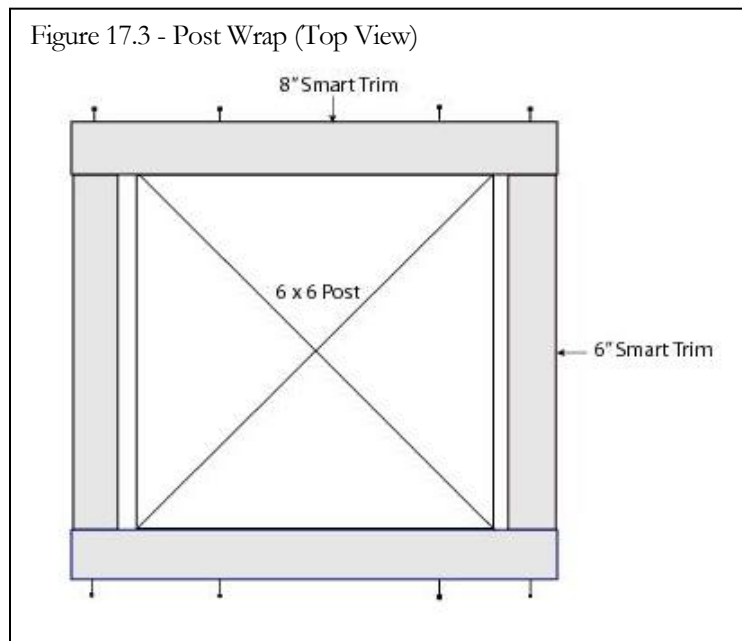
Figure 17.2b – Outside Smart Trim Overlaps



## Trim on Porch Posts (Volunteer)

### Wrap the Porch Posts

1. Cut and install Smart Trim to wrap the porch posts. (See Figure 17.3).
  - Cut pieces of 8" Smart Trim to fit on the front and back of each post. Make sure to measure each post and mark the piece to fit there. The Smart trim should be cut  $\frac{1}{2}$ " shorter than the length of the post to allow for expansion.
  - Cut pieces of 6" Smart Trim to fit on the sides of each post. Also, leave these pieces  $\frac{1}{2}$ " short.
  - Prime and paint all six sides.



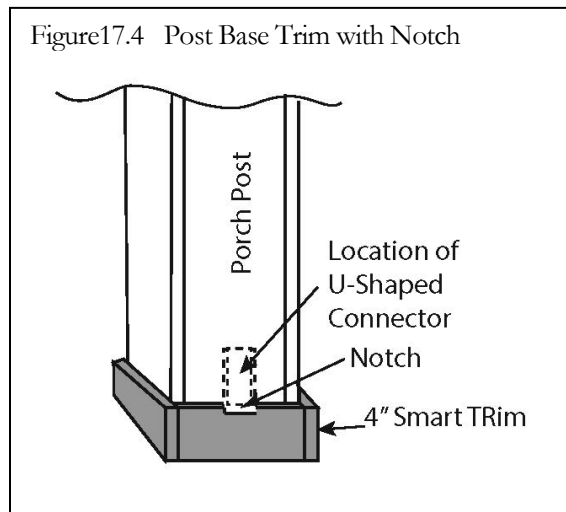
- The trim can be assembled with or without a reveal on the sides of the posts.
- For posts with a reveal:
  - Hold the tops of the side pieces flush to the Smart Trim on the porch beam, then attach the side pieces directly to the post.
  - Center the front and back pieces on the post and nail in place.
- For posts without a reveal:
  - Assemble the sides and back pieces of Smart Trim into a three sided box.
  - Position the assembly over the back of the post with the top of the assembly flush to the Smart Trim on the beam. Plumb the assembly on the post, then nail in place. Place nails down the center of the post.

- Position the front Smart Trim on the post with edges flush with the side Smart Trim. Clamp the front piece in place to close the gaps between the front and the sides, then nail in place. Place nails down the center of the post and down each edge into the side trim.

**(Optional) Install Decorative Trim at Bottom of each Post.**

Cut pieces of 1x4 Smart Trim to cover the bottom 3 ½” of each post. This trim will cover the gap between the bottom of the Smart Trim on the posts and the porch floor.

1. Cut two (2) pieces of 1x4 Smart trim to fit on the side of each post. These will be cut to the width of the post.
2. Cut two (2) pieces of 1x4 Smart Trim to fit across the front and back. These will be long enough to overlap the sides.
3. Pieces which will be under a porch rail will need to be notched to allow the U-shaped connector to recess enough to allow the bottom rail in the connector to be flush with the top of the Smart Trim. (See Figure 17.4).
4. Paint the pieces.
5. Install the pieces flush to the porch floor. Keep the nails high when installing the trim, nails will not penetrate the post base bracket.



**Smart Trim on Post Quality Checks**

- Ensure all nails are set and do not protrude from the sides.



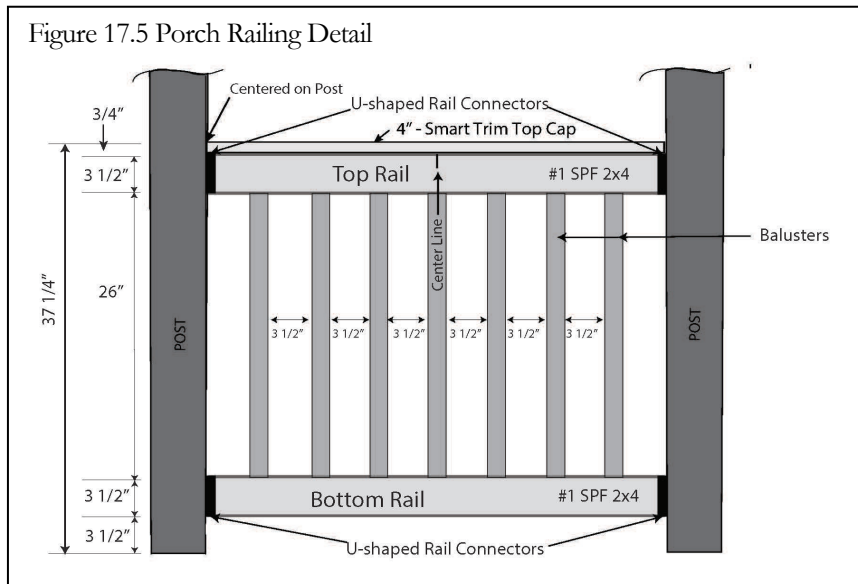
## Porch Railings

Railings will be installed on both the front and back porches. Sections of railing will be installed between two posts or between a post and a support on the house.

<b>Critical Issues</b>
<ul style="list-style-type: none"> <li>➤ The top of the porch railings must be at least 36” above the porch floor.</li> <li>➤ The space below the bottom railing must be less than 4”; 3 ½” is recommended where possible.</li> </ul>

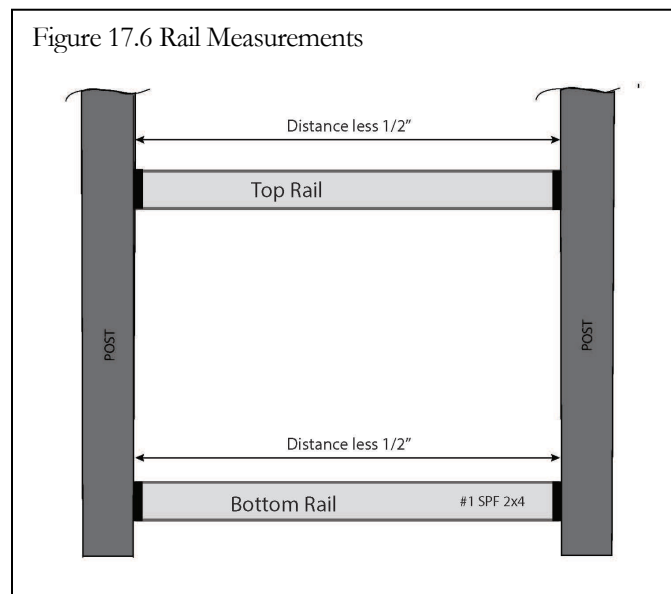
<b>Tools &amp; Materials Needed</b>	
<b>Porch Railings</b>	<b>Stair Posts &amp; Railings</b>
#1 SPF 2x4s for rails 4” Smart Trim for top cap U-Shaped Rail Connectors (4 per section) Deckorators Baluster Connectors Aluminum Balusters 2” Straight Pneumatic Finish Nails 2 ½” exterior wood screws  Driver w/ 1/8” bit Drill Driver w/ P2 bit Pneumatic Finish Nailer Tape Measure Clamps White Rubber Mallet	<b>Stair Posts</b>
	4x4x8’s Gravel Cement (60 lb for each post)  Post Hole Digger Spud Bar
	<b>Stair Railing</b>
	#1 SPF 2x4s for rails #1 SPF 2x4s for top cap 3” Exterior Screws for Railings 2 ½” exterior wood screws Deckorators Stair Connectors Aluminum Balusters
<b>Railing Support (House)</b>	<b>Finishing</b>
4” Smart Trim 3” Exterior Screws ½” PVC spacer material  1” hole saw	White Wood Filler White Exterior Paint White Painter’s Caulk Drop Cloths

## Porch Railing Installation



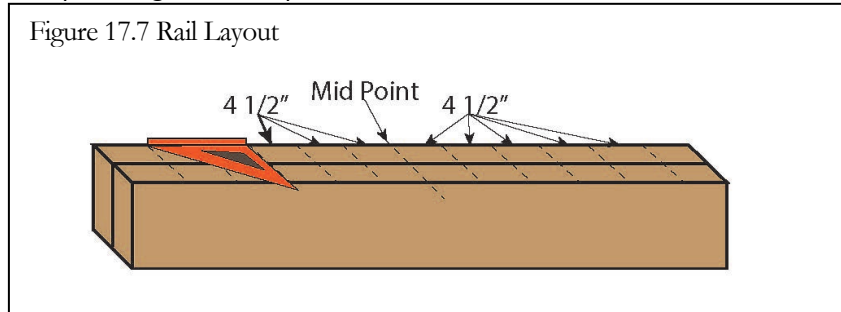
### Top and Bottom Rails

- Determine the length of each rail. (See Figure 17.6).
  - Measure the distance between two posts. If the posts are not plumb, the top and bottom rails may be a different length. Therefore, measure the top rail at 36" above the deck and the bottom rail at 4" above the deck.
  - Subtract 1/2" from each length. The U-Shaped connector will add 1/4" to each end of each rail.
- Cut pieces of 2x4s to the calculated length for the top and bottom rails.
- Paint 2x4s with two (2) coats of white exterior paint before adding the connecting hardware.

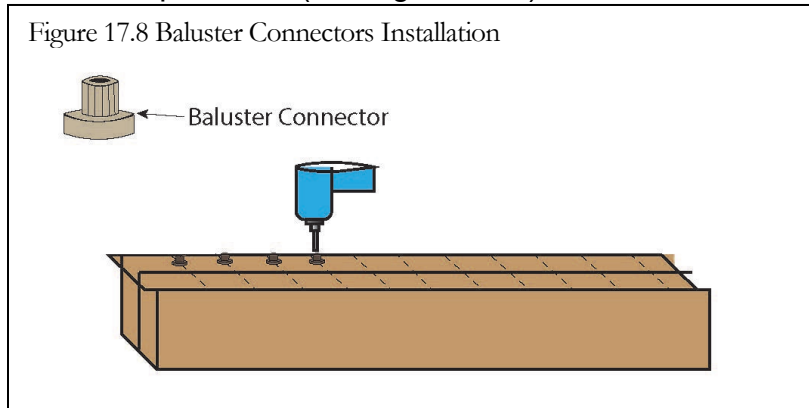


### Baluster Connectors

- Clamp the 2x4s together with the wide sides facing each other. If the rails are different lengths, align the 2x4s to ensure the balusters will be plumb.
- Make a line across the 2x4s at their midpoint.
- Mark top and bottom rails 4 1/2" on-center from the center line and centered on the board. (See figure 17.7).

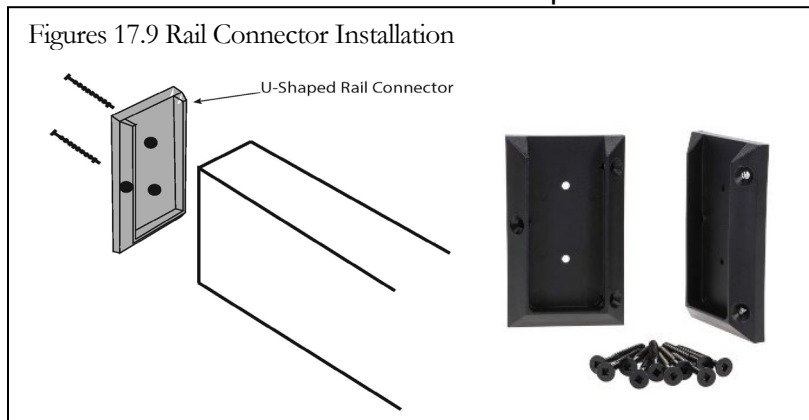


- Using a 1/8" drill bit, drill a pilot hole at each mark on both the top and bottom rails.
- Using a drill driver, screw on Deckorators baluster connectors on each mark using the screws provided. (See figure 17.8).

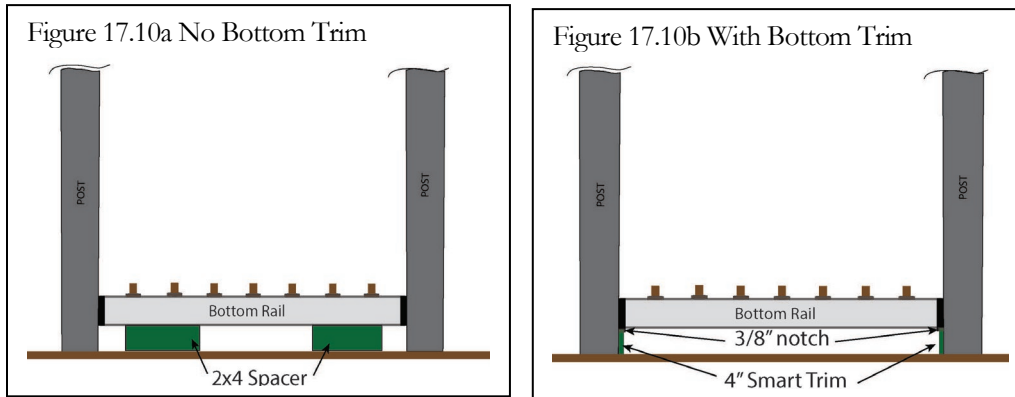


### U-Shaped Rail Connectors

- Attach a connector to each end of the rails with two (2) screws provided through the predrilled holes into the ends of the 2x4s.
- Install connectors on both ends of both the top and bottom rails.



## Bottom Rail Installation



- (No bottom trim):
  - Space the bottom rail 3 ½" above the deck by resting the rail on scrap pieces of 2x4, one at each end.
  - The rail should fit snugly between the posts.
  - Center the bottom rail on the post at each end.
  - Fasten with three (3) screws provided through the predrilled holes into the post.
- (With bottom trim):
  - Set the U-connectors in the notches made above. (See Figure 17.4).
  - The rail should fit snugly between the posts.
  - Center the bottom rail on the post at each end.
  - Fasten with three (3) screws provided through the predrilled holes into the post.

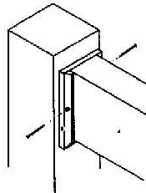
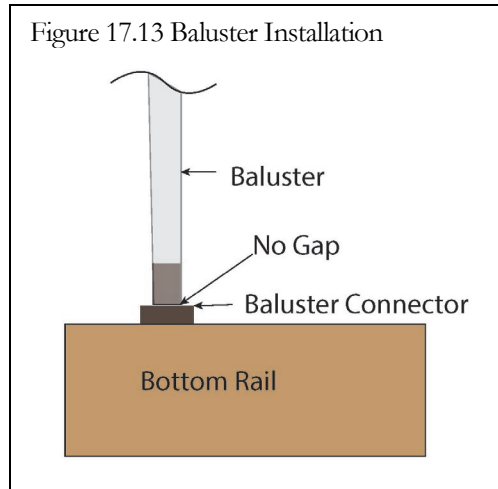


Figure 2

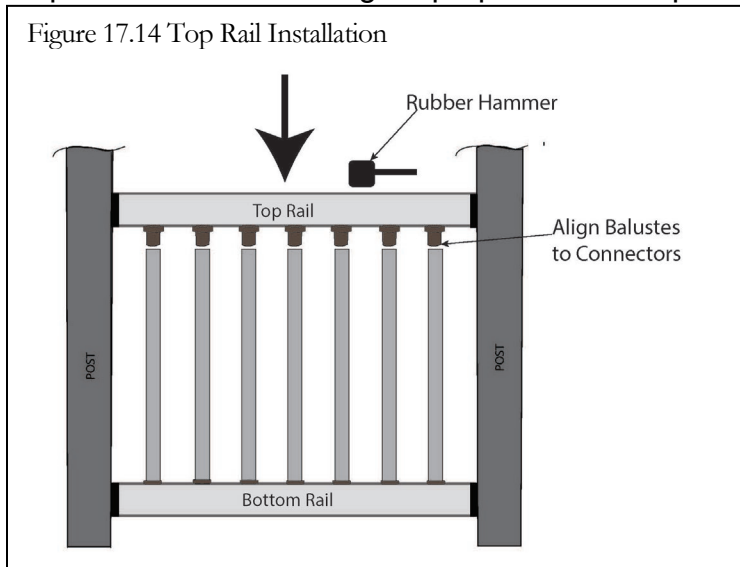
## Baluster Installation

- Slide balusters over the bottom connector. Ensure the balusters are seated tightly on the connectors.



### Top Rail Installation

- Carefully place the top rail over the balusters, making sure each baluster is seated properly on each connector. Using a rubber mallet, tap the top rail down until the connectors are completely seated into the balusters. (See figure 17.14).
- Center the top rail on the posts and secure it to the posts with three (3) screws provided through the predrilled holes into the post.
- Inspect the finished railing for proper baluster spacing.



**Railing Support at the House**

Install a piece of 4" Smart Trim on the house at the point where the railing will be connected. The support will provide a solid connection point.

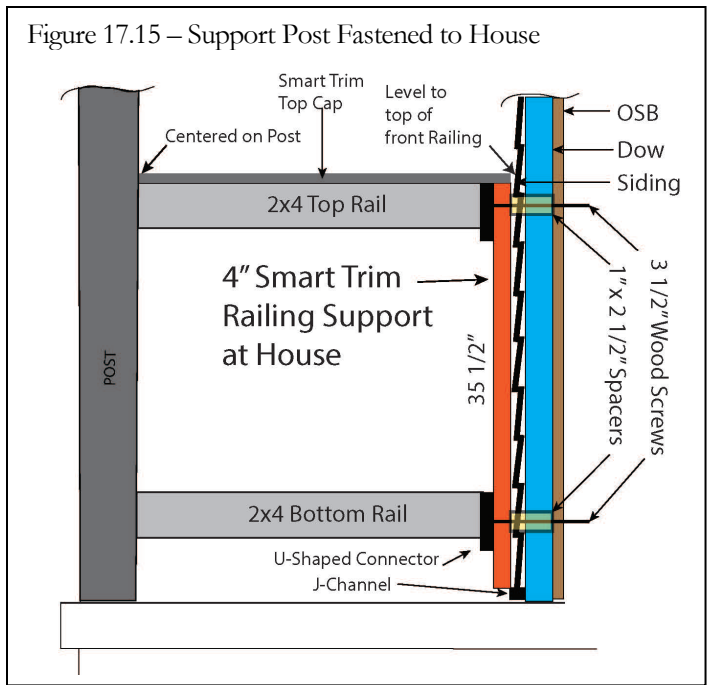
1. Locate the position for the railing support. (See Figure 17.15),

**Top**

- Make a mark on the house level with the top of the Top Rail of the front railings.

**Side**

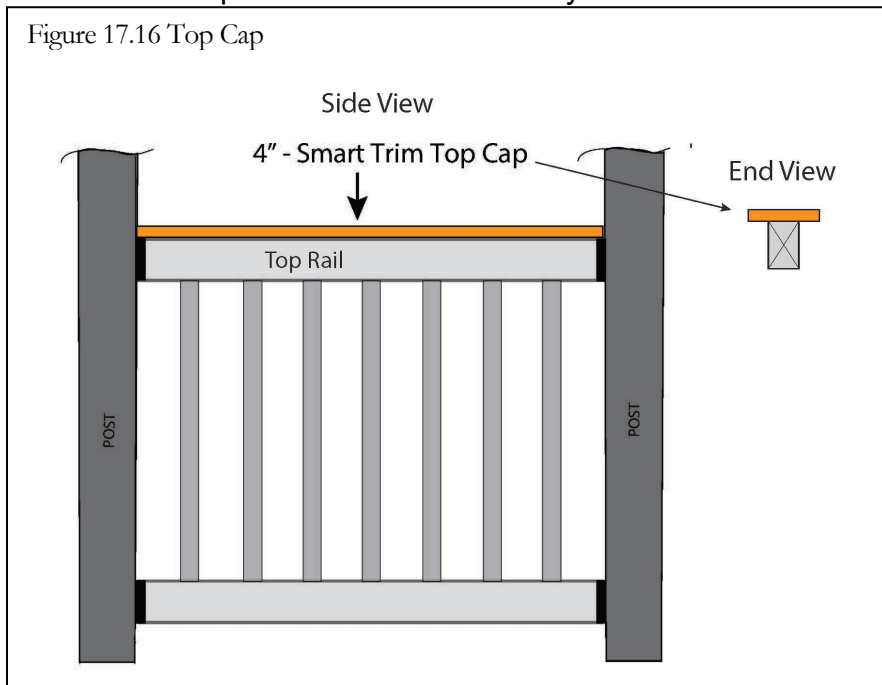
- Measure the distance from the edge of the porch concrete to the center of the corner post to which the railing will be connected.
  - Measure off the concrete porch edge at the house and make a mark on the house at the same distance. That mark will be the center of the support post.
  - Measure back 1/2 the width of the 4" Smart Trim and make a mark.
  - Draw a vertical plumb line at the second mark. That line will be the outside edge of the Smart Trim.
2. Install 1" PVC spacers to prevent the siding from being crushed when the support is installed.
    - Drill two (2) 1 1/8" holes through the siding and Styrofoam insulation. Do NOT drill through the OSB sheathing.
    - The first hole will be 2" below the top mark and centered where the support post will be installed.
    - The second hole will be 6" above the deck and centered where the support post will be installed.
    - Cut two (2) pieces of 1" PVC pipe for spacers. The length of the spacers should be equal to the width of the siding and the Styrofoam; approximately 2 1/2".
    - Insert the pieces in the holes.
  3. Install the railing support.
    - The railing support will extend from the top of the J-Channel on the deck to the Top mark made above. Approximately 35 1/2".
    - Cut a piece of 4" Smart Trim to fit.
    - Prime and paint all six sides.
    - Hold the Smart Trim in place and mark the position of the spacers below.
    - Drill pilot holes in the Smart trim at the location of the spacers.
    - Attach the support post to the house with 3 1/2" exterior wood screws through the pilot holes.



**Top Cap**

**1. Add a cap rail for a finished look.**

- Cut pieces of 4" Smart Trim to fit snugly over the top rail.
- Paint the Smart Trim with two (2) coats of white exterior paint.
- Install the cap over the top rail with 2 1/2" exterior wood screws; 1 screw in the center of the top of the Smart Trim every 12".

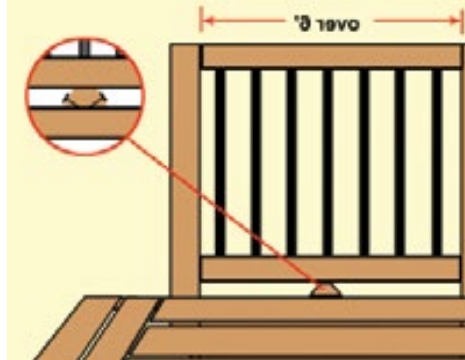


**2. Fill the holes.**

- Apply wood putty to the screw holes made by the screws.
- Allow the putty to dry, then sand to a smooth finish.

**Bottom Rail Supports**

- For rail sections longer than 4', support blocks are recommended. These can be made from leftover 2x4 rail material.
- Properly position the support block and toe-nail it to the bottom rail.





## Porch Stair Handrails (Volunteer)

### Critical Issues

- If there are four (4) or more rises and/or the porch is 30" or more above grade, handrails are required on both sides.
- Call OPUS before digging the post holes.

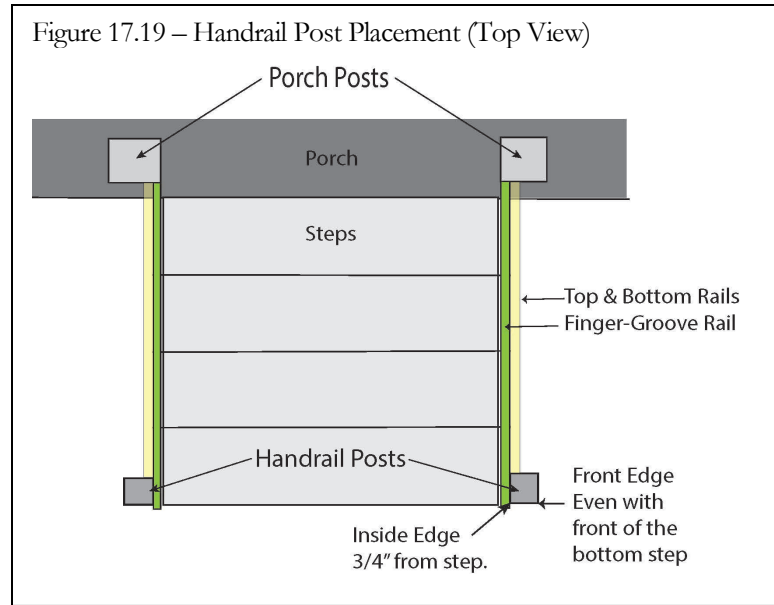


## Porch Stairs Railing Installation

The porch stair railings will be installed similarly to the porch railings except for the baluster connectors. The Deckorators' angled stair rail connectors will be used to create a snug and accurate baluster fit for stair angles ranging from 30 to 35 degrees.

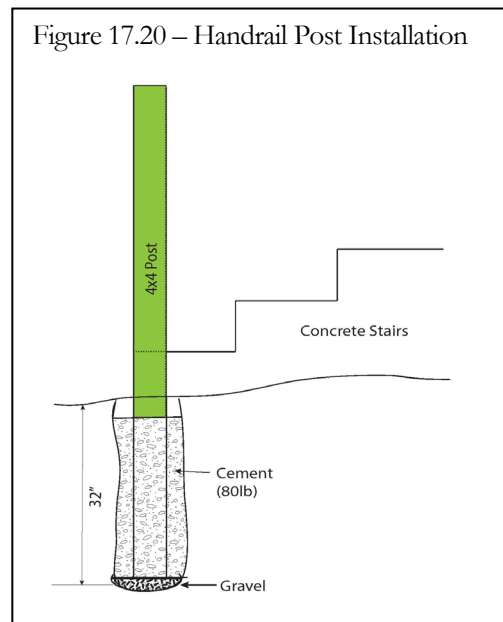
### Install the Stair Hand Railing Posts

1. Determine placement of the handrail posts. (See Figure 17.19)
  - The handrails will span between the porch posts on either side of the steps and the handrail posts at the bottom of the stairs.
  - The handrail post should be installed beside the bottom step with the front edge even with the front of the bottom stair. The post should be installed 3/4" from the side of the bottom stair to allow for the grooved handrail which is installed later.



## 2. Install the post.

- The front of the post should be flush with the front of the bottom step. The side of the post should be 3/4" from the of the step.
- Dig a 32" deep hole beside the bottom step for the post.
- Fill the bottom of the post hole with 2" to 4" of gravel to allow for water drainage.
- Place the post in the hole; place a scrap of 1x4 between the step and the post; align it with the front of the bottom step; plumb it; and brace it in place.
- Fill the hole with concrete. Allow the concrete to set up (about 2 hours) before removing the bracing.

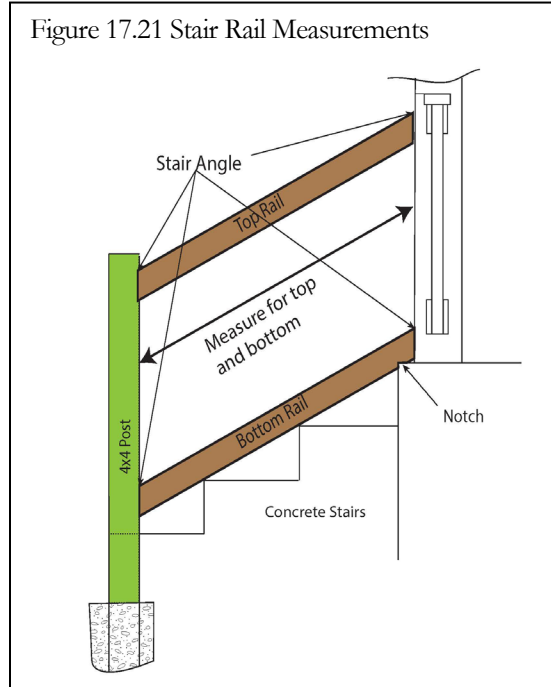


## Make Top and Bottom Stair Rails

### 1. Make the stair rails from #1 SPF 2x4.

- Bottom stair rail
  - Lay the bottom 2x4 rail on the steps alongside the posts.
  - The edge of the porch may not allow the rail to align with the stair nose. If so, a notch should be cut in the bottom rail. (See the figure 17.21).
  - Mark the angle and where the rails intersect the posts.
  - Cut the rail at the marks.
- Top stair rail.

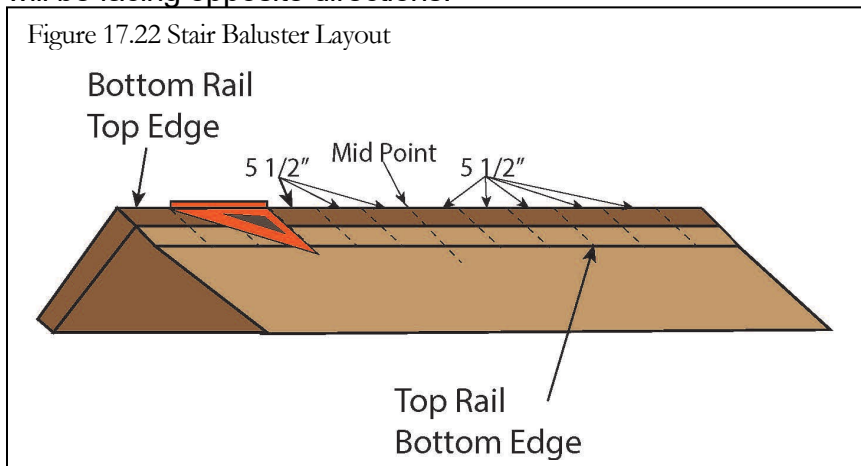
- If the posts are not plumb, the top rail may be a different length than the bottom.
- Clamp the top rail to the post at 36" above the nose of the steps.
- Mark the angle and where the rails intersect the posts.
- Cut the rail at the marks.



2. Paint the rails with two (2) coats of white exterior paint.

**Install Angled Baluster Connectors**

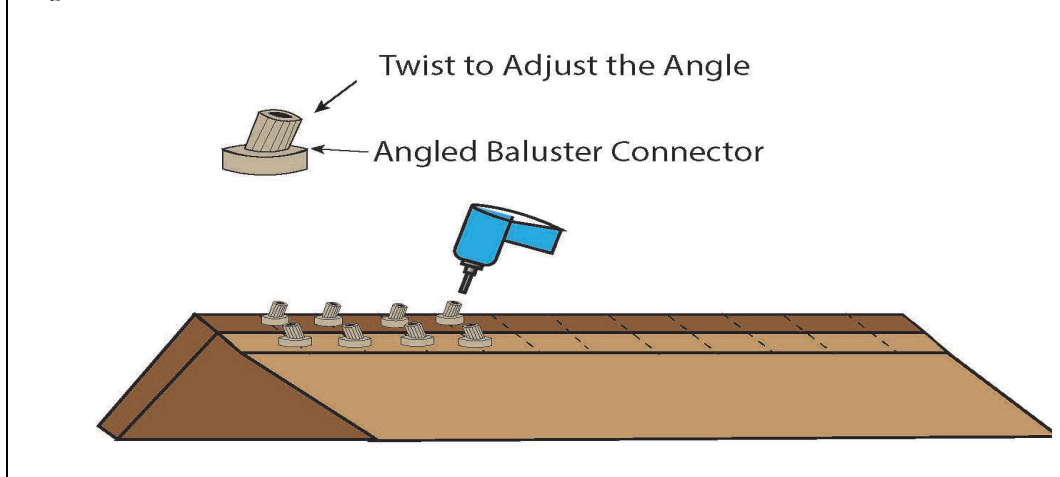
1. Clamp the top and bottom rails together with the 2x4 rails inverted. The top edge of the bottom rail and the bottom edge of the top rail should be facing up. (See figure 17.22).
2. Properly position the angled connectors on the rails. The top and bottom connectors will be facing opposite directions.



3. Mark the midpoint of the rails

4. Make marks 5 ½” on-center, working from the center out to the ends of the rails.
5. Drill pilot holes at each mark.
6. Twist the base of the connector to adjust to the correct stair angle.
7. Screw the connectors in place. To properly set angled connectors, begin screwing vertically until the screw bites into the wood. Reposition screw to the proper angle and tighten. Do not over-tighten, which can move the connector off center.

Figure 17.23 Stair Baluster Connectors



- Make sure connectors are properly aligned.

### Install Rail Connectors

- Similarly to the porch railings, attach a connector to each end of the rails with two (2) screws through the predrilled holes into the ends of the 2x4s.
- Install connectors on both ends of both the top and bottom rails.

### Install Bottom Rail

- The rails will be installed flush to the inside edge of the handrail post. (See figure 17.24).
1. Install the bottom rail with baluster and U-shaped connectors.
    - Place the bottom rail even with the stair noses.
    - The rail should fit snugly between the posts.
    - Align the bottom rail to the inside of the bottom post and approximately 1 ½” in from the edge of the top post.
    - Fasten with three (3) screws through the predrilled holes into the post.

### Install the Hand Rail Balusters

- Install the balusters similarly to the porch railings.
- Slide balusters over the bottom angled connector.
- Ensure the balusters are seated tightly on the connectors.

### Install Top Rail

- Carefully place the top rail over the balusters, making sure each baluster is seated properly on each connector.
- Inspect the finished railing for proper baluster spacing.

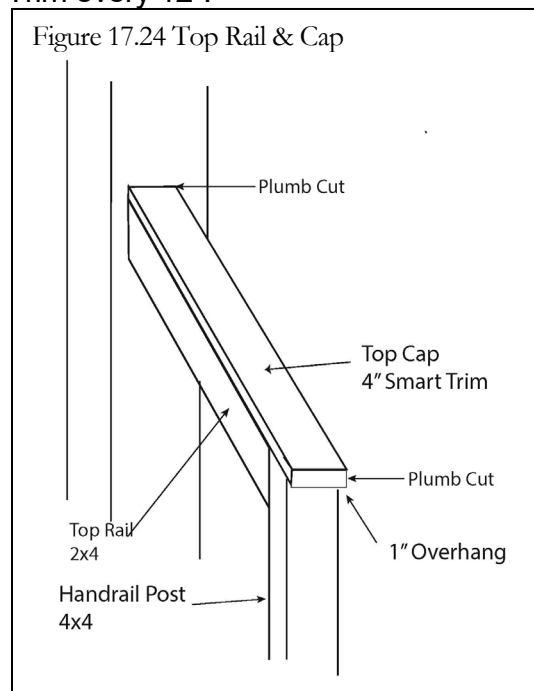
- Secure the top rail connectors to the posts with three (3) screws through the predrilled holes into the post.

### Cut the Bottom post

1. Draw a line on the inside face of the post following the top of the top rail.
2. Extend that line across the front of the post and up the outside face.
3. Cut off the bottom post at that line.

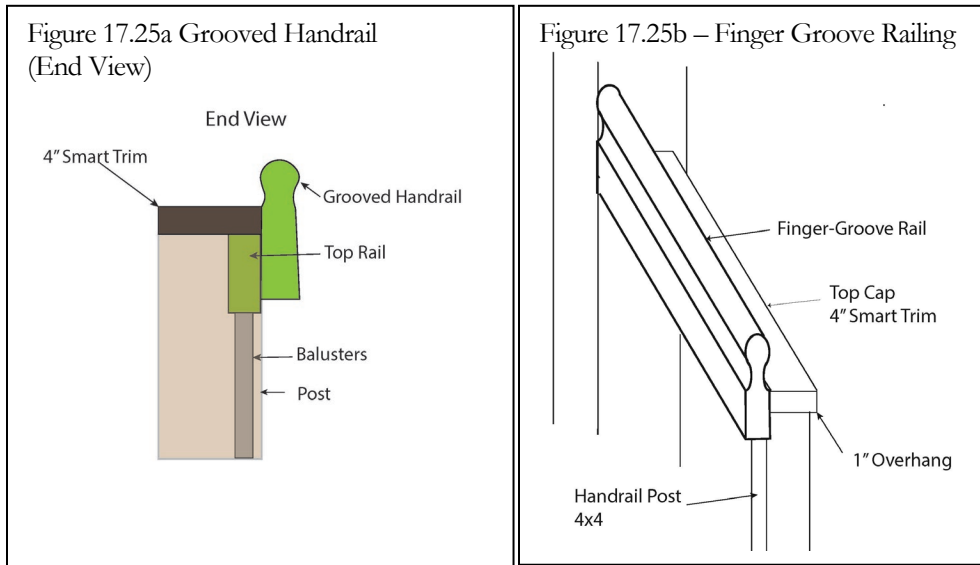
### Install the Top Cap

1. Cut a piece of 4" Smart Trim to fit over the top rail.
  - Hold the Smart Trim to the top post and mark the angle to fit snugly to the post.
  - Cut the top end of the Smart Trim at the angle marked.
  - Put the Top Cap in place.
  - Draw a line across the top of the Smart Trim 1" beyond the bottom edge of the bottom post.
  - Cut the bottom end of the Smart Trim at the same angle at the top.
2. Paint the Smart Trim with two (2) coats of white exterior paint.
3. Install the cap over the top rail with finishing nails; 1 nail in the center of the top of the Smart Trim every 12".



### Install the Groove Handrail

1. Cut a piece of 6" grooved handrail to fit along side of the top rail. The handrail should fit from the front of the porch post to the end of the top cap. (see figure 17.25a & 17.25b).
2. Plumb cut both ends.
3. Paint the handrail with two (2) coats of white exterior paint.
4. Screw the handrail to the top rail; 1 screw even 16" into the 2x4 top rail.
5. Putty and paint the screw holes.



Before continuing, stop and complete the **“Porch Trim Checklist”** found in Procore/Inspections.



### Summary

Porch Top Railing Height	37 1/4”
Clearance below Porch Bottom Railing	Less than 4”
Stair Handrail Height (Bottom)	0” above stair nosing
Grooved Handrail Height	38”