

Installation Guide

Standard Composite Railing Stair Kit

The following instructions will guide you through the installation of your new composite railing stair kit.

This installation guide is a recommendation for meeting most code requirements.

Always check your local building codes before starting a project and for determining the acceptable installation practices of your area.

Please read assembly instructions completely before beginning construction.

Always wear protective goggles and gloves when installing a composite railing system.

Remember to register your Limited Lifetime Warranty at the web site listed on the product box label.

Tools Required

- Protective eye glasses
- Tape measure
- Variable speed drill/screwdriver
- Rotary hammer or hammer drill and a masonry percussion bit recommended for concrete anchors purchased (for concrete installations)
- Drill bits $\frac{3}{32}$ " , $\frac{1}{4}$ " , $\frac{5}{16}$ " , $\frac{3}{8}$ " , $\frac{1}{2}$ " , $\frac{11}{16}$ "
- $\frac{3}{8}$ " x 3" Concrete Anchors/Fasteners (for concrete installations)
- Philips Driver and #2 Square Driver
- Wrench and $\frac{3}{4}$ " deep socket
- Level (min 24") and small torpedo level
- Miter Saw
- Snap Line
- Quick Clamp
- (Christy's[™]) PVC Glue

Installation Steps

Layout railing and position posts

The Composite Stair Rail Systems are designed for posts sets that are 62" between posts and/or a rail length of 72" between the posts. Stair systems are based off a standard 7-11 pitch. The composite rails and aluminum inserts can be trimmed to shorter lengths using a miter saw. When trimming of the rails is necessary, equal amounts should be cut from both ends of the rails in order to maintain equal spacing from the outer pickets and the adjacent posts.

Determine ahead of time where the posts will be anchored at the top and bottom of the stair system. It is best to do a sketch of the general layout in order to plan for post locations and any adjustments to rail lengths. Check measurements for accuracy prior to beginning the project. Remember that the outside dimensions of the composite posts are 4 $\frac{1}{4}$ " , unlike wood, which could be 3 $\frac{1}{2}$ " to 3 $\frac{7}{8}$ ". Also check the structural members below the deck and stair system to be sure there is no interference with the mounting brackets. If necessary, adjust the post locations. Stair post instructions are to be used for installing posts on the stairs, not horizontal landing areas. ***(If the top post of the stair system is mounted to the deck surface/substructure please refer to the composite horizontal post and railing instructions.)***

Install posts

Composite railing stair kits can be installed using the following methods:

- Post Tower (Concrete and Wooden Stair Systems)
- 4" x 4" Wood post sleeving

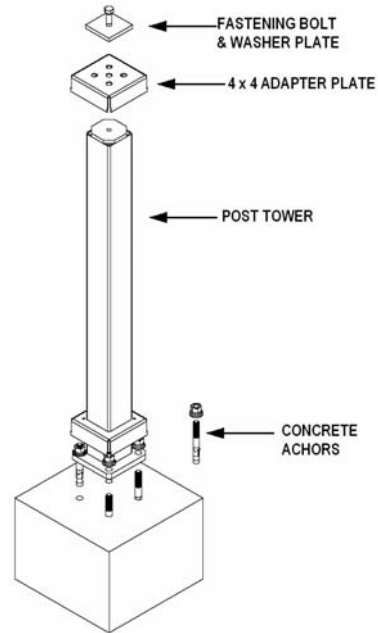
Post Tower (Concrete and Wooden Stair Systems)

The surface mount tower system is designed for 4 $\frac{1}{4}$ " composite posts in railing applications where the posts need to be mounted to a hard surface such as concrete, or this tower system can be used on wood stair systems when the substructure is modified as detailed at the end of this section. When installed as detailed below, composite posts using the post tower can meet post requirements for 42" high stair rail systems in residential applications.

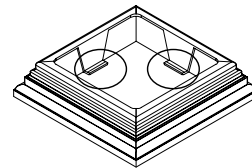
Install posts – *Continued*

Post Tower on Concrete Stairs

- 1) Lay out your post positions according to your stair rail design. Make sure to mark all post positions at least 5" from the edge of the concrete to reduce the chances of cracking the concrete when drilling holes for the concrete anchors.
- 2) Remove the tower assembly and bolt the top adapter plate to the top of the tower in the configuration shown in the assembly drawing.
- 3) Using an adjustable wrench or vice grips, bend the flanges of the top and bottom adapter plates in on all sides so that the post will slide over the tower without damaging the post. Don't bend the tabs in too far as the post should not be able to slide off the tower.
- 4) Place the tower in the designated area on the concrete surface and mark the location of the four bolt holes. Make sure tower is centered over your post location marks.
- 5) Remove the tower. Using a masonry bit, drill four holes deep enough and large enough to accommodate the fasteners that you have chosen. Install concrete anchors.
- 6) Place the tower back into the desired position. Make sure the tower is plumb using a level. If required, shim the tower base with stainless steel washers. Once level, secure to the concrete anchors.
- 7) Slide your posts over the tower and install the railing sections. *(Note: If using a post trim, cut the plastic tabs at the 90 degree bend and slide the trim piece over the post tower. Next slide the post over the tower and into the trim piece)*



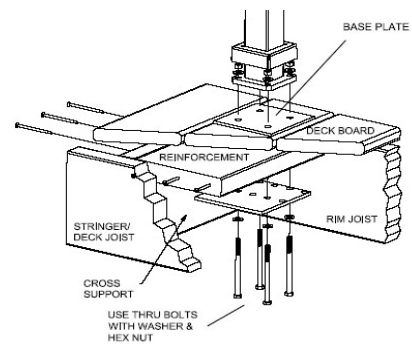
Post Tower on Concrete Stairs



Post Trim

Post Tower on Wood Stairs

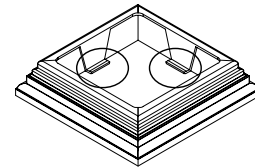
- 1) Lay out your post positions according to your stair rail design. Make sure to mark the post center line position at least 3 1/2" from the edge of the outside rim joist/stair stringers. The top plate must be a minimum of 1" from the stair stringer so the bolts will clear the rim joist/stair stringer on the underside.
- 2) Install a piece of 2" x 8" treated lumber between the stringers, under the stair boards where the tower is to be installed. Attach this reinforcement board to the stair stringers. (Three to four #10 x 4" screws should be used on each end.)
- 3) Thickness of the deck board and reinforcement board underneath should be a minimum of 2 1/2" actual thickness.
- 4) Take surface plate and use as a template. Mark the four corner holes for the four 5/16" x 4 1/2" threaded bolts.
- 5) Pre-Drill four 5/16" holes through the marked holes, drilling through the deck board and the reinforcement board.
- 6) Align the surface plate over the holes.



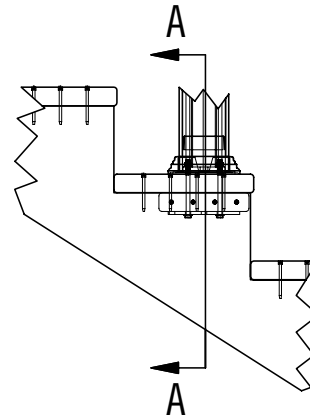
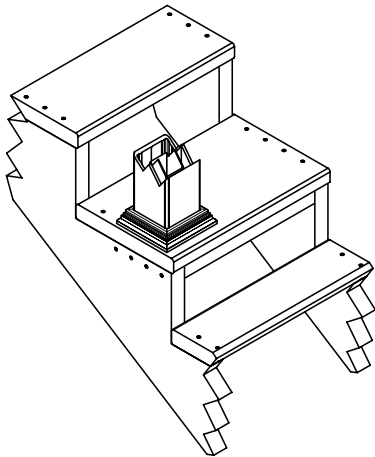
Post Tower on Wood Stairs

Install posts – *Continued*

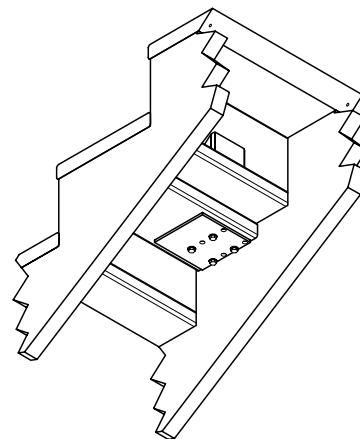
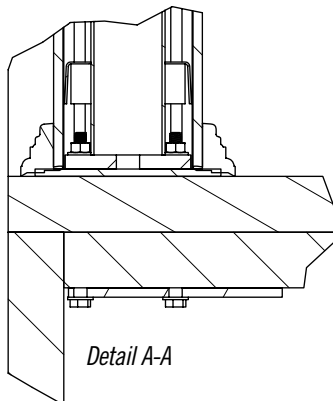
- 7) Take the second plate for underneath and drive the bolts up through the bottom plate, reinforcement board, stair tread deck board, surface plate, and tower mount.
- 8) Apply the washers and nuts. Tighten the bolts.
- 9) Bolt the top adapter plate to the top of the tower in the configuration shown in the assembly drawing.
- 10) Using an adjustable wrench or vice grips, bend the flanges of the top and bottom adapter plates in on all sides so that the post will slide over the tower without damaging the post. Don't bend the tabs in too far as the post should not be able to slide off the tower.
- 11) Slide your posts over the tower and install the railing sections. (*Note: If using a post trim, cut the plastic tabs at the 90 degree bend and slide the trim piece over the post tower. Next slide the post over the tower and into the trim piece.*)



Post Trim



Post Tower Mounts - Stairs

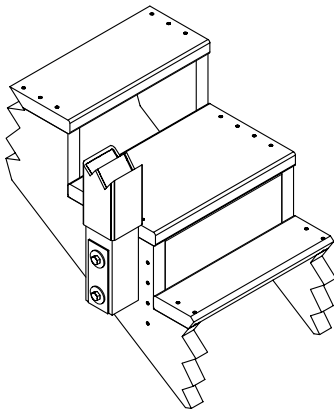


Install posts – Continued

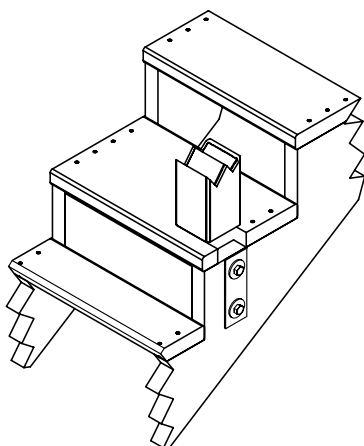
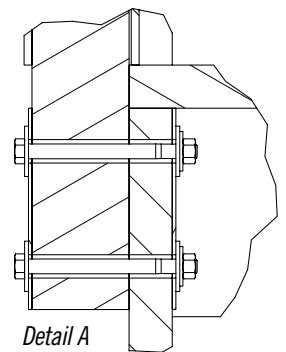
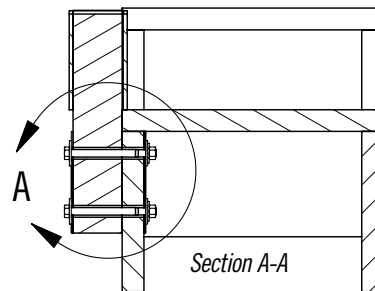
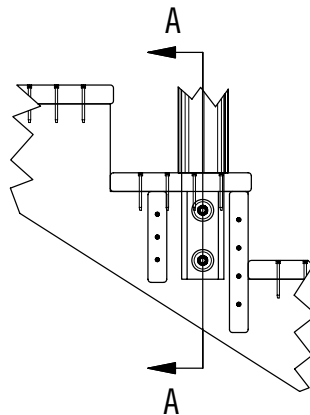
Sleeving a Wood 4" x 4" Post

The composite post can be used to sleeve 4" x 4" wooden posts. When installed as detailed below, composite posts used as a sleeve can meet post requirements for 42" high stair rail systems in residential applications. **Note: The instructions reflect how the wood posts were installed during testing to ensure the post attachment and substructure would meet the same load requirements as the railing system. Check your local code official for other acceptable attachment methods. (Please refer to the composite horizontal post and railing instruction when mounting to the deck surface/substructure.)**

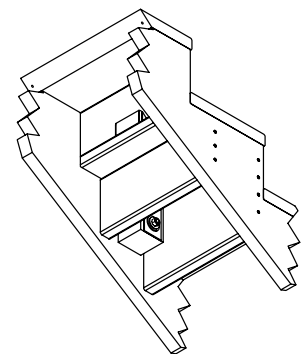
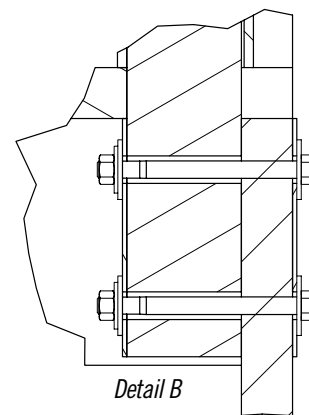
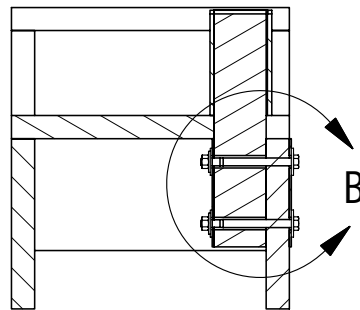
- 1) Lay out your post positions according to your stair rail design.
- 2) Temporarily attach the wood post in place.
- 3) Drill two 1/2" holes through the outside stair stringer, wood post, and galvanized steel plate. These holes should be approximately 4" apart. Enlarge the two holes on the galvanized steel plate to 11/16". The galvanized steel plate is 2 1/2" x 7" x 1/8". This galvanized steel plate will need to be purchased from your local metal shop or hardware store.
- 4) Insert two 1/2" x 6" carriage bolts and place a 5/8" washer under the head of each bolt. At the free end of the bolt use a 5/8" and 1/2" washer before the nut. Tighten all bolts. **For ACQ lumber, all bolts, washers, and nuts must be galvanized.** Please see the drawings below for assistance and always check with your local code officials for requirements in your area.



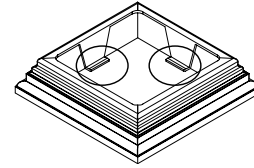
Post Mounting - Outside of Stair Stringer



Post Mounting - Inside of Stair Stringer



- 5) Slide your composite posts over the wood posts and install the stair rail sections.
 (Note: If using a post trim, cut the plastic tabs at the 90 degree bend. Slide the trim piece over the wood post, then slide the composite post over the wood post and into the trim piece.)

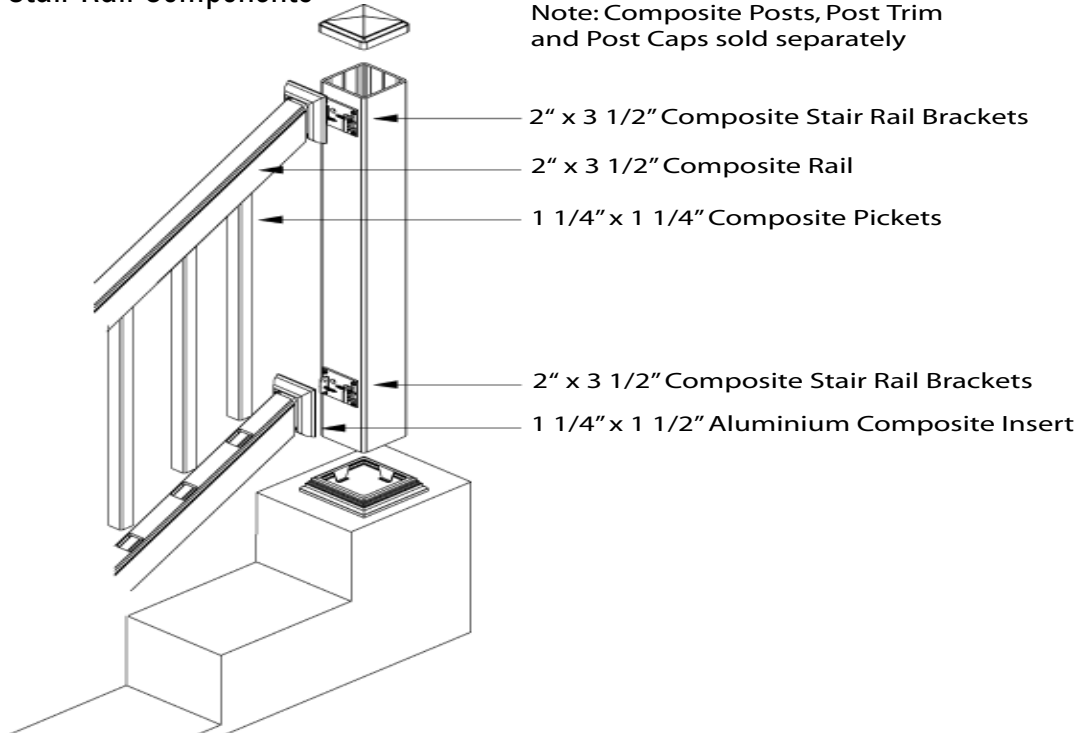


Post Trim

Standard Composite Stair Rail Installation

Always check your local building codes before starting a project. Please read assembly instructions completely before beginning construction. Always wear protective goggles and gloves when installing a composite railing system.

Standard Composite Stair Rail Components



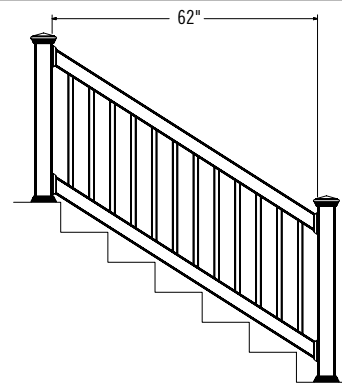
Note: Composite Posts, Post Trim and Post Caps sold separately

Railing Layout

Remember to check local building codes for stair rail height requirements in your area. The composite railing systems are designed to meet requirements for 36" and 42" high stair rail systems in residential applications. This is dependent on the stair post installation methods detailed in the preceding post installation instructions section.

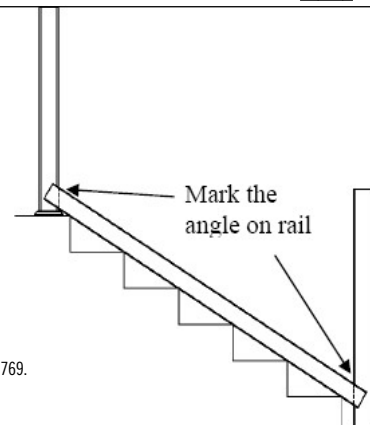
The 2" x 3 1/2" composite stair rail system is designed for posts set 62" apart and/or a rail length of 72" between posts. The stair systems are designed to accommodate angles up to 35°. Aluminum inserts are required in both the top and bottom rails in this stair rail system.

The 2" x 3 1/2" rails run in between the posts and are set in brackets.



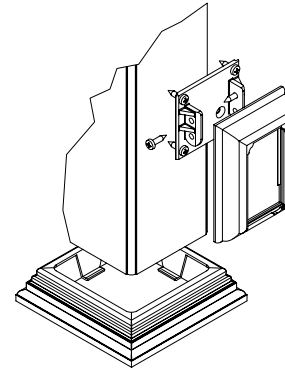
Railing Installation

- 1) **Determine Rail and Accessories Cut Angles.** To determine the cut angle at each end of your top and bottom rail, lay the rails on top of the stair steps with the rails centered between the posts. Mark the angle on each end of the rails, using the posts as a guide. **It is imperative the posts are square and level.** Make certain the bottom rail is oriented with the routed holes up and top rail is oriented with the routed holes facing down. **Important: Make sure that there is equal spacing between the picket holes and each end of rails/posts to maintain uniform picket spacing. Do not leave an open picket insert hole at the bracket.**

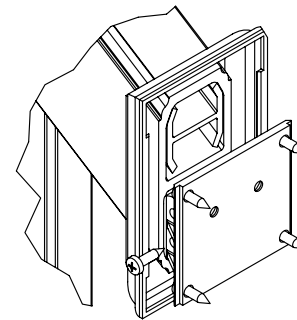


Railing Installation – *Continued*

- 2) **Cut Rails and Accessories.** On both rails subtract $\frac{1}{4}$ " from each mark on each end to allow for the thickness of the mounting bracket. For the bottom rail, insert the $\frac{1}{4}$ " x $1\frac{1}{2}$ " aluminum composite insert into the bottom cavity of the 2 " x $3\frac{1}{2}$ " rail and cut both the rail and insert at the marked angles on each end. For the top rail, insert the $\frac{1}{4}$ " x $1\frac{1}{2}$ " aluminum composite insert into the top cavity of the 2 " x $3\frac{1}{2}$ " rail and cut both the rail and insert at the marked angles on each end. For both top and bottom rails, the inserts should be the same length as the corresponding rails.
- 3) **Install Trim Base.** If using a trim piece, be sure you install the trim base section over the posts before you start attaching the rail sections to the posts.
- 4) **Install Bottom Rail.** Slide the notched trim covers from the 2 " x $3\frac{1}{2}$ " stair rail bracket kit onto the bottom rail. Make sure the notch is facing up on the lower location of the rail and facing down at the upper location of the rail. Ensure the $\frac{1}{4}$ " x $1\frac{1}{2}$ " aluminum insert is inserted into the bottom cavity of the 2 " x $3\frac{1}{2}$ " rail. Install the stair bracket base at both ends of the bottom rail. This is done by pre-drilling one $\frac{3}{32}$ " hole through the bottom side hole of the bracket on each side into the rail. Drive one of the screws provided through the hole of the bracket on each side into the rail. Make sure this screw goes into the metal insert. This will provide the mechanical attachment of the rail to the bracket. Lower bottom rail into position between posts. Make sure the holes for the pickets are facing up. Ensure the rail is at the correct angle and the bracket is centered on the post. You may need to place equal shims between two stair tread noses to elevate the bottom rail. Make sure you do not exceed code allowances for spacing in the "tread-rise triangle space". Pre-Drill $\frac{3}{32}$ " holes into the post through the bracket holes and attach bracket to the post using screws provided. Snap trim in place.
- 5) **Install Pickets & Top Rail.** Insert all the pickets into the holes in the bottom rail. Slide the notched trim covers from the 2 " x $3\frac{1}{2}$ " stair rail bracket kit onto the top rail. Make sure the notch is facing up on the lower location of the rail and facing down at the upper location of the rail. Ensure the $\frac{1}{4}$ " x $1\frac{1}{2}$ " aluminum insert is inserted into the top cavity of the 2 " x $3\frac{1}{2}$ " rail. Feed the rail onto the pickets. Ensure the rail is at the correct angle, the bracket is centered on the post, and the pickets are plumb. Install the stair bracket base at both ends of the top rail. This is done by pre-drilling one $\frac{3}{32}$ " hole through the top side hole of the bracket on each side into the rail. Drive one of the screws provided through the hole of the bracket on each side into the rail. Make sure this screw goes into the metal insert. This will provide the mechanical attachment of the rail to the bracket. Once the top of the rail has been seated onto all the pickets and the rail is at the correct angle, pre-drill $\frac{3}{32}$ " holes into the post through the bracket holes and attach bracket to the post using screws provided. Snap trim in place.
- 6) **Install Post Cap.** Place a 1 " x $\frac{1}{4}$ " wide bead of glue on inside of cap along the center of all four sides. Slide cap onto top of post. The glue will smear as the cap is slid on the post and a permanent bond will take effect after a few minutes. Be careful not to drip glue on the outside of a post or cap or it will cause a "scar".



Install Bottom Bracket



Install Top Rail and Bracket

Cleaning

Your composite railing system is manufactured using a blend of wood and plastic that binds the wood together and provides a coating around the individual wood fibers. An additional vinyl coat is applied to the surface to provide superior weather performance and color retention. For this reason and unlike traditional wood products, it is resistant to paints and penetrating stains. A mild detergent and water should be sufficient to keep the composite railing system looking new. For tough stains, Soft Scrub™ or baking soda works well. If stains or scuff marks appear, use a fiberglass cleaner/glaze or #0000 steel wool and Simple Green™.

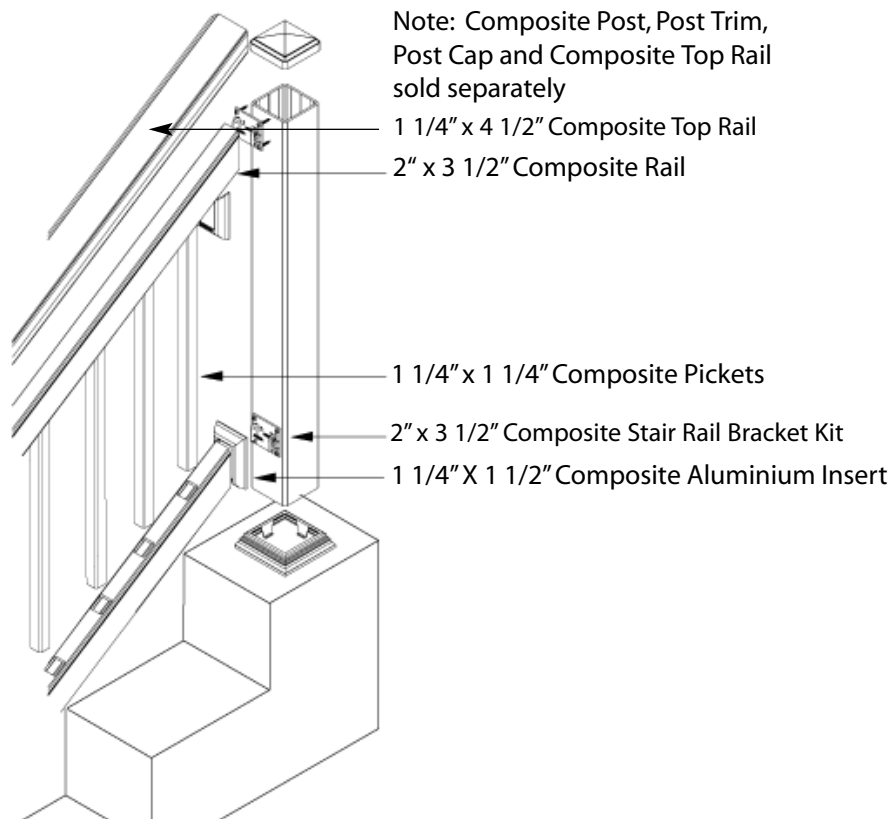
Important

It is the responsibility of the contractor to meet or exceed all code and safety requirements, and to obtain all required building permits. These instructions are only a guide, and may not address every circumstance. The deck and railing installer should determine and implement appropriate installation techniques for each situation. Manufacturer shall not be held liable for improper or unsafe installations.

Composite Top Rail Stair Rail Installation

Always check your local building codes before starting a project. Please read assembly instructions completely before beginning construction. Always wear protective goggles and gloves when installing a composite railing system.

Composite Top Rail Stair Rail Components

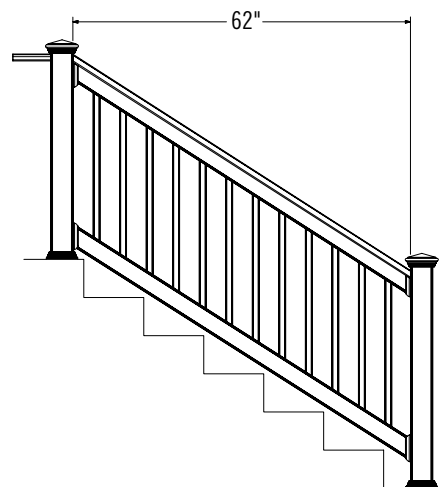


Railing Layout

Remember to check local building codes for stair rail height requirements in your area. The composite railing systems are designed to meet requirements for 36" and 42" high stair rail systems in residential applications. This is dependent on the stair post installation methods detailed in the preceding post installation instructions section.

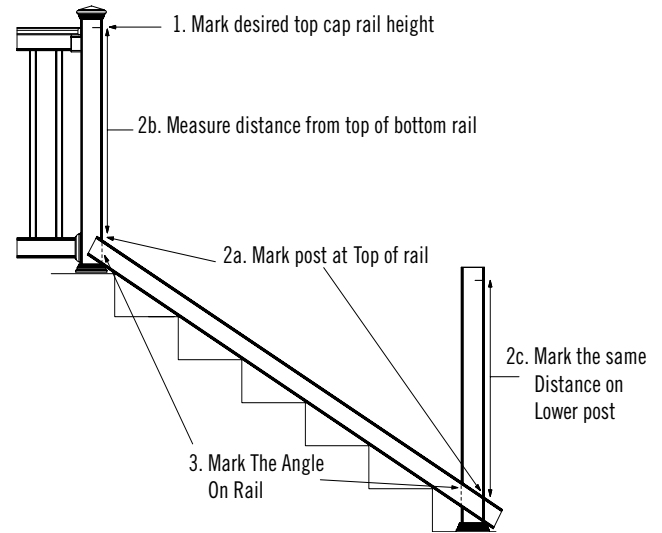
The 1 1/4" x 4 1/2" composite top rail stair rail system is designed for posts set 62" apart and/or a rail length of 72" between posts. The stair systems are designed to accommodate angles up to 35°. Aluminum inserts are required in both the top and bottom rails in this stair rail system.

The 2" x 3 1/2" rails run in between the posts and are set in brackets. The 1 1/4" x 4 1/2" top cap rail is installed on top of the 2 x 3 1/2" rail.

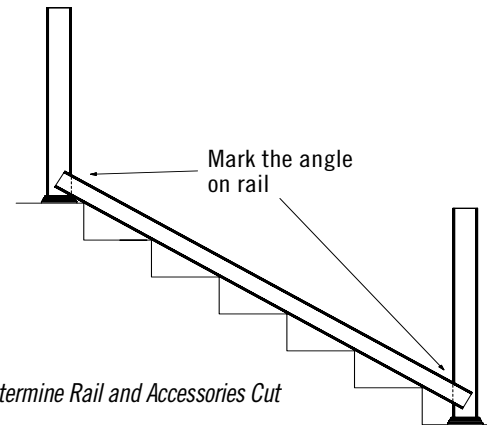


Railing Installation

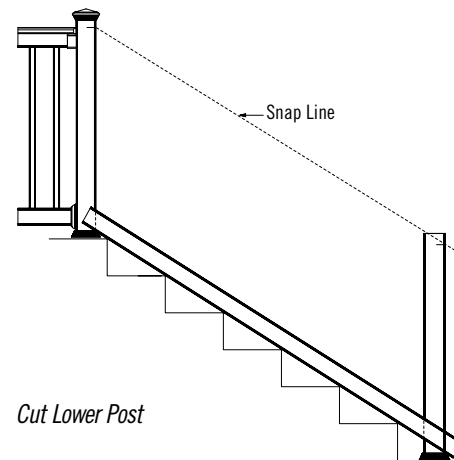
- 1) **Determine Top Cap Rail Height.** Determine the desired height of the top cap rail and mark the upper post.
- 2) **Determine Lower Post Height.** Lay a rail on the stair nose treads. If the post trim is already installed at the base, you may have to raise the rail to clear the trim by placing equal shims between two stair tread noses.
 - a. Mark the posts at the top of the rail in the locations shown above.
 - b. Measure the distance from the top of the bottom rail to the mark you created in Step 1
 - c. Translate the distance you just measured to the lower post.
- 3) **Determine Rail and Accessories Cut Angles.** To determine the cut angle at each end of your 2" x 3½" top and bottom rail, lay the rails on top of the stair steps with the rails centered between the posts. Mark the angle on each end of the rails, using the posts as a guide. *It is imperative the posts are square and level.* Make certain the bottom rail is oriented with the routed holes up and top rail is oriented with the routed holes facing down. Important: *Make sure that there is equal spacing between the picket holes and each end of rails/posts to maintain uniform picket spacing. Do not leave an open picket insert hole at the bracket.*
- 4) **Cut Rails and Accessories.** On both 2" x 3½" rails subtract ¼" from each mark on each end to allow for the thickness of the mounting bracket. For the bottom rail, insert the 1¼" x 1½" aluminum composite insert into the bottom cavity of the 2" x 3½" rail and cut both the rail and insert at the marked angles on each end. For the top rail, insert the 1¼" x 1½" aluminum composite insert into the top cavity of the 2" x 3½" rail and cut both the rail and insert at the marked angles on each end. For both top and bottom rails, the inserts should be the same length as the corresponding rails.
- 5) **Cut Lower Post.** Take a snap line and place one end on the mark created in Step 1. and the other end on the mark created in Step 2c.
 - a. **Top-of-Post Installation:** Translate the snap line mark perpendicularly by 1¼" to accommodate for the cap rail and determine the post cut line. Cut post using this line.
 - b. **Butted to Post Installation:** Mark the cut line as shown. This cut line will allow room for a post cap. Cut post using this line
- 6) **Cut Top Cap Rail Angle.**
 - a. **Top-of-Post Installation:** Lay the 1¼" x 4½" composite top rail on top of the stair steps with the channel facing down and mark the angle at the upper post. Cut the rail at this mark. Make sure the piece is long enough to extend past the lower post.
 - b. **Butted-to-Post Installation:** Lay the 1¼" x 4½" composite top rail on top of the stair steps with the channel facing down and mark the angles at both posts. Cut the rail at these marks.
- 7) **Install Trim Base.** If using a trim piece, be sure you install the trim base section over the posts before you start attaching the rail sections to the posts.



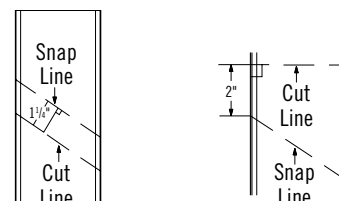
Determine Top Cap Rail Height



Determine Rail and Accessories Cut



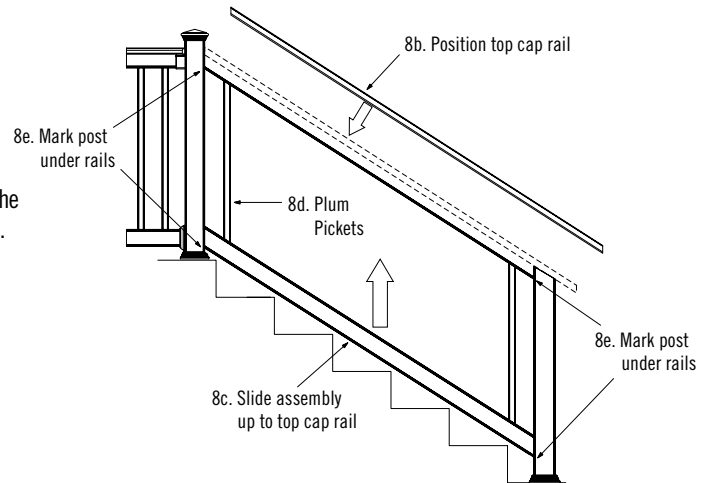
Cut Lower Post



Railing Installation – Continued

8) Determine Top and Bottom Bracket Location.

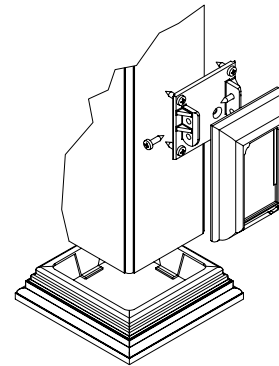
- Insert one picket in the far left hole and another picket in the far right hole of the bottom rail. Now assemble the top rail and position the partial section in place.
- Lay the top cap rail in place so that the top cap rail is at the desired position against the posts. The drawing below shows a typical Top-of-Post Assembly.
- Slide the partially assembled section up so that it is snug under the cap rail. You may need to place equal shims between two stair tread noses to elevate bottom rail to keep the assembly snug. Make sure you do not exceed code allowances for spacing in the “tread-rise triangle space”.
- Plumb the two pickets to ensure that the rails are at the correct angles.
- Mark the posts under the top and bottom rails.



Determine Bracket Locations

- Install Top and Bottom Brackets.** Remove the top cap rail and partial assembly and set aside. Line the bottom of the 2" x 3½" composite stair rail bracket with the line that was marked in the previous step. Center the bracket on the post and pre-drill the post through the four outside holes with a 3/32" bit. Secure the bracket in place using the screws provided. Repeat this step with three remaining brackets.

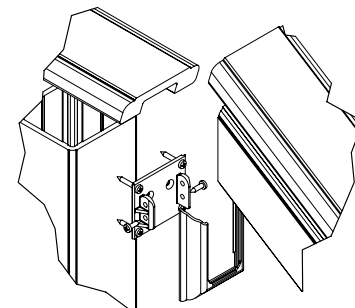
- Install Bottom Rail.** Slide the notched trim covers from the 2" x 3½" stair rail bracket kit onto the bottom rail. Make sure the notch is facing up on the lower location of the rail and facing down at the upper location of the rail. Ensure the 1¼" x 1½" aluminum insert is inserted into the bottom cavity of the 2" x 3½" rail. Place the rail on the stair tread noses or the shims you used to mark the bottom rail location. Make sure you do not exceed code allowances for spacing in the “tread-rise triangle space”. It is important that the bottom rail is in the same position as in Step 8. Install the rail to the stair bracket base at both ends of the bottom rail. This is done by pre-drilling one 3/32" hole through the bottom side hole of the bracket on each side into the rail. Drive one of the screws provided through the hole of the bracket on each side into the rail. Make sure this screw goes into the metal insert. This will provide the mechanical attachment of the rail to the bracket. Make sure the holes for the pickets are facing up. Ensure the rail is at the correct angle and the bracket is centered on the post. Snap trim in place.



Install Bottom Bracket

11) Install Top Rails.

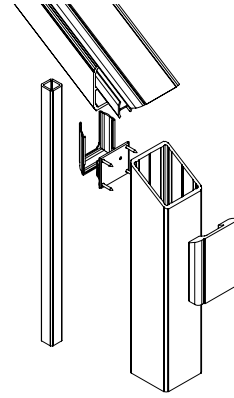
- Ensure the 1¼" x 1½" aluminum insert is inserted into the top cavity of the 2" x 3½" rail.
- Put all the pickets into the routed holes in the bottom rail. Feed the pickets one-by-one into the routed holes in the bottom of the top rail until both ends of the top rail are fully seated onto the pickets.
- Apply a 1/8" bead of Christy's glue down the center of the inside channel of the 1¼" x 4½" composite top rail. Place in the correct position over the top 2" x 3½" rail and slide rail back and forth slightly to distribute the glue. Set the rail in to the correct position and clamp top rail to 2" x 3½" rail with quick-clamps in two places for at least fifteen minutes to allow glue to set up.
- The glued top rails to desired angle and position and verify that the top rail is parallel to the bottom rail. Ensure the rail is at the correct angle, the bracket is centered on the post, and the pickets are plumb. Install the rail to the stair bracket base at both ends of the top rail. This is done by pre-drilling one 3/32" hole through the top side hole of the bracket on each side into the rail. Drive one of the screws provided through the hole of the bracket on each side into the rail. Make sure this screw goes into the metal insert. This will provide the mechanical attachment of the rail to the bracket.



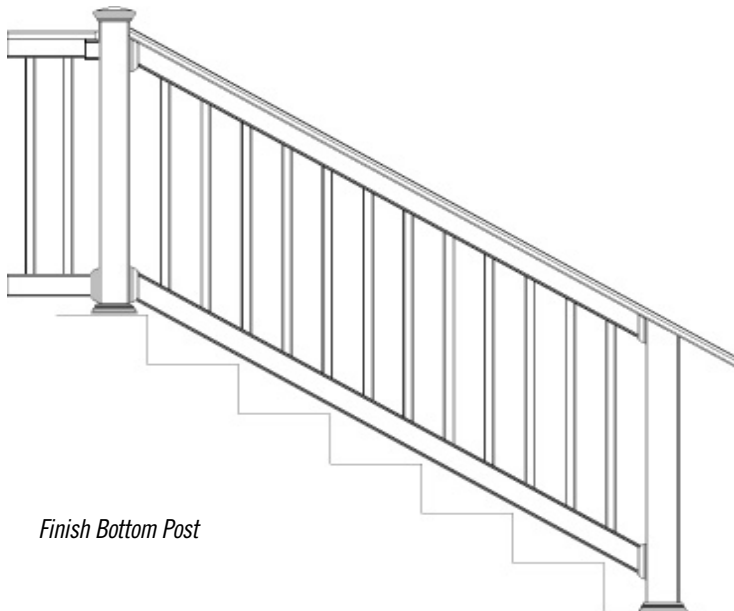
Install Top Rail and Bracket

Railing Installation – *Continued*

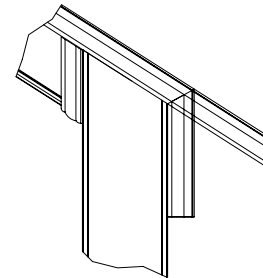
- 12) **Modify Stair Bracket Trim Covers.** Two 2" x 3½" stair bracket trim covers need to be modified to fit under the top and bottom rails. The trim covers should be cut equal to the stair angles for both ends of the top rail. The trim should be snug up to the top cap rail. Once trims are modified to the desired angle, apply glue to the back tabs and slide into place. You may need to apply tape to allow the glue to set up.
- 13) **Finish Bottom Post.** (Top-of-Post Installation only.) To finish off the top cap rail at the bottom post you can leave the rail open and paint the exposed end with matching touch-up paint or you can miter the end with a short piece of the top rail. The short piece can be fastened with glue and/or a tapered head #10 screw. Remember to pre-drill to prevent splitting.
- 14) **Install Post Cap.** (Butted-to-Post Installation only.) Place a 1" x ¼" wide bead of glue on inside of cap along the center of all four sides. Slide cap onto top of post. The glue will smear as the cap is slid on the post and a permanent bond will take effect after a few minutes. Be careful not to drip glue on the outside of a post or cap or it will cause a "scar".



Modify Stair Bracket Trim Covers



Finish Bottom Post



Finish Bottom Post

Cleaning

Your composite railing system is manufactured using a blend of wood and plastic that binds the wood together and provides a coating around the individual wood fibers. An additional vinyl coat is applied to the surface to provide superior weather performance and color retention. For this reason and unlike traditional wood products, it is resistant to paints and penetrating stains. A mild detergent and water should be sufficient to keep the composite railing system looking new. For tough stains, Soft Scrub™ or baking soda works well. If stains or scuff marks appear, use a fiberglass cleaner/glaze or #0000 steel wool and Simple Green™.

Important

It is the responsibility of the contractor to meet or exceed all code and safety requirements, and to obtain all required building permits. These instructions are only a guide, and may not address every circumstance. The deck and railing installer should determine and implement appropriate installation techniques for each situation. Manufacturer shall not be held liable for improper or unsafe installations.