

Installation Guide

Vinyl Rail T-Rail Stair Kit

The following instructions will guide you through the installation of your new vinyl 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 vinyl 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 $\frac{3}{32}$ " , $\frac{1}{4}$ " , $\frac{5}{16}$ " , $\frac{3}{8}$ " , $\frac{1}{2}$ " $\frac{11}{16}$ " , $\frac{1}{8}$ "
- $\frac{3}{8}$ " 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 Vinyl 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 vinyl 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 vinyl posts are 4", unlike wood, which could be $3\frac{1}{2}$ " to $3\frac{5}{8}$ ". 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 vinyl horizontal post and railing instructions.)***

Install posts

Vinyl railing posts can be installed using the following methods:

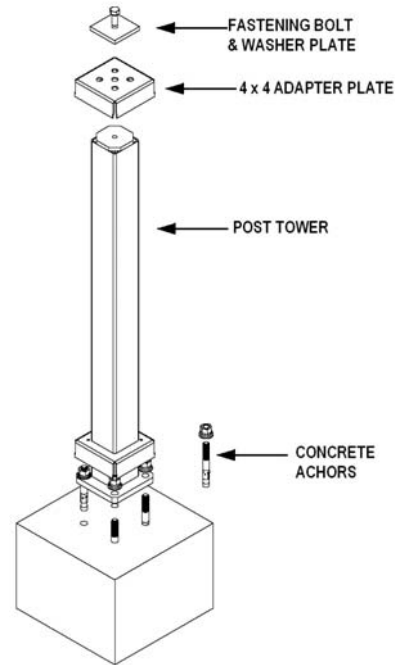
Post Tower (Concrete and Wooden Stair Systems)

The surface mount tower system is designed for 4" x 4" vinyl 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, vinyl posts using the post tower can meet post requirements for 42" high stair rail systems in 1 and 2 family applications.

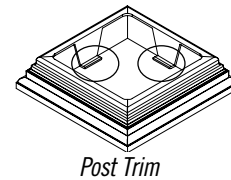
Install posts – *Continued*

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.)*



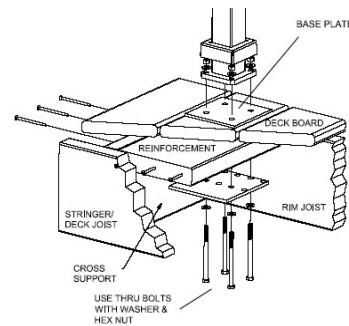
Post Tower on Concrete Stairs



Post Trim

Post Tower on Wood Stairs

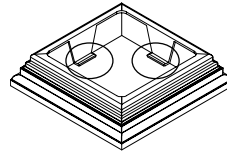
- 1) Lay out your post positions according to your stair rail design. Make sure to mark the post center line position at least 3 1/2" from the edge of the outside rim joist/stair stringers. The top plate must be a minimum of 1" from the stair stringer so the bolts will clear the rim joist/stair stringer 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.



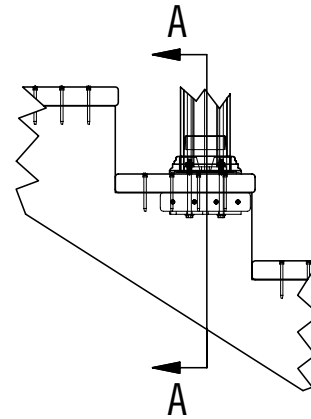
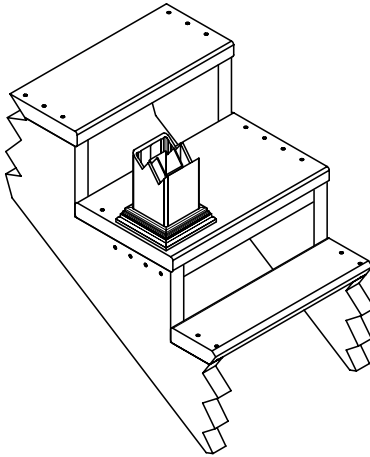
Post Tower on Wood Stairs

Install posts – Continued

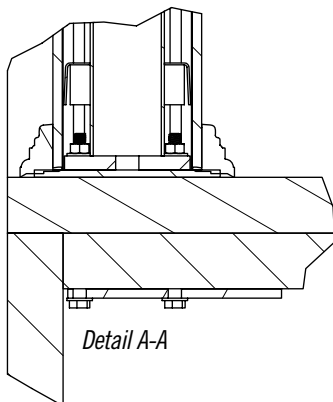
- 7) Take the second plate for underneath and drive the bolts up through the bottom plate, reinforcement board, stair tread deck board, surface plate, and tower mount.
- 8) Apply the washers and nuts. Tighten the bolts.
- 9) Bolt the top adapter plate to the top of the tower in the configuration shown 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.)*



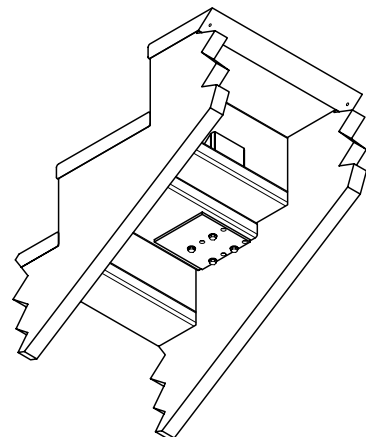
Post Trim



Post Tower Mounts - Stairs



Detail A-A

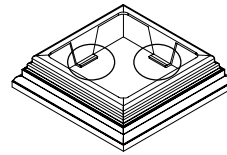


Install posts – Continued

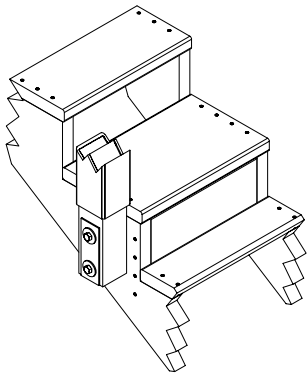
Sleeving a Wood 4" x 4" Post

The vinyl post can be used to sleeve 4" x 4" wooden posts. When installed as detailed below, vinyl 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 with your local code official for other acceptable attachment methods. (Please refer to the vinyl horizontal post and railing instruction when mounting to the deck surface/substructure.)**

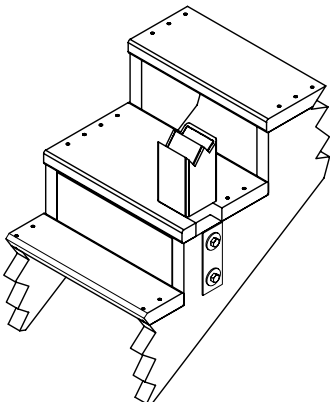
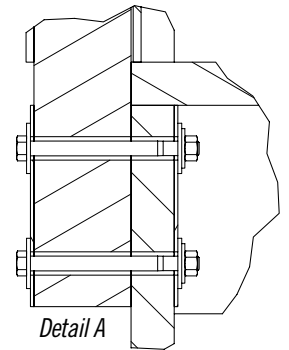
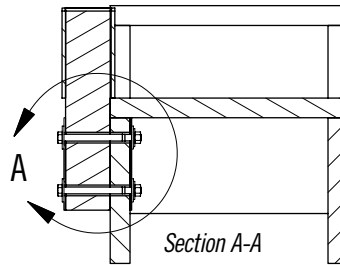
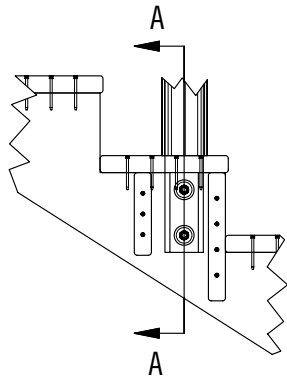
- 1) Lay out your post positions according to your stair rail design.
- 2) Temporarily attach the wood post in place.
- 3) Drill two 1/2" holes through the outside stair stringer, wood post, and galvanized steel plate. These holes should be approximately 4" apart. Enlarge the two holes on the galvanized steel plate to 1/16". 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.
- 5) Slide your vinyl 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 vinyl post over the wood post and into the trim piece.)*



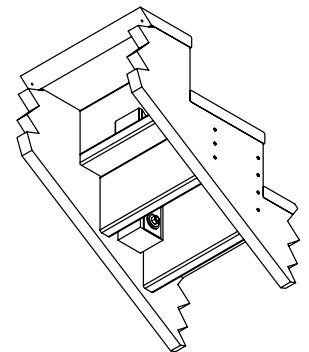
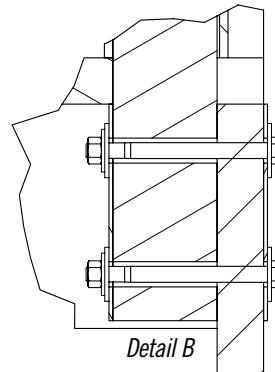
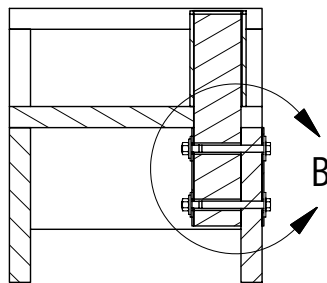
Post Trim



Post Mounting - Outside of Stair Stringer



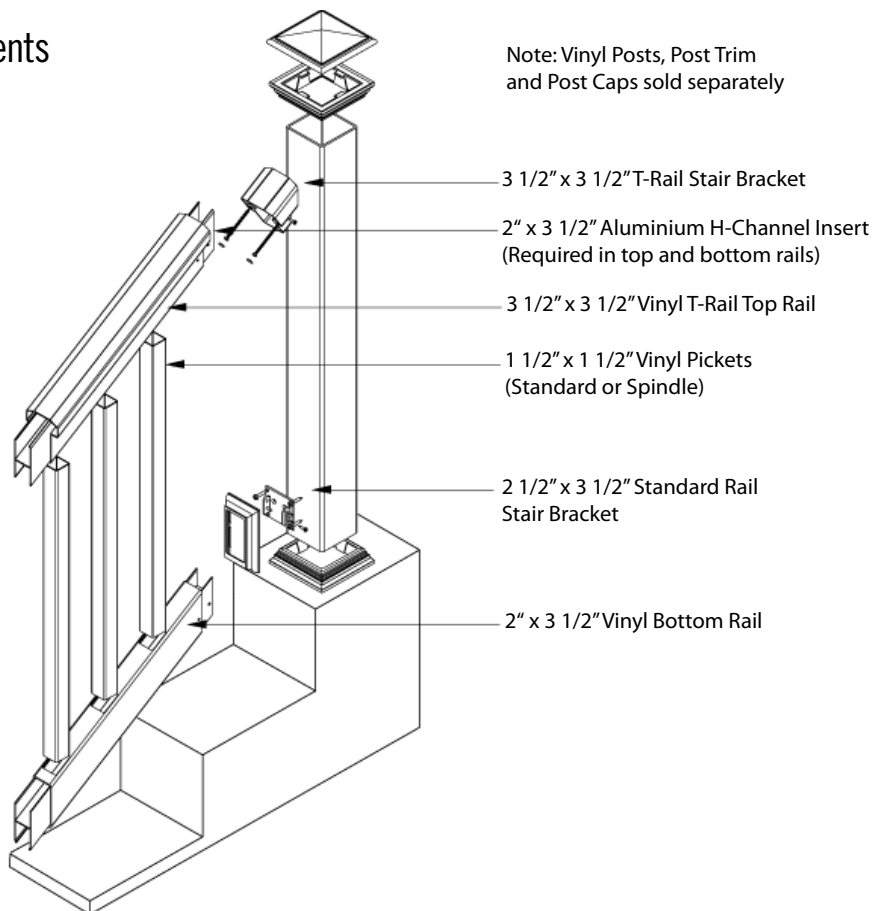
Post Mounting - Inside of Stair Stringer



Vinyl Rail T-Rail Stair Kit 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 vinyl railing system.

Vinyl Rail T-Rail Stair Kit Components



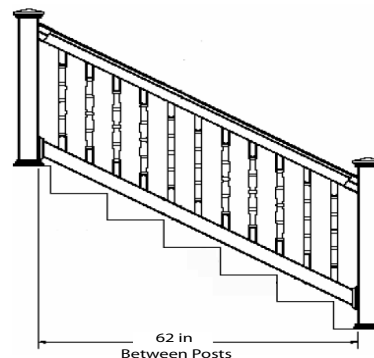
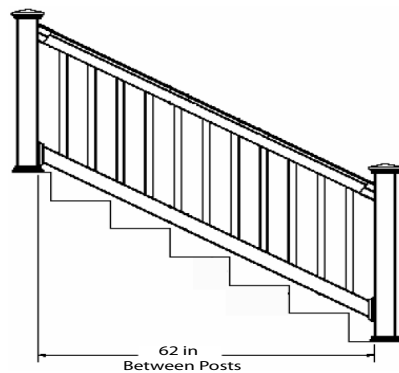
Railing Layout

Remember to check local building codes for rail height requirements in your area. The vinyl 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" and 3 1/2" x 3 1/2" rails run in between the posts and are installed with brackets. The Stair Rail Systems are designed for posts set 62" apart and/or a rail length of 72" between posts. Kits are available with 1 1/2" x 1 1/2" pickets or spindles.

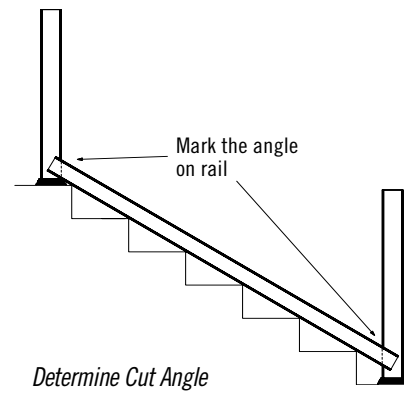
If the stair rail section to be installed is less than the standard rail kit length, you must cut equal amounts from each end of the two rails to make sure the gap between the first picket or spindle and the top post and the last picket or spindle and the bottom post are equal.

The two rails are pre-routed for the pickets/spindles and stairs based on a 32° stair angle. For stair installations with slopes greater than 32°, you will need to elongate the routed holes 1/16" for every 2° increase in slope. For example, the holes for a 36° stair rail slope would need to be elongated 1/8". A metal file can be used to elongate the routed holes in the rail. The elongation should always be made on the side of the hole facing the bottom of the stairs.



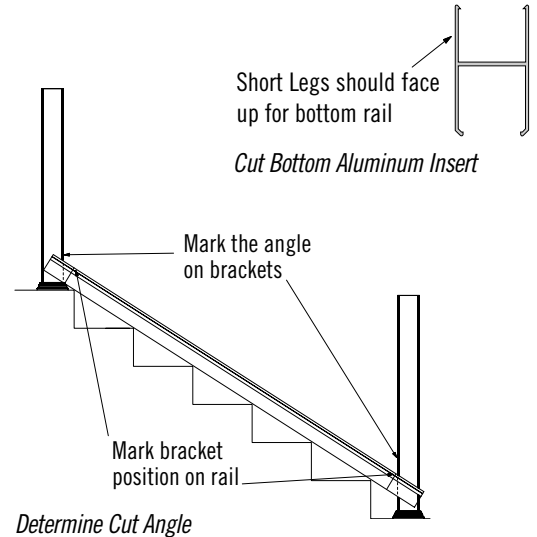
Rail Installation – Continued

- 1) **Determine Cut Angle and Trim Bottom Rail to Length.** To determine the cut angle at each end of bottom rail, remove the aluminum insert and lay the rail on top of the stair steps. Make certain the bottom rail is oriented with the routed holes facing up and centered between the posts. The space between the picket hole and post on both ends should be equal. It is imperative the posts are square and level. Next, mark the angle on each end of the rail using the post and a square as a guide. Subtract $\frac{3}{16}$ " from each mark on each end to allow for the thickness of the mounting bracket and cut the rails at each end.
- 2) **Cut Bottom Aluminum Insert to Length.** The ends of the bottom aluminum insert also need to be cut to length to match the angle of the stairs. Slide the aluminum insert into the rail previously cut. Ensure the bottom rail and insert are in the right orientation (routed holes and the insert's short legs are facing up). Next mark the angle on each end of the insert using the ends of the rail as a guide. Cut the ends of the insert as marked. Note: The insert and rail can be cut at the same time but make sure the insert is facing the proper direction for installation.
- 3) **Determine Cut Angle for the Top Rail, Insert, and Brackets.** Remove the aluminum insert from the top rail and slide on a T-Rail Stair Bracket over each end such that the counter-bored holes are toward the picket holes in rail. Lay the rail on top of the stairs with the routed holes facing downward. Center the rail between the posts making sure the space between the picket hole and post on both ends are equal. Adjust the bracket position such that it does not cover any portion of the picket/spindle hole. Mark the angle on each rail bracket using the post as a guide. Also mark the rail against the bracket to record the bracket location.
- 4) **Cut Top Rail, Insert, and Brackets to Length.** Re-insert the aluminum insert making sure the insert orientation is correct (short legs down). Make sure the T-Rail Stair Brackets are lined up to the marks you made on the rail in the previous step. Cut the rail, bracket, and insert simultaneously at each end using the angled mark you made on the bracket. The insert and rail should be the same length.
- 5) **Install Post Trim.** Be sure you install the post trim over the posts before you start attaching the stair rail sections to the posts. (Note: You may need to remove the four tabs on the bottom of the trim to allow a snug fit against the post and can notch the post trim if necessary.)
- 6) **Install Bottom Brackets.** Determine placement of bottom rail making sure the rail is at the same angle as the stairs mark the posts under the rail with a pencil. **Check with local building codes with for proper spacing between the bottom rail and stair tread.** This will be the location of the bottom of the bracket. Center the brackets and pre-drill the post through the four outside holes with a $\frac{1}{8}$ " drill bit and attach bracket to the post using four of the #12 x $1\frac{1}{4}$ " screws provided for each bracket.



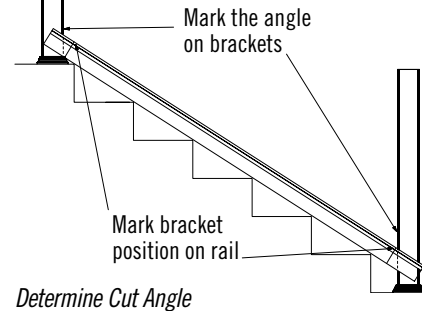
Mark the angle on rail

Determine Cut Angle



Short Legs should face up for bottom rail

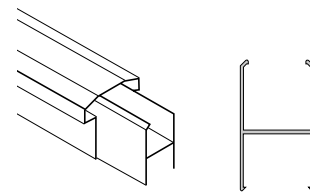
Cut Bottom Aluminum Insert



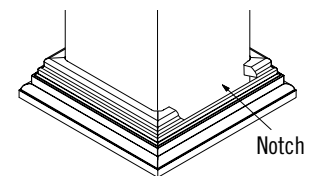
Mark the angle on brackets

Mark bracket position on rail

Determine Cut Angle

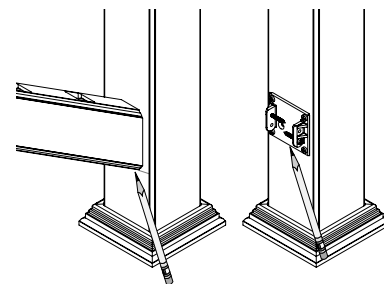


Cut Top Rail and Insert



Notch

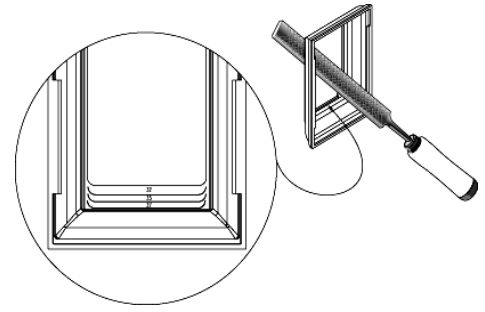
Install Post Trim



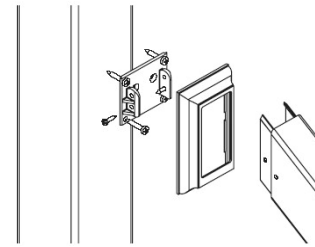
Install Bottom Brackets

Rail Installation – Continued

- 7) **Adjust Bracket Trims (if required).** The bracket trims are designed for a standard 7/11 stair tread or 32°. If your stair system is steeper you will need to cut or file out the trim opening using the marked lines shown on the inside of the trim.
- 8) **Install Bottom Rail.** Slide the trim pieces onto the bottom rail such that the finished trim faces towards the center of the rail. After making certain that the aluminum insert is positioned with the shorter legs facing the holes, lower bottom rail into position between the brackets. After making sure the rail is at the parallel angle to the stairs, drive two (one on each side) #8 x 3/4" screws provided through the bracket holes and into the vinyl rail and insert. (Pre-drill with a 3/32" drill) This will provide the mechanical attachment of the rail to the bracket. Snap trim in place. Repeat for the other bracket.



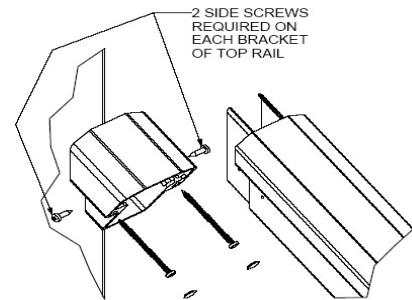
- 9) **Install Top Rail.** Insert all the pickets or spindles into the bottom rail. Make sure the previously cut brackets are slid on each end of the rail. Starting at the bottom end of the rail begin feeding the rail with aluminum insert down onto the pickets or spindles. Once the top of the rail has been seated onto all the pickets and the top and bottom rails are parallel, verify that your pickets are plumb and square. Mark and pre-drill 3/32" holes through the holes of the brackets and into the posts. Secure brackets and rail to the posts using the 4" screws provided. Pre-drill two 3/32" holes (one on each side) through the side of the bracket, rail, and insert just under the "T" flange of the bracket approximately 5/8" from the end of the rail or post. Install the # 8 x 3/4" screws into the pre-drilled holes.



Install Bottom Rail

(Note: depending on the length of your drill bit, you may need to remove the top rail before pre-drilling the previously marked bracket hole locations on the post. When doing this, pre-drill the holes at the estimated angle of the rail. You may also want to add a screw under the lip of the top rail through the bracket, rail, and insert to provide additional mechanical attachment of the rail to the bracket.)

- 10) **Install Post Cap.** Place a 1" x 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 Top Rail

Cleaning

If cleaning becomes necessary, use a mild detergent or household cleaner. 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.