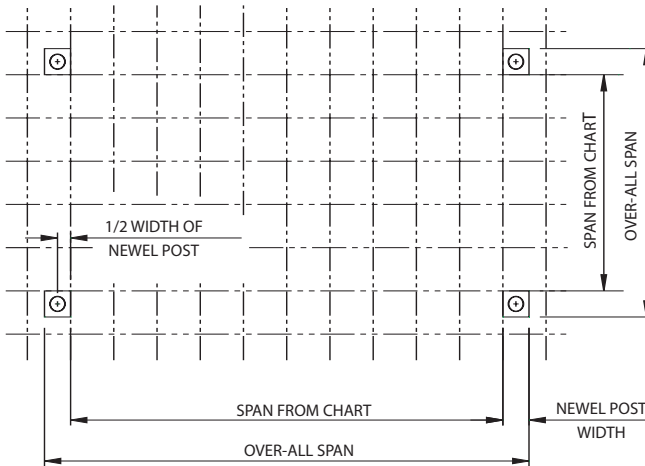


Balustrade Systems Installation

Step 1

Place newel posts in the proper locations based on span charts provided. Mark the inside edge of the post and remove. Calculate $\frac{1}{2}$ the width of the newel post and mark from the inside edge line of the newel post position. This marks the spot where the newel post hardware needs to be installed. **DO NOT SECURE NEWEL POST BEFORE INSTALLING ANGLE BRACKETS TO NEWEL POST AS SHOWN IN STEP 2.**



Step 2

Determine the placement of your top rail and bottom rail.

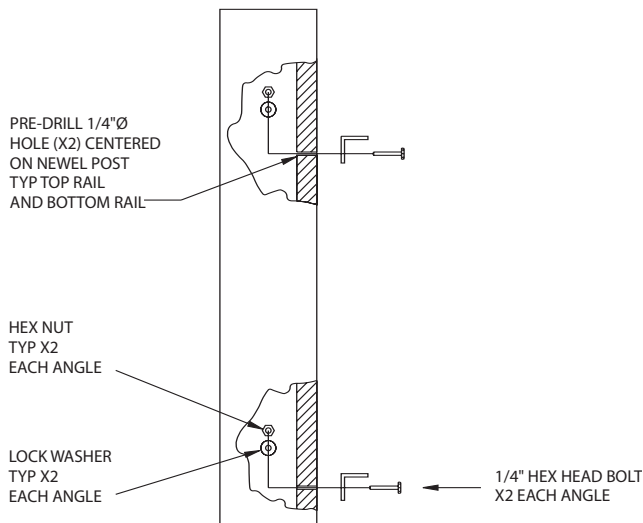
The information you will need to do this is:

- Height of baluster (not including pipe)
- Height of bottom rail
- Distance of bottom rail from substrate.

Locate the following components from the hardware kit:

- Aluminum angles (4 per newel post)
- $\frac{1}{4}$ " Hex Head Bolt (x8) or $\frac{1}{4}$ " threaded rod (x4)
- $\frac{1}{4}$ " Hex Head Nut (x8)
- Lock washers (x8)

Mark the position of the aluminum angle on the face of the newel post. Keep in mind that the angles mount to the underside of the rails. Drill (4) four $\frac{1}{4}$ " dia. holes in the locations where the brackets are to be mounted. Be sure the holes pass through the uPVC pipe of the newel post. Secure the brackets to the newel post as indicated in the diagram with bolts, washers and nuts provided in the hardware kit.



Step 3

It is important that the rails are assembled with the proper surfaces facing up and down according to the product drawings. The number of balusters required for each span of balustrade is determined using The National Building Codes 4" ball rule.

Check with product drawings to determine the "on-center" (o/c) spacing for the balusters you have chosen.

Multiply the number of balusters minus one (1) by the on center spacing to determine the total space between the newel posts occupied by balusters.

- ie. Baluster XXXX
On Center Spacing = 6"
Span Chart for 10 feet (120") between newel posts; 20 balusters are required
Therefore $(20-1) \times 6" = 114"$

Center the span you arrived at above (114") on the bottom rail and make a mark at each end of the span. Make a mark at each on-center increment. You should have the same number of marks as balusters. If not, re-calculate. Be sure the distance between the end of the rail and the first mark is less than the on-center dimension. This is to ensure that the 4" ball rule applies to the end baluster.

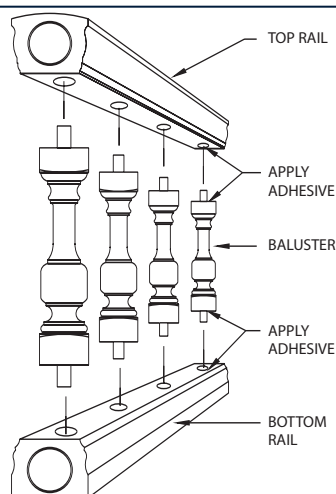
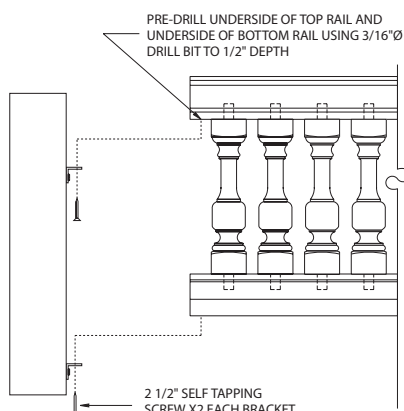
- ie. $120" (\text{span}) - 114" (\text{balusters}) = 6 \div 2 = 3"$
Therefore your first baluster is centered 3" from the newel post.

Check the product drawing for the diameter of the pipe on the end of the balusters. Bore out a hole of the corresponding diameter to a depth of $1\frac{1}{2}"$. Remove any excess product from the hole.

Repeat this procedure for the underside of the top rail.

Step 4

Use polyurethane adhesive (PL Premium™) or an approved equal. Adhesive must be applied to all contact surfaces. Apply a generous bead of adhesive such that it will spread across the entire contact surface. Place balusters into holes on bottom rail and ensure they are turned straight. Lay the top rail over the balusters, line up the balusters to the holes and drop into place. Use a rubber mallet to tap the top rail down to ensure a tight fit. Toe-nailing balusters to rails is also acceptable. Patch with an interior/exterior non-shrinking spackle or bondo. It is recommended that the rail-baluster assembly be clamped together during the adhesive drying time. Cargo load straps work well. Follow adhesive manufacturer's recommended curing time and clean up procedures.



Note: This diagram is showing only a segment of railing and is for display purposes only.

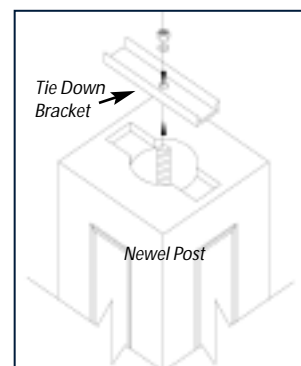
Step 5

"Toe-nail" with 3" wood screws to newel post (screws not included). Use a minimum of 4 screws (2 per side). Patch with a non-shrinking spackling or bondo.

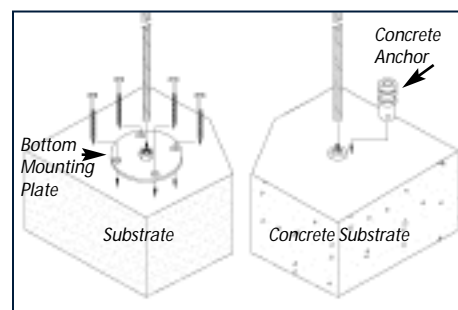
Mount the rail-baluster assembly onto the brackets secured to the newel post. Use the 2 1/2" self tapping screws (x8 per newel post) to secure the rails to the angle brackets. In keeping with four inch ball rule, the space between the bottom rail & substrate must not exceed 4".

Step 6

Set your railing system in place and mark all of the edges of the newel posts on the substrate. Move the railing system aside and mark the center of the newel posts on the substrate. Using a 7/8" diameter drill bit, drill a hole 2 1/4" deep into the substrate for each newel post. Use a hammer to drop the substrate anchors into each hole. Move the railing system back into place over the anchors. Place the 1/2" threaded rod into each newel post and thread it into the anchor about 1". Slide the top tie down bracket over the threaded rod and position the bracket in the pre-cut newel post groove so that the top of the bracket is flush with the top of the newel post (see illustration). Secure this assembly with the 1/2" lock washer and nut.



Set your railing system in place and mark as above. Center the round bottom mounting plate on the substrate and mark the four pre-drilled holes for plate attachment. Using a 3/16" diameter drill bit, drill 4 pilot holes into the substrate for each mounting plate and each newel post. Secure the bottom mounting plate with the provided threaded lag bolts. Move the railing system back into place over the anchors. Place the 1/2" threaded rod into each newel post and thread it into the factory applied nut on the mounting plate. Complete the top assembly as above.



Step 7

To install the decorative caps and/or balls you have chosen for the top of the newel post, apply adhesive to all contact surfaces of the cap and newel post. Center the cap on the post and apply. Screws may be used to secure the cap to the post although the adhesive is strong enough to bond permanently. The balustrade is ready for finishing. All products are supplied with a white double primed finish ready for customer applied finish topcoat. Quality latex or oil based paint should be used.

Step 8

In order to ensure the stability and integrity of the balustrade system, support blocks should be placed under the bottom rail such that the space between each supporting element does not exceed 48". Anchor the support blocks to the substrate and bottom rail.