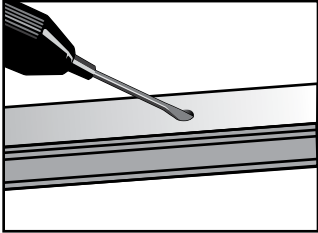


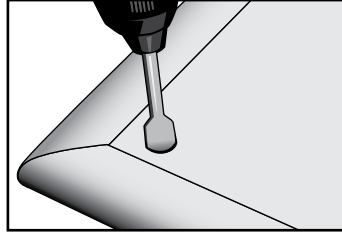
IMPORTANT: Please read instructions thoroughly before beginning.

The following instructions are designed to be used for the installation of our Iron Balusters. Before proceeding with the following steps, the handrail height should already be determined, the baluster locations should already be marked on the handrail, treads and balcony, and the newel posts should already be installed.

Drawing 1a

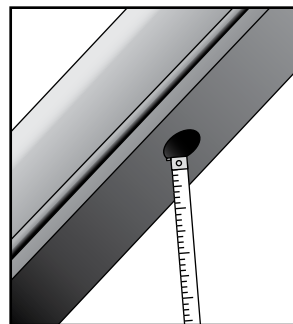


Drawing 1b



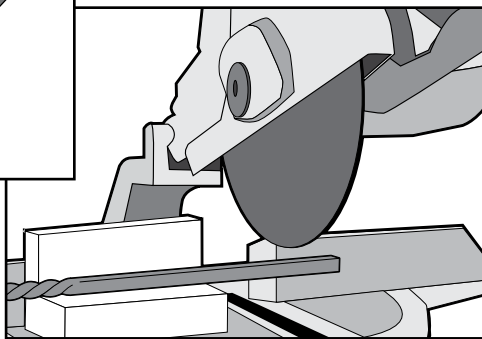
STEP 1 - DRILL THE HANDRAIL AND TREADS:

1. Drill a 9/16" diameter hole, 1" deep on the bottom of the handrail at each pre-marked baluster location (Drawing 1a).
2. Drill an 11/16" diameter hole, 3/4" deep on each tread at each marked baluster location (Drawing 1b).



Drawing 2a

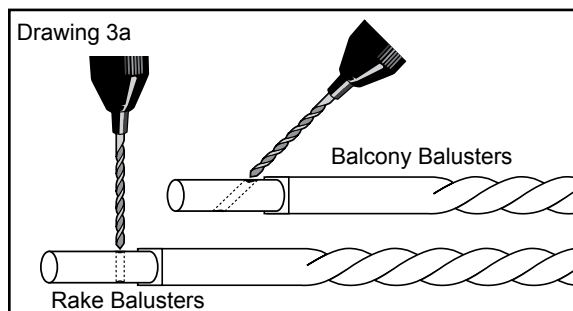
Drawing 2b



STEP 2 - TRIM THE BALUSTERS:

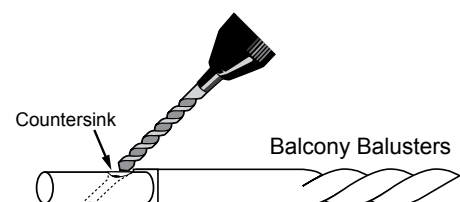
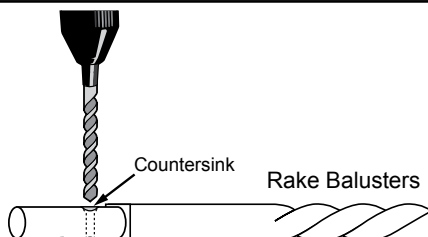
1. Temporarily attach the handrail to the newel posts in order to determine the required length for each baluster.
2. At each baluster location, measure the length between the tread and the lower side of the respective drilled hole in the handrail (Drawing 2a). Add 1" to the measurement for insertion into the handrail and 3/4" to the measurement for insertion into the tread. Transfer the measurements to each respective baluster. Remove the handrail from the newels.
3. Trim each baluster from the bottom using a metal cutting chop saw with a 14" abrasive blade or a portable band saw (Drawing 2b). Be sure to seclude your work area as hot sparks from a metal cutting chop saw can damage nearby windows, flooring, walls, etc.

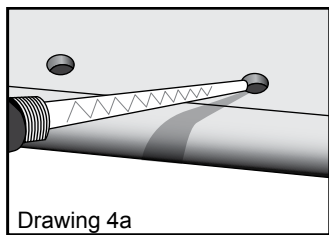
STEP 3 - DRILL THE BALUSTERS:



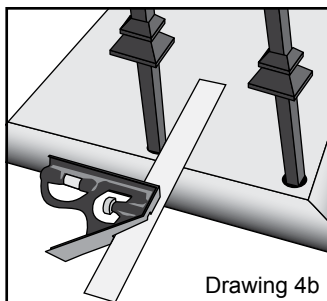
1. It is recommended that every 8th baluster be screwed to the tread and handrail, for a more secure stairway. Determine which balusters will be installed with screws for #2 below.
2. For rake balusters, drill a hole perpendicular through the top pin on every other baluster to accept a flat head screw. For balcony balusters, drill the hole at an angle to accept a flat head screw (Drawing 3a). Drill a second hole at an angle through the bottom of the balusters to accept a flat head screw.
3. Countersink each hole to accept the screw head (Drawing 3b).

Drawing 3b

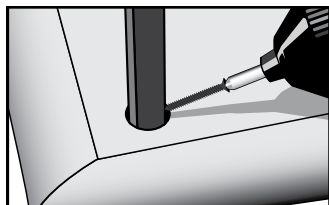




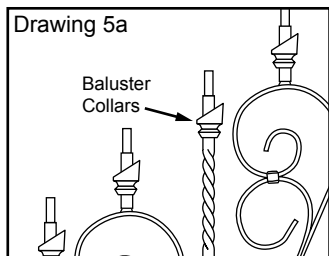
Drawing 4a



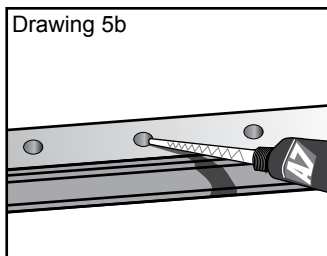
Drawing 4b



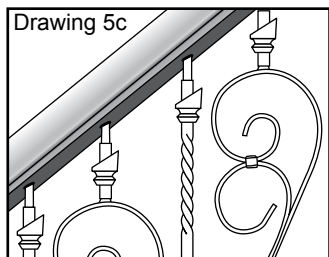
Drawing 4c



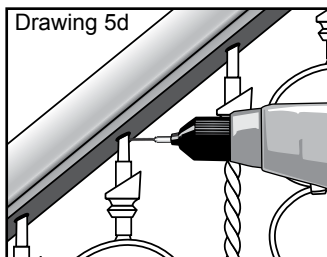
Drawing 5a



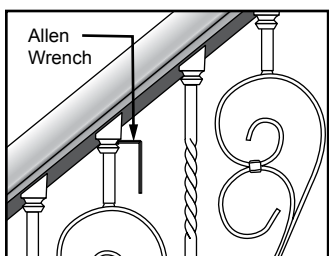
Drawing 5b



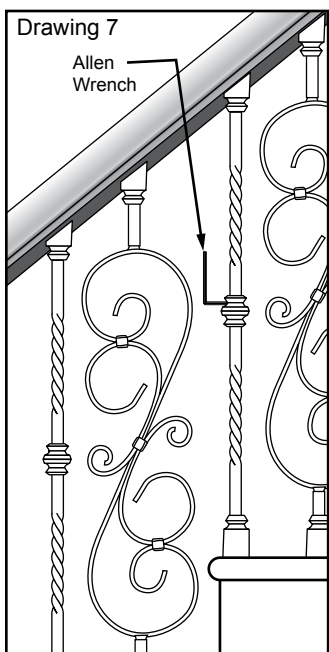
Drawing 5c



Drawing 5d



Drawing 6



Drawing 7

STEP 4 - SECURE THE BALUSTERS TO THE TREADS:

1. Fill the drilled tread holes half full with two-part epoxy or construction adhesive may be used (Drawing 4a).
2. With a bottom base on each baluster, place all balusters in position on the treads. Fill any void around the bottom of the balusters with two-part epoxy or construction adhesive. Rotate each baluster slightly to even the adhesive coverage. Use a combination square to straighten each baluster (Drawing 4b).
3. Secure every 8th baluster with a flat head screw (Drawing 4c).

STEP 5 - SECURE THE BALUSTERS TO THE HANDRAIL:

1. If top baluster collars are being used, place one on each baluster (Drawing 5a). (Note: The angle of the rake top baluster collars can be adjusted to the proper angle by using a hand held grinder).
2. Fill the holes in the handrail half full with construction adhesive (Drawing 5b). (Note: masking tape may be applied over the holes if the construction adhesive has a runny consistency).
3. Position the handrail on top of the balusters and permanently secure the handrail to the newel posts. If masking tape was used over the holes in the handrail, the balusters will push through the tape when the handrail is installed. Then, remove the remainder of the tape on the bottom of the handrail (Drawing 5c).
4. Secure every 8th baluster to the handrail with a flat head screw (Drawing 5d).

STEP 6 - TIGHTEN THE BALUSTER COLLARS:

1. Any protruding epoxy or adhesive should be left to dry (about 24 hours) and can then be removed with a utility knife.
2. Using an allen wrench, secure each top collar against the handrail and each bottom collar against the tread (Drawing 6).

INSTALLING ADJUSTABLE KNUCKLES

Adjustable Knuckles can be used on S4S balusters to create a unique baluster design.

1. After installing the balusters into the tread, but before placing the top baluster collars or handrail on top of the balusters, slide the desired number of Adjustable Knuckles over each baluster.
2. After placing the handrail on top of the balusters, slide each adjustable knuckle to the desired location and tighten the set screw using an allen wrench (Drawing 7).