



# Railing Replacement

Avoid Safety Issues and Future Costly Repairs Now

by Dennis Hill

**T**he pictures tell the story. Ugly rust stains drip over the concrete balcony, cracked and broken concrete, and corroded railing posts are all too common sights in communities and high-rises in Florida, especially on or near any part of Florida's 1,197 miles of coastline. It is estimated that over \$1 billion a year is spent on restoration in the state of Florida, although there are no firm figures on railing replacement as part of that restoration.

Many older communities and buildings in Florida are being compelled to replace their railings now, and many more will be replaced over the next 10 years. The replacement of a community's railings goes beyond just the aesthetics of unsightly stains and corroding posts, and the right decisions now can mean all the difference in the safety and longevity of the newly installed railing system.



“If your high-rise building or community is on the Intracoastal Waterway or east of it, you are probably experiencing some sort of deterioration in your railing posts and concrete,” states Frank Poma, president of Poma Construction’s Railing Division. “Those over 15 years are likely in need of repair or replacement before the situation becomes a life safety issue, and I have seen them needing replacement in as few as six years.”

There are a multitude of factors that contribute to concrete deterioration. Many of the symptoms may be caused by more than one mechanism. However, in the majority of restoration projects, the railings are a major contributing factor.

Once a community has decided to replace its railings with a particular design, the installation system, and the method by which the railing post is attached is crucial to the overall long-term performance of the railings themselves.

Until recently, only two methods existed for attaching railing posts to concrete slabs.

The first method, called plate mounting, employs a welded plate at the bottom of the railing post through which compatible concrete hardware anchors the plate to the concrete. This method consumes balcony space and diminishes the aesthetic look of the balcony since most balconies are tiled. The most serious problems arise when the anchoring holes are not properly waterproofed or the wrong hardware is used. Improper waterproofing will allow water to seep into the concrete, corroding the rebar and causing it to expand. This sets in motion a process known as spalling, whereby the expansion of the rebar causes the concrete to crack. Hairline cracks appear, allowing more water to seep into the concrete, and the problem just continues to worsen over time. Utilizing incompatible hardware, including carbon containing stainless steels, will cause electrolysis to occur. This may corrode the aluminum post and potentially cause concrete spalling.

Another problem arises due to the fact that the aluminum mounting plate, although powder-coated, is in direct contact with the concrete it is attached to. The alkalinity of the concrete attacks the finish leaving the unprotected aluminum in direct contact with the concrete. Electrolysis occurs, resulting in corrosion of the plate/post and paint delamination.

The second installation method is to core drill a three and one-half to four inch hole in the slab and embed the aluminum post directly into the concrete through the use of grout. Historically, this involved



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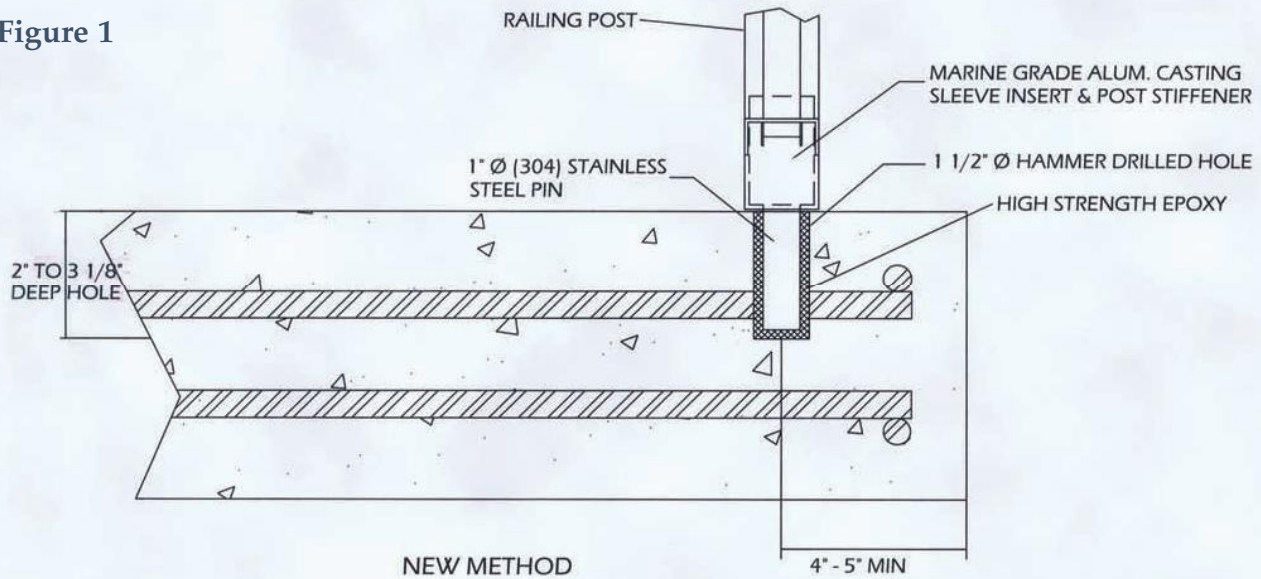
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Figure 1



severing the reinforcing steel located at the edge of the balcony. The use of improper grout material may permit separation between the grout and concrete allowing water intrusion to the rebar, producing spalling and cause the railings to loosen and fail.

Additionally, excessive alkalinity of the grout itself will corrode the imbedded post. Finally, a combination of salt spray and condensation may build up within the post. The post serves as a direct conduit into the center of the concrete, and electrolysis and spalling begin.

However, the industry has seen recent advancements in railing system installation methods. One such method uses a patent-pending system utilizing a carbon free stainless steel pin that is inserted into the railing post and set into the concrete with epoxy (See Figure 1). The epoxy waterproofs the hole, bonds to the concrete, and is electrically non-conductive preventing electrolysis.

The advantages of this system are a smaller core drilled hole; the absence of any contact between the aluminum with any cementitious material or steel; and a stainless steel pin that will never rust. Specially designed channels surrounding the insert permit condensate drainage from within the post to the surface of the concrete where it belongs.

“This particular system is a solution to Florida’s unforgiving



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coastal conditions," says Mike Bianchini, vice president of Carousel Development and Restoration. Bianchini says, "Our clients and engineers use it because it solves the problems that caused the railings to need replacement in the first place."

"Our system has been successful because it eliminates railings as a cause for potential structural damage and costly repairs in the future," adds Poma. "Once community and condominium associations see the costs of restoration and railing replacement now, they don't want to have to do it again."

"This is where a good preventive maintenance program comes into play," Bianchini explains. "Make sure that everything is fastened to the building with a 316 stainless steel fastener, not just the railings. Fill every hole with a urethane sealant, and check all attachments regularly. Attention to these items will go a long way toward dramatically increasing the life span of your buildings."

When it comes to replacing railings, appearance and functionality generally guide the selection process for most associations. However, when opting for a new railing system, either as an aesthetic choice or as part of a necessary and costly restoration, it is important to carefully consider the merits of each available system and the future ramifications of the decision made today.

Dennis Hill is Director of Corporate Development for Poma and Sons in Palm City, FL. For more information, visit [www.pomaonline.com](http://www.pomaonline.com). ■

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