

## **Anatomy of a Plaza Deck**

By Bart Mendel, President

As time passes, and many residential complexes face their 20<sup>th</sup>, 30<sup>th</sup> or 40<sup>th</sup> year, maintenance issues change. In this article we will look at a plaza deck building system in order to understand how it was originally constructed, expectations for its life expectancy, how to extend the life of the system, and ultimately how and when to replace the waterproofing.

Many apartment complexes and associations are constructed with a structural concrete deck above one or more levels of subterranean parking. Generally there are a number of separate residential buildings built on top of the structural concrete deck. For the purpose of this article, we are calling the area in between the buildings the plaza deck. This plaza deck is generally the common area and is enriched with walkways, landscaping, planters, exterior lighting, and sometimes amenities such as tennis courts, swimming pools or spas.

Plaza deck construction varies but generally the structural concrete portion of the assembly is about 12” thick with two layers of steel reinforcement, one at the top and one at the bottom of the pour. Rebar should have 2” concrete cover. If you can see the rebar, there is a problem because the rebar and concrete together provide the strength to resist structural loads. Usually this structural concrete assembly is poured level on top, although in some systems it is sloped to drain. Atop the structural deck is a waterproofing layer, usually an asphaltic waterproofing which can be liquid applied, peel and stick, or mopped in place. On top of the waterproofing layer is a second slab called a mud slab, which is generally thinner, non-structural, serves as protection of the waterproofing layer below, and is generally sloped to area drains. In cases where there is no mud slab, the structural deck itself is sloped to drain and waterproofing is installed directly on top. Finally, the exterior finishes such as landscaping, hardscaping, pavers, planters or amenities are installed.

It is important to understand that the waterproofing layer is sandwiched between the structural slab and a mud slab or exterior finishes. While the mud slab serves to protect the waterproofing layer, this waterproofing material does wear out. Depending upon the type of material and the quality of the original construction, life expectancy varies but generally is limited to 20 to 30 years. The purpose of the waterproofing is to protect the structural slab from water infiltration, and to protect the subterranean garage or finished building space below. The cost of replacement of the waterproofing layer is generally very high, mostly due to the fact that there is so much exterior finish in the way that will have to be removed and replaced just to get to the waterproofing layer.

We have seen many buildings where the subterranean garage shows signs of water infiltration such as leaks, rust and spalling concrete. Rebar rusts when it is attacked by water. Rust takes up more volume than normal iron, so it expands and breaks the surrounding concrete. Cracked concrete often creates further water infiltration, causing more rust, and so the cycle continues. Building owners often ignore these signs of water infiltration or install band-aids such as concrete spall repair performed from below, or even installation of troughs to catch leaking water or even falling chunks of concrete. Is it possible to fix a leaking structural deck from below? If you had a roof leak in your home, would you paint the ceiling? Typically these efforts only move the water to another location and do not solve the problem. Ultimately, over many years, the structural integrity of the deck becomes compromised.

Planters pose further complications. Planters and landscaping that are 20 to 40 years old are generally comprised of mature trees and shrubs. Excessive irrigation or root damage further degrades the life span of the waterproofing membrane. The only way to redo the waterproofing in planters is to remove all the plants and dirt, and then remove and replace the waterproofing. Again, much of the costs are associated with removal and replacement of landscaping—getting to the membrane—rather than the replacement of the membrane itself.

Owners and managers should take proactive steps to lengthen the life expectancy of their plaza deck waterproofing. Irrigation and landscaping should be monitored regularly and trees and plants with invasive roots replaced. Renewing the top coat of deck membranes can lengthen the life expectancy. Many commercial deck coating systems require replacement of the top coat every 4 years, which if performed routinely, can greatly extend the life expectancy of the system.

Once water infiltration has started, it is best to have the situation professionally assessed. In some cases it may be possible to abandon the original waterproofing membrane sandwiched below and install a new layer higher up in the system. In most cases, however, there is little choice but to remove plaza deck landscape and hardscape and install a new system entirely. This significant expense is rarely forecast, and owners and managers would be wise to plan for this capital expense as early as possible.

*Bart Mendel is President of Stonemark Construction Management, a full-service design and construction management firm that specializes in management of capital improvements, construction defect repairs, water infiltration and problem building analysis for homeowner associations and commercial projects.*

*Published in FOCUS Newsmagazine, CAI-Greater Los Angeles Chapter, May/June 2006.  
This and other educational articles are available on our website @ [www.stonemarkcm.com](http://www.stonemarkcm.com).*