

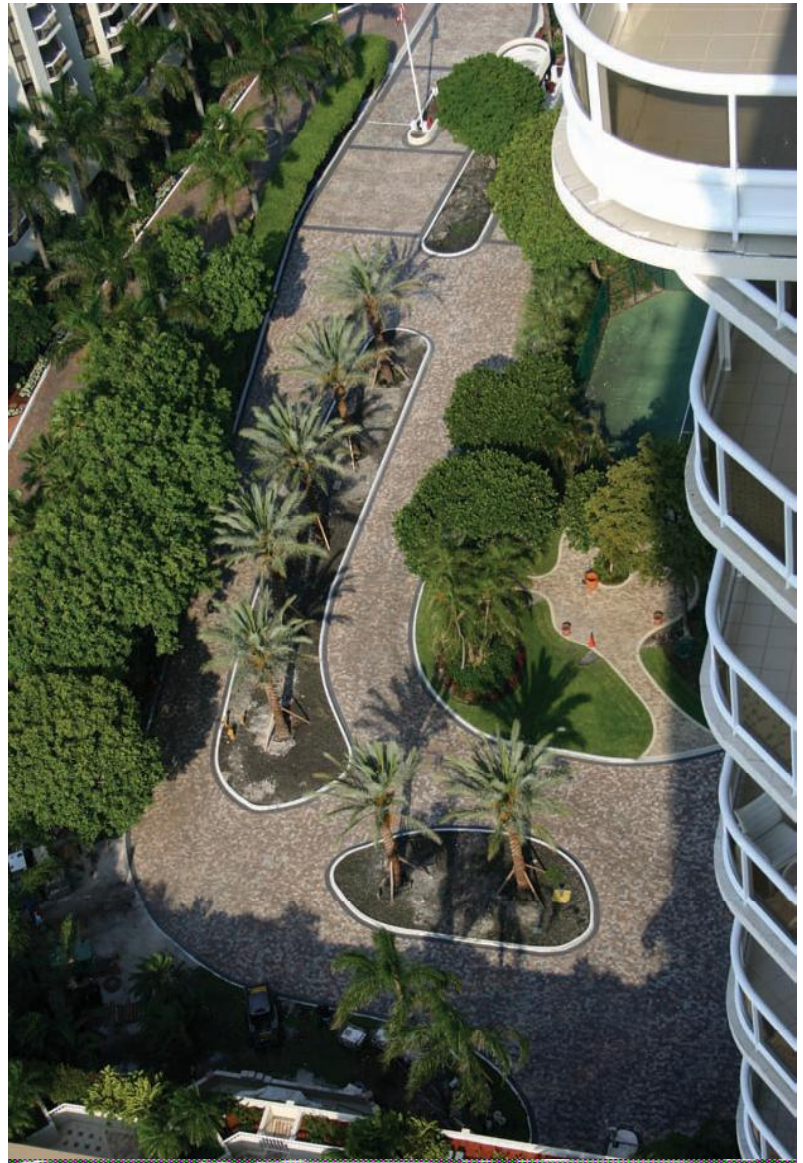
Avoiding Pitfalls in Plaza Deck Restoration

by Colin Meneely

It is no secret that the “gold” coast of South Florida is lined with high-rise condominiums—the majority of which are now close to 30 years old. Subject to the harsh environmental conditions common along the coast, age and natural wear-and-tear, it is crucial to examine the condition of these structures’ plaza decks. A thorough understanding of the issues and challenges that can arise during a plaza deck restoration project, as well as the basic steps in the repair process, will help ensure that the project is bid correctly from the onset and monitored properly throughout the process.

Bidding the Project

A typical plaza deck restoration project consists of the following major work items: topping slab and planter removal, waterproofing removal/deck preparation, concrete/pool restoration, deck/planter drain and plumbing installation, building planter walls, irrigation/electrical system installation, planter/deck waterproofing, paver installation, landscaping/amenity installation, painting and punch-out. Because the size of the deck and planters cannot grow or shrink, nearly all the work items in a typical unit price plaza deck contract are a fixed cost for the owner. The concrete restoration figures, however, have the highest possibility for differentiation in value. Therefore, it is in the best interest of the owner to hire the right firm, specializing in concrete restoration, to manage the project in order to minimize the schedule and budgetary impact of these changes. Relationships with these specialty contractors can be developed through involvement with associations and by keeping up with the latest technologies in the construction industry. Additionally, key people (e.g. manufacturers, distributors, or specialty contractors) frequently publish articles or make presentations at industry events.



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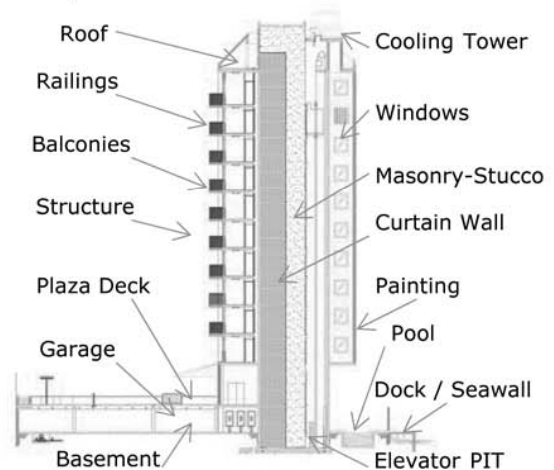
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Topping Slab and Planter Removal

Because of the potential for damage to the property, by far the riskiest step in the repair and restoration process is the topping slab and planter removal. Proper planning is key to success. Prior to the first bang of the hammer, proper care must be taken to protect all surrounding items. Windows and doors should be covered with plywood and, if plywood is not feasible, a blue mask should be used at a minimum. Further, anything underneath the work area must be relocated without exception. Any items that are to remain in operation (fan intakes, television/telephone communication lines, etc.) should be designated clearly. Of course, the best defense against property damage is to restrict the demolition contractor



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from getting too close to items to cause any damage. Initially, this could add cost to the project, as the topping slab near these items will have to be removed by pneumatic chipping hammers. However, the savings will be realized at the end of the project by avoiding replacement of damaged utilities. This strategy, however, will have to be determined by the estimating crew well before the actual commencement of the demolition.

Another important factor that should be determined is the method of debris removal. The job site should be thoroughly inspected to locate the closest area possible for dumpster or dump truck loading and this should be factored into all work items that require trash

removal. The final step in this process is completing clean 90-degree turn-ups that require extensive grinding or floating of the wall.

Removal of Waterproofing and Deck Preparation

The second work task is removing the existing waterproofing and preparing the deck. Depending on the surrounding environment, sandblasting, shotblasting or waterblasting can be used to remove the existing waterproofing and for deck preparation. The key ingredients to selecting a method are the containment of the material used, the type of membrane being removed, and the desired profile of the concrete. The profile must allow proper adhesion of the waterproofing membrane, but should not be deep enough to radiate through if the coating is the final surface. Care should be taken on all perimeter walls to remove the coating/paint to an elevation just above the future elevation of the pavers (including sand/mortar bed) to meet the level of the waterproofing.

Concrete/Pool Restoration and Deck/Planter Drain Installation

When the waterproofing removal is 100 percent complete, the concrete/pool restoration and the deck and planter drain installation can then be undertaken simultaneously. The concrete restoration must be performed after the waterproofing removal is totally complete for two reasons. First, the scarifying of the concrete in the waterproofing removal process will make 90 percent of all spalled concrete visible to the naked eye. Second, the water pressure and ricocheted blasting material make it unsafe to perform concrete repair in the same vicinity.

For the deck and planter drain installation, once the engineer has determined the location of the low spots in the deck, the drains can be installed. Before the drains are set in the concrete, however, they

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should have the bottom flanges and a small pipe segment attached so the hook-up to the horizontal piping can be easily accessed by the plumber. In order to obtain the correct final elevation of the grates, the drain bodies should be poured flush with the concrete deck. Then, an adjustable bi-level drain can be used to allow the elevation of the grate to vary in order to match the level of the pavers/deck. A bi-level drain should always be used when pavers are installed in the deck to allow for drainage at both the top of the structural deck and the top of the finished paver elevation.

The pool restoration includes removing the finish (marcyte, diamond brite, fiberglass, etc.), concrete restoration, removing the gutter tile, replacing the ladders and handrails, and in most cases, removing the pool coping. Replacing the handrails and ladders must include the installation of escutcheon plates into the structural deck prior to the waterproofing application to allow proper flashing around the connections. The reinstallation of the tile, diamond brite, and pool coping is predominantly an aesthetic concern. However, special attention must be paid to the corresponding codes with regard to the coping details and tile placement.

Construction of the Planter Walls

A two-part process, construction of the planter walls involves doweling the vertical steel prior to the installation of the waterproofing—a process which can occur concurrently with the concrete restoration. Once the deck has been surveyed, all dowel locations should be marked, drilled, and the steel placed with epoxy. The second part of the process involves laying the blocks, tying the horizontal steel, and grouting the cells. If the layout of the planters contains connecting planters or planters within other planters, blocks can be placed on their side to allow drainage of more than one planter per drain and also allow irrigation and electrical lines to serve more than one planter. This work can either be completed before or after the planters are waterproofed. If done prior to waterproofing, all debris from the pour must be cleaned to leave a clean 90-degree angle between the block and slab for proper flashing installation. If performed after the

waterproofing, it must occur immediately after because any moisture that may land inside the blocks can seep through the CMU block, possibly ruining the integrity of the waterproofing adhesion on the inside of the planter or staining of the pavers on the deck from the outside of the planter.

Installation of the Irrigation and Electrical Systems

Similar to the construction of the planter walls, the installation of the irrigation and electrical systems is also a two-part process. The pipes must be stubbed out prior to the installation of the waterproofing membrane in the planters, while the installation of the entire system should be completed following the waterproofing. The location of the electrical stub-outs should be placed as close to the proposed lighting fixture as possible to minimize the total run length of piping and, thus, the possibility of broken pipe. If long runs of piping must be used, the piping should be placed



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as close to the block wall as possible. This will help to protect the pipe from damage when the rock, fill, and plants are installed in the planter.

Planter and Deck Waterproofing

The most important step in the process is the planter and deck waterproofing. And, depending on the type of material used and the desired warranty period, this can be accomplished in several different ways. First, the sequencing of the expansion joint installation, if drainage board must be used, the amount of material required, and many other details determine whether or not the old expansion joints must be removed. During this process, it is important to monitor the waterproofing for quality control. One way to check the overall thickness of the material is by calculating the amount of material used over the total area of the deck. However, this method will not account for any low or high spots, rather just an average. Therefore, a mill gage should be used several times each day to determine that the proper amount of material is being placed in every location. Special inspections should occur after certain items are completed such as turn-ups at all perimeters, flashing around pipe stub-outs, caulking around drains and, most important, the installation of the expansion joints.

Once the installation of the waterproofing is completed on the deck and in the planters, a water test should be conducted prior to any other work being performed. It is critical that any leaks

be detected and immediately addressed at this stage in order to avoid any need for removal of construction materials to access the area of concern. The deck and planters should be water tested separately to determine if any leaching of water from the planter to the deck is taking place. This water test is usually conducted for at least 24 hours and should be inspected by the contractor, the waterproofing manufacturer's representative, as well as the engineer-of-record. All results should be well documented to avoid any future misunderstandings.

Installation of the Pavers

One of the most time-consuming steps is the installation of the pavers. Pavers come in several shapes, colors, and materials; however, the most common and cost-effective is the concrete paver. Although the actual installation of the pavers usually takes several weeks to complete, the most critical aspect of this work item occurs well before the first truck of pavers hits the job site. After the production in the manufacturing plant, the pavers are immediately palletized, wrapped and shipped to the job site, because of the high demand for concrete pavers. Therefore, the curing process is occurring as the pavers are sitting on the pallets—stored several courses high. This reduces the ability of the water to dissipate from the pavers into the air, which can lead to a white staining, or efflorescence, on the pavers that can vary from a defined white line to a general cloudiness of the entire paver. As a result, it is critical that the timing of the order be made in a fashion that allows the pallet to be broken immediately upon arrival and the pavers laid right



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away. The other critical factor in the installation is correctly surveying the deck from the beginning. As most paver layouts are repetitive in nature, it is important to ensure that the initial layout is made correctly.

Installation of the Landscaping

The most observed and criticized items on the deck are the landscaping and amenities. Although the function of the entire job is to restore the structural integrity of the deck and make it watertight, the form of the whole job is often the most important element to the client. The landscaping design, though typically selected by a landscape architect or engineer-of-record, should be carefully reviewed by both the concrete repair contractor and the landscaping contractor to ensure that the proposed landscaping is conducive to the surrounding environment.

If there are any issues that appear of great consequence (time of year for installation, resistance to wind or salt, availability of material), they should be raised and addressed well in advance of installation. The amenities can vary greatly from project to project and can include things such as trellises or porticos, water features, signage, tennis courts, shuffleboard courts, barbeque areas or permanent seating areas. These must be addressed individually, well in advance, to ensure that any work requiring penetration through the deck can be accomplished prior to the installation of the waterproofing.

Painting and Final Punch-out

The final two items, which occur simultaneously, are painting and final punch-out. Typically, the new planter walls, as well as surrounding perimeter walls, will require a fresh (or new) coat of paint. In addition, the final punch-out list must be created by the engineer-of-record and submitted in writing so that the project team can keep track of all items as they are completed, thus minimizing the amount of re-work.

Understanding the basic steps of a plaza deck restoration project is important to ensuring that the project remains on schedule. This knowledge will allow you to monitor the project's progress to ensure successful completion of a project this is both on time and within budget.

Colin Meneely is a Project Manager with Structural Preservation Systems' Florida East Branch in Pompano Beach, Fla. ■



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