

## Concepts for Plaza Deck Projects

By Peter D'Antonio

A number of excellent, definitive articles and papers has been presented in recent years on plaza deck waterproofing systems and design. Many of these papers have focused on contrasting system types, material advantages, and recommended standards. In most cases, these articles may be viewed as plaza deck waterproofing primers since they are based on both a generic material analysis and a general level of waterproofing experience. Despite advances in material technology and installation experience, however, there unfortunately continues to be an increase in leaks, litigation, and premature replacement of plaza deck systems. Although it is easy for designers and manufacturers to blame workmanship for most problems, certain safeguards by all parties could be taken to forestall problems. This article is intended to review several important concepts that should be applicable to most deck waterproofing projects. The concepts are not original but are based on observations accumulated from more than a thousand plaza deck applications, mostly rehab projects completed over the past 12 years.

**Concept 1:** One size does not fit all. The system from the last application may not be the best choice for the current project. Designers should carefully review the application before selecting a plaza deck waterproofing system. Systems offer benefits and performance values that will vary from project to project. Unfortunately, there is not a wide variety of manufacturers and system types available with an extensive track record. Some designers are reluctant to specify systems proprietarily, fearing lack of competition and higher prices. A chart outlining system advantages and disadvantages is often helpful in providing a simple comparison. In many cases, one system may clearly be a better choice.

**Concept 2:** Plaza deck system designs should be reviewed by a competent professional. Unfortunately, the design team on most

major new construction projects excludes consultation or peer review of the waterproofing design. In many cases, fundamental waterproofing principles are disregarded. The prime example is design with a lack of proper flashing height at transitions. It has always been good roofing practice to design a minimum of 6 to 8 inches at vertical flashings. The same should hold true for plaza deck waterproofing. In many problem projects, the proper flashing height has been sacrificed because of aesthetics. Increased flashing height minimizes the potential of water infiltration into the building. An experienced roofing and waterproofing consultant is best trained to advise on waterproofing design issues and can be a valid asset to the design team.



University of Minnesota Plaza Renovation, 2000. Designer: INSPEC, Inc. Contractor: Brent Anderson & Associates.

**Concept 3:** Systems that are intended to be fully adhered should be installed to a properly-prepared, concrete surface. Although this concept sounds academic, many of the waterproofing system failures recently investigated and replaced have been adhered systems that were only partially adhered or have delaminated from the concrete deck surface. Concrete deck surface preparation issues have been well documented for many years. Succumbing to the pressures of a general contractor to start work on improperly cured concrete is a risky proposition. Installing an asphaltic-based system directly over coal tar, for example, has proven to be a losing proposition in many cases, as well.

On one recent project, meeting minutes indicate that the manufacturer accepted the installation of a liquid-applied product despite large, unadhered areas. Hot-applied sheet membranes and liquid-applied systems that are intended to be adhered should be well bonded to the concrete deck to ensure dimensional stability, continuity, and watertight performance. Quality assurance procedures should mandate continuous inspection and frequent sampling. These issues emphasize the responsibilities of the contractor and the observer or inspector to ensure proper product installation prior to the installation of the overburden.

**Concept 4:** Full-time inspection is a necessary expense on a waterproofing project and is significantly less expensive than removing and replacing overburden. It has been estimated that damage to the waterproofing system during construction accounts for 85% of leakage after overburden placement. Overburden removal and replacement is an expensive exercise that can reach proportions in excess of 20 times the original cost of the waterproofing. In many cases, overburden removal means disrupting poured-in-place concrete toppings, asphalt paving, or expensive and irreplaceable landscaping.

Choosing a quality waterproofing system and experienced contractor are prerequisites, but full-time monitoring should go a long way toward ensuring that quality assurance procedures are followed, damage issues are addressed immediately, and that shortcuts are avoided. Properly-trained observers can deal not only with product installation but also other trade-related issues that can negatively impact the waterproofing.

**Concept 5:** First cost versus life cycle cost analysis. Why is it always easier explaining installed cost/risk issues to someone who has a failure on his hands than the design/construction team embarking on a new construction project? Unlike many other building components, failed deck waterproofing systems negatively impact occupants, building contents, and the structure. Life cycle analysis, using ASTM methodology, clearly makes a strong case for proven systems with a 20-year track record. In design review, a life cycle costing analysis should be prepared, including costs associated with overburden removal and replacement costs, deck prep, and disposal.

**Concept 6:** Shifting design and performance liabilities to general contractors and waterproofing subcontractors. In an effort to

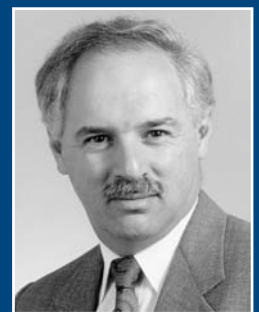
properly assess accountability for design and system changes initiated by contractors, design architects and consultants are taking the high ground in refusing to accept design liability for system substitutions not listed in specifications and plans. The qualities of waterproofing systems vary significantly and should not be casually substituted on the basis of cost, a warranty, or warranty duration. The design team is best suited to evaluate material and design. If the general or subcontractor wants to reduce price by changing the materials or design and the owner acquiesces, the general or sub should assume the liability for design. Designers should not be held responsible for design decisions made by builders and contractors.

**Concept 7:** The owners and building occupants should be aware of how intrusive the waterproofing system installation might be. Despite best efforts, deck construction will effectively close access to the area. All parties should be aware of the potential for asphaltic or adhesive fumes that will probably permeate the structure. This problem is mitigated by fume recovery equipment but may be a more serious issue on multiple decks and setbacks on high rise structures, particularly on rehab projects. Local ordinance and code regulations may escalate as the EPA and NRCA square off on the fume issue. Advising all parties in advance will minimize the crisis calls, unrealistic owner and occupant expectations, and project delays.

There is little magic in waterproofing systems design—just hard work and solid analysis. The best and most risk-free projects are based on assembling an experienced team of professionals, including the designer, (architect/engineer/consultant), waterproofing contractor, quality control and quality assurance personnel, and waterproofing system manufacturer and working together to solve the owner's problem. ■

## ABOUT THE AUTHOR

**Peter D'Antonio** has been with Sarnafil Roofing and Waterproofing Systems for more than 20 years in a variety of sales, marketing, and management positions. Mr. D'Antonio currently acts as the Waterproofing Manager and National Sales Manager of Educational Facilities at Sarnafil. An active RCI member since 1988, he has also served on the Board of Directors for the Sealant, Waterproofing, and Restoration Institute (SWRI), the Boston Chapter of CSI, and is currently on the Executive Committee of the US Department of Energy's Rebuild America Program. Peter resides in New Hampshire. He can be reached at [peter.dantonio@sarnafilus.com](mailto:peter.dantonio@sarnafilus.com).



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