

## Maintenance

# Sustainable, economical solutions to replacement

One of the challenges building and facility managers face on an almost daily basis is how to keep the key components of their aging facilities operating economically. Often replacing a component isn't possible due to the way the building is constructed around the part in question. Also, often the time-frame to get a new one isn't practical. Even when a new component is available, once you factor in cost, you must decide if the replacement is your best option.



**John McDonough, FMP**

District manager,  
Enecon Corp.,  
Denver

Advanced-polymer composite rebuilding and preservation systems often provide alternatives to replacement or costly conventional repair methods. These types of systems have been used for many years by the military and nuclear power industry; however, few facility and commercial property managers realize they are available. These options are often "green," because they provide the facility manager the ability to repair rather than replace a piece of equipment, thereby keeping material out of a landfill.

One recent project where these alternatives materials came into play was a historic and iconic 100-plus-year-old water tower, which was experiencing issues as



*The applicability of concretelike polymer-based materials is widespread and can be beneficial when setting, securing or repairing areas around handrails, metal stair noses and footers.*

a result of severe deterioration of the concrete footers supporting it. Over the decades, numerous patching and coating projects were done using various concrete compounds. While in the short term each of these fixes temporarily made the bases look better, due to the fact concrete shrinks as it cures, the repairs eventually cracked, flaked and failed. Also, the new concrete and cementitious materials used didn't bond well to the older cured concrete, which further contributed to the degradation of the concrete footers.

As part of a large-scale restoration effort, the owner of the water tower sought new technologies and options. Based on research, the owner elected to use an advanced

polymer-based material that not only gave the appearance of concrete but also delivered a bond strength to the existing concrete material that strengthened and protected it from further decay. Additionally, the repair material selected would bond to the steel bases that sit on the concrete, thereby stopping water from entering the existing gap between the steel and concrete, which in the past had caused severe corrosion to the steel as well as damage to the concrete as a result of freeze-thaw cycling. While the material selected was more expensive than conventional modified concrete patching material, the owner realized that short-term fixes yield short-term results and elected to invest in a solution that is

designed to last.

The applicability of these concretelike polymer-based materials is widespread. The bond strength of these type of systems to concrete often is greater than concrete's ability to bond to itself. These types of materials also bond to metallic surfaces, which is beneficial when setting, securing or repairing areas around handrails and metal stair noses. There is zero shrinkage during the curing process; consequently, the material can be easily formed. Also fast set-up times make these systems applicable in a wide range of applications.

Another area where these compounds are seeing a great deal of

*Please see 'McDonough,' Page 19*

## McDonough

---

*Continued from Page 13*

practical application is where metal posts and railing are set in concrete. These areas often are subject to pooling water. Consequently rain, melting snow and de-icing chemicals penetrate into the concrete and voids between the concrete and handrail bases causing severe corrosion resulting in the swelling of the steel set in the concrete, thereby causing the concrete to crack as a result of corrosion or the expansion

of water in freezing conditions. Steel bases that are surface mounted to the slab or wall tops also can experience corrosion from water and de-icing chemicals used in the winter. Simply coating these areas with a paintlike material may not deliver a long-term solution if the design causes water and chemicals to pond at the point of attachment.

Advanced-polymer composite rebuilding and coating systems are available from a handful of manufacturers and come in a variety of forms

to address myriad repair, restoration and protection roles. Investing in these newer technologies isn't always the right answer. However, a knowledgeable solutions provider should assist you in determining when the investment delivers the return on investment you are seeking.

Some of the questions you should be asking when speaking to your solutions provider are what are the alternatives, what's the cost of each solution and what's the turnaround

time required from start to return to service. What is the cost associated with doing nothing and pushing the repair out to some future date? What are the owner's long-term plans for the building?

At the end, when you wonder if an alternative to replacement is available or if a large-scale capital project might be avoided, check with your engineered solutions provider. You might just find that there's a green solution that in the end keeps more green into your pocket.▲