Many parking structure owners put off replacing the roof slab membrane. It can be an expensive mistake. “Deficiencies in concrete will not self-heal, but deterioration will continue to the point of compromising the structural integrity of the building if no remedial action is taken,” says Edgar Vargas, senior engineer, GENIVAR Inc., a global engineering company with offices in 35 countries.

Vargas was a seminar speaker at the building envelope forum in Toronto recently. His topic: restoration, repair and protection of concrete building envelopes and parking structures. “The reluctance of owners to spend money until concrete deficiencies are so serious can affect the eventual cost of repairs exponentially,” he told the audience.

In addition to facing higher repair costs by putting off the inevitable, building owners could be forced by city officials to close their buildings until the repairs are done, he said. “At the first signs of leakage, investigate. Get an engineer to assess it.” Vargas said concrete roof slabs themselves have long-term durability, when properly protected and maintained. “Do the waterproofing repairs and masonry that is required and it will last as long as the building.”

Numerous older parking garages, however, were constructed without waterproofing membranes, leaving them unprotected from chloride and deicing salts attack, he told the session. A membrane should last up to 20 years, in some cases longer. “It is always money well spent to hire an engineer or an expert in the field to have a periodic review of the building envelope and garage structure so that deficiencies are determined and appropriate repairs are carried out.”

One of the most common testing methods for problems is to drag a chain over the surface to listen for internal deterioration in the concrete. Among a host of testing methods are: coring, impact echo, pulse velocity, x-rays, tensile bond and ground penetrating radar, Vargas pointed out.

He said smart building owners incorporate project capital expenditures that take potential
Waterproof membranes prolong life of concrete roof slabs

repairs into account in their reserve funds.
For buildings to function properly, he said, exterior walls must control heat flow, air flow, water vapour, rain, sun, noise and fire.

Restoration, repair and protection of concrete building envelopes has been a recognized and necessary practice over the past 50 years, Vargas said.
“It is the recognition of various performance problems that new technologies, methods and better products have evolved over the years and will continue to in the years to come.”

Vargas added that updates to building codes and standards help to ensure that better design technologies are implemented, starting at the design and construction stages.
A case in point is waterproofing membranes, which were not required in parking garages with suspended slabs years ago. “Now designers are required to provide such (membranes) based on expected exposure conditions.”

Waterproofing membranes can be either thin or thick typically installed in two layers. With thick membranes, however, the bottom layer is hot-applied rubberized asphalt covered with a wearing course consisting of either an asphaltic concrete or mastic asphalt, he said.

An alternative to a membrane is a concrete sealer, which doesn’t penetrate the concrete, Vargas said.
He said the most likely area of a parking garage to deteriorate is at expansion joints. Options for sealing are with caulking, an elastic sheet or an engineered gland.

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