



Is your parking structure sound? Peace of mind through preventative maintenance

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In light of recent events that have taken place including the deterioration and ultimate collapse of a parking structure in the N.Y./N.J. metropolitan area several years ago and many recent garage collapses throughout the country, it is imperative that building owners and associations be made aware of the importance of evaluating the condition of your parking garage.

The first task is to identify the type of garage you have. There are several different types of structures. If you cannot locate the original construction drawings, you should have a qualified engineer visit the site and identify it for you.

Types of garage structures:

1. Steel reinforced pre-cast construction
2. Steel reinforced cast in place construction
3. Steel beam support, steel reinforced slab construction
4. Post and pre-tensioned cast in place construction
5. External post-tensioned construction

Typical useful lives for these types of structures vary:

There are many variables that come into play when estimating how long before your garage needs a major renovation. Maintenance is the key when considering how long you would like your structure to last without a major renovation. Also consider exposure to elements and what type of structure you have.

Currently, there are existing parking structures 100 years old without having major reconstruction, however, this is not typical. Most structures can last 15-20 years without a major "face lift" if accompanied by annual maintenance. If annual maintenance is not performed and the garage condition worsens, the owner could spend hundred of thousands of dollars repairing the garage, not to mention the potential safety hazard the garage has posed to residents, staff and visitors.

Even though parking structures are constructed of highly durable and long lasting concrete and steel, these structures are exposed to the elements. They are also exposed to unnatural elements, such as chloride (found in de-icing and salt products), oil, anti-freeze, gas, etc. which can accelerate deterioration.

Water is the number one influence of parking garage deterioration. Parking garages are always exposed to water, whether it was brought in by a vehicle, or came down the ramp from the exterior or is infiltrating into the garage from a void or crack in the structure. Water is always present on these structures.

Examples of typical deficiencies to look for in your parking structure include:

* Any standing or non-draining water: drainage is a concern in a parking structure. Make sure all drains are clear and operational. Standing water is one of the most destructive and common

problems within parking structures. Without effective and adequate drainage, standing water can lead to slipping hazards, corrosion and even compromising the structural integrity of the garage.

* Joint deterioration: this is a deficiency that needs to be addressed immediately. These areas need to be sealed at all times. Joints allow movement without cracking the concrete. Unsealed joints will allow water to pass through to steel components, causing corrosion and deterioration.

* Spalled, delaminated or cracked concrete: presence of spalled, delaminated or cracked concrete on the driving surface and/or structural columns should be identified and inspected. Again, damaged concrete can allow the passage of water to the reinforcing steel which will exacerbate the corrosion and deterioration process.

Also, movement/deflection, interior and exterior structural steel deterioration, failed or broken connection welds, mechanically fastened expansion joint degradation, crack or ripped overlay, corrosion of the metal housing, to name a few.

Maintenance and preservation techniques:

Keeping the garage clean and free of standing water is of utmost importance.

Create a weekly schedule of tasks for the maintenance crew, to include a fresh water wash down and a sweeping of the standing water. The fresh water will rid all chemicals such as chloride that are harmful to your garage. Ensure all drains are operating properly, and have the maintenance crew report any leaks immediately.

Having your staff inspect all connections, areas of deterioration, expansion joints and anything else that may not "seem right" will be a proactive step that may save your building an unnecessary capital investment.

You may also want to institute a preventative maintenance plan, which sets money aside to help finance the application of new traffic coatings and sealants to the driving surface every 3-5 years. These menial costs will pay off in the long run.

Inspections:

Inspection by a professional engineer once every 3-5 years will save you from unnecessary expenses. Engineers will utilize tests such as visual inspection and sound survey, core samples, compressive strength test, and steel inspections.

The importance of maintaining your parking structure will not only benefit you financially in the long run, it will protect you from unsafe conditions posed by structures which are not maintained. Weekly inspections and maintenance can bring the cost of repairs and or reconstruction to a minimum. An engineering inspection scheduled every 3-5 years will assist in cost savings over the long-term.

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