

EFFICIENT MAINTENANCE OF PRECAST CONCRETE PARKING STRUCTURES

Precast, prestressed concrete parking structures are exceptionally durable, and are well-suited for areas where corrosion could be a problem. In order to provide many years of reliable service, however, they must be properly designed, manufactured, erected and maintained according to the principles of durable design.

Design criteria to be considered in the design of any parking structure should include the following:

- Concrete quality with low water-cement ratios of 0.40 or less and compressive strengths of 5,000 to 6,000 psi
- Proper surface drainage with slopes of 1.5% or more
- Minimum concrete cover over reinforcing steel
- Surface sealers as required
- Crack prevention designs
- High quality construction joint and control joint sealants
- Regular maintenance program to maximize service life of the structure

Required maintenance is divided into three general types: housekeeping, preventive maintenance, and repairs.

HOUSEKEEPING

- Sweeping and trash pickup
- Window cleaning
- Elevator maintenance and cleaning
- Parking space restriping
- Lighting fixture cleaning and re-lamping
- Cleaning, repair and maintenance of signs
- Security systems check

PREVENTIVE MAINTENANCE SCHEDULE

Semiannually:

- Wash down and flush all floor surfaces
- Inspect floor surfaces for any excessive wear and cracking
- Cracks should be routed and sealed with a high-quality sealant
- Inspect floor expansion and control joints for deterioration, wear or abuse from snowplows, etc. Plows should be equipped with rubber-tipped blades
- Inspect and clean floor drains

Annually (Spring):

- Inspect mortar joints
- Inspect each sealant joint and replace sealant as required
- Inspect all structural connections and surrounding concrete area
- Inspect parapets and guard rails and tighten rail bolts
- Inspect all elastomeric bearing pads

REPAIRS

- Repairs are generally necessary due to the lack of a preventive maintenance program
- Repairs may include patching of potholes, removal and replacement of reinforcing steel or bearing pads, etc.
- It is recommended that the owner secure the services of a qualified engineer for appropriate repair methods

It is also strongly recommended that the owner retain an engineer experienced in parking structure design and restoration to periodically perform a condition audit of the parking structure. The potential deterioration of parking structures due to deicing agents and ocean salts is a complex electro-chemical phenomenon.

Copies of the maintenance program should be given to the owner and maintenance staff when the project is completed. Ensuring that maintenance personnel are properly educated and trained is critical to the success of the maintenance program and the ultimate service life of the structure. A properly designed, constructed and maintained precast concrete parking structure should provide a 50-year plus service life and a significantly lower life-cycle cost compared with a conventional cast-in-place concrete parking structure.



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