DCE EMERGENCY ON-CALL SERVICE
ON – SITE FORM

Date: 03/18/14 Time Called: 03/14/14 at 2PM

Address: Moon (Circle Centre) Garage – Parking Garage - 26 West Georgia Street

Arrive Time on Site: @ DCE – 9:00 AM / On-Site - 9:30 AM Departure Time from Site: 10:30 AM

Is DCE on site: [YES] NO

- If not, DO NOT enter the site or proceed with services.
- DCE Representative on Site: Steve Wolff and Kate Warpool
- DCE Representative who called for Services: Kate Warpool

Is IFD on site: YES NO [N/A]
Has IFD cleared the building and stated it is safe to enter the area: YES NO

- If not, DO NOT enter the site or proceed with services

Is IMPD on site: YES NO [N/A]

- If not and it is felt the site is unsafe, notify DCE and ask for IMPD to be on site and/or leave the site.

The following description and comments are based on visual observations by JSE and discussion with DCE staff and owner representatives on site.

Concrete deterioration in the form of cracking, delamination, and spalling with visibly corroding reinforcement was observed in numerous areas on the underside of the parking garage floor slab. Deteriorated concrete has been removed and exposed reinforcing steel has been coated with a corrosion inhibitive coating in many of the areas. On the topside of the slab, patches have been applied and concrete has been sealed in some areas. Concrete delamination that could eventually spall was also detected. Exposed reinforcing steel that had been coated is showing evidence that corrosion has continued. Concrete cracking and "potholes" were also observed on the topside of the slab.

The deterioration is likely the result of water and chloride infiltration and freeze-thaw cycles. Corrosion results from long-term exposure of the concrete to moisture and chlorides from deicing salts. When water and chlorides penetrate into the concrete through the cracks in sufficient concentrations, embedded steel begins to corrode resulting in internal cracking of the concrete, a condition that is associated with spalling and delamination. Spalled concrete could fall, endangering people and could damage vehicles.

Owner representatives indicated that a maintenance plan is in effect and repairs had been done. We were also told that additional repairs are scheduled to be performed. Owner representatives stated that a consulting engineering firm had been hired to perform routine inspections and to develop and monitor further repair programs should additional repairs be necessary.

Based upon our visual observation and discussion with DCE staff and owner representatives, JSE recommends the following:

1) Repair and patch areas of delaminated or spalled concrete on top and bottom of floor slabs. Areas of delaminated concrete should be chipped out to at least 3/4 inch above (bottom of slab) or below (top of slab) any exposed reinforcing steel (where possible). Affected areas should be removed until pristine reinforcing steel is encountered. Exposed concrete and steel surfaces in repair openings should be sandblasted clean to remove dust, rust or loose material, and exposed reinforcing steel should be painted with protective coating. If reinforcing steel corrosion has resulted in significant loss of bar diameter, a qualified structural engineer should inspect the reinforcing steel in the removal area to determine if there is a need for supplemental reinforcing steel. Mortar should be used to fill the removal areas. The use of a bonding agent is recommended to improve the bond between the mortar and the exposed concrete.

2) Seal cracks in floors.

3) Apply and maintain a protective coating on floors.

Above recommendations should be performed under the supervision of a qualified structural engineer.

Javier F. Gauthier, Ph.D., P.E., S.E.
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