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October 1, 2004

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Mr. Buick Alavy City of Minneapolis Property Services 350 South 5th Street, Room 223 Minneapolis, MN 55415

Re: Annual Observation Report St. Anthony Parking Facility 201 Second Avenue Southeast Minneapolis, Minnesota Walker Commission No. 21-3215.00

Dear Mr. Alavy:

In conformance with the City of Minneapolis inspection requirements for parking ramps, the following is a summary of the structural condition of the St. Anthony Parking Facility.

Walker completed a third year field observation of the parking facility to review the condition of the structural elements.

## FACILITY DESCRIPTION

Built in 1980, the St. Anthony Parking Facility is a cast-in-place, post-tensioned concrete parking structure approximately 304 feet long and 110 feet wide. There are seven supported levels with a floor area of 250,000 square feet and a slab-on-grade with a floor area of 28,000 square feet. The parking structure consists of a five inch to seven-inch thick post-tensioned concrete floor slab supported on post-tensioned concrete beams. The beams are spaced at approximately 20 feet on center, span 54 feet and are supported on conventionally reinforced concrete columns. Epoxy coated reinforcing steel was used in the top portion of the floor slab. A corrosion inhibiting admixture (DCI by W.R. Grace Co.) was added to the concrete used in the beams and floor slabs. A dosage rate of 3.5 gallons per cubic yard of concrete was typical. In addition, a concrete sealer was applied to the slab surface upon completion of construction and again in 1989 and 1995.

Access to and from the facility is via street level entry/exit on Second Avenue. The parking facility is a double threaded helix design with one-way traffic and angle parking. Stair towers are located at the northeast and southeast corners and an elevator tower is located at the south end of the facility. At the basement level of the elevator tower a tunnel provides access to the south side of Second Street. The facility provides parking for approximately 910 vehicles.

City of Minneapolis Maintenance and Repair Departments completed concrete floor slab repairs in 2002 and isolated floor repairs and recoating of traffic topping in 2004.



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## VISUAL OBSERVATION SUMMARY AND CONCLUSIONS

During the course of our visual observation of this parking facility, we did not observe any conditions, which would restrict the facility from qualifying for an operating certificate. Limited overhead concrete removals to reduce the hazard of falling concrete are recommended. However, hidden or latent conditions may exist in this facility, which have not yet revealed themselves through visual evidence and may require removal in subsequent years. The following is a summary of conditions noted:

- 1. Exposed floor slab post-tensioning tendons were observed at three locations on Level 7 due to minimal concrete cover. Tendons sheaths were not breached.
- 2. Leaking/leaching floor cracks at isolated locations.
- 3. Spot failures of expansion joint glands and nosings, construction joints, and cove sealant.
- 4. Weathered/deteriorated joint sealants were typical at top exposed level.
- 5. Deteriorated nosing material at premolded wide seal expansion joints was noted throughout.
- 6. Concrete ceiling, columns, column patches, wall, and floor slab delaminations and spalls at random locations.
- 7. Debonded/damaged traffic coating was noted at Level 2. Worn traffic topping was noted in drive lanes.
- 8. Isolated beam cracks.
- 9. One location of a leaking and leaching beam crack at expansion joint.
- 10. Moderate to severe corrosion with isolated areas of 100% section loss to door frames (bottom 6" typical) at many levels of the northeast and southeast stair towers.
- 11. Adhesive failure and leaking at caulked expansion joint on roof level west bay.
- 12. Damaged/loose snow fence gate on Roof west bay.
- 13. Isolated areas of ponding water.
- 14. Debonded grout pockets at interior precast wall panel connections were typical at both stair towers.
- 15. Isolated areas of moderate to severe corrosion to metal stair pans.
- 16. Stair nosing has moved vertically causing trip hazard at the first landing of the southeast stair tower.
- 17. Isolated cracks and spot delaminations on precast façade panels.
- 18. Weathered/deteriorated joint sealants at facade panels were typical.

Leaking construction joints, expansion joints, or cracks can contribute to corrosion of embedded posttensioning tendons and anchors and reinforcing steel. Corrosion of embedded post-tensioning tendons and anchors can adversely affect the structural integrity of the floor slab; therefore, all joints and slab cracks should be sealed and maintained annually.

It should be noted that Walker Parking Consultants/Engineers, Inc. has not performed a structural review to verify the structural adequacy of the original design, as this is not within the scope of work. During our review, we did not observe deterioration to be indicative of inadequate original structural design or construction.



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## CERTIFICATION

The City of Minneapolis Ramp Certification Ordinance requires that the engineer state whether the structure is capable of supporting the loads for which it is used. This structure is primarily used for the parking of passenger cars and, in our opinion, presently is capable of supporting that load.

Our recommendations include the continuation of annual structural maintenance, repair stair tread nosing, removal of all loose concrete overhead as it is detected, seal all leaking or deteriorated slab cracks and joints, and remaining items noted above.

The above engineering services provided were completed by me or under my direct supervision. My field of practice is structural engineering with primary emphasis on concrete deterioration and renovation. Walker Parking Consultants/Engineers, Inc. carries the \$250,000 insurance coverage required by Section 108.80 of the City Ordinance.

If we can be of further assistance or answer any questions, please call on us.

Sincerely,

WALKER PARKING CONSULTANTS

Stephen D. Disch, P.E. Principal

Kihad J. Clames

Richard J. Elsner, P.E. Project Manager