



**WALKER**  
PARKING CONSULTANTS

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October 14, 2005

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

Re: *Annual Observation Report  
Centre Village Parking Facility  
700 Fifth Avenue South  
Minneapolis, Minnesota  
Walker Commission No. 21-3254.00*

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 Centre Village 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 1983-84, the Centre Village Parking Facility is a cast-in-place, post-tensioned concrete parking structure approximately 328 feet long and 122 feet wide. This facility supports a condominium complex above. There are three supported parking levels and one slab-on-grade level below street level, and seven supported levels above street level. The supported floor area is 310,000 square feet and the slab-on-grade area is 40,000 square feet. The supported floor consists of an eight-inch thick, two-way post-tensioned concrete slab system supported on conventionally reinforced concrete columns. The slab spans typically 27'-8" in the north-south direction. In the east-west direction the slab spans are 16 feet and 28 feet. 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 floor slabs. A typical dose rate was 3.5 gallons per cubic yard of concrete. In addition, a concrete sealer was applied to the slab surface upon completion of construction and again in 1990, on the upper levels in 1996, the lower levels in 1997, and half of the facility in 2003 with the remainder in 2004.

Access to the above grade parking is provided by an entry express ramp from Fifth Avenue and with an exit express ramp to Eighth Street. Access to the below grade parking is provided by an entry express ramp from Seventh Street and with an exit express ramp to Fifth Avenue.



The traffic flow on the supported levels is one-way with 90-degree parking. The levels below grade are an end-to-end helix and the upper levels are of a double-threaded helix design. Stair towers are located at the northeast and southeast corners of the facility. Elevator towers are provided at the northwest corner and the center of the west side. An additional stair tower is provided at the center of the west side for the below grade parking. The facility provides parking for approximately 1,190 vehicles.

## **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. Floor slab delaminations were noted throughout all levels primarily located adjacent to construction joints and columns.
2. Exposed post-tensioning tendons were noted at a few floor slab spalls. Tendon sheathing was noted to be in good condition.
3. One slab post-tensioning tendon was noted broken at Level 3.
4. Exposed conventional reinforcement at isolated locations.
5. Many small floor spalls located at previous vehicle fire area at southeast corner of Level 4. Also, a few ceiling spalls were observed.
6. Extensive full depth floor cracking throughout Levels D through 2. Light to heavy water staining on ceilings below.
7. Full depth floor cracking was primarily concentrated to the middle crossover and end bays at Levels 3-7. Light to heavy water staining on ceiling below.
8. Isolated floor slab construction joints were leaking.
9. Traffic topping was noted worn in isolated areas.
10. Adhesive failure of cove joint sealant was noted primarily at the Street Level. Cove joint sealant is needed at concrete islands/curbs and at the uphill side of columns throughout.
11. Joint sealant is needed at the north, south, east and west walls at Levels 2-7.
12. Failed joint sealants between the sidewalk and supported slab on street level results in leaking below.
13. Isolated concrete ceiling delaminations were noted primarily at leaking slab cracks or construction joints.
14. Isolated concrete column delaminations were noted primarily at the corners at the slab intersection.
15. Small areas of ponding water were noted throughout.
16. Horizontal crack in brick cap mortar joint of the exterior panels.



17. Rusted concrete panel to column connection.
18. Spalled brick on east wall elevation.
19. Isolated mortar joint deterioration observed.
20. Numerous vertical wall cracks in mortar joints and through bricks on east wall of north and south stair towers.
21. Rust staining and deteriorated joint sealant observed at brick construction joints.
22. Corrosion of brick shelf angles was noted throughout.
23. Emergency electrical generator appears to exhaust directly into Level B.

In 2005, a new concrete overlay has been placed at grade level by the west hotel entry area.

Leaking or unsealed construction joints or cracks can contribute to corrosion of embedded post-tensioning 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 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.

## **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, removal of all loose concrete overhead as it is detected and remaining items noted above. We strongly recommend a program be undertaken summer, 2006, to repair the leaking and slab cracks and construction joints to protect the post-tensioning tendons. Additionally, we recommend a more detailed investigation and repair of the façade cracks, brick spalling and rusting shelf angles to protect the public from falling materials. Structural maintenance should include consideration of traffic topping around the columns where the reinforcing steel is located near the top surface of the slab. Also, item 23. is a safety issue and needs further review.

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.



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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