October 14, 2005

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. 21-3254.00

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 St. Anthony Parking Facility.

Walker completed a first year field observation, chain drag and chloride ion testing of this 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, 1995, and 2003.

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.

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. Leaking/leaching floor cracks at isolated locations.
2. Spot failures of expansion joint glands and nosings, and construction joint and cove sealants. Weathered/deteriorated joint sealants were typical at top exposed level.
3. Deteriorated nosing material at premolded wide seal expansion joints was noted throughout.
4. Concrete delaminations and spalls at random locations at ceilings, columns, walls, curbs, and floor slabs.
5. Debonded/damaged traffic coating at Levels 2 and 3, and in drive lanes.
6. Isolated beam, column, and ceiling cracks.
7. Damaged/loose snow fence gate on Roof west bay.
8. Isolated areas of ponding water.
9. Replace metal pans and landings on Levels 2 and 3 in Stair B.
10. Isolated cracks and spot delaminations on precast façade panels.
11. Weathered/deteriorated joint sealants at facade panels were typical.
12. Door on roof level at Stair B will not open.
13. Swing gate missing at Stair A, Level 2.
14. Leaching cracks in tunnel ceiling and walls, and isolated roof level columns.
15. Isolated beam delaminations.
16. Isolated stair landing delaminations.

Leaking construction joints, expansion 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 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.

CHLORIDE ION TESTING

Enclosed are test results from American Engineering Testing. A chloride comparison table indicates the change in chloride concentrations at selected locations in the parking facility. Chloride sampling this year was taken in close proximity to the 1984, 1987, 1990, 1992, 1996, 1999 and 2002 sites.

Twenty-four (24) concrete powder samples were removed from eight (8) locations and tested for acid soluble chloride ion content (salt contamination). Powder samples were removed in one-inch increments at each location to establish the chloride ion content of concrete as a function of depth.

Concentrations of chloride ions ranging from 375 to 550 parts per million (PPM), along with the presence of moisture and oxygen, are needed to support corrosion of "gray" (non-epoxy coated) mild steel reinforcement in concrete. Of particular importance is the chloride ion concentration at the level of steel reinforcement.

The amount of chloride ions in the concrete at the 0 to 1-inch increment below the surface ranges from 270 PPM to 2810 PPM, averaging 1387 PPM. At the 1 to 2 inch increment, the amount of chloride ranges from <80 PPM to 930 PPM, averaging 340 PPM. At the 2 to 3 inch increment, the amount of chloride ranges from <80 PPM to 80 PPM, averaging 80 PPM.

Review of the test results indicates high chloride ion concentrations, above the threshold values to support corrosion of the "gray" reinforcing steel in the top 1 inch of the floor slab and at 3 locations in the 1 to 2 inch range. The design drawings specify that the top mild steel have 1-1/2 inches of concrete cover. Therefore, the floor slab is chloride contaminated at the level of top reinforcing steel. Since the mild steel in the top of the floor slab is epoxy coated and DCI was added to the concrete, additional protection against corrosion is in place.

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.

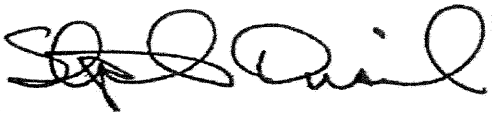
Our recommendations include the continuation of annual structural maintenance, repair stair tread nosing, removal of all loose concrete overhead as it is detected, seal all leaking or deteriorated slab cracks and joints, and remaining items noted above.

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

WALKER
PARKING CONSULTANTS

CHLORIDE ION CONTENT DETERMINATION
LABORATORY ANALYSIS RESULTS FORM

Sample No.	Sample Identification	CHLORIDE ION CONTENT -PPM- Depth Increment Tested 0" – 1"	1" – 2"	2" – 3"	Comments
CL-1	Drive Lane	1650	240	80	Level 9, East Bay
CL-2	Drive Lane	305	80	<80	Level 8, West Bay
CL-5	Drive Lane	270	<80	<80	Level 7, East Bay
CL-6	Drive Lane	1415	505	<80	Level 6, East Bay
CL-8	Drive Lane	965	285	< 80	Level 5, East Bay
CL-10	Drive Lane	2370	470	<80	Level 4, West Bay
CL-13	Drive Lane	1310	<80	<80	Level 3, East Bay
CL14	Drive Lane	2810	930	<80	Level 2, West Bay

American Information

Date Received: 9-27-05
Test Required: Acid Soluble Chloride Content
Samples Tested By: JSkubitz

AMERICAN ENGINEERING TESTING, INC.
St. Paul, MN

Walker Information

Project Name: St. Anthony Ramp
Project Number: 21-3254.00
Samples Taken By: JCL
Date Sampled: 9/19/05
Number Submitted: 24
Date Submitted: 9/26/05

ST. ANTHONY PARKING RAMP -- CHLORIDE COMPARISON

			1984 PPM VALUES			1987 PPM VALUES			1990 PPM VALUES			1992 PPM VALUES			1996 PPM VALUES			1999 PPM VALUES			2002 PPM VALUES			2005 PPM VALUES		
#	ID	TIER	0"-1"	1"-2"	2"-3"	0"-1"	1"-2"	2"-3"	0"-1"	1"-2"	2"-3"	0"-1"	1"-2"	2"-3"	0"-1"	1"-2"	2"-3"	0"-1"	1"-2"	2"-3"	0"-1"	1"-2"	2"-3"	0"-1"	1"-2"	2"-3"
1	D	9	840	90	50							872	136	54	3418	491	216				1605	385	80	1650	290	80
2	D	8				125	210	114	297	113	42	364	72	39	4171	291	220	1495	245	220	635	345	80	305	80	<80
3	D	8																								
4	D	7	240	50	40																					
5	D	7	130	70	40	244	58	76	434	100	96	247	86	44	1663	328	260	565	275	175	665	80	80	270	<80	<80
6	D	6				1630	158	90	751	134	120	1432	76	65	4804	436	208	2130	440	210	2795	380	80	1415	505	<80
7	D	6																								
8	D	5	300	90	90	1750	122	60	593	117	88	488	40	35	2121	264	167	1230	260	230	925	80	80	965	285	<80
9	D	5	290	40	50																					
10	D	4				1770	140	92	921	129	40	2196	244	55	>6000	817	231	1625	220	240	3345	955	110	2370	470	<80
11	D	4																								
12	D	3	470	90	80																					
13	D	3	540	30	40	484	104	65	2570	283	106	232	58	53	2899	229	182	1635	305	175	2315	145	80	1310	<80	<80
14	D	2	2800	310	80	2280	135	50	1030	144	40	2232	135	61	>6000	1803	972	3430	685	275	2385	355	80	2810	930	<80
15	D	2	490	50	50																					
16	D	1	560	50	60																					
# ENTRIES			10	10	10	7	7	7	7	7	7	8	8	8	8	8	8	7	7	7	8	8	8	8	8	8
MINIMUM			130	30	40	125	58	50	297	100	40	232	40	35	1663	229	167	565	220	175	635	80	80	270	<80	<80
AVERAGE			666	87	58	1183	132	78	942	146	76	1008	106	51	3885	582	307	1730	347	218	1834	341	84	1387	340	80
STD DEV			737	77	18	807	43	20	706	58	32	789	61	10	1546	494	253	822	153	33	963	263	10	841	274	0
MAXIMUM			2800	310	90	2280	210	114	2570	283	120	2232	244	65	>6000	1803	972	3430	685	275	3345	955	110	2810	930	80
% increase from previous year =						78%	52%	35%	-20%	10%	-3%	7%	-27%	-33%	285%	450%	505%	-55%	-40%	-29%	6%	-2%	-62%	-24%	0%	-4%
% increase from 1984 =						78%	52%	35%	41%	67%	31%	51%	22%	-13%	483%	569%	429%	160%	299%	276%	175%	292%	44%	108%	291%	38%
Overall Average			1984 AVG=		270	1987 AVG=		465	1990 AVG=		388	1992 AVG=		388	1996 AVG=		1591	1999 AVG=		765	2002 AVG=		753	2005 AVG=		602